



**FCC 47 CFR PART 15 SUBPART C  
INDUSTRY CANADA RSS-210 ISSUE 8**

**CERTIFICATION TEST REPORT**

**FOR**

**WIRELESS LAMP**

**MODEL NUMBER: LED12BR30/827INT and LED12BR30/827TEL**

**FCC ID: PUU94440**

**REPORT NUMBER: R10238242-RF**

**ISSUE DATE: 2014-04-24**

*Prepared for*  
**GE LIGHTING SOLUTIONS, INC.  
1975 NOBLE RD.  
BLDG 338E  
CLEVELAND, OH 44112-1719, USA**

*Prepared by*

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**NVLAP LAB CODE 200246-0**

Revision History

| Rev. | Issue Date | Revisions                                      | Revised By |
|------|------------|------------------------------------------------|------------|
| --   | 2014-04-18 | Initial Issue                                  | Jeff Moser |
| 1    | 2014-04-22 | Added radio model and manufacturer (Page 6)    | Jeff Moser |
| 2    | 2014-04-24 | Revised report based on TCB reviewer feedback. | Jeff Moser |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** GE LIGHTING SOLUTIONS, INC.  
1975 NOBLE RD., BLDG 338E  
CLEVELAND, OH 44112-1719, USA

**EUT DESCRIPTION:** WIRELESS LAMP

**MODEL:** LED12BR30/827INT and LED12BR30/827TEL

**SERIAL NUMBER:** Non-serialized Unit.

**DATE TESTED:** 2014-03-04 through 2014-03-06, 2014-04-23

| APPLICABLE STANDARDS                     |              |
|------------------------------------------|--------------|
| STANDARD                                 | TEST RESULTS |
| FCC PART 15 SUBPART C                    | Pass         |
| INDUSTRY CANADA RSS-210 Issue 8, Annex 1 | Pass         |
| INDUSTRY CANADA RSS-GEN Issue 3          | Pass         |

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released  
For UL LLC By:



Mike Antola  
EMC Lead Engineer  
UL - Consumer Technology Division

Prepared By:



Jeff Moser  
EMC Program Manager

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2002460.htm>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | ±2.5 dB     |
| Radiated Disturbance, 30 to 1000 MHz  | ±3.4 dB     |

Uncertainty figures are valid to a confidence level of 95%.

## **5. EQUIPMENT UNDER TEST**

### **5.1. DESCRIPTION OF EUT**

The EUT is a transceiver used for lighting applications and dimming control of LED drivers. The transceiver operates between 431MHz and 437MHz. The transceiver is a Lutron, Model PJ2-3BRL.

The only difference between the LED12BR30/827INT and LED12BR30/827TEL is shipping packaging. The physical units are the same.

### **5.2. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes an integral wire antenna.

### **5.3. SOFTWARE AND FIRMWARE**

The firmware and driver software installed in the EUT during testing was 0795203, rev. A.

The test utility software used during testing was 0795410, rev. A.

### **5.4. WORST-CASE CONFIGURATION AND MODE**

The device was oriented to produce the highest emission at the device's fundamental operating frequency. The worst-case orientation was investigated over three orthogonal orientations of the device. The upright orientation (Y orientation presented in the SETUP PHOTOS section of this report) proved to be the worst-case orientation.

### **5.5. MODIFICATIONS**

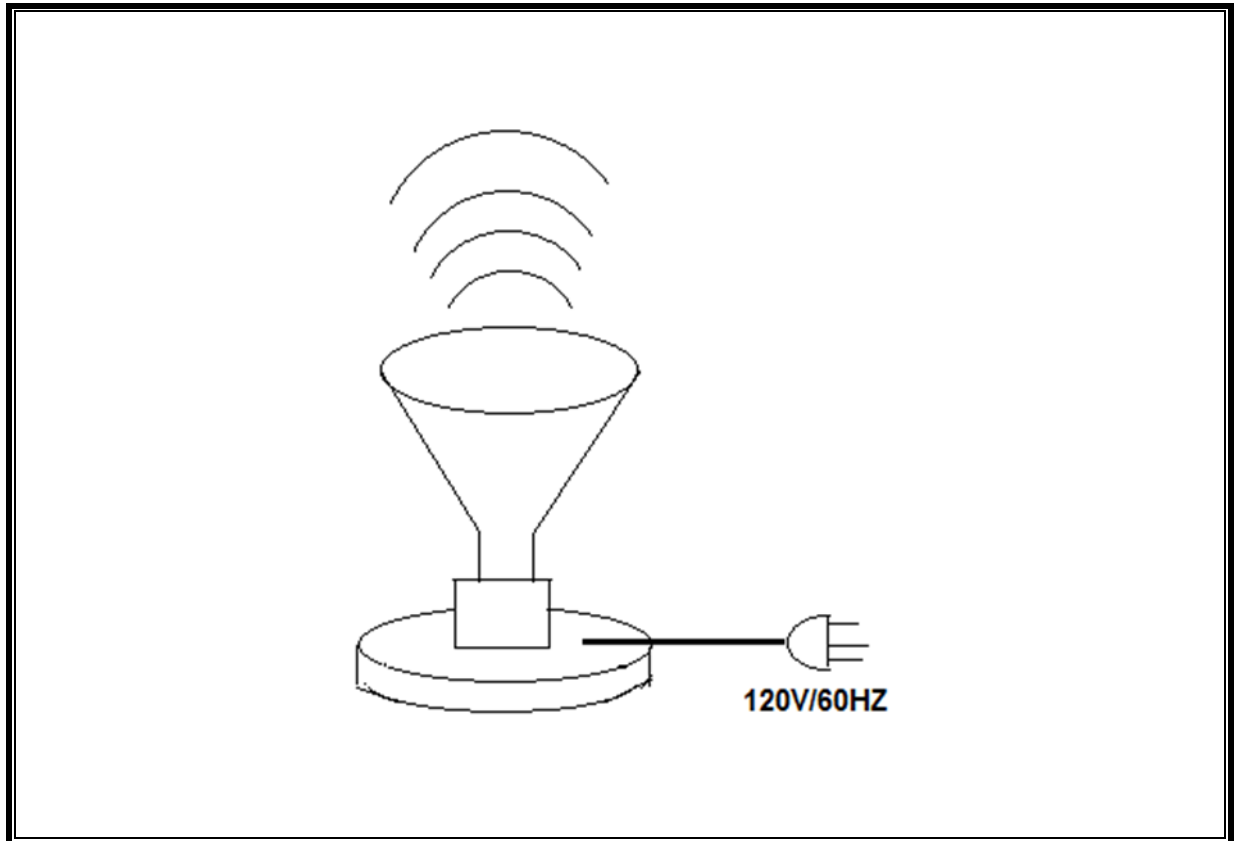
No modifications were made during testing.

## 5.6. DESCRIPTION OF TEST SETUP

### TEST SETUP

The EUT was placed on a standard test table.

### SETUP DIAGRAM FOR TESTS



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

### Wireless Conducted Measurement Equipment

| Equipment ID | Description             | Manufacturer         | Model Number | Last Cal.  | Next Cal.  |
|--------------|-------------------------|----------------------|--------------|------------|------------|
|              | <b>Common Equipment</b> |                      |              |            |            |
| SA0016       | Spectrum Analyzer       | Agilent Technologies | N9030A       | 2013-09-04 | 2014-09-30 |

### Radiated Disturbance Emissions (E-field)

| Equip. ID                         | Description                                       | Manufacturer             | Model Number          | Last Cal.  | Next Cal.  |
|-----------------------------------|---------------------------------------------------|--------------------------|-----------------------|------------|------------|
|                                   | <b>&lt;30 MHz (E-field)</b>                       |                          |                       |            |            |
| AT0037                            | Loop Antenna (Low Range)                          | Electro-Metrics          | EM-6871               | 2013-12-02 | 2014-12-31 |
| AT0036                            | Loop Antenna (High Range)                         | Electro-Metrics          | EM-6872               | 2013-12-02 | 2014-12-31 |
|                                   | <b>30-1000 MHz Range</b>                          |                          |                       |            |            |
| AT0025                            | Biconical Antenna, 30 to 300 MHz                  | Schaffner-Chase EMC Ltd. | VBA6106A              | 2013-06-14 | 2014-06-30 |
| AT0030                            | Log-periodic Antenna, 200 MHz to 1000 MHz         | Schaffner                | UPA6109               | 2013-06-12 | 2014-06-30 |
|                                   | <b>1-5 GHz</b>                                    |                          |                       |            |            |
| AT0062                            | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren             | 3117                  | 2013-08-27 | 2014-08-31 |
|                                   | <b>Gain-Loss Chains</b>                           |                          |                       |            |            |
| SAC_C (Biconical 3m location)     | Gain-Loss string for biconical antenna at 3m      | Various                  | Various               | 2013-09-06 | 2014-09-30 |
| SAC_D (Log-Periodic 3m location)  | Gain-Loss string for log-periodic antenna at 3m   | Various                  | Various               | 2013-09-06 | 2014-09-30 |
| SAC_E_LR (Loop & Rod 3m location) | Gain-Loss string for loop/rod antenna at 3m       | Various                  | Various               | 2013-09-06 | 2014-09-30 |
| SAC_E_HORN                        | Gain-Loss string for horn antenna at 3m           | Various                  | Various               | 2013-09-06 | 2014-09-30 |
|                                   | <b>Receiver &amp; Software</b>                    |                          |                       |            |            |
| SAR003                            | Spectrum Analyzer / Receiver                      | Rohde & Schwarz          | ESIB40 (1088.7490.40) | 2013-09-03 | 2014-09-30 |
| SA0016                            | Spectrum Analyzer                                 | Agilent                  | N9030A                | 2013-09-04 | 2014-09-30 |

| Equip. ID     | Description                      | Manufacturer     | Model Number           | Last Cal.  | Next Cal.  |
|---------------|----------------------------------|------------------|------------------------|------------|------------|
| SOFTEMI       | EMI Software                     | UL               | Version 9.5            | NA         | NA         |
|               | <b>RF Amp (&gt;1GHz)</b>         |                  |                        |            |            |
| AMP011        | RF Amp, 1-20GHz                  | Miteq            | AMF-6D-01002000-22-10P | 2013-09-04 | 2014-09-30 |
|               | <b>Additional Equipment used</b> |                  |                        |            |            |
| HI0034        | Temp/Humid/Pressure Meter        | Cole-Parmer      | 99760-00               | 2014-02-19 | 2015-02-28 |
| CBL252980-001 | Cable                            | Huber and Shuner | 84203450               | 2013-11-09 | 2014-11-30 |

Conducted Disturbance Emissions - Voltage

| Equipment ID | Description                                  | Manufacturer        | Model Number             | Last Cal.  | Next Cal.  |
|--------------|----------------------------------------------|---------------------|--------------------------|------------|------------|
|              | <b>Equipment – Ground Plane E</b>            |                     |                          |            |            |
| SA0015       | EMI Test Receiver 9kHz-7GHz                  | Rohde & Schwarz     | ESCI 7                   | 2013-09-04 | 2014-09-30 |
| ATA016       | Coaxial cable, 20 ft., BNC -male to BNC-male | UL                  | RG-223                   | 2013-09-05 | 2014-09-30 |
| HI0069       | Temp/Humid/Pressure Meter                    | Cole-Parmer         | 99760-00                 | 2013-06-17 | 2014-06-30 |
| SOFTEMI      | EMI Software                                 | UL                  | Version 9.5              | NA         | NA         |
|              | <b>Transient Limiter</b>                     |                     |                          |            |            |
| ATA222       | Transient Limiter, 0.009 to 100 MHz          | Electro-Metrics     | EM-7600                  | 2013-09-06 | 2014-09-30 |
|              | <b>LISN (FCC &amp; CISPR testing)</b>        |                     |                          |            |            |
| LISN003      | LISN, 50-ohm/50-uH, 2-conductor, 25A         | Fischer Custom Com. | FCC-LISN-50-25-2-01-550V | 2013-09-03 | 2014-09-30 |

## 7. ANTENNA PORT TEST RESULTS

**Note:** Given that the EUT had an imbedded antenna with not accessible antenna port, the following tests were performed over the air via a receive antenna.

### 7.1. 20 dB AND 99% BW

#### LIMITS

FCC §15.231 (c)

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.

IC A1.1.3

For the purpose of Section A1.1, the 99% Bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

#### TEST PROCEDURE

ANSI C63.4

The transmitter output is connected to the spectrum analyzer.

**20dB Bandwidth:** The RBW is set to 100 KHz. The VBW is set to 300 KHz. The sweep time is coupled. Bandwidth is determined at the points 20 dB down from the modulated carrier.

**99% Bandwidth:** The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

## **RESULTS**

No non-compliance noted:

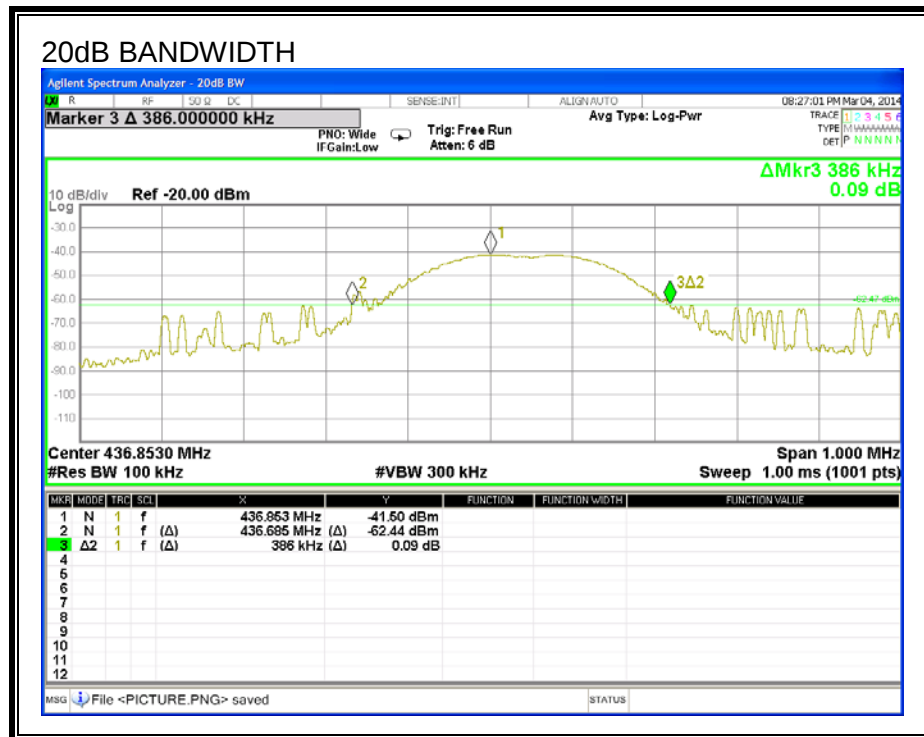
### 20dB Bandwidth

| <b>Frequency<br/>(MHz)</b> | <b>20dB Bandwidth<br/>(kHz)</b> | <b>Limit<br/>(kHz)</b> | <b>Margin<br/>(kHz)</b> |
|----------------------------|---------------------------------|------------------------|-------------------------|
| 436.853                    | 386                             | 1092.1325              | -706.1325               |

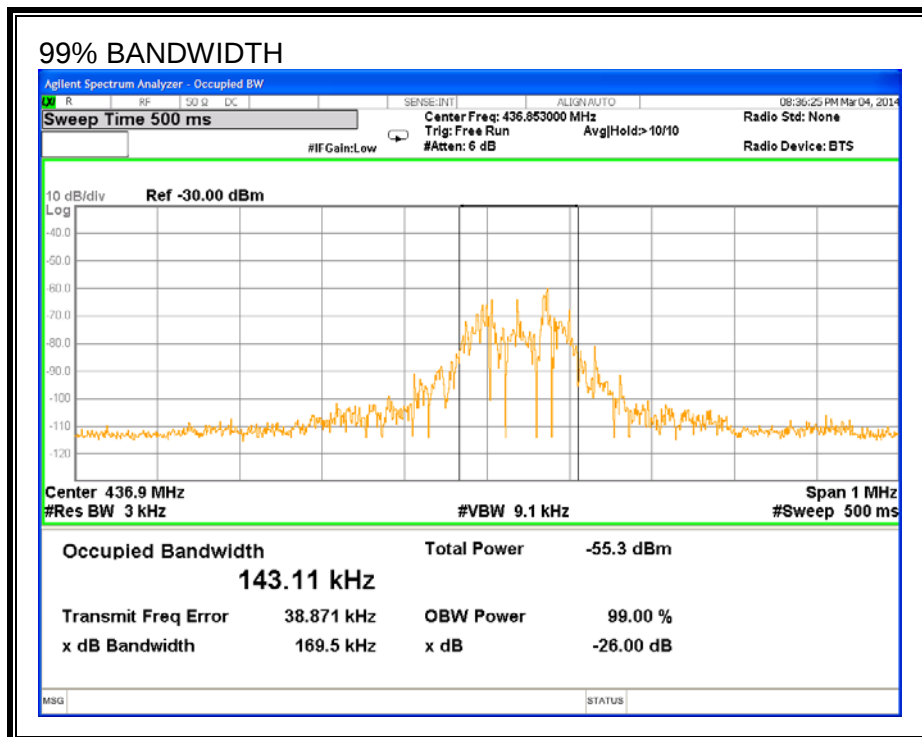
### 99% Bandwidth

| <b>Frequency<br/>(MHz)</b> | <b>99% Bandwidth<br/>(kHz)</b> | <b>Limit<br/>(kHz)</b> | <b>Margin<br/>(kHz)</b> |
|----------------------------|--------------------------------|------------------------|-------------------------|
| 436.9                      | 143.11                         | 1092.25                | -949.14                 |

## 20dB BANDWIDTH



99% BANDWIDTH



## 7.2. DUTY CYCLE

### LIMITS

FCC §15.35 (c)

The measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled and the span is set to 0 Hz. The number of pulses is measured and calculated in a 100 ms scan.

### CALCULATION

Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is (# of long pulses \* long pulse width) + (# of short pulses \* short pulse width) / 100 or T

### RESULTS

No non-compliance noted:

| One Period (ms) | Pulse Width (ms) | # of Pulses | Duty Cycle | 20*Log Duty Cycle (dB) |
|-----------------|------------------|-------------|------------|------------------------|
| 100             | 4.98             | 2           | 0.100      | -20.03                 |

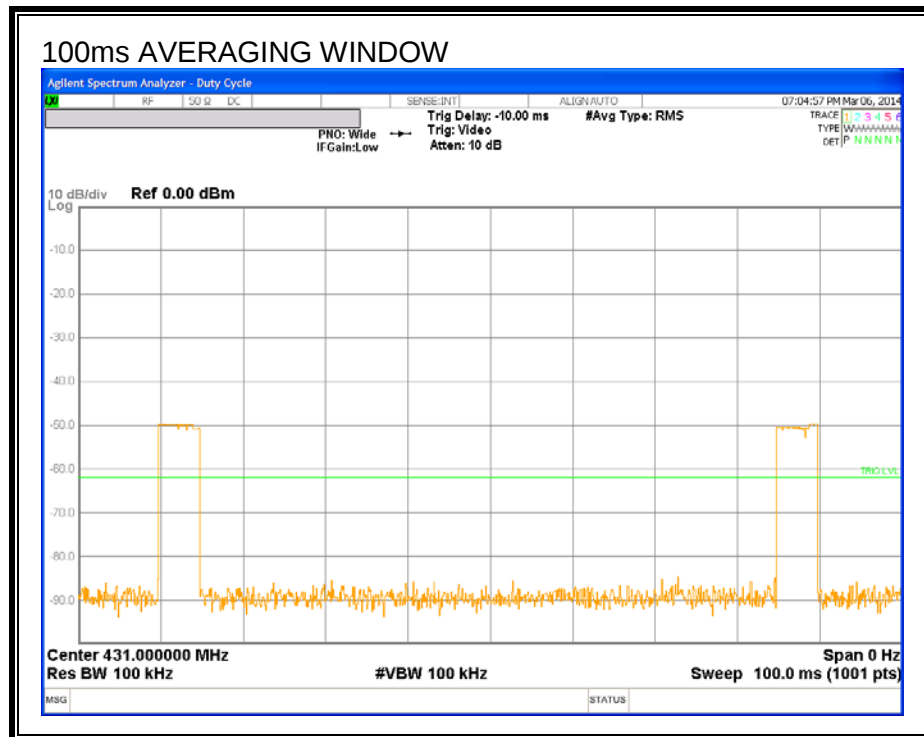
**Note:** The 100ms averaging window was used per paragraph (c) of Section 15.35 where it says in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

As can be seen in the following screenshot, the transmission lasts longer than 100ms and no more than two pulses are in a 100ms window. Also, all the pulses are of the same duration.

## PULSE TRAIN



## 100ms AVERAGING WINDOW





### 7.3. TRANSMISSION TIME

#### LIMITS

FCC §15.231 (a) (2)

IC A1.1.1 (b)

A transmitter activated automatically shall cease transmission within 5 seconds after activation.

#### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is set to 10 seconds and the span is set to 0 Hz.

#### RESULTS

No non-compliance noted:



## 8. RADIATED EMISSION TEST RESULTS

### 8.1. TX RADIATED SPURIOUS EMISSION

#### LIMITS

FCC §15.231 (a)

IC A1.1.2

In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

**TABLE (1)**

| Fundamental frequency (MHz) | Field strength of<br>fundamental<br>(microvolts/meter) | Field strength of<br>spurious emissions<br>(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 12500 .....                                  | *375 to 1,250                                                 |
| Above 470.....              | 12,500 .....                                           | 1,250                                                         |

\* Linear interpolations.

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| 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 -         | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.52525           | 2655 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 156.7 - 156.9       | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 162.0125 - 167.17   | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 167.72 - 173.2      | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 240 - 285           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              | 322 - 335.4         |                 |                  |

- 1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.  
2 Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) 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<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 - 0.490      | 2400/F(kHz)                          | 300 <sup>Note</sup>              |
| 0.490 - 1.705      | 24000/F(kHz)                         | 30 <sup>Note</sup>               |
| 1.705 - 30         | 30                                   | 30 <sup>Note</sup>               |
| 30 - 88            | 100 **                               | 3                                |
| 88 - 216           | 150 **                               | 3                                |
| 216 - 960          | 200 **                               | 3                                |
| Above 960          | 500                                  | 3                                |

\*\* 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.

Note – The limit was adjusted by 40 dB/decade ( $40 \cdot \log[X/3]$ , where x is measurement distance above)

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

## **TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

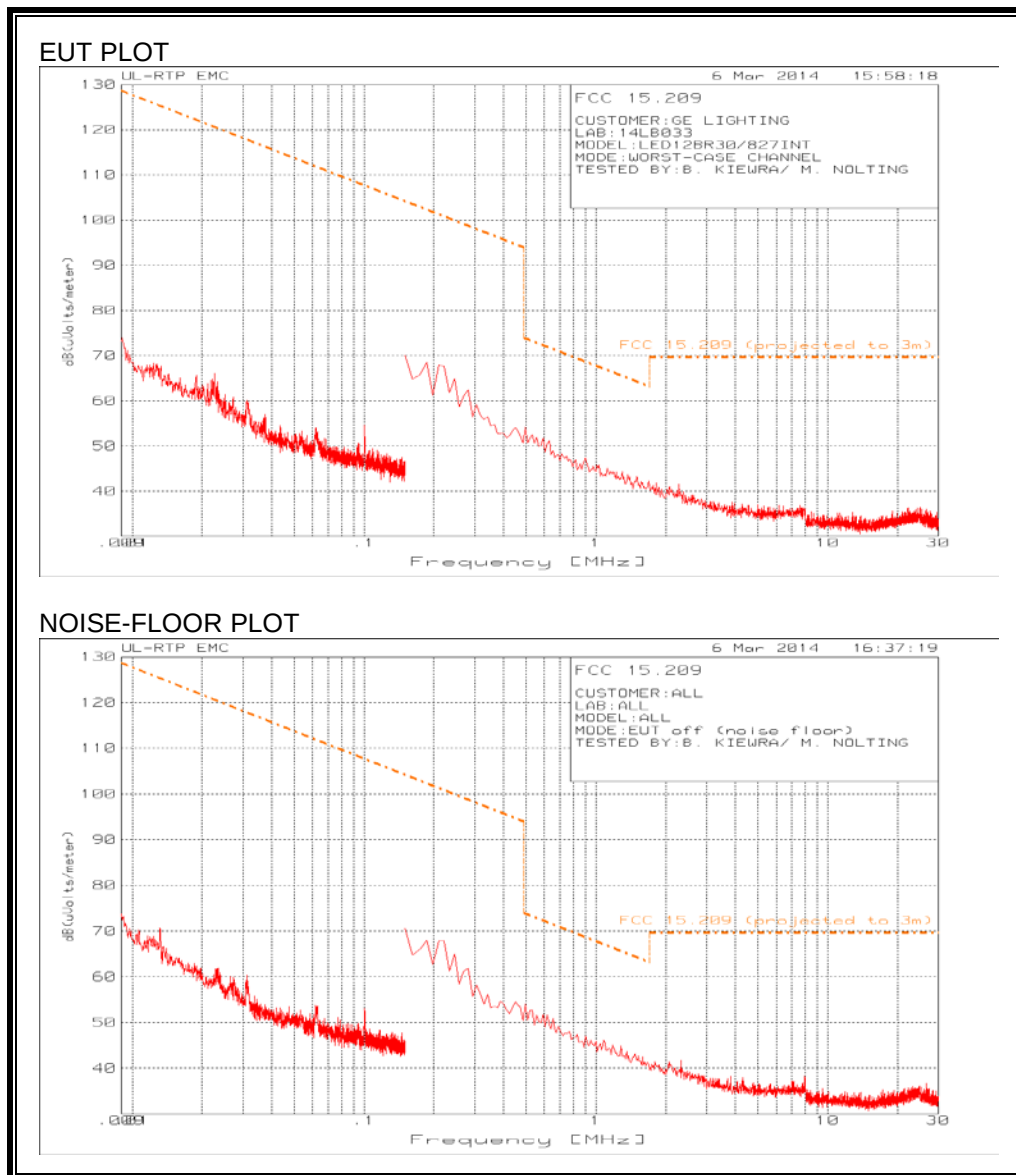
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

## **RESULTS**

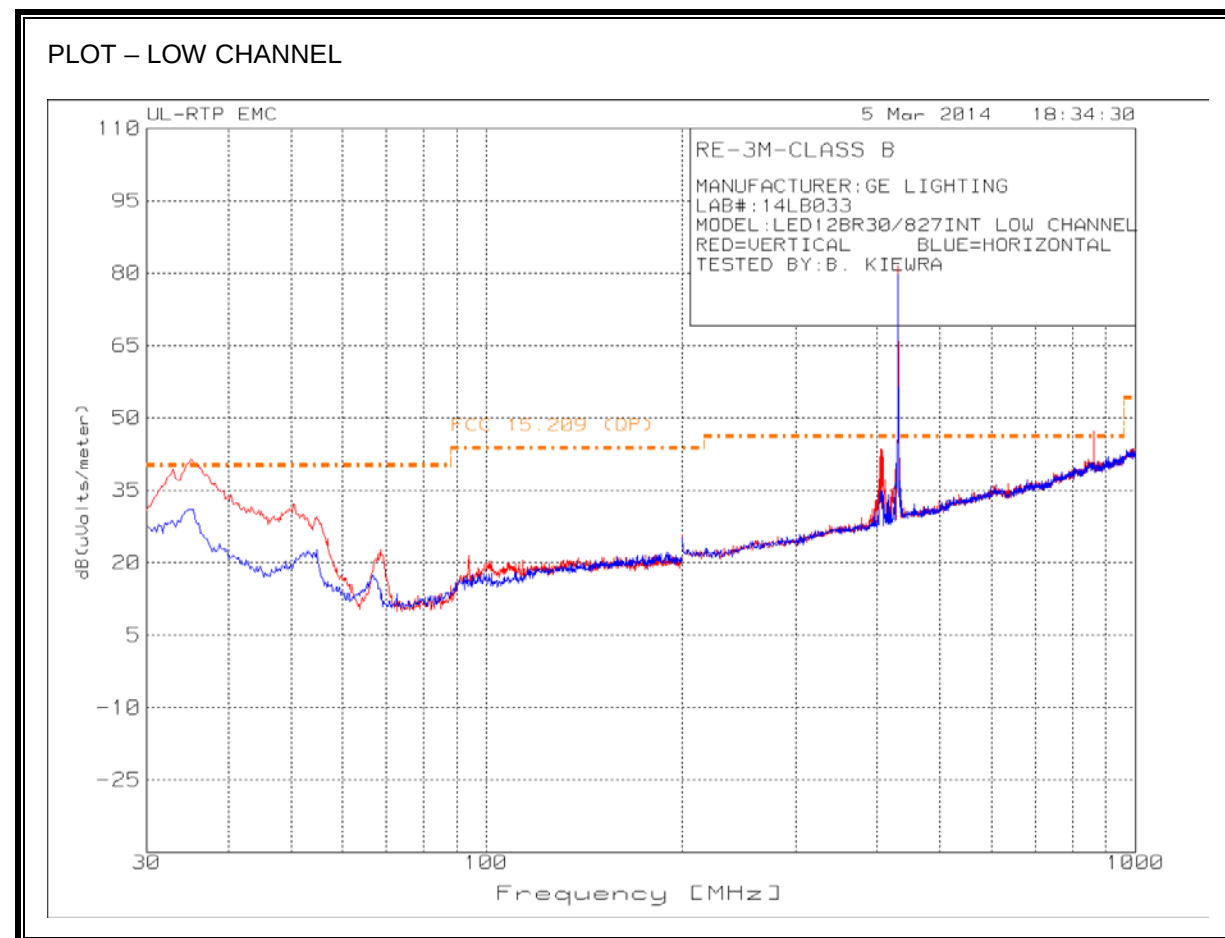
No non-compliance noted:

## TX SPURIOUS EMISSIONS (BELOW 30 MHz)

**Note:** All measurements were made at a test distance of 3 m. The limits in the plots and tabular data are the FCC/IC limits extrapolated from the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz-30 MHz) to the measurement distance to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were  $40 \cdot \log$  (specification distance / test distance).



**FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz) Low Channel**



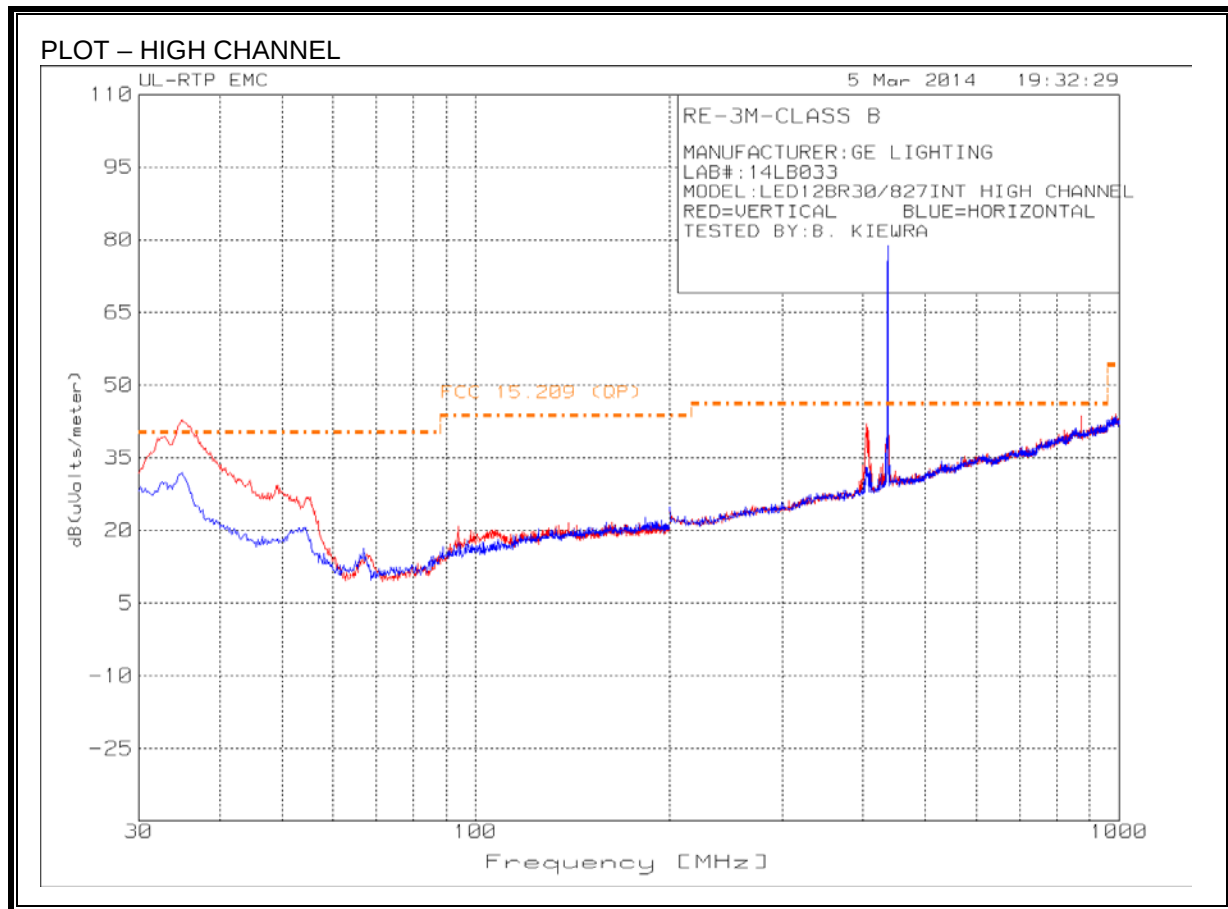
# TABULAR DATA – LOW CHANNEL

MANUFACTURER:GE LIGHTING  
LAB#:14LB033  
MODEL:LED12BR30/827INT LOW CHANNEL  
RED=VERTICAL BLUE=HORIZONTAL  
TESTED BY:B. KIEWRA

| Test Frequency [MHz] | Meter Reading [dBuV] | Detector* | Antenna [dB/m] | Gain/ Loss [dB] | Field Strength [dBuV/m] | FCC 15.209 QP Limit [dBuV/m] | Margin [dB] | FCC 15.231 Peak Limit [dBuV/m] | Margin [dB] | DCF [dB] | Average Field Strength [dBuV/m] | FCC 15.231 Average Limit [dBuV/m] | Margin [dB] | Polarity | Restricted Band? Y/N |
|----------------------|----------------------|-----------|----------------|-----------------|-------------------------|------------------------------|-------------|--------------------------------|-------------|----------|---------------------------------|-----------------------------------|-------------|----------|----------------------|
| 32.893               | 47.1                 | PK        | 16.6           | -24.2           | 39.5                    | --                           | --          | 80.7                           | -41.3       | -20.0    | 19.4                            | 60.7                              | -41.3       | Vert     | N                    |
| 35.105               | 50.1                 | PK        | 15.6           | -24.2           | 41.5                    | --                           | --          | 80.7                           | -39.2       | -20.0    | 21.5                            | 60.7                              | -39.2       | Vert     | N                    |
| 40.380               | 45.0                 | PK        | 13.4           | -24.2           | 34.2                    | --                           | --          | 80.7                           | -46.6       | -20.0    | 14.1                            | 60.7                              | -46.6       | Vert     | N                    |
| 405.556              | 34.3                 | QP        | 15.8           | -27.0           | 23.1                    | 46.0                         | -22.9       | --                             | --          | --       | --                              | --                                | --          | Vert     | Y                    |
| 430.989              | 100.2                | PK        | 16.4           | -26.8           | 89.8                    | --                           | --          | 100.7                          | -10.9       | -20.0    | 69.8                            | 80.7                              | -10.9       | Vert     | N                    |
| 861.775              | 51.4                 | PK        | 22.6           | -26.7           | 47.3                    | --                           | --          | 80.7                           | -33.4       | -20.0    | 27.3                            | 60.7                              | -33.5       | Vert     | N                    |
| 430.990              | 97.9                 | PK        | 16.4           | -26.8           | 87.5                    | --                           | --          | 100.7                          | -13.2       | -20.0    | 67.5                            | 80.7                              | -13.3       | Horz     | N                    |

\*PK = Peak, QP = Quasi-Peak, AV = Average.

**FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz) High Channel**



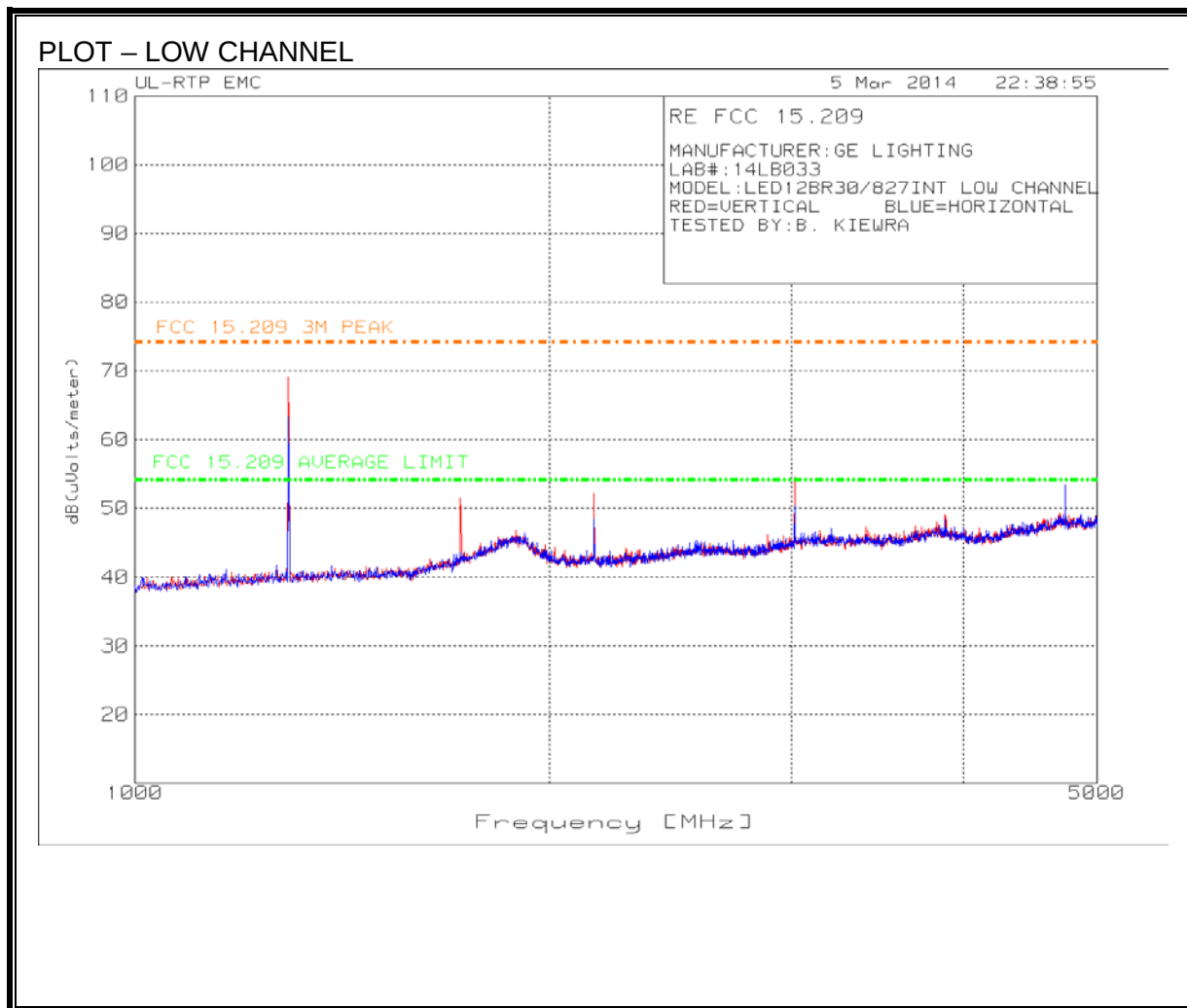
## TABULAR DATA – HIGH CHANNEL

MANUFACTURER:GE LIGHTING  
LAB#:14LB033  
MODEL:LED12BR30/827INT HIGH CHANNEL  
RED=VERTICAL BLUE=HORIZONTAL  
TESTED BY:B. KIEWRA

| Test Frequency [MHz] | Meter Reading [dBuV] | Detector* | Antenna [dB/m] | Gain/Loss [dB] | Field Strength [dBuV/m] | FCC 15.209 QP Limit [dBuV/m] | Margin [dB] | FCC 15.231 Peak Limit [dBuV/m] | Margin [dB] | DCF [dB] | Average Field Strength [dBuV/m] | FCC 15.231 Average Limit [dBuV/m] | Margin [dB] | Polarity | Restricted Band? Y/N |
|----------------------|----------------------|-----------|----------------|----------------|-------------------------|------------------------------|-------------|--------------------------------|-------------|----------|---------------------------------|-----------------------------------|-------------|----------|----------------------|
| 32.893               | 47.0                 | PK        | 16.6           | -24.2          | 39.4                    | --                           | --          | 80.9                           | -41.5       | -20.0    | 19.4                            | 60.9                              | -41.6       | Vert     | N                    |
| 34.935               | 51.3                 | PK        | 15.7           | -24.2          | 42.8                    | --                           | --          | 80.9                           | -38.1       | -20.0    | 22.8                            | 60.9                              | -38.1       | Vert     | N                    |
| 39.189               | 45.2                 | PK        | 14.0           | -24.3          | 34.9                    | --                           | --          | 80.9                           | -46.0       | -20.0    | 14.9                            | 60.9                              | -46.0       | Vert     | N                    |
| 404.146              | 34.3                 | QP        | 15.8           | -27.0          | 23.1                    | 46.0                         | -22.9       | --                             | --          | --       | --                              | --                                | --          | Vert     | Y                    |
| 436.989              | 100.1                | PK        | 16.7           | -26.9          | 89.9                    | --                           | --          | 100.9                          | -11.1       | -20.0    | 69.8                            | 80.9                              | -11.1       | Vert     | N                    |
| 874.049              | 48.1                 | PK        | 22.5           | -26.8          | 43.8                    | --                           | --          | 80.9                           | -37.1       | -20.0    | 23.8                            | 60.9                              | -37.2       | Vert     | N                    |
| 436.990              | 95.4                 | PK        | 16.7           | -26.9          | 85.2                    | --                           | --          | 100.9                          | -15.7       | -20.0    | 65.2                            | 80.9                              | -15.8       | Horz     | N                    |

\*PK = Peak, QP = Quasi-Peak, AV = Average.

**HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz - Low Channel**



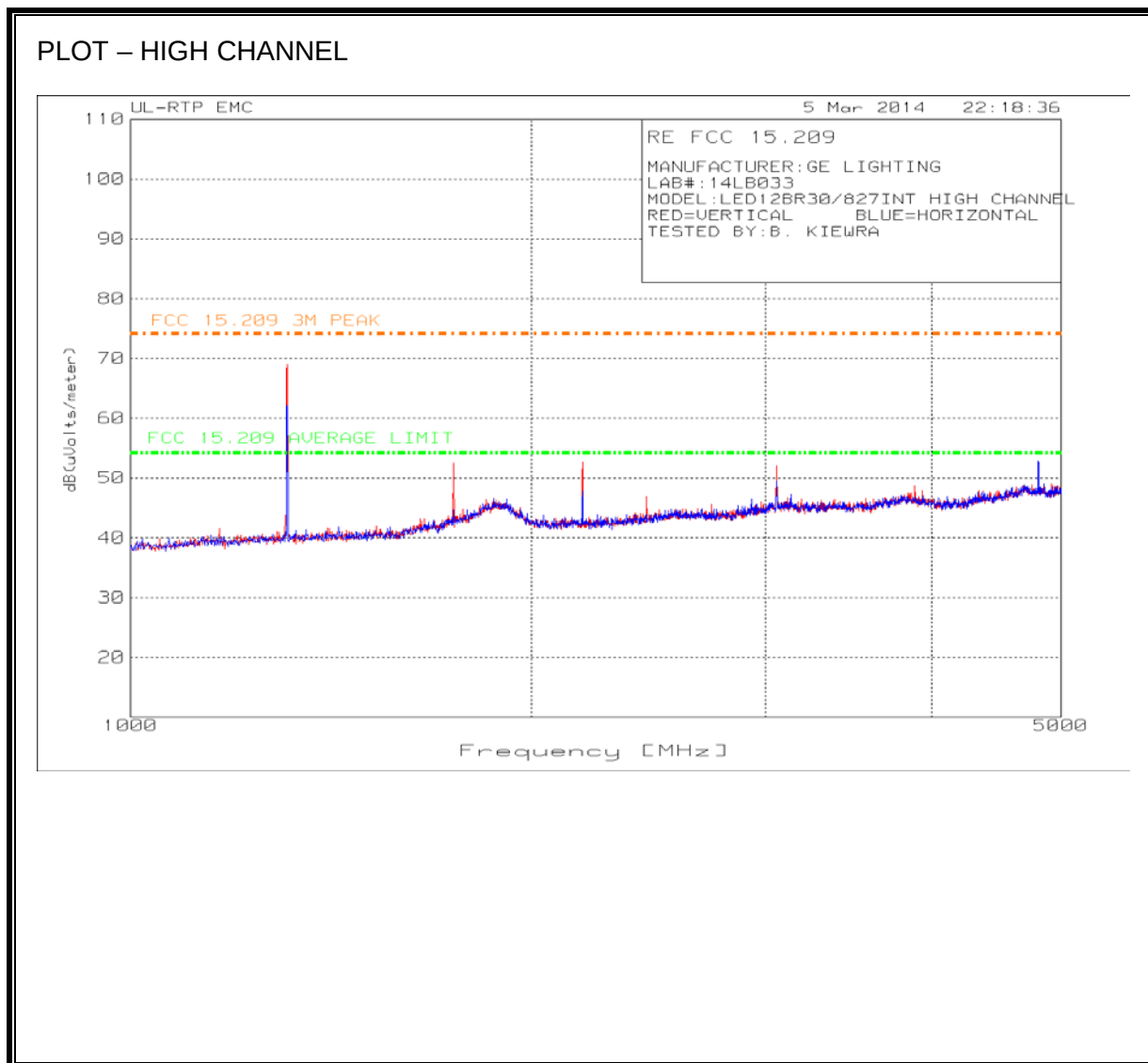
# TABULAR DATA – LOW CHANNEL

MANUFACTURER:GE LIGHTING  
LAB#:14LB033  
MODEL:LED12BR30/827INT LOW CHANNEL  
RED=VERTICAL BLUE=HORIZONTAL  
TESTED BY:B. KIEWRA

| Test Frequency [MHz] | Meter Reading [dBuV] | Detector* | Antenna [dB/m] | Gain/ Loss [dB] | ATA174 (dB) | Field Strength [dBuV/m] | FCC 15.231 Peak Limit [dBuV/m] | Margin [dB] | DCF (dB) | Average Field Strength [dBuV/m] | FCC 15.231 Average Limit [dBuV/m] | Margin [dB] | Polarity | Restricted Band? Y/N |
|----------------------|----------------------|-----------|----------------|-----------------|-------------|-------------------------|--------------------------------|-------------|----------|---------------------------------|-----------------------------------|-------------|----------|----------------------|
| 1292.195             | 67.7                 | PK        | 25.2           | -33.8           | 10.0        | 69.1                    | 80.73                          | -11.7       | -20.03   | 49.0                            | 60.73                             | -11.7       | Vert     | N                    |
| 1723.149             | 47.2                 | PK        | 26.4           | -32.1           | 10.0        | 51.5                    | 80.73                          | -29.2       | -20.03   | 31.5                            | 60.73                             | -29.3       | Vert     | N                    |
| 2154.103             | 47.7                 | PK        | 27.6           | -33.1           | 10.0        | 52.2                    | 80.73                          | -28.5       | -20.03   | 32.2                            | 60.73                             | -28.6       | Vert     | N                    |
| 3014.014             | 46.5                 | PK        | 30.3           | -33.0           | 10.0        | 53.8                    | 80.73                          | -26.9       | -20.03   | 33.8                            | 60.73                             | -27.0       | Vert     | N                    |
| 1292.195             | 62.0                 | PK        | 25.2           | -33.8           | 10.0        | 63.4                    | 80.73                          | -17.4       | -20.03   | 43.3                            | 60.73                             | -17.4       | Horz     | N                    |
| 2155.437             | 42.9                 | PK        | 27.6           | -33.1           | 10.0        | 47.4                    | 80.73                          | -33.4       | -20.03   | 27.3                            | 60.73                             | -33.4       | Horz     | N                    |
| 3016.016             | 42.5                 | PK        | 30.3           | -33.0           | 10.0        | 49.8                    | 80.73                          | -30.9       | -20.03   | 29.8                            | 60.73                             | -31.0       | Horz     | N                    |
| 4739.740             | 41.7                 | PK        | 32.7           | -31.0           | 10.0        | 53.4                    | 74.0                           | -20.6       | -20.03   | 33.4                            | 54.00                             | -20.6       | Horz     | Y                    |

\*PK = Peak, QP = Quasi-Peak, AV = Average.

**HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz - High Channel**



## PLOT – HIGH CHANNEL

MANUFACTURER:GE LIGHTING  
LAB#:14LB033  
MODEL:LED12BR30/827INT HIGH CHANNEL  
RED=VERTICAL BLUE=HORIZONTAL  
TESTED BY:B. KIEWRA

| Test Frequency [MHz] | Meter Reading [dBuV] | Detector* | Antenna [dB/m] | Gain/Loss [dB] | ATA174 (dB) | Field Strength [dBuV/m] | FCC 15.231 Peak Limit [dBuV/m] | Margin [dB] | DCF (dB) | Average Field Strength [dBuV/m] | FCC 15.231 Average Limit [dBuV/m] | Margin [dB] | Polarity | Restricted Band? Y/N |
|----------------------|----------------------|-----------|----------------|----------------|-------------|-------------------------|--------------------------------|-------------|----------|---------------------------------|-----------------------------------|-------------|----------|----------------------|
| 1310.874             | 67.6                 | PK        | 25.2           | -33.8          | 10.0        | 69.0                    | 74.00                          | -5.1        | -20.03   | 48.9                            | 54.00                             | -5.1        | Vert     | Y                    |
| 1747.165             | 47.7                 | PK        | 26.5           | -31.7          | 10.0        | 52.5                    | 80.93                          | -28.5       | -20.03   | 32.5                            | 60.93                             | -28.5       | Vert     | N                    |
| 2184.790             | 48.2                 | PK        | 27.6           | -33.2          | 10.0        | 52.6                    | 80.93                          | -28.4       | -20.03   | 32.6                            | 60.93                             | -28.4       | Vert     | N                    |
| 3058.058             | 44.5                 | PK        | 30.4           | -32.8          | 10.0        | 52.1                    | 80.93                          | -28.9       | -20.03   | 32.0                            | 60.93                             | -28.9       | Vert     | N                    |
| 4807.808             | 38.6                 | PK        | 32.8           | -30.9          | 10.0        | 50.5                    | 74.00                          | -23.5       | -20.03   | 30.5                            | 54.00                             | -23.5       | Vert     | Y                    |
| 1309.540             | 60.8                 | PK        | 25.2           | -33.8          | 10.0        | 62.2                    | 74.00                          | -11.8       | -20.03   | 42.2                            | 54.00                             | -11.8       | Horz     | Y                    |
| 2184.790             | 43.5                 | PK        | 27.6           | -33.2          | 10.0        | 47.9                    | 80.93                          | -33.0       | -20.03   | 27.9                            | 60.93                             | -33.1       | Horz     | N                    |
| 3056.056             | 41.1                 | PK        | 30.4           | -32.8          | 10.0        | 48.7                    | 80.93                          | -32.2       | -20.03   | 28.7                            | 60.93                             | -32.2       | Horz     | N                    |
| 4805.806             | 41.0                 | PK        | 32.8           | -30.9          | 10.0        | 52.9                    | 74.00                          | -21.2       | -20.03   | 32.8                            | 54.00                             | -21.2       | Horz     | Y                    |

\*PK = Peak, QP = Quasi-Peak, AV = Average.

## 9. AC MAINS LINE CONDUCTED EMISSIONS

### LIMITS

§15.207 (a)  
IC RSS-GEN, Section 7.2.2

| Frequency of emission<br>(MHz)                   | Conducted Limit (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        |
| * Decreases with the logarithm of the frequency. |                        |           |

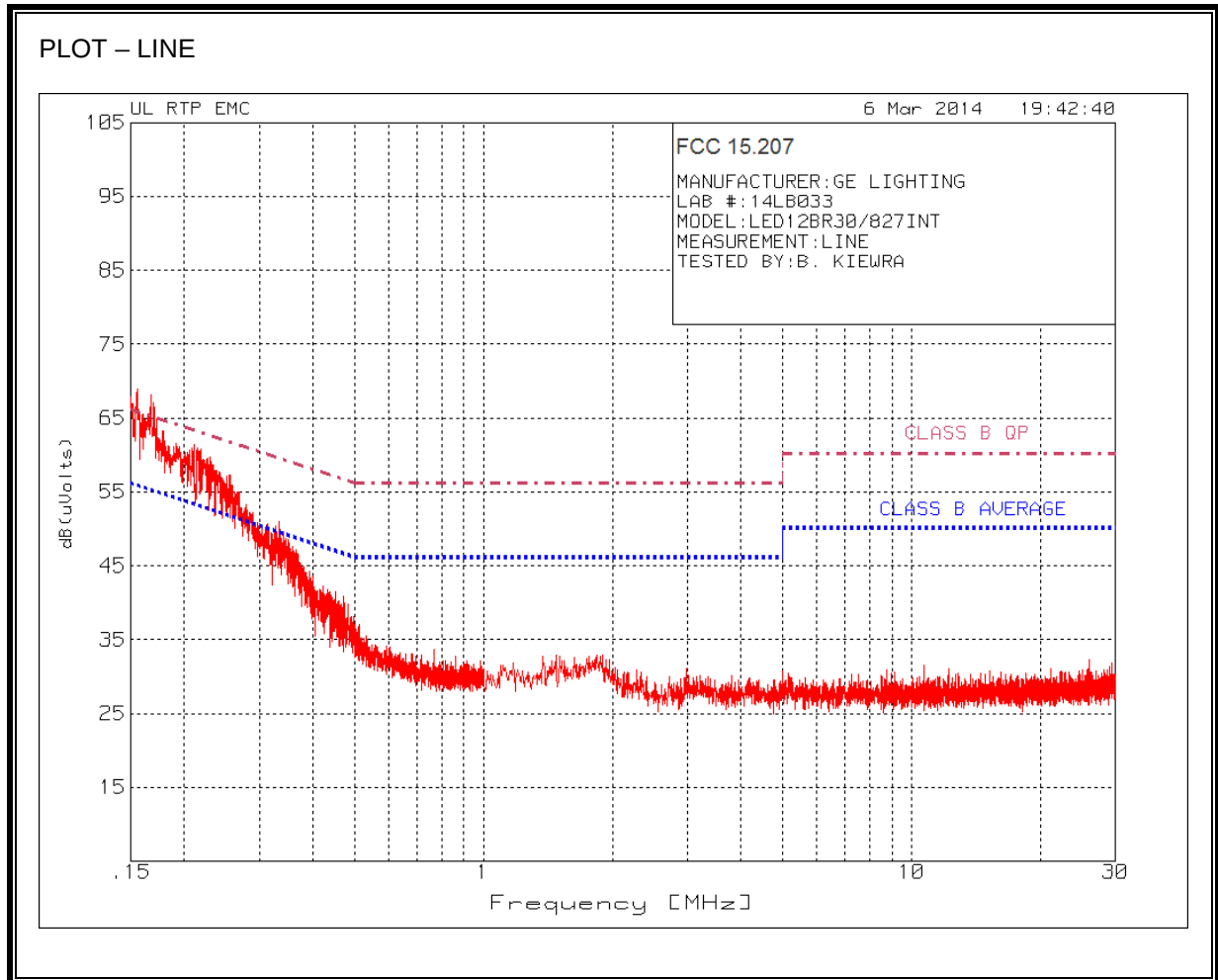
### TEST PROCEDURE

ANSI C63.4

### RESULTS

No non-compliance noted. Measurements made with worst-case channel transmitting.

**LINE 1 RESULTS**



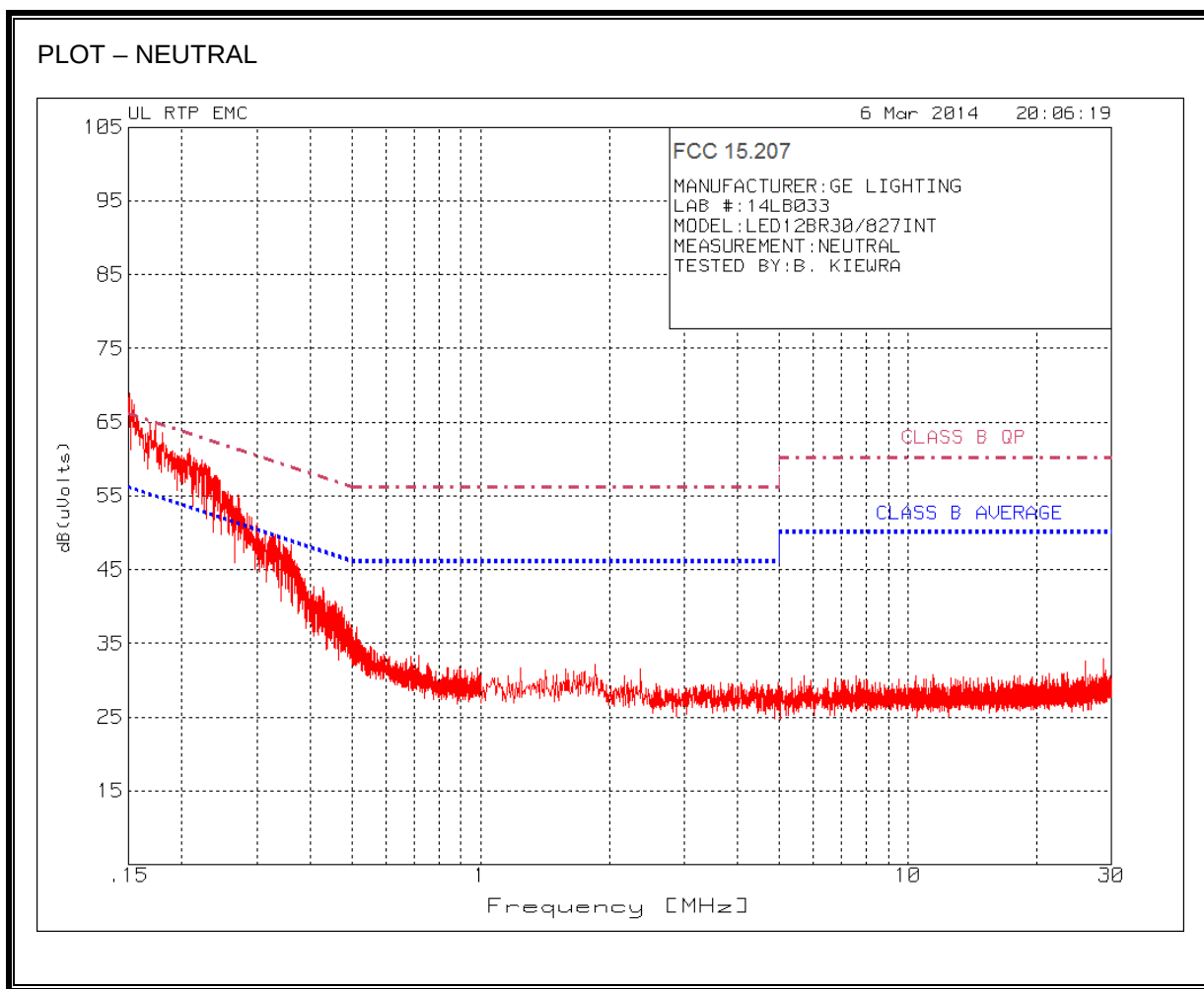
## TABULAR DATA – LINE

MANUFACTURER:GE LIGHTING  
LAB #:14LB033  
MODEL:LED12BR30/827INT  
MEASUREMENT:LINE  
TESTED BY:B. KIEWRA

| Test Frequency [MHz] | Meter Reading [dBuV] | Detector* | LISN [dB] | Cable Loss [dB] | RF Line Voltage [dBuV] | FCC 15.207 (QP) [dBuV] | Margin [dB] | FCC 15.207 (AV) [dBuV] | Margin [dB] |
|----------------------|----------------------|-----------|-----------|-----------------|------------------------|------------------------|-------------|------------------------|-------------|
| 0.154                | 50.4                 | QP        | 0.4       | 9.3             | 60.1                   | 65.8                   | -5.7        | --                     | --          |
| 0.163                | 47.9                 | QP        | 0.4       | 9.3             | 57.6                   | 65.3                   | -7.7        | --                     | --          |
| 0.171                | 47.1                 | QP        | 0.3       | 9.3             | 56.7                   | 64.9                   | -8.3        | --                     | --          |
| 0.189                | 44.6                 | QP        | 0.3       | 9.3             | 54.2                   | 64.1                   | -9.9        | --                     | --          |
| 0.204                | 43.1                 | QP        | 0.2       | 9.3             | 52.6                   | 63.4                   | -10.8       | --                     | --          |
| 0.224                | 41.3                 | QP        | 0.2       | 9.3             | 50.8                   | 62.7                   | -11.9       | --                     | --          |
| 0.255                | 38.4                 | QP        | 0.2       | 9.3             | 47.9                   | 61.6                   | -13.7       | --                     | --          |
| 0.154                | 28.61                | CAV       | 0.4       | 9.3             | 38.31                  | --                     | --          | 55.8                   | -17.49      |
| 0.163                | 26.85                | CAV       | 0.4       | 9.3             | 36.55                  | --                     | --          | 55.3                   | -18.76      |
| 0.171                | 26.67                | CAV       | 0.3       | 9.3             | 36.27                  | --                     | --          | 54.9                   | -18.66      |
| 0.189                | 24.79                | CAV       | 0.3       | 9.3             | 34.39                  | --                     | --          | 54.1                   | -19.71      |
| 0.204                | 22.17                | CAV       | 0.2       | 9.3             | 31.67                  | --                     | --          | 53.4                   | -21.76      |
| 0.224                | 21.74                | CAV       | 0.2       | 9.3             | 31.24                  | --                     | --          | 52.7                   | -21.41      |
| 0.255                | 19.78                | CAV       | 0.2       | 9.3             | 29.28                  | --                     | --          | 51.6                   | -22.31      |
| 0.264                | 19.32                | CAV       | 0.2       | 9.3             | 28.82                  | --                     | --          | 51.3                   | -22.48      |
| 0.277                | 17.62                | CAV       | 0.1       | 9.3             | 27.02                  | --                     | --          | 50.9                   | -23.88      |
| 0.305                | 18.57                | CAV       | 0.1       | 9.3             | 27.97                  | --                     | --          | 50.1                   | -22.14      |
| 0.330                | 18.72                | CAV       | 0.1       | 9.3             | 28.12                  | --                     | --          | 49.5                   | -21.33      |
| 0.346                | 18.2                 | CAV       | 0.1       | 9.3             | 27.6                   | --                     | --          | 49.1                   | -21.5       |
| 0.372                | 17.0                 | CAV       | 0.1       | 9.3             | 26.4                   | --                     | --          | 48.5                   | -22.0       |
| 0.394                | 14.2                 | CAV       | 0.1       | 9.3             | 23.6                   | --                     | --          | 48.0                   | -24.4       |
| 0.417                | 13.6                 | CAV       | 0.1       | 9.3             | 23.0                   | --                     | --          | 47.5                   | -24.5       |

\*PK = Peak, QP = Quasi-Peak, Av = Average

**LINE 2 RESULTS**



TABULAR DATA – NEUTRAL

MANUFACTURER:GE LIGHTING  
LAB #:14LB033  
MODEL:LED12BR30/827INT  
MEASUREMENT:NEUTRAL  
TESTED BY:B. KIEWRA

| Test Frequency [MHz] | Meter Reading [dBuV] | Detector* | LISN [dB] | Cable Loss [dB] | RF Line Voltage [dBuV] | FCC 15.207 (QP) [dBuV] | Margin [dB] | FCC 15.207 (AV) [dBuV] | Margin [dB] |
|----------------------|----------------------|-----------|-----------|-----------------|------------------------|------------------------|-------------|------------------------|-------------|
| 0.1544               | 49.48                | QP        | 0.4       | 9.3             | 59.18                  | 65.8                   | -6.58       | --                     | --          |
| 0.1555               | 49.22                | QP        | 0.4       | 9.3             | 58.92                  | 65.7                   | -6.78       | --                     | --          |
| 0.1661               | 46.94                | QP        | 0.3       | 9.3             | 56.54                  | 65.2                   | -8.61       | --                     | --          |
| 0.1780               | 44.67                | QP        | 0.3       | 9.3             | 54.27                  | 64.6                   | -10.31      | --                     | --          |
| 0.1903               | 43.51                | QP        | 0.3       | 9.3             | 53.11                  | 64.0                   | -10.91      | --                     | --          |
| 0.2042               | 42.59                | QP        | 0.2       | 9.3             | 52.09                  | 63.4                   | -11.35      | --                     | --          |
| 0.2172               | 41.77                | QP        | 0.2       | 9.3             | 51.27                  | 62.9                   | -11.66      | --                     | --          |
| 0.2333               | 40.06                | QP        | 0.2       | 9.3             | 49.56                  | 62.3                   | -12.77      | --                     | --          |
| 0.2515               | 38.09                | QP        | 0.2       | 9.3             | 47.59                  | 61.7                   | -14.12      | --                     | --          |
| 0.2670               | 36.22                | QP        | 0.2       | 9.3             | 45.72                  | 61.2                   | -15.49      | --                     | --          |
| 0.1544               | 28.04                | CAV       | 0.4       | 9.3             | 37.74                  | --                     | --          | 55.8                   | -18.02      |
| 0.1555               | 27.68                | CAV       | 0.4       | 9.3             | 37.38                  | --                     | --          | 55.7                   | -18.32      |
| 0.1661               | 26.28                | CAV       | 0.3       | 9.3             | 35.88                  | --                     | --          | 55.2                   | -19.27      |
| 0.1780               | 24.62                | CAV       | 0.3       | 9.3             | 34.22                  | --                     | --          | 54.6                   | -20.36      |
| 0.1903               | 24.44                | CAV       | 0.3       | 9.3             | 34.04                  | --                     | --          | 54.0                   | -19.98      |
| 0.2042               | 21.70                | CAV       | 0.2       | 9.3             | 31.20                  | --                     | --          | 53.4                   | -22.24      |
| 0.2172               | 22.58                | CAV       | 0.2       | 9.3             | 32.08                  | --                     | --          | 52.9                   | -20.85      |
| 0.2333               | 20.49                | CAV       | 0.2       | 9.3             | 29.99                  | --                     | --          | 52.3                   | -22.34      |
| 0.2515               | 19.61                | CAV       | 0.2       | 9.3             | 29.11                  | --                     | --          | 51.7                   | -22.60      |
| 0.2670               | 18.74                | CAV       | 0.2       | 9.3             | 28.24                  | --                     | --          | 51.2                   | -22.97      |
| 0.2811               | 17.28                | CAV       | 0.1       | 9.3             | 26.68                  | --                     | --          | 50.8                   | -24.10      |
| 0.296                | 19.2                 | CAV       | 0.1       | 9.3             | 28.6                   | --                     | --          | 50.4                   | -21.8       |
| 0.324                | 18.7                 | CAV       | 0.1       | 9.3             | 28.1                   | --                     | --          | 49.6                   | -21.5       |
| 0.359                | 16.7                 | CAV       | 0.1       | 9.3             | 26.1                   | --                     | --          | 48.8                   | -22.7       |
| 0.377                | 16.4                 | CAV       | 0.1       | 9.3             | 25.8                   | --                     | --          | 48.4                   | -22.6       |
| 0.421                | 13.1                 | CAV       | 0.1       | 9.3             | 22.5                   | --                     | --          | 47.4                   | -24.9       |

\*PK = Peak, QP = Quasi-Peak, Av = Average

## END OF REPORT