



TEST REPORT

Report Number: 103394702MIN-001A
Project Number: G103394702

Testing performed on the
333-210-US
Class II Permissive Changes

FCC ID: USE333210

to
47 CFR Part 15.207 & 15.209; Part 15.215:2018
47 CFR, Part 15:2018, §15.107 and §15.109, Class A

For
Paxton Access Ltd

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Date of issue: March 28, 2018

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1.0 GENERAL DESCRIPTION

Model:	333-210-US
Type of EUT:	PROXIMITY P38 compact reader
Intertek ID:	MIN1802270955-009
Related Submittal(s) Grants:	Class II Permissive Changes
FCC ID:	USE333210
Related Submittal(s) Grants:	Class II Permissive Changes
Company:	Paxton Access Ltd
Customer:	Walter Riche
Address:	Paxton House Home Farm Road Brighton E. SUSX BN1 9HU, United Kingdom
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Test Standards:	<input checked="" type="checkbox"/> 47 CFR, Part 15:2018, §15.207 &15.209, §15.215 <input checked="" type="checkbox"/> 47 CFR, Part 15:2018, §15.107 and §15.109, Class B
Type of radio:	<input checked="" type="checkbox"/> Stand -alone <input type="checkbox"/> Module <input type="checkbox"/> Hybrid
Date Sample Submitted:	February 28, 2018
Test Work Started:	March 1, 2018
Test Work Completed:	March 13, 2018
Test Sample Conditions:	<input type="checkbox"/> Damaged <input type="checkbox"/> Poor (Usable) <input checked="" type="checkbox"/> Good

1.1 Product Description; Test Facility

Product Description:	125kHz Transmitter
Operating Frequency	125kHz
Modulation:	ASK
Antenna(s) Info:	Integral antenna
Antenna Installation:	<input type="checkbox"/> User <input type="checkbox"/> Professional <input checked="" type="checkbox"/> Factory
Transmitter Power Configuration:	<input type="checkbox"/> Internal battery <input checked="" type="checkbox"/> External power source <input checked="" type="checkbox"/> 13.8 VDC from PS <input type="checkbox"/> Other:
Special Test Arrangement:	The transmitter was tested while connected to and powered through Paxton test jig which included power supply
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)
- [REDACTED]

Operating modes of the EUT:

No.	Description
1	The EUT was connected to test jig and was setup to operate in standby/wait mode or to transmit by pressing button. The EUT was able to transmit continuously by continuously pressing the button.

Cables:

No.	Type	Length	Designation	Note
1	6 wires, unshielded	>3m	DC power and communication	

Support equipment/Services:

No.	Item	Description
1	Paxton test jig	A configuration to include power and communication to and from the EUT. Power supply: SW20-S120-24

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: 86-106kPa

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
15.209, 15.215(b)	Field Strength of Fundamental and Spurious Emissions	Pass
15.207	Transmitter Power Line conducted emissions	Pass
15.109	Digital device radiated emissions	Pass
15.107	Digital device conducted emissions	Pass

Notes: Due to Class II Permissive changes, only the above tests were performed.

3.0 TEST CONDITIONS AND RESULTS

3.1 Field Strength of Fundamental and Spurious

Test location: OATS Anechoic Chamber Other

Test distance: 10 meters 3 meters

Test result: **Pass**

Max. Emissions margin at: **40.0** dB below the limits

Notes: Frequencies above 30MHz were unrelated to the transmitter and were related to unintentional radiation.

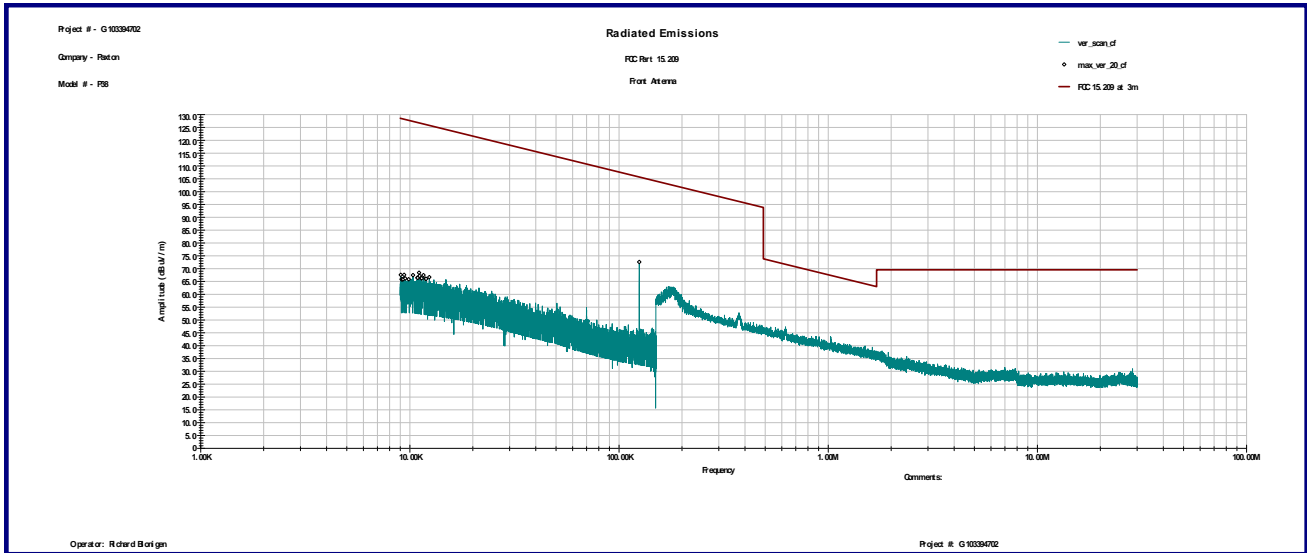
Date:	March 7, 2018	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC 15.209	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 38%(RH); 98kPa	
Equipment Verification:	<input checked="" type="checkbox"/>	
Note:	None	

Table 3.1.1

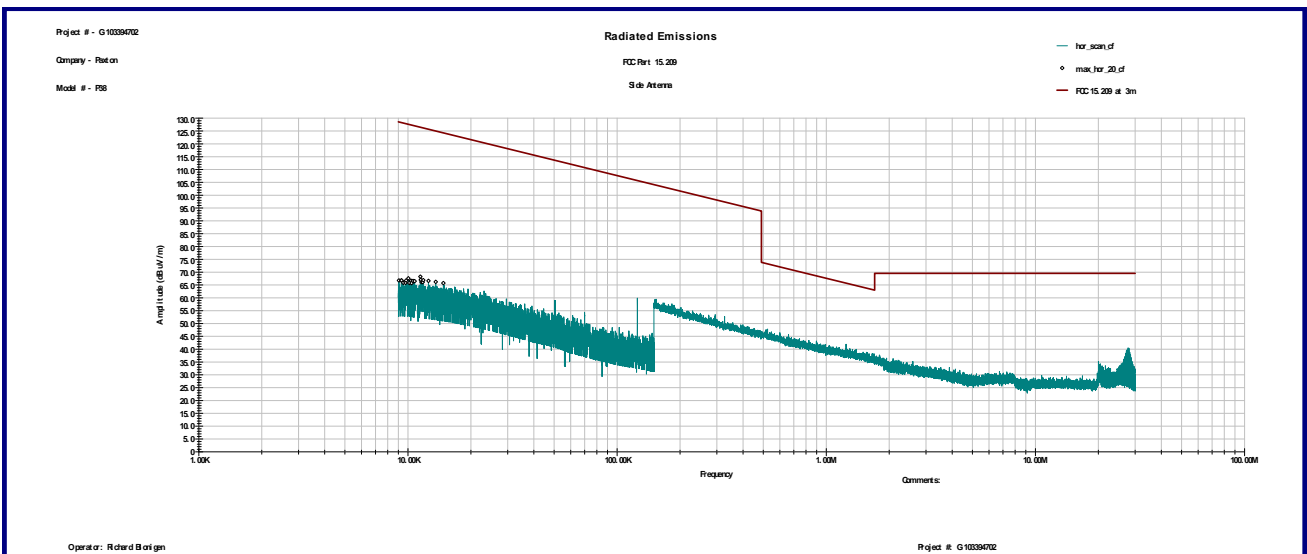
Frequency MHz	Antenna Orient.	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dB μ V	Total @ 3m dB μ V/m	15.209 Limit dB μ V/m	Distance Factor (dB)	Margin dB	Comments
0.125	Front	63.5	0.1	28.8	15.5	50.3	25.7	80.0	-55.4	
0.373	Front	54.2	0.1	28.7	12.8	38.4	16.2	80.0	-57.8	
0.627	Front	49.7	0.1	28.7	10.5	31.7	31.7	40.0	-40.0	
0.125	Side	63.5	0.1	28.8	11.1	45.9	25.7	80.0	-59.8	

Graph 3.1.1

Front antenna orientation

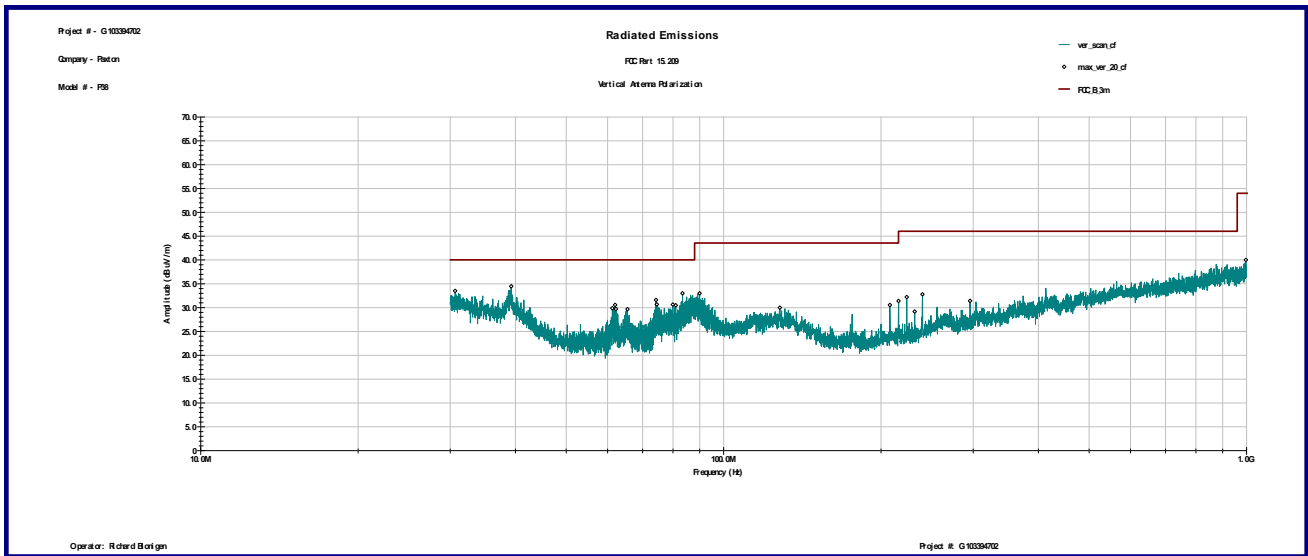


Side antenna orientation

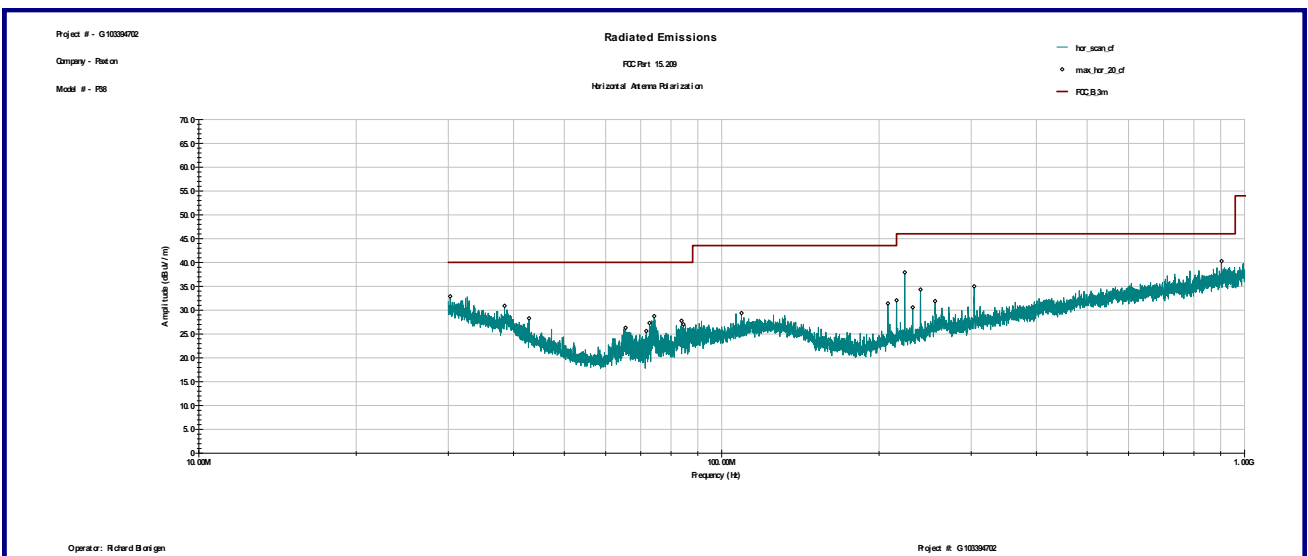


Graph 3.1.2

Vertical antenna polarization



Horizontal antenna polarization





3.2 Transmitter power line conducted emissions

Test location: OATS Anechoic Chamber Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 10.0 dB below the limits

Note: None

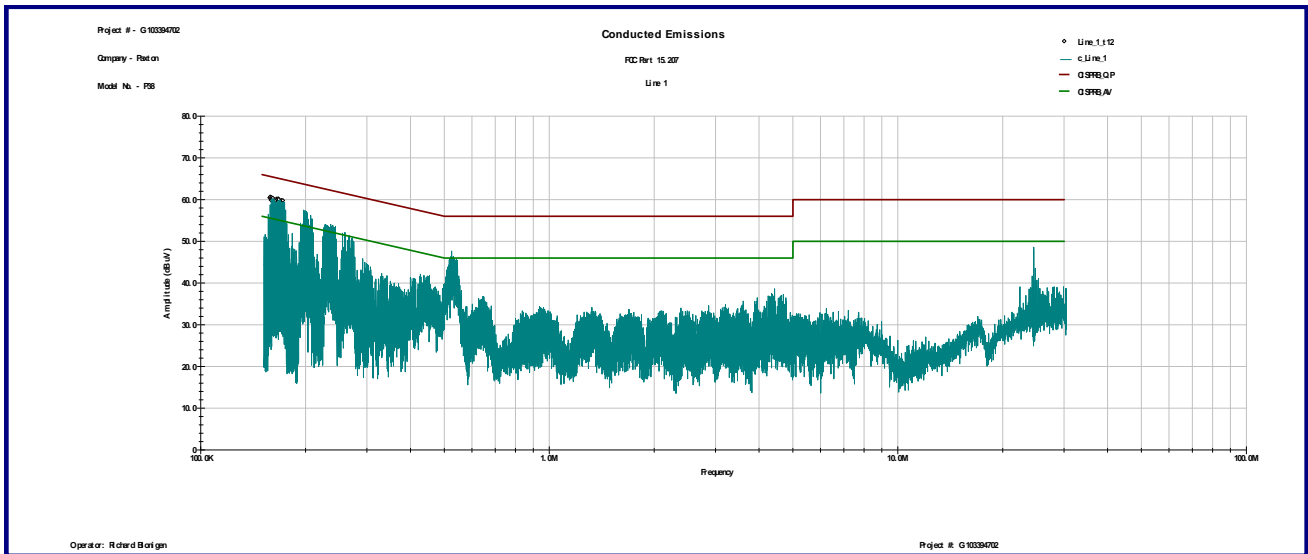
Date:	March 13, 2018	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC Part 15.207	
Test Point:	Power Line	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 37%(RH); 98kPa	
Equipment Verification:	<input checked="" type="checkbox"/>	
Note:	None	

Table 3.2.1

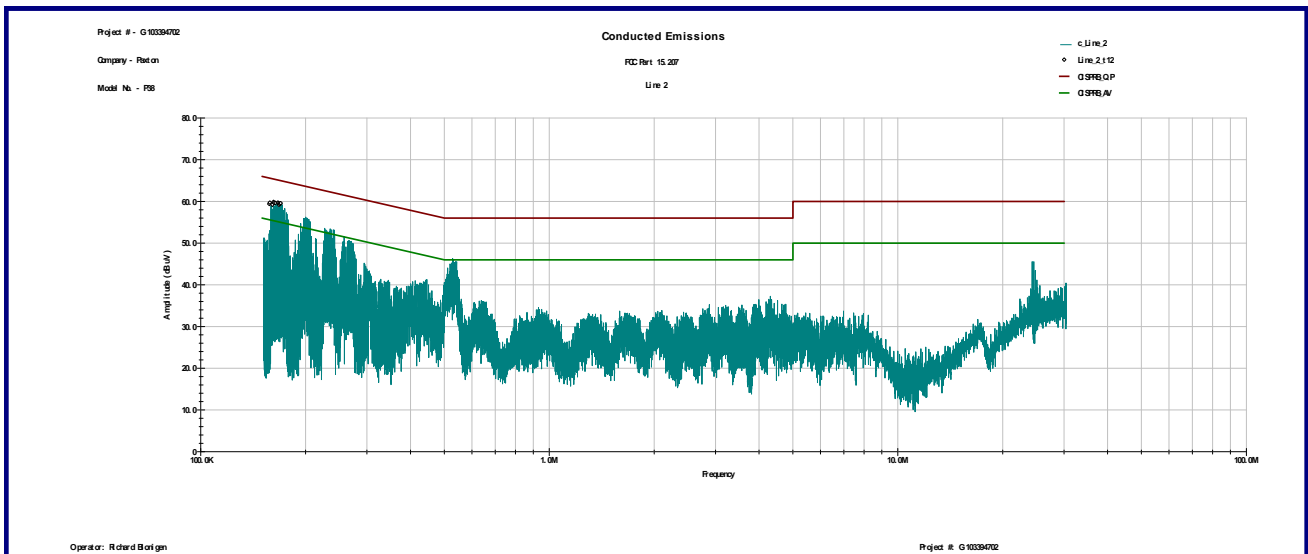
Line 1							
Frequency MHz	QP dB μ V	AVG dB μ V	Cable Loss dB	QP Lim dB μ V	AVG Lim dB μ V	QP Margin dB	AVG Margin dB
0.171	54.8	41.1	0.1	64.9	54.9	-10.0	-13.7
0.196	50.8	36.4	0.1	63.8	53.8	-12.9	-17.3
0.240	48.5	36.4	0.1	62.1	52.1	-13.5	-15.6
0.257	47.2	35.1	0.1	61.5	51.5	-14.2	-16.3
0.535	45.1	31.5	0.2	56.0	46.0	-10.7	-14.3
24.240	43.7	33.1	1.2	60.0	50.0	-15.1	-15.7
Line 2							
Frequency MHz	QP dB μ V	AVG dB μ V	Cable Loss dB	QP Lim dB μ V	AVG Lim dB μ V	QP Margin dB	AVG Margin dB
0.161	54.5	41.1	0.1	65.4	55.4	-10.8	-14.2
0.199	50.9	37.4	0.1	63.7	53.7	-12.7	-16.2
0.232	48.7	36.1	0.1	62.4	52.4	-13.6	-16.2
0.270	46.8	35.3	0.1	61.1	51.1	-14.2	-15.7
0.535	45.1	31.4	0.2	56.0	46.0	-10.7	-14.4
24.240	42.7	33.1	1.2	60.0	50.0	-16.1	-15.7

Graph 3.2.1

Line 1



Line 2





3.3 Digital device radiated emissions

Test location: OATS Anechoic Chamber

Test distance: 10 meters 3 meters

Test result: **Pass**

Frequency range: 30MHz-1000MHz

Max. Emissions margin: 4.9 dB below the limits

Notes: None

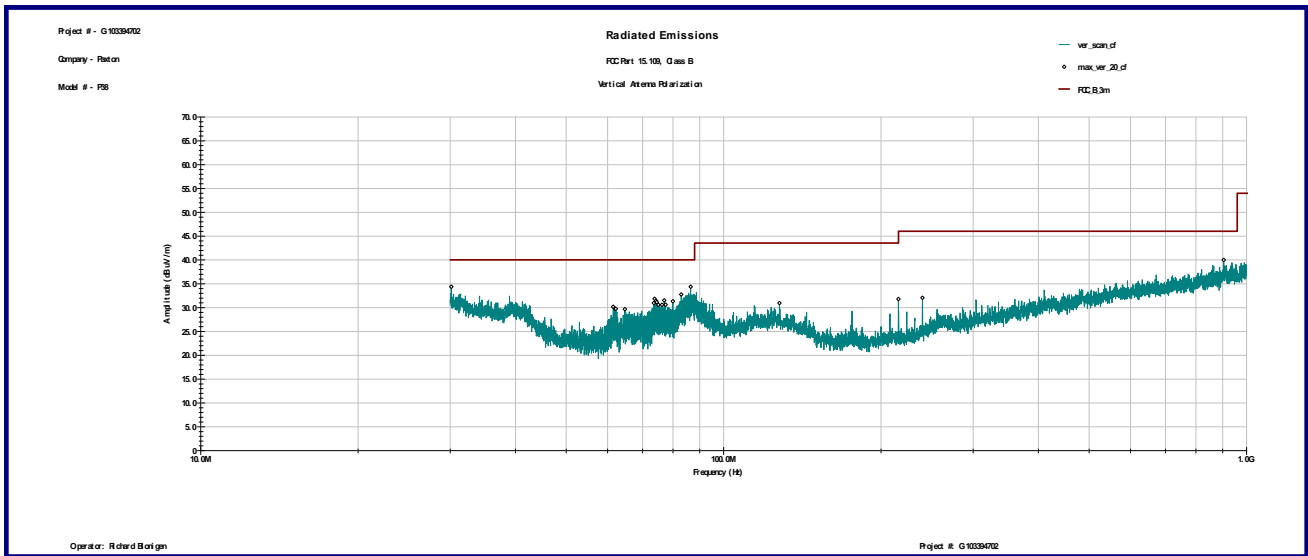
Date:	March 7, 2017	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC Part 15.109, Class B	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 38%(RH); 98kPa	
Equipment Verification:	<input checked="" type="checkbox"/>	
Note:	None	

Table 3.3.1

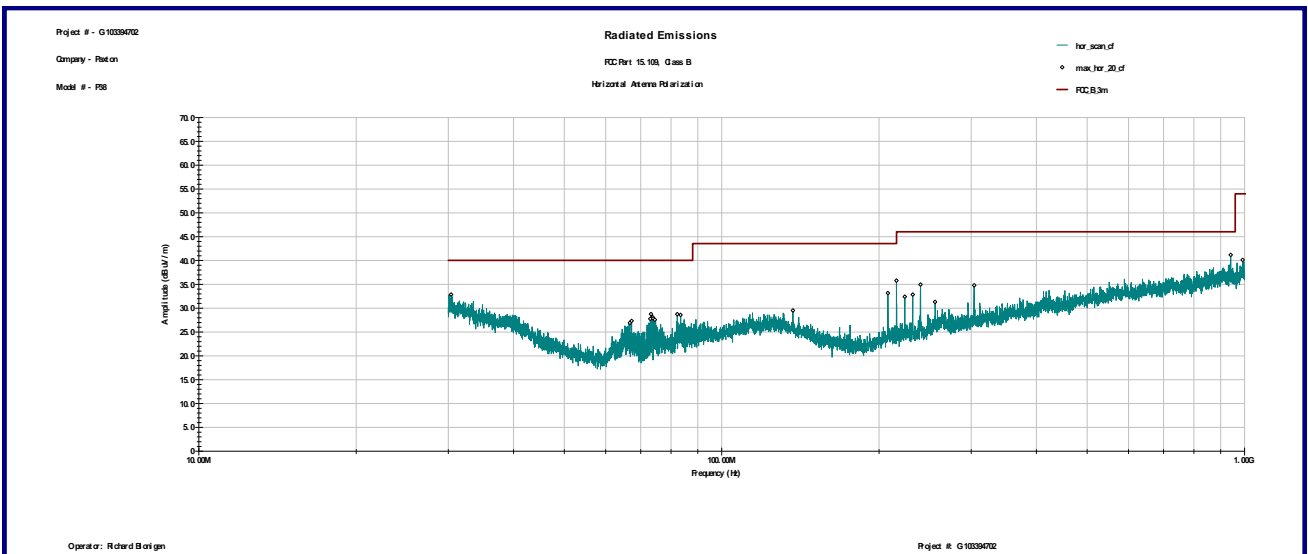
Frequency MHz	Antenna Polarity	Peak Reading dBμV	Total C.F. dB1/m	Total at 3m dBμV/m	Limit dBμV/m	Margin dB
30.158 MHz	V	10.0	24.4	34.4	40.0	-5.6
61.507 MHz	V	18.9	11.3	30.2	40.0	-9.8
64.761 MHz	V	18.9	10.8	29.7	40.0	-10.3
73.549 MHz	V	19.4	11.6	31.0	40.0	-9.0
76.238 MHz	V	18.6	12.0	30.6	40.0	-9.4
79.985 MHz	V	19.0	12.4	31.3	40.0	-8.7
82.982 MHz	V	20.0	12.8	32.8	40.0	-7.2
215.97 MHz	V	16.2	15.5	31.8	43.5	-11.7
239.99 MHz	V	14.6	17.5	32.1	46.0	-14.0
904.63 MHz	V	11.2	28.8	40.0	46.0	-6.0
30.386 MHz	H	8.6	24.2	32.9	40.0	-7.2
66.763 MHz	H	16.1	10.8	26.9	40.0	-13.1
73.271 MHz	H	17.2	11.5	28.8	40.0	-11.3
74.494 MHz	H	15.9	11.7	27.6	40.0	-12.4
136.83 MHz	H	12.0	17.5	29.5	43.5	-14.0
208.0 MHz	H	17.2	15.9	33.2	43.5	-10.4
232.02 MHz	H	16.4	16.4	32.8	46.0	-13.2
239.99 MHz	H	17.4	17.5	34.9	46.0	-11.1
941.1 MHz	H	12.3	28.9	41.2	46.0	-4.9
991.87 MHz	H	10.6	29.5	40.1	54.0	-13.9

Graph 3.3.1

Vertical antenna polarization



Horizontal antenna polarization





3.4 Digital device conducted emissions

Test location: OATS Anechoic Chamber Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 9.8 dB below the limits

Notes: None

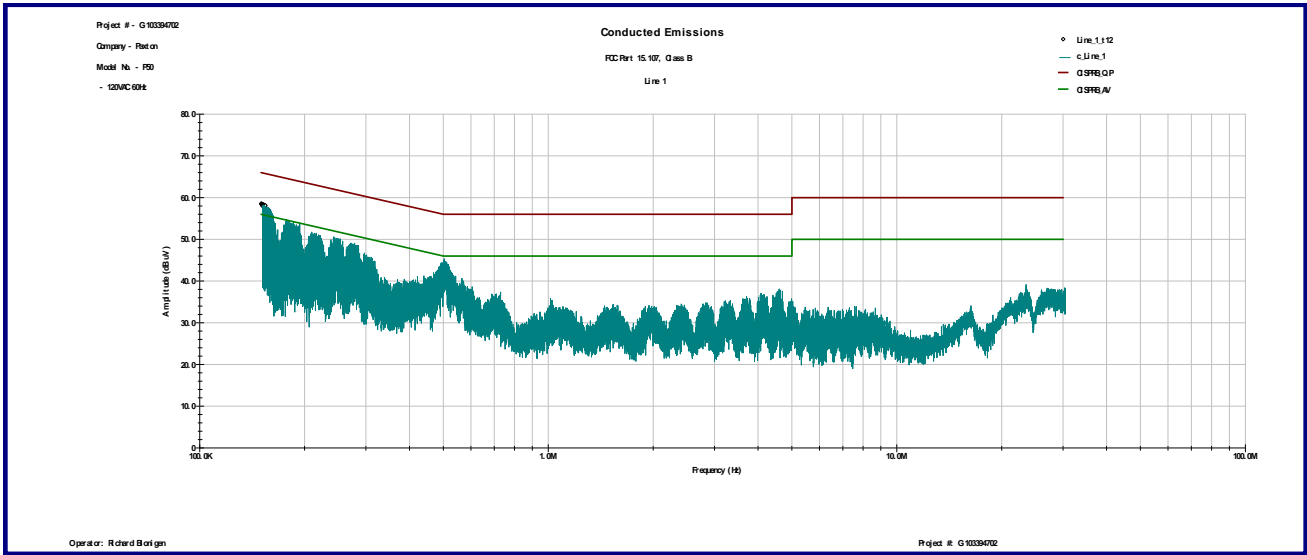
Date:	March 13, 2018	Result: Pass
Tested by:	Richard Blonigen	
Standard:	FCC Part 15.107 Class B	
Test Point:	Power Line	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 37%(RH); 98kPa	
Equipment Verification:	<input checked="" type="checkbox"/>	
Note:	None	

Table 3.4.1

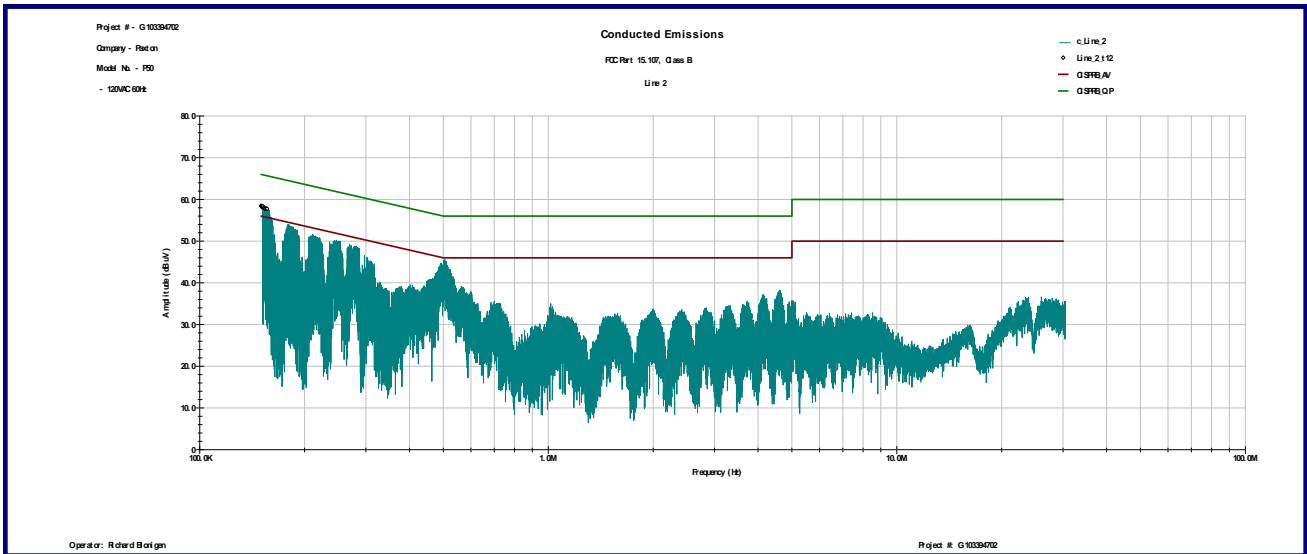
Line 1							
Frequency MHz	QP dB μ V	AVG dB μ V	Cable Loss dB	QP Lim dB μ V	AVG Lim dB μ V	QP Margin dB	AVG Margin dB
0.154	55.9	42.5	0.1	65.8	55.8	-9.8	-13.2
0.183	52.0	37.3	0.1	64.3	54.3	-12.3	-17.0
0.218	49.7	37.1	0.1	62.9	52.9	-13.1	-15.7
0.254	47.9	36.2	0.1	61.6	51.6	-13.6	-15.3
0.280	45.8	31.9	0.1	60.8	50.8	-14.9	-18.8
0.505	44.6	33.5	0.2	56.0	46.0	-11.2	-12.3
Line 2							
Frequency MHz	QP dB μ V	AVG dB μ V	Cable Loss dB	QP Lim dB μ V	AVG Lim dB μ V	QP Margin dB	AVG Margin dB
0.156	55.5	42.0	0.1	65.7	55.7	-10.1	-13.6
0.181	51.7	38.9	0.1	64.4	54.4	-12.7	-15.5
0.209	49.2	37.1	0.1	63.2	53.2	-14.0	-16.1
0.248	47.3	36.1	0.1	61.8	51.8	-14.4	-15.6
0.278	45.6	32.6	0.1	60.9	50.9	-15.2	-18.2
0.499	43.8	33.5	0.2	56.0	46.0	-12.1	-12.4

Graph 3.4.1

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	ESU	100398	25283	03/21/2017	03/21/2018	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	FSP 40	100024	12559	01/26/2017	01/26/2018	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	10/30/2017	10/30/2018	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	6579	15580	10/04/2017	10/04/2018	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Schaffner-Teseq	CBL6112B	2468	9734	06/15/2017	06/15/2018	<input checked="" type="checkbox"/>
Loop Antenna	ETS	6512	00060486	19942	01/03/2017	01/03/2018	<input checked="" type="checkbox"/>
LISN	COM-Power	Li-215A	191971	172316	06/14/2017	06/14/2018	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	12/01/2016	12/01/2017	<input checked="" type="checkbox"/>
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	VBU	<input checked="" type="checkbox"/>



5.0 Revision History

REVISION LEVEL	DATE	REPORT NUMBER	PREPARED	REVIEWED	NOTES
0	3-28-2018	103394702MIN-001A	RB	NS	Original Issue