

**EMC TEST REPORT**

For

Hangzhou Enya Arts&amp;Crafts Co.,Ltd

Decoration light

Model No.: EY#&-\*\*\*\*, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE,  
&=T MEANS TREE,&=L MEANS LIGHTING CHAIN, “\*\*\*\*” MEANS  
QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED)

Additional Model No.: EY#-\*\*\* , # means voltage ( 3-6VDC ) , \*\*\* means quantity of  
LED, from 001 to 200 (indicates 1 LED to 200 LED)

Prepared for : Hangzhou Enya Arts&Crafts Co.,Ltd  
Address : No.2-1 Fengcheng Road, Pingyao Town, Yuhang District,  
Hangzhou

Prepared by : Zhongshan LCS Compliance Testing Laboratory Ltd.  
Address : 23F, Building A, Zhongshan Harbor of iDEAS, No. 25 Gangyi  
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Date of receipt of test sample : May 13, 2019  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : May 13, 2019~ May 25, 2019  
Date of Report : May 25, 2019



**EMC TEST REPORT**  
**EN 55015: 2013+A1: 2015**

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment  
**EN 61547: 2009**

Equipment for general lighting purposes - EMC immunity requirements

**Report Reference No. .... :** LCS190513016DE

**Date Of Issue ..... :** May 25, 2019

**Testing Laboratory Name..... :** Zhongshan LCS Compliance Testing Laboratory Ltd.

**Address ..... :** 23F, Building A, Zhongshan Harbor of iDEAS, No. 25 Gangyi Road, Torch Development Zone, Zhongshan, Guangdong, China

**Testing Location/ Procedure ... :** Full application of Harmonised standards   
Partial application of Harmonised standards   
Other standard testing method

**Applicant's Name ..... :** Hangzhou Enya Arts&Crafts Co.,Ltd

**Address ..... :** No.2-1 Fengcheng Road, Pingyao Town, Yuhang District, Hangzhou

**Test Specification:**

**Standard ..... :** EN 55015: 2013+A1: 2015  
EN 61000-3-2: 2014  
EN 61000-3-3: 2013  
EN 61547: 2009

**Test Report Form No..... :** LCSEMC-1.0

**TRF Originator ..... :** Zhongshan LCS Compliance Testing Laboratory Ltd.

**Master TRF ..... :** Dated 2016-08

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**Test Item Description. .... :** Decoration light

**Trade Mark ..... :** N/A

**Model/ Type Reference ..... :** EY#&-\*\*\*\*, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "\*\*\*\*" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED)

**Ratings ..... :** 31VDC, 50Hz, Max.15W

**Result ..... :** Positive

**Compiled by:**

*Mindie*

**Supervised by:**

*Cindy*

**Approved by:**



Mindie Mai/ File administrators

Cindy Nie/ Technique principal

Edison Xia / Manager

## EMC -- TEST REPORT

**Test Report No. : LCS190513016DE**

May 25, 2019

Date of issue

EY#&-\*\*\*\*, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS  
 Type/Model.....: LIGHTING CHAIN, “\*\*\*\*” MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED)

EUT.....: Decoration light

**Applicant.....: Hangzhou Enya Arts&Crafts Co.,Ltd**  
 Address .....: No.2-1 Fengcheng Road, Pingyao Town, Yuhang District, Hangzhou  
 Telephone.....: /  
 Fax.....: /

**Manufacturer .....: Hangzhou Enya Arts&Crafts Co.,Ltd**  
 Address .....: No.2-1 Fengcheng Road, Pingyao Town, Yuhang District, Hangzhou  
 Telephone.....: /  
 Fax.....: /

**Factory .....: Hangzhou Enya Arts&Crafts Co.,Ltd**  
 Address .....: No.2-1 Fengcheng Road, Pingyao Town, Yuhang District, Hangzhou  
 Telephone.....: /  
 Fax.....: /

**Test Result** according to the standards on page 7: **Positive**

The test report merely corresponds to the test sample.  
 It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

### Revision History

| Revision | Issue Date   | Revisions     | Revised By |
|----------|--------------|---------------|------------|
| 00       | May 25, 2019 | Initial Issue | Edison Xia |
|          |              |               |            |
|          |              |               |            |

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# 1. SUMMARY OF STANDARDS AND RESULTS

## 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

| <b>EMISSION (EN 55015: 2013+A1: 2015)</b>         |                             |                             |                |
|---|-----------------------------|-----------------------------|----------------|
| <b>Description of Test Item</b>                   | <b>Standard</b>             | <b>Limits</b>               | <b>Results</b> |
| Conducted disturbance at mains terminals          | EN 55015: 2013+A1: 2015     | -----                       | PASS           |
| Magnetic field emission                           | EN 55015: 2013+A1: 2015     | -----                       | PASS           |
| Radiated disturbance                              | EN 55015: 2013+A1: 2015     | -----                       | PASS           |
| Harmonic current emissions                        | EN 61000-3-2: 2014          | Class C                     | N/A            |
| Voltage fluctuations & flicker                    | EN 61000-3-3: 2013          | -----                       | N/A            |
| <b>IMMUNITY (EN 61547: 2009)</b>                  |                             |                             |                |
| <b>Description of Test Item</b>                   | <b>Basic Standard</b>       | <b>Performance Criteria</b> | <b>Results</b> |
| Electrostatic discharge (ESD)                     | EN 61000-4-2: 2009          | B                           | PASS           |
| Radio-frequency, Continuous radiated disturbance  | EN 61000-4-3: 2006+A2: 2010 | A                           | PASS           |
| Electrical fast transient (EFT)                   | EN 61000-4-4: 2012          | B                           | PASS           |
| Surge (Input a.c. power ports)                    | EN 61000-4-5: 2014+A1:2017  | C                           | N/A            |
| Radio-frequency, Continuous conducted disturbance | EN 61000-4-6: 2014+A1:2015  | A                           | PASS           |
| Power frequency magnetic field                    | EN 61000-4-8: 2010          | A                           | PASS           |
| Voltage dips, 30% reduction                       | EN 61000-4-11: 2004+A1:2017 | C                           | N/A            |
| Voltage interruptions                             |                             | B                           | N/A            |
| N/A is an abbreviation for Not Applicable.        |                             |                             |                |

## 1.2. Description of Performance Criteria

### **General Performance Criteria**

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.

#### 1.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 1.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 1.2.3. Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be loss.



## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

|              |   |
|--------------|---|
| EUT          | : Decoration light  |
| Trade Mark   | : N/A   |
| Model Number | : EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE, &=L MEANS LIGHTING CHAIN, “****” MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) |
| Power Supply | : 31VDC, 50Hz, Max.15W  |

### 2.2. Description of Test Facility

|                                     |   |
|-------------------------------------|---|
| Site Description<br>EMC Lab.        | : TUV RH Registration Number. is UA 50418075 0001.<br>UL Registration Number. is 100571-492.<br>NVLAP Registration Number. is 600112-0.                                 |
| Test Facilities                     | Zhongshan LCS Compliance Testing Laboratory Ltd.<br>23F, Building A, Zhongshan Harbor of iDEAS, No. 25 Gangyi Road, Torch Development Zone, Zhongshan, Guangdong, China |
| RF Field Strength<br>Susceptibility | Shenzhen LCS Compliance Testing Laboratory Ltd.<br>1F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue., Bao'an District, Shenzhen, Guangdong, China              |

### 2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

### 2.4.Measurement Uncertainty

| Test                                       | Parameters  | Expanded uncertainty (U <sub>lab</sub> ) | Expanded uncertainty (U <sub>cispr</sub> ) |
|--|---|--|--|
| Conducted Emission                         | Level accuracy<br>(9kHz to 150kHz)<br>(150kHz to 30MHz) | ± 1.40 dB<br>± 2.80 dB                   | ± 4.0 dB<br>± 3.6 dB                       |
| Electromagnetic Radiated Emission (3-loop) | Level accuracy<br>(9kHz to 30MHz)                       | ± 3.46 dB                                | N/A  |
| Radiated Emission                          | Level accuracy<br>(9kHz to 30MHz)                       | ± 3.12 dB                                | N/A  |
| Radiated Emission                          | Level accuracy<br>(30MHz to 200MHz)                     | ± 4.66 dB                                | ± 5.2 dB                                   |
| Radiated Emission                          | Level accuracy<br>(200MHz to 1000MHz)                   | ± 4.64 dB                                | ± 5.0 dB                                   |
| Mains Harmonic                             | Voltage   | ± 0.640%                                 | N/A  |
| Voltage Fluctuations & Flicker             | Voltage   | ± 0.530%                                 | N/A  |

- (1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.
- (2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

### 3. MEASURING DEVICES AND TEST EQUIPMENT

#### Conducted Disturbance

| Item | Test Equipment     | Manufacturer | Model No.   | Serial No.    | Due Date.  |
|------|--------------------|--------------|-------------|---------------|------------|
| 1    | EMI Test Receiver  | R&S          | ESCI        | 101010        | 2020-02-10 |
| 2    | 10dB Attenuator    | SCHWARZBECK  | VTSD9561-F  | 9561-F059     | 2019-06-28 |
| 3    | Artificial Mains   | SCHWARZBECK  | NSLK8127    | 8127716       | 2019-06-28 |
| 4    | EMI Test Software  | EZ           | EZ EMC      | N/A           | 2019-06-28 |
| 5    | ISN CAT6           | SCHWARZBECK  | NTFM 8158   | NTFM 8158#120 | 2019-06-28 |
| 6    | Vorsteckteiler 6dB | SCHWARZBECK  | VT 9420-221 | N/A           | 2019-06-28 |

#### Radiated Disturbance(9kHz to 30MHz)

| Item | Test Equipment      | Manufacturer | Model No. | Serial No. | Due Date.  |
|------|---------------------|--------------|-----------|------------|------------|
| 1    | EMI Test Receiver   | R&S          | ESPI      | 101142     | 2019-06-28 |
| 2    | Triple-loop Antenna | EVERFINE     | LLA-2     | 9161       | 2019-06-28 |
| 3    | EMI Test Software   | EZ           | EZ EMC    | N/A        | 2019-06-28 |

#### Radiated Disturbance(30MHz to 300MHz)

| Item | Test Equipment           | Manufacturer   | Model No.    | Serial No.    | Due Date.  |
|------|--------------------------|----------------|--------------|---------------|------------|
| 1    | 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M       | 03CH03-HY     | 2019-08-05 |
| 2    | EMI Test Receiver        | R&S            | ESCI         | 101940        | 2019-06-28 |
| 3    | Log per Antenna          | SCHWARZBECK    | VULB9163     | 5094          | 2019-04-30 |
| 4    | EMI Test Software        | AUDIX          | E3           | N/A           | 2019-06-28 |
| 5    | Positioning Controller   | MF             | BK8807-4A-2T | 2016-0808-008 | 2019-06-28 |

#### Electrostatic Discharge Immunity Test (ESD)

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Due Date.  |
|------|----------------|--------------|-----------|------------|------------|
| 1    | ESD Simulator  | KIKUSUI      | KES4021   | KC001311   | 2019-07-01 |

#### Electrical Fast Transient/Burst Immunity Test (EFT)

| Item | Test Equipment                          | Manufacturer | Model No. | Serial No. | Due Date.  |
|------|---|--------------|-----------|------------|------------|
| 1    | Electrical fast transient(EFT)generator | HTEC         | HEFT51    | 162201     | 2019-06-28 |
| 2    | Coupling Clamp                          | HTEC         | H3C       | 163701     | 2019-06-28 |

#### Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields (CS)

| Item | Test Equipment                     | Manufacturer | Model No. | Serial No.    | Due Date.  |
|------|------------------------------------|--------------|-----------|---------------|------------|
| 1    | Conducted Susceptibility Generator | HTEC         | CDG6000   | 126A140012016 | 2019-06-28 |
| 2    | CDN                                | HTEC         | CDN-M2+M3 | A22/0382/2016 | 2019-06-28 |
| 3    | Attenuator                         | HTEC         | ATT6      | HA1601        | 2019-06-28 |
| 4    | Electromagnetic injection clamp    | LUTHI        | EM101     | 35535         | 2019-06-28 |

## Power Frequency Magnetic Field Immunity Test

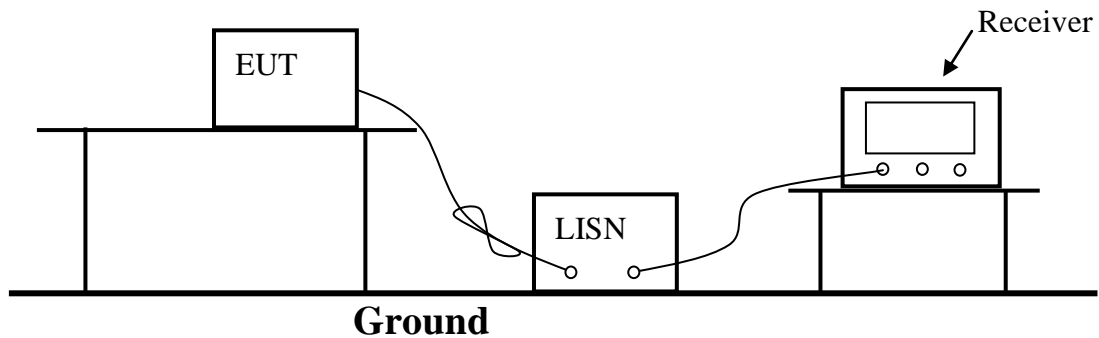
| Item | Test Equipment                             | Manufacturer | Model No. | Serial No. | Due Date.  |
|------|--|--------------|-----------|------------|------------|
| 1    | Power frequency mag-field generator System | HTEC         | HPFMF100  | 100-2400   | 2019-06-28 |

## Radiated, Radio-Frequency, Electromagnetic Field Immunity Test (RS)

| Item | Test Equipment                         | Manufacturer    | Model No.      | Serial No.                 | Due Date.  |
|------|--|-----------------|----------------|----------------------------|------------|
| 1    | RS Test Software                       | Tonscend        | /              | /                          | 2019-06-15 |
| 2    | ESG Vector Signal Generator            | Agilent         | E4438C         | MY42081396                 | 2019-11-15 |
| 3    | 3m Semi Anechoic Chamber               | SIDT FRANKONIA  | SAC-3M         | 03CH03-HY                  | 2019-06-15 |
| 4    | RF Power Amplifier                     | OPHIR           | 5225R          | 1052                       | NCR        |
| 5    | RF Power Amplifier                     | OPHIR           | 5273F          | 1019                       | NCR        |
| 6    | Stacked Broadband Log Periodic Antenna | SCHWARZBECK     | STLP 9128      | 9128ES-145                 | NCR        |
| 7    | Stacked Mikrowellen Log.-Per Antenna   | SCHWARZBECK     | STLP 9149      | 9149-484                   | NCR        |
| 8    | Electric field probe                   | Narda S.TS./PMM | EP601          | 611WX80208                 | 2020-03-24 |
| 9    | Sound Level meter                      | BK Precision    | 735            | 73500873100100<br>20       | 2019-06-15 |
| 10   | Audio Analyzer                         | R&S             | UPV            | 1146.2003K02-10<br>1721-UW | 2019-06-15 |
| 11   | Mouse Simulation                       | Bruel & Kjaer   | 4227           | A0304216                   | 2019-06-15 |
| 12   | Ear Simulation and supply              | Bruel & Kjaer   | 2667.4182.5935 | A0305284                   | 2019-06-15 |
| 13   | Acoustical Calibrators                 | Bruel & Kjaer   | 4231           | A0304215                   | 2019-06-15 |

## 4. POWER LINE CONDUCTED MEASUREMENT

### 4.1. Block Diagram of Test Setup



### 4.2. Conducted Power Line Emission Measurement Standard and Limits

#### 4.2.1. Standard:

EN 55015: 2013+A1: 2015

#### 4.2.2. Limits

| Frequency       | At mains terminals (dB $\mu$ V) |               |
|-----------------|---------------------------------|---------------|
|                 | Quasi-peak Level                | Average Level |
| 9kHz ~ 50kHz    | 110                             | --            |
| 50kHz ~ 150kHz  | 90 ~ 80*                        | --            |
| 150kHz ~ 0.5MHz | 66 ~ 56*                        | 56 ~ 46*      |
| 0.5MHz ~ 5.0MHz | 56                              | 46            |
| 5.0MHz ~ 30MHz  | 60                              | 50            |

1. At the transition frequency the lower limit applies.
2. \* decreasing linearly with logarithm of the frequency.

### 4.3. EUT Configuration on Test

The configuration of the EUT is same as Section 3.1.

### 4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT as shown in Section 4.1.
- 4.4.2. Turn on the power of all equipments.
- 4.4.3. Let the EUT work in test mode (On) and measure it.

#### 4.5. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN 55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN 55015 standard.

The bandwidth of the test receiver is set at 200Hz in 9k~150kHz range and 9kHz in 150k~30MHz range.

The frequency range from 9kHz to 30MHz is checked.

All the test results are listed in Section 4.6.

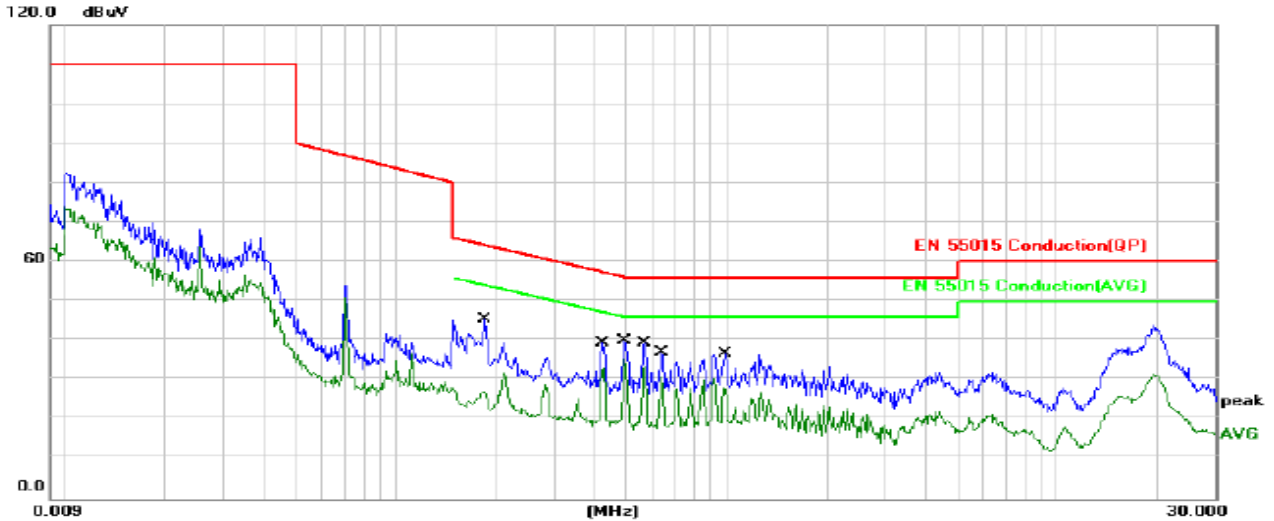
The frequency range from 9kHz to 30MHz is investigated.

#### 4.6. Test Results

**PASS.**

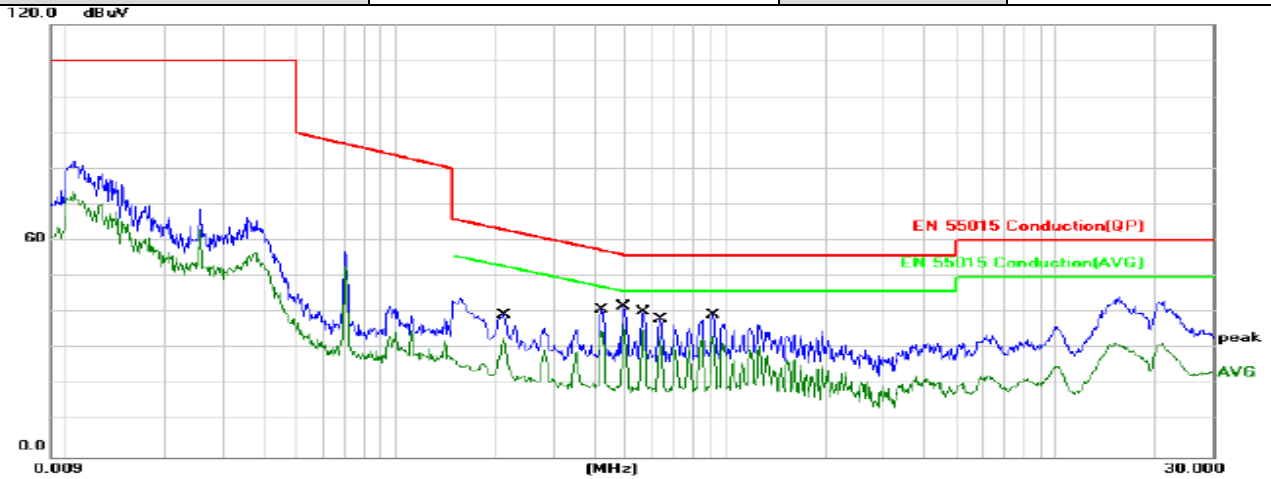
The test result please refer to the next page.

|                                 |  |                      |         |
|---------------------------------|--|----------------------|---------|
| <b>Model No.</b>                | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Test Mode</b>     | ON      |
| <b>Environmental Conditions</b> | 24°C, 56% RH   | <b>Test Engineer</b> | DEAN YA |
| <b>Pol</b>                      | Line   |                      |         |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.1858       | 24.57                    | 10.23                   | 34.80                    | 64.22         | -29.42     | QP       |         |
| 2   |     | 0.1858       | 16.14                    | 10.23                   | 26.37                    | 54.22         | -27.85     | AVG      |         |
| 3   |     | 0.4223       | 26.45                    | 10.20                   | 36.65                    | 57.40         | -20.75     | QP       |         |
| 4   |     | 0.4223       | 22.97                    | 10.20                   | 33.17                    | 47.40         | -14.23     | AVG      |         |
| 5   |     | 0.4943       | 28.38                    | 10.20                   | 38.58                    | 56.10         | -17.52     | QP       |         |
| 6   | *   | 0.4943       | 25.44                    | 10.20                   | 35.64                    | 46.10         | -10.46     | AVG      |         |
| 7   |     | 0.5674       | 25.66                    | 10.20                   | 35.86                    | 56.00         | -20.14     | QP       |         |
| 8   |     | 0.5674       | 23.31                    | 10.20                   | 33.51                    | 46.00         | -12.49     | AVG      |         |
| 9   |     | 0.6387       | 23.21                    | 10.20                   | 33.41                    | 56.00         | -22.59     | QP       |         |
| 10  |     | 0.6387       | 20.46                    | 10.20                   | 30.66                    | 46.00         | -15.34     | AVG      |         |
| 11  |     | 0.9962       | 22.32                    | 10.20                   | 32.52                    | 56.00         | -23.48     | QP       |         |
| 12  |     | 0.9962       | 17.10                    | 10.20                   | 27.30                    | 46.00         | -18.70     | AVG      |         |

|                                 |  |                      |         |
|---------------------------------|--|----------------------|---------|
| <b>Model No.</b>                | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Test Mode</b>     | ON      |
| <b>Environmental Conditions</b> | 24°C, 56% RH   | <b>Test Engineer</b> | DEAN YA |
| <b>Pol</b>                      | Neutral  |                      |         |

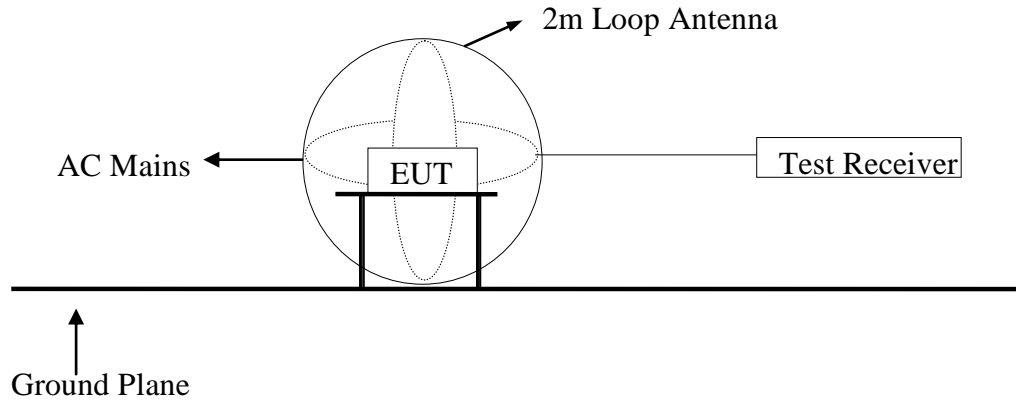


| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.2109       | 27.73                    | 10.22                   | 37.95                    | 63.17         | -25.22     | QP       |         |
| 2   |     | 0.2109       | 23.24                    | 10.22                   | 33.46                    | 53.17         | -19.71     | AVG      |         |
| 3   |     | 0.4235       | 28.15                    | 10.20                   | 38.35                    | 57.38         | -19.03     | QP       |         |
| 4   |     | 0.4235       | 25.39                    | 10.20                   | 35.59                    | 47.38         | -11.79     | AVG      |         |
| 5   |     | 0.4960       | 29.11                    | 10.20                   | 39.31                    | 56.07         | -16.76     | QP       |         |
| 6   | *   | 0.4960       | 26.39                    | 10.20                   | 36.59                    | 46.07         | -9.48      | AVG      |         |
| 7   |     | 0.5676       | 27.04                    | 10.20                   | 37.24                    | 56.00         | -18.76     | QP       |         |
| 8   |     | 0.5676       | 24.55                    | 10.20                   | 34.75                    | 46.00         | -11.25     | AVG      |         |
| 9   |     | 0.6382       | 24.67                    | 10.20                   | 34.87                    | 56.00         | -21.13     | QP       |         |
| 10  |     | 0.6382       | 22.26                    | 10.20                   | 32.46                    | 46.00         | -13.54     | AVG      |         |
| 11  |     | 0.9183       | 25.87                    | 10.20                   | 36.07                    | 56.00         | -19.93     | QP       |         |
| 12  |     | 0.9183       | 23.82                    | 10.20                   | 34.02                    | 46.00         | -11.98     | AVG      |         |



## 5. MAGNETIC FIELD EMISSION MEASUREMENT

### 5.1. Block Diagram of Test Setup



### 5.2. Magnetic Field Emission Measurement Standard and Limits

#### 5.2.1. Test Standard

EN 55015: 2013+A1: 2015

#### 5.2.2. Test Limits

| Frequency       | Limits for loop diameter (dB $\mu$ A) |
|-----------------|---------------------------------------|
|                 | 2m                                    |
| 9kHz ~ 70kHz    | 88                                    |
| 70kHz ~ 150kHz  | 88 ~ 58*                              |
| 150kHz ~ 3.0MHz | 58 ~ 22*                              |
| 3.0MHz ~ 30MHz  | 22                                    |

1. At the transition frequency the lower limit applies.
2. \* decreasing linearly with logarithm of the frequency.

### 5.3. EUT Configuration on Test

The configuration of the EUT is same as Section 3.3.

### 5.4. Operating Condition of EUT

Same as conducted measurement which is listed in Section 4.4, except the test set up replaced by Section 5.1.

## 5.5. Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch.

The frequency range from 9kHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9kHz to 150kHz, the bandwidth of the field strength meter is set at 200Hz. For frequency band 150kHz to 30MHz, the bandwidth is set at 9kHz.

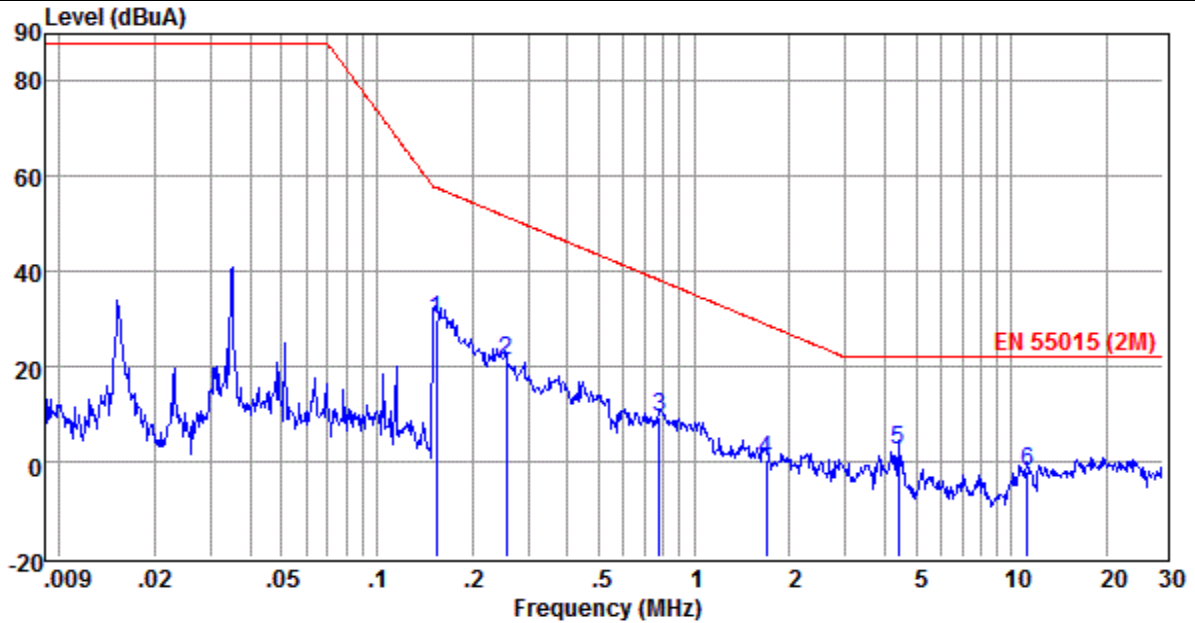
All the test results are listed in Section 5.6.

## 5.6. Test Results

**PASS.**

The frequency range from 9kHz to 30MHz is investigated.

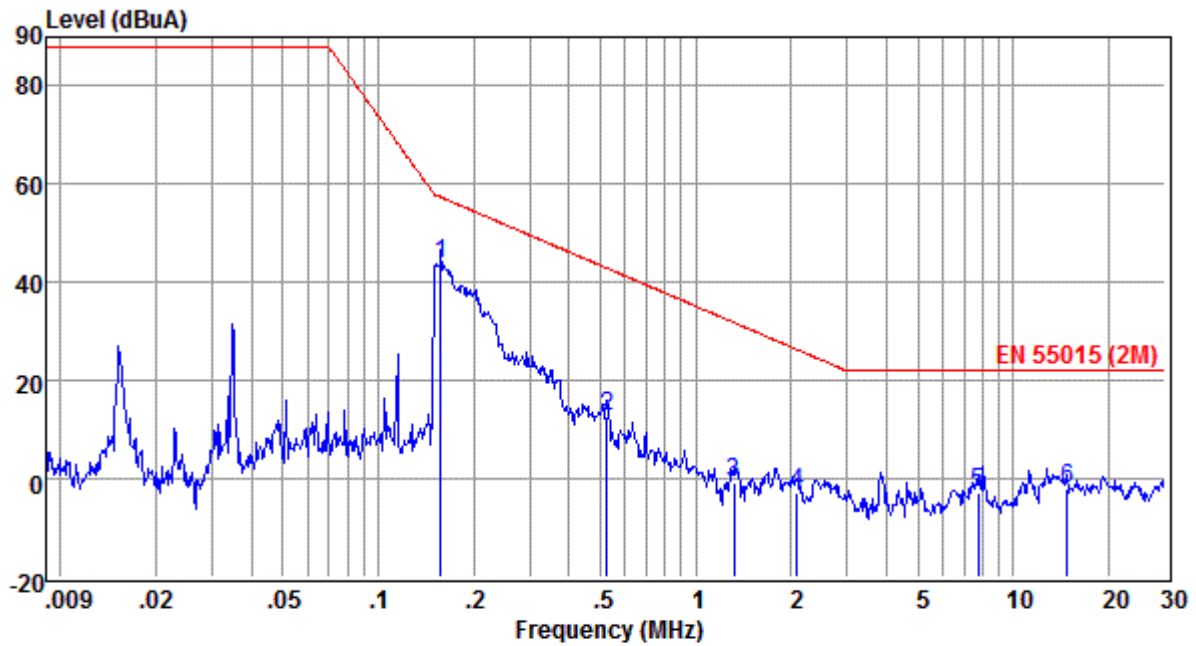
|                                 |  |                      |         |
|---------------------------------|--|----------------------|---------|
| <b>Model No.</b>                | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Test Mode</b>     | ON      |
| <b>Environmental Conditions</b> | 24°C, 56% RH   | <b>Test Engineer</b> | DEAN YA |
| <b>Pol</b>                      | X  |                      |         |



|   | Freq  | Reading | LisnFac | CabLos | Measured | Limit  | Over   | Remark |
|---|-------|---------|---------|--------|----------|--------|--------|--------|
|   | MHz   | dBuV    | dB      | dB     | dBuV/m   | dBuV/m | dBuV/m |        |
| 1 | 0.15  | -31.53  | 60.85   | 0.54   | 29.86    | 57.69  | -27.83 | QP     |
| 2 | 0.26  | -40.47  | 61.00   | 0.58   | 21.11    | 51.55  | -30.44 | QP     |
| 3 | 0.78  | -51.56  | 60.54   | 0.65   | 9.63     | 38.20  | -28.57 | QP     |
| 4 | 1.68  | -58.77  | 58.70   | 0.68   | 0.61     | 28.94  | -28.33 | QP     |
| 5 | 4.39  | -52.02  | 53.69   | 0.71   | 2.38     | 22.00  | -19.62 | QP     |
| 6 | 11.24 | -50.70  | 48.07   | 0.82   | -1.81    | 22.00  | -23.81 | QP     |

Remarks: 1. C.F (Correction Factor) = Insertion loss + Cable loss.  
 2. Measured = Reading + Lisn Factor +Cable Loss.

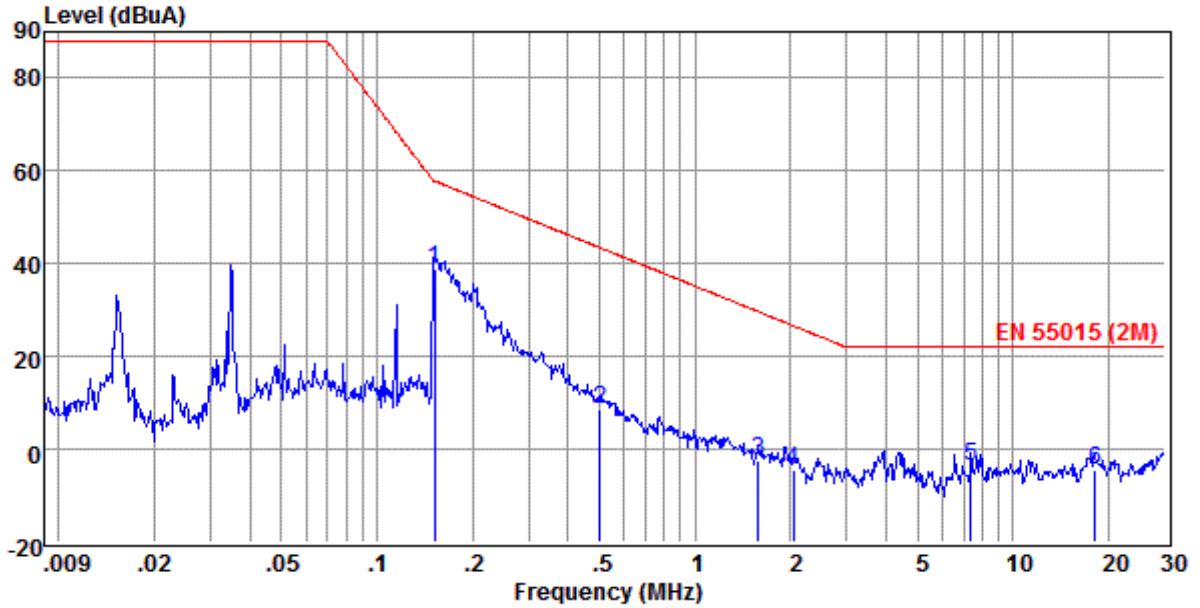
|                                 |  |                      |         |
|---------------------------------|--|----------------------|---------|
| <b>Model No.</b>                | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Test Mode</b>     | ON      |
| <b>Environmental Conditions</b> | 24°C, 56% RH   | <b>Test Engineer</b> | DEAN YA |
| <b>Pol</b>                      | Y  |                      |         |



|   | Freq  | Reading | LisnFac | CabLos | Measured | Limit  | Over   | Remark |
|---|-------|---------|---------|--------|----------|--------|--------|--------|
|   | MHz   | dBuV    | dB      | dB     | dBuV/m   | dBuV/m | dBuV/m |        |
| 1 | 0.16  | -17.66  | 60.86   | 0.54   | 43.74    | 57.40  | -13.66 | QP     |
| 2 | 0.52  | -48.75  | 60.93   | 0.63   | 12.81    | 42.97  | -30.16 | QP     |
| 3 | 1.32  | -60.37  | 58.98   | 0.67   | -0.72    | 31.86  | -32.58 | QP     |
| 4 | 2.08  | -61.81  | 58.27   | 0.69   | -2.85    | 26.40  | -29.25 | QP     |
| 5 | 7.74  | -52.71  | 49.23   | 0.78   | -2.70    | 22.00  | -24.70 | QP     |
| 6 | 14.81 | -50.52  | 47.52   | 0.84   | -2.16    | 22.00  | -24.16 | QP     |

Remarks: 1. C.F (Correction Factor) = Insertion loss + Cable loss.  
 2. Measured = Reading + Lisn Factor +Cable Loss.

|                                 |  |                      |         |
|---------------------------------|--|----------------------|---------|
| <b>Model No.</b>                | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Test Mode</b>     | ON      |
| <b>Environmental Conditions</b> | 24°C, 56% RH   | <b>Test Engineer</b> | DEAN YA |
| <b>Pol</b>                      | Z  |                      |         |

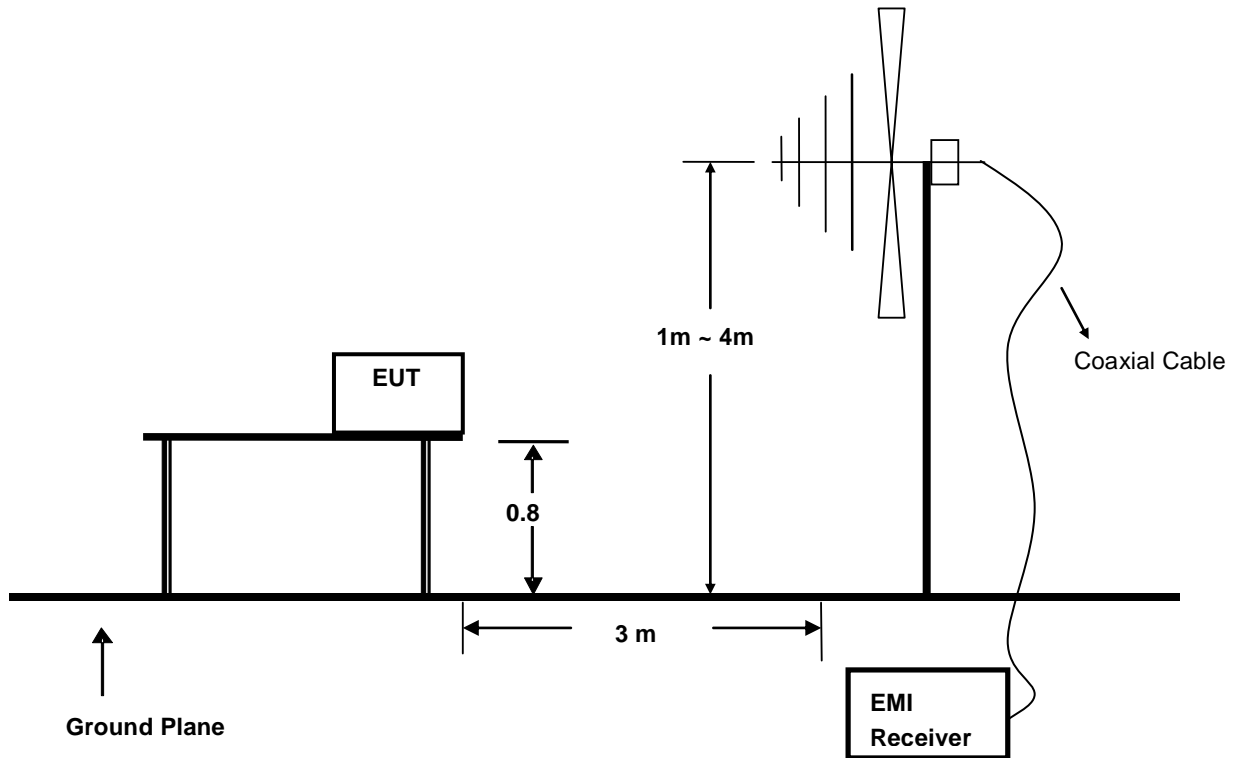


|   | Freq  | Reading | LisnFac | CabLos | Measured | Limit  | Over   | Remark |
|---|-------|---------|---------|--------|----------|--------|--------|--------|
|   | MHz   | dBuV    | dB      | dB     | dBuV/m   | dBuV/m | dBuV/m |        |
| 1 | 0.15  | -22.50  | 60.84   | 0.54   | 38.88    | 57.89  | -19.01 | QP     |
| 2 | 0.50  | -52.90  | 60.94   | 0.63   | 8.67     | 43.46  | -34.79 | QP     |
| 3 | 1.58  | -61.79  | 58.77   | 0.67   | -2.35    | 29.72  | -32.07 | QP     |
| 4 | 2.05  | -63.47  | 58.37   | 0.69   | -4.41    | 26.60  | -31.01 | QP     |
| 5 | 7.37  | -54.03  | 49.41   | 0.77   | -3.85    | 22.00  | -25.85 | QP     |
| 6 | 18.14 | -52.13  | 46.90   | 0.86   | -4.37    | 22.00  | -26.37 | QP     |

Remarks: 1. C.F (Correction Factor) = Insertion loss + Cable loss.  
 2. Measured = Reading + Lisn Factor +Cable Loss.

## 6. RADIATED EMISSION MEASUREMENT

### 6.1. Block Diagram of Test Setup



### 6.2. Test Standard

EN 55015: 2013+A1: 2015

### 6.3. Radiated Emission Limits

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

| FREQUENCY<br>(MHz) | DISTANCE<br>(Meters) | FIELD STRENGTHS LIMIT<br>(dB $\mu$ V/m) |
|--------------------|----------------------|---|
| 30 ~ 230           | 3                    | 40                                      |
| 230 ~ 300          | 3                    | 47                                      |

Note: (1) The smaller limit shall apply at the combination 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 EUT.

## 6.4.EUT Configuration on Test

The EN 55015 regulations test method must be used to find the maximum emission during radiated emission measurement.

## 6.5.Operating Condition of EUT

6.5.1 Turn on the power.

6.5.2 After that, let the EUT work in test mode (ON) and measure it.

## 6.6.Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

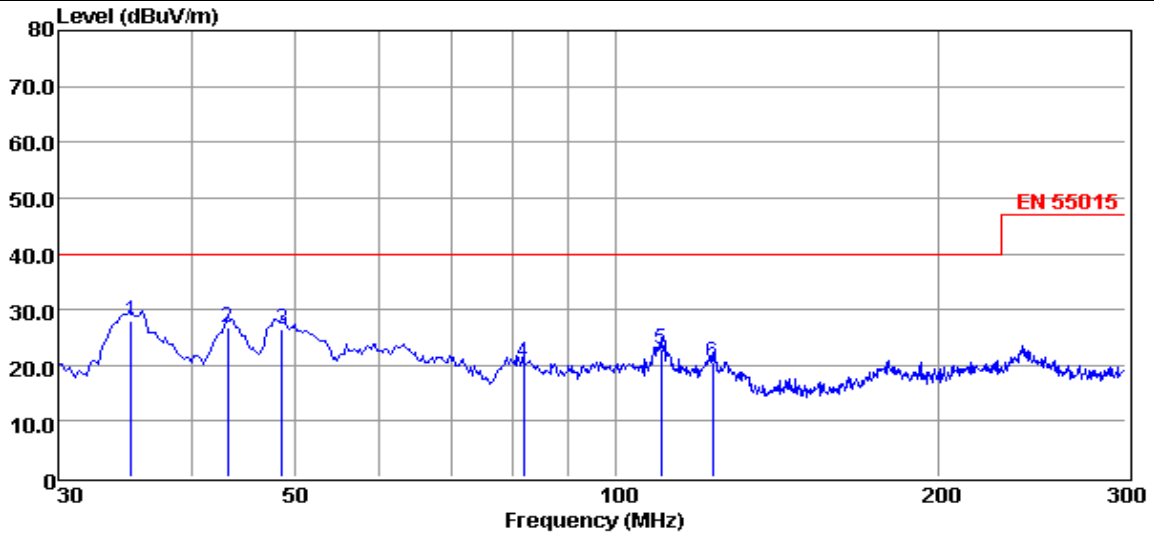
The frequency range from 30MHz to 300MHz is investigated.

## 6.7.Test Results

**PASS.**

The test result please refer to the next page.

|                                 |  |                          |            |
|---------------------------------|--|--------------------------|------------|
| <b>Model No.</b>                | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Test Mode</b>         | ON         |
| <b>Environmental Conditions</b> | 24°C, 56% RH   | <b>Detector Function</b> | Quasi-peak |
| <b>Pol</b>                      | Vertical   | <b>Distance</b>          | 3m         |
| <b>Test Engineer</b>            | DEAN YA  |                          |            |

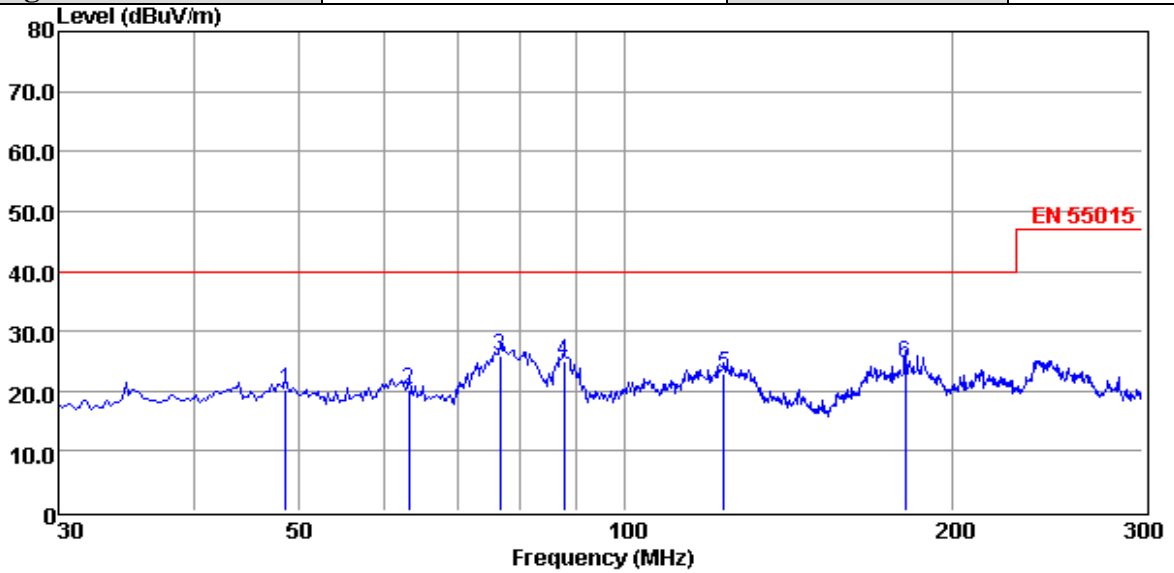


|   | Freq   | Reading | CabLos | Antfac | Measured | Limit  | Over   | Remark |
|---|--------|---------|--------|--------|----------|--------|--------|--------|
|   | MHz    | dBuV    | dB     | dB/m   | dBuV/m   | dBuV/m | dB     |        |
| 1 | 35.13  | 15.31   | 0.41   | 12.33  | 28.05    | 40.00  | -11.95 | QP     |
| 2 | 43.23  | 12.70   | 0.50   | 13.56  | 26.76    | 40.00  | -13.24 | QP     |
| 3 | 48.63  | 12.93   | 0.35   | 13.33  | 26.61    | 40.00  | -13.39 | QP     |
| 4 | 81.84  | 10.55   | 0.65   | 9.19   | 20.39    | 40.00  | -19.61 | QP     |
| 5 | 110.19 | 10.09   | 0.61   | 12.22  | 22.92    | 40.00  | -17.08 | QP     |
| 6 | 123.15 | 9.73    | 0.70   | 9.99   | 20.42    | 40.00  | -19.58 | QP     |

- Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that are 20db below the official limit are not reported



|                                 |  |                          |            |
|---------------------------------|--|--------------------------|------------|
| <b>Model No.</b>                | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Test Mode</b>         | ON         |
| <b>Environmental Conditions</b> | 24°C, 56% RH   | <b>Detector Function</b> | Quasi-peak |
| <b>Pol</b>                      | Horizontal   | <b>Distance</b>          | 3m         |
| <b>Test Engineer</b>            | DEAN YA  |                          |            |

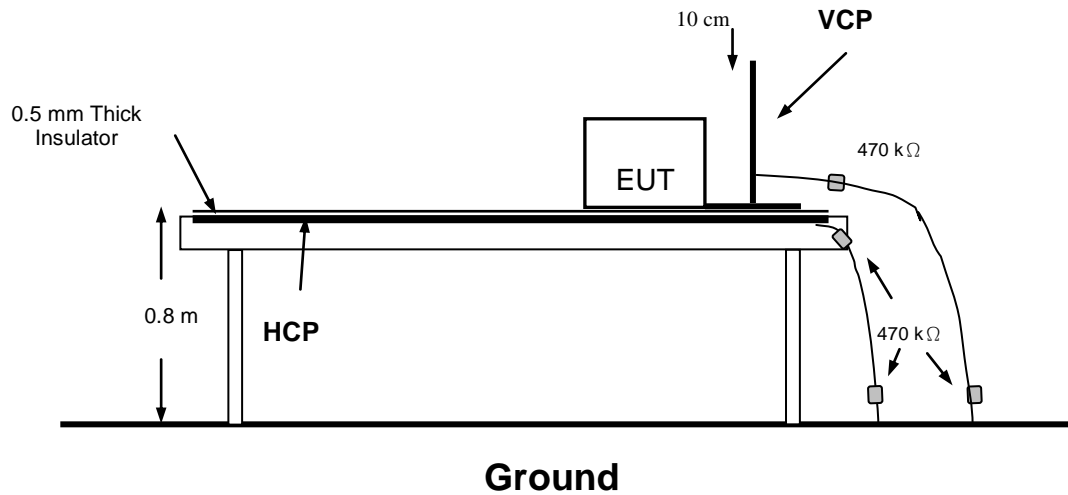


|   | Freq   | Reading | CabLos | Antfac | Measured | Limit  | Over   | Remark |
|---|--------|---------|--------|--------|----------|--------|--------|--------|
|   | MHz    | dBuV    | dB     | dB/m   | dBuV/m   | dBuV/m | dB     |        |
| 1 | 48.63  | 6.63    | 0.35   | 13.33  | 20.31    | 40.00  | -19.69 | QP     |
| 2 | 63.21  | 8.43    | 0.48   | 11.42  | 20.33    | 40.00  | -19.67 | QP     |
| 3 | 76.71  | 17.46   | 0.47   | 8.05   | 25.98    | 40.00  | -14.02 | QP     |
| 4 | 87.78  | 13.27   | 0.47   | 11.19  | 24.93    | 40.00  | -15.07 | QP     |
| 5 | 123.42 | 12.14   | 0.70   | 9.95   | 22.79    | 40.00  | -17.21 | QP     |
| 6 | 181.20 | 14.06   | 0.89   | 9.79   | 24.74    | 40.00  | -15.26 | QP     |

Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that ate 20db blow the official limit are not reported

## 7. ELECTROSTATIC DISCHARGE TEST

### 7.1. Block Diagram of Test Setup



### 7.2. Test Standard

EN 61547: 2009 (EN 61000-4-2: 2009, Severity Level: Air Discharge: Level 3,  $\pm 8$ KV  
Contact Discharge: Level 2,  $\pm 4$ KV)

### 7.3. Severity Levels and Performance Criterion

#### 7.3.1. Severity level

| Level | Test Voltage Contact Discharge (KV) | Test Voltage Air Discharge (KV) |
|-------|-------------------------------------|---------------------------------|
| 1.    | $\pm 2$                             | $\pm 2$                         |
| 2.    | $\pm 4$                             | $\pm 4$                         |
| 3.    | $\pm 6$                             | $\pm 8$                         |
| 4.    | $\pm 8$                             | $\pm 15$                        |
| X     | Special                             | Special                         |

#### 7.3.2. Performance criterion: **B**

### 7.4. EUT Configuration on Test

The configuration of EUT is listed in Section 3.6

## 7.5. Operating Condition of EUT

- 7.5.1. Setup the EUT as shown in Section 7.1.
- 7.5.2. Turn on the power of all equipments.
- 7.5.3. Let the EUT work in test mode (ON) and measure it.

## 7.6. Test Procedure

### 7.6.1. Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Because the case of the EUT is metal surface, so it does not need to be tested.

### 7.6.2. Contact Discharge

All the procedure shall be same as Section 7.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 7.6.3. Indirect Discharge For Horizontal Coupling Plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

### 7.6.4. Indirect Discharge For Vertical Coupling Plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 7.7. Test Results

**PASS.**

Please refer to the following page.

# Electrostatic Discharge Test Results

|                  |  |                      |          |
|------------------|--|----------------------|----------|
| <b>Standard</b>  | <input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2  |                      |          |
| <b>Applicant</b> | Hangzhou Enya Arts&Crafts Co.,Ltd  |                      |          |
| <b>EUT</b>       | Decoration light   | <b>Temperature</b>   | 23.2°C   |
| <b>M/N</b>       | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Humidity</b>      | 56%      |
| <b>Criterion</b> | B  | <b>Pressure</b>      | 1021mbar |
| <b>Test Mode</b> | ON   | <b>Test Engineer</b> | DEAN YA  |

| Air Discharge |                                     |                                     |                                     |                                     |                          |  |
|---------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--|
| Test Points   | Test Levels                         |                                     |                                     | Results                             |                          |  |
|               | ± 2KV                               | ± 4KV                               | ± 8KV                               | Pass                                | Fail                     | Performance Criterion  |
| Front         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Back          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Left          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Right         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Top           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |
| Bottom        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |

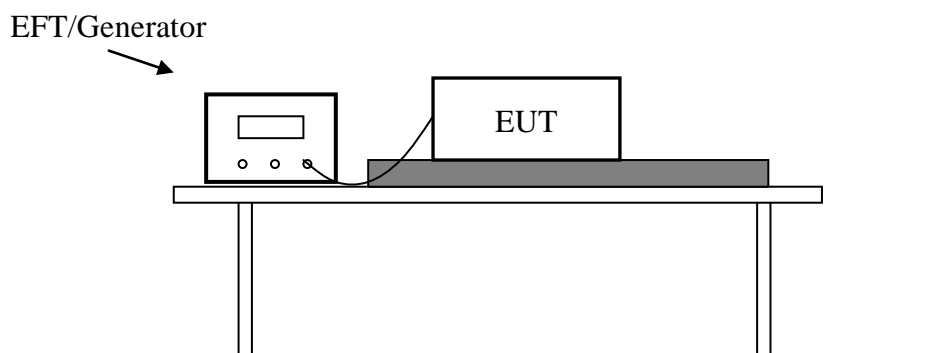
| Contact Discharge |                                     |                                     |                                     |                          |  |  |
|-------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--|
| Test Points       | Test Levels                         |                                     | Results                             |                          |  |  |
|                   | ± 2 KV                              | ±4 KV                               | Pass                                | Fail                     | Performance Criterion  |  |
| Front             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Back              | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Left              | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Right             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Top               | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Bottom            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |

| Discharge To Horizontal Coupling Plane |                                     |                                     |                                     |                          |  |  |
|--|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--|
| Side of EUT                            | Test Levels                         |                                     | Results                             |                          |  |  |
|  | ± 2 KV                              | ± 4 KV                              | Pass                                | Fail                     | Performance Criterion  |  |
| Front                                  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Back                                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Left                                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Right                                  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |

| Discharge To Vertical Coupling Plane |                                     |                                     |                                     |                          |  |  |
|--------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--|
| Side of EUT                          | Test Levels                         |                                     | Results                             |                          |  |  |
|                                      | ± 2 KV                              | ± 4 KV                              | Pass                                | Fail                     | Performance Criterion  |  |
| Front                                | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Back                                 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Left                                 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |
| Right                                | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> A <input checked="" type="checkbox"/> B |  |

## 8. ELECTRICAL FAST TRANSIENT/BURST TEST

### 8.1. Block Diagram of Test Setup



### 8.2. Test Standard

EN 61547: 2009 (EN 61000-4-4: 2012, Severity Level: Level 2: 1KV)

### 8.3. Severity Levels and Performance Criterion

#### 8.3.1. Severity level

| Open Circuit Output Test Voltage $\pm 10\%$ |                       |   |
|---|-----------------------|---|
| Level                                       | On Power Supply Lines | On I/O (Input/Output) Signal data and control lines |
| 1.  | 0.5 KV                | 0.25 KV   |
| 2.  | 1 KV                  | 0.5 KV  |
| 3.  | 2 KV                  | 1 KV  |
| 4.  | 4 KV                  | 2 KV  |
| X   | Special               | Special   |

#### 8.3.2. Performance criterion: **B**

### 8.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.7.

### 8.5. Operating Condition of EUT

8.5.1. Setup the EUT as shown in Section 8.1.

8.5.2. Turn on the power of all equipments.

8.5.3. Let the EUT work in test mode (ON) and measure it.

## 8.6. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

### 8.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

### 8.6.2. For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

### 8.6.3. For DC output line ports:

It's unnecessary to test.

## 8.7. Test Results

**PASS.**

Please refer to the following page.

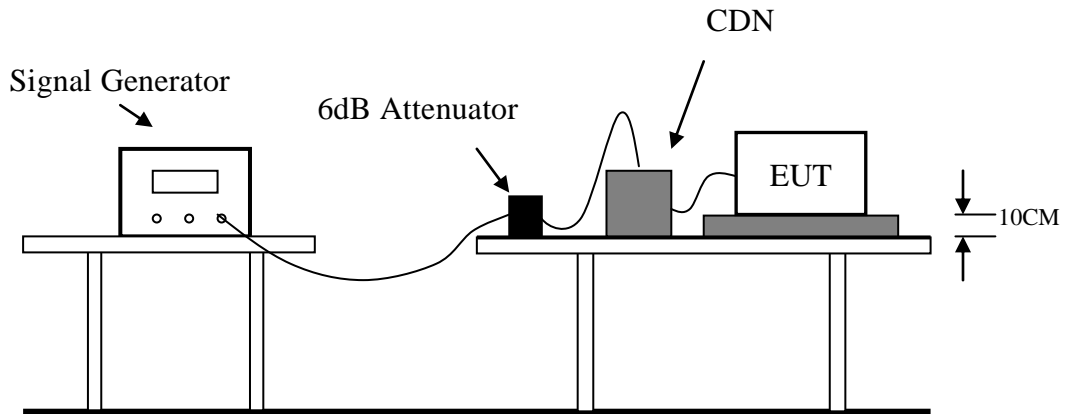
## Electrical Fast Transient/Burst Test Results

|                      |  |                    |        |
|----------------------|--|--------------------|--------|
| <b>Standard</b>      | <input type="checkbox"/> IEC 61000-4-4 <input checked="" type="checkbox"/> EN 61000-4-4  |                    |        |
| <b>Applicant</b>     | Hangzhou Enya Arts&Crafts Co.,Ltd  |                    |        |
| <b>EUT</b>           | Decoration light   | <b>Temperature</b> | 23.9°C |
| <b>M/N</b>           | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, “****” MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Humidity</b>    | 56%    |
| <b>Test Mode</b>     | ON   | <b>Criterion</b>   | B      |
| <b>Test Engineer</b> | DEAN YA  |                    |        |

| Line        | Test Voltage | Result (+) | Result (-) |
|-------------|--------------|------------|------------|
| L           | 1KV          | PASS       | PASS       |
| N           | 1KV          | PASS       | PASS       |
| PE          | 1KV          | PASS       | PASS       |
| L-N         | 1KV          | PASS       | PASS       |
| L-PE        | 1KV          | PASS       | PASS       |
| N-PE        | 1KV          | PASS       | PASS       |
| L-N-PE      | 1KV          | PASS       | PASS       |
| Signal Line |              |            |            |
| I/O Cable   |              |            |            |
| Note:       |              |            |            |

## 9. INJECTED CURRENTS SUSCEPTIBILITY TEST

### 9.1. Block Diagram of Test Setup



### 9.2. Test Standard

EN 61547: 2009 (EN 61000-4-6: 2014+A1:2015, Severity Level: 3V (rms), 0.15MHz ~ 80MHz)

### 9.3. Severity Levels and Performance Criterion

#### 9.3.1. Severity level

| Level | Field Strength (V) |
|-------|--------------------|
| 1.    | 1                  |
| 2.    | 3                  |
| 3.    | 10                 |
| X     | Special            |

#### 9.3.2. Performance criterion: A

### 9.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.7.



## 9.5. Operating Condition of EUT

- 9.5.1. Setup the EUT as shown in Section 9.1.
- 9.5.2. Turn on the power of all equipments.
- 9.5.3. Let the EUT work in test mode (ON) and measure it.

## 9.6. Test Procedure

- 9.6.1. Set up the EUT, CDN and test generators as shown on Section 9.1.
- 9.6.2. Let the EUT work in test mode and measure it.
- 9.6.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 9.6.4. The disturbance signal described below is injected to EUT through CDN.
- 9.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 9.6.6. The frequency range is swept from 150kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 9.6.7. The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 9.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

## 9.7. Test Results

**PASS.**

Please refer to the following page.

## Injected Currents Susceptibility Test Results

|                      |  |                    |       |
|----------------------|--|--------------------|-------|
| <b>Standard</b>      | <input type="checkbox"/> IEC 61000-4-6 <input checked="" type="checkbox"/> EN 61000-4-6  |                    |       |
| <b>Applicant</b>     | Hangzhou Enya Arts&Crafts Co.,Ltd  |                    |       |
| <b>EUT</b>           | Decoration light   | <b>Temperature</b> | 23.5℃ |
| <b>M/N</b>           | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Humidity</b>    | 56%   |
| <b>Test Mode</b>     | ON   | <b>Criterion</b>   | A     |
| <b>Test Engineer</b> | DEAN YA  |                    |       |

| Frequency Range (MHz) | Injected Position | Strength (Unmodulated) | Criterion | Result |
|-----------------------|-------------------|------------------------|-----------|--------|
| 0.15 ~ 80             | AC Mains          | 3V                     | A         | PASS   |

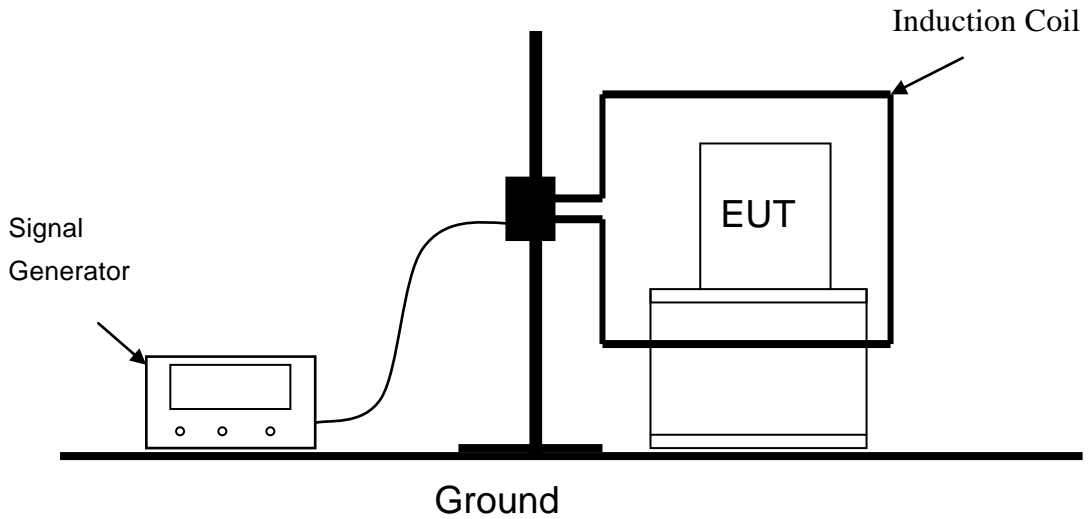
**Remark:**

1. Modulation Signal:1kHz 80% AM
2. Measurement Equipment:  
     Simulator: CIT-10 (FRANKONIA)  
     CDN : CDN-M2 (FRANKONIA)  
          CDN-M3 (FRANKONIA)

**Note:**

## 10. MAGNETIC FIELD IMMUNITY TEST

### 10. 1. Block Diagram of Test Setup



### 10. 2. Test Standard

EN 61547: 2009 (EN 61000-4-8: 2010, Severity Level 2: 3A/m)

### 10. 3. Severity Levels and Performance Criterion

#### 10. 3.1. Severity level

| Level | Magnetic Field Strength (A/m) |
|-------|-------------------------------|
| 1.    | 1                             |
| 2.    | 3                             |
| 3.    | 10                            |
| 4.    | 30                            |
| 5.    | 100                           |
| X     | Special                       |

#### 10. 3.2. Performance criterion: A

### 10. 4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.8.

## 10. 5. Operating Condition of EUT

- 10. 5.1. Setup the EUT as shown in Section 10. 1.
- 10. 5.2. Turn on the power of all equipments.
- 10. 5.3. Let the EUT work in test mode (On) and measure it.

## 10. 6. Test Procedure

- 10. 6.1. Set up the EUT system as shown on Section 10. 1.
- 10. 6.2. The Induction coil is set up in horizontal or vertical.
- 10. 6.3. Let the EUT work in test mode and measure it.

## 10. 7. Test Results

**PASS.**

Please refer to the following page.

## Magnetic Field Immunity Test Result

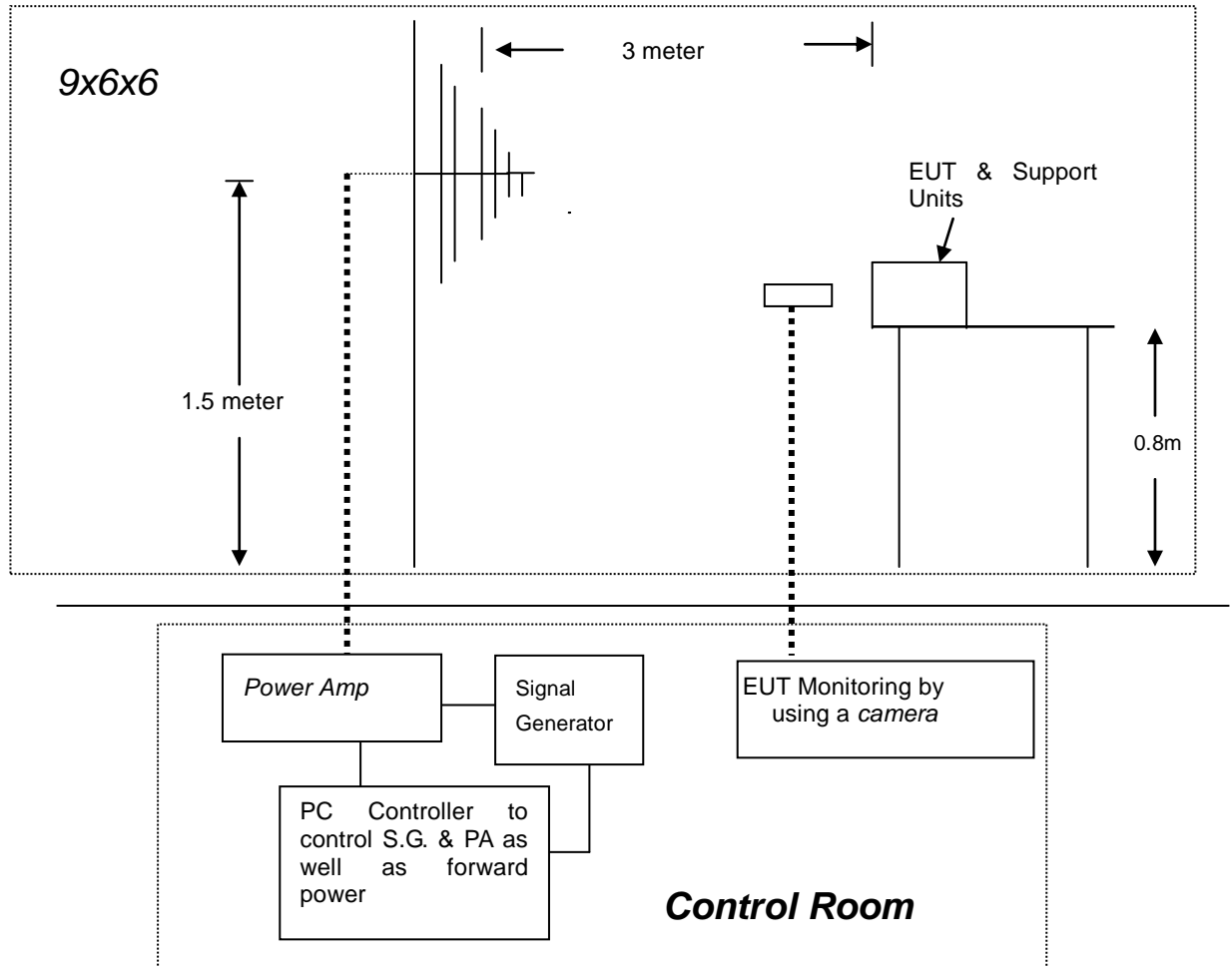
|                      |  |                    |        |
|----------------------|--|--------------------|--------|
| <b>Standard</b>      | <input type="checkbox"/> IEC 61000-4-8 <input checked="" type="checkbox"/> EN 61000-4-8  |                    |        |
| <b>Applicant</b>     | Hangzhou Enya Arts&Crafts Co.,Ltd  |                    |        |
| <b>EUT</b>           | Decoration light   | <b>Temperature</b> | 23.4°C |
| <b>M/N</b>           | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, “ **** ” MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Humidity</b>    | 56%    |
| <b>Test Mode</b>     | ON   | <b>Criterion</b>   | A      |
| <b>Test Engineer</b> | DEAN YA  |                    |        |

| Test Level (A/M) | Testing Duration | Coil Orientation | Criterion | Result |
|------------------|------------------|------------------|-----------|--------|
| 3                | 5 mins           | X                | A         | PASS   |
| 3                | 5 mins           | Y                | A         | PASS   |
| 3                | 5 mins           | Z                | A         | PASS   |

Note:

# 11. RF FIELD STRENGTH SUSCEPTIBILITY TEST

## 11. 1. Block Diagram of Test Setup



## 11. 2. Test Standard

EN 61547: 2009 (EN 61000-4-3: 2006+A2: 2010, Severity Level: 2, 3V / m)

## 11. 3. Severity Levels and Performance Criterion

### 11. 3.1. Severity level

| Level | Field Strength (V/m) |
|-------|----------------------|
| 1     | 1                    |
| 2     | 3                    |
| 3     | 10                   |
| X     | Special              |

### 11. 3.2. Performance criterion: A

#### 11. 4.EUT Configuration on Test

The configuration of EUT are listed in Section 3.10.

#### 11. 5.Operating Condition of EUT

11. 5.1.Setup the EUT as shown in Section 11. 1.

11. 5.2.Turn on the power of all equipments.

11. 5.3.Let the EUT work in test mode (On) and measure it.

#### 11. 6.Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows:

| Condition of Test         | Remarks                  |
|---------------------------|--------------------------|
| 1. Fielded Strength       | 3 V/m (Severity Level 2) |
| 2. Radiated Signal        | Unmodulated              |
| 3. Scanning Frequency     | 80 - 1000 MHz            |
| 4. Dwell time of radiated | 0.0015 decade/s          |
| 5. Waiting Time           | 3 Sec.                   |

#### 11. 7.Test Results

**PASS.**

Please refer to the following page.

# RF Field Strength Susceptibility Test Results

|                        |  |                      |         |
|------------------------|--|----------------------|---------|
| <b>Standard</b>        | <input type="checkbox"/> IEC 61000-4-3 <input checked="" type="checkbox"/> EN 61000-4-3  |                      |         |
| <b>Applicant</b>       | Hangzhou Enya Arts&Crafts Co.,Ltd  |                      |         |
| <b>EUT</b>             | Decoration light   | <b>Temperature</b>   | 23.8°C  |
| <b>M/N</b>             | EY#&-****, #=I MEANS INDOORUSE, #=O MEANS OUTDOORUSE, &=T MEANS TREE,&=L MEANS LIGHTING CHAIN, "****" MEANS QUANTITY OF LED, FROM 0001 TO 1500 (INDICATES 1 LED TO 1500 LED) | <b>Humidity</b>      | 56%     |
| <b>Field Strength</b>  | 3 V/m  | <b>Criterion</b>     | A       |
| <b>Test Mode</b>       | ON   | <b>Test Engineer</b> | DEAN YA |
| <b>Frequency Range</b> | 80 MHz to 1000 MHz   |                      |         |
| <b>Modulation</b>      | <input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1KHz 80%   |                      |         |
| <b>Steps</b>           | 1%   |                      |         |

|              | Horizontal | Vertical |
|--------------|------------|----------|
| <b>Front</b> | PASS       | PASS     |
| <b>Right</b> | PASS       | PASS     |
| <b>Rear</b>  | PASS       | PASS     |
| <b>Left</b>  | PASS       | PASS     |

**Test Equipment:**

1. Signal Generator: 2031 (MARCONI)
2. Power Amplifier: 500A100 & 100W/1000M1 (A&R)
3. Power Antenna: 3108 (EMCO) & AT1080 (A&R)
4. Field Monitor: FM2000 (A&R)

Note:



## 12. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

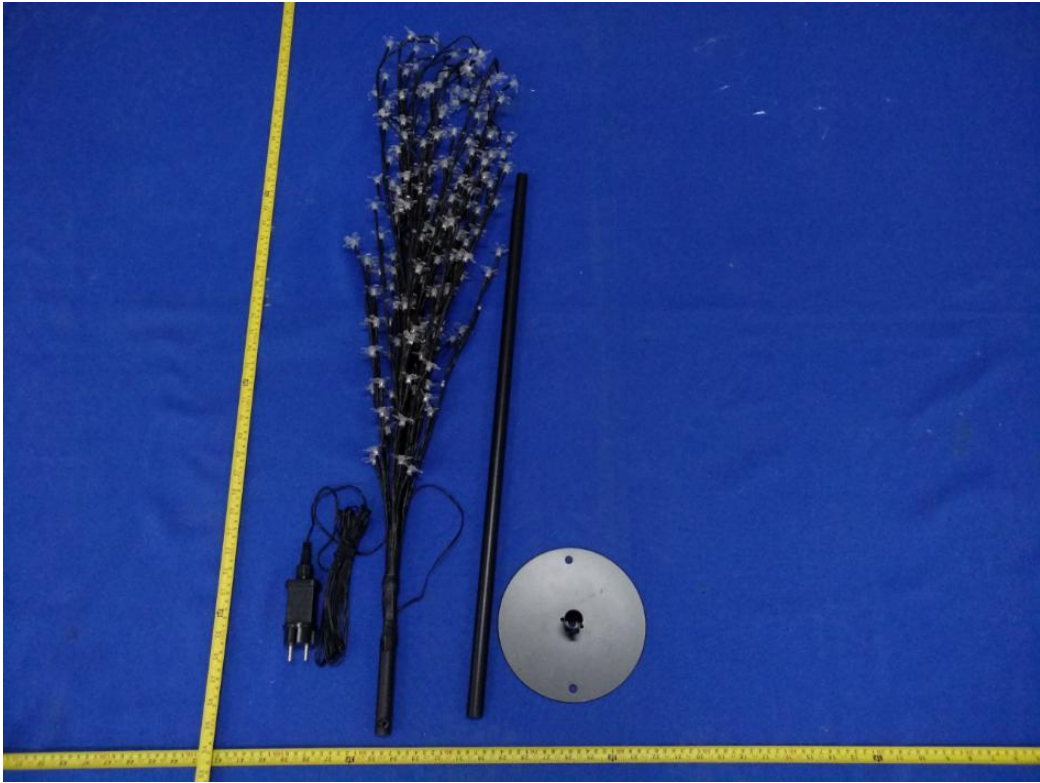


Fig. 1

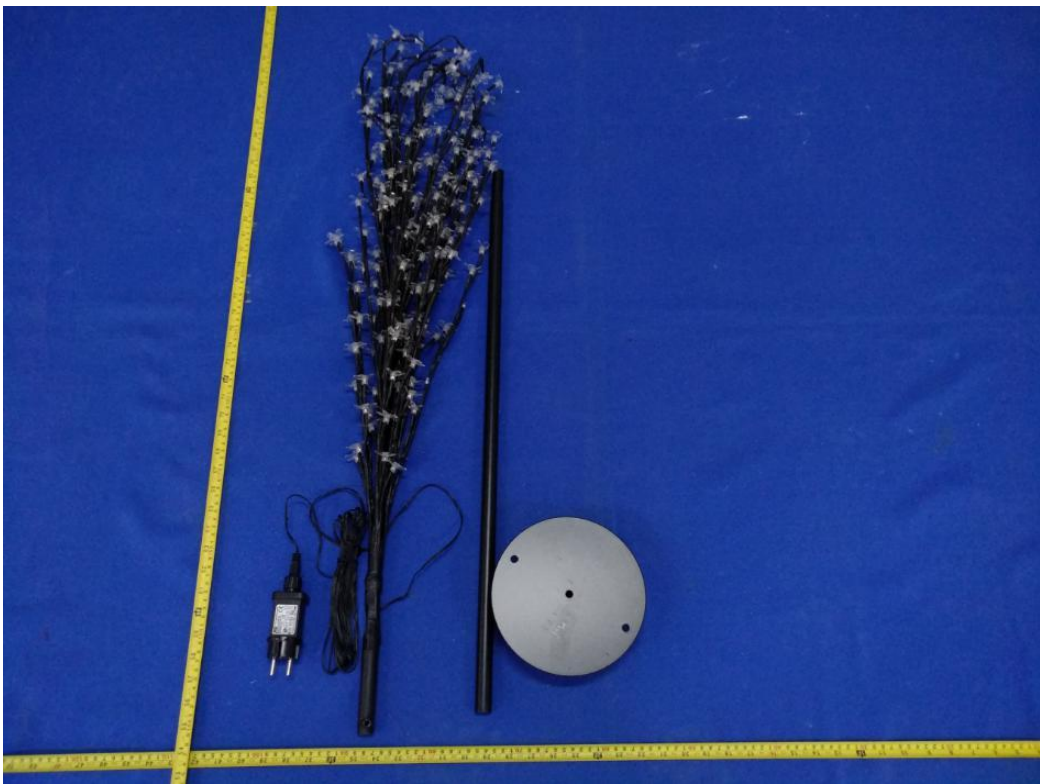


Fig. 2

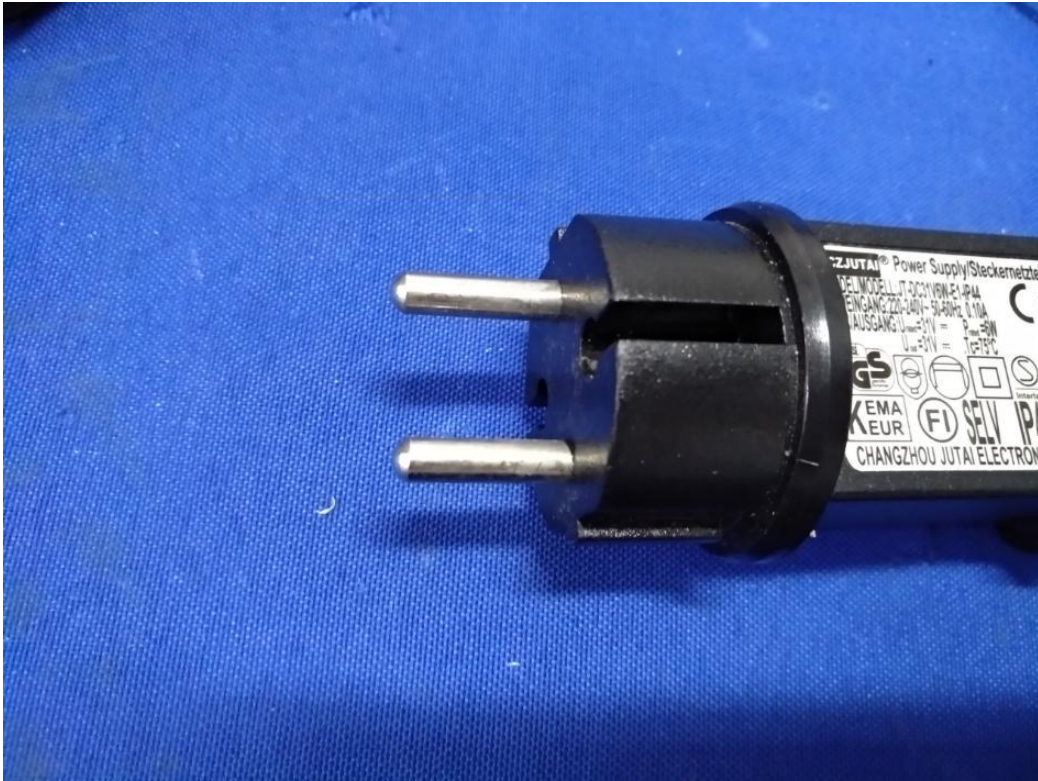


Fig. 3



Fig. 4

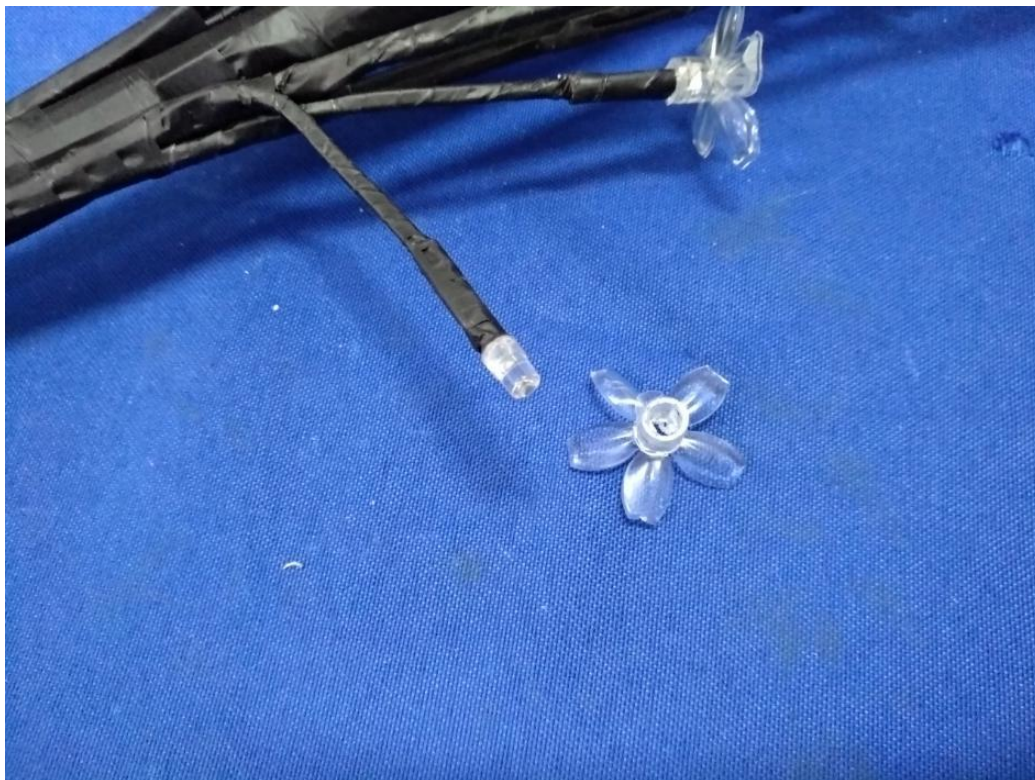


Fig. 5



Fig. 6



Fig. 7



Fig. 8

-----THE END OF TEST REPORT-----