



TEST REPORT

Report Number: 100585126MIN-001

Project Number: G100585126

Testing performed on the
Spectrum 700 Path 2 / AWS Path 2 SISO Secondary Remote Antenna Unit

to
47 CFR, Part 27:2010, Enclosure Spurious Radiated Emissions

For
ADC Telecommunications Inc. - a TE Connectivity Company

Test Performed by:
Intertek Testing Services NA, Inc.
7250 Hudson Blvd., Suite 100
Oakdale, MN 55128 USA

Test Authorized by:
ADC Telecommunications Inc.- a TE Connectivity
Company
541 E Trimble Road
San Jose, CA 95131 USA

Prepared by: Richard Blonigen
Richard Blonigen

Date: December 13, 2011

Reviewed by: Norman Shpilsher
Norman Shpilsher

Date: December 13, 2011

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. This report must not be used to claim product endorsement by A2LA, NIST nor any other agency of the U.S. Government.



TABLE OF CONTENTS

- 1.0 DESCRIPTION OF THE SAMPLE (EUT) 3**
- 2.0 TEST SUMMARY 4**
 - 2.1 Statement of the Measurement Uncertainty 4
- 3.0 EQUIPMENT UNDER TEST 5**
 - 3.1 Power Configuration 5
 - 3.2 EUT Configuration 5
 - 3.3 Environmental conditions..... 6
- 4.0 TEST CONDITIONS AND RESULTS 7**
 - 4.1 Enclosure Spurious Radiated Emissions 7
- 5.0 TEST EQUIPMENT 27**



1.0 DESCRIPTION OF THE SAMPLE (EUT)

Model:	Spectrum 700 Path 2 / AWS Path 2 SISO Secondary Remote Antenna Unit SPT-S2-70AWS-22-SISO
Type of EUT:	Repeater / Booster
Operating Frequency Range:	728 – 756MHz 2110 – 2155MHz
Company:	ADC Telecommunications Inc. - a TE Connectivity Company
Customer:	Sue Cyr
Address:	541 E. Trimble Road San Jose, CA 95131 USA
Phone:	408-952-2445
Fax:	408-952-2645
e-mail:	sue.cyr@te.com
Test Standards:	<input type="checkbox"/> EN 55022:2006 +A1:2007, Class [REDACTED] <input type="checkbox"/> EN 55011:2007 +A2:2007, Group [REDACTED], Class [REDACTED] <input checked="" type="checkbox"/> 47 CFR, Part 27:2010, Enclosure Spurious Radiated Emissions <input type="checkbox"/> ICES-003, Issue 4:2004 <input type="checkbox"/> EN 55014-1:2006 <input type="checkbox"/> EN 61326-1:2006 <input type="checkbox"/> Class [REDACTED] for Radiated and Conducted Emissions <input type="checkbox"/> Basic Immunity Test Requirements <input type="checkbox"/> Immunity Test Requirements for Industrial Locations <input type="checkbox"/> EN 60601-1-2:2001 +A1:2006 <input type="checkbox"/> EN 61000-6-3:2007 <input type="checkbox"/> EN 61000-6-4:2007 <input type="checkbox"/> EN 61000-3-2:2006 <input type="checkbox"/> EN 61000-3-3:1995 +A1:2001 +A2:2006 <input type="checkbox"/> EN 61000-6-1:2007 <input type="checkbox"/> EN 61000-6-2:2005 <input type="checkbox"/> EN 55024:1998 + A1:2001 + A2:2003
Date Sample Submitted:	December 8, 2011
Test Work Started:	December 8, 2011
Test Work Completed:	December 9, 2011
Test Sample Conditions:	<input type="checkbox"/> Damaged <input type="checkbox"/> Poor (Usable) <input checked="" type="checkbox"/> Good <input type="checkbox"/> Prototype <input checked="" type="checkbox"/> Production <input type="checkbox"/> Used



2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST STANDARD	TEST	RESULT
Part 27	Enclosure Spurious Radiated Emissions	Pass

2.1 Statement of the Measurement Uncertainty

Note: The measured result in this report is within the specification limits by more than the measurement uncertainty; the measured result indicates that the product tested complies with the specification limit.

The expanded uncertainty ($k = 2$) for radiated emissions from 30 to 1000 MHz has been determined to be: ± 4 dB at 10m and ± 5.4 dB at 3m

The expanded uncertainty ($k = 2$) for conducted emissions from 150 kHz to 30 MHz has been determined to be:
 ± 2.6 dB

3.0 EQUIPMENT UNDER TEST

3.1 Power Configuration

Rated voltage:	<input type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/> 400VAC <input checked="" type="checkbox"/> 54VDC from external support Power
Rated current:	<input type="checkbox"/> Amp.
Rated frequency:	<input type="checkbox"/> 50Hz <input checked="" type="checkbox"/> 60Hz
Number of phases:	<input checked="" type="checkbox"/> 1 Phase <input type="checkbox"/> 3 Phases

3.2 EUT Configuration

The equipment under test was operated during the measurement under the following conditions:

- Standby
- Test program (H - Pattern)
- Continuous Operation (see details below)
- Specific test program
-

Operating modes of the EUT:

No.	Description
1	Continuous transmitting at 2111MHz, 2132MHz, and 2154MHz
2	Continuous transmitting at 729MHz, 742MHz, and 755MHz

Cables:

No.	Type	Length	Designation	Note
1	Two RF coax	10m each	RF signal cables to the Support Equipment	

Support equipment/Services:

No.	Item	Description
1	Agilent 8648C	Signal Generator
2	Prism Host Unit p/n 1449226	Host Unit
3	IFEU p/n MR2216G7	54 V Power Supply
4	Prism DRU unit	DRU
5	Spectrum IFEU Unit	IFEU
6	Spectrum Main RAU	Remote Antenna

General notes: None

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 °C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.0 TEST CONDITIONS AND RESULTS

4.1 Enclosure Spurious Radiated Emissions

Description of the test location

Test location: OATS Anechoic Chamber

Test distance: 10 meters 3 meters

Test result: **Pass**

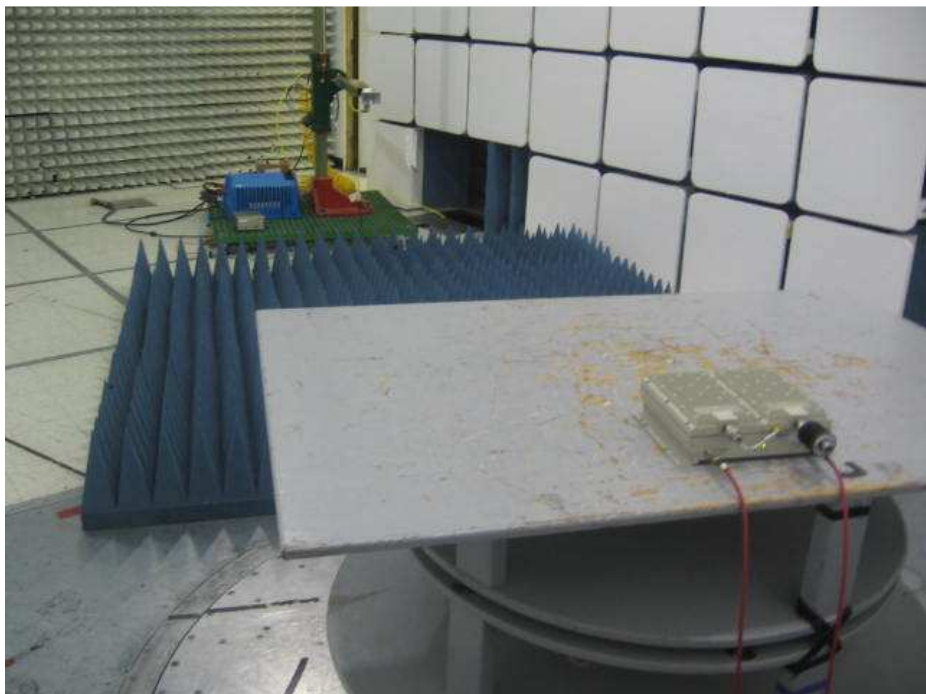
Frequency range: 30MHz-10GHz (700 Band)
 30MHz-22GHz (AWS Band)

Max. Emissions margin: dB below the Reference Limits

- Notes:**
1. The Radiated Emissions testing was performed in the Anechoic chamber at 3m measurement distance (see Table 1 and Graphs 1-12)
 2. The Spurious Radiated Power limits of -13dBm was correlated with field strength Reference Limit of 82.2dB μ V/m during field strength measurements at 3m measurement distance
 3. No spurious or harmonic emissions with margin less than 20dB below the Reference Limits were detected; therefore, no emissions were measured with substitution method
 4. Emissions at operating frequencies were excluded from the Table
-



Test Setup Photos

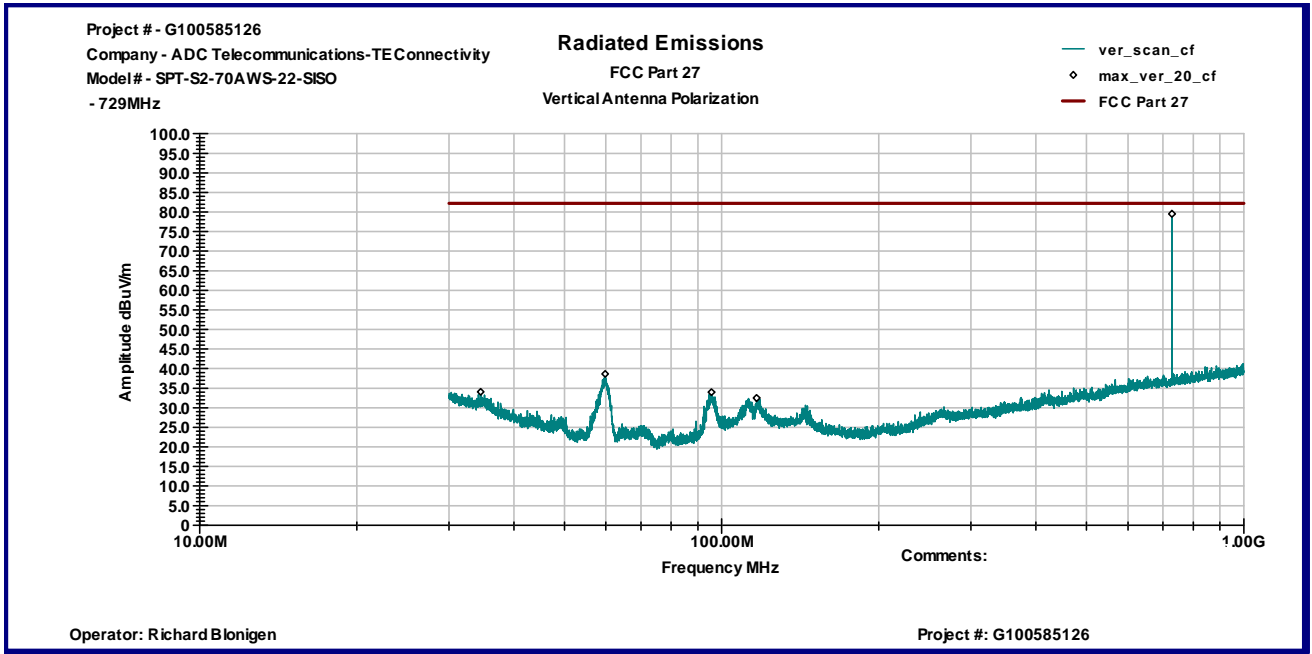


Test Setup Photos

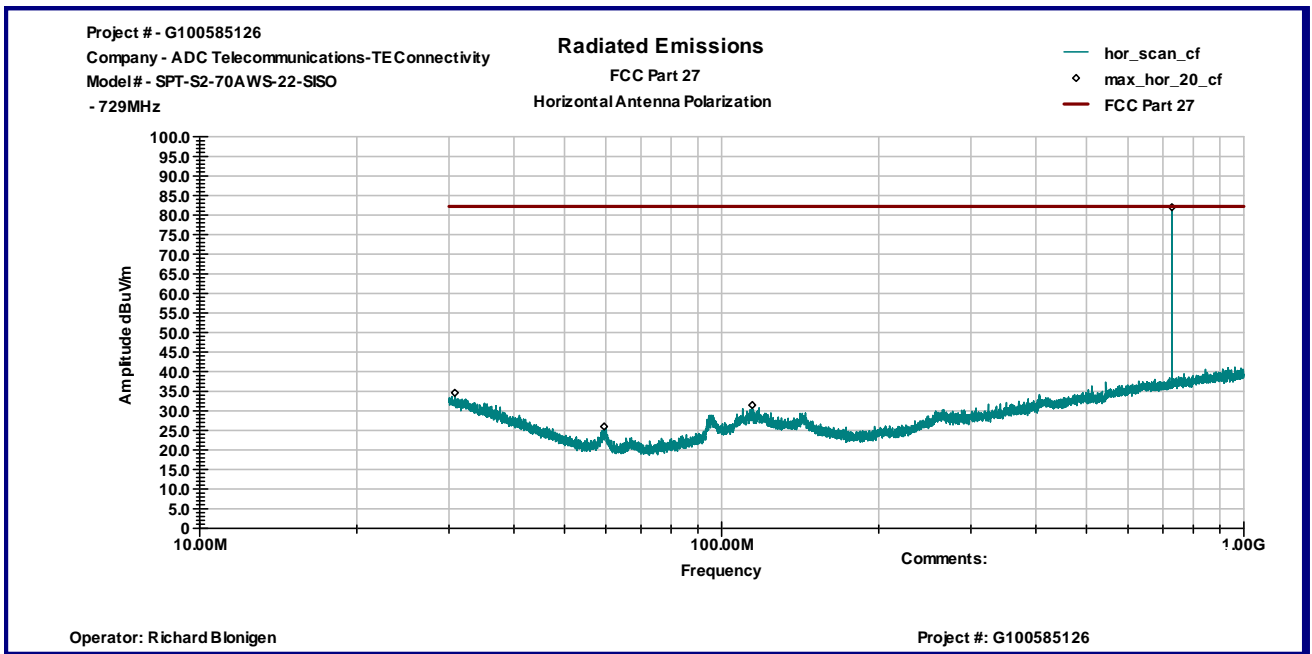
Date:	December 8, 2011	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC Part 27	
Test Point:	Enclosure	
Operation mode:	See page 5	
Note:	Channels 728-756MHz Frequency Range 30MHz-10GHz	

Table 1

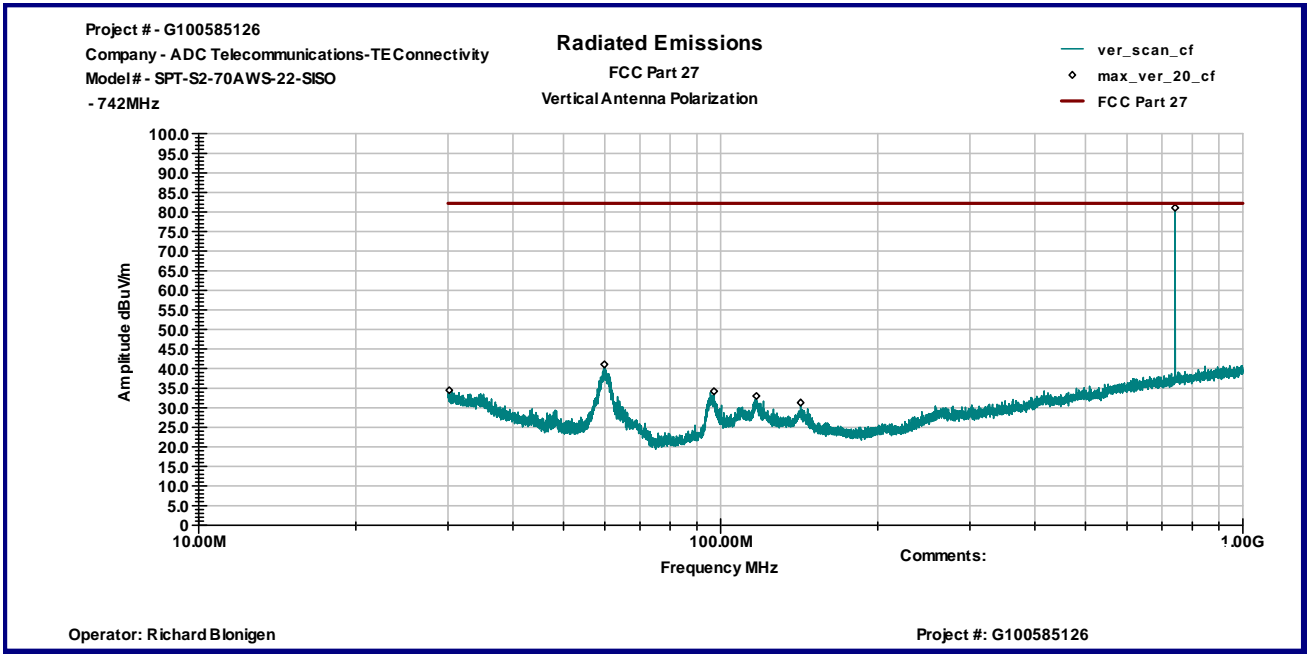
Frequency MHz	Antenna Polarity	Peak Reading dB μ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB μ V/m	QP Limit dB μ V/m	Margin dB
Channel 729MHz							
34.527 MHz	V	16.2	17.8	0.0	34.0	82.2	-48.2
59.801 MHz	V	31.4	7.2	0.0	38.6	82.2	-43.6
1.459 GHz	V	65.2	27.5	43.0	49.7	82.2	-32.5
4.948 GHz	V	55.8	37.6	42.0	51.5	82.2	-30.7
6.484 GHz	V	47.4	39.2	42.0	44.6	82.2	-37.6
30.81 MHz	H	14.7	19.9	0.0	34.6	82.2	-47.6
114.41 MHz	H	17.8	13.7	0.0	31.5	82.2	-50.7
1.459 GHz	H	61.1	27.5	43.0	45.6	82.2	-36.6
4.024 GHz	H	51.7	36.5	43.0	45.3	82.2	-36.9
4.945 GHz	H	54.1	37.5	42.0	49.7	82.2	-32.5
Channel 742MHz							
59.853 MHz	V	33.9	7.2	0.0	41.1	82.2	-41.1
97.099 MHz	V	22.3	11.9	0.0	34.2	82.2	-48.0
1.483 GHz	V	70.4	27.6	43.0	55.0	82.2	-27.2
4.948 GHz	V	55.5	37.6	42.0	51.1	82.2	-31.1
9.139 GHz	V	41.1	43.6	40.5	44.2	82.2	-38.0
31.341 MHz	H	15.3	19.6	0.0	34.9	82.2	-47.3
120.93 MHz	H	16.3	14.0	0.0	30.3	82.2	-51.9
1.483 GHz	H	66.2	27.6	43.0	50.8	82.2	-31.4
4.024 GHz	H	51.3	36.5	43.0	44.9	82.2	-37.3
4.945 GHz	H	53.9	37.5	42.0	49.4	82.2	-32.8
Channel 755MHz							
60.089 MHz	V	32.8	7.2	0.0	40.0	82.2	-42.2
868.68 MHz	V	17.5	25.0	0.0	42.5	82.2	-39.7
1.51 GHz	V	72.4	27.7	43.0	57.1	82.2	-25.2
3.019 GHz	V	62.2	33.6	43.8	52.0	82.2	-30.2
4.945 GHz	V	56.0	37.6	42.0	51.7	82.2	-30.5
30.126 MHz	H	13.7	20.3	0.0	34.0	82.2	-48.2
868.68 MHz	H	17.1	25.0	0.0	42.1	82.2	-40.1
1.51 GHz	H	67.8	27.7	43.0	52.5	82.2	-29.7
3.019 GHz	H	61.2	33.4	43.8	50.8	82.2	-31.4
4.948 GHz	H	53.3	37.6	42.0	48.9	82.2	-33.3



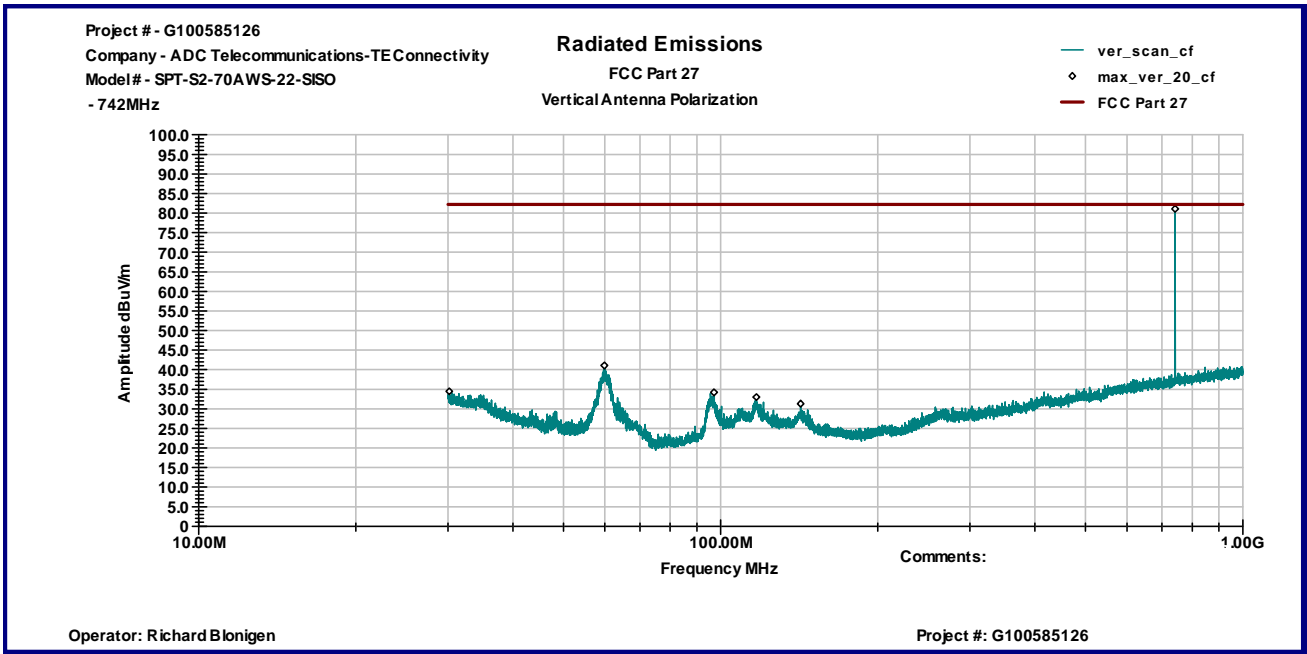
Graph 1



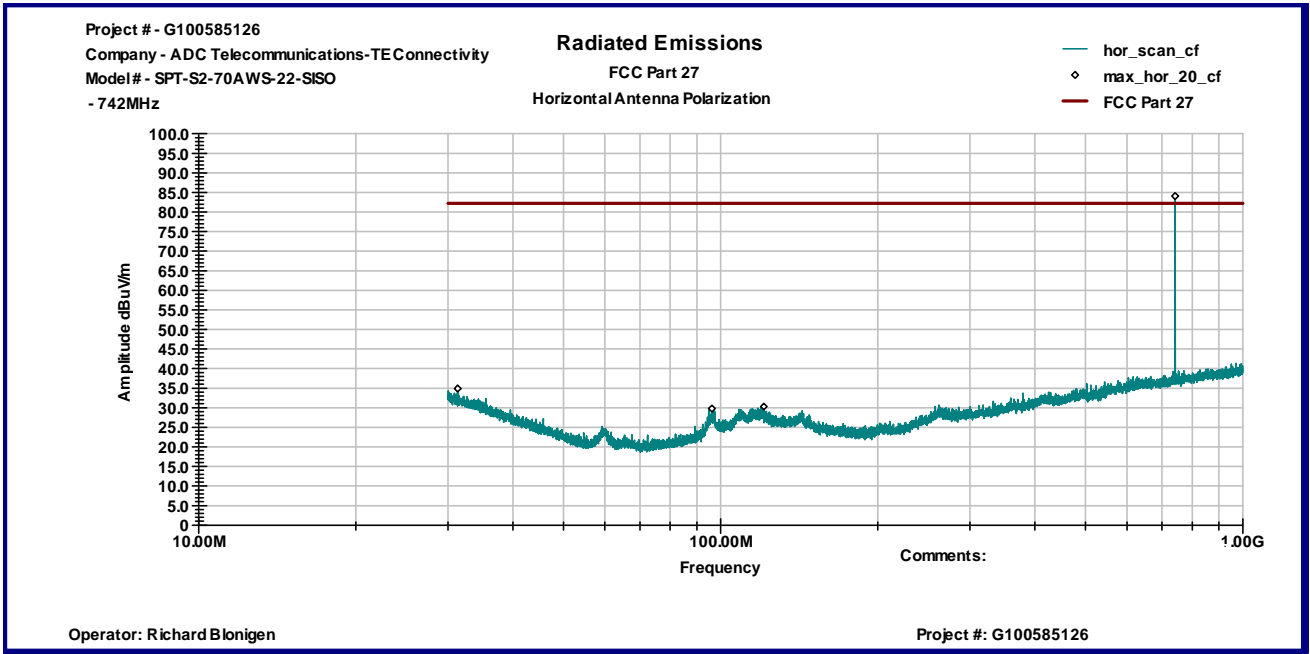
Graph 2



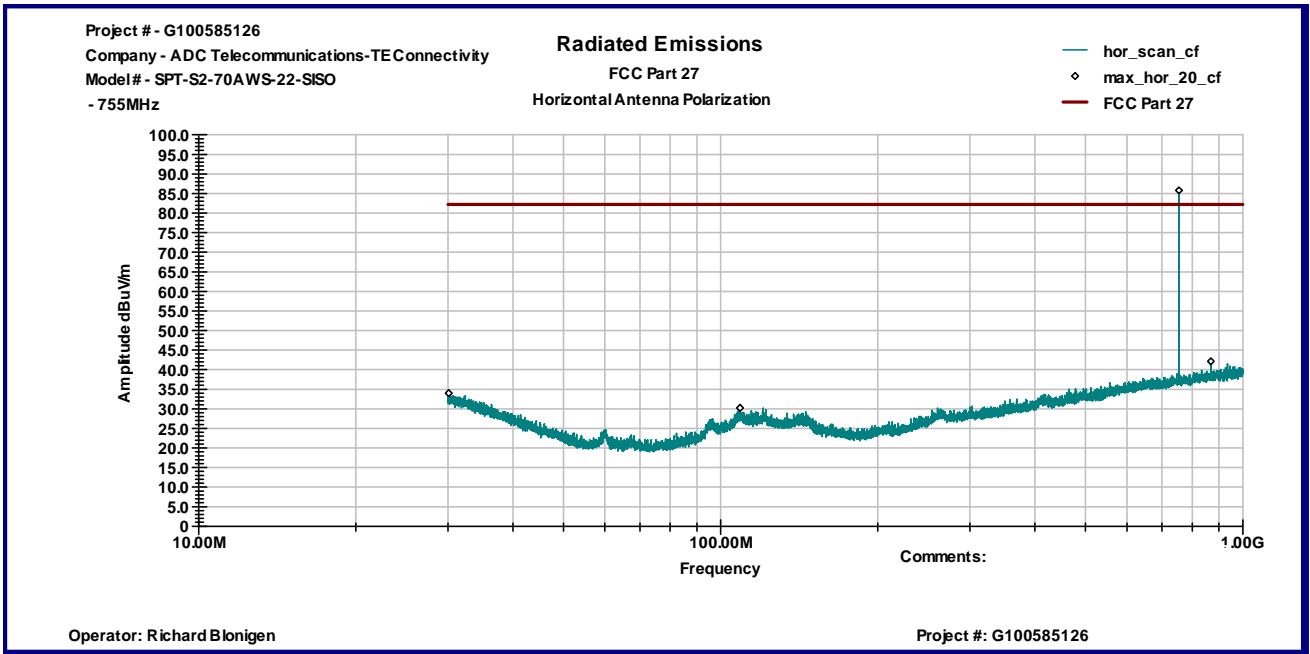
Graph 3



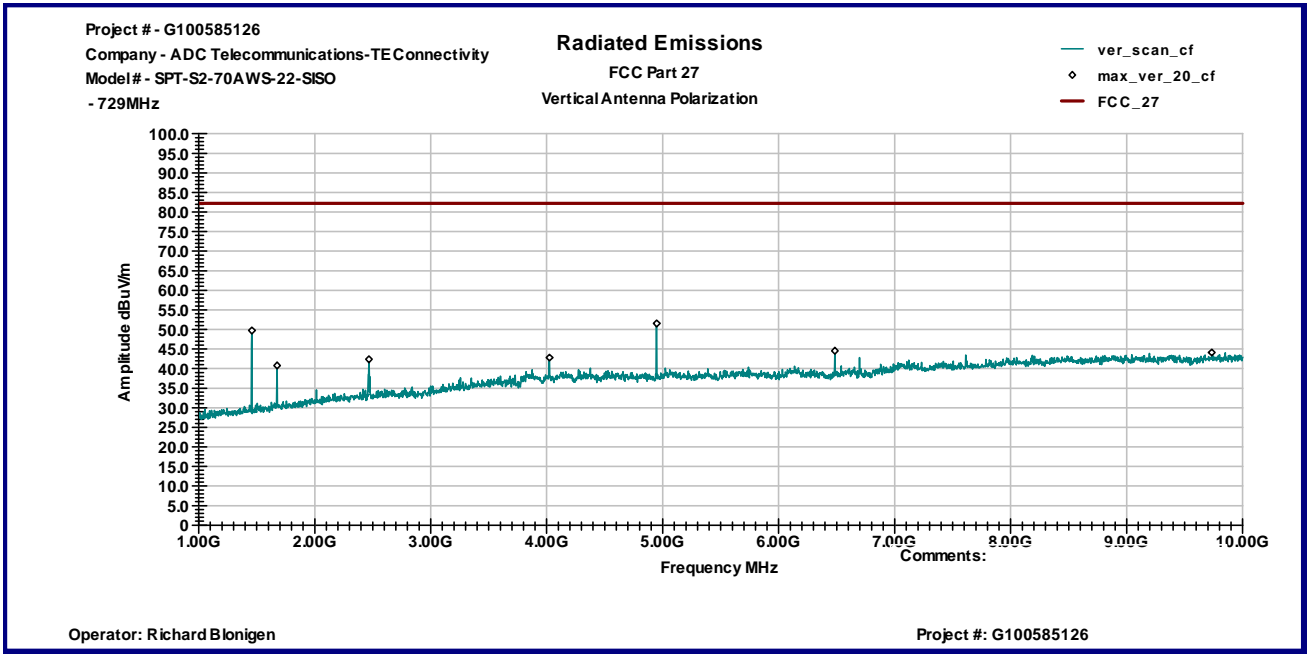
Graph 4



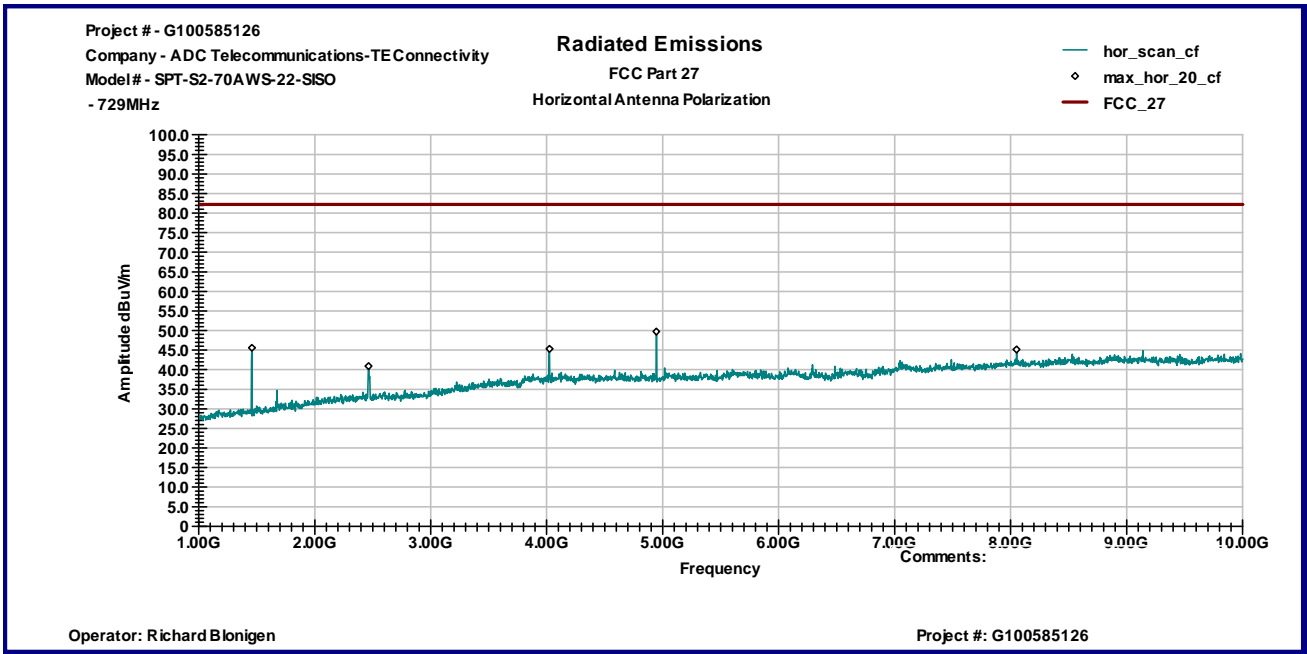
Graph 5



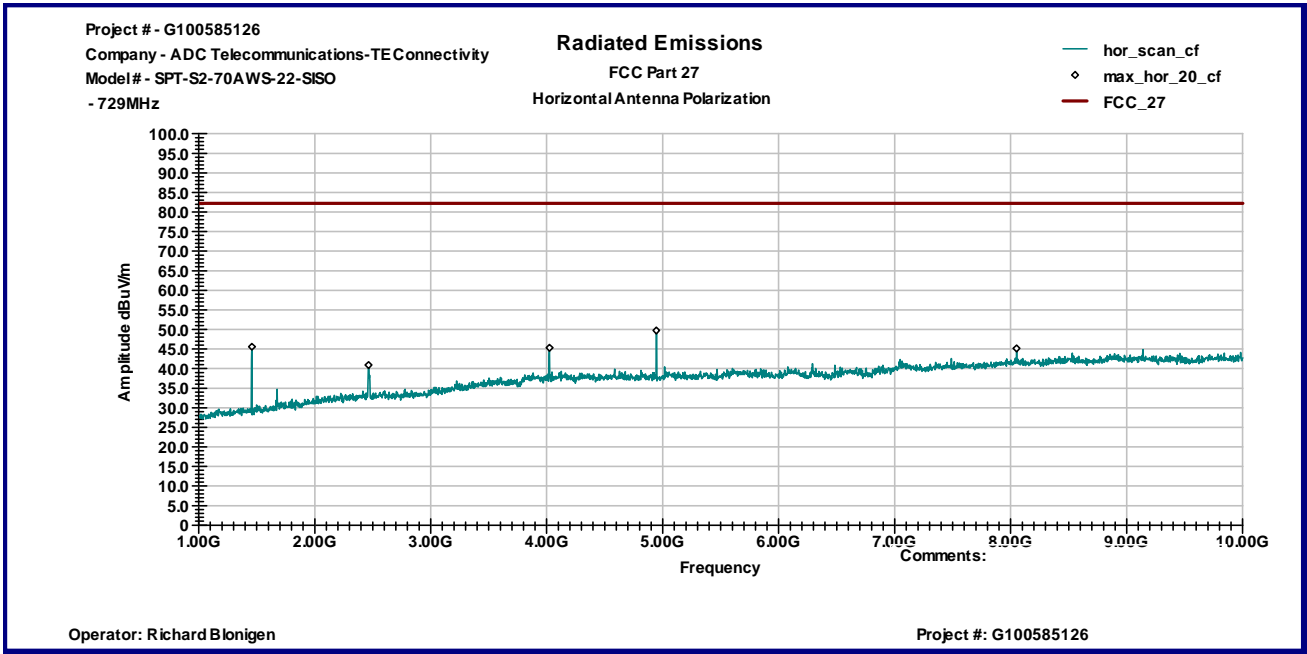
Graph 6



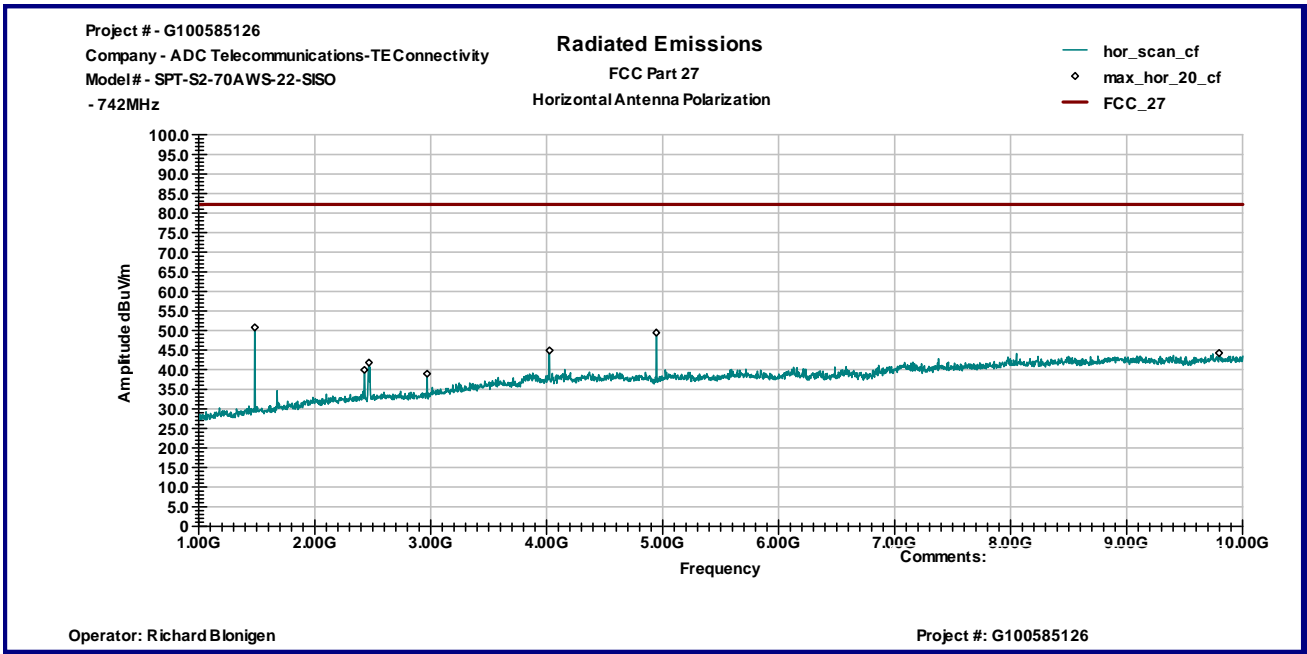
Graph 7



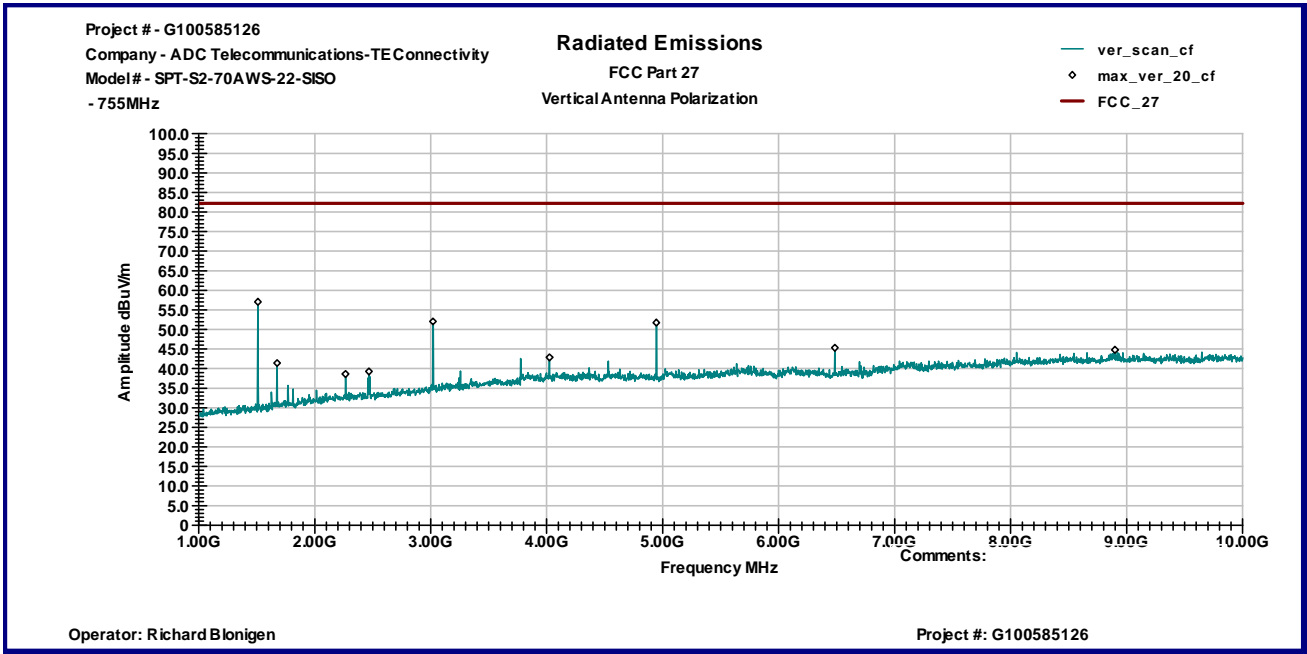
Graph 8



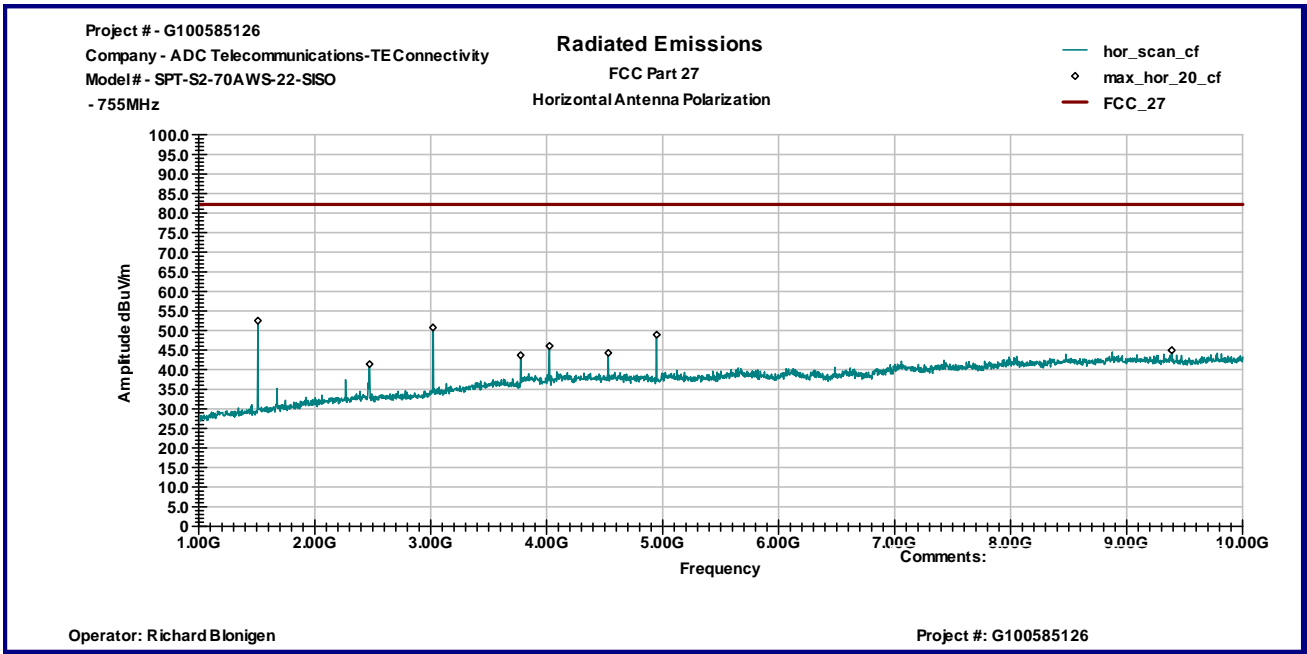
Graph 9



Graph 10



Graph 11

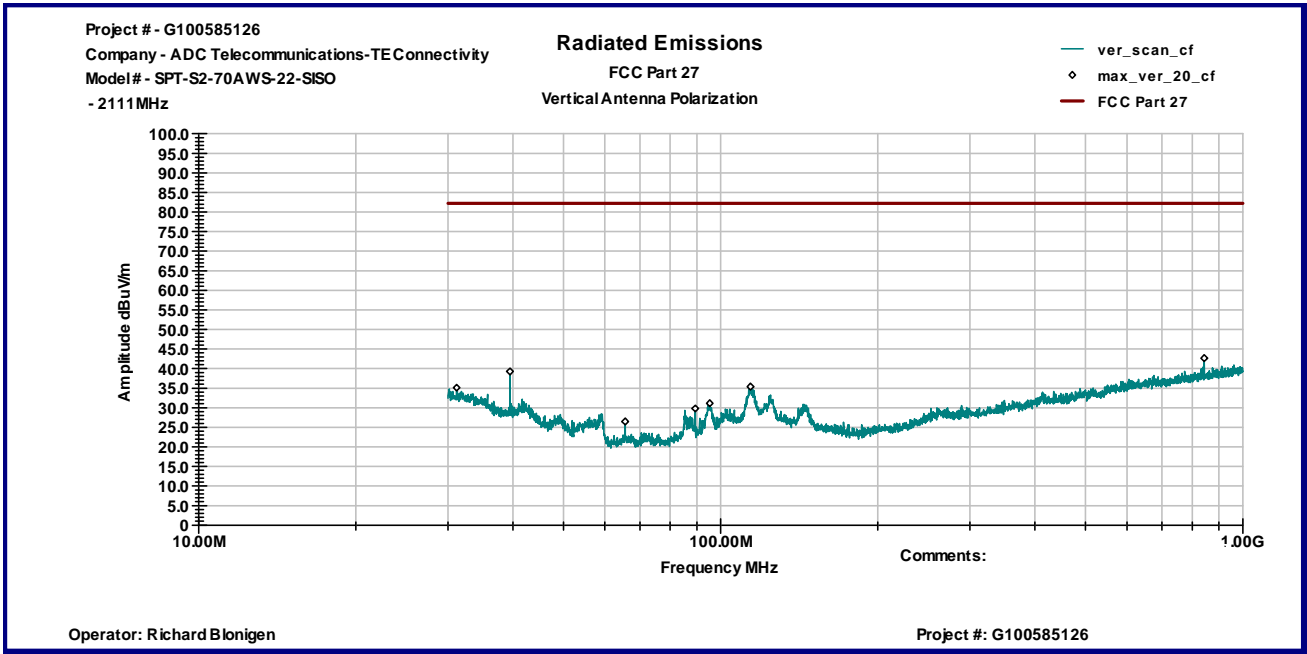


Graph 12

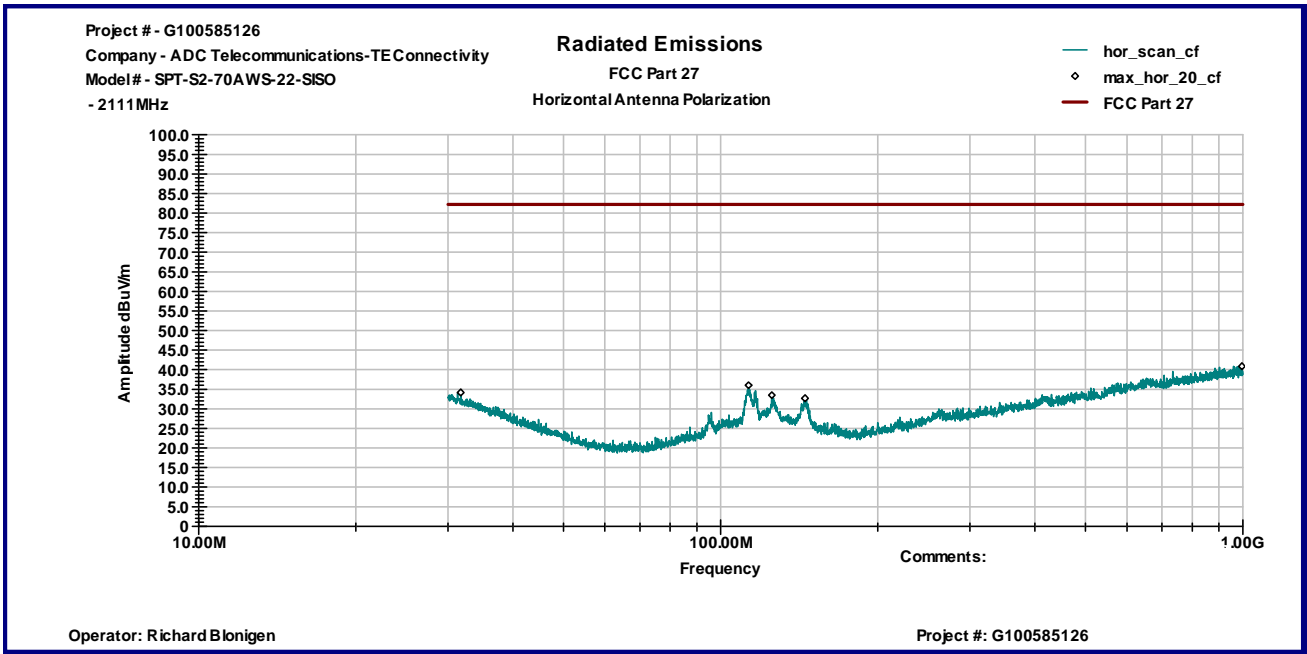
Date:	December 9, 2011	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC Part 27	
Test Point:	Enclosure	
Operation mode:	See page 5	
Note:	Channels 2110MHz – 2155MHz Frequency Range 30MHz-22GHz	

Table 2

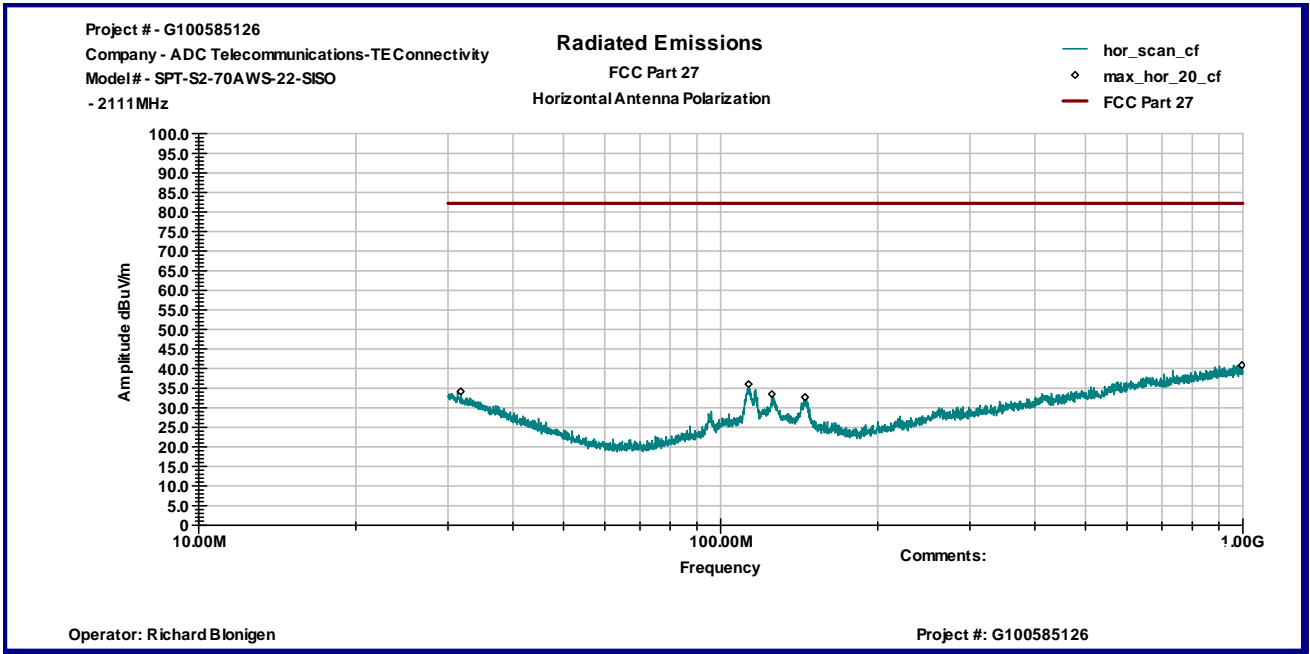
Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	QP Limit dBμV/m	Margin dB
Channel 2111MHz							
844.25 MHz	V	17.7	25.0	0.0	42.7	82.2	-39.5
4.2187 GHz	V	60.3	36.7	42.7	54.3	82.2	-27.9
4.944 GHz	V	55.3	37.6	42.0	51.0	82.2	-31.2
14.481 GHz	V	42.9	49.4	41.2	51.1	82.2	-31.1
17.983 GHz	V	41.8	54.8	41.3	55.3	82.2	-26.9
Channel 2132MHz							
996.55 MHz	H	14.4	26.4	0.0	40.9	82.2	-41.3
4.2187 GHz	H	56.1	36.6	42.7	50.1	82.2	-32.1
4.944 GHz	H	53.8	37.5	42.0	49.4	82.2	-32.8
14.538 GHz	H	43.4	49.3	41.2	51.5	82.2	-30.7
17.983 GHz	H	42.0	54.8	41.3	55.5	82.2	-26.7
Channel 2154MHz							
975.85 MHz	V	14.8	26.2	0.0	40.9	82.2	-41.3
4.264 GHz	V	61.7	36.7	42.6	55.8	82.2	-26.4
12.792 GHz	V	47.5	46.2	41.8	51.8	82.2	-30.4
14.929 GHz	V	47.5	48.1	41.1	54.4	82.2	-27.8
17.983 GHz	V	43.0	54.8	41.3	56.5	82.2	-25.7
966.48 MHz	H	14.9	26.1	0.0	41.0	82.2	-41.2
4.264 GHz	H	60.6	36.7	42.6	54.6	82.2	-27.6
8.531 GHz	H	50.0	43.1	40.3	52.8	82.2	-29.4
10.662 GHz	H	49.5	45.6	41.6	53.5	82.2	-28.7
14.929 GHz	H	49.2	48.1	41.1	56.2	82.2	-26.0
Channel 2154MHz							
907.83 MHz	V	15.6	25.4	0.0	41.0	82.2	-41.2
4.944 GHz	V	52.9	37.6	42.0	48.6	82.2	-33.6
6.4683 GHz	V	47.3	39.2	42.0	44.5	82.2	-37.7
13.784 GHz	V	43.9	48.2	41.4	50.8	82.2	-31.4
18.0 GHz	V	42.5	54.9	41.3	56.1	82.2	-26.1
113.26 MHz	H	21.9	13.7	0.0	35.5	82.2	-46.7
955.15 MHz	H	15.2	25.9	0.0	41.1	82.2	-41.1
4.3037 GHz	H	51.2	36.7	42.5	45.4	82.2	-36.8
4.944 GHz	H	53.3	37.5	42.0	48.9	82.2	-33.3
14.288 GHz	H	43.6	49.1	41.2	51.4	82.2	-30.8



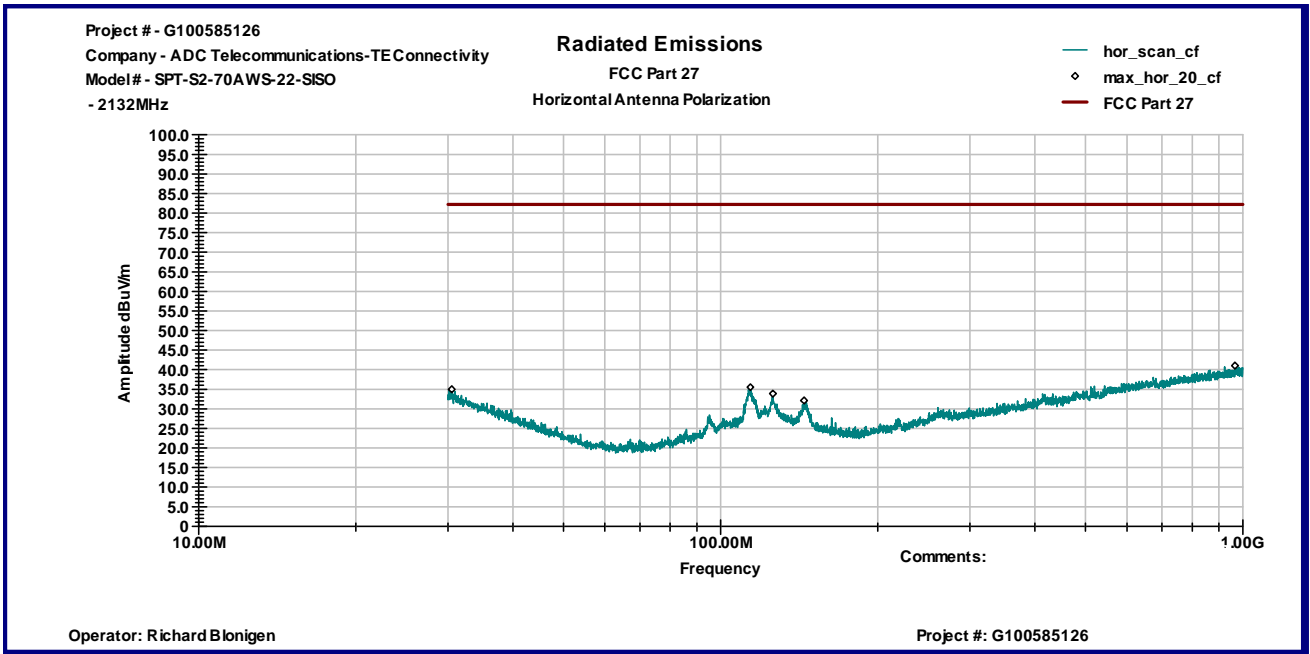
Graph 13



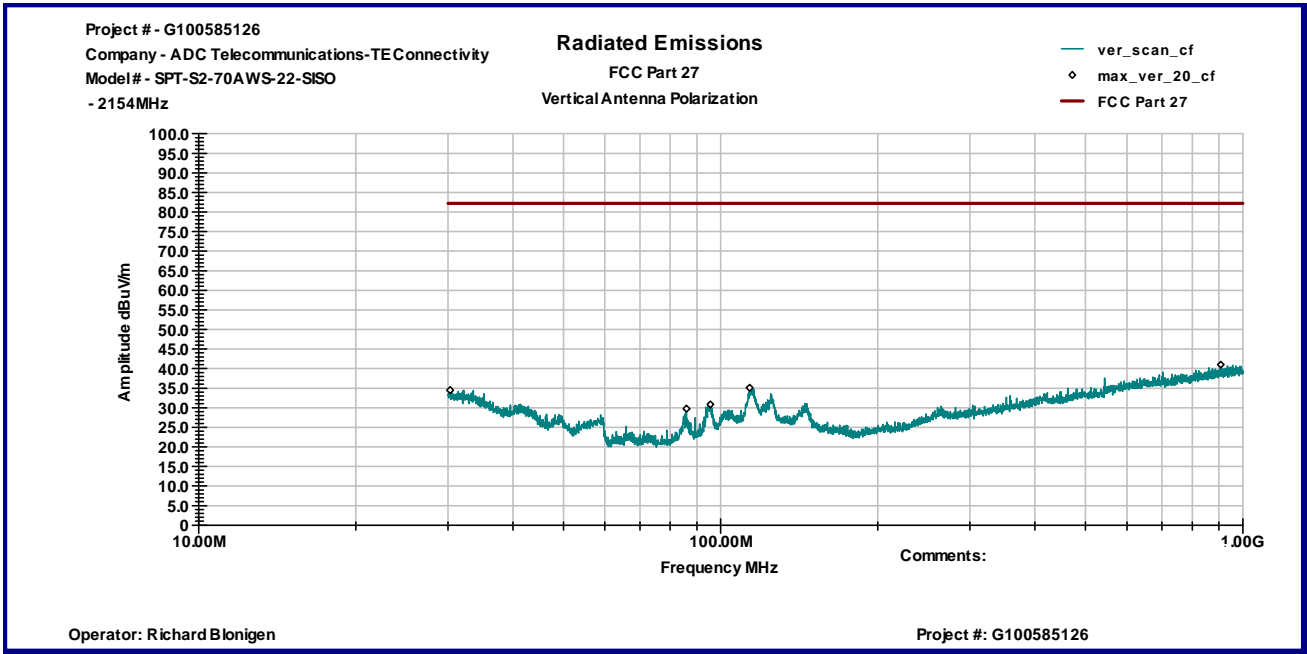
Graph 14



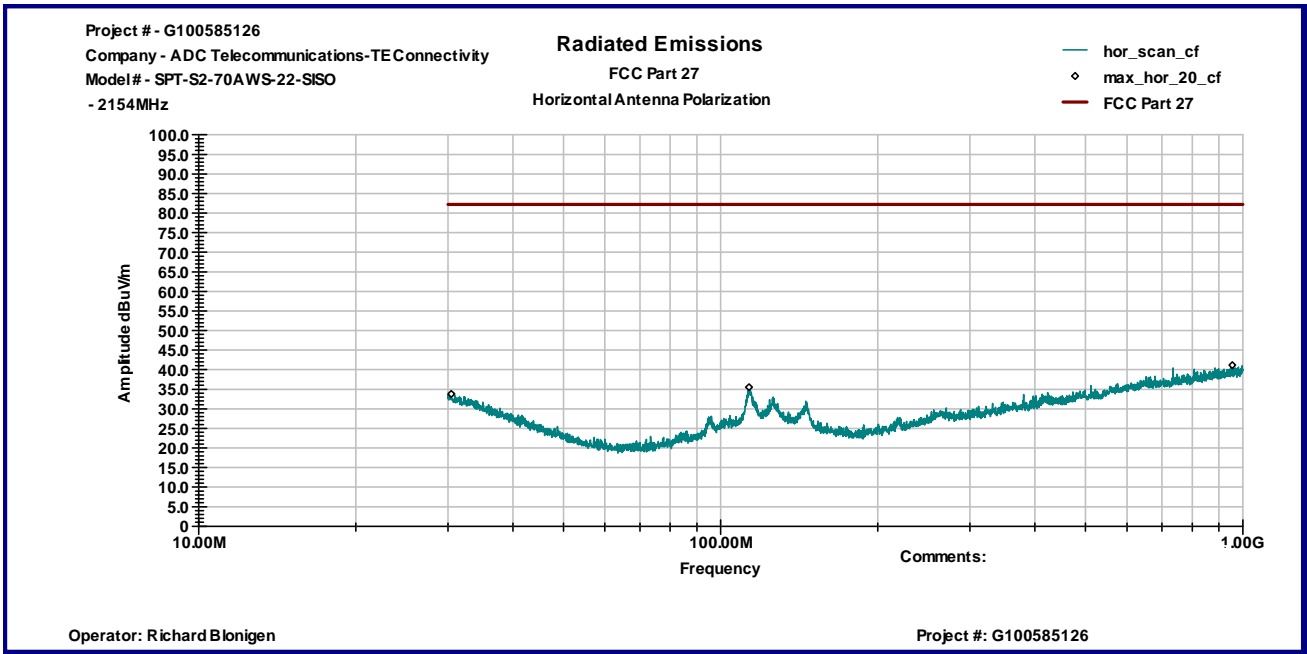
Graph 15



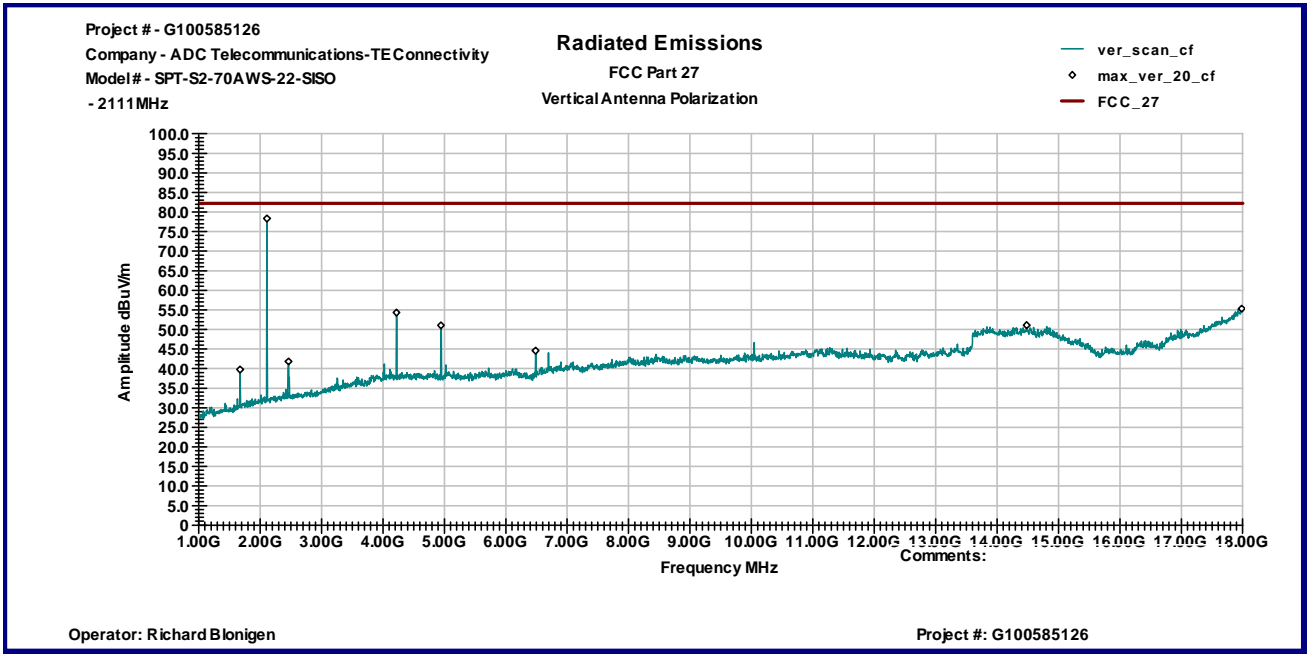
Graph 16



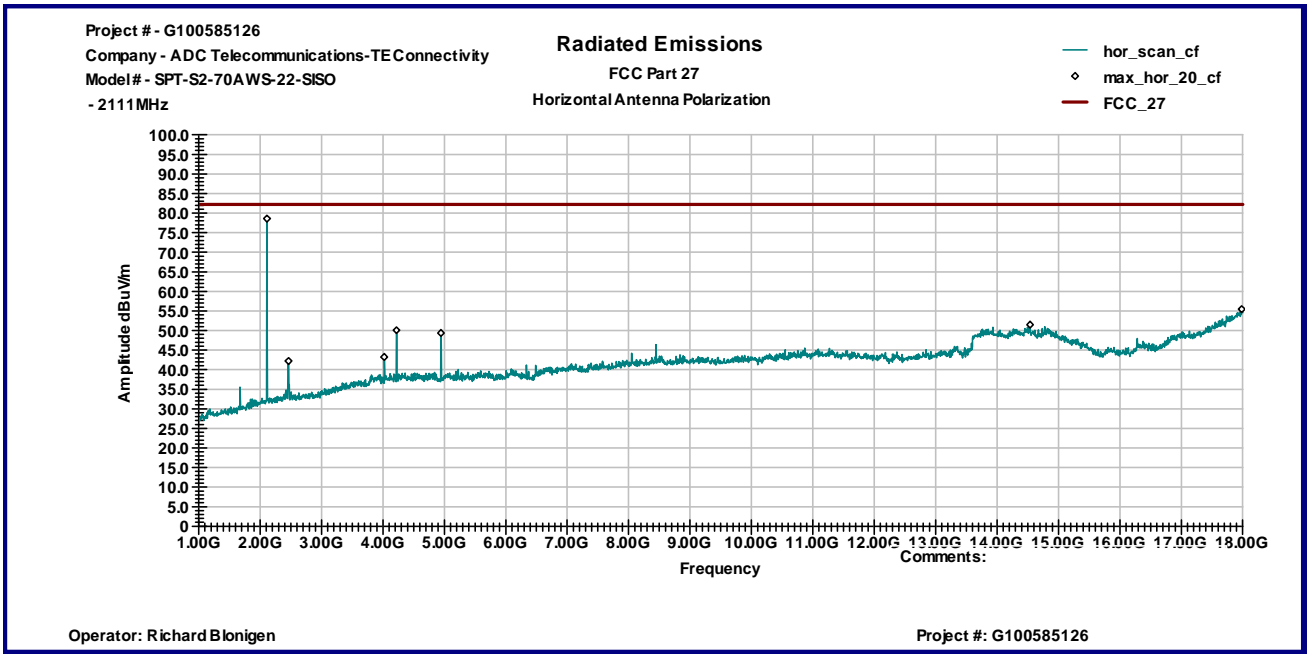
Graph 17



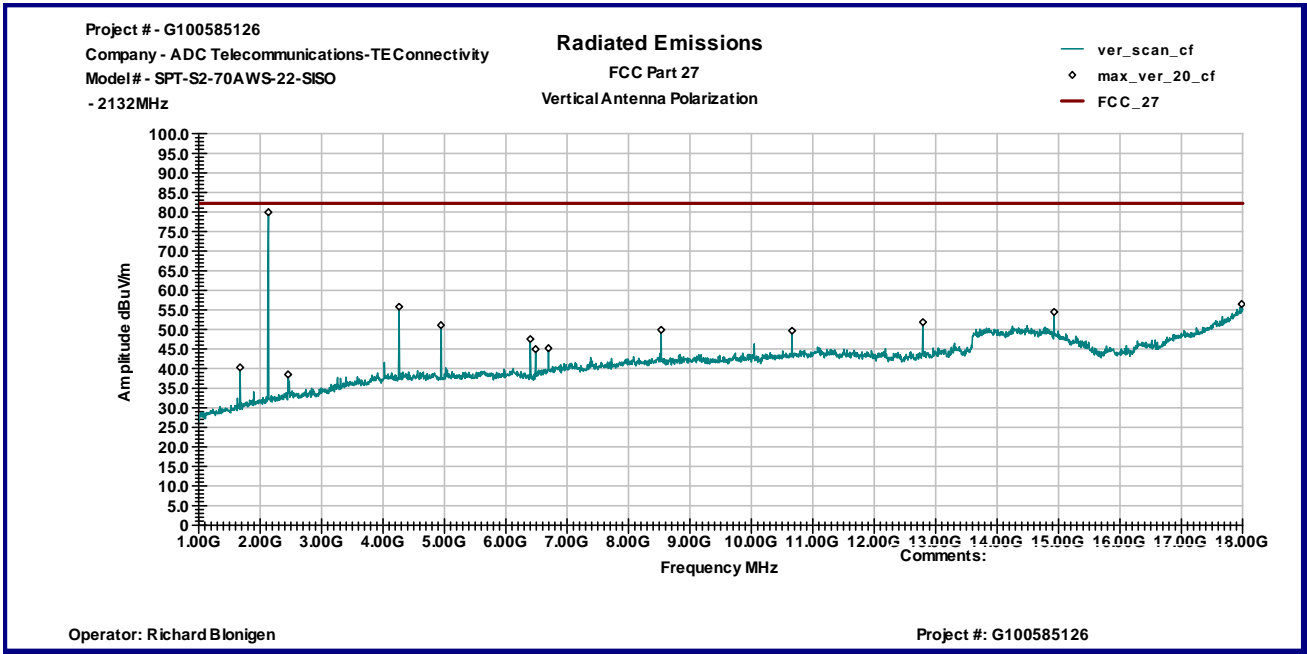
Graph 18



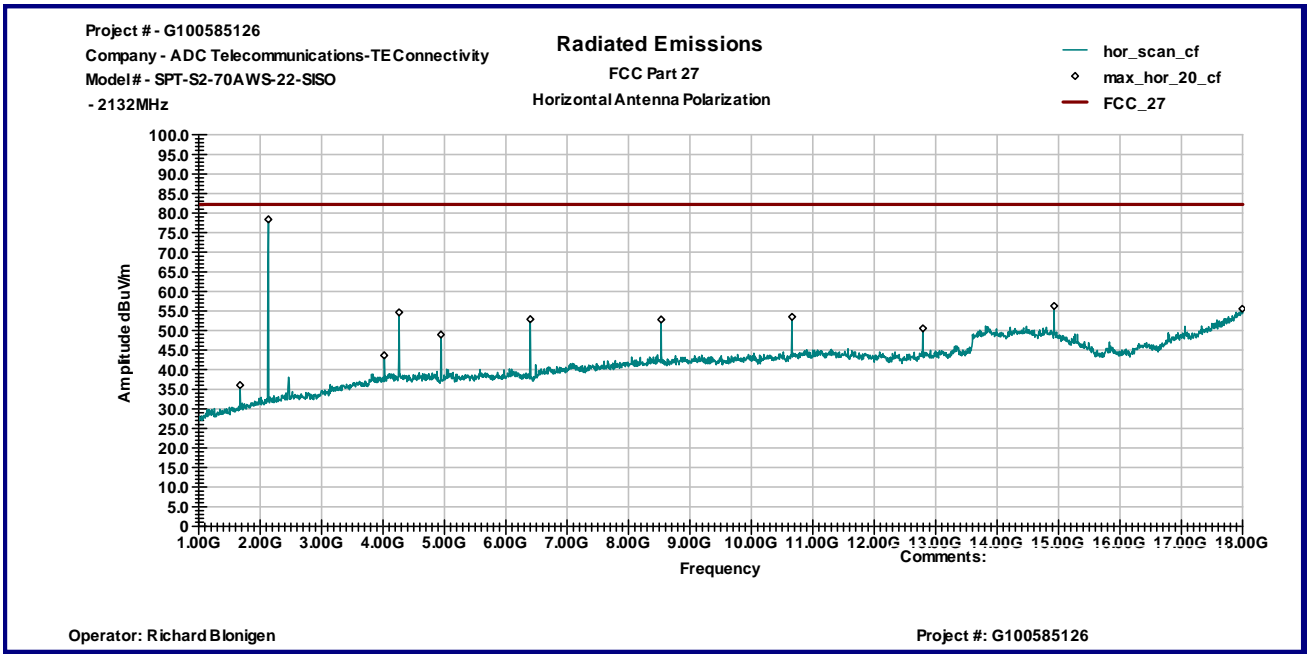
Graph 19



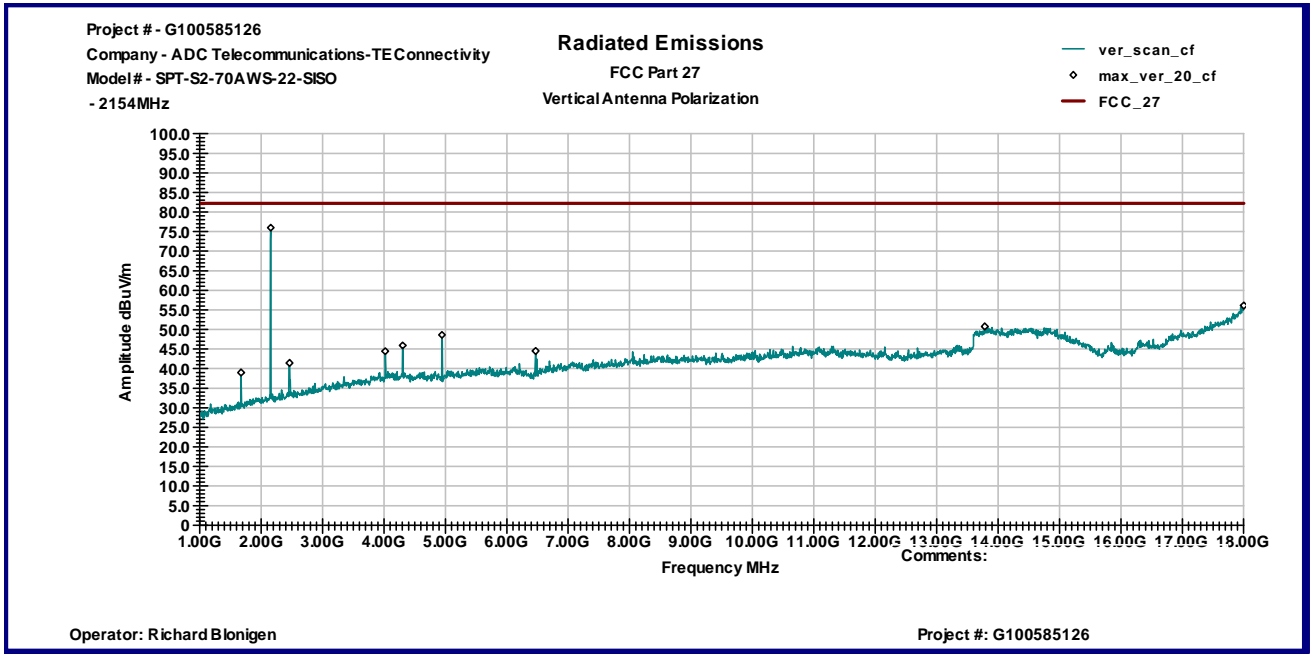
Graph 20



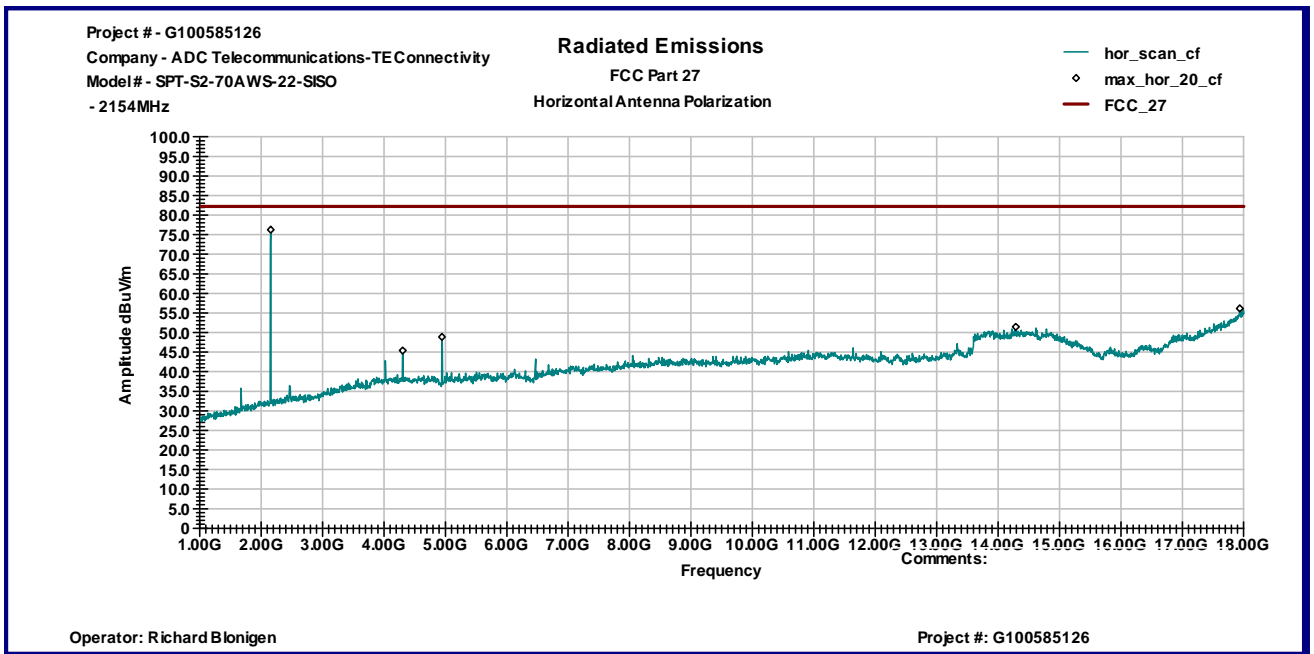
Graph 21



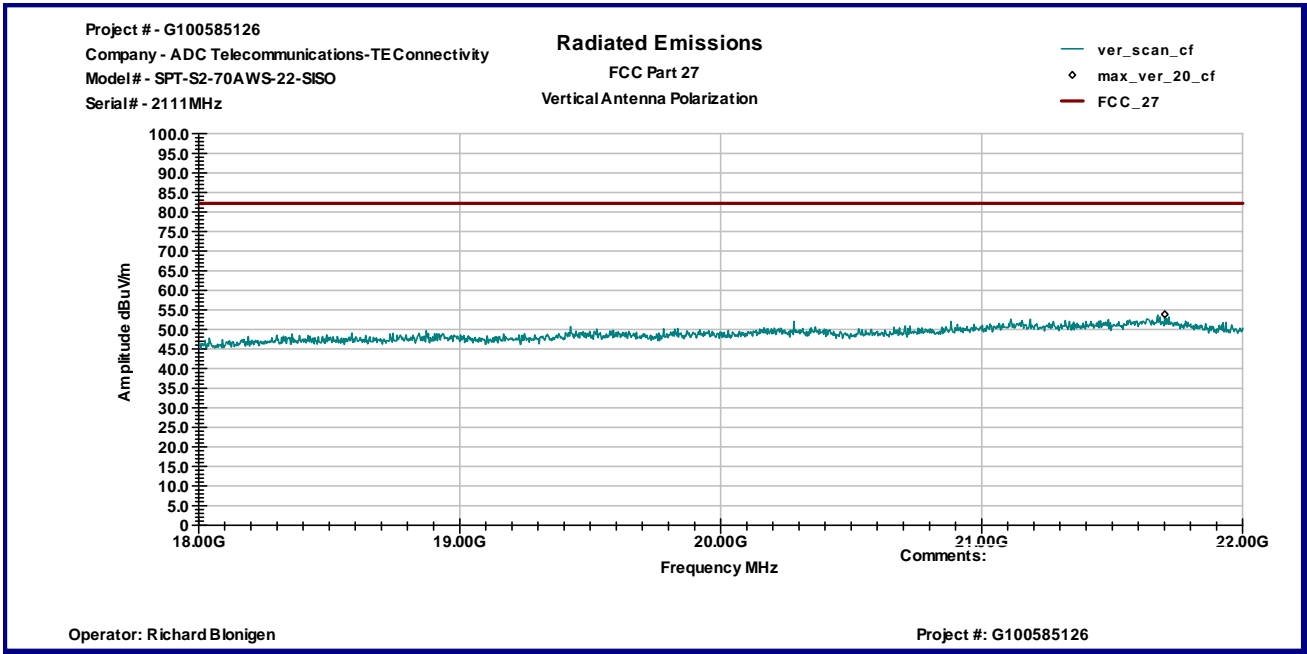
Graph 22



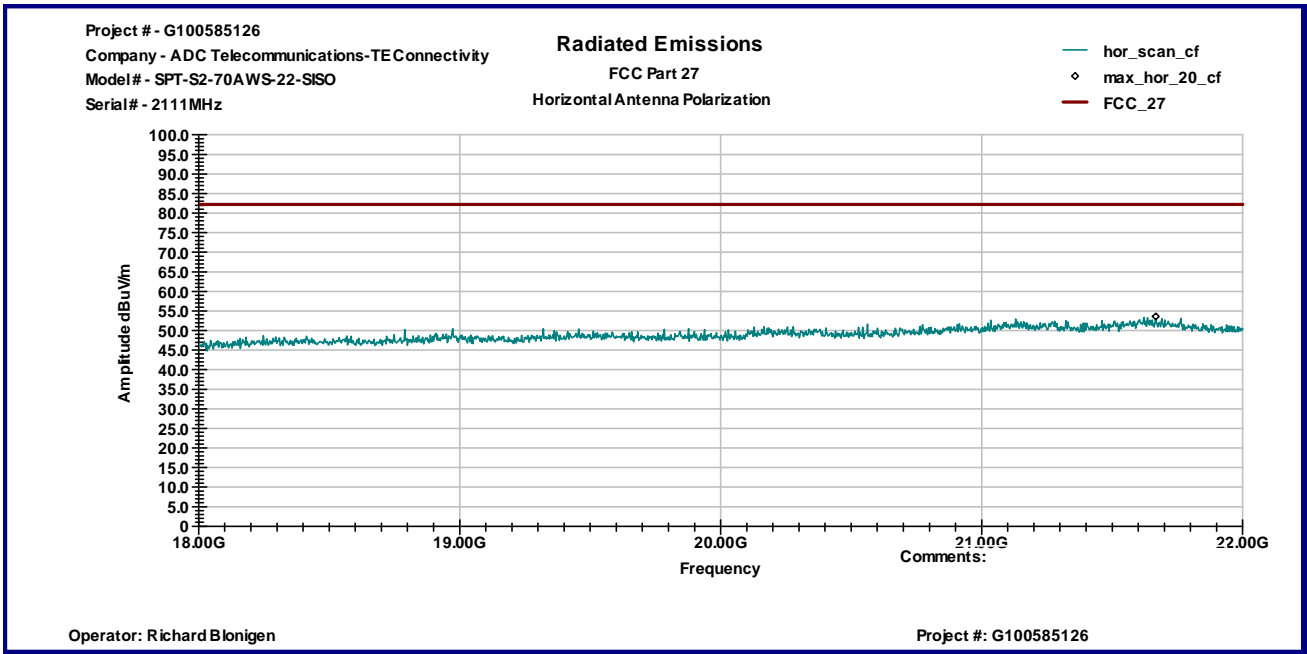
Graph 23



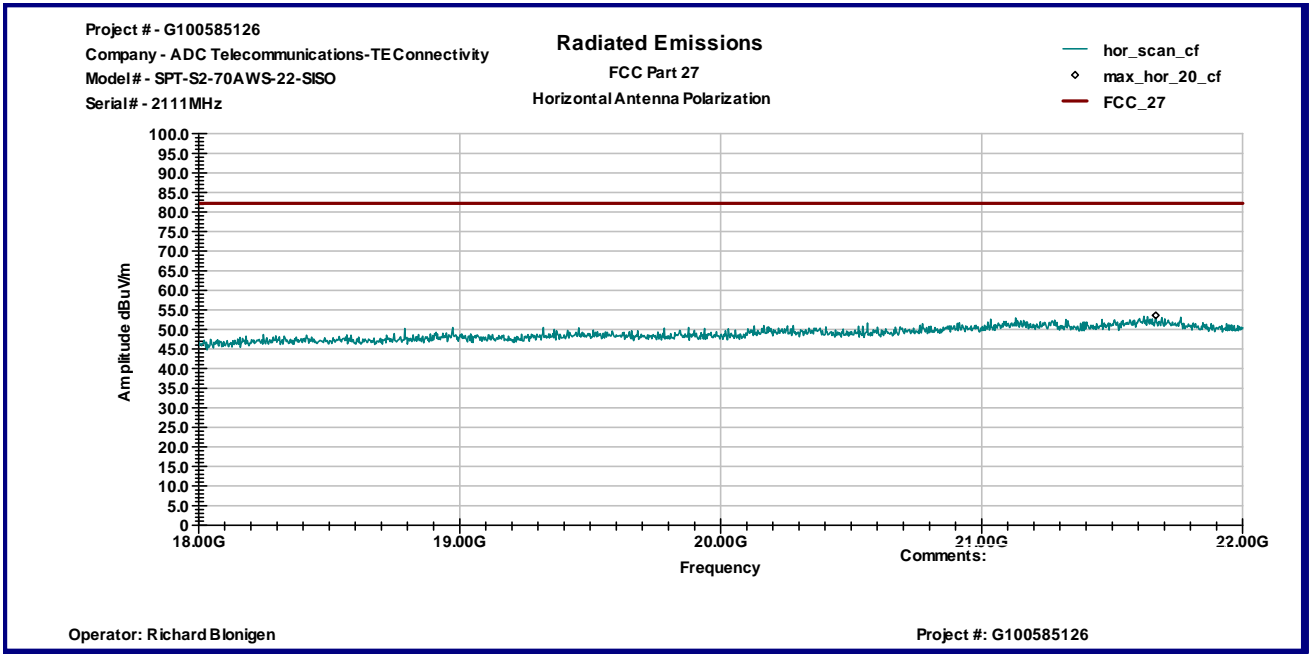
Graph 24



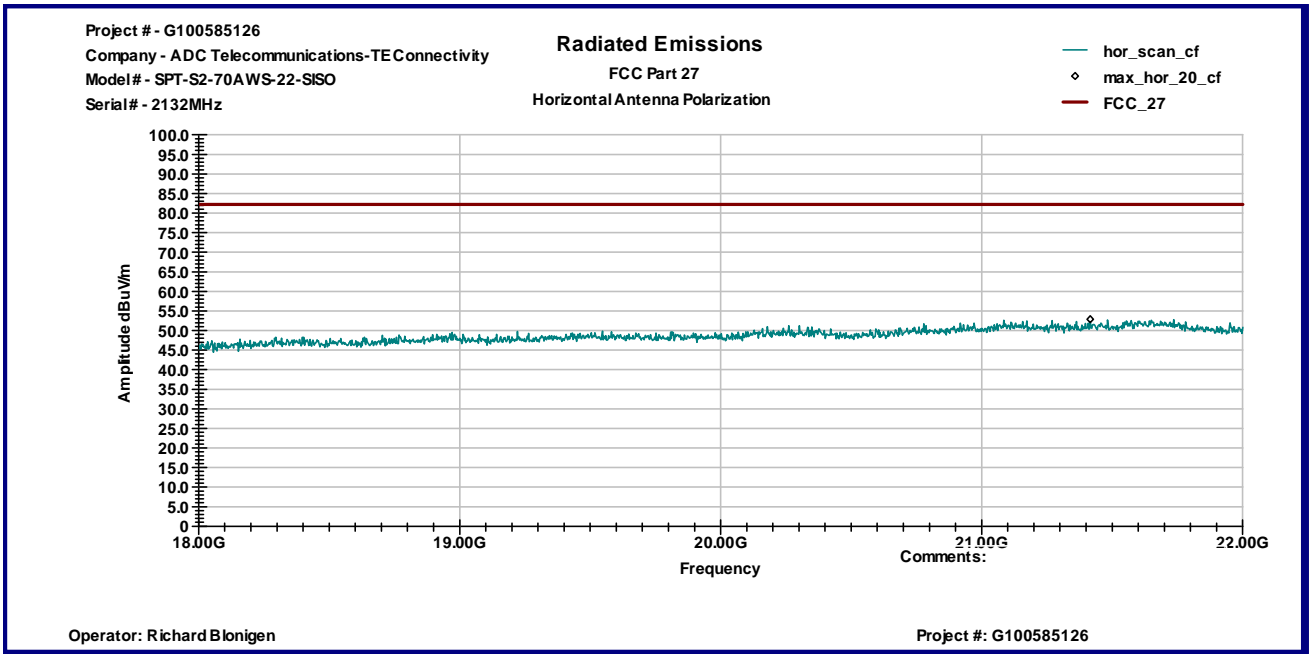
Graph 25



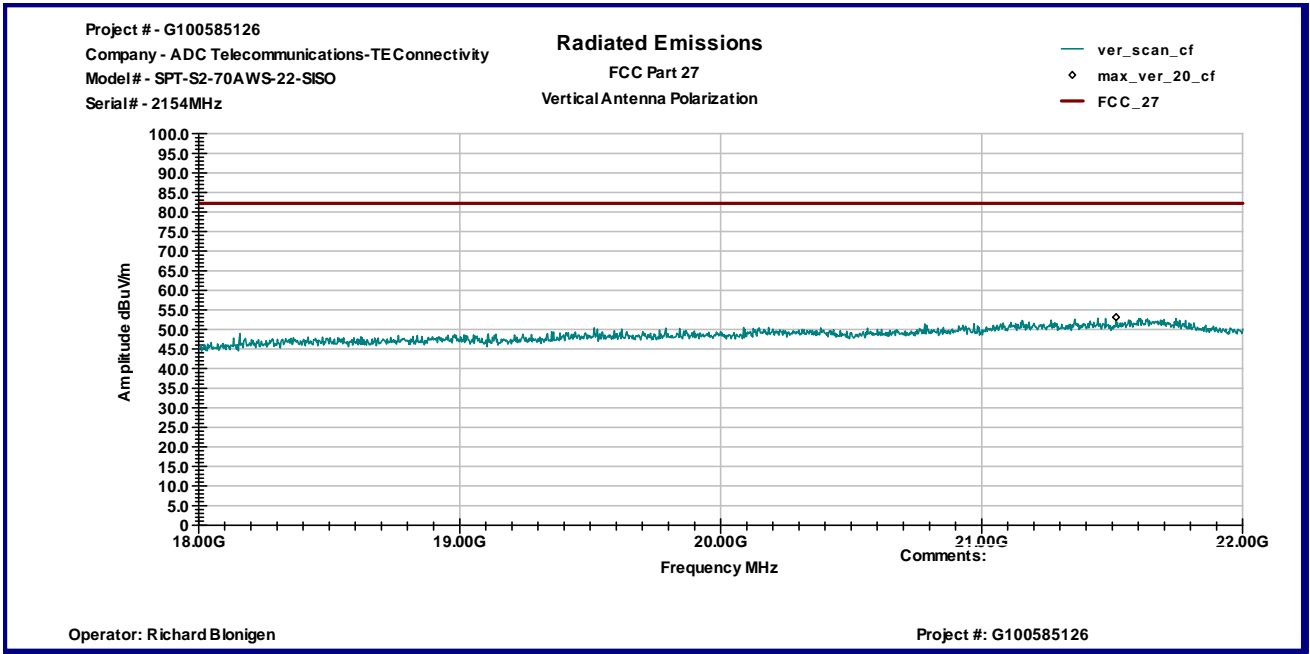
Graph 26



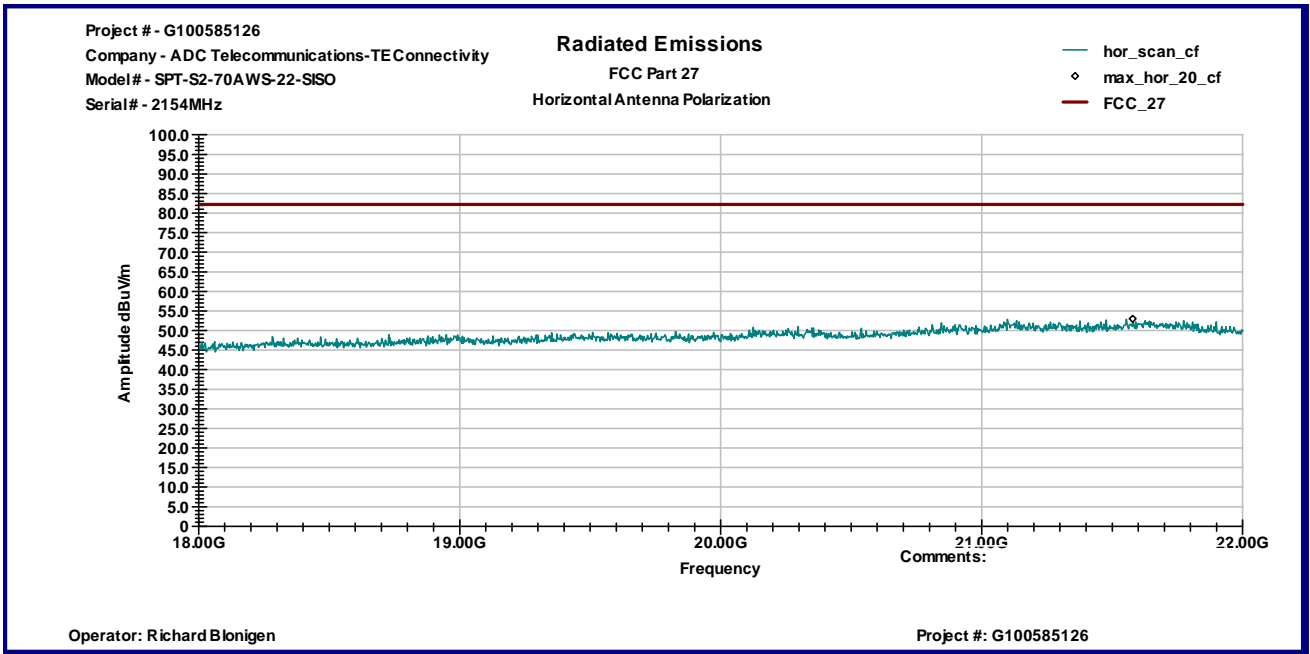
Graph 27



Graph 28



Graph 29



Graph 30



5.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	FSP 40	100024	12559	11/17/2012	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	05/12/2012	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2468	9734	11/08/2012	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	6579	15580	04/29/2012	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1402232	172081	10/31/2012	<input checked="" type="checkbox"/>
System	TILE! Instrument Control		Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	10/31/2012	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	10/31/2012	<input checked="" type="checkbox"/>