

# SmartLabs, Inc.

## TEST REPORT FOR

### OutletLinc™ - Dimmer (Dual-Band) Outlet, 2472D

#### Tested To The Following Standards:

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

Report No.: 91264-3

Date of issue: February 28, 2011



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.

## TABLE OF CONTENTS

Administrative Information .....	3
Test Report Information .....	3
Report Authorization .....	3
Test Facility Information .....	4
Site Registration & Accreditation Information .....	4
Summary of Results .....	5
Conditions During Testing .....	5
Equipment Under Test.....	6
Peripheral Devices .....	6
FCC Part 15 Subpart C.....	7
15.207 AC Conducted Emissions.....	7
15.249(a) RF Power Output .....	14
Occupied Bandwidth -20dBc .....	18
Bandedge.....	20
15.249(d) Field Strength of Spurious Emissions .....	23
RSS-210.....	27
99 % Bandwidth.....	27
Supplemental Information .....	30
Measurement Uncertainty .....	30
Emissions Test Details.....	30

## ADMINISTRATIVE INFORMATION

### Test Report Information

**REPORT PREPARED FOR:**

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

Representative: John Lockyer  
Customer Reference Number: 11-3JL0217

**DATE OF EQUIPMENT RECEIPT:**

**DATE(S) OF TESTING:**

**REPORT PREPARED BY:**

Dianne Dudley  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

Project Number: 91264

February 17, 2011

February 17-24, 2011

### 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 A	US0060	R-2945, C-3248 & T-1572	3082D-1	90473

## SUMMARY OF RESULTS

### Standard / Specification: FCC Part 15 Subpart C 15.249 and RSS-210 Issue 8

Description	Test Procedure/Method	Results
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)	Pass
Occupied Bandwidth -20dBc	FCC Part 15 Subpart C Section 15.249	Pass
Bandedge	FCC Part 15 Subpart C Section 15.249	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 15.207 Conducted Emissions testing: R16 is changed to 39K instead of 33K on the digital board.

## **EQUIPMENT UNDER TEST (EUT)**

### **EQUIPMENT UNDER TEST**

The following model has been tested by CKC Laboratories: **OutletLinc™ - Dimmer (Dual-Band) Outlet, 2472D**

The manufacturer states that the following additional models are identical electrically to the one which was tested, or any differences between them do not affect their EMC characteristics, and therefore they meet the level of testing equivalent to the tested models. **Outlet Dimmer, 4741A1**

#### **OutletLinc™ - Dimmer (Dual-Band) Outlet**

Manuf: SmartLabs, Inc.

Model: 2472D

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.

### 15.207 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 #: **91264** Date: 2/24/2011  
 Test Type: **Conducted Emissions** Time: 15:03:08  
 Equipment: **OutletLinc™- Dimmer (Dual-Band) Outlet** Sequence#: 8  
 Manufacturer: SmartLabs, Inc. Tested By: E. Wong  
 Model: 2472D 110V 60Hz  
 S/N: NA

***Test Equipment:***

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
T1	ANP06084	Attenuator	SA18N10W-06	12/8/2010	12/8/2012
T2	ANP04358	Cable	RG142	5/7/2010	5/7/2012
T3	AN02610	High Pass Filter	HE9615-150K-50-720B	11/16/2009	11/16/2011
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
OutletLinc™- Dimmer (Dual-Band) Outlet*	SmartLabs, Inc.	2472D	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. Orientated in normal operating position, the EUT is set in constant transmit mode. No load is connected to the EUT for evaluation of RF parameter. Ground cable is connected to chassis as intended.  
 914.9 - 915.1MHz  
 TX freq = 914.9 - 915.1MHz

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

12°C, 54% Relative Humidity

Modification: R16 is changed to 39K instead of 33K on the digital board.

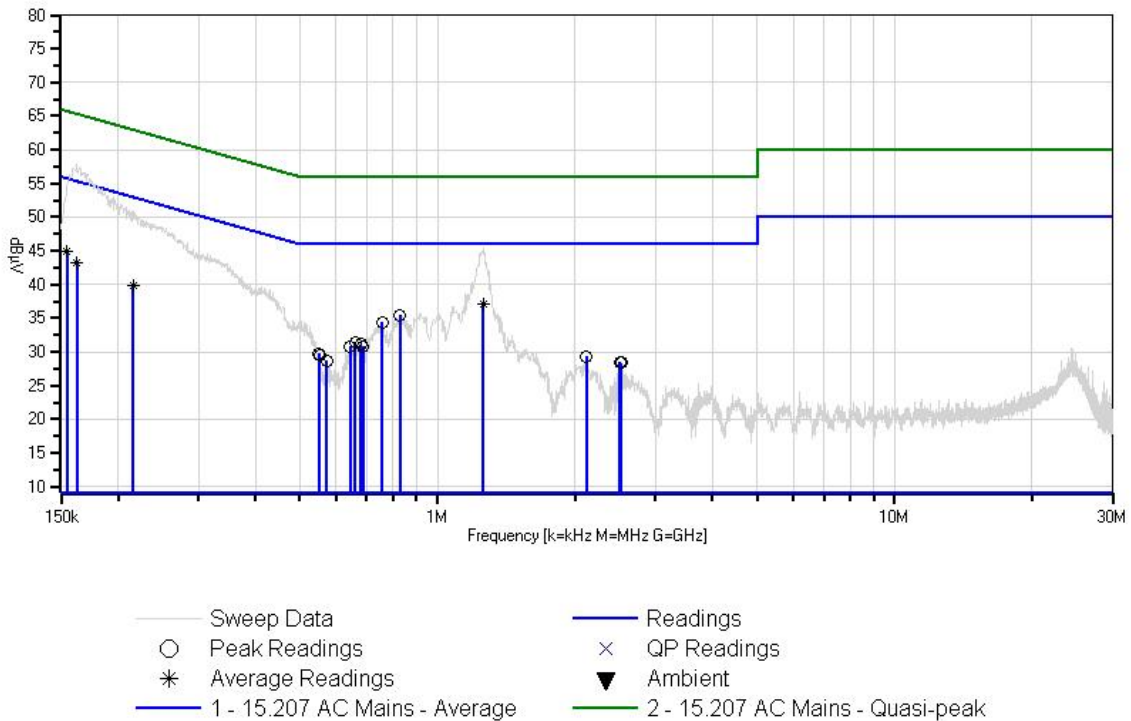
Ext Attn: 0 dB

<b>Measurement Data:</b>		Reading listed by margin.						Test Lead: Black				
#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant	
1	1.258M	30.9	+5.8	+0.1	+0.2	+0.0	+0.0	37.0	46.0	-9.0	Black	
Ave												
^	1.264M	39.3	+5.8	+0.1	+0.2	+0.0	+0.0	45.4	46.0	-0.6	Black	
3	827.029k	29.4	+5.8	+0.1	+0.2	+0.0	+0.0	35.5	46.0	-10.5	Black	
4	154.752k	37.7	+5.8	+0.1	+1.3	+0.0	+0.0	44.9	55.7	-10.8	Black	
Ave												
5	755.763k	28.3	+5.8	+0.1	+0.2	+0.0	+0.0	34.4	46.0	-11.6	Black	
6	162.363k	37.0	+5.8	+0.1	+0.4	+0.0	+0.0	43.3	55.3	-12.0	Black	
Ave												
^	162.363k	51.5	+5.8	+0.1	+0.4	+0.0	+0.0	57.8	55.3	+2.5	Black	
8	215.449k	33.7	+5.8	+0.1	+0.3	+0.0	+0.0	39.9	53.0	-13.1	Black	
Ave												
^	215.449k	44.7	+5.8	+0.1	+0.3	+0.0	+0.0	50.9	53.0	-2.1	Black	
10	659.771k	25.3	+5.8	+0.1	+0.3	+0.0	+0.0	31.5	46.0	-14.5	Black	
11	680.860k	24.9	+5.8	+0.1	+0.3	+0.0	+0.0	31.1	46.0	-14.9	Black	
12	686.678k	24.6	+5.8	+0.1	+0.3	+0.0	+0.0	30.8	46.0	-15.2	Black	
13	643.773k	24.6	+5.8	+0.1	+0.3	+0.0	+0.0	30.8	46.0	-15.2	Black	
14	549.963k	23.6	+5.8	+0.1	+0.3	+0.0	+0.0	29.8	46.0	-16.2	Black	
15	551.418k	23.3	+5.8	+0.1	+0.3	+0.0	+0.0	29.5	46.0	-16.5	Black	
16	2.115M	23.3	+5.8	+0.1	+0.1	+0.0	+0.0	29.3	46.0	-16.7	Black	



17	571.779k	22.5	+5.8	+0.1	+0.3	+0.0	+0.0	28.7	46.0	-17.3	Black
18	2.506M	22.4	+5.8	+0.2	+0.1	+0.0	+0.0	28.5	46.0	-17.5	Black
19	2.527M	22.3	+5.8	+0.2	+0.1	+0.0	+0.0	28.4	46.0	-17.6	Black

CKC Laboratories, Inc. Date: 2/24/2011 Time: 15:03:08 SmartLabs, Inc. WO#: 91264  
15.207 AC Mains - Average Test Lead: Black 110V 60Hz Sequence#: 8 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 #: **91264** Date: 2/24/2011  
 Test Type: **Conducted Emissions** Time: 14:56:28  
 Equipment: **OutletLinc™- Dimmer (Dual-Band) Outlet** Sequence#: 7  
 Manufacturer: SmartLabs, Inc. Tested By: E. Wong  
 Model: 2472D 110V 60Hz  
 S/N: NA

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
T1	ANP06084	Attenuator	SA18N10W-06	12/8/2010	12/8/2012
T2	ANP04358	Cable	RG142	5/7/2010	5/7/2012
T3	AN02610	High Pass Filter	HE9615-150K-50-720B	11/16/2009	11/16/2011
	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
OutletLinc™- Dimmer (Dual-Band) Outlet*	SmartLabs, Inc.	2472D	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. Orientated in normal operating position, the EUT is set in constant transmit mode. No load is connected to the EUT for evaluation of RF parameter. Ground cable is connected to chassis as intended.  
 914.9 - 915.1MHz  
 TX freq = 914.9 - 915.1MHz  
 Frequency range of measurement = 150kHz- 30MHz.  
 150 kHz-30 MHz; RBW=9 kHz, VBW=9kHz  
 12°C, 54% Relative Humidity  
 Modification: R16 is changed to 39K instead of 33K on the digital board.

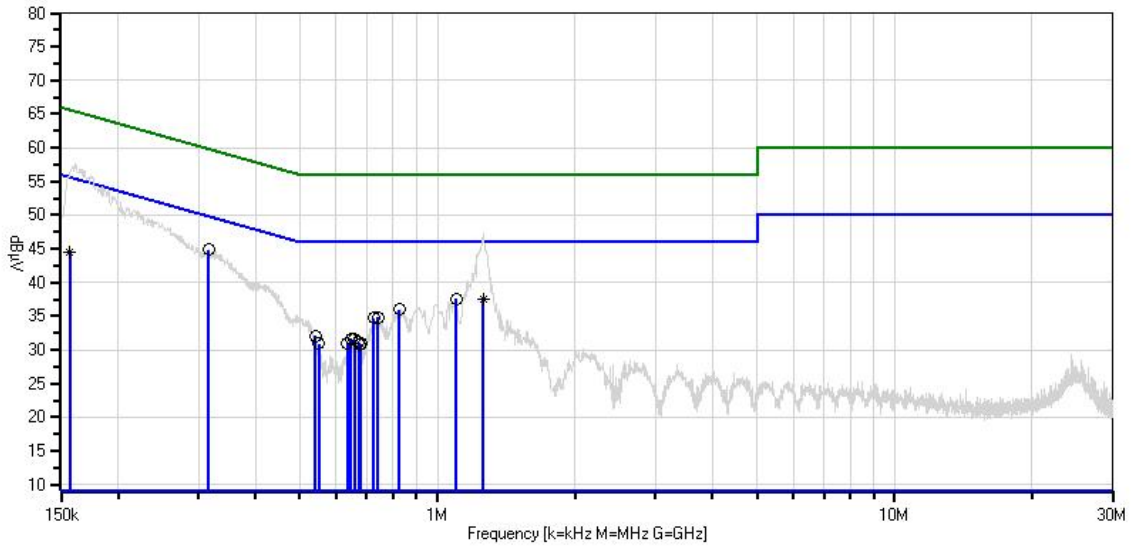
Ext Attn: 0 dB

**Measurement Data:** Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	315.802k	38.8	+5.7	+0.1	+0.3	+0.0	+0.0	44.9	49.8	-4.9	White
2	1.260M	31.4	+5.8	+0.1	+0.2	+0.1	+0.0	37.6	46.0	-8.4	White
^	1.260M	41.0	+5.8	+0.1	+0.2	+0.1	+0.0	47.2	46.0	+1.2	White
4	1.098M	31.5	+5.8	+0.1	+0.2	+0.0	+0.0	37.6	46.0	-8.4	White

5	824.846k	29.9	+5.8	+0.1	+0.2	+0.0	+0.0	36.0	46.0	-10.0	White
6	156.827k	37.7	+5.8	+0.1	+0.9	+0.0	+0.0	44.5	55.6	-11.1	White
^	161.634k	51.4	+5.8	+0.1	+0.4	+0.0	+0.0	57.7	55.4	+2.3	White
8	739.763k	28.7	+5.8	+0.1	+0.2	+0.0	+0.0	34.8	46.0	-11.2	White
9	724.492k	28.6	+5.8	+0.1	+0.2	+0.0	+0.0	34.7	46.0	-11.3	White
10	540.509k	25.9	+5.8	+0.1	+0.3	+0.0	+0.0	32.1	46.0	-13.9	White
11	659.043k	25.4	+5.8	+0.1	+0.3	+0.0	+0.0	31.6	46.0	-14.4	White
12	647.408k	25.4	+5.8	+0.1	+0.3	+0.0	+0.0	31.6	46.0	-14.4	White
13	673.587k	24.9	+5.8	+0.1	+0.3	+0.0	+0.0	31.1	46.0	-14.9	White
14	679.405k	24.7	+5.8	+0.1	+0.3	+0.0	+0.0	30.9	46.0	-15.1	White
15	635.773k	24.7	+5.8	+0.1	+0.3	+0.0	+0.0	30.9	46.0	-15.1	White
16	549.962k	24.7	+5.8	+0.1	+0.3	+0.0	+0.0	30.9	46.0	-15.1	White
17	677.223k	24.6	+5.8	+0.1	+0.3	+0.0	+0.0	30.8	46.0	-15.2	White

CKC Laboratories, Inc. Date: 2/24/2011 Time: 14:56:28 SmartLabs, Inc. WO#: 91264  
 15.207 AC Mains - Average Test Lead: White 110V 60Hz Sequence#: 7 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) RF Power Output**

**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 #: **91264** Date: 2/24/2011  
 Test Type: **Radiated Scan** Time: 09:59:44  
 Equipment: **OutletLinc™- Dimmer (Dual-Band) Outlet** Sequence#: 1  
 Manufacturer: SmartLabs, Inc. Tested By: E. Wong  
 Model: 2472D  
 S/N: NA

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
T2	AN00309	Preamp	8447D	5/7/2010	5/7/2012
T3	AN01995	Biconilog Antenna	CBL6111C	3/8/2010	3/8/2012
T4	ANP05050	Cable	RG223/U	4/16/2009	4/16/2011
T5	ANP05198	Cable	8268	12/21/2010	12/21/2012
T6	AN00786	Preamp	83017A	8/5/2010	8/5/2012
T7	AN00849	Horn Antenna	3115	4/23/2010	4/23/2012
T8	AN02948	Cable	32022-2-2909K-24TC	9/21/2009	9/21/2011
T9	ANP05421	Cable	Sucoflex 104A	2/12/2010	2/12/2012
T10	ANP05563	Cable	ANDL-1-PNMN-48	9/3/2010	9/3/2012
T11	AN03169	High Pass Filter	HM1155-11SS	9/14/2009	9/14/2011
	AN00314	Loop Antenna	6502	6/30/2010	6/30/2012

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

Function	Manufacturer	Model #	S/N
OutletLinc™- Dimmer (Dual-Band) Outlet*	SmartLabs, Inc.	2472D	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. Orientated in normal operating position, the EUT is set in constant transmit mode. No load is connected to the EUT for evaluation of RF parameter. Ground cable is connected to chassis as intended.

914.9 - 915.1MHz

TX freq = 914.9 - 915.1MHz

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.

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.

12°C, 54% Relative Humidity

Ext Attn: 0 dB

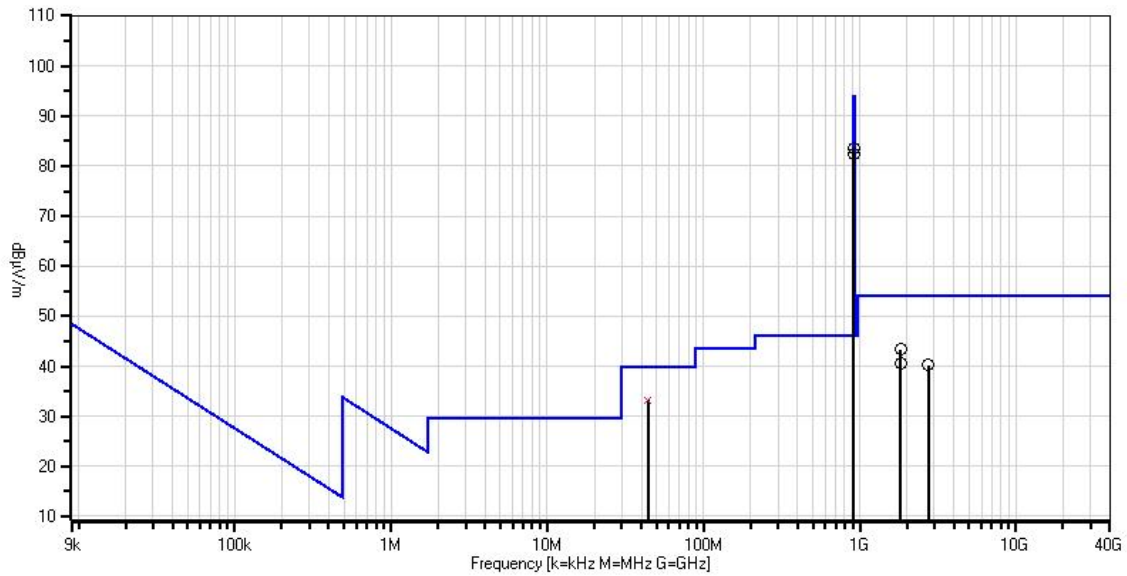
**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
	MHz	dB $\mu$ V	T9	T10	T11		Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	44.237M	49.0	+0.0	-27.8	+10.8	+0.1	+0.0	33.2	40.0	-6.8	Vert
	QP		+1.1	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
^	44.237M	51.3	+0.0	-27.8	+10.8	+0.1	+0.0	35.5	40.0	-4.5	Vert
			+1.1	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
3	915.093M	80.6	+0.0	-27.1	+23.6	+0.7	+0.0	83.6	94.0	-10.4	Horiz
			+5.8	+0.0	+0.0	+0.0			Fundamental		
			+0.0	+0.0	+0.0						
4	914.927M	80.6	+0.0	-27.1	+23.6	+0.7	+0.0	83.6	94.0	-10.4	Horiz
			+5.8	+0.0	+0.0	+0.0			Fundamental		
			+0.0	+0.0	+0.0						
5	1829.733M	50.0	+0.0	+0.0	+0.0	+0.0	+0.0	43.4	54.0	-10.6	Horiz
			+0.0	-38.2	+27.2	+0.4					
			+1.0	+2.7	+0.3						
6	914.940M	79.4	+0.0	-27.1	+23.6	+0.7	+0.0	82.4	94.0	-11.6	Vert
			+5.8	+0.0	+0.0	+0.0			Fundamental		
			+0.0	+0.0	+0.0						
7	915.107M	79.3	+0.0	-27.1	+23.6	+0.7	+0.0	82.3	94.0	-11.7	Vert
			+5.8	+0.0	+0.0	+0.0			Fundamental		
			+0.0	+0.0	+0.0						
8	1829.930M	47.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.6	54.0	-13.4	Vert
			+0.0	-38.2	+27.2	+0.4					
			+1.0	+2.7	+0.3						
9	2745.100M	43.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.2	54.0	-13.8	Vert
			+0.0	-37.8	+29.3	+0.5					
			+1.4	+3.3	+0.3						

CKC Laboratories, Inc. Date: 2/24/2011 Time: 09:59:44 SmartLabs, Inc. WO#: 91264  
 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter) Test Distance: 3 Meters Sequence#: 1 Ext  
 ATTN: 0 dB



— Readings  
 × QP Readings  
 ▼ Ambient  
 ○ Peak Readings  
 \* Average Readings  
 — 1 - 15.249 Carrier and Spurious Emissions (902-928 MHz Transmitter)



**Test Setup Photos**



## Occupied Bandwidth -20dBc

### Test Conditions / Setup

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. Orientated in normal operating position, the EUT is set in constant transmit mode. No load is connected to the EUT for evaluation of RF parameter. Ground cable is connected to chassis as intended.

914.9 - 915.1MHz

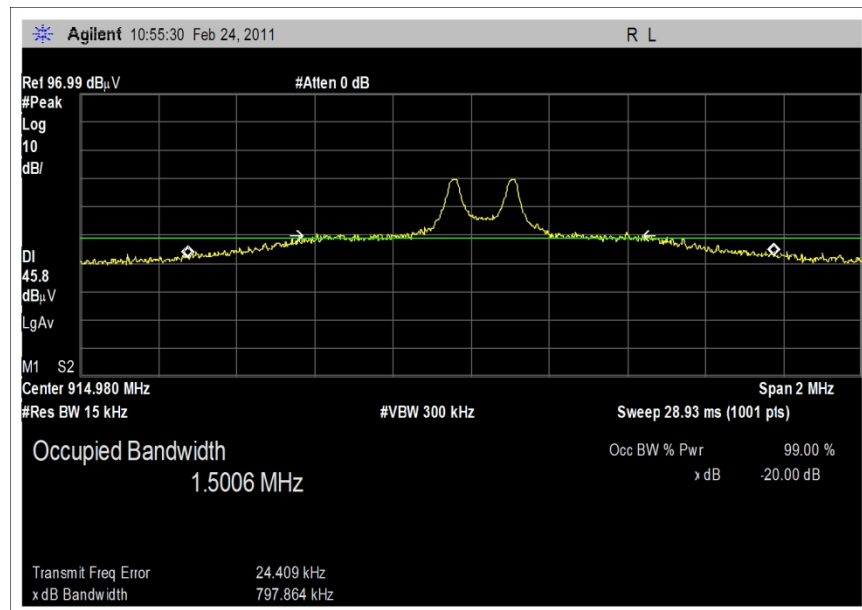
TX freq = 914.9 - 915.1MHz

12°C, 54% Relative Humidity

Engineer Name: E. Wong

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN02672	Spectrum Analyzer	E4446A	Agilent	8/9/2010	8/9/2012
AN00309	Preamp	8447D	HP	5/7/2010	5/7/2012
AN01995	Biconilog Antenna	CBL6111C	Chase	3/8/2010	3/8/2012
ANP05050	Cable	RG223/U	Pasternack	4/16/2009	4/16/2011
ANP05198	Cable	8268	Belden	12/21/2010	12/21/2012
AN00786	Preamp	83017A	HP	8/5/2010	8/5/2012

### Test Plot



**Test Setup Photos**



## Bandedge

### Test Conditions / Setup

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. Orientated in normal operating position, the EUT is set in constant transmit mode. No load is connected to the EUT for evaluation of RF parameter. Ground cable is connected to chassis as intended.

914.9 - 915.1MHz

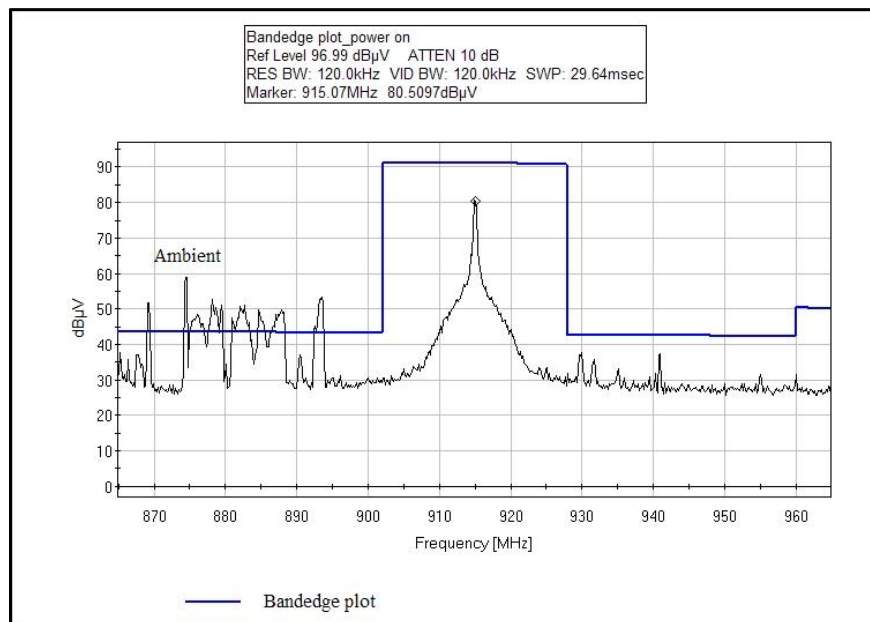
TX freq = 914.9 - 915.1MHz

12°C, 54% Relative Humidity

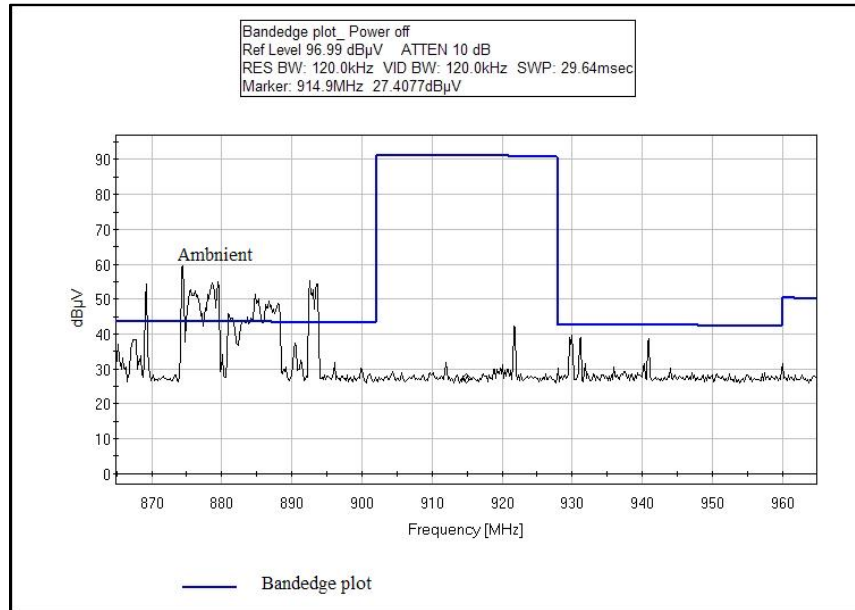
Engineer Name: E. Wong

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN02672	Spectrum Analyzer	E4446A	Agilent	8/9/2010	8/9/2012
AN00309	Preamp	8447D	HP	5/7/2010	5/7/2012
AN01995	Biconilog Antenna	CBL6111C	Chase	3/8/2010	3/8/2012
ANP05050	Cable	RG223/U	Pasternack	4/16/2009	4/16/2011
ANP05198	Cable	8268	Belden	12/21/2010	12/21/2012
AN00786	Preamp	83017A	HP	8/5/2010	8/5/2012

### Test Plots



**Power On**



**Power Off**

**Test Setup Photos**





**15.249(d) Field Strength of Spurious Emissions**

**Test Data Sheets**

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

Customer: **SmartLabs, Inc.**  
 Specification: **FCC 15.249(d) / 15.209**  
 Work Order #: **91264** Date: 2/24/2011  
 Test Type: **Radiated Scan** Time: 09:59:44  
 Equipment: **OutletLinc™- Dimmer (Dual-Band) Outlet** Sequence#: 1  
 Manufacturer: SmartLabs, Inc. Tested By: E. Wong  
 Model: 2472D  
 S/N: NA

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
T2	AN00309	Preamp	8447D	5/7/2010	5/7/2012
T3	AN01995	Biconilog Antenna	CBL6111C	3/8/2010	3/8/2012
T4	ANP05050	Cable	RG223/U	4/16/2009	4/16/2011
T5	ANP05198	Cable	8268	12/21/2010	12/21/2012
T6	AN00786	Preamp	83017A	8/5/2010	8/5/2012
T7	AN00849	Horn Antenna	3115	4/23/2010	4/23/2012
T8	AN02948	Cable	32022-2-2909K-24TC	9/21/2009	9/21/2011
T9	ANP05421	Cable	Sucoflex 104A	2/12/2010	2/12/2012
T10	ANP05563	Cable	ANDL-1-PNMN-48	9/3/2010	9/3/2012
T11	AN03169	High Pass Filter	HM1155-11SS	9/14/2009	9/14/2011
	AN00314	Loop Antenna	6502	6/30/2010	6/30/2012

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

Function	Manufacturer	Model #	S/N
OutletLinc™- Dimmer (Dual-Band) Outlet*	SmartLabs, Inc.	2472D	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. Orientated in normal operating position, the EUT is set in constant transmit mode. No load is connected to the EUT for evaluation of RF parameter. Ground cable is connected to chassis as intended.

914.9 - 915.1MHz  
TX freq = 914.9 - 915.1MHz

Frequency range of measurement = 9 kHz- 10 GHz.  
9 kH -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.

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.

12°C, 54% Relative Humidity

Ext Attn: 0 dB

**Measurement Data:**

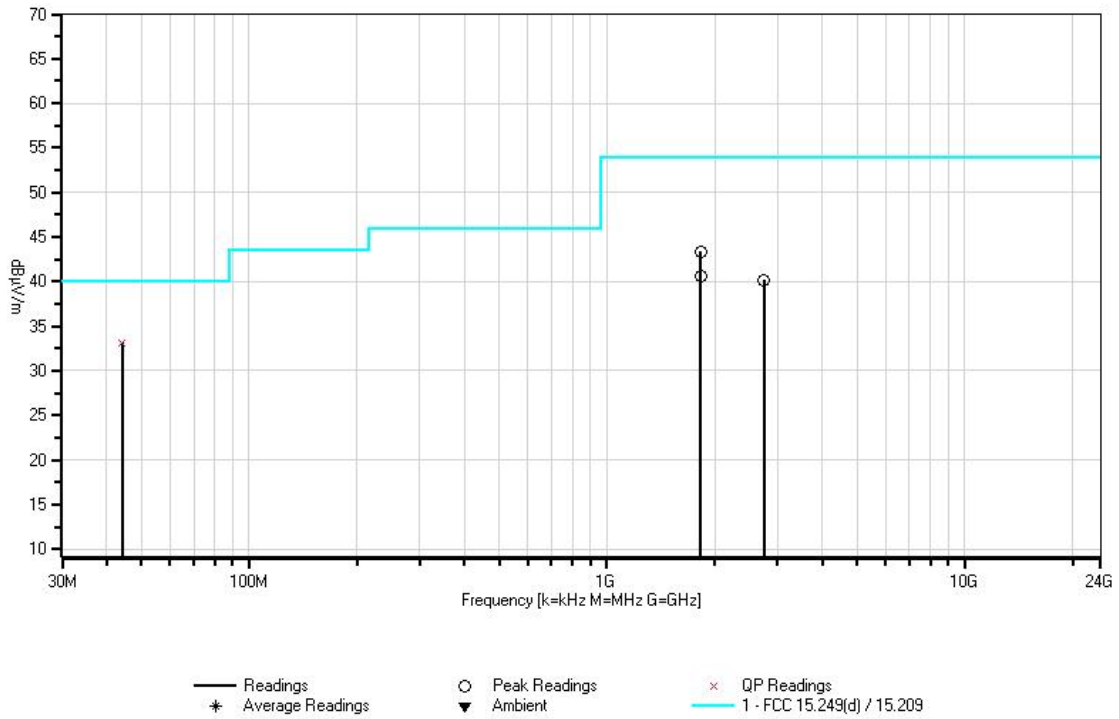
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.					Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
			T1 dB	T2 dB	T3 dB	T4 dB	T5 dB					
1	44.237M QP	49.0	+0.0	-27.8	+10.8	+0.1	+0.0	33.2	40.0	-6.8	Vert	
			+1.1	+0.0	+0.0	+0.0						
			+0.0	+0.0	+0.0	+0.0						
^	44.237M	51.3	+0.0	-27.8	+10.8	+0.1	+0.0	35.5	40.0	-4.5	Vert	
			+1.1	+0.0	+0.0	+0.0						
			+0.0	+0.0	+0.0	+0.0						
3	1829.733M	50.0	+0.0	+0.0	+0.0	+0.0	+0.0	43.4	54.0	-10.6	Horiz	
			+0.0	-38.2	+27.2	+0.4						
			+1.0	+2.7	+0.3							
4	1829.930M	47.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.6	54.0	-13.4	Vert	
			+0.0	-38.2	+27.2	+0.4						
			+1.0	+2.7	+0.3							
5	2745.100M	43.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.2	54.0	-13.8	Vert	
			+0.0	-37.8	+29.3	+0.5						
			+1.4	+3.3	+0.3							



CKC Laboratories, Inc. Date: 2/24/2011 Time: 09:59:44 SmartLabs, Inc. WO#: 91264  
FCC 15.249(d) / 15.209 Test Distance: 3 Meters Sequence#: 1 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. Orientated in normal operating position, the EUT is set in constant transmit mode. No load is connected to the EUT for evaluation of RF parameter. Ground cable is connected to chassis as intended.

914.9 - 915.1MHz

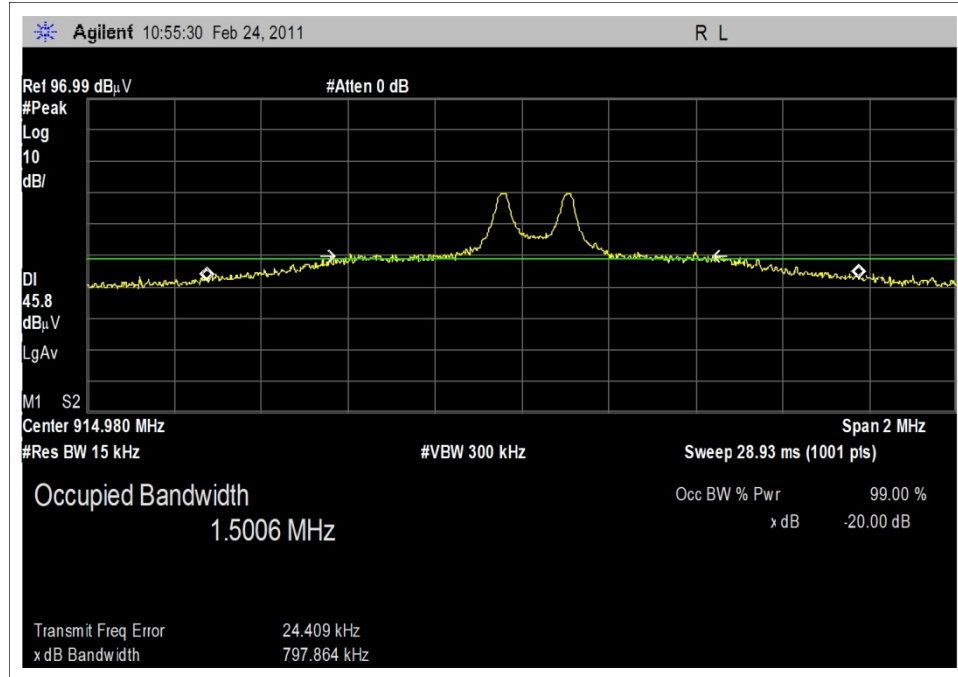
TX freq = 914.9 - 915.1MHz

12°C, 54% Relative Humidity

Engineer Name: E. Wong

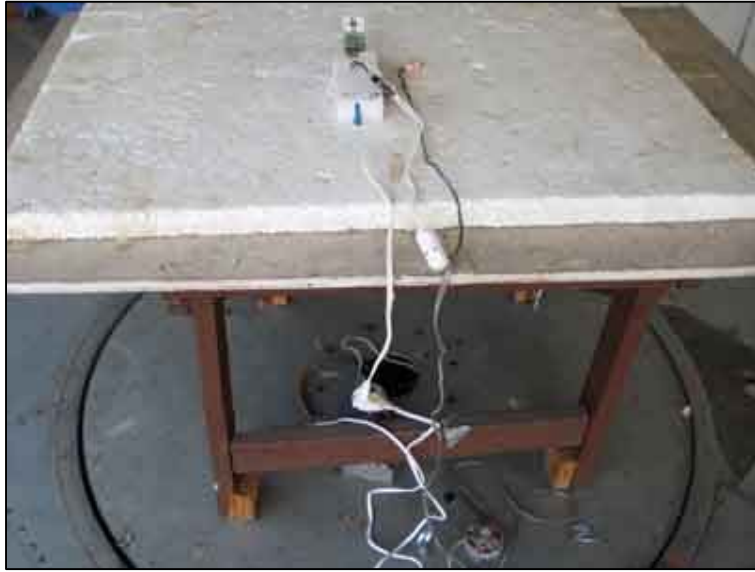
<b>Test Equipment</b>					
<b>Asset/Serial #</b>	<b>Description</b>	<b>Model</b>	<b>Manufacturer</b>	<b>Cal Date</b>	<b>Cal Due</b>
AN02672	Spectrum Analyzer	E4446A	Agilent	8/9/2010	8/9/2012
AN00309	Preamp	8447D	HP	5/7/2010	5/7/2012
AN01995	Biconilog Antenna	CBL6111C	Chase	3/8/2010	3/8/2012
ANP05050	Cable	RG223/U	Pasternack	4/16/2009	4/16/2011
ANP05198	Cable	8268	Belden	12/21/2010	12/21/2012
AN00786	Preamp	83017A	HP	8/5/2010	8/5/2012

**Test Plot**



**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**

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	(dB $\mu$ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB $\mu$ V/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. 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 "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. 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/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients 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

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

#### Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. 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.