

# ReelSonar

## ADDENDUM TO TEST REPORT 94243-5

### Bluetooth Ultrasonic Fish Finder Model: iBobber

#### Tested To The Following Standards:

#### FCC Part 15 Subpart C § 15.249

Report No.: 94243-5A

Date of issue: April 28, 2014



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:**

ReelSonar  
2316 Eastlake Ave E  
Seattle, WA 98102

Representative: Chris Doughty  
Customer Reference Number: 14-004

**REPORT PREPARED BY:**

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

Project Number: 94243

**DATE OF EQUIPMENT RECEIPT:**

February 24, 2014

**DATE(S) OF TESTING:**

February 24-March 4, 2014

April 18, 2014

### Revision History

**Original:** Testing of the Bluetooth Ultrasonic Fish Finder, iBobber to FCC 15.249.

**Addendum A:** To replace data sheet and test plots in section 15.215(c) Occupied Bandwidth. To replace data sheet and test plots in section 15.249(a) Maximum Power Output. Replace data in Field Strength Spurious emissions and Band Edge section 15.249(d). Add Y and Z Axis photos to all test sections.

### 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.  
22116 23rd Drive S.E., Suite A  
Bothell, WA 98021-4413

## 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
Bothell	US0081	SL2-IN-E-1145R	3082C-1	318736	A-0148

## SUMMARY OF RESULTS

### Standard / Specification: FCC Part 15 Subpart C

Test Procedure/Method	Description	Results
15.249(a)	Maximum Power Output	Pass
15.215(c)	Occupied Bandwidth	Pass
15.249(d)	Field Strength of Spurious Emissions and Band Edge	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

#### Bluetooth Ultrasonic Fish Finder

Manuf: ReelSonar

Model: iBobber

Serial: E0-C7-9D-63-27-DE

### 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) CFR 47 Section 15 Subpart C requirements for Intentional Radiators.

### 15.249(a) Maximum Power Output

#### Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **ReelSonar**  
 Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**  
 Work Order #: **94243** Date: **4/18/2014**  
 Test Type: **Maximized Emissions** Time: **11:21:06**  
 Equipment: **Bluetooth Ultrasonic Fish Finder** Sequence#: **2**  
 Manufacturer: ReelSonar Tested By: Steven Pittsford  
 Model: iBobber  
 S/N: E0-C7-9D-63-27-DE

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
T2	AN03209	Preamp	83051A	3/5/2013	3/5/2015
T3	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	9/16/2013	9/16/2015
T4	ANP05547	Cable	Heliax	9/7/2012	9/7/2014
T5	AN02872	Spectrum Analyzer	E4440A	7/19/2013	7/19/2015

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

Function	Manufacturer	Model #	S/N
Bluetooth Ultrasonic Fish Finder*	ReelSonar	iBobber	E0-C7-9D-63-27-DE

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

Temperature: 21°C

Pressure: 101.9kPa

Humidity: 34%

Vertical and Horizontal Polarizations X, Y &amp; Z Axis investigated only worst reported.

CISPR Bandwidths Used

EUT is located on the top of the test table 80cm over the ground plane.

EUT is continuously transmitting at Low, Mid and High Channels.

Low 2.402GHz Fundamental

Med 2.440GHz Fundamental

High 2.482GHz Fundamental

15.31(e) Fresh Battery Installed

Ext Attn: 0 dB

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

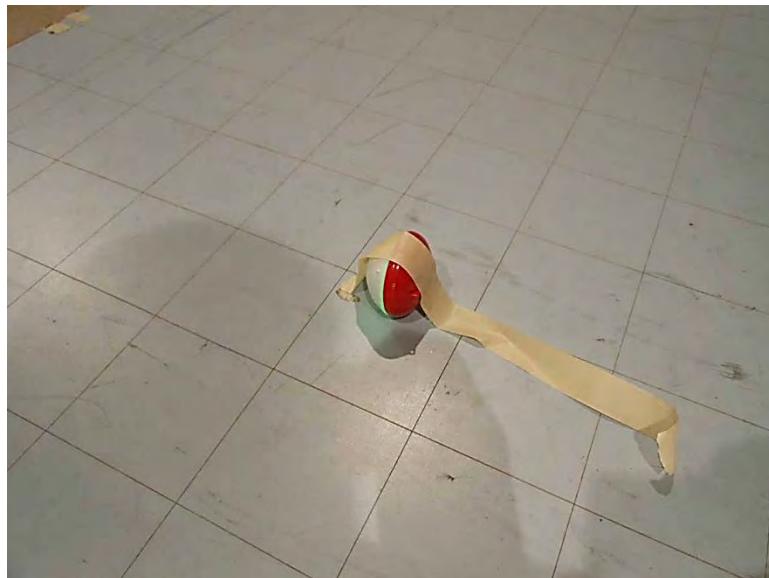
#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	2441.783M	91.0	+1.4 +0.0	-30.4	+28.0	+2.5	+0.0 355	92.5	94.0	-1.5	V & H 101
2	2402.000M	90.6	+1.4 +0.0	-30.4	+28.0	+2.5	+0.0 360	92.1	94.0	-1.9	V & H 101
3	2479.792M	89.9	+1.4 +0.0	-30.3	+27.9	+2.6	+0.0 343	91.5	94.0	-2.5	V & H 101

## Test Setup Photo

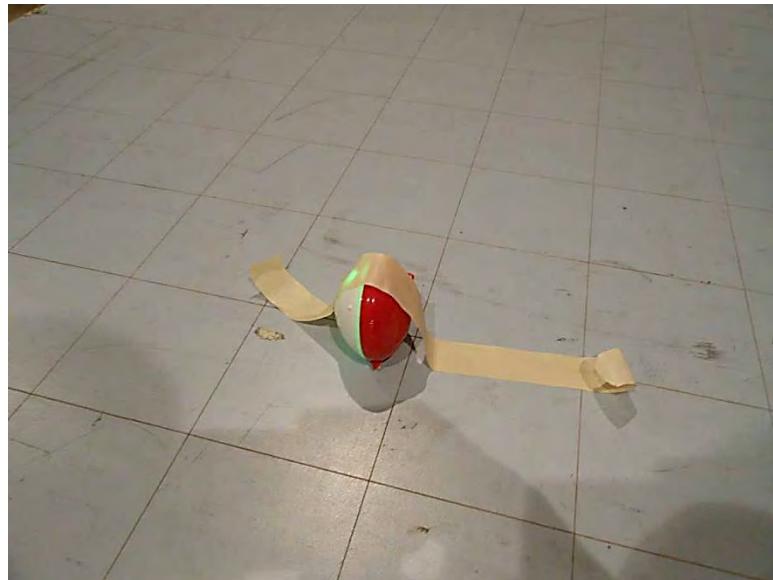
Note: Photo Timestamp Not Set – Photos taken day of testing (date of actual test) 03/04/2014.



Overall Test Setup



Y-Axis



Z-Axis

## 15.215(c) Occupied Bandwidth

### Test Conditions / Setup

#### OBW FCC 15.215 (c)

-20dB occupied bandwidth

Work Order #: 94243 Date: 4/18/2014  
 Test Type: Maximized Emissions Time: 11:00  
 Equipment: Bluetooth Ultrasonic Fish Finder  
 Manufacturer: ReelSonar Tested By: Steven Pittsford  
 Model: iBobber  
 S/N: E0-C7-9D-63-27-DE

Test Conditions:

Temp: 21°C

Humidity: 30%

Pressure: 102.2kPa

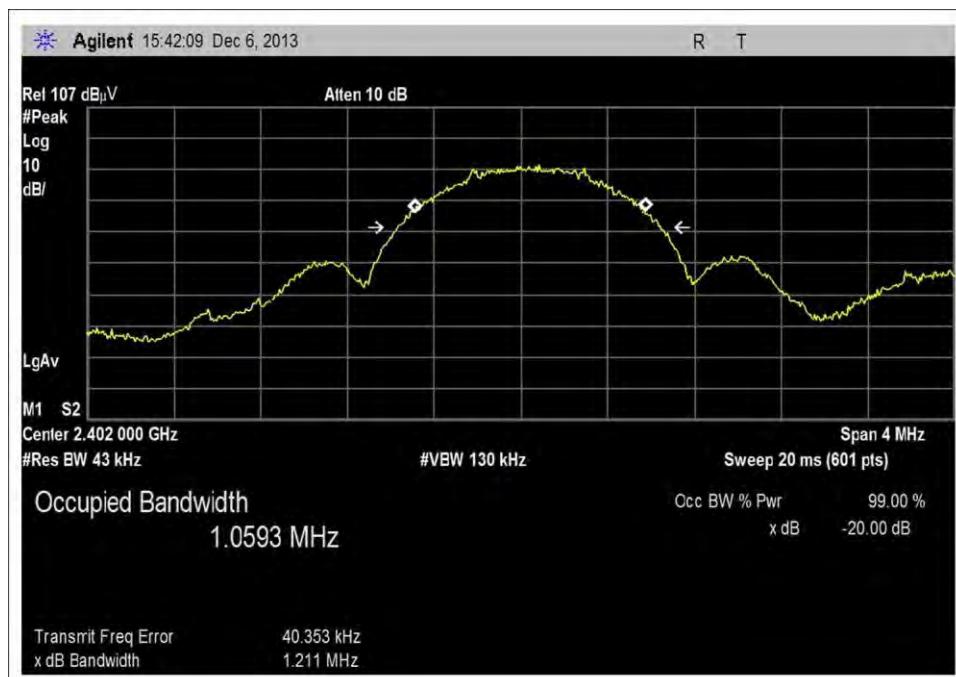
EUT's antenna is non-removable, thus the data will be gathered through radiated measurements. EUT is located on top of a test table, 80cm over the ground plane. EUT is power with a fresh battery.

### Test Equipment

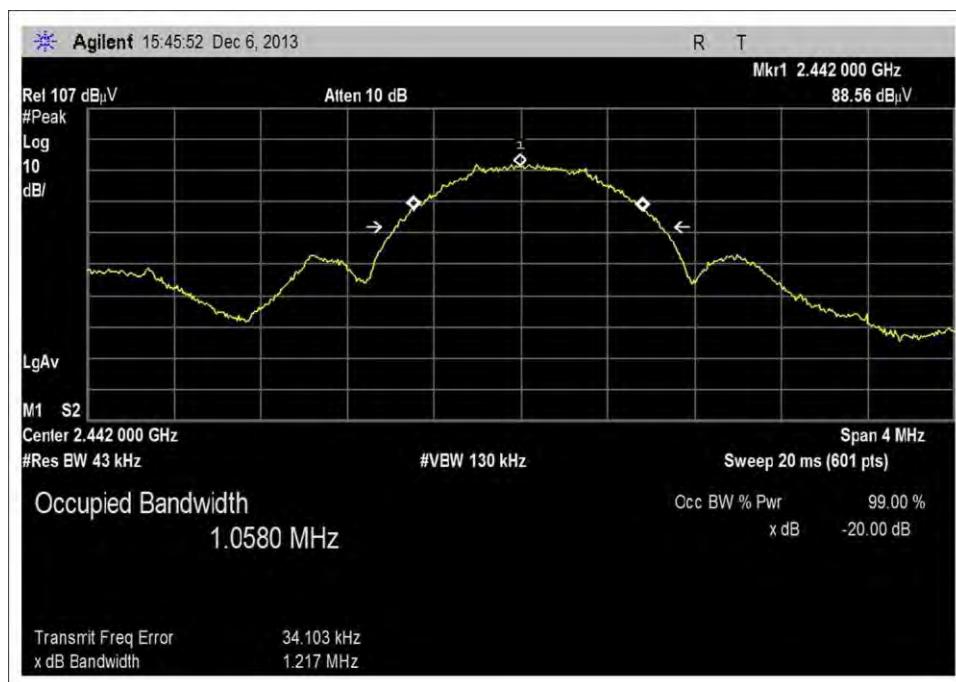
Asset #	Description	Model	Manufacturer	Cal Date	Cal Due
01467	Horn Antenna-ANSI C63.5 Calibration	3115	EMCO	9/16/2013	9/16/2015
03209	Preamp	83051A	Agilent	3/5/2013	3/5/2015
P05546	Cable	Heliax	Andrews	3/27/2013	3/27/2015
P06505	Cable	32026-29080-29080-84	Astrolab	10/18/2013	10/18/2015
02871	Spectrum Analyzer	E4440A	Agilent	7/19/2013	7/19/2015

Frequency (MHz)		-20dB Bandwidth			
2402		1.211MHz			
2442		1.217MHz			
2480		1.207MHz			

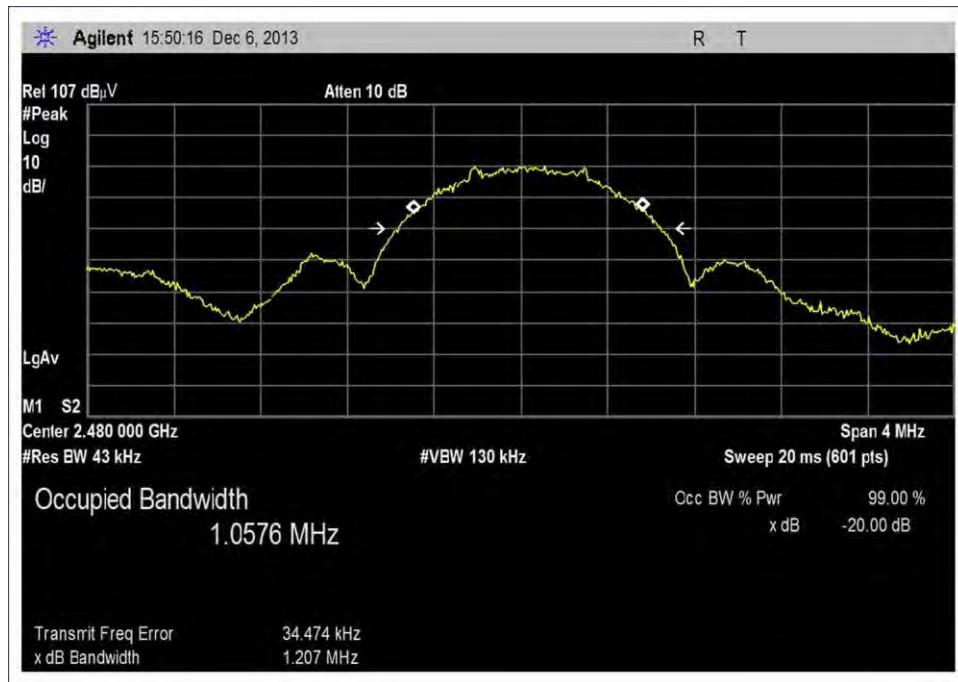
## Test Data



Low



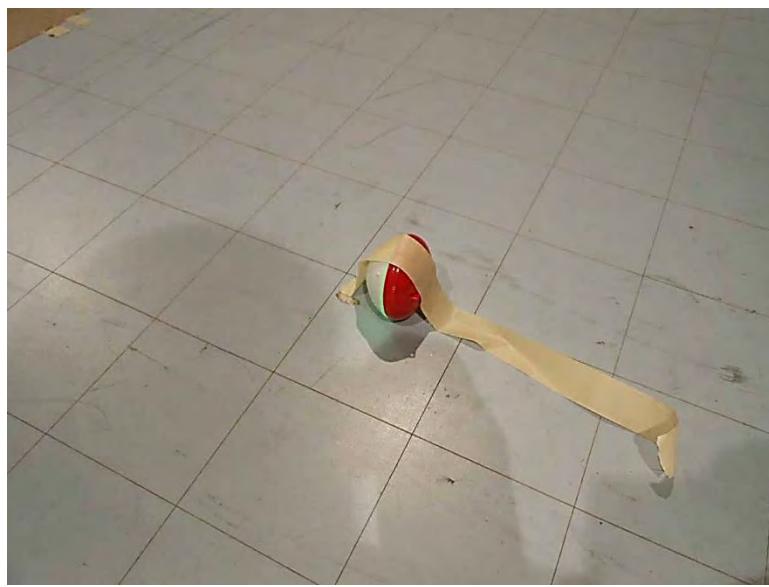
Middle



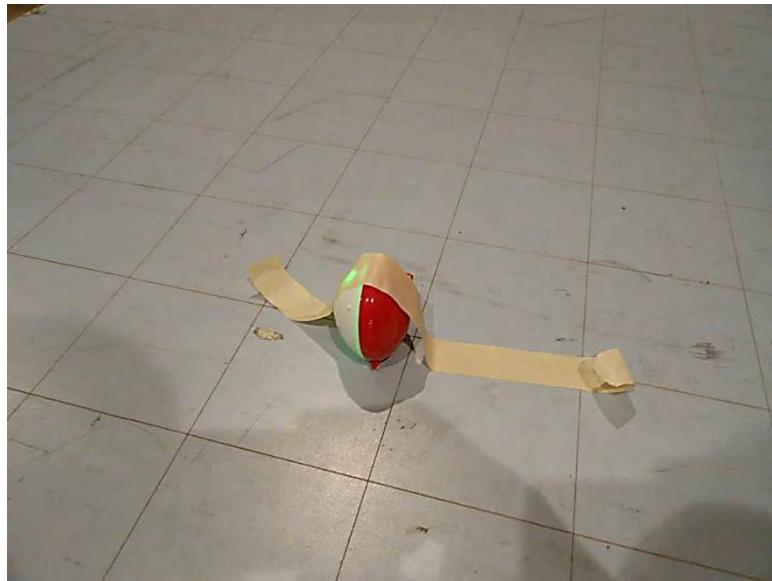
High

## Test Photo(s)

Note: Photo Timestamp Not Set – Photos taken day of testing (date of actual test) 03/04/2014.



Y-Axis



X-Axis

## 15.249(d) Field Strength of Spurious Emissions and Band Edge

### Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **ReelSonar**  
 Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**  
 Work Order #: **94243** Date: **2/24/2014**  
 Test Type: **Maximized Emissions** Time: **09:30:04**  
 Equipment: **Bluetooth Ultrasonic Fish Finder** Sequence#: **2**  
 Manufacturer: **ReelSonar** Tested By: **Steven Pittsford**  
 Model: **iBobber**  
 S/N: **E0-C7-9D-63-27-DE**

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06505	Cable	32026-29080-29080-84	10/18/2013	10/18/2015
T2	AN03209	Preamp	83051A	3/5/2013	3/5/2015
T3	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	9/16/2013	9/16/2015
T4	ANP05547	Cable	Heliax	9/7/2012	9/7/2014
T5	AN02872	Spectrum Analyzer	E4440A	7/19/2013	7/19/2015
T6	AN02308	Preamp	8447D	4/3/2012	4/3/2014
T7	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
T8	ANP05360	Cable	RG214	12/3/2012	12/3/2014
T9	ANP05541	Cable	Heliax	4/11/2012	4/11/2014
T10	AN00052	Loop Antenna	6502	5/16/2012	5/16/2014
T11	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	12/18/2012	12/18/2014
T12	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	12/17/2012	12/17/2014
T13	ANP05422	Cable	PE35591-72	6/8/2012	6/8/2014
T14	AN02763-69	Waveguide	Multiple	6/7/2012	6/7/2014

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

Function	Manufacturer	Model #	S/N
Bluetooth Ultrasonic Fish Finder*	ReelSonar	iBobber	E0-C7-9D-63-27-DE

**Support Devices:**

Function	Manufacturer	Model #	S/N

**Test Conditions / Notes:**

Temperature: 21°C

Pressure: 101.9kPa

Humidity: 33%

Frequency: 9k-25GHz

Vertical and Horizontal Polarizations X, Y &amp; Z Axis investigated only worst reported.

CISPR Bandwidths Used

EUT is located on the top of the test table 80cm over the ground plane.

EUT is continuously transmitting at Low, Mid and High Channels.

Low 2.402GHz Fundamental

Med 2.440GHz Fundamental

High 2.482GHz Fundamental

15.31(e) Fresh Battery Installed

Ext Attn: 0 dB

#	Freq	Rdng	Reading listed by margin.				Test Distance: 3 Meters				
			T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13	T14							
	MHz	dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	9914.250M	32.8	+2.9	-27.9	+37.4	+4.9	+0.0	50.1	54.0	-3.9	Horiz
			+0.0	+0.0	+0.0	+0.0					118
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
2	9919.950M	32.5	+2.9	-27.9	+37.3	+4.9	+0.0	49.7	54.0	-4.3	Vert
			+0.0	+0.0	+0.0	+0.0	360				118
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
3	7204.590M	34.1	+2.4	-28.2	+36.5	+4.3	+0.0	49.1	54.0	-4.9	Vert
			+0.0	+0.0	+0.0	+0.0	294				119
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
4	9763.710M	31.6	+2.9	-27.8	+37.4	+4.9	+0.0	49.0	54.0	-5.0	Vert
			+0.0	+0.0	+0.0	+0.0	360				112
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
5	7436.133M	32.4	+2.5	-28.2	+37.5	+4.4	+0.0	48.6	54.0	-5.4	Vert
			+0.0	+0.0	+0.0	+0.0					119
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
6	7319.550M	32.5	+2.4	-28.2	+37.0	+4.3	+0.0	48.0	54.0	-6.0	Vert
			+0.0	+0.0	+0.0	+0.0					107
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					
7	4881.940M	39.9	+2.7	-30.9	+32.3	+3.6	+0.0	47.6	54.0	-6.4	Vert
			+0.0	+0.0	+0.0	+0.0					158
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+0.0					

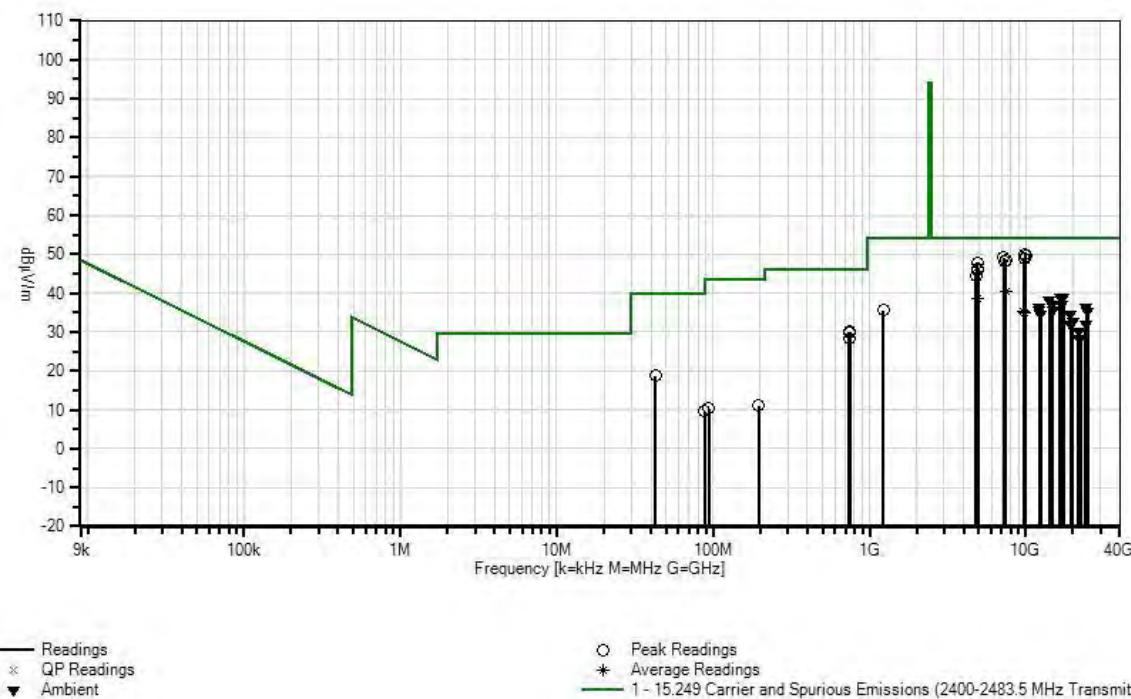
8	4958.267M	38.2	+2.6	-30.8	+32.5	+3.6	+0.0	46.1	54.0	-7.9	Vert
			+0.0	+0.0	+0.0	+0.0	360		High		110
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
9	4958.100M	37.9	+2.6	-30.8	+32.5	+3.6	+0.0	45.8	54.0	-8.2	Horiz
			+0.0	+0.0	+0.0	+0.0	14		High		131
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
10	4806.090M	37.4	+2.5	-30.9	+32.1	+3.5	+0.0	44.6	54.0	-9.4	Horiz
			+0.0	+0.0	+0.0	+0.0			Low		135
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
11	4806.020M	37.1	+2.5	-30.9	+32.1	+3.5	+0.0	44.3	54.0	-9.7	Vert
			+0.0	+0.0	+0.0	+0.0	360		Low		103
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
12	7436.133M	24.1	+2.5	-28.2	+37.5	+4.4	+0.0	40.3	54.0	-13.7	Horiz
Ave			+0.0	+0.0	+0.0	+0.0	249		High		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	7436.133M	33.0	+2.5	-28.2	+37.5	+4.4	+0.0	49.2	54.0	-4.8	Horiz
			+0.0	+0.0	+0.0	+0.0	360		High		117
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
14	16454.000	40.2	+4.0	+0.0	+0.0	+6.4	+0.0	39.0	54.0	-15.0	V & H
M			+0.0	+0.0	+0.0	+0.0					
Ambient			+0.0	+0.0	-11.6	+0.0			Noise Floor		101
			+0.0	+0.0							
15	17374.000	40.0	+4.2	+0.0	+0.0	+6.9	+0.0	38.9	54.0	-15.1	V & H
M			+0.0	+0.0	+0.0	+0.0					
Ambient			+0.0	+0.0	-12.2	+0.0			Noise Floor		101
			+0.0	+0.0							
16	4882.080M	31.0	+2.7	-30.9	+32.3	+3.6	+0.0	38.7	54.0	-15.3	Horiz
Ave			+0.0	+0.0	+0.0	+0.0	359		Mid		125
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	4882.030M	40.0	+2.7	-30.9	+32.3	+3.6	+0.0	47.7	54.0	-6.3	Horiz
			+0.0	+0.0	+0.0	+0.0			Mid		125
			+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
18	14050.000	42.7	+4.6	+0.0	+0.0	+6.1	+0.0	38.2	54.0	-15.8	V & H
M			+0.0	+0.0	+0.0	+0.0					
Ambient			+0.0	+0.0	-15.2	+0.0			Noise Floor		101
			+0.0	+0.0							
19	743.200M	33.2	+0.8	+0.0	+0.0	+0.0	+0.0	30.1	46.0	-15.9	Vert
			+0.0	-28.0	+21.3	+1.8			Mid		99
			+1.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							
20	746.400M	33.0	+0.8	+0.0	+0.0	+0.0	+0.0	29.9	46.0	-16.1	Vert
			+0.0	-28.0	+21.3	+1.8			High		99
			+1.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							

21	17080.000	39.2	+4.3	+0.0	+0.0	+6.6	+0.0	37.3	54.0	-16.7	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	-12.8	+0.0					Noise Floor
			+0.0	+0.0							101
22	14640.000	42.1	+3.8	+0.0	+0.0	+6.3	+0.0	37.2	54.0	-16.8	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	-15.0	+0.0					Noise Floor
			+0.0	+0.0							101
23	742.400M	31.6	+0.8	+0.0	+0.0	+0.0	+0.0	28.5	46.0	-17.5	Vert
			+0.0	-28.0	+21.3	+1.8	360				Low
			+1.0	+0.0	+0.0	+0.0					114
			+0.0	+0.0							
24	24400.000	40.7	+0.0	+0.0	+0.0	+0.0	+0.0	36.4	54.0	-17.6	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-13.1					Noise Floor
			+8.7	+0.1							101
25	12107.000	41.0	+3.6	+0.0	+0.0	+5.6	+0.0	36.3	54.0	-17.7	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	-13.9	+0.0					Noise Floor
			+0.0	+0.0							101
26	14892.000	40.5	+3.7	+0.0	+0.0	+6.3	+0.0	35.7	54.0	-18.3	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	-14.8	+0.0					Noise Floor
			+0.0	+0.0							101
27	12200.000	40.4	+3.5	+0.0	+0.0	+5.7	+0.0	35.7	54.0	-18.3	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	-13.9	+0.0					Noise Floor
			+0.0	+0.0							101
28	1225.400M	39.2	+1.0	-30.7	+24.4	+1.7	+0.0	35.6	54.0	-18.4	Vert
			+0.0	+0.0	+0.0	+0.0	360				Low
			+0.0	+0.0	+0.0	+0.0					109
			+0.0	+0.0							
29	24820.000	38.9	+0.0	+0.0	+0.0	+0.0	+0.0	35.3	54.0	-18.7	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-12.4					Noise Floor
			+8.6	+0.2							101
30	9613.470M	17.8	+2.9	-27.8	+37.5	+4.8	+0.0	35.2	54.0	-18.8	Vert
	Ave		+0.0	+0.0	+0.0	+0.0	274				Low
			+0.0	+0.0	+0.0	+0.0					119
			+0.0	+0.0							
^	9613.470M	33.4	+2.9	-27.8	+37.5	+4.8	+0.0	50.8	54.0	-3.2	Vert
			+0.0	+0.0	+0.0	+0.0	310				Low
			+0.0	+0.0	+0.0	+0.0					119
			+0.0	+0.0							
32	9916.700M	17.6	+2.9	-27.9	+37.3	+4.9	+0.0	34.8	54.0	-19.2	Horiz
	Ave		+0.0	+0.0	+0.0	+0.0	111				High
			+0.0	+0.0	+0.0	+0.0					118
			+0.0	+0.0							
33	19250.000	38.8	+0.0	+0.0	+0.0	+0.0	+0.0	34.7	54.0	-19.3	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-13.3					Noise Floor
			+7.7	+1.5							101

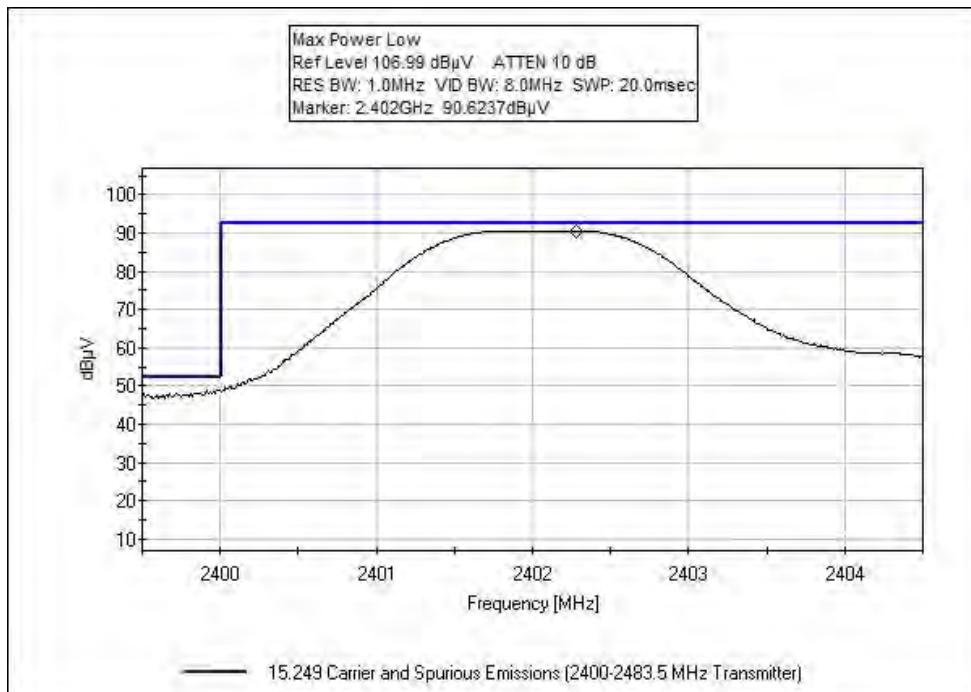
34	12410.000	39.4	+3.5	+0.0	+0.0	+5.7	+0.0	34.5	54.0	-19.5	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	-14.1	+0.0					Noise Floor
			+0.0	+0.0							101
35	42.750M	34.1	+0.2	+0.0	+0.0	+0.0	+0.0	18.7	40.0	-21.3	Vert
			+0.0	-28.0	+11.7	+0.4					99
			+0.3	+0.0	+0.0	+0.0					
			+0.0	+0.0							
36	19865.000	37.2	+0.0	+0.0	+0.0	+0.0	+0.0	32.6	54.0	-21.4	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-13.4					Noise Floor
			+7.9	+0.9							101
37	19216.000	36.2	+0.0	+0.0	+0.0	+0.0	+0.0	32.1	54.0	-21.9	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-13.3					Noise Floor
			+7.7	+1.5							101
38	24020.000	37.1	+0.0	+0.0	+0.0	+0.0	+0.0	31.9	54.0	-22.1	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-13.9					Noise Floor
			+8.6	+0.1							101
39	21960.000	37.9	+0.0	+0.0	+0.0	+0.0	+0.0	30.0	54.0	-24.0	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-16.4					Noise Floor
			+8.3	+0.2							101
40	22338.000	36.9	+0.0	+0.0	+0.0	+0.0	+0.0	28.5	54.0	-25.5	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-16.8					Noise Floor
			+8.3	+0.1							101
41	21618.000	35.6	+0.0	+0.0	+0.0	+0.0	+0.0	28.3	54.0	-25.7	V & H
	M		+0.0	+0.0	+0.0	+0.0					
	Ambient		+0.0	+0.0	+0.0	-15.8					Noise Floor
			+8.2	+0.3							101
42	87.800M	28.1	+0.3	+0.0	+0.0	+0.0	+0.0	9.5	40.0	-30.5	Vert
			+0.0	-28.0	+8.2	+0.6	360				99
			+0.3	+0.0	+0.0	+0.0					
			+0.0	+0.0							
43	196.430M	27.5	+0.4	+0.0	+0.0	+0.0	+0.0	11.0	43.5	-32.5	Vert
			+0.0	-27.3	+9.0	+0.9					99
			+0.5	+0.0	+0.0	+0.0					
			+0.0	+0.0							
44	93.920M	28.0	+0.3	+0.0	+0.0	+0.0	+0.0	10.3	43.5	-33.2	Vert
			+0.0	-27.9	+9.0	+0.6					400
			+0.3	+0.0	+0.0	+0.0					
			+0.0	+0.0							
45	150.000k	48.2	+0.0	+0.0	+0.0	+0.0	-80.0	-22.3	24.1	-46.4	Paral
			+0.0	+0.0	+0.0	+0.0	360				99
			+0.0	+9.5	+0.0	+0.0					
			+0.0	+0.0							
46	150.000k	45.9	+0.0	+0.0	+0.0	+0.0	-80.0	-24.6	24.1	-48.7	Paral
			+0.0	+0.0	+0.0	+0.0	326				99
			+0.0	+9.5	+0.0	+0.0					
			+0.0	+0.0							

47	150.000k	45.8	+0.0	+0.0	+0.0	+0.0	-80.0	-24.7	24.1	-48.8	Paral
			+0.0	+0.0	+0.0	+0.0			Mid		99
			+0.0	+9.5	+0.0	+0.0					
			+0.0	+0.0							
48	20.082k	43.6	+0.0	+0.0	+0.0	+0.0	-80.0	-24.0	41.5	-65.5	Paral
			+0.0	+0.0	+0.0	+0.0	36		Mid		99
			+0.0	+12.4	+0.0	+0.0					
			+0.0	+0.0							
49	17.673k	43.9	+0.0	+0.0	+0.0	+0.0	-80.0	-23.0	42.6	-65.6	Paral
			+0.0	+0.0	+0.0	+0.0	21		Low		99
			+0.0	+13.1	+0.0	+0.0					
			+0.0	+0.0							
50	15.831k	44.2	+0.0	+0.0	+0.0	+0.0	-80.0	-22.0	43.6	-65.6	Paral
			+0.0	+0.0	+0.0	+0.0			High		99
			+0.0	+13.8	+0.0	+0.0					
			+0.0	+0.0							

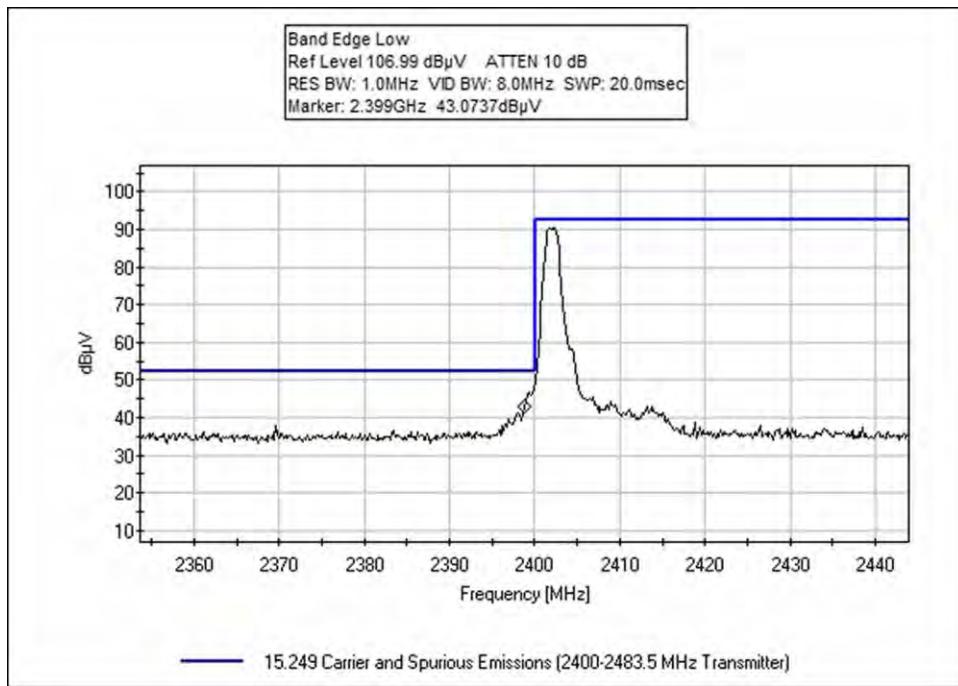
CKC Laboratories, Inc. Date: 3/4/2014 Time: 09:30:04 ReelSonar WO#: 94243  
 Test Distance: 3 Meters Sequence#: 2 V & H  
 ReelSonar Bluetooth Ultrasonic Fish Finder P/N: iBobber

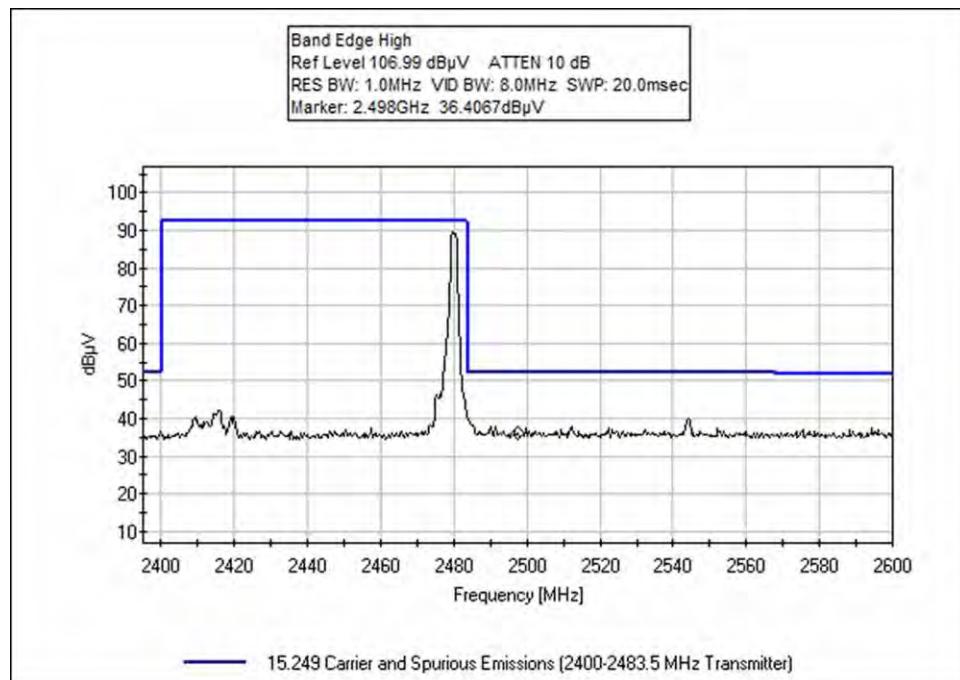


## Band Edge Test Data



Low





High

## Test Setup Photo(s)

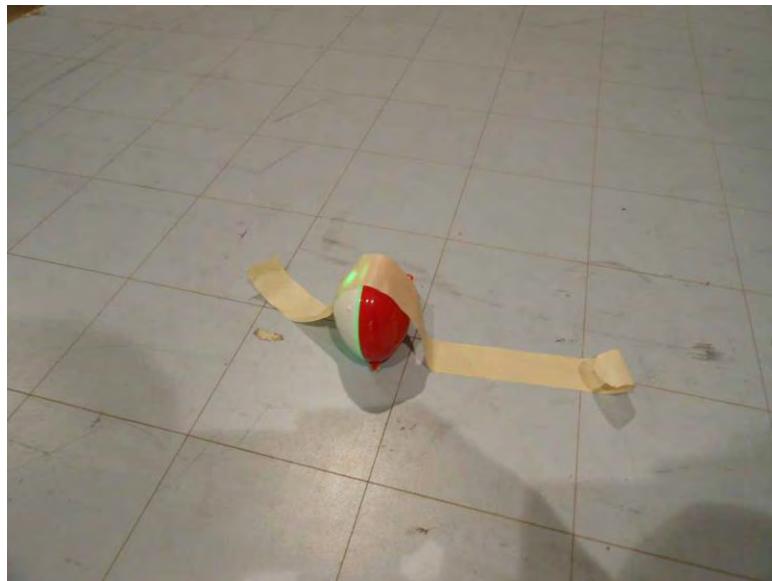
Note: Photo Timestamp Not Set – Photos taken day of testing (date of actual test) 03/04/2014.



Overall Test Setup



Y-Axis



Z-Axis

## 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  $\text{dB}\mu\text{V}/\text{m}$ , the spectrum analyzer reading in  $\text{dB}\mu\text{V}$  was corrected by using the following formula. This reading was then compared to the applicable specification limit.

<b>SAMPLE CALCULATIONS</b>	
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. 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.

<b>MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE</b>			
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.