SmartLabs, Inc.

TEST REPORT FOR

SwitchLinc 2-Wire Dimmer, 2474DWH

Tested To The Following Standards:

FCC Part 15 Subpart C Sections 15.207, 15.249
and
RSS 210 Issue 8

Report No.: 92707-4

Date of issue: February 7, 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:

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Irvine, CA 92606

Representative: John Lockyer
Customer Reference Number: 12-3JL0117-02

REPORT PREPARED BY:

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CKC Laboratories, Inc.
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Mariposa, CA 95338

Project Number: 92707

DATE OF EQUIPMENT RECEIPT: January 25, 2012
DATE(S) OF TESTING: January 25, 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 #	Japan	Canada	FCC
Brea D	US0060	R-1256, C-1319, T-1660 & G-255	3082D-2	100638

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C 15.207, 15.249 and RSS 210 Issue 8

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 / ANSI C63.4 (2003)	Pass
RF Power Output	FCC Part 15 Subpart C Section 15.249(a)(b)	Pass
-20dBc Occupied Bandwidth	FCC Part 15 Subpart C Section 15.249	Pass
Bandedge	FCC Part 15 Subpart C	Pass
Field Strength of Spurious Emissions	FCC Part 15 Subpart C Section 15.249(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
Modification during conducted emissions testing: grounding crystal clock.

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

SwitchLinc 2-Wire Dimmer
Manuf: SmartLabs, Inc.
Model: 2474DWH
Serial: 17.6B.FE

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Light Bulb
Manuf: Reveal
Model: 18U93
Serial: NA

Light Fixture
Manuf: SmartLabs, Inc.
Model: 738V
Serial: NA

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 Conditions / Setup

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. The EUT is connected to a supported light bulb.
The EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to maximum.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = Fundamental
RBW=120 kHz, VBW=120 kHz
Test environment conditions: 18°C, 39% relative humidity, 100kPa

15.31(e) compliance: the supply voltage was varied between 85% and 115% of the **nominal** rated supply voltage (110Vac), no change in the Fundamental signal level was observed.

Engineer Name: D. Nguyen

Test Equipment

Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN00010	Preamp	8447D	HP	3/19/2010	3/19/2012
AN00851	Biconilog Antenna	CBL6111C	Schaffner	3/8/2010	3/8/2012
ANP04382	Cable	LDF-50	Andrew	9/3/2010	9/3/2012
ANP05555	Cable	RG223/U	Pasternack	8/18/2010	8/18/2012
ANP05569	Cable	RG-214/U	Pasternack	8/18/2010	8/18/2012
AN02869	Spectrum Analyzer	E4440A	Agilent	2/12/2011	2/12/2013

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 #:	**92707**	Date:	1/25/2012
Test Type:	**Conducted Emissions**	Time:	16:49:40
Equipment:	**SwitchLinc 2-Wire Dimmer**	Sequence#:	7
Manufacturer:	SmartLabs, Inc.	Tested By:	Don Nguyen
Model:	2474DWH		110V 60Hz
S/N:	17.6B.FE		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	12/8/2010	12/8/2012
T2	ANP01910	Cable	RG-142	3/19/2010	3/19/2012
T3	AN02128	50uH LISN-L1 (dB)	3816/2NM	8/1/2011	8/1/2013
	AN02128	50uH LISN-L2 (dB)	3816/2NM	8/1/2011	8/1/2013
	AN02869	Spectrum Analyzer	E4440A	2/12/2011	2/12/2013
T4	AN02343	High Pass Filter	HE9615-150K-50-720B	1/4/2011	1/4/2013

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

Function	Manufacturer	Model #	S/N
SwitchLinc 2-Wire Dimmer*	SmartLabs, Inc.	2474DWH	17.6B.FE

Support Devices:

Function	Manufacturer	Model #	S/N
Light bulb	Reveal	18U93	NA
Light fixture	SmartLabs, Inc.	738V	NA

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is connected to a supported light bulb.
EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to Off.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = 150kHz-30MHz
RBW=9 kHz, VBW=9 kHz
Test environment conditions: 18°C, 39% relative humidity, 100kPa
Modification: grounding crystal clock.

Ext Attn: 0 dB

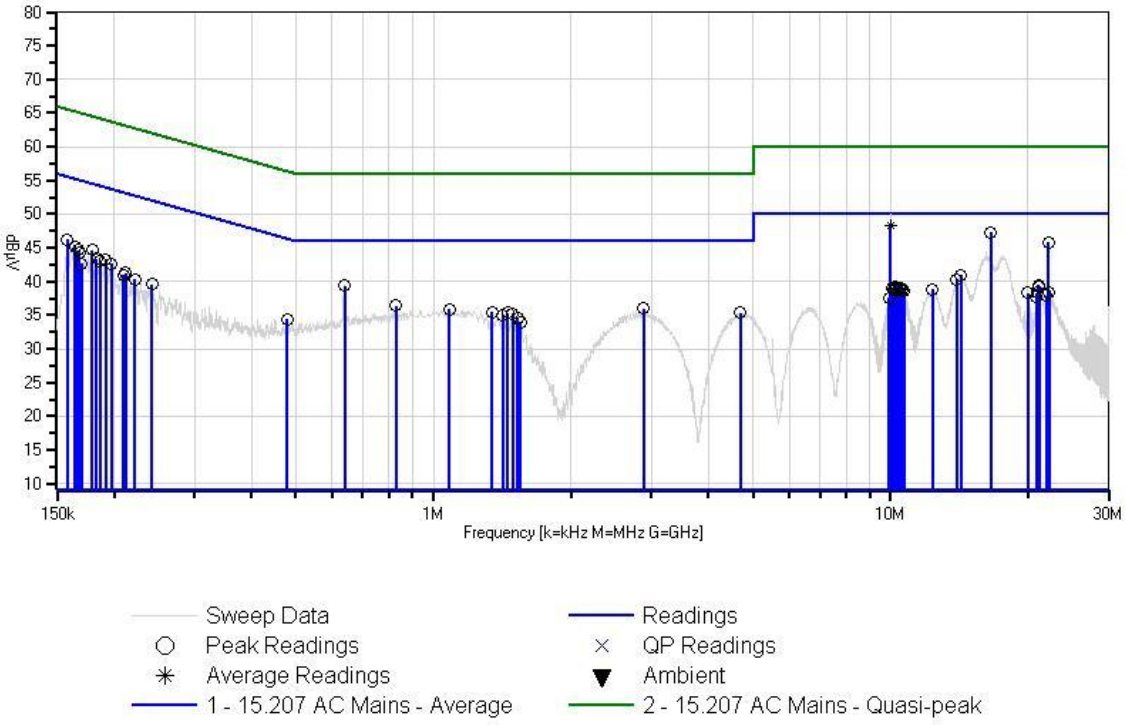
Measurement Data: Reading listed by margin. Test Lead: L1

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	10.000M Ave	41.7	+5.7	+0.3	+0.5	+0.2	+0.0	48.4	50.0	-1.6	L1
^	10.004M	43.3	+5.7	+0.3	+0.5	+0.2	+0.0	50.0	50.0	+0.0	L1
3	16.589M	40.1	+5.7	+0.3	+0.9	+0.3	+0.0	47.3	50.0	-2.7	L1
4	22.121M	38.0	+5.8	+0.4	+1.3	+0.3	+0.0	45.8	50.0	-4.2	L1
5	638.682k	33.3	+5.7	+0.1	+0.0	+0.3	+0.0	39.4	46.0	-6.6	L1
6	14.274M	34.0	+5.7	+0.3	+0.7	+0.3	+0.0	41.0	50.0	-9.0	L1
7	157.999k	39.4	+5.7	+0.1	+0.0	+1.0	+0.0	46.2	55.6	-9.4	L1
8	828.483k	30.3	+5.7	+0.1	+0.0	+0.3	+0.0	36.4	46.0	-9.6	L1
9	13.959M	33.4	+5.7	+0.3	+0.7	+0.2	+0.0	40.3	50.0	-9.7	L1
10	179.088k	38.6	+5.7	+0.1	+0.0	+0.3	+0.0	44.7	54.5	-9.8	L1
11	164.544k	38.9	+5.7	+0.1	+0.0	+0.5	+0.0	45.2	55.2	-10.0	L1
12	2.880M	29.8	+5.7	+0.2	+0.1	+0.2	+0.0	36.0	46.0	-10.0	L1
13	1.081M	29.7	+5.7	+0.1	+0.1	+0.3	+0.0	35.9	46.0	-10.1	L1
14	166.726k	38.5	+5.7	+0.1	+0.0	+0.4	+0.0	44.7	55.1	-10.4	L1
15	1.345M	29.3	+5.7	+0.1	+0.1	+0.3	+0.0	35.5	46.0	-10.5	L1
16	21.049M	31.8	+5.8	+0.4	+1.2	+0.3	+0.0	39.5	50.0	-10.5	L1
17	1.451M	29.3	+5.7	+0.1	+0.1	+0.2	+0.0	35.4	46.0	-10.6	L1
18	4.692M	29.2	+5.7	+0.2	+0.1	+0.2	+0.0	35.4	46.0	-10.6	L1
19	1.490M	29.2	+5.7	+0.1	+0.1	+0.2	+0.0	35.3	46.0	-10.7	L1
20	168.180k	38.1	+5.7	+0.1	+0.0	+0.4	+0.0	44.3	55.0	-10.7	L1
21	21.175M	31.5	+5.8	+0.4	+1.3	+0.3	+0.0	39.3	50.0	-10.7	L1
22	10.247M	32.6	+5.7	+0.3	+0.5	+0.2	+0.0	39.3	50.0	-10.7	L1
23	191.451k	37.2	+5.7	+0.1	+0.0	+0.2	+0.0	43.2	54.0	-10.8	L1
24	10.301M	32.4	+5.7	+0.3	+0.5	+0.2	+0.0	39.1	50.0	-10.9	L1

25	10.526M	32.4	+5.7	+0.3	+0.5	+0.2	+0.0	39.1	50.0	-10.9	L1
26	10.472M	32.3	+5.7	+0.3	+0.5	+0.2	+0.0	39.0	50.0	-11.0	L1
27	182.724k	37.3	+5.7	+0.1	+0.0	+0.3	+0.0	43.4	54.4	-11.0	L1
28	1.417M	28.9	+5.7	+0.1	+0.1	+0.2	+0.0	35.0	46.0	-11.0	L1
29	10.085M	32.3	+5.7	+0.3	+0.5	+0.2	+0.0	39.0	50.0	-11.0	L1
30	10.382M	32.2	+5.7	+0.3	+0.5	+0.2	+0.0	38.9	50.0	-11.1	L1
31	197.268k	36.7	+5.7	+0.1	+0.0	+0.1	+0.0	42.6	53.7	-11.1	L1
32	12.337M	32.1	+5.7	+0.3	+0.6	+0.2	+0.0	38.9	50.0	-11.1	L1
33	10.580M	32.2	+5.7	+0.3	+0.5	+0.2	+0.0	38.9	50.0	-11.1	L1
34	186.360k	37.0	+5.7	+0.1	+0.0	+0.2	+0.0	43.0	54.2	-11.2	L1
35	10.139M	32.0	+5.7	+0.3	+0.5	+0.2	+0.0	38.7	50.0	-11.3	L1
36	10.193M	32.0	+5.7	+0.3	+0.5	+0.2	+0.0	38.7	50.0	-11.3	L1
37	10.688M	31.9	+5.7	+0.3	+0.5	+0.2	+0.0	38.6	50.0	-11.4	L1
38	1.528M	28.4	+5.7	+0.1	+0.1	+0.2	+0.0	34.5	46.0	-11.5	L1
39	22.211M	30.6	+5.8	+0.4	+1.3	+0.3	+0.0	38.4	50.0	-11.6	L1
40	19.995M	30.6	+5.8	+0.4	+1.2	+0.3	+0.0	38.3	50.0	-11.7	L1
41	20.932M	30.6	+5.8	+0.4	+1.2	+0.3	+0.0	38.3	50.0	-11.7	L1
42	211.813k	35.4	+5.7	+0.1	+0.0	+0.1	+0.0	41.3	53.1	-11.8	L1
43	477.970k	28.3	+5.7	+0.1	+0.0	+0.3	+0.0	34.4	46.4	-12.0	L1
44	1.549M	27.9	+5.7	+0.1	+0.1	+0.2	+0.0	34.0	46.0	-12.0	L1
45	21.905M	30.1	+5.8	+0.4	+1.3	+0.3	+0.0	37.9	50.0	-12.1	L1
46	209.631k	35.1	+5.7	+0.1	+0.0	+0.1	+0.0	41.0	53.2	-12.2	L1
47	169.635k	36.5	+5.7	+0.1	+0.0	+0.4	+0.0	42.7	55.0	-12.3	L1
48	20.869M	30.0	+5.8	+0.4	+1.2	+0.3	+0.0	37.7	50.0	-12.3	L1

49	242.355k	33.7	+5.7	+0.1	+0.0	+0.1	+0.0	39.6	52.0	-12.4	L1
50	221.993k	34.4	+5.7	+0.1	+0.0	+0.1	+0.0	40.3	52.7	-12.4	L1
51	9.923M	30.9	+5.7	+0.3	+0.5	+0.2	+0.0	37.6	50.0	-12.4	L1

CKC Laboratories, Inc. Date: 1/25/2012 Time: 16:49:40 SmartLabs, Inc. WO#: 92707
15.207 AC Mains - Average Test Lead: L1 110V 60Hz Sequence#: 7 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 #: **92707** Date: 1/25/2012
Test Type: **Conducted Emissions** Time: 4:42:53 PM
Equipment: **SwitchLinc 2-Wire Dimmer** Sequence#: 6
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2474DWH 110V 60Hz
S/N: 17.6B.FE

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	12/8/2010	12/8/2012
T2	ANP01910	Cable	RG-142	3/19/2010	3/19/2012
	AN02128	50uH LISN-L1 (dB)	3816/2NM	8/1/2011	8/1/2013
T3	AN02128	50uH LISN-L2 (dB)	3816/2NM	8/1/2011	8/1/2013
	AN02869	Spectrum Analyzer	E4440A	2/12/2011	2/12/2013
T4	AN02343	High Pass Filter	HE9615-150K-50-720B	1/4/2011	1/4/2013

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

Function	Manufacturer	Model #	S/N
SwitchLinc 2-Wire Dimmer*	SmartLabs, Inc.	2474DWH	17.6B.FE

Support Devices:

Function	Manufacturer	Model #	S/N
Light bulb	Reveal	18U93	NA
Light fixture	SmartLabs, Inc.	738V	NA

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is connected to a supported light bulb.
EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to Off.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = 150kHz-30MHz
RBW=9 kHz,VBW=9 kHz
Test environment conditions: 18°C, 39% relative humidity, 100kPa
Modification: grounding crystal clock.

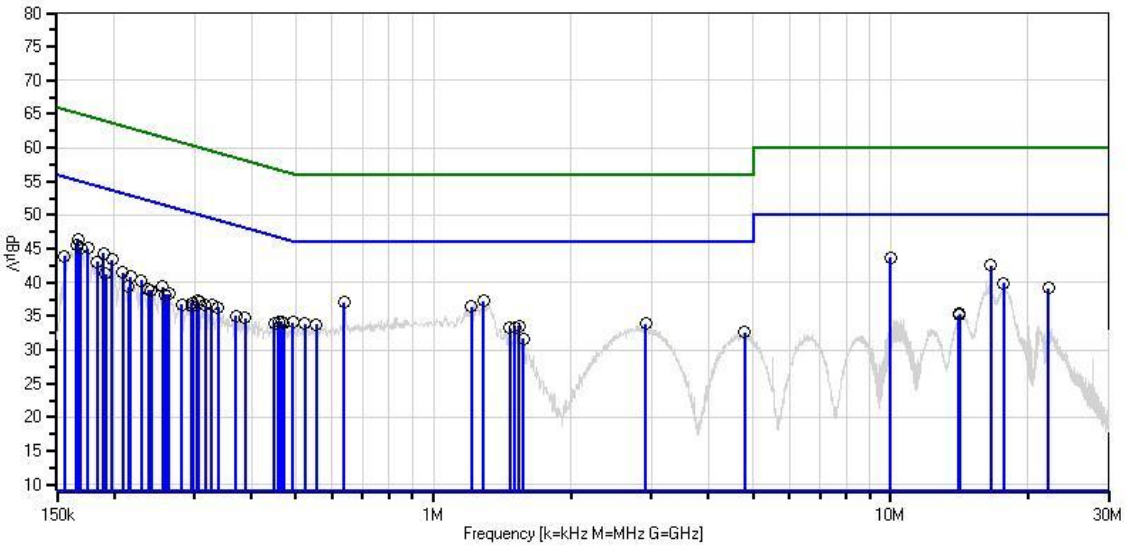
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L2

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	9.995M	36.9	+5.7	+0.3	+0.6	+0.2	+0.0	43.7	50.0	-6.3	L2
2	16.589M	35.1	+5.7	+0.3	+1.1	+0.3	+0.0	42.5	50.0	-7.5	L2
3	166.726k	40.2	+5.7	+0.1	+0.0	+0.4	+0.0	46.4	55.1	-8.7	L2
4	1.285M	31.1	+5.7	+0.1	+0.1	+0.3	+0.0	37.3	46.0	-8.7	L2
5	637.955k	31.0	+5.7	+0.1	+0.0	+0.3	+0.0	37.1	46.0	-8.9	L2
6	165.271k	39.4	+5.7	+0.1	+0.0	+0.4	+0.0	45.6	55.2	-9.6	L2
7	175.452k	39.0	+5.7	+0.1	+0.0	+0.3	+0.0	45.1	54.7	-9.6	L2
8	1.209M	30.2	+5.7	+0.1	+0.1	+0.3	+0.0	36.4	46.0	-9.6	L2
9	189.996k	38.3	+5.7	+0.1	+0.0	+0.2	+0.0	44.3	54.0	-9.7	L2
10	168.907k	39.0	+5.7	+0.1	+0.0	+0.4	+0.0	45.2	55.0	-9.8	L2
11	17.697M	32.2	+5.8	+0.4	+1.2	+0.3	+0.0	39.9	50.0	-10.1	L2
12	197.996k	37.5	+5.7	+0.1	+0.0	+0.1	+0.0	43.4	53.7	-10.3	L2
13	22.121M	31.1	+5.8	+0.4	+1.6	+0.3	+0.0	39.2	50.0	-10.8	L2
14	183.451k	37.0	+5.7	+0.1	+0.0	+0.3	+0.0	43.1	54.3	-11.2	L2
15	208.904k	35.6	+5.7	+0.1	+0.0	+0.1	+0.0	41.5	53.2	-11.7	L2
16	155.818k	36.5	+5.7	+0.1	+0.0	+1.6	+0.0	43.9	55.7	-11.8	L2
17	217.630k	35.0	+5.7	+0.1	+0.0	+0.1	+0.0	40.9	52.9	-12.0	L2
18	491.787k	28.0	+5.7	+0.1	+0.0	+0.3	+0.0	34.1	46.1	-12.0	L2
19	523.057k	27.8	+5.7	+0.1	+0.0	+0.3	+0.0	33.9	46.0	-12.1	L2
20	2.919M	27.6	+5.7	+0.2	+0.2	+0.2	+0.0	33.9	46.0	-12.1	L2
21	229.265k	34.4	+5.7	+0.1	+0.0	+0.1	+0.0	40.3	52.5	-12.2	L2
22	255.445k	33.4	+5.7	+0.1	+0.0	+0.2	+0.0	39.4	51.6	-12.2	L2
23	554.327k	27.7	+5.7	+0.1	+0.0	+0.3	+0.0	33.8	46.0	-12.2	L2
24	464.880k	28.1	+5.7	+0.1	+0.0	+0.3	+0.0	34.2	46.6	-12.4	L2

25	1.536M	27.5	+5.7	+0.1	+0.1	+0.2	+0.0	33.6	46.0	-12.4	L2
26	457.608k	28.1	+5.7	+0.1	+0.0	+0.3	+0.0	34.2	46.7	-12.5	L2
27	469.243k	27.8	+5.7	+0.1	+0.0	+0.3	+0.0	33.9	46.5	-12.6	L2
28	191.451k	35.3	+5.7	+0.1	+0.0	+0.2	+0.0	41.3	54.0	-12.7	L2
29	304.168k	31.4	+5.7	+0.1	+0.0	+0.2	+0.0	37.4	50.1	-12.7	L2
30	1.468M	27.1	+5.7	+0.1	+0.1	+0.2	+0.0	33.2	46.0	-12.8	L2
31	1.507M	27.1	+5.7	+0.1	+0.1	+0.2	+0.0	33.2	46.0	-12.8	L2
32	326.711k	30.6	+5.7	+0.1	+0.0	+0.2	+0.0	36.6	49.5	-12.9	L2
33	448.882k	27.9	+5.7	+0.1	+0.0	+0.3	+0.0	34.0	46.9	-12.9	L2
34	263.444k	32.3	+5.7	+0.1	+0.0	+0.2	+0.0	38.3	51.3	-13.0	L2
35	306.349k	31.1	+5.7	+0.1	+0.0	+0.2	+0.0	37.1	50.1	-13.0	L2
36	337.619k	30.3	+5.7	+0.1	+0.0	+0.2	+0.0	36.3	49.3	-13.0	L2
37	237.992k	33.1	+5.7	+0.1	+0.0	+0.1	+0.0	39.0	52.2	-13.2	L2
38	241.628k	32.9	+5.7	+0.1	+0.0	+0.1	+0.0	38.8	52.0	-13.2	L2
39	316.530k	30.6	+5.7	+0.1	+0.0	+0.2	+0.0	36.6	49.8	-13.2	L2
40	259.081k	32.2	+5.7	+0.1	+0.0	+0.2	+0.0	38.2	51.5	-13.3	L2
41	387.796k	28.7	+5.7	+0.1	+0.0	+0.2	+0.0	34.7	48.1	-13.4	L2
42	4.790M	26.3	+5.7	+0.2	+0.2	+0.2	+0.0	32.6	46.0	-13.4	L2
43	295.441k	30.9	+5.7	+0.1	+0.0	+0.2	+0.0	36.9	50.4	-13.5	L2
44	369.616k	29.0	+5.7	+0.1	+0.0	+0.2	+0.0	35.0	48.5	-13.5	L2
45	214.721k	33.5	+5.7	+0.1	+0.0	+0.1	+0.0	39.4	53.0	-13.6	L2
46	296.896k	30.4	+5.7	+0.1	+0.0	+0.2	+0.0	36.4	50.3	-13.9	L2
47	280.897k	30.7	+5.7	+0.1	+0.0	+0.2	+0.0	36.7	50.8	-14.1	L2
48	1.575M	25.6	+5.7	+0.1	+0.1	+0.2	+0.0	31.7	46.0	-14.3	L2
49	14.157M	28.2	+5.7	+0.3	+0.9	+0.3	+0.0	35.4	50.0	-14.6	L2
50	14.121M	28.1	+5.7	+0.3	+0.9	+0.2	+0.0	35.2	50.0	-14.8	L2

CKC Laboratories, Inc. Date: 1/25/2012 Time: 4:42:53 PM SmartLabs, Inc. WO#: 92707
15.207 AC Mains - Average Test Lead: L2 110V 60Hz Sequence#: 6 Ext ATTN: 0 dB



Sweep Data
Peak Readings
Average Readings
1 - 15.207 AC Mains - Average
Readings
QP Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Setup Photos

15.249 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 #: **92707** Date: 1/25/2012
Test Type: **Maximized Emissions** Time: 10:35:36
Equipment: **SwitchLinc 2-Wire Dimmer** Sequence#: 2
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2474DWH
S/N: 17.6B.FE

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/19/2010	3/19/2012
T2	AN00851	Biconilog Antenna	CBL6111C	3/8/2010	3/8/2012
T3	ANP04382	Cable	LDF-50	9/3/2010	9/3/2012
T4	ANP05555	Cable	RG223/U	8/18/2010	8/18/2012
T5	ANP05569	Cable	RG-214/U	8/18/2010	8/18/2012
	AN02869	Spectrum Analyzer	E4440A	2/12/2011	2/12/2013

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

Function	Manufacturer	Model #	S/N
SwitchLinc 2-Wire Dimmer*	SmartLabs, Inc.	2474DWH	17.6B.FE

Support Devices:

Function	Manufacturer	Model #	S/N
Light bulb	Reveal	18U93	NA
Light fixture	SmartLabs, Inc.	738V	NA

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is connected to a supported light bulb.
EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to maximum.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = Fundamental
RBW=120 kHz, VBW=120 kHz
Test environment conditions: 18°C, 39% relative humidity, 100kPa

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	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	914.923M	83.7	-27.5 +4.1	+23.3	+3.3	+0.6	+0.0	87.5	94.0	-6.5	Horiz
2	915.073M	83.6	-27.5 +4.1	+23.3	+3.3	+0.6	+0.0	87.4	94.0	-6.6	Horiz
3	914.911M	78.0	-27.5 +4.1	+23.3	+3.3	+0.6	+0.0	81.8	94.0	-12.2	Vert
4	915.071M	78.0	-27.5 +4.1	+23.3	+3.3	+0.6	+0.0	81.8	94.0	-12.2	Vert
5	914.910M	76.3	-27.5 +4.1	+23.3	+3.3	+0.6	+0.0	80.1	94.0	-13.9	Vert
6	915.070M	76.3	-27.5 +4.1	+23.3	+3.3	+0.6	+0.0	80.1	94.0	-13.9	Vert

Test Setup Photos

-20dBc Occupied Bandwidth

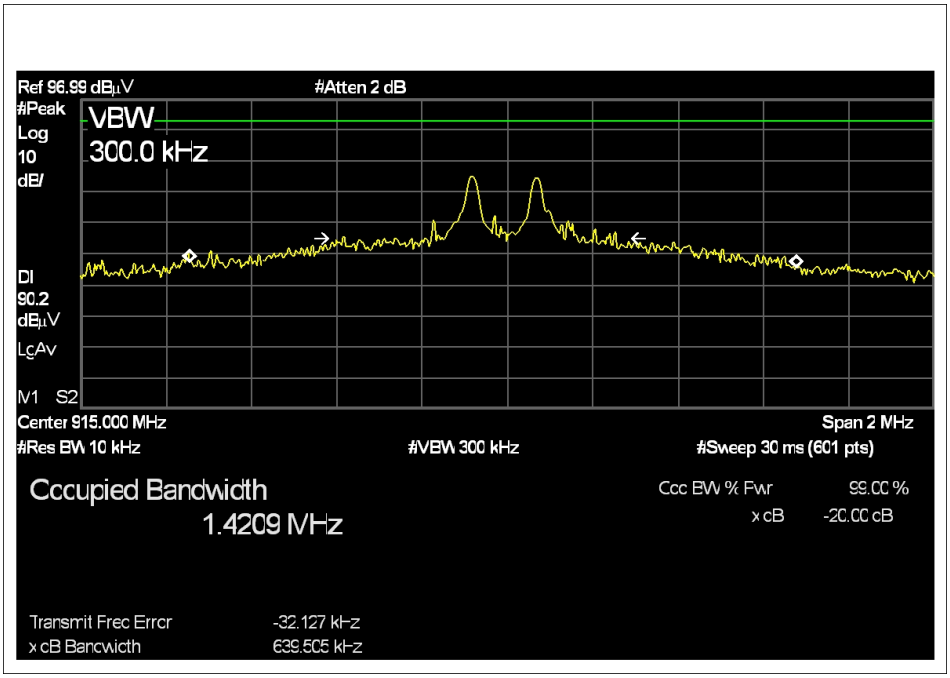
Test Conditions / Setup

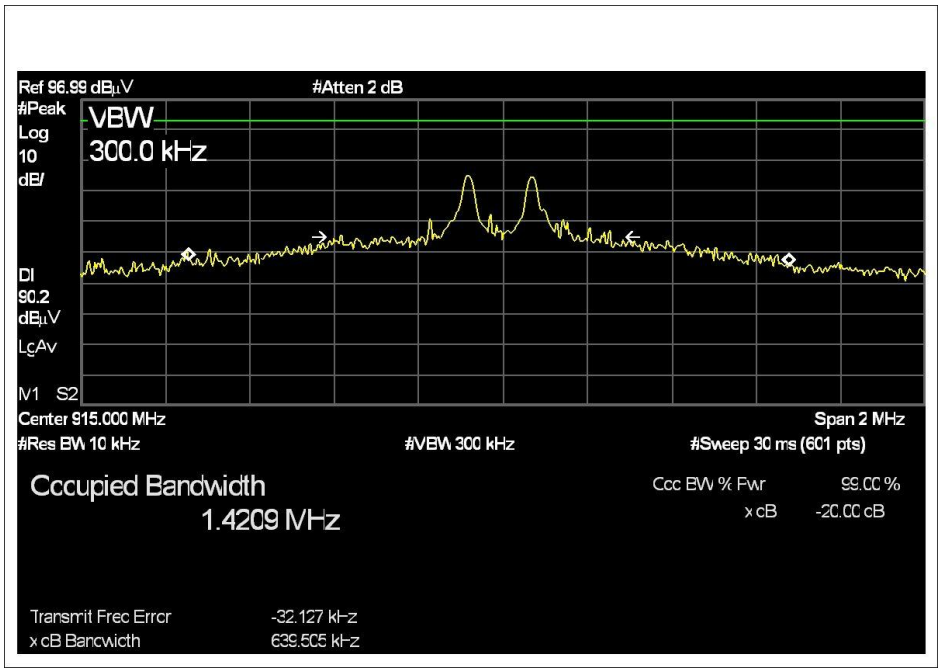
The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. The EUT is connected to a supported light bulb.
The EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to maximum.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = Fundamental
RBW=120 kHz, VBW=120 kHz
Test environment conditions: 18°C, 39% relative humidity, 100kPa
15.31(e) compliance: the supply voltage was varied between 85% and 115% of the **nominal** rated supply voltage (110Vac), no change in the Fundamental signal level was observed.

Engineer Name: D. Nguyen

Test Equipment					
Asset/Serial #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
AN00010	Preamp	8447D	HP	3/19/2010	3/19/2012
AN00851	Biconilog Antenna	CBL6111C	Schaffner	3/8/2010	3/8/2012
ANP04382	Cable	LDF-50	Andrew	9/3/2010	9/3/2012
ANP05555	Cable	RG223/U	Pasternack	8/18/2010	8/18/2012
ANP05569	Cable	RG-214/U	Pasternack	8/18/2010	8/18/2012
AN02869	Spectrum Analyzer	E4440A	Agilent	2/12/2011	2/12/2013

Test Plots


Ref 96.99 dBµV
#Atten 2 dB
#Peak
Log
10
dB/
VBW
300.0 kHz
Dl
90.2
dBµV
LcAv
M1 S2
Center 915.000 MHz
Span 2 MHz
#Res BW 10 kHz
#VBW 300 kHz
#Sweep 30 ms (601 pts)
Cccupied Bandwidth
1.4209 MHz
Ccc BW % Fwr 99.CC %
x cB -2C.CC cB
Transmit Frec Error -32.127 kHz
x cB Bandwidth 639.5C5 kHz


Ref 96.99 dBµV
#Atten 2 dB
#Peak
Log
10
dB/
VBW
300.0 kHz
Dl
90.2
dBµV
LcAv
M1 S2
Center 915.000 MHz
Span 2 MHz
#Res BW 10 kHz
#VBW 300 kHz
#Sweep 30 ms (601 pts)
Cccupied Bandwidth
1.4209 MHz
Ccc BW % Fwr 99.CC %
x cB -2C.CC cB
Transmit Frec Error -32.127 kHz
x cB Bandwidth 639.5C5 kHz

Test Setup Photos

Bandedge

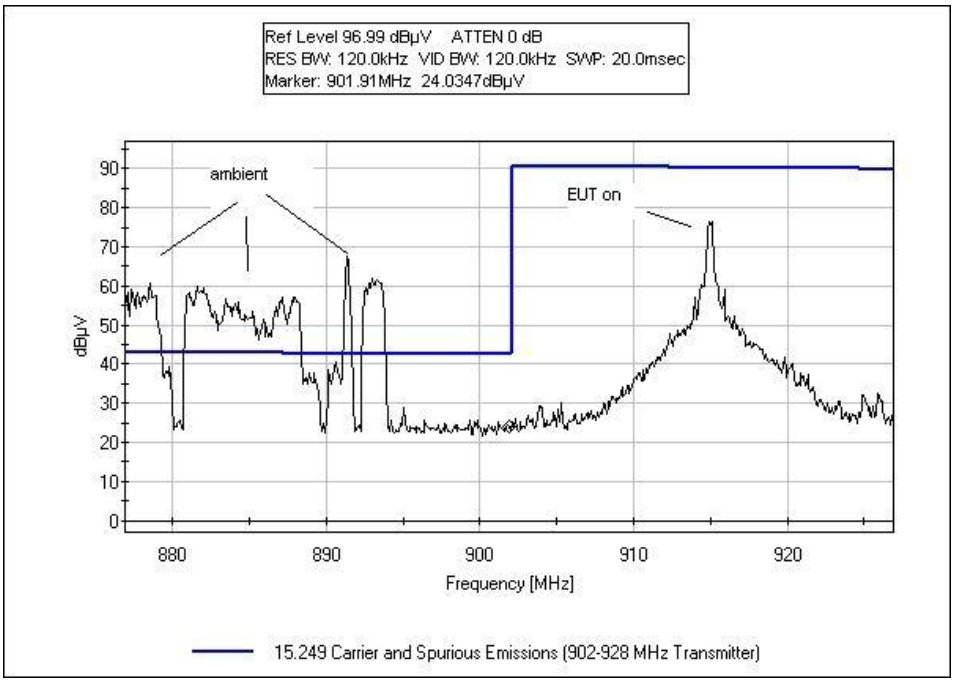
Test Conditions / Setup

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. The EUT is connected to a supported light bulb.
The EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to maximum.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = Fundamental
RBW=120 kHz,VBW=120 kHz
Test environment conditions: 18°C, 39% relative humidity, 100kPa
15.31(e) compliance: the supply voltage was varied between 85% and 115% of the **nominal** rated supply voltage (110Vac), no change in the Fundamental signal level was observed.

Engineer Name: D. Nguyen

Test Equipment					
Asset/Serial #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
AN00010	Preamp	8447D	HP	3/19/2010	3/19/2012
AN00851	Biconilog Antenna	CBL6111C	Schaffner	3/8/2010	3/8/2012
ANP04382	Cable	LDF-50	Andrew	9/3/2010	9/3/2012
ANP05555	Cable	RG223/U	Pasternack	8/18/2010	8/18/2012
ANP05569	Cable	RG-214/U	Pasternack	8/18/2010	8/18/2012
AN02869	Spectrum Analyzer	E4440A	Agilent	2/12/2011	2/12/2013

Test Data



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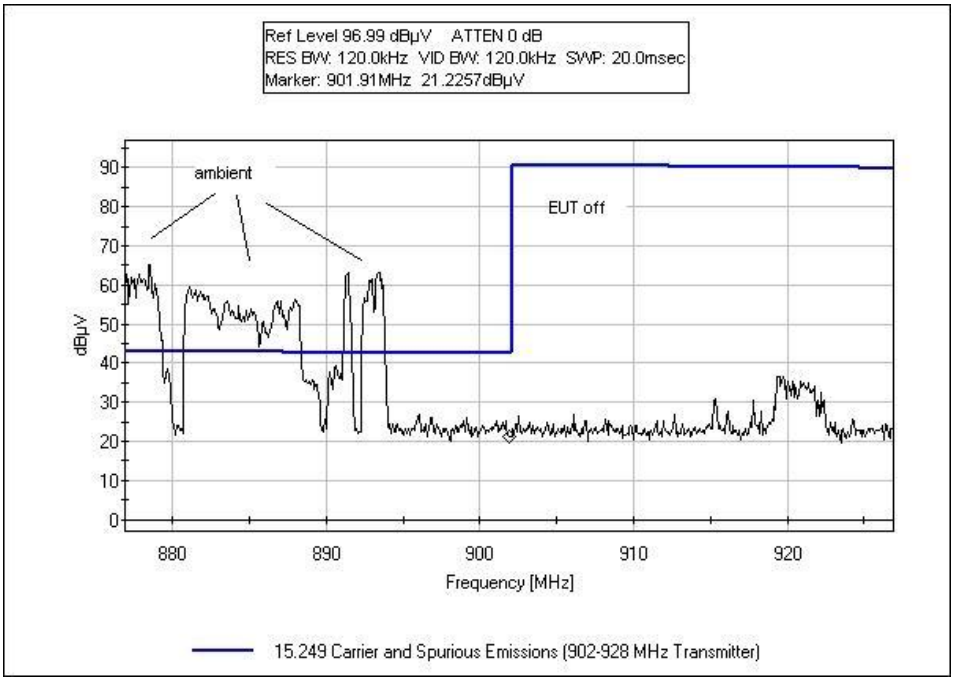
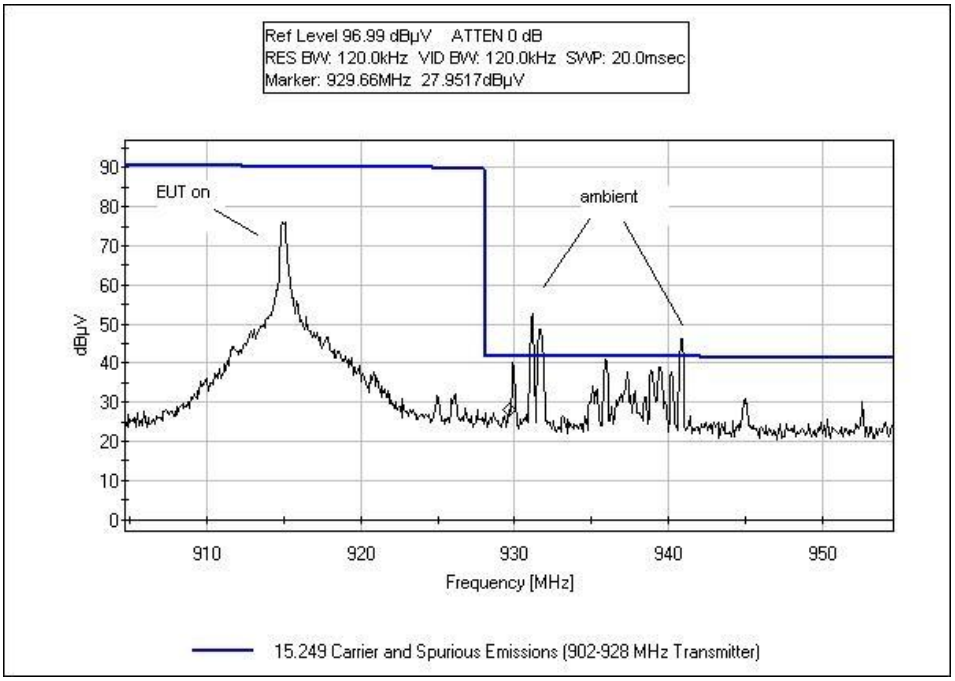
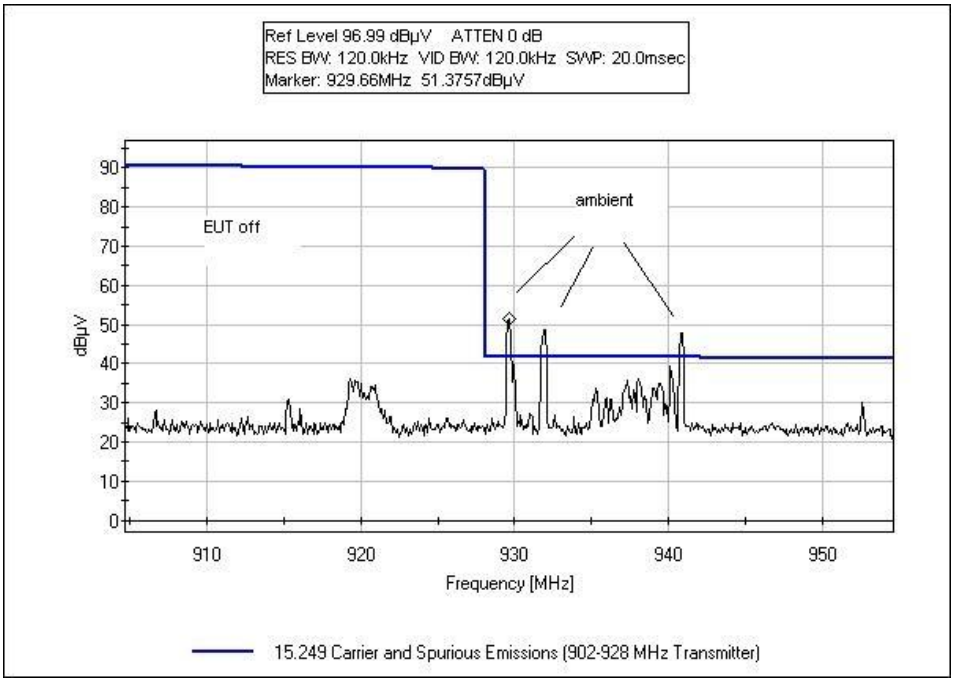


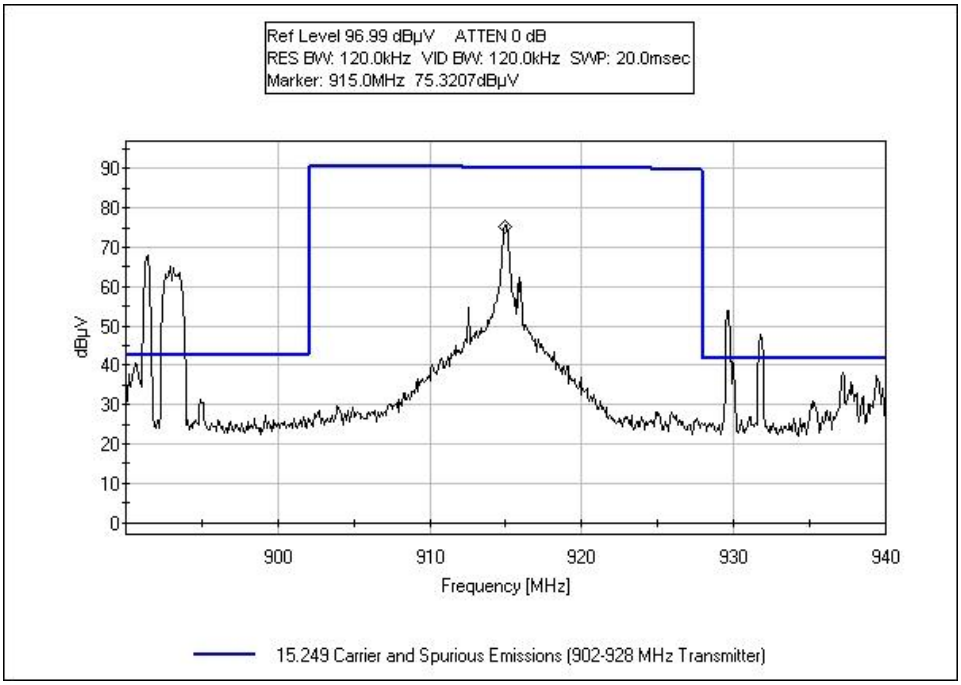
Left Off



Right On



Right Off


Ref Level 96.99 dBµV ATTEN 0 dB
RES BW: 120.0kHz VID BW: 120.0kHz SWP: 20.0msec
Marker: 915.0MHz 75.3207dBµV
dBµV
90
80
70
60
50
40
30
20
10
0
900
910
920
930
940
Frequency [MHz]
15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)

Center

Test Setup Photos

15.249(d) Field Strength Spurious Emissions

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 #: **92707** Date: 1/25/2012
Test Type: **Maximized Emissions** Time: 11:35:29
Equipment: **SwitchLinc 2-Wire Dimmer** Sequence#: 3
Manufacturer: SmartLabs, Inc. Tested By: Don Nguyen
Model: 2474DWH
S/N: 17.6B.FE

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/19/2010	3/19/2012
T2	AN00851	Biconilog Antenna	CBL6111C	3/8/2010	3/8/2012
T3	ANP04382	Cable	LDF-50	9/3/2010	9/3/2012
T4	ANP05555	Cable	RG223/U	8/18/2010	8/18/2012
T5	ANP05569	Cable	RG-214/U	8/18/2010	8/18/2012
T6	AN02869	Spectrum Analyzer	E4440A	2/12/2011	2/12/2013
T7	AN00787	Preamp	83017A	4/8/2011	4/8/2013
T8	AN01646	Horn Antenna	3115	8/18/2010	8/18/2012
T9	AN02947	Cable	32022-29094K-29094K-72TC	8/8/2011	8/8/2013
T10	ANP05988	Cable	LDF1-50	3/12/2010	3/12/2012
T11	AN03169	High Pass Filter	HM1155-11SS	9/22/2011	9/22/2013
T12	AN00314	Loop Antenna	6502	6/30/2010	6/30/2012

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

Function	Manufacturer	Model #	S/N
SwitchLinc 2-Wire Dimmer*	SmartLabs, Inc.	2474DWH	17.6B.FE

Support Devices:

Function	Manufacturer	Model #	S/N
Light bulb	Reveal	18U93	NA
Light fixture	SmartLabs, Inc.	738V	NA

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is connected to a supported light bulb.
EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to maximum.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = 9 kHz- 10 GHz.
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: 18°C, 39% relative humidity, 100kPa

Ext Attn: 0 dB

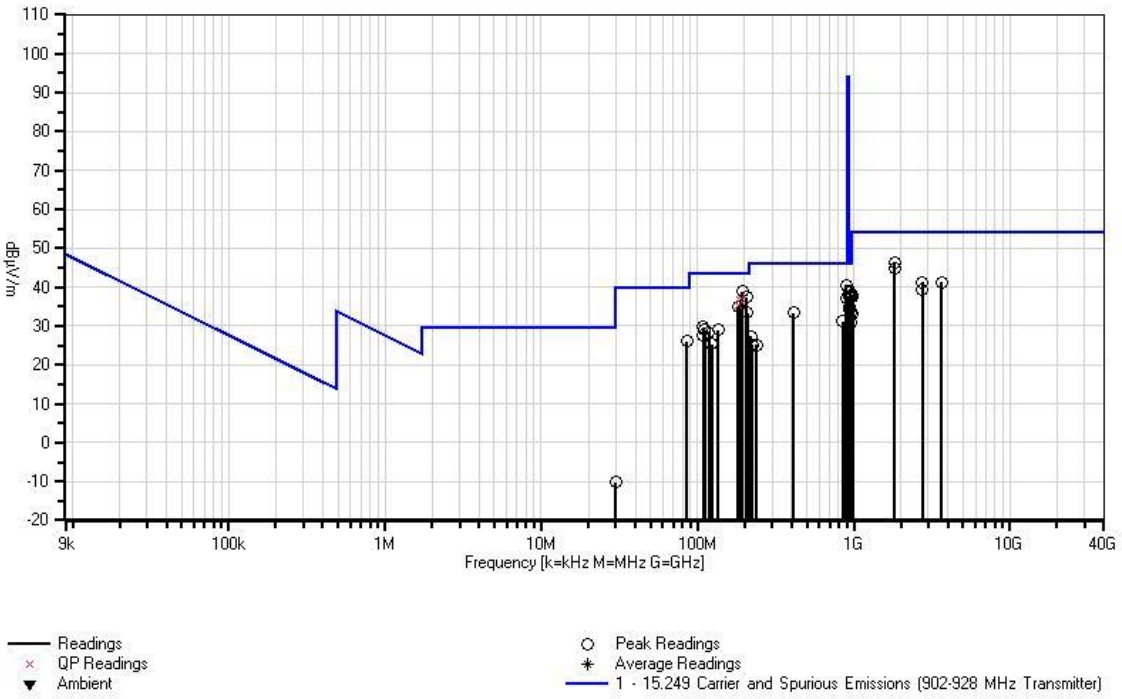
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	193.700M	52.9	-26.7 +1.8 +0.0	+8.9 +0.0 +0.0	+1.6 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	38.8	43.5	-4.7	Vert
2	895.073M	37.1	-27.5 +4.0 +0.0	+23.0 +0.0 +0.0	+3.3 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	40.5	46.0	-5.5	Horiz
3	894.923M	37.0	-27.5 +4.0 +0.0	+23.0 +0.0 +0.0	+3.3 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	40.4	46.0	-5.6	Horiz
4	205.200M	51.0	-26.7 +1.8 +0.0	+9.4 +0.0 +0.0	+1.6 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	37.4	43.5	-6.1	Vert
5	190.050M QP	51.2	-26.7 +1.8 +0.0	+8.9 +0.0 +0.0	+1.6 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	37.1	43.5	-6.4	Vert
^	190.050M	55.6	+0.0 +1.8 +0.0	+0.0 +0.0 +0.0	+1.6 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0	59.0	43.5	+15.5	Vert
7	188.100M QP	51.0	-26.7 +1.7 +0.0	+8.9 +0.0 +0.0	+1.6 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	36.8	43.5	-6.7	Horiz
^	188.100M	55.6	+0.0 +1.7 +0.0	+0.0 +0.0 +0.0	+1.6 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0	58.9	43.5	+15.4	Horiz
9	945.063M	34.3	-27.5 +4.2 +0.0	+23.8 +0.0 +0.0	+3.4 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	38.8	46.0	-7.2	Horiz
10	944.913M	34.0	-27.5 +4.2 +0.0	+23.8 +0.0 +0.0	+3.4 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	38.5	46.0	-7.5	Horiz
11	1830.100M	50.3	+0.0 +0.0 +0.4	+0.0 +0.0 +3.2	+4.9 -39.4 +0.4	+0.0 +26.6 +0.0	+0.0	46.4	54.0	-7.6	Vert

12	181.100M QP	49.6	-26.8 +1.7 +0.0	+8.9 +0.0 +0.0	+1.5 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	35.2	43.5	-8.3	Horiz
13	934.913M	33.4	-27.5 +4.1 +0.0	+23.6 +0.0 +0.0	+3.4 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	37.6	46.0	-8.4	Horiz
14	183.700M	49.5	-26.8 +1.7 +0.0	+8.9 +0.0 +0.0	+1.5 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	35.1	43.5	-8.4	Vert
15	894.908M	33.9	-27.5 +4.0 +0.0	+23.0 +0.0 +0.0	+3.3 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	37.3	46.0	-8.7	Vert
16	895.083M	33.6	-27.5 +4.0 +0.0	+23.0 +0.0 +0.0	+3.3 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	37.0	46.0	-9.0	Vert
17	1830.000M	48.6	+0.0 +0.0 +0.4	+0.0 +0.0 +3.2	+4.9 -39.4 +0.4	+0.0 +26.6 +0.0	+0.0	44.7	54.0	-9.3	Horiz
18	207.400M	46.9	-26.7 +1.8 +0.0	+9.5 +0.0 +0.0	+1.6 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	33.4	43.5	-10.1	Horiz
19	207.400M	46.9	-26.7 +1.8 +0.0	+9.5 +0.0 +0.0	+1.6 +0.0 +0.0	+0.3 +0.0 +0.0	+0.0	33.4	43.5	-10.1	Horiz
20	944.923M	30.3	-27.5 +4.2 +0.0	+23.8 +0.0 +0.0	+3.4 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	34.8	46.0	-11.2	Vert
21	945.073M	29.8	-27.5 +4.2 +0.0	+23.8 +0.0 +0.0	+3.4 +0.0 +0.0	+0.6 +0.0 +0.0	+0.0	34.3	46.0	-11.7	Vert
22	411.400M	39.1	-27.4 +2.5 +0.0	+16.4 +0.0 +0.0	+2.4 +0.0 +0.0	+0.4 +0.0 +0.0	+0.0	33.4	46.0	-12.6	Horiz
23	3660.100M	36.5	+0.0 +0.0 +0.6	+0.0 +0.0 +5.1	+7.0 -39.7 +0.3	+0.0 +31.5 +0.0	+0.0	41.3	54.0	-12.7	Vert
24	2745.000M	40.3	+0.0 +0.0 +0.5	+0.0 +0.0 +4.3	+6.3 -39.7 +0.3	+0.0 +29.3 +0.0	+0.0	41.3	54.0	-12.7	Horiz
25	108.330M	43.6	-27.1 +1.3 +0.0	+10.6 +0.0 +0.0	+1.2 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0	29.8	43.5	-13.7	Horiz
26	85.780M	42.2	-27.1 +1.3 +0.0	+8.3 +0.0 +0.0	+1.2 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0	26.1	40.0	-13.9	Horiz
27	135.330M	41.4	-27.0 +1.5 +0.0	+11.6 +0.0 +0.0	+1.3 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0	29.0	43.5	-14.5	Horiz
28	110.570M	42.4	-27.1 +1.4 +0.0	+10.8 +0.0 +0.0	+1.2 +0.0 +0.0	+0.2 +0.0 +0.0	+0.0	28.9	43.5	-14.6	Horiz

29	2745.100M	38.4	+0.0	+0.0	+6.3	+0.0	+0.0	39.4	54.0	-14.6	Vert
			+0.0	+0.0	-39.7	+29.3					
			+0.5	+4.3	+0.3	+0.0					
30	845.020M	28.8	-27.7	+22.5	+3.1	+0.7	+0.0	31.2	46.0	-14.8	Vert
			+3.8	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
31	955.058M	26.2	-27.5	+24.0	+3.4	+0.6	+0.0	30.9	46.0	-15.1	Vert
			+4.2	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
32	118.530M	41.0	-27.0	+11.5	+1.3	+0.2	+0.0	28.4	43.5	-15.1	Horiz
			+1.4	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
33	108.620M	41.5	-27.1	+10.6	+1.2	+0.2	+0.0	27.7	43.5	-15.8	Vert
			+1.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
34	965.074M	33.1	-27.5	+24.1	+3.4	+0.6	+0.0	38.0	54.0	-16.0	Horiz
			+4.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
35	985.074M	32.3	-27.4	+24.5	+3.4	+0.6	+0.0	37.7	54.0	-16.3	Horiz
			+4.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
36	964.933M	32.6	-27.5	+24.1	+3.4	+0.6	+0.0	37.5	54.0	-16.5	Horiz
			+4.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
37	984.924M	32.0	-27.4	+24.5	+3.4	+0.6	+0.0	37.4	54.0	-16.6	Horiz
			+4.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
38	123.080M	37.7	-27.0	+11.8	+1.3	+0.2	+0.0	25.4	43.5	-18.1	Vert
			+1.4	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
39	219.200M	39.6	-26.6	+10.4	+1.7	+0.3	+0.0	27.3	46.0	-18.7	Vert
			+1.9	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
40	965.058M	28.7	-27.5	+24.1	+3.4	+0.6	+0.0	33.6	54.0	-20.4	Vert
			+4.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
41	223.400M	37.2	-26.6	+10.7	+1.7	+0.3	+0.0	25.2	46.0	-20.8	Horiz
			+1.9	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
42	974.939M	28.0	-27.4	+24.3	+3.4	+0.6	+0.0	33.2	54.0	-20.8	Horiz
			+4.3	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
43	239.400M	35.6	-26.5	+11.9	+1.8	+0.3	+0.0	25.1	46.0	-20.9	Horiz
			+2.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
44	29.998M	23.3	+0.0	+0.0	+0.6	+0.0	-40.0	-10.2	29.5	-39.7	Perpe
			+0.8	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+5.1					
45	29.998M	13.2	+0.0	+0.0	+0.6	+0.0	-40.0	-20.3	29.5	-49.8	Perpe
			+0.8	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+5.1					

CKC Laboratories, Inc. Date: 1/25/2012 Time: 11:35:29 SmartLabs, Inc. WO#: 92707
15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Sequence#: 3 Ext
ATTN: 0 dB



Test Setup Photos

RSS-210

99 % Bandwidth

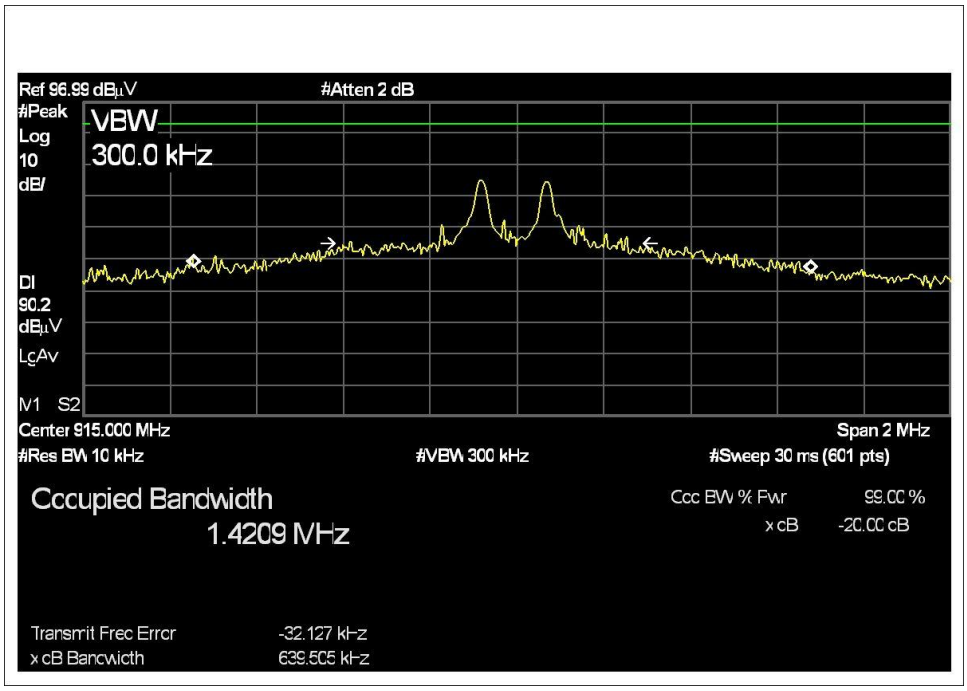
Test Conditions / Setup

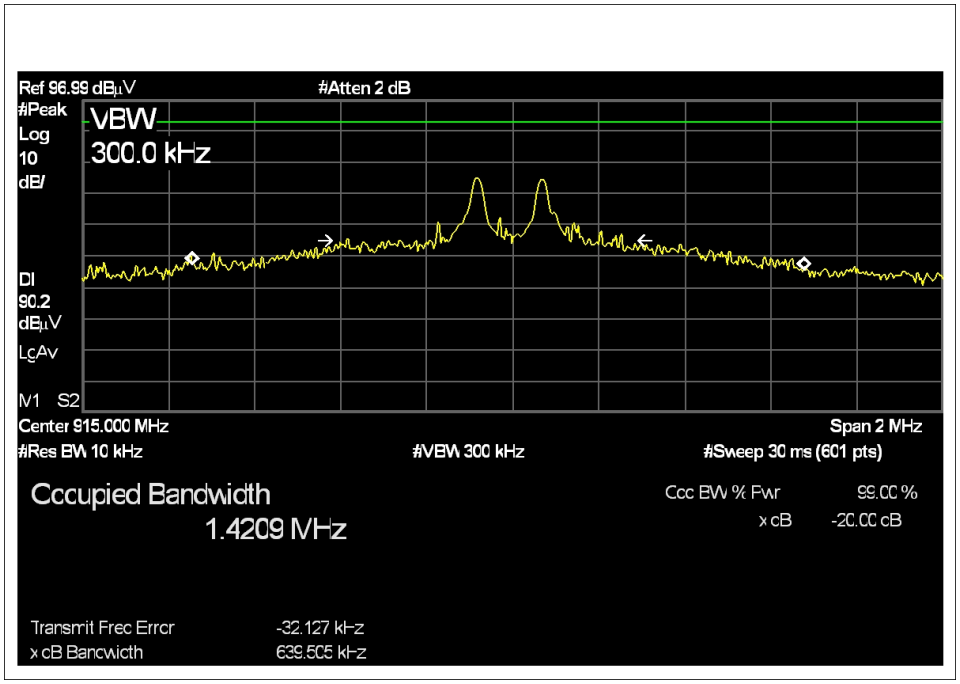
The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. The EUT is connected to a supported light bulb.
The EUT is wall mounted device in fixed position and grounded.
Light bulb brightness level is set to maximum.
The EUT is set in constant transmit mode.
Operating voltage: 110Vac/60Hz
TX freq = 914.5-915.5 MHz
Frequency range of measurement = Fundamental
RBW=120 kHz,VBW=120 kHz
Test environment conditions: 18°C, 39% relative humidity, 100kPa
15.31(e) compliance: the supply voltage was varied between 85% and 115% of the **nominal** rated supply voltage (110Vac), no change in the Fundamental signal level was observed.

Engineer Name: D. Nguyen

Test Equipment					
Asset/Serial #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
AN00010	Preamp	8447D	HP	3/19/2010	3/19/2012
AN00851	Biconilog Antenna	CBL6111C	Schaffner	3/8/2010	3/8/2012
ANP04382	Cable	LDF-50	Andrew	9/3/2010	9/3/2012
ANP05555	Cable	RG223/U	Pasternack	8/18/2010	8/18/2012
ANP05569	Cable	RG-214/U	Pasternack	8/18/2010	8/18/2012
AN02869	Spectrum Analyzer	E4440A	Agilent	2/12/2011	2/12/2013

Test Data


Ref 96.99 dBµV
#Atten 2 dB
#Peak
Log
10
dB/
VBW
300.0 kHz
Dl
90.2
dBµV
LçAv
M1 S2
Center 915.000 MHz
Span 2 MHz
#Res BW 10 kHz
#VBW 300 kHz
#Sweep 30 ms (601 pts)
Cccupied Bandwidth
1.4209 MHz
Ccc BW % Fwr 99.CC %
x cB -2C.CC cB
Transmit Frec Error -32.127 kHz
x cB Bancwicth 639.5C5 kHz


Ref 96.99 dBµV
#Atten 2 dB
#Peak
Log
10
dB/
VBW
300.0 kHz
Dl
90.2
dBµV
LçAv
M1 S2
Center 915.000 MHz
Span 2 MHz
#Res BW 10 kHz
#VBW 300 kHz
#Sweep 30 ms (601 pts)
Cccupied Bandwidth
1.4209 MHz
Ccc BW % Fwr 99.CC %
x cB -2C.CC cB
Transmit Frec Error -32.127 kHz
x cB Bancwicth 639.5C5 kHz

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.