

## FCC&IC CERTIFICATION TEST REPORT FOR

|                             |   |   |
|-----------------------------|---|---|
| <b>Applicant</b>            | : | Elec-Tech International Co., Ltd.   |
| <b>Address</b>              | : | No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District,<br>Zhuhai City, Guangdong Province, P.R. China 519085   |
| <b>Equipment under Test</b> | : | LED WRAP LIGHT  |
| <b>FCC Model No.</b>        | : | 546761XX("XX"=00-99, which respectively represents<br>different LED source colour temperature)  |
| <b>IC Model No.</b>         | : | 54676141; 54676142; 54676143  |
| <b>Trade Mark</b>           | : | ETI; Commercial Electric  |
| <b>FCC ID</b>               | : | XZH-5467612016  |
| <b>IC</b>                   | : | 20122-5467612016  |
| <b>Manufacturer</b>         | : | Elec-Tech International Co., Ltd.   |
| <b>Address</b>              | : | No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District,<br>Zhuhai City, Guangdong Province, P.R. China 519085   |
| <b>Factory 1</b>            | : | Wuhu 3E Lighting Co., Ltd.  |
| <b>Address</b>              | : | 11 Wei er ci RD Eastern Wuhu Economic & Technological<br>Development Area, Wuhu City, Anhui Province 241000<br>China  |
| <b>Factory 2</b>            | : | Elec-Tech International Co., Ltd.   |
| <b>Address</b>              | : | 18-1 Keji 6th Road Gangwan Ave Tangjiawan Town<br>Xiangzhou District Zhuhai City Guangdong Province, P.R.<br>China 519085                                   |
| <b>Factory 3</b>            | : | Guangdong NVCETi Lighting Co., Ltd.   |
| <b>Address</b>              | : | Factory#2-2, No. 1, South Zhongzhu Science &<br>Technology Road, Innovation Coast, High Tech District,<br>Zhuhai City, Guangdong Province, P.R.China 519085 |

**Issued By: Dongguan Dongdian Testing Service Co., Ltd.**

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Guangdong Province, China, 523808

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# REPORT

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**TEST REPORT DECLARE**

|                             |   |   |
|-----------------------------|---|---|
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**Test Standard Used:**

FCC Rules and Regulations Part 15 Subpart C: 2015, RSS-210 Issue 8 Dec. 2010

**Test procedure used:**

ANSI C63.10:2013, ANSI C63.4:2014, RSS-Gen Issue 4, Nov. 2014.

**We Declare:**

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

**After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&IC standards.**

|                      |                              |                        |               |
|----------------------|------------------------------|------------------------|---------------|
| <b>Report No:</b>    | DDT-R16Q0108-3E1             |                        |               |
| <b>Date of Test:</b> | Jan. 08, 2016 ~Feb. 28, 2016 | <b>Date of Report:</b> | Mar. 15, 2016 |

*Prepared By:*

*Damon Hu*  
 Damon Hu/Engineer

*Approved by:*

  
 Kuo-Feng LMC Schager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

## 1. Summary of test results

| Description of Test Item       | Standard   | Results |
|--------------------------------|--|---------|
| 20dB Bandwidth                 | FCC Part 15: 15.215<br>RSS-210 Issue 8<br>ANSI C63.10:2013<br>ANSI C63.4:2014                        | PASS    |
| Radiated Emission              | FCC Part 15: 15.209<br>FCC Part 15: 15.245<br>RSS-210 Issue 8<br>ANSI C63.10:2013<br>ANSI C63.4:2014 | PASS    |
| Power Line Conducted Emissions | FCC Part 15: 15.207<br>RSS-Gen Issue 4<br>ANSI C63.10:2013<br>ANSI C63.4:2014                        | PASS    |

Note: N/A is an abbreviation for Not Applicable.

## 2. General test information

### 2.1. Description of EUT

|                          |   |
|--------------------------|---|
| EUT* Name                | : LED WRAP LIGHT  |
| FCC Model Number         | : 546761XX (“XX”=00-99, which respectively represents different LED colour temperature) |
| IC Model Number          | : 54676141; 54676142; 54676143  |
| EUT function description | : Please reference user manual of this device   |
| Power supply             | : AC 120V/60Hz, 39.5W   |
| Operation frequency      | : 5790MHz   |
| Antenna Type             | : PCB antenna, maximum PK gain: 2.58dBi   |
| Date of Receipt          | : Jan. 08, 2016   |
| Sample Type              | : Series production   |

Note 1: EUT is the ab. of equipment under test.

Note 2: the models 54676141, 54676142 and 54676143 are identical except the colour temperature, therefore the model 54676141 was tested and recorded in this report.

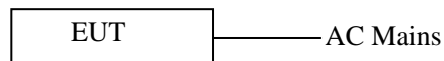
### 2.2. Accessories of EUT

| Description of Accessories | Manufacturer | Model number or Type | Serial No. | Other |
|----------------------------|--------------|----------------------|------------|-------|
| /                          | /            | /                    | /          | /     |

### 2.3. Assistant equipment used for test

| Description of Assistant equipment | Manufacturer | Model number or Type | EMC Compliance | SN |
|------------------------------------|--------------|----------------------|----------------|----|
| /                                  | /            | /                    | /              | /  |

### 2.4. Block diagram of EUT configuration for test



The system was configured for test as normally used by user.

## 2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

|                    |           |
|--------------------|-----------|
| Temperature range: | 21-25°C   |
| Humidity range:    | 40-75%    |
| Pressure range:    | 86-106kPa |

## 2.6. Deviations of test standard

No Deviation

## 2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-22891499 <http://www.dgddt.com>

FCC Registration Number: 270092

## 2.8. Measurement uncertainty

| Test Item   | Uncertainty                                    |
|---|--|
| Uncertainty for Conduction emission test  | ±2.44dB (150KHz-30MHz)                         |
|   | ±2.94dB (9KHz-150KHz)                          |
| Uncertainty for Radiation Emission test(include Fundamental emission)<br>(30MHz-1GHz)     | ±3.14 dB (Antenna Polarize: V)                 |
|   | ±3.16 dB (Antenna Polarize: H)                 |
| Uncertainty for Radiation Emission test<br>(1GHz to 18GHz)( include Fundamental emission) | ±4.14dB(1-6GHz)                                |
|   | ±4.46dB (6GHz-18Gz)                            |
| Bandwidth   | ±1.1%  |
| Stop Transmitting Time Test   | ±0.6%  |
| Uncertainty for frequency error   | 6.7 x 10 <sup>-8</sup> (Antenna couple method) |
|   | 5.5 x 10 <sup>-8</sup> (Conducted method)      |

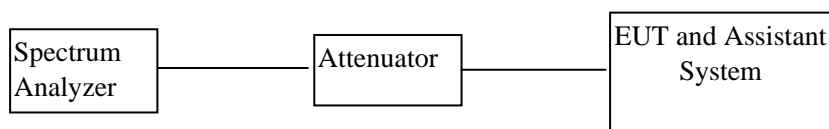
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 3. Equipment used during test

| Equipment                                  | Manufacturer  | Model No.    | Serial No.   | Last Cal.  | Cal. Interval |
|--|---------------|--------------|--------------|------------|---------------|
| <b>RF Connected Test</b>                   |               |              |              |            |               |
| Spectrum analyzer                          | R&S           | FSU26        | 1166.1660.26 | 2015/10/24 | 1 Year        |
| Attenuator                                 | Mini-Circuits | BW-S10W2     | 101109       | 2015/08/18 | 1 Year        |
| RF Cable                                   | Micable       | C10-01-01-1  | 100309       | 2015/08/18 | 1 Year        |
| <b>Radiated Emission Test</b>              |               |              |              |            |               |
| EMI Test Receiver                          | R&S           | ESU8         | 100316       | 2015/10/24 | 1Year         |
| Spectrum analyzer                          | R&S           | FSU26        | 1166.1660.26 | 2015/10/24 | 1Year         |
| Spectrum analyzer                          | Agilent       | E4447A       | MY50180031   | 2015/09/08 | 1Year         |
| Trilog Broadband Antenna                   | Schwarzbeck   | VULB9163     | 9163-462     | 2015/05/30 | 1 Year        |
| Active Loop antenna                        | Schwarzbeck   | FMZB-1519    | 1519-038     | 2015/10/24 | 1 Year        |
| Double Ridged Horn Antenna                 | R&S           | HF907        | 100276       | 2015/10/31 | 1 Year        |
| Horn antenna                               | A.H.          | SAS-573      | 2522         | 2015/12/19 | 1 Year        |
| Pre-amplifier                              | A.H.          | PAM-0118     | 360          | 2015/08/18 | 1 Year        |
| RF Cable                                   | HUBSER        | CP-X2        | W11.03       | 2015/10/24 | 1Year         |
| RF Cable                                   | HUBSER        | CP-X1        | W12.02       | 2015/10/24 | 1 Year        |
| MI Cable                                   | HUBSER        | C10-01-01-1M | 1091629      | 2015/10/24 | 1 Year        |
| Test software                              | Audix         | E3           | V 6.11111b   | /          | /             |
| <b>Power Line Conducted Emissions Test</b> |               |              |              |            |               |
| Test Receiver                              | R&S           | ESU8         | 100316       | 2015/10/24 | 1 Year        |
| LISN 1                                     | R&S           | ENV216       | 101109       | 2015/10/24 | 1 Year        |
| LISN 2                                     | R&S           | ESH2-Z5      | 100309       | 2015/10/24 | 1 Year        |
| Pulse Limiter                              | R&S           | ESH3-Z2      | 101242       | 2015-10-24 | 1 Year        |
| CE Cable 1                                 | HUBSER        | ESU8/RF2     | W10.01       | 2015/10/24 | 1 Year        |
| Test software                              | Audix         | E3           | V 6.11111b   | /          | /             |

### 4. 20dB Bandwidth

#### 4.1. Block diagram of test setup



#### 4.2. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

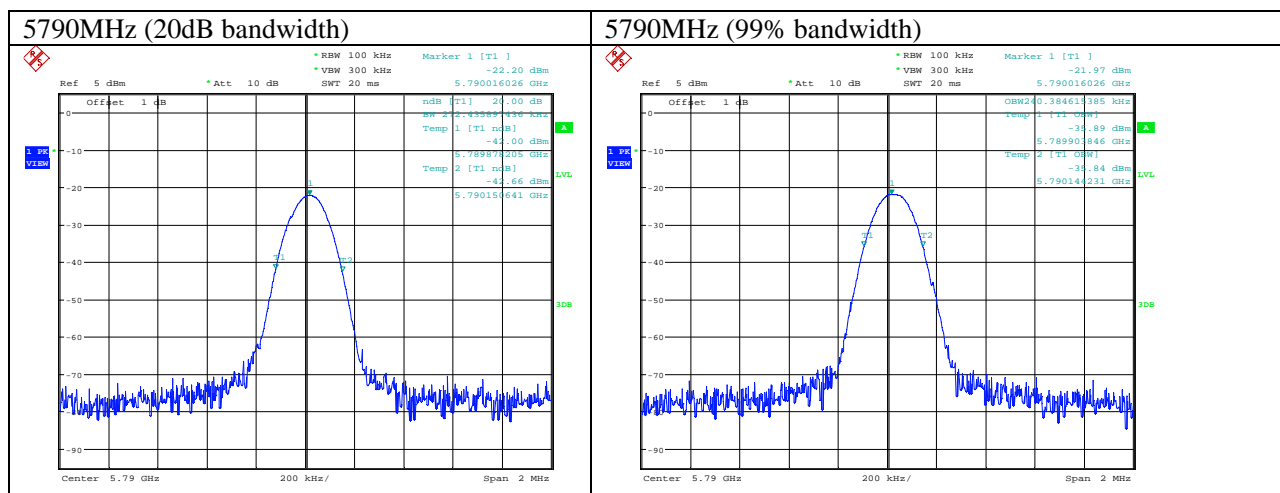
### 4.3. Test Procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 300 kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

### 4.4. Test Result

| EUT: LED WRAP LIGHT M/N: 546761XX |                   |                             |                            |                         |              |            |
|-----------------------------------|-------------------|-----------------------------|----------------------------|-------------------------|--------------|------------|
| Mode                              | Cent. Freq. (MHz) | 20dB bandwidth Result (MHz) | 99% bandwidth Result (MHz) | Limit (MHz)             | Margin (MHz) | Conclusion |
| TX mode                           | 5790              | 0.272                       | 0.240                      | /                       | /            | PASS       |
| Test Date : Feb. 22, 2016         |                   |                             |                            | Test Engineer: Damon Hu |              |            |

### 4.5. Original test data

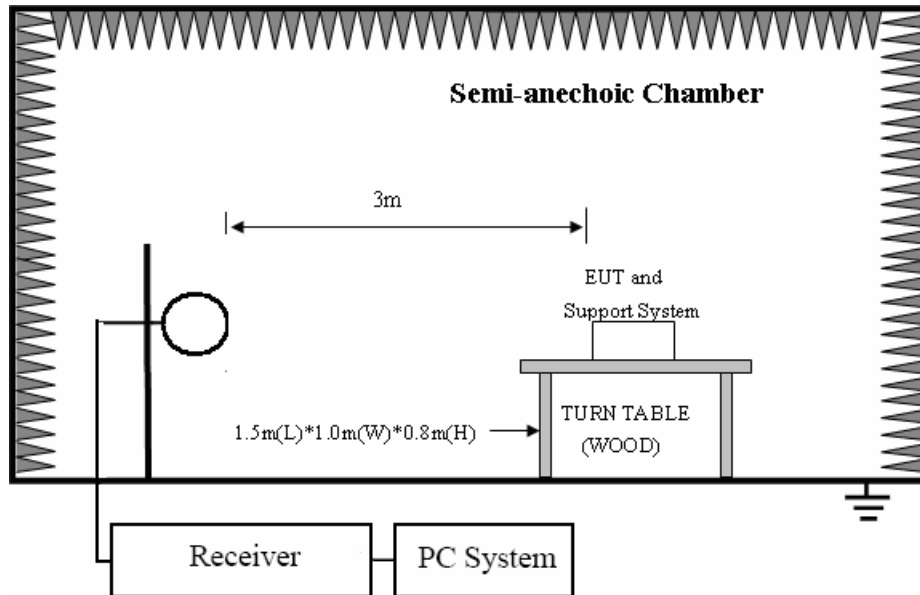




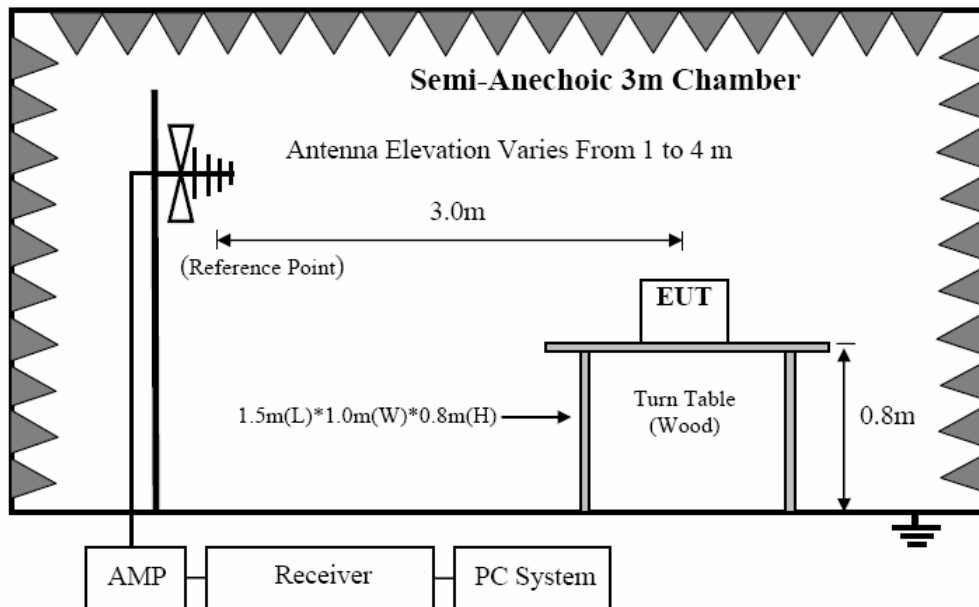
## 5. Radiated emission

### 5.1. Block diagram of test setup

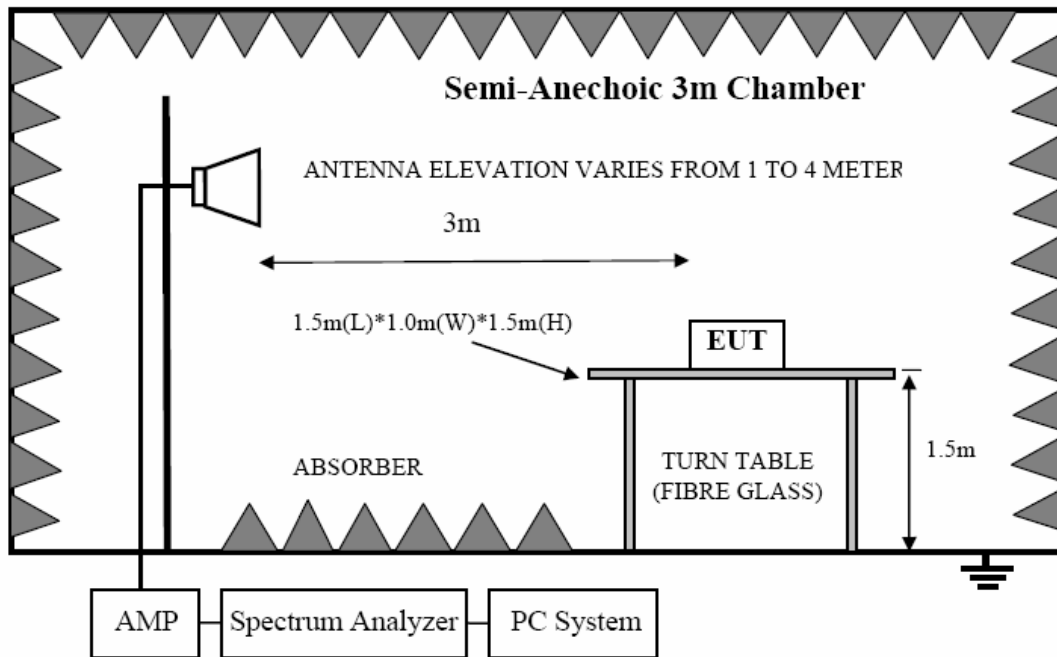
In 3m Anechoic Chamber Test Setup Diagram for 9KHz-30MHz



In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

**5.2. Limit**

1. FCC 15.205 Restricted frequency band

| MHz                        | MHz                   | MHz             | GHz              |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138             | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.7 - 156.9         | 2690 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 322 - 335.4           | 3600 - 4400     | ( <sup>2</sup> ) |

2. FCC 15.209 Limit.

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT |               |
|------------------|--------------------|-----------------------|---------------|
|                  |                    | μV/m                  | dB(μV)/m      |
| 0.009 ~ 0.490    | 300                | 2400/F(KHz)           | 67.6-20log(F) |
| 0.490 ~ 1.705    | 30                 | 24000/F(KHz)          | 87.6-20log(F) |
| 1.705 ~ 30.0     | 30                 | 30                    | 29.54         |
| 30 ~ 88          | 3                  | 100                   | 40.0          |
| 88 ~ 216         | 3                  | 150                   | 43.5          |

|            |   |   |      |
|------------|---|---|------|
| 216 ~ 960  | 3 | 200   | 46.0 |
| 960 ~ 1000 | 3 | 500   | 54.0 |
| Above 1000 | 3 | 74.0 dB( $\mu$ V)/m (Peak)<br>54.0 dB( $\mu$ V)/m (Average) |      |

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\text{Log}(30m/3m)$$

### 3. Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

## 5.3. Test Procedure

(1) EUT height should be 0.8m for below 1GHz at a semi - anechoic chamber while EUT height should be 1.5m for above 1GHz at full chamber or semi - anechoic chamber ground with absorbers.

(2) Test antenna was located 1m/3m from the EUT on an adjustable mast, and the antenna used as below table:

| Test frequency range | Test antenna used                      | Test distance |
|----------------------|--|---------------|
| 9KHz-30MHz           | Active Loop antenna                    | 3 m           |
| 30MHz-1GHz           | Trilog Broadband Antenna               | 3 m           |
| 1GHz-18GHz           | Double Ridged Horn Antenna(1GHz-18GHz) | 3 m           |
| 18GHz-40GHz          | Horn Antenna(18GHz-40GHz)              | 1 m           |

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30MHz, the Trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9KHz to 40GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1m to 4m(Except loop antenna, it's fixed 1m above

ground.)

- (b) Change work frequency or channel of device if practicable.
- (c) Change modulation type of device if practicable.
- (d) Change power supply range from 85% to 115% of the rated supply voltage
- (e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

highest emissions.

Spectrum frequency from 9KHz to 40GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18GHz to 40GHz, so below final test was performed with frequency range from 9KHz to 18GHz.

- (4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2013 on Radiated Emission test.
- (5) The emissions from 9KHz to 1GHz were measured based on CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz, for emissions from 9KHz-90KHz,110KHz-490KHz and above 1GHz were measured based on average detector, for emissions above 1GHz, peak emissions also be measured and need comply with Peak limit.
- (6) The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW

| Frequency band | RBW    |
|----------------|--------|
| 9KHz-150KHz    | 200Hz  |
| 150KHz-30MHz   | 9KHz   |
| 30MHz-1GHz     | 120KHz |

- (7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RMS detector RBW 1MHz VBW 3MHz for Average measure(according ANSI C63.10:2013 clause 4.2.3.2.3 procedure for average measure).
- (8) For fundamental frequency test, according to section 4.5 test result of this report, the EUT's BW (max) =0.272MHz, so set spectrum analyzer's RBW=1MHz, VBW=3MHz. peak detector for PK, RMS detector for AV, Read the Level in spectrum analyzer and record.
- (9) X, Y, Z three axial are tested and the report only the worst case.

#### 5.4. Test result

**PASS. (See below detailed test result)**

All the emissions except fundamental emission from 9 KHz to 40GHz were comply with FCC PART 15.209 limits limit.

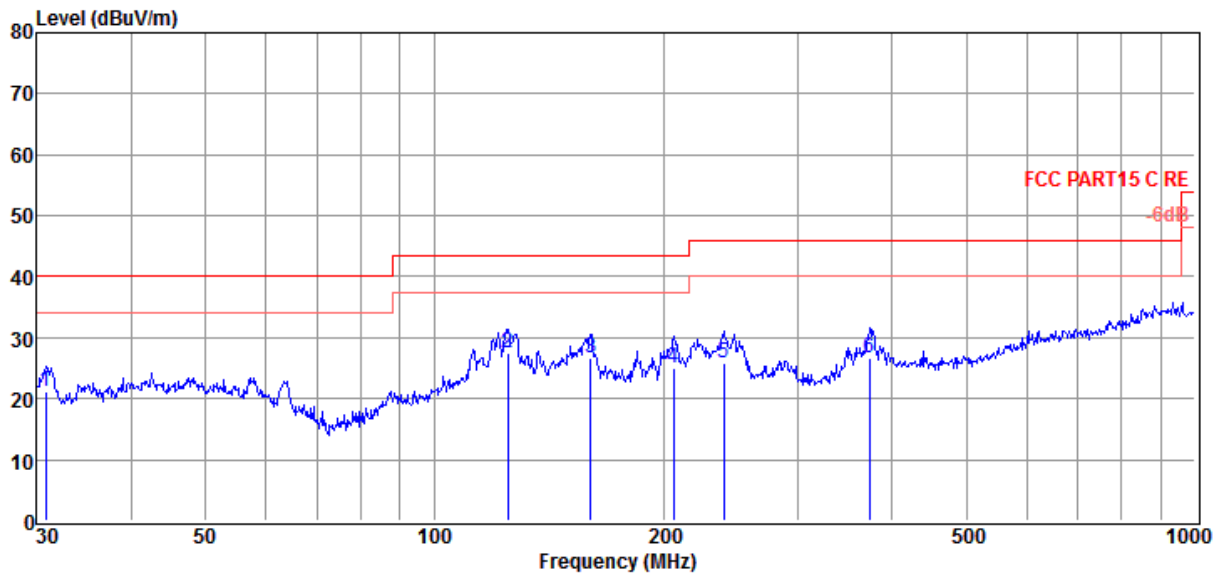
Note1: According exploratory test no any obvious emission were detected from 9KHz to 30MHz and 18GHz to 40GHz, so the final test was performed with frequency range from 30MHz to 18GHz and recorded in below.

Note2: For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

## TR-4-E-009 Radiated Emission Test Result

|  |   |
|--|---|
| <b>Test Site</b> : DDT 3m Chamber                          | E:\2016 Report Data\16Q0108-3\RE.EM6                  |
| <b>Test Date</b> : 2016-01-11                              | <b>Tested By</b> : Jerry                              |
| <b>EUT</b> : LED WRAP LIGHT                                | <b>Model Number</b> : 54676141                        |
| <b>Power Supply</b> : AC 120V/60Hz                         | <b>Test Mode</b> : TX mode                            |
| <b>Condition</b> : Temp:24.5'C,Humi:55%,<br>Press:100.1kPa | <b>Antenna/Distance</b> : 2015 VULB9163/3m/HORIZONTAL |
| <b>Memo</b> :  |   |

Data: 15



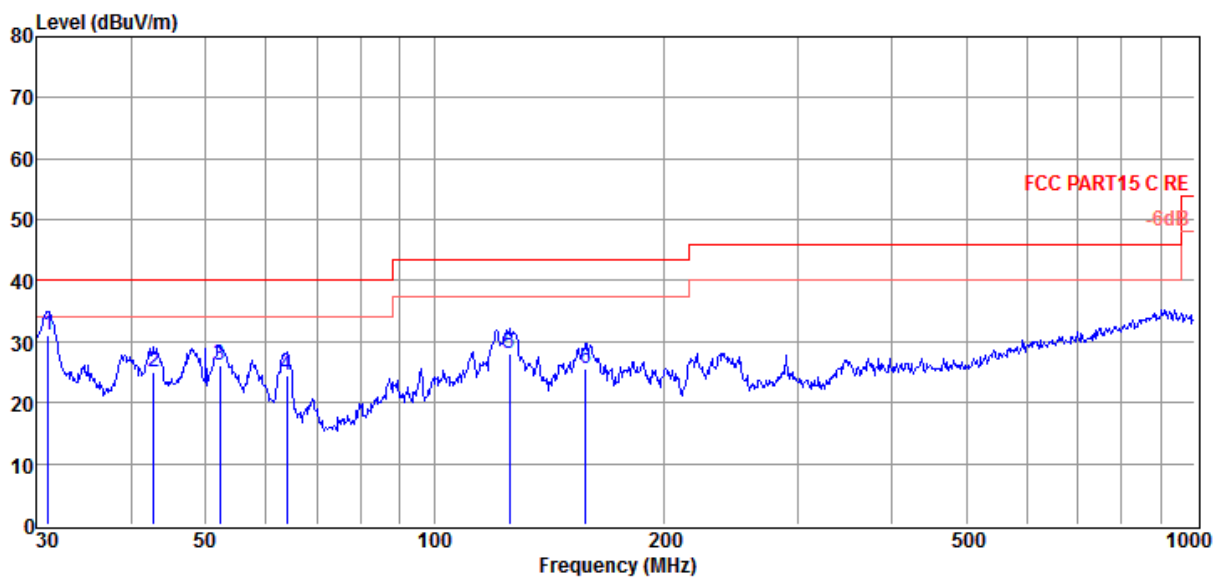
| Item<br>(Mark) | Freq<br>(MHz) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>dB | Result<br>Level<br>(dBμV/m) | Limit<br>Line<br>(dBμV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|---------------|-------------------------|-----------------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 30.85         | 4.40                    | 13.15                       | 3.68                | 21.23                       | 40.00                     | -18.77                | QP       | HORIZONTAL   |
| 2              | 125.01        | 14.01                   | 8.97                        | 4.45                | 27.43                       | 43.50                     | -16.07                | QP       | HORIZONTAL   |
| 3              | 160.35        | 14.62                   | 7.33                        | 4.66                | 26.61                       | 43.50                     | -16.89                | QP       | HORIZONTAL   |
| 4              | 206.40        | 12.66                   | 7.55                        | 4.93                | 25.14                       | 43.50                     | -18.36                | QP       | HORIZONTAL   |
| 5              | 239.99        | 9.57                    | 11.30                       | 5.09                | 25.96                       | 46.00                     | -20.04                | QP       | HORIZONTAL   |
| 6              | 373.31        | 6.83                    | 14.10                       | 5.69                | 26.62                       | 46.00                     | -19.38                | QP       | HORIZONTAL   |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.  
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

## TR-4-E-009 Radiated Emission Test Result

|  |   |
|--|---|
| <b>Test Site</b> : DDT 3m Chamber                          | E:\2016 Report Data\16Q0108-3\RE.EM6                |
| <b>Test Date</b> : 2016-01-11                              | <b>Tested By</b> : Jerry                            |
| <b>EUT</b> : LED WRAP LIGHT                                | <b>Model Number</b> : 54676141                      |
| <b>Power Supply</b> : AC 120V/60Hz                         | <b>Test Mode</b> : TX mode                          |
| <b>Condition</b> : Temp:24.5'C,Humi:55%,<br>Press:100.1kPa | <b>Antenna/Distance</b> : 2015 VULB9163/3m/VERTICAL |
| <b>Memo</b> :  |   |

Data: 16



| Item<br>(Mark) | Freq<br>(MHz) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>dB | Result<br>Level<br>(dBμV/m) | Limit<br>Line<br>(dBμV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|---------------|-------------------------|-----------------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 31.07         | 14.14                   | 13.15                       | 3.68                | 30.97                       | 40.00                     | -9.03                 | QP       | VERTICAL     |
| 2              | 42.75         | 7.89                    | 13.40                       | 3.82                | 25.11                       | 40.00                     | -14.89                | QP       | VERTICAL     |
| 3              | 52.21         | 9.99                    | 12.30                       | 3.91                | 26.20                       | 40.00                     | -13.80                | QP       | VERTICAL     |
| 4              | 63.98         | 11.28                   | 9.07                        | 4.01                | 24.36                       | 40.00                     | -15.64                | QP       | VERTICAL     |
| 5              | 125.45        | 14.73                   | 8.97                        | 4.45                | 28.15                       | 43.50                     | -15.35                | QP       | VERTICAL     |
| 6              | 158.11        | 13.59                   | 7.37                        | 4.65                | 25.61                       | 43.50                     | -17.89                | QP       | VERTICAL     |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.  
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

**Radiated Emission test (above 1GHz)**

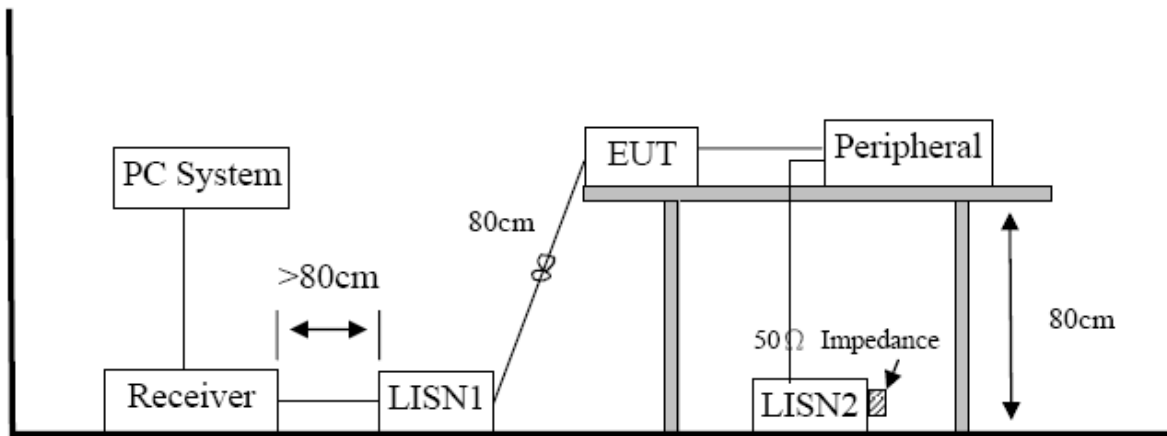
| Freq (MHz)                | Read level (dB $\mu$ V) | Antenna Factor (dB/m) | PRM Factor (dB) | Cable Loss (dB) | Result Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Detector type | Polarization |
|---------------------------|-------------------------|-----------------------|-----------------|-----------------|-----------------------------|----------------------|-------------|---------------|--------------|
| Tx mode 5790MHz           |                         |                       |                 |                 |                             |                      |             |               |              |
| 5150.00                   | 26.25                   | 34.01                 | 29.33           | 8.84            | 39.77                       | 74.00                | -34.23      | Peak          | HORIZONTAL   |
| 5350.00                   | 24.94                   | 34.41                 | 29.30           | 9.03            | 39.08                       | 74.00                | -34.92      | Peak          | HORIZONTAL   |
| 5790.00                   | 52.91                   | 35.77                 | 29.21           | 8.73            | 68.20                       | 114.00               | -45.80      | Peak          | HORIZONTAL   |
| 5785.00                   | 46.03                   | 34.87                 | 29.21           | 9.47            | 61.16                       | 74.00                | -12.84      | Peak          | HORIZONTAL   |
| 5785.00                   | 33.10                   | 34.87                 | 29.21           | 9.47            | 48.23                       | 54.00                | -5.77       | Average       | HORIZONTAL   |
| 5815.00                   | 24.69                   | 34.89                 | 29.21           | 9.50            | 39.87                       | 74.00                | -34.13      | Peak          | HORIZONTAL   |
| 8004.00                   | 28.76                   | 37.50                 | 31.15           | 10.38           | 45.49                       | 74.00                | -28.51      | Peak          | HORIZONTAL   |
| 10384.00                  | 27.79                   | 38.55                 | 33.17           | 11.24           | 44.41                       | 74.00                | -29.59      | Peak          | HORIZONTAL   |
| 11580.00                  | 33.23                   | 38.93                 | 34.56           | 12.12           | 49.72                       | 74.00                | -24.28      | Peak          | HORIZONTAL   |
| 13920.00                  | 32.76                   | 40.28                 | 34.78           | 13.19           | 51.45                       | 74.00                | -22.55      | Peak          | HORIZONTAL   |
| 17370.00                  | 23.59                   | 43.23                 | 37.03           | 18.67           | 48.46                       | 74.00                | -25.54      | Peak          | HORIZONTAL   |
| 5150.00                   | 26.06                   | 34.01                 | 29.33           | 8.84            | 39.58                       | 74.00                | -34.42      | Peak          | VERTICAL     |
| 5350.00                   | 26.47                   | 34.41                 | 29.30           | 9.03            | 40.61                       | 74.00                | -33.39      | Peak          | VERTICAL     |
| 5785.00                   | 41.73                   | 34.87                 | 29.21           | 9.47            | 56.86                       | 74.00                | -17.14      | Peak          | VERTICAL     |
| 5785.00                   | 32.23                   | 34.87                 | 29.21           | 9.47            | 47.36                       | 54.00                | -6.64       | Average       | VERTICAL     |
| 5790.00                   | 54.65                   | 35.77                 | 29.21           | 8.73            | 69.94                       | 114.00               | -44.06      | Peak          | VERTICAL     |
| 5815.00                   | 25.14                   | 34.89                 | 29.21           | 9.50            | 40.32                       | 74.00                | -33.68      | Peak          | VERTICAL     |
| 7154.00                   | 28.80                   | 37.19                 | 30.47           | 9.90            | 45.42                       | 74.00                | -28.58      | Peak          | VERTICAL     |
| 8905.00                   | 27.90                   | 37.78                 | 32.26           | 10.55           | 43.97                       | 74.00                | -30.03      | Peak          | VERTICAL     |
| 11580.00                  | 29.17                   | 38.93                 | 34.56           | 12.12           | 45.66                       | 74.00                | -28.34      | Peak          | VERTICAL     |
| 17370.00                  | 30.38                   | 43.23                 | 37.03           | 18.67           | 55.25                       | 74.00                | -18.75      | Peak          | VERTICAL     |
| 17370.00                  | 16.41                   | 43.23                 | 37.03           | 18.67           | 41.28                       | 54.00                | -12.72      | Average       | VERTICAL     |
| Test Date : Jan. 20, 2016 |                         |                       |                 |                 | Test Engineer : Damon Hu    |                      |             |               |              |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.



## 6. Power Line Conducted Emission

### 6.1. Block diagram of test setup



### 6.2. Power Line Conducted Emission Limits(Class B)

| Frequency       | Quasi-Peak Level<br>dB( $\mu$ V) | Average Level<br>dB( $\mu$ V) |
|-----------------|----------------------------------|-------------------------------|
| 150kHz ~ 500kHz | 66 ~ 56*                         | 56 ~ 46*                      |
| 500kHz ~ 5MHz   | 56                               | 46                            |
| 5MHz ~ 30MHz    | 60                               | 50                            |

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

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

### 6.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 6.1 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

#### **6.4. Test Result**

PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “-----” means Peak detection; “-----” mans Average detection

# TR-4-E-010 Conducted Emission Test Result

**Test Site** : DDT 1# Shield Room

E:\2016 report data\16Q0108-3\CE.EM6

**Test Date** : 2016-01-20

**Tested By** : Jerry

**EUT** : LED WRAP LIGHT

**Model Number** : 54676141

**Power Supply** : AC 120V/60Hz

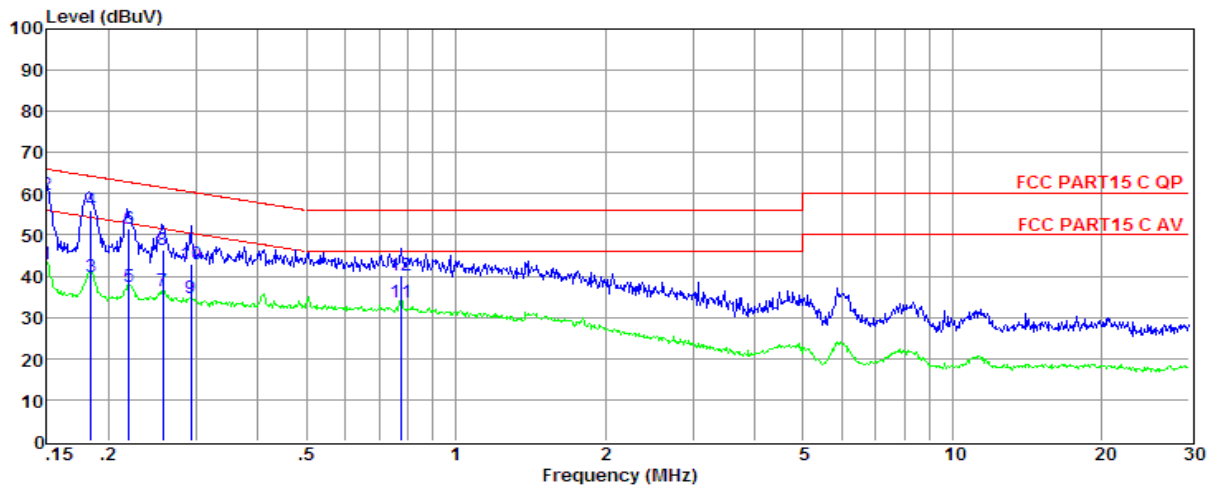
**Test Mode** : TX mode

**Condition** : Temp:24.5°C,Humi:55%,  
Press:100.1kPa

**LISN** : 2015 ENV216/NEUTRAL

**Memo** :

Data: 30



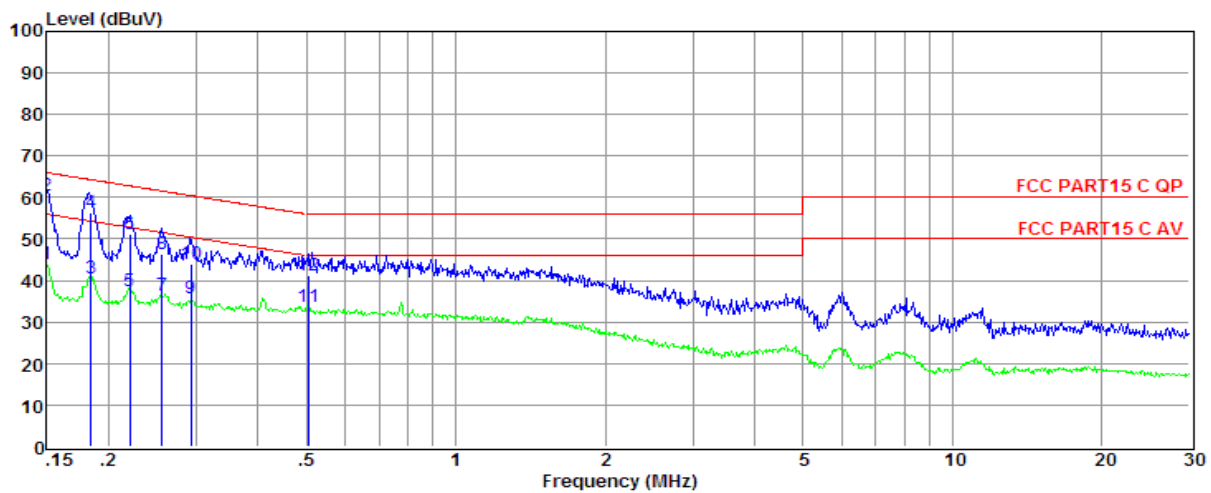
| Item   | Freq  | Read Level | LISN Factor | Cable Loss | Pulse Limiter Factor | Result Level | Limit Line | Over Limit | Detector | Phase   |
|--------|-------|------------|-------------|------------|----------------------|--------------|------------|------------|----------|---------|
| (Mark) | (MHz) | (dBμV)     | (dB)        | (dB)       | (dB)                 | (dBμV)       | (dBμV)     | (dB)       |          |         |
| 1      | 0.15  | 23.63      | 9.60        | 0.01       | 9.84                 | 43.08        | 56.00      | -12.92     | Average  | NEUTRAL |
| 2      | 0.15  | 40.39      | 9.60        | 0.01       | 9.84                 | 59.84        | 66.00      | -6.16      | QP       | NEUTRAL |
| 3      | 0.18  | 20.34      | 9.59        | 0.02       | 9.85                 | 39.80        | 54.28      | -14.48     | Average  | NEUTRAL |
| 4      | 0.18  | 36.62      | 9.59        | 0.02       | 9.85                 | 56.08        | 64.28      | -8.20      | QP       | NEUTRAL |
| 5      | 0.22  | 18.02      | 9.59        | 0.02       | 9.85                 | 37.48        | 52.83      | -15.35     | Average  | NEUTRAL |
| 6      | 0.22  | 32.23      | 9.59        | 0.02       | 9.85                 | 51.69        | 62.83      | -11.14     | QP       | NEUTRAL |
| 7      | 0.26  | 17.09      | 9.60        | 0.02       | 9.85                 | 36.56        | 51.51      | -14.95     | Average  | NEUTRAL |
| 8      | 0.26  | 27.00      | 9.60        | 0.02       | 9.85                 | 46.47        | 61.51      | -15.04     | QP       | NEUTRAL |
| 9      | 0.29  | 15.24      | 9.60        | 0.02       | 9.85                 | 34.71        | 50.46      | -15.75     | Average  | NEUTRAL |
| 10     | 0.29  | 23.41      | 9.60        | 0.02       | 9.85                 | 42.88        | 60.46      | -17.58     | QP       | NEUTRAL |
| 11     | 0.78  | 14.08      | 9.61        | 0.08       | 9.86                 | 33.63        | 46.00      | -12.37     | Average  | NEUTRAL |
| 12     | 0.78  | 20.74      | 9.61        | 0.08       | 9.86                 | 40.29        | 56.00      | -15.71     | QP       | NEUTRAL |

- Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

# TR-4-E-010 Conducted Emission Test Result

**Test Site** : DDT 1# Shield Room E:\2016 report data\16Q0108-3\CE.EM6  
**Test Date** : 2016-01-20 **Tested By** : Jerry  
**EUT** : LED WRAP LIGHT **Model Number** : 54676741  
**Power Supply** : AC 120V/60Hz **Test Mode** : TX mode  
**Condition** : Temp:24.5°C,Humi:55%,  
**LISN** : 2015 ENV216/LINE  
 Press:100.1kPa  
**Memo** :

Data: 32



| Item<br>(Mark) | Freq<br>(MHz) | Read<br>Level<br>(dBμV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Pulse<br>Limiter<br>Factor<br>(dB) | Result<br>Level<br>(dBμV) | Limit<br>Line<br>(dBμV) | Over<br>Limit<br>(dB) | Detector | Phase |
|----------------|---------------|-------------------------|------------------------|-----------------------|------------------------------------|---------------------------|-------------------------|-----------------------|----------|-------|
| 1              | 0.15          | 24.42                   | 9.61                   | 0.01                  | 9.84                               | 43.88                     | 56.00                   | -12.12                | Average  | LINE  |
| 2              | 0.15          | 40.98                   | 9.61                   | 0.01                  | 9.84                               | 60.44                     | 66.00                   | -5.56                 | QP       | LINE  |
| 3              | 0.18          | 20.92                   | 9.62                   | 0.02                  | 9.85                               | 40.41                     | 54.28                   | -13.87                | Average  | LINE  |
| 4              | 0.18          | 37.03                   | 9.62                   | 0.02                  | 9.85                               | 56.52                     | 64.28                   | -7.76                 | QP       | LINE  |
| 5              | 0.22          | 18.01                   | 9.62                   | 0.02                  | 9.85                               | 37.50                     | 52.79                   | -15.29                | Average  | LINE  |
| 6              | 0.22          | 31.87                   | 9.62                   | 0.02                  | 9.85                               | 51.36                     | 62.79                   | -11.43                | QP       | LINE  |
| 7              | 0.26          | 17.08                   | 9.62                   | 0.02                  | 9.85                               | 36.57                     | 51.56                   | -14.99                | Average  | LINE  |
| 8              | 0.26          | 26.95                   | 9.62                   | 0.02                  | 9.85                               | 46.44                     | 61.56                   | -15.12                | QP       | LINE  |
| 9              | 0.29          | 16.20                   | 9.62                   | 0.02                  | 9.85                               | 35.69                     | 50.46                   | -14.77                | Average  | LINE  |
| 10             | 0.29          | 24.36                   | 9.62                   | 0.02                  | 9.85                               | 43.85                     | 60.46                   | -16.61                | QP       | LINE  |
| 11             | 0.51          | 14.03                   | 9.63                   | 0.03                  | 9.87                               | 33.56                     | 46.00                   | -12.44                | Average  | LINE  |
| 12             | 0.51          | 21.55                   | 9.63                   | 0.03                  | 9.87                               | 41.08                     | 56.00                   | -14.92                | QP       | LINE  |

- Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

## **7. Antenna Requirements**

### **7.1. Limit**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **7.2. Result**

The antennas used for this product are Integrated chip antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 2.58dBi.

**END OF REPORT**