SmartLabs, Inc.

TEST REPORT FOR

INSTEON LED Light Bulb, 2672-222 BulbLinc

Tested To The Following Standards:

FCC Part 15 Subpart C Section 15.207 & 15.249
and
RSS-210 Issue 8

Report No.: 93071-7

Date of issue: June 4, 2012

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

SmartLabs, Inc.
16542 Millikan Ave.
Irvine, CA 92606

REPRESENTATIVE: Matthew Carter
Customer Reference Number: 12-3MC0417-01

REPORT PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 93071

DATE OF EQUIPMENT RECEIPT: May 21, 2012
DATE(S) OF TESTING: May 21 - 23, 2012

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Brea A	US0060	SL2-IN-E-1146R	3082D-1	90473	R-2945 C-3248 T-1572

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C and RSS-210

Description	Test Procedure/Method	Results
Voltage Variation	FCC Part 15 Subpart C Section 15.31(e)	Pass
Conducted Emissions	FCC Part 15 Subpart C Section 15.207	Pass
RF Power Output	FCC Part 15 Subpart C Section 15.249(a)	Pass
-20dBc Occupied Bandwidth	FCC Part 15 Subpart C Section 15.249	Pass
Field Strength of Spurious & Harmonic Emissions	FCC Part 15 Subpart C Section 15.249(b) & (d)	Pass
99 % Bandwidth	RSS-210 Issue 8	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

INSTEON LED Light Bulb
Manuf: SmartLabs, Inc.
Model: 2672-222 BulbLinc
Serial: NA

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15C requirements for Unlicensed Radio Frequency Devices, Subpart C - Intentional Radiators.

15.31(e) Voltage Variations

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **SmartLabs, Inc.**
Specification: **15.31e**
Work Order #: **93071** Date: 5/22/2012
Test Type: **Maximized Emissions** Time: 15:48:43
Equipment: **INSTEON LED Light Bulb** Sequence#: 11
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2672-222 BULBLINC
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	3/29/2012	3/29/2014
T2	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
T3	ANP05198	Cable	8268	12/21/2010	12/21/2012
T4	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

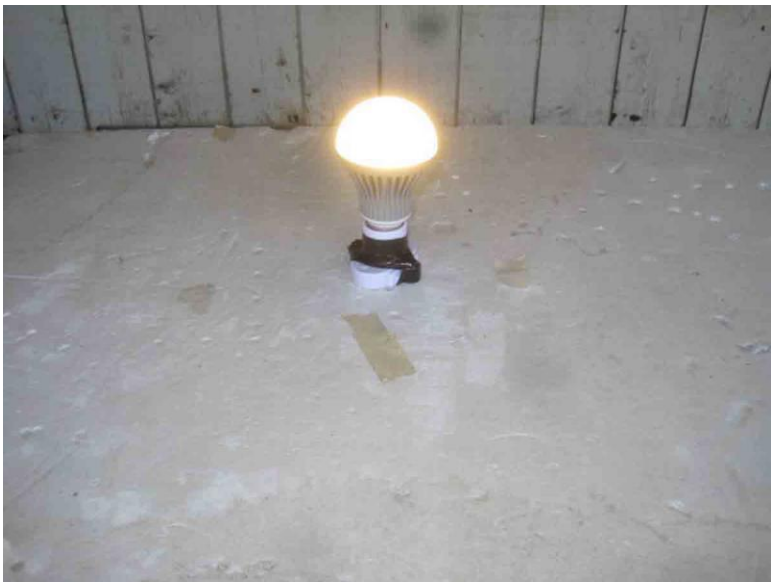
The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.
The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement =fundamental
RBW=120 kHz,VBW=120 kHz

Test environment conditions: 20°C, 52% relative humidity, 100kPa

15.31(e) compliance: the supply voltage was varied between 85% and 115% of the nominal rated supply voltage (120Vac), no change in the Fundamental signal level was observed.

Test Setup Photos



15.207 AC Conducted Emissions

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer:	**SmartLabs, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**93071**	Date:	5/22/2012
Test Type:	**Conducted Emissions**	Time:	14:04:16
Equipment:	**INSTEON LED Light Bulb**	Sequence#:	17
Manufacturer:	SmartLabs, Inc.	Tested By:	Don Nguyen
Model:	2672-222 BULBLINC		120V 60Hz
S/N:	NA		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02610	High Pass Filter	HE9615-150K-50-720B	11/21/2011	11/21/2013
T2	ANP04358	Cable	RG142	4/10/2012	4/10/2014
T3	ANP06084	Attenuator	SA18N10W-06	12/8/2010	12/8/2012
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
T4	AN00847.1	50uH LISN-Line 1 (dB)	3816/2NM	12/21/2010	12/21/2012
	AN00847.1	50uH LISN-Line 2 (dB)	3816/2NM	12/21/2010	12/21/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The EUT is placed on the wooden table. EUT is installed in fixed position. The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement = 150kHz-30MHz
150 kHz-30 MHz;RBW=9 kHz,VBW=9 kHz

Test environment conditions: 20°C, 42% relative humidity, 100kPa

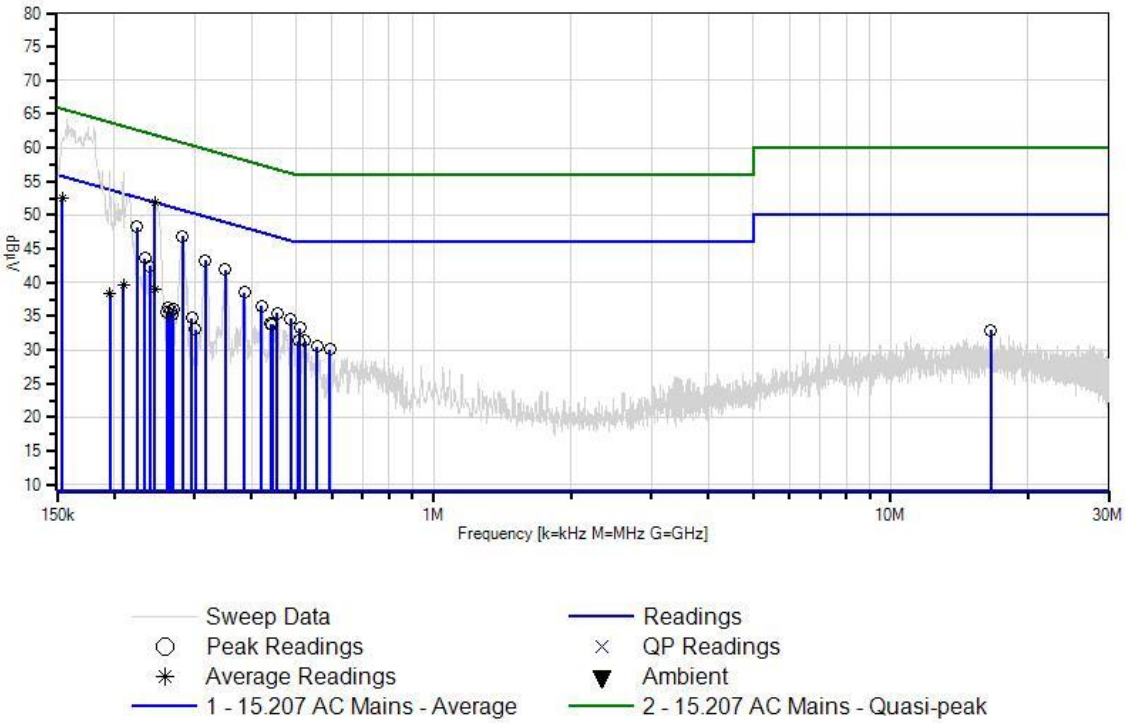
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L1 (Live)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	245.218k Ave	45.8	+0.2	+0.0	+5.8	+0.0	+0.0	51.8	51.9	-0.1	L1 (L
2	154.093k Ave	45.4	+1.4	+0.0	+5.8	+0.0	+0.0	52.6	55.8	-3.2	L1 (L
^	154.093k	59.1	+1.4	+0.0	+5.8	+0.0	+0.0	66.3	55.8	+10.5	L1 (L
^	157.998k	57.9	+0.8	+0.0	+5.8	+0.0	+0.0	64.5	55.6	+8.9	L1 (L
5	282.350k	40.9	+0.2	+0.0	+5.8	+0.0	+0.0	46.9	50.7	-3.8	L1 (L
6	224.901k	42.2	+0.2	+0.0	+5.8	+0.0	+0.0	48.2	52.6	-4.4	L1 (L
7	317.256k	37.3	+0.2	+0.1	+5.7	+0.0	+0.0	43.3	49.8	-6.5	L1 (L
8	350.708k	35.9	+0.2	+0.1	+5.7	+0.0	+0.0	41.9	48.9	-7.0	L1 (L
9	233.628k	37.6	+0.2	+0.0	+5.8	+0.0	+0.0	43.6	52.3	-8.7	L1 (L
10	239.445k	36.4	+0.2	+0.0	+5.8	+0.0	+0.0	42.4	52.1	-9.7	L1 (L
11	385.614k	32.5	+0.2	+0.1	+5.7	+0.0	+0.0	38.5	48.2	-9.7	L1 (L
12	420.520k	30.5	+0.2	+0.1	+5.7	+0.0	+0.0	36.5	47.4	-10.9	L1 (L
13	454.698k	29.5	+0.2	+0.1	+5.7	+0.0	+0.0	35.5	46.8	-11.3	L1 (L
14	486.695k	28.6	+0.2	+0.1	+5.7	+0.0	+0.0	34.6	46.2	-11.6	L1 (L
15	510.693k	27.2	+0.2	+0.1	+5.7	+0.0	+0.0	33.2	46.0	-12.8	L1 (L
16	245.218k Ave	33.1	+0.2	+0.0	+5.8	+0.0	+0.0	39.1	51.9	-12.8	L1 (L
^	248.899k	45.7	+0.2	+0.0	+5.8	+0.0	+0.0	51.7	51.8	-0.1	L1 (L
18	440.154k	27.9	+0.2	+0.1	+5.7	+0.0	+0.0	33.9	47.1	-13.2	L1 (L
19	443.790k	27.8	+0.2	+0.1	+5.7	+0.0	+0.0	33.8	47.0	-13.2	L1 (L
20	209.630k Ave	33.6	+0.2	+0.0	+5.8	+0.0	+0.0	39.6	53.2	-13.6	L1 (L
^	209.630k	50.5	+0.2	+0.0	+5.8	+0.0	+0.0	56.5	53.2	+3.3	L1 (L
^	213.993k	46.8	+0.2	+0.0	+5.8	+0.0	+0.0	52.8	53.0	-0.2	L1 (L
23	523.056k	25.3	+0.2	+0.1	+5.7	+0.0	+0.0	31.3	46.0	-14.7	L1 (L

24	507.057k	25.3	+0.2	+0.1	+5.7	+0.0	+0.0	31.3	46.0	-14.7	L1 (L
25	269.261k	30.1	+0.2	+0.0	+5.8	+0.0	+0.0	36.1	51.1	-15.0	L1 (L
26	262.716k	30.2	+0.2	+0.0	+5.8	+0.0	+0.0	36.2	51.3	-15.1	L1 (L
27	266.352k	29.8	+0.2	+0.0	+5.8	+0.0	+0.0	35.8	51.2	-15.4	L1 (L
28	555.780k	24.5	+0.2	+0.0	+5.8	+0.0	+0.0	30.5	46.0	-15.5	L1 (L
29	195.813k Ave	32.3	+0.2	+0.0	+5.8	+0.0	+0.0	38.3	53.8	-15.5	L1 (L
^	195.813k	50.7	+0.2	+0.0	+5.8	+0.0	+0.0	56.7	53.8	+2.9	L1 (L
31	295.440k	28.7	+0.2	+0.1	+5.7	+0.0	+0.0	34.7	50.4	-15.7	L1 (L
32	260.534k	29.7	+0.2	+0.0	+5.8	+0.0	+0.0	35.7	51.4	-15.7	L1 (L
33	593.595k	24.1	+0.2	+0.0	+5.8	+0.0	+0.0	30.1	46.0	-15.9	L1 (L
34	267.806k	29.2	+0.2	+0.0	+5.8	+0.0	+0.0	35.2	51.2	-16.0	L1 (L
35	16.589M	25.7	+0.2	+0.3	+5.8	+0.9	+0.0	32.9	50.0	-17.1	L1 (L
36	301.258k	27.0	+0.2	+0.1	+5.7	+0.0	+0.0	33.0	50.2	-17.2	L1 (L

CKC Laboratories, Inc. Date: 5/22/2012 Time: 14:04:16 SmartLabs, Inc. WO#: 93071
15.207 AC Mains - Average Test Lead: L1 (Live) 120V 60Hz Sequence#: 17 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **SmartLabs, Inc.**
Specification: **15.207 AC Mains - Average**
Work Order #: **93071** Date: 5/22/2012
Test Type: **Conducted Emissions** Time: 14:09:26
Equipment: **INSTEON LED Light Bulb** Sequence#: 18
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2672-222 BULBLINC 120V 60Hz
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02610	High Pass Filter	HE9615-150K-50-720B	11/21/2011	11/21/2013
T2	ANP04358	Cable	RG142	4/10/2012	4/10/2014
T3	ANP06084	Attenuator	SA18N10W-06	12/8/2010	12/8/2012
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
	AN00847.1	50uH LISN-Line 1 (dB)	3816/2NM	12/21/2010	12/21/2012
T4	AN00847.1	50uH LISN-Line 2 (dB)	3816/2NM	12/21/2010	12/21/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The EUT is placed on the wooden table. EUT is installed in fixed position. The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement = 150kHz-30MHz
150 kHz-30 MHz;RBW=9 kHz,VBW=9 kHz

Test environment conditions: 20°C, 42% relative humidity, 100kPa

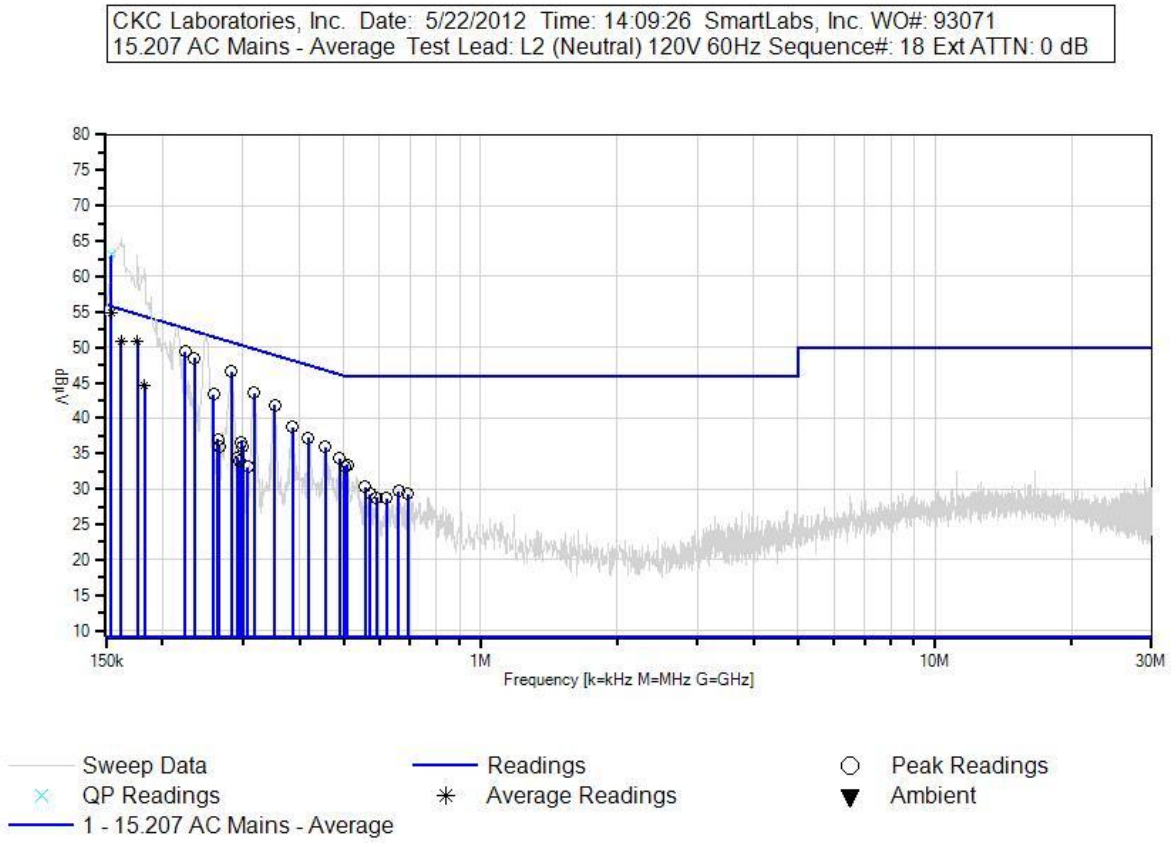
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L2 (Neutral)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	154.054k Ave	47.6	+1.4	+0.0	+5.8	+0.0	+0.0	54.8	55.8	-1.0	L2 (N
2	154.054k QP	55.8	+1.4	+0.0	+5.8	+0.0	+0.0	63.0	65.8	-2.8	L2 (N
^	154.054k	59.4	+1.4	+0.0	+5.8	+0.0	+0.0	66.6	55.8	+10.8	L2 (N
4	224.175k	43.4	+0.2	+0.0	+5.8	+0.0	+0.0	49.4	52.7	-3.3	L2 (N

5	235.083k	42.5	+0.2	+0.0	+5.8	+0.0	+0.0	48.5	52.3	-3.8	L2 (N
6	176.179k	44.7	+0.3	+0.0	+5.8	+0.0	+0.0	50.8	54.7	-3.9	L2 (N
Ave											
^	176.179k	56.8	+0.3	+0.0	+5.8	+0.0	+0.0	62.9	54.7	+8.2	L2 (N
8	283.079k	40.6	+0.2	+0.1	+5.7	+0.0	+0.0	46.6	50.7	-4.1	L2 (N
9	162.363k	44.5	+0.5	+0.0	+5.8	+0.0	+0.0	50.8	55.3	-4.5	L2 (N
Ave											
^	162.363k	59.0	+0.5	+0.0	+5.8	+0.0	+0.0	65.3	55.3	+10.0	L2 (N
11	317.985k	37.5	+0.2	+0.1	+5.7	+0.0	+0.0	43.5	49.8	-6.3	L2 (N
12	352.890k	35.8	+0.2	+0.1	+5.7	+0.0	+0.0	41.8	48.9	-7.1	L2 (N
13	259.081k	37.3	+0.2	+0.0	+5.8	+0.0	+0.0	43.3	51.5	-8.2	L2 (N
14	386.342k	32.7	+0.2	+0.1	+5.7	+0.0	+0.0	38.7	48.1	-9.4	L2 (N
15	182.724k	38.5	+0.3	+0.0	+5.8	+0.0	+0.0	44.6	54.4	-9.8	L2 (N
Ave											
^	182.724k	55.0	+0.3	+0.0	+5.8	+0.0	+0.0	61.1	54.4	+6.7	L2 (N
17	418.339k	31.2	+0.2	+0.1	+5.7	+0.0	+0.0	37.2	47.5	-10.3	L2 (N
18	455.427k	29.9	+0.2	+0.1	+5.7	+0.0	+0.0	35.9	46.8	-10.9	L2 (N
19	489.605k	28.3	+0.2	+0.1	+5.7	+0.0	+0.0	34.3	46.2	-11.9	L2 (N
20	509.240k	27.4	+0.2	+0.1	+5.7	+0.0	+0.0	33.4	46.0	-12.6	L2 (N
21	502.695k	27.2	+0.2	+0.1	+5.7	+0.0	+0.0	33.2	46.0	-12.8	L2 (N
22	297.623k	30.6	+0.2	+0.1	+5.7	+0.0	+0.0	36.6	50.3	-13.7	L2 (N
23	300.532k	30.0	+0.2	+0.1	+5.7	+0.0	+0.0	36.0	50.2	-14.2	L2 (N
24	264.171k	31.0	+0.2	+0.0	+5.8	+0.0	+0.0	37.0	51.3	-14.3	L2 (N
25	266.353k	30.0	+0.2	+0.0	+5.8	+0.0	+0.0	36.0	51.2	-15.2	L2 (N
26	558.690k	24.3	+0.2	+0.0	+5.8	+0.0	+0.0	30.3	46.0	-15.7	L2 (N
27	291.805k	28.4	+0.2	+0.1	+5.7	+0.0	+0.0	34.4	50.5	-16.1	L2 (N
28	661.953k	23.7	+0.2	+0.0	+5.8	+0.0	+0.0	29.7	46.0	-16.3	L2 (N
29	295.441k	28.0	+0.2	+0.1	+5.7	+0.0	+0.0	34.0	50.4	-16.4	L2 (N
30	573.234k	23.3	+0.2	+0.0	+5.8	+0.0	+0.0	29.3	46.0	-16.7	L2 (N

31	691.768k	23.3	+0.2	+0.0	+5.8	+0.0	+0.0	29.3	46.0	-16.7	L2 (N
32	307.804k	27.1	+0.2	+0.1	+5.7	+0.0	+0.0	33.1	50.0	-16.9	L2 (N
33	590.687k	22.8	+0.2	+0.0	+5.8	+0.0	+0.0	28.8	46.0	-17.2	L2 (N
34	622.684k	22.7	+0.2	+0.0	+5.8	+0.0	+0.0	28.7	46.0	-17.3	L2 (N



Test Setup Photos

15.249(a) RF Power Output

Test Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **SmartLabs, Inc.**
Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
Work Order #: **93071** Date: 5/22/2012
Test Type: **Maximized Emissions** Time: 15:48:43
Equipment: **INSTEON LED Light Bulb** Sequence#: 11
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2672-222 BULBLINC
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	3/29/2012	3/29/2014
T2	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
T3	ANP05198	Cable	8268	12/21/2010	12/21/2012
T4	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.
The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement =fundamental
RBW=120 kHz,VBW=120 kHz

Test environment conditions: 20°C, 52% relative humidity, 100kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	914.923M	72.1	-27.2	+0.5	+5.8	+22.7	+0.0	73.9	94.0	-20.1	Vert
2	915.083M	72.1	-27.2	+0.5	+5.8	+22.7	+0.0	73.9	94.0	-20.1	Vert
3	915.083M	67.4	-27.2	+0.5	+5.8	+22.7	+0.0	69.2	94.0	-24.8	Horiz
4	914.923M	67.4	-27.2	+0.5	+5.8	+22.7	+0.0	69.2	94.0	-24.8	Horiz

Test Setup Photos

-20dBc Occupied Bandwidth

Test Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **SmartLabs, Inc.**
Specification: **OBW**
Work Order #: **93071** Date: 5/22/2012
Test Type: **Maximized Emissions** Time: 15:48:43
Equipment: **INSTEON LED Light Bulb** Sequence#: 11
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2672-222 BULBLINC
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	3/29/2012	3/29/2014
T2	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
T3	ANP05198	Cable	8268	12/21/2010	12/21/2012
T4	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

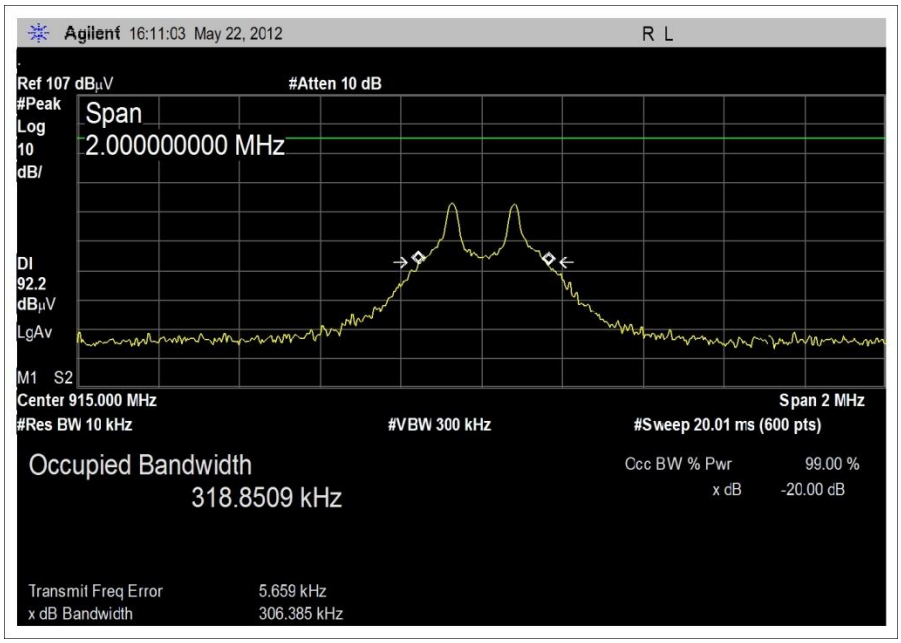
Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

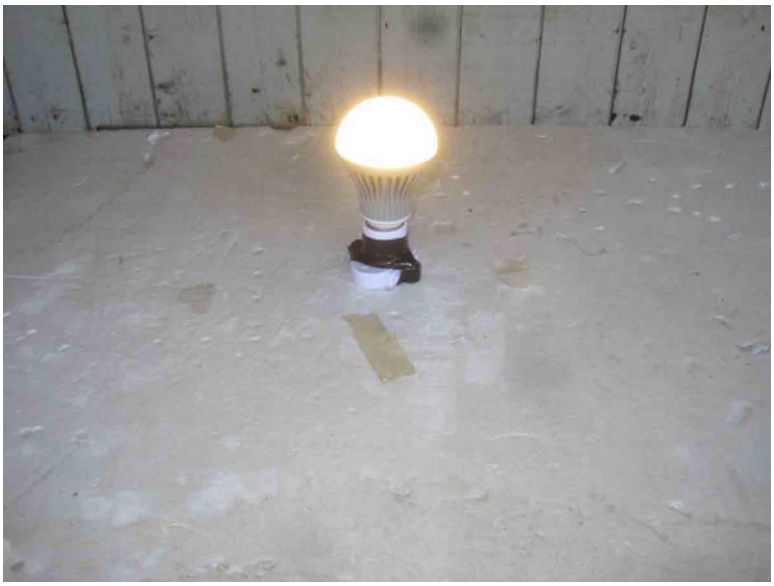
The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.
The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement =fundamental
RBW=120 kHz,VBW=120 kHz

Test environment conditions: 20°C, 52% relative humidity, 100kPa


Agilent 16:11:03 May 22, 2012
R L
Ref 107 dBµV
#Atten 10 dB
#Peak
Log
10
dB/
Span
2.000000000 MHz
DI
92.2
dBµV
LgAv
M1 S2
Center 915.000 MHz
Span 2 MHz
#Res BW 10 kHz
#VBW 300 kHz
#Sweep 20.01 ms (600 pts)
Occupied Bandwidth
318.8509 kHz
Ccc BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 5.659 kHz
x dB Bandwidth 306.385 kHz

Test Setup Photos



Bandedge

Test Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **SmartLabs, Inc.**
Specification: **Bandedge**
Work Order #: **93071** Date: 5/22/2012
Test Type: **Maximized Emissions** Time: 15:48:43
Equipment: **INSTEON LED Light Bulb** Sequence#: 11
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2672-222 BULBLINC
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	3/29/2012	3/29/2014
T2	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
T3	ANP05198	Cable	8268	12/21/2010	12/21/2012
T4	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

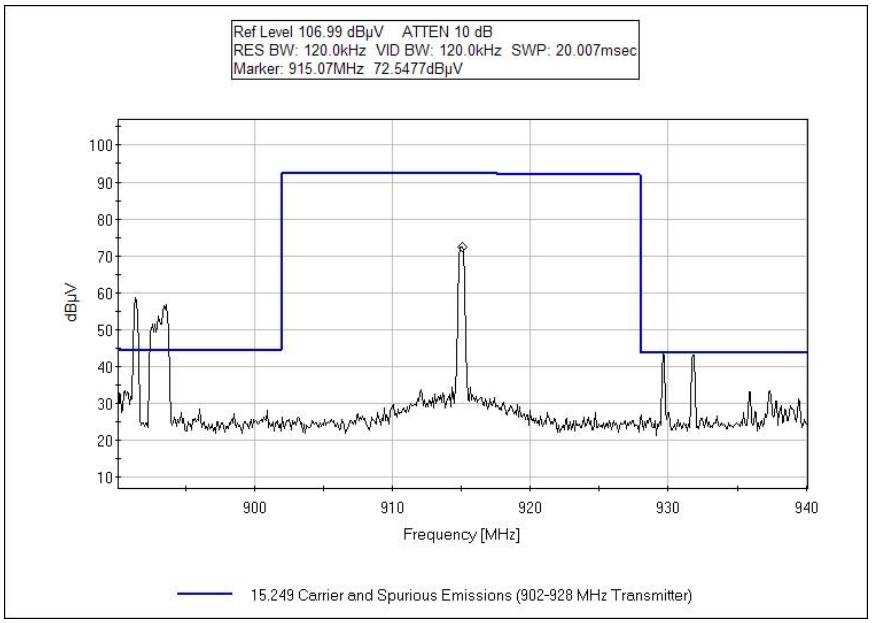
Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

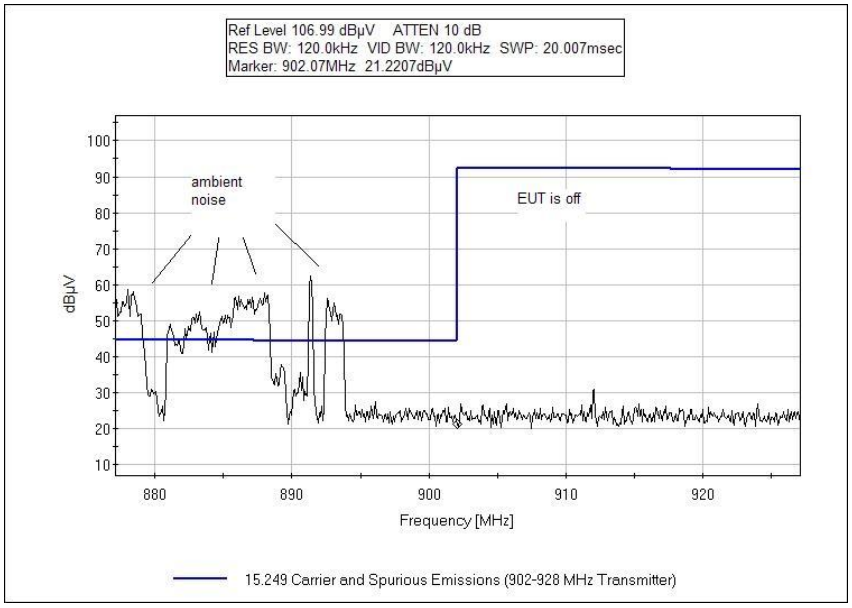
The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.
The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement =fundamental
RBW=120 kHz,VBW=120 kHz

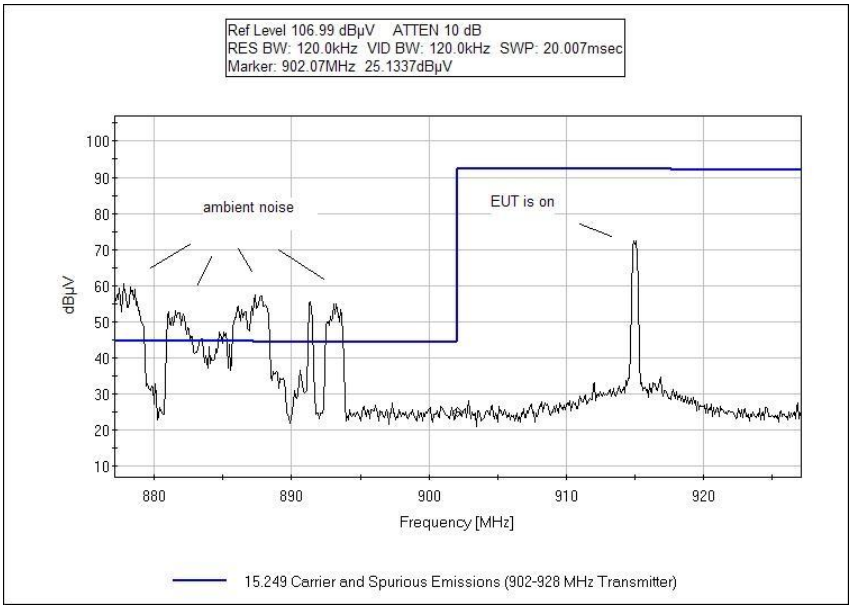
Test environment conditions: 20°C, 52% relative humidity, 100kPa



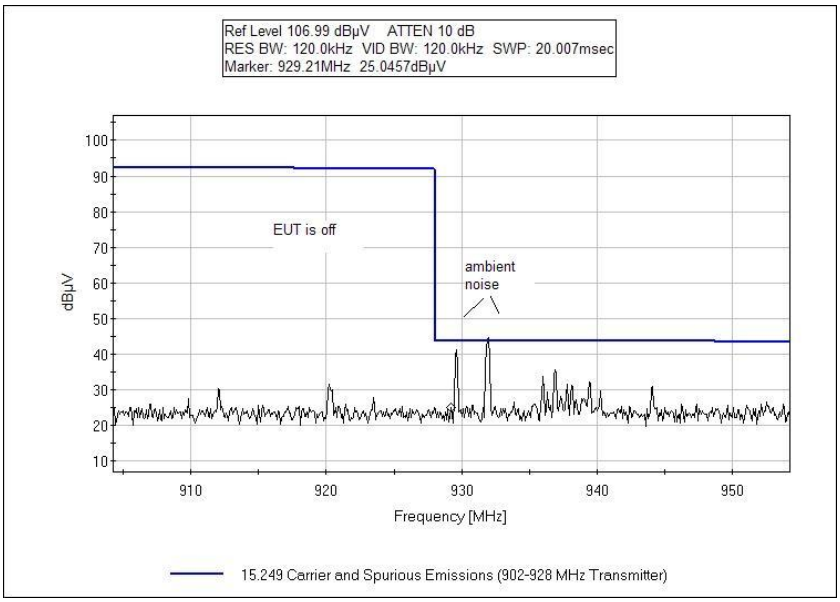
Center



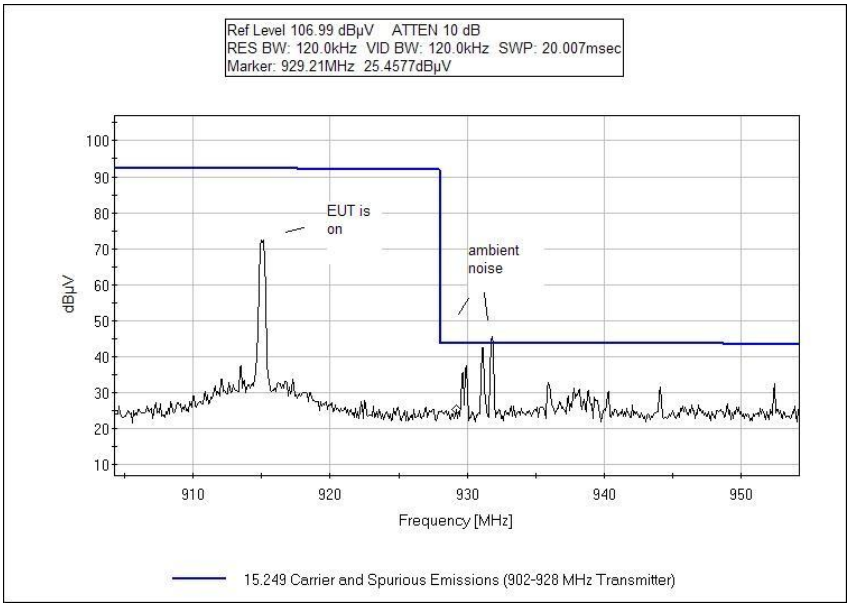
Left Bandedge with Tx Off



Left Bandedge with Tx On

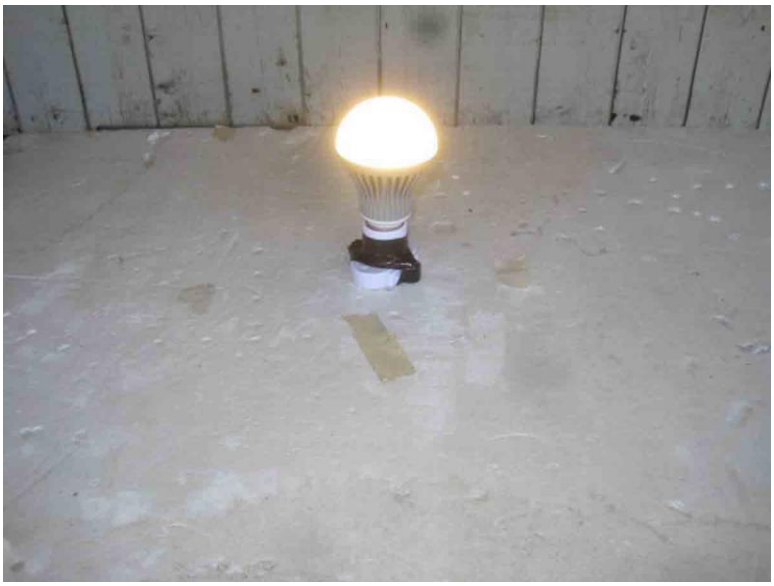


Right Bandedge with Tx Off



Right Bandedge with Tx On

Test Setup Photos



15.249(b)&(d) Field Strength of Spurious & Harmonic Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **SmartLabs, Inc.**
Specification: **15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)**
Work Order #: **93071** Date: 5/23/2012
Test Type: **Maximized Emissions** Time: 08:48:31
Equipment: **INSTEON LED Light Bulb** Sequence#: 10
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2672-222 BULBLINC
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	3/29/2012	3/29/2014
T2	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
T3	ANP05198	Cable	8268	12/21/2010	12/21/2012
T4	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
T5	AN00786	Preamp	83017A	8/5/2010	8/5/2012
T6	AN01646	Horn Antenna	3115	4/13/2012	4/13/2014
T7	AN03239	Cable	32022-2-29094K-24TC	8/30/2011	8/30/2013
T8	ANP05421	Cable	Sucoflex 104A	2/8/2012	2/8/2014
T9	ANP06081	Cable	L1-PNMNM-48	4/28/2011	4/28/2013
T10	AN03169	High Pass Filter	HM1155-11SS	9/22/2011	9/22/2013
	AN00314	Loop Antenna	6502	6/30/2010	6/30/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.
The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement = 9kHz-10GHz
9 kHz -150 kHz;RBW=200 Hz,VBW=200 Hz;
150 kHz-30 MHz;RBW=9 kHz,VBW=9 kHz;
30 MHz-1000 MHz;RBW=120 kHz,VBW=120 kHz,
1000 MHz-10000 MHz;RBW=1 MHz,VBW=1 MHz.

Test environment conditions: 20°C, 52% relative humidity, 100kPa

Ext Attn: 0 dB

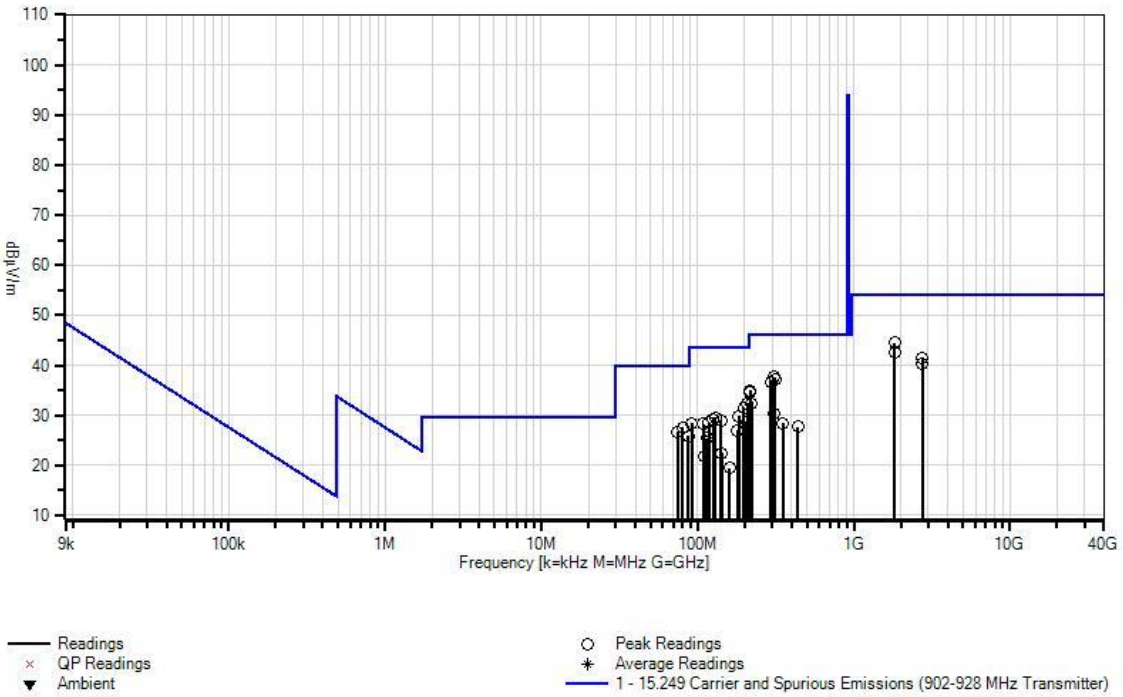
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	305.580M	48.8	-27.8 +0.0 +0.0	+0.2 +0.0 +0.0	+3.1 +0.0	+13.3 +0.0	+0.0	37.6	46.0	-8.4	Horiz
2	312.080M	48.1	-27.8 +0.0 +0.0	+0.2 +0.0 +0.0	+3.2 +0.0	+13.5 +0.0	+0.0	37.2	46.0	-8.8	Horiz
3	295.580M	48.0	-27.8 +0.0 +0.0	+0.2 +0.0 +0.0	+3.1 +0.0	+13.1 +0.0	+0.0	36.6	46.0	-9.4	Horiz
4	1830.030M	50.3	+0.0 -38.2 +2.8	+0.0 +27.8 +0.4	+0.0 +0.3	+0.0 +1.1	+0.0	44.5	54.0	-9.5	Vert
5	217.280M	49.6	-27.8 +0.0 +0.0	+0.2 +0.0 +0.0	+2.6 +0.0	+10.3 +0.0	+0.0	34.9	46.0	-11.1	Horiz
6	207.250M	48.0	-27.9 +0.0 +0.0	+0.2 +0.0 +0.0	+2.5 +0.0	+9.6 +0.0	+0.0	32.4	43.5	-11.1	Vert
7	209.280M	47.7	-27.9 +0.0 +0.0	+0.2 +0.0 +0.0	+2.5 +0.0	+9.7 +0.0	+0.0	32.2	43.5	-11.3	Horiz
8	218.250M	49.2	-27.8 +0.0 +0.0	+0.2 +0.0 +0.0	+2.6 +0.0	+10.4 +0.0	+0.0	34.6	46.0	-11.4	Vert
9	1830.030M	48.3	+0.0 -38.2 +2.8	+0.0 +27.8 +0.4	+0.0 +0.3	+0.0 +1.1	+0.0	42.5	54.0	-11.5	Horiz
10	197.250M	47.6	-27.9 +0.0 +0.0	+0.2 +0.0 +0.0	+2.5 +0.0	+9.0 +0.0	+0.0	31.4	43.5	-12.1	Vert

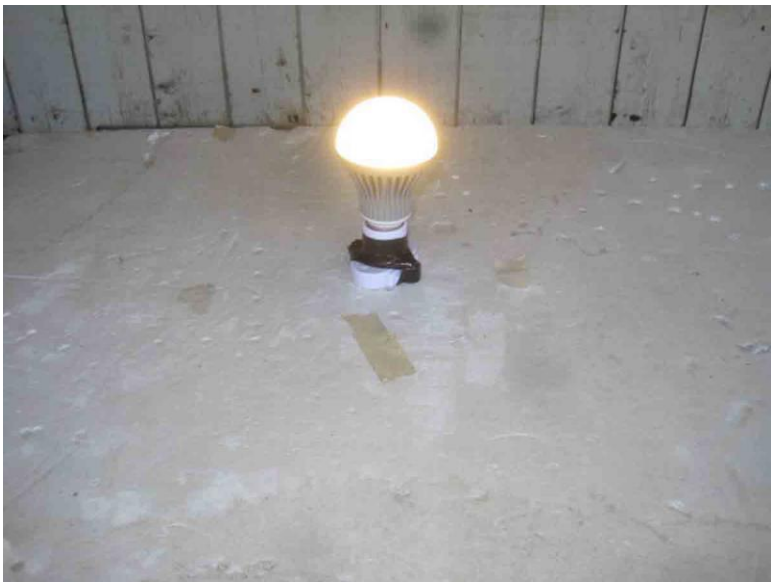
11	80.500M	46.8	-28.1 +0.0 +0.0	+0.1 +0.0 +0.0	+1.5 +0.0	+7.3 +0.0	+0.0	27.6	40.0	-12.4	Vert
12	2745.030M	45.1	+0.0 -37.8 +3.4	+0.0 +28.7 +0.3	+0.0 +0.4	+0.0 +1.4	+0.0	41.5	54.0	-12.5	Vert
13	74.300M	46.8	-28.1 +0.0 +0.0	+0.1 +0.0 +0.0	+1.4 +0.0	+6.5 +0.0	+0.0	26.7	40.0	-13.3	Vert
14	220.750M	46.9	-27.8 +0.0 +0.0	+0.2 +0.0 +0.0	+2.6 +0.0	+10.5 +0.0	+0.0	32.4	46.0	-13.6	Vert
15	2745.030M	44.0	+0.0 -37.8 +3.4	+0.0 +28.7 +0.3	+0.0 +0.4	+0.0 +1.4	+0.0	40.4	54.0	-13.6	Horiz
16	183.950M	46.2	-27.9 +0.0 +0.0	+0.2 +0.0 +0.0	+2.4 +0.0	+8.9 +0.0	+0.0	29.8	43.5	-13.7	Vert
17	129.330M	43.7	-28.0 +0.0 +0.0	+0.2 +0.0 +0.0	+1.9 +0.0	+11.7 +0.0	+0.0	29.5	43.5	-14.0	Horiz
18	87.200M	44.1	-28.1 +0.0 +0.0	+0.1 +0.0 +0.0	+1.6 +0.0	+8.2 +0.0	+0.0	25.9	40.0	-14.1	Vert
19	125.830M	43.4	-28.0 +0.0 +0.0	+0.2 +0.0 +0.0	+1.9 +0.0	+11.7 +0.0	+0.0	29.2	43.5	-14.3	Horiz
20	141.330M	43.3	-27.9 +0.0 +0.0	+0.1 +0.0 +0.0	+2.0 +0.0	+11.5 +0.0	+0.0	29.0	43.5	-14.5	Horiz
21	205.780M	44.5	-27.9 +0.0 +0.0	+0.2 +0.0 +0.0	+2.5 +0.0	+9.4 +0.0	+0.0	28.7	43.5	-14.8	Horiz
22	118.080M	43.2	-28.0 +0.0 +0.0	+0.2 +0.0 +0.0	+1.8 +0.0	+11.4 +0.0	+0.0	28.6	43.5	-14.9	Horiz
23	91.800M	46.1	-28.1 +0.0 +0.0	+0.1 +0.0 +0.0	+1.6 +0.0	+8.7 +0.0	+0.0	28.4	43.5	-15.1	Vert
24	108.200M	43.9	-28.0 +0.0 +0.0	+0.1 +0.0 +0.0	+1.8 +0.0	+10.5 +0.0	+0.0	28.3	43.5	-15.2	Vert
25	310.800M	41.4	-27.8 +0.0 +0.0	+0.2 +0.0 +0.0	+3.1 +0.0	+13.5 +0.0	+0.0	30.4	46.0	-15.6	Vert
26	180.750M	43.5	-27.9 +0.0 +0.0	+0.2 +0.0 +0.0	+2.3 +0.0	+8.9 +0.0	+0.0	27.0	43.5	-16.5	Vert
27	119.500M	40.9	-28.0 +0.0 +0.0	+0.2 +0.0 +0.0	+1.9 +0.0	+11.6 +0.0	+0.0	26.6	43.5	-16.9	Vert

28	352.580M	37.9	-27.9 +0.0 +0.0	+0.3 +0.0 +0.0	+3.3 +0.0	+14.8 +0.0	+0.0	28.4	46.0	-17.6	Horiz
29	114.150M	40.3	-28.0 +0.0 +0.0	+0.2 +0.0 +0.0	+1.8 +0.0	+11.1 +0.0	+0.0	25.4	43.5	-18.1	Vert
30	438.800M	34.5	-27.8 +0.0 +0.0	+0.3 +0.0 +0.0	+3.8 +0.0	+16.9 +0.0	+0.0	27.7	46.0	-18.3	Vert
31	142.250M	36.9	-27.9 +0.0 +0.0	+0.1 +0.0 +0.0	+2.0 +0.0	+11.4 +0.0	+0.0	22.5	43.5	-21.0	Vert
32	110.030M	37.2	-28.0 +0.0 +0.0	+0.1 +0.0 +0.0	+1.8 +0.0	+10.7 +0.0	+0.0	21.8	43.5	-21.7	Horiz
33	160.850M	34.6	-27.9 +0.0 +0.0	+0.1 +0.0 +0.0	+2.2 +0.0	+10.4 +0.0	+0.0	19.4	43.5	-24.1	Vert

CKC Laboratories, Inc. Date: 5/23/2012 Time: 08:48:31 SmartLabs, Inc. WO#: 93071
15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Sequence#: 10 Ext
ATTN: 0 dB



Test Setup Photos



RSS-210

99 % Bandwidth

Test Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **SmartLabs, Inc.**
Specification: **99% BW**
Work Order #: **93071** Date: 5/22/2012
Test Type: **Maximized Emissions** Time: 15:48:43
Equipment: **INSTEON LED Light Bulb** Sequence#: 11
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2672-222 BULBLINC
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	3/29/2012	3/29/2014
T2	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
T3	ANP05198	Cable	8268	12/21/2010	12/21/2012
T4	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
INSTEON LED Light Bulb*	SmartLabs, Inc.	2672-222 BULBLINC	NA

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.
The EUT is set in constant transmit mode.
Voltage input: 120Vac/60Hz
TX freq = 914.5-915.5 MHz

Frequency range of measurement =fundamental
RBW=120 kHz,VBW=120 kHz

Test environment conditions: 20°C, 52% relative humidity, 100kPa

Test Setup Photos

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.