TEST REPORT

Report Number: 102693203MIN-001
Project Number: G102693203

Testing performed on the
PC-0191

FCC ID: CCKPC0191
IC: 5251A-PC0191

to
47 CFR Part 15.247:2015
RSS- 247, Issue 1, 2015
RSS-Gen, Issue 4, 2014
47 CFR, Part 15:2015, §15.107 and §15.109, Class B / ICES-003, Issue 6:2016

For
Digital Monitoring Products Inc.

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

Test Authorized by:
Digital Monitoring Products Inc.
2500 North Partnership Blvd
Springfield, MO 65803 USA

Prepared by: _____
Simon Khazon

Reviewed by: _____ Date of issue: August 30, 2016
Norman Shpilsher

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1.0 GENERAL DESCRIPTION

Model:	PC-0191
Type of EUT:	Universal transmitter
Intertek Sample ID:	MIN1608121502-001
FCC ID:	CCKPC0191
IC:	5251A-PC0191
Related Submittal(s) Grants:	None
Company:	Digital Monitoring Products Inc.
Customer:	Mr. James Wilson
Address:	2500 North Partnership Blvd Springfield, MO 65803 USA
Phone:	417-831-9362 Ext. 167
e-mail:	jwilson@dmp.com
Test Standards:	☒ 47 CFR, Part 15:2015, §15.247 ☒ RSS-247, Issue 1, 2015 ☒ RSS-Gen, Issue 4, 2014 ☒ 47 CFR, Part 15:2015, §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:	August 12, 2016
Test Work Started:	August 24, 2016
Test Work Completed:	August 30, 2016
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	Universal transmitter
Transmitter Type:	☒ FHSS ☐ Digital Modulation ☐ WiFi ☐ Blue Tooth
Permitted Range of Operation:	902 – 928MHz
Range of Operation:	905.6 – 924.4MHz
Number of Channels:	53
Modulation:	FSK
Emission Designator:	F1D
Antenna(s) Info:	Type: Internal; Gain: 1.0dBi; Connector Type: Soldered to PCB
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter power configuration:	☒ 3VDC from Internal battery ☐ External power source
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 and FCC Public Notice DA 00-705

1.2 EUT Configuration

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

☐ - Standby
☒ - Continuous transmissions with hopping function enabled
☒ - Continuous transmissions with hopping function disabled (modulated signal)
☐ - Continuous transmissions with hopping function disabled (un-modulated signal)
☒ - Continuous receiving
☐ - Test program (customer specific)
☐ -

Operating modes of the EUT:

No.	Description
1	Test was performed at low channel, middle channel, and upper channel

Cables:

No.	Type	Length	Designation	Note
	None			

Support equipment/Services:

No.	Item	Description
1	SMY02 Signal Generator	RF Source

1.3 Environmental conditions

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

☒ **Normal**

Temperature:	+15 to +35 ° C
Humidity:	20-75 %
Atmospheric pressure:	86-106 kPa

☐ **Extreme**

☐ **Temperature:**	-20 to +50 ° C
☐ **Supply voltage:**	85% to +115%

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)

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
15.247(b), (c) / RSS-247 5.4	Maximum peak output power	Pass
15.247/(e) / RSS-247 5.1	Hopping channel carrier frequencies separation	Pass
15.247(a) / RSS-247 5.1	20dB bandwidth of the hopping channel	Pass
15.247/(e) / RSS-247 5.1	Number of hopping frequencies	Pass
15.247/(e) / RSS-247 5.1	Average time of occupancy of hopping frequency	Pass
15.247(d) / RSS-247 5.5	Antenna conducted spurious emissions	N/A
15.247(d) / RSS-247 5.5	Radiated spurious emissions	Pass
15.247(i) / RSS- Gen 5.5	RF Exposure Compliance	Pass
15.207 / RSS-Gen 7.2.2	Transmitter Power Line conducted emissions	N/A
15.109 / ICES-003	Receiver/digital device radiated emissions	Pass
15.107 / ICES-003	Digital device conducted emissions	N/A

3.0 TEST CONDITIONS AND RESULTS

3.1 Maximum peak output power

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Max. Margin: 25.22dB below the limits

Power Output: Distance:	**Radiated** ☒ **3m** ☐ **10m**				
Frequency Range:	☐ 902-928MHz ☐ 2400-2483.5MHz ☐ 5725-5850MHz				
Low Frequency MHz	**Measured field dBµV/m**	**Tx Peak Power W**	**Tx Peak Power dBm**	**Limit dBm**	**Margin dB**
Vertical Antenna	99.6	0.00219026	3.40	30.0	- 26.6
Horizontal Antenna	99.7	0.00224128	3.50	30.0	- 26.5
Middle Frequency MHz					
Vertical Antenna	99.0	0.00189599	2.78	30.0	- 27.22
Horizontal Antenna	101.0	0.00300494	4.78	30.0	- 25.22
Upper Frequency MHz					
Vertical Antenna	98.0	0.00184138	2.65	30.0	- 27.35
Horizontal Antenna	100.6	0.00272360	4.35	30.0	- 25.35
RBW:	☒ 100kHz ☐ 3MHz ☐ 10MHz				
VBW:	☒ 300kHz ☐ 3MHz ☐ 10MHz				
Antenna Gain:	☒ < 6dBi and = 1.0dBi ☐ >6dBi and = dBi, Output power reduction = dB				

Notes: The Maximum Peak Output Power was calculated from measured field strength at fundamentals (see Tables 3.1.1 and 3.1.2) using equitation $P=(E \times d)^2/30G$

Date:	August 24-26, 2016	**Result: Pass**
Tested by:	Simon Khazon	
Standard:	FCC Part 15.247	
Test Point:	Emissions at Fundamental	
Operation mode:	See page 5	
Environmental Conditions:	25℃; 54%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.1.1

Frequency	Antenna		Ant. CF	Cable loss	Pre-amp	Peak Reading	Total @ 3m	Total @ 3m	Comments
MHz	Polarity	Hts(cm)	dB1/m	dB	Gain (dB)	dBµV	dBµV/m	V/m	
Low Channel									
905.61	V	100	21.7	2.6	0.0	75.3	99.6	0.095871	
905.61	H	145	21.7	2.6	0.0	75.4	99.7	0.096981	
Middle Channel									
915.02	V	130	21.8	2.6	0.0	74.6	99.0	0.089199	
915.02	H	100	21.8	2.6	0.0	76.6	101.0	0.112294	
Upper Channel									
924.39	V	159	21.8	2.6	0.0	74.4	98.9	0.087905	
924.39	H	174	21.8	2.6	0.0	76.1	100.6	0.106908	

The Maximum Peak Output Power was calculated from equitation: $P = \frac{(E*d)^2}{30G}$

Where: E is the measured maximum fundamental field strength in V/m,
G=1.26 is the numeric gain (from logarithmic Gain of 1dBi) of the transmitting antenna with reference to an isotropic radiator,
D=3 is the distance in meters from which the field strength was measured.

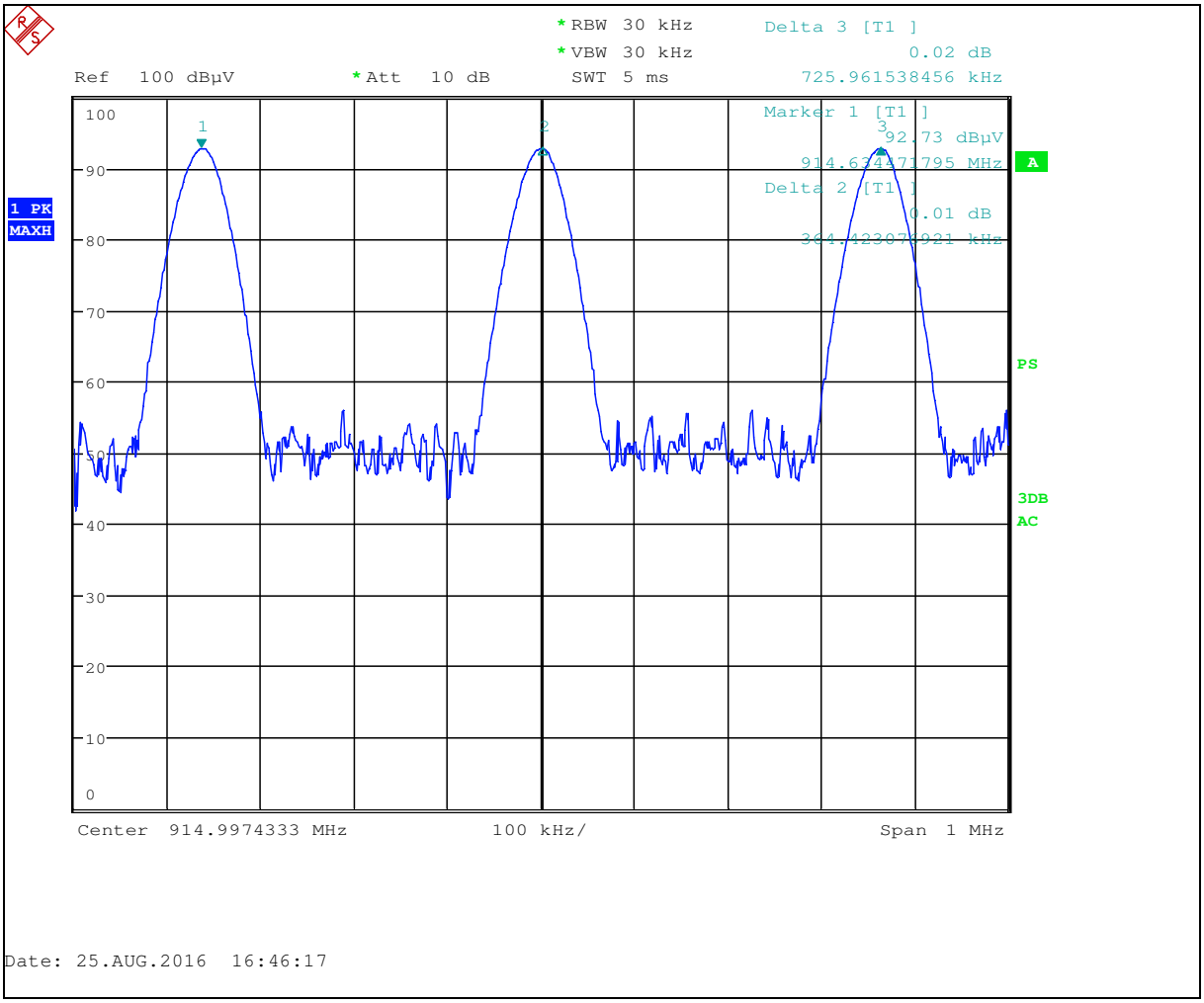
Table 3.1.2

Frequency	Antenna	Field strength	Peak Power	Peak Power	Comments
MHz	Polarity	at 3m (V/m)	W	dBm	
Low Channel					
905.61	V	0.09587114	0.00219026	3.40	
905.61	H	0.09698128	0.00224128	3.50	
Middle Channel					
915.02	V	0.08919855	0.00189599	2.78	
915.02	H	0.11229432	0.00300494	4.78	
Upper Channel					
924.39	V	0.08790470	0.00184138	2.65	
924.39	H	0.10690847	0.00272360	4.35	

3.2 Hopping channel carrier frequencies separation

Frequency Range:	☒ 902-928MHz ☐ 2400-2483.5MHz ☐ 5725-5850MHz	
Measured Separation (kHz)	**Limit (kHz)**	**Result**
361.5	25	**Pass**
Limit:	☒ 25kHz ☐ 20dB channel bandwidth ☐ 2/3 of 20dB channel bandwidth	
Span:	1 MHz	
RBW:	☐ 3kHz ☒ 30kHz ☐ 100kHz ☐ other kHz	
VBW:	☐ 3kHz ☒ 30kHz ☐ 100kHz ☐ other kHz	

Notes: None

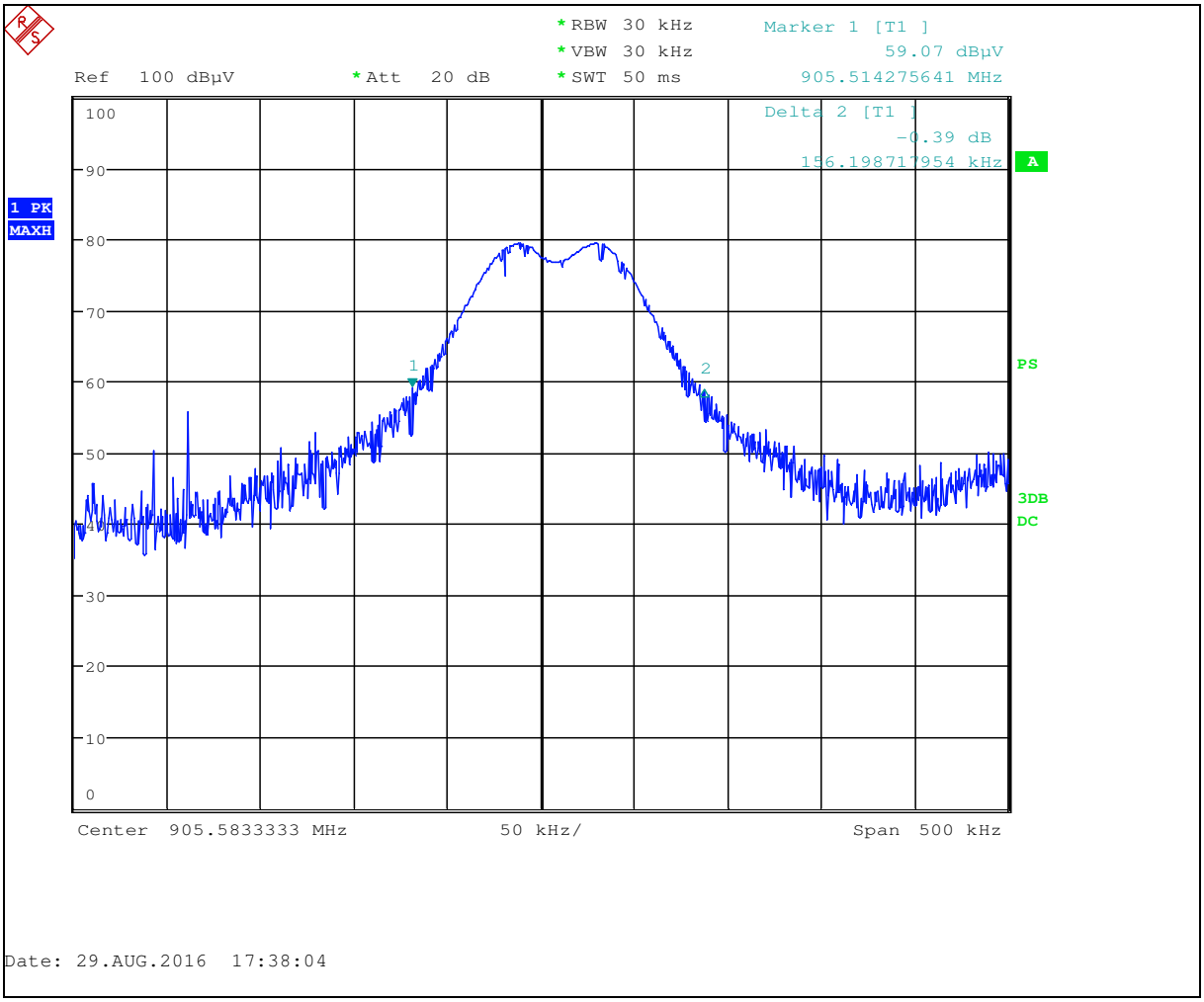

*RBW 30 kHz
*VBW 30 kHz
Ref 100 dBµV
*Att 10 dB
SWT 5 ms
Delta 3 [T1]
0.02 dB
725.961538456 kHz
Marker 1 [T1]
92.73 dBµV
914.634471795 MHz
Delta 2 [T1]
0.01 dB
364.423076921 kHz
1 PK
MAXH
A
PS
3DB
AC
100
90
80
70
60
50
40
30
20
10
0
Center 914.9974333 MHz
100 kHz/
Span 1 MHz
Date: 25.AUG.2016 16:46:17

Graph 3.2.1

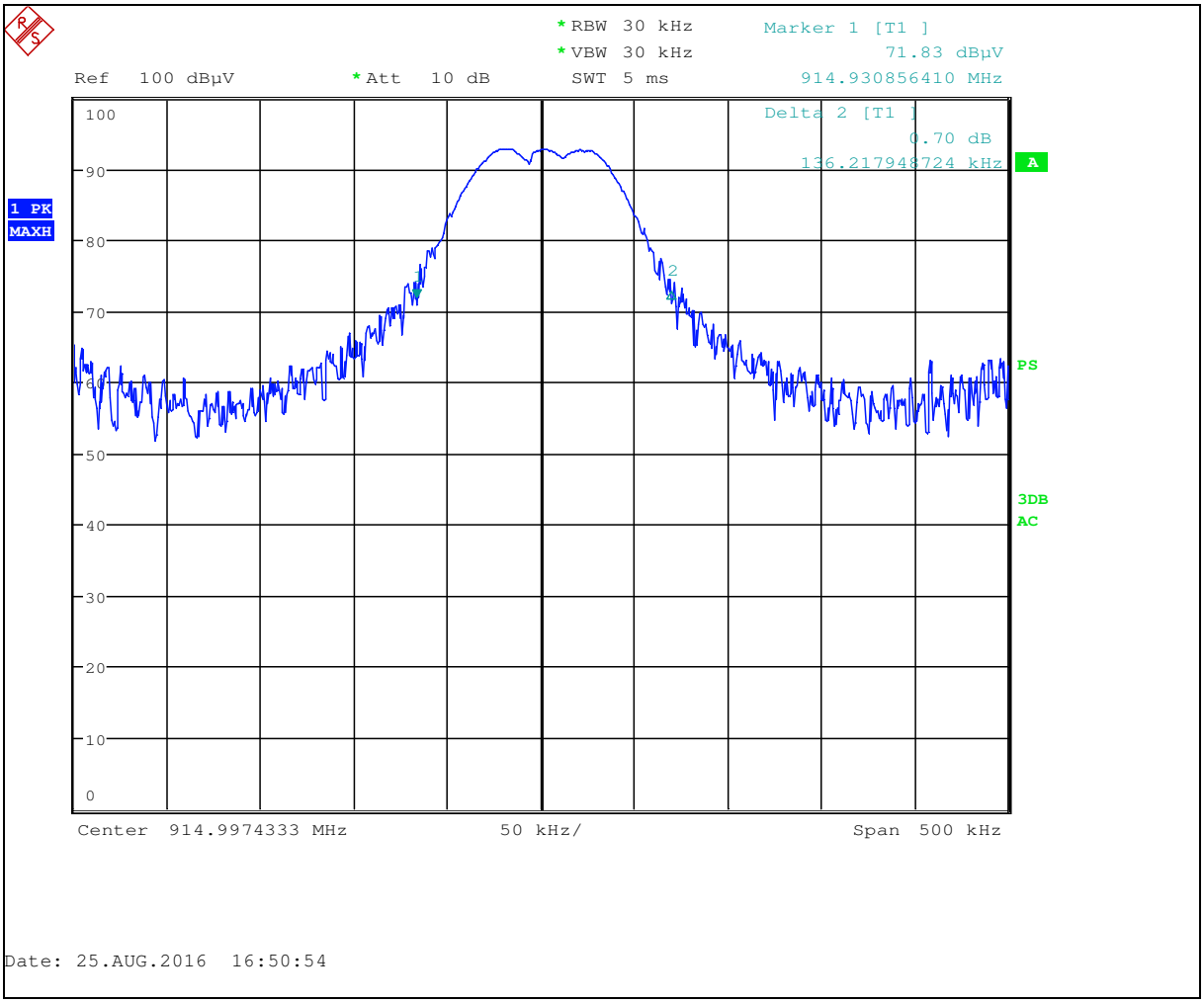
3.3 20dB Bandwidth of the hopping channel

Frequency Range:	☐ 902-928MHz ☐ 2400-2483.5MHz ☐ 5725-5850MHz			
Low Frequency Channel (kHz)	**Middle Frequency Channel (kHz)**	**Upper Frequency Channel (kHz)**	**Limit (kHz)**	**Result**
156.2	136.2	146.3	250	**Pass**
Span:	500kHz			
RBW:	☒ 30kHz ☐ 10kHz ☐ 100kHz ☐ other kHz			
VBW:	☒ 30kHz ☐ 10kHz ☐ 100kHz ☐ other kHz			

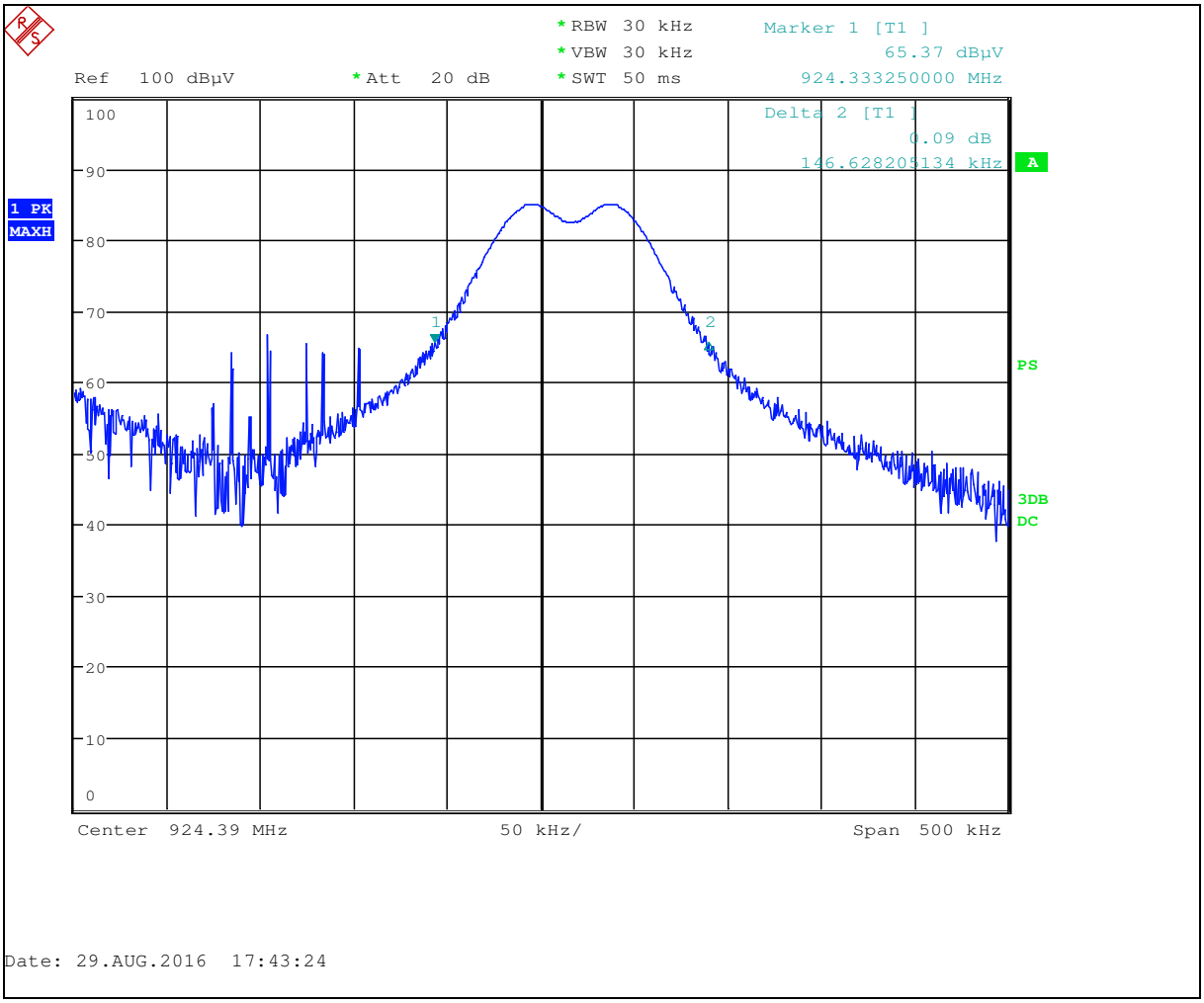
Notes: None


*RBW 30 kHz
*VBW 30 kHz
*SWT 50 ms
Marker 1 [T1]
59.07 dBµV
905.514275641 MHz
Delta 2 [T1]
-0.39 dB
156.19871954 kHz
Ref 100 dBµV
*Att 20 dB
1 PK
MAXH
A
PS
3DB
DC
100
90
80
70
60
50
40
30
20
10
0
Center 905.5833333 MHz
50 kHz/
Span 500 kHz
Date: 29.AUG.2016 17:38:04

Graph 3.3.1


*RBW 30 kHz
*VBW 30 kHz
Ref 100 dBµV
*Att 10 dB
SWT 5 ms
Marker 1 [T1]
71.83 dBµV
914.930856410 MHz
Delta 2 [T1]
0.70 dB
136.217948724 kHz
1 PK
MAXH
A
PS
3DB
AC
100
90
80
70
60
50
40
30
20
10
0
Center 914.9974333 MHz
50 kHz/
Span 500 kHz
Date: 25.AUG.2016 16:50:54

Graph 3.3.2

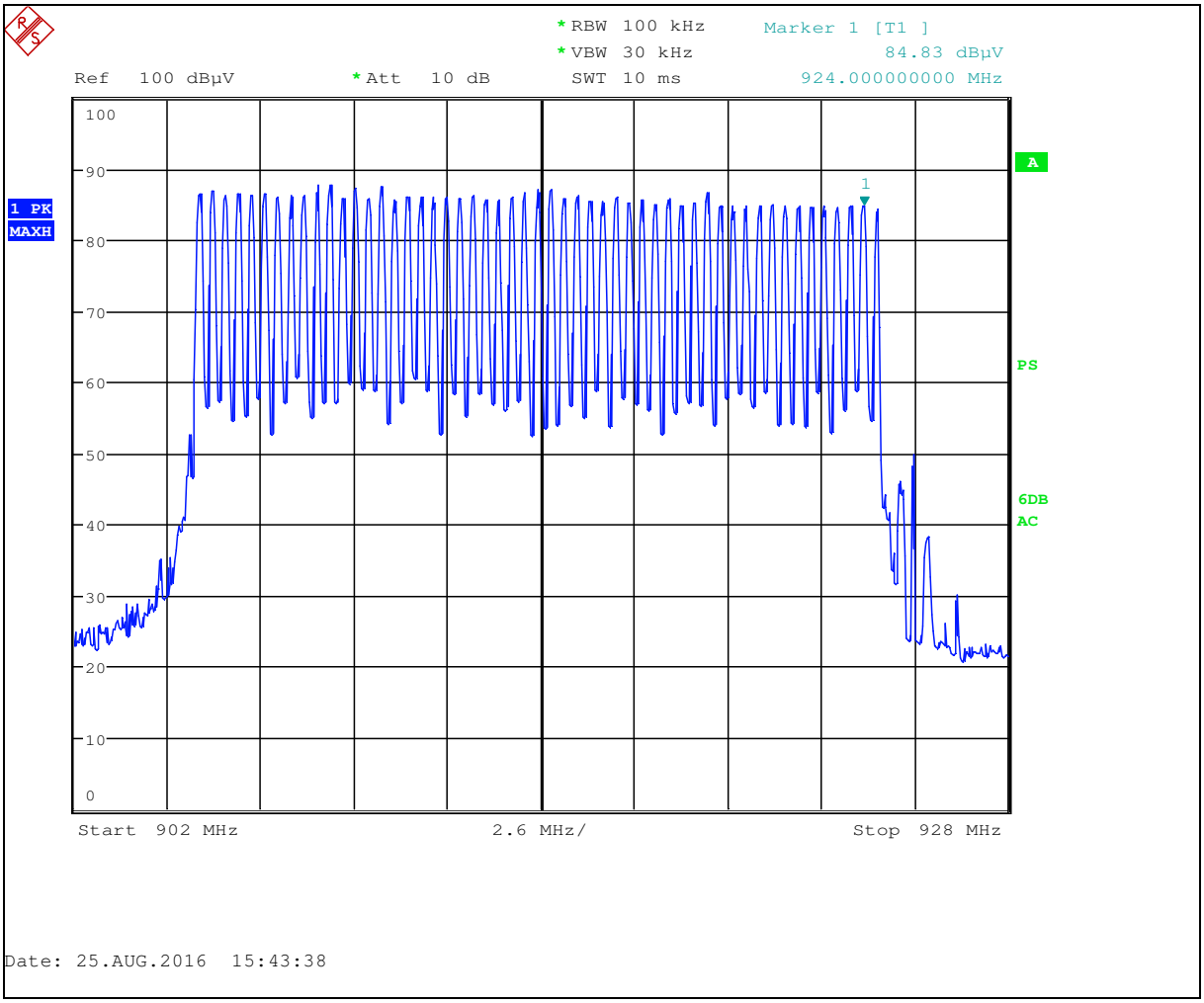

*RBW 30 kHz
*VBW 30 kHz
*SWT 50 ms
Marker 1 [T1]
65.37 dBµV
924.333250000 MHz
Delta 2 [T1]
0.09 dB
146.628205134 kHz
Ref 100 dBµV
*Att 20 dB
1 PK
MAXH
A
PS
3DB
DC
Center 924.39 MHz
50 kHz/
Span 500 kHz
Date: 29.AUG.2016 17:43:24

Graph 3.3.3

3.4 Number of hopping frequencies

Frequency Range:	☒ 902-928MHz ☐ 2400-2483.5MHz ☐ 5725-5850MHz	
Measured Number	**Requirements**	**Result**
53	50	**Pass**
Channel 20dB Bandwidth:	☒ <250kHz ☐ ≥250kHz	

Notes: None


*RBW 100 kHz
*VBW 30 kHz
Marker 1 [T1]
84.83 dBµV
Ref 100 dBµV
*Att 10 dB
SWT 10 ms
924.000000000 MHz
100
90
80
70
60
50
40
30
20
10
0
1 PK
MAXH
A
PS
6DB
AC
Start 902 MHz
2.6 MHz/
Stop 928 MHz
Date: 25.AUG.2016 15:43:38

Graph 3.4.1

3.5 Average time of occupancy of hopping frequency

Frequency Range:	☒ 902-928MHz ☐ 2400-2483.5MHz ☐ 5725-5850MHz		
Measured / Calculated Time sec	**Period sec**	**Limit sec**	**Result**
0.3	20	0.4	**Pass**
Period:	☐ 10s ☒ 20s ☐ 30s ☒ 0.4s multiplied by the channel number		
Channel 20dB Bandwidth:	☒ <250kHz ☐ ≥250kHz		

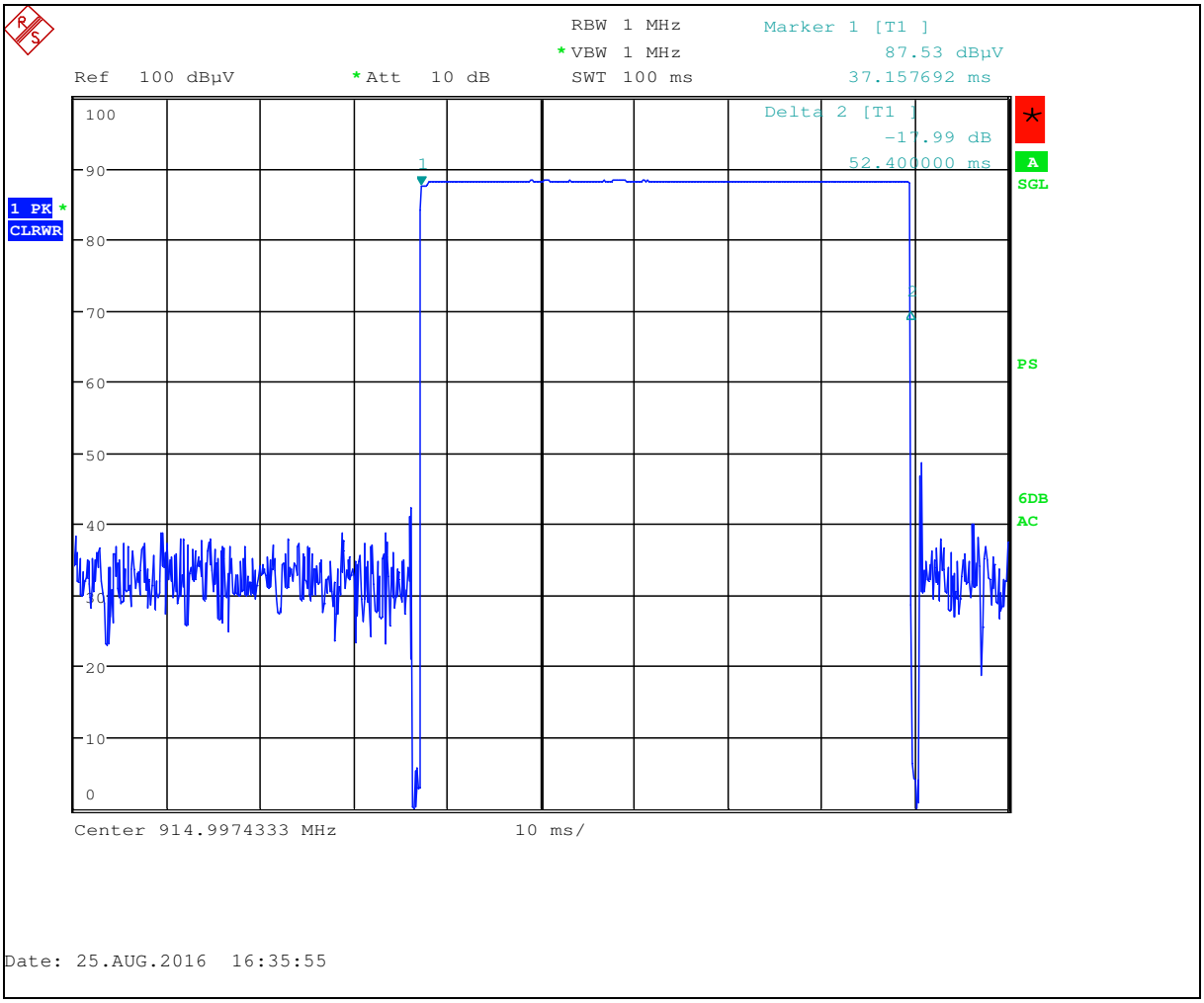
Time of occupancy calculation:

Single occupancy duration (single duration) = 37ms (See graph 3.5.1)
The minimum measured repetition of the channel occupancy (repetition) = 8 (See graph 3.5.2)

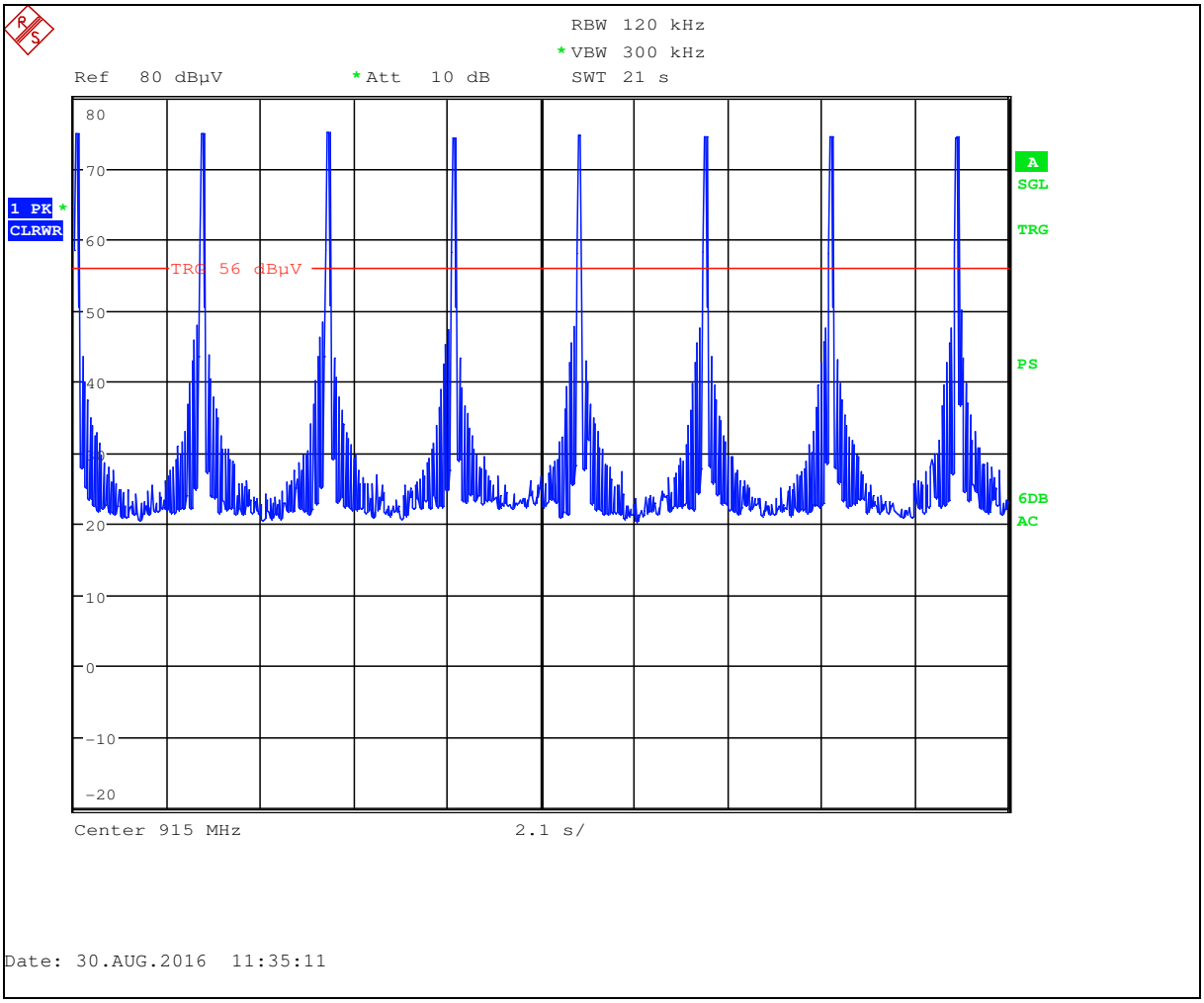
Period = 20

Time of occupancy = (single duration) x (repetition) = 37 x 8 = 296ms=0.3s

Notes: None


RBW 1 MHz
*VBW 1 MHz
SWT 100 ms
Marker 1 [T1]
87.53 dBµV
37.157692 ms
Delta 2 [T1]
-17.99 dB
52.400000 ms
Ref 100 dBµV
*Att 10 dB
100
90
80
70
60
50
40
30
20
10
0
1 PK *
CLRWR
A
SGL
PS
6DB
AC
Center 914.9974333 MHz
10 ms/
Date: 25.AUG.2016 16:35:55

Graph 3.5.1


RBW 120 kHz
*VBW 300 kHz
Ref 80 dBµV
*Att 10 dB
SWT 21 s
80
70
60
50
40
30
20
10
0
-10
-20
1 PK *
CLRWR
TRG 56 dBµV
A
SGL
TRG
PS
6DB
AC
Center 915 MHz
2.1 s/
Date: 30.AUG.2016 11:35:11

Graph 3.5.2

3.6 Antenna conducted spurious emissions

Frequency Range:	☐ 902-928MHz ☐ 2400-2483.5MHz ☐ 5725-5850MHz		
	Minimum Measured Attenuation dB	**Minimum Allowed Attenuation dB**	**Margin dB**
Low Frequency Channel			
Middle Frequency Channel			
Upper Frequency Channel			
Analyzer Settings:	☐ RBW=100KHz		
Minimum Allowed Attenuation:	☐ 20dB ☐ 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

Notes: Test was not performed as EUT does not contain antenna port.

3.7 Radiated spurious emissions

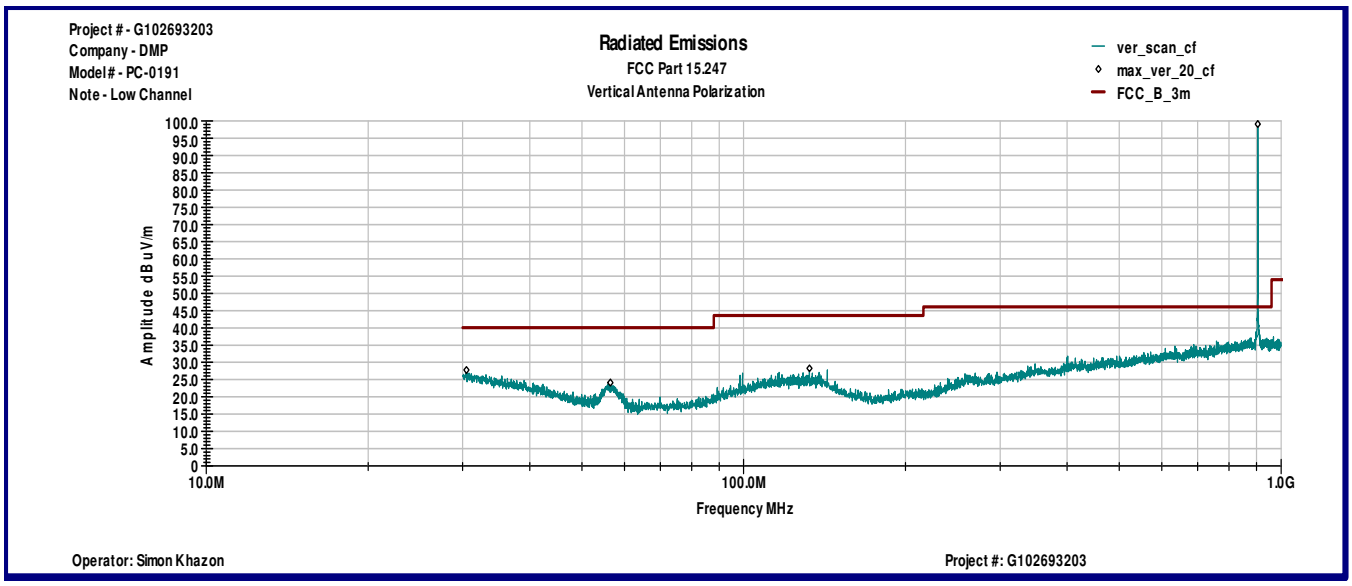
Test location:	☐ OATS	☒ Anechoic Chamber ☐ Other
Test distance:	☐ 10 meters	☒ 3 meters
Test result:		**Pass**
Max. Margin:		1.8dB below the limits

Notes:
1. Emissions at fundamentals are excluded from the Tables;
2. Peak readings of spurious emissions are below the 15.209 Quasi-peak and average limits; therefore no quasi-peak readings below 1Ghz and average readings above 1GHz were taken.

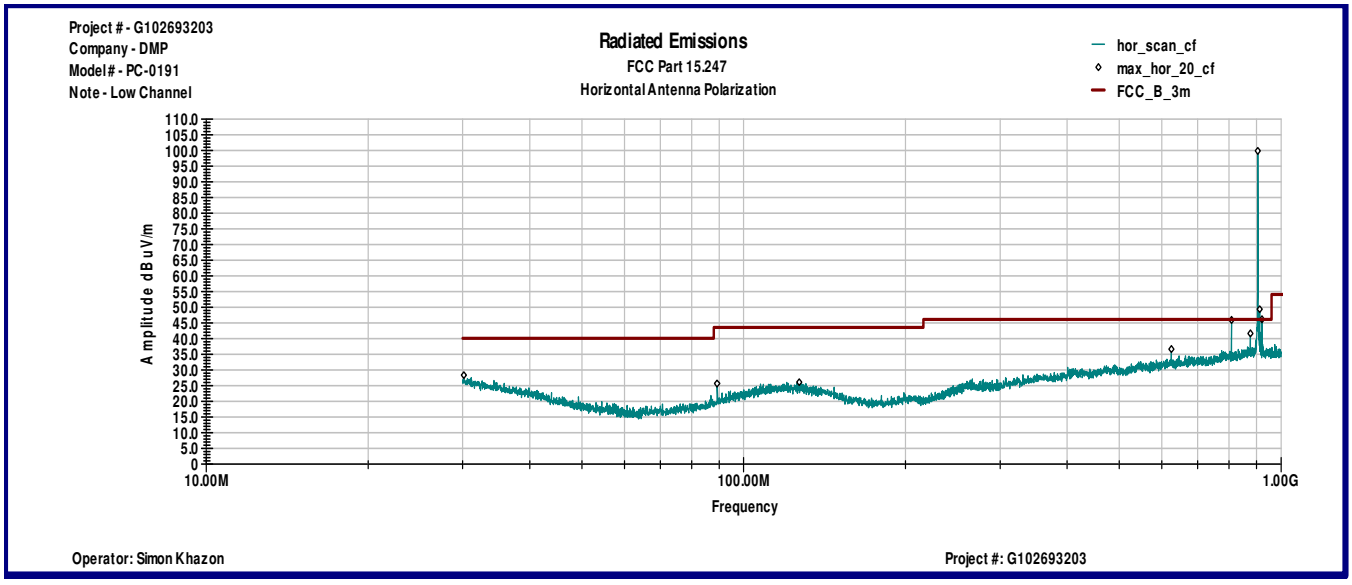
Date:	August 25-30, 2016	**Result: Pass**
Tested by:	Simon Khazon	
Standard:	FCC Part 15.247(d)	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24℃; 45%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Frequency Range 30-1000MHz	

Table 3.7.1

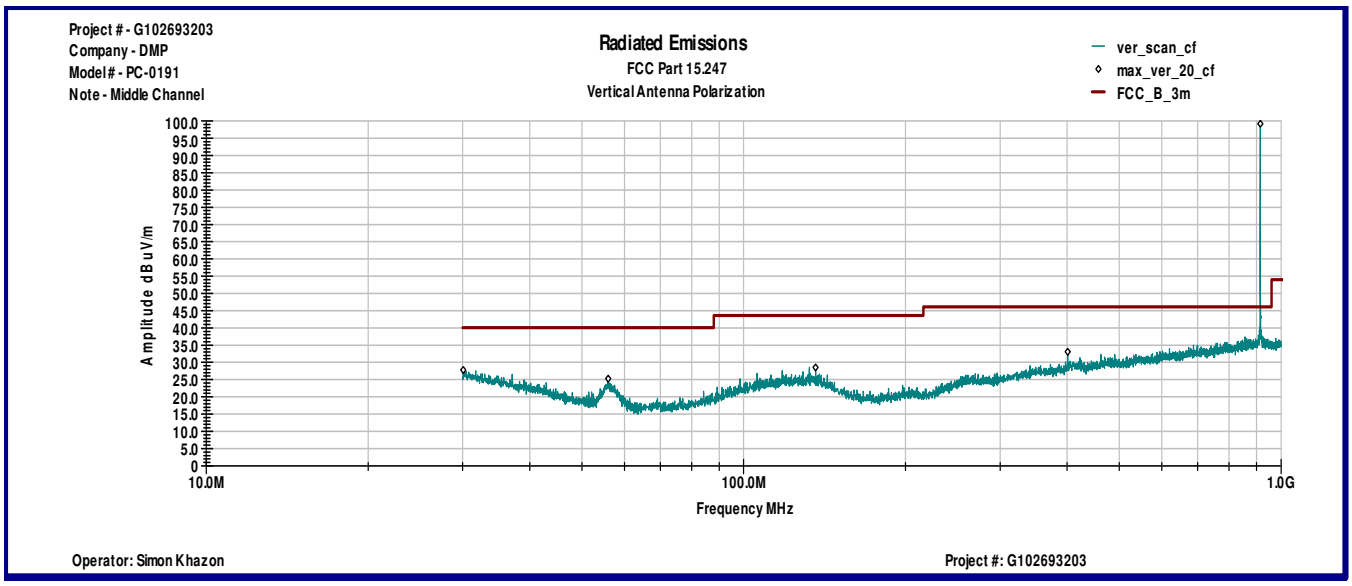
Frequency MHz	Antenna Polarity	Peak Reading dBµV	Total C.F. dB1/m	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
		Lower Channel				
30.485 MHz	V	7.8	19.9	27.7	40.0	-12.3
56.46 MHz	V	16.4	7.7	24.1	40.0	-15.9
132.53 MHz	V	14.5	13.8	28.2	43.5	-15.3
30.139 MHz	H	8.2	20.1	28.3	40.0	-11.7
89.256 MHz	H	15.4	10.2	25.6	43.5	-17.9
624.86 MHz	H	14.3	22.3	36.6	46.0	-9.4
		Middle Channel				
30.069 MHz	V	7.6	20.2	27.8	40.0	-12.3
55.975 MHz	V	17.4	7.8	25.3	40.0	-14.8
136.11 MHz	V	15.0	13.5	28.5	43.5	-15.0
30.589 MHz	H	7.9	19.9	27.8	40.0	-12.2
89.33 MHz	H	14.9	10.2	25.1	43.5	-18.4
126.64 MHz	H	11.9	13.9	25.8	43.5	-17.7
		Upper Channel				
30.554 MHz	V	8.1	19.9	28.0	40.0	-12.0
55.594 MHz	V	16.0	7.9	23.9	40.0	-16.1
137.46 MHz	V	13.9	13.5	27.4	43.5	-16.2
30.935 MHz	H	9.0	19.7	28.7	40.0	-11.3
89.33 MHz	H	14.9	10.2	25.1	43.5	-18.4
113.28 MHz	H	13.2	13.7	26.9	43.5	-16.6



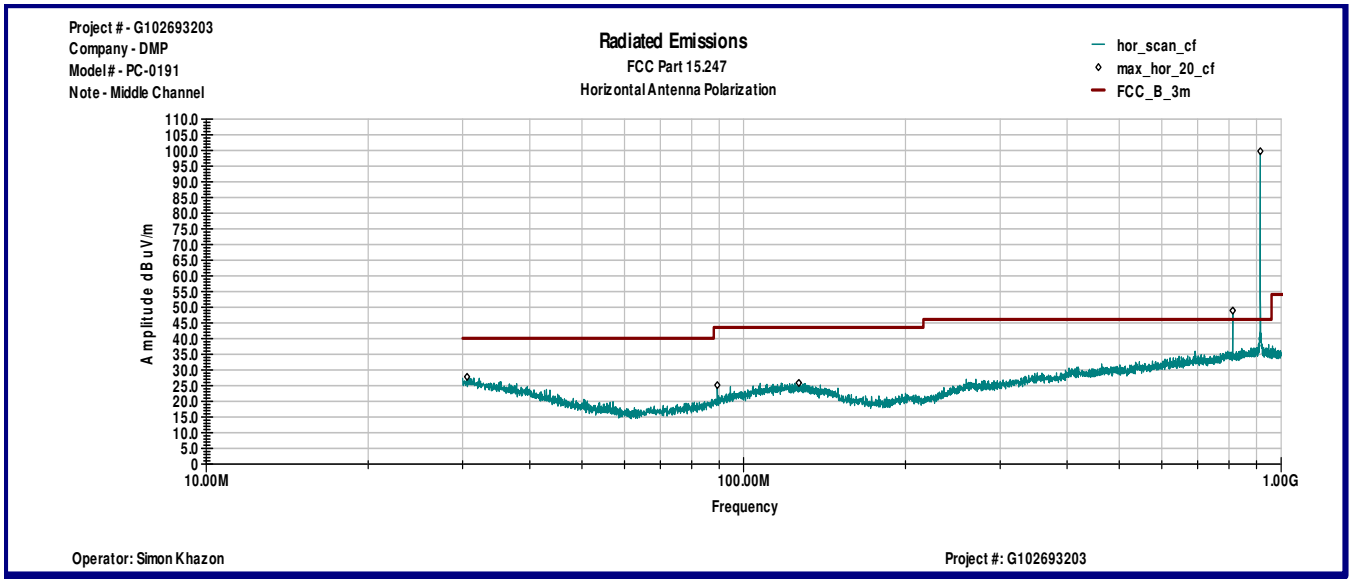
Graph 3.7.1



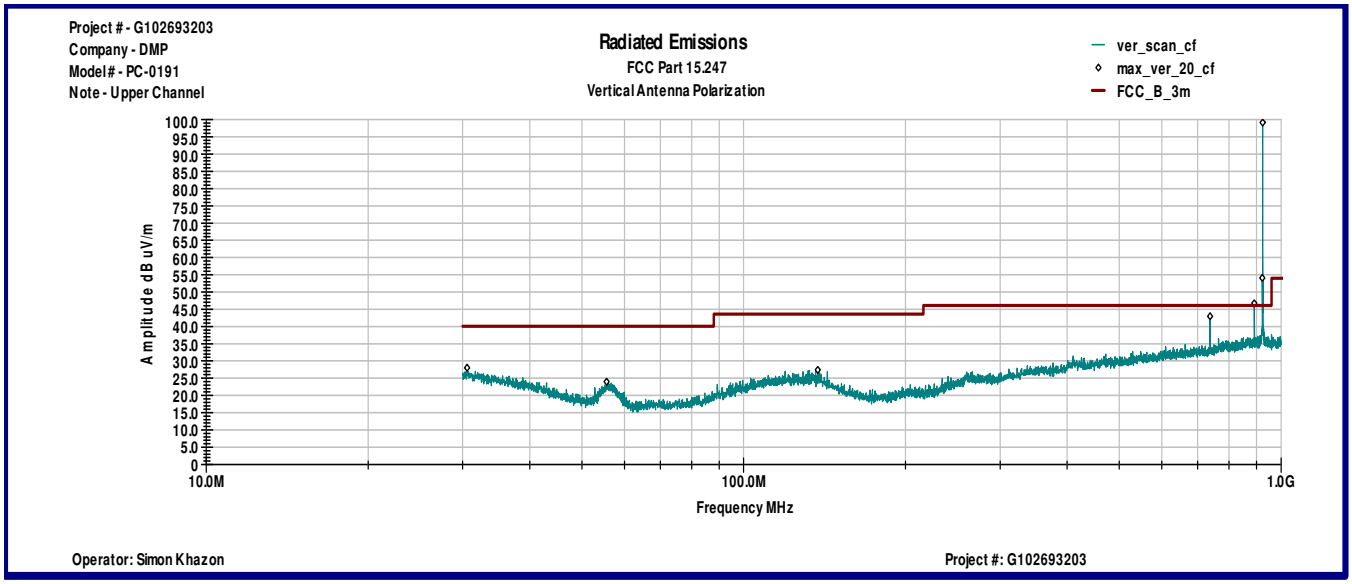
Graph 3.7.2



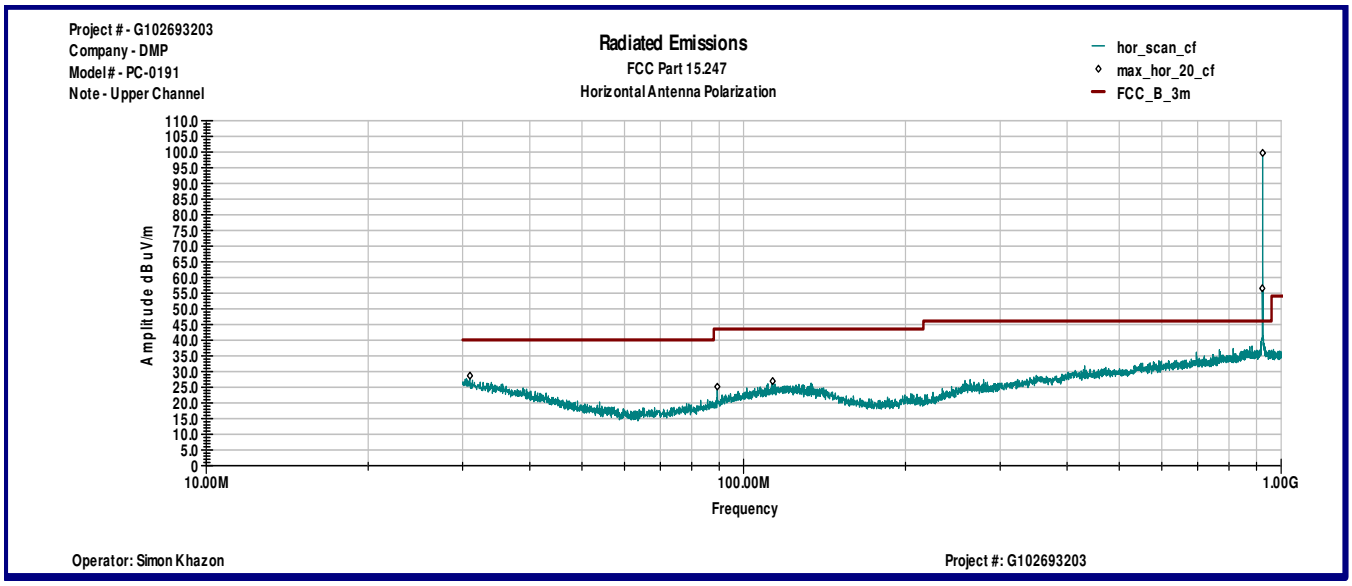
Graph 3.7.3



Graph 3.7.4



Graph 3.7.5

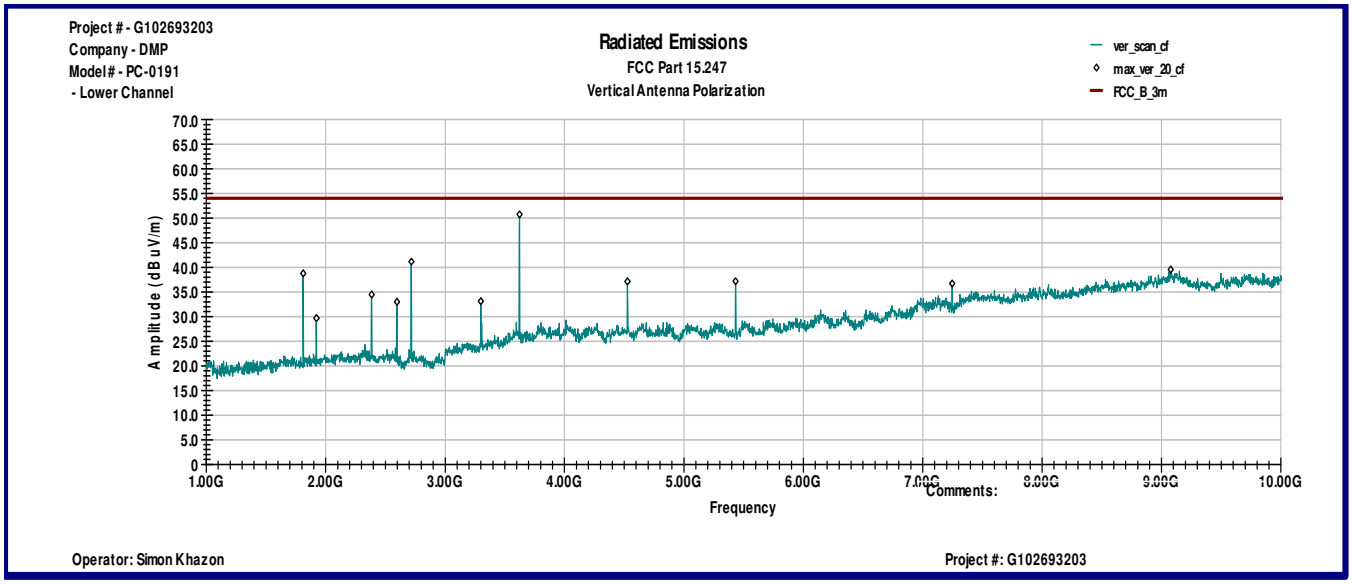


Graph 3.7.6

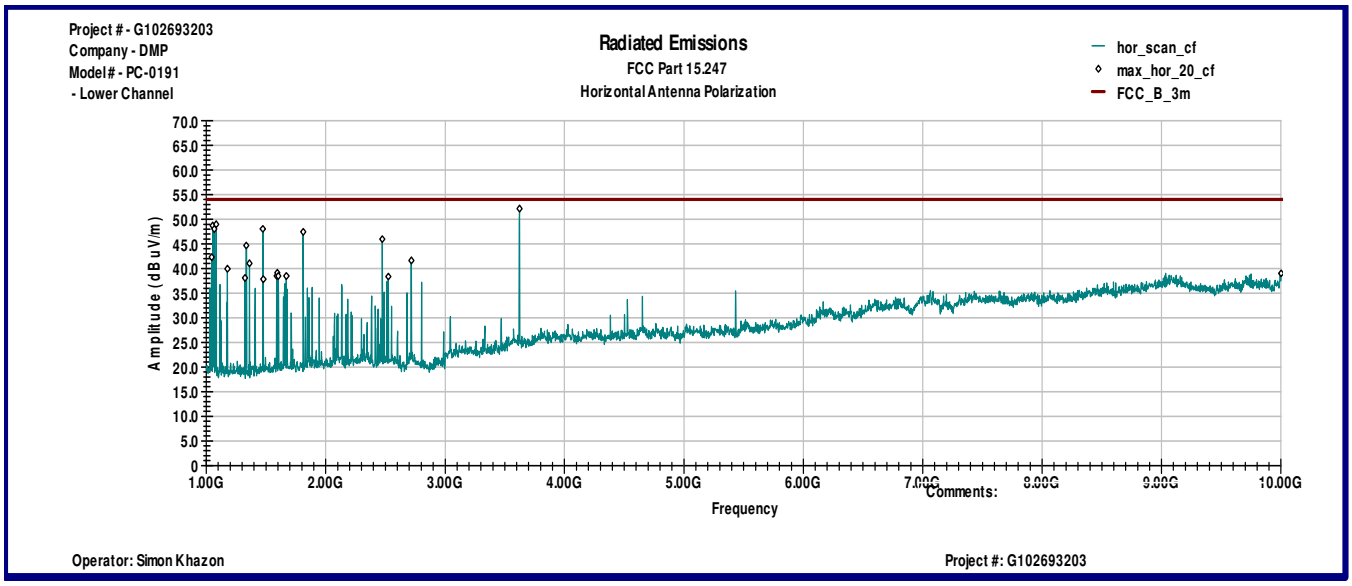
Date:	August 25-30, 2016	**Result: Pass**
Tested by:	Simon Khazon	
Standard:	FCC Part 15.247(d)	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24℃; 45%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Lower Channel Frequency Range 1-10GHz	

Table 3.7.2

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
1.8126 GHz	V	52.8	29.5	43.6	38.7	54.0	-15.2
2.386 GHz	V	46.9	31.5	43.9	34.5	54.0	-19.5
2.7177 GHz	V	52.5	32.6	44.0	41.2	54.0	-12.8
3.6229 GHz	V	58.6	35.7	43.5	50.7	54.0	-3.3
4.528 GHz	V	42.5	37.0	42.3	37.1	54.0	-16.9
5.4331 GHz	V	40.5	38.5	41.8	37.2	54.0	-16.8
7.246 GHz	V	36.7	41.3	41.3	36.7	54.0	-17.3
9.0769 GHz	V	36.1	43.8	40.4	39.5	54.0	-14.5
1.0463 GHz	H	59.5	25.9	43.0	42.3	54.0	-11.7
1.054 GHz	H	65.9	25.9	43.1	48.7	54.0	-5.3
1.0823 GHz	H	66.0	26.0	43.1	49.0	54.0	-5.0
1.1774 GHz	H	56.7	26.4	43.1	39.9	54.0	-14.0
1.324 GHz	H	54.3	27.0	43.2	38.1	54.0	-15.9
1.3343 GHz	H	60.8	27.0	43.2	44.7	54.0	-9.3
1.3626 GHz	H	57.1	27.2	43.2	41.0	54.0	-12.9
1.4731 GHz	H	63.7	27.6	43.3	48.0	54.0	-6.0
1.8126 GHz	H	61.8	29.2	43.6	47.4	54.0	-6.6
2.4734 GHz	H	58.4	31.5	43.9	46.0	54.0	-8.0
2.5249 GHz	H	50.7	31.7	44.0	38.4	54.0	-15.6
2.7177 GHz	H	53.2	32.4	44.0	41.6	54.0	-12.4
3.6229 GHz	H	60.2	35.5	43.5	52.2	54.0	-1.8
10.0 GHz	H	35.7	44.7	41.4	39.0	54.0	-15.0



Graph 3.7.7

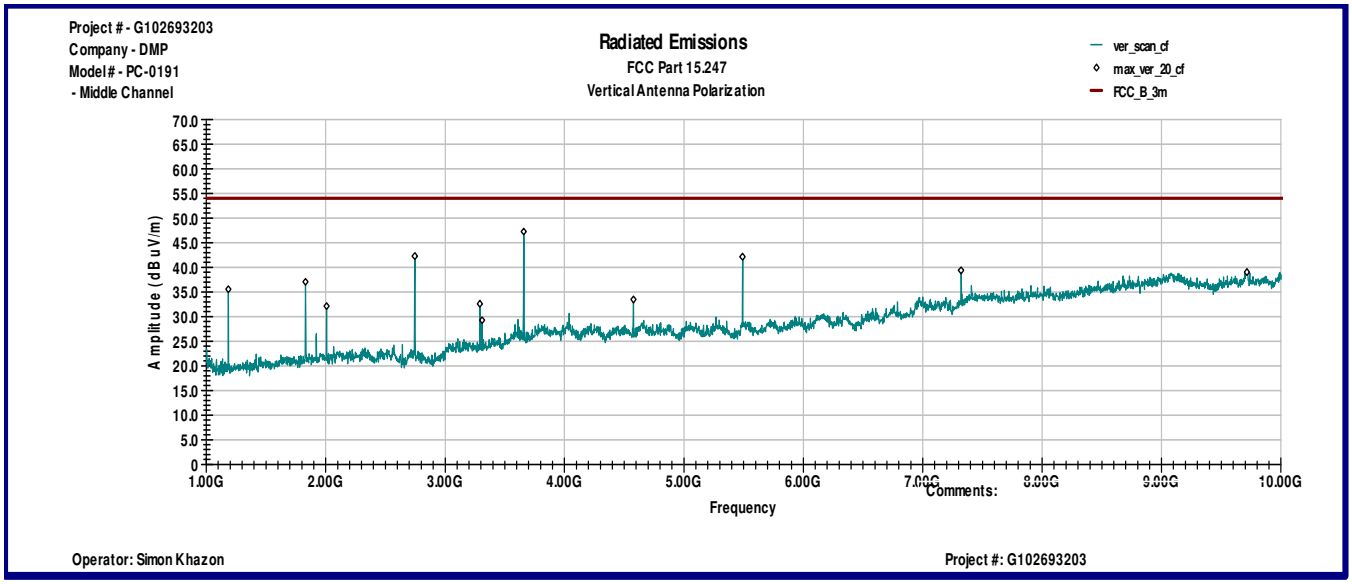


Graph 3.7.8

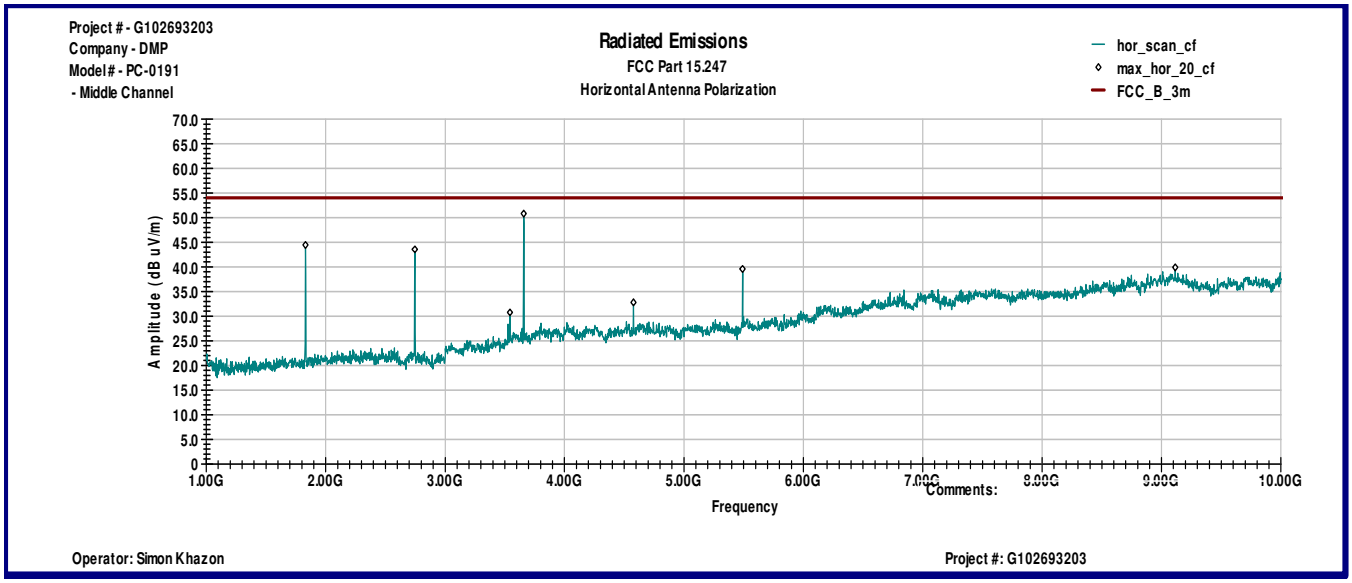
Date:	August 25-30, 2016	**Result: Pass**
Tested by:	Simon Khazon	
Standard:	FCC Part 15.247(d)	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24℃; 45%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Middle Channel Frequency Range 1-10GHz	

Table 3.7.3

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
1.1851 GHz	V	52.2	26.4	43.1	35.5	54.0	-18.5
1.8306 GHz	V	51.1	29.6	43.6	37.1	54.0	-16.9
2.008 GHz	V	45.5	30.4	43.7	32.1	54.0	-21.9
2.746 GHz	V	53.5	32.7	44.0	42.2	54.0	-11.7
3.2911 GHz	V	41.8	34.6	43.9	32.6	54.0	-21.4
3.3091 GHz	V	38.5	34.7	43.8	29.3	54.0	-24.7
3.6589 GHz	V	54.9	35.8	43.5	47.2	54.0	-6.7
4.5769 GHz	V	38.7	37.0	42.3	33.5	54.0	-20.5
5.4897 GHz	V	45.3	38.6	41.8	42.1	54.0	-11.8
7.3206 GHz	V	39.1	41.5	41.2	39.4	54.0	-14.6
9.7146 GHz	V	35.6	44.5	41.0	39.0	54.0	-15.0
1.8306 GHz	H	58.8	29.2	43.6	44.4	54.0	-9.5
2.746 GHz	H	55.0	32.5	44.0	43.5	54.0	-10.4
3.5431 GHz	H	39.2	35.2	43.7	30.7	54.0	-23.3
3.6589 GHz	H	58.7	35.6	43.5	50.8	54.0	-3.2
4.5769 GHz	H	38.2	36.9	42.3	32.8	54.0	-21.2
5.4897 GHz	H	42.8	38.6	41.8	39.6	54.0	-14.4
9.1154 GHz	H	36.6	43.7	40.4	39.9	54.0	-14.1



Graph 3.7.9

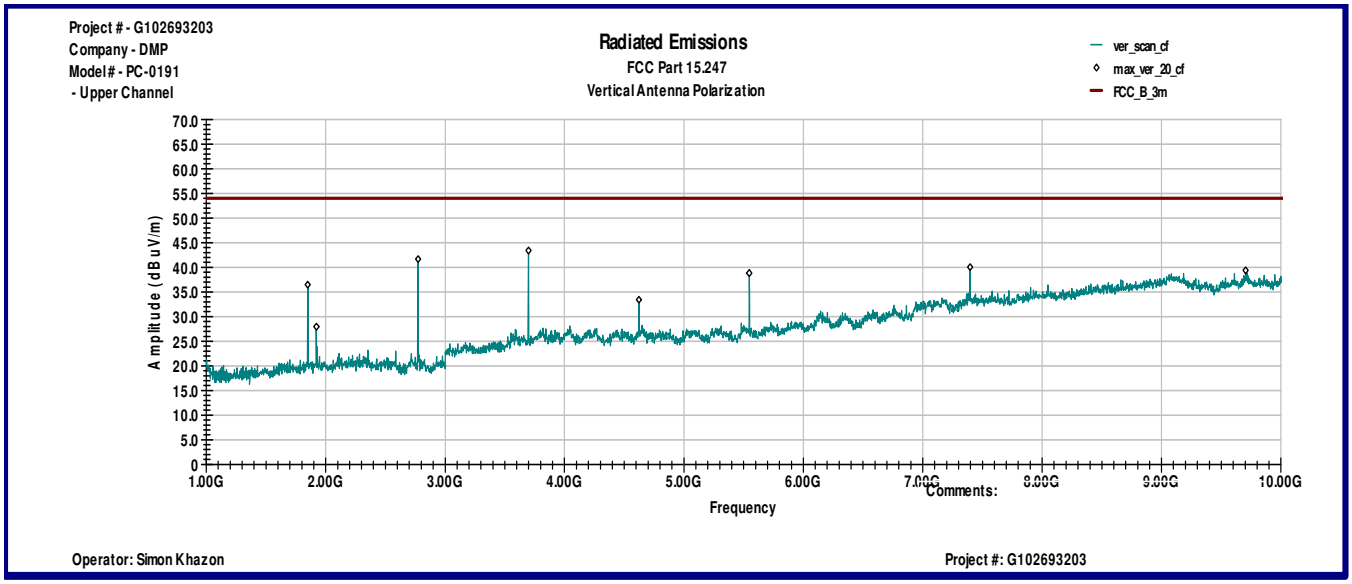


Graph 3.7.10

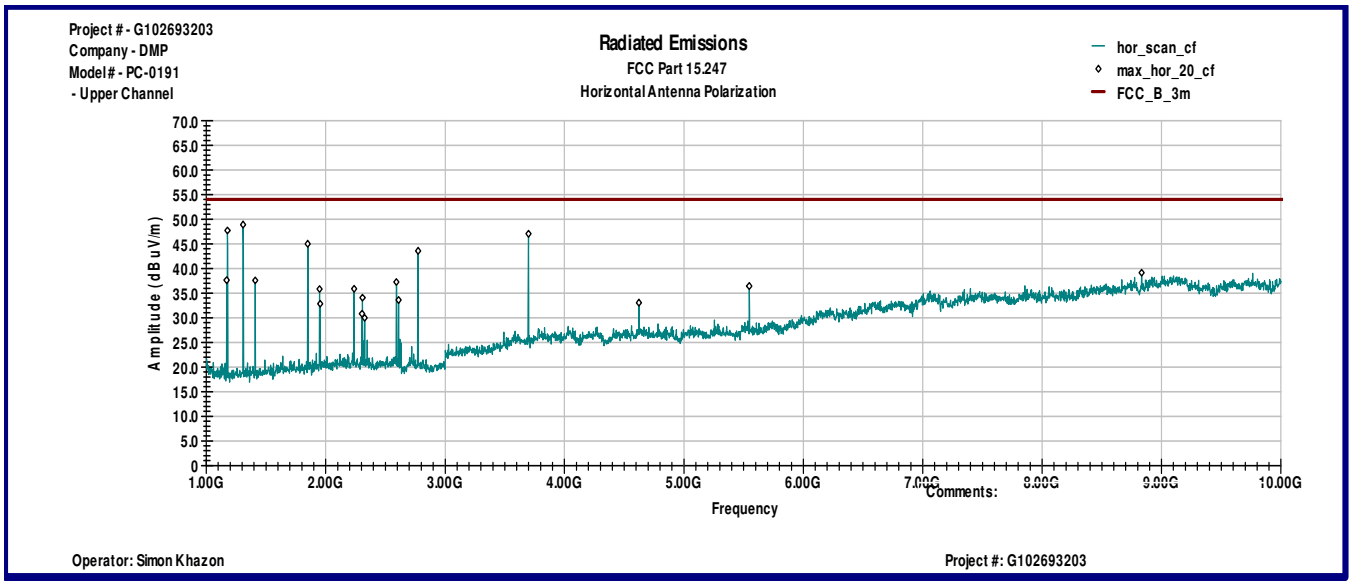
Date:	August 25-30, 2016	**Result: Pass**
Tested by:	Simon Khazon	
Standard:	FCC Part 15.247(d)	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24℃; 45%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	Upper Channel Frequency Range 1-10GHz	

Table 3.7.4

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
1.8486 GHz	V	50.4	29.7	43.6	36.5	54.0	-17.5
2.7743 GHz	V	52.9	32.8	44.0	41.7	54.0	-12.3
3.6974 GHz	V	50.9	35.9	43.4	43.4	54.0	-10.6
5.5463 GHz	V	41.9	38.7	41.8	38.8	54.0	-15.2
7.3977 GHz	V	39.4	41.7	41.1	40.0	54.0	-13.9
9.7043 GHz	V	35.9	44.5	41.0	39.4	54.0	-14.6
1.1774 GHz	H	64.4	26.4	43.1	47.7	54.0	-6.3
1.3086 GHz	H	65.1	26.9	43.2	48.9	54.0	-5.1
1.8486 GHz	H	59.3	29.3	43.6	45.0	54.0	-9.0
2.7743 GHz	H	54.9	32.6	44.0	43.6	54.0	-10.4
3.6974 GHz	H	54.8	35.7	43.4	47.0	54.0	-7.0
4.6231 GHz	H	38.3	37.0	42.2	33.0	54.0	-21.0
5.5463 GHz	H	39.6	38.6	41.8	36.4	54.0	-17.6
8.8326 GHz	H	36.0	43.4	40.3	39.1	54.0	-14.8



Graph 3.7.11



Graph 3.7.12

Date:	August 25-30, 2016	**Result: Pass**
Tested by:	Simon Khazon	
Standard:	FCC Part 15.247(d)	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24℃; 45%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.7.5

Frequency	Antenna		Ant. CF	Cable loss	Pre-amp	Peak Reading	Total @ 3m	Limit	Margin	Comments
MHz	Polarity	Hts(cm)	dB1/m	dB	Gain (dB)	dBµV	dBµV/m	dBµV/m	dB	
Bandege Compliance										
902.00	V	119	21.7	2.6	0.0	14.9	39.2	46.0	-6.8	
902.00	H	155	21.7	2.6	0.0	14.7	39.0	46.0	-7.0	
928.00	V	112	21.9	2.6	0.0	11.9	36.4	46.0	-9.6	
928.00	H	174	21.9	2.6	0.0	13.6	38.1	46.0	-7.9	

3.8 RF Exposure Compliance

The maximum measured antenna radiated power, P is 4.78 dBm

The antenna gain, G is 1.0dBi

The maximum EIRP power = P + G
ERP = 4.78 + 1.0= 5.78dBm, or 0.0038W

The limits for Maximum Permissible Exposure (MPE) for transmitter operating at 902-928MHz, MPE is 928/1500 = 0.619mW/cm^2, or 6.2W/m^2

The Power Density, S is related to EIRP with the equation:
S = EIRP / 4πD^2, where D is the safe separation distance and = 0.2m, or 20cm
S = 0.004 / 4π*0.2^2,
S = 0.08W/m^{2,}, or below the Maximum Permissible Exposure (MPE) of 6.2W/m^2

3.9 Transmitter power line conducted emissions

Test location: ☐ OATS ☐ Anechoic Chamber ☐ Other

Test result: **N/A**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: dB below the limits

Notes: Test was not performed as EUT is battery operated.

3.10 Receiver/digital device radiated emissions

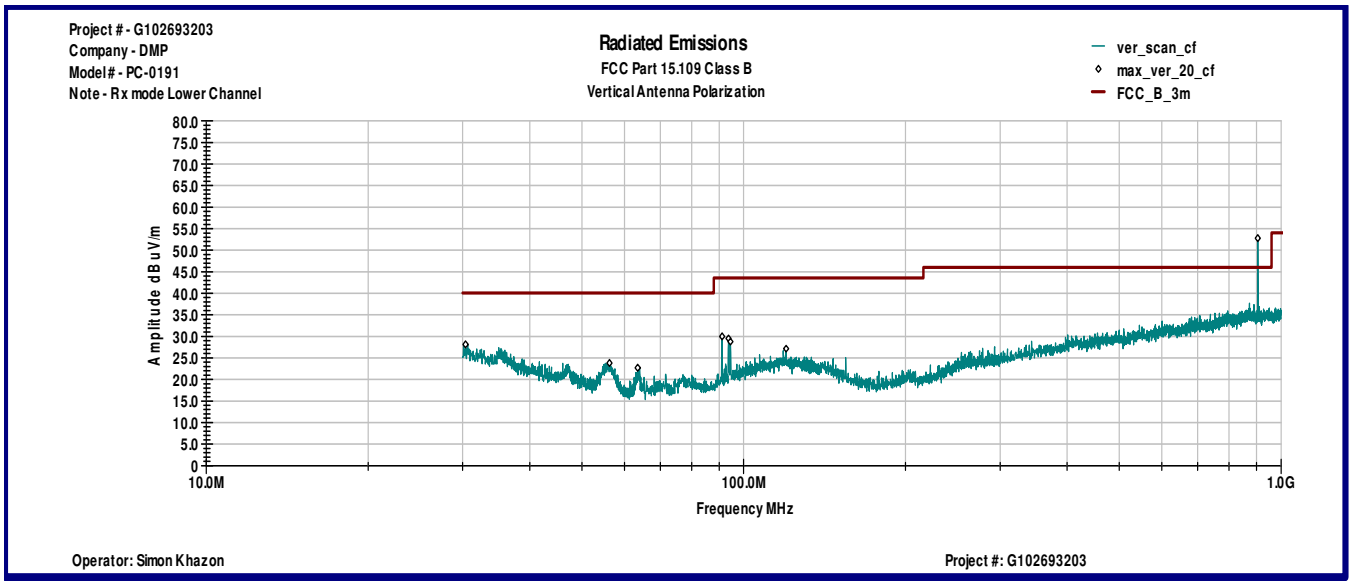
Test location:	☐ OATS ☒ Anechoic Chamber
Test distance:	☐ 10 meters ☒ 3 meters
Test result:	**Pass**
Frequency range:	30MHz-5000MHz
Max. Emissions margin:	11.9dB below the limits

Notes: Emissions from a Signal Generator at fundamentals were excluded from the Tables.

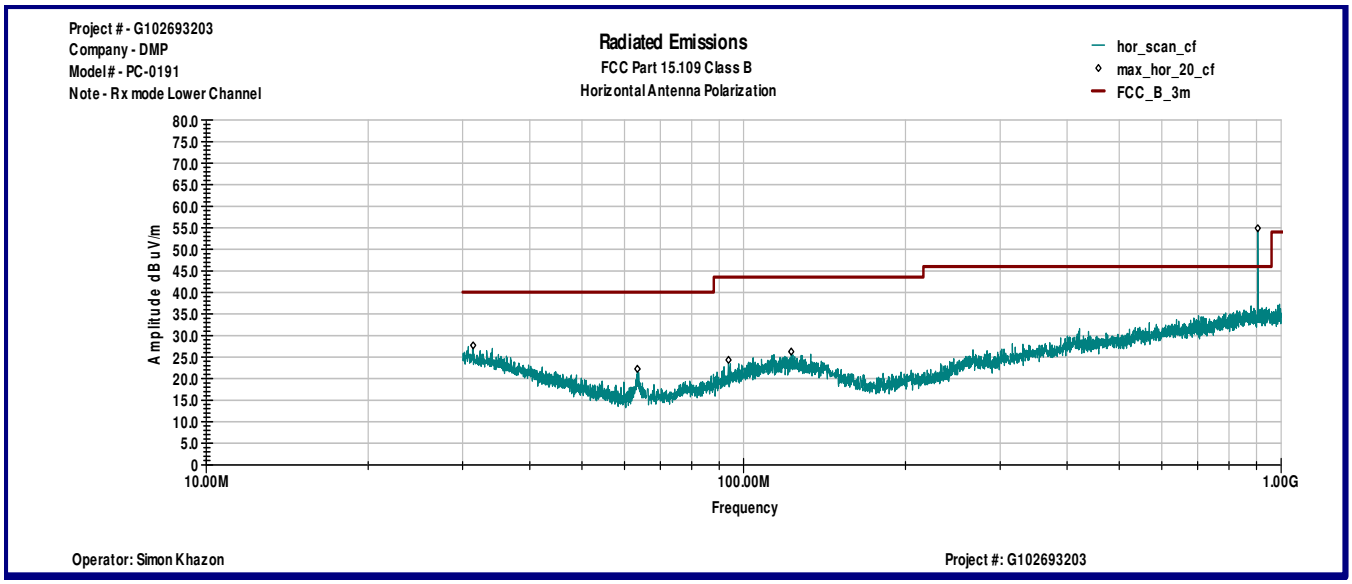
Date:	August 26-30, 2016	**Result: Pass**
Tested by:	Simon Khazon	
Standard:	FCC Part 15.209	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	24℃; 54%(RH); 96.3kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.10.1

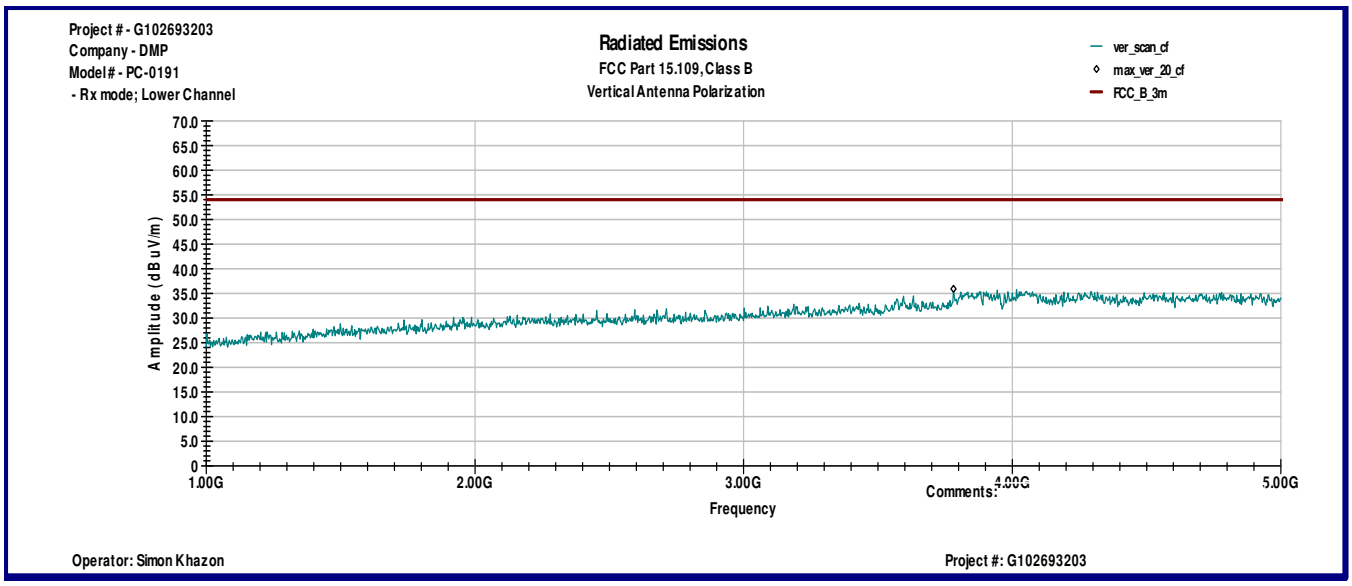
Frequency MHz	Antenna Polarity	Peak Reading dBµV	Total C.F. dB1/m	Total at 3m dBµV/m	Limit dBµV/m	Margin dB
		Lower Channel				
30.381 MHz	V	8.1	20.0	28.1	40.0	-11.9
91.121 MHz	V	19.3	10.7	30.0	43.5	-13.6
119.92 MHz	V	13.2	13.9	27.1	43.5	-16.4
31.385 MHz	H	8.3	19.4	27.7	40.0	-12.3
63.456 MHz	H	15.3	6.9	22.3	40.0	-17.7
122.68 MHz	H	12.3	14.0	26.3	43.5	-17.3
		Middle Channel				
35.645 MHz	V	11.5	17.0	28.5	40.0	-11.5
91.121 MHz	V	20.9	10.7	31.6	43.5	-12.0
116.27 MHz	V	12.3	13.8	26.1	43.5	-17.4
154.84 MHz	V	13.8	12.3	26.1	43.5	-17.4
30.346 MHz	H	7.9	20.0	27.9	40.0	-12.1
127.68 MHz	H	12.2	13.9	26.1	43.5	-17.4
		Upper Channel				
35.126 MHz	V	10.0	17.4	27.3	40.0	-12.7
56.113 MHz	V	17.1	7.8	24.9	40.0	-15.1
94.479 MHz	V	16.7	11.4	28.1	43.5	-15.4
30.381 MHz	H	7.0	20.0	27.0	40.0	-13.0
94.479 MHz	H	14.1	11.4	25.6	43.5	-18.0
118.36 MHz	H	12.4	13.9	26.3	43.5	-17.2



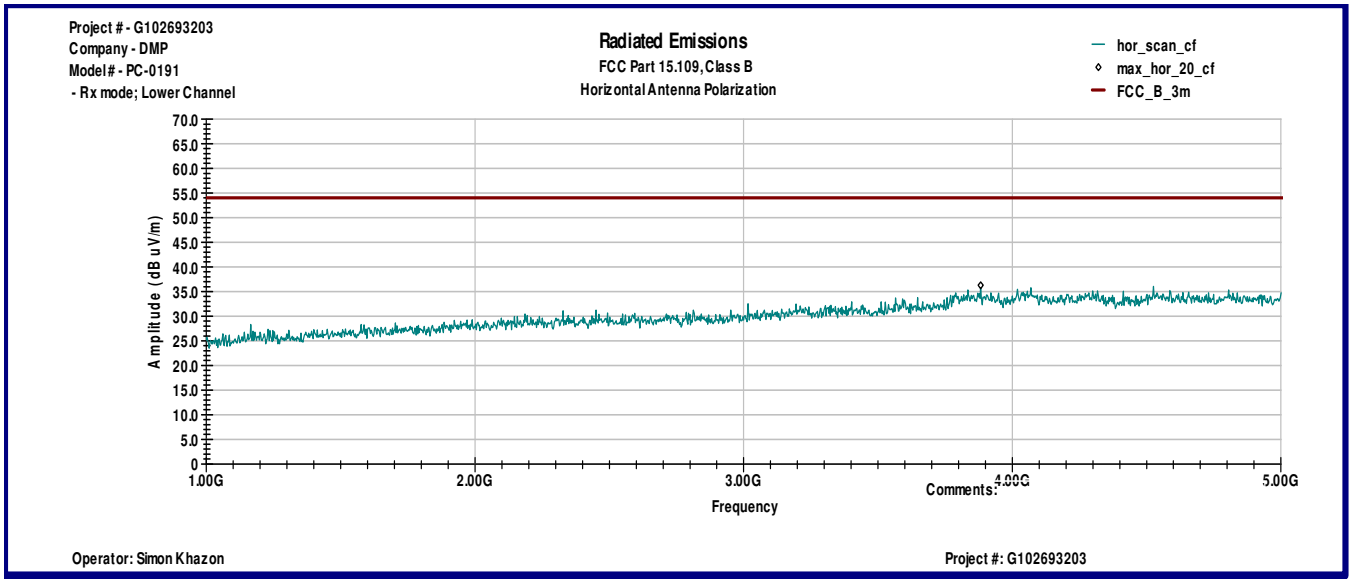
Graph 3.10.1



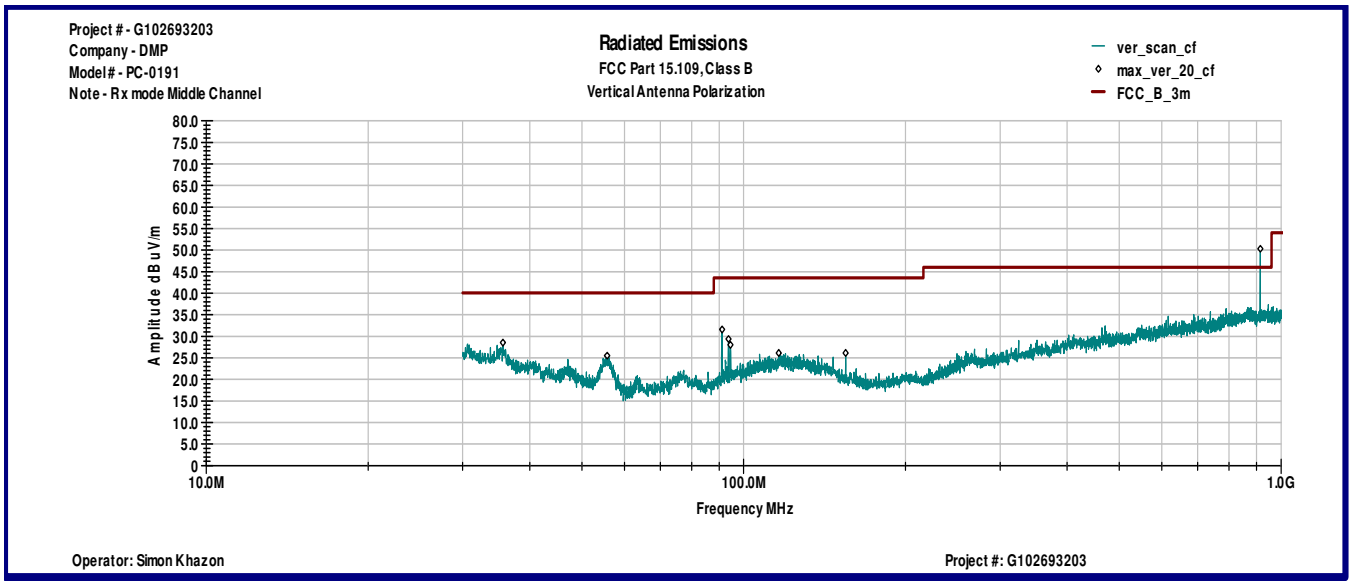
Graph 3.10.2



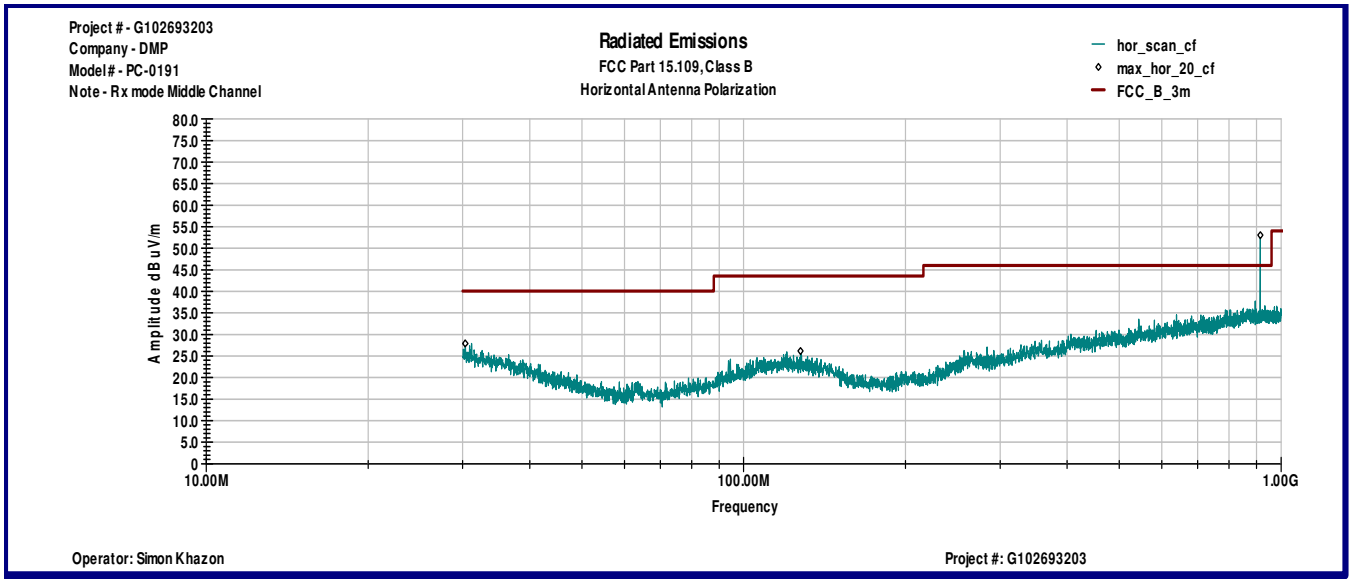
Graph 3.10.3



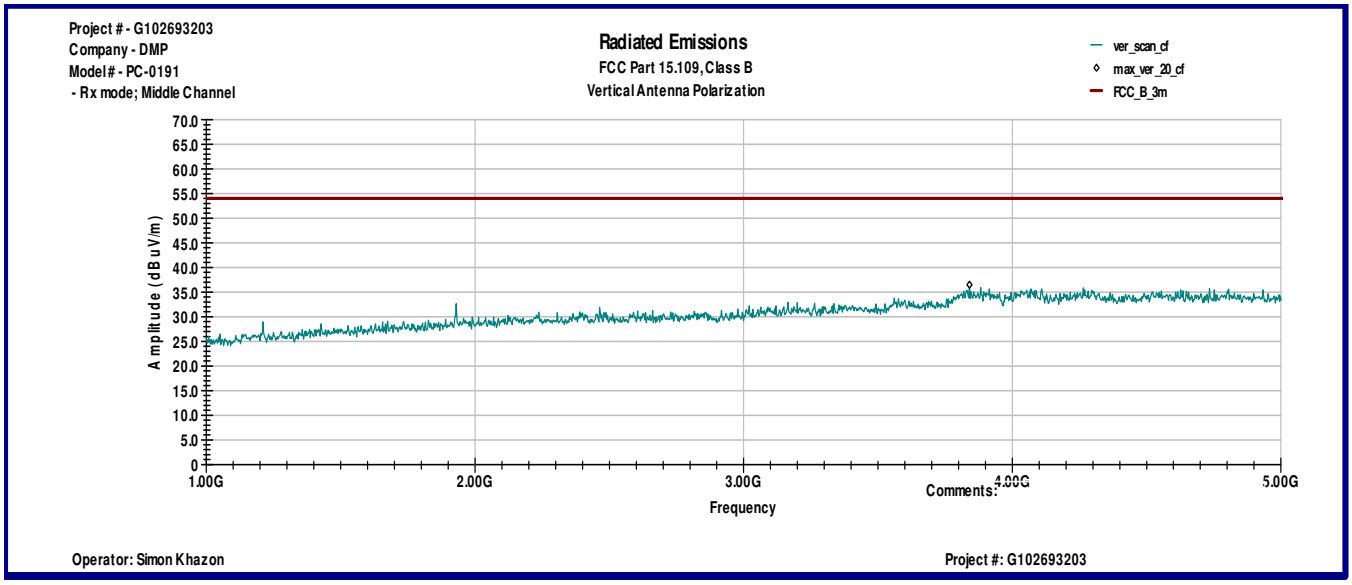
Graph 3.10.4



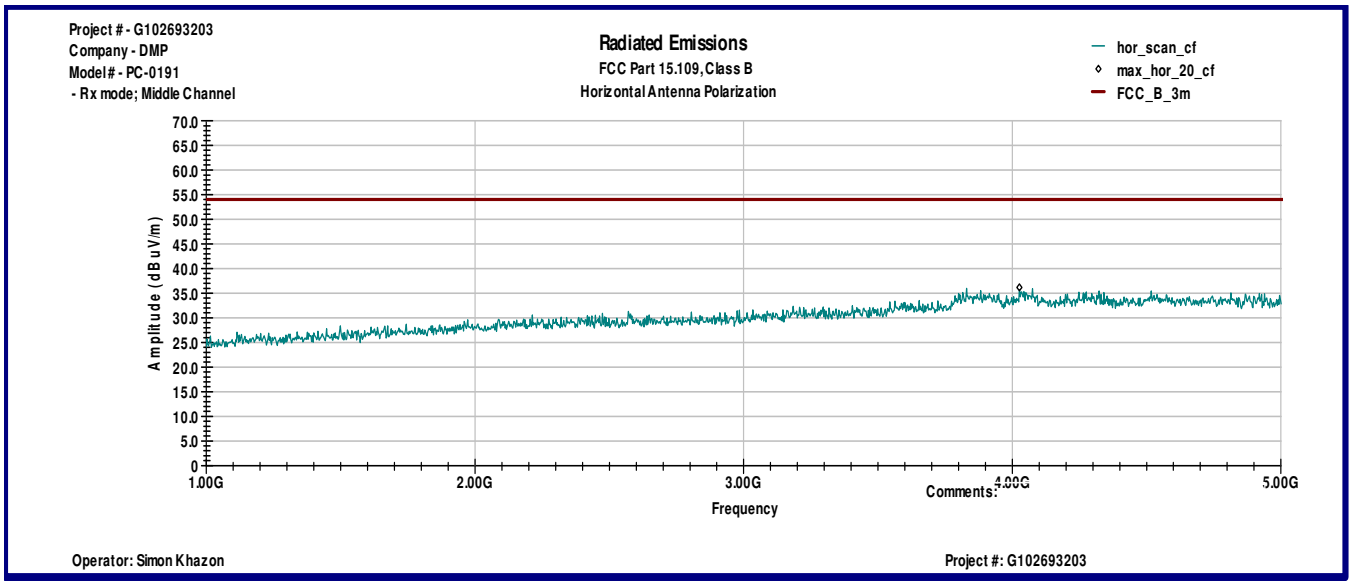
Graph 3.10.5



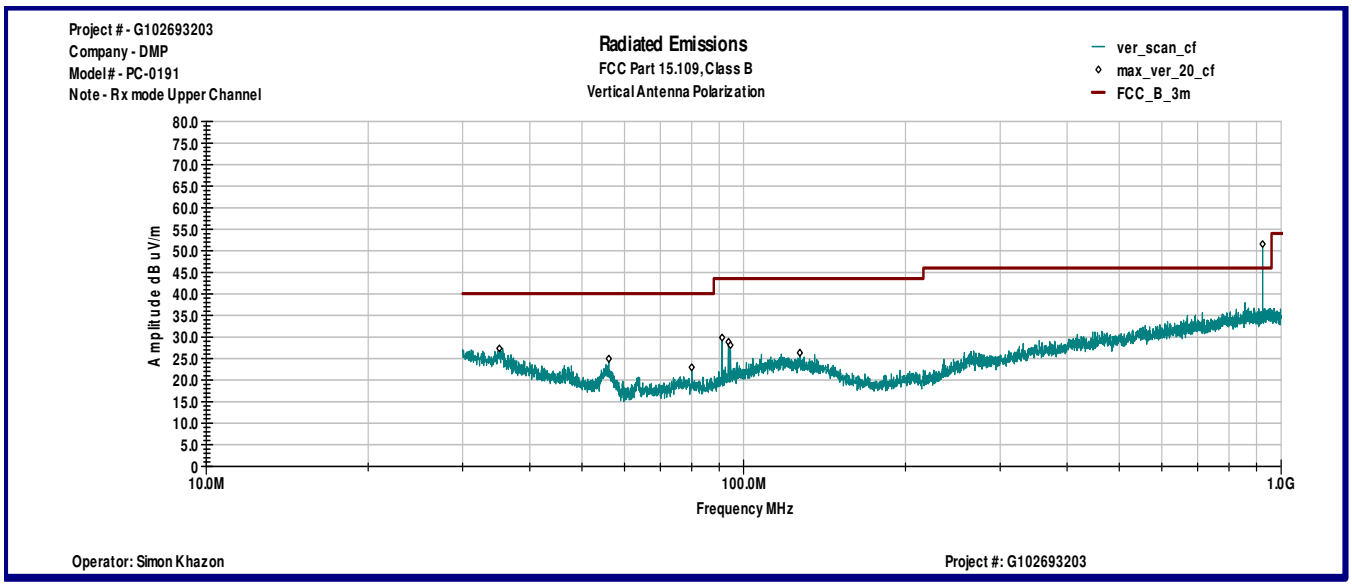
Graph 3.10.6



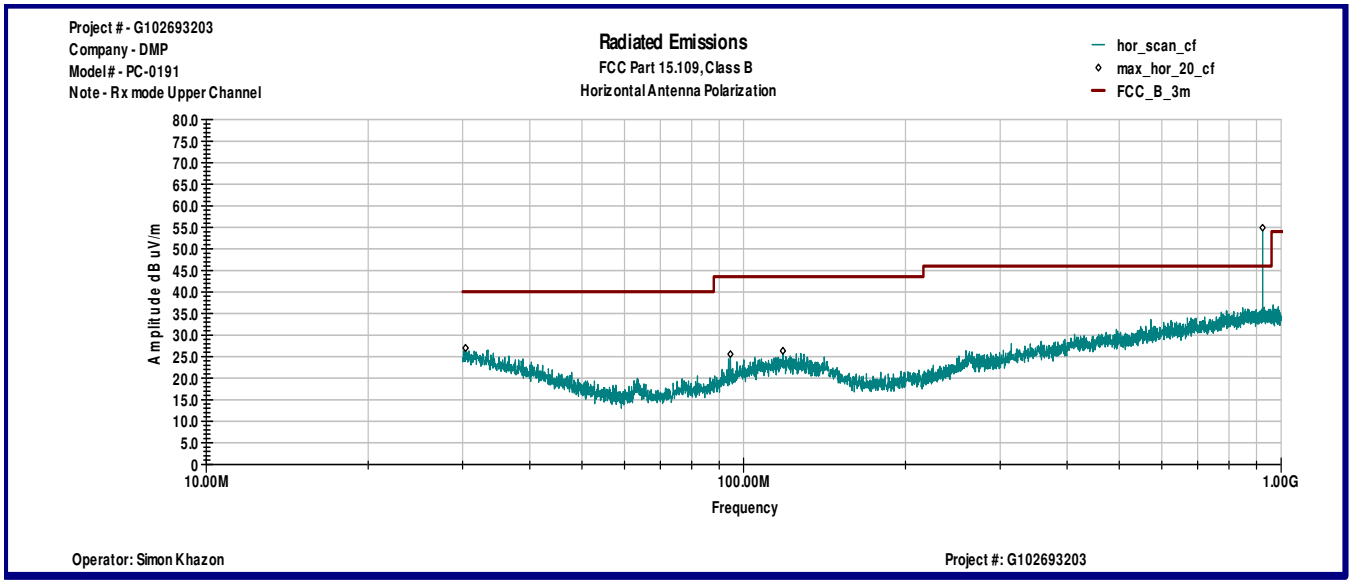
Graph 3.10.7



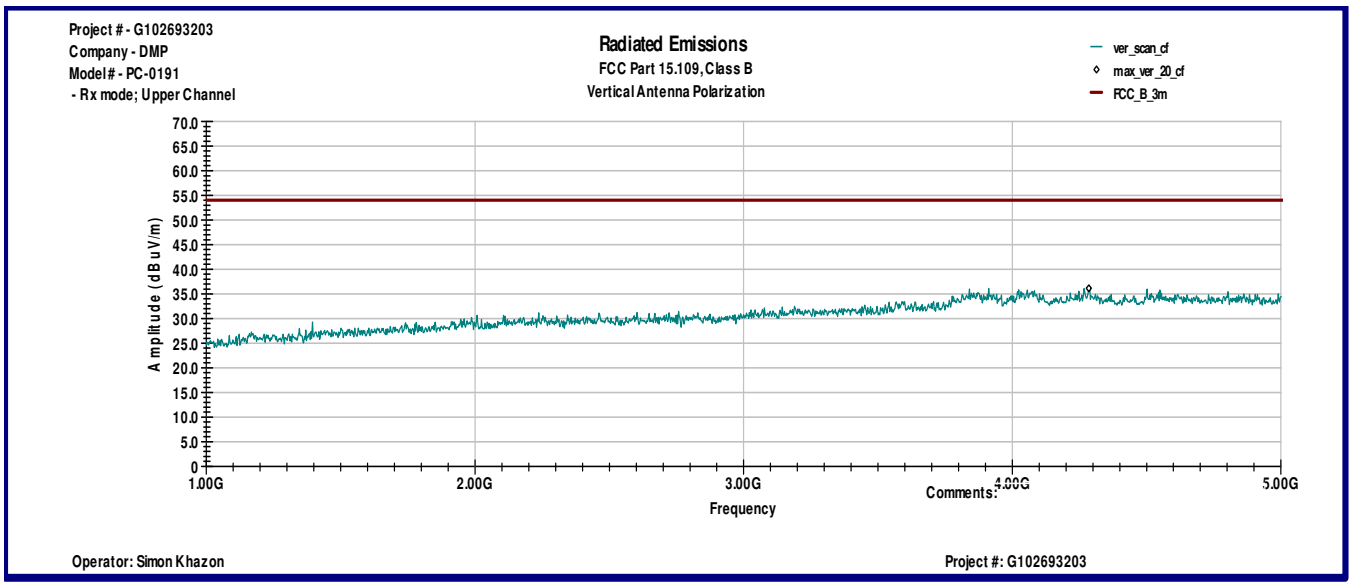
Graph 3.10.8



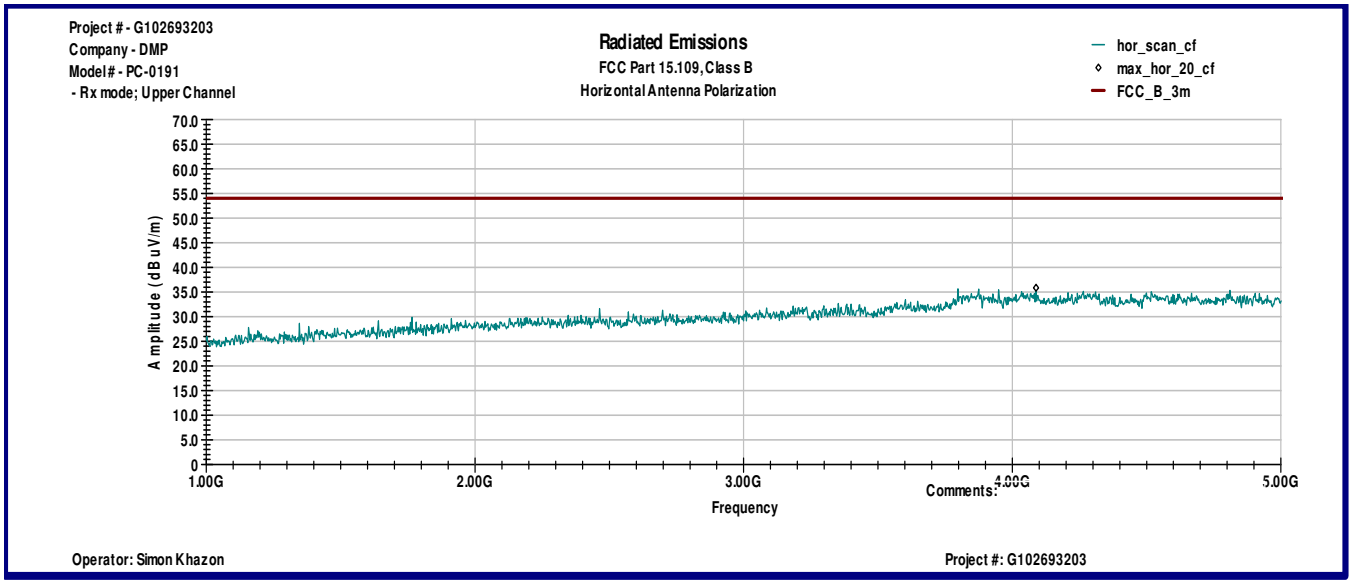
Graph 3.10.9



Graph 3.10.10



Graph 3.10.11



Graph 3.10.12

3.11 Digital device conducted emissions

Test location: ☐ OATS ☐ Anechoic Chamber ☐ Other

Test result: **N/A**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: dB below the limits

Notes: Test was not performed as EUT is battery operated equipment.

4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	FSP 40	100024	12559	01/20/2017	☒
Spectrum Analyzer	R & S	ESU	100398	25283	02/11/2017	☒
Bicono-Log Antenna	Schaffner-Teseq	CBL6112B	2468	9734	01/11/2017	☒
Horn Antenna	EMCO	3115	9507-4513	9936	07/12/2017	☒
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1402232	172081	11/19/2016	☒
High Pass Filter	REACTEL Inc.	7HS-1G-S12	0223	15275	VBU	☒
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	☒

5.0 Revision History

REVISION LEVEL	DATE	REPORT NUMBER	PREPARED	REVIEWED	NOTES
0	08-30-2016	102693203MIN-001	SK	NS	Original Issue