TEST REPORT

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

Testing performed on the
373-210-US
Class II Permissive Changes

FCC ID: USE323110

to
47 CFR Part 15.207 & 15.209; Part 15.215:2017
47 CFR, Part 15:2017, §15.107 and §15.109, Class A

For
Paxton Access Ltd

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

Test Authorized by:
Paxton Access Ltd
Paxton House
Home Farm Road
Brighton E. SUSX BN1 9HU, United Kingdom

Prepared by: Richard Blonigen

Reviewed by: Norman Shpilsher

Date of issue: March 28, 2018

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1.0 GENERAL DESCRIPTION

Model:	373-210-US
Type of EUT:	PROXIMITY P75 compact reader
Intertek ID:	MIN1802270955-011
FCC ID:	USE323110
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
Phone:	+44 (0)1273 811044
e-mail:	Walter.Riche@paxton.co.uk
Test Standards:	☒ 47 CFR, Part 15:2018, §15.207 &15.209, §15.215 ☒ 47 CFR, Part 15:2018, §15.107 and §15.109, Class B
Type of radio:	☒ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	February 28, 2018
Test Work Started:	March 1, 2018
Test Work Completed:	March 13, 2018
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	125kHz Transmitter
Operating Frequency	125kHz
Modulation:	ASK
Antenna(s) Info:	Integral antenna
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter Power Configuration:	☐ Internal battery ☒ External power source ☒ 12 VDC from PS ☐ 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)
☐ -

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(μV/m)
RA = Receiver Amplitude in dB(μV)
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(μV) 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(μV/m).

RA = 48.1 dB(μV)
AF = 7.4 dB(m^{-1})
CF = 1.6 dB
AG = 16.0 dB
FS = RA + AF + CF - AG
FS = 48.1 + 7.4 + 1.6 – 16.0
FS = 41.1 dB(μV/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
15.215(c)	Bandwidth of the emission	Pass
15.207	Transmitter Power Line conducted emissions	Pass
15.109	Digital device radiated emissions	Pass
15.107	Digital device conducted emissions	Pass

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: 41.3dB below the limits

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

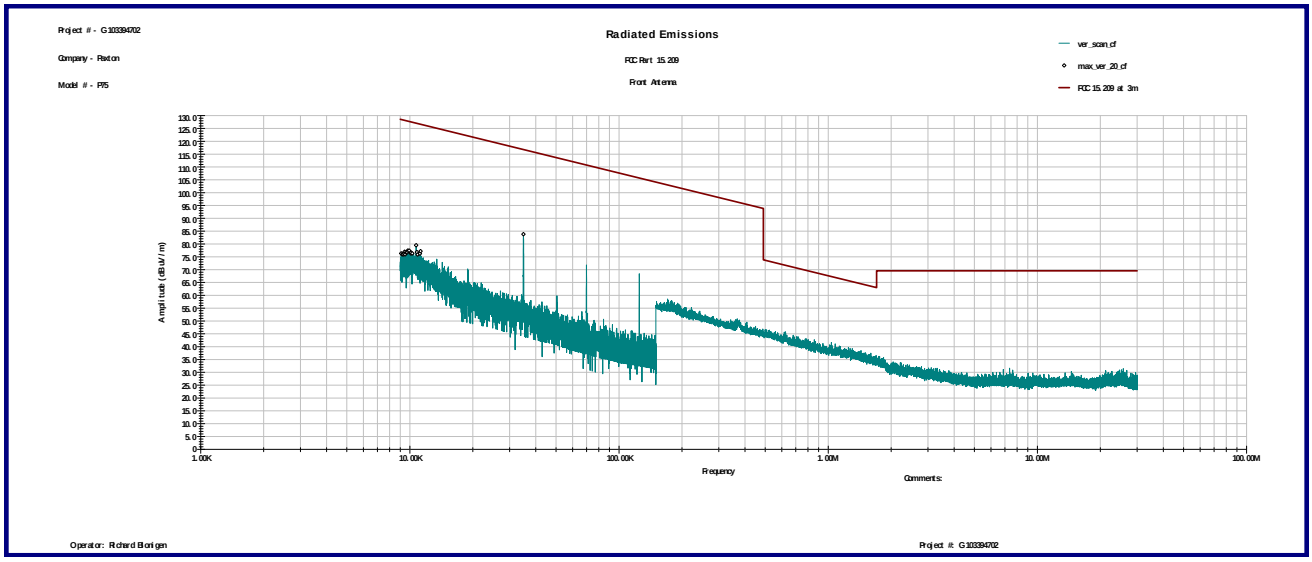
Date:	March 7, 2018	**Result: Pass**
Tested by:	Richard Blonigen	
Standard:	FCC 15.209	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 38%(RH); 98kPa	
Equipment Verification:	☒	
Note:	Frequency Range:9kHz – 30MHz	

Table 3.1.1

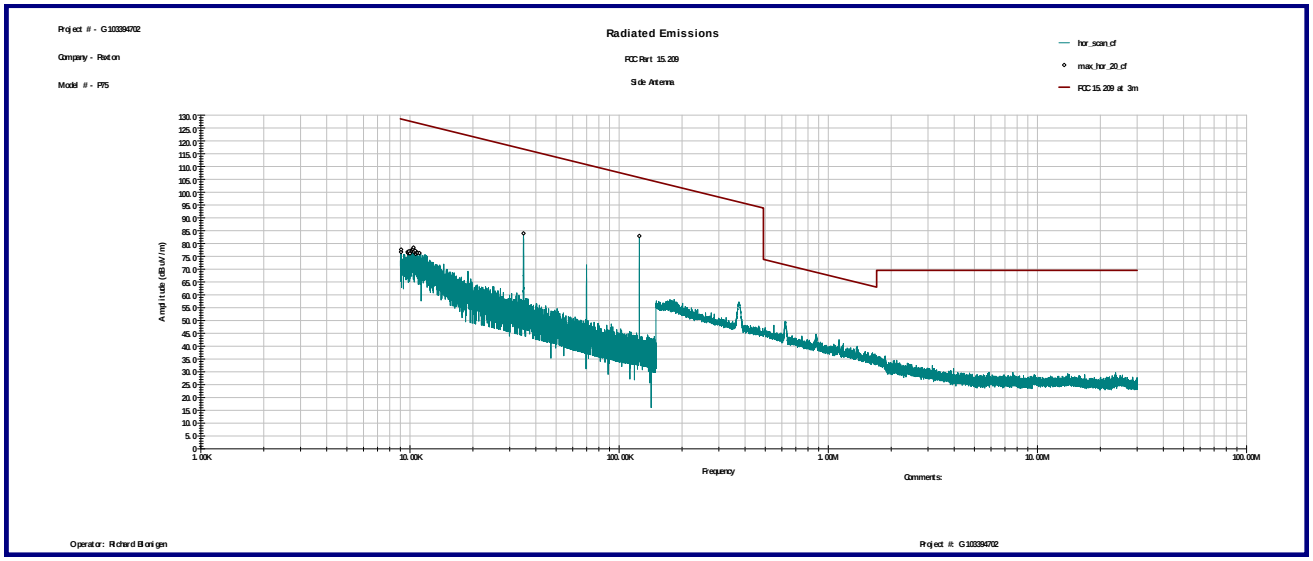
Frequency MHz	Antenna Orient.	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dBµV	Total @ 3m dBµV/m	15.209 Limit dBµV/m	Distance Factor (dB)	Margin dB	Comments
0.035	Front	75.1	0.0	28.8	8.8	55.1	36.7	80.0	-61.6	
0.070	Front	68.2	0.1	28.8	8.3	47.8	30.7	80.0	-62.9	
0.125	Front	63.5	0.1	28.8	10.2	45.0	25.7	80.0	-60.7	
0.035	Side	75.1	0.0	28.8	9.0	55.3	36.7	80.0	-61.4	
0.070	Side	68.2	0.1	28.8	8.2	47.7	30.7	80.0	-63.0	
0.125	Side	63.5	0.1	28.8	19.5	54.3	25.7	80.0	-51.4	
0.373	Side	54.2	0.1	28.7	10.6	36.2	16.2	80.0	-60.0	
0.627	Side	49.7	0.1	28.7	9.2	30.4	31.7	40.0	-41.3	

Graph 3.1.1

Front antenna orientation

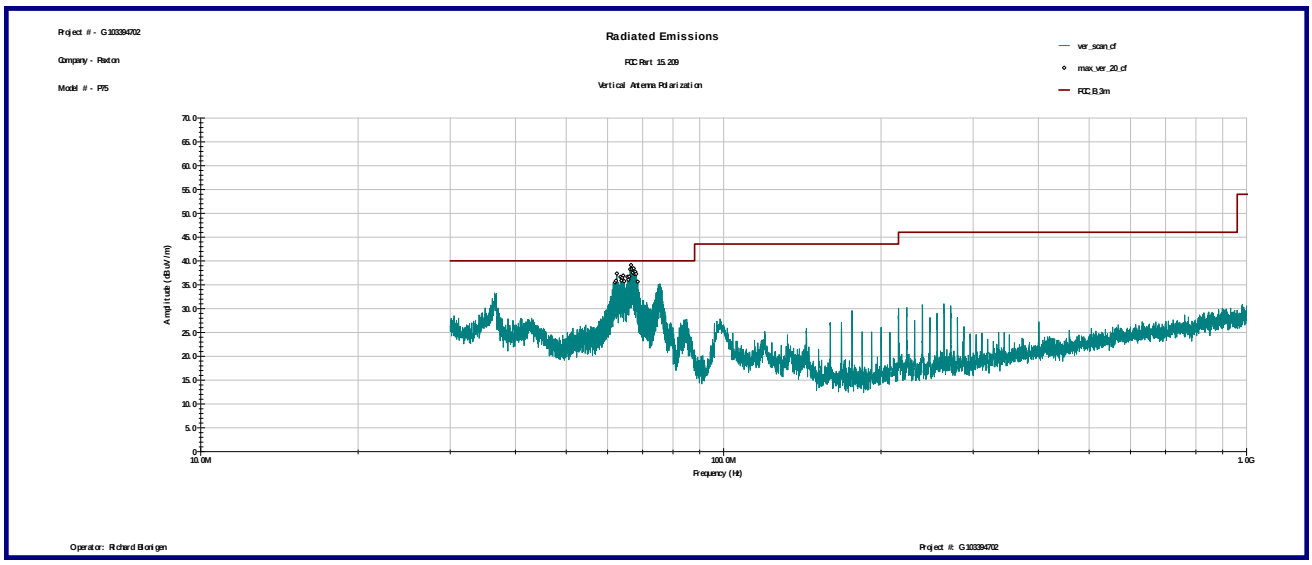


Side antenna orientation

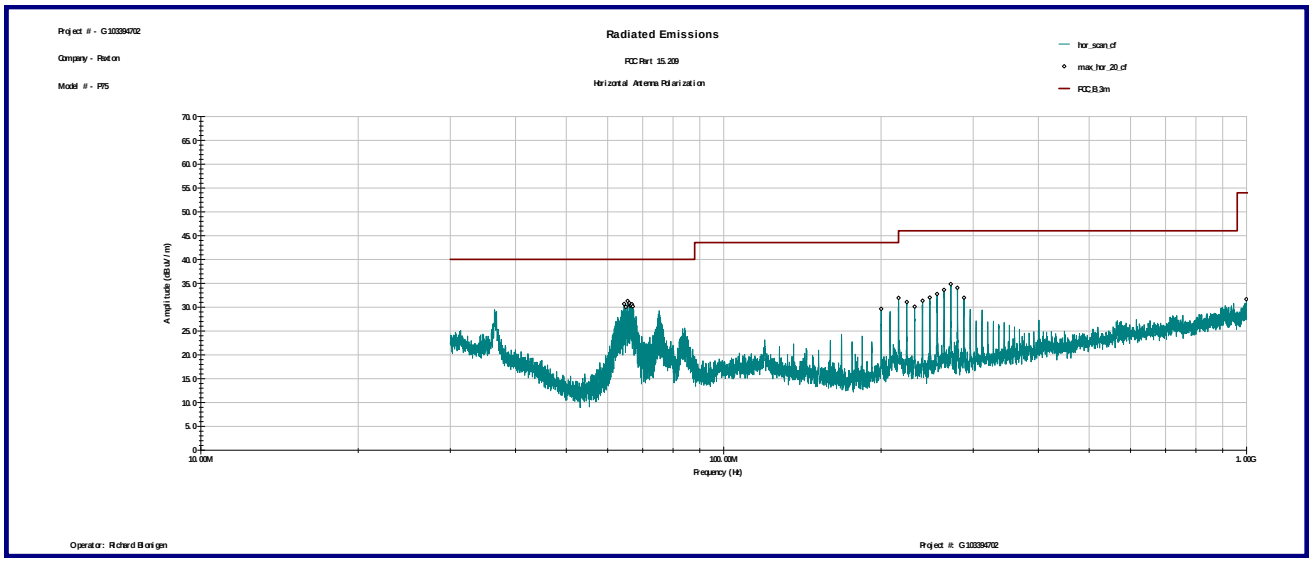


Graph 3.1.2

Vertical antenna polarization



Horizontal antenna polarization



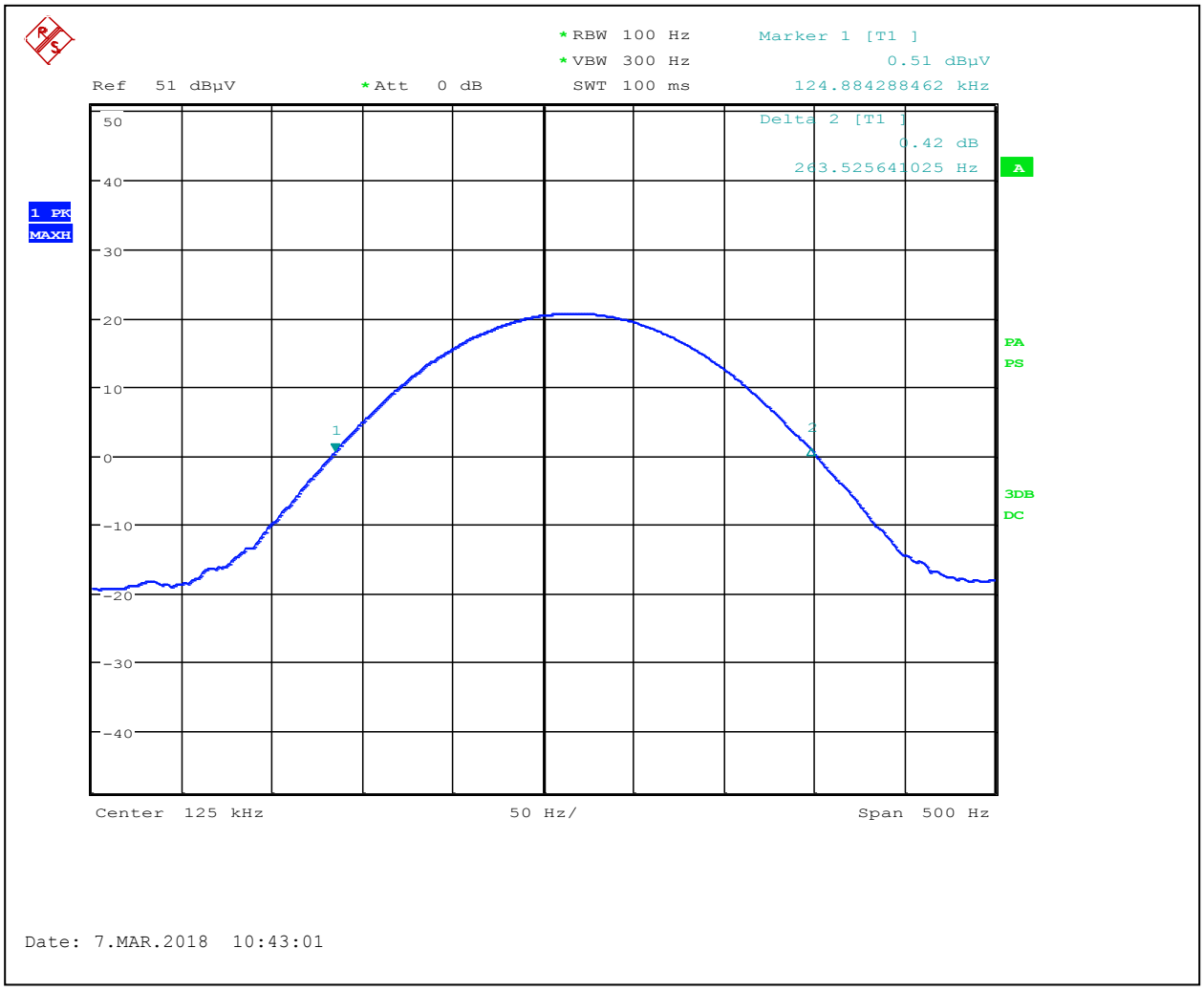
3.2 Bandwidth of Emissions

Center Frequency of operation MHz	Measured 20dB bandwidth kHz	Measured 99% bandwidth kHz	Result
0.125	0.263	0.222	**Pass**
RBW: **VBW:**	☐ 10kHz ☐ 100kHz ☒ other 1kHz ☐ 30kHz ☐ 300kHz ☒ other 1kHz		

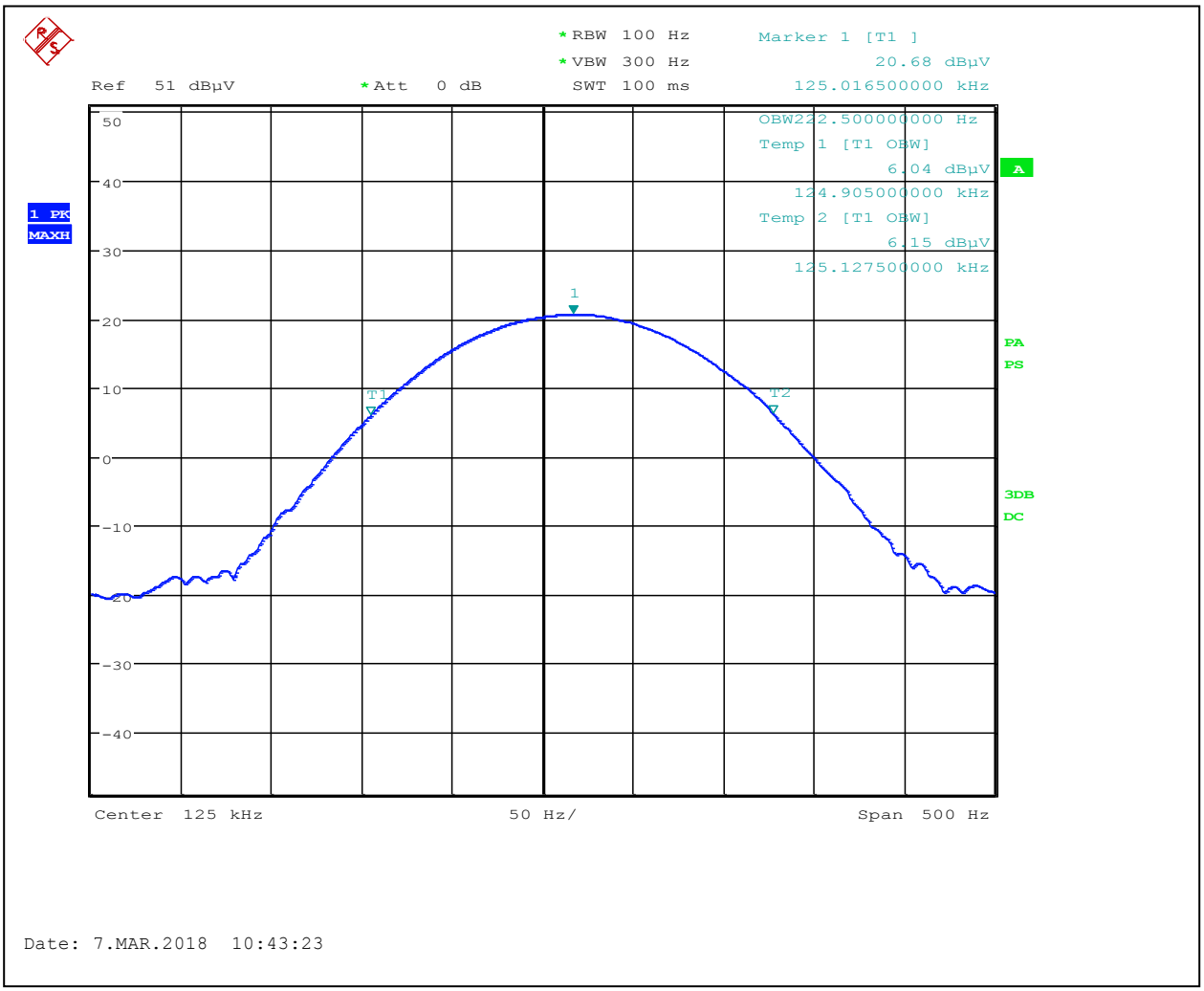
Graphs 3-3-1 and 3-3-2 show bandwidth of emissions

Notes: None

Graph 3.2.1


*RBW 100 Hz
*VBW 300 Hz
Ref 51 dBµV
*Att 0 dB
SWT 100 ms
Marker 1 [T1]
0.51 dBµV
124.884288462 kHz
Delta 2 [T1]
0.42 dB
263.525641025 Hz
1 PK
MAXH
A
PA
PS
3DB
DC
50
40
30
20
10
0
-10
-20
-30
-40
Center 125 kHz
50 Hz/
Span 500 Hz
Date: 7.MAR.2018 10:43:01

Graph 3.2.2


*RBW 100 Hz
*VBW 300 Hz
Ref 51 dBµV
*Att 0 dB
SWT 100 ms
Marker 1 [T1]
20.68 dBµV
125.016500000 kHz
OBW222.500000000 Hz
Temp 1 [T1 OBW]
6.04 dBµV
124.905000000 kHz
Temp 2 [T1 OBW]
6.15 dBµV
125.127500000 kHz
1 PK
MAXH
A
PA
PS
3DB
DC
50
40
30
20
10
0
-10
-20
-30
-40
T1
T2
Center 125 kHz
50 Hz/
Span 500 Hz
Date: 7.MAR.2018 10:43:23

3.3 Transmitter power line conducted emissions

Test location:	☐ OATS ☒ Anechoic Chamber ☐ Other
Test result:	**Pass**
Frequency range:	0.15MHz-30MHz
Max. Emissions margin:	9.1 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:	☒	
Note:	None	

Table 3.3.1

Line 1

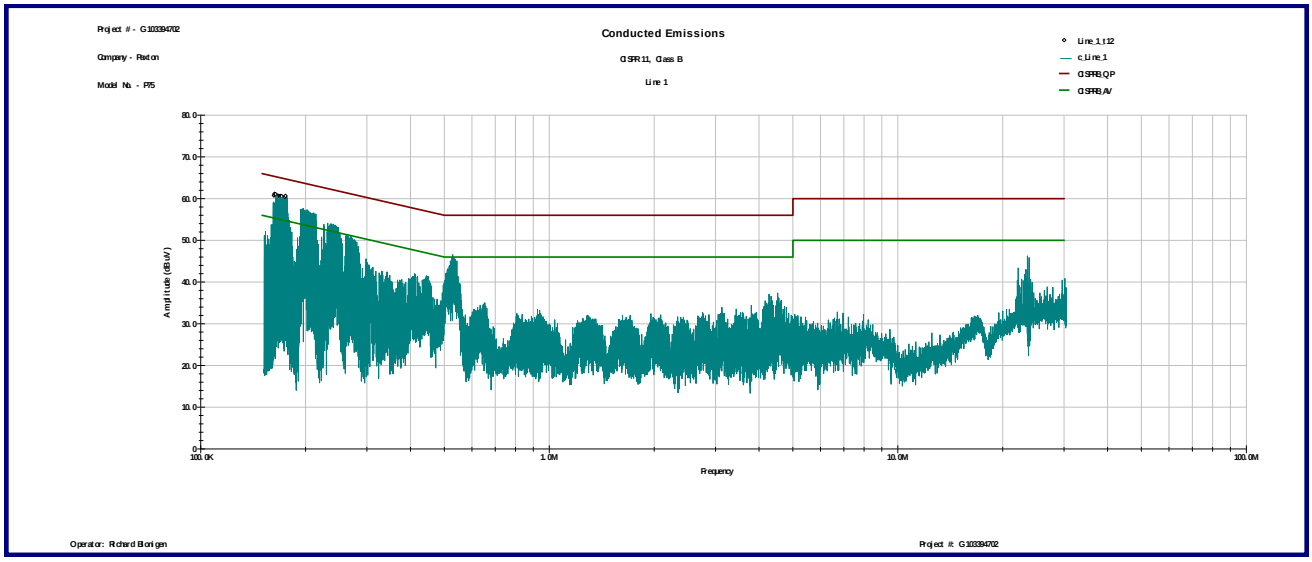
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.162	56.1	42.2	0.1	65.4	55.4	-9.2	-13.1
0.201	51.8	37.9	0.1	63.6	53.6	-11.7	-15.6
0.240	48.8	36.6	0.1	62.1	52.1	-13.2	-15.4
0.265	47.9	35.9	0.1	61.3	51.3	-13.3	-15.3
0.522	45.9	31.2	0.2	56.0	46.0	-9.9	-14.6
23.250	44.0	33.6	1.2	60.0	50.0	-14.8	-15.2

Line 2

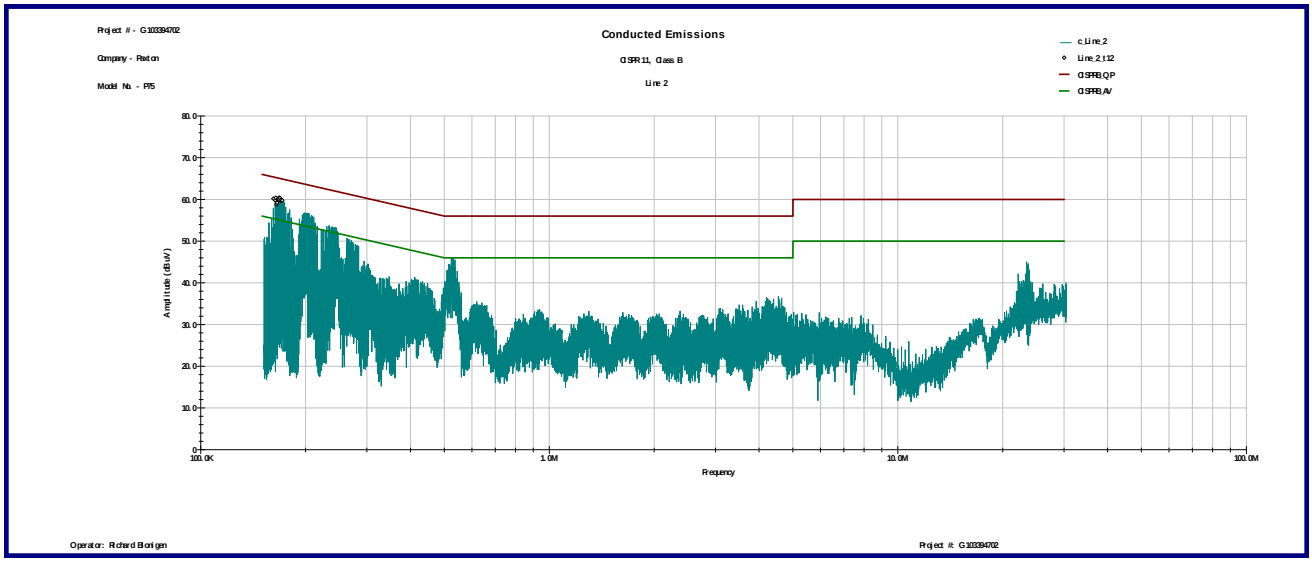
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.168	55.9	42.1	0.1	65.1	55.1	-9.1	-12.9
0.200	51.7	37.6	0.1	63.6	53.6	-11.8	-15.9
0.241	48.9	36.8	0.1	62.1	52.1	-13.1	-15.2
0.270	48.1	35.9	0.1	61.1	51.1	-12.9	-15.1
0.523	45.5	31.6	0.2	56.0	46.0	-10.3	-14.2
23.509	43.2	33.7	1.2	60.0	50.0	-15.6	-15.1

Graph 3.3.1

Line 1



Line 2



3.4 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: 2.0 dB below the limits

Notes: None

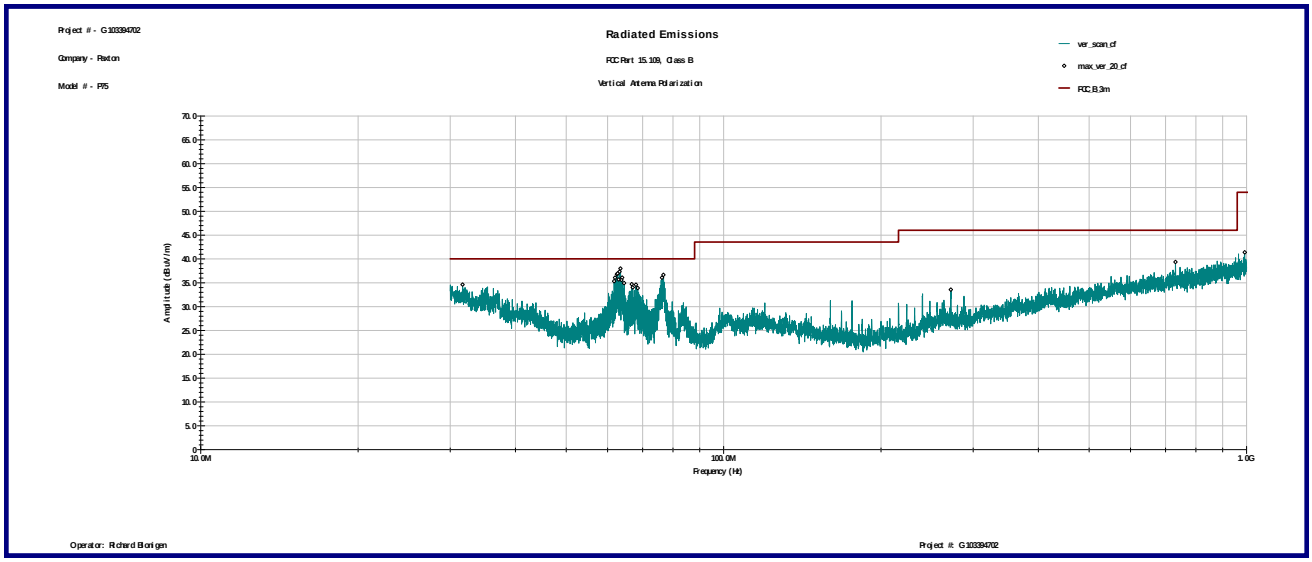
Date:	March 7, 2017	**Result: Pass**
Tested by:	Richard Blonigen	
Standard:	FCC Part 15.109, Class B	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 38%(RH); 8kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.4.1

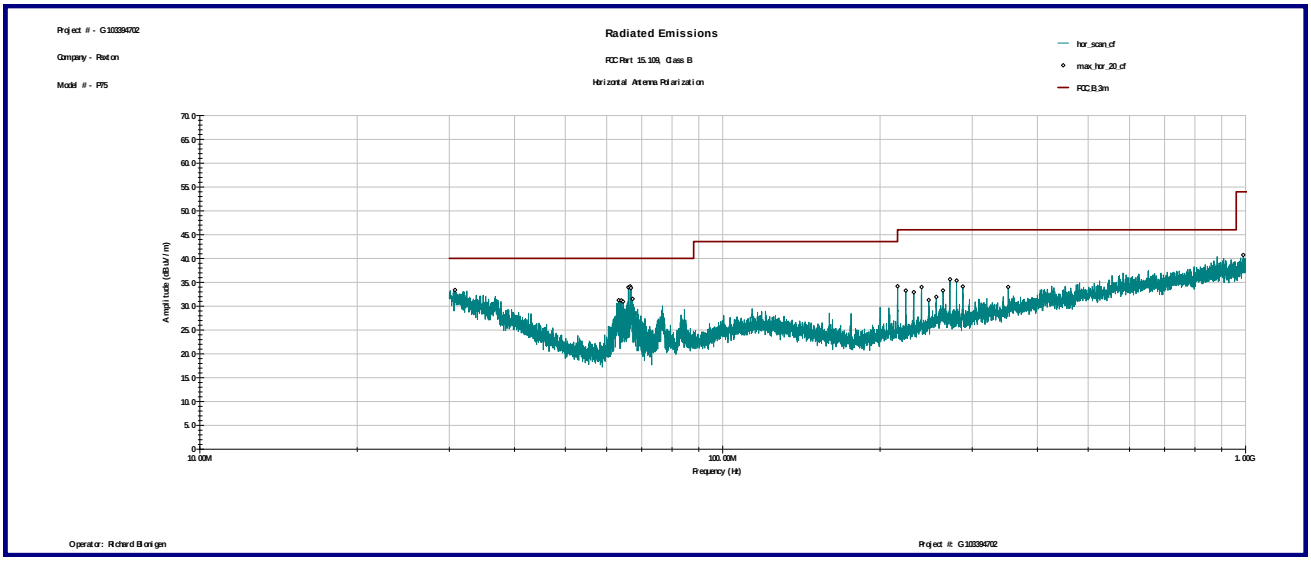
Frequency MHz	Antenna Polarity	Peak Reading dBµV	Total C.F. dB1/m	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
31.684 MHz	V	10.9	23.7	34.6	40.0	-5.4
61.758 MHz	V	24.1	11.3	35.3	40.0	-4.7
62.536 MHz	V	25.8	11.0	36.8	40.0	-3.2
63.259 MHz	V	26.6	10.7	37.3	40.0	-2.7
63.51 MHz	V	27.3	10.7	38.0	40.0	-2.0
64.511 MHz	V	24.2	10.8	34.9	40.0	-5.1
66.736 MHz	V	23.9	10.8	34.7	40.0	-5.3
67.014 MHz	V	23.2	10.8	34.0	40.0	-6.0
271.99 MHz	V	14.6	18.9	33.6	46.0	-12.5
731.32 MHz	V	12.6	26.7	39.4	46.0	-6.7
992.11 MHz	V	11.9	29.5	41.4	54.0	-12.6
30.772 MHz	H	9.4	24.0	33.4	40.0	-6.6
63.287 MHz	H	20.5	10.7	31.2	40.0	-8.8
66.012 MHz	H	23.1	10.8	33.9	40.0	-6.1
66.541 MHz	H	23.4	10.8	34.2	40.0	-5.8
216.08 MHz	H	18.6	15.5	34.2	46.0	-11.9
224.05 MHz	H	17.3	16.0	33.3	46.0	-12.8
256.16 MHz	H	13.1	18.8	31.9	46.0	-14.1
263.91 MHz	H	13.7	19.6	33.3	46.0	-12.7
287.93 MHz	H	15.1	19.0	34.1	46.0	-11.9
351.59 MHz	H	13.1	20.9	34.0	46.0	-12.0
989.9 MHz	H	11.3	29.4	40.7	54.0	-13.3

Graph 3.4.1

Vertical antenna polarization



Horizontal antenna polarization



3.5 Digital device conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 9.5 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:	☒	
Note:	None	

Table 3.5.1

Line 1

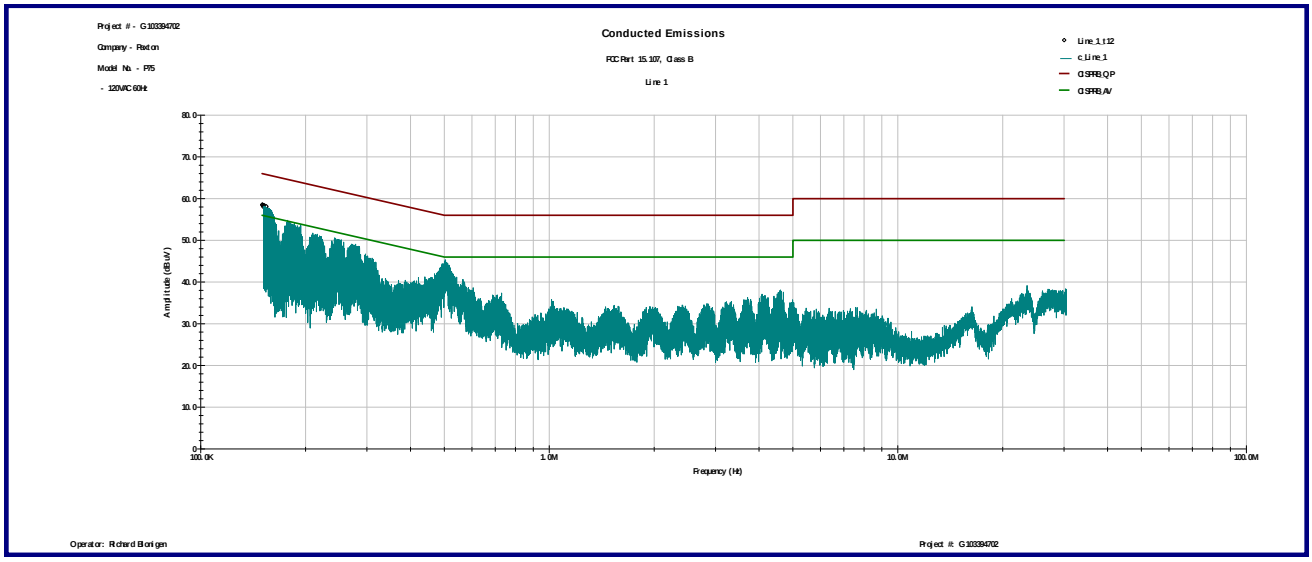
Frequency	QP dBµV	AVG dBµV	QP Limit dBµV	AVG Limit dBµV	QP Margin dB	AVG Margin dB
152.19 KHz	56.4	42.1	65.9	55.9	-9.5	-13.8
178.24 KHz	52.8	37.7	64.6	54.6	-11.8	-16.8
210.5 KHz	49.8	36.7	63.2	53.2	-13.4	-16.4
239.61 KHz	48.6	36.2	62.1	52.1	-13.5	-15.9
263.45 KHz	46.9	31.2	61.3	51.3	-14.4	-20.1
497.53 KHz	44.0	33.7	56.0	46.0	-12.1	-12.3

Line 2

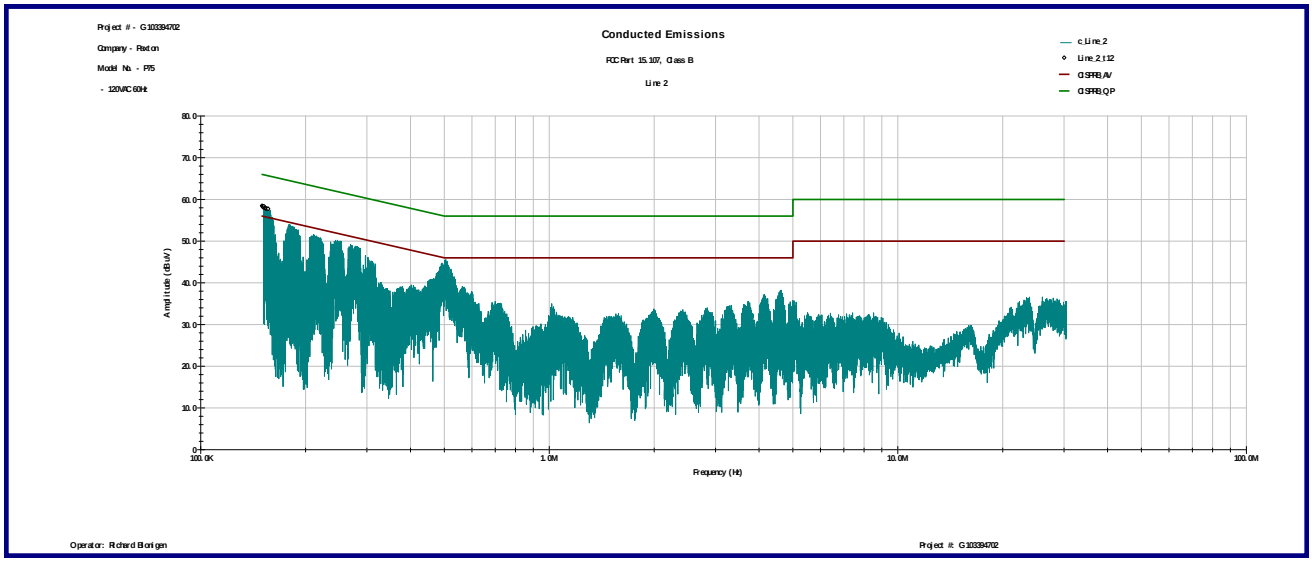
Frequency	QP dBµV	AVG dBµV	QP Limit dBµV	AVG Limit dBµV	QP Margin dB	AVG Margin dB
152.68 KHz	56.3	42.5	65.9	55.9	-9.6	-13.4
177.15 KHz	52.6	38.0	64.6	54.6	-12.0	-16.6
209.05 KHz	49.6	36.7	63.2	53.2	-13.6	-16.6
249.17 KHz	48.4	34.7	61.8	51.8	-13.4	-17.1
273.73 KHz	46.9	35.2	61.0	51.0	-14.2	-15.8
496.64 KHz	44.2	33.6	56.1	46.1	-11.8	-12.4

Graph 3.5.1

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	02/16/2018	02/16/2019	☒
Spectrum Analyzer	R & S	ESCI	100358	12909	10/30/2017	10/30/2018	☒
Bicono-Log Antenna	Teseq	CBL6112D	32859	25289	05/18/2017	05/18/2018	☒
Loop Antenna	ETS	6512	00060486	19942	01/12/2018	01/12/2019	☒
LISN	COM-Power	Li-215A	191970	172315	06/27/2017	06/27/2018	☒
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	3-28-2018	103394702MIN-001A	RB	NS	Original Issue