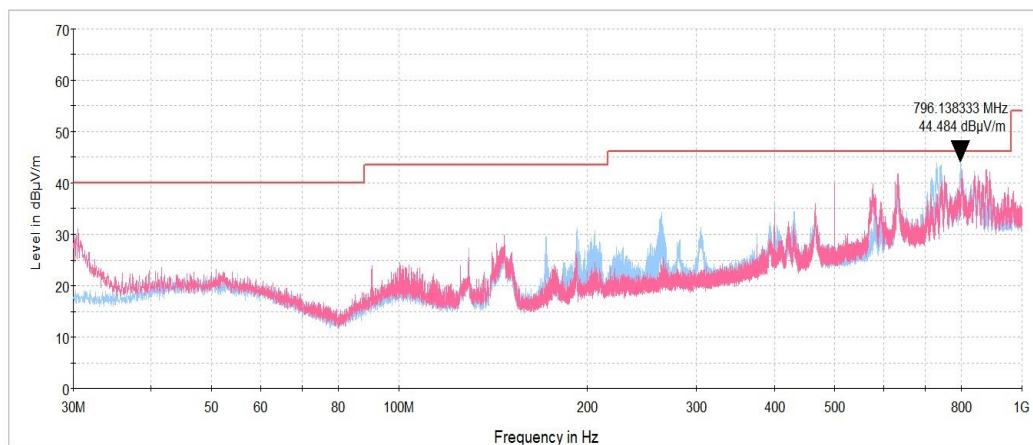




Test specification:		FCC Section 15.255(d)(2), RSS-210 section J.3, Out of band radiated emissions below 40 GHz	
Test procedure:		47 CFR, Section 2.1053; ANSI C63.10, Section 9.13	
Test mode:		Verdict: PASS	
Date(s):			
25-Feb-22			
Temperature: 23 °C	Relative Humidity: 54 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

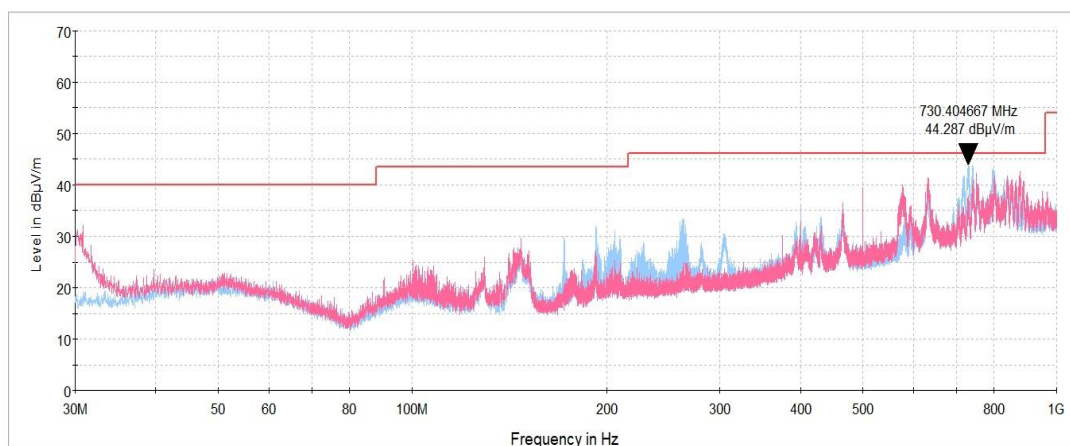
Plot 7.3.5 Radiated emission measurements from 30 to 1000 MHz at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical



Plot 7.3.6 Radiated emission measurements from 30 to 1000 MHz at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical

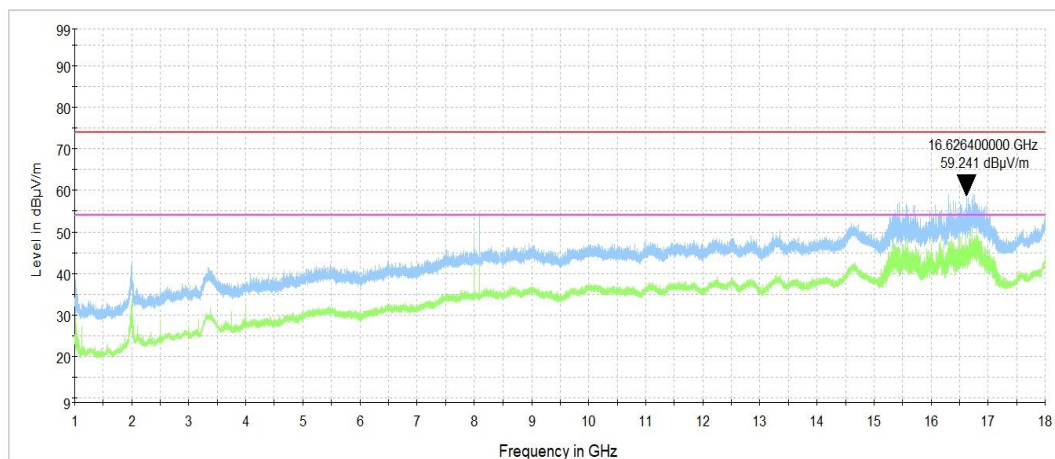




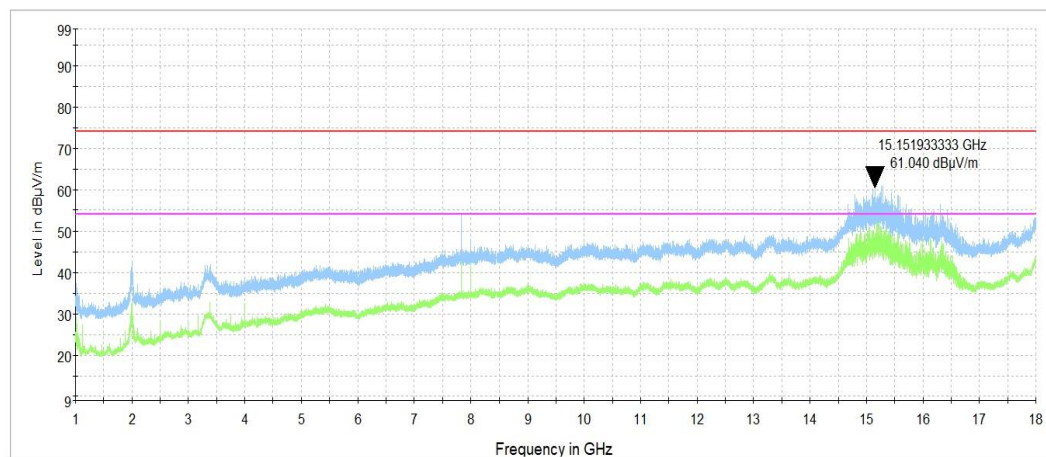
Test specification:		FCC Section 15.255(d)(2), RSS-210 section J.3, Out of band radiated emissions below 40 GHz	
Test procedure:		47 CFR, Section 2.1053; ANSI C63.10, Section 9.13	
Test mode:		Verdict: PASS	
Date(s):			
25-Feb-22			
Temperature: 23 °C	Relative Humidity: 54 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.7 Radiated emission measurements from 1 to 18 MHz at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical

**Plot 7.3.8 Radiated emission measurements from 1 to 18 MHz at mid frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical

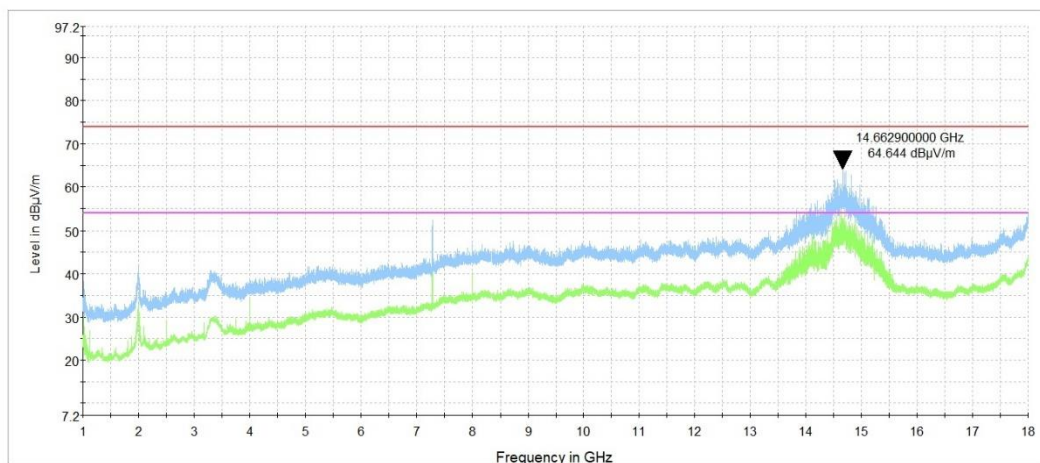




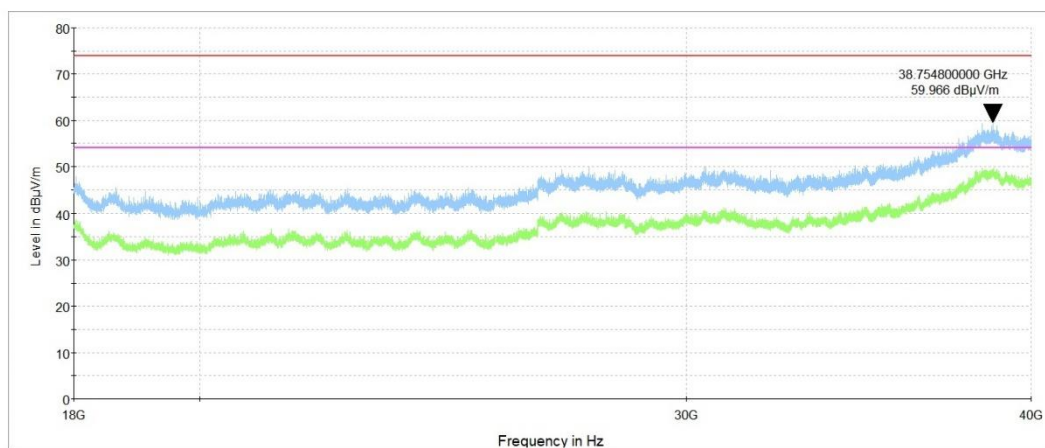
Test specification:		FCC Section 15.255(d)(2), RSS-210 section J.3, Out of band radiated emissions below 40 GHz	
Test procedure:		47 CFR, Section 2.1053; ANSI C63.10, Section 9.13	
Test mode:		Verdict: PASS	
Date(s):			
25-Feb-22			
Temperature: 23 °C	Relative Humidity: 54 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.9 Radiated emission measurements from 1 to 18 MHz at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical

**Plot 7.3.10 Radiated emission measurements from 18 to 40 GHz at low frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical

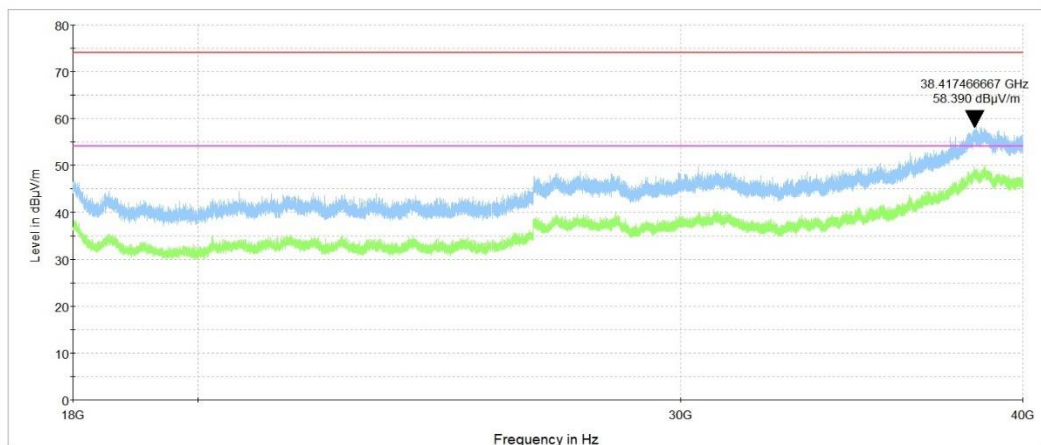




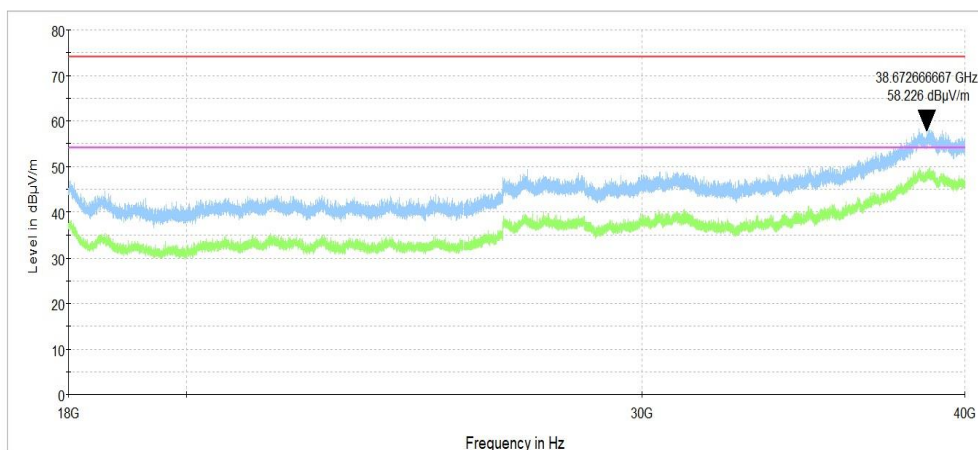
Test specification:		FCC Section 15.255(d)(2), RSS-210 section J.3, Out of band radiated emissions below 40 GHz	
Test procedure:		47 CFR, Section 2.1053; ANSI C63.10, Section 9.13	
Test mode:		Verdict: PASS	
Date(s):			
25-Feb-22			
Temperature: 23 °C	Relative Humidity: 54 %	Air Pressure: 1012 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.11 Radiated emission measurements from 18 to 40 GHz at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical

**Plot 7.3.12 Radiated emission measurements from 18 to 40 GHz at high frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical





Test specification: FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 21-Feb-22			
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

7.4 Out of band radiated emissions above 40 GHz up to 200 GHz

7.4.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Radiated spurious emission test limits

Frequency, GHz	Power density at 3 m distance pW/cm ²	Distance, m	Field strength dB(μV/m)*, peak	Field strength dB(μV/m)*, average
40 – 220	90.0	3.0	105.30	85.30
90 - 110	90.0	0.50	120.90**	100.90**
110 - 140	90.0	0.05	140.90**	120.90**
140 - 200	90.0	0.01	154.80**	134.80**

* - Field strength was calculated per equation (26) of ANSI C63.10-2013 section 9 as follows: $E = \sqrt{PD \times 377}$, where PD is the power density at the distance specified by the limit in W/m², E- field strength in V/m.

** - The limit for other test distance was calculated using the inverse distance extrapolation factor as follows:
 $\text{Lim}_{S2} = \text{Lim}_{S1} + 20 \log (S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

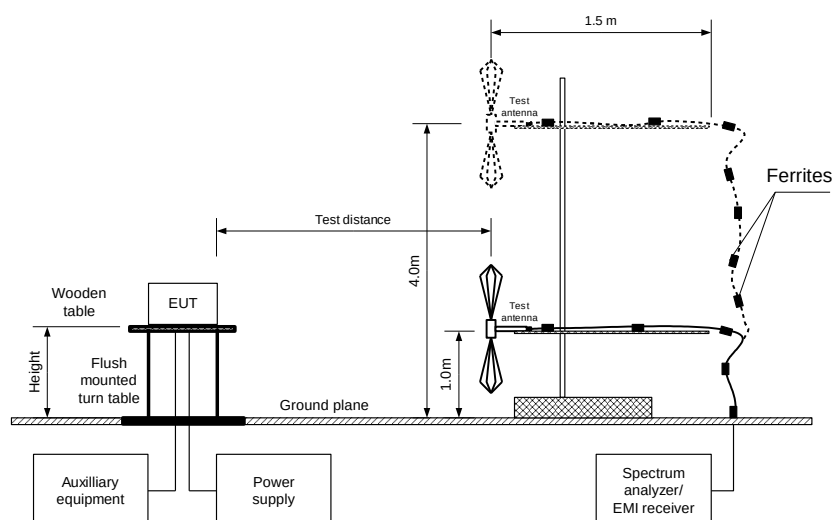
7.4.2 Test procedure for spurious emission field strength measurements

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

7.4.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 3600, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.4.2.3 The test results are given in Table 7.4.2 and shown in the associated plots.

Figure 7.4.1 Radiated emissions above 40 GHz test set up





Test specification: FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 21-Feb-22			
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Table 7.4.2 Out of band radiated emissions test results

TEST DISTANCE: 0.05 - 3 m
 EUT POSITION: Typical (Vertical)
 MODULATION: 16QAM
 TRANSMITTER OUTPUT POWER: Maximum
 INVESTIGATED FREQUENCY RANGE: 40 – 200 GHz
 RESOLUTION BANDWIDTH: 1000 kHz
 VIDEO BANDWIDTH: ≥ Resolution bandwidth
 TEST ANTENNA TYPE: Standard Gain Horn 24dB (40-60 GHz)
 Standard Gain Horn 24dB (50-75 GHz)
 Standard Gain Horn 24dB (75-110 GHz)
 Standard Gain Horn 24dB (90-140 GHz)
 Standard Gain Horn 24dB (140-220 GHz)

Standard Gain Horn 24dB (140-220 GHz)										
Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 kHz)			Verdict
	Polariz.	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
Low carrier frequency										
58320	Vert	1.5	148	104.52	120.9	-16.38	95.77	100.9	-5.13	Pass
Mid carrier frequency										
62640	Vert	1.5	25	104.77	120.9	-16.13	95.82	100.9	-5.08	Pass
High carrier frequency										
64800	Vert	1.5	38	104.55	120.9	-16.35	95.91	100.9	-4.99	Pass

*- EUT front panel refer to 0 degrees position of turntable.

**- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 5376	HL 771	HL 3291	HL 5380	HL 770	HL 3290	HL 4483	HL 3294
HL 3235	HL 4023	HL 3434	HL 3536	HL 747	HL 3306	HL 772	

Full description is given in Appendix A.

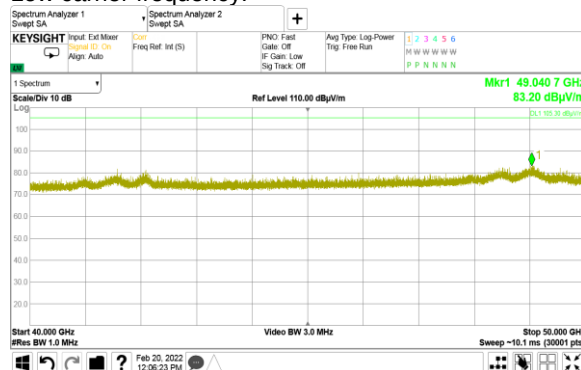


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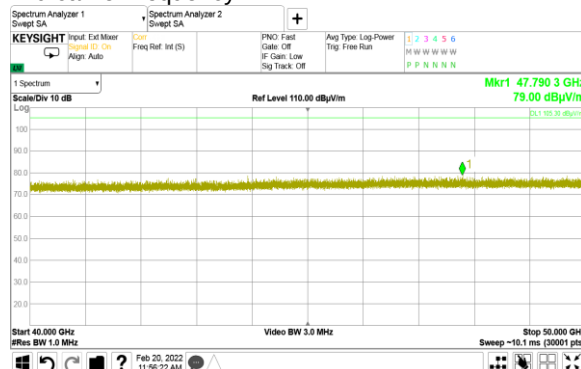
Test specification:		FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		21-Feb-22	
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.1 Spurious emission measurements in 40 – 50 GHz range

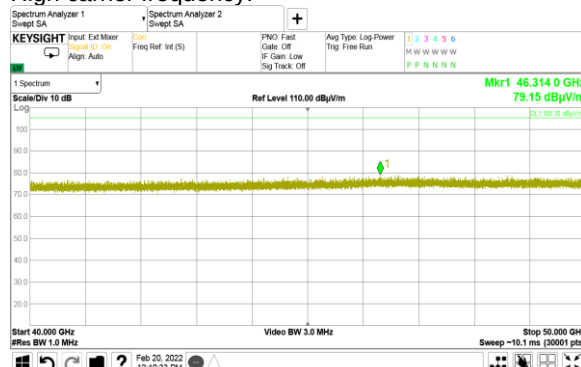
TEST SITE:
TEST DISTANCE:
MODULATION:
ANTENNA POLARIZATION:
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency:



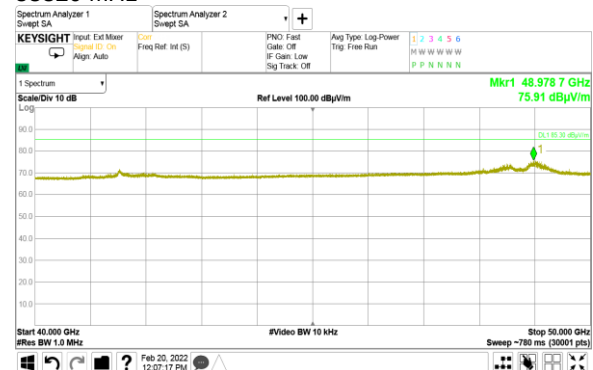
Mid carrier frequency:



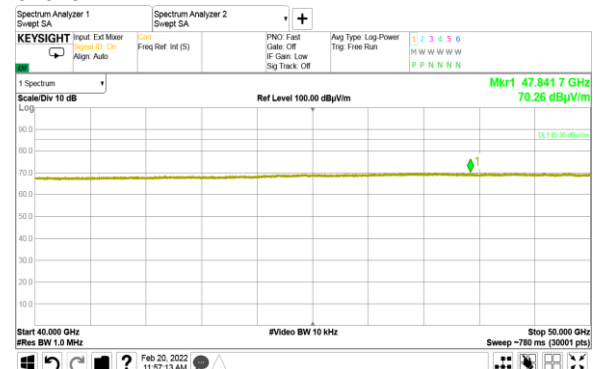
High carrier frequency:



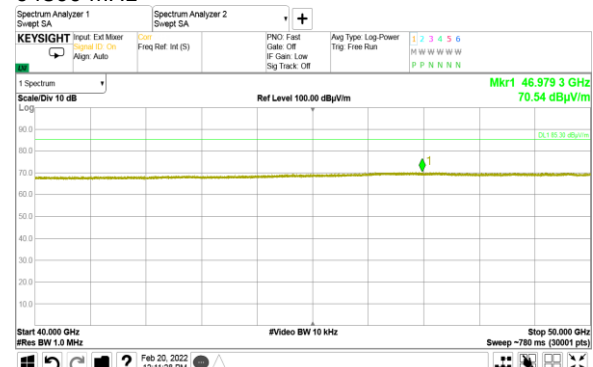
OATS
3 m
16QAM
Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz
58320 MHz



62640 MHz



64800 MHz



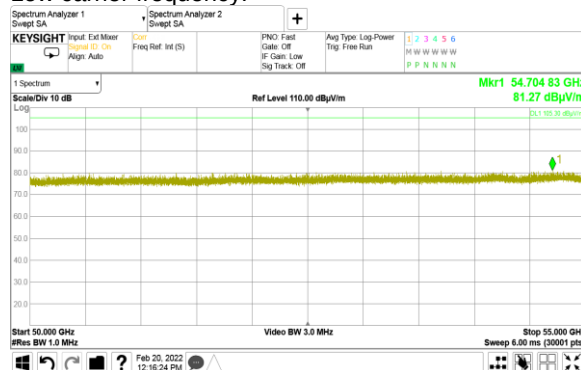


HERMON LABORATORIES

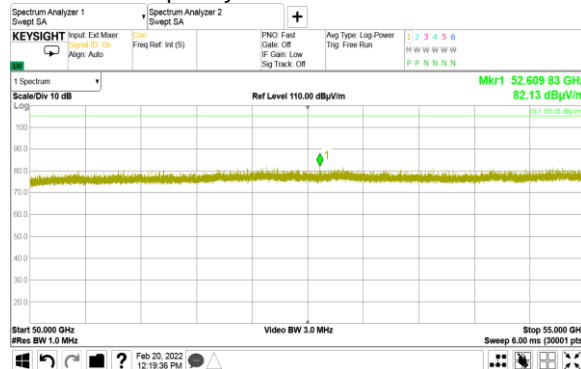
Test specification:		FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		21-Feb-22	
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.2 Spurious emission measurements in 50 – 55 GHz range

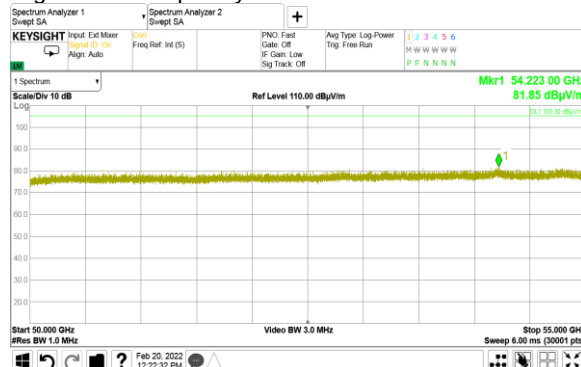
TEST SITE:
TEST DISTANCE:
MODULATION:
ANTENNA POLARIZATION:
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency:



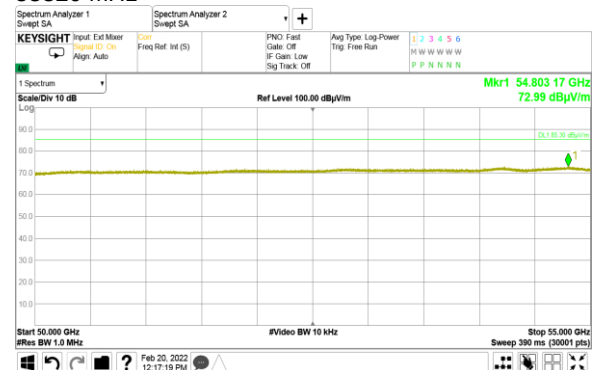
Mid carrier frequency:



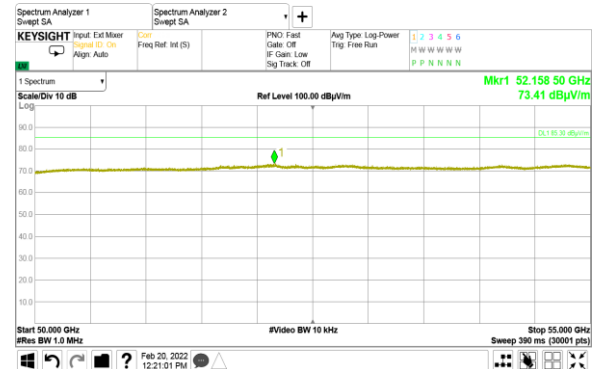
High carrier frequency:



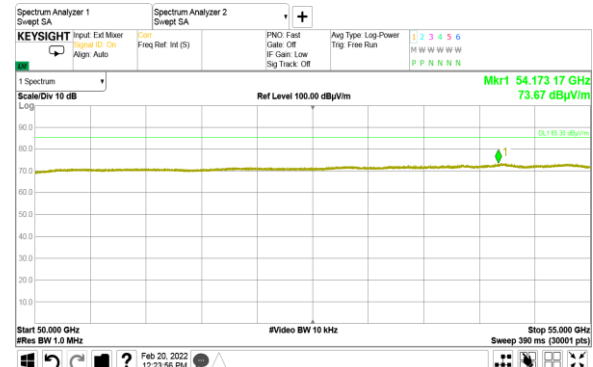
OATS
3 m
16QAM
Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz
58320 MHz



62640 MHz



64800 MHz



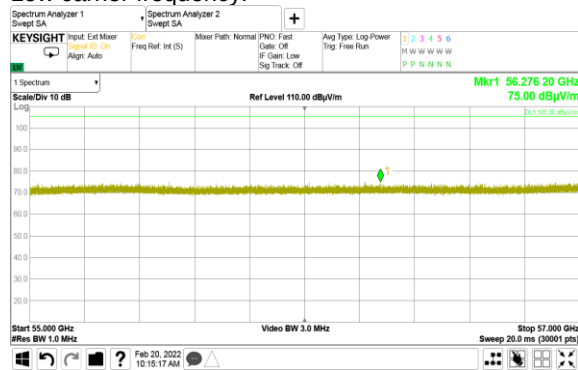


HERMON LABORATORIES

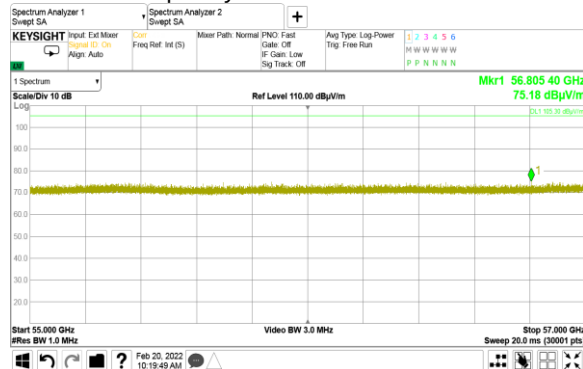
Test specification:		FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		21-Feb-22	
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.3 Spurious emission measurements in 55 – 57 GHz range

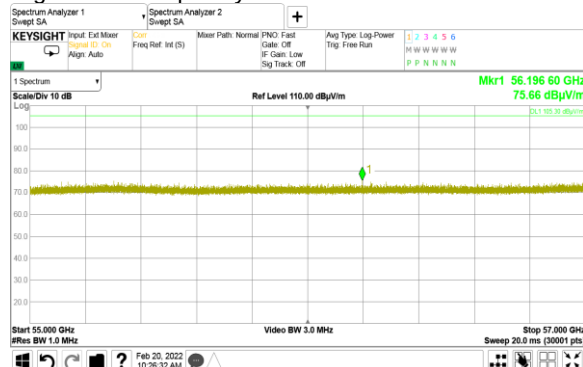
TEST SITE:
TEST DISTANCE:
MODULATION:
ANTENNA POLARIZATION:
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency:



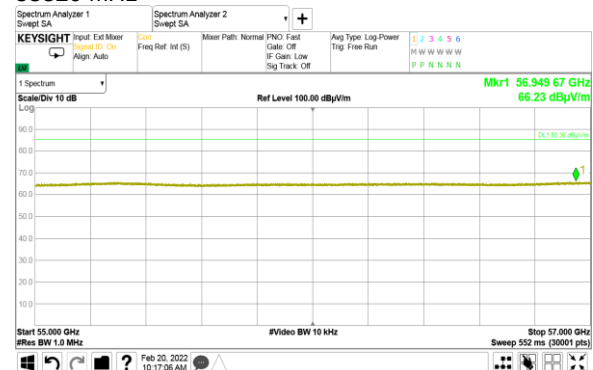
Mid carrier frequency:



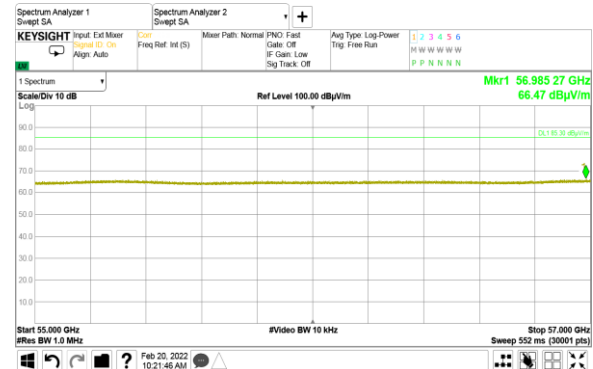
High carrier frequency:



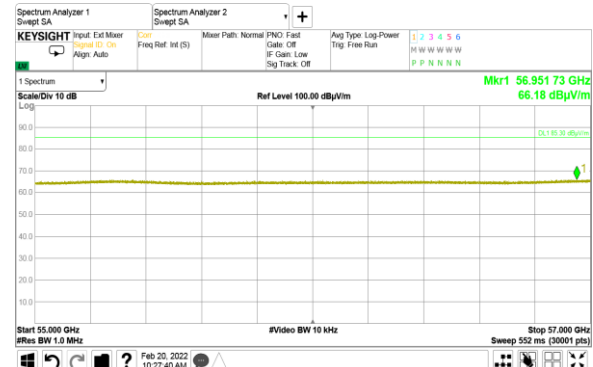
OATS
3 m
16QAM
Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz
58320 MHz



62640 MHz



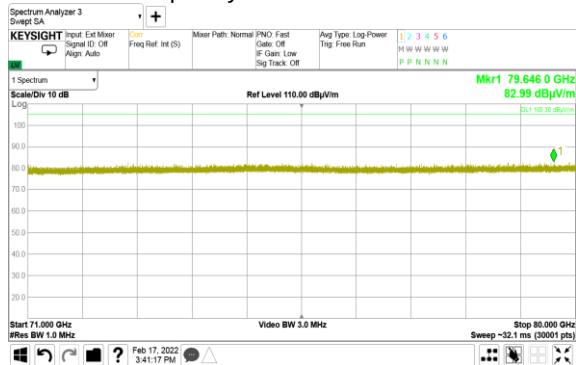
64800 MHz



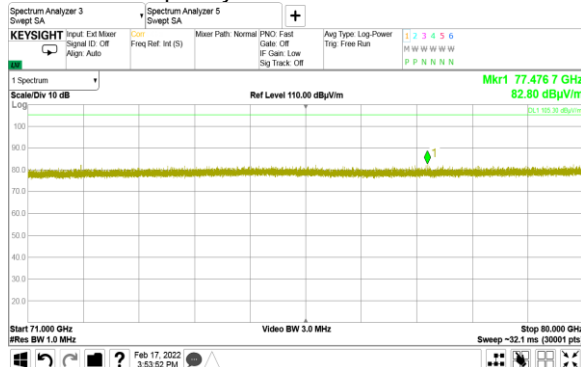
Test specification:		FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	
Date(s):		21-Feb-22	
Temperature: 10 °C		Relative Humidity: 48 %	
Remarks:		Air Pressure: 1020 hPa	
		Power: 48 VDC	
		Verdict: PASS	

Plot 7.4.4 Spurious emission measurements in 71 – 80 GHz range

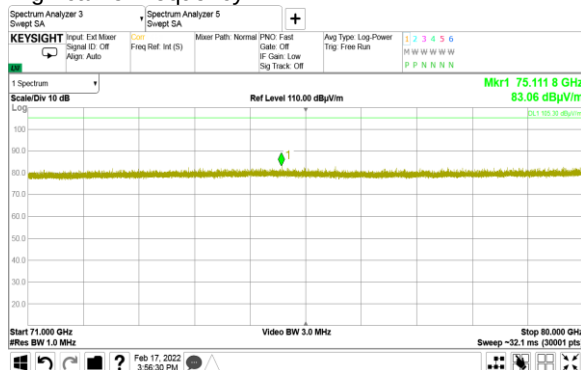
TEST SITE:
TEST DISTANCE:
MODULATION:
ANTENNA POLARIZATION:
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency:



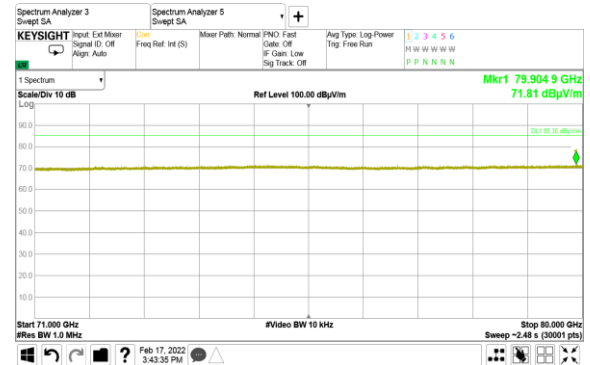
Mid carrier frequency:



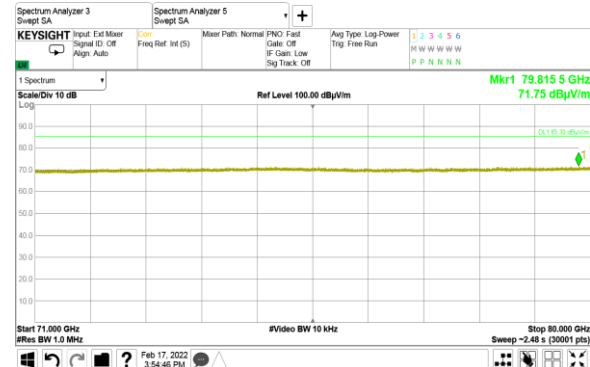
High carrier frequency:



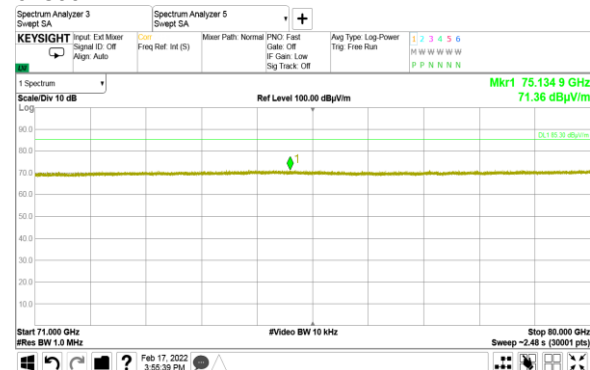
OATS
3 m
16QAM
Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz
58320 MHz



62640 MHz



64800 MHz



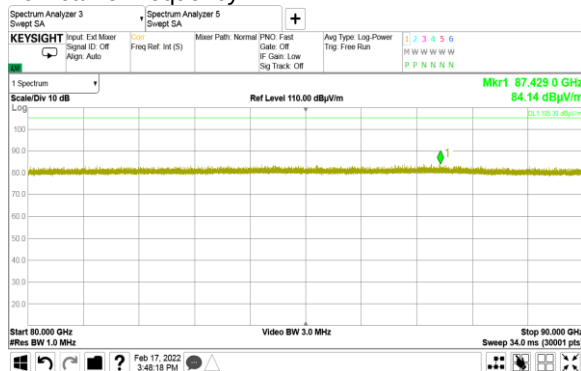


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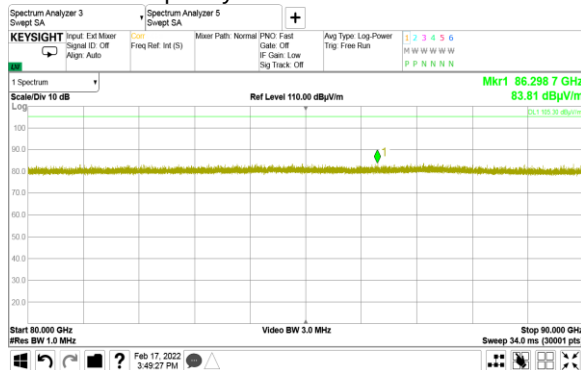
Test specification:		FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		21-Feb-22	
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.5 Spurious emission measurements in 80 – 90 GHz range

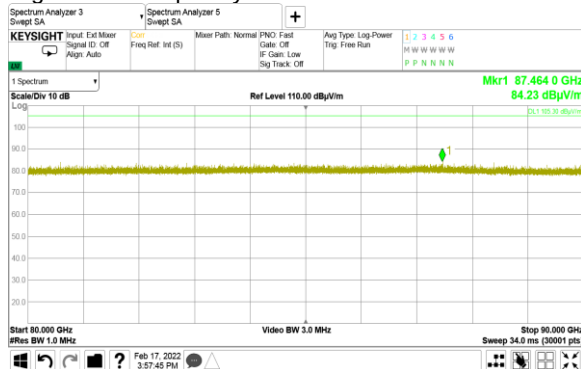
TEST SITE:
TEST DISTANCE:
MODULATION:
ANTENNA POLARIZATION:
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency:



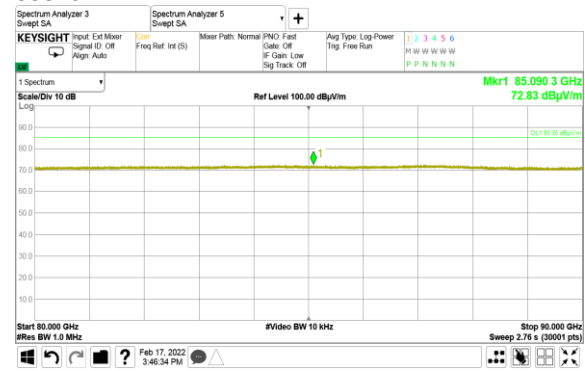
Mid carrier frequency:



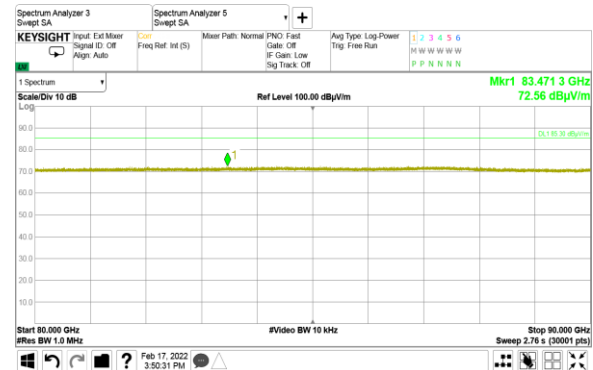
High carrier frequency:



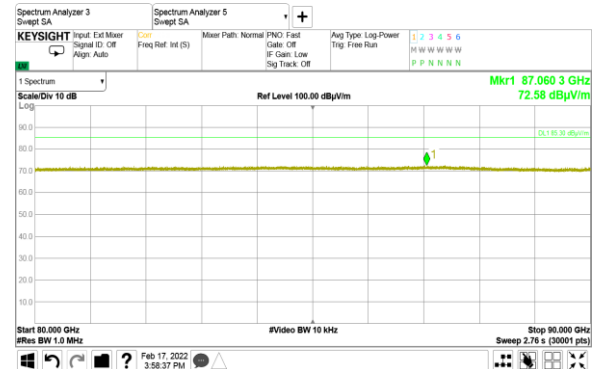
OATS
3 m
16QAM
Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz
58320 MHz



62640 MHz



64800 MHz



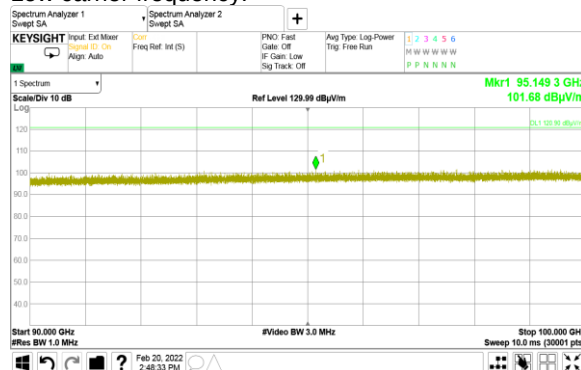


HERMON LABORATORIES

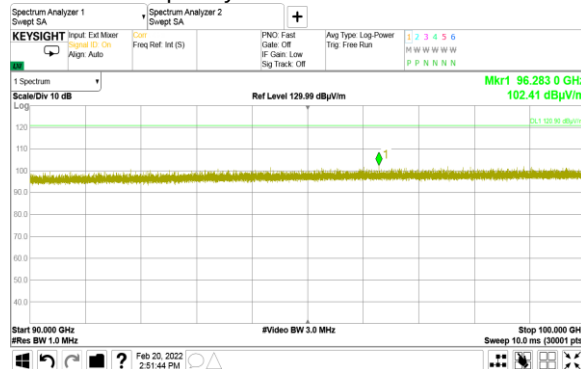
Test specification:		FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		21-Feb-22	
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.6 Spurious emission measurements in 90 - 100 GHz range

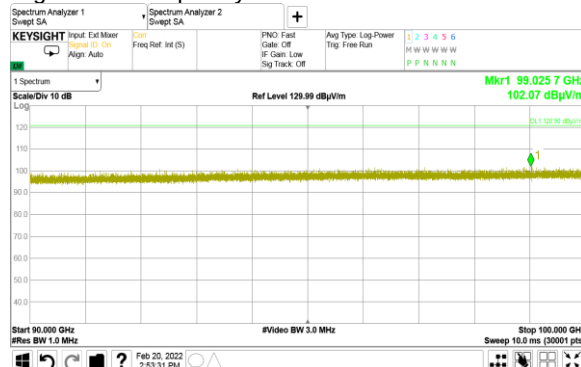
TEST SITE:
TEST DISTANCE:
MODULATION:
ANTENNA POLARIZATION:
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency:



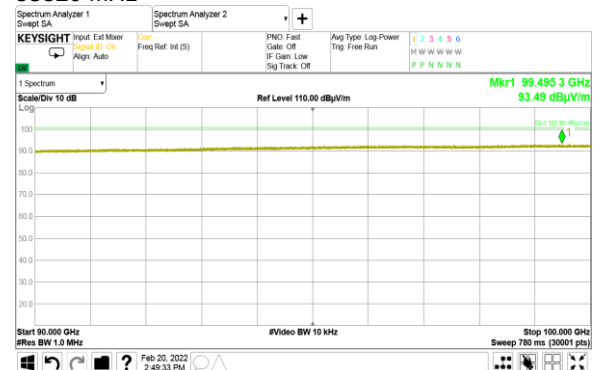
Mid carrier frequency:



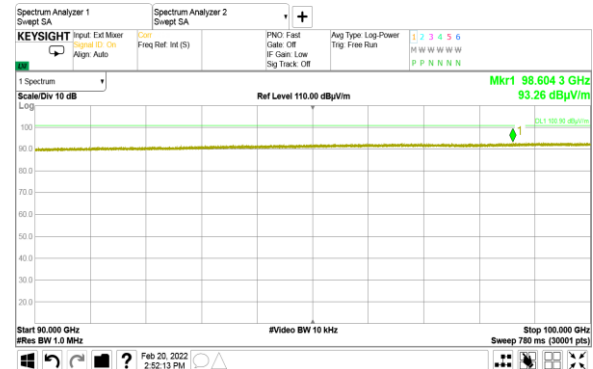
High carrier frequency:



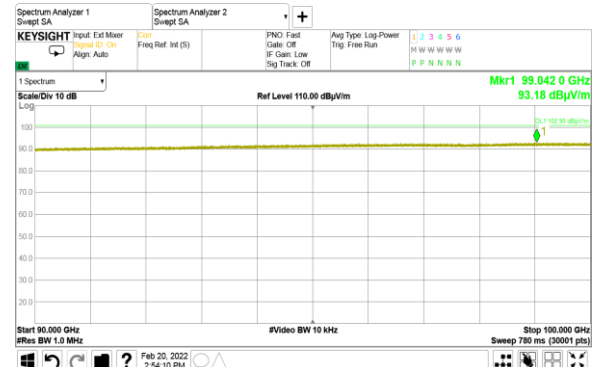
OATS
0.5 m
16QAM
Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz
58320 MHz



62640 MHz



64800 MHz



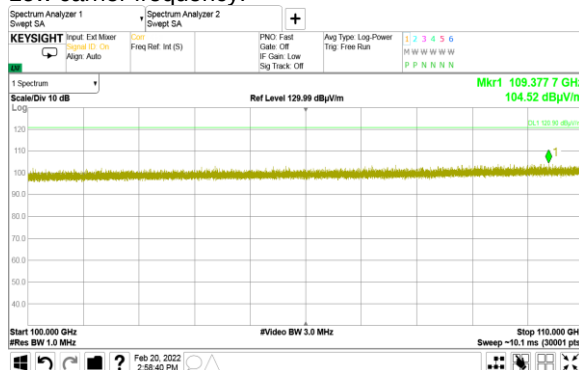


HERMON LABORATORIES

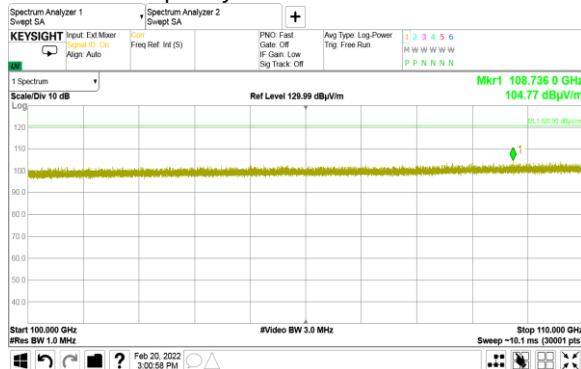
Test specification:		FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
21-Feb-22			
Temperature: 10 °C	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.7 Spurious emission measurements in 100 - 110 GHz range

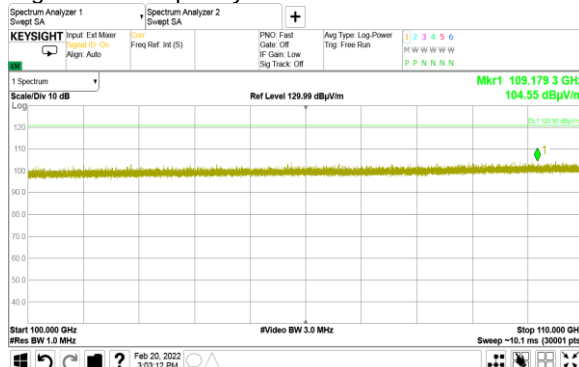
TEST SITE:
TEST DISTANCE:
MODULATION:
ANTENNA POLARIZATION:
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency:



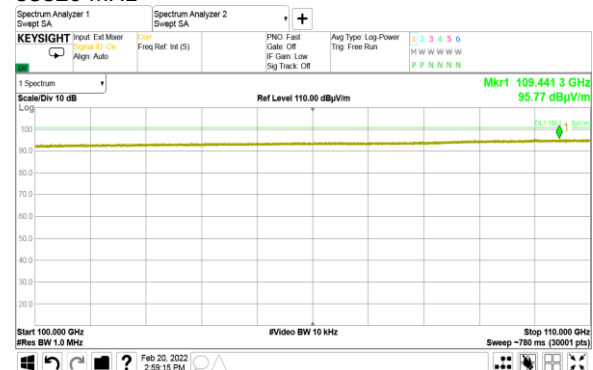
Mid carrier frequency:



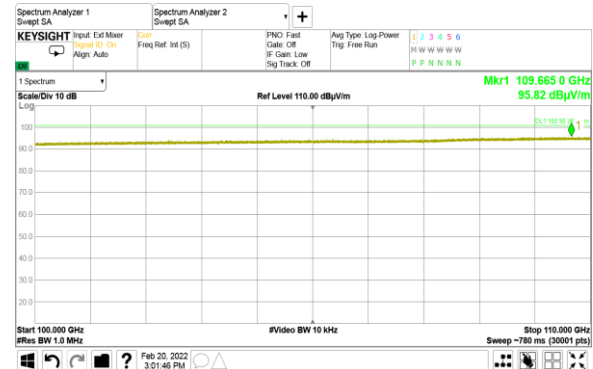
High carrier frequency:



OATS
0.5 m
16QAM
Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz
58320 MHz



62640 MHz



64800 MHz

