

# ***FCC TEST REPORT***

**FCC ID** : WIR-8464208002R  
**Applicant** : Ultra-Lit Tree Co.  
**Address** : 1989 Johns Drive, Glenview, IL 60025, US

**Equipment Under Test (EUT) :**

**Product Name** : Christmas Tree Fire alert system  
**Model No.** : 8464208002

**Standards** : FCC CFR47 Part 15 Section 15.109:2009

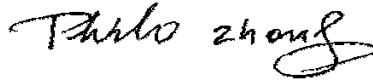
**Date of Test** : July 27, 2011 ~ July 29, 2011

**Date of Issue** : August 10, 2011

**Test Engineer** : Hunk yan



**Reviewed By** : Philo zhong



|                    |               |
|--------------------|---------------|
| <b>Test Result</b> | <b>: PASS</b> |
|--------------------|---------------|

**Prepared By:**

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- ☆ The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2003. The test results have been reviewed against the Directives above and found to meet their essential requirements.

WALTEK SERVICES

Reference No.: WT11063372-D-E-F

## 2 Test Summary

| FCC CFR47 Part 15 Subpart B Requirements |  |                  |        |
|--|--|------------------|--------|
| Test Items                               | Test Requirement                         | Test Method      | Result |
| Radiated Emission<br>(30MHz to 2GHz)     | FCC CFR47 Part 15 Section<br>15.109:2009 | ANSI C63.4: 2003 | PASS   |
| Conducted Emission<br>(150KHz to 30MHz)  | FCC CFR47 Part 15 Section<br>15.107:2009 | ANSI C63.4: 2003 | N/A    |

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## 4 General Information

### 4.1 Client Information

**Applicant** : Ultra-Lit Tree Co.  
**Address of Applicant** : 1989 Johns Drive, Glenview, IL 60025, US

**Manufacturer** : DongGuan Protronic Electronics Ltd.  
**Address of Manufacturer** : Protronic Industrial Park, Xiangxi Village, Shipai Town, Dongguan, Guangdong China

### 4.2 General Description of E.U.T.

**Product Name** : Christmas Tree Fire alert system  
**Model No.** : 8464208002  
**Operation Frequency** : 433.92MHz

### 4.3 Details of E.U.T.

**Technical Data:** : DC 9.0V Battery

### 4.4 Description of Support Units

The EUT has been tested as an independent unit. All the test was performed in the condition of DC 9.0V input.

### 4.5 Standards Applicable for Testing

The customer requested FCC tests for a Christmas Tree Fire alert system. The standards used were FCC CFR47 Part 15 Section 15.109:2009.

#### **4.6 Test Facility**

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: IC7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, Aug.03, 2010.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

#### **4.7 Test Location**

All the tests were performed at:

Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China

## 5 Equipment Used during Test

| Equipment Name                           | Manufacturer Model                            | Equipment No | Internal No | Specification   | Cal. Date    | Due Date     | Cert. No    | Uncertainty   |
|--|---|--------------|-------------|---|--------------|--------------|-------------|---|
| EMC Analyzer                             | Agilent/ E7405A                               | MY45114943   | W2008001    | 9k-26.5GHz  | Aug. 2, 2011 | Aug. 1, 2012 | Wws20081596 | ±1dB  |
| Trilog Broadband Antenne                 | SCHWARZB ECK MESS-ELEKTROM / VULB9163         | 336          | W2008002    | 30-3000 MHz   | Aug. 2, 2011 | Aug. 1, 2012 | -           | ±1dB  |
| Broad-band Horn Antenna                  | SCHWARZB ECK MESS-ELEKTROM / BBHA 9120D(1201) | 667          | W2008003    | 1-18GHz   | Aug. 2, 2011 | Aug. 1, 2012 | -           | f<10 GHz: ±1dB<br>10GHz<f<18 GHz: ±1.5dB                    |
| Broadband Preamplifier                   | SCHWARZB ECK MESS-ELEKTROM / BBV 9718         | 9718-148     | W2008004    | 0.5-18GHz   | Aug. 2, 2011 | Aug. 1, 2012 | -           | ±1.2dB  |
| 10m Coaxial Cable with N-male Connectors | SCHWARZB ECK MESS-ELEKTROM / AK 9515 H        | -            | -           | -   | Aug. 2, 2011 | Aug. 1, 2012 | -           | -   |
| 10m 50 Ohm Coaxial Cable                 | SCHWARZB ECK MESS-ELEKTROM / AK 9513          | -            | -           | -   | Aug. 2, 2011 | Aug. 1, 2012 | -           | -   |
| Positioning Controller                   | C&C LAB/ CC-C-IF                              | -            | -           | -   | Aug. 2, 2011 | Aug. 1, 2012 | -           | -   |
| Color Monitor                            | SUNSP0/ SP-14C                                | -            | -           | -   | Aug. 2, 2011 | Aug. 1, 2012 | -           | -   |
| Test Receiver                            | ROHDE&SC HWARZ/ ESPI                          | 101155       | W2005001    | 9k-3GHz   | Aug. 2, 2011 | Aug. 1, 2012 | Wws20080942 | ±1dB  |
| EMI Receiver                             | Beijingkehuan                                 | KH3931       | -           | 9k-1GHz   | Aug. 2, 2011 | Aug. 1, 2012 | -           | -   |
| Two-Line V-Network                       | ROHDE&SC HWARZ/ ENV216                        | 100115       | W2005002    | 50Ω/50μH  | Aug. 2, 2011 | Aug. 1, 2012 | Wws20080941 | ±10%  |
| Digital Power Analyzer                   | Em Test AG/Switzerland/ DPA 500               | V0745103095  | W2008012    | Power: 2000VA<br>Vol-range: 0-300V<br>Freq_range: 10-80Hz | Aug. 2, 2011 | Aug. 1, 2012 | Wwd20081185 | Voltage distinguish:0.025%<br>Power_freq distinguish:0.02Hz |

| Equipment Name                        | Manufacturer Model              | Equipment No | Internal No | Specification                                      | Cal. Date    | Due Date     | Cert. No     | Uncertainty  |
|---------------------------------------|---------------------------------|--------------|-------------|--|--------------|--------------|--------------|--|
| Power Source                          | Em Test AG/Switzerland/ ACS 500 | V07451 03096 | W2008013    | Vol-range: 0-300V<br>Power_freq : 10-80Hz          |              |              |              |  |
| RF Generator                          | TESEQ GmbH/ NSG4070             | 25781        | W2008008    | Fraq-range: 9K-1GHz<br>RF voltage: -60 dBm- +10dBm | Aug. 2, 2011 | Aug. 1, 2012 | Wws20 081890 | Power_freq distinguish0.1Hz<br>RFelectricity distinguish 0.1 B |
| CDN M-Type                            | TESEQ GmbH/ CDN M016            | 25112        | W2008009    | Voltage correct factor 9.5 dB                      | Aug. 2, 2011 | Aug. 1, 2012 | Wwc20 082396 | 150K-80MHz: ±1dB<br>80-230MHz:-2-+3dB                          |
| EM-Clamp                              | TESEQ GmbH/ KEMZ 801            | 25453        | W2008010    | Freq_range : 0.15-1000 MHz                         | Aug. 2, 2011 | Aug. 1, 2012 | Wwc20 082397 | 0.3-400 MHz: ±4dB<br>Other freq: ±5dB                          |
| Attenuator 6dB                        | TESEQ GmbH/ ATN6050             | 25365        | -           | -  | Aug. 2, 2011 | Aug. 1, 2012 | Wws20 081597 | -  |
| All Modules Generator                 | SCHAFFNER/6150                  | 34579        | W2008006    | voltage:200V -4.4KV<br>Pulse current: 100A-2.2KA   | Aug. 2, 2011 | Aug. 1, 2012 | Wwc20 082401 | voltage: ±10%<br>Pulse current: ±10%                           |
| Capacitive Coupling Clamp             | SCHAFFNER/ CDN 8014             | 25311        | -           | -  | Aug. 2, 2011 | Aug. 1, 2012 | Wwc20 082398 | -  |
| Signal and Data Line Coupling Network | SCHAFFNER/ CDN 117              | 25627        | W2008011    | 1.2/50µS   | Aug. 2, 2011 | Aug. 1, 2012 | Wwc20 082399 | -  |
| AC Power Supply                       | TONGYUN/ DTDGC-4                | -            | -           | -  | Aug. 2, 2011 | Aug. 1, 2012 | Wws20 080944 | -  |

## 6 Conducted Emission Data

Test Requirement: FCC CFR47 Part 15 Section 15.107  
Test Method: ANSI C63.4:2003  
Test Result: N/A

Remark: Because the power of the EUT is supported by 9.0V Battery, this test is not applicable.

## 7 Radiation Emission Data

Test Requirement: FCC CFR47 Part 15 Section 15.109  
Test Method: ANSI C63.4:2003  
Test Result: PASS  
Frequency Range: 30MHz to 2GHz  
Measurement Distance: 3m  
Class: Class B  
Limit: 40.0 dB $\mu$ V/m between 30MHz & 88MHz  
43.5 dB $\mu$ V/m between 88MHz & 216MHz  
46.0 dB $\mu$ V/m between 216MHz & 960MHz  
54.0 dB $\mu$ V/m above 960MHz  
54.0 dBuV/m for AVG above 1GHz  
74.0 dBuV/m for peak above 1GHz  
Detector: Peak for pre-scan (120kHz resolution bandwidth)

### EUT Operation:

The EUT was pre-tested in two mode: standby mode and receive mode. The worse mode is receive mode, so the report show that data only.

### 7.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

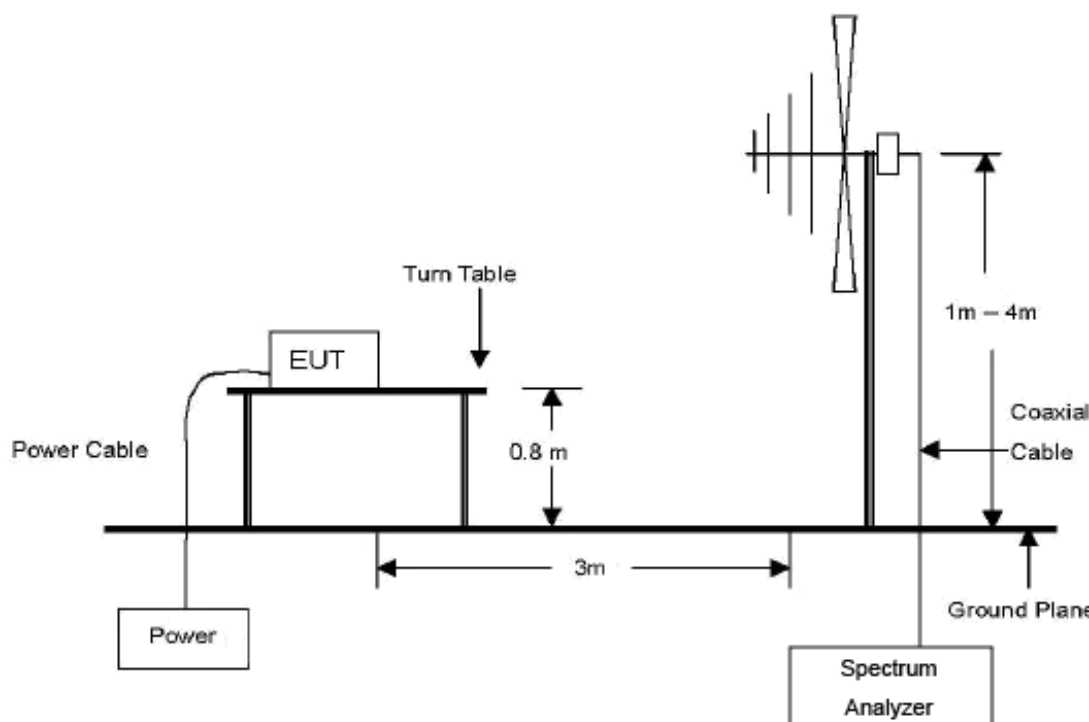
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek EMC Lab is  $\pm 5.03$ dB.



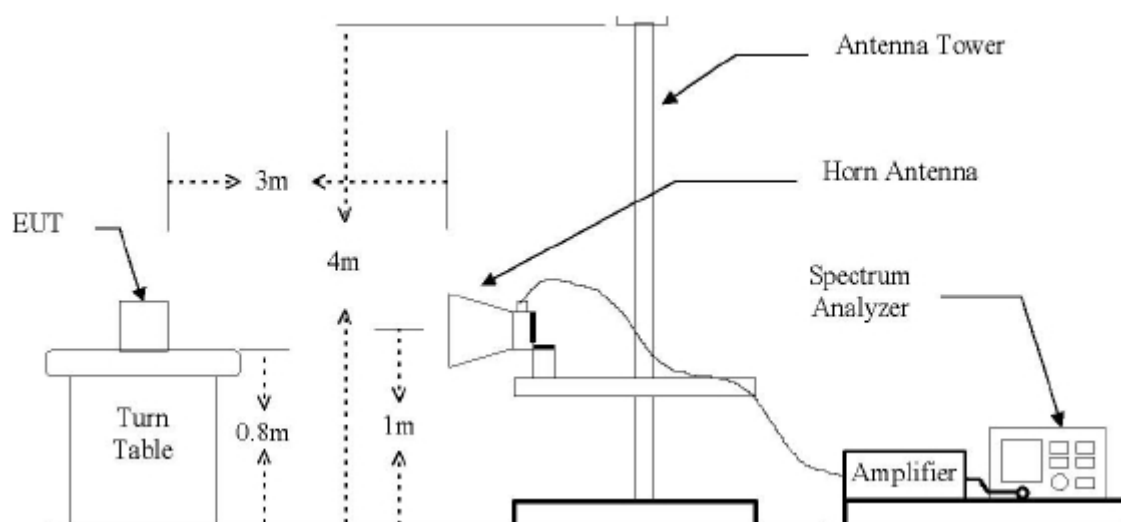
## 7.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003.

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 2 GHz Emissions.



### 7.3 Spectrum Analyzer Setup

According to FCC Part15 B Rules, the system was tested 30 to 2000MHz.

Below 1GHz

Start Frequency ..... 30 MHz  
Stop Frequency ..... 1000MHz  
Sweep Speed ..... Auto  
IF Bandwidth ..... 120 KHz  
Video Bandwidth ..... 100KHz  
Quasi-Peak Adapter Bandwidth ..... 120 KHz  
Quasi-Peak Adapter Mode ..... Normal  
Resolution Bandwidth ..... 100KHz

Above 1GHz

Start Frequency ..... 1000 MHz  
Stop Frequency ..... 2000MHz  
Sweep Speed ..... Auto  
IF Bandwidth ..... 120 KHz  
Video Bandwidth ..... 1MHz  
Quasi-Peak Adapter Bandwidth ..... 120 KHz  
Quasi-Peak Adapter Mode ..... Normal  
Resolution Bandwidth ..... 1MHz

## 7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X(normal uses) axis positioning. And all the modes was tested in the report.Only the worst case is shown in the report.
8. The EUT was pre-testrd in two mode:standby mode and receive mode.According to ANSI STANDARD C63.4-2003 12.1.1.2 OTHER TYPES OF RECEIVERS: In receive mode,a typical signal or an unmodulated CW signal at the operating frequency of the EUT shall be supplied to the EUT for all measurements. Such a signal may be supplied by either a signal generator and an antenna in close proximity to the EUT or directly conducted into the antenna terminals of the EUT. The signal level shall be sufficient to the local oscillator of the EUT.In this report, the antenna of the signal generator is under the turntable.

## 7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

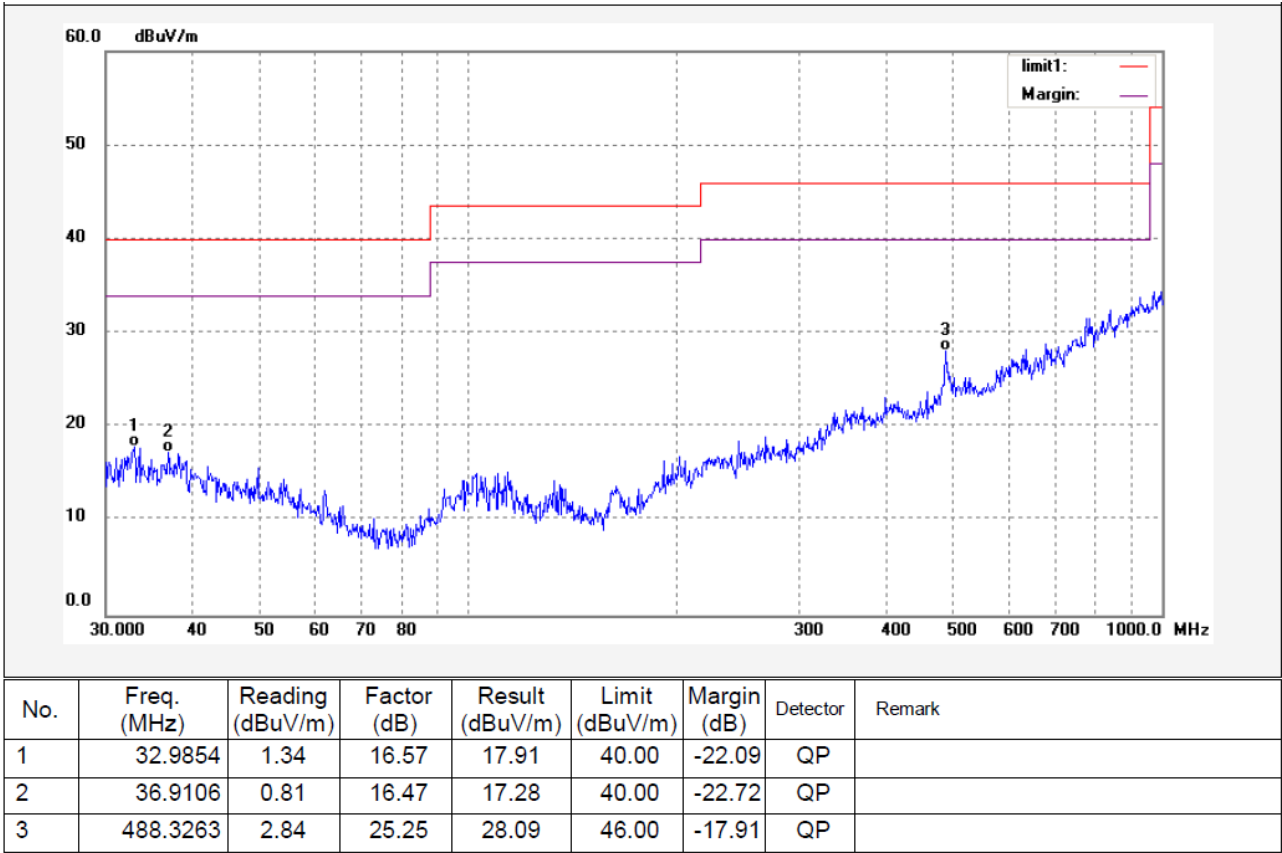
$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

7.6 Summary of Test Results

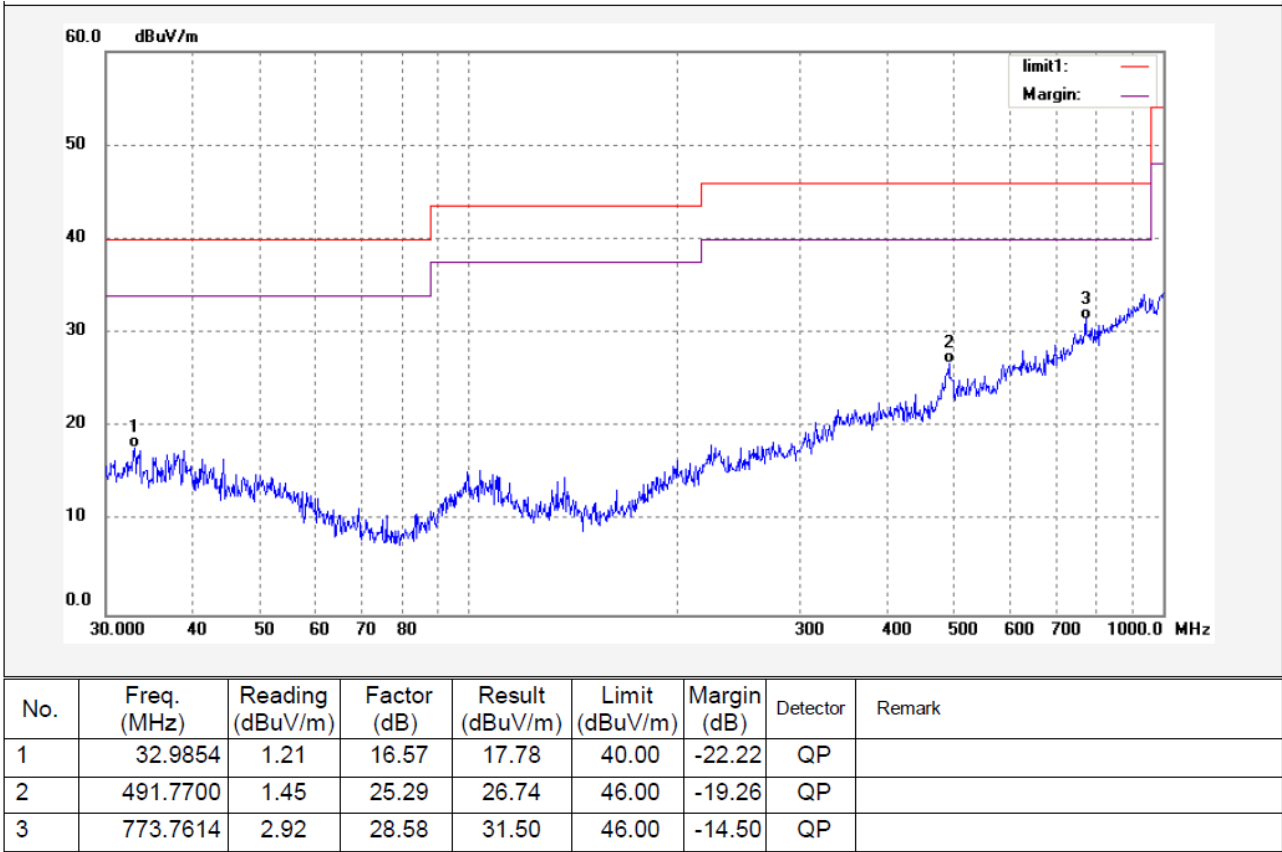
According to the data in this section, the EUT complied with the FCC CFR47 Part 15 Section 15.109 standard.

Frequency Range: 30MHz ~ 1000MHz

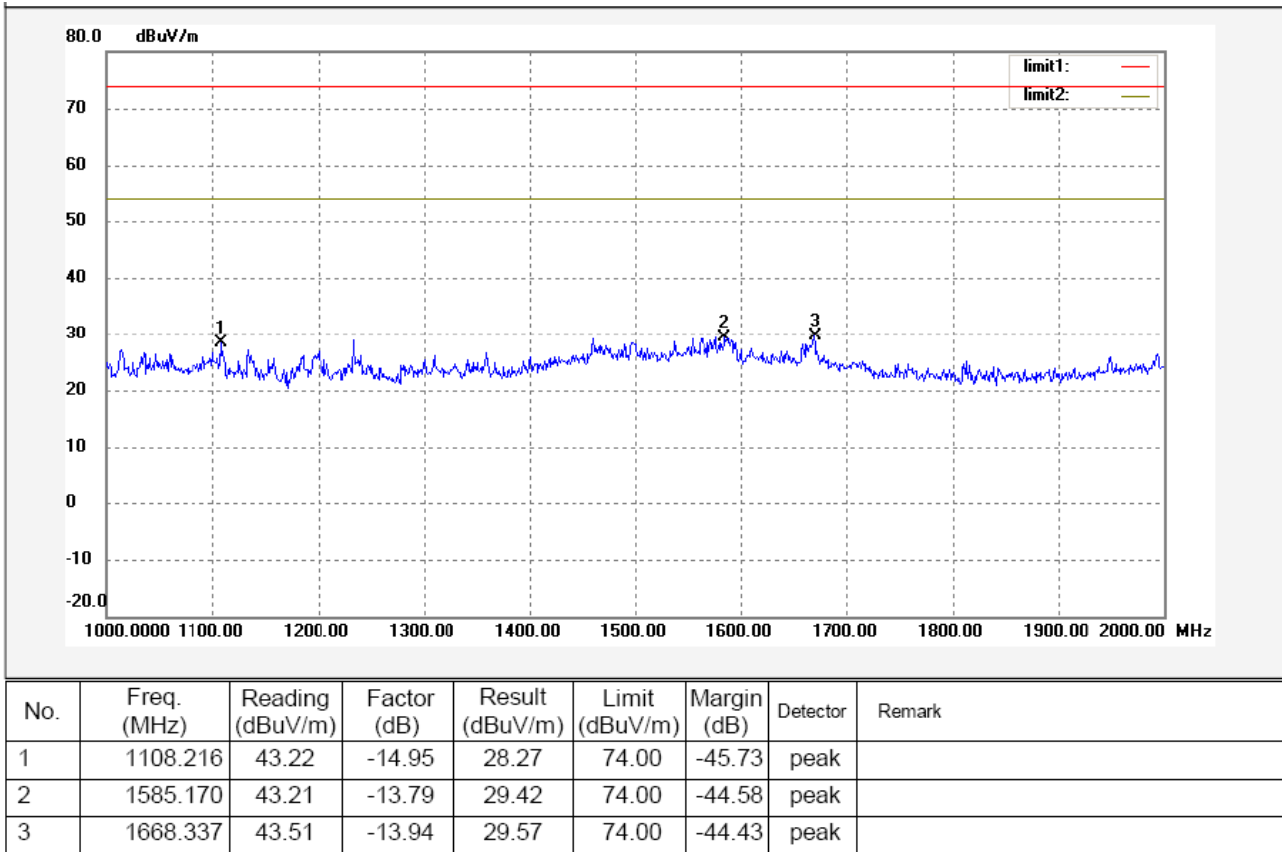
Antenna polarization: Vertical



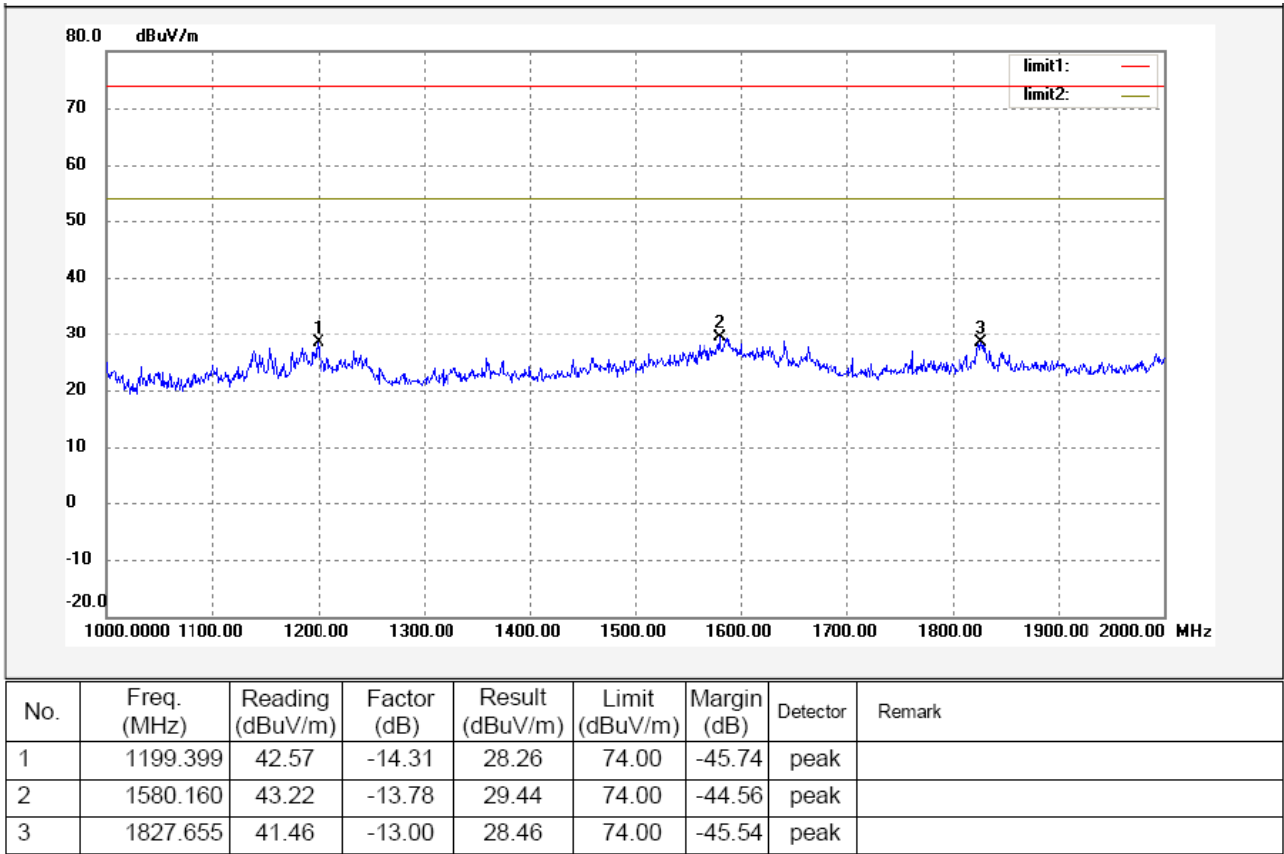
Antenna polarization: Horizontal



Frequency Range: 1GHz ~ 2GHz  
Antenna polarization: Vertical

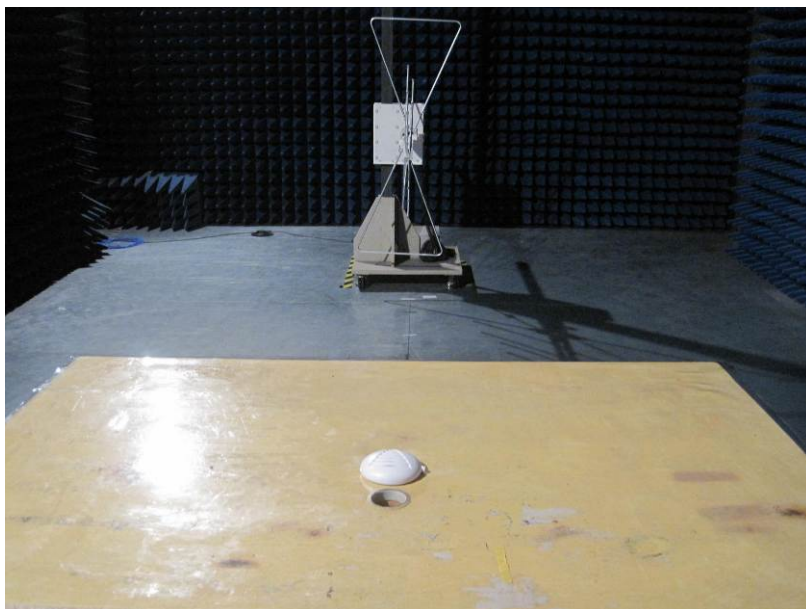


Antenna polarization: Horizontal

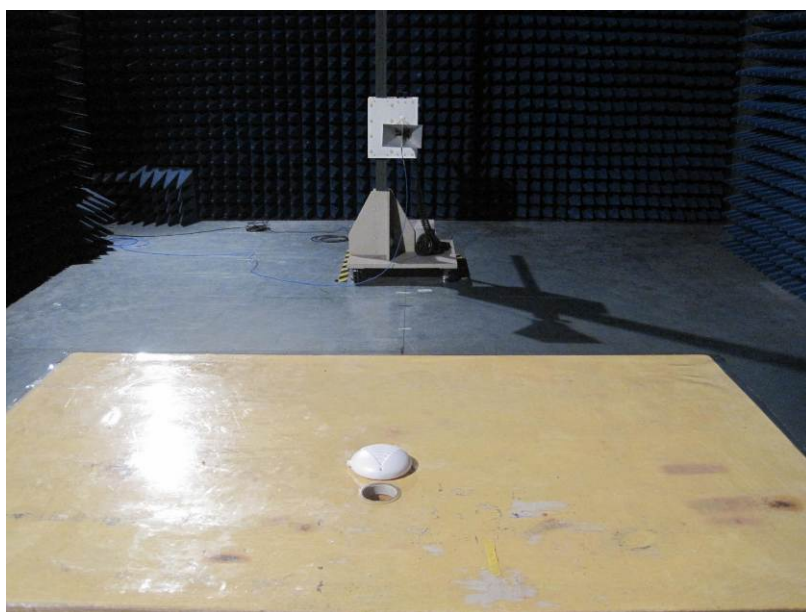


## 7.7 Photograph – Radiation Emission Test Setup

Below 1GHz



Above 1GHz





## 8 Photographs - Constructional Details

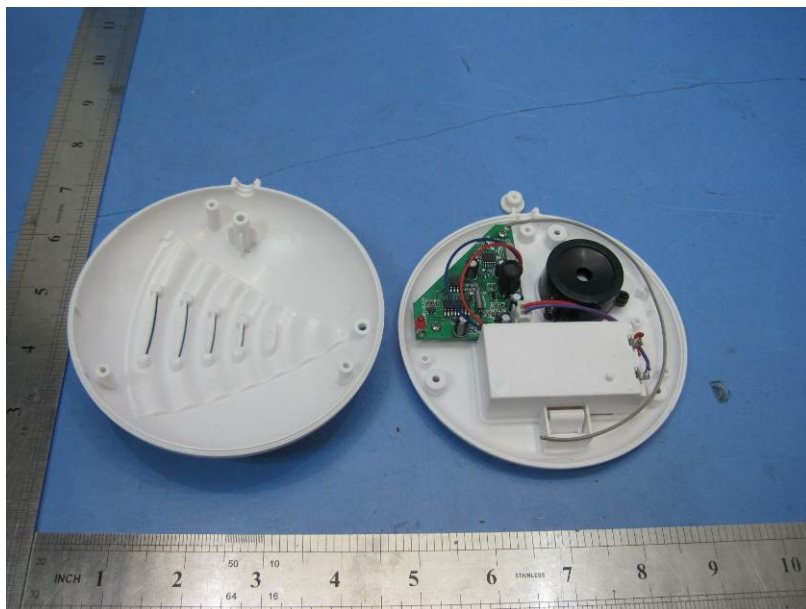
### 8.1 EUT – Front View



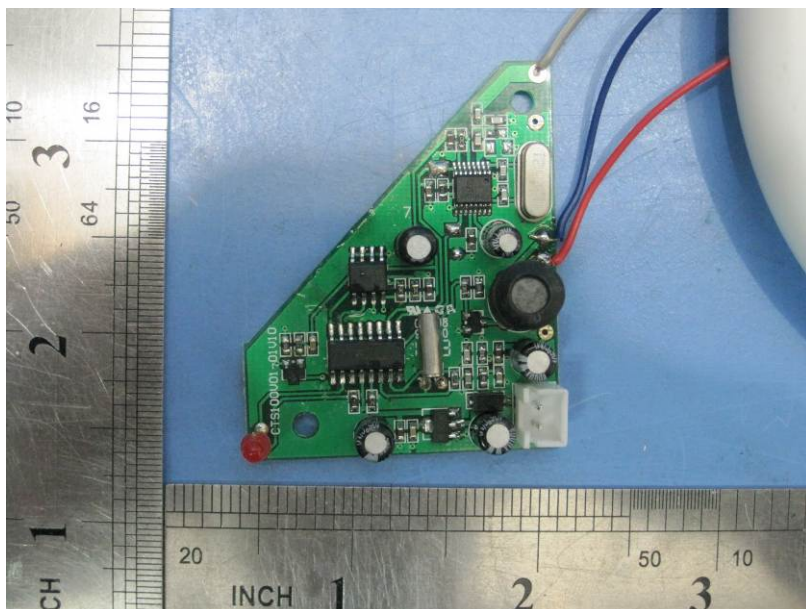
### 8.2 EUT – Back View



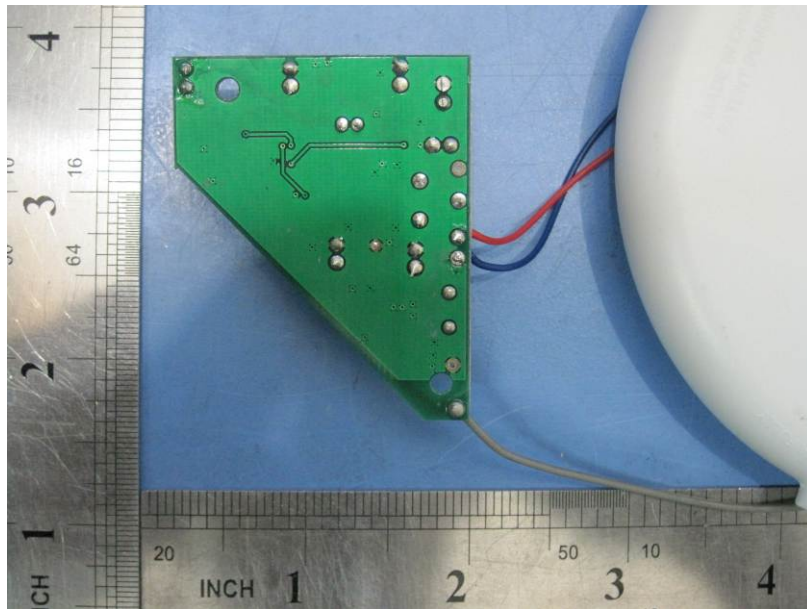
### 8.3 EUT – Open View



### 8.4 PCB – Front View



## 8.5 PCB – Back View



## 9 FCC Label

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1)this device may not cause harmful interference,and (2) this device must accept any interference received, including interference that may cause undesired operation

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

