



**F2 Labs**  
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## CERTIFICATION TEST REPORT

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**Manufacturing Address:** EIKO ELECTRIC PRODUCTS CORP  
WANG FENG INDUSTRY ZONE  
GONG MING TOWN  
BAO'AN DISTRICT  
SHENZHEN GUANGDONG CHINA

**Applicant:** United Pet Group, Inc.  
3001 Commerce Street  
Blacksburg, Virginia 24060-6671 USA

**Product Name:** Remote Control

**Product Description:** Hand-held battery operated remote control that set color and display modes on decorative LED Lights used for small fountains and garden ponds. Remote control operates in the 20 foot range.

**Model:** 19765-603

**FCC ID:** 2AJF819765-603

**Testing Commenced:** May 5, 2016

**Testing Ended:** Aug. 16, 2016

**Summary of Test Results:** In Compliance

### Standards:

- ❖ FCC Part 15 Subpart C, Section 15.249
- ❖ FCC Part 15 Subpart C, Section 15.215(c) – Additional provisions to the general radiated emission limitations
- ❖ FCC Part 15 Subpart C, Section 15.31(e)



Order Number: F2LQ8280

Applicant: United Pet Group, Inc.

Model: 19765-603

**Evaluation Conducted by:**

Joe Knepper, EMC Proj. Eng.

**Report Reviewed by:**

Ken Littell, Director of EMC & Wireless Operations

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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 the 2013 version of ANSI C63.10 and recommended FCC procedure of measurement of operating under Section 15.249. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data, and are expressed with a 95% confidence factor. Note: Only measurements listed below which relate to tests included in this Test Report are applicable to it.

Measurement Range	Expanded Uncertainty	Combined Uncertainty
Radiated Emissions <1 GHz @ 3m	±5.07dB	±2.54
Radiated Emissions <1 GHz @ 10m	±5.09dB	±2.55
Radiated Emissions 1 GHz to 2.7 GHz	±3.62dB	±1.81
Radiated Emissions 2.7 GHz to 18 GHz	±3.10dB	±1.55
AC Power Line Conducted Emissions, 150kHz to 30 MHz	±2.76dB	±1.38

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
F2LQ8280-01E	First Issue	Aug. 16, 2016	K. Littell



**2 SUMMARY OF TEST RESULTS**

<b>Test Name</b>	<b>Standard(s)</b>	<b>Results</b>
<b>-20dB Occupied Bandwidth</b>	<b>CFR 47 Part 15.215(c)</b>	<b>Complies</b>
<b>Field Strength of Emissions</b>	<b>CFR 47 Part 15.249(a)(d)</b>	<b>Complies</b>
<b>Conducted Emissions</b>	<b>CFR 47 Part 15.207(a)</b>	<b>Not Applicable</b>
<b>Variation of the Input Power</b>	<b>CFR 47 Part 15.31(e)</b>	<b>Not Applicable</b>

Note: EUT met requirements of CFR 47 Part 15.31(e) by being tested with new, non-rechargeable batteries.

<b>Modifications Made to the Equipment</b>
<b>None</b>



### 3 TABLE OF MEASURED RESULTS

Test	High Channel 2.473 GHz	Mid Channel 2.442 GHz	Low Channel 2.411 GHz
Average Field Strength of Fundamental	51.9 dB $\mu$ V/m	51.5 dB $\mu$ V/m	51.0 dB $\mu$ V/m
Peak Field Strength of Fundamental	83.2 dB $\mu$ V/m	82.4 dB $\mu$ V/m	83.3 dB $\mu$ V/m
Average Limit for Fundamental	50 millivolts/meter (93.98 dB $\mu$ V/m)	50 millivolts/meter (93.98 dB $\mu$ V/m)	50 millivolts/meter (93.98 dB $\mu$ V/m)
Peak Limit for Fundamental	(113.98dBuV/m)	(113.98dBuV/m)	(113.98dBuV/m)
-20dB Occupied Bandwidth	1.855 MHz	1.686 MHz	1.264 MHz

The 20dB bandwidth of the emission shall be contained within the frequency band designated in the rule section under which the equipment is operated.



#### 4 ENGINEERING STATEMENT

This report has been prepared on behalf of United Pet Group, Inc., to provide documentation for the testing described herein. This equipment has been tested and found to comply with part 15.249 of the FCC Rules using ANSI C63.10 2013 standard. The test results found in this test report relate only to the items tested.



**5 EUT INFORMATION AND DATA**

**5.1 Equipment Under Test:**

Product: Remote Control  
Model: 19765-603  
Serial No.: None Spec.  
FCC ID: 2AJF819765-603

**5.2 Trade Name:**

United Pet Group, Inc.

**5.3 Power Supply:**

Battery-operated

**5.4 Applicable Rules:**

CFR 47, Part 15.249

**5.5 Equipment Category:**

Radio Transceiver

**5.6 Antenna:**

0dBi Gain Integral Antenna

**5.7 Accessories:**

N/A

**5.8 Test Item Condition:**

The equipment to be tested was received in good condition.

**5.9 Testing Algorithm:**

EUT transmitted at high (2.473 GHz), mid (2.442 GHz) and low (2.411 GHz) channels intermittently. The EUT had a capacitance touch button to activate transmissions.





**6 LIST OF MEASUREMENT INSTRUMENTATION**

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	AlbatrossProjects	B83117-DF435-T261	US140023	May 12, 2017
Spectrum Analyzer	CL138	Agilent Technologies	E4407B	US41192779	Nov. 13, 2016
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Nov. 25, 2016
Pre-Amplifier	CL045	Hewlett-Packard	8447D	2944A08445	Nov. 2, 2016
Pre-Amplifier	CL153	Keysight Tech.	83006A	MY39500791	May 6, 2017
Horn Antenna	CL098	Emco	3115	9809-5580	Dec. 10, 2016
Horn Antenna	CL114	AH Systems, Inc.	SAS-572	237	Oct. 16, 2016
Software:	Tile Version 1.0		Software Verified: Aug. 16, 2016		
Software:	EMC 32, Version 5.20.2		Software Verified: Aug. 16, 2016		
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	Apr. 1, 2017
Loop Antenna	CL194	A. H. Systems, Inc.	SAS-562B	281	Mar. 9, 2018
Preamplifier	CL189	Com-Power	PAM-840A	461303	June 18, 2017



## 7 FCC PART 15.215(e) – OCCUPIED BANDWIDTH

### 7.1 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 20 dB 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. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

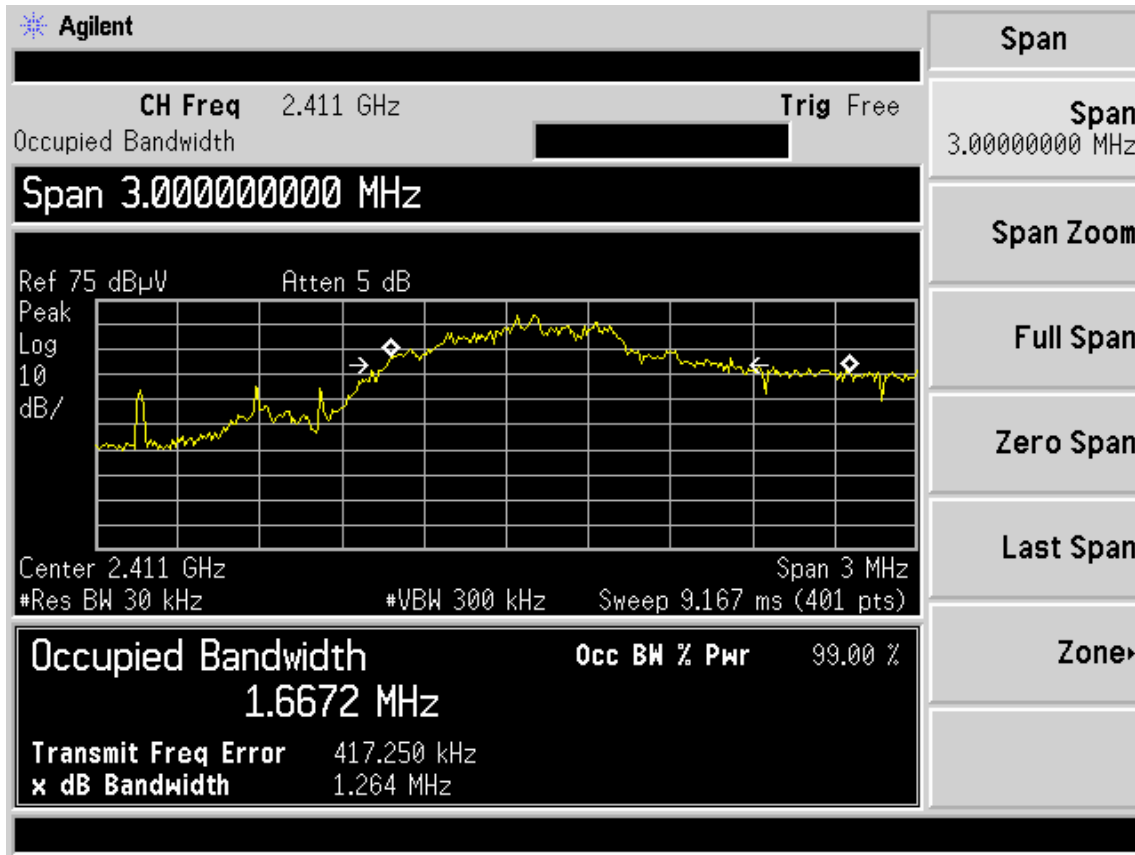
Bandwidth measurements were made at the low (2.411 GHz), mid (2.442 GHz) and upper (2.473 GHz) frequencies. The bandwidth was measured using the analyzer's marker function.



### 7.2 Occupied Bandwidth Test Data

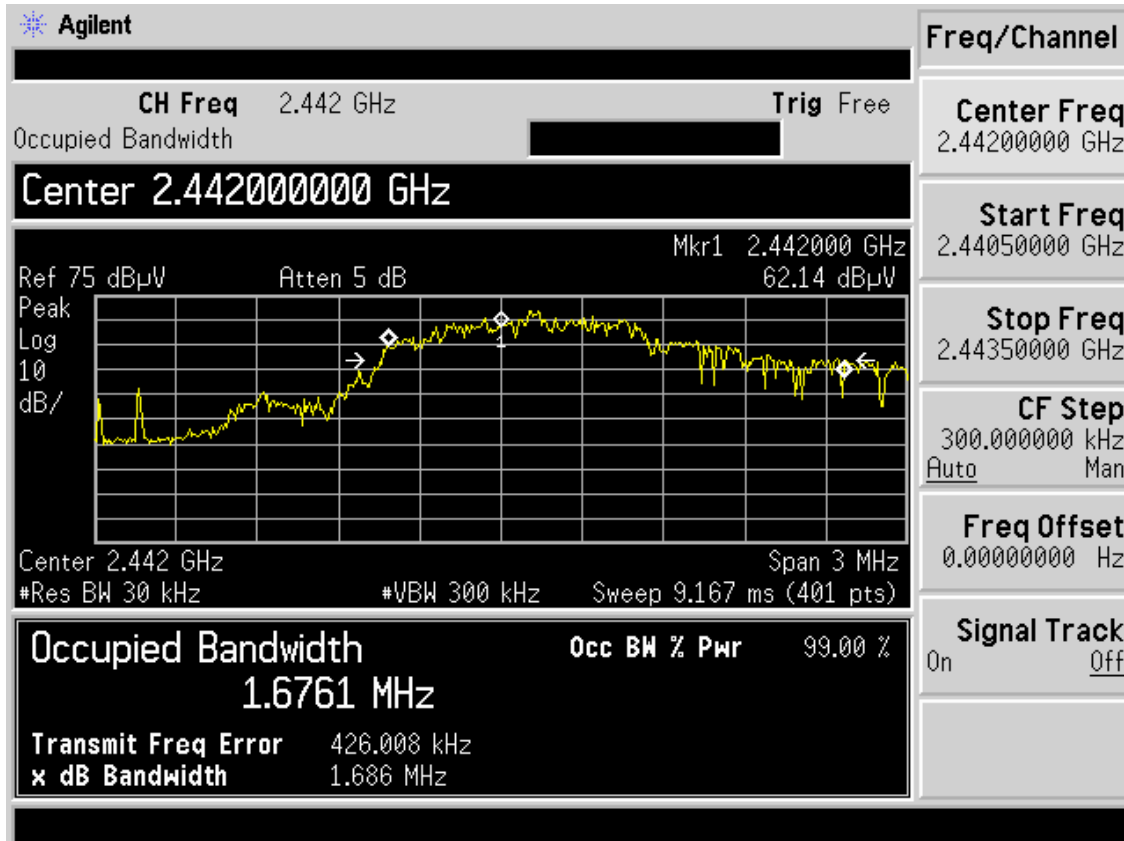
<b>Test Date:</b>	Aug. 16, 2016	<b>Test Engineer(s):</b>	J. Knepper
<b>Standards:</b>	CFR 47 Part 15.215(c)	<b>Air Temperature:</b>	20.2°C
		<b>Relative Humidity:</b>	42%

#### Low Channel



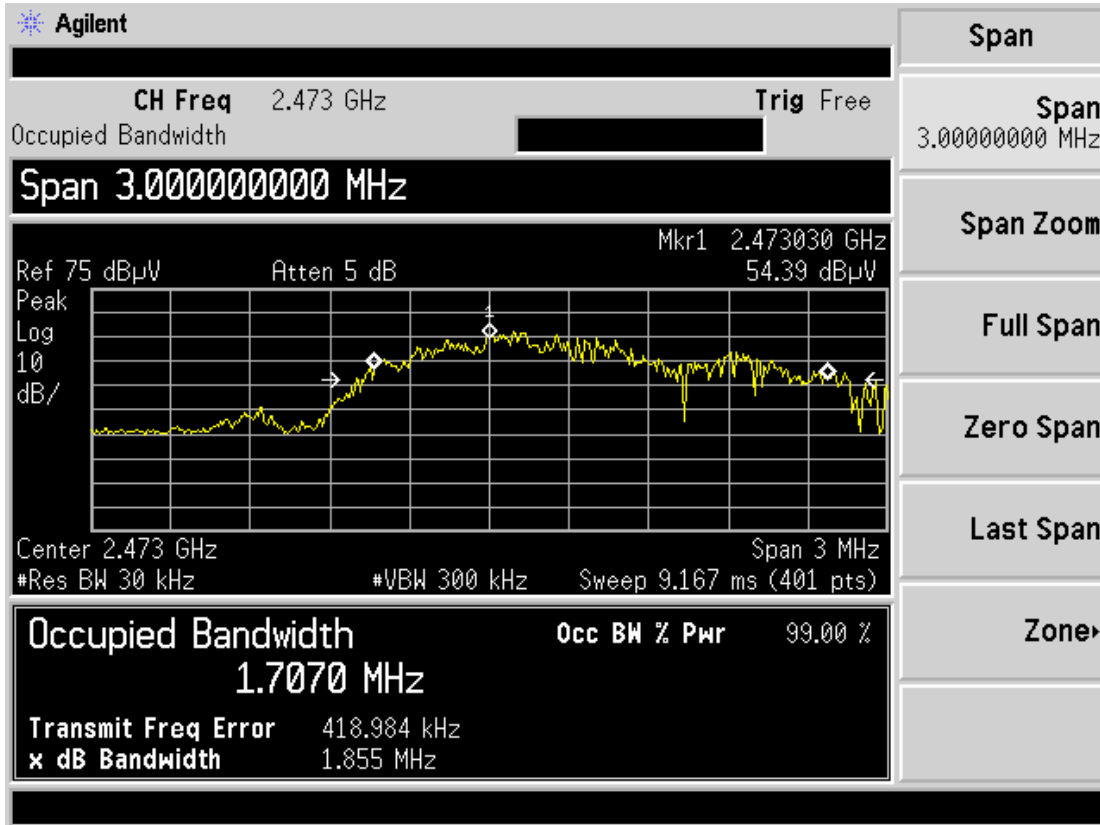


### Mid Channel





### High Channel





**8 FCC PART 15.249(a)(d) – FIELD STRENGTH OF EMISSIONS FROM INTENTIONAL RADIATORS**

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

<b>Fundamental frequency</b>	<b>Field strength of fundamental (millivolts/meter)</b>	<b>Field strength of harmonics (microvolts/meter)</b>
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

NOTE: During the pre-scan evaluation, the EUT was rotated in all possible directions to find the maximum emissions. The orthogonal position that showed the highest emissions was used. The antenna was raised between 1 and 4 meters and the EUT turntable was rotated 360 degrees to maximize the emissions. The following data reflects the worst case spurious emissions for the Low, Mid, and High channels, as the EUT was set up to transmit on the low, mid, and high channels simultaneously.



**8.1 Test Data - Field Strength of Emissions from Intentional Radiators**

<b>Test Date:</b>	May 5, 2016	<b>Test Engineer(s):</b>	J. Knepper
<b>Standards:</b>	CFR 47 Part 15.249(a)	<b>Air Temperature:</b>	20.6°C
		<b>Relative Humidity:</b>	48%

**Low Channel: >1 GHz**

Frequency (MHz)	Polarity	Corr. (dB)	MaxPeak (dBµV/m)	MaxPeak (dBµV/m) Limit	MaxPeak Margin	Average (dBµV/m)	Average (dBµV/m) Limit	Average Margin	Bandwidth (kHz)
2411.130000	V	6.80	83.3	114	-30.7	51	94	-43.0	1000.000
2411.130000	H	6.80	80.5	114	-33.5	49.6	94	-44.4	1000.000

**Mid Channel: >1 GHz**

Frequency (MHz)	Polarity	Corr. (dB)	MaxPeak (dBµV/m)	MaxPeak (dBµV/m) Limit	MaxPeak Margin	Average (dBµV/m)	Average (dBµV/m) Limit	Average Margin	Bandwidth (kHz)
2442.024000	V	6.80	82.4	114	-31.6	51.5	94	-42.5	1000.000
2442.024000	H	6.80	81.9	114	-32.1	50.3	94	-43.7	1000.000

**High Channel: >1 GHz**

Frequency (MHz)	Polarity	Corr. (dB)	MaxPeak (dBµV/m)	MaxPeak (dBµV/m) Limit	MaxPeak Margin	Average (dBµV/m)	Average (dBµV/m) Limit	Average Margin	Bandwidth (kHz)
2472.979000	H	6.90	83.2	114	-30.8	51.9	94	-42.1	1000.000
2472.979000	V	6.90	81.8	114	-32.2	49.9	94	-44.1	1000.000



## 8.2 Test Data – Spurious Emissions

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 possible directions 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 63.10 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.

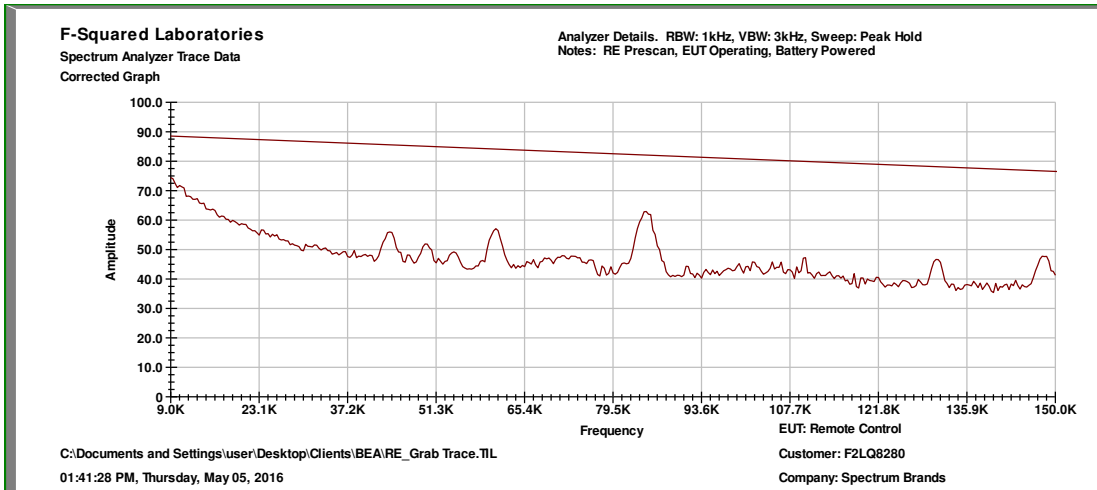
In the following plots, the black line indicates ambient noise and the red line indicates the measurement with the EUT on. Emissions to be found by the EUT were measured and listed in tables below. The following data reflects the worst case spurious emissions for the Low, Mid, and High channels, as the EUT was set up to transmit on the low, mid, and high channels simultaneously.



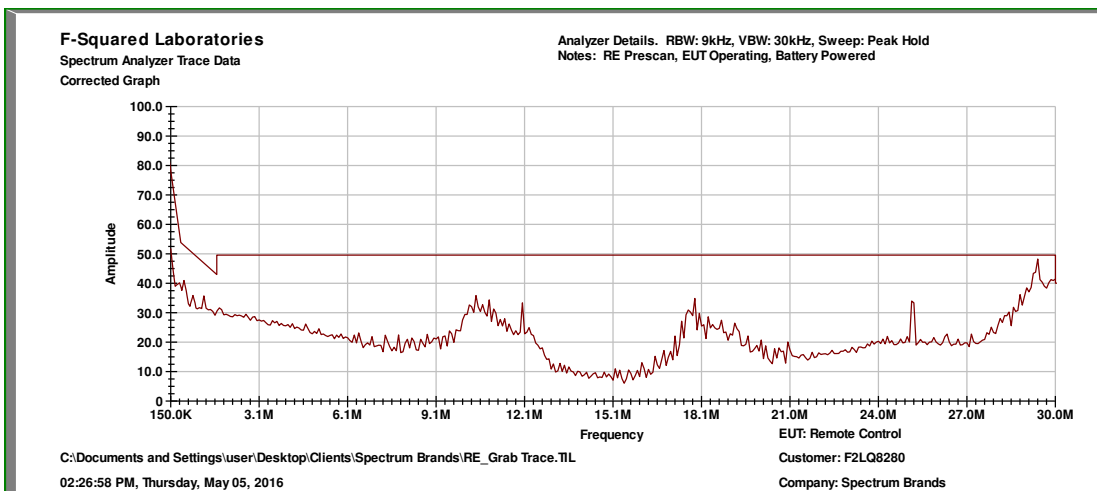


<b>Test Date:</b>	May 5, 2016	<b>Test Engineer(s):</b>	J. Knepper
<b>Standards:</b>	CFR 47 Part 15.249(d) / Part 15.209	<b>Air Temperature:</b>	20.6°C
		<b>Relative Humidity:</b>	48%

### 0.009 MHz to 0.15 MHz

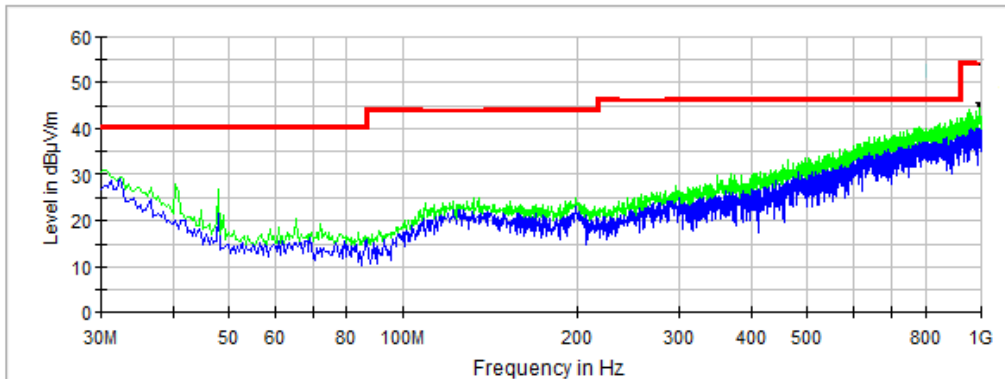


### 0.15 MHz to 30 MHz

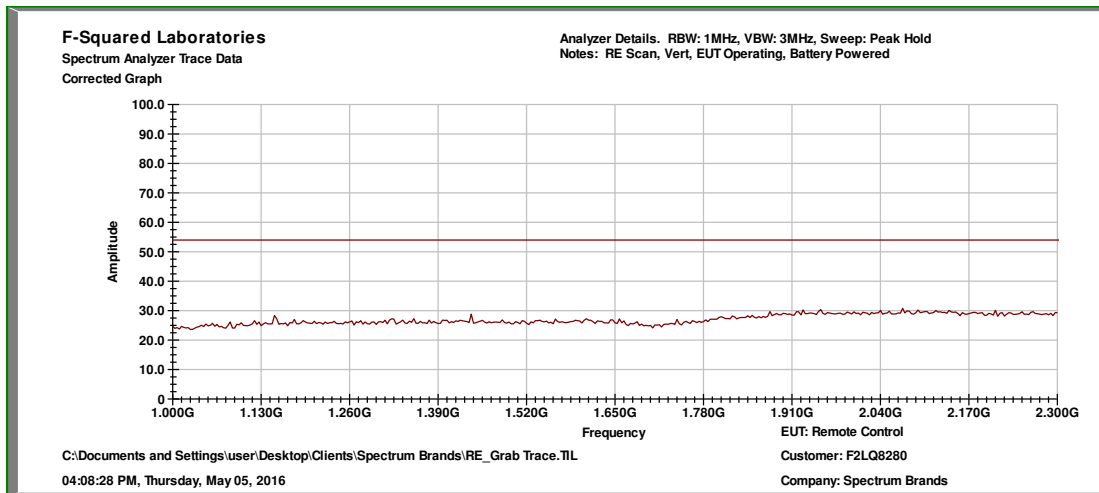




### 30 MHz to 1 GHz, Vertical

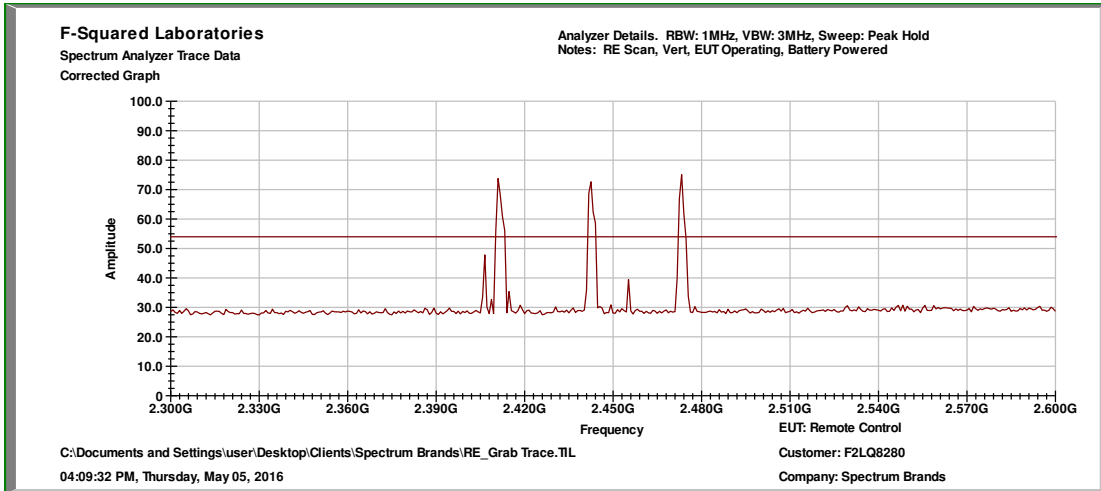


### 1 GHz to 2.3 GHz, Vertical

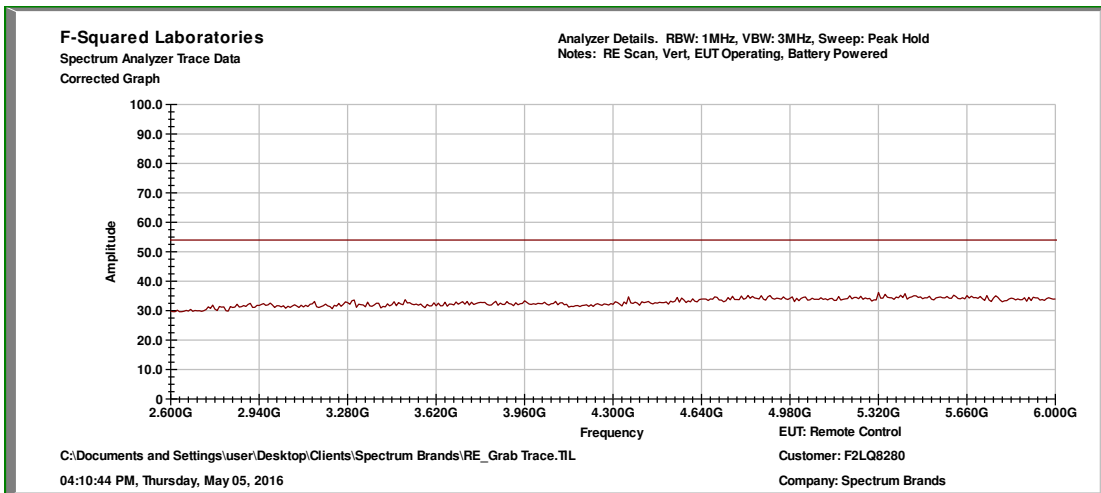




### 2.3 GHz to 2.6 GHz, Vertical

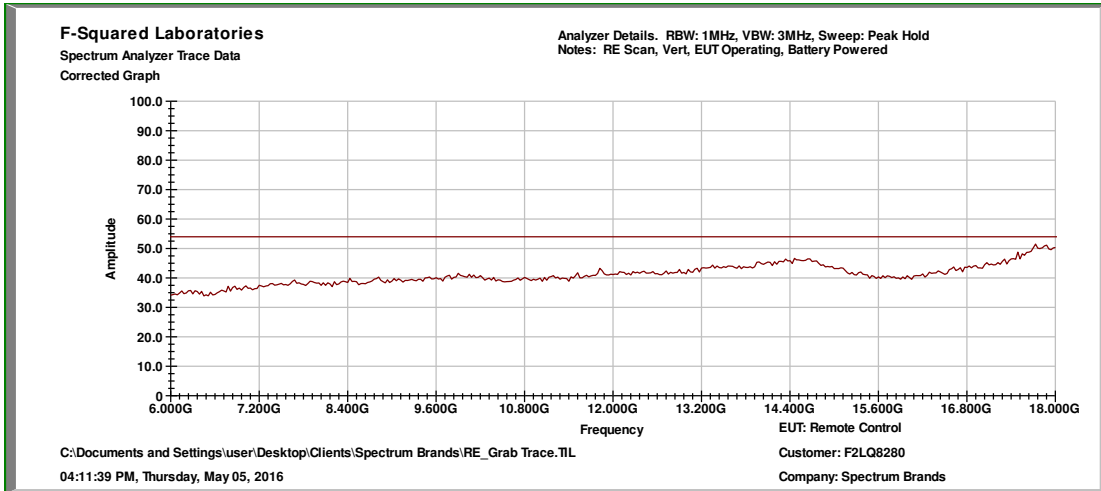


### 2.6 GHz to 6 GHz, Vertical

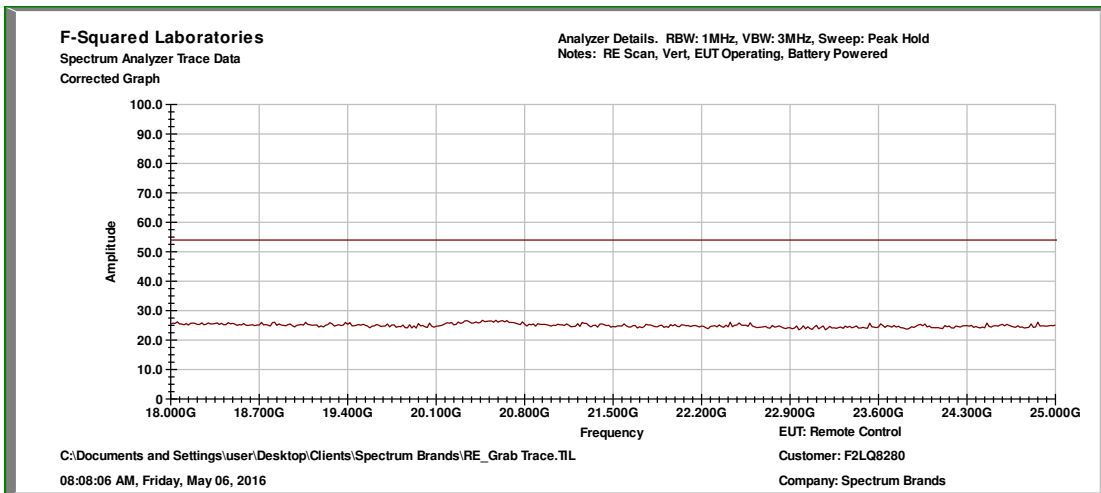




### 6 GHz to 18 GHz, Vertical

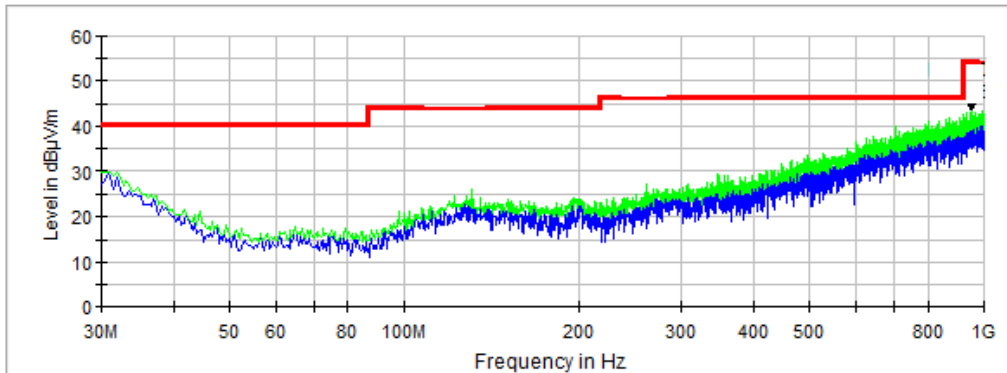


### 18 GHz to 25 GHz, Vertical

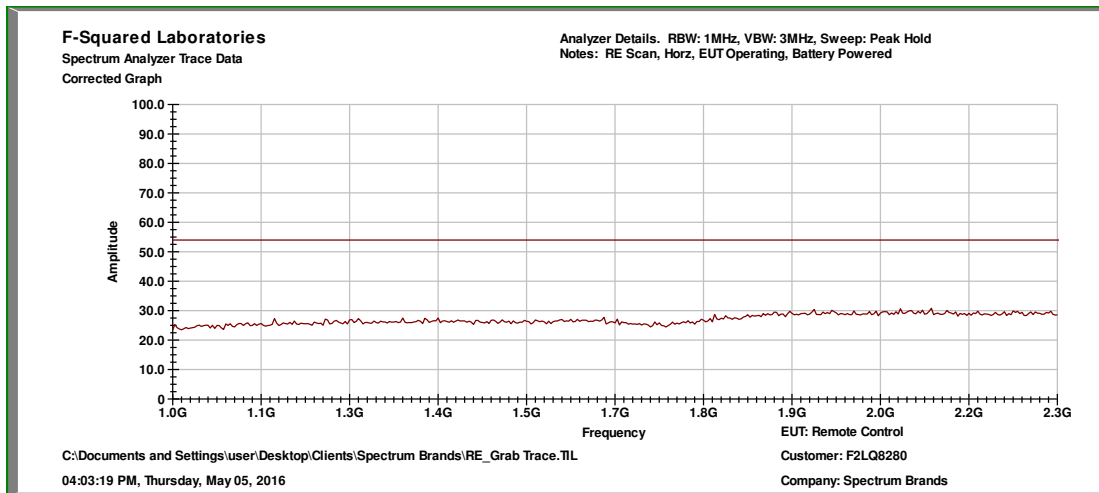




### 30 MHz to 1 GHz, Horizontal

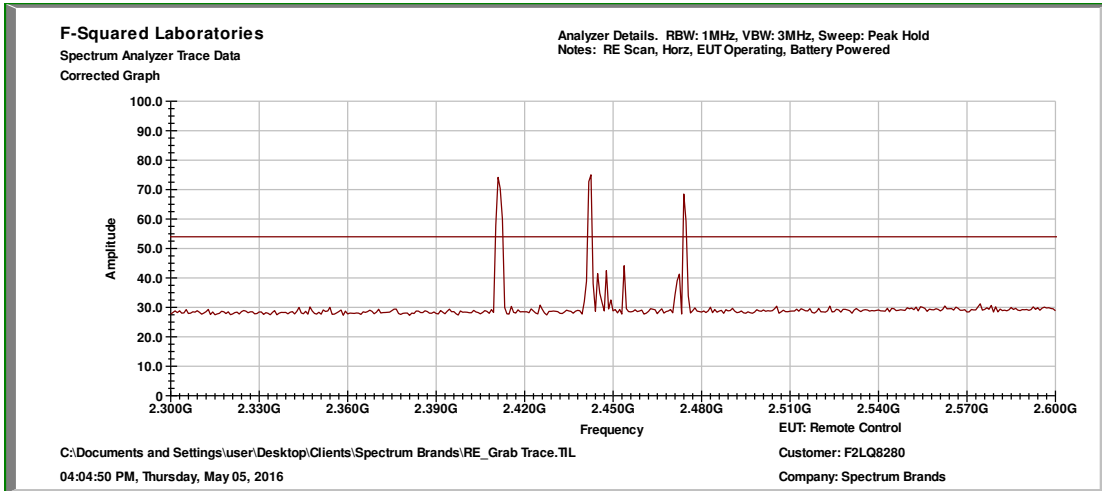


### 1 GHz to 2.3 GHz, Horizontal

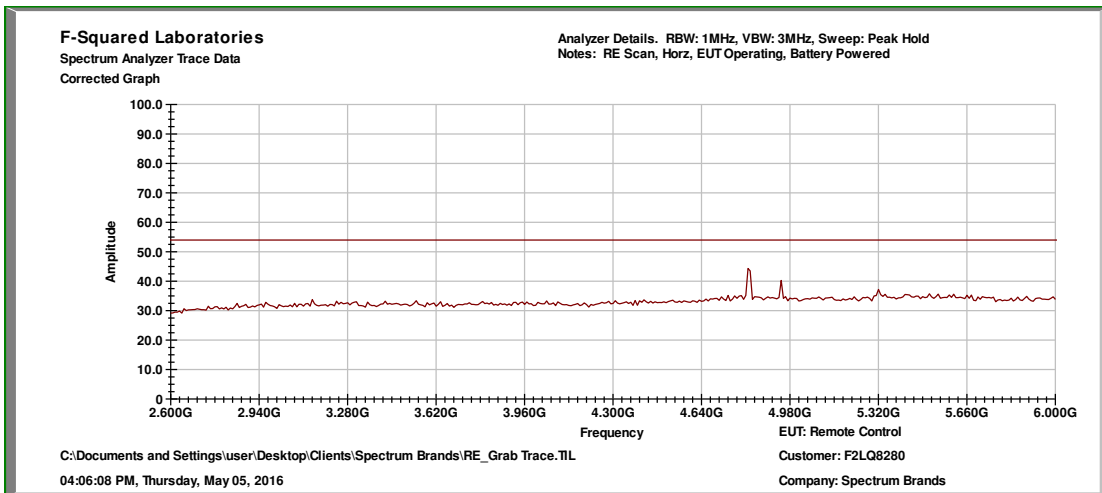




### 2.3 GHz to 2.6 GHz, Horizontal

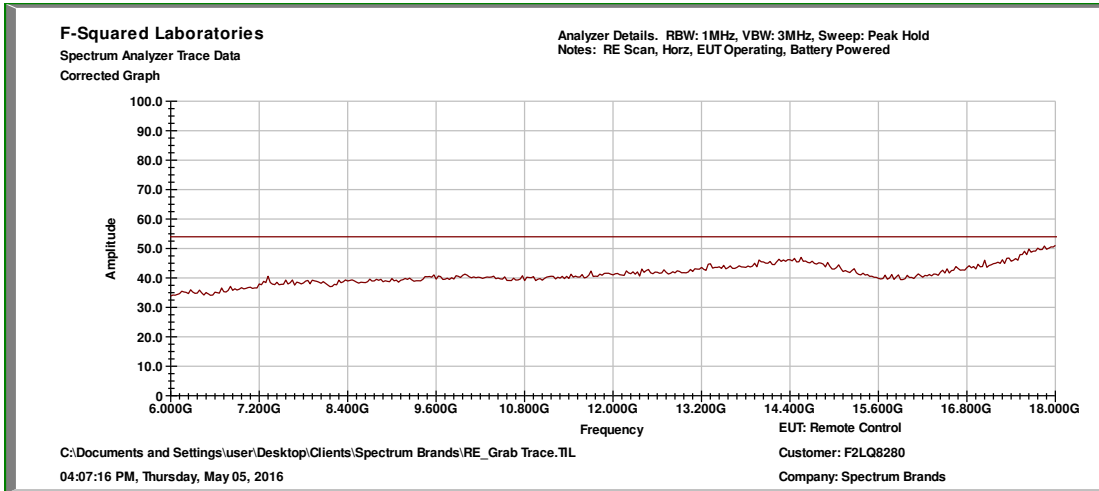


### 2.6 GHz to 6 GHz, Horizontal

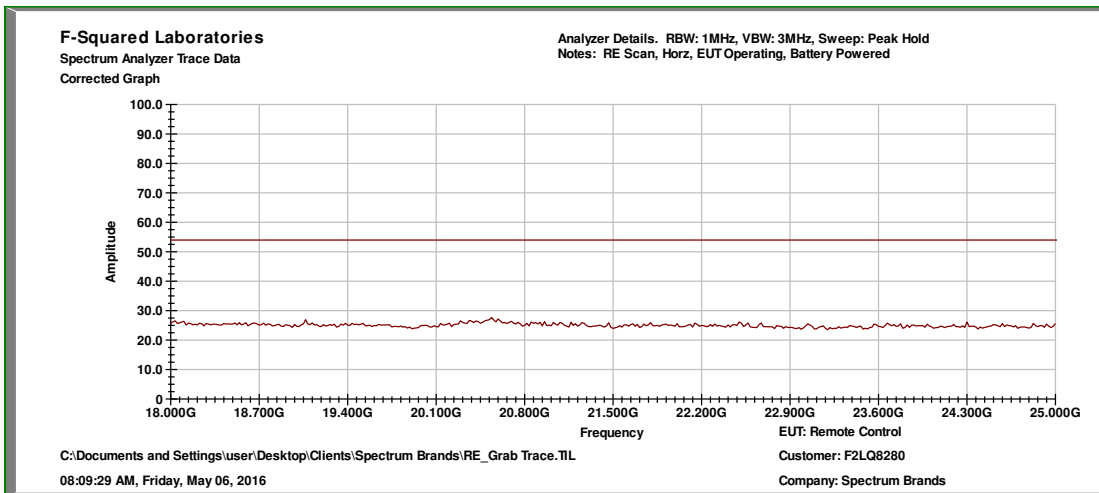




### 6 GHz to 18 GHz, Horizontal



### 18 GHz to 25 GHz, Horizontal

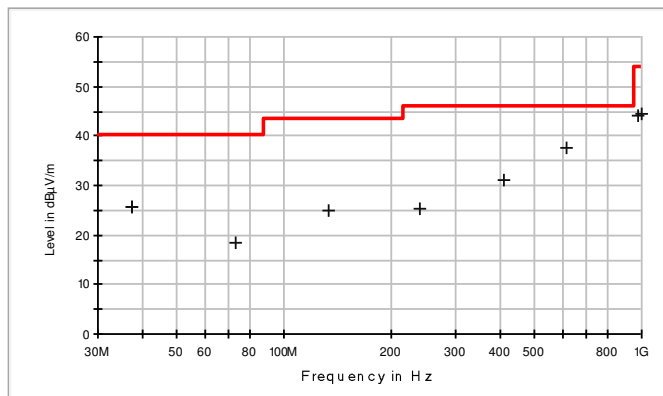




### Measurements

<1 GHZ

Frequency (MHz)	Antenna Polarization	Reading (dBμV)	Cable Loss & Antenna Factor (dB)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
37.500000	V	7.5	18.2	25.7	40.0	-14.3
37.500000	H	7.5	18.2	25.7	40.0	-14.3
73.000000	H	7.5	10.8	18.3	40.0	-21.7
132.432000	V	7.8	17.3	25.1	43.52	-18.4
410.000000	H	8.7	22.6	31.3	46.02	-14.7
614.000000	V	10.9	26.9	37.8	46.02	-8.2
977.496000	V	11.3	32.9	44.2	46.02	-1.8
998.200000	H	11.4	33.0	44.4	54.00	-9.6







>1 GHZ

MaxPeak

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2400.000000	H	37.6	6.5	44.10	74.0	-29.9
2483.500000	H	39.5	7.0	46.50	74.0	-27.5
2483.500000	V	39.0	7.0	46.00	74.0	-28.0
2400.000000	V	52.6	6.5	59.10	74.0	-14.9

Average

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2400.000000	H	25.0	6.5	31.50	54.0	-22.5
2483.500000	H	25.2	7.0	32.20	54.0	-21.8
2483.500000	V	25.2	7.0	32.20	54.0	-21.8
2400.000000	V	25.0	6.5	31.50	54.0	-22.5



9 PHOTOGRAPHS/EXHIBITS – PRODUCT PHOTOS, TEST SETUPS

Radiated Spurious Emissions, <1GHz



Radiated Spurious Emissions >1GHz, Occupied Bandwidth

