Report on the FCC Testing of:

Domo Tactical Communications (DTC) Ltd.
Digital Video Transceiver,
Model: SOL8SDR Plain - SOL8SDR 2x2W-P-234091

In accordance with FCC 47 CFR Part 90 and FCC 47 CFR Part 2

Prepared for: Domo Tactical Communications (DTC) Ltd.
Solent, Fusion 2, 1100 Parkway
Solent Business Park, Whiteley
Fareham, Hampshire, PO15 7AB
United Kingdom

Add value.
Inspire trust.

FCC ID: XRFSOL8SDRP234091

COMMERCIAL-IN-CONFIDENCE

Document Number: 75942063-04 | Issue: 05

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Simon Bennett	Chief Engineer	Authorised Signatory	12 April 2019

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD 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 90 and FCC 47 CFR Part 2. The sample tested was found to comply with the requirements defined in the applied rules.

NAME	RESPONSIBLE FOR	SIGNATURE
Matthew Russell	Testing	
Graeme Lawler	Testing	

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY
A sample of this product was tested and found to be com pliant with FCC 47 CFR Part 90: 2017 and FCC 47 CFR Part 2: 2017

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Contents

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	10 October 2018
2	To amend the FCC ID	14 December 2018
3	To amend the application form.	07 January 2019
4	To amend the FCC ID	21 January 2019
5	To amend the application form.	12 April 2019

Table 1

1.2 Introduction

Applicant	Domo Tactical Communications (DTC) Ltd
Manufacturer	Domo Tactical Communications (DTC) Ltd
Model Number(s)	SOL8SDR Plain- SOL8SDR 2x2W-P-234091
Serial Number(s)	040767, 040357
Hardware Version(s)	4
Software Version(s)	4.02
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 90: 2017 FCC 47 CFR Part 2: 2017
Order Number Date	PO-047375-1 07-March-2018
Date of Receipt of EUT	04-May-2018
Start of Test	18-May-2018
Finish of Test	25-September-2018
Name of Engineer(s)	Matthew Russell Graeme Lawler
Related Document(s)	ANSI C63.26: 2015

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 90 and FCC 47 CFR Part 2 is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 90	Part 2			
Configuration and Mode: 2.4 GHz - Transmit					
2.1	90.205	2.1046	Maximum Conducted Output Power	Pass	
2.2	90.207	2.1047	Types of Emissions	Declaration	
2.3	90.210	2.1051	Spurious Emissions at Antenna Terminals	Pass	
2.4	90.210	2.1053	Radiated Spurious Emissions	Pass	
-	90.210	2.1055	Frequency Stability	N/T	Results can be found in Document 75942063-05

Table 2

1.4 Application Form

EQUIPMENT DESCRIPTION	
Model Name/Number	SOL8SDR Plain- SOL8SDR 2x2W-P-234091
Part Number	SOL8SDR 2X2W-P-234091
Hardware Version	4
Software Version	4.0.2
FCC ID (if applicable)	XRFSOL8SDRP234091
Industry Canada ID (if applicable)	8638A-SOL8SDR 2x2W-P
Technical Description (Please provide a brief description of the intended use of the equipment)	SOL8 software defined radio is an ultra-miniature COFDM digital video transceiver. The Plain -P is an ultra-miniature package ideal for integration into small concealment solutions offering 2W output and MIMO. Capable of Video and IP transmission providing greater than 25Mb/s over a selectable bandwidth of between 2.5-10MHz.

INTENTIONAL RADIATORS								
Technology	Conducted Declared Output Power (dBm)	Antenna Gain (dBi)	Supported Bandwidth(s) (MHz)	Modulation Scheme(s)	ITU Emission Designator	Test Channels (MHz)		
						Bottom	Middle	Top
COFDM	2x 33	2	2.5	16QAM-BPSK	2M50D7W	2451.25	2466.75	2482.25
COFDM	2x 33	2	3	16QAM-BPSK	3M00D7W	2451.50	2466.75	2482.00
COFDM	2x 33	2	3.5	16QAM-BPSK	3M50D7W	2451.75	2466.75	2481.75
COFDM	2x 33	2	5	16QAM-BPSK	5M00D7W	2452.50	2466.75	2481.00
COFDM	2x 33	2	6	16QAM-BPSK	6M00D7W	2453.00	2466.75	2480.50
COFDM	2x 33	2	7	16QAM-BPSK	7M00D7W	2453.50	2466.75	2480.00
COFDM	2x 33	2	8	16QAM-BPSK	8M00D7W	2454.00	2466.75	2479.50
COFDM	2x 33	2	10	16QAM-BPSK	10M0D7W	2455.00	2466.75	2478.50

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	2600.00 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	2451.25 MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☒ Class B Digital Device (Use in residential environment only) ☐	

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
External DC	Nominal Voltage	Maximum Current	
	12V	1.8A	
Battery	Nominal Voltage	Battery Operating End Point Voltage	
	12V	9V	
Can EUT transmit whilst being charged?		Yes ☐ No ☒	

EXTREME CONDITIONS					
Maximum temperature	60	°C	Minimum temperature	-10	°C

Ancillaries
Please list all ancillaries which will be used with the device.
12v LEAD AND RJ 45

ANTENNA CHARACTERISTICS					
☒	Antenna connector		State impedance	50	Ohm
☐	Temporary antenna connector		State impedance		Ohm
☐	Integral antenna	Type			
☒	External antenna	Type			

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

Name: Rob Garth

Position held: Product Director Date: 09/04/2019

1.5 Product Information

1.5.1 Technical Description

SOL8 software defined radio is an ultra-miniature COFDM digital video transceiver. The Plain -P is an ultra-miniature package ideal for integration into small concealment solutions offering 2W output and MIMO. Capable of Video and IP transmission providing greater than 25MB/s over a selectable bandwidth of between 2.5-10MHz.

1.5.2 Test Channels

The following centre frequencies were used as the test channels depending on the bandwidth of the transmitter.

Channel Bandwidth (MHz)	Bottom Channel (MHz)	Middle Channel (MHz)	Top Channel (MHz)
2.5	2451.25	2466.75	2482.25
3	2451.50	2466.75	2482.00
3.5	2451.75	2466.75	2481.75
5	2452.50	2466.75	2481.00
6	2453.00	2466.75	2480.50
7	2453.50	2466.75	2480.00
8	2454.00	2466.75	2479.50
10	2455.00	2466.75	2478.50

Table 3

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: 040767			
0	As supplied by the customer	Not Applicable	Not Applicable
1	Domo had to place components on the board that suppliers had not placed on the board. This caused the RF paths to become faulty. Therefore, causing failures. They also had to re calibrate the power on the outputs of the unit to conform to specification.	Domo Tactical	July 2018
Serial Number: 040357			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4

1.8 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz - Transmit		
Maximum Conducted Output Power	Matthew Russell	UKAS
Types of Emissions	Matthew Russell	UKAS
Spurious Emissions at Antenna Terminals	Matthew Russell	UKAS
Radiated Spurious Emissions	Graeme Lawler	UKAS

Table 5

Office Address:

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

2 Test Details

2.1 Maximum Conducted Output Power

2.1.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.205
FCC 47 CFR Part 2, Clause 2.1046

2.1.2 Equipment Under Test and Modification State

SOL8SDR2x2W-P-234091, S/N: 040357 - Modification State 0

2.1.3 Date of Test

25-September-2018

2.1.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.2.4.2.

The EUT did not transmit continuously and the duty cycle was non-constant therefore a gated power meter was used to ensure measurements were only made during the transmitter on time.

Total Power measurements were calculated using the procedure in KDB 662911 D01, E(2)(b).

2.1.5 Environmental Conditions

Ambient Temperature	23.2 °C
Relative Humidity	36.8 %

2.1.6 Test Results

2.4 GHz - Transmit

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.5	2.24	33.3	2.14	33.3	2.14
Port B	33.2	2.09	33.2	2.09	33.1	2.04
Total Power	36.4	4.33	36.3	4.23	36.2	4.18

Table 6 – Maximum Conducted Output Power – 2.5 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.5	2.24	33.2	2.09	33.2	2.09
Port B	33.3	2.14	33.1	2.04	33.1	2.04
Total Power	36.4	4.38	36.2	4.13	36.2	4.13

Table 7 – Maximum Conducted Output Power – 3 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.5	2.24	33.2	2.09	33.2	2.09
Port B	33.2	2.09	33.2	2.09	33.1	2.04
Total Power	36.4	4.33	36.2	4.18	36.2	4.13

Table 8 – Maximum Conducted Output Power – 3.5 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.4	2.19	33.1	2.04	33.2	2.09
Port B	33.2	2.09	33.1	2.04	33.1	2.04
Total Power	36.3	4.28	36.1	4.08	36.2	4.13

Table 9 – Maximum Conducted Output Power – 5 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.3	2.14	33.0	2.00	32.9	1.95
Port B	33.2	2.09	33.2	2.09	33.0	2.00
Total Power	36.3	4.23	36.1	4.08	36.0	3.95

Table 10 – Maximum Conducted Output Power – 6 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.3	2.09	33.0	2.00	33.0	2.00
Port B	33.2	2.09	33.1	2.04	33.0	2.00
Total Power	36.3	4.23	36.1	4.04	36.0	3.99

Table 11 – Maximum Conducted Output Power – 7 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.3	2.14	33.0	2.00	33.1	2.04
Port B	33.2	2.09	33.1	2.04	33.0	2.00
Total Power	36.2	4.18	36.0	3.95	36.0	3.99

Table 12 – Maximum Conducted Output Power – 8 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (W)	Result (dBm)	Result (W)	Result (dBm)	Result (W)
Port A	33.3	2.14	32.09	1.95	33.0	2.00
Port B	33.1	2.04	33.0	2.00	33.0	2.00
Total Power	36.2	4.18	36.0	3.95	36.0	3.99

Table 13 – Maximum Conducted Output Power – 10 MHz Bandwidth

FCC 47 CFR Part 90, Limit Clause 90.205

Frequency (MHz)	Limit
< 25	1000 W
25 to 50	300 W
72 to 76	300 W
150 to 174	Refer to 90.205 (d) of the specification
217 to 220	Refer to 90.259 of the specification
220 to 222	Refer to 90.729 of the specification
421 to 430	Refer to 90.279 of the specification
450 to 470	Refer to 90.205 (h) of the specification
470 to 512	Refer to 90.307 and 90.309 of the specification
758 to 775 and 788 to 805	Refer to 90.541 and 90.542 of the specification
806 to 824, 851 to 869, 869 to 901 and 935 to 940	Refer to 90.635 of the specification
902 to 927.25	LMS systems operating pursuant to subpart M of the specification: 30 W
927.25 to 928	LMS equipment: 300 W
929 to 930	Refer to 90.494 of the specification
1427 to 1429.5 and 1429.5 to 1432	Refer to 90.259 of the specification
2450 to 2483.5	5 W
4940 to 4990	Refer to 90.1215 of the specification
5850 to 5925	Refer to subpart M of the specification
All other frequency bands	On a case by case basis

Table 14 - Specification Limits for Maximum ERP

2.1.7 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
Attenuator (10dB, 1W)	Sealectro	60-674-1010-89	1224	12	30-Jun-2018
Multimeter	Iso-tech	IDM101	2419	12	23-Nov-2018
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	11-Jul-2018
Hygrometer	Rotronic	I-1000	3220	12	30-Aug-2018
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	02-Oct-2018
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	06-Mar-2019
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4520	12	13-Feb-2019
PXA Signal Analyser	Keysight Technologies	N9030A	4653	12	05-Feb-2019
Attenuator (20dB, 100W)	Weinschel	48-20-43	4869	12	11-Jul-2018
Quad Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon

Table 15

O/P Mon – Output Monitored using calibrated equipment

2.2 Types of Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.207
FCC 47 CFR Part 2, Clause 2.1047

2.2.2 Equipment Under Test

SOL8SDR2x2W-P-234091

2.2.3 Date of Test

23-May-2018

2.2.4 Test Method

The following information was provided by the manufacturer.

2.2.5 Test Results

2.4 GHz - Transmit

The class of emission has been declared by the manufacturer as D1W. This emission class is permitted for use as per FCC 47 CFR Part 90.207 and therefore must be considered on a case-by-case basis.

The modulation scheme used is BPSK and 16-QAM with authorised bandwidths of 2.5, 3, 3.5, 5, 6, 7, 8 and 10 MHz.

The device is intended primarily for the transmission of digital video information. The video input signal goes through an ADC before the information is modulated within the given bandwidth.

FCC 47 CFR Part 90, Limit Clause 90.207

As per FCC Part 90.207 (b) through (n).

FCC 47 CFR Part 2, Limit Clause 2.1047

Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

2.3 Spurious Emissions at Antenna Terminals

2.3.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.210
FCC 47 CFR Part 2, Clause 2.1051

2.3.2 Equipment Under Test and Modification State

SOL8SDR2x2W-P-234091, S/N: 040767 - Modification State 0

2.3.3 Date of Test

18-May-2018

2.3.4 Test Method

This test was performed in accordance with FCC Part 90, Clause 90.210 Emission Mask B and ANSI C63.26, Clause 5.7, 5,7,1, 5.7.2.

For emissions removed > 250% of the authorised bandwidth from the centre frequency, the limit shall be reduced 3 dB for MIMO operation when N=2 and N is the number of transmitters simultaneously operating.

3 dB = 10*LOG(2).

This level shall be equivalent to -16 dBm for all frequencies removed by more than 250% of the authorised bandwidth.

The limit line shall be reduced by a further 3 dB to that shown on the plots below to account for simultaneous transmissions from both antenna ports. Sufficient margin is shown on the plots and therefore it was confirmed that the EUT meets this more stringent limit.

2.3.5 Environmental Conditions

Ambient Temperature	23.6 °C
Relative Humidity	34.8 %

2.3.6 Test Results

2.4 GHz - Transmit

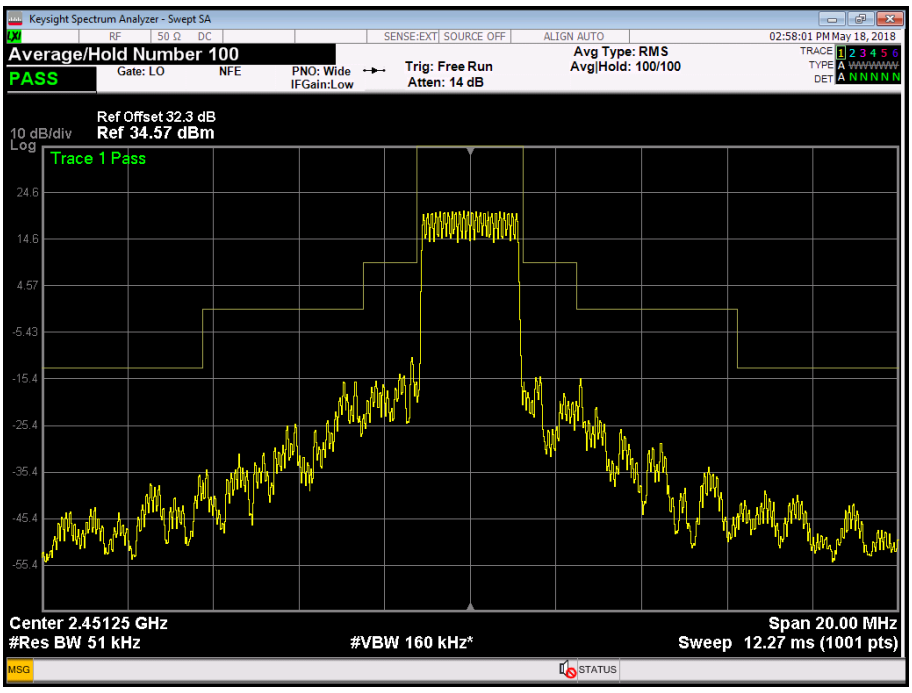

Figure 1 - Bottom Channel - Transmitter Mask - 2.5 MHz Bandwidth, Port A

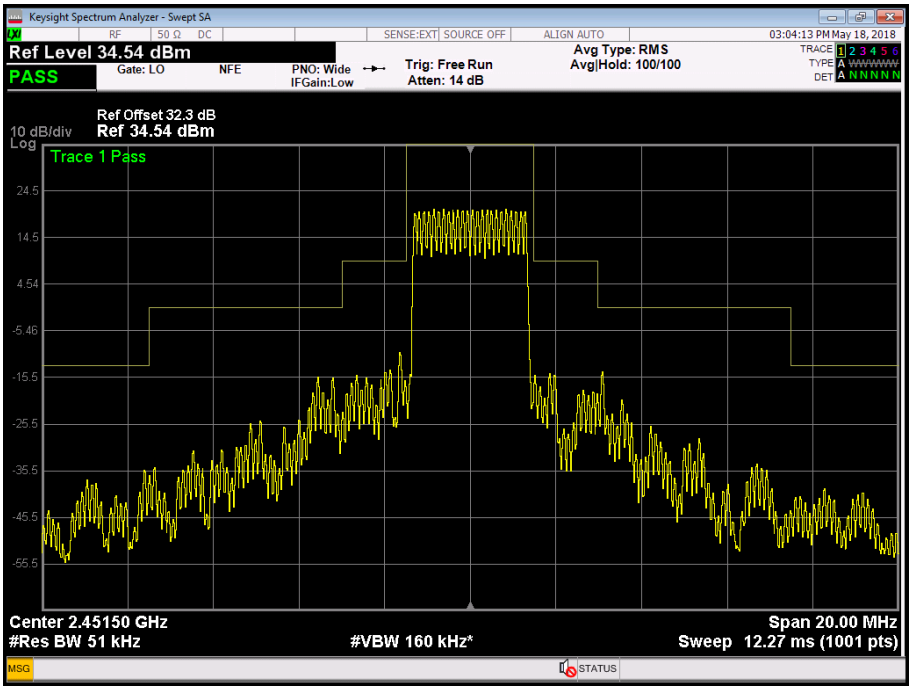

Figure 2 - Bottom Channel - Transmitter Mask - 3 MHz Bandwidth, Port A

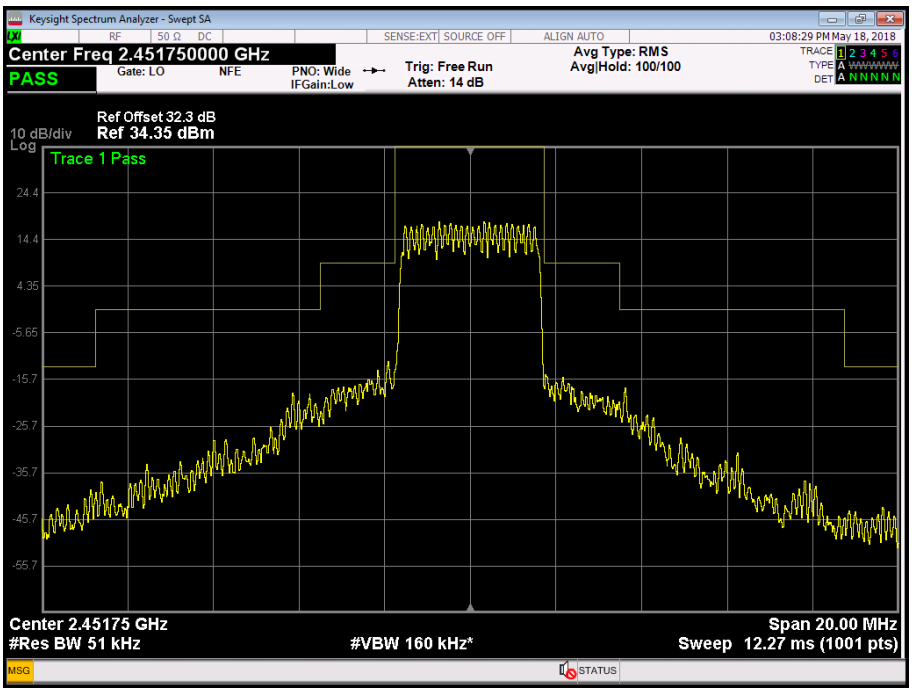

Figure 3 - Bottom Channel - Transmitter Mask - 3.5 MHz Bandwidth, Port A

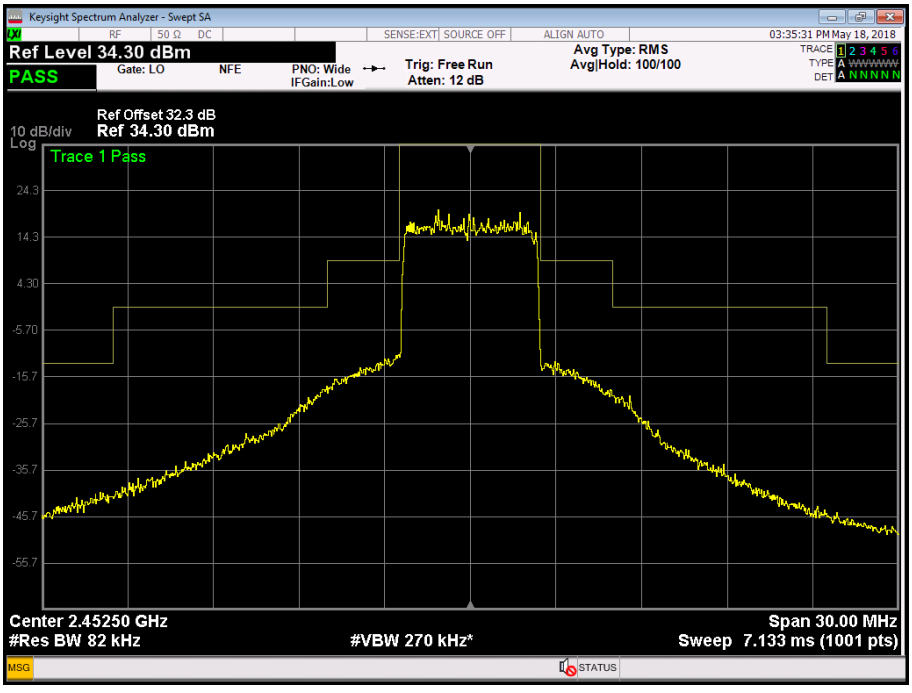

Figure 4 - Bottom Channel - Transmitter Mask - 5 MHz Bandwidth, Port A

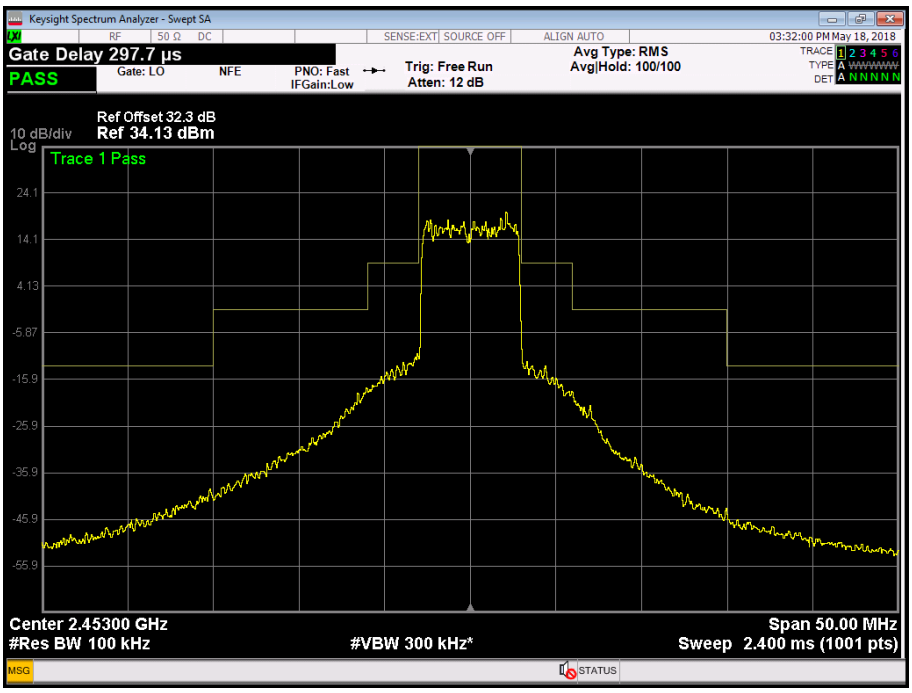

Figure 5 - Bottom Channel - Transmitter Mask - 6 MHz Bandwidth, Port A

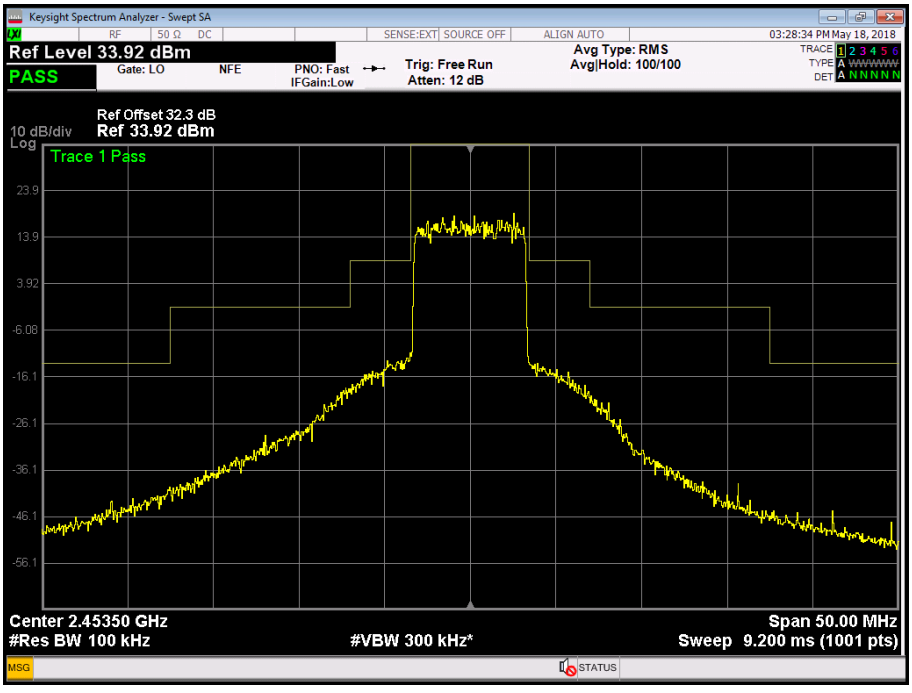

Figure 6 - Bottom Channel - Transmitter Mask - 7 MHz Bandwidth, Port A

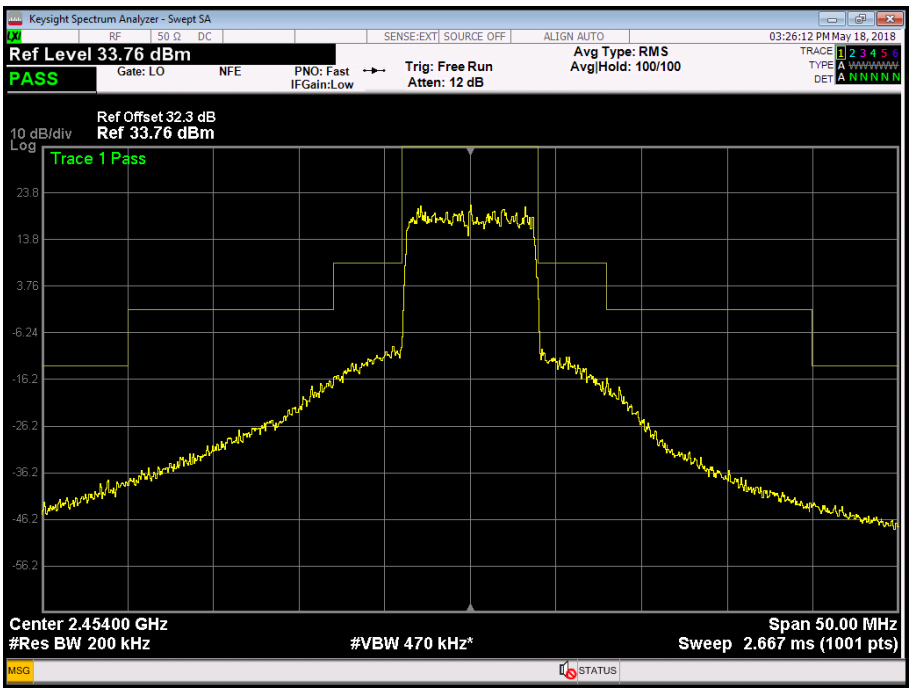

Figure 7 - Bottom Channel - Transmitter Mask - 8 MHz Bandwidth, Port A

Figure 8 - Bottom Channel - Transmitter Mask - 10 MHz Bandwidth, Port A

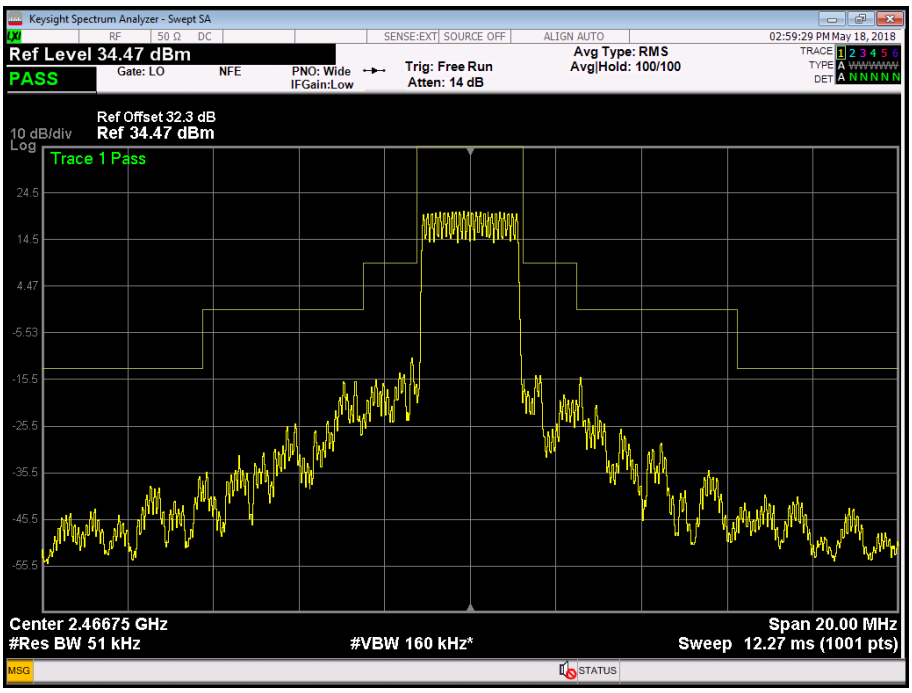

Figure 9 - Middle Channel - Transmitter Mask - 2.5 MHz Bandwidth, Port A

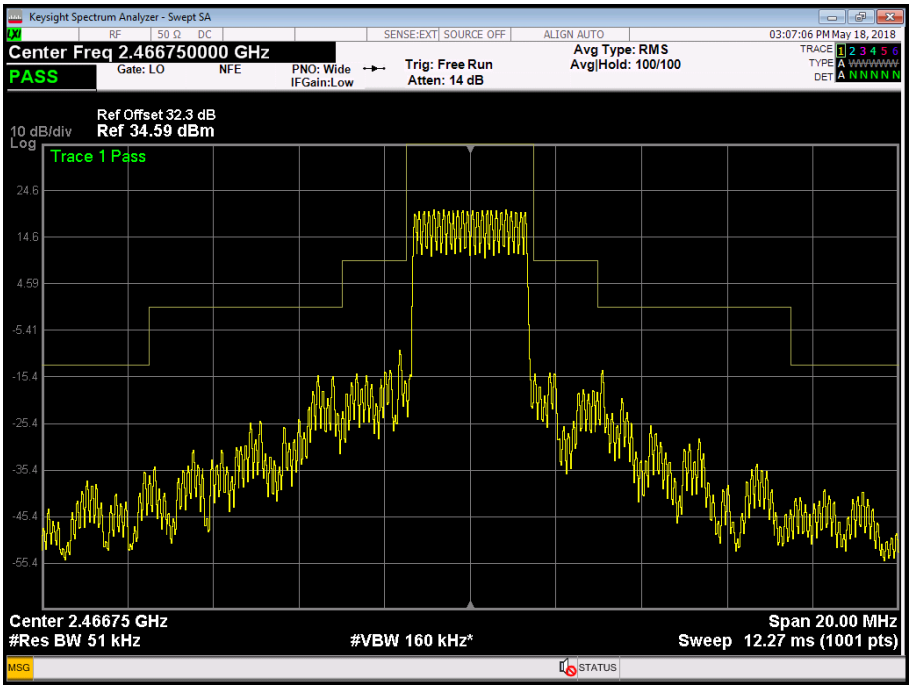

Figure 10 - Middle Channel - Transmitter Mask - 3 MHz Bandwidth, Port A

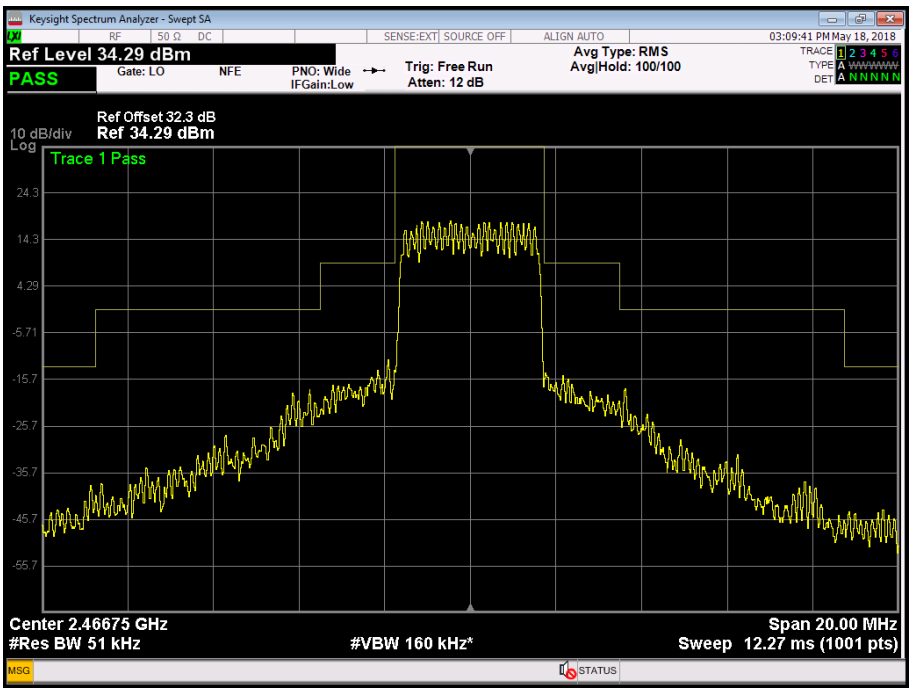

Figure 11 - Middle Channel - Transmitter Mask - 3.5 MHz Bandwidth, Port A

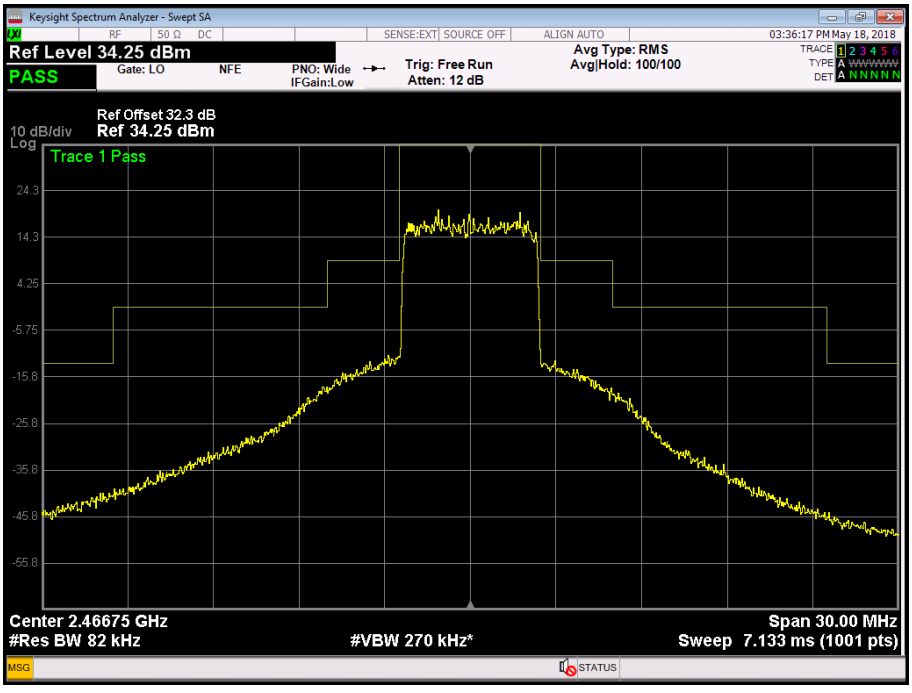

Figure 12 - Middle Channel - Transmitter Mask - 5 MHz Bandwidth, Port A

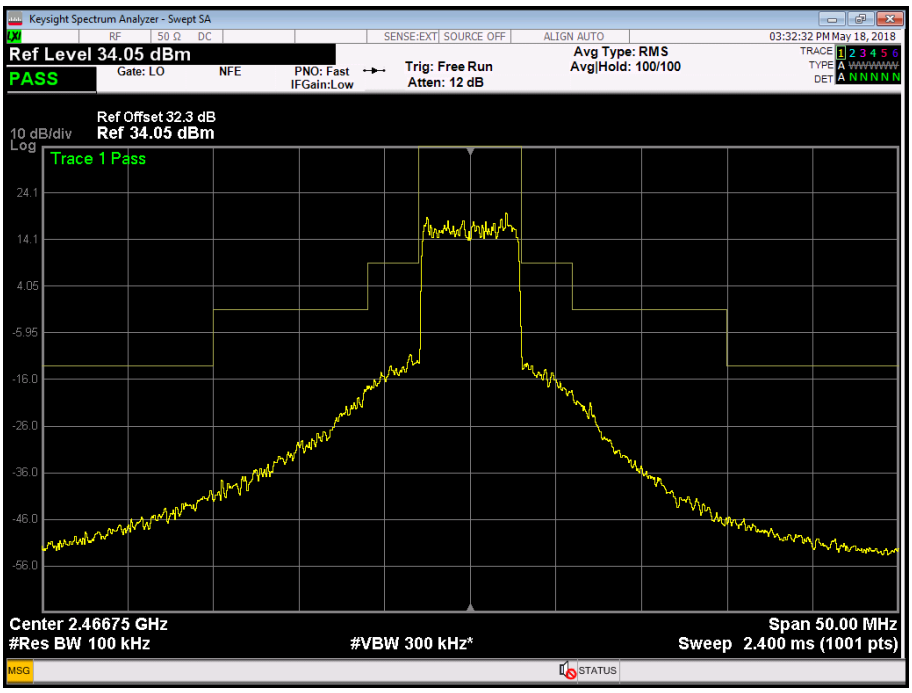

Figure 13 - Middle Channel - Transmitter Mask - 6 MHz Bandwidth, Port A

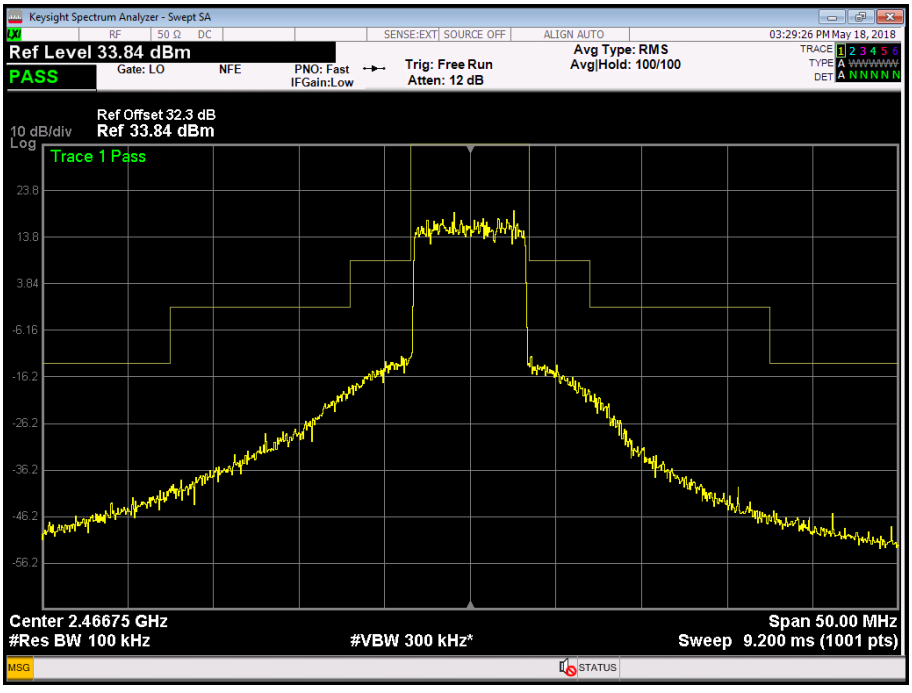

Figure 14 - Middle Channel - Transmitter Mask - 7 MHz Bandwidth, Port A

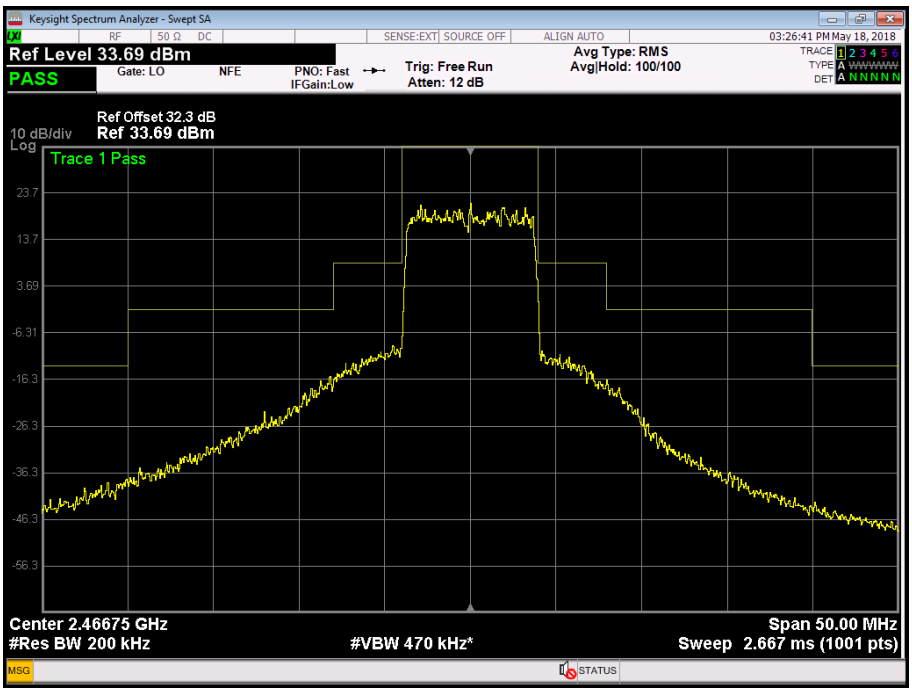

Figure 15 - Middle Channel - Transmitter Mask - 8 MHz Bandwidth, Port A

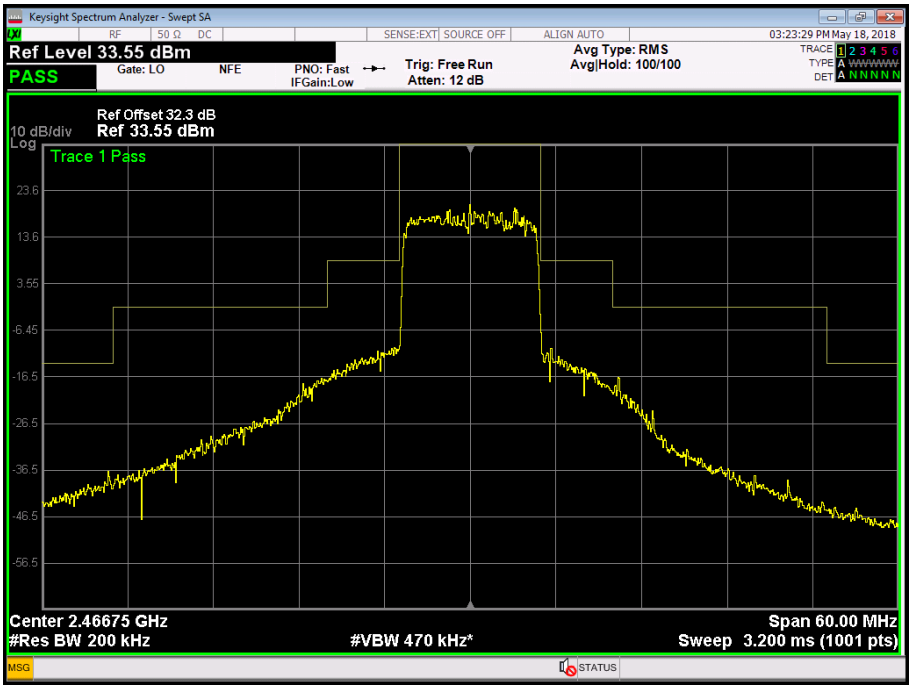

Figure 16 - Middle Channel - Transmitter Mask - 10 MHz Bandwidth, Port A

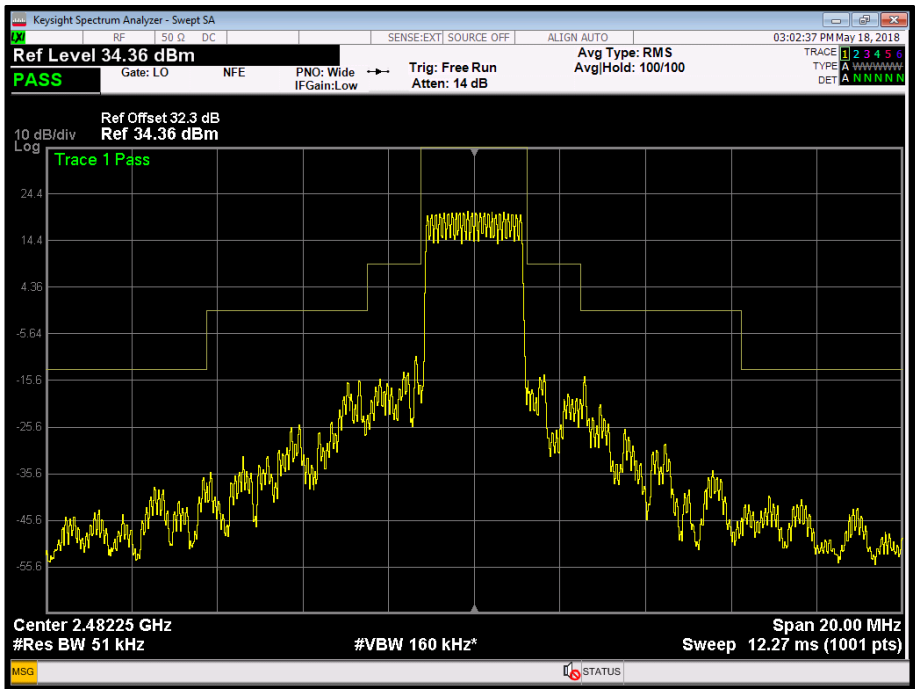

Figure 17 - Top Channel - Transmitter Mask - 2.5 MHz Bandwidth, Port A

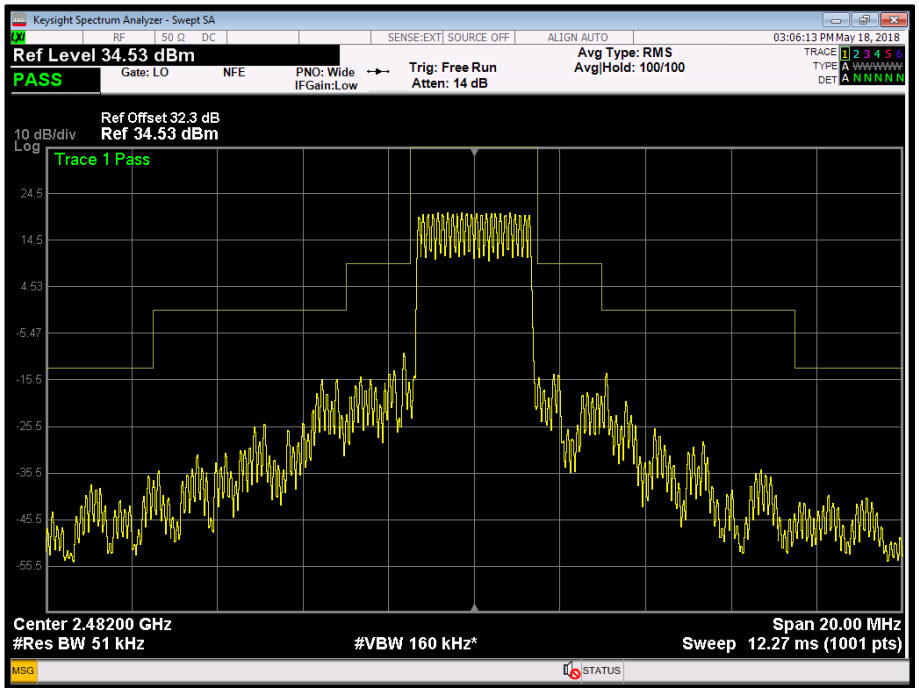

Figure 18 –Top Channel - Transmitter Mask - 3 MHz Bandwidth, Port A

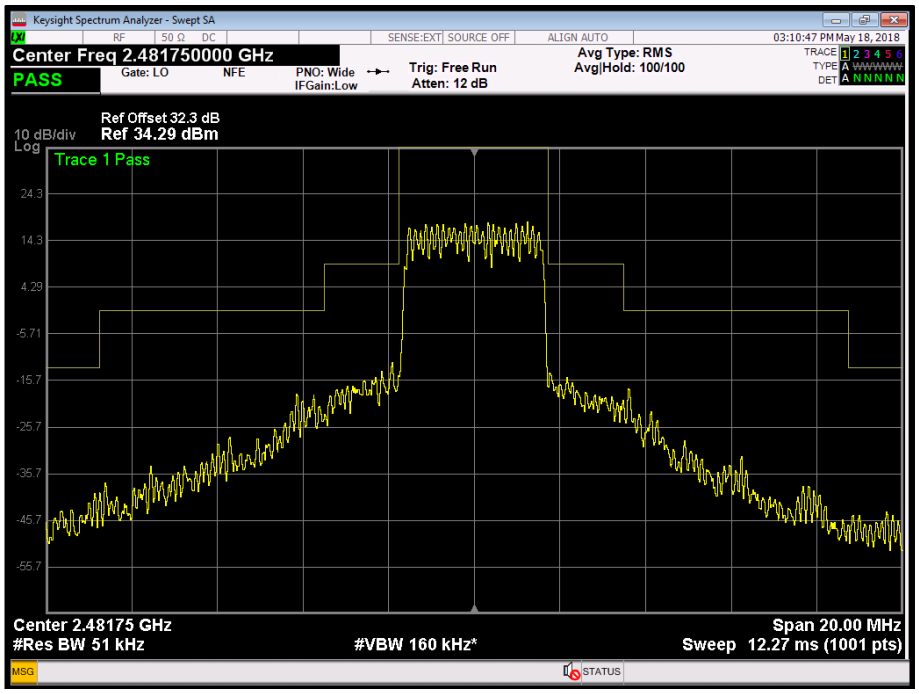

Figure 19 - Top Channel - Transmitter Mask - 3.5 MHz Bandwidth, Port A

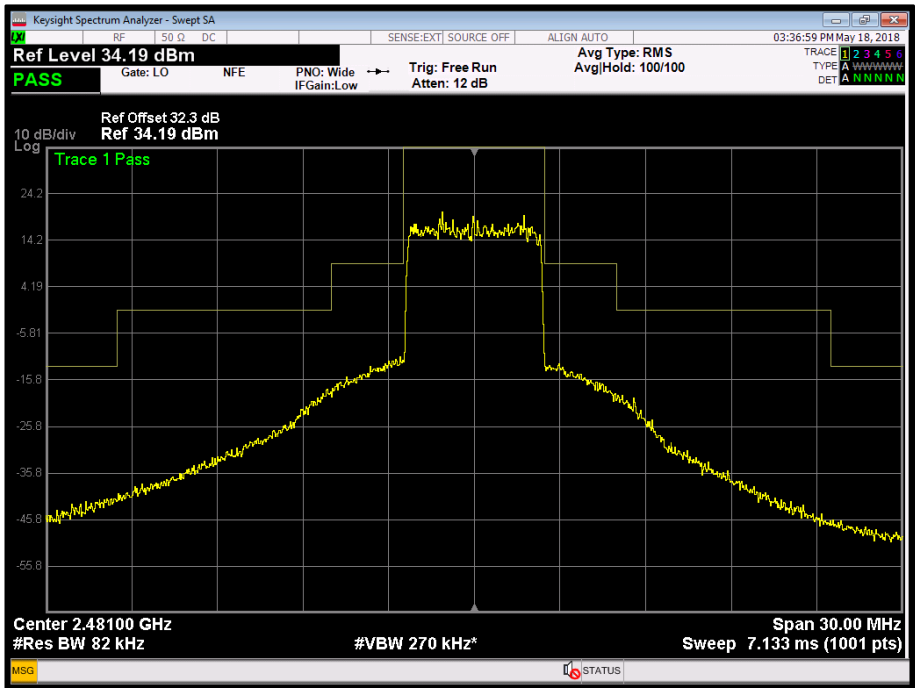

Figure 20 - Top Channel - Transmitter Mask - 5 MHz Bandwidth, Port A

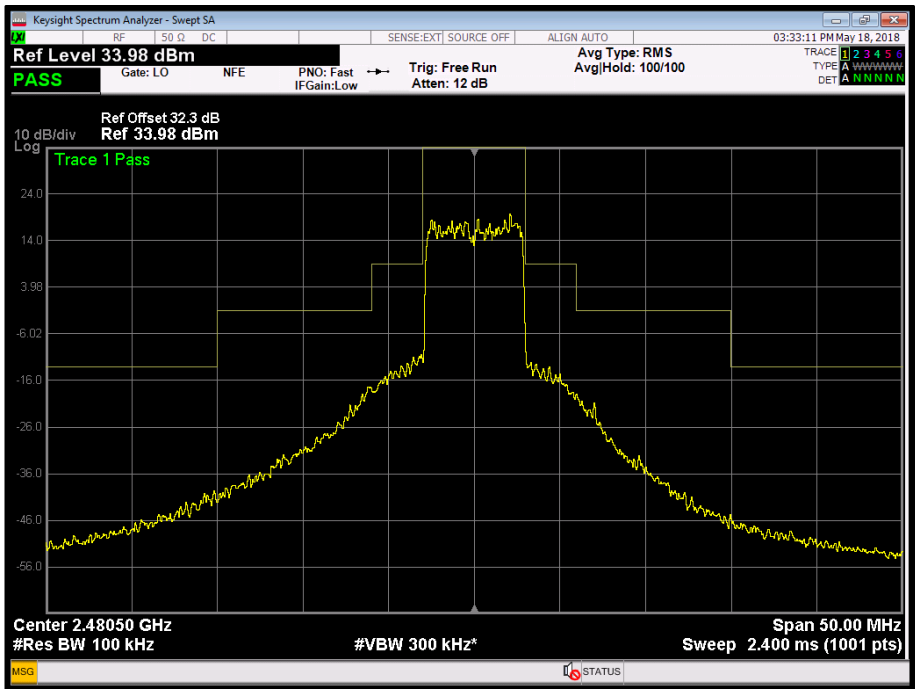

Figure 21 - Top Channel - Transmitter Mask - 6 MHz Bandwidth, Port A

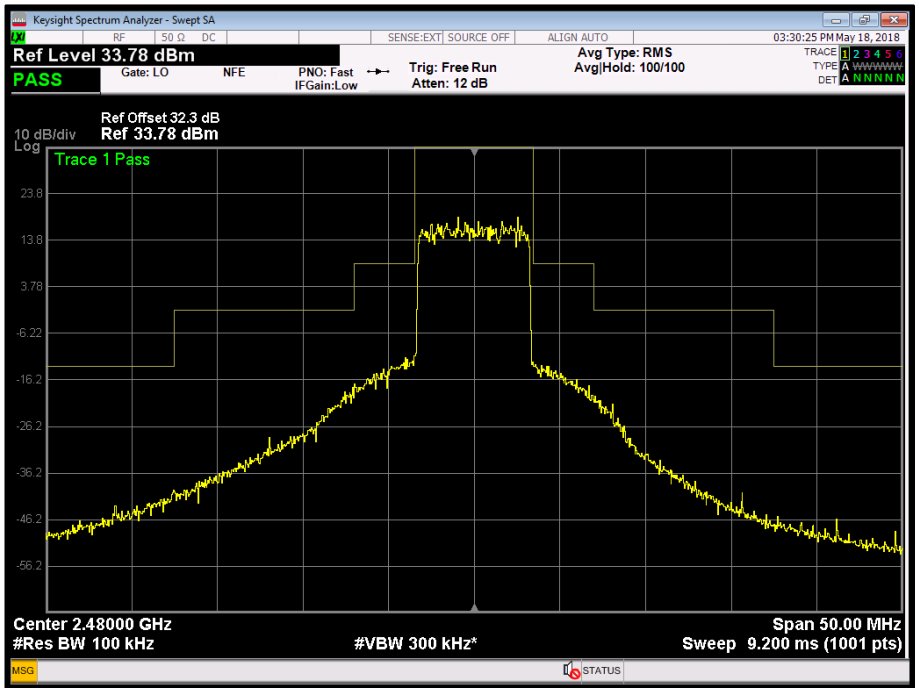

Figure 22 - Top Channel - Transmitter Mask - 7 MHz Bandwidth, Port A

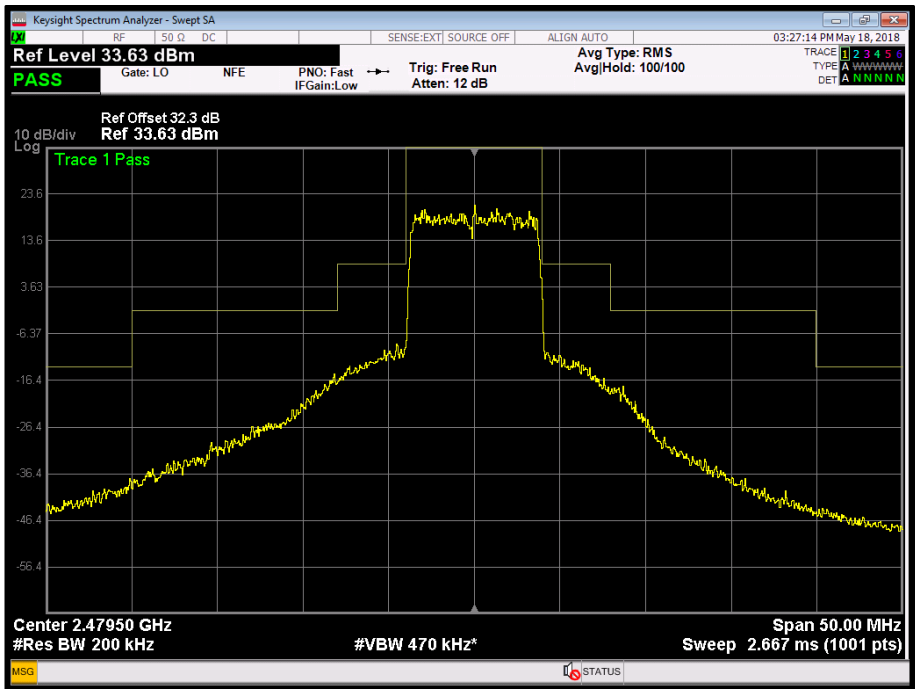

Figure 23 - Top Channel - Transmitter Mask - 8 MHz Bandwidth, Port A

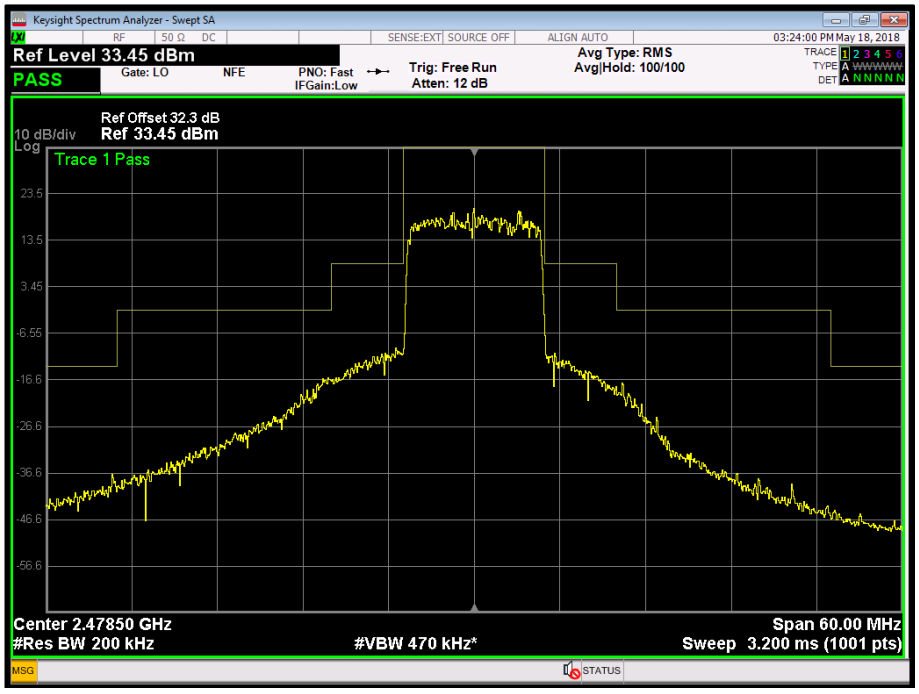

Figure 24 - Top Channel - Transmitter Mask - 10 MHz Bandwidth, Port A

FCC 47 CFR Part 90, Limit Clause 90.210

The EUT shall comply with emission mask B as per FCC 47 CFR Part 90.210.

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
Attenuator (10dB, 1W)	Sealectro	60-674-1010-89	1224	12	30-Jun-2018
Multimeter	Iso-tech	IDM101	2419	12	23-Nov-2018
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	11-Jul-2018
Hygrometer	Rotronic	I-1000	3220	12	30-Aug-2018
PXA Signal Analyser	Keysight Technologies	N9030A	4653	12	05-Feb-2019
Attenuator (20dB, 100W)	Weinschel	48-20-43	4869	12	11-Jul-2018
Quad Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon

Table 16

O/P Mon – Output Monitored using calibrated equipment

2.4 Radiated Spurious Emissions

2.4.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.210
FCC 47 CFR Part 2, Clause 2.1053

2.4.2 Equipment Under Test and Modification State

SOL8SDR2x2W-P-234091, S/N: 040767 - Modification State 1

2.4.3 Date of Test

01-August-2018 to 05-August-2018

2.4.4 Test Method

The EUT was powered from a 12 V DC battery and a preliminary profile of the Spurious Radiated Emissions was obtained up to the 10th harmonic by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation. This pre-scan was performed using peak detector and max-hold trance. To determine the level of final emissions which were recorded as average first the peak-to-average ratio was determined, and this level subtracted from the peak result. A duty cycle correction factor was then determined (10*Log(1/x), where x is the duty cycle in decimal, and this correction was added to determine the final level of average emissions.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The EUT was set to transmit on maximum power (5 MHz bandwidth) with both channels operating simultaneously.

For any emissions found the EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator, the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss.

2.4.5 Environmental Conditions

Ambient Temperature	19.5 - 19.9°C
Relative Humidity	54.4 - 68.4 %

2.4.6 Test Results

2.4 GHz - Transmit

Frequency (MHz)	Level (dBm)
*	

Table 17 - Bottom Channel - 30 MHz to 1 GHz - Emissions Results

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

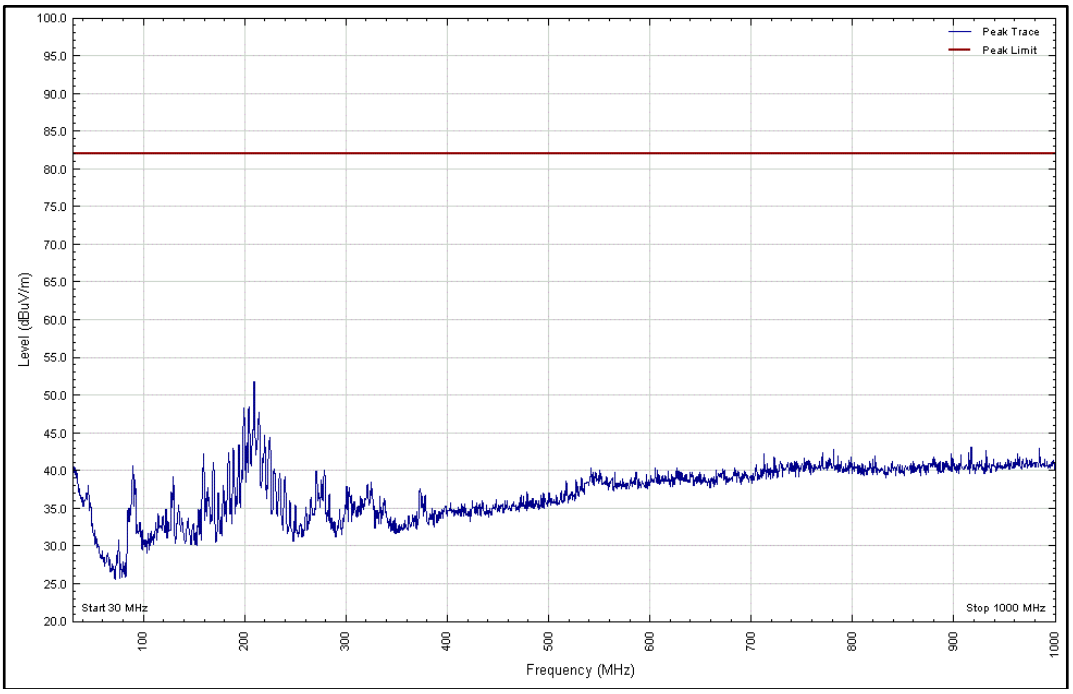

Figure 25 - Bottom Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation X

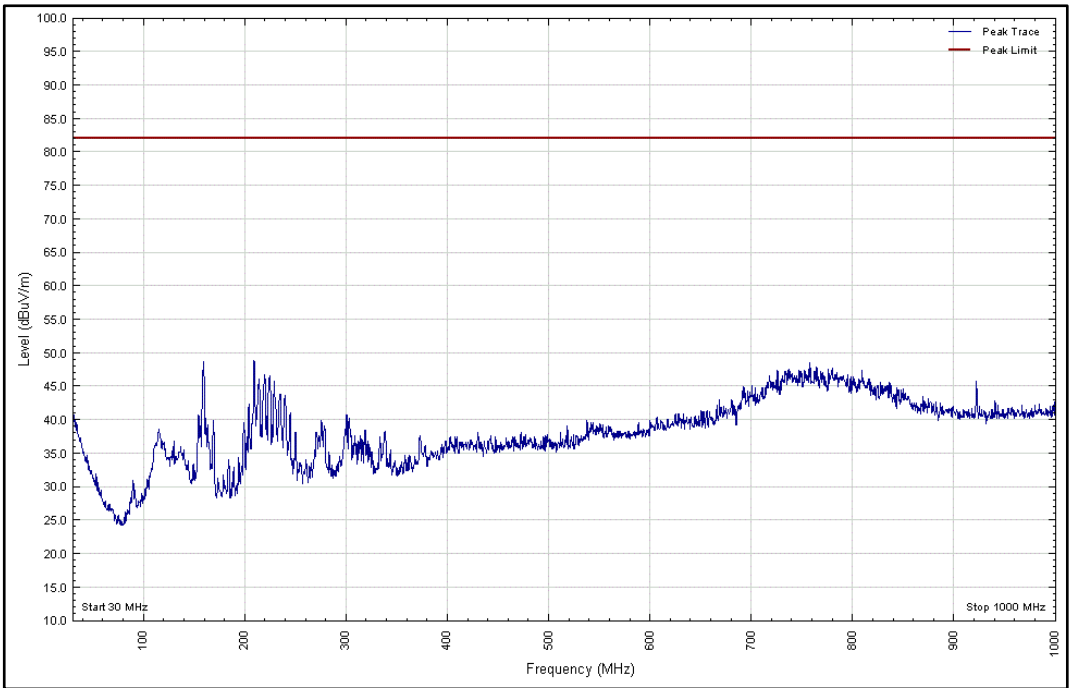

Figure 26 - Bottom Channel - 30 MHz to 1 GHz, Horizontal, EUT Orientation X

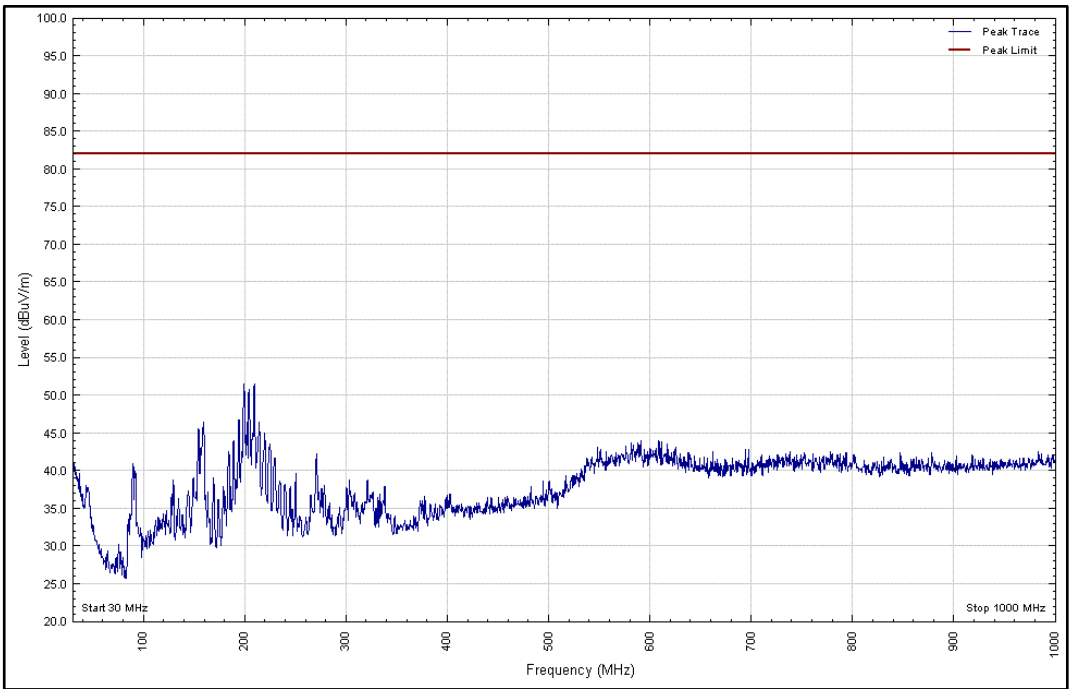

Figure 27 - Bottom Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation Y

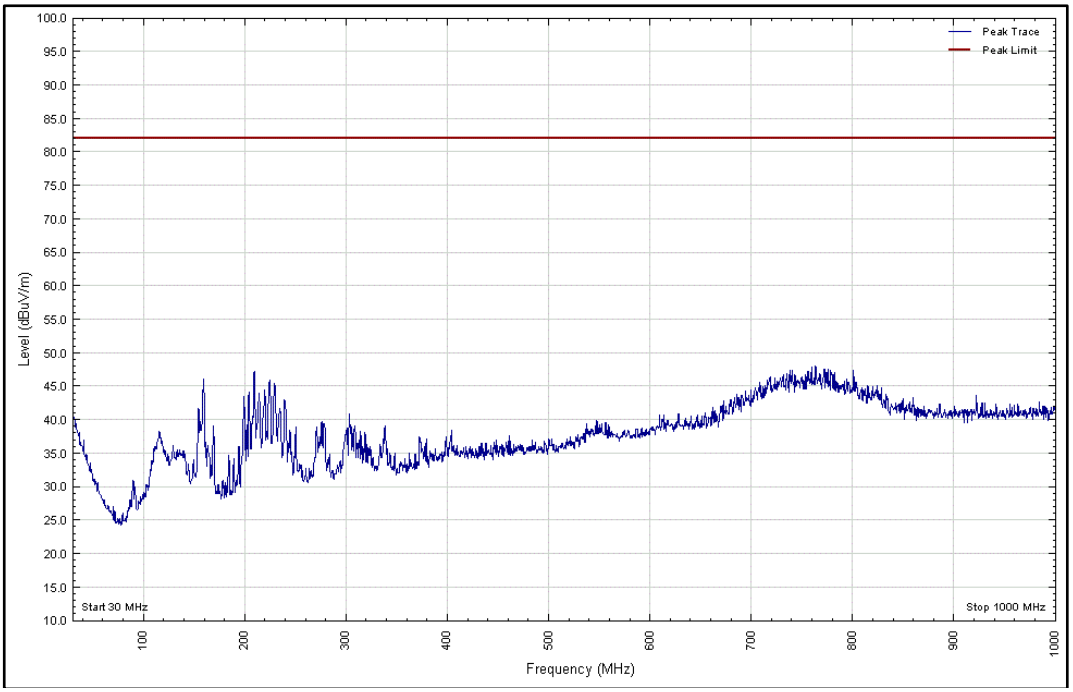

Figure 28 - Bottom Channel - 30 MHz to 1 GHz, Horizontal, EUT Orientation Y

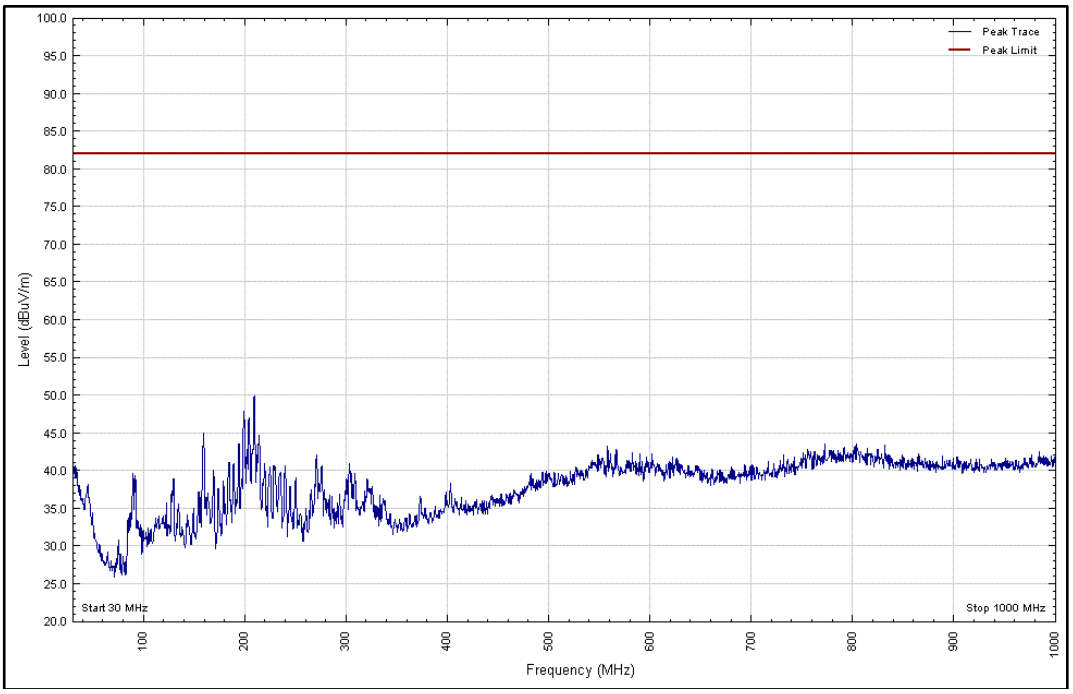

Figure 29 - Bottom Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation Z

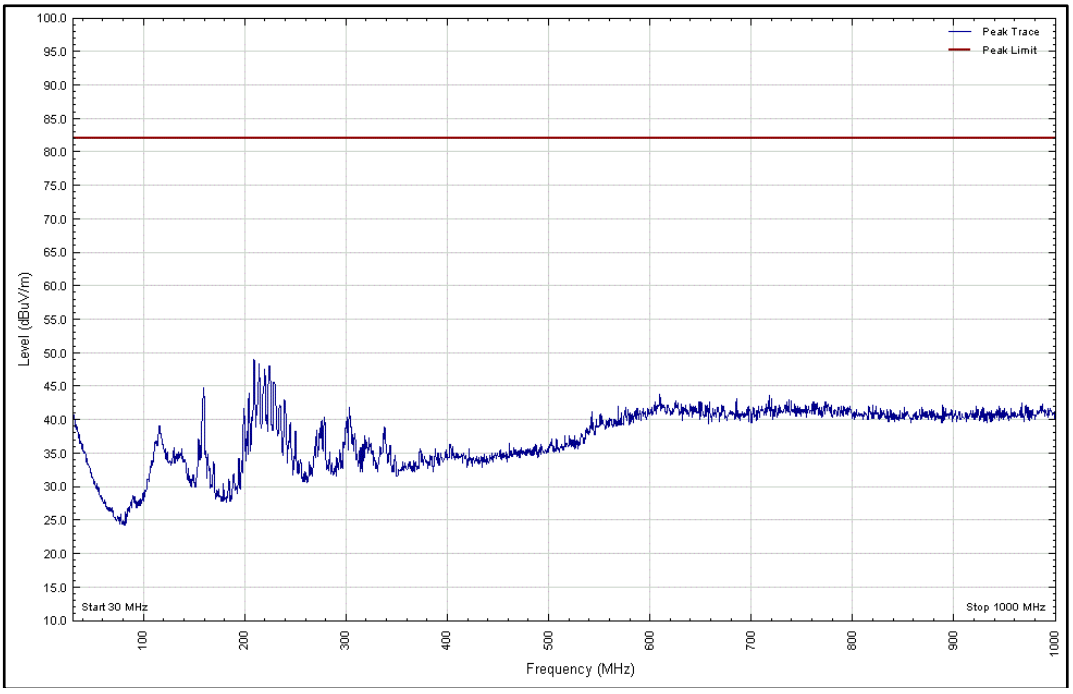

Figure 30 - Bottom Channel - 30 MHz to 1 GHz, Horizontal, EUT Orientation Z

Frequency (MHz)	Level (dBm)
12260.325	-20.70

Table 18 - Bottom Channel – 1 GHz to 25 GHz - Emissions Results

No other emissions were detected within 10 dB of the limit.

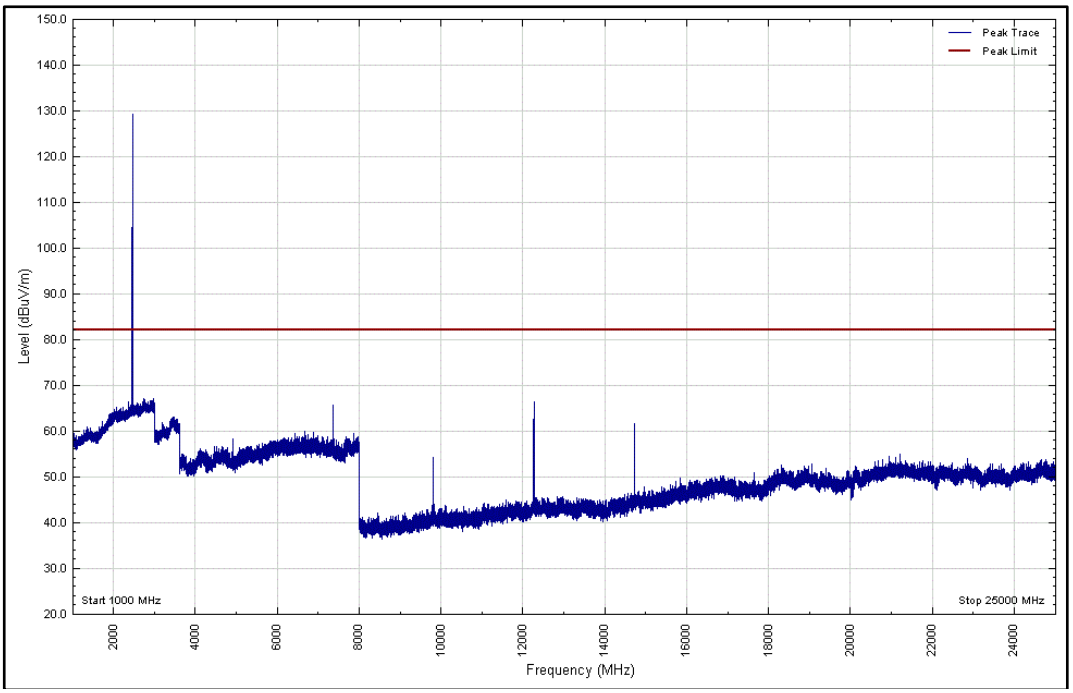

Figure 31 - Bottom Channel - 1 GHz to 25 GHz, Vertical, EUT Orientation X

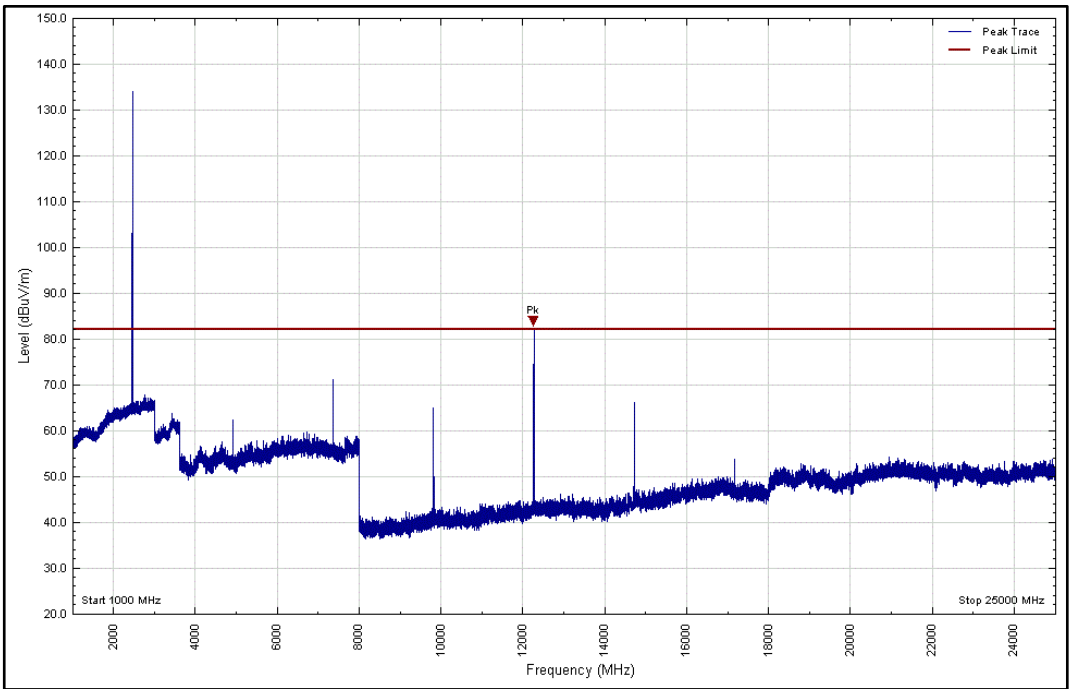

Figure 32 - Bottom Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation X

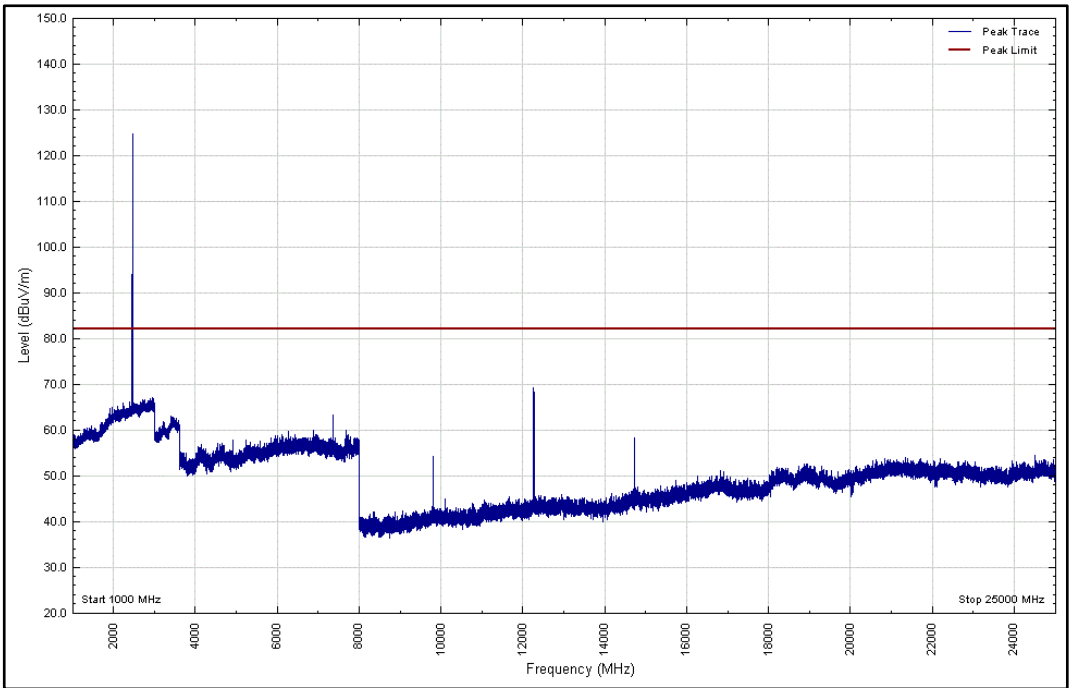

Figure 33 - Bottom Channel - 1 GHz to 25 GHz Vertical, EUT Orientation Y

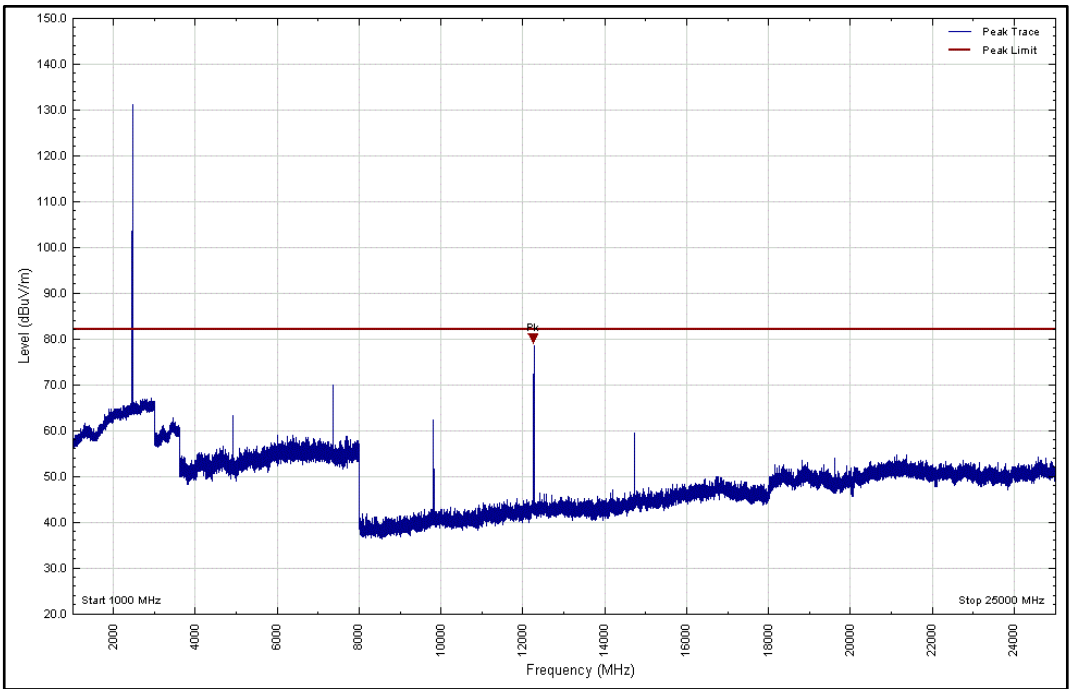

Figure 34 - Bottom Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation Y

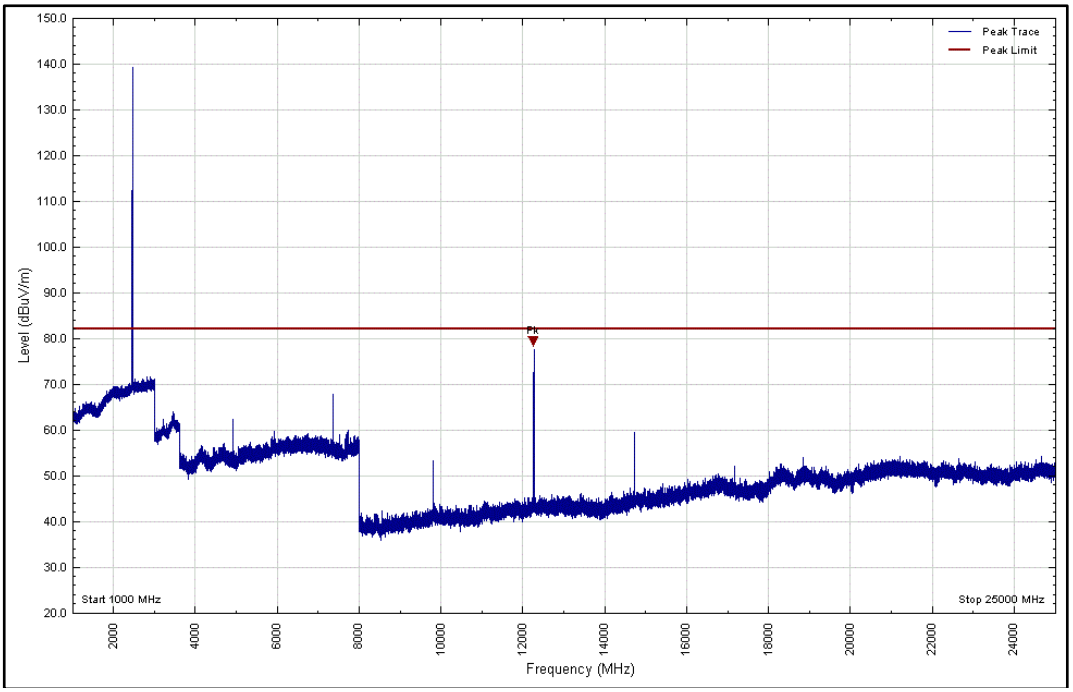

Figure 35 - Bottom Channel - 1 GHz to 25 GHz, Vertical, EUT Orientation Z

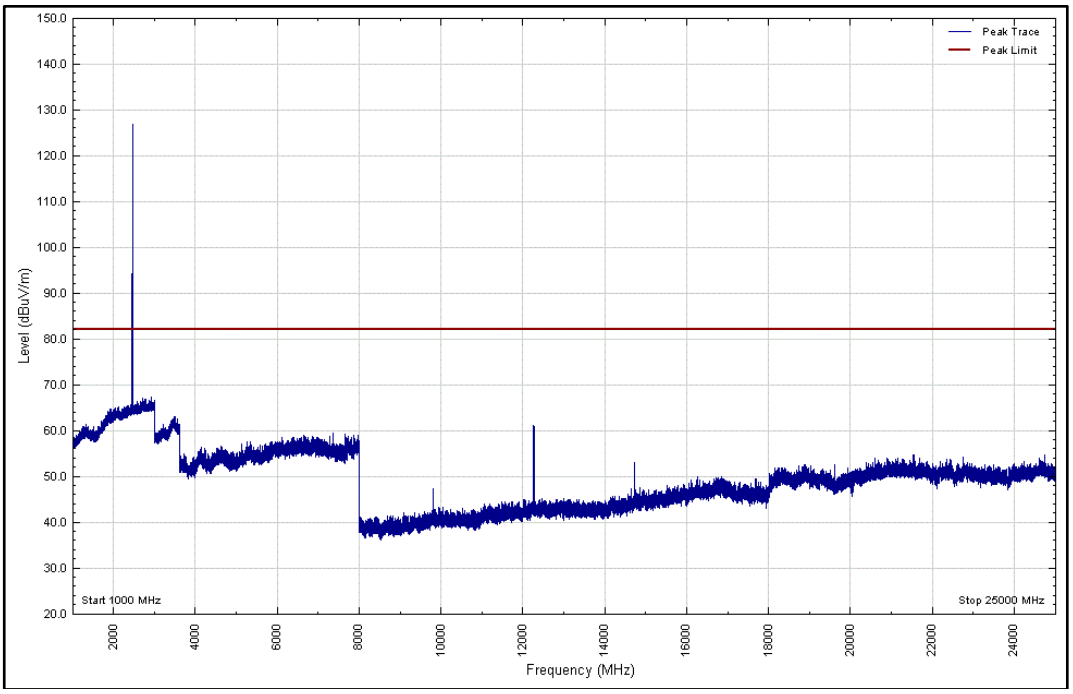

Figure 36 - Bottom Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation Z

Frequency (MHz)	Level (dBm)
*	

Table 19 - Middle Channel - 30 MHz to 1 GHz - Emissions Results

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

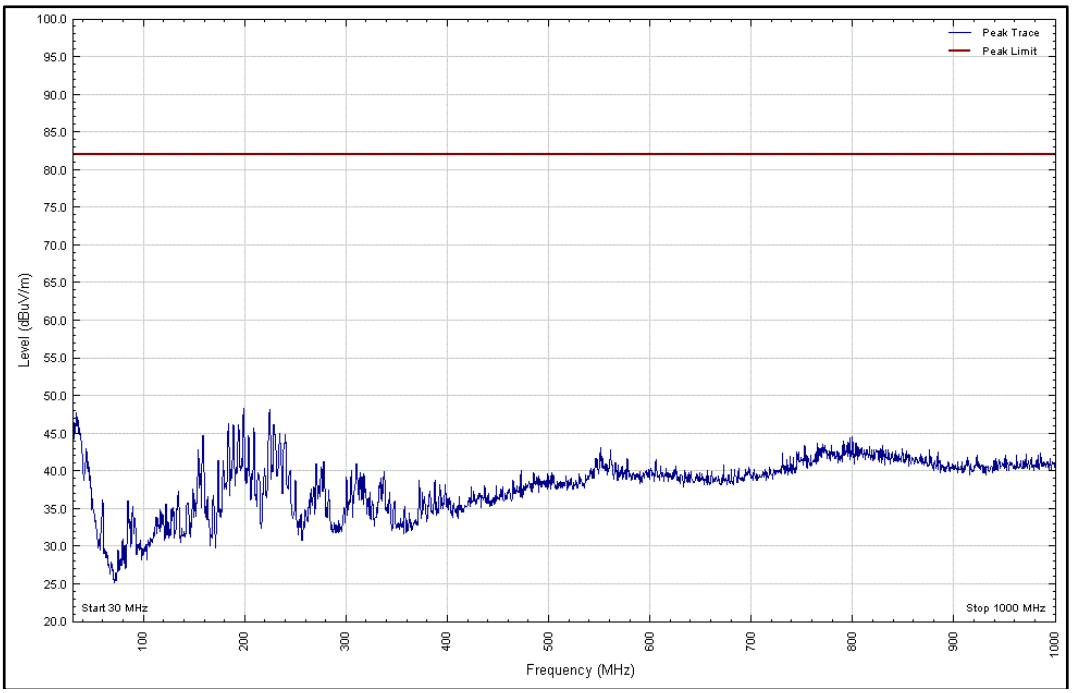

Figure 37 - Middle Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation X

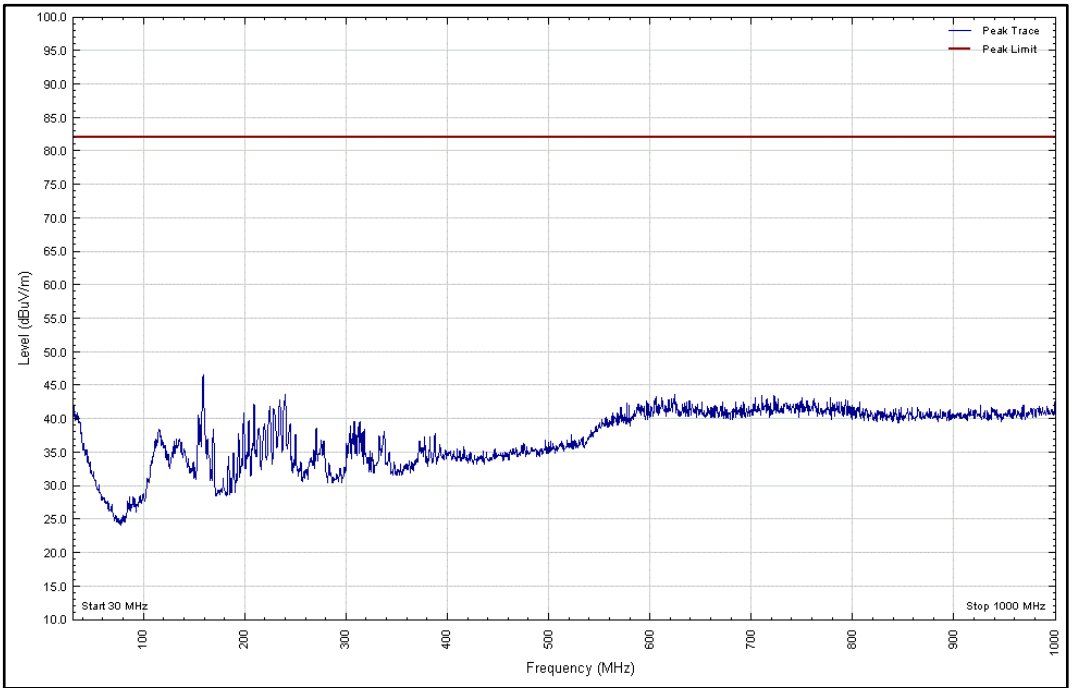

Figure 38 - Middle Channel - 30 MHz to 1 GHz, Horizontal, EUT Orientation X

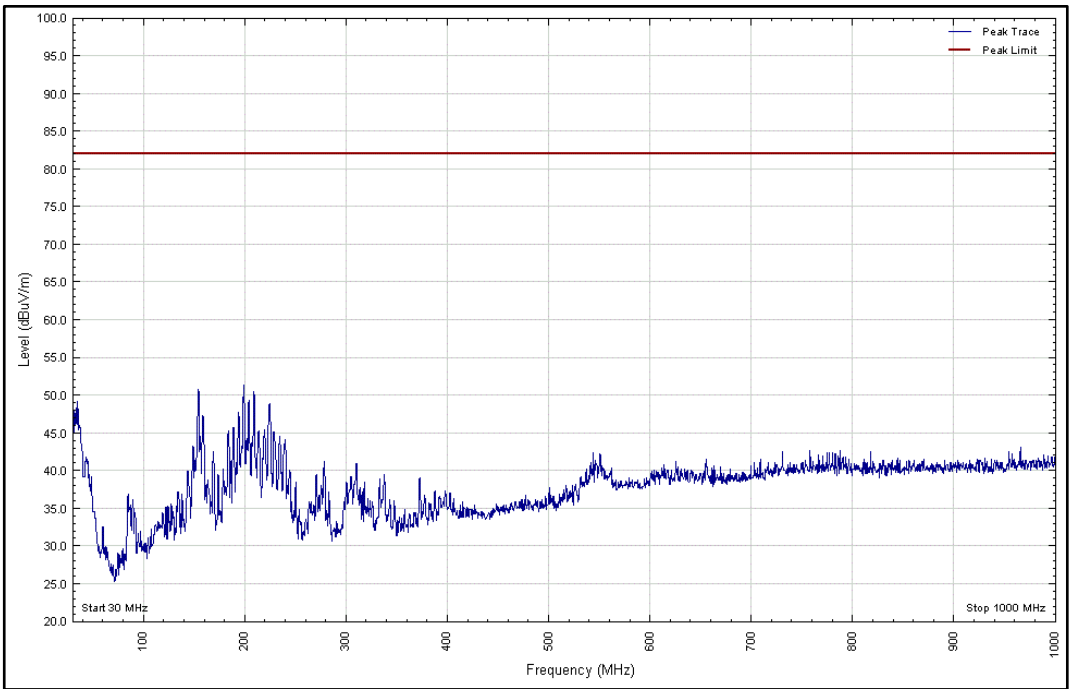

Figure 39 - Middle Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation Y

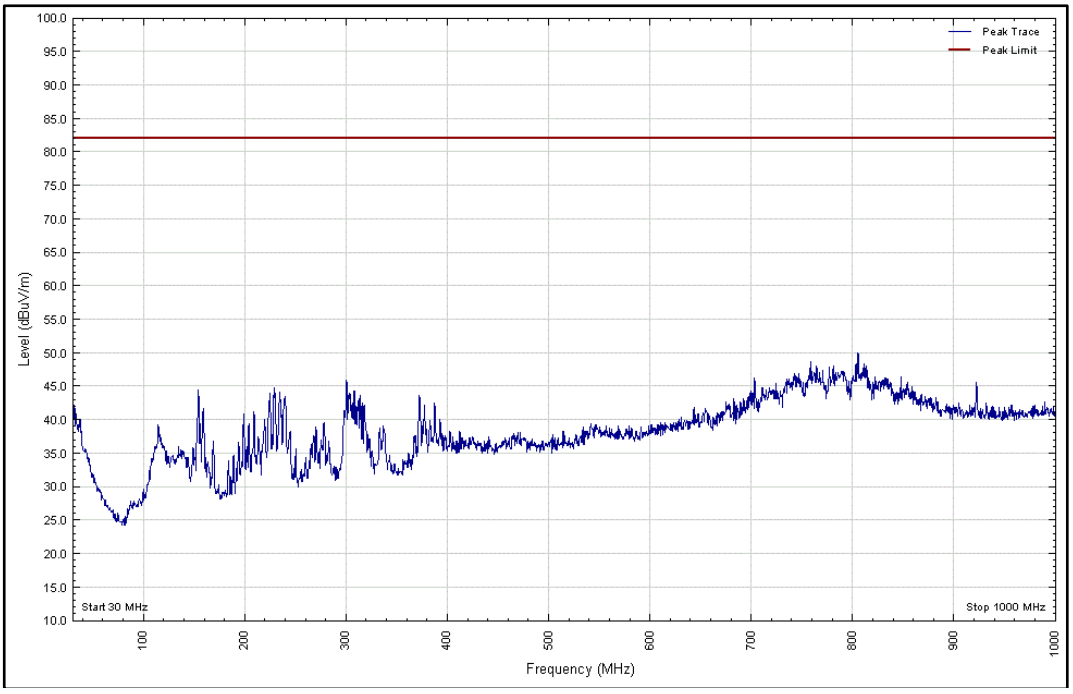

Figure 40 - Middle Channel - 30 MHz to 1 GHz, Horizontal, EUT Orientation Y

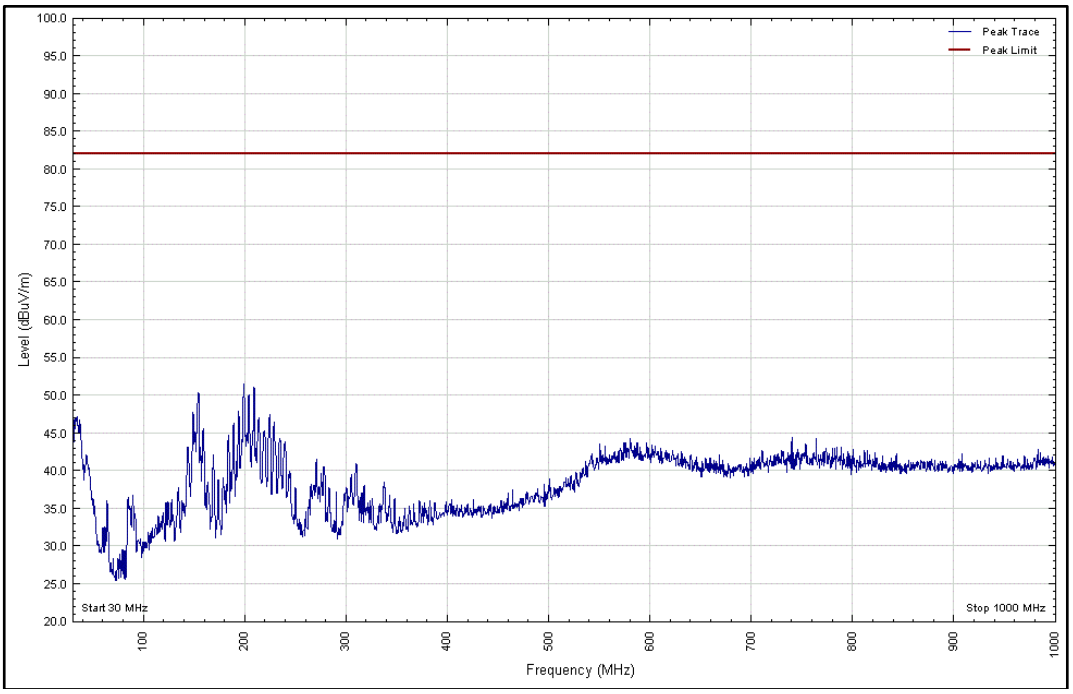

Figure 41 - Middle Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation Z

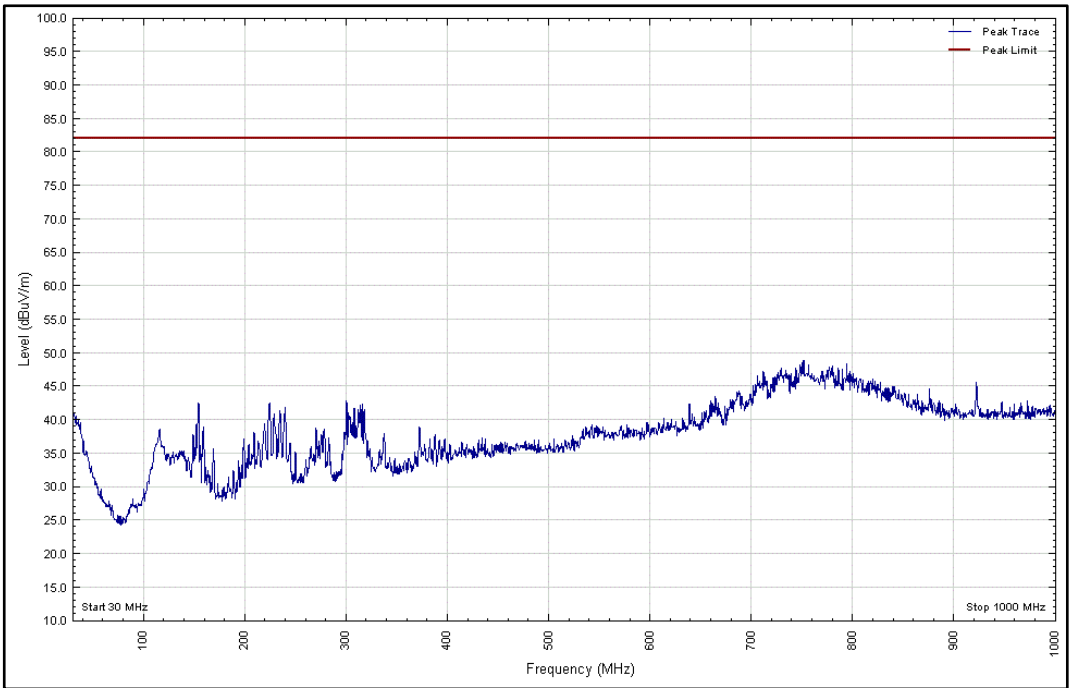

Figure 42 - Middle Channel - 30 MHz to 1 GHz. Horizontal, EUT Orientation Z

Frequency (MHz)	Level (dBm)
12333.405	-22.07

Table 20 - Middle Channel - 1 GHz to 25 GHz - Emissions Results

No other emissions were detected within 10 dB of the limit.

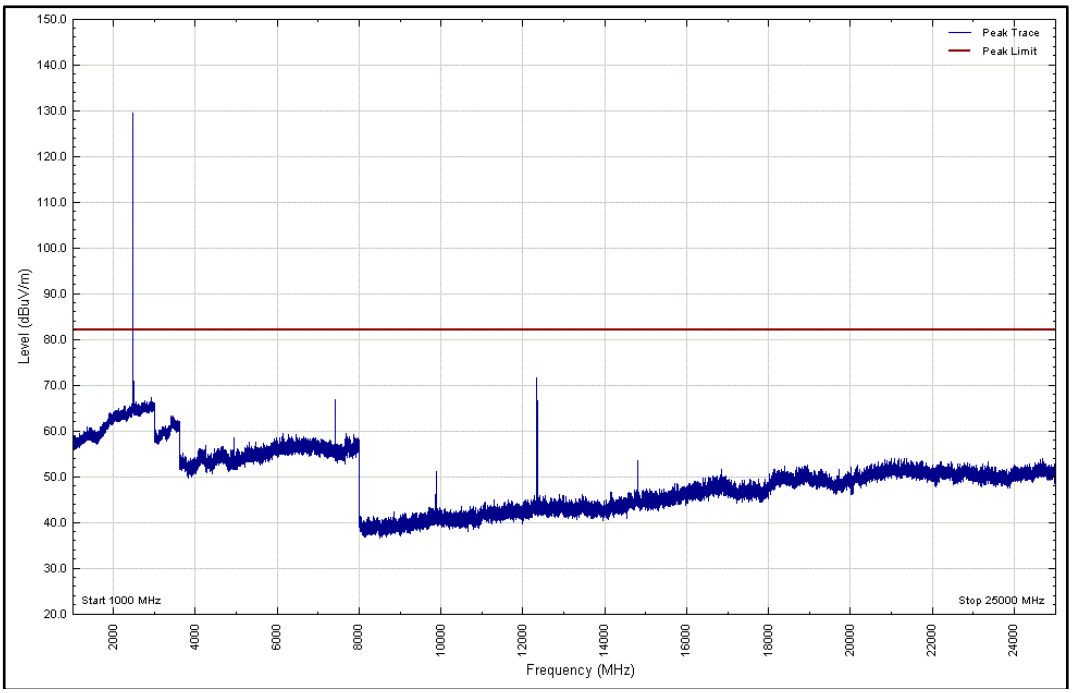

Figure 43 - Middle Channel - 1 GHz to 25 GHz, Vertical, EUT Orientation X

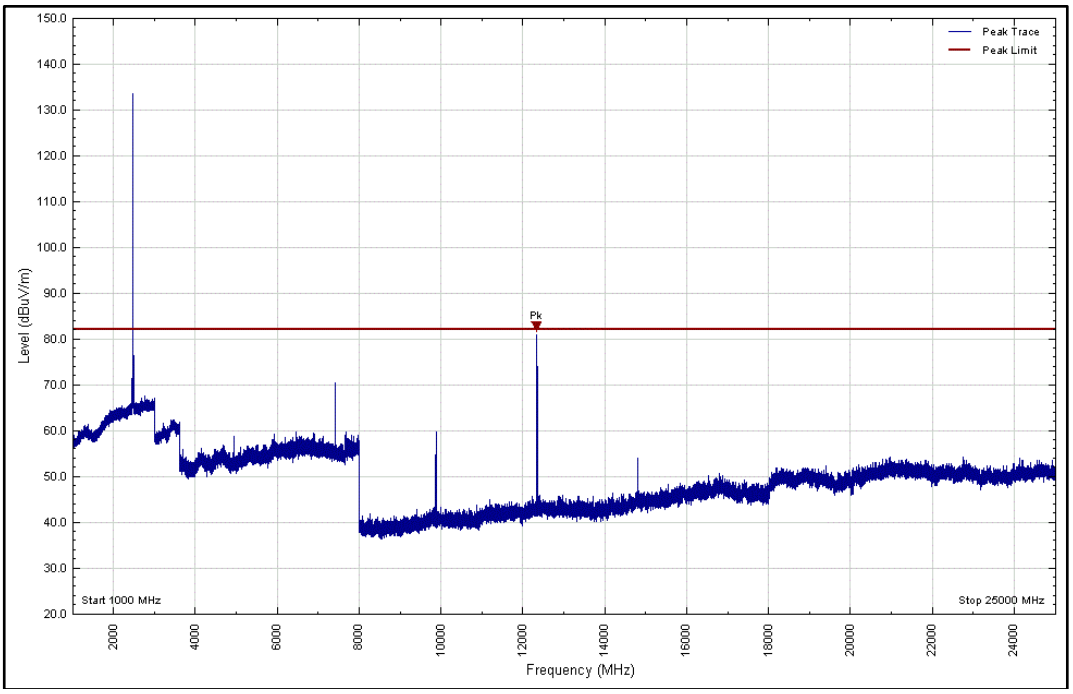

Figure 44 - Middle Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation X

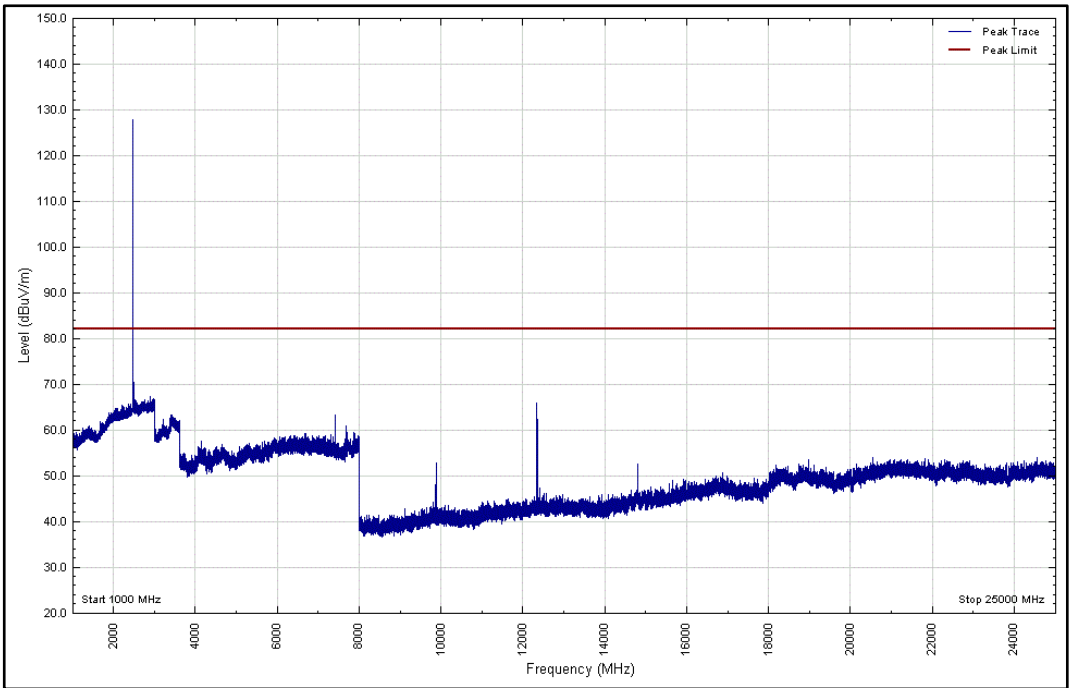

Figure 45 - Middle Channel - 1 GHz to 25 GHz Vertical, EUT Orientation Y

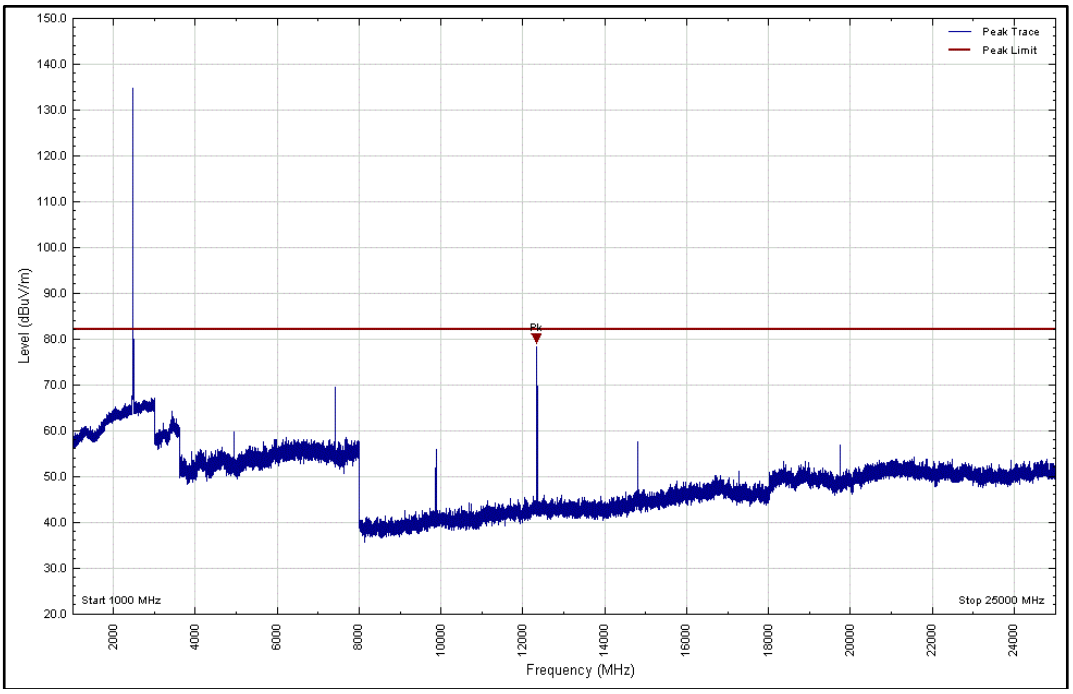

Figure 46 - Middle Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation Y

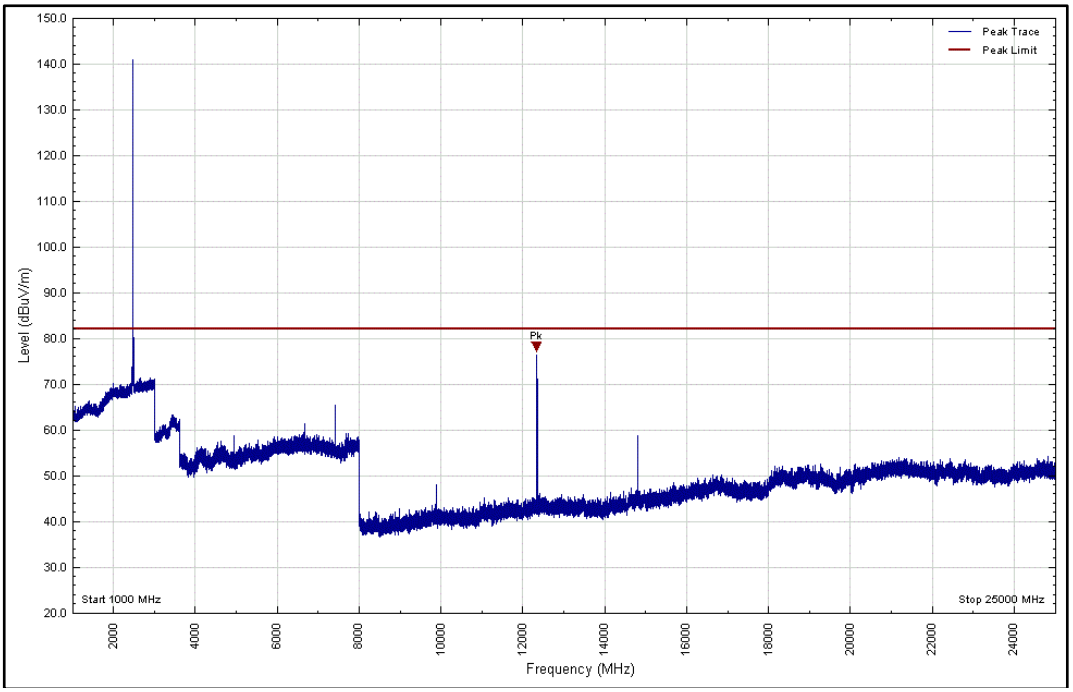

Figure 47 - Middle Channel - 1 GHz to 25 GHz, Vertical, EUT Orientation Z

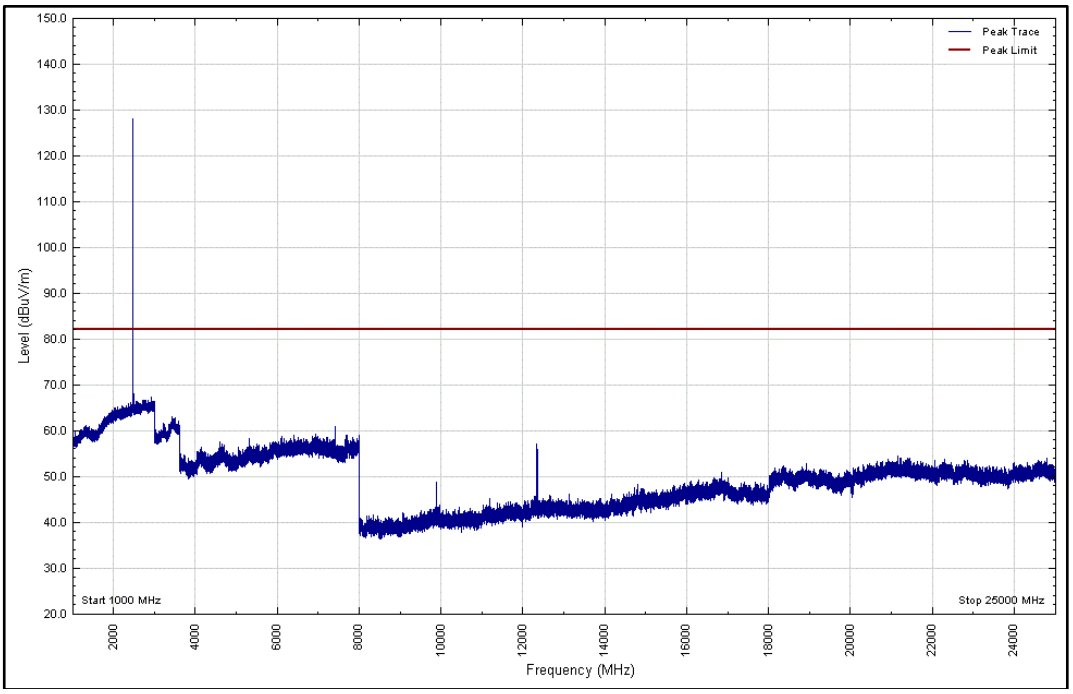

Figure 48 - Middle Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation Z

Frequency (MHz)	Level (dBm)
*	

Table 21 – Top Channel - 30 MHz to 1 GHz - Emissions Results

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

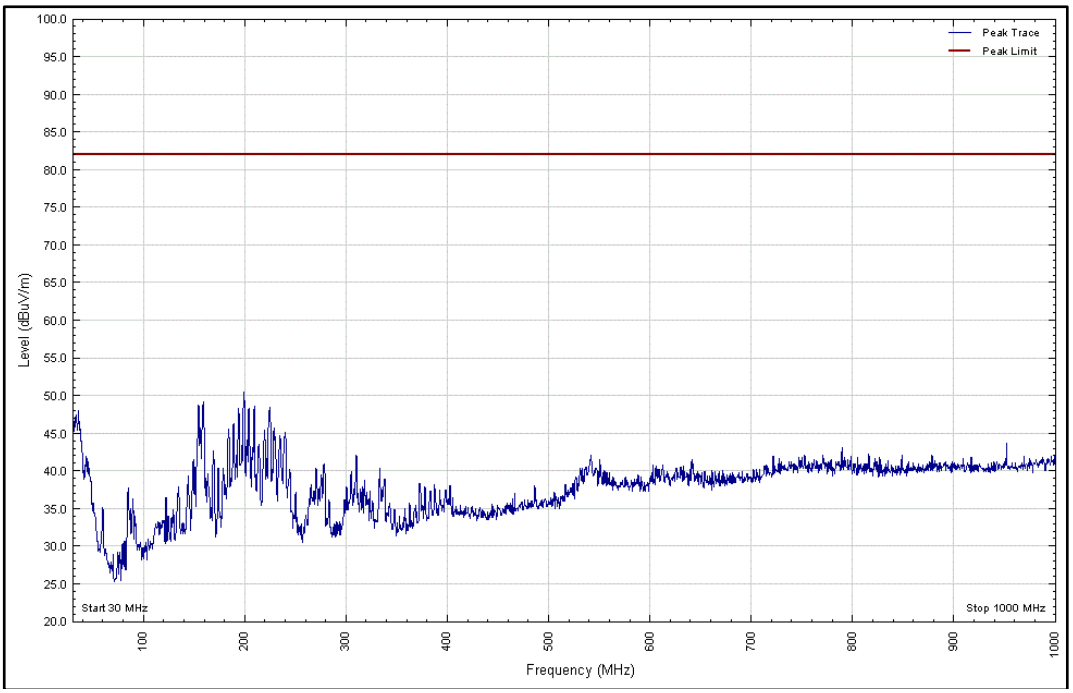

Figure 49 - Top Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation X

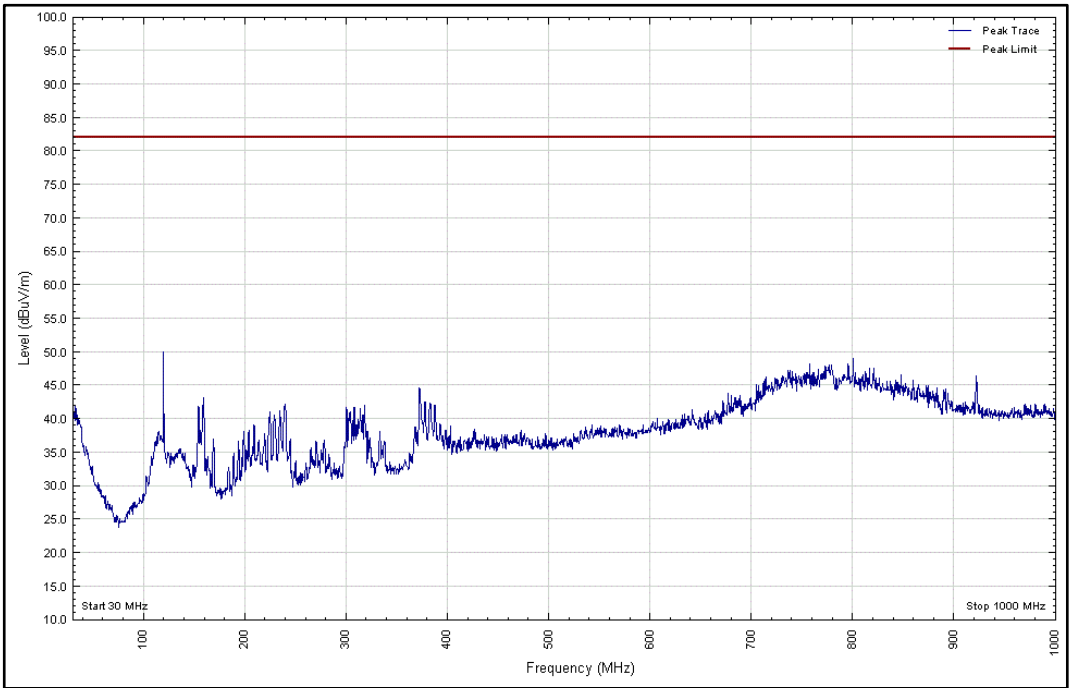

Figure 50 - Top Channel - 30 MHz to 1 GHz, Horizontal, EUT Orientation X

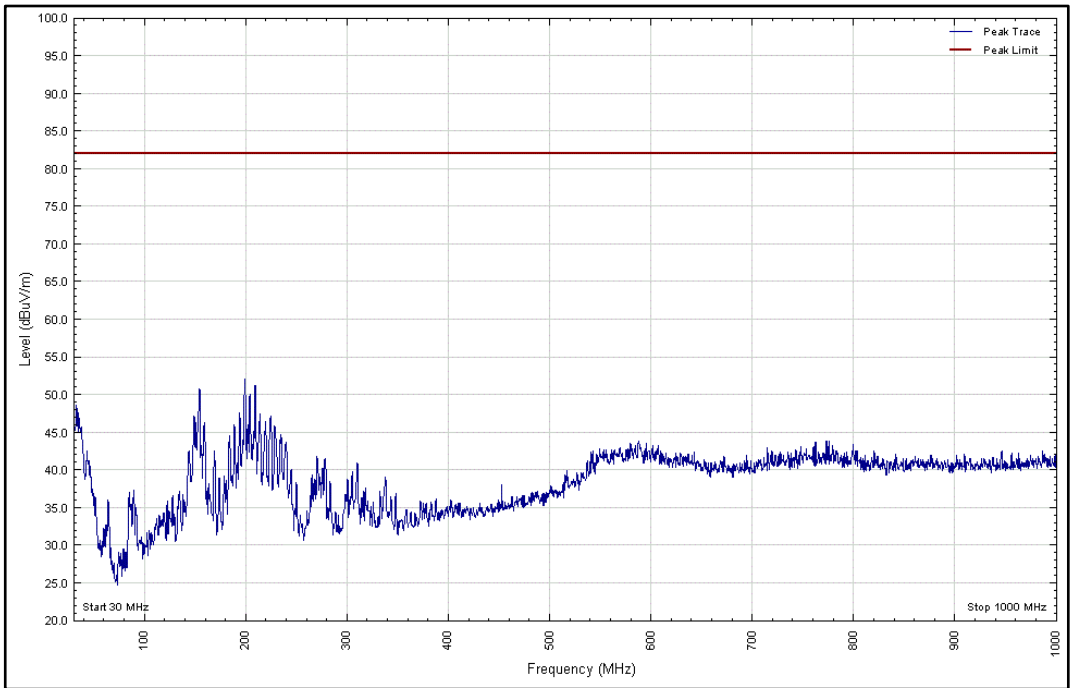

Figure 51 - Top Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation Y

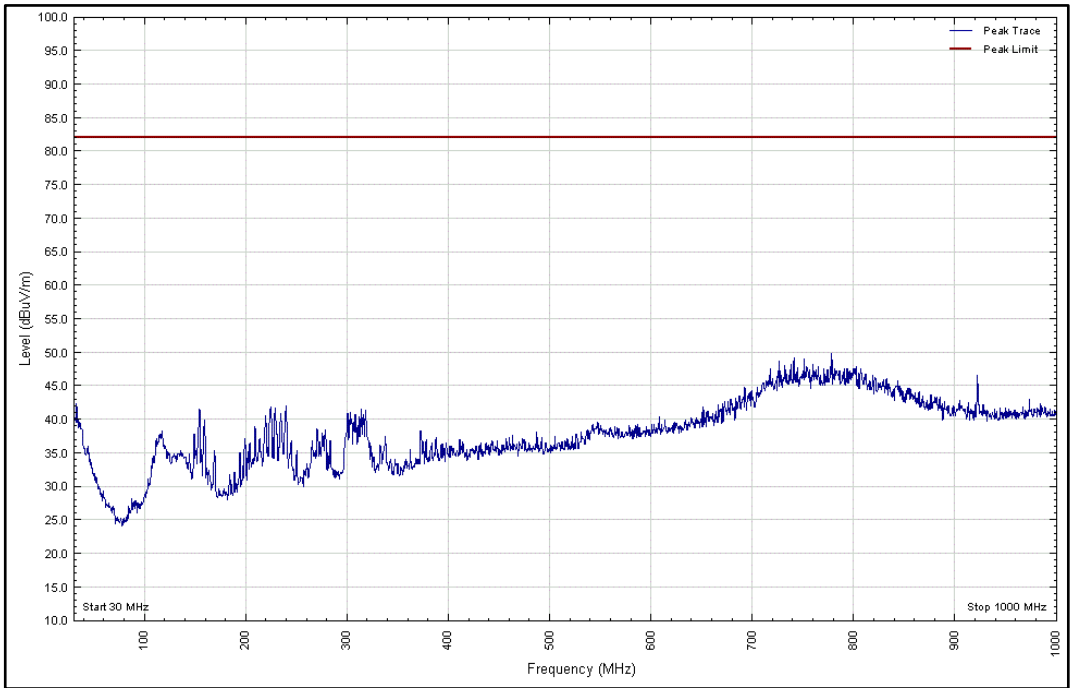

Figure 52 - Top Channel - 30 MHz to 1 GHz, Horizontal, EUT Orientation Y

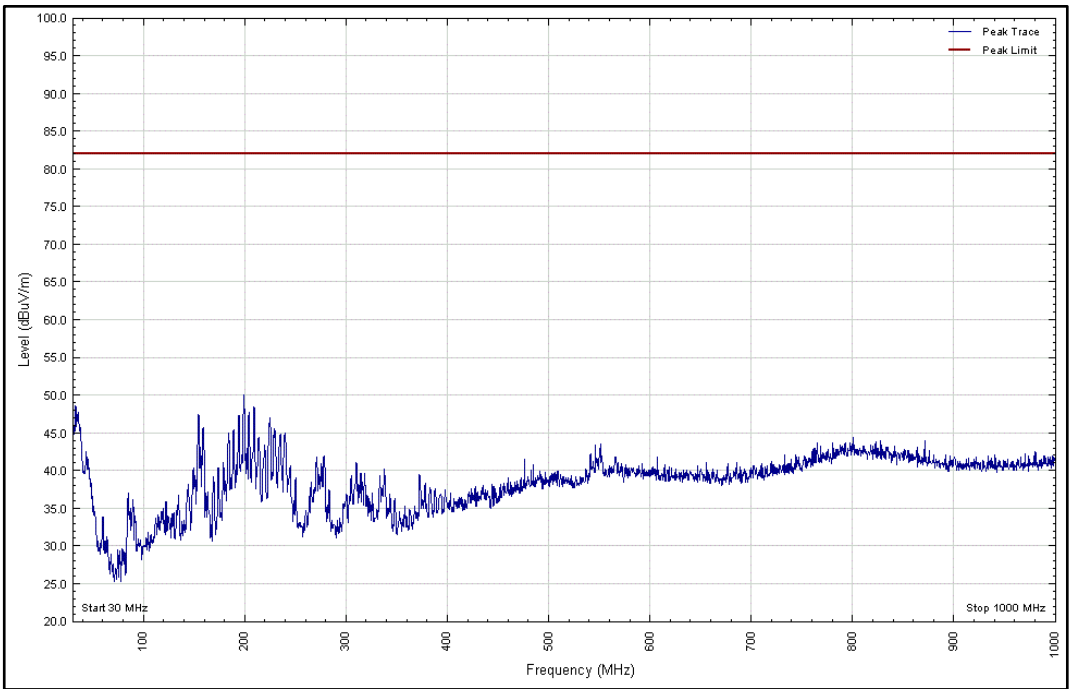

Figure 53 - Top Channel - 30 MHz to 1 GHz, Vertical, EUT Orientation Z

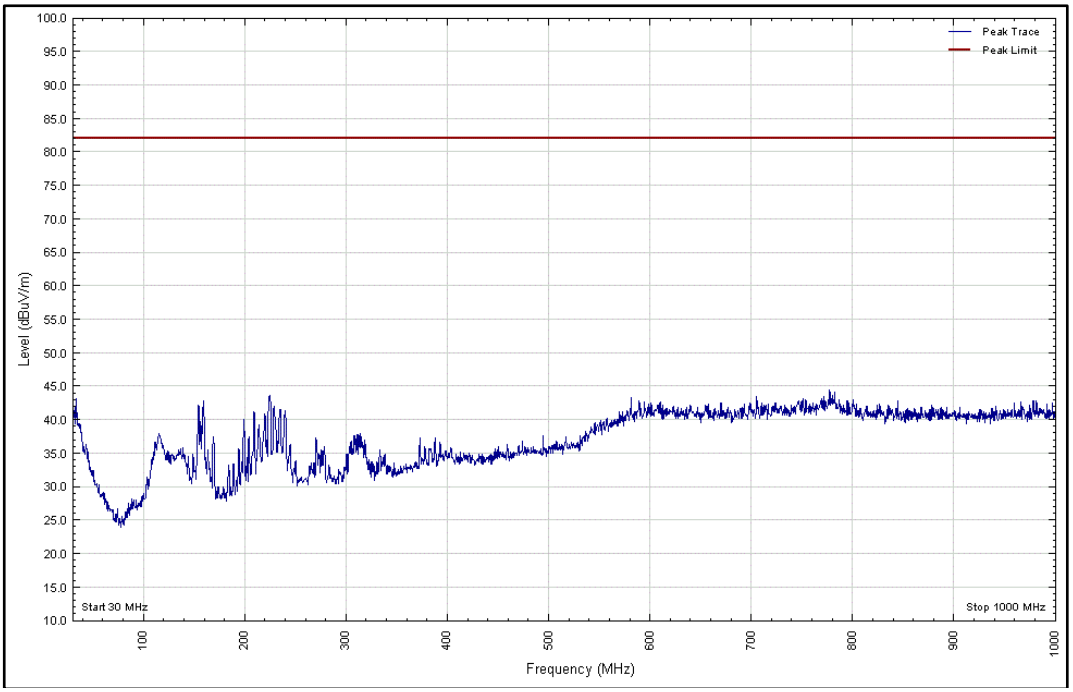

Figure 54 - Top Channel - 30 MHz to 1 GHz. Horizontal, EUT Orientation Z

Frequency (MHz)	Level (dBm)
*	

Table 22 - Top Channel - 1 GHz to 25 GHz - Emissions Results

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

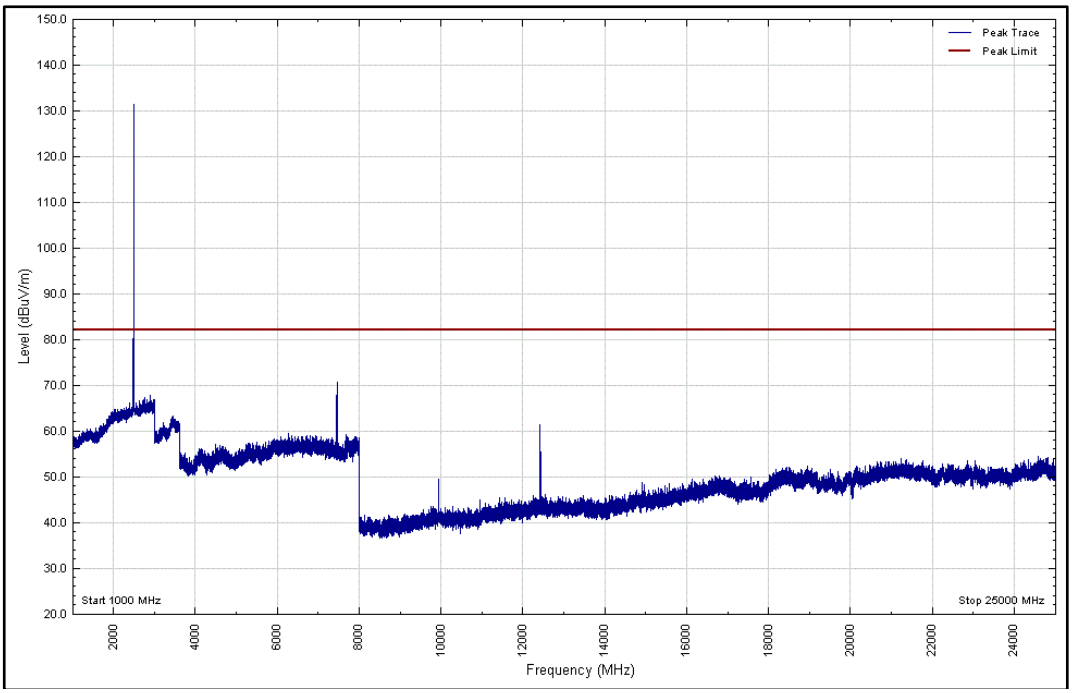

Figure 55 - Top Channel - 1 GHz to 25 GHz, Vertical, EUT Orientation X

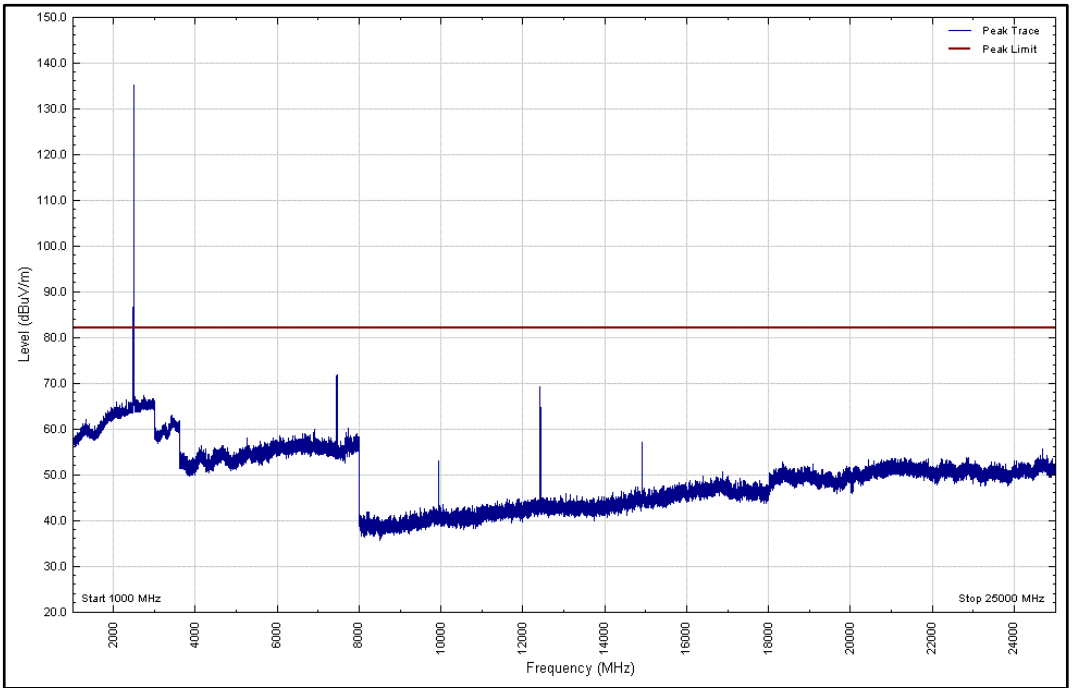

Figure 56 - Top Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation X

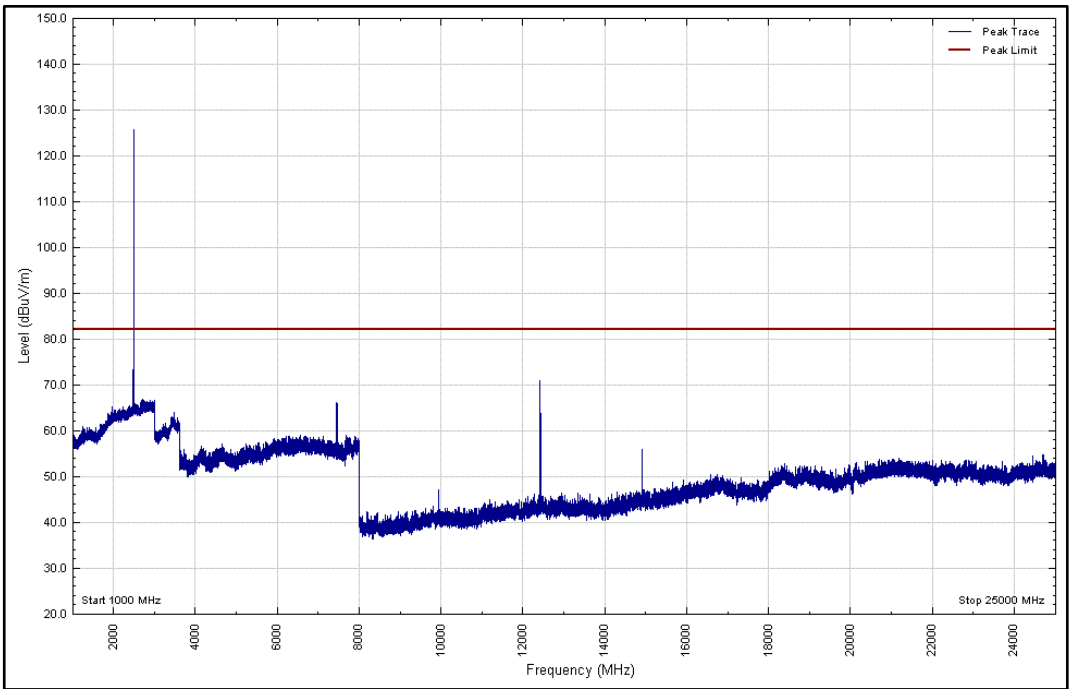

Figure 57 - Top Channel - 1 GHz to 25 GHz, Vertical, EUT Orientation Y

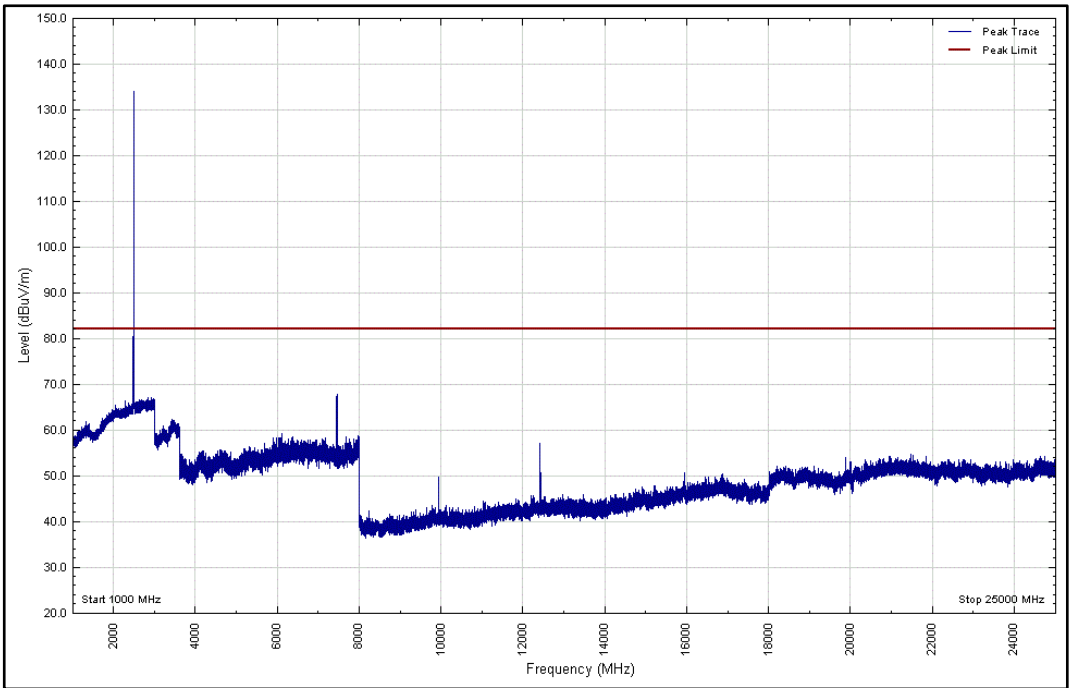

Figure 58 - Top Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation Y

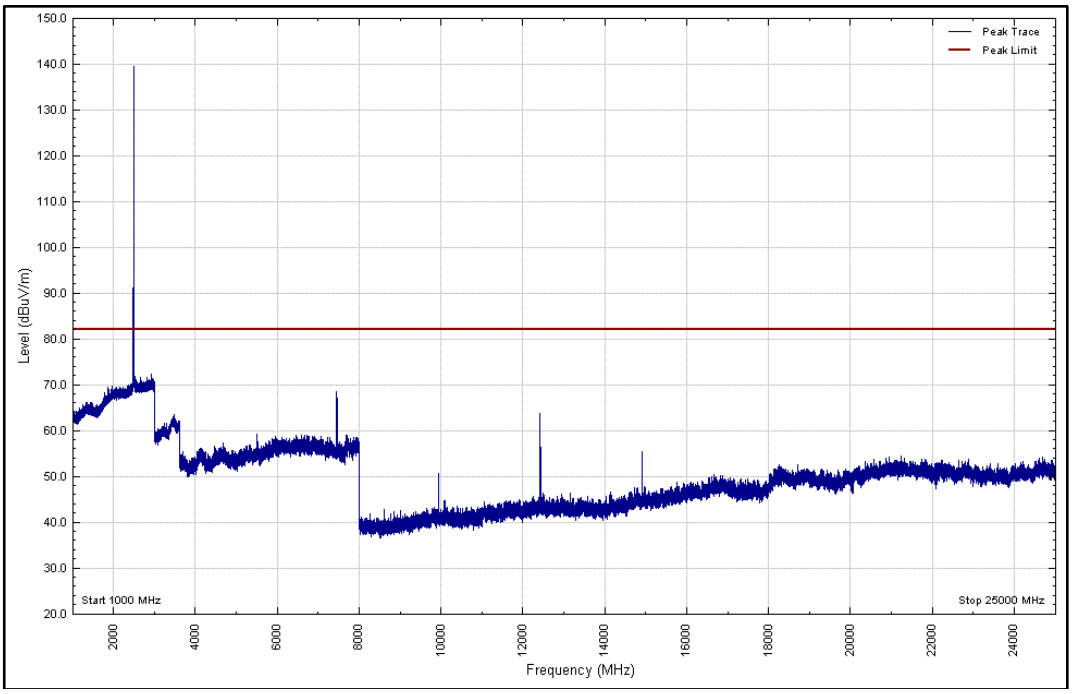

Figure 59 - Top Channel - 1 GHz to 25 GHz, Vertical, EUT Orientation Z

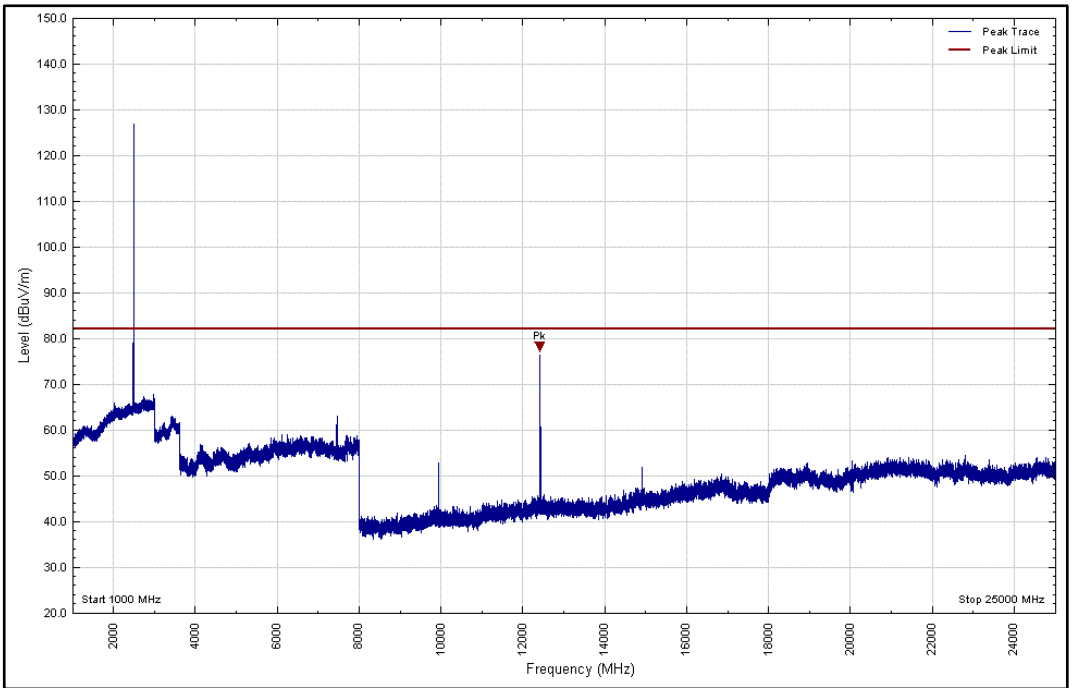

Figure 60 - Top Channel - 1 GHz to 25 GHz, Horizontal, EUT Orientation Z

FCC 47 CFR Part 90, Limit Clause 90.210(b)(3)

On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

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
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	10-May-2019
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	20-Oct-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	12-Jan-2019
18GHz - 40GHz Pre-Amplifier	Phase One	PSO4-0087	1534	12	02-Feb-2019
Screened Room (5)	Rainford	Rainford	1545	36	09-Jun-2018
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Iso-tech	IDM101	2417	12	02-Oct-2018
Antenna (Bilog)	Chase	CBL6143	2904	24	08-Aug-2019
Antenna (DRG Horn)	ETS-Lindgren	3115	3125	12	21-Jul-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Termination (50ohm)	Meca	405-1	3512	12	01-Nov-2018
Termination (50ohm)	Meca	405-1	3516	12	01-Nov-2018
1 Metre SMA Cable	Rhophase	3PS-1801A-1000-3PS	4099	12	19-Sep-2018
1501A 4.0M Km Km Cable	Rhophase	KPS-1501A-4000-KPS	4301	12	19-Feb-2019
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4411	12	16-May-2019
Cable (Rx, Nm-Nm, 7m)	Scott Cables	SLU18-NMNM-07.00M	4498	6	19-Jun-2018
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	02-Jul-2018
Cable (Rx, SMAm-SMAm 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	15-Aug-2018
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	01-Mar-2019
Mast Controller	Maturo Gmbh	NCD	4810	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	4811	-	TU
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	12-Feb-2019
Hygrometer	Rotronic	HP21	4989	12	26-Apr-2019

Table 23

TU - Traceability Unscheduled

3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Maximum Conducted Output Power	± 3.2 dB
Types of Emissions	-
Spurious Emissions at Antenna Terminals	± 3.45 dB
Radiated Spurious Emissions	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 18 GHz: ± 6.3 dB

Table 24