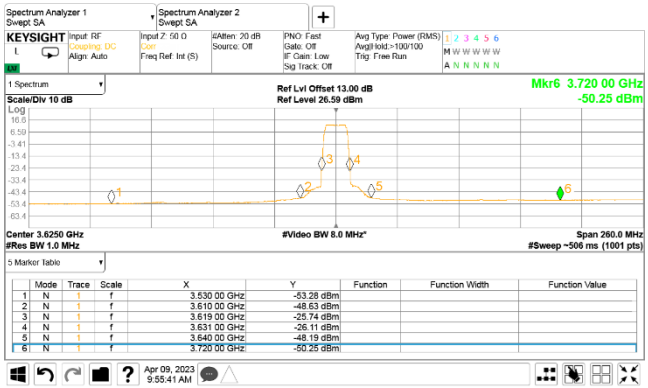
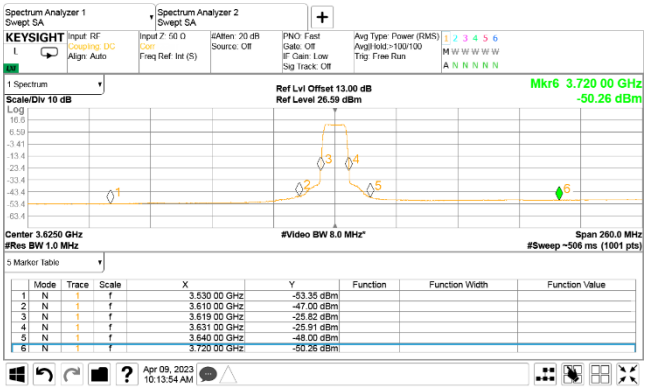
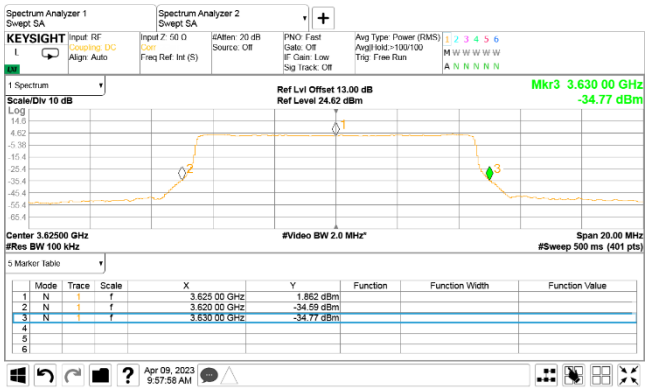
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

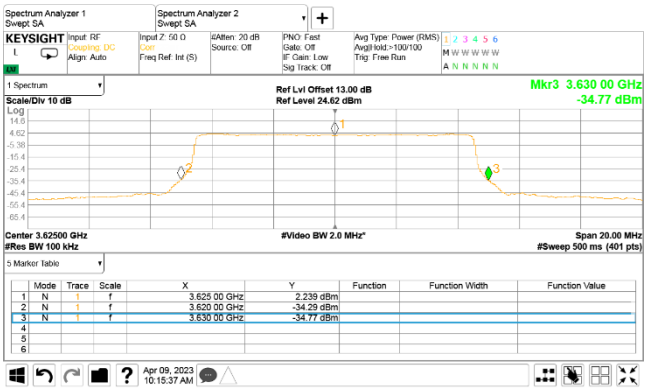
Plot 7.4.4 Emission mask test results at mid carrier frequency

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





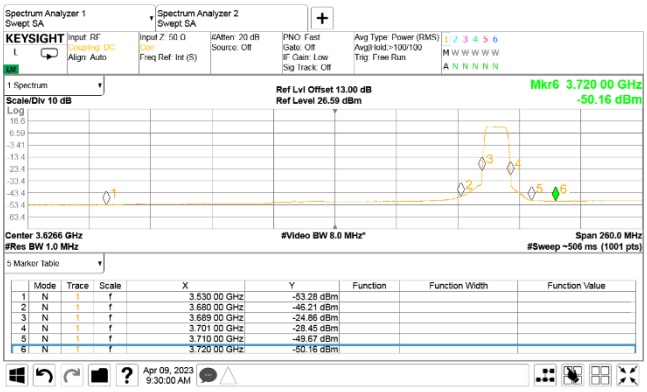


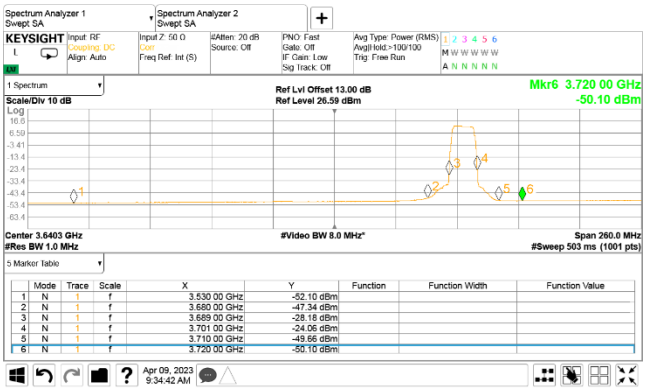


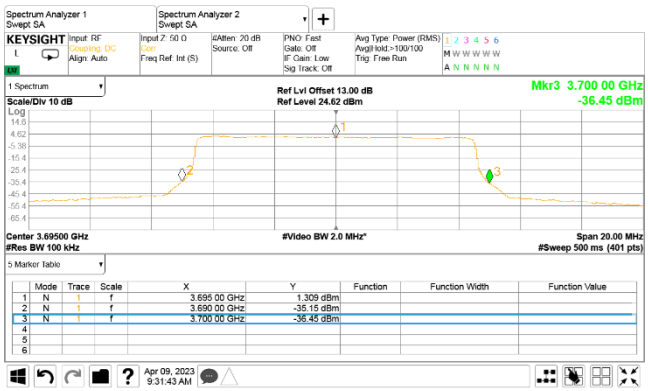
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

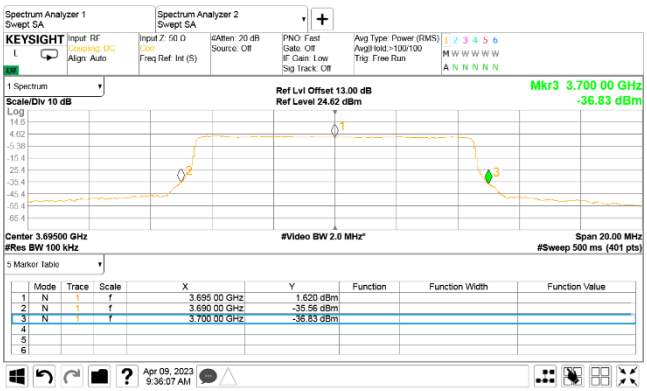
Plot 7.4.5 Emission mask test results at high carrier frequency

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





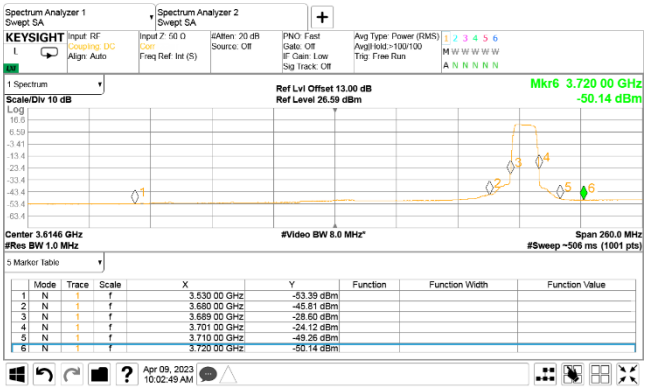


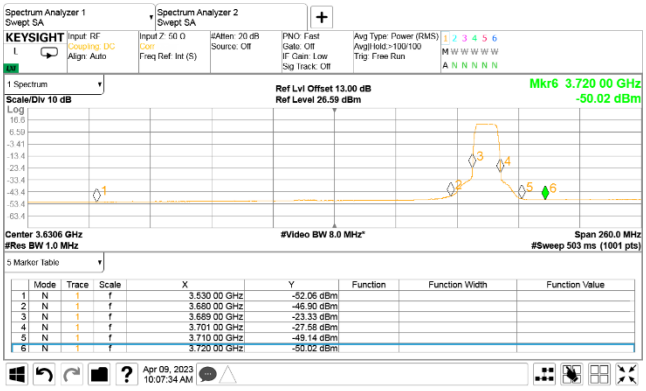


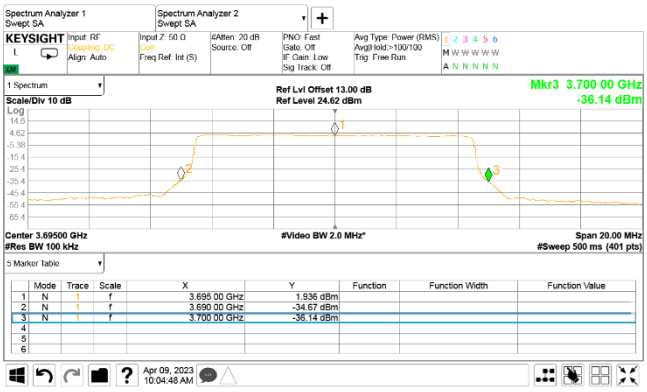
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

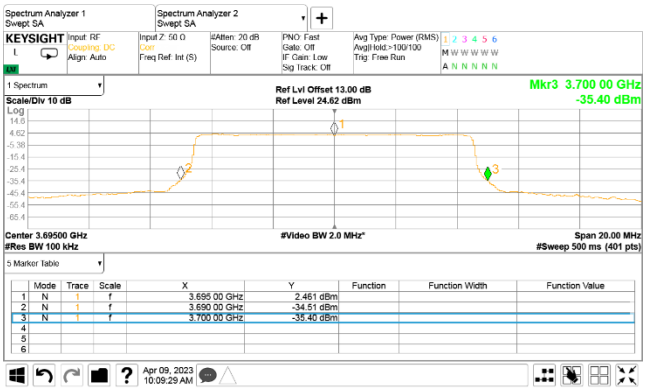
Plot 7.4.6 Emission mask test results at high carrier frequency

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





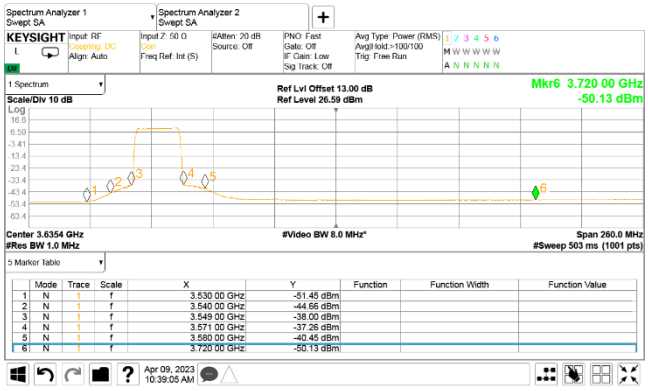


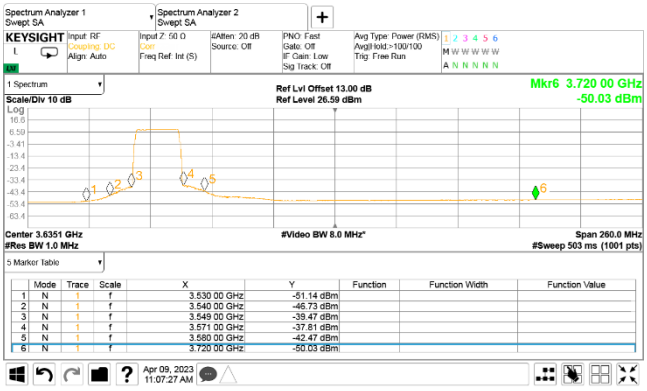


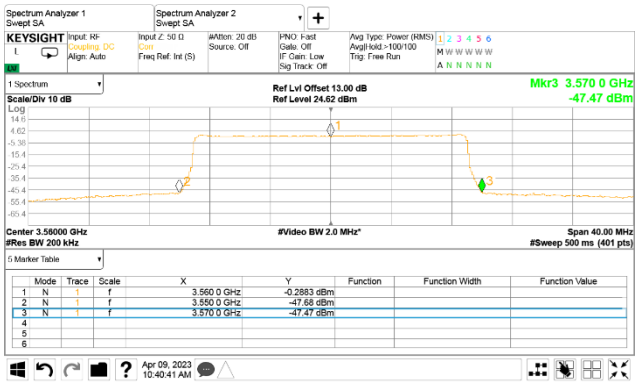
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

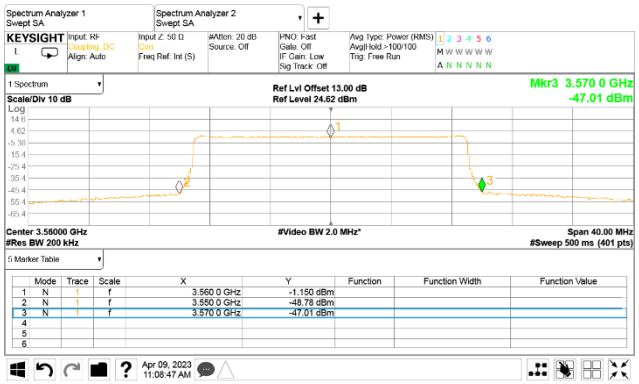
Plot 7.4.7 Emission mask test results at low carrier frequency

CHANNEL SPACING: 20 MHz
ANTENNA CHAIN 1: ANTENNA CHAIN 2:
Modulation: 256QAM **Modulation: 256QAM**





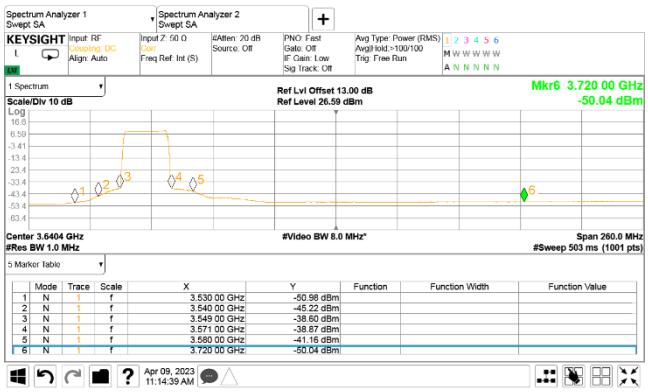


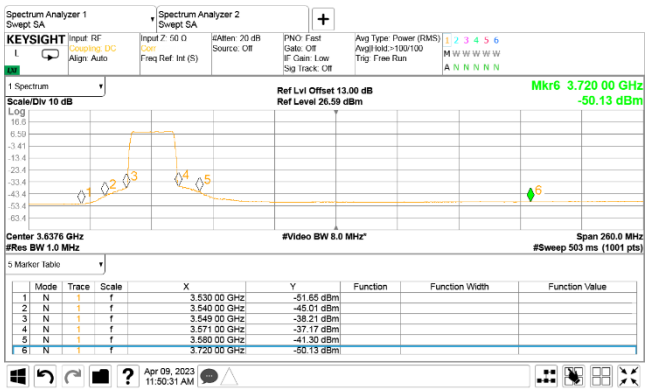


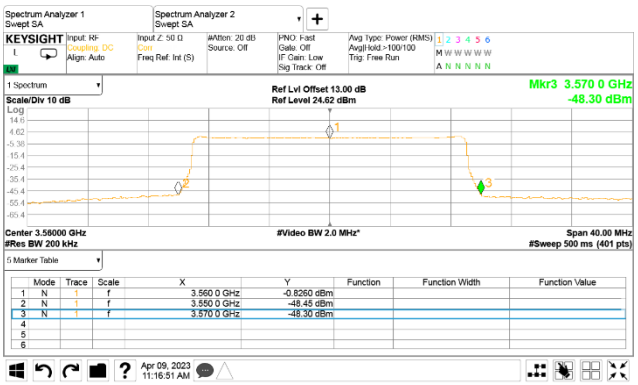
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

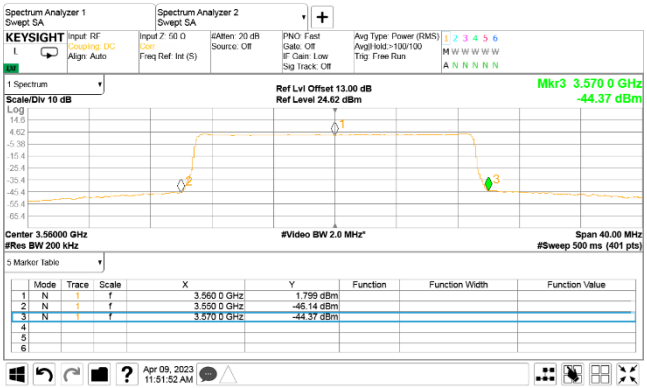
Plot 7.4.8 Emission mask test results at low carrier frequency

CHANNEL SPACING: 20 MHz
ANTENNA CHAIN 3: ANTENNA CHAIN 4:
Modulation: 256QAM **Modulation: 256QAM**





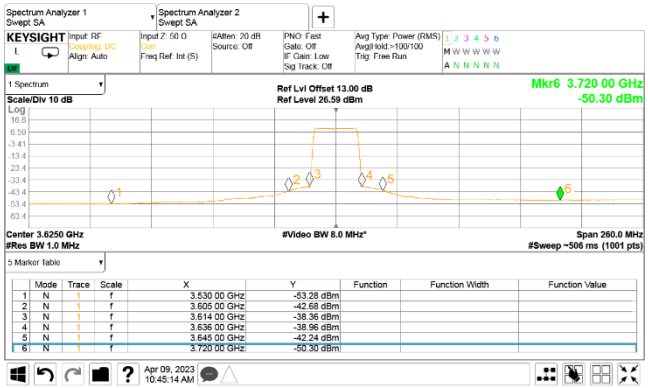


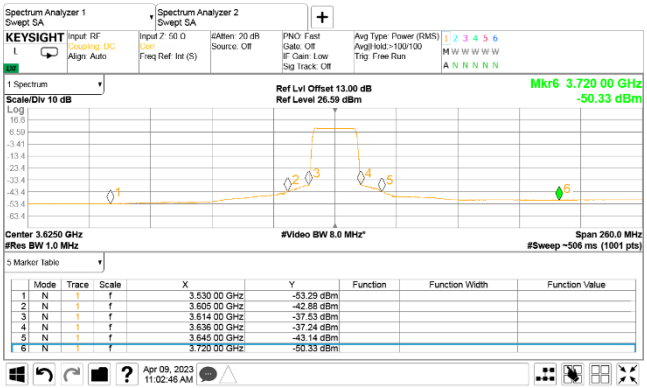


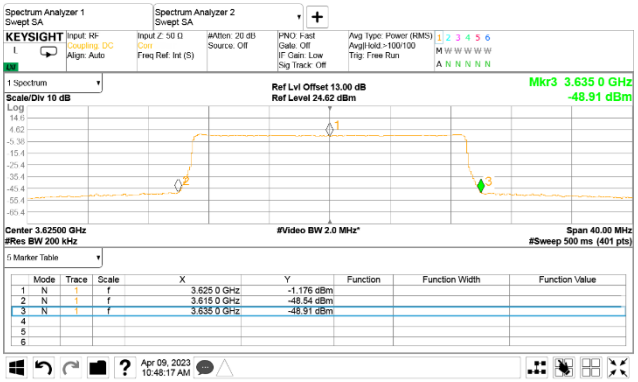
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

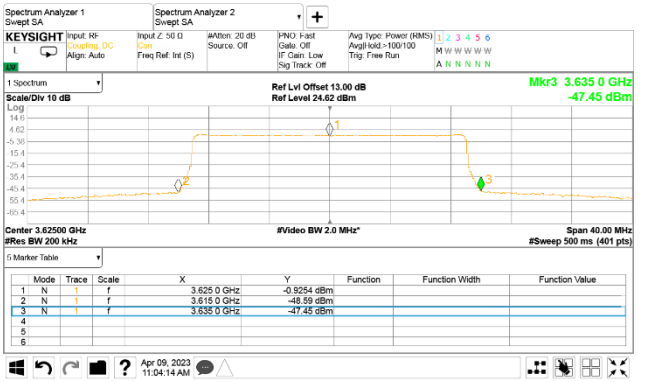
Plot 7.4.9 Emission mask test results at mid carrier frequency

CHANNEL SPACING: 20 MHz
ANTENNA CHAIN 1: ANTENNA CHAIN 2:
Modulation: 256QAM **Modulation: 256QAM**





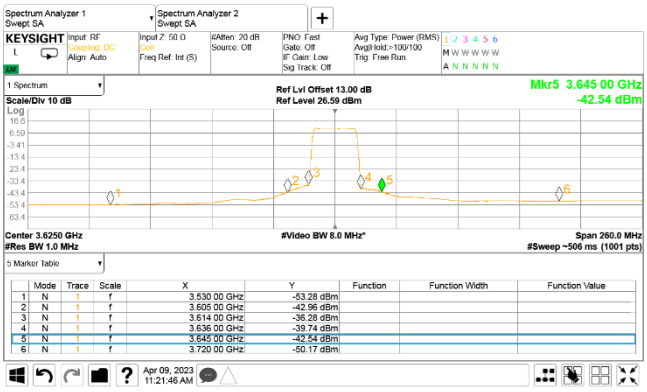


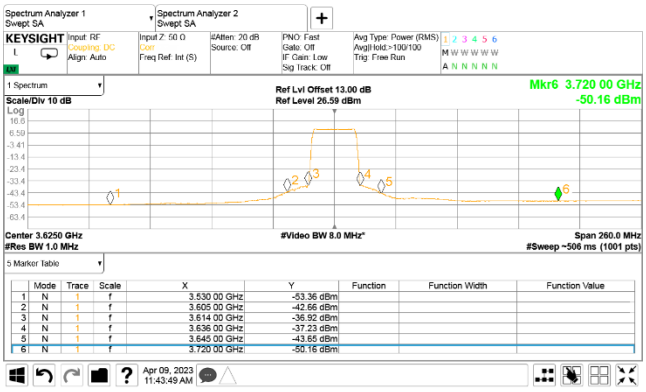


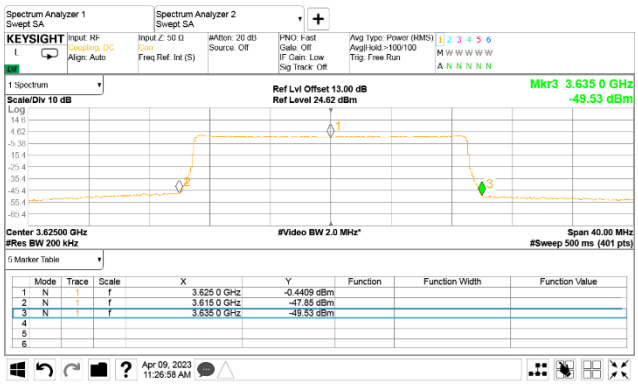
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

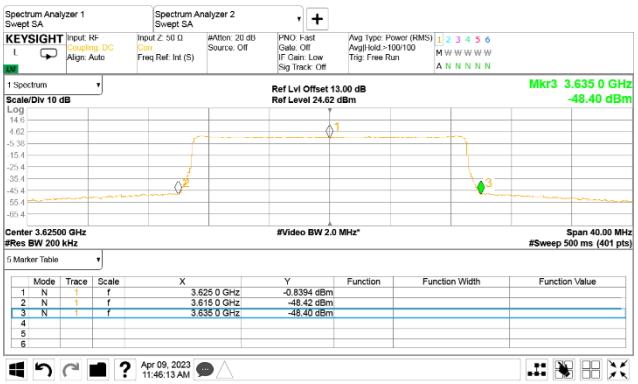
Plot 7.4.10 Emission mask test results at mid carrier frequency

CHANNEL SPACING: 20 MHz
ANTENNA CHAIN 3: ANTENNA CHAIN 4:
Modulation: 256QAM **Modulation: 256QAM**





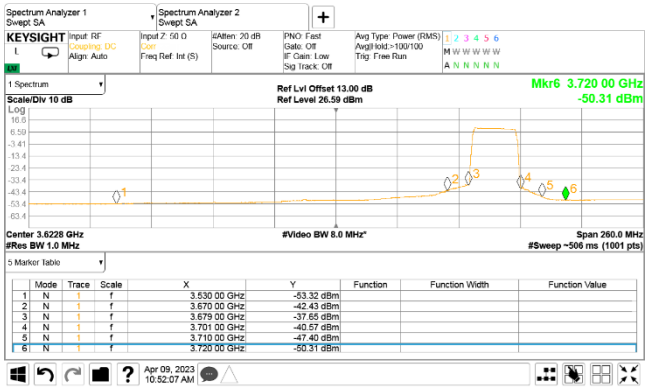


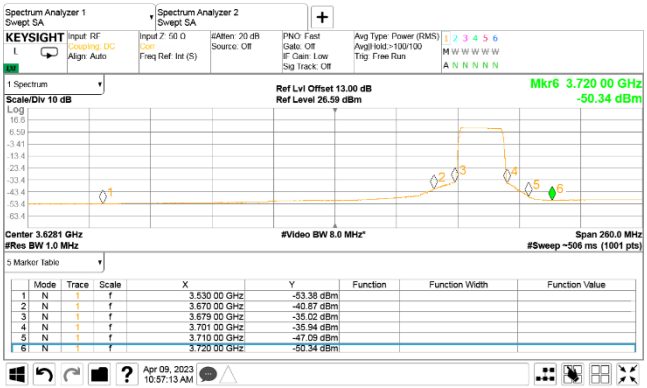


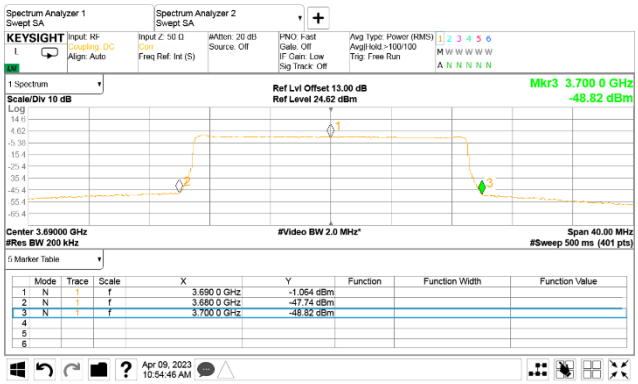
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

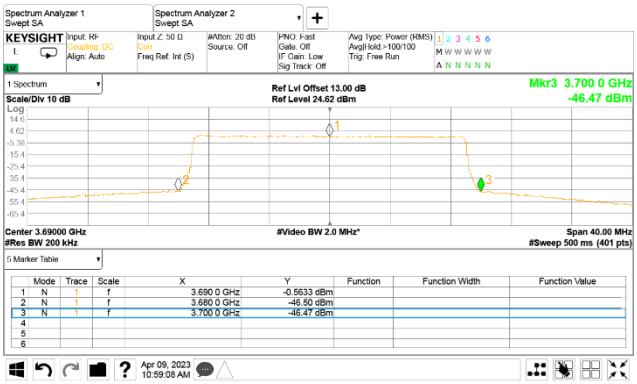
Plot 7.4.11 Emission mask test results at high carrier frequency

CHANNEL SPACING: 20 MHz
ANTENNA CHAIN 1: ANTENNA CHAIN 2:
Modulation: 256QAM **Modulation: 256QAM**





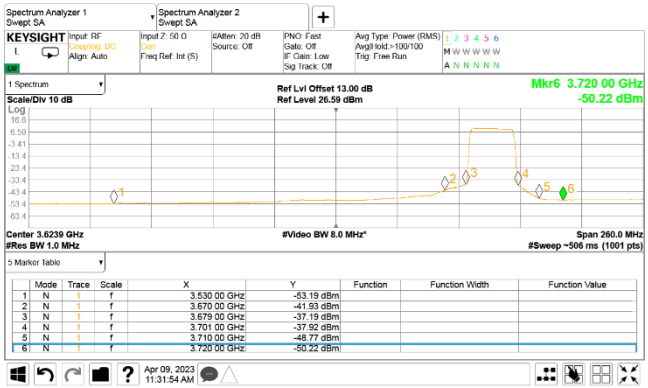


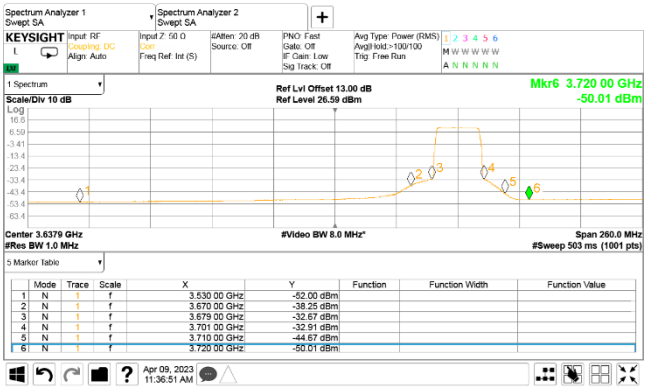


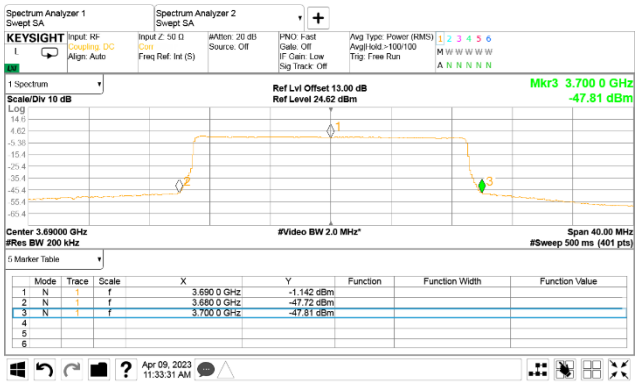
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	09-Apr-23		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

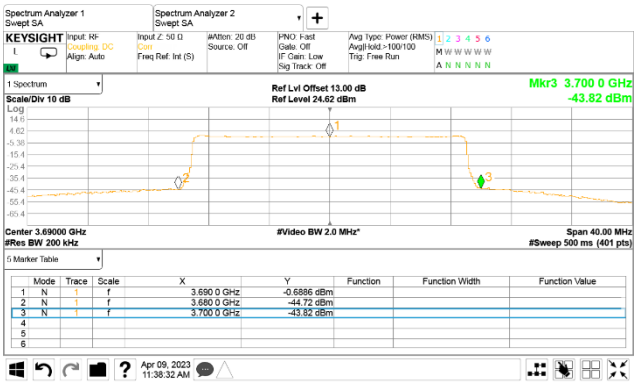
Plot 7.4.12 Emission mask test results at high carrier frequency

CHANNEL SPACING: 20 MHz
ANTENNA CHAIN 3: ANTENNA CHAIN 4:
Modulation: 256QAM **Modulation: 256QAM**









Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	24-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

7.5 Radiated spurious emission measurements

7.5.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Radiated spurious emission test limits

Frequency, MHz	EIRP of spurious, dBm	Equivalent field strength limit @ 3m, dB(μV/m)***
0.09 – below 3530.0	-40.0	55.2
3720.0 – 10th harmonic*	-40.0	55.2

*** - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows: E=sqrt(30×P×1.64)/r, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters

7.5.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and the performance check was conducted.

7.5.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.5.2.3 The worst test results (the lowest margins) were recorded in Table 7.5.2 and shown in the associated plots.

7.5.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.5.3.1 The EUT was set up as shown in Figure 7.5.2, energized and the performance check was conducted.

7.5.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

7.5.3.3 The worst test results (the lowest margins) were recorded in Table 7.5.2 and shown in the associated plots.

Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	24-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Figure 7.5.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

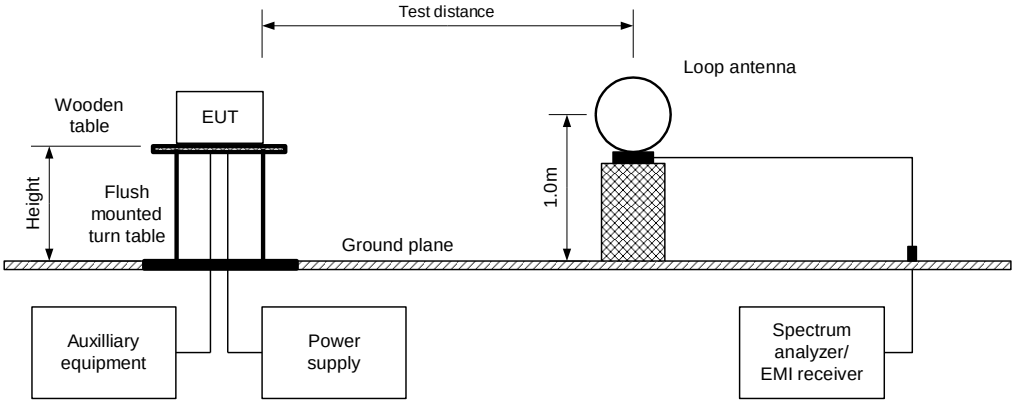
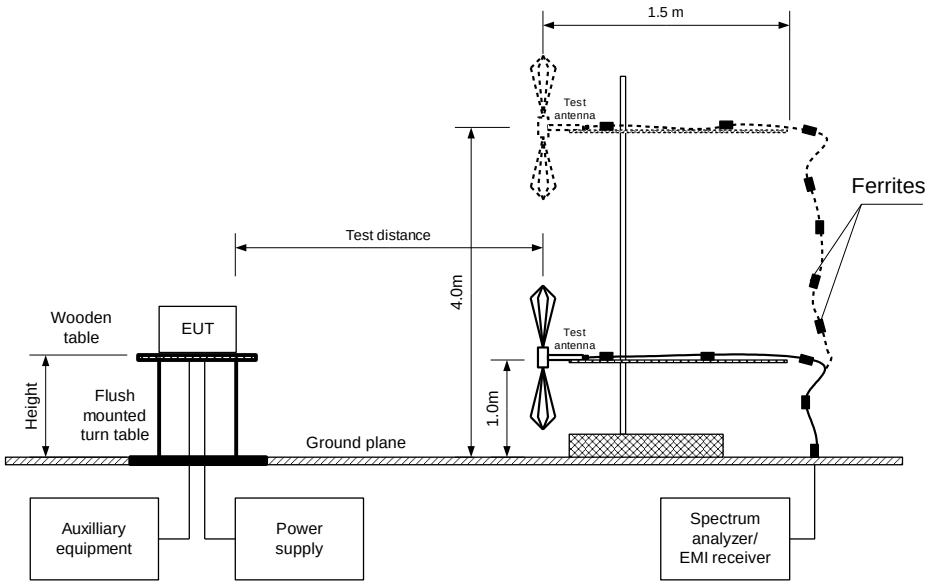


Figure 7.5.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 96.41(e)(2), Radiated spurious emissions**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	24-Apr-23		
Temperature: 24 ºC	**Relative Humidity:** 52 %	**Air Pressure:** 1011 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	3550 - 3700 MHz
TEST DISTANCE:	3 m
TEST SITE:	Semi anechoic chamber
INVESTIGATED FREQUENCY RANGE:	0.009 – 37000 MHz
DETECTOR USED:	Peak
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz)
MODULATION:	256QAM
OCCUPIED BANDWIDTH	20 MHz (Output power and PSD Worst case)
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
Low carrier frequency 3560 MHz							
33.638575	34.61	55.20	-20.59	120	V	1.02	-101.0
38.423449	45.53	55.20	-9.67	120	V	1.0	124.0
102.378860	32.53	55.20	-22.67	120	V	1.02	75.0
274.980959	41.52	55.20	-13.68	120	H	1.02	14.0
375.005417	41.91	55.20	-13.29	120	H	1.02	-170.0
424.996041	36.84	55.20	-18.36	120	V	1.02	-179.0
595.192215	37.51	55.20	-17.69	120	H	1.24	143.0
Mid carrier frequency 3625 MHz							
36.961785	46.03	55.20	-9.17	120	V	1.02	-152.0
102.637971	43.09	55.20	-12.11	120	V	1.02	91.0
268.779244	37.00	55.20	-18.20	120	V	1.63	170
375.001042	49.37	55.20	-5.83	120	V	1.22	180
425.005249	39.92	55.20	-15.28	120	V	1.0	157
546.327618	17.26	55.20	-37.94	120	V	1.0	124
595.195595	38.99	55.20	-16.21	120	H	1.02	41
High carrier frequency 3690 MHz							
36.525052	45.93	55.20	-9.27	120	V	1.0	-153
104.406323	45.50	55.20	-9.80	120	V	1.0	-180
374.991667	49.59	55.20	-5.61	120	V	1.22	180
425.002874	39.62	55.20	-15.58	120	V	1.0	156
556.805290	32.94	55.20	-22.26	120	V	1.0	107.0
595.198167	37.67	55.20	-17.53	120	V	1.02	124.0

*****- Margin = Field strength of spurious – calculated field strength limit.
******- EUT front panel refers to 0 degrees position of turntable.

Reference numbers of test equipment used

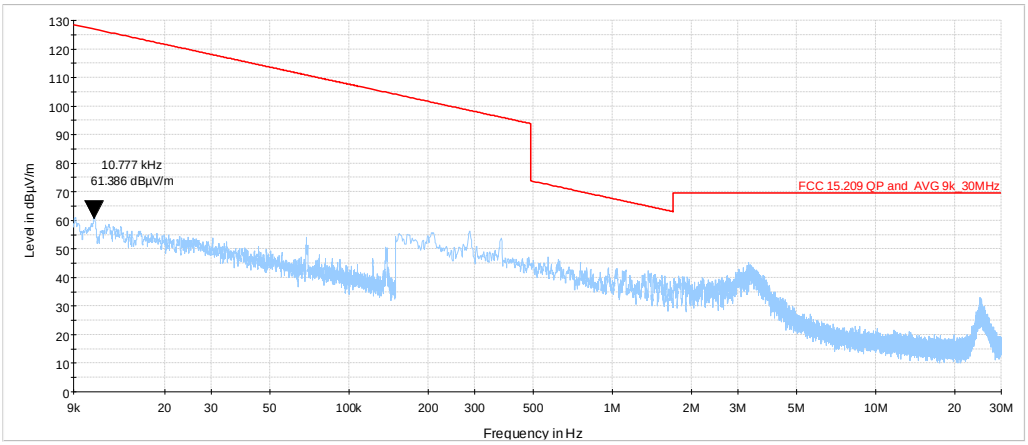
HL 0446	HL 3903	HL 4933	HL 4956	HL 5084	HL 5085	HL 5288	HL 5902
HL 7585							

Full description is given in Appendix A.

Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	24-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

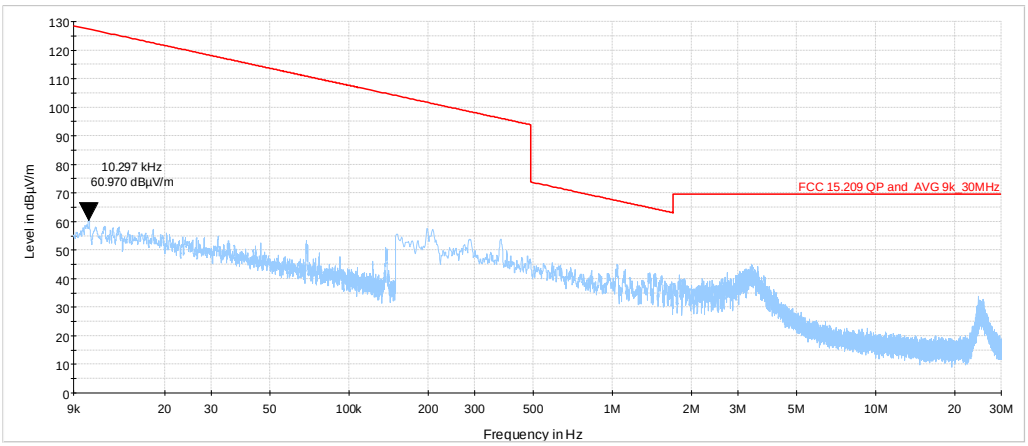
Plot 7.5.1 Radiated emission measurements in 9 kHz - 30 MHz range

TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Low
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Plot 7.5.2 Radiated emission measurements in 9 kHz - 30 MHz range

TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Mid
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	24-Apr-23		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.5.3 Radiated emission measurements in 9 kHz - 30 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m