26 dB Bandwidth – High Channel, QPSK, Port 3

01:22:20 PM 03/29/2023

26 dB Bandwidth – High Channel, QPSK, Port 4

01:24:33 PM 03/29/2023

26 dB Bandwidth – Low Channel, 16QAM, Port 1

05:02:52 PM 03/29/2023

26 dB Bandwidth – Low Channel, 16QAM, Port 2

05:05:55 PM 03/29/2023

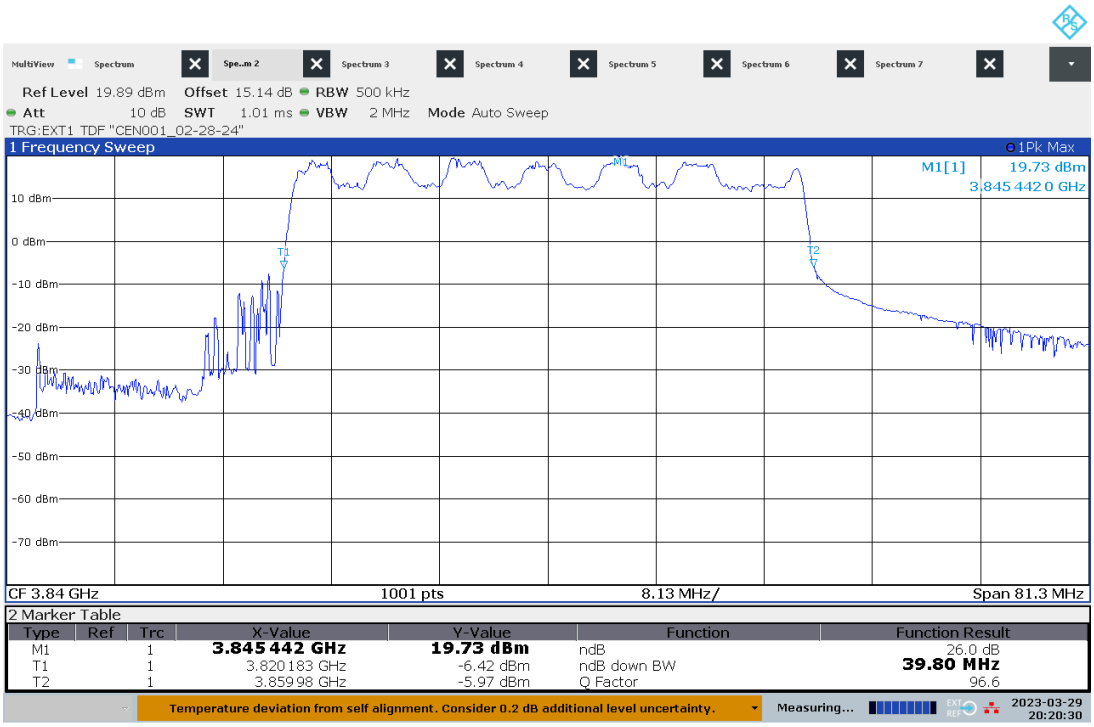
26 dB Bandwidth – Low Channel, 16QAM, Port 3

05:09:16 PM 03/29/2023

26 dB Bandwidth – Low Channel, 16QAM, Port 4

05:12:04 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 16QAM, Port 1

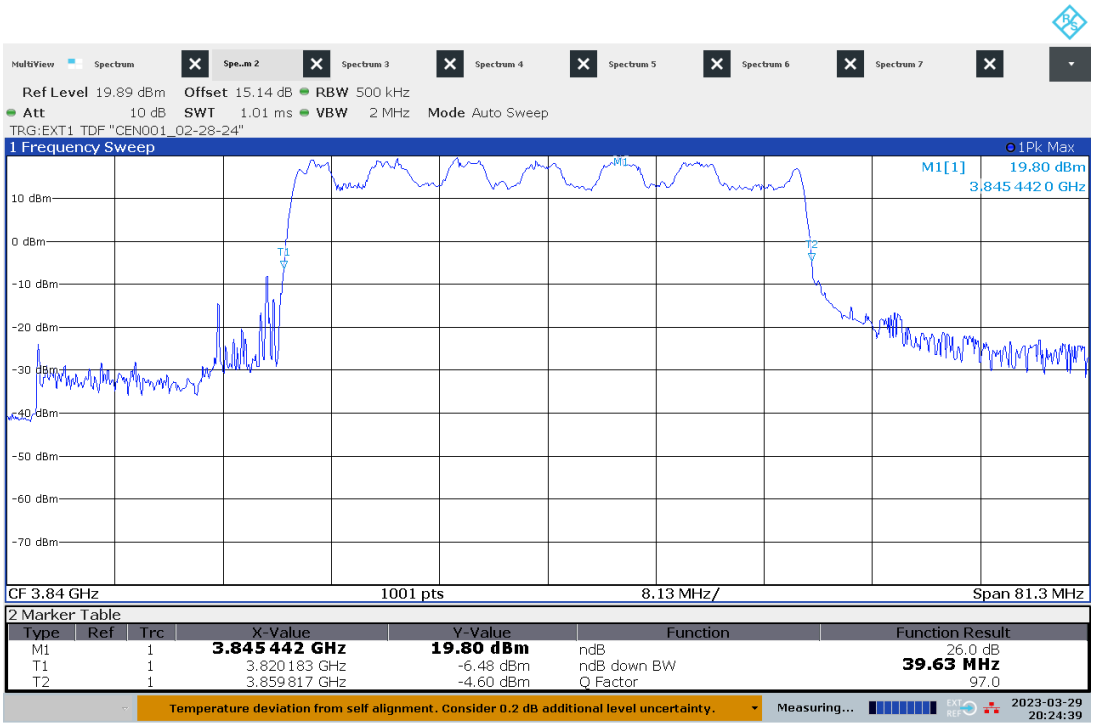


08:20:30 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 16QAM, Port 2

08:22:42 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 16QAM, Port 3



08:24:39 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 16QAM, Port 4

08:26:20 PM 03/29/2023

26 dB Bandwidth – High Channel, 16QAM, Port 1

02:00:30 PM 03/29/2023

26 dB Bandwidth – High Channel, 16QAM, Port 2

01:57:53 PM 03/29/2023

26 dB Bandwidth – High Channel, 16QAM, Port 3

01:53:43 PM 03/29/2023

26 dB Bandwidth – High Channel, 16QAM, Port 4

01:50:23 PM 03/29/2023

26 dB Bandwidth – Low Channel, 64QAM, Port 1

06:23:15 PM 03/29/2023

26 dB Bandwidth – Low Channel, 64QAM, Port 2

06:25:26 PM 03/29/2023

26 dB Bandwidth – Low Channel, 64QAM, Port 3

06:27:20 PM 03/29/2023

26 dB Bandwidth – Low Channel, 64QAM, Port 4

06:30:00 PM 03/29/2023

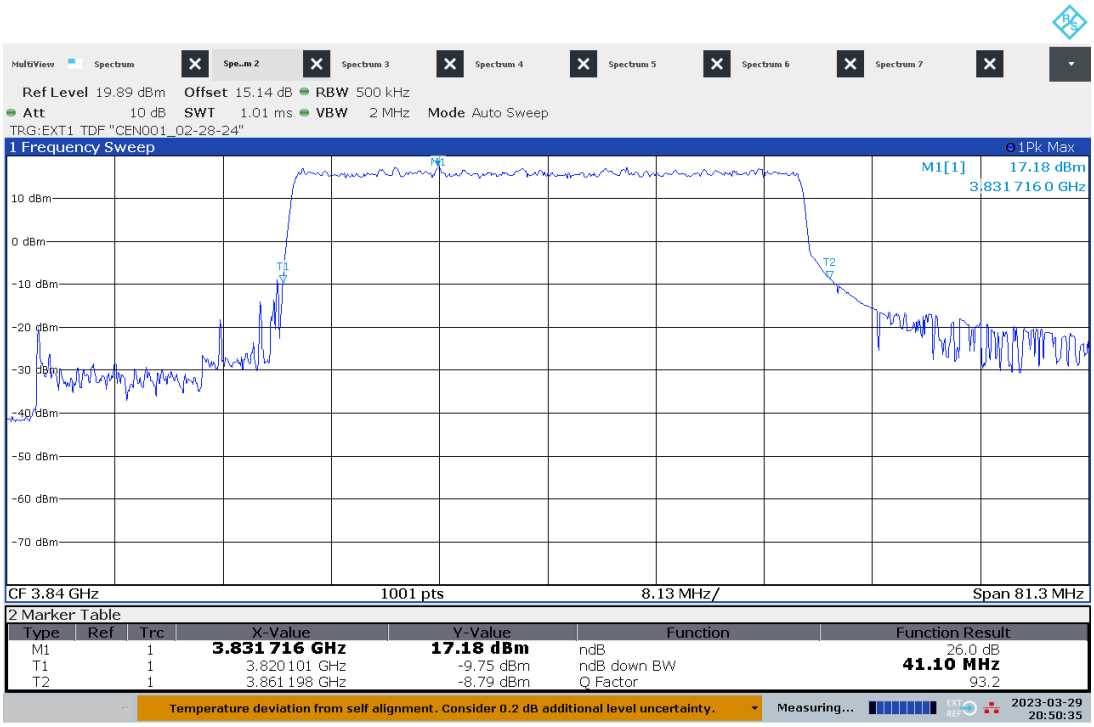
26 dB Bandwidth – Mid Channel, 64QAM, Port 1

08:47:08 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 64QAM, Port 2

08:48:49 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 64QAM, Port 3



08:50:35 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 64QAM, Port 4

08:52:11 PM 03/29/2023

26 dB Bandwidth – High Channel, 64QAM, Port 1

02:31:45 PM 03/29/2023

26 dB Bandwidth – High Channel, 64QAM, Port 2

02:35:49 PM 03/29/2023

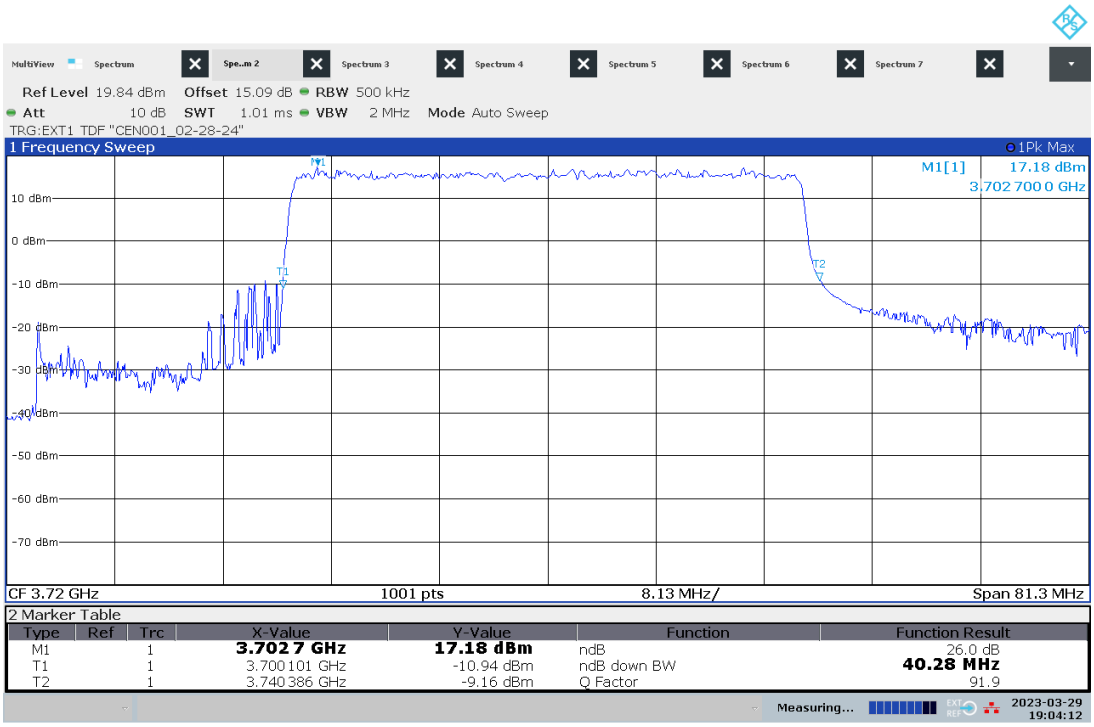
26 dB Bandwidth – High Channel, 64QAM, Port 3

02:38:53 PM 03/29/2023

26 dB Bandwidth – High Channel, 64QAM, Port 4

02:41:29 PM 03/29/2023

26 dB Bandwidth – Low Channel, 256QAM, Port 1

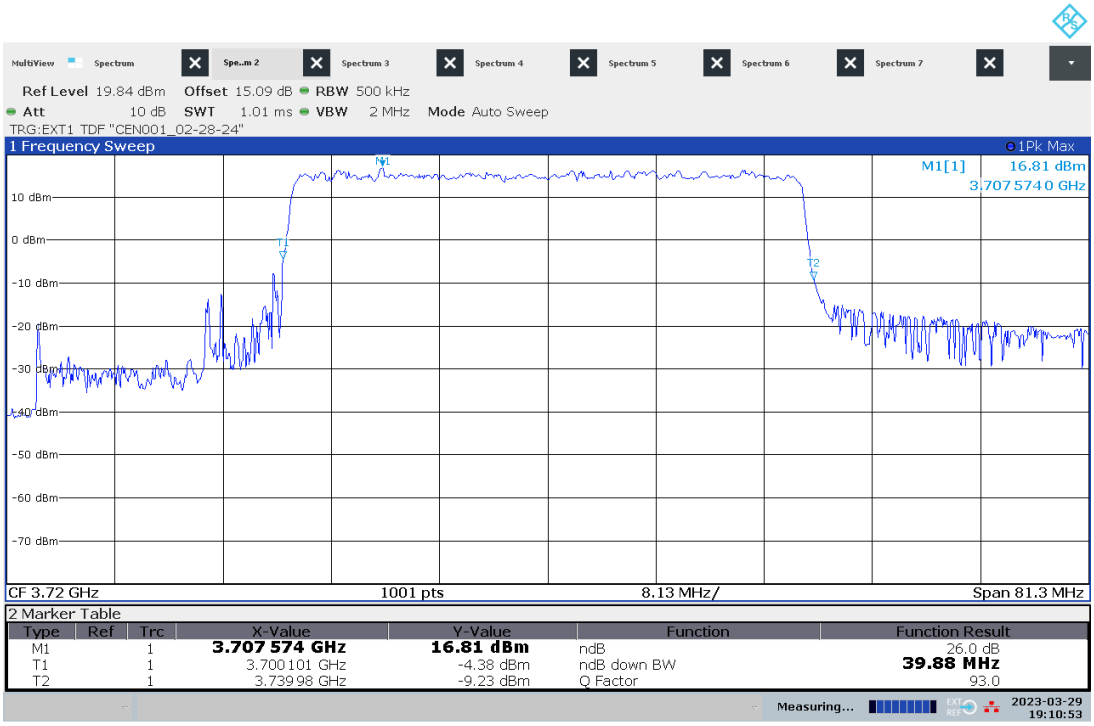


07:04:12 PM 03/29/2023

26 dB Bandwidth – Low Channel, 256QAM, Port 2

07:08:02 PM 03/29/2023

26 dB Bandwidth – Low Channel, 256QAM, Port 3



07:10:53 PM 03/29/2023

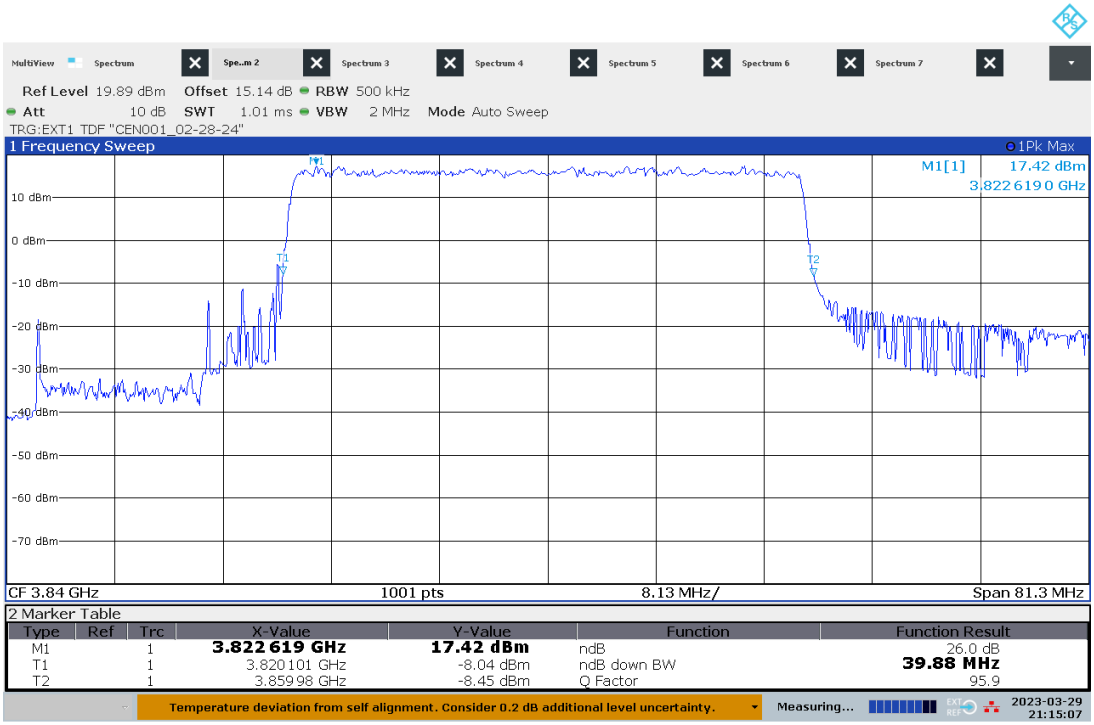
26 dB Bandwidth – Low Channel, 256QAM, Port 4

07:14:42 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 256QAM, Port 1

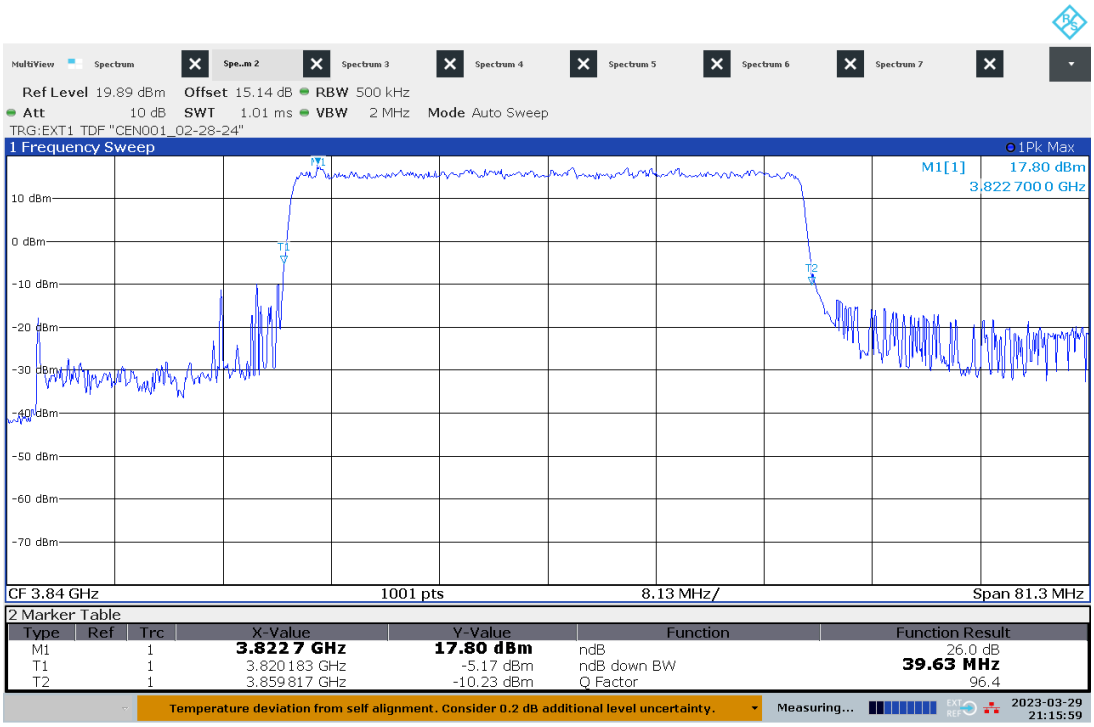
09:13:07 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 256QAM, Port 2



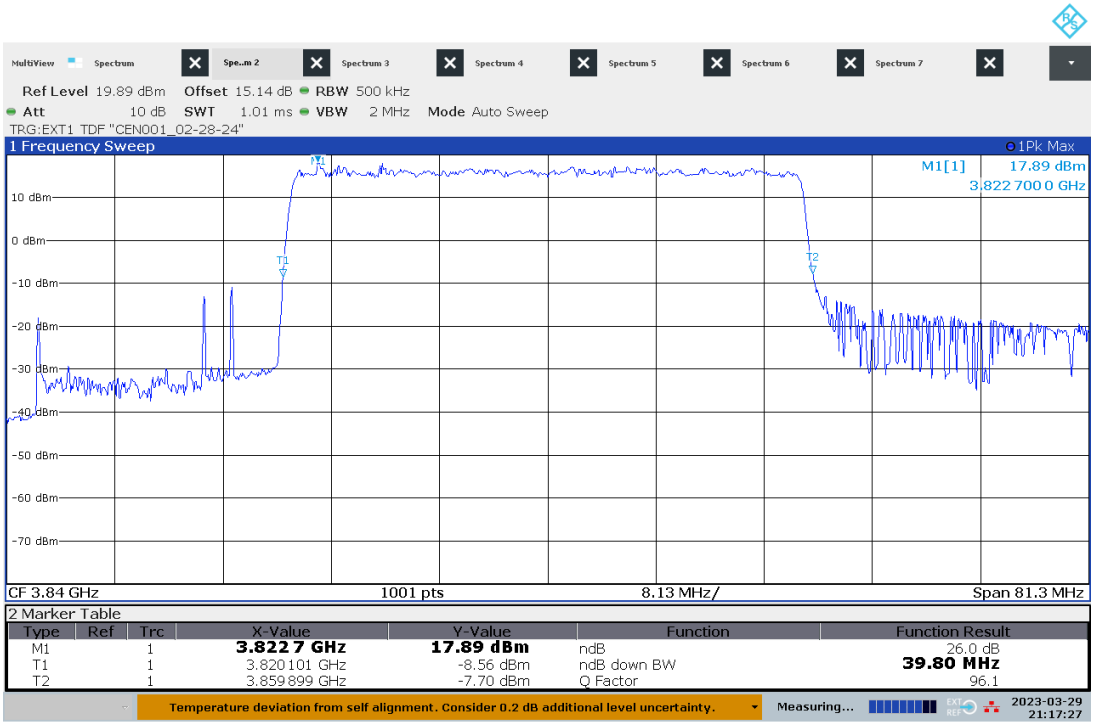
09:15:07 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 256QAM, Port 3



09:15:59 PM 03/29/2023

26 dB Bandwidth – Mid Channel, 256QAM, Port 4



09:17:27 PM 03/29/2023

26 dB Bandwidth – High Channel, 256QAM, Port 1

03:04:13 PM 03/29/2023

26 dB Bandwidth – High Channel, 256QAM, Port 2

03:07:10 PM 03/29/2023

26 dB Bandwidth – High Channel, 256QAM, Port 3

03:10:49 PM 03/29/2023

26 dB Bandwidth – High Channel, 256QAM, Port 4

03:13:18 PM 03/29/2023

	Product Standard: FCC Title 47 CFR Part 27			Limit applied: See Report Section 8.2			
Test Date	Test Personnel/ Initials	Supervising Engineer/ Initials	Input Voltage	Mode	Atmospheric Data		
					Temp C°	Relative Humidity %	Atmospheric Pressure mbar
03/29/2023	Kouma Sinn KPS	Vathana Ven VJV	48V POE	Transmitting	23	21	1012

Deviations, Additions, or Exclusions: None

9 Frequency Stability

9.1 Method

Tests are performed in accordance with ANSI C63.26:2015.

9.2 Limits

FCC Title 47 Part 27.54 Frequency stability. The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

9.3 Test Site

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

9.4 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV009	weather station	Davis Instruments	6351 Vantage VUE	DAV009	03/27/2023	03/27/2024
CEN001	DC-40GHz attenuator 20dB	cblhf201-5-2	C411-20	CEN001	02/28/2023	02/28/2024
ROS005-1	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	11/18/2022	11/18/2023
SAF1153'	Freezing Rain\Icing\Temp\Humidity\ -73deg C to +190deg C, 95% humidity, Ice Freezing Rain	Cincinnati Sub-Zero	CTH-(FR)64-6-6-SC/AC	12-CT15628	12/02/2022	12/02/2023
None None	2m Mini SMA Cable RF Switch Controller (DC-18 GHz)	See Below Mini-Circuits	None RC-2SP4T-A18	None 02202230028	See below See below	See below See below

Notes: The 2m Mini SMA cable and RF Switch Controller were provided by the manufacturer with the total as follows: Low Frequency, 3720 MHz, -15.09 dB; Mid frequency, 3840 MHz, -15.14 dB; High Frequency, 3960 MHz, -15.25 dB.

Software Utilized:

Name	Manufacturer	Version
None	N/A	N/A

9.5 Results:

The sample tested was found to Comply.

9.6 Setup Photographs:

Confidential – Photos not included in this report.

9.7 Plots/Data:

Frequency Stability Over Temperature Variations
Mod: QPSK, BW: 40 MHz, Antenna Port: 1, Low Ch. 3720 MHz

Frequency stability over temperature

Modulation: QPSK, Bandwidth: 40 MHz, Antenna Port: 1 , Low Ch. 3720MHz

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM
(Deg. C)	(GHz)	(GHz)	--	--
-30	3.7010599	-9E-07	-2.43174E-07	0.00
-20	3.7010647	-5.7E-06	-1.5401E-06	-0.02
-10	3.7010599	-9E-07	-2.43174E-07	0.00
0	3.7010583	-7E-07	-1.89135E-07	0.00
10	3.7010645	5.5E-06	1.48606E-06	0.01
20	3.701059	0	0	0.00
30	3.7009609	-9.81E-05	-2.65059E-05	-0.27
40	3.7010604	1.4E-06	3.7827E-07	0.00
50	3.7010703	1.13E-05	3.05318E-06	0.03

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM
(Deg. C)	(GHz)	(GHz)	--	--
-30	3.7390396	-1.9E-06	-5.08152E-07	-0.01
-20	3.7390325	5.2E-06	1.39073E-06	0.01
-10	3.7390477	-1E-05	-2.67448E-06	-0.03
0	3.7390246	-1.31E-05	-3.50358E-06	-0.04
10	3.7390282	-9.5E-06	-2.54076E-06	-0.03
20	3.7390377	0	0	0.00
30	3.7391599	0.0001222	3.26822E-05	0.33
40	3.7390417	4E-06	1.06979E-06	0.01
50	3.7391088	7.11E-05	1.90156E-05	0.19

Frequency Stability Over Temperature Variations
Mod: QPSK, BW: 40 MHz, Antenna Port: 1, Mid Ch. 3840 MHz

Frequency stability over temperature

Modulation: QPSK, Bandwidth: 40 MHz, Antenna Port: 1 , Mid Ch. 3840 MHz

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM
(Deg. C)	(GHz)	(GHz)	--	--
-30	3.82106	6E-07	1.57024E-07	0.00
-20	3.8210611	-5E-07	-1.30854E-07	0.00
-10	3.8210594	1.2E-06	3.14049E-07	0.00
0	3.8210574	-3.2E-06	-8.37464E-07	-0.01
10	3.8210581	-2.5E-06	-6.54269E-07	-0.01
20	3.8210606	0	0	0.00
30	3.8210644	3.8E-06	9.94488E-07	0.01
40	3.821063	2.4E-06	6.28098E-07	0.01
50	3.821037	-2.36E-05	-6.1763E-06	-0.06

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM
(Deg. C)	(GHz)	(GHz)	--	--
-30	3.8590182	2.06E-05	5.33812E-06	0.05
-20	3.859021	1.78E-05	4.61255E-06	0.05
-10	3.8590223	1.65E-05	4.27568E-06	0.04
0	3.8590264	-1.24E-05	-3.21324E-06	-0.03
10	3.8590274	-1.14E-05	-2.9541E-06	-0.03
20	3.8590388	0	0	0.00
30	3.8590365	-2.3E-06	-5.96003E-07	-0.01
40	3.8590308	-8E-06	-2.07306E-06	-0.02
50	3.8591001	6.13E-05	1.58848E-05	0.16

Frequency Stability Over Temperature Variations
Mod: QPSK, BW: 40 MHz, Antenna Port: 1, High Ch. 3960 MHz

Frequency stability over temperature

Modulation: QPSK, Bandwidth: 40 MHz, Antenna Port: 1 , High Ch. 3960 MHz

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM
(Deg. C)	(GHz)	(GHz)	--	--
-30	3.9410476	4.6E-06	1.1672E-06	0.01
-20	3.941048	4.2E-06	1.06571E-06	0.01
-10	3.9410302	2.2E-05	5.58227E-06	0.06
0	3.9410521	-1E-07	-2.53739E-08	0.00
10	3.9410558	3.6E-06	9.13462E-07	0.01
20	3.9410522	0	0	0.00
30	3.9410496	-2.6E-06	-6.59722E-07	-0.01
40	3.9410583	6.1E-06	1.54781E-06	0.02
50	3.9410501	-2.1E-06	-5.32853E-07	-0.01

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM
(Deg. C)	(GHz)	(GHz)	--	--
-30	3.9790152	2.71E-05	6.81068E-06	0.07
-20	3.9790163	2.6E-05	6.53424E-06	0.07
-10	3.9790457	-3.4E-06	-8.54477E-07	-0.01
0	3.9790306	-1.17E-05	-2.94041E-06	-0.03
10	3.9790251	-1.72E-05	-4.32265E-06	-0.04
20	3.9790423	0	0	0.00
30	3.9790349	-7.4E-06	-1.85974E-06	-0.02
40	3.9790256	-1.67E-05	-4.19699E-06	-0.04
50	3.9790864	4.41E-05	1.10831E-05	0.11

Frequency Stability Over Voltage Variations
Modulation: QPSK, Bandwidth: 40 MHz, Antenna Port: 1, Low Ch. 3720 MHz

Lower Edge of Occupied Bandwidth

Voltage	Low Edge	v Edge Deviat	Low Edge (%)	PPM
(VDC)	(GHz)	(GHz)	--	--
44	3.7010605	3.8E-06	1.02673E-06	0.01
48	3.7010567	0	0	0.00
57	3.7010625	5.8E-06	1.56712E-06	0.02

Upper Edge of Occupied Bandwidth

Voltage	Upper Edge	er Edge Devia	Upper Edge (%)	PPM
(VDC)	(GHz)	(GHz)	--	--
44	3.7390381	2.5E-06	6.68622E-07	0.01
48	3.7390356	0	0	0.00
57	3.7390464	1.08E-05	2.88845E-06	0.03

Frequency Stability Over Voltage Variations
Modulation: QPSK, Bandwidth: 40 MHz, Antenna Port: 1, Mid Ch. 3840 MHz

Lower Edge of Occupied Bandwidth

Voltage	Low Edge	Edge Devia	Low Edge (%)	PPM
(VDC)	(GHz)	(GHz)	--	--
44	3.820576	-0.000491	-0.000128393	-1.28
48	3.8210666	0	0	0.00
57	3.8210587	-7.9E-06	-2.06749E-06	-0.02

Upper Edge of Occupied Bandwidth

Voltage	Upper Edge	r Edge Devi	Upper Edge (%)	PPM
(VDC)	(GHz)	(GHz)	--	--
44	3.8590329	-8.3E-06	-2.15079E-06	-0.02
48	3.8590412	0	0	0.00
57	3.859031	-1.02E-05	-2.64314E-06	-0.03

Frequency Stability Over Voltage Variations
Modulation: QPSK, Bandwidth: 40 MHz, Antenna Port: 1, High Ch. 3960 MHz

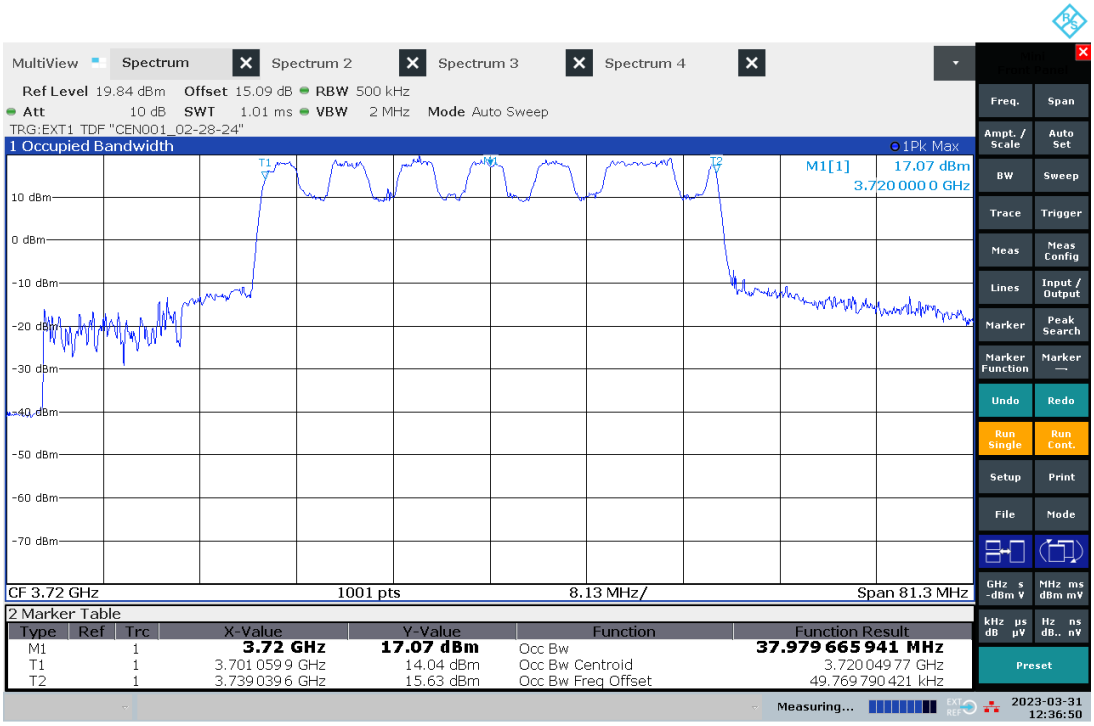
Lower Edge of Occupied Bandwidth

Voltage	Low Edge	Edge Devia	Low Edge (%)	PPM
(VDC)	(GHz)	(GHz)	--	--
44	3.9410551	-2.7E-06	-6.85095E-07	-0.01
48	3.9410578	0	0	0.00
57	3.9410376	-2.02E-05	-5.12553E-06	-0.05

Upper Edge of Occupied Bandwidth

Voltage	Upper Edge	r Edge Devi	Upper Edge (%)	PPM
(VDC)	(GHz)	(GHz)	--	--
44	3.9790278	9.1E-06	2.287E-06	0.02
48	3.9790187	0	0	0.00
57	3.9790411	2.24E-05	5.62953E-06	0.06

Frequency Stability – Low Channel, QPSK, Port 1 (-30 °C)

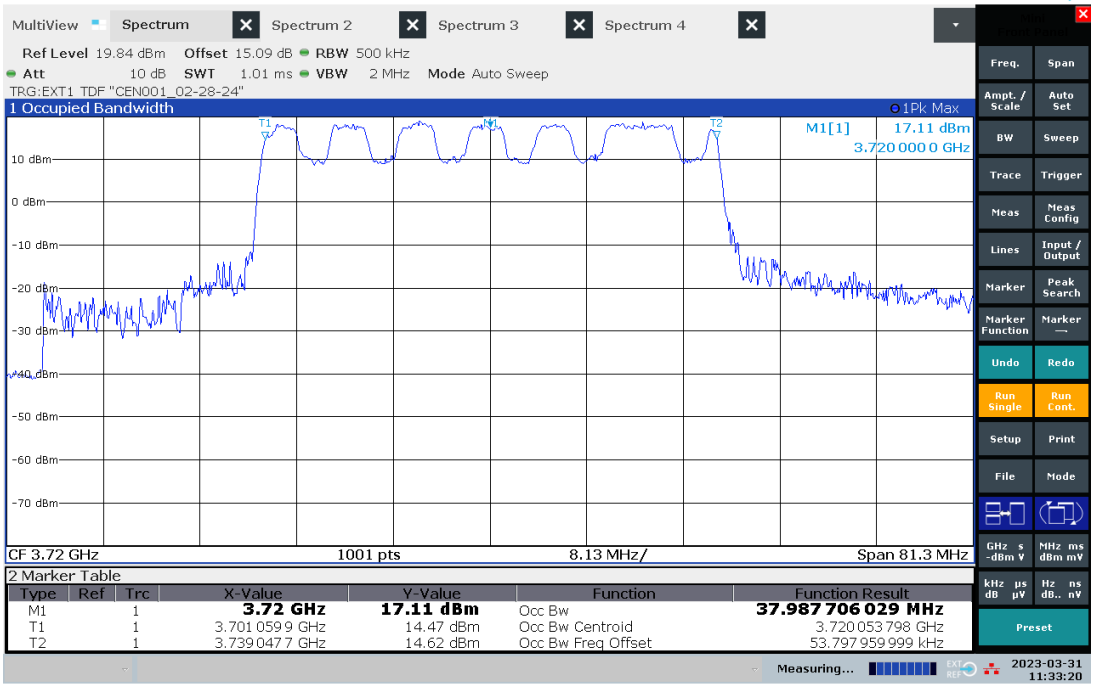


12:36:50 PM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (-20 °C)

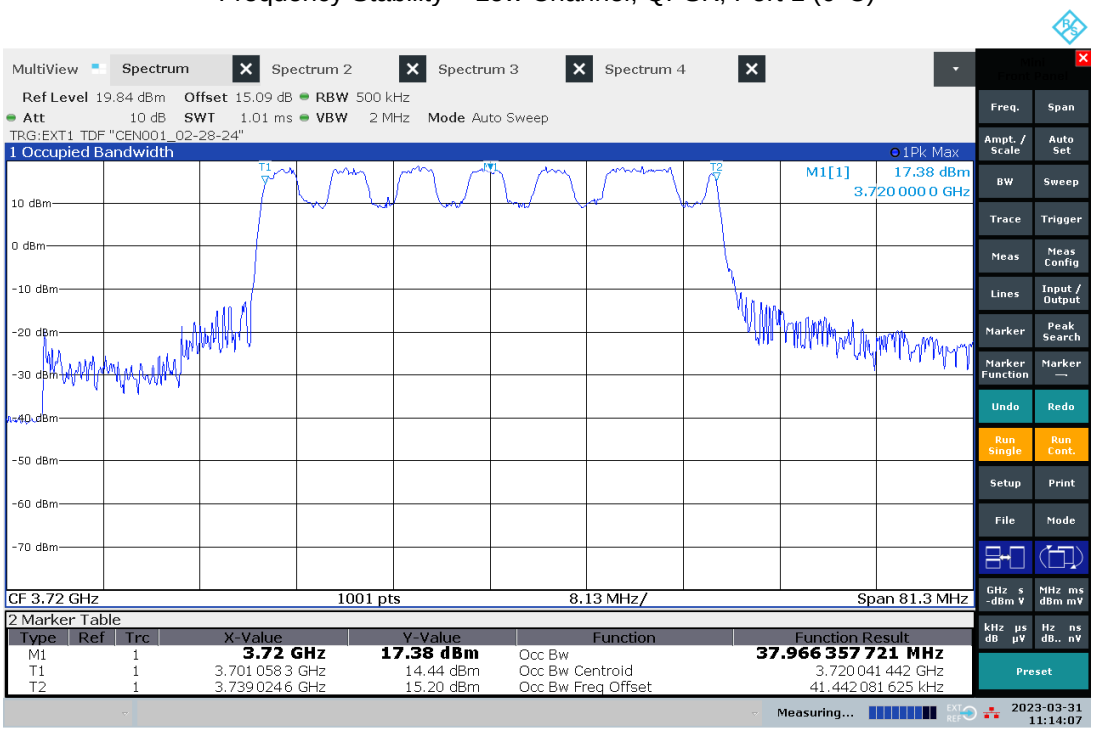
12:17:44 PM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (-10°C)



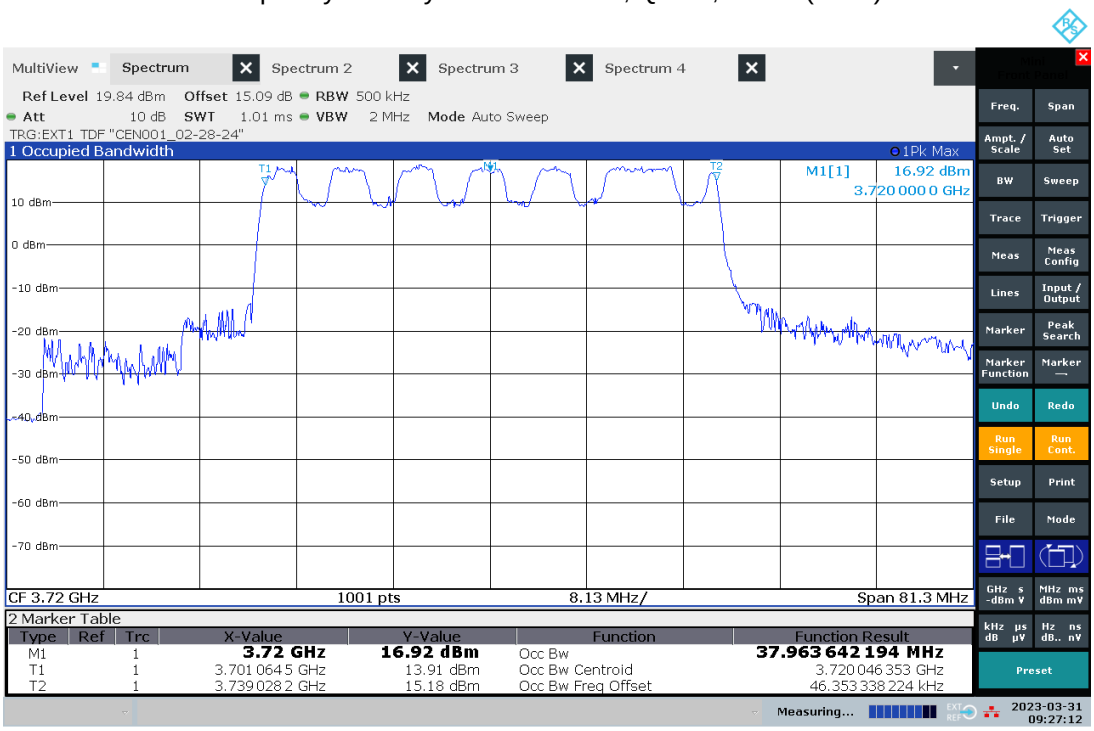
11:33:21 AM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (0°C)



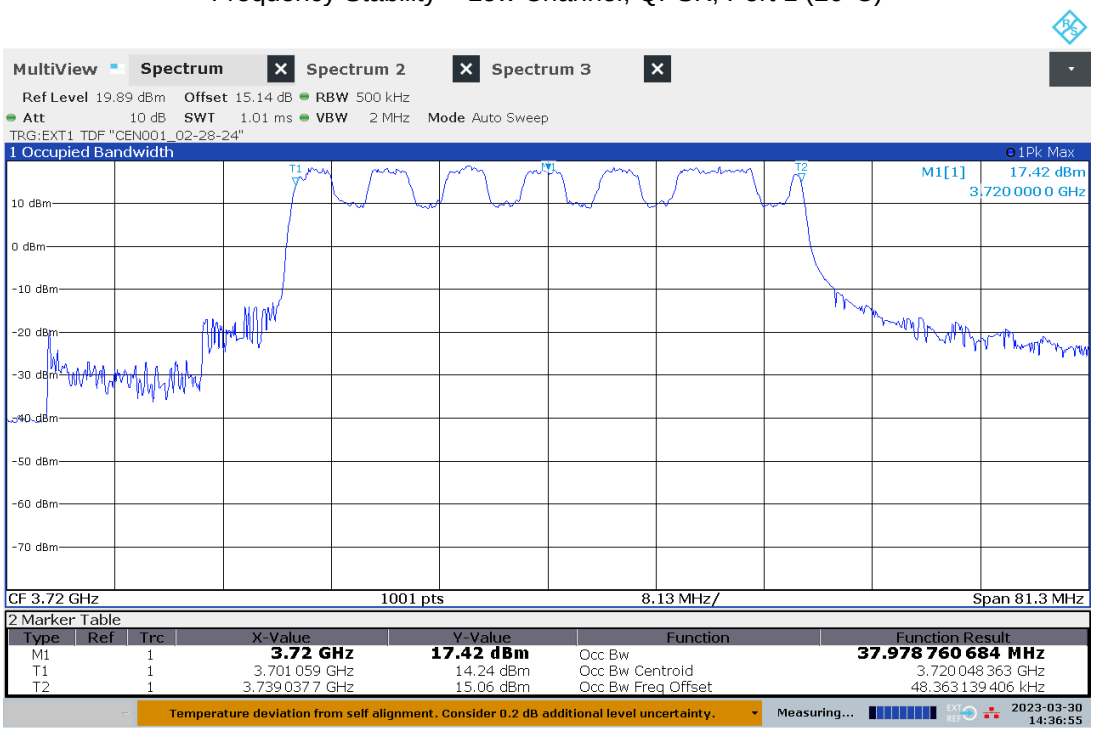
11:14:08 AM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (10°C)



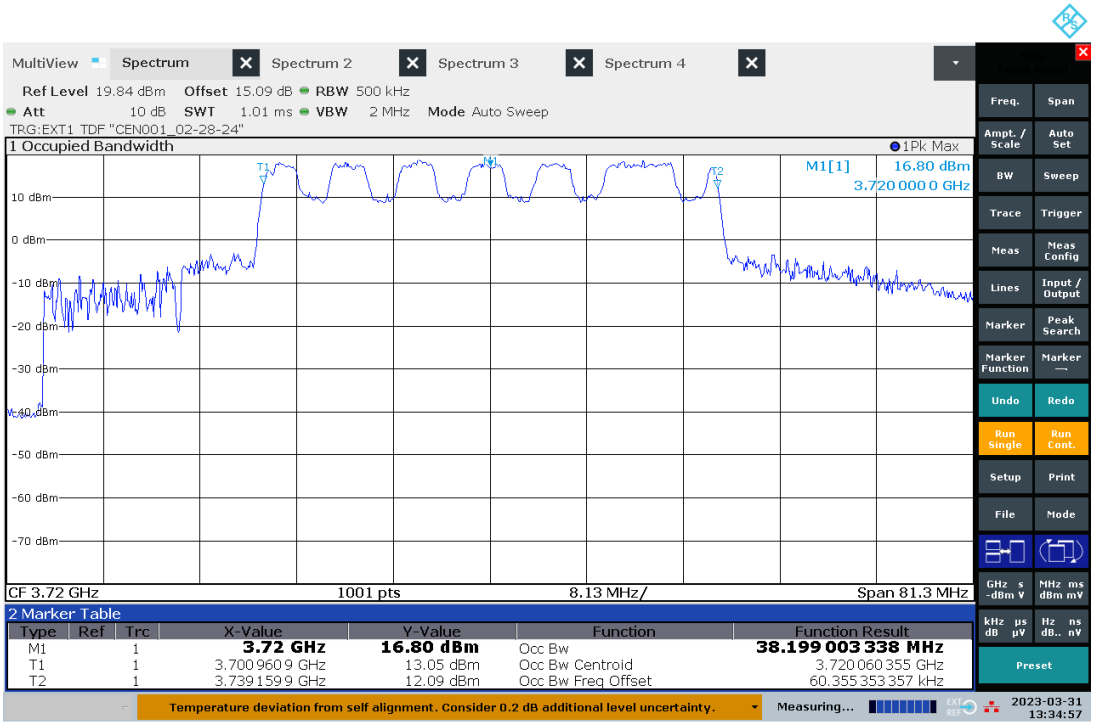
09:27:13 AM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (20°C)



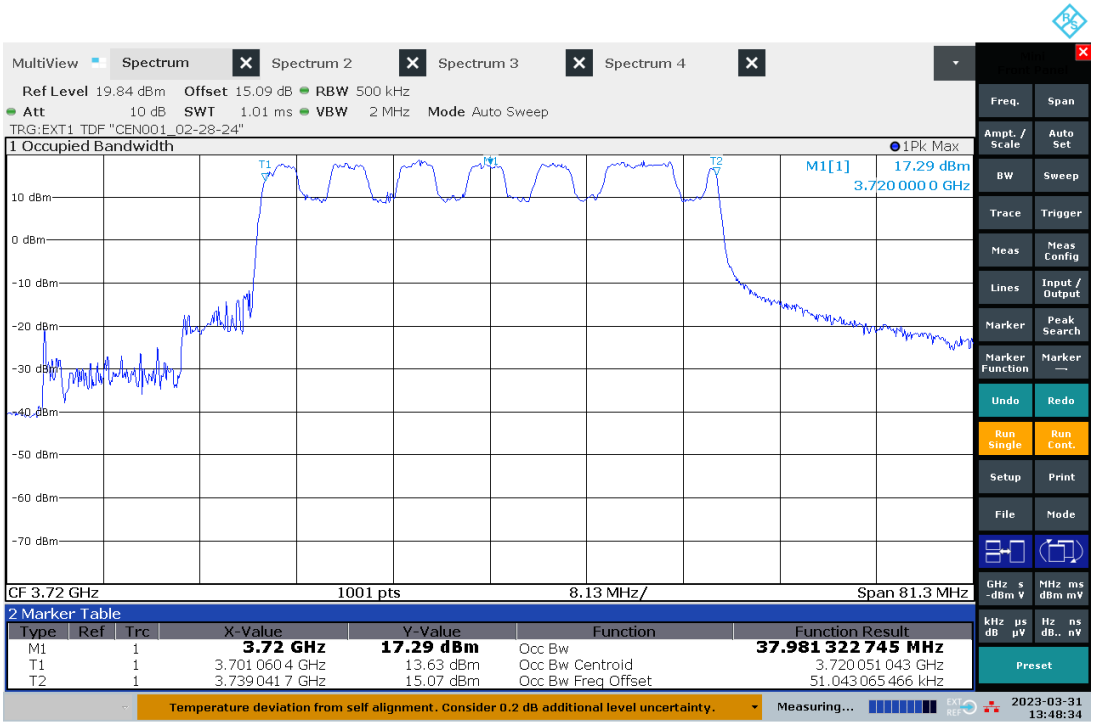
02:36:56 PM 03/30/2023

Frequency Stability – Low Channel, QPSK, Port 1 (30°C)



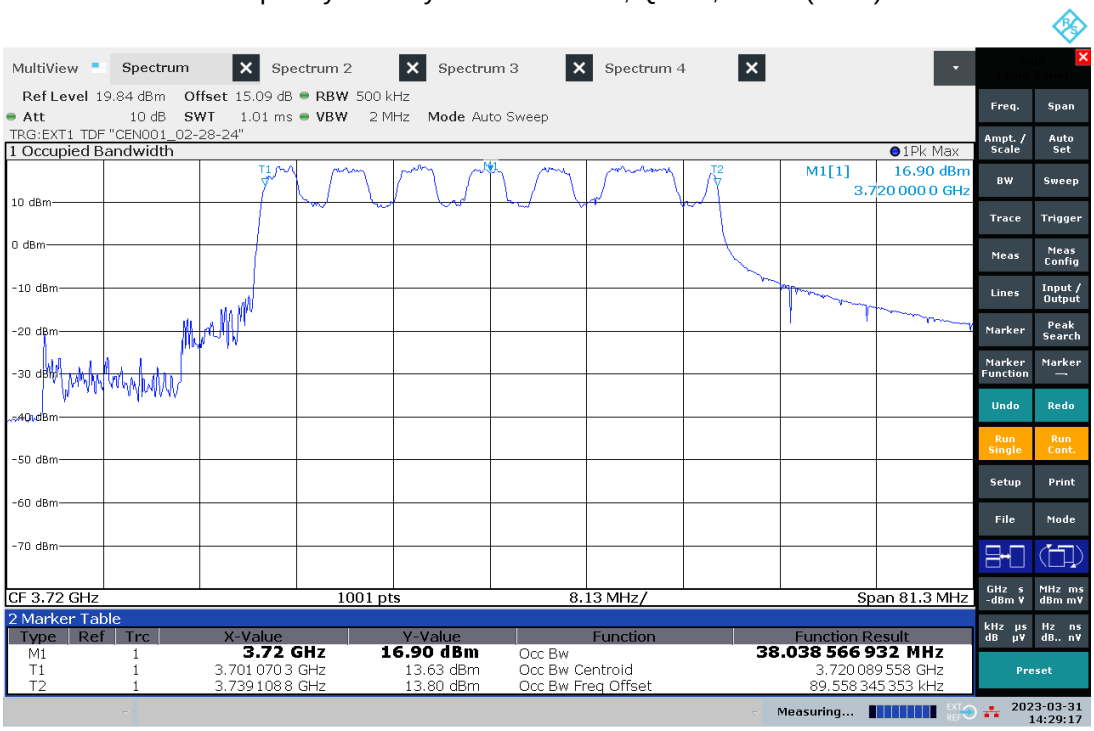
01:34:57 PM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (40°C)



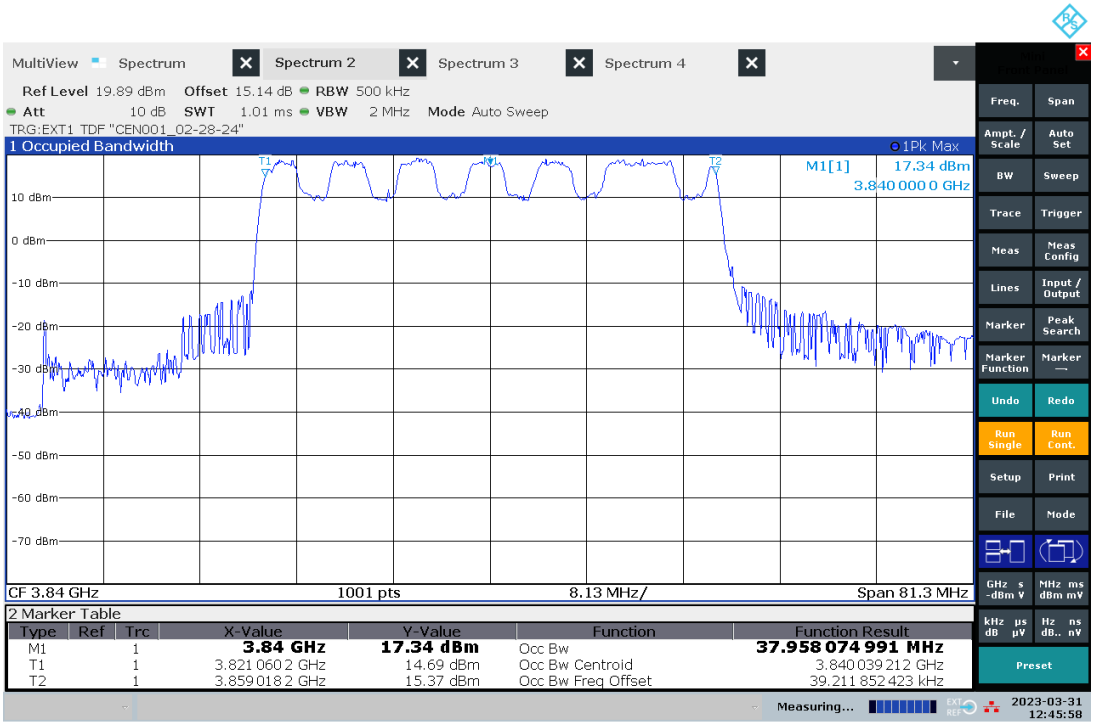
01:48:35 PM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (50°C)



02:29:17 PM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (-30 °C)

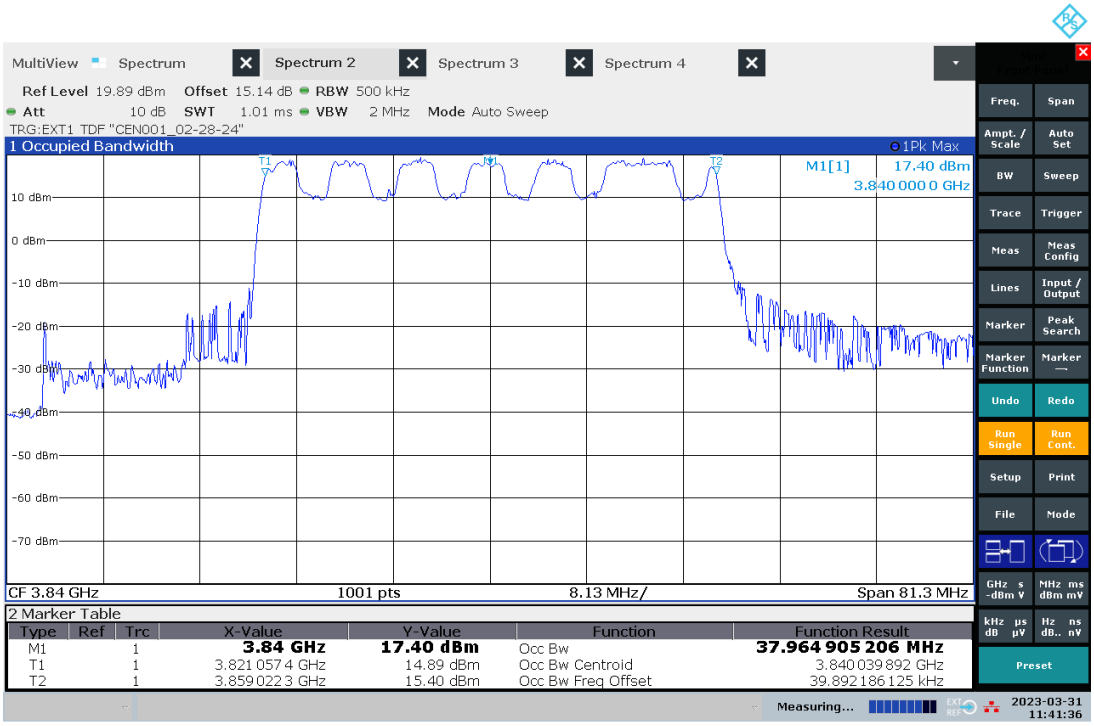


12:45:59 PM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (-20 °C)

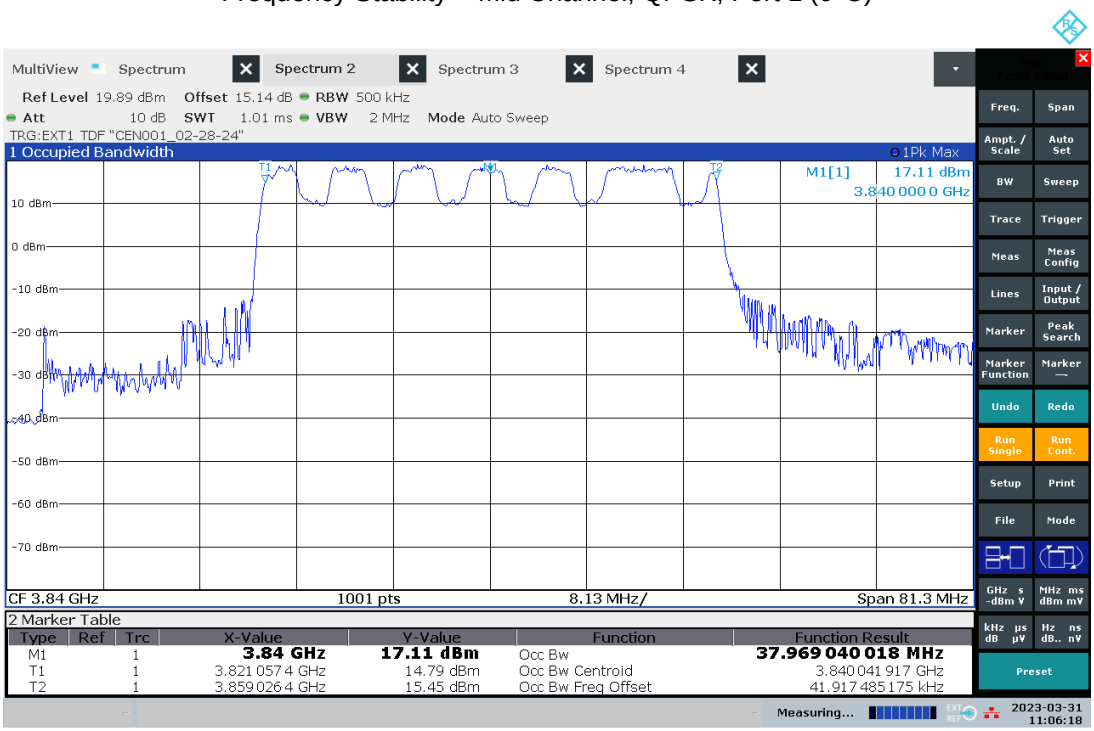
12:10:31 PM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (-10°C)



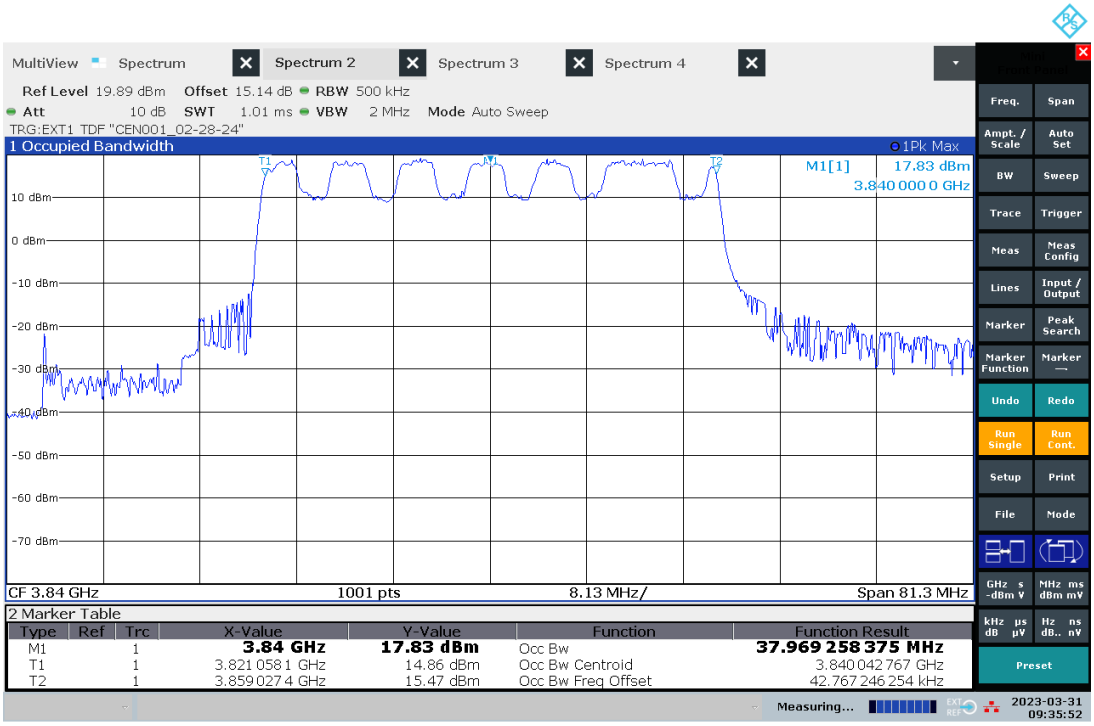
11:41:36 AM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (0°C)



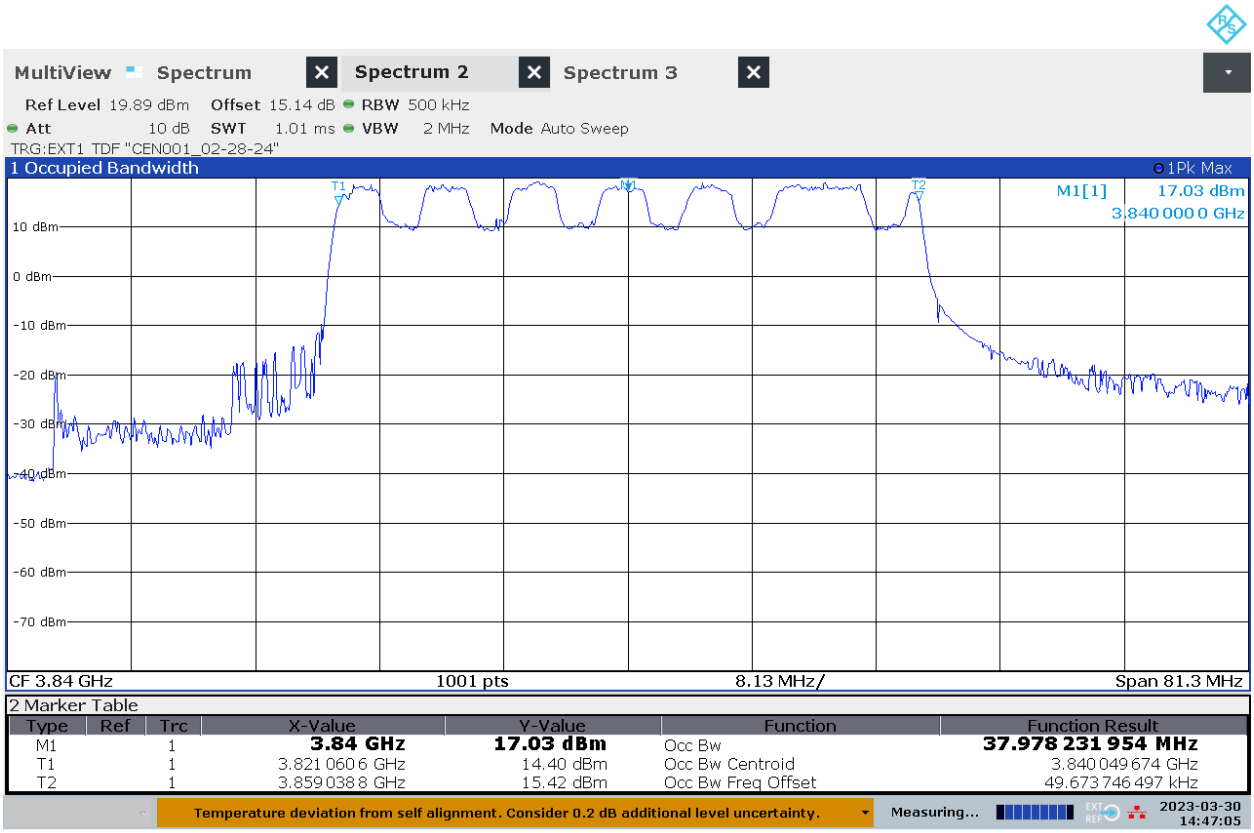
11:06:19 AM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (10°C)



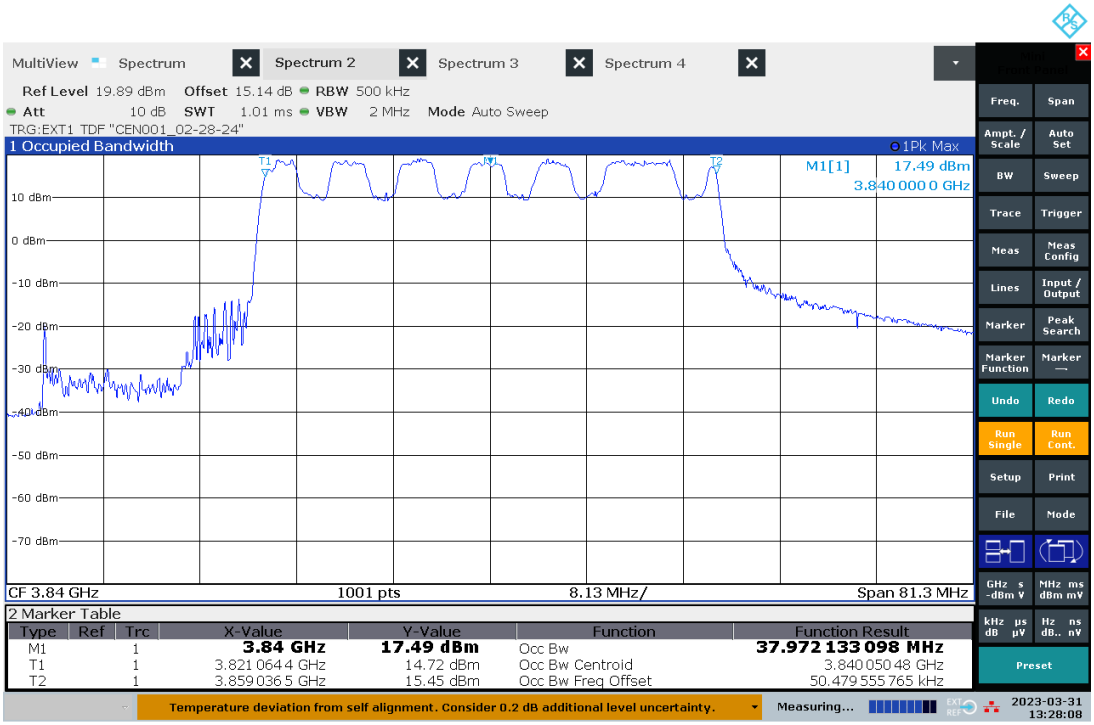
09:35:52 AM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (20°C)



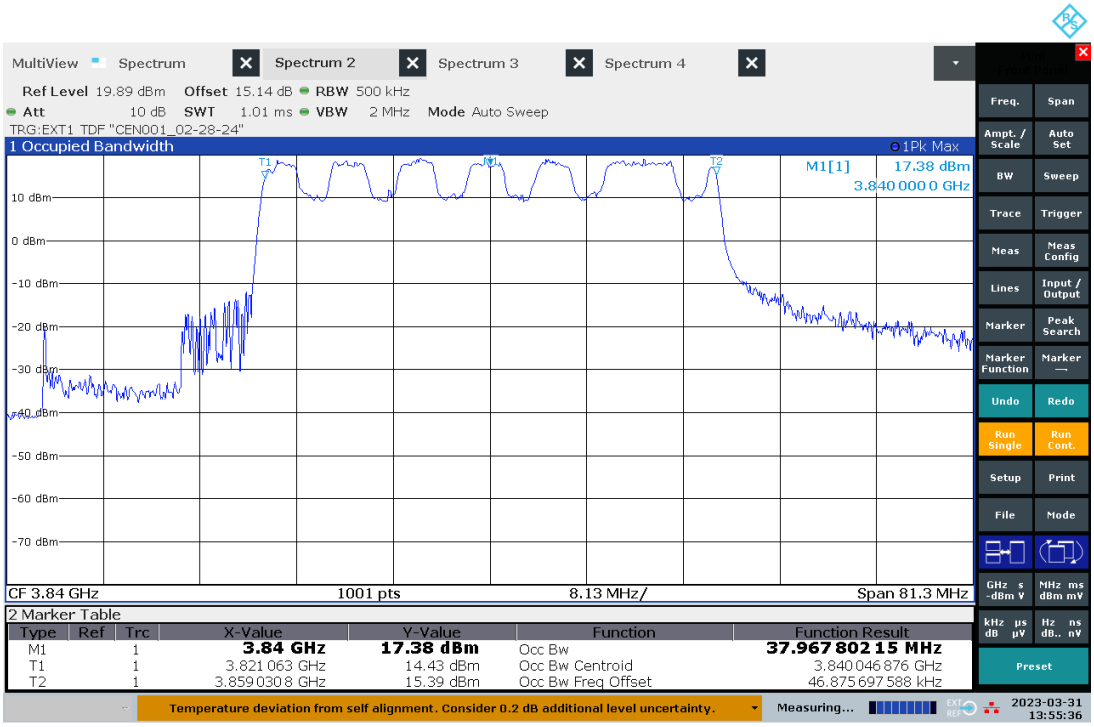
02:47:05 PM 03/30/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (30°C)



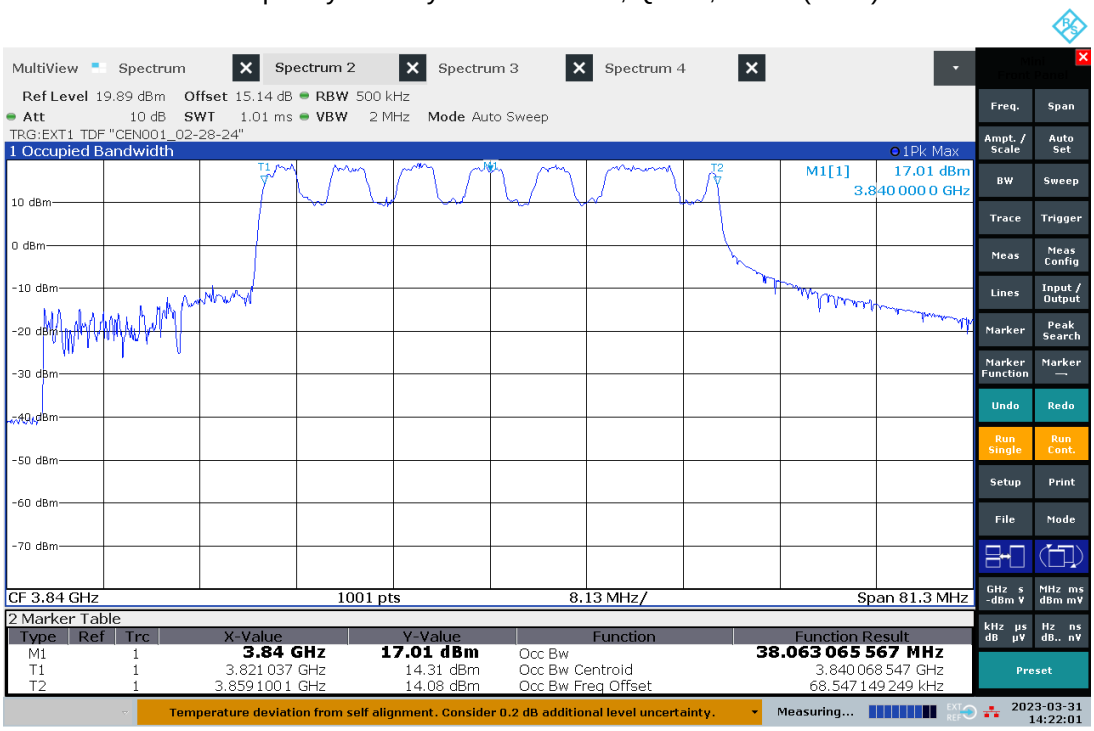
01:28:09 PM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (40°C)



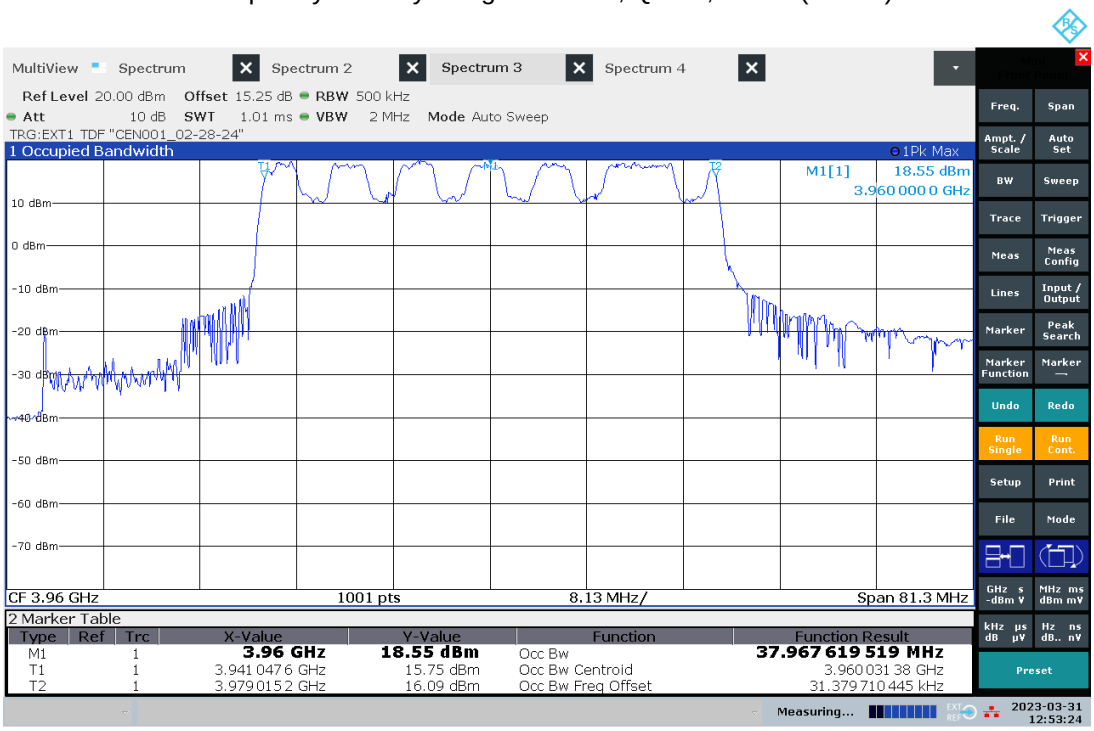
01:55:37 PM 03/31/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (50°C)



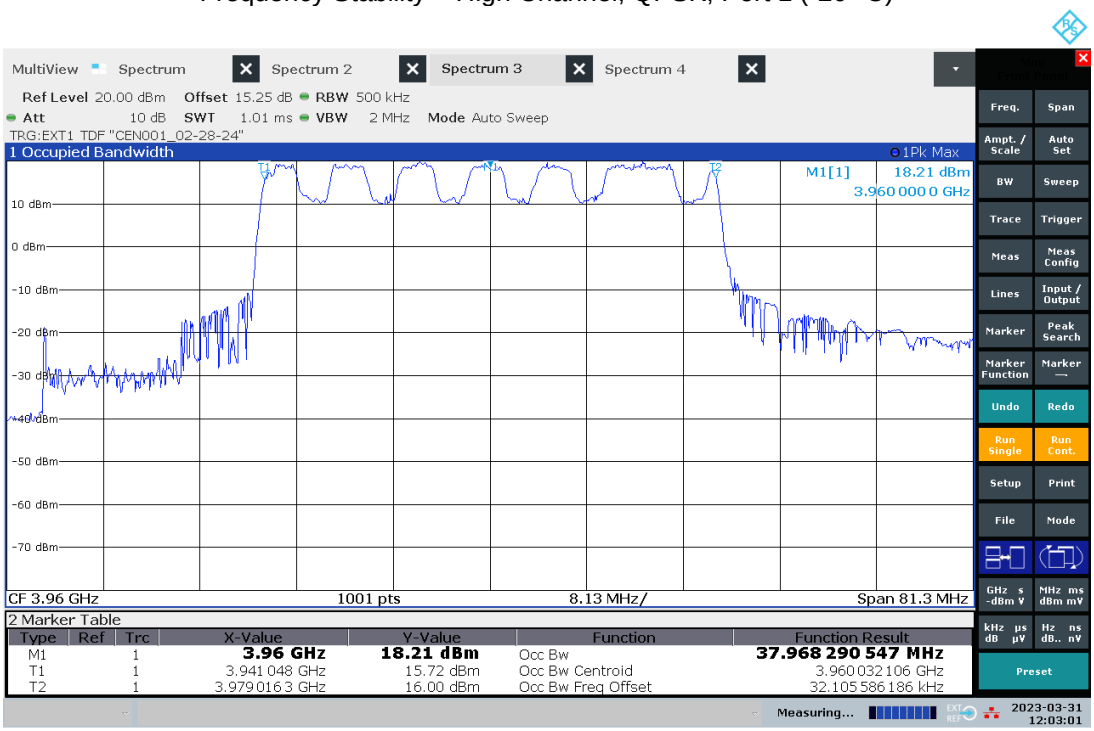
02:22:02 PM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (-30 °C)



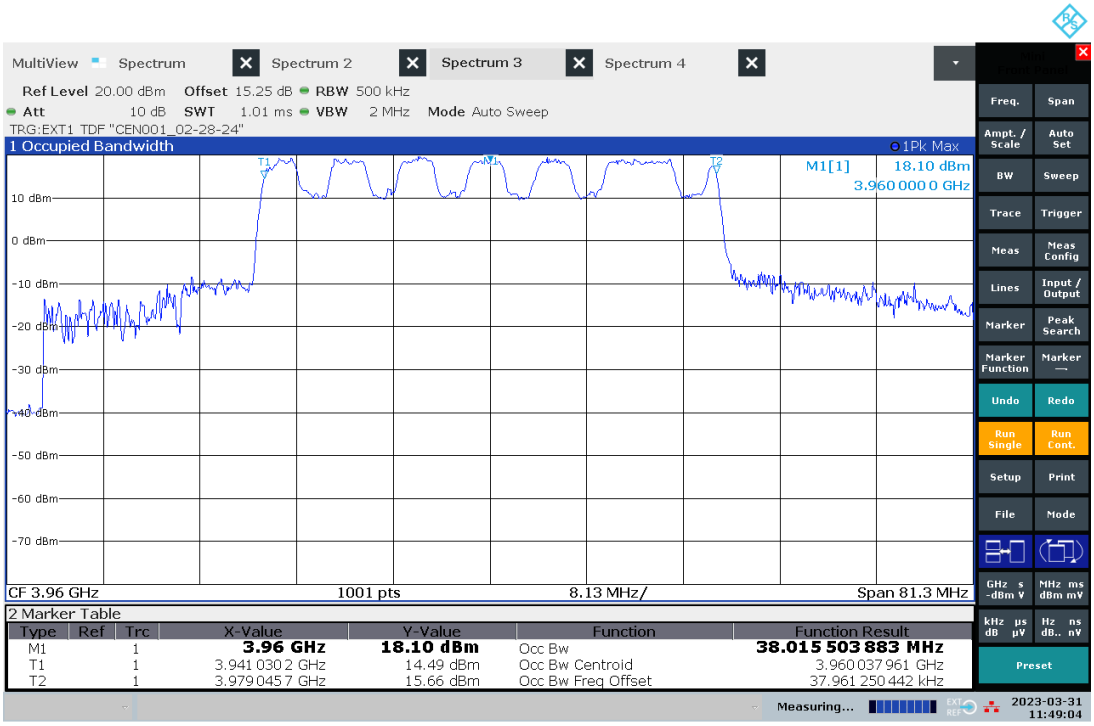
12:53:25 PM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (-20 °C)



12:03:01 PM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (-10°C)

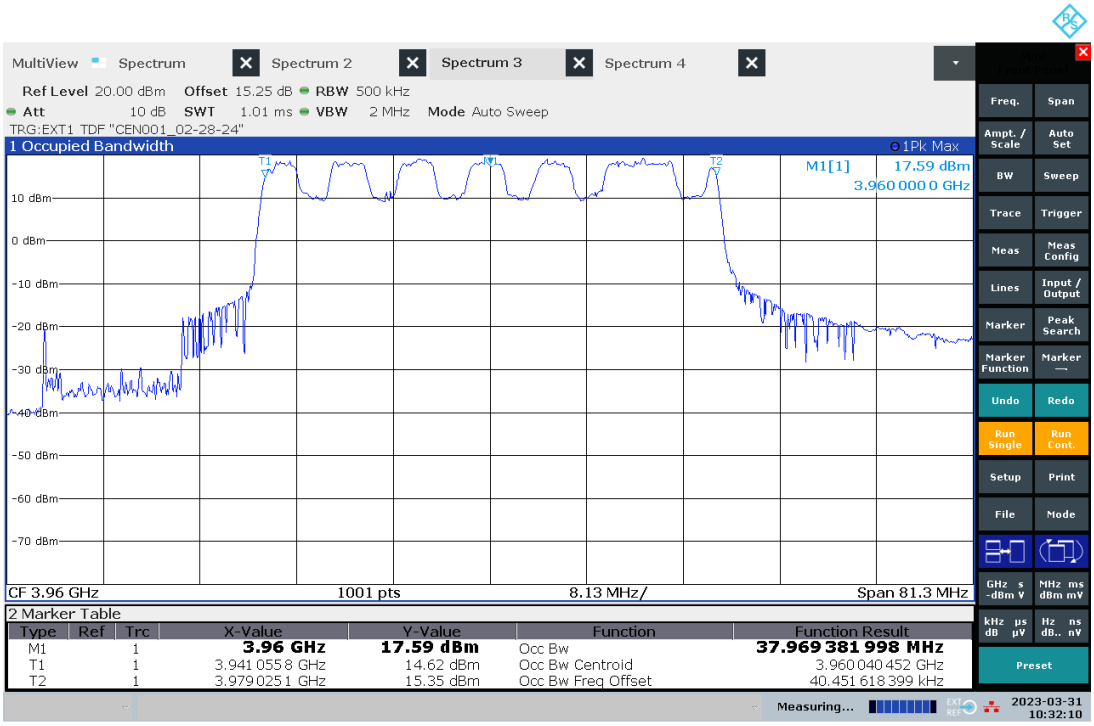


11:49:05 AM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (0°C)

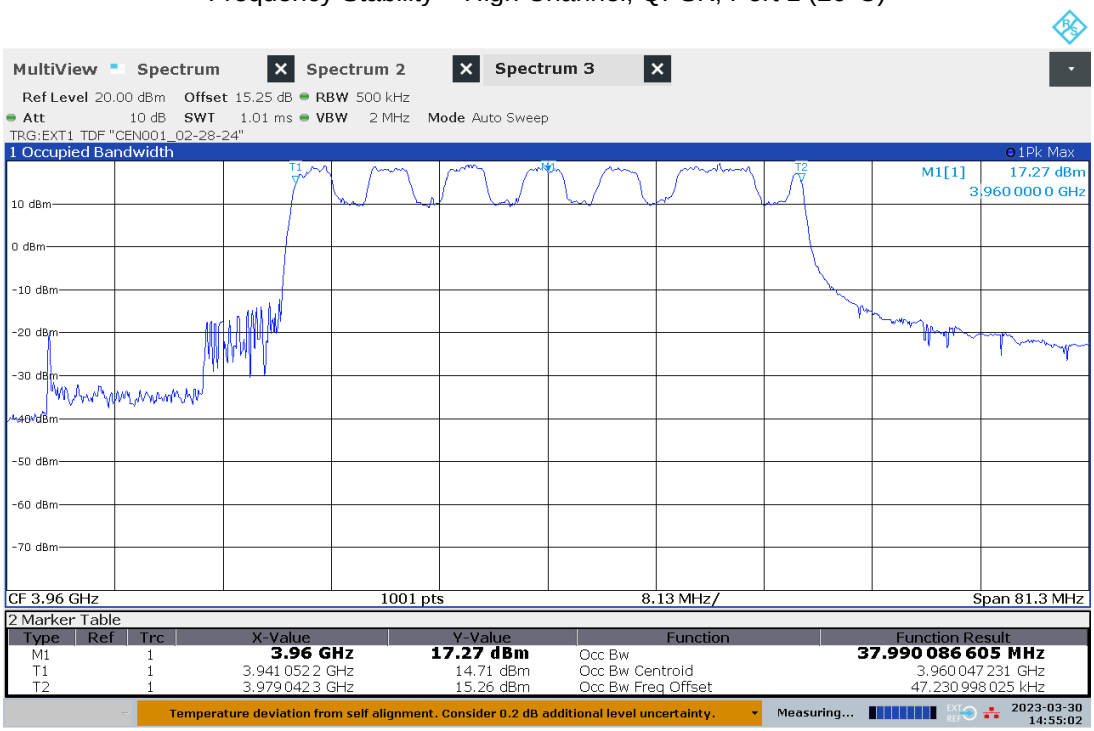
10:57:14 AM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (10°C)



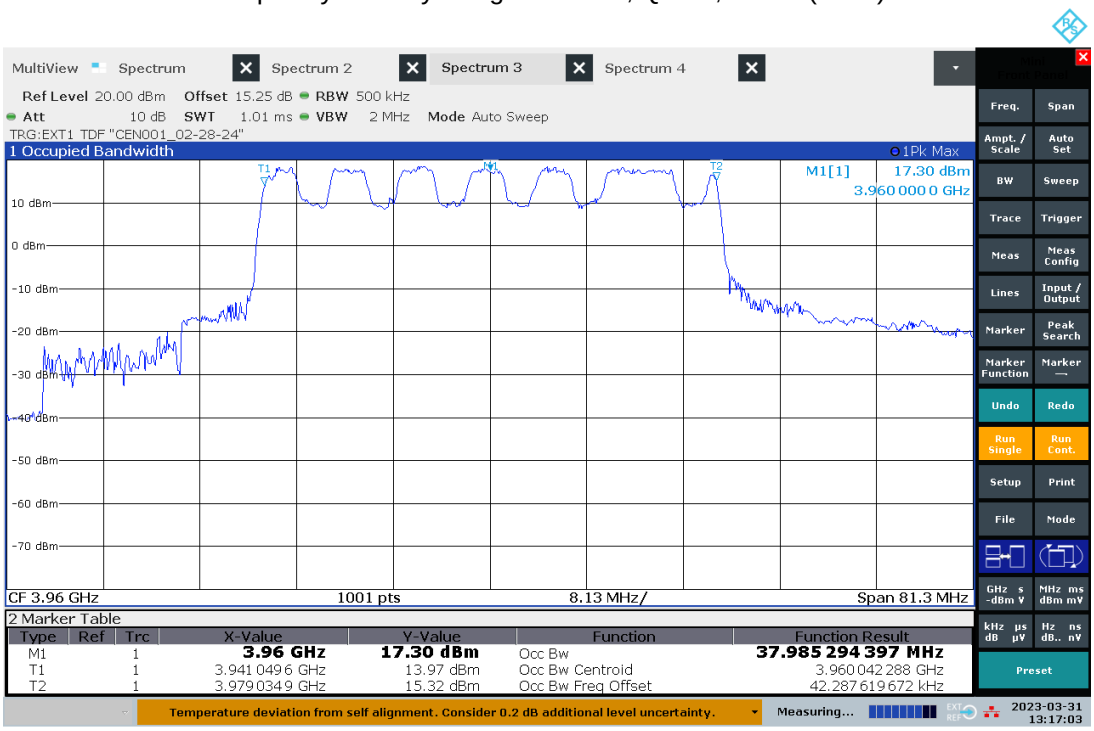
10:32:10 AM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (20°C)



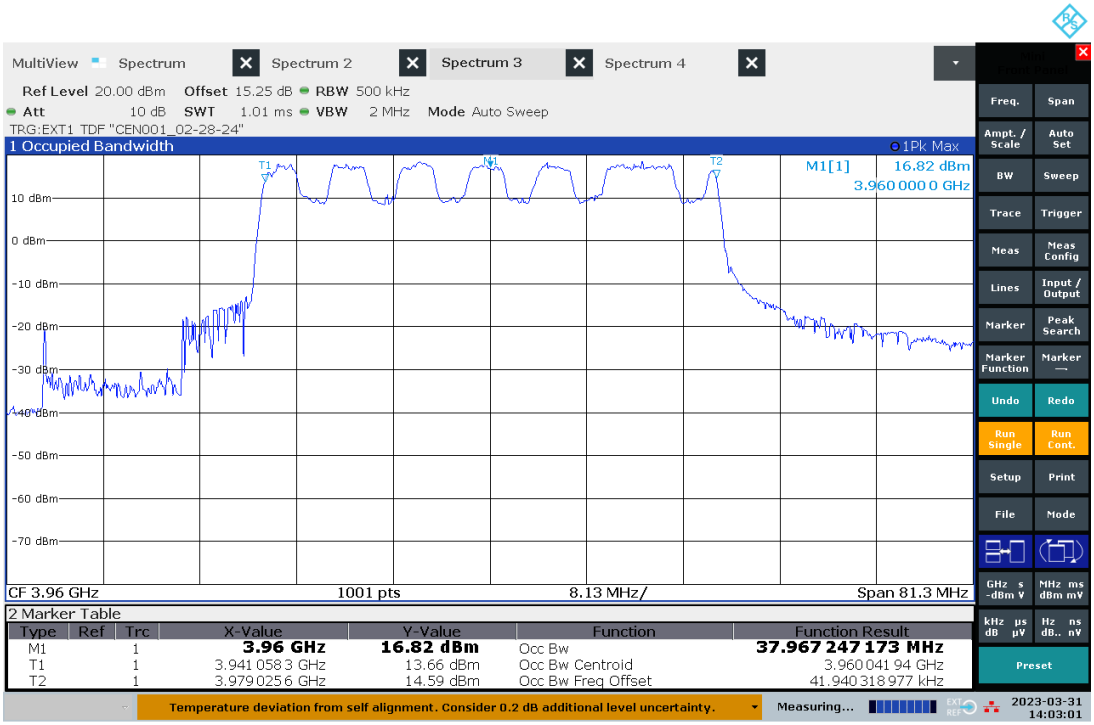
02:55:02 PM 03/30/2023

Frequency Stability – High Channel, QPSK, Port 1 (30°C)



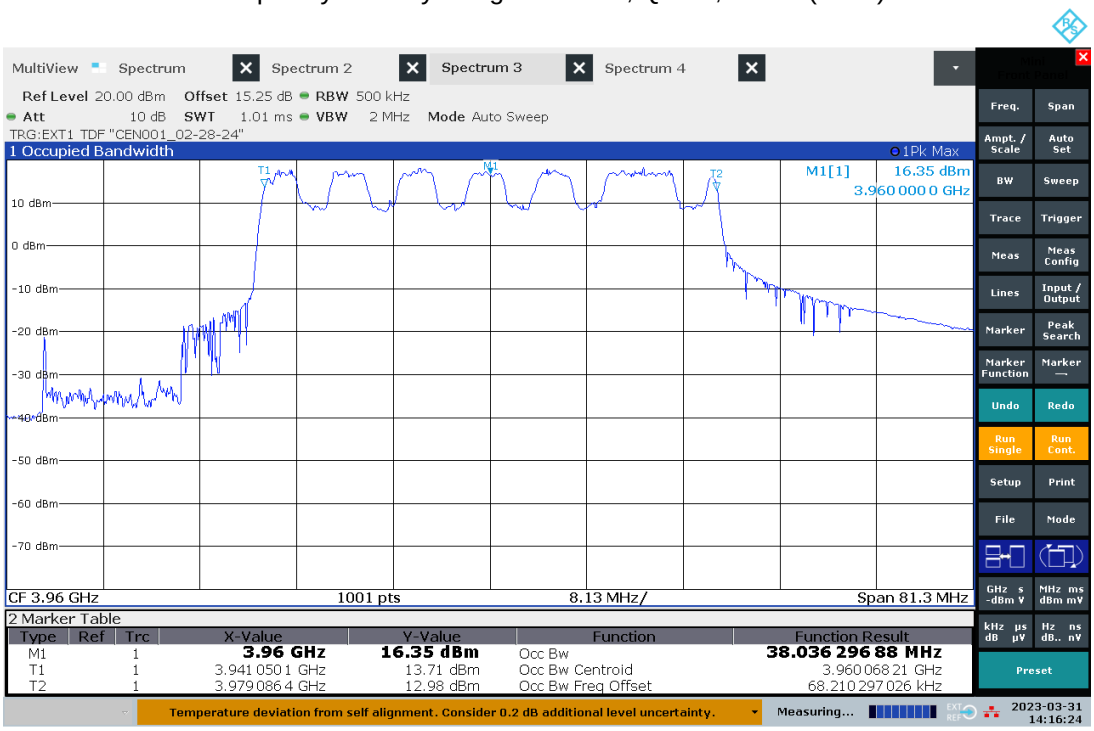
01:17:03 PM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (40°C)



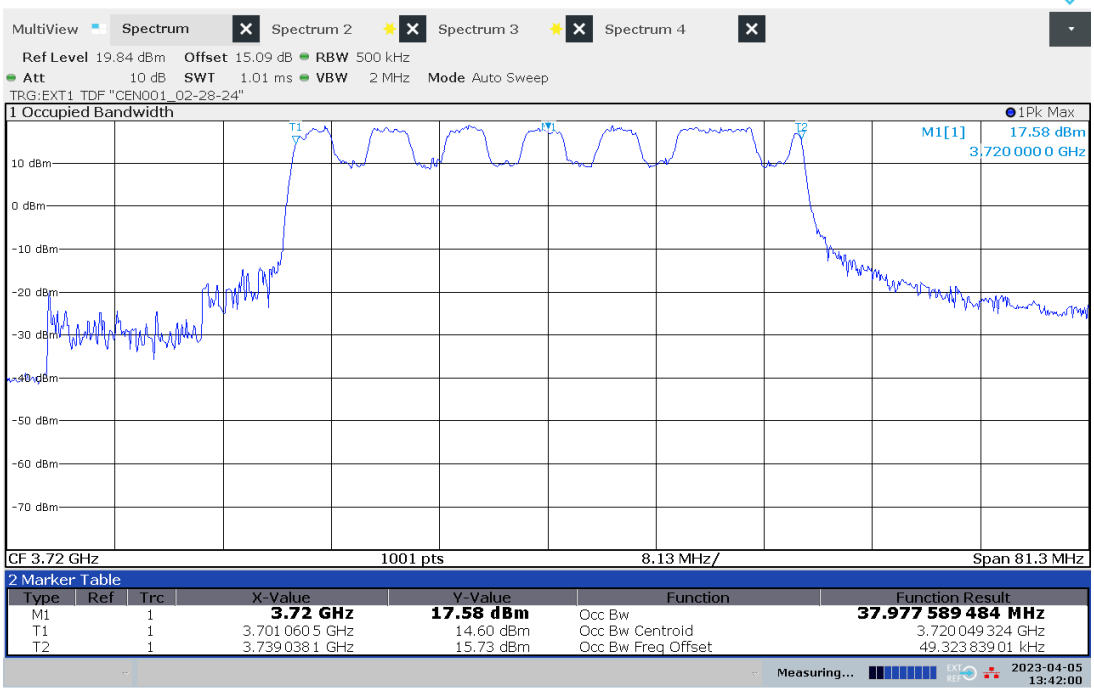
02:03:01 PM 03/31/2023

Frequency Stability – High Channel, QPSK, Port 1 (50°C)



02:16:24 PM 03/31/2023

Frequency Stability – Low Channel, QPSK, Port 1 (44VDC)

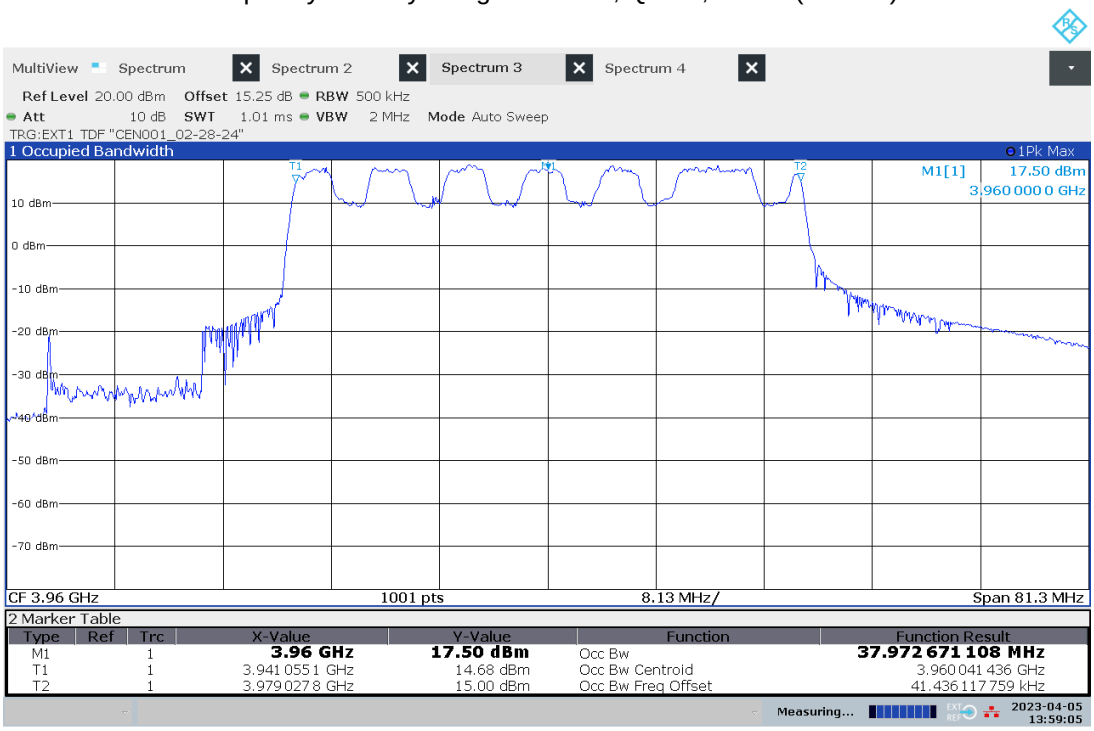


01:42:01 PM 04/05/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (44VDC)

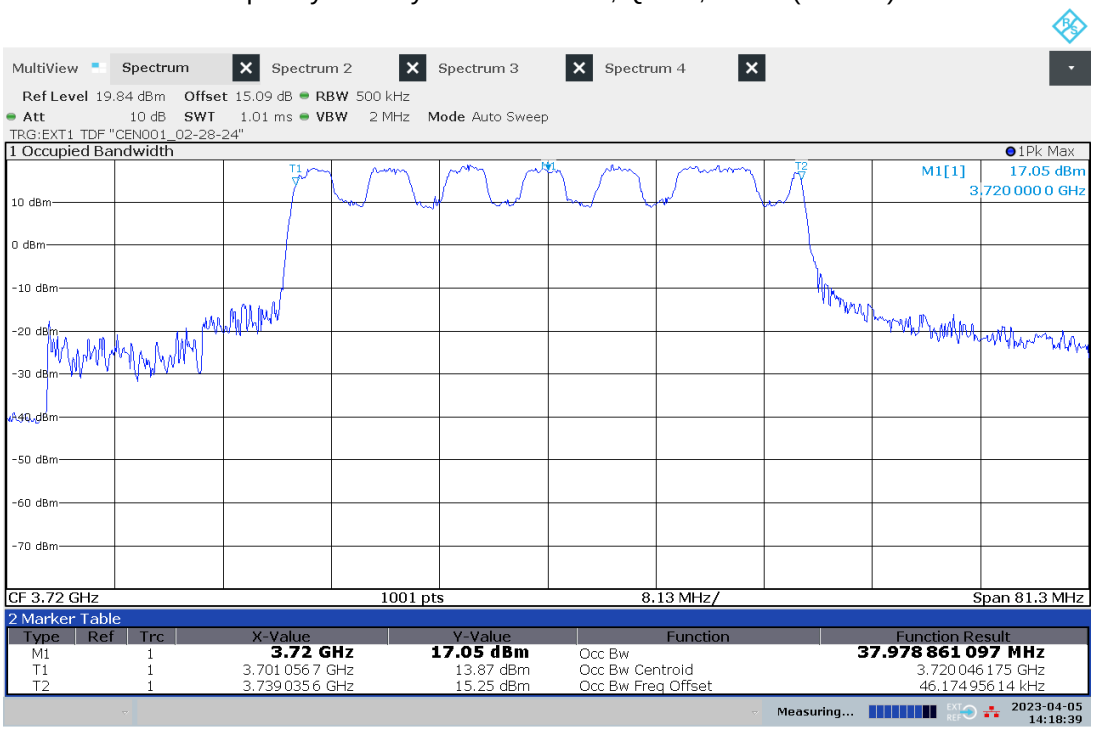
01:51:43 PM 04/05/2023

Frequency Stability – High Channel, QPSK, Port 1 (44VDC)



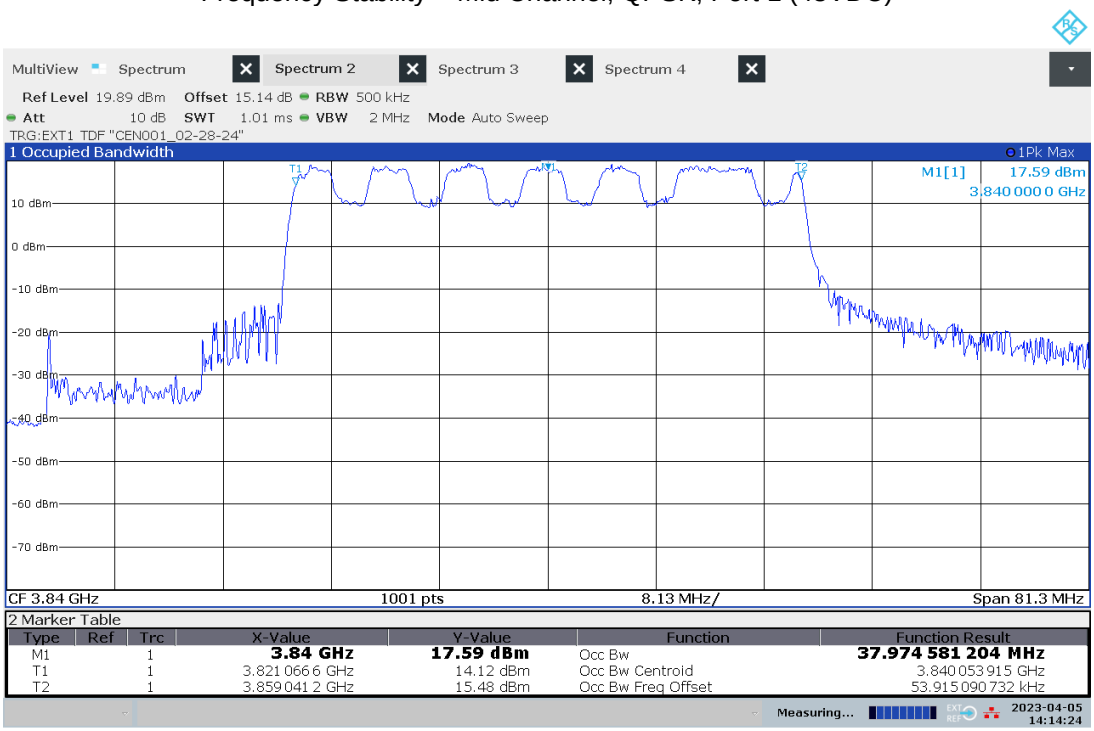
01:59:05 PM 04/05/2023

Frequency Stability – Low Channel, QPSK, Port 1 (48VDC)



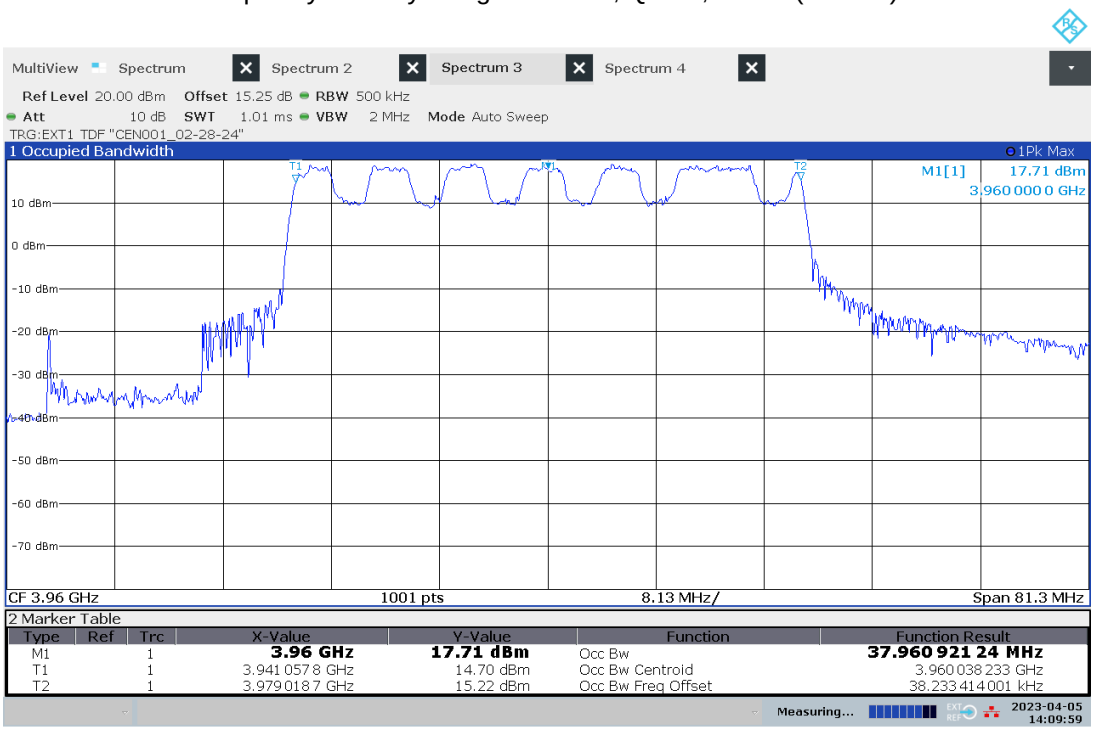
02:18:40 PM 04/05/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (48VDC)



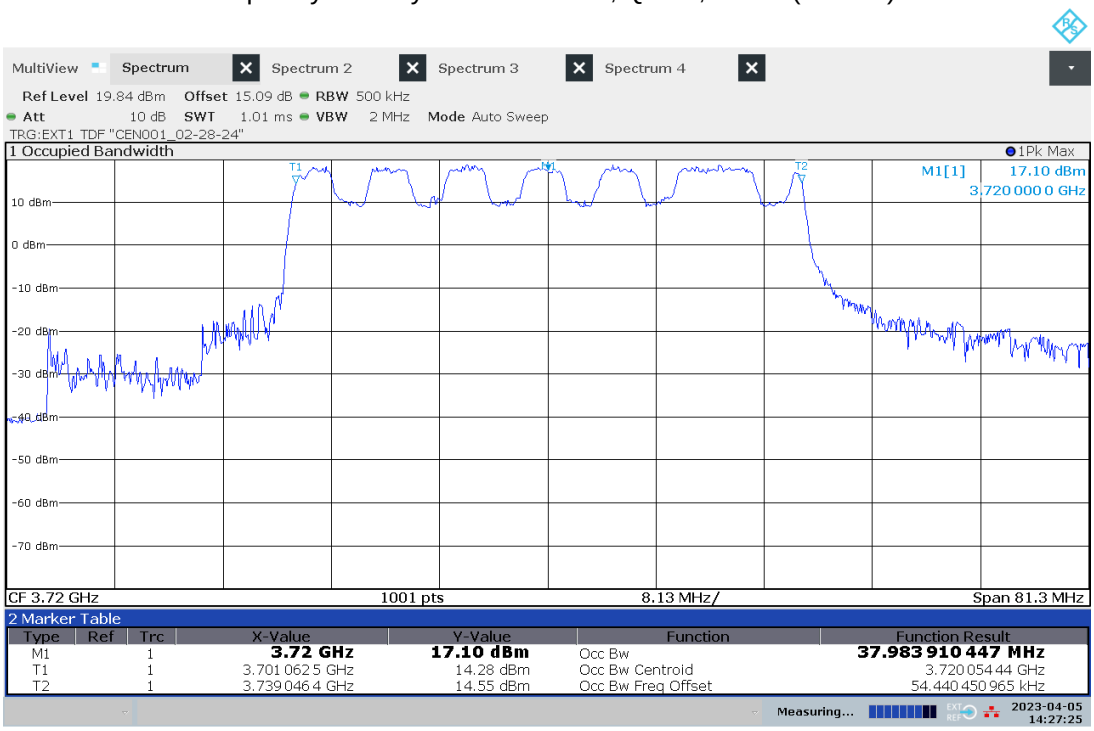
02:14:24 PM 04/05/2023

Frequency Stability – High Channel, QPSK, Port 1 (48VDC)



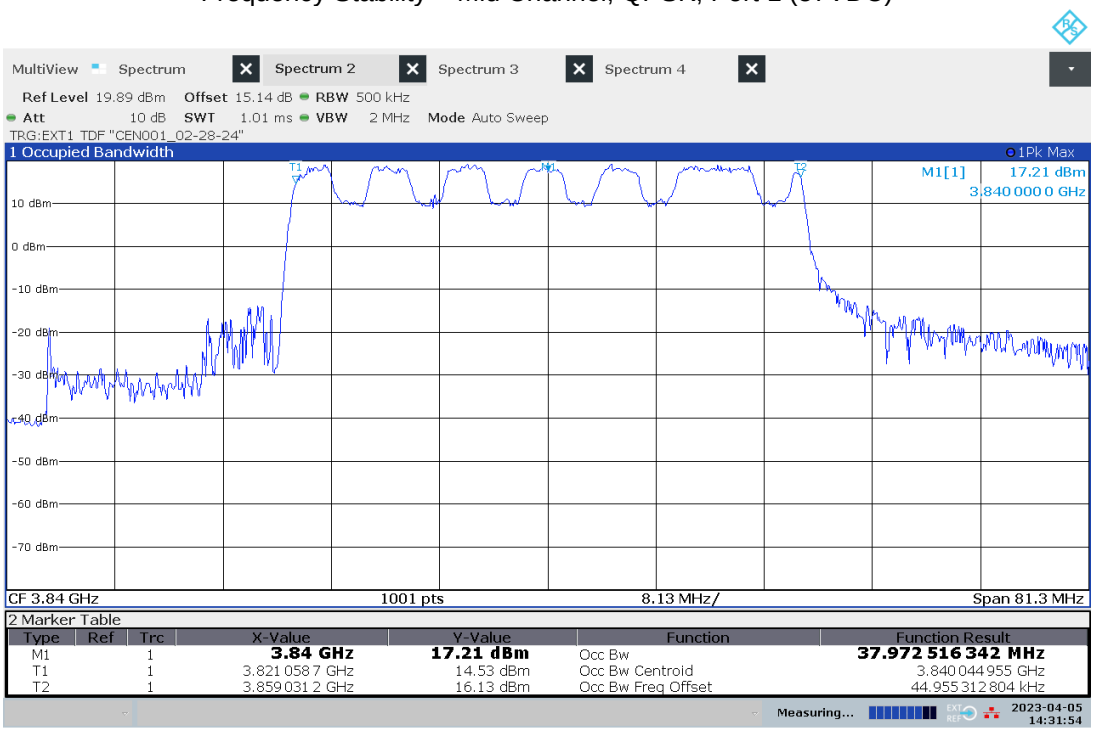
02:10:00 PM 04/05/2023

Frequency Stability – Low Channel, QPSK, Port 1 (57VDC)



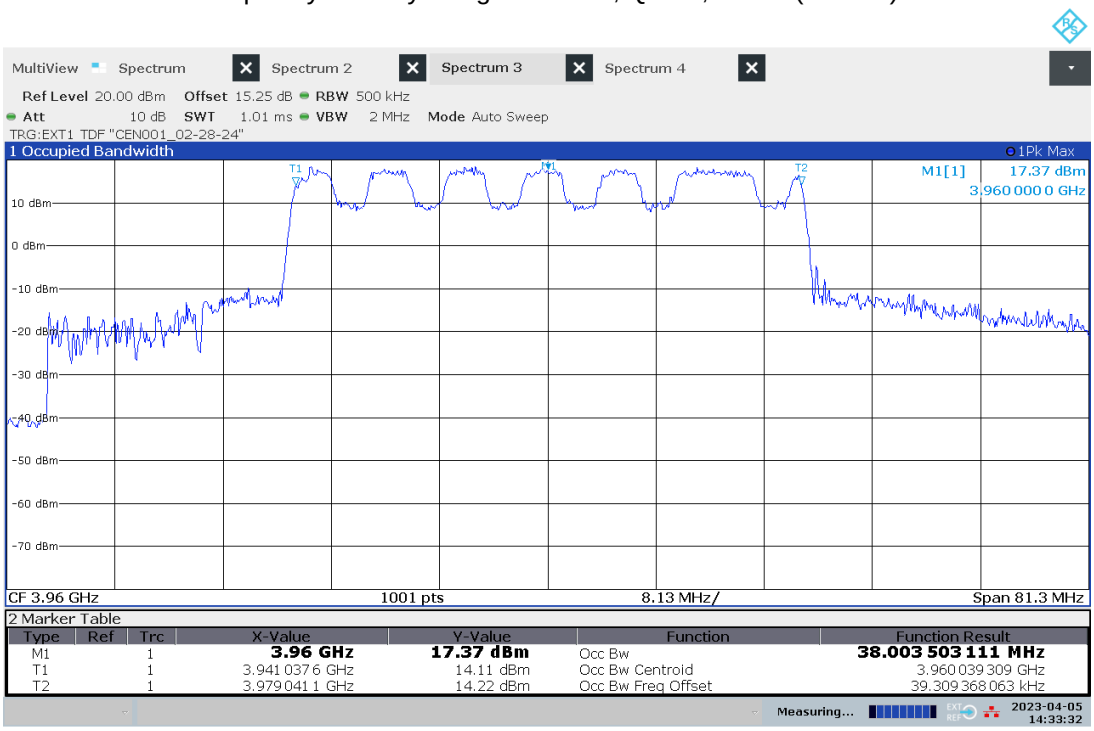
02:27:26 PM 04/05/2023

Frequency Stability – Mid Channel, QPSK, Port 1 (57VDC)



02:31:55 PM 04/05/2023

Frequency Stability – High Channel, QPSK, Port 1 (57VDC)



02:33:32 PM 04/05/2023

Test Date	Product Standard: FCC Part 27			Limit applied: See Report Section 9.2			
	Test Personnel/ Initials	Supervising Engineer/ Initials	Input Voltage	Mode	Atmospheric Data		
					Temp C°	Relative Humidity %	Atmospheric Pressure mbar
03/31/2023	Kouma Sinn KPS	Vathana Ven VJV	48V POE	Transmitting	N/A	N/A	N/A
04/05/2023	Kouma Sinn KPS	Vathana Ven VJV	48V POE	Transmitting	23	24	1009

Deviations, Additions, or Exclusions: None

10 Band Edges

10.1 Method

Tests are performed in accordance with ANSI C63.26:2015.

10.2 Limits

FCC Part 27.53(l)(1) For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (l)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

10.3 Test Site

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

10.4 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV009'	weather station	Davis Instruments	6351 Vantage VUE	DAV009	03/27/2023	03/27/2024
CEN001'	DC-40GHz attenuator 20dB	cblhf201-5-2	C411-20	CEN001	02/28/2023	02/28/2024
ROS005-1'	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	11/18/2022	11/18/2023
None	2m Mini SMA Cable	See Below	None	None	See below	See below
None	RF Switch Controller (DC-18 GHz)	Mini-Circuits	RC-2SP4T-A18	02202230028	See below	See below

Notes: The 2m Mini SMA cable and RF Switch Controller were provided by the manufacturer with the total as follows: Low Frequency, 3720 MHz, -15.09 dB; Mid frequency, 3840 MHz, -15.14dB; High Frequency, 3960 MHz, -15.25 dB.

Software Utilized:

Name	Manufacturer	Version
None	N/A	N/A

10.5 Results:

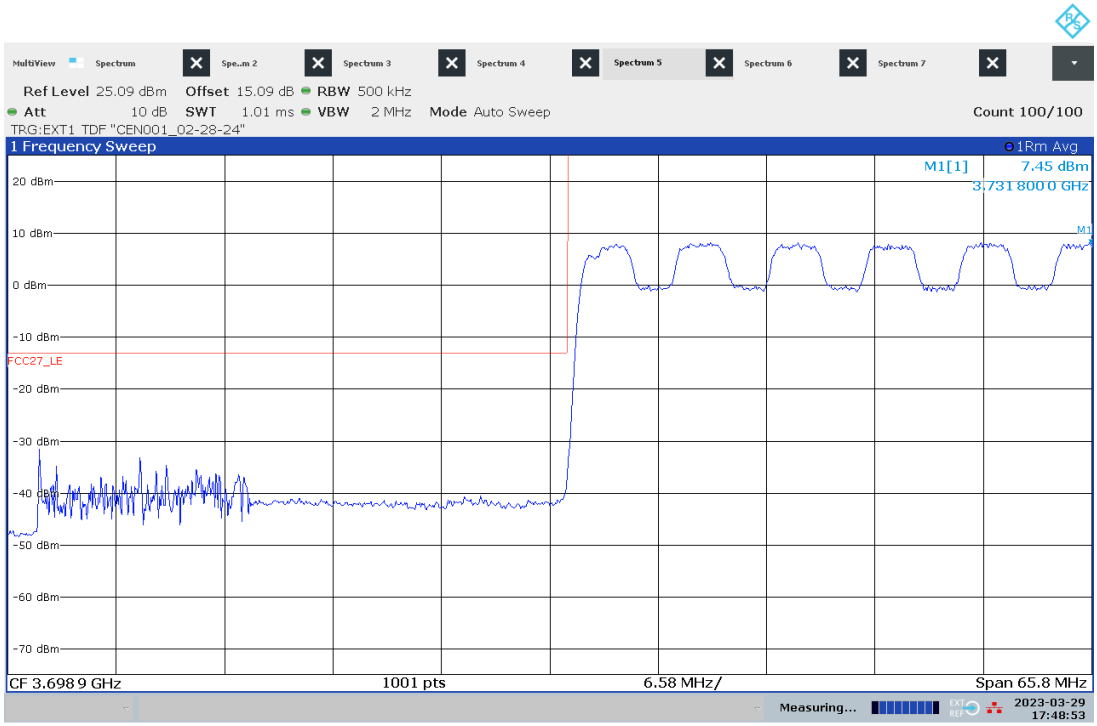
The sample tested was found to Comply.

10.6 Setup Photograph:

Confidential – Photos not included in this report.

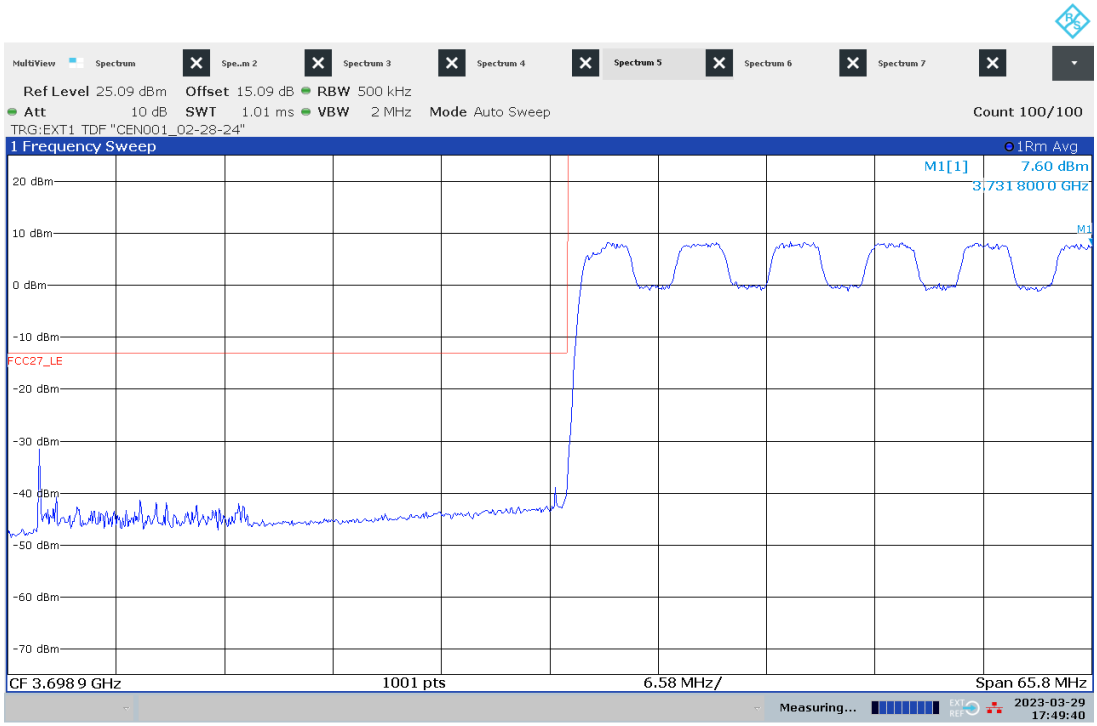
10.7 Plots/Data:

Lower Band Edge, QPSK, Port 1



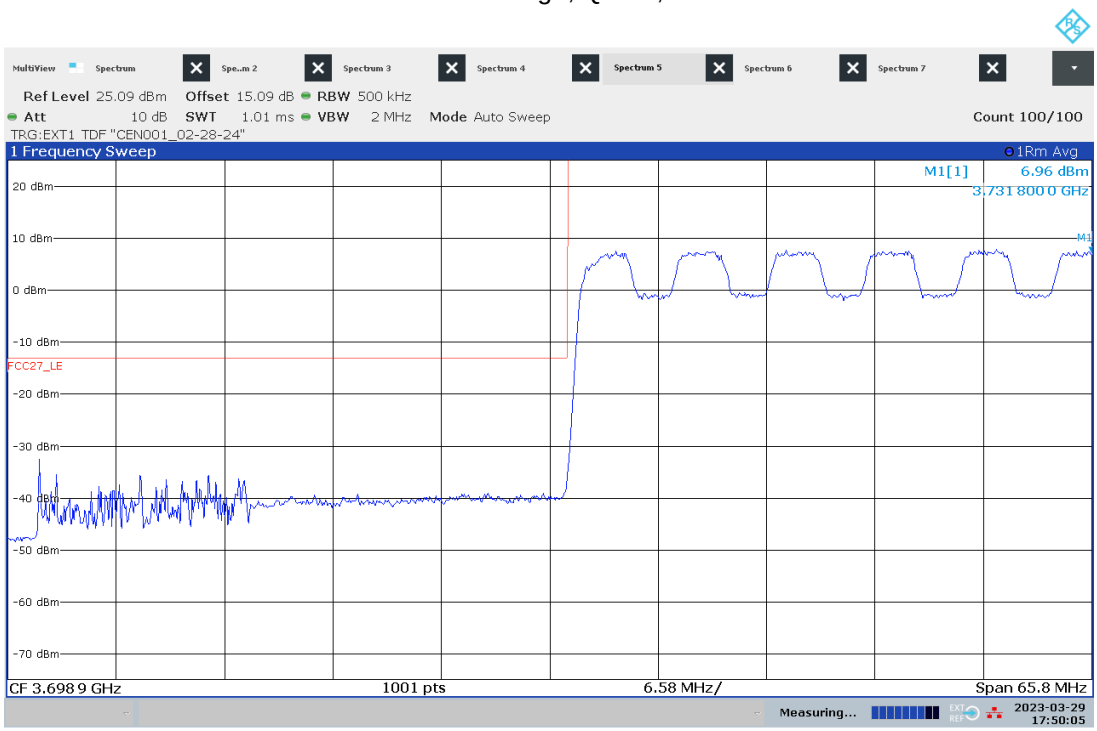
05:48:53 PM 03/29/2023

Lower Band Edge, QPSK, Port 2



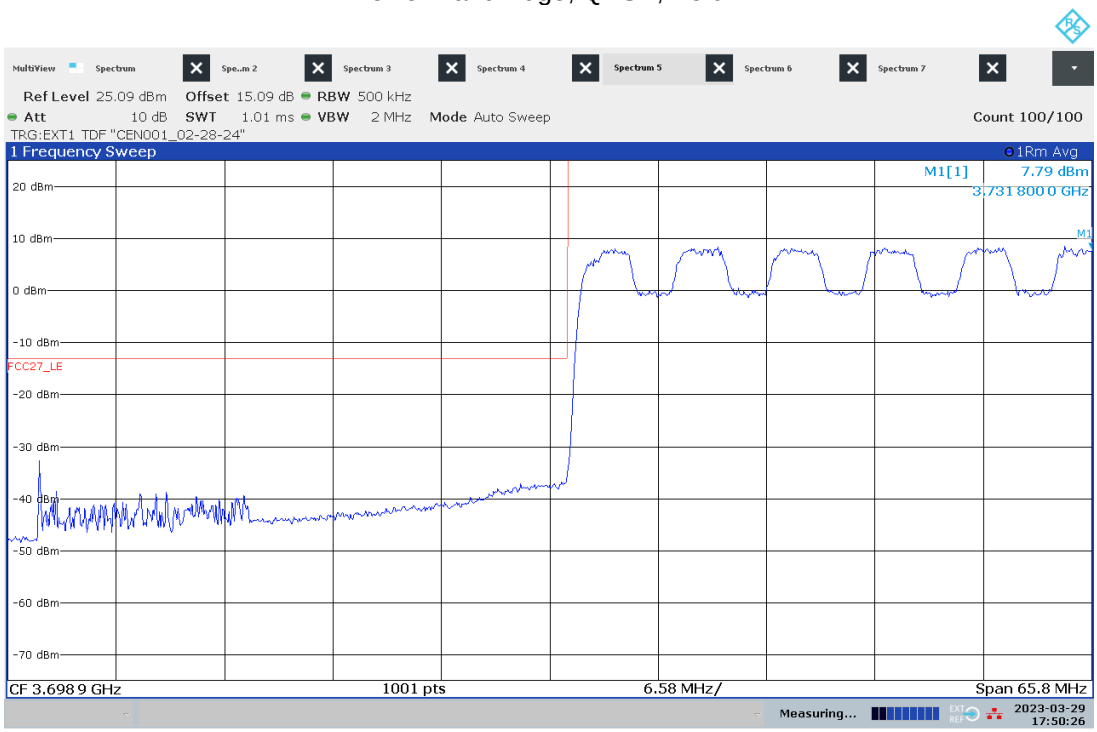
05:49:41 PM 03/29/2023

Lower Band Edge, QPSK, Port 3



05:50:05 PM 03/29/2023

Lower Band Edge, QPSK, Port 4

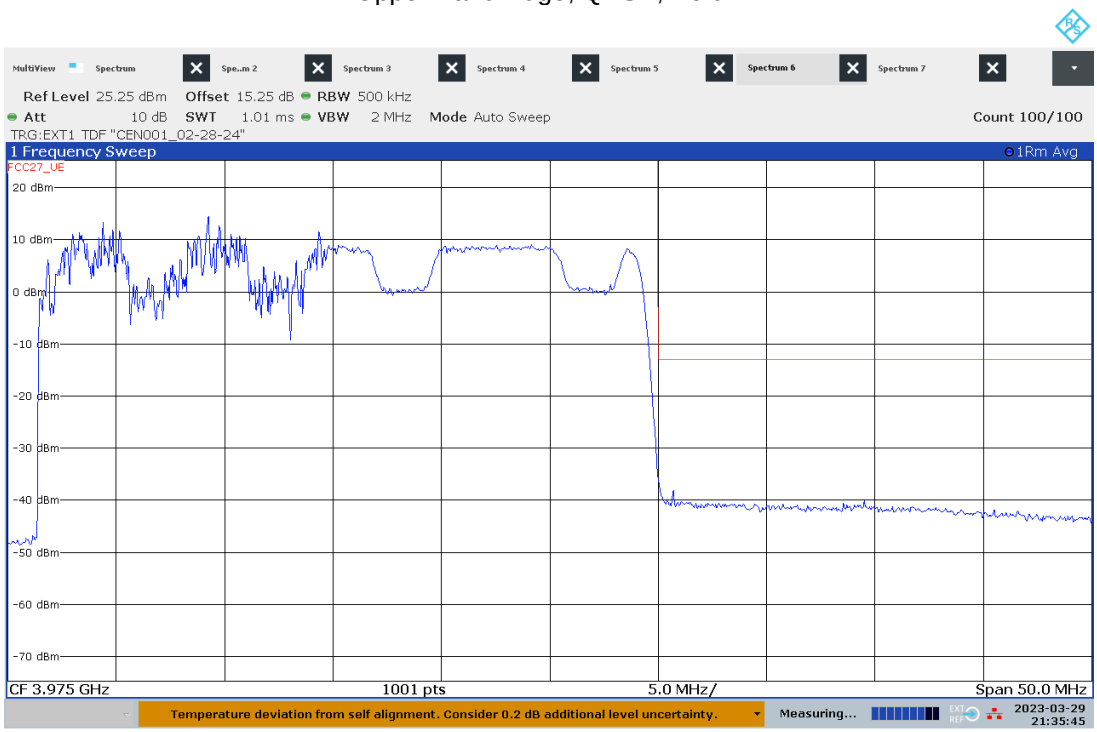


05:50:26 PM 03/29/2023

Upper Band Edge, QPSK, Port 1

09:36:07 PM 03/29/2023

Upper Band Edge, QPSK, Port 2



09:35:45 PM 03/29/2023

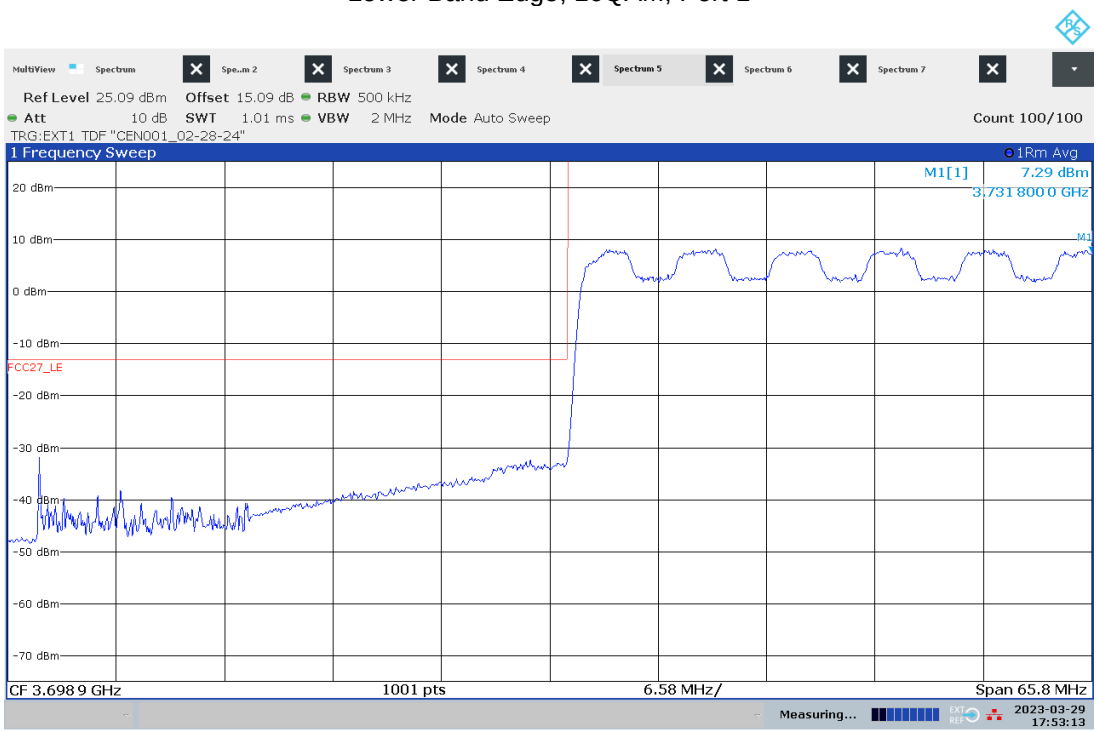
Upper Band Edge, QPSK, Port 3

09:36:27 PM 03/29/2023

Upper Band Edge, QPSK, Port 4

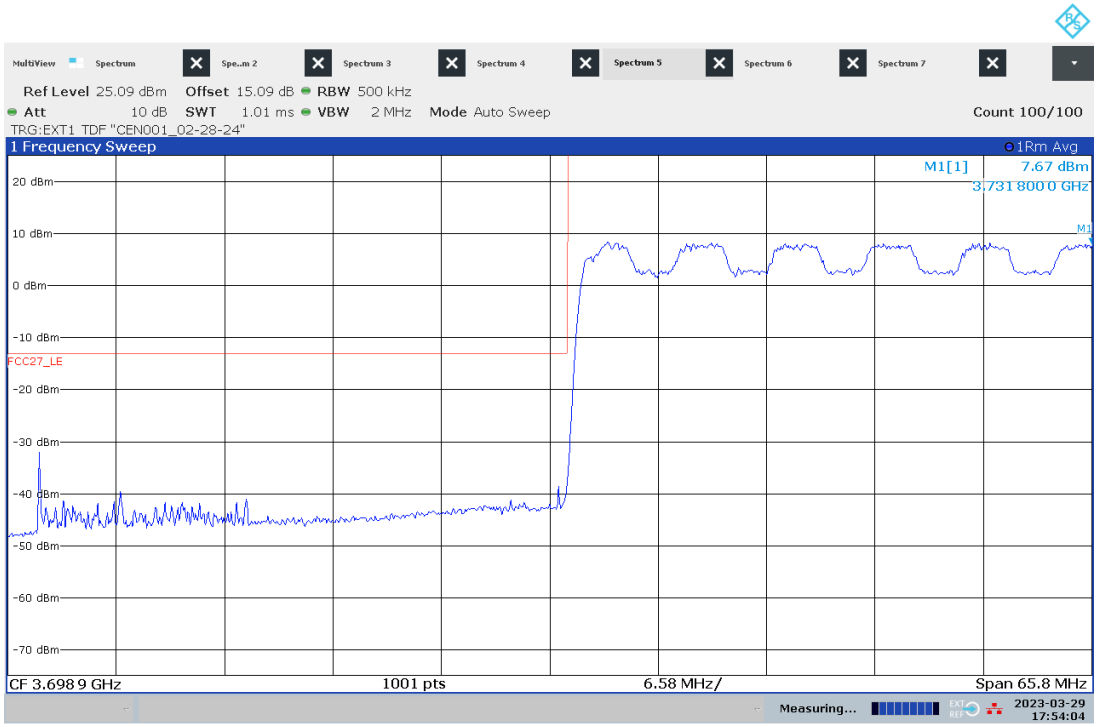
09:36:53 PM 03/29/2023

Lower Band Edge, 16QAM, Port 1



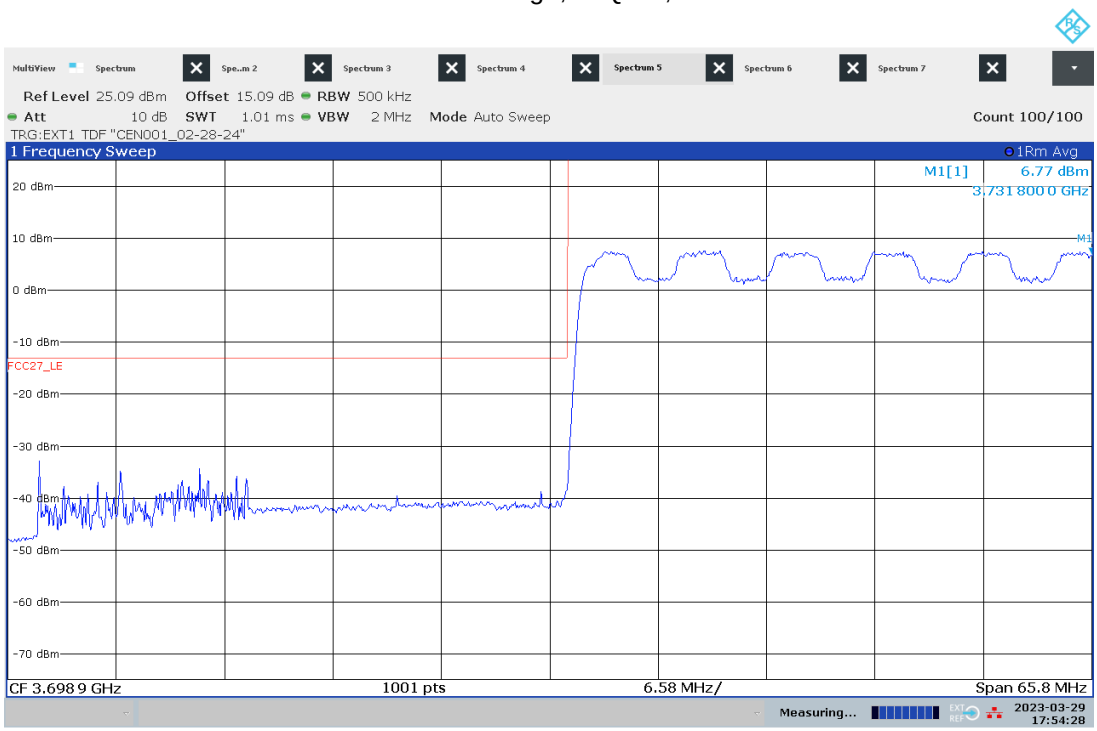
05:53:14 PM 03/29/2023

Lower Band Edge, 16QAM, Port 2



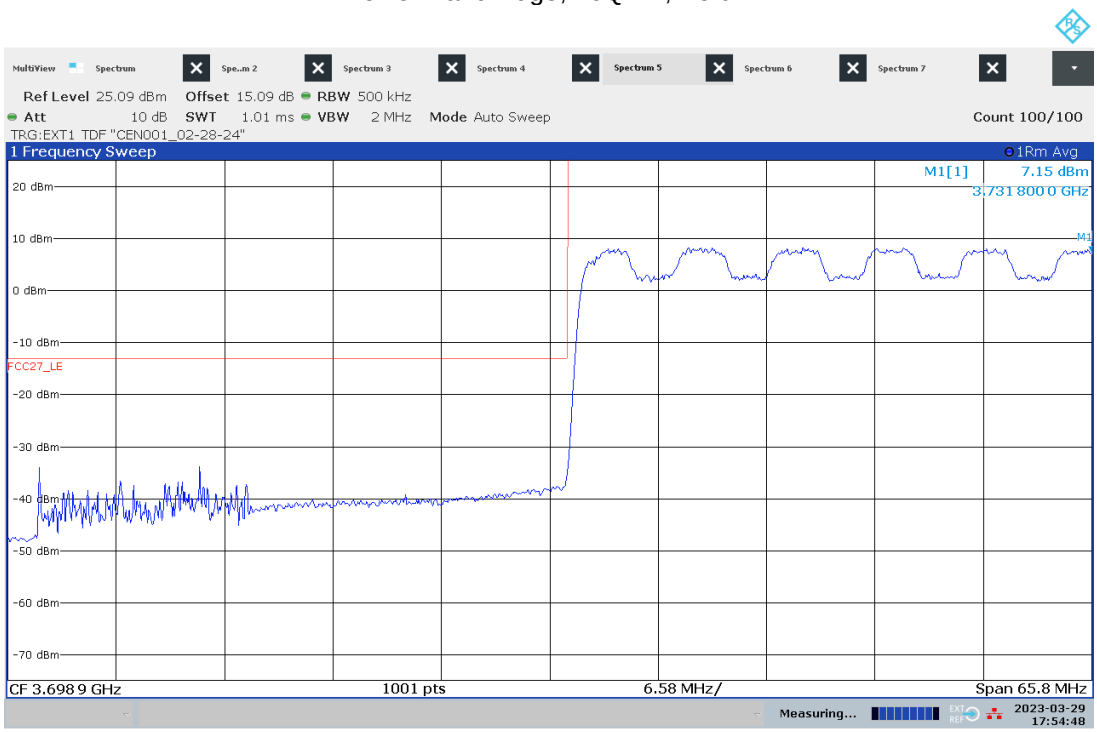
05:54:04 PM 03/29/2023

Lower Band Edge, 16QAM, Port 3



05:54:28 PM 03/29/2023

Lower Band Edge, 16QAM, Port 4

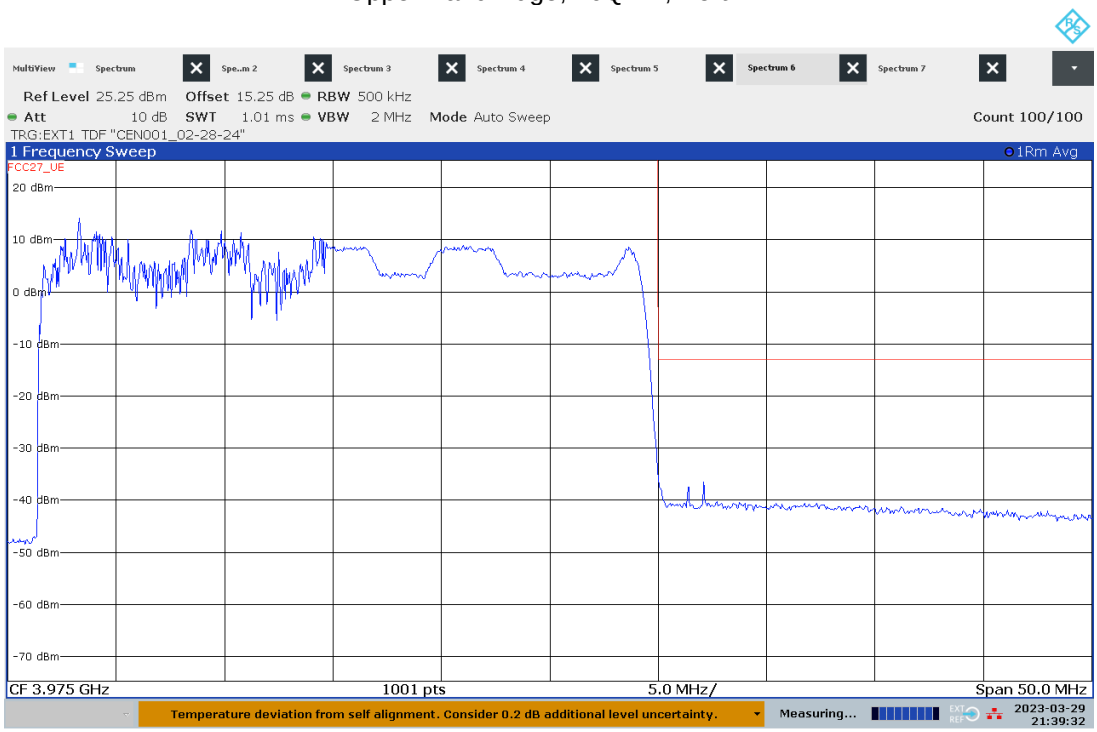


05:54:48 PM 03/29/2023

Upper Band Edge, 16QAM, Port 1

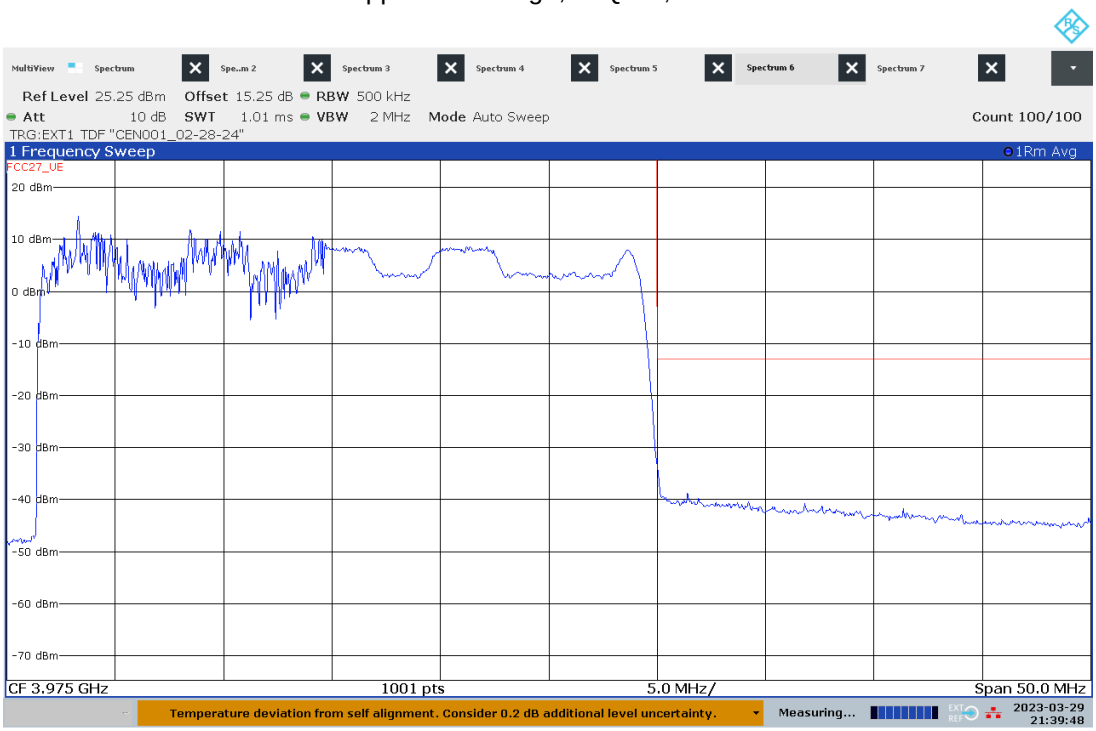
09:38:36 PM 03/29/2023

Upper Band Edge, 16QAM, Port 2



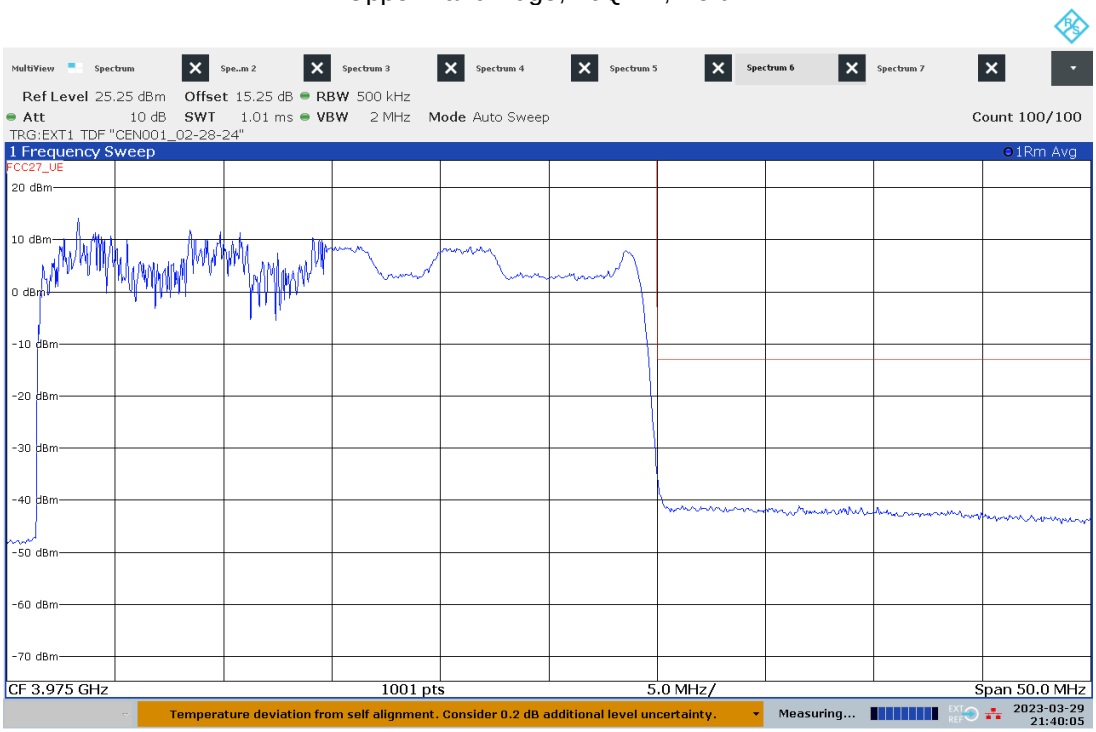
09:39:32 PM 03/29/2023

Upper Band Edge, 16QAM, Port 3



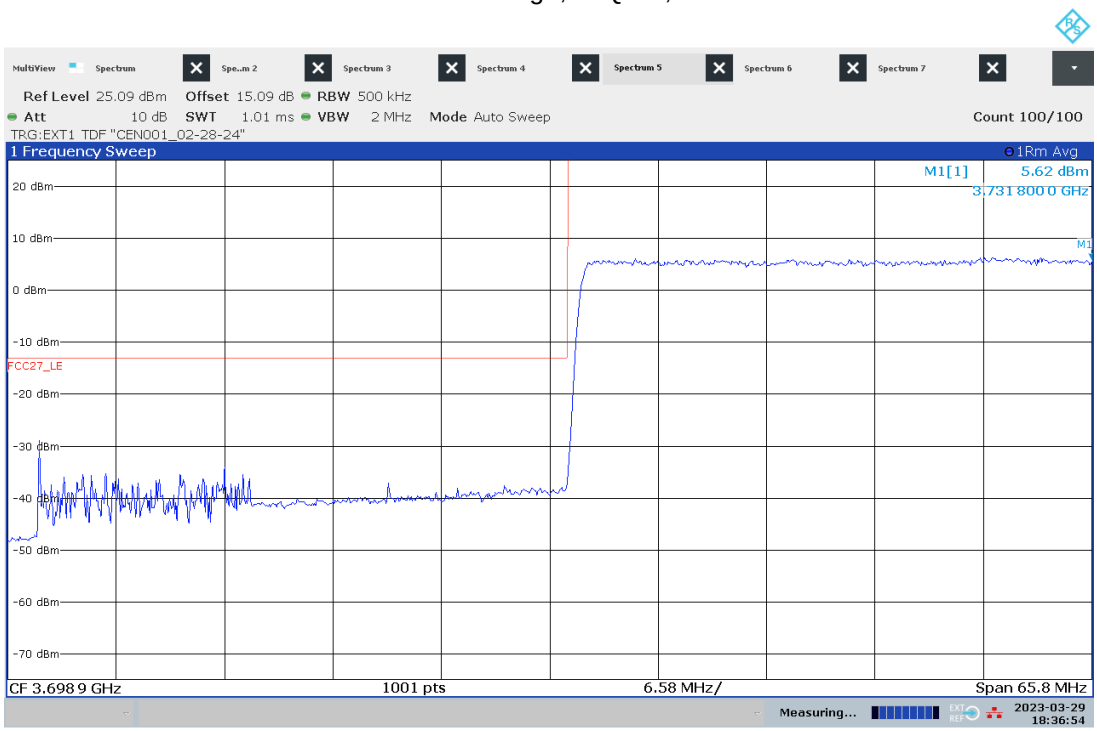
09:39:48 PM 03/29/2023

Upper Band Edge, 16QAM, Port 4



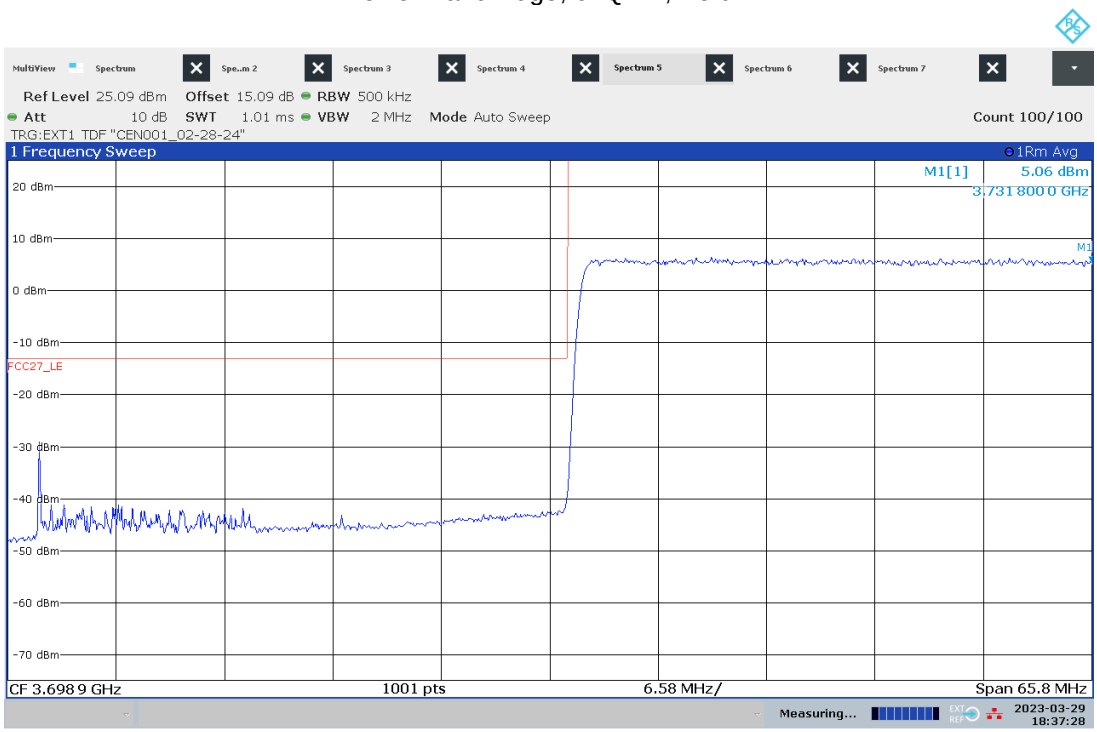
09:40:05 PM 03/29/2023

Lower Band Edge, 64QAM, Port 1



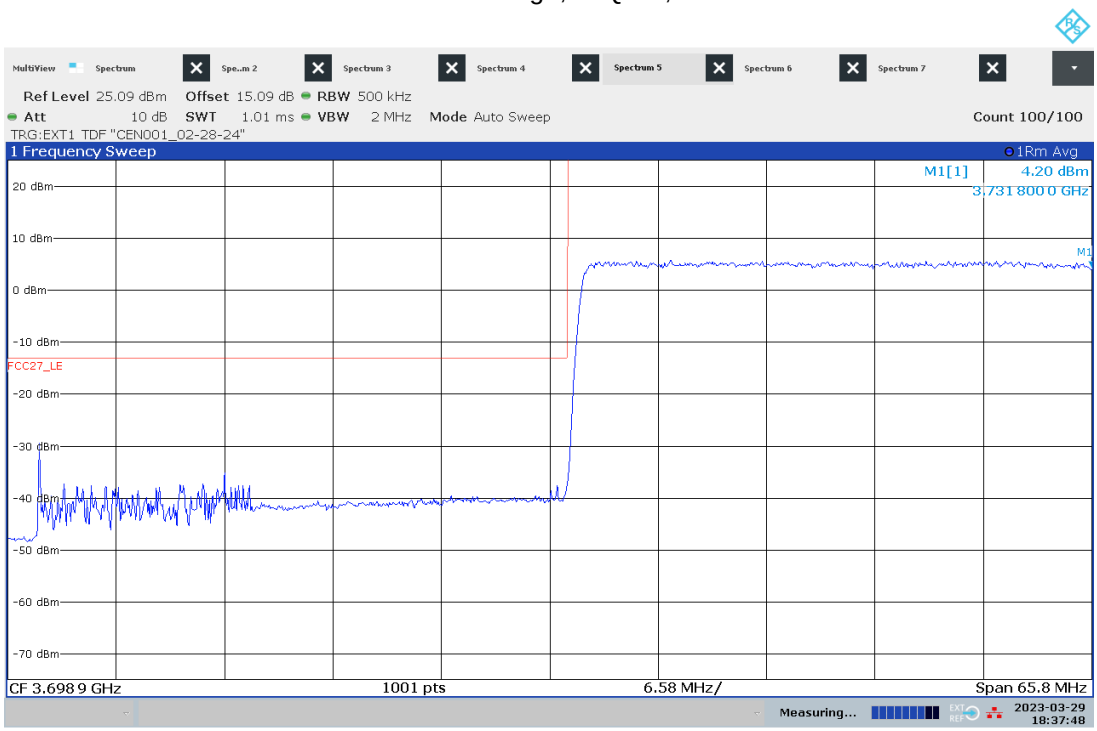
06:36:54 PM 03/29/2023

Lower Band Edge, 64QAM, Port 2



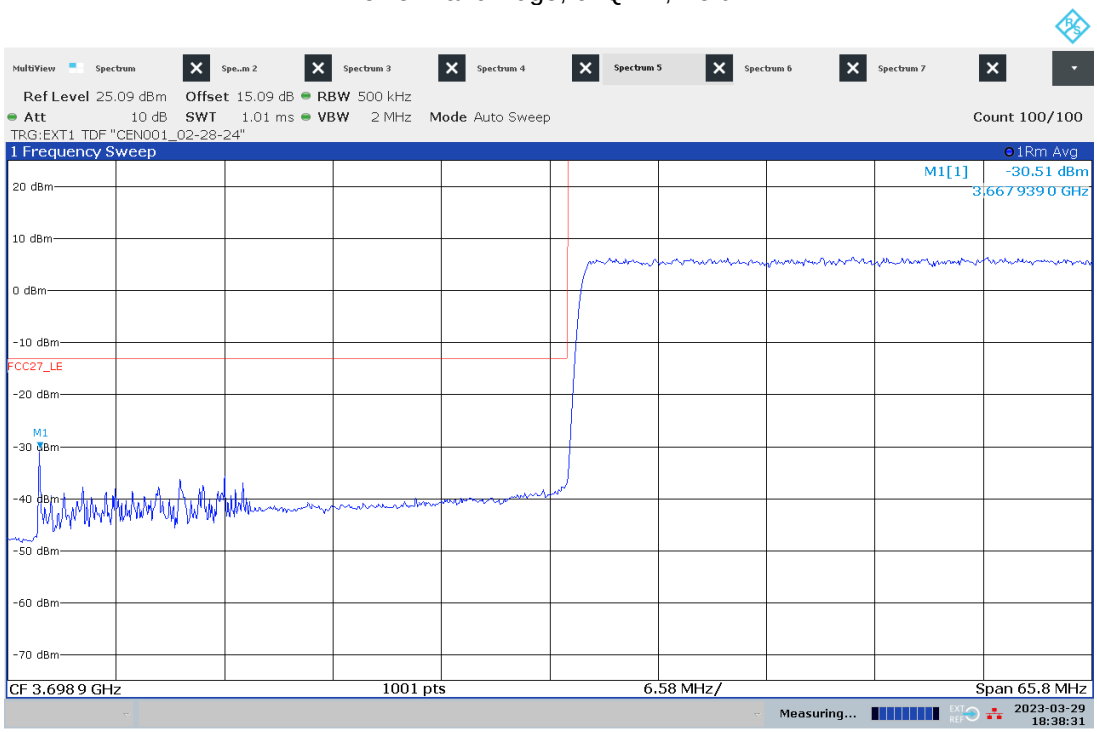
06:37:28 PM 03/29/2023

Lower Band Edge, 64QAM, Port 3



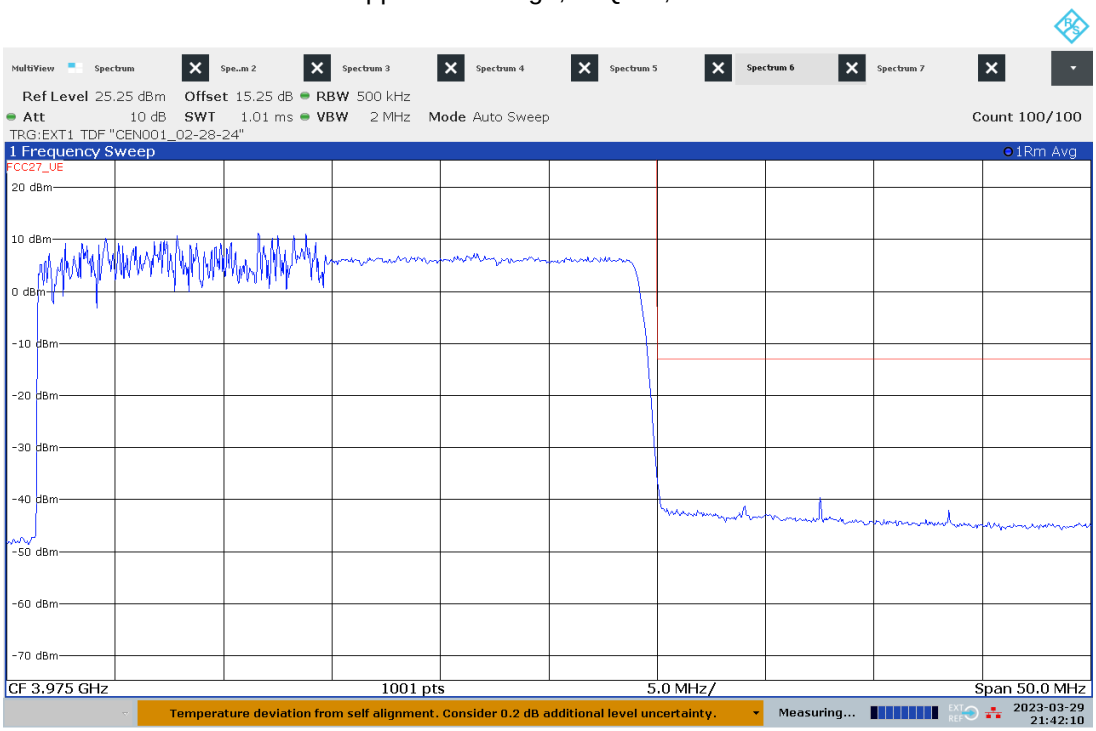
06:37:48 PM 03/29/2023

Lower Band Edge, 64QAM, Port 4



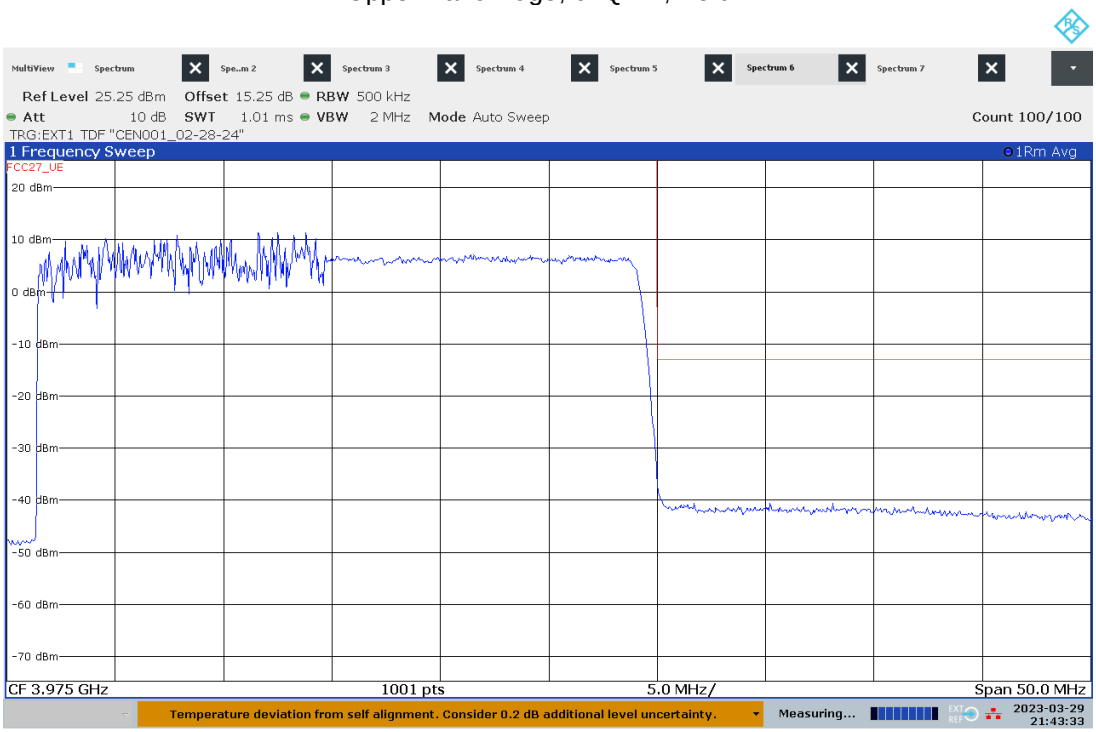
06:38:31 PM 03/29/2023

Upper Band Edge, 64QAM, Port 1



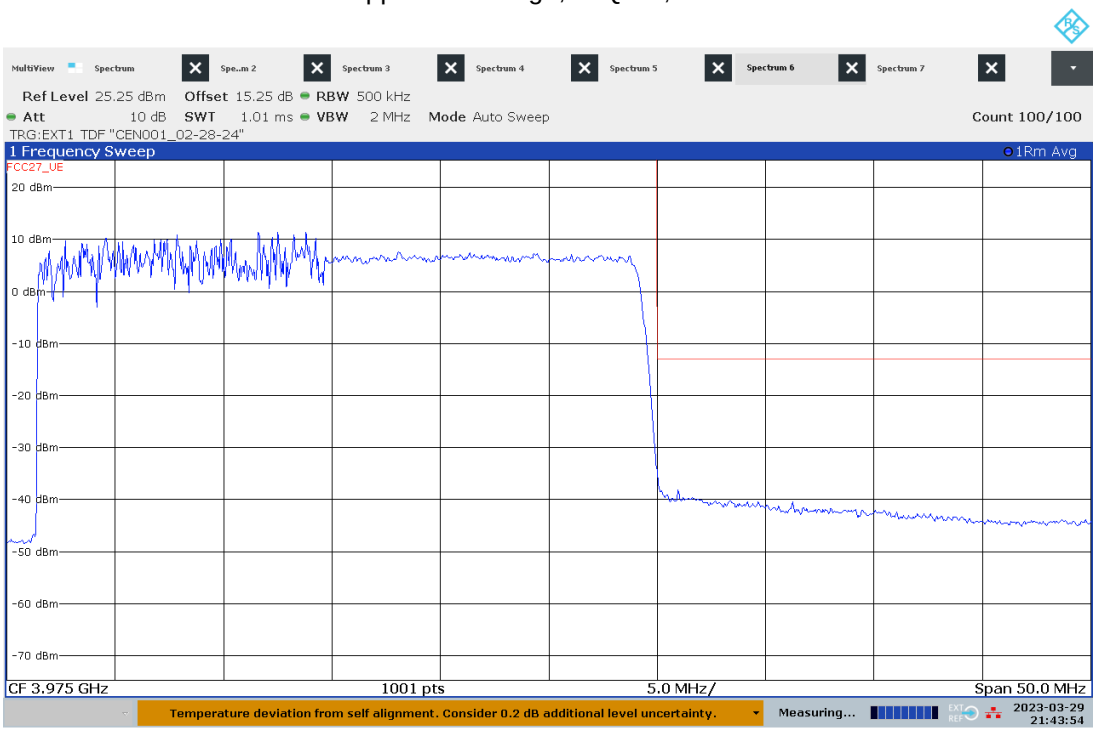
09:42:11 PM 03/29/2023

Upper Band Edge, 64QAM, Port 2



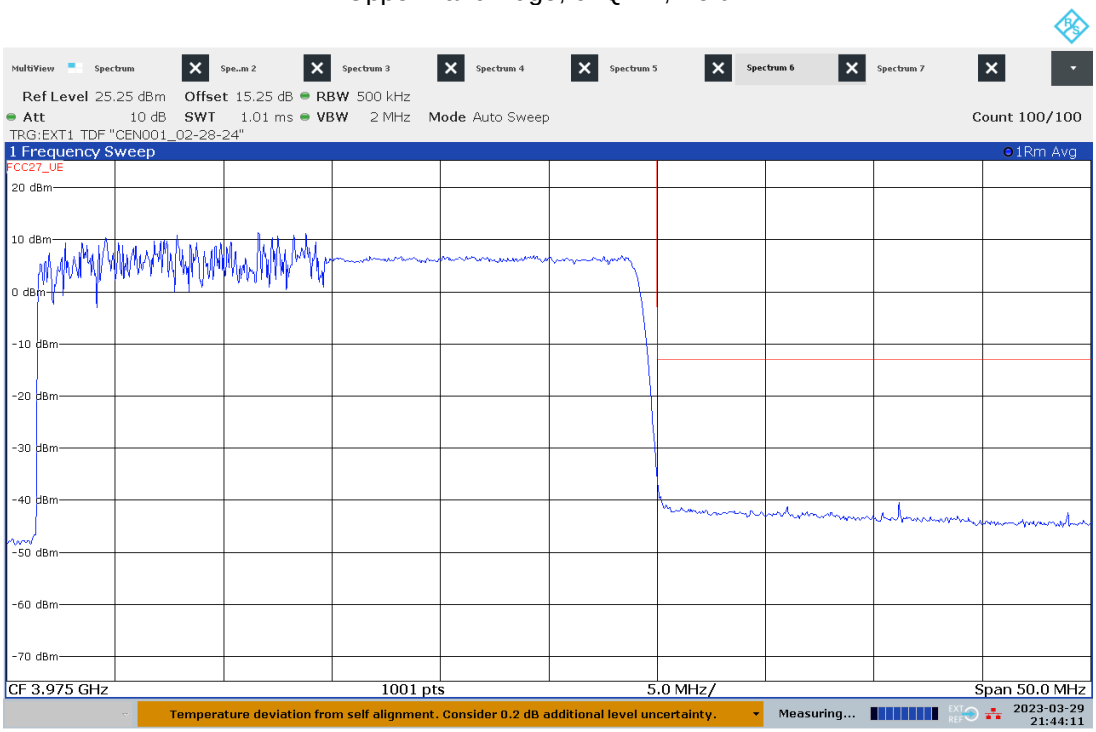
09:43:33 PM 03/29/2023

Upper Band Edge, 64QAM, Port 3



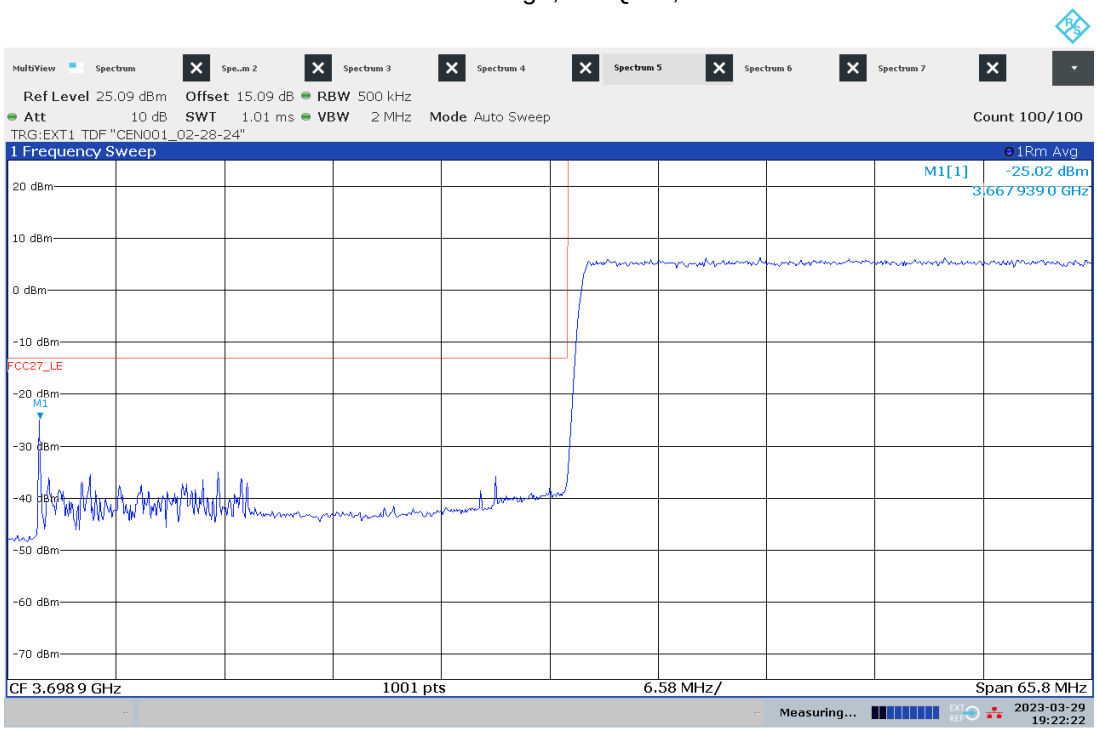
09:43:54 PM 03/29/2023

Upper Band Edge, 64QAM, Port 4



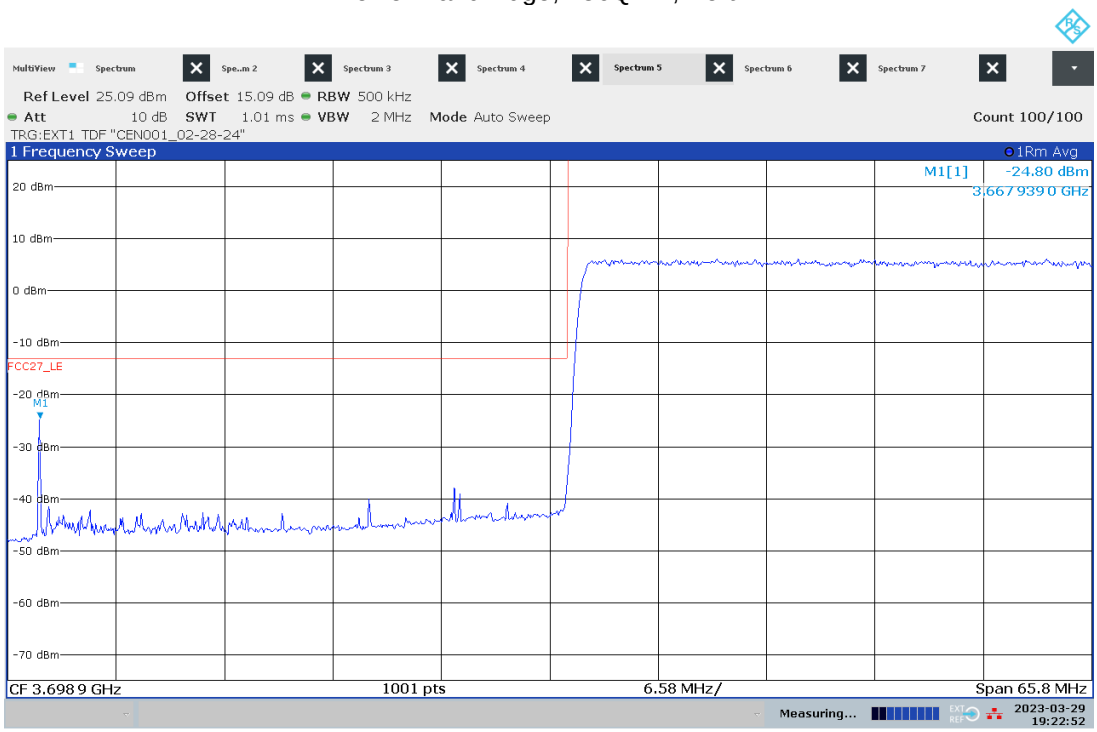
09:44:11 PM 03/29/2023

Lower Band Edge, 256QAM, Port 1



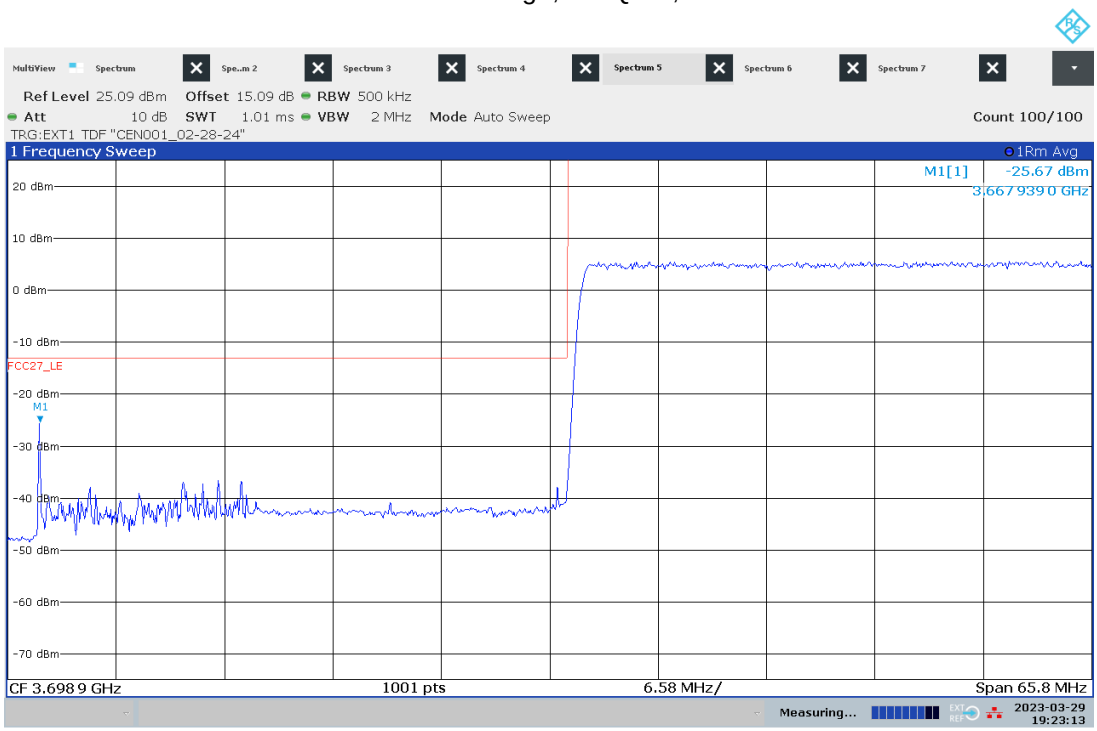
07:22:22 PM 03/29/2023

Lower Band Edge, 256QAM, Port 2



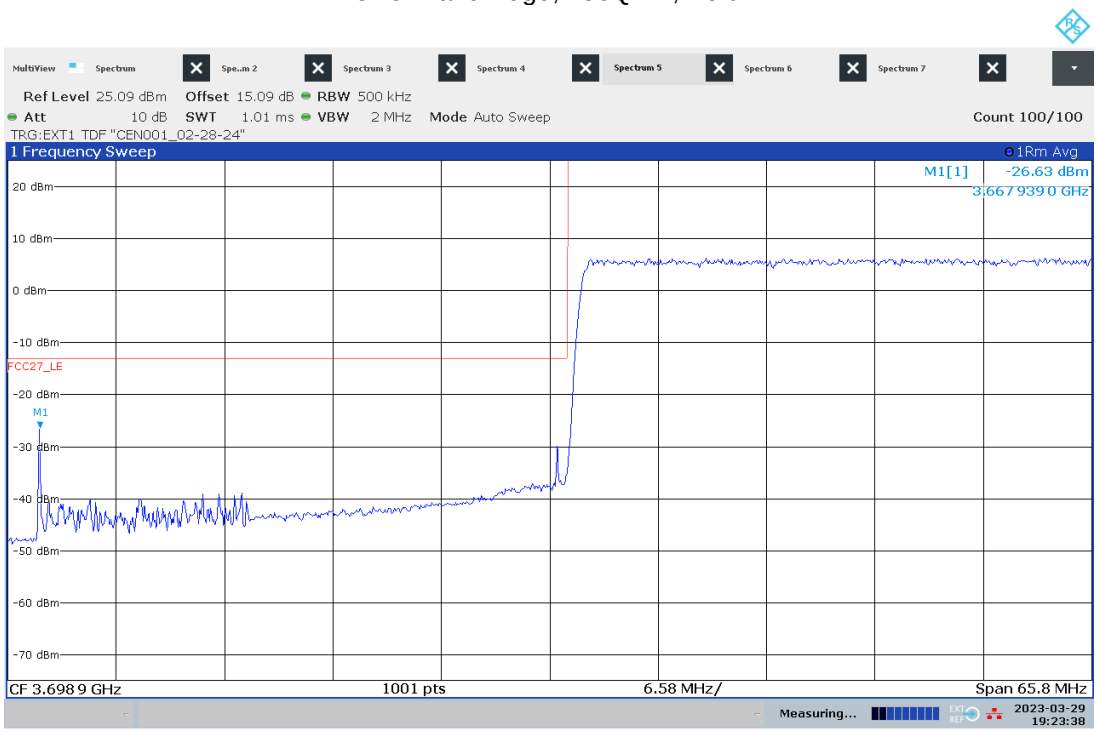
07:22:52 PM 03/29/2023

Lower Band Edge, 256QAM, Port 3



07:23:14 PM 03/29/2023

Lower Band Edge, 256QAM, Port 4

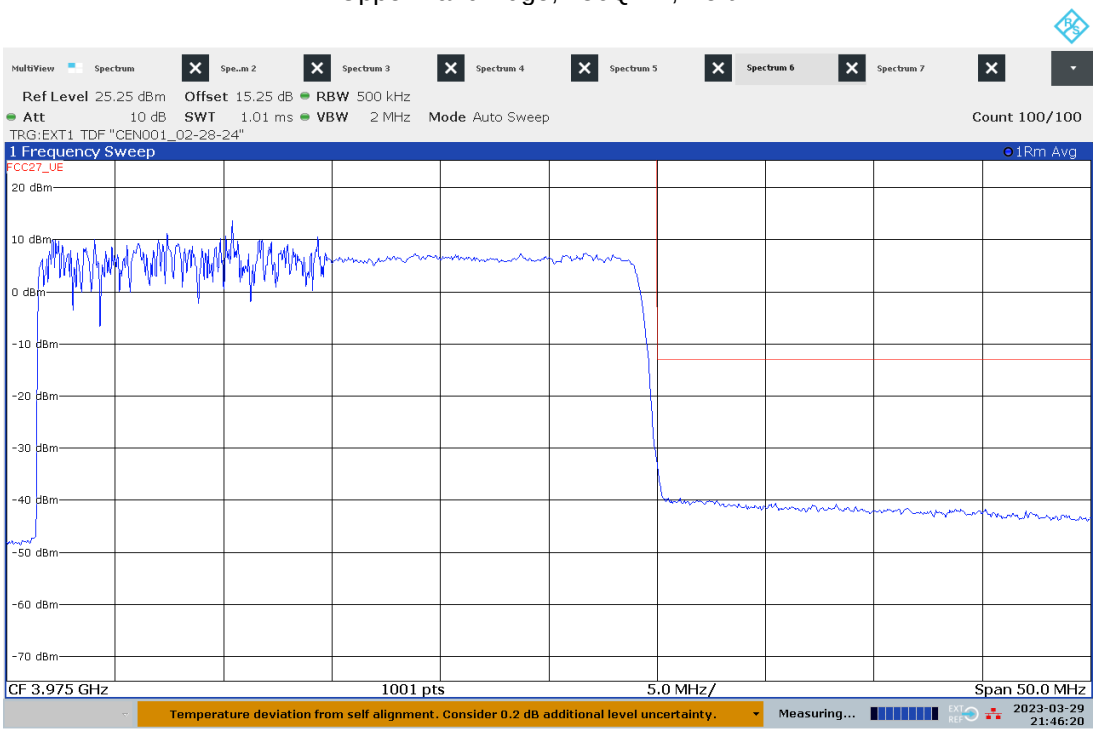


07:23:38 PM 03/29/2023

Upper Band Edge, 256QAM, Port 1

09:45:44 PM 03/29/2023

Upper Band Edge, 256QAM, Port 2

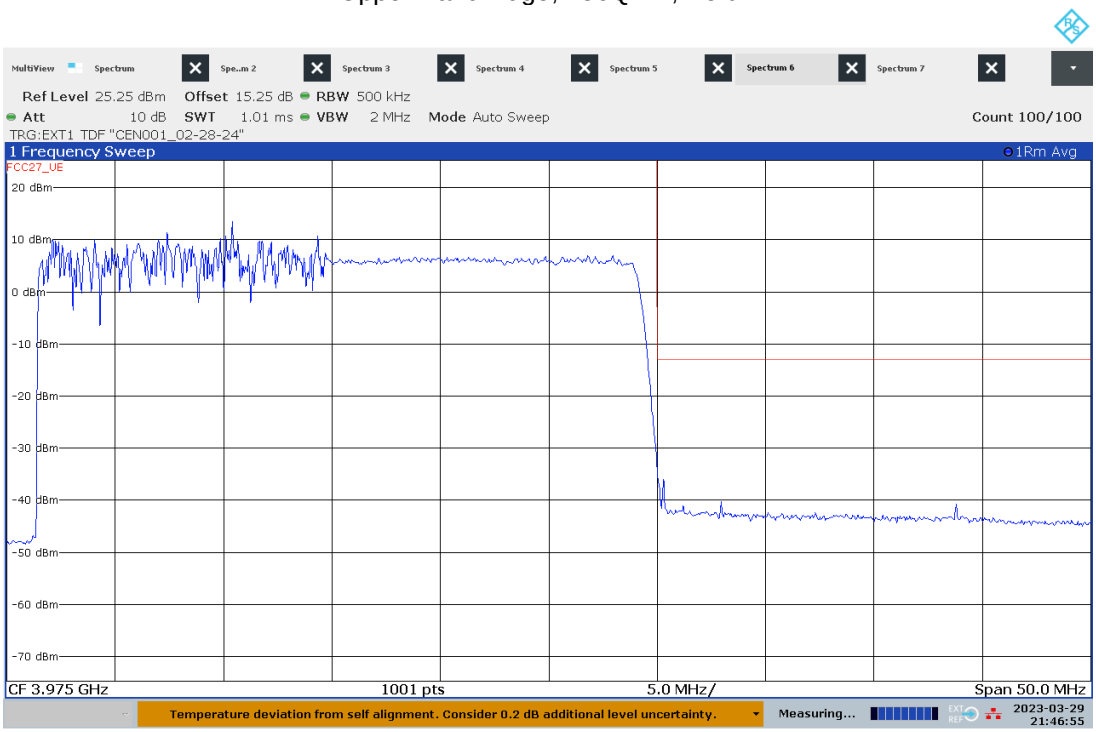


09:46:21 PM 03/29/2023

Upper Band Edge, 256QAM, Port 3

09:46:38 PM 03/29/2023

Upper Band Edge, 256QAM, Port 4



09:46:55 PM 03/29/2023

	Product Standard: FCC Title 47 CFR Part 27			Limit applied: See Report Section 10.2			
Test Date	Test Personnel/ Initials	Supervising Engineer/ Initials	Input Voltage	Mode	Atmospheric Data		
					Temp C°	Relative Humidity %	Atmospheric Pressure mbar
03/29/2023	Kouma Sinn KPS	Vathana Ven VJV	48V POE	Transmitting	23	21	1012

Deviations, Additions, or Exclusions: None

11 Antenna Port Conducted and Radiated Spurious Emissions

11.1 Method

Tests are performed in accordance with ANSI C63.4: 2014 and ANSI C63.26:2015.

11.2 Limits

FCC Part 27.53(l)(1) (1) For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (l)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

11.3 Test Site

Antenna Port Conducted Emissions Site:
The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Radiated Emissions Site:
The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	5.0 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.9 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.1 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	4.7 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	4.7 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

Alternately, when BAT-EMC Emission Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. The “Correction” includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the “Level” column.

11.4 Test Equipment Used:

Test equipment used for antenna port conducted

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV009	weather station	Davis Instruments	6351 Vantage VUE	DAV009	03/27/2023	03/27/2024
CEN001	DC-40GHz attenuator 20dB	cblhf201-5-2	C411-20	CEN001	02/28/2023	02/28/2024
ROS005-1	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	11/18/2022	11/18/2023
None	2m Mini SMA Cable	See Below	None	None	See below	See below
None	RF Switch Controller (DC-18 GHz)	Mini-Circuits	RC-2SP4T-A18	02202230028	See below	See below

Notes: The 2m Mini SMA cable and RF Switch Controller were provided by the manufacturer with the total as follows: Low Frequency, 3720 MHz, -15.09 dB; Mid frequency, 3840 MHz, -15.14 dB; High Frequency, 3960 MHz, -15.25 dB.

Software Utilized:

Name	Manufacturer	Version
None	N/A	N/A

Test equipment used for radiated emissions from 9 kHz-30 MHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	09/27/2022	09/27/2023
IW006'	DC-18GHz cable 8.4m long	Insulated Wire	2800-NPS	IW006	07/14/2022	07/14/2023
DAV006'	Weather Station	Davis	6250	MS191218071	02/21/2022	02/21/2024
IW002'	2 meter Armored cable	Insulated Wire	2800-NPS	002	10/11/2022	10/11/2023
IW002'	2 meter Armored cable	Insulated Wire	2800-NPS	002	10/11/2022	10/11/2023
145-414'	Cable 145-414	Huber + Suhner	3m Track A cable	145-414	07/09/2021	07/09/2022
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/23/2022	06/23/2023
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	09/06/2022	09/06/2023

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	NEXIO	3.18.0.16

Test equipment used for radiated emissions from 30-1000 MHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
145145'	Broadband Hybrid Antenna 30 MHz - 3 GHz	Sunol Sciences Corp.	JB3	A122313	06/16/2022	06/16/2023
145-408'	10m Chamber - 3m Track B In-floor Cable	Huber + Suhner	sucoflex 106-11000mm	001	07/14/2022	07/14/2023
PRE11'	50dB gain pre-amp	Pasternack	PRE11	PRE11	09/20/2022	09/20/2023
HS002'	DC-18GHz cable 1.5M long	Huber & Suhner	SucoFlex 106A	HS002	07/17/2022	07/17/2023
145-406'	10m Track A In-floor Cable #1	Huber + Suhner	sucoflex 160-19220mm	001	07/14/2022	07/14/2023
IW001'	2 meter cable	Insulated Wire	2801-NPS	001	07/14/2022	07/14/2023
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/23/2022	06/23/2023
DAV006'	Weather Station	Davis	6250	MS191218071	02/21/2022	02/21/2024

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	NEXIO	3.18.0.16

Test equipment used for radiated emissions from 1-18 GHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	09/27/2022	09/27/2023
IW006'	DC-18GHz cable 8.4m long	Insulated Wire	2800-NPS	IW006	07/14/2022	07/14/2023
PRE12'	Pre-amplifier	Com Power	PAM-118A	18040117	12/17/2022	12/17/2023
IW002'	2 meter Armored cable	Insulated Wire	2800-NPS	002	10/11/2022	10/11/2023
IW002'	2 meter Armored cable	Insulated Wire	2800-NPS	002	10/11/2022	10/11/2023
145-414'	Cable 145-414	Huber + Suhner	3m Track A cable	145-414	07/09/2021	07/09/2022
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/23/2022	06/23/2023
DAV006'	Weather Station	Davis	6250	MS191218071	02/21/2022	02/21/2024

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	NEXIO	3.18.0.16

Test equipment used for radiated emissions from 18-40 GHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
PRE9'	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	09/23/2022	09/23/2023
CBLHF2012-5M-2'	5m 9kHz-40GHz Coaxial Cable - SET2	Huber & Suhner	SF102	252676002	02/25/2023	02/25/2024
CBLHF2012-2M-2'	2m 9kHz-40GHz Coaxial Cable - SET2	Huber & Suhner	SF102	252675002	02/18/2023	02/18/2024
REA006'	18GHz High Pass Filter	Reactel, Inc	7HS-18G/40G K11	(06)1	04/28/2022	04/28/2023
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/23/2022	06/23/2023
ETS004'	18-40GHZ horn antenna	ets004	3116C	00218579	02/23/2023	02/23/2024
DAV006'	Weather Station	Davis	6250	MS191218071	02/21/2022	02/21/2024

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/2010

11.5 Results:

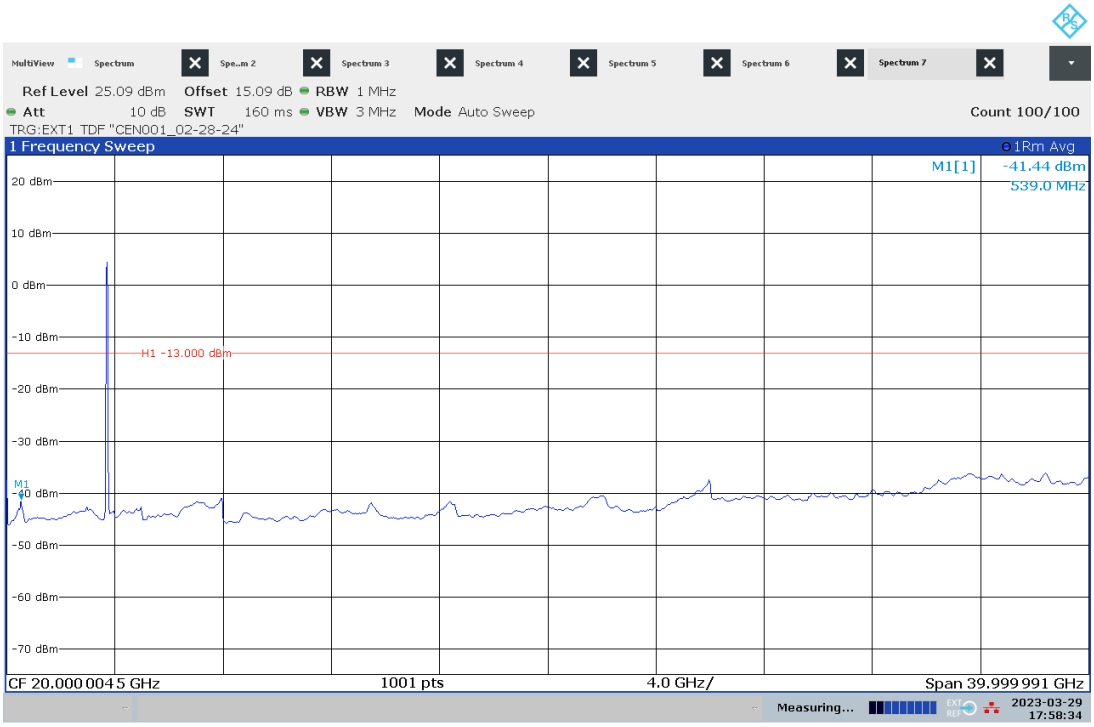
The sample tested was found to Comply.

11.6 Setup Photographs:

Confidential – Photos not included in this report.

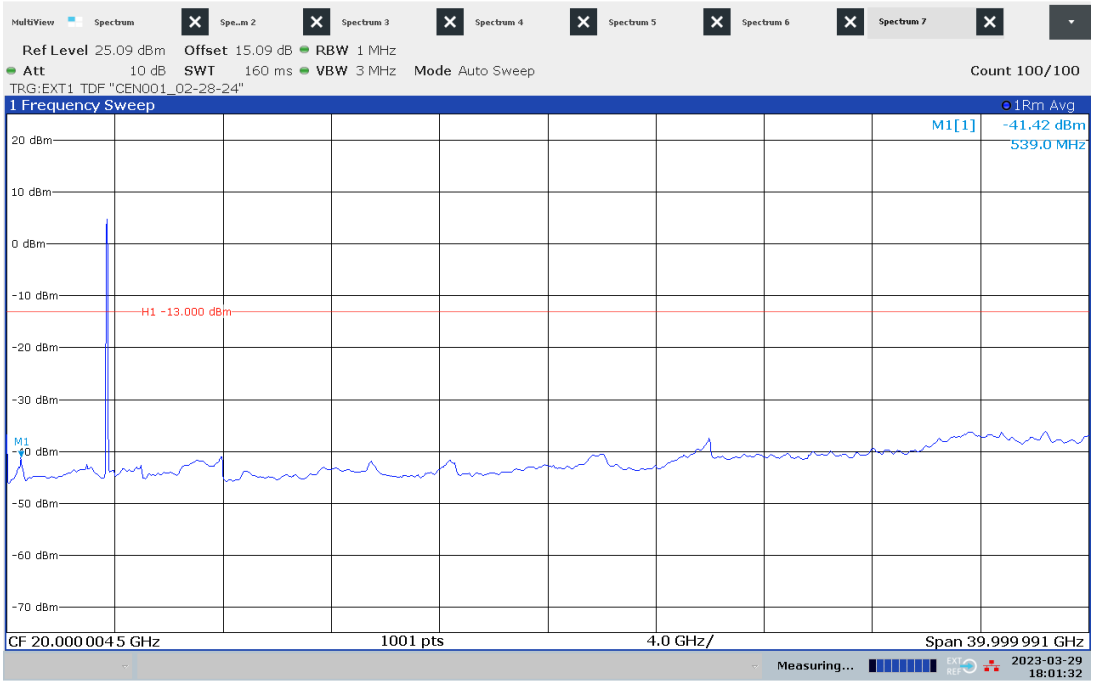
11.7 Plots/Data:

Antenna Port 1 Conducted Emissions – Low Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



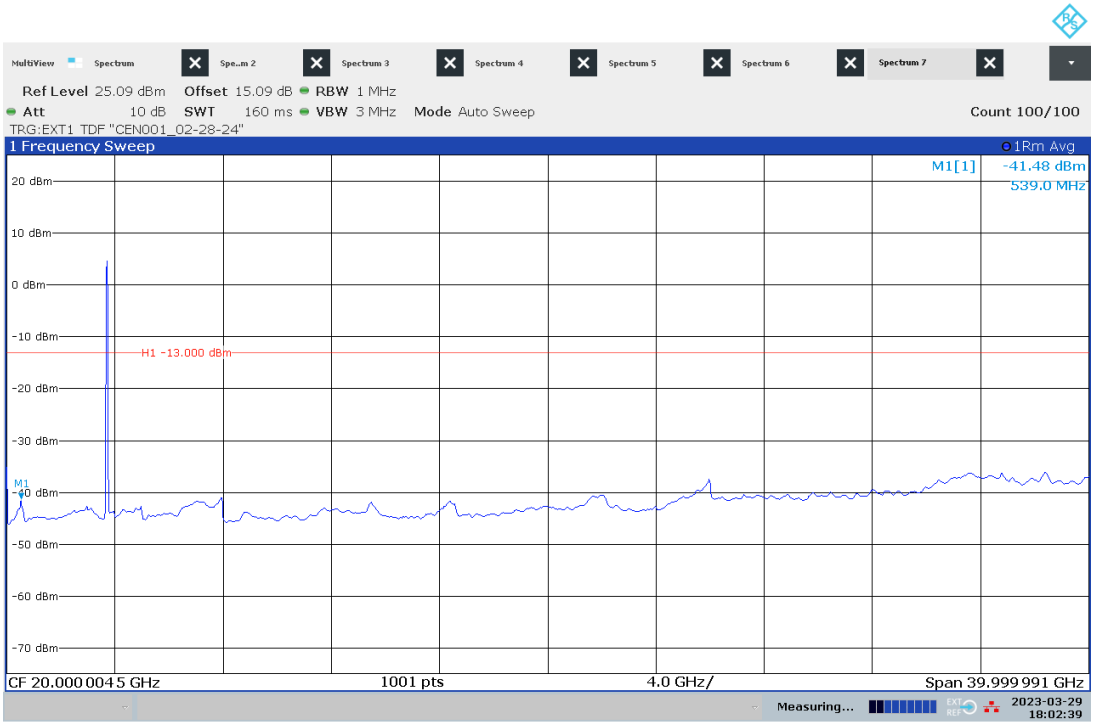
05:58:34 PM 03/29/2023

Antenna Port 2 Conducted Emissions – Low Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



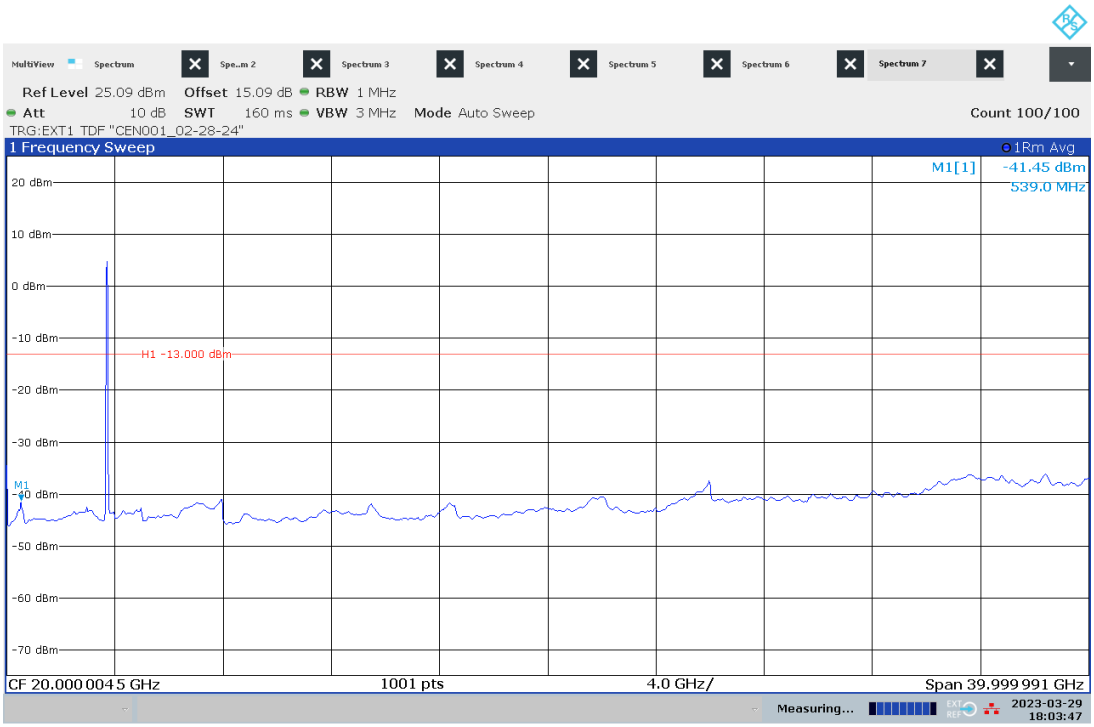
06:01:32 PM 03/29/2023

Antenna Port 3 Conducted Emissions – Low Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



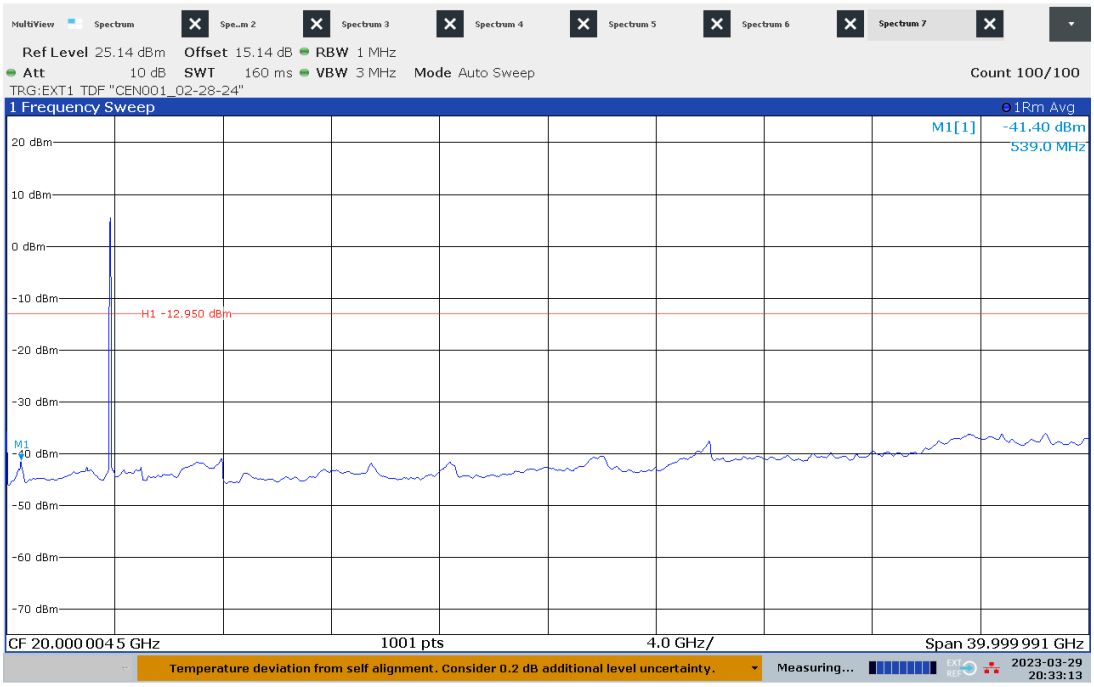
06:02:39 PM 03/29/2023

Antenna Port 4 Conducted Emissions – Low Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



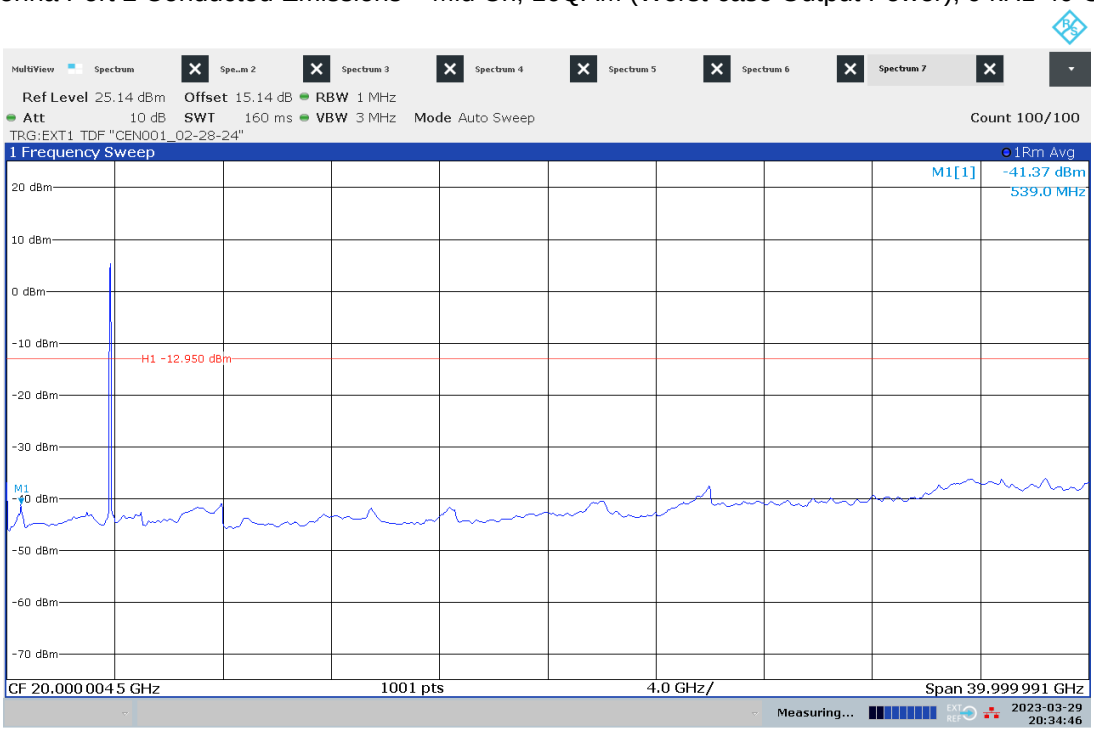
06:03:47 PM 03/29/2023

Antenna Port 1 Conducted Emissions – Mid Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



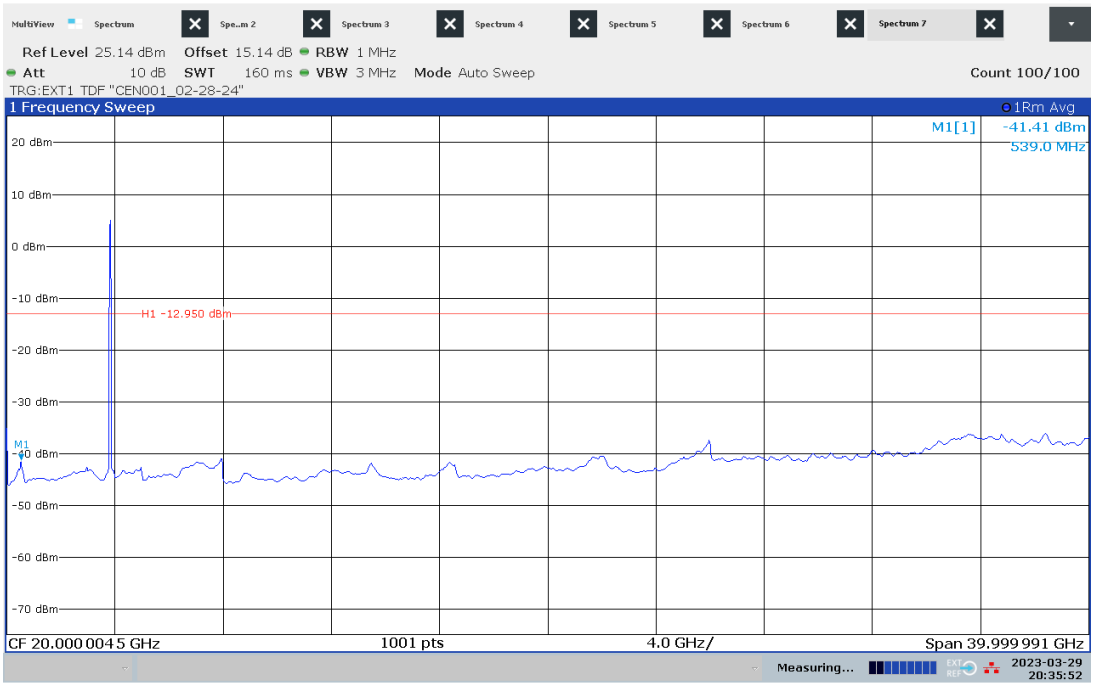
08:33:13 PM 03/29/2023

Antenna Port 2 Conducted Emissions – Mid Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



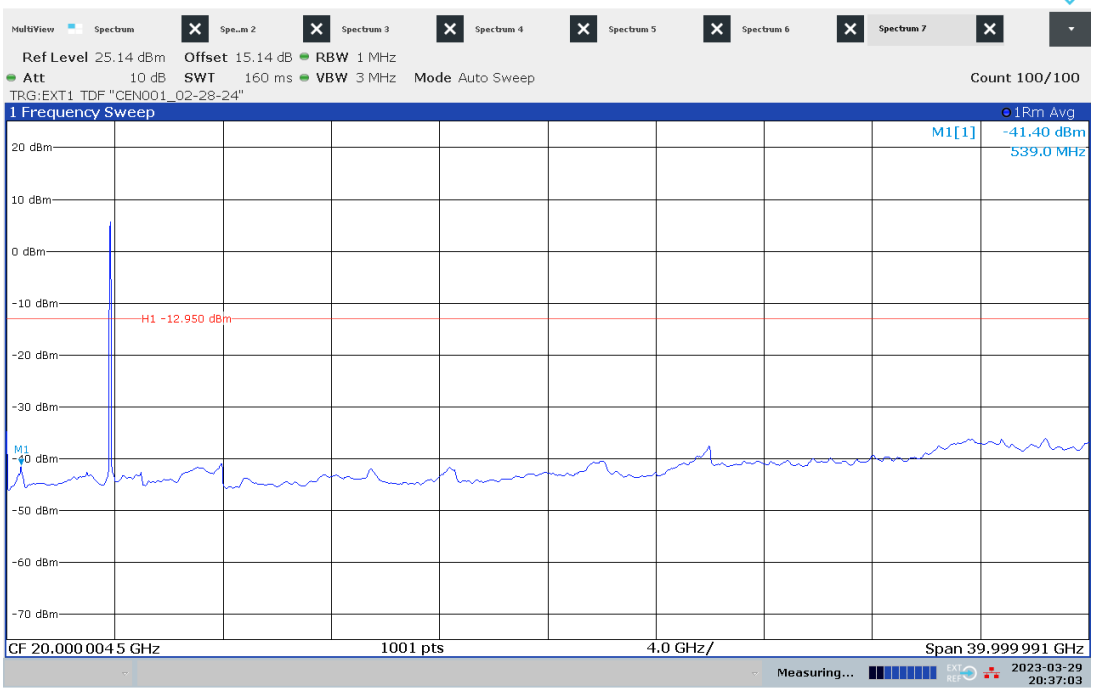
08:34:46 PM 03/29/2023

Antenna Port 3 Conducted Emissions – Mid Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



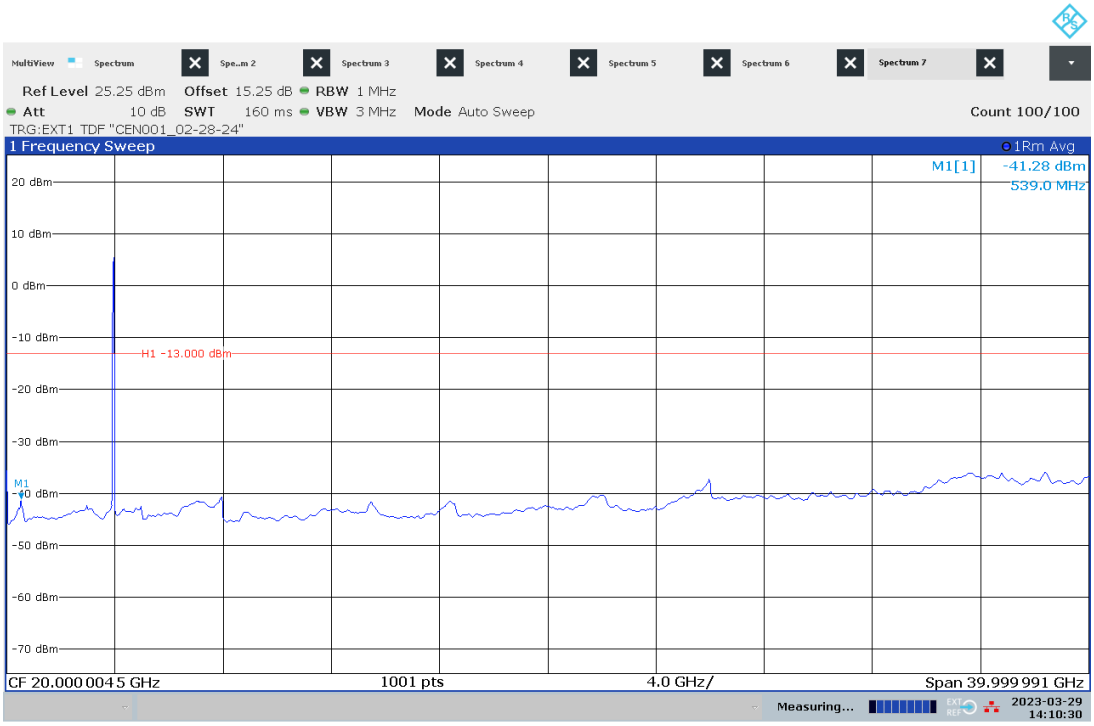
08:35:52 PM 03/29/2023

Antenna Port 4 Conducted Emissions – Mid Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



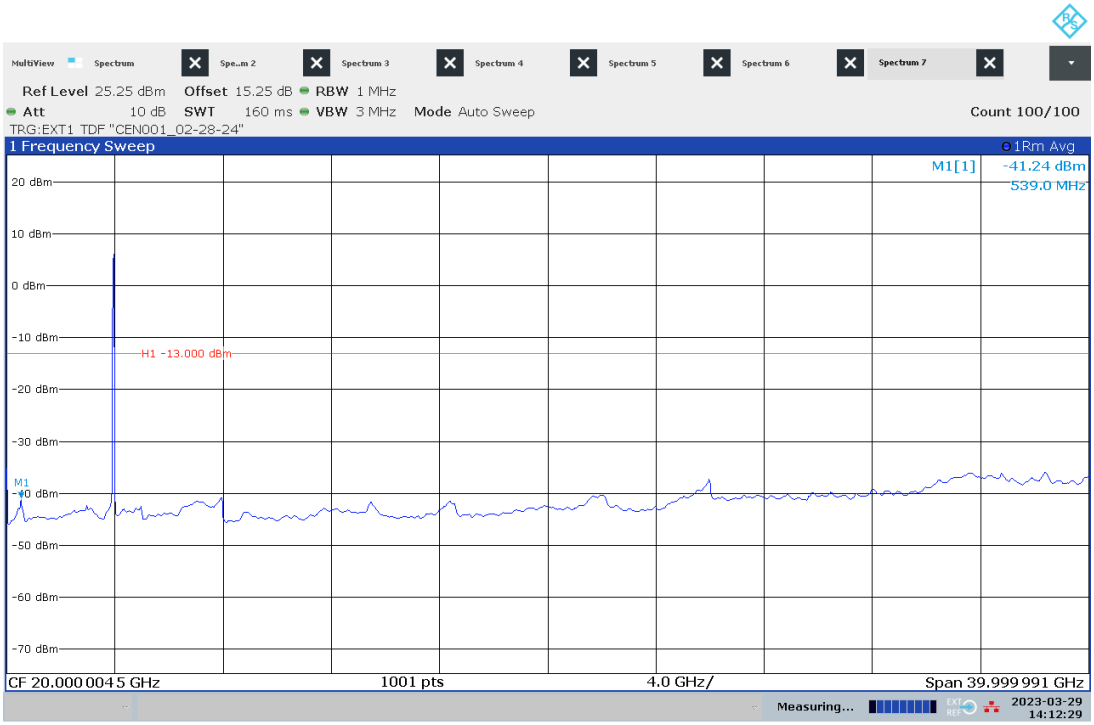
08:37:03 PM 03/29/2023

Antenna Port 1 Conducted Emissions – High Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



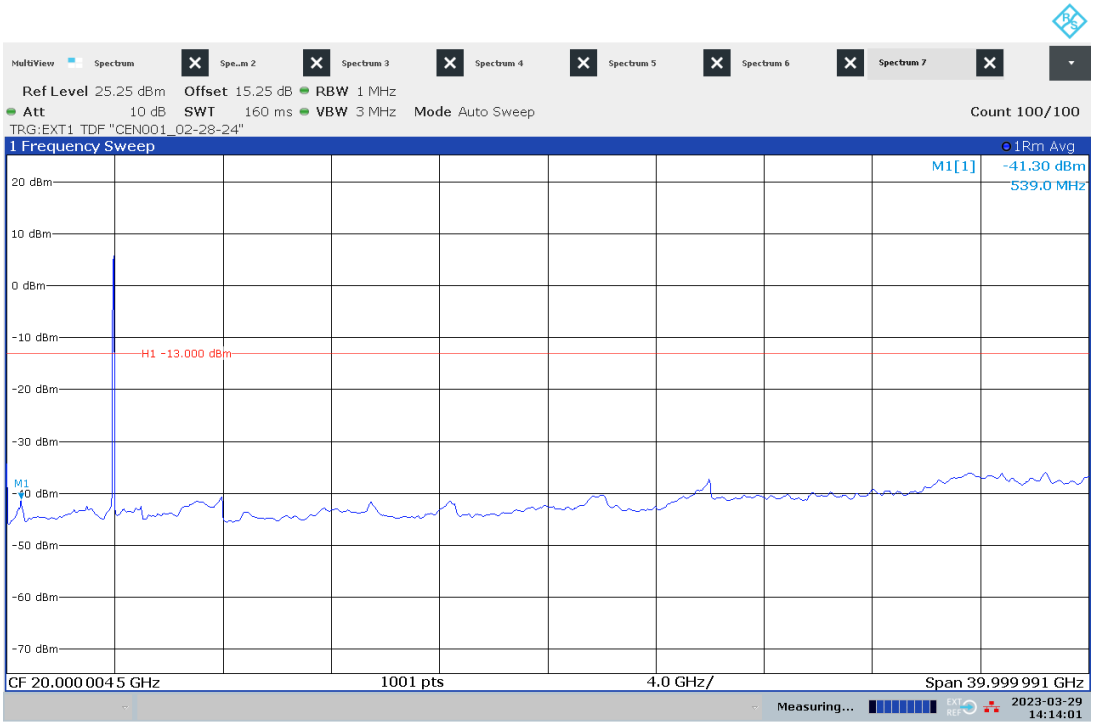
02:10:30 PM 03/29/2023

Antenna Port 2 Conducted Emissions – High Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



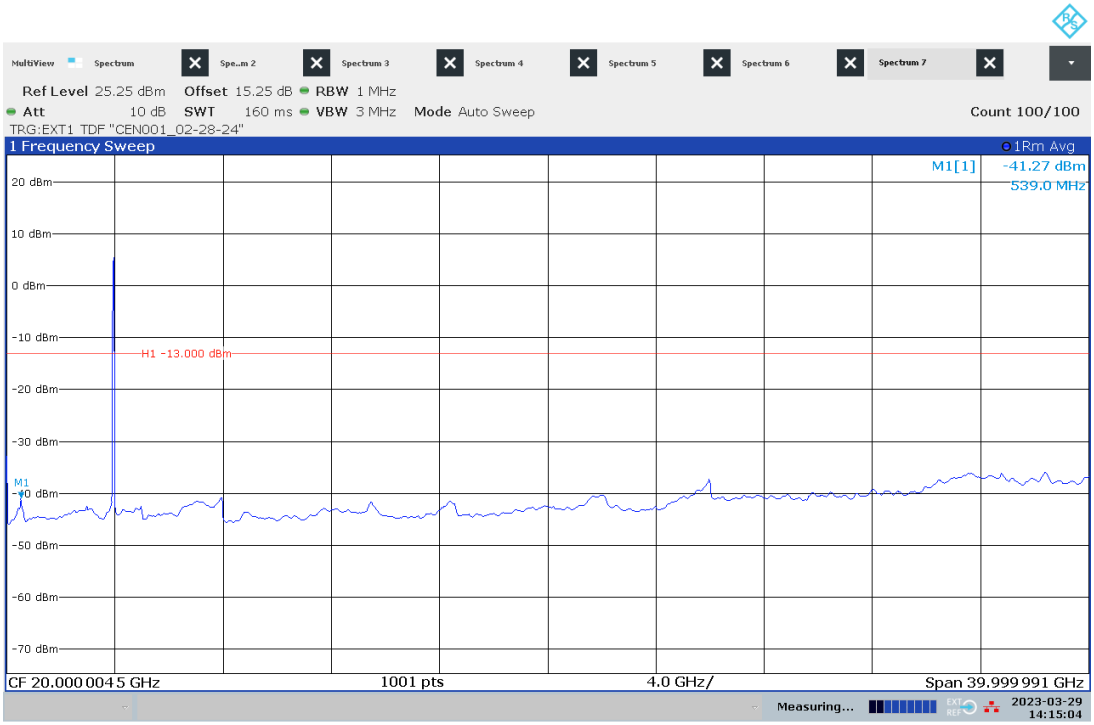
02:12:30 PM 03/29/2023

Antenna Port 3 Conducted Emissions – High Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



02:14:02 PM 03/29/2023

Antenna Port 4 Conducted Emissions – High Ch, 16QAM (Worst-case Output Power), 9 kHz-40 GHz



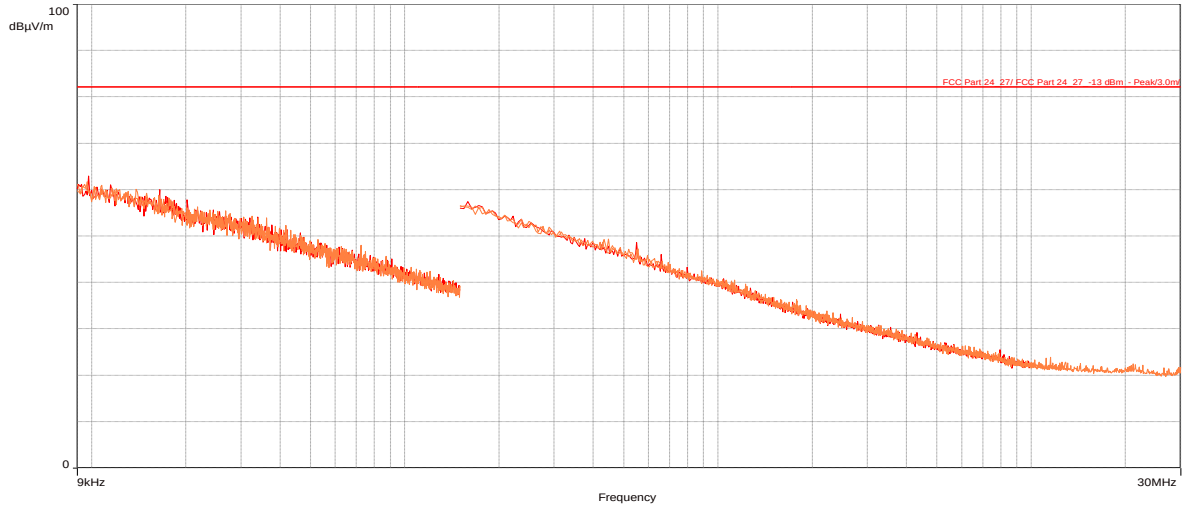
02:15:05 PM 03/29/2023

Radiated Emissions From 9 kHz-30 MHz, Transmit at Low Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/6/2023 4:42:56 PM
Client and Project Number	Commscope_G105382536
Engineer	Vathana Ven
Temperature	24 deg C
Humidity	32 %
Atmospheric Pressure	1007 mB
Comments	RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location (FCC Part 27), Tx Low CH_16QAM Worst-case output power

Graph:



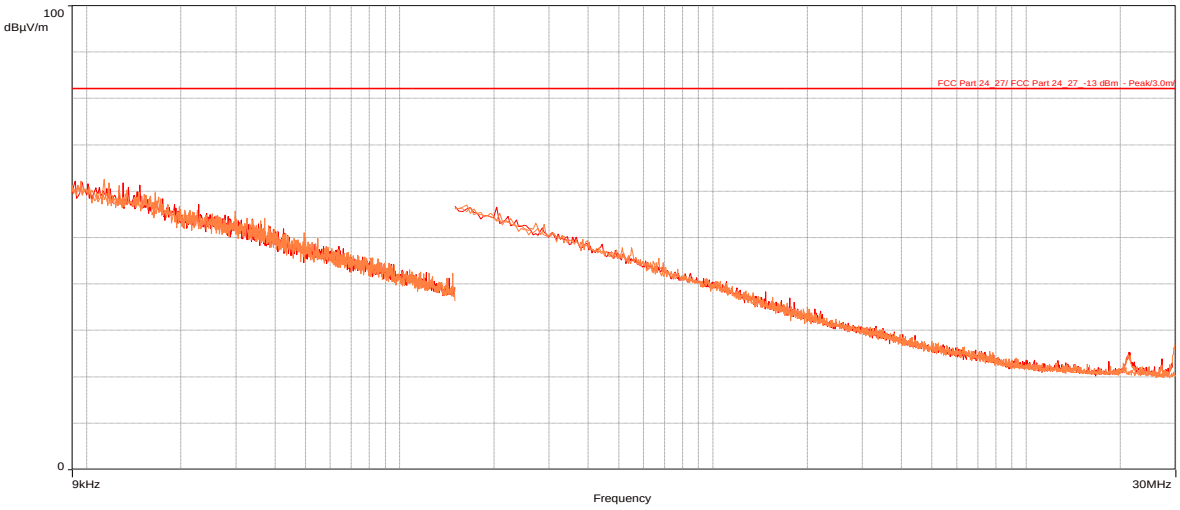
Results: No emissions were detected.

Radiated Emissions From 9 kHz-30 MHz, Transmit at Mid Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/6/2023 7:02:57 PM
Client and Project Number	Commscope_G105382536
Engineer	Vathana Ven
Temperature	24 deg C
Humidity	32 %
Atmospheric Pressure	1007 mB
Comments	RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location (FCC Part 27)_Tx Mid CH_16QAM Worst-case output power

Graph:



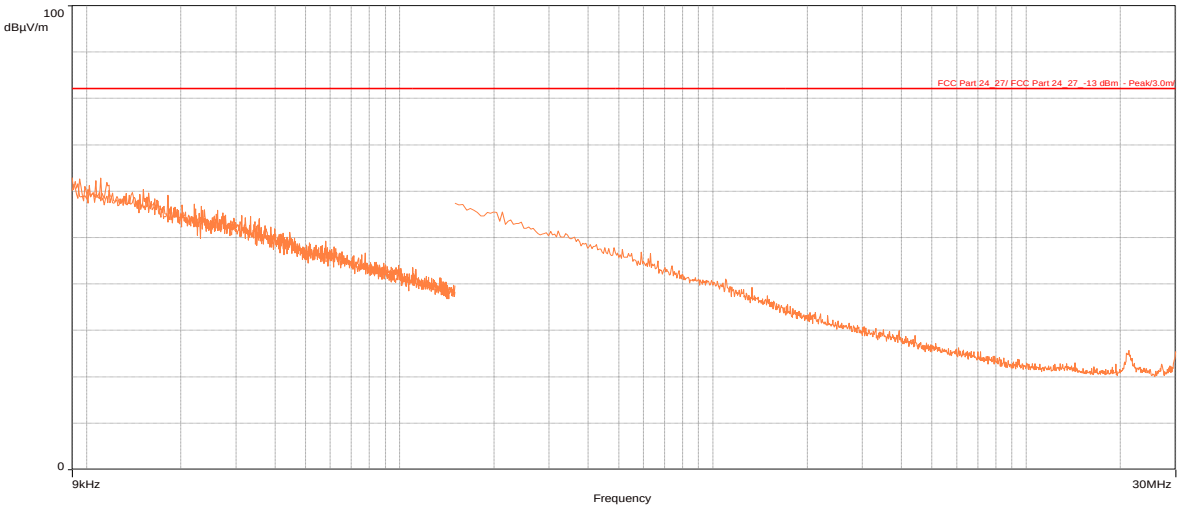
Results: No emissions were detected.

Radiated Emissions From 9 kHz-30 MHz, Transmit at High Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/6/2023 9:53:45 PM
Client and Project Number	Commscope_G105382536
Engineer	Vathana Ven
Temperature	24 deg C
Humidity	32 %
Atmospheric Pressure	1007 mB
Comments	RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location (FCC Part 27)_Tx High CH_16QAM Worst-case output power

Graph:



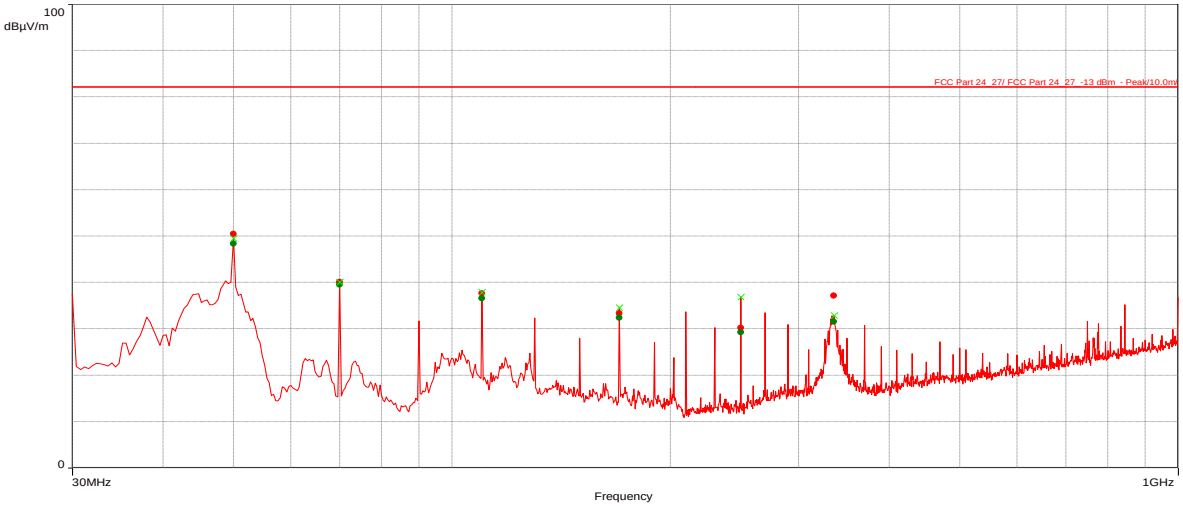
Results: No emissions were detected.

Radiated Emissions From 30 MHz-1000 MHz, Transmit at Low Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/7/2023 4:44:59 PM
Client and Project Number	Commscope_G105382536
Engineer	Vathana Ven
Temperature	24 deg C
Humidity	25 %
Atmospheric Pressure	1012 mB
Comments	RE 30-1000MHz_POE_Tx Low CH_16QAM_Worst-case output power

Graph:



Results:

Peak (PASS) (6)

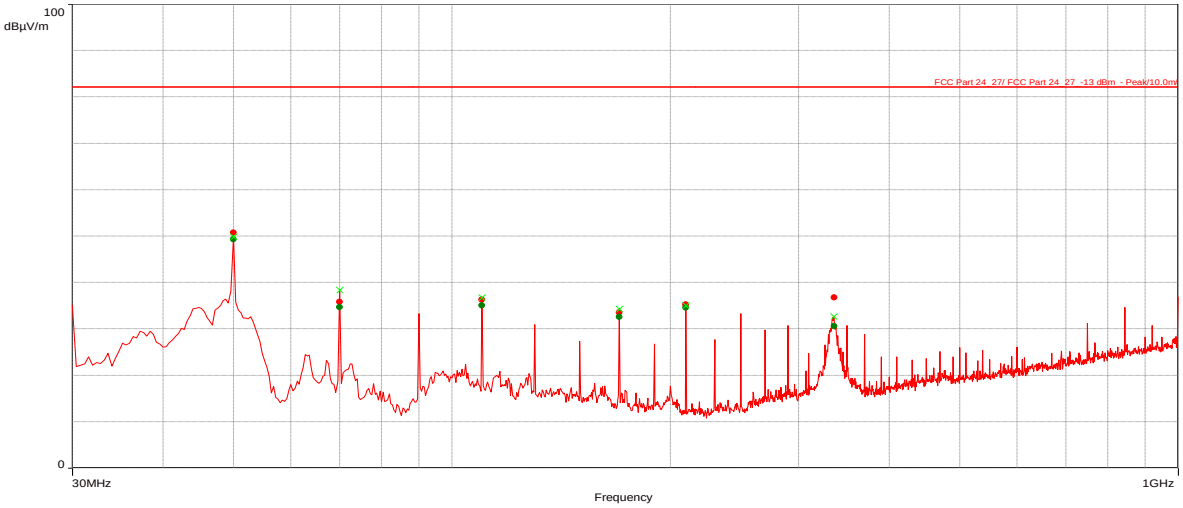
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
50	50.48	82.16	-31.68	232.00	1.49	Vertical	120k	-25.07
70	40.09	82.16	-41.07	5.00	2.11	Vertical	120k	-24.75
110	37.66	82.16	-44.50	192.00	2.29	Vertical	120k	-19.91
170	33.40	82.16	-48.76	161.00	1.53	Vertical	120k	-20.28
250	30.24	82.16	-51.92	198.00	1.00	Vertical	120k	-20.17
335.7473684	37.21	82.16	-44.95	229.00	3.28	Horizontal	120k	-17.32

Radiated Emissions From 30 MHz-1000 MHz, Transmit at Mid Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/7/2023 5:31:23 PM
Client and Project Number	Commscope_G105382536
Engineer	Vathana Ven
Temperature	24 deg C
Humidity	25 %
Atmospheric Pressure	1012 mB
Comments	RE 30-1000MHz_POE_Tx Mid CH_16QAM_Worst-case output power

Graph:



Results:

Peak (PASS) (6)

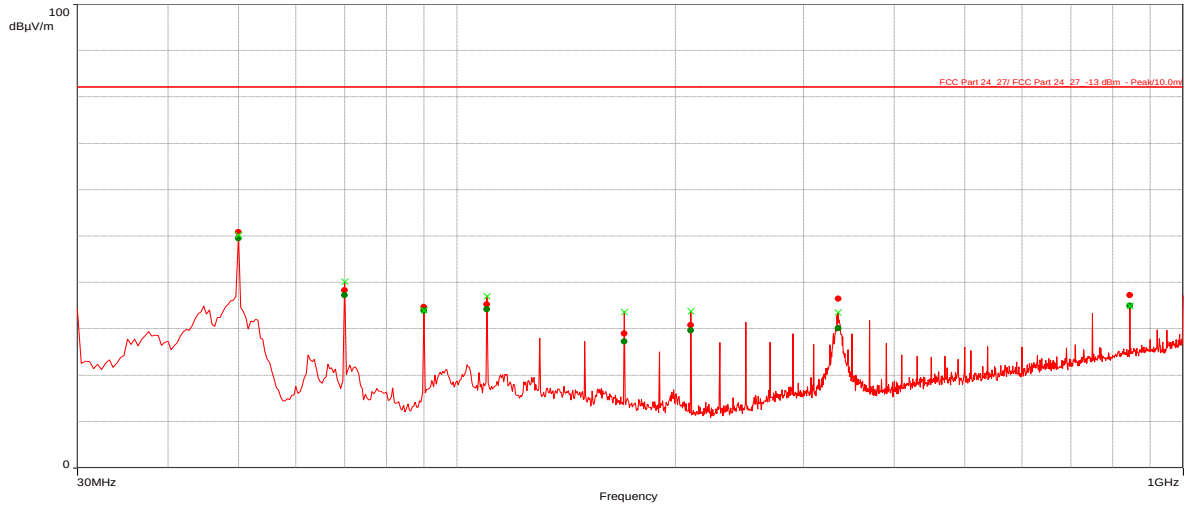
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
50	50.77	82.16	-31.39	185.00	2.11	Vertical	120k	-25.07
70	35.87	82.16	-46.29	249.00	2.15	Vertical	120k	-24.75
110	36.29	82.16	-45.87	189.00	2.08	Vertical	120k	-19.91
170	33.52	82.16	-48.64	254.00	3.62	Horizontal	120k	-20.28
210	35.27	82.16	-46.89	234.00	1.00	Vertical	120k	-21.48
335.9157895	36.78	82.16	-45.38	213.00	2.27	Horizontal	120k	-17.32

Radiated Emissions From 30 MHz-1000 MHz, Transmit at High Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/7/2023 6:08:54 PM
Client and Project Number	Commscope_G105382536
Engineer	Vathana Ven
Temperature	24 deg C
Humidity	25 %
Atmospheric Pressure	1012 mB
Comments	RE 30-1000MHz_POE_Tx High CH_16QAM_Worst-case output power

Graph:



Results:

Peak (PASS) (8)

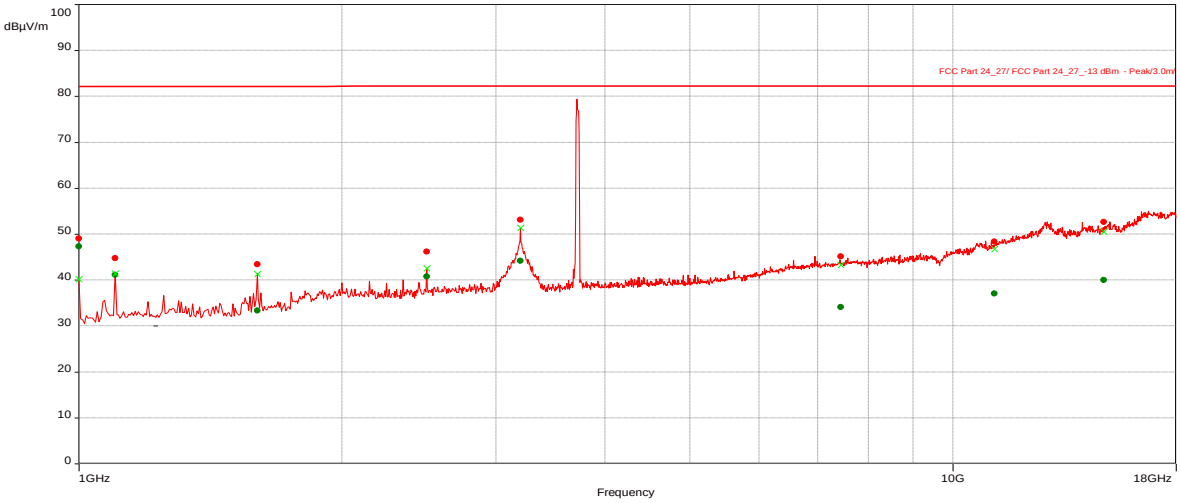
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	RBW	Correction (dB)
50	50.86	82.16	-31.30	173.00	1.68	Vertical	120000.00	120k	-25.07
70	38.32	82.16	-43.84	359.00	2.37	Vertical	120000.00	120k	-24.75
90	34.72	82.16	-47.44	25.00	1.27	Vertical	120000.00	120k	-24.99
110	35.27	82.16	-46.89	164.00	2.24	Vertical	120000.00	120k	-19.91
170	29.04	82.16	-53.12	250.00	3.53	Horizontal	120000.00	120k	-20.28
210	30.79	82.16	-51.37	239.00	1.00	Vertical	120000.00	120k	-21.48
335.0526316	36.46	82.16	-45.70	223.00	3.09	Horizontal	120000.00	120k	-17.32
844.8	37.31	82.16	-44.85	45.00	1.00	Horizontal	120000.00	120k	-6.50

Radiated Emissions From 1-40 GHz, Transmit at Low Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/12/2023 6:22:33 PM
Client and Project Number	CommScope
Engineer	Kouma Sinn
Temperature	23 C
Humidity	25 %
Atmospheric Pressure	997 mbar
Comments	Scan 1: RE 1-18 GHz_POE_Tx Low CH_16QAM_Worst-case output power

Graph:



Results:

Peak (PASS) (8)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
1000	49.02	82.16	-33.14	208.00	1.81	Vertical	1M	-9.44
1100	44.81	82.16	-37.36	162.00	1.51	Horizontal	1M	-9.34
1600	43.46	82.18	-38.72	163.00	1.00	Horizontal	1M	-8.46
2500	46.19	82.19	-36.00	40.00	1.00	Vertical	1M	-3.80
3200	53.12	82.20	-29.08	161.00	1.27	Horizontal	1M	6.67
7438.421053	45.16	82.23	-37.07	87.00	1.85	Vertical	1M	3.74
11158.15789	48.43	82.24	-33.82	26.00	1.27	Horizontal	1M	9.14
14878.94737	52.71	82.25	-29.55	26.00	3.79	Horizontal	1M	14.43

Average (PASS) (8)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
1000	47.39	--	208.00	1.81	Vertical	1M	-9.44
1100	41.21	--	162.00	1.51	Horizontal	1M	-9.34
1600	33.40	--	163.00	1.00	Horizontal	1M	-8.46
2500	40.77	--	40.00	1.00	Vertical	1M	-3.80
3200	44.21	--	161.00	1.27	Horizontal	1M	6.67
7438.421053	34.11	--	87.00	1.85	Vertical	1M	3.74
11158.15789	37.03	--	26.00	1.27	Horizontal	1M	9.14
14878.94737	40.01	--	26.00	3.79	Horizontal	1M	14.43

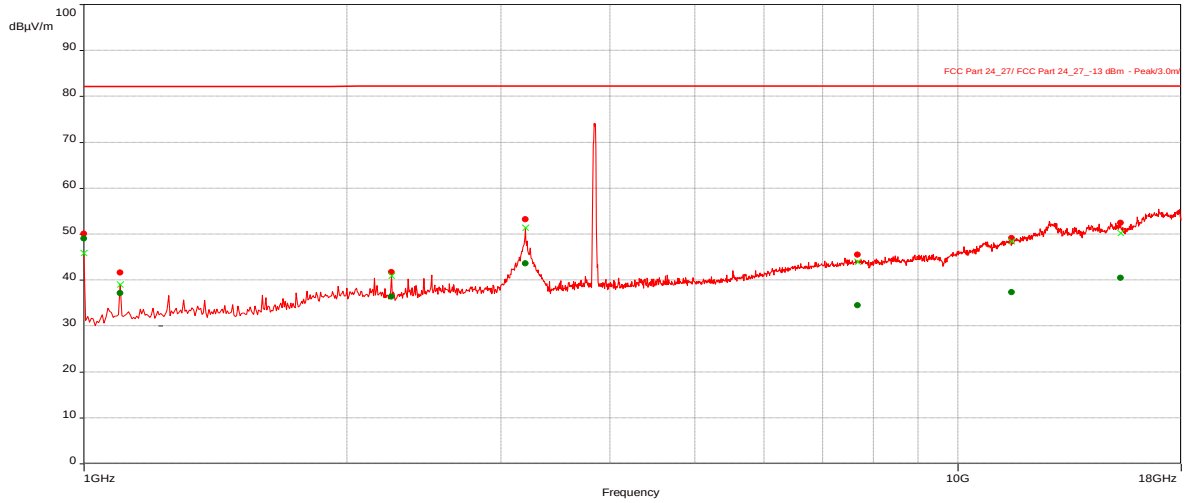
Notes: The highest peak on the plot is the fundamental frequency at 3720 MHz. Manual scan was performed around the EUT at a distance of 10 cm with no emission was detected above instrument noise floor.

Radiated Emissions From 1-40 GHz, Transmit at Mid Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/12/2023 7:02:22 PM
Client and Project Number	CommScope
Engineer	Kouma Sinn
Temperature	23 C
Humidity	25 %
Atmospheric Pressure	997 mbar
Comments	Scan 2: RE 1-18 GHz_POE_Tx Mid CH_16QAM_Worst-case output power

Graph:



Results:

Peak (PASS) (7)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
1000	50.09	82.16	-32.07	210.00	1.74	Vertical	1M	-9.44
1100	41.67	82.16	-40.49	15.00	1.41	Vertical	1M	-9.34
2250	41.75	82.19	-40.44	15.00	1.27	Vertical	1M	-5.12
3200	53.26	82.20	-28.94	293.00	1.51	Horizontal	1M	6.67
7682.368421	45.56	82.23	-36.67	207.00	2.52	Vertical	1M	4.28
11515	49.12	82.24	-33.12	144.00	3.29	Vertical	1M	9.62
15357.89474	52.51	82.25	-29.74	341.00	2.28	Vertical	1M	14.62

Average (PASS) (7)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
1000	49.09	--	210.00	1.74	Vertical	1M	-9.44
1100	37.14	--	15.00	1.41	Vertical	1M	-9.34
2250	36.45	--	15.00	1.27	Vertical	1M	-5.12
3200	43.68	--	293.00	1.51	Horizontal	1M	6.67
7682.368421	34.56	--	207.00	2.52	Vertical	1M	4.28
11515	37.40	--	144.00	3.29	Vertical	1M	9.62
15357.89474	40.49	--	341.00	2.28	Vertical	1M	14.62

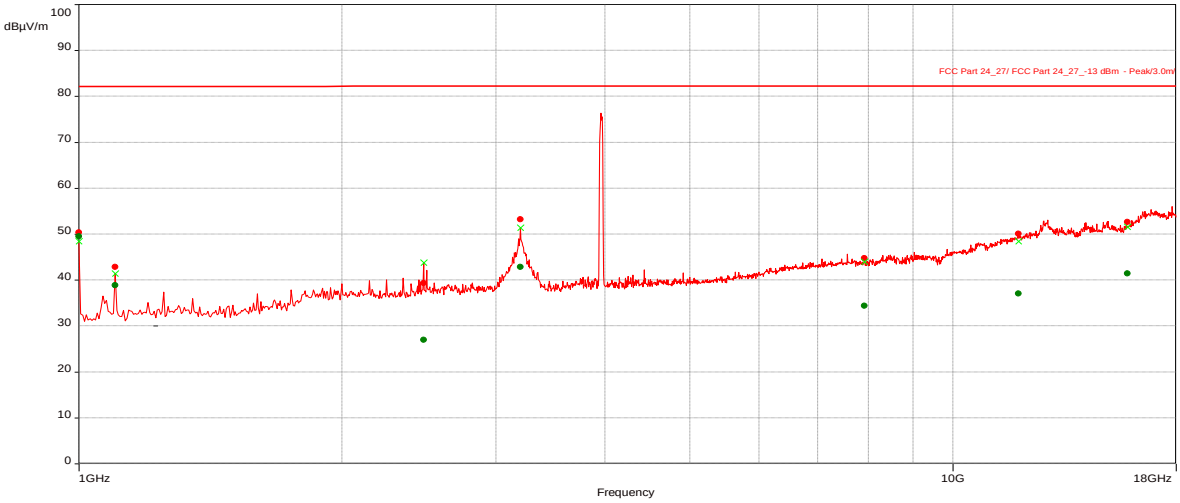
Notes: The highest peak on the plot is the fundamental frequency at 3840 MHz. Manual scan was performed around the EUT at a distance of 10 cm with no emission was detected above instrument noise floor.

Radiated Emissions From 1-40 GHz, Transmit at High Channel, 16QAM Modulation (Worst-case Output Power)

Test Information:

Date and Time	4/12/2023 7:56:43 PM
Client and Project Number	CommScope
Engineer	Kouma Sinn
Temperature	23 C
Humidity	25 %
Atmospheric Pressure	997 mbar
Comments	Scan 3: RE 30-1000MHz_POE_Tx High CH_16QAM_Worst-case output power

Graph:



Results:

Peak (PASS) (7)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
1000	50.36	82.16	-31.80	207.00	1.74	Vertical	1M	-9.44
1100	42.88	82.16	-39.29	136.00	1.38	Horizontal	1M	-9.34
2480.526316	39.34	82.19	-42.85	285.00	1.44	Vertical	1M	-4.04
3200	53.26	82.20	-28.94	150.00	1.98	Horizontal	1M	6.67
7921.578947	44.78	82.23	-37.45	0.00	2.32	Vertical	1M	4.68
11881.05263	50.09	82.25	-32.15	313.00	3.86	Vertical	1M	10.07
15838.94737	52.66	82.26	-29.60	139.00	1.04	Vertical	1M	15.27

Average (PASS) (7)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
1000	49.53	--	207.00	1.74	Vertical	1M	-9.44
1100	38.84	--	136.00	1.38	Horizontal	1M	-9.34
2480.526316	26.96	--	285.00	1.44	Vertical	1M	-4.04
3200	42.86	--	150.00	1.98	Horizontal	1M	6.67
7921.578947	34.41	--	0.00	2.32	Vertical	1M	4.68
11881.05263	37.04	--	313.00	3.86	Vertical	1M	10.07
15838.94737	41.43	--	139.00	1.04	Vertical	1M	15.27

Notes: The highest peak on the plot is the fundamental frequency at 3720 MHz. Manual scan was performed around the EUT at a distance of 10 cm with no emission was detected above instrument noise floor.

	Product Standard: FCC Title 47 CFR Part 27			Limit applied: See Section 11.2 Pretest Verification w/BB source:			
Test Date	Test Personnel/ Initials	Supervising Engineer/ Initials	Input Voltage	Mode	Atmospheric Data		
					Temp C°	Relative Humidity %	Atmospheric Pressure mbar
03/29/2023	Kouma Sinn KPS	Vathana Ven VJV	POE	Transmitting	23	21	1012
04/06/2023	Vathana Ven VJV	Kouma Sinn KPS	POE	Transmitting	24	32	1007
04/07/2023	Vathana Ven VJV	Kouma Sinn KPS	POE	Transmitting	24	25	1012
04/12/2023	Kouma Sinn KPS	Vathana Ven VJV	POE	Transmitting	23	25	997

Deviations, Additions, or Exclusions: None

12 AC Mains Conducted Emissions

12.1 Method

Tests are performed in accordance with FCC Part 15 Subpart B: 04/2023 and ANSI C63.4:2014.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
AC Line Conducted Emissions	150 kHz - 30 MHz	1.2 dB	3.4dB
Telco Port Emissions	150 kHz - 30 MHz	2.8 dB	5.0dB
AC Line Conducted Emissions	9 kHz - 150 MHz	2.2 dB	3.4 dB

As shown in the table above our conducted emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculations

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN or ISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 μV/m

When BAT-EMC Emission Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. The “Correction” includes LISN Factor, Attenuator, and Cable Loss. These are already accounted for in the “Level” column.

12.2 Limits

FCC Part 15.107 (b) – For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the Table below.

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15–0.5	79	66
0.5–30	73	60

12.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV009'	weather station	Davis Instruments	6351 Vantage VUE	DAV009	03/27/2023	03/27/2024
ROS002'	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	06/30/2022	06/30/2023
WEI26'	Attenuator 20dB 2 Watts	Weinschel	WA18-20	1001015N0010004	06/07/2022	06/07/2023
CBLBNC2012-3'	50 Ohm Coaxial Cable	Pomona	RG58C/U	CBLBNC2012-3	04/27/2022	04/27/2023
LISN35'	LISN 50uH/250uH 50ohm	Com Power	LI-215A	191960	06/14/2022	06/14/2023

Software Utilized:

Name	Manufacturer	Version
Setup_BAT-EMC	Nexio	2022.0.27.0

12.4 Results:

The sample tested was found to Comply.

12.5 Setup Photographs:

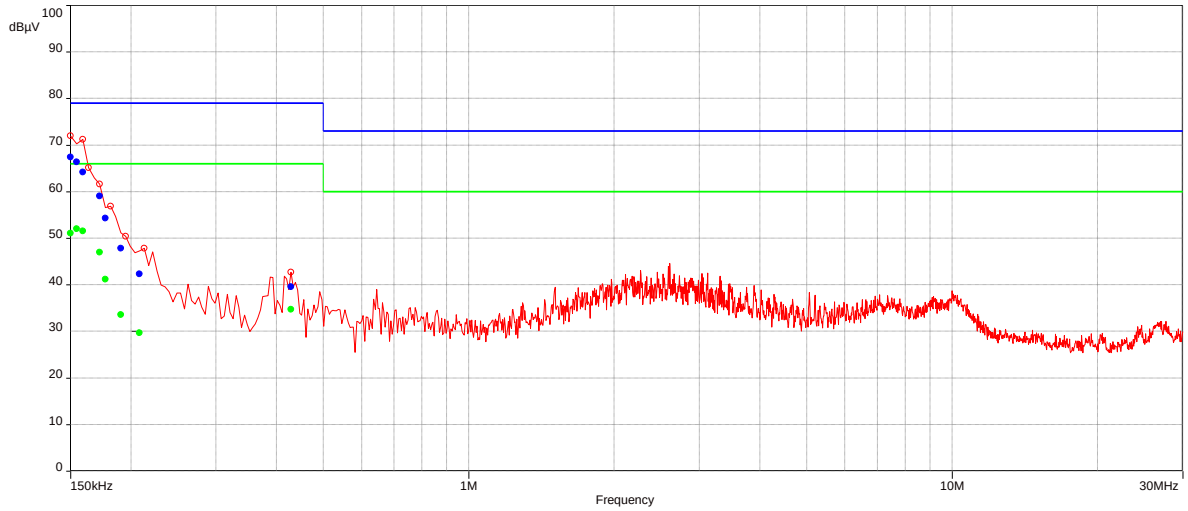
Confidential – Photos not included in this report.

12.6 Plots/Data:

Test Information:

Date and Time	4/13/2023 7:02:44 PM
Client and Project Number	CommScope
Engineer	Kouma Sinn
Temperature	23 deg C
Humidity	33 %
Atmospheric Pressure	1008 mbars
Comments	CommScope, 120VAC 60Hz, Tx at Mid Channel (16QAM-Worst-case Output Power), Single Phase Under 15 Amp_150kHz to 30 MHz ESCI

Graph:



Results:

QuasiPeak(Pass) (8)

Frequency (MHz)	QP Level (dBµV)	QP Limit (dBuV)	QP Margin (dB)	Line	RBW	Meas.Time	Correction (dB)
0.15068	67.37	79.00	-11.63	Neutral	9k	0.01	20.26
0.15506	66.35	79.00	-12.65	Phase 1	9k	0.01	19.82
0.15946	64.20	79.00	-14.80	Neutral	9k	0.01	20.20
0.17028	59.06	79.00	-19.94	Phase 1	9k	0.01	19.82
0.17798	54.28	79.00	-24.72	Neutral	9k	0.01	20.10
0.19046	47.85	79.00	-31.15	Phase 1	9k	0.01	19.82
0.21038	42.30	79.00	-36.70	Neutral	9k	0.01	19.97
0.43104	39.59	79.00	-39.41	Neutral	9k	0.01	19.96

Average(Pass) (8)

Frequency (MHz)	AVG Level (dBµV)	AVG Limit (dBuV)	AVG Margin (dB)	Line	RBW	Meas.Time	Correction (dB)
0.15068	51.01	66.00	-14.99	Neutral	9k	0.01	20.26
0.15506	52.01	66.00	-13.99	Phase 1	9k	0.01	19.82
0.15946	51.54	66.00	-14.46	Neutral	9k	0.01	20.20
0.17028	46.96	66.00	-19.04	Phase 1	9k	0.01	19.82
0.17798	41.12	66.00	-24.88	Neutral	9k	0.01	20.10
0.19046	33.61	66.00	-32.39	Phase 1	9k	0.01	19.82
0.21038	29.70	66.00	-36.30	Neutral	9k	0.01	19.97
0.43104	34.69	66.00	-31.31	Neutral	9k	0.01	19.96

	Product Standard: FCC Part 15 Subpart B Class A	Limit applied: See Report Section 12.2

				Pretest Verification w/ signal generator: Yes			
Test Date	Test Personnel/ Initials	Supervising Engineer/ Initials	Input Voltage	Mode	Atmospheric Data		
					Temp C°	Relative Humidity %	Atmospheric Pressure mbar
04/13/2023	Kouma Sinn KPS	Vathana Ven VJV	120VAC 60Hz	Transmitting	23	33	1008

Deviations, Additions, or Exclusions: None

13 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	04/18/2023	105382536BOX-001	KPS KPS	VFV VFV	Original Issue