



**FCC 47 CFR PART 15 SUBPART C**

**TEST REPORT**

**For**

**315 MHz Wireless Remote Control**

**Model: 87338, 87339, 87440**

**Brand: Gemmy**

**Test Report Number:**

**SZ120328B05-RP**

Issued for

**GEMMY INDUSTRIES (HK)LIMITED BVI**

**Unit No.301 on 3<sup>rd</sup> Floor, East Ocean Centre, No.98 Granville Road,  
Kowloon, Hong Kong**

Issued By

**Compliance Certification Services (Shenzhen) Inc.**

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Issued Date: March 31, 2012



TESTING CERT #2861.01

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### 1. TEST RESULT CERTIFICATION

|                     |   |
|---------------------|---|
| <b>Product</b>      | 315 MHz Wireless Remote Control   |
| <b>Model</b>        | 87338, 87339, 87440   |
| <b>Brand</b>        | Gemmy   |
| <b>Tested</b>       | March 28~30, 2012   |
| <b>Applicant</b>    | <b>GEMMY INDUSTRIES (HK)LIMITED BVI</b><br>Unit No.301 on 3 <sup>rd</sup> Floor, East Ocean Centre, No.98 Granville Road, Kowloon, Hong Kong  |
| <b>Manufacturer</b> | (1) <b>Shenzhen Lighting Opto-Electronic Technology Co., Ltd.</b><br>Egongling Village, Pinghu Town, Longgang Dist. Shenzhen City. China<br>(2) <b>XingYu Electronic(Hui Zhou) Co., LTD</b><br>Hengjiangwei Village, Yihe Town, Boluo County, Huizhou City, Guangdong Province, China |

| APPLICABLE STANDARDS               |                         |
|------------------------------------|-------------------------|
| STANDARD                           | TEST RESULT             |
| FCC 47 CFR Part 15 Subpart C       | No non-compliance noted |
| DEVIATION FROM APPLICABLE STANDARD |                         |
| None                               |                         |

#### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.209 and Part 15.231.

The test results of this report relate only to the tested sample identified in this report.

**Approved by:**

**Reviewed by:**

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**Tom Gan**  
Supervisor of EMC Dept.  
Compliance Certification Service Inc.

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**Aven Zhou**  
Supervisor of Report Dept.  
Compliance Certification Service Inc.



## 2. EUT DESCRIPTION

|                             |   |
|-----------------------------|---|
| <b>Product</b>              | 315 MHz Wireless Remote Control                         |
| <b>Model</b>                | 87338, 87339, 87440                                     |
| <b>Brand</b>                | Gemmy   |
| <b>Model Difference</b>     | The model are identical only the name are different     |
| <b>Power Supply</b>         | DC3.0V supplied by the battery                          |
| <b>Frequency Range</b>      | 315 MHz   |
| <b>Transmit Power</b>       | Peak: 84.22dBuV/m (Max.)<br>Average: 69.31dBuV/m (Max.) |
| <b>Modulation Technique</b> | AM  |
| <b>Number of Channels</b>   | 1 Channels  |
| <b>Antenna Designation</b>  | Internally installed spring antenna with 3dBi           |
| <b>Temperature Range</b>    | -20°C ~ +85°C   |

**Remark:** This submittal(s) (test report) is intended for FCC ID: GPO87338 filing to comply with Section 15.209 and 15.231 of the FCC Part 15, Subpart C Rules.



### 3. TEST METHODOLOGY

#### 3.1 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

The following test mode(s) were scanned during the preliminary test below 1G:

| Test Item          | Test mode   | Worse mode                          |
|--------------------|---|-------------------------------------|
| Conducted Emission | Not applicable since the EUT supplied by the battery. | <input type="checkbox"/>            |
| Radiated Emission  | Mode 1: TX  | <input checked="" type="checkbox"/> |

Above 1G, TX mode with the highest data rate (worst case) are chosen for full testing.

The field strength of spurious radiation emission was measured in the following position: EUT stand-up position (Y mode) and lie-down position (X, Z mode) The following data show only the worst case setup.

The worst case (Y axis) was reported.



## 4. FACILITIES AND ACCREDITATIONS

### 4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4:2003, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 4.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

|              |             |
|--------------|-------------|
| <b>USA</b>   | <b>A2LA</b> |
| <b>China</b> | <b>CNAS</b> |

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

|               |                                    |
|---------------|------------------------------------|
| <b>USA</b>    | <b>FCC</b>                         |
| <b>Japan</b>  | <b>VCCI(C-3478, R-3135, T-652)</b> |
| <b>Canada</b> | <b>INDUSTRY CANADA</b>             |
| <b>Taiwan</b> | <b>BSMI</b>                        |
| <b>Norway</b> | <b>Nemko</b>                       |

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

### 4.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement         | Frequency       | Uncertainty |
|---------------------|-----------------|-------------|
| Conducted emissions | 9kHz~30MHz      | +/- 3.18dB  |
| Radiated emissions  | 30MHz ~ 200MHz  | +/- 3.79dB  |
|                     | 200MHz ~1000MHz | +/- 3.62dB  |
|                     | Above 1000MHz   | +/- 5.04dB  |

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

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.



## 5. SETUP OF EQUIPMENT UNDER TEST

### 5.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 5.2 SUPPORT EQUIPMENT

| Device Type | Brand | Model | FCC ID | Series No. | Data Cable | Power Cord |
|-------------|-------|-------|--------|------------|------------|------------|
| N/A         |       |       |        |            |            |            |

**Remark:**

*Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



## 6. FCC PART 15.231 REQUIREMENTS

### 6.1 20 DB BANDWIDTH

#### LIMIT

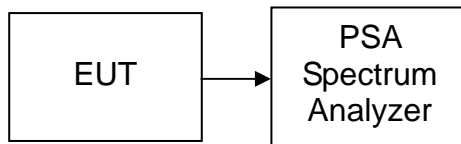
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

#### MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model  | Serial Number | Last Calibration | Due Calibration |
|-------------------|--------------|--------|---------------|------------------|-----------------|
| Spectrum Analyzer | Agilent      | E4446A | US44300399    | 03/19/2012       | 03/19/2013      |

*Remark: Each piece of equipment is scheduled for calibration once a year.*

#### Test Configuration



#### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 10 kHz and VBW is set 30kHz.

#### TEST RESULTS

*No non-compliance noted.*

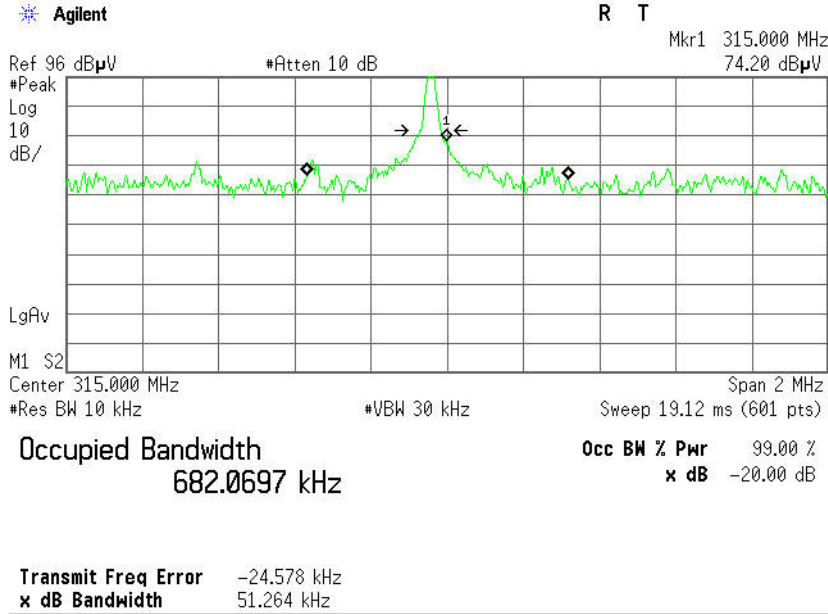
#### Test Data

| Frequency (MHz) | 20 dB Bandwidth (MHz) | Limit (MHz) | Result |
|-----------------|-----------------------|-------------|--------|
| 315.00          | 0.0513                | 0.7875      | PASS   |





Test Plot





## 6.2 LIMIT OF TRANSMISSION TIME

### LIMIT

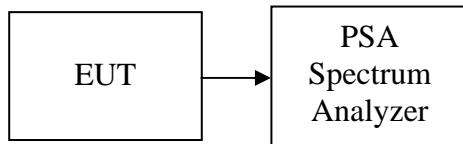
According to 15.231 (a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

### MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model  | Serial Number | Last Calibration | Due Calibration |
|-------------------|--------------|--------|---------------|------------------|-----------------|
| Spectrum Analyzer | Agilent      | E4446A | US44300399    | 03/19/2012       | 03/19/2013      |

*Remark: Each piece of equipment is scheduled for calibration once a year.*

### Test Configuration



### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW and VBW are set to 1MHz.

### TEST RESULTS

*No non-compliance noted*

### Test Data

| Frequency (MHz) | Limit (Second) | Result |
|-----------------|----------------|--------|
| 315.00          | 5.00           | PASS   |

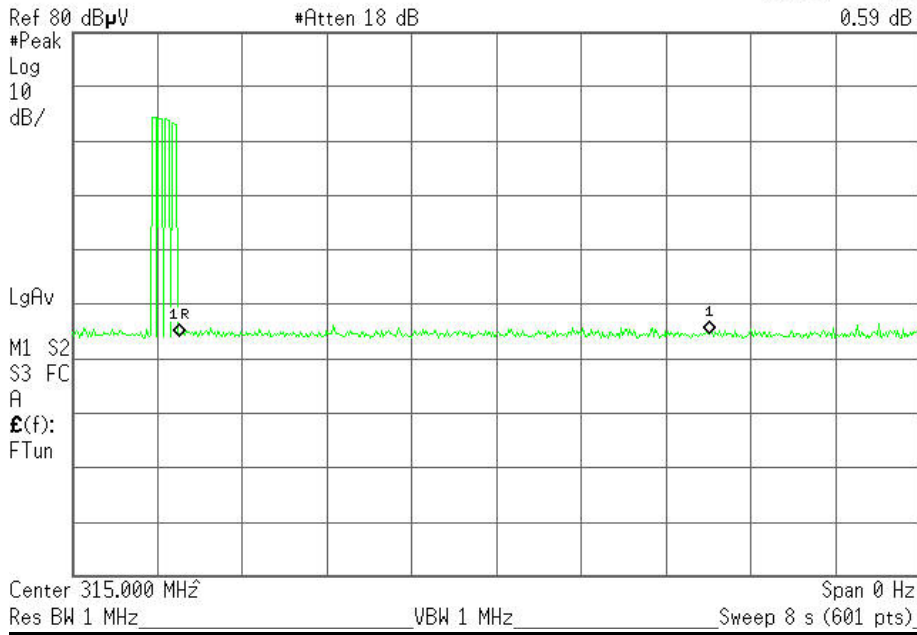


**Test Plot**

Agilent 17:37:13 Feb 22, 2012

R T

Mkr1 5 s  
0.59 dB





### 6.3 DUTY CYCLE

#### LIMIT

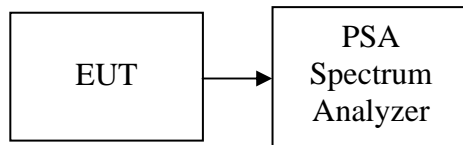
Nil (No dedicated limit specified in the Rules)

#### MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model  | Serial Number | Last Calibration | Due Calibration |
|-------------------|--------------|--------|---------------|------------------|-----------------|
| Spectrum Analyzer | Agilent      | E4446A | US44300399    | 03/21/2011       | 03/21/2012      |

*Remark: Each piece of equipment is scheduled for calibration once a year.*

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span = 0Hz, Adjust Sweep = 50ms
5. Repeat above procedures until all frequency measured were complete.

#### TEST RESULTS

*No non-compliance noted*

#### Test Data

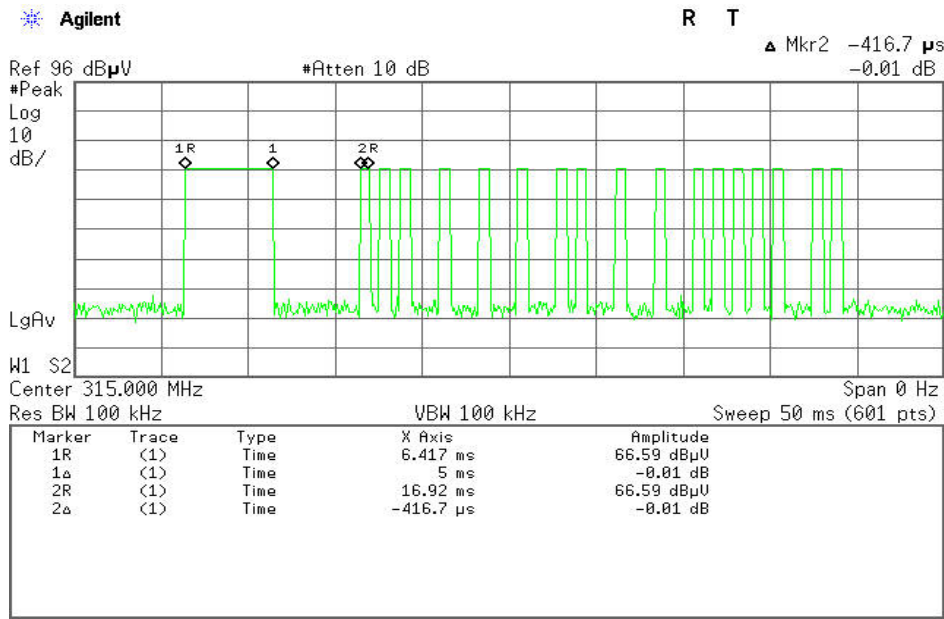
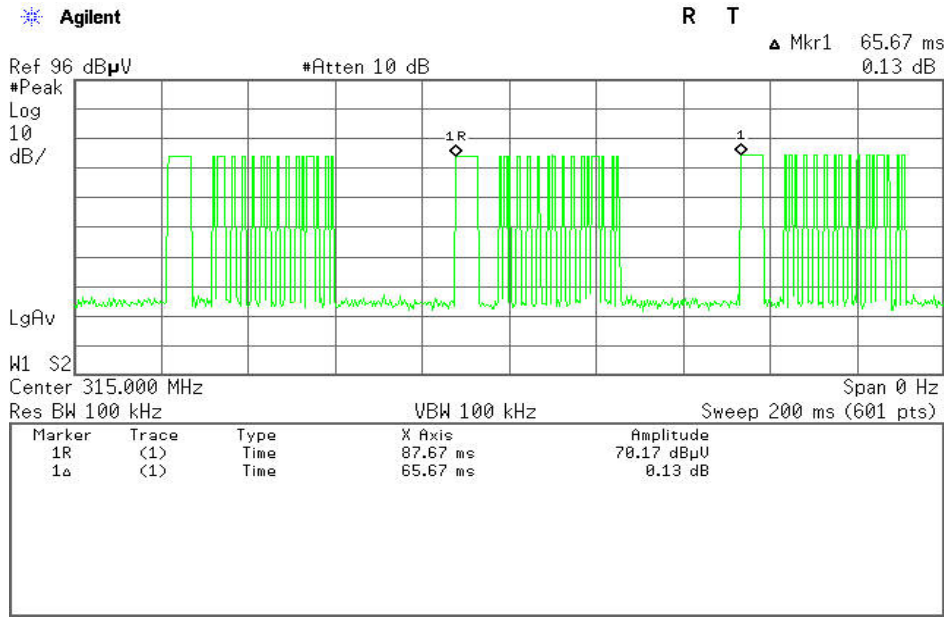
Ton+off = 65.67ms

Ton = 5.0+0.4\*17=11.8ms

*Duty Cycle Correction Factor =  $20 * \log (Ton / Ton+ off) = 20 * \log (11.8/65.67) = -14.91 \text{ dB}$*



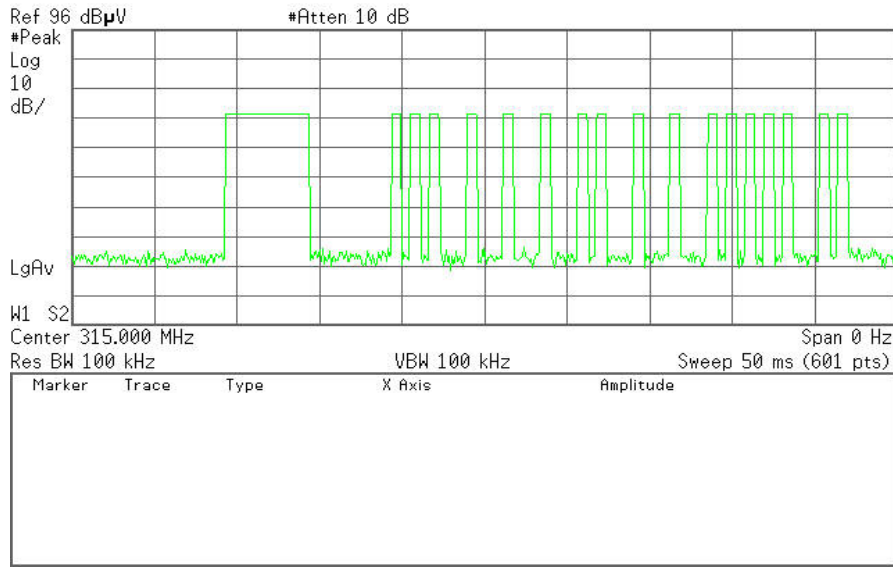
Test Plot





Agilent

R T





## 6.4 RADIATED EMISSIONS

### LIMIT

1. According to §15.231(b), In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following: Fundamental Field Strength of Field Strength of Frequency Fundamental Spurious Emissions (MHz) (microvolts/meter) (microvolts/meter)

| Fundamental Frequency (MHz) | Field Strength of Fundamental (microvolts/meter) | Field Strength of Spurious Emissions (microvolts/meter) |
|-----------------------------|--|---|
| 40.66 – 40.70               | 2,250  | 225   |
| 70 – 130                    | 1,250  | 125   |
| 130 – 174                   | 1,250 to 3,750 **                                | 125 to 375 **   |
| 174 – 260                   | 3,750  | 375   |
| 260 – 470                   | 3,750 to 12,500 **                               | 375 to 1,250 **   |
| Above 470                   | 12,500   | 1,250   |

\*\* linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

2. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (mV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 30-88           | 100*                  | 3                        |
| 88-216          | 150*                  | 3                        |
| 216-960         | 200*                  | 3                        |
| Above 960       | 500                   | 3                        |

**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

3. In the above emission table, the tighter limit applies at the band edges.

| Frequency (Hz) | Field Strength (µV/m at 3-meter) | Field Strength (dBµV/m at 3-meter) |
|----------------|----------------------------------|------------------------------------|
| 30-88          | 100                              | 40                                 |
| 88-216         | 150                              | 43.5                               |
| 216-960        | 200                              | 46                                 |
| Above 960      | 500                              | 54                                 |



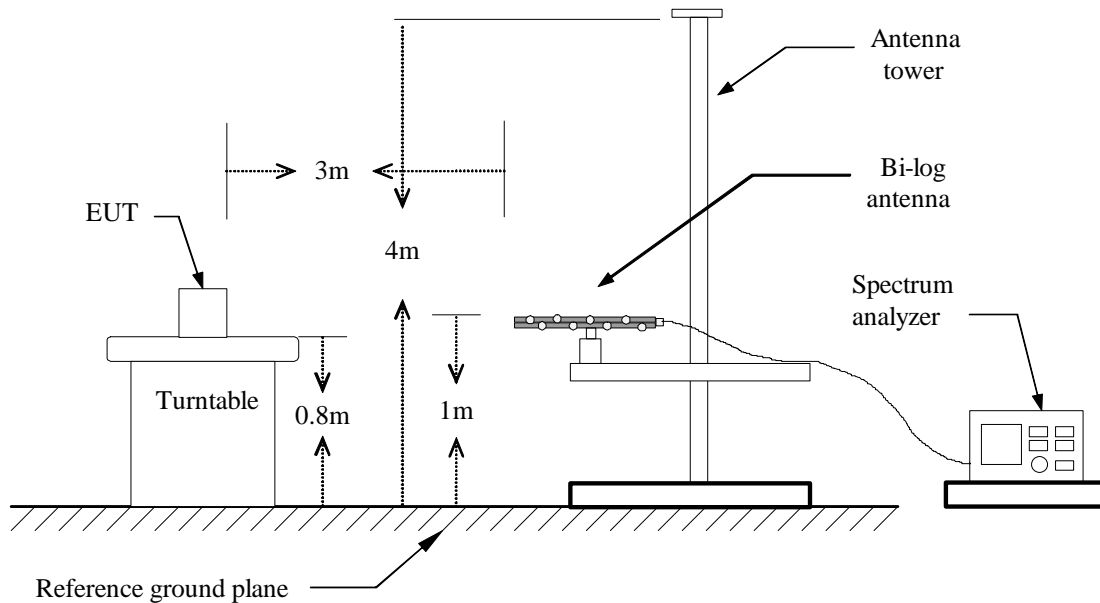
**MEASUREMENT EQUIPMENT USED**

| Radiated Emission Test Site 966 (2) |              |                    |               |                  |                 |  |
|-------------------------------------|--------------|--------------------|---------------|------------------|-----------------|--|
| Name of Equipment                   | Manufacturer | Model Number       | Serial Number | Last Calibration | Due Calibration |  |
| PSA Series Spectrum Analyzer        | Agilent      | E4446A             | US44300399    | 03/19/2012       | 03/19/2013      |  |
| Amplifier                           | MITEQ        | AM-1604-3000       | 1411843       | 03/18/2012       | 03/18/2013      |  |
| Turn Table                          | EMCO         | 2081-1.21          | N/A           | N.C.R            | N.C.R           |  |
| Controller                          | CT           | N/A                | N/A           | N.C.R            | N.C.R           |  |
| High Noise Amplifier                | Agilent      | 8449B              | 3008A01838    | 03/18/2012       | 03/18/2013      |  |
| Bilog Antenna                       | SCHAFFNER    | CBL6143            | 5082          | 03/17/2012       | 03/17/2013      |  |
| Horn Antenna                        | SCHWARZBECK  | BBHA9120           | D286          | 03/17/2012       | 03/17/2013      |  |
| Loop Antenna                        | A. R. A      | PLA-1030/B         | 1029          | 03/19/2012       | 03/19/2013      |  |
| Temp. / Humidity Meter              | VICTOR       | VC230              | N/A           | 03/31/2012       | 03/31/2013      |  |
| Antenna Tower                       | SUNOL        | TLT2               | N/A           | N.C.R            | N.C.R           |  |
| Test S/W                            | FARAD        | LZ-RF / CCS-SZ-3A2 |               |                  |                 |  |

**Remark:** Each piece of equipment is scheduled for calibration once a year.

**Test Configuration**

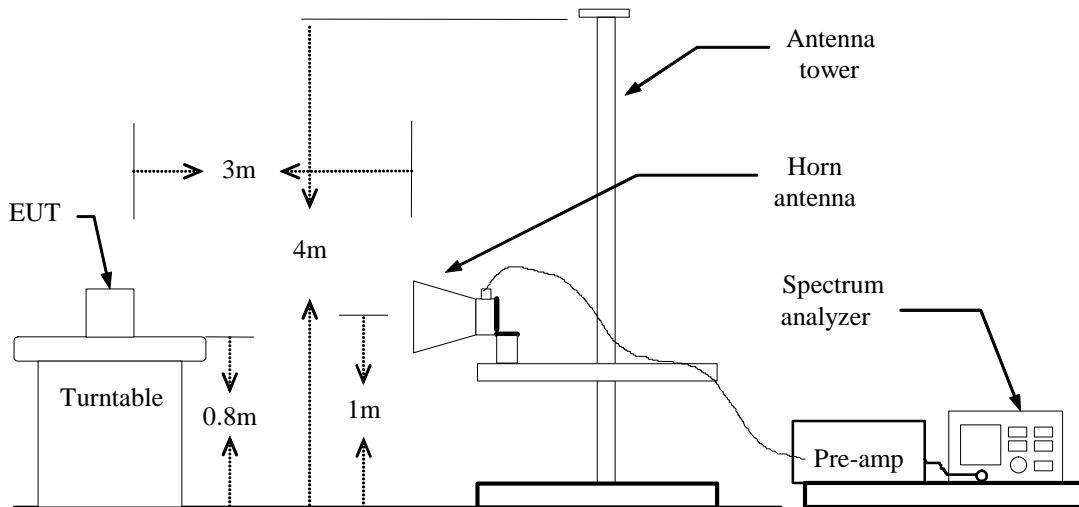
**Below 1 GHz**







## Above 1 GHz



## 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 varied from 1m to 4m to find out the highest 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. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

7. Repeat above procedures until the measurements for all frequencies are complete.







## 6.5 POWERLINE CONDUCTED EMISSIONS

### LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dBµV) |          |
|-----------------------|---------------|----------|
|                       | Quasi-peak    | Average  |
| 0.15 to 0.50          | 66 to 56      | 56 to 46 |
| 0.50 to 5             | 56            | 46       |
| 5 to 30               | 60            | 50       |

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### MEASUREMENT EQUIPMENT USED

| Conducted Emission Test Site |               |                    |               |                  |                 |
|------------------------------|---------------|--------------------|---------------|------------------|-----------------|
| Name of Equipment            | Manufacturer  | Model Number       | Serial Number | Last Calibration | Due Calibration |
| ESCI EMI TEST RECEIVE.ESCI   | ROHDE&SCHWARZ | ESCI               | 100783        | 03/17/2012       | 03/17/2013      |
| LISN                         | SCHAFFNER     | NNB42              | 2001/001      | 05/26/2011       | 05/26/2012      |
| LISN                         | EMCO          | 3825/2             | 8901-1459     | 03/19/2012       | 03/19/2013      |
| Temp. / Humidity Meter       | VICTOR        | VC230              | N/A           | 03/31/2012       | 03/31/2013      |
| Test S/W                     | FARAD         | EZ-EMC/ CCS-3A1-CE |               |                  |                 |

**Remark:** Each piece of equipment is scheduled for calibration once a year.

### TEST CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### TEST RESULTS

*Not applicable (Since the EUT is powered by battery)*