Report on the FCC Testing of the

Domo Tactical Communications (DTC) Ltd.
Digital Video Transceiver,
Model: Mesh SOL8SDR CONCEALMENT MODULE-SOL8SDR-C-470043

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

Product Service

Choose certainty.
Add value.

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

FCC ID: XRFSOL8SDRC470043

COMMERCIAL-IN-CONFIDENCE

Document Number: 75942063-06 | Issue: 04

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Natalie Bennett	21 January 2019	
Authorised Signatory	Simon Bennett	21 January 2019	

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 90 and FCC 47 CFR Part 2. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Matthew Russell	21 January 2019	
Testing	Nandhini Mathivanan	21 January 2019	
Testing	Graeme Lawler	21 January 2019	

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 90: 2017 and FCC 47 CFR Part 2: 2017.

ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

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Product Service

Contents

Product Service

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	23 August 2018
2	To amend the FCC ID	14 December 2018
3	To amend the application form.	07 January 2019
4	To amend the address and company name on the front page.	21 January 2019

1.2 Introduction

Applicant	Domo Tactical Communications (DTC) Ltd
Manufacturer	Domo Tactical Communications (DTC) Ltd
Model Number(s)	Mesh SOL8SDR CONCEALMENT MODULE - SOL8SDR-C-470043
Serial Number(s)	108873
Hardware Version(s)	4
Software Version(s)	4.02
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 90: 2017 FCC 47 CFR Part 2: 2017
Order Number Date	PO-047375-1 26-February-2018
Date of Receipt of EUT	04-May-2018
Start of Test	09-May-2018
Finish of Test	14-August-2018
Name of Engineer(s)	Matthew Russell, Nandhini Mathivanan and Graeme Lawler
Related Document(s)	ANSI C63.26: 2015

Product Service

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: 4.9 GHz - Transmit					
2.1	90.205	2.1046	Maximum Conducted Output Power	Pass	ANSI C63.26
2.2	90.207	2.1047	Types of Emissions	Declaration	
2.3	90.209	2.1049	Bandwidth Limitations	Pass	
2.4	90.210	2.1051	Spurious Emissions at Antenna Terminals	Pass	
2.5	90.210	2.1051	Radiated Spurious Emissions	Pass	
2.6	90.210	2.1055	Frequency Stability	Pass	

Table 1

Product Service

1.4 Application Form

EQUIPMENT DESCRIPTION	
Model Name/Number	Mesh SOL8SDR CONCEALMENT MODULE- SOL8SDR-C-470043
Part Number	SOL8SDR-C-470043 (MODULE)
Hardware Version	4
Software Version	4.0.2
FCC ID (if applicable)	XRFSOL8SDRC470043
Industry Canada ID (if applicable)	8638A-SOL8SDR-C
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 Concealment -C is an ultra-miniature package ideal for integration into small concealment solutions. Capable of Video and IP transmission providing greater than 25mb/s over a s electable bandwidth of between 2.5-10 MHz.

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	20	2	2.5	16QAM-BPSK	10M00D1W	4941.25	4965.0	4988.75
COFDM	20	2	3	16QAM-BPSK	10M00D1W	4941.5	4965.0	4988.5
COFDM	20	2	3.5	16QAM-BPSK	10M00D1W	4941.75	4965.0	4988.25
COFDM	20	2	5	16QAM-BPSK	10M00D1W	4942.5	4965.0	4987.5
COFDM	20	2	6	16QAM-BPSK	10M00D1W	4943.0	4965.0	4987.0
COFDM	20	2	7	16QAM-BPSK	10M00D1W	4943.5	4965.0	4986.5
COFDM	20	2	8	16QAM-BPSK	10M00D1W	4944.0	4965.0	4986.0
COFDM	20	2	10	16QAM-BPSK	10M00D1W	4945.0	4965.0	4985.0

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	5000.0 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	4941.25 MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☒ Class B Digital Device (Use in residential environment only) ☐	

Product Service

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
External DC	Nominal Voltage	Maximum Current	
	12V	1.5A	
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: Stuart Doe

Position held: Head of Engineering Date: 30/04/18

Product Service

1.5 Product Information

1.5.1 Technical Description

SOL8 software defined radio is an ultra-miniature COFDM digital video transceiver. The Concealment -C is an ultra-miniature package ideal for integration into small concealment solutions. Capable of Video and IP transmission providing greater than 25mb/s over a selectable bandwidth of between 2.5-10 MHz.

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	4941.25	4965.0	4988.75
3	4941.5	4965.0	4988.5
3.5	4941.75	4965.0	4988.25
5	4942.5	4965.0	4987.5
6	4943.0	4965.0	4987.0
7	4943.5	4965.0	4986.5
8	4944.0	4965.0	4986.0
10	4945.0	4965.0	4985.0

Table 2

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: 108873			
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: 4.9 GHz - Transmit		
Maximum Conducted Output Power	Matthew Russell	UKAS
Types of Emissions	Matthew Russell	UKAS
Bandwidth Limitations	Nandhini Mathivanan	UKAS
Spurious Emissions at Antenna Terminals	Nandhini Mathivanan	UKAS
Radiated Spurious Emissions	Graeme Lawler	UKAS
Frequency Stability	Nandhini Mathivanan Matthew Russell	UKAS

Table 4

Office Address:

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

Product Service

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

Mesh SOL8SDR CONCEALMENT MODULE - SOL8SDR-C-470043,
S/N: 108873 - Modification State 0

2.1.3 Date of Test

09-May-2018 to 14-August 2018

2.1.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.2.4.4.1 and 5.2.4.5.

The EUT did not transmit continuously therefore a gated trigger was implemented and measurements were only made during the transmitter on time.

Power spectral density results recorded in the tables below were measured with a 1 MHz RBW.

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

2.1.5 Environmental Conditions

Ambient Temperature	23.1 °C
Relative Humidity	35.9 %

2.1.6 Test Results

4.9 GHz - Transmit

Description	Bottom Channel	Middle Channel	Top Channel
	Result (dB)	Result (dB)	Result (dB)
2.5 MHz Bandwidth, CCDF	11.86	11.87	11.95
3 MHz Bandwidth, CCDF	11.94	11.93	12.00
3.5 MHz Bandwidth, CCDF	11.96	11.96	12.01
5 MHz Bandwidth, CCDF	12.08	12.07	12.10
6 MHz Bandwidth, CCDF	12.10	12.07	12.12
7 MHz Bandwidth, CCDF	12.15	12.12	12.17
8 MHz Bandwidth, CCDF	12.20	12.21	12.21
10 MHz Bandwidth, CCDF	12.29	12.25	12.31

Table 5 – Peak to Average Ratio Measurements

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.95	124.45	20.65	116.14	20.56	113.76
Power - Port B	20.51	112.46	20.62	115.35	20.36	108.64
Power - Total Power	23.75	236.91	23.65	231.49	23.47	222.41
PSD - Port A	16.37	43.35	16.29	42.56	16.58	45.50
PSD - Port B	16.51	44.77	16.53	44.98	16.23	41.98
PSD - Total PSD	19.45	88.12	19.42	87.54	19.42	87.47

Table 6 – Maximum Conducted Output Power – 2.5 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.84	121.34	20.61	115.08	20.53	112.98
Power - Port B	20.59	114.55	20.66	116.41	20.36	108.64
Power - Total Power	23.73	235.89	23.65	231.49	23.46	221.62
PSD - Port A	16.15	41.21	15.09	32.28	14.14	32.66
PSD - Port B	15.08	32.21	14.98	31.48	14.66	29.24
PSD - Total PSD	18.66	73.42	18.05	63.76	17.82	61.90

Table 7 – Maximum Conducted Output Power – 3 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.82	120.78	20.60	114.82	20.57	114.02
Power - Port B	20.53	112.98	20.59	114.55	20.30	107.15
Power - Total Power	23.69	233.76	23.61	229.37	23.45	221.18
PSD - Port A	15.73	37.41	15.46	35.16	14.67	29.31
PSD - Port B	14.52	28.31	15.05	31.99	13.79	23.93
PSD - Total Power	18.18	65.72	18.27	67.14	17.26	53.24

Table 8 – Maximum Conducted Output Power – 3.5 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.72	118.03	20.49	111.94	20.46	111.17
Power - Port B	20.44	110.66	20.51	112.46	20.21	104.95
Power - Total Power	23.59	228.69	23.51	224.40	23.35	216.13
PSD - Port A	13.57	22.75	11.79	15.10	13.49	22.34
PSD - Port B	13.41	21.93	13.27	21.23	13.22	20.99
PSD - Total PSD	16.50	44.68	15.60	36.33	16.37	43.33

Table 9 – Maximum Conducted Output Power – 5 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.29	106.91	20.29	106.91	20.25	105.93
Power - Port B	20.31	107.40	20.39	109.40	20.11	102.57
Power - Total Power	23.31	214.30	23.35	216.30	23.19	208.49
PSD - Port A	12.65	18.41	11.79	15.10	11.28	13.43
PSD - Port B	11.61	14.49	13.37	21.73	11.06	12.76
PSD - Total PSD	15.17	32.90	15.66	36.83	14.18	26.19

Table 10 – Maximum Conducted Output Power – 6 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.36	108.64	20.13	103.04	20.10	102.33
Power - Port B	20.12	102.80	20.18	104.23	19.90	97.72
Power - Total Power	23.25	211.44	23.17	207.27	23.01	200.05
PSD - Port A	12.90	19.50	12.24	16.75	12.15	16.41
PSD - Port B	11.42	13.87	12.28	16.90	11.60	14.45
PSD - Total Power	15.23	33.37	15.27	33.65	14.89	30.86

Table 11 – Maximum Conducted Output Power – 7 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.23	105.44	20.04	100.93	20.01	100.23
Power - Port B	20.03	100.69	20.11	102.57	19.82	95.94
Power - Total Power	23.14	206.13	23.09	203.49	22.93	196.17
PSD - Port A	12.19	16.56	11.99	15.81	11.98	15.78
PSD - Port B	11.69	14.76	11.87	15.38	11.56	14.32
PSD - Total PSD	14.96	31.31	14.94	31.19	14.79	30.10

Table 12 – Maximum Conducted Output Power – 8 MHz Bandwidth

Description	Bottom Channel		Middle Channel		Top Channel	
	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)	Result (dBm)	Result (mW)
Power - Port A	20.06	101.39	19.84	96.38	19.81	95.72
Power - Port B	19.88	97.27	19.97	99.31	19.68	92.90
Power - Total Power	22.98	198.67	22.92	195.69	22.76	188.62
PSD - Port A	10.12	10.28	9.90	9.77	9.89	9.75
PSD - Port B	9.67	9.27	9.82	9.59	9.54	8.99
PSD - Total PSD	12.91	19.55	12.87	19.37	12.73	18.74

Table 13 – Maximum Conducted Output Power – 10 MHz Bandwidth

FCC 47 CFR Part 90, Limit Clause 90.1215

Channel Bandwidth (MHz)	Low Power Maximum Conducted Output Power (dBm)	High Power Maximum Conducted Output Power (dBm)
1	7	20
5	14	27
10	17	30
15	18.8	31.8
20	20	33

Table 14 - Specification Limits for Conducted Power

High power devices are also limited to a peak power spectral density of 21 dBm per one MHz.

High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to peak power spectral density of 21 dBm/MHz.

90.1215(e): The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Product Service

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

Product Service

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

Mesh SOL8SDR CONCEALMENT MODULE - SOL8SDR-C-470043

2.2.3 Test Method

The following information was provided by the manufacturer

2.2.4 Test Results

4.9 GHz - Transmit

The class of emission has been declared by the manufacturer as D1W. This emission class is to be considered for use on a case-by-case basis as stated in FCC 47 CFR Part 90.207(n).

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(n).

FCC 47 CFR Part 2, Limit Clause 2.1047(d)

Other types of equipment. A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

Product Service

2.3 Bandwidth Limitations

2.3.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.209
FCC 47 CFR Part 2, Clause 2.1049

2.3.2 Equipment Under Test and Modification State

Mesh SOL8SDR CONCEALMENT MODULE - SOL8SDR-C-470043,
S/N: 108873 - Modification State 0

2.3.3 Date of Test

10-May-2018

2.3.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.4.4. Occupied Bandwidth Power Bandwidth (99%) measurement procedure.

2.3.5 Environmental Conditions

Ambient Temperature	22.6 °C
Relative Humidity	33.9 %

2.3.6 Test Results

4.9 GHz - Transmit

Description	Occupied Bandwidth (MHz)		
	Bottom Channel	Middle Channel	Top Channel
2.5 MHz Bandwidth, Port A	2.315	2.315	2.315
3 MHz Bandwidth, Port A	2.772	2.772	2.772
3.5 MHz Bandwidth, Port A	3.241	3.241	3.230
5 MHz Bandwidth, Port A	4.631	4.631	4.631
6 MHz Bandwidth, Port A	5.529	5.529	5.529
7 MHz Bandwidth, Port A	6.519	6.519	6.519
8 MHz Bandwidth, Port A	7.423	7.442	7.423
10 MHz Bandwidth, Port A	9.262	9.262	9.262

Table 16 - Occupied Bandwidth Results

Product Service

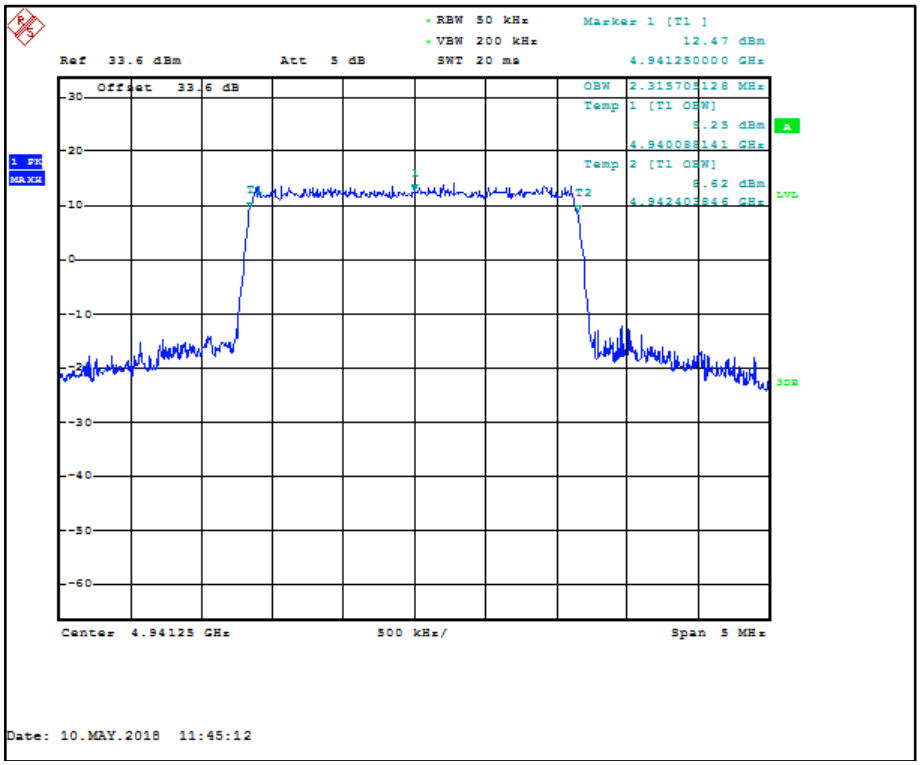

Figure 1 - Bottom Channel - Occupied Bandwidth - 2.5 MHz Bandwidth, Port A

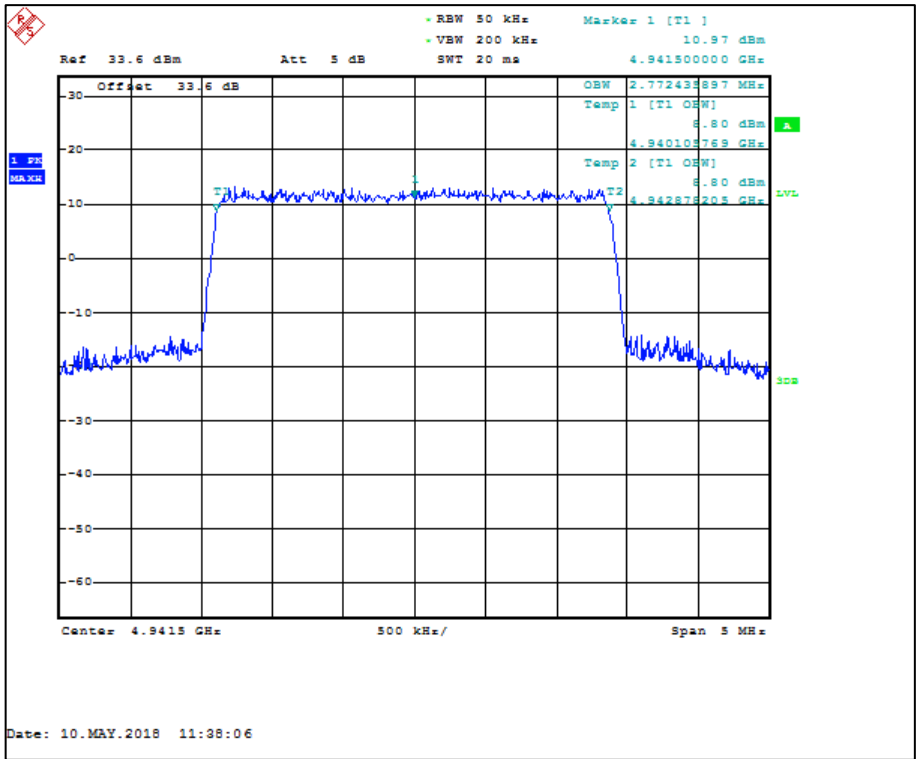

Figure 2 - Bottom Channel - Occupied Bandwidth - 3 MHz Bandwidth, Port A

Product Service

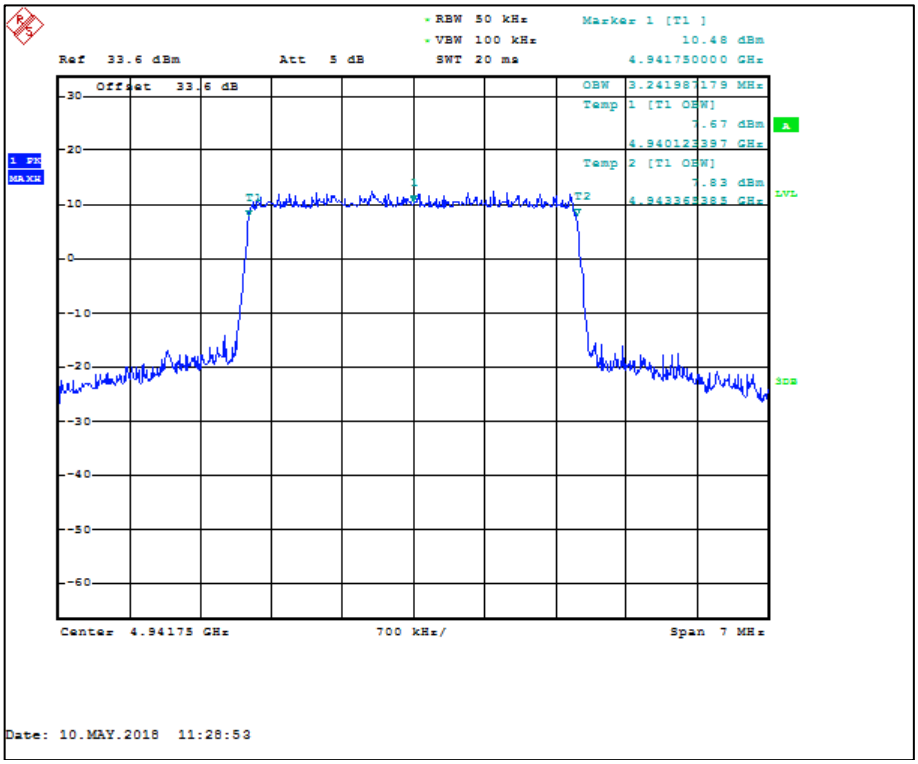

Figure 3 - Bottom Channel - Occupied Bandwidth - 3.5 MHz Bandwidth, Port A

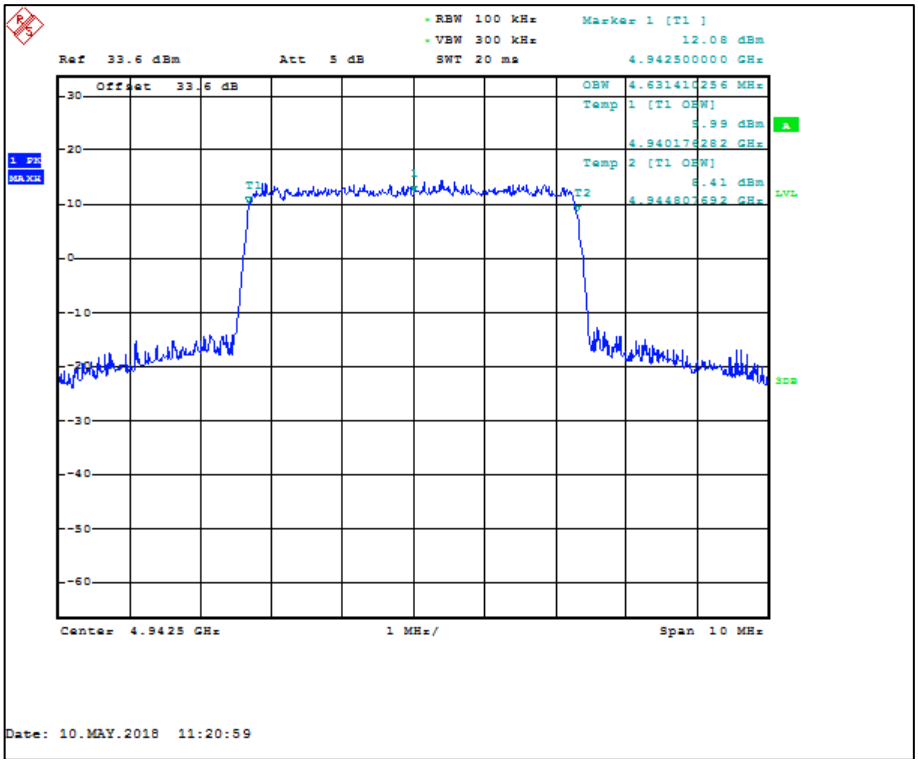

Figure 4 - Bottom Channel - Occupied Bandwidth - 5 MHz Bandwidth, Port A

Product Service

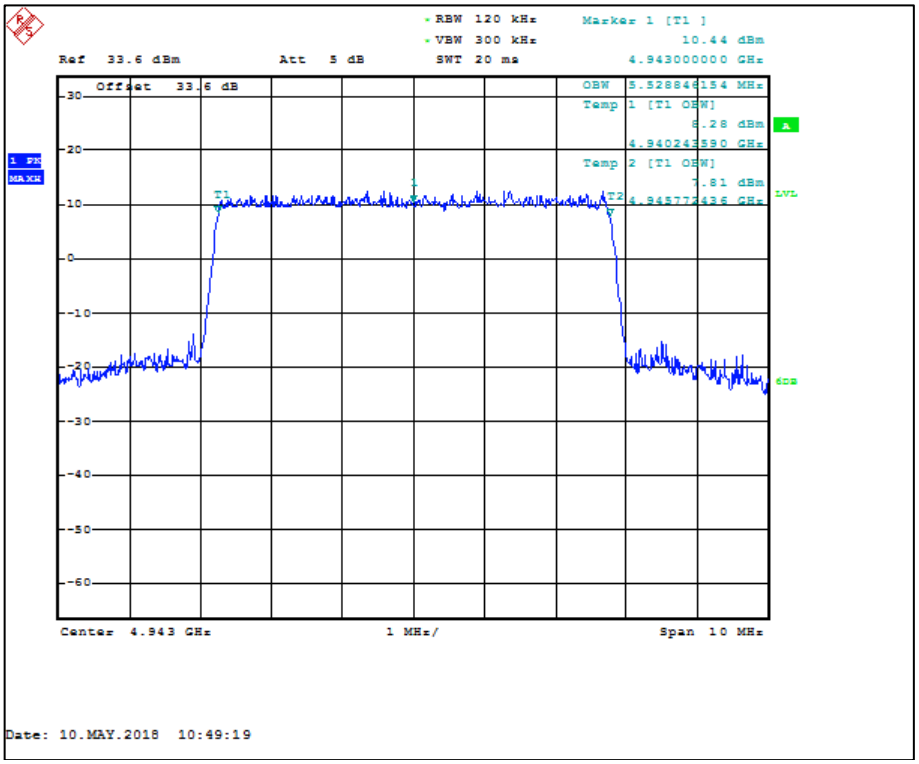

Figure 5 - Bottom Channel - Occupied Bandwidth - 6 MHz Bandwidth, Port A

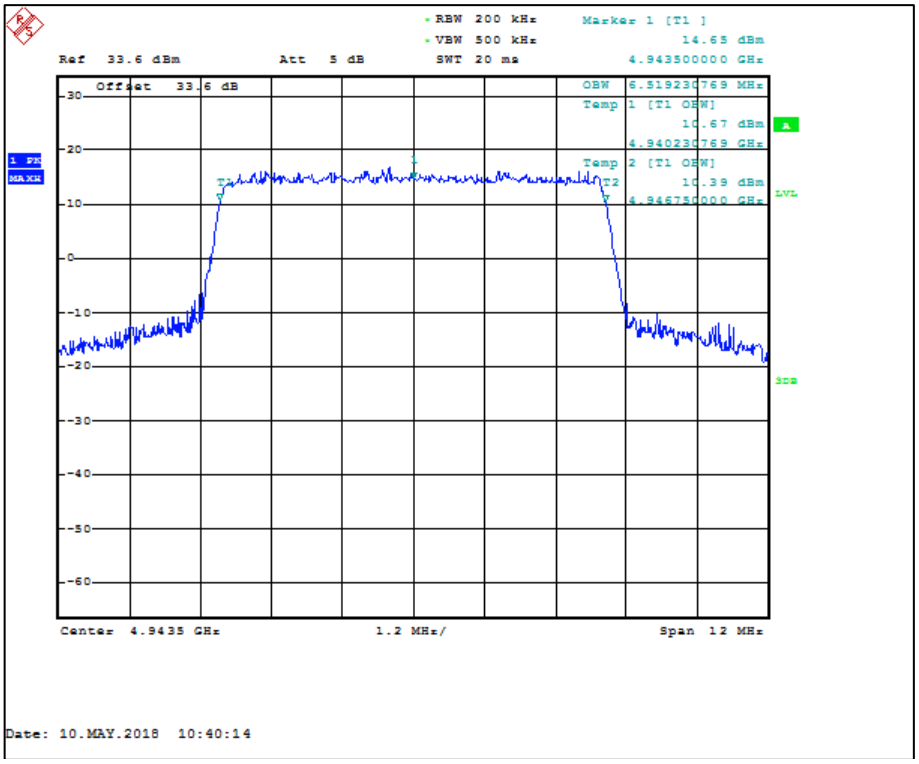

Figure 6 - Bottom Channel - Occupied Bandwidth - 7 MHz Bandwidth, Port A

Product Service

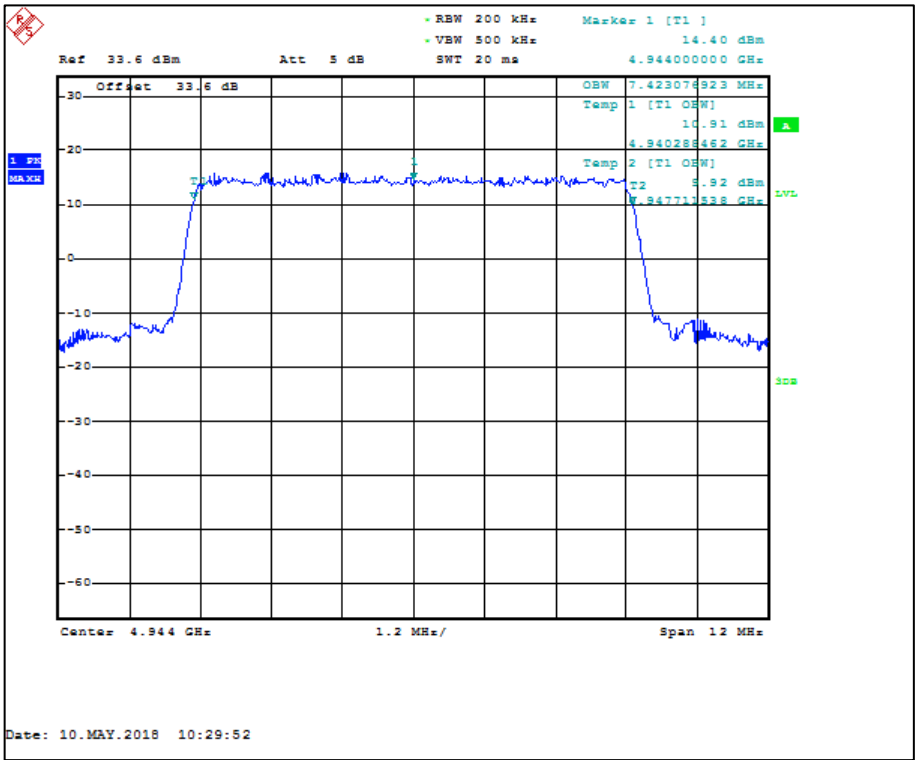

Figure 7 - Bottom Channel - Occupied Bandwidth - 8 MHz Bandwidth, Port A

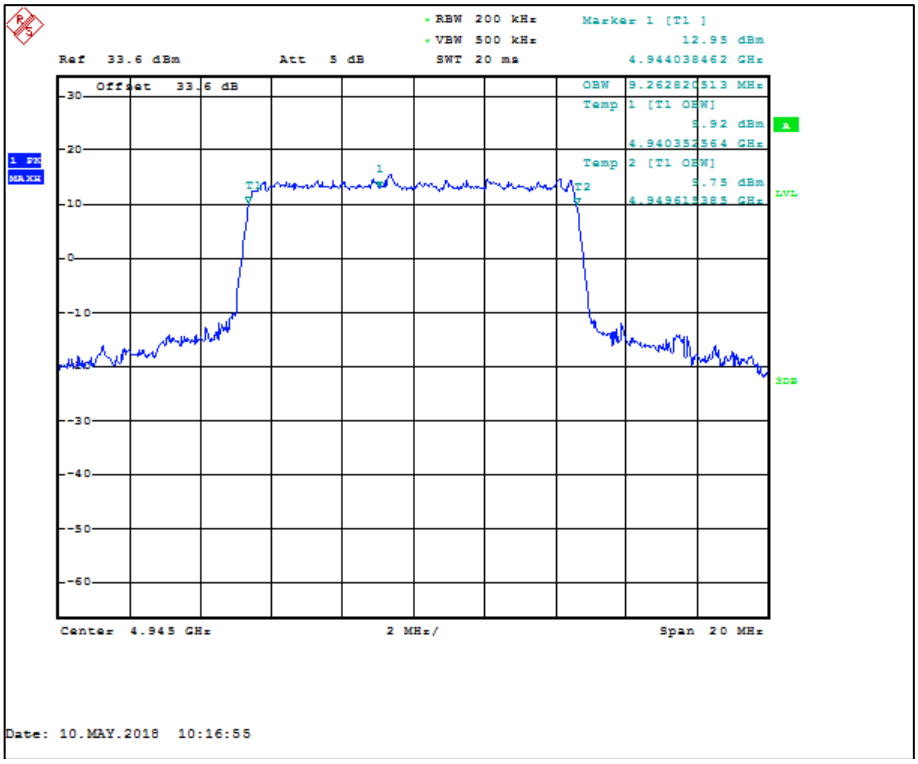

Figure 8 - Bottom Channel - Occupied Bandwidth - 10 MHz Bandwidth, Port A

Product Service

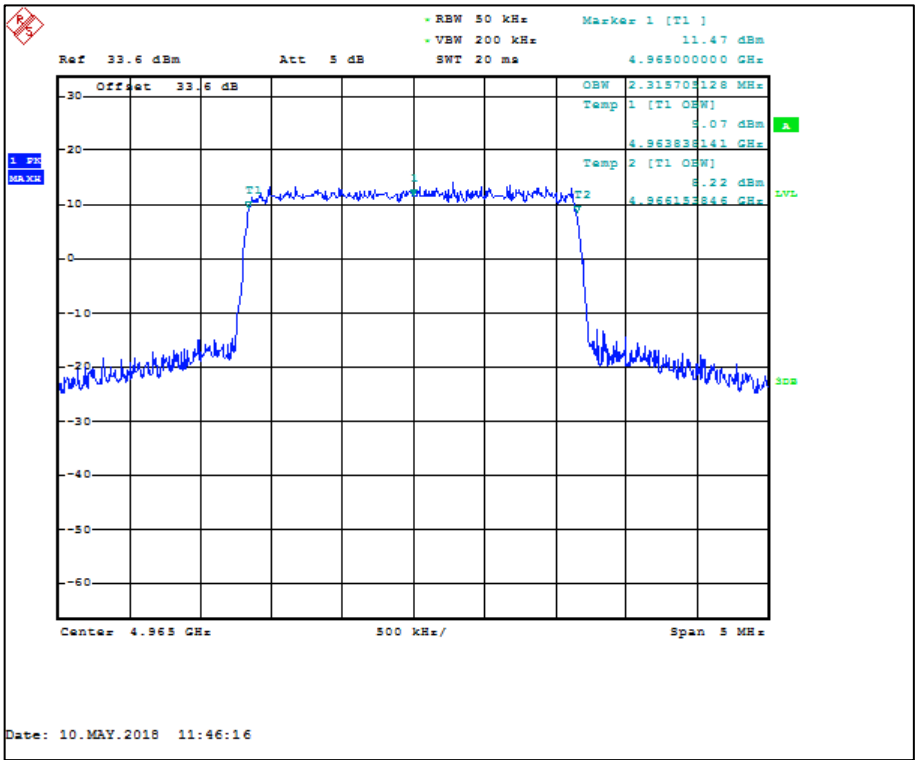

Figure 9 - Middle Channel - Occupied Bandwidth - 2.5 MHz Bandwidth, Port A

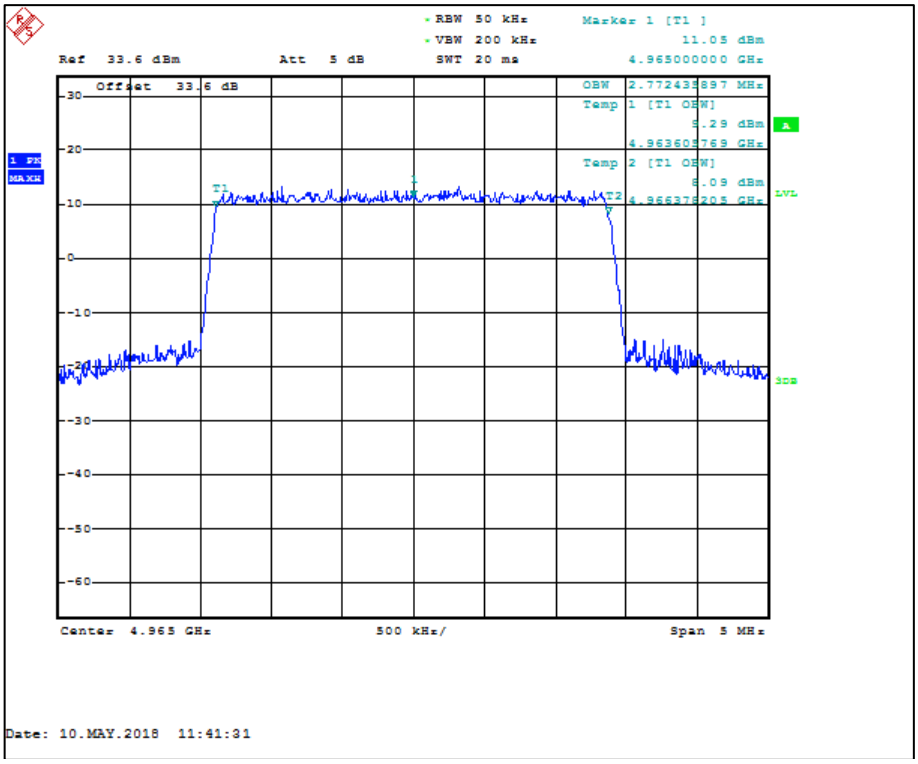

Figure 10 - Middle Channel - Occupied Bandwidth - 3 MHz Bandwidth, Port A

Product Service

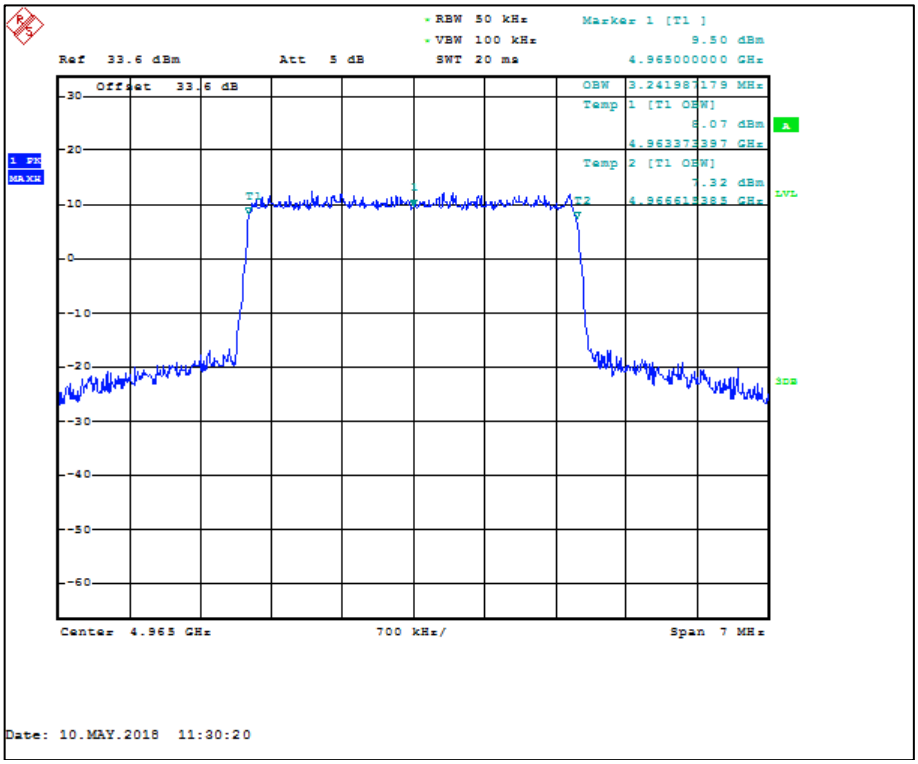

Figure 11 - Middle Channel - Occupied Bandwidth - 3.5 MHz Bandwidth, Port A

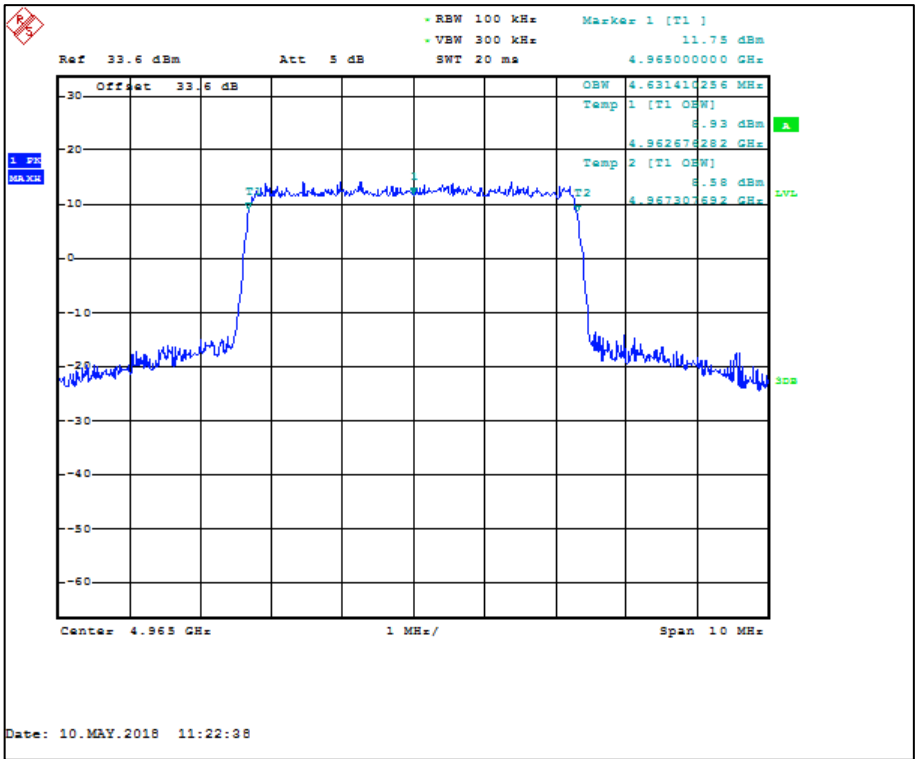

Figure 12 - Middle Channel - Occupied Bandwidth - 5 MHz Bandwidth, Port A

Product Service

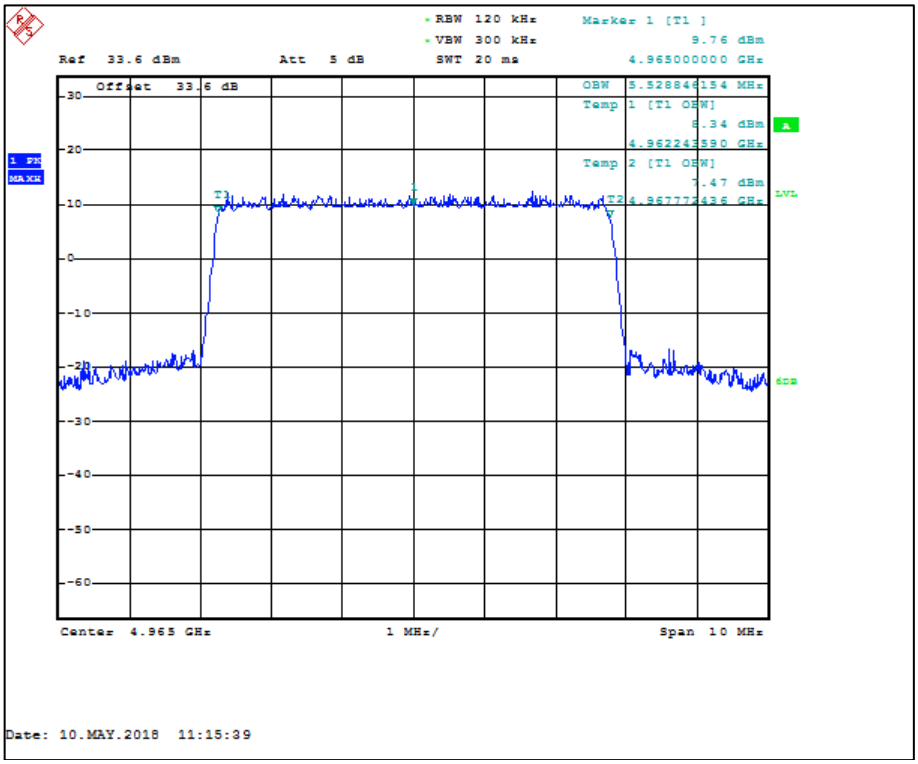

Figure 13 - Middle Channel - Occupied Bandwidth - 6 MHz Bandwidth, Port A

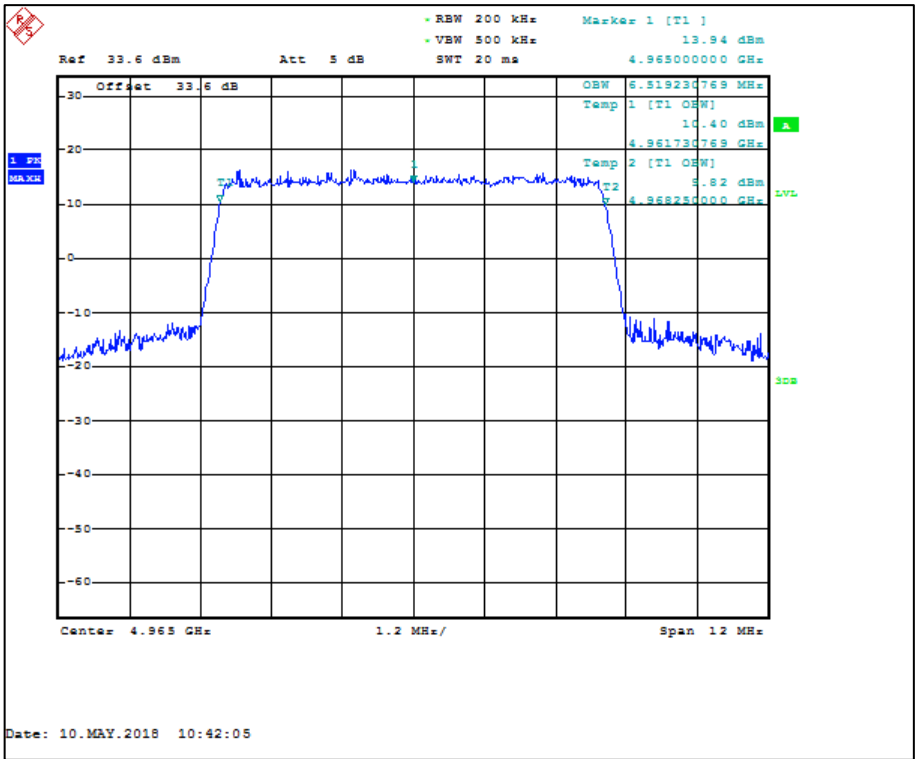

Figure 14 - Middle Channel - Occupied Bandwidth - 7 MHz Bandwidth, Port A

Product Service

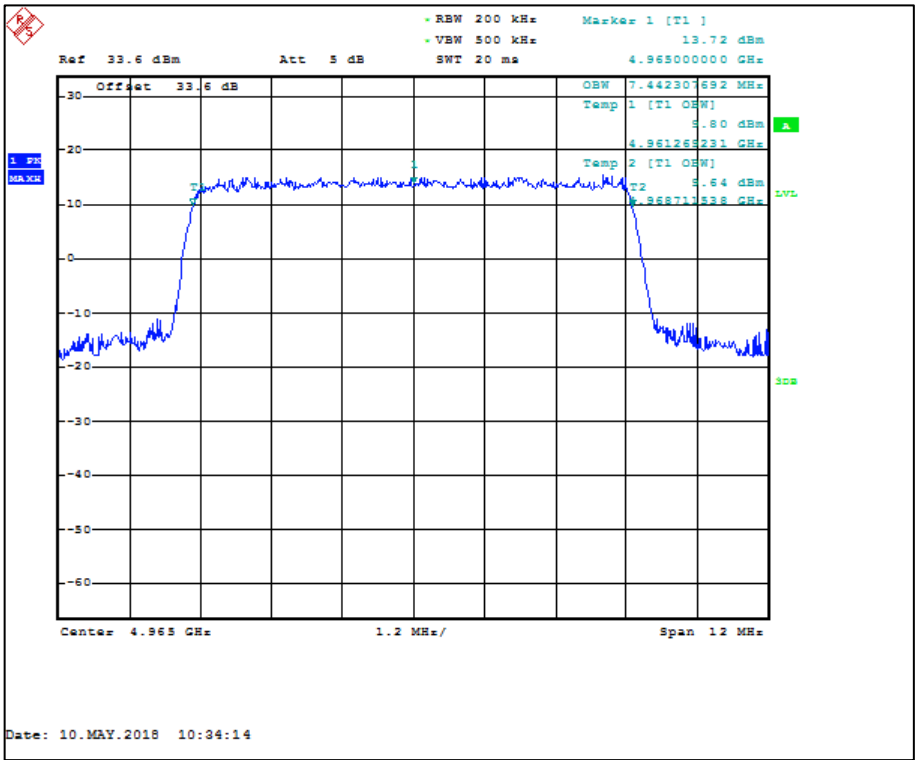

Figure 15 - Middle Channel - Occupied Bandwidth - 8 MHz Bandwidth, Port A

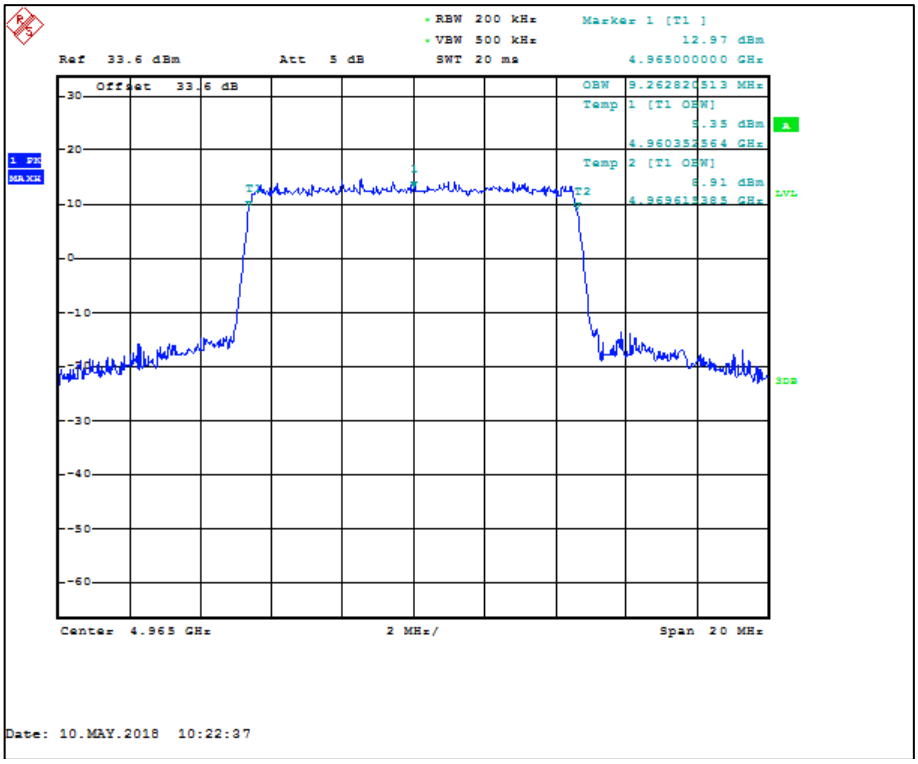

Figure 16 - Middle Channel - Occupied Bandwidth - 10 MHz Bandwidth, Port A

Product Service

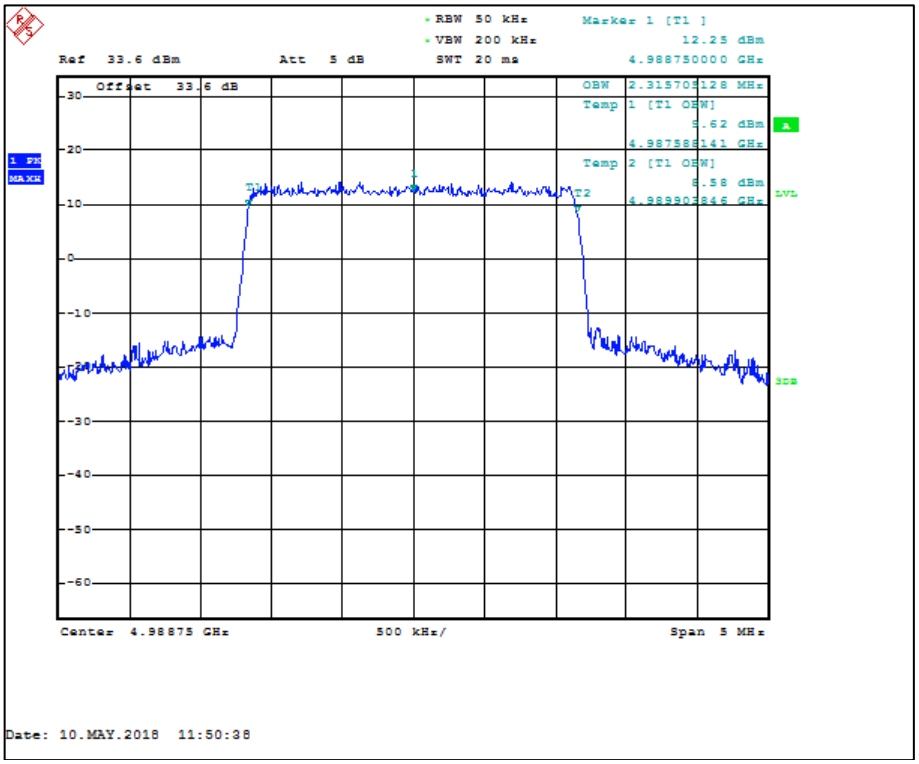

Figure 17 - Top Channel - Occupied Bandwidth - 2.5 MHz Bandwidth, Port A

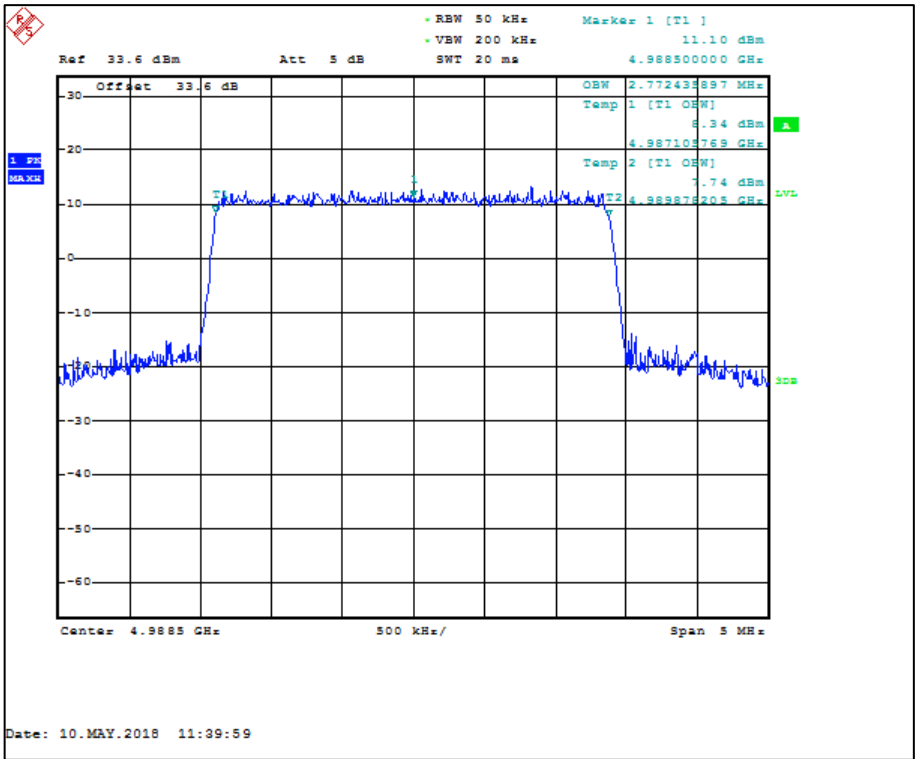

Figure 18 - Top Channel - Occupied Bandwidth - 3 MHz Bandwidth, Port A

Product Service

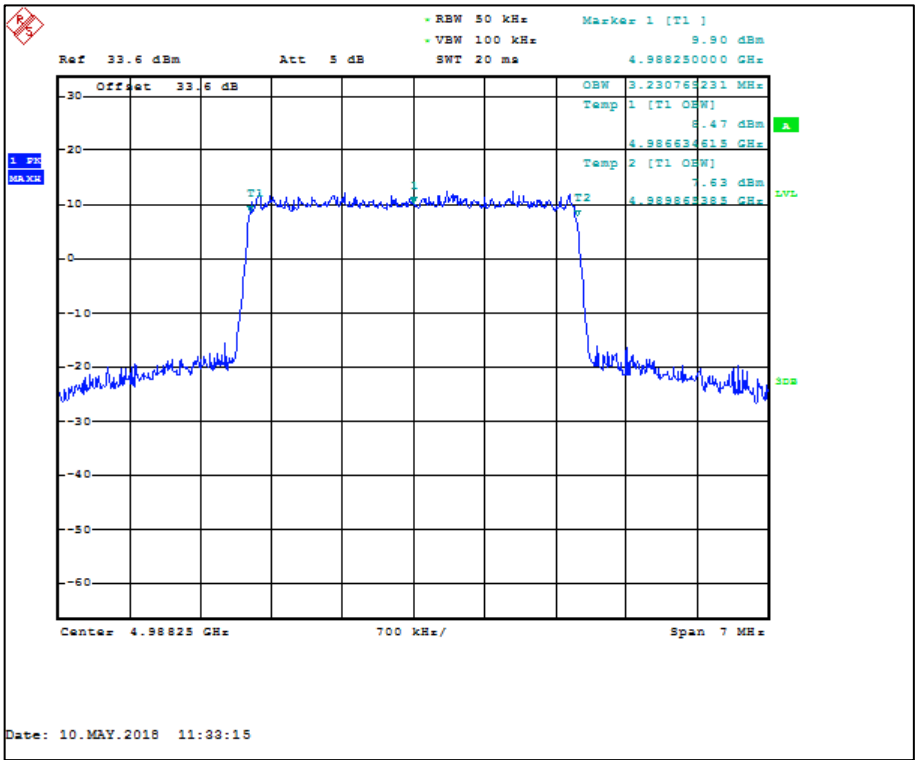

Figure 19 - Top Channel - Occupied Bandwidth - 3.5 MHz Bandwidth, Port A

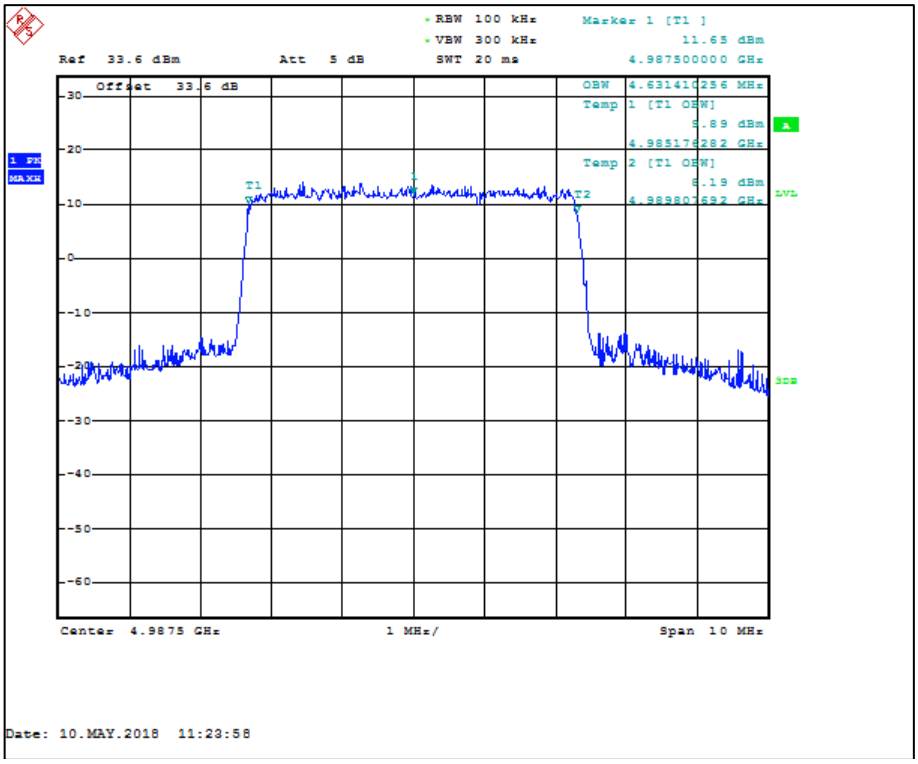

Figure 20 - Top Channel - Occupied Bandwidth - 5 MHz Bandwidth, Port A

Product Service

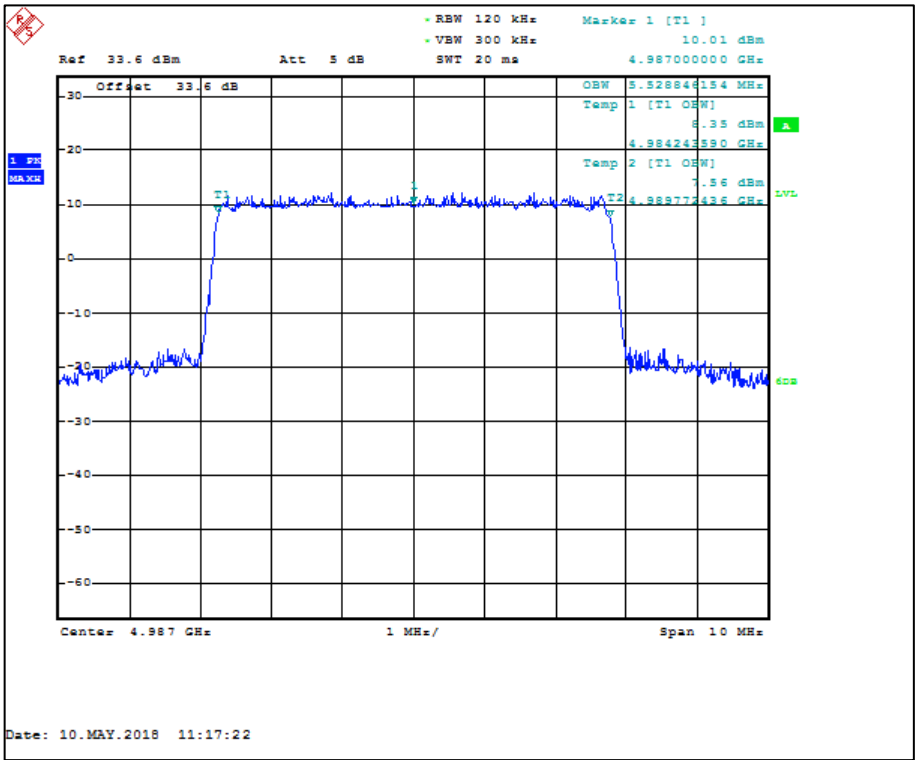

Figure 21 - Top Channel - Occupied Bandwidth - 6 MHz Bandwidth, Port A

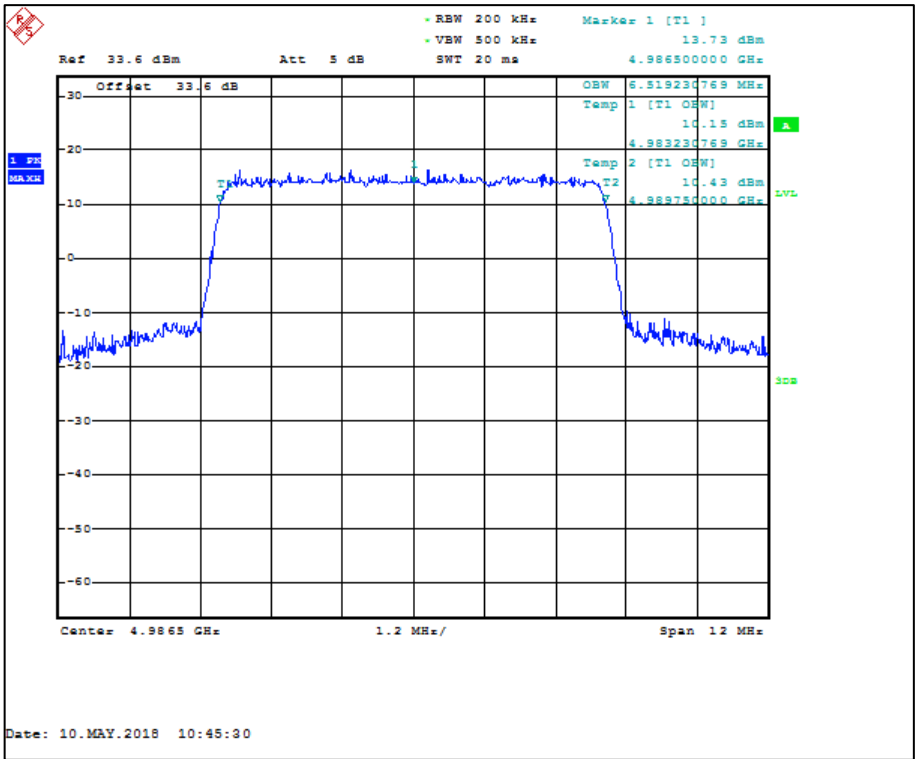

Figure 22 - Top Channel - Occupied Bandwidth - 7 MHz Bandwidth, Port A

Product Service

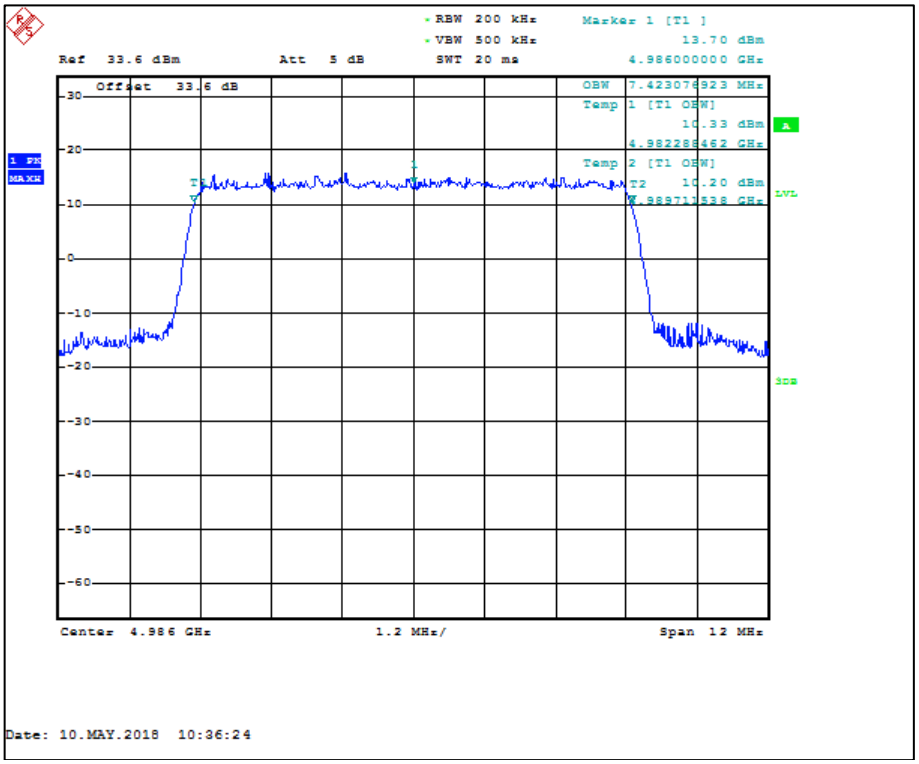

Figure 23 - Top Channel - Occupied Bandwidth - 8 MHz Bandwidth, Port A

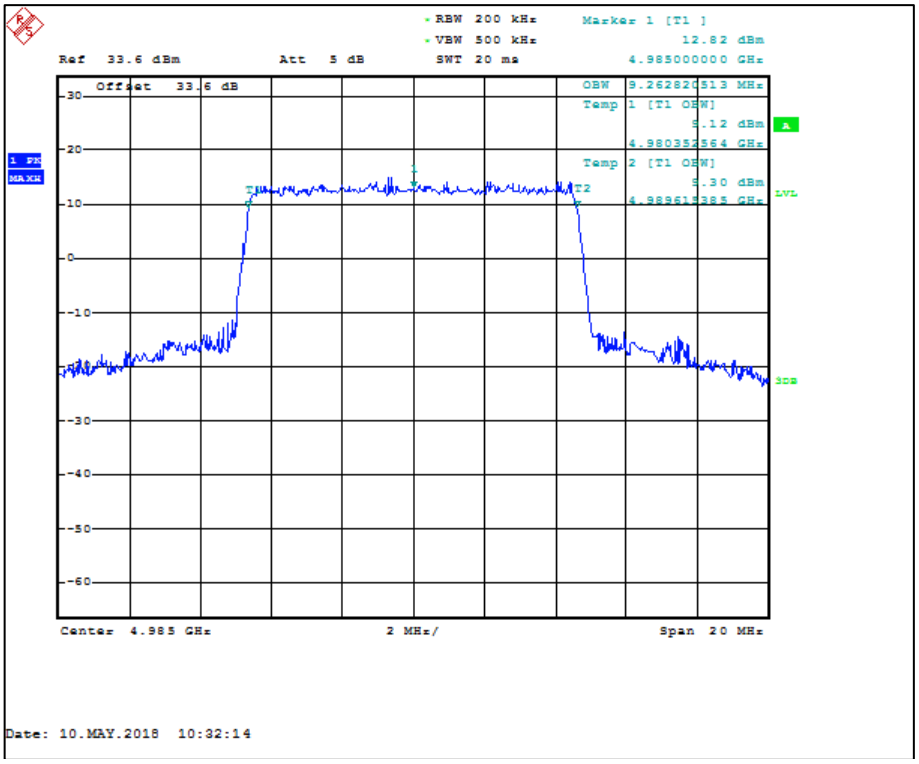

Figure 24 - Top Channel - Occupied Bandwidth - 10 MHz Bandwidth, Port A

FCC 47 CFR Part 90, Limit Clause

None Specified.

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
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	14-Mar-2019
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	02-Oct-2018
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	06-Mar-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 17

O/P Mon – Output Monitored using calibrated equipment

Product Service

2.4 Spurious Emissions at Antenna Terminals

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test and Modification State

Mesh SOL8SDR CONCEALMENT MODULE - SOL8SDR-C-470043,
S/N: 108873 - Modification State 0

2.4.3 Date of Test

11-May-2018

2.4.4 Test Method

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

The limit line used for compliance with the appropriate rules for emissions for emissions removed > 150% of the authorised bandwidth from the centre frequency, is -25 dBm. This is then further reduced by 3 dB for MIMO operation when N=2 and N is the number of transmitters simultaneously operating.

3 dB = 10*LOG(2)

2.4.5 Environmental Conditions

Ambient Temperature	23.1 °C
Relative Humidity	36.0 %

Product Service

2.4.6 Test Results

4.9 GHz – Transmit

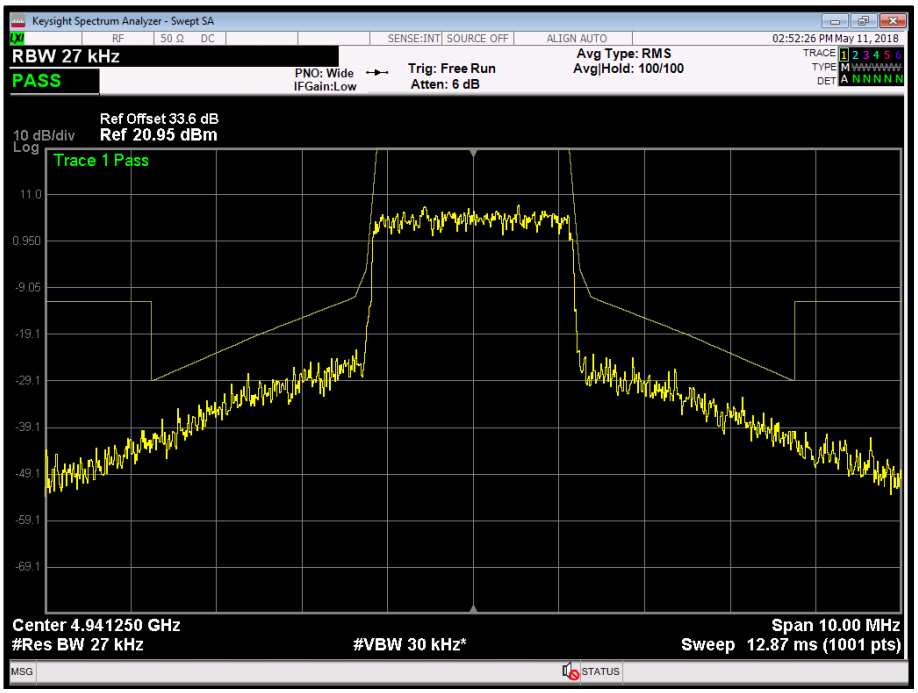

Figure 25 - Bottom Channel - Transmitter Mask - 2.5 MHz Bandwidth, Port A

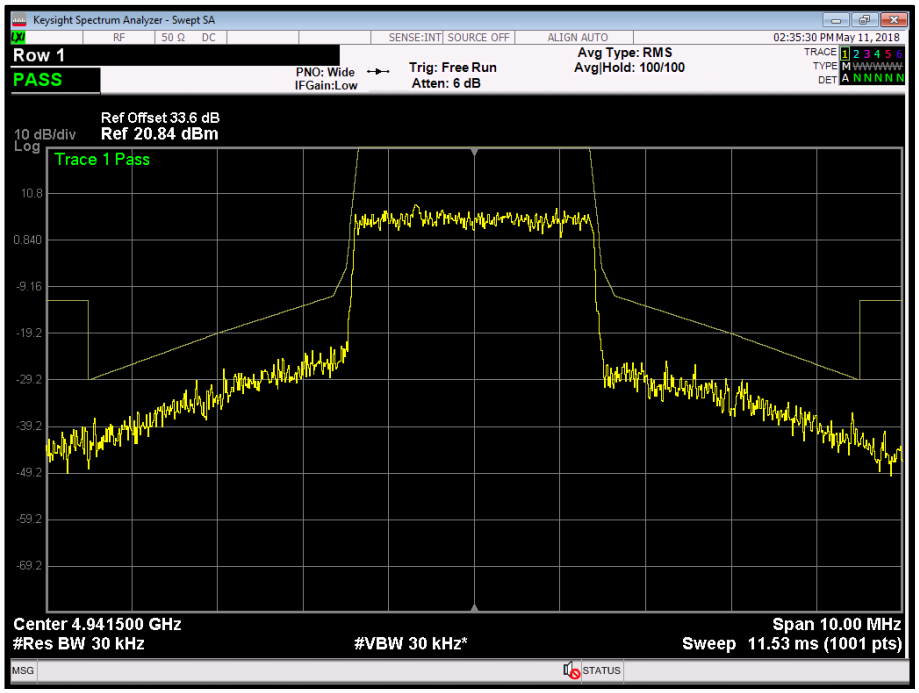

Figure 26 - Bottom Channel - Transmitter Mask - 3 MHz Bandwidth, Port A

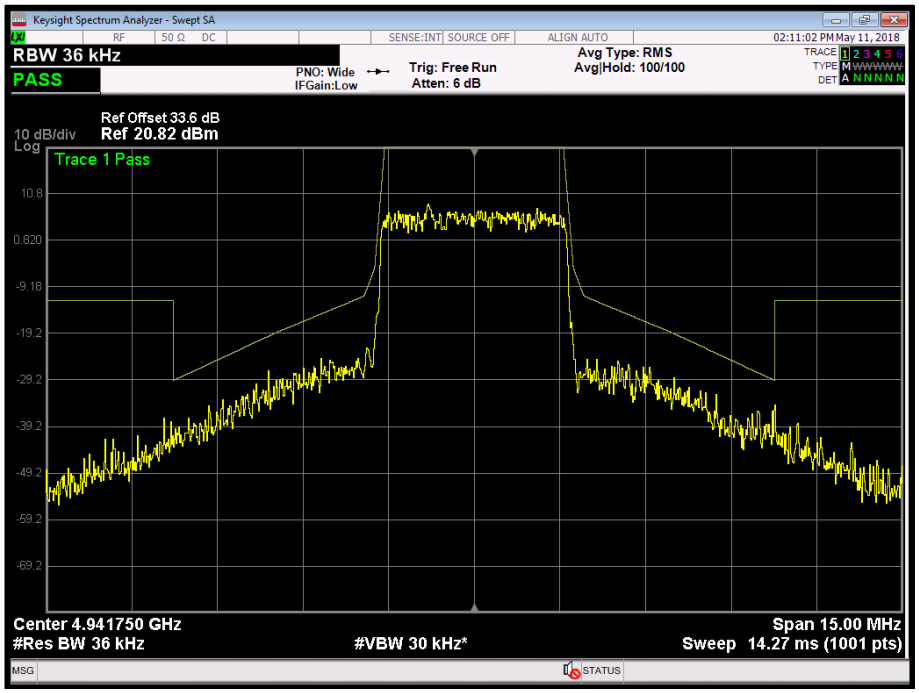

Figure 27 - Bottom Channel - Transmitter Mask - 3.5 MHz Bandwidth, Port A

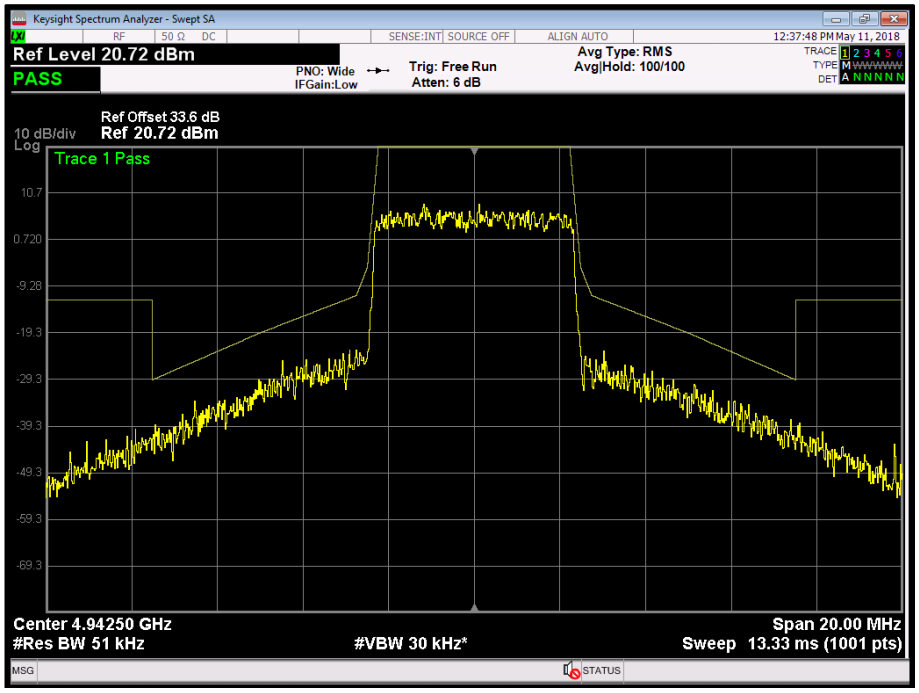

Figure 28 - Bottom Channel - Transmitter Mask - 5 MHz Bandwidth, Port A

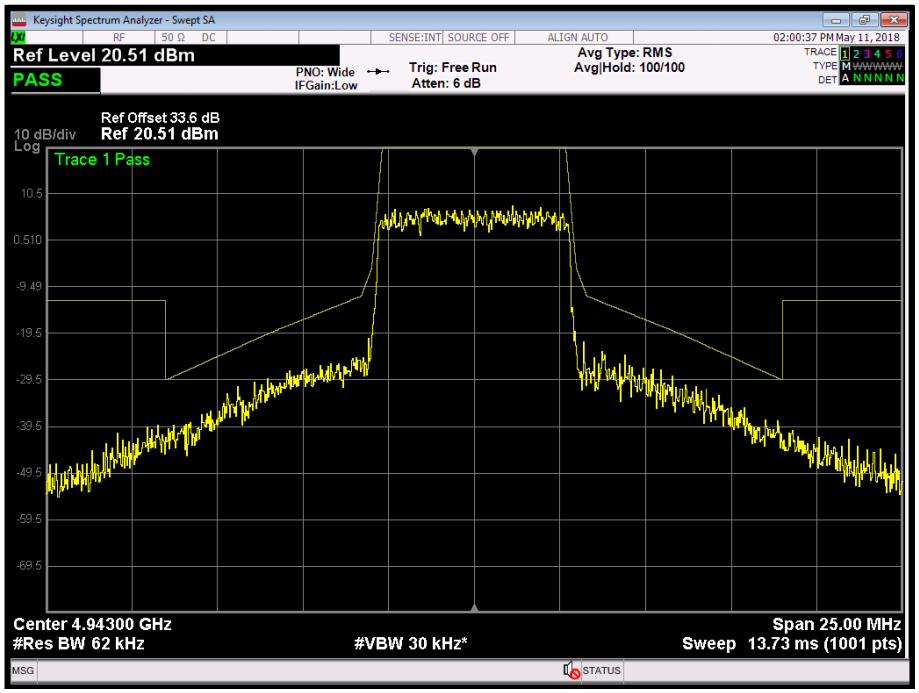

Figure 29 - Bottom Channel - Transmitter Mask - 6 MHz Bandwidth, Port A

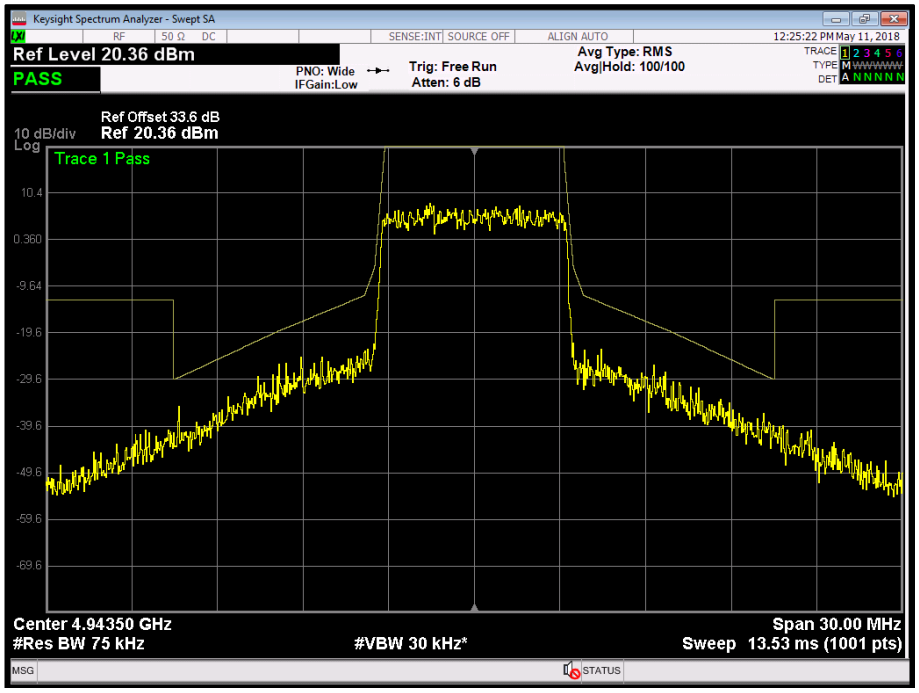

Figure 30 - Bottom Channel - Transmitter Mask - 7 MHz Bandwidth, Port A

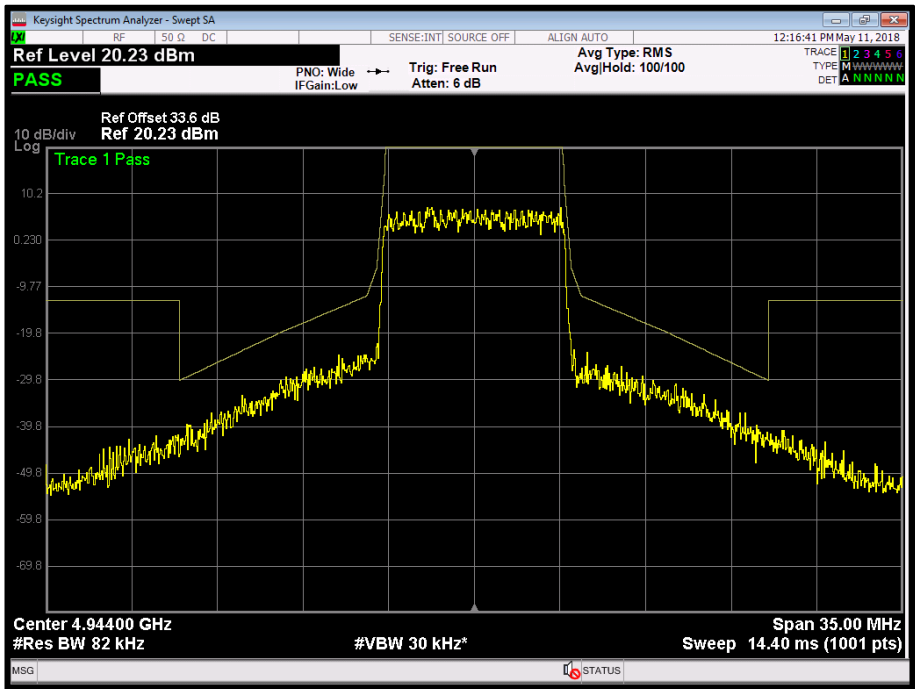

Figure 31 - Bottom Channel - Transmitter Mask - 8 MHz Bandwidth, Port A

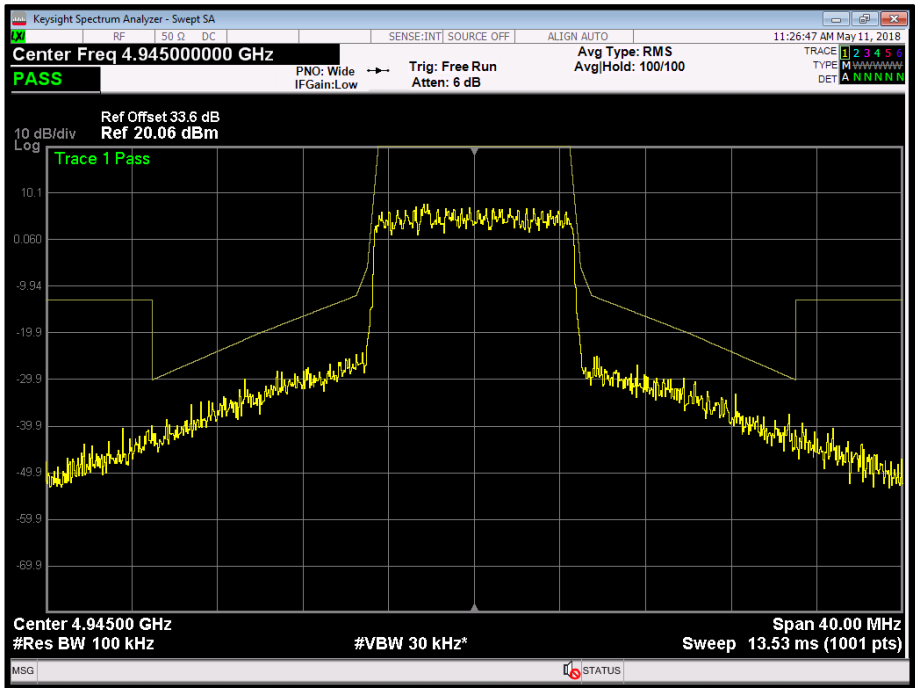

Figure 32 - Bottom Channel - Transmitter Mask - 10 MHz Bandwidth, Port A

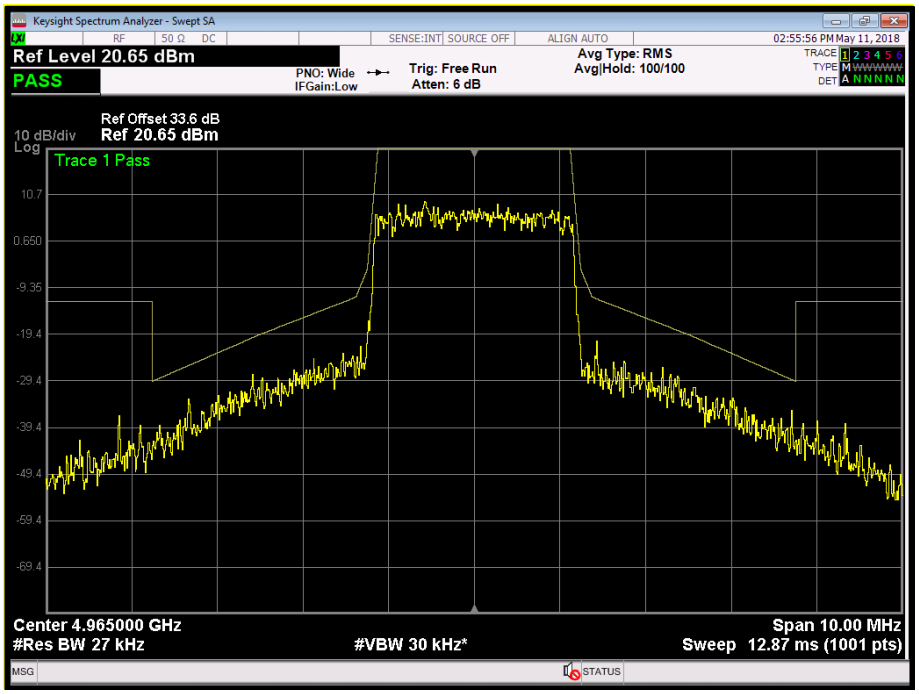

Figure 33 - Middle Channel - Transmitter Mask - 2.5 MHz Bandwidth, Port A

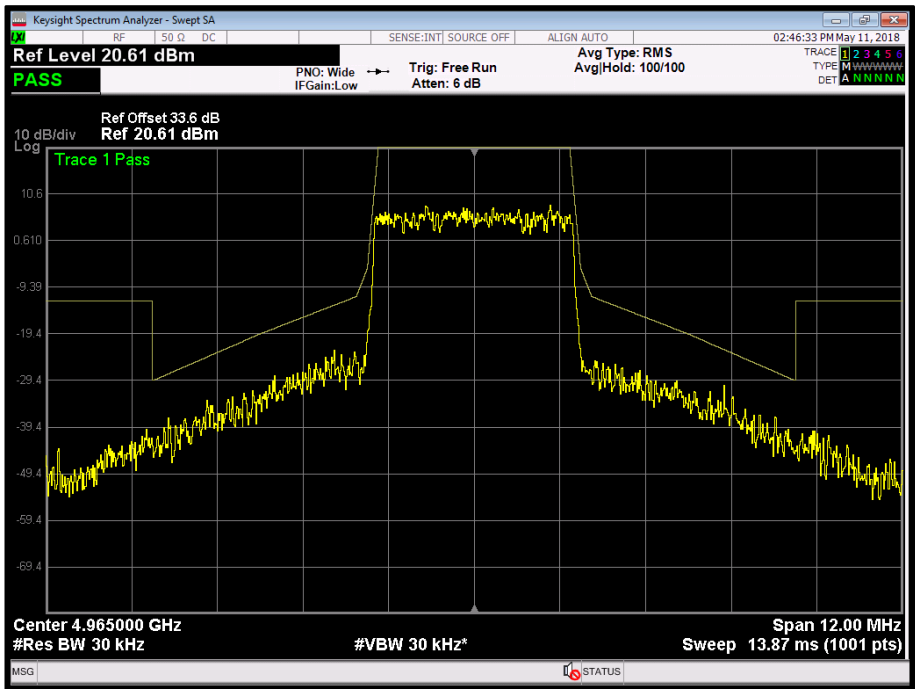

Figure 34 - Middle Channel - Transmitter Mask - 3 MHz Bandwidth, Port A

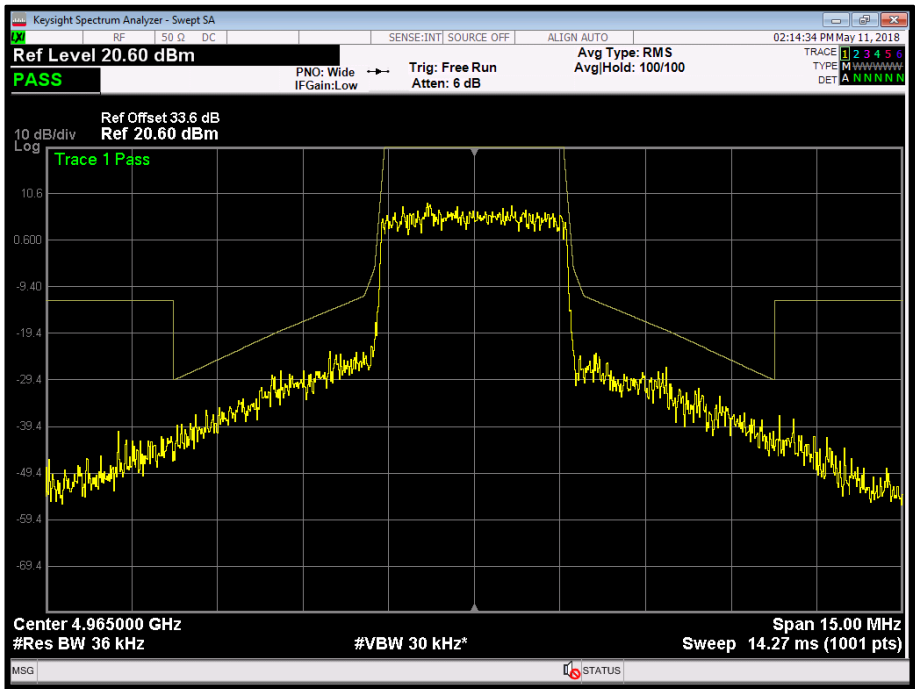

Figure 35 - Middle Channel - Transmitter Mask - 3.5 MHz Bandwidth, Port A

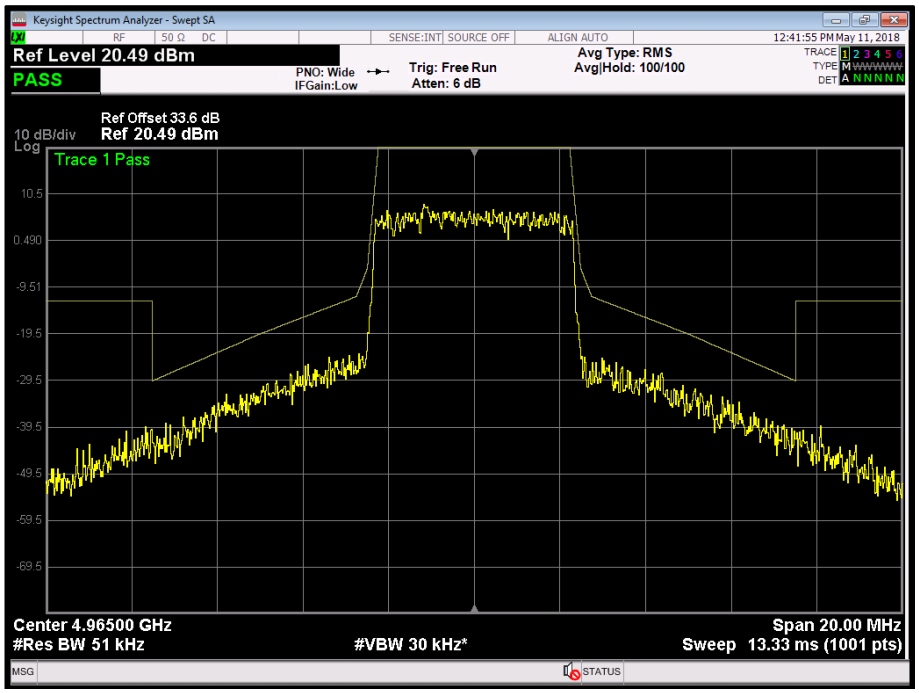

Figure 36 - Middle Channel - Transmitter Mask - 5 MHz Bandwidth, Port A

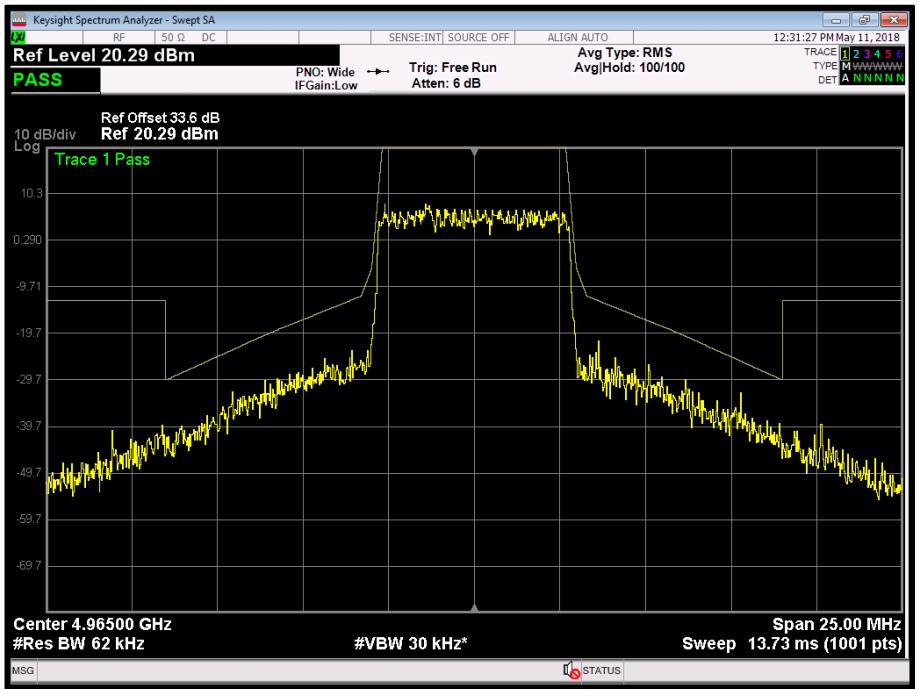

Figure 37 - Middle Channel - Transmitter Mask - 6 MHz Bandwidth, Port A

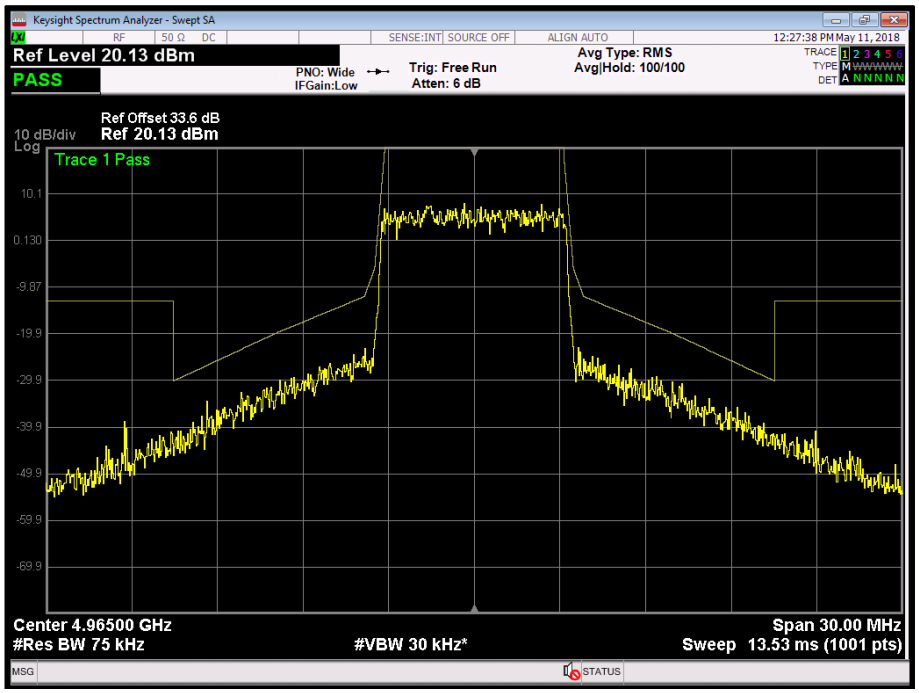

Figure 38 - Middle Channel - Transmitter Mask - 7 MHz Bandwidth, Port A

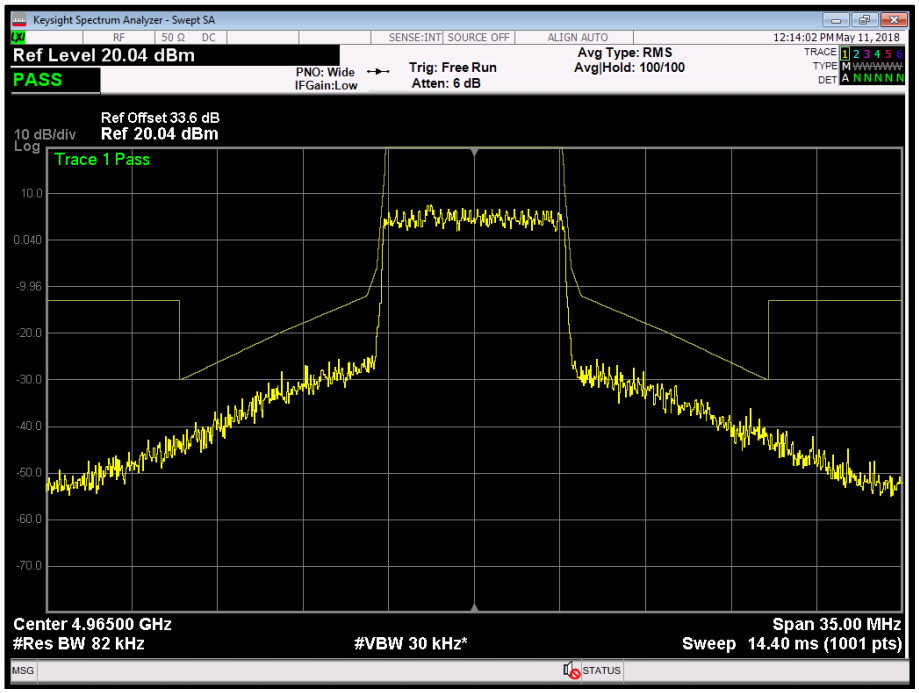

Figure 39 - Middle Channel - Transmitter Mask - 8 MHz Bandwidth, Port A

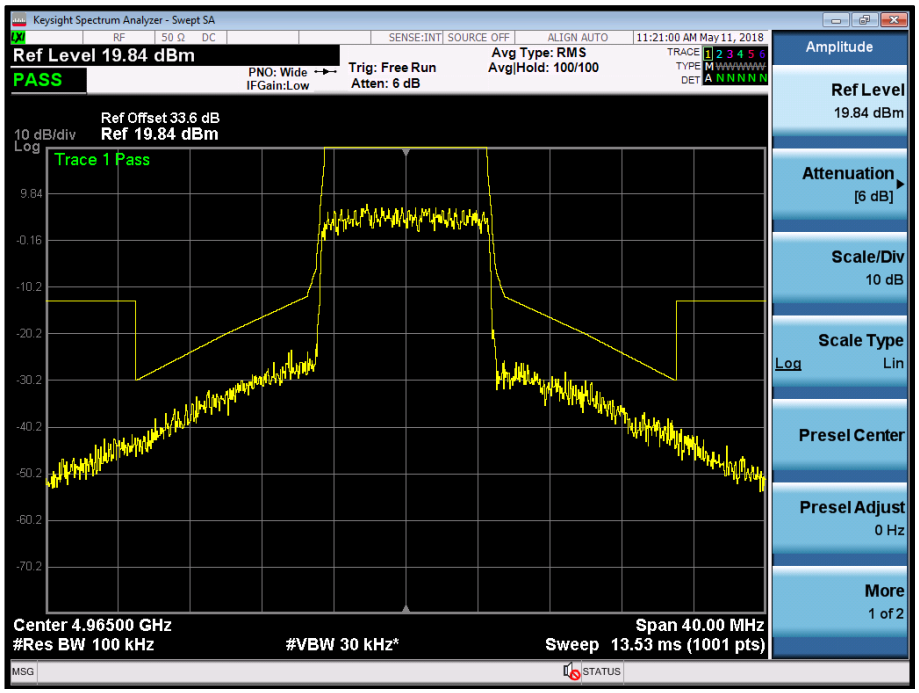

Figure 40 - Middle Channel - Transmitter Mask - 10 MHz Bandwidth, Port A

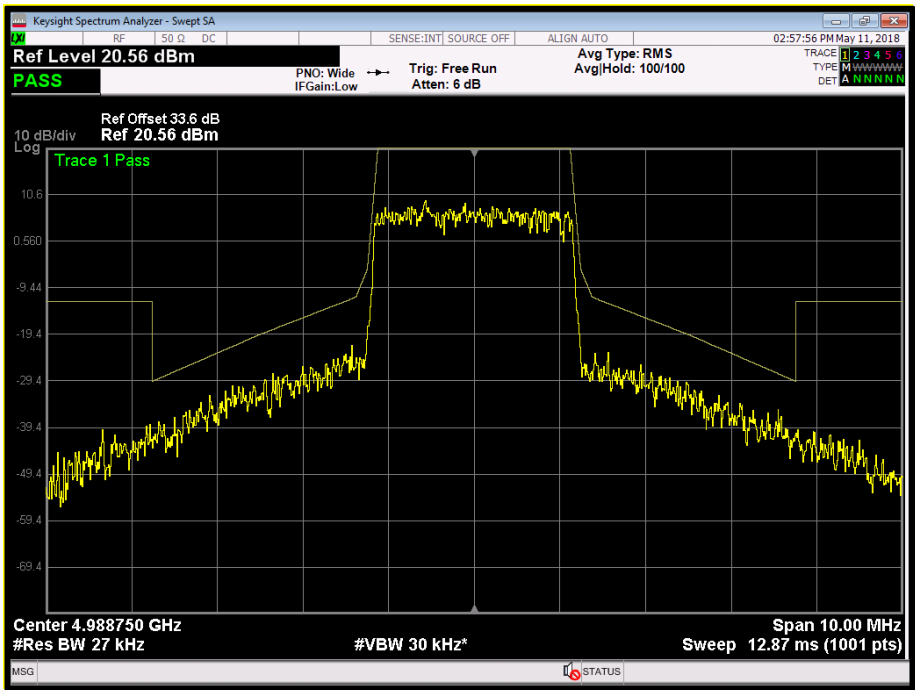

Figure 41 - Top Channel - Transmitter Mask - 2.5 MHz Bandwidth, Port A

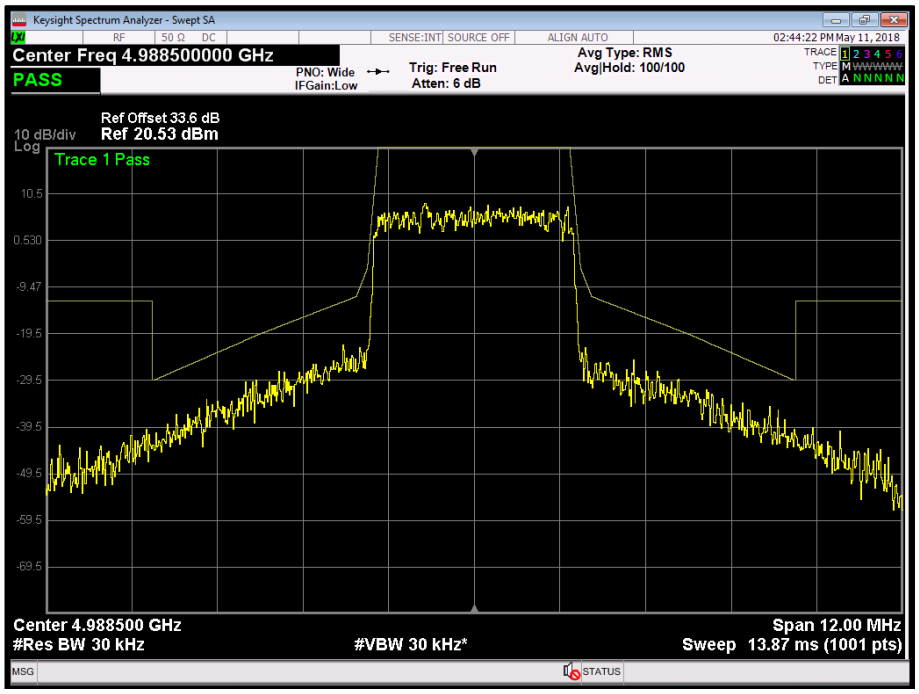

Figure 42 –Top Channel - Transmitter Mask - 3 MHz Bandwidth, Port A

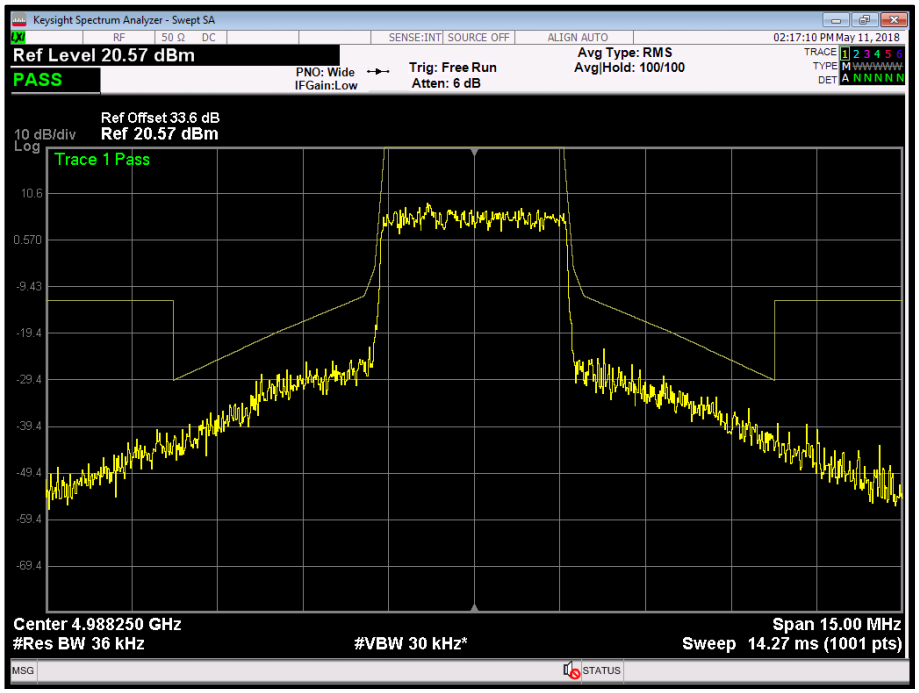

Figure 43 - Top Channel - Transmitter Mask - 3.5 MHz Bandwidth, Port A

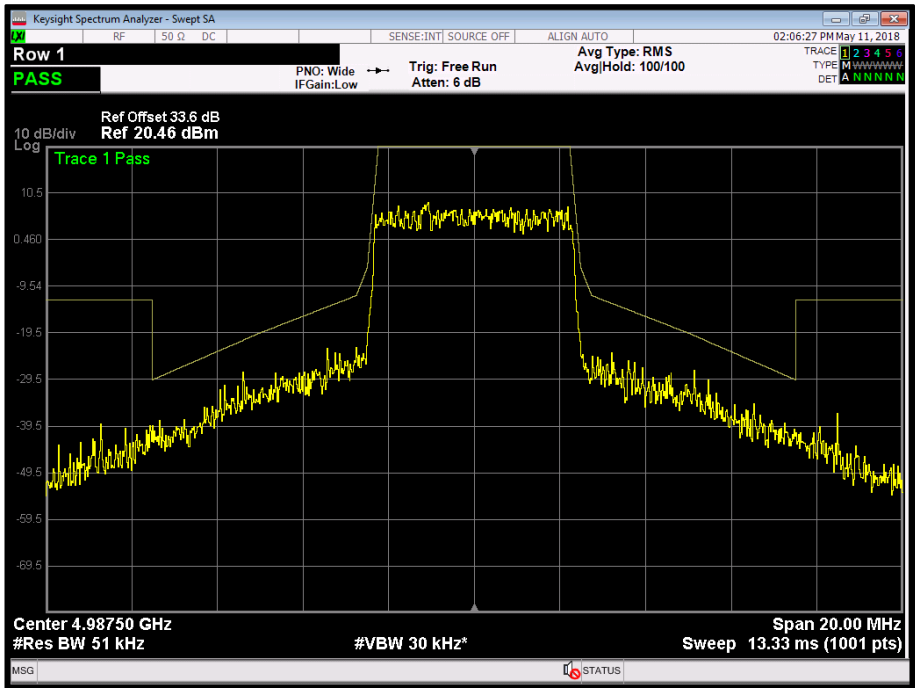

Figure 44 - Top Channel - Transmitter Mask - 5 MHz Bandwidth, Port A

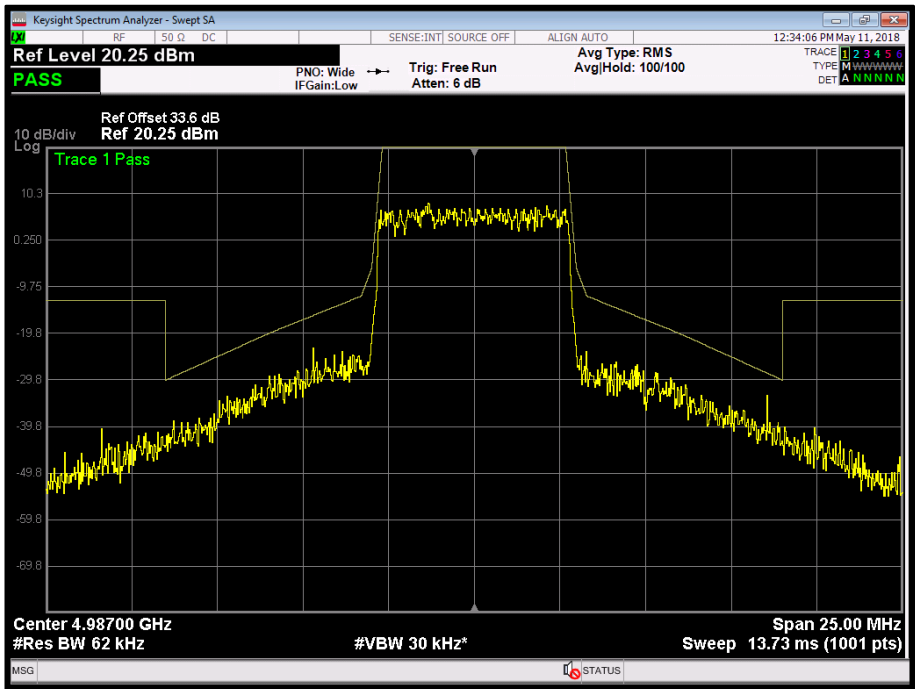

Figure 45 - Top Channel - Transmitter Mask - 6 MHz Bandwidth, Port A

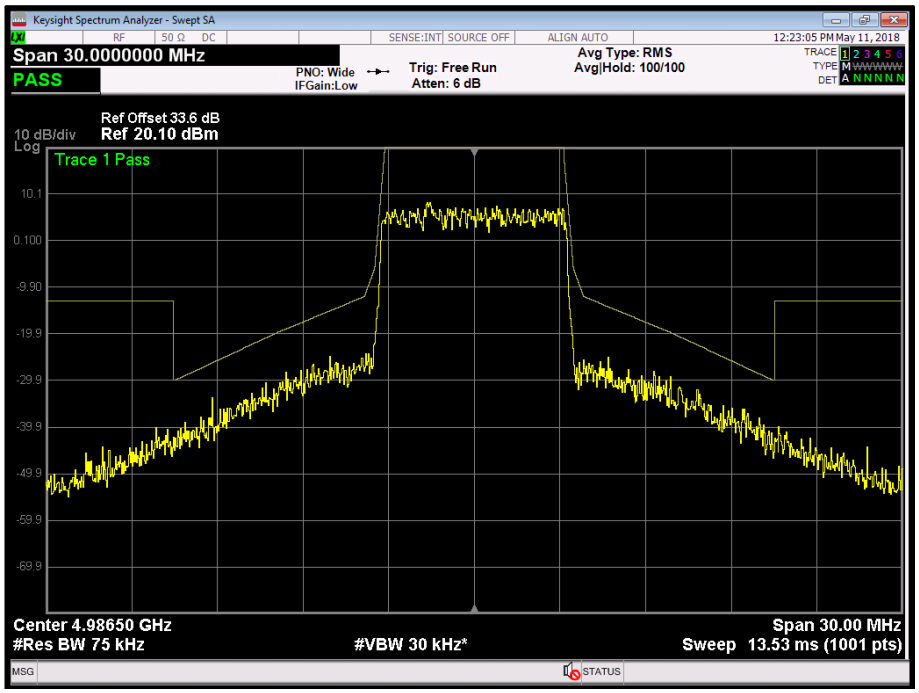

Figure 46 - Top Channel - Transmitter Mask - 7 MHz Bandwidth, Port A

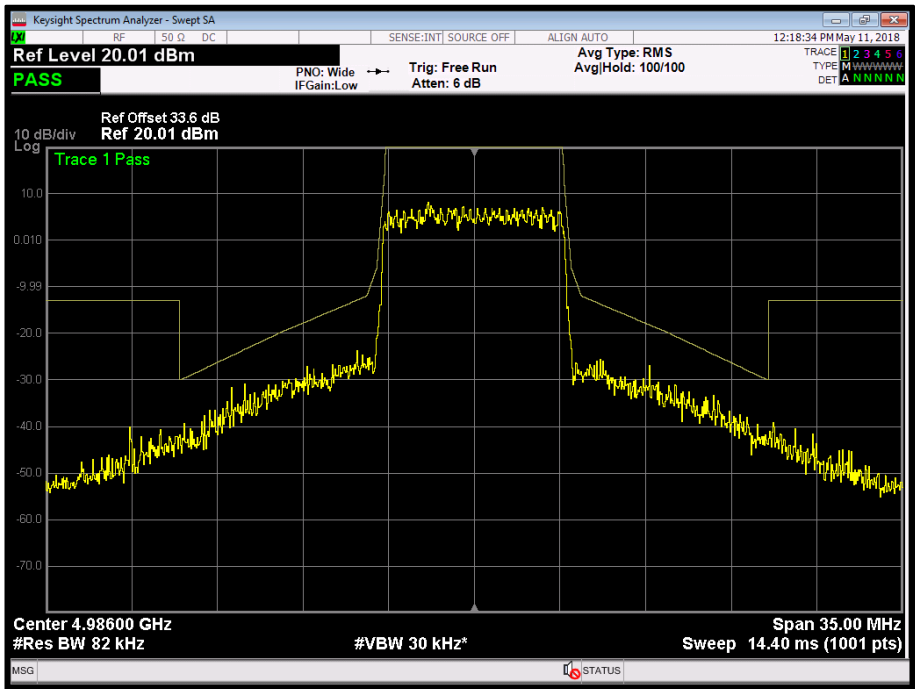

Figure 47 - Top Channel - Transmitter Mask - 8 MHz Bandwidth, Port A

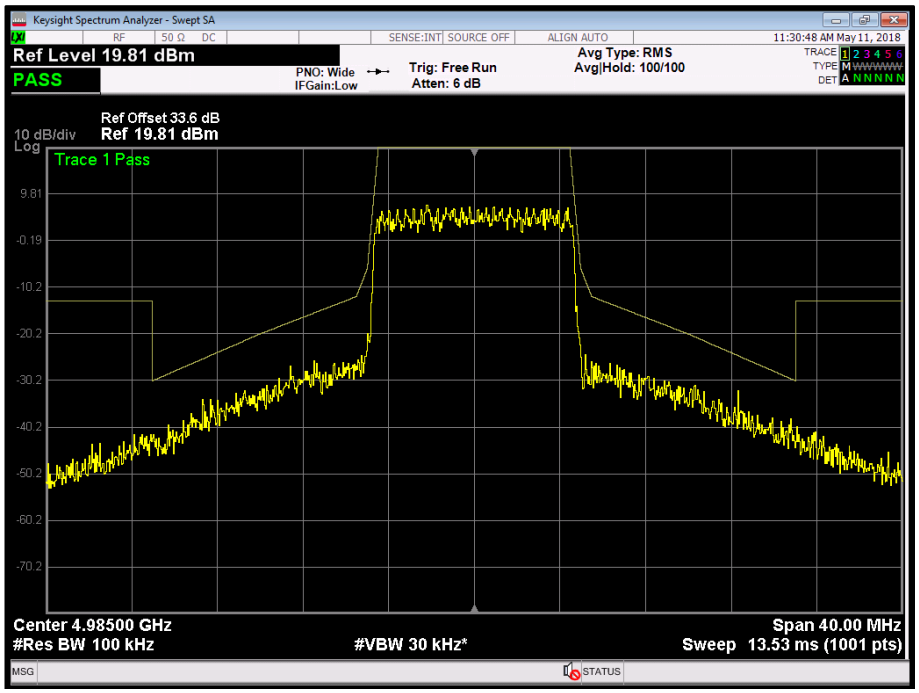

Figure 48 - Top Channel - Transmitter Mask - 10 MHz Bandwidth, Port A

FCC 47 CFR Part 90, Limit Clause 90.210

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

Product Service

2.4.7 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
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 18

O/P Mon – Output Monitored using calibrated equipment

Product Service

2.5 Radiated Spurious Emissions

2.5.1 Specification Reference

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

2.5.2 Equipment Under Test and Modification State

Mesh SOL8SDR CONCEALMENT MODULE - SOL8SDR-C-470043,
S/N: 108873 - Modification State 0

2.5.3 Date of Test

20-May-2018 to 10-June-2018

2.5.4 Test Method

Testing was performed in accordance with ANSI C63.26, clause 5.5.4.
The limit line used on the plots was calculated from equation c) in clause 5.2.7

E (dBµV/m) = EIRP (dBm) − 20log(D) + 104.8; where D is the measurement distance (in the far field region) in m.

-13 dBm – 20*Log(3) + 104.8 = 82.26 dBµV/m at 3m.

2.5.5 Environmental Conditions

Ambient Temperature	19.5 °C
Relative Humidity	68.4 %

Product Service

2.5.6 Test Results

4.9 GHz - Transmit

Frequency (MHz)	Level (dBm)
*	

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

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

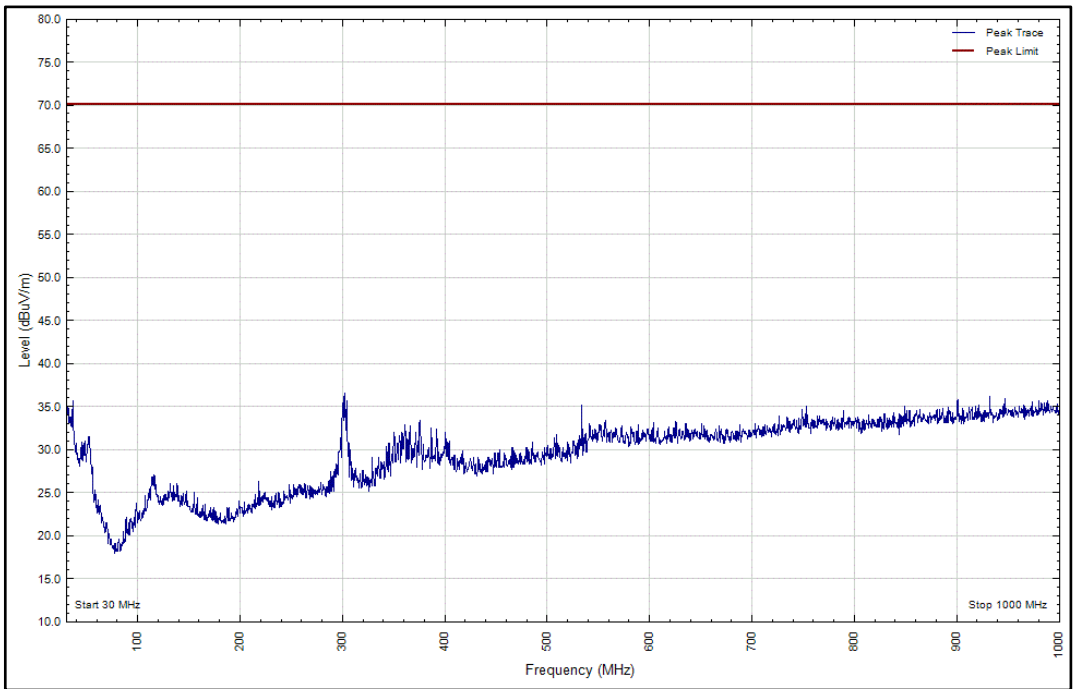

Figure 49 - Bottom Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation X

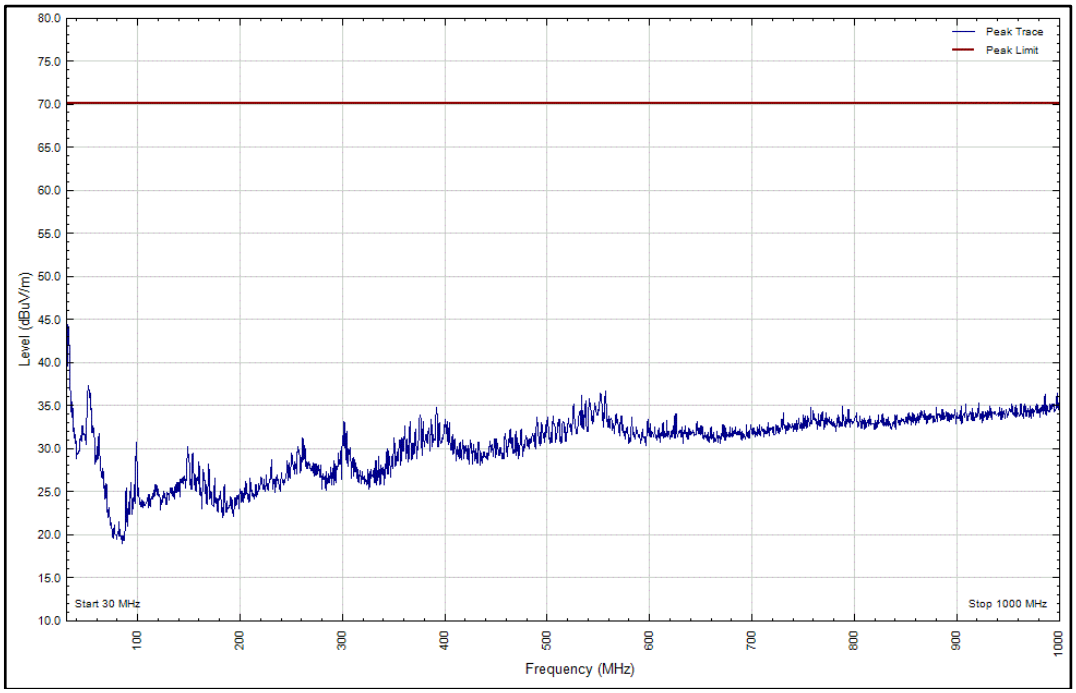

Figure 50 - Bottom Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation X

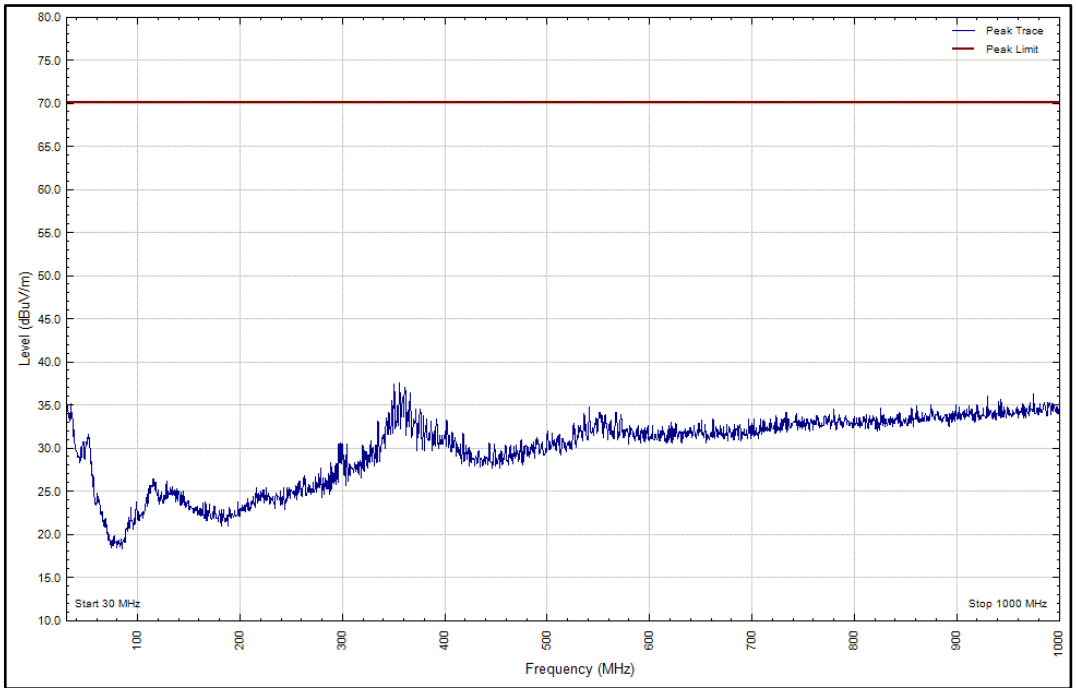

Figure 51 - Bottom Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation Y

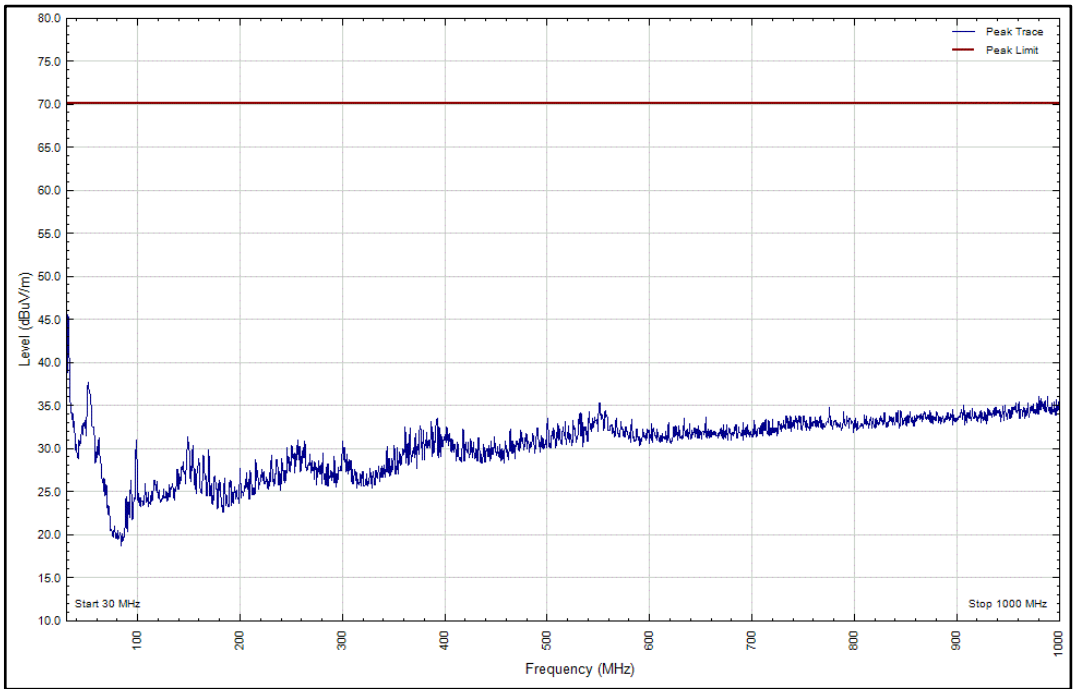

Figure 52 - Bottom Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation Y

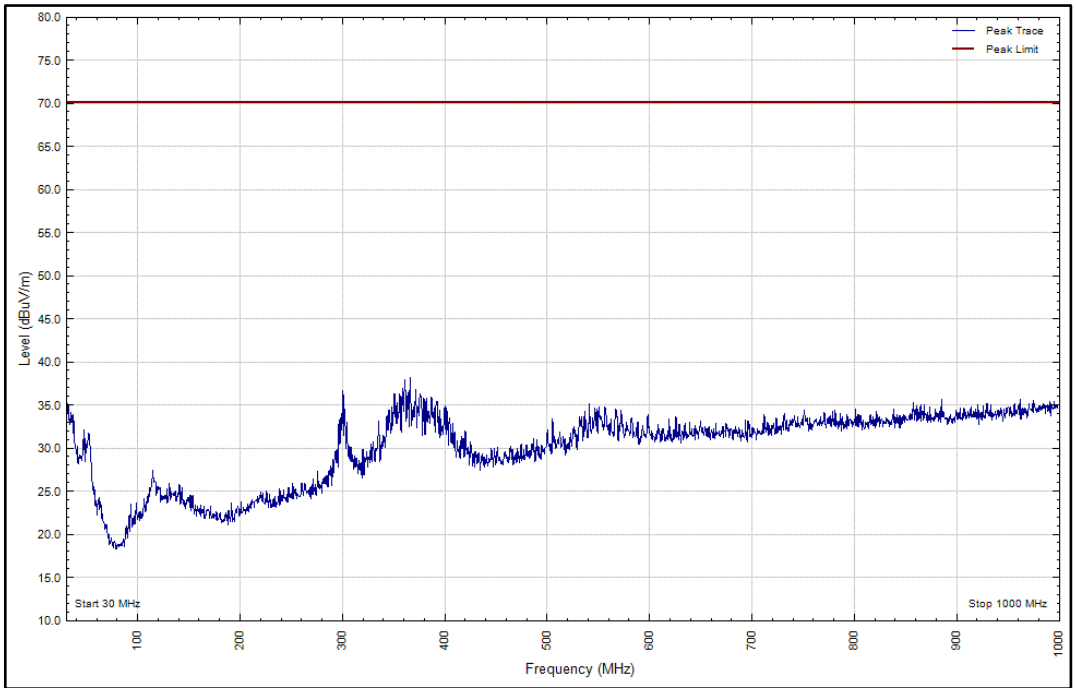

Figure 53 - Bottom Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation Z

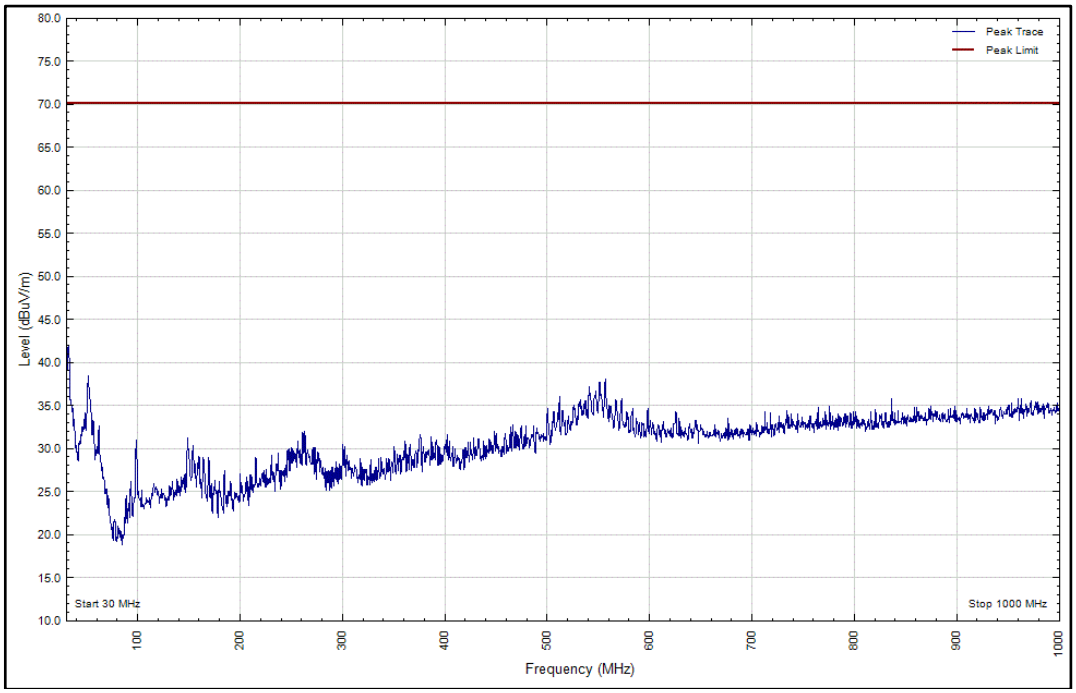

Figure 54 - Bottom Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation Z

Frequency (MHz)	Level (dBm)
*	

Table 20 - Middle Channel - 30 MHz to 1 GHz - Emissions Results

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

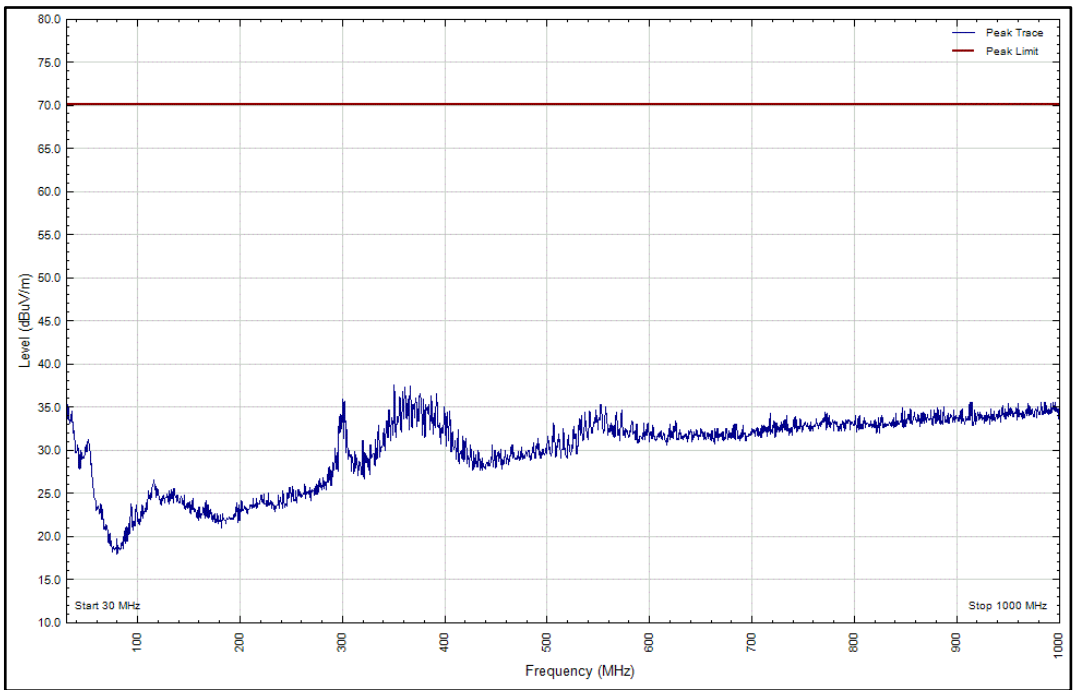

Figure 55 - Middle Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation X

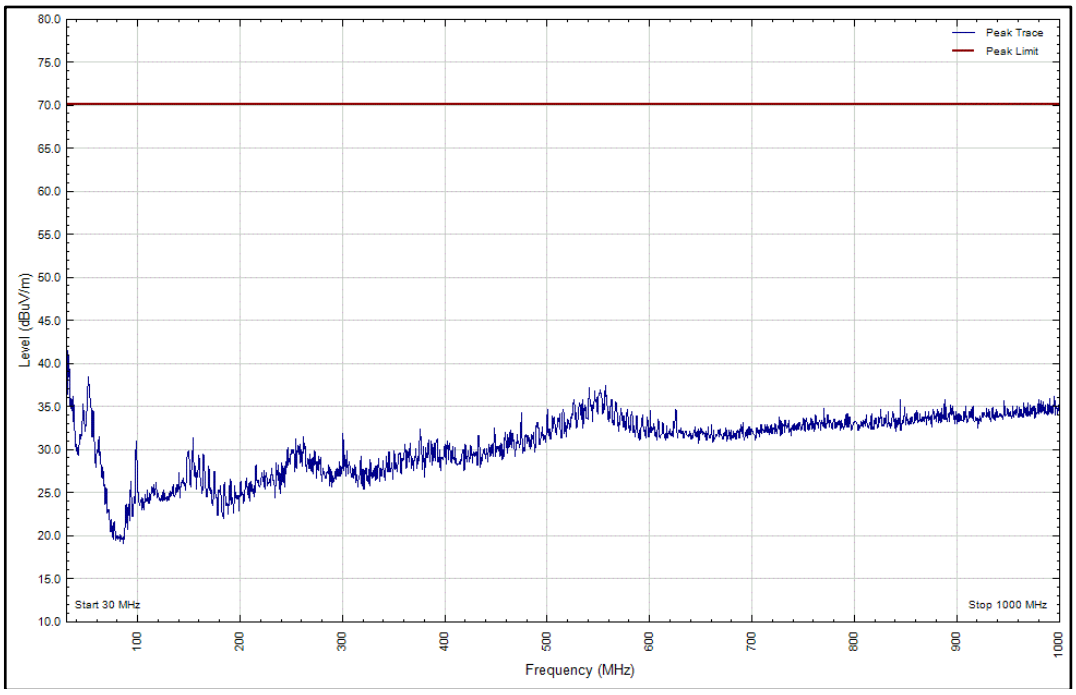

Figure 56 - Middle Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation X

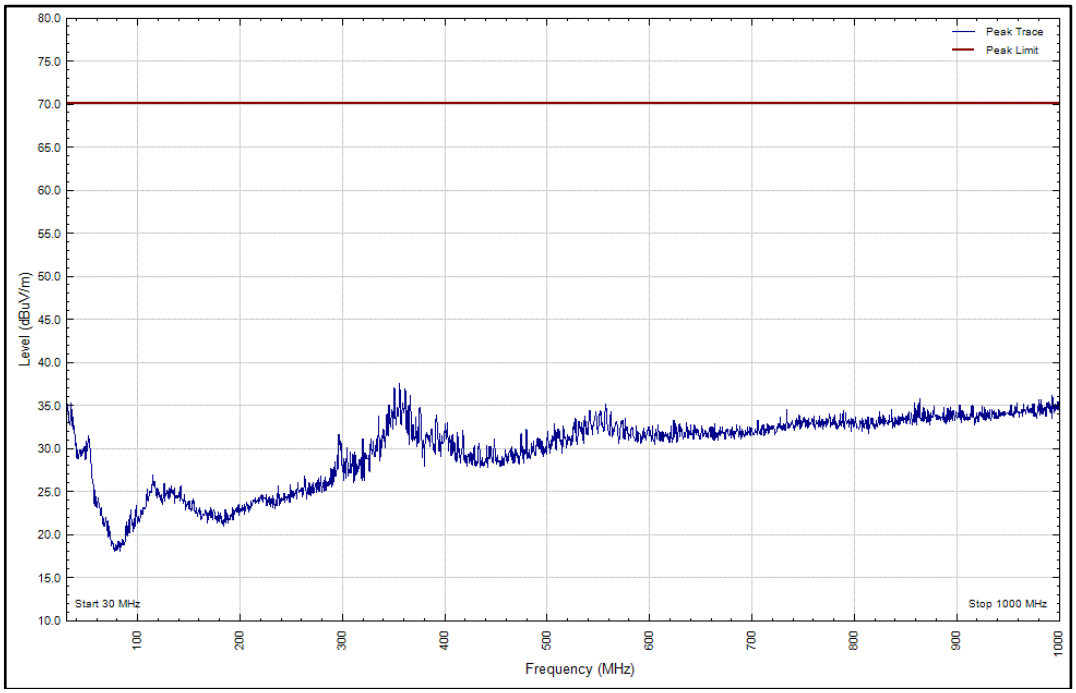

Figure 57 - Middle Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation Y

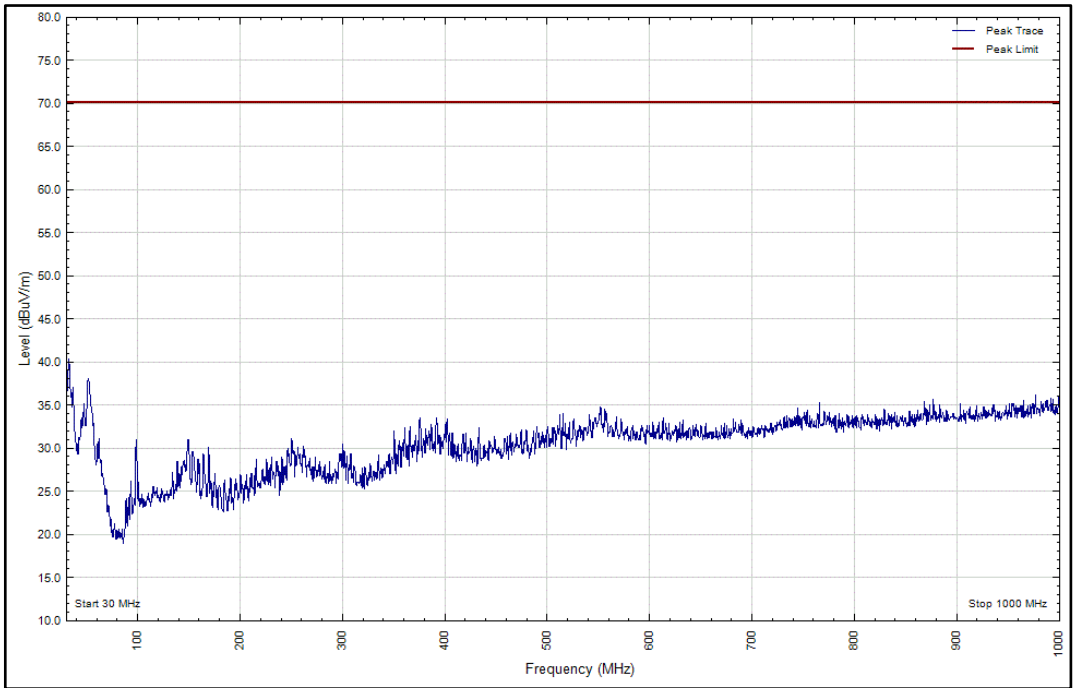

Figure 58 - Middle Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation Y

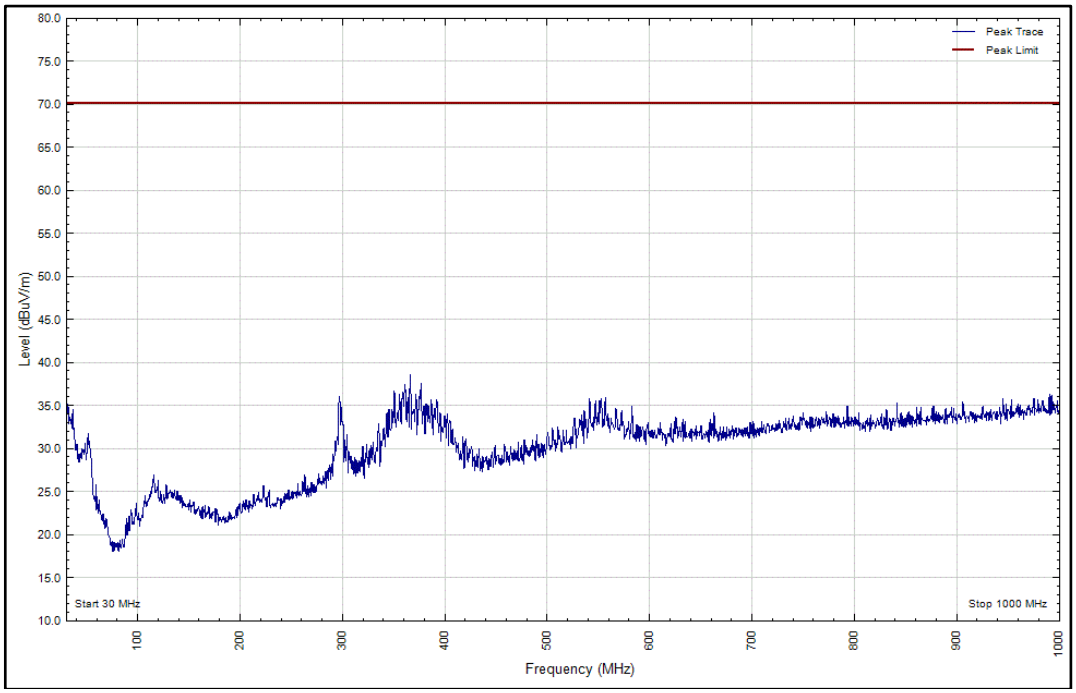

Figure 59 - Middle Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation Z

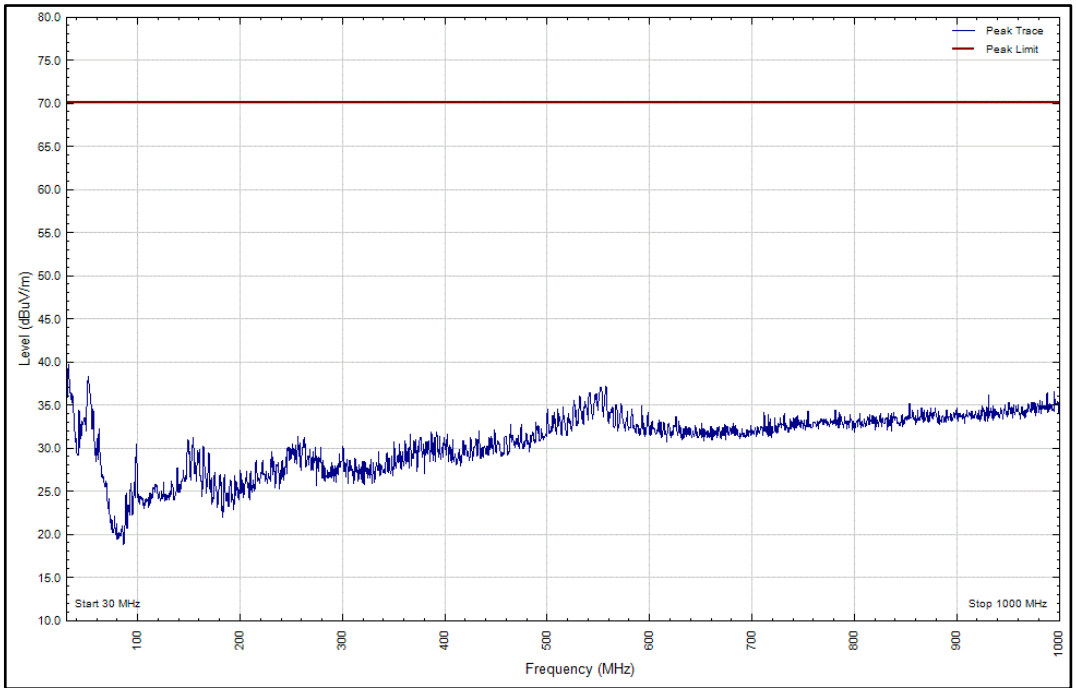

Figure 60 - Middle Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation Z

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.

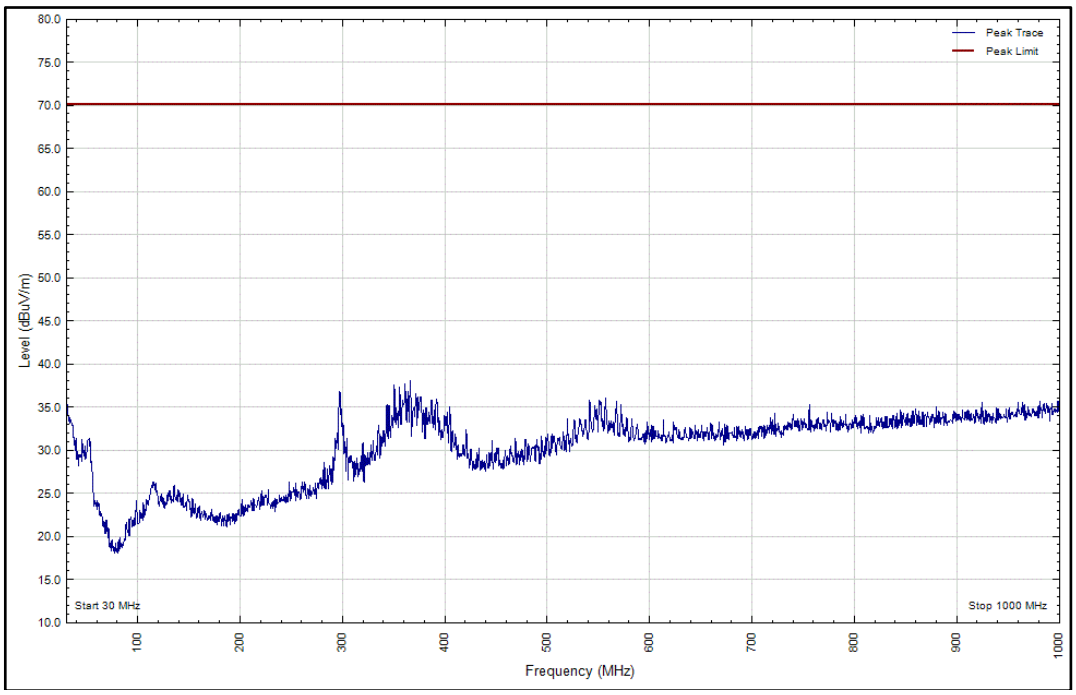

Figure 61 - Top Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation X

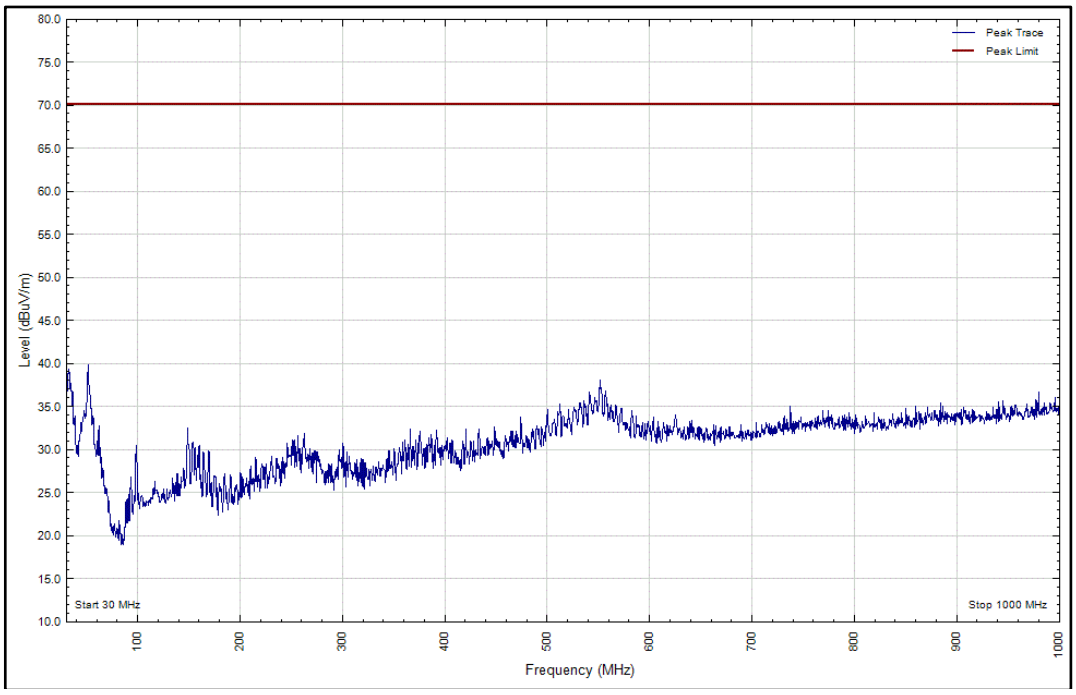

Figure 62 - Top Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation X

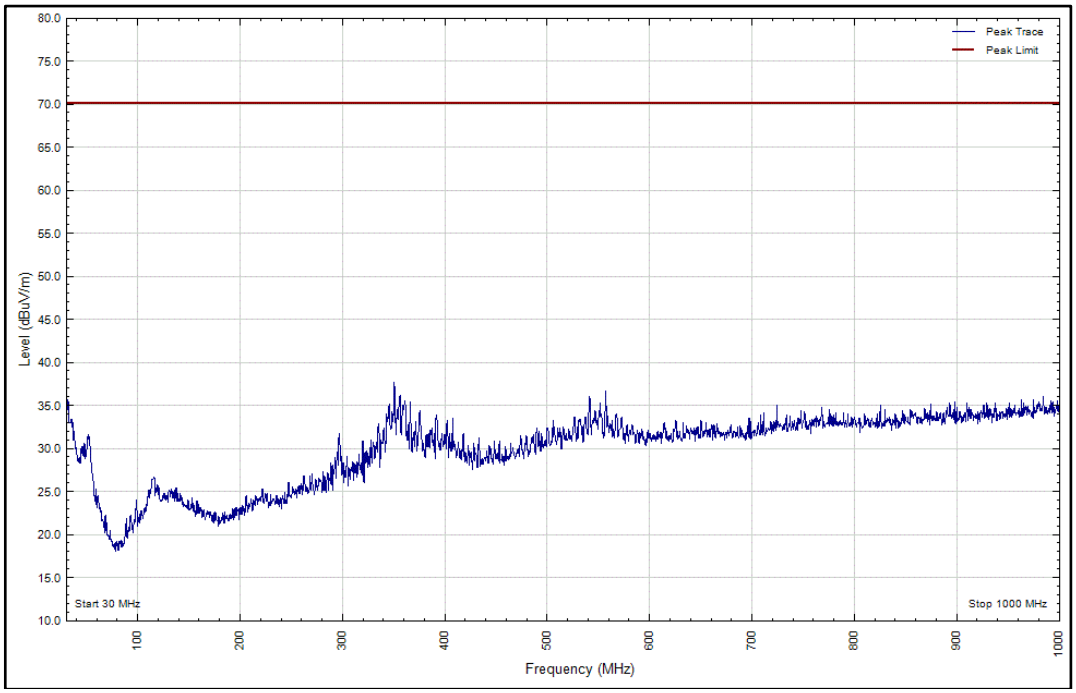

Figure 63 - Top Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation Y

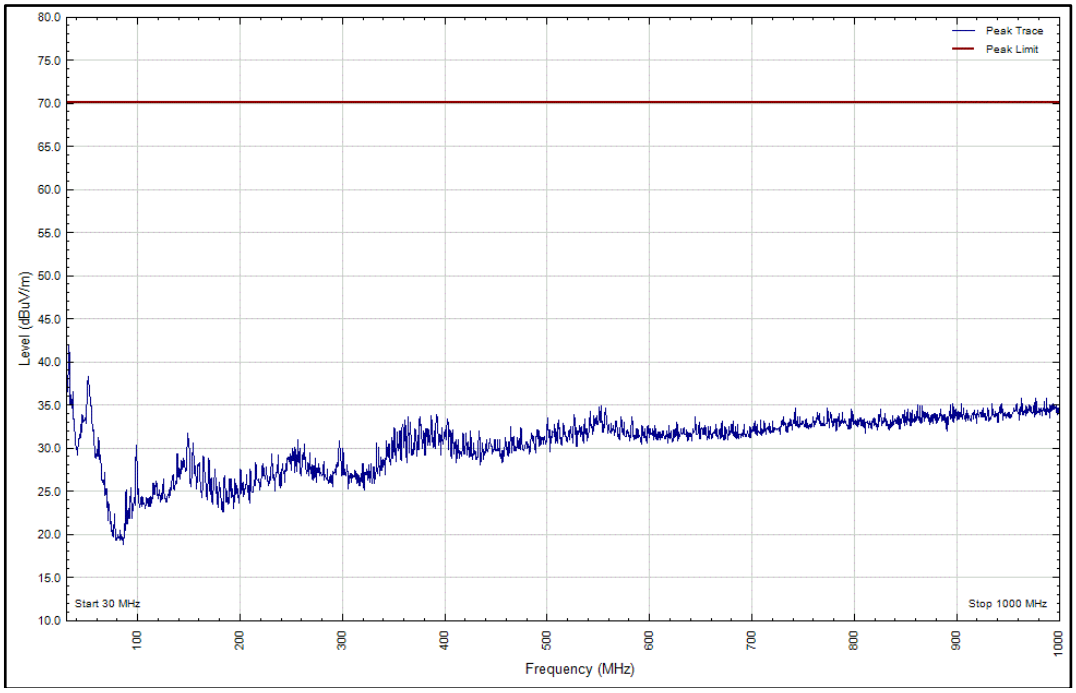

Figure 64 - Top Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation Y

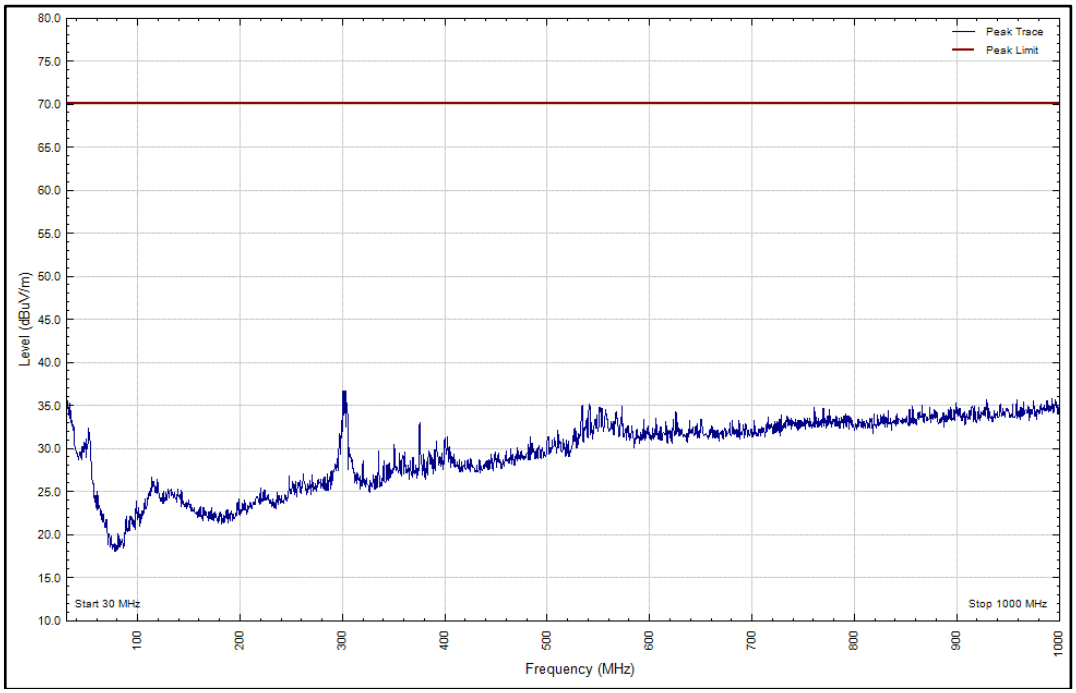

Figure 65 - Top Channel – 30 MHz to 1 GHz – Horizontal, EUT Orientation Z

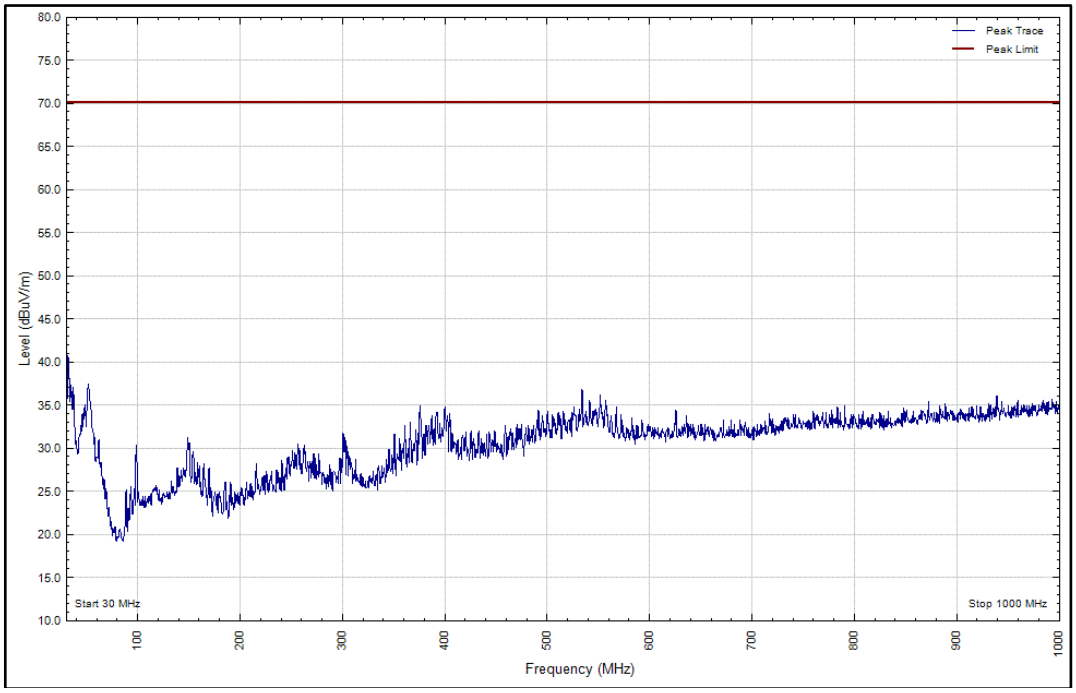

Figure 66 - Top Channel – 30 MHz to 1 GHz – Vertical, EUT Orientation Z

Frequency (MHz)	Level (dBm)
*	

Table 22 - Bottom Channel - 1 GHz to 40 GHz - Emissions Results

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

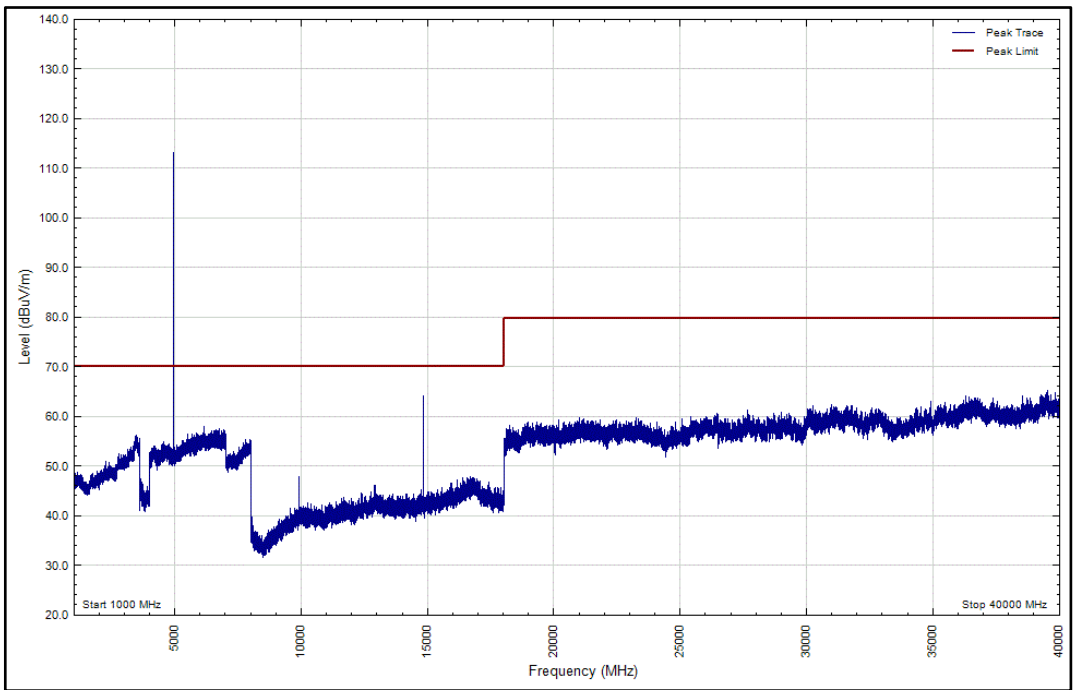

Figure 67 - Bottom Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation X

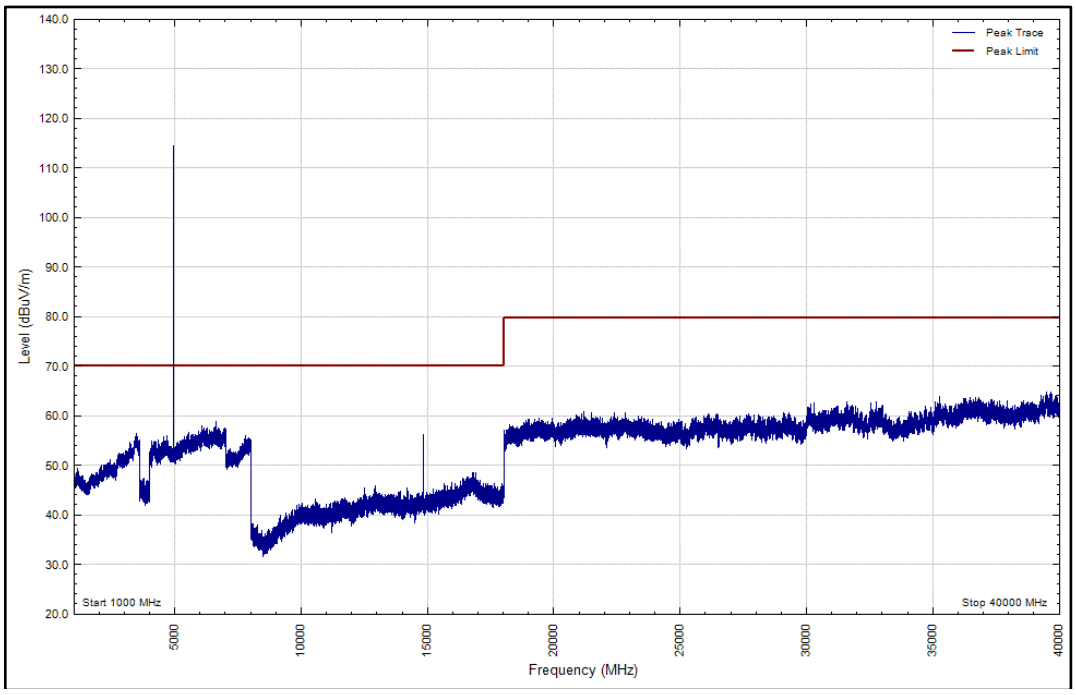

Figure 68 - Bottom Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation X

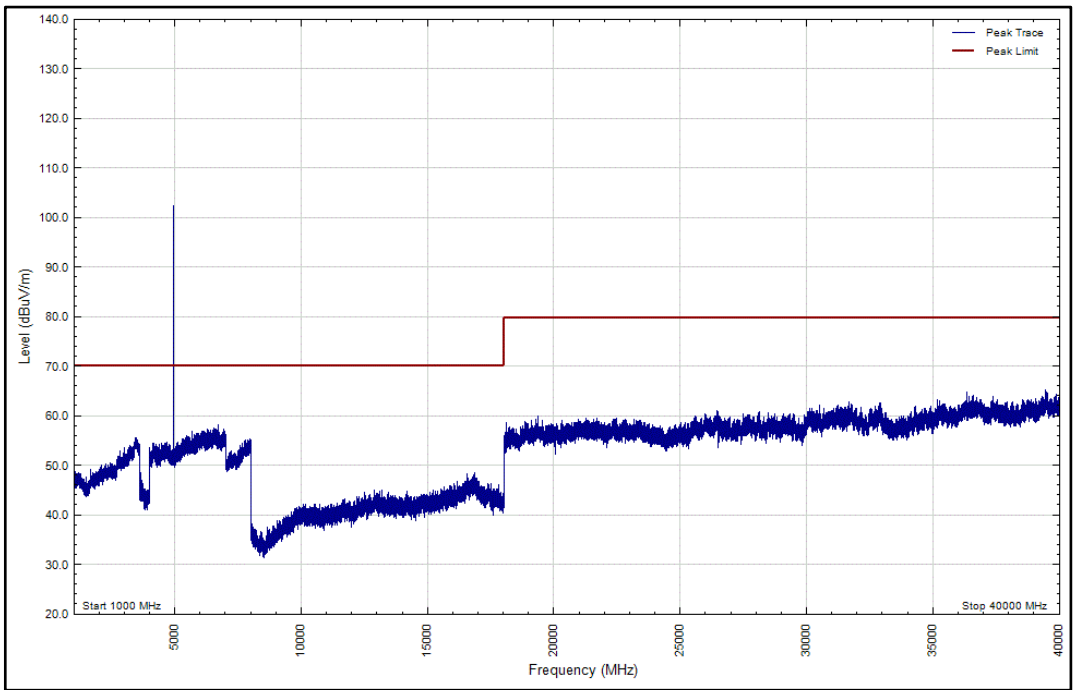

Figure 69 - Bottom Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation Y

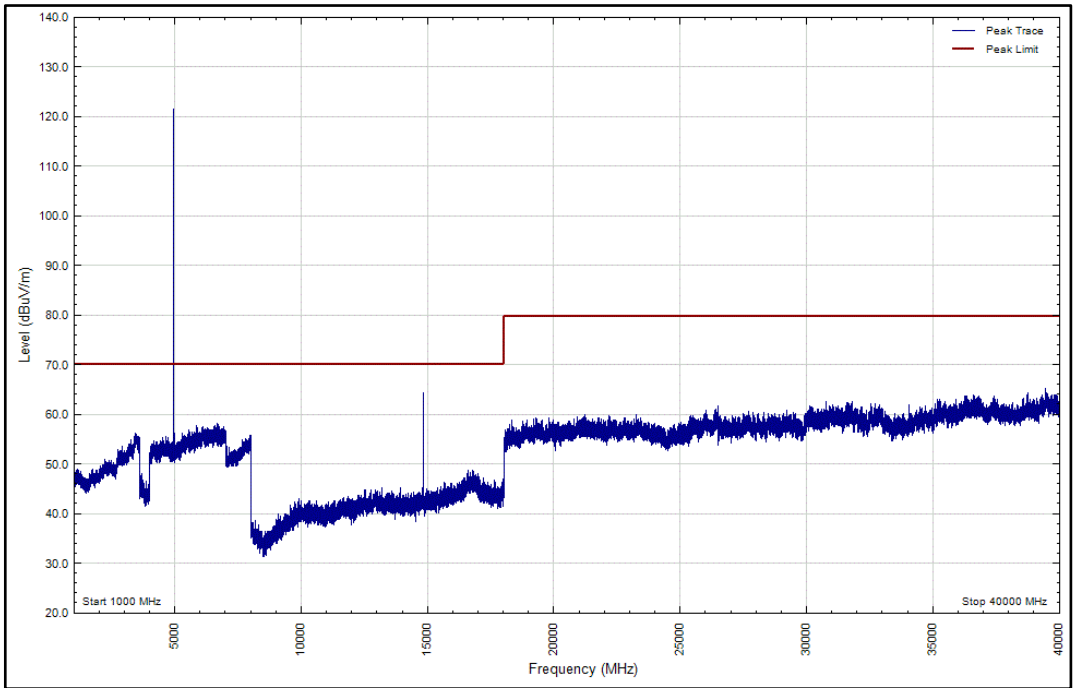

Figure 70 - Bottom Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation Y

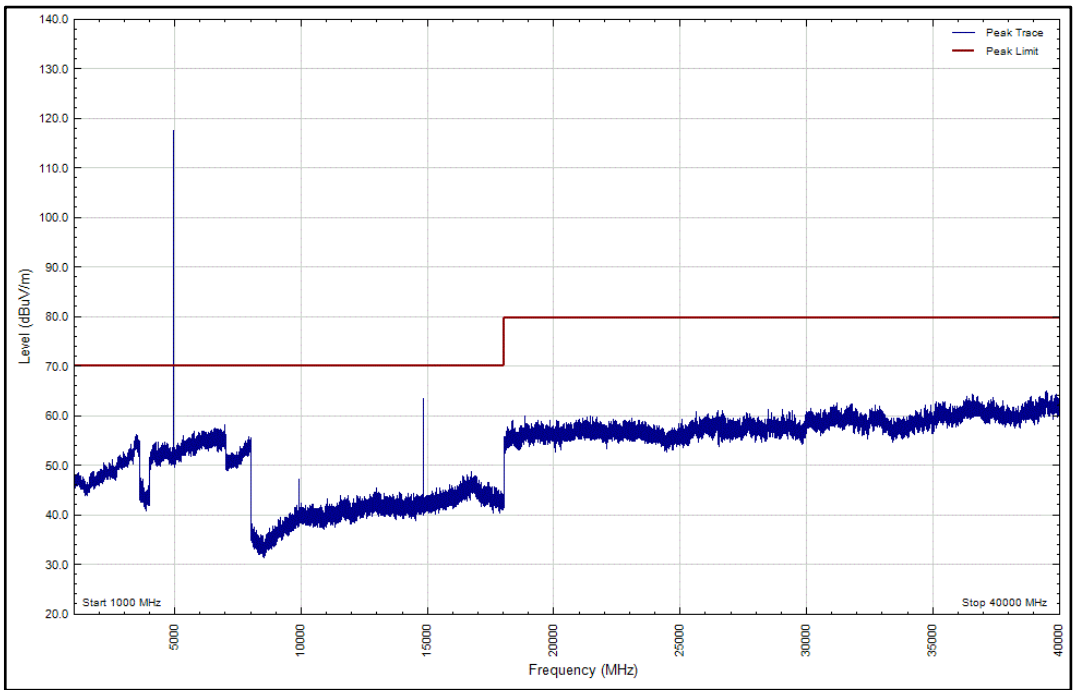

Figure 71 - Bottom Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation Z

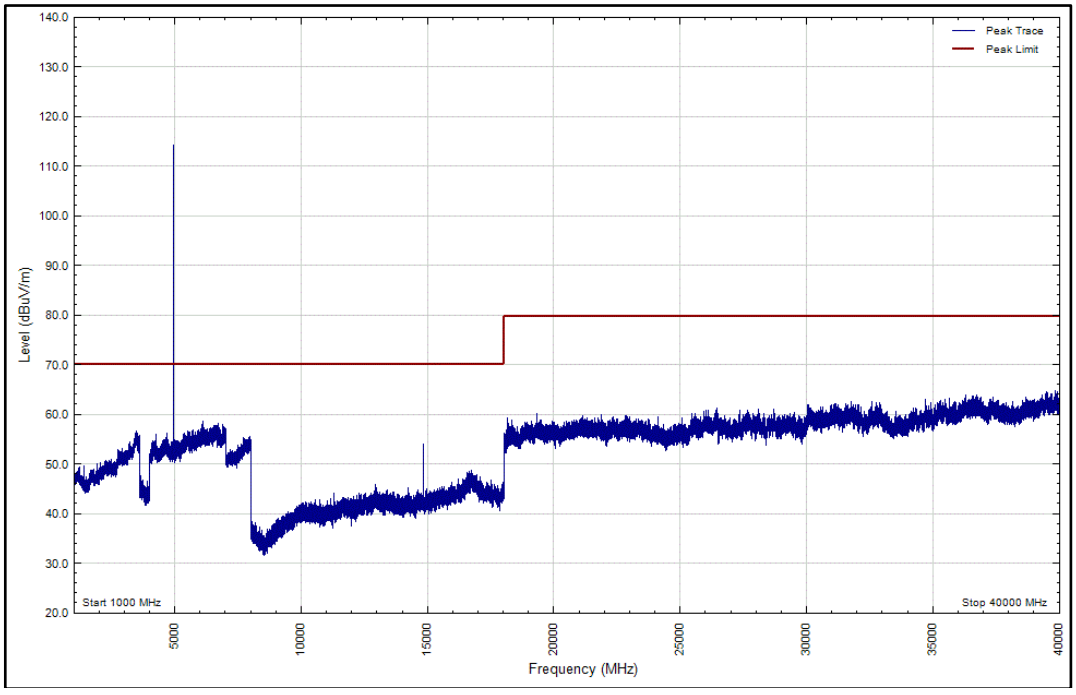

Figure 72 - Bottom Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation Z

Frequency (MHz)	Level (dBm)
*	

Table 23 - Middle Channel - 1 GHz to 40 GHz - Emissions Results

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

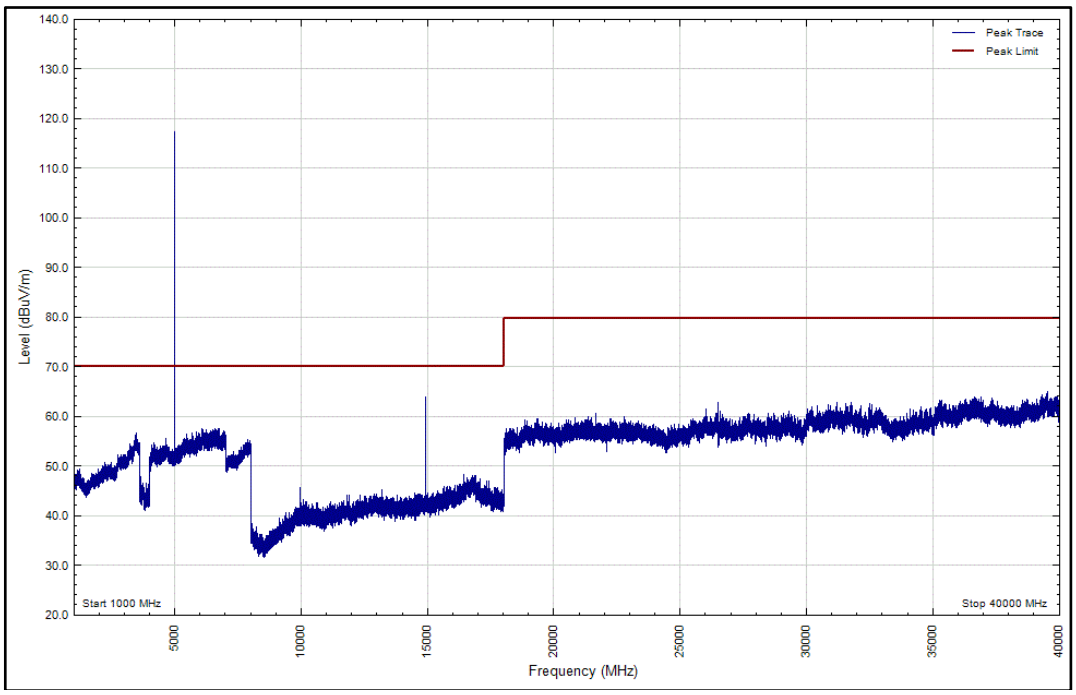

Figure 73 – Middle Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation X

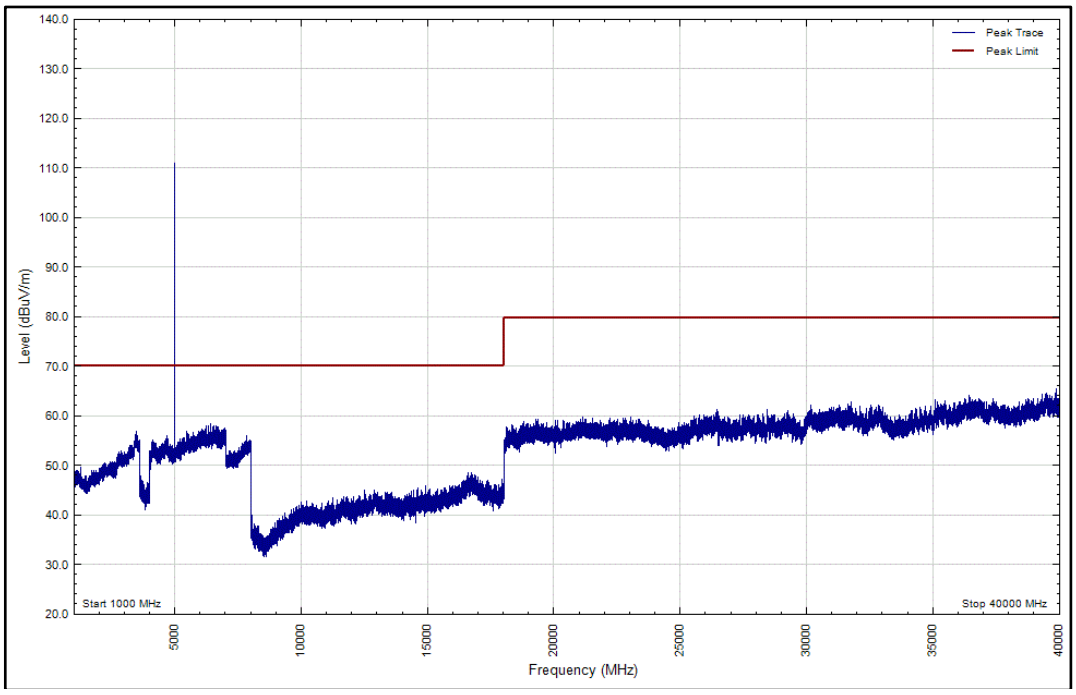

Figure 74 - Middle Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation X

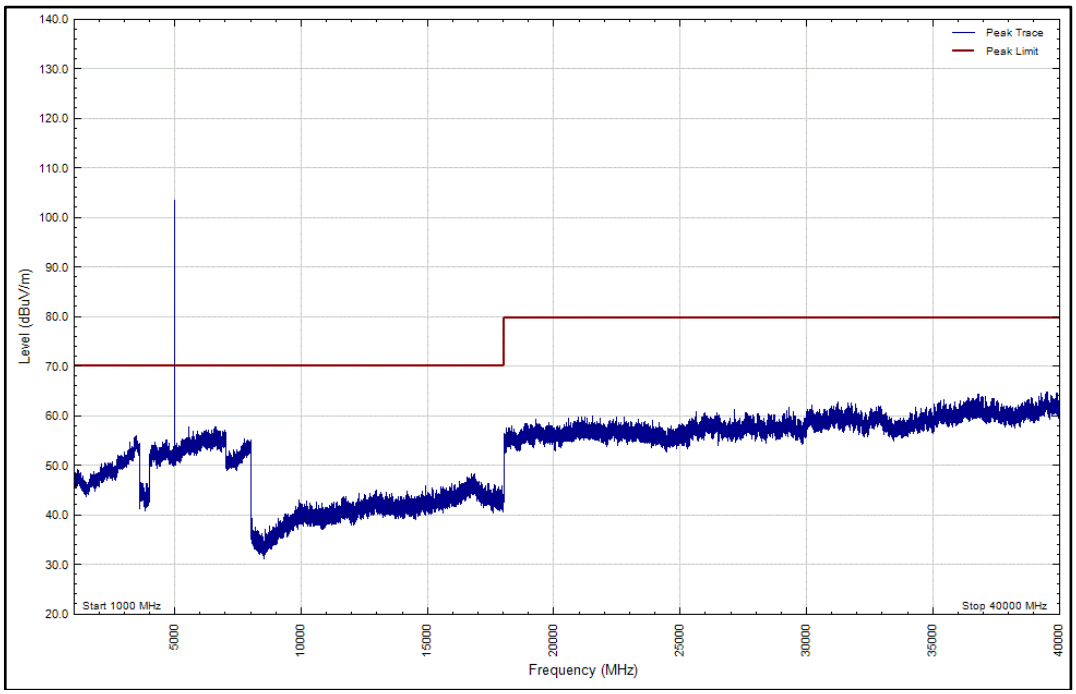

Figure 75 - Middle Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation Y

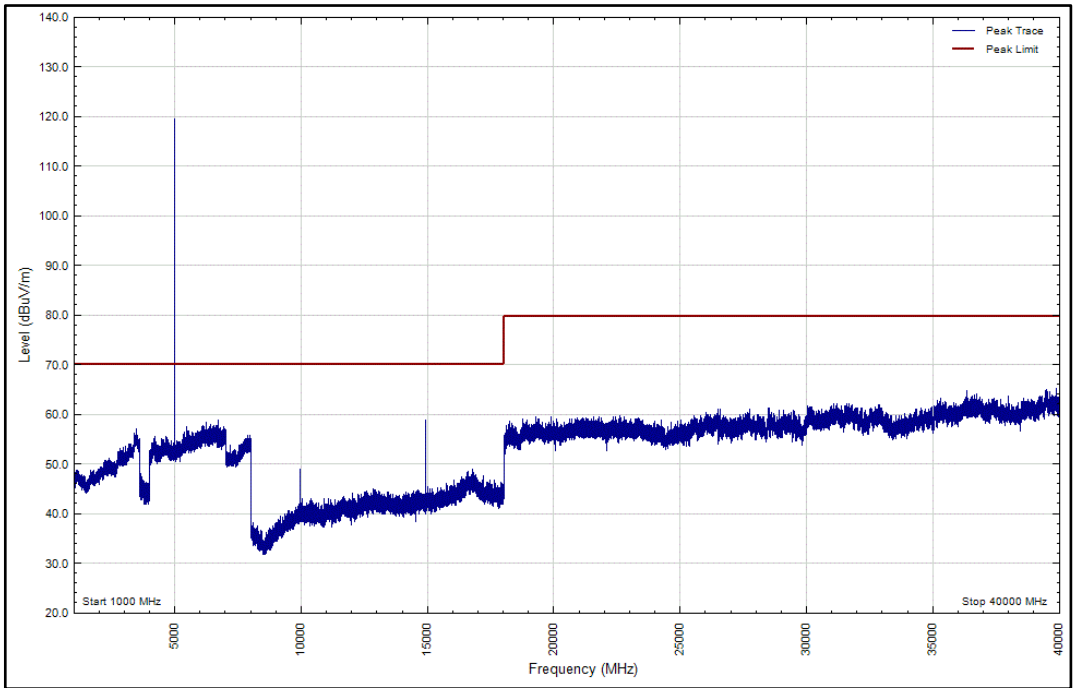

Figure 76 - Middle Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation Y

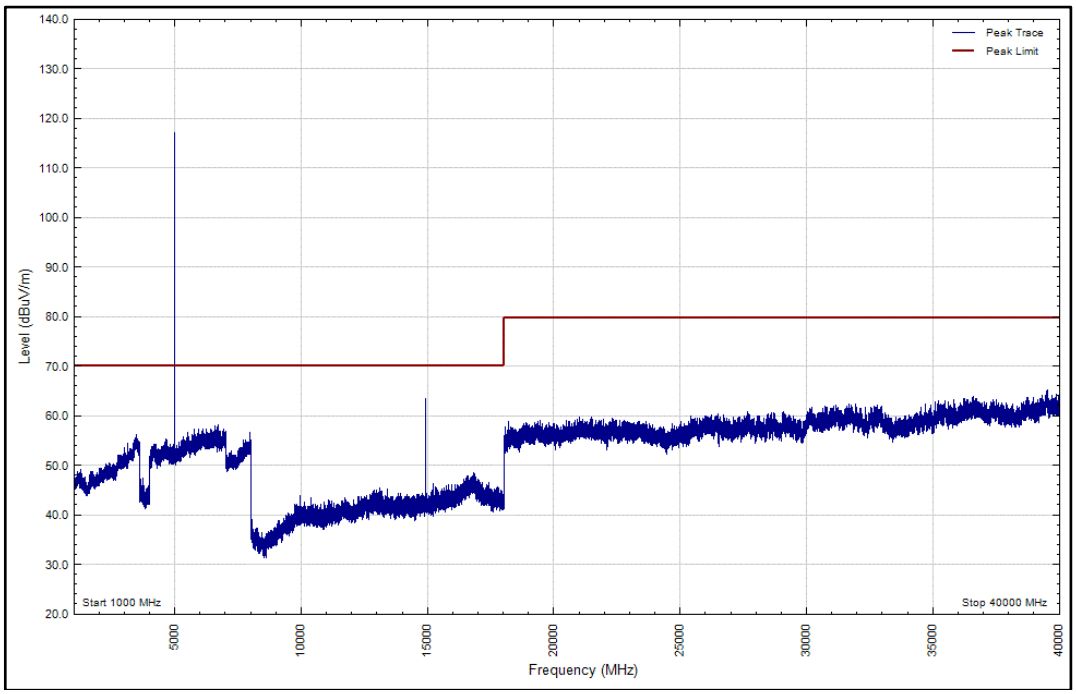

Figure 77 - Middle Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation Z

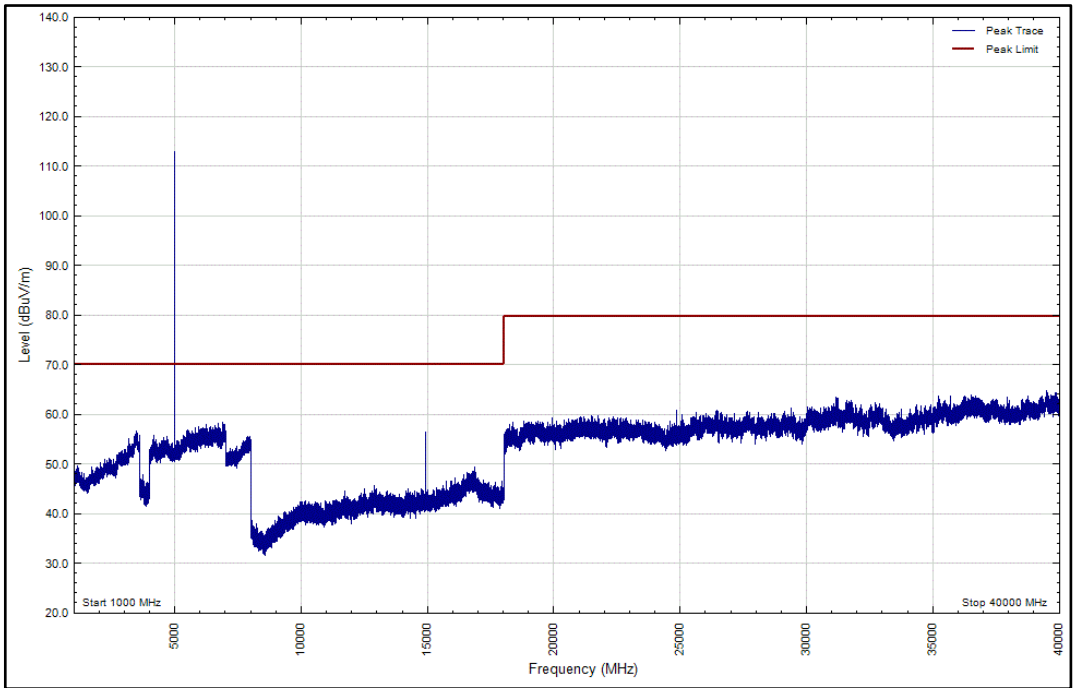

Figure 78 - Middle Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation Z

Frequency (MHz)	Level (dBm)
*	

Table 24 - Top Channel - 1 GHz to 40 GHz - Emissions Results

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

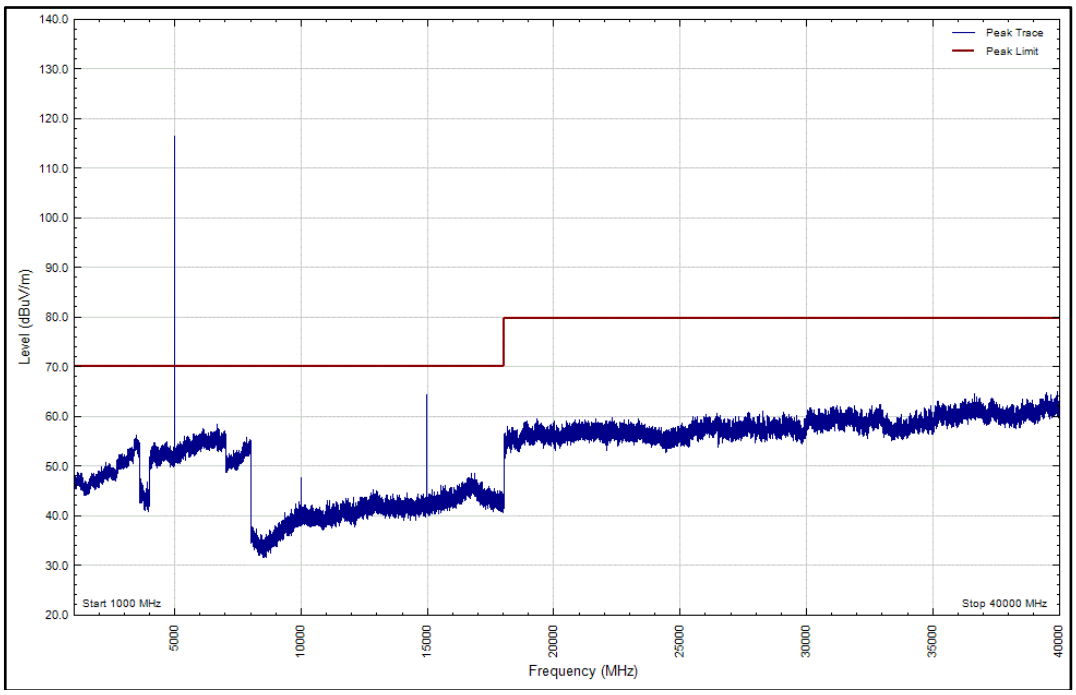

Figure 79 - Top Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation X

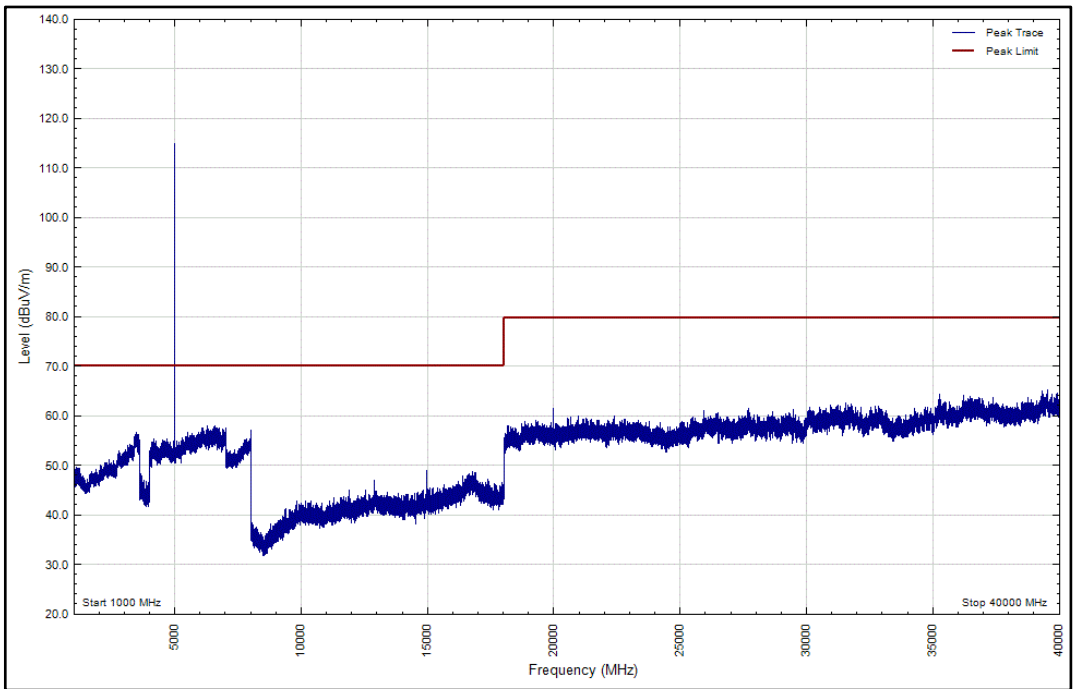

Figure 80 - Top Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation X

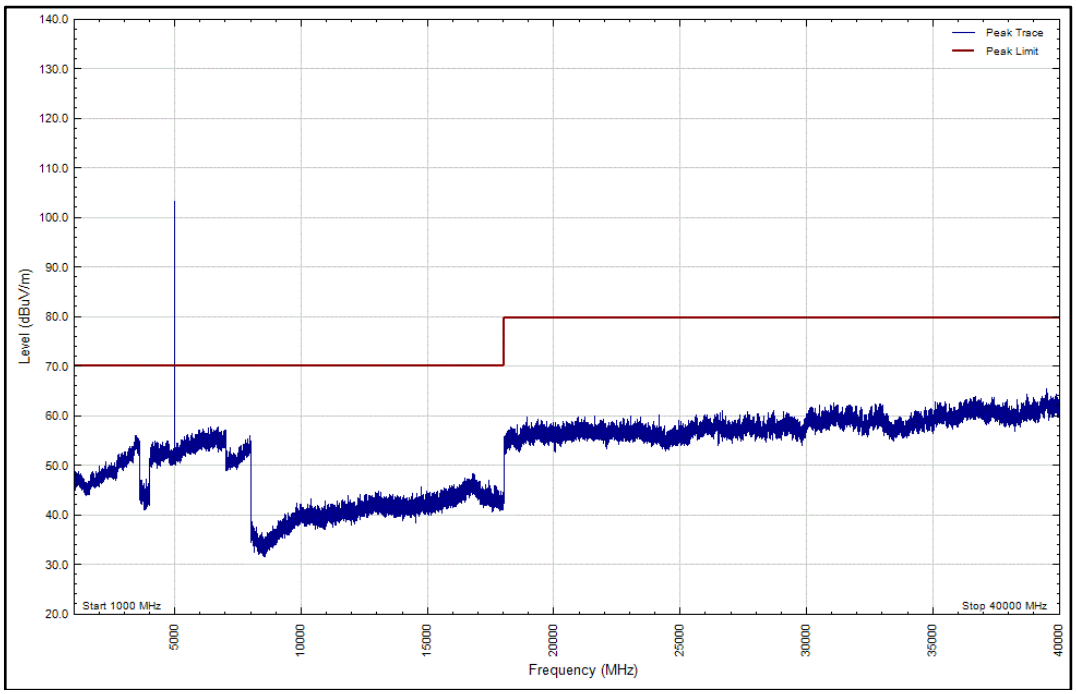

Figure 81 - Top Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation Y

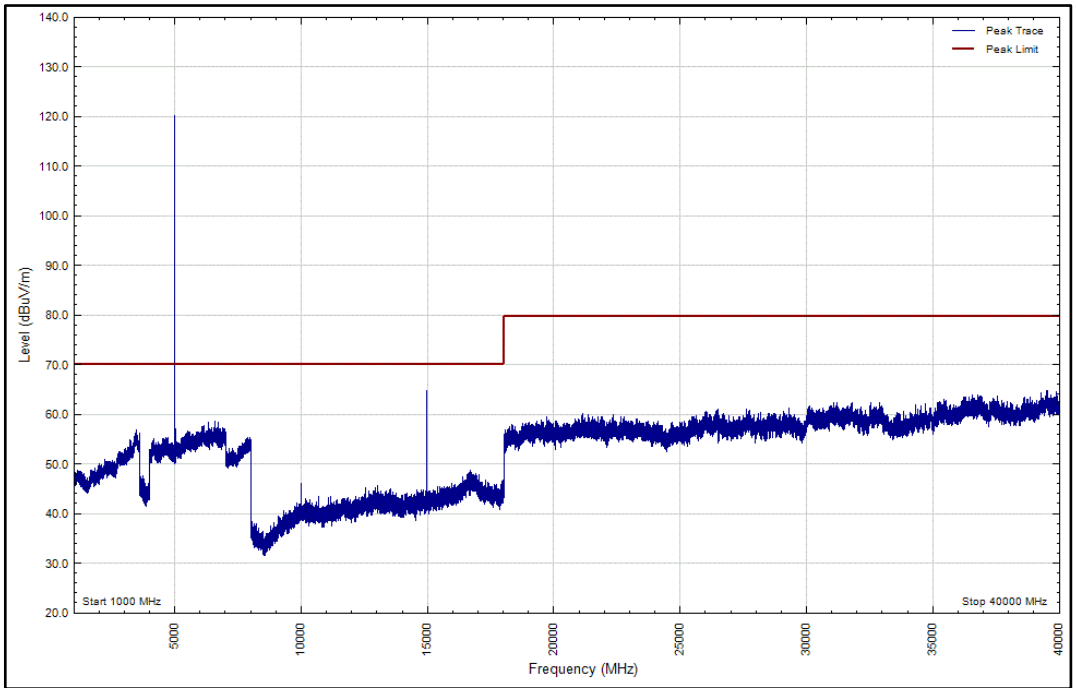

Figure 82 - Top Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation Y

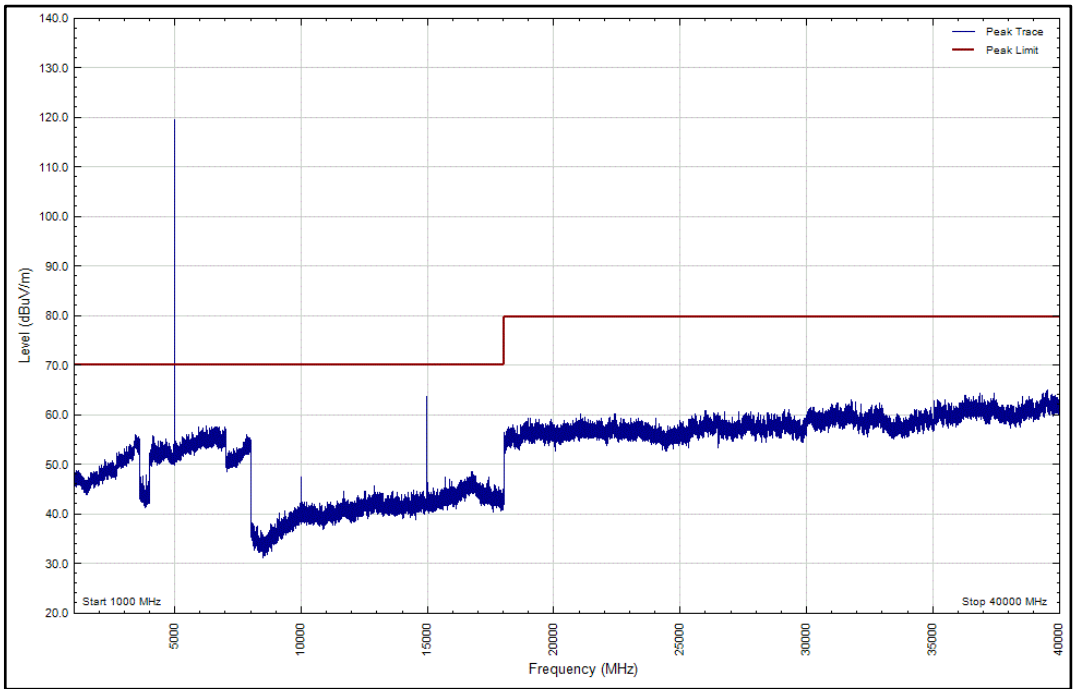

Figure 83 - Top Channel – 1 GHz to 40 GHz – Horizontal, EUT Orientation Z

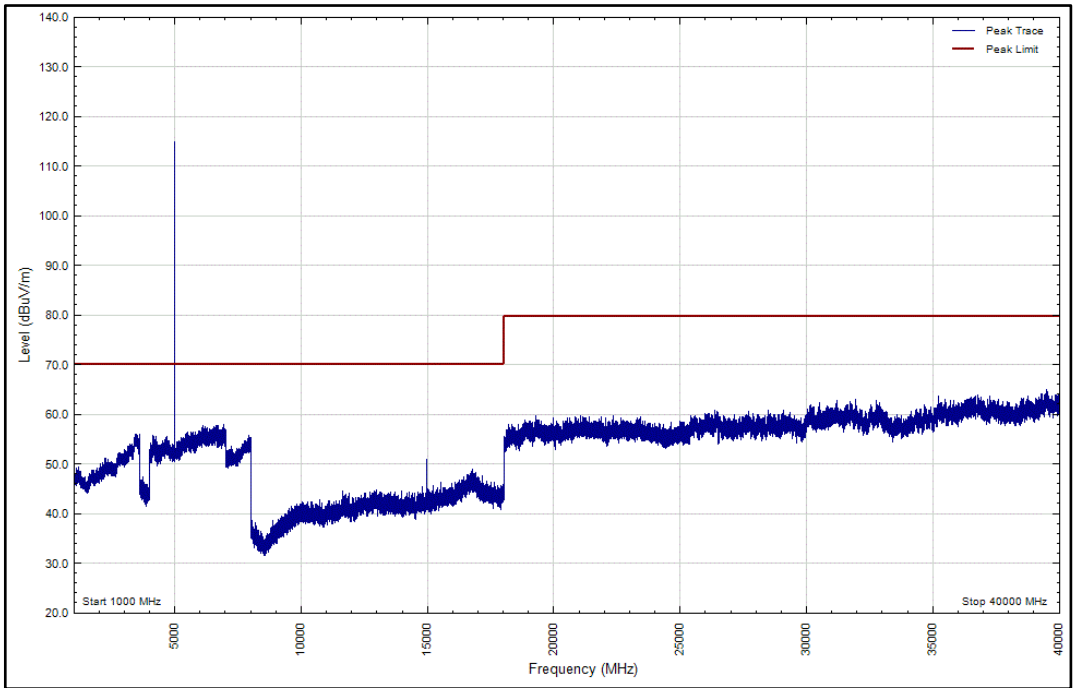

Figure 84 - Top Channel – 1 GHz to 40 GHz – Vertical, EUT Orientation Z

FCC 47 CFR Part 90, Limit Clause 90.210

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

Product Service

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
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Filter (High Pass)	Lorch	SHP7-7000-SR	566	-	O/P Mon
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	18-Jul-2018
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Cable (3m, N(m) - N(m))	Reynolds	269-0088-3000	2412	-	O/P Mon
Multimeter	Iso-tech	IDM101	2417	12	02-Oct-2018
Power Supply Unit	Farnell	LT30-2	2659	-	TU
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
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	4412	12	15-Jun-2018
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
Quad Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon
Hygrometer	Rotronic	HP21	4989	12	26-Apr-2019

Table 25

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

Product Service

2.6 Frequency Stability

2.6.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.210
FCC 47 CFR Part 2, Clause 2.1055

2.6.2 Equipment Under Test and Modification State

Mesh SOL8SDR CONCEALMENT MODULE - SOL8SDR-C-470043,
S/N: 108873 - Modification State 0

2.6.3 Date of Test

16-May-2018 to 18-May-2018

2.6.4 Test Method

Testing was performed in accordance with FCC Part 2, Clause 2.1055.

In accordance with 2.1055, the temperature was varied from -30°C to +50° in 10° steps at both minimum and maximum voltage extremes. At 20°C the nominal voltage 12V, minimum voltage 10.2 V and maximum voltage 13.8 V was performed. The peak value was determined using the marker peak function and the frequency of the points -20 dBc relative to the peak were recorded as f1 and f2.

To find out the frequency error, two marker method was used. $f_c = (f_1 + f_2) / 2$. The frequency error is the difference between the declared transmitted frequency and calculated carrier frequency declared frequency.

2.6.5 Environmental Conditions

Ambient Temperature	20.7 - 21.8 °C
Relative Humidity	32.5 - 39.6 %

2.6.6 Test Results

4.9 GHz - Transmit

Voltage	Frequency Error (ppm)		
	Bottom Channel	Middle Channel	Top Channel
10.2 V DC	6.067	0	6.011
13.8 V DC	0	3.021	3.009

Table 26 - Frequency Stability Under Voltage Variations

Temperature	Frequency Error (ppm)		
	Bottom Channel	Middle Channel	Top Channel
+50.0 °C	4.550	1.510	7.520
+40.0 °C	1.520	1.510	0
+30.0 °C	4.550	4.532	6.018
+20.0 °C	3.033	6.042	3.009
+10.0 °C	1.512	3.021	-4.514
0 °C	4.550	-3.021	4.514
-10.0 °C	0	3.021	1.505
-20.0 °C	0	3.021	4.514
-30.0 °C	24.266	-34.730	-9.027

Table 27 - Frequency Stability Under Voltage Variations

FCC 47 CFR Part 90, Limit Clause 90.213

To be specified in the station authorisation.

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
Signal Generator	Hewlett Packard	ESG4000A	61	12	14-Jul-2018
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Attenuator (10dB, 1W)	Sealectro	60-674-1010-89	1224	12	30-Jun-2018
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	20-Oct-2018
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	11-Jul-2018
Thermocouple Thermometer	Fluke	51	3174	12	09-Jan-2019
Hygrometer	Rotronic	I-1000	3220	12	30-Aug-2018
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	20-Oct-2018
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 28

O/P Mon – Output Monitored using calibrated equipment

Product Service

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	-
Bandwidth Limitations	± 58.05 Hz
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
Frequency Stability	± 11 Hz

Table 29