TEST REPORT

Report Number: 102982605MIN-005B
Project Number: G102982605

Testing performed on the
R1
(Electronic Wall Mounted Access Control Reader, BLE)
FCC ID: 2AK5B-R1
IC: 22134-R1

to
47 CFR, Part 15. 249:2017
RSS- 210, Issue 9, 2016
RSS-Gen, Issue 4, 2014
47 CFR, Part 15:2017, §15.107 and §15.109, Class B / ICES-003, Issue 6:2016

For
Latchable Inc.

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

Test Authorized by:
Latchable Inc.
450 West 33rd Street-12th Floor
New York, NY 10001 USA

Prepared by: _____
Uri Spector

Reviewed by: _____ Date of issue: May 3, 2017
Norman Shpilsher

TABLE OF CONTENTS

1.0 GENERAL DESCRIPTION

Model:	R1
Type of EUT:	Electronic Wall Mounted Access Control Reader, BLE
Serial Number:	2
FCC ID:	2AK5B-R1
IC:	22134-R1
Related Submittal(s) Grants:	This is composite device with the same ID under different section of FCC and ISED regulations.
Company:	Latchable Inc.
Customer:	Mr. Jim Griszbacher
Address:	450 West 33rd Street-12th Floor New York, NY 10001 USA
Phone:	(609) 922-3739
E-mail:	jim@latchaccess.com
Test Standards:	☒ 47 CFR, Part 15:2017, §15.249 ☒ RSS–210, Issue 9, 2016 ☒ 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:	April, 24, 2017
Test Work Started:	April, 24, 2017
Test Work Completed:	April 28, 2017
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	2.4 GHz Bluetooth BLE Transceiver
Permitted Band of Operation:	2400MHz to 2483.5MHz
Operating Frequency	2402MHz to 2480MHz
Modulation:	GFSK
Emission Designator:	1M74F1D
Antenna(s) Info:	Antenna Type: Chip antenna Gain: -1.0dBi
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter Power Configuration:	☐ Internal battery ☒ 120VAC via SL Power ME10A1203B01 AC Adapter ☐ 100-240VAC ☐ 230VAC ☐ 400VAC ☐ VDC ☐ Other: 0.2 Amp. ☐ 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 modulated
☒ - Continuous un-modulated
☐ - Test program (customer specific)
☒ - See below

Operating modes of the EUT:

No.	Description
1	Samples wired to provide continuous transmitting mode at low channel, middle channel and high channel or receiving/standby mode. The programming tools used to flash the firmware images was Segger J-Link (for BLE flashing) programmers.

Cables:

No.	Type	Length	Designation	Note
1	Ethernet cable	24cm	Unshielded CAT5	
2	Multi-conductor I/O cable	26cm	Unshielded, with DC power input, relay contacts, RS-485 communications interface, and additional inputs for peripheral devices	

Support equipment/Services:

No.	Item	Description
1	Apple Macbook Pro	Local PC (used for purpose of testing and set transmitter)
	AC wall adapter	SL Power ME10A1203B01 AC/DC Adapter
2	R & S RF Generator SMR20	RF Generator (to activate a receiver portion for FCC 15.109 testing)

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(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:

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. Emissions margin at fundamental: 2.0dB below the limits

Notes: The EUT was tested for worst case emissions.

Date:	April 24, 2017	**Result: Pass**
Tested by:	Uri Spector	
Standard:	FCC 15.249(a) / RSS-210 A2.9	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	24°C; 45%(RH); 98.7kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.1.1

Frequency	Antenna		Ant. CF	Cable loss	Pre-amp	Reading	Total @ 3m	Limit	Margin	Comments
MHz	Polarity	Hts(cm)	dB1/m	dB	Gain (dB)	dBµV	dBµV/m	dBµV/m	dB	
2402.32	V	264	28.2	2.9	0.0	57.0	88.1	94.0	-5.9	Peak
2402.32	H	368	28.2	2.9	0.0	56.0	87.1	94.0	-6.9	Peak
2440.41	V	253	28.3	2.9	0.0	57.8	89.0	94.0	-5.0	Peak
2440.41	H	347	28.3	2.9	0.0	57.9	89.1	94.0	-4.9	Peak
2480.44	V	253	28.4	2.9	0.0	60.7	92.0	94.0	-2.0	Peak
2480.44	H	109	28.4	2.9	0.0	59.1	90.4	94.0	-3.6	Peak

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: 8.7dB below the limits

Max. margin of bandedge compliance: 1.1dB below the limits

Notes:

1. The EUT was tested for worst case emissions.
2. Fundamental transmitting frequency was excluded from the table.
3. No harmonics and spurious emissions were detected above the 2nd harmonic.

Date:	April 24, 2017 and April 25, 2017	**Result: Pass**
Tested by:	Uri Spector	
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	24°C; 45%(RH); 98.7kPa	
Equipment Verification:	☒	
Note:	30MHz-1GHz	

Table 3.2.1

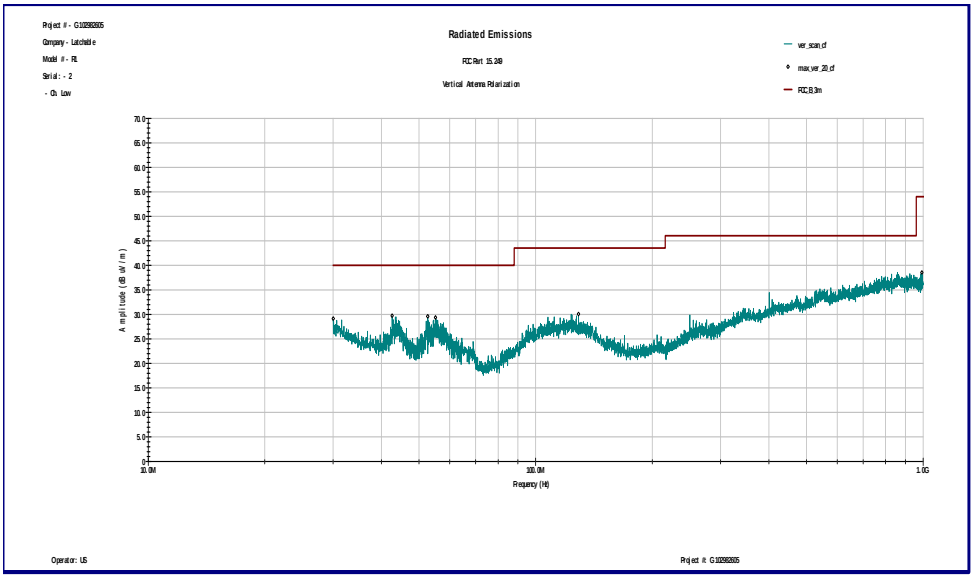
Frequency MHz	Antenna Polarity	Peak Reading dBµV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
Ch. 2402MHz							
30.035 MHz	V	7.6	21.6	0.0	29.1	40.0	-10.9
42.606 MHz	V	15.2	14.6	0.0	29.7	40.0	-10.3
52.65 MHz	V	18.1	11.5	0.0	29.6	40.0	-10.4
55.144 MHz	V	18.2	11.1	0.0	29.4	40.0	-10.6
129.03 MHz	V	12.8	17.3	0.0	30.1	43.5	-13.5
30.208 MHz	H	7.9	23.3	0.0	31.2	40.0	-8.8
122.09 MHz	H	13.3	16.6	0.0	29.9	43.5	-13.6
Ch. 2440MHz							
30.104 MHz	V	7.3	21.5	0.0	28.8	40.0	-11.2
43.057 MHz	V	15.2	14.4	0.0	29.6	40.0	-10.4
50.018 MHz	V	15.0	12.0	0.0	27.0	40.0	-13.0
52.581 MHz	V	17.6	11.6	0.0	29.1	40.0	-10.9
54.936 MHz	V	18.4	11.1	0.0	29.5	40.0	-10.5
66.125 MHz	V	16.0	10.0	0.0	26.0	40.0	-14.0
133.58 MHz	V	12.9	17.2	0.0	30.1	43.5	-13.4
31.316 MHz	H	8.7	22.6	0.0	31.3	40.0	-8.7
119.47 MHz	H	12.4	16.6	0.0	29.0	43.5	-14.5
250.17 MHz	H	13.9	17.2	0.0	31.0	46.0	-15.0
Ch. 2480MHz							
30.139 MHz	V	8.1	21.5	0.0	29.6	40.0	-10.4
43.264 MHz	V	14.3	14.3	0.0	28.6	40.0	-11.4
45.135 MHz	V	14.4	13.4	0.0	27.9	40.0	-12.1
51.923 MHz	V	16.5	11.7	0.0	28.2	40.0	-11.8
52.927 MHz	V	18.1	11.5	0.0	29.6	40.0	-10.4
64.857 MHz	V	14.6	10.1	0.0	24.7	40.0	-15.3
121.86 MHz	V	12.7	17.5	0.0	30.2	43.5	-13.3
30.831 MHz	H	8.4	22.9	0.0	31.3	40.0	-8.7
134.47 MHz	H	12.4	16.4	0.0	28.8	43.5	-14.7
250.01 MHz	H	16.0	17.1	0.0	33.1	46.0	-12.9

Date:	March 2, 2017	**Result: Pass**
Tested by:	Uri Spector	
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; 39%(RH); 96.7kPa	
Equipment Verification:	☒	
Note:	1GHz-25GHz	

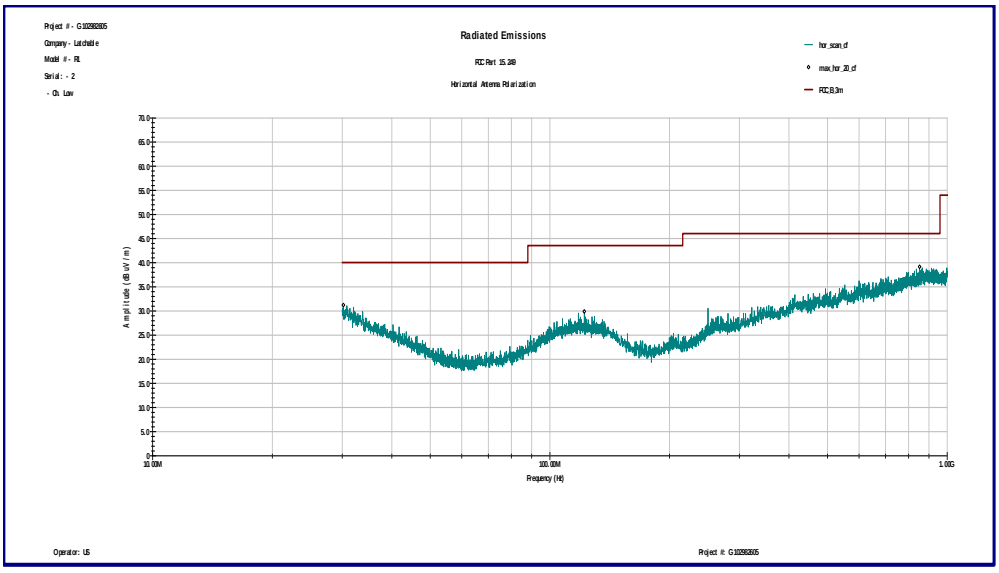
Table 3.2.3

Frequency	Antenna		Ant. CF	Cable loss	Pre-amp	Reading	AVG Value	Total @ 3m	Limit	Margin	Comments
MHz	Polarity	Hts(cm)	dB1/m	dB	Gain (dB)	dBµV	C.F. (dB)	dBµV/m	dBµV/m	dB	
2402MHz											
2325.20	V	184	28.0	2.8	0.0	30.1	0.0	60.9	74.0	-13.1	Peak
2325.20	V	184	28.0	2.8	0.0	30.1	33.7	27.2	54.0	-26.8	AVG Value
4804.84	V	235	32.9	4.1	39.2	62.9	0.0	60.7	74.0	-13.3	Peak
4804.84	H	239	32.9	4.1	39.2	61.1	0.0	58.9	74.0	-15.1	Peak
4804.84	V	235	32.9	4.1	39.2	62.9	33.7	27.0	54.0	-27.0	AVG Value
4804.84	H	235	32.9	4.1	39.2	61.1	33.7	25.2	54.0	-28.8	AVG Value
2440MHz											
4880.04	V	259	33.0	4.1	39.1	58.2	0.0	56.1	74.0	-17.9	Peak
4880.04	H	269	33.0	4.1	39.1	58.7	0.0	56.6	74.0	-17.4	Peak
4880.04	V	259	33.0	4.1	39.1	58.2	33.7	22.4	54.0	-31.5	AVG Value
4880.04	H	269	33.0	4.1	39.1	58.7	33.7	22.9	54.0	-31.0	AVG Value
2480MHz											
4960.22	V	237	33.1	4.1	39.0	54.8	0.0	52.9	74.0	-21.1	Peak
4960.22	H	312	33.1	4.1	39.0	53.2	0.0	51.3	74.0	-22.7	Peak
4960.22	V	237	33.1	4.1	39.0	54.8	33.7	19.2	54.0	-34.7	AVG Value
4960.22	H	312	33.1	4.1	39.0	53.2	33.7	17.6	54.0	-36.3	AVG Value
Bandedge Compliance											
2390.00	V	164	28.1	2.9	0.0	21.7	0.0	52.7	54.0	-1.3	Peak
2390.00	H	109	28.1	2.9	0.0	19.0	0.0	50.0	54.0	-4.0	Peak
2483.50	V	204	28.4	2.9	0.0	21.6	0.0	52.9	54.0	-1.1	Peak
2483.50	H	156	28.4	2.9	0.0	18.8	0.0	50.1	54.0	-3.9	Peak

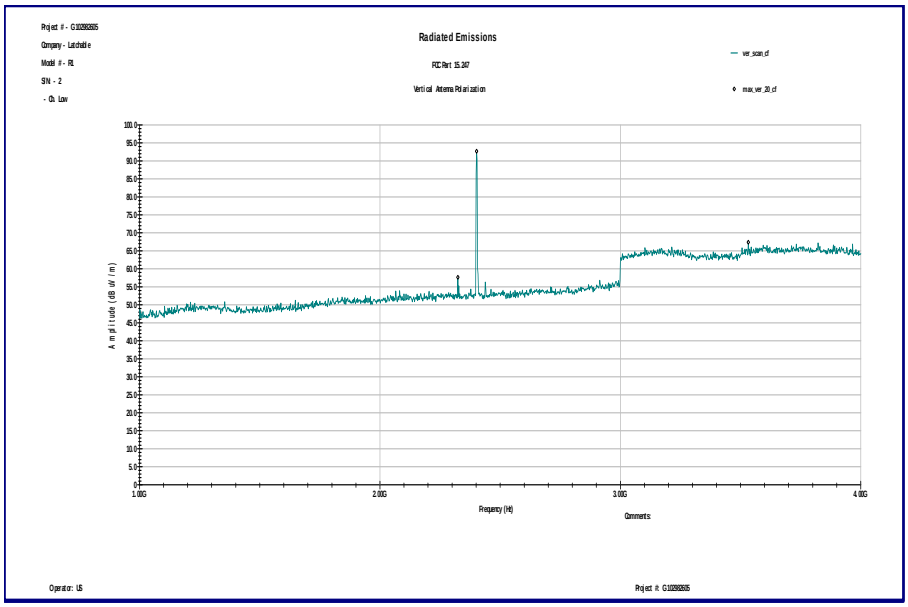
Graph 3.2.1 (Peak)



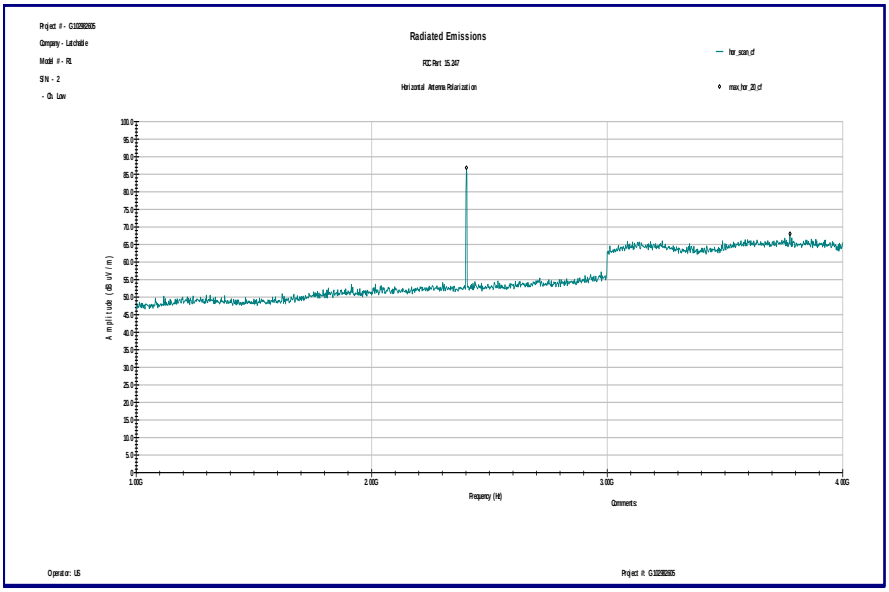
Graph 3.2.2 (Peak)



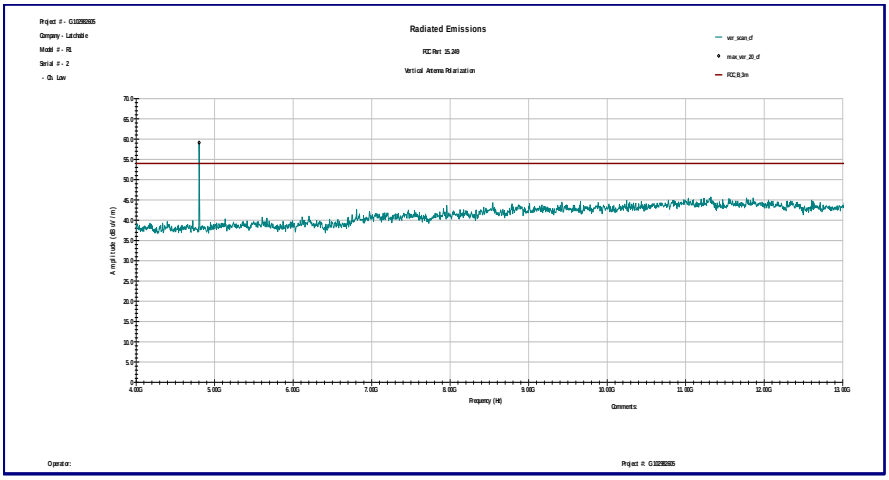
Graph 3.2.3 (Peak)



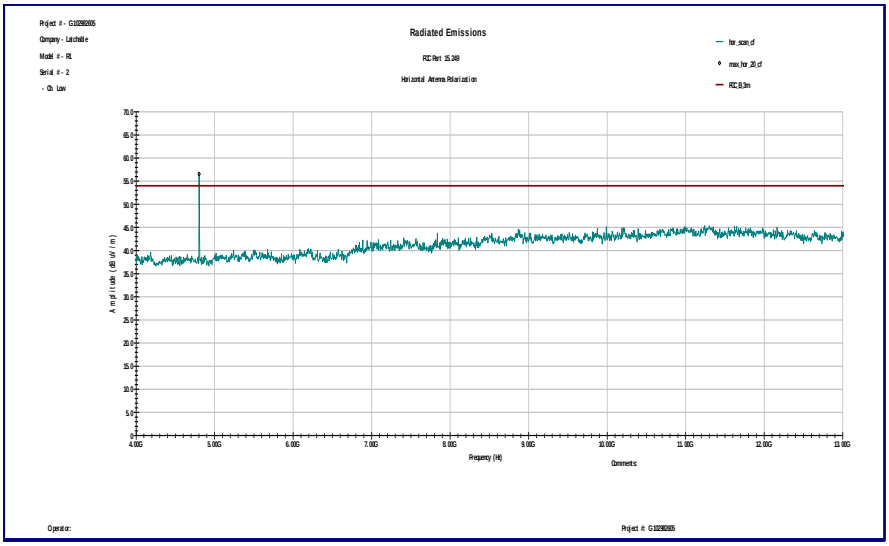
Graph 3.2.4 (Peak)



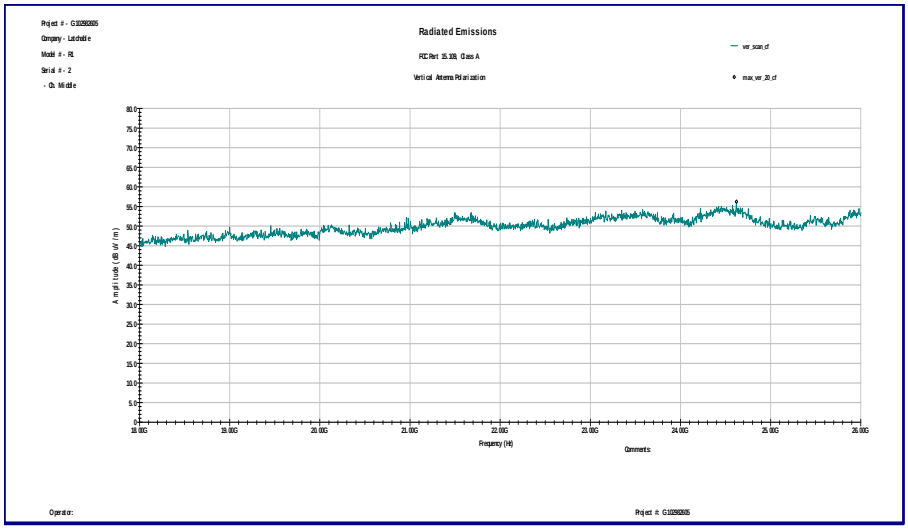
Graph 3.2.5 (Peak)



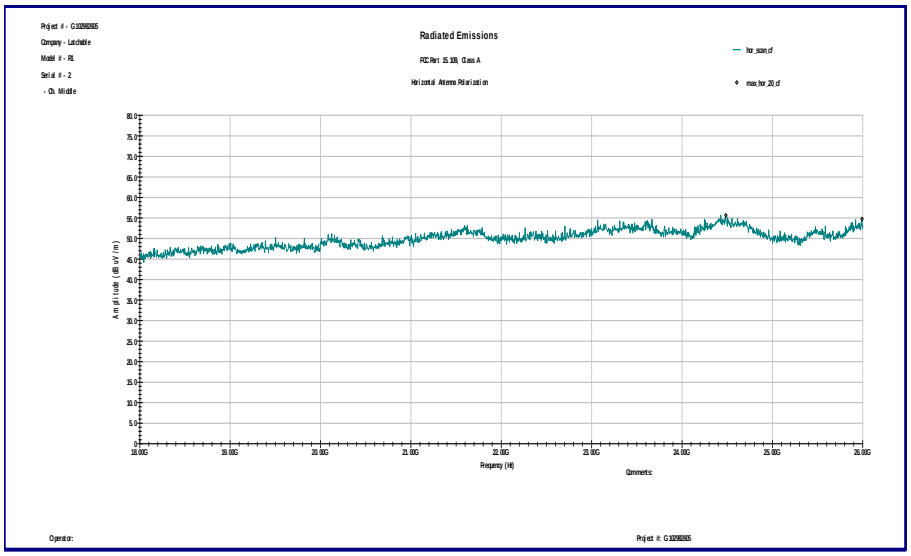
Graph 3.2.6 (Peak)



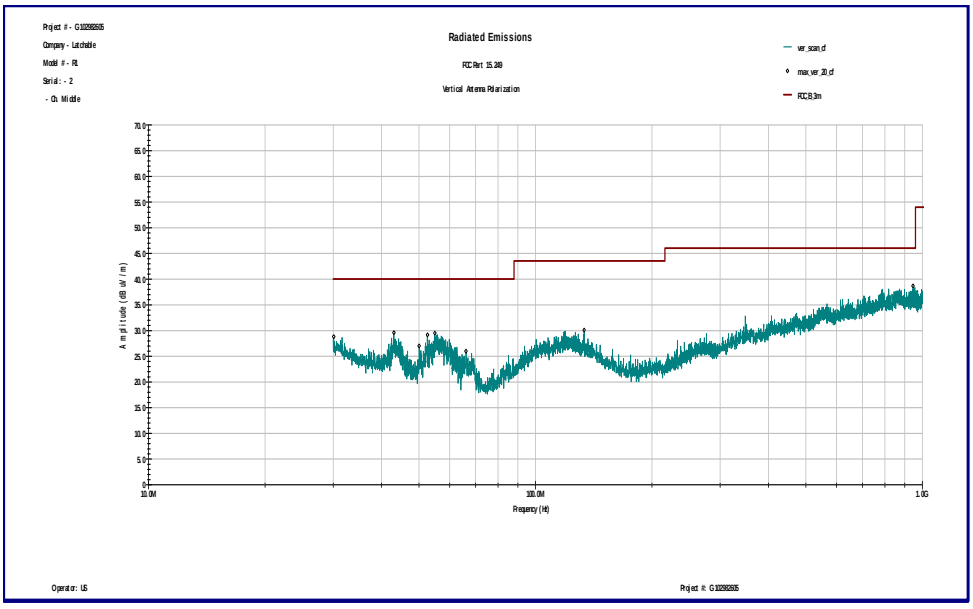
Graph 3.2.7 (Peak)



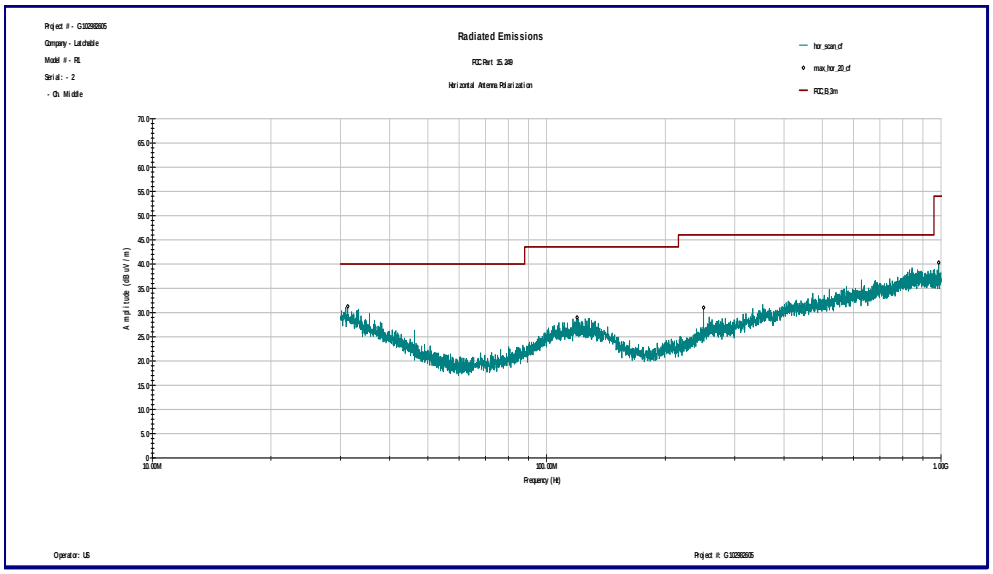
Graph 3.2.8 (Peak)



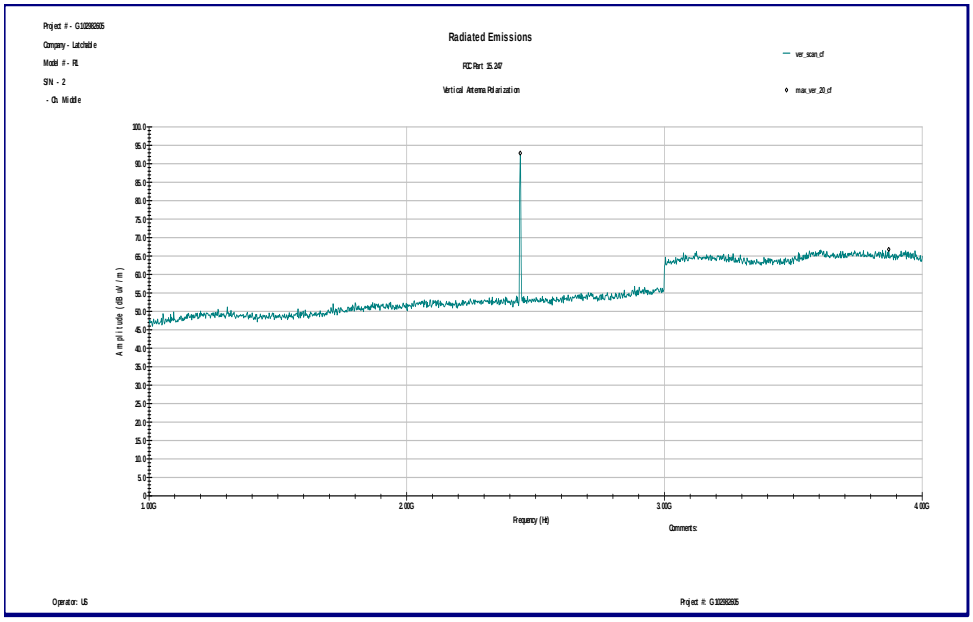
Graph 3.2.9 (Peak)



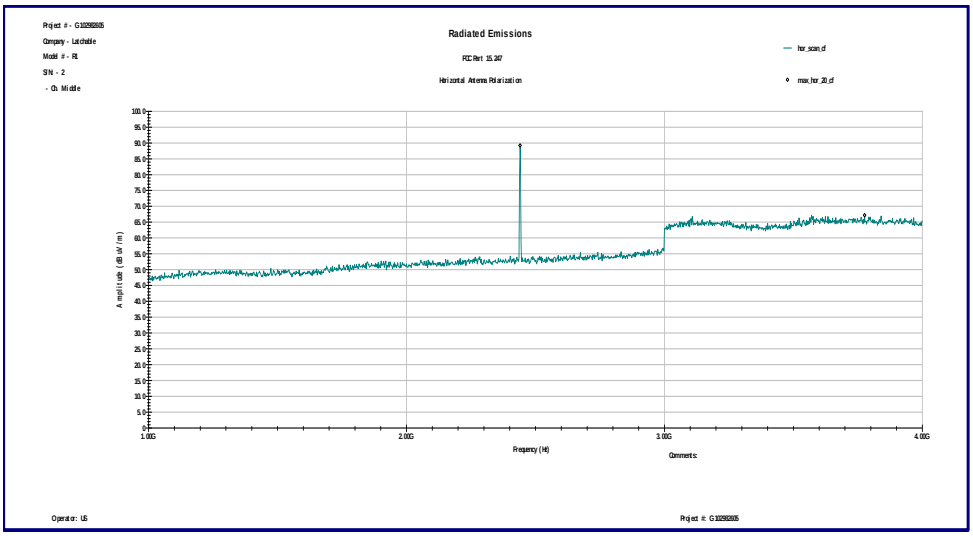
Graph 3.2.10 (Peak)



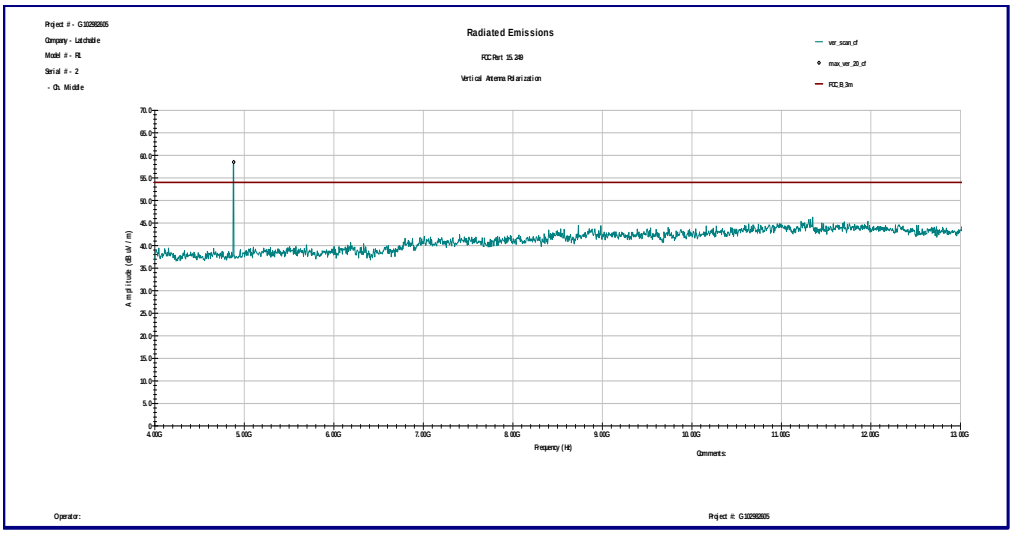
Graph 3.2.11 (Peak)



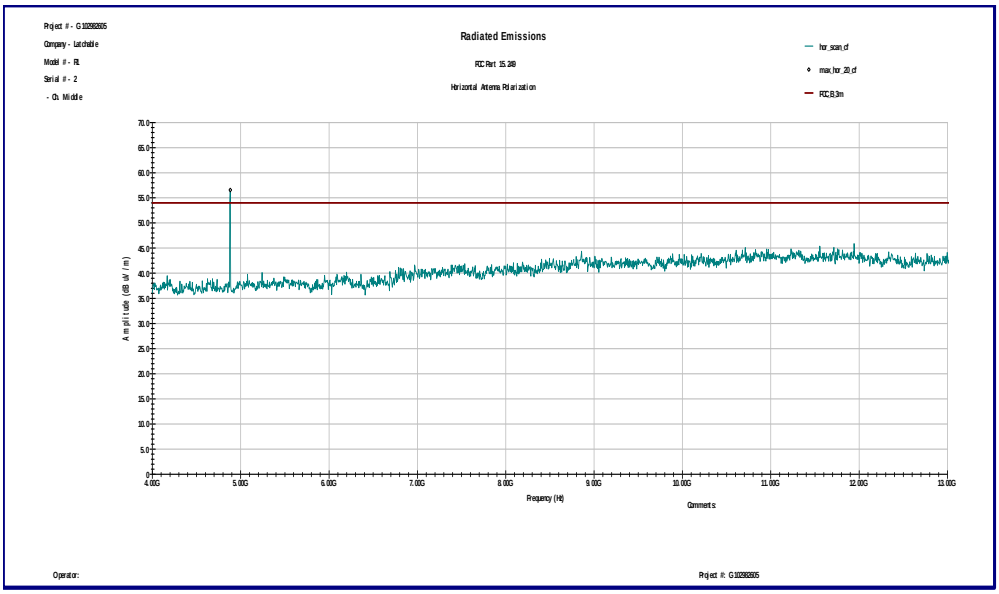
Graph 3.2.12 (Peak)



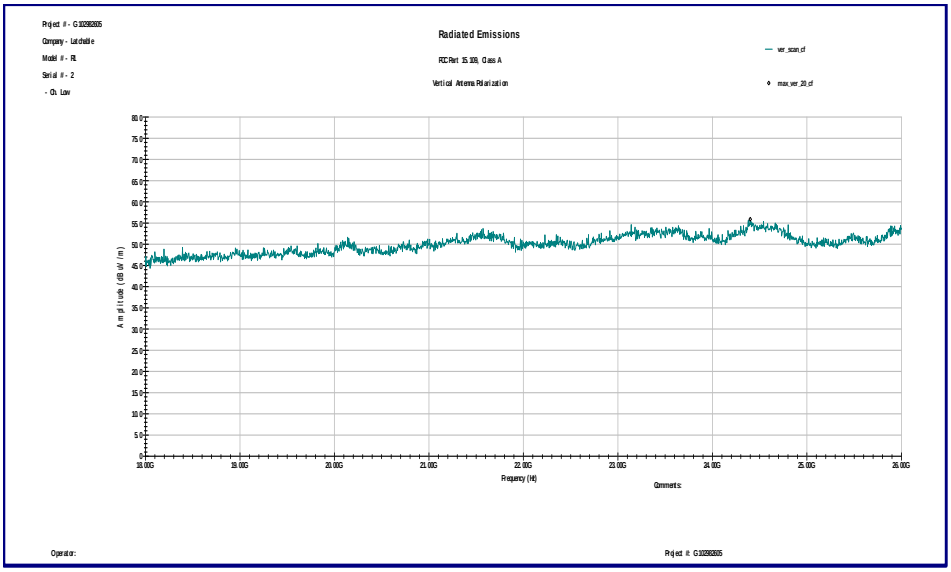
Graph 3.2.13 (Peak)



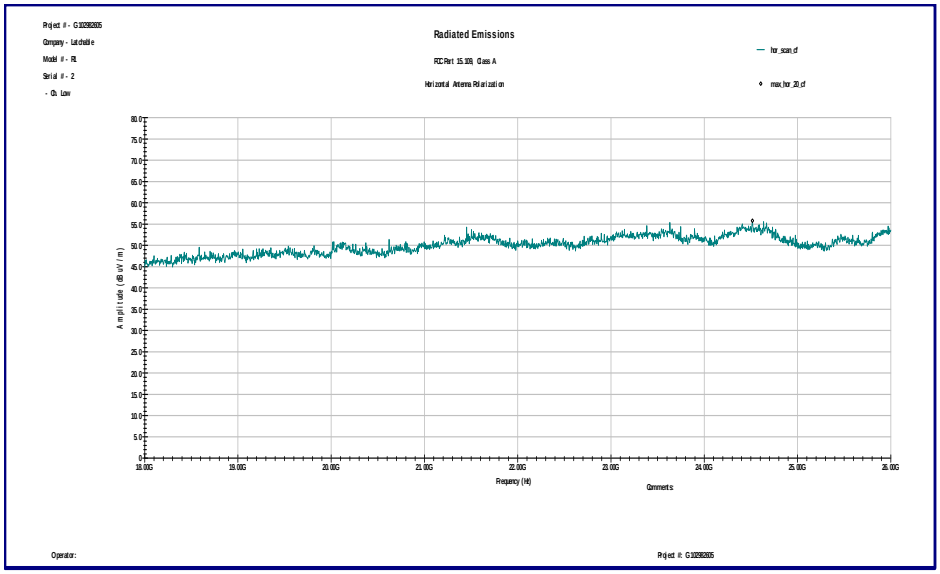
Graph 3.2.14 (Peak)



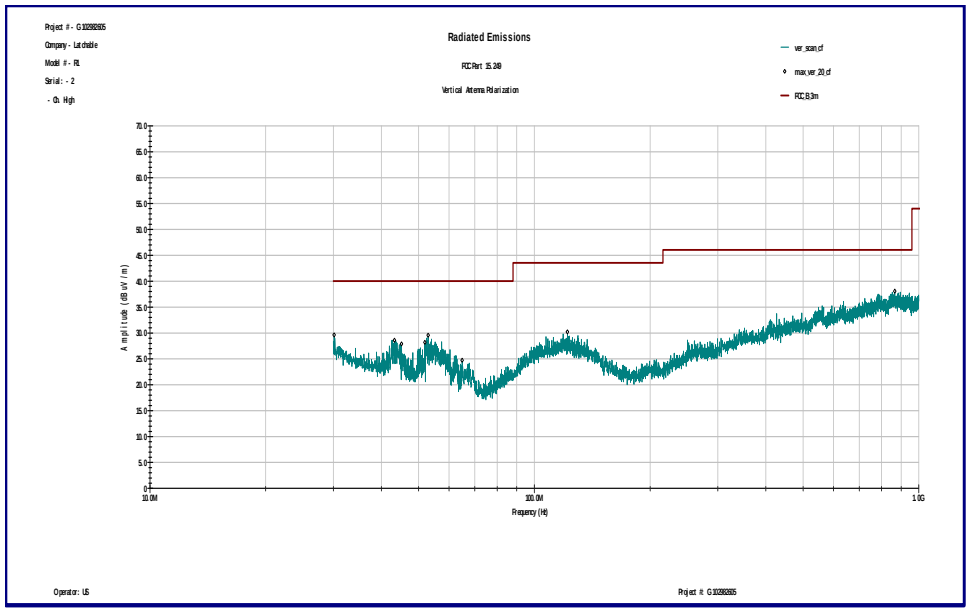
Graph 3.2.15 (Peak)



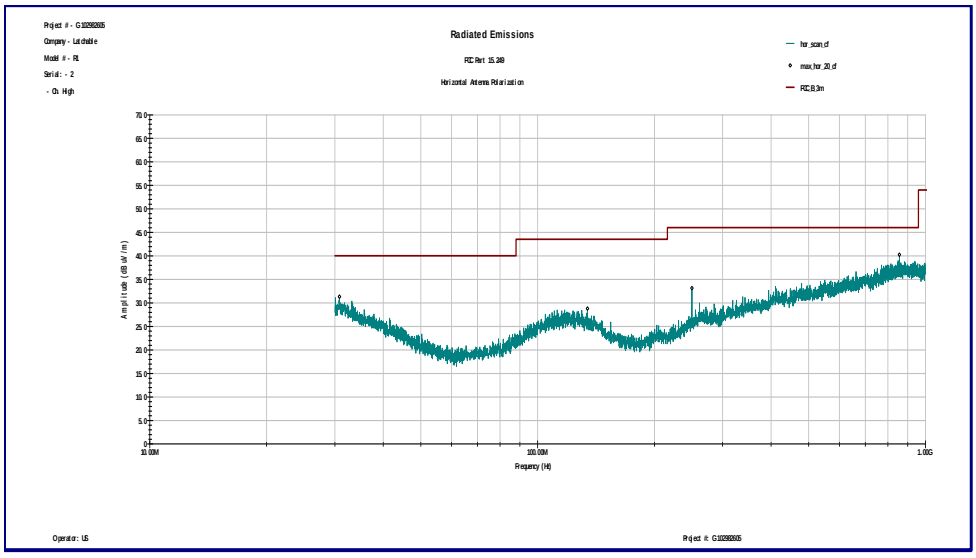
Graph 3.2.16 (Peak)



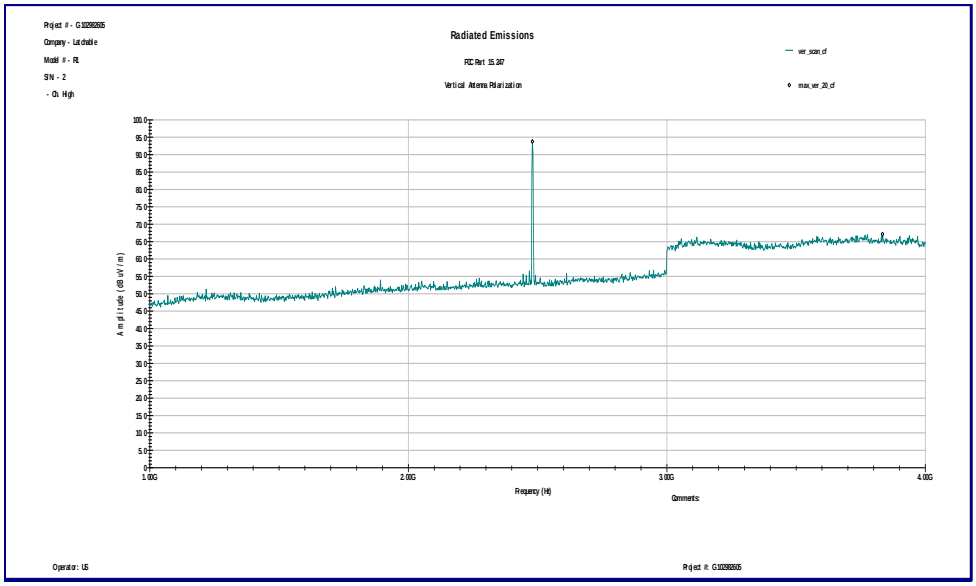
Graph 3.2.17 (Peak)



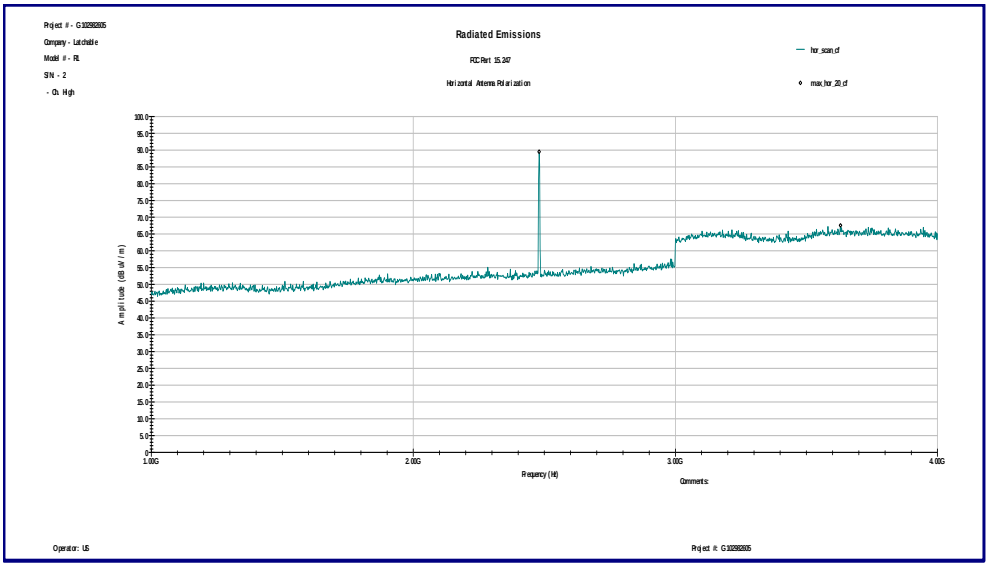
Graph 3.2.18 (Peak)



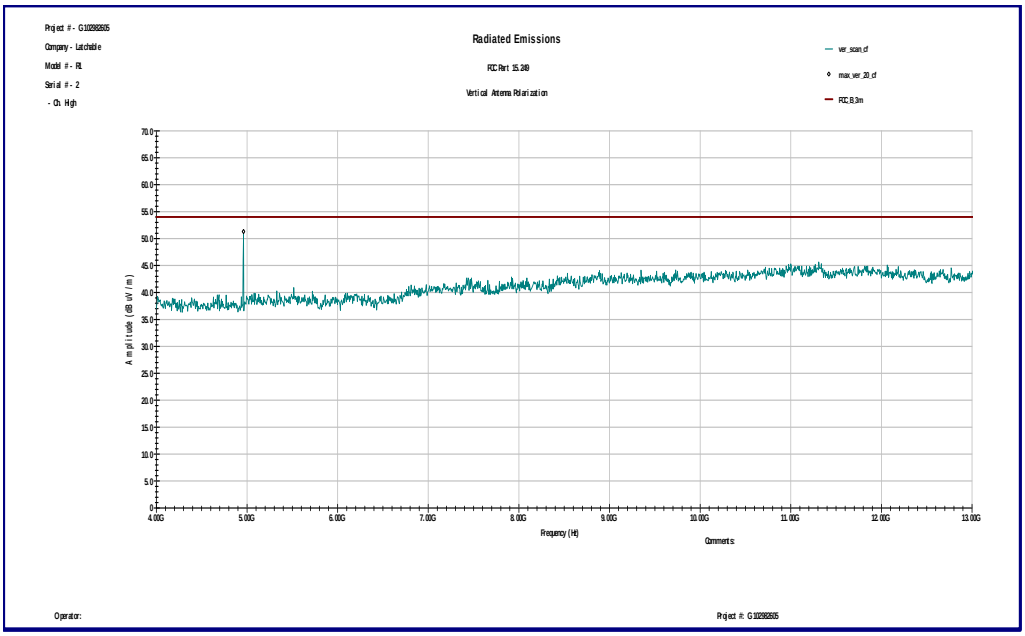
Graph 3.2.19 (Peak)



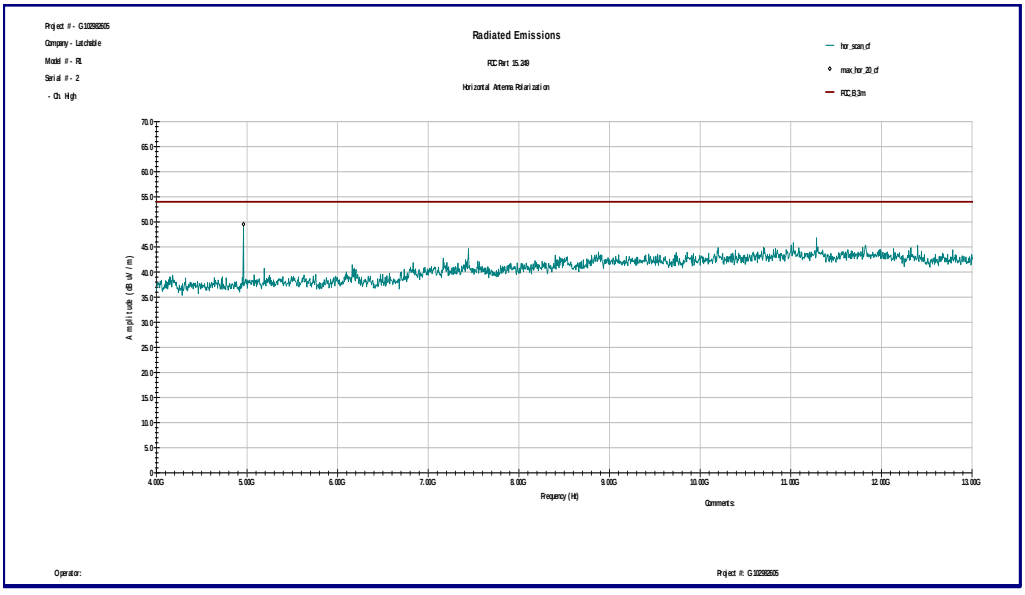
Graph 3.2.20 (Peak)



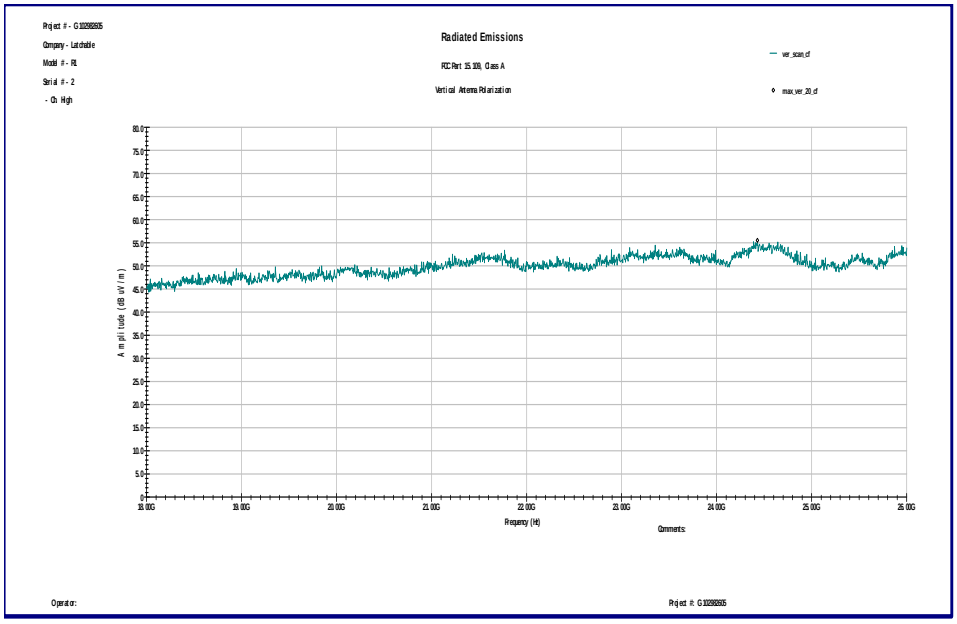
Graph 3.2.21 (Peak)



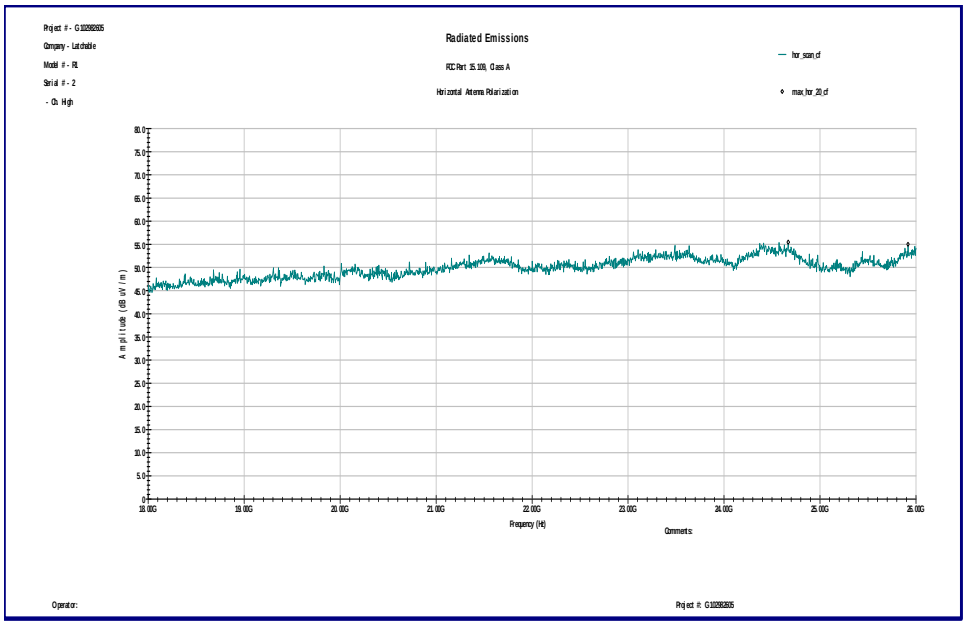
Graph 3.2.22 (Peak)



Graph 3.2.23 (Peak)



Graph 3.2.24 (Peak)



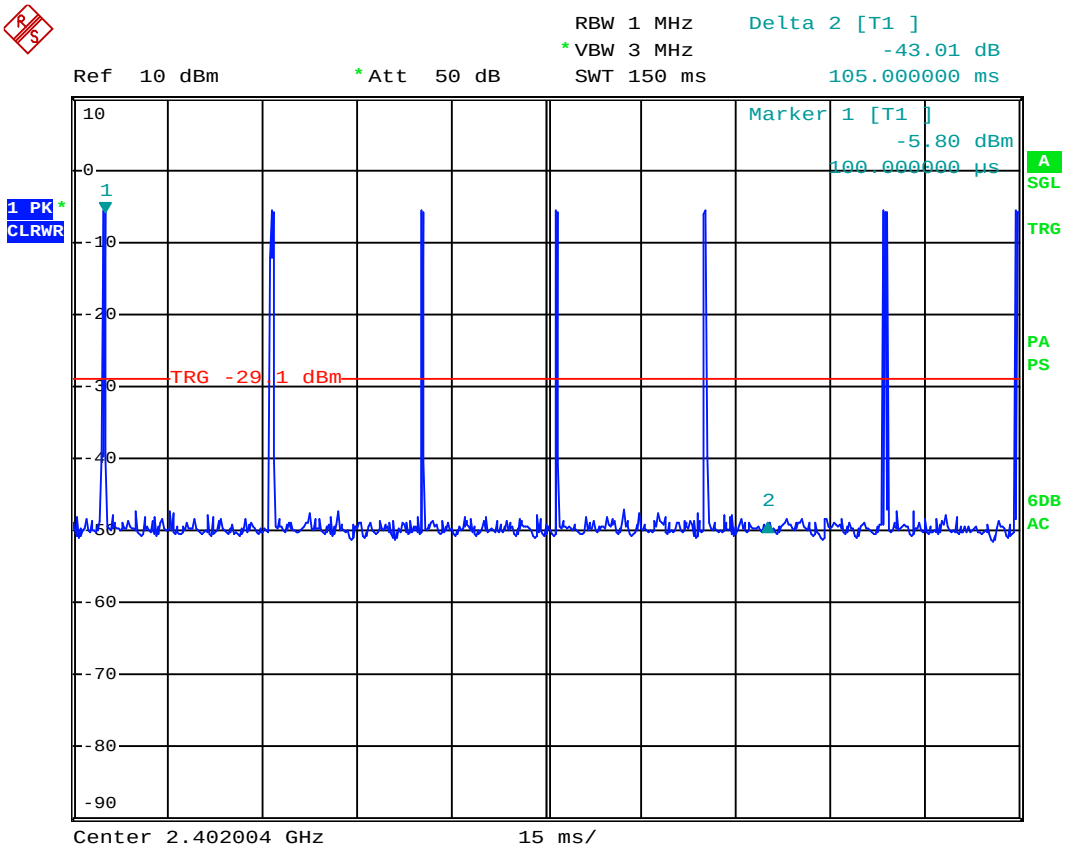
3.2.1 Average correction factor calculation

An Average correction factor is calculated by averaging one complete pulse train.

The pulse train exceeds 100ms. Therefore the measured field strength was determined during a 100ms interval. There are 5 pulses within 100ms.Time with field strength is in its maximum value (length of pulses) = 0.412ms (see Graph 3.2.1.2)

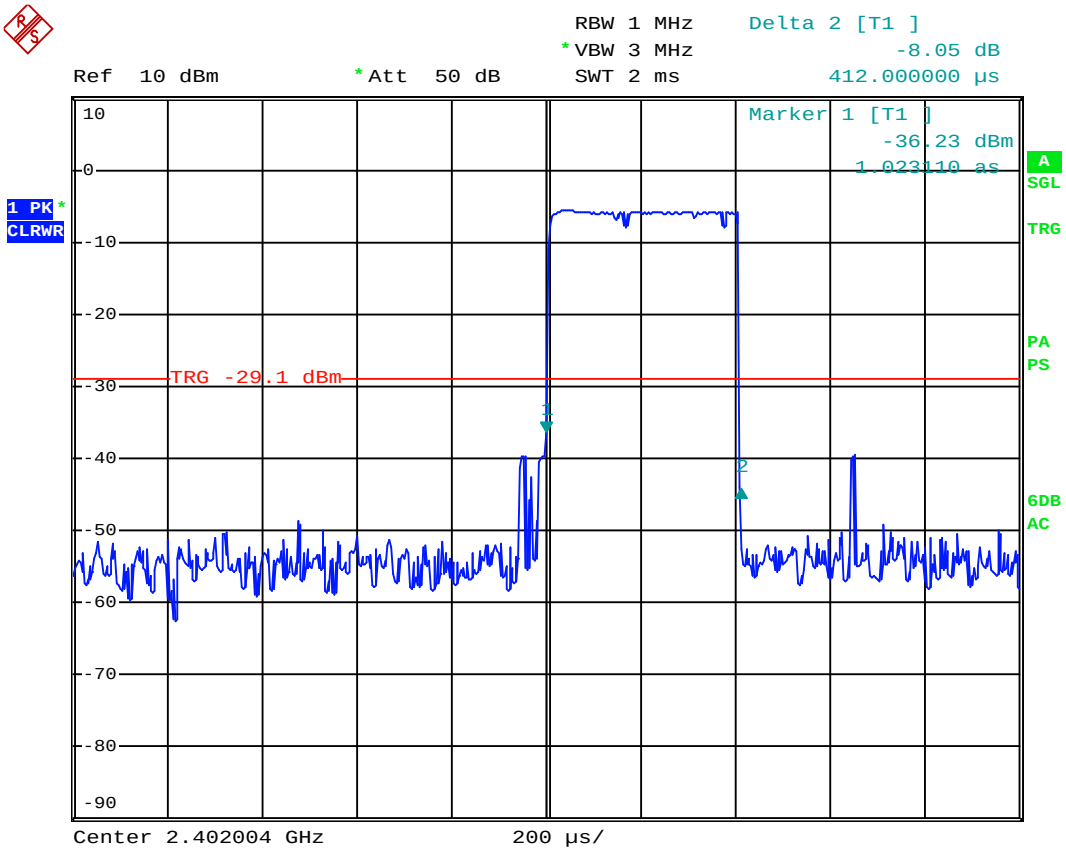
Average Correction Factor = 20Log(5*0.412ms/100ms) = -33.7dB

Graph 3.2.1.1



Date: 26.APR.2017 13:58:16

Graph 3.2.1.2



Date: 26.APR.2017 14:02:39

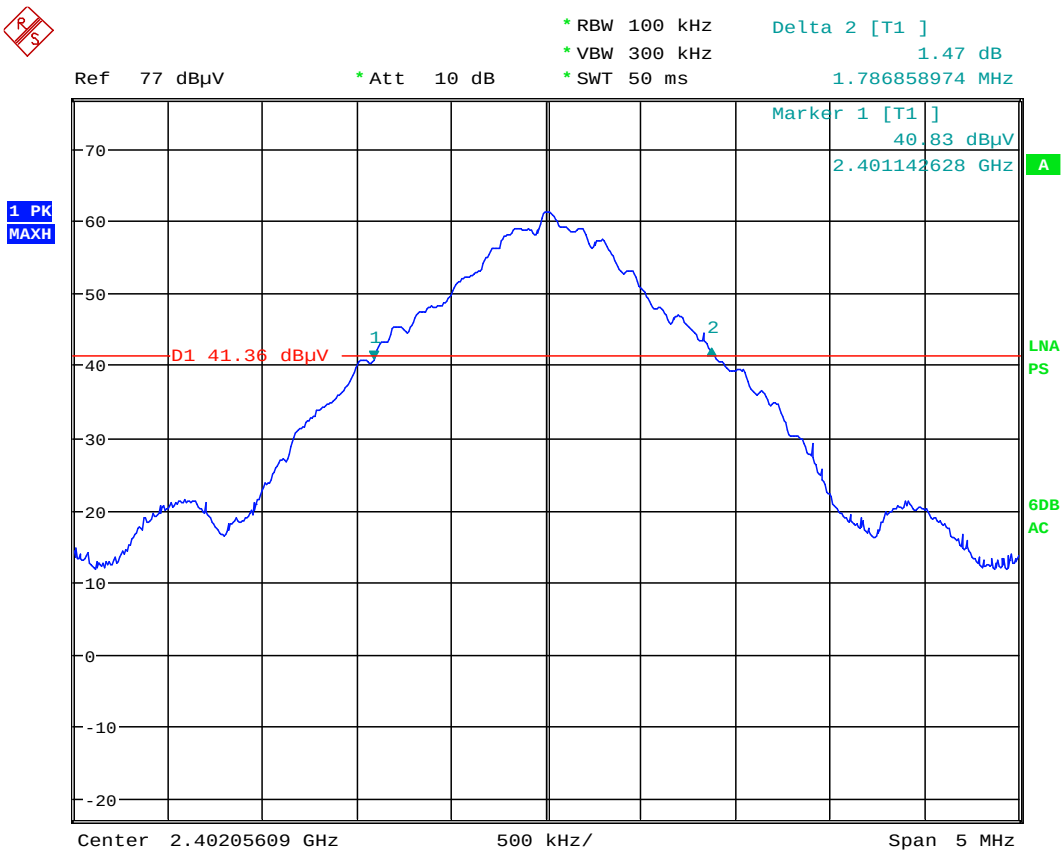
3.3 Bandwidth of Emissions

Center Frequency of operation MHz	Measured 20dB bandwidth MHz	Measured 99% bandwidth MHz
2402	1.78	1.74
2440	1.91	1.74
2480	1.86	1.72

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

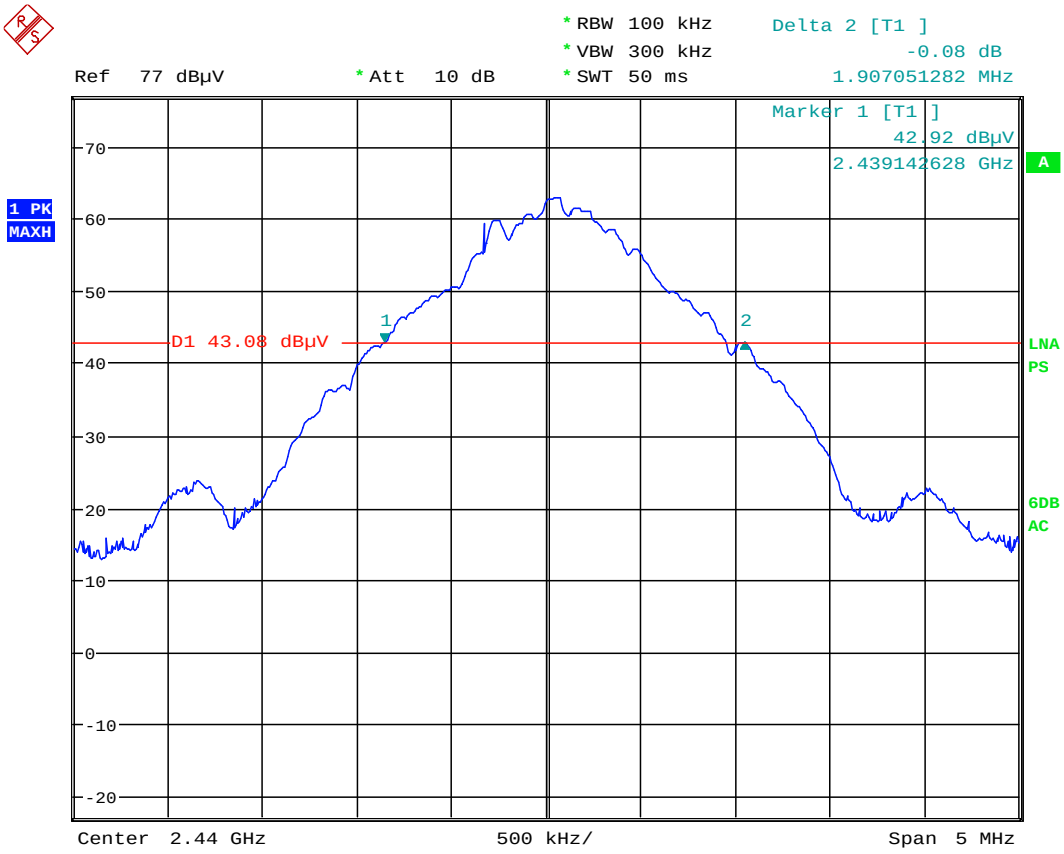
Notes: The bandwidth of emissions is contained within the frequency band of operation

Graph 3.3.1



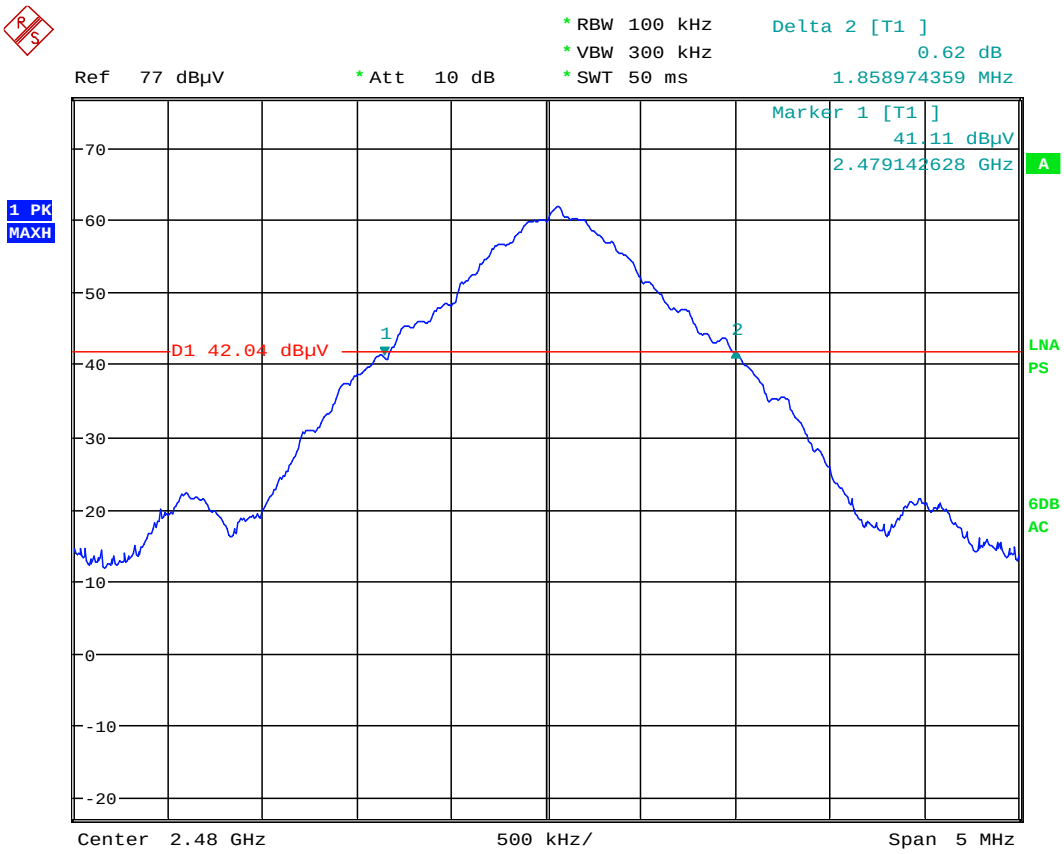
Date: 24.APR.2017 10:53:28

Graph 3.3.2



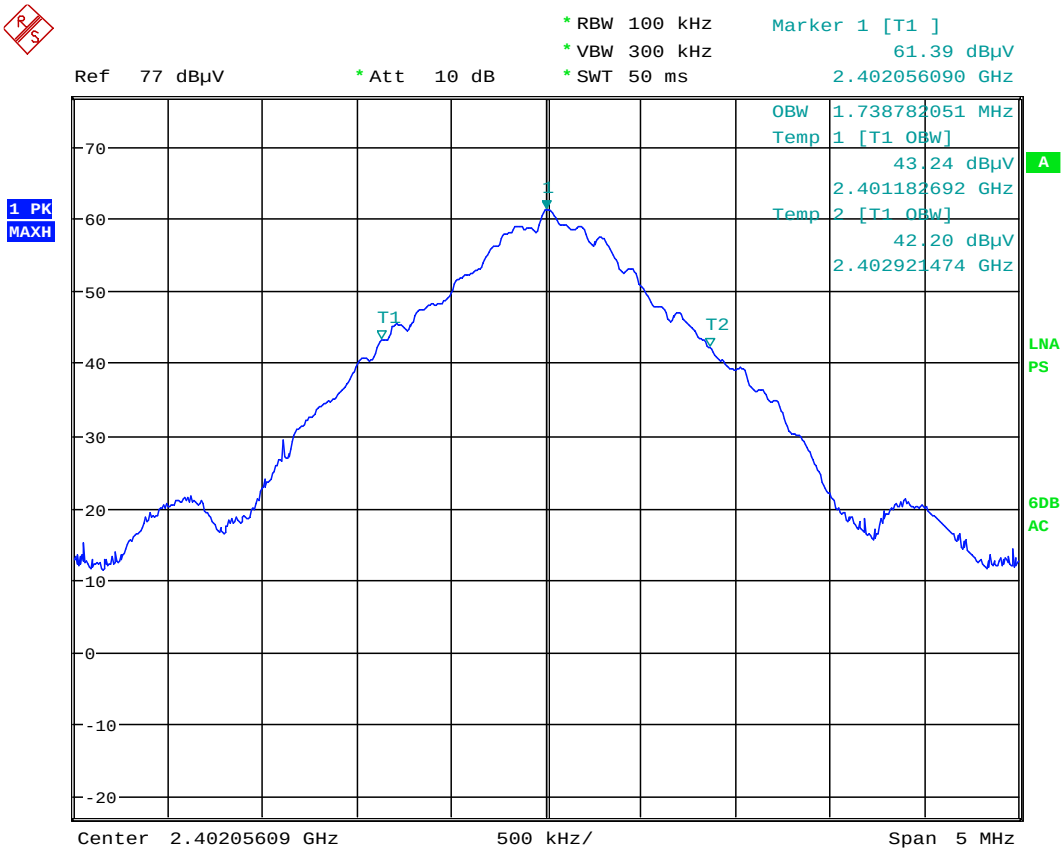
Date: 24.APR.2017 11:00:38

Graph 3.3.3



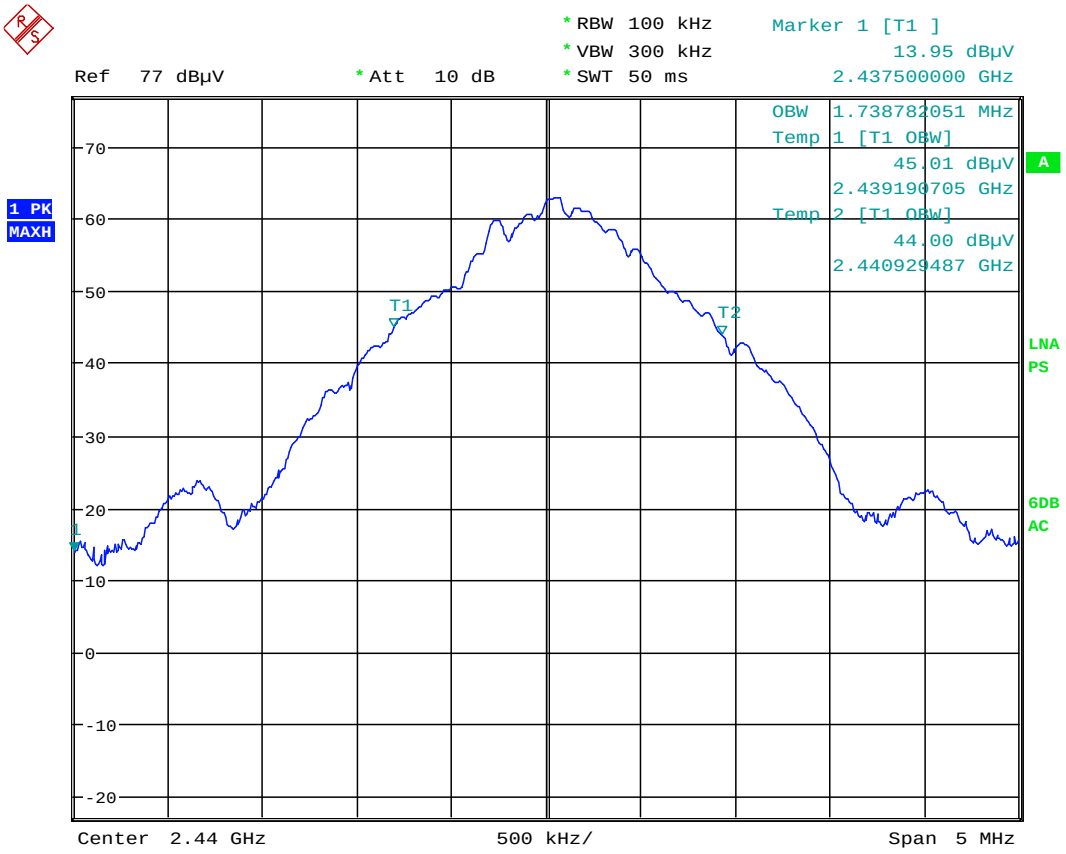
Date: 24.APR.2017 11:05:02

Graph 3.3.4



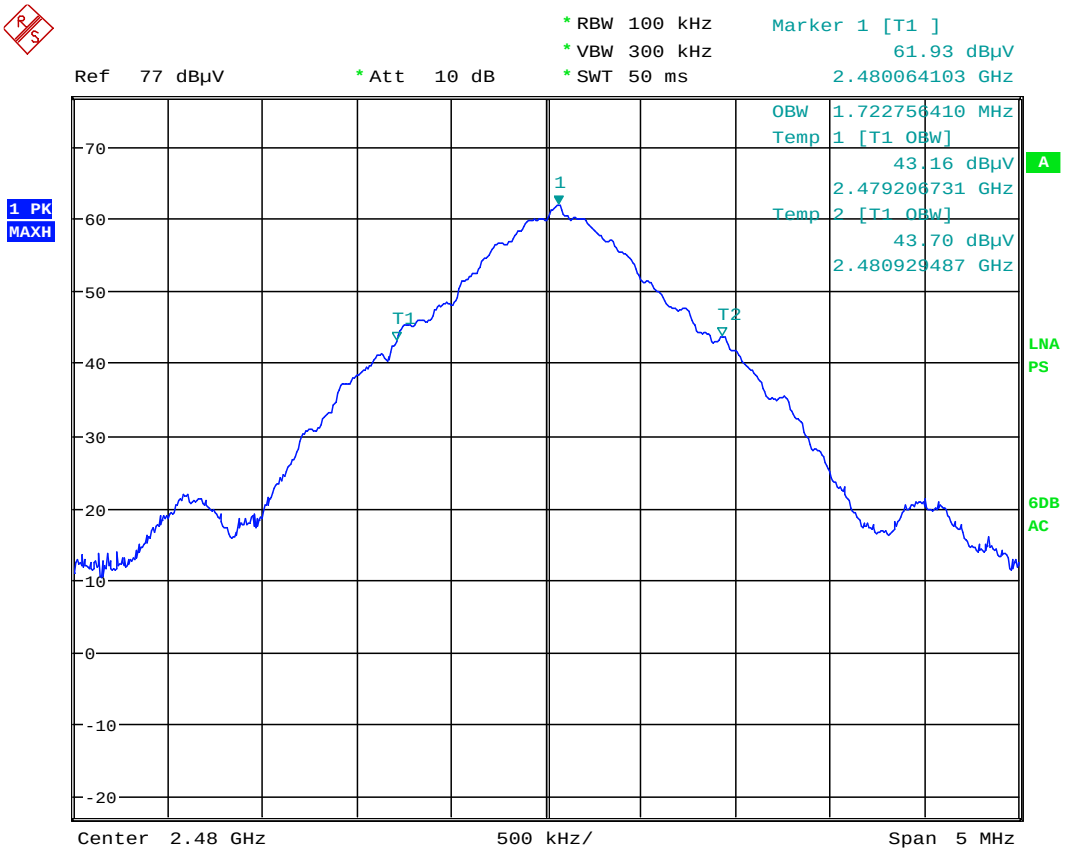
Date: 24.APR.2017 10:55:04

Graph 3.3.5



Date: 24.APR.2017 10:59:28

Graph 3.3.6



Date: 24.APR.2017 11:05:57

3.4 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 13.7dB below the limits

Notes: Test was performed at the AC adapter.

Date:	April 27, 2017	**Result: Pass**
Tested by:	Uri Spector	
Standard:	FCC part 15.207	
Test Point:	Power Line	
Operation mode:	See page 5	
Environmental Conditions:	24°C; 43%(RH); 97.5kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.4.1

Line 1

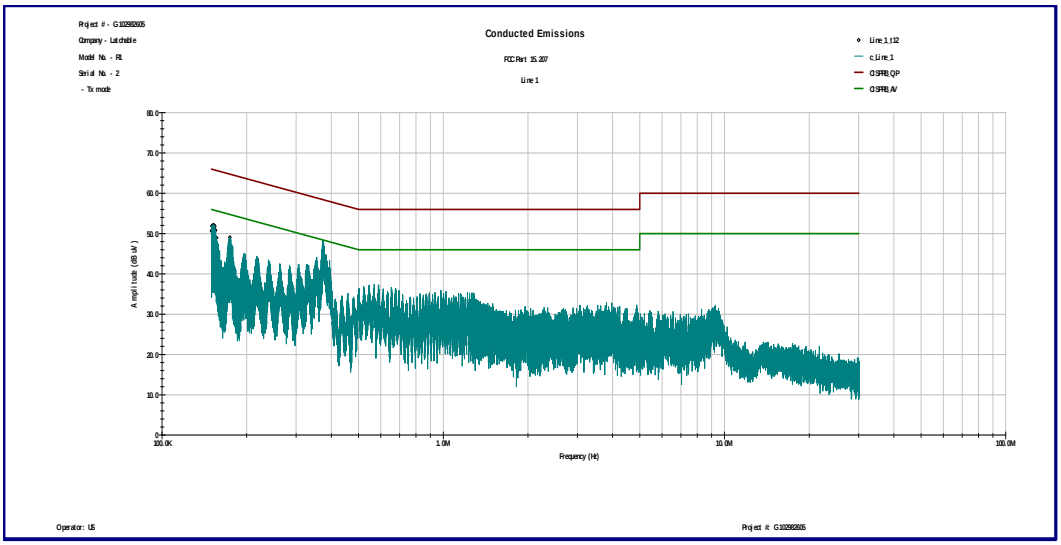
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.152	48.7	31.9	0.1	65.9	55.9	-17.1	-23.9
0.175	44.6	29.0	0.1	64.7	54.7	-20.0	-25.6
0.374	44.6	32.5	0.1	58.4	48.4	-13.7	-15.8
0.589	33.2	21.8	0.2	56.0	46.0	-22.6	-24.0
1.280	26.4	14.2	0.2	56.0	46.0	-29.4	-31.6
9.281	27.8	18.9	0.7	60.0	50.0	-31.5	-30.4

Line 2

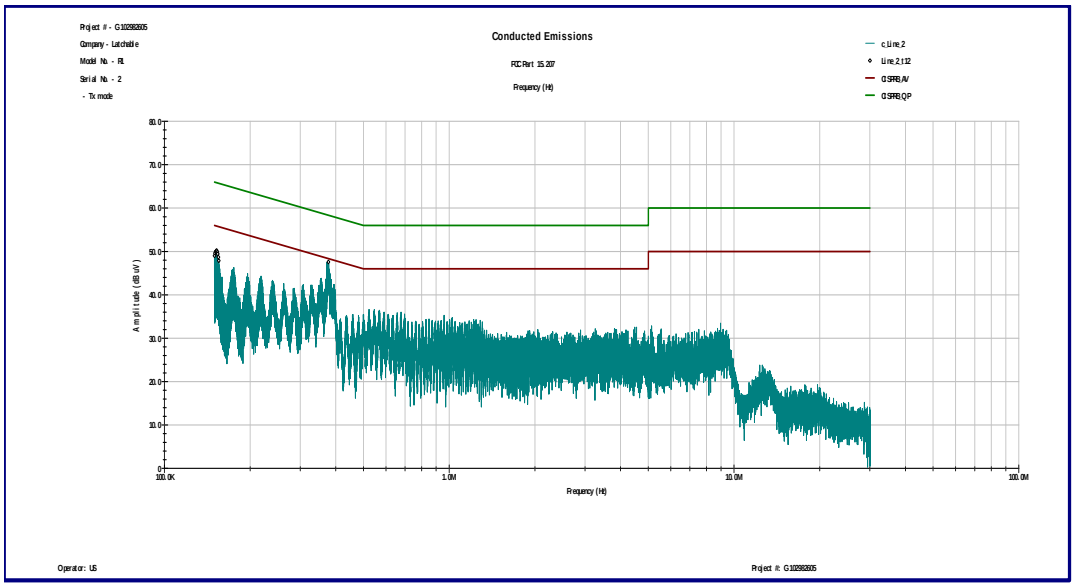
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.153	47.0	32.0	0.1	65.8	55.8	-18.7	-23.7
0.218	39.3	27.4	0.1	62.9	52.9	-23.5	-25.4
0.377	43.8	32.9	0.1	58.3	48.3	-14.4	-15.3
0.677	31.8	18.4	0.2	56.0	46.0	-24.0	-27.4
3.257	26.2	15.4	0.4	56.0	46.0	-29.4	-30.2
9.413	28.5	19.9	0.7	60.0	50.0	-30.8	-29.4

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-13GHz

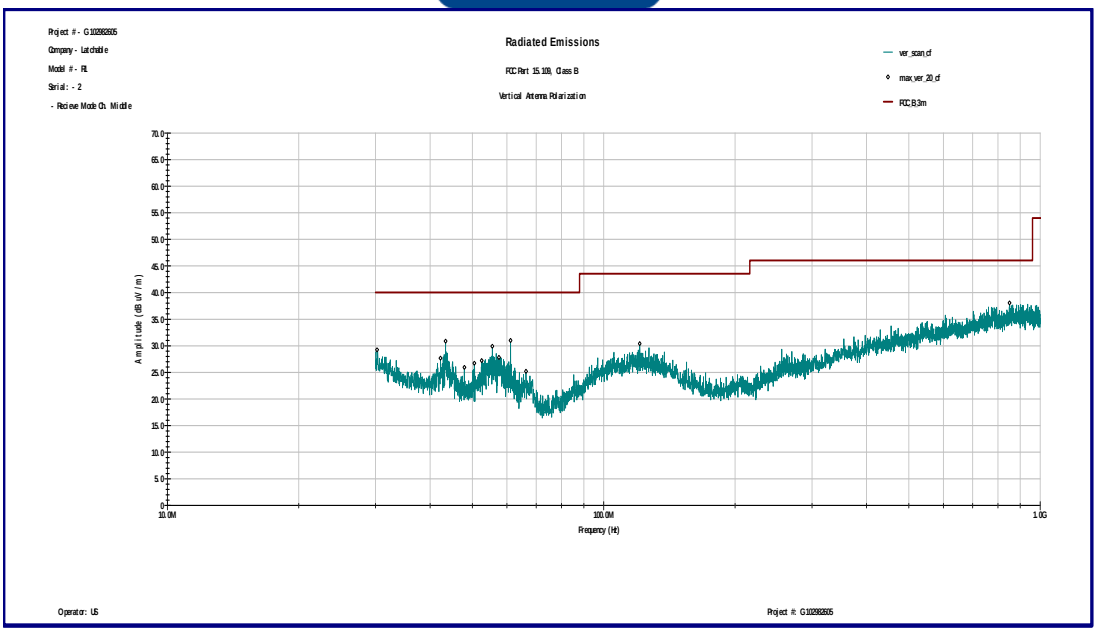
Max. Emissions margin: 9.7dB below the limits

Notes: The Radiated Emissions testing was performed in the Anechoic Chamber at 3m measurement distance (see Table 3.9.1 and Graphs 3.5.1 - 3.5.12)
Radiated Emissions from the RF Generator were excluded from the tables.

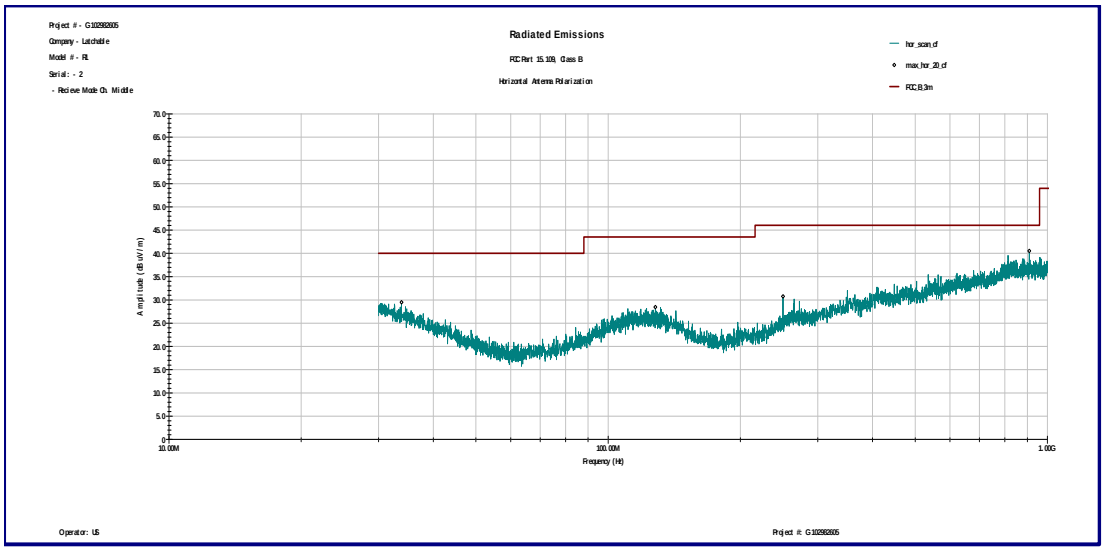
Date:	April 26 – April 28, 2017	**Result: Pass**
Tested by:	Uri Spector	
Standard:	FCC Part 15.109, Class B	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24°C; 43%(RH); 97.5kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.9.1

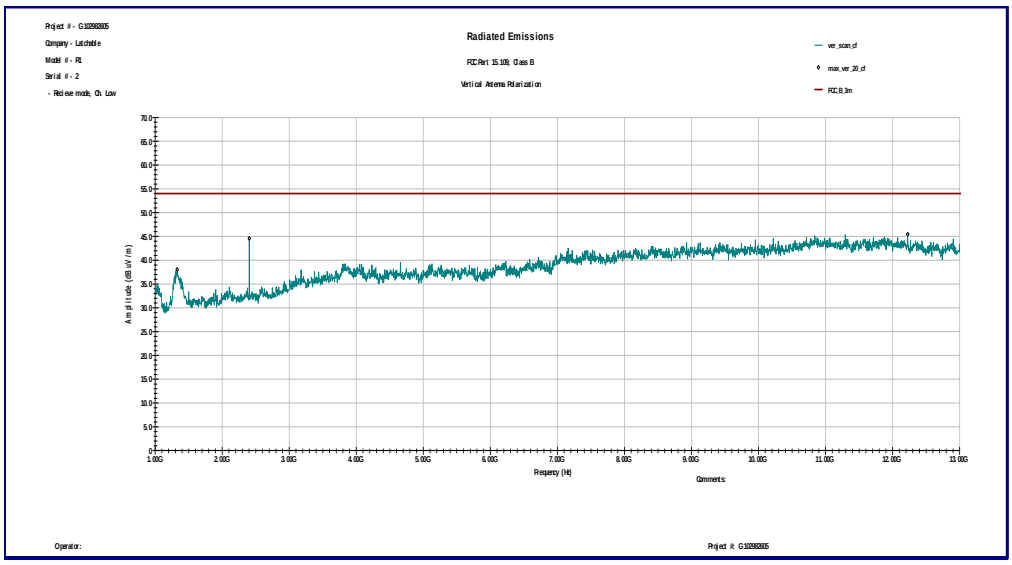
Frequency MHz	Antenna Polarity	Peak Reading dBµV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
Channel 1							
30.381 MHz	V	6.9	21.3	0.0	28.2	40.0	-11.8
43.784 MHz	V	15.0	14.0	0.0	29.0	40.0	-11.0
48.529 MHz	V	13.3	12.4	0.0	25.8	40.0	-14.2
53.031 MHz	V	18.3	11.5	0.0	29.8	40.0	-10.3
30.554 MHz	H	7.05	23.1	0.0	30.1	40.0	-9.9
34.814 MHz	H	9.74	20.5	0.0	30.3	40.0	-9.7
125.07 MHz	H	12.02	16.6	0.0	28.7	43.5	-14.9
250.17 MHz	H	13.09	17.2	0.0	30.2	46.0	-15.8
1.328 GHz	V	52.37	27.5	41.8	38.1	54.0	-15.9
1.012 GHz	H	54.16	26.0	42.0	38.1	54.0	-15.8
1.304 GHz	H	52.15	27.4	41.8	37.7	54.0	-16.3
Channel 7							
30.139 MHz	V	6.8	21.5	0.0	28.3	40.0	-11.7
43.68 MHz	V	15.4	14.1	0.0	29.5	40.0	-10.5
57.568 MHz	V	18.4	11.1	0.0	29.5	40.0	-10.5
127.68 MHz	V	11.8	17.4	0.0	29.1	43.5	-14.4
31.143 MHz	H	7.6	22.7	0.0	30.3	40.0	-9.7
131.64 MHz	H	11.8	16.5	0.0	28.3	43.5	-15.2
1.352 GHz	V	52.5	27.5	41.8	38.1	54.0	-15.8
1.02 GHz	H	52.7	26.0	42.0	36.7	54.0	-17.3
1.324 GHz	H	52.0	27.4	41.8	37.6	54.0	-16.4
Channel 13							
30.381 MHz	V	6.9	21.3	0.0	28.2	40.0	-11.8
53.031 MHz	V	18.3	11.5	0.0	29.8	40.0	-10.3
66.051 MHz	V	15.1	10.0	0.0	25.1	40.0	-14.9
84.257 MHz	V	12.9	11.9	0.0	24.7	40.0	-15.3
125.37 MHz	V	11.8	17.5	0.0	29.3	43.5	-14.3
30.554 MHz	H	12.3	10.0	0.0	30.1	40.0	-9.9
34.814 MHz	H	7.1	23.1	0.0	30.3	40.0	-9.7
125.07 MHz	H	9.7	20.5	0.0	28.7	43.5	-14.9
1.024 GHz	V	51.1	25.6	42.0	34.8	54.0	-19.2
1.3 GHz	V	52.8	27.5	41.8	38.5	54.0	-15.5
1.044 GHz	H	53.0	26.0	41.9	37.1	54.0	-16.9
1.292 GHz	H	52.3	27.3	41.8	37.8	54.0	-16.1



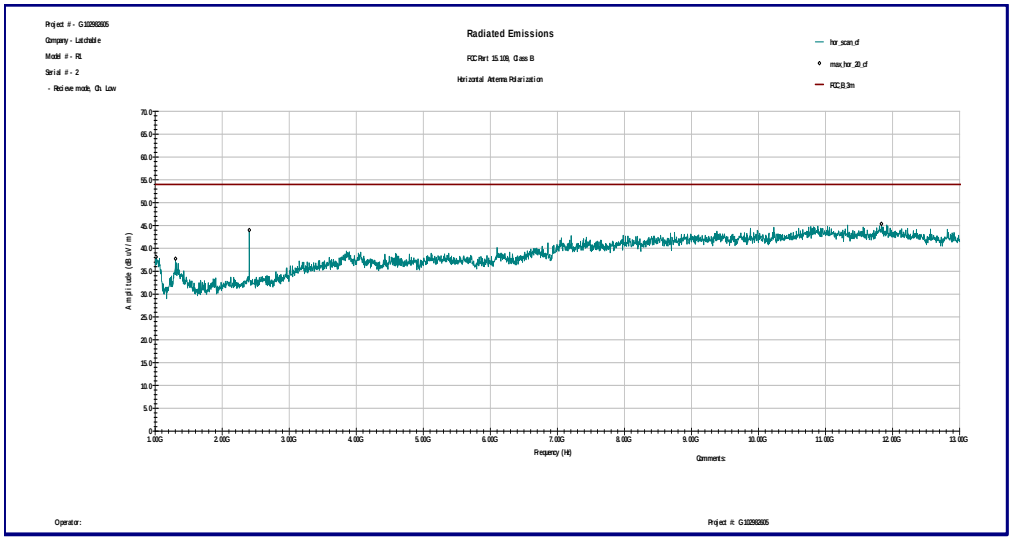
Graph 3.5.1



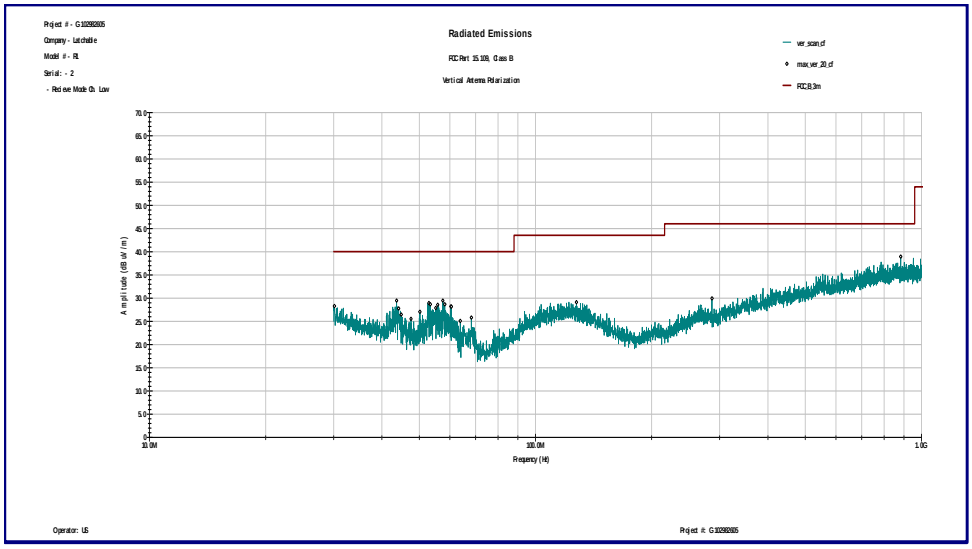
Graph 3.5.2



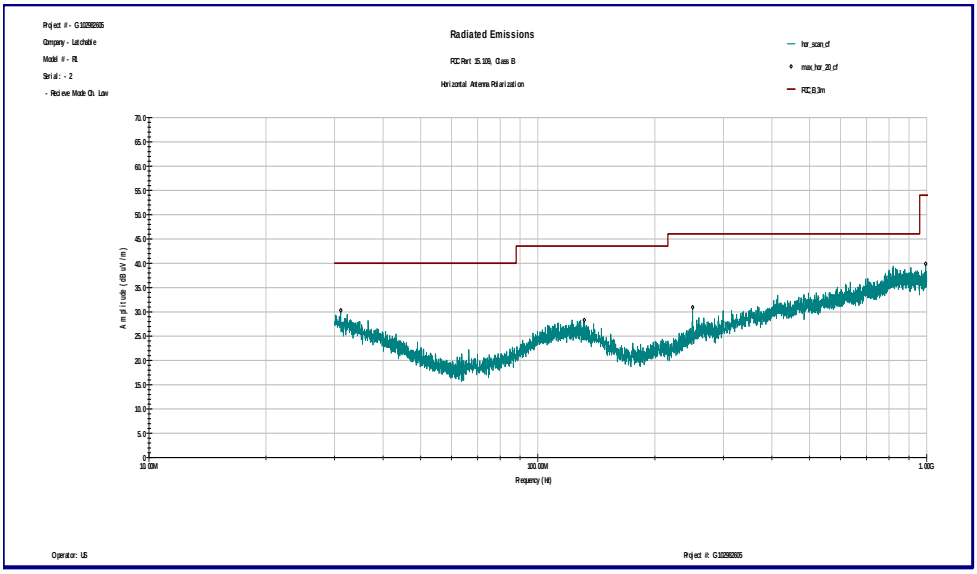
Graph 3.5.3



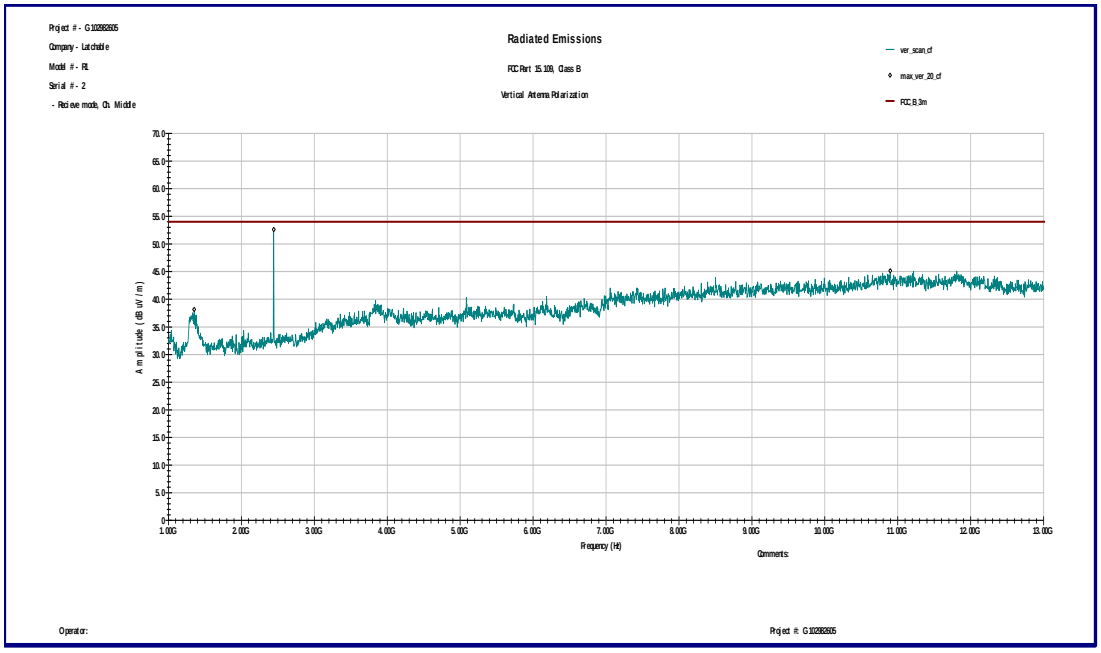
Graph 3.5.4



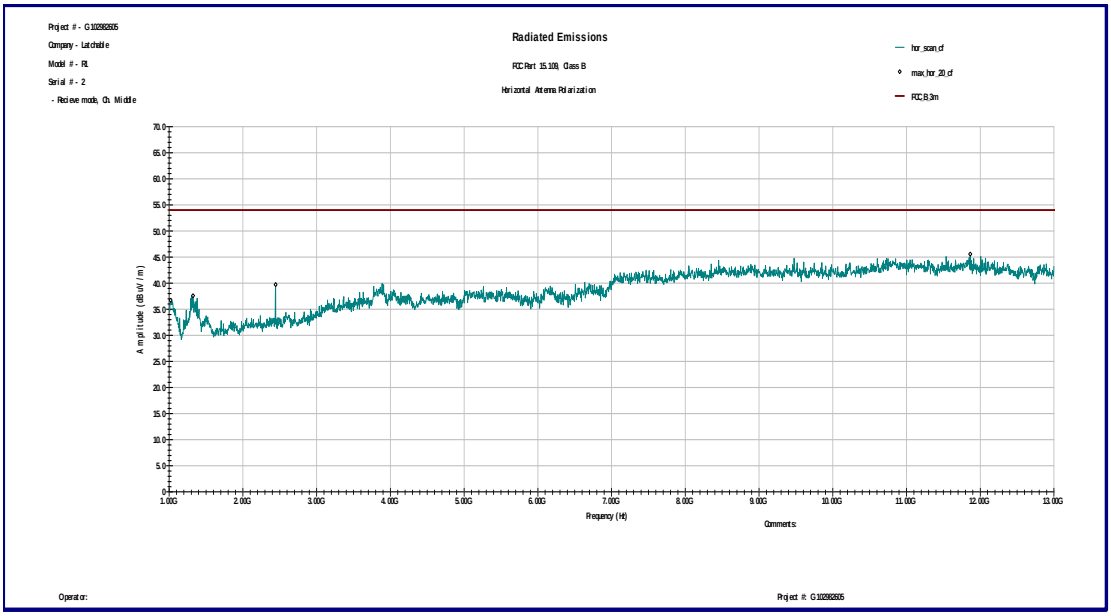
Graph 3.5.5



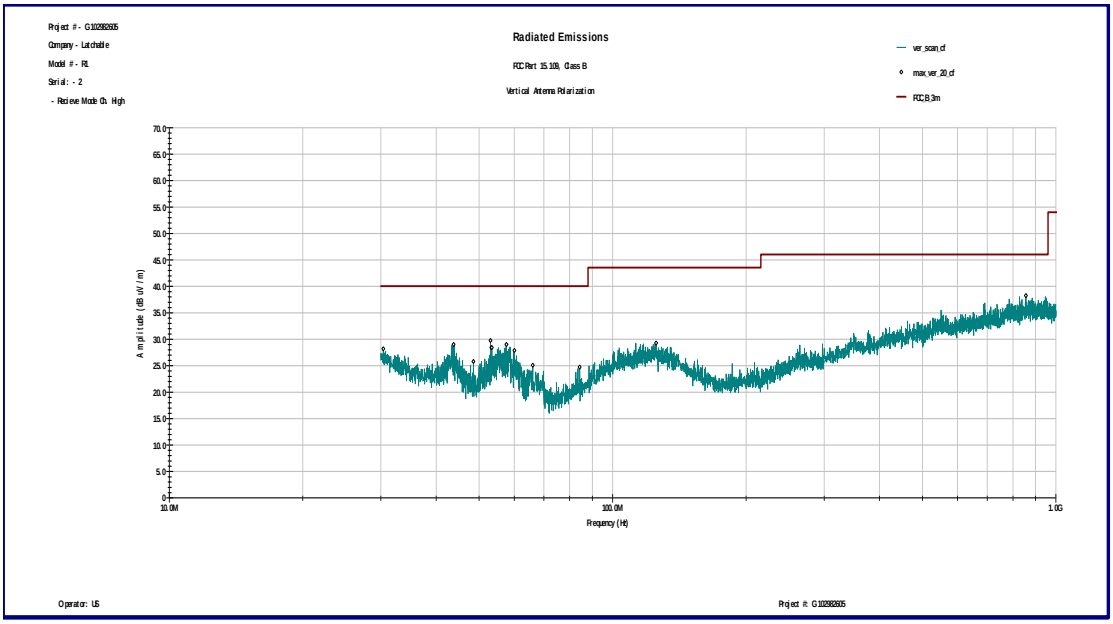
Graph 3.5.6



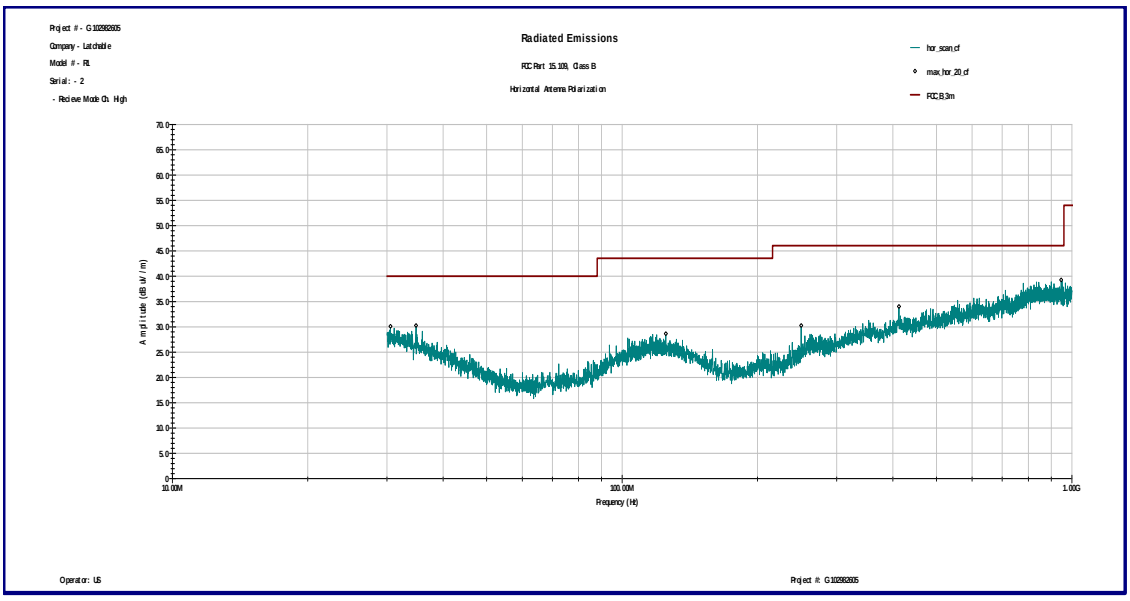
Graph 3.5.7



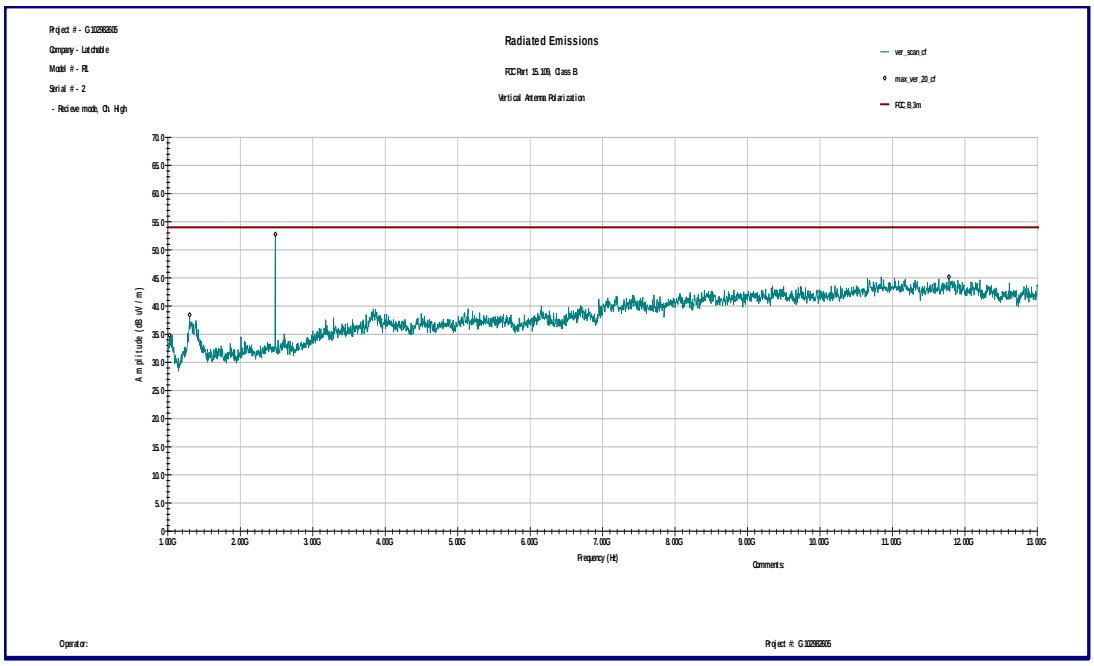
Graph 3.5.8



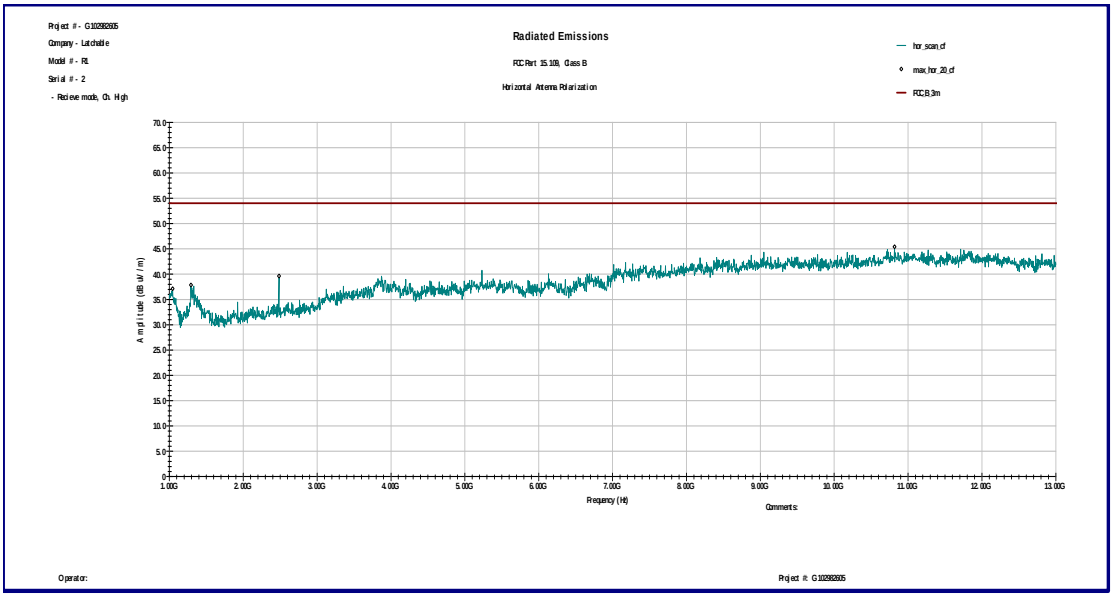
Graph 3.5.9



Graph 3.5.10



Graph 3.5.11



Graph 3.5.12

3.6 Digital device conducted emissions

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 6.6dB below the limits

Notes: Test was performed at the AC adapter.

Date:	April 3, 2017	**Result: Pass**
Tested by:	Uri Spector	
Standard:	FCC Part 15.107, Class B	
Test Point:	Line 1 and Line 2	
Operation mode:	See page 5	
Environmental Conditions:	24°C; 43%(RH); 97.5kPa	
Equipment Verification:	☒	
Note:	None	

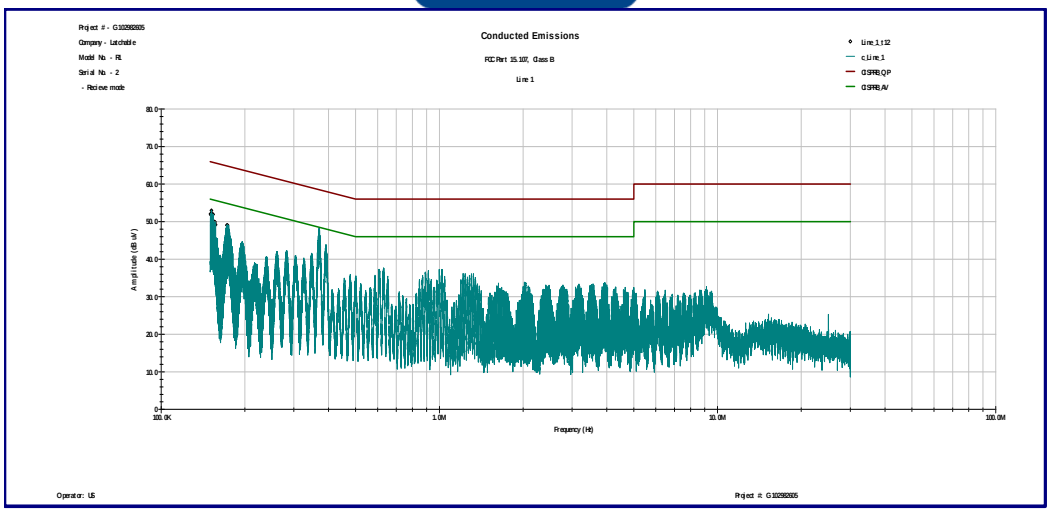
Table 3.10.1

Line 1

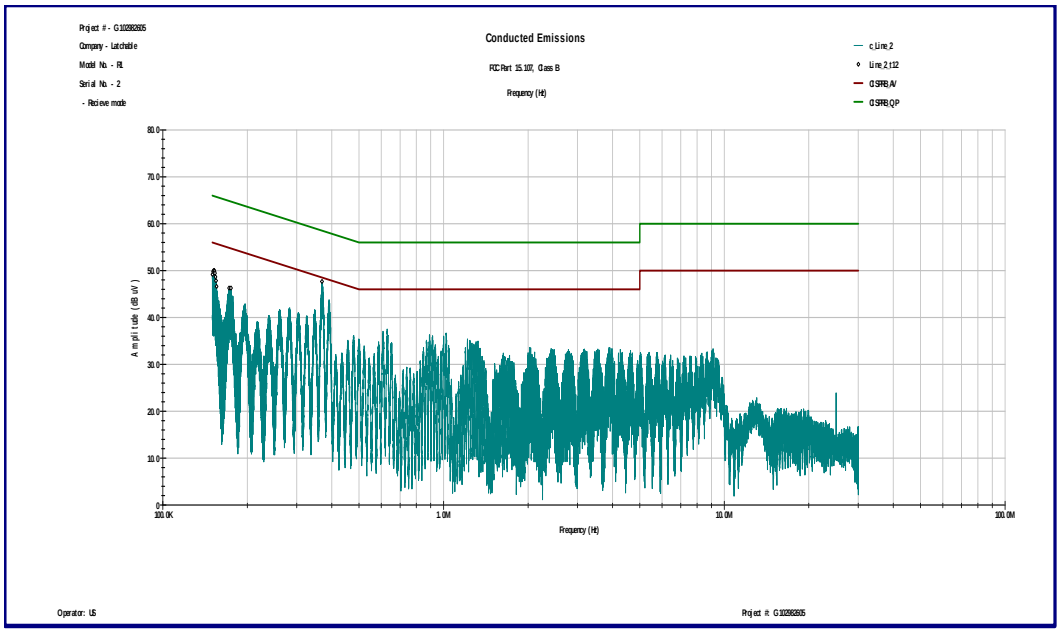
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.151	50.2	40.7	0.1	65.9	55.9	-15.7	-15.2
0.261	40.4	34.2	0.1	61.4	51.4	-20.9	-17.1
0.371	46.2	41.4	0.1	58.5	48.5	-12.1	-6.9
1.024	35.3	31.0	0.2	56.0	46.0	-20.5	-14.8
3.957	31.0	25.5	0.5	56.0	46.0	-24.5	-20.0
9.113	29.1	25.3	0.7	60.0	50.0	-30.2	-24.0

Line 2

Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.152	48.8	40.5	0.1	65.9	55.9	-17.0	-15.3
0.261	40.3	35.6	0.1	61.4	51.4	-21.0	-15.7
0.367	45.8	41.8	0.1	58.6	48.6	-12.6	-6.6
1.021	35.4	31.2	0.2	56.0	46.0	-20.4	-14.6
3.889	31.0	28.3	0.5	56.0	46.0	-24.5	-17.2
9.110	30.5	27.8	0.7	60.0	50.0	-28.8	-21.5



Graph 3.10.1



Graph 3.10.2

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	10/03/2016	10/03/2017	☒
Horn Antenna	EMCO	3115	9507-4513	9936	07/12/2016	07/12/2017	☒
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	12/09/2016	12/09/2017	☒
High Pass Filter	Reactel	7HS-4G-S12	0223	015274	VBU	VBU	☒
LISN	COM-Power	Li-215A	191970	172315	06/13/2016	06/13/2017	☒
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	☒
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	05-03-2017	102982605MIN-005B	US	NS	Original Issue