



TEST DATA

Test Data Number: 3150809MIN-002

Project Number: 3150809

Testing performed on the
InterReach Fusion Wideband

To
47 CFR, Part 24:2007

For
ADC Telecommunications Inc.

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

Test Authorized by:
ADC Telecommunications Inc.
5341 12th Avenue East
Shakopee, MN 55379

Prepared by: 
Norman Shpilsher

Date: May 16, 2008

Reviewed by: 
Uri Spector

Date: May 16, 2008



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1.0 DESCRIPTION OF THE SAMPLE (EUT)

Model:	InterReach Fusion Wideband System, which consists of: - FSN-W2-808519-1, Remote Access Unit (RAU) - Main Hub - Expansion Hub
Type of EUT:	Indoor Fiber / Coaxial Repeater
Serial Number:	N/A
Company:	ADC Telecommunications Inc.
Customer:	Mr. Mark Miska
Address:	1187 Park Place Shakopee, MN 55379
Phone:	952-403-8340
Fax:	952-403-8858
Test Standards:	☐ EN 55022:2006, Class A ☐ EN 55011:1998 + A1:1999 + A2:2002, Group ☐ , Class ☐ ☐ 47 CFR, Part 15:2007, §15.107 and §15.109, Class A ☐ 47 CFR, Part 22:2007 ☒ 47 CFR, Part 24:2007 ☐ 47 CFR, Part 90:2007 ☐ EN 55014-1:2000 + A1:2001 + A2:2002 ☐ EN 61326-1:2006 ☐ Class ☐ for Radiated and Conducted Emissions ☐ EN 60601-1-2:2001 +A1:2006 ☐ Class ☐ Radiated and Conducted Emissions ☐ EN 61000-6-3:2007 ☐ EN 61000-6-4:2007 ☐ EN 61000-3-2:2006 ☐ EN 61000-3-3:1995 +A1:2001 +A2:2006 ☐ Other ☐

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 24	Spurious Enclosure 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

General notes:

1. Test was performed with the System in Tx mode tuned to the low frequency (1930MHz), middle frequency (1960MHz), and upper frequency (1990MHz) of the operating band.
In Rx mode the System was tuned to the low frequency of 1850MHz, middle frequency of 1880MHz, and upper frequency of 1910MHz of the operating band.
Testing was performed in frequency range from 30MHz to 10GHz.
2. In Tx mode the DL2 Port of the Main Hub was connected to the Signal Generator, and all other RF ports of the System were terminated with 50Ohm terminator.
In Rx mode the PCS24 Port of the RAU was connected to the Signal Generator, and all other RF ports of the System were terminated with 50Ohm terminator.
The Signal Generator was located outside of the test site.
3. The Spurious Radiated Power limits of -13dBm was correlated with field strength reference level of 82.2dB μ V/m during field strength measurements at 3m measurement distance.

3.0 TEST RESULTS

3.1 Spurious Radiated Emissions, Tx Mode

No emissions were chosen for substitution measurements as the maximum emissions is more than 20dB below the reference limit

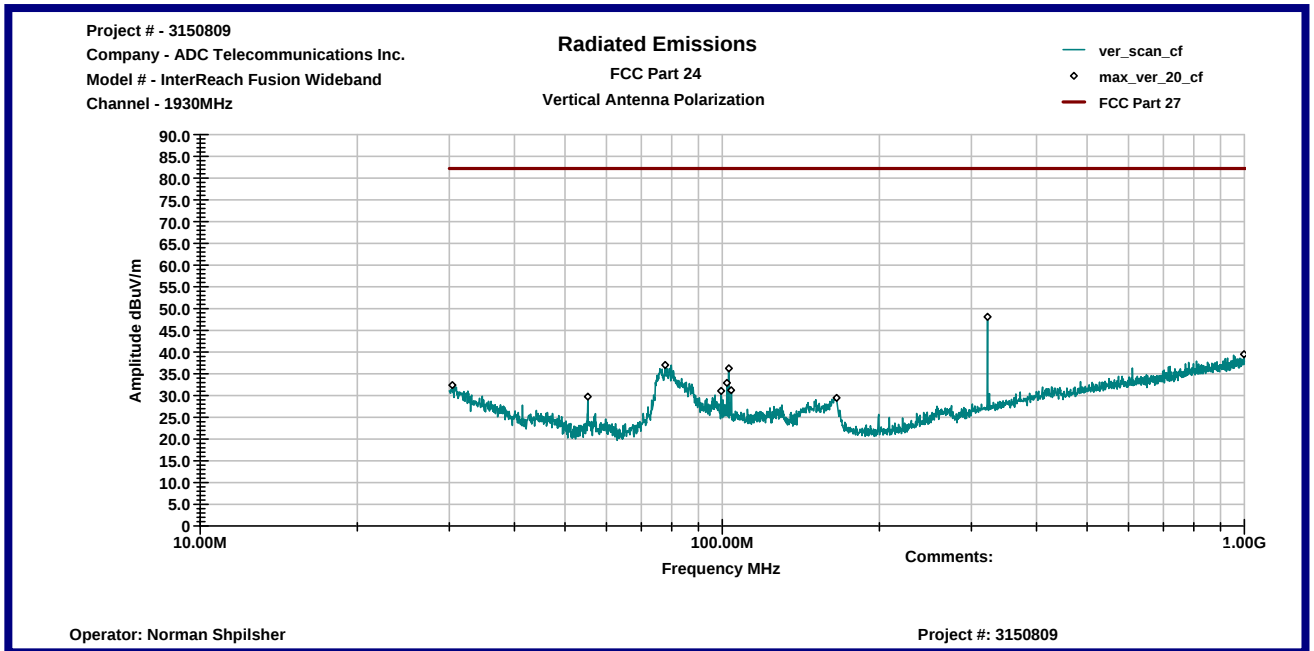
Radiated Emissions from 30MHz to 1GHz

Date: 05-07-2008

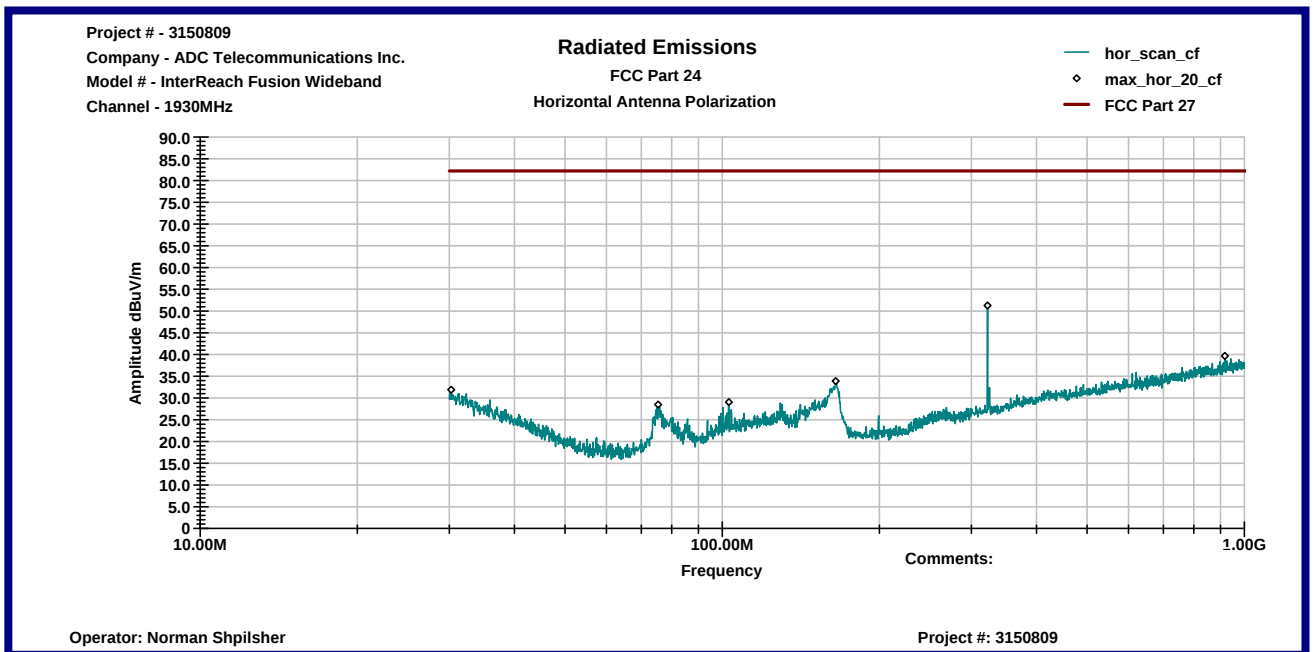
Company: ADC Telecommunications Inc.
Model: InterReach Fusion Wideband
Test Engineer: Norman Shpilsher
Special Info: Tx Mode
Standard: FCC Part 24
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 Measurements were taken using a Peak detector

Table # 1

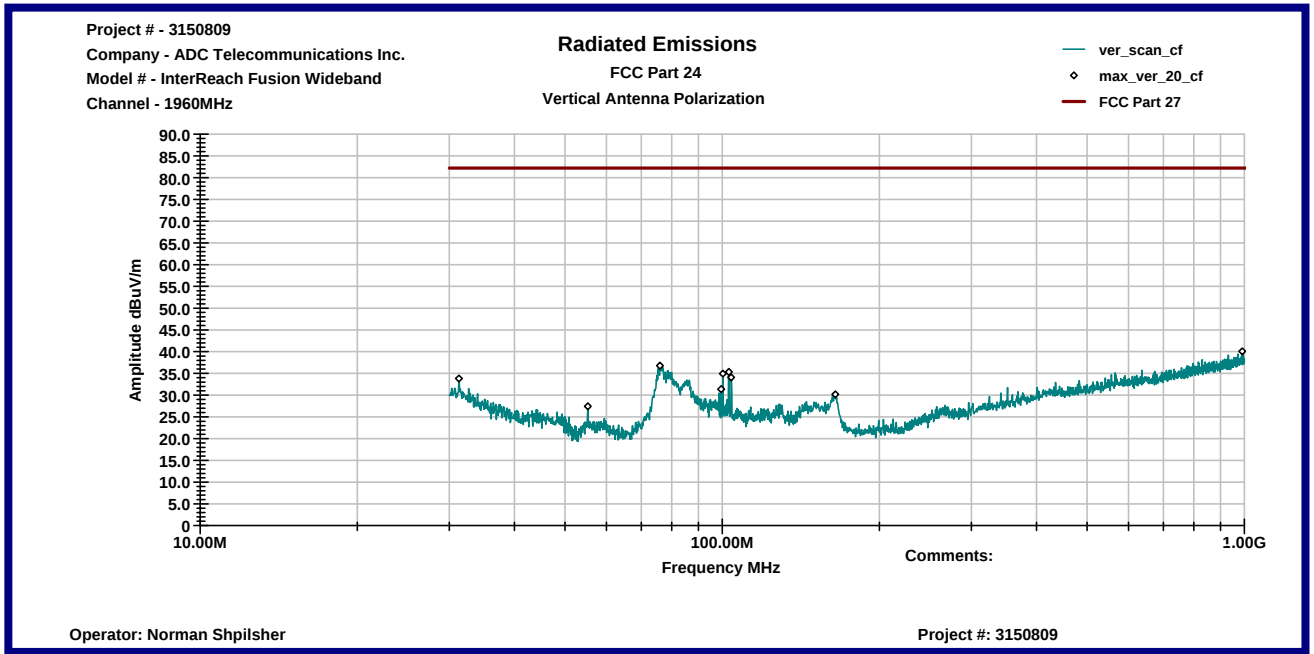
Frequency	Ant. Polarity	Peak Reading dBμV	Ant.Factor dB1/m	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
1930MHz Channel						
77.765 MHz	V	28.3	8.7	37.0	82.2	-45.2
322.17 MHz	V	32.0	16.1	48.1	82.2	-34.1
998.59 MHz	V	13.5	25.9	39.5	82.2	-42.7
164.97 MHz	H	22.1	11.8	33.9	82.2	-48.3
322.17 MHz	H	35.1	16.1	51.3	82.2	-31.0
917.95 MHz	H	14.8	24.9	39.7	82.2	-42.5
1960MHz Channel						
75.974 MHz	V	28.2	8.6	36.8	82.2	-45.5
102.98 MHz	V	23.0	12.3	35.3	82.2	-46.9
990.8 MHz	V	14.2	25.8	40.1	82.2	-42.1
31.108 MHz	H	11.0	20.0	31.0	82.2	-51.2
162.07 MHz	H	22.2	12.0	34.2	82.2	-48.0
351.95 MHz	H	17.3	17.0	34.3	82.2	-47.9
1990MHz Channel						
76.273 MHz	V	28.8	8.6	37.4	82.2	-44.8
100.3 MHz	V	22.4	11.9	34.2	82.2	-48.0
984.44 MHz	V	14.6	25.8	40.4	82.2	-41.9
160.79 MHz	H	22.4	12.1	34.4	82.2	-47.8
294.86 MHz	H	18.8	15.4	34.2	82.2	-48.0
965.34 MHz	H	14.6	25.5	40.1	82.2	-42.1



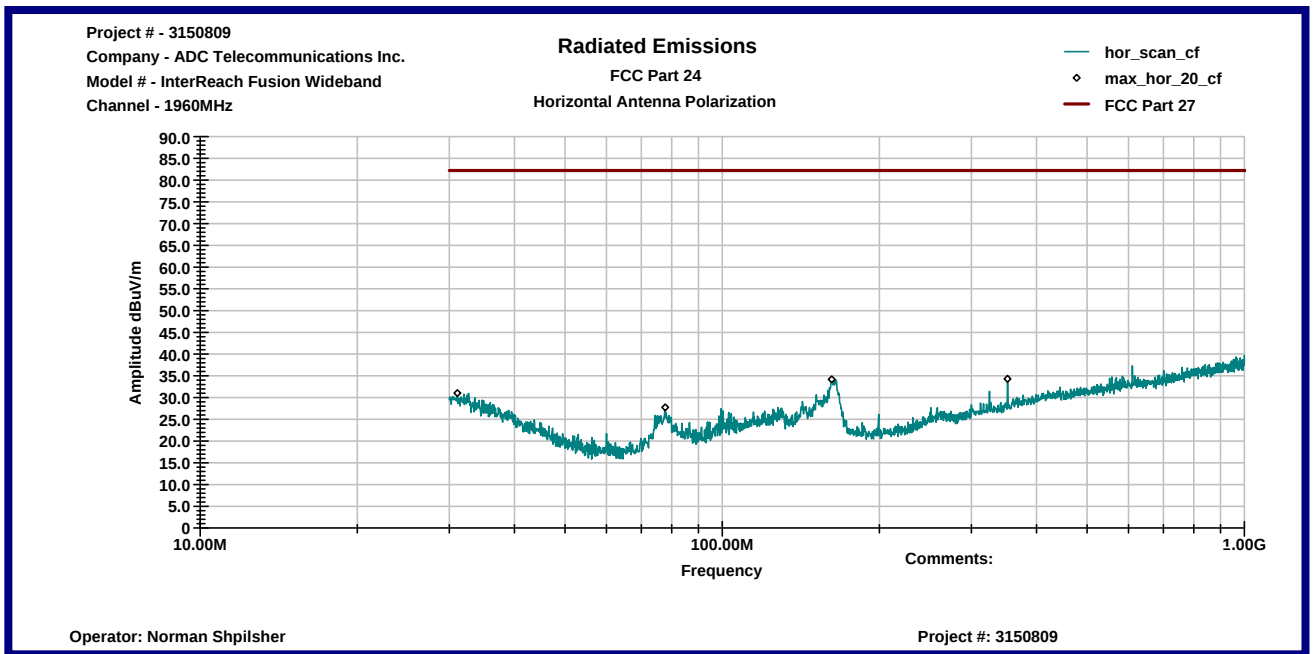
Graph 1



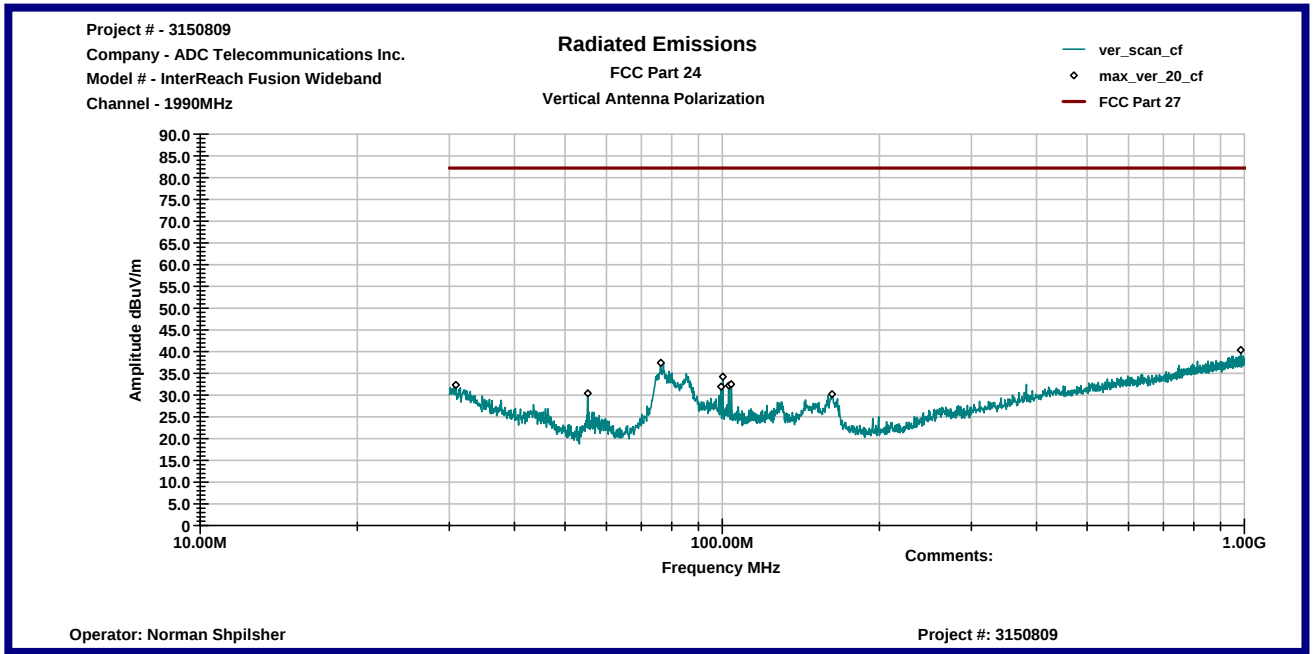
Graph 2



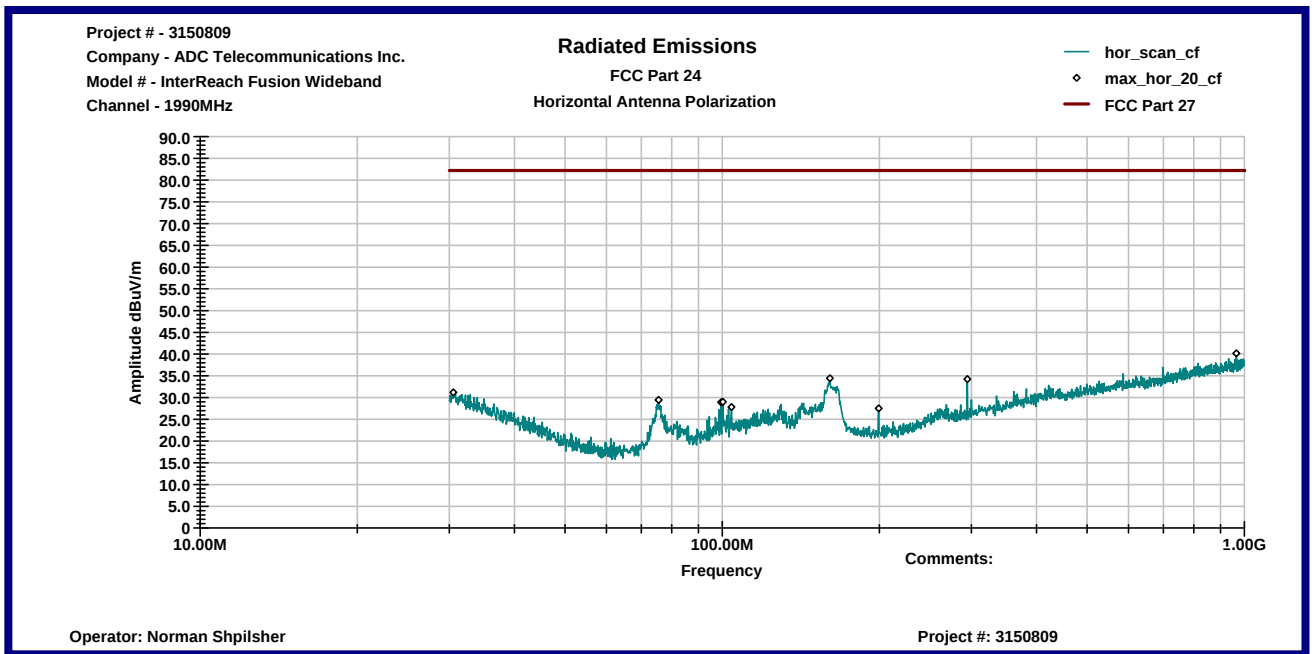
Graph 3



Graph 4



Graph 5



Graph 6

Radiated Emissions from 1 to 20GHz
Date: 05-07-2008

Company: ADC Telecommunications Inc.
Model: InterReach Fusion Wideband
Test Engineer: Norman Shpilsher
Special Info: Tx Mode
Standard: FCC Part 24
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 Measurements were taken using a Peak detector

Table # 2

Frequency MHz	Antenna Polarity	Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
1930MHz Channel							
1.7917 GHz	V	61.5	30.4	38.9	52.9	82.2	-29.3
1.9326 GHz	V	64.4	31.1	38.7	56.8	82.2	-25.4
6.9694 GHz	V	41.2	43.1	37.1	47.2	82.2	-35.0
1.7917 GHz	H	60.6	30.4	38.9	52.0	82.2	-30.2
1.9326 GHz	H	64.2	31.1	38.7	56.6	82.2	-25.6
3.584 GHz	H	44.3	35.7	37.6	42.4	82.2	-39.8
1960MHz Channel							
1.7917 GHz	V	61.9	30.4	38.9	53.4	82.2	-28.8
1.9617 GHz	V	66.7	31.2	38.7	59.2	82.2	-23.0
9.7574 GHz	V	36.4	46.6	34.8	48.2	82.2	-34.0
1.7917 GHz	H	60.7	30.4	38.9	52.1	82.2	-30.1
1.9617 GHz	H	68.0	31.2	38.7	60.5	82.2	-21.7
3.2197 GHz	H	45.9	34.6	37.8	42.7	82.2	-39.6
1990MHz Channel							
1.7917 GHz	V	62.0	30.4	38.9	53.5	82.2	-28.7
1.9909 GHz	V	63.1	31.4	38.6	55.9	82.2	-26.3
9.7574 GHz	V	37.2	46.6	34.8	49.0	82.2	-33.2
1.7917 GHz	H	60.9	30.4	38.9	52.3	82.2	-29.9
1.9909 GHz	H	67.7	31.4	38.6	60.5	82.2	-21.7
3.2197 GHz	H	45.9	34.6	37.8	42.7	82.2	-39.5
3.584 GHz	H	44.1	35.7	37.6	42.2	82.2	-40.0
5.3763 GHz	H	38.2	40.8	37.4	41.6	82.2	-40.6

Project # - 3150809

Company - ADC Telecommunications Inc.

Model # - InterReach Fusion Wideband

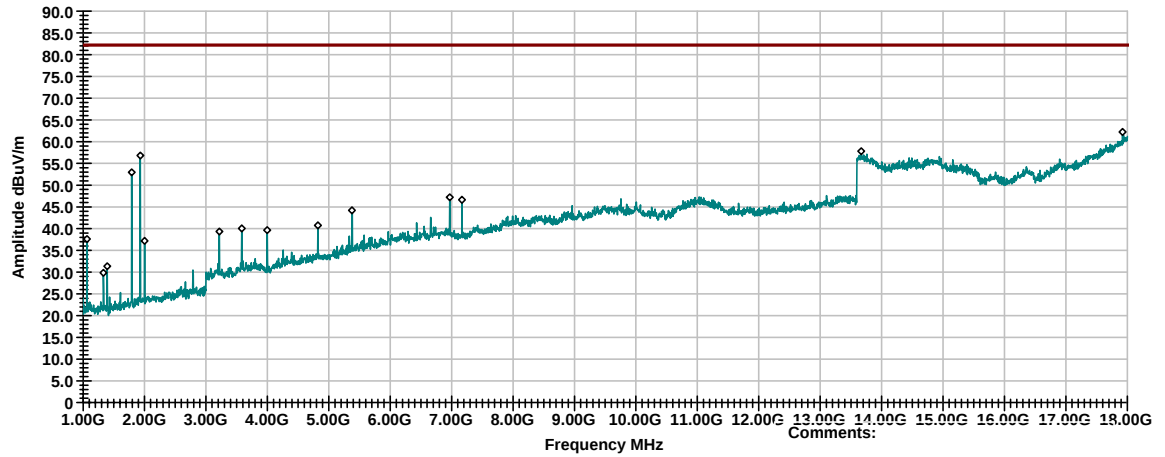
Channel - 1930MHz

Radiated Emissions

FCC Part 24

Vertical Antenna Polarization

ver_scan_cf
max_ver_20_cf
Limits



Operator: Norman Shpilsher

Project #: 3150809

Graph 7

Project # - 3150809

Company - ADC Telecommunications Inc.

Model # - InterReach Fusion Wideband

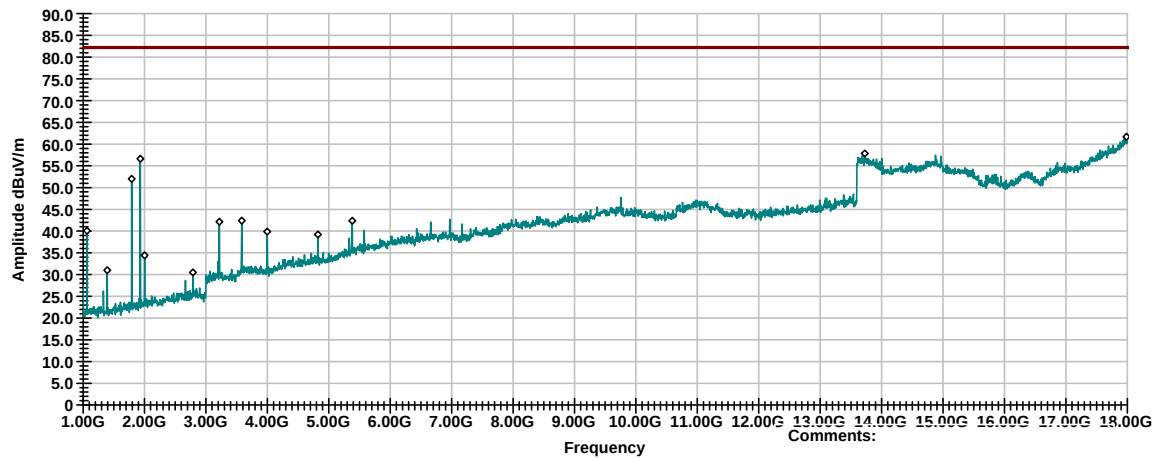
Channel - 1930MHz

Radiated Emissions

FCC Part 24

Horizontal Antenna Polarization

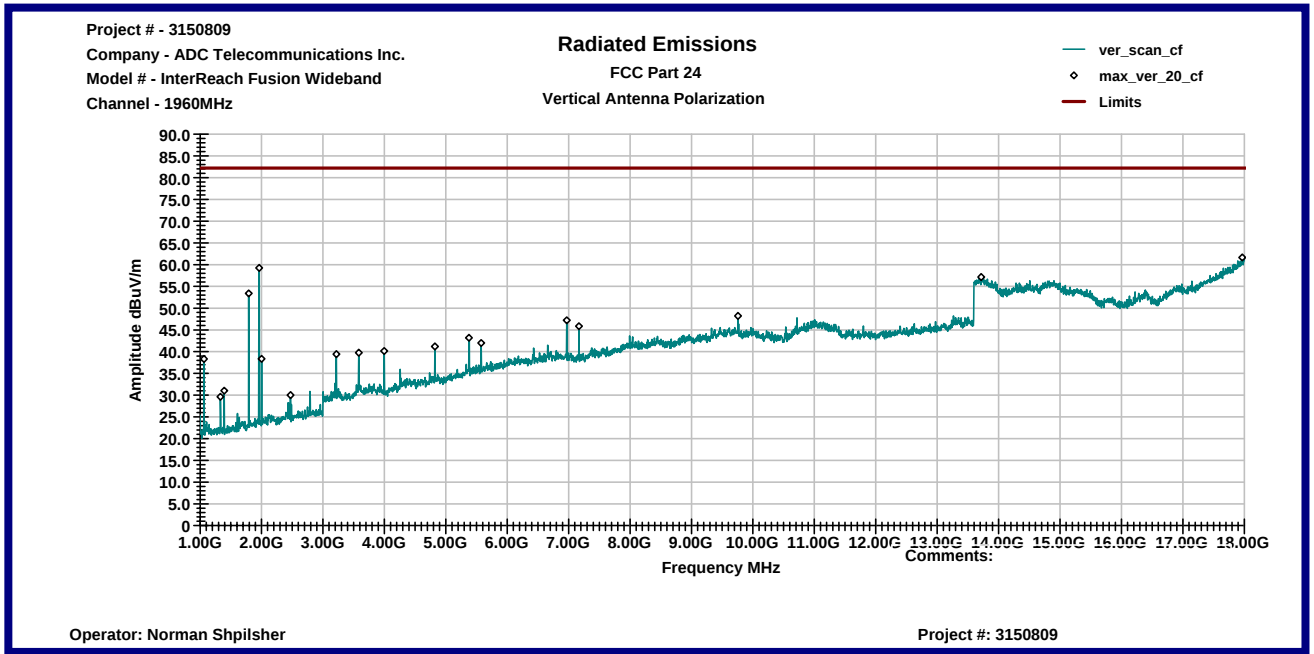
hor_scan_cf
max_hor_20_cf
Limits



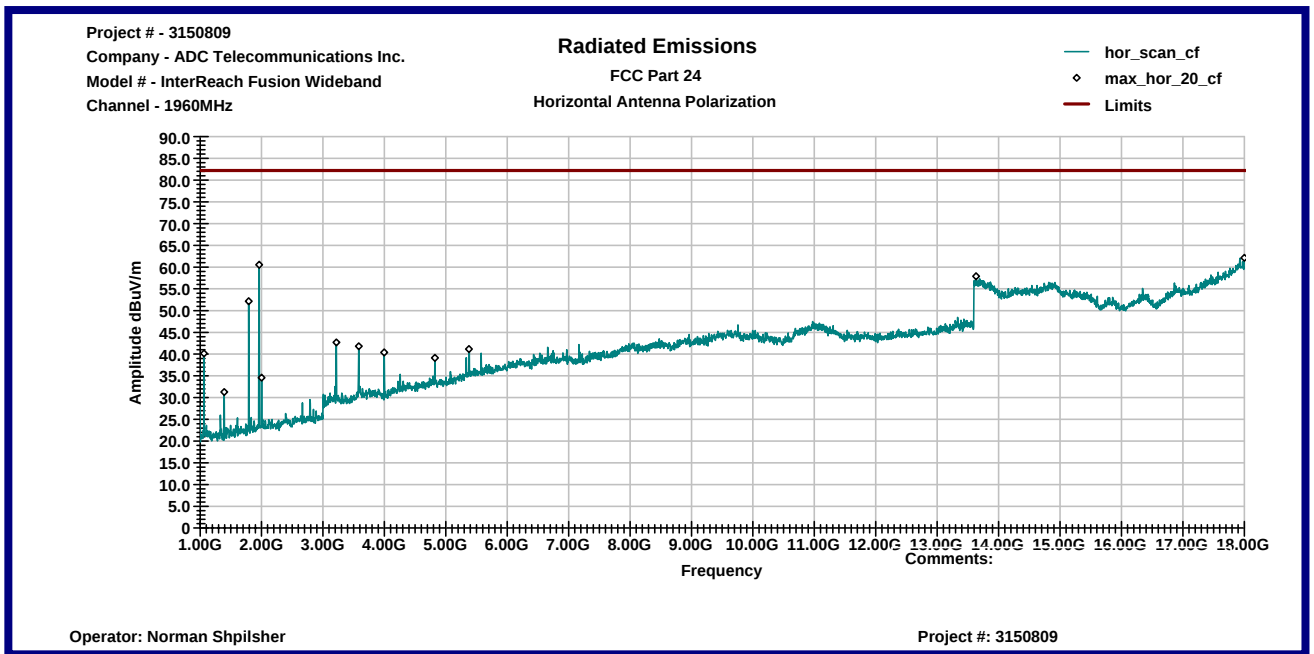
Operator: Norman Shpilsher

Project #: 3150809

Graph 9



Graph 9



Graph 10

Project # - 3150809

Company - ADC Telecommunications Inc.

Model # - InterReach Fusion Wideband

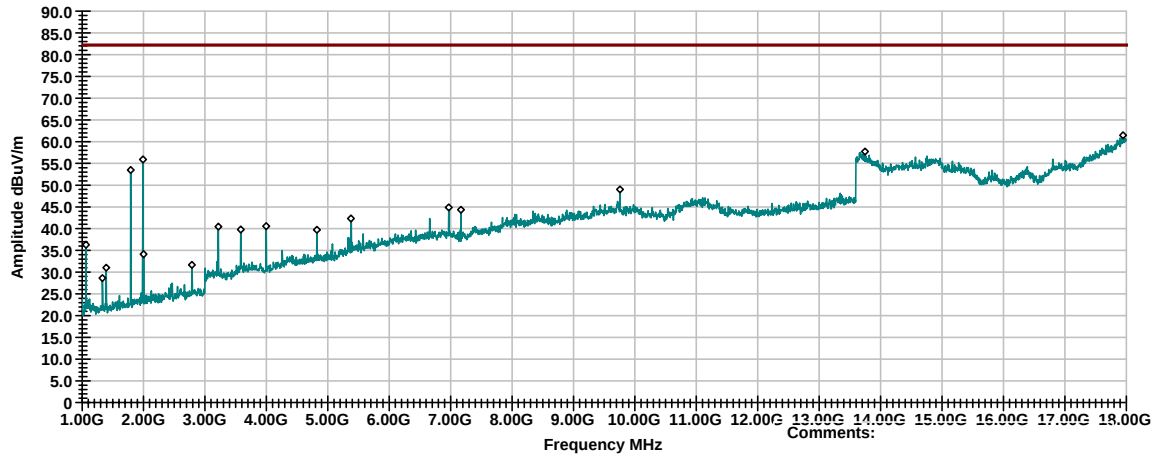
Channel - 1990MHz

Radiated Emissions

FCC Part 24

Vertical Antenna Polarization

ver_scan_cf
max_ver_20_cf
Limits



Operator: Norman Shpilsher

Project #: 3150809

Graph 11

Project # - 3150809

Company - ADC Telecommunications Inc.

Model # - InterReach Fusion Wideband

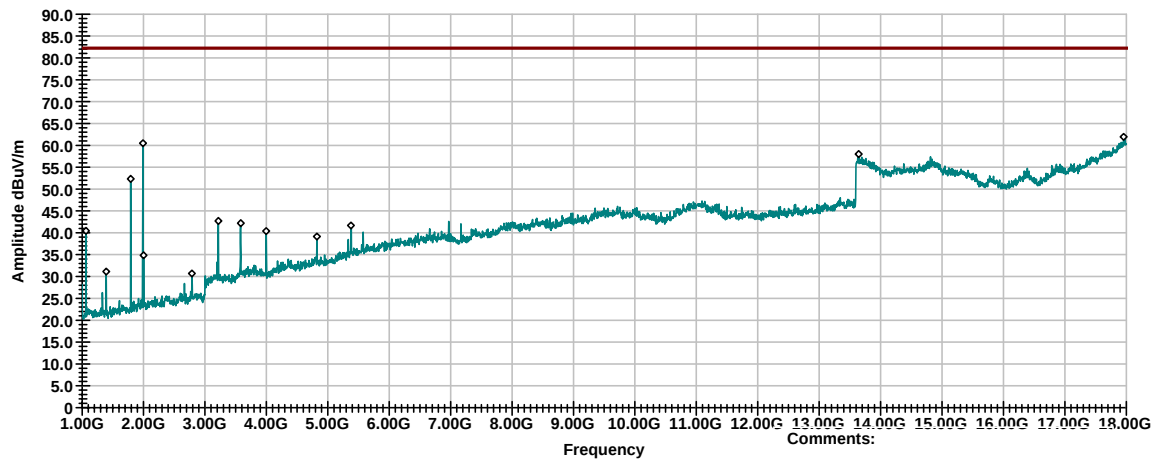
Channel - 1990MHz

Radiated Emissions

FCC Part 24

Horizontal Antenna Polarization

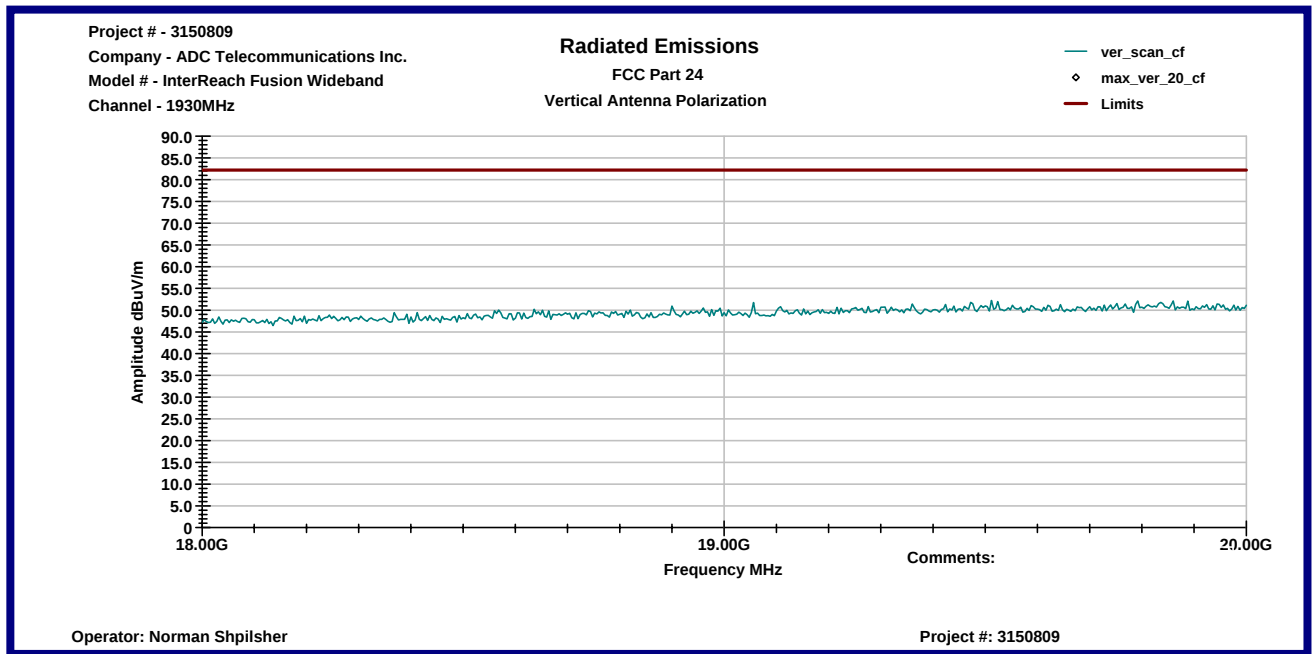
hor_scan_cf
max_hor_20_cf
Limits



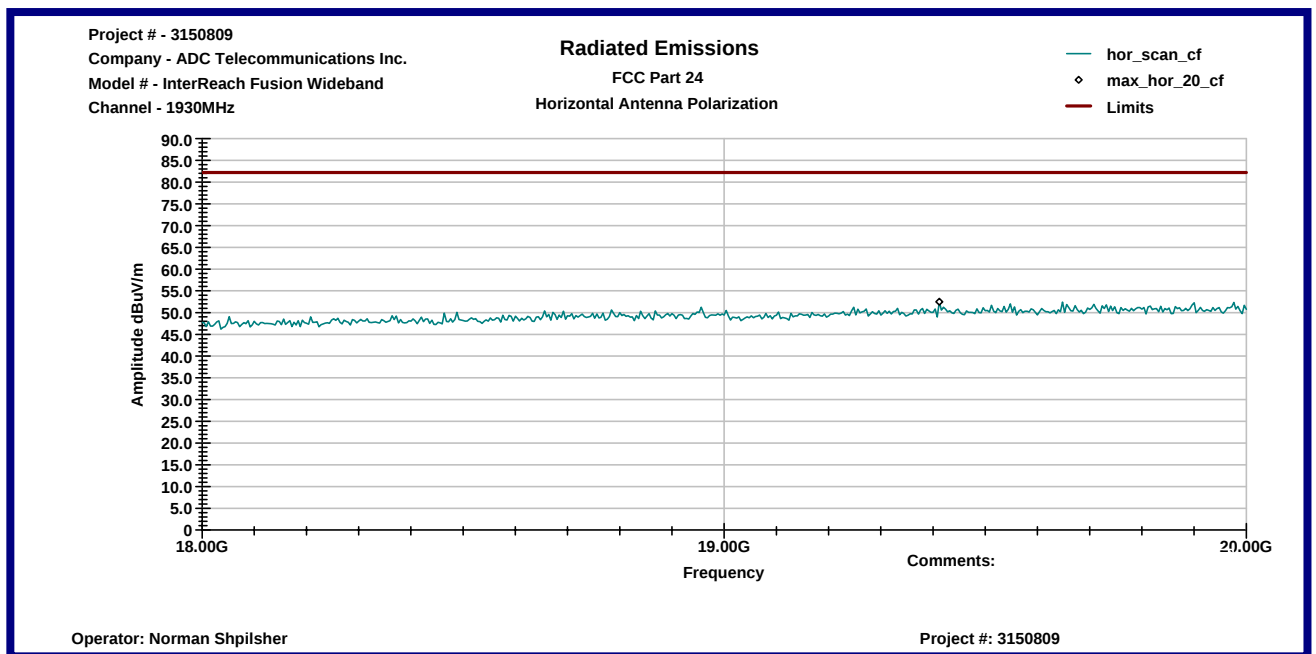
Operator: Norman Shpilsher

Project #: 3150809

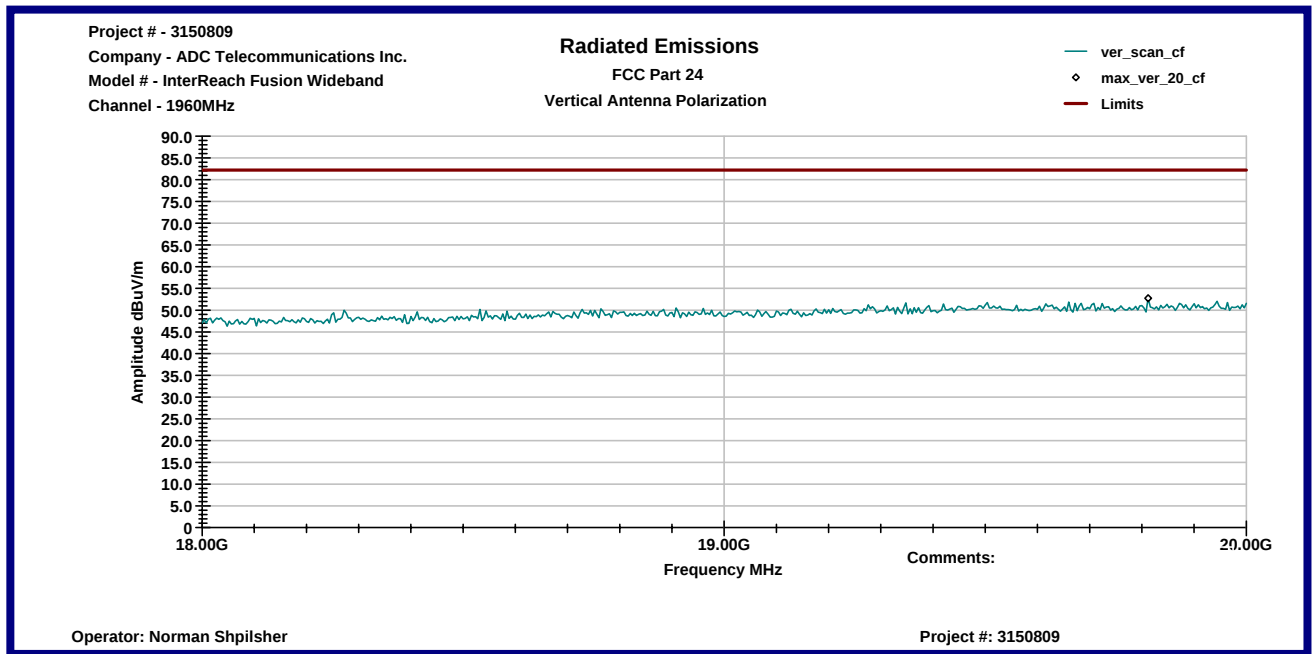
Graph 12



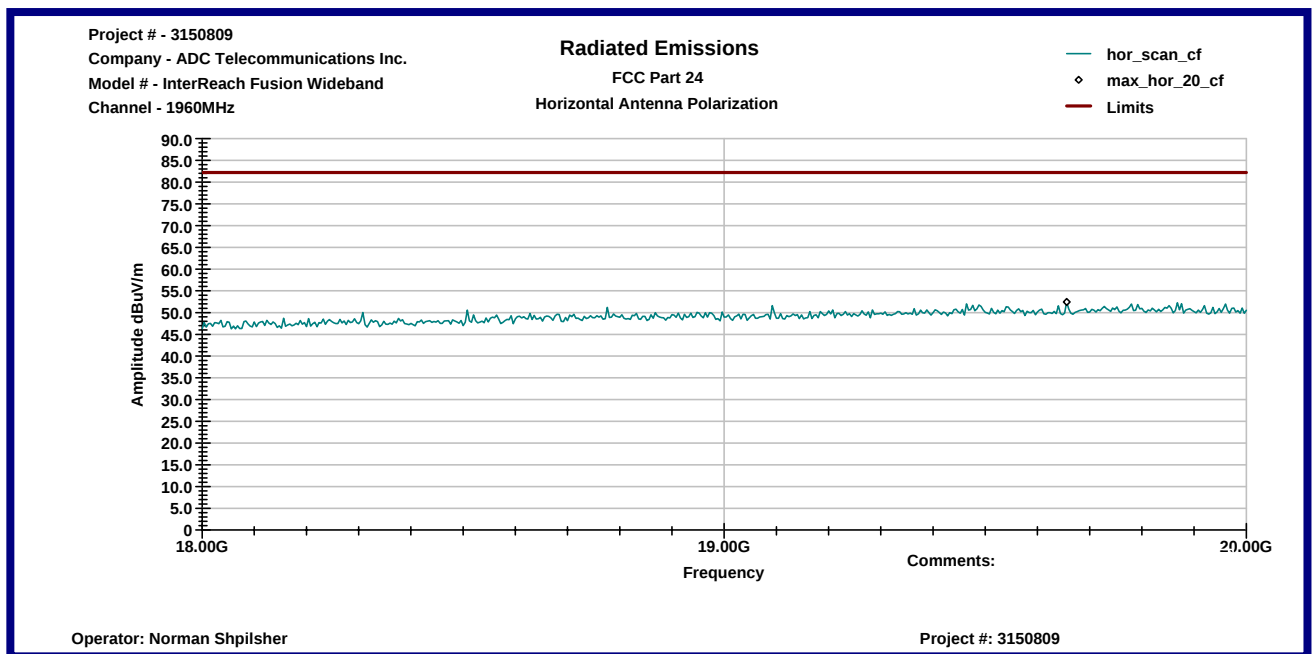
Graph 13



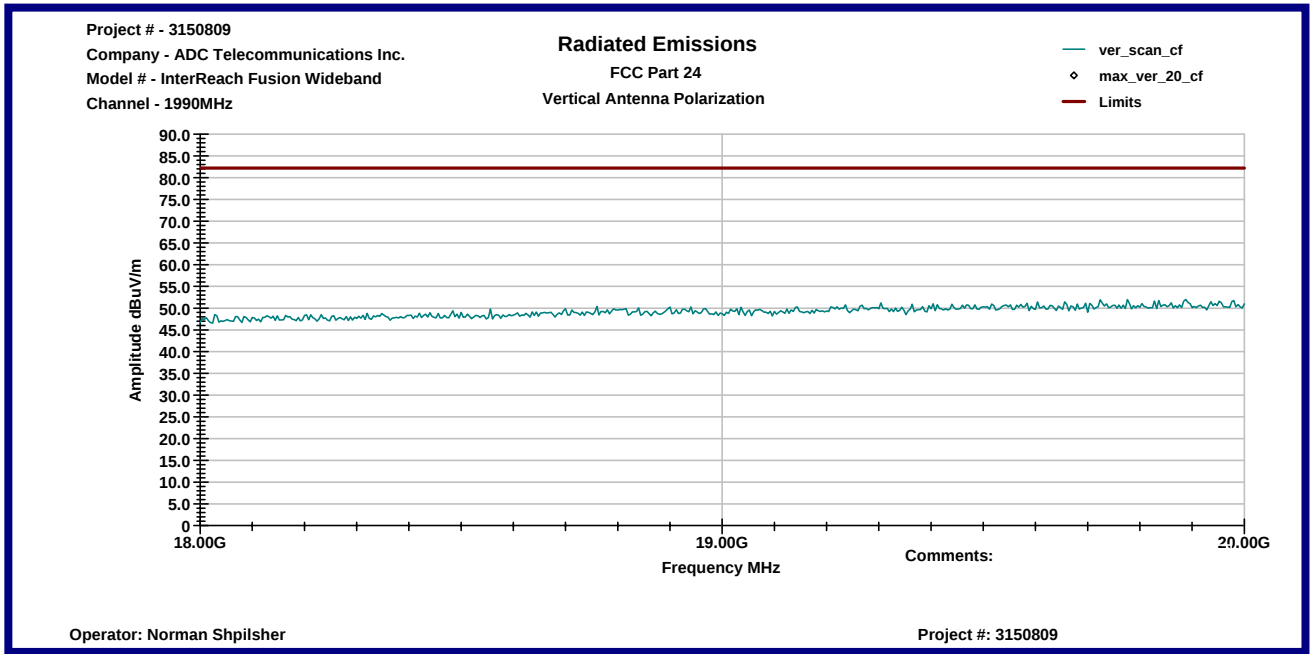
Graph 14



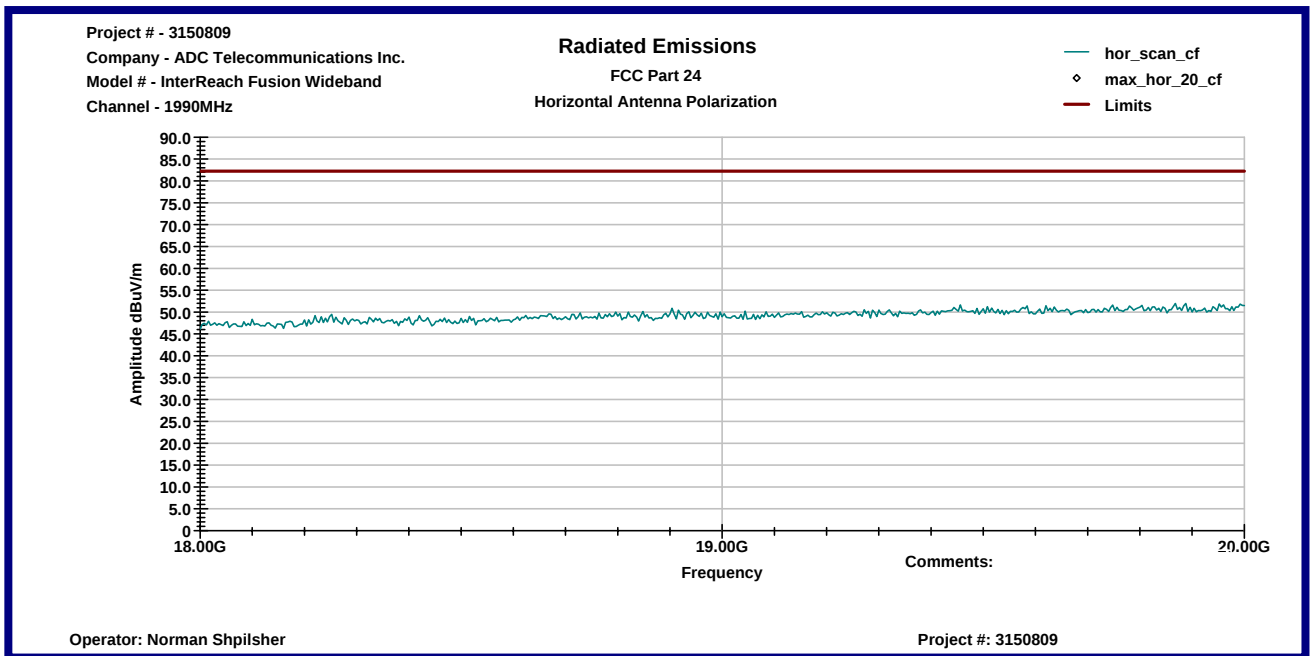
Graph 15



Graph 16



Graph 17



Graph 18

3.2 Spurious Radiated Emissions, Rx Mode

No emissions were chosen for substitution measurements as the maximum emissions is more than 20dB below the reference limit

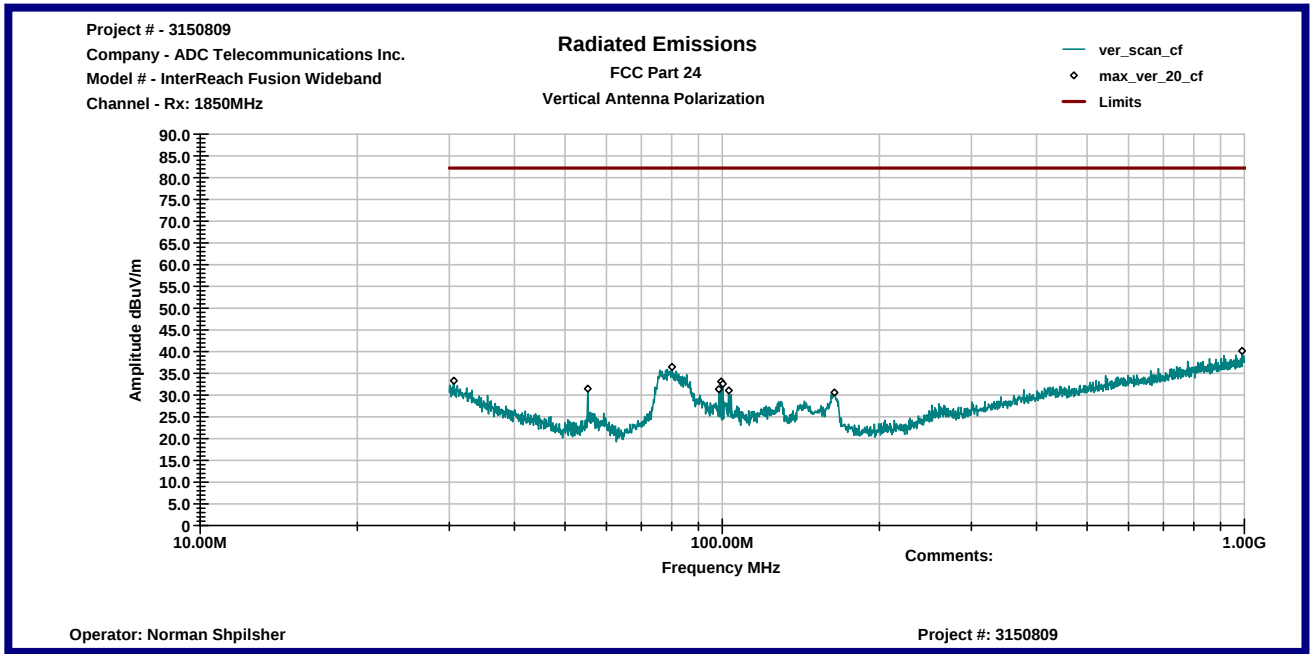
Radiated Emissions from 30MHz to 1GHz

Date: 05-07-2008

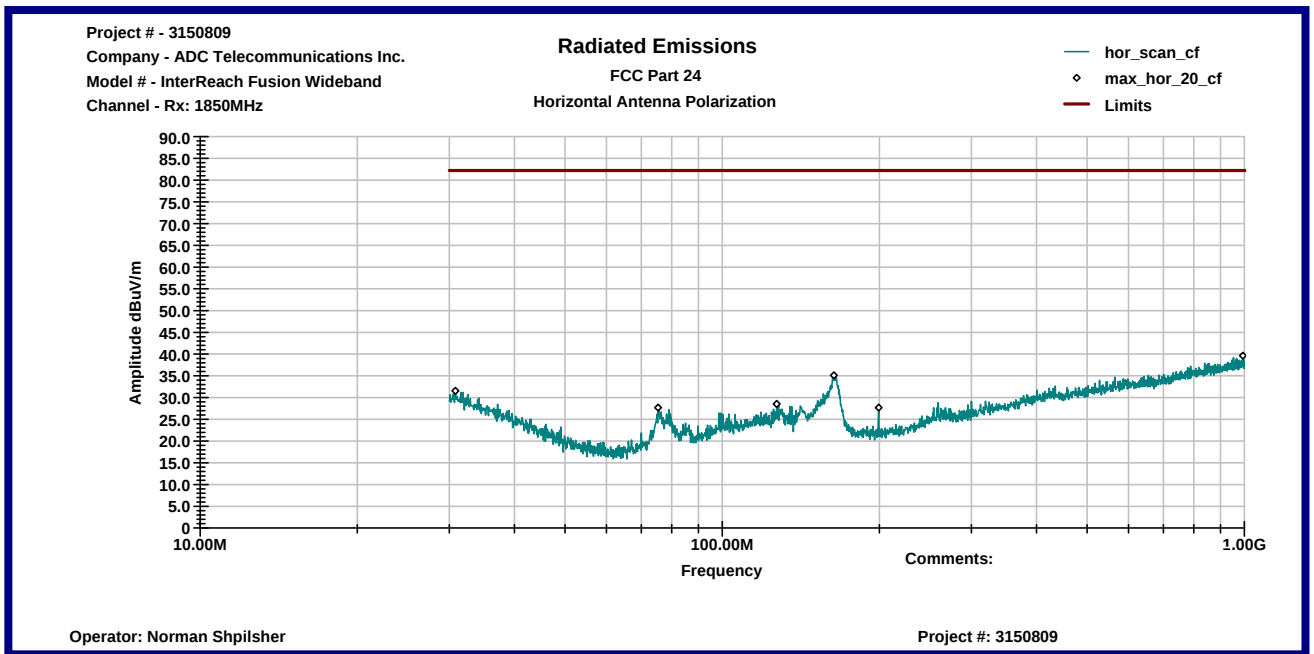
Company: ADC Telecommunications Inc.
Model: InterReach Fusion Wideband
Test Engineer: Norman Shpilsher
Special Info: Rx Mode
Standard: FCC Part 24
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 Measurements were taken using a Peak detector

Table # 3

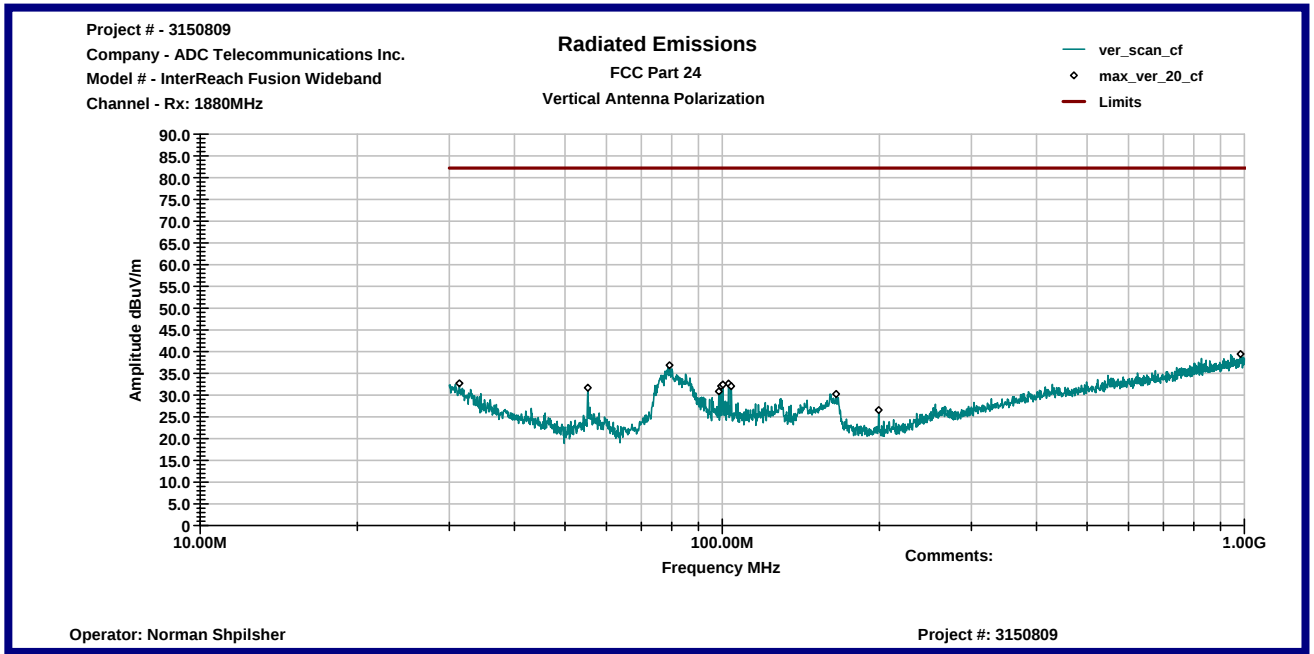
Frequency	Ant. Polarity	Peak Reading dBμV	Ant.Factor dB1/m	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
1850MHz Channel						
30.623 MHz	V	13.1	20.2	33.3	82.2	-48.9
80.153 MHz	V	27.5	9.0	36.5	82.2	-45.7
990.1 MHz	V	14.3	25.8	40.2	82.2	-42.1
30.831 MHz	H	11.4	20.1	31.5	82.2	-50.7
163.68 MHz	H	23.2	11.9	35.1	82.2	-47.1
993.63 MHz	H	13.7	25.9	39.6	82.2	-42.6
1880MHz Channel						
31.385 MHz	V	12.9	19.8	32.7	82.2	-49.5
79.258 MHz	V	28.0	8.9	36.8	82.2	-45.4
983.73 MHz	V	13.7	25.8	39.4	82.2	-42.8
31.87 MHz	H	11.7	19.6	31.2	82.2	-51.0
164.33 MHz	H	24.0	11.9	35.9	82.2	-46.3
987.27 MHz	H	13.3	25.8	39.1	82.2	-43.1
1910MHz Channel						
78.81 MHz	V	26.9	8.8	35.7	82.2	-46.5
99.553 MHz	V	20.4	11.7	32.1	82.2	-50.1
961.1 MHz	V	13.3	25.5	38.7	82.2	-43.5
31.039 MHz	H	10.9	20.0	30.9	82.2	-51.3
164.33 MHz	H	23.0	11.9	34.8	82.2	-47.4
946.95 MHz	H	14.3	25.3	39.6	82.2	-42.6



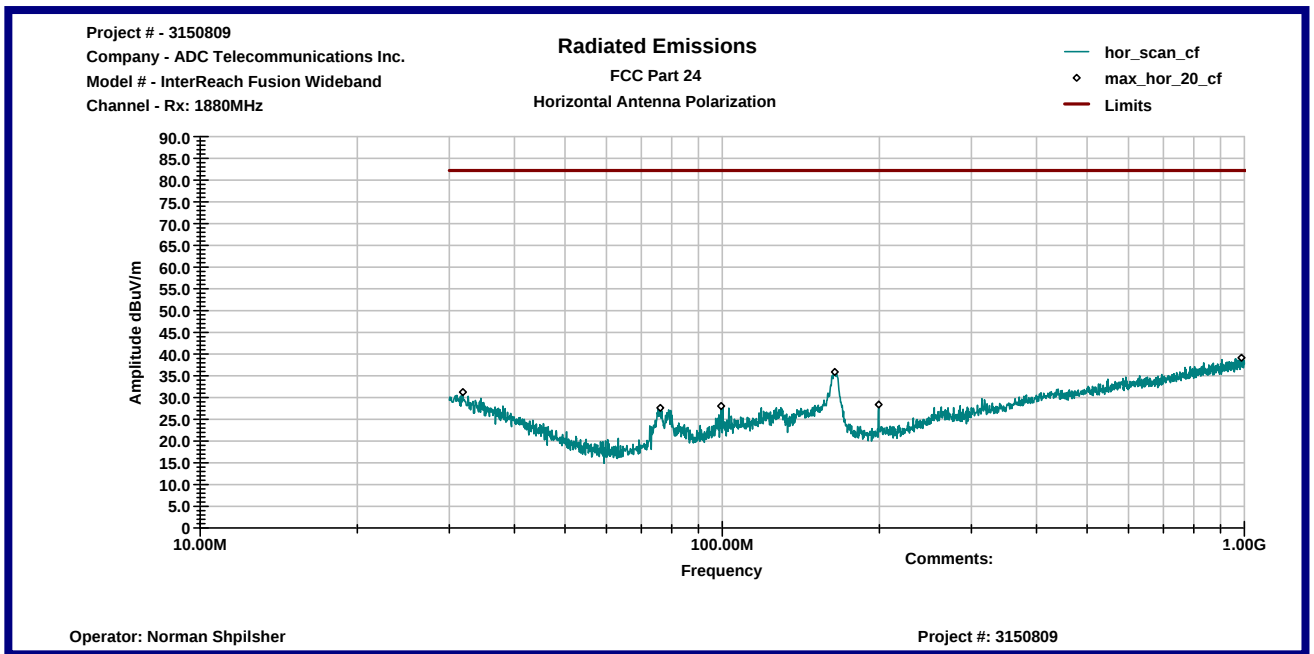
Graph 19



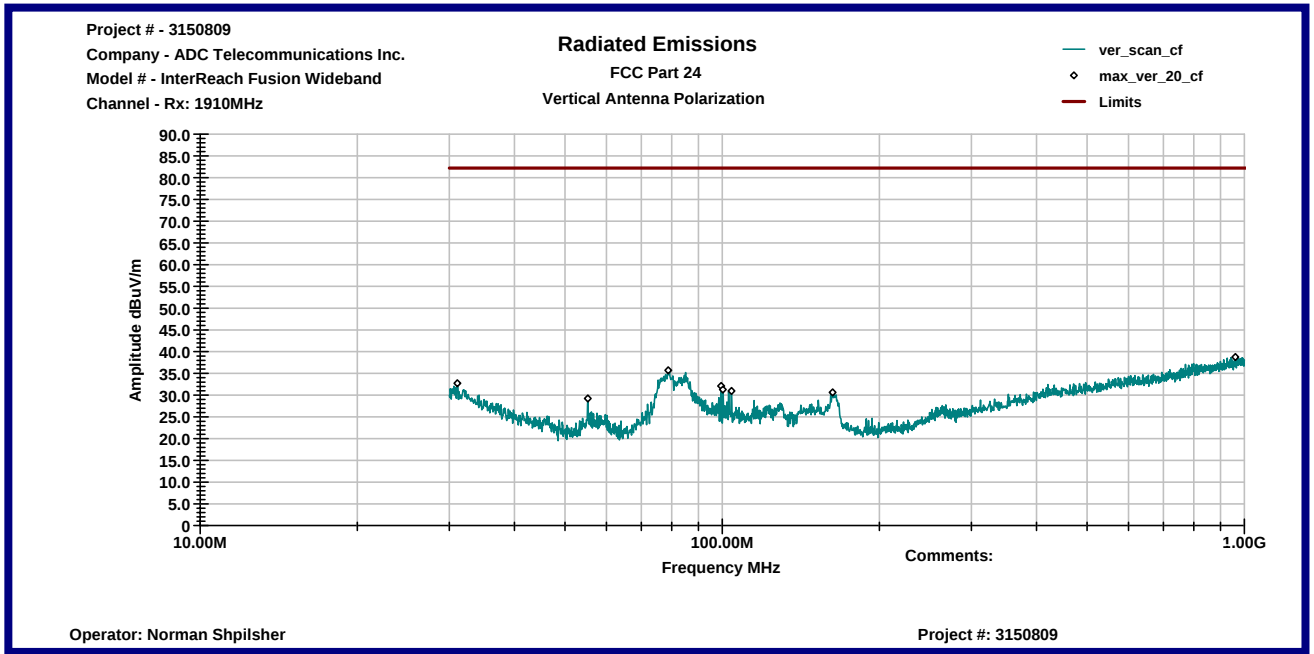
Graph 20



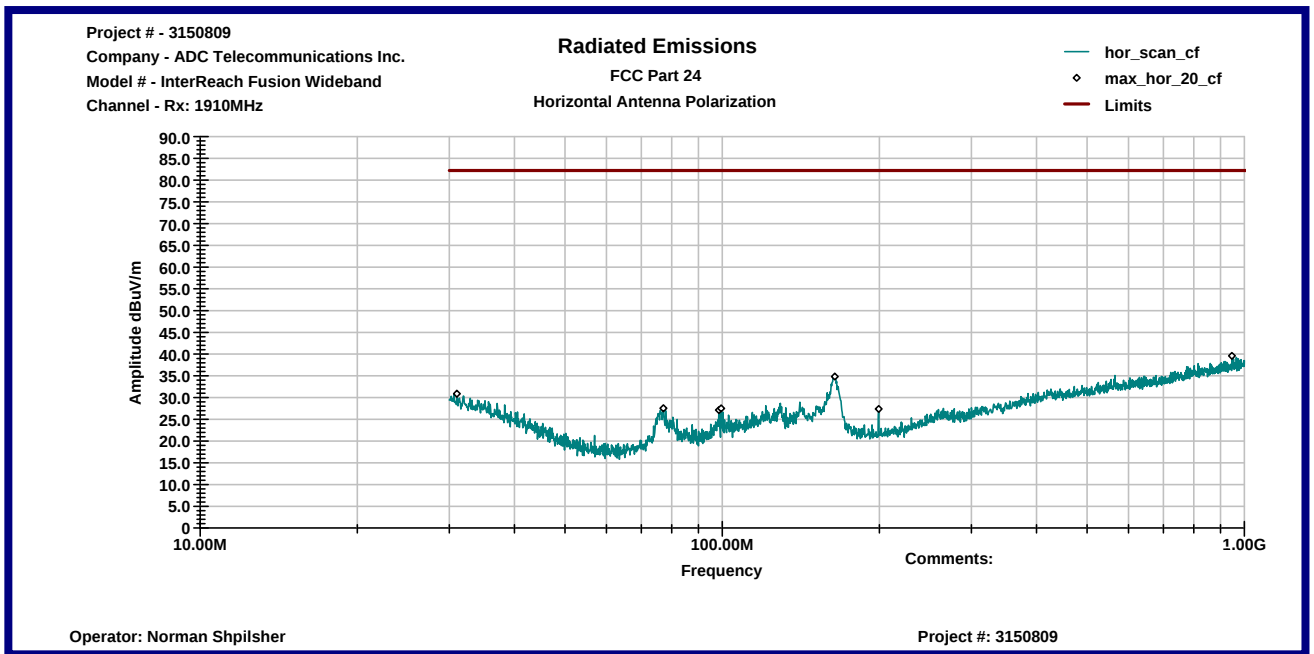
Graph 21



Graph 22



Graph 23



Graph 24

Radiated Emissions from 1 to 20GHz
Date: 05-07-2008

Company: ADC Telecommunications Inc.
Model: InterReach Fusion Wideband
Test Engineer: Norman Shpilsher
Special Info: Rx Mode
Standard: FCC Part 24
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 Measurements were taken using a Peak detector

Table # 4

Frequency MHz	Antenna Polarity	Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
1850MHz Channel							
1.7917 GHz	V	67.0	30.4	38.9	58.5	82.2	-23.7
7.1686 GHz	V	38.2	43.5	37.0	44.7	82.2	-37.5
9.7574 GHz	V	36.1	46.6	34.8	47.9	82.2	-34.3
1.7917 GHz	H	63.8	30.4	38.9	55.2	82.2	-27.0
3.2197 GHz	H	47.5	34.6	37.8	44.3	82.2	-37.9
6.9694 GHz	H	37.6	43.1	37.1	43.5	82.2	-38.7
1880MHz Channel							
1.7917 GHz	V	68.0	30.4	38.9	59.5	82.2	-22.7
5.3811 GHz	V	39.1	40.8	37.3	42.6	82.2	-39.6
6.9694 GHz	V	37.8	43.1	37.1	43.7	82.2	-38.5
1.7917 GHz	H	63.5	30.4	38.9	54.9	82.2	-27.3
3.2197 GHz	H	47.4	34.6	37.8	44.2	82.2	-38.0
5.3763 GHz	H	39.1	40.8	37.4	42.6	82.2	-39.6
1910MHz Channel							
1.7917 GHz	V	68.2	30.4	38.9	59.7	82.2	-22.6
5.3763 GHz	V	41.0	40.8	37.4	44.5	82.2	-37.7
9.7574 GHz	V	37.3	46.6	34.8	49.2	82.2	-33.0
1.7917 GHz	H	62.8	30.4	38.9	54.3	82.2	-27.9
3.9969 GHz	H	42.1	36.9	37.7	41.2	82.2	-41.0
5.3763 GHz	H	38.9	40.8	37.4	42.4	82.2	-39.8

Project # - 3150809

Company - ADC Telecommunications Inc.

Model # - InterReach Fusion Wideband

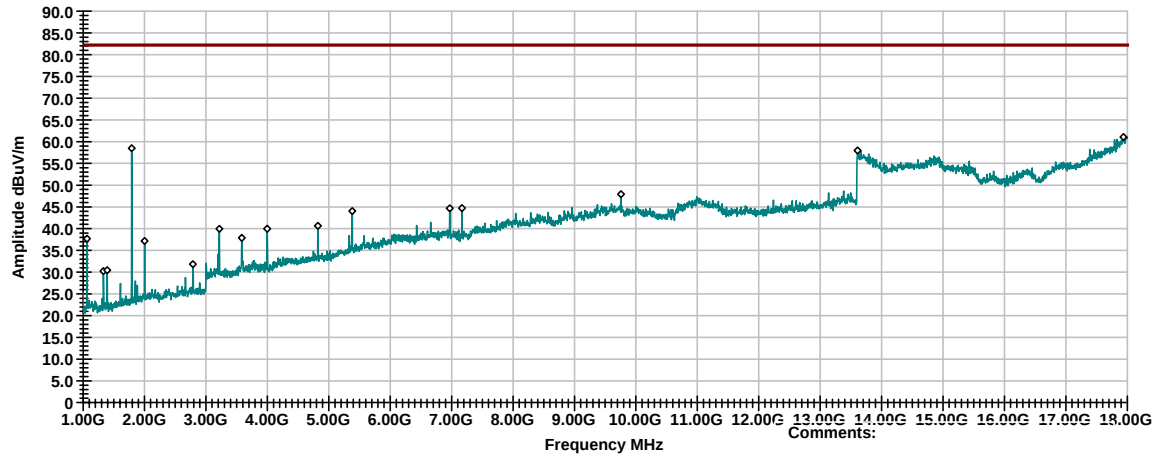
Channel - Rx: 1850MHz

Radiated Emissions

FCC Part 24

Vertical Antenna Polarization

ver_scan_cf
max_ver_20_cf
Limits



Operator: Norman Shpilsher

Project #: 3150809

Graph 25

Project # - 3150809

Company - ADC Telecommunications Inc.

Model # - InterReach Fusion Wideband

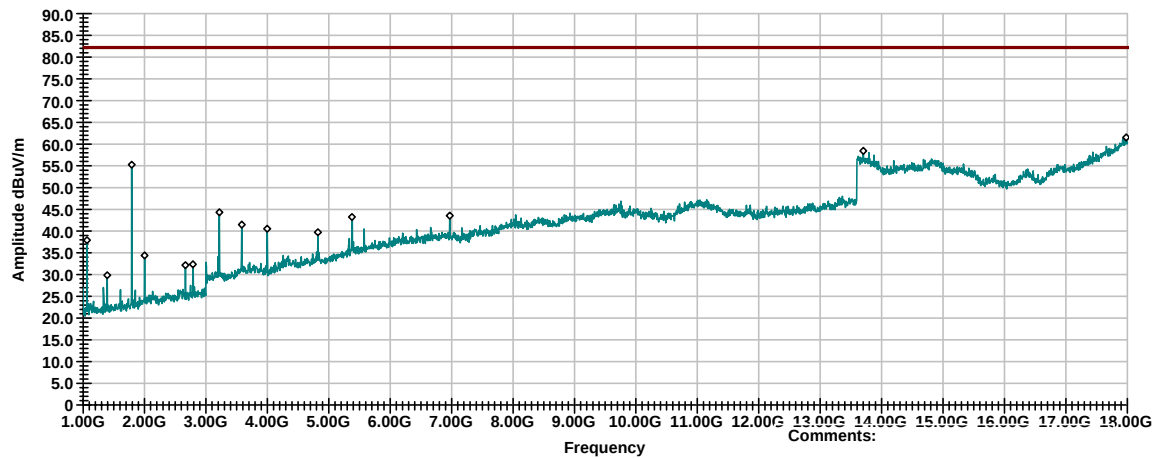
Channel - Rx: 1850MHz

Radiated Emissions

FCC Part 24

Horizontal Antenna Polarization

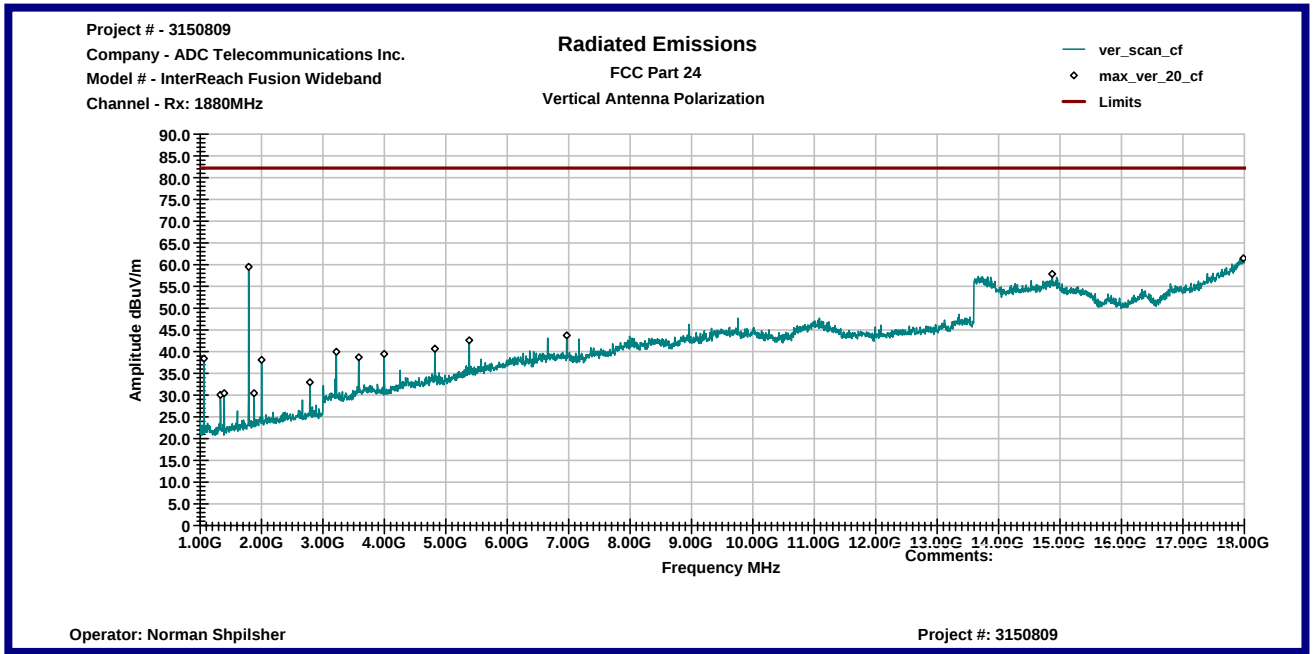
hor_scan_cf
max_hor_20_cf
Limits



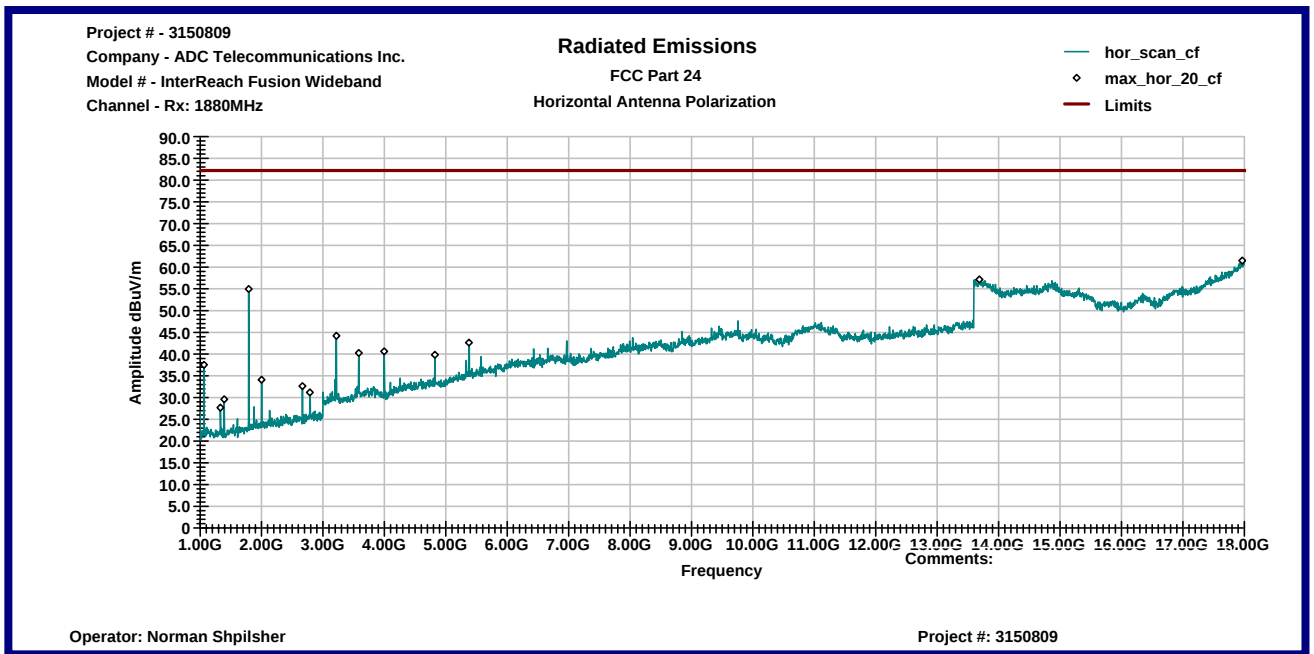
Operator: Norman Shpilsher

Project #: 3150809

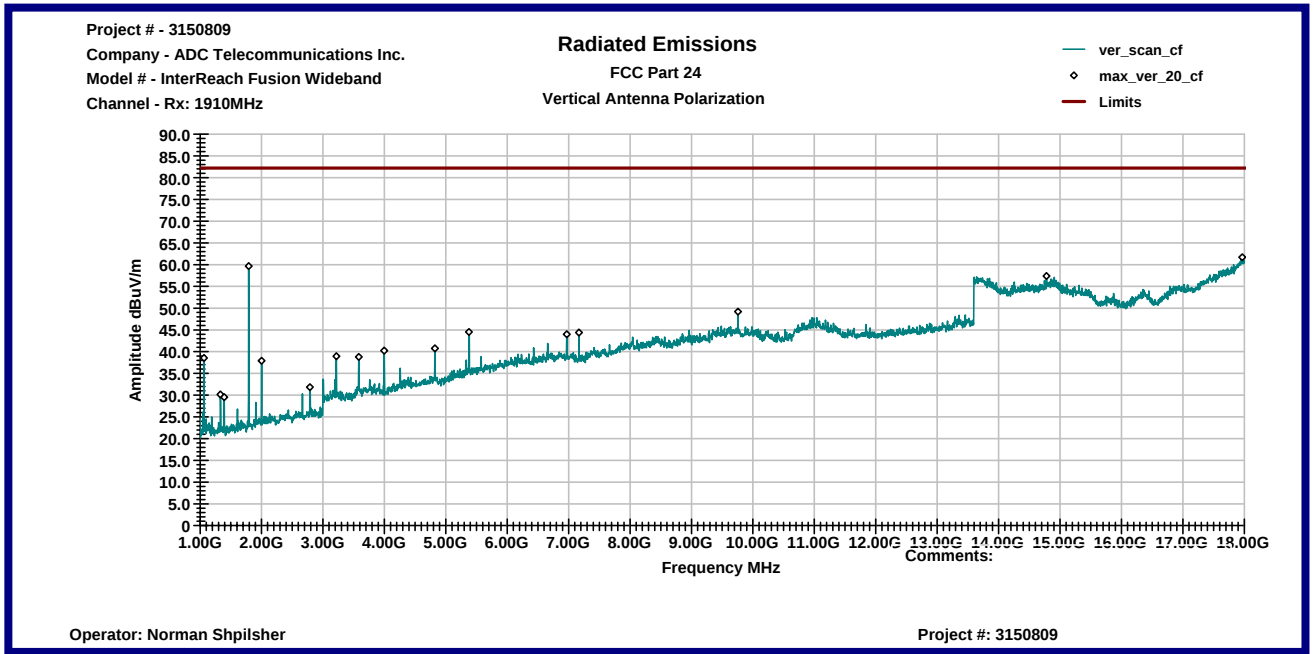
Graph 26



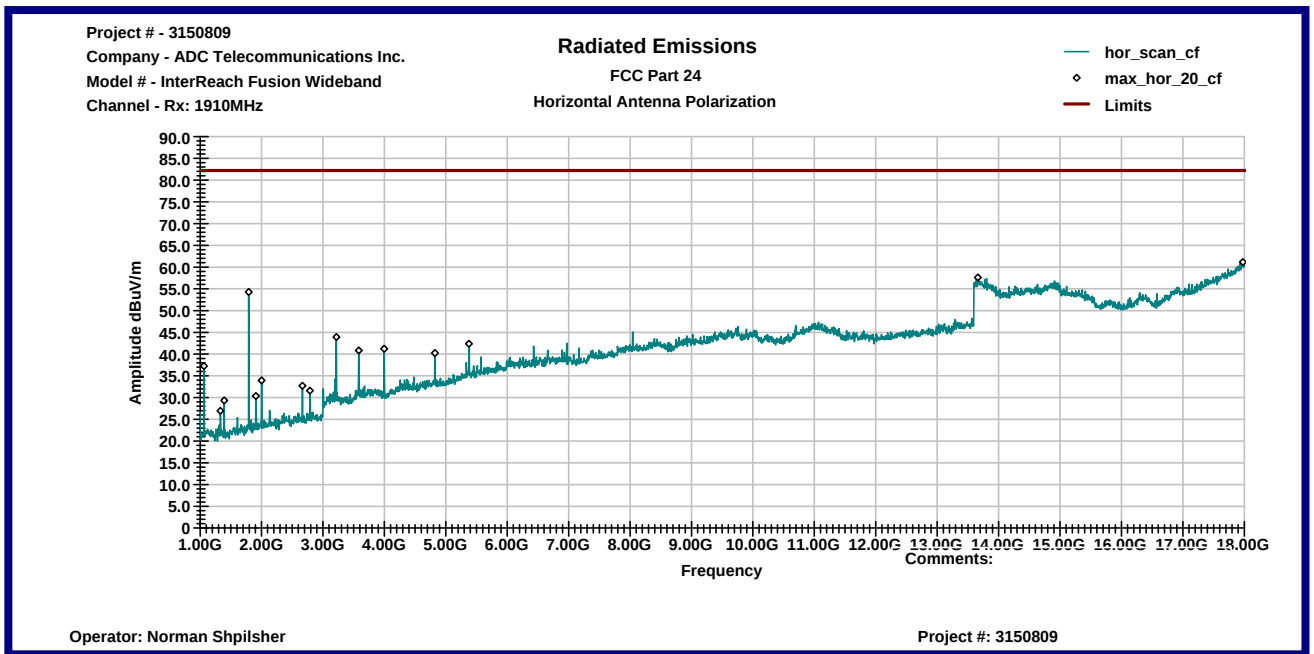
Graph 27



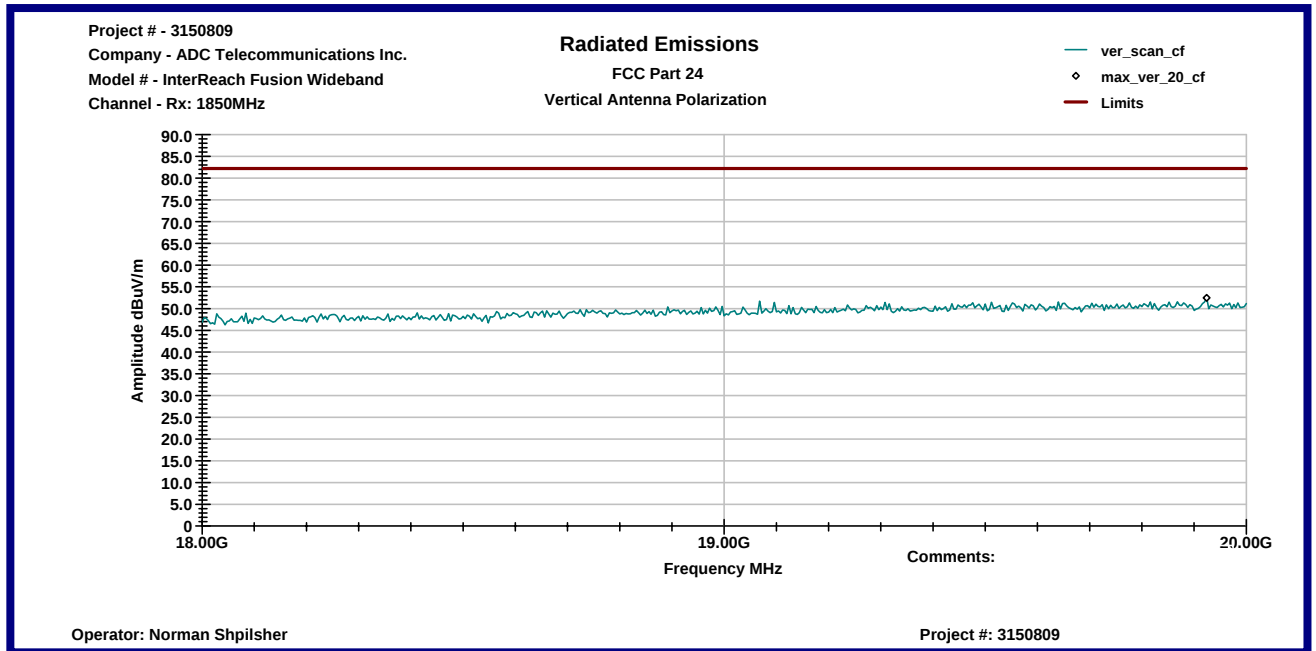
Graph 28



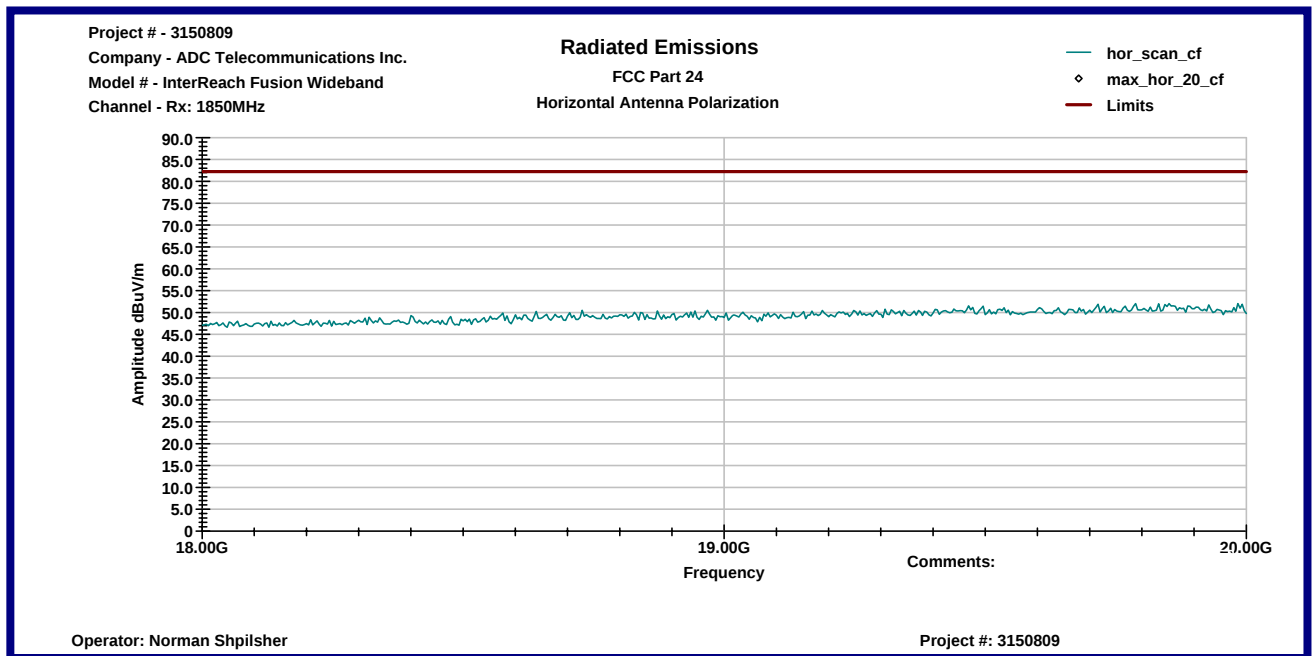
Graph 29



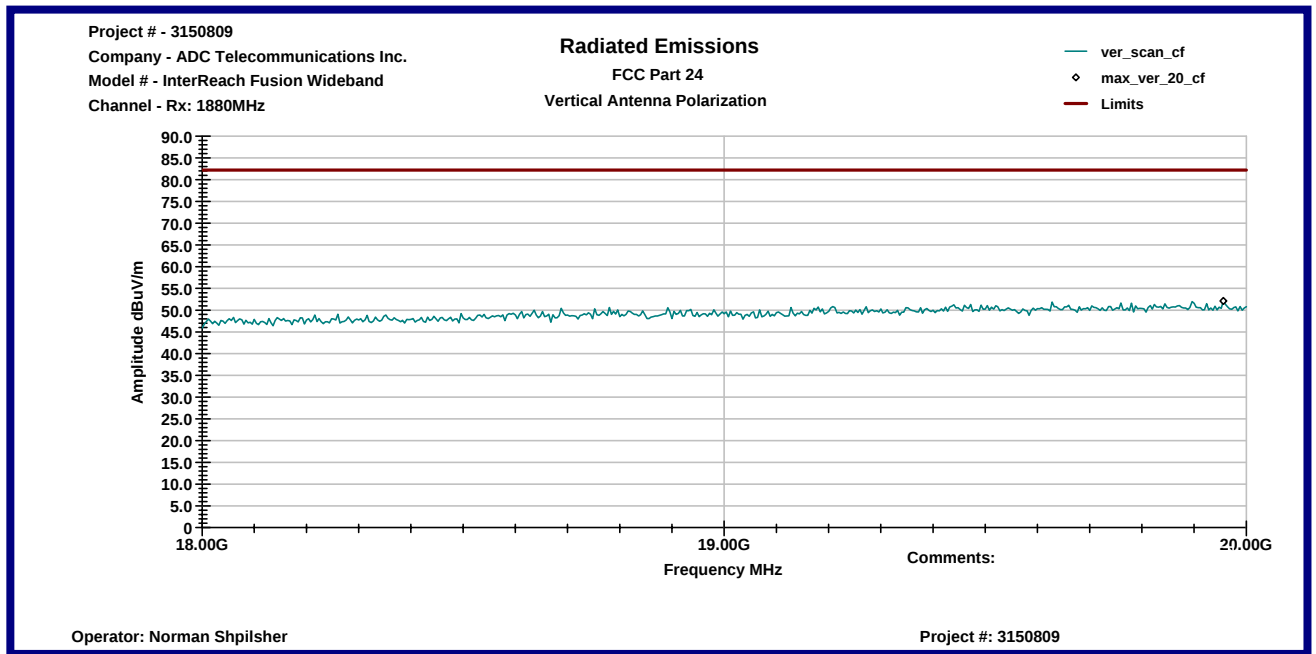
Graph 30



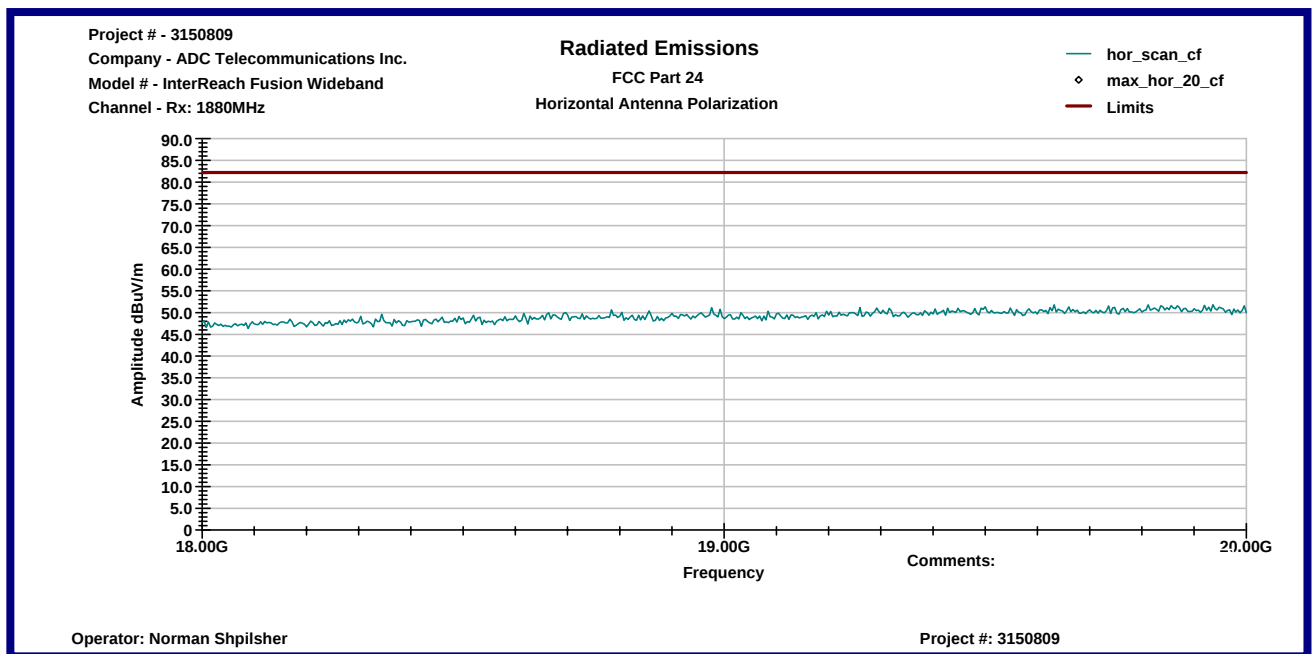
Graph 31



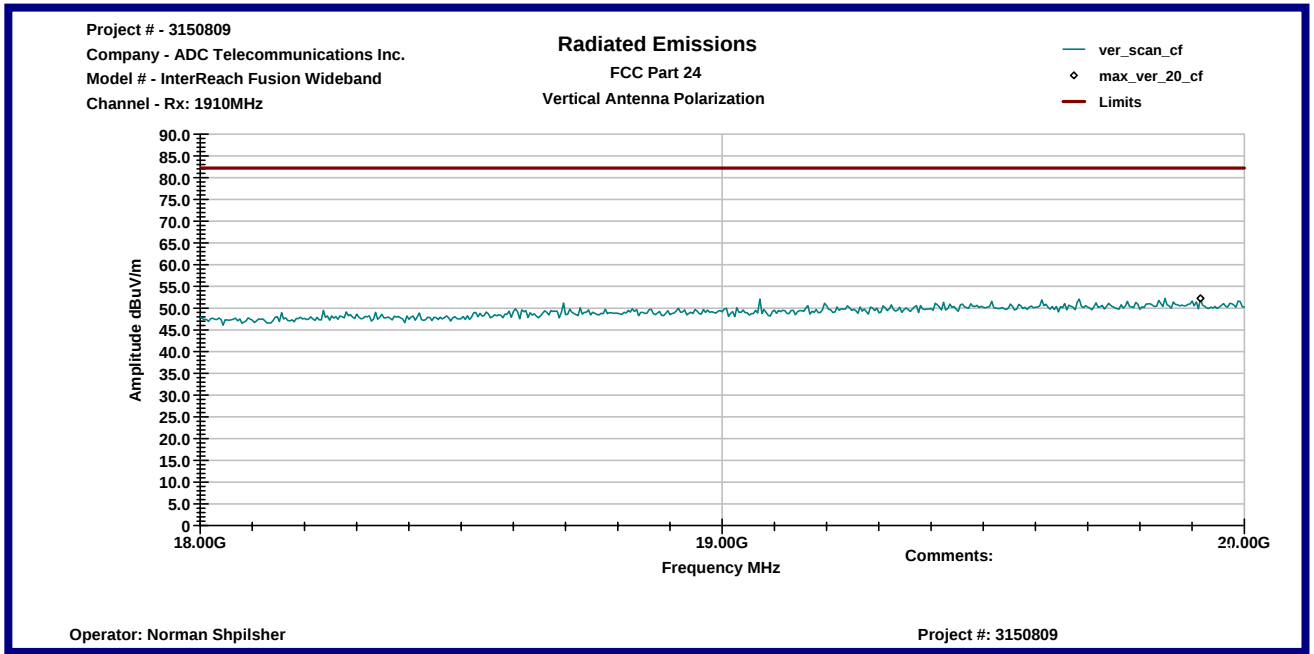
Graph 32



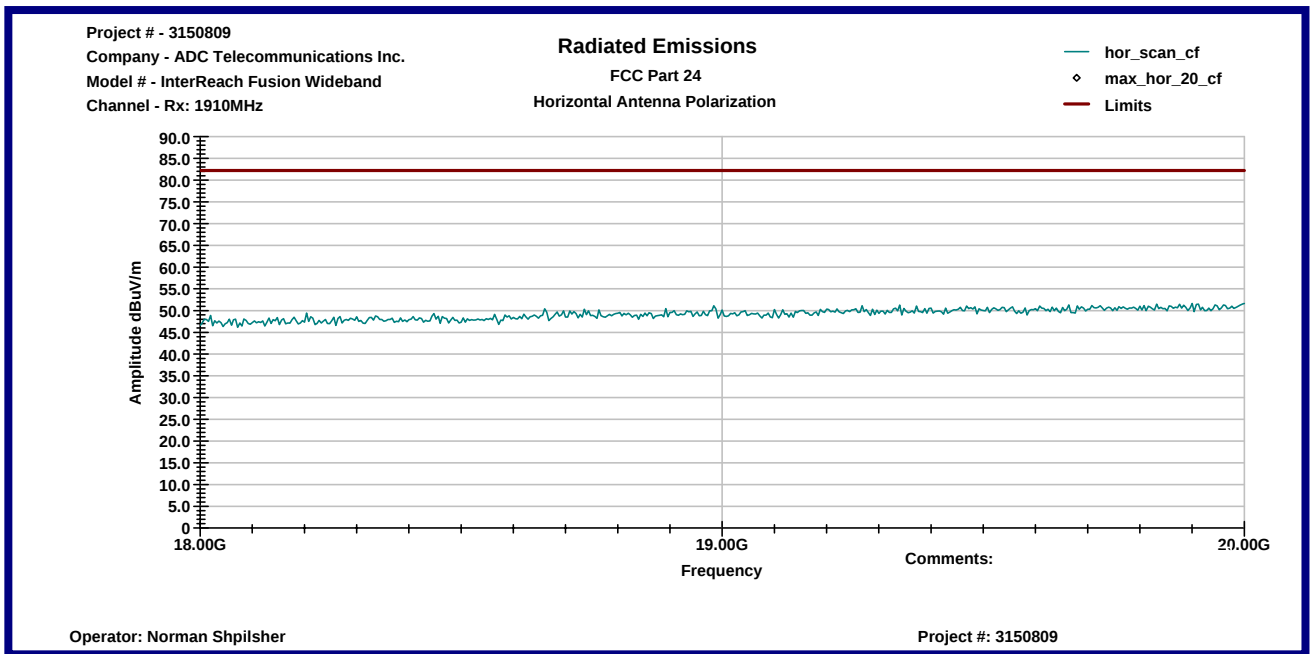
Graph 33



Graph 34



Graph 35



Graph 36

3.3 Environmental conditions

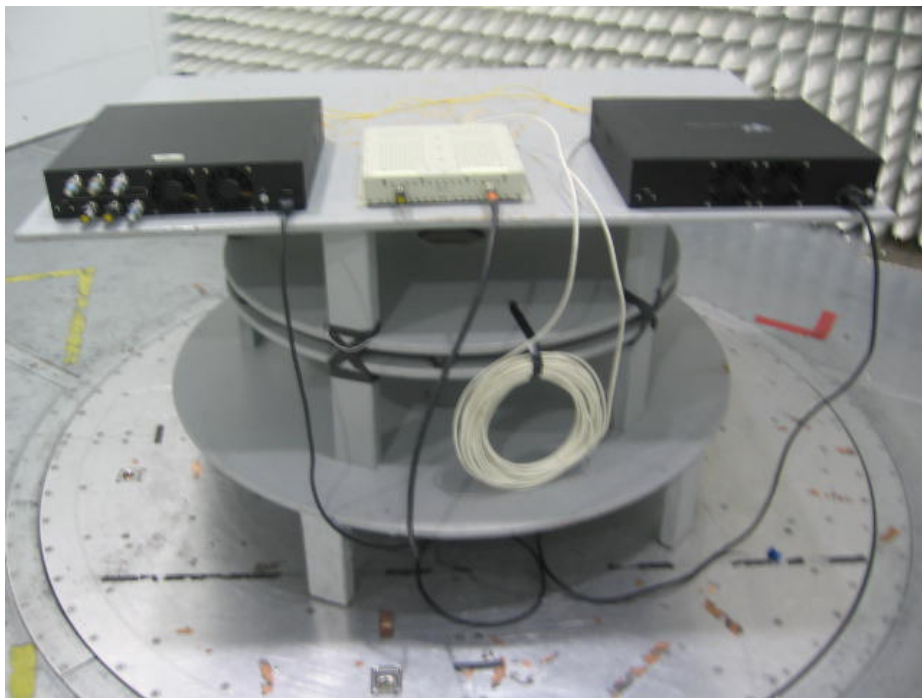
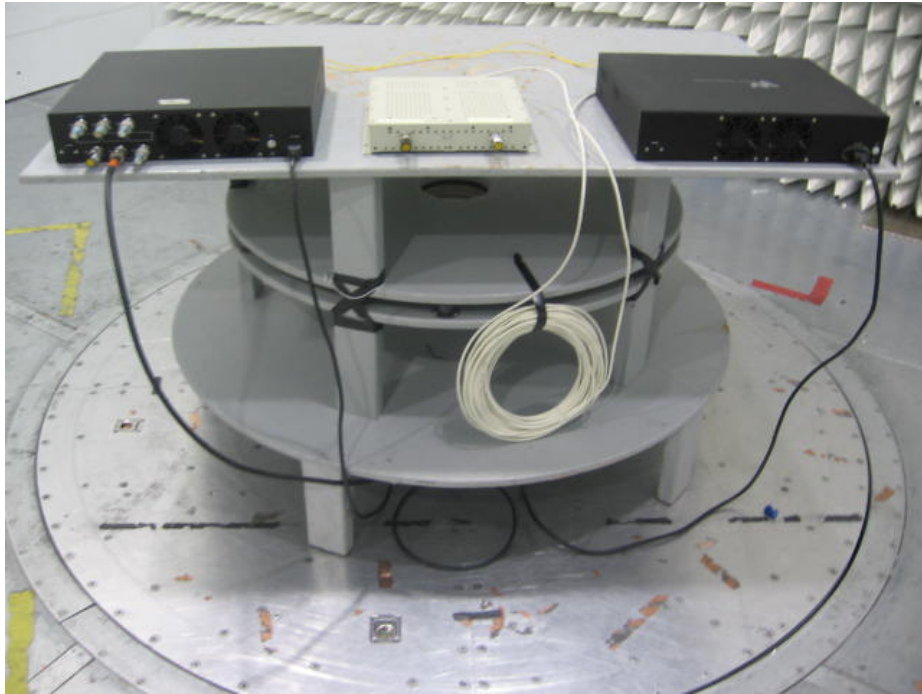
During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.0 PHOTOS







5.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	CAL DUE	USED
Receiver RF Section	HP	85462A	3325A00106	03/03/2009	☐
RF Filter Section	HP	85460A	3330A00109	03/03/2009	☐
Spectrum Analyzer	R & S	FSP 40	100024	08/23/2008	☒
Spectrum Analyzer	Agilent	E7402A	MY44212200	29/10/2008	☐
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2468	07/30/2008	☒
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2630	09/07/2008	☐
Horn Antenna	EMCO	3115	9507-4513	02/13/2009	☒
Horn Antenna	EMCO	3115	6579	03/20/2009	☐
Waveguide Horn Antenna	EMCO	3116	9904-2423	07/20/2008	☒
LISN	Fischer Custom Communications	FCC-LISN-2	316	09/24/2008	☐
LISN	Fischer Custom Communications	FCC-LISN-50-25-2	2014	10/22/2008	☐
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	04/28/2009	☒
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	01/17/2009	☒
Pre-Amplifier	MITEQ	AMF-6F-26004000-40-8P	13224444	11/05/2008	☐
System	TILE! Instrument Control		Ver. 3.4.K.29	VBU	☒