



## TEST REPORT

Report Number: 100790006MIN-001  
Project Number: G100790006

Testing performed on the  
Spectrum 700p1/AWSp1 SRAU

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.  
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Oakdale, MN 55128 USA

Test Authorized by:  
ADC Telecommunications Inc.- a TE Connectivity  
Company  
541 E Trimble Road  
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Richard Blonigen

Date: July 23, 2012

Reviewed by: Norman Shpilsher  
Norman Shpilsher

Date: July 23, 2012

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## 1.0 DESCRIPTION OF THE SAMPLE (EUT)

<b>Model:</b>	Spectrum 700p1/AWSp1 SRAU: SPT-S2-70AWS-1-SISO
<b>Type of EUT:</b>	Repeater / Booster
<b>Operating Frequency Range:</b>	728 – 757MHz (700 band) 2110 – 2155 MHz (AWS band)
<b>Company:</b>	ADC Telecommunications Inc. - a TE Connectivity Company
<b>Customer:</b>	Sue Cyr
<b>Address:</b>	541 E. Trimble Road San Jose, CA 95131 USA
<b>Phone:</b>	408-952-2445
<b>Fax:</b>	408-952-2645
<b>e-mail:</b>	<a href="mailto:sue.cyr@te.com">sue.cyr@te.com</a>
<b>Test Standards:</b>	<input type="checkbox"/> EN 55022:2006 +A1:2007, Class █ <input type="checkbox"/> EN 55011:2007 +A2:2007, Group █, Class █ <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 █ 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
<b>Date Sample Submitted:</b>	July 16, 2012
<b>Test Work Started:</b>	July 16, 2012
<b>Test Work Completed:</b>	July 20, 2012
<b>Test Sample Conditions:</b>	<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:  $\pm 4$  dB at 10m and  $\pm 5.4$  dB at 3m

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

### 3.0 EQUIPMENT UNDER TEST

#### 3.1 Power Configuration

<b>Rated voltage:</b>	<input type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/> 400VAC <input checked="" type="checkbox"/> 54VDC from external support Power
<b>Rated current:</b>	<input type="checkbox"/> Amp.
<b>Rated frequency:</b>	<input type="checkbox"/> 50Hz <input checked="" type="checkbox"/> 60Hz
<b>Number of phases:</b>	<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 729MHz, 742MHz, and 756MHz at 20dBm output power
2	Continuous transmitting at 2111MHz, 2132MHz, and 2154MHz at 20dBm output power

#### 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	Aeroflex IRF 3413	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

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### 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

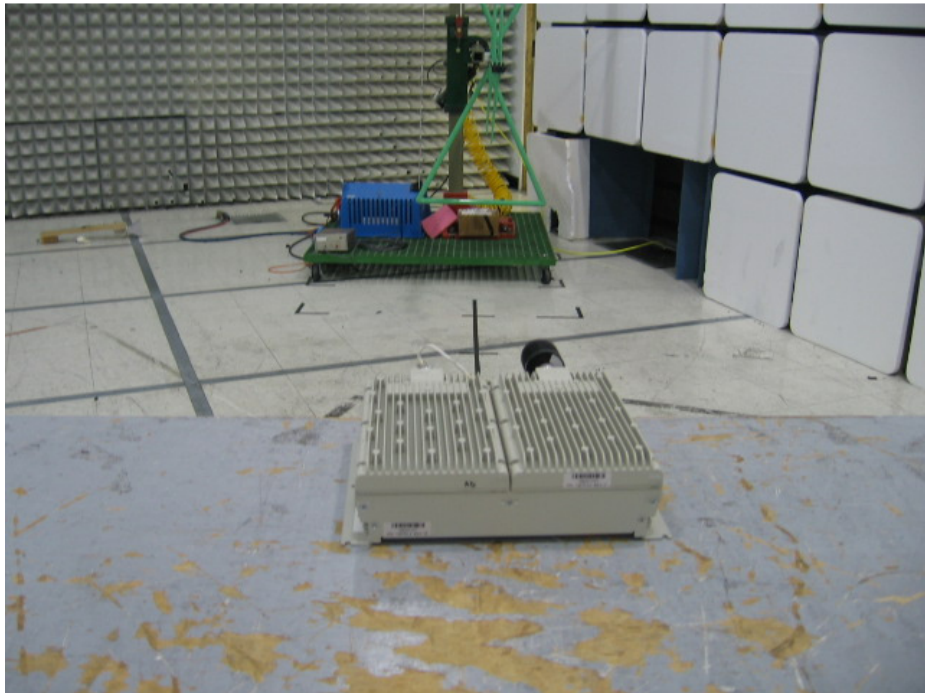
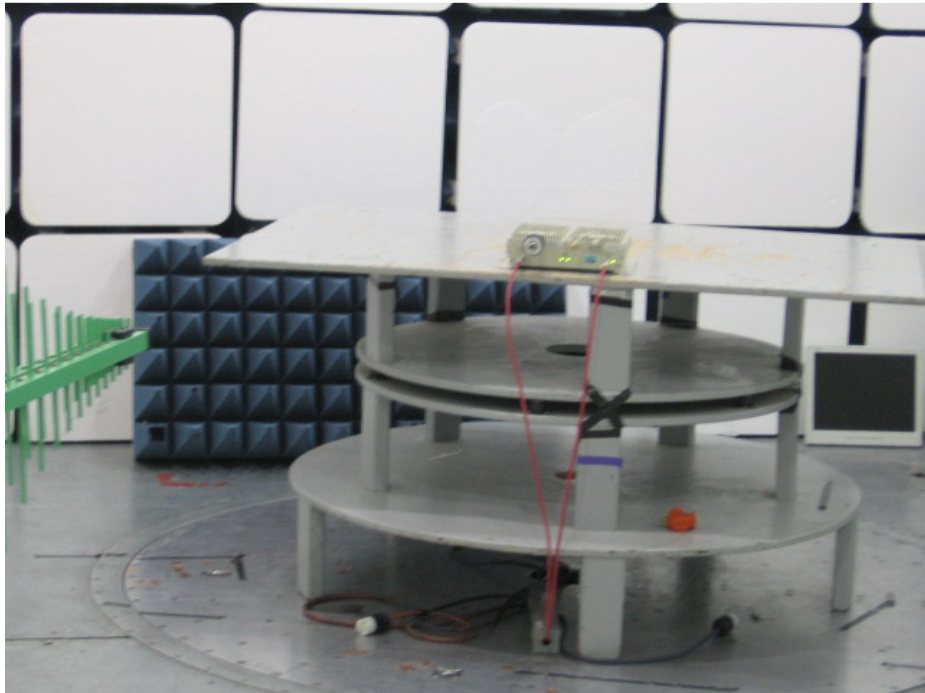
**Test distance:**  10 meters  3 meters

**Test result:** **Pass**

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

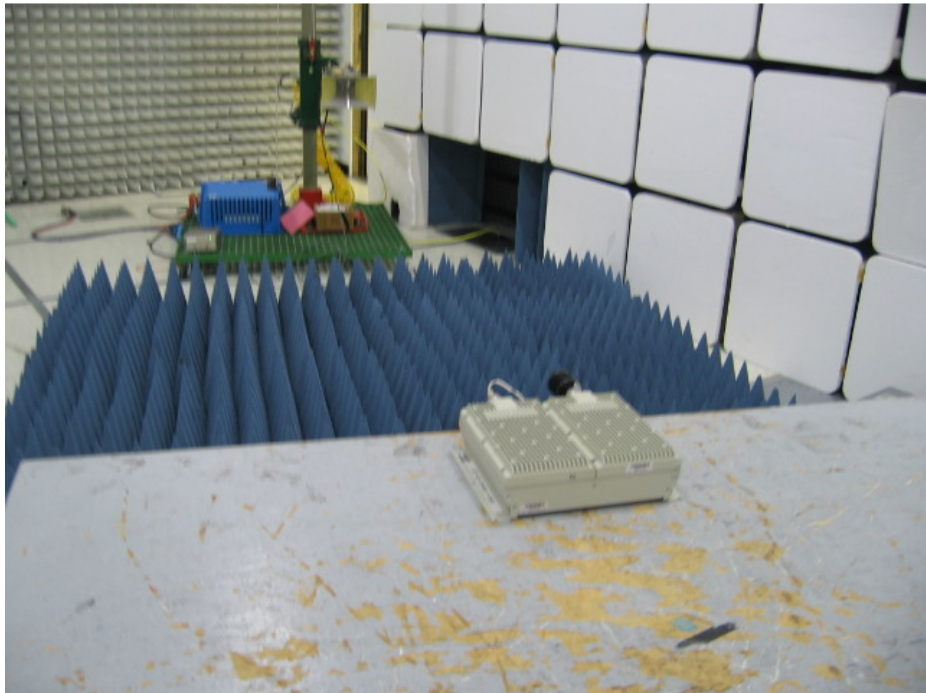
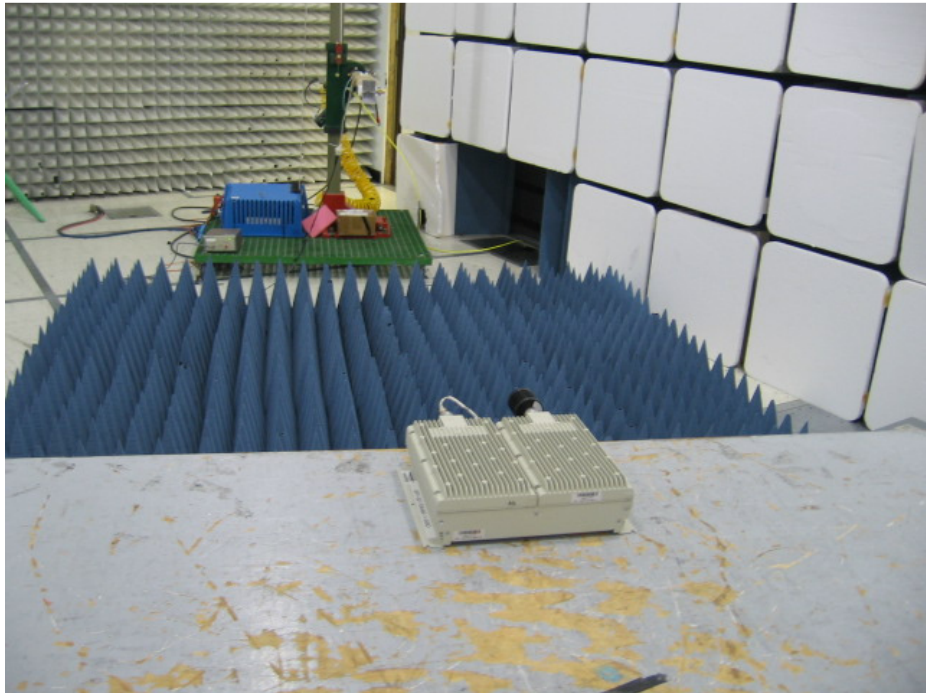
**Max. Emissions margin:** 26.7 dB below the Reference Limits

- Notes:**
1. The Radiated Emissions testing was performed in the Anechoic chamber at 3m measurement distance (see Table 1 & 2 and Graphs 1-30)
  2. The Spurious Radiated Power limits of -13dBm was correlated with field strength Reference Limit of 82.2dB $\mu$ 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



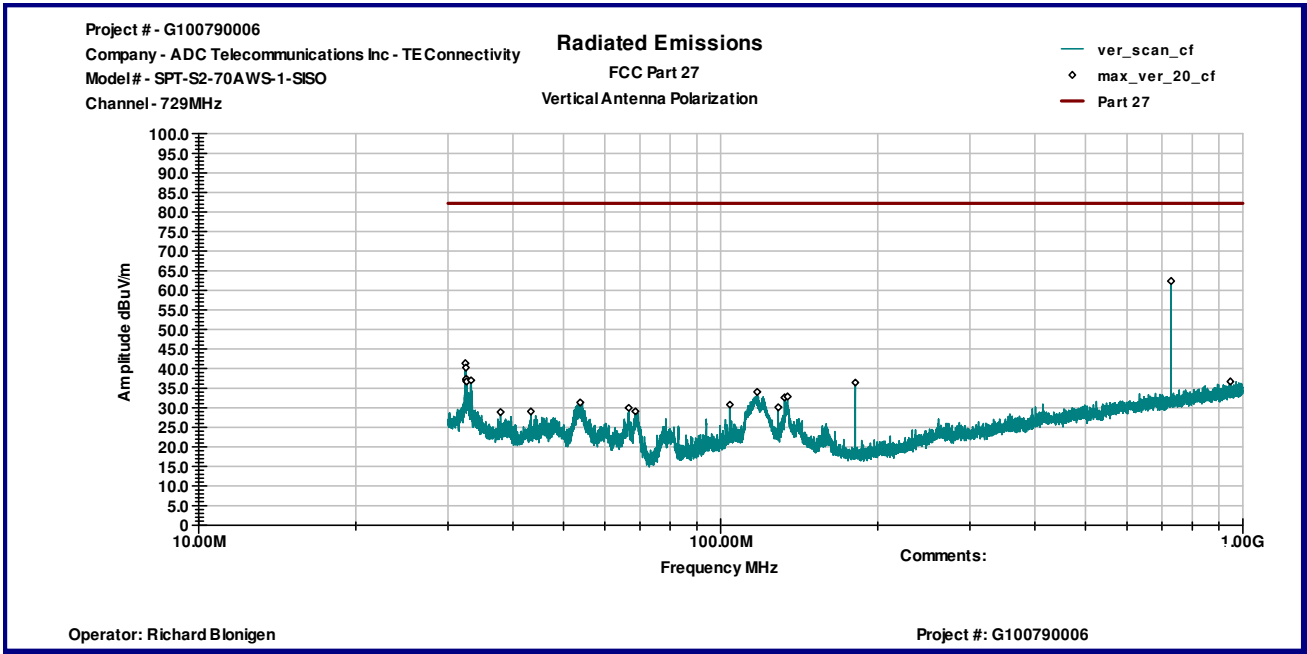


Test Setup Photos

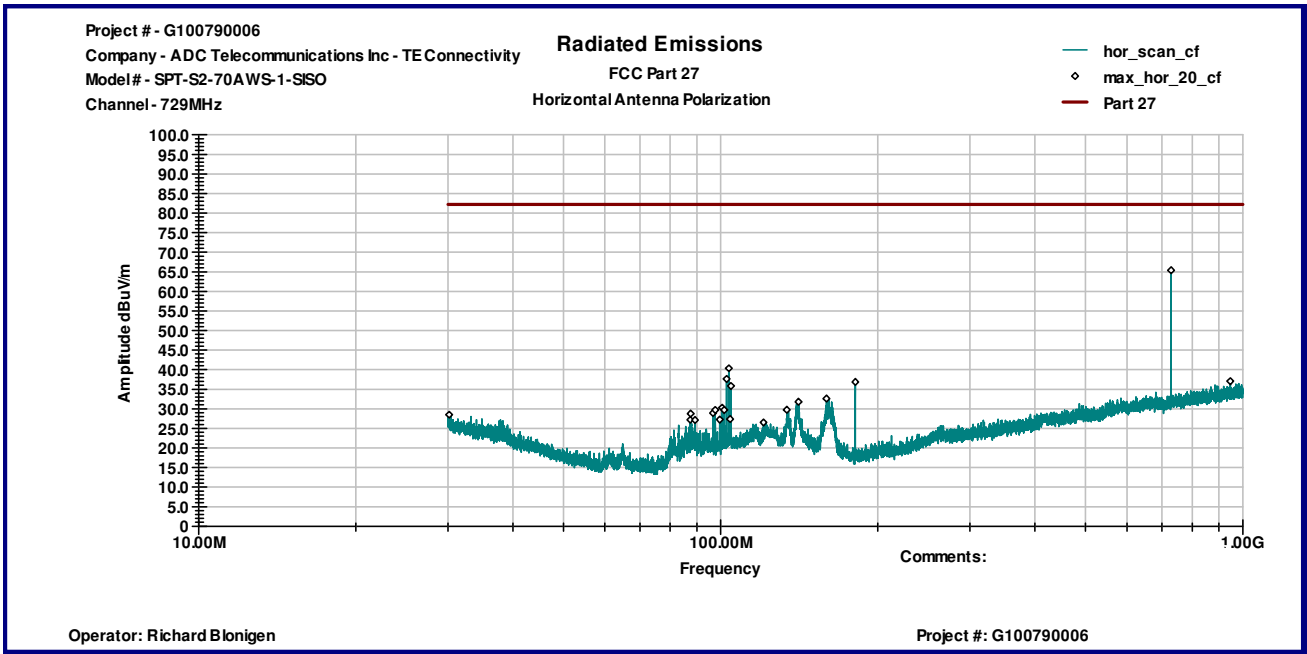
<b>Date:</b>	July 16-20, 2012	<b>Result: Pass</b>
<b>Tested by:</b>	Richard Blonigen	
<b>Standard:</b>	FCC Part 27	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	Channels 728-756MHz Frequency Range 30MHz-10GHz	

**Table 1**

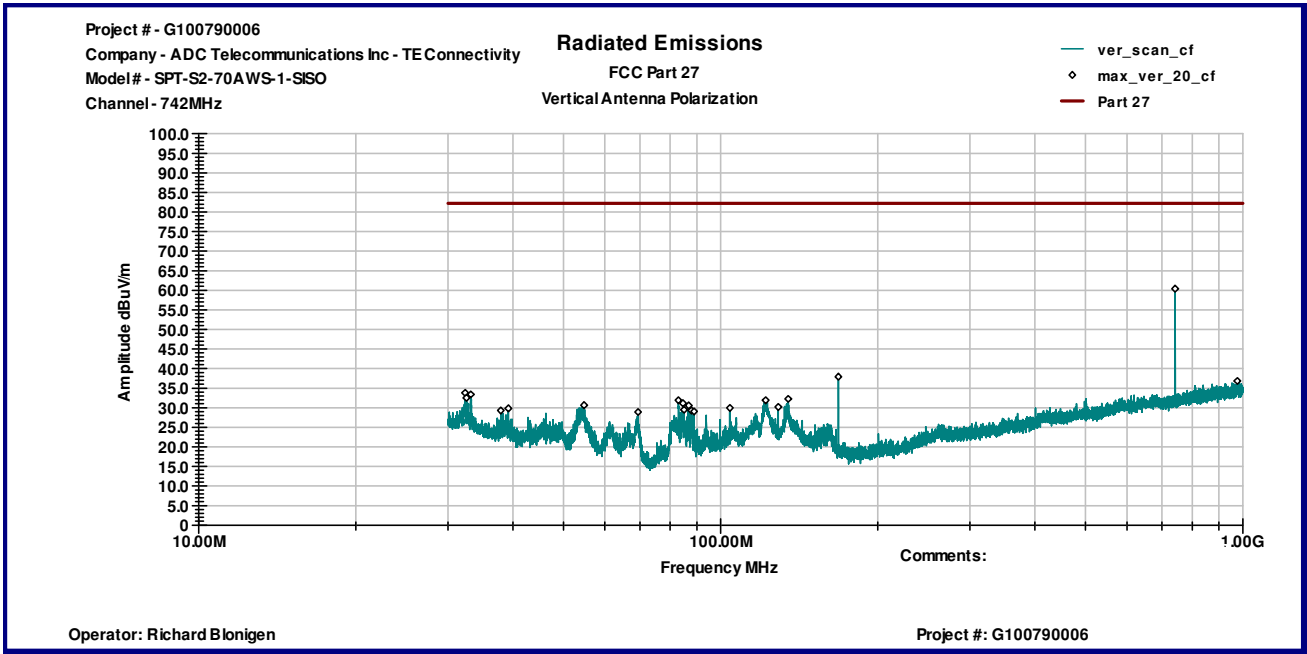
Frequency MHz	Antenna Polarity	Peak Reading dB $\mu$ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB
<b>Channel 729MHz</b>							
32.43 MHz	V	22.4	19.0	0.0	41.3	82.2	-40.9
32.489 MHz	V	21.3	19.0	0.0	40.2	82.2	-42.0
32.559 MHz	V	18.5	18.9	0.0	37.4	82.2	-44.8
33.248 MHz	V	18.5	18.5	0.0	37.0	82.2	-45.2
9.619 GHz	V	52.1	43.9	40.9	55.1	82.2	-27.1
<b>Channel 742MHz</b>							
102.61 MHz	H	24.9	12.8		37.6	82.2	-44.6
103.61 MHz	H	27.5	12.9	0.0	40.3	82.2	-41.9
181.11 MHz	H	25.7	11.1	0.0	36.9	82.2	-45.4
946.71 MHz	H	11.2	25.8	0.0	37.0	82.2	-45.2
2.458 GHz	H	55.8	31.4	43.5	43.7	82.2	-38.5
<b>Channel 756MHz</b>							
32.395 MHz	V	14.8	19.0	0.0	33.8	82.2	-48.4
33.213 MHz	V	14.9	18.6	0.0	33.4	82.2	-48.8
168.09 MHz	V	26.3	11.7	0.0	37.9	82.2	-44.3
976.77 MHz	V	10.7	26.1	0.0	36.8	82.2	-45.4
9.364 GHz	V	52.5	43.7	40.7	55.5	82.2	-26.7
43.617 MHz	H	22.5	13.0	0.0	35.5	82.2	-46.7
93.772 MHz	H	23.3	11.1	0.0	34.4	82.2	-47.8
168.09 MHz	H	23.9	11.7	0.0	35.6	82.2	-46.6
971.7 MHz	H	11.1	26.2	0.0	37.3	82.2	-44.9
9.727 GHz	H	52.0	44.0	41.1	54.9	82.2	-27.3
<b>Channel 756MHz</b>							
32.501 MHz	V	19.4	18.9	0.0	38.3	82.2	-43.9
154.12 MHz	V	26.0	12.4	0.0	38.4	82.2	-43.8
844.43 MHz	V	16.6	25.0	0.0	41.6	82.2	-40.6
1.513 GHz	V	61.3	27.7	43.0	46.0	82.2	-36.3
1.72 GHz	V	52.3	28.7	43.3	37.7	82.2	-44.5
134.04 MHz	H	19.8	13.7	0.0	33.6	82.2	-48.6
154.12 MHz	H	25.8	12.4	0.0	38.2	82.2	-44.0
994.93 MHz	H	11.1	26.4	0.0	37.6	82.2	-44.7
1.513 GHz	H	57.7	27.6	43.0	42.3	82.2	-39.9
8.953 GHz	H	51.0	43.3	40.3	54.0	82.2	-28.2



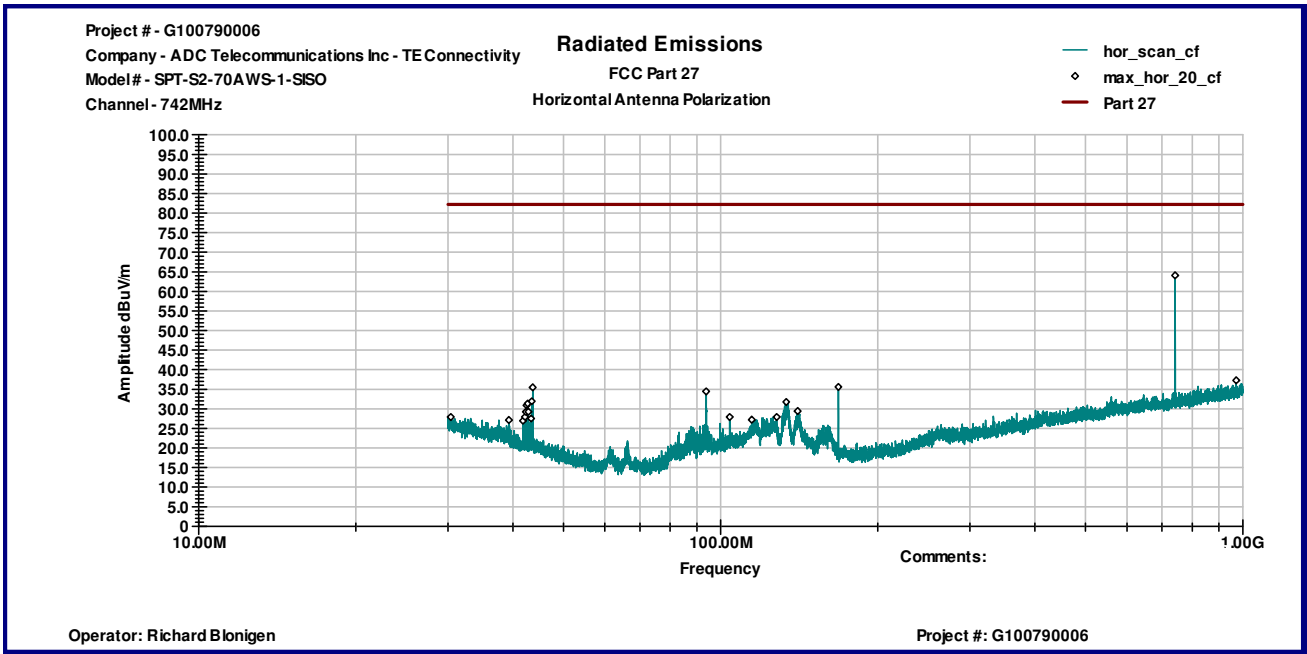
Graph 1



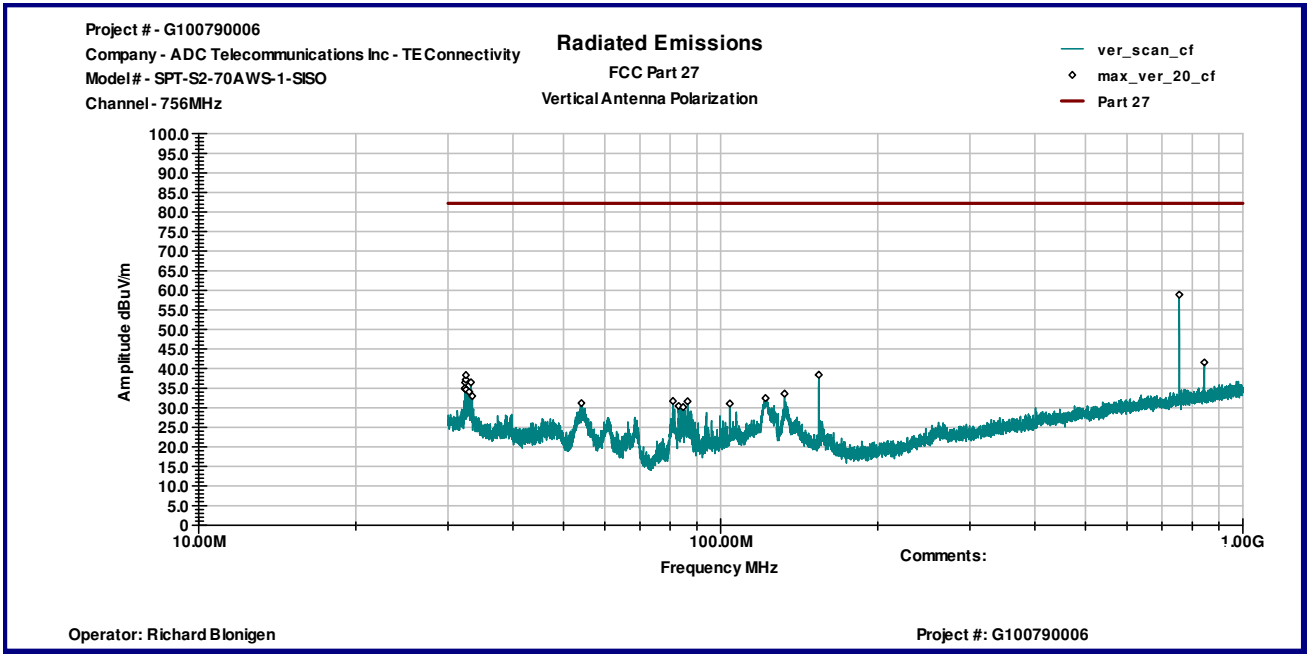
Graph 2



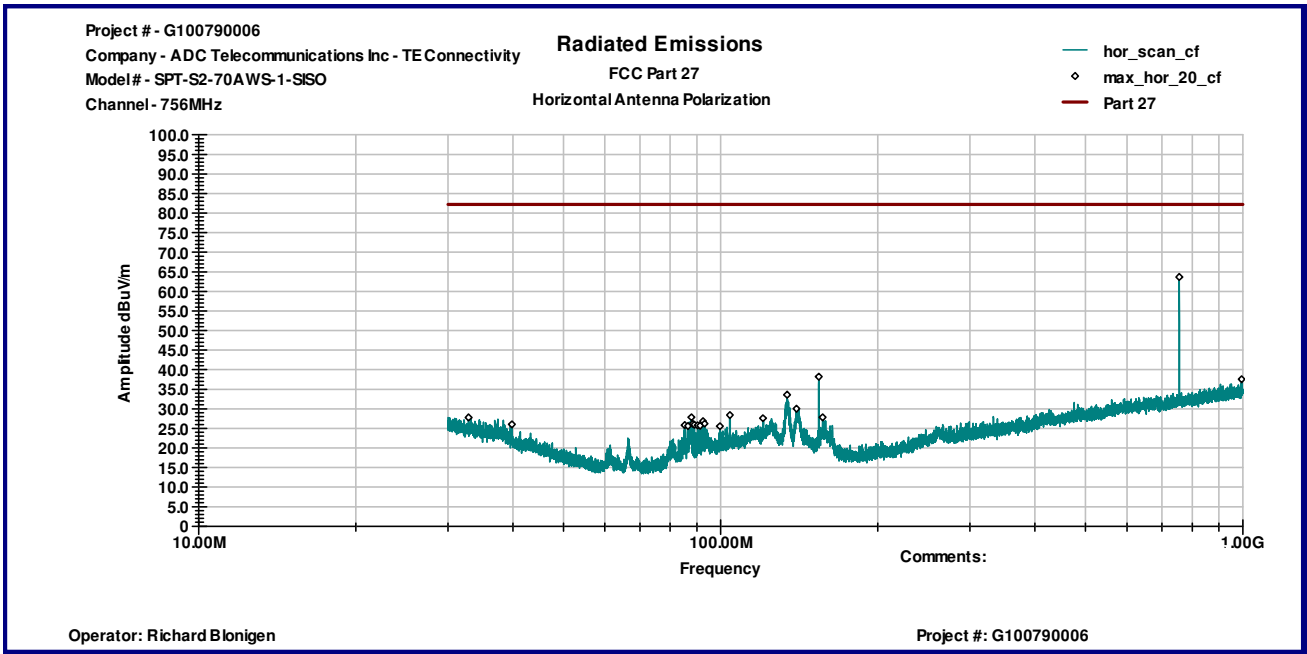
Graph 3



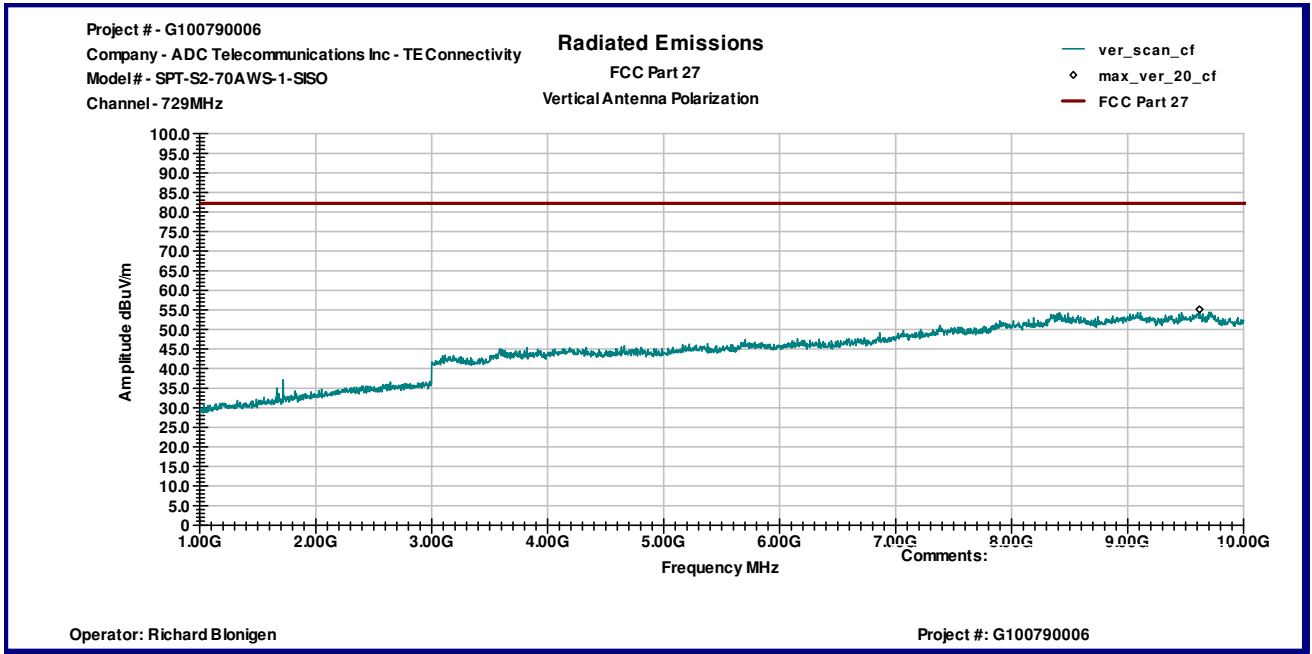
Graph 4



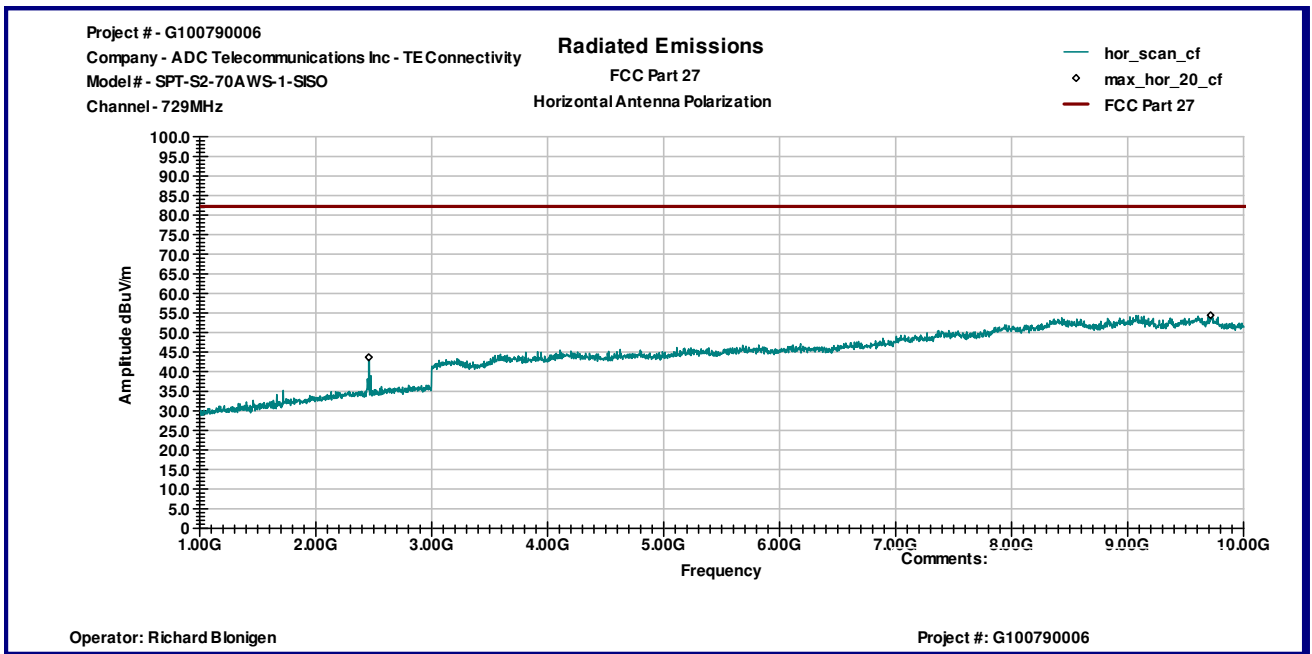
Graph 5



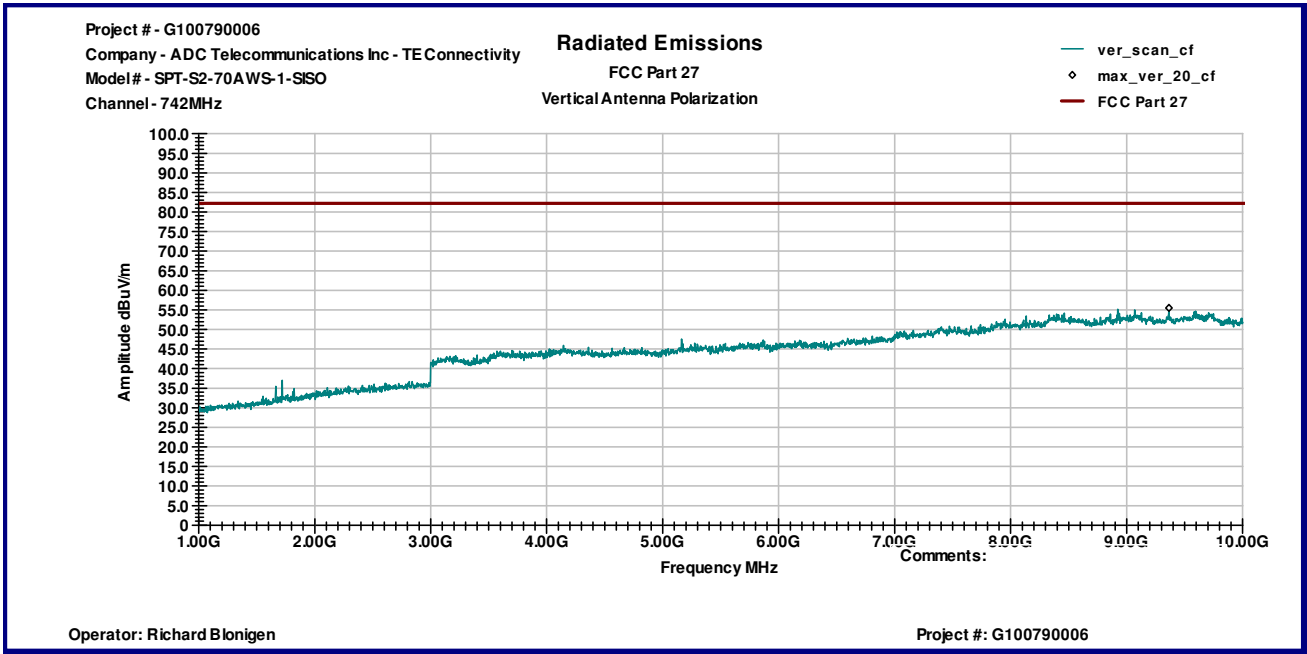
Graph 6



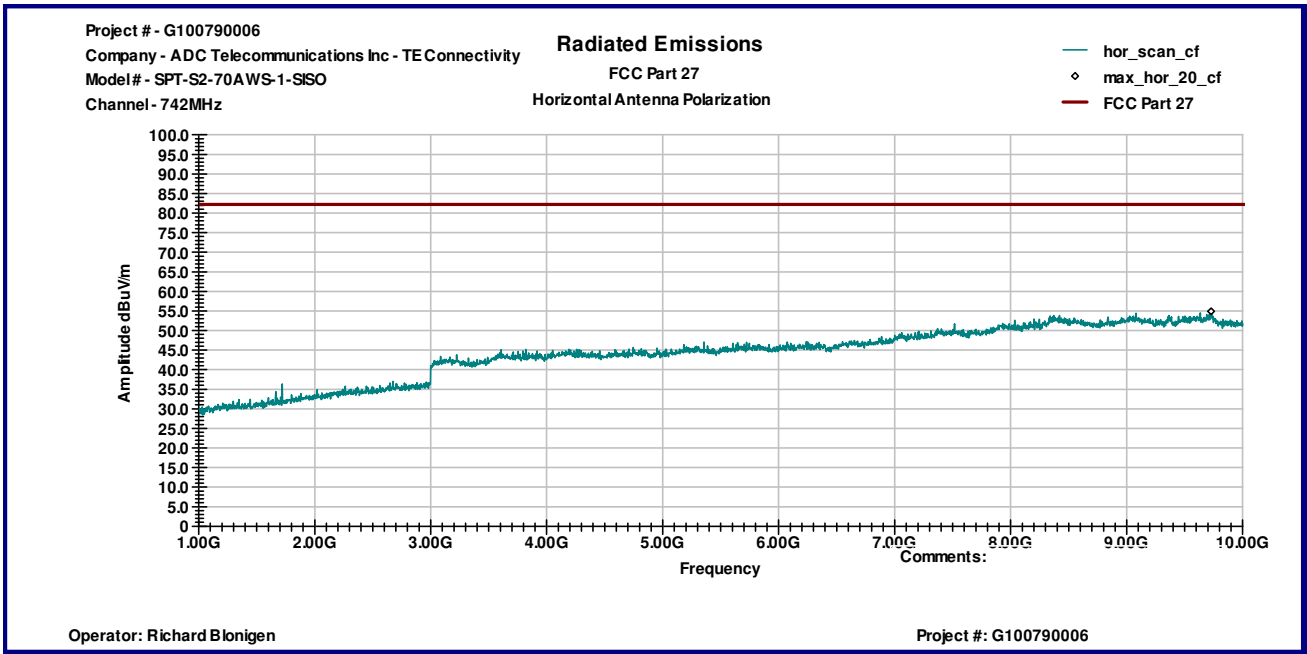
Graph 7



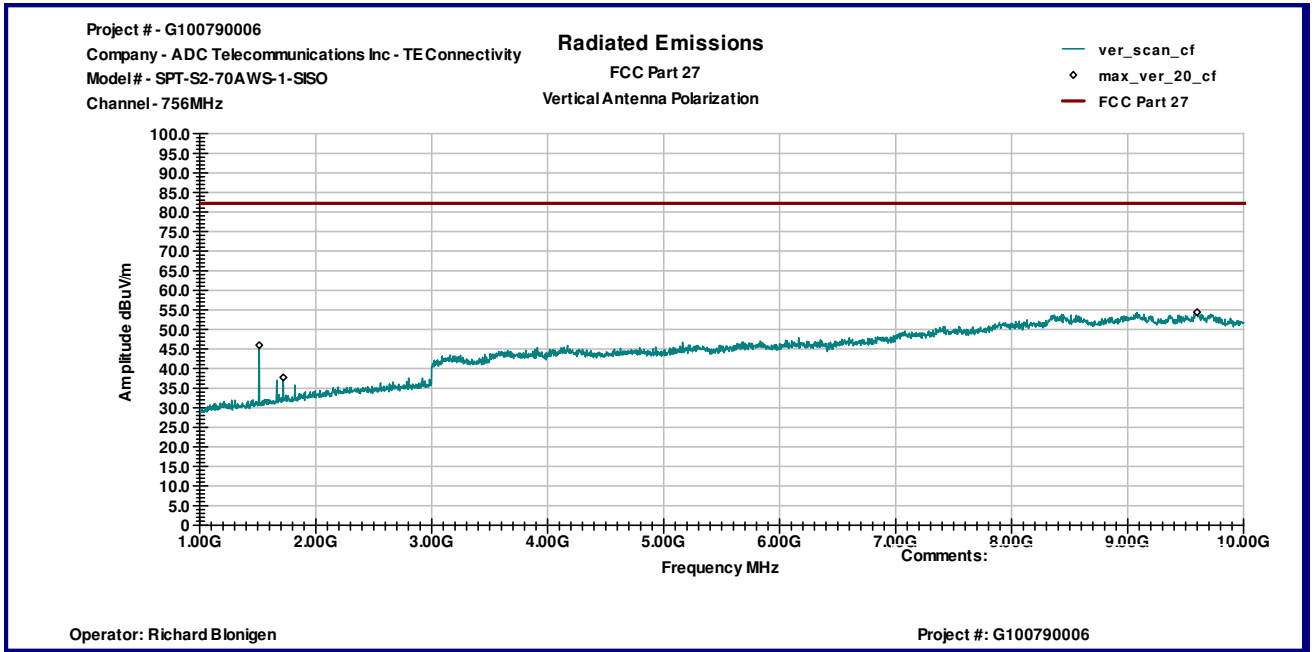
Graph 8



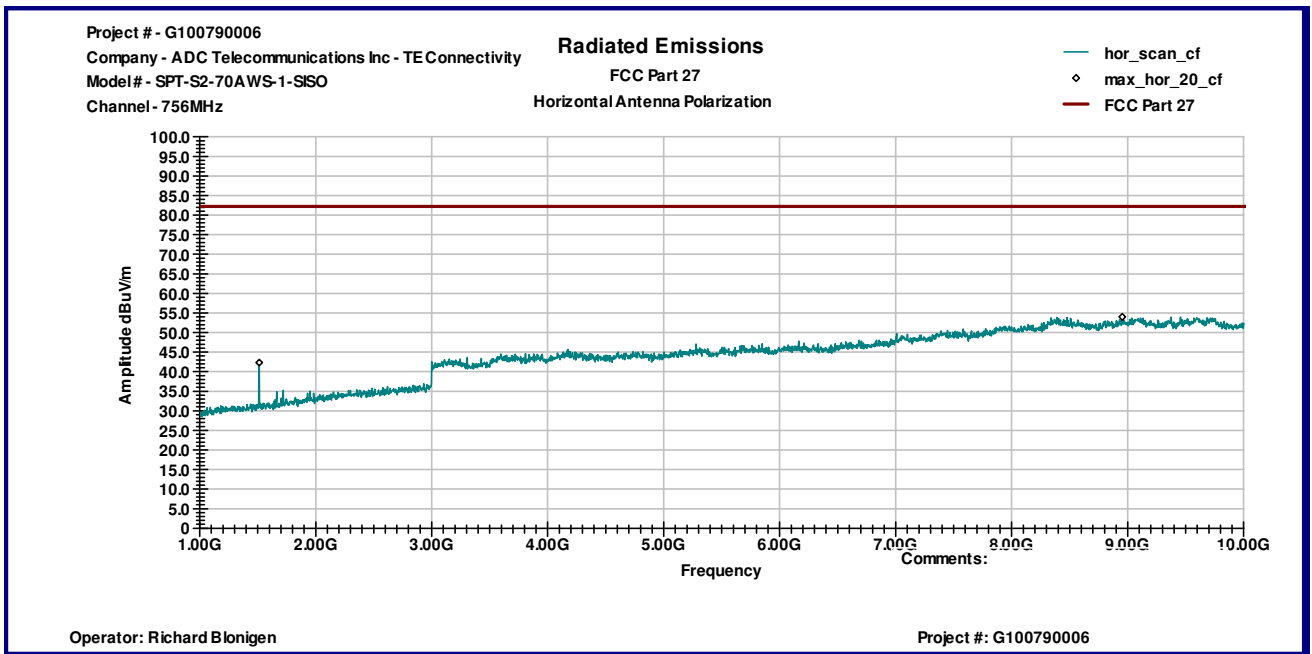
Graph 9



Graph 10



Graph 11



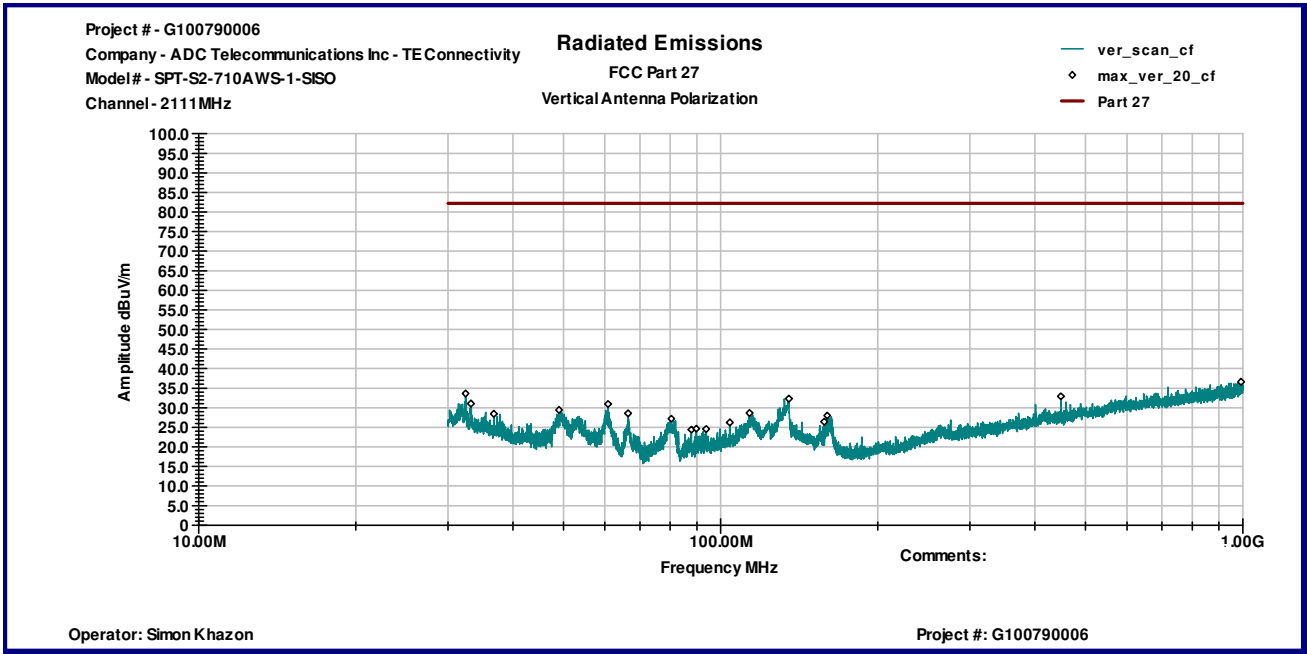
Graph 12



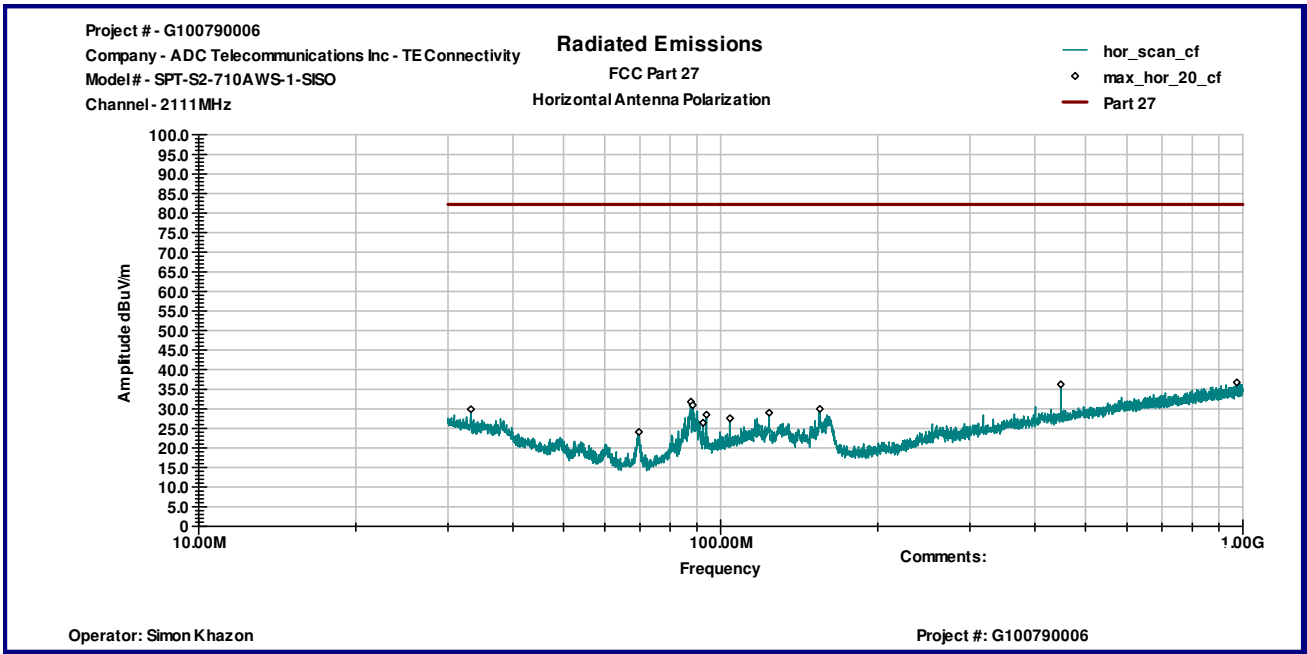
<b>Date:</b>	July 16-20, 2012	<b>Result: Pass</b>
<b>Tested by:</b>	Richard Blonigen	
<b>Standard:</b>	FCC Part 27	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	Channels 2110 – 2155 MHz Frequency Range 30MHz-22GHz	

**Table 2**

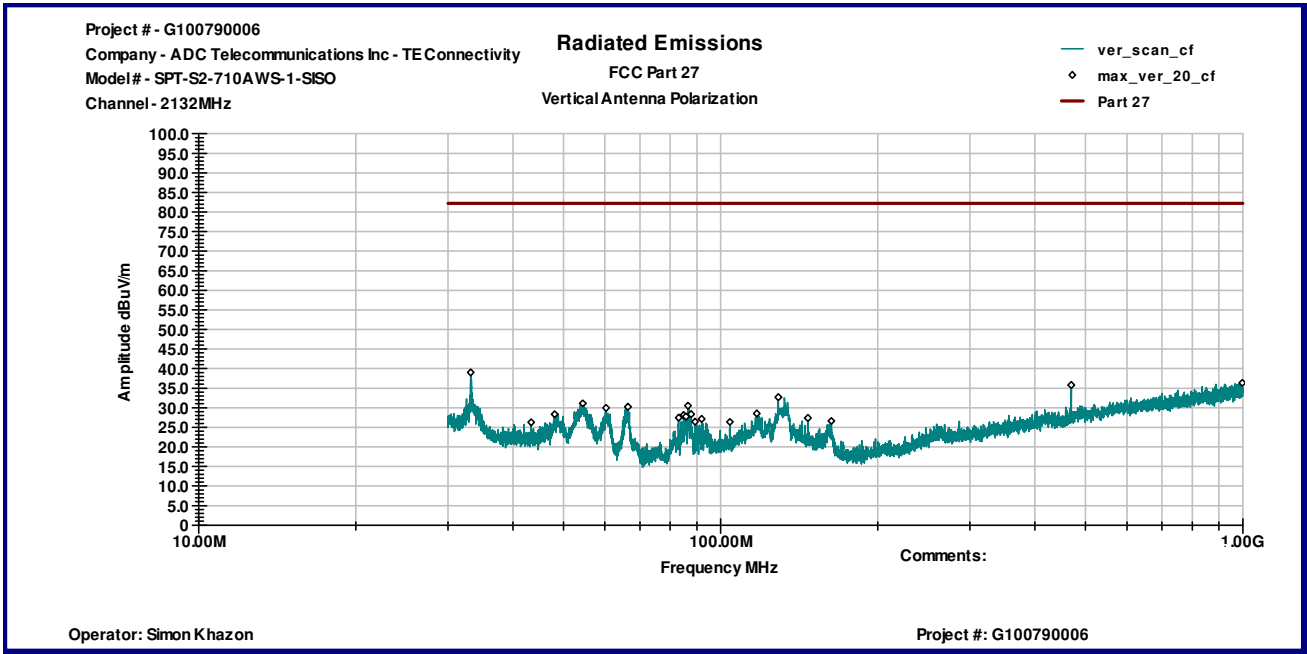
Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
<b>Channel 2111MHz</b>							
32.457 MHz	V	14.6	19.0	0.0	33.6	82.2	-48.6
135.08 MHz	V	18.6	13.7	0.0	32.3	82.2	-49.9
448.45 MHz	V	13.4	19.6	0.0	32.9	82.2	-49.3
992.85 MHz	V	10.2	26.4	0.0	36.6	82.2	-45.6
1.7208 GHz	V	52.4	28.7	43.3	37.9	82.2	-44.3
<b>Channel 2132MHz</b>							
87.689 MHz	H	22.0	9.8	0.0	31.8	82.2	-50.4
88.36 MHz	H	21.1	9.9	0.0	30.9	82.2	-51.3
448.23 MHz	H	16.7	19.6	0.0	36.2	82.2	-46.0
974.54 MHz	H	10.6	26.2	0.0	36.7	82.2	-45.5
1.7208 GHz	H	54.2	28.6	43.3	39.5	82.2	-42.7
<b>Channel 2154MHz</b>							
33.194 MHz	V	20.5	18.6	0.0	39.0	82.2	-43.2
469.33 MHz	V	15.6	20.2	0.0	35.8	82.2	-46.4
998.52 MHz	V	9.9	26.4	0.0	36.3	82.2	-45.9
1.7208 GHz	V	52.5	28.7	43.3	37.9	82.2	-44.3
4.264 GHz	V	54.9	36.7	42.6	48.9	82.2	-33.3
86.57 MHz	H	29.9	9.6	0.0	39.5	82.2	-42.7
162.72 MHz	H	40.3	11.9	0.0	52.2	82.2	-30.0
164.65 MHz	H	27.7	11.8	0.0	39.4	82.2	-42.8
981.61 MHz	H	11.4	26.1	0.0	37.5	82.2	-44.7
1.7208 GHz	H	53.6	28.6	43.3	39.0	82.2	-43.2
<b>Channel 2154MHz</b>							
33.211 MHz	V	15.8	18.6	0.0	34.3	82.2	-47.9
132.5 MHz	V	18.5	13.8	0.0	32.3	82.2	-49.9
491.32 MHz	V	18.6	20.8	0.0	39.4	82.2	-42.8
945.78 MHz	V	11.5	25.8	0.0	37.3	82.2	-44.9
4.3082 GHz	V	58.1	36.7	42.5	52.2	82.2	-30.0
85.003 MHz	H	26.6	9.4	0.0	36.0	82.2	-46.2
86.495 MHz	H	28.1	9.6	0.0	37.7	82.2	-44.5
491.52 MHz	H	15.8	20.8	0.0	36.6	82.2	-45.6
942.71 MHz	H	11.5	25.8	0.0	37.2	82.2	-45.0
1.7208 GHz	H	54.1	28.6	43.3	39.5	82.2	-42.7



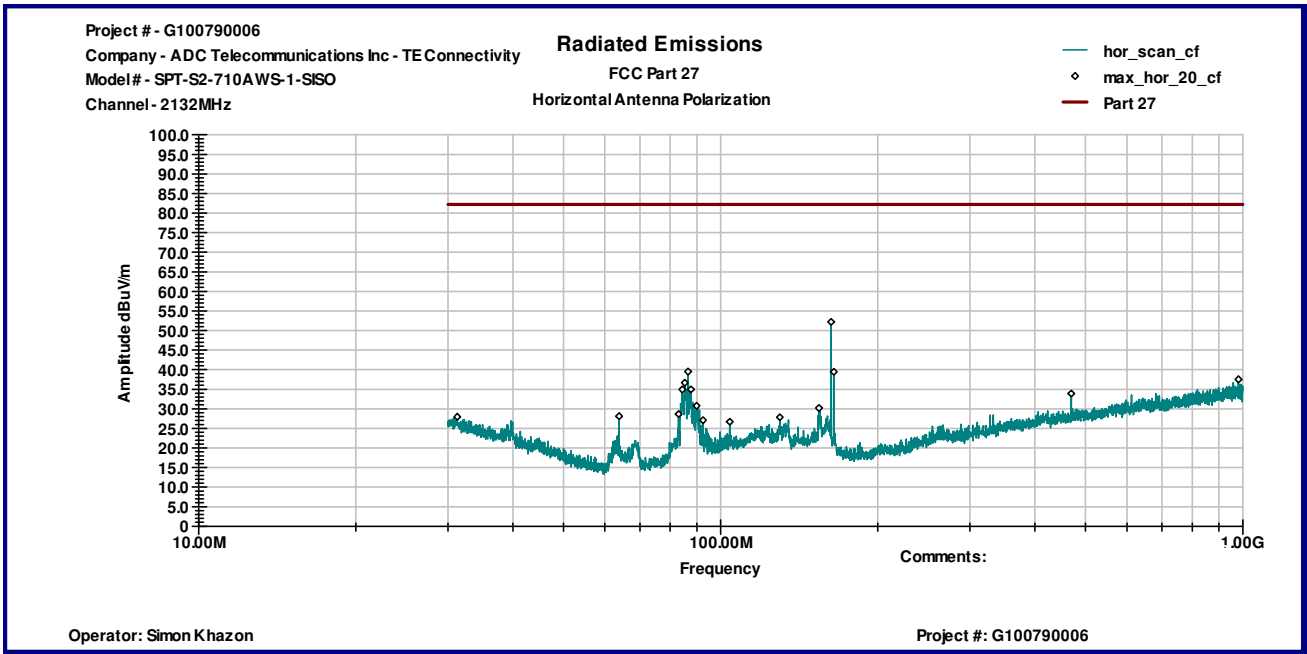
**Graph 13**



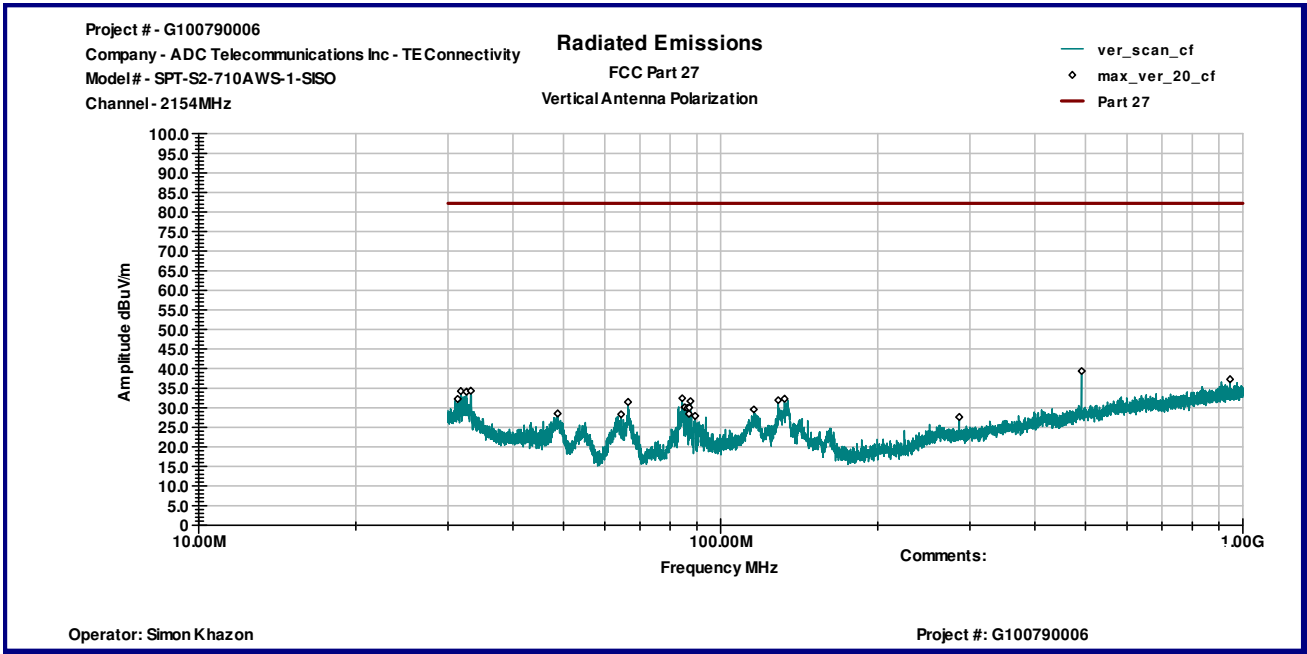
**Graph 14**



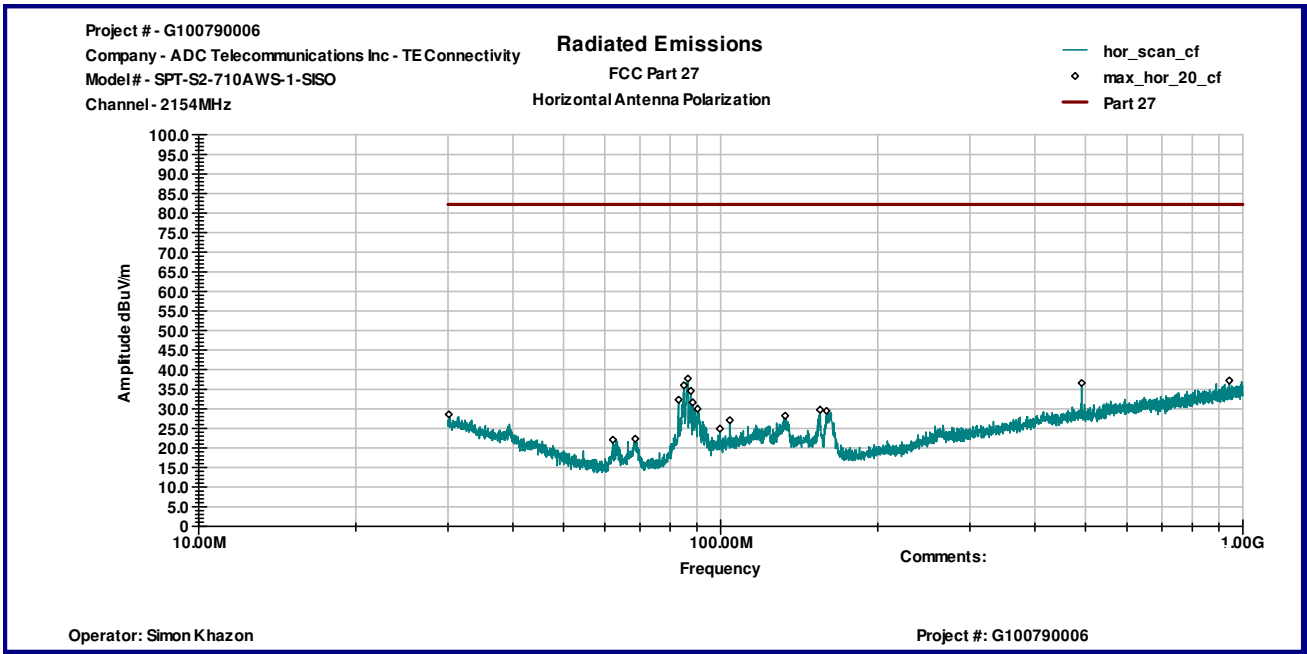
Graph 15



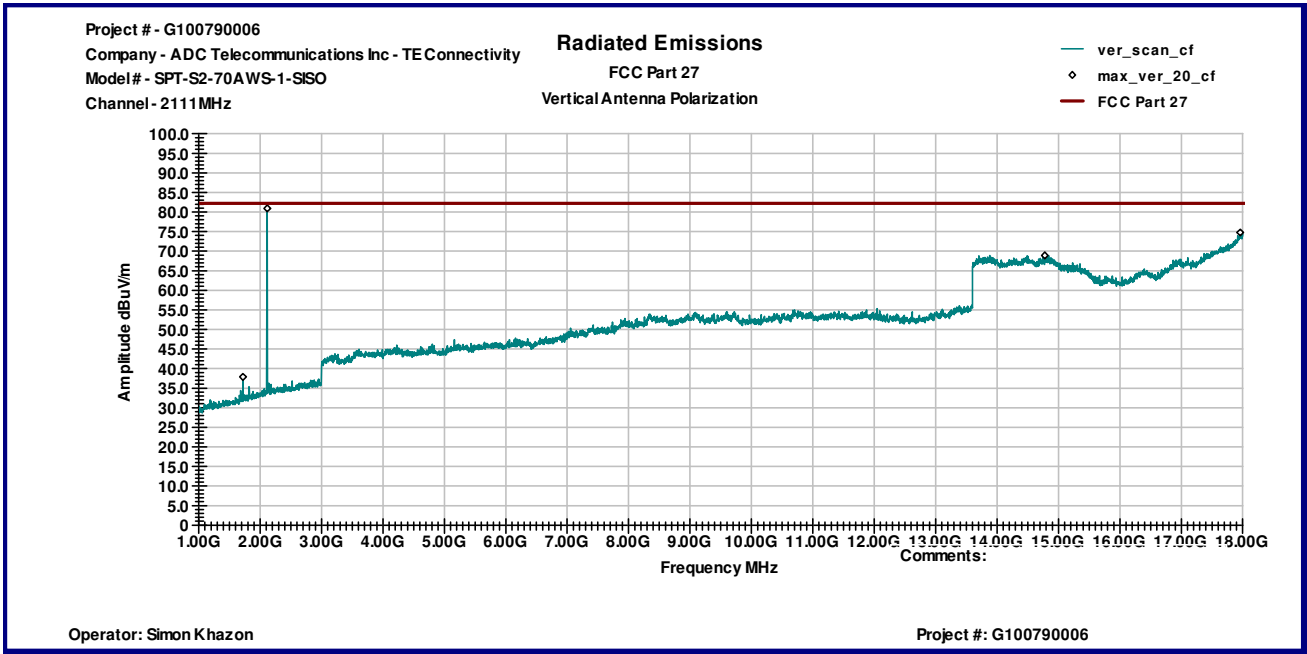
Graph 16



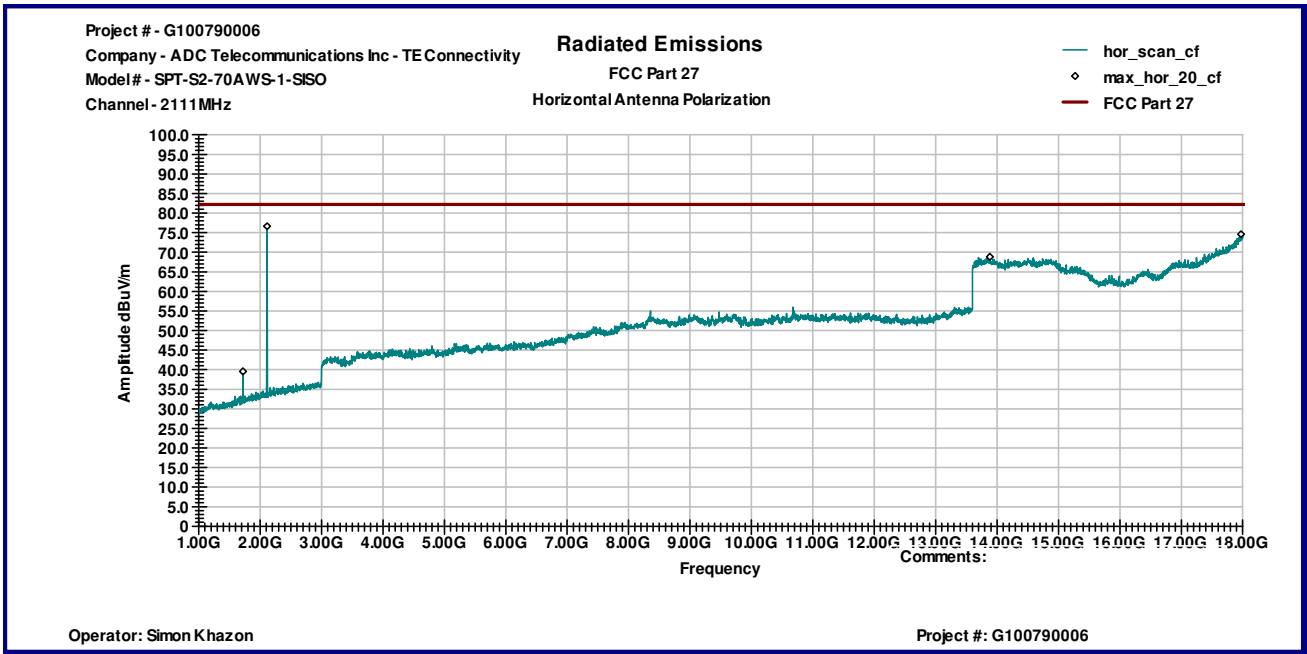
Graph 17



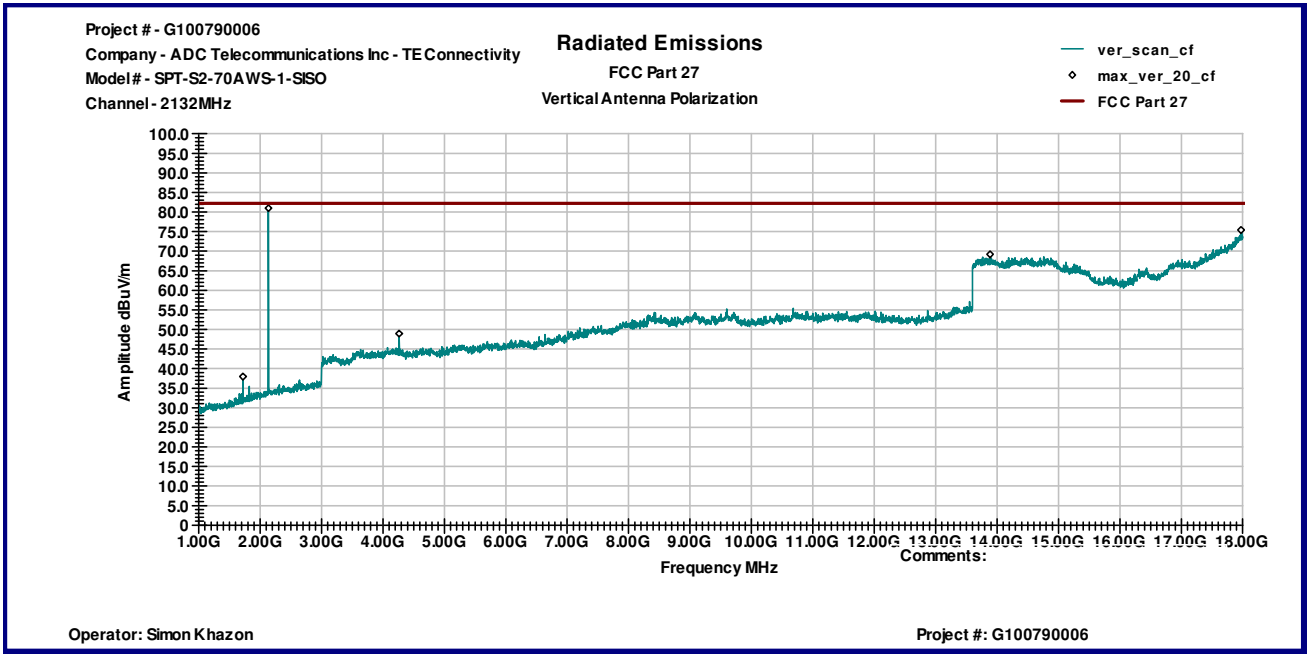
Graph 18



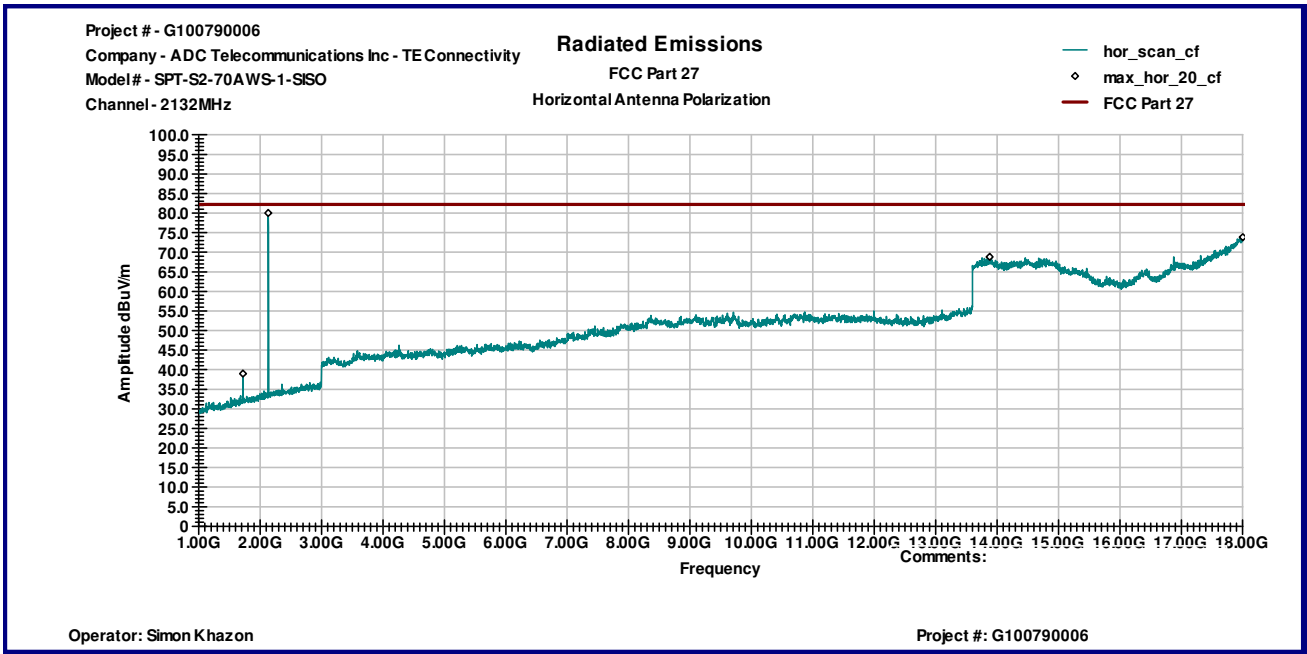
**Graph 19**



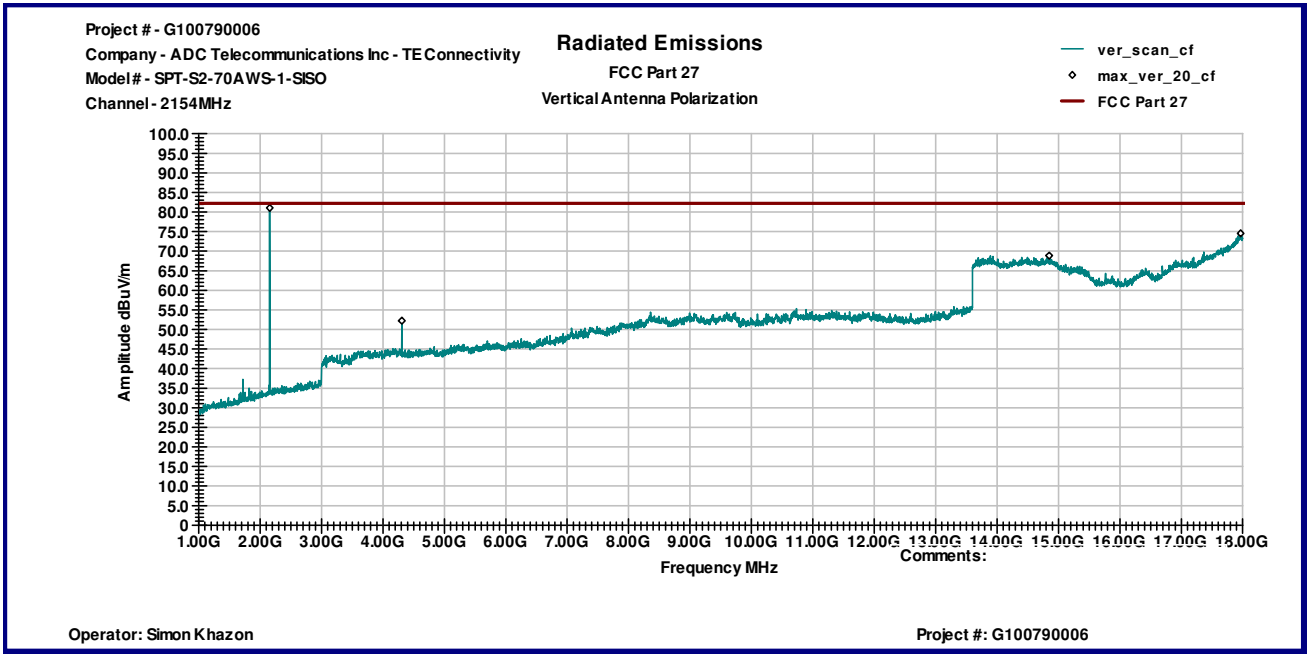
**Graph 20**



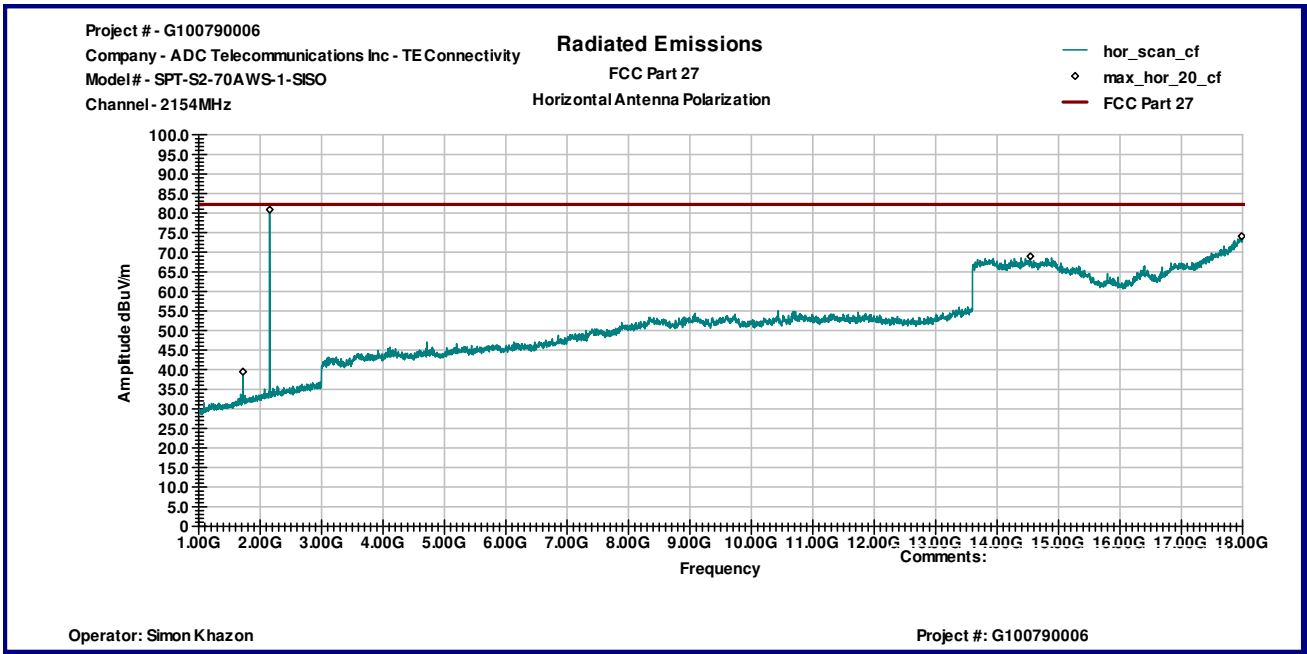
**Graph 21**



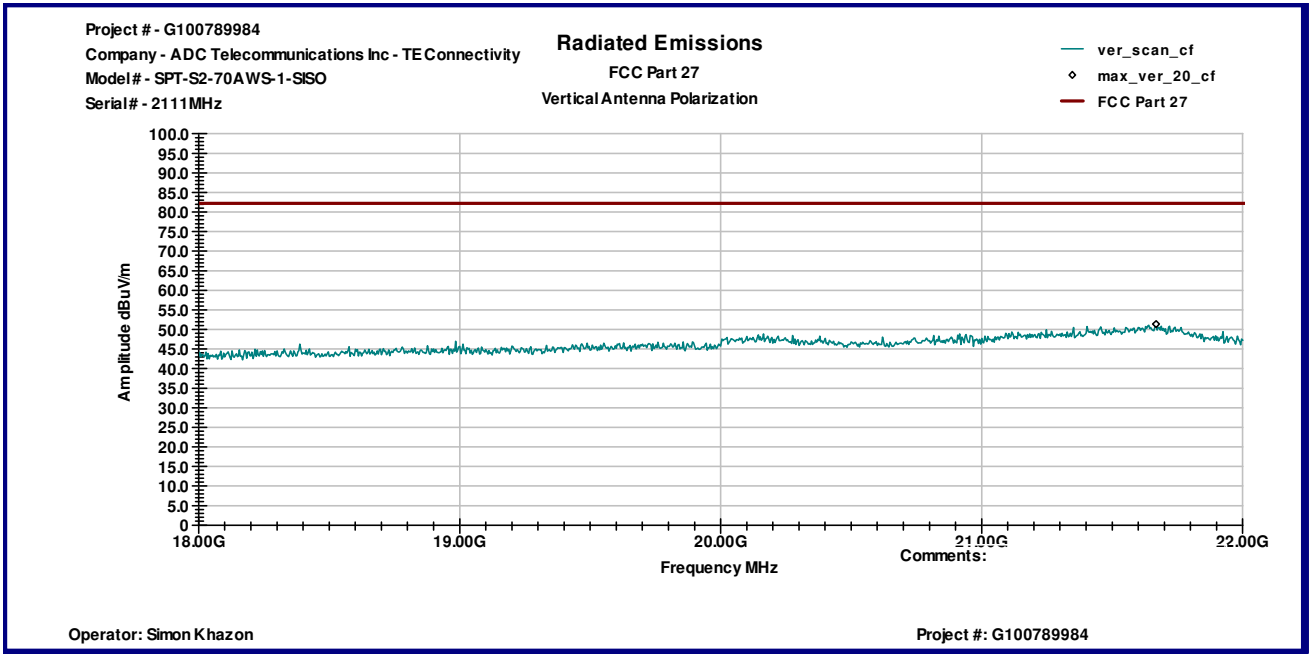
**Graph 22**



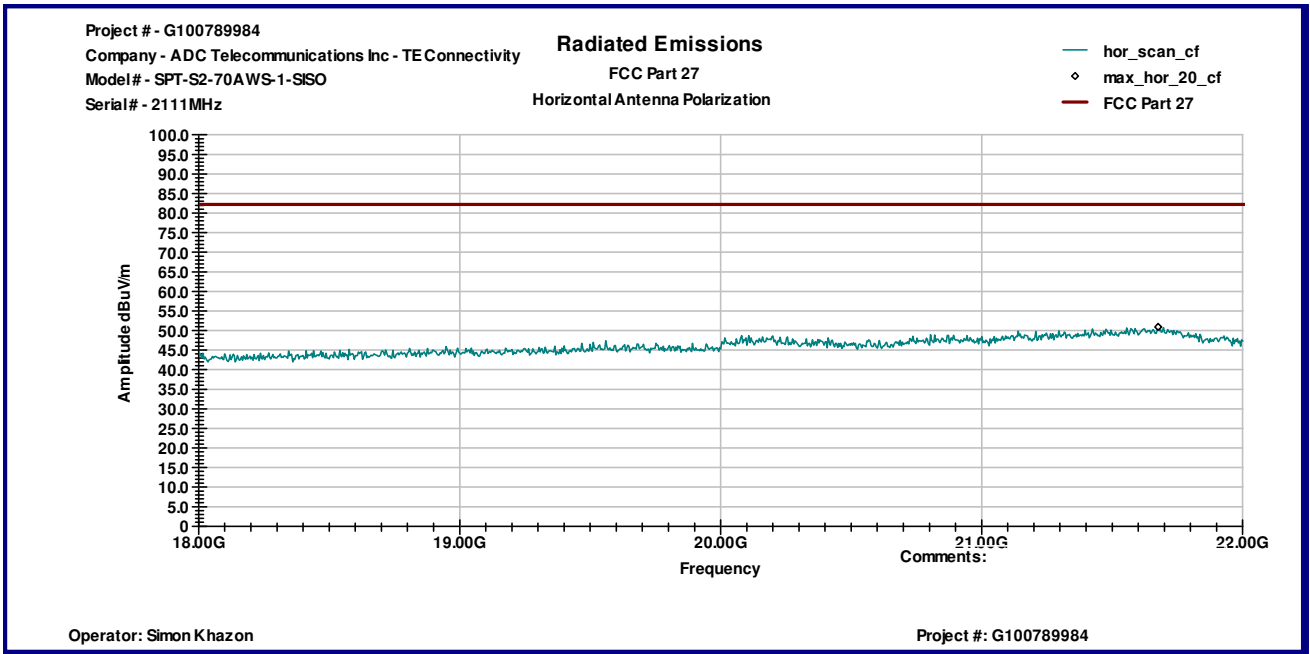
**Graph 23**



**Graph 24**

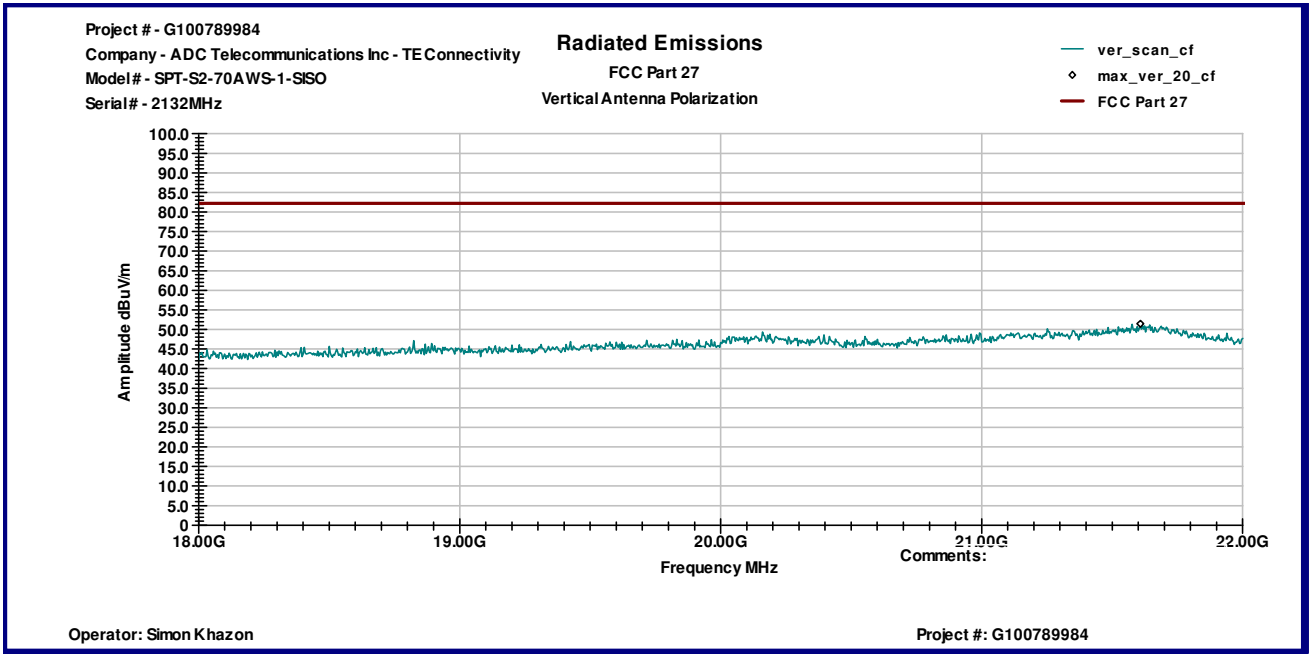


Graph 25

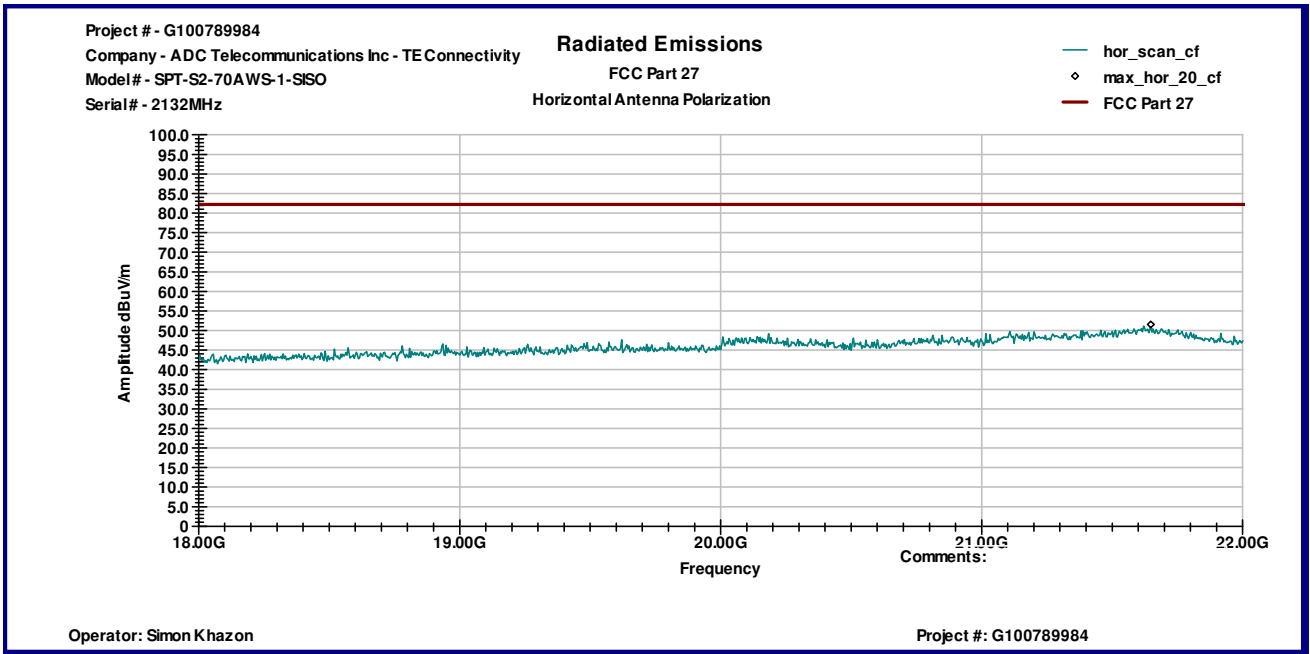


Graph 26

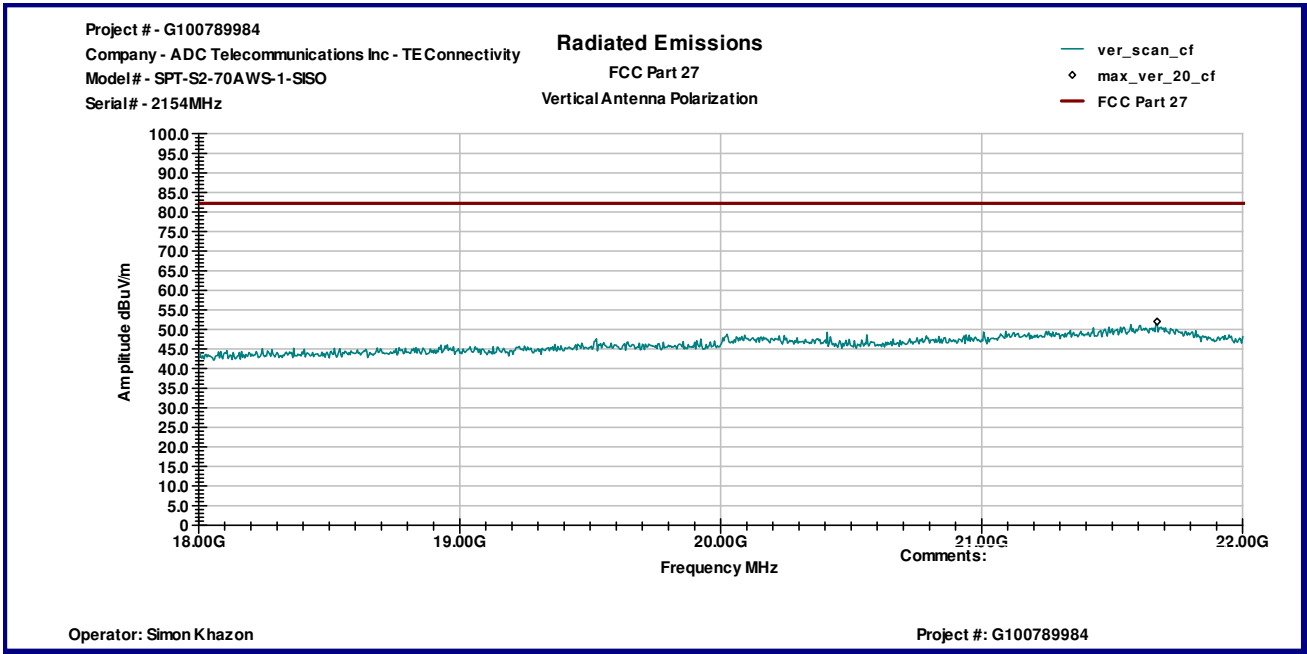




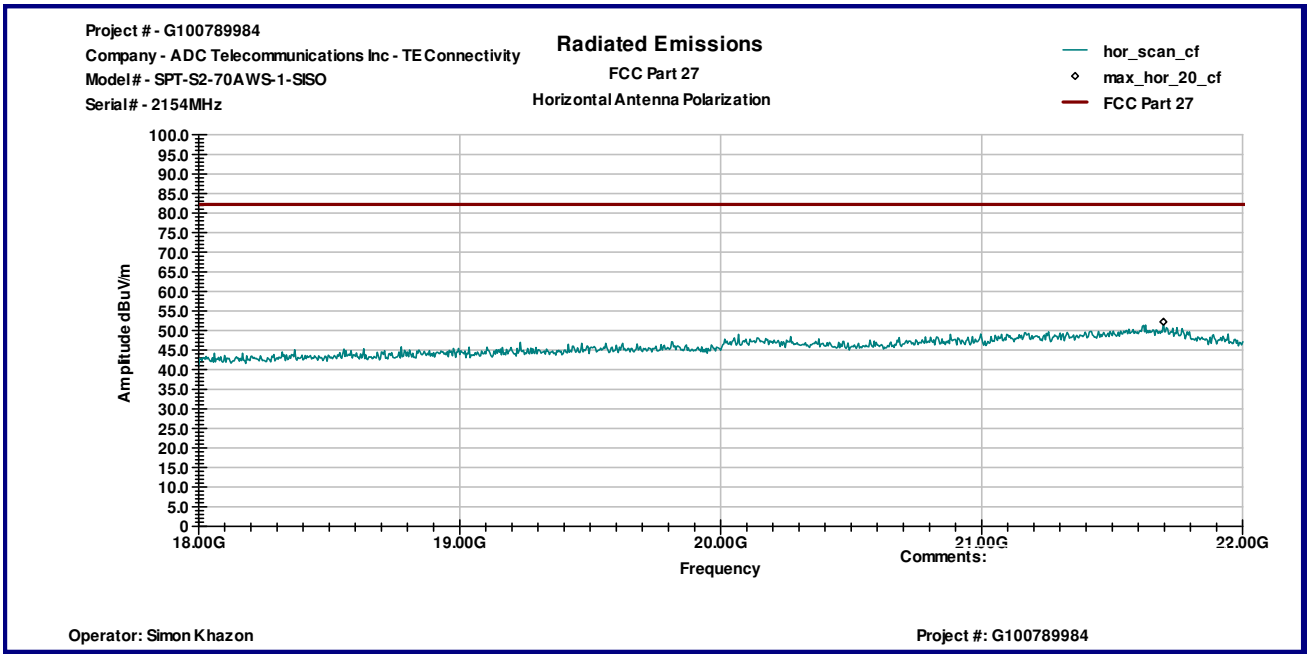
Graph 27



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	ESU	100398	25283	12/09/2012	<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	9507-4513	9936	05/16/2013	<input checked="" type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	10/31/2012	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1402232	172081	10/31/2012	<input checked="" type="checkbox"/>
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>

