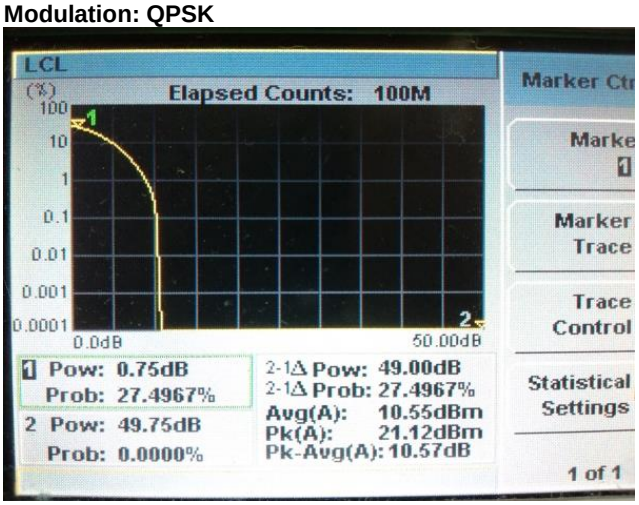
Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 04-Apr-23		
Temperature: 24.3. ºC	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

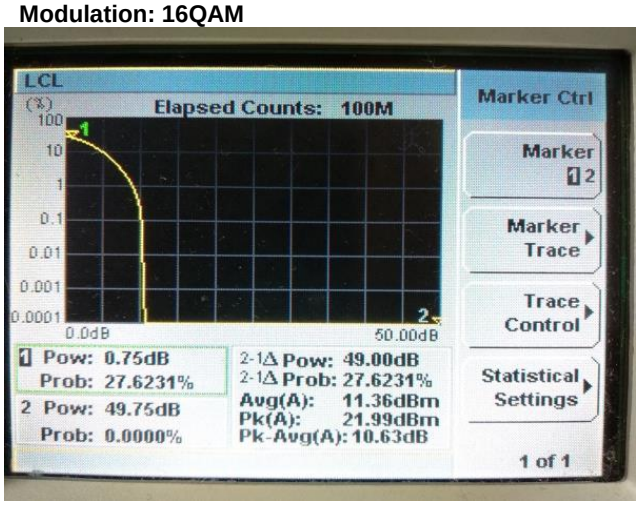
Plot 7.2.3 Peak-to-average power ratio test results at high frequency

CHANNEL SPACING: 10 MHz
ANTENNA PORT: 1

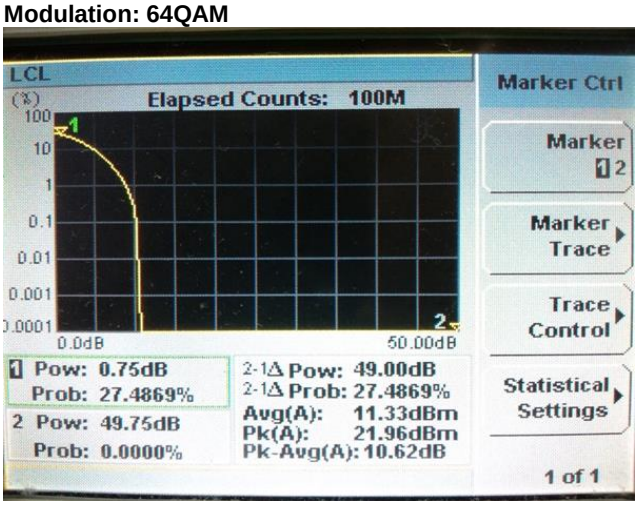
Modulation: QPSK



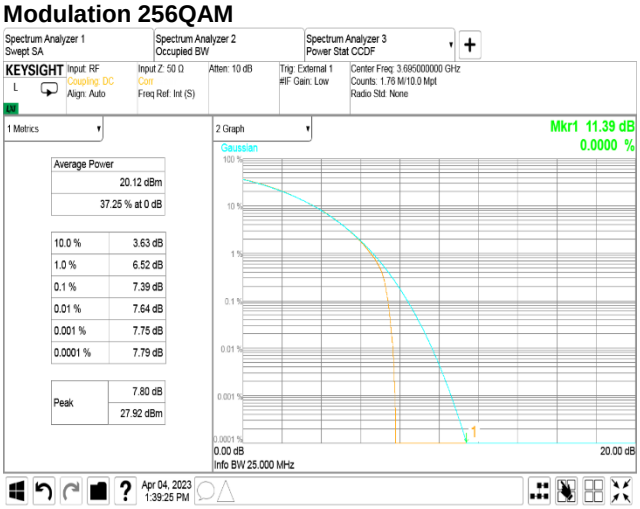
Modulation: 16QAM



Modulation: 64QAM



Modulation 256QAM

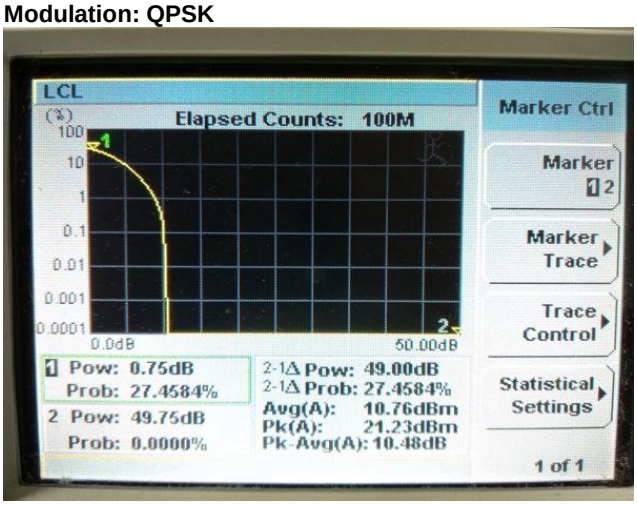


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 04-Apr-23		
Temperature: 24.3. ºC	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

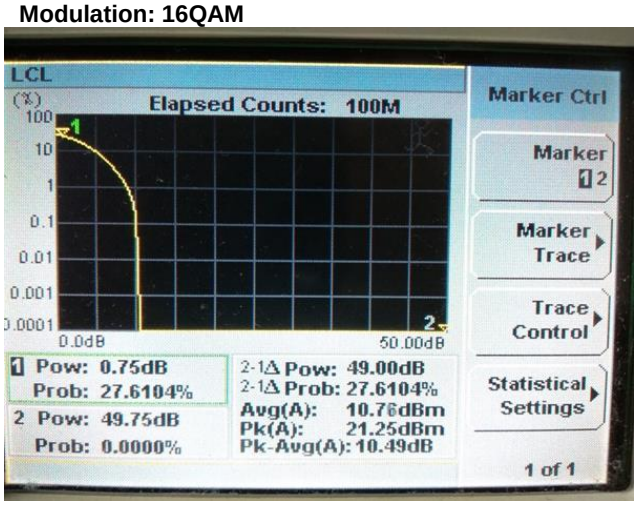
Plot 7.2.4 Peak-to-average power ratio test results at low frequency

CHANNEL SPACING: 20 MHz
ANTENNA PORT: 1

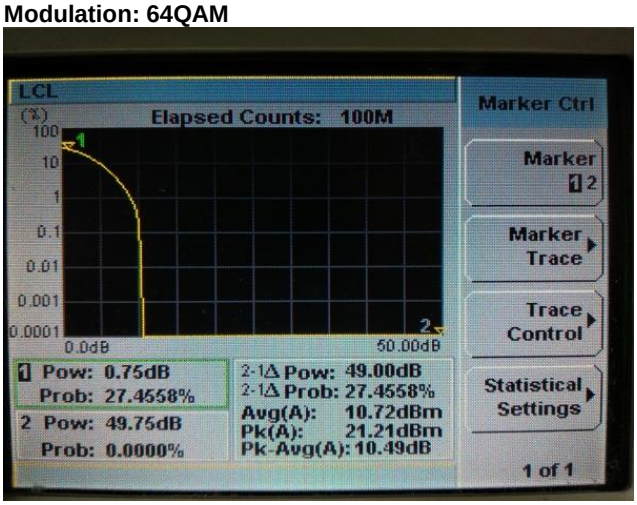
Modulation: QPSK



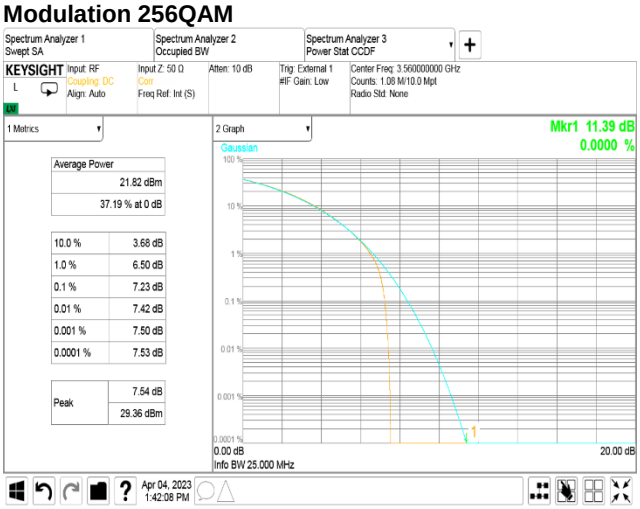
Modulation: 16QAM



Modulation: 64QAM



Modulation 256QAM

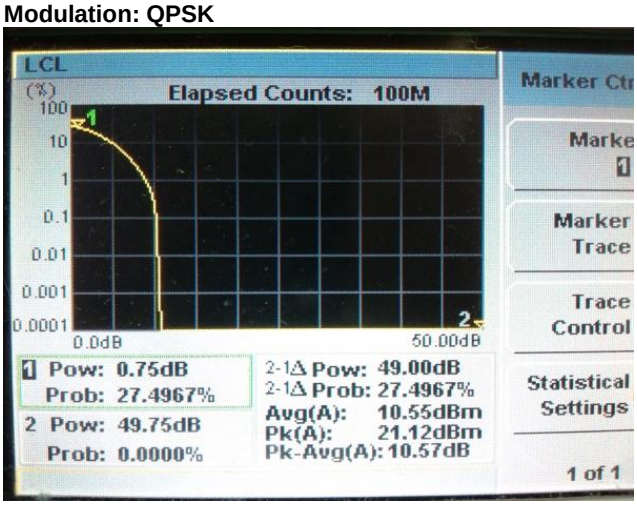


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 04-Apr-23		
Temperature: 24.3. ºC	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

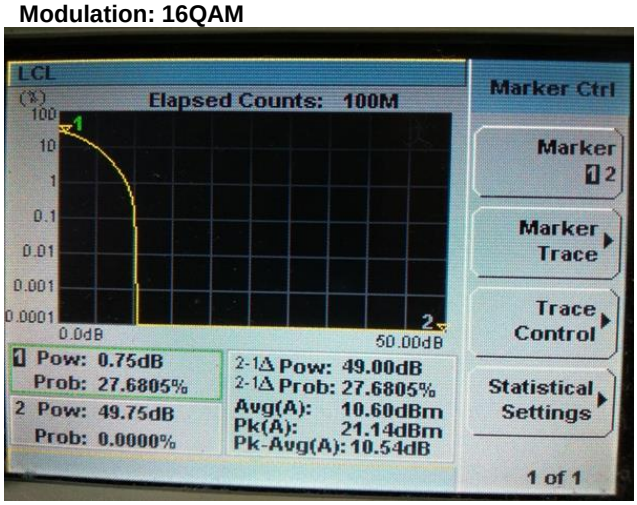
Plot 7.2.5 Peak-to-average power ratio test results at mid frequency

CHANNEL SPACING: 20 MHz
ANTENNA PORT: 1

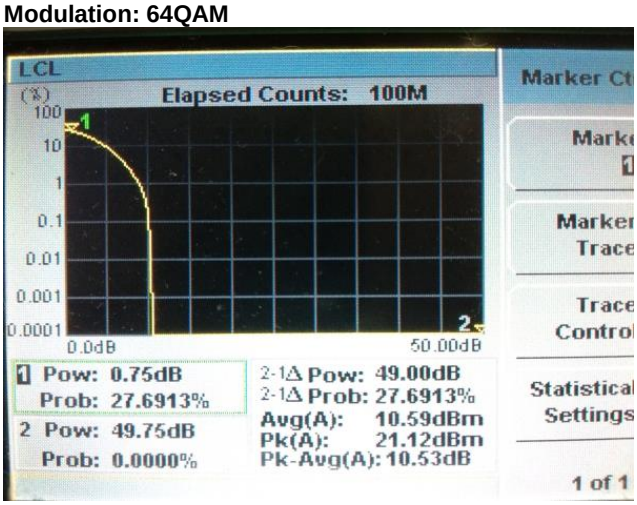
Modulation: QPSK



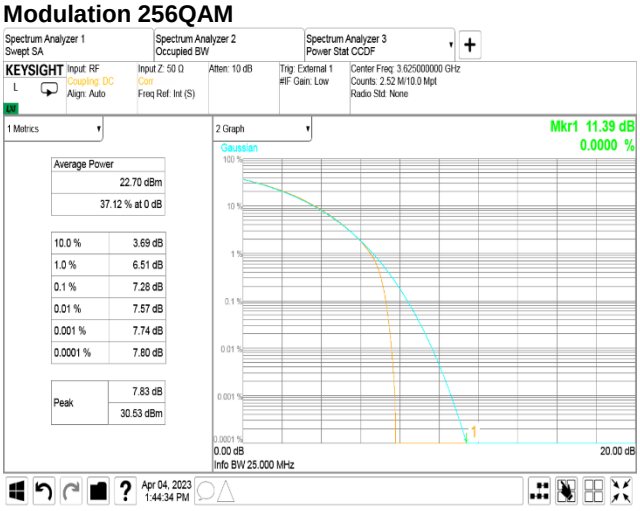
Modulation: 16QAM



Modulation: 64QAM



Modulation 256QAM

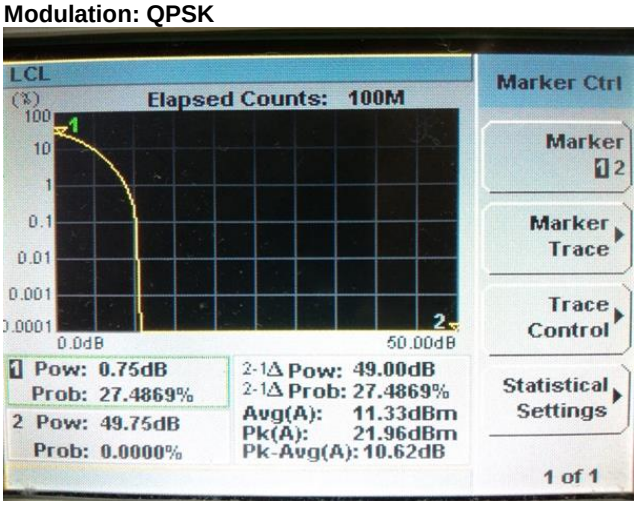


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 04-Apr-23		
Temperature: 24.3. ºC	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

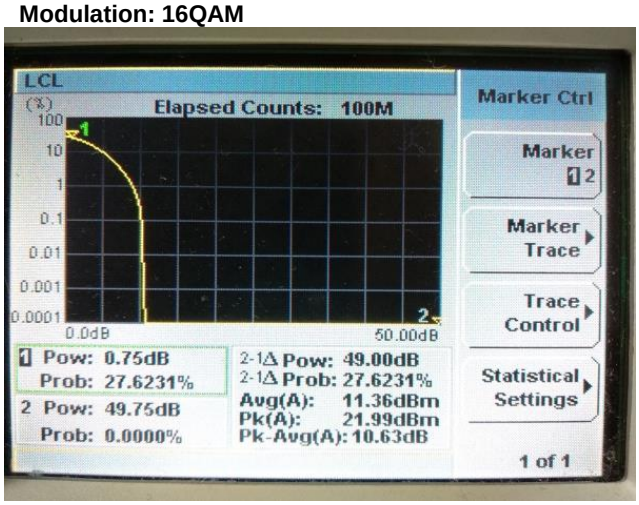
Plot 7.2.6 Peak-to-average power ratio test results at high frequency

CHANNEL SPACING: 20 MHz
ANTENNA PORT: 1

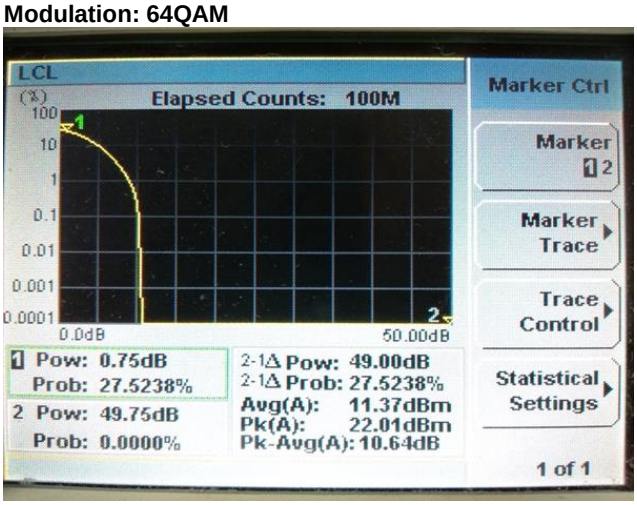
Modulation: QPSK



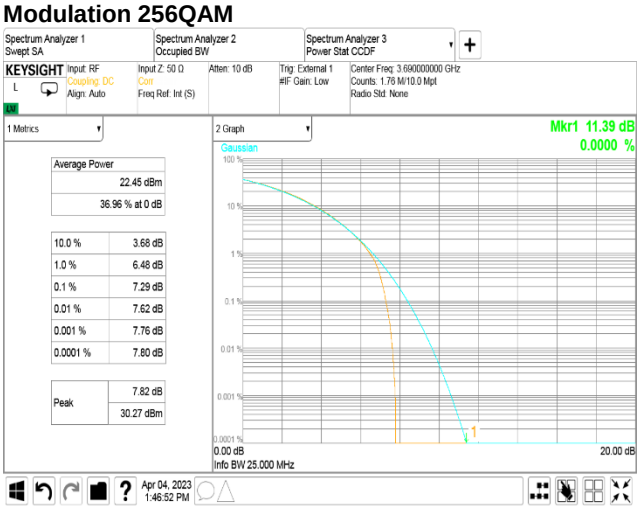
Modulation: 16QAM



Modulation: 64QAM



Modulation 256QAM



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

7.3 Occupied bandwidth test

7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, %	Maximum allowed bandwidth, MHz
3550 - 3700	99	10 / 20 MHz

* - Modulation envelope reference points are provided in terms of attenuation below the unmodulated carrier.

7.3.2 Test procedure

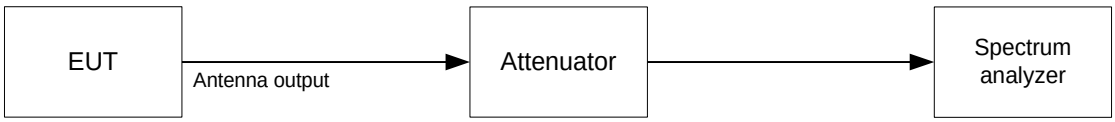
7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

7.3.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.

7.3.2.3 The EUT was set to transmit the normally modulated carrier.

7.3.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 Occupied bandwidth test setup



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 1 – 5% of the OBW
VIDEO BANDWIDTH: > RBW
MODULATION ENVELOPE REFERENCE POINTS: 99%

Carrier frequency, MHz	Occupied bandwidth, MHz	Limit, MHz	Margin, MHz	Verdict
Channel spacing 10 MHz				
Modulation QPSK				
3555.0	8.9506	10.0	-1.0494	Pass
3625.0	8.9584	10.0	-1.0416	Pass
3695.0	8.9443	10.0	-1.0557	Pass
Modulation 16QAM				
3555.0	8.9462	10.0	-1.0538	Pass
3625.0	8.9396	10.0	-1.0604	Pass
3695.0	8.9342	10.0	-1.0658	Pass
Modulation 64QAM				
3555.0	8.9288	10.0	-1.0712	Pass
3625.0	8.9318	10.0	-1.0682	Pass
3695.0	8.9470	10.0	-1.0530	Pass
Modulation 256QAM				
3555.0	9.0233	10.0	-0.9767	Pass
3625.0	9.0270	10.0	-0.9730	Pass
3695.0	9.0176	10.0	-0.9824	Pass
Channel spacing 20 MHz				
Modulation QPSK				
3560.0	17.874	20.0	-2.1251	Pass
3625.0	17.880	20.0	-2.1199	Pass
3690.0	17.856	20.0	-2.1432	Pass
Modulation 16QAM				
3560.0	17.8495	20.0	-2.1505	Pass
3625.0	17.8480	20.0	-2.1520	Pass
3690.0	17.8555	20.0	-2.1445	Pass
Modulation 64QAM				
3560.0	17.8611	20.0	-2.1389	Pass
3625.0	17.8811	20.0	-2.1189	Pass
3690.0	17.8603	20.0	-2.1397	Pass
Modulation 256QAM				
3560.0	17.837	20	-2.163	Pass
3625.0	17.846	20	-2.154	Pass
3690.0	17.825	20	-2.175	Pass

Reference numbers of test equipment used

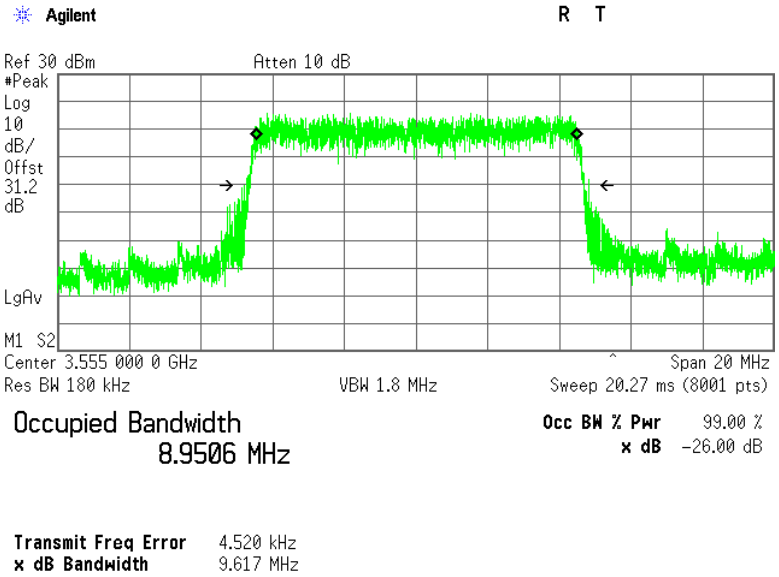
HL 3787	HL 3818	HL 3903					

Full description is given in Appendix A.

Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

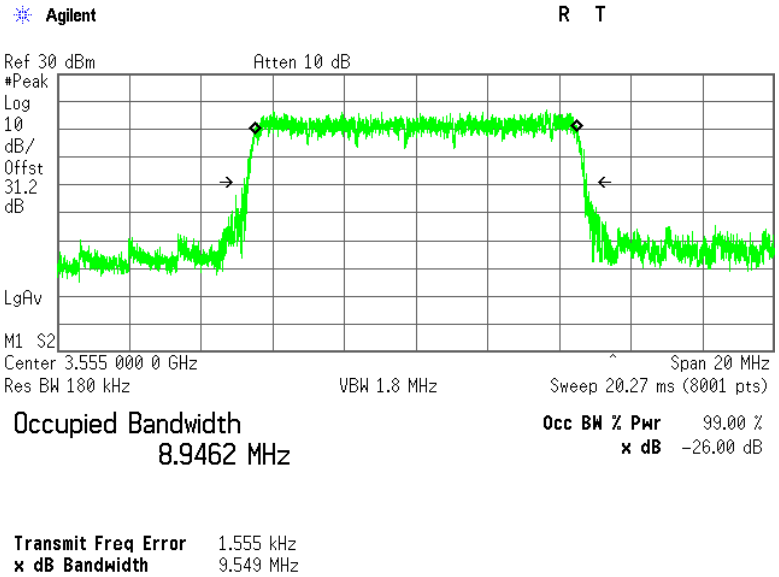
Plot 7.3.1 Occupied bandwidth test result at low frequency

MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Plot 7.3.2 Occupied bandwidth test result at low frequency

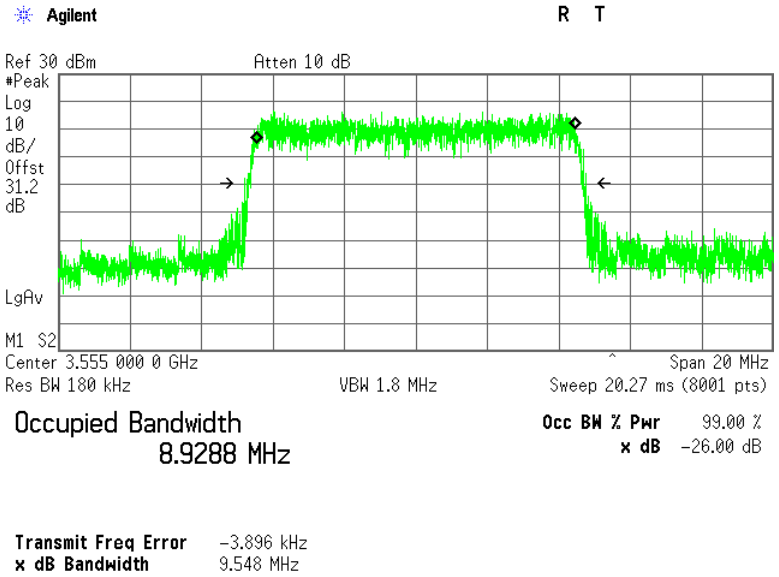
MODULATION: 16QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

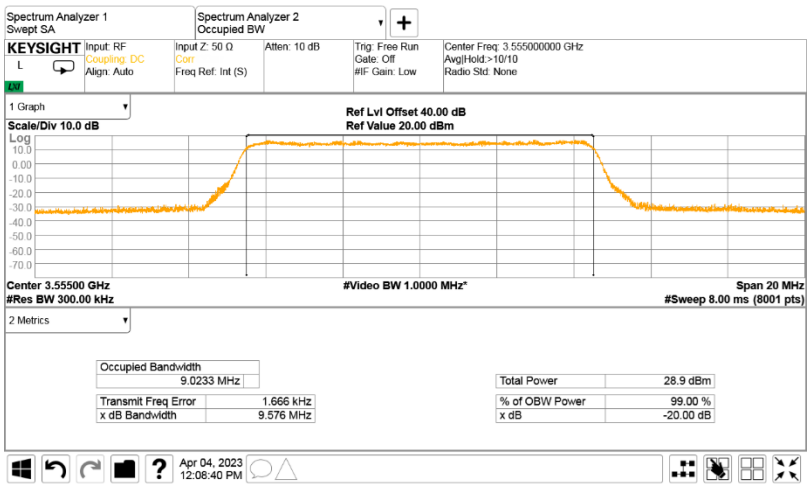
Plot 7.3.3 Occupied bandwidth test result at low frequency

MODULATION: 64QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Plot 7.3.4 Occupied bandwidth test result at low frequency

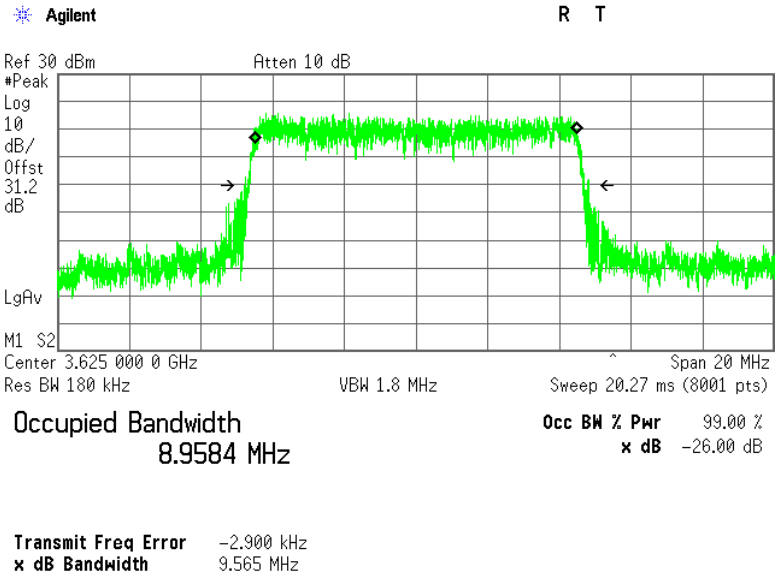
MODULATION: 256QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

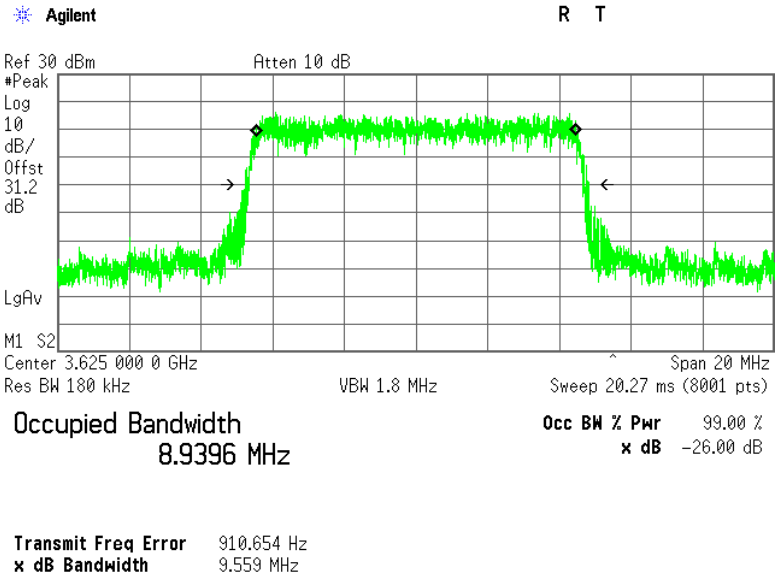
Plot 7.3.5 Occupied bandwidth test result at mid frequency

MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Plot 7.3.6 Occupied bandwidth test result at mid frequency

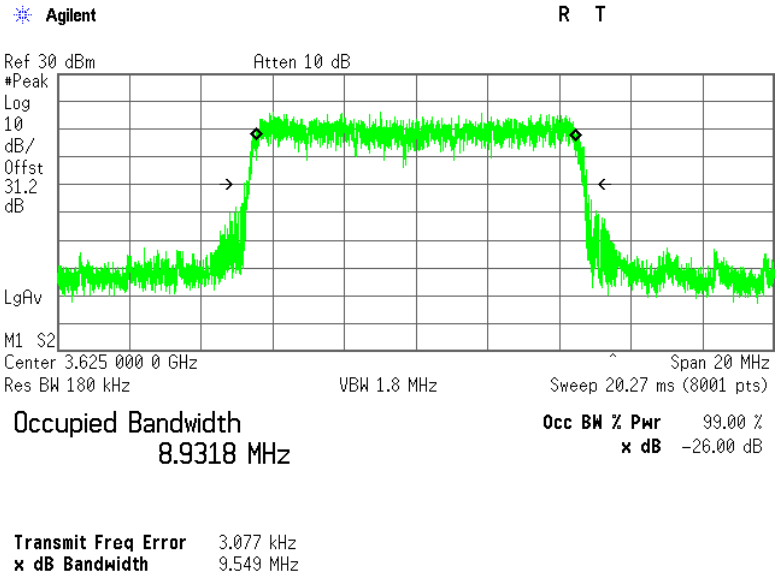
MODULATION: 16QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

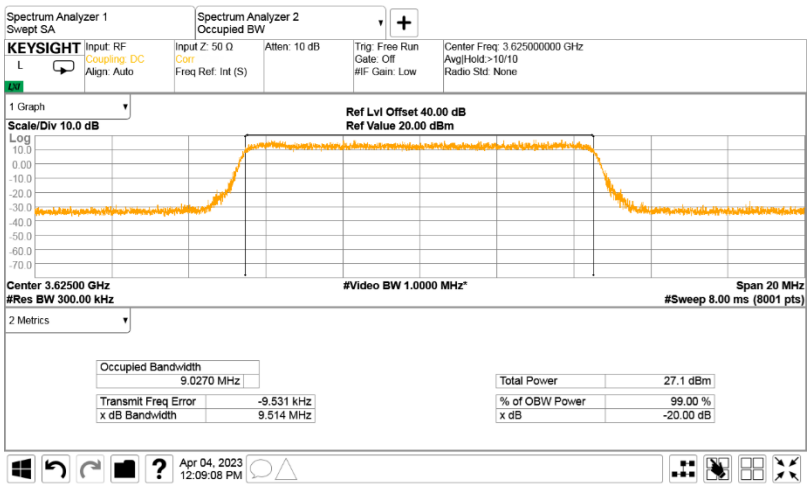
Plot 7.3.7 Occupied bandwidth test result at mid frequency

MODULATION: 64QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Plot 7.3.8 Occupied bandwidth test result at mid frequency

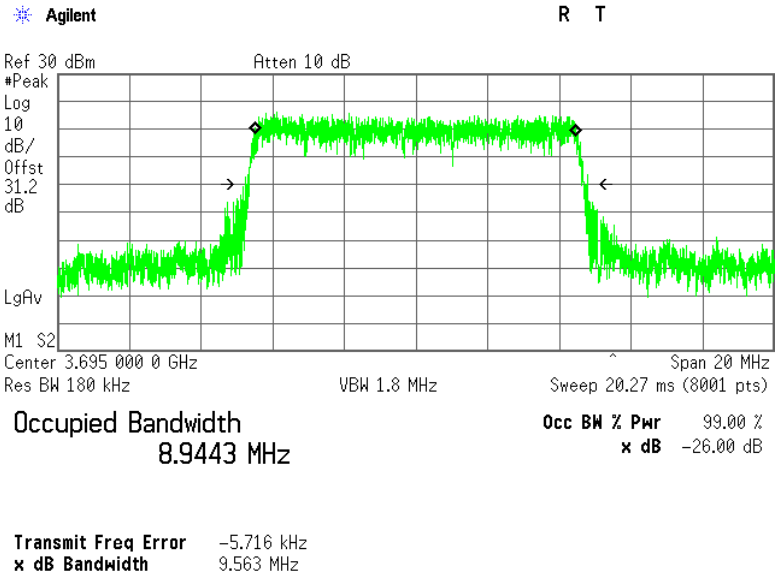
MODULATION: 256QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

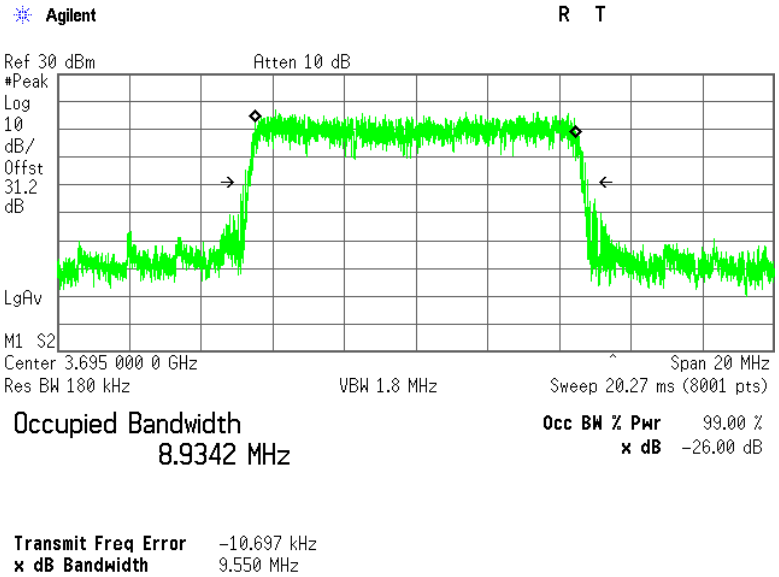
Plot 7.3.9 Occupied bandwidth test result at high frequency

MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Plot 7.3.10 Occupied bandwidth test result at high frequency

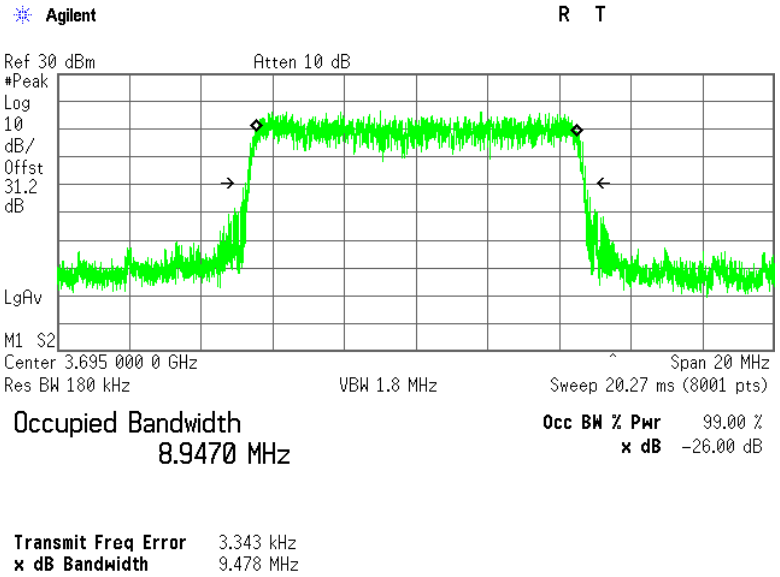
MODULATION: 16QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

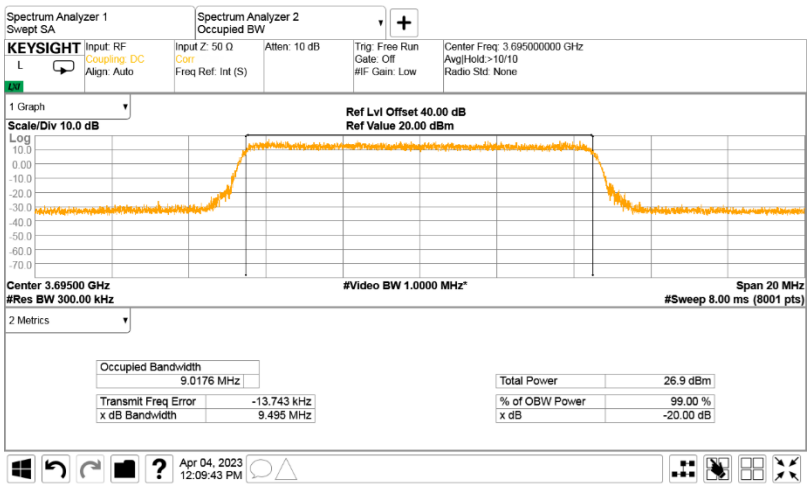
Plot 7.3.11 Occupied bandwidth test result at high frequency

MODULATION: 64QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Plot 7.3.12 Occupied bandwidth test result at high frequency

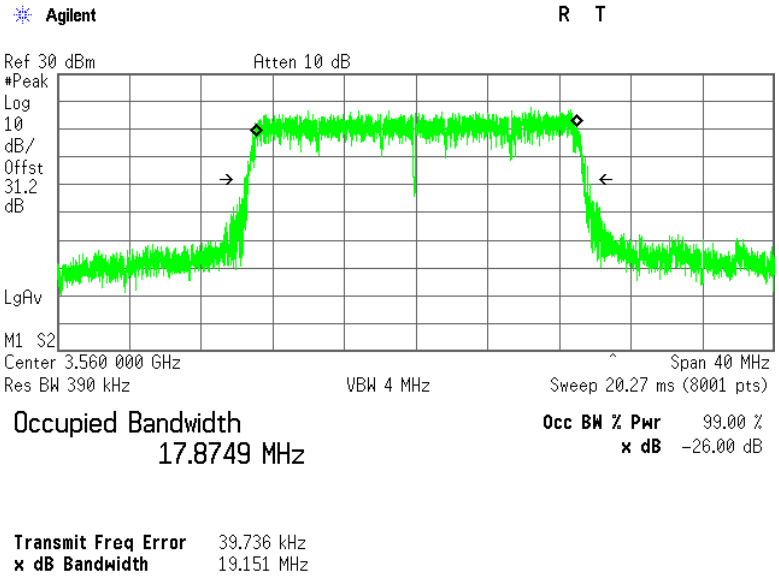
MODULATION: 256QAM
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

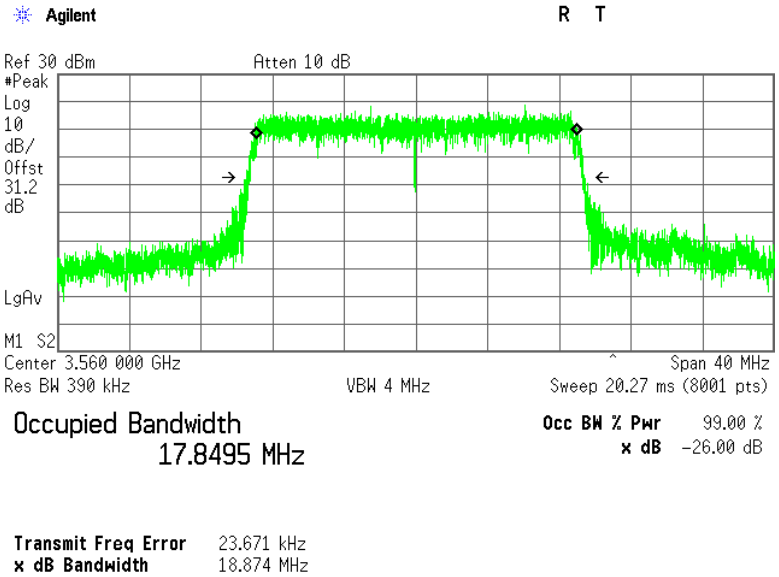
Plot 7.3.13 Occupied bandwidth test result at low frequency

MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Plot 7.3.14 Occupied bandwidth test result at low frequency

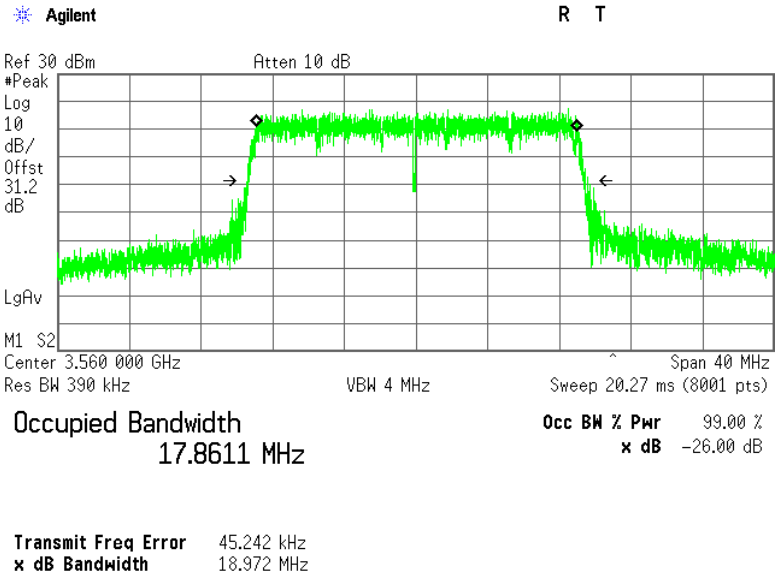
MODULATION: 16QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

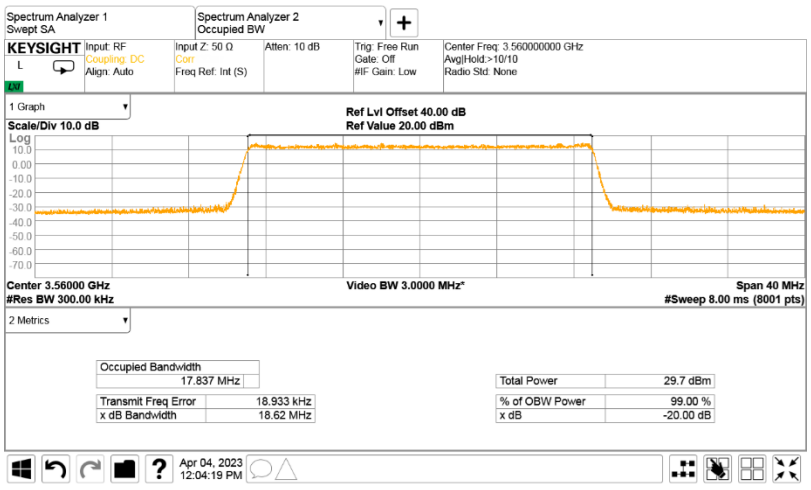
Plot 7.3.15 Occupied bandwidth test result at low frequency

MODULATION: 64QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Plot 7.3.16 Occupied bandwidth test result at low frequency

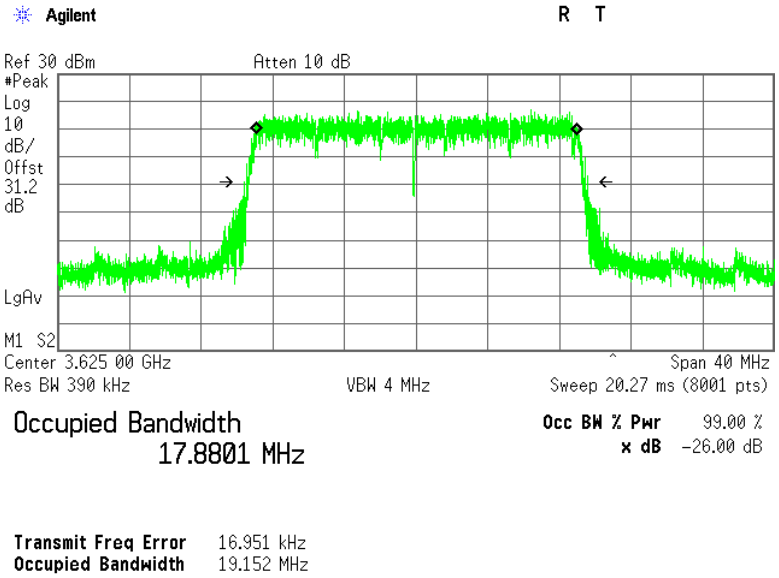
MODULATION: 256QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

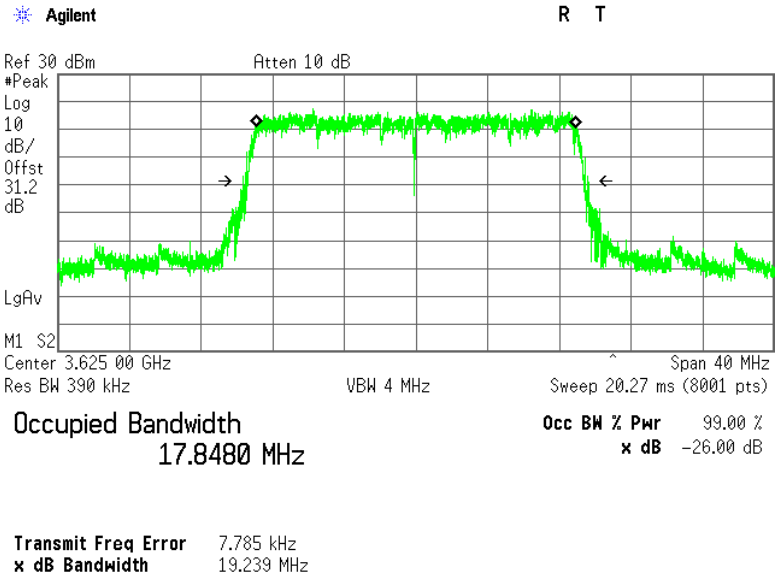
Plot 7.3.17 Occupied bandwidth test result at mid frequency

MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Plot 7.3.18 Occupied bandwidth test result at mid frequency

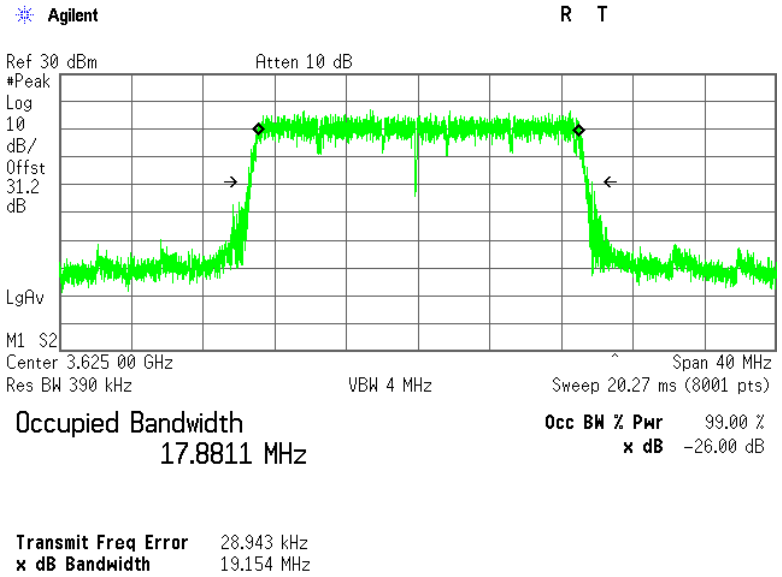
MODULATION: 16QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

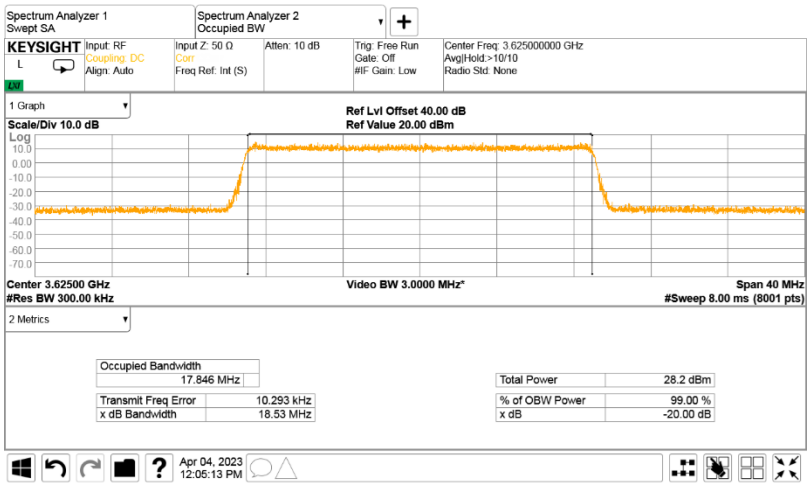
Plot 7.3.19 Occupied bandwidth test result at mid frequency

MODULATION: 64QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Plot 7.3.20 Occupied bandwidth test result at mid frequency

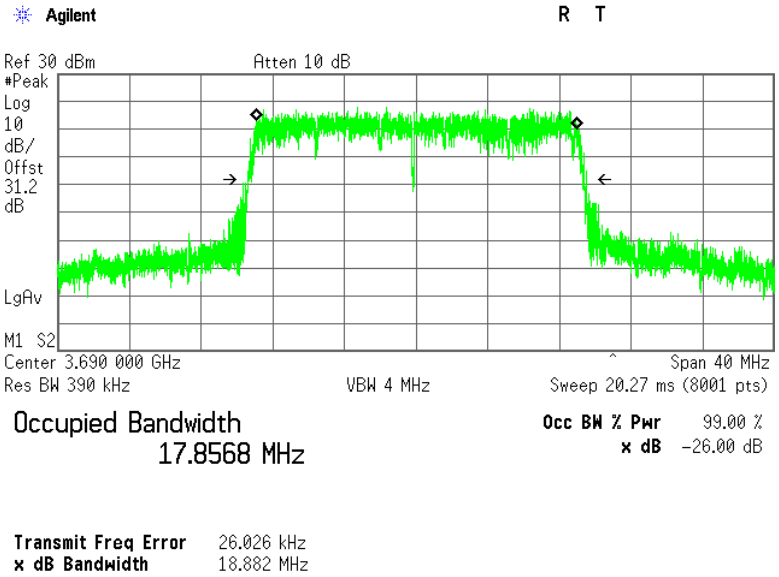
MODULATION: 256QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

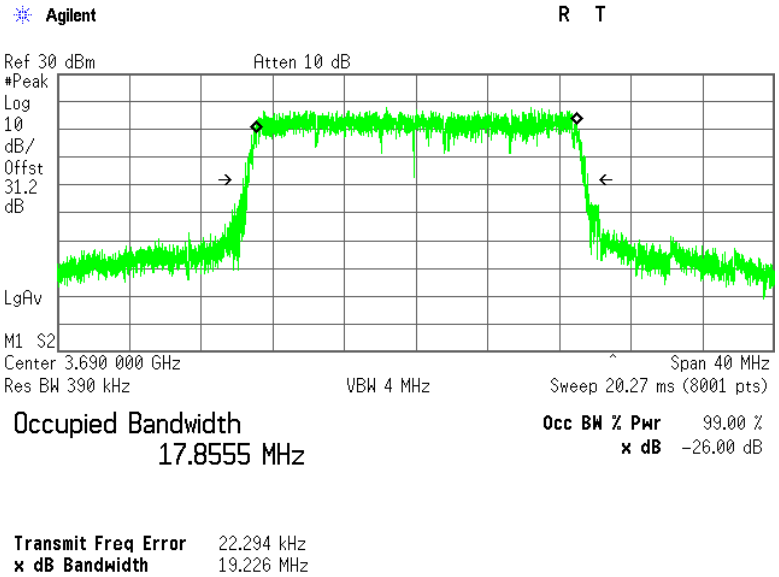
Plot 7.3.21 Occupied bandwidth test result at high frequency

MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Plot 7.3.22 Occupied bandwidth test result at high frequency

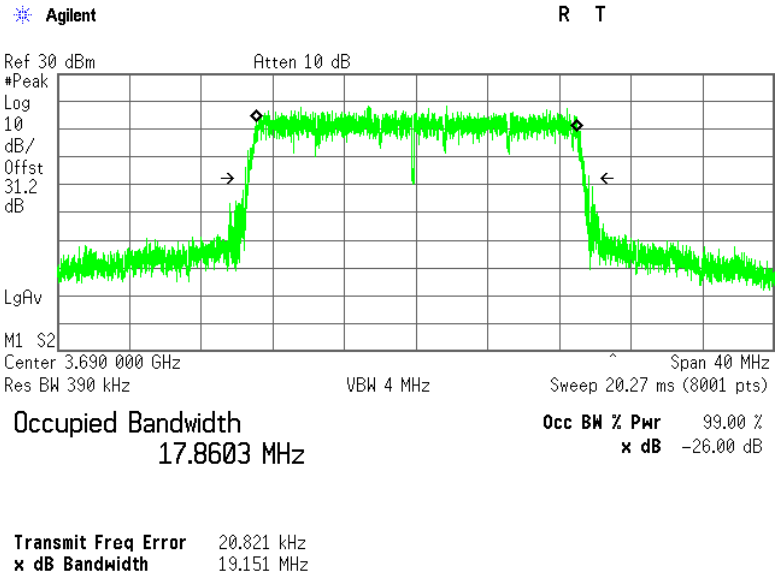
MODULATION: 16QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Test specification:	Section2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	04-Oct-18 – 04-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

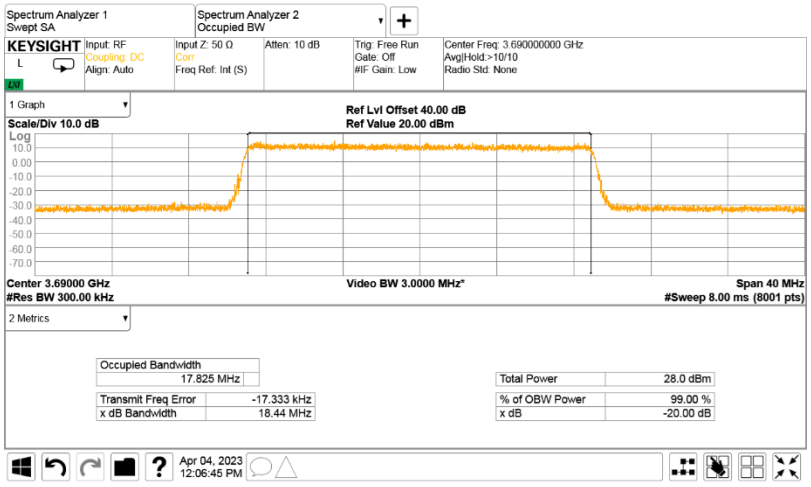
Plot 7.3.23 Occupied bandwidth test result at high frequency

MODULATION: 64QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Plot 7.3.24 Occupied bandwidth test result at high frequency

MODULATION: 256QAM
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1



Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

7.4 Emission outside the fundamental test

7.4.1 General

This test was performed to measure Emission outside the fundamental at RF antenna connector. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Emission outside the fundamental limits

Frequency displacement from frequency block	Limit*, dBm/MHz	RBW, kHz
Channel Spacing 10 MHz		
0 – 1 MHz	- 13	100
0 – 10 MHz	- 13	1000
10 – 20 MHz	- 25	1000
Above 3530 MHz and below 3720 MHz	- 25	1000
Below 3530 MHz and above 3720 MHz	- 40	1000
Channel Spacing 20 MHz		
0 – 1 MHz	- 13	100
0 – 10 MHz	- 13	1000
10 – 20 MHz	- 25	1000
Above 3530 MHz and below 3720 MHz	- 25	1000
Below 3530 MHz and above 3720 MHz	- 40	1000

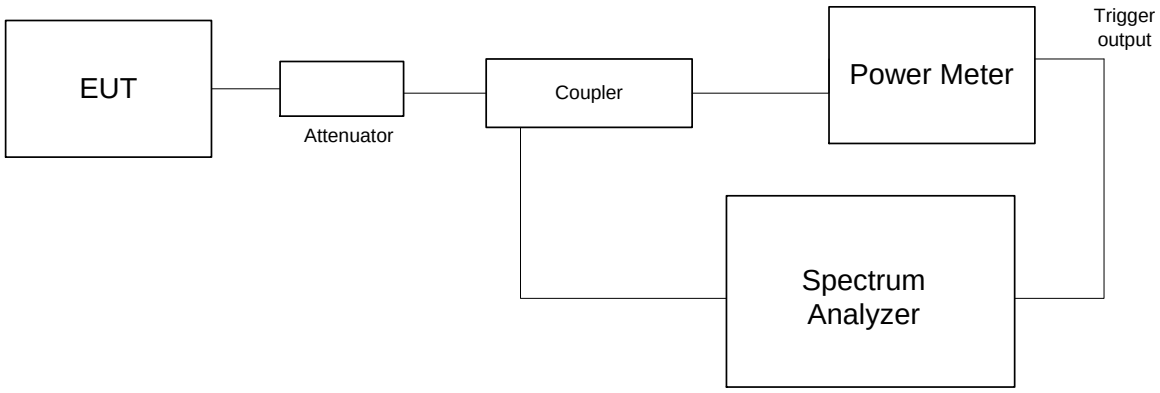
* - Limit at each antenna connector (amount of antennas N = 2)

7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.

7.4.2.2 The Emission outside the fundamental was measured with spectrum analyzer as provided in Table 7.4.2, Table 7.4.3 and the the associated plots.

Figure 7.4.1 Emission outside the fundamental test setup



Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Table 7.4.2 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 1
ANTENNA PORT: Worst case
CHANEL SPACING: 10MHz

Frequency MHz	Band edge	SA reading over 1 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3555.0 MHz							
3530.00	Low	-54.09	-48.09	1000	-40	-8.09	Pass
3540.00	Low	-50.24	-44.24	1000	-25	-19.24	
3549.00	Low	-29.31	-23.31	1000	-13	-10.31	
3550.00	Low	-36.63	-30.63	100	-13	-17.63	
3560.00	High	-36.26	-30.26	100	-13	-17.26	
3561.00	High	-24.44	-18.44	1000	-13	-5.44	
3570.00	High	-48.24	-42.24	1000	-25	-17.24	
3720.00	High	-51.33	-45.33	1000	-40	-5.33	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.31	-47.31	1000	-40	-7.31	Pass
3610.00	Low	-46.75	-40.75	1000	-25	-15.75	
3619.00	Low	-26.15	-20.15	1000	-13	-7.15	
3620.00	Low	-34.99	-28.99	100	-13	-15.99	
3630.00	High	-35.26	-29.26	100	-13	-16.26	
3631.00	High	-26.52	-20.52	1000	-13	-7.52	
3640.00	High	-47.62	-41.62	1000	-25	-16.62	
3720.00	High	-50.10	-44.1	1000	-40	-4.1	
High frequency 3695.0 MHz							
3530.00	Low	-53.28	-47.28	1000	-40	-7.28	Pass
3680.00	Low	-46.21	-40.21	1000	-25	-15.21	
3689.00	Low	-24.86	-18.86	1000	-13	-5.86	
3690.00	Low	-35.15	-29.15	100	-13	-16.15	
3700.00	High	-36.45	-30.45	100	-13	-17.45	
3701.00	High	-28.45	-22.45	1000	-13	-9.45	
3710.00	High	-49.57	-43.57	1000	-25	-18.57	
3720.00	High	-50.16	-44.16	1000	-40	-4.16	

* - SA Reading over 1 chain = Max SA reading (Chains #1&2 and #3&4)
** - Total band edge = Maximum SA Reading over 1 chain + 10*log(N) = SA reading +6 dB
*** - Margin = Total band edge – Specification limit

Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.3 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 2
ANTENNA PORT: Worst case
CHANEL SPACING: 10MHz

Frequency MHz	Band edge	SA reading over 2 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3555.0 MHz							
3530.00	Low	-53.02	-47.02	1000	-40	-7.02	Pass
3540.00	Low	-49.18	-43.18	1000	-25	-18.18	
3549.00	Low	-31.63	-25.63	1000	-13	-12.63	
3550.00	Low	-35.65	-29.65	100	-13	-16.65	
3560.00	High	-35.73	-29.73	100	-13	-16.73	
3561.00	High	-32.91	-26.91	1000	-13	-13.91	
3570.00	High	-49.35	-43.35	1000	-25	-18.35	
3720.00	High	-50.24	-44.24	1000	-40	-4.24	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.27	-47.27	1000	-40	-7.27	Pass
3610.00	Low	-48.00	-42	1000	-25	-17	
3619.00	Low	-25.98	-19.98	1000	-13	-6.98	
3620.00	Low	-35.05	-29.05	100	-13	-16.05	
3630.00	High	-35.45	-29.45	100	-13	-16.45	
3631.00	High	-26.31	-20.31	1000	-13	-7.31	
3640.00	High	-48.87	-42.87	1000	-25	-17.87	
3720.00	High	-50.27	-44.27	1000	-40	-4.27	
High frequency 3695.0 MHz							
3530.00	Low	-52.10	-46.1	1000	-40	-6.1	Pass
3680.00	Low	-47.34	-41.34	1000	-25	-16.34	
3689.00	Low	-28.18	-22.18	1000	-13	-9.18	
3690.00	Low	-35.56	-29.56	100	-13	-16.56	
3700.00	High	-36.83	-30.83	100	-13	-17.83	
3701.00	High	-24.06	-18.06	1000	-13	-5.06	
3710.00	High	-49.66	-43.66	1000	-25	-18.66	
3720.00	High	-50.10	-44.1	1000	-40	-4.1	

* - SA Reading over 1 chain = Max SA reading (Chains #1&2 and #3&4)
** - Total band edge = Maximum SA Reading over 1 chain + 10*log(N) = SA reading +6 dB
*** - Margin = Total band edge – Specification limit

Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.4 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 3
ANTENNA PORT: Worst case
CHANEL SPACING: 10MHz

Frequency MHz	Band edge	SA reading over3 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3555.0 MHz							
3530.00	Low	-53.07	-47.07	1000	-40	-7.07	Pass
3540.00	Low	-49.82	-43.82	1000	-25	-18.82	
3549.00	Low	-29.63	-23.63	1000	-13	-10.63	
3550.00	Low	-35.44	-29.44	100	-13	-16.44	
3560.00	High	-35.81	-29.81	100	-13	-16.81	
3561.00	High	-23.93	-17.93	1000	-13	-4.93	
3570.00	High	-48.58	-42.58	1000	-25	-17.58	
3720.00	High	-50.24	-44.24	1000	-40	-4.24	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.28	-47.28	1000	-40	-7.28	Pass
3610.00	Low	-48.63	-42.63	1000	-25	-17.63	
3619.00	Low	-25.74	-19.74	1000	-13	-6.74	
3620.00	Low	-34.59	-28.59	100	-13	-15.59	
3630.00	High	-34.77	-28.77	100	-13	-15.77	
3631.00	High	-26.11	-20.11	1000	-13	-7.11	
3640.00	High	-48.19	-42.19	1000	-25	-17.19	
3720.00	High	-50.25	-44.25	1000	-40	-4.25	
High frequency 3695.0 MHz							
3530.00	Low	-53.39	-47.39	1000	-40	-7.39	Pass
3680.00	Low	-45.81	-39.81	1000	-25	-14.81	
3689.00	Low	-28.60	-22.6	1000	-13	-9.6	
3690.00	Low	-34.67	-28.67	100	-13	-15.67	
3700.00	High	-36.14	-30.14	100	-13	-17.14	
3701.00	High	-24.12	-18.12	1000	-13	-5.12	
3710.00	High	-49.26	-43.26	1000	-25	-18.26	
3720.00	High	-50.14	-44.14	1000	-40	-4.14	

* - SA Reading over 1 chain = Max SA reading (Chains #1&2 and #3&4)
** - Total band edge = Maximum SA Reading over 1 chain + 10*log(N) = SA reading +6 dB
*** - Margin = Total band edge – Specification limit

Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.5 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 4
ANTENNA PORT: Worst case
CHANEL SPACING: 10MHz

Frequency MHz	Band edge	SA reading over4 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3555.0 MHz							
3530.00	Low	-53.18	-47.18	1000	-40	-7.18	Pass
3540.00	Low	-48.87	-42.87	1000	-25	-17.87	
3549.00	Low	-24.32	-18.32	1000	-13	-5.32	
3550.00	Low	-35.13	-29.13	100	-13	-16.13	
3560.00	High	-35.11	-29.11	100	-13	-16.11	
3561.00	High	-27.61	-21.61	1000	-13	-8.61	
3570.00	High	-46.98	-40.98	1000	-25	-15.98	
3720.00	High	-50.28	-44.28	1000	-40	-4.28	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.35	-47.35	1000	-40	-7.35	Pass
3610.00	Low	-47.00	-41	1000	-25	-16	
3619.00	Low	-25.82	-19.82	1000	-13	-6.82	
3620.00	Low	-34.29	-28.29	100	-13	-15.29	
3630.00	High	-34.77	-28.77	100	-13	-15.77	
3631.00	High	-25.91	-19.91	1000	-13	-6.91	
3640.00	High	-48.00	-42	1000	-25	-17	
3720.00	High	-50.26	-44.26	1000	-40	-4.26	
High frequency 3695.0 MHz							
3530.00	Low	-52.06	-46.06	1000	-40	-6.06	Pass
3680.00	Low	-46.90	-40.9	1000	-25	-15.9	
3689.00	Low	-23.33	-17.33	1000	-13	-4.33	
3690.00	Low	-34.51	-28.51	100	-13	-15.51	
3700.00	High	-35.40	-29.4	100	-13	-16.4	
3701.00	High	-27.58	-21.58	1000	-13	-8.58	
3710.00	High	-49.14	-43.14	1000	-25	-18.14	
3720.00	High	-50.02	-44.02	1000	-40	-4.02	

* - SA Reading over 1 chain = Max SA reading (Chains #1&2 and #3&4)
** - Total band edge = Maximum SA Reading over 1 chain + 10*log(N) = SA reading +6 dB
*** - Margin = Total band edge – Specification limit

Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.6 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 1
ANTENNA PORT: Worst case
CHANEL SPACING: 20MHz

Frequency MHz	Band edge	SA reading over 1 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3560.0 MHz							
3530.00	Low	-51.45	-45.45	1000	-40	-5.45	Pass
3540.00	Low	-44.66	-38.66	1000	-25	-13.66	
3549.00	Low	-38.00	-32.00	1000	-13	-19.00	
3550.00	Low	-47.68	-41.68	200	-13	-28.68	
3570.00	High	-47.47	-41.47	200	-13	-28.47	
3571.00	High	-37.26	-31.26	1000	-13	-18.26	
3580.00	High	-40.45	-34.45	1000	-25	-9.45	
3720.00	High	-50.13	-44.13	1000	-40	-4.13	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.28	-47.28	1000	-40	-7.28	Pass
3605.00	Low	-42.68	-36.68	1000	-25	-11.68	
3614.00	Low	-38.36	-32.36	1000	-13	-19.36	
3615.00	Low	-48.54	-42.54	200	-13	-29.54	
3635.00	High	-48.91	-42.91	200	-13	-29.91	
3636.00	High	-38.96	-32.96	1000	-13	-19.96	
3645.00	High	-42.24	-36.24	1000	-25	-11.24	
3720.00	High	-50.30	-44.3	1000	-40	-4.30	
High frequency 3690.0 MHz							
3530.00	Low	-53.32	-47.32	1000	-40	-7.32	Pass
3670.00	Low	-42.43	-36.43	1000	-25	-11.43	
3679.00	Low	-37.65	-31.65	1000	-13	-18.65	
3680.00	Low	-47.74	-41.74	200	-13	-28.74	
3700.00	High	-48.82	-42.82	200	-13	-29.82	
3701.00	High	-40.57	-34.57	1000	-13	-21.57	
3710.00	High	-47.40	-41.4	1000	-25	-16.40	
3720.00	High	-50.31	-44.31	1000	-40	-4.31	

* - SA Reading over 1 chain = Max SA reading (Chains #1&2 and #3&4)
** - Total band edge = Maximum SA Reading over 1 chain + 10*log(N) = SA reading +6 dB
*** - Margin = Total band edge – Specification limit

Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.7 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 2
ANTENNA PORT: Worst case
CHANEL SPACING: 20MHz

Frequency MHz	Band edge	SA reading over 2 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3560.0 MHz							
3530.00	Low	-51.14	-45.14	1000	-40	-5.14	Pass
3540.00	Low	-46.73	-40.73	1000	-25	-15.73	
3549.00	Low	-39.47	-33.47	1000	-13	-20.47	
3550.00	Low	-48.78	-42.78	200	-13	-29.78	
3570.00	High	-47.01	-41.01	200	-13	-28.01	
3571.00	High	-37.81	-31.81	1000	-13	-18.81	
3580.00	High	-42.47	-36.47	1000	-25	-11.47	
3720.00	High	-50.03	-44.03	1000	-40	-4.03	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.29	-47.29	1000	-40	-7.29	Pass
3605.00	Low	-42.88	-36.88	1000	-25	-11.88	
3614.00	Low	-37.53	-31.53	1000	-13	-18.53	
3615.00	Low	-48.59	-42.59	200	-13	-29.59	
3635.00	High	-47.45	-41.45	200	-13	-28.45	
3636.00	High	-37.24	-31.24	1000	-13	-18.24	
3645.00	High	-43.14	-37.14	1000	-25	-12.14	
3720.00	High	-50.33	-44.33	1000	-40	-4.33	
High frequency 3690.0 MHz							
3530.00	Low	-53.38	-47.38	1000	-40	-7.38	Pass
3670.00	Low	-40.87	-34.87	1000	-25	-9.87	
3679.00	Low	-35.02	-29.02	1000	-13	-16.02	
3680.00	Low	-46.50	-40.5	200	-13	-27.5	
3700.00	High	-46.47	-40.47	200	-13	-27.47	
3701.00	High	-35.94	-29.94	1000	-13	-16.94	
3710.00	High	-47.09	-41.09	1000	-25	-16.09	
3720.00	High	-50.34	-44.34	1000	-40	-4.34	

Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.8 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 3
ANTENNA PORT: Worst case
CHANEL SPACING: 20MHz

Frequency MHz	Band edge	SA reading over 3 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3560.0 MHz							
3530.00	Low	-50.98	-44.98	1000	-40	-4.98	Pass
3540.00	Low	-45.22	-39.22	1000	-25	-14.22	
3549.00	Low	-38.60	-32.6	1000	-13	-19.6	
3550.00	Low	-48.45	-42.45	200	-13	-29.45	
3570.00	High	-48.30	-42.3	200	-13	-29.3	
3571.00	High	-38.87	-32.87	1000	-13	-19.87	
3580.00	High	-41.16	-35.16	1000	-25	-10.16	
3720.00	High	-50.04	-44.04	1000	-40	-4.04	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.28	-47.28	1000	-40	-7.28	Pass
3605.00	Low	-42.96	-36.96	1000	-25	-11.96	
3614.00	Low	-36.28	-30.28	1000	-13	-17.28	
3615.00	Low	-47.85	-41.85	200	-13	-28.85	
3635.00	High	-49.53	-43.53	200	-13	-30.53	
3636.00	High	-39.74	-33.74	1000	-13	-20.74	
3645.00	High	-42.54	-36.54	1000	-25	-11.54	
3720.00	High	-50.17	-44.17	1000	-40	-4.17	
High frequency 3690.0 MHz							
3530.00	Low	-53.19	-47.19	1000	-40	-7.19	Pass
3670.00	Low	-41.93	-35.93	1000	-25	-10.93	
3679.00	Low	-37.19	-31.19	1000	-13	-18.19	
3680.00	Low	-47.72	-41.72	200	-13	-28.72	
3700.00	High	-47.81	-41.81	200	-13	-28.81	
3701.00	High	-37.92	-31.92	1000	-13	-18.92	
3710.00	High	-48.77	-42.77	1000	-25	-17.77	
3720.00	High	-50.22	-44.22	1000	-40	-4.22	

Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.9 Emission outside the fundamental test results

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
NUMBER OF CHAINS: 4
ANTENNA PORT: Worst case
CHANEL SPACING: 20MHz

Frequency MHz	Band edge	SA reading over 4 chain, dBm	Total band edge*, dBm	RBW, kHz	Limit, dBm	Margin, dB	Verdict
256 QAM							
Low frequency 3560.0 MHz							
3530.00	Low	-51.65	-45.65	1000	-40	-5.65	Pass
3540.00	Low	-45.01	-39.01	1000	-25	-14.01	
3549.00	Low	-38.21	-32.21	1000	-13	-19.21	
3550.00	Low	-46.14	-40.14	200	-13	-27.14	
3570.00	High	-44.37	-38.37	200	-13	-25.37	
3571.00	High	-37.17	-31.17	1000	-13	-18.17	
3580.00	High	-41.30	-35.3	1000	-25	-10.3	
3720.00	High	-50.13	-44.13	1000	-40	-4.13	
Mid frequency 3625.0 MHz							
3530.00	Low	-53.36	-47.36	1000	-40	-7.36	Pass
3605.00	Low	-42.66	-36.66	1000	-25	-11.66	
3614.00	Low	-36.92	-30.92	1000	-13	-17.92	
3615.00	Low	-48.42	-42.42	200	-13	-29.42	
3635.00	High	-48.40	-42.4	200	-13	-29.4	
3636.00	High	-37.23	-31.23	1000	-13	-18.23	
3645.00	High	-43.65	-37.65	1000	-25	-12.65	
3720.00	High	-50.16	-44.16	1000	-40	-4.16	
High frequency 3690.0 MHz							
3530.00	Low	-52.00	-46.00	1000	-40	-6.00	Pass
3670.00	Low	-38.25	-32.25	1000	-25	-7.25	
3679.00	Low	-32.67	-26.67	1000	-13	-13.67	
3680.00	Low	-44.72	-38.72	200	-13	-25.72	
3700.00	High	-43.82	-37.82	200	-13	-24.82	
3701.00	High	-32.91	-26.91	1000	-13	-13.91	
3710.00	High	-44.67	-38.67	1000	-25	-13.67	
3720.00	High	-50.01	-44.01	1000	-40	-4.01	

Reference numbers of test equipment used

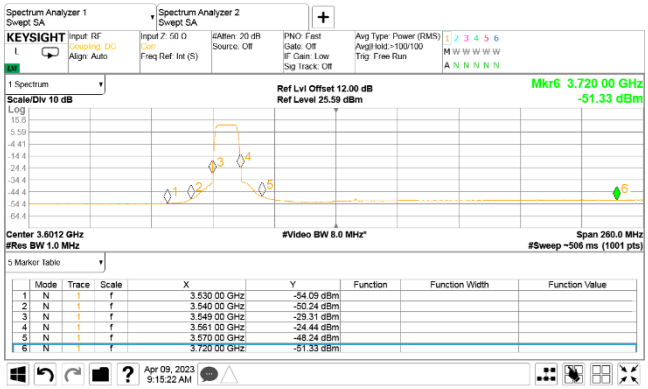
HL 3301	HL 3302	HL 4355	HL 4366	HL 6143			

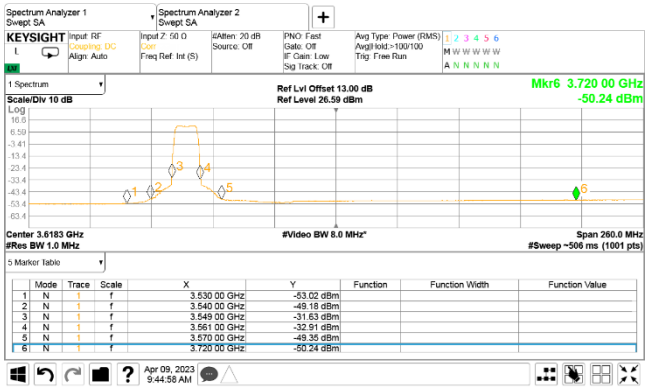
Full description is given in Appendix A.

Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

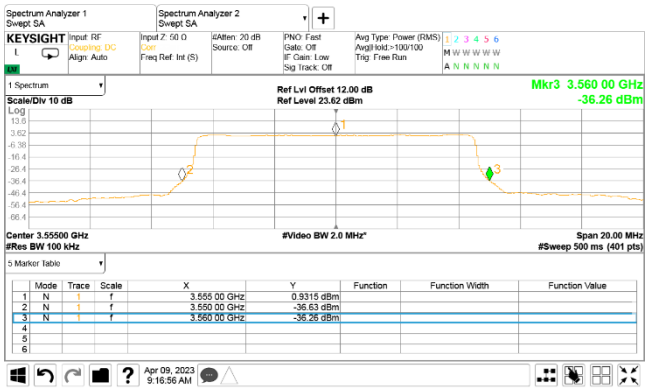
Plot 7.4.1 Emission mask test results at low carrier frequency

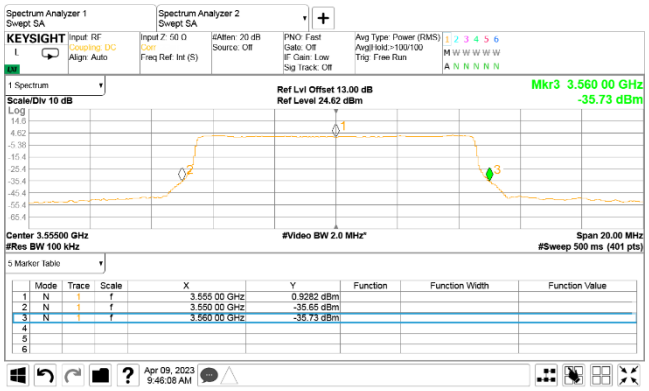
CHANNEL SPACING:
ANTENNA CHAIN 1:
Modulation: 256QAM





10 MHz
ANTENNA CHAIN 1:
Modulation: 256QAM

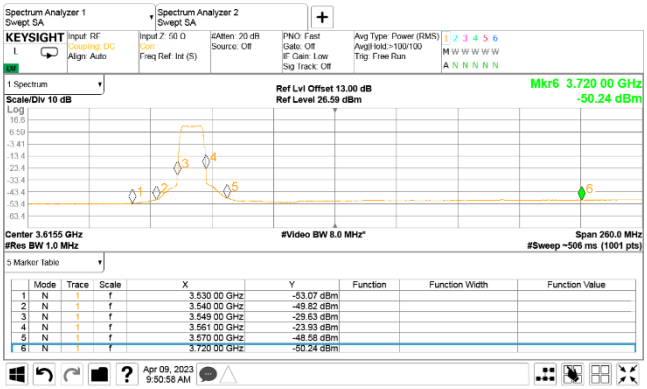


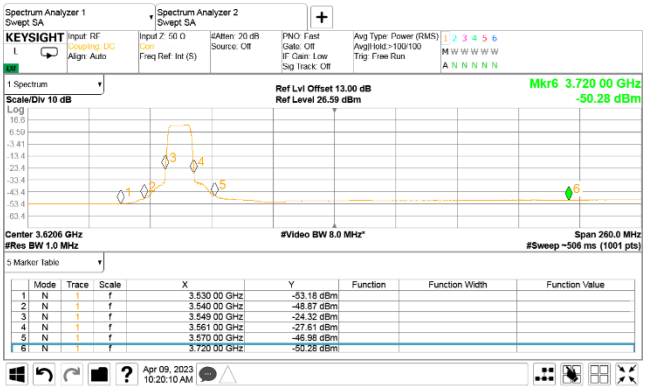


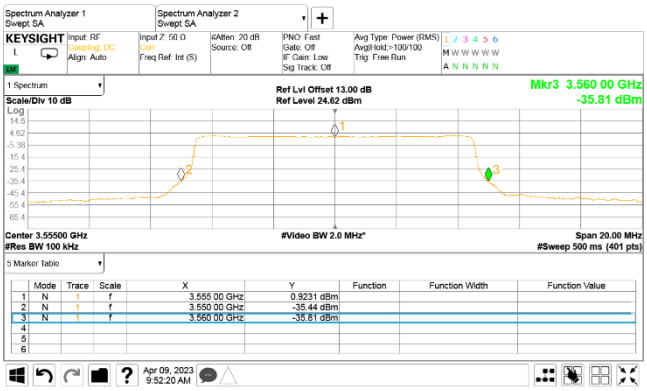
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

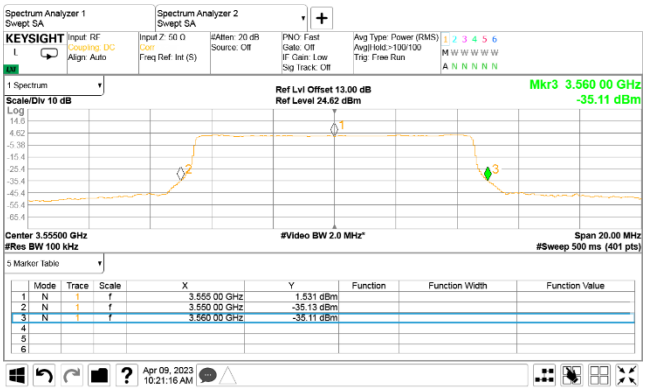
Plot 7.4.2 Emission mask test results at low carrier frequency

CHANNEL SPACING: 10 MHz
ANTENNA CHAIN 3: ANTENNA CHAIN 4:
Modulation: 256QAM **Modulation: 256QAM**









Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.3 Emission mask test results at mid carrier frequency

CHANNEL SPACING: 10 MHz
ANTENNA CHAIN 1: ANTENNA CHAIN 2:
Modulation: 256QAM **Modulation: 256QAM**