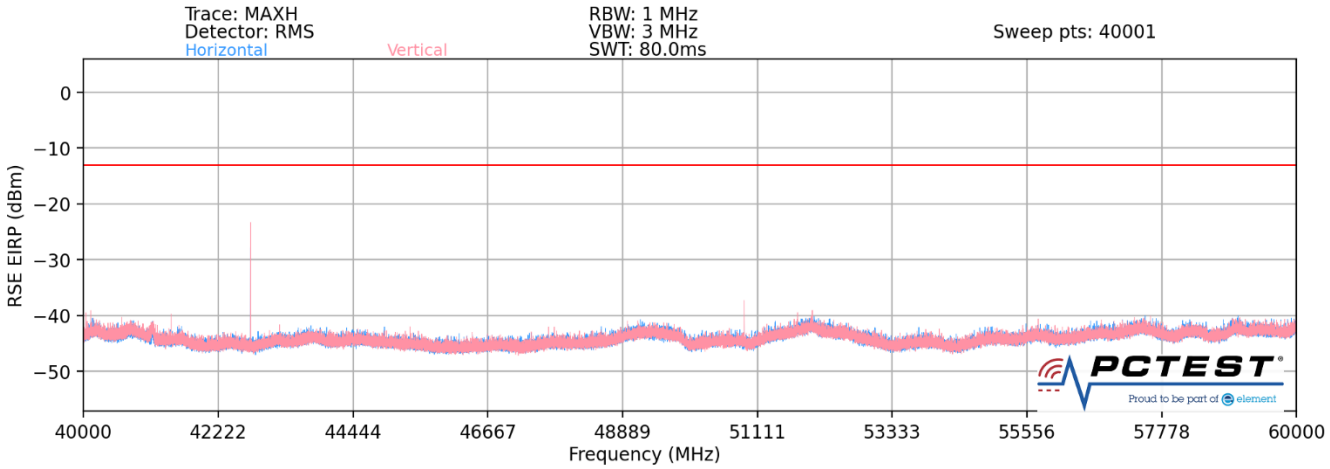
40GHz - 60GHz



Plot 7-142. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

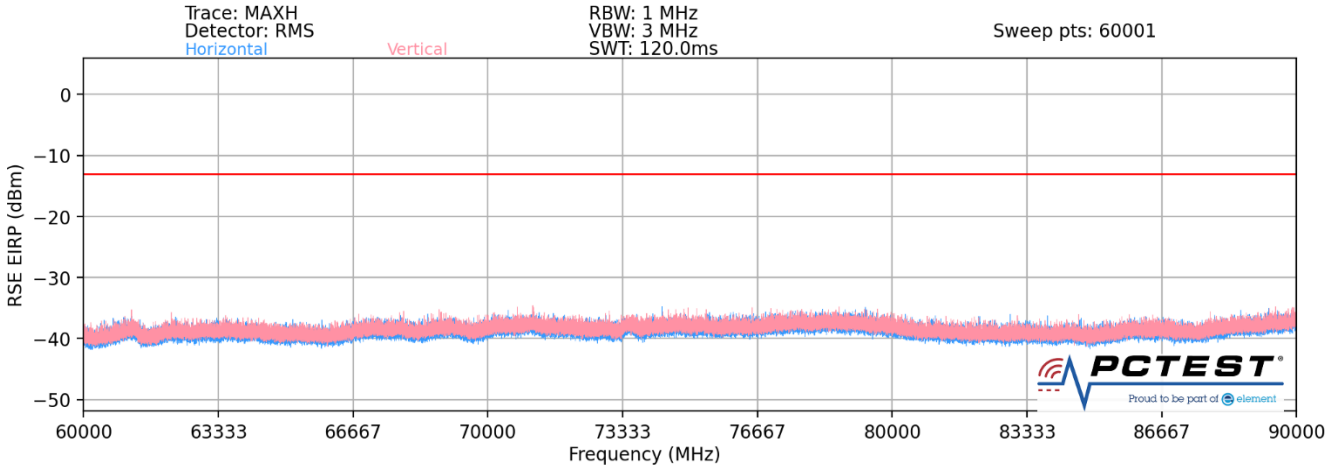
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
40627.37	Low	50	2Tx	QPSK	V	23	83	-44.71	-13.00	-31.71
42444.05	Low	50	2Tx	QPSK	V	321	259	-28.98	-13.00	-15.98
42753.50	Low	50	2Tx	QPSK	V	334	258	-28.12	-13.00	-15.12
43059.84	Mid	50	2Tx	QPSK	V	50	52	-29.56	-13.00	-16.56
46155.04	Mid	50	2Tx	QPSK	V	112	154	-54.91	-13.00	-41.91
50894.48	High	50	2Tx	QPSK	V	101	280	-43.12	-13.00	-30.12

Table 7-95. Ant 2 - 2Tx - Spurious Emissions Table (40GHz - 60GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses. Measurements were performed at a distance of 1.5 meter.

60GHz - 90GHz



Plot 7-143. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

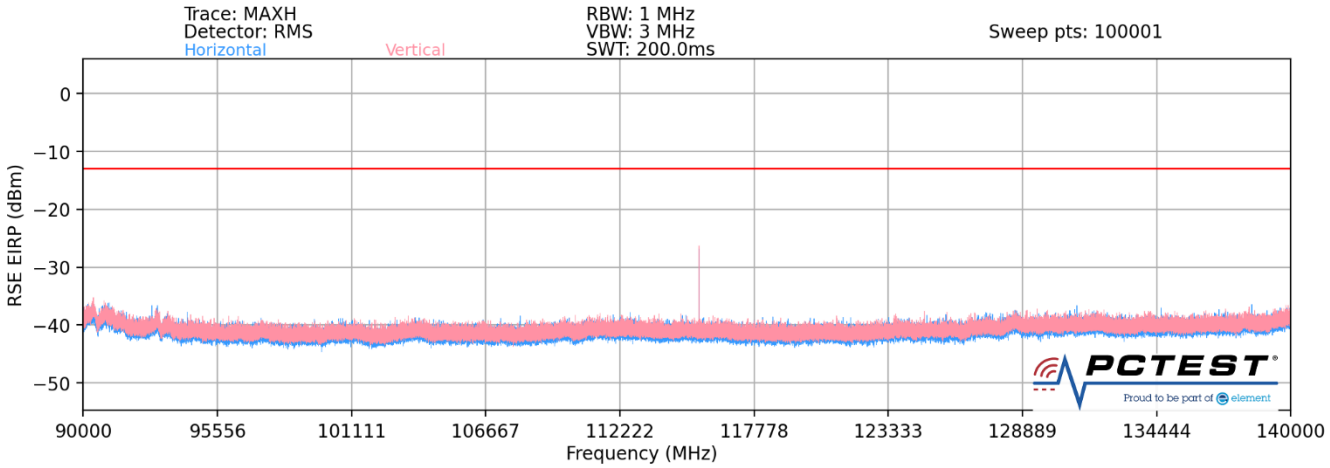
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74367.65	Low	50	2Tx	QPSK	H	2	289	-48.41	-13.00	-35.41
77000.11	Mid	50	2Tx	QPSK	H	27	9	-44.24	-13.00	-31.24
86998.88	High	50	2Tx	QPSK	H	82	259	-49.41	-13.00	-36.41
88280.28	High	50	2Tx	QPSK	H	80	260	-39.15	-13.00	-26.15

Table 7-96. Ant 2 - 2Tx -Spurious Emissions Table (60GHz - 90GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

90GHz - 140GHz



Plot 7-144. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

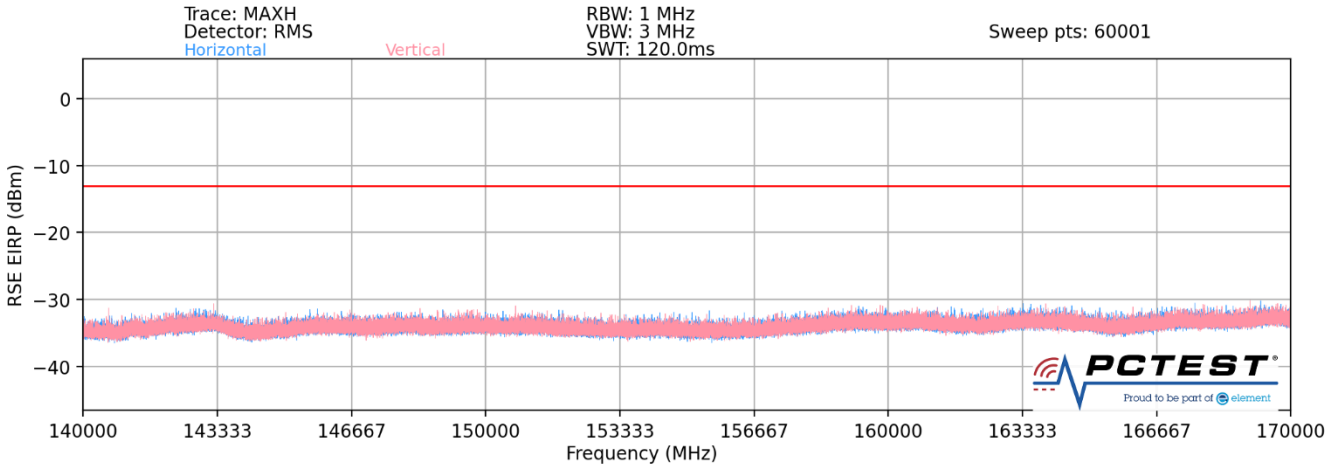
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
90020.00	Low	50	2Tx	QPSK	V	-	-	-37.36	-13.00	-24.36
96480.00	Low	50	2Tx	QPSK	V	-	-	-36.88	-13.00	-23.88
97460.00	Low	50	2Tx	QPSK	V	-	-	-39.37	-13.00	-26.37
115020.00	Mid	50	2Tx	QPSK	V	58	289	-35.50	-13.00	-22.50
115500.00	Mid	50	2Tx	QPSK	V	58	289	-35.21	-13.00	-22.21
115780.00	High	50	2Tx	QPSK	V	58	289	-32.45	-13.00	-19.45

Table 7-97. Ant2 -2Tx - Spurious Emissions Table (90GHz - 140GHz)

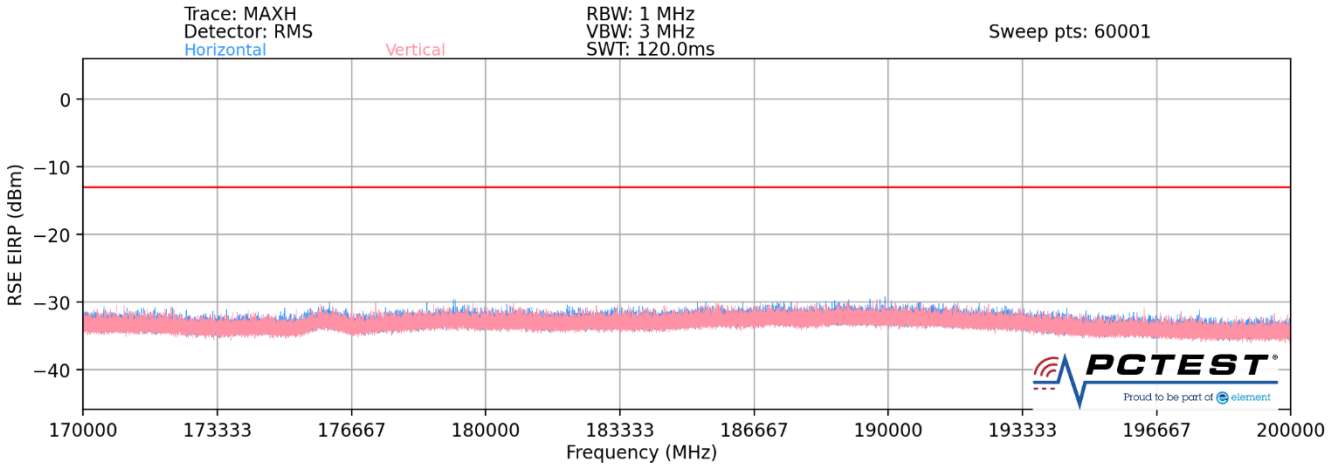
Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

140GHz - 200GHz



Plot 7-145. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)



Plot 7-146. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
147830.00	Low	50	2Tx	QPSK	H	-	-	-39.63	-13.00	-26.63
153994.00	Mid	50	2Tx	QPSK	H	-	-	-40.68	-13.00	-27.68
156830.00	High	50	2Tx	QPSK	H	-	-	-39.63	-13.00	-26.63

Table 7-98. Ant 2 - 2Tx - Spurious Emissions Table (140GHz - 220GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

7.5 Band Edge Emissions

§2.1051, §30.203

Test Overview

All out of band emissions are measured in a radiated setup while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modulations were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is -13dBm/1MHz. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

Test Procedure Used

ANSI C63.26-2015 Section 5 and ANSI C63.26-2015 Section 6.4
KDB 842590 D01 v01r02 Section 4.4.2.4

Test Settings

1. Start and stop frequency were set such that both upper and lower band edges are measured.
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 1MHz
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning.

2) Band Edge emissions were measured at a 1 meter distance.

3) The spectrum analyzer for each measurement shows an offset value that was determined using the measurement antenna factor, cable loss, far field measurement distance. A sample calculation is shown on the following page.

4) This device supports transmission of H-polarized and V-polarized beams from the antenna array in both CP-OFDM and DFT-s-OFDM transmission schemes. SISO and MIMO operation is also supported for some configurations. As part of the testing, all modes were fully investigated and only the worst case has been included in this report.

5) All combinations of 1CC and 2CC were fully investigated, and only the worst case has been included in this report.

6) All 2CC cases were investigated with PCC prioritization feature, which was the higher PCC at the band edge for the worst case.

7) The Total Radiated Power measurements shown in this section were performed in accordance with the guidance of Section 4.4.2.4 of KDB 842590 D01 for the Spherical Method.

Sample Analyzer Offset Calculation (at 27.5GHz)

Measurement Antenna Factor = 40.70dB/m

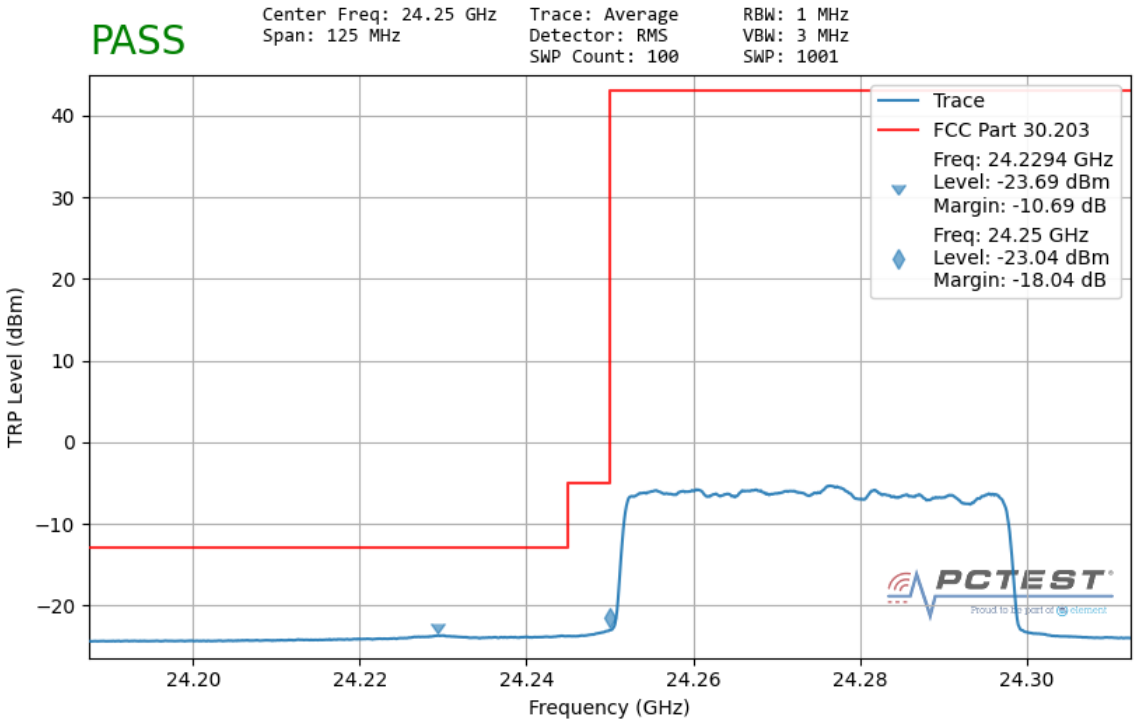
Cable Loss = 8.82dB

Analyzer Offset (dB) = AF (dB/m) + CL (dB) + 107 + $20\log_{10}(D)$ – 104.8dB, where D = 1m

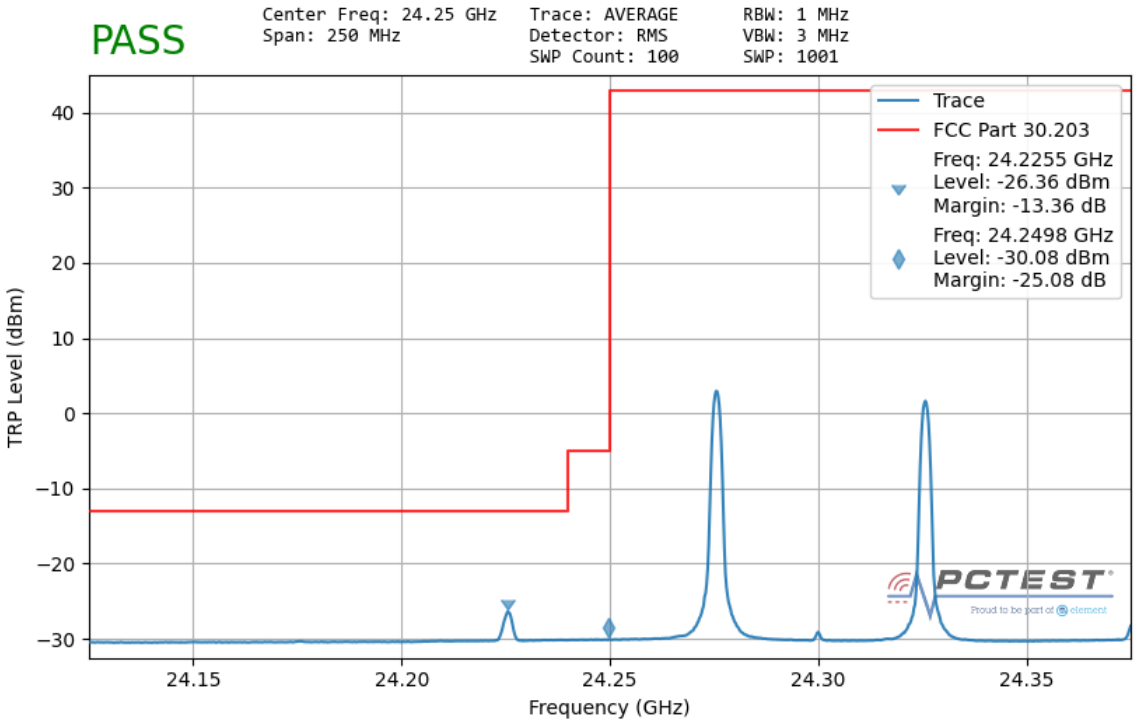
= 40.70dB/m + 8.82dB + 107 + $20\log_{10}(1m)$ – 104.8dB

= 51.72dB

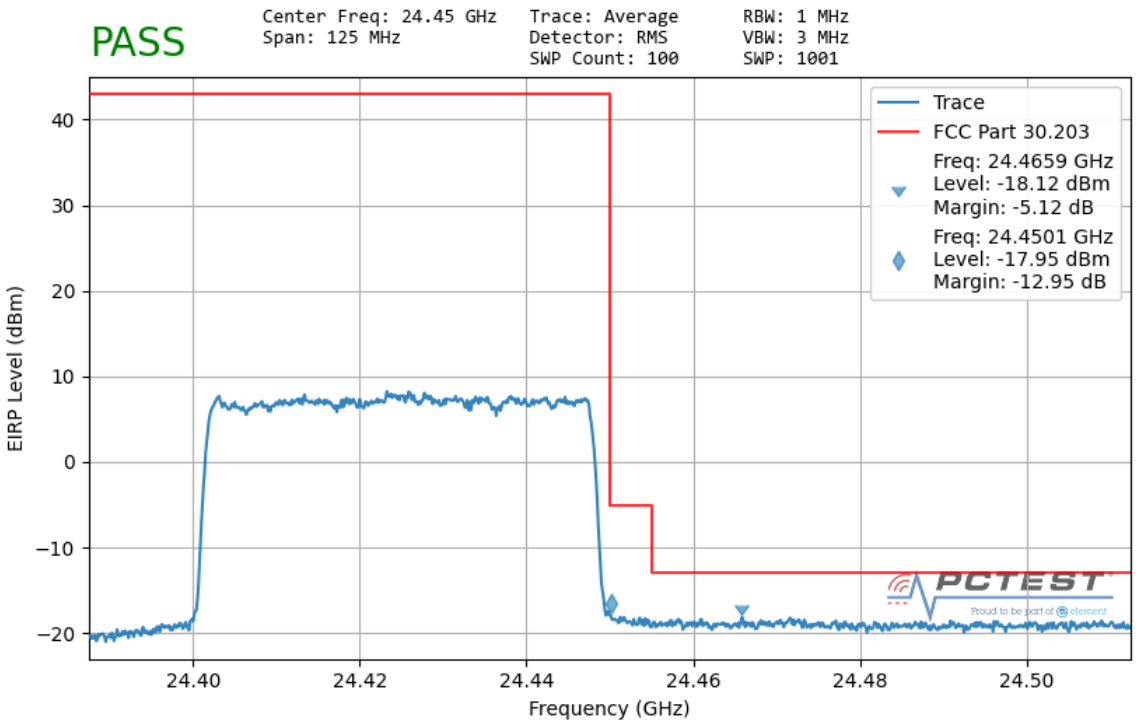
Band n258-R1 – Worst Case



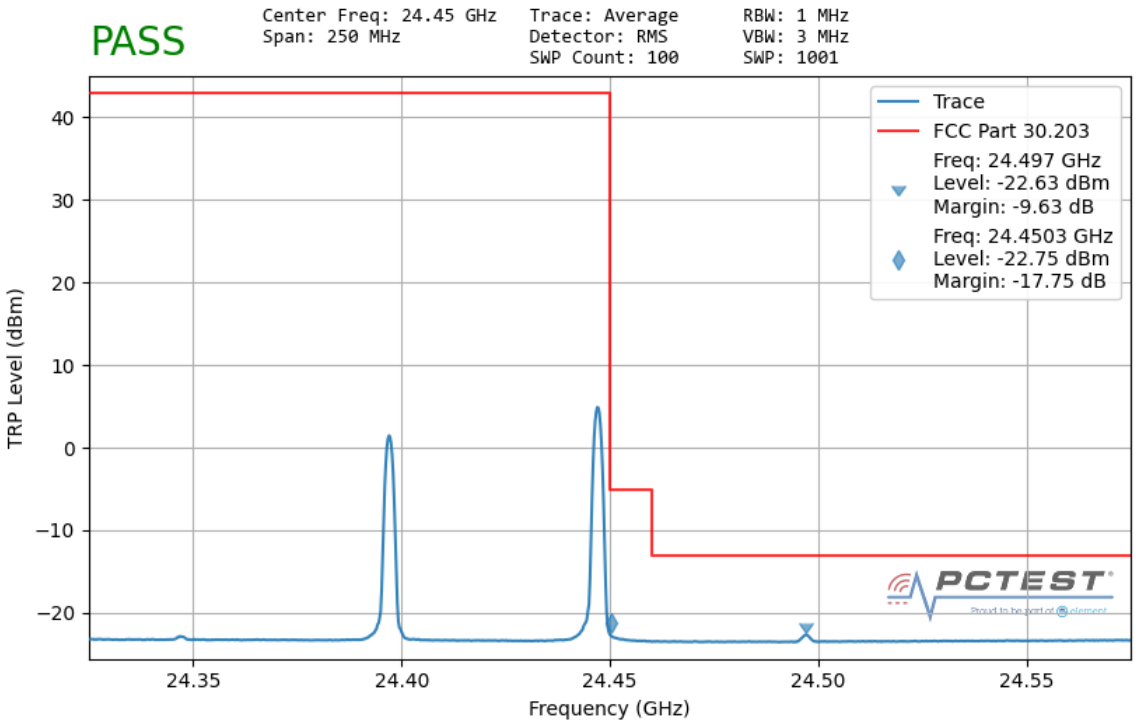
Plot 7-147. Ant 1 Lower Band Edge – TRP (50MHz-1CC – pi/2-BPSK Full RB)



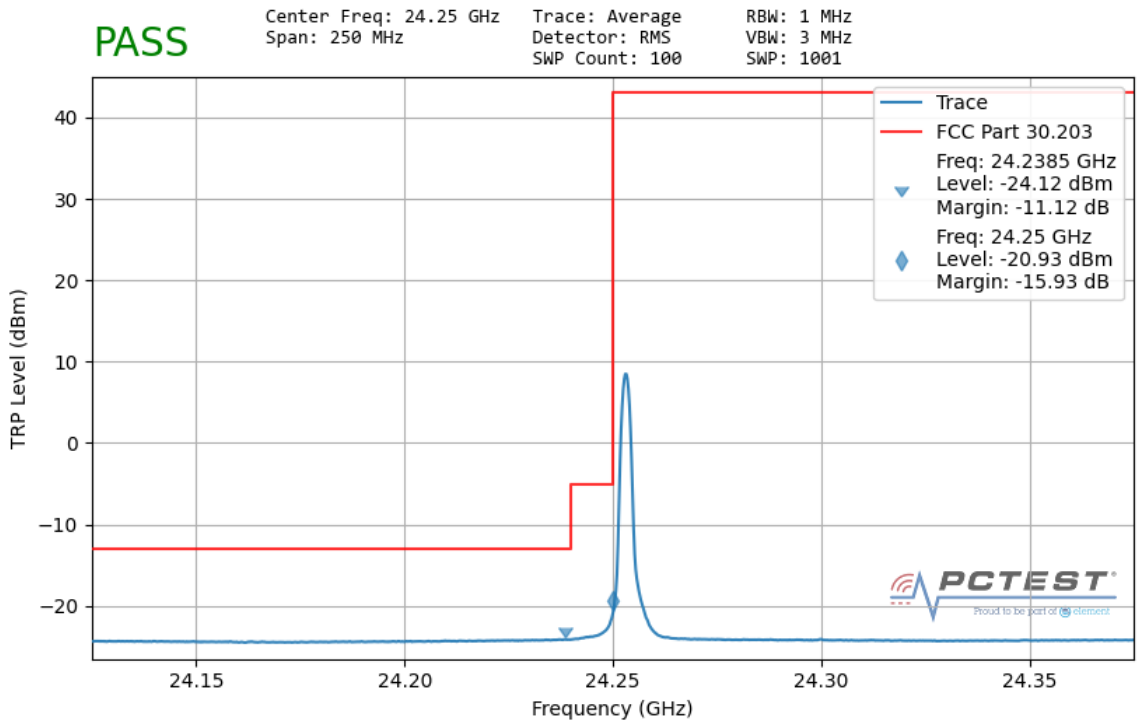
Plot 7-148. Ant 1 Lower Band Edge – TRP (50MHz-2CC – QPSK 1 RB)



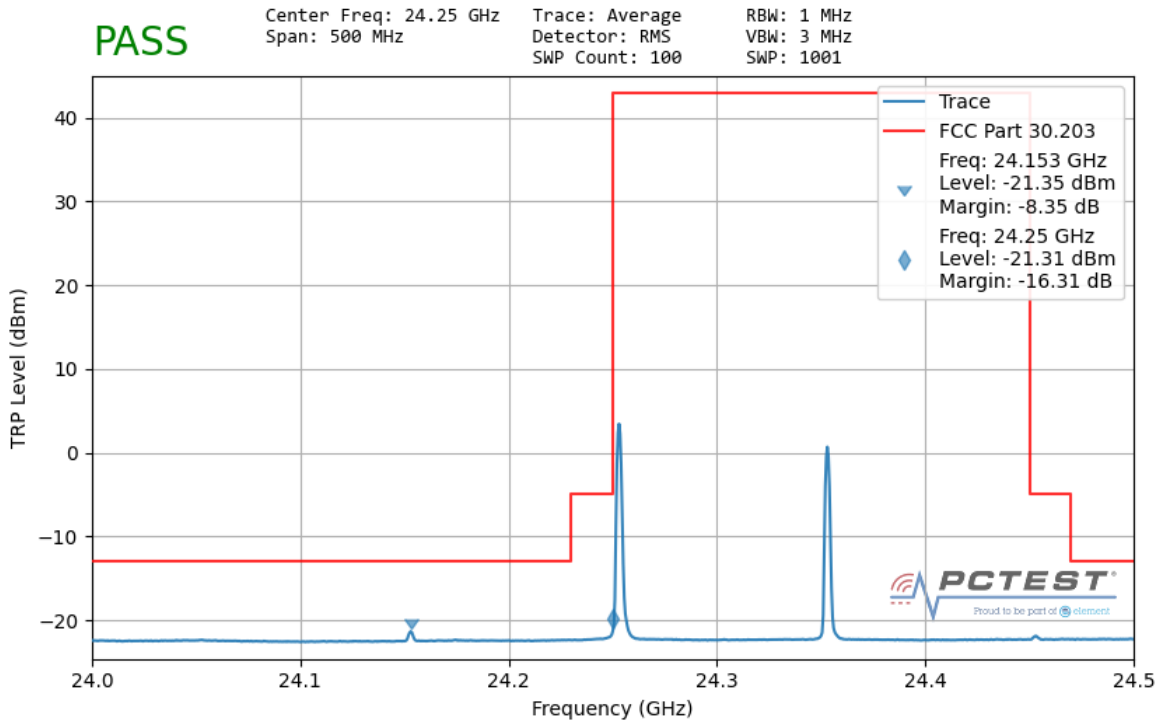
Plot 7-149. Ant 1 Upper Band Edge (50MHz-1CC – pi/2-BPSK Full RB)



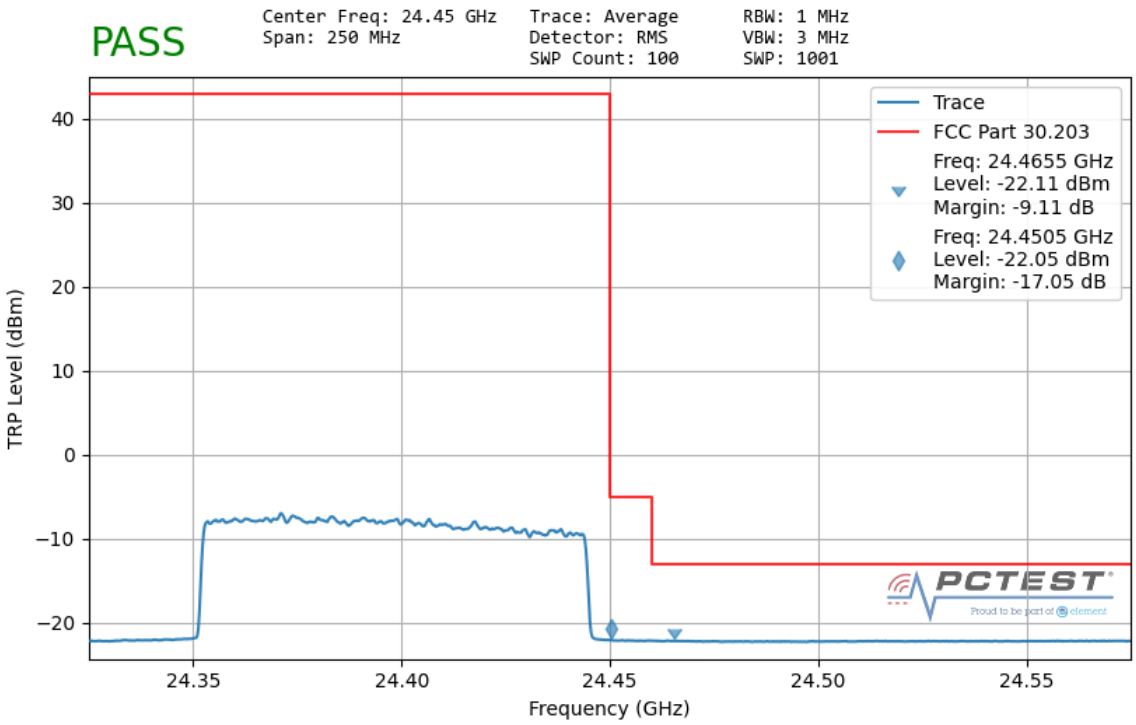
Plot 7-150. Ant 1 Upper Band Edge -TRP(50MHz-2CC – QPSK 1 RB)



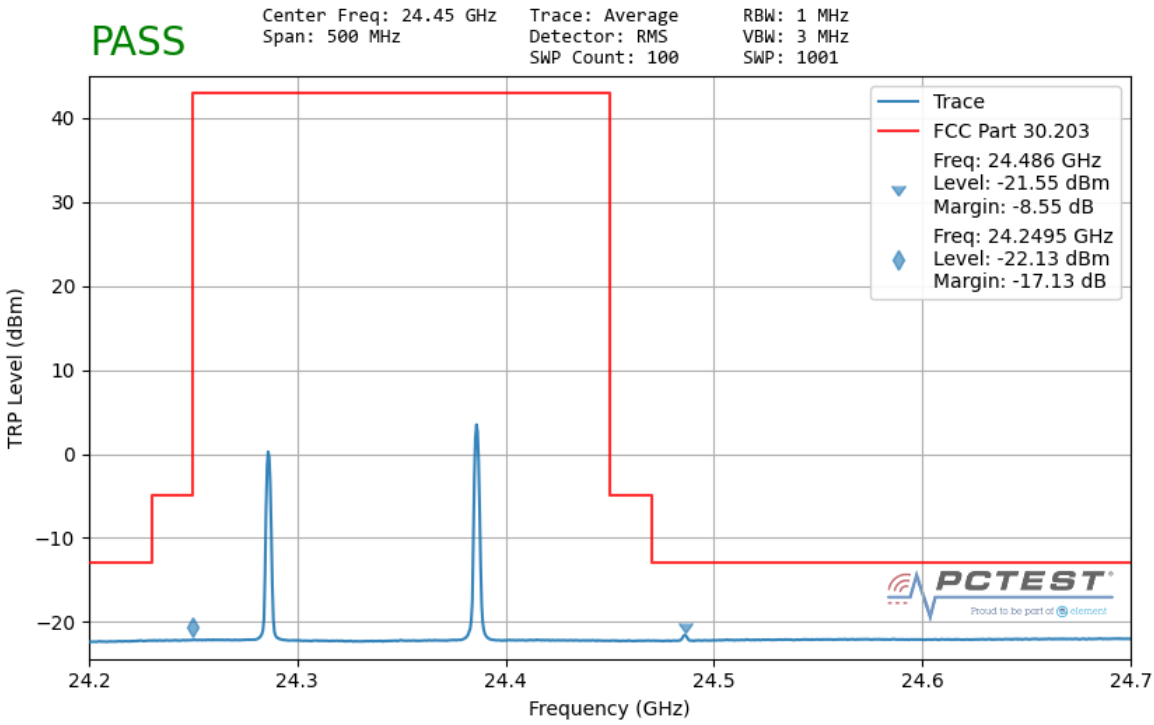
Plot 7-151. Ant 1 Lower Band Edge- TRP (100MHz-1CC – pi/2-BPSK 1 RB)



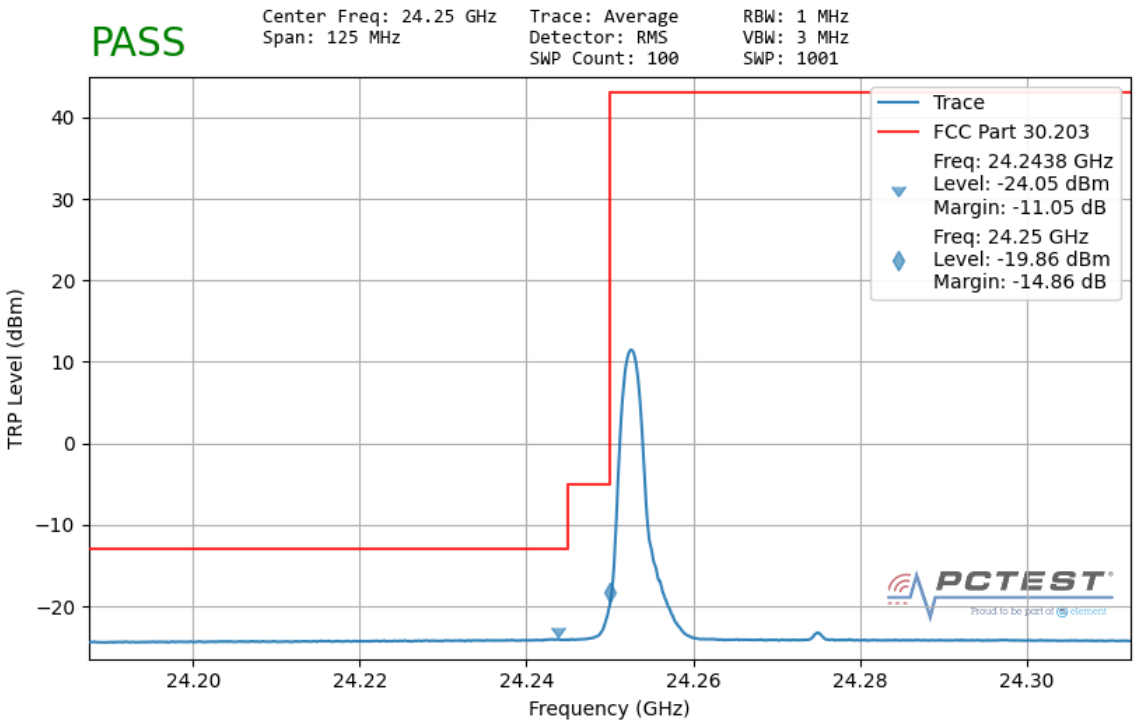
Plot 7-152. Ant 1 Lower Band Edge- TRP (100MHz-2CC – QPSK 1 RB)



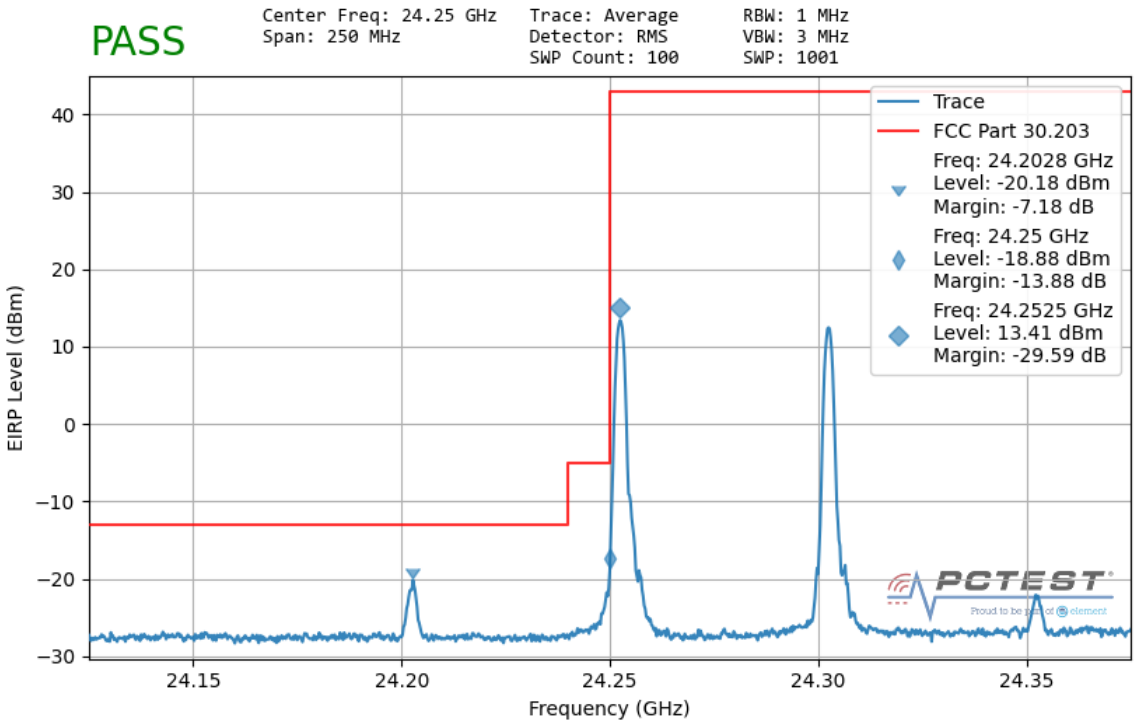
Plot 7-153. Ant 1 Upper Band Edge-TRP (100MHz-1CC – QPSK Full RB)



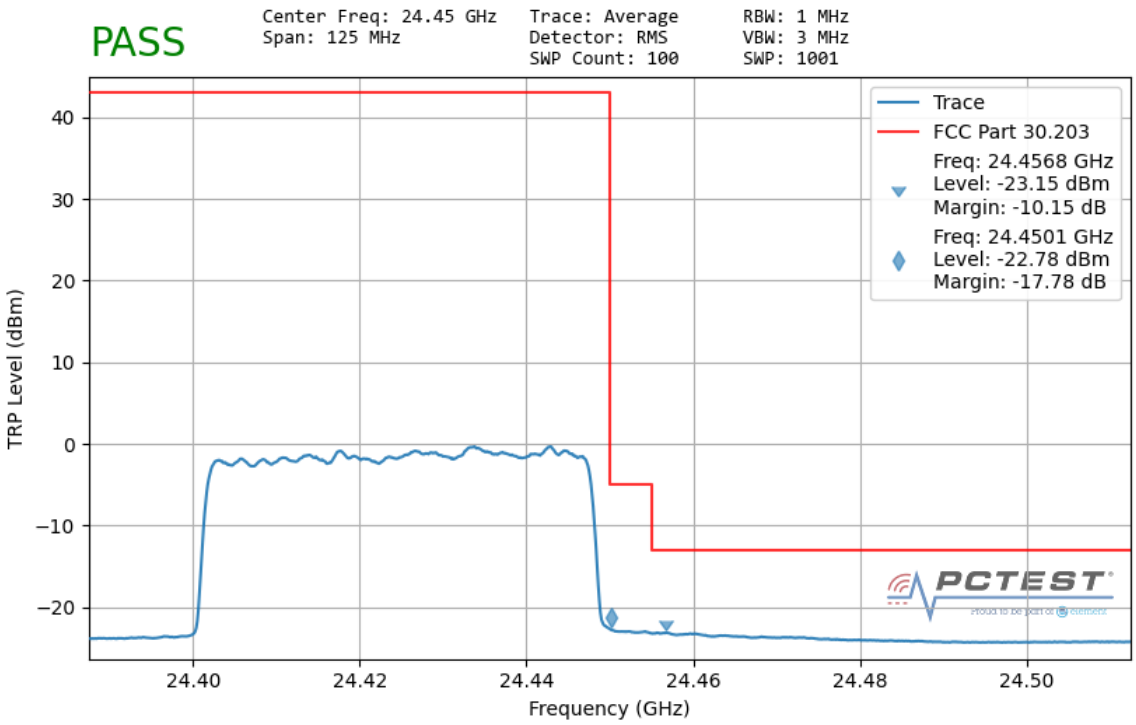
Plot 7-154. Ant 1 Upper Band Edge- TRP (100MHz-2CC – QPSK 1 RB)



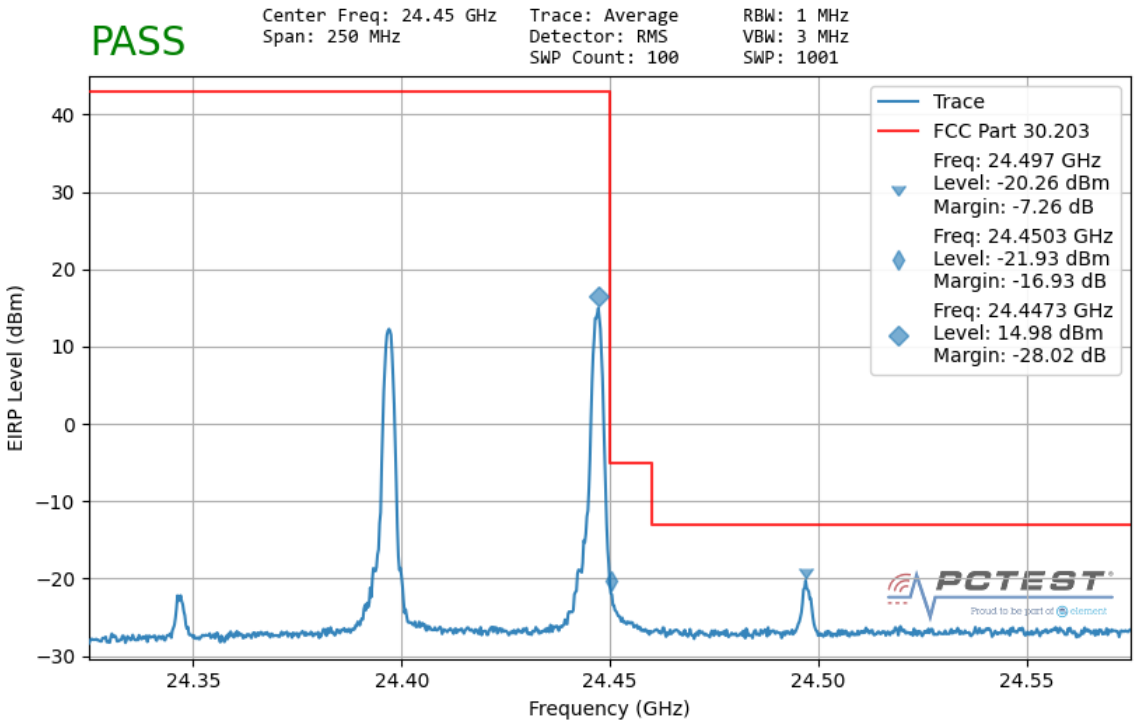
Plot 7-155. Ant 2 Lower Band Edge- TRP (50MHz-1CC – QPSK 1 RB)



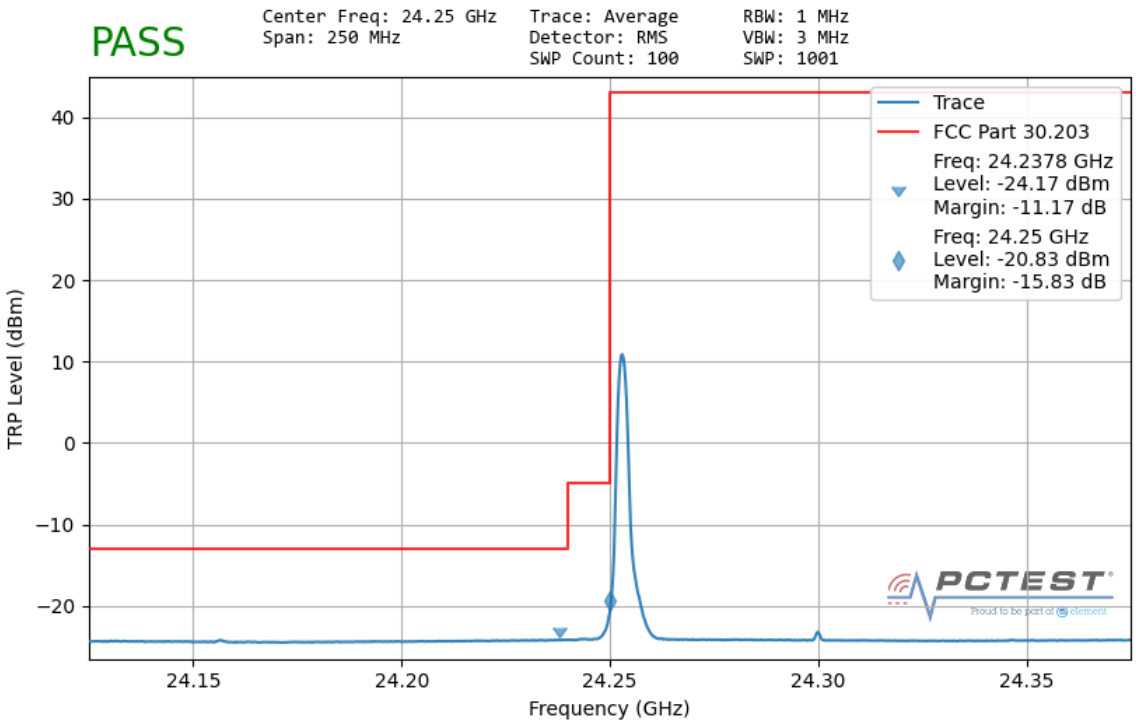
Plot 7-156. Ant 2 Lower Band Edge – (50MHz-2CC – QPSK 1 RB)



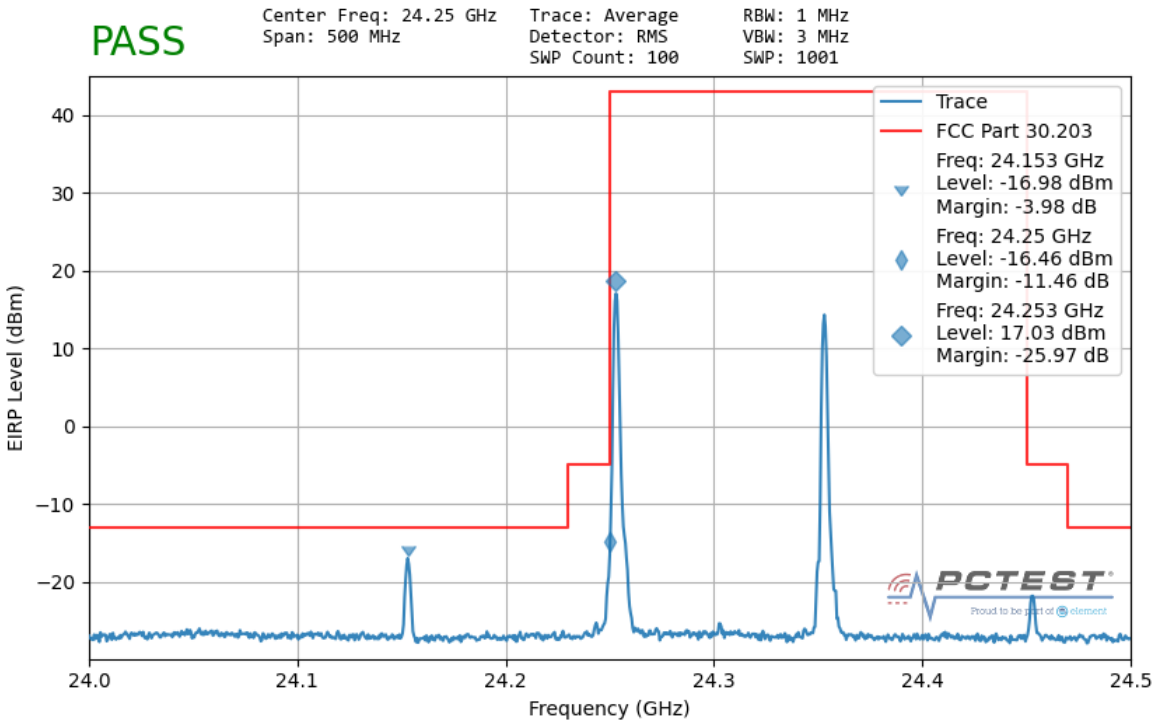
Plot 7-157. Ant 2 Upper Band Edge- TRP (50MHz-1CC – QPSK Full RB)



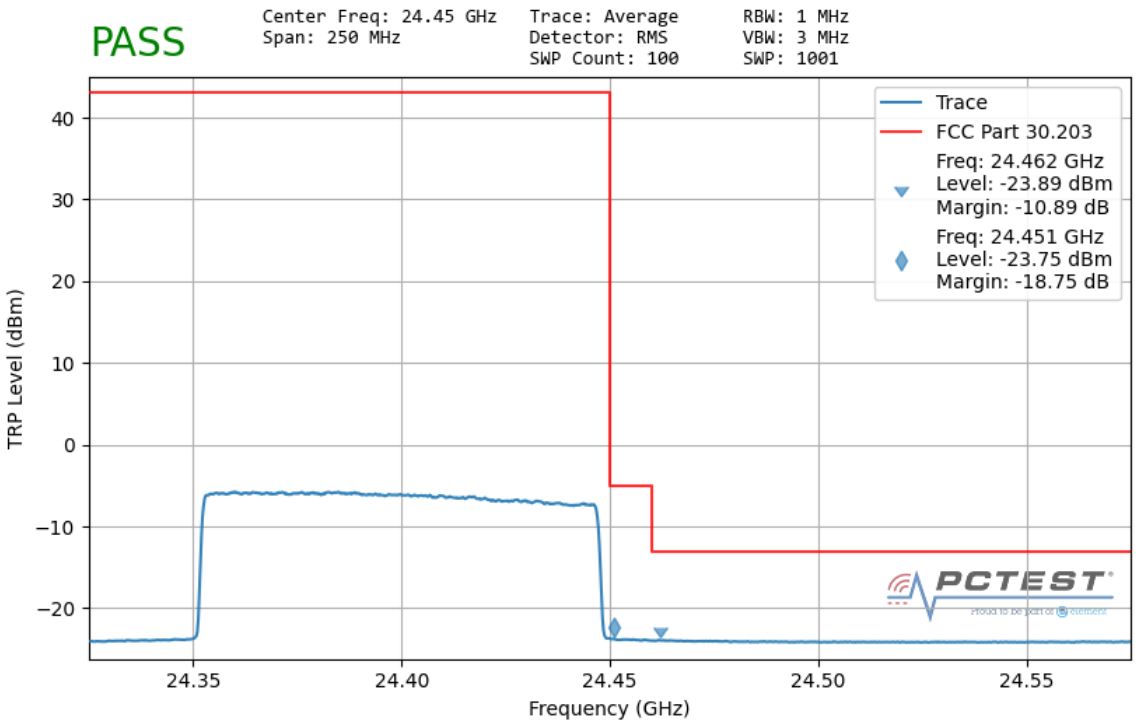
Plot 7-158. Ant 2 Upper Band Edge – (50MHz-2CC – QPSK 1 RB)



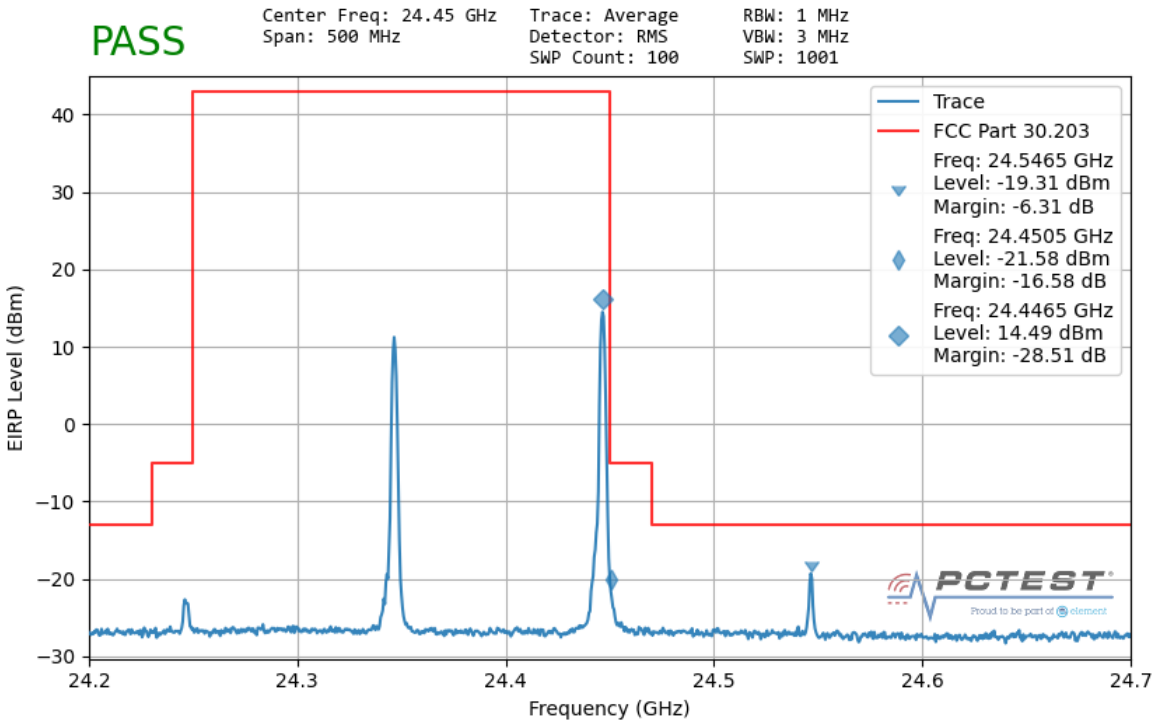
Plot 7-159. Ant 2 Lower Band Edge- TRP (100MHz-1CC – QPSK 1 RB)



Plot 7-160. Ant 2 Lower Band Edge – (100MHz-2CC – QPSK 1 RB)

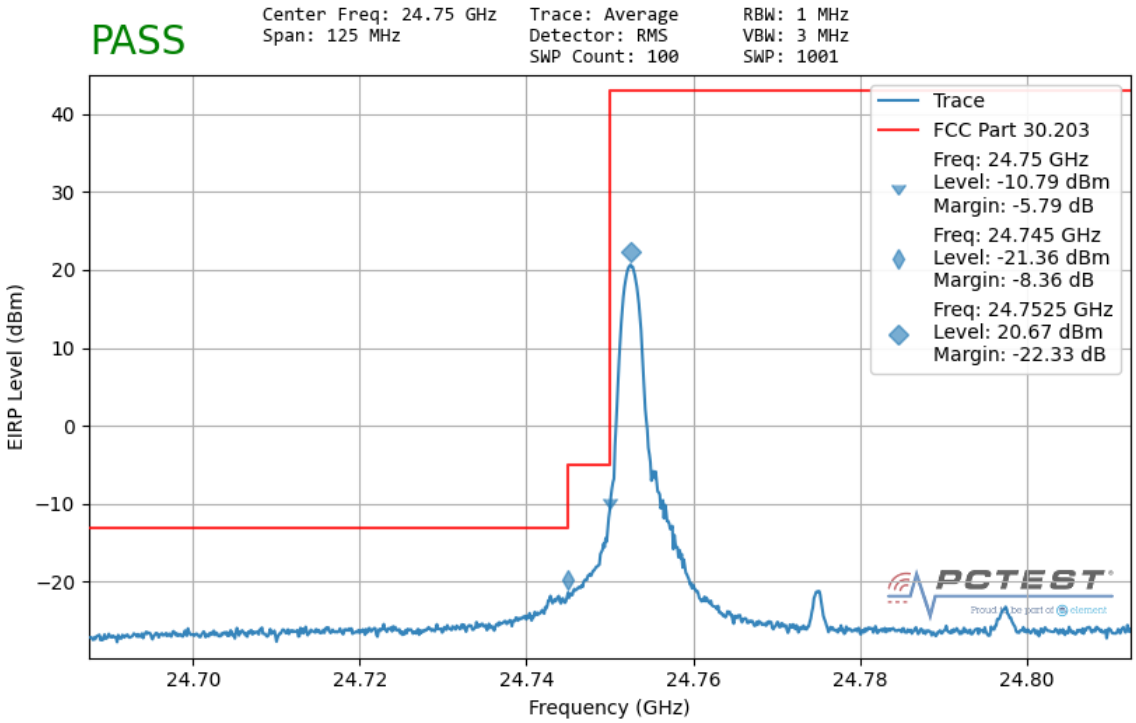


Plot 7-161. Ant 2 Upper Band Edge- TRP (100MHz-1CC – QPSK Full RB)

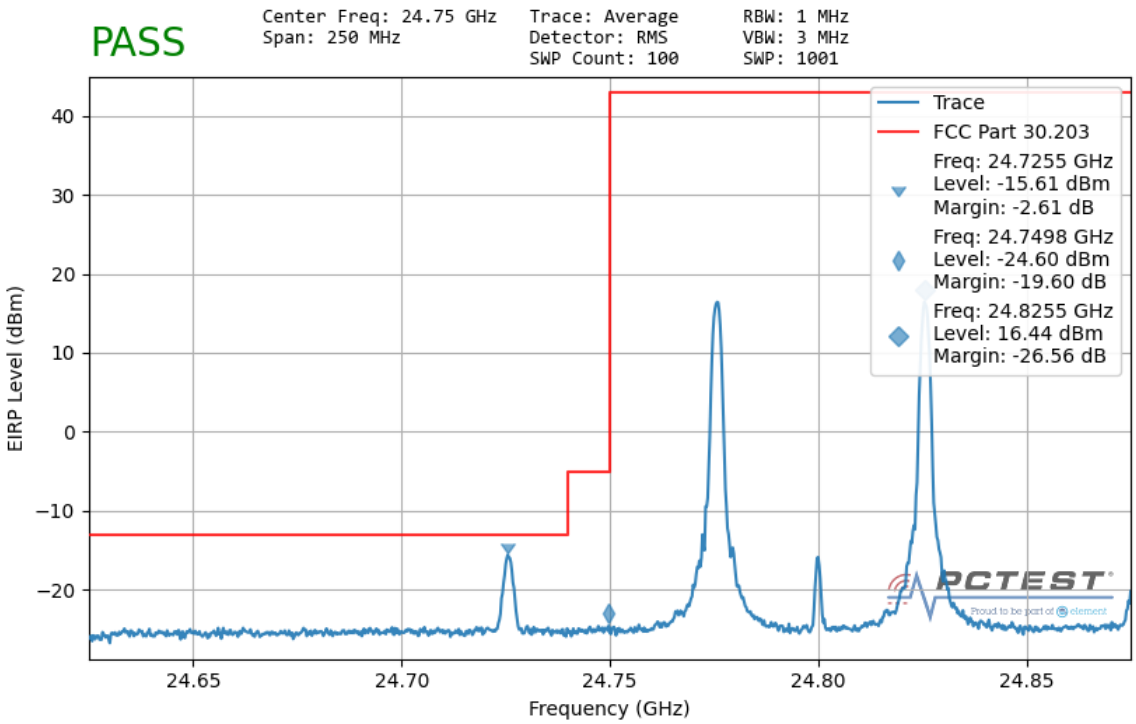


Plot 7-162. Ant 2 Upper Band Edge (100MHz-2CC – QPSK 1 RB)

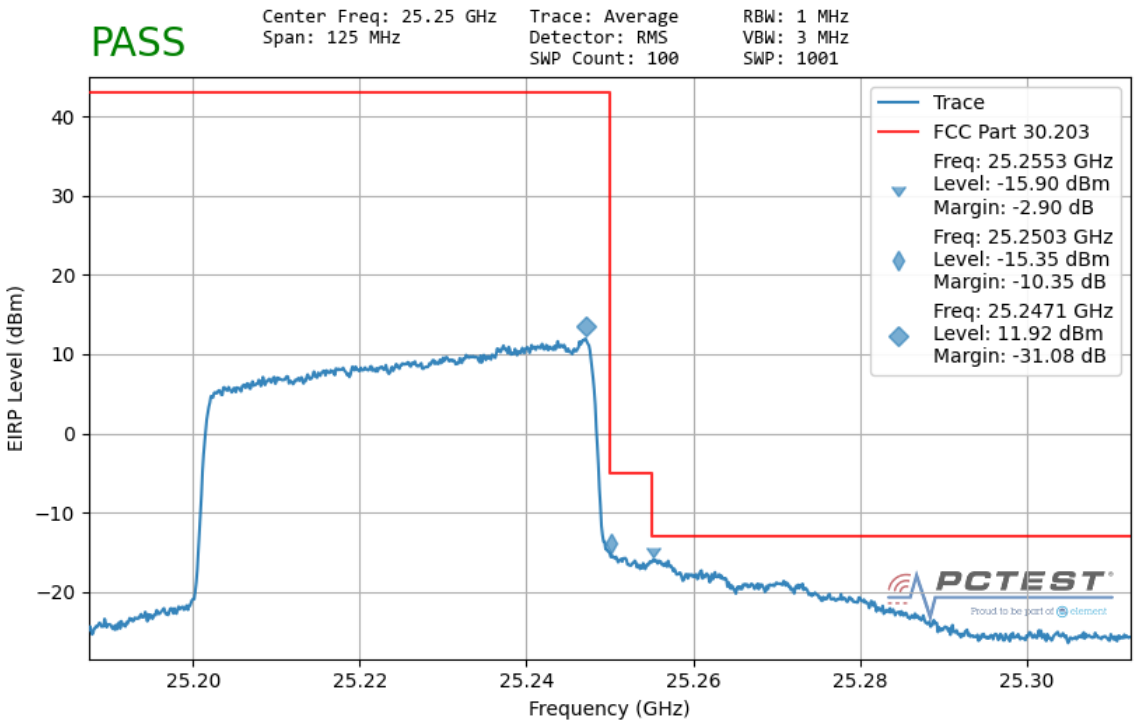
Band n258-R2 – Worst Case



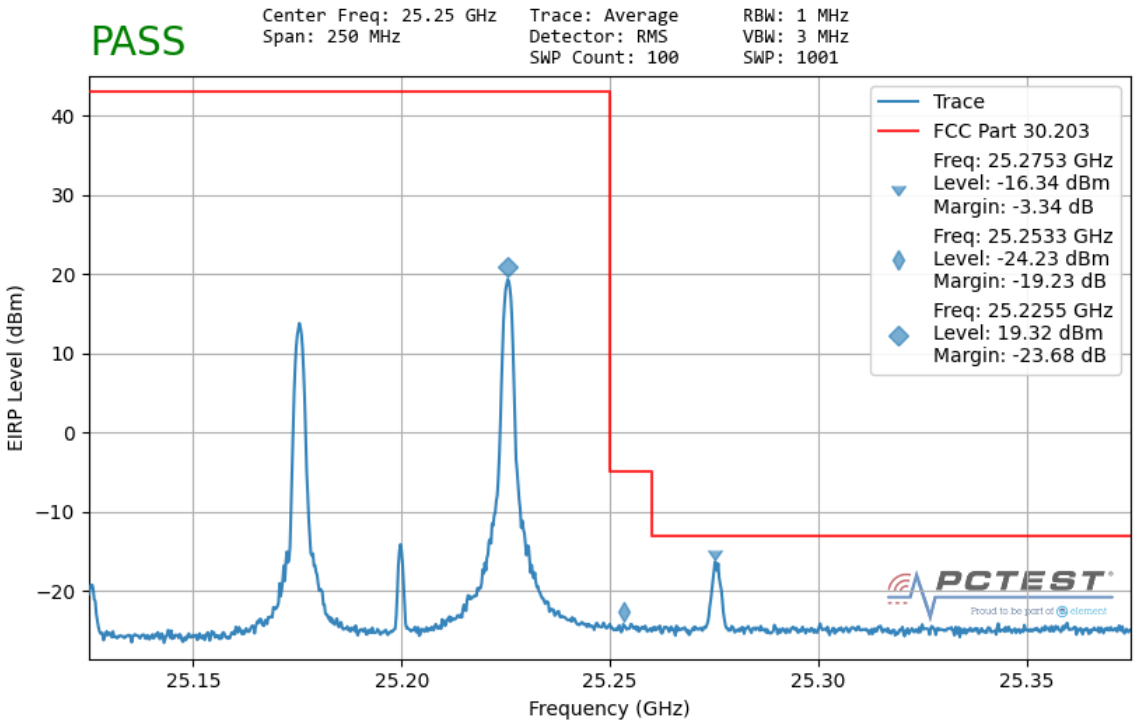
Plot 7-163. Ant 1 Lower Band Edge – (50MHz-1CC – QPSK 1 RB)



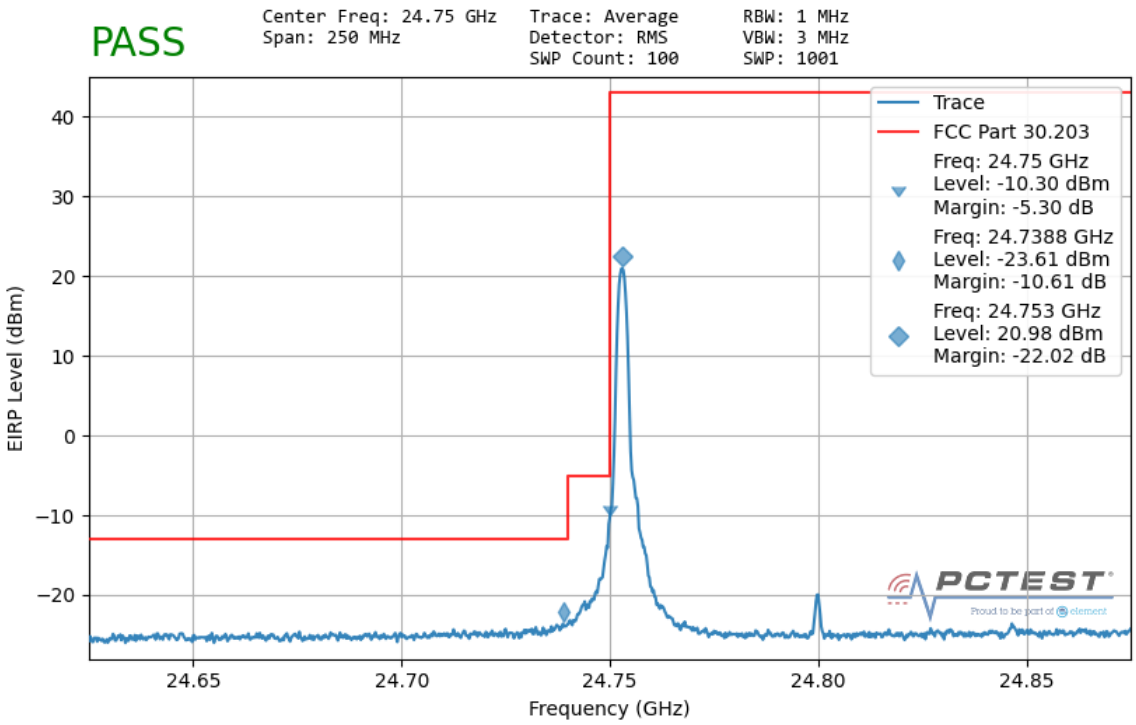
Plot 7-164. Ant 1 Lower Band Edge – (50MHz-2CC – QPSK 1 RB)



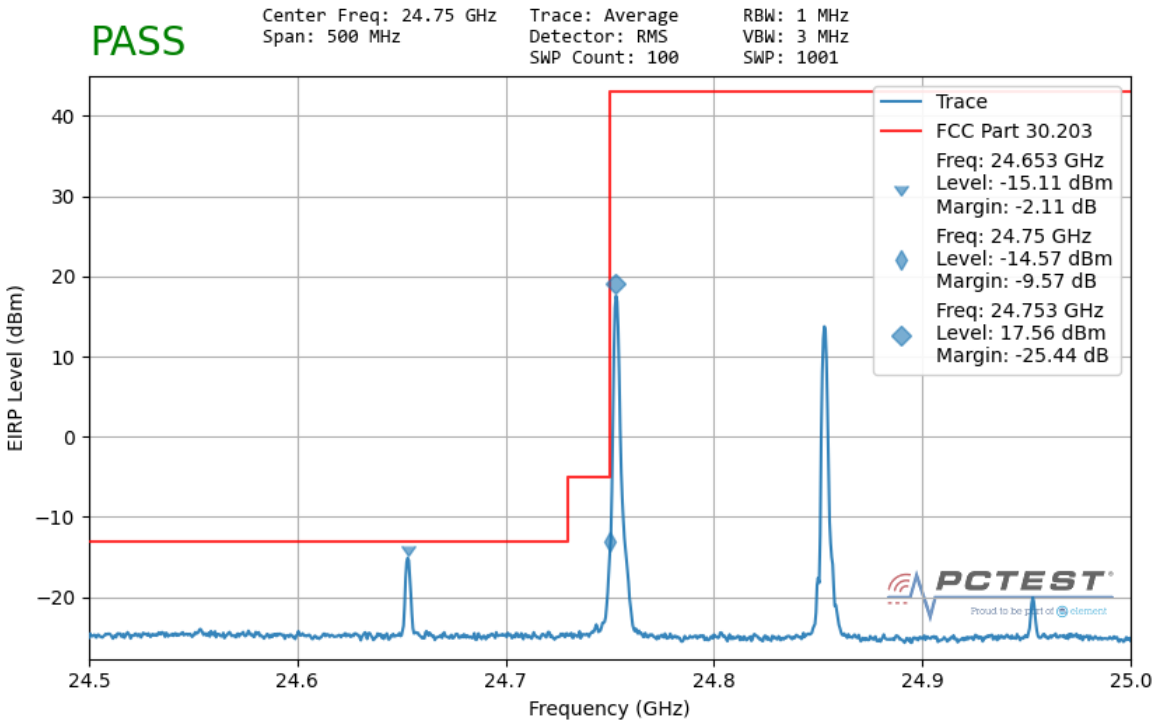
Plot 7-165. Ant 1 Upper Band Edge (50MHz-1CC – QPSK Full RB)



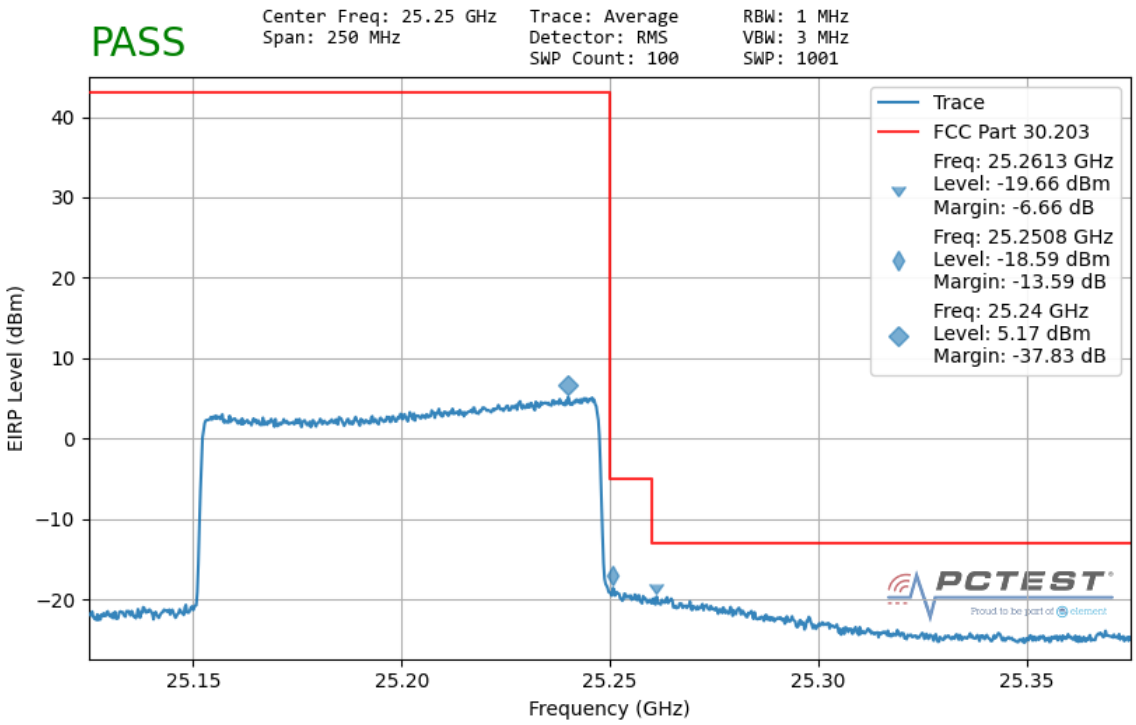
Plot 7-166. Ant 1 Upper Band Edge -(50MHz-2CC – QPSK 1 RB)



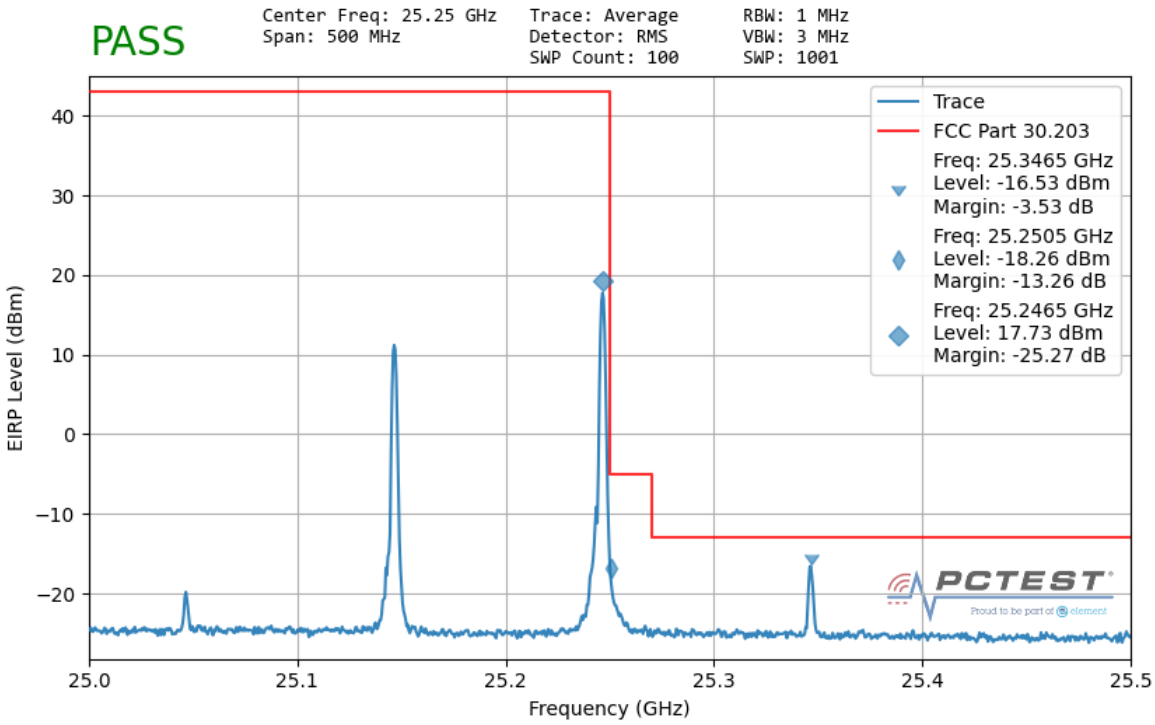
Plot 7-167. Ant 1 Lower Band Edge- (100MHz-1CC – pi/2-BPSK 1 RB)



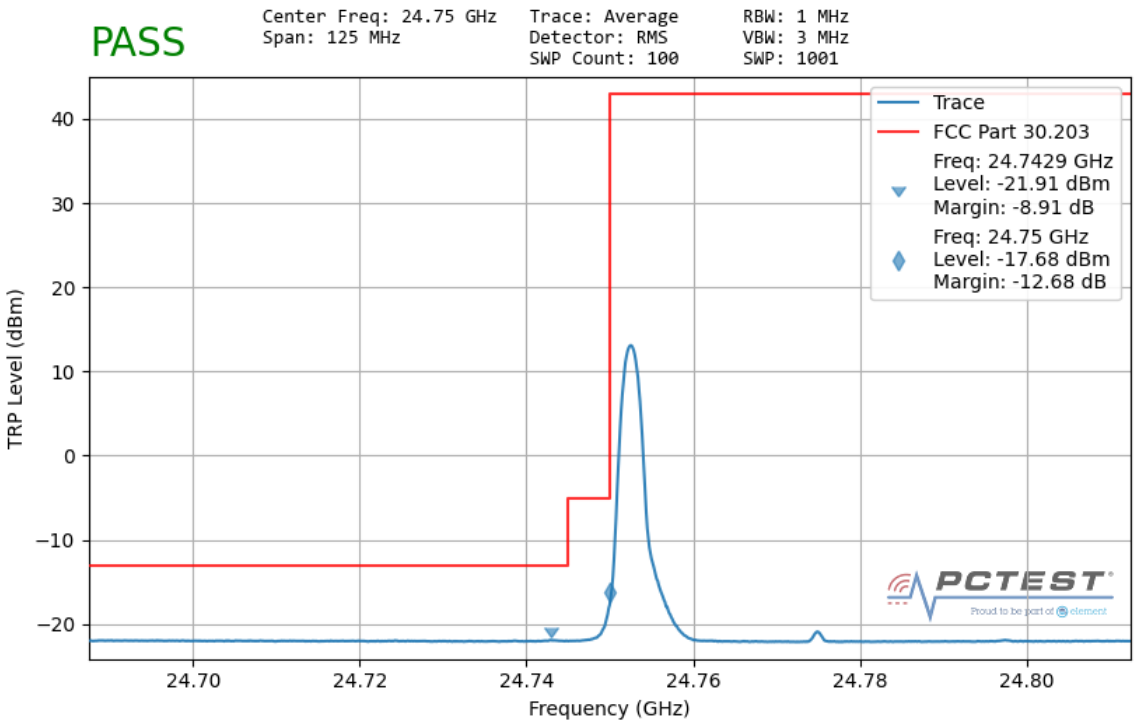
Plot 7-168. Ant 1 Lower Band Edge (100MHz-2CC – QPSK 1 RB)



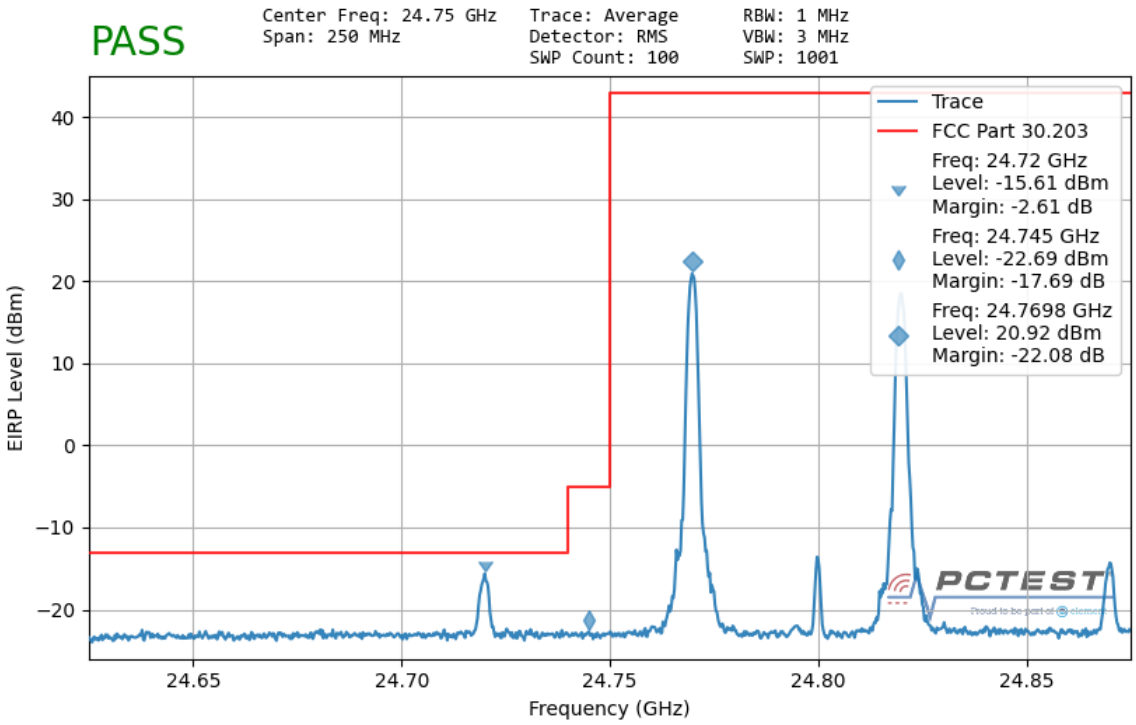
Plot 7-169. Ant 1 Upper Band Edge (100MHz-1CC – QPSK Full RB)



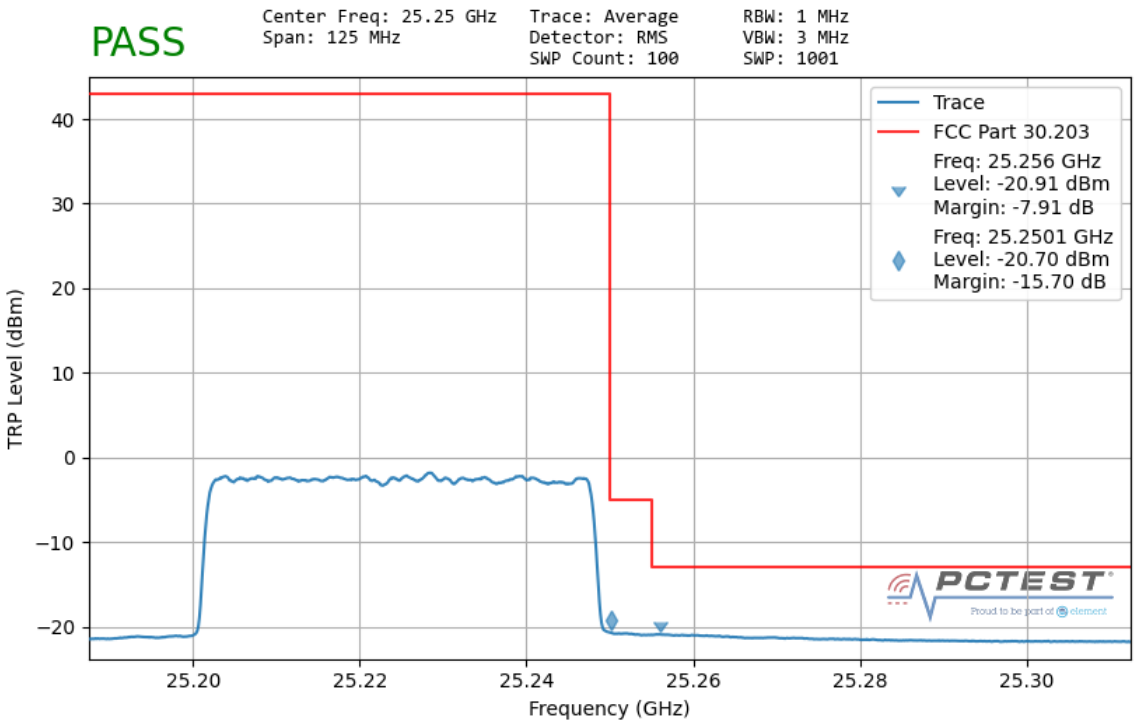
Plot 7-170. Ant 1 Upper Band Edge (100MHz-2CC – QPSK 1 RB)



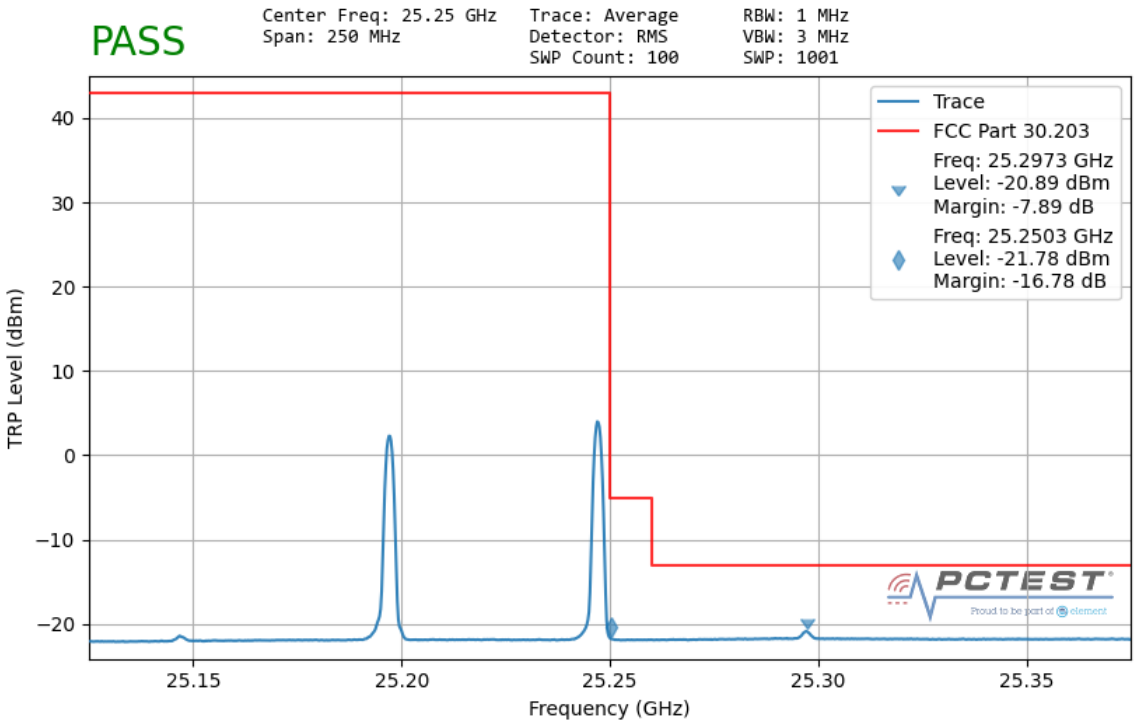
Plot 7-171. Ant 2 Lower Band Edge- TRP (50MHz-1CC – QPSK 1 RB)



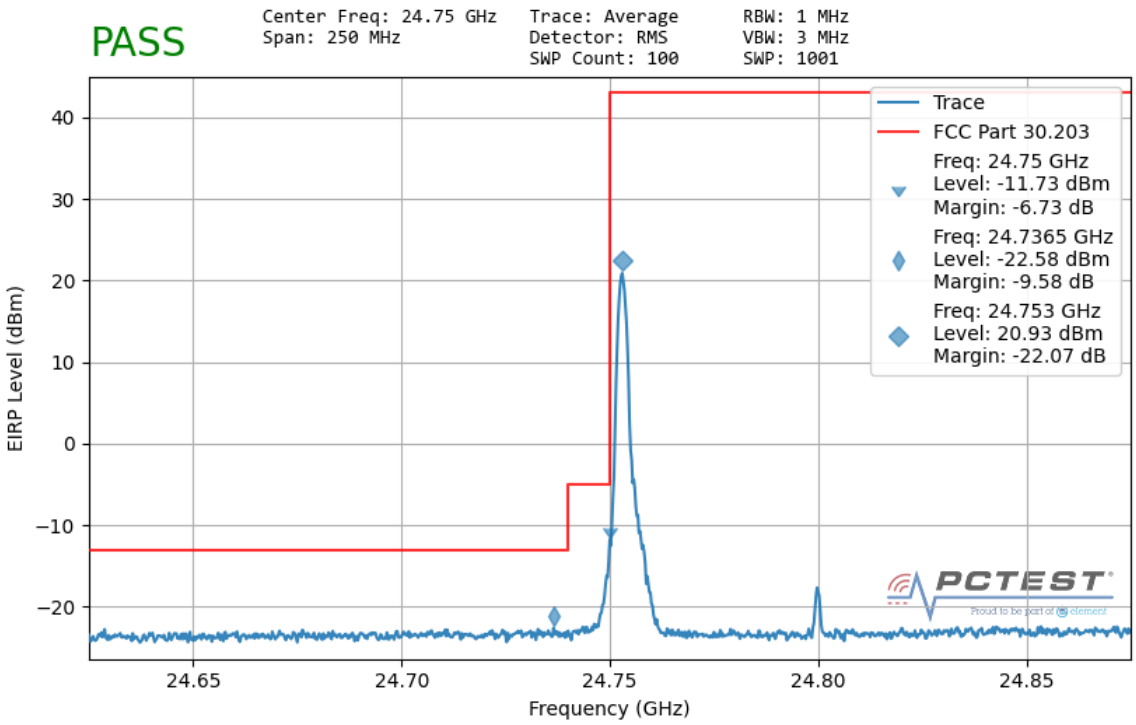
Plot 7-172. Ant 2 Lower Band Edge – (50MHz-2CC – QPSK 1 RB)



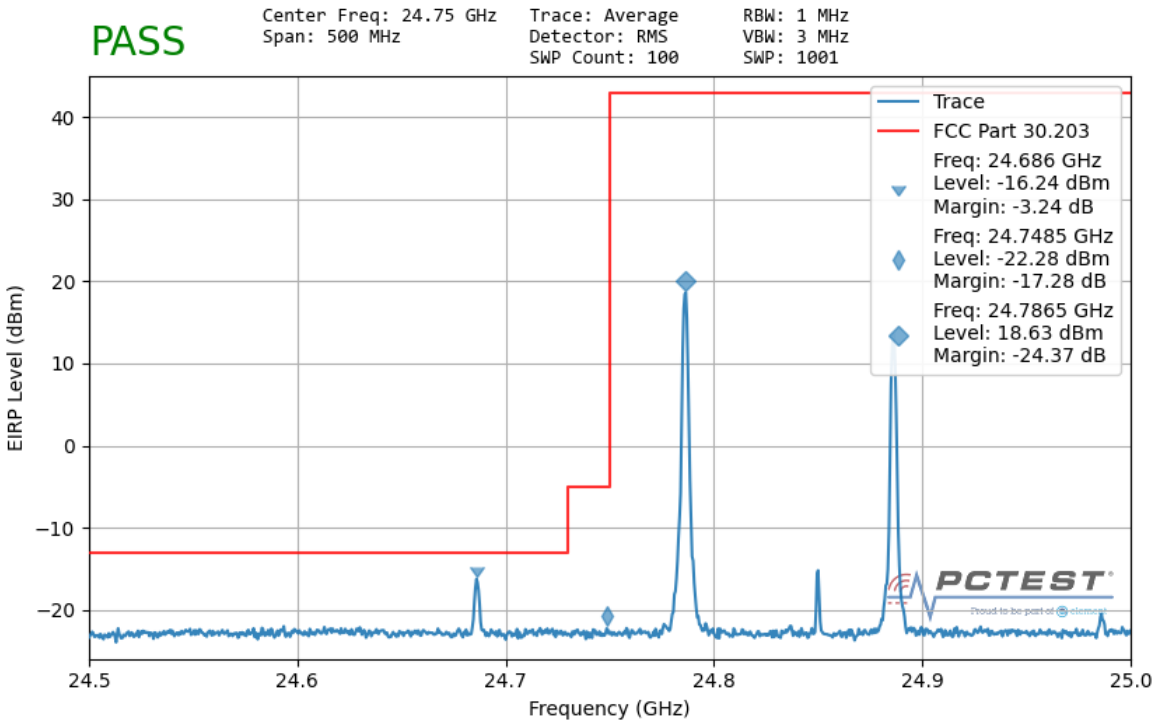
Plot 7-173. Ant 2 Upper Band Edge- TRP (50MHz-1CC – QPSK Full RB)



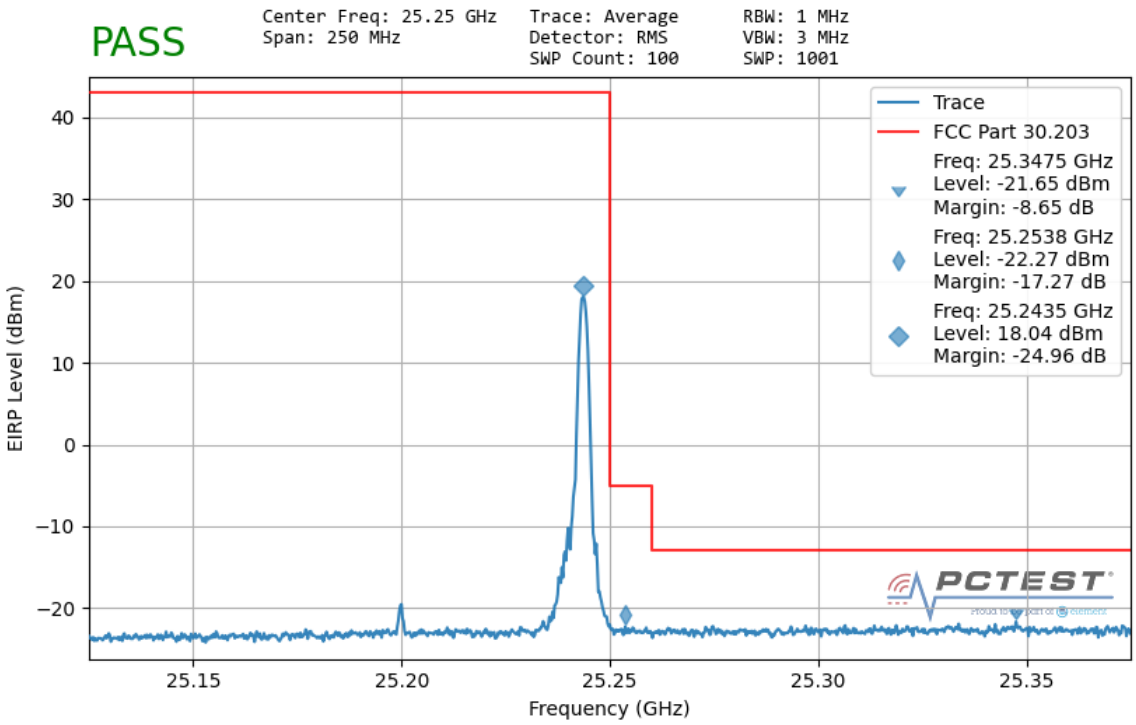
Plot 7-174. Ant 2 Upper Band Edge – TRP (50MHz-2CC – QPSK 1 RB)



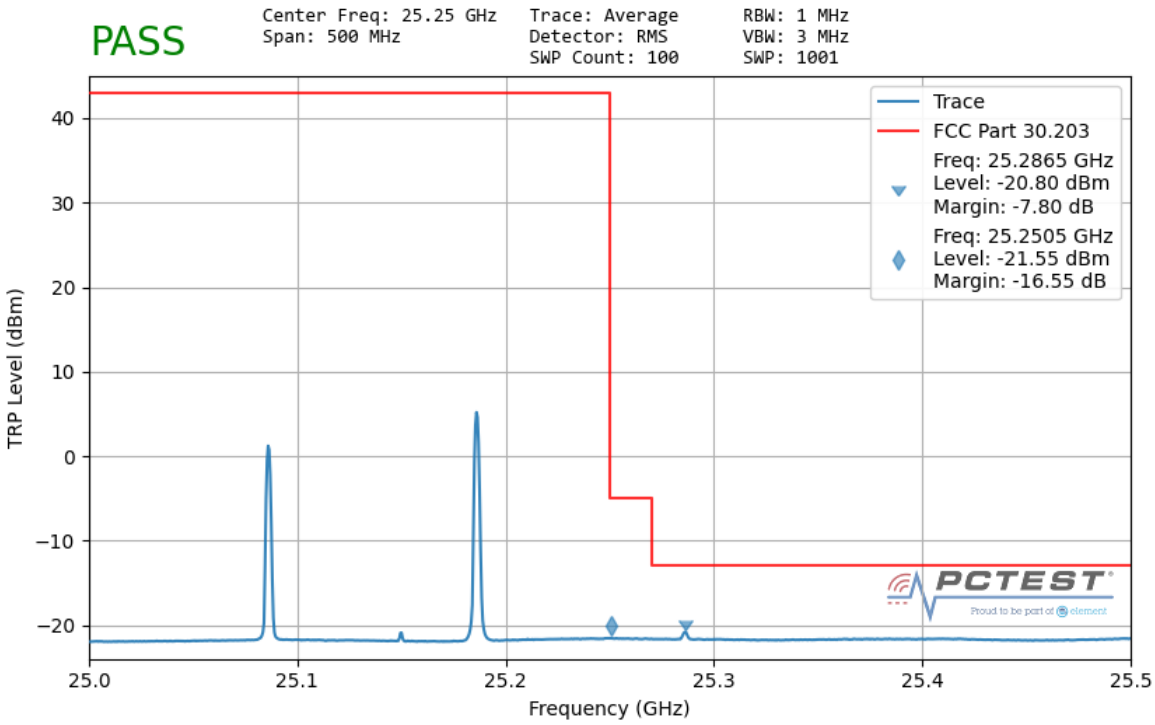
Plot 7-175. Ant 2 Lower Band Edge (100MHz-1CC – QPSK 1 RB)



Plot 7-176. Ant 2 Lower Band Edge – (100MHz-2CC – QPSK 1 RB)

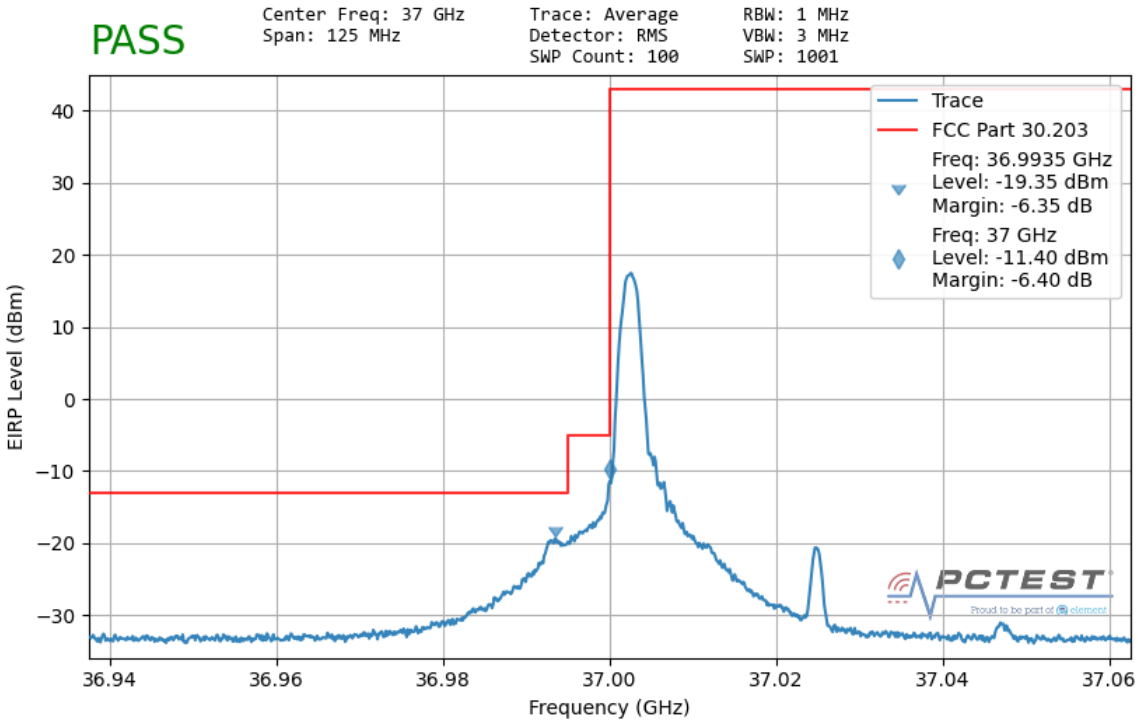


Plot 7-177. Ant 2 Upper Band Edge- (100MHz-1CC – pi/2-BPSK 1 RB)

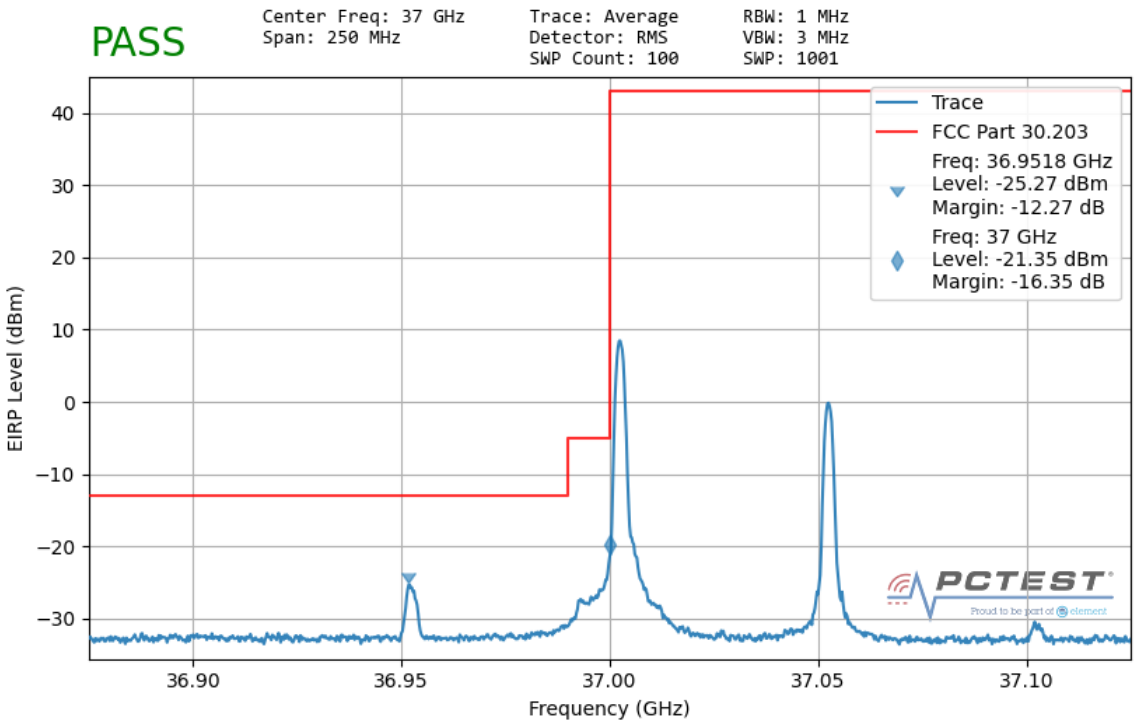


Plot 7-178. Ant 2 Upper Band Edge-TRP (100MHz-2CC – QPSK 1 RB)

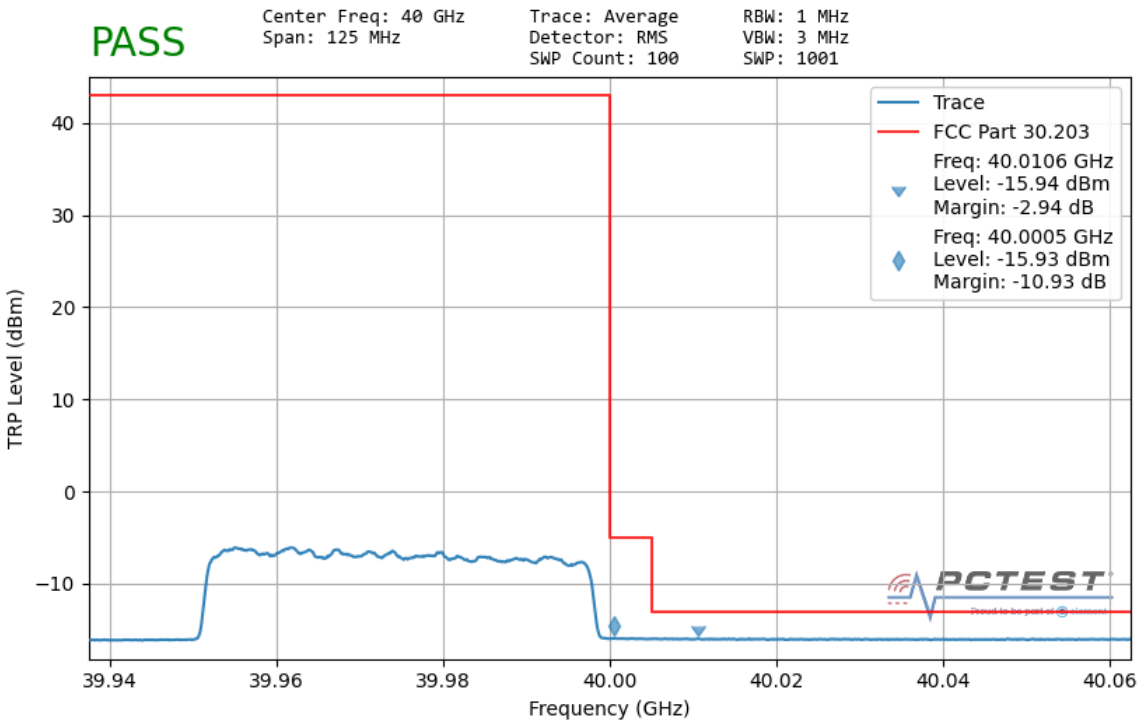
Band n260 – Worst Case



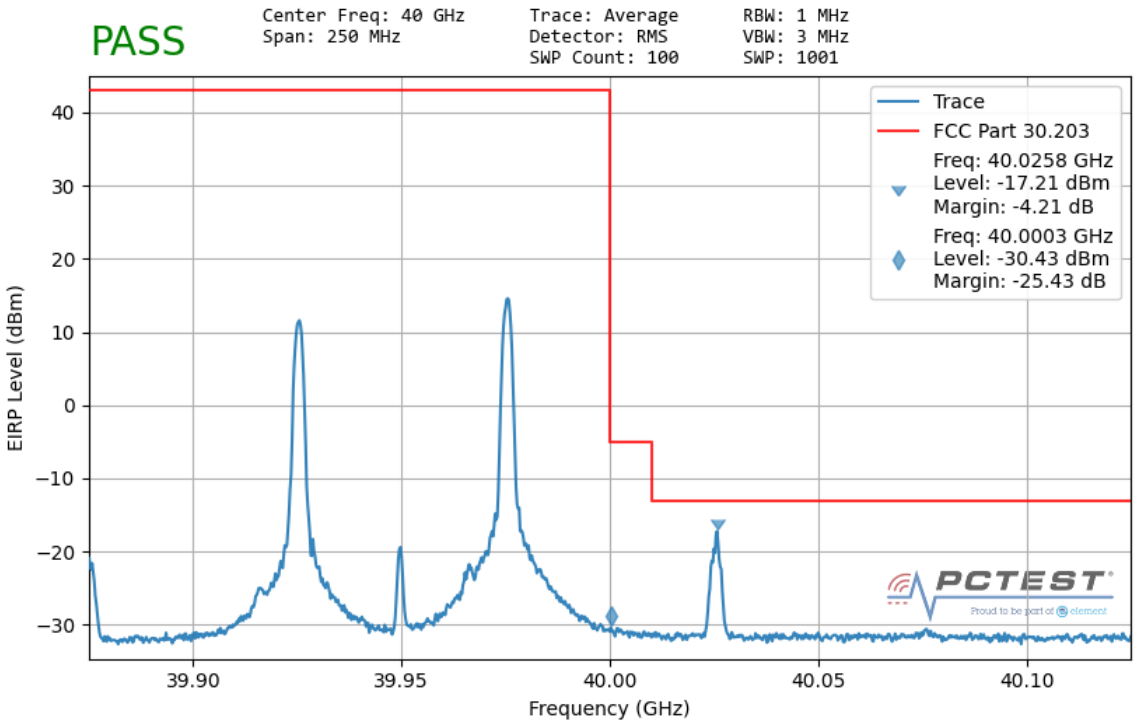
Plot 7-179. Ant 1 Lower Band Edge (50MHz-1CC – pi/2-BPSK 1 RB)



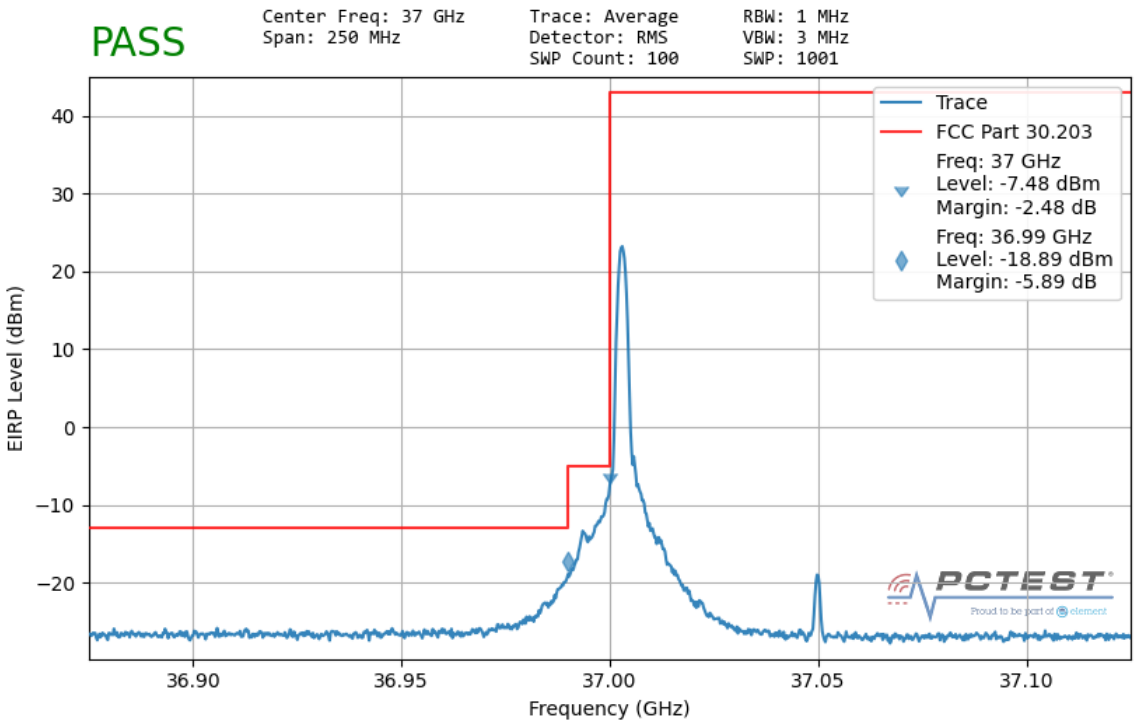
Plot 7-180. Ant 1 Lower Band Edge – TRP (50MHz-2CC – QPSK 1 RB)



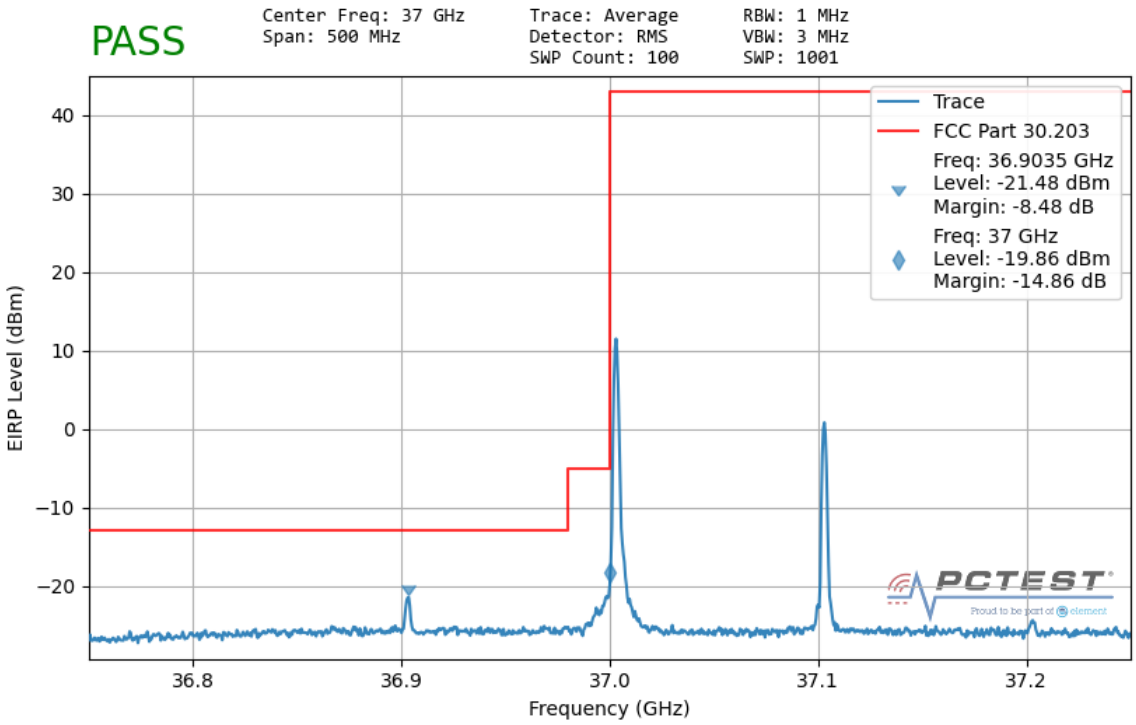
Plot 7-181. Ant 1 Upper Band Edge- TRP (50MHz-1CC – QPSK Full RB)



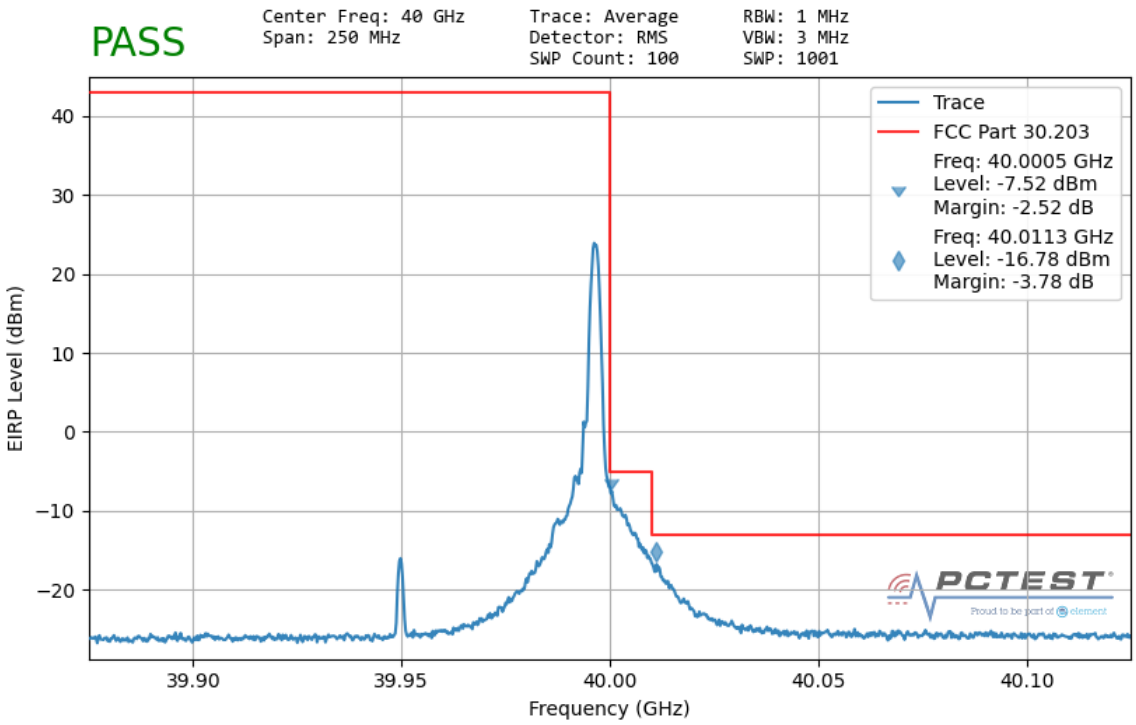
Plot 7-182. Ant 1 Upper Band Edge (50MHz-2CC – QPSK 1 RB)



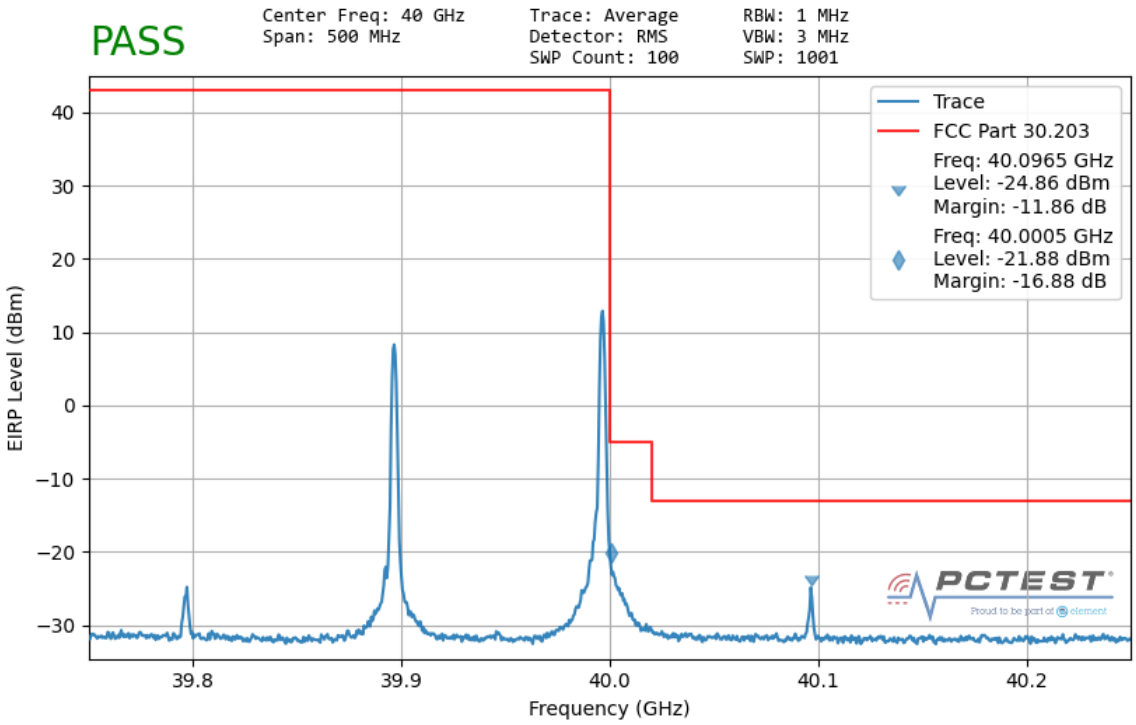
Plot 7-183. Ant 1 Lower Band Edge (100MHz-1CC – pi/2-BPSK 1 RB)



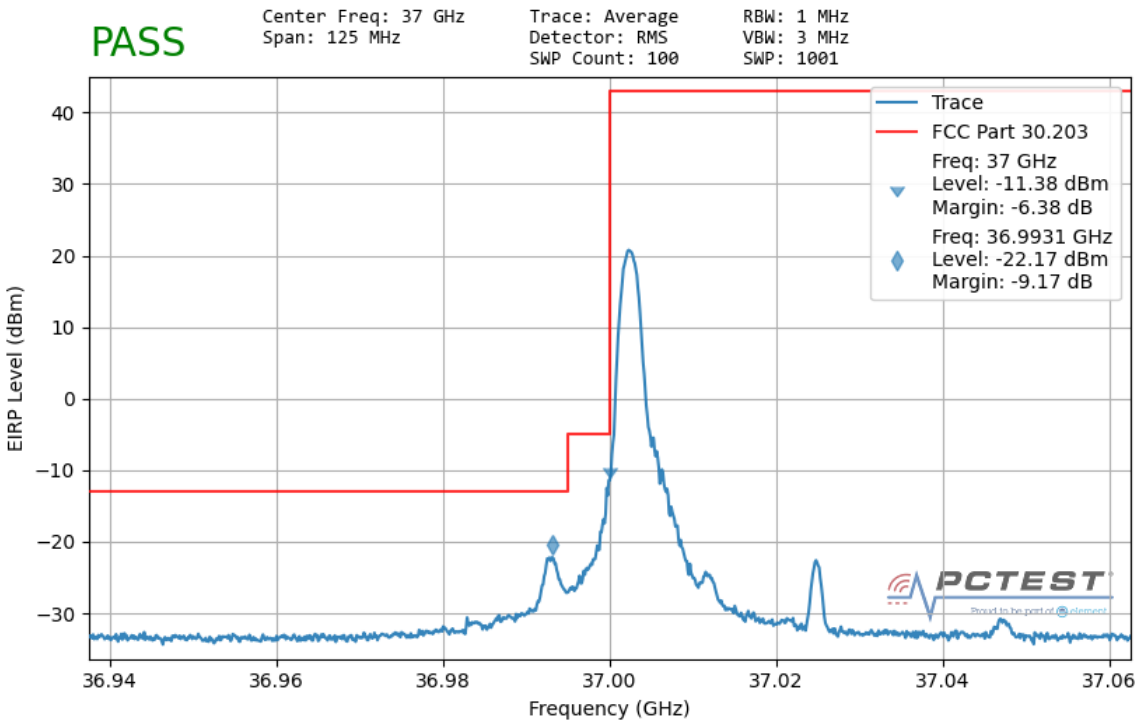
Plot 7-184. Ant 1 Lower Band Edge (100MHz-2CC – QPSK 1 RB)



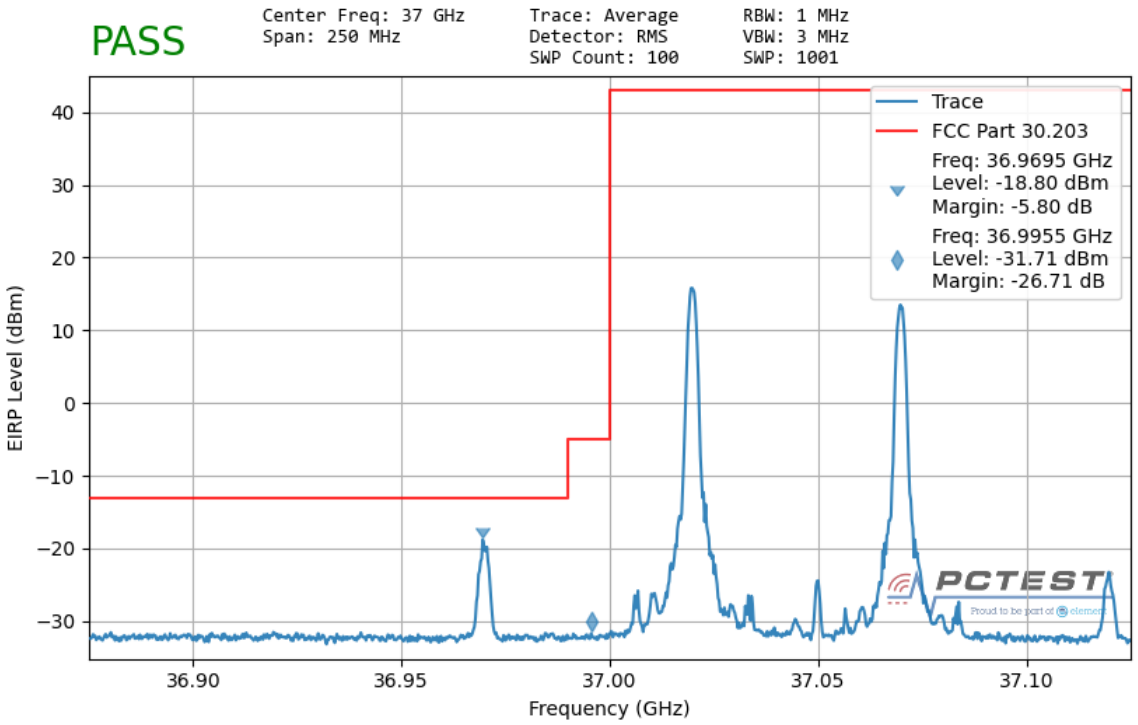
Plot 7-185. Ant 1 Upper Band Edge (100MHz-1CC – QPSK 1 RB)



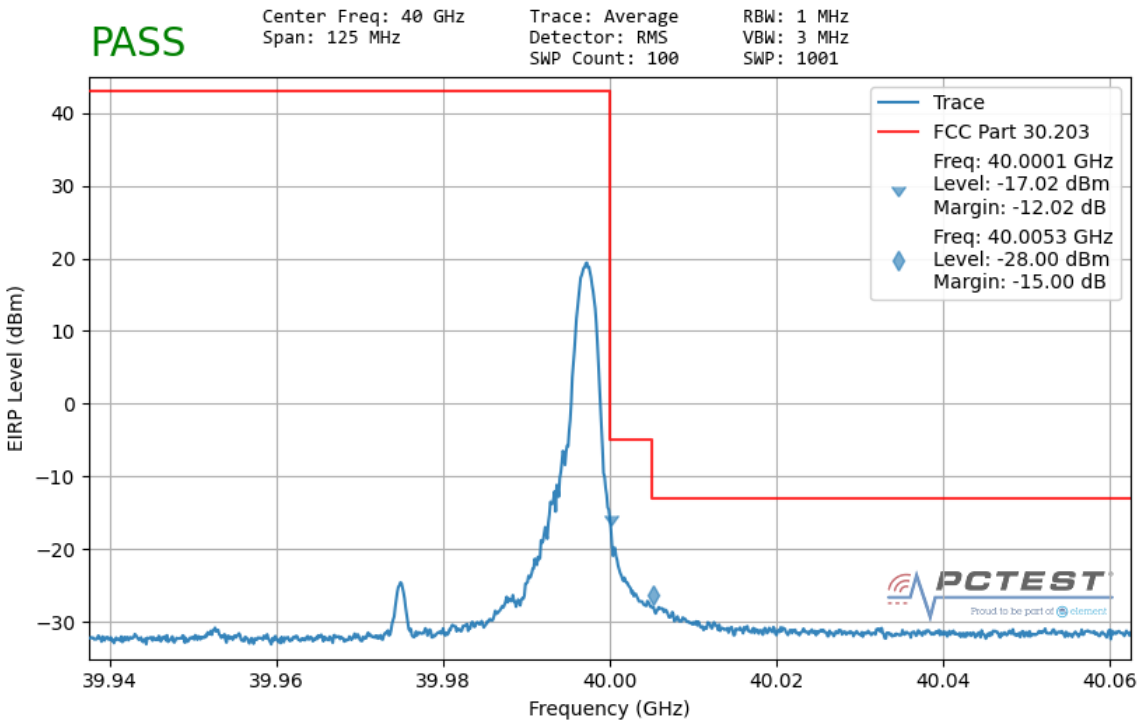
Plot 7-186. Ant 1 Upper Band Edge – (100MHz-2CC – QPSK 1 RB)



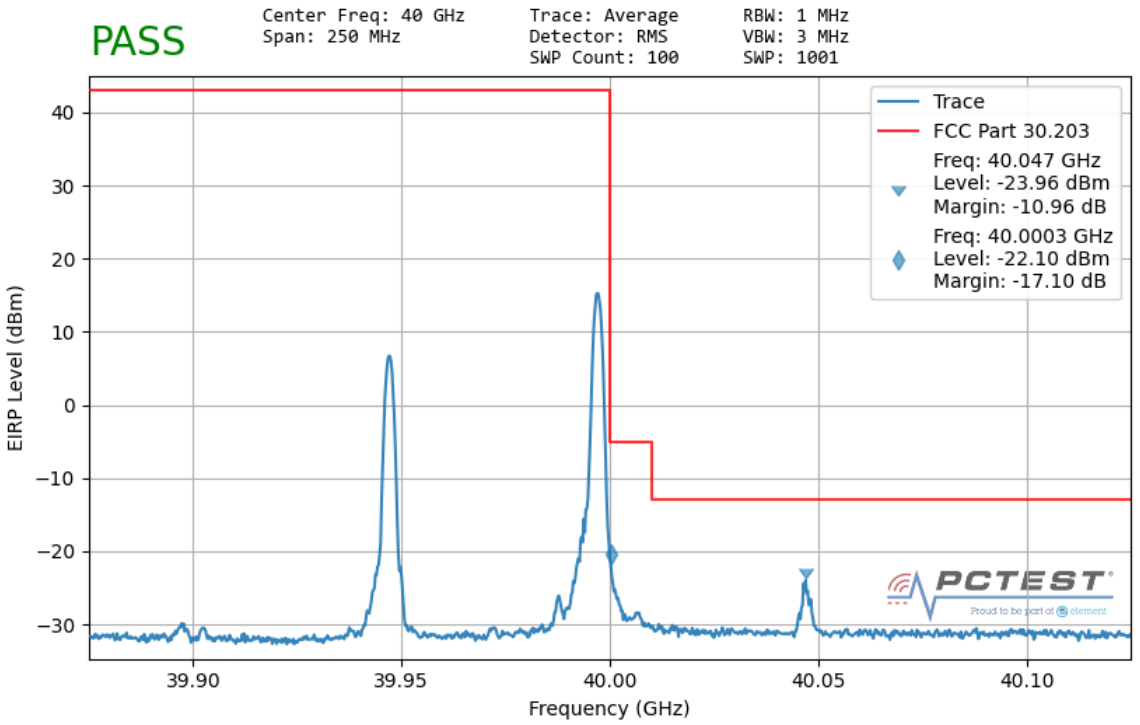
Plot 7-187. Ant 2 Lower Band Edge (50MHz-1CC – QPSK Full RB)



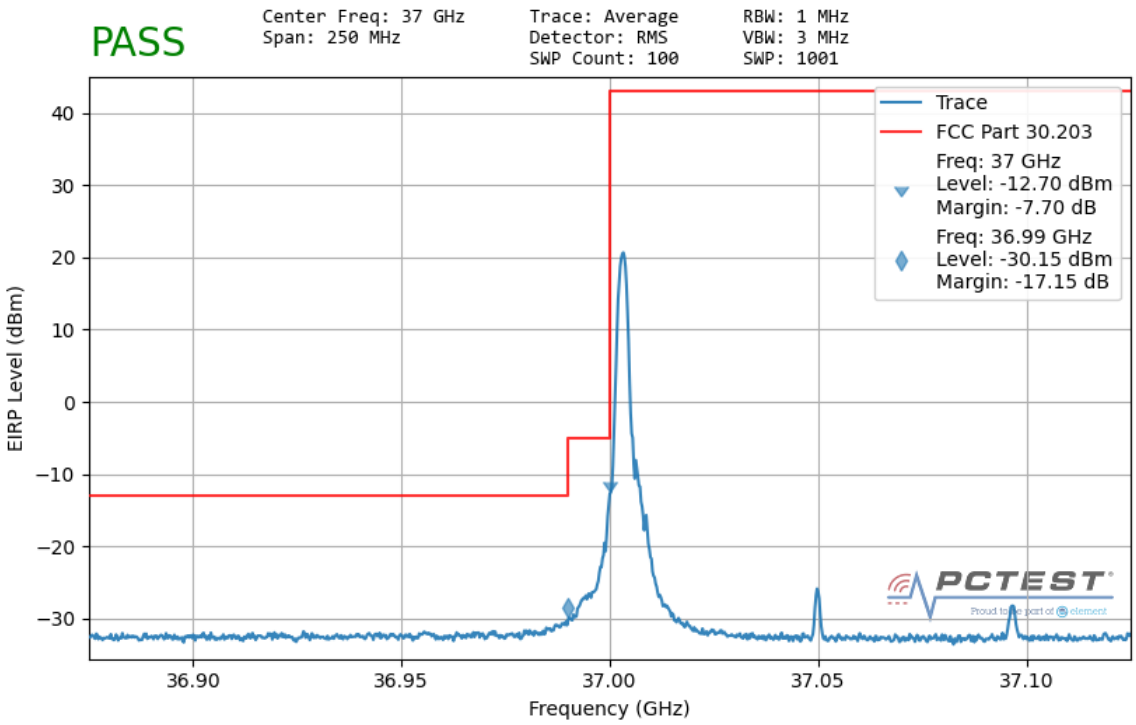
Plot 7-188. Ant 2 Lower Band Edge (50MHz-2CC – QPSK 1 RB)



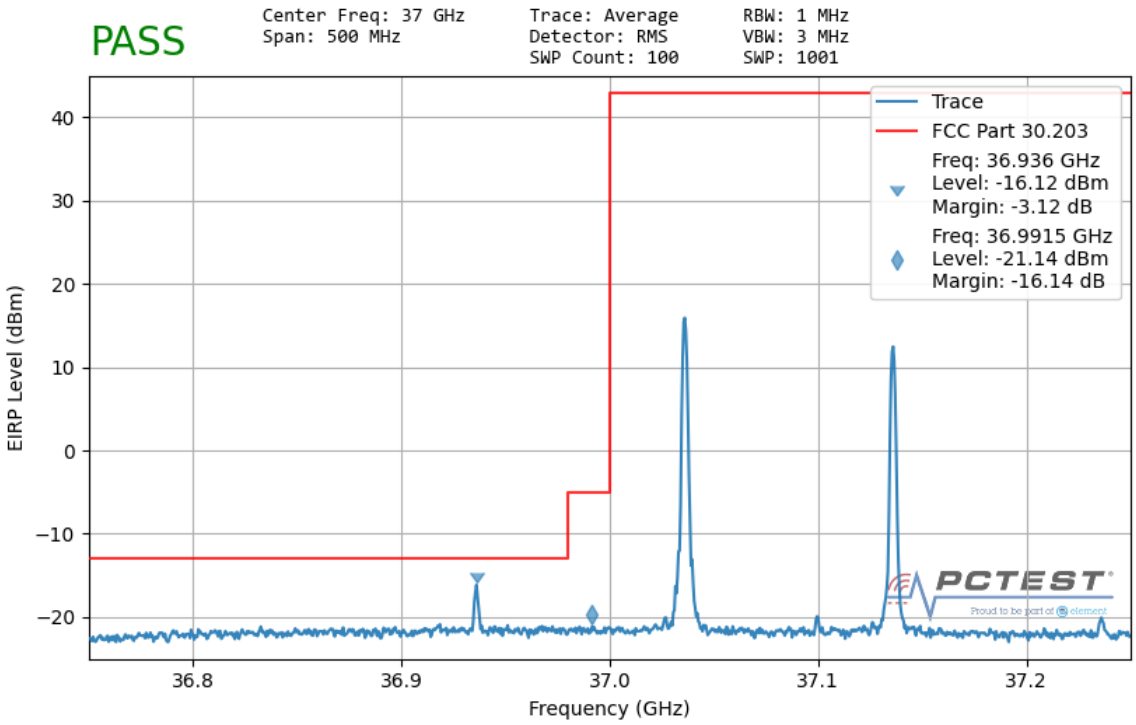
Plot 7-189. Ant 2 Upper Band Edge (50MHz-1CC – QPSK 1 RB)



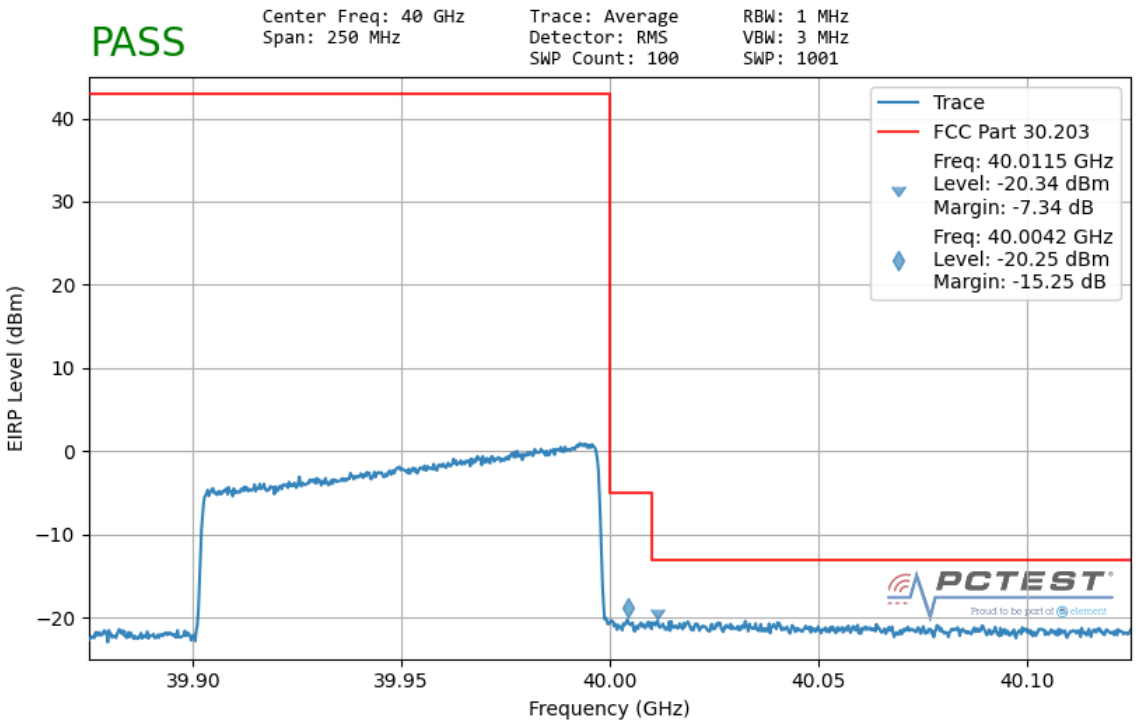
Plot 7-190. Ant 2 Upper Band Edge (50MHz-2CC – QPSK 1 RB)



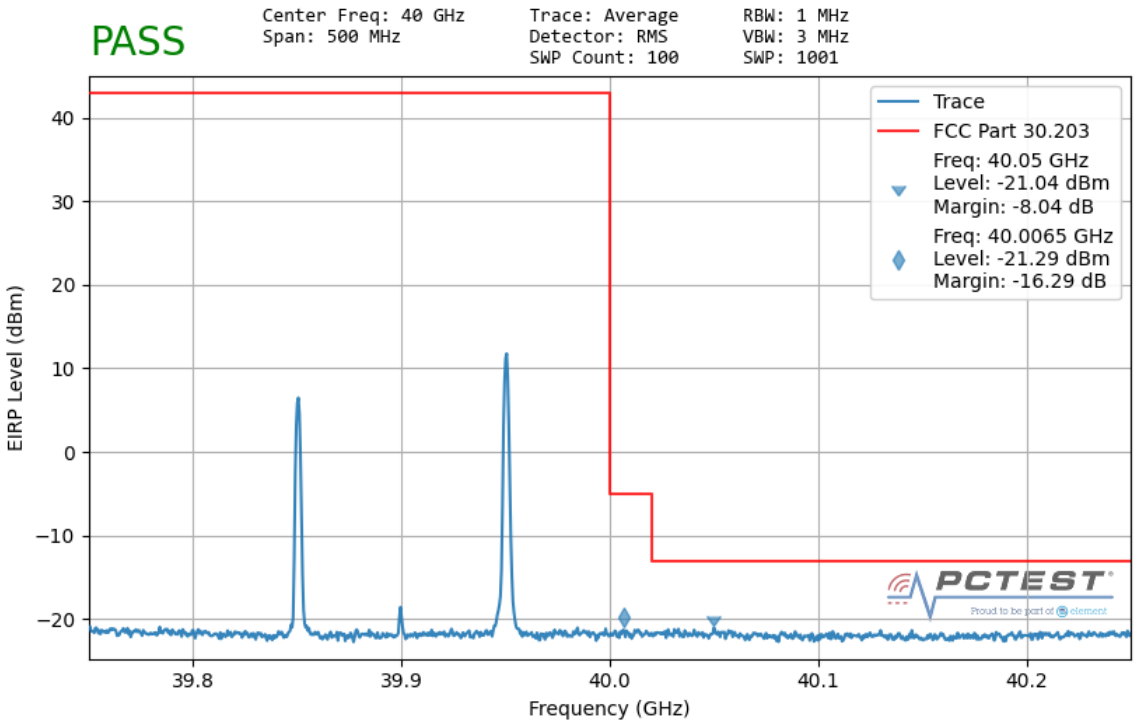
Plot 7-191. Ant 2 Lower Band Edge (100MHz-1CC – QPSK 1 RB)



Plot 7-192. Ant 2 Lower Band Edge – (100MHz-2CC – QPSK 1 RB)

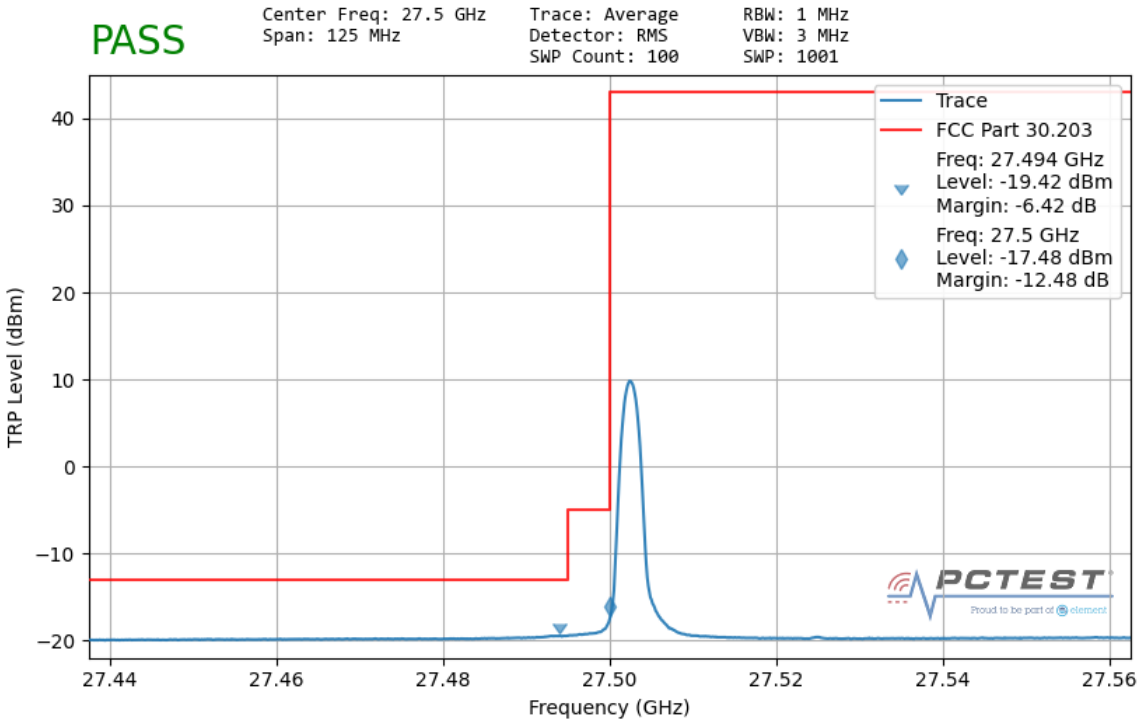


Plot 7-193. Ant 2 Upper Band Edge (100MHz-1CC – QPSK Full RB)

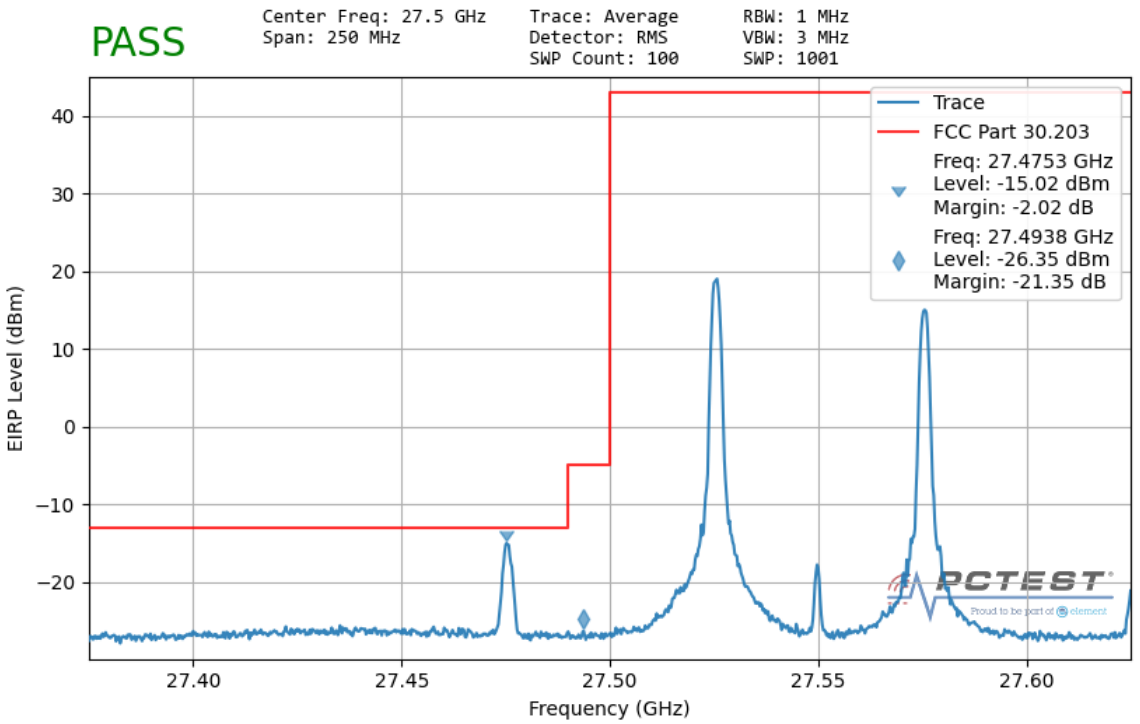


Plot 7-194. Ant 2 Upper Band Edge (100MHz-2CC – QPSK 1 RB)

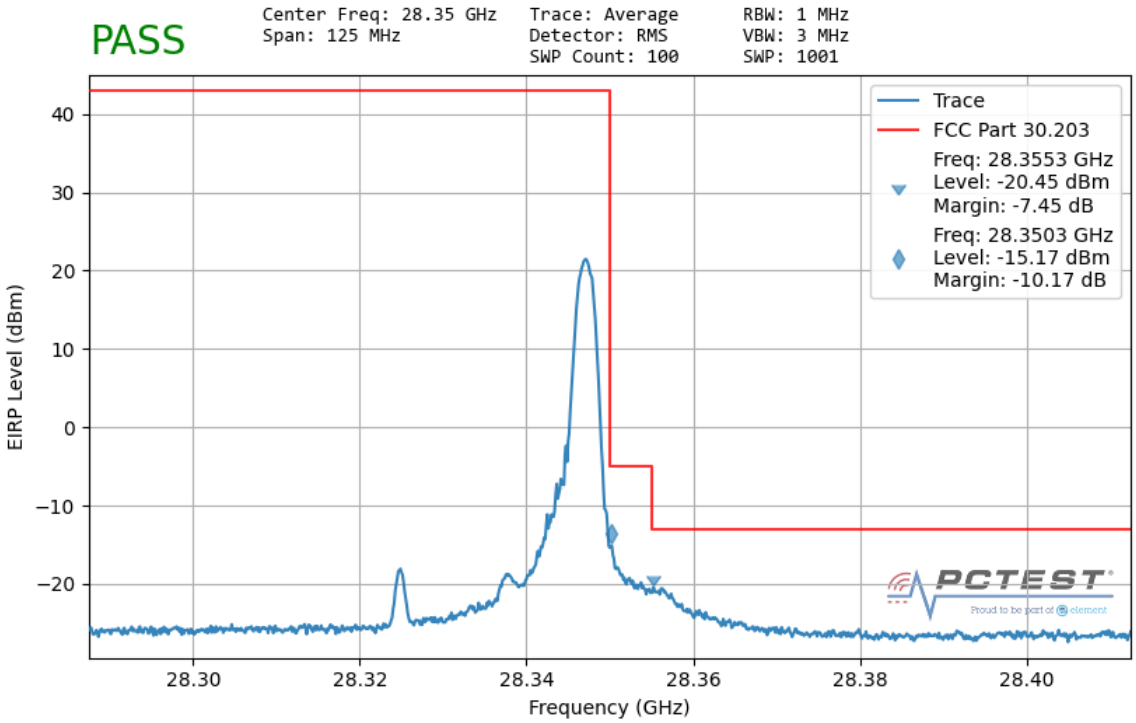
Band n261 – Worst Case



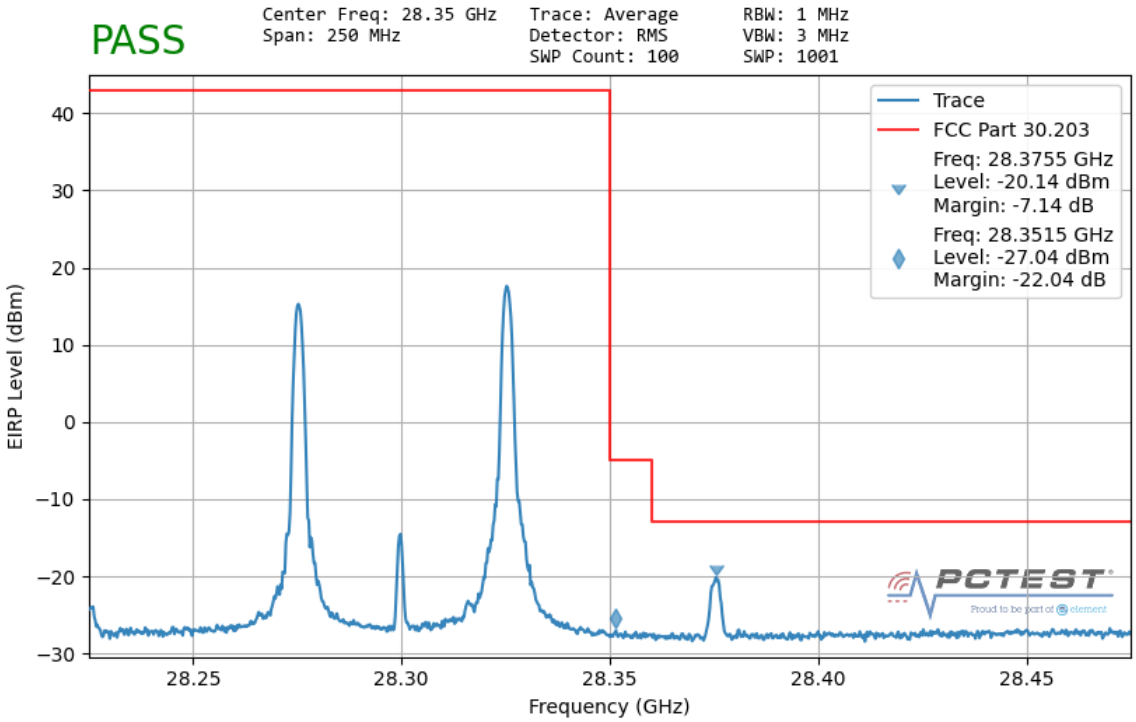
Plot 7-195. Ant 1 Lower Band Edge- TRP (50MHz-1CC – QPSK 1 RB)



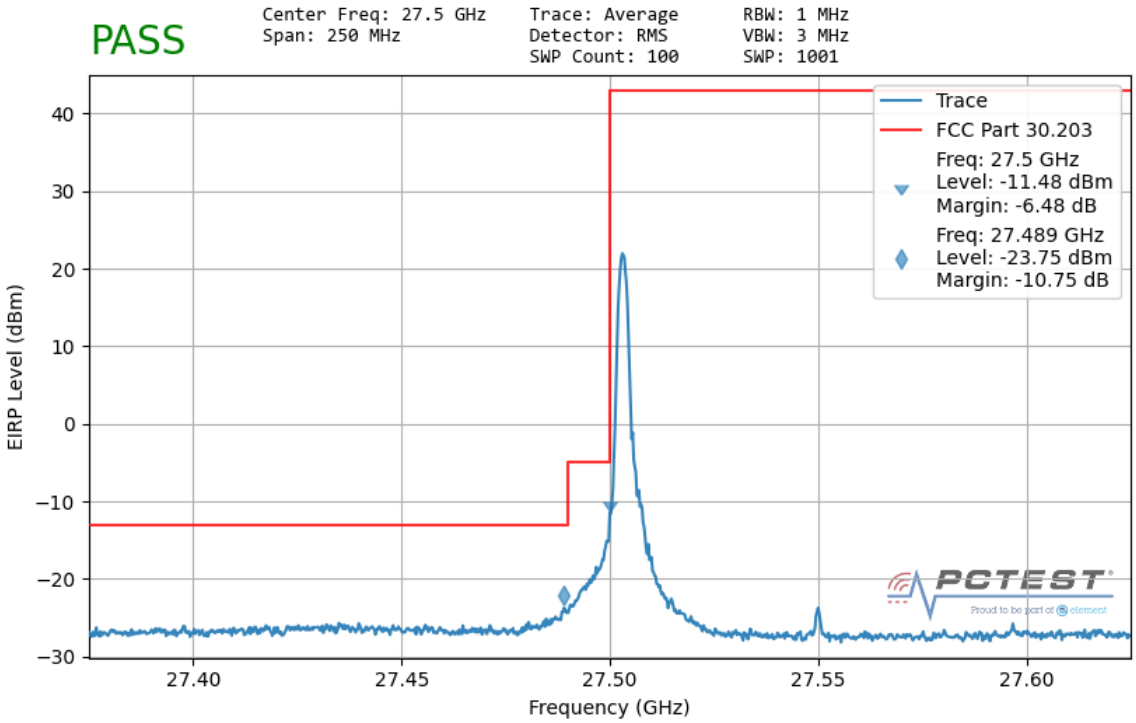
Plot 7-196. Ant 1 Lower Band Edge (50MHz-2CC – QPSK 1 RB)



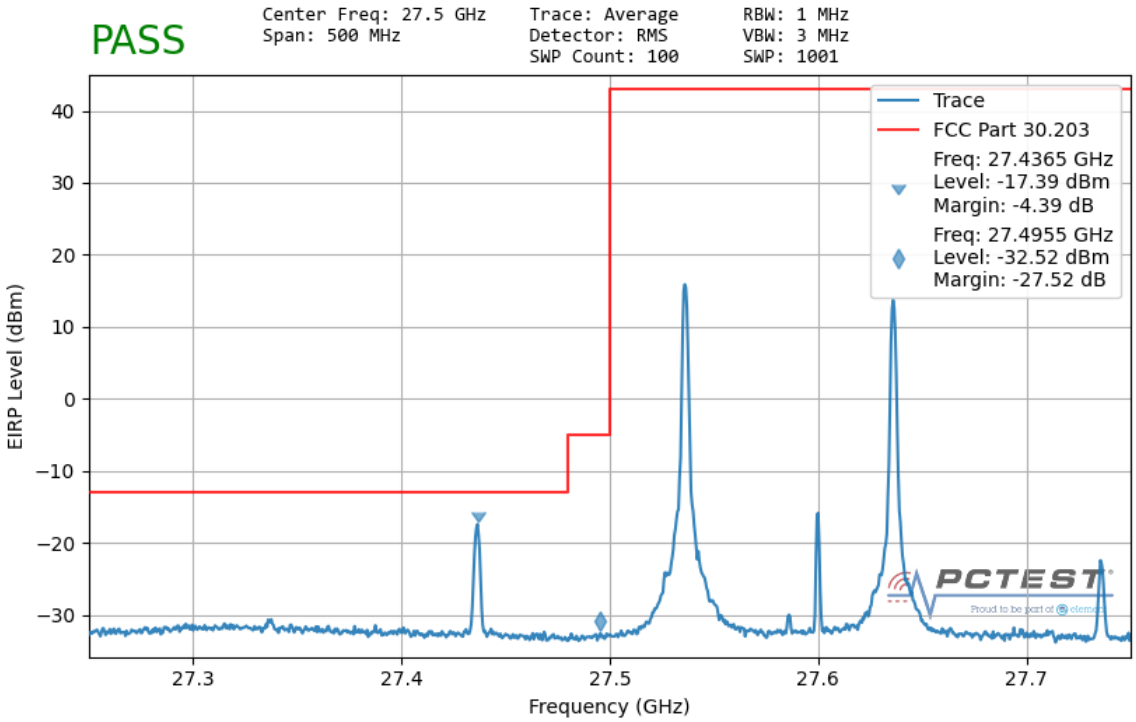
Plot 7-197. Ant 1 Upper Band Edge (50MHz-1CC – QPSK 1 RB)



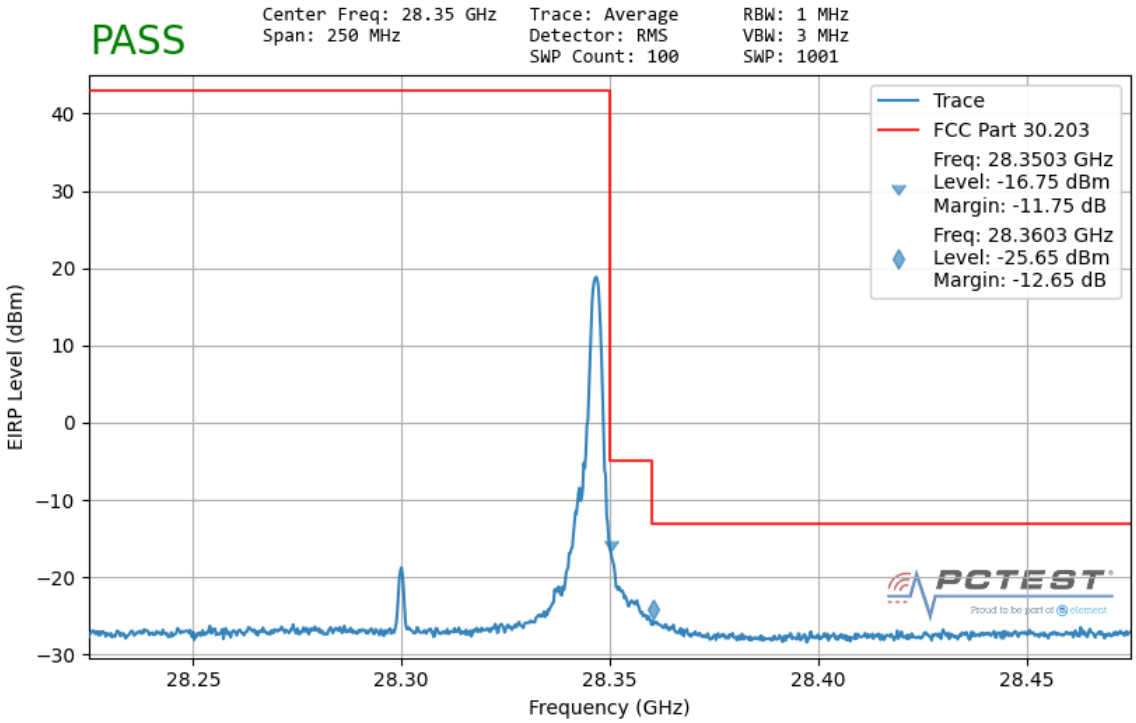
Plot 7-198. Ant 1 Upper Band Edge (50MHz-2CC – QPSK 1 RB)



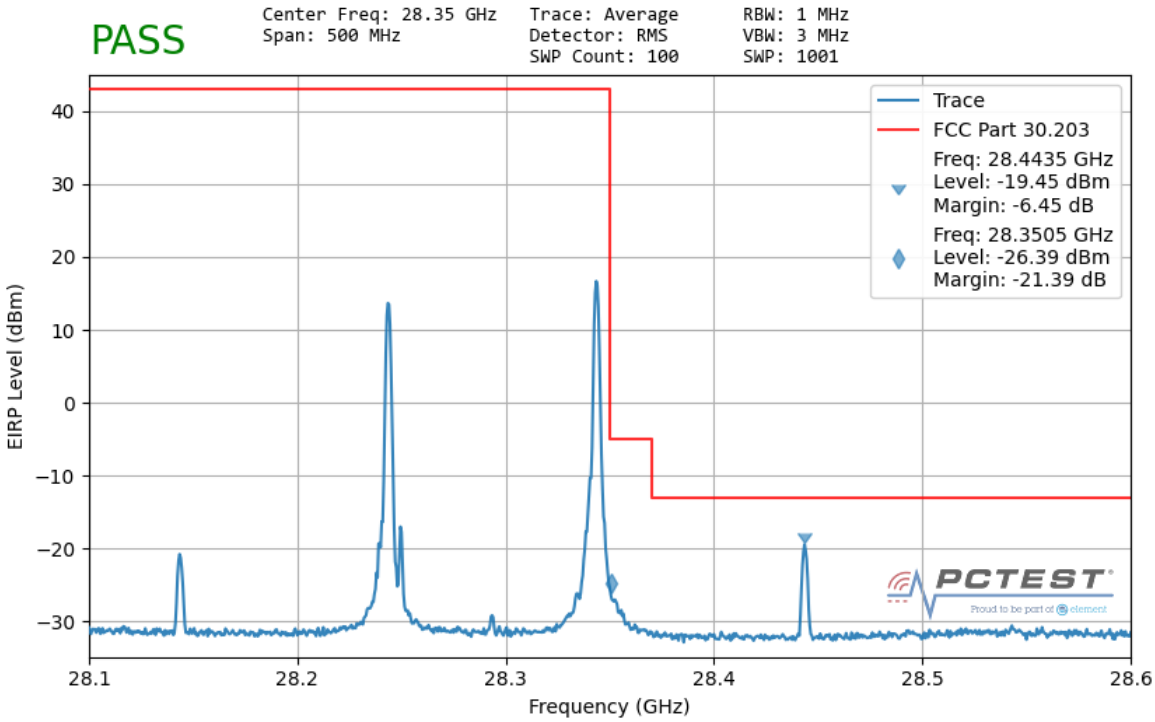
Plot 7-199. Ant 1 Lower Band Edge (100MHz-1CC – QPSK 1 RB)



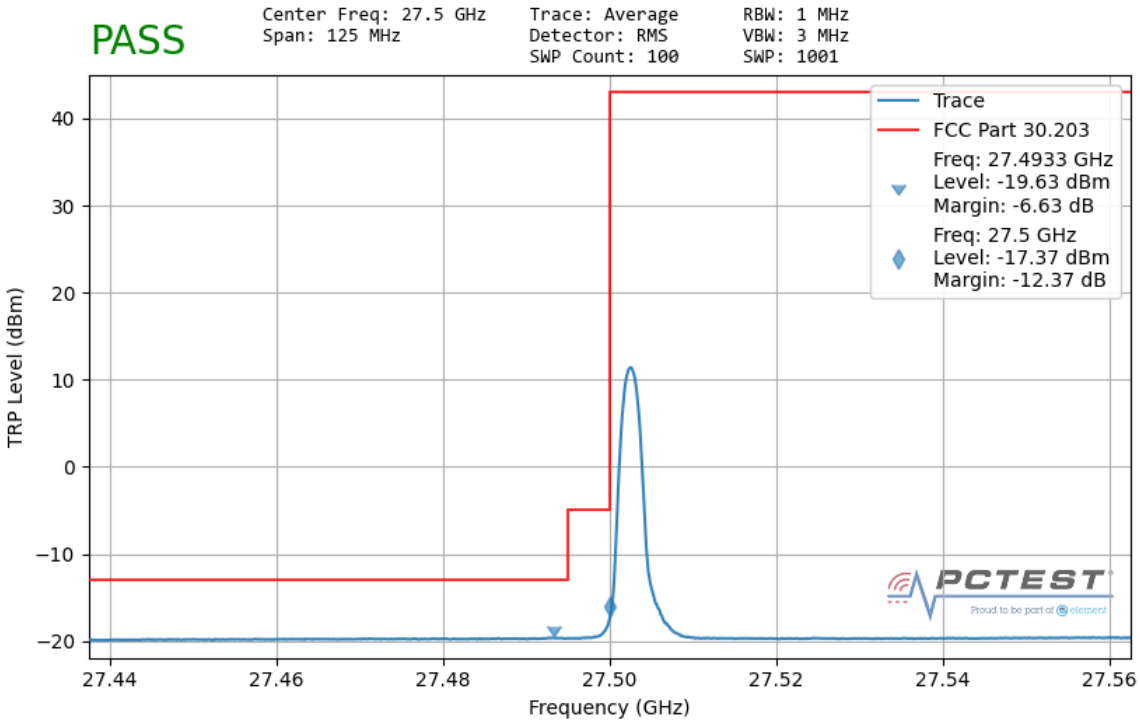
Plot 7-200. Ant 1 Lower Band Edge – TRP (100MHz-2CC – QPSK 1 RB)



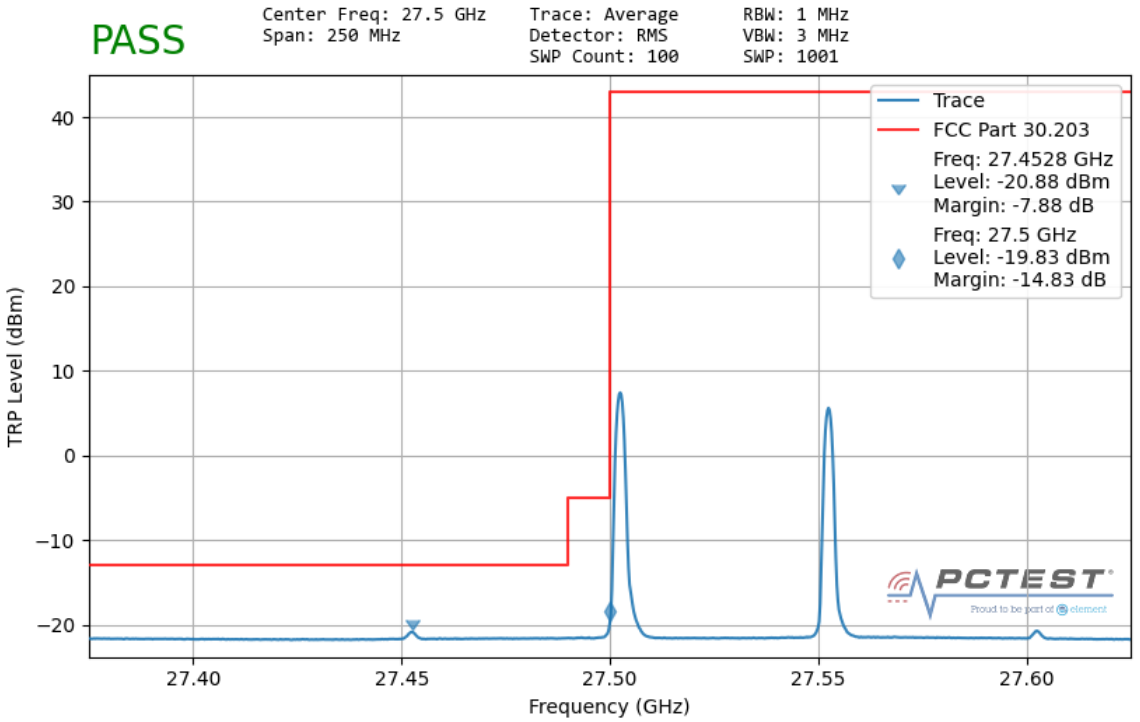
Plot 7-201. Ant 1 Upper Band Edge (100MHz-1CC – QPSK 1 RB)



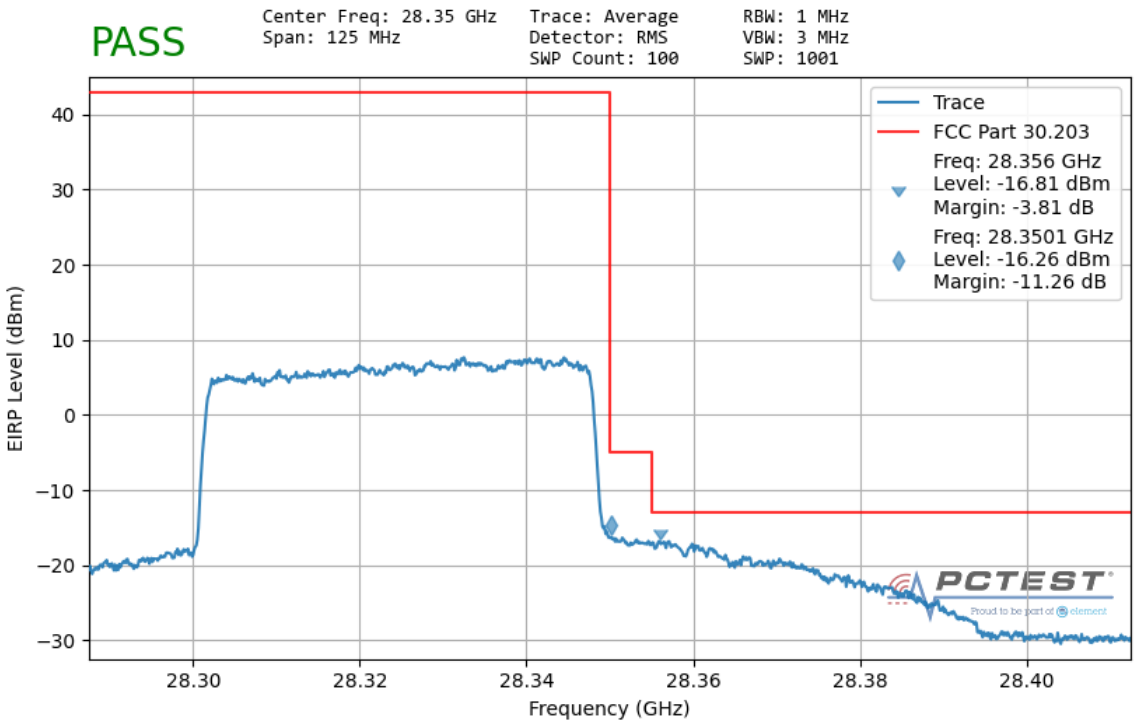
Plot 7-202. Ant 1 Upper Band Edge (100MHz-2CC – QPSK 1 RB)



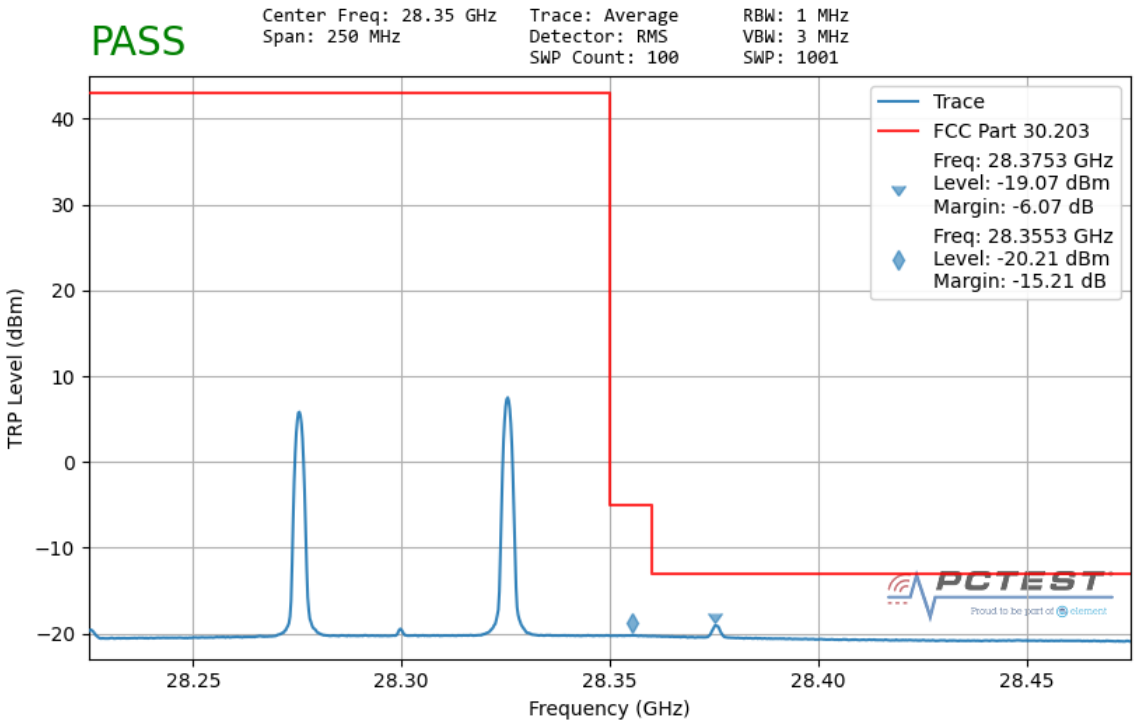
Plot 7-203. Ant 2 Lower Band Edge- TRP (50MHz-1CC – QPSK 1 RB)



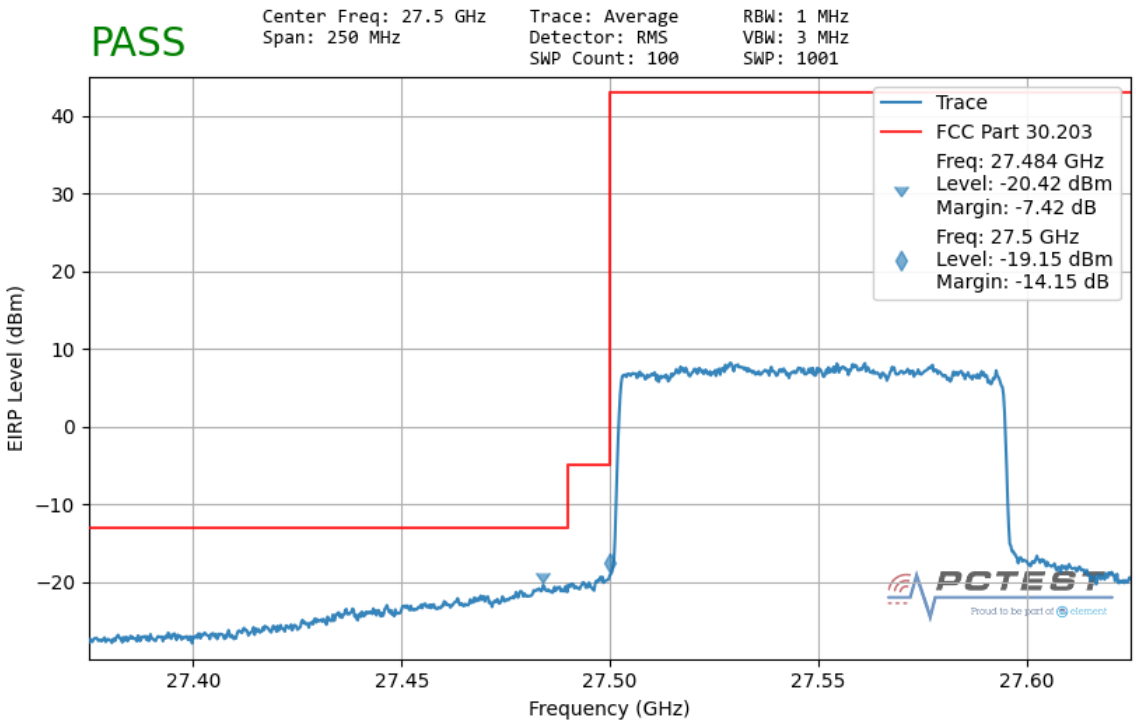
Plot 7-204. Ant 2 Lower Band Edge – TRP (50MHz-2CC – QPSK 1 RB)



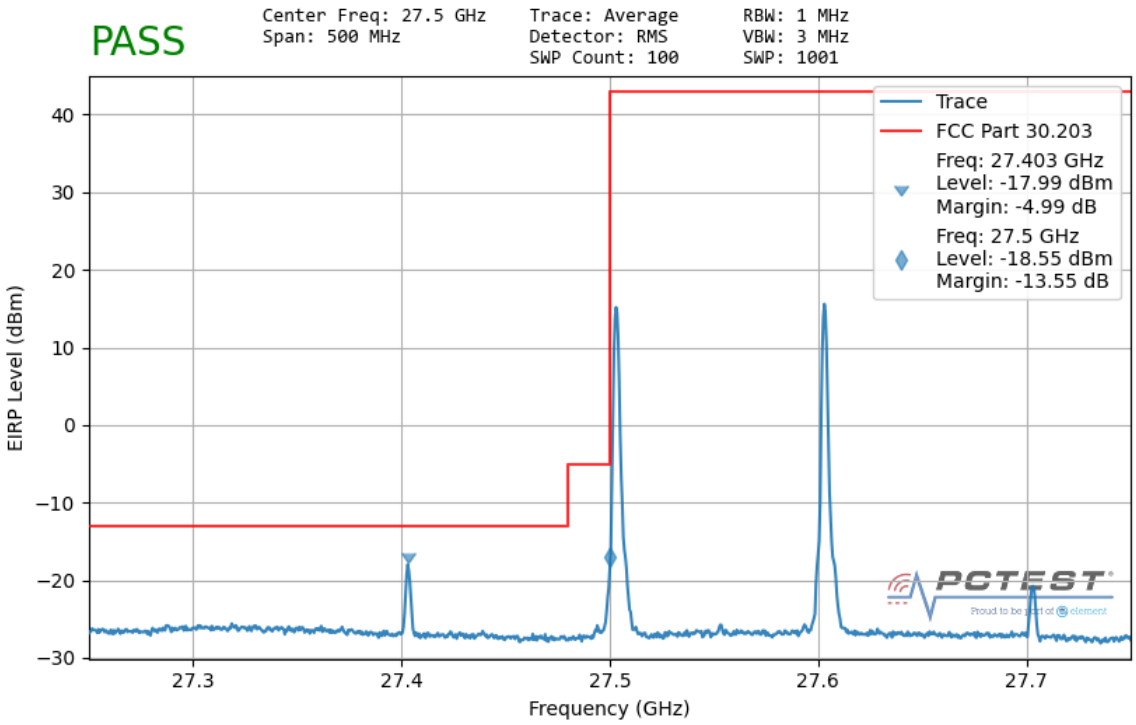
Plot 7-205. Ant 2 Upper Band Edge (50MHz-1CC – QPSK Full RB)



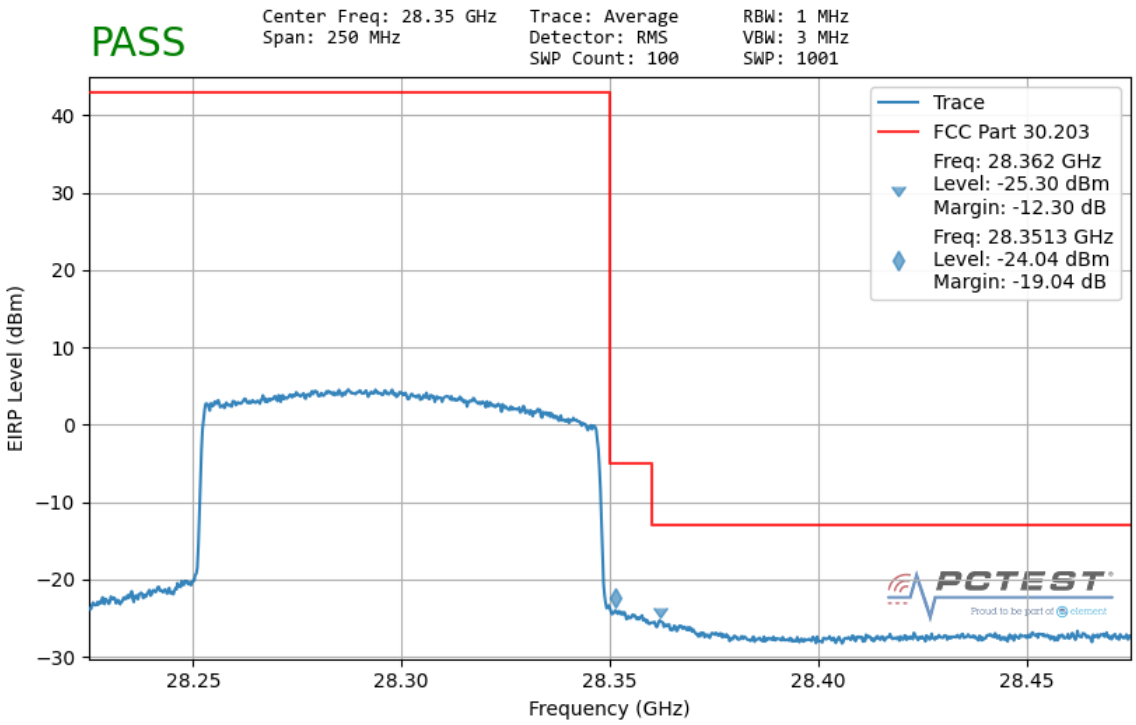
Plot 7-206. Ant 2 Upper Band Edge- TRP (50MHz-2CC – QPSK 1 RB)



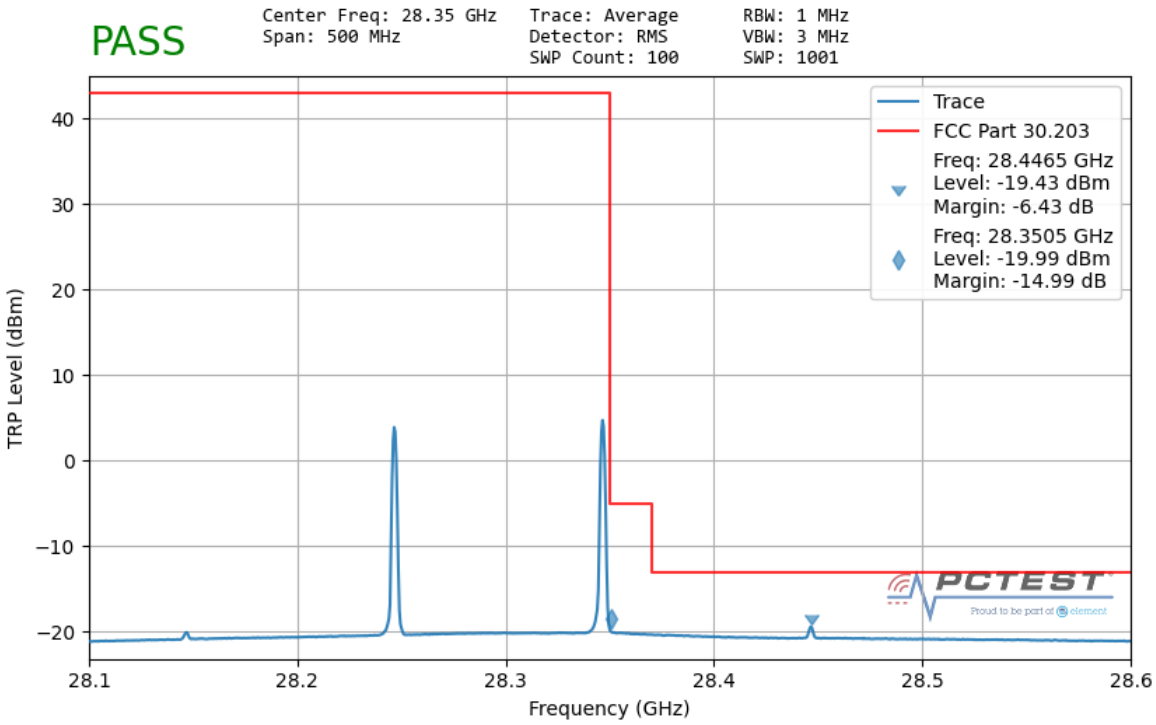
Plot 7-207. Ant 2 Lower Band Edge (100MHz-1CC – pi/2-BPSK Full RB)



Plot 7-208. Ant 2 Lower Band Edge (100MHz-2CC – QPSK 1 RB)



Plot 7-209. Ant 2 Upper Band Edge (100MHz-1CC – QPSK Full RB)



Plot 7-210. Ant 2 Upper Band Edge – TRP (100MHz-2CC – QPSK 1 RB)

7.6 Frequency Stability / Temperature Variation

§2.1055

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Test Procedure Used

ANSI C63.5-2015 Section 5.6
KDB 842590 D01 v01r02 Section 4.5

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was placed inside an environmental chamber that uses a foam plug to maintain the temperature condition inside the chamber. The horn antenna measured the frequency of the fundamental signal.

Test Notes

The Frequency Deviation column in the table below is the amount of deviation measured from the center frequency of the Reference measurement (first row).

Frequency Stability Measurements (Band n258-R1)

§2.1055

OPERATING FREQUENCY:	24,349,920,000	Hz
CHANNEL:	2018331	
REFERENCE VOLTAGE:	4.43	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.43	+ 20 (Ref)	24,350,564,850	0	0.0000000
100 %		- 30	24,350,658,902	-94,052	-0.0003863
100 %		- 20	24,350,730,756	-165,906	-0.0006813
100 %		- 10	24,350,728,212	-163,361	-0.0006709
100 %		0	24,350,687,928	-123,078	-0.0005055
100 %		+ 10	24,350,636,575	-71,725	-0.0002946
100 %		+ 20	24,350,564,850	0	0.0000000
100 %		+ 30	24,350,518,535	46,316	0.0001902
100 %		+ 40	24,350,487,962	76,888	0.0003158
100 %		+ 50	24,350,511,385	53,465	0.0002196
BATT. ENDPOINT	3.36	+ 20	24,350,665,646	-100,796	-0.0004139

Table 7-99. Frequency Stability Data (n258-R1)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Stability Measurements (Band n258-R1)

§2.1055

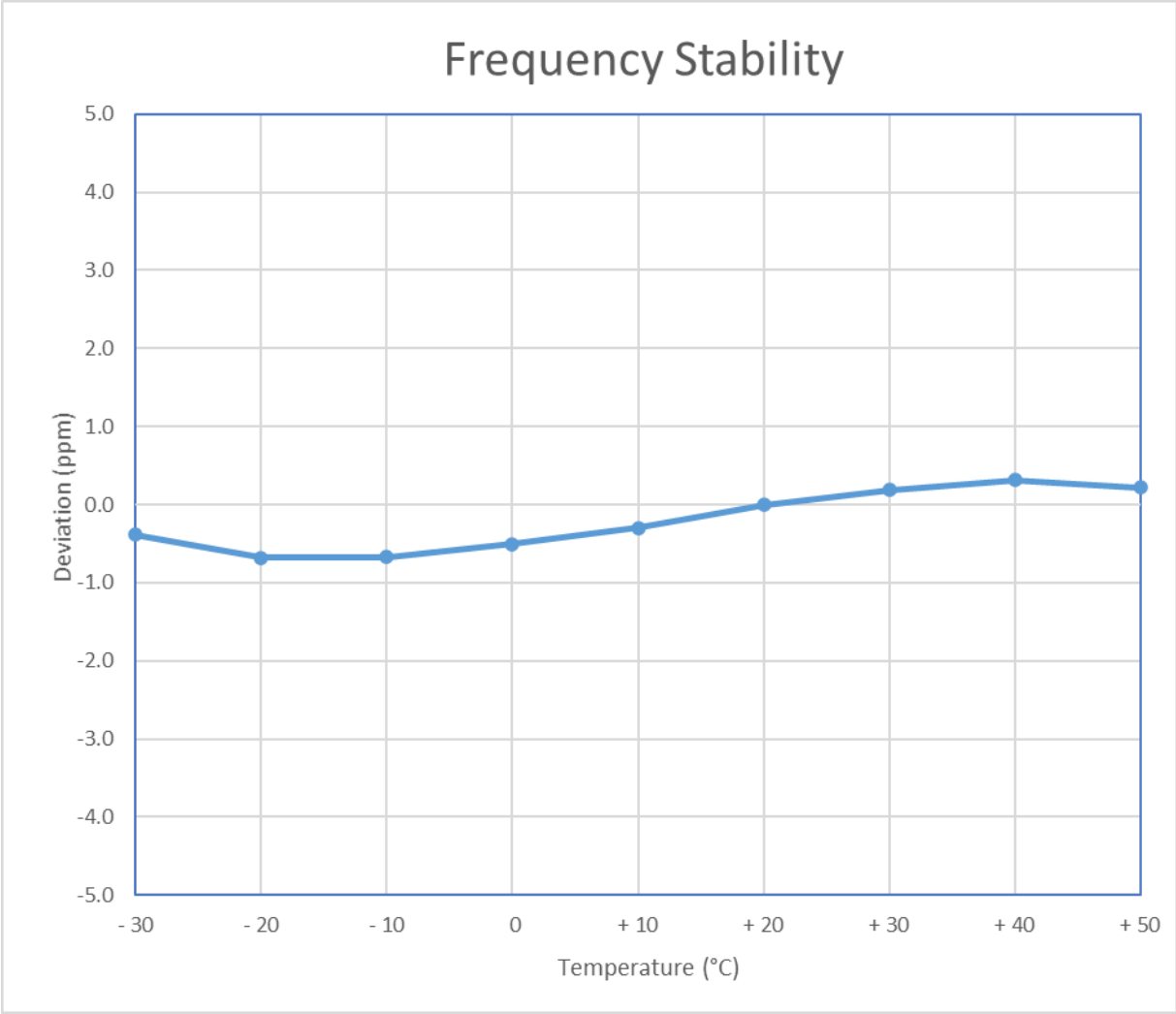


Figure 7-1. Frequency Stability Graph (n258-R1)

Frequency Stability Measurements (Band n258-R2)

§2.1055

OPERATING FREQUENCY:	24,999,960,000	Hz
CHANNEL:	2029165	
REFERENCE VOLTAGE:	4.43	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.43	+ 20 (Ref)	25,000,617,258	0	0.0000000
100 %		- 30	25,000,713,644	-96,386	-0.0003855
100 %		- 20	25,000,769,713	-152,455	-0.0006098
100 %		- 10	25,000,786,114	-168,857	-0.0006754
100 %		0	25,000,738,198	-120,941	-0.0004838
100 %		+ 10	25,000,672,493	-55,235	-0.0002209
100 %		+ 20	25,000,617,258	0	0.0000000
100 %		+ 30	25,000,538,734	78,524	0.0003141
100 %		+ 40	24,999,983,177	634,081	0.0025363
100 %		+ 50	24,999,919,259	697,998	0.0027920
BATT. ENDPOINT	3.36	+ 20	25,000,659,381	-42,124	-0.0001685

Table 7-100. Frequency Stability Data (n258-R2)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Stability Measurements (Band n258-R2)

§2.1055

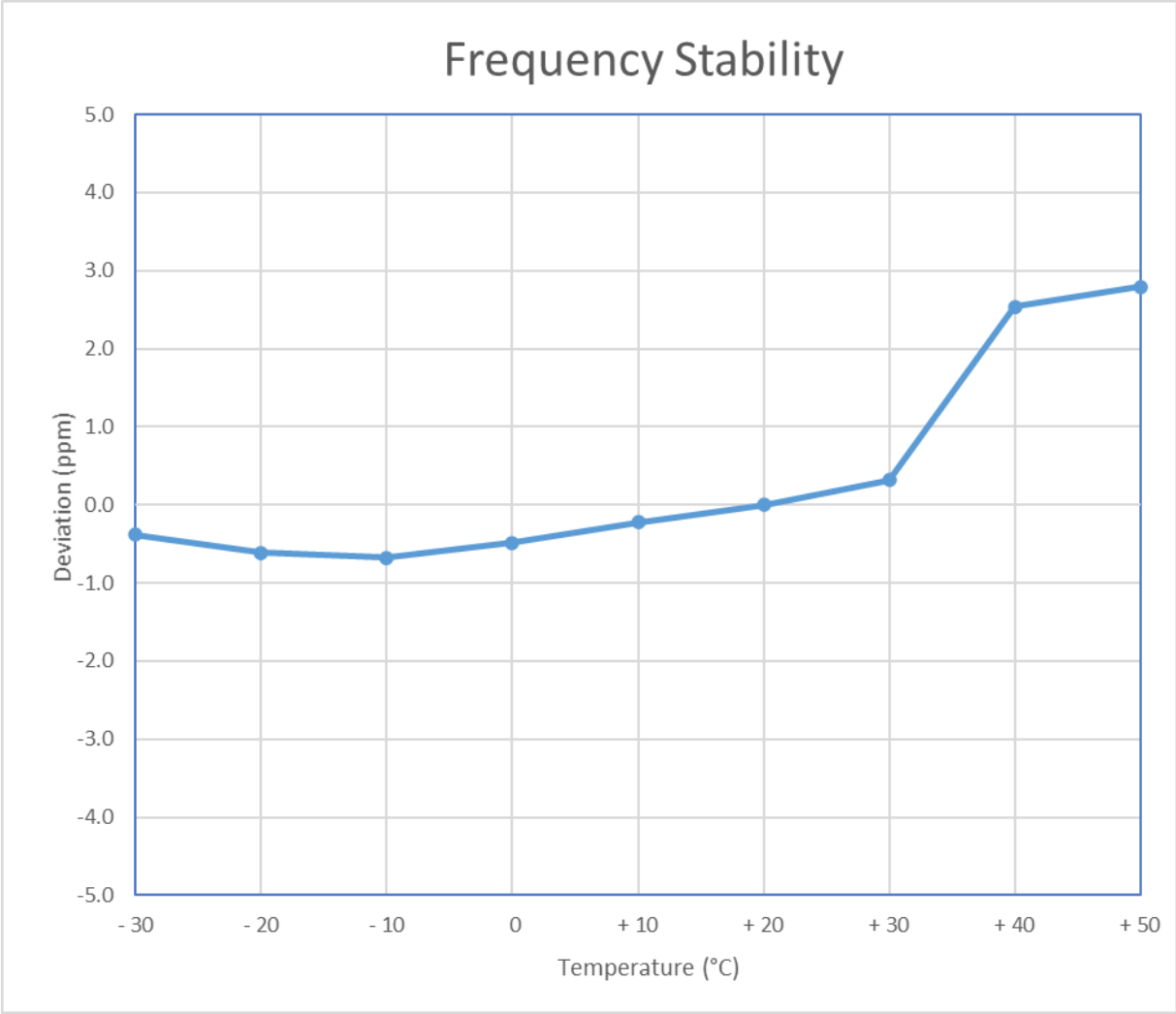


Figure 7-1. Frequency Stability Graph (n258-R2)

Frequency Stability Measurements (Band n261)

§2.1055

OPERATING FREQUENCY:	27,924,960,000	Hz
CHANNEL:	2077915	
REFERENCE VOLTAGE:	4.43	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.43	+ 20 (Ref)	27,925,643,813	0	0.0000000
100 %		- 30	27,925,729,805	-85,992	-0.0003079
100 %		- 20	27,925,783,139	-139,327	-0.0004989
100 %		- 10	27,925,769,500	-125,688	-0.0004501
100 %		0	27,925,735,818	-92,005	-0.0003295
100 %		+ 10	27,925,683,426	-39,613	-0.0001419
100 %		+ 20	27,925,643,813	0	0.0000000
100 %		+ 30	27,925,538,351	105,461	0.0003777
100 %		+ 40	27,925,477,904	165,908	0.0005941
100 %		+ 50	27,925,552,240	91,573	0.0003279
BATT. ENDPOINT	3.36	+ 20	27,925,621,086	22,726	0.0000814

Table 7-101. Frequency Stability Data (n261)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Stability Measurements (Band n261)

§2.1055

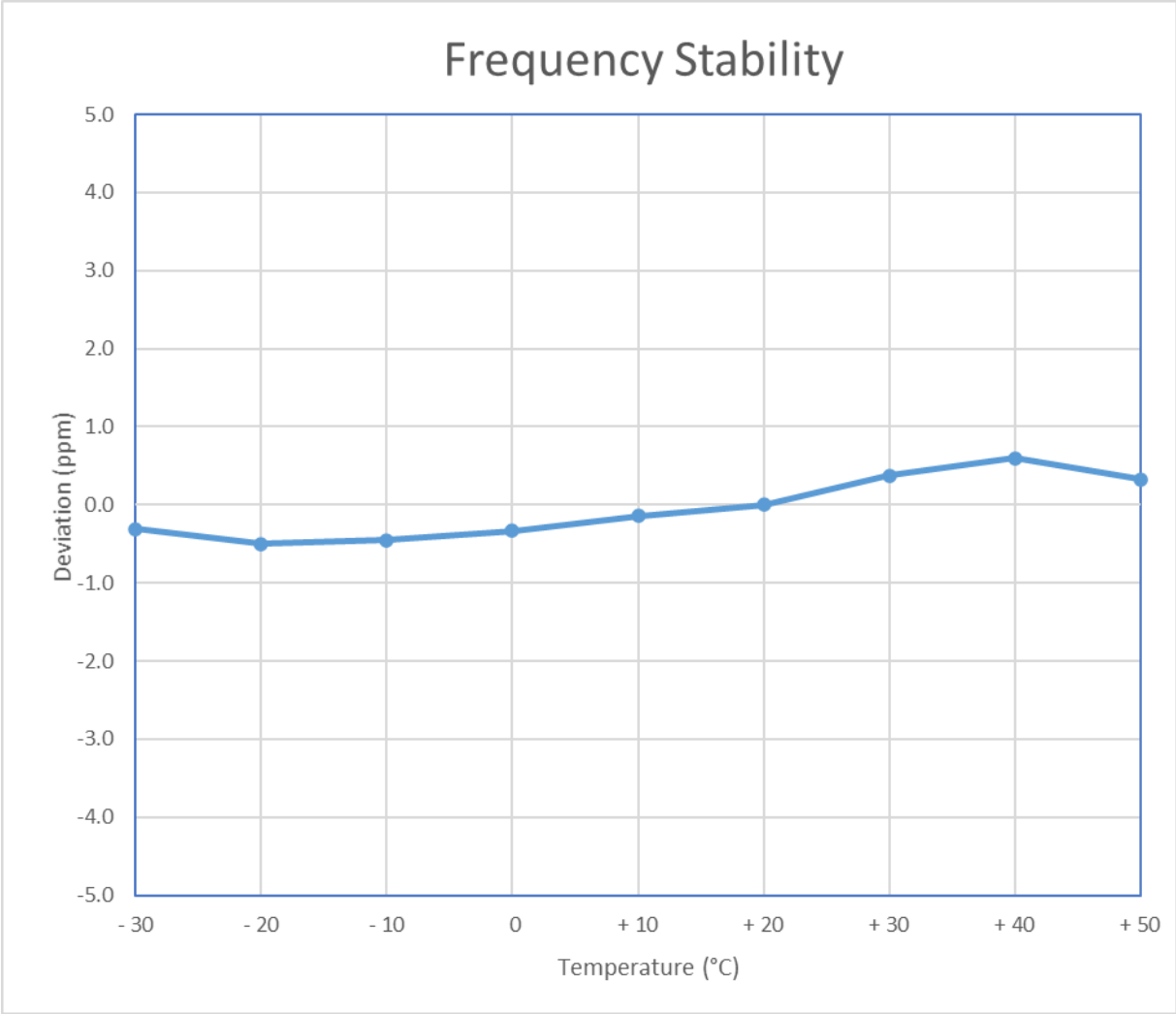


Figure 7-2. Frequency Stability Graph (n261)

Frequency Stability Measurements (Band n260)

§2.1055

OPERATING FREQUENCY:	38,495,520,000	Hz
CHANNEL:	2254091	
REFERENCE VOLTAGE:	4.43	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.43	+ 20 (Ref)	38,500,649,749	0	0.0000000
100 %		- 30	38,500,887,735	-237,986	-0.0006182
100 %		- 20	38,500,831,889	-182,140	-0.0004731
100 %		- 10	38,500,341,247	308,502	0.0008014
100 %		0	38,500,818,057	-168,308	-0.0004372
100 %		+ 10	38,499,881,560	768,189	0.0019955
100 %		+ 20	38,500,649,749	0	0.0000000
100 %		+ 30	38,500,536,232	113,517	0.0002949
100 %		+ 40	38,499,941,520	708,229	0.0018398
100 %		+ 50	38,499,924,557	725,192	0.0018838
BATT. ENDPOINT	3.36	+ 20	38,500,953,666	-303,917	-0.0007895

Table 7-102. Frequency Stability Data (n260)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Stability Measurements (Band n260)

§2.1055

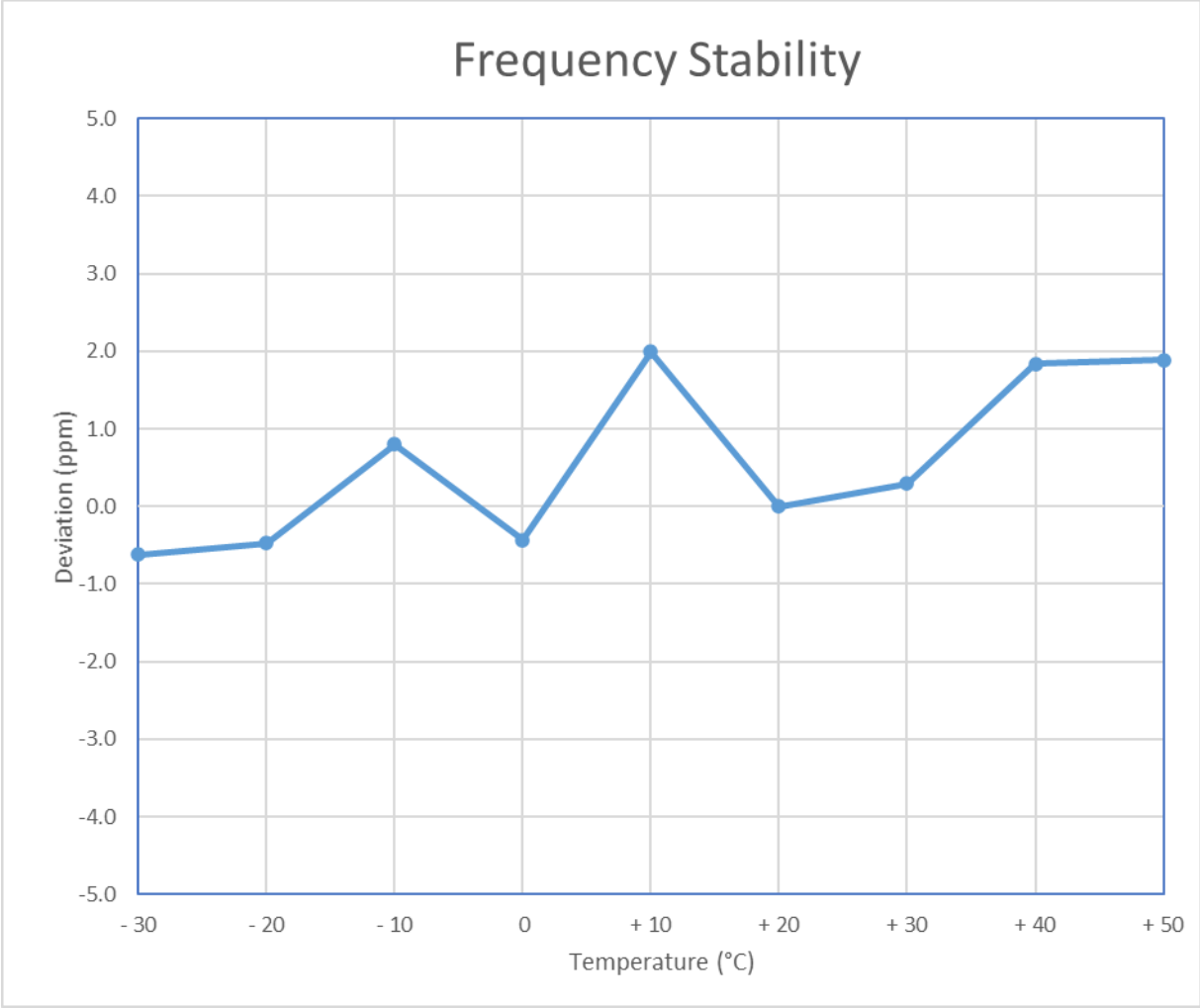


Figure 7-3. Frequency Stability Graph (n260)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMS901U** complies with all the requirements of Part 30.

9.0 APPENDIX A

9.1 VDI Mixer Verification Certificate

Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902
Phone: 434-297-3257
Fax: 434-297-3258

Certificate of Conformance

To: PCTEST Engineering Laboratory
7185 Oakland Mills Road
Columbia, MD 21046
United States

From: Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902

Packing List No: 202943
Shipping Date: 08/28/20
Today's Date: 08/28/20
PO Number: 200414.DP2

Quantity Shipped	Unit	Description	Order-Job Number
1	EA	VDIWR19.0SAX-M-M4 WR19SAX-M-M4 / SN: SAX 679	20177A-01

The VDI product(s) in this shipment meet(s) the guidelines for performance specifications established in accordance with the corresponding Purchase Order. Data presented in the User Guide, where applicable, has been obtained in accordance with VDI's Quality Management System. All instruments, used to obtain data, which require calibration have been calibrated with equipment traceable to the National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI).

Authorized Signature
Virginia Diodes, Inc

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Virginia Diodes, Inc
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Fax: 434-297-3258

Certificate of Conformance

To: PCTEST Engineering Laboratory
7185 Oakland Mills Road
Columbia, MD 21046
United States

From: Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902

Packing List No: 202695
Shipping Date: 08/12/20
Today's Date: 08/14/20
PO Number: 200414.DP2

Quantity Shipped	Unit	Description	Order-Job Number
1	EA	VDIWR12.0SAX-M-M6 S/N: SAX 680	20177B-01

The VDI product(s) in this shipment meet(s) the guidelines for performance specifications established in accordance with the corresponding Purchase Order. Data presented in the User Guide, where applicable, has been obtained in accordance with VDI's Quality Management System. All instruments, used to obtain data, which require calibration have been calibrated with equipment traceable to the National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI).

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To: PCTEST Engineering Laboratory
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Columbia, MD 21046
United States

From: Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902

Packing List No: 203623
Shipping Date: 10/22/20
Today's Date: 10/22/20
PO Number: 200414.DP2

Quantity Shipped	Unit	Description	Order-Job Number
1	EA	VDIWR8.0SAX-M-M9 S/N: SAX 681	20177C-01

The VDI product(s) in this shipment meet(s) the guidelines for performance specifications established in accordance with the corresponding Purchase Order. Data presented in the User Guide, where applicable, has been obtained in accordance with VDI's Quality Management System. All instruments, used to obtain data, which require calibration have been calibrated with equipment traceable to the National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI).

Authorized Signature
Virginia Diodes, Inc

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Certificate of Conformance

To: PCTEST Engineering Laboratory
7185 Oakland Mills Road
Columbia, MD 21046
United States

From: Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902

Packing List No: 203281 **Today's Date:** 09/24/20
Shipping Date: 09/24/20 **PO Number:** 200414.DP2

Quantity Shipped	Unit	Description	Order-Job Number
1	EA	VDIWR5.1SAX-M-M18 WR5.1SAX-M-M18 - Mini Spectrum Analyzer Extension Module; SN: SAX 682.	20177D-01

The VDI product(s) in this shipment meet(s) the guidelines for performance specifications established in accordance with the corresponding Purchase Order. Data presented in the User Guide, where applicable, has been obtained in accordance with VDI's Quality Management System. All instruments, used to obtain data, which require calibration have been calibrated with equipment traceable to the National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI).

Authorized Signature
Virginia Diodes, Inc

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9.2 Test Scope Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

PCTEST ENGINEERING LABORATORY, LLC
7185 Oakland Mills Road
Columbia, MD 21046
Randy Ortanez Phone: 410 290 6652

ELECTRICAL[1]

Valid To: May 31, 2022 Certificate Number: 2041.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above, ***as well as the two satellite laboratory locations listed below***, to perform the following Electromagnetic Compatibility, SAR, HAC, Telecommunications, OTA, Battery, RF, and Conformance and Protocol testing of wireless devices:

Test Technology:	**Test Method(s) [2]:**
Emissions Radiated and Conducted	CFR 47, FCC Parts 15B/C/D/E/F/G/H (using ANSI C63.4:2014, ANSI C63.10:2013, ANSI C63.17:2013, and FCC KDB 905462 D02 (v02)), 18 (using MP-5:1986); ANSI C63.10:2020; KDB 987594; ETSI TS 134 124 Universal Mobile Telecommunications System (UMTS); (3GPP TS 34.124); (3GPP TS38.124 NR; Electromagnetic Compatibility (EMC) Requirements for Mobile Terminals and Ancillary Equipment); ETSI TS 136 124 LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); (3GPP TS 36.124); ETSI TS 151 010-1 Digital Cellular Telecommunications System (Phase 2+) (GSM); 3GPP TS 51.010-1, Section 12 (Conducted and Radiated Spurious Emissions); EN55011; EN 55032; CNS 13438 (up to 6 GHz); AS/NZS CISPR 11; IEC/CISPR 11; CISPR 32; FCC OET/MP-5; ICES-003; KN 11; KN 32; VCCI V-3(2016.11); VCCI V-3 (2015.04); VCCI 32-1: VCCI-CISPR 32
Accessibility	CFR 47, FCC Part 14
Transmitter/Receiver	RSS 111; RSS 112; RSS 117; RSS 119; RSS 123; RSS 125; RSS 127; RSS 130; RSS 131; RSS 132; RSS 133; RSS 134; RSS 135; RSS 137; RSS 139; RSS 140; RSS 141; RSS 142; RSS 170; RSS 181; RSS 182; RSS 191; RSS 192; RSS 194; RSS 195; RSS 196; RSS 197; RSS 199; RSS 210; RSS 211; RSS 213; RSS 215; RSS 216; RSS 220; RSS 222; RSS 236; RSS 238; RSS 243; RSS 244; RSS 246; RSS 247; RSS 251; RSS 252; RSS 287; RSS 288; RSS 310; RSS Gen