

SmartLabs, Inc.

TEST REPORT FOR

**INSTEON LED Bulb
Model: 2672-452**

Tested To The Following Standards:

FCC Part 15 Subpart C Sections 15.207 & 15.249

Report No.: 95045-8

Date of issue: October 30, 2013



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.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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

REPORT PREPARED BY:

Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

REPRESENTATIVE: John Lockyer
Customer Reference Number: 13-3JL1018-01

Project Number: 95045

DATE OF EQUIPMENT RECEIPT:

October 21, 2013

DATE(S) OF TESTING:

October 21 - 22, 2013

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.

A handwritten signature in black ink that reads "Steve Behm". The signature is written in a cursive style and is positioned above a horizontal line.

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

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Brea D	US0060	SL2-IN-E-1146R	3082D-2	100638	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C

Description	Test Procedure/Method	Results
Conducted Emissions	FCC Part 15 Subpart C Section 15.207 / ANSI C63.4 / ANSI C63.10	Pass
Fundamental Field Strength	FCC Part 15 Subpart C Section 15.249(a) / ANSI C63.4 / ANSI C63.10	Pass
Voltage Variation	FCC Part 15 Subpart C Section 15.31(e) / ANSI C63.4 / ANSI C63.10	Pass
Occupied Bandwidth	FCC Part 15 Subpart C Section 15.215(c) / ANSI C63.4 / ANSI C63.10	Pass
Radiated Spurious Emissions	FCC Part 15 Subpart C Section 15.249(a) / ANSI C63.4 / ANSI C63.10	Pass
Band Edge	FCC Part 15 Subpart C 15.249(d) / ANSI C63.4 / ANSI C63.10	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 Bulb

Manuf: SmartLabs, Inc.

Model: 2672-452

Serial: None

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.

15.207 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 #: **95045**

Date: 10/21/2013

Test Type: **Conducted Emissions**

Time: 8:49:37 AM

Equipment: **INSTEON LED Bulb**

Sequence#: 13

Manufacturer: SmartLabs, Inc.

Tested By: Don Nguyen

Model: 2672-452

120V 60Hz

S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
	AN02672	Spectrum Analyzer	E4446A	9/4/2012	9/4/2014
T4	AN00969A	50uH LISN-Line 1 (L1) (dB)	3816/2NM	3/12/2013	3/12/2015
	AN00969A	50uH LISN-Line 2 (L2) (dB)	3816/2NM	3/12/2013	3/12/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
INSTEON LED Bulb*	SmartLabs, Inc.	2672-452	NA

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The EUT is placed on wooden table. EUT is turned on and set into transmit always mode.
Operating frequency: 914.5-915.5MHz

Frequency Range: 150kHz-30MHz
VBW=RBW=9kHz

Temp: 19°C, 30% Relative Humidity, 100.1kpa

Site D

Ext Attn: 0 dB

Measurement Data:

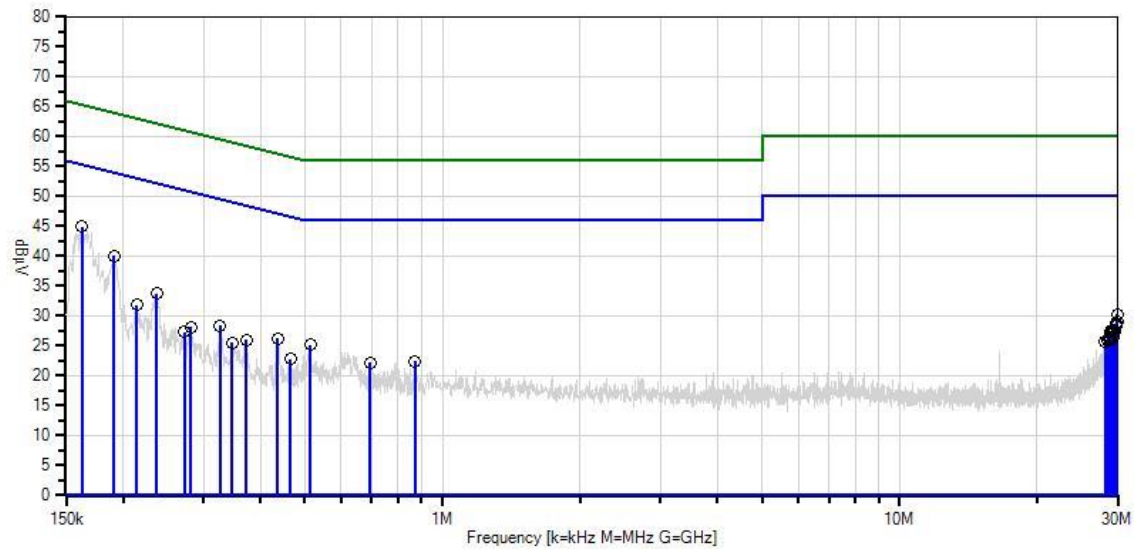
Reading listed by margin.

Test Lead: L1(L)

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	162.363k	38.5	+5.7	+0.1	+0.5	+0.1	+0.0	44.9	55.3	-10.4	L1(L)
2	190.724k	34.0	+5.7	+0.1	+0.2	+0.1	+0.0	40.1	54.0	-13.9	L1(L)
3	237.265k	27.7	+5.7	+0.1	+0.2	+0.1	+0.0	33.8	52.2	-18.4	L1(L)
4	29.966M	21.9	+5.8	+0.5	+0.3	+1.8	+0.0	30.3	50.0	-19.7	L1(L)
5	436.519k	20.2	+5.7	+0.1	+0.2	+0.1	+0.0	26.3	47.1	-20.8	L1(L)
6	513.603k	19.1	+5.7	+0.1	+0.2	+0.1	+0.0	25.2	46.0	-20.8	L1(L)
7	29.931M	20.7	+5.8	+0.5	+0.3	+1.8	+0.0	29.1	50.0	-20.9	L1(L)
8	213.994k	25.7	+5.7	+0.1	+0.2	+0.1	+0.0	31.8	53.0	-21.2	L1(L)
9	325.984k	22.3	+5.7	+0.1	+0.2	+0.1	+0.0	28.4	49.6	-21.2	L1(L)
10	29.699M	20.4	+5.8	+0.5	+0.3	+1.8	+0.0	28.8	50.0	-21.2	L1(L)
11	29.836M	20.2	+5.8	+0.5	+0.3	+1.8	+0.0	28.6	50.0	-21.4	L1(L)
12	29.746M	19.9	+5.8	+0.5	+0.3	+1.8	+0.0	28.3	50.0	-21.7	L1(L)
13	372.525k	19.9	+5.7	+0.1	+0.2	+0.1	+0.0	26.0	48.4	-22.4	L1(L)
14	29.294M	19.2	+5.8	+0.5	+0.3	+1.8	+0.0	27.6	50.0	-22.4	L1(L)
15	29.253M	19.1	+5.8	+0.5	+0.3	+1.8	+0.0	27.5	50.0	-22.5	L1(L)
16	280.897k	22.1	+5.7	+0.1	+0.2	+0.1	+0.0	28.2	50.8	-22.6	L1(L)
17	28.945M	19.0	+5.8	+0.5	+0.3	+1.8	+0.0	27.4	50.0	-22.6	L1(L)
18	29.561M	19.0	+5.8	+0.5	+0.3	+1.8	+0.0	27.4	50.0	-22.6	L1(L)

19	29.418M	18.9	+5.8	+0.5	+0.3	+1.8	+0.0	27.3	50.0	-22.7	L1(L)
20	346.346k	19.4	+5.7	+0.1	+0.2	+0.1	+0.0	25.5	49.0	-23.5	L1(L)
21	29.445M	18.1	+5.8	+0.5	+0.3	+1.8	+0.0	26.5	50.0	-23.5	L1(L)
22	869.934k	16.4	+5.7	+0.1	+0.1	+0.1	+0.0	22.4	46.0	-23.6	L1(L)
23	28.876M	18.0	+5.8	+0.5	+0.3	+1.8	+0.0	26.4	50.0	-23.6	L1(L)
24	272.171k	21.2	+5.7	+0.1	+0.2	+0.1	+0.0	27.3	51.1	-23.8	L1(L)
25	464.880k	16.7	+5.7	+0.1	+0.2	+0.1	+0.0	22.8	46.6	-23.8	L1(L)
26	695.404k	16.1	+5.7	+0.1	+0.2	+0.1	+0.0	22.2	46.0	-23.8	L1(L)
27	28.712M	17.8	+5.8	+0.5	+0.3	+1.7	+0.0	26.1	50.0	-23.9	L1(L)
28	28.616M	17.6	+5.8	+0.5	+0.3	+1.7	+0.0	25.9	50.0	-24.1	L1(L)
29	28.917M	17.5	+5.8	+0.5	+0.3	+1.8	+0.0	25.9	50.0	-24.1	L1(L)
30	28.143M	17.4	+5.8	+0.5	+0.3	+1.7	+0.0	25.7	50.0	-24.3	L1(L)

CKC Laboratories, Inc. Date: 10/21/2013 Time: 8:49:37 AM SmartLabs, Inc. WO#: 95045
 15.207 AC Mains - Average Test Lead: L1(L) 120V 60Hz Sequence#: 13 Ext ATTN: 0 dB



— Sweep Data	— Readings
○ Peak Readings	× QP Readings
* Average Readings	▼ Ambient
— 1 - 15.207 AC Mains - Average	— 2 - 15.207 AC Mains - Quasi-peak

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 #: **95045**
Test Type: **Conducted Emissions**
Equipment: **INSTEON LED Bulb**
Manufacturer: **SmartLabs, Inc.**
Model: **2672-452**
S/N: **NA**

Date: 10/21/2013
Time: 8:53:30 AM
Sequence#: 14
Tested By: Don Nguyen
120V 60Hz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T2	ANP01910	Cable	RG-142	2/6/2012	2/6/2014
T3	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
	AN02672	Spectrum Analyzer	E4446A	9/4/2012	9/4/2014
	AN00969A	50uH LISN-Line 1 (L1) (dB)	3816/2NM	3/12/2013	3/12/2015
T4	AN00969A	50uH LISN-Line 2 (L2) (dB)	3816/2NM	3/12/2013	3/12/2015

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
INSTEON LED Bulb*	SmartLabs, Inc.	2672-452	NA

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The EUT is placed on wooden table. EUT is turned on and set into transmit always mode.
Operating frequency: 914.5-915.5MHz

Frequency Range: 150kHz-30MHz
VBW=RBW=9kHz

Temp: 19°C, 30% Relative Humidity, 100.1kpa

Site D

Ext Attn: 0 dB

Measurement Data:

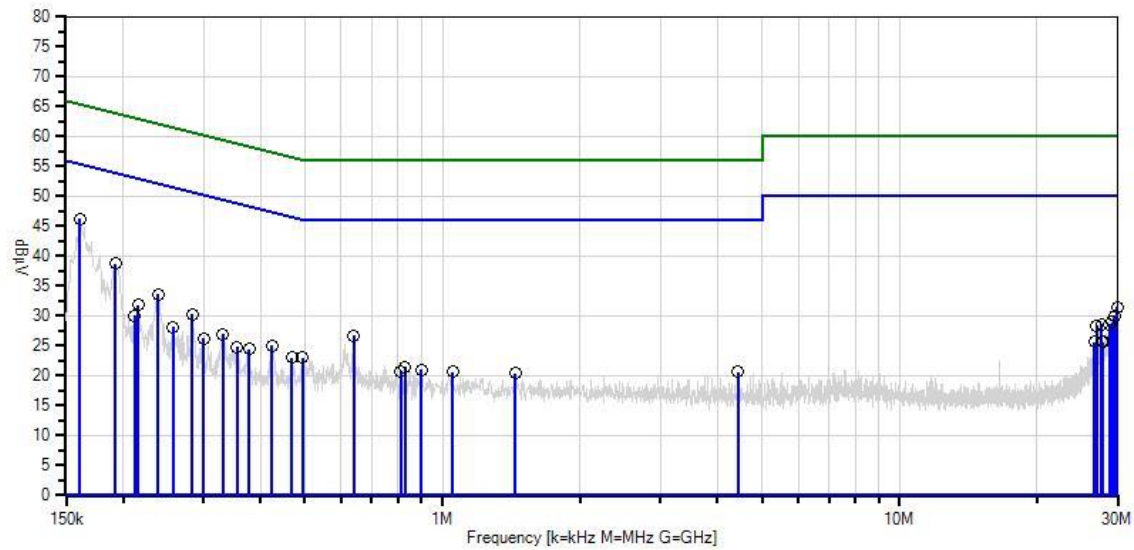
Reading listed by margin.

Test Lead: L2(N)

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	160.908k	40.0	+5.7	+0.1	+0.5	+0.0	+0.0	46.3	55.4	-9.1	L2(N)
2	192.178k	32.7	+5.7	+0.1	+0.2	+0.0	+0.0	38.7	53.9	-15.2	L2(N)
3	238.719k	27.6	+5.7	+0.1	+0.2	+0.0	+0.0	33.6	52.1	-18.5	L2(N)
4	29.918M	23.1	+5.8	+0.5	+0.3	+1.8	+0.0	31.5	50.0	-18.5	L2(N)
5	639.410k	20.7	+5.7	+0.1	+0.2	+0.0	+0.0	26.7	46.0	-19.3	L2(N)

6	29.486M	21.6	+5.8	+0.5	+0.3	+1.8	+0.0	30.0	50.0	-20.0	L2(N)
7	283.806k	24.3	+5.7	+0.1	+0.2	+0.0	+0.0	30.3	50.7	-20.4	L2(N)
8	29.185M	20.6	+5.8	+0.5	+0.3	+1.8	+0.0	29.0	50.0	-21.0	L2(N)
9	215.449k	25.9	+5.7	+0.1	+0.2	+0.0	+0.0	31.9	53.0	-21.1	L2(N)
10	27.650M	20.3	+5.8	+0.5	+0.3	+1.7	+0.0	28.6	50.0	-21.4	L2(N)
11	28.808M	20.2	+5.8	+0.5	+0.3	+1.8	+0.0	28.6	50.0	-21.4	L2(N)
12	27.026M	20.3	+5.8	+0.4	+0.3	+1.6	+0.0	28.4	50.0	-21.6	L2(N)
13	424.157k	19.1	+5.7	+0.1	+0.2	+0.0	+0.0	25.1	47.4	-22.3	L2(N)
14	330.347k	21.0	+5.7	+0.1	+0.2	+0.0	+0.0	27.0	49.4	-22.4	L2(N)
15	493.968k	17.0	+5.7	+0.1	+0.2	+0.0	+0.0	23.0	46.1	-23.1	L2(N)
16	211.813k	24.0	+5.7	+0.1	+0.2	+0.0	+0.0	30.0	53.1	-23.1	L2(N)
17	256.899k	22.2	+5.7	+0.1	+0.2	+0.0	+0.0	28.2	51.5	-23.3	L2(N)
18	468.516k	17.0	+5.7	+0.1	+0.2	+0.0	+0.0	23.0	46.5	-23.5	L2(N)
19	377.615k	18.5	+5.7	+0.1	+0.2	+0.0	+0.0	24.5	48.3	-23.8	L2(N)
20	299.804k	20.3	+5.7	+0.1	+0.2	+0.0	+0.0	26.3	50.2	-23.9	L2(N)
21	355.072k	18.8	+5.7	+0.1	+0.2	+0.0	+0.0	24.8	48.8	-24.0	L2(N)
22	27.890M	17.4	+5.8	+0.5	+0.3	+1.7	+0.0	25.7	50.0	-24.3	L2(N)
23	26.677M	17.5	+5.8	+0.4	+0.3	+1.6	+0.0	25.6	50.0	-24.4	L2(N)
24	27.677M	17.3	+5.8	+0.5	+0.3	+1.7	+0.0	25.6	50.0	-24.4	L2(N)
25	828.483k	15.6	+5.7	+0.1	+0.1	+0.0	+0.0	21.5	46.0	-24.5	L2(N)
26	898.469k	15.1	+5.7	+0.1	+0.1	+0.0	+0.0	21.0	46.0	-25.0	L2(N)
27	809.576k	14.9	+5.7	+0.1	+0.1	+0.0	+0.0	20.8	46.0	-25.2	L2(N)
28	4.437M	14.6	+5.7	+0.2	+0.1	+0.1	+0.0	20.7	46.0	-25.3	L2(N)
29	1.052M	14.6	+5.7	+0.1	+0.1	+0.1	+0.0	20.6	46.0	-25.4	L2(N)
30	1.443M	14.3	+5.7	+0.1	+0.2	+0.1	+0.0	20.4	46.0	-25.6	L2(N)

CKC Laboratories, Inc. Date: 10/21/2013 Time: 8:53:30 AM SmartLabs, Inc. WO#: 95045
 15.207 AC Mains - Average Test Lead: L2(N) 120V 60Hz Sequence#: 14 Ext ATTN: 0 dB



— Sweep Data	— Readings
○ Peak Readings	× QP Readings
* Average Readings	▼ Ambient
— 1 - 15.207 AC Mains - Average	— 2 - 15.207 AC Mains - Quasi-peak

Test Setup Photos



15.249(a) Fundamental Field Strength

Test Data Sheets

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 #: **95045**

Date: 10/21/2013

Test Type: **Maximized Emissions**

Time: 14:56:54

Equipment: **INSTEON LED Bulb**

Sequence#: 14

Manufacturer: SmartLabs, Inc.

Tested By: Don Nguyen

Model: 2672-452

S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamplifier	8447D	3/29/2012	3/29/2014
T2	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
	AN02672	Spectrum Analyzer	E4446A	9/4/2012	9/4/2014

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
INSTEON LED Bulb*	SmartLabs, Inc.	2672-452	NA

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position. EUT is turned on and set into transmit always mode.

Operating frequency: 914.5-915.5MHz

Frequency Range: fundamental

RBW=VBW=120kHz

Temp: 21°C, 31% Relative Humidity, 100.2kpa

Site D

Ext Attn: 0 dB

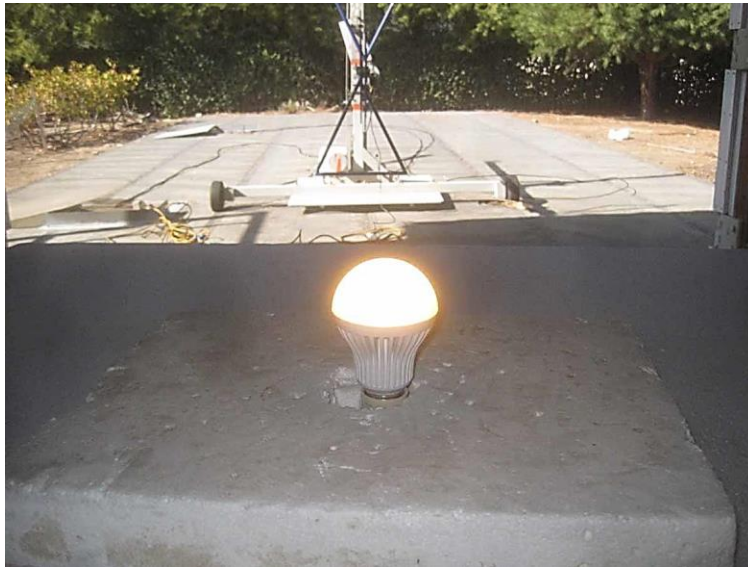
Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	914.920M QP	89.8	-27.4 +3.6	+22.2	+0.5	+3.5	+0.0	92.2	94.0	-1.8	Vert
^	914.920M	90.1	-27.4 +3.6	+22.2	+0.5	+3.5	+0.0	92.5	94.0	-1.5	Vert
3	915.070M QP	89.7	-27.4 +3.6	+22.2	+0.5	+3.5	+0.0	92.1	94.0	-1.9	Vert
^	915.070M	89.8	-27.4 +3.6	+22.2	+0.5	+3.5	+0.0	92.2	94.0	-1.8	Vert
5	914.919M	82.0	-27.4 +3.6	+22.2	+0.5	+3.5	+0.0	84.4	94.0	-9.6	Horiz
6	915.069M	81.9	-27.4 +3.6	+22.2	+0.5	+3.5	+0.0	84.3	94.0	-9.7	Horiz

Test Setup Photos



15.31(e) Voltage Variations

Test Data

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

Customer: **SmartLabs, Inc.**

Specification: **15.31e**

Work Order #: **95045**

Date: 10/21/2013

Test Type: **Maximized Emissions**

Time: 14:56:54

Equipment: **INSTEON LED Bulb**

Sequence#: 14

Manufacturer: SmartLabs, Inc.

Tested By: Don Nguyen

Model: 2672-452

S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamplifier	8447D	3/29/2012	3/29/2014
T2	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
	AN02672	Spectrum Analyzer	E4446A	9/4/2012	9/4/2014

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
INSTEON LED Bulb*	SmartLabs, Inc.	2672-452	NA

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position. EUT is turned on and set into transmit always mode.

Operating frequency: 914.5-915.5MHz

Frequency Range: fundamental

RBW=VBW=120kHz

Temp: 21°C, 31% Relative Humidity, 100.2kpa

Site D

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

Test Setup Photos



15.215(c) Occupied Bandwidth

Test Data

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

Customer: **SmartLabs, Inc.**

Specification: **Occupied Bandwidth**

Work Order #: **95045**

Test Type: **Maximized Emissions**

Equipment: **INSTEON LED Bulb**

Manufacturer: SmartLabs, Inc.

Model: 2672-452

S/N: NA

Date: 10/21/2013

Time: 14:56:54

Sequence#: 14

Tested By: Don Nguyen

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamplifier	8447D	3/29/2012	3/29/2014
T2	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
	AN02672	Spectrum Analyzer	E4446A	9/4/2012	9/4/2014

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
INSTEON LED Bulb*	SmartLabs, Inc.	2672-452	NA

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.

EUT is turned on and set into transmit always mode.

Operating frequency: 914.5-915.5MHz

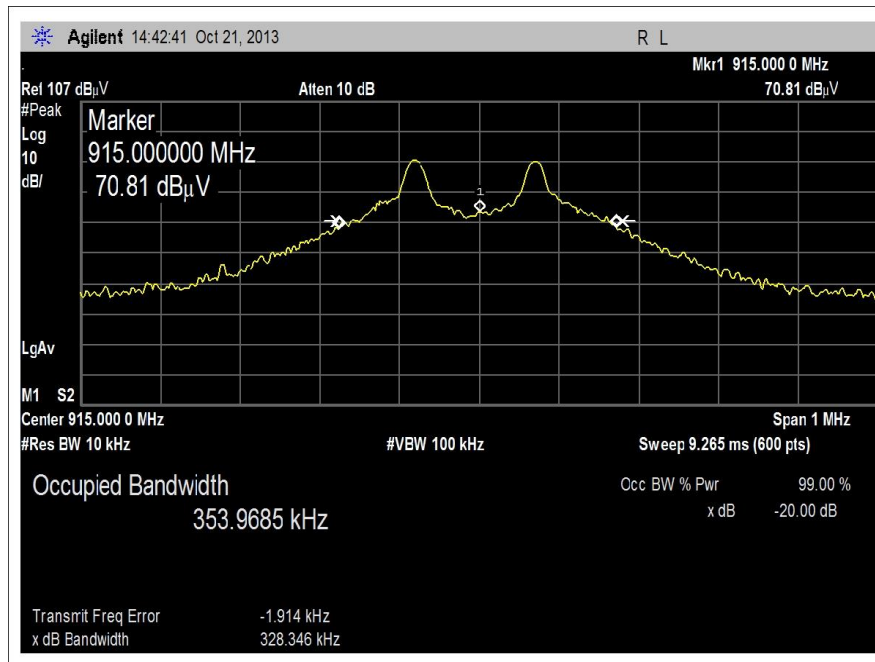
Frequency Range: fundamental

RBW=VBW=120kHz

Temp: 21°C, 31% Relative Humidity, 100.2kpa

Site D

Test Plot



Test Setup Photos



15.249(a) Radiated Spurious 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 #: **95045** Date: 10/21/2013

Test Type: **Maximized Emissions** Time: 15:24:44

Equipment: **INSTEON LED Bulb** Sequence#: 15

Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen

Model: 2672-452

S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/29/2012	3/29/2014
T2	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
	AN02672	Spectrum Analyzer	E4446A	9/4/2012	9/4/2014
T6	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T7	AN01646	Horn Antenna	3115	4/13/2012	4/13/2014
T8	ANP06360	Cable	L1-PNMNM-48	8/29/2012	8/29/2014
T9	AN03169	High Pass Filter	HM1155-11SS	7/30/2013	7/30/2015
T10	AN02946	Cable	32022-2-2909K-36TC	7/31/2013	7/31/2015
	AN00314	Loop Antenna	6502	6/29/2012	6/29/2014

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
INSTEON LED Bulb*	SmartLabs, Inc.	2672-452	NA

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position. EUT is turned on and set into transmit always mode.

Operating frequency: 914.5-915.5MHz

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.

Temp: 21°C, 31% Relative Humidity, 100.2kpal

Site D

Ext Attn: 0 dB

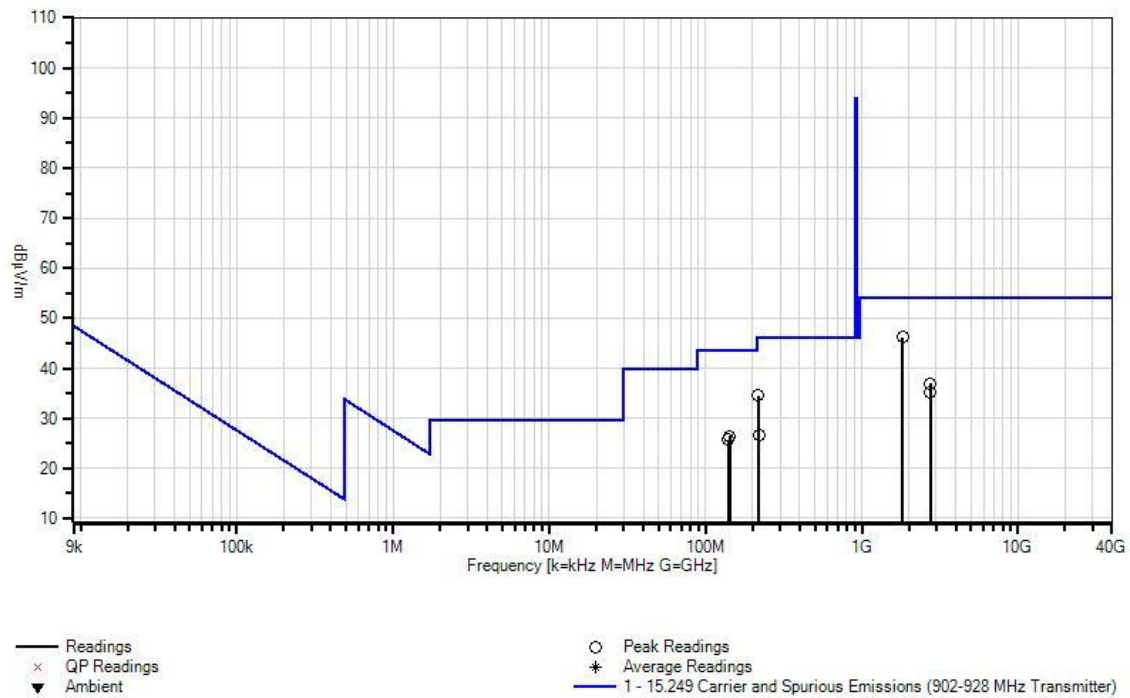
Measurement Data:

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	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	1829.992M	49.7	+0.0 +5.2 +0.3	+0.0 -39.7 +0.5	+0.0 +27.4	+0.0 +2.8	+0.0	46.2	54.0	-7.8	Horiz
2	1829.992M	49.7	+0.0 +5.2 +0.3	+0.0 -39.7 +0.5	+0.0 +27.4	+0.0 +2.8	+0.0	46.2	54.0	-7.8	Vert
3	218.100M	47.3	-26.5 +1.7 +0.0	+10.3 +0.0 +0.0	+0.3 +0.0	+1.5 +0.0	+0.0	34.6	46.0	-11.4	Horiz
4	143.370M	39.1	-26.9 +1.4 +0.0	+11.4 +0.0 +0.0	+0.2 +0.0	+1.2 +0.0	+0.0	26.4	43.5	-17.1	Horiz
5	2744.992M	38.5	+0.0 +5.9 +0.2	+0.0 -39.7 +0.8	+0.0 +27.8	+0.0 +3.4	+0.0	36.9	54.0	-17.1	Vert
6	139.620M	38.3	-26.9 +1.4 +0.0	+11.5 +0.0 +0.0	+0.2 +0.0	+1.2 +0.0	+0.0	25.7	43.5	-17.8	Vert
7	2744.992M	36.9	+0.0 +5.9 +0.2	+0.0 -39.7 +0.8	+0.0 +27.8	+0.0 +3.4	+0.0	35.3	54.0	-18.7	Horiz
8	218.500M	39.1	-26.5 +1.7 +0.0	+10.4 +0.0 +0.0	+0.3 +0.0	+1.5 +0.0	+0.0	26.5	46.0	-19.5	Vert

CKC Laboratories, Inc. Date: 10/21/2013 Time: 15:24:44 SmartLabs, Inc. WO#: 95045
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Sequence#: 15 Ext
 ATTN: 0 dB



Test Setup Photos



15.249(d) Band Edge

Test Data

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

Customer: **SmartLabs, Inc.**

Specification: **Band Edge**

Work Order #: **95045**

Date: 10/21/2013

Test Type: **Maximized Emissions**

Time: 14:56:54

Equipment: **INSTEON LED Bulb**

Sequence#: 14

Manufacturer: SmartLabs, Inc.

Tested By: Don Nguyen

Model: 2672-452

S/N: NA

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamplifier	8447D	3/29/2012	3/29/2014
T2	AN00851	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T3	ANP05555	Cable	RG223/U	6/19/2012	6/19/2014
T4	ANP05569	Cable	RG-214/U	6/19/2012	6/19/2014
T5	ANP04382	Cable	LDF-50	8/30/2012	8/30/2014
	AN02672	Spectrum Analyzer	E4446A	9/4/2012	9/4/2014

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
INSTEON LED Bulb*	SmartLabs, Inc.	2672-452	NA

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is installed in fixed position.

EUT is turned on and set into transmit always mode.

Operating frequency: 914.5-915.5MHz

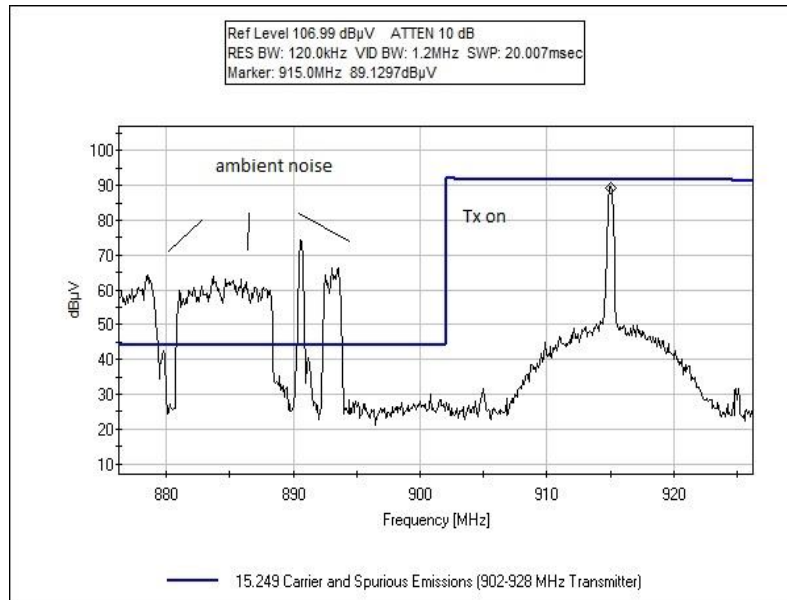
Frequency Range: fundamental

RBW=VBW=120kHz

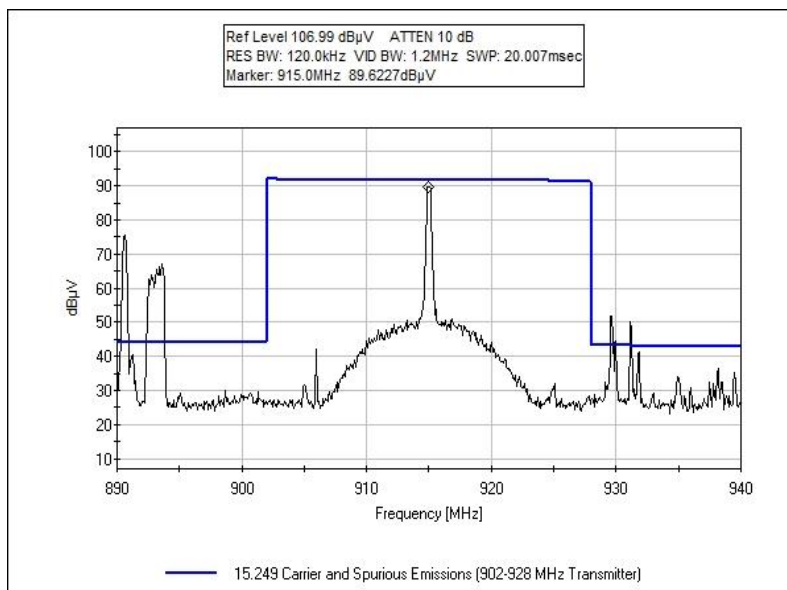
Temp: 21°C, 31% Relative Humidity, 100.2kpa

Site D

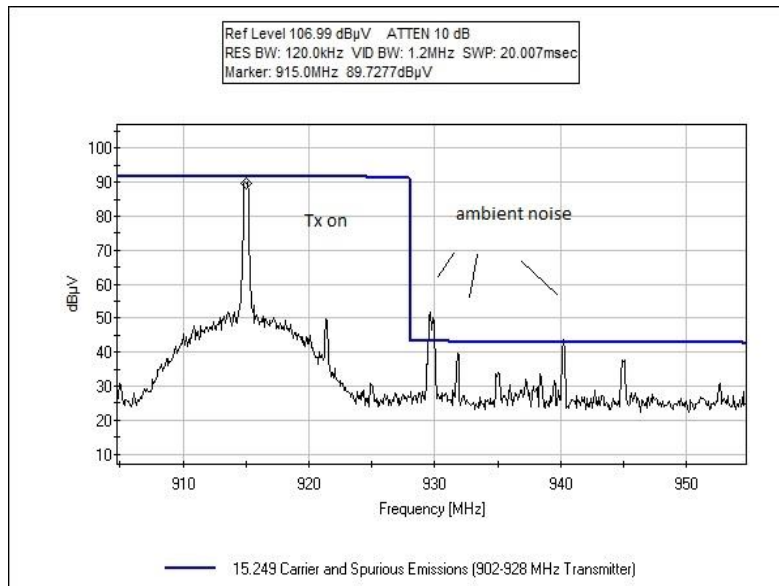
Test Plots



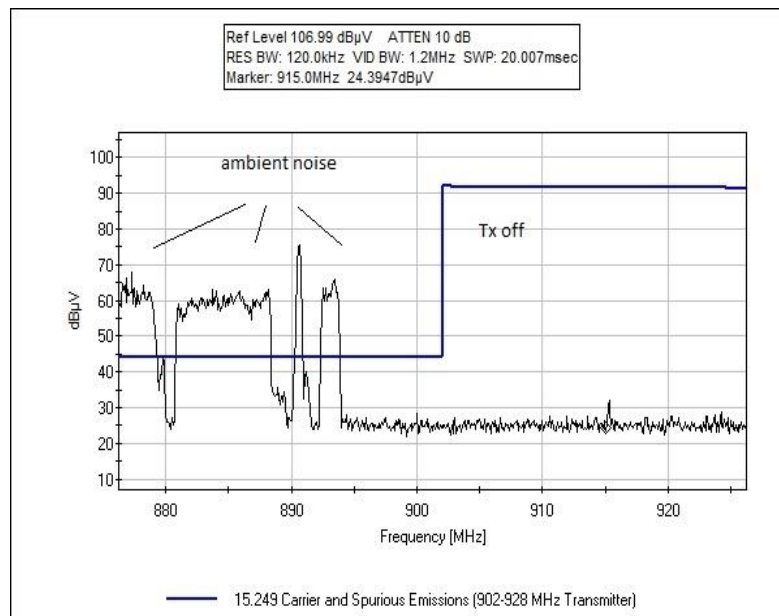
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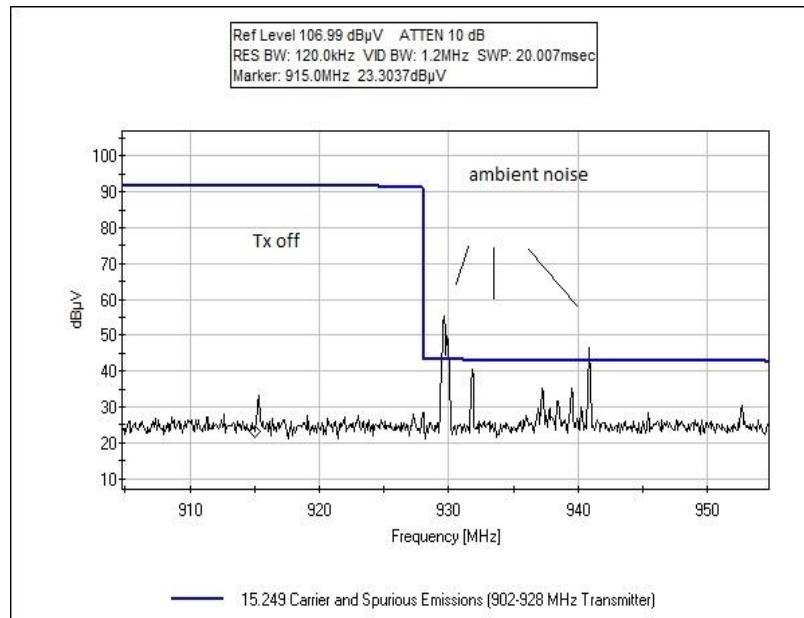
On



On



Off



Off

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 dB μ V/m, the spectrum analyzer reading in dB μ V 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	9 kHz	150 kHz	200 Hz
RADIATED 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.