

Report on the FCC Testing of the
 Monica Healthcare Ltd
 Interface unit. Model: Novii System Interface Unit
 POD. Model: Novii System Pod
 In accordance with FCC 47 CFR Parts 15 and 18
 (Simultaneous Transmission)



Product Service

Choose certainty.
 Add value.

Prepared for: Monica Healthcare Ltd
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FCC ID:
 YOM-6960-MON (Novii Pod) YOM -6961-MON (Novii Interface Unit)

COMMERCIAL-IN-CONFIDENCE

Date: December 2017
 Document Number: 75941097-05 | Issue: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Clare Wright	13 December 2017	
Authorised Signatory	Matthew Russell	13 December 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 Parts 15 and 18 (Simultaneous Transmission). The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Jack Tuckwell	13 December 2017	

FCC Accreditation
 90987 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15:2016 and FCC 47 CFR Part 18:2016.

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Contents

1	Report Summary	2
1.1	Report Modification Record.....	2
1.2	Introduction.....	2
1.3	Brief Summary of Results	3
1.4	Application Form	4
1.5	Product Information	9
1.6	Deviations from the Standard.....	9
1.7	EUT Modification Record	9
1.8	Test Location.....	10
2	Test Details	11
2.1	Radiated Spurious Emissions (Simultaneous Transmission)	11
3	Measurement Uncertainty	19



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	13 December 2017

Table 1

1.2 Introduction

Applicant	Monica Healthcare Ltd
Manufacturer	Monica Healthcare Ltd
Model Number(s)	Interface and Pod
Serial Number(s)	Interface: TA1772 Pod: AA5425, AA5431
Hardware Version(s)	Interface Rev L Pod Rev H
Software Version(s)	Interface V2.71 Pod V2.54
Number of Samples Tested	1 interface and 1 pod
Test Specification/Issue/Date	FCC 47 CFR Parts 15: 2016 FCC 47 CFR Parts 18: 2016
Order Number	Issue 2 501559
Date	30-November-2017
Date of Receipt of EUT	04-December-2017
Start of Test	07-December-2017
Finish of Test	07-December-2017
Name of Engineer(s)	Jack Tuckwell
Related Document(s)	ANSI C63.10 (2013)



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Parts 15 and 18 is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	FCC Part 15	FCC Part 18			
Configuration and Mode: Wireless Charging + Bluetooth Transmit					
2.1	15.247 (d) and 15.205	18.305(b)	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.10

Table 2



1.4 Application Form

EQUIPMENT DESCRIPTION	
Model Name/Number	Novii Interface Unit
Part Number	107-PT-001
Hardware Version	Rev L
Software Version	Rev 2.71
FCC ID (if applicable)	YOM-6961_MON
Industry Canada ID (if applicable)	
Technical Description (Please provide a brief description of the intended use of the equipment)	The Novii System Interface Unit is part of the Novii Wireless Patch System: a Maternal/Fetal monitor that records Fetal heart rate, Maternal Heart Rate and Uterine Contractions from a pregnant subject.

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
Bluetooth (Left Side)	2042-2408	10	1.18	1 MHz/ channel	V2.1+ EDR	1M00F1D	2402	2440	2480
Bluetooth (Right Side)	2042-2408	10	3.24	1 MHz/ channel	V2.1+ EDR	1M00F1D	2402	2440	2480
QI Wireless Charger transmitter	0.110 to 0.205	37		0.095	Frequency Modulation				

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	26MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	0Hz

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
	x		100-240
External DC	Nominal Voltage		Maximum Current
	5V		2.5A
Battery	Nominal Voltage		Battery Operating End Point Voltage
	N/A		
Can EUT transmit whilst being charged?			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>



EXTREME CONDITIONS					
Maximum temperature	30	°C	Minimum temperature	10	°C

Ancillaries
Please list all ancillaries which will be used with the device.
Novii System Pod

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	Ceramic (Antenova SRCW004)	
<input type="checkbox"/>	External antenna	Type		

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

Name: Jean-Francois Pieri

Position held: CTO

Date: 12th December 2017



EQUIPMENT DESCRIPTION	
Model Name/Number	Novii System Interface Unit / Novii System Pod
Part Number	107-PT-001 / 107-PT-003
Hardware Version	Interface Rev_L / Pod Rev_H
Software Version	Interface v2.71 / Pod v2.54
FCC ID (if applicable)	Interface: YOM-6961-MON Pod: YOM-6960-MON
Industry Canada ID (if applicable)	N/A
Technical Description (Please provide a brief description of the intended use of the equipment)	The Novii Wireless Patch System is a small, reliable, accurate intrapartum Maternal/Fetal monitor. It monitors the Maternal and Fetal heart rate and Uterine Contractins during labour and delivery.

EQUIPMENT SUPPLIED	
WPT Source	<input type="checkbox"/>
WPT Client	<input type="checkbox"/>
WPT System (Client and source designed to work exclusively together)	<input checked="" type="checkbox"/>

WPT SOURCE		
<input type="checkbox"/>	Type 1	No intelligent communication transmitted wirelessly
<input checked="" type="checkbox"/>	Type 2	Transmission is modulated including load modulation techniques where: <ol style="list-style-type: none"> 1. Fundamental is < 490 kHz and ; 2. All emissions are > 40 dB below RSS-GEN field strength limits.
<input type="checkbox"/>	Type 3	Neither type 1 or type 2, but uses some form of modulation to transmit intelligent communication.
Is the device intended for us in any of the following?:		
<input type="checkbox"/>	High power WPT device (e.g charging electric vehicles)	
<input type="checkbox"/>	WPT over a distance of > 10 cm	
<input checked="" type="checkbox"/>	Medical Device	
<input type="checkbox"/>	WPT source operating at a frequency > 400 MHz	
Does the device support power management transfer?		Yes
Can the source and client operate at different separation distances?		No
Minimum Distance:	5 mm	Maximum Distance: 5 mm
Does the EUT contain any other wireless modules (excluding WPT device)?		Yes
Can the device transmit secondary frequencies?		Yes Bluetooth
State Frequencies:	2402 to 2480MHz	

WPT SOURCE DESIGN	
<input type="checkbox"/>	Single fixed power transfer zone – single client
<input checked="" type="checkbox"/>	Multiple fixed power transfer zone – single client
<input type="checkbox"/>	Multiple non-fixed power transfer zone – single client
<input type="checkbox"/>	Multiple power transfer zone – multiples clients



POWER SOURCE			
<input type="checkbox"/>	AC mains	State voltage	
	AC supply frequency (Hz)		
	VAC		
	Max Current		
	Hz		
<input type="checkbox"/>	Single phase	<input type="checkbox"/>	Three phase
And / Or			
<input checked="" type="checkbox"/>	External DC supply		
	Nominal voltage	5 V	Max Current 2.5 A
	Extreme upper voltage	5.125 V	
	Extreme lower voltage	4.875 V	
Battery			
<input type="checkbox"/>	Nickel Cadmium	<input type="checkbox"/>	Lead acid (Vehicle regulated)
<input type="checkbox"/>	Alkaline	<input type="checkbox"/>	Leclanche
<input type="checkbox"/>	Lithium	<input type="checkbox"/>	Other Details:
	Volts nominal.		
End point voltage as quoted by equipment manufacturer			V

FREQUENCY INFORMATION			
Frequency Range	0.11 to 0.205	MHz	
Channel Spacing (where applicable)			
Receiver Frequency Range (if different)	to	MHz	
Channel Spacing (if different)			
Test Frequencies*	Bottom	MHz	Channel Number (if applicable)
	Middle	MHz	Channel Number (if applicable)
	Top	MHz	Channel Number (if applicable)
Intermediate Frequencies		MHz	
Highest Internally Generated Frequency:		MHz	

POWER CHARACTERISTICS			
Maximum TX power	5	W	
Minimum TX power		W (if variable)	
Is transmitter intended for:			
Continuous duty		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Intermittent duty		<input type="checkbox"/> Yes	<input type="checkbox"/> No
If intermittent state DUTY CYCLE			
Transmitter ON		seconds	
Transmitter OFF		seconds	



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

MODULATION CHARACTERISTICS			
<input type="checkbox"/>	Amplitude	<input checked="" type="checkbox"/>	Frequency
<input type="checkbox"/>	Phase	<input type="checkbox"/>	Other (please provide details):
Can the transmitter operate un-modulated?			<input type="checkbox"/> Yes <input type="checkbox"/> No

CLASS OF EMISSION USED	
ITU designation or Class of Emission:	
1	
(if applicable) 2	
(if applicable) 3	
If more than three classes of emission, list separately:	

BATTERY POWER SUPPLY	
Model name/number	Identification/Part number
Manufacturer	Country of Origin

ANCILLARIES (If applicable)	
Model name/number	Identification/Part number
Manufacturer	Country of Origin

EXTREME CONDITIONS			
Extreme test voltages (Max)	5.125 / 4.2	V	Extreme test voltages (Mix) V
Nominal DC Voltage	5/4.2	V	DC Maximum Current 2.5 A
Maximum temperature	43	°C	Minimum temperature 10 °C

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

Name: Simon Branson
 Date: 08/12/17

Position held: Engineering Manager



1.5 Product Information

1.5.1 Technical Description

The Monica Novii POD is an intrapartum Maternal/Fetal Monitor that non-invasively measures and displays fetal heart rate (FHR), uterine activity (UA) and maternal heart rate (MHR).

The Novii POD acquires and displays the FHR tracing from abdominal surface electrodes that pick up the fetal ECG (fECG) signal. Using the same surface electrodes, the POD also acquires and displays the UA tracing from the uterine electromyography (EMG) signal and the MHR tracing from the maternal ECG signal (mECG).

The POD is indicated for use on women who are at >36 completed weeks, in labor, with singleton pregnancies, using surface electrodes on the maternal abdomen.

The Novii Patch is an accessory to the Novii POD that connects directly to the Novii POD and contains the surface electrodes that attach to the abdomen. The Novii Interface is an accessory to the Novii POD which provides a means of interfacing the wireless output of the Novii POD to the transducer inputs of a Maternal/Fetal Monitor.

The Novii Interface enables signals collected by the Novii POD to be printed and displayed on a Maternal/Fetal Monitor and sent on to a central network, if connected.

The Novii Interface is the WPT transmitter and was tested with the Novii POD which is a WPT client only device.

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: TA1772			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: AA5425			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3



Product Service

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: Wireless Charging + Bluetooth Transmit		
Radiated Spurious Emissions (Simultaneous Transmission)	Jack Tuckwell	UKAS

Table 4

Office Address:

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



2 Test Details

2.1 Radiated Spurious Emissions (Simultaneous Transmission)

2.1.1 Specification Reference

FCC 47 CFR Part 15, Clause 15.247 (d) and 15.205
FCC 47 CFR Part 18, Clause 18.305(b)

2.1.2 Equipment Under Test and Modification State

Interface, S/N: TA1772 - Modification State 0
Pod, S/N: AA5425 - Modification State 0

2.1.3 Date of Test

07-December-2017

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clauses 6.5 and 6.6.

2.1.5 Environmental Conditions

Ambient Temperature 18.1 °C
Relative Humidity 41.0 %

2.1.6 Test Results

Wireless Charging + Bluetooth Transmit

The EUT was configured for simultaneous transmission in the following mode of operation:

Technology	Frequency Band	Channel Frequency
Wireless Charging	100 kHz to 300 kHz	172 kHz
Bluetooth (GFSK/DH5)	2400 MHz to 2483.5 MHz	2441 MHz

Table 5 - Modes of Operation

The Interface and POD were both configured for Bluetooth transmissions at maximum power on 2441 MHz. The Interface wireless charger was configured in a test mode to output at maximum amplitude. The POD was placed on the Interface unit to exercise the WPT.

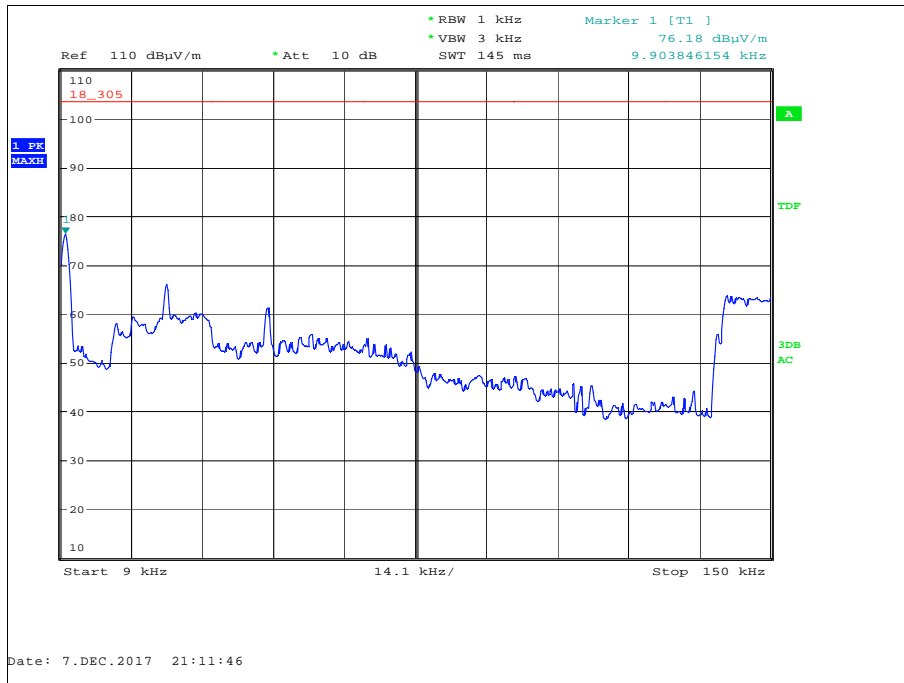


Figure 1 – 9 kHz to 150 kHz - Horizontal and Vertical

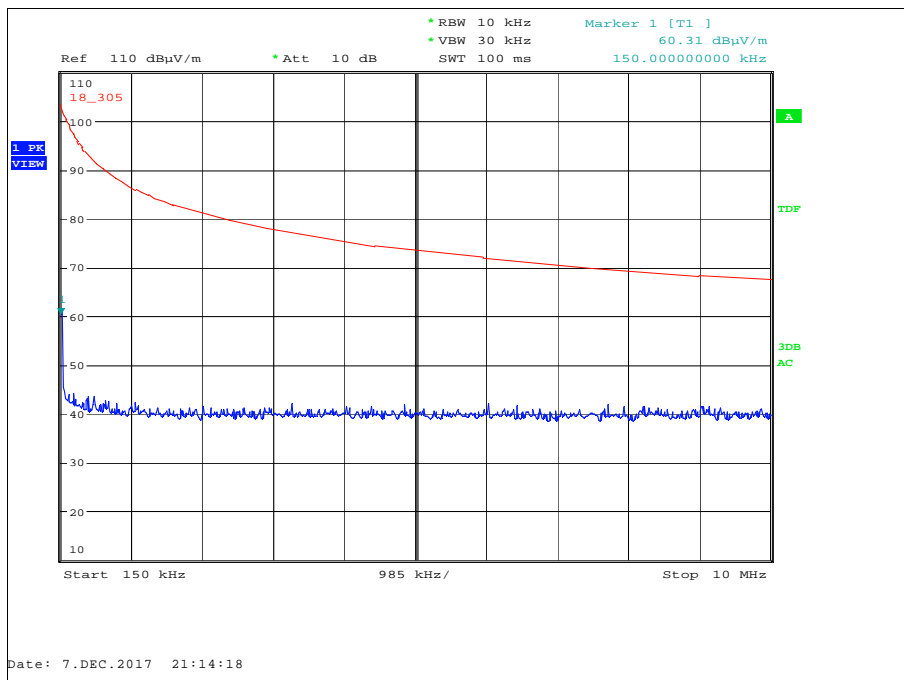


Figure 2 – 150 kHz to 10 MHz - Horizontal and Vertical

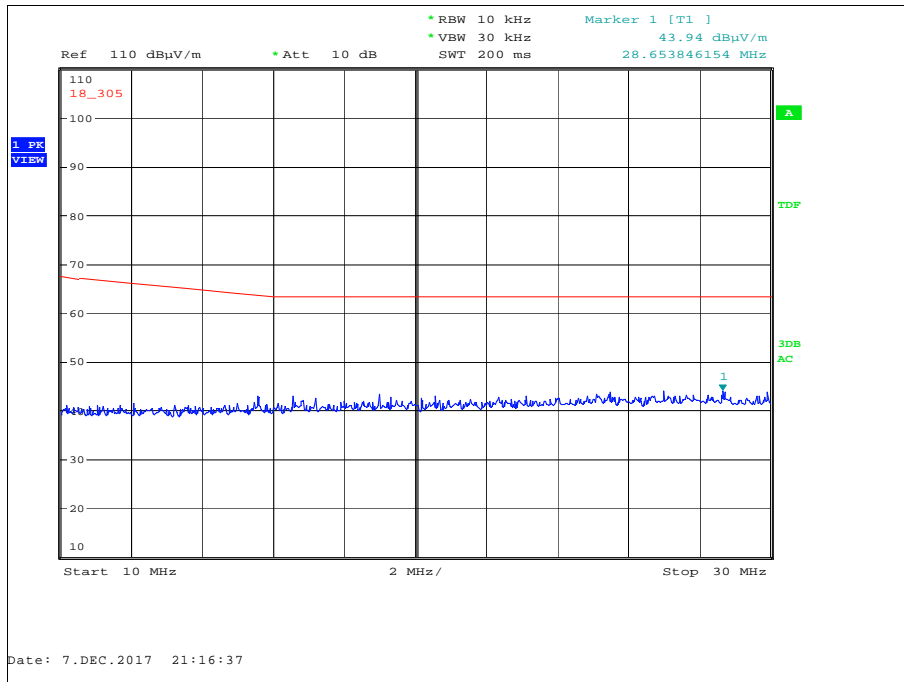


Figure 3 – 10 MHz to 30 MHz - Horizontal and Vertical



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
52.724	32.1	40.0	-7.9	360	1.00	Vertical
163.096	40.5	43.5	-3.0	211	1.00	Vertical
295.891	39.4	46.0	-6.6	245	1.18	Horizontal
509.438	29.1	46.0	-16.9	28	1.00	Vertical
690.434*	48.3			159	1.71	Vertical
887.668*	49.0			253	1.73	Horizontal

Table 6 - 30 MHz to 1 GHz Emissions Results

*Emission is above -6 dB of the limit in the restricted band of 46 dB μ V/m (Quasi-Peak) however the frequency does not fall in a restricted band and therefore the limit is -20 dBc of which there is more than 6 dB margin hence the emission was not further investigated.

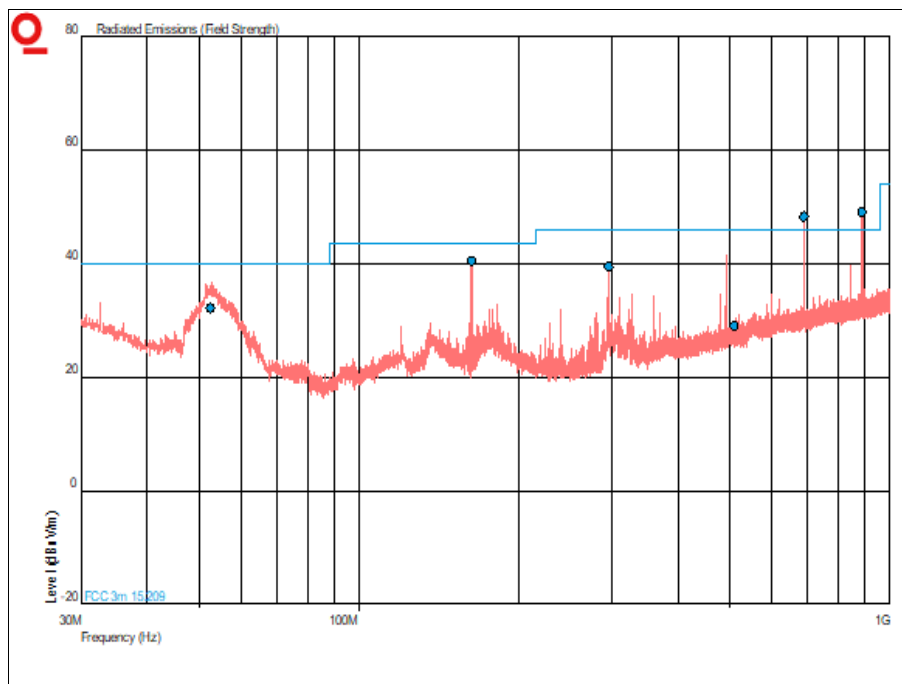


Figure 4 - 30 MHz to 1 GHz - Horizontal and Vertical



Frequency (GHz)	Result ($\mu\text{V}/\text{m}$)		Limit ($\mu\text{V}/\text{m}$)		Margin ($\mu\text{V}/\text{m}$)	
	Peak	Average	Peak	Average	Peak	Average
1.085	54.82	50.17	74.00	54.00	19.18	3.83
1.282*						
4.88	54.97	46.80	74.00	54.00	19.03	7.20
7.3195	56.19	47.02	74.00	54.00	17.81	6.98

Table 7 - 1 GHz to 25 GHz Emissions Results

*Emission is above -6 dB of the limit in the restricted band of 74 dB $\mu\text{V}/\text{m}$ (Peak) or 54 dB $\mu\text{V}/\text{m}$ (Average) however the frequency does not fall in a restricted band and therefore the limit is -20 dBc of which there is more than 6 dB margin hence the emission was not further investigated.

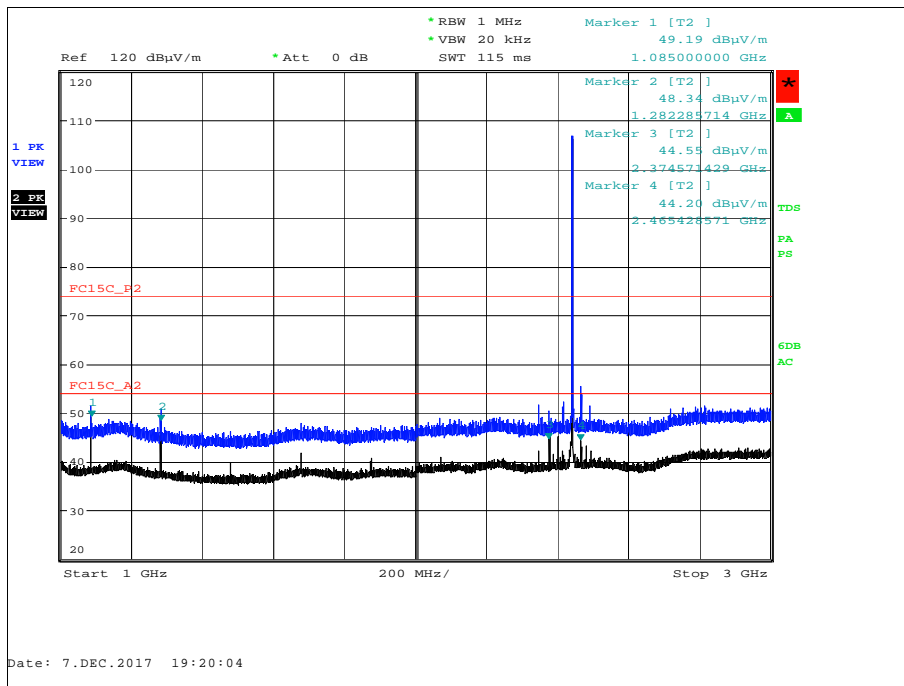


Figure 5 - 1 GHz to 3 GHz - Horizontal and Vertical

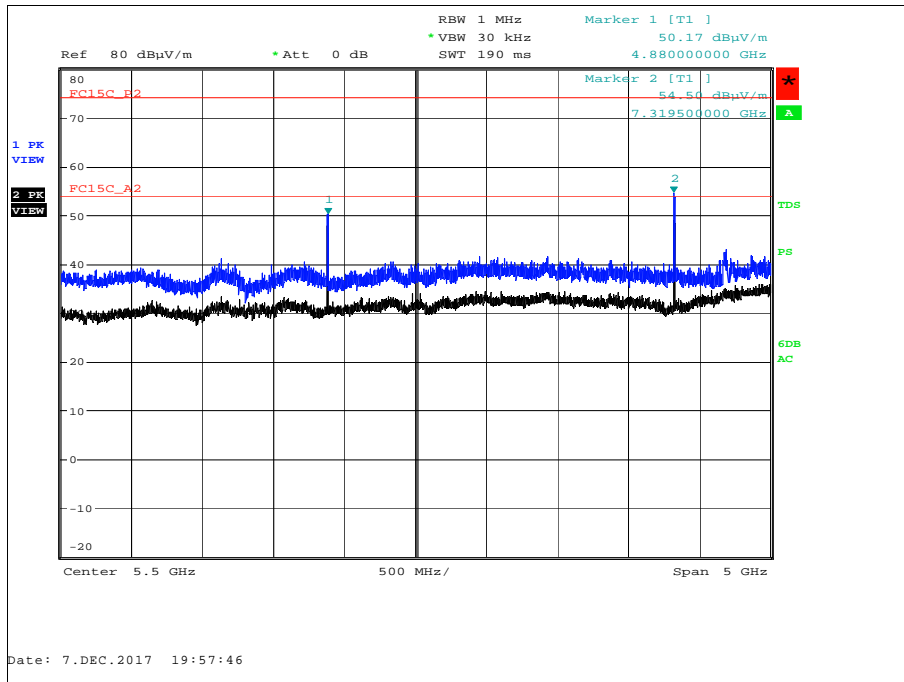


Figure 6 - 3 GHz to 8 GHz - Horizontal and Vertical

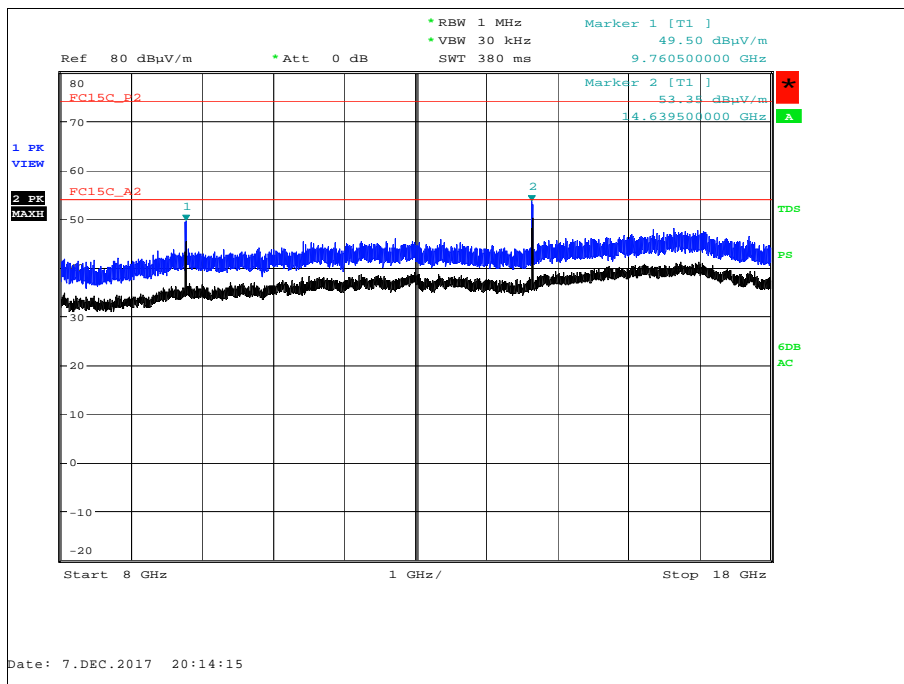


Figure 7 - 8 GHz to 18 GHz - Horizontal and Vertical

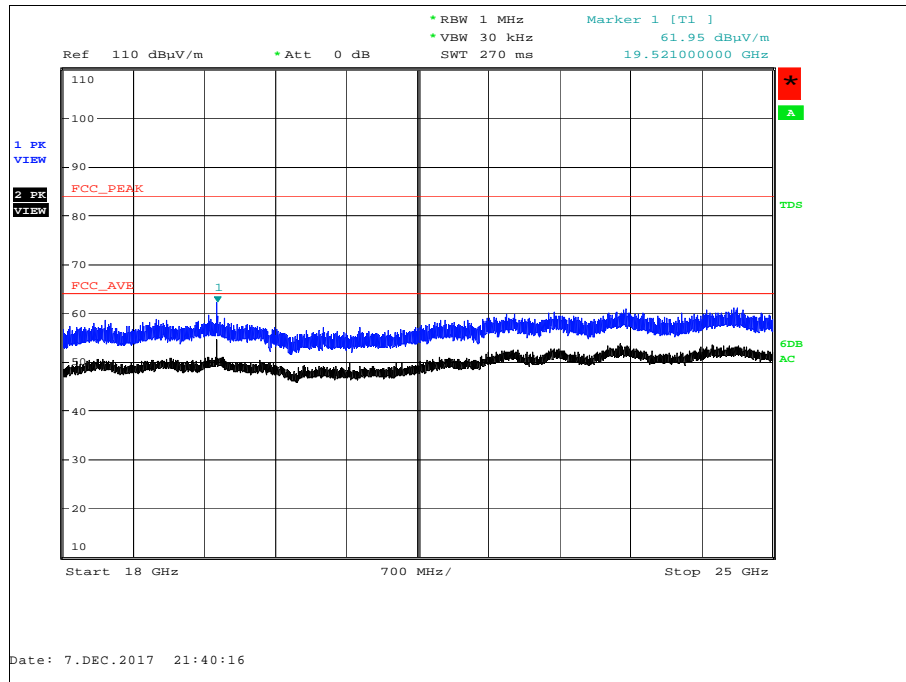


Figure 8 - 18 GHz to 25 GHz - Horizontal and Vertical

FCC 47 CFR Parts 15.247(d), 15.205, 18.305(b)

The least stringent limits from the applicable rule parts were used to determine compliance for Radiated Emissions testing of multiple transmission sources.

The least stringent applicable limit was:

Rule Part	Limit
Part 15.247 (d)	-20 dBc
Part 15.205	Peak: 74 dBμV/m at 3m, Average 54 dBμV/m at 3m
Part 18.302(b)	15 μV/m at 300m

Table 8 - Limit Table



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
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	09-Dec-2018
Antenna 18-40GHz (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	07-Dec-2018
Pre-Amplifier	Phase One	PS04-0086	1533	12	31-Jul-2018
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	HYGROPALM 1	2338	12	24-Oct-2018
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018
Compliance 5 Emissions	Schaffner	C5e Software	3275	-	Software
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	18-Oct-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-2018
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 9

TU - Traceability Unscheduled



3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Radiated Spurious Emissions (Simultaneous Transmission)	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB

Table 10