

TEST REPORT

Report Number: 103257443MIN-007

Project Number: G103257443

Testing performed on the
PC-503

FCC ID: HS9-201503

IC: 573R-201503

to

47 CFR, Part 15.249:2017

RSS- 210, Issue 9, 2016 (Amendment)

RSS-Gen, Issue 4, 2014

47 CFR, Part 15:2017, §15.107 and §15.109, Class / ICES-003, Issue 6:2016

For

Honeywell International, Inc.

Test Performed by:
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Oakdale, MN 55128 USA

Test Authorized by:
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Date of issue: October 23, 2017

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1.0 GENERAL DESCRIPTION

Model:	PC-503
Type of EUT:	Thermostat Commissioning Tool
Intertek Sample ID:	MIN1710021457-001
FCC ID:	HS9-201503
IC:	573R-201503
Related Submittal(s) Grants:	None
Company:	Honeywell International, Inc.
Customer:	John Grazulis
Address:	6060 Rockside Woods Blvd N Cleveland, OH 44131-7303 USA
Phone:	(216) 682-1439
e-mail:	john.grazulis@honeywell.com
Test Standards:	☒ 47 CFR, Part 15.249:2017, test method: ANSI C63.10-2013 ☒ RSS-210, Issue 9, 2016 (Amendment) ☒ RSS-Gen, Issue 4, 2014 ☒ 47 CFR, Part 15:2017, §15.107 and §15.109, Class B, test method: ANSI C63.4-2014 ☒ ICES-003, Issue 6:2016 ☐ Other
Type of radio:	☒ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	October 2, 2017
Test Work Started:	October 6, 2017
Test Work Completed:	October 17, 2017
Test Sample Conditions:	☐ Damaged ☐ Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	ZigBee 2.4GHz Radio
Operating Frequency	2405 - 2480 MHz
Permitted Band of Operation:	2400 – 2483.5 MHz
Modulation:	O-QPSK
Emission Designator:	2M36GXW
Antenna(s) Info:	Type SMD Chip Antenna Gain Avg Gain -0.5dBi; Peak Gain 1.3dBi Connector Soldered on PCB
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter Power Configuration:	☐ Internal battery ☒ External power source ☒ 5.0 VDC from USB port ☐ 50Hz ☐ 60Hz
Special Test Arrangement:	None
Test Facility Accreditation:	A2LA (Certificate No. 1427.01)
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2013

1.2 EUT Configuration

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

- ☐ - Standby
- ☒ - Continuous
- ☒ - Continuous un-modulated
- ☐ - Test program (customer specific)
- ☐ -

Operating modes of the EUT:

No.	Description
1	EUT transmitted continuously at lower, middle and upper channels
2	EUT in receiving mode to receive RF at lower, middle and upper channels

Cables:

No.	Type	Length	Designation	Note
1	Shielded, USB connector	1.6 m	DC Power	
2	4-wire unshielded	1m	Connected to Host PC to set the desire mode of operation. Used only for purpose of testing	

Support equipment/Services:

No.	Item	Description
1	HP Laptop	Host PC
2	SMR 20 Signal Generator	RF Source

1.3 Environmental conditions

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

☐ Normal

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

1.4 Measurement uncertainty

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 radiated emissions above 1GHz has been determined to be: ± 6.4 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

1.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where: FS = Field Strength in dB(μ V/m)

RA = Receiver Amplitude in dB(μ V)

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB(m^{-1})

AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB(μ V) is obtained. The antenna factor of 7.4 dB(m^{-1}) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB(μ V/m).

$$RA = 48.1 \text{ dB}(\mu\text{V})$$

$$AF = 7.4 \text{ dB}(m^{-1})$$

$$CF = 1.6 \text{ dB}$$

$$AG = 16.0 \text{ dB}$$

$$FS = RA + AF + CF - AG$$

$$FS = 48.1 + 7.4 + 1.6 - 16.0$$

$$FS = 41.1 \text{ dB}(\mu\text{V}/\text{m})$$

General notes: None

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 SPECIFICATION	TEST PARAMETERS	RESULT
15.249(a) / RSS-210 A2.9(a)	Field strength of fundamental	Pass
15.249(a) / RSS-210 A2.9(a)	Field strength of harmonics	Pass
15.249(d) / RSS-210 A2.9(b)	Field strength of spurious emissions	Pass
15.215(c) / RSS- Gen 4.6.1	Bandwidth of the emission	Pass
15.207/RSS-Gen 7.2.2	Transmitter Power Line conducted emissions	Pass
15.109/ICES-003	Receiver/digital device radiated emissions	Pass
15.107/ ICES-003	Digital device conducted emissions	Pass

3.0 TEST CONDITIONS AND RESULTS

3.1 Field strength of fundamental

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

Test result: Pass

Max. Peak Emissions margin at fundamental: 15.6dB below the limits

Max. Average Emissions margin at fundamental: 1.7dB below the limits

Notes: None

Date:	October 10, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC 15.249(a) / RSS-210 A2.9	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 44%(RH); 96.5kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.1.1

Frequency MHz	Antenna		Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dBμV	Total @ 3m dBμV/m	Limit dBμV/m	Margin dB	Comments
Polarity	Hts(cm)									
Channel 11										
2404.00	V	100	28.2	2.9	0.0	67.3	98.4	114.0	-15.6	Peak
2404.48	H	109	28.2	2.9	0.0	66.6	97.7	114.0	-16.3	Peak
2404.00	V	100	28.2	2.9	0.0	61.2	92.3	94.0	-1.7	AVG
2404.48	H	109	28.2	2.9	0.0	61.1	92.2	94.0	-1.8	AVG
Channel 19										
2443.91	V	104	28.3	2.9	0.0	65.2	96.4	114.0	-17.6	Peak
2443.91	H	110	28.3	2.9	0.0	63.7	94.9	114.0	-19.1	Peak
2443.91	V	104	28.3	2.9	0.0	59.5	90.7	94.0	-3.3	AVG
2443.91	H	110	28.3	2.9	0.0	57.4	88.6	94.0	-5.4	AVG
Channel 26										
2479.48	V	108	28.4	2.9	0.0	63.7	95.0	114.0	-19.0	Peak
2479.48	H	104	28.4	2.9	0.0	63.4	94.7	114.0	-19.3	Peak
2479.48	V	108	28.4	2.9	0.0	58.3	89.6	94.0	-4.4	AVG
2479.48	H	104	28.4	2.9	0.0	57.7	89.0	94.0	-5.0	AVG

3.2 Field strength of harmonics and spurious emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

Frequency range of measurements: 30MHz-25GHz

Test result: Pass

Max. margin of harmonics and spurious emissions: 4.2dB below the limits

Max. margin of band edge emissions: 3.7dB below the limits

Notes: None

Date:	October 10-11, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 44%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Frequency Range: 30-1000MHz	

Table 3.2.1

Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Total at 3m dBμV/m	AVG Limit dBμV/m	Margin dB
Channel 11						
72.02 MHz	V	20.3	11.4	31.7	40.0	-8.3
143.91 MHz	V	21.1	16.5	37.5	43.5	-6.0
148.41 MHz	V	8.4	16.5	24.9	43.5	-18.6
31.108 MHz	H	-1.2	23.8	22.5	40.0	-17.5
143.91 MHz	H	19.4	16.5	35.9	43.5	-7.6
288.1 MHz	H	10.1	19.0	29.1	46.0	-16.9
Channel 19						
32.217 MHz	V	0.3	23.4	23.7	40.0	-16.3
72.02 MHz	V	21.4	11.4	32.8	40.0	-7.2
143.91 MHz	V	22.0	16.5	38.4	43.5	-5.1
864.19 MHz	V	1.0	28.1	29.1	46.0	-16.9
30.416 MHz	H	-2.6	24.2	21.6	40.0	-18.4
143.91 MHz	H	19.0	16.5	35.5	43.5	-8.1
873.39 MHz	H	0.5	28.1	28.6	46.0	-17.4
Channel 26						
64.598 MHz	V	12.1	10.8	22.9	40.0	-17.1
72.02 MHz	V	22.6	11.4	34.0	40.0	-6.0
148.41 MHz	V	10.1	16.5	26.6	43.5	-17.0
31.836 MHz	H	-0.6	23.6	23.0	40.0	-17.0
143.91 MHz	H	18.9	16.5	35.4	43.5	-8.1
941.64 MHz	H	-0.1	28.9	28.8	46.0	-17.3

Date:	October 10-11, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 44%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Frequency Range: 1-8GHz	

Table 3.2.2

Frequency MHz	Antenna		Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Peak Reading dBμV	Total @ 3m dBμV/m	AVG Limit dBμV/m	Margin dB
	Polarity	Hts(cm)							
Channel 11									
4810.00	V	196	32.9	4.1	39.2	48.1	45.9	54.0	-8.1
4810.00	H	219	32.9	4.1	39.2	48.3	46.1	54.0	-7.9
Channel 19									
4889.82	V	183	33.0	4.1	39.1	40.1	38.1	54.0	-15.9
4889.82	H	168	33.0	4.1	39.1	41.3	39.3	54.0	-14.7
Channel 26									
4959.86	V	242	33.1	4.1	39.0	42.9	41.0	54.0	-12.9
4959.86	H	185	33.1	4.1	39.0	51.6	49.7	54.0	-4.2
7438.42	V	232	36.3	5.4	38.0	36.8	40.4	54.0	-13.5
7438.42	H	168	36.3	5.4	38.0	43.5	47.1	54.0	-6.8

Date:	October 10-11, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 44%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Frequency Range: 8-25GMHz Limits at 1m distance derived with adding 9.5dB or $20\log(3m/1m)$	

Table 3.2.3

Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 1m dBμV/m	AVG Limit @1m dBμV/m	Margin dB
			Channel 11				
14.852 GHz	V	42.5	48.6	38.4	52.6	63.5	-10.9
12.024 GHz	H	42.4	46.0	36.8	51.6	63.5	-11.9
14.708 GHz	H	42.2	49.4	38.6	53.0	63.5	-10.5
			Channel 19				
9.78 GHz	V	40.6	44.0	37.0	47.6	63.5	-15.9
14.398 GHz	V	42.0	49.6	38.9	52.8	63.5	-10.7
9.782 GHz	H	39.8	44.1	37.0	47.0	63.5	-16.5
12.222 GHz	H	42.9	45.8	37.1	51.7	63.5	-11.9
14.898 GHz	H	42.6	48.5	38.3	52.7	63.5	-10.8
			Channel 26				
9.924 GHz	V	42.4	44.4	36.9	49.9	63.5	-13.6
14.36 GHz	V	42.1	49.7	38.9	52.9	63.5	-10.6
9.92 GHz	H	41.5	44.4	36.9	49.0	63.5	-14.6
12.4 GHz	H	41.1	45.7	37.3	49.5	63.5	-14.1
14.496 GHz	H	41.6	49.7	38.8	52.5	63.5	-11.1

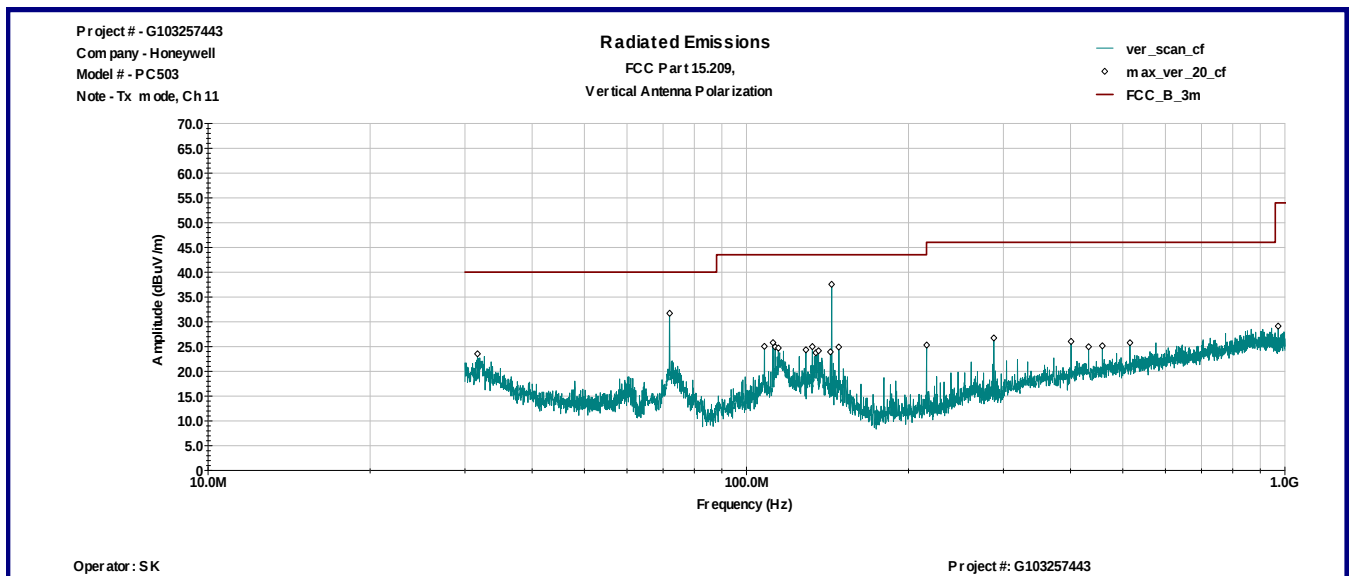
Date:	October 10-11, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 44%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Band Edge Compliance	

Table 3.2.4

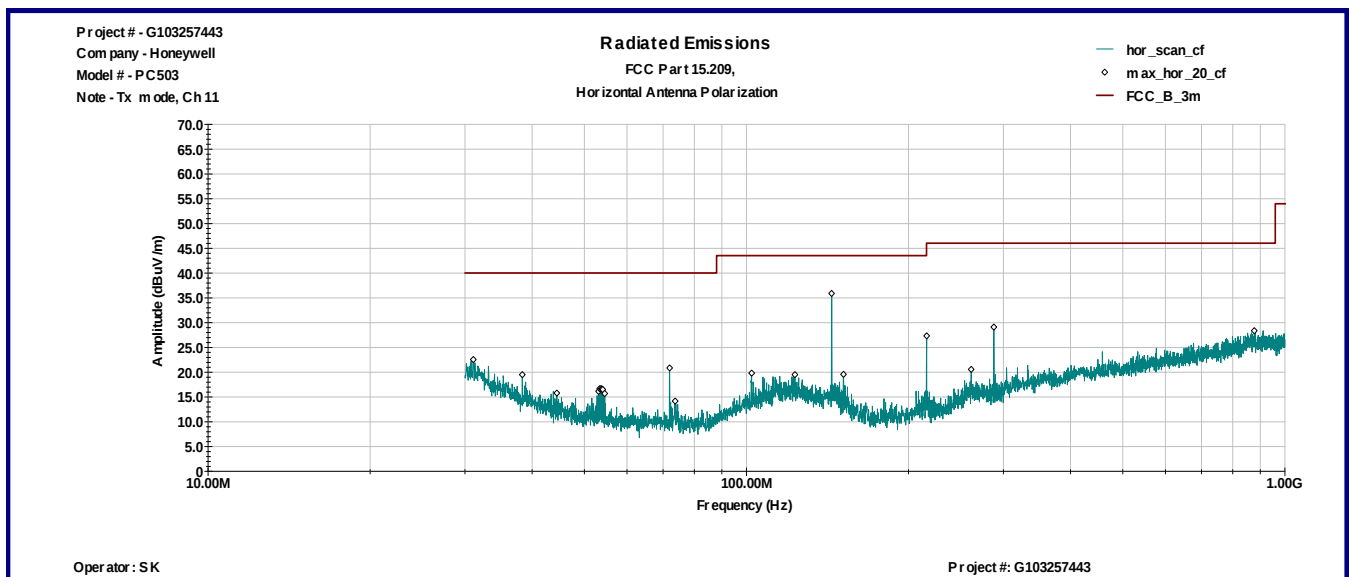
Frequency MHz	Antenna		Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dBμV	Total @ 3m dBμV/m	Limit dBμV/m	Margin dB	Comments
Polarity	Hts(cm)									
Channel 11										
2390.00	V	100	28.1	2.9	0.0	3.9	34.9	74.0	-39.1	Peak
2390.00	H	109	28.1	2.9	0.0	7.6	38.6	74.0	-35.4	Peak
2390.00	V	100	28.1	2.9	0.0	0.3	31.3	54.0	-22.7	AVG
2390.00	H	100	28.1	2.9	0.0	0.9	31.9	54.0	-22.1	AVG
Channel 26										
2483.50	V	100	28.4	2.9	0.0	28.4	59.7	74.0	-14.3	Peak
2483.50	H	100	28.4	2.9	0.0	27.1	58.4	74.0	-15.6	Peak
2483.50	V	100	28.4	2.9	0.0	19.0	50.3	54.0	-3.7	AVG
2483.50	H	100	28.4	2.9	0.0	18.9	50.2	54.0	-3.8	AVG

Graph 3.2.1

Vertical antenna polarization

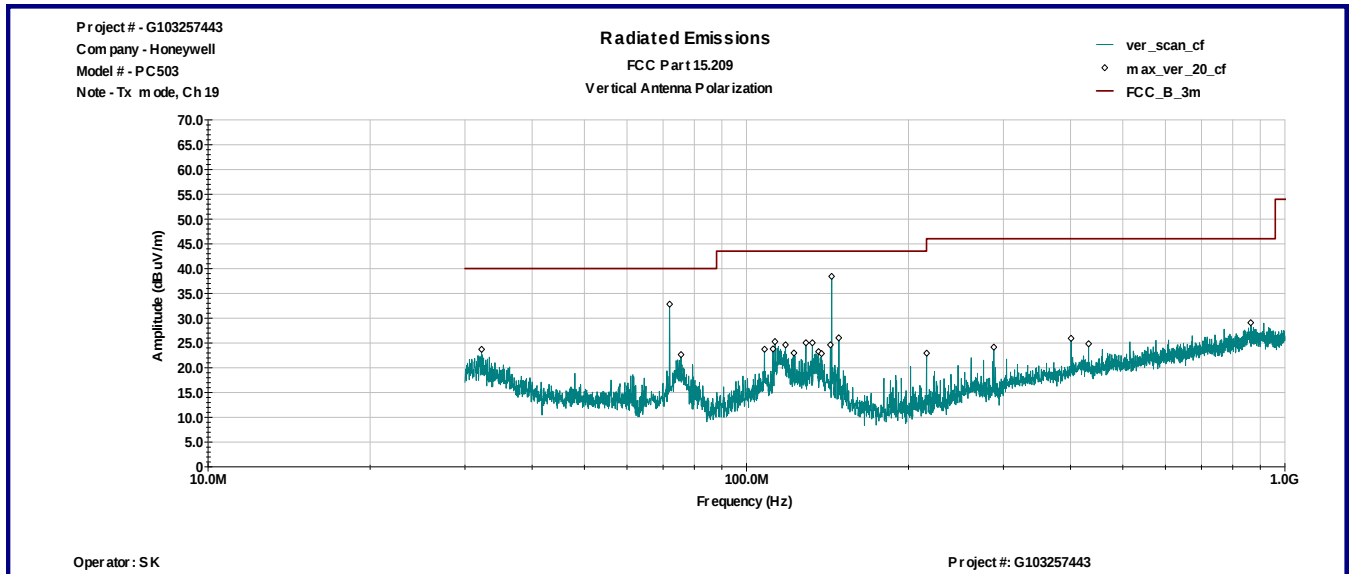


Horizontal antenna polarization

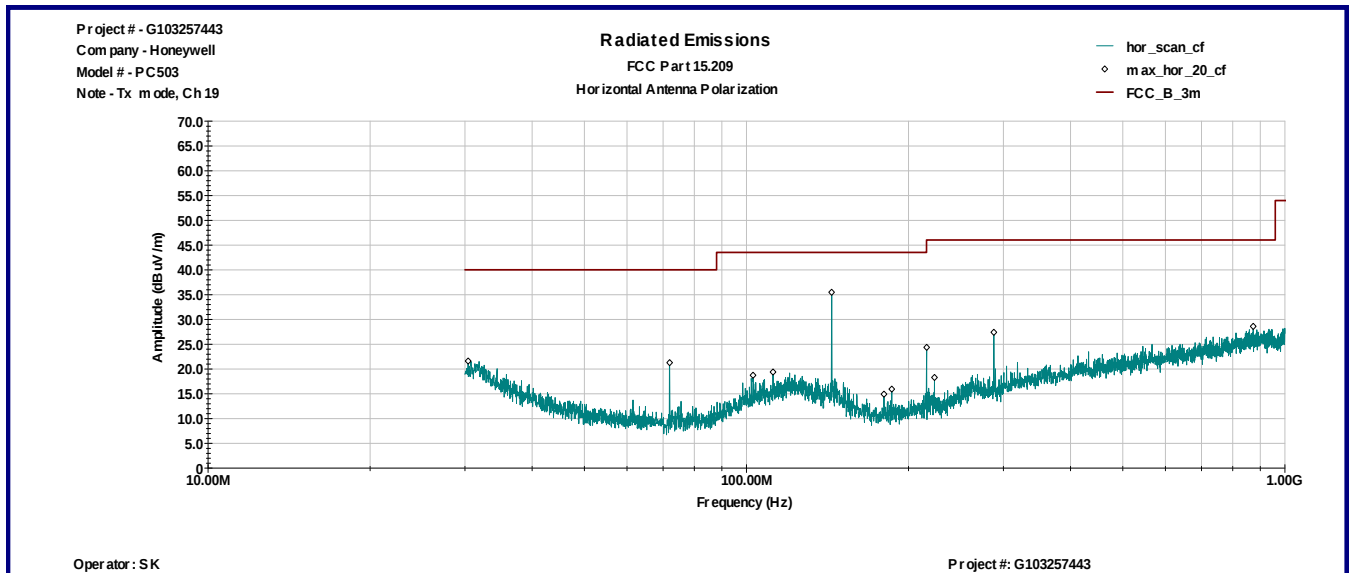


Graph 3.2.2

Vertical antenna polarization

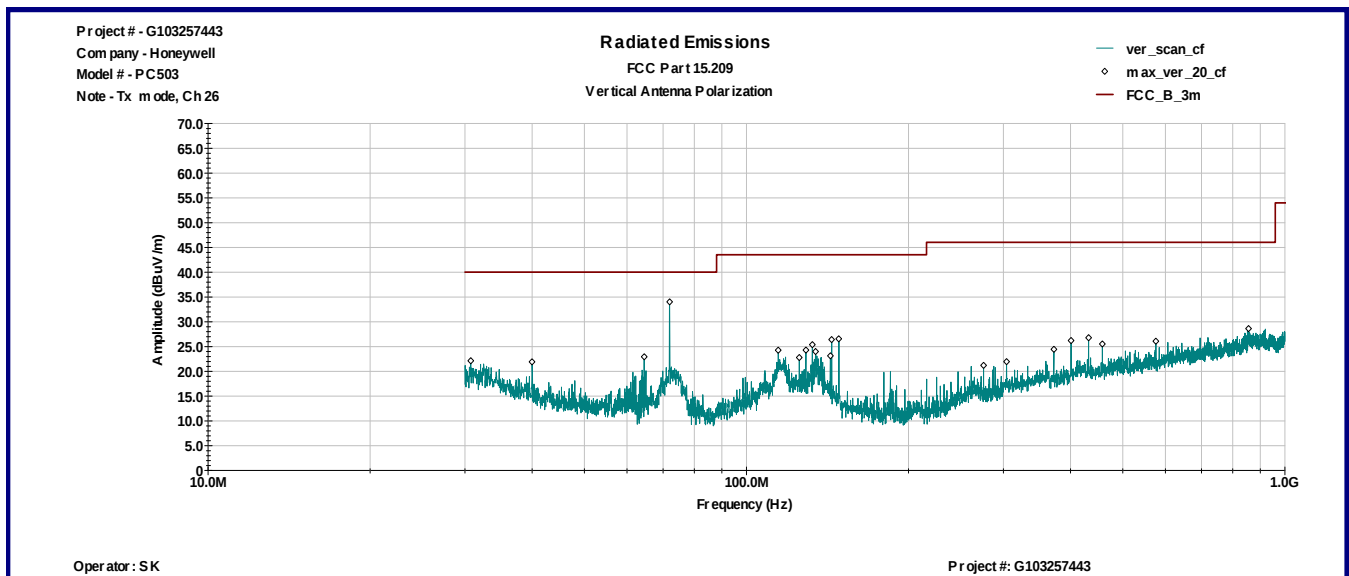


Horizontal antenna polarization

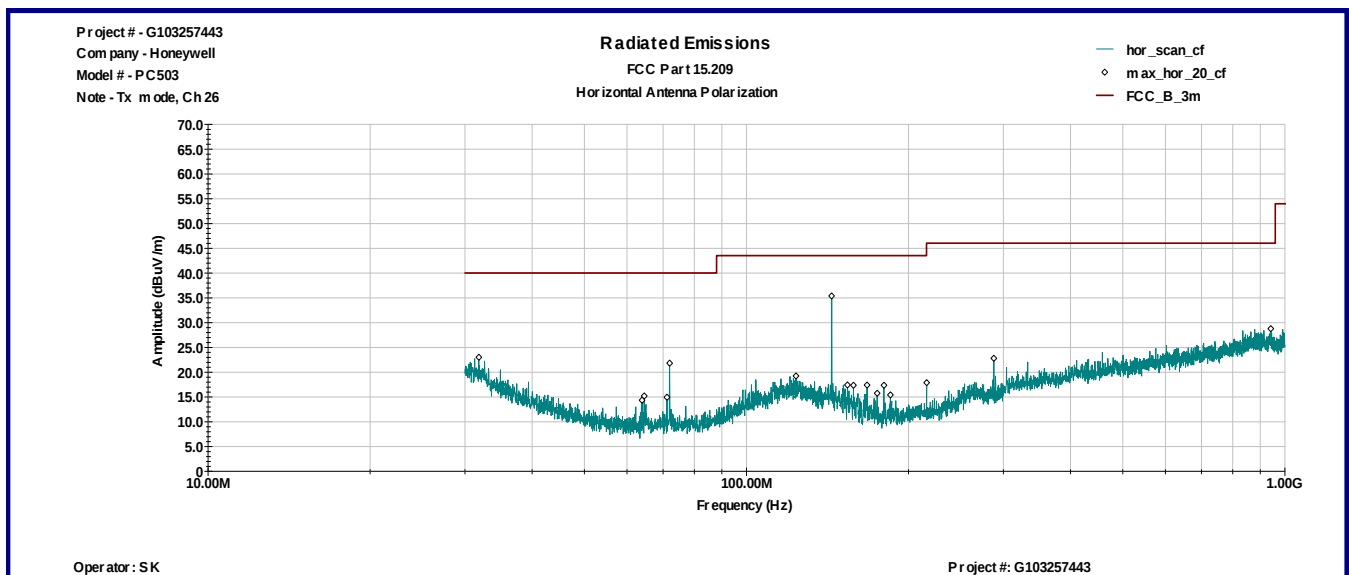


Graph 3.2.3

Vertical antenna polarization

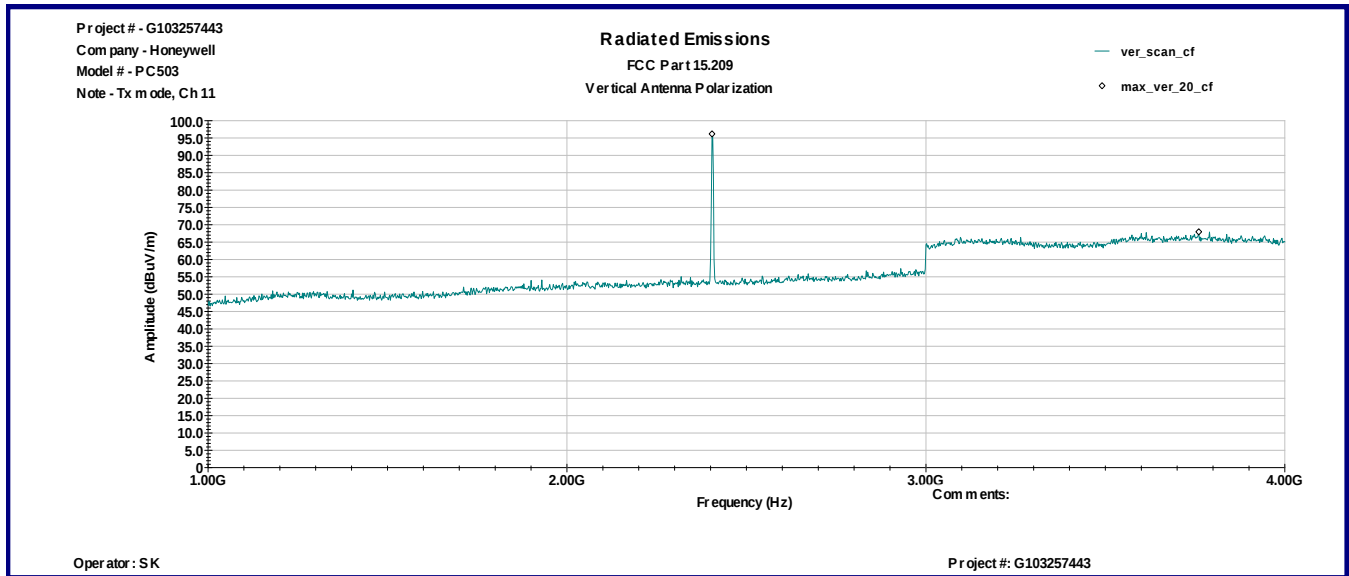


Horizontal antenna polarization

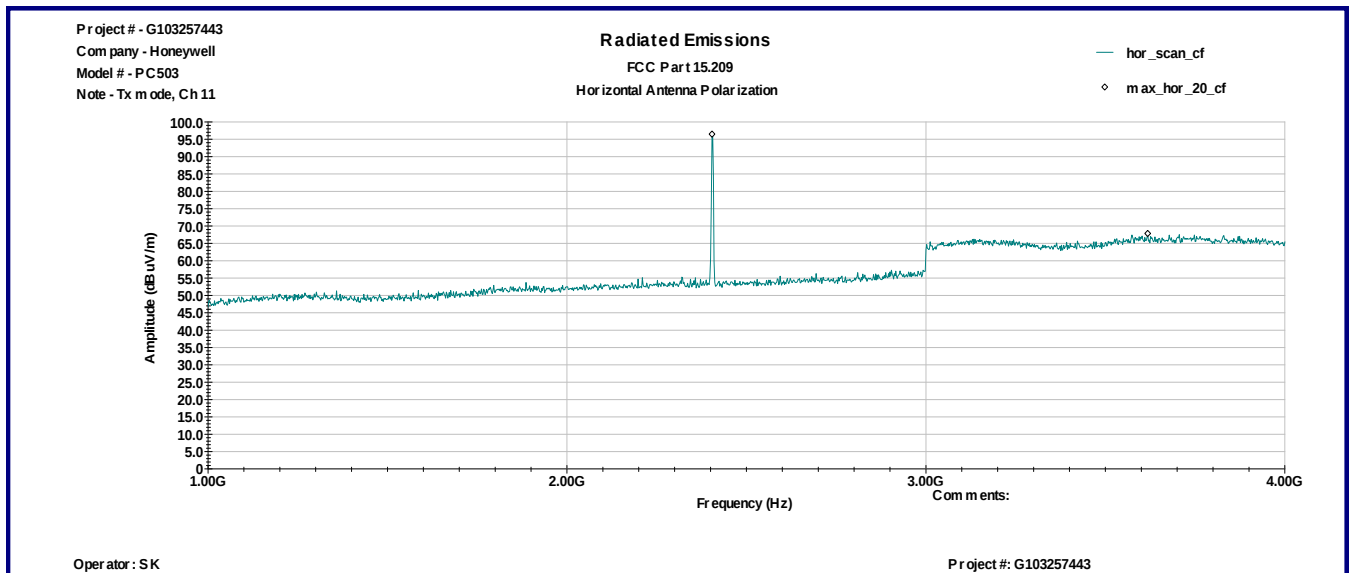


Graph 3.2.4

Vertical antenna polarization

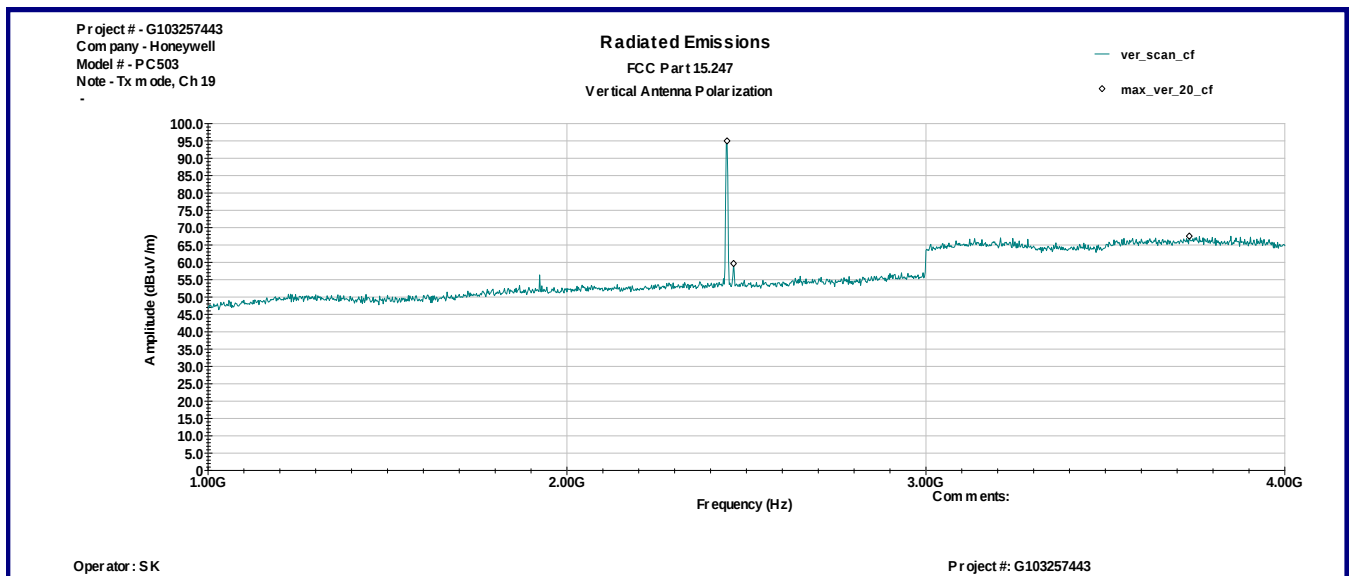


Horizontal antenna polarization

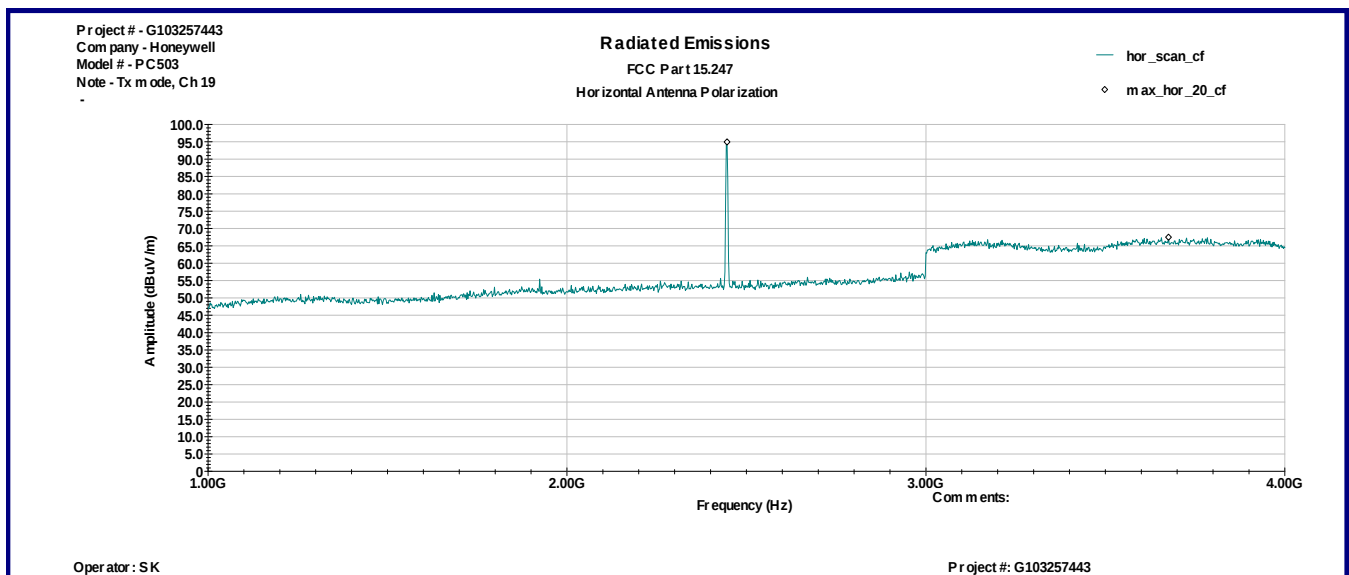


Graph 3.2.5

Vertical antenna polarization

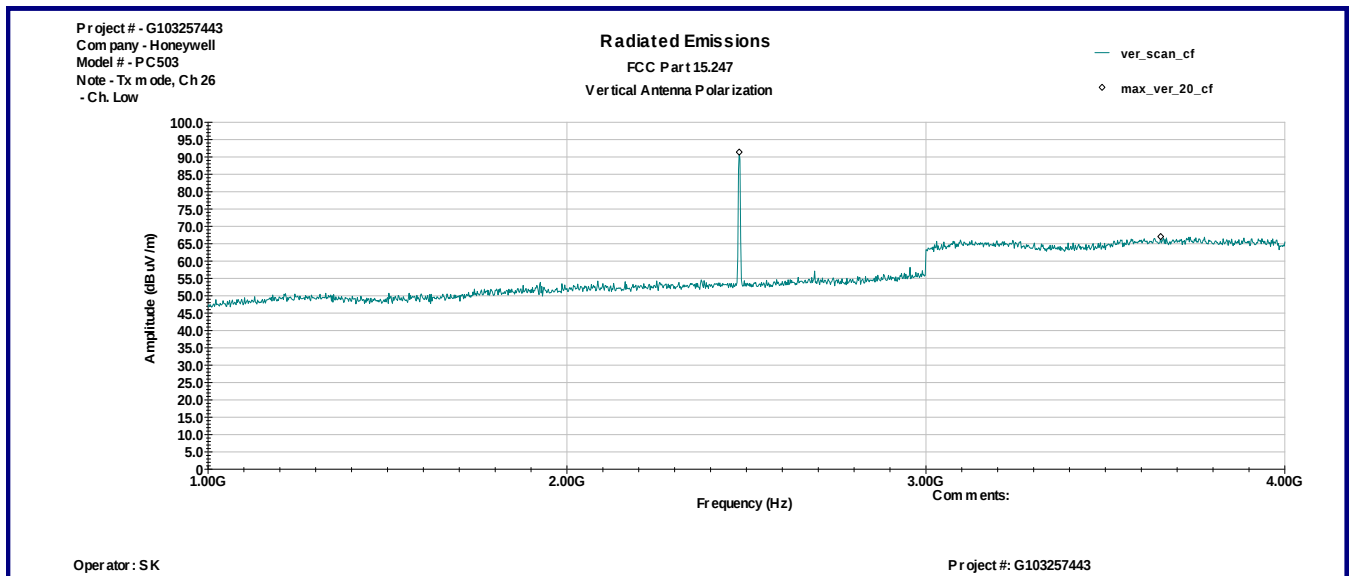


Horizontal antenna polarization

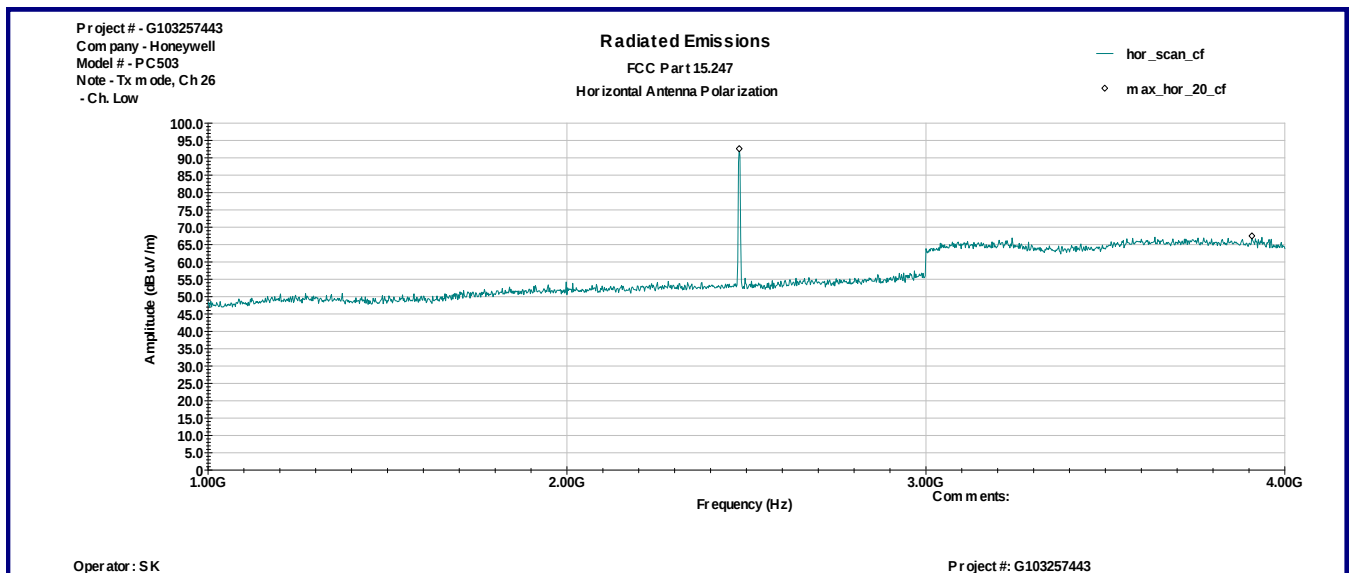


Graph 3.2.6

Vertical antenna polarization

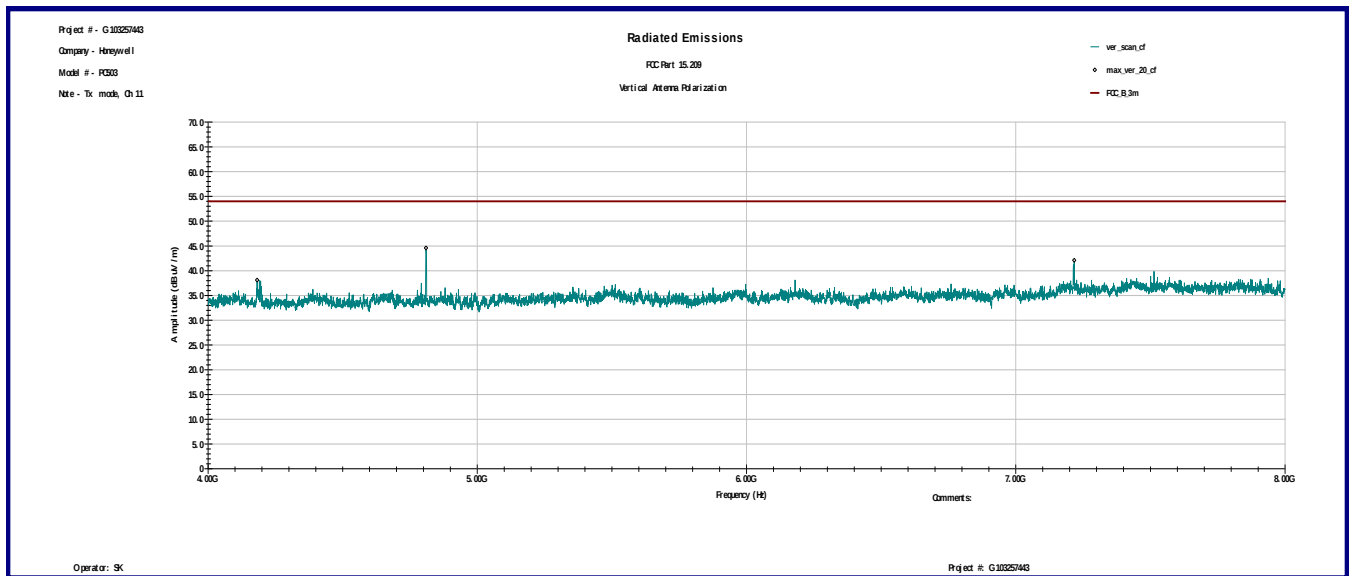


Horizontal antenna polarization

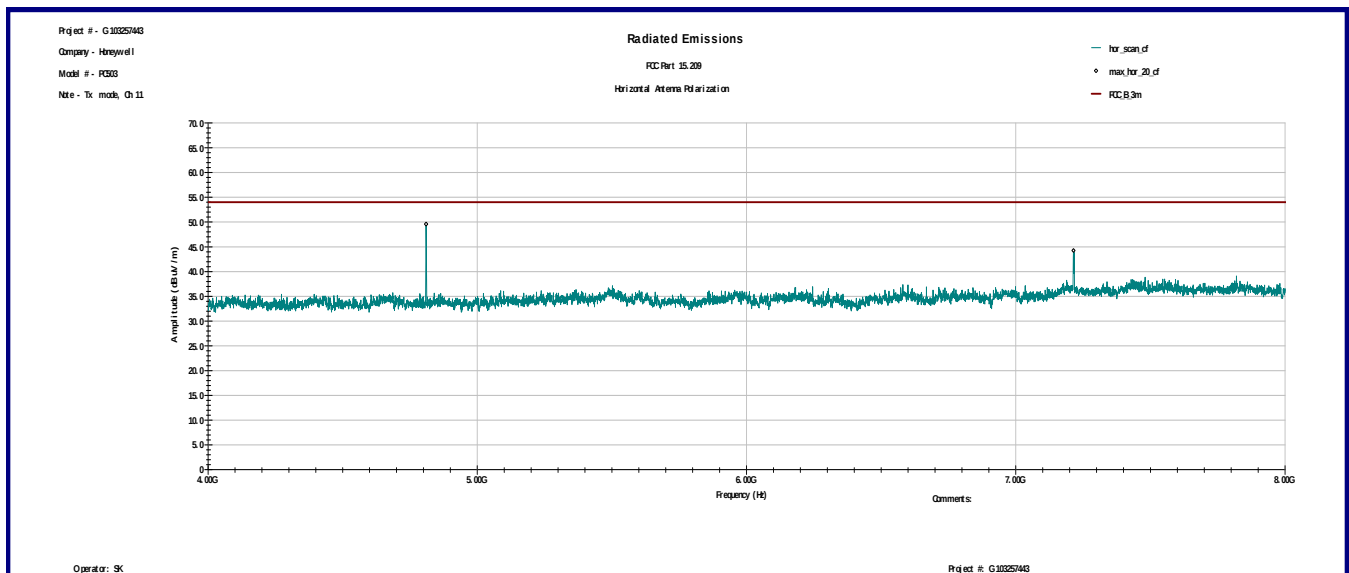


Graph 3.2.7

Vertical antenna polarization

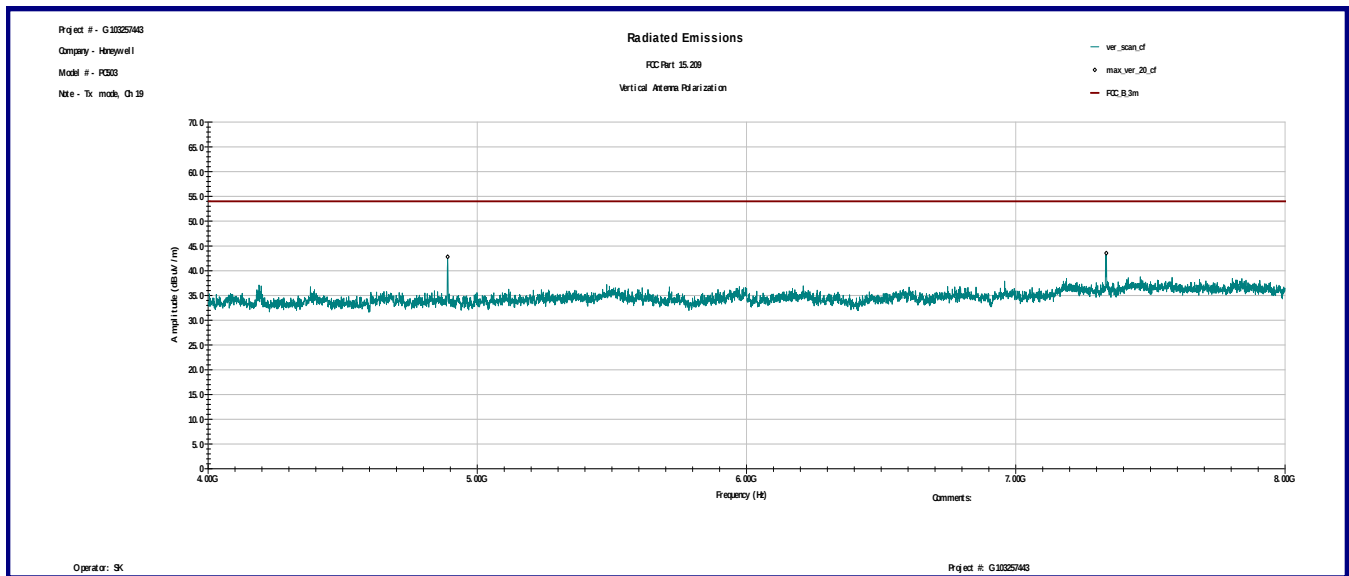


Horizontal antenna polarization

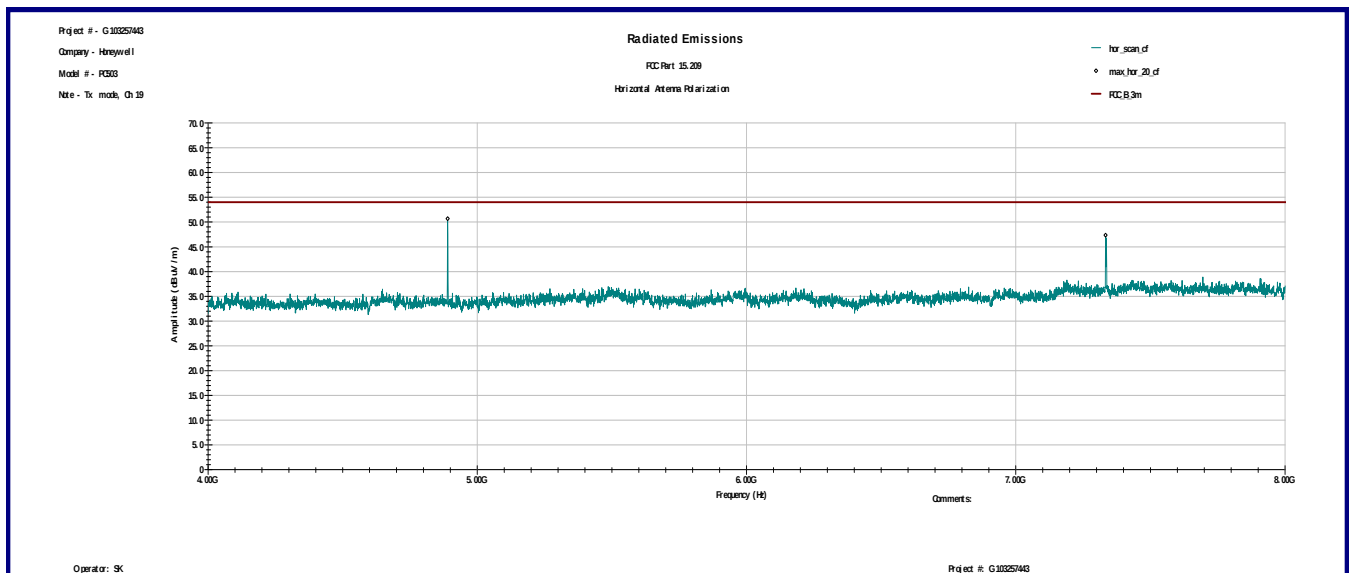


Graph 3.2.8

Vertical antenna polarization

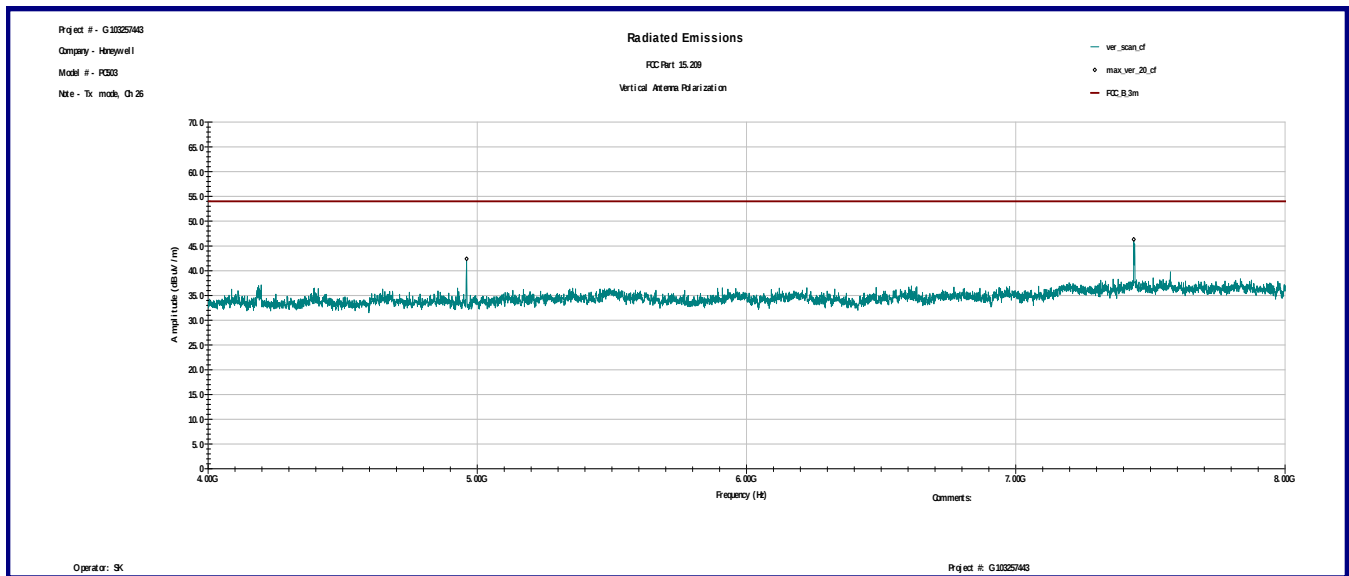


Horizontal antenna polarization

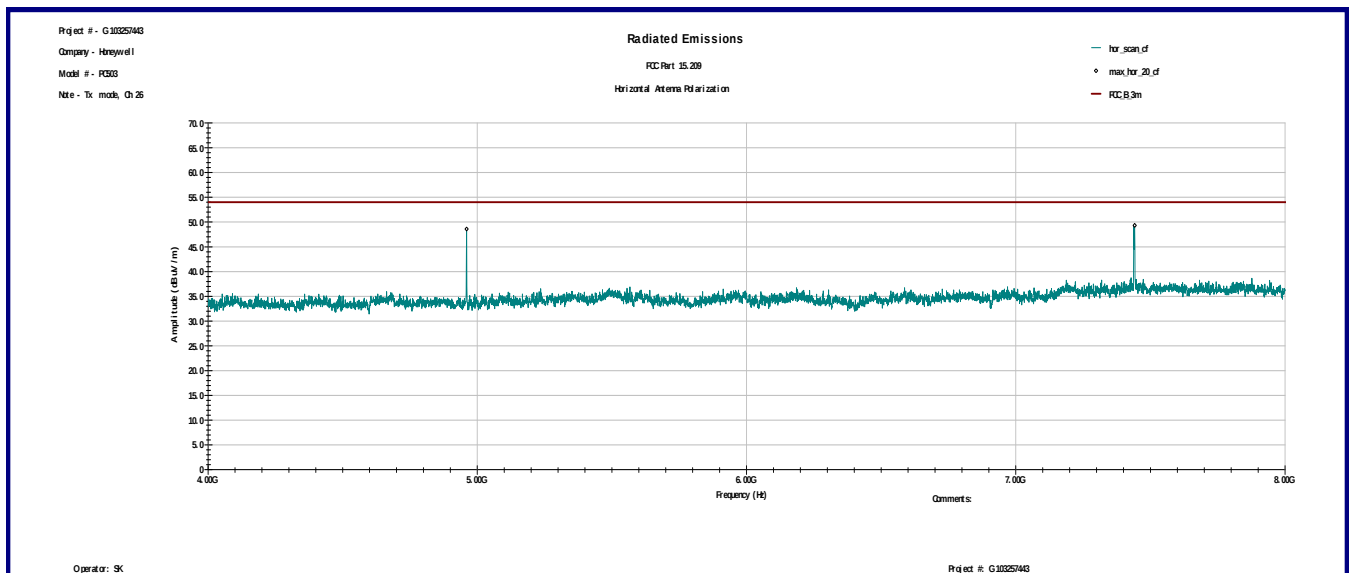


Graph 3.2.9

Vertical antenna polarization

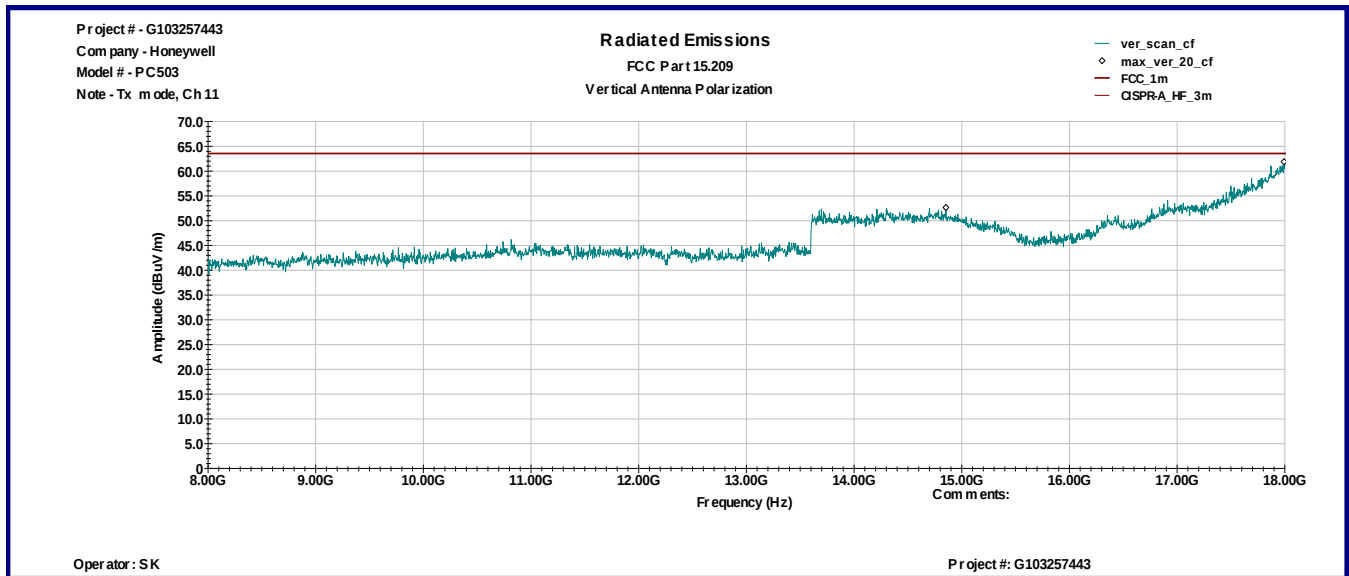


Horizontal antenna polarization

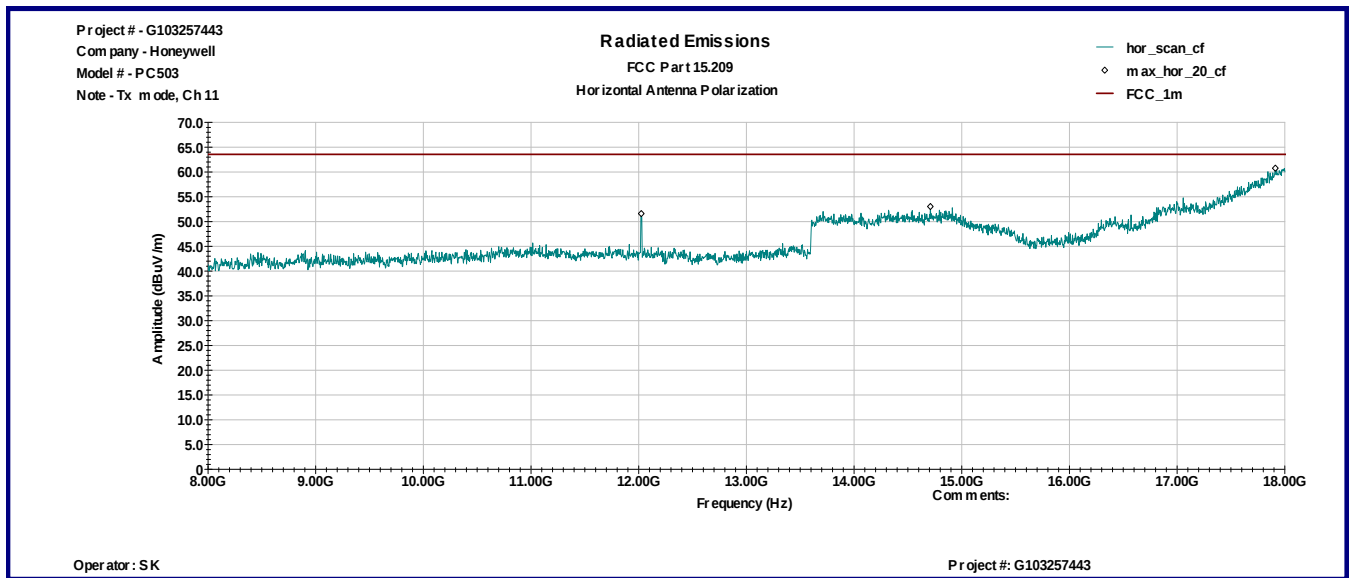


Graph 3.2.10

Vertical antenna polarization

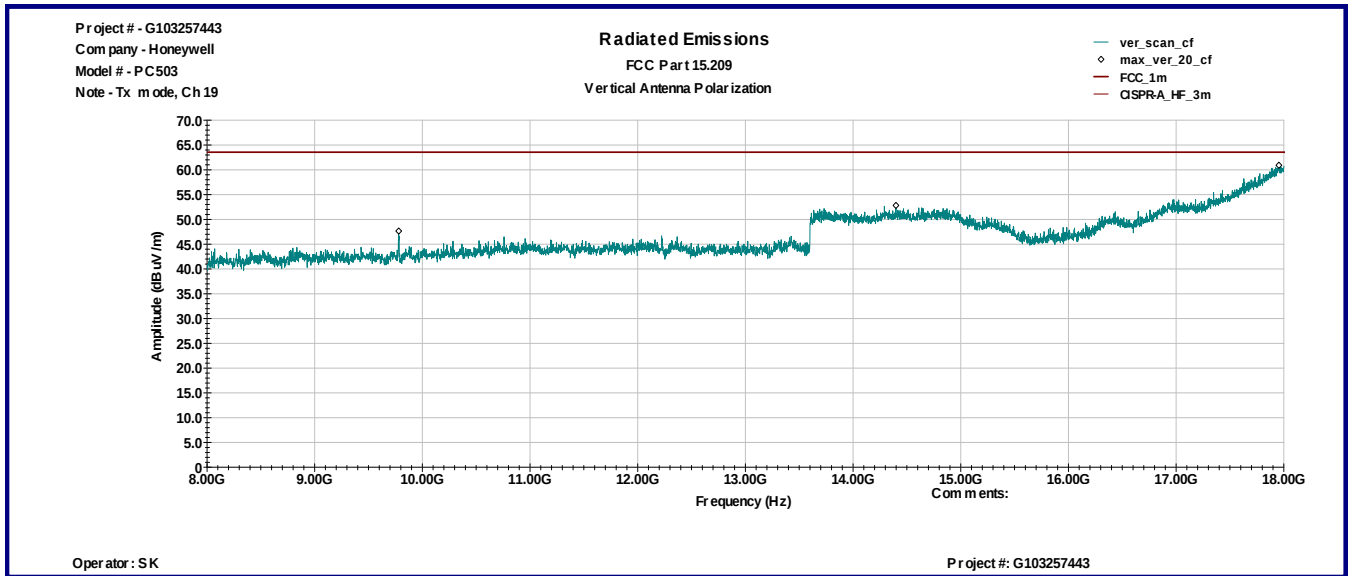


Horizontal antenna polarization

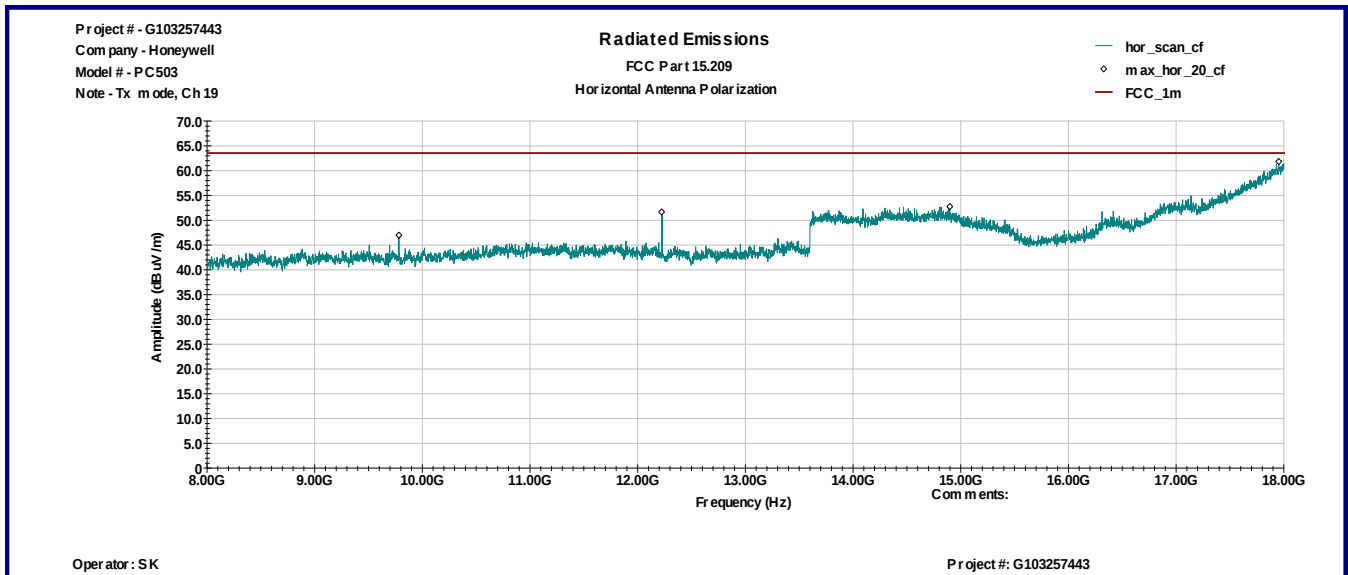


Graph 3.2.11

Vertical antenna polarization

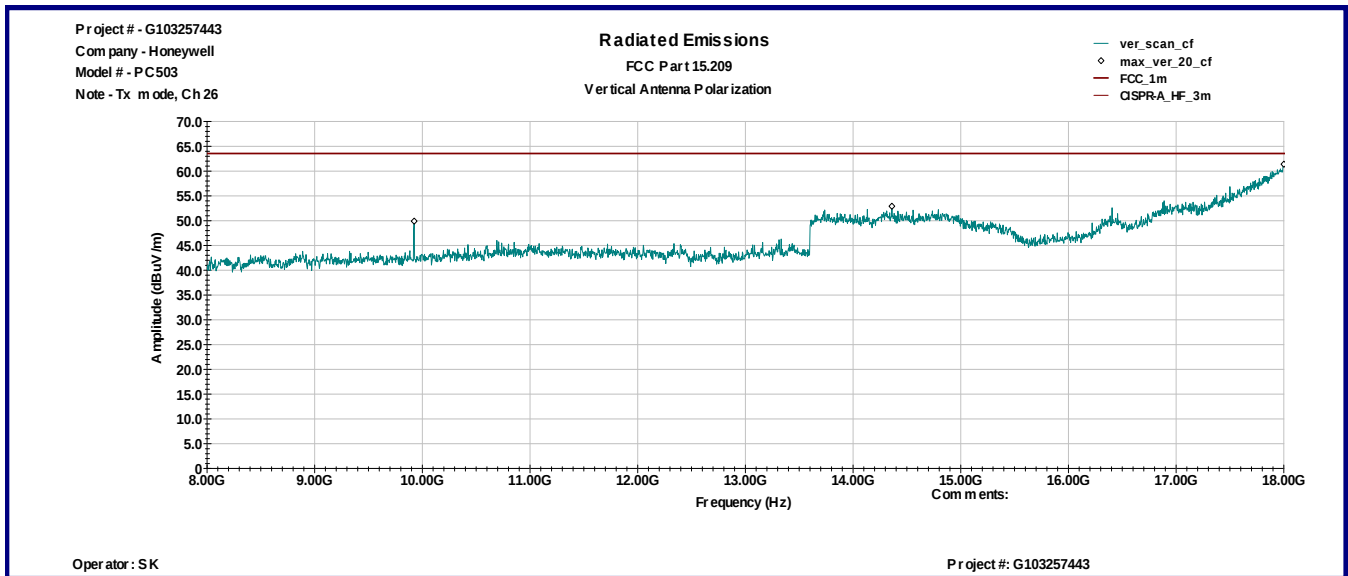


Horizontal antenna polarization

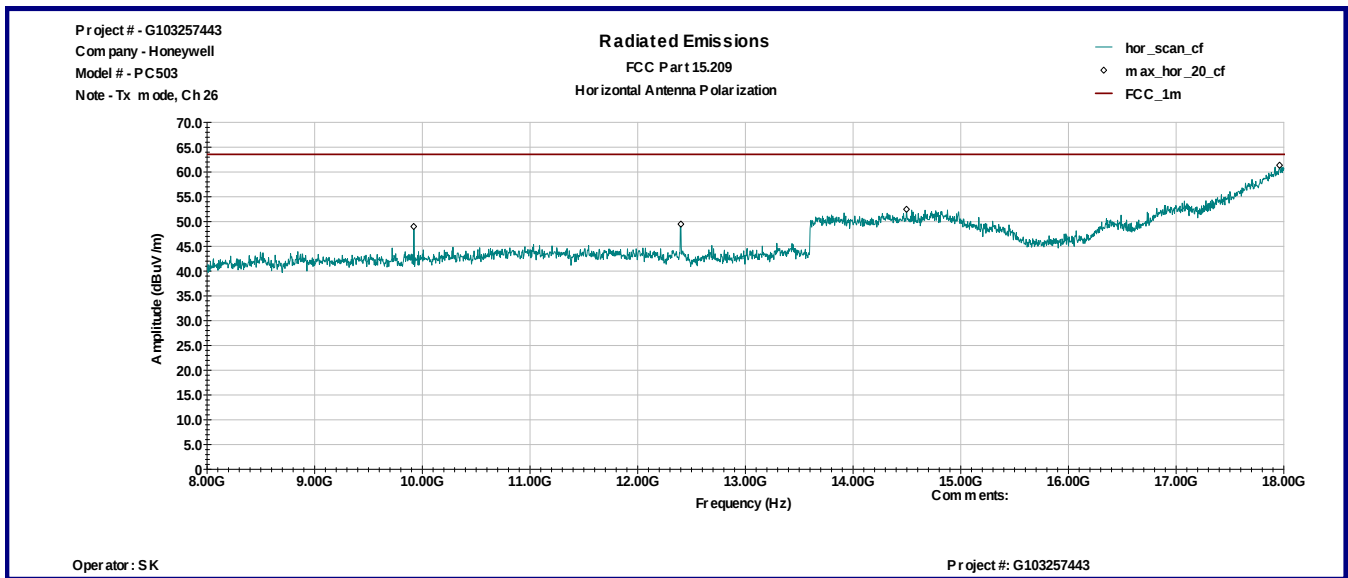


Graph 3.2.12

Vertical antenna polarization

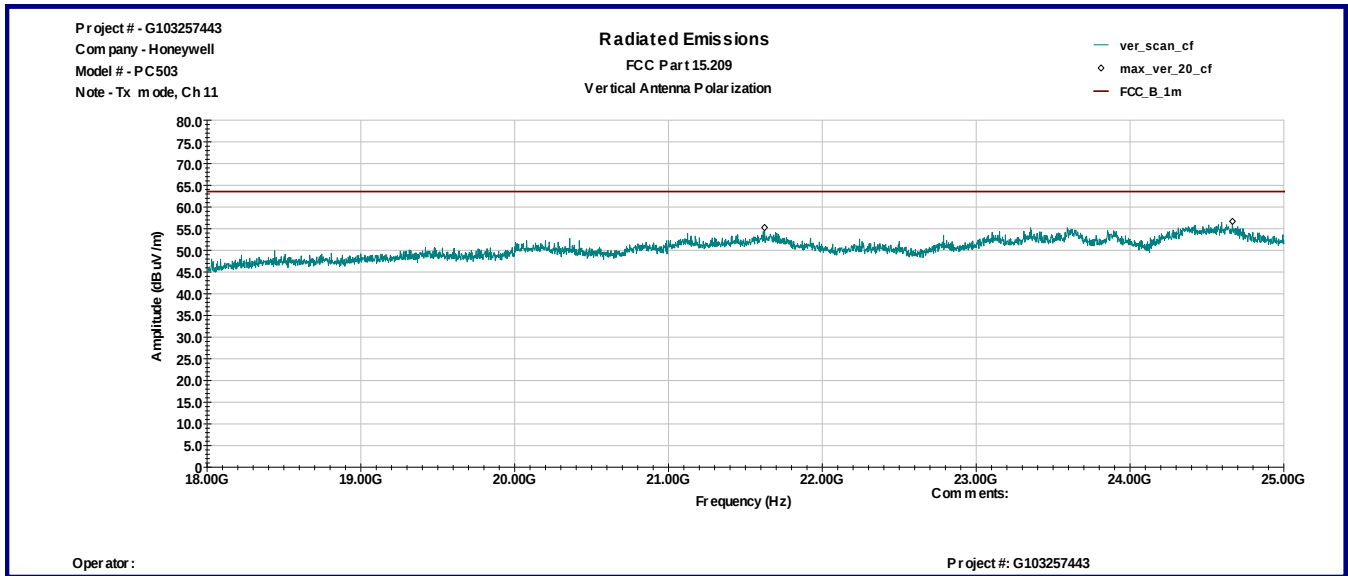


Horizontal antenna polarization

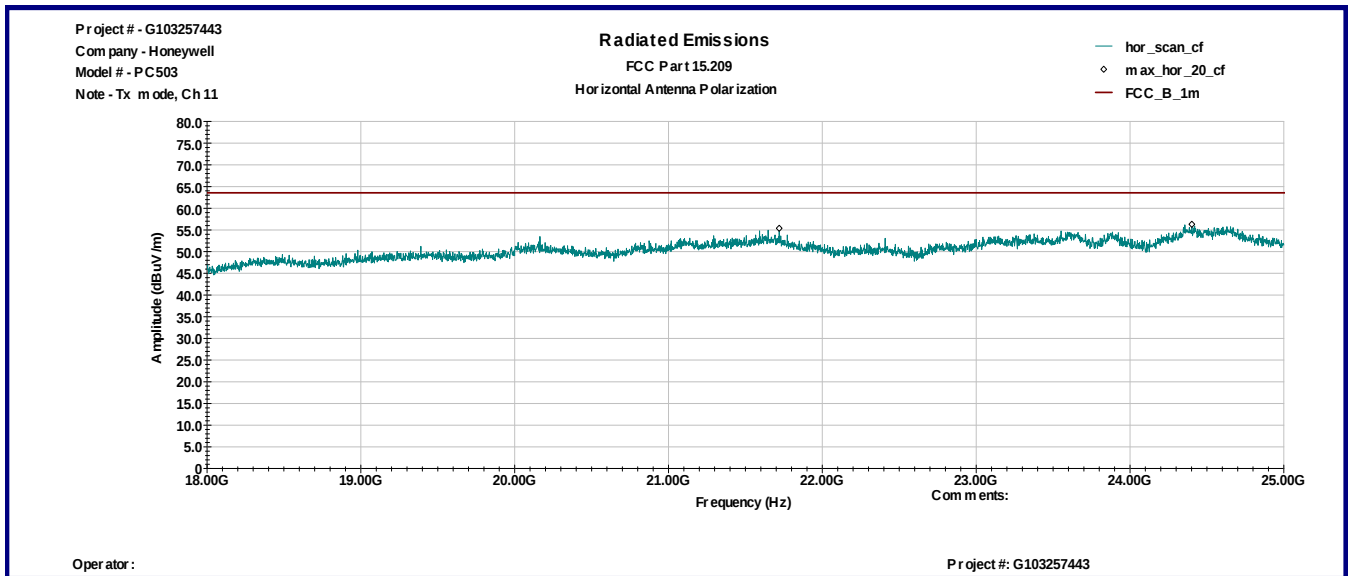


Graph 3.2.13

Vertical antenna polarization

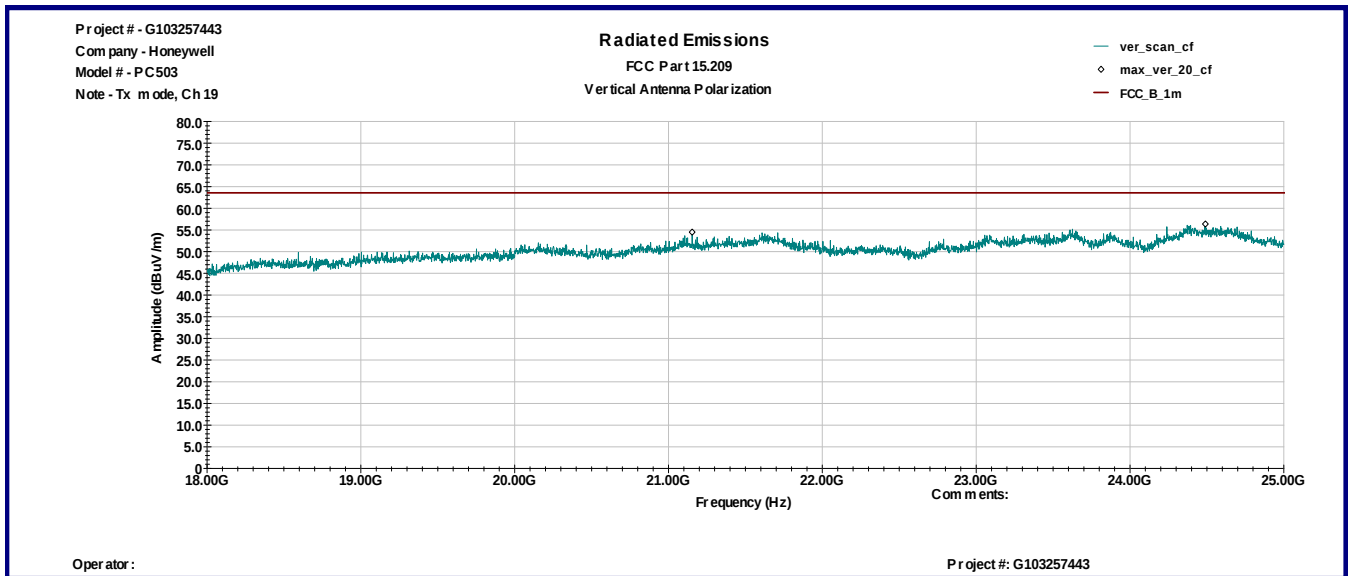


Horizontal antenna polarization

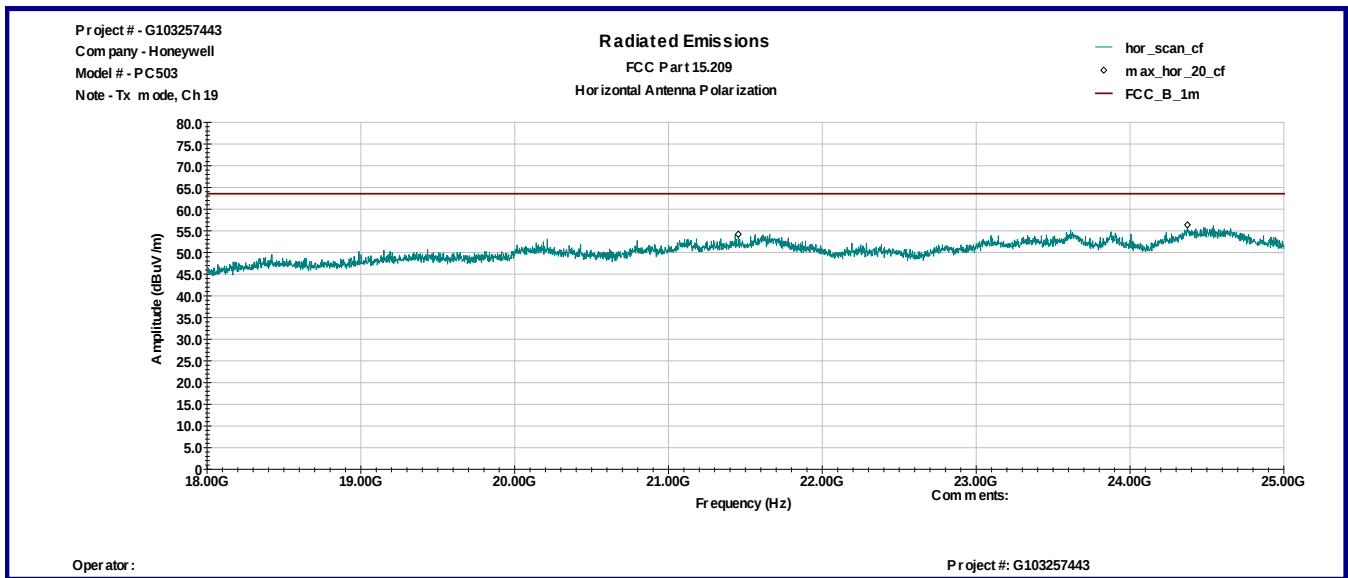


Graph 3.2.14

Vertical antenna polarization

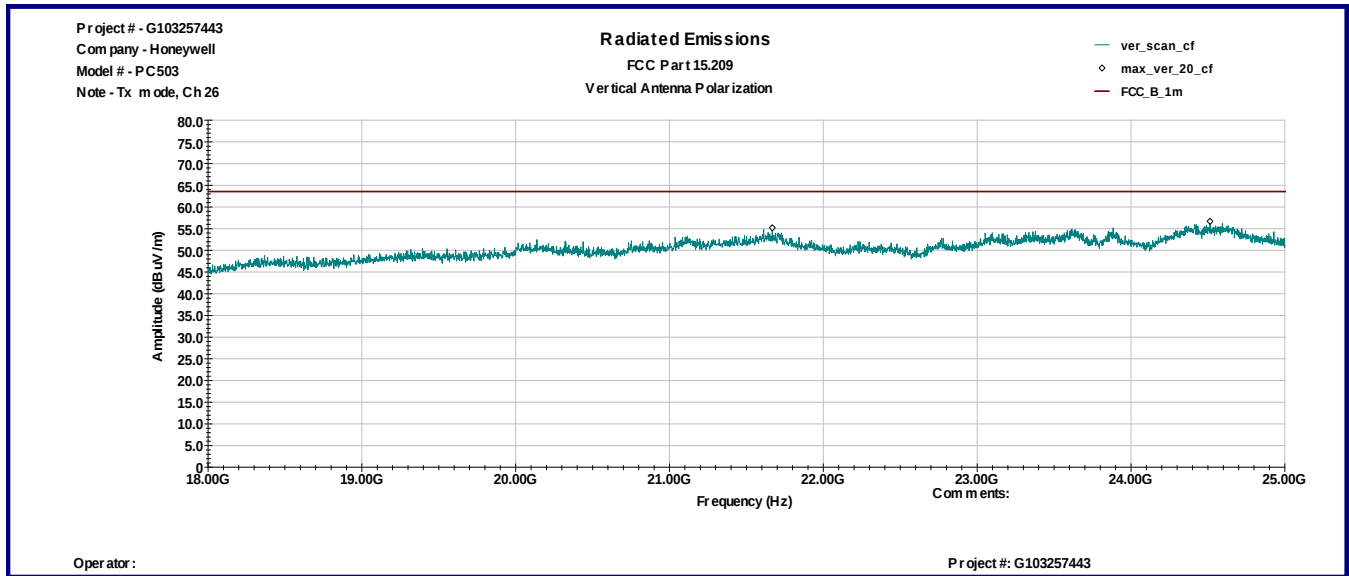


Horizontal antenna polarization

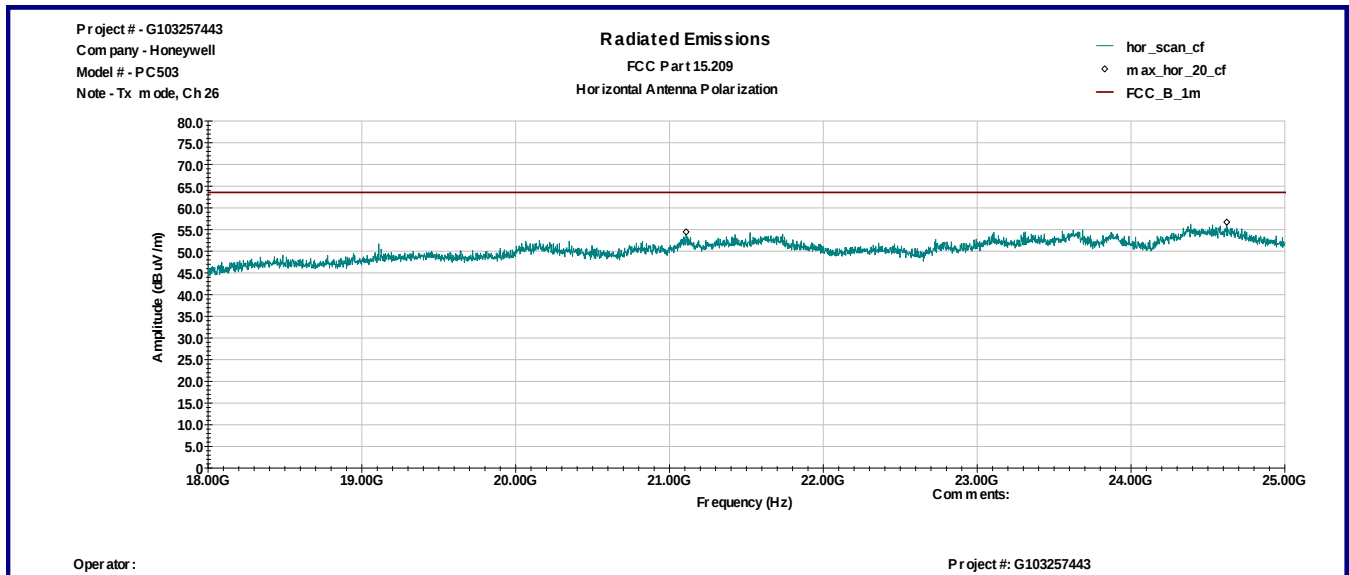


Graph 3.2.15

Vertical antenna polarization



Horizontal antenna polarization



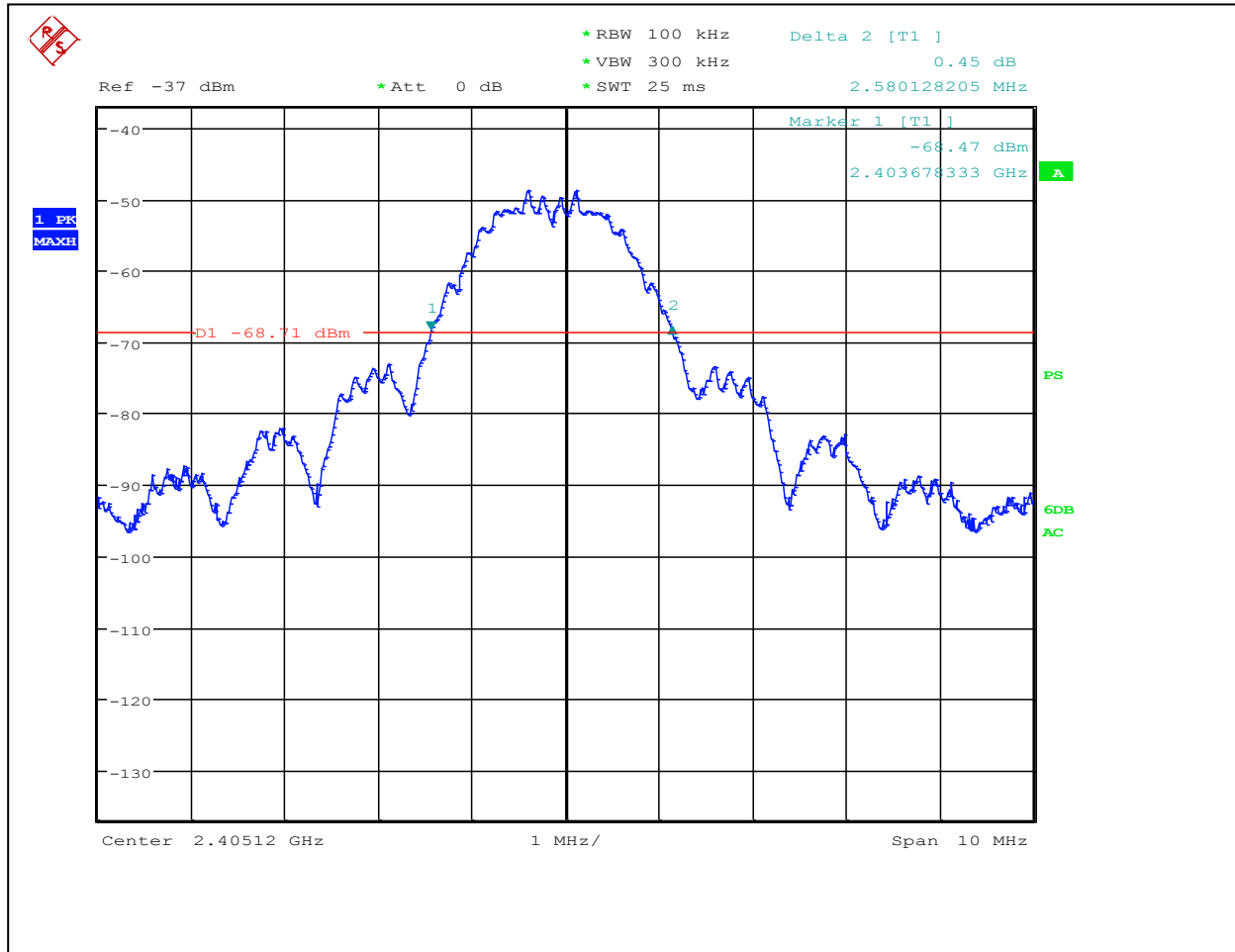
3.3 Bandwidth of Emissions

Center Frequency of operation MHz	Measured 20dB bandwidth MHz	Measured 99% bandwidth MHz
2405	2.58	2.36
2444	2.55	2.36
2480	2.58	2.35

Graphs 3-3-1 - 3-3-6 are show bandwidth of emissions

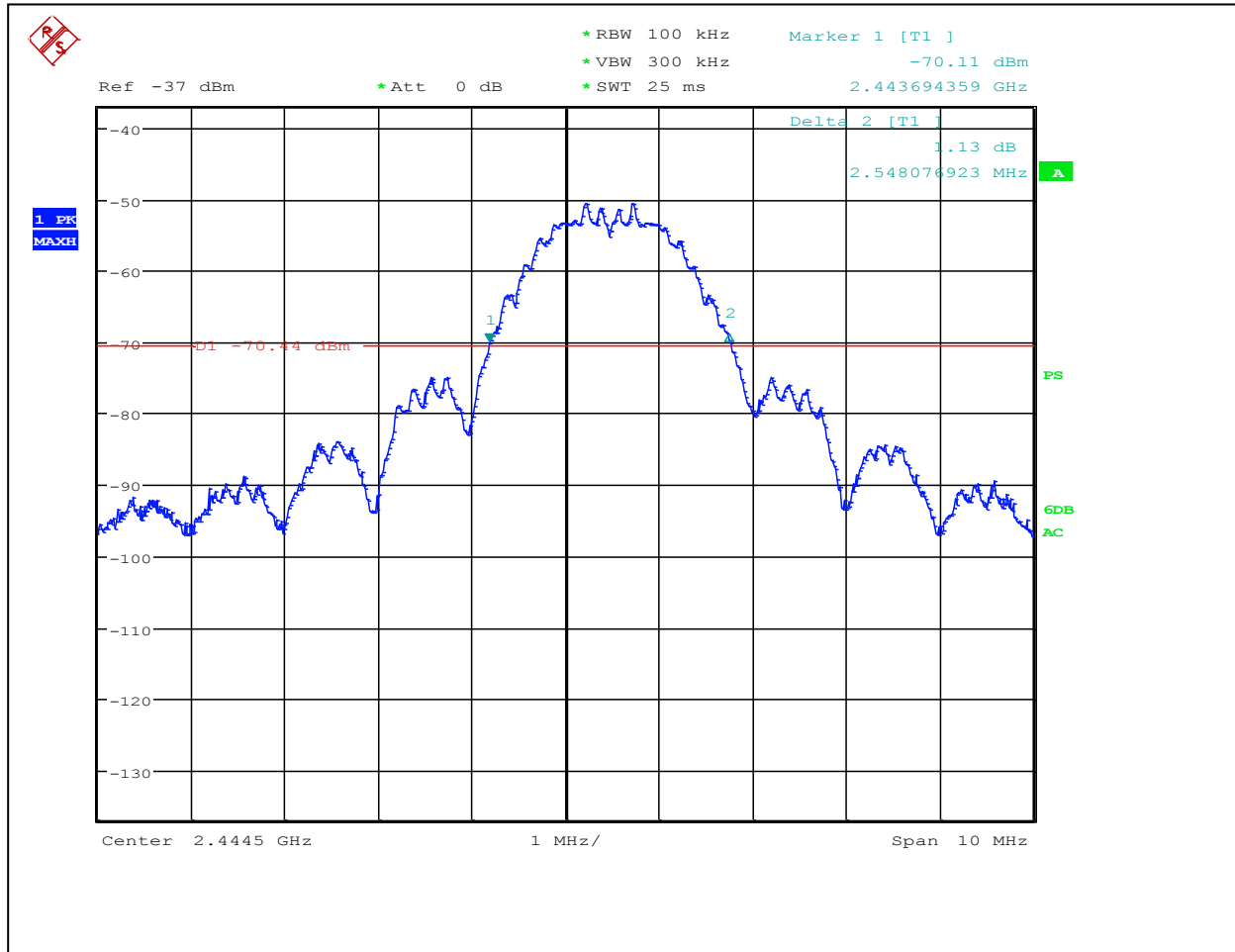
Notes: *The bandwidth of emissions is contained within the frequency band of operation*

Graph 3.3.1



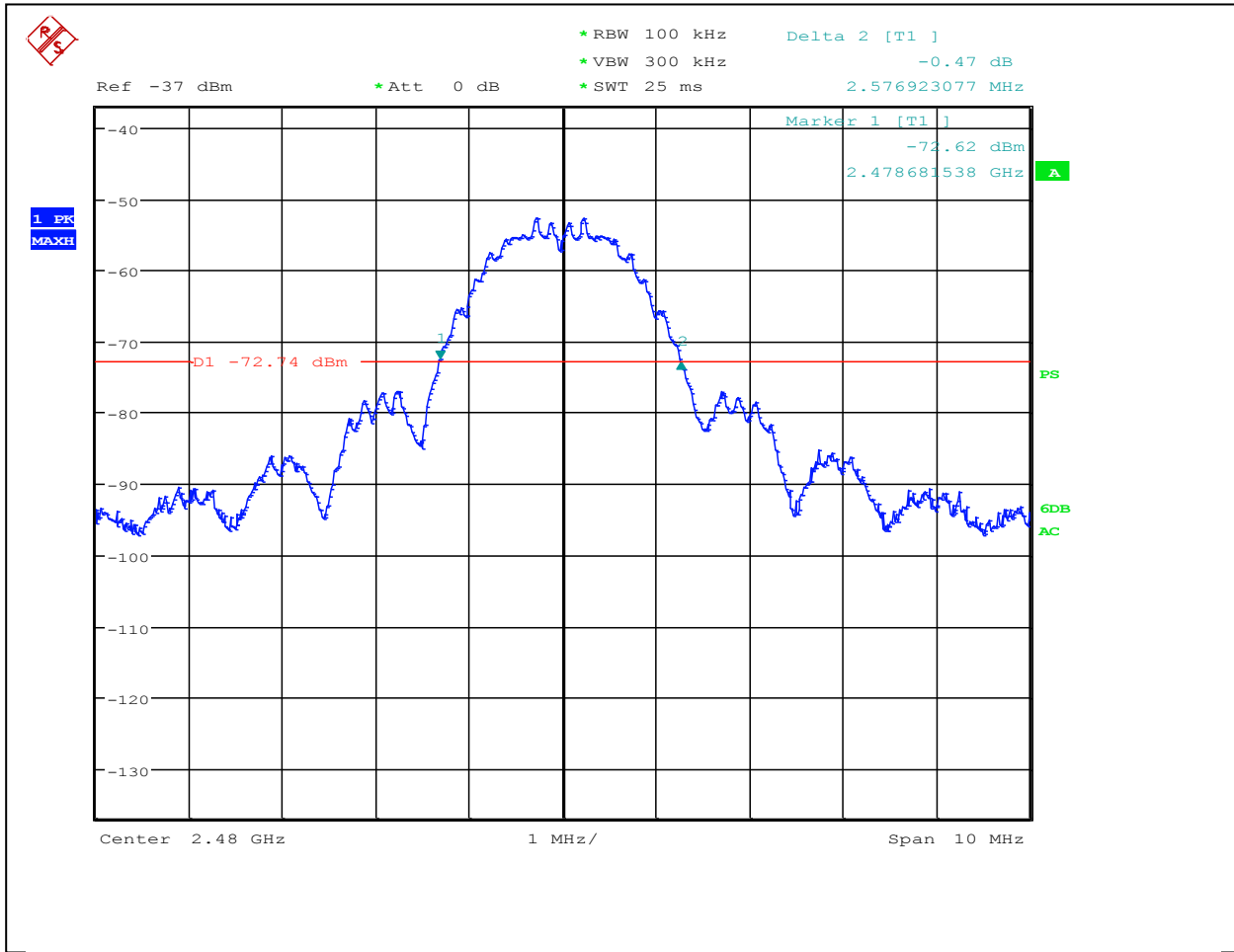
Date: 11.OCT.2017 11:38:01

Graph 3.3.2



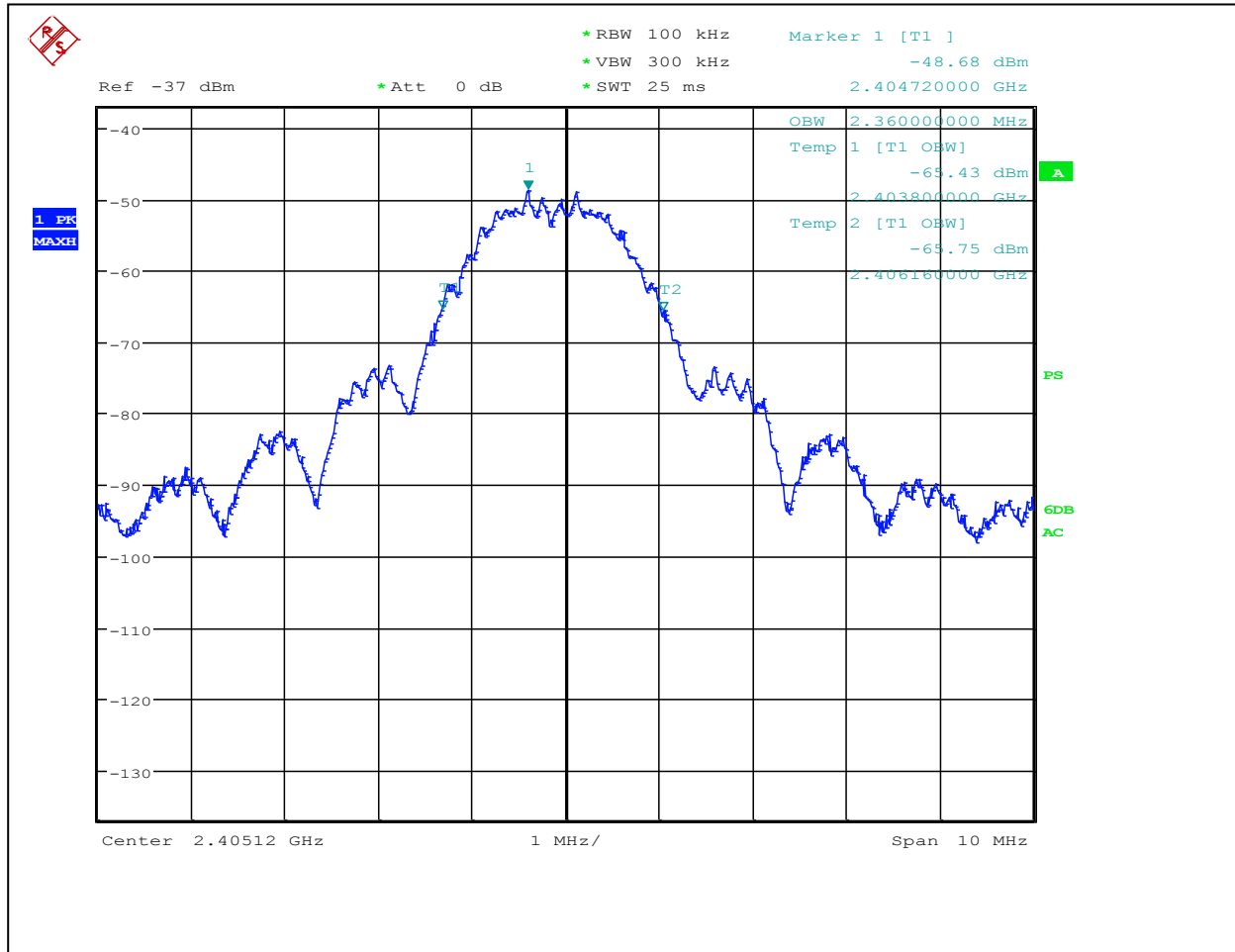
Date: 11.OCT.2017 11:34:36

Graph 3.3.3



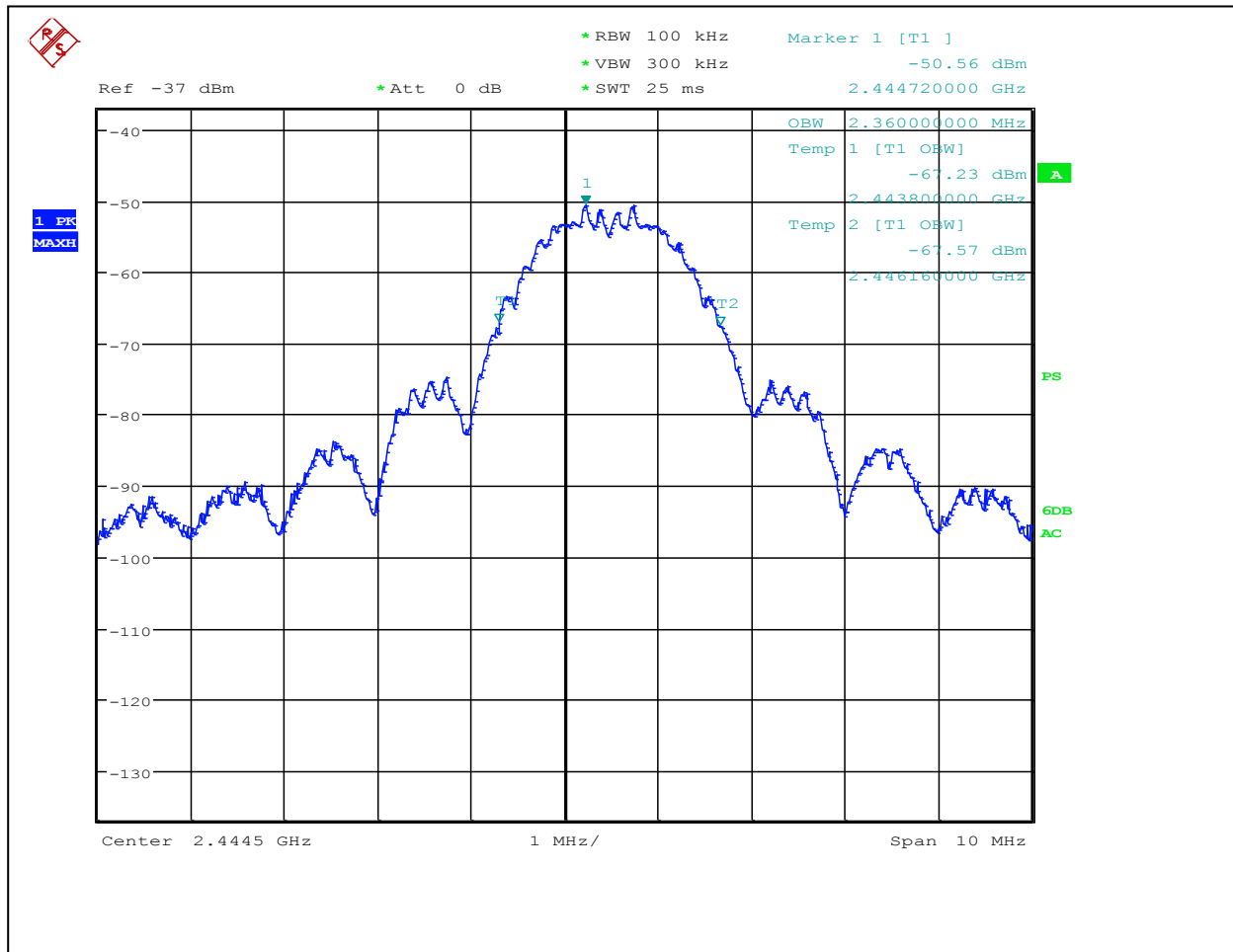
Date: 11.OCT.2017 11:40:42

Graph 3.3.4



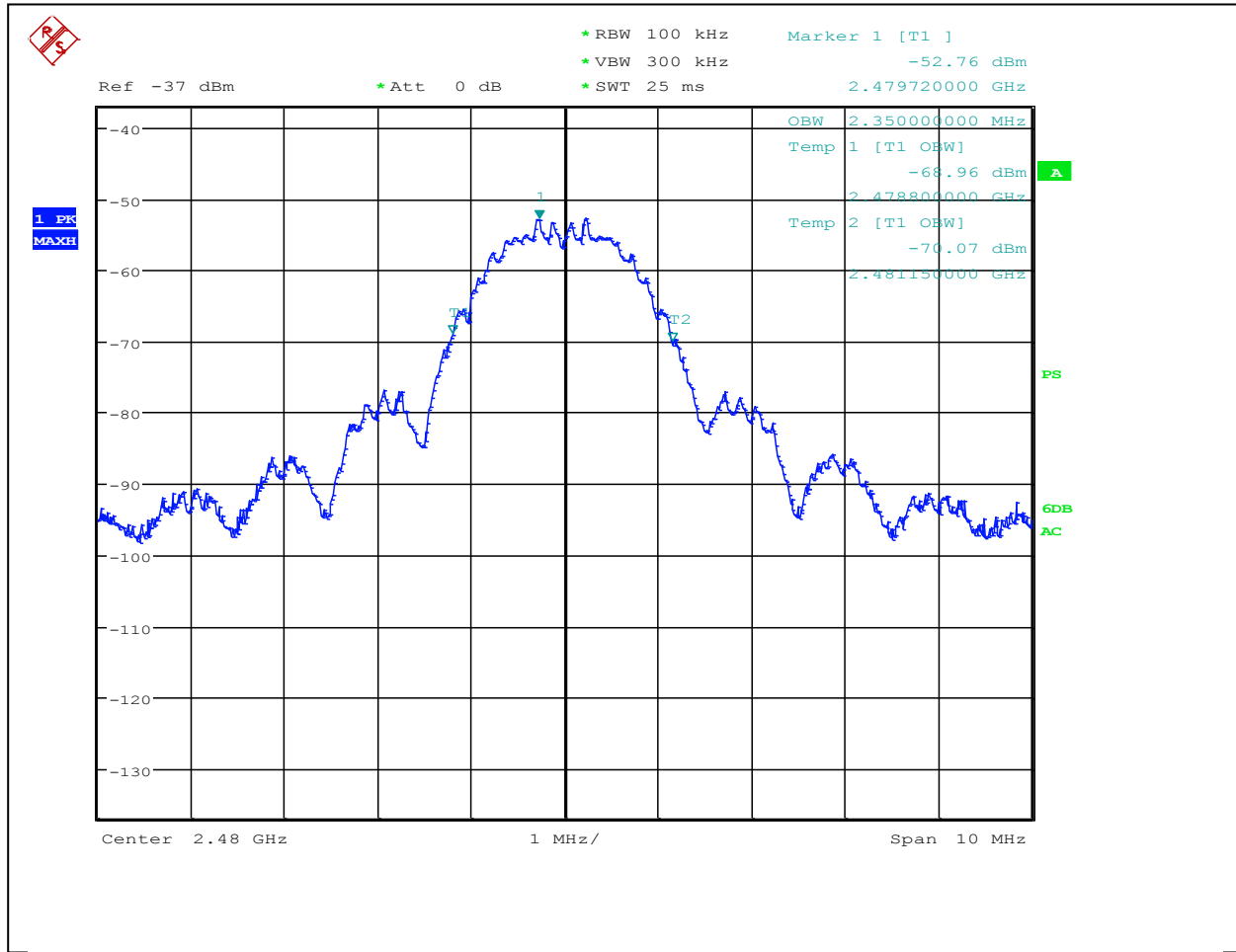
Date: 11.OCT.2017 11:38:29

Graph 3.3.5



Date: 11.OCT.2017 11:35:19

Graph 3.3.6



Date: 11.OCT.2017 11:41:22

3.4 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 16.5dB below the limits

Notes: Test was performed at AC Port of the Host PC unit

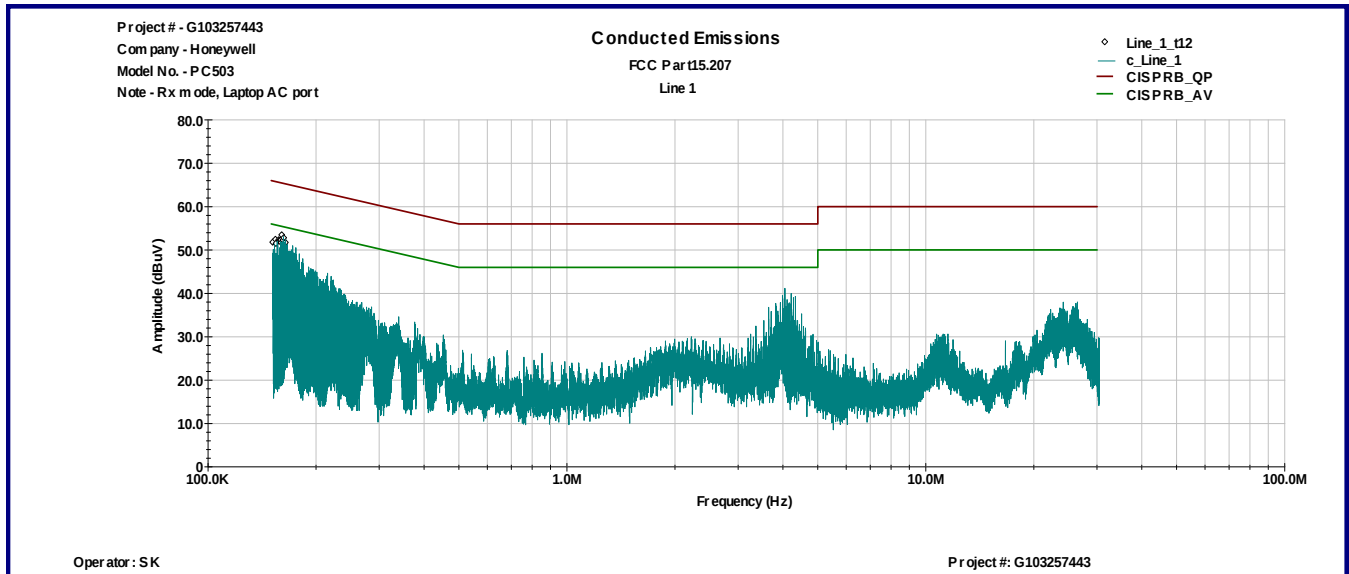
Date:	October 13, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC 15.207	
Test Point:	Power Line	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 44%(RH); 96.5kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.4.1

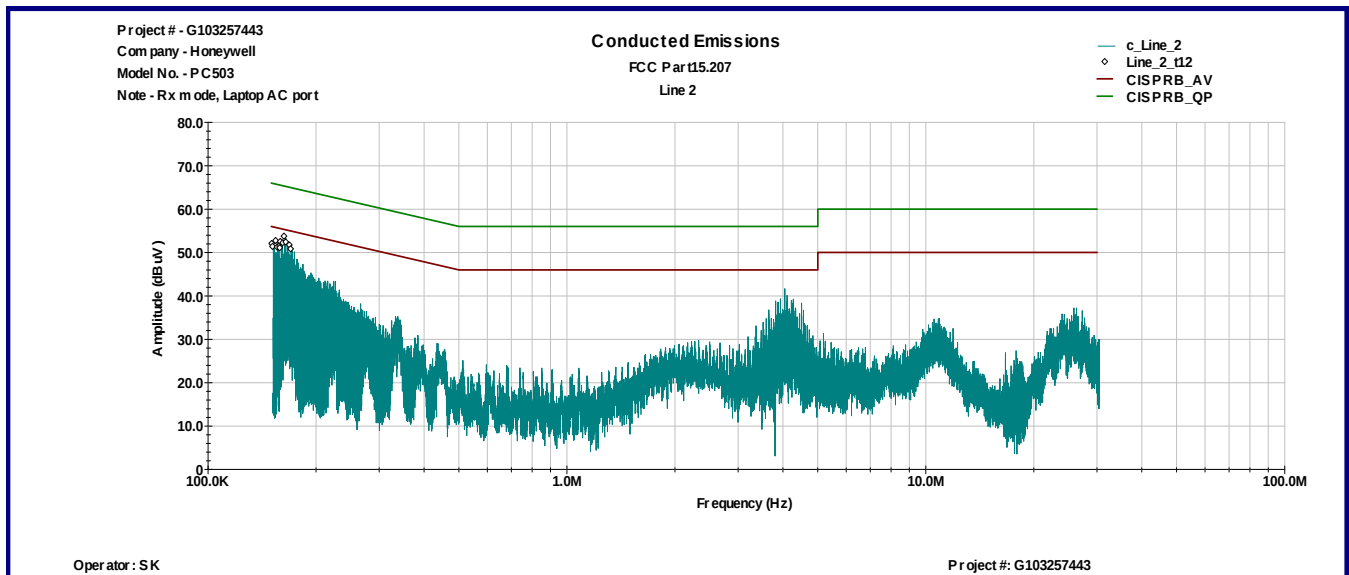
Line 1						
Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
150.89 KHz	42.8	20.3	66.0	56.0	-23.2	-35.7
154.0 KHz	42.6	22.2	65.8	55.8	-23.2	-33.6
157.6 KHz	44.9	26.5	65.6	55.6	-20.7	-29.1
160.5 KHz	47.8	31.1	65.4	55.4	-17.7	-24.3
160.58 KHz	48.1	31.6	65.4	55.4	-17.3	-23.9
160.74 KHz	48.0	31.5	65.4	55.4	-17.4	-23.9
163.22 KHz	48.9	34.0	65.3	55.3	-16.5	-21.3
163.74 KHz	48.8	34.4	65.3	55.3	-16.5	-20.9
Line 2						
Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
152.91 KHz	41.9	21.2	65.8	55.8	-23.9	-34.7
157.42 KHz	45.1	26.3	65.6	55.6	-20.5	-29.3
162.52 KHz	48.5	33.7	65.3	55.3	-16.8	-21.6
163.64 KHz	48.7	34.6	65.3	55.3	-16.6	-20.7
165.13 KHz	48.6	35.0	65.2	55.2	-16.6	-20.2
166.36 KHz	48.4	35.2	65.1	55.1	-16.8	-19.9
166.86 KHz	48.4	35.0	65.1	55.1	-16.7	-20.1
168.23 KHz	48.3	34.2	65.1	55.1	-16.7	-20.8

Graph 3.4.1

Line 1



Line 2



3.5 Receiver/digital device radiated emissions

Test location: ☐ OATS ☒ Anechoic Chamber

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Frequency range: 30MHz-13000MHz

Max. Emissions margin: 2.9dB below the limits

Notes: The Radiated Emissions test was performed in the Anechoic chamber at 3m measurement distance (see Table 3.11.1 and Graphs 3.11.1 and 3.11.2)

Date:	October 13, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC Part 15.109, Class B	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24°C; 46%(RH); 96.5kPa	
Equipment Verification:	☒	
Note:	Frequency Range 30-1000MHz	

Table 3.5.1

Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Total at 3m dBμV/m	QP Limit dBμV/m	Margin dB
Channel 11						
30.519 MHz	V	-0.4	24.1	23.7	40.0	-16.3
72.02 MHz	V	24.6	11.4	36.0	40.0	-4.0
132.53 MHz	V	8.7	17.5	26.2	43.5	-17.3
32.286 MHz	H	-0.6	23.3	22.7	40.0	-17.3
72.02 MHz	H	12.3	11.4	23.8	40.0	-16.3
143.91 MHz	H	18.9	16.5	35.4	43.5	-8.1
288.1 MHz	H	7.8	19.0	26.8	46.0	-19.3
Channel 19						
64.598 MHz	V	13.0	10.8	23.8	40.0	-16.2
72.02 MHz	V	24.1	11.4	35.6	40.0	-4.4
909.46 MHz	V	0.8	28.9	29.7	46.0	-16.4
72.02 MHz	H	11.9	11.4	23.3	40.0	-16.7
144.07 MHz	H	18.0	16.4	34.4	43.5	-9.1
288.1 MHz	H	9.5	19.0	28.5	46.0	-17.5
Channel 26						
64.598 MHz	V	12.5	10.8	23.3	40.0	-16.7
72.02 MHz	V	22.9	11.4	34.4	40.0	-5.7
866.67 MHz	V	1.2	28.1	29.3	46.0	-16.8
31.143 MHz	H	-0.8	23.8	23.0	40.0	-17.0
143.91 MHz	H	18.1	16.5	34.6	43.5	-9.0
576.03 MHz	H	2.1	25.2	27.3	46.0	-18.8

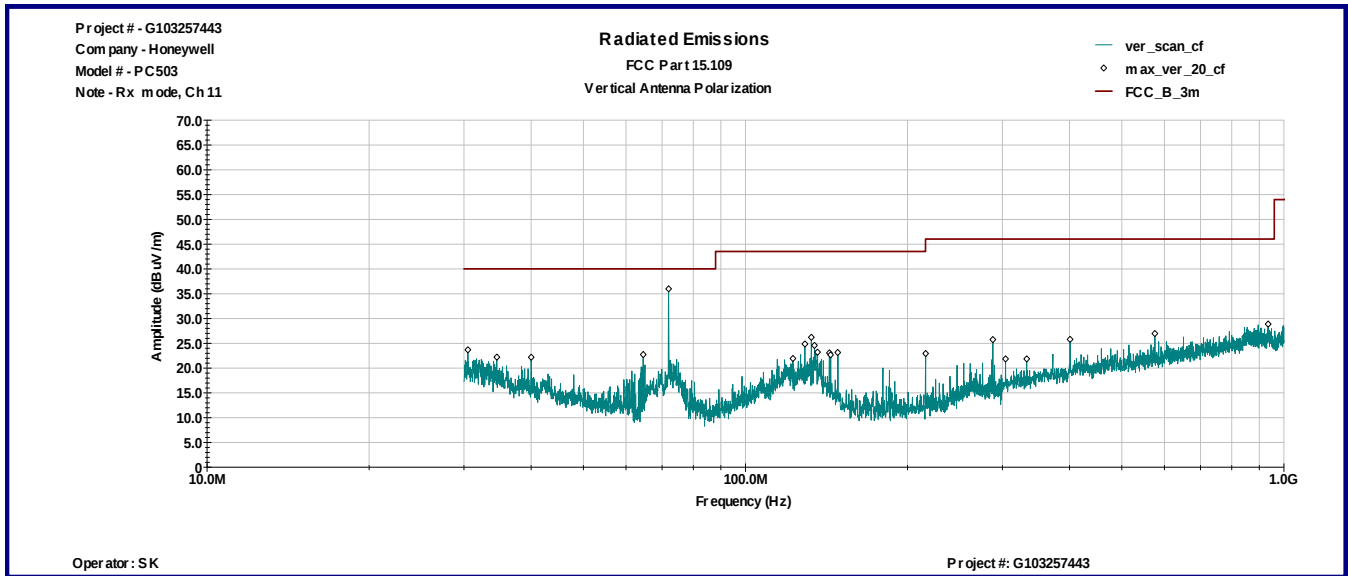
Date:	October 13, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC Part 15.109, Class B	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24°C; 46%(RH); 96.5kPa	
Equipment Verification:	☒	
Note:	Frequency Range 1000-13000MHz	

Table 3.5.2

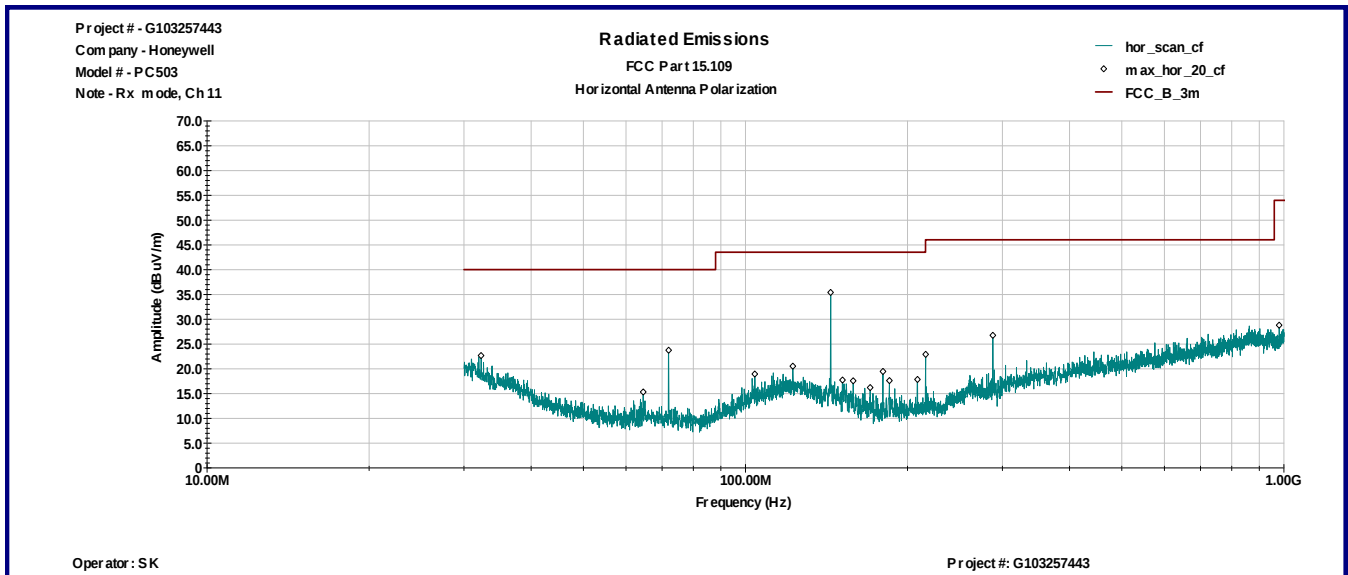
Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	AVG Limit dBμV/m	Margin dB
Channel 11							
1.992 GHz	V	53.9	29.9	40.8	43.0	54.0	-11.0
4.952 GHz	V	49.4	37.2	39.1	47.5	54.0	-6.5
10.864 GHz	V	40.7	46.1	36.8	50.0	54.0	-4.0
1.792 GHz	H	49.9	28.9	41.2	37.6	54.0	-16.4
4.952 GHz	H	52.0	37.1	39.1	50.1	54.0	-3.9
11.832 GHz	H	40.6	46.3	36.8	50.1	54.0	-3.9
Channel 19							
1.328 GHz	V	57.7	27.5	41.8	43.4	54.0	-10.6
4.952 GHz	V	49.8	37.2	39.1	47.9	54.0	-6.1
10.736 GHz	V	41.1	45.7	36.8	50.0	54.0	-4.0
1.8 GHz	H	51.6	28.9	41.2	39.4	54.0	-14.6
1.992 GHz	H	49.8	29.8	40.8	38.8	54.0	-15.1
2.4 GHz	H	48.7	31.1	40.4	39.4	54.0	-14.5
11.048 GHz	H	40.8	46.2	36.8	50.1	54.0	-3.8
Channel 26							
3.192 GHz	V	50.0	34.1	40.4	43.6	54.0	-10.4
4.952 GHz	V	48.9	37.2	39.1	47.0	54.0	-6.9
10.856 GHz	V	40.8	46.0	36.8	50.0	54.0	-4.0
1.992 GHz	H	49.6	29.8	40.8	38.6	54.0	-15.4
4.952 GHz	H	53.1	37.1	39.1	51.1	54.0	-2.9
10.912 GHz	H	41.0	46.1	36.8	50.4	54.0	-3.6

Graph 3.5.1

Vertical antenna polarization

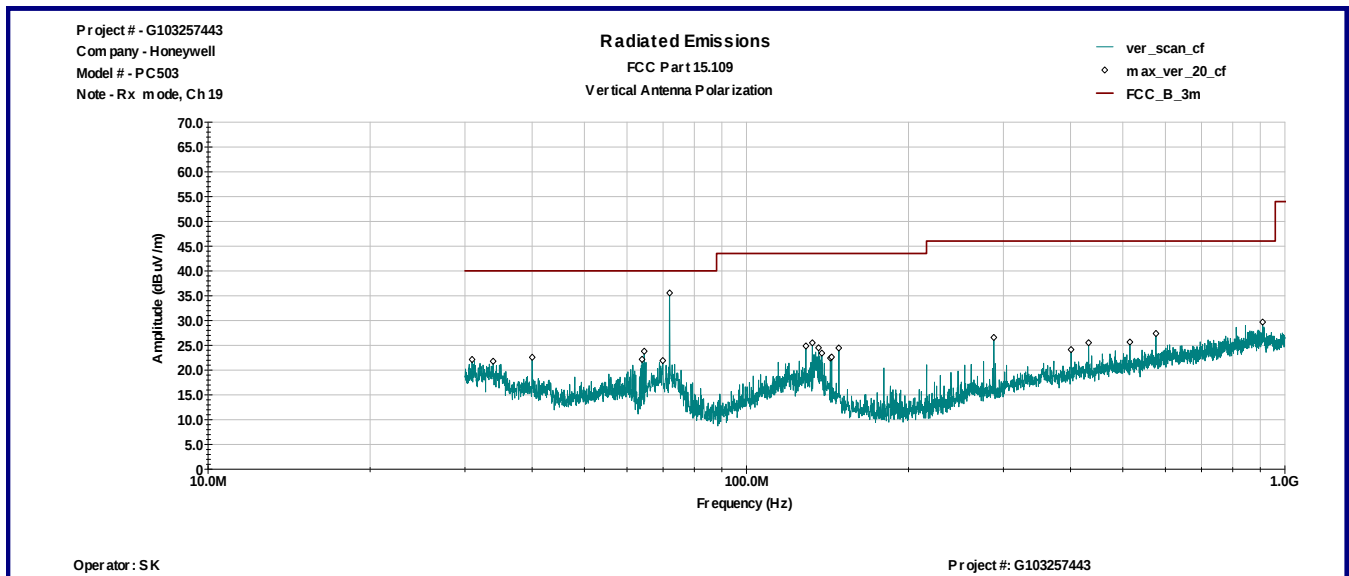


Horizontal antenna polarization

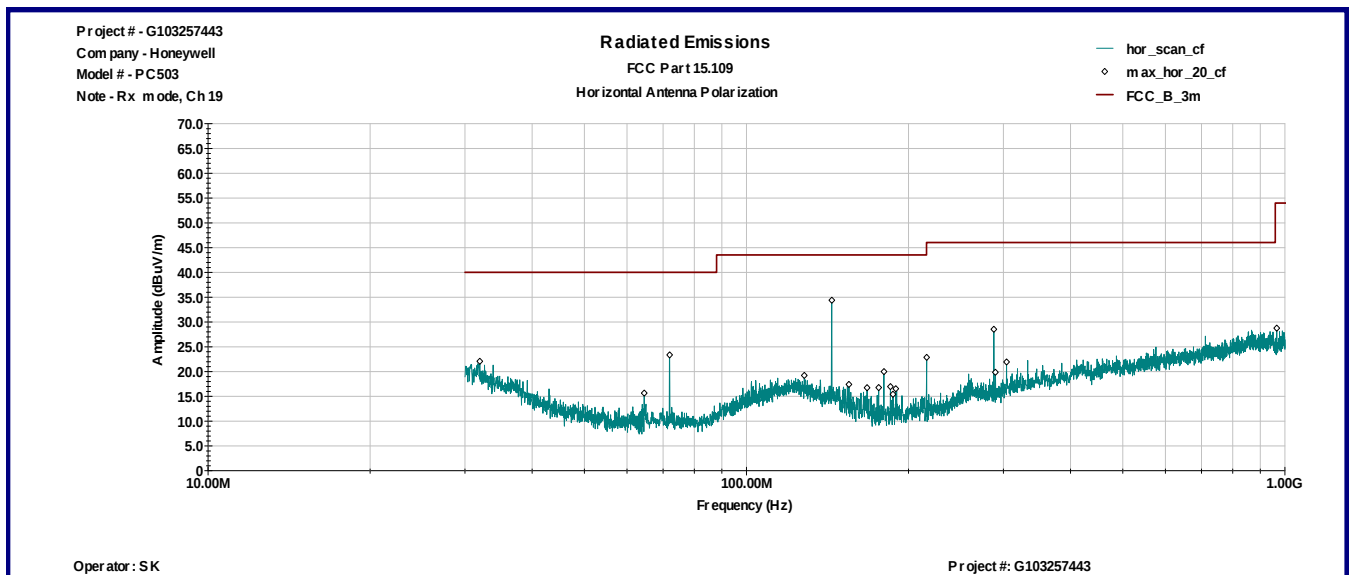


Graph 3.5.2

Vertical antenna polarization

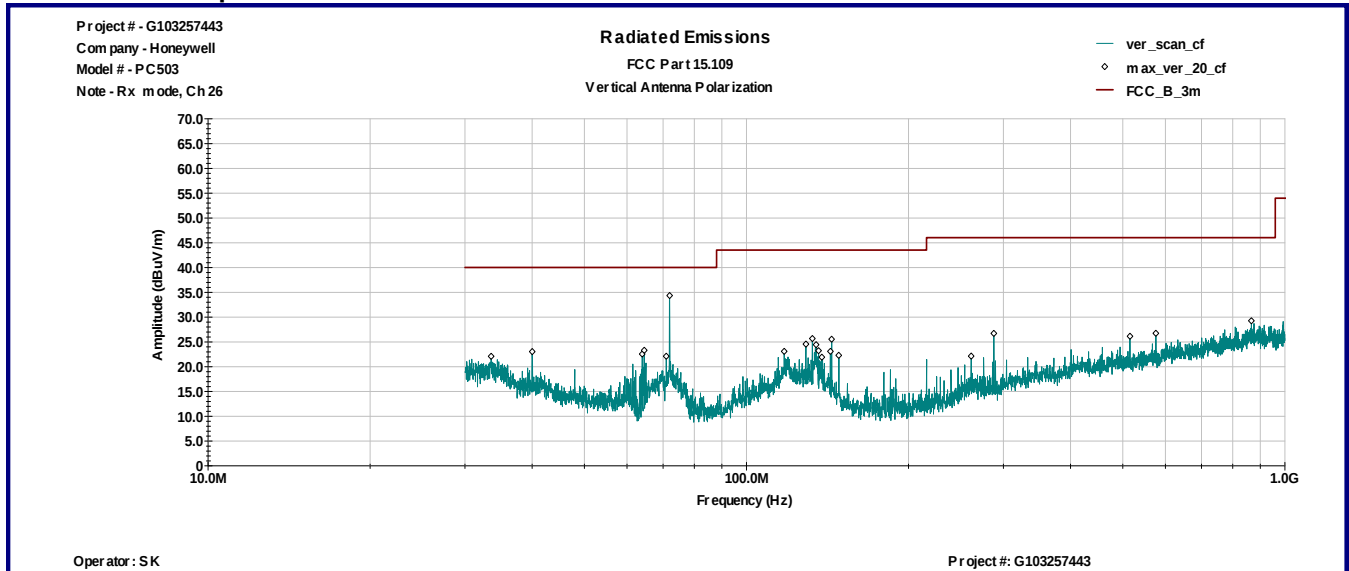


Horizontal antenna polarization

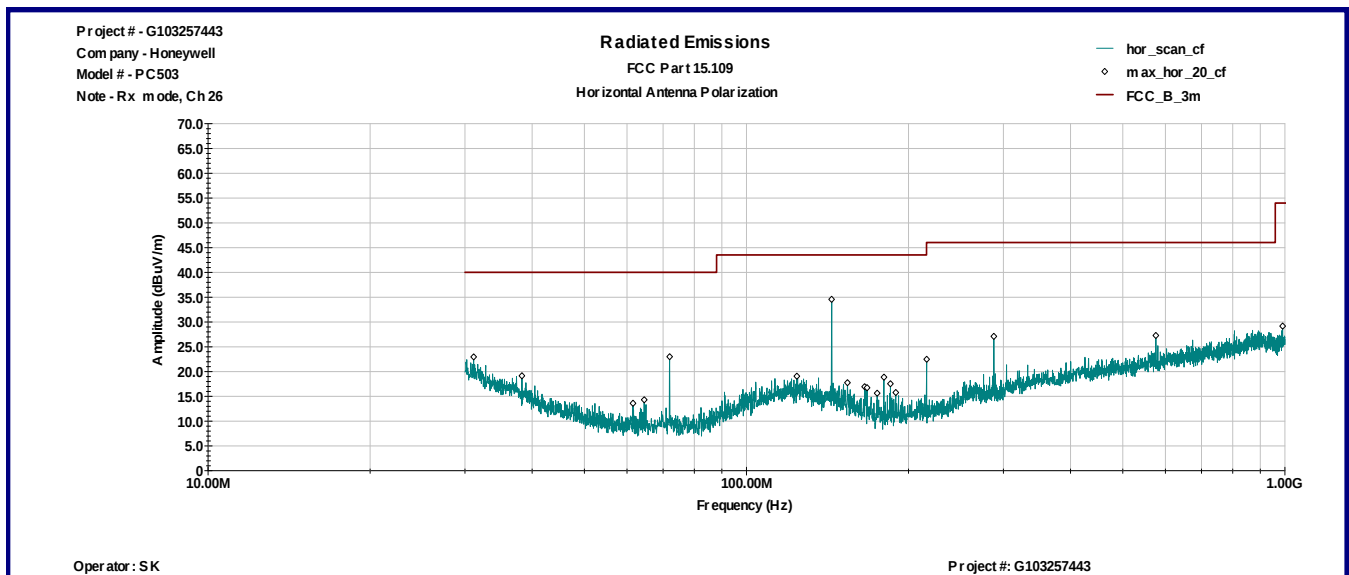


Graph 3.5.3

Vertical antenna polarization

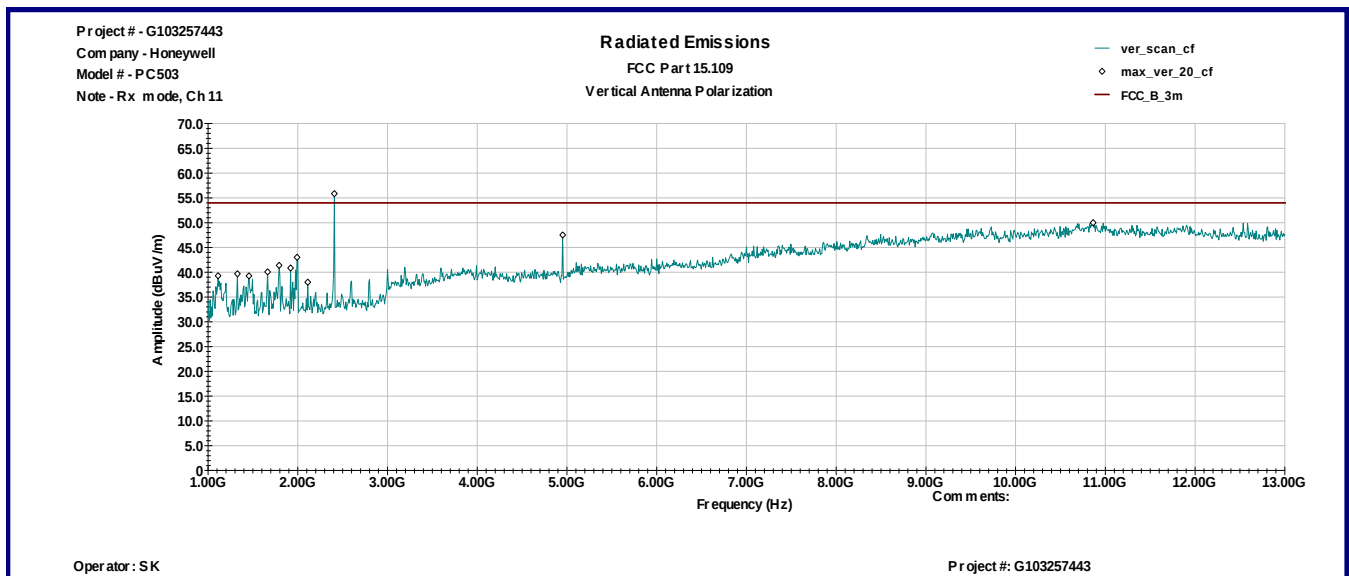


Horizontal antenna polarization

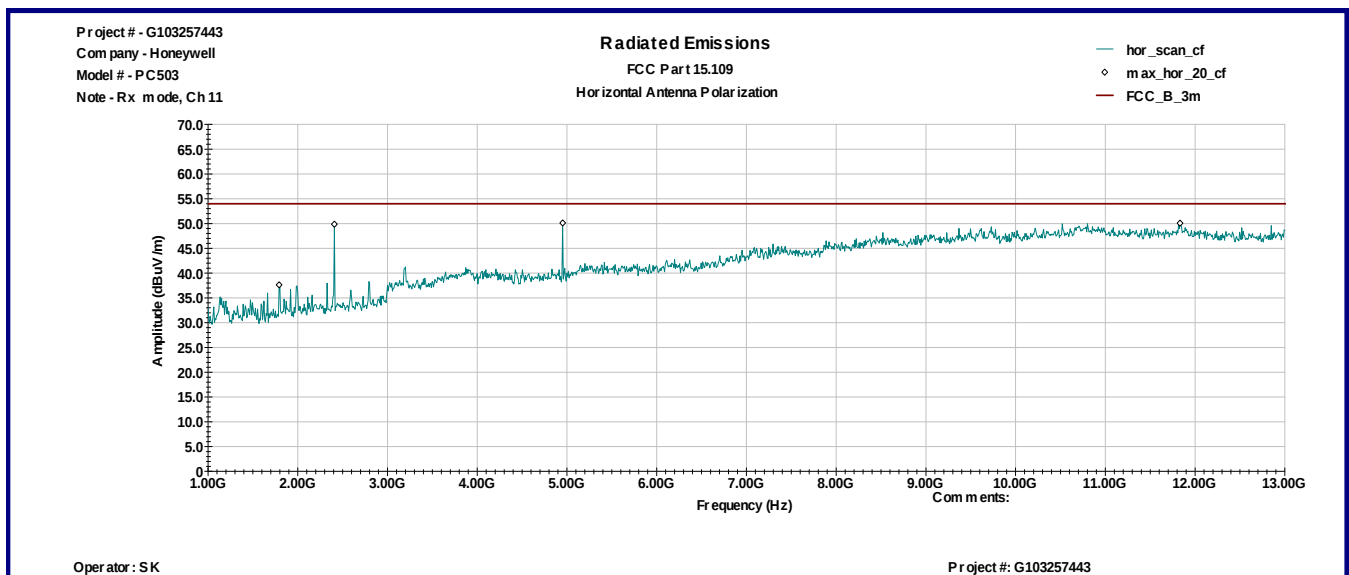


Graph 3.5.4

Vertical antenna polarization

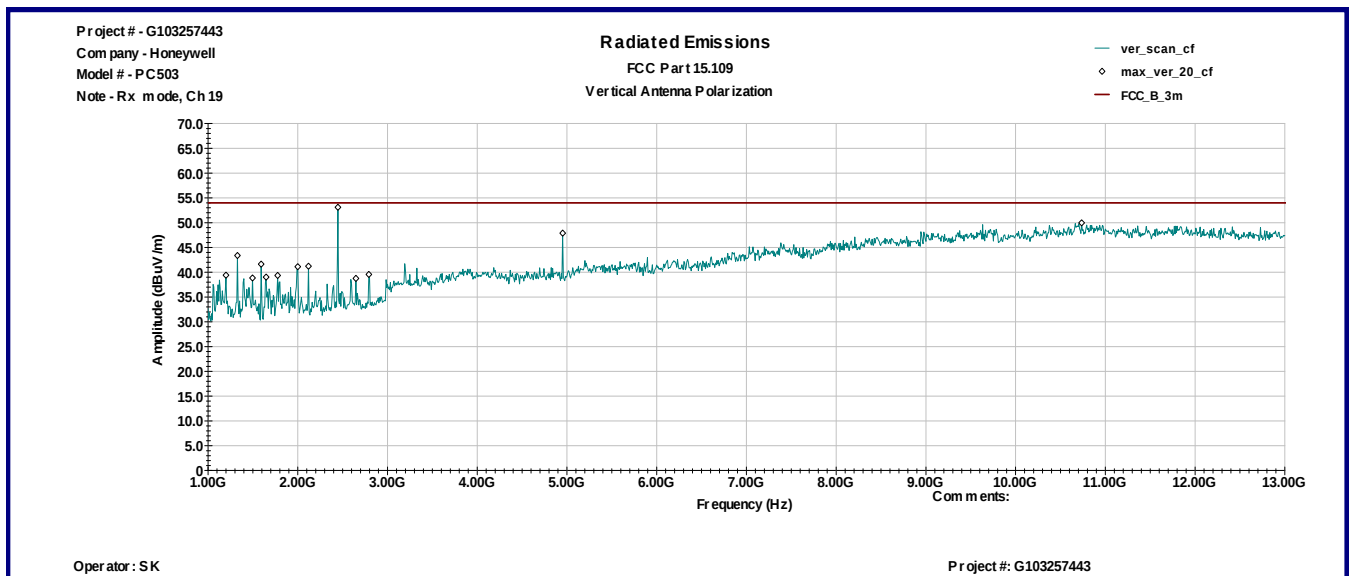


Horizontal antenna polarization

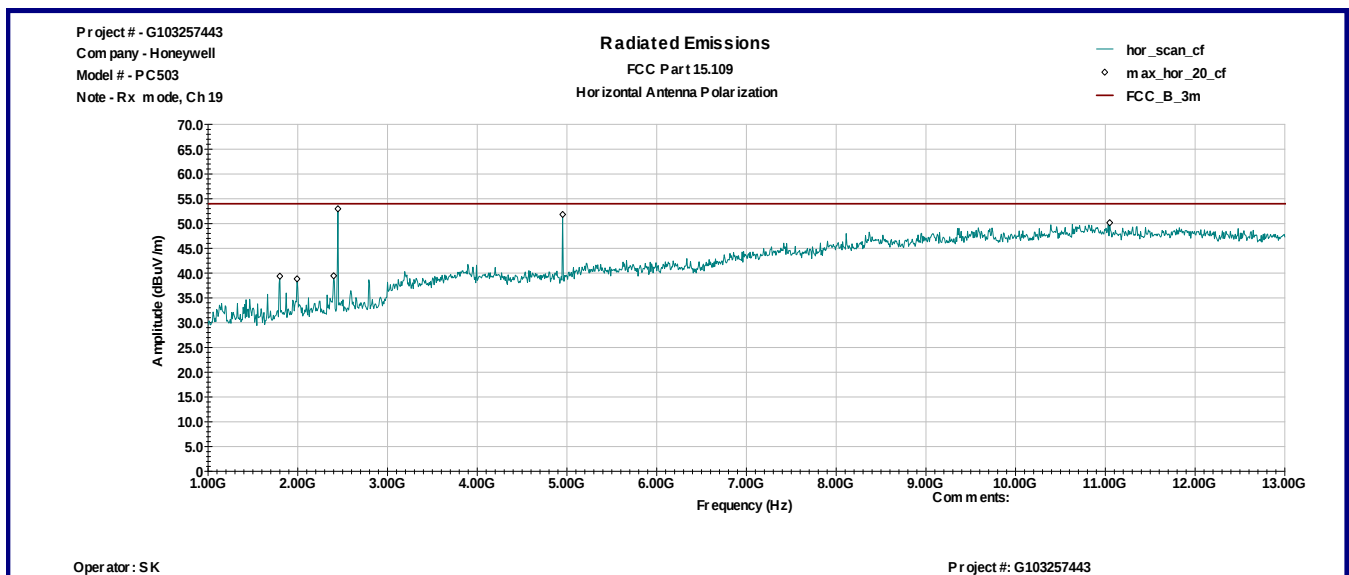


Graph 3.5.5

Vertical antenna polarization

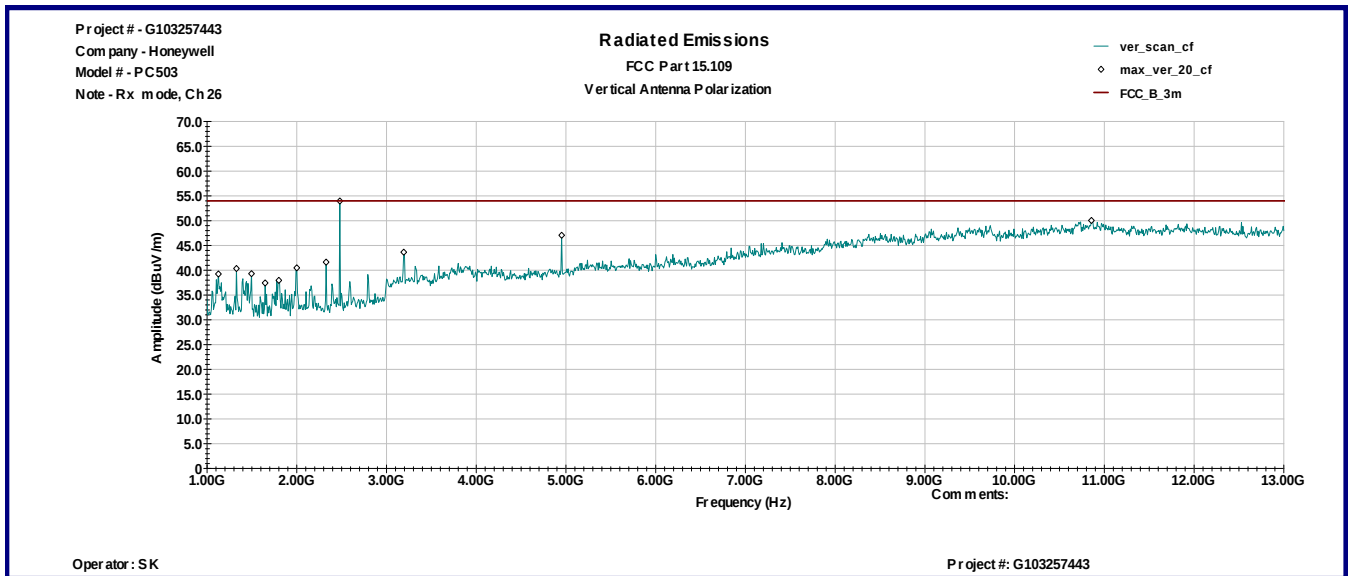


Horizontal antenna polarization

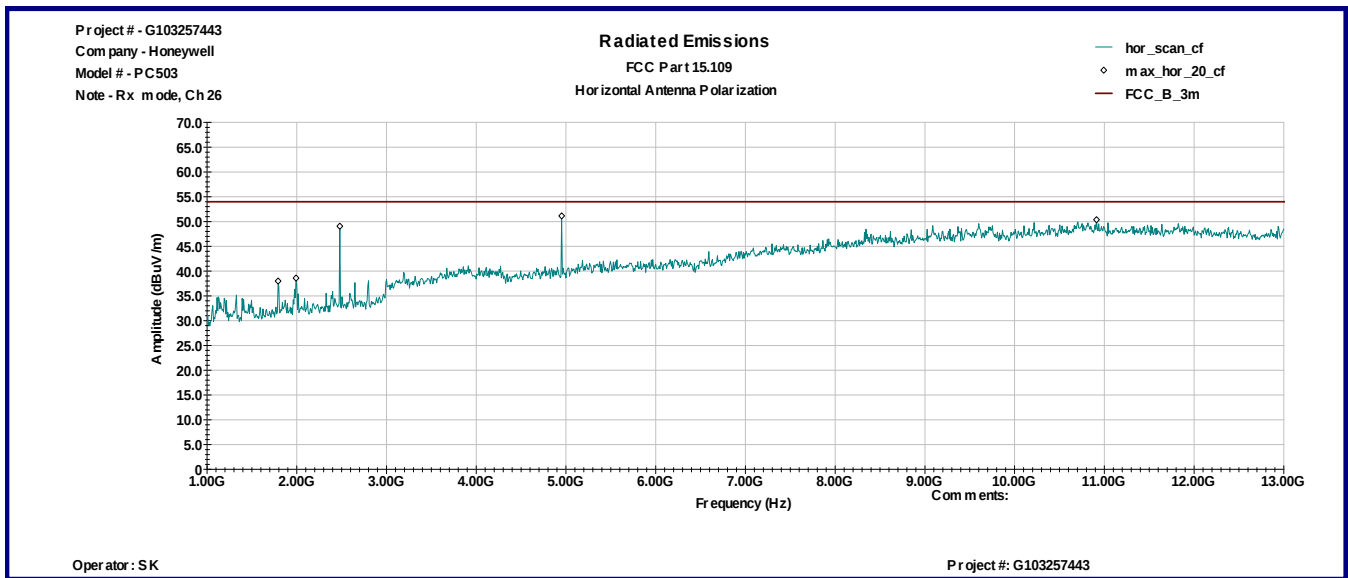


Graph 3.5.6

Vertical antenna polarization



Horizontal antenna polarization



3.6 Digital device conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 16.6dB below the limits

Notes: The Test was performed at AC port of the Host PC (Laptop)

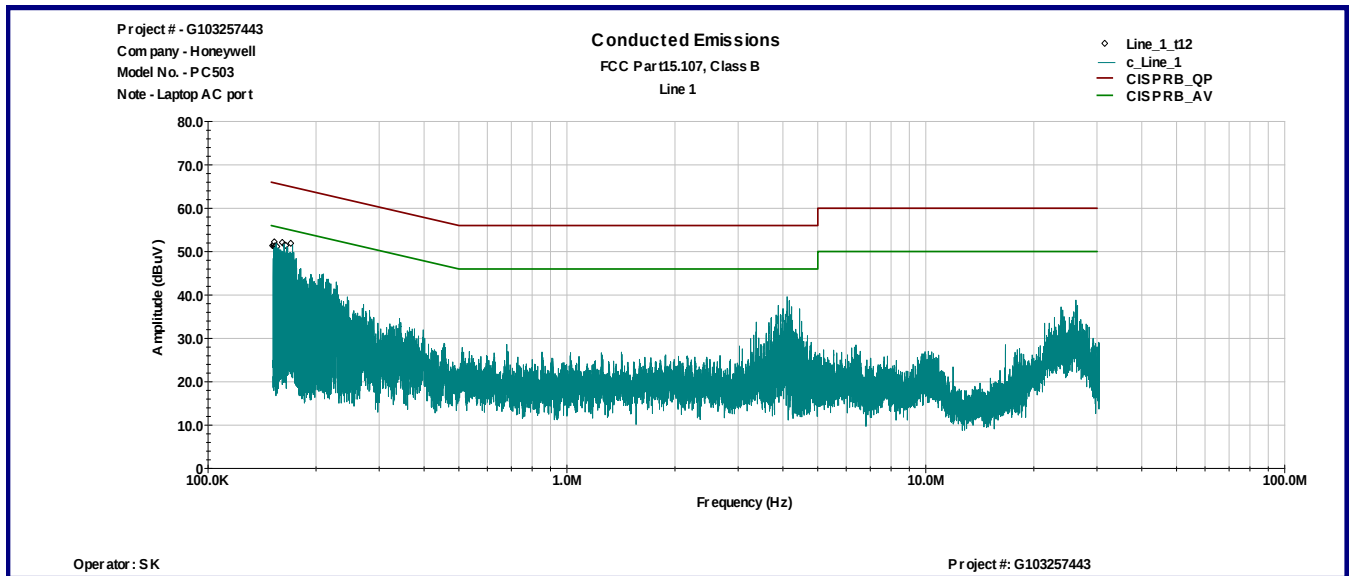
Date:	October 13, 2017	Result: Pass
Tested by:	Simon Khazon	
Standard:	FCC Part 15.107, Class B	
Test Point:	Line 1 and Line 2	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 44%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.6.1

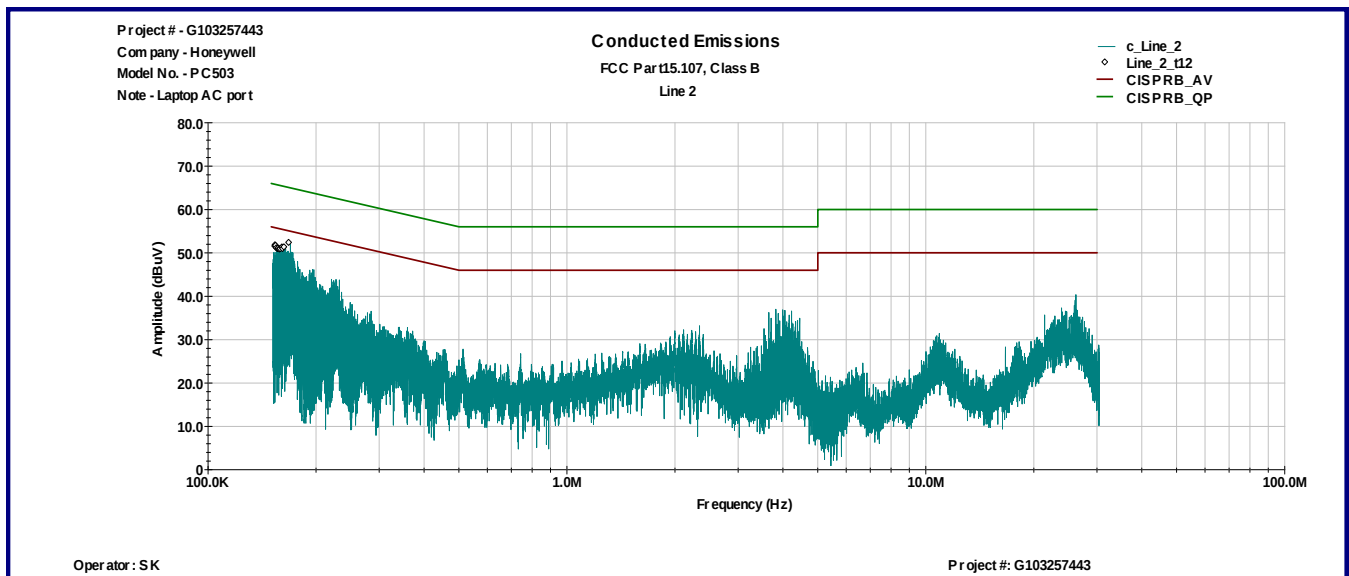
Line 1						
Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
150.71 KHz	42.5	20.3	66.0	56.0	-23.4	-35.7
154.1 KHz	42.0	21.9	65.8	55.8	-23.8	-33.9
157.0 KHz	45.1	26.6	65.6	55.6	-20.5	-29.0
160.3 KHz	47.7	32.2	65.4	55.4	-17.8	-23.2
160.93 KHz	47.9	30.9	65.4	55.4	-17.5	-24.5
163.74 KHz	48.7	33.9	65.3	55.3	-16.6	-21.4
Line 2						
Frequency	QP dBμV	AVG dBμV	QP Limit dBμV	AVG Limit dBμV	QP Margin dB	AVG Margin dB
152.93 KHz	41.6	21.5	65.8	55.8	-24.2	-34.3
157.62 KHz	45.9	26.9	65.6	55.6	-19.7	-28.7
162.44 KHz	48.7	33.9	65.3	55.3	-16.6	-21.4
164.41 KHz	46.9	35.0	65.3	55.3	-18.4	-20.3
166.23 KHz	48.5	35.1	65.1	55.1	-16.6	-20.0
168.17 KHz	48.3	34.3	65.1	55.1	-16.8	-20.8

Graph 3.6.1

Line 1



Line 2



4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	LAST CAL DATE	CAL DUE	USED
Spectrum Analyzer	R & S	FSP 40	100024	12559	01/26/2017	01/26/2018	☒
Spectrum Analyzer	R & S	ESU	100398	25283	03/21/2017	03/21/2018	☒
Bicono-Log Antenna	Teseq	CBL6112D	32859	25289	05/18/2017	05/18/2018	☒
Horn Antenna	EMCO	3115	9507-4513	9936	07/27/2017	07/27/2018	☒
LISN	Solar Electronics	9252-50-R-24-BNC	068545	MIN-0060	03/22/2017	03/22/2018	☒
LISN	COM-Power	Li-215A	191970	172315	06/27/2017	06/27/2018	☒
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	12/01/2016	12/01/2017	☒
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	12/01/2016	12/01/2017	☐
Pre-Amplifier	MITEQ	AMF-6F-26004000-40-8P	13224444	MIN-0064	12/01/2016	12/01/2017	☐
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	VBU	☒

5.0 Revision History

REVISION LEVEL	DATE	REPORT NUMBER	PREPARED	REVIEWED	NOTES
0	10-23-2017	103257443MIN-007	SK	NS	Original Issue
1	12-04-2017	103257443MIN-007	SK <i>SK Heje</i>	NS <i>NS Heje</i>	Model name changed from PC503 to PC-503