

# Certification Test Report

For a  
**Personal Alarm Safety System**

**Manufacturer:**

Scott Health & Safety, Division of Scott  
4320 Goldmine Road  
Monroe, North Carolina 28110  
United States of America

**Testing Laboratory:**

F-Squared Laboratories  
16740 Peters Road  
Middlefield, Ohio 44062  
United States of America

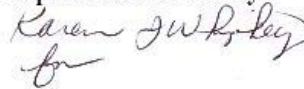
The Personal Alarm Safety System, model 200451-02, was tested and was found to comply with the requirements of the Federal Communications Commission outlined in the Federal Register CFR 47, Part 15.247.

The product was received on June 22, 2007 and the testing was completed on Sept. 5, 2007.

**Evaluation Conducted By:**

  
**John A. Harrington**  
EMC Technical Manager

**Report Reviewed By:**

  
**Wendy Fuster**  
President



*success thru compliance*

**F-Squared Laboratories**  
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Reports noted as a revision replace all previously issued reports and/or antecedent report revisions issued under this job number.

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## **1. ENGINEERING STATEMENT**

This report has been prepared on behalf of Scott Health & Safety, Division of Scott to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.247 of the FCC Rules using ANSI C63.4 2003 standards. The test results found in this test report relate only to the items tested.

### **1.1. Equipment Under Test:**

Pak Alert SE 7 Personal Alarm Safety System (P.A.S.S.) with Transceiver  
FCC ID T5E 200451

### **1.2. Trade Name:**

Scott Health & Safety, Division of Scott

### **1.3. Model:**

**200451-01, -02, -11, -12, -61, -62**

### **1.4. Power Supply:**

Batteries - 6 AA

### **1.5. Applicable Rules:**

CFR 47, Part 15.247

### **1.6. Equipment Category:**

Radio Transceiver-DTS

### **1.7. Antenna:**

(integral)

### **1.8. Measurement Location:**

F-Squared Laboratories 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.

### **1.9. Measurement Procedure:**

All measurements were performed according to the 2003 version of ANSI C63.4 and recommended FCC procedure of measurement of DTS operating under Section 15.247 dated March 2005 (KDB #558074). A list of the measurement equipment can be found in Section 2.

### **1.10. Uncertainty Budget:**

Radiated Emission - Combined Uncertainty (+ or -) 2.24 dB; Expanded Uncertainty (+ or -) 4.48 dB

## 2. LIST OF MEASUREMENT INFORMATION

Equipment Type	Manufacturer	Model	Serial Number	Calibration Due Date
Shield Room	Shielding Resources	3 Meter	001	Feb. 13, 2008
Thermohygrometer	Oakton	32230-80	001	Aug. 31, 2007
OATS	Compliance Labs	N/A	001	Aug. 16, 2008
Spectrum Analyzer	Hewlett Packard	8591E	3520A04145	Aug. 1, 2008
Antenna 1-Chamber	ETS/EMCO	3142B	9811-1330	June 29, 2009
Antenna 2-OATS	Sunol Sciences	JB1	A101101	June 29, 2009
Horn Antenna	Emco	3115	9809-5580	Sept. 21, 2007
Horn Antenna	A. H. Systems, Inc.	SAS-572	237	June 15, 2008
Horn Antenna	A. H. Systems, Inc.	SAS-586	142	June 15, 2008
Pre-Amplifier	Hewlett-Packard	8447D	2944A08445	Oct. 3, 2007
Pre-Amplifier	Hewlett Packard	83006A	310A00500	Oct. 3, 2007
Active 18" Loop Antenna	A.H. Systems, Inc.	SAS-562B	241	July 11, 2007
Test Receiver	Rohde & Schwartz	ESU 1302.6005.40	100002	Nov. 11, 2007
Receiver	Rohde & Schwarz	Display, EASI- 0-804-8932-52;	84982/015; 849152/005	July 31, 2008

### **3. EQUIPMENT UNDER TEST (EUT) INFORMATION AND DATA**

#### **3.1 Test Item Condition:**

The equipment to be tested was received in good condition.

#### **3.2 Testing Algorithm:**

For RF antenna conducted tests, the PASS was equipped with an SMA connector for connection to the measuring equipment. For radiated emissions tests, on the OATS, the PASS was equipped with integral/internal antenna and installed in a SCBA. The highest emissions were recorded in the data tables.

#### **3.3 Radiated Emission Testing on Open Area Test Site (OATS):**

The EUT was tested at a distance of 3.0 meters. The emissions were maximized by rotating the table and raising/lowering the antenna mounted on a 4.0 meter mast.\* Both horizontal and vertical field components were measured. The output of the antenna was connected to the input of the receiver and emissions were measured in the range 10 kHz to 25 GHz. The values up to 1GHz are quasi-peak readings made at 3.0 meters with a resolution bandwidth of 200 Hz from 9 kHz to 150 kHz, 9 kHz from 150 kHz to 30 MHz and 120 kHz from 30 MHz to 1 GHz. The measurements above 1 GHz with a resolution bandwidth of 1 MHz are average readings at a distance of 3.0 meters. The raw measurements were corrected to allow for antenna factor, cable loss and preamplifier gain. All data for radiated emissions can be found in Section 10.2.

*\*The EUT was examined in three orthogonal positions to ensure maximization of emissions.*

#### **3.4 The EUT was battery-operated. Fresh batteries were used for each measurement performed.**

**4. EUT CONFIGURATION AND CABLES**

**4.1. Equipment Under Test (EUT):**

Device	Manufacturer	Model Number	Serial Number
Complete SCBA	Scott Health & Safety	Air-Pak	None Specified
PASS Test Fixture	Scott Health & Safety	200451-02	None Specified

**4.2. Accessories (Support Equipment):**

None

**4.3. Cables:**

None

**5. FCC PART 15.403(f) – DIGITAL MODULATION**

**Product Description:**

The PASS is a digital transmission system (DTS).\* Digital modulation was applied in single frequency mode for all tests.

**6. FCC PART 15.31(m) – OPERATING FREQUENCIES**

**Number of Operating Frequencies:**

The EUT was operating at 2.425 GHz, its only frequency of operation.



**7. FCC PART 15.247(a)(2) – BANDWIDTH**

<b>Test Date:</b>	June 27, 2007	<b>Test Engineer:</b>	J. Harrington
<b>Standard:</b>	FCC 47 CFR 15, Subpart C	<b>Air Temperature:</b>	29.4° C
<b>Clause:</b>	15.247(a)(2)	<b>Relative Humidity:</b>	42%
<b>Test Method:</b>	KDB #558074	<b>Sample Assessed:</b>	S02

**7.1. Requirements:**

The 6dB bandwidth shall be greater than 500 kHz.

Bandwidth measurements were made with the spectrum analyzer impulse bandwidth set at 120 kHz (video bandwidth set at 300 kHz). The bandwidth was measured using the analyzer's marker function.

**7.2. Results:**

The measured 6dB bandwidth with the EUT operating (2.425 GHz) was 1648.8 kHz (see spectral plots in Figures 1 and 2).

The measured 6dB bandwidth meets the requirements. The EUT complies.

## 8. IC, RSS-Gen Issue 2 – 99% BANDWIDTH

Test Date:	Sept. 5, 2007	Test Engineer:	J. Harrington
Standard:	IC, RSS-Gen Issue 2:2007	Air Temperature:	27.9° C
Clause:	4.6.1	Relative Humidity:	44%
Test Method:	Industry Canada, RSS-Gen Issue 2:2007	Sample Assessed:	S02

### 8.1. Requirements:

Measure the 99% emission Bandwidth.

The EUT antenna port was directly connected to the spectrum analyzer via a modified 50 ohm termination. The EUT was operated at maximum power and normal modulation. The spectrum analyzer's span was set wide enough to capture all products of the modulation process. The RBW was set to be 1% of the span. The VBS was set to be  $\geq 3$  times the RBW.

### 8.2. Results:

Total sum of linear power elements: 1339.26 mW

0.5% of total power: 6.70 mW

Lowest frequency by which 0.5% power is achieved: 2423.530 MHz

Highest frequency by which 0.5% power is achieved: 2426.360 MHz

99% occupied bandwidth: 2.830 MHz

Refer to Figure 33.

**9. FCC PART 15.247(b)(3) – POWER OUTPUT**

<b>Test Date:</b>	June 27, 2007	<b>Test Engineer:</b>	J. Harrington
<b>Standard:</b>	FCC 47 CFR 15, Subpart C	<b>Air Temperature:</b>	27.9° C
<b>Clause:</b>	15.247(b)	<b>Relative Humidity:</b>	42%
<b>Test Method:</b>	KDB #558074	<b>Sample Assessed:</b>	S02

The EUT was fitted with an SMA connector and directly connected to the input of the spectrum analyzer. The peak power output was measured.

**9.1. Requirements:**

The peak power output shall be 1 watt (30 dBm) or less.

Power output measurements were made at the operating frequency (2.425 GHz), with the spectrum analyzer impulse bandwidth set at 1.7 MHz (video bandwidth set at 3 MHz). The peak output level was measured using the spectrum analyzer's marker function.

**9.2. Results:**

The measured peak power output found with the EUT operating (2.425 GHz) was 18.71 dBm = 74.3 mW (see plot in Figure 3).

The measured peak power output was less than the 1 watt limit. The EUT complies.

**10. FCC PART 15.247(b)(5) – RF SAFETY**

Scott Health and Safety, the manufacturer of the EUT is requesting a mathematical adjustment of the measured RF power, at the frequency of operation, based on source based time averaging characteristics of the EUT. They have provided the following information in support of that request.

The request is for a reduction in the measured RF power, based on 0.8 % transmitter duty factor out of any 100 ms window of measurement. The supporting evidence is presented below as the declared theory of operation from the manufacturer, along with two measurements of the transmit packet envelope and repetition cycles as captured on an oscilloscope.

**Theory of Operation**

The transceiver operates on a single channel at 2425.0 MHz with a nominal conducted output power of +20 dBm and is stabilized by means of an internal voltage regulator.

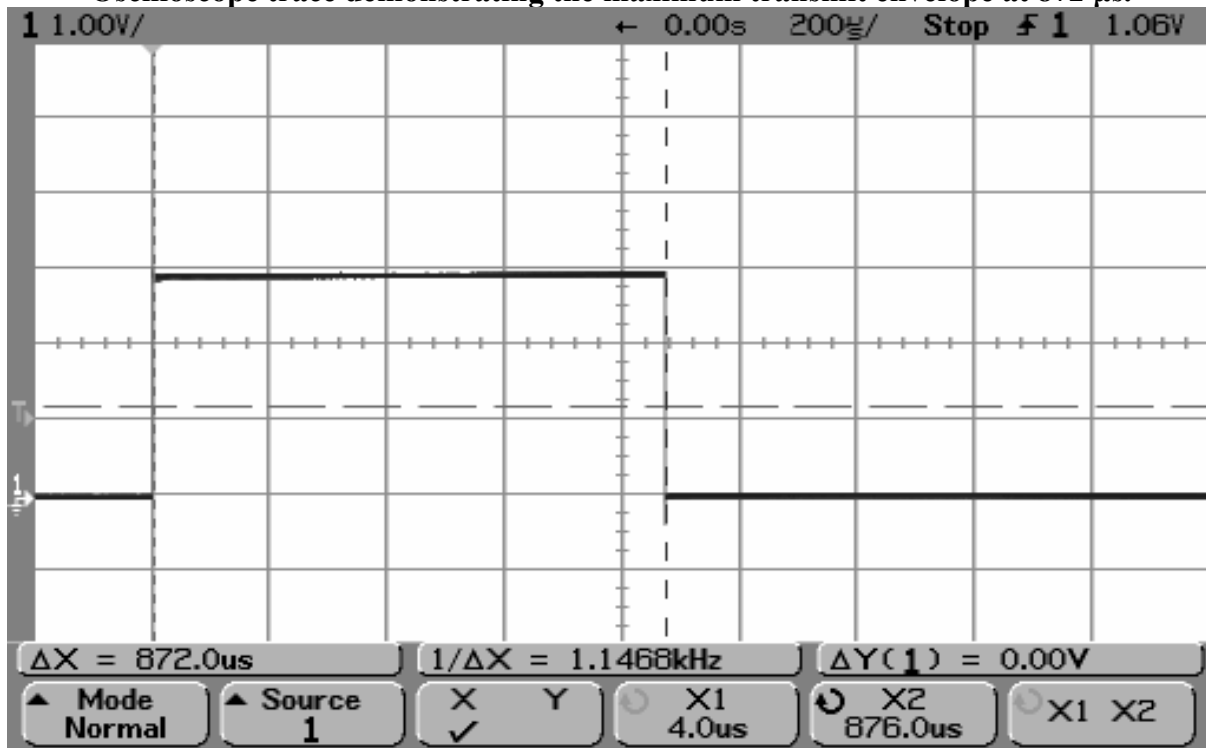
The device operates in a packet mode only. No continuous RF carrier is possible. Each packet is 872  $\mu$ S long and is repeated at a rate of 4 times per second. The average time between packets is  $\frac{1}{4}$  second but they will dither in time. The shortest repetition between two adjacent packets is 173 mS. Digital data is sent using O-QPSK modulation at a bit rate of 2 MCPS with a payload bit rate of 250 MBPS.

Output frequency is controlled to within 20 ppm by a 16.00 MHz crystal on the radio transceiver chip. The RF oscillator is entirely contained within the radio chip. No external inductor is used.

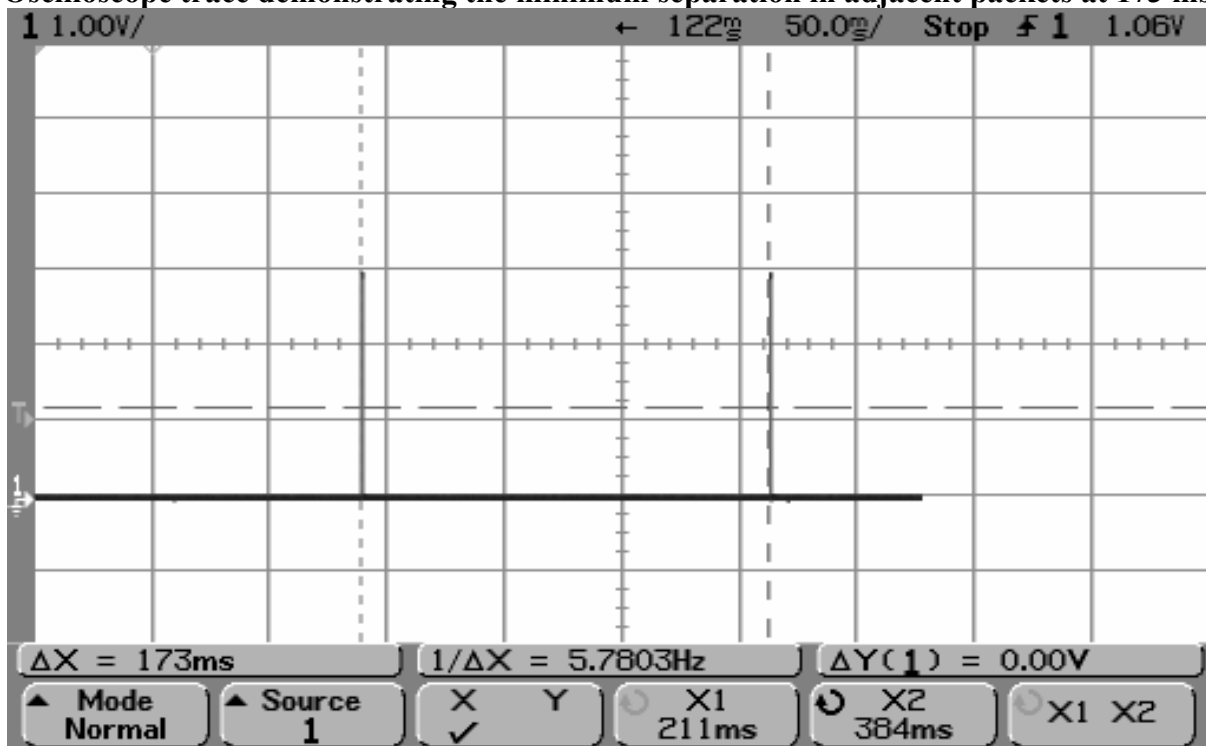
The antenna is a printed circuit board Planar Inverted F (PIFA) with a nominal gain of -2 dBi and a peak gain of -1.9 dBi along a single axis.

The minimum separation distance of the EUT from the user will be greater than 2.5 cm, in all cases, based on the dimensions of the enclosure, as well as the typical usage where the EUT will be used and worn outside of protective fire-fighting clothing and gear.

Oscilloscope trace demonstrating the maximum transmit envelope at 872  $\mu$ s.



Oscilloscope trace demonstrating the minimum separation in adjacent packets at 173 ms.



Exposure category	<u>low threshold</u>	<u>high threshold</u>
general population	$(60/f_{\text{GHz}}) \text{ mW}, d < 2.5 \text{ cm}$ $(120/f_{\text{GHz}}) \text{ mW}, d \geq 2.5 \text{ cm}$	$(900/f_{\text{GHz}}) \text{ mW}, d < 20 \text{ cm}$
occupational	$(375/f_{\text{GHz}}) \text{ mW}, d < 2.5 \text{ cm}$ $(900/f_{\text{GHz}}) \text{ mW}, d \geq 2.5 \text{ cm}$	$(2250/f_{\text{GHz}}) \text{ mW}, d < 20 \text{ cm}$

Transmit packet on time: 0.87 (mS)  
Packet repetition time: 173.00 (mS)  
Maximum peak output power at antenna input terminal: 19.9 (dBm)  
Antenna gain(typical): -1.9 (dBi)  
Antenna gain(typical): 0.65 (numeric)  
Maximum peak output power at antenna output: 18.03 (dBm)  
Maximum peak output power at antenna output: 63.53 (mW)  
Use-based time-averaged power, conducted: 0.32 (mW)  
Maximum peak radiated output: 113.30 (dBuV/m @ 3m)  
Maximum peak radiated output: 18.10 (dBm)  
Maximum peak radiated output: 64.57 (mW)  
Use-based time-averaged power, radiated: 0.33 (mW)  
Low threshold for  $d < 2.5 \text{ cm}$  at 2.425 GHz: 24.74 (mW)  
Low threshold for  $d > 2.5 \text{ cm}$  at 2.425 GHz: 49.48 (mW)

**In both cases, computed and measured, the output power is below the low threshold for all separation distances greater than and less than 2.5 cm.**

**Photo of the EUT with the enclosure, demonstrating the minimum separation of 2.5 cm from the human body.**



**11. FCC Part 15.247(c) – SPURIOUS EMISSIONS - ANTENNA**

<b>Test Date:</b>	June 27, 2007	<b>Test Engineer:</b>	J. Harrington
<b>Standard:</b>	FCC 47 CFR 15, Subpart C	<b>Air Temperature:</b>	23.5° C
<b>Clause:</b>	15.247(c)	<b>Relative Humidity:</b>	43%
<b>Test Method:</b>	KDB #558074	<b>Sample Assessed:</b>	S02

The following tests were performed to demonstrate compliance.

**11.1. RF Antenna Conducted Test**

The EUT was fitted with an SMA connector and directly connected to the input of the spectrum analyzer.

**11.1.1. Requirements:**

All harmonics and spurs must be at least 20dB down from the highest emission level measured within the authorized band up through the tenth harmonic.

Spurious emissions measurements were made at the operating frequency (2.425 GHz) with the appropriate spectrum analyzer impulse bandwidth.

**11.1.2. Results:**

The EUT meets FCC Part 15.247(c) requirements for conducted spurious emissions (refer to Figures 16 to 31).



## **11.2. RADIATED EMISSIONS (Restricted Bands)**

The EUT was fitted with its integral antenna. Radiated emissions were measured on the Open Area Test Site (OATS). All emissions generated that fall in the restricted bands per FCC Part 15.205 were examined.

### **11.2.1. Requirements:**

All emissions that fall in the restricted bands defined in FCC Part 15.205 shall not exceed the maximum field strength listed in FCC Part 15.209(a).

### **11.2.2. Results:**

The EUT meets FCC Part 15.209 restrictions on field intensity in the restricted bands. Hence, the EUT satisfies FCC Part 15.247(c) regarding emissions in the restricted bands.

**Harmonics & Spurious Emissions – 15.35(b)**  
**EUT Upright**

**Radiated Emission  
Measurements**

**Detail**

FCC 47 CFR 15 subpart C, clauses 15.205, 15.209 and 15.247(d)

F2LQ2803. Scott Health and Safety. Personal Alarm Safety System (PASS)

JAH. 06/27/07. EUT UPRIGHT      Measurements at 3m

**Results**

Frequency (MHz)	Detector	Ant. Pol.	Reading (dBuV)	AF (dB/m)	CL (dB)	Pre Amp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
52.62	Qp	V	14.50	7.4	1.3	0.0	23.2	40.0	16.8
52.62	Qp	H	7.20	7.9	1.3	0.0	16.4	40.0	23.6
2,425.00	Pk	V	99.49	29.0	1.6	27.3	102.9	N/A	N/A
2,425.00	Av	V	N/A	29.0	1.6	27.3	N/A	N/A	N/A
4,848.80	Pk	V	50.50	34.0	2.6	28.3	58.7	74.0	15.3
4,848.80	Av	V	13.90	34.0	2.6	28.3	22.1	54.0	31.9
7,275.00	Pk	V	44.32	35.9	3.2	28.3	55.1	74.0	18.9
7,275.00	Av	V		35.9	3.2	28.3	10.8	54.0	43.2
9,700.00	Pk	V	43.62	38.4	3.9	28.3	57.6	74.0	16.4
9,700.00	Av	V	13.90	38.4	3.9	28.3	27.9	54.0	26.1
2,425.00	Pk	H	112.57	29.0	1.6	27.3	115.9	N/A	N/A
2,425.00	Av	H	N/A	29.0	1.6	27.3	N/A	N/A	N/A
4,849.80	Pk	H	64.34	34.0	2.6	28.3	72.6	74.0	1.4
4,849.80	Av	H	13.90	34.0	2.6	28.3	22.1	54.0	31.9
7,275.00	Pk	H	56.58	35.9	3.2	28.3	67.4	74.0	6.6
7,275.00	Av	H	13.90	35.9	3.2	28.3	24.7	54.0	29.3
9,700.00	Pk	H	43.64	38.4	3.9	28.3	57.6	74.0	16.4
9,700.00	Av	H	13.90	38.4	3.9	28.3	27.9	54.0	26.1

**Radiated Emission  
Measurements**

**Detail**

FCC 47 CFR 15 subpart C, clauses 15.205, 15.209 and 15.247(d)

F2LQ2803. Scott Health and Safety. Personal Alarm Safety System (PASS)

JAH. 06/27/07. EUT on its SIDE Measurements at 3m

**Results**

Frequency (MHz)	Detector	Ant. Pol.	Reading (dBuV)	AF (dB/m)	CL (dB)	Pre Amp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
52.62	Qp	V	16.80	7.4	1.3	0.0	25.5	40.0	14.5
52.62	Qp	H	8.50	7.9	1.3	0.0	17.7	40.0	22.3
2,425.00	Pk	V	102.62	29.0	1.6	27.3	106.0	N/A	N/A
2,425.00	Av	V	N/A	29.0	1.6	27.3	N/A	N/A	N/A
4,848.80	Pk	V	45.84	34.0	2.6	28.3	54.1	74.0	19.9
4,848.80	Av	V	13.90	34.0	2.6	28.3	22.1	54.0	31.9
7,275.00	Pk	V	43.60	35.9	3.2	28.3	54.4	74.0	19.6
7,275.00	Av	V	13.90	35.9	3.2	28.3	24.7	54.0	29.3
9,700.00	Pk	V	43.60	38.4	3.9	28.3	57.6	74.0	16.4
9,700.00	Av	V	13.90	38.4	3.9	28.3	27.9	54.0	26.1
2,425.00	Pk	H	89.96	29.0	1.6	27.3	93.3	N/A	N/A
2,425.00	Av	H	N/A	29.0	1.6	27.3	N/A	N/A	N/A
4,849.80	Pk	H	48.76	34.0	2.6	28.3	57.0	74.0	17.0
4,849.80	Av	H	13.90	34.0	2.6	28.3	22.1	54.0	31.9
7,275.00	Pk	H	43.60	35.9	3.2	28.3	54.4	74.0	19.6
7,275.00	Av	H	13.90	35.9	3.2	28.3	24.7	54.0	29.3
9,700.00	Pk	H	43.60	38.4	3.9	28.3	57.6	74.0	16.4
9,700.00	Av	H	13.90	38.4	3.9	28.3	27.9	54.0	26.1

# **Radiated Emission Measurements**

## **Detail**

FCC 47 CFR 15 subpart C, clauses 15.205, 15.209 and 15.247(d)  
F2LQ2803. Scott Health and Safety. Personal Alarm Safety System (PASS)  
JAH. 06/27/07. EUT on its Measurements at  
BACK 3m

## **Results**

Frequency (MHz)	Detector	Ant. Pol.	Reading (dBuV)	AF (dB/m)	CL (dB)	Pre Amp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
52.62	Qp	V	16.70	7.4	1.3	0.0	25.4	40.0	14.6
52.62	Qp	H	8.70	7.9	1.3	0.0	17.9	40.0	22.1
2,425.00	Pk	V	101.43	29.0	1.6	27.3	104.8	N/A	N/A
2,425.00	Av	V	N/A	29.0	1.6	27.3	N/A	N/A	N/A
4,848.80	Pk	V	57.49	34.0	2.6	28.3	65.7	74.0	8.3
4,848.80	Av	V	13.90	34.0	2.6	28.3	22.1	54.0	31.9
7,275.00	Pk	V	43.60	35.9	3.2	28.3	54.4	74.0	19.6
7,275.00	Av	V	13.90	35.9	3.2	28.3	24.7	54.0	29.3
9,700.00	Pk	V	43.60	38.4	3.9	28.3	57.6	74.0	16.4
9,700.00	Av	V	13.90	38.4	3.9	28.3	27.9	54.0	26.1
2,425.00	Pk	H	100.73	29.0	1.6	27.3	104.1	N/A	N/A
2,425.00	Av	H	N/A	29.0	1.6	27.3	N/A	N/A	N/A
4,849.80	Pk	H	57.23	34.0	2.6	28.3	65.5	74.0	8.5
4,849.80	Av	H	13.90	34.0	2.6	28.3	22.1	54.0	31.9
7,275.00	Pk	H	44.06	35.9	3.2	28.3	54.9	74.0	19.1
7,275.00	Av	H	13.90	35.9	3.2	28.3	24.7	54.0	29.3
9,700.00	Pk	H	43.60	38.4	3.9	28.3	57.6	74.0	16.4
9,700.00	Av	H	13.90	38.4	3.9	28.3	27.9	54.0	26.1

**12. FCC PART 15.247(d) – PEAK POWER SPECTRAL DENSITY (PSD)**

<b>Test Date:</b>	June 28, 2007	<b>Test Engineer:</b>	J. Harrington
<b>Standard:</b>	FCC 47 CFR 15, Subpart C	<b>Air Temperature:</b>	26.9° C
<b>Clause:</b>	15.247(d)	<b>Relative Humidity:</b>	41%
<b>Test Method:</b>	KDB #558074	<b>Sample Assessed:</b>	S02

Peak power spectral density measurements were performed.

**12.1. Requirements:**

The peak power spectral density shall not exceed +8dBm in any 3 kHz band during any time interval of continuous transmission.

Power spectral density measurements were performed at a resolution bandwidth of 3 kHz (video bandwidth set at 3 MHz). The span was set at 1.704 MHz, the sweep rate was set to 568 seconds. The peak spectral density was measured at 1.11dBm at 2.425077 GHz.

**12.2. Results:**

The peak power spectral density measured from the EUT is less than the 8 dBm limit per FCC Part 15.247(d). The EUT meets the requirements of FCC Part 15.247(d) (refer to Figure 32).

### 13. FIGURES – SPECTRAL DATA PLOTS

Figure 1: Occupied Bandwidth

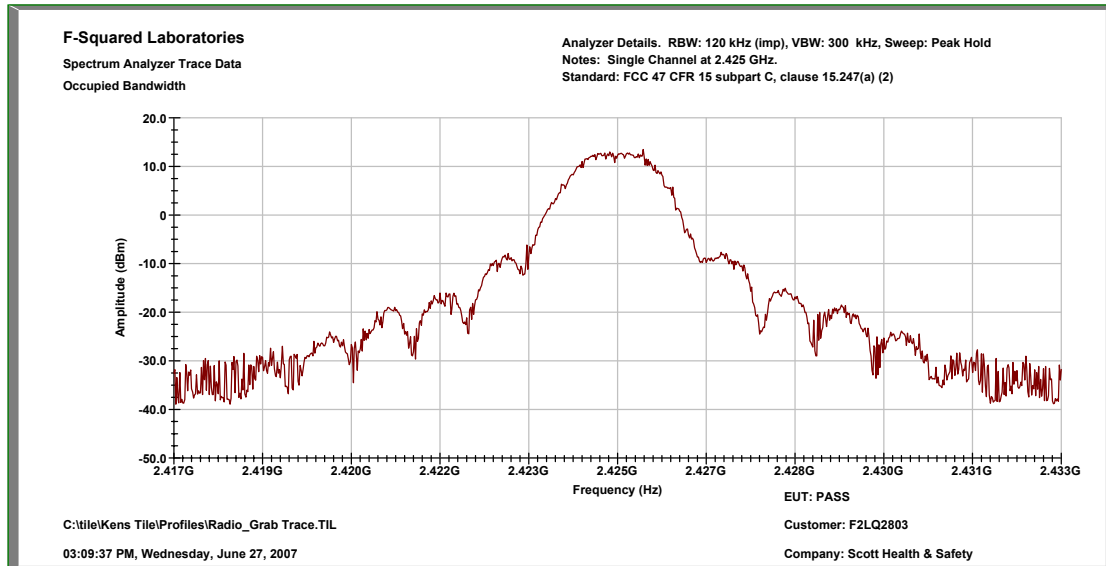


Figure 2: Occupied Bandwidth

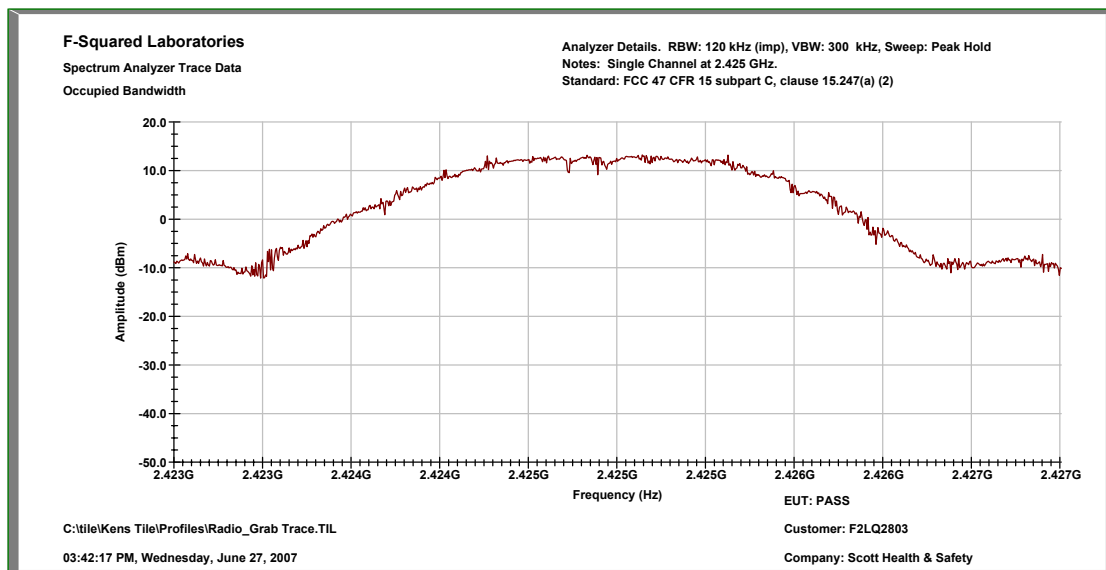


Figure 3: Peak Power Output

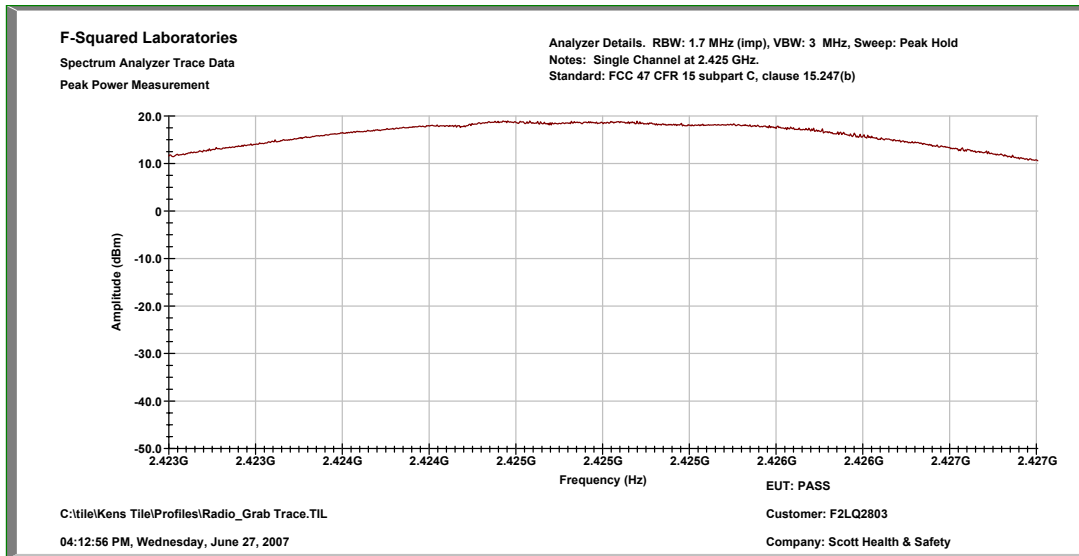


Figure 4: Harmonics & Spurious Emissions, EUT Upright, Vertical, 30 to 300 MHz

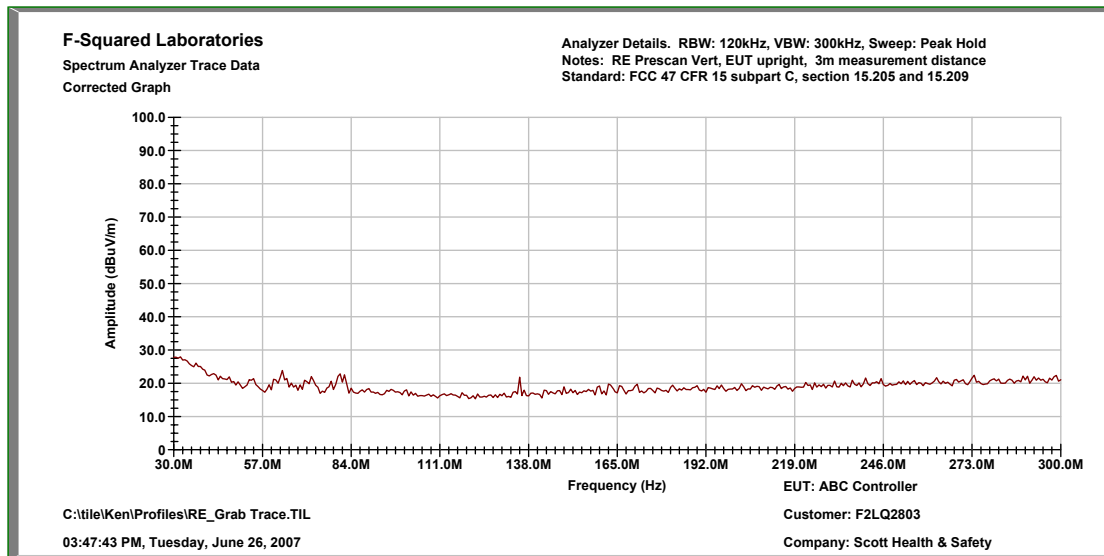


Figure 5: Harmonics & Spurious Emissions, EUT Upright, Vertical, 300 to 1000 MHz

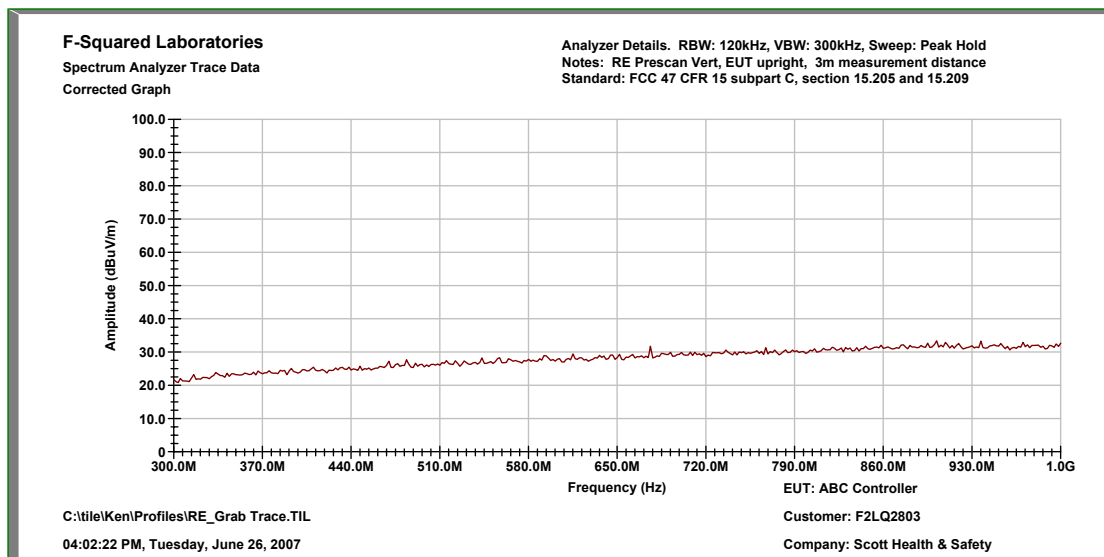




Figure 6: Harmonics & Spurious Emissions, EUT Upright, Horizontal, 30 to 300 MHz

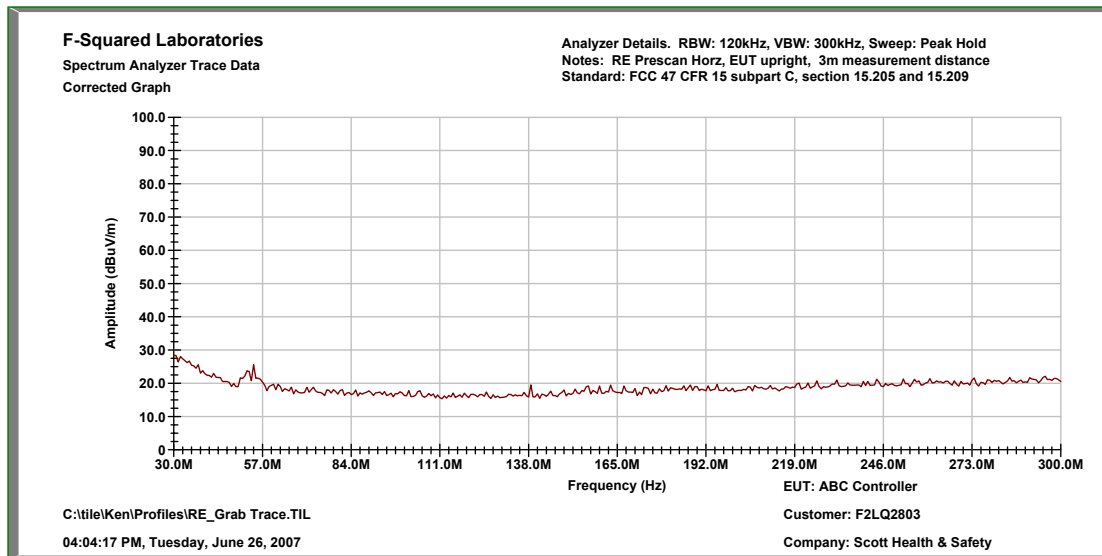


Figure 7: Harmonics & Spurious Emissions, EUT Upright, Horizontal, 300 to 1000 MHz

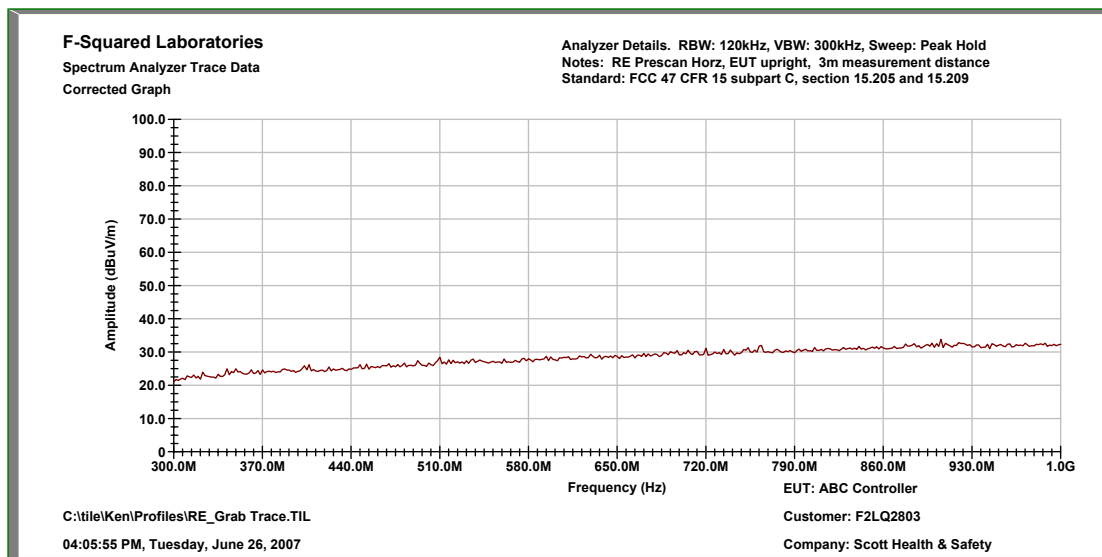


Figure 8: Harmonics & Spurious Emissions, EUT Side, Vertical, 300 to 300 MHz

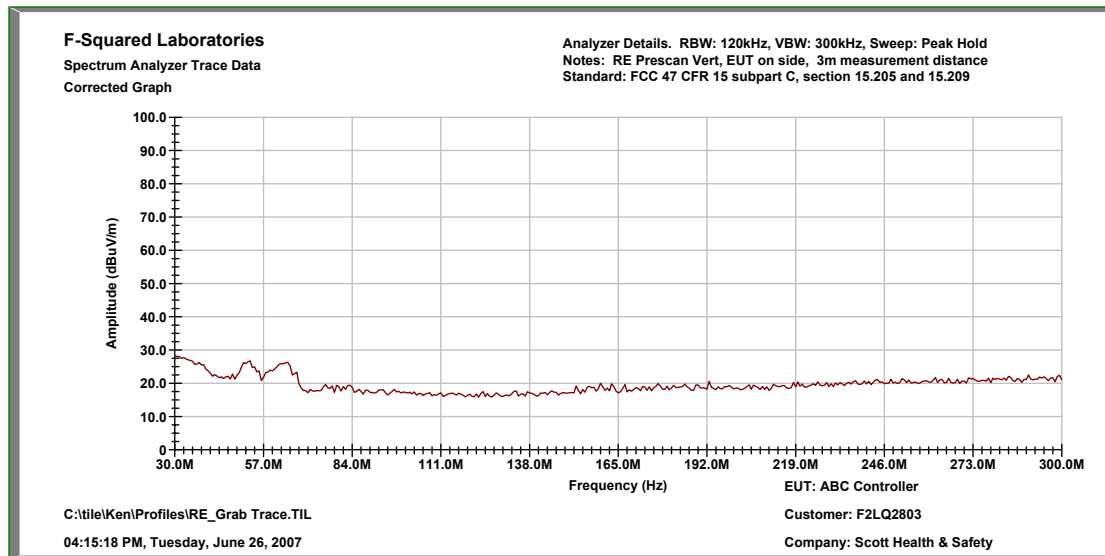


Figure 9: Harmonics & Spurious Emissions, EUT Side, Vertical, 300 to 1000 MHz

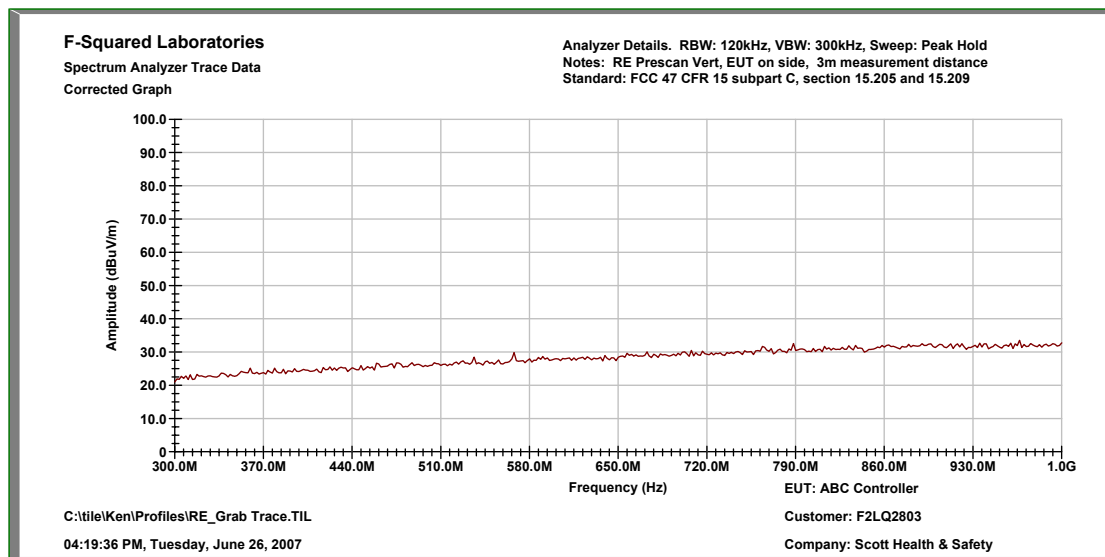


Figure 10: Harmonics & Spurious Emissions, EUT Side, Horizontal, 30 to 300 MHz

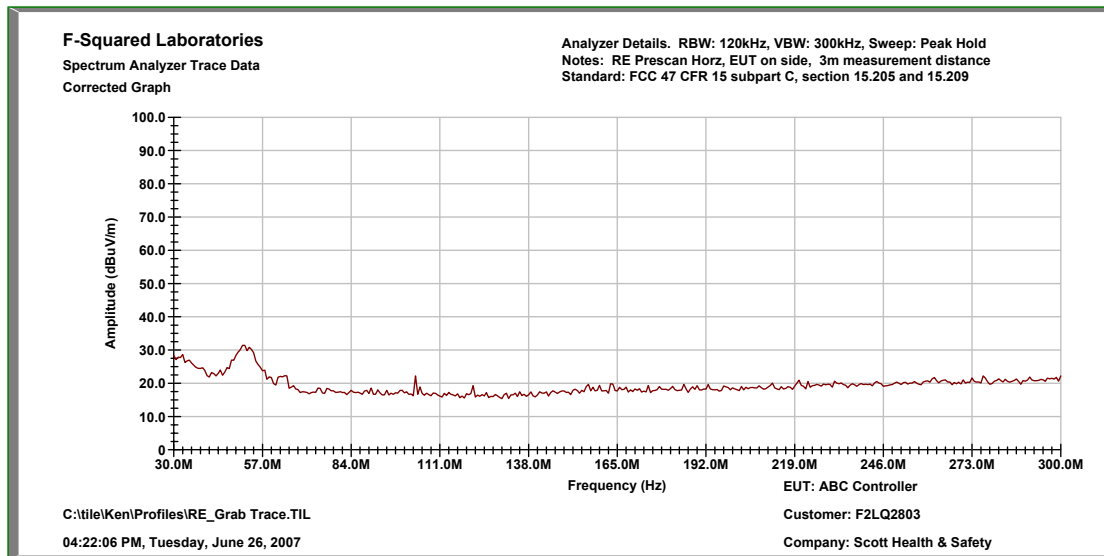


Figure 11: Harmonics & Spurious Emissions, EUT Side, Horizontal, 300 to 1000 MHz

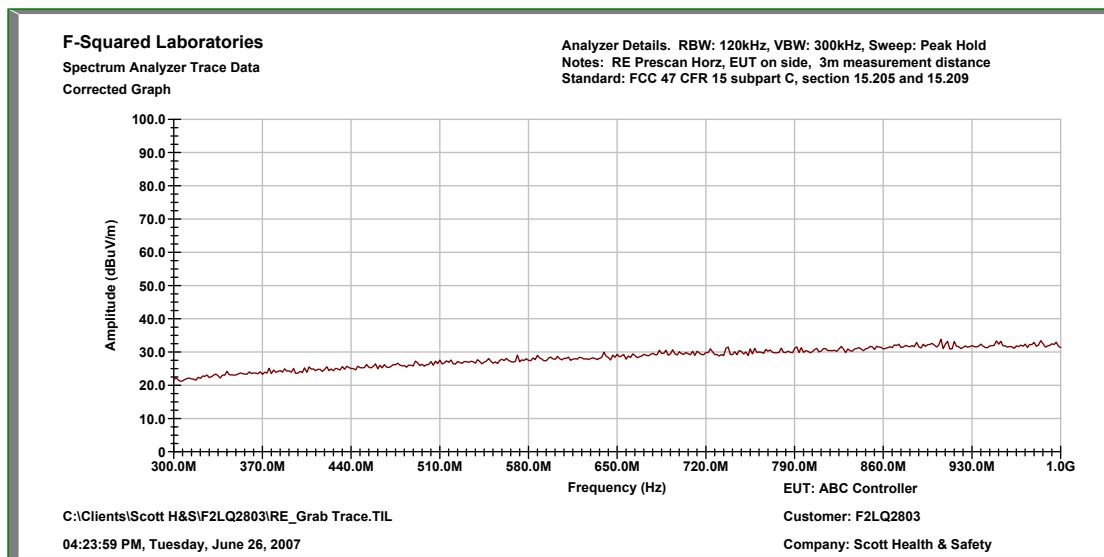


Figure 12: Harmonics & Spurious Emissions, EUT Back, Vertical, 30 to 300 MHz

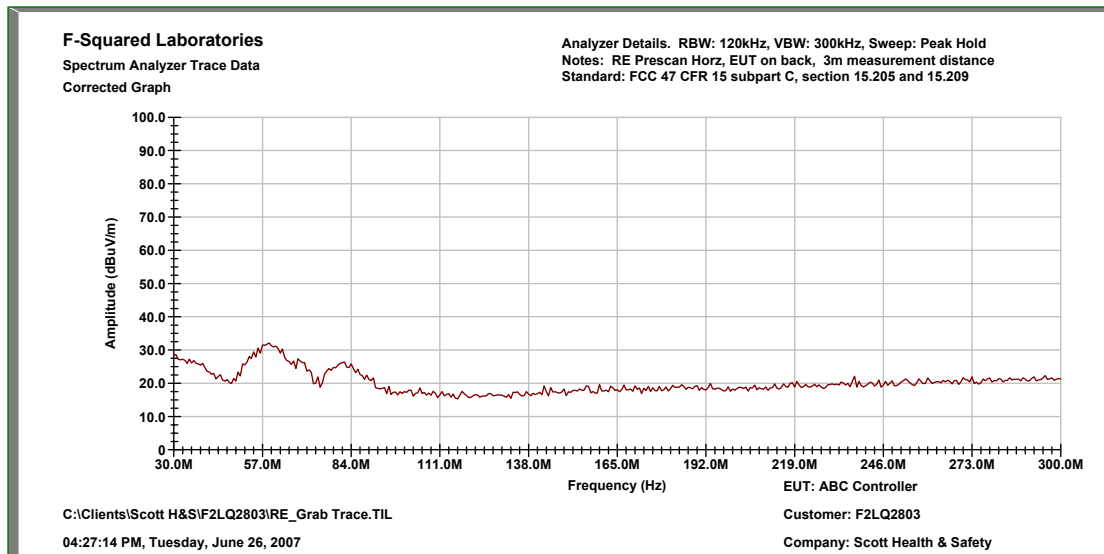


Figure 13: Harmonics & Spurious Emissions, EUT Back, Vertical, 300 to 1000 MHz

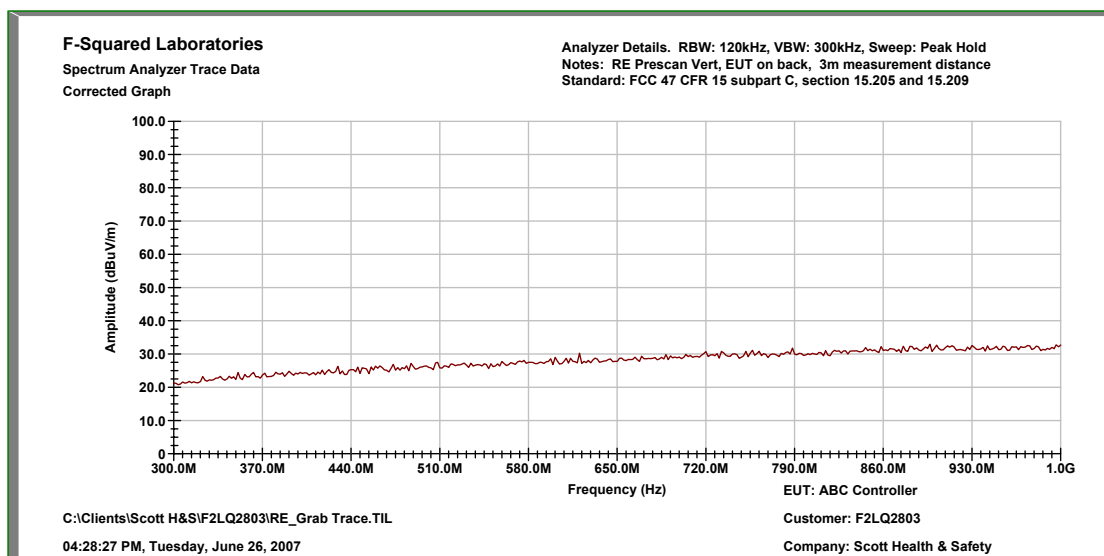


Figure 14: Harmonics & Spurious Emissions, EUT Back, Horizontal, 30 to 300 MHz

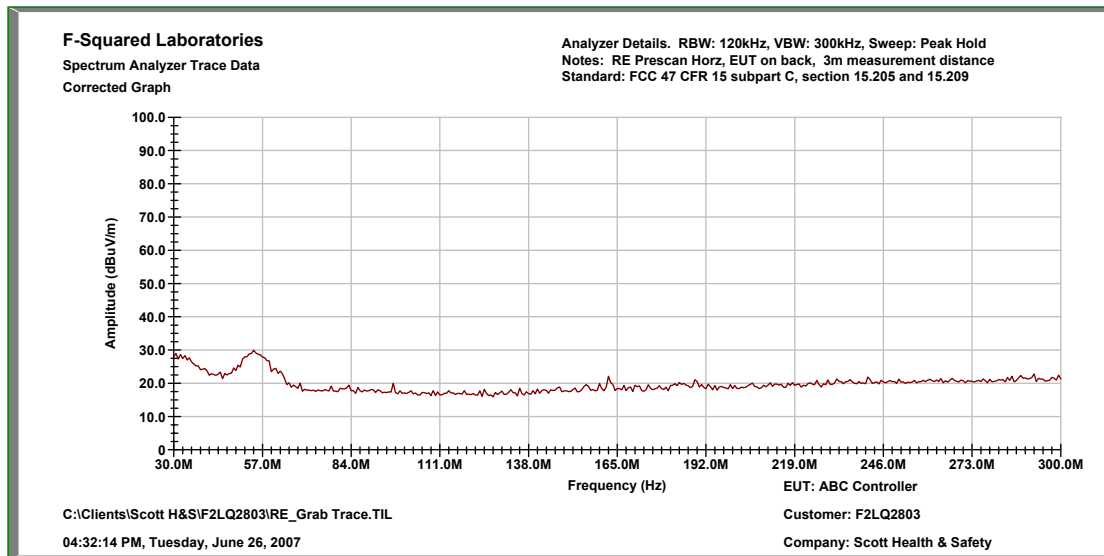


Figure 15: Harmonics & Spurious Emissions, EUT Back, Horizontal, 300 to 1000 MHz

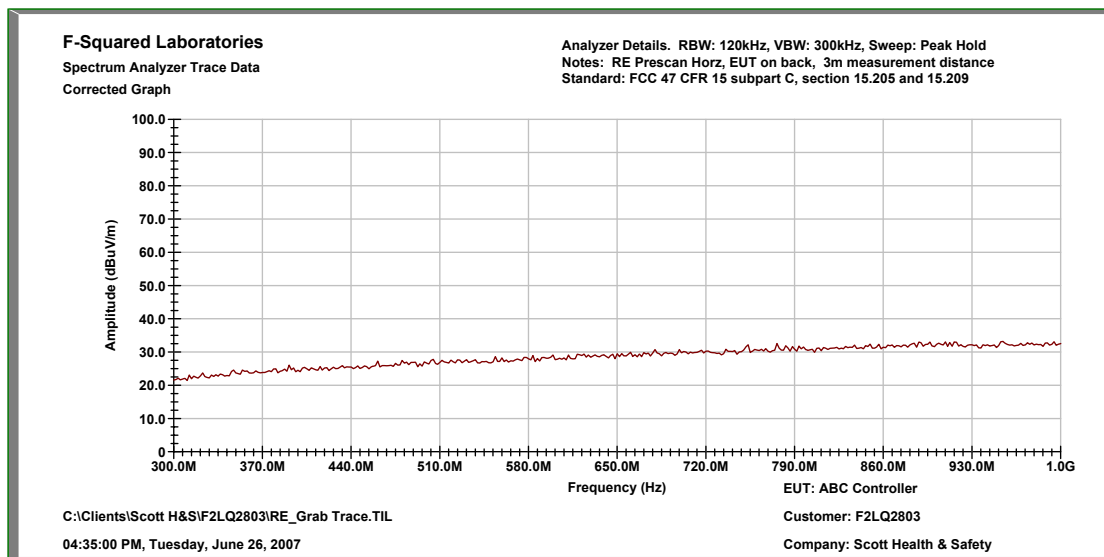


Figure 16: Spurious Emissions – Antenna Conducted, 30 MHz to 1000 MHz

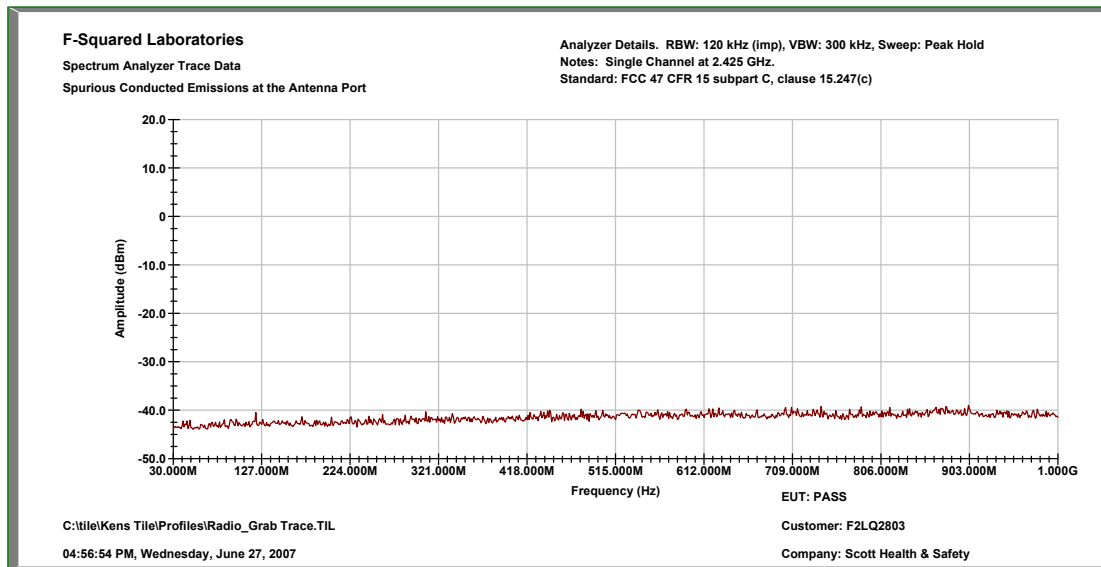


Figure 17: Spurious Emissions – Antenna Conducted, 1 GHz to 2 GHz

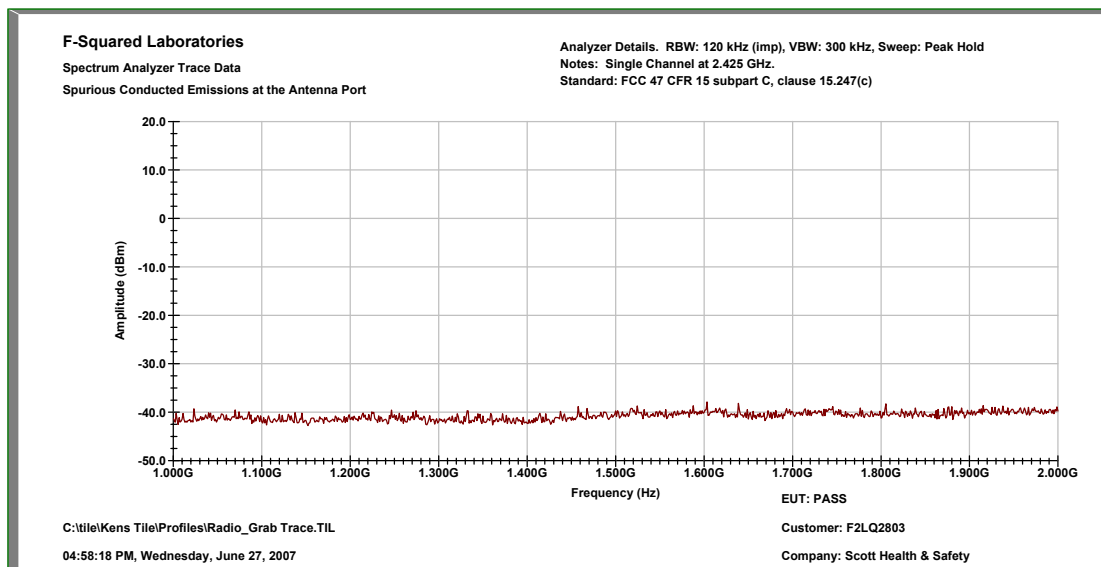


Figure 18: Spurious Emissions – Antenna Conducted, 2 GHz to 3 GHz

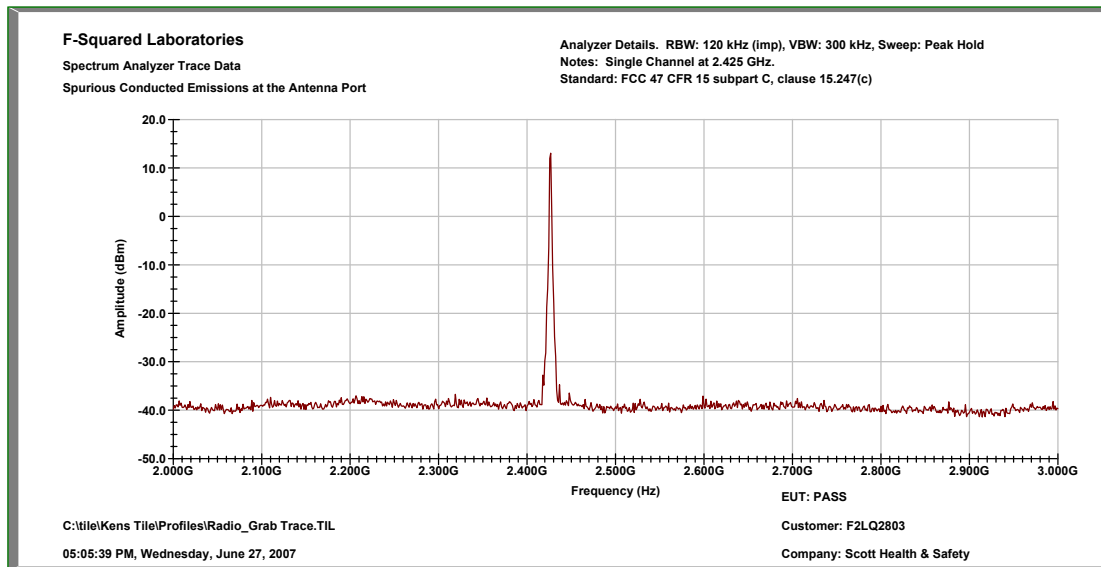


Figure 19: Spurious Emissions – Antenna Conducted, 3 GHz to 4 GHz

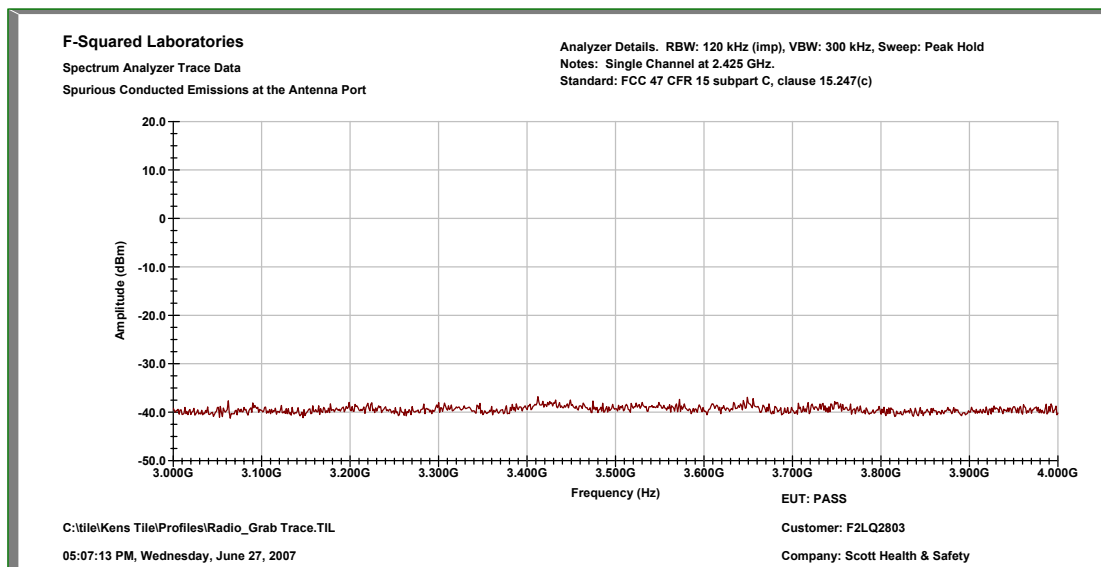


Figure 20: Spurious Emissions – Antenna Conducted, 4 GHz to 5 GHz

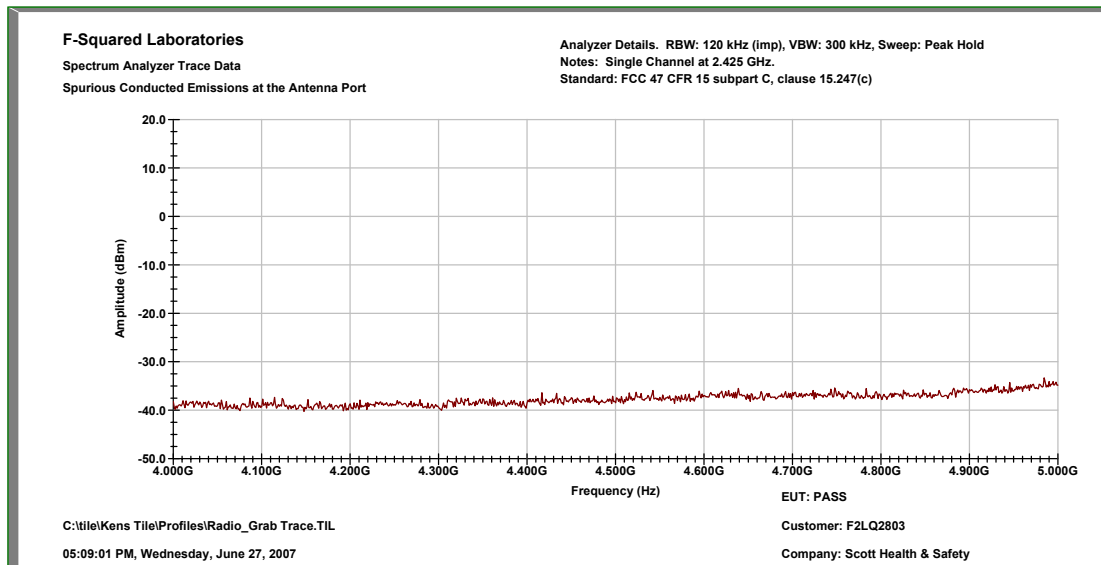


Figure 21: Spurious Emissions – Antenna Conducted, 4.85 GHz, -55.9 dBc

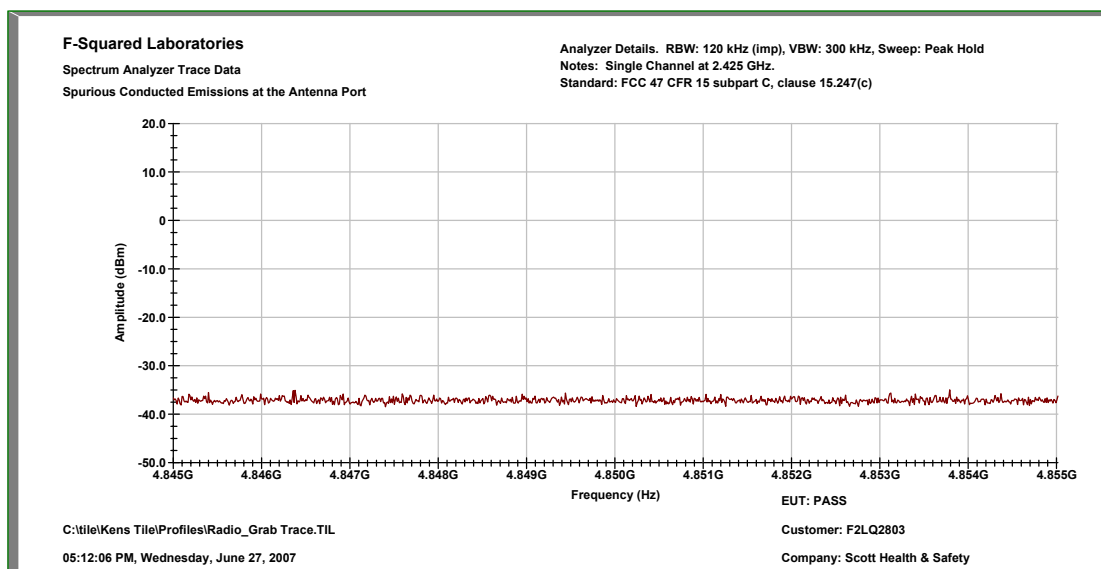




Figure 22: Spurious Emissions – Antenna Conducted, 5 GHz to 6 GHz

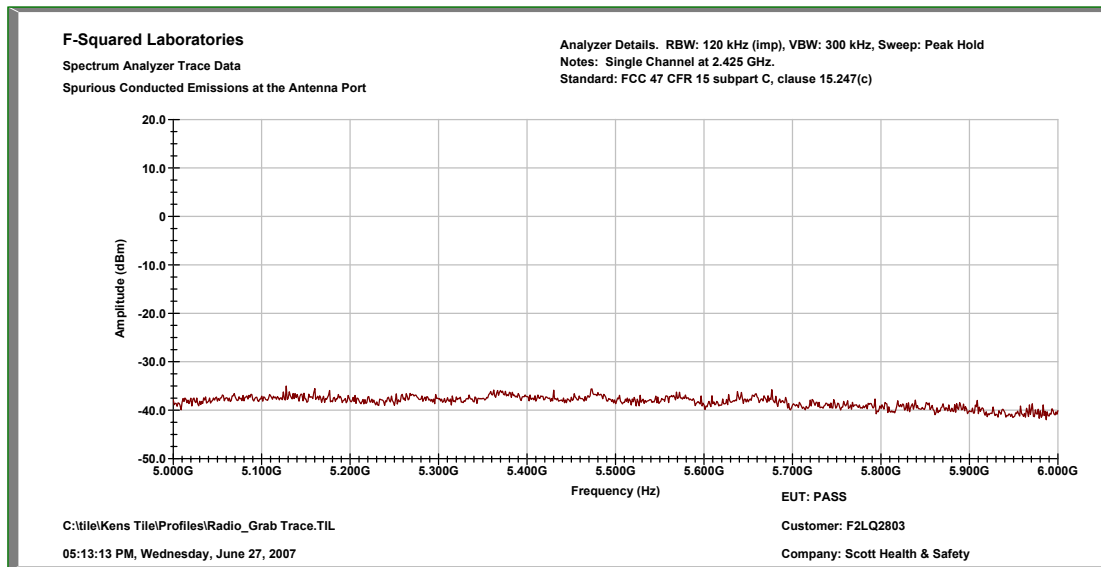


Figure 23: Spurious Emissions – Antenna Conducted, 6 GHz to 7 GHz

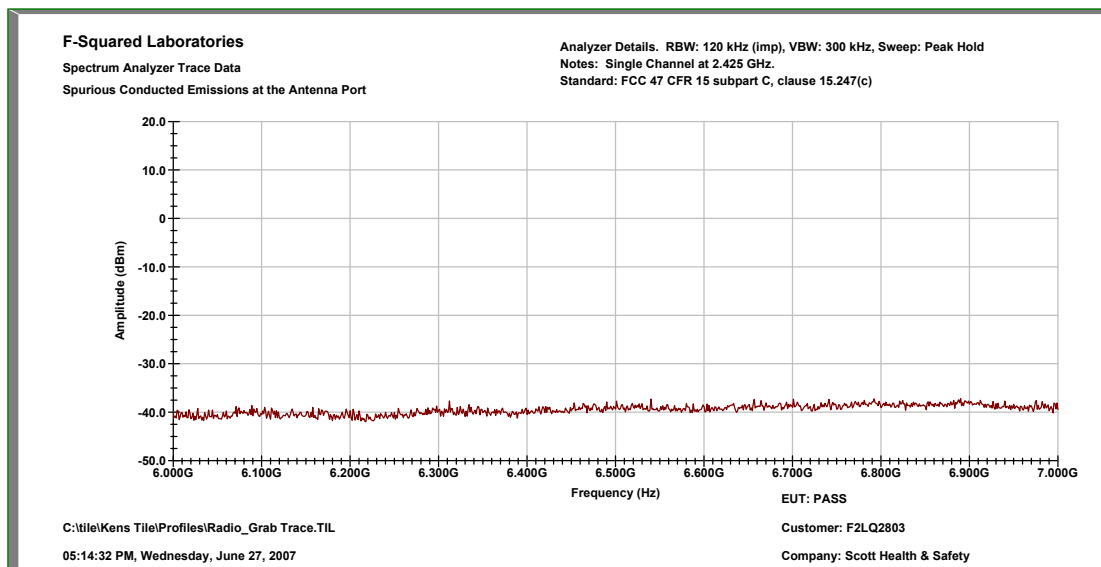


Figure 24: Spurious Emissions – Antenna Conducted, 7 GHz to 8 GHz

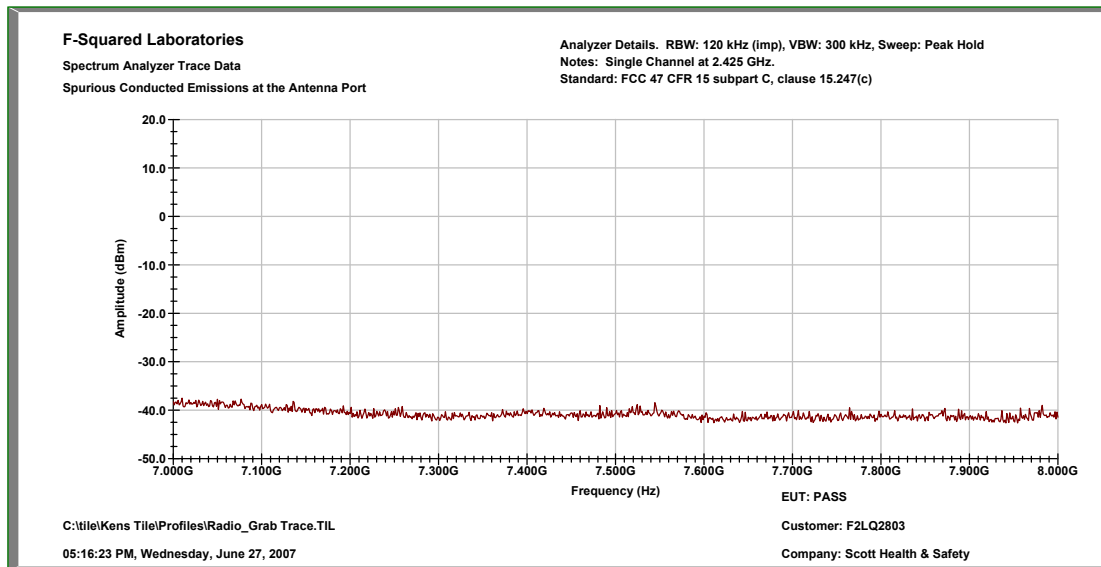


Figure 25: Spurious Emissions – Antenna Conducted, 7.275 GHz, -54.9 dBc

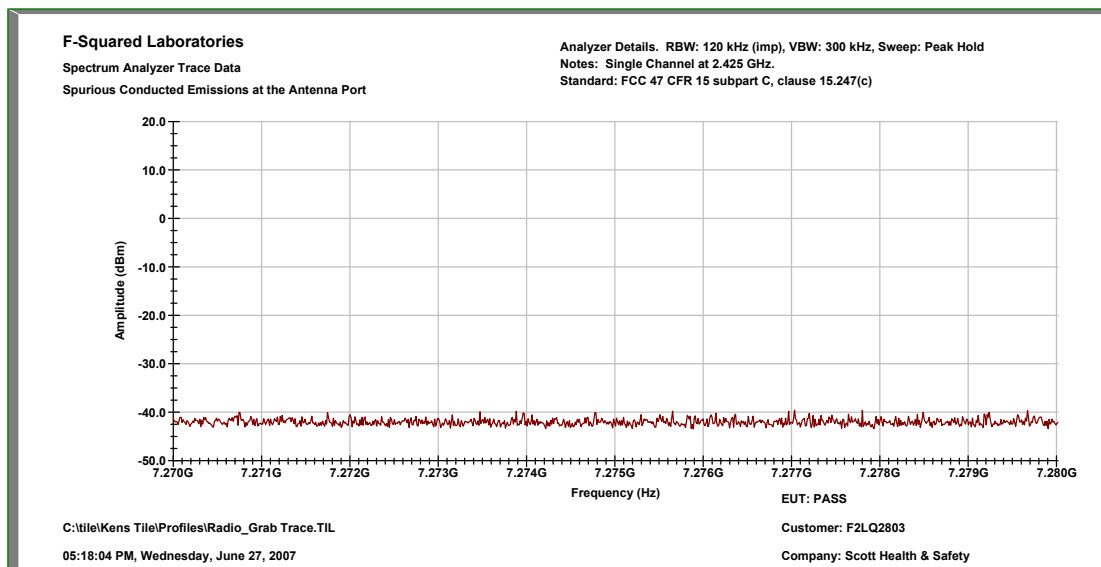


Figure 26: Spurious Emissions – Antenna Conducted, 8 GHz to 9 GHz

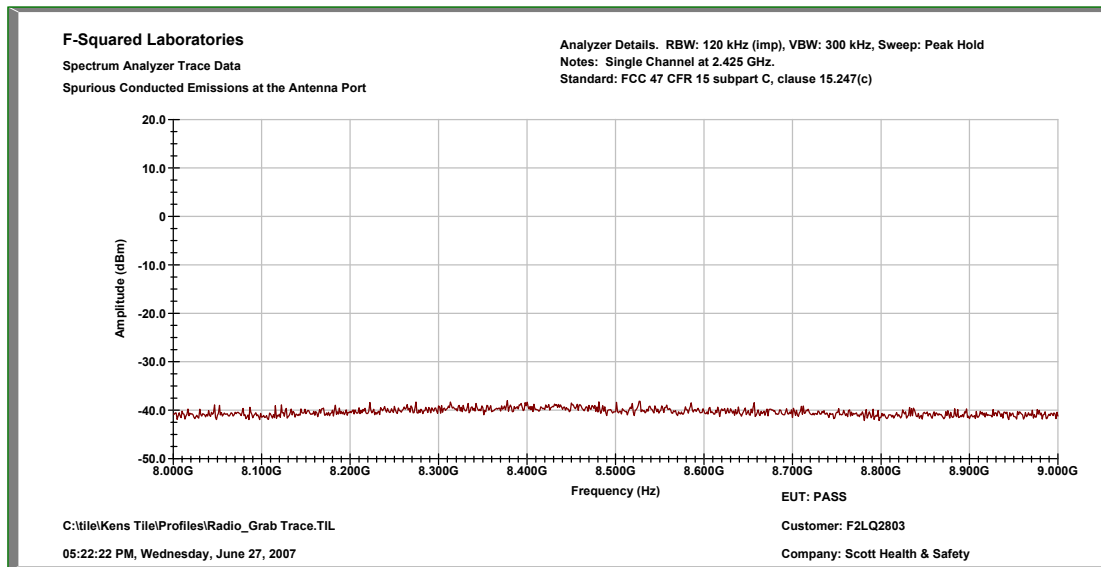


Figure 27: Spurious Emissions – Antenna Conducted, 9 GHz to 10 GHz

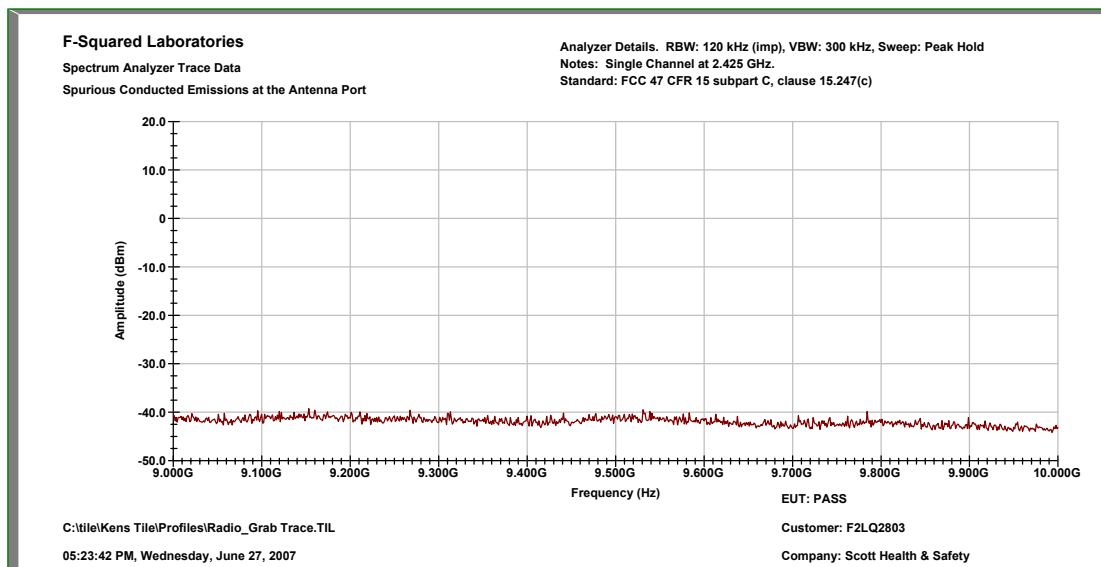


Figure 28: Spurious Emissions – Antenna Conducted, 9.7 GHz, -73.2 dBc

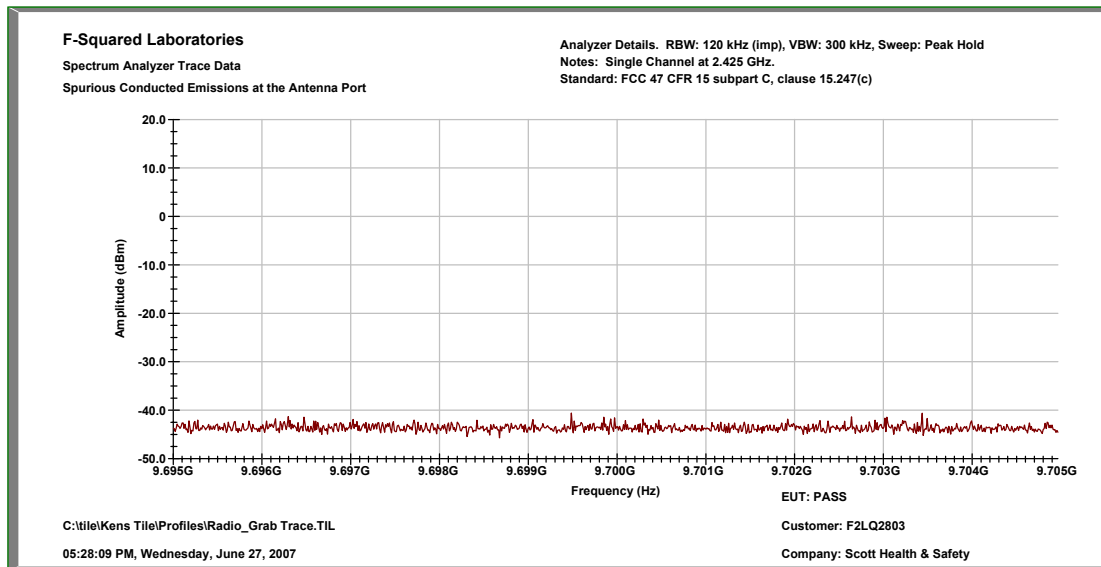


Figure 29: Spurious Emissions – Antenna Conducted, 10 GHz to 15 GHz

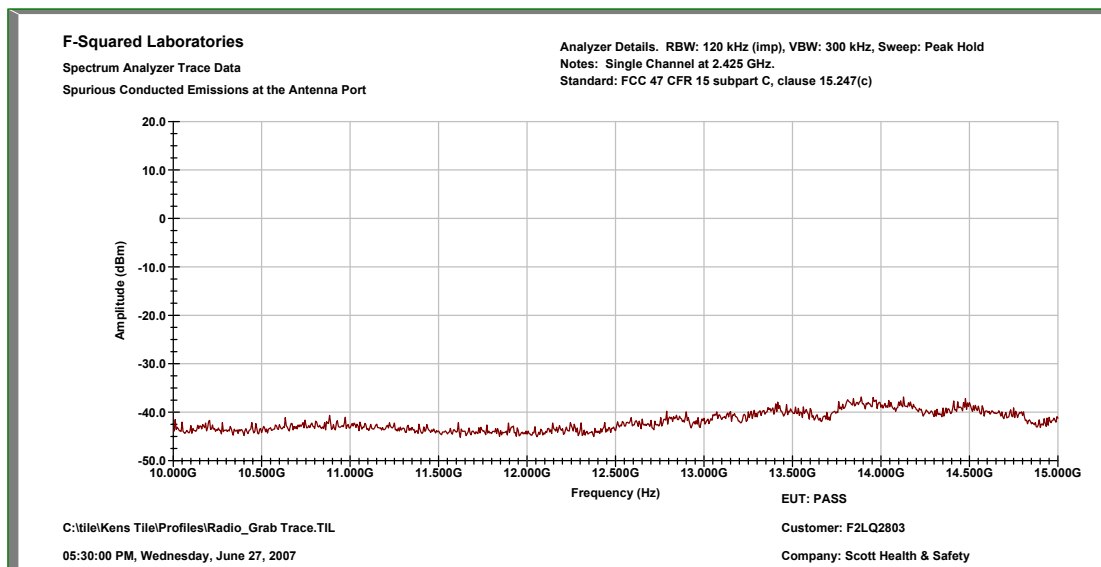


Figure 30: Spurious Emissions – Antenna Conducted, 15 GHz to 20 GHz

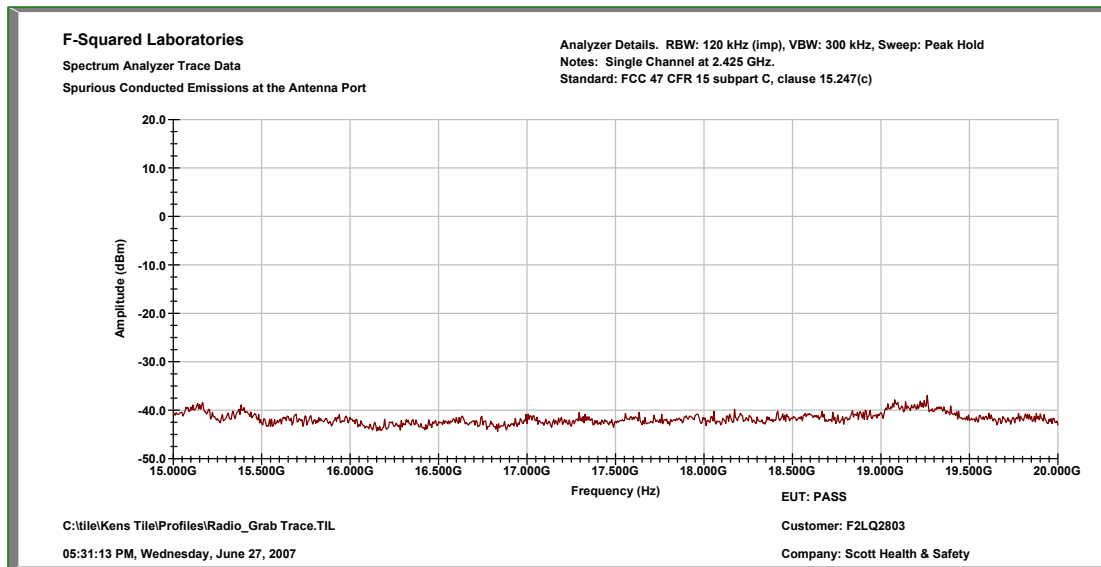


Figure 31: Spurious Emissions – Antenna Conducted, 20 GHz to 25 GHz

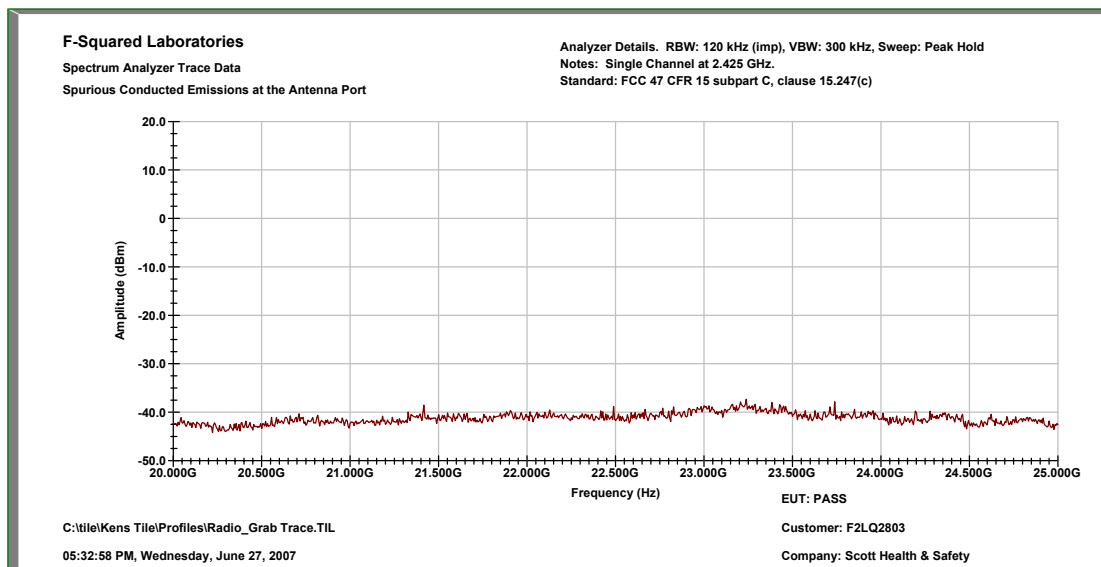
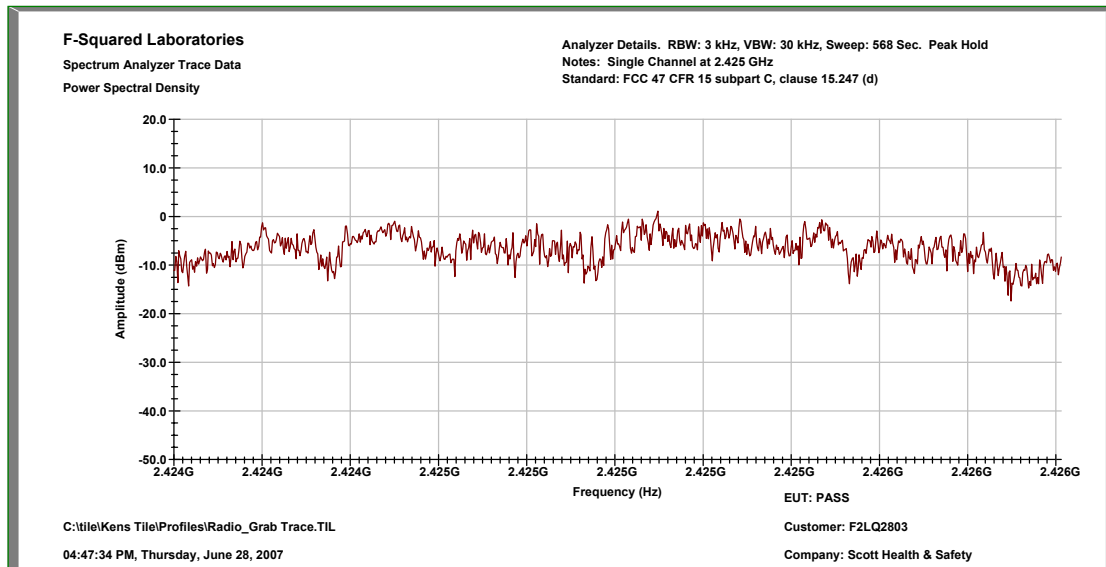
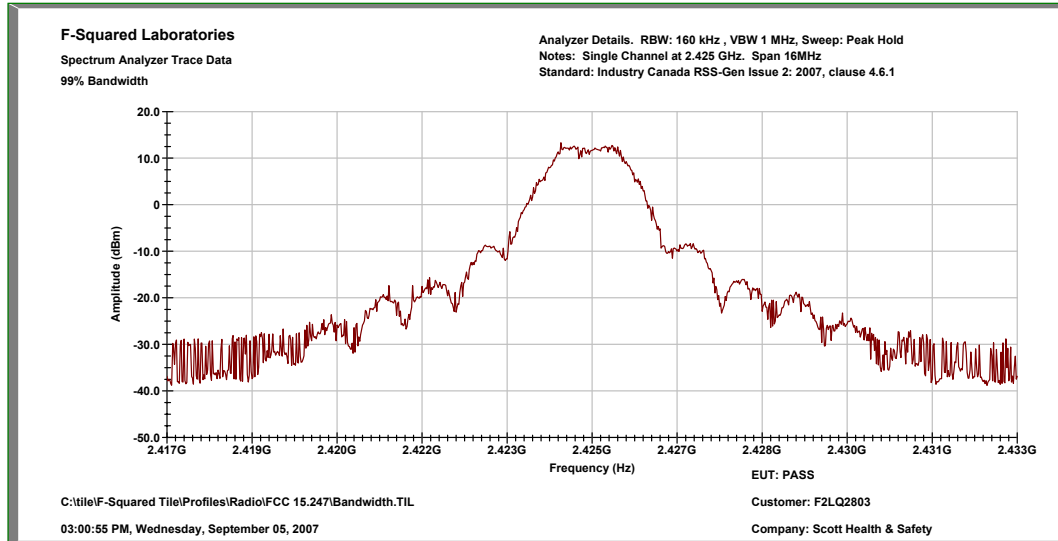


Figure 32: Peak Power Spectral Density



Span = 1.705 MHz; sweep rate = 568 seconds.

Figure 33: 99% Bandwidth

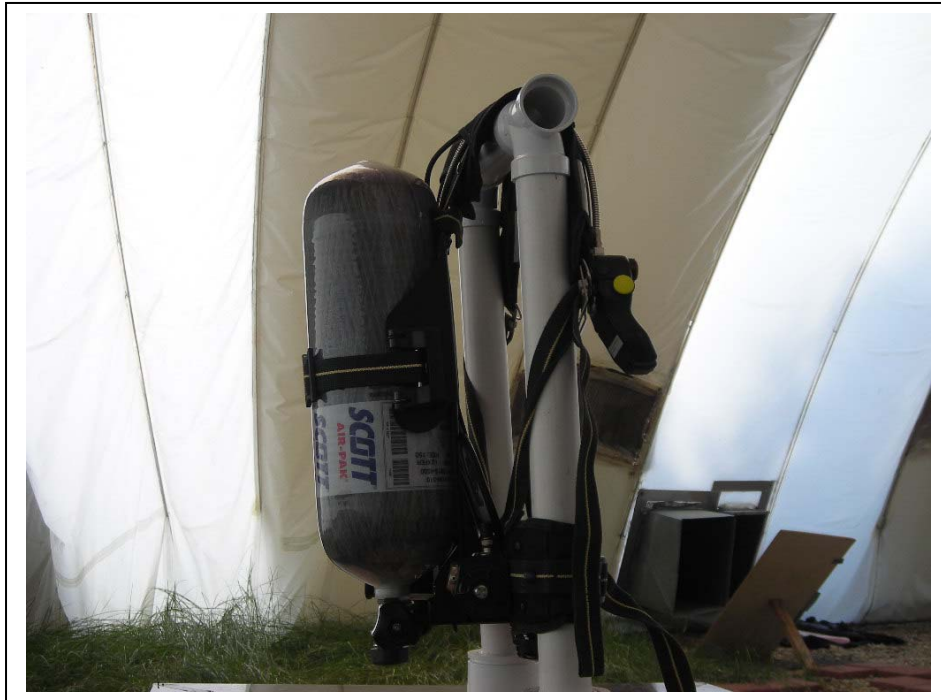


14. PHOTOGRAPHS/EXHIBITS – PRODUCT PHOTOS, TEST SETUPS

**Orthogonal Positions of Remote Control – Radiated Emissions Test on OATS:  
EUT on Side**



**Orthogonal Positions of Remote Control – Radiated Emissions Test on OATS:  
EUT Upright**





**Orthogonal Positions of Remote Control – Radiated Emissions Test on OATS:  
EUT on its Back**



### Antenna Conducted Measurements

