# PERMISSIVE CHANGE TEST REPORT

**Report Number. :** 12361331C

| | | |
|---|---|---|
| **Applicant** | : | Philips Lighting North America Corporation<br>10275 W. Higgins Rd.<br>Rosemont, IL 60018 |
| **Model** | : | SNS300 |
| **FCC ID** | : | 2AF2N-SNS400 |
| **ISED ID** | : | 20659-SNS400 |
| **EUT Description** | : | Ceiling Luminaire Mounted Light Sensor with 2.4GHz radio |
| **Test Standard(s)** | : | FCC 47 CFR PART 15 SUBPART C<br>ISED RSS-247 ISSUE 2 |

**Date Of Issue:**
2018-07-24

**Prepared by:**
UL LLC
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TEL: (847) 272-8800

NVLAP TESTING
NVLAB LAB CODE: 100414-0

# REPORT REVISION HISTORY

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| 1.0 | 2018-07-24 | Original Issue | BM |



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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Philips Lighting North America

**EUT DESCRIPTION:** ceiling luminaire mounted light sensor with 2.4GHz radio

**MODEL:** SNS300

**SERIAL NUMBER:** see section 5.6

**DATE TESTED:** 2018-07-02 TO 2018-07-03

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart C | Compliant |
| ISED RSS-247 Issue 2 | Compliant |
| ISED RSS-GEN Issue 5 | Compliant |

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

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

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, RSS-GEN Issue 5, and RSS-247 Issue 2.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, Illinois, USA.

| 333 Pfingsten Road |
| --- |
| ☒ Chamber 10m (ISED:2180A-1) |

UL LLC is accredited by NVLAP, Laboratory Code 1004141-0. The full scope of accreditation can be viewed at https://www.nist.gov/nvlap.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

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

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + *Path Factor (dB)
Example: 28.9dBuV/m = 36.5 dBuV + 18.7 dB/m + (– 27.5) dB
*Path factor may include cable, preamp and attenuators. Positive path factor indicates losses only and negative path factor indicates gain (preamp).

## 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER | UNCERTAINTY |
|---|---|
| Worst Case Conducted Disturbance, 9KHz to 0.15 MHz | 3.84 dB |
| Worst Case Conducted Disturbance, 0.15 to 30 MHz | 3.65 dB |
| Worst Case Radiated Disturbance, 9KHz to 30 MHz | 3.15 dB |
| Worst Case Radiated Disturbance, 30 to 1000 MHz | 5.36 dB |
| Worst Case Radiated Disturbance, 1000 to 18000 MHz | 4.32 dB |
| Worst Case Radiated Disturbance, 18000 to 26000 MHz | 4.45 dB |

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



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# 5. EQUIPMENT UNDER TEST

## 5.1. EUT DESCRIPTION

The EUT is a ceiling luminaire mounted light sensor with 2.4GHz ZigBee type radio. All the hardware in SNS300 is electronically identical to hardware in SNS200.

## 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

| Frequency Range | Mode | Output Power (dBm) | Output Power (mW) |
|---|---|---|---|
| 2405 - 2475 | TX | 2.323 | 1.71 |

* power measurements are from the original model SNS201 (UL Test Report # 12361331A)

## 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an Inverted F PCB antenna, with a maximum gain of 3.3dB.

## 5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was: FCC Mode V0.30

The test utility software used during testing was: none

## 5.5. WORST-CASE CONFIGURATION AND MODE

Radiated Spurious Emissions between 30MHz to 25GHz were performed with the EUT set to transmit at the intended power setting on low, middle and high channels.

The EUT is Luminaire mounted only therefore all radiated spurious emissions were conducted in single orientation.

For testing purposes the EUT was set to 100% duty cycle, however in normal use the worst case pulse train will be approximately 10mS over 100mS period.



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## 5.6. DESCRIPTION OF TEST SETUP

**EUT and SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| Description | Manufactu | Model | Serial Number | FCC ID |
| Radiated Sample | Philips | SNS300 | 3516420385 | 2AF2N-SNS400 |

**I/O CABLES**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | DC Input | 1 | Wire | solid | 30cm | - |

**TEST SETUP**

Frequencies and modes of operation are varied by setting the initial input voltage to pre-defined level. Once mode is set the voltage is raised to 20VDC.



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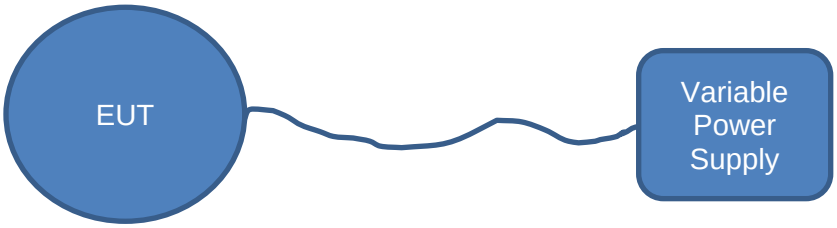
**SETUP DIAGRAM FOR RADIATED TESTS**



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# 6. MEASUREMENT METHOD

Out-of-band emissions in restricted bands: ANSI C63.10, section 7.5 and 11.12.1

Band-edge: ANSI C63.10, section 11.12.1



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# 7. TEST AND MEASUREMENT EQUIPMENT

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

| Description | Manufacturer | Model | Identifier | Cal. Date | Cal. Due Date |
|---|---|---|---|---|---|
| Antenna Array | UL | BOMS | EMC4276 | 01/16/2018 | 01/31/2019 |
| EMI Test Receiver | Rohde & Schwarz | ESU | EMC4323 | 12/20/2017 | 12/31/2018 |
| Spectrum Analyzer | Agilent | N9030A (PXA) | EMC4360 | 12/28/2017 | 12/31/2018 |
| EMI Test Receiver | Rohde & Schwarz | ESR | EMC4377 | 12/23/2017 | 12/31/2018 |
| Transient Limiter | Electro-Metrics | EM7600-2 | EMC4224 | N/A | N/A |
| High Pass Filter | Solar Electronics | 2803-150 | EMC4327 | N/A | N/A |
| Attenuator | HP | 8494B | 2831A00838 | N/A | N/A |
| LISN - L1 | Solar | 8602-50-TS-50-N | EMC4066 | 12/29/2017 | 12/31/2018 |
| LISN - L2 | Solar | 8602-50-TS-50-N | EMC4064 | 12/29/2017 | 12/31/2018 |



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# 8. ANTENNA PORT TEST RESULTS

## 8.1. ON TIME AND DUTY CYCLE

**LIMITS**

None; for reporting purposes only.

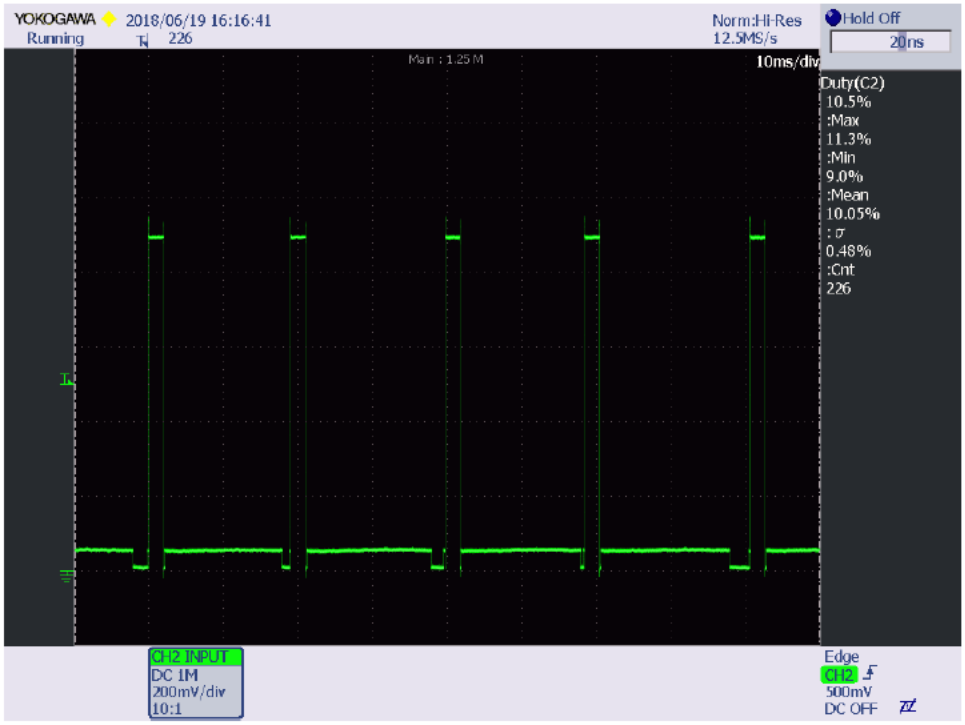
**PROCEDURE**

**ON TIME AND DUTY CYCLE RESULTS**

| Mode | ON Time B (msec) | Period (msec) | Duty Cycle x (linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/B Minimum VBW (kHz) |
|---|---|---|---|---|---|---|
| *TX Mode | 100.000 | 100.000 | 1.000 | 100.00% | 0.00 | 0.010 |

* For testing purposes the device was set to transmit with 100% duty cycle, however in normal operation the transmit duration is very short and total pulse transmit time is about 11.3%. Per 15.35 duty cycle is used for harmonic measurements above 1GHz.

Measurement:




Over 226 randomly picket events of 100ms long the duty-cycle is average 10.05% (with a stdev=0.48). Max measured duty-cycle is 11.3% (over 100ms period).

Above data is provided by the manufacturer. The samples used for testing in the lab were programmed with special software which only allowed continuous modulated TX with 100% duty cycle.

# 9. RADIATED TEST RESULTS

## 9.1. LIMITS AND PROCEDURE

**LIMITS**

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) @ 300 m | - |
| 0.490-1.705 | 24000/F(kHz) @ 30 m | - |
| 1.705 - 30 | 30 @ 30m | - |
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

**TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters for frequencies 9kHz-30MHz and 1GHz-25GHz. For frequencies 30MHz-1GHz the antenna distance is 10m. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

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

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements. For harmonics in restricted bands duty cycle correction per FCC 15.35 was used.

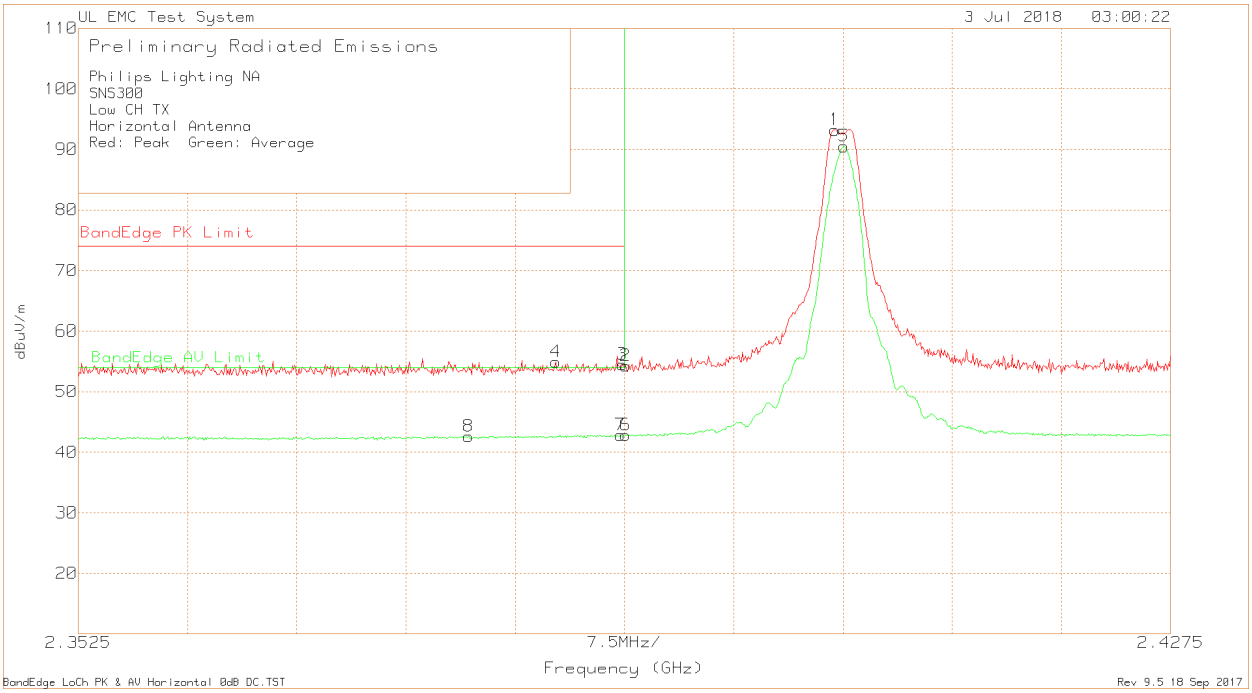
The spectrum from30MHz to 25 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. For frequencies 9kHz-30MHz random channels was used.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For frequencies 9kHz-30MHz no height scan was conducted.

# 9.2. TRANSMITTER 1GHz – 25GHz

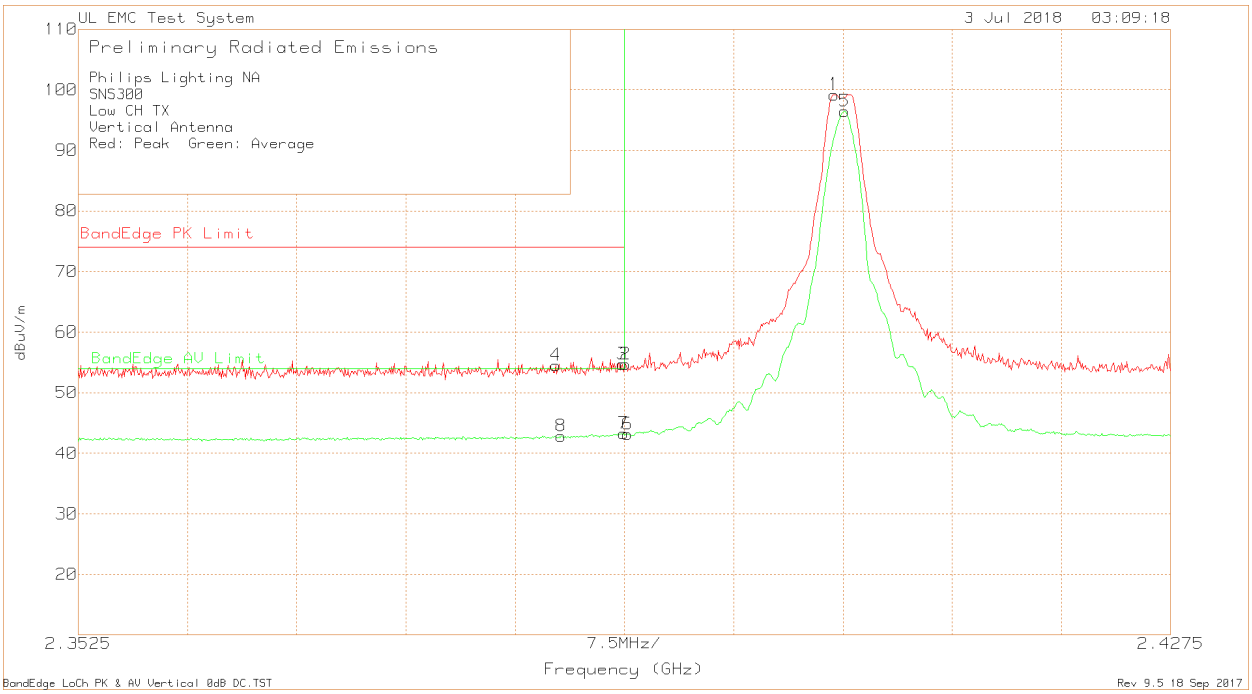
## 9.2.1. Low Channel

**Band Edge Data – Horizontal**



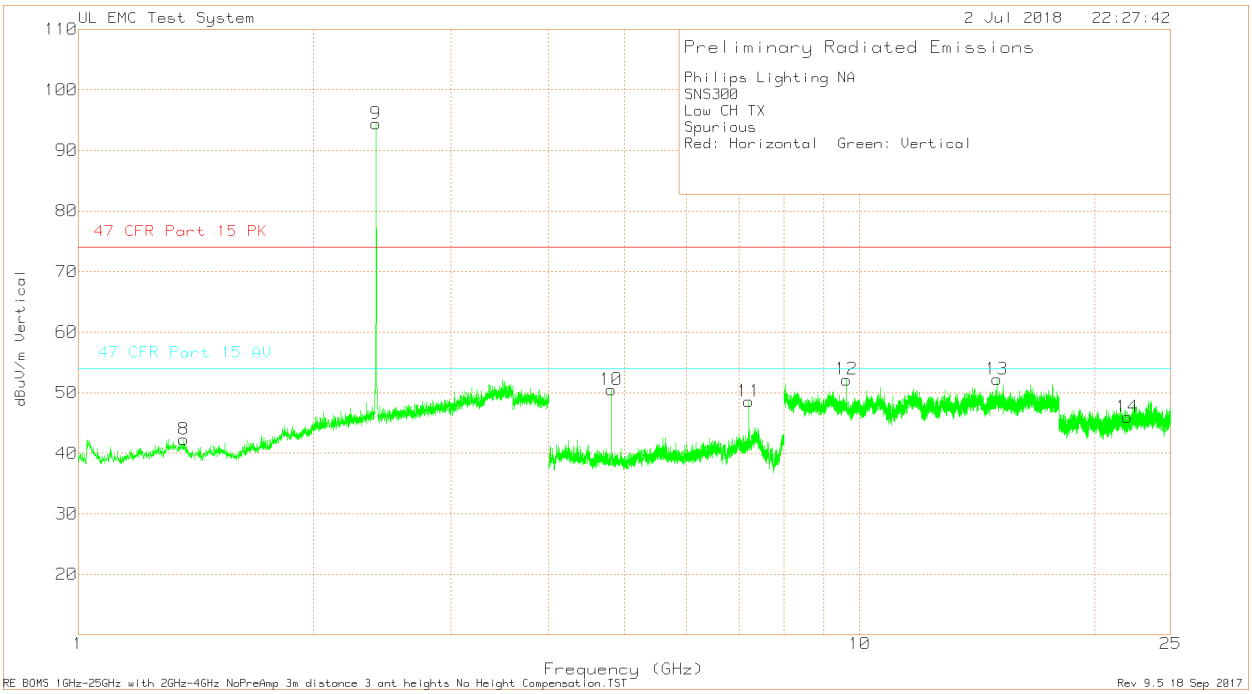

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Philips Lighting NA | | | | | | | | | | | | | |
| SNS300 | | | | | | | | | | | | | |
| Low CH TX | | | | | | | | | | | | | |
| Horizontal Antenna | | | | | | | | | | | | | |
| Red: Peak Green: Average | | | | | | | | | | | | | |
| Trace MArkers | | | | | | | | | | | | | |
| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Anteanna Factor dB/m | Path Factor dB | Level dBuV/m | BandEdge PK Limit dBuV/m | Margin (dB) | BandEdge AV Limit dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
| 1 | 2.4044 | 66.64 | Pk | 21.8 | 4.75 | 93.19 | - | - | - | - | 261 | 129 | H |
| 2 | 2.3901 | 27.71 | Pk | 21.8 | 4.76 | 54.27 | - | - | - | - | 261 | 129 | H |
| 3 | 2.3899 | 27.9 | Pk | 21.8 | 4.76 | 54.46 | 74 | -19.54 | - | - | 261 | 129 | H |
| 4 | 2.3853 | 28.4 | Pk | 21.8 | 4.69 | 54.89 | 74 | -19.11 | - | - | 261 | 129 | H |
| 5 | 2.4051 | 63.94 | Av | 21.8 | 4.75 | 90.49 | - | - | - | - | 261 | 129 | H |
| 6 | 2.3901 | 16.24 | Av | 21.8 | 4.76 | 42.8 | - | - | - | - | 261 | 129 | H |
| 7 | 2.3897 | 16.29 | Av | 21.8 | 4.76 | 42.85 | 74 | -31.15 | 54 | -11.15 | 261 | 129 | H |
| 8 | 2.3793 | 16.15 | Av | 21.8 | 4.67 | 42.62 | 74 | -31.38 | 54 | -11.38 | 261 | 129 | H |
| Pk - Peak detector | | | | | | | | | | | | | |
| Av - Average Detector | | | | | | | | | | | | | |

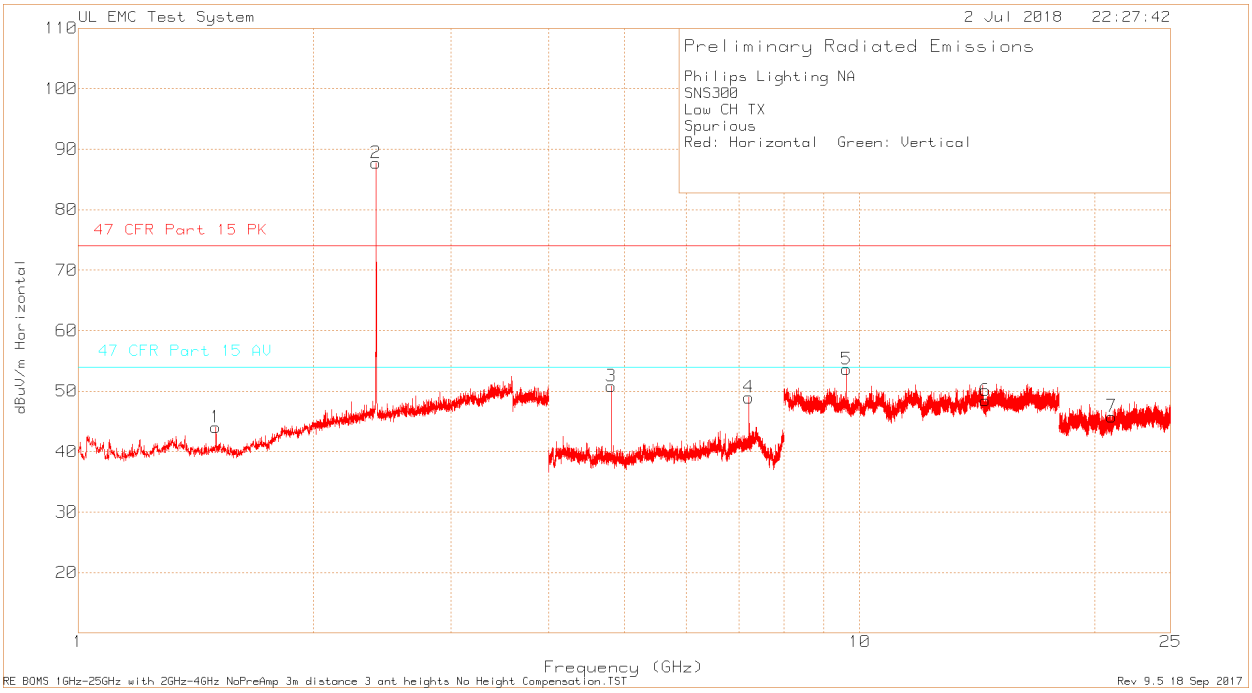
## Band Edge Data - Vertical




| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Philips Lighting NA | | | | | | | | | | | | | |
| SNS300 | | | | | | | | | | | | | |
| Low CH TX | | | | | | | | | | | | | |
| Vertical Antenna | | | | | | | | | | | | | |
| Red: Peak Green: Average | | | | | | | | | | | | | |
| Trace MArkers | | | | | | | | | | | | | |
| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Anteanna Factor dB/m | Path Factor dB | Level dBuV/m | BandEdge PK Limit dBuV/m | Margin (dB) | BandEdge AV Limit dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
| 1 | 2.4044 | 72.65 | Pk | 21.8 | 4.75 | 99.2 | - | - | - | - | 276 | 144 | V |
| 2 | 2.3901 | 28.12 | Pk | 21.8 | 4.76 | 54.68 | - | - | - | - | 276 | 144 | V |
| 3 | 2.3899 | 28.11 | Pk | 21.8 | 4.76 | 54.67 | 74 | -19.33 | - | - | 276 | 144 | V |
| 4 | 2.3853 | 28.02 | Pk | 21.8 | 4.69 | 54.51 | 74 | -19.49 | - | - | 276 | 144 | V |
| 5 | 2.4051 | 69.89 | Av | 21.8 | 4.75 | 96.44 | - | - | - | - | 276 | 144 | V |
| 6 | 2.3902 | 16.6 | Av | 21.8 | 4.77 | 43.17 | - | - | - | - | 276 | 144 | V |
| 7 | 2.3899 | 16.72 | Av | 21.8 | 4.76 | 43.28 | 74 | -30.72 | 54 | -10.72 | 276 | 144 | V |
| 8 | 2.3857 | 16.31 | Av | 21.8 | 4.7 | 42.81 | 74 | -31.19 | 54 | -11.19 | 276 | 144 | V |
| Pk - Peak detector | | | | | | | | | | | | | |
| Av - Average detector | | | | | | | | | | | | | |

## Spurious Emissions 1GHz – 25GHz



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Philips Lighting NA
SNS300
Low CH TX
Spurious
Red: Horizontal Green: Vertical
Trace MArkers

| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Antenna Factor dB/m | Path Factor dB | Level dBuV/m | 47 CFR Part 15.209 PK dBuV/m | Margin (dB) | 47 CFR Part 15.209 AV dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.5 | 70.59 | Pk | 27.8 | -54.41 | 43.98 | 74 | -30.02 | 54 | -10.02 | 0-360 | 150 | H |
| 2 | 2.405 | 61.15 | Pk | 21.8 | 4.75 | 87.7 | 74 | 13.7 | 54 | 33.7 | 0-360 | 200 | H |
| 3 | 4.811 | 74.02 | Pk | 27.7 | -50.88 | 50.84 | 74 | -23.16 | 54 | -3.16 | 0-360 | 100 | H |
| 4 | 7.217 | 64.43 | Pk | 29.8 | -45.29 | 48.94 | 74 | -25.06 | 54 | -5.06 | 0-360 | 200 | H |
| 5 | 9.618 | 66.52 | Pk | 36.4 | -49.28 | 53.64 | 74 | -20.36 | 54 | -0.36 | 0-360 | 100 | H |
| 6 | 14.48 | 49.51 | Pk | 39.8 | -40.87 | 48.44 | 74 | -25.56 | 54 | -5.56 | 0-360 | 150 | H |
| 7 | 21.034 | 53.17 | Pk | 40.1 | -47.48 | 45.79 | 74 | -28.21 | 54 | -8.21 | 0-360 | 200 | H |
| 8 | 1.365 | 68.63 | Pk | 28.7 | -55.04 | 42.29 | 74 | -31.71 | 54 | -11.71 | 0-360 | 100 | V |
| 9 | 2.405 | 67.84 | Pk | 21.8 | 4.75 | 94.39 | 74 | 20.39 | 54 | 40.39 | 0-360 | 150 | V |
| 10 | 4.811 | 73.65 | Pk | 27.7 | -50.88 | 50.47 | 74 | -23.53 | 54 | -3.53 | 0-360 | 200 | V |
| 11 | 7.217 | 64.03 | Pk | 29.8 | -45.29 | 48.54 | 74 | -25.46 | 54 | -5.46 | 0-360 | 200 | V |
| 12 | 9.622 | 65.1 | Pk | 36.4 | -49.34 | 52.16 | 74 | -21.84 | 54 | -1.84 | 0-360 | 150 | V |
| 13 | 14.994 | 52.86 | Pk | 39.8 | -40.48 | 52.18 | 74 | -21.82 | 54 | -1.82 | 0-360 | 100 | V |
| 14 | 22.021 | 52.32 | Pk | 40.4 | -46.79 | 45.93 | 74 | -28.07 | 54 | -8.07 | 0-360 | 150 | V |

Pk - Peak detector

Radiated Emission Data

| Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Antenna Factor dB/m | Path Factor dB | Level dBuV/m | DC Factor dB | Av Level with DC dB | 47 CFR Part 15.209 PK dBuV/m | Margin (dB) | 47 CFR Part 15.209 AV dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8098 | 74.81 | Pk | 27.7 | -50.92 | 51.59 | -18.93 | 32.66 | 74 | -22.41 | 54 | -21.34 | 44 | 100 | H |
| 7.2132 | 65.8 | Pk | 29.8 | -45.3 | 50.3 | -18.93 | 31.37 | 74 | -23.7 | 54 | -22.63 | 73 | 197 | H |
| 7.2162 | 65.11 | Pk | 29.8 | -45.36 | 49.55 | -18.93 | 30.62 | 74 | -24.45 | 54 | -23.38 | 68 | 223 | V |
| 4.8109 | 75.49 | Pk | 27.7 | -50.88 | 52.31 | -18.93 | 33.38 | 74 | -21.69 | 54 | -20.62 | 9 | 253 | V |
| 9.6174 | 67.51 | Pk | 36.4 | -49.28 | 54.63 | -18.93 | 35.7 | 74 | -19.37 | 54 | -18.3 | 115 | 133 | H |
| 9.6177 | 66.61 | Pk | 36.4 | -49.28 | 53.73 | -18.93 | 34.8 | 74 | -20.27 | 54 | -19.2 | 147 | 236 | V |
| 14.9939 | 53.41 | Pk | 39.8 | -40.49 | 52.72 | -18.93 | 33.79 | 74 | -21.28 | 54 | -20.21 | 360 | 100 | V |

Pk - Peak detector



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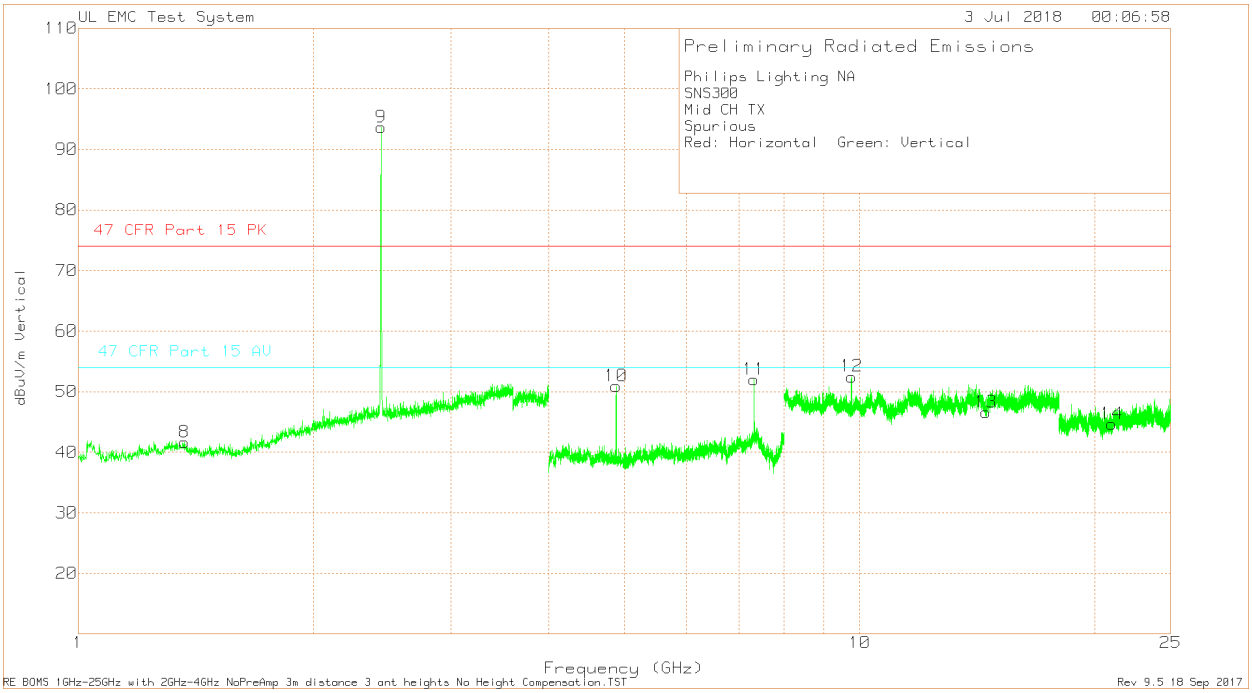
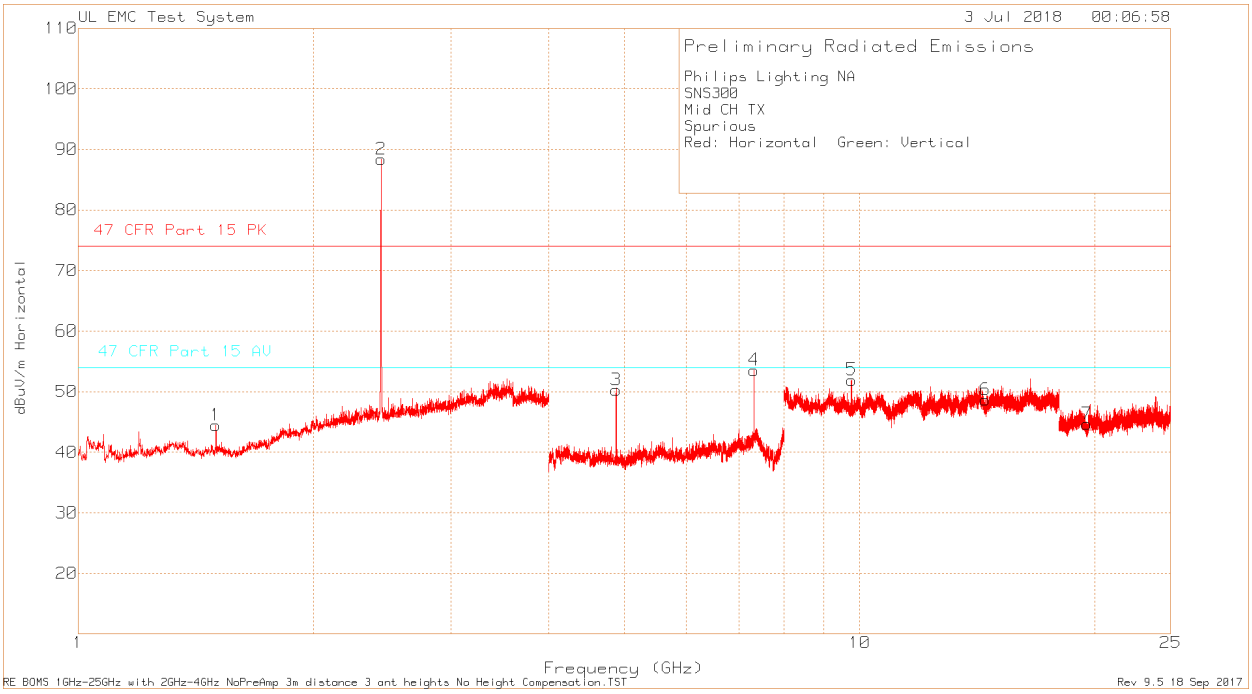
### 9.2.2. Middle Channel

**Spurious Emissions 1GHz – 25GHz**



Philips Lighting NA
SNS300
Mid CH TX
Spurious
Red: Horizontal Green: Vertical
Trace MArkers

| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Antenna Factor dB/m | Path Factor dB | Level dBuV/m | 47 CFR Part 15.209 PK dBuV/m | Margin (dB) | 47 CFR Part 15.209 AV dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.5 | 71.05 | Pk | 27.8 | -54.41 | 44.44 | 74 | -29.56 | 54 | -9.56 | 0-360 | 150 | H |
| 2 | 2.44 | 61.83 | Pk | 21.9 | 4.61 | 88.34 | 74 | 14.34 | 54 | 34.34 | 0-360 | 149 | H |
| 3 | 4.879 | 72.74 | Pk | 27.7 | -50.17 | 50.27 | 74 | -23.73 | 54 | -3.73 | 0-360 | 100 | H |
| 4 | 7.322 | 67.97 | Pk | 30.6 | -45.03 | 53.54 | 74 | -20.46 | 54 | -0.46 | 0-360 | 200 | H |
| 5 | 9.763 | 65.05 | Pk | 36.4 | -49.51 | 51.94 | 74 | -22.06 | 54 | -2.06 | 0-360 | 100 | H |
| 6 | 14.485 | 49.87 | Pk | 39.8 | -41.01 | 48.66 | 74 | -25.34 | 54 | -5.34 | 0-360 | 150 | H |
| 7 | 19.543 | 55.92 | Pk | 40.3 | -51.59 | 44.63 | 74 | -29.37 | 54 | -9.37 | 0-360 | 150 | H |
| 8 | 1.366 | 68.22 | Pk | 28.7 | -55.26 | 41.66 | 74 | -32.34 | 54 | -12.34 | 0-360 | 200 | V |
| 9 | 2.44 | 67.12 | Pk | 21.9 | 4.61 | 93.63 | 74 | 19.63 | 54 | 39.63 | 0-360 | 150 | V |
| 10 | 4.879 | 73.37 | Pk | 27.7 | -50.17 | 50.9 | 74 | -23.1 | 54 | -3.1 | 0-360 | 199 | V |
| 11 | 7.319 | 66.34 | Pk | 30.6 | -44.96 | 51.98 | 74 | -22.02 | 54 | -2.02 | 0-360 | 199 | V |
| 12 | 9.762 | 65.69 | Pk | 36.4 | -49.6 | 52.49 | 74 | -21.51 | 54 | -1.51 | 0-360 | 100 | V |
| 13 | 14.507 | 47.68 | Pk | 39.8 | -40.9 | 46.58 | 74 | -27.42 | 54 | -7.42 | 0-360 | 200 | V |
| 14 | 21.033 | 51.91 | Pk | 40.1 | -47.38 | 44.63 | 74 | -29.37 | 54 | -9.37 | 0-360 | 100 | V |

Pk - Peak detector

Radiated Emission Data

| Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Antenna Factor dB/m | Path Factor dB | Level dBuV/m | DC Factor dB | Av Level with DC dB | 47 CFR Part 15.209 PK dBuV/m | Margin (dB) | 47 CFR Part 15.209 AV dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8789 | 73.71 | Pk | 27.7 | -50.16 | 51.25 | -18.93 | 32.32 | 74 | -22.75 | 54 | -21.68 | 49 | 100 | H |
| 7.3182 | 68.59 | Pk | 30.6 | -45.08 | 54.11 | -18.93 | 35.18 | 74 | -19.89 | 54 | -18.82 | 68 | 185 | H |
| 7.3213 | 68.46 | Pk | 30.6 | -45.1 | 53.96 | -18.93 | 35.03 | 74 | -20.04 | 54 | -18.97 | 79 | 249 | V |
| 4.8788 | 73.77 | Pk | 27.7 | -50.16 | 51.31 | -18.93 | 32.38 | 74 | -22.69 | 54 | -21.62 | 360 | 245 | V |
| 9.7615 | 66.66 | Pk | 36.4 | -49.64 | 53.42 | -18.93 | 34.49 | 74 | -20.58 | 54 | -19.51 | 211 | 100 | H |
| 9.7617 | 67.28 | Pk | 36.4 | -49.62 | 54.06 | -18.93 | 35.13 | 74 | -19.94 | 54 | -18.87 | 153 | 108 | V |

Pk - Peak detector



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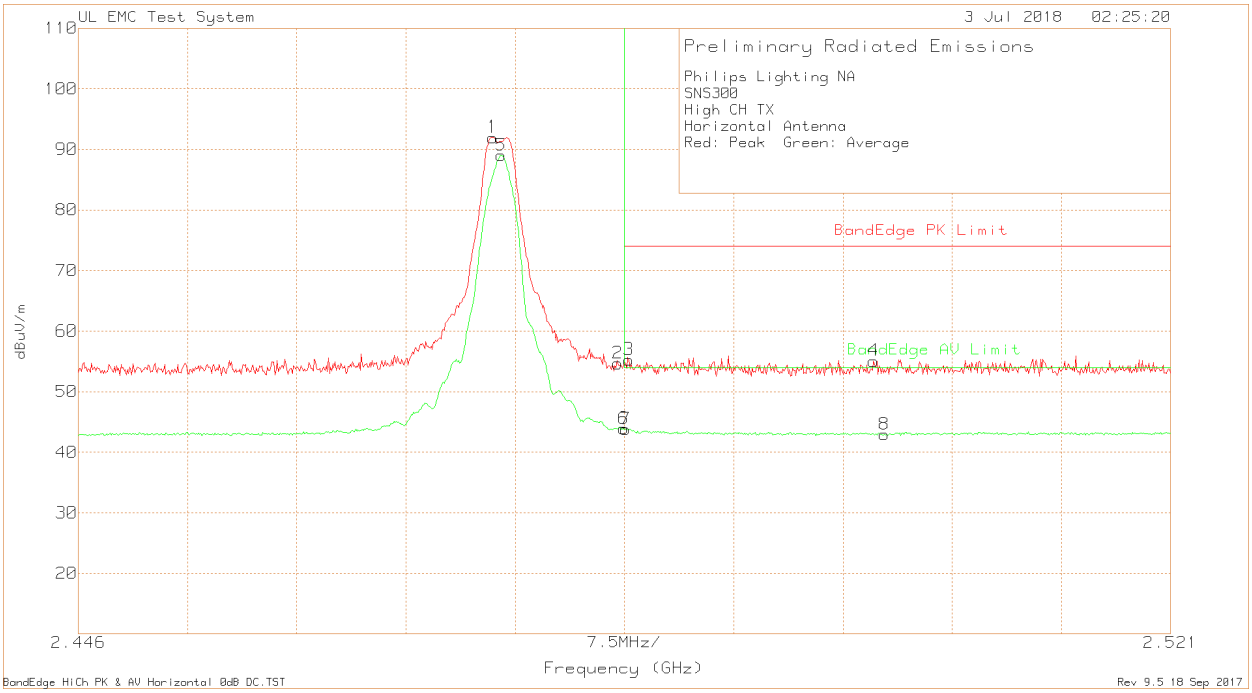
333 Pfingsten Rd, Northbrook, IL 60062, USA TEL: (847) 272-8800

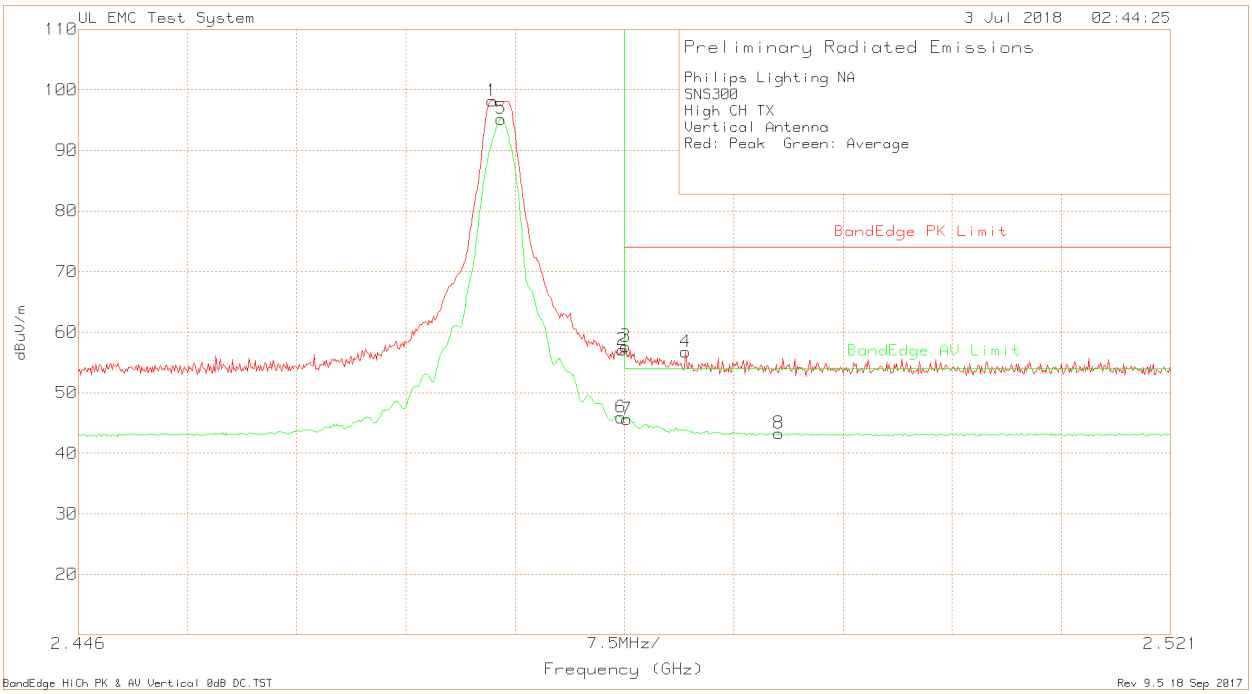
## 9.2.3. High Channel

**Band Edge Data – Horizontal**



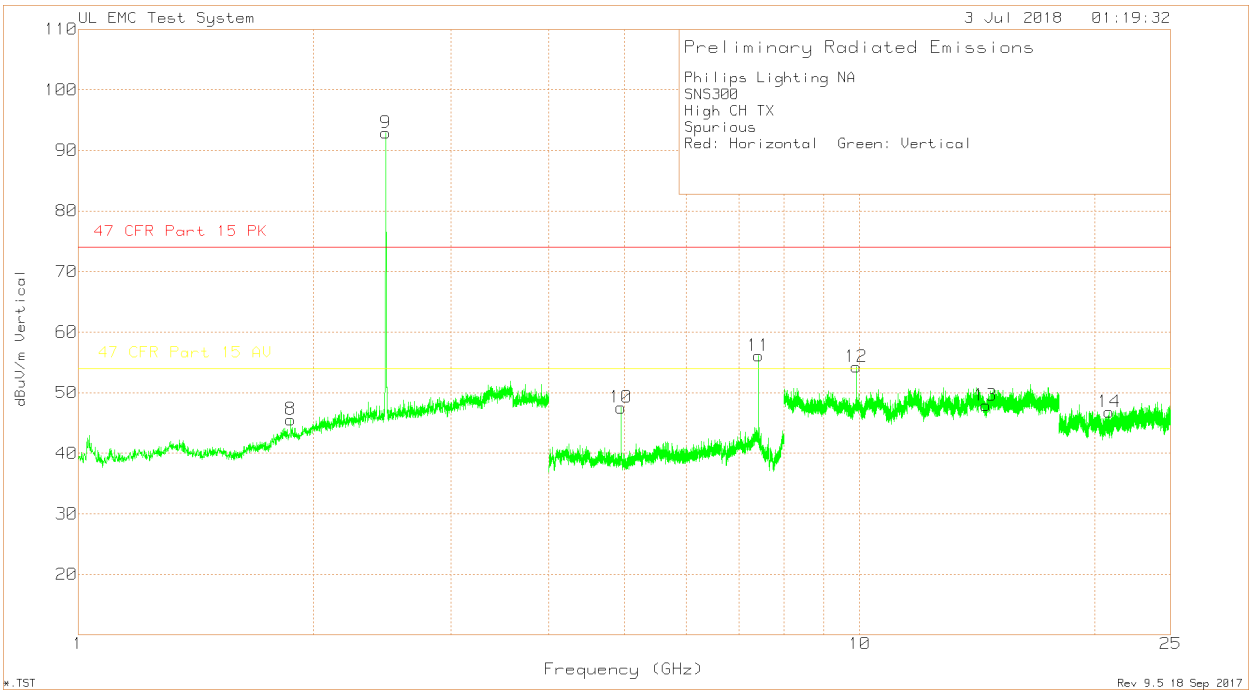

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Philips Lighting NA | | | | | | | | | | | | | |
| SNS300 | | | | | | | | | | | | | |
| High CH TX | | | | | | | | | | | | | |
| Horizontal Antenna | | | | | | | | | | | | | |
| Red: Peak Green: Average | | | | | | | | | | | | | |
| Trace MArkers | | | | | | | | | | | | | |
| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Anteanna Factor dB/m | Path Factor dB | Level dBuV/m | BandEdge PK Limit dBuV/m | Margin (dB) | BandEdge AV Limit dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
| 1 | 2.4745 | 65.42 | Pk | 22 | 4.56 | 91.98 | - | - | - | - | 259 | 121 | H |
| 2 | 2.4831 | 28.14 | Pk | 22 | 4.52 | 54.66 | - | - | - | - | 259 | 121 | H |
| 3 | 2.4838 | 28.64 | Pk | 22.1 | 4.53 | 55.27 | 74 | -18.73 | - | - | 259 | 121 | H |
| 4 | 2.5006 | 28.47 | Pk | 22.1 | 4.51 | 55.08 | 74 | -18.92 | - | - | 259 | 121 | H |
| 5 | 2.475 | 62.49 | Av | 22 | 4.54 | 89.03 | - | - | - | - | 259 | 121 | H |
| 6 | 2.4834 | 17.27 | Av | 22.1 | 4.53 | 43.9 | - | - | - | - | 259 | 121 | H |
| 7 | 2.4836 | 17.17 | Av | 22.1 | 4.53 | 43.8 | 74 | -30.2 | 54 | -10.2 | 259 | 121 | H |
| 8 | 2.5014 | 16.29 | Av | 22.1 | 4.51 | 42.9 | 74 | -31.1 | 54 | -11.1 | 259 | 121 | H |
| Pk - Peak detector | | | | | | | | | | | | | |
| Av - Average detector | | | | | | | | | | | | | |

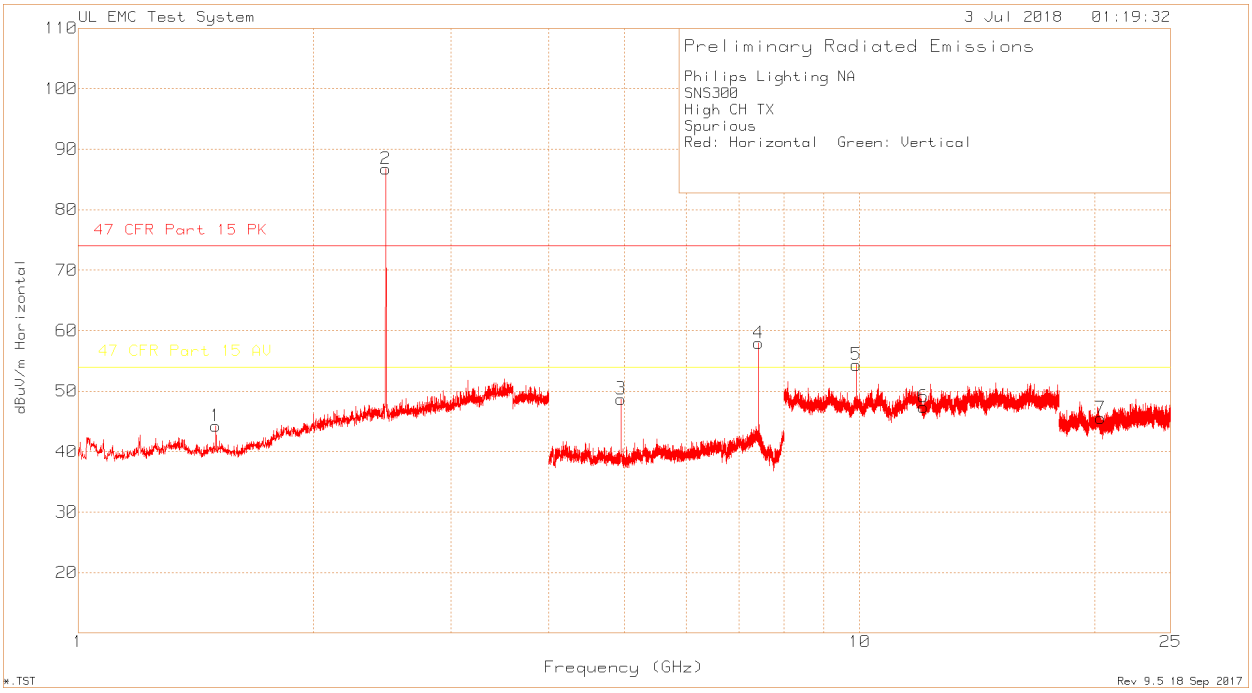
## Band Edge Data Vertical




| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Philips Lighting NA | | | | | | | | | | | | | |
| SNS300 | | | | | | | | | | | | | |
| High CH TX | | | | | | | | | | | | | |
| Vertical Antenna | | | | | | | | | | | | | |
| Red: Peak Green: Average | | | | | | | | | | | | | |
| Trace MArkers | | | | | | | | | | | | | |
| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Anteanna Factor dB/m | Path Factor dB | Level dBuV/m | BandEdge PK Limit dBuV/m | Margin (dB) | BandEdge AV Limit dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
| 1 | 2.4744 | 71.64 | Pk | 22 | 4.56 | 98.2 | - | - | - | - | 263 | 128 | V |
| 2 | 2.4834 | 30.44 | Pk | 22.1 | 4.53 | 57.07 | - | - | - | - | 263 | 128 | V |
| 3 | 2.4836 | 31.02 | Pk | 22.1 | 4.53 | 57.65 | 74 | -16.35 | - | - | 263 | 128 | V |
| 4 | 2.4877 | 30.11 | Pk | 22.1 | 4.54 | 56.75 | 74 | -17.25 | - | - | 263 | 128 | V |
| 5 | 2.475 | 68.68 | Av | 22 | 4.54 | 95.22 | - | - | - | - | 263 | 128 | V |
| 6 | 2.4833 | 19.39 | Av | 22 | 4.53 | 45.92 | - | - | - | - | 263 | 128 | V |
| 7 | 2.4837 | 19.03 | Av | 22.1 | 4.53 | 45.66 | 74 | -28.34 | 54 | -8.34 | 263 | 128 | V |
| 8 | 2.4941 | 16.67 | Av | 22.1 | 4.52 | 43.29 | 74 | -30.71 | 54 | -10.71 | 263 | 128 | V |
| Pk - Peak detector | | | | | | | | | | | | | |
| Av - Average Detector | | | | | | | | | | | | | |

**Spurious Emissions 1GHz – 25GHz**



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Philips Lighting NA
SNS300
High CH TX
Spurious
Red: Horizontal Green: Vertical
Trace MArkers

| Marker No. | Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Antenna Factor dB/m | Path Factor dB | Level dBuV/m | 47 CFR Part 15.209 PK dBuV/m | Margin (dB) | 47 CFR Part 15.209 AV dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.5 | 70.85 | Pk | 27.8 | -54.41 | 44.24 | 74 | -29.76 | 54 | -9.76 | 0-360 | 150 | H |
| 2 | 2.475 | 60.22 | Pk | 22 | 4.55 | 86.77 | 74 | 12.77 | 54 | 32.77 | 0-360 | 150 | H |
| 3 | 4.949 | 70.41 | Pk | 27.8 | -49.51 | 48.7 | 74 | -25.3 | 54 | -5.3 | 0-360 | 100 | H |
| 4 | 7.424 | 73.48 | Pk | 30.8 | -46.32 | 57.96 | 74 | -16.04 | 54 | 3.96 | 0-360 | 150 | H |
| 5 | 9.902 | 66.04 | Pk | 36.4 | -48.11 | 54.33 | 74 | -19.67 | 54 | 0.33 | 0-360 | 100 | H |
| 6 | 12.074 | 54.68 | Pk | 39.4 | -46.67 | 47.41 | 74 | -26.59 | 54 | -6.59 | 0-360 | 200 | H |
| 7 | 20.346 | 55.14 | Pk | 40.2 | -49.82 | 45.52 | 74 | -28.48 | 54 | -8.48 | 0-360 | 100 | H |
| 8 | 1.871 | 67.95 | Pk | 31 | -53.38 | 45.57 | 74 | -28.43 | 54 | -8.43 | 0-360 | 150 | V |
| 9 | 2.475 | 66.33 | Pk | 22 | 4.55 | 92.88 | 74 | 18.88 | 54 | 38.88 | 0-360 | 150 | V |
| 10 | 4.951 | 69.15 | Pk | 27.8 | -49.42 | 47.53 | 74 | -26.47 | 54 | -6.47 | 0-360 | 200 | V |
| 11 | 7.427 | 71.85 | Pk | 30.8 | -46.58 | 56.07 | 74 | -17.93 | 54 | 2.07 | 0-360 | 200 | V |
| 12 | 9.898 | 66.12 | Pk | 36.4 | -48.24 | 54.28 | 74 | -19.72 | 54 | 0.28 | 0-360 | 100 | V |
| 13 | 14.497 | 49.1 | Pk | 39.8 | -41.01 | 47.89 | 74 | -26.11 | 54 | -6.11 | 0-360 | 199 | V |
| 14 | 20.872 | 54.93 | Pk | 40.2 | -48.34 | 46.79 | 74 | -27.21 | 54 | -7.21 | 0-360 | 150 | V |

Pk - Peak detector

Radiated Emission Data

| Test Frequency (GHz) | Meter Reading (dBuV) | Detector | Antenna Factor dB/m | Path Factor dB | Level dBuV/m | DC Factor dB | Av Level with DC dB | 47 CFR Part 15.209 PK dBuV/m | Margin (dB) | 47 CFR Part 15.209 AV dBuV/m | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.9488 | 70.98 | Pk | 27.8 | -49.51 | 49.27 | -18.93 | 30.34 | 74 | -24.73 | 54 | -23.66 | 44 | 100 | H |
| 7.4262 | 74.1 | Pk | 30.8 | -46.52 | 58.38 | -18.93 | 39.45 | 74 | -15.62 | 54 | -14.55 | 76 | 187 | H |
| 7.4233 | 72.65 | Pk | 30.8 | -46.45 | 57 | -18.93 | 38.07 | 74 | -17 | 54 | -15.93 | 80 | 251 | V |
| 9.8979 | 67.16 | Pk | 36.4 | -48.25 | 55.31 | -18.93 | 36.38 | 74 | -18.69 | 54 | -17.62 | 216 | 101 | H |
| 9.9016 | 67.27 | Pk | 36.4 | -48.17 | 55.5 | -18.93 | 36.57 | 74 | -18.5 | 54 | -17.43 | 148 | 241 | V |

Pk - Peak detector



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# 10. SETUP PHOTOS

**RADIATED RF MEASUREMENT SETUP**

**1GHz - 25GHz**

**1GHz – 25GHz closeup**

# END OF REPORT



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