F2 Labs
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Middlefield, Ohio 44062
United States of America
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CERTIFICATION TEST REPORT

Manufacturer:	**Tabtronics** **2153 Winners Circle** **Dayton, Ohio 45404-1176** **United States of America**
Applicant:	**ActiGraph, LLC** **49 East Chase Street** **Pensacola, Florida 32502**
Product:	**ActiGraph Link**
Model:	**GT9X**
FCC ID:	**DFW-03**
Testing Commenced:	**June 18, 2014**
Testing Ended:	**June 20, 2014**
Summary of Test Results:	**Page 5**

Standards:

- **FCC Part 15 Subpart C, Section 15.247**
- **FCC Part 15, Subpart C, Section 15.207**

Evaluation Conducted by:

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Report Reviewed by:

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TABLE OF CONTENTS

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 2009 version of ANSI C63.4 and recommended FCC procedure of measurement of DTS operating under Section 15.247 and in KDB558074. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

Radiated Emission

- Combined Uncertainty (+ or -) 2.67 dB
- Expanded Uncertainty (+ or -) 5.35 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
F2LQ6006A-01E	First Issue	July 1, 2014	W. Fuster
F2LQ6006A-01E Rev. 1	Revision to manufacturer information.	Nov. 6, 2014	W. Fuster

2 SUMMARY OF TEST RESULTS

Test Name	Standard(s)	Results
-6dB Occupied Bandwidth	CFR 47 Part 15.247(a)(2) / KDB558074	Complies
Conducted Output Power	CFR 47 Part 15.247(b)(3) / KDB558074	Complies
Conducted Spurious Emissions	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Complies
Radiated Spurious Emission with 0.5dBi Integral Antenna	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Complies
Peak Power Spectral Density	CFR 47 Part 15.247(e) / KDB558074	Complies
Conducted Emissions	CFR 47 Part 15.207(a)	Complies

Note: Product was operated with fully charged internal battery. The device is placed into a charger fixture to get recharged. The charger fixture is connected to a computer via a USB cable. Conducted Emissions was performed on a laptop computer while the charger was connected and the EUT was charging. The device cannot be used while charging and the spurious emissions of the EUT were worse while it was in use; therefore, all other tests besides the Conducted Emissions were performed while the EUT was in use and not during charging.

Modifications Made to the Equipment
None

3 TABLE OF MEASURED RESULTS

Test	High Channel 2.480GHz	Mid Channel 2.440GHz	Low Channel 2.402GHz
Conducted Output Power	0.0804mW (-10.95dBm)	0.0801mW (-10.96dBm)	0.0891mW (-10.50dBm)
Conducted Output Power Limit	1 Watt, (30dBm)	1 Watt, (30dBm)	1 Watt, (30dBm)
E.I.R.P. with 0.5dBi Integral antenna	0.0902mW (-10.45dBm)	0.08995mW (-10.46dBm)	0.1000mW (-10.00dBm)
E.I.R.P. Limit	4 Watts, (36.02dBm)	4 Watts, (36.02dBm)	4 Watts, (36.02dBm)
Peak Power Spectral Density	-22.11 dBm	-21.65 dBm	-21.21 dBm
Peak Power Spectral Density Limit	8 dBm	8 dBm	8 dBm
-6dB Occupied bandwidth	706.87 MHz	729.58 MHz	727.70 MHz
-6dB Occupied Bandwidth Limit	≥ 500KHz	≥ 500KHz	≥ 500KHz

4 ENGINEERING STATEMENT

This report has been prepared on behalf of ActiGraph, LLC, 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 2009 and KDB558074 standards. 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: ActiGraph Link
Model: GT9X
Serial No.: None assigned
FCC ID: DFW-03

5.2 Trade Name:

ActiGraph, LLC

5.3 Power Supply:

Rechargeable Internal Battery

5.4 Applicable Rules:

CFR 47, Part 15.247, subpart C

5.5 Equipment Category:

Radio Transmitter-DTS

5.6 Antenna:

0.5dBi Internal Chip Antenna

5.7 Accessories:

Charging base and USB cable

5.8 Test Item Condition:

The equipment to be tested was received in good condition.

5.9 Testing Algorithm:

The EUT was configured to permit frequency changes from low-mid-upper transmission channel using digital modulation (required for digital transmission systems). For RF antenna conducted tests, the EUT was equipped with an SMA connector for connection to the measuring equipment. For radiated emissions tests, in a semi-anechoic chamber and on the OATS, the EUT was equipped with integral/internal chip antenna. The highest emissions were recorded in the data tables.

6 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Temp/Hum. Recorder	CL137	Extech	RH520	CH16992	May 5, 2015
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Oct. 31, 2014
Cable: 0.3m Low Loss	CL116	A.H. Systems, Inc.	SAC-26G-0.3	206	Aug. 1, 2014
Spectrum Analyzer	CL138	Agilent Technologies	E4407B	US41192779	Oct. 29, 2014
Shield Room	0175	Ray Proof	N/A	11645	Verified
OATS-3m	CL017	Compliance Labs	N/A	001	Dec. 12, 2014
Antenna 1-Chamber	0142	ETS/EMCO	3142B	9811-1330	Verified
Antenna 2-OATS	0105	Sunol Sciences	JB1	A101101	May 7, 2015
Pre-Amplifier	CL153	Agilent	83006A	MY39500900	Jan. 9, 2015
Active 18” Loop Antenna	CL082	A.H. Systems, Inc.	SAS-562B	241	Sept. 6, 2014
Antenna, Horn	CL098	Emco	3115	9809-5580	Dec. 3, 2015
Antenna, Horn	CL114	A.H. Systems, Inc.	SAS-572	237	Sept. 6, 2014
Cable: 0.3m Low Loss	CL117	A.H. Systems, Inc.	SAC-26G-3	207	Jan. 16, 2015
Coaxial Cable	CL139	Thermax	M17/128-RG400	JB (Brown)	Feb. 6, 2015
Coaxial Cable	CL140	Thermax	M17/128-RG400	JC (Brown)	Feb. 6, 2015
Temp/Hum. Rec.	CL119	Extech	RH520	H005869	Jan. 8, 2015
Transient Limiter	CL102	Hewlett Packard	11947A	3107A03325	Feb. 11, 2015
LISN 2	0147	Solar	8028-50-TS-24-BNC	1128	Jan. 16, 2017
LISN 4	0146	Solar	8028-50-TS-24-BNC	1127	Jan. 16, 2017
Spectrum Analyzer	CL147	Agilent	E7402A	MY45101241	Oct. 24, 2014
Software:	Tile Version 1.0		Software Verified: June 20, 2014		

7 FCC PART 15.247(a)(2) – OCCUPIED BANDWIDTH

7.1 Requirements:

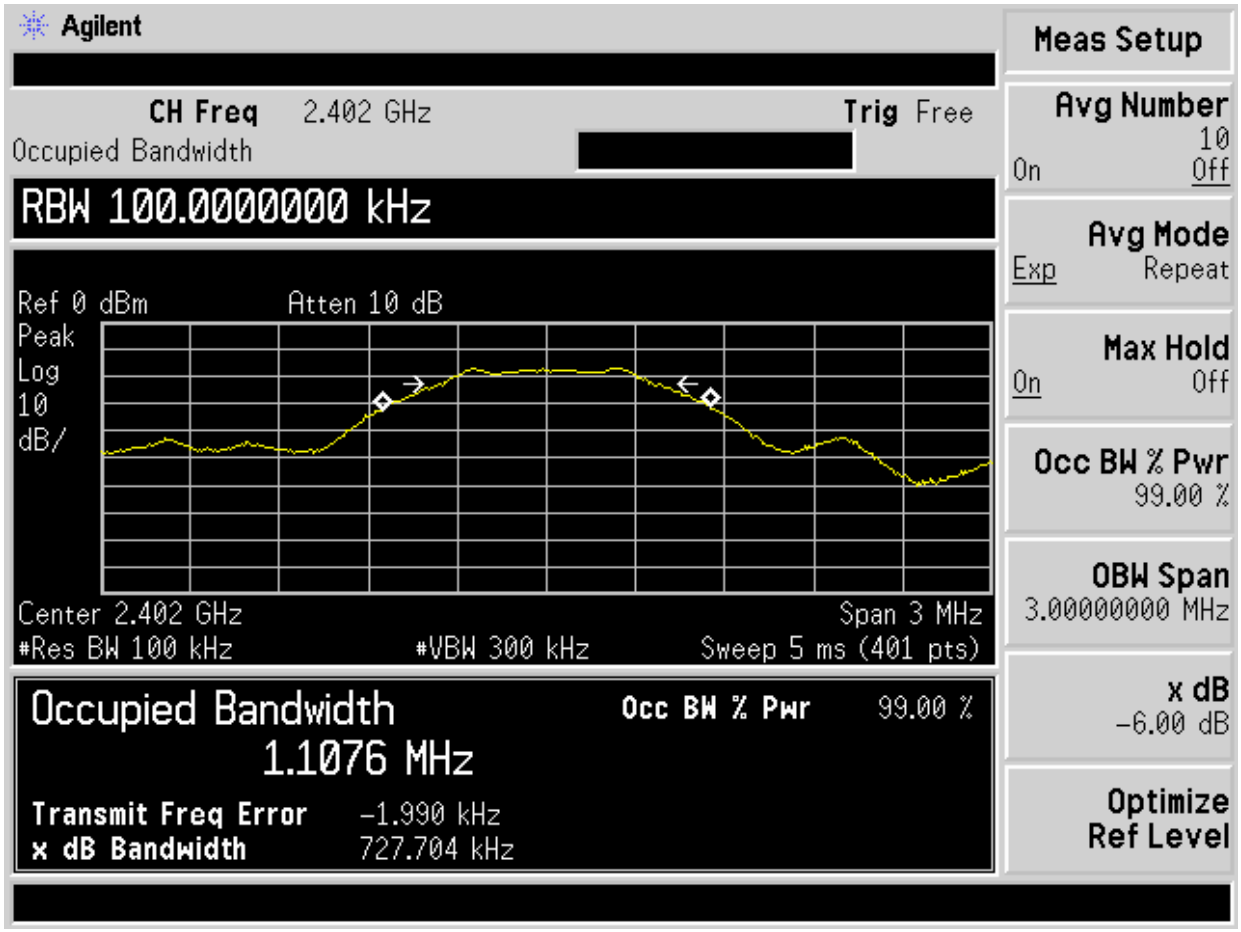
The 6dB bandwidth shall be greater than 500 kHz.

Bandwidth measurements were made at the low (2.402 GHz), mid (2.440 GHz) and upper (2.480 GHz) frequencies. The bandwidth was measured using the analyzer's marker function.

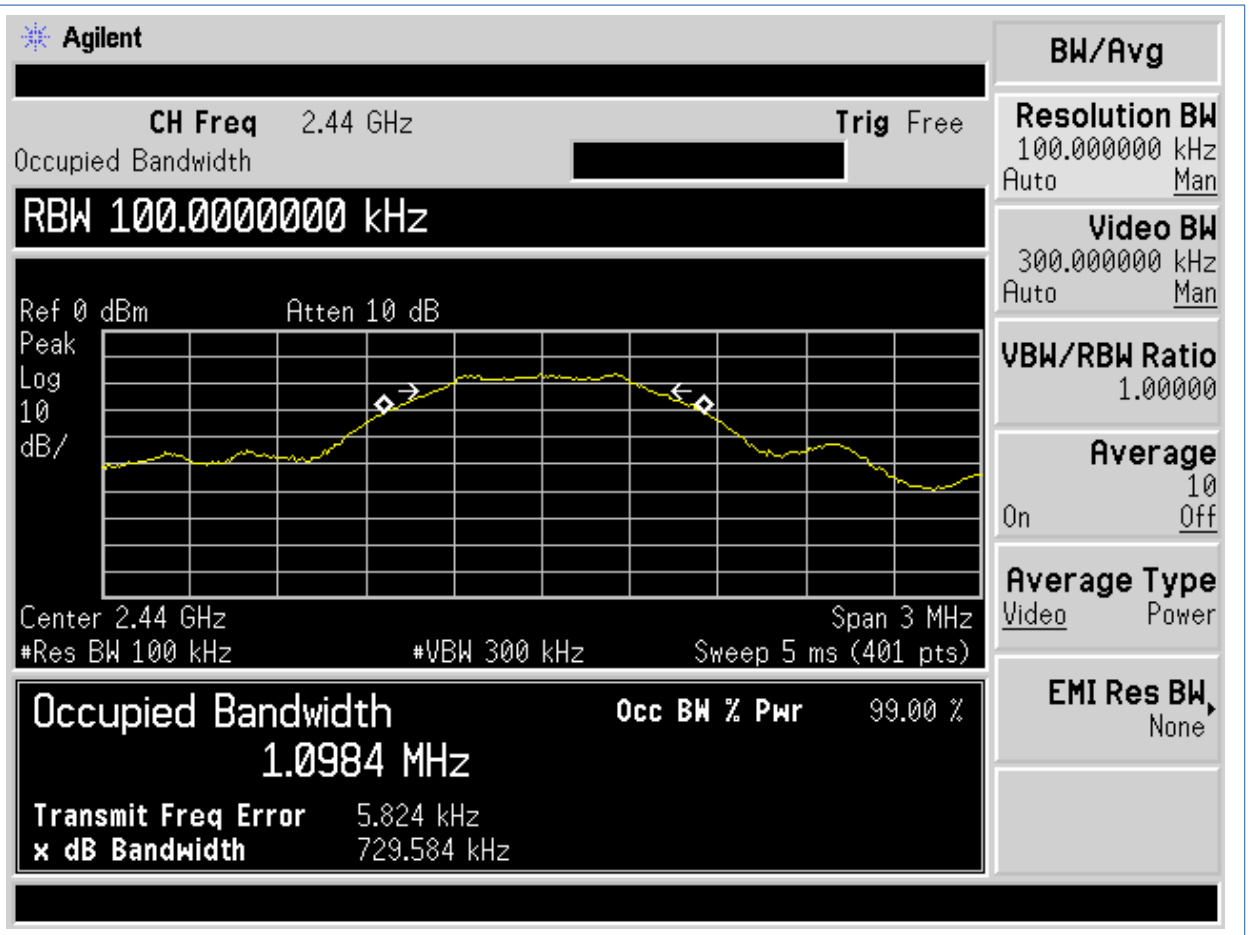
7.2 Occupied Bandwidth Test Data

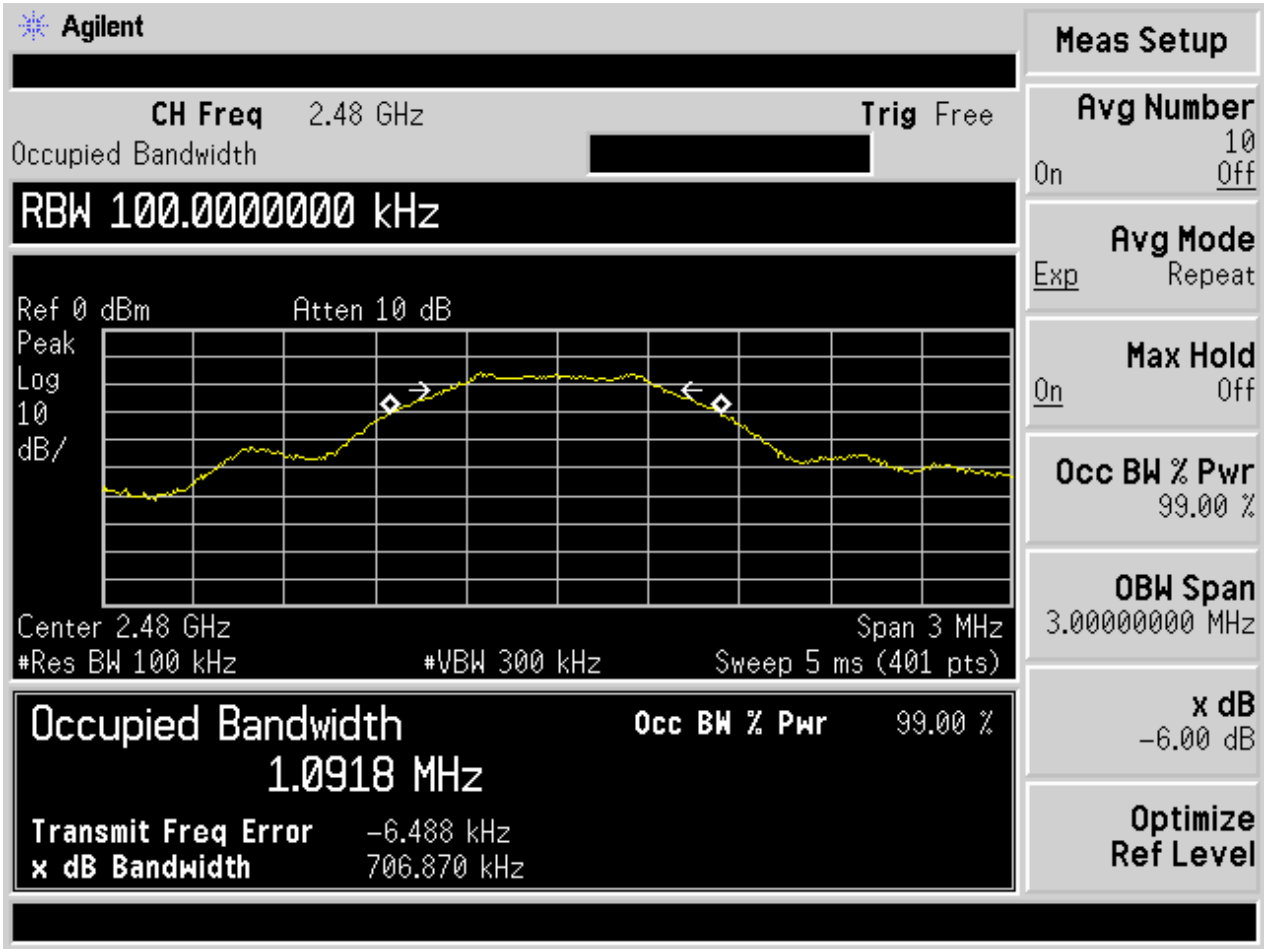
Test Date:	June 20, 2014	**Test Engineer(s):**	J. Knepper; K. Littell
Standards:	CFR 47 Part 15.247(a)(2); KDB558074	**Air Temperature:**	23.6ºC
		Relative Humidity:	45%

Low Channel



Mid Channel


Agilent
CH Freq 2.44 GHz
Trig Free
Occupied Bandwidth
RBW 100.0000000 kHz
Ref 0 dBm
Atten 10 dB
Peak
Log
10
dB/
Center 2.44 GHz
Span 3 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.0984 MHz
Occ BW % Pwr 99.00 %
Transmit Freq Error 5.824 kHz
x dB Bandwidth 729.584 kHz
BW/Avg
Resolution BW
100.000000 kHz
Auto Man
Video BW
300.000000 kHz
Auto Man
VBW/RBW Ratio
1.00000
Average
10
On Off
Average Type
Video Power
EMI Res BW
None


Agilent
Meas Setup
CH Freq 2.48 GHz
Trig Free
Occupied Bandwidth
RBW 100.0000000 kHz
Avg Number
10
On Off
Avg Mode
Exp Repeat
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
3.00000000 MHz
Ref 0 dBm
Atten 10 dB
Peak
Log
10
dB/
Center 2.48 GHz
Span 3 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
1.0918 MHz
Occ BW % Pwr 99.00 %
Transmit Freq Error -6.488 kHz
x dB Bandwidth 706.870 kHz
x dB
-6.00 dB
Optimize
Ref Level

8 FCC PART 15.247(b)(3) – CONDUCTED OUTPUT POWER

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

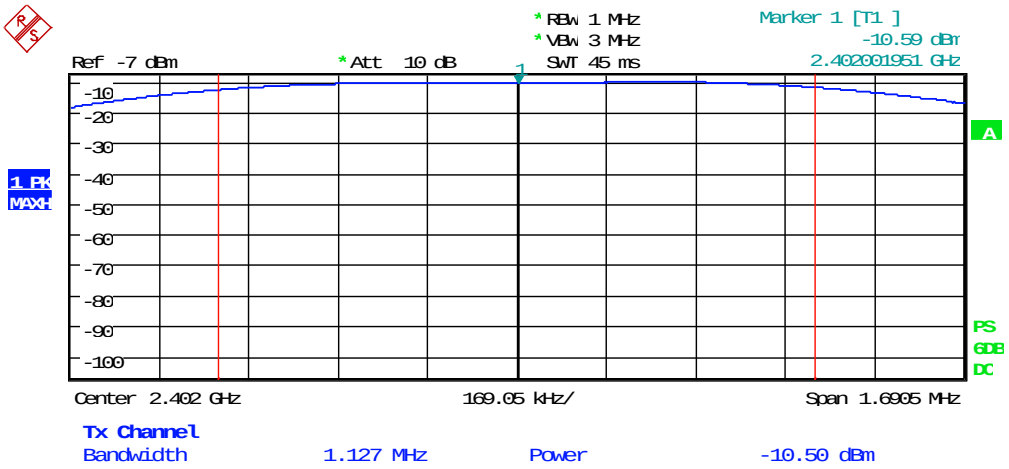
8.1 Requirements:

The peak power output shall be 1 watt (30 dBm) or less when using an antenna with a gain of less than 6dBi. For antennas having a gain of more than 6dBi, the limit is reduced by 1dB for every dB the antenna gain is over 6dBi.

8.2 Conducted Output Power Test Data

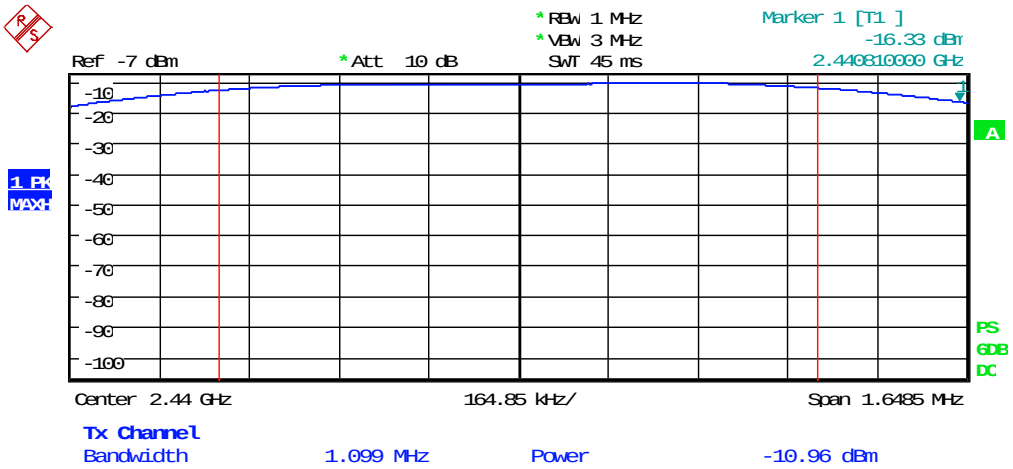
Test Date:	June 20, 2014	Test Engineer(s):	J. Knepper; K. Littell
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	Air Temperature:	23.4ºC
		Relative Humidity:	45%

Low Channel



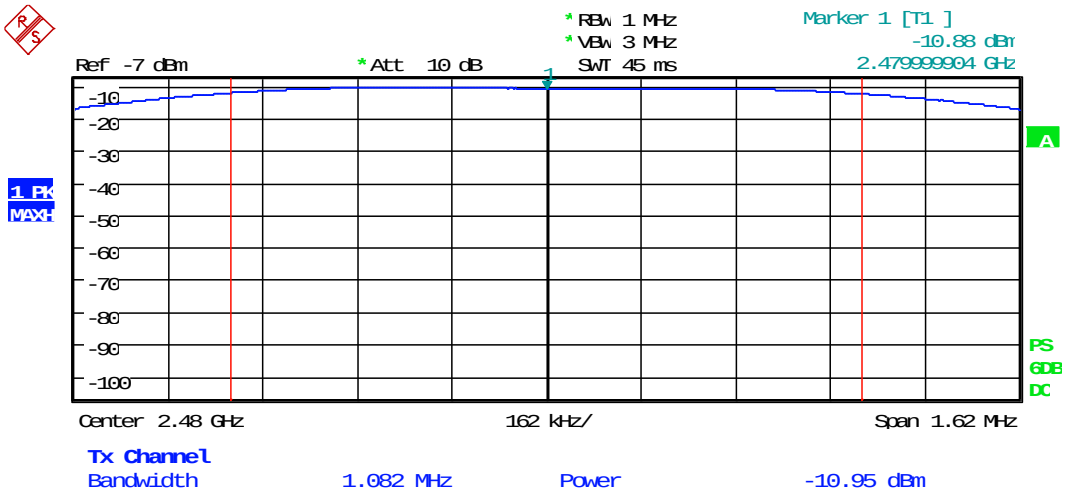
Date: 20.JUN.2014 14:53:07

Mid Channel



Date: 20.JUN.2014 14:40:04

High Channel



Date: 20.JUN.2014 14:20:55

9 FCC Part 15.247(c) – CONDUCTED SPURIOUS EMISSIONS

The following tests were performed to demonstrate compliance.

RF Antenna Conducted Test

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

9.1 Requirements:

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

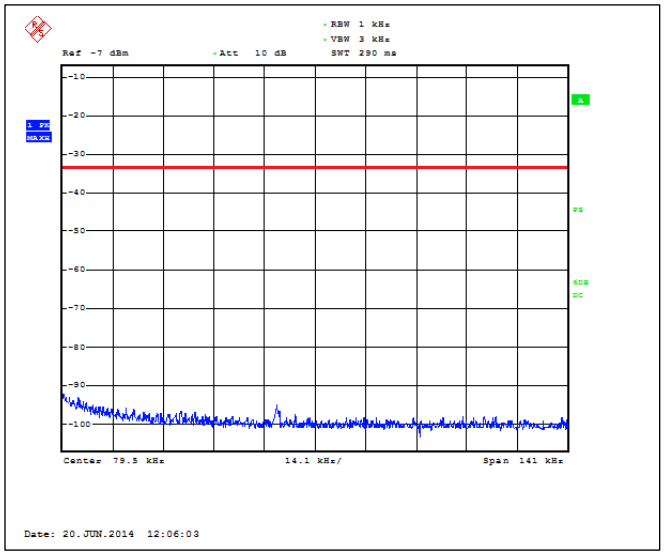
Spurious emissions measurements were made at the low, mid, and upper channels with the appropriate spectrum analyzer impulse bandwidth. Additionally, 20dB down points were measured for the low and high channels to verify band edge compliance.

9.2 Test Data – CONDUCTED SPURIOUS EMISSIONS

Test Date:	June 20, 2014	**Test Engineer(s):**	J. Knepper; K. Littell
Standards:	FCC Part 15.247(d); KDB558074	**Air Temperature:**	24.4ºC
		Relative Humidity:	48%

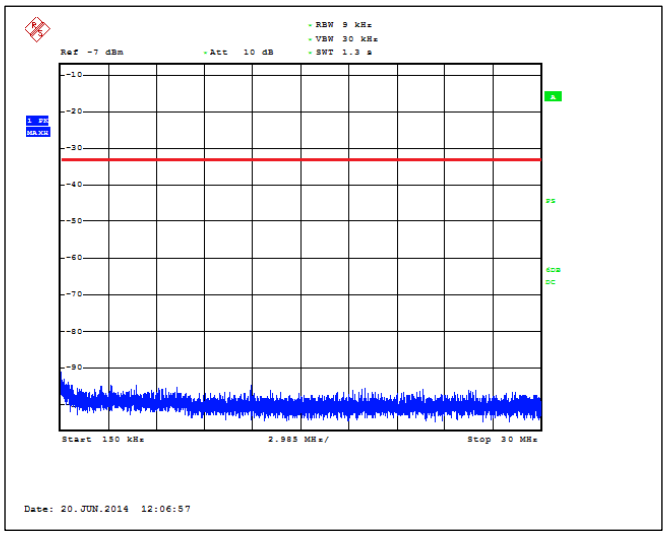
Low Channel: .009 MHz to 0.15 MHz

.

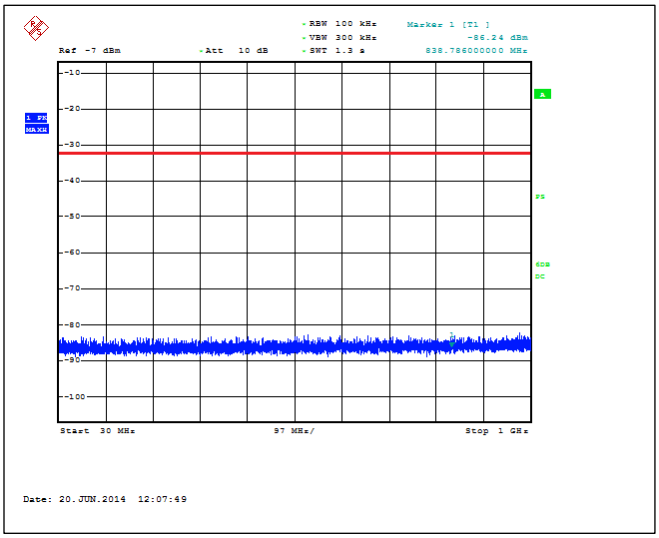


Low Channel: 0.15 MHz to 30 MHz

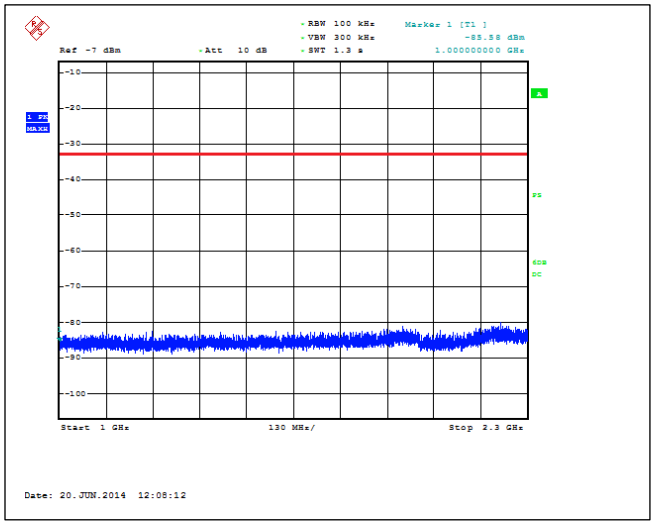
.



Low Channel: 30 MHz to 1 GHz



Low Channel: 1 GHz to 2.3 GHz



Low Channel: 2.3 GHz to 2.7 GHz

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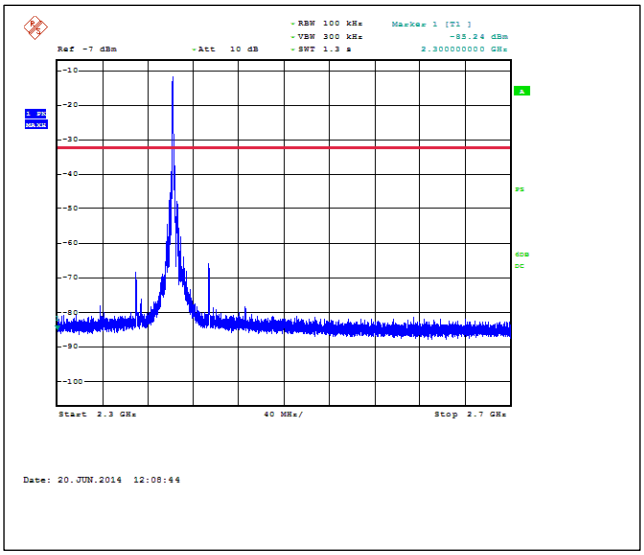

Low Channel: 2.7 GHz to 6 GHz

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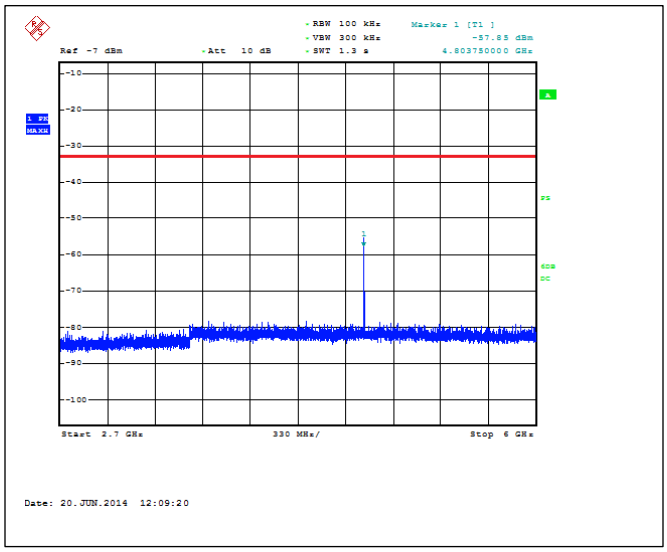

Low Channel: 6 GHz to 18 GHz

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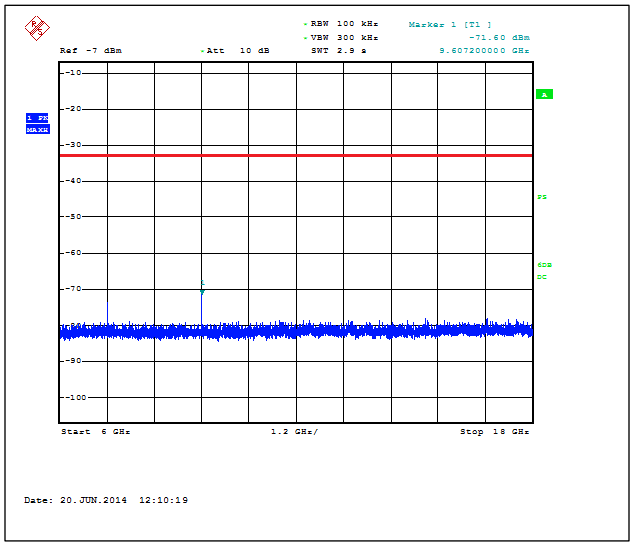
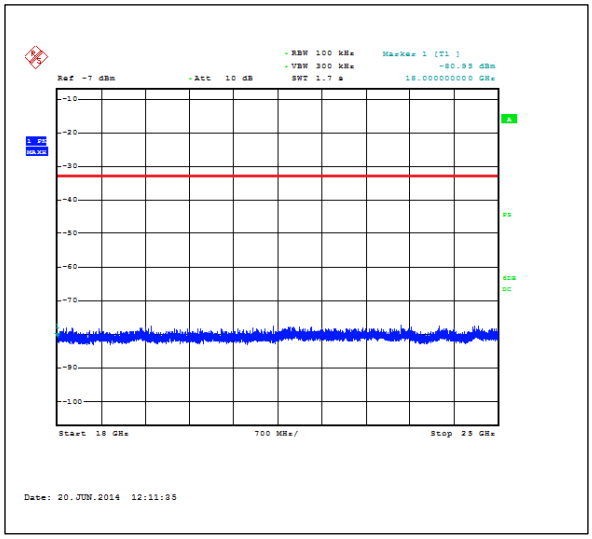
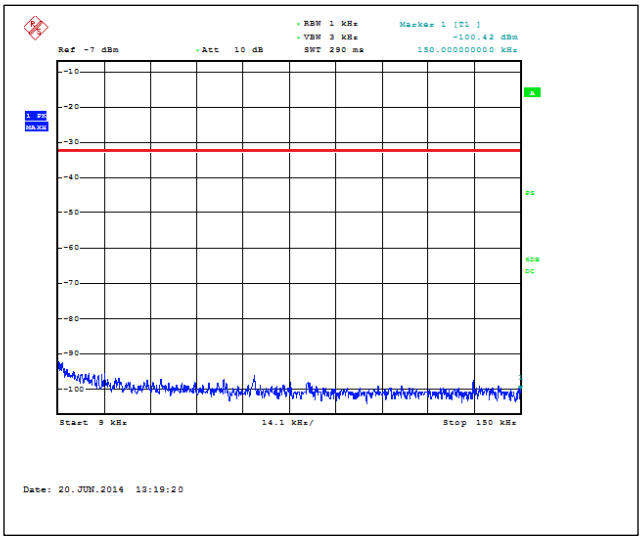


Low Channel: 18 GHz to 26 GHz

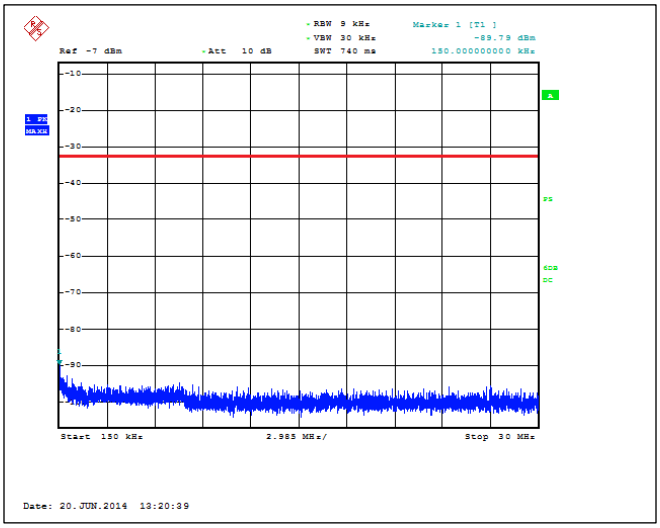
.



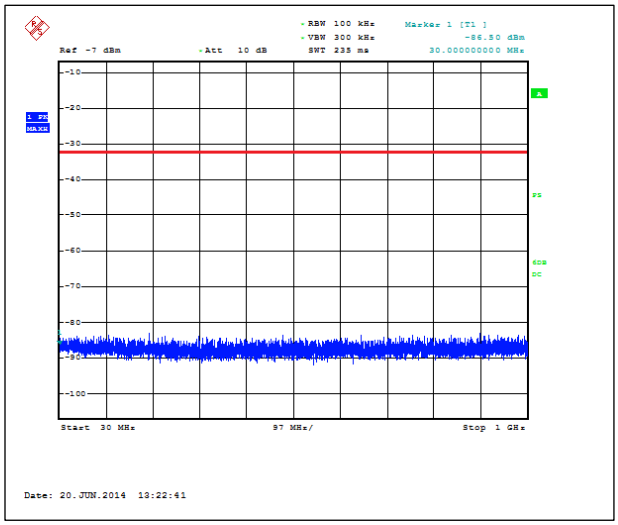
Mid Channel: .009 MHz to 0.15 MHz



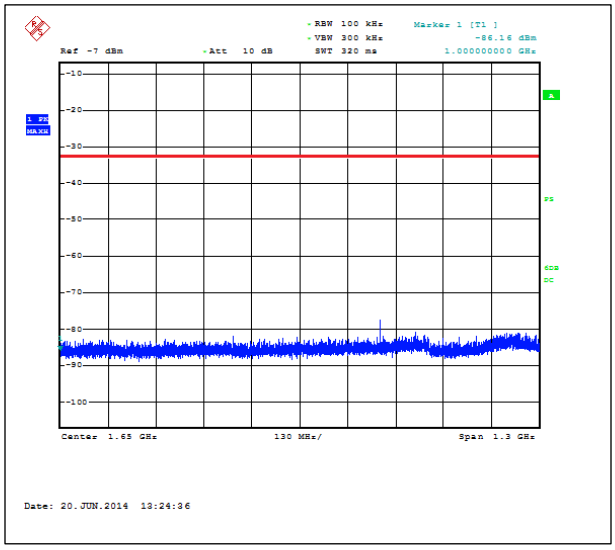
Mid Channel: 0.15 MHz to 30 MHz



Mid Channel: 30 MHz to 1 GHz



Mid Channel: 1 GHz to 2.3 GHz



Mid Channel: 2.3 GHz to 2.7 GHz

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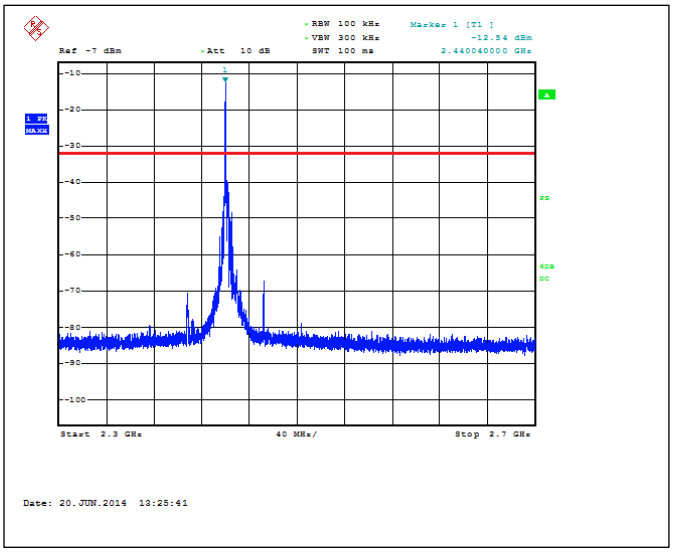

Mid Channel: 2.7 GHz to 6 GHz

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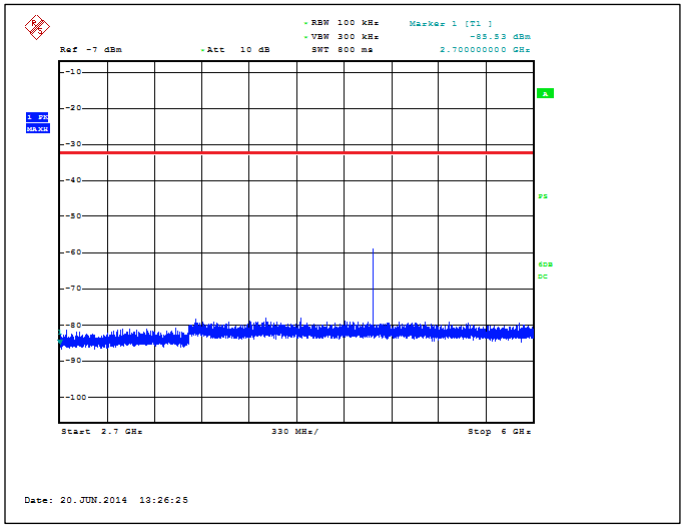
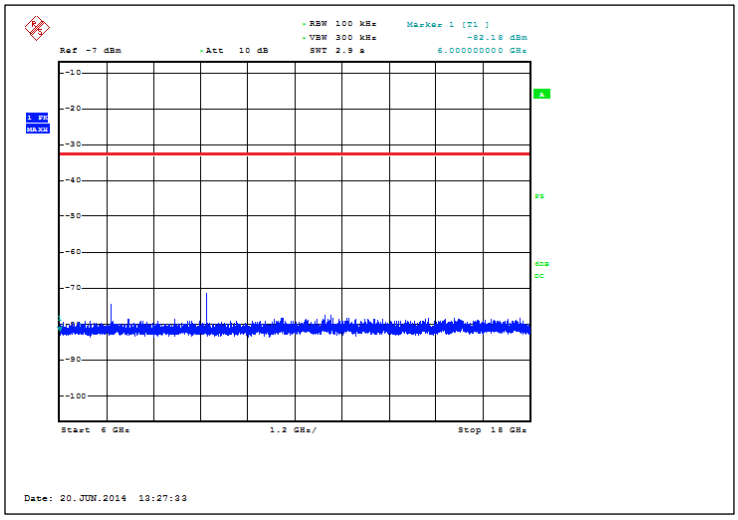
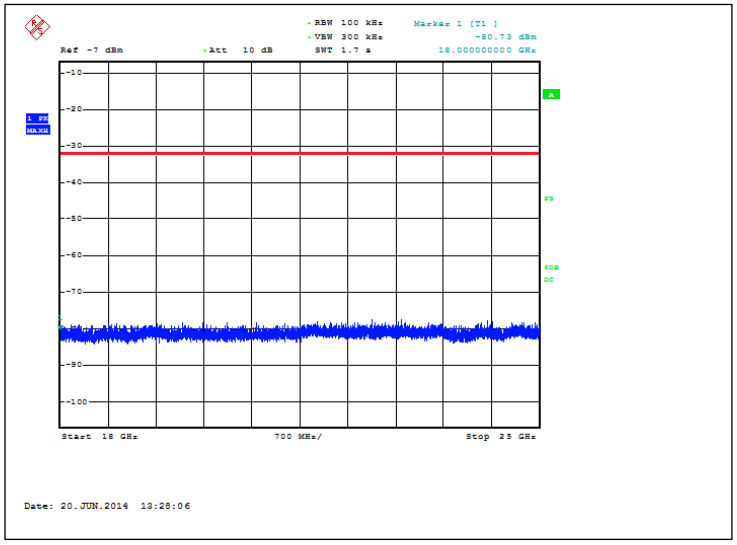


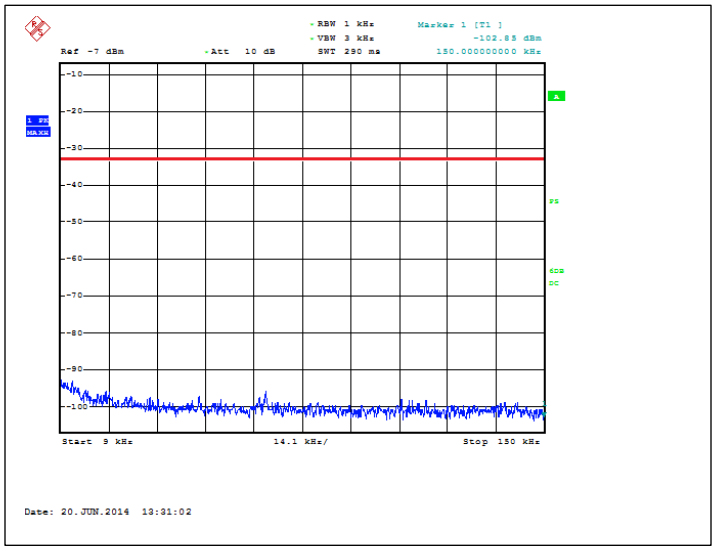
Mid Channel: 6 GHz to 18 GHz



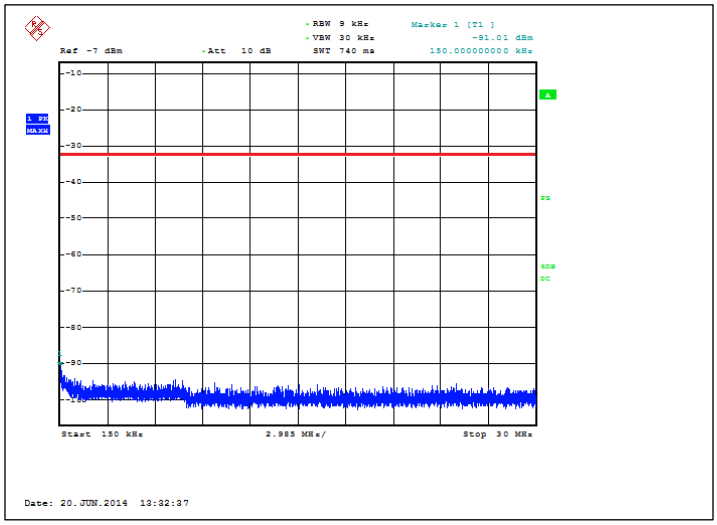
Mid Channel: 18 GHz to 26 GHz



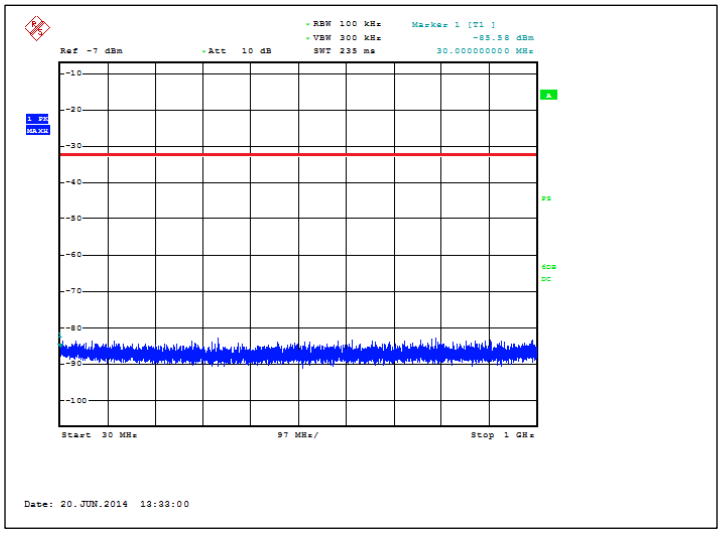
High Channel: .009 MHz to 0.15 MHz



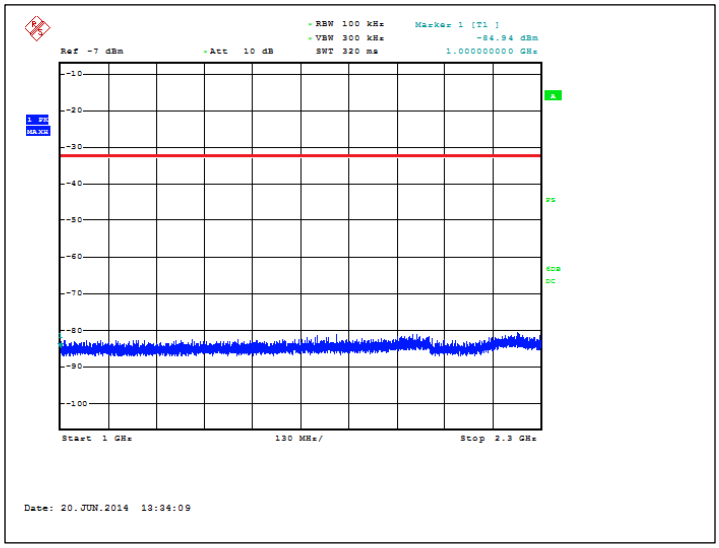
High Channel: 0.15 MHz to 30 MHz



High Channel: 30 MHz to 1 GHz



High Channel: 1 GHz to 2.3 GHz



High Channel: 2.3 GHz to 2.7 GHz

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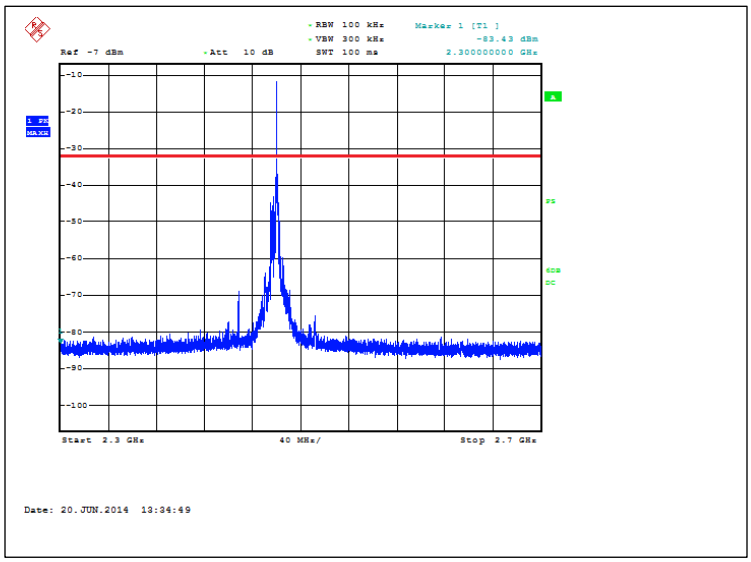

High Channel: 2.7 GHz to 6 GHz

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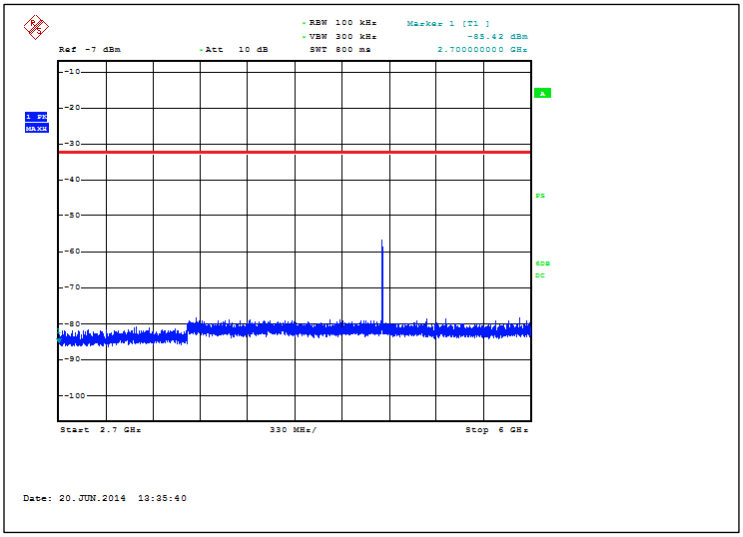
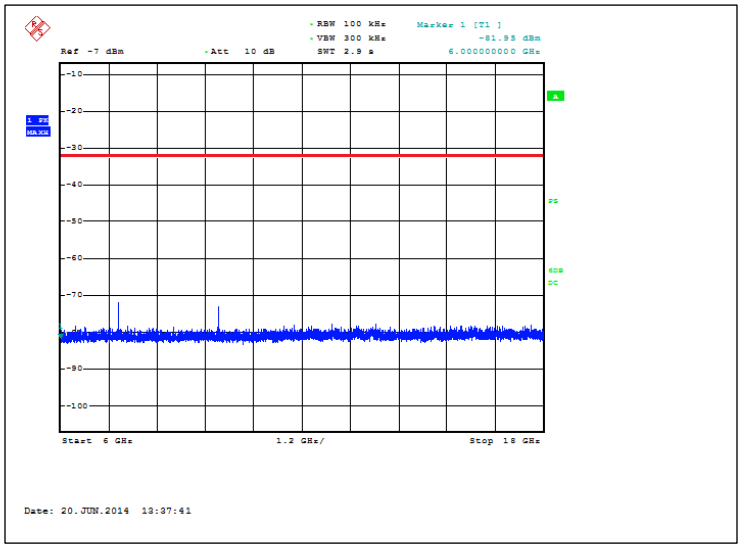
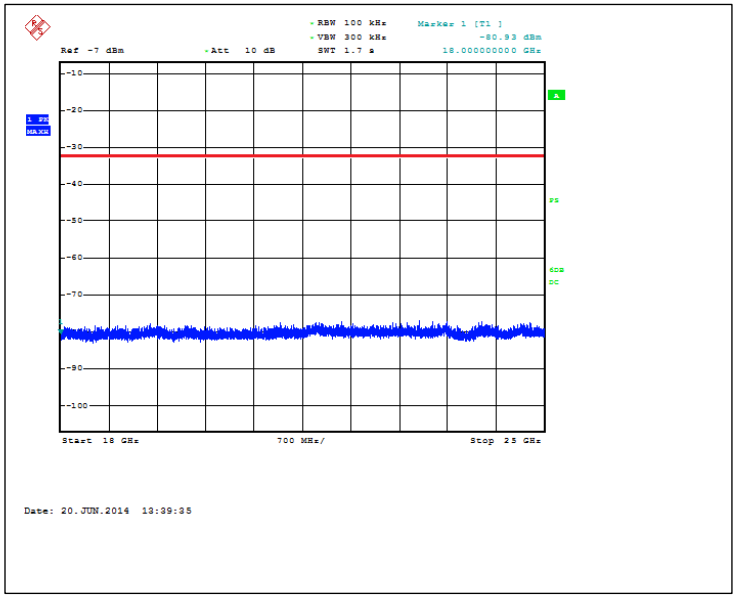


High Channel: 6 GHz to 18 GHz



High Channel: 18 GHz to 26 GHz



10 RADIATED SPURIOUS EMISSION

The EUT antenna port was fitted with its integral/internal chip 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.

10.1 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).

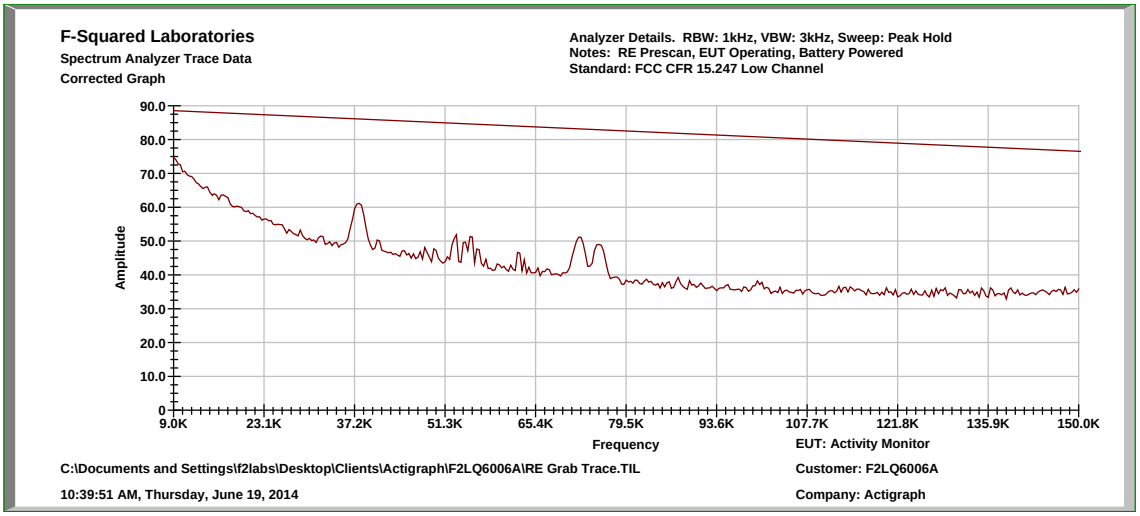
10.2 Radiated Spurious Emission Test Data

Test Date(s):	June 18-19, 2014	**Test Engineer(s):**	J. Knepper; K. Littell
Standards:	CFR 47 Part 15.247(d); Part 15.209 / KDB558074	**Air Temperature:**	23.2ºC
		Relative Humidity:	57%

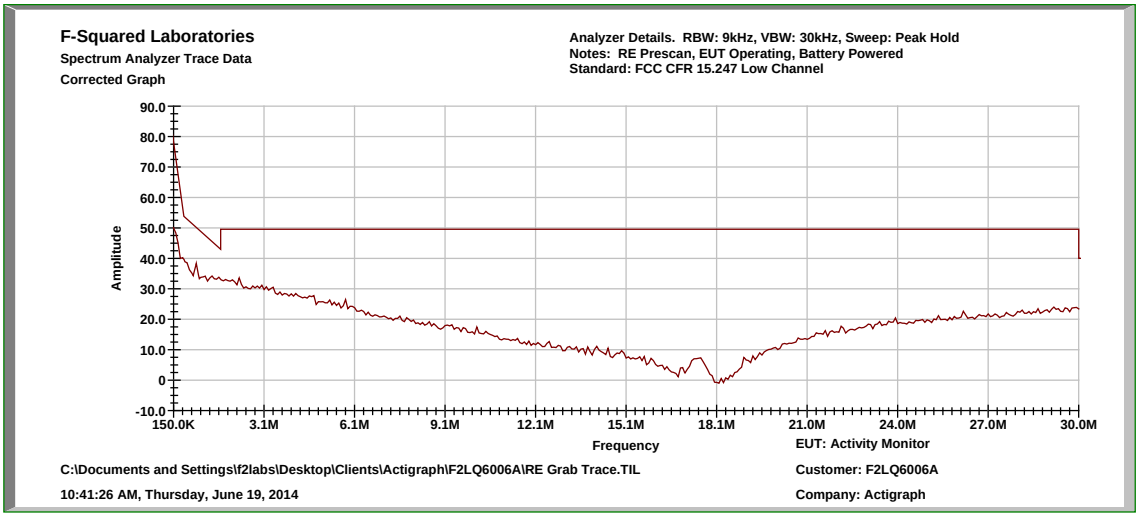
Notes: Plots are peak, max hold pre-scan data included only to determine what frequencies to investigate and measure. During the pre-scan evaluation, the EUT was rotated in all possible directions to find the maximum emissions. The orthogonal position that showed the highest emissions was used. At some 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 63.4 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.

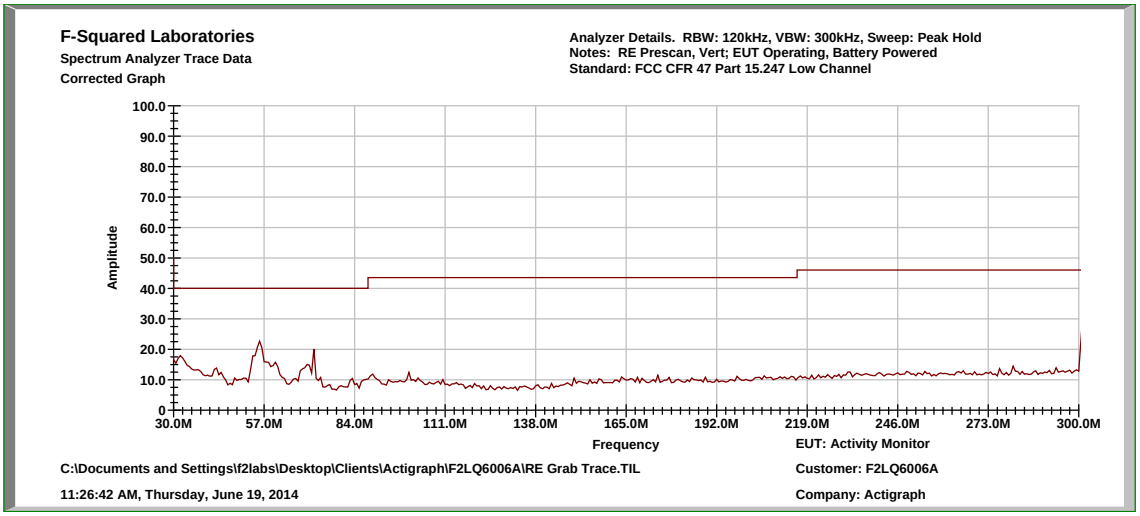
0.5dBi Integral Antenna: Low Channel, .009 MHz to 0.15 MHz



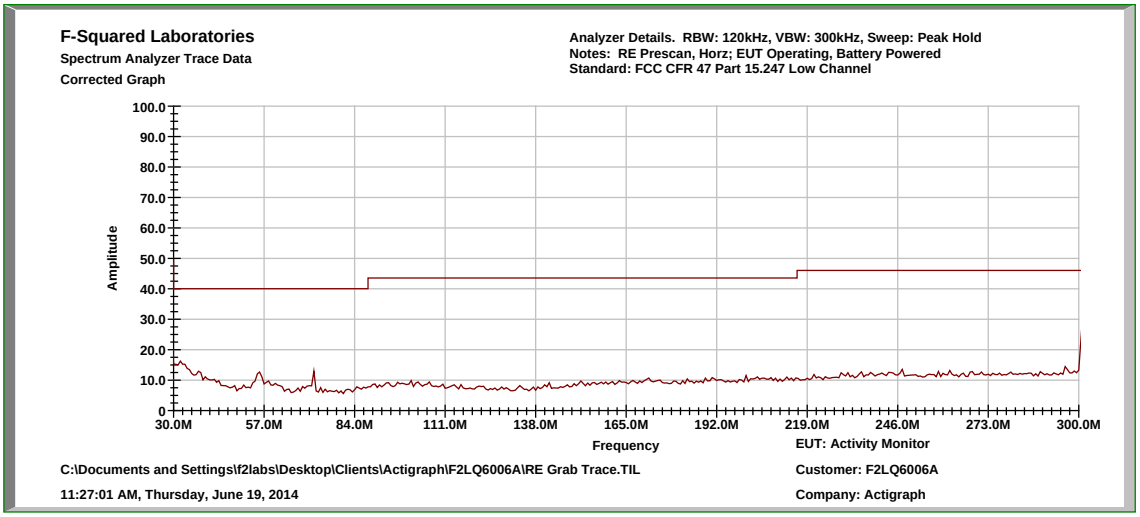
0.5dBi Integral Antenna: Low Channel, 0.15 MHz to 30 MHz



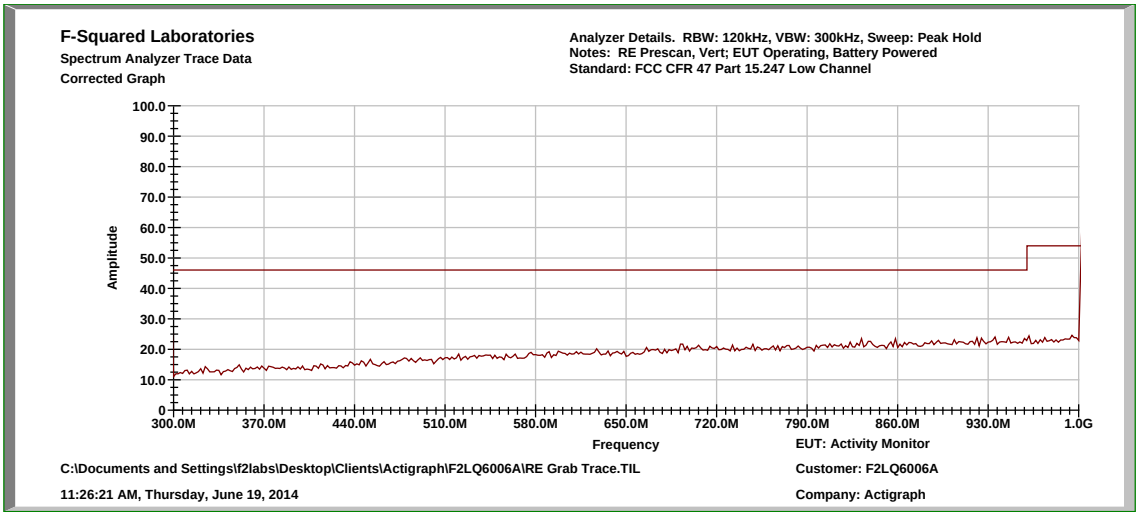
0.5dBi Integral Antenna: Low Channel, 30 MHz to 300 MHz, Vertical



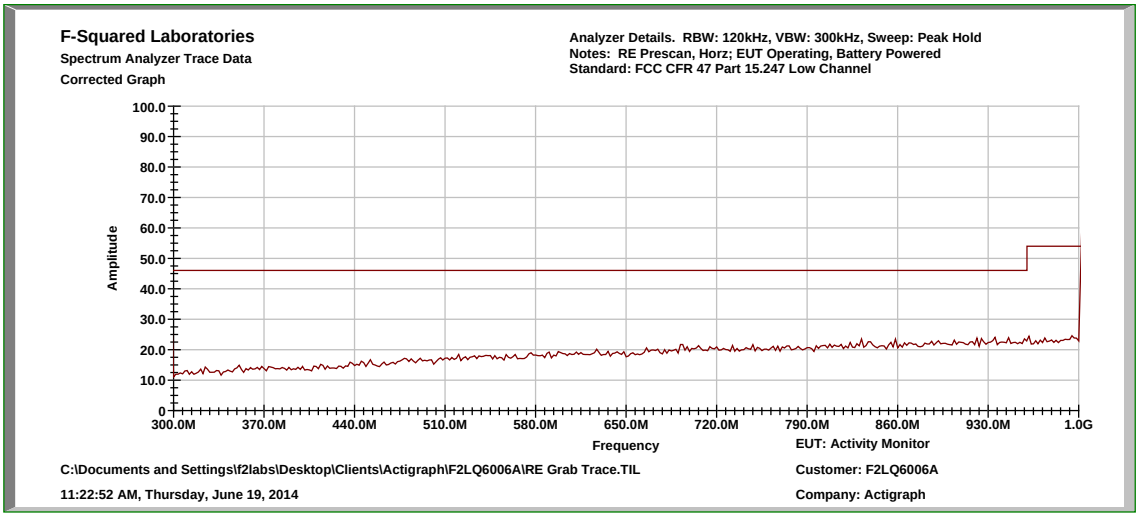
0.5dBi Integral Antenna: 30 MHz to 300 MHz, Horizontal



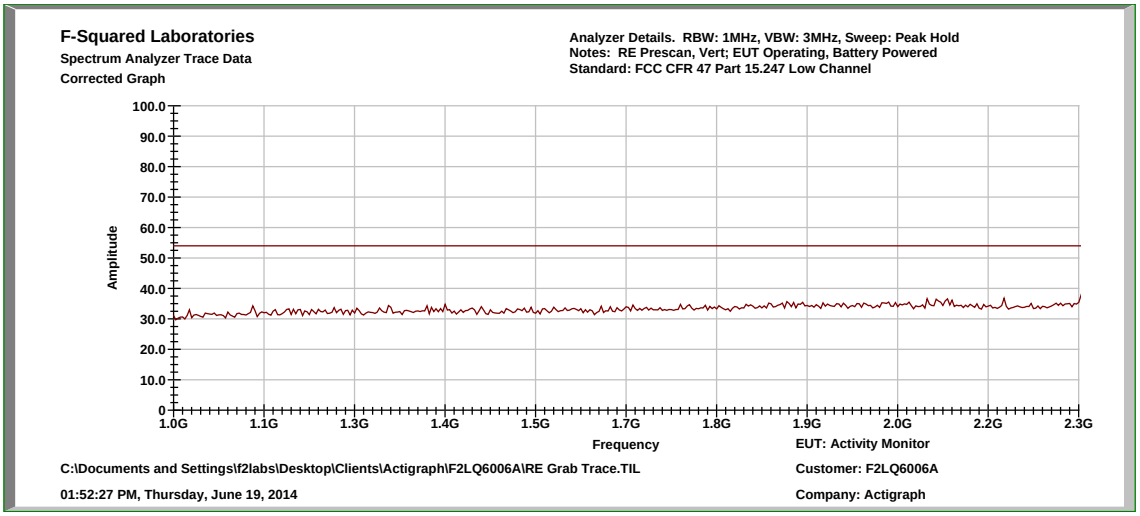
0.5dBi Integral Antenna: Low Channel, 300 MHz to 1 GHz, Vertical



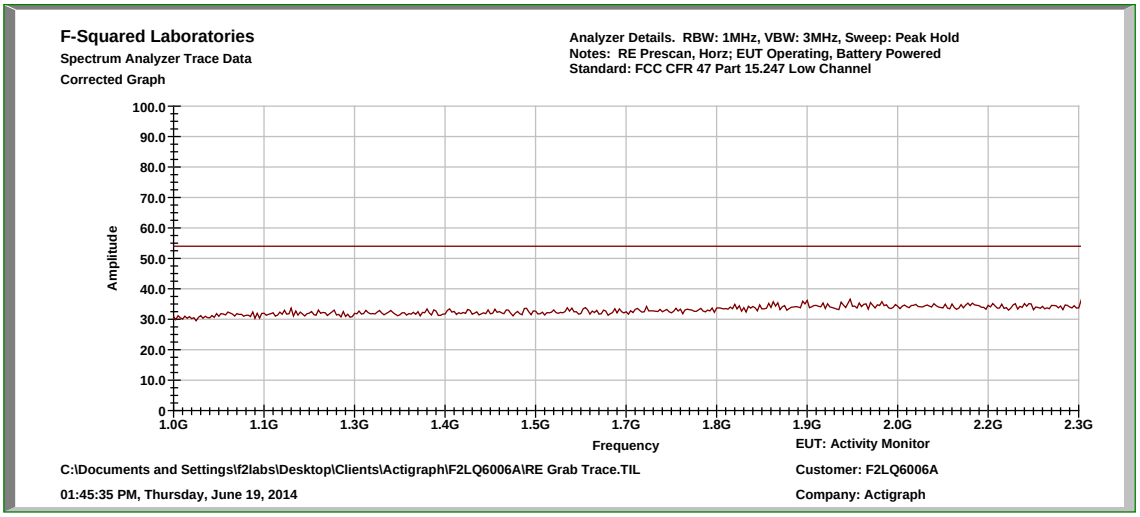
0.5dBi Integral Antenna: Low Channel, 300 MHz to 1 GHz, Horizontal



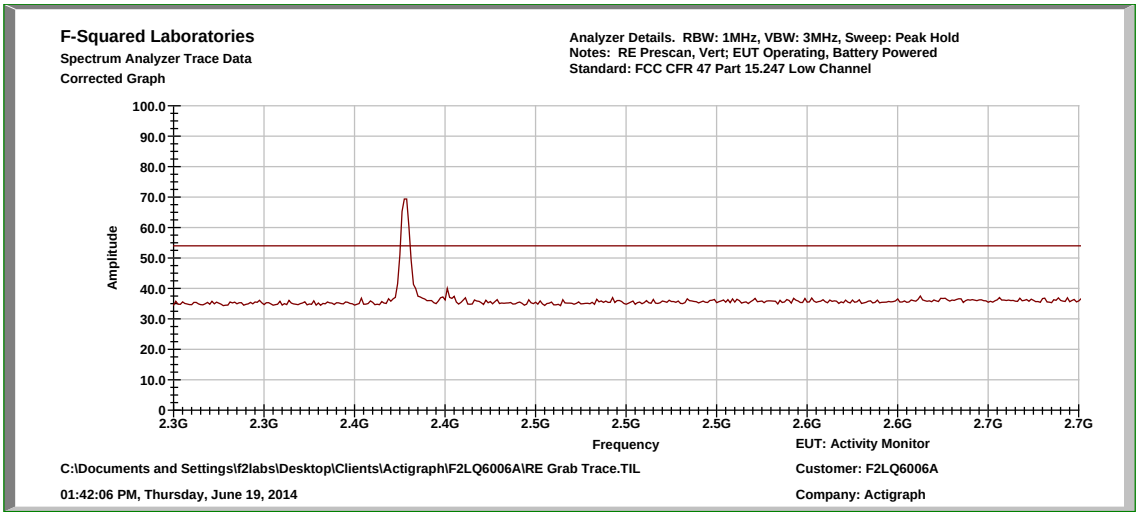
0.5dBi Integral Antenna: Low Channel, 1 GHz to 2.3 GHz, Vertical



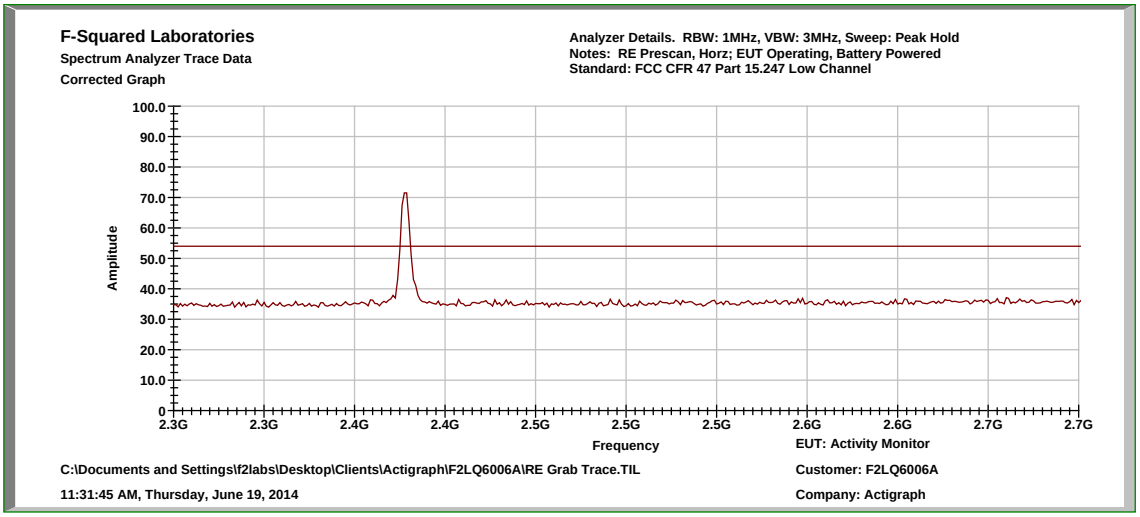
0.5dBi Integral Antenna: Low Channel, 1 GHz to 2.3 GHz, Horizontal



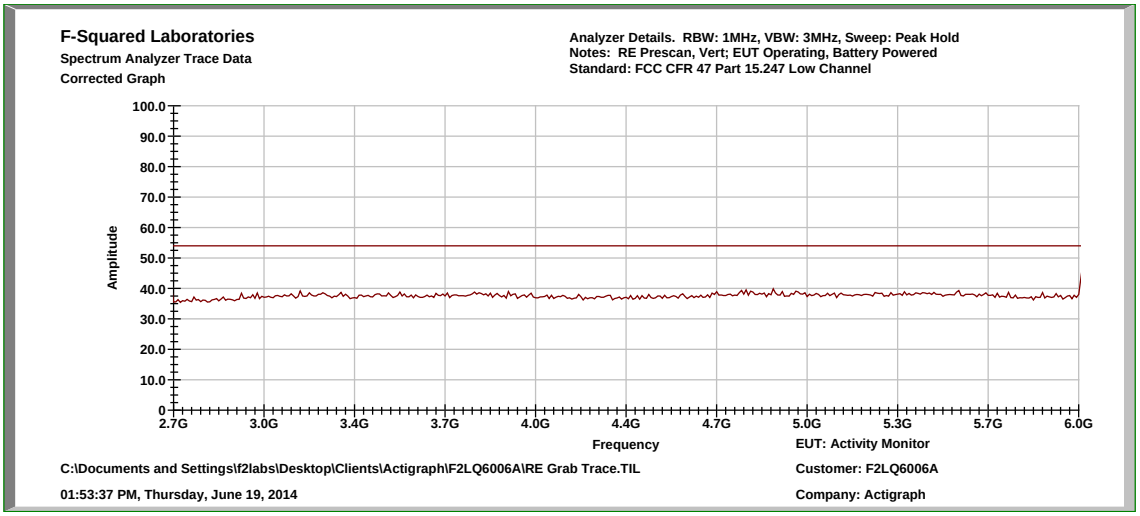
0.5dBi Integral Antenna: Low Channel, 2.3 GHz to 2.7 GHz, Vertical



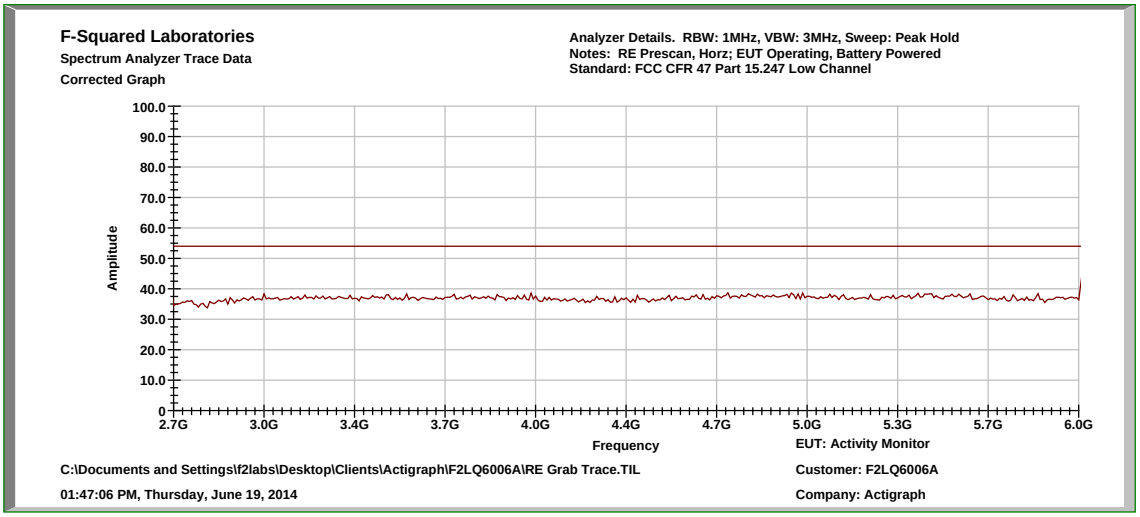
0.5dBi Integral Antenna: Low Channel, 2.3 GHz to 2.7 GHz, Horizontal



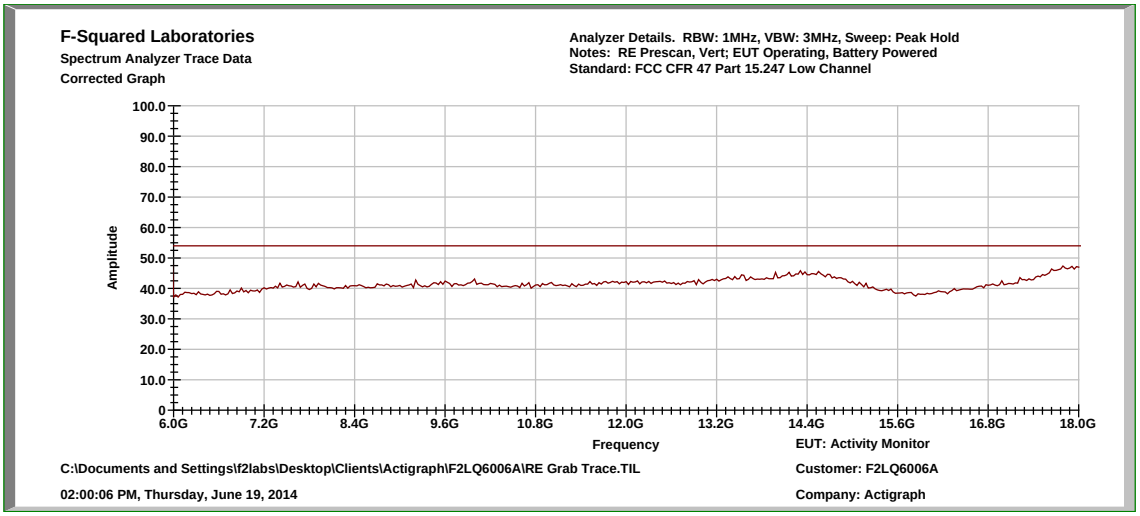
0.5dBi Integral Antenna: Low Channel, 2.7 GHz to 6 GHz, Vertical



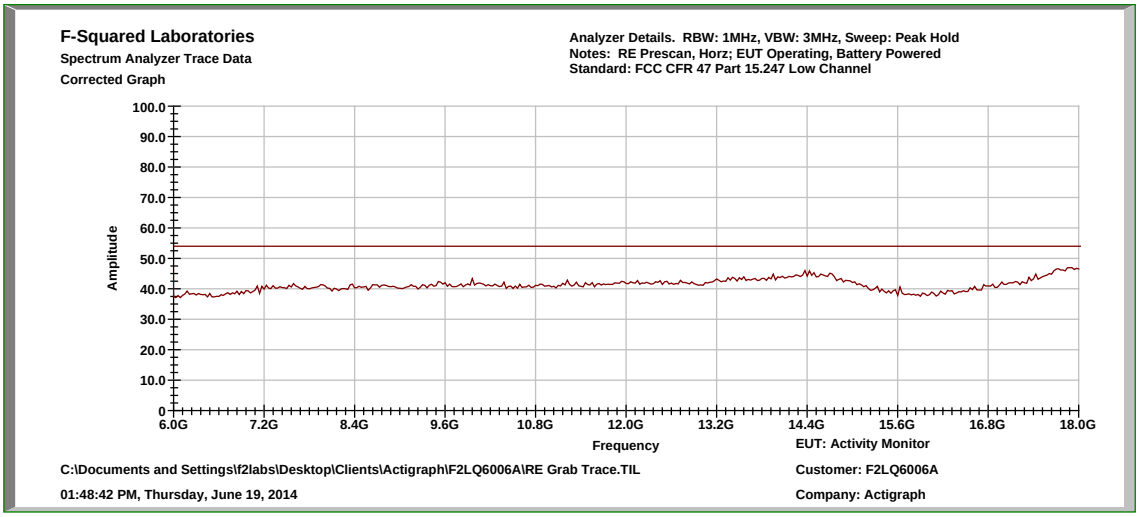
0.5dBi Integral Antenna: Low Channel, 2.7 GHz to 6 GHz, Horizontal



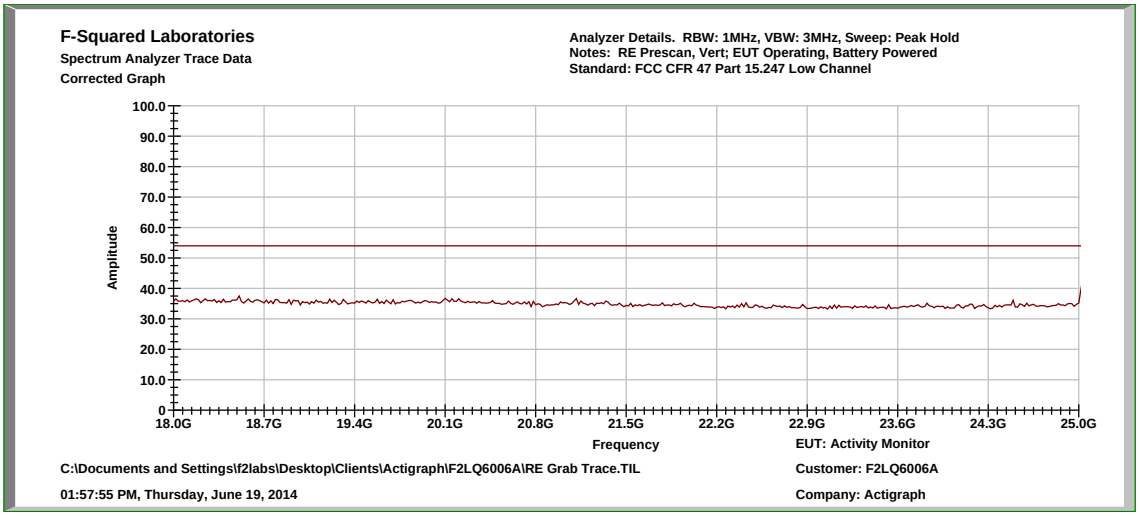
0.5dBi Integral Antenna: Low Channel, 6 GHz to 18 GHz, Vertical



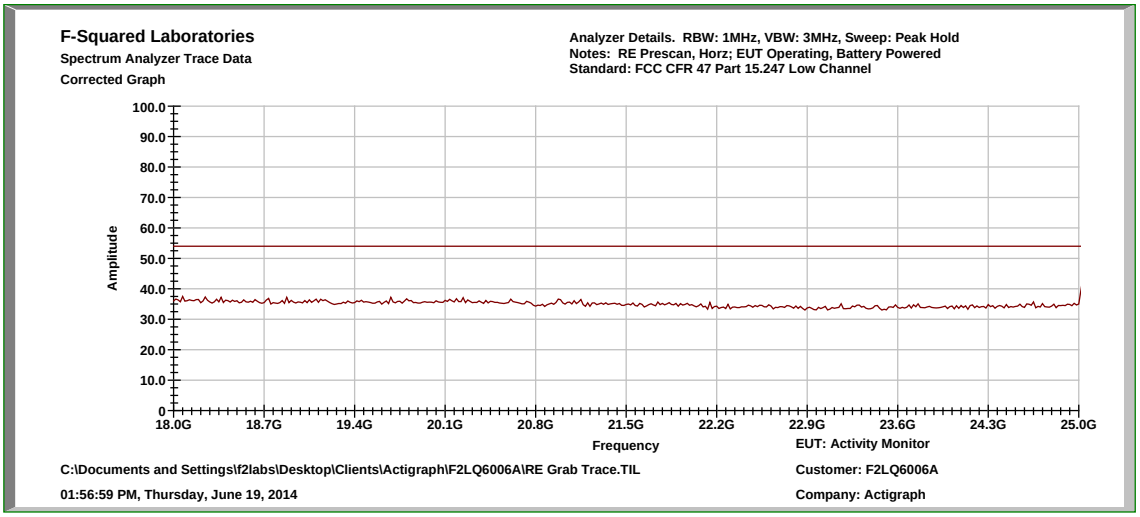
0.5dBi Integral Antenna: Low Channel, 6 GHz to 18 GHz, Horizontal



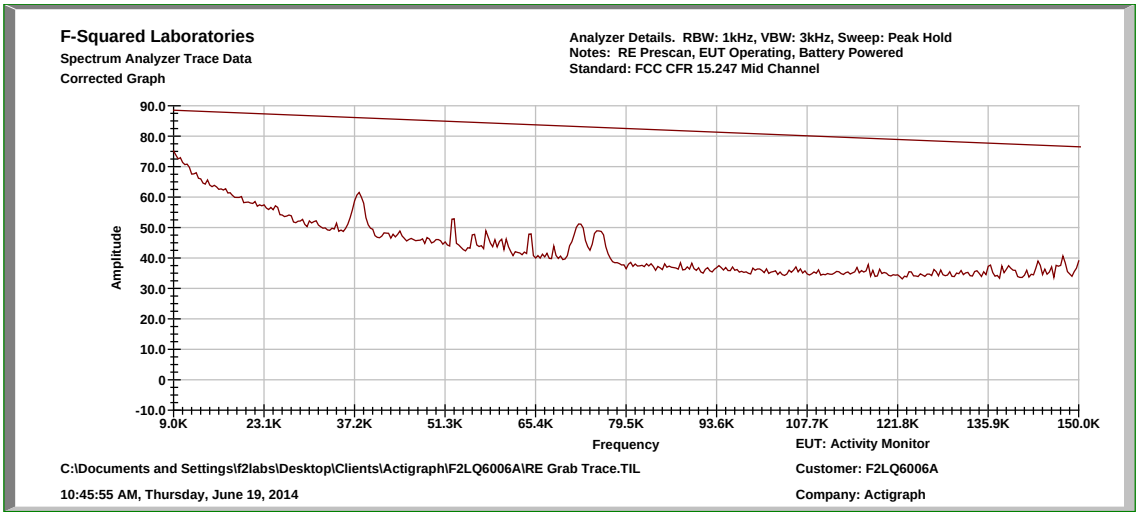
0.5dBi Integral Antenna: Low Channel, 18 GHz to 25 GHz, Vertical



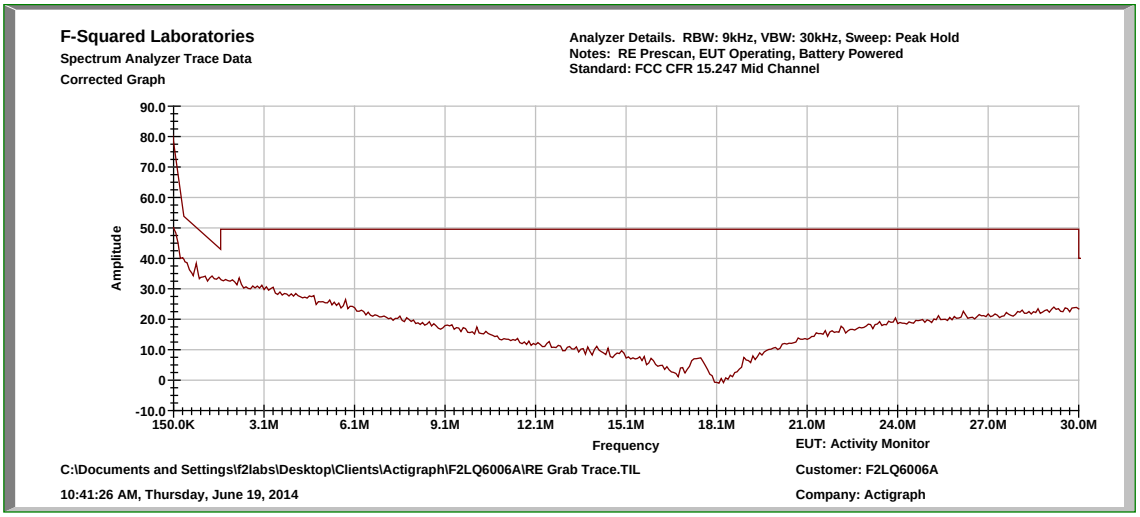
0.5dBi Integral Antenna: Low Channel, 18 GHz to 25 GHz, Horizontal



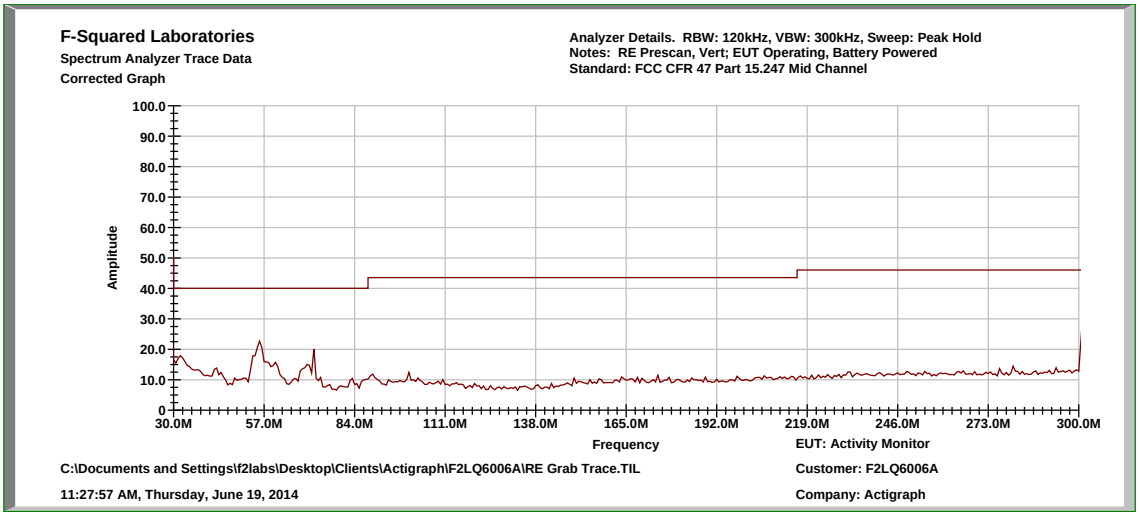
0.5dBi Integral Antenna: Mid Channel, .009 MHz to 0.15 MHz



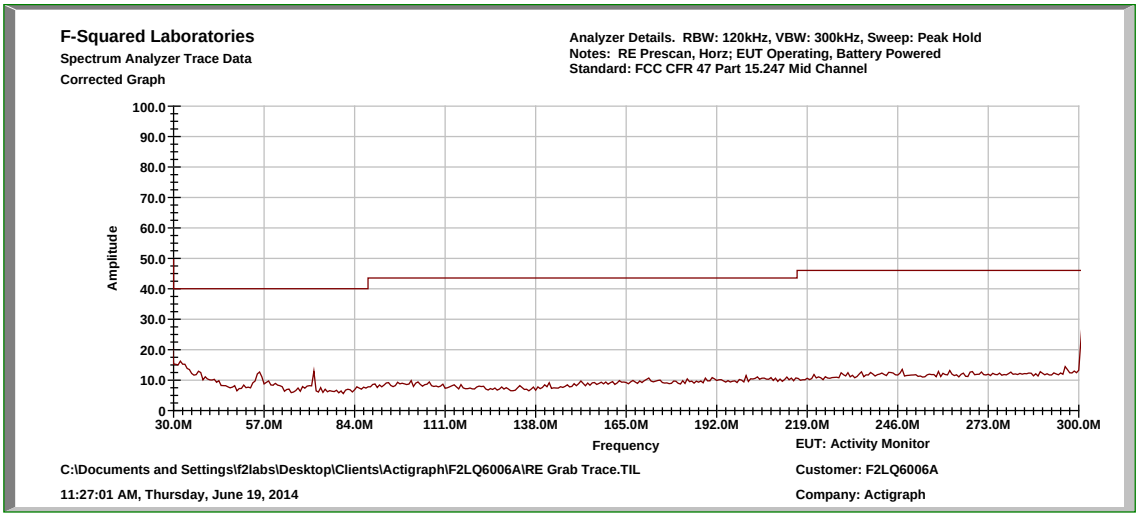
0.5dBi Integral Antenna: Mid Channel, 0.15 MHz to 30 MHz



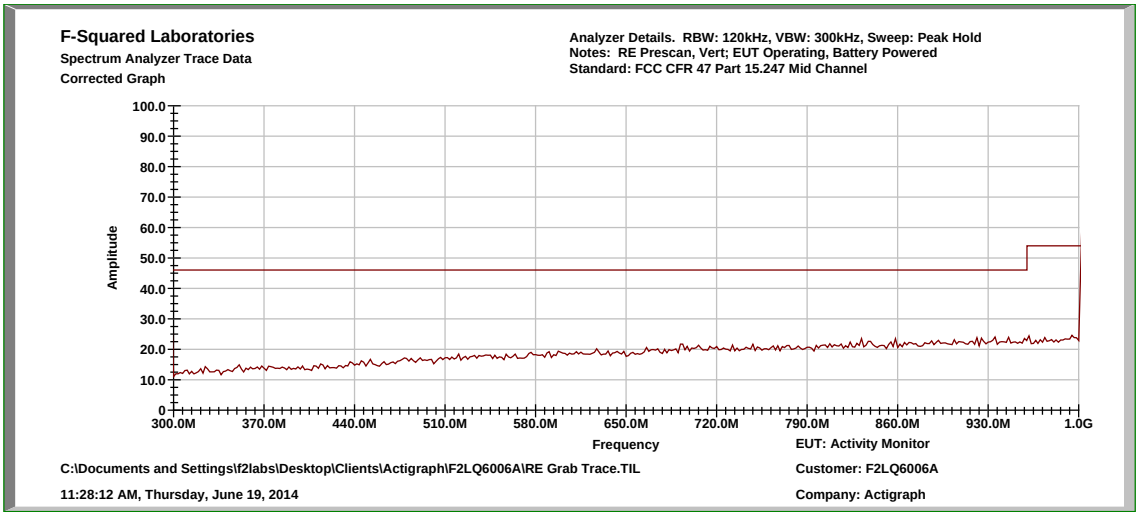
0.5dBi Integral Antenna: Mid Channel, 30 MHz to 300 MHz, Vertical



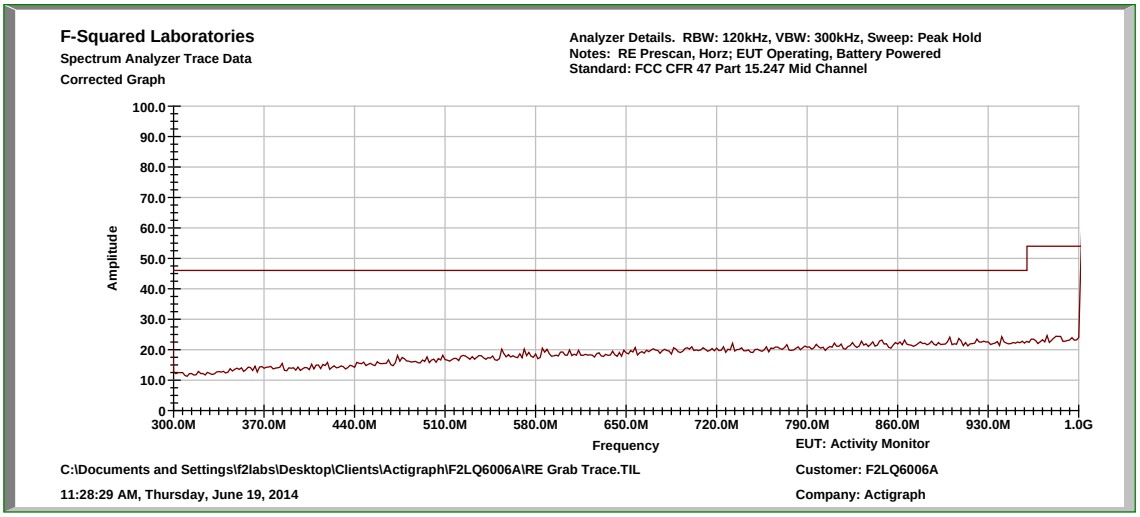
0.5dBi Integral Antenna: Mid Channel, 30 MHz to 300 MHz, Horizontal



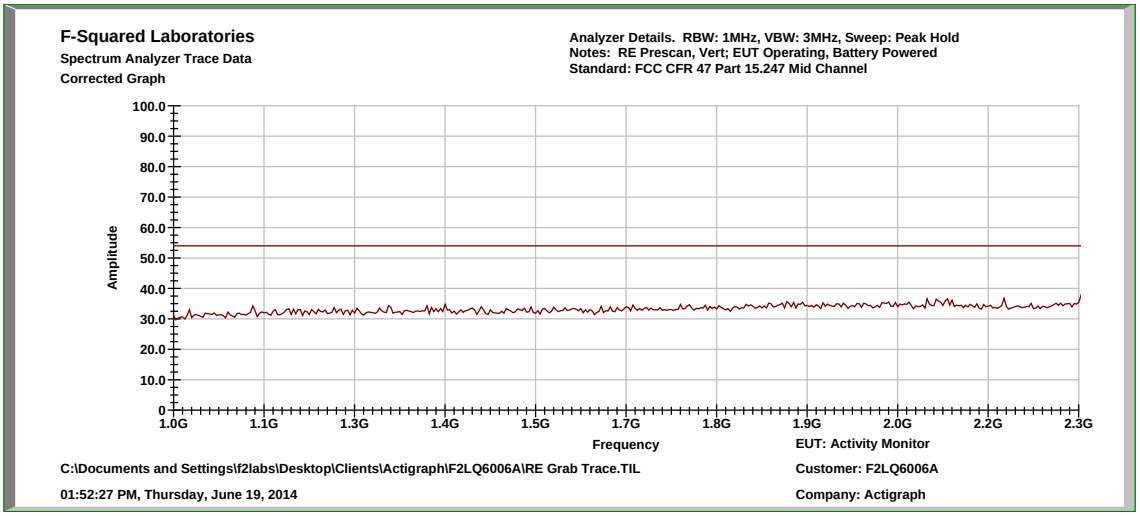
0.5dBi Integral Antenna: Mid Channel, 300 MHz to 1 GHz, Vertical



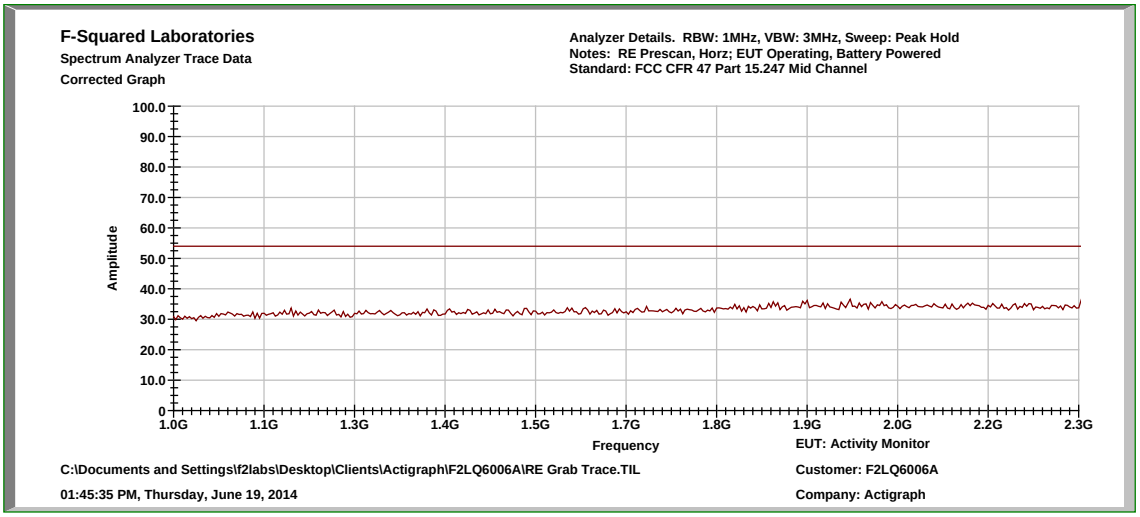
0.5dBi Integral Antenna: Mid Channel, 300 MHz to 1 GHz, Horizontal



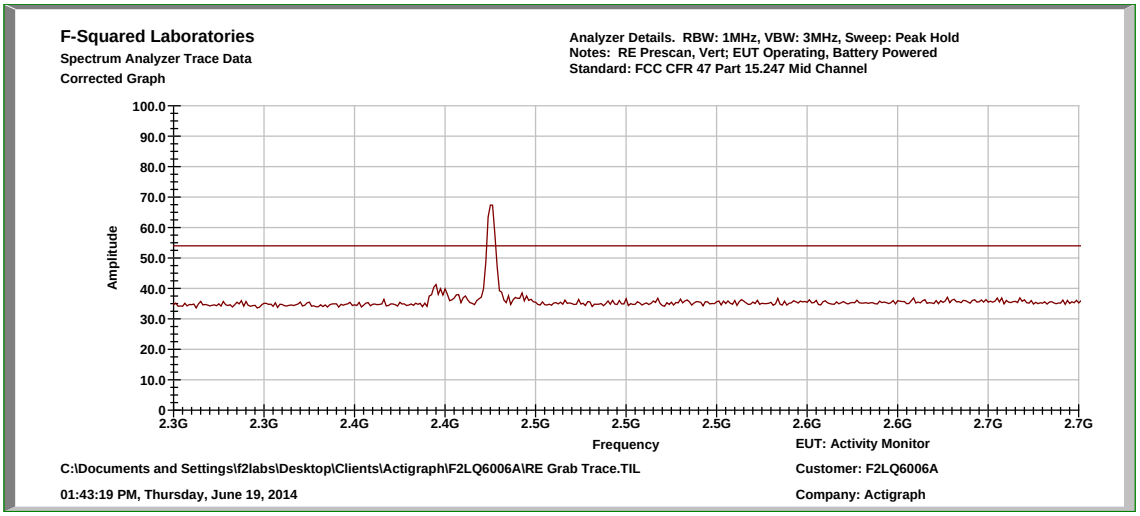
0.5dBi Integral Antenna: Mid Channel, 1 GHz to 2.3 GHz, Vertical



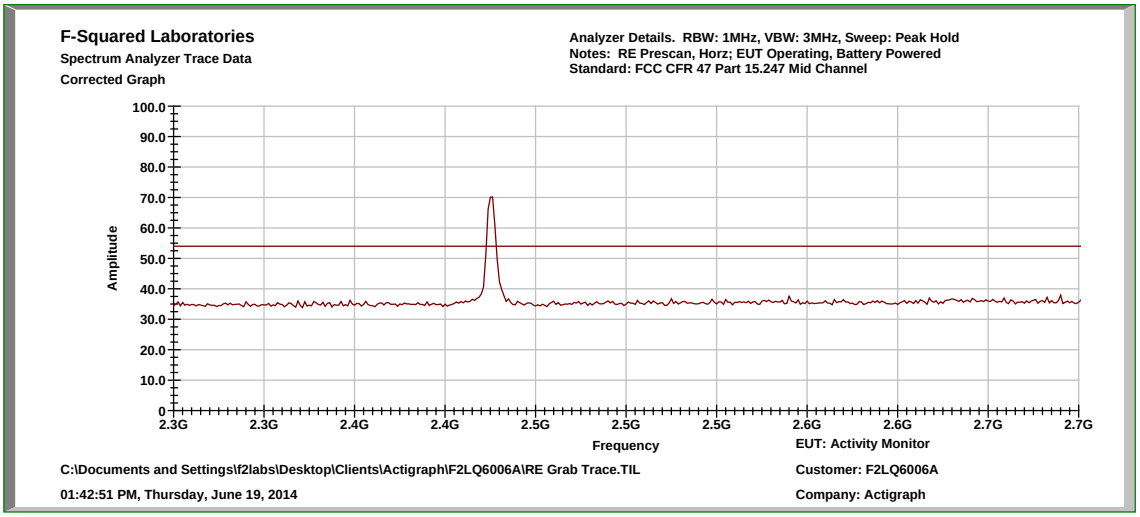
0.5dBi Integral Antenna: Mid Channel, 1 GHz to 2.3 GHz, Horizontal



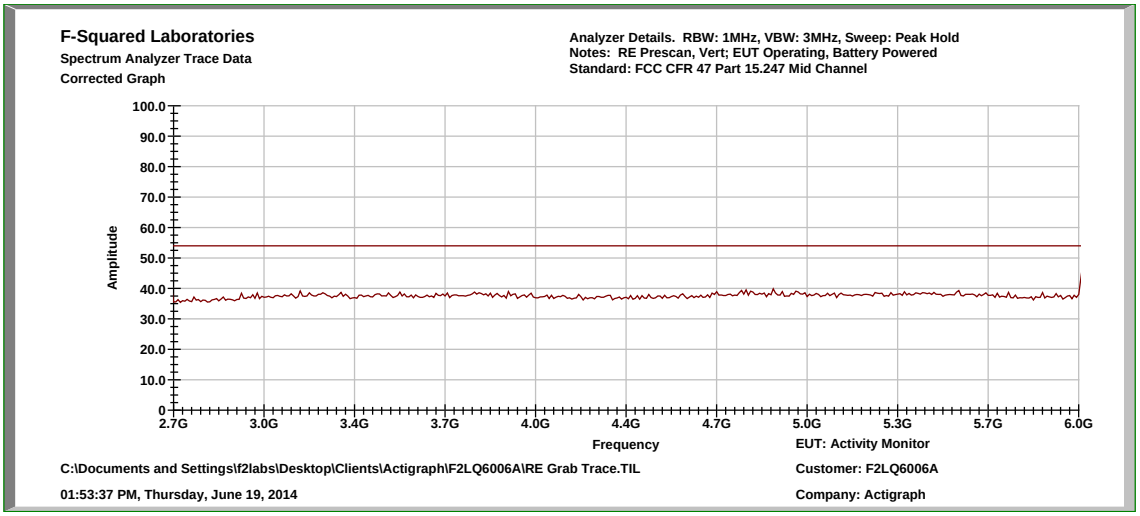
0.5dBi Integral Antenna: Mid Channel, 2.3 GHz to 2.7 GHz, Vertical



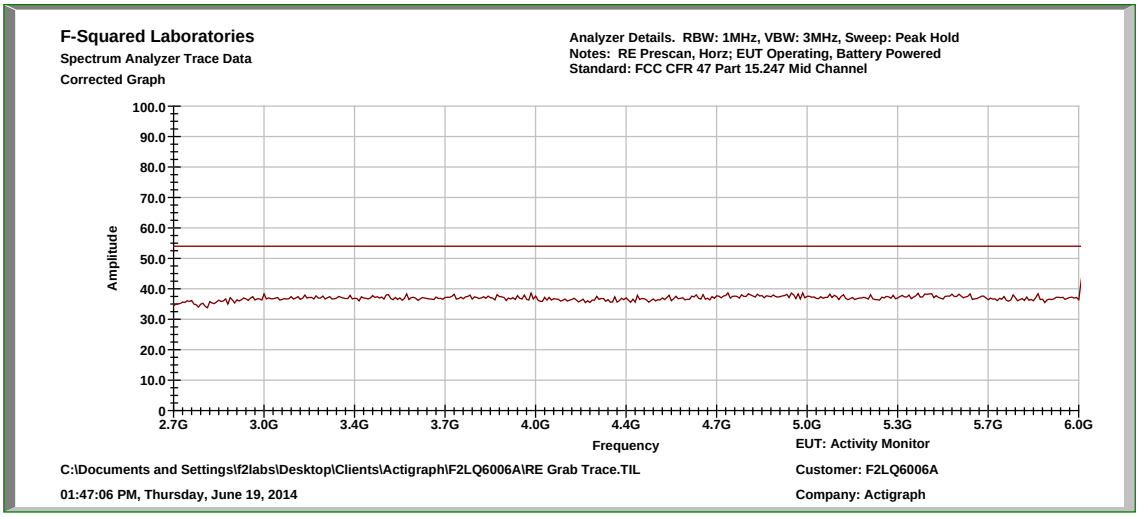
0.5dBi Integral Antenna: Mid Channel, 2.3 GHz to 2.7 GHz, Horizontal



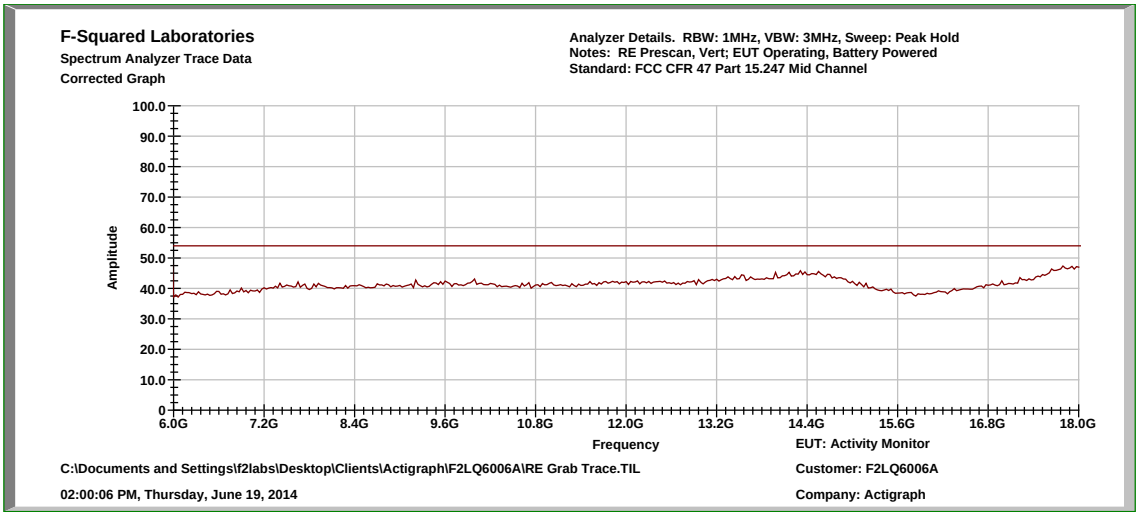
0.5dBi Integral Antenna: Mid Channel, 2.7 GHz to 6 GHz, Vertical



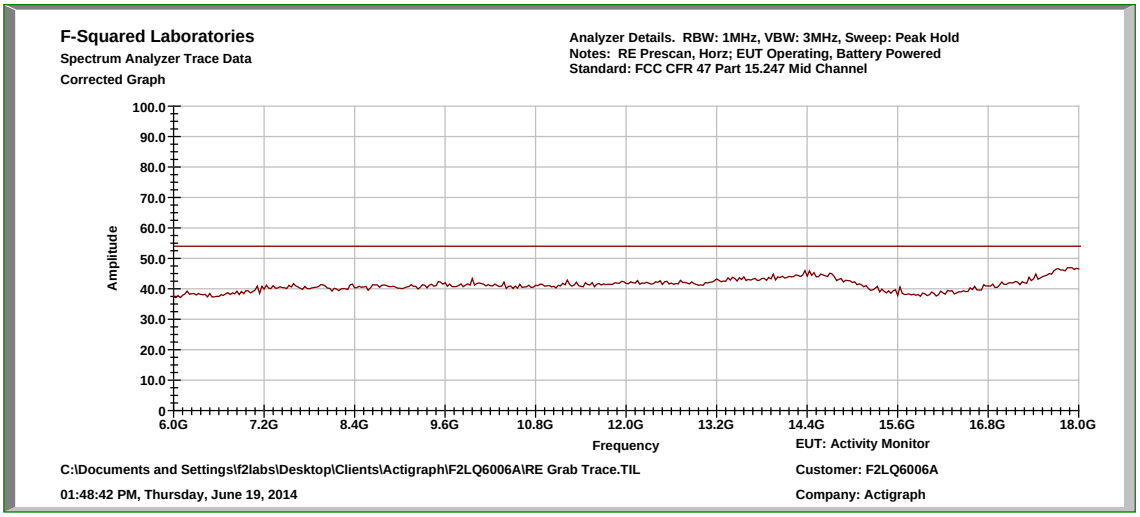
0.5dBi Integral Antenna: Mid Channel, 2.7 GHz to 6 GHz, Horizontal



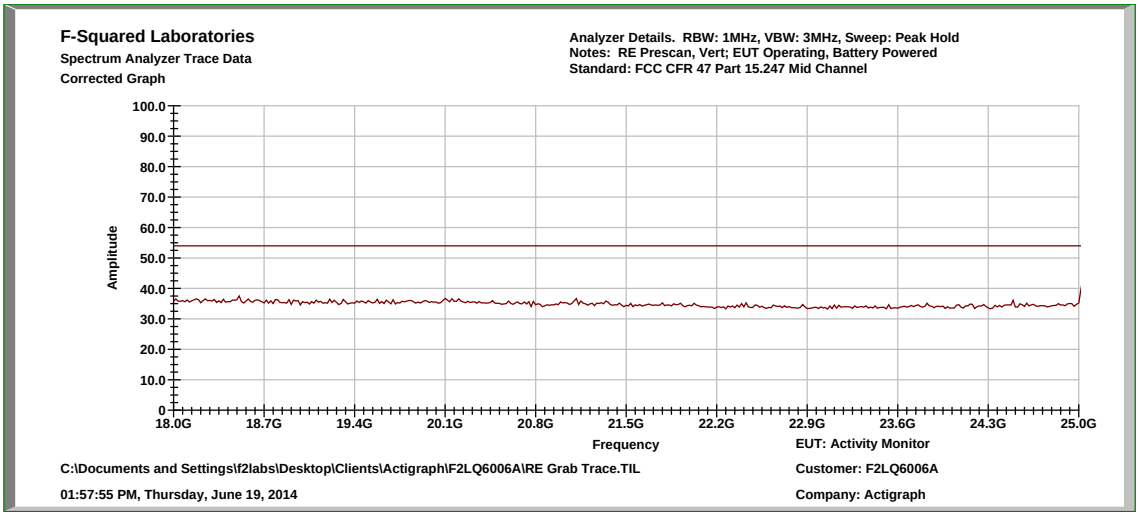
0.5dBi Integral Antenna: Mid Channel, 6 GHz to 18 GHz, Vertical



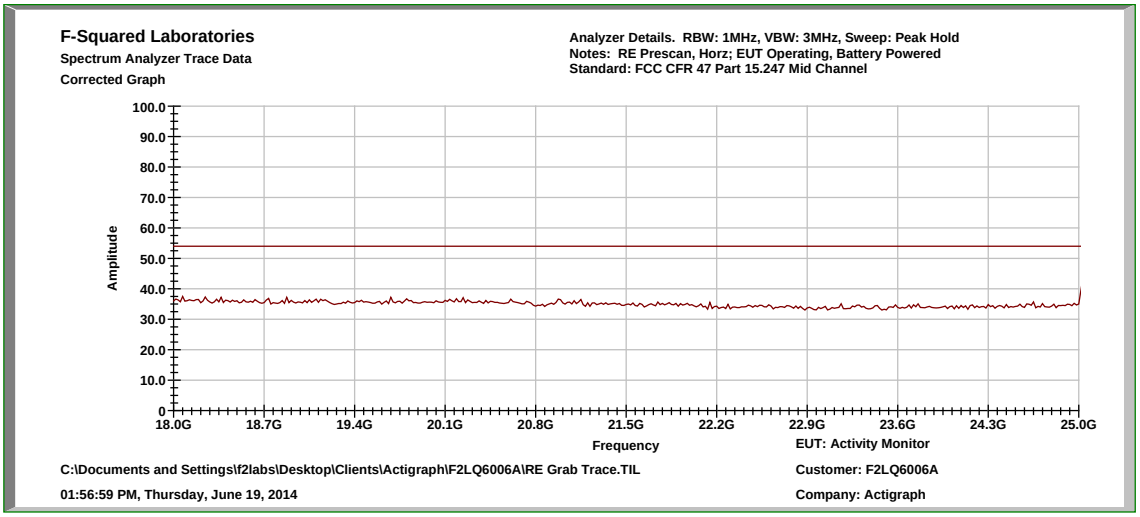
0.5dBi Integral Antenna: Mid Channel, 6 GHz to 18 GHz, Horizontal



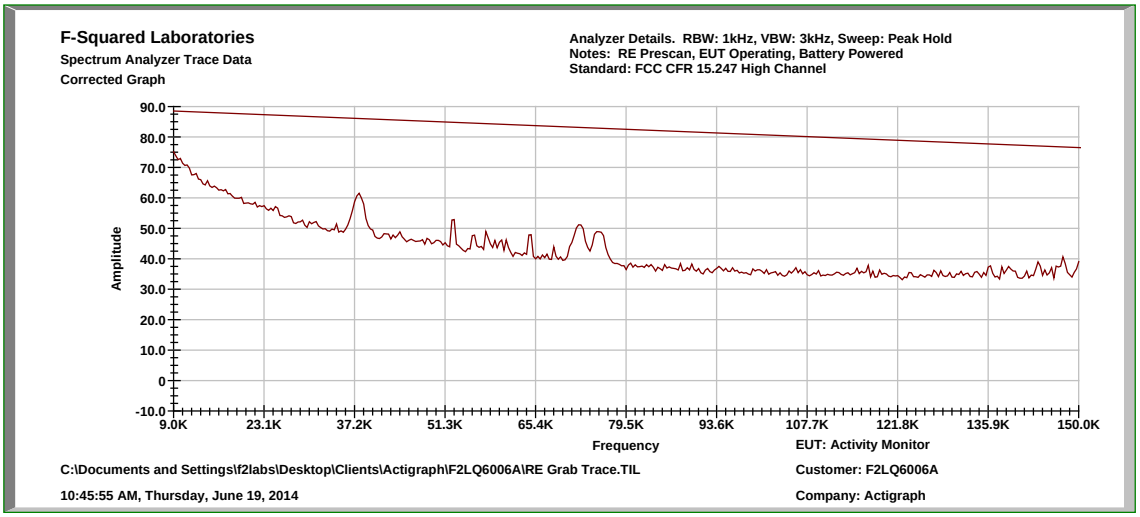
0.5dBi Integral Antenna: Mid Channel, 18 GHz to 25 GHz, Vertical



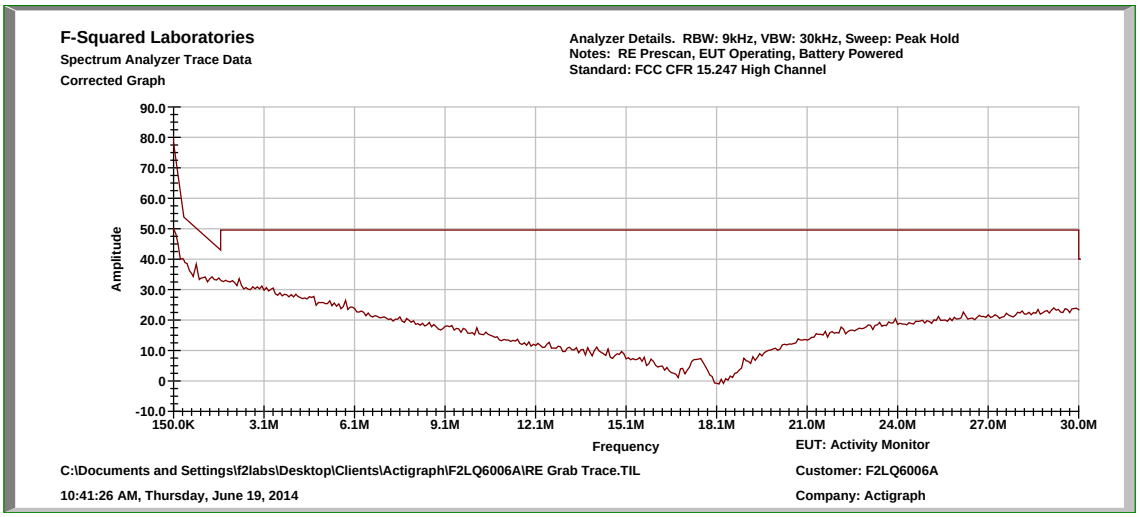
0.5dBi Integral Antenna: Mid Channel, 18 GHz to 25 GHz, Horizontal



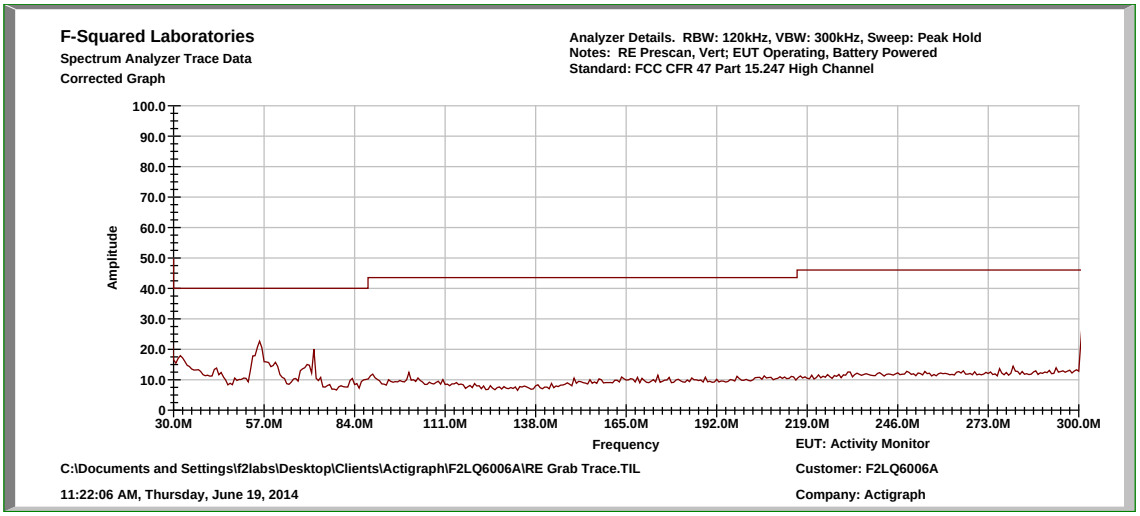
0.5dBi Integral Antenna: High Channel, .009 MHz to 0.15 MHz



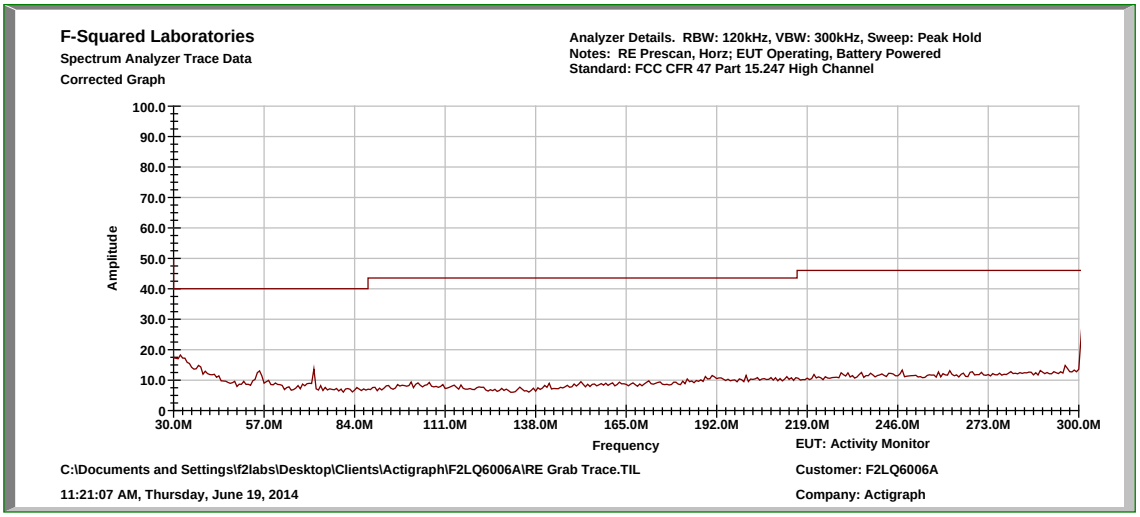
0.5dBi Integral Antenna: High Channel, 0.15 MHz to 30 MHz



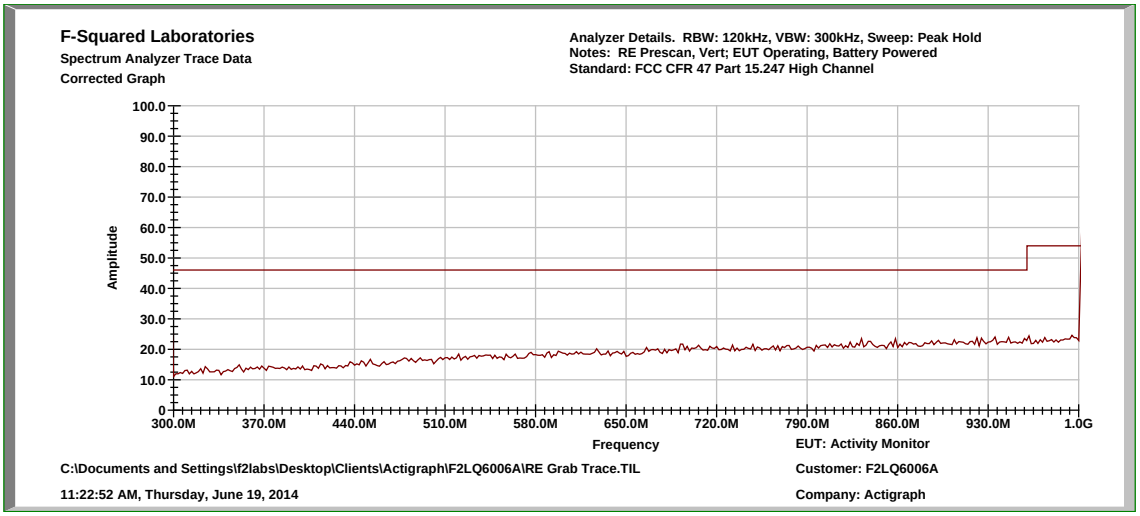
0.5dBi Integral Antenna: High Channel, 30 MHz to 300 MHz, Vertical



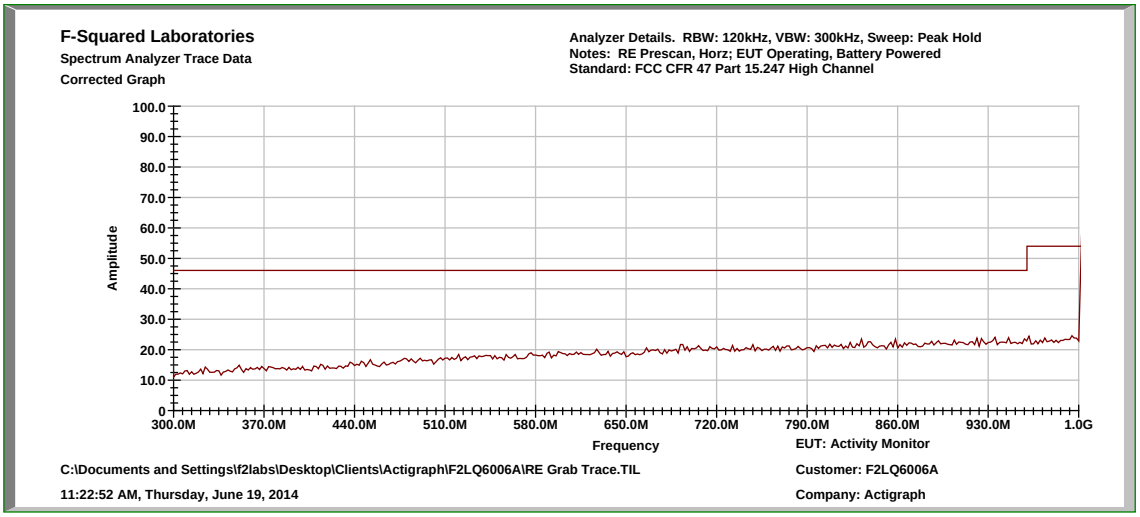
0.5dBi Integral Antenna: High Channel, 30 MHz to 300 MHz, Horizontal



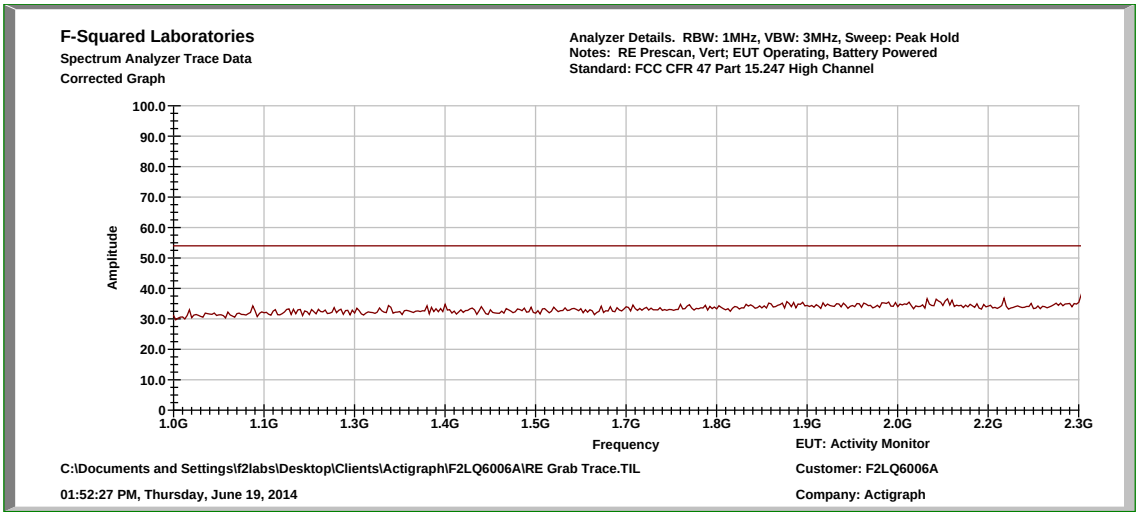
0.5dBi Integral Antenna: High Channel, 300 MHz to 1 GHz, Vertical



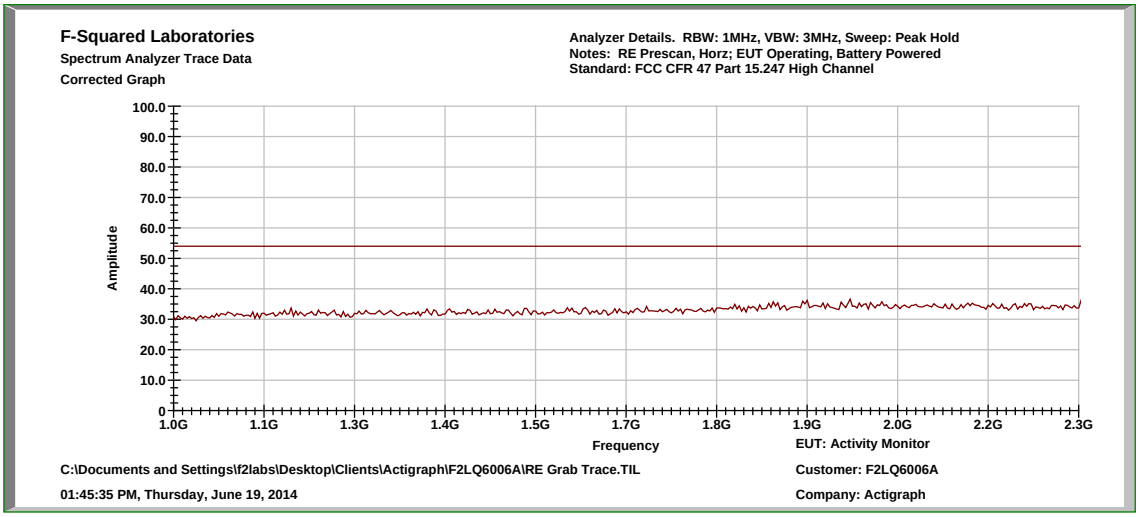
0.5dBi Integral Antenna: High Channel, 300 MHz to 1 GHz, Horizontal



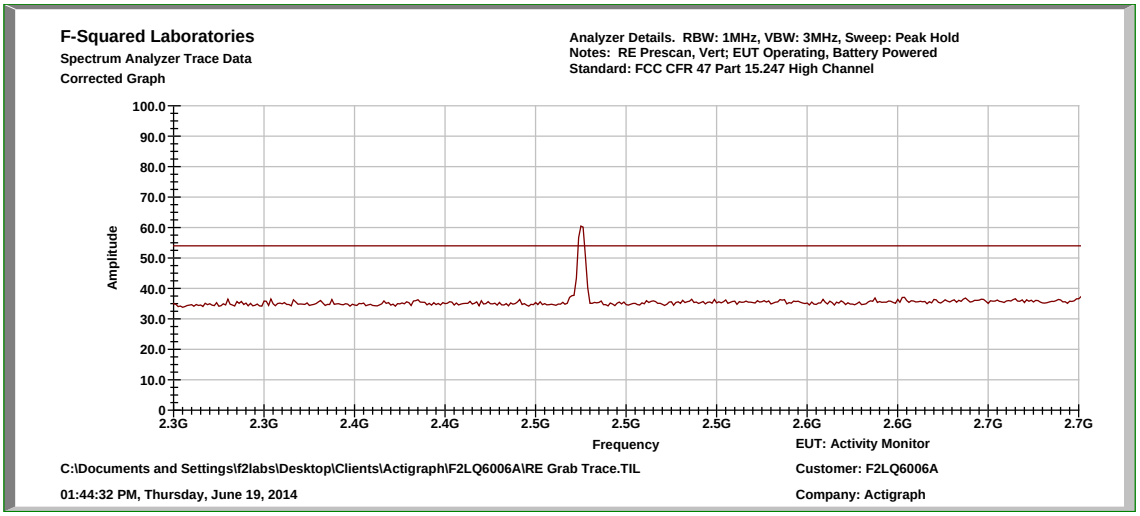
0.5dBi Integral Antenna: High Channel, 1 GHz to 2.3 GHz, Vertical



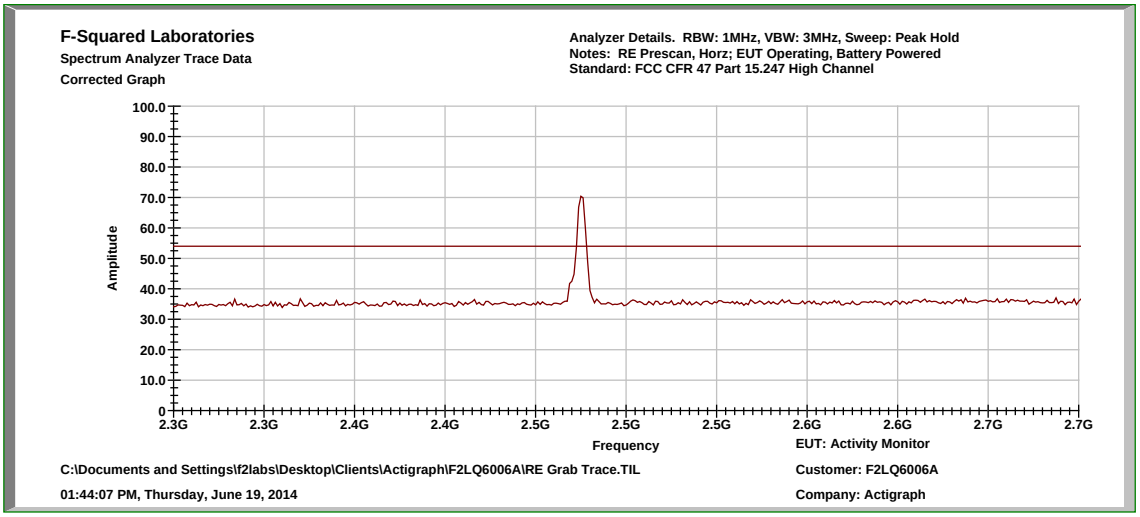
0.5dBi Integral Antenna: High Channel, 1 GHz to 2.3 GHz, Horizontal



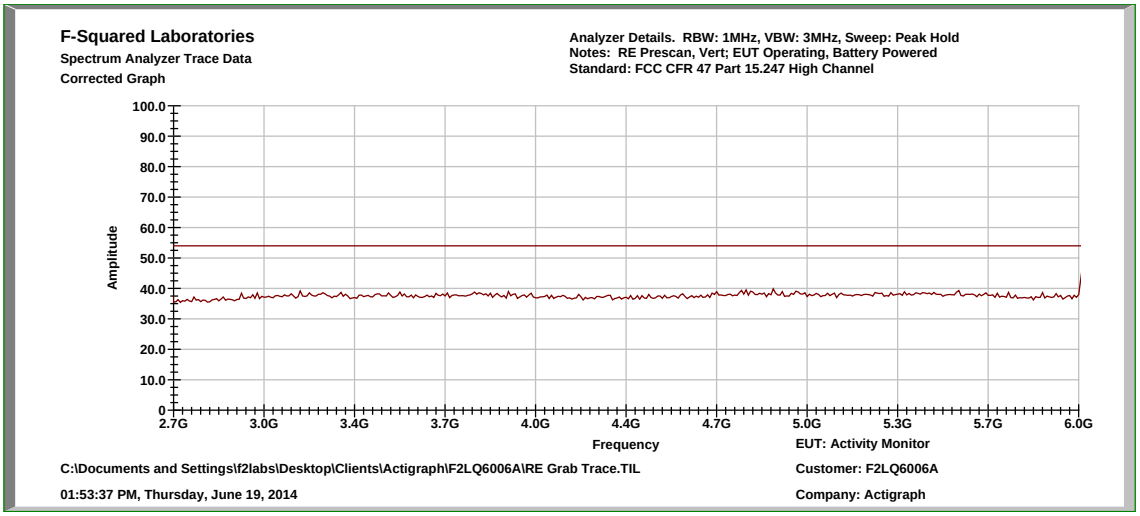
0.5dBi Integral Antenna: High Channel, 2.3 GHz to 2.7 GHz, Vertical



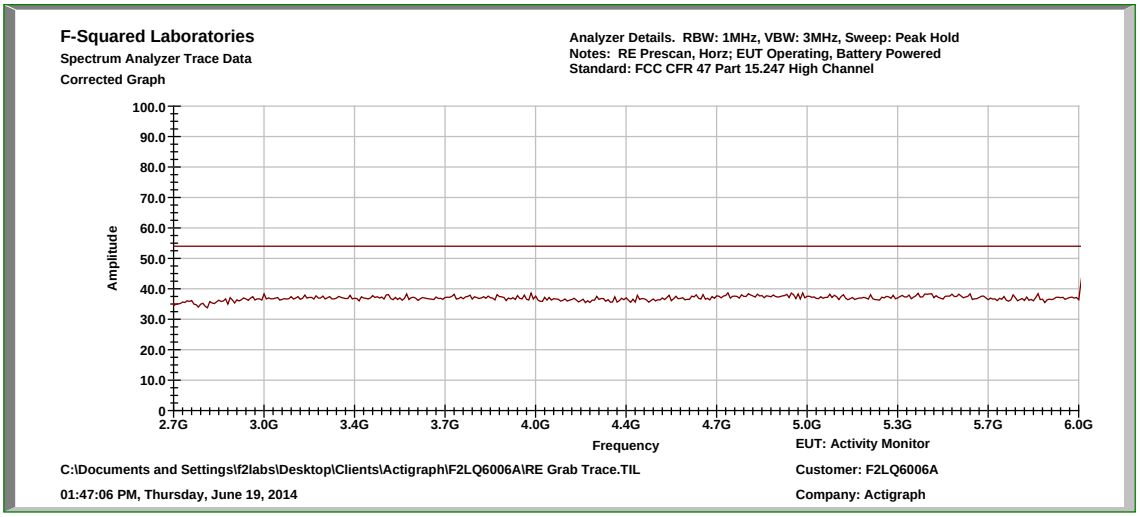
0.5dBi Integral Antenna: High Channel, 2.3 GHz to 2.7 GHz, Horizontal



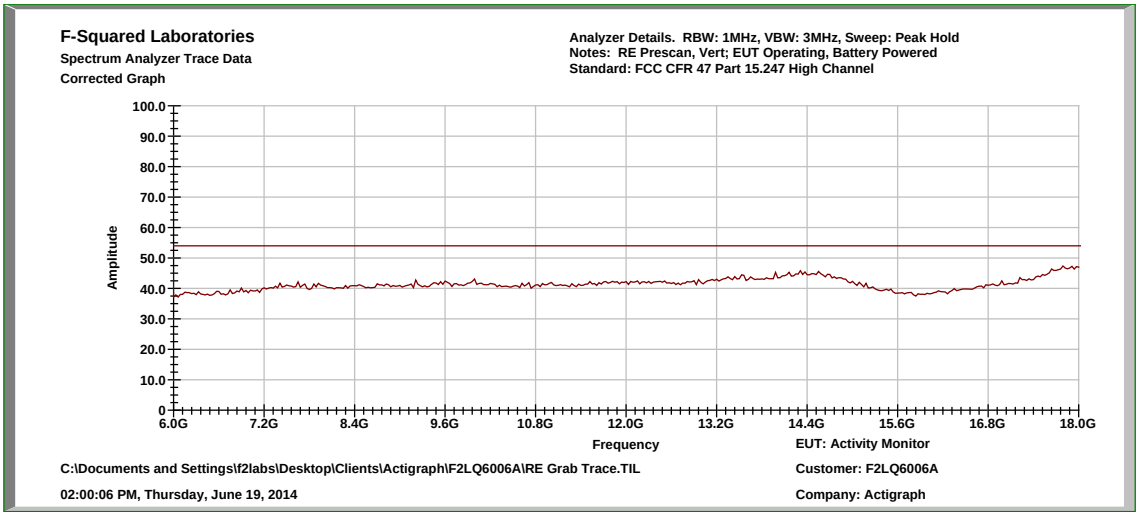
0.5dBi Integral Antenna: High Channel, 2.7 GHz to 6 GHz, Vertical



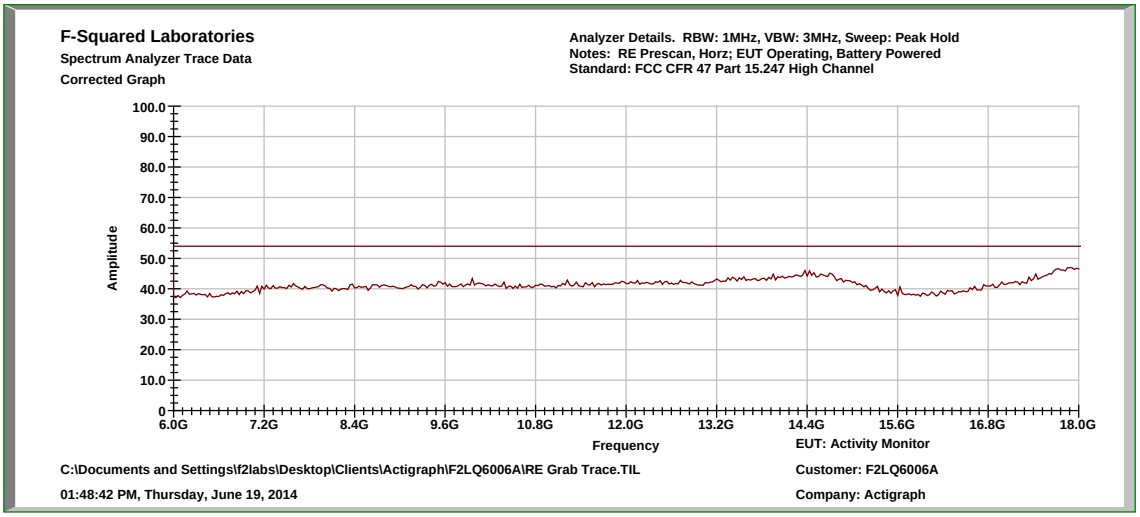
0.5dBi Integral Antenna: High Channel, 2.7 GHz to 6 GHz, Horizontal



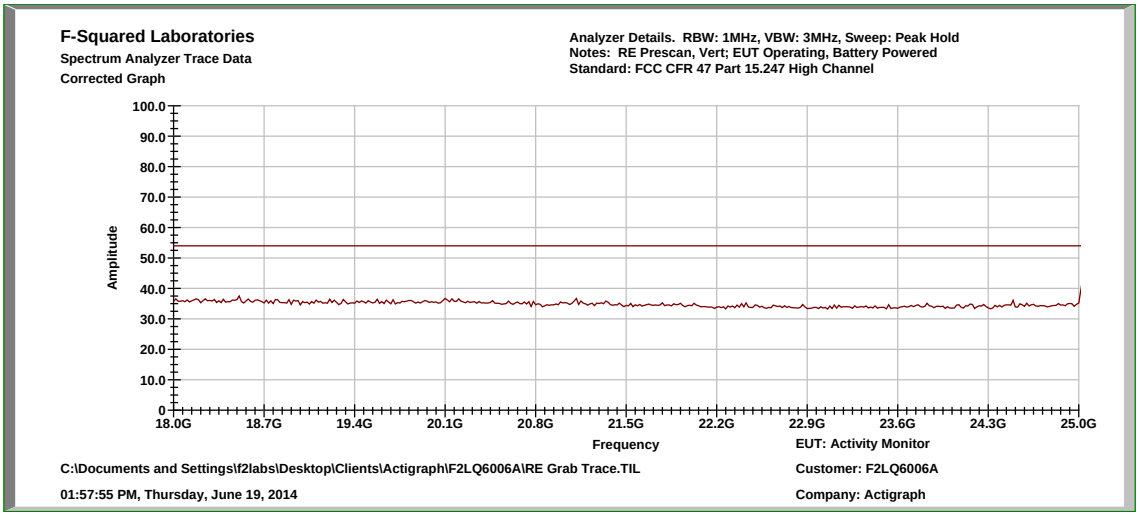
0.5dBi Integral Antenna: High Channel, 6 GHz to 18 GHz, Vertical



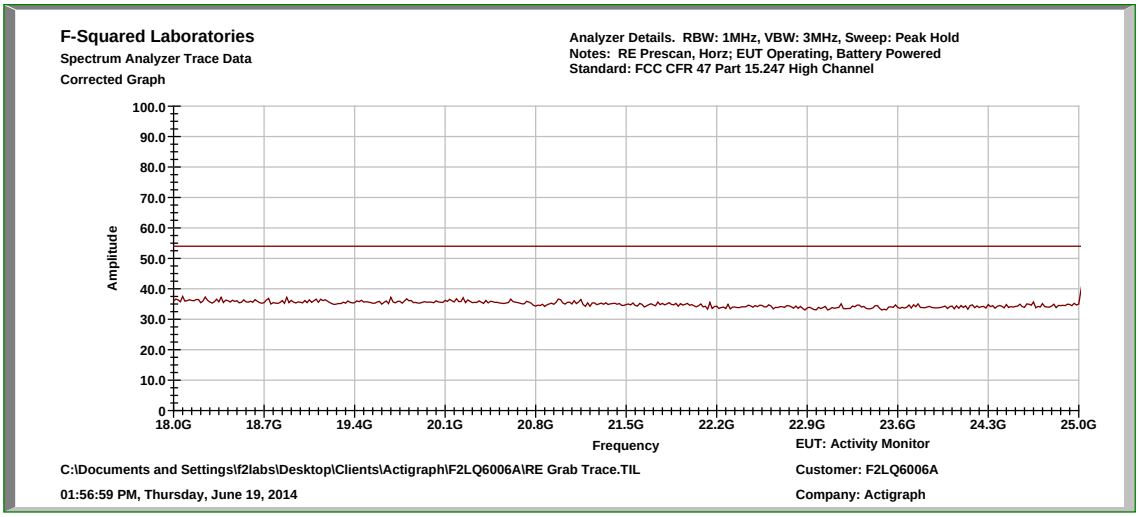
0.5dBi Integral Antenna: High Channel, 6 GHz to 18 GHz, Horizontal



0.5dBi Integral Antenna: High Channel, 18 GHz to 25 GHz, Vertical



0.5dBi Integral Antenna: High Channel, 18 GHz to 25 GHz, Horizontal



Low Channel – Quasi Peak

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
31.710000	V	6.8	19.7	26.50	30.0	-3.5
53.200000	V	13.1	8.7	21.80	30.0	-8.2
55.110000	H	12.1	8.7	20.80	30.0	-9.2
67.780000	H	9.7	9.5	19.20	30.0	-10.8
70.090000	V	11.4	9.0	20.40	30.0	-9.6
135.410000	V	8.2	15.4	23.60	30.0	-6.4

Low Channel - MaxPeak

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2399.000000	H	47.5	-5.9	41.60	74.0	-32.4
2399.000000	V	45.9	-5.9	40.00	74.0	-34.0
2406.000000	H	46.8	-5.9	40.90	74.0	-33.1
2406.000000	V	46.2	-5.9	40.30	74.0	-33.7
2484.000000	H	38.0	-5.8	32.20	74.0	-41.8
2484.000000	V	37.7	-5.8	31.90	74.0	-42.1

Low Channel - Average

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2399.000000	H	40.0	-5.9	34.10	54.0	-19.9
2399.000000	V	37.9	-5.9	32.00	54.0	-22.0
2406.000000	H	36.5	-5.9	30.60	54.0	-23.4
2406.000000	V	34.5	-5.9	28.60	54.0	-25.4
2484.000000	H	24.4	-5.8	18.60	54.0	-35.4
2484.000000	V	24.4	-5.8	18.60	54.0	-35.4

Mid Channel – Quasi Peak

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
31.710000	V	6.7	19.7	26.40	30.0	-3.6
53.200000	V	12.8	8.7	21.50	30.0	-8.5
55.110000	H	12.0	8.7	20.70	30.0	-9.3
67.780000	H	9.8	9.5	19.30	30.0	-10.7
70.090000	V	11.5	9.0	20.50	30.0	-9.5
135.410000	V	7.8	15.4	23.20	30.0	-6.8

Mid Channel - Max Peak

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2399.000000	H	37.2	-5.9	31.3	74.0	-42.7
2399.000000	V	38.0	-5.9	32.1	74.0	-41.9
2437.000000	V	50.4	-5.9	44.5	74.0	-29.5
2437.000000	H	50.1	-5.9	44.2	74.0	-29.8
2443.000000	H	48.1	-5.9	42.2	74.0	-31.8
2443.000000	V	44.7	-5.9	38.8	74.0	-35.2
2484.000000	H	38.1	-5.8	32.3	74.0	-41.7
2484.000000	V	38.3	-5.8	32.5	74.0	-41.5

Mid Channel - Average

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2399.000000	H	24.4	-5.9	18.5	54.0	-35.5
2399.000000	V	24.3	-5.9	18.4	54.0	-35.6
2437.000000	V	27.7	-5.9	21.8	54.0	-32.2
2437.000000	H	41.8	-5.9	35.9	54.0	-18.1
2443.000000	H	40.0	-5.9	34.1	54.0	-19.9
2443.000000	V	27.3	-5.9	21.4	54.0	-32.6
2484.000000	H	24.4	-5.8	18.6	54.0	-35.4
2484.000000	V	24.4	-5.8	18.6	54.0	-35.4

High Channel – Quasi Peak

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
31.710000	V	7.1	19.7	26.8	30.0	-3.2
53.200000	V	13.2	8.7	21.9	30.0	-8.1
55.110000	H	12.0	8.7	20.7	30.0	-9.3
67.780000	H	10.0	9.5	19.5	30.0	-10.5
70.090000	V	11.4	9.0	20.4	30.0	-9.6
135.410000	V	7.9	15.4	23.3	30.0	-6.7

High Channel - MaxPeak

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2399.000000	V	37.4	-5.9	31.5	74.0	-42.5
2399.000000	H	37.5	-5.9	31.6	74.0	-42.4
2477.000000	H	51.2	-5.8	45.4	74.0	-28.6
2477.000000	V	48.3	-5.8	42.5	74.0	-31.5
2483.000000	V	40.9	-5.8	35.1	74.0	-38.9
2483.000000	H	44.2	-5.8	38.4	74.0	-35.6

High Channel - Average

Frequency (MHz)	Antenna Polarization	Reading (dBµV)	Cable Loss & Antenna Factor (dB)	Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2399.000000	V	24.3	-5.9	18.4	54.0	-35.6
2399.000000	H	24.3	-5.9	18.4	54.0	-35.6
2402.000000	H	43.2	-5.9	37.3	54.0	-16.7
2402.000000	V	36.4	-5.9	30.5	54.0	-23.5
2406.000000	V	72.4	-5.9	32.3	54.0	-21.7
2406.000000	H	79.6	-5.9	31.7	54.0	-22.3
2484.000000	V	29.5	-5.8	23.7	54.0	-30.3
2484.000000	H	35.5	-5.8	29.7	54.0	-24.3

11 FCC PART 15.247 – PEAK POWER SPECTRAL DENSITY (PSD)

Peak power spectral density measurements were performed.

11.1 Requirements:

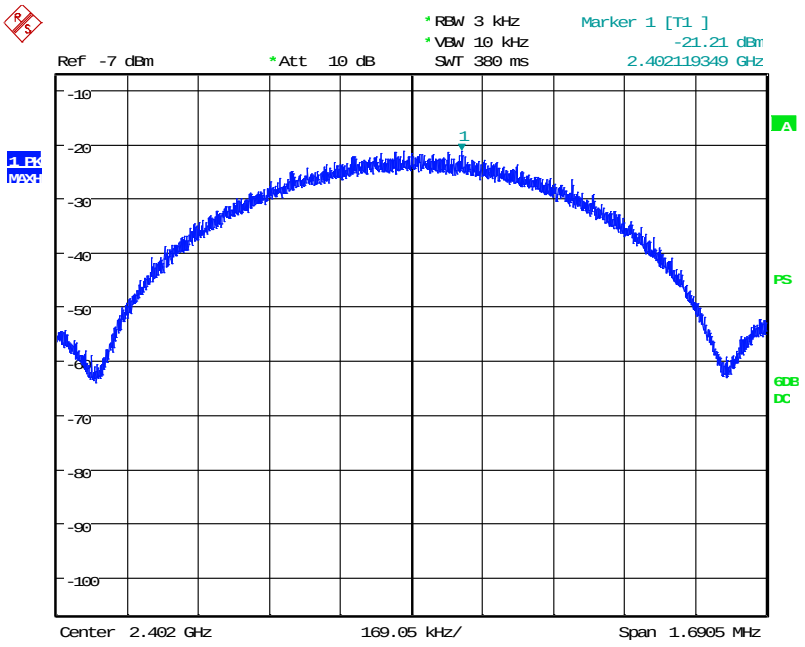
The peak power spectral density shall not exceed +8dBm in any 3 kHz band during any time interval of continuous transmission.

Power spectral density measurements were performed at a resolution bandwidth of 3 kHz (video bandwidth set at 10 KHz). The peak spectral densities were measured at the low, mid, and upper channels.

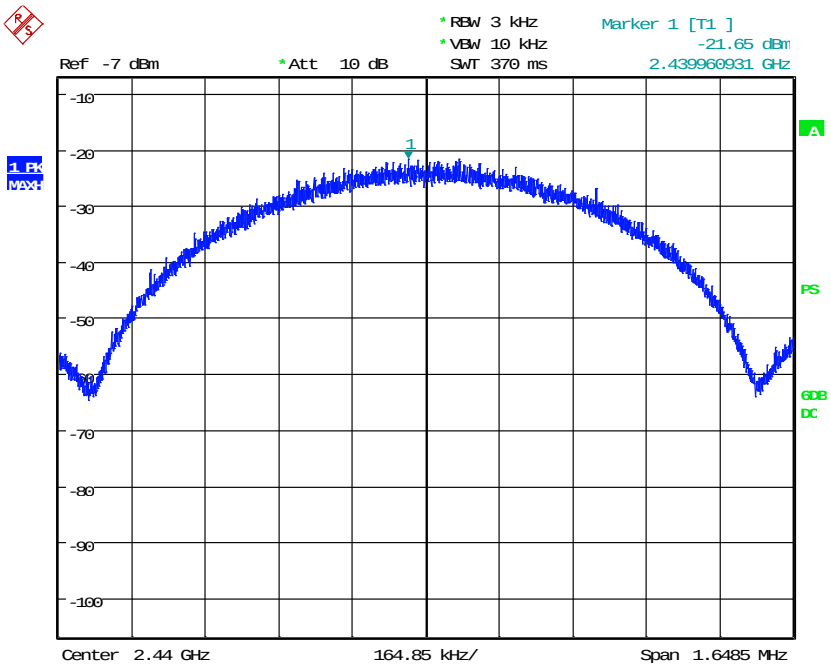
11.2 Peak Power Spectral Density Test Data

Test Date(s):	June 20, 2014	Test Engineer(s):	J. Knepper; K. Littell
Standards:	CFR 47 Part 15.247; KDB558074	Air Temperature:	23.6ºC
		Relative Humidity:	45%

Low Channel

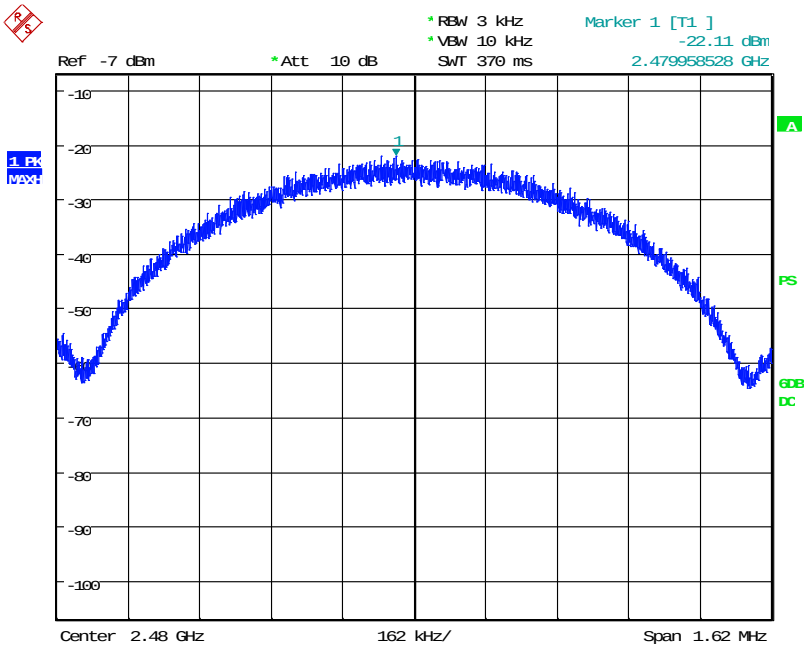


Mid Channel



Date: 20.JUN.2014 14:43:10

High Channel



Date: 20.JUN.2014 14:22:09

12 CONDUCTED EMISSIONS

12.1 Requirements

In accordance with FCC CFR 47 Part 15.207(a), “Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

12.2 Procedure

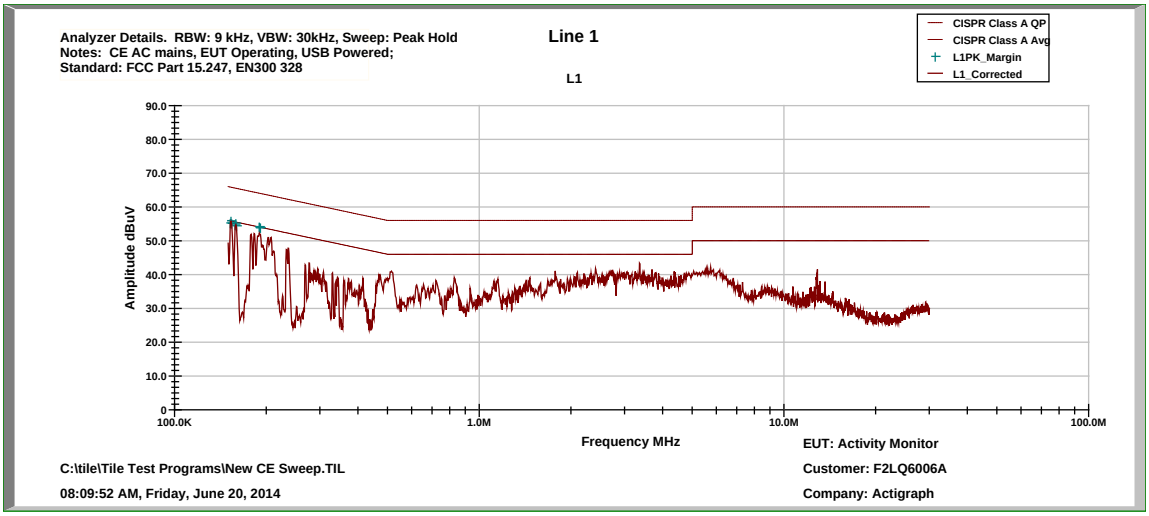
The EUT was placed on a 1.0 x 1.5 meter non-conductive table, 0.8 meter above a horizontal ground plane and 0.4 meter from a vertical ground plane. Power was provided to the EUT through a LISN bonded to a 3 x 2 meter ground plane. The LISN and peripherals were supplied power through a filtered AC power source. The output of the LISN was connected to the input of the receiver via a transient limiter, and emissions in the range 150 kHz to 30 MHz were measured. The measurements were recorded using the quasi-peak and average detectors as directed by the standard, and the resolution bandwidth during testing was 9 kHz. The raw measurements were corrected to allow for attenuation from the LISN, transient limiter and cables

12.3 Conducted Emissions Test Data

Test Date:	June 20, 2014	**Test Engineer:**	J. Knepper
Rule:	15.207(a)	**Air Temperature:**	20.6º C
Test Results:	Pass	**Relative Humidity:**	51%

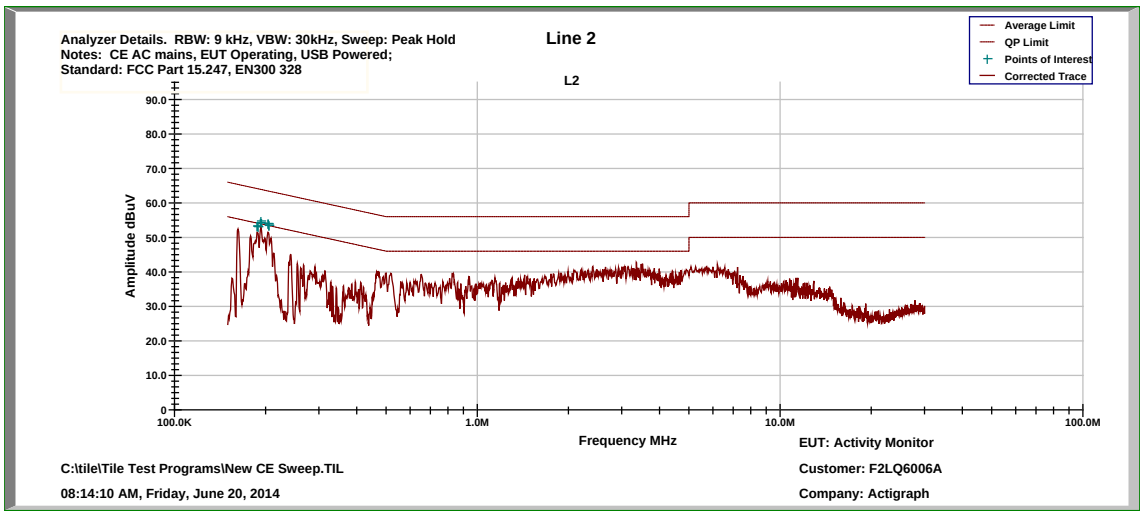
Note: The data below represents worst case results of all three channels.

Conducted Test – Line 1: 0.15 MHz to 30 MHz



Top Discrete Measurements								
No.	**Conductor**	**Frequency (MHz)**	**Detector**	**Level (dBµV)**	**Adjustment (dB)**	**Results (dBµV)**	**Limit (dBµV)**	**Margin (dB)**
1	Line 1	0.152433	Quasi-Peak	38.88	11.488	50.368	65.868	-15.500
		0.152433	Average	13.386	11.488	24.874	55.868	-30.994
2	Line 1	0.153243	Quasi-Peak	38.675	11.484	50.159	65.824	-15.665
		0.153243	Average	13.413	11.484	24.897	55.824	-30.927
3	Line 1	0.154054	Quasi-Peak	38.099	11.480	49.579	65.779	-16.200
		0.154054	Average	13.742	11.480	25.222	55.779	-30.557
4	Line 1	0.158109	Quasi-Peak	37.772	11.459	49.231	65.564	-16.333
		0.158109	Average	14.503	11.459	25.962	55.564	-29.602
5	Line 1	0.158919	Quasi-Peak	37.771	11.455	49.226	65.521	-16.30
		0.158919	Average	13.582	11.455	25.037	55.521	-30.484
6	Line 1	0.15973	Quasi-Peak	37.806	11.451	49.257	65.478	-16.221
		0.15973	Average	11.11	11.451	22.561	55.478	-32.917
7	Line 1	0.189732	Quasi-Peak	38.318	11.152	49.47	64.049	-14.579
		0.189732	Average	27.706	11.152	38.858	54.049	-15.191
8	Line 1	0.19	Quasi-Peak	38.515	11.150	49.665	64.037	-14.372
		0.19	Average	27.625	11.150	38.775	54.037	-15.262
9	Line 1	0.190543	Quasi-Peak	38.519	11.146	49.665	64.014	-14.349
		0.190543	Average	28.135	11.146	39.281	54.014	-14.733
10	Line 1	0.191354	Quasi-Peak	38.634	11.139	49.773	63.979	-14.206
		0.191354	Average	29.101	11.139	40.24	53.979	-13.739

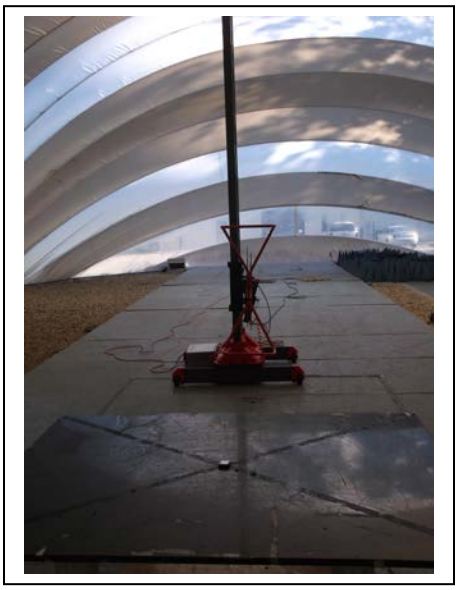
Conducted Test – Line 2: 0.15 MHz to 30 MHz



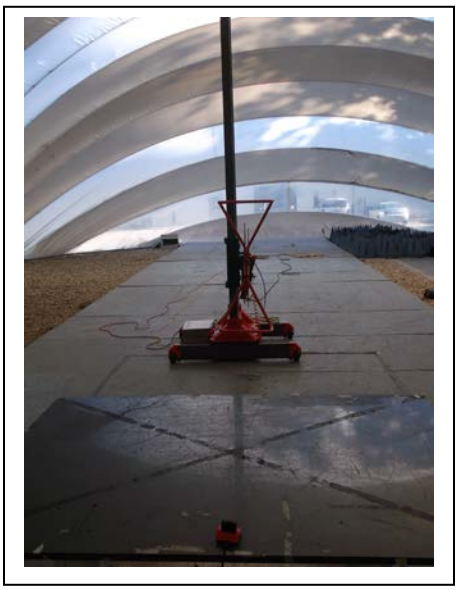
Top Discrete Measurements								
No.	Conductor	Frequency (MHz)	Detector	Level (dBµV)	Adjustment (dB)	Results (dBµV)	Limit (dBµV)	Margin (dB)
1	Line 2	0.187299	Quasi-Peak	37.230	11.0	48.23	64.156	-15.926
		0.187299	Average	24.577	11.0	35.577	54.156	-18.579
2	Line 2	0.18811	Quasi-Peak	38.283	11.0	49.283	64.121	-14.838
		0.18811	Average	24.863	11.0	35.863	54.121	-18.258
3	Line 2	0.188921	Quasi-Peak	38.932	11.0	49.932	64.085	-14.153
		0.188921	Average	24.818	11.0	35.818	54.085	-18.267
4	Line 2	0.192164	Quasi-Peak	38.034	11.0	49.034	63.943	-14.909
		0.192164	Average	27.222	11.0	38.222	53.943	-15.721
5	Line 2	0.192975	Quasi-Peak	37.704	11.0	48.704	63.908	-15.20
		0.192975	Average	27.752	11.0	38.752	53.908	-15.156
6	Line 2	0.193786	Quasi-Peak	36.880	11.0	47.880	63.873	-15.993
		0.193786	Average	27.542	11.0	38.542	53.873	-15.331
7	Line 2	0.203516	Quasi-Peak	36.878	11.0	47.878	63.467	-15.589
		0.203516	Average	27.929	11.0	38.929	53.467	-14.538
8	Line 2	0.204327	Quasi-Peak	36.870	11.0	47.870	63.434	-15.564
		0.204327	Average	28.784	11.0	39.784	53.434	-13.650
9	Line 2	0.205	Quasi-Peak	36.661	11.0	47.661	63.406	-15.745
		0.205	Average	27.639	11.0	38.639	53.406	-14.767
10	Line 2	0.205138	Quasi-Peak	36.459	11.0	47.459	63.400	-15.941
		0.205138	Average	26.938	11.0	37.938	53.400	-15.462

13 PHOTOGRAPHS/EXHIBITS – PRODUCT PHOTOS, TEST SETUPS

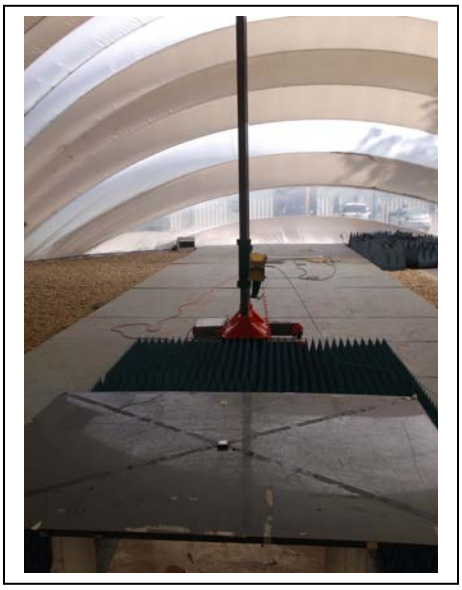
Radiated Spurious Emission with 0.5dBi Integral Antenna



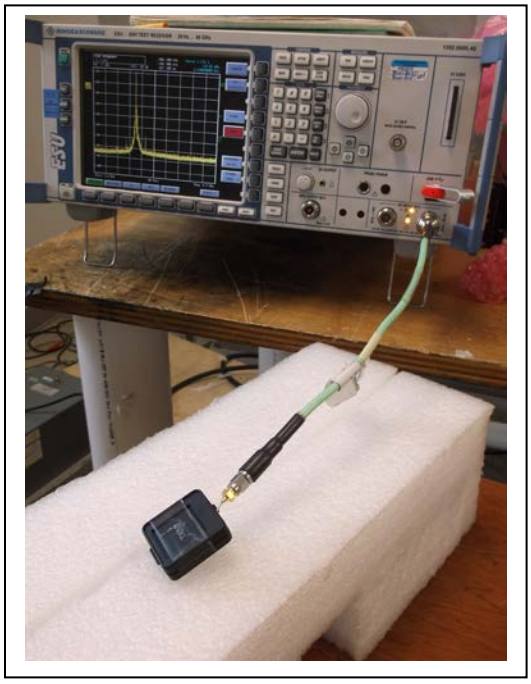
Radiated Spurious Emissions while charging



Radiated Spurious Emission with 0.5dBi Integral Antenna, cont'd



Conducted Output Power, Peak Power Spectral Density, -6dB Occupied Bandwidth, and Conducted Spurious Emissions



Conducted Emissions