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CERTIFICATION TEST REPORT

Manufacturer: Intellirod Spine Inc.
554 White Pond Drive, Suite F
Akron, Ohio 44320
United States of America

Applicant: Same As Above

Product: Loadpro™

Model: C3520-0

FCC ID: 2ADUW-007-1002

Testing Commenced: Oct. 29, 2014

Testing Ended: Dec 9, 2014

Summary of Test Results: Page 4

Standards:

- FCC Part 15 Subpart C, Section 15.225, 15.209

Evaluation Conducted by:

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Report Reviewed by:

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1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

1.2 Measurement Procedure:

All measurements were performed according to ANSI C63.10 and recommended FCC procedure of measurement of DTS operating under Section 15.225. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

Radiated Emissions

- Combined Uncertainty (+ or -) 2.67 dB
- Expanded Uncertainty (+ or -) 5.35 dB

Conducted Emissions

- Combined Uncertainty (+ or -) 1.88 dB
- Expanded Uncertainty (+ or -) 3.75 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1.4 Document History

Document Number	Description	Issue Date	Approved By
F2LQ6398D2-01E	First Issue	Dec. 17, 2014	K. Littell



2 SUMMARY OF TEST RESULTS

Test Name	Standard(s)	Results
Operation Within the Band 13.110-14.010 MHz	FCC Part 15 Subpart C 15.225(a)(b)(c)(d)	Complies
Radiated Emissions	FCC Part 15 Subpart C 15.209	Complies*
Frequency Stability	FCC Part 15 Subpart C 15.225(e)	Complies
Occupied Bandwidth	FCC Part 15 Subpart C 15.215(c)	Complies

**Complies with modifications below.*

Modifications Made to the Intellirod Reader
• Added IPF cap in parallel L5. • Added IPF Cap in parallel L6. • C8 populated with 33pF. • Added 18pF cap in parallel with R15. • Added ferrite (Fair-Rite #0446173951) on coaxial cable to antenna.



3 **ENGINEERING STATEMENT**

This report has been prepared on behalf of Intellirod Spine Inc., to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.225 of the FCC Rules using ANSI C63.4 2003 and Part 15 standards. The test results found in this test report relate only to the items tested.

4 **EUT INFORMATION AND DATA**

4.1 **Equipment Under Test:**

Product: Loadpro™

Model: C3520-0

Serial No.: Not applicable

FCC ID: 2ADUW-007-1002

4.2 **Trade Name:**

Intellirod Spine Inc.

4.3 **Power Supply:**

Battery-operated

4.4 **Applicable Rules:**

CFR 47, Part 15.225, subpart C

4.5 **Equipment Category:**

RFID

4.6 **Antenna:**

Internal RFID Loop Antenna

4.7 **Accessories:**

N/A

4.8 **Test Item Condition:**

The equipment to be tested was received in good condition.

4.9 **Testing Algorithm:**

EUT was set up in a normal testing manner, powered by a 3V battery. EUT scanned for a sensor and gave a reading when nearby. The highest emissions were recorded in the data tables.

**5 LIST OF MEASUREMENT INSTRUMENTATION**

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shield Room	0175	Ray Proof	N/A	11645	Verified
Temp/Hum. Recorder	CL137	Extech	RH520	CH16992	May 5, 2015
OATS-3m	CL017	Compliance Labs	N/A	001	Dec. 13, 2014
Spectrum Analyzer	CL147	Agilent	E7402A	MY45101241	Nov. 7, 2015
Spectrum Analyzer	CL138	Agilent Technologies	E4407B	US41192779	Nov. 17, 2015
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Nov. 12, 2015
Antenna 1-Chamber	0142	ETS/EMCO	3142B	9811-1330	Verified
Antenna 2-OATS	0105	Sunol Sciences	JB1	A101101	May 7, 2015
Pre-Amplifier	CL045	Hewlett Packard	8447D	2944A08445	Nov. 15, 2015
Amplifier with Monopole & 18" Loop	CL163	A.H. Systems, Inc.	EHA-52B	100	Apr. 24, 2015
LISN 1	0149	Solar	8028-50-TS-24-BNC	1130	Oct. 18, 2016
LISN 2	0147	Solar	8028-50-TS-24-BNC	1128	Oct. 28, 2016



6 FCC PART 15.225(a)(b)(c)(d) – Operation Within the band 13.110-14.010 MHz

6.1 Requirements

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters. (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters. (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters. (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

6.2 Test Procedure

Notes: Plots are peak, max hold pre-scan data included only to determine what frequencies to investigate and measure. During the pre-scan evaluation, the EUT was rotated in all three orthogonal positions to find the maximum emissions. The orthogonal position that showed the highest emissions was used. At some frequencies, no emissions from the EUT were measurable over the ambient noise floor. The readings did not change with EUT on and EUT off.

At least 6 of the highest frequencies were measured per ANSI 63.4 on the Open Area Test Site. Frequencies below 1GHz were measured using a quasi-peak detector. The antenna was raised between 1 and 4 meters and the EUT turntable was rotated 360 degrees to maximize the emissions. Some of the frequencies did not change with the EUT on or off. At those frequencies, the test distance was shortened to 1 meter and still no emissions from the EUT were visible or over the ambient or limit.

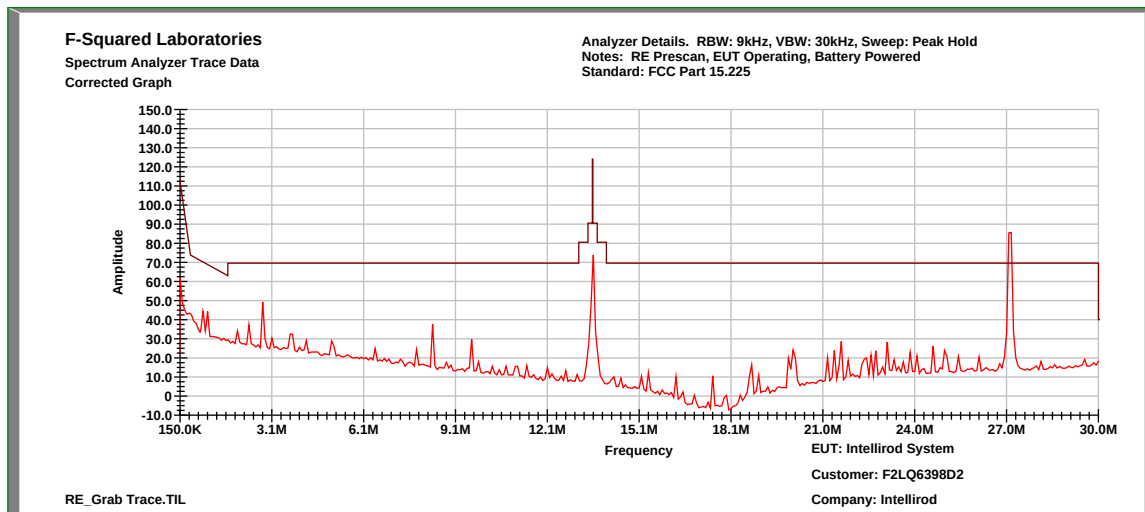


6.3 Test Data

Test Date(s):	Oct. 28, 2014	Test Engineer:	J. Knepper
Standards:	CFR 47 Part 15.225 & 15.209	Air Temperature:	14.5°C
		Relative Humidity:	39%

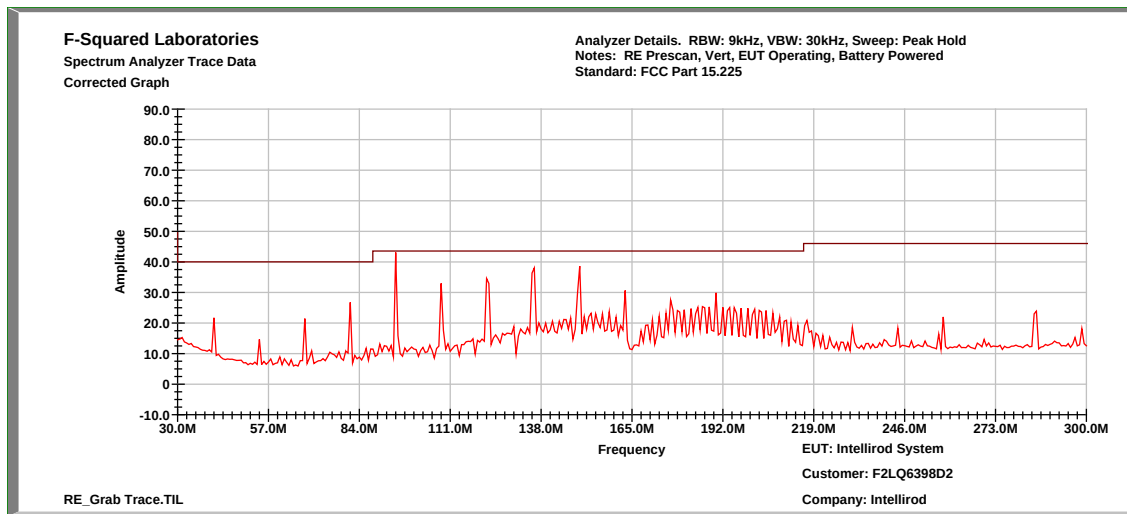
Note: Data below reflects results with modifications per Section 2 of this Test Report.

0.15 MHz to 30.0 MHz

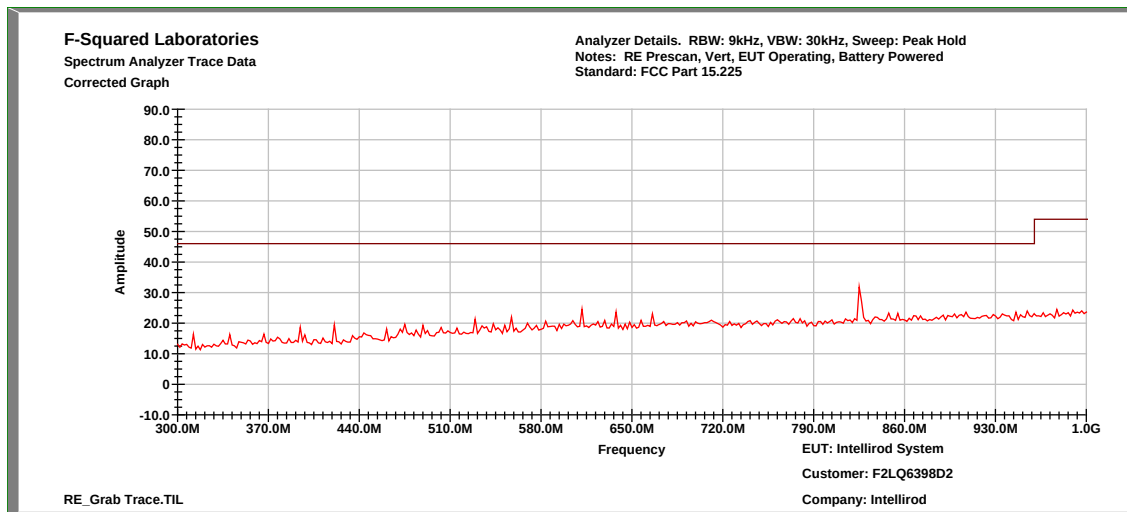




30 MHz to 300 MHz, Vertical

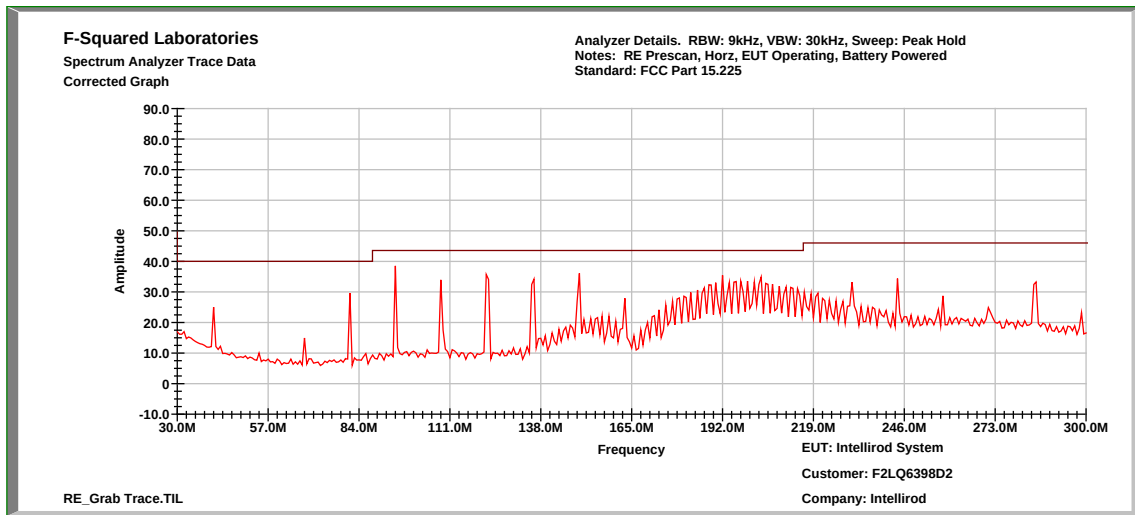


300 MHz to 1000 MHz, Vertical

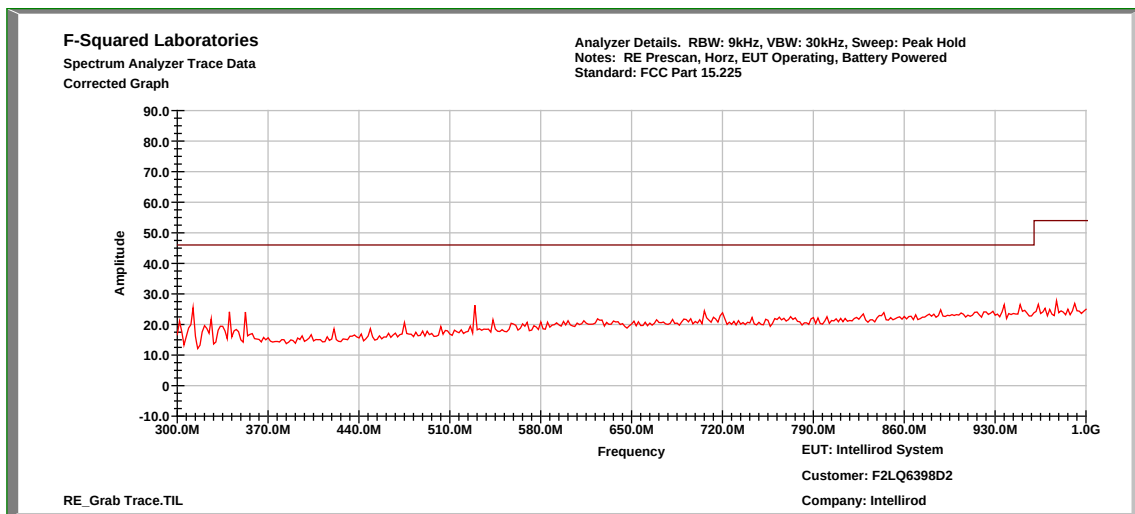


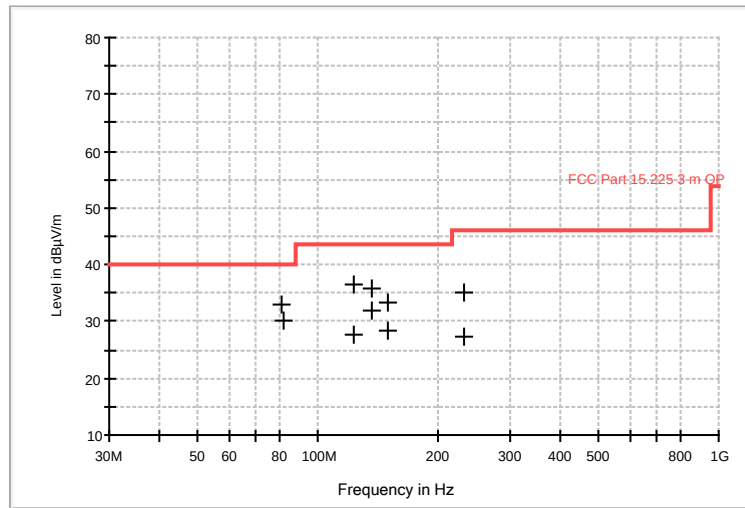


30 MHz to 300 MHz, Horizontal



300 MHz to 1000 MHz, Horizontal





Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Cable Loss & Antenna Factor (dB)	Emission (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Bandwidth
13.560000	N/A	54.68	0.50	55.18	104	-48.8	9
27.120000	N/A	27.12	11.10	38.22	49.5	-11.3	9
81.350000	H	23.8	9.1	32.9	40.0	-7.1	120
81.370000	V	20.6	9.5	30.1	40.0	-9.9	120
122.030000	V	11.7	15.9	27.6	43.5	-15.9	120
122.030000	H	20.8	15.7	36.5	43.5	-7.0	120
135.590000	H	20.7	15.3	36.0	43.5	-7.5	120
135.610000	V	16.6	15.4	32.0	43.5	-11.5	120
149.170000	H	18.8	14.5	33.3	43.5	-10.2	120
149.170000	V	14.3	14.3	28.6	43.5	-14.9	120
230.530000	V	12.1	14.3	26.4	46.0	-19.6	120
230.530000	H	21.0	14.0	35.0	46.0	-11.0	120



7 FCC PART 15.225(e) – FREQUENCY STABILITY

7.1 Requirements

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20°C to $+50^{\circ}\text{C}$ at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20°C . For battery-operated equipment, the equipment tests shall be performed using a new battery.

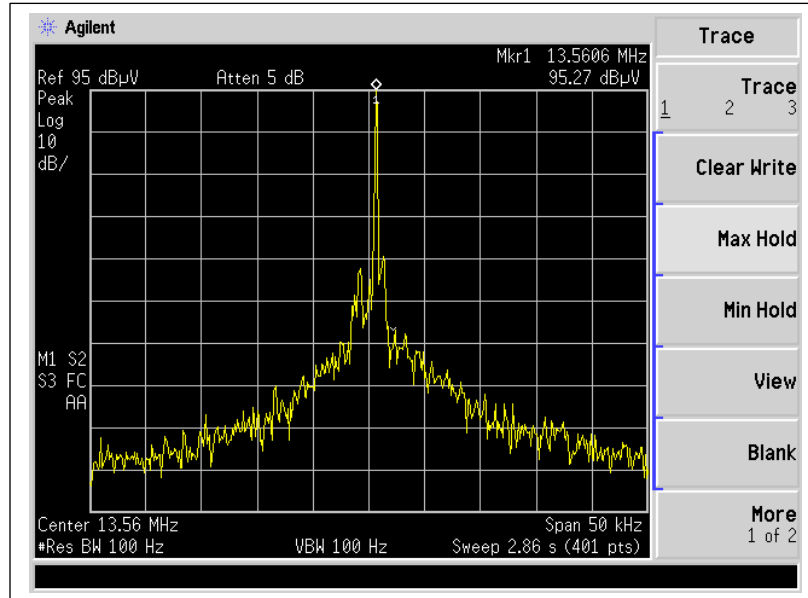
Test Procedure:

The EUT was placed in a temperature chamber with a near field probe and was allowed to stabilize. After the EUT had stabilized, measurements were recorded.

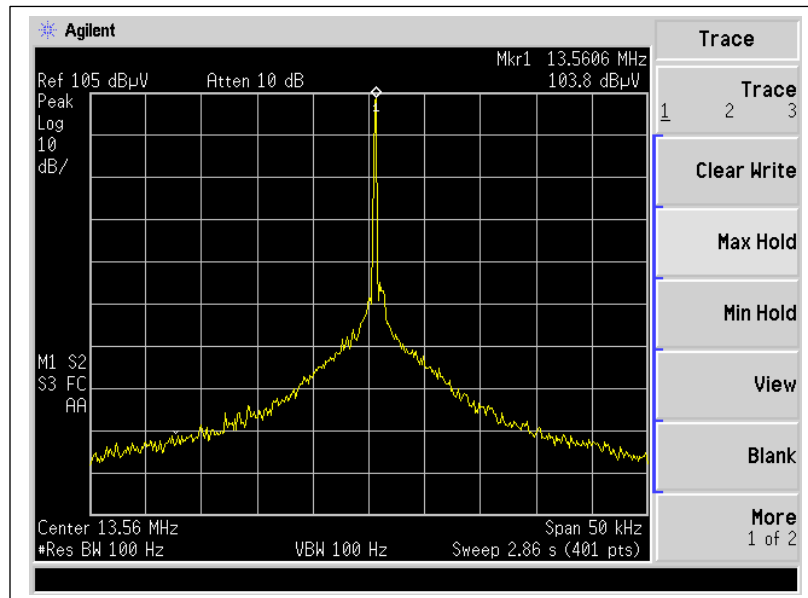


7.2 Test Data

-20°C



+50°C





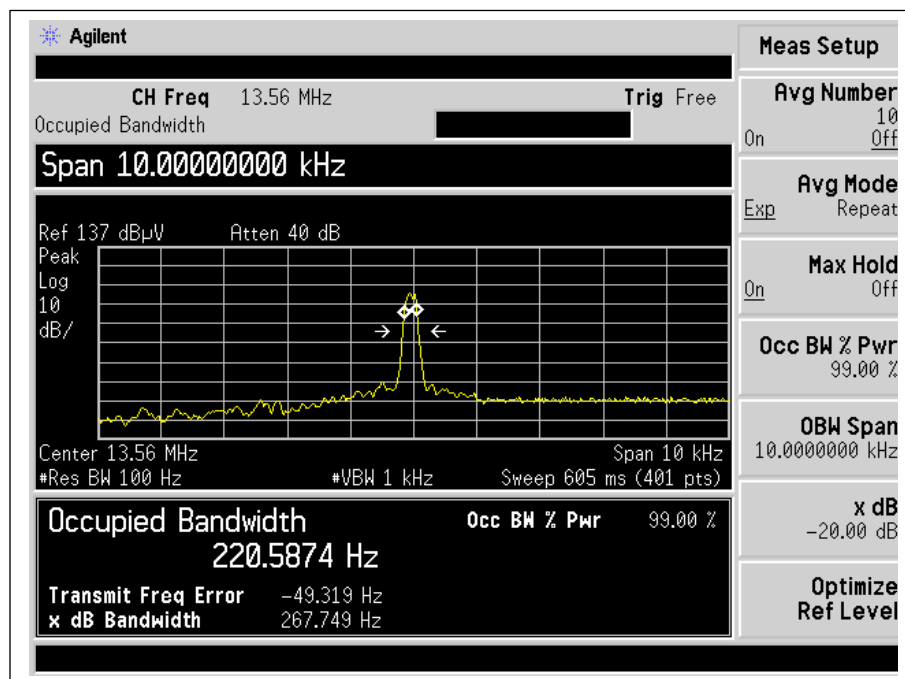
8 FCC PART 15.215(C) OCCUPIED BANDWIDTH

8.1 Requirements:

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through §15.257 and in Subpart E of this part, must be designed to ensure that the 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

8.2 Test Data

Date(s):	Oct. 29, 2014	Test Engineer:	J. Knepper
Standards:	FCC Part 15.215(d) Occupied Bandwidth	Air Temperature:	20.4°C
		Relative Humidity:	48%





9 PHOTOGRAPHS/EXHIBITS – PRODUCT PHOTOS, TEST SETUPS

Temperature Chamber



Radiated Spurious Emissions

