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Job Number: 1001494941  
Project Number: 12CA19074  
File Number: MC16433  
Date: August 17, 2012  
Model: LLC1681

# **Electromagnetic Compatibility Test Report**

**For**

**Philips Lighting Electronics N. A.**

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Job #: 1001494941    Project #: 12CA19074    File #: MC16433  
Model Number:    LLC1681  
Client Name:    Philips Lighting Electronics N. A.

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## Test Report Details

Tests Performed By:    **UL LLC**  
                                  **333 Pfingsten Rd.**  
                                  **Northbrook, IL 60062**

Tests Performed For:    **Philips Lighting Electronics N. A.**  
                                  **10275 West Higgins Road**  
                                  **Rosemont, IL 60018**

Applicant Contact:    **Richard Haring**  
Phone:    **(847) 390-5195**  
E-mail:    **richard.haring@philips.com**

Test Report Date:    **August 17, 2012**

Product Type:    **Wireless Light Control**

Product standards    **FCC Part 15, Subpart C, 15.249**  
                                  **Industry Canada, RSS-210, A2.9**

Model Number:    **LLC1681**

EUT Category:    **Lighting Products - Ballasts**

Testing Start Date:    **April 02, 2012**

Date Testing Complete:    **April 23, 2012**

**Overall Results:**    **Compliant**

UL LLC reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. UL LLC shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL LLC issued reports. 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.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

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## Report Revision History

| Revision Date | Description | Revised By | Revision Reviewed By |
|---------------|-------------|------------|----------------------|
| None          |             |            |                      |

**1.0 G E N E R A L - Product Description****1.1 Equipment Description**

The Equipment Under Test (EUT) is a Actilume LLC1681 2.4GHz wireless ballast control for use in fluorescent fixtures.

**1.2 Device Configuration During Test****1.2.1 Equipment Used During Test:**

| Use                                                                                                               | Product Type                            | Manufacturer                       | Model   | Comments |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------|---------|----------|
| EUT                                                                                                               | Actilume Wireless Light Fixture Control | Philips Lighting Electronics N. A. | LLC1681 | None     |
| Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test) |                                         |                                    |         |          |

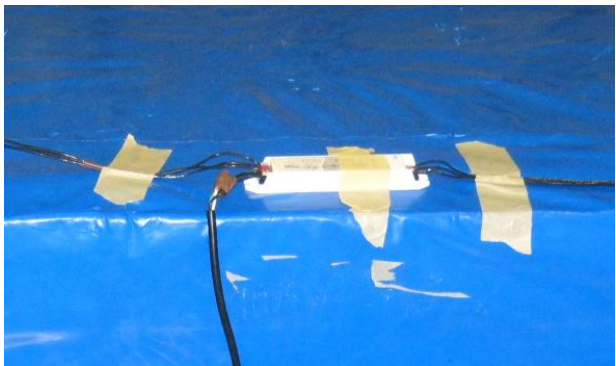
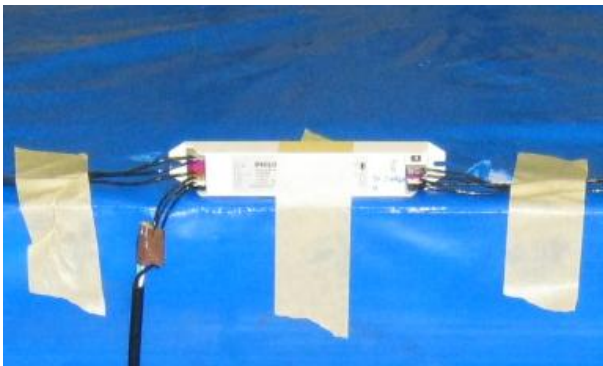
**1.2.2 Input/Output Ports:**

| Port #                                                                                                                                                                               | Name                                    | Type* | Cable Max. >3m (Y/N) | Cable Shielded (Y/N) | Comments |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------|----------------------|----------------------|----------|
| 0                                                                                                                                                                                    | Enclosure                               | N/E   | —                    | —                    | None     |
| 1                                                                                                                                                                                    | Mains                                   | AC    | Y                    | N                    | None     |
| 2                                                                                                                                                                                    | Various low voltage and contact outputs | AC/DC | Y                    | N                    | 7 wires  |
| Note:<br>AC = AC Power Port      DC = DC Power Port      N/E = Non-Electrical<br>I/O = Signal Input or Output Port (Not Involved in Process Control)<br>TP = Telecommunication Ports |                                         |       |                      |                      |          |

**1.2.3 Power Interface:**

| Mode # /Rated | Voltage (V) | Current (A) | Power (W) | Frequency (DC/AC-Hz) | Phases (#) | Comments                                                                                                                         |
|---------------|-------------|-------------|-----------|----------------------|------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1             | 120         | -           | -         | 60                   | 1          | None                                                                                                                             |
| 2             | 277         | -           | -         | 60                   | 1          | Initial measurements showed that input voltage has no effect on the radio part of the device. All testing was conducted at 120V. |

### 1.3 EUT Configurations

| Mode #                                                                            | Description                                                                                                   |                                                                                    |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 1                                                                                 | EUT was configured on 80cm support in two orientations. Axis 1 and Axis 2. Axis 2 was found to be worst case. |                                                                                    |
| Axis 1                                                                            |                                                                                                               | Axis 2                                                                             |
|  |                                                                                                               |  |

### 1.4 EUT Operation Modes

| Mode # | Description                              |
|--------|------------------------------------------|
| 1      | TX Mode on Low, middle and High channels |
| 2      | TX board removed, electronics only       |

### 1.5 Rational for EUT Configuration

| Mode # | Description                                                                                                                                                     |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | The selected EUT configuration was chosen to maximize emissions. Various configuration were explored and EUT positioning. Only the worst case data is reported. |

## 2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by UL LLC in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

### 2.1 Deviations from standard test methods

None

### 2.2 Device Modifications Necessary for Compliance

None

### 2.3 Reference Standards

| Standard Number                | Standard Name                                                              | Standard Date |
|--------------------------------|----------------------------------------------------------------------------|---------------|
| FCC Part 15, Subpart C, 15.249 | Code of Federal Regulations, Part 15, Radio Frequency Devices              | 2012          |
| RSS-210                        | Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment | Issue 8       |

### 2.4 Results Summary

This product is considered **Class A**

| Requirement – Test                      | Result (Compliant / Non-Compliant)* |
|-----------------------------------------|-------------------------------------|
| Fundamental Radiated Emissions          | Compliant                           |
| Spurious Radiated Emissions             | Compliant                           |
| Occupied Bandwidth (20dB and 99% power) | Compliant                           |
| Line Conducted Emissions                | Compliant                           |

Test Engineer:



Bartlomiej Mucha (Ext.41216)  
Staff Engineer  
International EMC Services  
Conformity Assessment Services

Reviewer:



Michael Ferrer(Ext.41312)  
Senior Project Engineer  
International EMC Services  
Conformity Assessment Services

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

### 3.0    Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

### 4.0    EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

----- United States -----

|                                      |                                             |
|--------------------------------------|---------------------------------------------|
| Code of Federal Regulations Title 47 | Part 15, Subpart C, Radio Frequency Devices |
|--------------------------------------|---------------------------------------------|

----- Canada -----

|         |                                                                            |
|---------|----------------------------------------------------------------------------|
| RSS-210 | Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipmnet |
|---------|----------------------------------------------------------------------------|

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

|                            |            |                         |         |                              |           |
|----------------------------|------------|-------------------------|---------|------------------------------|-----------|
| Ambient<br>Temperature, °C | 22.5 ± 2.5 | Relative<br>Humidity, % | 45 ± 15 | Barometric<br>Pressure, mBar | 950 ± 150 |
|----------------------------|------------|-------------------------|---------|------------------------------|-----------|

#### Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)

Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)

Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

**4.1 Test Conditions and Results – FUNDAMENTAL RADIATED EMISSIONS**

|                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Test Description                                                                                                                                   | Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. |                                |
| Basic Standard                                                                                                                                     | 47 CFR Part 15.249<br>RSS-210, A2.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |
| UL LPG                                                                                                                                             | 80-EM-S0029                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                |
|                                                                                                                                                    | Frequency range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Measurement Point              |
| Fully configured sample scanned over the following frequency range                                                                                 | 2.4GHz – 2.4835GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (3 meter measurement distance) |
| <b>Limits</b>                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |
| Frequency (MHz)                                                                                                                                    | Limit (dBμV/m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                |
|                                                                                                                                                    | Peak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Average                        |
| 2400 – 2483.5                                                                                                                                      | 113.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 93.98                          |
| Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |



Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**Table 1 Radiated Emissions EUT Configuration Settings**

| Power Interface Mode #          | EUT Configurations Mode # | EUT Operation Mode # |
|---------------------------------|---------------------------|----------------------|
| 1                               | 1                         | 1                    |
| Supplementary information: None |                           |                      |

**Table 2 Radiated Emissions Test Equipment**

| Description       | Manufacturer    | Model | Identifier | Cal. Date | Cal. Due Date |
|-------------------|-----------------|-------|------------|-----------|---------------|
| Spectrum Analyzer | Rhode & Schwarz | FSEK  | EMC4182    | 20111227  | 20121231      |
| Antenna Array     | UL              | BOMS  | EMC4276    | 20111227  | 20121231      |

**Table 3 Radiated Emissions Data Points**

| Test Frequency | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | CFR 47 Part 15 Class B 3m | Margin | Azimuth [Deps] | Height [cm] | Polarity |
|----------------|---------------|----------|-------------------|-------------------|--------|---------------------------|--------|----------------|-------------|----------|
| <b>Axis 1</b>  |               |          |                   |                   |        |                           |        |                |             |          |
| 2405.478       | 62.62         | PK       | 21.8              | 4.14              | 88.56  | 113.98                    | -25.42 | 137            | 101         | Horz     |
| 2405.039       | 60.42         | LnAv     | 21.8              | 4.15              | 86.37  | 93.98                     | -7.61  | 137            | 101         | Horz     |
| 2405.448       | 65.65         | PK       | 21.8              | 4.14              | 91.59  | 113.98                    | -22.39 | 240            | 100         | Vert     |
| 2405.033       | 63.54         | LnAv     | 21.8              | 4.15              | 89.49  | 93.98                     | -4.49  | 240            | 100         | Vert     |
| 2449.462       | 63.01         | PK       | 21.9              | 4.35              | 89.26  | 113.98                    | -24.72 | 298            | 100         | Horz     |
| 2450.045       | 60.81         | LnAv     | 22                | 4.34              | 87.15  | 93.98                     | -6.83  | 298            | 100         | Horz     |
| 2449.453       | 65.24         | PK       | 21.9              | 4.35              | 91.49  | 113.98                    | -22.49 | 215            | 100         | Vert     |
| 2450.048       | 63.07         | LnAv     | 22                | 4.34              | 89.41  | 93.98                     | -4.57  | 215            | 100         | Vert     |
| 2474.498       | 62.98         | PK       | 22                | 3.83              | 88.81  | 113.98                    | -25.17 | 215            | 100         | Horz     |
| 2474.997       | 60.79         | LnAv     | 22                | 3.81              | 86.6   | 93.98                     | -7.38  | 215            | 100         | Horz     |
| 2474.498       | 65.75         | PK       | 22                | 3.83              | 91.58  | 113.98                    | -22.4  | 215            | 100         | Vert     |
| 2475.027       | 63.6          | LnAv     | 22                | 3.81              | 89.41  | 93.98                     | -4.57  | 215            | 100         | Vert     |
| <b>Axis 2</b>  |               |          |                   |                   |        |                           |        |                |             |          |
| 2405.469       | 67.28         | PK       | 21.8              | 4.14              | 93.22  | 113.98                    | -20.76 | 315            | 100         | Horz     |
| 2405.018       | 65.14         | LnAv     | 21.8              | 4.15              | 91.09  | 93.98                     | -2.89  | 315            | 100         | Horz     |
| 2405.409       | 63.89         | PK       | 21.8              | 4.14              | 89.83  | 113.98                    | -24.15 | 59             | 128         | Vert     |
| 2405.018       | 61.71         | LnAv     | 21.8              | 4.15              | 87.66  | 93.98                     | -6.32  | 59             | 128         | Vert     |
| 2450.481       | 66.67         | PK       | 22                | 4.34              | 93.01  | 113.98                    | -20.97 | 352            | 100         | Horz     |
| 2450.024       | 64.46         | LnAv     | 22                | 4.34              | 90.8   | 93.98                     | -3.18  | 352            | 100         | Horz     |
| 2449.51        | 61.72         | PK       | 21.9              | 4.35              | 87.97  | 113.98                    | -26.01 | 301            | 100         | Vert     |
| 2450.033       | 59.42         | LnAv     | 22                | 4.34              | 85.76  | 93.98                     | -8.22  | 301            | 100         | Vert     |
| 2474.464       | 66.07         | PK       | 22                | 3.83              | 91.9   | 113.98                    | -22.08 | 314            | 100         | Horz     |
| 2475.011       | 63.85         | LnAv     | 22                | 3.81              | 89.66  | 93.98                     | -4.32  | 314            | 100         | Horz     |
| 2474.512       | 61.76         | PK       | 22                | 3.83              | 87.59  | 113.98                    | -26.39 | 320            | 101         | Vert     |
| 2474.993       | 59.43         | LnAv     | 22                | 3.81              | 85.24  | 93.98                     | -8.74  | 320            | 101         | Vert     |

Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**4.2 Test Conditions and Results – RADIATED SPURIOUS EMISSIONS**

|                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                           |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|------------|
| Test Description                                                                                                                                                                                                                                                                 | Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4 2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. |            |                           |            |
| Basic Standard                                                                                                                                                                                                                                                                   | 47 CFR Part 15.249<br>RSS-210, A2.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                           |            |
| UL LPG                                                                                                                                                                                                                                                                           | 80-EM-S0029                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                           |            |
|                                                                                                                                                                                                                                                                                  | Frequency range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            | Measurement Point         |            |
| Fully configured sample scanned over the following frequency range                                                                                                                                                                                                               | 30MHz – 1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            | 10m measurement distance  |            |
|                                                                                                                                                                                                                                                                                  | 1GHz – 25GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            | 3 m measurement distance  |            |
| Limits - Class A                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                           |            |
| Frequency (MHz)                                                                                                                                                                                                                                                                  | Limit (dBµV/m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                           |            |
|                                                                                                                                                                                                                                                                                  | Class A Limits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            | Class B / Spurious Limits |            |
|                                                                                                                                                                                                                                                                                  | Detector PK/QP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Average    | Detector PK/QP            | Average    |
| 30 to 88                                                                                                                                                                                                                                                                         | QP 39.08 @ 10M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -          | QP 29.54 @ 10M            | -          |
| 88 to 216                                                                                                                                                                                                                                                                        | QP 43.52 @ 10M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -          | QP 33.06 @ 10M            | -          |
| 216 to 960                                                                                                                                                                                                                                                                       | QP 46.44 @ 10M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -          | QP 35.56 @ 10M            | -          |
| 960 to 1,000                                                                                                                                                                                                                                                                     | QP 49.54 @ 10M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -          | QP 43.52 @ 10M            | -          |
| Above 1000                                                                                                                                                                                                                                                                       | PK 80 @ 3m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | AV 60 @ 3m | PK 74 @ 3M                | AV 54 @ 3M |
| Supplementary information: All emissions recorded in frequency range between 30MHz – 1GHz are product of the digital device and not product of the transmitter - compliance with class A limits only is required. Data with transmitter board removed is included for reference. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                           |            |
| The above limits for class B, below 1GHz were extrapolated to 10m distance using 10.46dB factor.                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                           |            |

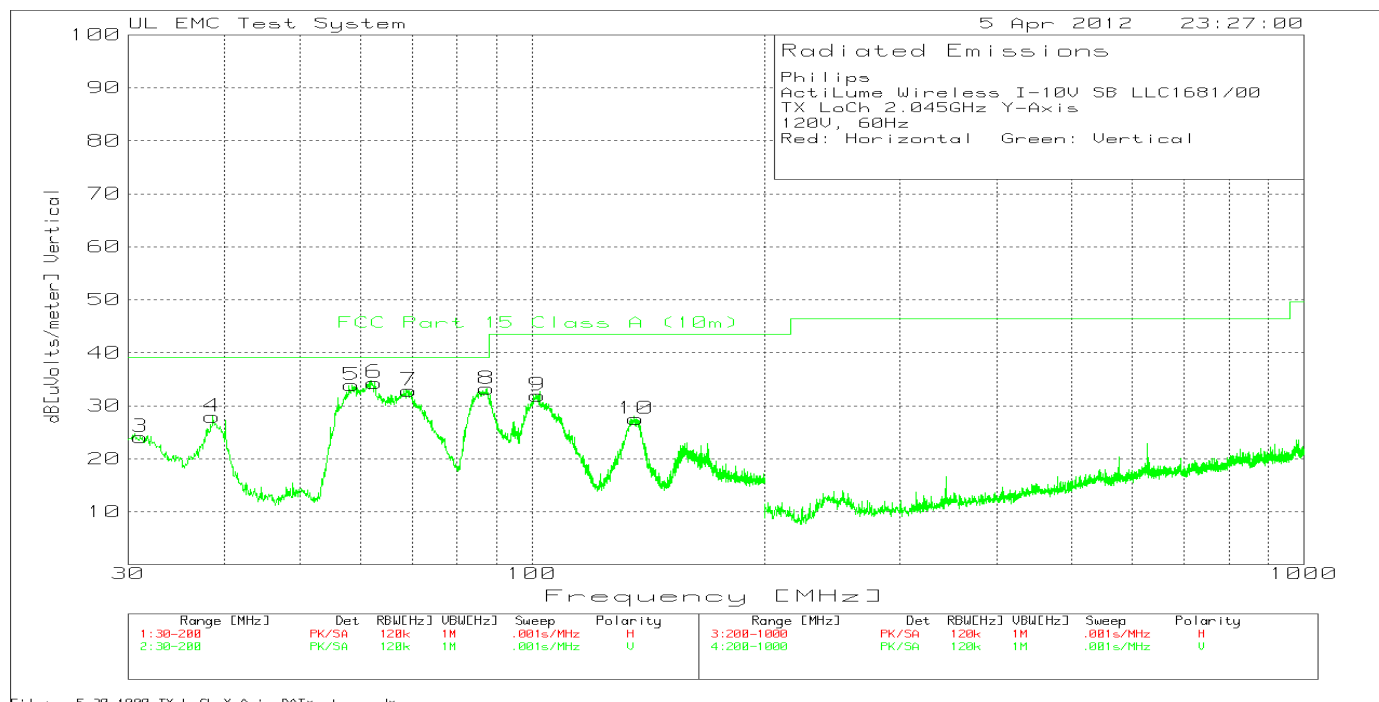
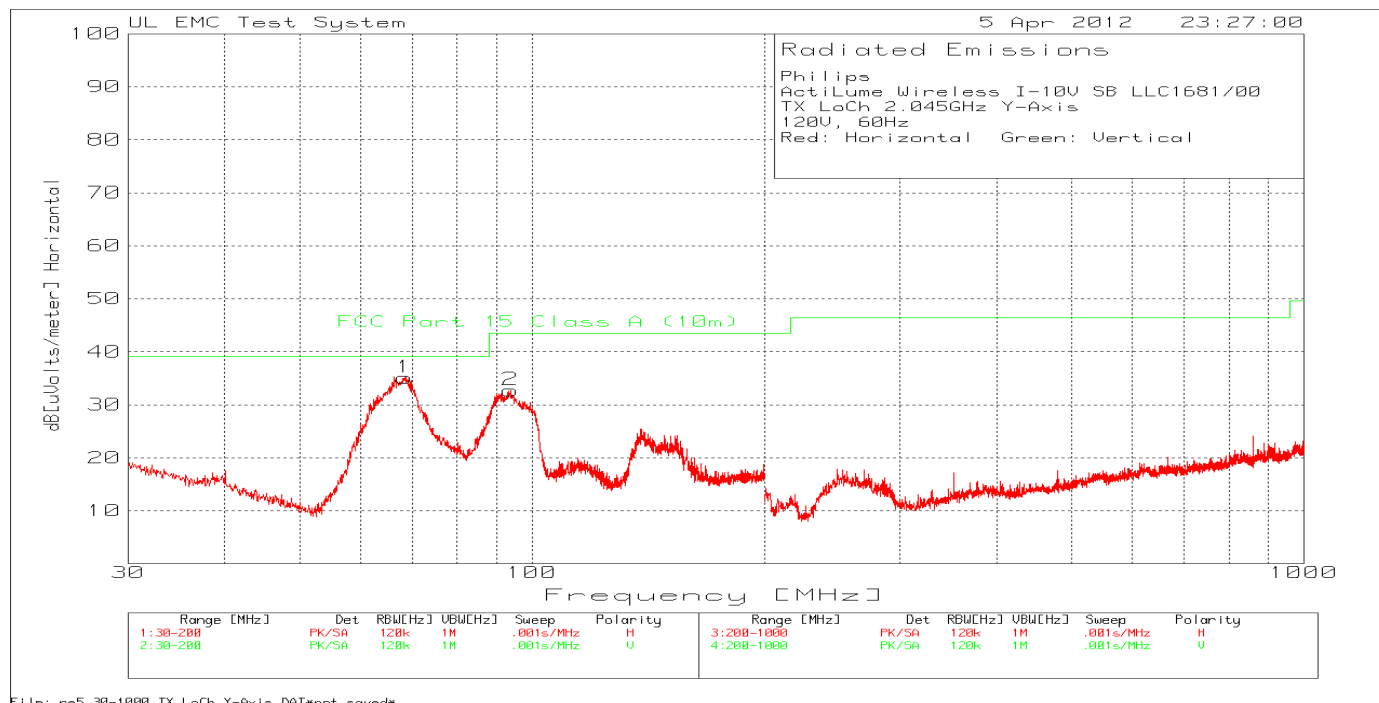
**Table 4 Radiated Emissions EUT Configuration Settings**

| Power Interface Mode #          | EUT Configurations Mode # | EUT Operation Mode # |
|---------------------------------|---------------------------|----------------------|
| 1                               | 1                         | 1                    |
| Supplementary information: None |                           |                      |

**Table 5 Radiated Emissions Test Equipment**

| Description       | Manufacturer    | Model    | Identifier | Cal. Date | Cal. Due Date |
|-------------------|-----------------|----------|------------|-----------|---------------|
| EMI Test Receiver | Rohde & Schwarz | ESU      | EMC4323    | 20111227  | 20121231      |
| Bicon Antenna     | Chase           | VBA6106A | EMC4078    | 20120117  | 20130131      |
| Log-P Antenna     | Chase           | UPA6109  | EMC4313    | 20110929  | 20120629      |
| Spectrum Analyzer | Rhode & Schwarz | FSEK     | EMC4182    | 20111227  | 20121231      |
| Antenna Array     | UL              | BOMS     | EMC4276    | 20111227  | 20121231      |

Figure 1 Radiated Emissions Graph 30MHz-1GHz TX Low Channel



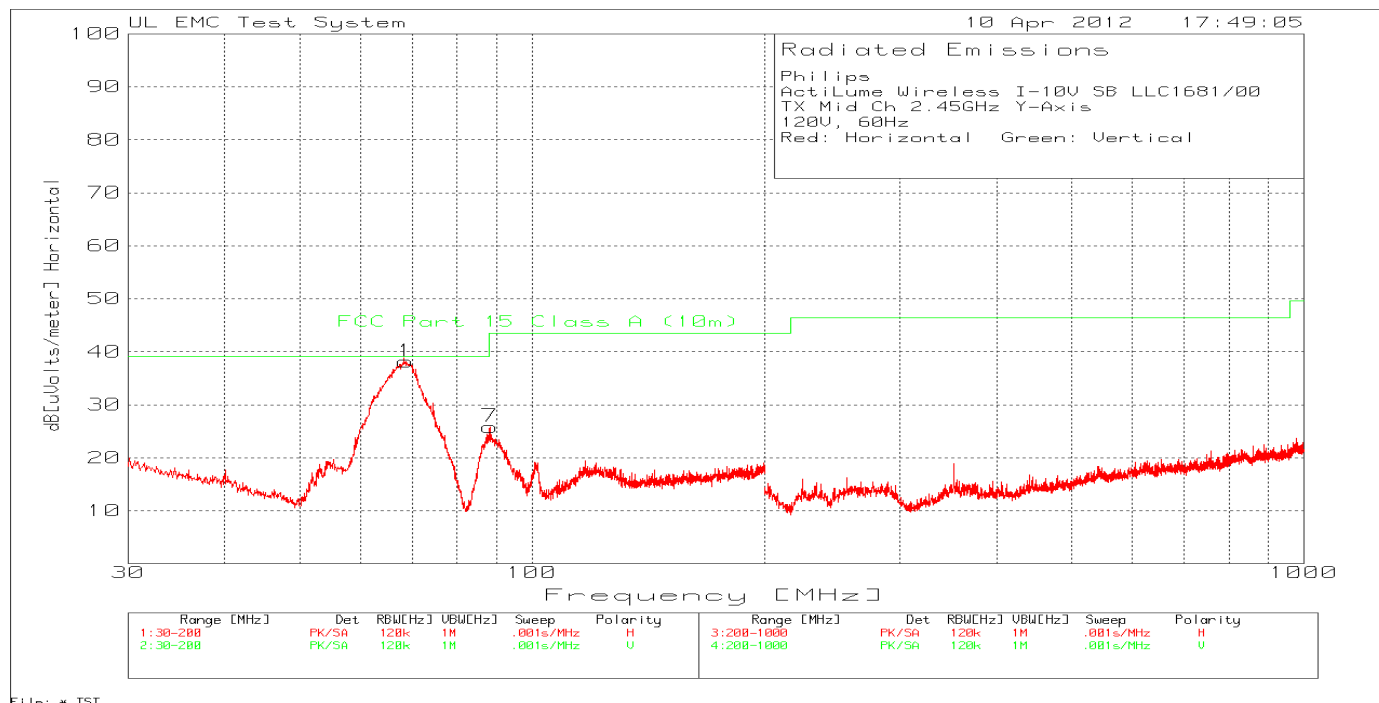
Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**Table 6 Radiated Emissions Data Points 30MHz – 1GHz TX Low Channel**

| Philips<br>ActiLume Wireless I-10V SB LLC1681/00<br>TX LoCh 2.045GHz Y-Axis<br>120V, 60Hz<br>Red: Horizontal Green: Vertical |               |          |                   |                   |        |                           |        |                |             |          |
|------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|-------------------|--------|---------------------------|--------|----------------|-------------|----------|
| Test Frequency                                                                                                               | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A (10m) | Margin | Height [cm]    | Polarity    |          |
| 68.4858                                                                                                                      | 58.27         | PK       | 6.2               | -29.4             | 35.07  | 39.1                      | -4.03  | 400            | Horz        |          |
| 93.8031                                                                                                                      | 52.41         | PK       | 9.6               | -29.3             | 32.71  | 43.5                      | -10.79 | 250            | Horz        |          |
| 31.1044                                                                                                                      | 35.93         | PK       | 17.5              | -29.3             | 24.13  | 39.1                      | -14.97 | 99             | Vert        |          |
| 38.5807                                                                                                                      | 42.7          | PK       | 14.7              | -29.4             | 28     | 39.1                      | -11.1  | 99             | Vert        |          |
| 58.4608                                                                                                                      | 55.97         | PK       | 7.2               | -29.3             | 33.87  | 39.1                      | -5.23  | 300            | Vert        |          |
| 62.5387                                                                                                                      | 57.28         | PK       | 6.4               | -29.3             | 34.38  | 39.1                      | -4.72  | 300            | Vert        |          |
| 69.3353                                                                                                                      | 56.14         | PK       | 6.1               | -29.4             | 32.84  | 39.1                      | -6.26  | 300            | Vert        |          |
| 87.5162                                                                                                                      | 54            | PK       | 8.6               | -29.4             | 33.2   | 39.1                      | -5.9   | 300            | Vert        |          |
| 101.7041                                                                                                                     | 50.52         | PK       | 10.9              | -29.5             | 31.92  | 43.5                      | -11.58 | 300            | Vert        |          |
| 136.2819                                                                                                                     | 42.7          | PK       | 14.2              | -29.4             | 27.5   | 43.5                      | -16    | 99             | Vert        |          |
| Test Frequency                                                                                                               | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A (10m) | Margin | Azimuth [Degs] | Height [cm] | Polarity |
| 68.3117                                                                                                                      | 53.97         | QP       | 6.2               | -29.4             | 30.77  | 39.1                      | -8.33  | 183            | 398         | Horz     |
| 67.7769                                                                                                                      | 53.92         | QP       | 6.2               | -29.4             | 30.72  | 39.1                      | -8.38  | 172            | 396         | Horz     |
| 62.05                                                                                                                        | 52.59         | QP       | 6.5               | -29.3             | 29.79  | 39.1                      | -9.31  | 278            | 289         | Vert     |
| 86.955                                                                                                                       | 49.61         | QP       | 8.5               | -29.5             | 28.61  | 39.1                      | -10.49 | 269            | 398         | Vert     |
| 58.6796                                                                                                                      | 50.74         | QP       | 7.1               | -29.3             | 28.54  | 39.1                      | -10.56 | 295            | 260         | Vert     |
| PK - Peak detector<br>QP - Quasi-Peak detector                                                                               |               |          |                   |                   |        |                           |        |                |             |          |

Figure 2 Radiated Emissions Graph 30MHz-1GHz TX Mid Channel



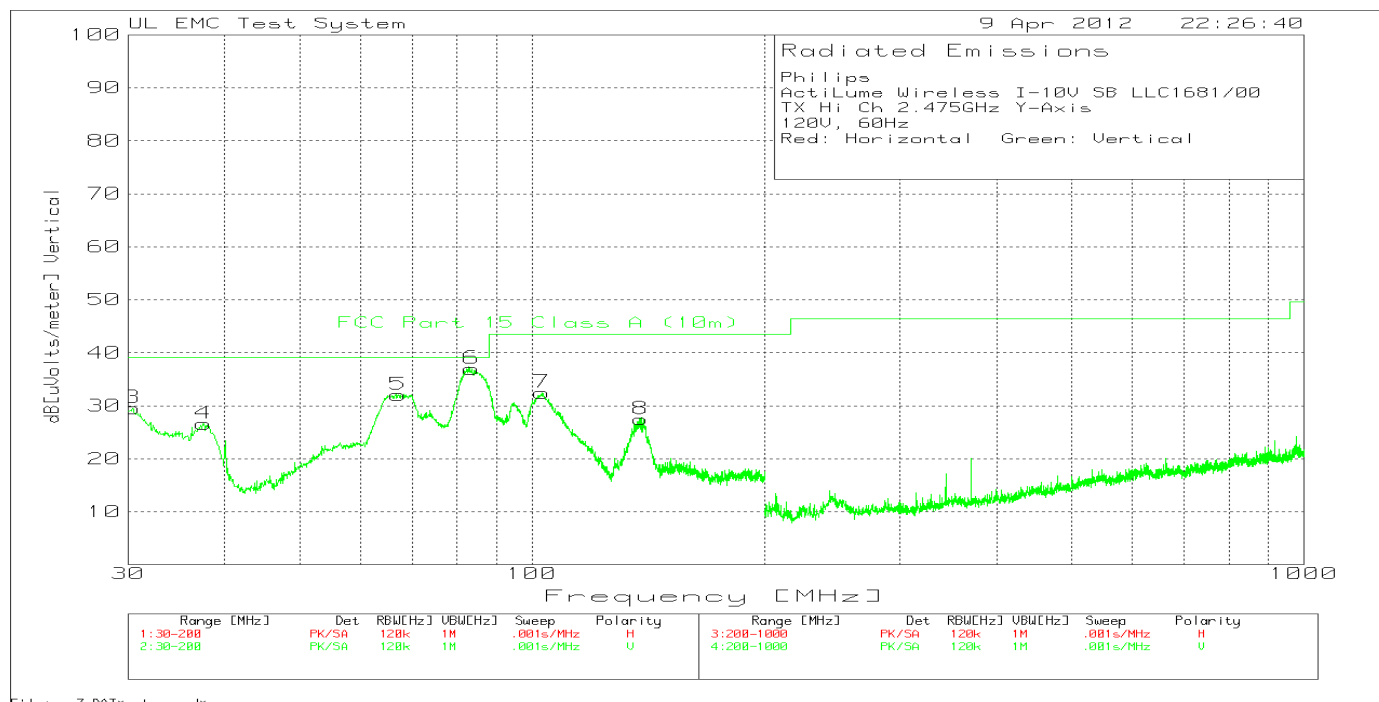
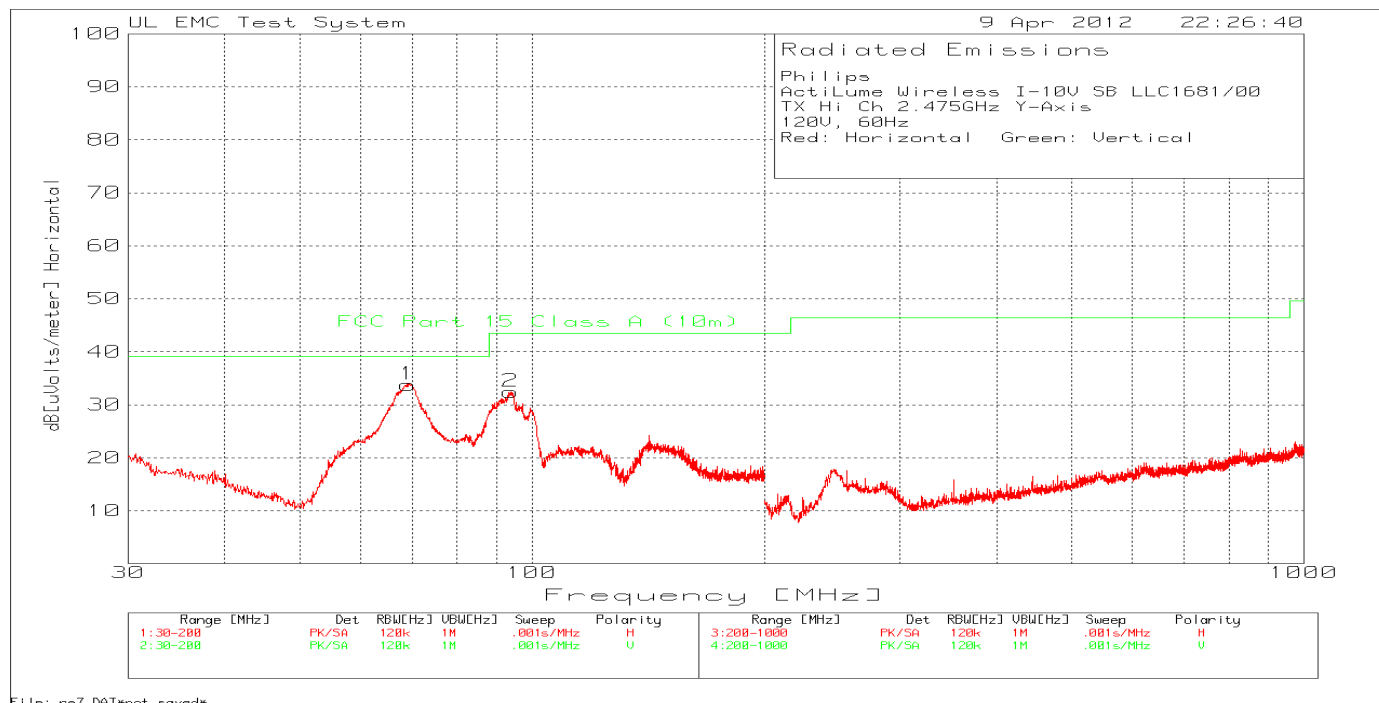
Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**Table 7 Radiated Emissions Data Points 30MHz – 1GHz TX Mid Channel**

| Philips<br>ActiLume Wireless I-10V SB LLC1681/00<br>TX Mid Ch 2.45GHz Y-Axis<br>120V, 60Hz<br>Red: Horizontal Green: Vertical |               |          |                   |                   |        |                           |        |                |             |          |
|-------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|-------------------|--------|---------------------------|--------|----------------|-------------|----------|
| Test Frequency                                                                                                                | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A (10m) | Margin | Height [cm]    | Polarity    |          |
| 68.5707                                                                                                                       | 61.43         | PK       | 6.1               | -29.4             | 38.13  | 39.1                      | -0.97  | 400            | Horz        |          |
| 88.1959                                                                                                                       | 46.63         | PK       | 8.6               | -29.4             | 25.83  | 43.5                      | -17.67 | 250            | Horz        |          |
| 62.1139                                                                                                                       | 60.39         | PK       | 6.5               | -29.3             | 37.59  | 39.1                      | -1.51  | 300            | Vert        |          |
| 65.4273                                                                                                                       | 58.6          | PK       | 6.2               | -29.4             | 35.4   | 39.1                      | -3.7   | 400            | Vert        |          |
| 69.3353                                                                                                                       | 60.18         | PK       | 6.1               | -29.4             | 36.88  | 39.1                      | -2.22  | 400            | Vert        |          |
| 49.5402                                                                                                                       | 46            | PK       | 10.1              | -29.4             | 26.7   | 39.1                      | -12.4  | 101            | Vert        |          |
| 93.2084                                                                                                                       | 46.84         | PK       | 9.5               | -29.4             | 26.94  | 43.5                      | -16.56 | 200            | Vert        |          |
| Test Frequency                                                                                                                | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A (10m) | Margin | Azimuth [Degs] | Height [cm] | Polarity |
| 68.285                                                                                                                        | 58.5          | QP       | 6.2               | -29.4             | 35.3   | 39.1                      | -3.8   | 165            | 398         | Horz     |
| 61.71                                                                                                                         | 57.67         | QP       | 6.5               | -29.3             | 34.87  | 39.1                      | -4.23  | 350            | 259         | Vert     |
| 65.4406                                                                                                                       | 54.49         | QP       | 6.2               | -29.4             | 31.29  | 39.1                      | -7.81  | 270            | 393         | Vert     |
| 69.1477                                                                                                                       | 56.9          | QP       | 6.1               | -29.4             | 33.6   | 39.1                      | -5.5   | 259            | 388         | Vert     |
| PK - Peak detector<br>QP - Quasi-Peak detector                                                                                |               |          |                   |                   |        |                           |        |                |             |          |

Figure 3 Radiated Emissions Graph 30MHz-1GHz TX High Channel





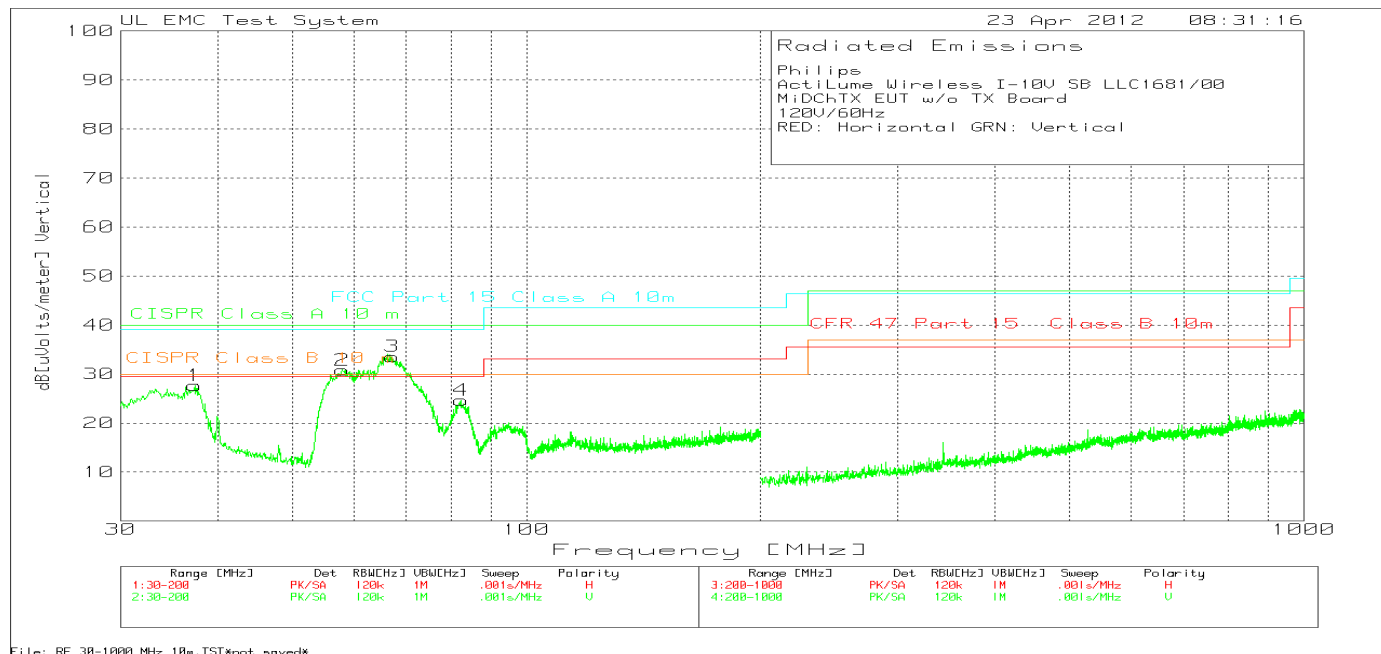
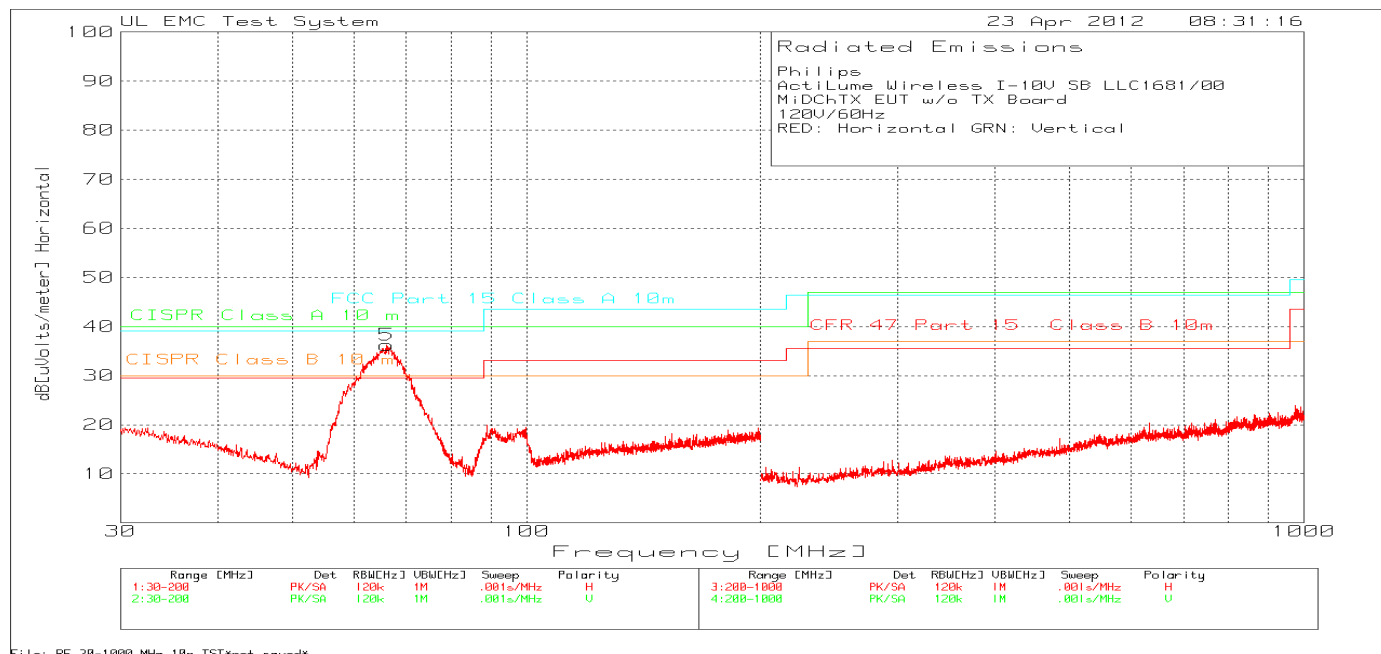
Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**Table 8 Radiated Emissions Data Points 30MHz – 1GHz TX High Channel**

| Philips<br>ActiLume Wireless I-10V SB LLC1681/00<br>TX Hi Ch 2.475GHz Y-Axis<br>120V, 60Hz<br>Red: Horizontal Green: Vertical |               |          |                   |                   |        |                           |        |                |             |          |
|-------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|-------------------|--------|---------------------------|--------|----------------|-------------|----------|
| Test Frequency                                                                                                                | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A (10m) | Margin | Height [cm]    | Polarity    |          |
| 69.0805                                                                                                                       | 57.15         | PK       | 6.1               | -29.4             | 33.85  | 39.1                      | -5.25  | 400            | Horz        |          |
| 93.7181                                                                                                                       | 52.16         | PK       | 9.6               | -29.3             | 32.46  | 43.5                      | -11.04 | 250            | Horz        |          |
| 30.3398                                                                                                                       | 41.12         | PK       | 17.7              | -29.3             | 29.52  | 39.1                      | -9.58  | 101            | Vert        |          |
| 37.5612                                                                                                                       | 40.87         | PK       | 15                | -29.3             | 26.57  | 39.1                      | -12.53 | 101            | Vert        |          |
| 67.0415                                                                                                                       | 55.22         | PK       | 6.2               | -29.4             | 32.02  | 39.1                      | -7.08  | 400            | Vert        |          |
| 83.5232                                                                                                                       | 58.6          | PK       | 7.8               | -29.4             | 37     | 39.1                      | -2.1   | 400            | Vert        |          |
| 102.9785                                                                                                                      | 50.83         | PK       | 11.1              | -29.5             | 32.43  | 43.5                      | -11.07 | 101            | Vert        |          |
| 138.4058                                                                                                                      | 42.68         | PK       | 14.2              | -29.4             | 27.48  | 43.5                      | -16.02 | 101            | Vert        |          |
| Test Frequency                                                                                                                | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A (10m) | Margin | Azimuth [Deps] | Height [cm] | Polarity |
| 69.26                                                                                                                         | 54.09         | QP       | 6.1               | -29.4             | 30.79  | 39.1                      | -8.31  | 148            | 396         | Horz     |
| 83.699679                                                                                                                     | 54.98         | QP       | 7.8               | -29.4             | 33.38  | 39.1                      | -5.72  | 65             | 397         | Vert     |
| 67.0121                                                                                                                       | 52.4          | QP       | 6.2               | -29.4             | 29.2   | 39.1                      | -9.9   | 261            | 393         | Vert     |
| 86.955                                                                                                                        | 49.61         | QP       | 8.5               | -29.5             | 28.61  | 39.1                      | -10.49 | 269            | 398         | Vert     |
| 58.6796                                                                                                                       | 50.74         | QP       | 7.1               | -29.3             | 28.54  | 39.1                      | -10.56 | 295            | 260         | Vert     |
| PK - Peak detector<br>QP - Quasi-Peak detector                                                                                |               |          |                   |                   |        |                           |        |                |             |          |

**Figure 4 Radiated Emissions Graph 30MHz-1GHz (Middle Channel Sample) TX Board Removed**



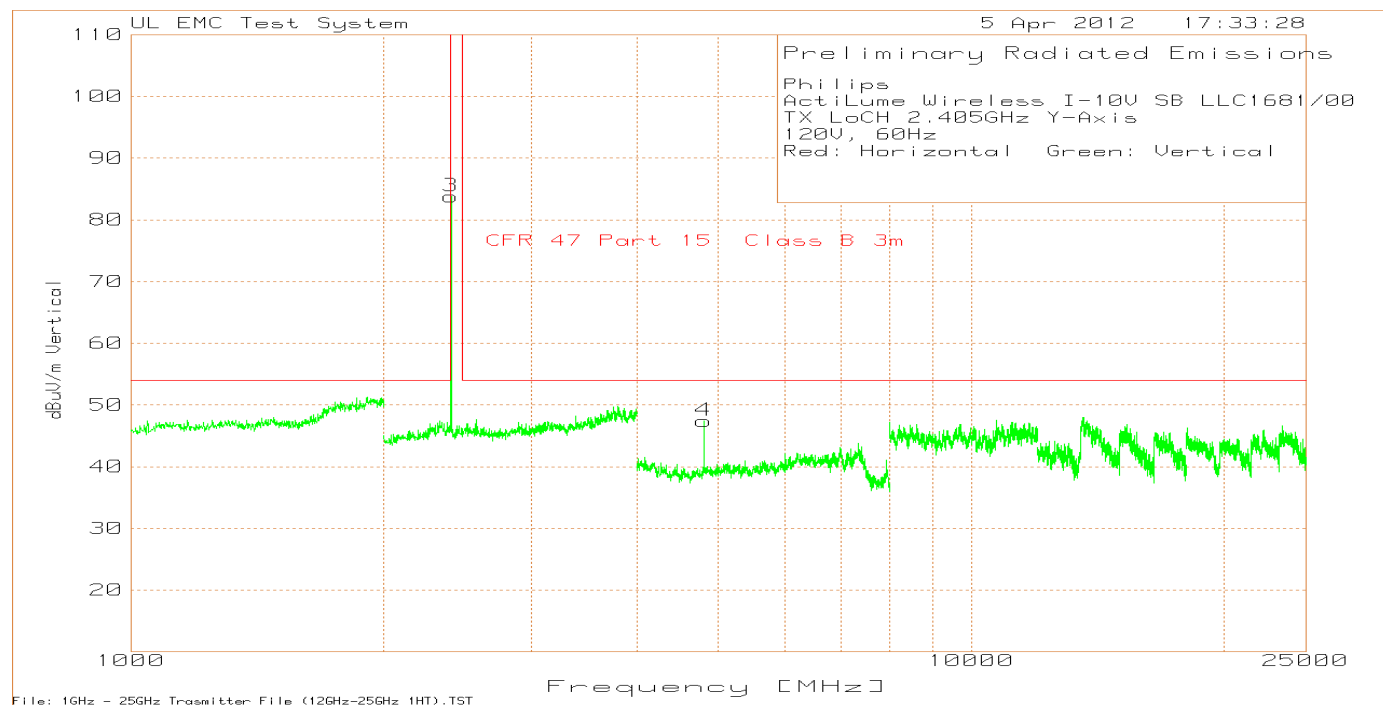
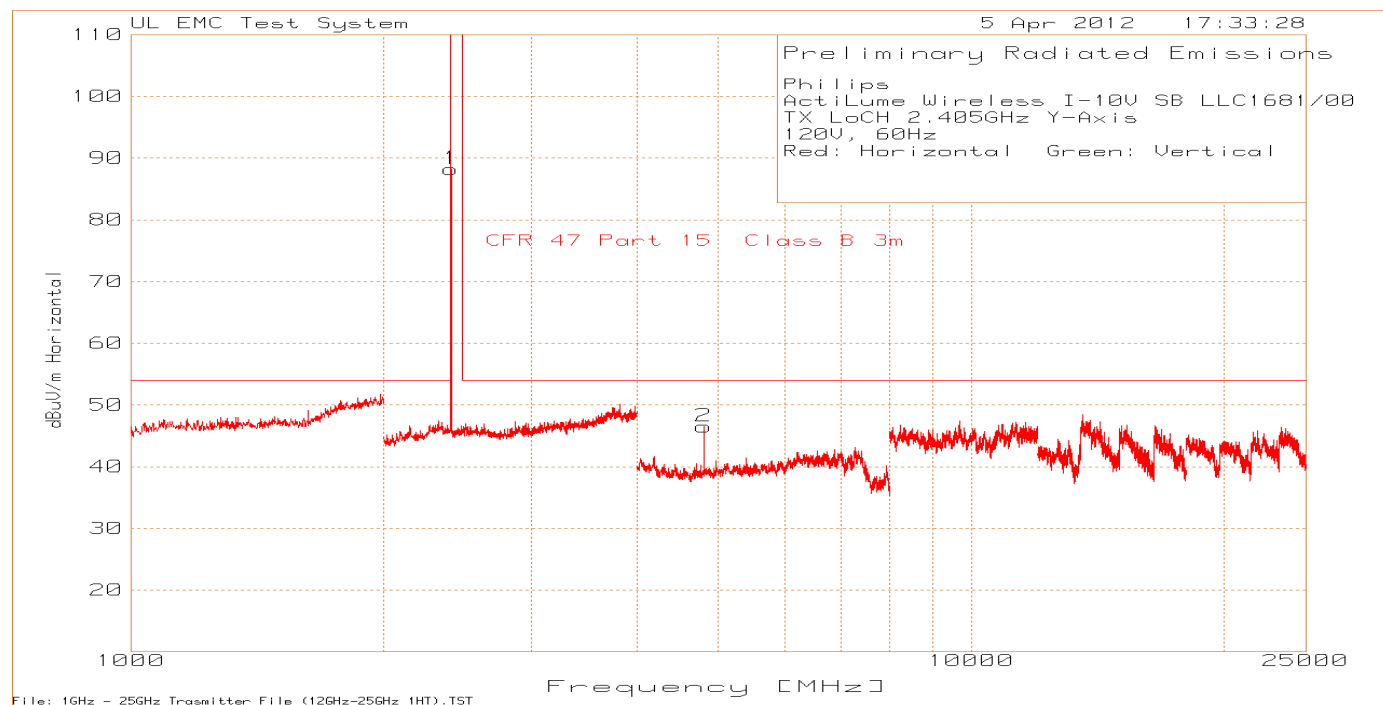
Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

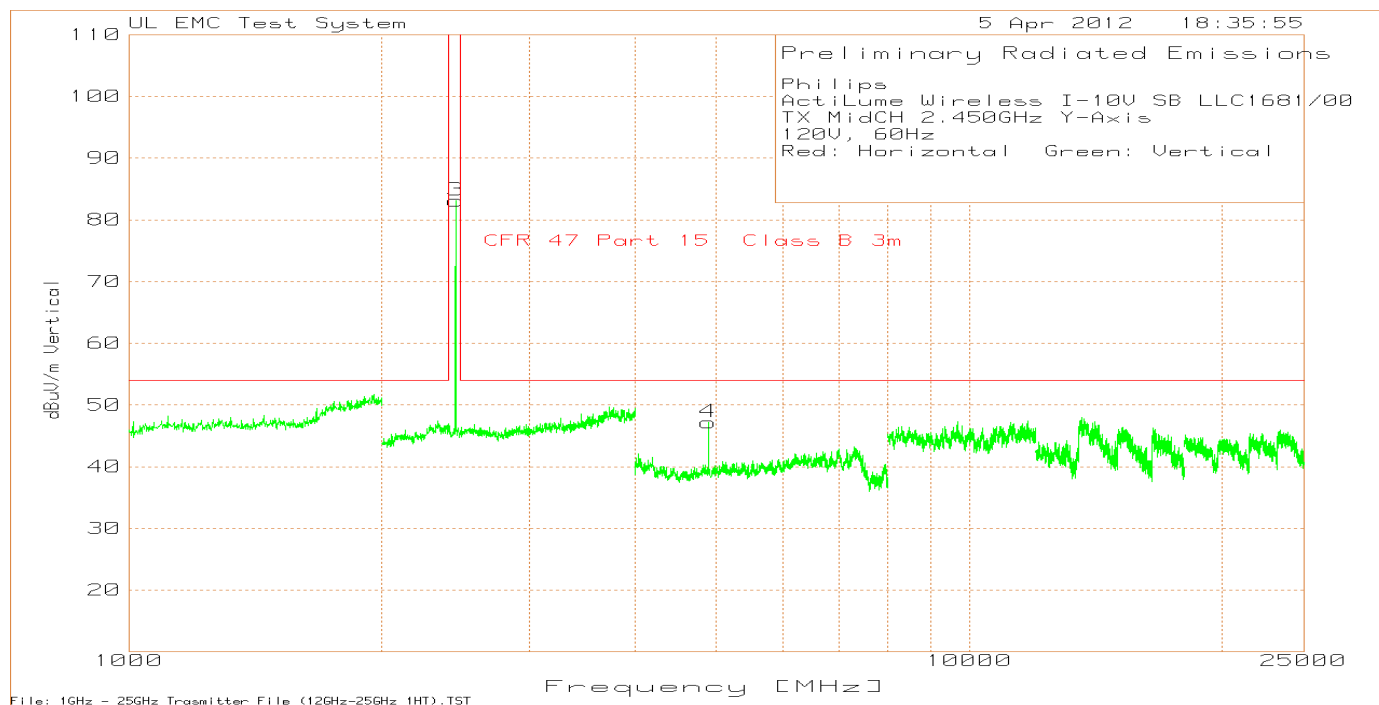
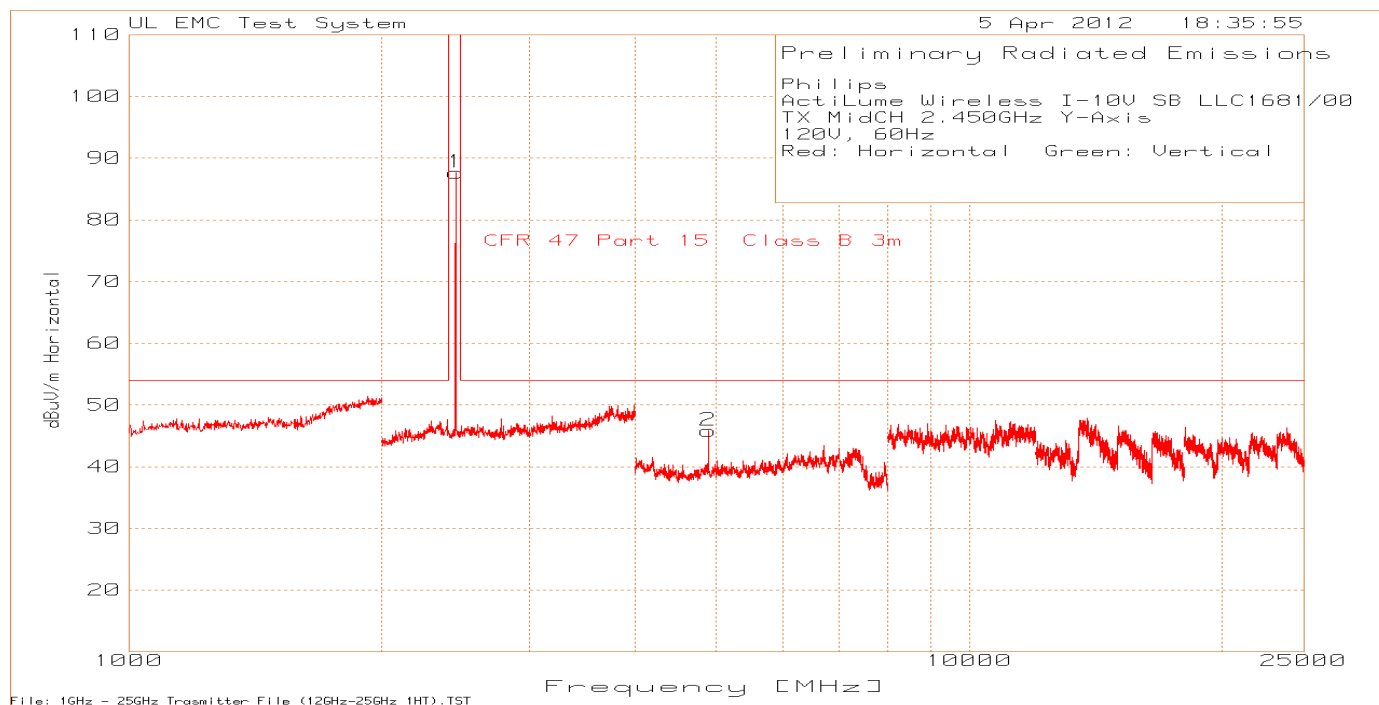
**Table 9 Radiated Emissions Data Points 30MHz – 1GHz (Middle Channel Sample) TX Board Removed**

| Philips<br>ActiLume Wireless I-10V SB LLC1681/00<br>MiDChTX EUT w/o TX Board<br>120V/60Hz<br>RED: Horizontal GRN: Vertical |               |          |                   |                   |        |                         |        |                |             |          |
|----------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|-------------------|--------|-------------------------|--------|----------------|-------------|----------|
| Test Frequency                                                                                                             | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A 10m | Margin | Height [cm]    | Polarity    |          |
| 66.022                                                                                                                     | 59.4          | PK       | 6.2               | -29.4             | 36.2   | 39.1                    | -2.9   | 400            | Horz        |          |
| 37.3913                                                                                                                    | 41.76         | PK       | 15.1              | -29.2             | 27.66  | 39.1                    | -11.44 | 99             | Vert        |          |
| 57.951                                                                                                                     | 52.8          | PK       | 7.3               | -29.3             | 30.8   | 39.1                    | -8.3   | 250            | Vert        |          |
| 67.1264                                                                                                                    | 56.78         | PK       | 6.2               | -29.4             | 33.58  | 39.1                    | -5.52  | 250            | Vert        |          |
| 82.3338                                                                                                                    | 46.66         | PK       | 7.5               | -29.5             | 24.66  | 39.1                    | -14.44 | 400            | Vert        |          |
| Test Frequency                                                                                                             | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | FCC Part 15 Class A 10m | Margin | Azimuth [Degs] | Height [cm] | Polarity |
| 66.301667                                                                                                                  | 53.93         | QP       | 6.2               | -29.4             | 30.73  | 39.1                    | -8.37  | 342            | 400         | Horz     |
| 67.026154                                                                                                                  | 52.4          | QP       | 6.2               | -29.4             | 29.2   | 39.1                    | -9.9   | 245            | 373         | Vert     |
| PK - Peak detector<br>QP - Quasi-Peak detector                                                                             |               |          |                   |                   |        |                         |        |                |             |          |

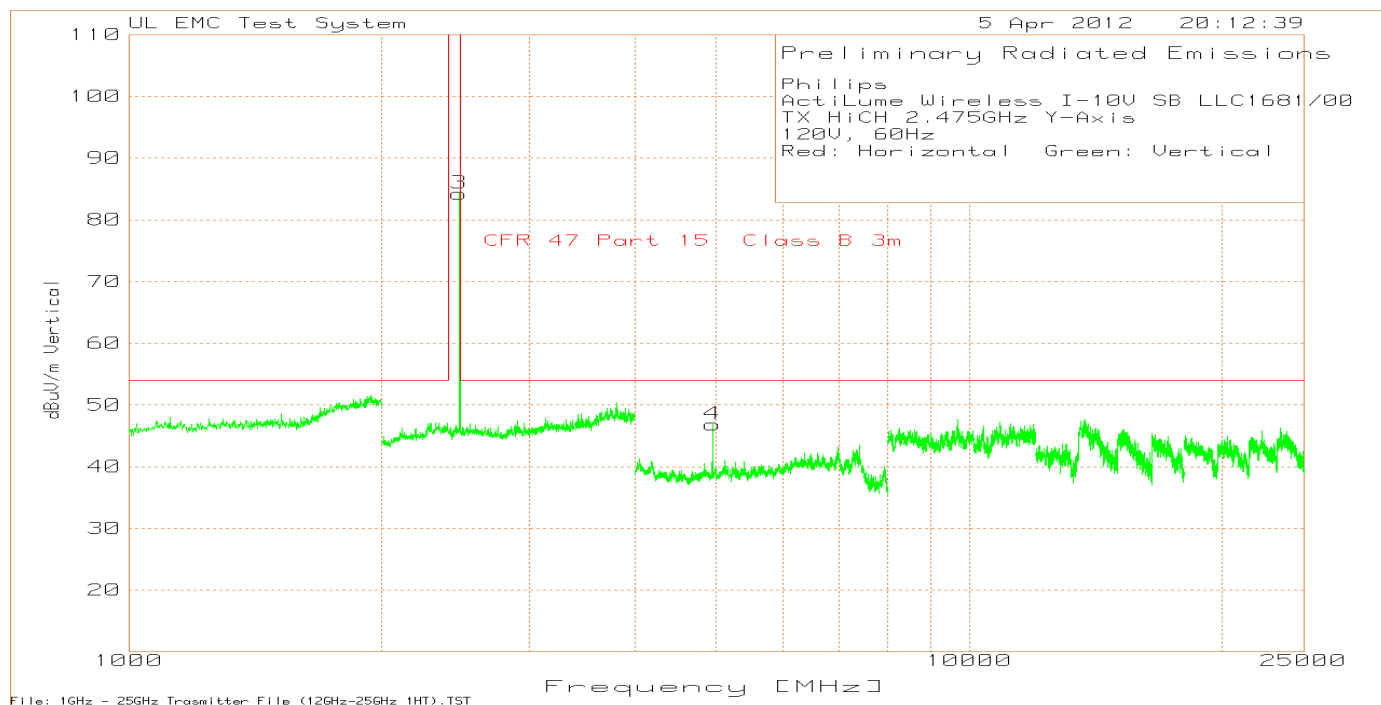
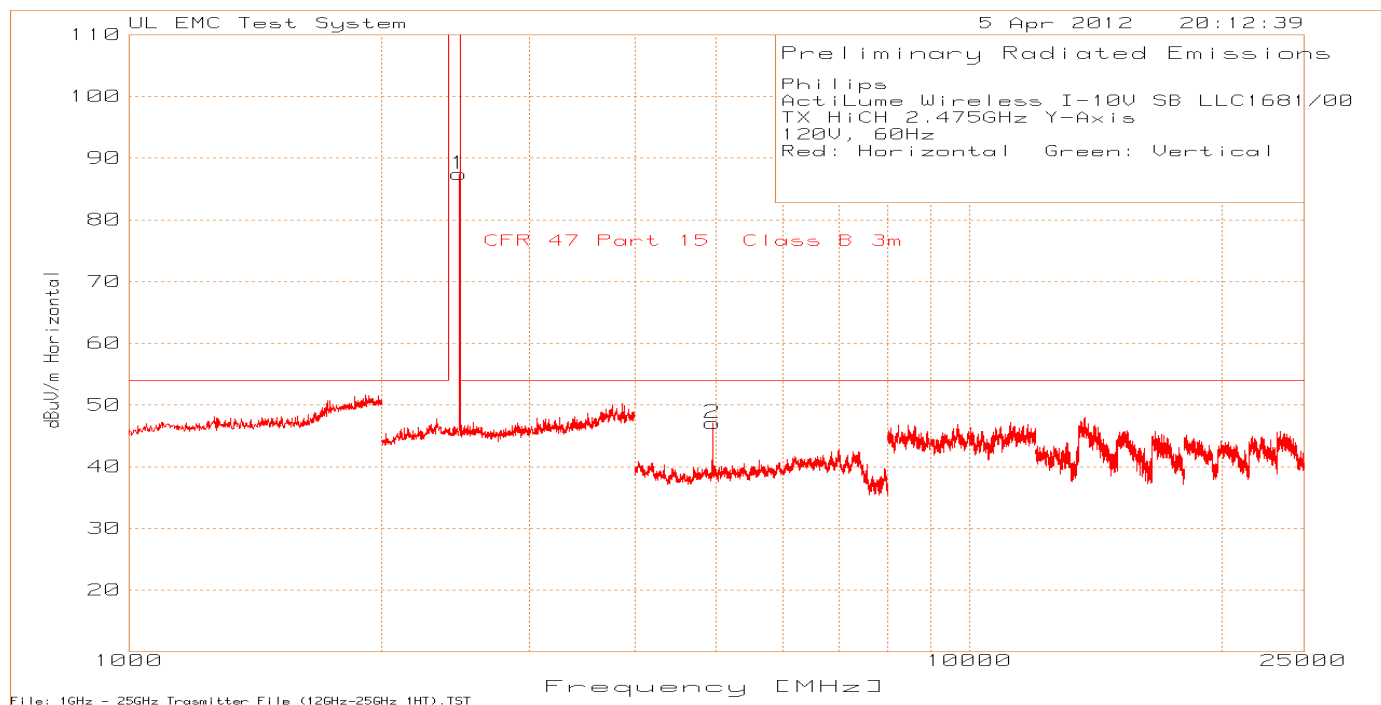
**Figure 5 Radiated Emissions Graph 1GHz-25GHz Low Channel**



**Figure 6 Radiated Emissions Graph 1GHz-25GHz Middle Channel**



**Figure 7 Radiated Emissions Graph 1GHz-25GHz High Channel**



Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**Table 10 Radiated Emissions Data Points 1GHz-25GHz Low Channel**

| Philips<br>ActiLume Wireless I-10V SB LLC1681/00<br>TX LoCH 2.405GHz Y-Axis<br>120V, 60Hz<br>Red: Horizontal Green: Vertical |               |          |                   |                   |        |                           |        |             |          |
|------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|-------------------|--------|---------------------------|--------|-------------|----------|
| Test Frequency                                                                                                               | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | CFR 47 Part 15 Class B 3m | Margin | Height [cm] | Polarity |
| 2404.404                                                                                                                     | 62.27         | PK       | 21.8              | 4.18              | 88.25  | -                         | -      | 99          | Horz     |
| 4808.539                                                                                                                     | 70.22         | PK       | 27.7              | -51.36            | 46.56  | 54                        | -7.44  | 100         | Horz     |
| 2404.404                                                                                                                     | 57.79         | PK       | 21.8              | 4.18              | 83.77  | -                         | -      | 101         | Vert     |
| 4808.539                                                                                                                     | 71.04         | PK       | 27.7              | -51.36            | 47.38  | 54                        | -6.62  | 100         | Vert     |
| PK - Peak detector<br>LnAv - Linear Average detector                                                                         |               |          |                   |                   |        |                           |        |             |          |

**Table 11 Radiated Emissions Data Points 1GHz-25GHz Middle Channel**

| Philips<br>ActiLume Wireless I-10V SB LLC1681/00<br>TX MidCH 2.450GHz Y-Axis<br>120V, 60Hz<br>Red: Horizontal Green: Vertical |               |          |                   |                   |        |                           |        |             |          |
|-------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|-------------------|--------|---------------------------|--------|-------------|----------|
| Test Frequency                                                                                                                | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | CFR 47 Part 15 Class B 3m | Margin | Height [cm] | Polarity |
| 2450.45                                                                                                                       | 61.32         | PK       | 22                | 4.34              | 87.66  | -                         | -      | 100         | Horz     |
| 4899.266                                                                                                                      | 69.83         | PK       | 27.7              | -51.65            | 45.88  | 54                        | -8.12  | 100         | Horz     |
| 2448.448                                                                                                                      | 56.88         | PK       | 21.9              | 4.37              | 83.15  | -                         | -      | 150         | Vert     |
| 4899.266                                                                                                                      | 71.18         | PK       | 27.7              | -51.65            | 47.23  | 54                        | -6.77  | 100         | Vert     |
| PK - Peak detector<br>LnAv - Linear Average detector                                                                          |               |          |                   |                   |        |                           |        |             |          |

**Table 12 Radiated Emissions Data Points 1GHz-25GHz High Channel**

| Philips<br>ActiLume Wireless I-10V SB LLC1681/00<br>TX HiCH 2.475GHz Y-Axis<br>120V, 60Hz<br>Red: Horizontal Green: Vertical |               |          |                   |                   |        |                           |        |             |          |
|------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|-------------------|--------|---------------------------|--------|-------------|----------|
| Test Frequency                                                                                                               | Meter Reading | Detector | Antenna Factor dB | Path Loss/Gain dB | dBuV/m | CFR 47 Part 15 Class B 3m | Margin | Height [cm] | Polarity |
| 2474.474                                                                                                                     | 61.56         | PK       | 22                | 3.83              | 87.39  | -                         | -      | 99          | Horz     |
| 4949.967                                                                                                                     | 70.93         | PK       | 27.8              | -51.59            | 47.14  | 54                        | -6.86  | 100         | Horz     |
| 2474.474                                                                                                                     | 58.4          | PK       | 22                | 3.83              | 84.23  | -                         | -      | 150         | Vert     |
| 4949.967                                                                                                                     | 70.69         | PK       | 27.8              | -51.59            | 46.9   | 54                        | -7.1   | 100         | Vert     |
| PK - Peak detector<br>LnAv - Linear Average detector                                                                         |               |          |                   |                   |        |                           |        |             |          |

**4.3 Test Conditions and Results – Occupied Bandwidth**

|                    |                                                                                                                                                                                                                                                                                   |                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Test Description   | Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard. |                                   |
| Basic Standard     |                                                                                                                                                                                                                                                                                   | 47 CFR Part 15.215<br>RSS-Gen 4.6 |
| Occupied Bandwidth |                                                                                                                                                                                                                                                                                   |                                   |
| 20dB and 99% Power |                                                                                                                                                                                                                                                                                   |                                   |

**Table 13 Occupied Bandwidth Configuration Settings**

| Power Interface Mode #          | EUT Configurations Mode # | EUT Operation Mode # |
|---------------------------------|---------------------------|----------------------|
| 1                               | 1                         | 1                    |
| Supplementary information: None |                           |                      |

**Table 14 Occupied Bandwidth Test Equipment**

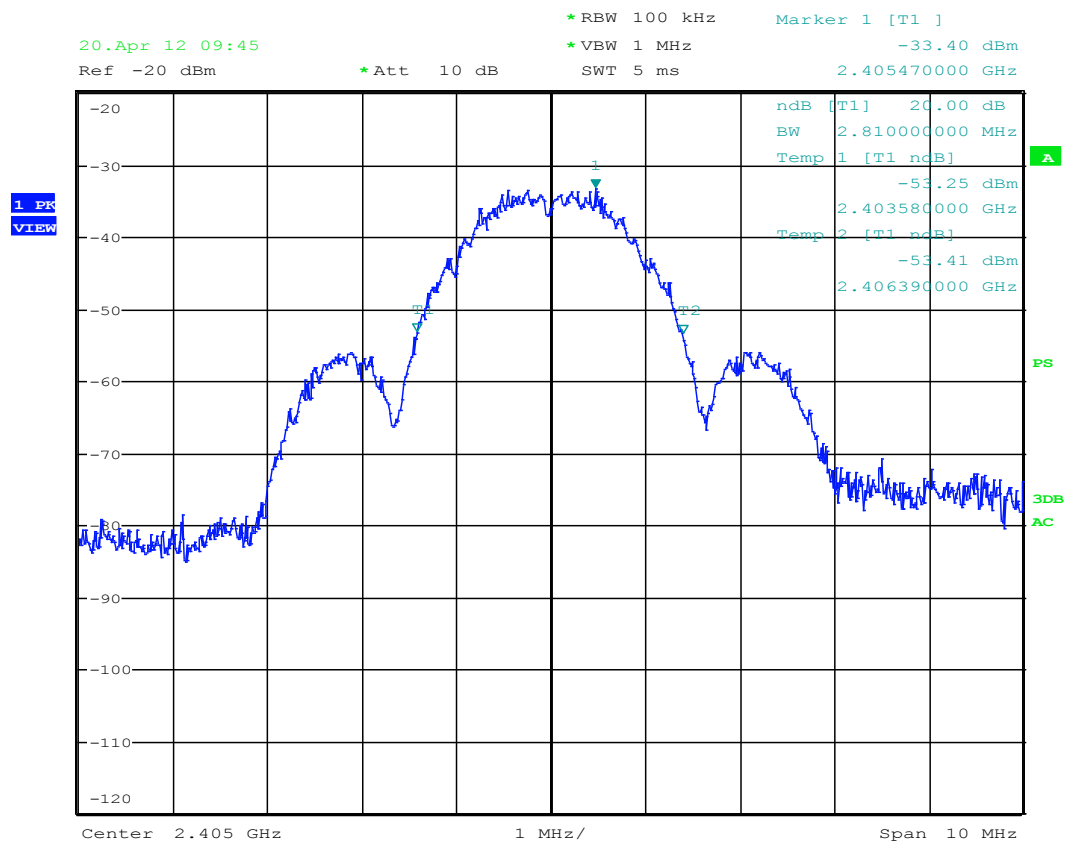
| Description       | Manufacturer    | Model | Identifier | Cal. Date | Cal. Due Date |
|-------------------|-----------------|-------|------------|-----------|---------------|
| Spectrum Analyzer | Rhode & Schwarz | FSEK  | EMC4182    | 20111227  | 20121231      |
| Antenna Array     | UL              | BOMS  | EMC4276    | 20111227  | 20121231      |

**Table 15 Occupied Bandwidth Results**

| Bandwidth                         | Occupied Bandwidth Results |                |
|-----------------------------------|----------------------------|----------------|
| Measurement Point / Frequency MHz | -20 dBc (MHz)              | 99 % PWR (MHz) |
| 2405                              | 2.810                      | 2.640          |
| 2450                              | 2.780                      | 2.620          |
| 2475                              | 2.820                      | 2.620          |



Figure 8 20dB Bandwidth Graph Low Channel



Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

### Figure 9 20dB Bandwidth Graph Middle Channel

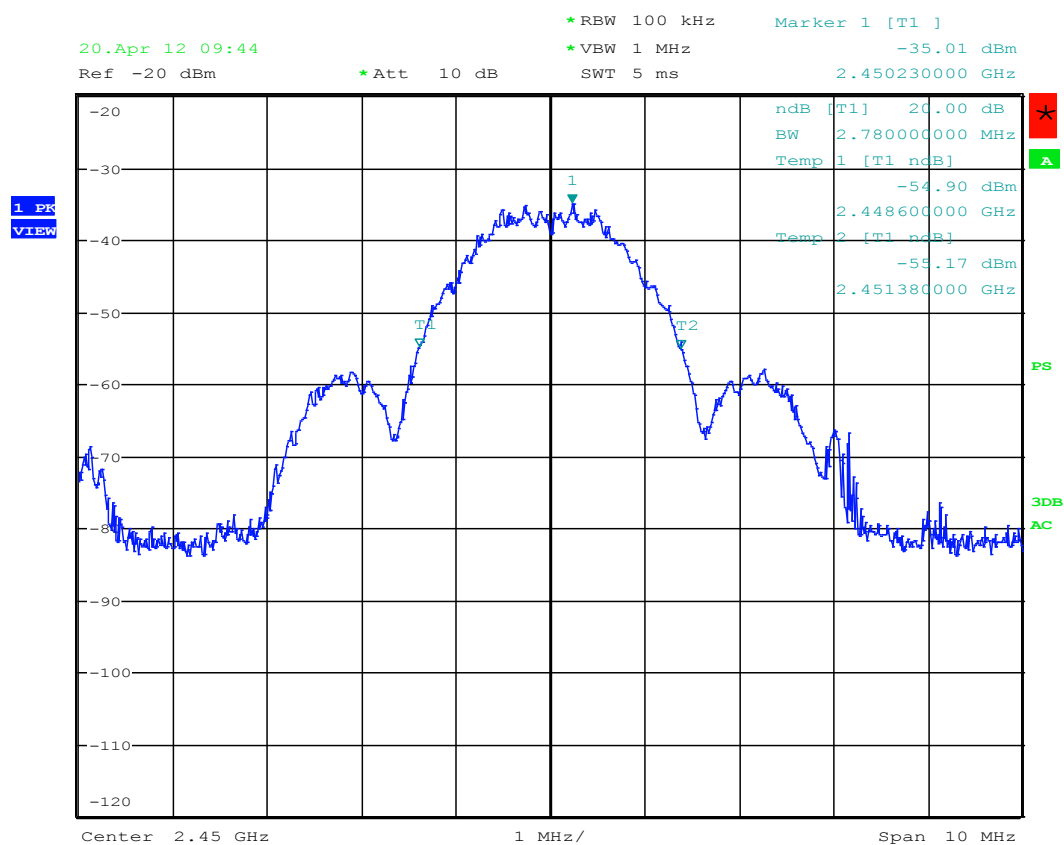


Figure 10 20dB Bandwidth Graph High Channel

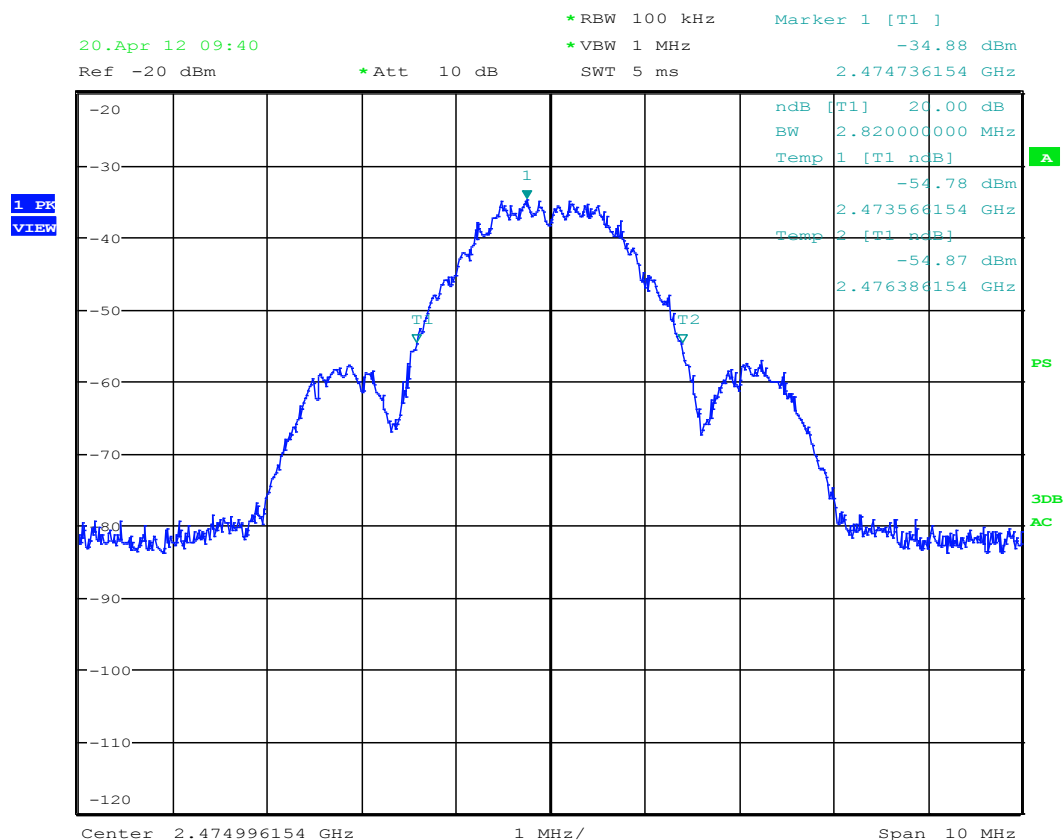


Figure 11 Power Bandwidth 99% Graph Low Channel

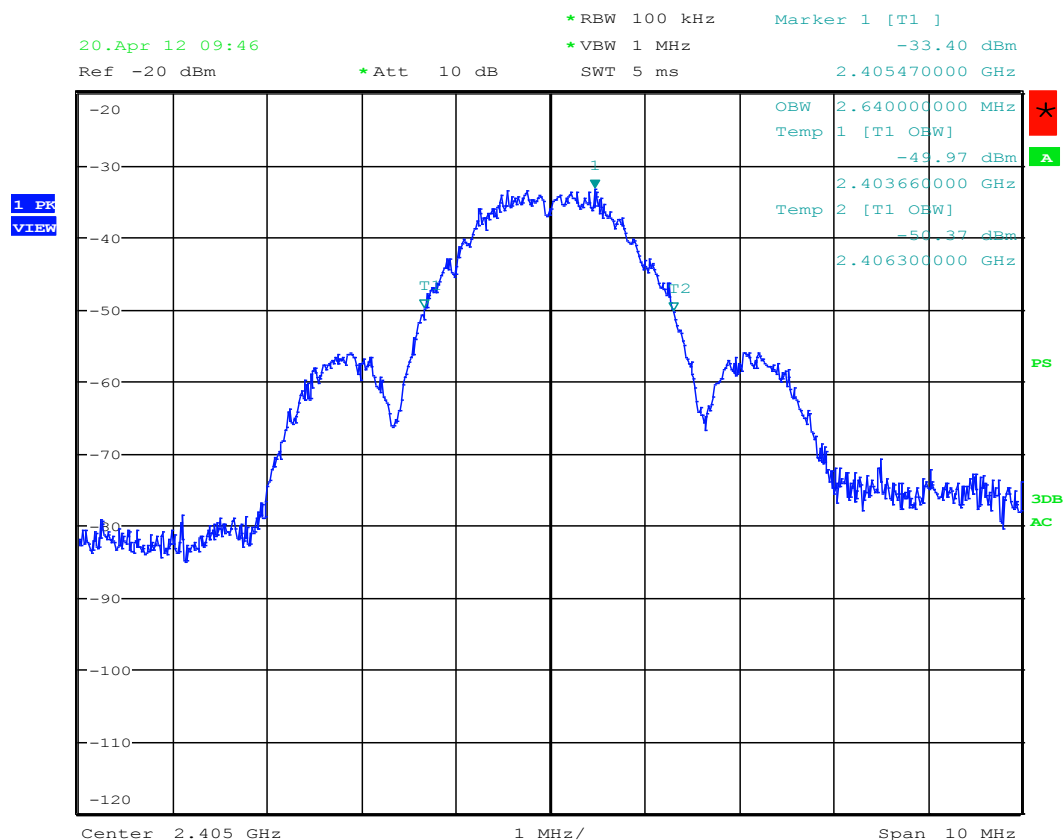


Figure 12 Power Bandwidth 99% Graph Middle Channel

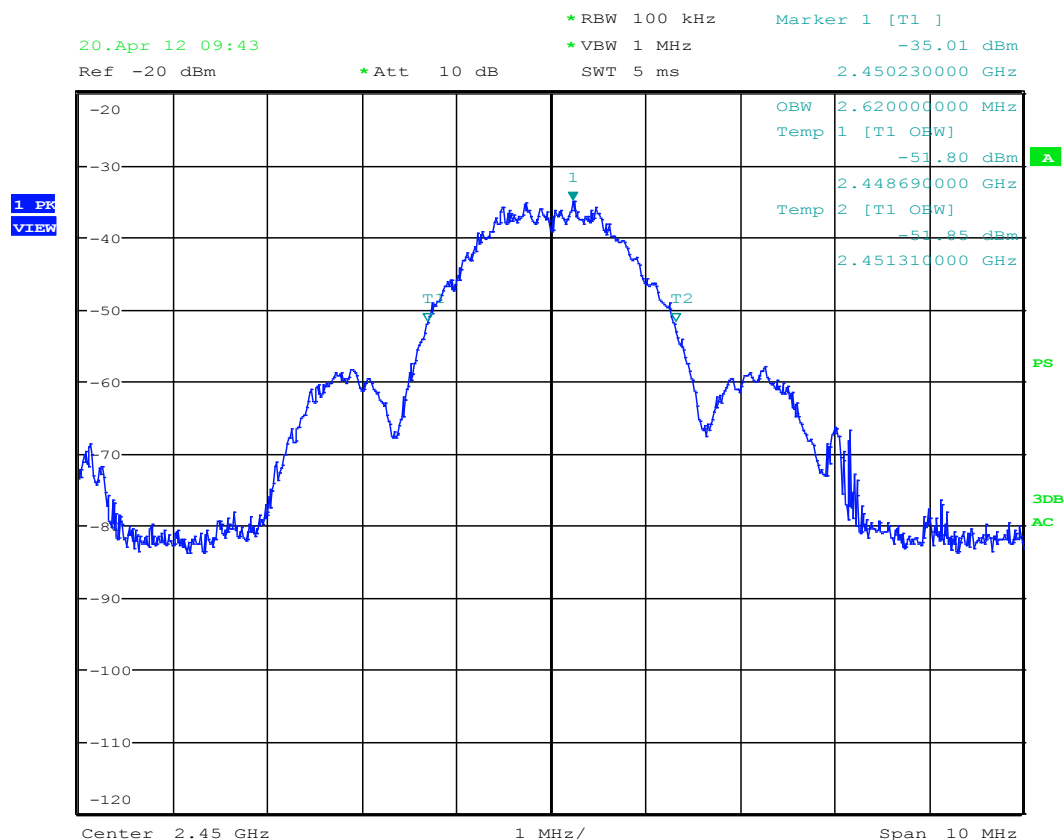
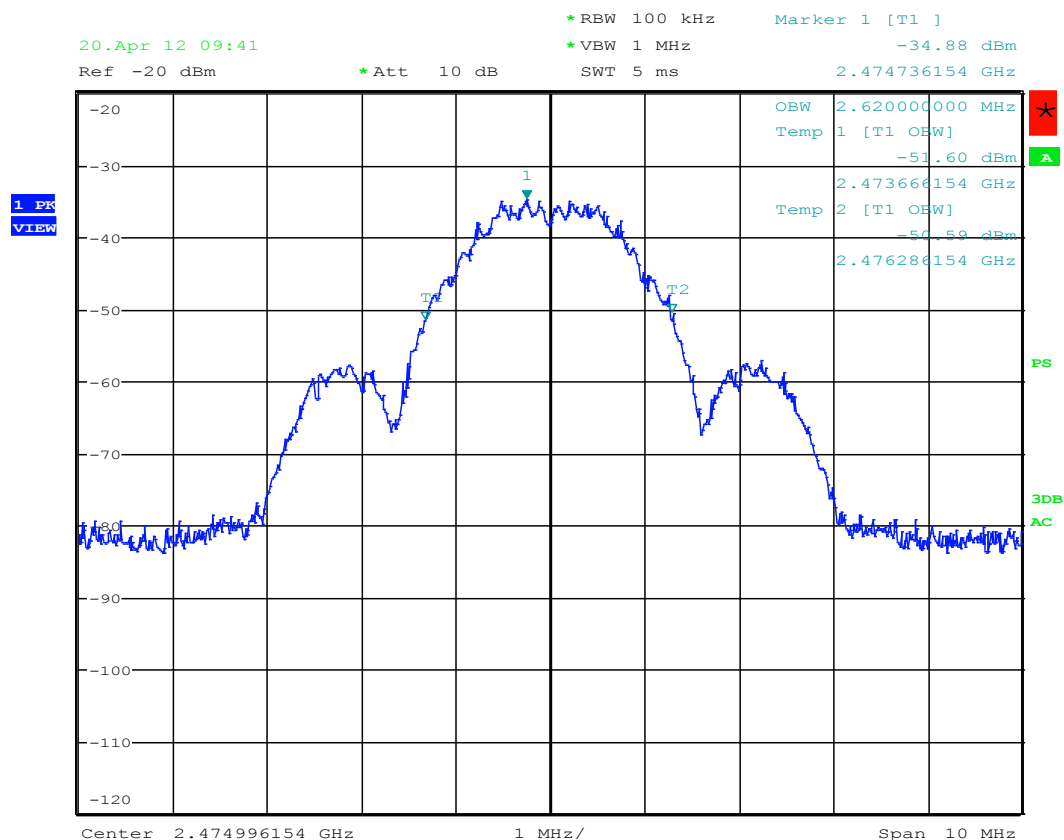


Figure 13 Power Bandwidth 99% Graph High Channel



Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**4.4 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS**

|                                                                                                                                              |                                                                                                                                                                                                           |                   |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Test Description                                                                                                                             | Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN. |                   |
| Basic Standard                                                                                                                               | 47 CFR Part 15.207                                                                                                                                                                                        |                   |
| UL LPG                                                                                                                                       | 80-EM-S0026                                                                                                                                                                                               |                   |
|                                                                                                                                              | Frequency range on each side of line                                                                                                                                                                      | Measurement Point |
| Fully configured sample scanned over the following frequency range                                                                           | 150kHz to 30MHz                                                                                                                                                                                           | Mains             |
| <b>Limits - Class A</b>                                                                                                                      |                                                                                                                                                                                                           |                   |
| Frequency (MHz)                                                                                                                              | Limit (dB $\mu$ V)                                                                                                                                                                                        |                   |
|                                                                                                                                              | Quasi-Peak                                                                                                                                                                                                | Average           |
| 0.15 to 0.50                                                                                                                                 | 79                                                                                                                                                                                                        | 66                |
| 0.50 to 30                                                                                                                                   | 73                                                                                                                                                                                                        | 60                |
| Supplementary information: The transmitter has no effect on line conducted emissions. See data with TX board installed and TX board removed. |                                                                                                                                                                                                           |                   |

**Table 16 Conducted Emissions EUT Configuration Settings**

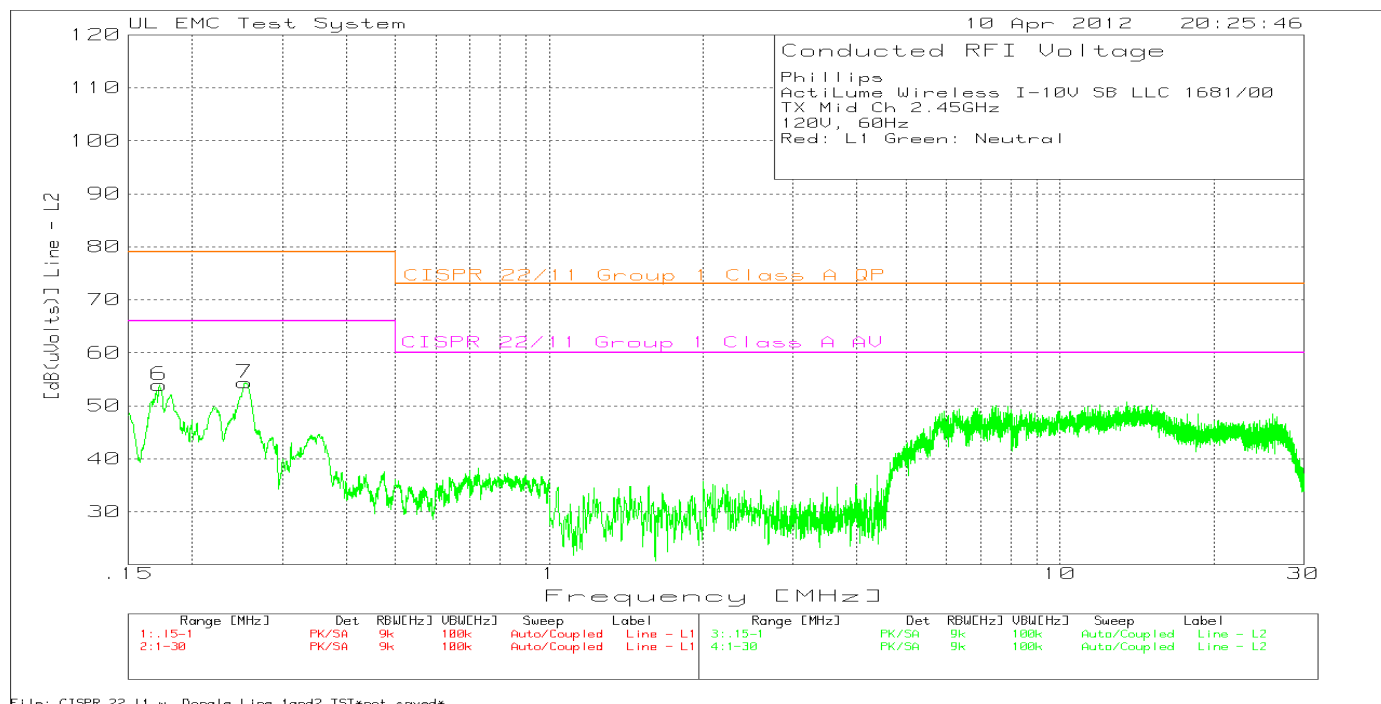
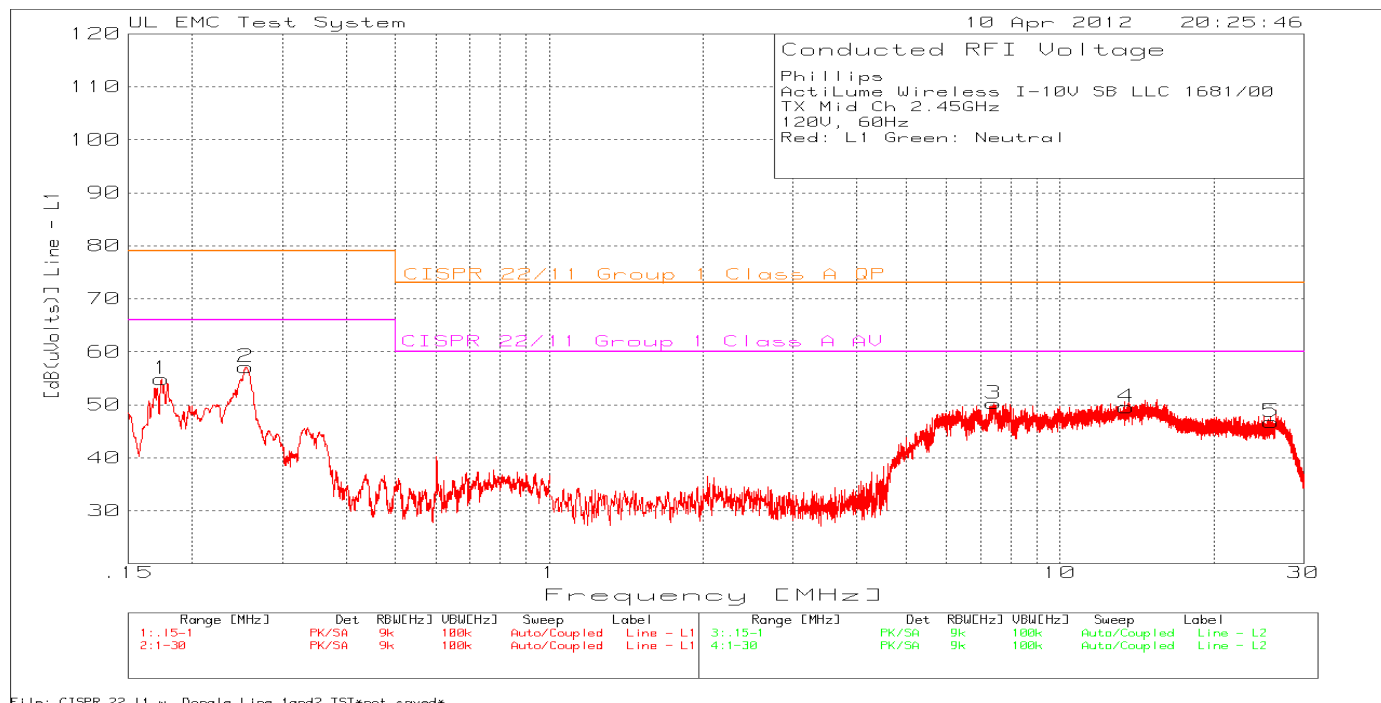
| Power Interface Mode #          | EUT Configurations Mode # | EUT Operation Mode # |
|---------------------------------|---------------------------|----------------------|
| 1                               | 1                         | 1                    |
| Supplementary information: None |                           |                      |

**Table 17 Conducted Emissions Test Equipment**

| Description       | Manufacturer      | Model           | Identifier     | Cal. Date   | Cal. Due Date |
|-------------------|-------------------|-----------------|----------------|-------------|---------------|
| EMI Test Receiver | Rohde & Schwarz   | ESCI            | EMC4328        | Dec 28 2011 | Dec 31 2012   |
| Transient Limiter | Electro-Metrics   | EM7600-2        | EMC4224        | N/A         | N/A           |
| HighPass Filter   | Solar Electronics | 2803-150        | 885551         | N/A         | N/A           |
| Attenuator        | HP                | 8494B           | 2831A00<br>838 | N/A         | N/A           |
| LISN - L1         | Solar             | 8602-50-TS-50-N | EMC4052        | Jan 6 2012  | Jan 6 2013    |
| LISN - L2         | Solar             | 8602-50-TS-50-N | EMC4064        | Jan 6 2012  | Jan 6 2013    |



Figure 14 Conducted Emissions Graph TX Mid Ch



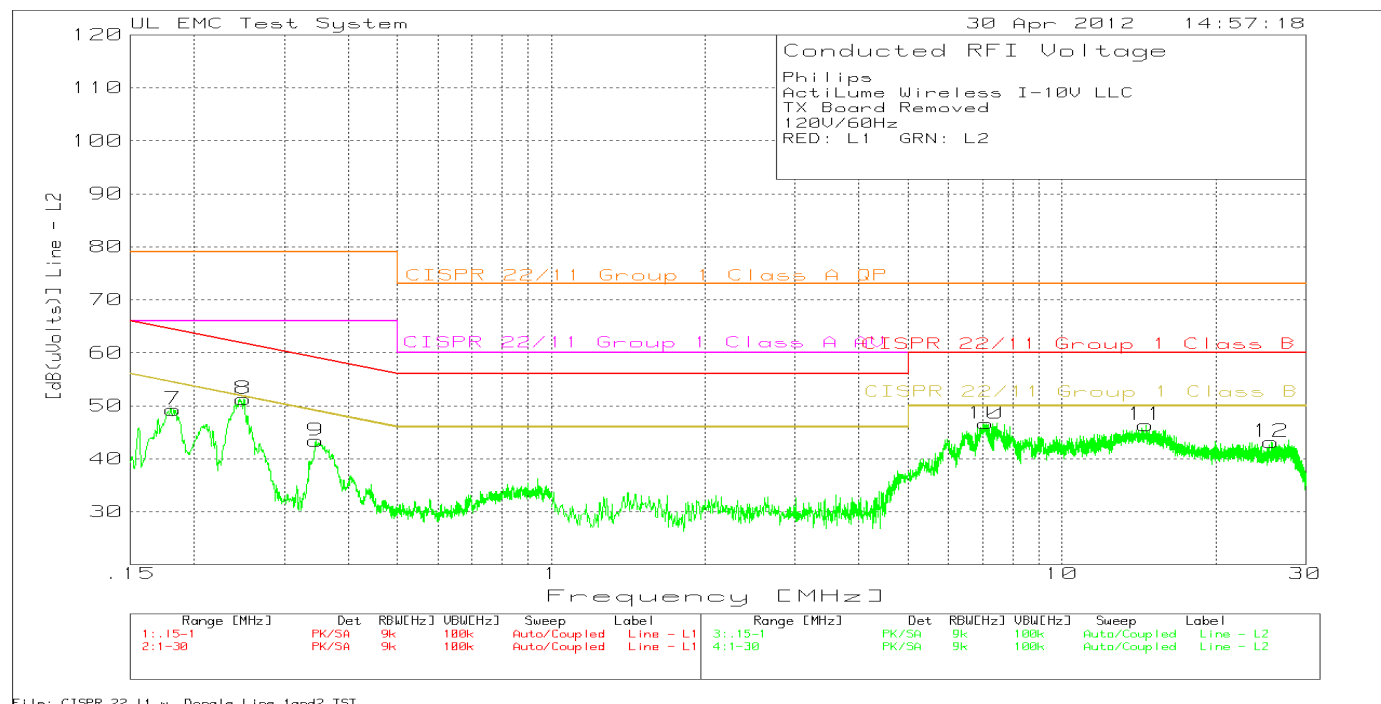
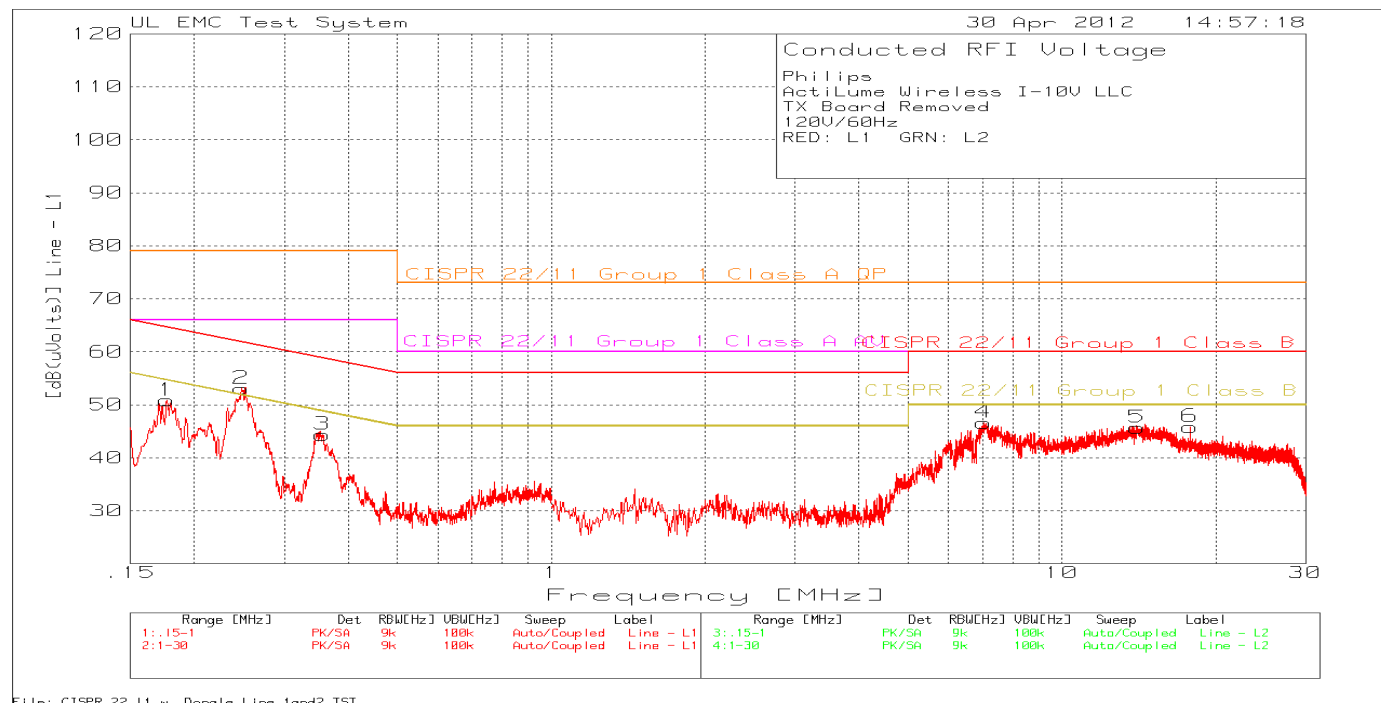
Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**Table 18 Conducted Emissions Data Points TX Mid Ch**

| Test Frequency                                                          | Meter Reading | Detector | LISN Factor dB | Path Loss dB | Level dBuV | CISPR 22/11 Group 1 Class A QP | Margin | CISPR 22/11 Group 1 Class A AV | Margin |
|-------------------------------------------------------------------------|---------------|----------|----------------|--------------|------------|--------------------------------|--------|--------------------------------|--------|
| Line 1                                                                  |               |          |                |              |            |                                |        |                                |        |
| 0.174                                                                   | 42.53         | PK       | 0.1            | 12.2         | 54.83      | 79                             | -24.17 | 66                             | -11.17 |
| 0.255                                                                   | 45.79         | PK       | 0.1            | 11.2         | 57.09      | 79                             | -21.91 | 66                             | -8.91  |
| 7.41426                                                                 | 39.07         | PK       | 0.3            | 10.9         | 50.27      | 73                             | -22.73 | 60                             | -9.73  |
| 13.52791                                                                | 37.57         | PK       | 0.9            | 11.1         | 49.57      | 73                             | -23.43 | 60                             | -10.43 |
| 25.91095                                                                | 32.93         | PK       | 2.1            | 11.7         | 46.73      | 73                             | -26.27 | 60                             | -13.27 |
| Line 2                                                                  |               |          |                |              |            |                                |        |                                |        |
| 0.17272                                                                 | 41.64         | PK       | 0.1            | 12.2         | 53.94      | 79                             | -25.06 | 66                             | -12.06 |
| 0.25394                                                                 | 43.09         | PK       | 0.1            | 11.2         | 54.39      | 79                             | -24.61 | 66                             | -11.61 |
| Line 1                                                                  |               |          |                |              |            |                                |        |                                |        |
| 0.179985                                                                | 36.99         | QP       | 0.1            | 12           | 49.09      | 79                             | -29.91 | 66                             | -16.91 |
| 0.25534                                                                 | 43.18         | QP       | 0.1            | 11.2         | 54.48      | 79                             | -24.52 | 66                             | -11.52 |
| 7.416945                                                                | 34.61         | QP       | 0.3            | 10.9         | 45.81      | 73                             | -27.19 | 60                             | -14.19 |
| 13.52985                                                                | 34.09         | QP       | 0.9            | 11.1         | 46.09      | 73                             | -26.91 | 60                             | -13.91 |
| 25.914275                                                               | 28.92         | QP       | 2.1            | 11.7         | 42.72      | 73                             | -30.28 | 60                             | -17.28 |
| Line 2                                                                  |               |          |                |              |            |                                |        |                                |        |
| 0.17998                                                                 | 37.95         | QP       | 0.1            | 12           | 50.05      | 79                             | -28.95 | 66                             | -15.95 |
| 0.25587                                                                 | 40.46         | QP       | 0.1            | 11.2         | 51.76      | 79                             | -27.24 | 66                             | -14.24 |
| Line 1                                                                  |               |          |                |              |            |                                |        |                                |        |
| 0.179985                                                                | 29.23         | Av       | 0.1            | 12           | 41.33      | 79                             | -37.67 | 66                             | -24.67 |
| 0.25534                                                                 | 26.55         | Av       | 0.1            | 11.2         | 37.85      | 79                             | -41.15 | 66                             | -28.15 |
| 7.416945                                                                | 28.16         | Av       | 0.3            | 10.9         | 39.36      | 73                             | -33.64 | 60                             | -20.64 |
| 13.52985                                                                | 29.11         | Av       | 0.9            | 11.1         | 41.11      | 73                             | -31.89 | 60                             | -18.89 |
| 25.914275                                                               | 24.29         | Av       | 2.1            | 11.7         | 38.09      | 73                             | -34.91 | 60                             | -21.91 |
| Line 2                                                                  |               |          |                |              |            |                                |        |                                |        |
| 0.17998                                                                 | 29.5          | Av       | 0.1            | 12           | 41.6       | 79                             | -37.4  | 66                             | -24.4  |
| 0.25587                                                                 | 23.65         | Av       | 0.1            | 11.2         | 34.95      | 79                             | -44.05 | 66                             | -31.05 |
| PK - Peak detector<br>QP - Quasi-Peak detector<br>Av - Average detector |               |          |                |              |            |                                |        |                                |        |

**Figure 15 Conducted Emissions Graph TX Board Removed**



Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

**Table 19 Conducted Emissions Data Points TX Board Removed**

Philips

ActiLume Wireless I-10V LLC

TX Board Removed

120V/60Hz

RED: L1 GRN: L2

| Test No.  | Frequency [MHz] | Meter Reading [dB(uV)] | Transducer Factor [dB] | Gain/Loss Factor [dB] | Level [dB(uVolts)] | Limit:1 | 2      | 3      | 4     | 5 | 6 |
|-----------|-----------------|------------------------|------------------------|-----------------------|--------------------|---------|--------|--------|-------|---|---|
| =====     |                 |                        |                        |                       |                    |         |        |        |       |   |   |
| Line - L1 |                 |                        |                        |                       |                    |         |        |        |       |   |   |
| 1         | .17662          | 38.61 PK               | .1                     | 12.1                  | 50.81              | 79      | 66     | 64.6   | 54.6  | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -28.19  | -15.19 | -13.79 | -3.79 | - | - |
| 2         | .24797          | 41.66 PK               | .1                     | 11.3                  | 53.06              | 79      | 66     | 61.8   | 51.8  | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -25.94  | -12.94 | -8.74  | 1.26  | - | - |
| 3         | .35641          | 33.6 PK                | 0                      | 10.8                  | 44.4               | 79      | 66     | 58.8   | 48.8  | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -34.6   | -21.6  | -14.4  | -4.4  | - | - |
| 4         | 7.03297         | 35.71 PK               | .1                     | 10.8                  | 46.61              | 73      | 60     | 60     | 50    | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -26.39  | -13.39 | -13.39 | -3.39 | - | - |
| 5         | 14.01059        | 34.44 PK               | .1                     | 11.1                  | 45.64              | 73      | 60     | 60     | 50    | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -27.36  | -14.36 | -14.36 | -4.36 | - | - |
| 6         | 17.85292        | 34.41 PK               | .1                     | 11.3                  | 45.81              | 73      | 60     | 60     | 50    | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -27.19  | -14.19 | -14.19 | -4.19 | - | - |
| Line - L2 |                 |                        |                        |                       |                    |         |        |        |       |   |   |
| 7         | .18228          | 37.24 PK               | .1                     | 11.9                  | 49.24              | 79      | 66     | 64.4   | 54.4  | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -29.76  | -16.76 | -15.16 | -5.16 | - | - |
| 8         | .25023          | 39.87 PK               | .1                     | 11.3                  | 51.27              | 79      | 66     | 61.7   | 51.7  | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -27.73  | -14.73 | -10.43 | -4.43 | - | - |
| 9         | .34594          | 32.57 PK               | 0                      | 10.8                  | 43.37              | 79      | 66     | 59.1   | 49.1  | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -35.63  | -22.63 | -15.73 | -5.73 | - | - |
| 10        | 7.09672         | 35.68 PK               | .1                     | 10.9                  | 46.68              | 73      | 60     | 60     | 50    | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -26.32  | -13.32 | -13.32 | -3.32 | - | - |
| 11        | 14.61331        | 35 PK                  | .2                     | 11.2                  | 46.4               | 73      | 60     | 60     | 50    | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -26.6   | -13.6  | -13.6  | -3.6  | - | - |
| 12        | 25.69405        | 31.27 PK               | .1                     | 11.8                  | 43.17              | 73      | 60     | 60     | 50    | - | - |
|           |                 |                        |                        | Margin [dB]           |                    | -29.83  | -16.83 | -16.83 | -6.83 | - | - |

LIMIT 1: CISPR 22/11 Group 1 Class A QP

LIMIT 2: CISPR 22/11 Group 1 Class A AV

LIMIT 3: CISPR 22/11 Group 1 Class B QP

LIMIT 4: CISPR 22/11 Group 1 Class B AV

Model Number: LLC1681

Client Name: Philips Lighting Electronics N. A.

Philips  
 ActiLume Wireless I-10V LLC  
 TX Board Removed  
 120V/60Hz  
 RED: L1 GRN: L2

| Test Frequency [MHz] | Meter Reading [dB(uV)] | Transducer Factor [dB] | Gain/Loss Factor [dB] | Level [dB(uVolts)] | Limit:1 | 2      | 3      | 4      | 5 | 6 |
|----------------------|------------------------|------------------------|-----------------------|--------------------|---------|--------|--------|--------|---|---|
| =====                |                        |                        |                       |                    |         |        |        |        |   |   |
| Line - L1            |                        |                        |                       |                    |         |        |        |        |   |   |
| .17563               | 30.53 QP               | .1                     | 12.1                  | 42.73              | 79      | 66     | 64.69  | 54.69  | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -36.27  | -23.27 | -21.96 | -11.96 | - | - |
| .24798               | 34.81 QP               | .1                     | 11.3                  | 46.21              | 79      | 66     | 61.82  | 51.82  | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -32.79  | -19.79 | -15.61 | -5.61  | - | - |
| .35447               | 28.86 QP               | 0                      | 10.8                  | 39.66              | 79      | 66     | 58.86  | 48.86  | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -39.34  | -26.34 | -19.2  | -9.2   | - | - |
| 7.05309              | 31.69 QP               | .1                     | 10.8                  | 42.59              | 73      | 60     | 60     | 50     | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -30.41  | -17.41 | -17.41 | -7.41  | - | - |
| 14.0244              | 30.68 QP               | .1                     | 11.1                  | 41.88              | 73      | 60     | 60     | 50     | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -31.12  | -18.12 | -18.12 | -8.12  | - | - |
| 17.85188             | 27.55 QP               | .1                     | 11.3                  | 38.95              | 73      | 60     | 60     | 50     | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -34.05  | -21.05 | -21.05 | -11.05 | - | - |
| Line - L2 .15 - 1MHz |                        |                        |                       |                    |         |        |        |        |   |   |
| .18127               | 31.29 QP               | .1                     | 12                    | 43.39              | 79      | 66     | 64.43  | 54.43  | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -35.61  | -22.61 | -21.04 | -11.04 | - | - |
| .24875               | 33.47 QP               | .1                     | 11.3                  | 44.87              | 79      | 66     | 61.8   | 51.8   | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -34.13  | -21.13 | -16.93 | -6.93  | - | - |
| .34751               | 28.58 QP               | 0                      | 10.8                  | 39.38              | 79      | 66     | 59.02  | 49.02  | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -39.62  | -26.62 | -19.64 | -9.64  | - | - |
| 7.08544              | 31.7 QP                | .1                     | 10.9                  | 42.7               | 73      | 60     | 60     | 50     | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -30.3   | -17.3  | -17.3  | -7.3   | - | - |
| 14.60328             | 29.73 QP               | .2                     | 11.2                  | 41.13              | 73      | 60     | 60     | 50     | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -31.87  | -18.87 | -18.87 | -8.87  | - | - |
| 25.6972              | 25.69 QP               | .1                     | 11.8                  | 37.59              | 73      | 60     | 60     | 50     | - | - |
|                      |                        |                        | Margin [dB]:          |                    | -35.41  | -22.41 | -22.41 | -12.41 | - | - |

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector  
 QP - Quasi-Peak detector  
 Av - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP  
 LIMIT 2: CISPR 22/11 Group 1 Class A AV  
 LIMIT 3: CISPR 22/11 Group 1 Class B QP  
 LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips  
ActiLume Wireless I-10V LLC  
TX Board Removed  
120V/60Hz  
RED: L1 GRN: L2

| Test<br>Frequency<br>[MHz] | Meter<br>Reading<br>[dB(uV)] | Transducer<br>Factor<br>[dB] | Gain/Loss<br>Factor<br>[dB] | Level<br>[dB(uVolts)] | Limit:1 | 2      | 3      | 4      | 5 | 6 |
|----------------------------|------------------------------|------------------------------|-----------------------------|-----------------------|---------|--------|--------|--------|---|---|
| =====                      |                              |                              |                             |                       |         |        |        |        |   |   |
| Line - L1 .15 - 1MHz       |                              |                              |                             |                       |         |        |        |        |   |   |
| .17563                     | 25.42 Av                     | .1                           | 12.1                        | 37.62                 | 79      | 66     | 64.69  | 54.69  | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -41.38  | -28.38 | -27.07 | -17.07 | - | - |
| .24798                     | 23.01 Av                     | .1                           | 11.3                        | 34.41                 | 79      | 66     | 61.82  | 51.82  | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -44.59  | -31.59 | -27.41 | -17.41 | - | - |
| .35447                     | 23.62 Av                     | 0                            | 10.8                        | 34.42                 | 79      | 66     | 58.86  | 48.86  | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -44.58  | -31.58 | -24.44 | -14.44 | - | - |
| 7.05309                    | 26.99 Av                     | .1                           | 10.8                        | 37.89                 | 73      | 60     | 60     | 50     | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -35.11  | -22.11 | -22.11 | -12.11 | - | - |
| 14.0244                    | 26.27 Av                     | .1                           | 11.1                        | 37.47                 | 73      | 60     | 60     | 50     | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -35.53  | -22.53 | -22.53 | -12.53 | - | - |
| 17.85188                   | 23.21 Av                     | .1                           | 11.3                        | 34.61                 | 73      | 60     | 60     | 50     | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -38.39  | -25.39 | -25.39 | -15.39 | - | - |
| Line - L2 .15 - 1MHz       |                              |                              |                             |                       |         |        |        |        |   |   |
| .18127                     | 22.61 Av                     | .1                           | 12                          | 34.71                 | 79      | 66     | 64.43  | 54.43  | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -44.29  | -31.29 | -29.72 | -19.72 | - | - |
| .24875                     | 20.82 Av                     | .1                           | 11.3                        | 32.22                 | 79      | 66     | 61.8   | 51.8   | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -46.78  | -33.78 | -29.58 | -19.58 | - | - |
| .34751                     | 25.22 Av                     | 0                            | 10.8                        | 36.02                 | 79      | 66     | 59.02  | 49.02  | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -42.98  | -29.98 | -23    | -13    | - | - |
| 7.08544                    | 26.93 Av                     | .1                           | 10.9                        | 37.93                 | 73      | 60     | 60     | 50     | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -35.07  | -22.07 | -22.07 | -12.07 | - | - |
| 14.60328                   | 25.47 Av                     | .2                           | 11.2                        | 36.87                 | 73      | 60     | 60     | 50     | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -36.13  | -23.13 | -23.13 | -13.13 | - | - |
| 25.6972                    | 21.47 Av                     | .1                           | 11.8                        | 33.37                 | 73      | 60     | 60     | 50     | - | - |
|                            |                              |                              | Margin [dB]:                |                       | -39.63  | -26.63 | -26.63 | -16.63 | - | - |

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector  
QP - Quasi-Peak detector  
Av - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP  
LIMIT 2: CISPR 22/11 Group 1 Class A AV  
LIMIT 3: CISPR 22/11 Group 1 Class B QP  
LIMIT 4: CISPR 22/11 Group 1 Class B AV

## Appendix A

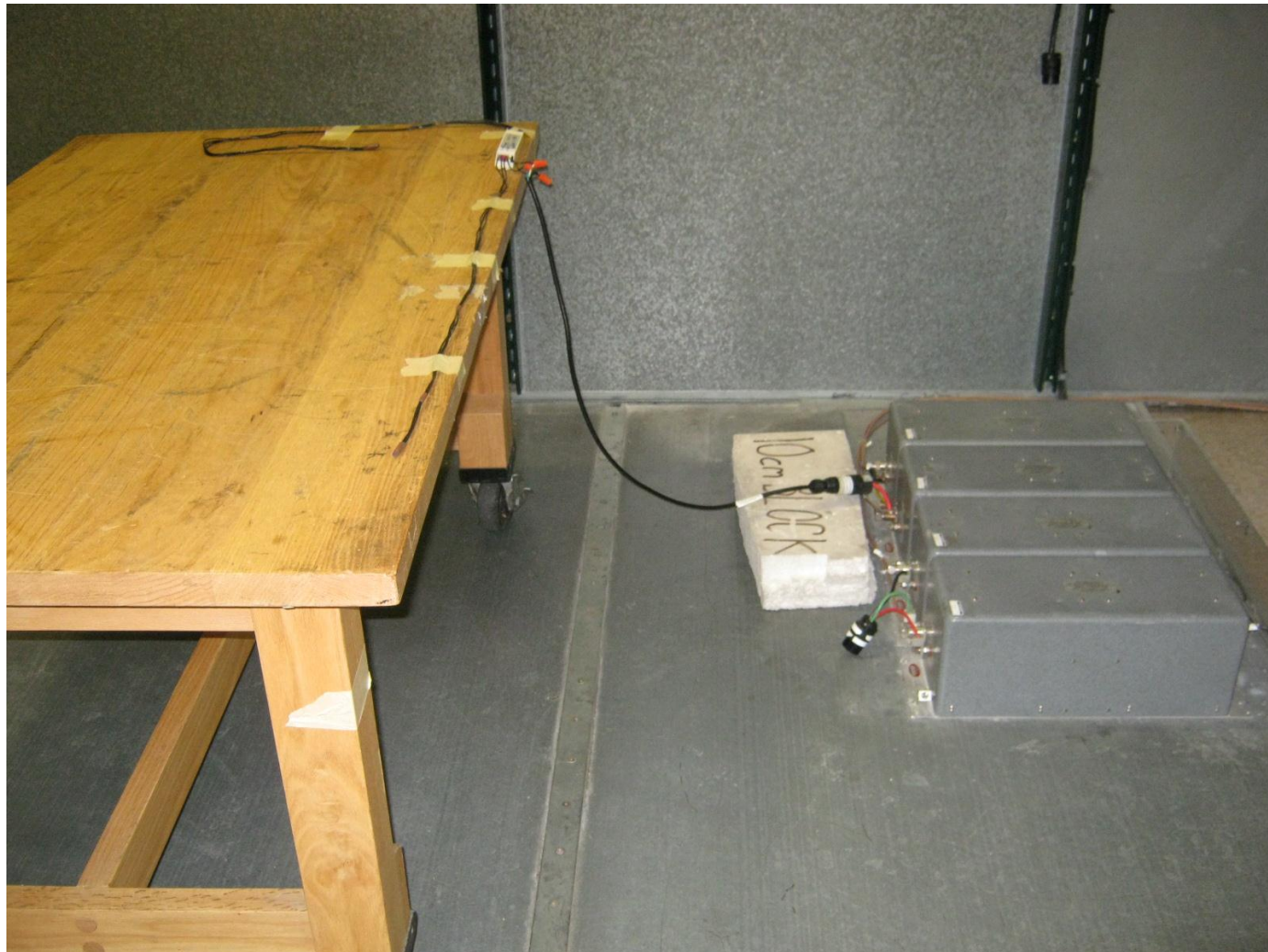
### Test Setup Photos

#### Radiated Emissions





### Line Conducted Measurements





## Appendix B

### Accreditations and Authorizations



NVLAP Lab code: 100414-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see <http://ts.nist.gov/standards/scopes/1004140.htm>



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91044).



Industry Canada    Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: Radiated Emissions R-621, Conducted Emissions C-642.



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 2004/108/EC, Annex III (2-3). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6

