



TEST REPORT

Report Number: 100790007MIN-001

Project Number: G100790007

Testing performed on the
Spectrum 800p1/AWSp1 SRAU

to

47 CFR, Part 27:2010, Enclosure Spurious Radiated Emissions
47 CFR, Part 90:2010, Enclosure Spurious Radiated Emissions

For

ADC Telecommunications Inc. - a TE Connectivity Company

Test Performed by:
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Test Authorized by:
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Company
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Date: July 24, 2012

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Date: July 24, 2012

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1.0 DESCRIPTION OF THE SAMPLE (EUT)

Model:	Spectrum 800p1/AWSp1 SRAU : SPT-S1-80AWS-1
Type of EUT:	Repeater / Booster
Operating Frequency Range:	851 – 869 MHz (SMR band) 2110 – 2155 MHz (AWS band)
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 checked="" type="checkbox"/> 47 CFR, Part 90:2010, 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:	July 16, 2012
Test Work Started:	July 23, 2012
Test Work Completed:	July 24, 2012
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
Part 90	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 852MHz, 860MHz, and 868MHz at 24dBm 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

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

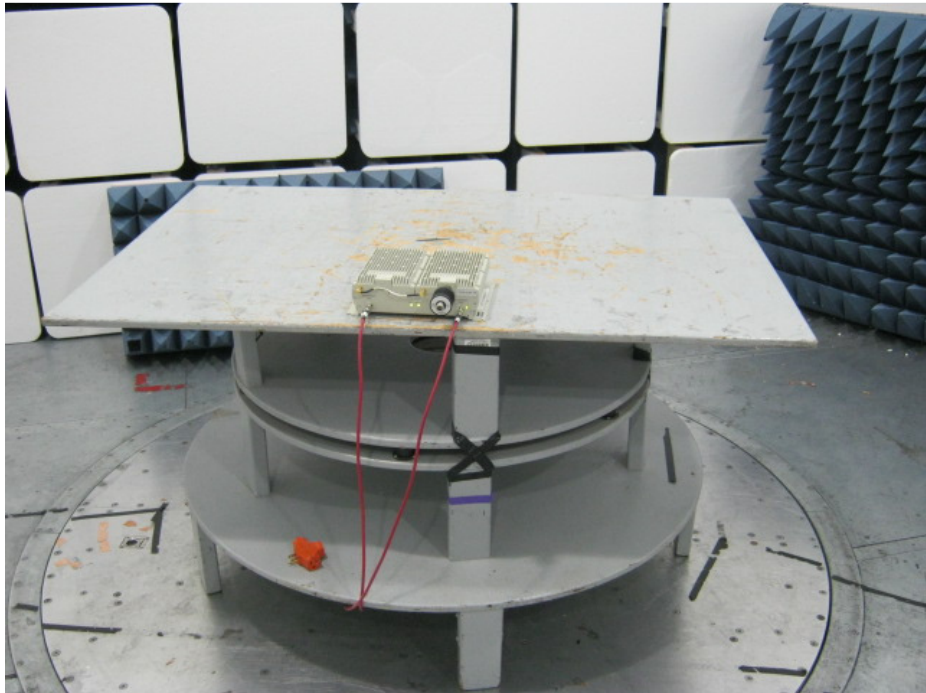
Test distance: 10 meters 3 meters

Test result: **Pass**

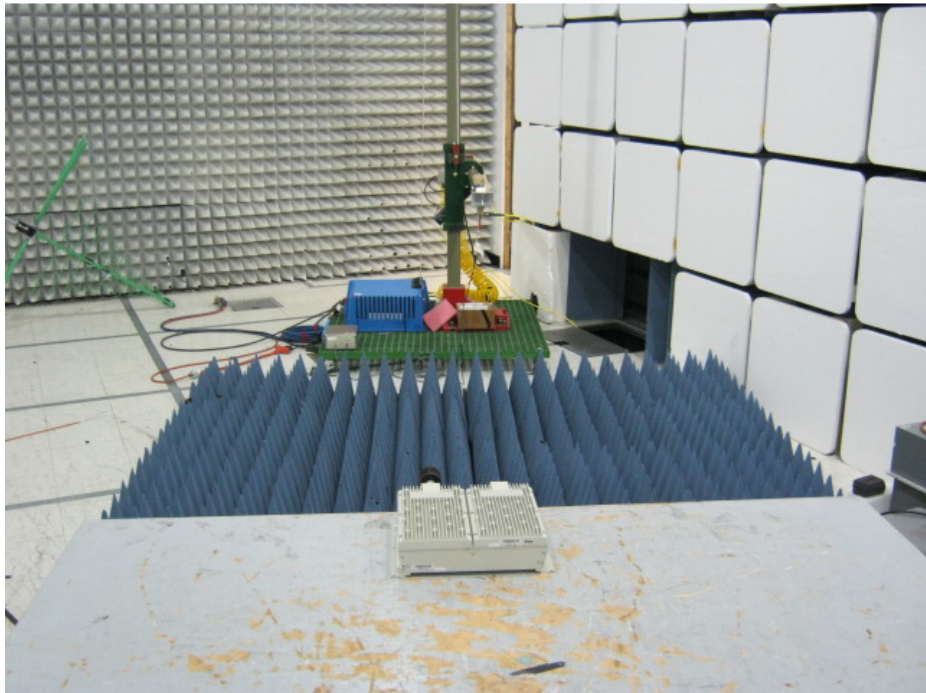
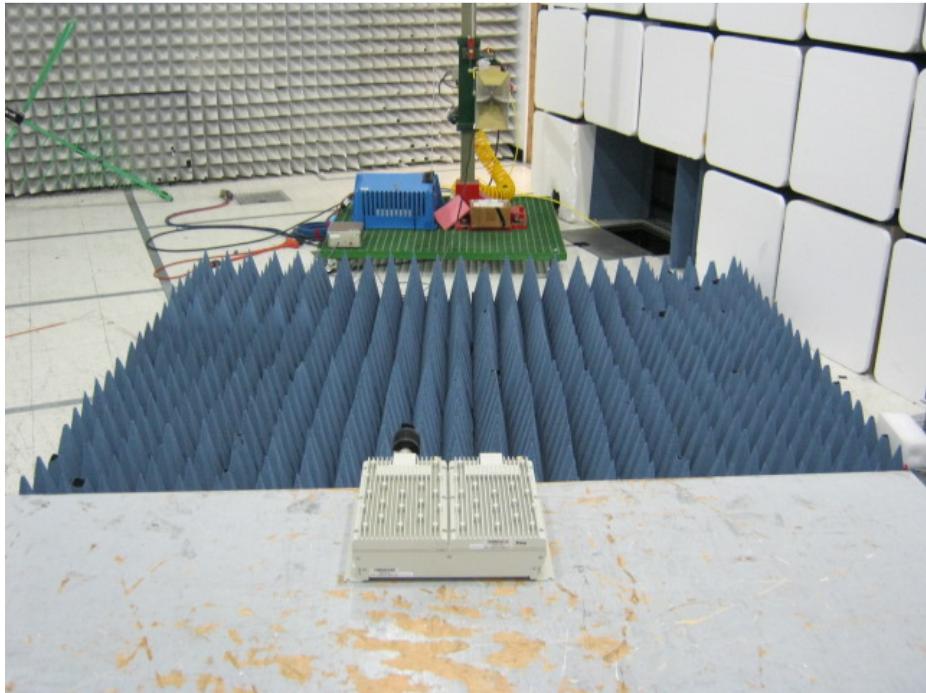
Frequency range: 30MHz-10GHz (SMR Band)
30MHz-22GHz (AWS Band)

Max. Emissions margin: 22.4 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 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

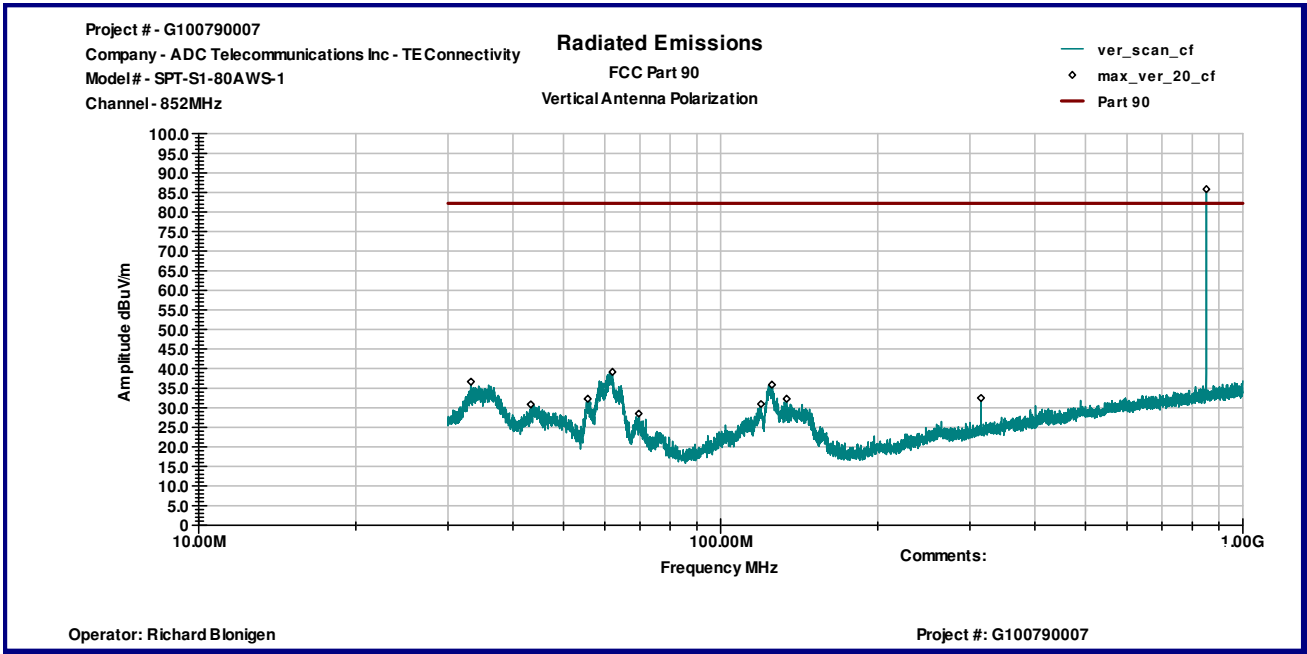


Test Setup Photos

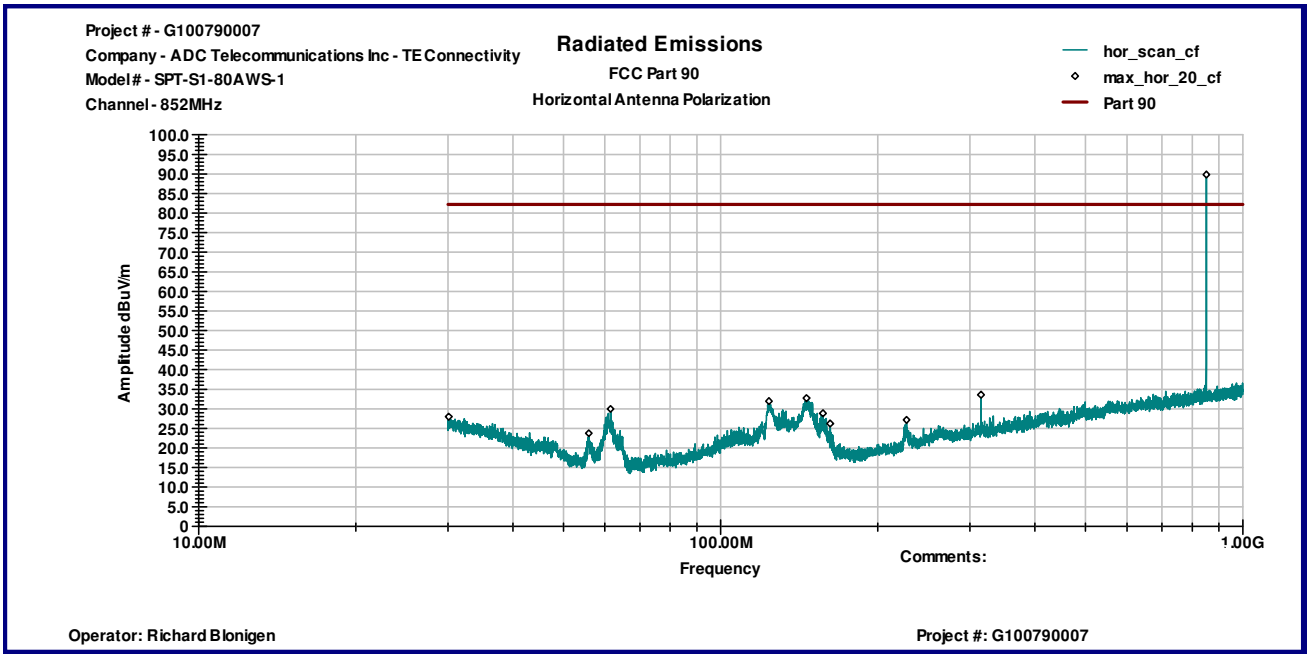
Date:	July 23-24, 2012	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC Part 90	
Test Point:	Enclosure	
Operation mode:	See page 5	
Note:	Channels 851 – 869MHz Frequency Range 30MHz-10GHz	

Table 1

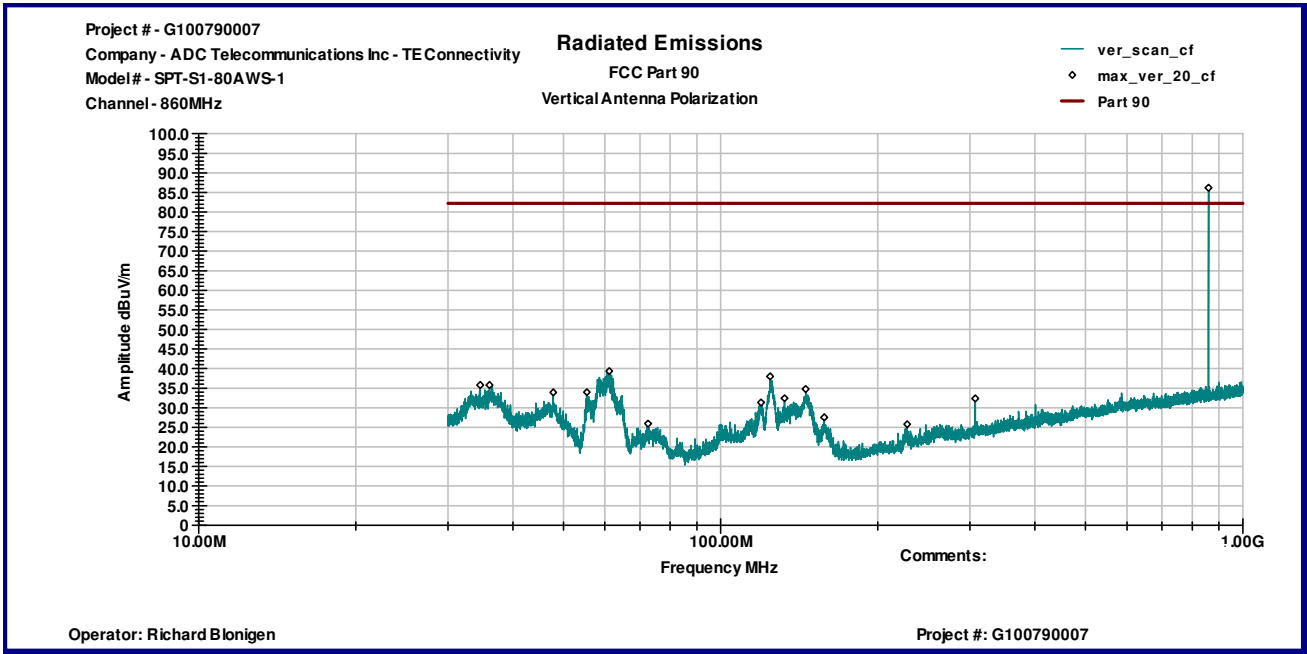
Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
Channel 852MHz							
62.036 MHz	V	32.1	7.1	0.0	39.1	82.2	-43.1
1.705 GHz	V	63.6	28.6	43.2	49.0	82.2	-33.2
2.554 GHz	V	58.2	31.8	43.5	46.5	82.2	-35.7
3.409 GHz	V	62.2	34.7	43.6	53.3	82.2	-28.9
4.258 GHz	V	59.3	36.7	42.6	53.3	82.2	-28.9
Channel 858MHz							
315.27 MHz	H	17.2	16.4	0.0	33.6	82.2	-48.6
1.705 GHz	H	60.7	28.5	43.2	45.9	82.2	-36.3
2.554 GHz	H	57.1	31.7	43.5	45.3	82.2	-36.9
3.409 GHz	H	63.8	34.5	43.6	54.7	82.2	-27.5
4.258 GHz	H	57.5	36.5	42.6	51.4	82.2	-30.8
Channel 860MHz							
61.146 MHz	V	32.2	7.1	0.0	39.4	82.2	-42.9
124.39 MHz	V	24.0	14.0	0.0	38.0	82.2	-44.2
1.72 GHz	V	64.7	28.7	43.3	50.2	82.2	-32.1
3.442 GHz	V	60.7	34.8	43.6	51.9	82.2	-30.3
4.3 GHz	V	56.6	36.7	42.6	50.7	82.2	-31.5
Channel 866MHz							
145.7 MHz	H	19.8	13.0	0.0	32.9	82.2	-49.3
1.72 GHz	H	61.6	28.6	43.3	46.9	82.2	-35.3
2.578 GHz	H	60.0	31.8	43.5	48.3	82.2	-33.9
3.442 GHz	H	61.2	34.6	43.6	52.2	82.2	-30.0
4.3 GHz	H	60.0	36.5	42.6	54.0	82.2	-28.3
Channel 868MHz							
35.071 MHz	V	17.4	17.5	0.0	34.9	82.2	-47.3
60.395 MHz	V	30.7	7.1	0.0	37.8	82.2	-44.4
125.79 MHz	V	23.2	13.9	0.0	37.2	82.2	-45.0
1.738 GHz	V	61.2	28.8	43.3	46.7	82.2	-35.5
4.339 GHz	V	65.6	36.7	42.5	59.8	82.2	-22.4
Channel 874MHz							
125.02 MHz	H	17.8	14.0	0.0	31.8	82.2	-50.4
143.95 MHz	H	18.9	13.1	0.0	32.0	82.2	-50.2
299.45 MHz	H	13.2	15.9	0.0	29.1	82.2	-53.1
1.738 GHz	H	59.6	28.7	43.3	45.0	82.2	-37.2
4.339 GHz	H	65.2	36.5	42.5	59.3	82.2	-23.0



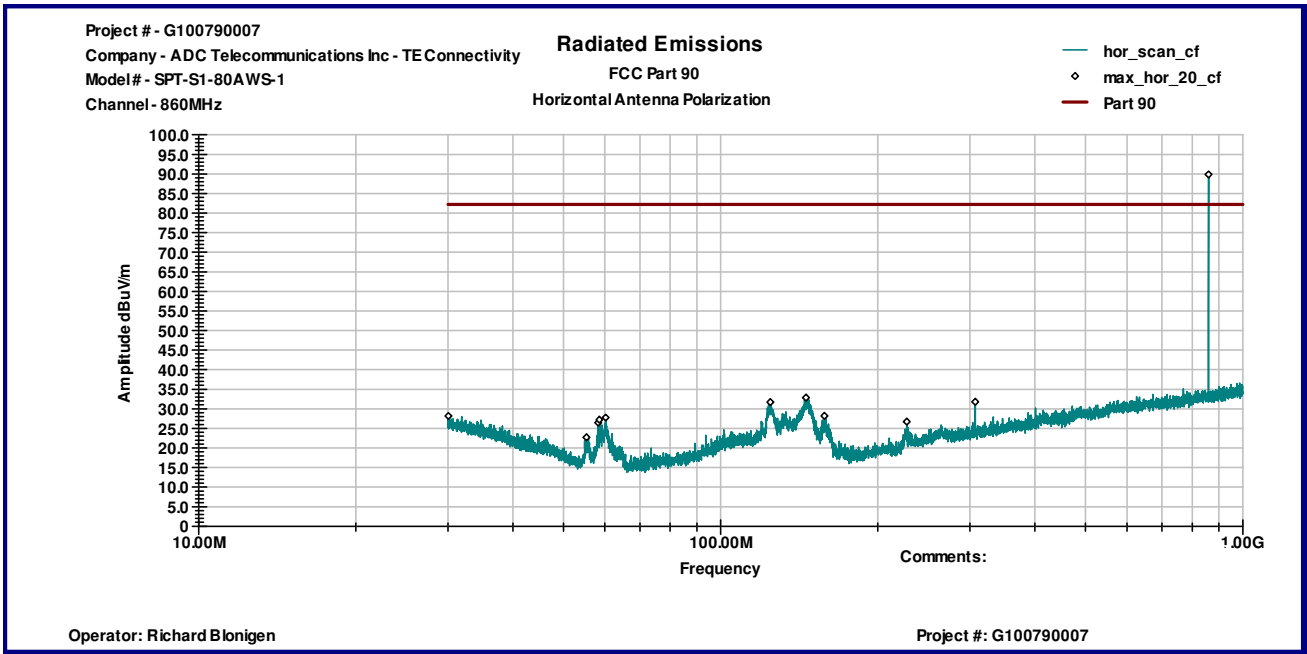
Graph 1



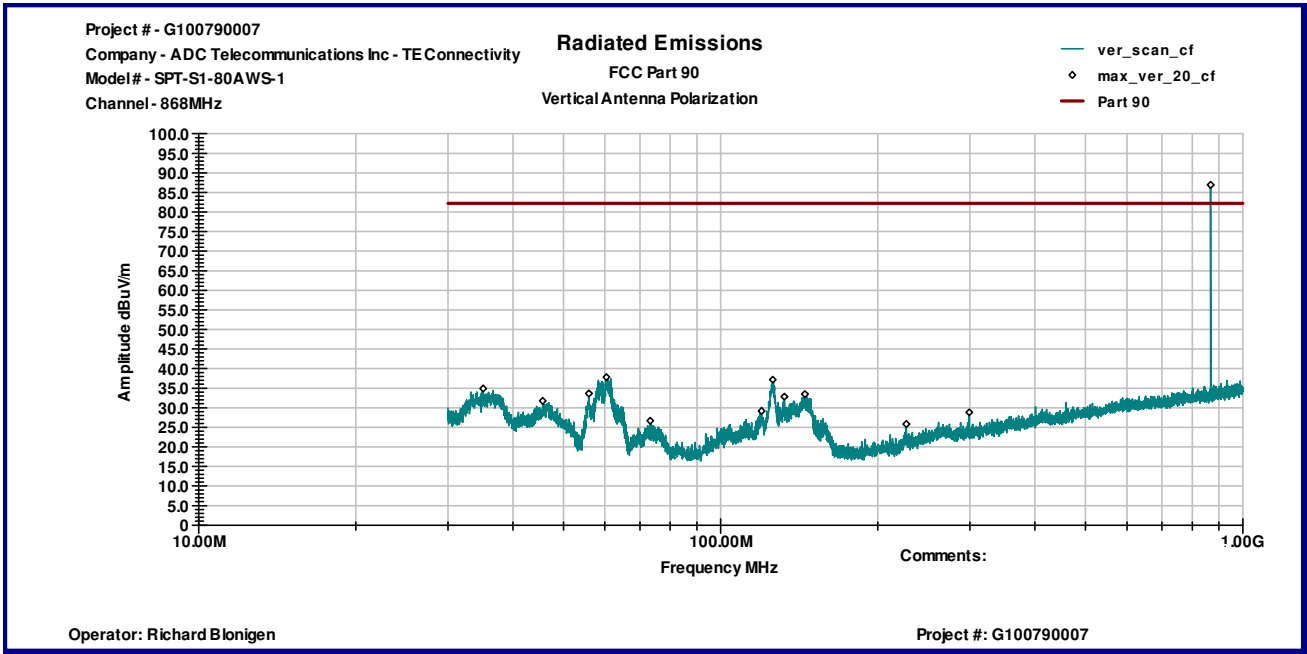
Graph 2



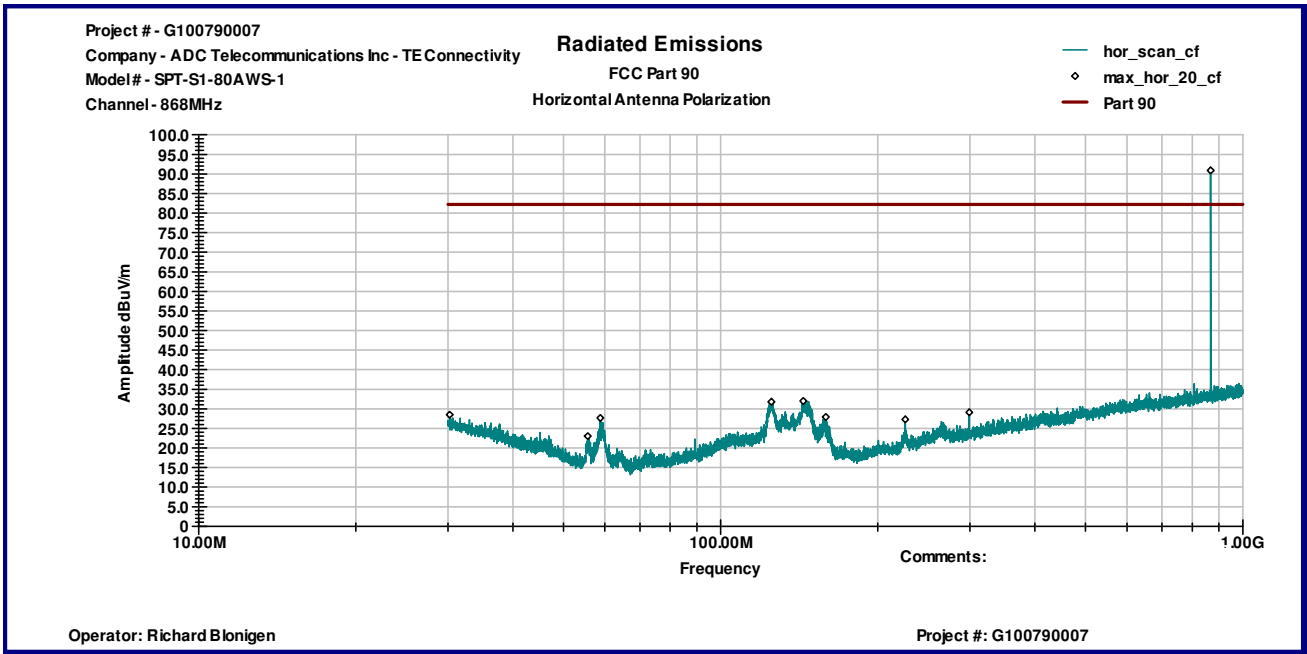
Graph 3



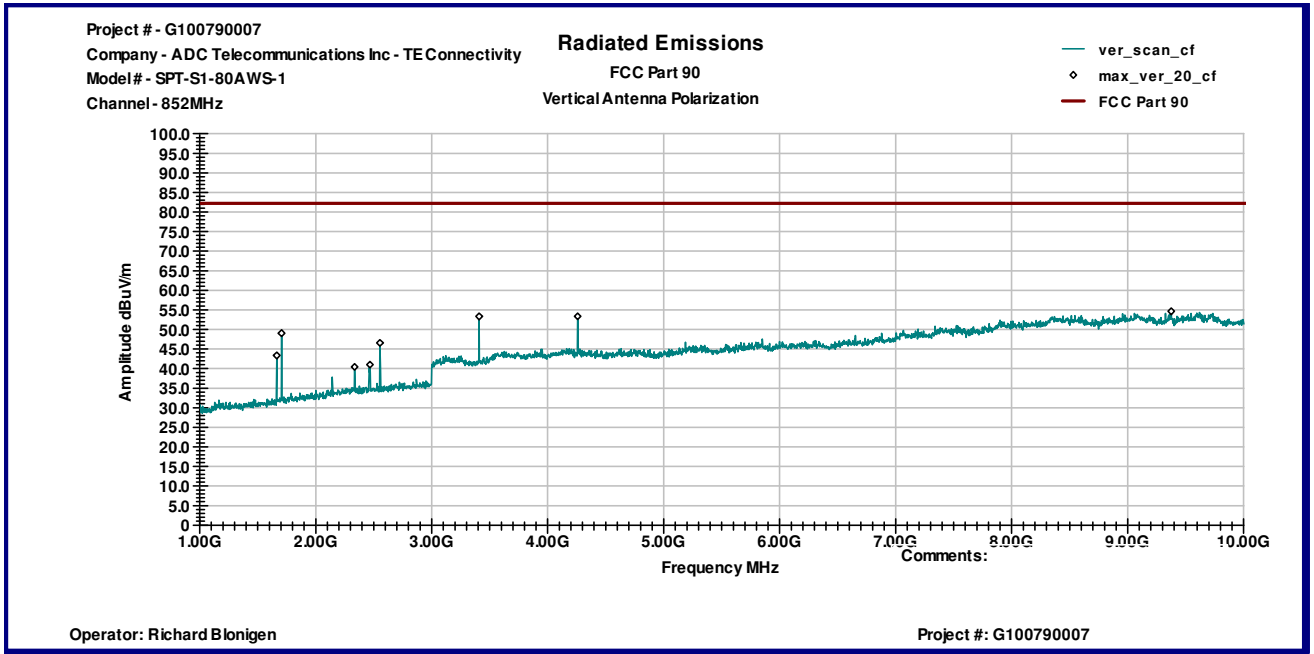
Graph 4



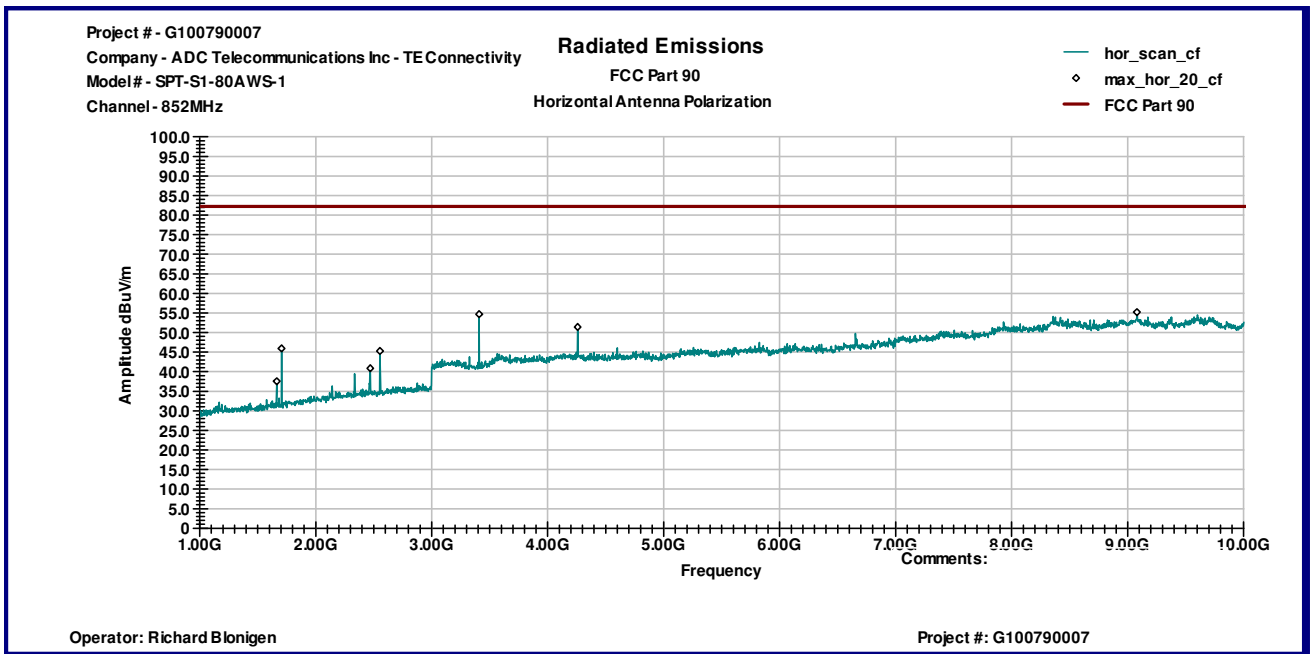
Graph 5



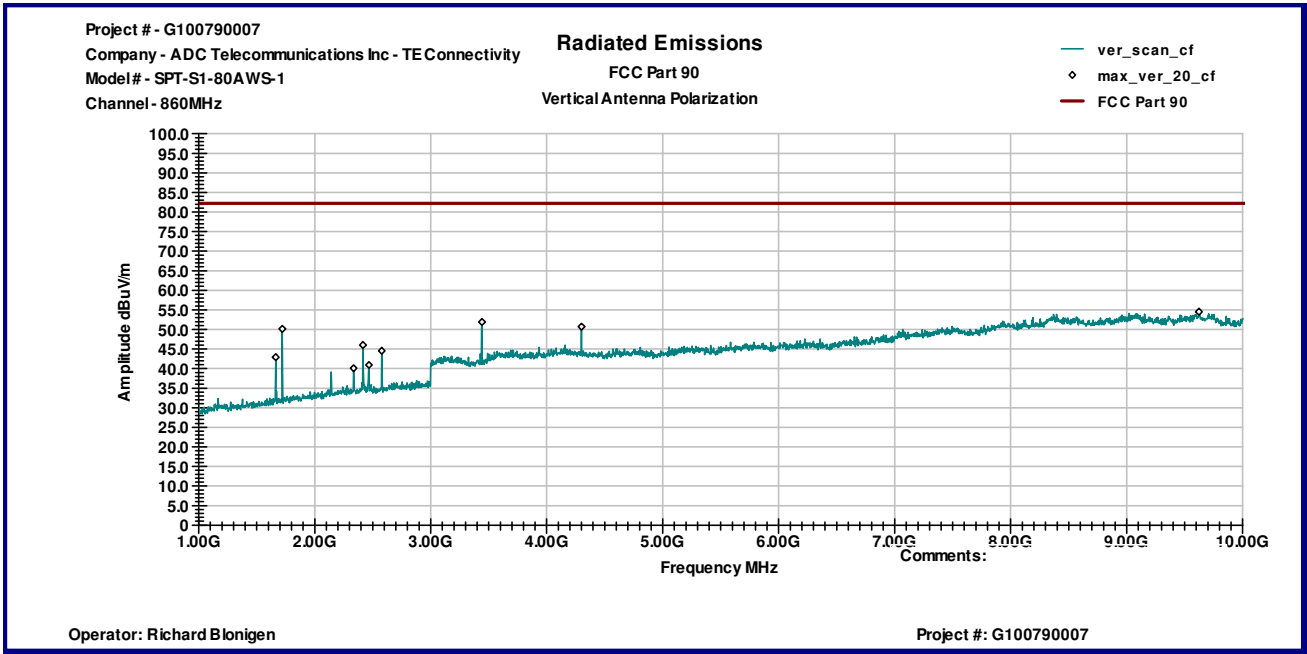
Graph 6



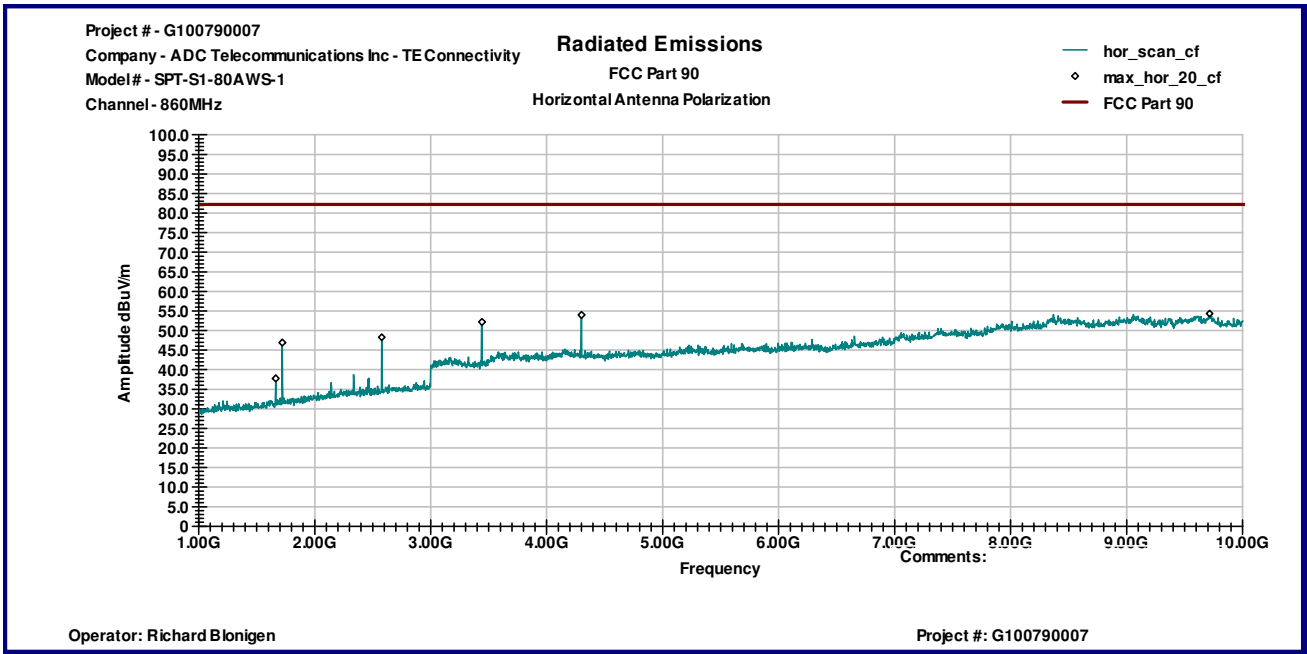
Graph 7



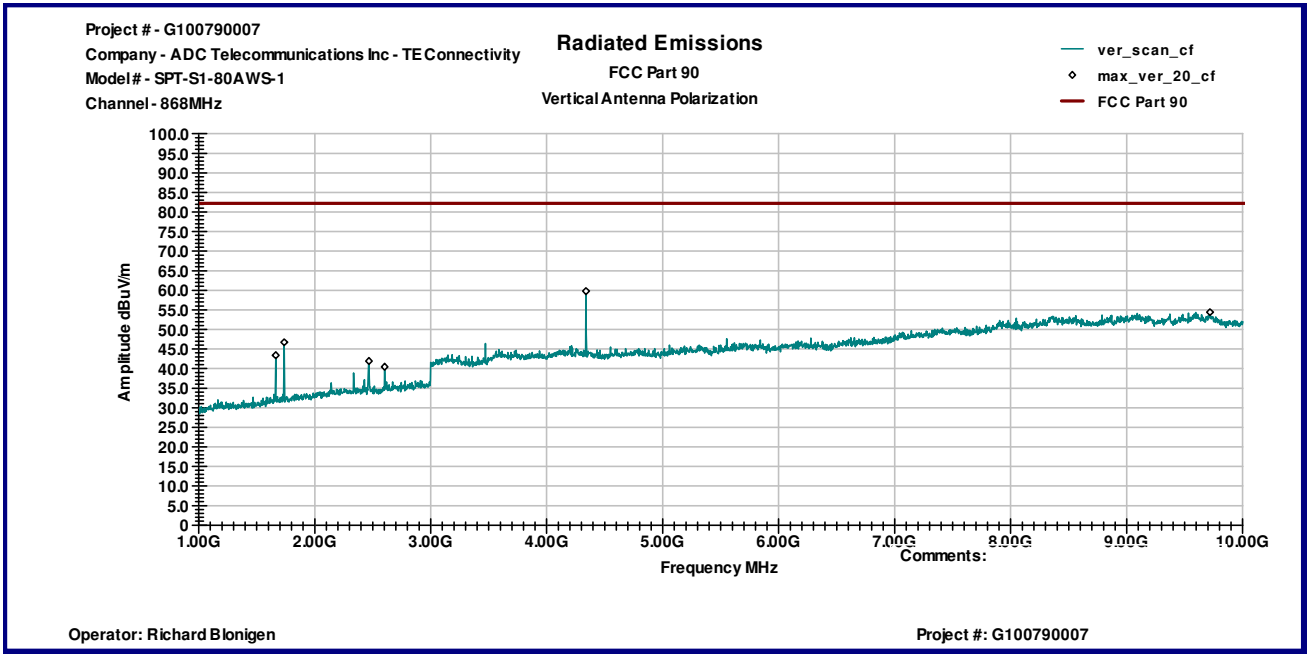
Graph 8



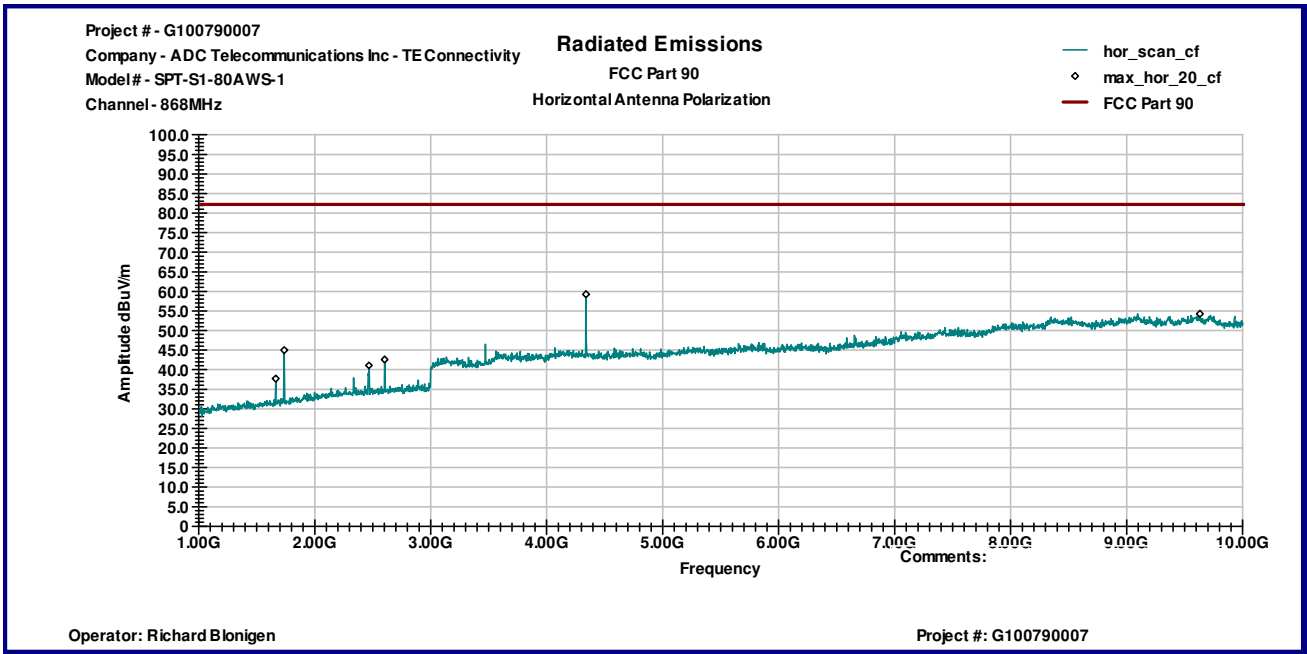
Graph 9



Graph 10



Graph 11

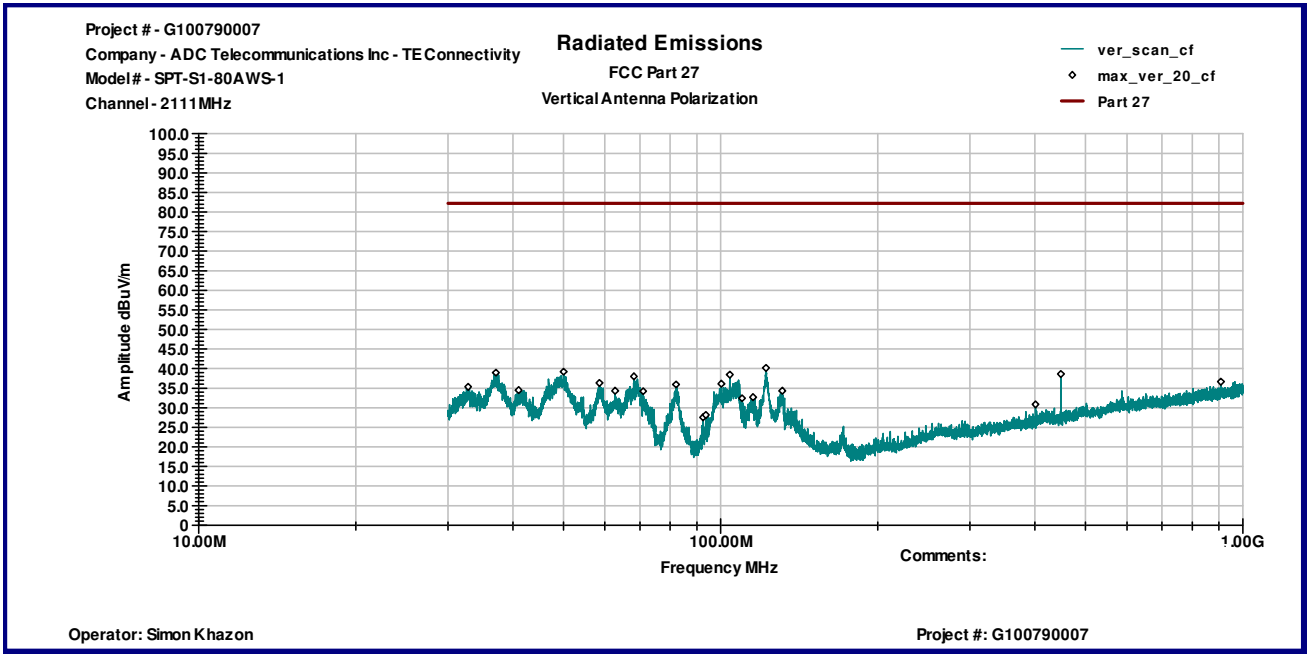


Graph 12

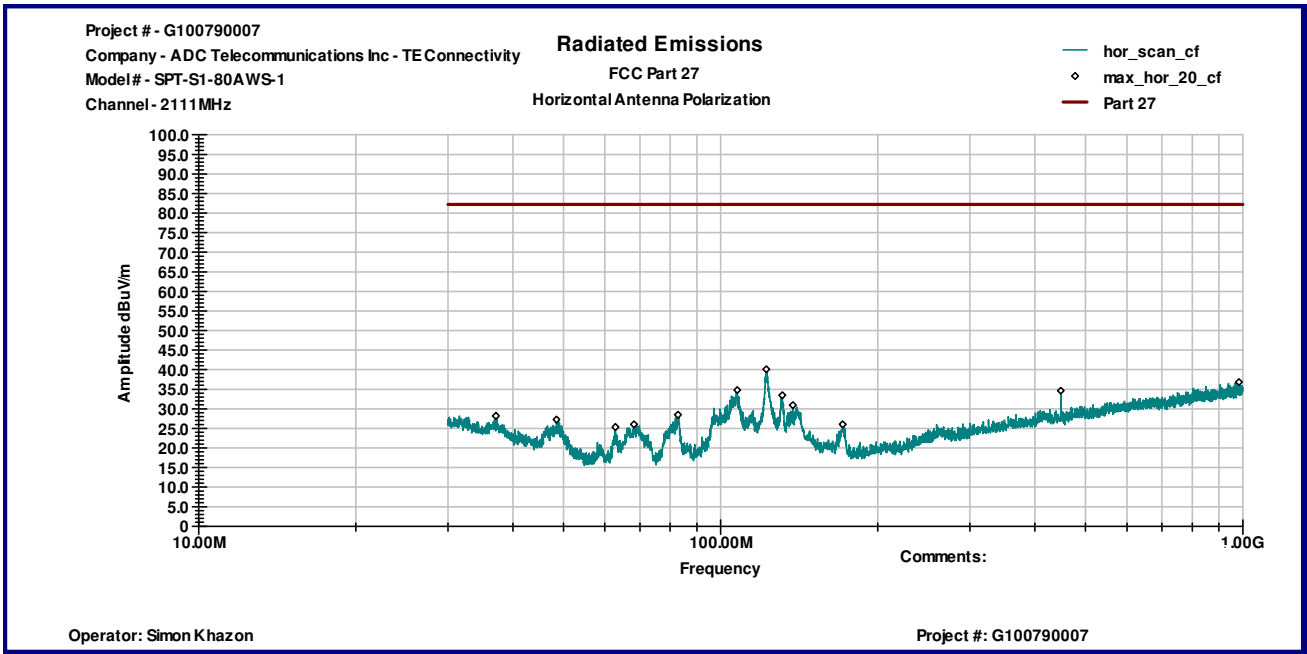
Date:	July 23-24, 2012	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC Part 27	
Test Point:	Enclosure	
Operation mode:	See page 5	
Note:	Channels 2110 – 2155 MHz Frequency Range 30MHz-22GHz	

Table 2

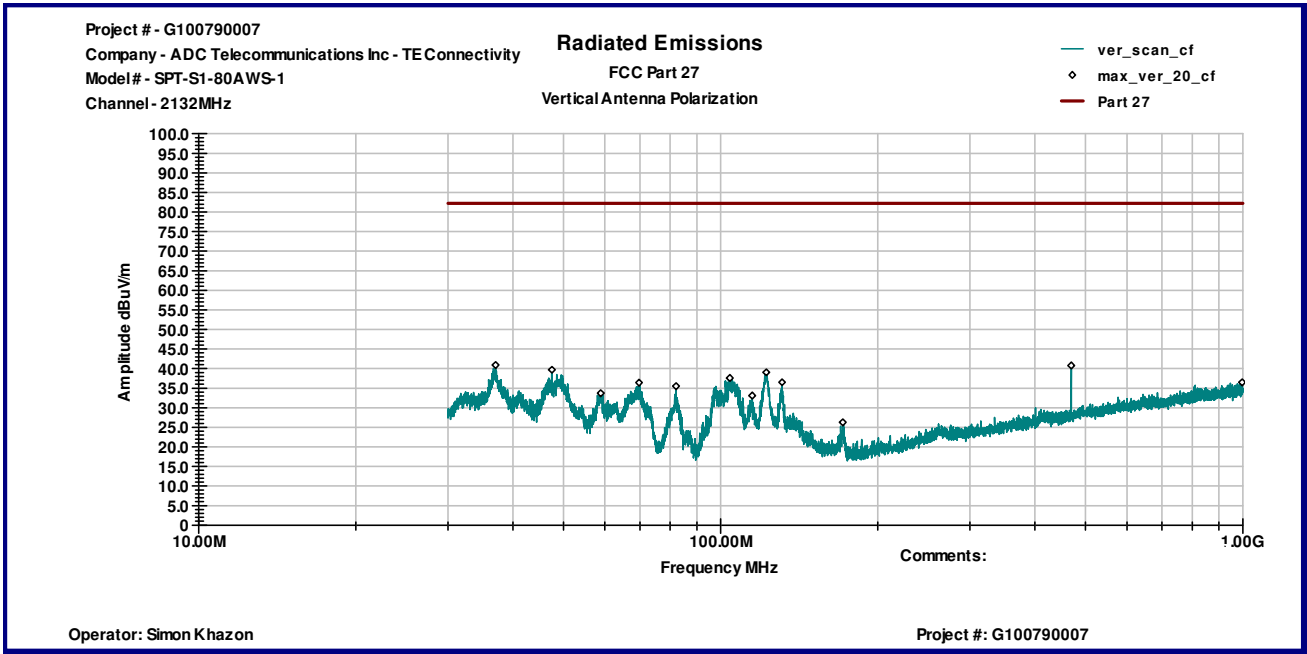
Frequency MHz	Antenna Polarity	Peak Reading dB μ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB μ V/m	Limit dB μ V/m	Margin dB
Channel 2111MHz							
37.089 MHz	V	22.6	16.4	0.0	39.0	82.2	-43.2
49.994 MHz	V	29.1	10.1	0.0	39.2	82.2	-43.0
122.09 MHz	V	26.2	14.0	0.0	40.1	82.2	-42.1
1.663 GHz	V	58.0	28.4	43.2	43.3	82.2	-38.9
2.4662 GHz	V	54.4	31.5	43.5	42.4	82.2	-39.8
Channel 2132MHz							
107.54 MHz	H	21.5	13.3	0.0	34.8	82.2	-47.4
122.24 MHz	H	26.1	14.0	0.0	40.1	82.2	-42.1
983.38 MHz	H	10.7	26.2	0.0	36.8	82.2	-45.4
1.663 GHz	H	54.8	28.3	43.2	39.9	82.2	-42.3
2.4662 GHz	H	53.0	31.4	43.5	40.9	82.2	-41.3
Channel 2154MHz							
37.036 MHz	V	24.5	16.4	0.0	40.9	82.2	-41.3
47.494 MHz	V	28.5	11.2	0.0	39.7	82.2	-42.5
469.33 MHz	V	20.6	20.2	0.0	40.8	82.2	-41.4
1.663 GHz	V	55.1	28.4	43.2	40.3	82.2	-41.9
2.445 GHz	V	62.1	31.5	43.5	50.1	82.2	-32.1
107.61 MHz	H	21.7	13.3	0.0	35.0	82.2	-47.2
122.16 MHz	H	26.6	14.0	0.0	40.6	82.2	-41.6
957.21 MHz	H	10.8	25.9	0.0	36.6	82.2	-45.6
2.4237 GHz	H	54.0	31.3	43.5	41.8	82.2	-40.4
3.3247 GHz	H	57.3	34.3	43.7	47.9	82.2	-34.3
Channel 2154MHz							
36.826 MHz	V	23.4	16.5	0.0	40.0	82.2	-42.2
49.493 MHz	V	28.8	10.3	0.0	39.2	82.2	-43.0
122.16 MHz	V	26.8	14.0	0.0	40.8	82.2	-41.4
491.32 MHz	V	19.4	20.8	0.0	40.2	82.2	-42.0
2.4662 GHz	V	52.9	31.5	43.5	41.0	82.2	-41.2
106.27 MHz	H	22.6	13.2	0.0	35.8	82.2	-46.4
122.31 MHz	H	27.2	14.0	0.0	41.1	82.2	-41.1
966.05 MHz	H	11.0	26.1	0.0	37.1	82.2	-45.1
2.4577 GHz	H	53.2	31.4	43.5	41.1	82.2	-41.1
3.3247 GHz	H	57.0	34.3	43.7	47.6	82.2	-34.6



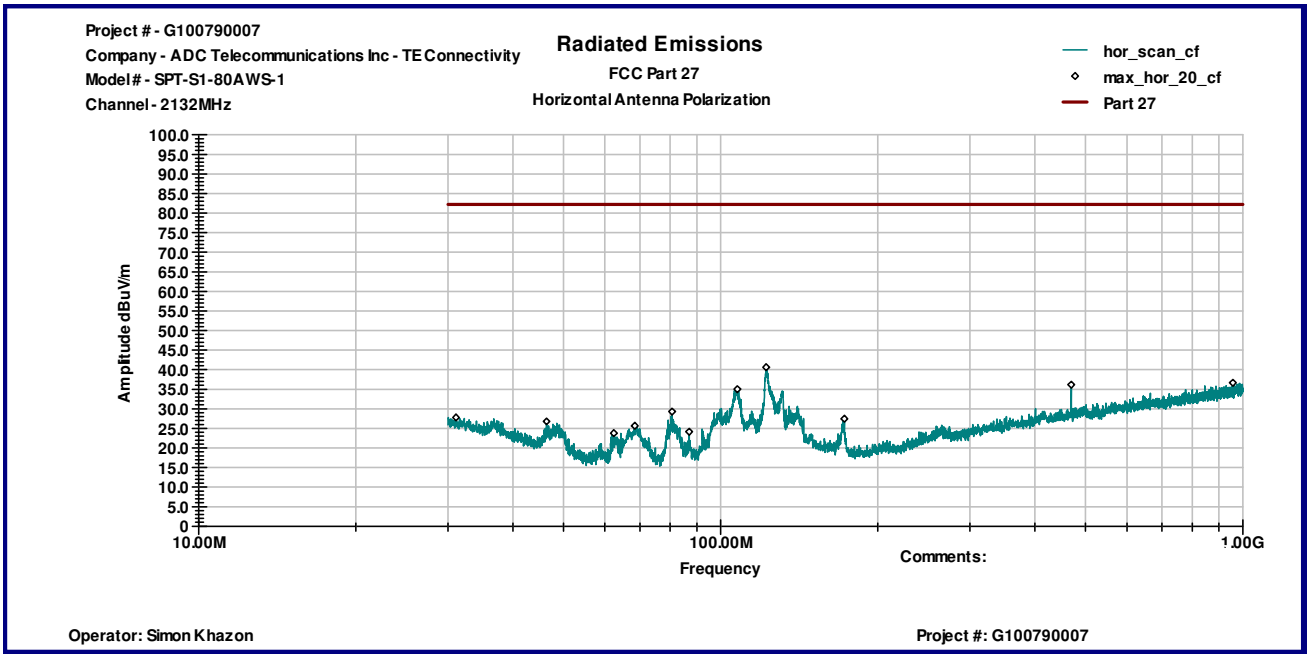
Graph 13



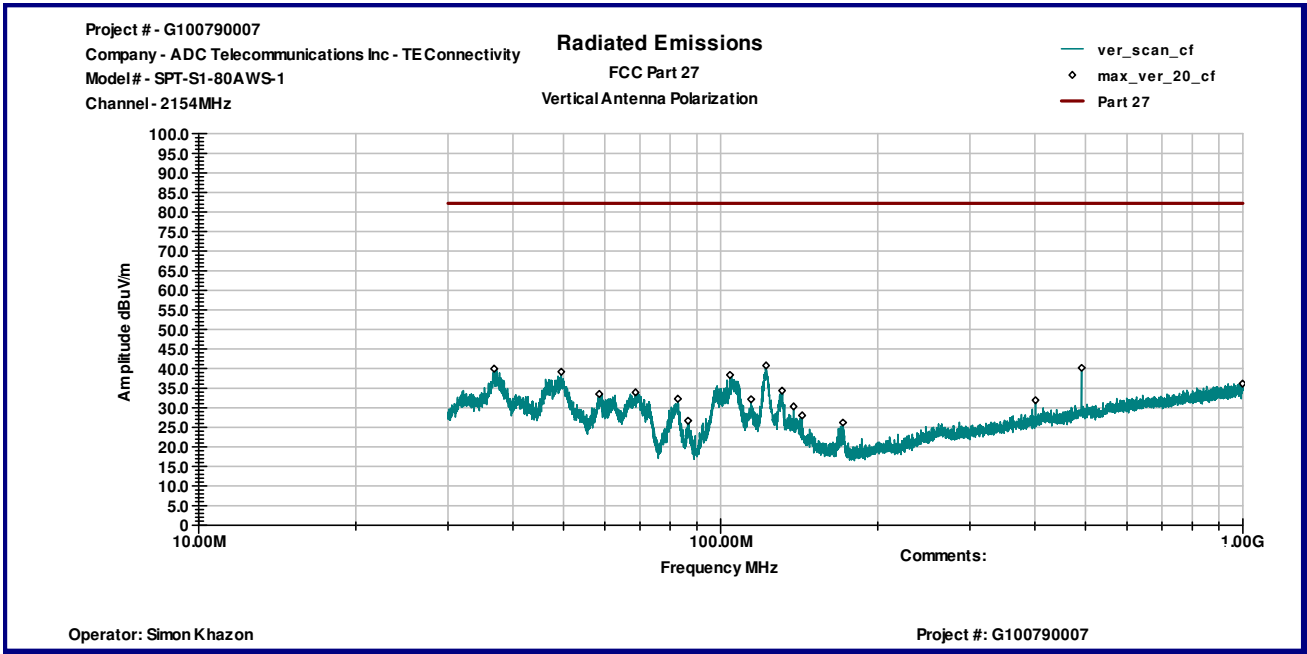
Graph 14



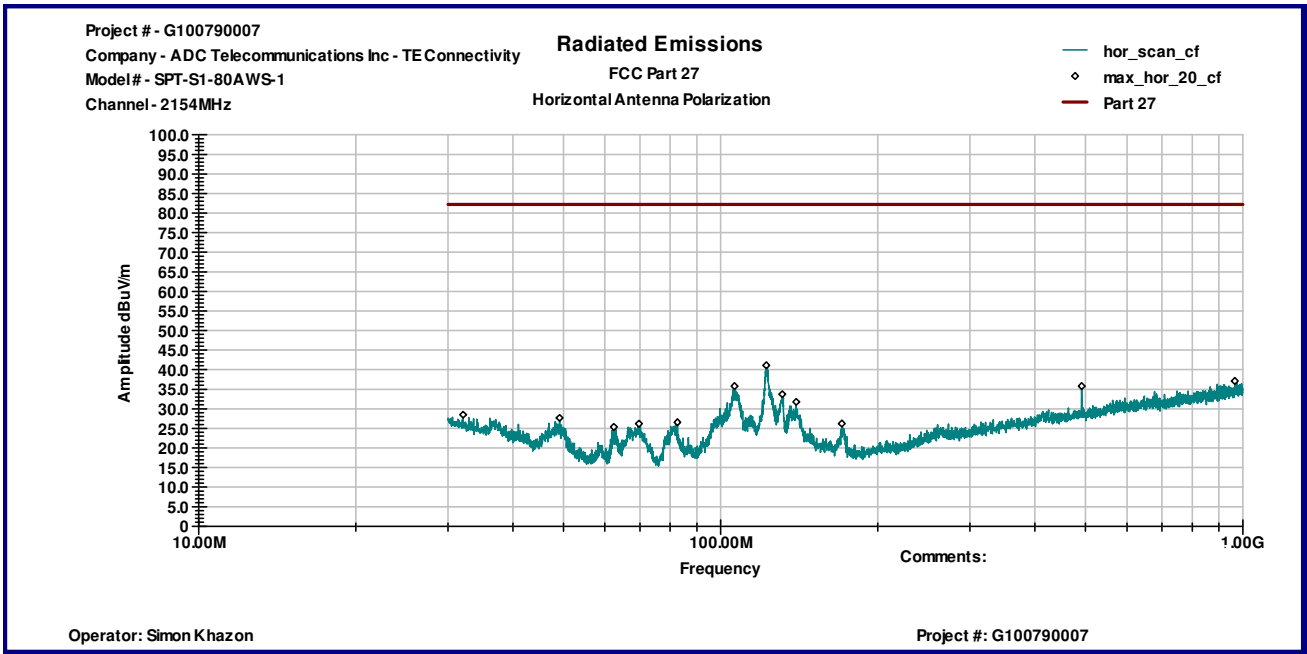
Graph 15



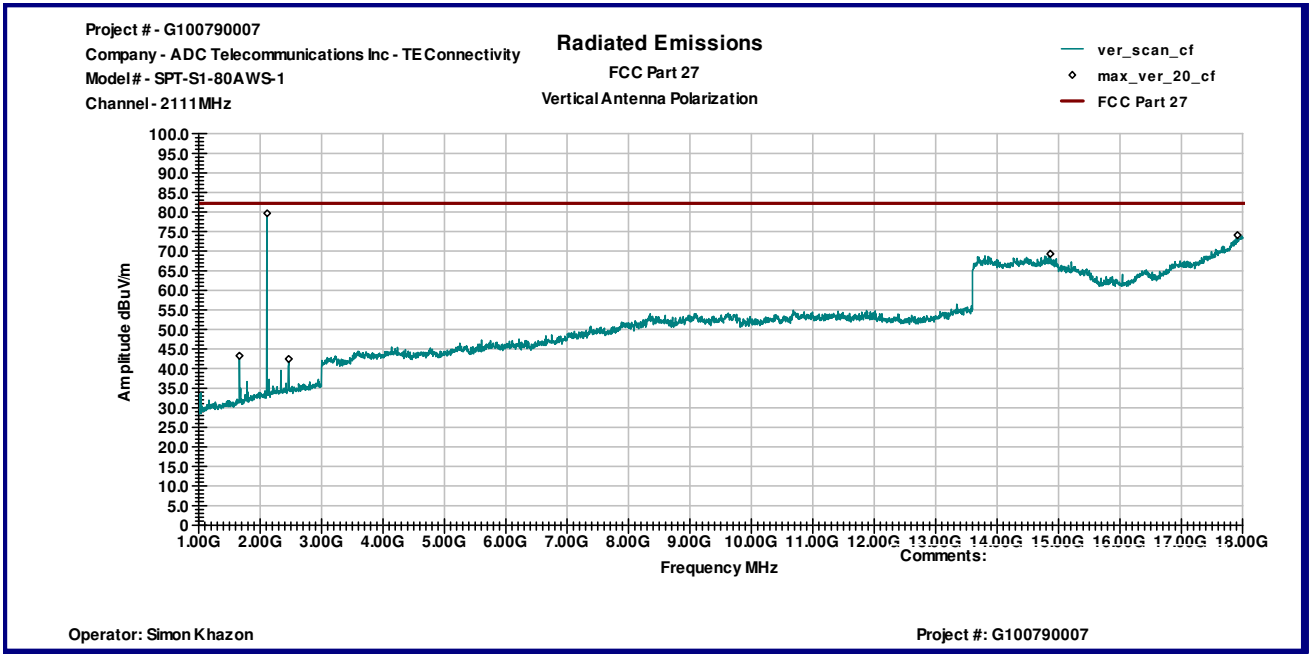
Graph 16



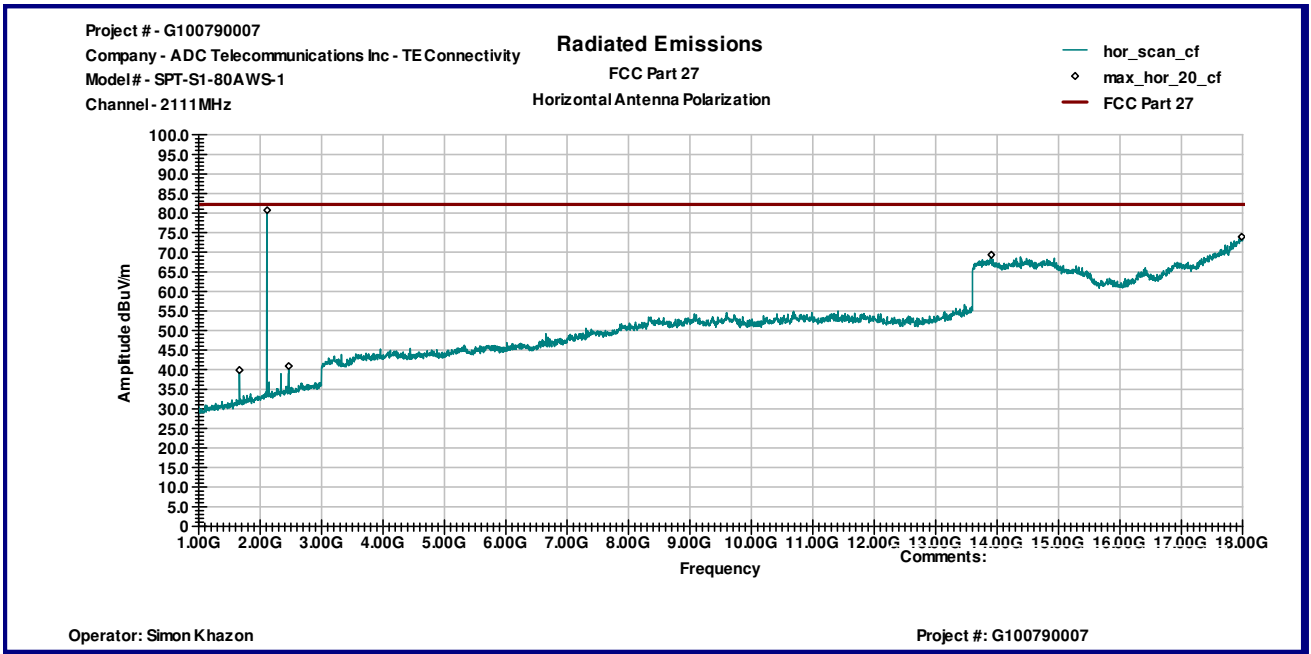
Graph 17



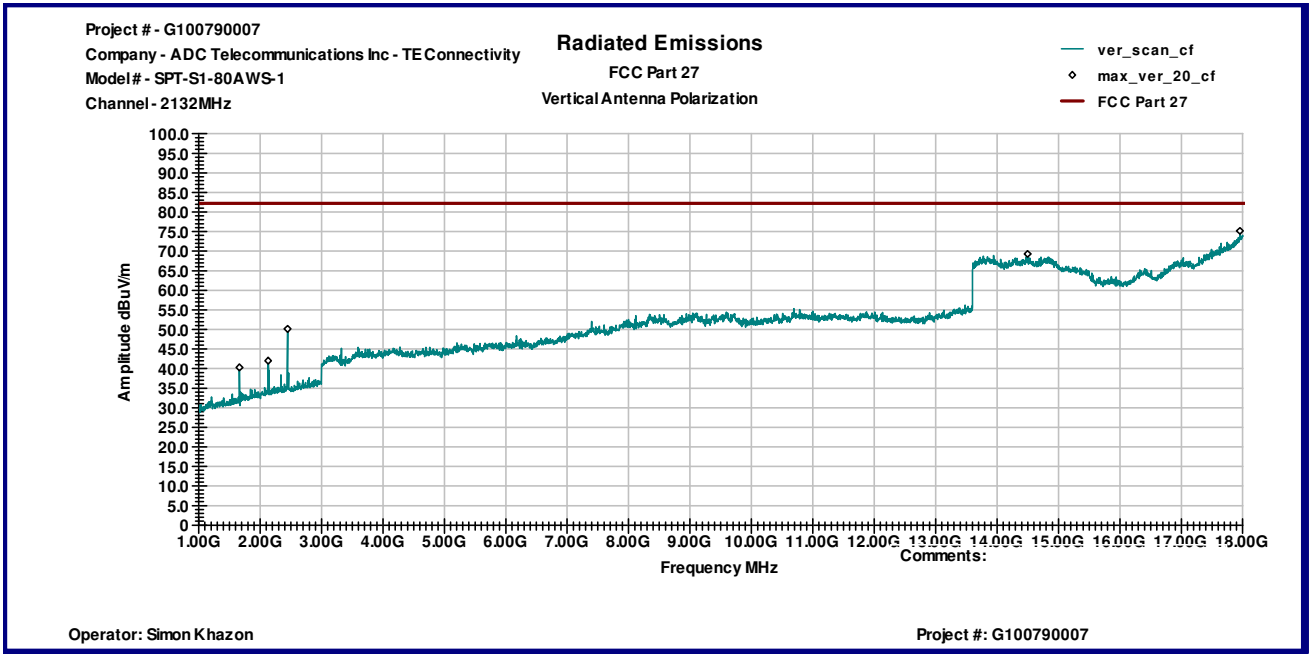
Graph 18



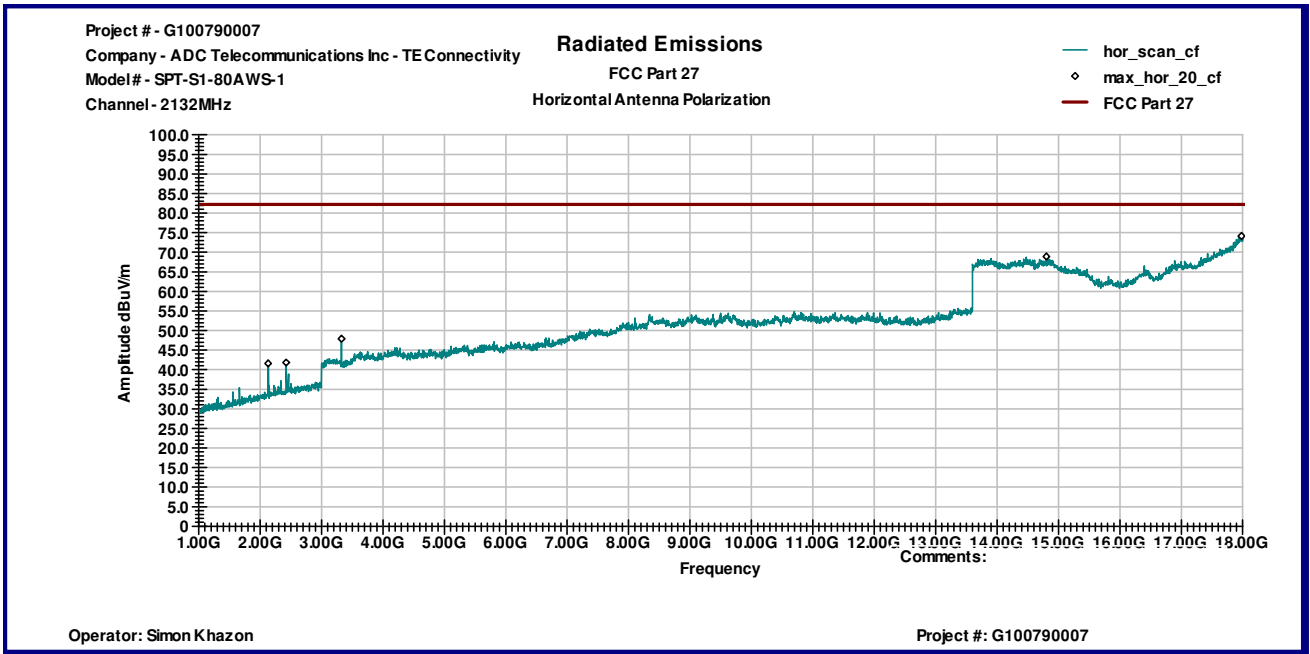
Graph 19



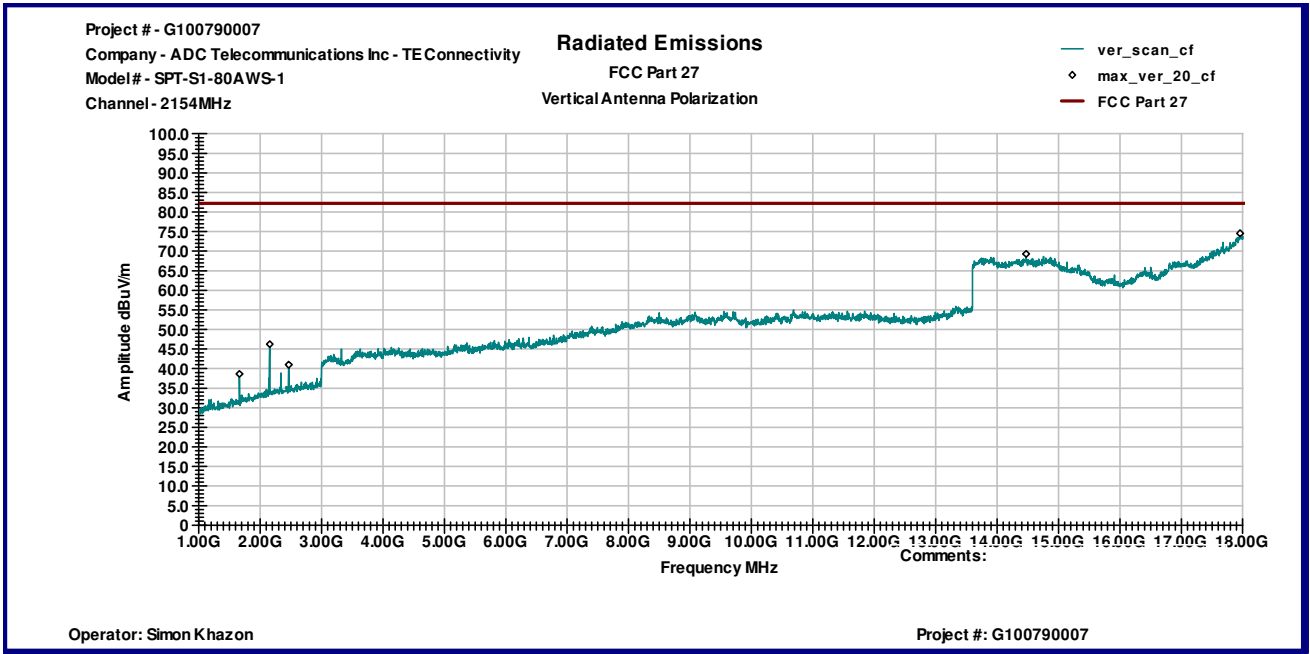
Graph 20



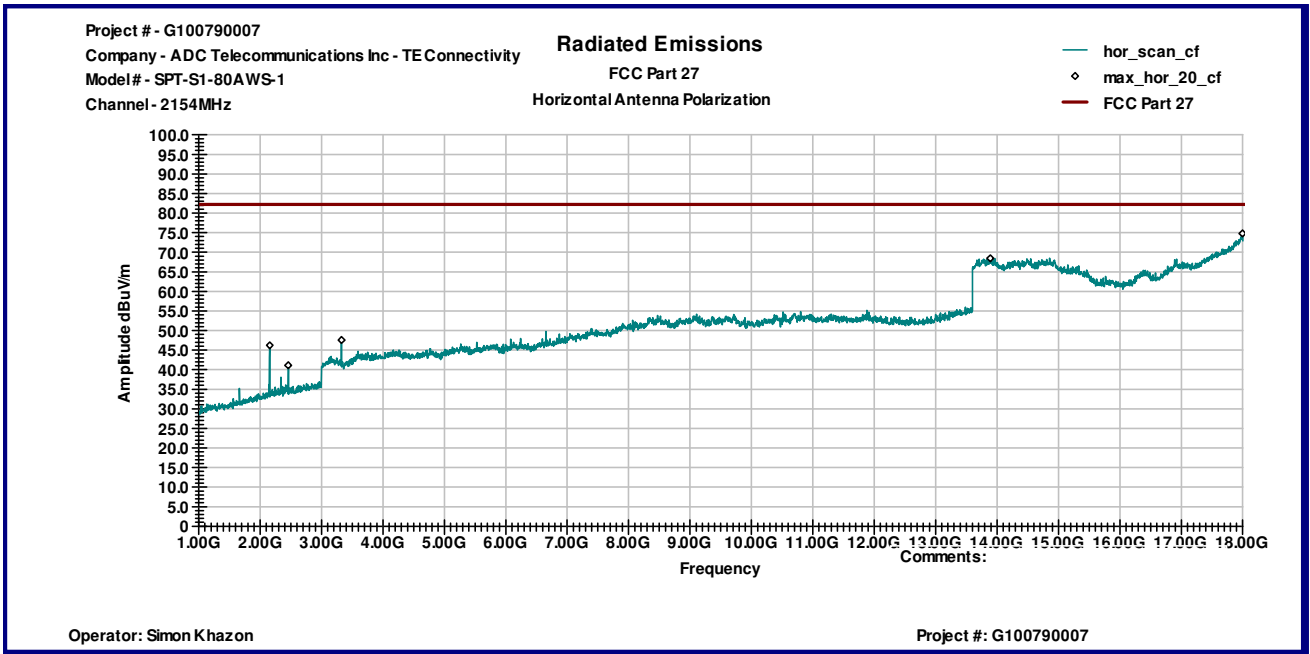
Graph 21



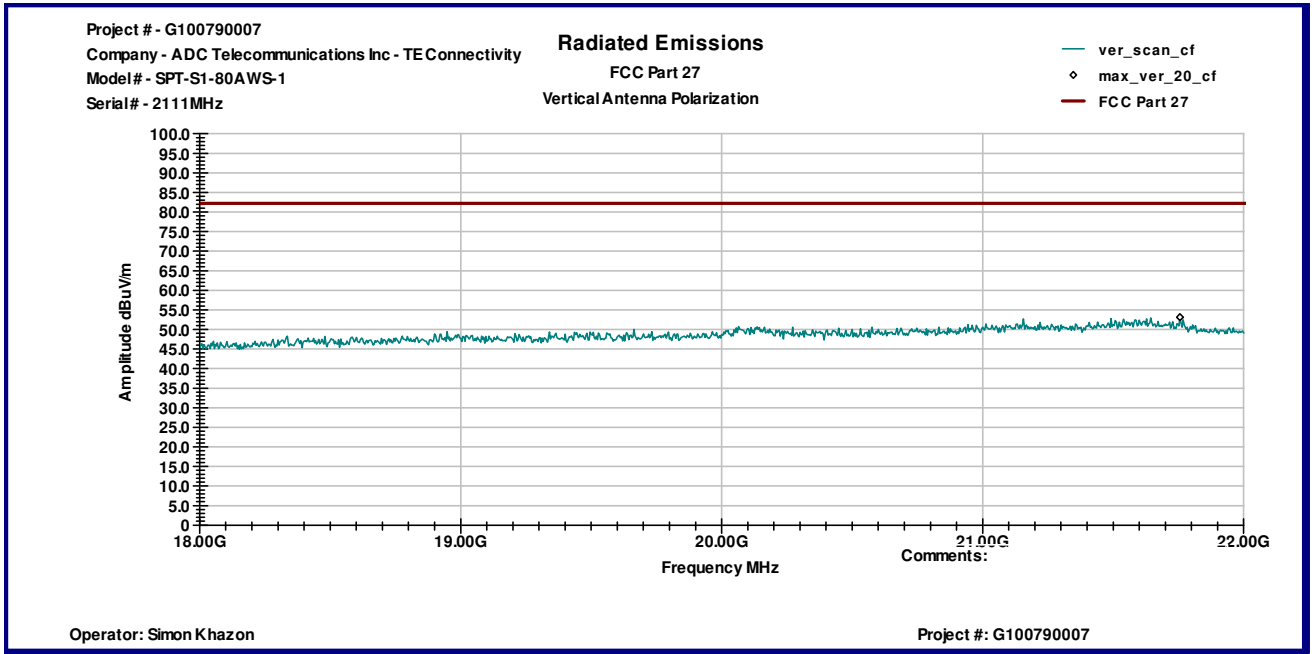
Graph 22



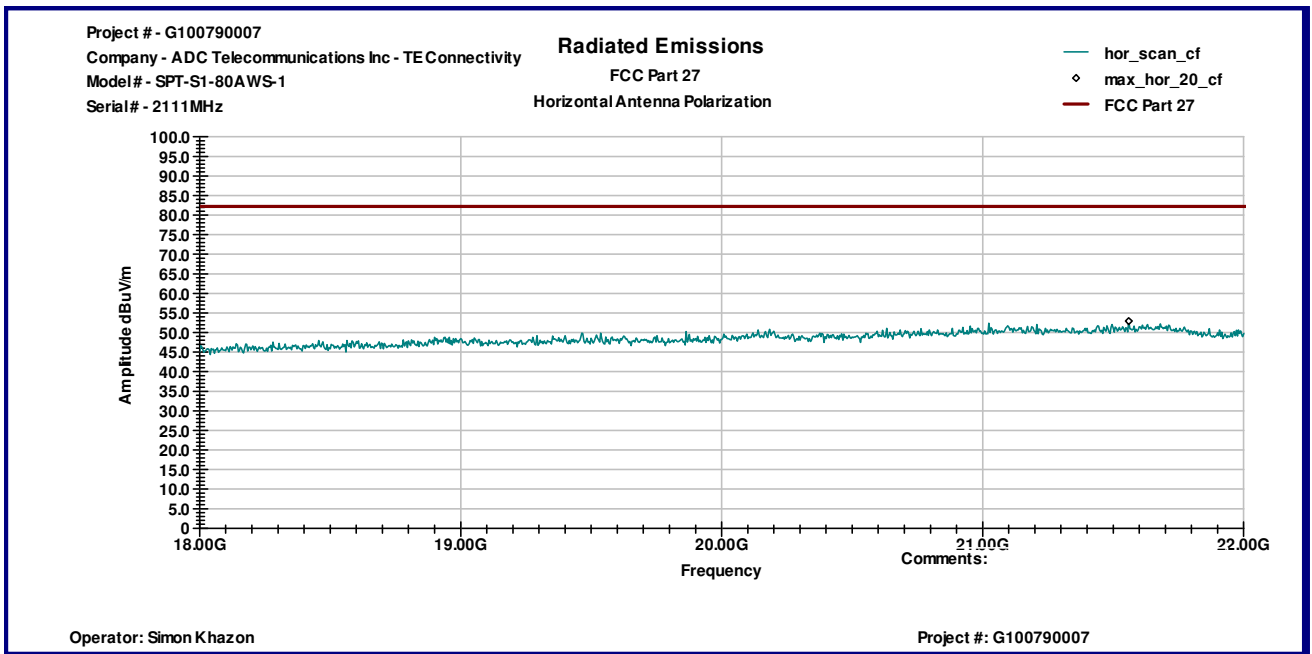
Graph 23



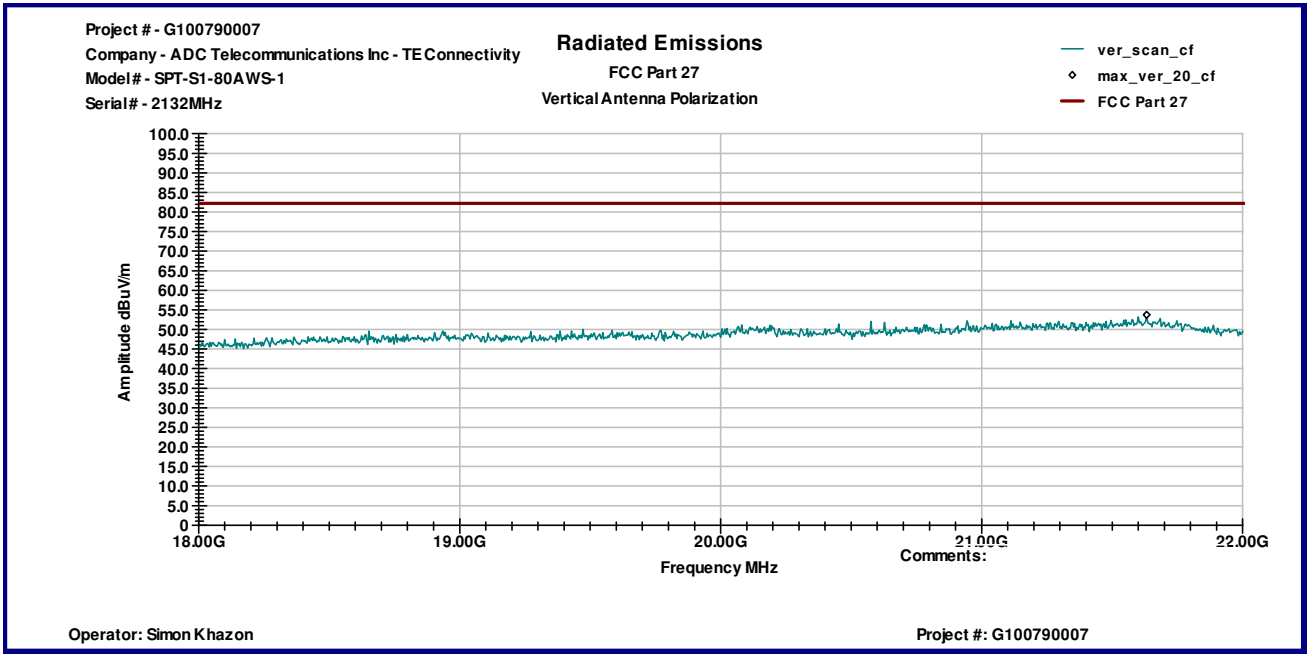
Graph 24



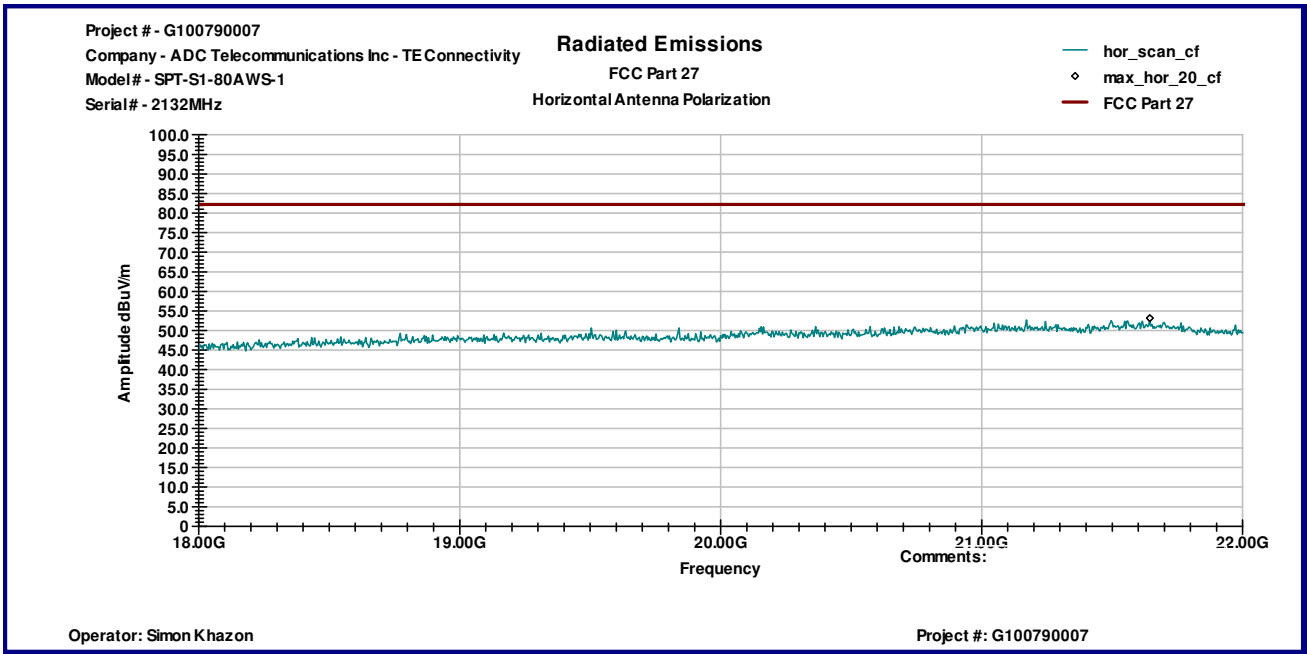
Graph 25



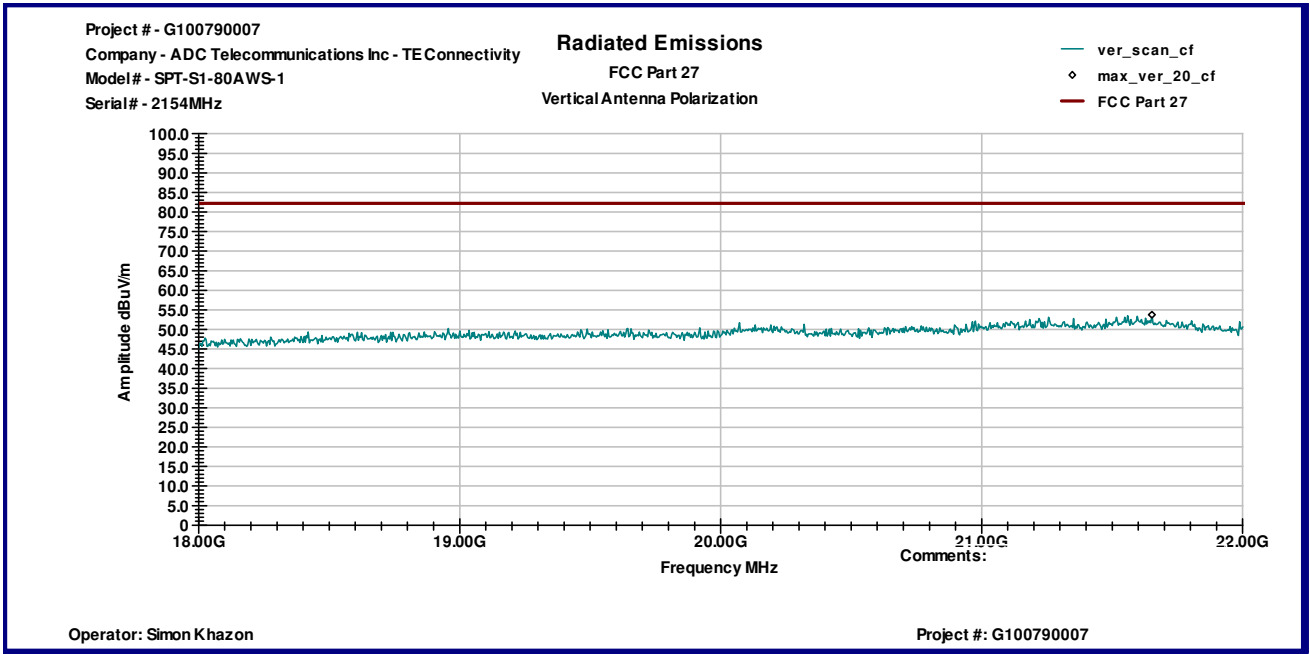
Graph 26



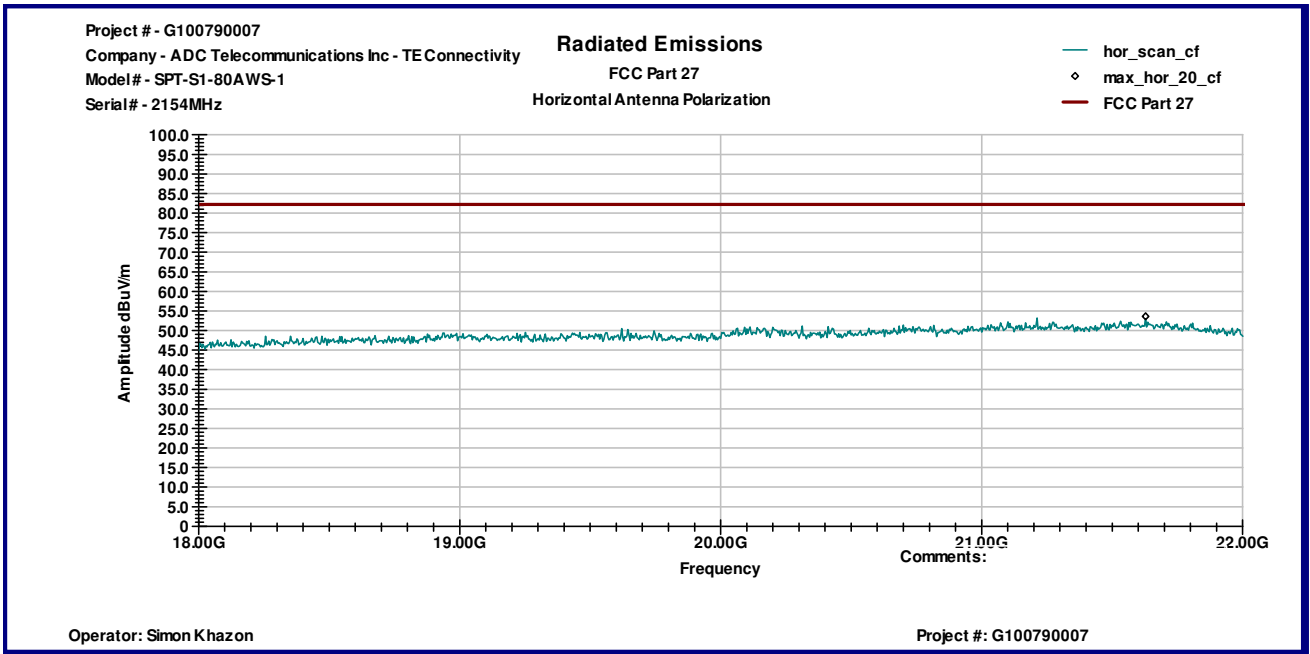
Graph 27



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"/>

