

FCC and Industry Canada Testing of the  
 SureFlap Ltd  
 Automatic Pet Door. Model: iMPD\*\*  
 In accordance with FCC 47 CFR Part 15C,  
 Industry Canada RSS-247 and  
 Industry Canada RSS-GEN



Product Service

Choose certainty.  
 Add value.

Prepared for: SureFlap Ltd  
 7 The Irwin Centre  
 Scotland Road  
 Dry Drayton  
 Cambridge  
 CD23 8AR  
 United Kingdom

FCC ID: XO9-IMP00003  
 IC: 8906A-IMP000003

COMMERCIAL-IN-CONFIDENCE

Date: November 2017  
 Document Number: 75938838-12 | Issue: 03

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Jennifer Harris	23 November 2017	
Authorised Signatory	Matthew Russell	23 November 2017	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C, Industry Canada RSS-247 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Mehadi Choudhury	23 November 2017	
Testing	Graeme Lawler	23 November 2017	

FCC Accreditation  
 UK0010 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation  
 IC2932B-1 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with FCC 47 CFR Part 15C: 2016, Industry Canada RSS-247: Issue 2 (2017-02) and Industry Canada RSS-GEN: Issue 4 (2014-11).

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 is a trading name of TÜV SÜD Ltd  
 Registered in Scotland at East Kilbride,  
 Glasgow G75 0QF, United Kingdom  
 Registered number: SC215164

TÜV SÜD Ltd is a  
 TÜV SÜD Group Company

Phone: +44 (0) 1489 558100  
 Fax: +44 (0) 1489 558101  
[www.tuv-sud.co.uk](http://www.tuv-sud.co.uk)

TÜV SÜD Product Service  
 Octagon House  
 Concorde Way  
 Fareham  
 Hampshire PO15 5RL  
 United Kingdom



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# 1 Report Summary

## 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	03 July 2017
2	To amend the FCC and IC IDs to all capital letters.	26 October 2017
3	Amended section 2.5 and added FCC designation number	22 November 2017

**Table 1**

## 1.2 Introduction

Applicant	SureFlap Ltd
Manufacturer	SureFlap Ltd
Model Number(s)	iMPD** (** represent the colour variation of the product.)
Serial Number(s)	A019-0141698 Not Serialised (75938838-TSR0048) Not Serialised (75938838-TSR0003)
Hardware Version(s)	Door 1.2 RF Module 4.0 LCD 1.0
Software Version(s)	Door 0.9 RF Module 0.9 LCD 1.0
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2016 Industry Canada RSS-247, Issue 2 (2017-02) Industry Canada RSS-GEN: Issue 4 (2014-11)
Order Number	1511
Date	23-December-2016
Date of Receipt of EUT	24-April-2017 and 16-May-2017
Start of Test	05-June-2017
Finish of Test	20-November-2017
Name of Engineer(s)	Mehadi Choudhury and Graeme Lawler
Related Document(s)	ANSI C63.10 (2013) KDB 662911 D01 v02r02



### 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, Industry Canada RSS-247 and Industry Canada RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15C	RSS-247	RSS-GEN			
Configuration and Mode: Pet Door - 2.4 GHz SRD						
2.5	15.205	-	8.10	Restricted Band Edges	Pass	ANSI C63.10
2.3	15.247 (a)(2)	5.2	6.6	Emission Bandwidth	Pass	ANSI C63.10
2.1	15.247 (b)(3)	5.4	-	Maximum Conducted Output Power	Pass	ANSI C63.10 KDB 662911 D01 v02r02
2.4	15.247 (d)	5.5	-	Authorised Band Edges	Pass	ANSI C63.10
2.6	15.247 (d) and 15.205	5.5	6.13	Spurious Radiated Emissions	Pass	ANSI C63.10
2.2	15.247 (e)	5.4	6.12	Power Spectral Density	Pass	ANSI C63.10 KDB 662911 D01 v02r02

**Table 2**



**1.4 Application Form**

EQUIPMENT DESCRIPTION	
Model Name/Number	iMPD** (* ** represent the colour variation of the product.)
Part Number	N/A
Hardware Version	Door 1.2 RF Module 4.0 LCD 1.0
Software Version	Door 0.9 RF Module 0.9 LCD 1.0
FCC ID (if applicable)	XO9-IMP00003
Industry Canada ID (if applicable)	8906A-IMP000003
Technical Description (Please provide a brief description of the intended use of the equipment)	Pet door connected by 2.4 GHz RF to a hub which is connected to the internet. Allows the conditional entry of animals based on RFID tags. Usually situated in an external door of a house.

INTENTIONAL RADIATORS									
Technology	Frequency Band (MHz)	Conducted Declared Output Power (dBm)	Antenna Gain (dBi)	Supported Bandwidth (s) (MHz)	Modulation Scheme(s)	ITU Emission Designator	Test Channels (MHz)		
							Bottom	Middle	Top
802.15.4	2.4 GHz	0	3.82		O-QPSK		2425	2450	2480
RFID	126 kHz	N/A							
RFID	133 kHz	N/A							

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	estimated 32 MHz (would require measurement to confirm)

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
External DC	Nominal Voltage		Maximum Current
Battery	Nominal Voltage		Battery Operating End Point Voltage
	6		5-6.5V
Can EUT transmit whilst being charged?			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>



EXTREME CONDITIONS					
Maximum temperature	40	°C	Minimum temperature	-20	°C

Ancillaries
Please list all ancillaries which will be used with the device.
N/A

ANTENNA CHARACTERISTICS				
<input type="checkbox"/>	Antenna connector		State impedance	Ohm
<input type="checkbox"/>	Temporary antenna connector		State impedance	Ohm
<input checked="" type="checkbox"/>	Integral antenna	Type	PCB	
<input type="checkbox"/>	External antenna	Type		

I hereby declare that the information supplied is correct and complete.

Name: Roger Geere

Position held: Principle Engineer

Date: 27 June 2017



## 1.5 Product Information

### 1.5.1 Technical Description

Pet door connected by 2.4 GHz RF to a hub which is connected to the internet. Allows the conditional entry of animals based on RFID tags. Usually situated in an external door of a house.

### 1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

### 1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: A019-0141698			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: Not Serialised (75938838-TSR0048)			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: Not Serialised (75938838-TSR003)			
0	As supplied by the customer	Not Applicable	Not Applicable

**Table 3**



### 1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Pet Door - 2.4 GHz SRD		
Restricted Band Edges	Graeme Lawler	UKAS
Emission Bandwidth	Mehadi Choudhury	UKAS
Maximum Conducted Output Power	Mehadi Choudhury	UKAS
Authorised Band Edges	Graeme Lawler	UKAS
Spurious Radiated Emissions	Graeme Lawler	UKAS
Power Spectral Density	Mehadi Choudhury	UKAS

**Table 4**

Office Address:

Octagon House  
Concorde Way  
Segensworth North  
Fareham  
Hampshire  
PO15 5RL  
United Kingdom

FCC Designation Number – UK0010 / Industry Canada Registration Number - IC2932B-1





## 2 Test Details

### 2.1 Restricted Band Edges

#### 2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205  
Industry Canada RSS-GEN, Clause 8.10

#### 2.1.2 Equipment Under Test and Modification State

iMPD\*\*, S/N: A019-0141698 - Modification State 0

#### 2.1.3 Date of Test

06-June-2017

#### 2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.13.1.

Plots for average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.3.

Final average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.2.

#### 2.1.5 Environmental Conditions

Ambient Temperature 21.3 °C  
Relative Humidity 37.0 %

#### 2.1.6 Test Results

Pet Door - 2.4 GHz SRD

Frequency (MHz)	Measured Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBµV/m)
2425	2390.0	58.30	46.28
2480	2483.5	63.36	48.12

**Table 5**

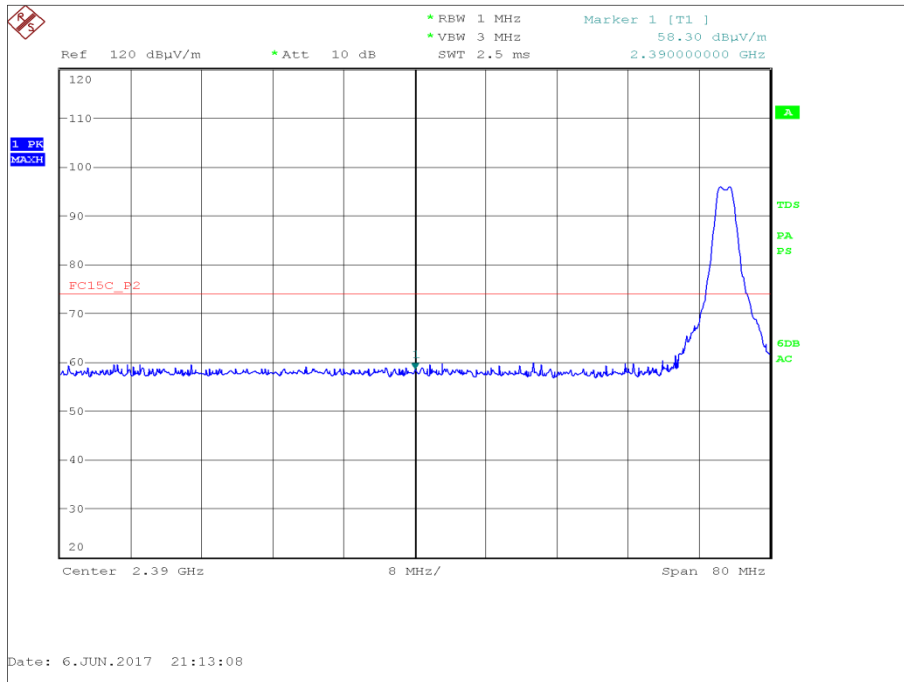


Figure 1 - 2425 MHz - Measured Frequency 2390 MHz - Peak

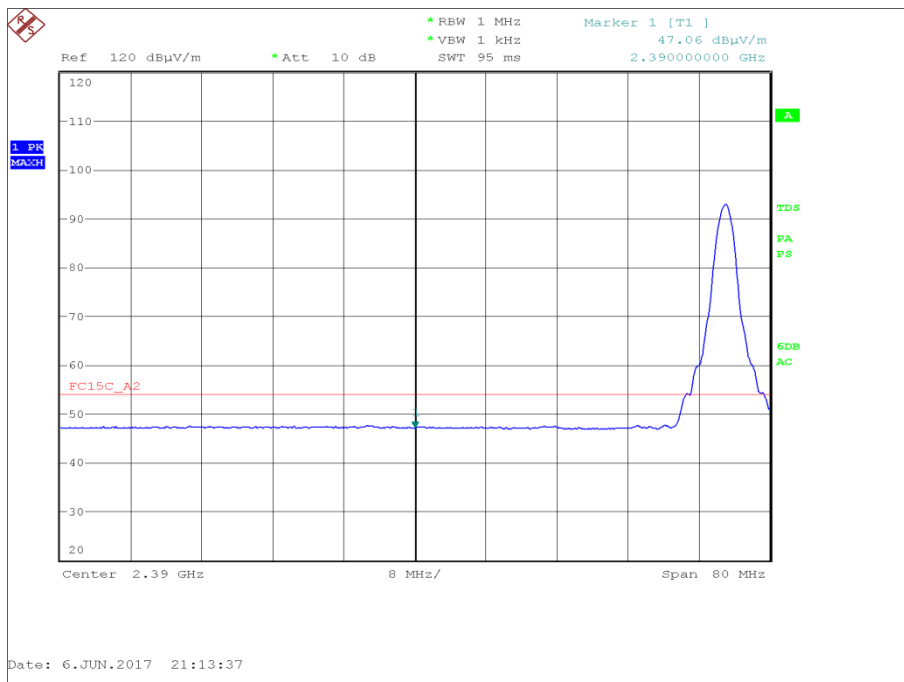


Figure 2 - 2425 MHz - Measured Frequency 2390 MHz - Average

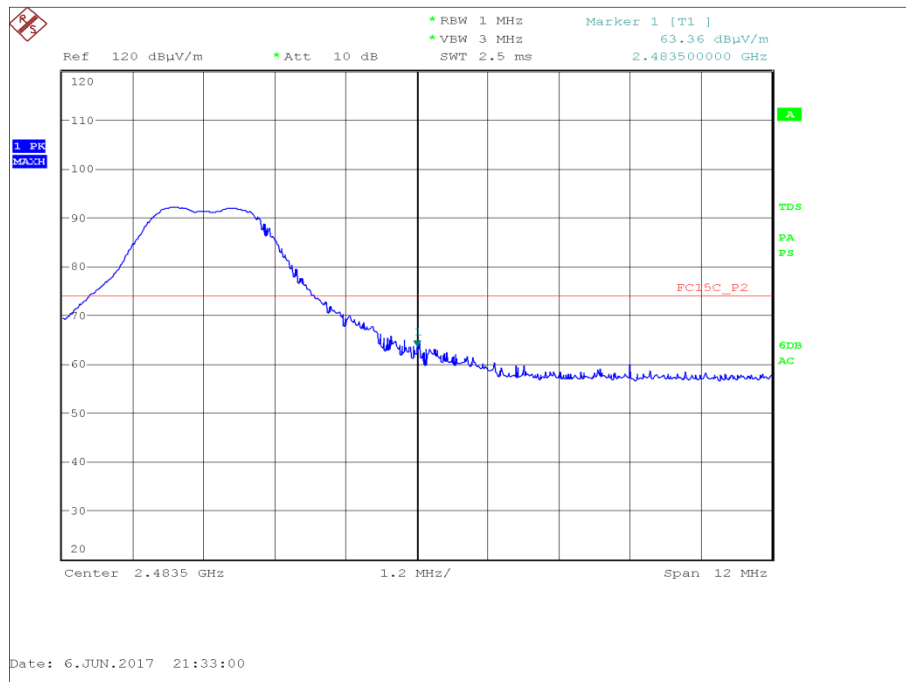


Figure 3 - 2480 MHz - Measured Frequency 2483.5 MHz - Peak

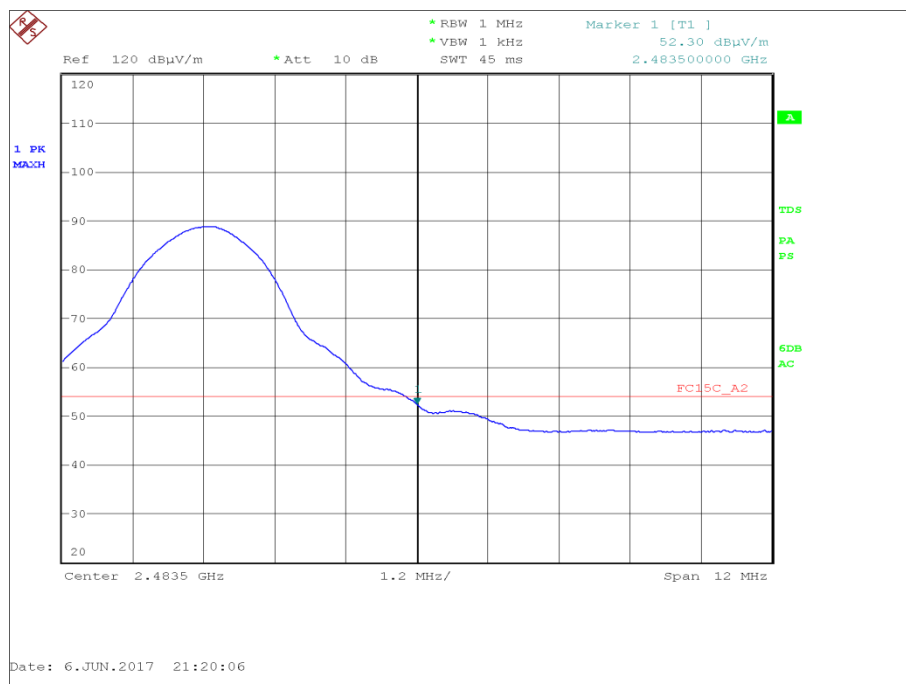


Figure 4 - 2480 MHz - Measured Frequency 2483.5 MHz - Average



FCC 47 CFR Part 15C, Limit Clause 15.205

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54

**Table 6**

Industry Canada RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength (µV/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

**Table 7**

\*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

**2.1.7 Test Location and Test Equipment Used**

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2138	12	2-Feb-2018
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	2-May-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	12-Nov-2017
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Cable (Rx, SMAm-SMAm 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	-	O/P Mon
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	17-Feb-2018

**Table 8**

TU - Traceability Unscheduled  
 O/P Mon – Output Monitored using calibrated equipment



**2.2 Emission Bandwidth**

**2.2.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)  
Industry Canada RSS-247, Clause 5.2  
Industry Canada RSS-GEN, Clause 6.6

**2.2.2 Equipment Under Test and Modification State**

iMPD\*\*, S/N: Not Serialised (75938838-TSR0048) - Modification State 0

**2.2.3 Date of Test**

06-June-2017

**2.2.4 Test Method**

This test was performed in accordance with ANSI C63.10, clause 11.8.2.

**2.2.5 Environmental Conditions**

Ambient Temperature 19.9 - 21.0 °C  
Relative Humidity 52.0 - 53.1 %

**2.2.6 Test Results**

Pet Door - 2.4 GHz SRD

Frequency (MHz)	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
2425	1.59	2.36
2450	1.56	2.36
2480	1.50	2.39

**Table 9**

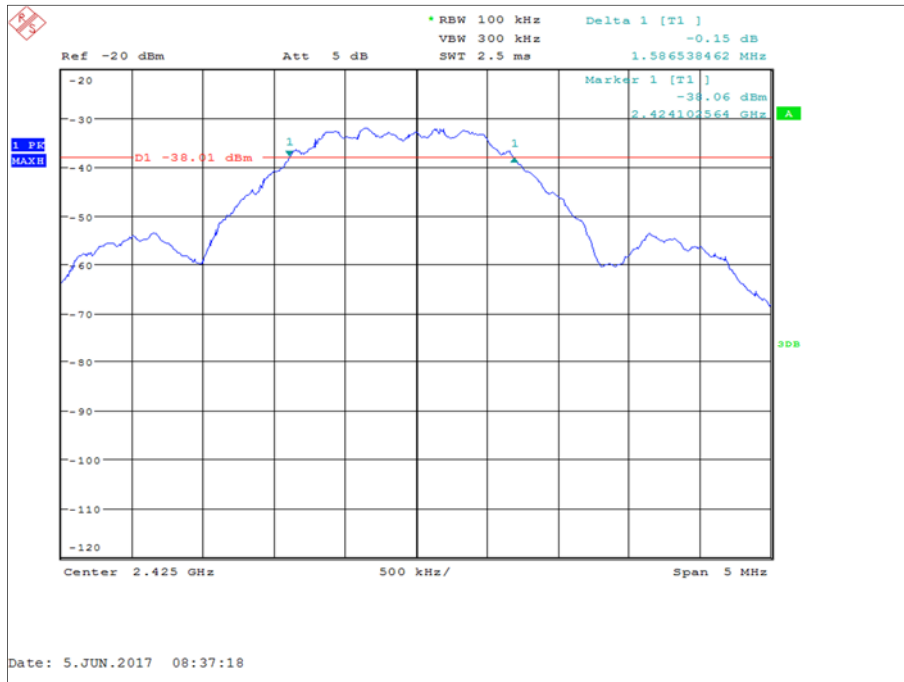


Figure 5 - 2425 MHz

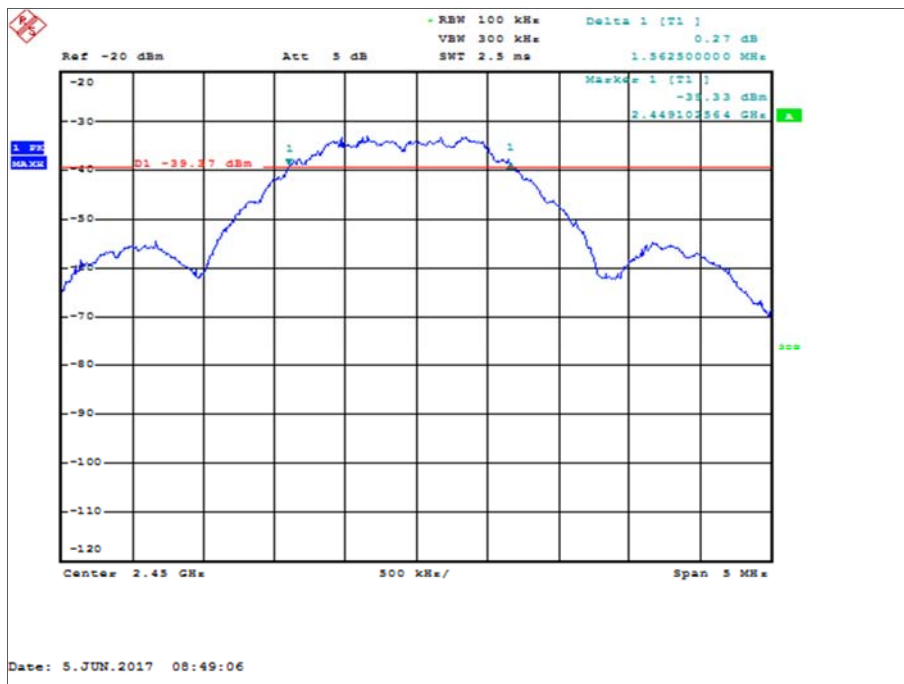
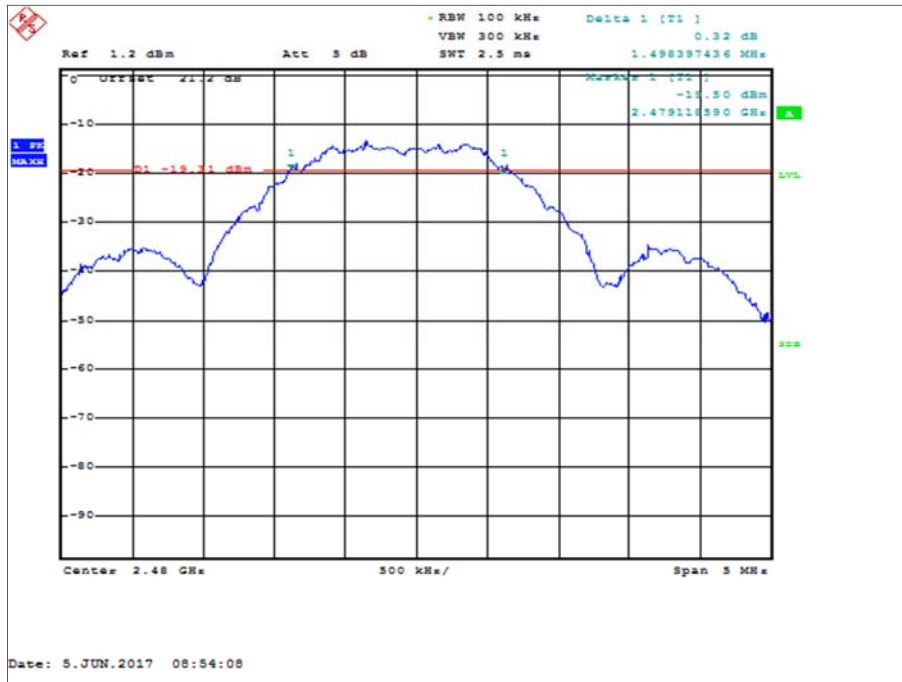


Figure 6 - 2450 MHz



**Figure 7 - 2480 MHz**

FCC 47 CFR Part 15C, Limit Clause 15.247(a)(2)

The minimum 6 dB Bandwidth shall be at least 500 kHz.

Industry Canada RSS-247, Clause 5.2(a)

The minimum 6 dB Bandwidth shall be at least 500 kHz.

**2.2.7 Test Location and Test Equipment Used**

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
20dB SMA Attenuator dc - 18GHz	Sealectro	60-674-1020-89	345	12	30-Jun-2017
Hygrometer	Rotronic	I-1000	3220	12	23-Aug-2017
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-Sep-2017
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	15-Sep-2017
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	8-Sep-2017
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	9-Sep-2017
2 metre SMA Cable	IW Microwave	3PS-1806LC-788-3PS	4829	12	24-Jan-2018

**Table 10**



### 2.3 Maximum Conducted Output Power

#### 2.3.1 Specification Reference

FCC 47 CFR Part 15C Clause 15.247 (b)(3)  
Industry Canada RSS-247, Clause 5.4

#### 2.3.2 Equipment Under Test and Modification State

iMPD\*\*, S/N: Not Serialised (75938838-TSR0048) - Modification State 0

#### 2.3.3 Date of Test

05-June-2017

#### 2.3.4 Test Method

Pet Door - 2.4 GHz SRD

This test was performed in accordance with ANSI C63.10, clause 11.9.1.1.

#### 2.3.5 Environmental Conditions

Ambient Temperature 21.0 °C  
Relative Humidity 53.1 %

#### 2.3.6 Test Results

Pet Door - 2.4 GHz SRD

250 kbps

Frequency (MHz)	Output Power	
	dBm	mW
2425	-8.05	0.16
2450	-8.95	0.13
2480	-10.52	0.09

**Table 11**

#### FCC 47 CFR Part 15C, Limit Clause 15.247 (b)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

#### Industry Canada RSS-247, Limit Clause 5.4 (d)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of the specification.





**2.3.7 Test Location and Test Equipment Used**

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
20dB SMA Attenuator dc - 18GHz	Sealectro	60-674-1020-89	345	12	30-Jun-2017
Thermocouple Thermometer	Fluke	51	3172	12	16-Nov-2017
Hygrometer	Rotronic	I-1000	3220	12	23-Aug-2017
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-Sep-2017
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	15-Sep-2017
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	8-Sep-2017
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	9-Sep-2017
2 metre SMA Cable	IW Microwave	3PS-1806LC-788-3PS	4829	12	24-Jan-2018

**Table 12**



**2.4 Authorised Band Edges**

**2.4.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (d)  
Industry Canada RSS-247, Clause 5.5

**2.4.2 Equipment Under Test and Modification State**

iMPD\*\*, S/N: A019-0141698 - Modification State 0

**2.4.3 Date of Test**

06-June-2017

**2.4.4 Test Method**

The test was performed in accordance with ANSI C63.10, clause 11.13.1.

**2.4.5 Environmental Conditions**

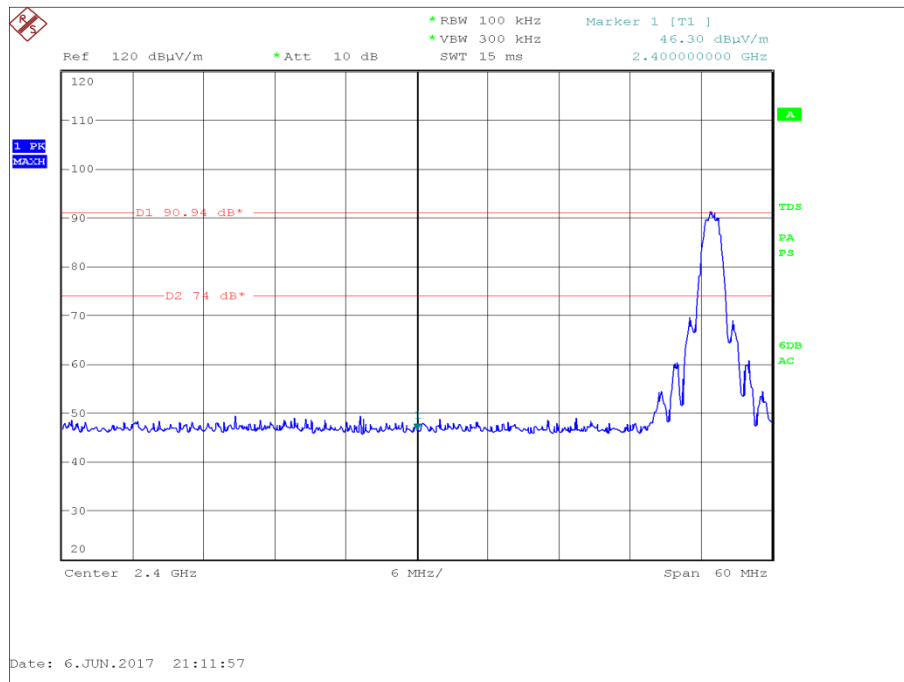
Ambient Temperature 21.3 °C  
Relative Humidity 37.0 %

**2.4.6 Test Results**

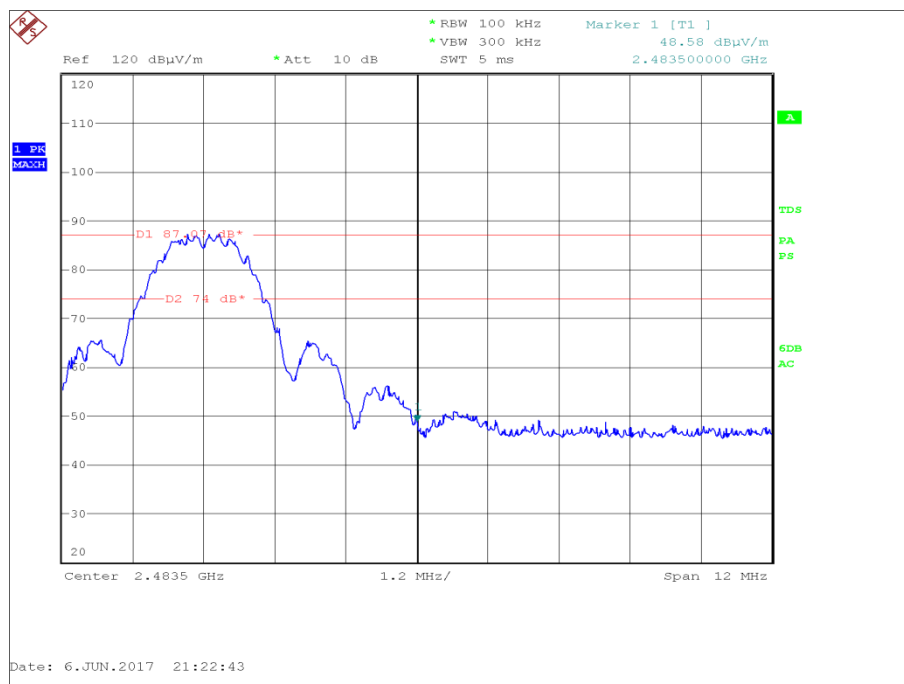
Pet Door - 2.4 GHz SRD

Frequency (MHz)	Measured Frequency (MHz)	Peak Level (dBµV/m)
2425	2400.0	46.30
2480	2483.5	48.58

**Table 13**



**Figure 8 - 2425 MHz - Measured Frequency 2400 MHz**



**Figure 9 - 2480 MHz - Measured Frequency 2483.5 MHz**

FCC 47 CFR Part 15C, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.



Industry Canada RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

**2.4.7 Test Location and Test Equipment Used**

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygromer	Rotronic	A1	2138	12	2-Feb-2018
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	2-May-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	12-Nov-2017
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	23-Jul-2017
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	17-Feb-2018

**Table 14**

TU - Traceability Unscheduled



**2.5 Spurious Radiated Emissions**

**2.5.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (d) and 15.205  
 Industry Canada RSS-247, Clause 5.5  
 Industry Canada RSS-GEN, Clause 6.13

**2.5.2 Equipment Under Test and Modification State**

iMPD\*\*, S/N: A019-0141698 - Modification State 0  
 iMPD\*\*, Not Serialised (75938838-TSR0003)

**2.5.3 Date of Test**

06-June-2017 to 07-June-2017 & 20-Nov-2017

**2.5.4 Test Method**

Testing was performed in accordance with ANSI C63.10, clause 11.11, 11.12.1 and 11.12.2.7

Plots for average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.3

Final average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.2

**2.5.5 Environmental Conditions**

Ambient Temperature 18.1 - 21.3 °C  
 Relative Humidity 37.0 - 47.0 %

**2.5.6 Test Results**

Pet Door - 2.4 GHz SRD

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.004	30.6	40.0	-9.4	0	1.00	Horizontal
30.934	30.0	40.0	-10.0	0	1.00	Horizontal
37.500	27.3	40.0	-12.7	0	1.00	Horizontal
912.145	34.1	46.0	-11.9	0	1.00	Horizontal
941.251	34.3	46.0	-11.7	0	1.00	Horizontal
960.000	34.7	46.0	-11.3	0	1.00	Horizontal

**Table 15 - 2425 MHz - 20 MHz to 1 GHz**

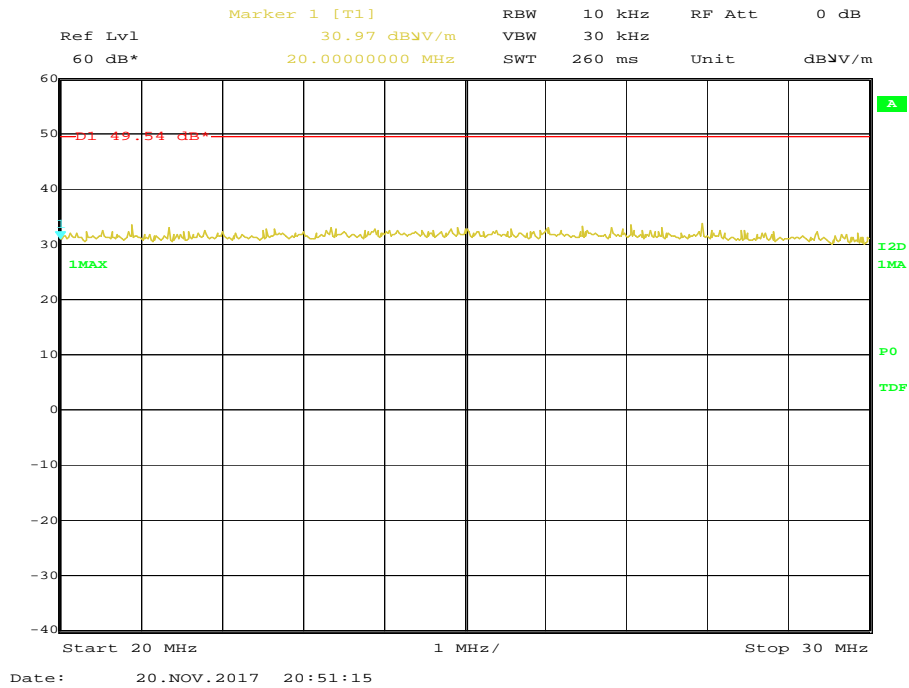


Figure 10 - 2425 MHz - 20 MHz to 30 MHz - Horizontal and Vertical

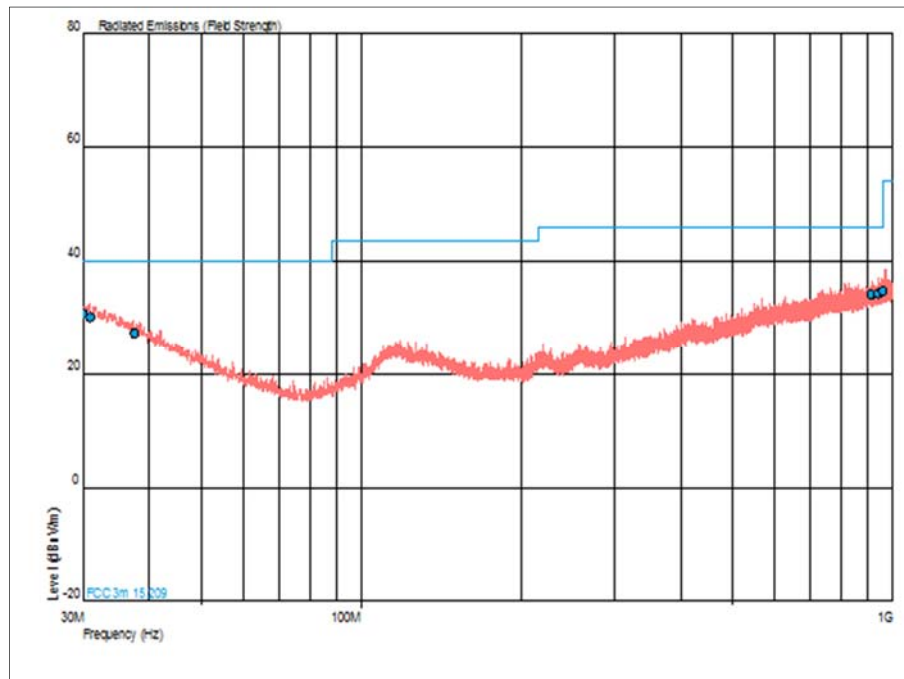


Figure 11 - 2425 MHz - 30 MHz to 1 GHz - Horizontal and Vertical



Frequency (MHz)	Result (µV/m)		Limit (µV/m)		Margin (µV/m)	
	Peak	Average	Peak	Average	Peak	Average
*						

Table 16 - 2425 MHz - 1 GHz to 25 GHz

\*No emissions were detected within 10 dB of the limit.

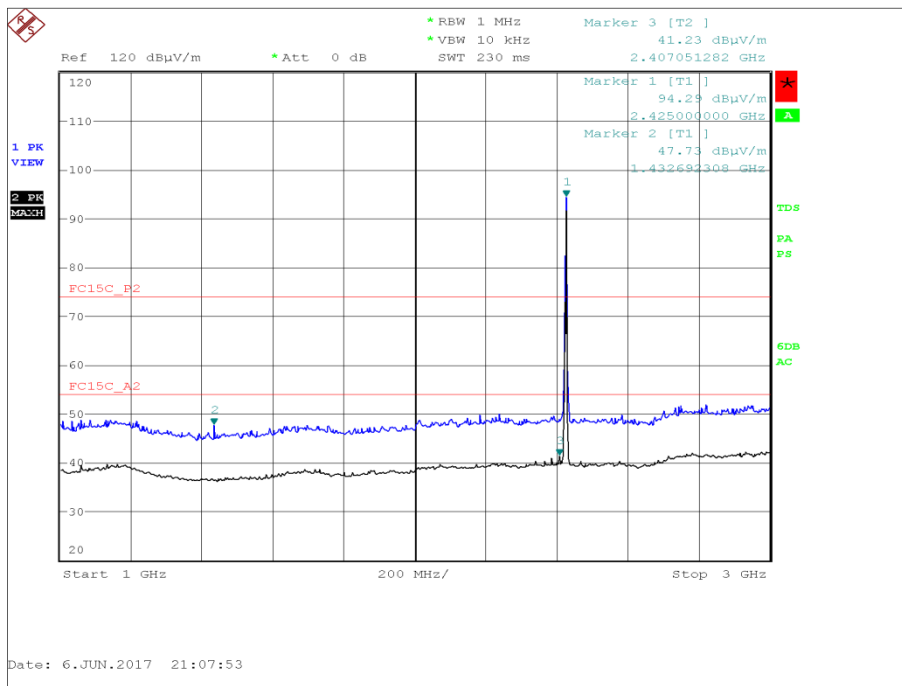


Figure 12 - 2425 MHz - 1 GHz to 3 GHz - Horizontal and Vertical

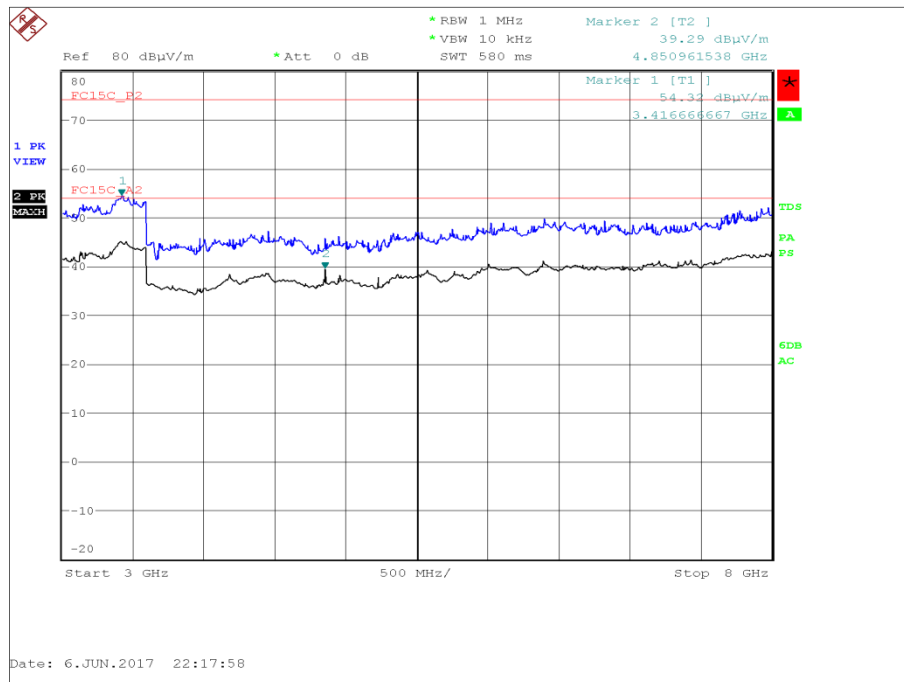


Figure 13 - 2425 MHz - 3 GHz to 8 GHz - Horizontal and Vertical

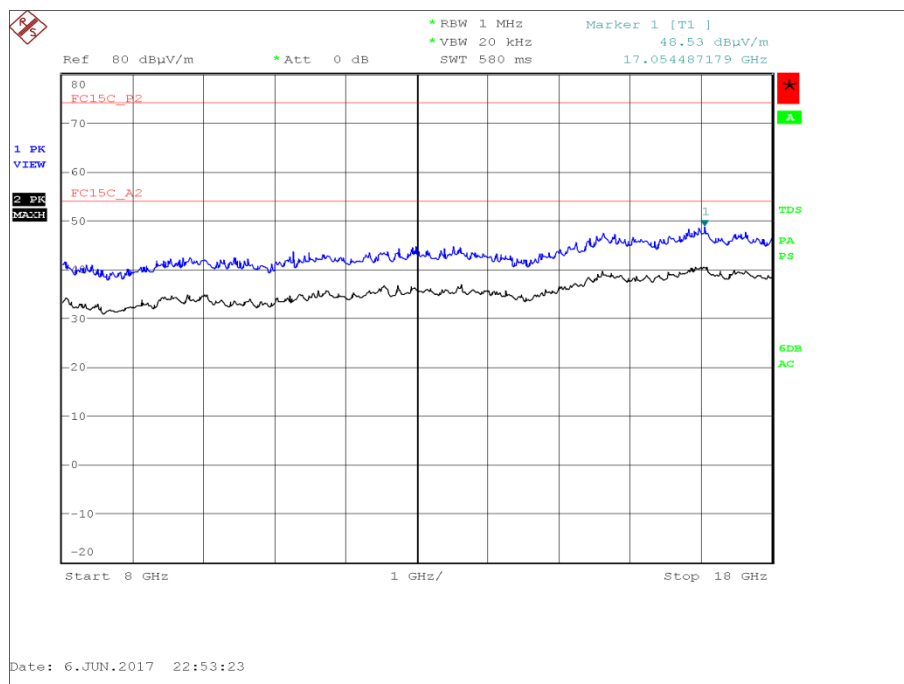
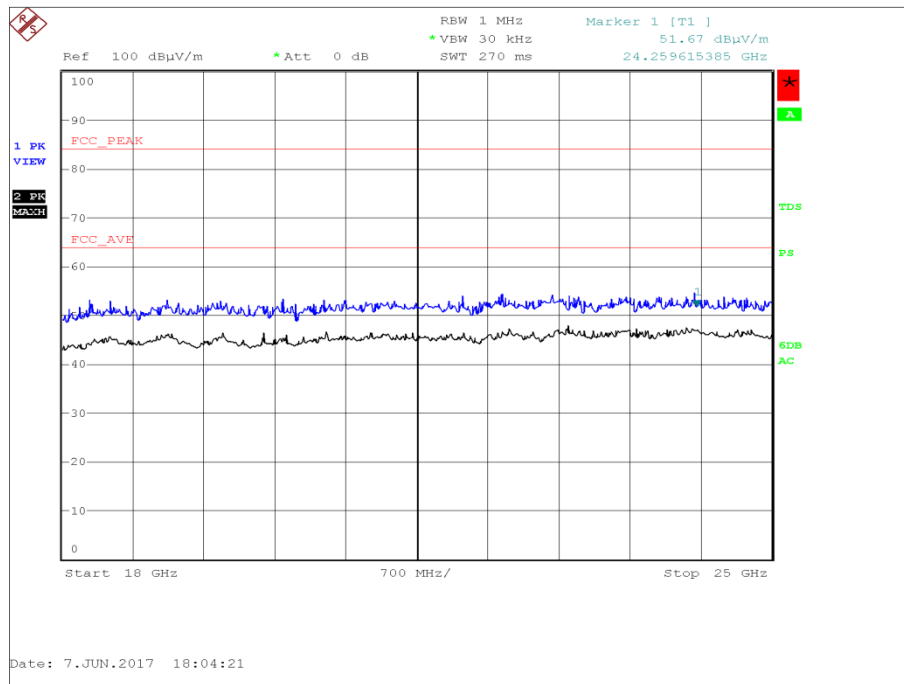


Figure 14 - 2425 MHz - 8 GHz to 18 GHz - Horizontal and Vertical





**Figure 15 - 2425 MHz - 18 GHz to 25 GHz - Horizontal and Vertical**

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.253	30.6	40.0	-9.4	0	1.00	Horizontal
32.455	29.5	40.0	-10.5	0	1.00	Horizontal
37.500	27.3	40.0	-12.7	0	1.00	Horizontal
821.611	33.2	46.0	-12.8	0	1.00	Horizontal
868.147	33.4	46.0	-12.6	0	1.00	Horizontal
960.000	34.7	46.0	-11.3	0	1.00	Horizontal

**Table 17 - 2450 MHz - 20 MHz to 1 GHz**

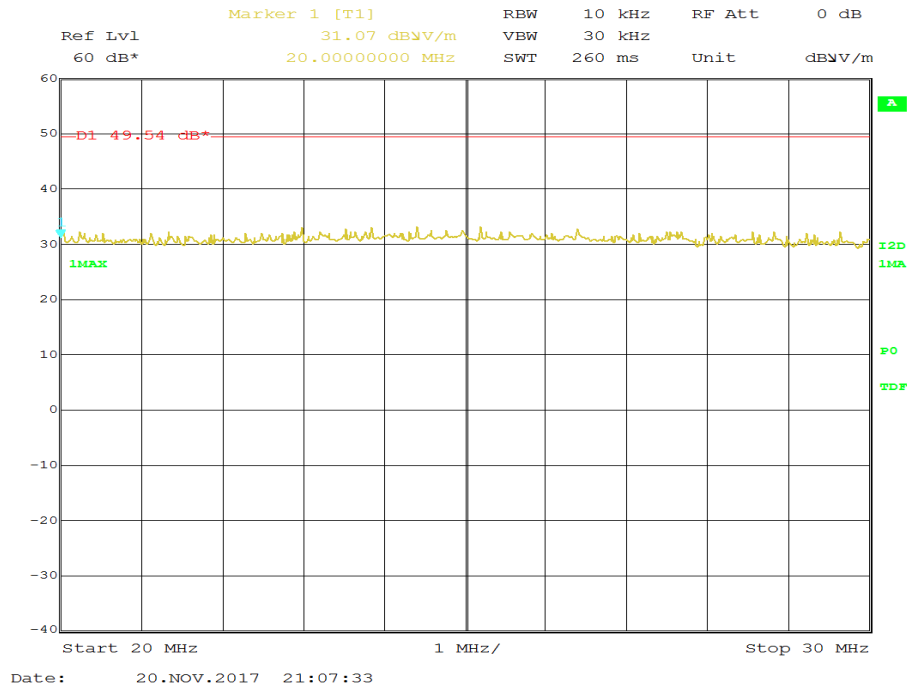


Figure 16a - 2450 MHz - 20 MHz to 30 MHz - Horizontal and Vertical

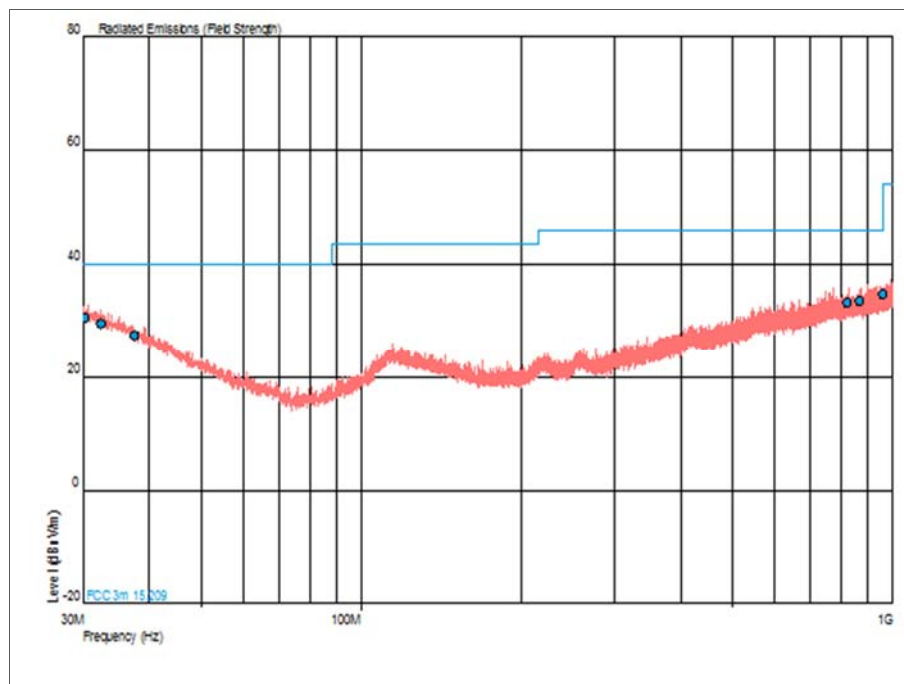


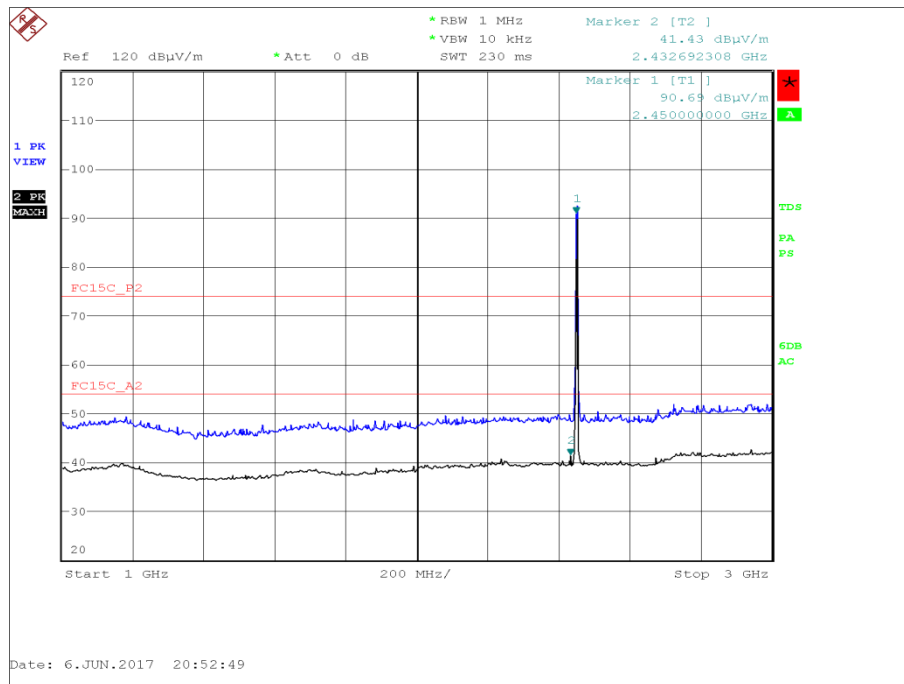
Figure 17b - 2450 MHz - 30 MHz to 1 GHz - Horizontal and Vertical



Frequency (MHz)	Result ( $\mu\text{V}/\text{m}$ )		Limit ( $\mu\text{V}/\text{m}$ )		Margin ( $\mu\text{V}/\text{m}$ )	
	Peak	Average	Peak	Average	Peak	Average
*						

**Table 18 - 2450 MHz - 1 GHz to 25 GHz**

\*No emissions were detected within 10 dB of the limit.



**Figure 18 - 2450 MHz - 1 GHz to 3 GHz - Horizontal and Vertical**

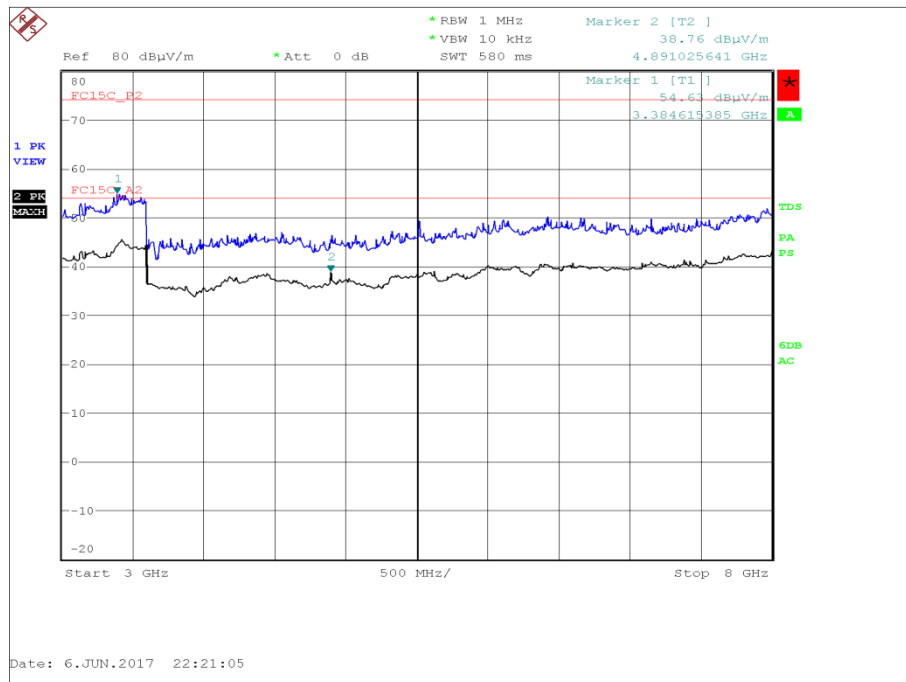


Figure 19 - 2450 MHz - 3 GHz to 8 GHz - Horizontal and Vertical

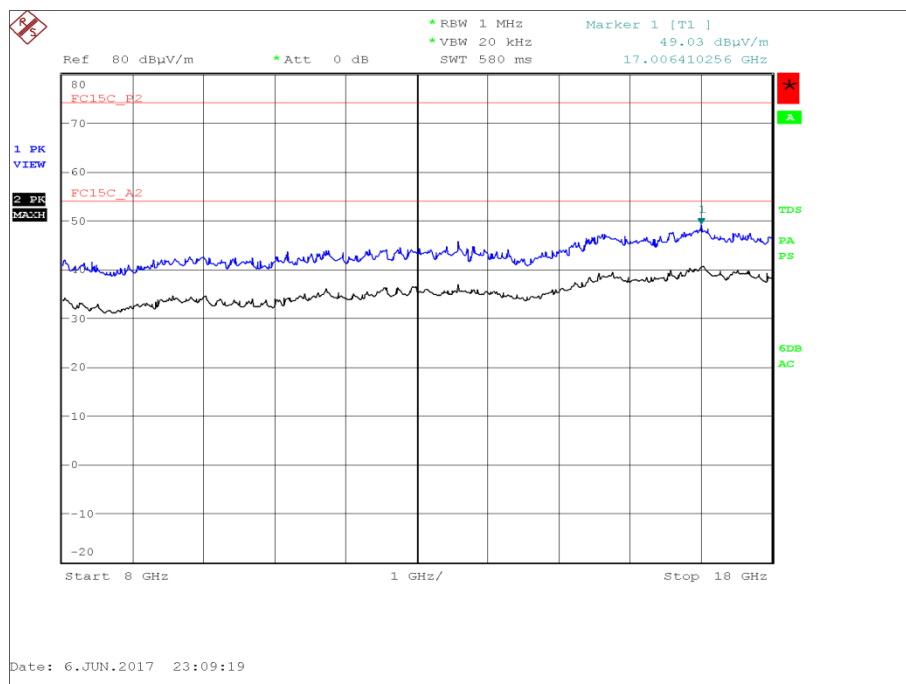


Figure 20 - 2450 MHz - 8 GHz to 18 GHz - Horizontal and Vertical

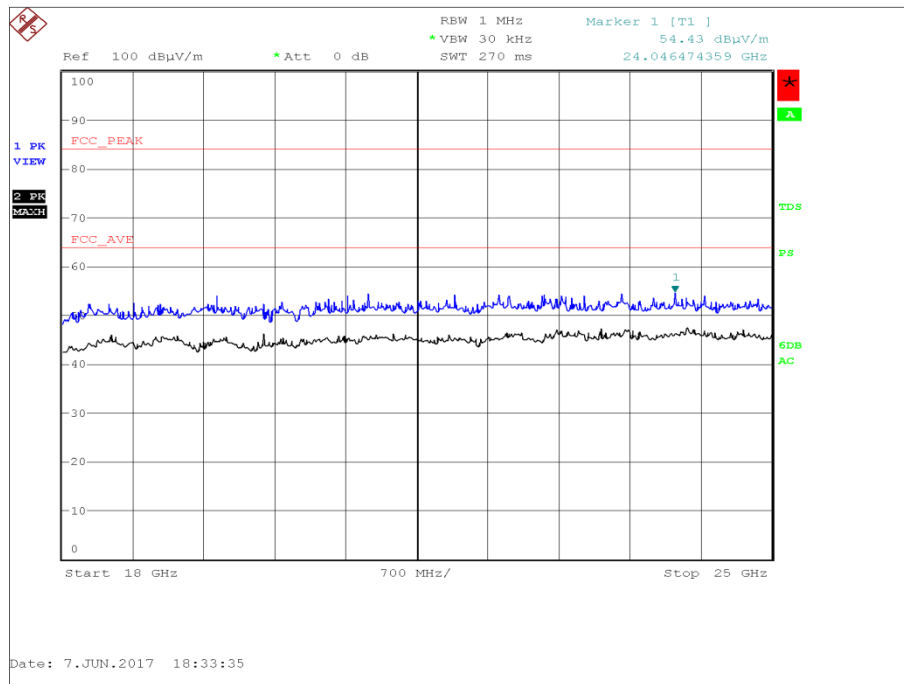


Figure 21 - 2450 MHz - 18 GHz to 25 GHz - Horizontal and Vertical

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.657	30.2	40.0	-9.8	0	1.00	Horizontal
31.969	29.7	40.0	-10.3	0	1.00	Horizontal
37.500	27.3	40.0	-12.7	0	1.00	Horizontal
841.659	33.3	46.0	-12.7	0	1.00	Horizontal
903.861	34.1	46.0	-11.9	0	1.00	Horizontal
960.000	34.7	46.0	-11.3	0	1.00	Horizontal

Table 19 - 2480 MHz - 20 MHz to 1 GHz

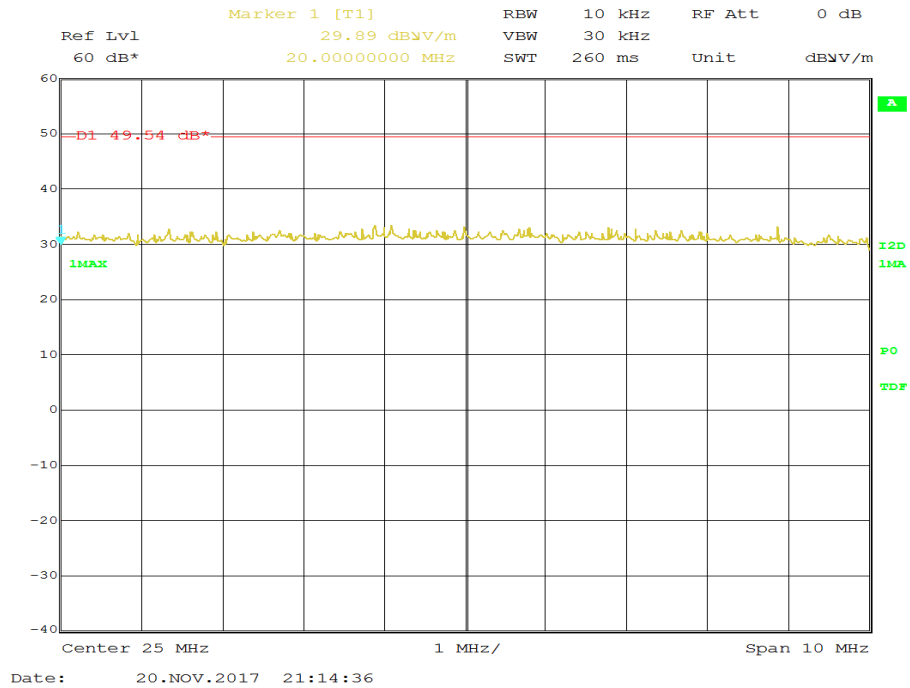


Figure 22a - 2480 MHz - 20 MHz to 30 MHz - Horizontal and Vertical

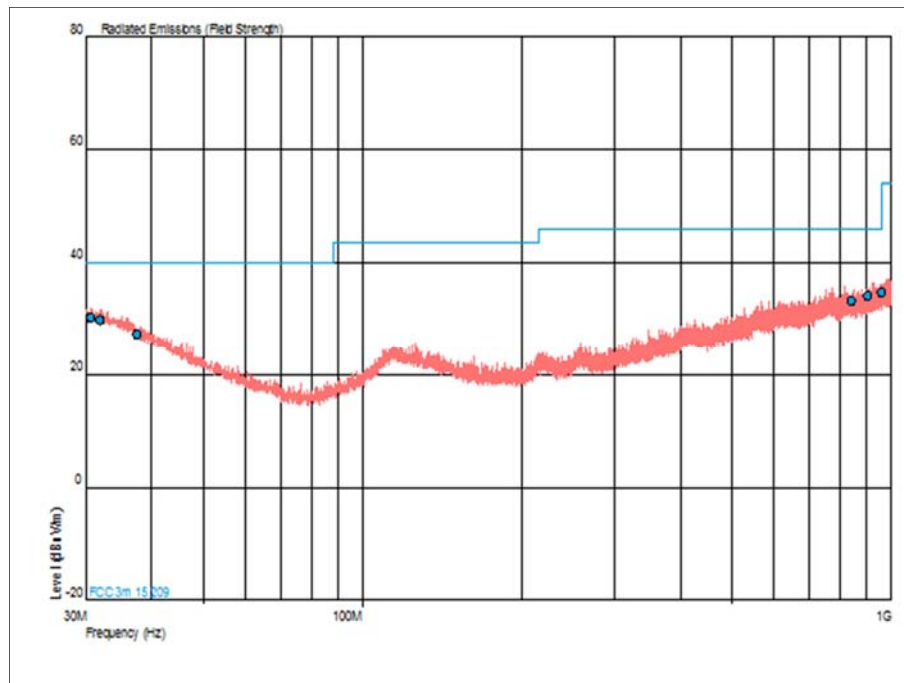


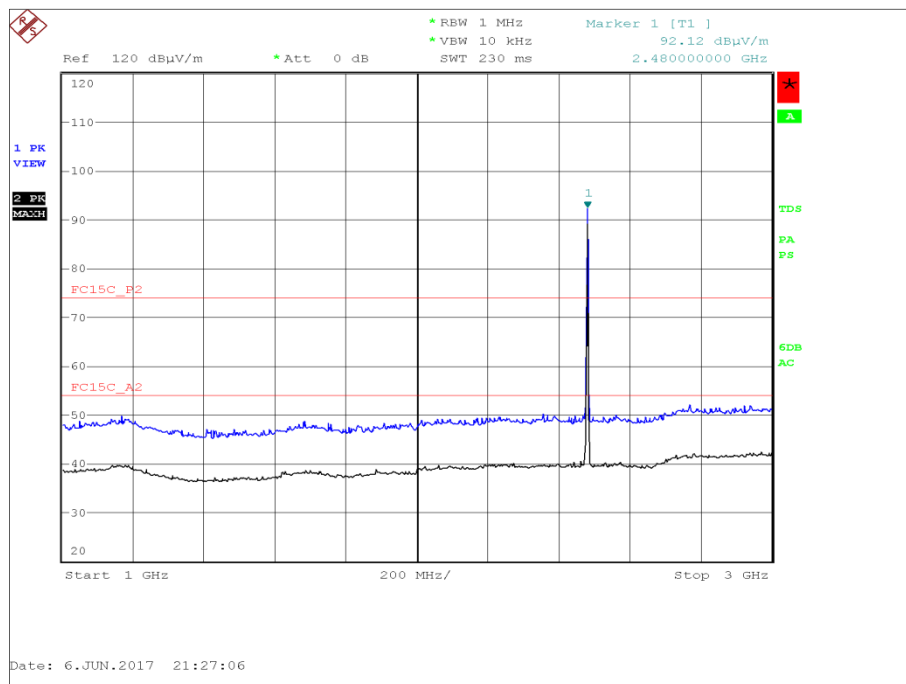
Figure 23b - 2480 MHz - 30 MHz to 1 GHz - Horizontal and Vertical



Frequency (MHz)	Result ( $\mu\text{V}/\text{m}$ )		Limit ( $\mu\text{V}/\text{m}$ )		Margin ( $\mu\text{V}/\text{m}$ )	
	Peak	Average	Peak	Average	Peak	Average
*						

**Table 20 - 2480 MHz - 1 GHz to 25 GHz**

\*No emissions were detected within 10 dB of the limit.



**Figure 24 - 2480 MHz - 1 GHz to 3 GHz - Horizontal and Vertical**

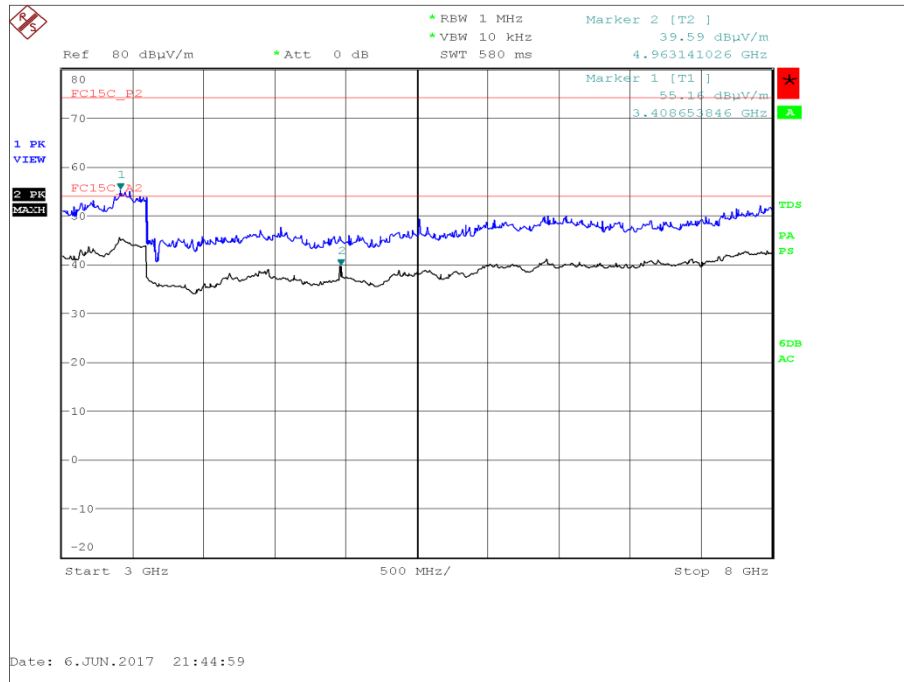


Figure 25 - 2480 MHz - 3 GHz to 8 GHz - Horizontal and Vertical

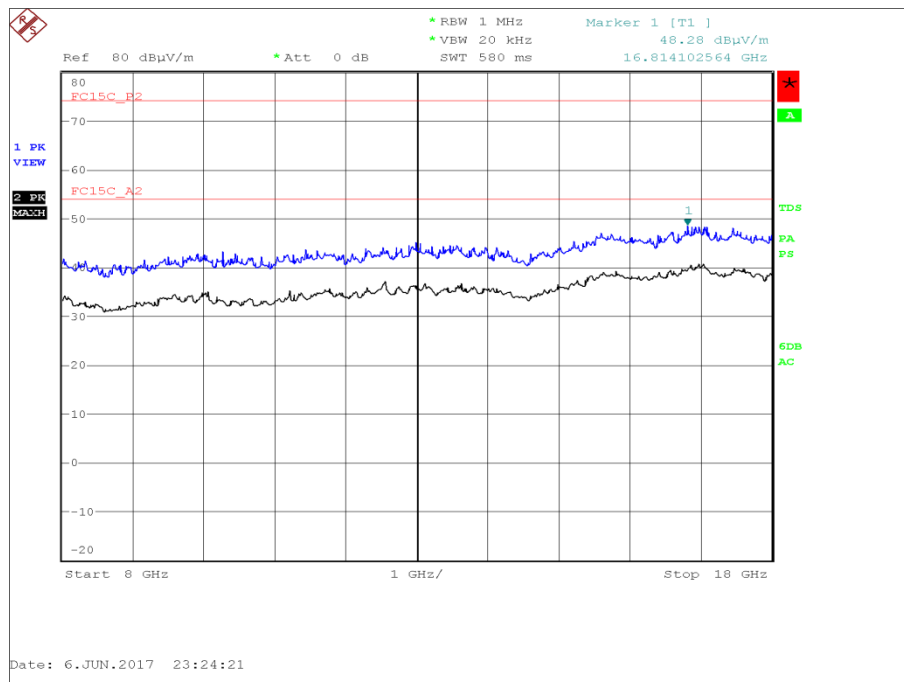


Figure 26 - 2480 MHz - 8 GHz to 18 GHz - Horizontal and Vertical



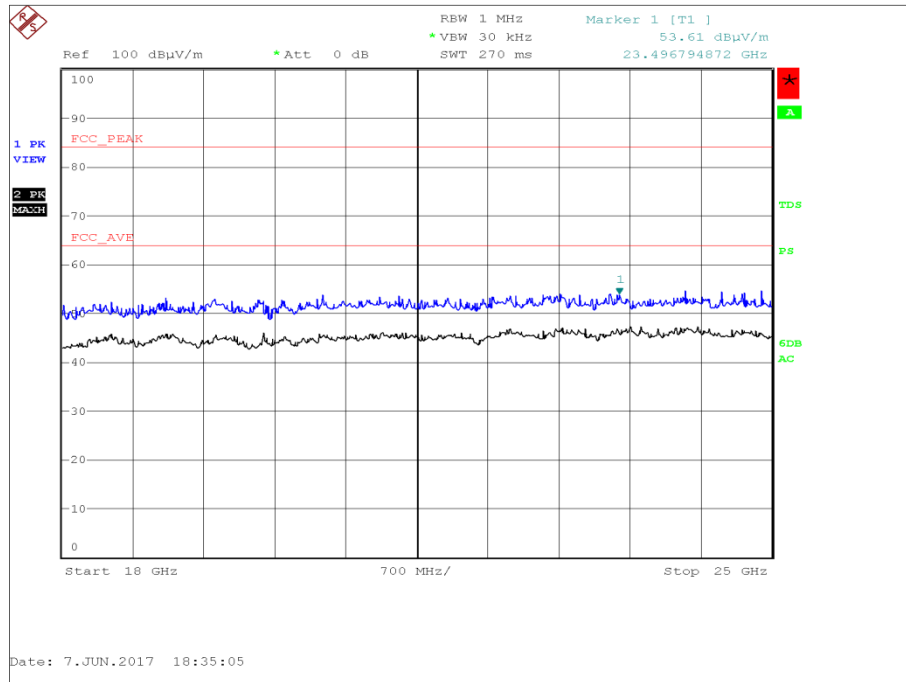


Figure 27 - 2480 MHz - 18 GHz to 25 GHz - Horizontal and Vertical



FCC 47 CFR Part 15C, Limit Clause 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

Industry Canada RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

**2.5.7 Test Location and Test Equipment Used**

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna 18-40GHz (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	12-Feb-2018
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	9-Dec-2018
Antenna (Dish/Tripod/Adaptor, 1GHz-18GHz)	Rohde & Schwarz	AC-008	334	-	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	10-Oct-2018
Antenna 18-40GHz (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	7-Dec-2018
Pre-Amplifier	Phase One	PS04-0086	1533	12	31-Jul-2018
18GHz - 40GHz Pre-Amplifier	Phase One	PS04-0087	1534	12	23-Jan-2018
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU



Hygromer	Rotronic	A1	2138	12	2-Feb-2018
Antenna (Bilog)	Chase	CBL6143	2904	24	08-Aug-2019
Comb Generator	Schaffner	RSG1000	3034	-	TU
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	2-May-2018
EMI Test Receiver	Rohde & Schwarz	ESIB26	424	12	19-June-2018
Tilt Antenna Mast	maturu Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturu Gmbh	NCD	3917	-	TU
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	22-May-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-2018
Cable (Yellow, Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4527	6	4-Dec-2017
Cable (Rx, SMAm-SMAm 0.5m)	Scott Cables	SLSL18-SMSM-00.50M	4528	-	O/P Mon
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	17-Feb-2018
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	17-Feb-2018

**Table 21**

TU - Traceability Unscheduled



**2.6 Power Spectral Density**

**2.6.1 Specification Reference**

FCC 47 CFR Part 15C, Clause 15.247 (e)  
Industry Canada RSS-247, Clause 5.4  
Industry Canada RSS-GEN, Clause 6.12

**2.6.2 Equipment Under Test and Modification State**

iMPD\*\*, S/N: Not Serialised (75938838-TSR0048) - Modification State 0

**2.6.3 Date of Test**

06-June-2017

**2.6.4 Test Method**

This test was performed in accordance with ANSI C63.10, clause 11.10.2.

**2.6.5 Environmental Conditions**

Ambient Temperature 19.9 °C  
Relative Humidity 52.0 %

**2.6.6 Test Results**

Pet Door - 2.4 GHz SRD

Frequency (MHz)	Power Spectral Density (dBm)
2405.0	-15.71
2440.0	-16.54
2475.0	-19.26

**Table 22**

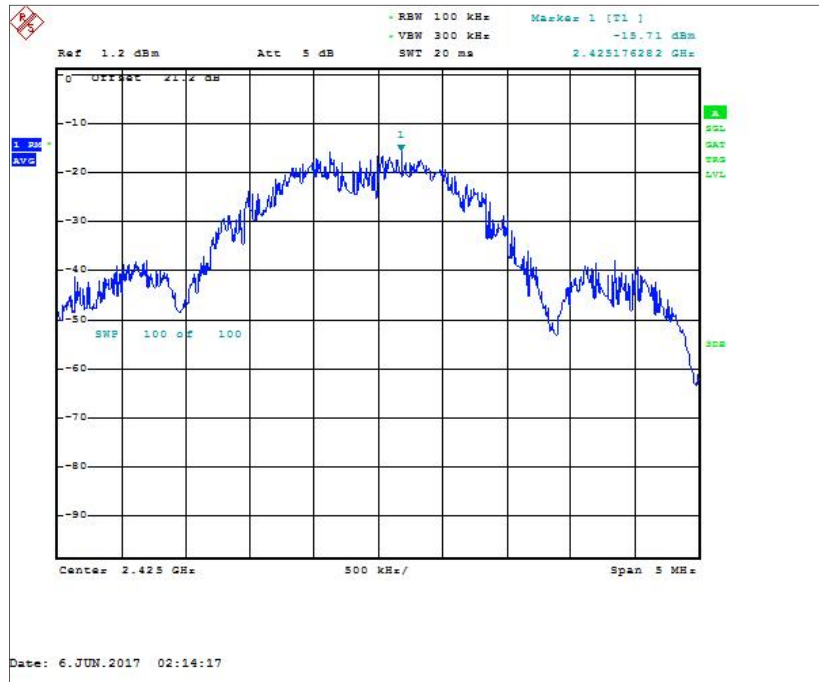


Figure 28 - 2425.0 MHz

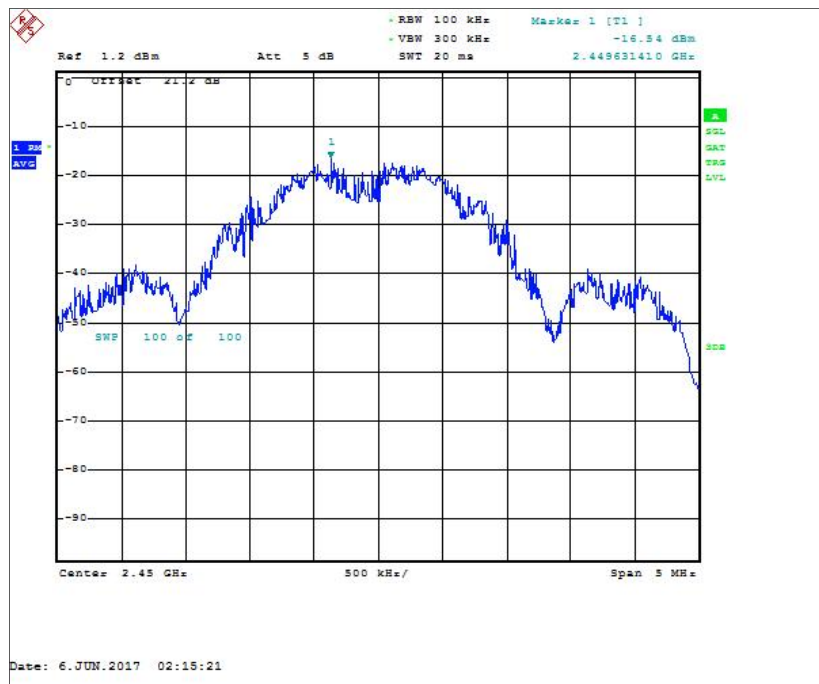
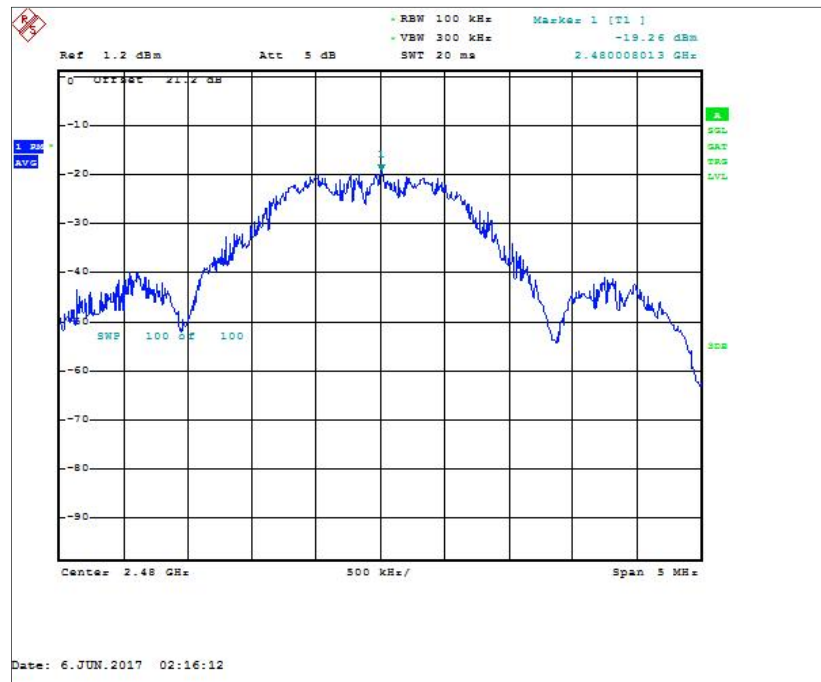


Figure 29 - 2450.0 MHz



**Figure 30 - 2480.0 MHz**

FCC 47 CFR Part 15C, Limit Clause 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Industry Canada RSS-247, Limit Clause 5.2(b)

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.



**2.6.7 Test Location and Test Equipment Used**

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
20dB SMA Attenuator dc - 18GHz	Sealectro	60-674-1020-89	345	12	30-Jun-2017
Hygrometer	Rotronic	I-1000	3220	12	23-Aug-2017
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	9-Sep-2017
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	15-Sep-2017
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	8-Sep-2017
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	9-Sep-2017
RadiPower USB RF power sensor	DARE!! Instruments	RPR3006W	4466	12	10-Nov-2017
2 metre SMA Cable	IW Microwave	3PS-1806LC-788-3PS	4829	12	24-Jan-2018

**Table 23**



### 3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Restricted Band Edges	30 MHz to 1 GHz: $\pm 5.1$ dB 1 GHz to 40 GHz: $\pm 6.3$ dB
Emission Bandwidth	$\pm 58.64$ kHz
Maximum Conducted Output Power	$\pm 0.96$ dB
Authorised Band Edges	30 MHz to 1 GHz: $\pm 5.1$ dB 1 GHz to 40 GHz: $\pm 6.3$ dB
Spurious Radiated Emissions	30 MHz to 1 GHz: $\pm 5.1$ dB 1 GHz to 40 GHz: $\pm 6.3$ dB
Power Spectral Density	$\pm 0.96$ dB

**Table 24**