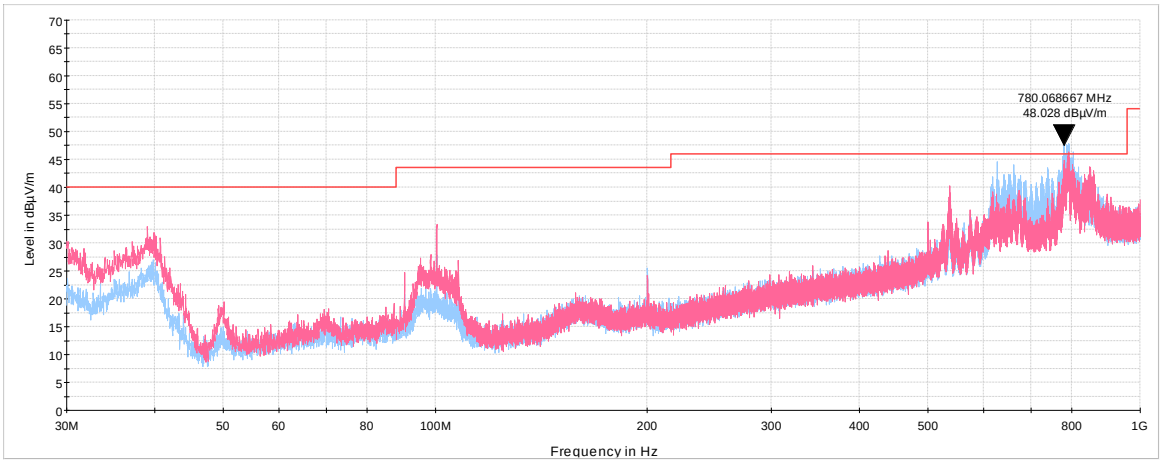
Test specification:	FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz		
Test procedure:	ANSI C63.10, Sections 9.9, 9.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

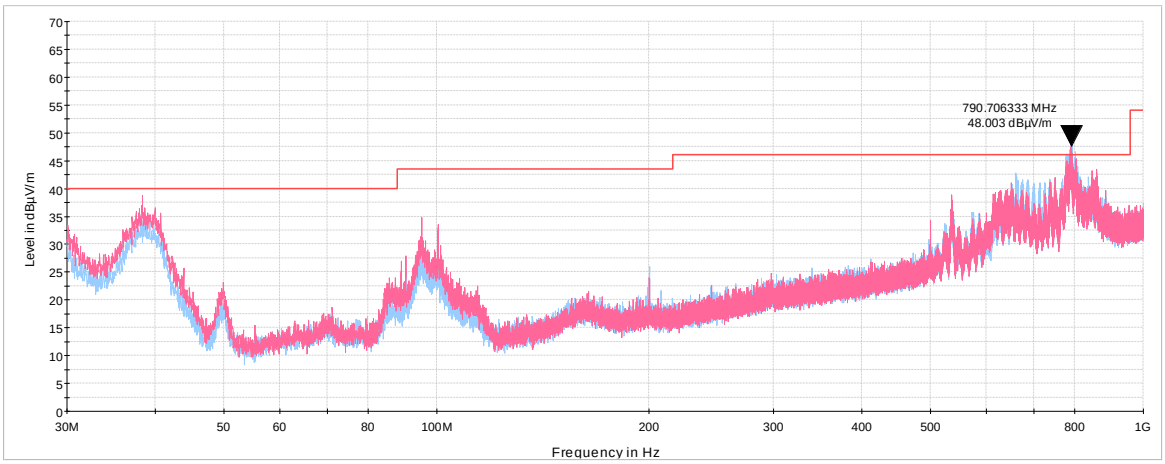
Plot 7.3.5 Radiated emission measurements from 30 to 1000 MHz at mid frequency

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

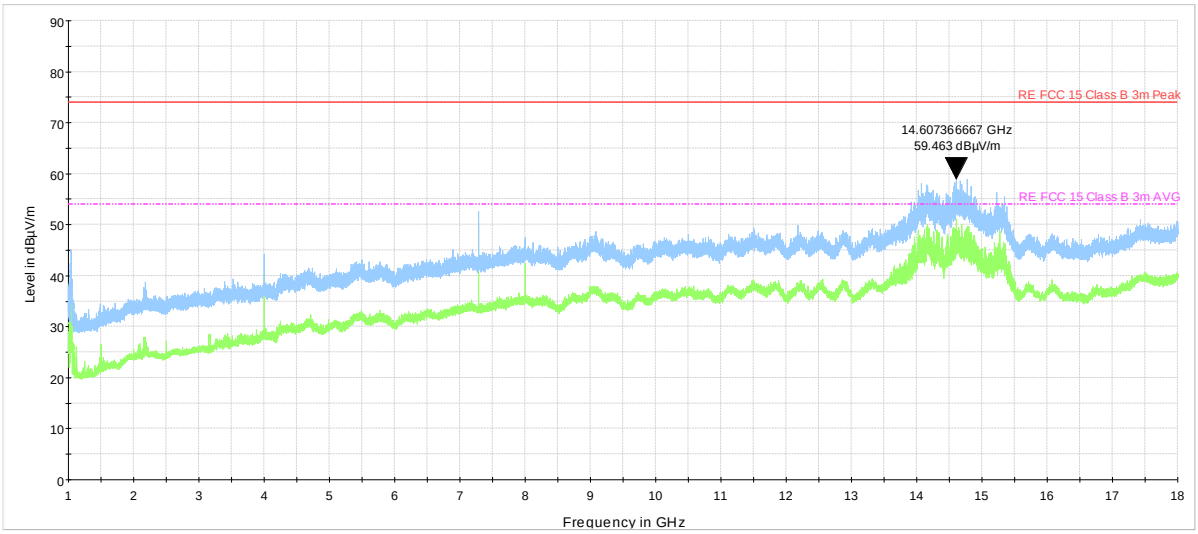
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical



Test specification:	FCC Section 15.255(d)(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):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

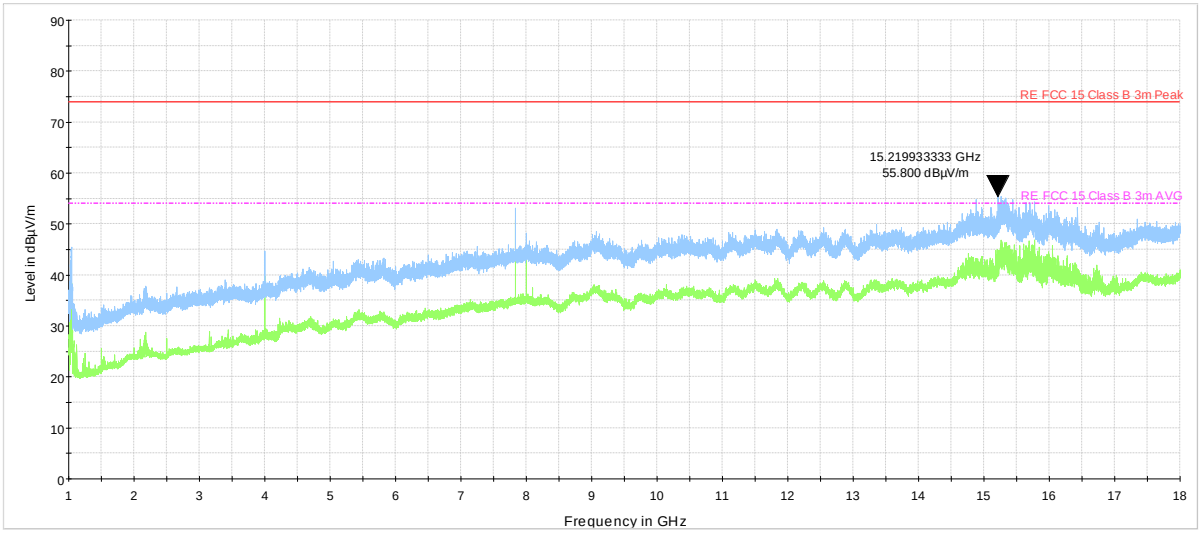
Plot 7.3.7 Radiated emission measurements from 1 to 18 MHz at low frequency

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

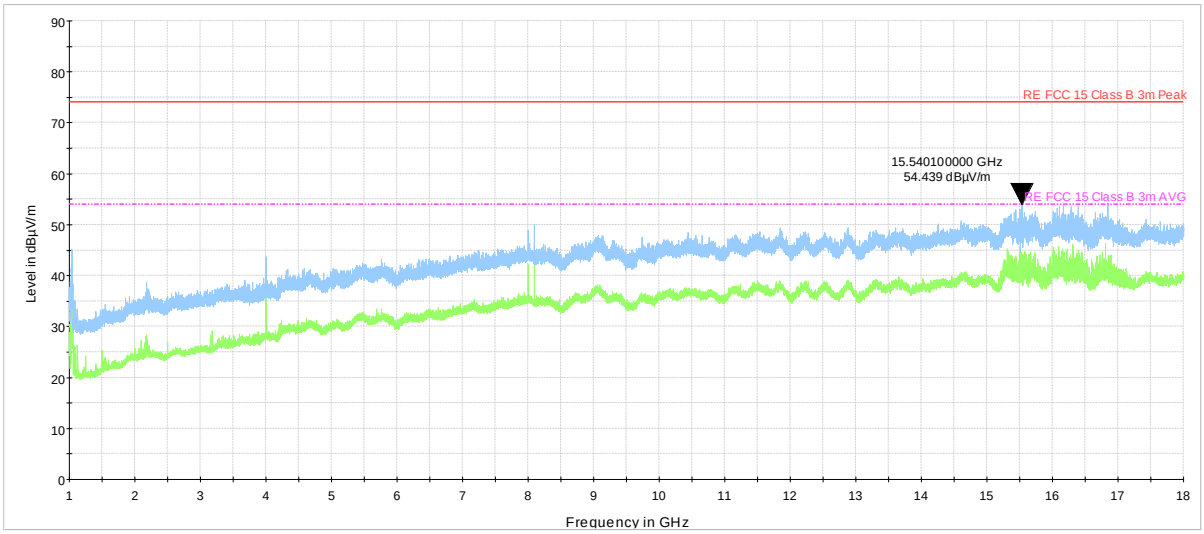
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical and Horizontal
EUT POSITION:	Typical



Test specification:	FCC Section 15.255(d)(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):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

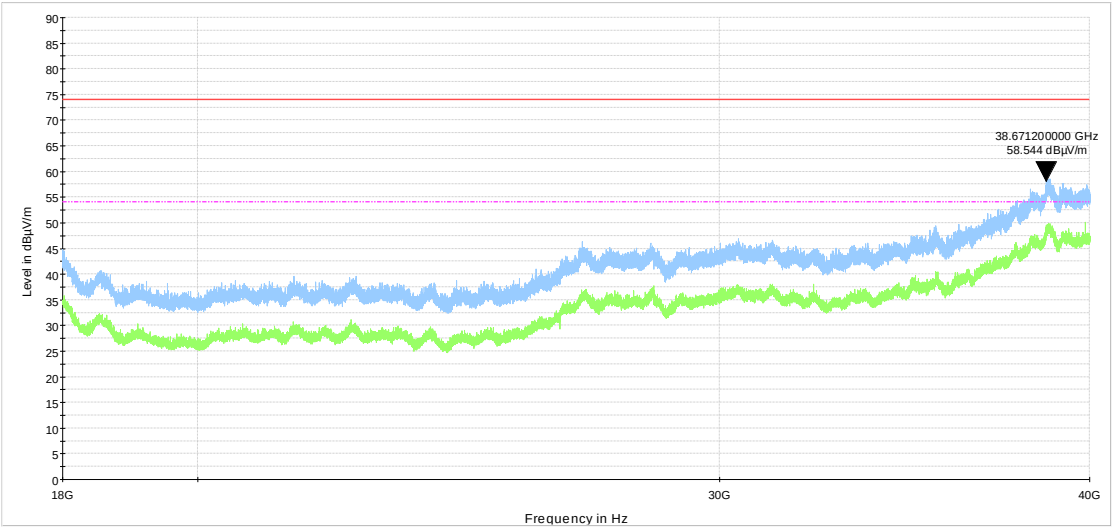
Plot 7.3.9 Radiated emission measurements from 1 to 18 MHz at high frequency

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

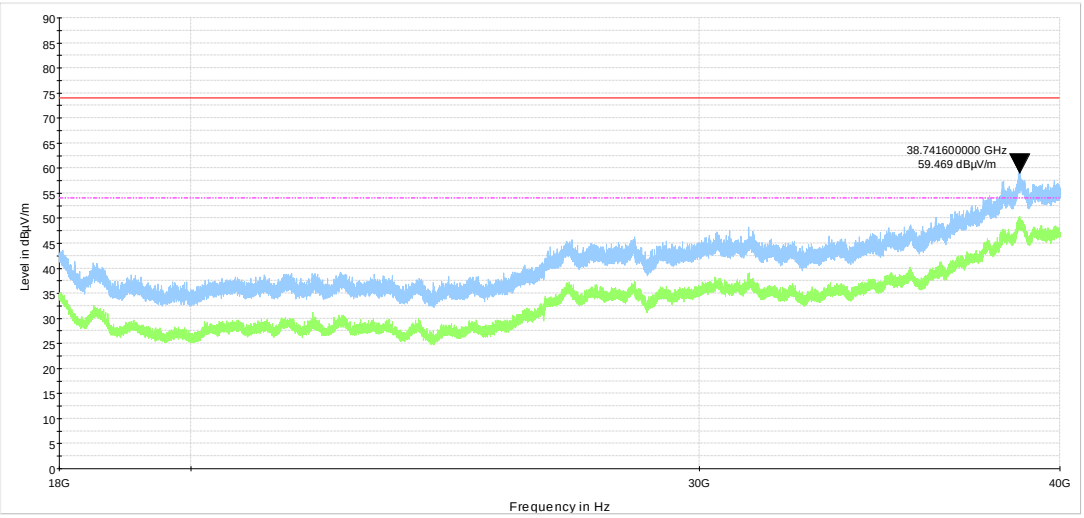
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical



Test specification:	FCC Section 15.255(d)(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):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

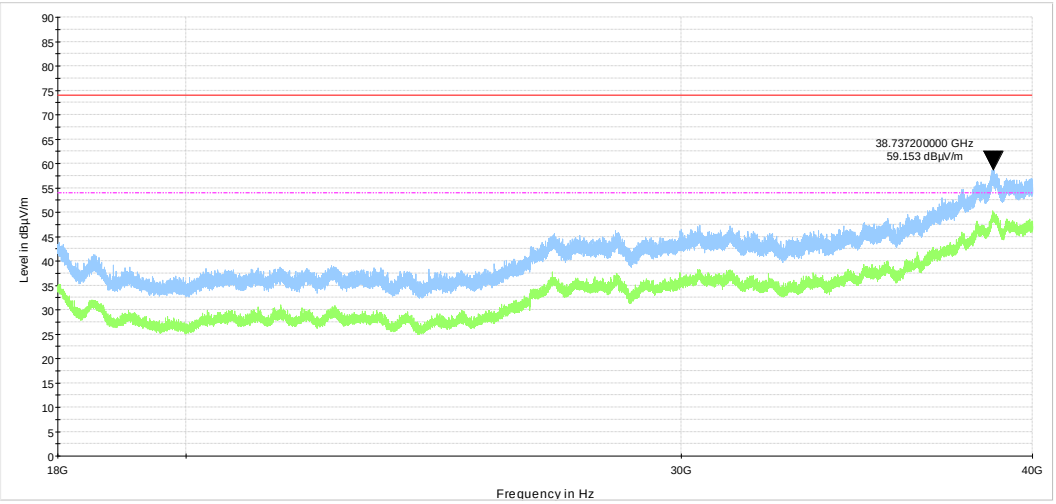
Plot 7.3.11 Radiated emission measurements from 18 to 40 GHz at mid frequency

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):	17-Mar-22		
Temperature: 10 ºC	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×377), where PD is the power density at the distance specified by the limit in W/m^2, E- field strength in V/m.
**- The limit for other test distance was calculated using the inverse distance extrapolation factor as follows:
$Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

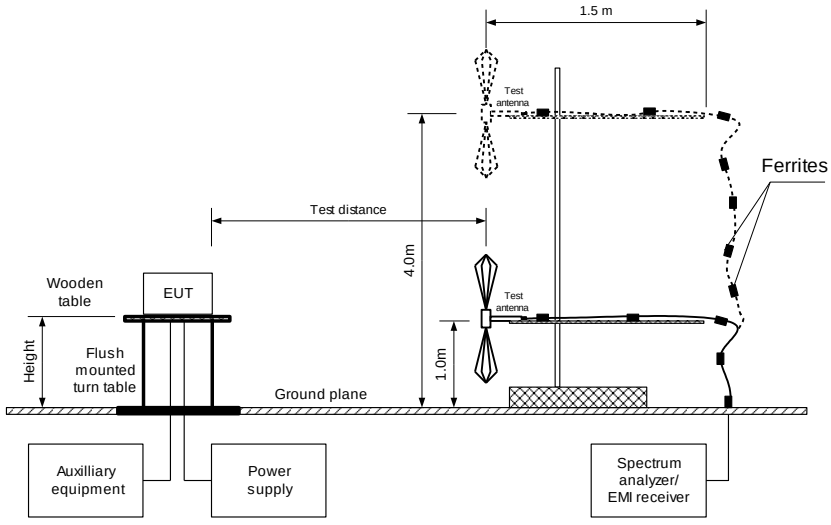
7.4.2 Test procedure for spurious emission field strength measurements

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):	17-Mar-22		
Temperature: 10 ºC	**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)

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										
109171.7	Vert	1.5	0	104.63	120.9	-16.27	95.78	100.9	-5.12	Pass
Mid carrier frequency										
108156.7	Vert	1.5	0	103.69	120.9	-17.21	95.93	100.9	-4.97	Pass
High carrier frequency										
109224.3	Vert	1.5	0	104.04	120.9	-16.86	95.76	100.9	-5.14	Pass

*****- EUT front panel refer to 0 degrees position of turntable.
******- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

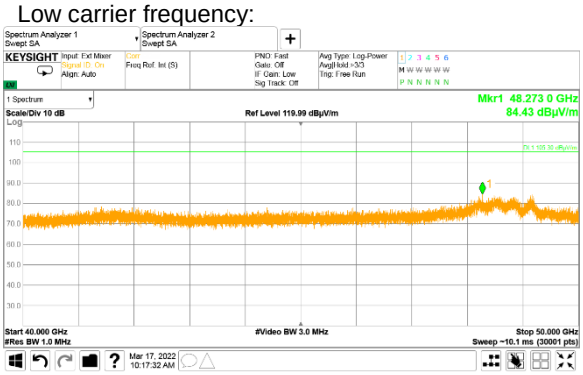
HL 5376	HL 771	HL 3291	HL 5380	HL 0770	HL 3290	HL 4483	HL 3294
HL 3235	HL 4023	HL 3434	HL 3536	HL 0747	HL 3306	HL 772	

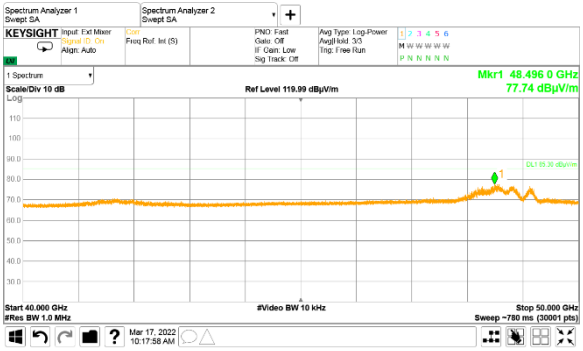
Full description is given in Appendix A.

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):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

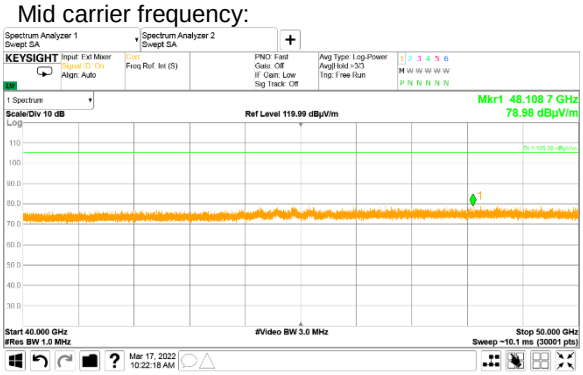
Plot 7.4.1 Spurious emission measurements in 40 – 50 GHz range

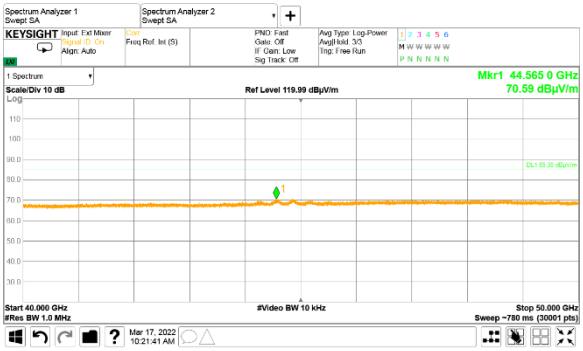
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: 16QAM
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency: 58320 MHz



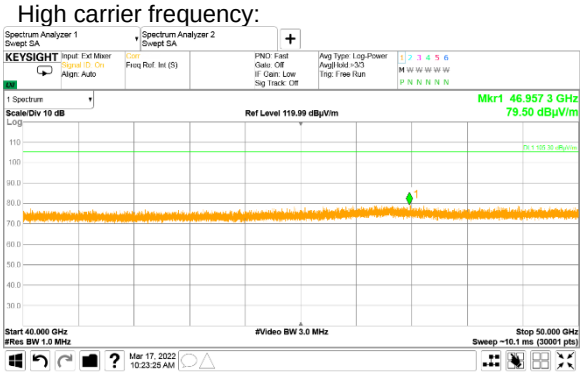


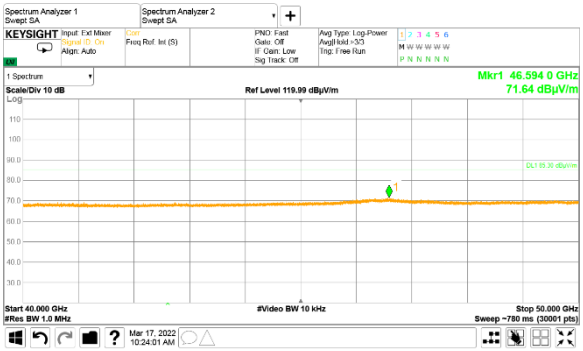
Mid carrier frequency: 62640 MHz





High carrier frequency: 64800 MHz

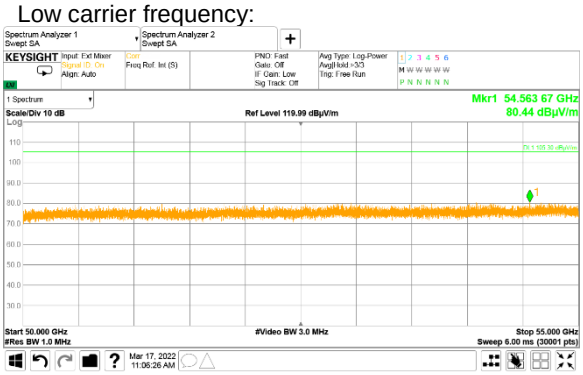


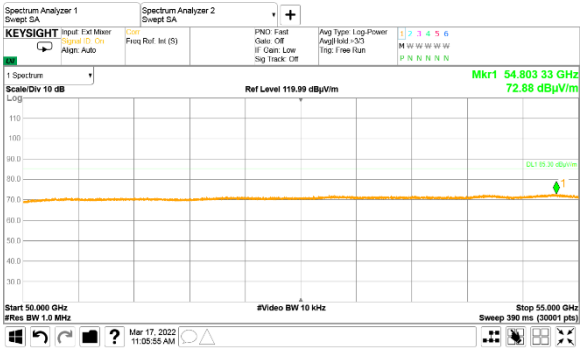


Test specification:	FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz		
Test procedure:	ANSI C63.10, Sections 9.9, 9.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

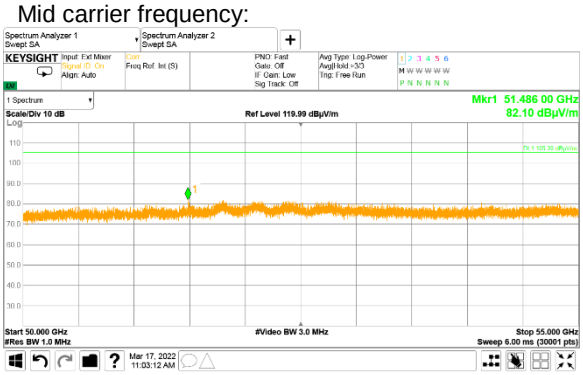
Plot 7.4.2 Spurious emission measurements in 50 – 55 GHz range

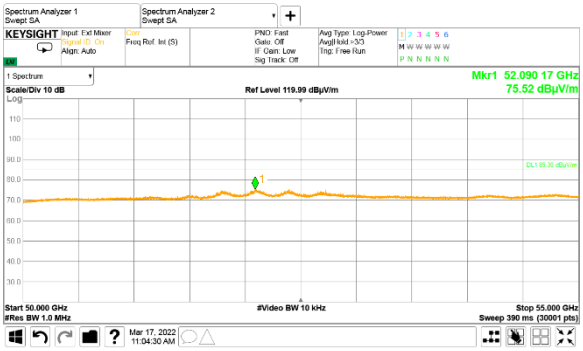
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: 16QAM
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency: 58320 MHz



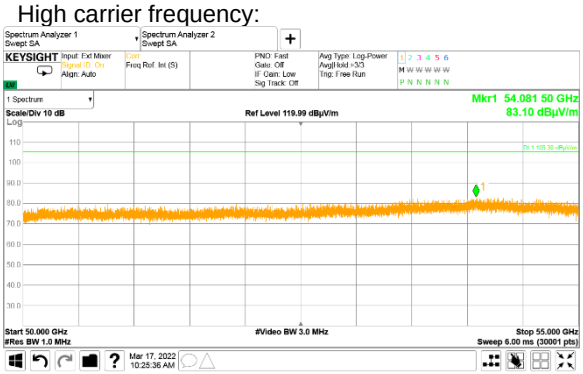


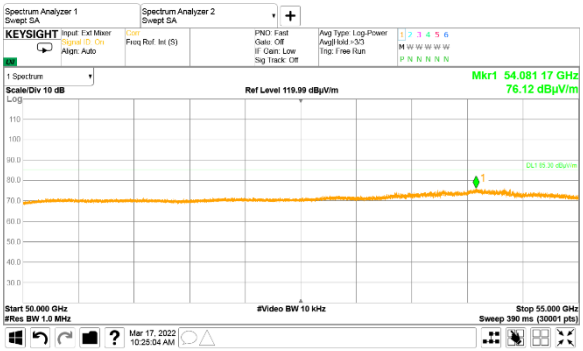
Mid carrier frequency: 62640 MHz





High carrier frequency: 64800 MHz



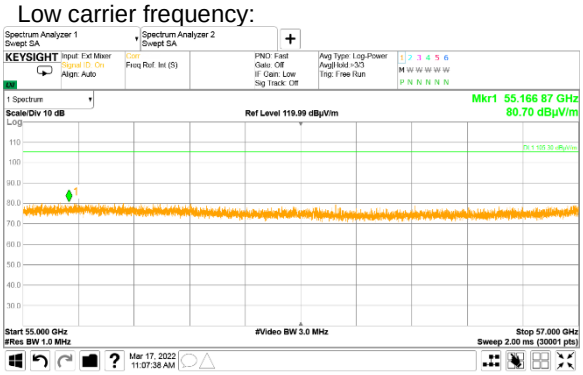


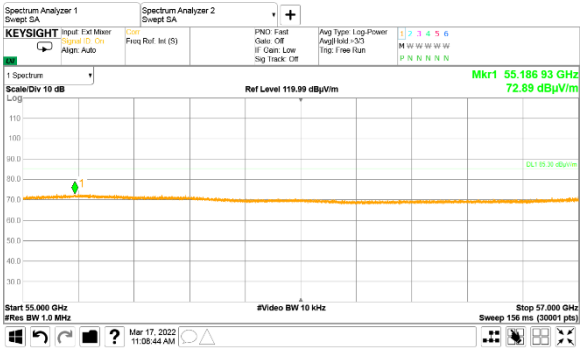
Test specification:	FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz		
Test procedure:	ANSI C63.10, Sections 9.9, 9.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.3 Spurious emission measurements in 55 – 57 GHz range

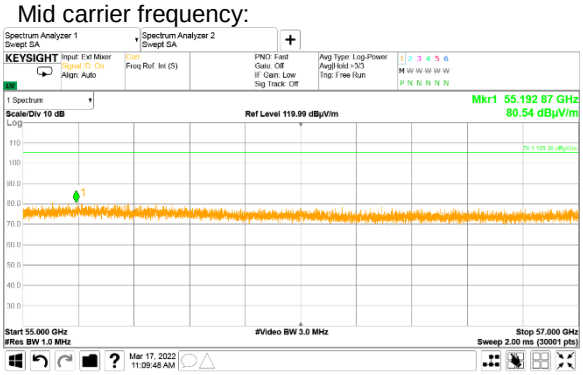
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: 16QAM
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
DETECTOR: Peak RBW = 1 MHz; VBW = 10 kHz

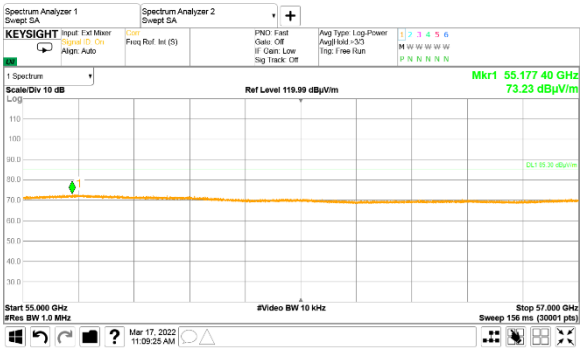
Low carrier frequency: 58320 MHz



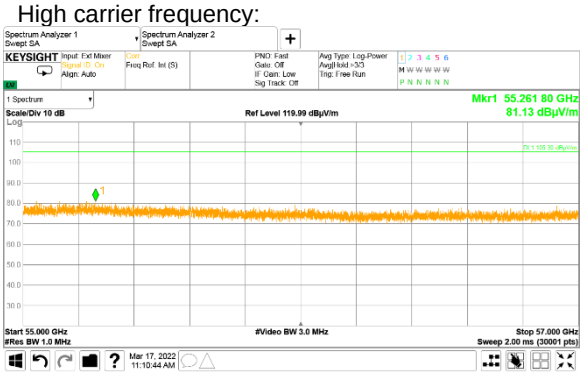


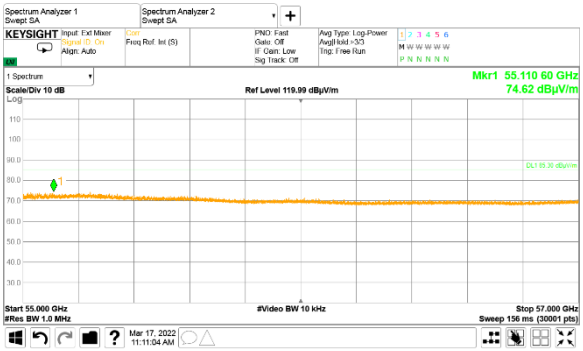
Mid carrier frequency: 62640 MHz





High carrier frequency: 64800 MHz

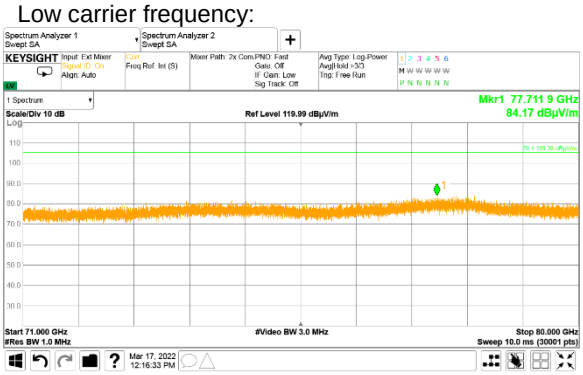


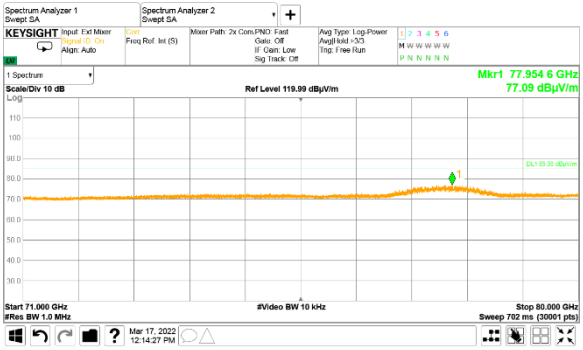


Test specification:	FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz		
Test procedure:	ANSI C63.10, Sections 9.9, 9.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

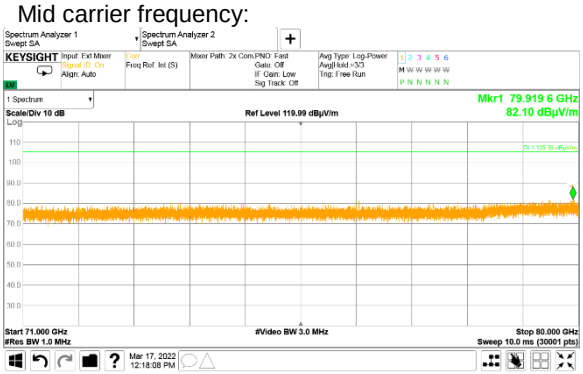
Plot 7.4.4 Spurious emission measurements in 71 – 80 GHz range

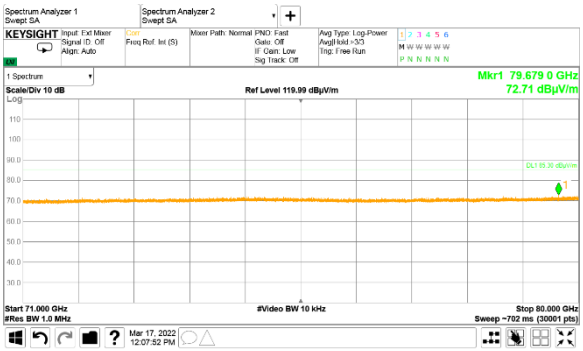
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: 16QAM
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency: 58320 MHz



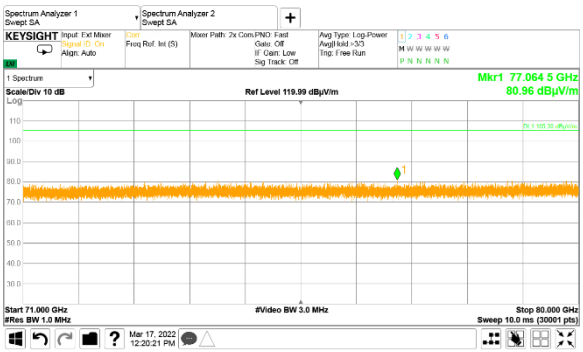


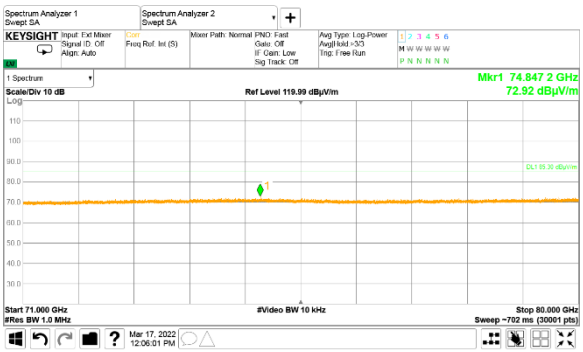
Mid carrier frequency: 62640 MHz





High carrier frequency: 64800 MHz

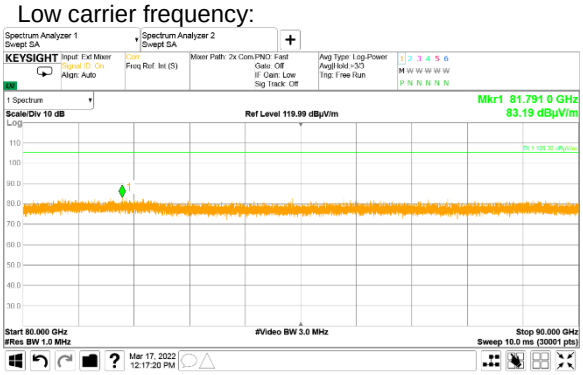


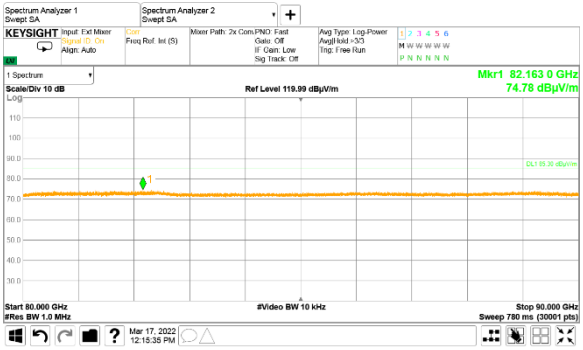


Test specification:	FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz		
Test procedure:	ANSI C63.10, Sections 9.9, 9.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

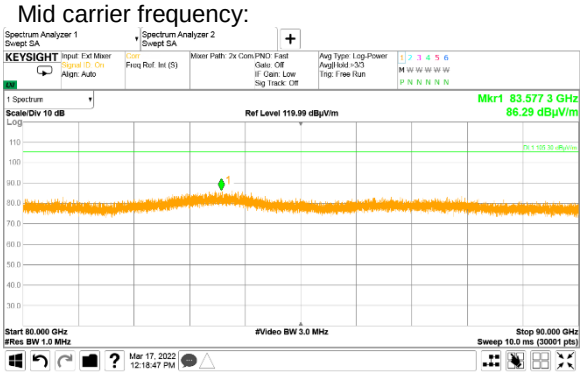
Plot 7.4.5 Spurious emission measurements in 80 – 90 GHz range

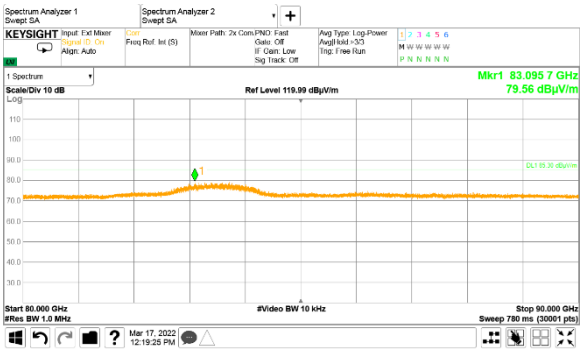
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: 16QAM
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency: 58320 MHz



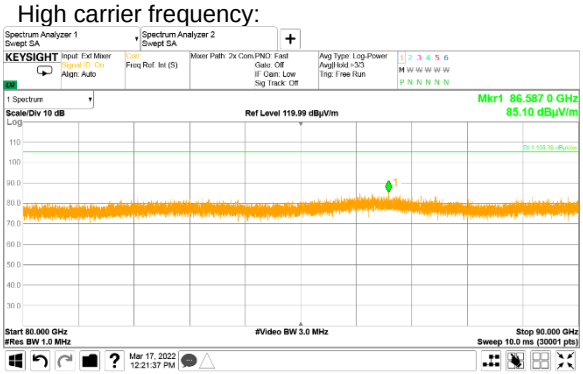


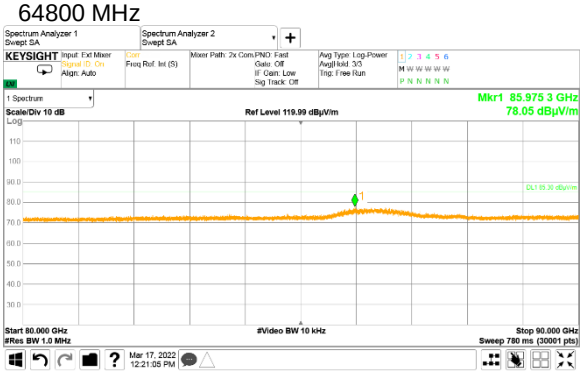
Mid carrier frequency: 62640 MHz





High carrier frequency: 64800 MHz

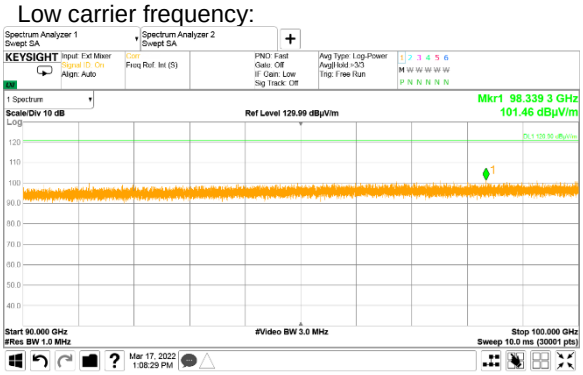


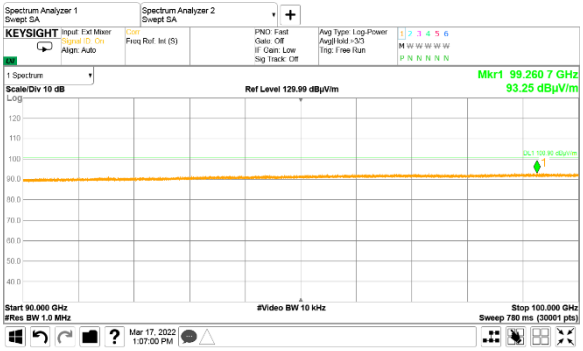


Test specification:	FCC Section 15.255(d)(3), RSS-210 section J.3, Out of band radiated emissions above 40 GHz		
Test procedure:	ANSI C63.10, Sections 9.9, 9.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Mar-22		
Temperature: 10 ºC	Relative Humidity: 48 %	Air Pressure: 1020 hPa	Power: 48 VDC
Remarks:			

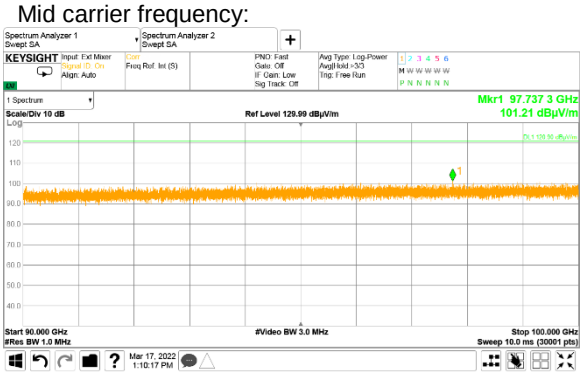
Plot 7.4.6 Spurious emission measurements in 90 - 100 GHz range

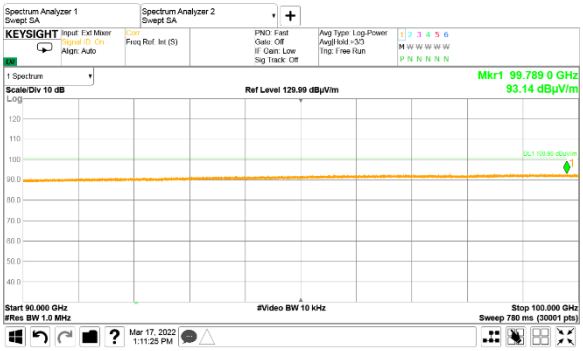
TEST SITE: OATS
TEST DISTANCE: 0.5 m
MODULATION: 16QAM
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak RBW = 1 MHz; VBW = 3 MHz
Low carrier frequency: 58320 MHz





Mid carrier frequency: 62640 MHz





High carrier frequency: 64800 MHz