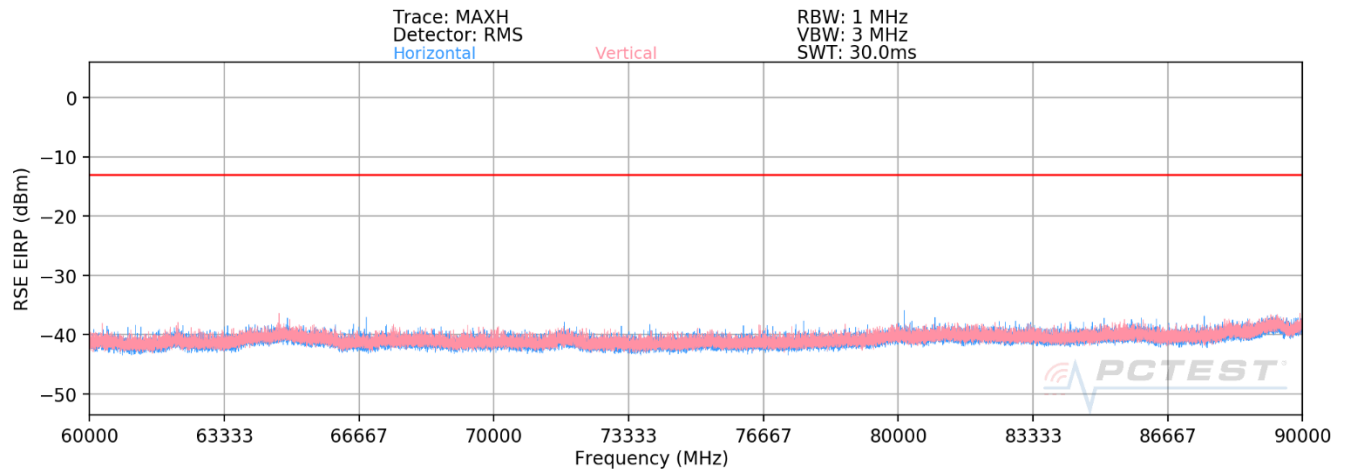


60GHz - 90GHz



Plot 7-51. Ant 1-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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74050.56	Low	50	2Tx	QPSK	V	243	36	-41.58	-13.00	-28.58
77000.43	Mid	50	2Tx	QPSK	V	228	28	-38.77	-13.00	-25.77
79950.66	High	50	2Tx	QPSK	V	225	31	-38.52	-13.00	-25.52

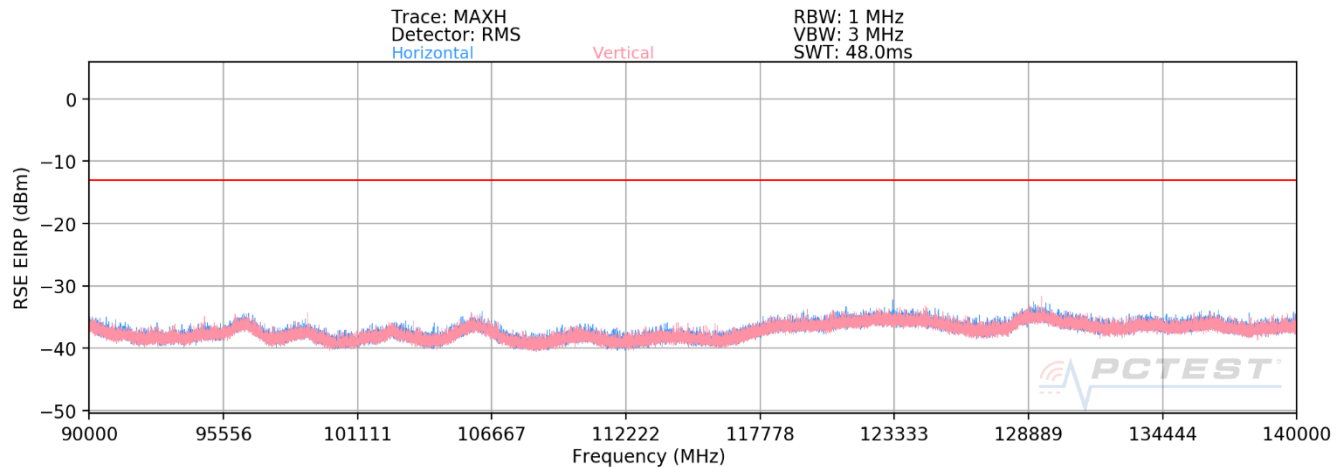
Table 7-43. Ant 1 - 2Tx -Spurious Emissions Table (60GHz - 90GHz)

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.

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90GHz - 140GHz



Plot 7-52. Ant 1-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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
115508.51	Low	50	2Tx	QPSK	V	-	-	-42.91	-13.00	-29.91
115503.05	Mid	50	2Tx	QPSK	V	-	-	-42.78	-13.00	-29.78
119925.69	High	50	2Tx	QPSK	V	317	358	-39.49	-13.00	-26.49

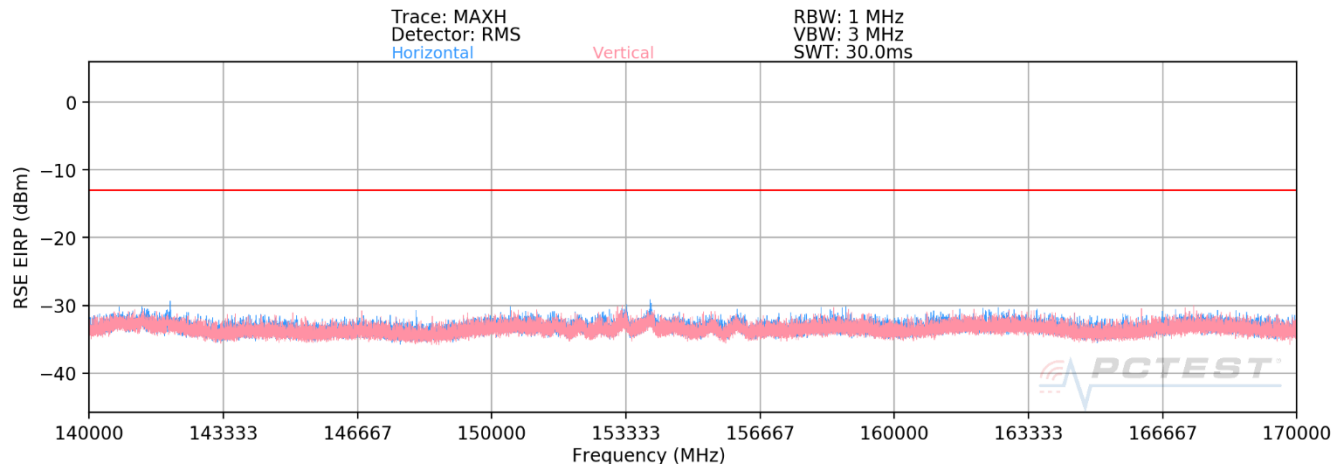
Table 7-44. Ant 1 - 2Tx -Spurious Emissions Table (90GHz - 140GHz)

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.

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140GHz - 170GHz



Plot 7-53. Ant 1-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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148096.11	Low	50	2Tx	QPSK	V	-	-	-39.44	-13.00	-26.44
154003.74	Mid	50	2Tx	QPSK	V	-	-	-37.55	-13.00	-24.55
159905.13	High	50	2Tx	QPSK	V	-	-	-38.96	-13.00	-25.96

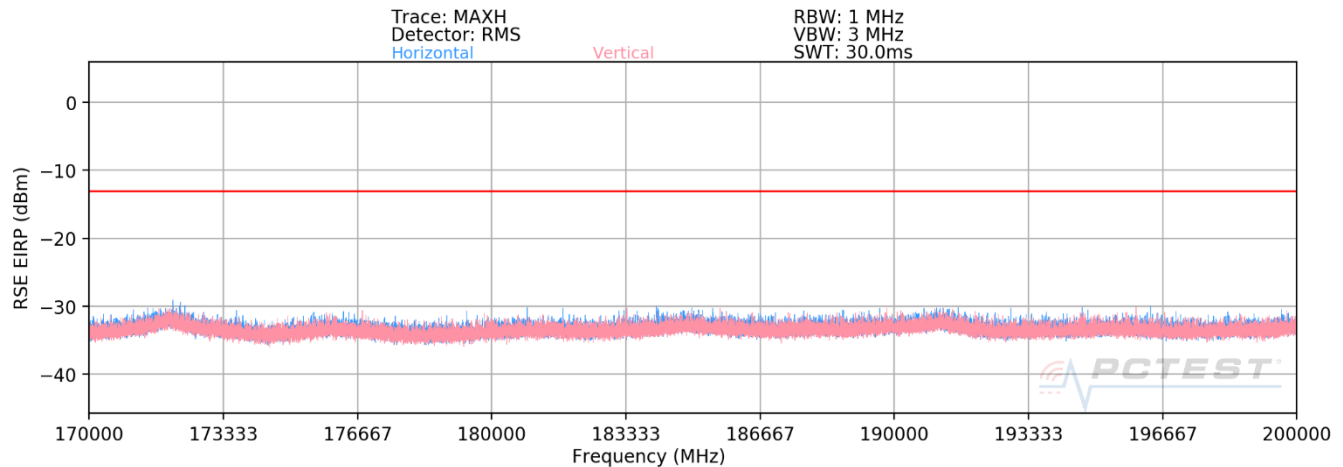
Table 7-45. Ant 1 - 2Tx -Spurious Emissions Table (140GHz - 170GHz)

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.

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170GHz - 200GHz



Plot 7-54. Ant 1-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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
185139.99	Low	50	2Tx	QPSK	V	-	-	-37.73	-13.00	-24.73
192516.59	Mid	50	2Tx	QPSK	V	-	-	-38.60	-13.00	-25.60
199874.85	High	50	2Tx	QPSK	V	-	-	-37.92	-13.00	-24.92

Table 7-46. Ant 1 - 2Tx -Spurious Emissions Table (170GHz - 200GHz)

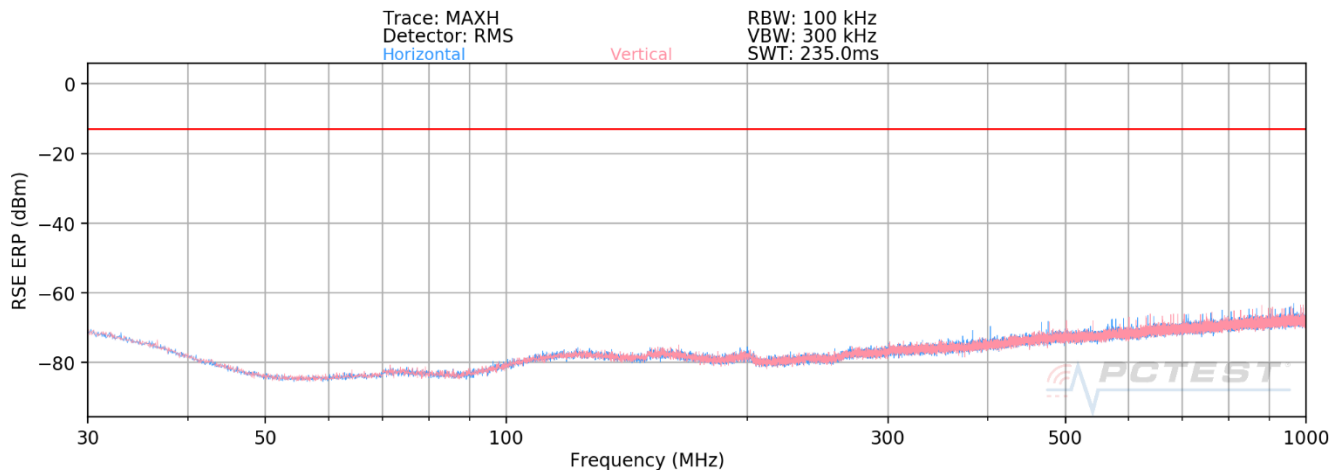
Notes

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.

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Band n260- Ant 2

30MHz - 1GHz



Plot 7-55. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
499.50	Mid	50	2Tx	QPSK	V	-	-	-70.56	-13.00	-57.56
623.85	Mid	50	2Tx	QPSK	V	-	-	-69.80	-13.00	-56.80
961.10	Mid	50	2Tx	QPSK	V	-	-	-67.37	-13.00	-54.37

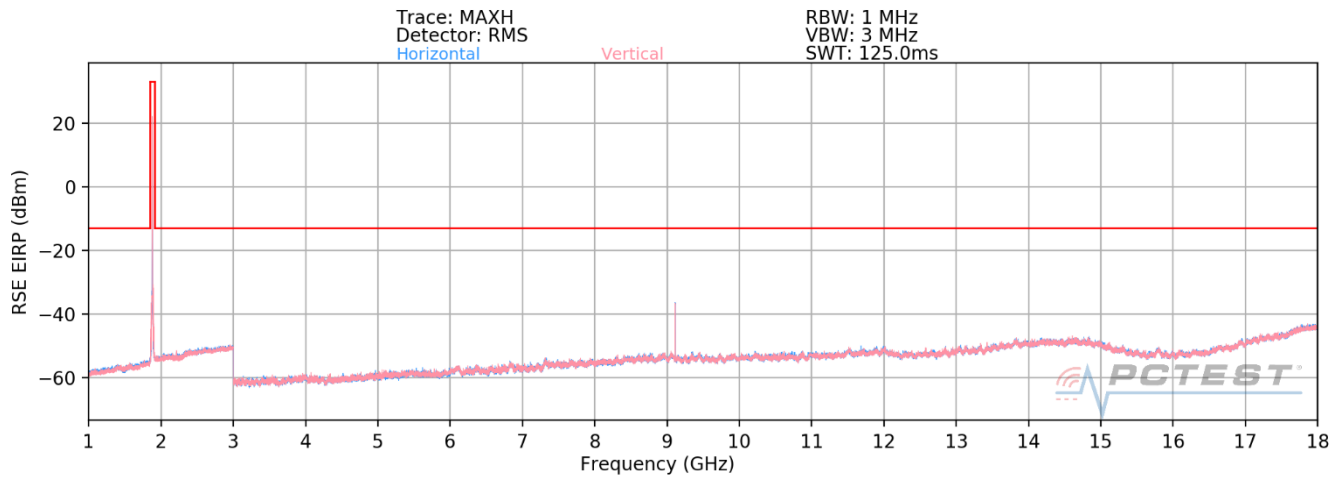
Table 7-47. Ant 2 - 2Tx -Spurious Emissions Table (30MHz - 1GHz)

Notes

The RSE ERP 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 3 meter.

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1GHz - 18GHz



Plot 7-56. 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 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8404.80	Low	50	2Tx	QPSK	V	348	251	-36.80	-13.00	-23.80
9111.80	Mid	50	2Tx	QPSK	V	355	343	-34.36	-13.00	-21.36
9153.25	High	50	2Tx	QPSK	V	354	353	-32.01	-13.00	-19.01

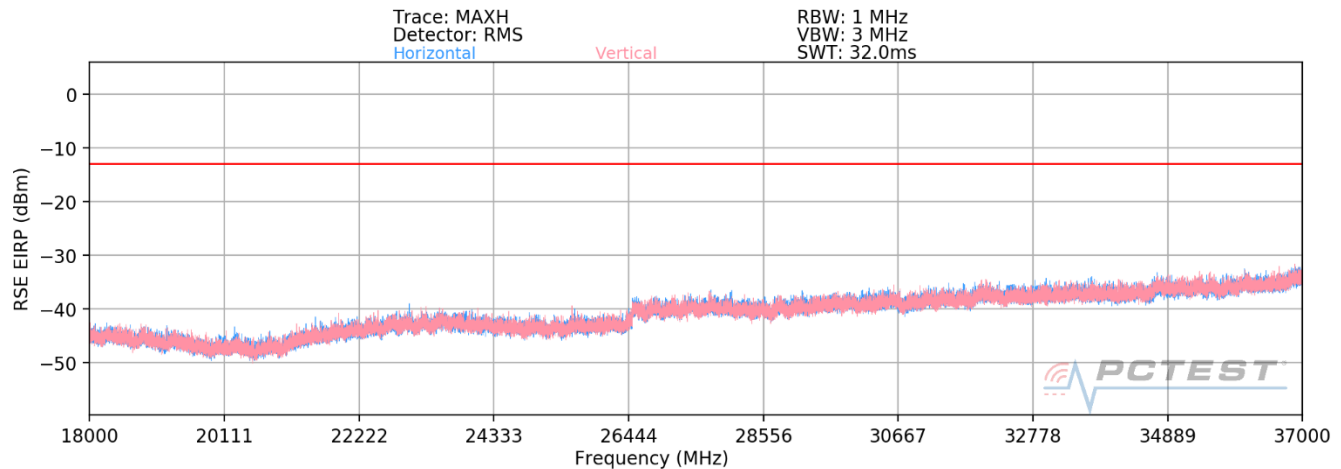
Table 7-48. Ant 2 - 2Tx -Spurious Emissions Table (1GHz - 18GHz)

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 3 meter.

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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18GHz – 37GHz



Plot 7-57. 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.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
36844.50	Low	50	2Tx	QPSK	V	-	-	-37.21	-13.00	-24.21
36856.90	Mid	50	2Tx	QPSK	V	-	-	-39.37	-13.00	-26.37
36837.70	High	50	2Tx	QPSK	V	-	-	-39.31	-13.00	-26.31

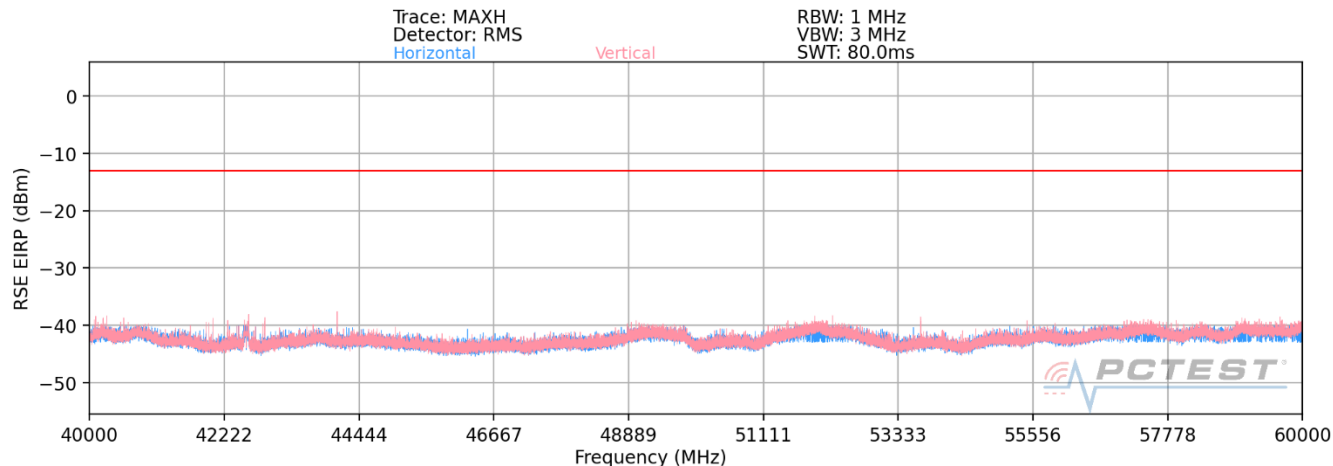
Table 7-49. Ant 2 - 2Tx -Spurious Emissions Table (18GHz – 37GHz)

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.

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40GHz - 60GHz



Plot 7-58. 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 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
42930.94	Low	50	2Tx	QPSK	V	109	351	-42.18	-13.00	-29.18
44082.93	Mid	50	2Tx	QPSK	V	83	314	-45.08	-13.00	-32.08
46233.33	High	50	2Tx	QPSK	V	99	322	-47.64	-13.00	-34.64

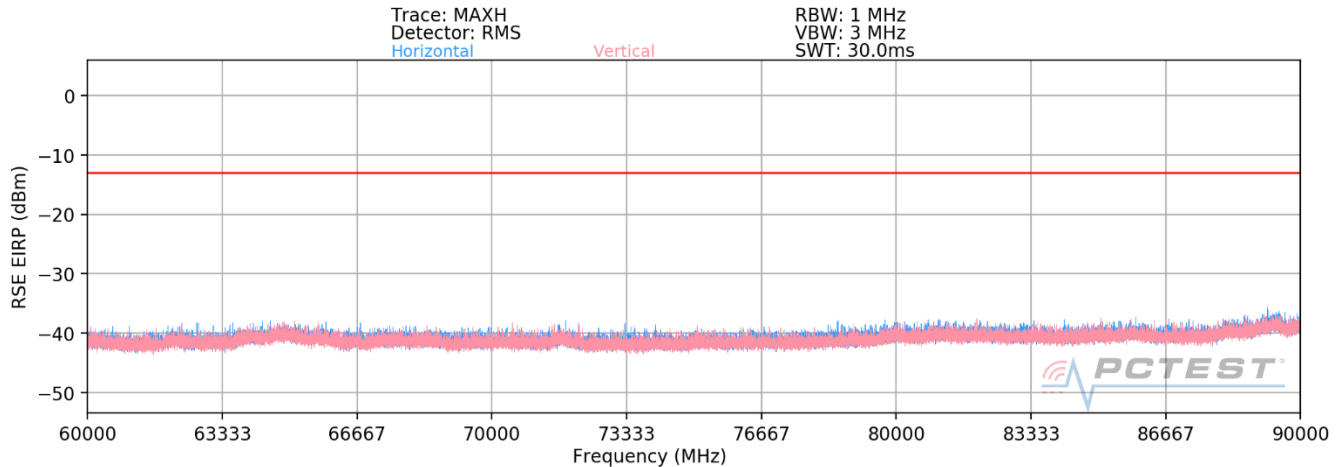
Table 7-50. Ant 2 - 2Tx -Spurious Emissions Table (40GHz - 60GHz)

Notes

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

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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60GHz - 90GHz



Plot 7-59. 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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74051.25	Low	50	2Tx	QPSK	V	40	341	-39.63	-13.00	-26.63
77000.91	Mid	50	2Tx	QPSK	V	128	335	-38.29	-13.00	-25.29
79950.63	High	50	2Tx	QPSK	V	130	332	-40.58	-13.00	-27.58

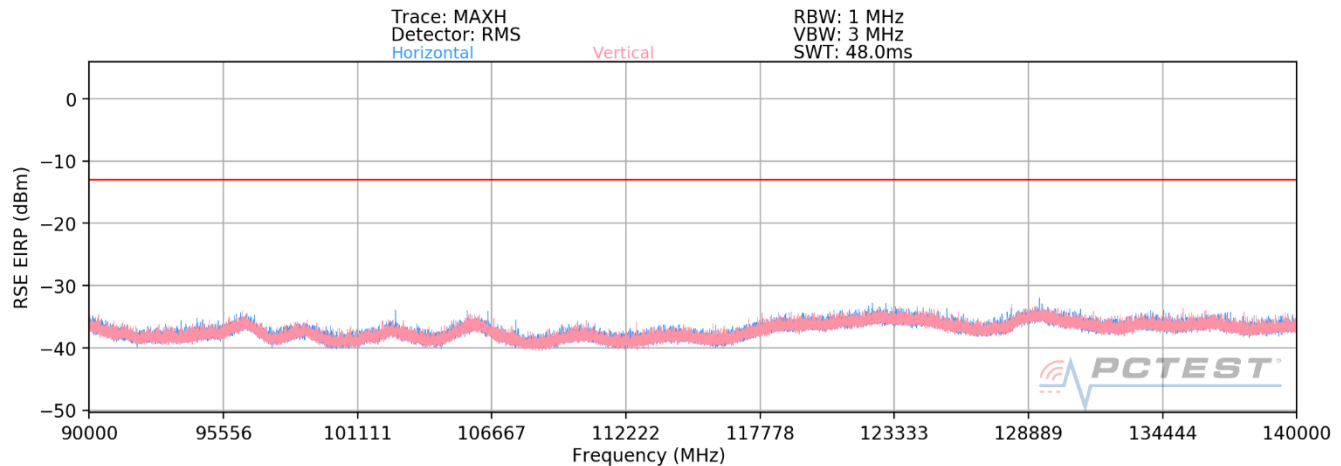
Table 7-51. Ant 2 - 2Tx -Spurious Emissions Table (60GHz - 90GHz)

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.

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90GHz - 140GHz



Plot 7-60. 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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
111076.26	Low	50	2Tx	QPSK	V	90	1	-41.73	-13.00	-28.73
115506.32	Mid	50	2Tx	QPSK	V	-	-	-42.70	-13.00	-29.70
119925.93	High	50	2Tx	QPSK	V	134	1	-39.46	-13.00	-26.46

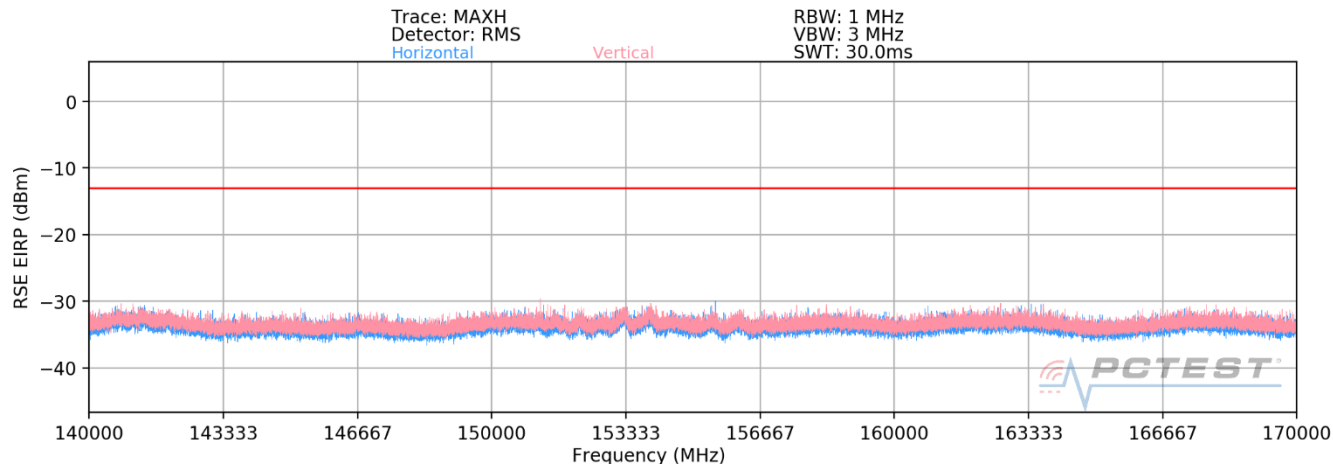
Table 7-52. Ant2 -2Tx -Spurious Emissions Table (90GHz - 140GHz)

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.

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140GHz - 170GHz



Plot 7-61. 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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148117.17	Low	50	2Tx	QPSK	V	-	-	-39.44	-13.00	-26.44
154003.74	Mid	50	2Tx	QPSK	V	-	-	-37.15	-13.00	-24.15
159312.90	High	50	2Tx	QPSK	V	-	-	-38.91	-13.00	-25.91

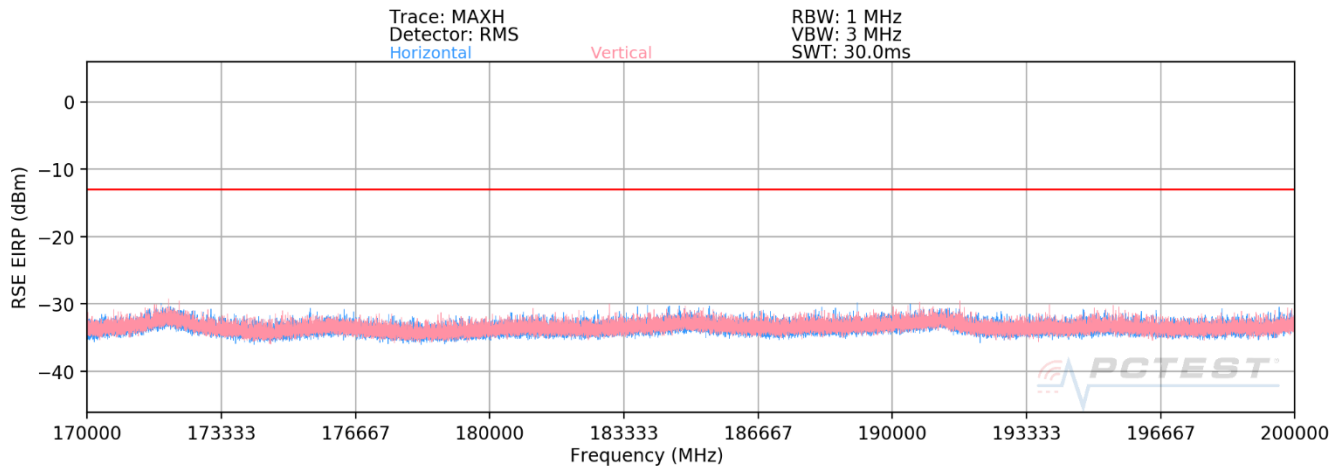
Table 7-53. Ant 2 - 2Tx -Spurious Emissions Table (140GHz - 170GHz)

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.

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170GHz - 200GHz



Plot 7-62. 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]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
185125.92	Low	50	2Tx	QPSK	V	-	-	-37.72	-13.00	-24.72
192496.64	Mid	50	2Tx	QPSK	V	-	-	-38.57	-13.00	-25.57
199892.70	High	50	2Tx	QPSK	V	-	-	-37.98	-13.00	-24.98

Table 7-54. Ant 2 - 2Tx -Spurious Emissions Table (170GHz - 200GHz)

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.

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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 v01r01 Section 4.4.2.5 & 4.4.2.2

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 $\geq 3 \times$ RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times$ 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) Since some of Band Edge EIRP exceed emission limit, the TRP measurement was performed as the alternative method. The plots measured are TRP are labeled as "TRP" in the captions.

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Sample Analyzer Offset Calculation (at 27.5GHz)

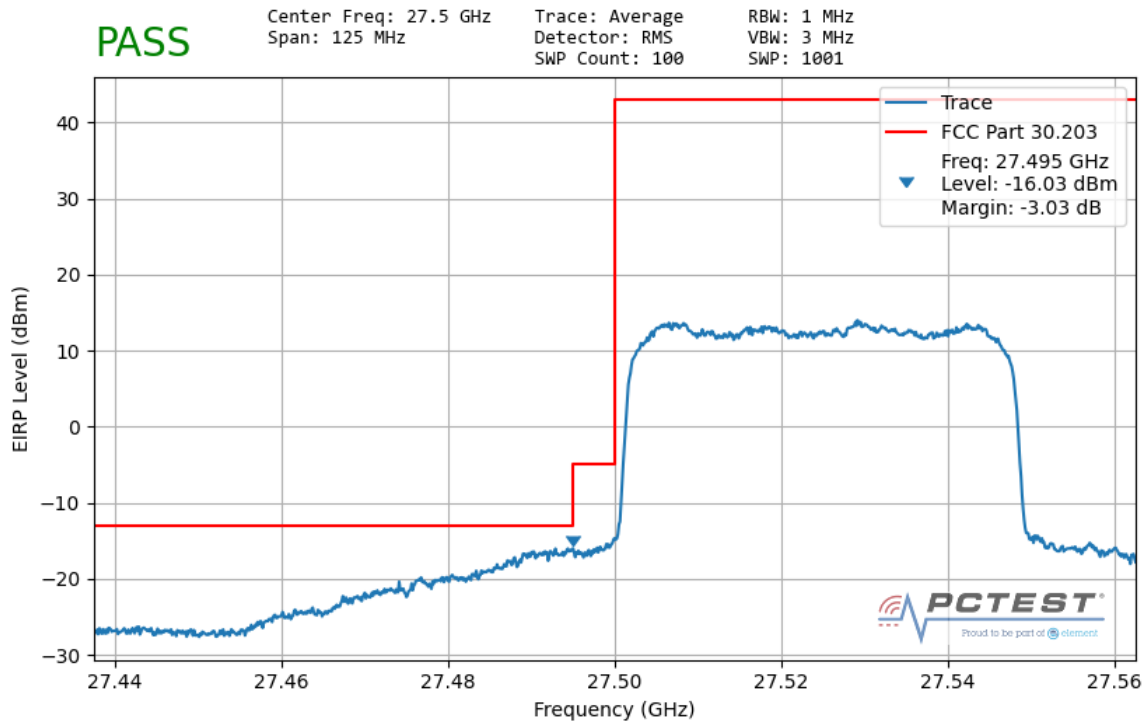
Measurement Antenna Factor = 40.70dB/m

Cable Loss = 8.82dB

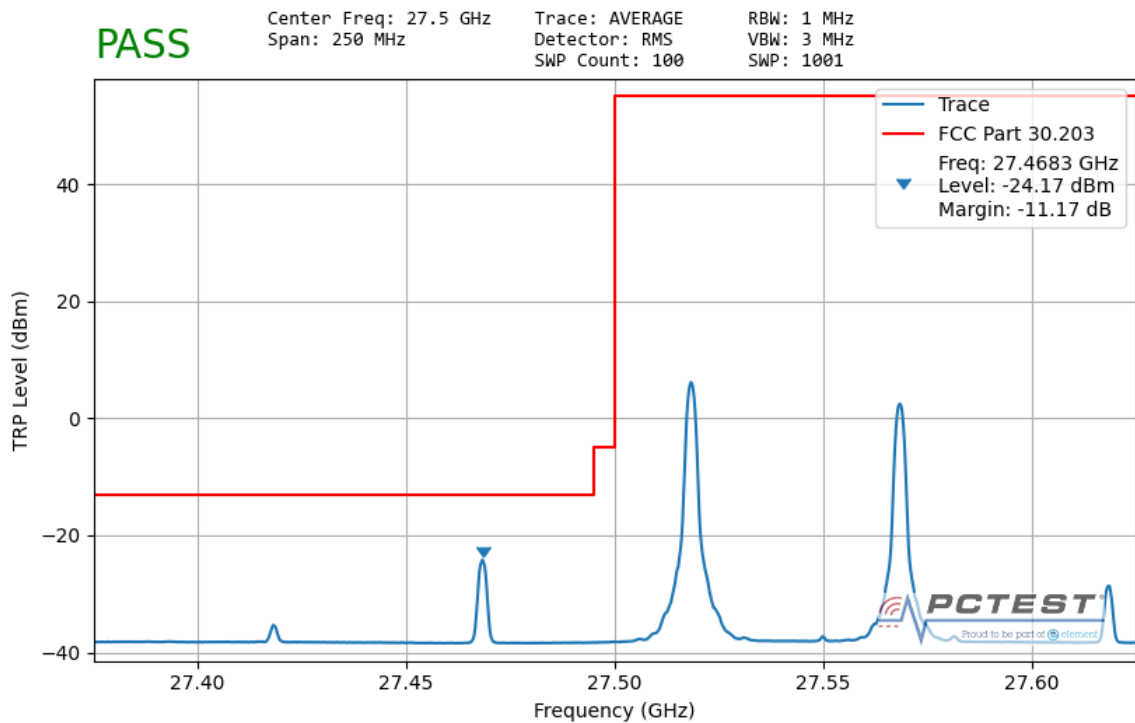
$$\begin{aligned}
 \text{Analyzer Offset (dB)} &= \text{AF (dB/m)} + \text{CL (dB)} + 107 + 20\log_{10}(D) - 104.8\text{dB, where } D = 1\text{m} \\
 &= 40.70\text{dB/m} + 8.82\text{dB} + 107 + 20\log_{10}(1\text{m}) - 104.8\text{dB} \\
 &= 51.72\text{dB}
 \end{aligned}$$

FCC ID: A3LSMG998U	 PCTEST [®] Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Band n261 – Worst-Case

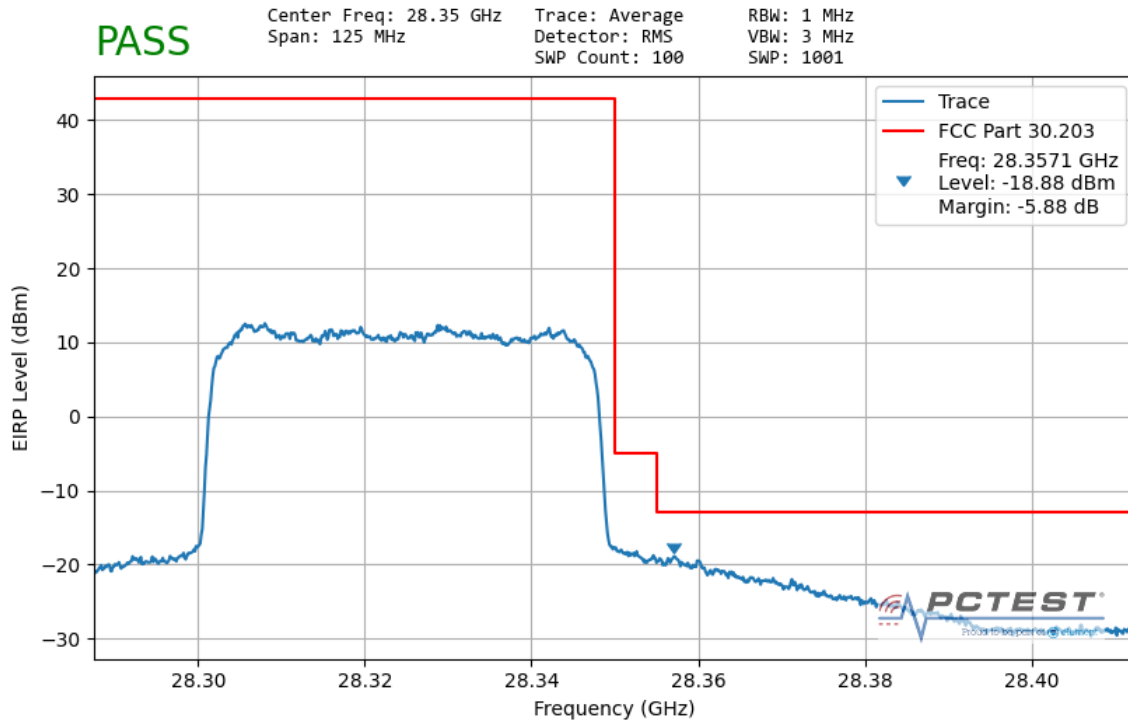


Plot 7-63. Ant 1 Lower Band Edge (50MHz-1CC – QPSK Full RB)

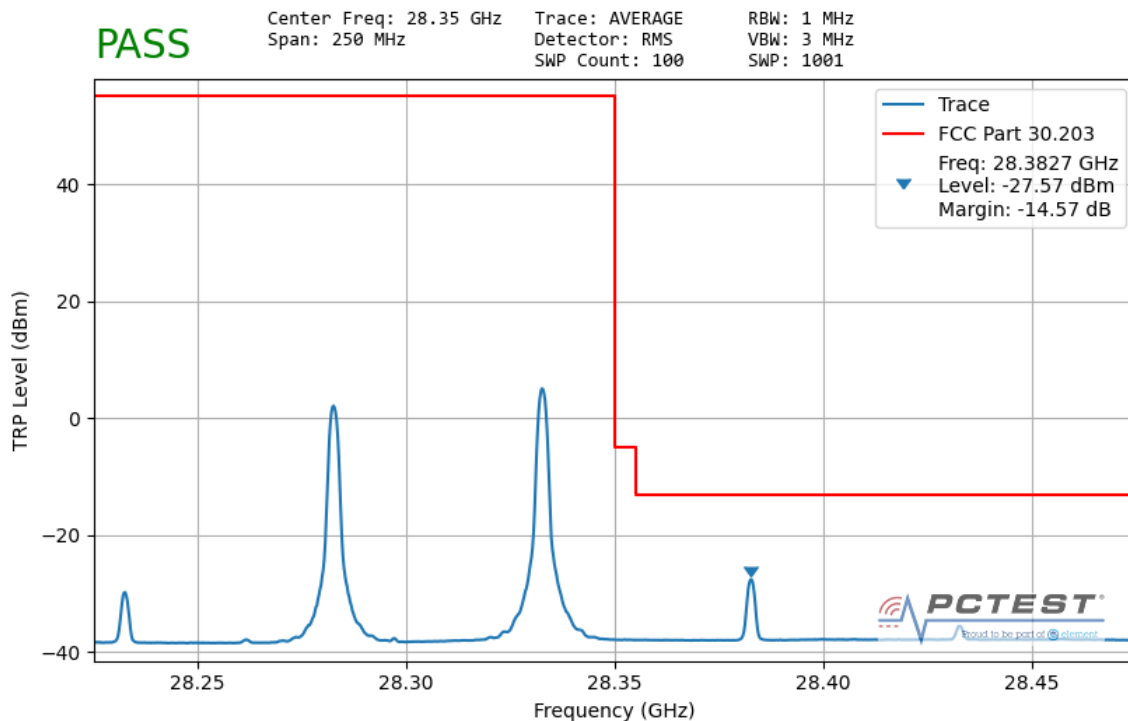


Plot 7-64. Ant 1 Lower Band Edge – TRP (50MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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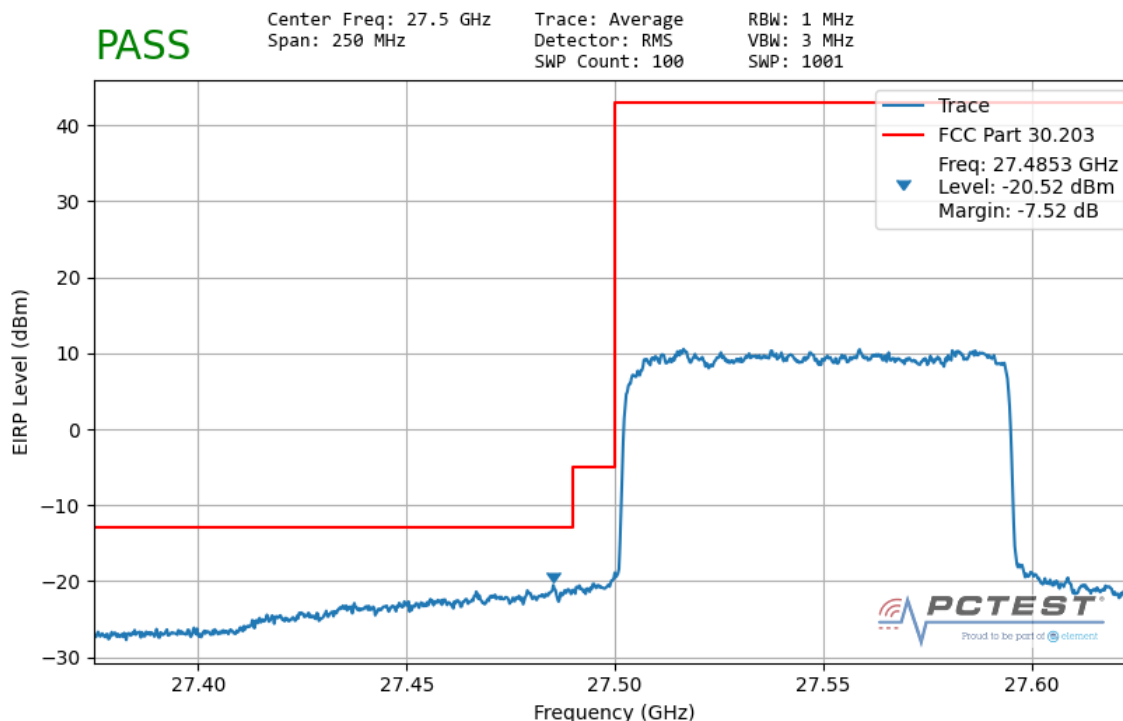


Plot 7-65. Ant 1 Upper Band Edge (50MHz-1CC – QPSK Full RB)

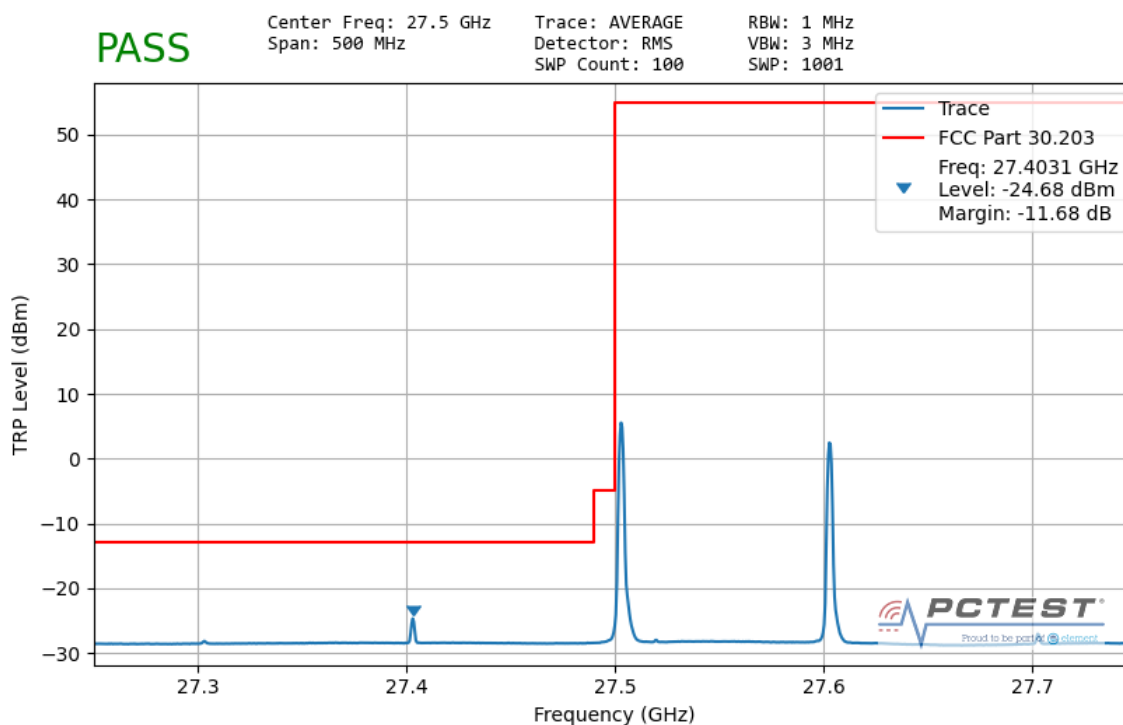


Plot 7-66. Ant 1 Upper Band Edge – TRP (50MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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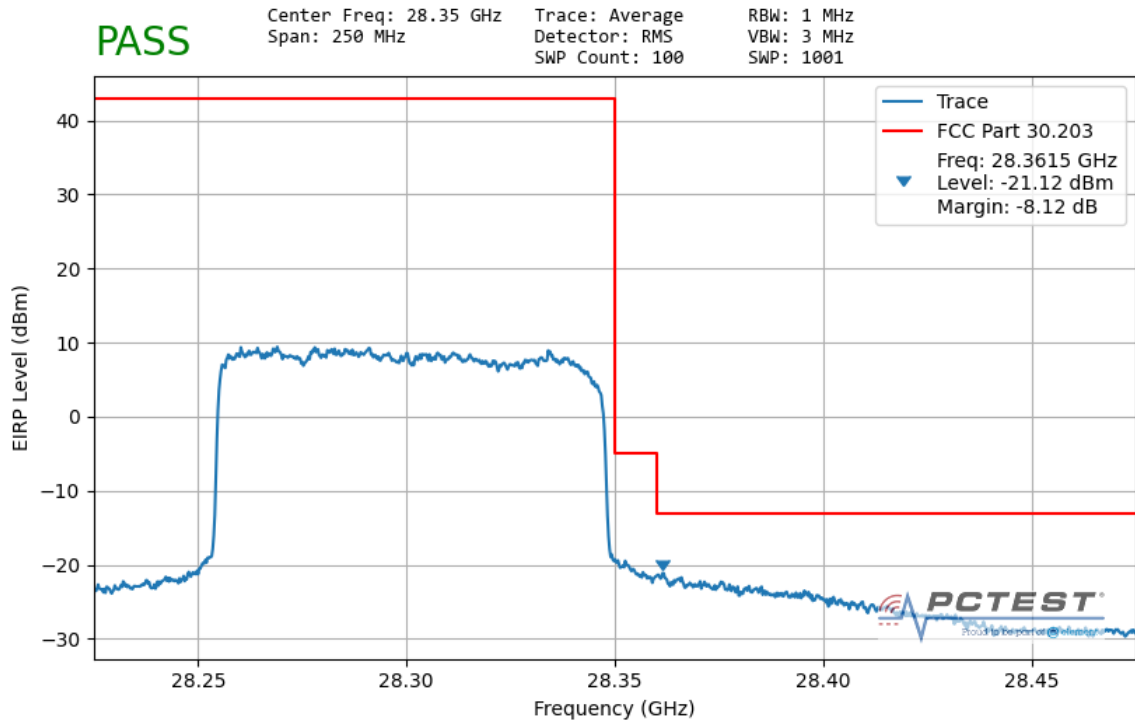


Plot 7-67. Ant 1 Lower Band Edge (100MHz-1CC – QPSK Full RB)

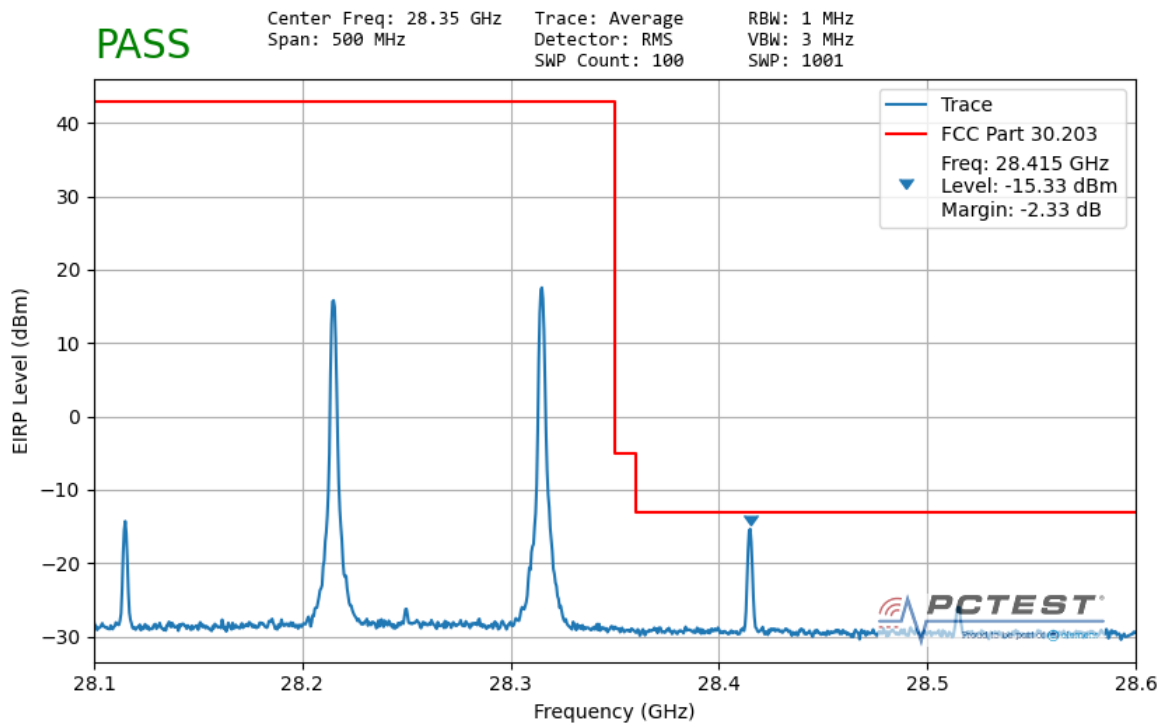


Plot 7-68. Ant 1 Lower Band Edge – TRP (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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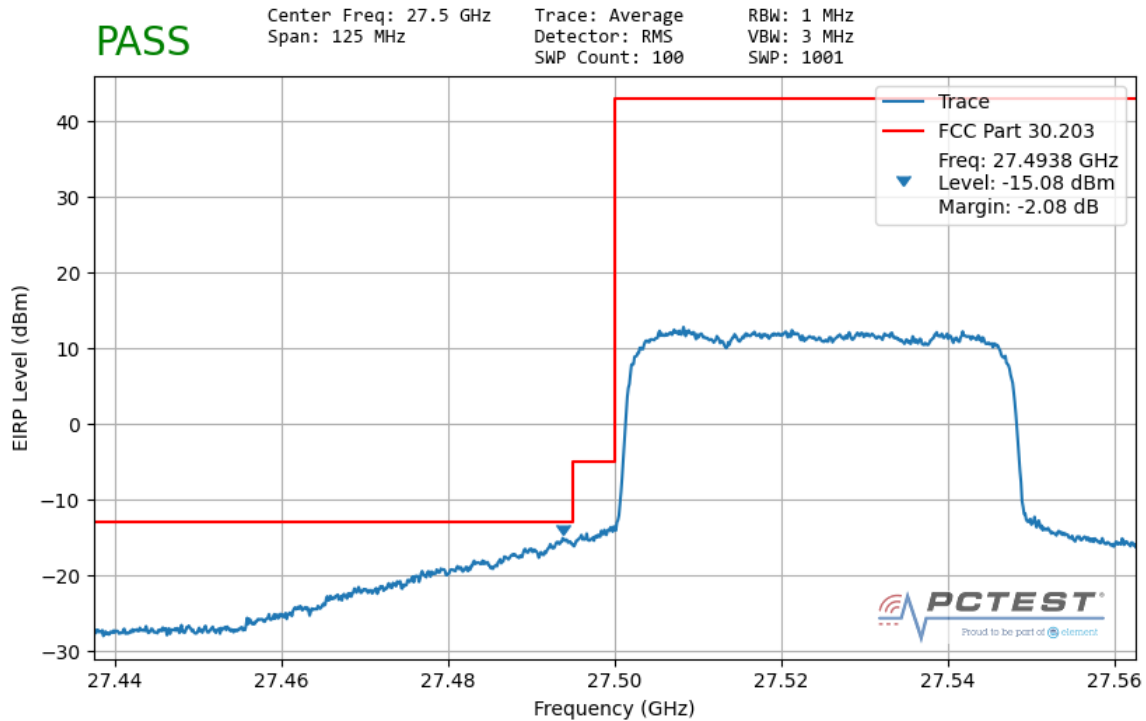


Plot 7-69. Ant 1 Upper Band Edge (100MHz-1CC – QPSK Full RB)

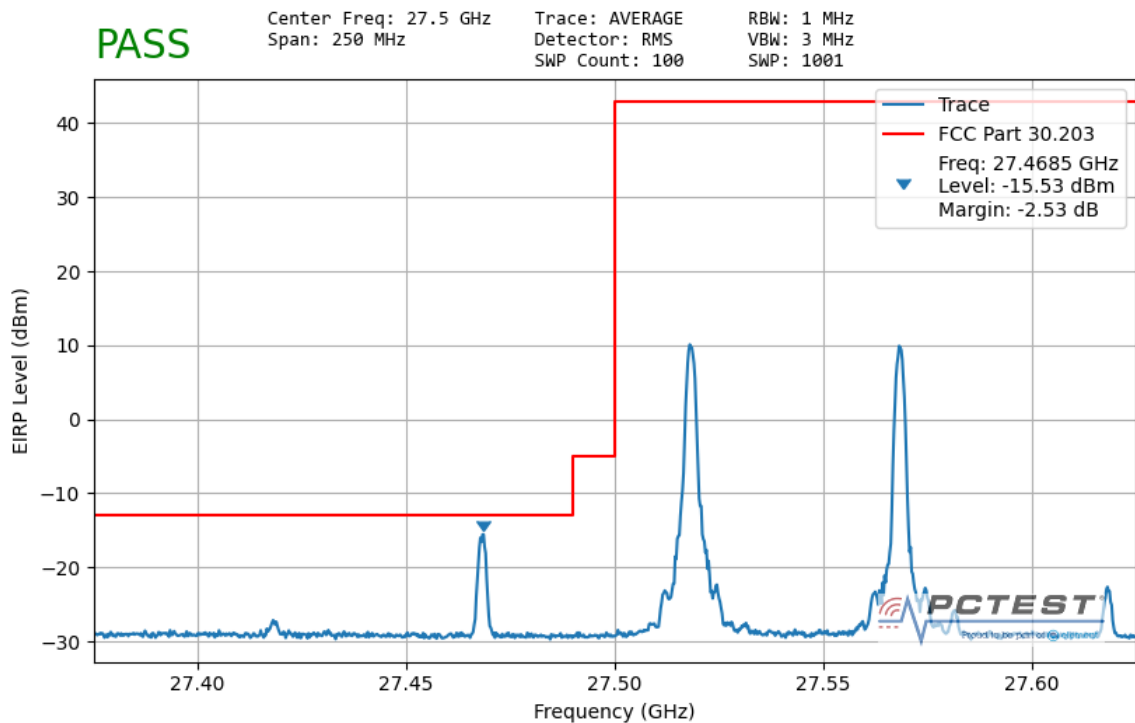


Plot 7-70. Ant 1 Upper Band Edge (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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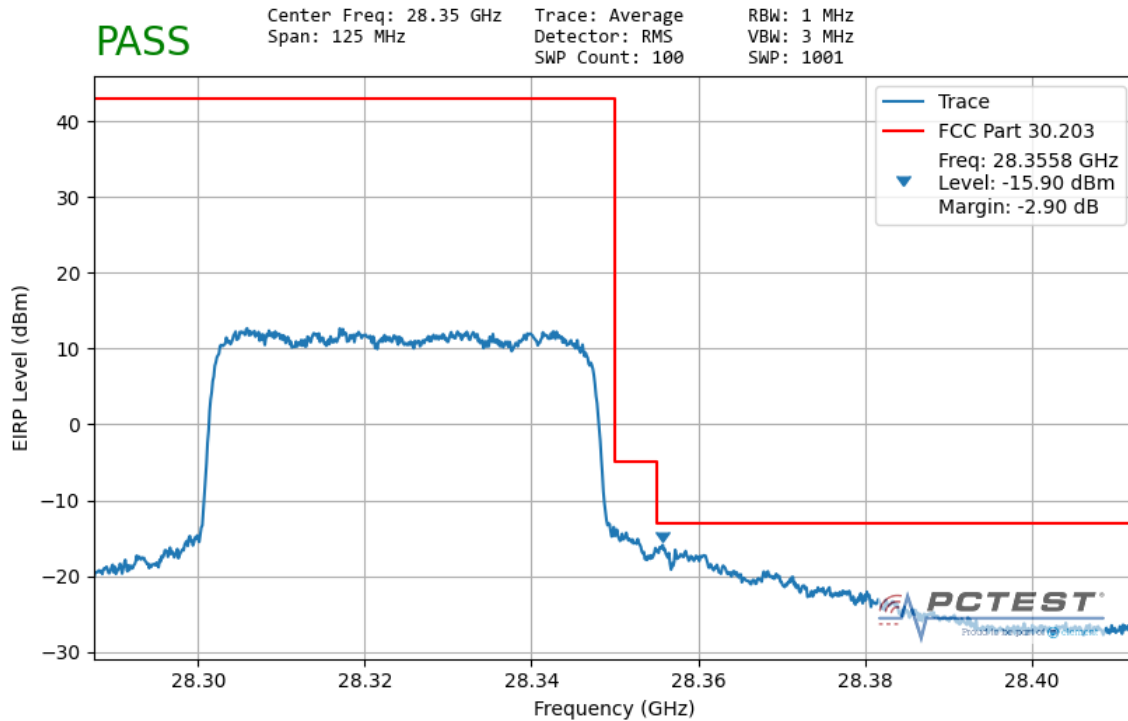


Plot 7-71. Ant 2 Lower Band Edge (50MHz-1CC – QPSK Full RB)

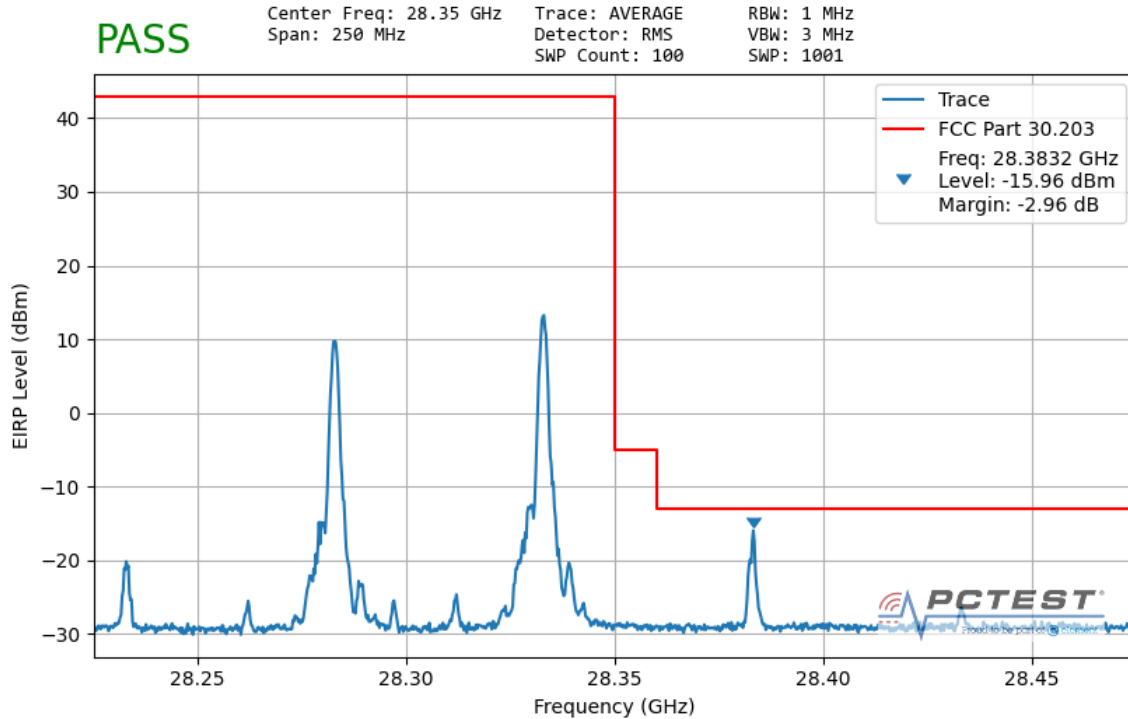


Plot 7-72. Ant 2 Lower Band Edge (50MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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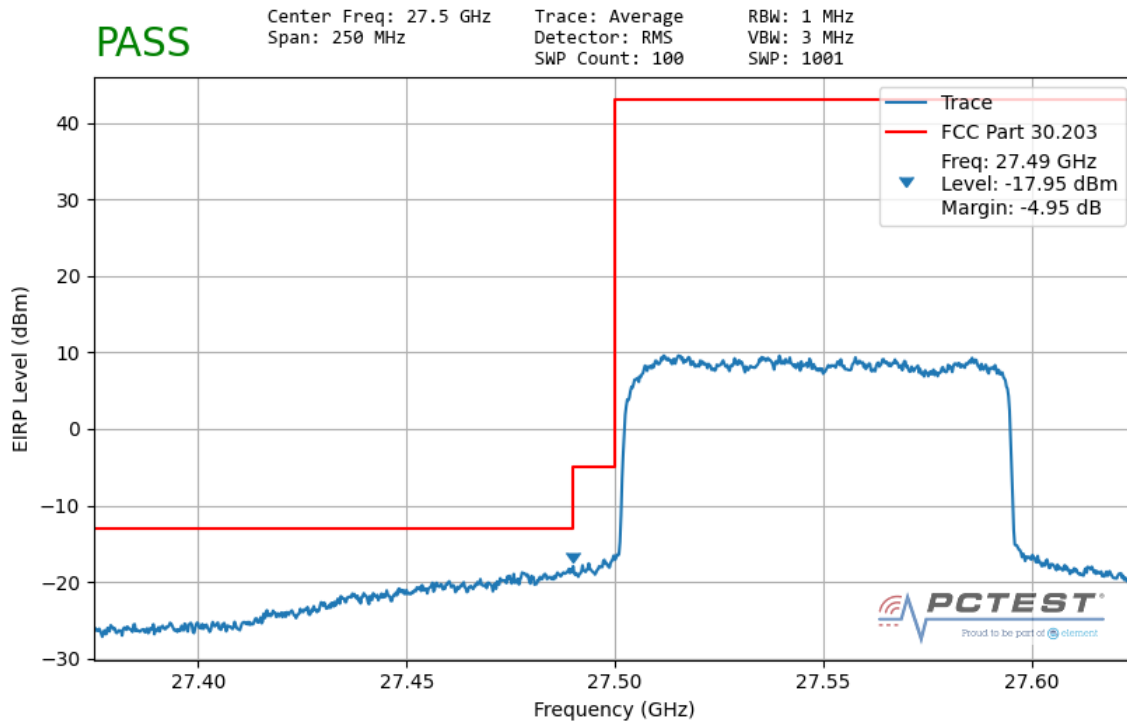


Plot 7-73. Ant 2 Upper Band Edge (50MHz-1CC – QPSK Full RB)

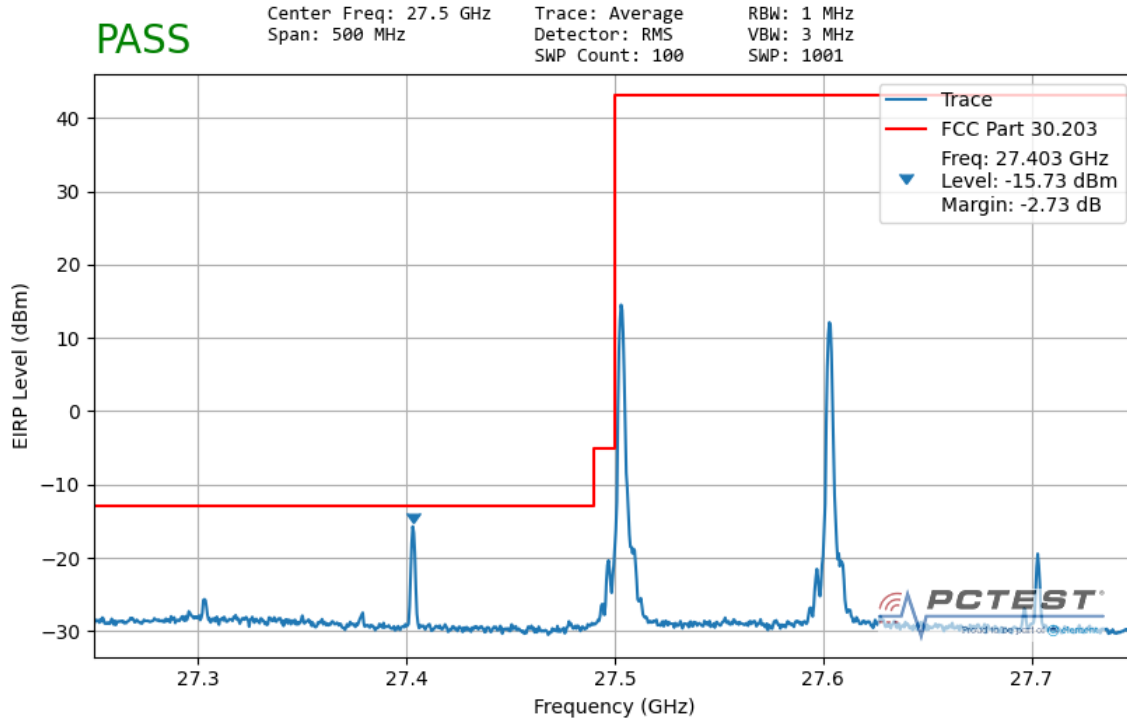


Plot 7-74. Ant 2 Upper Band Edge (50MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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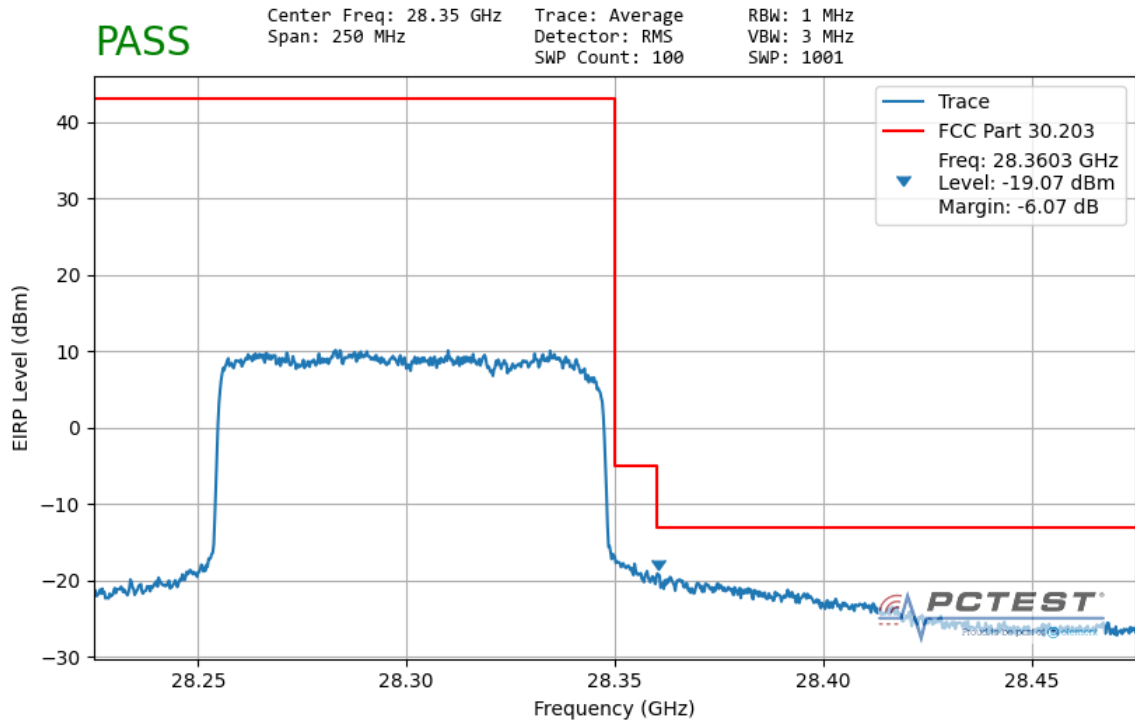


Plot 7-75. Ant 2 Lower Band Edge (100MHz-1CC – QPSK Full RB)

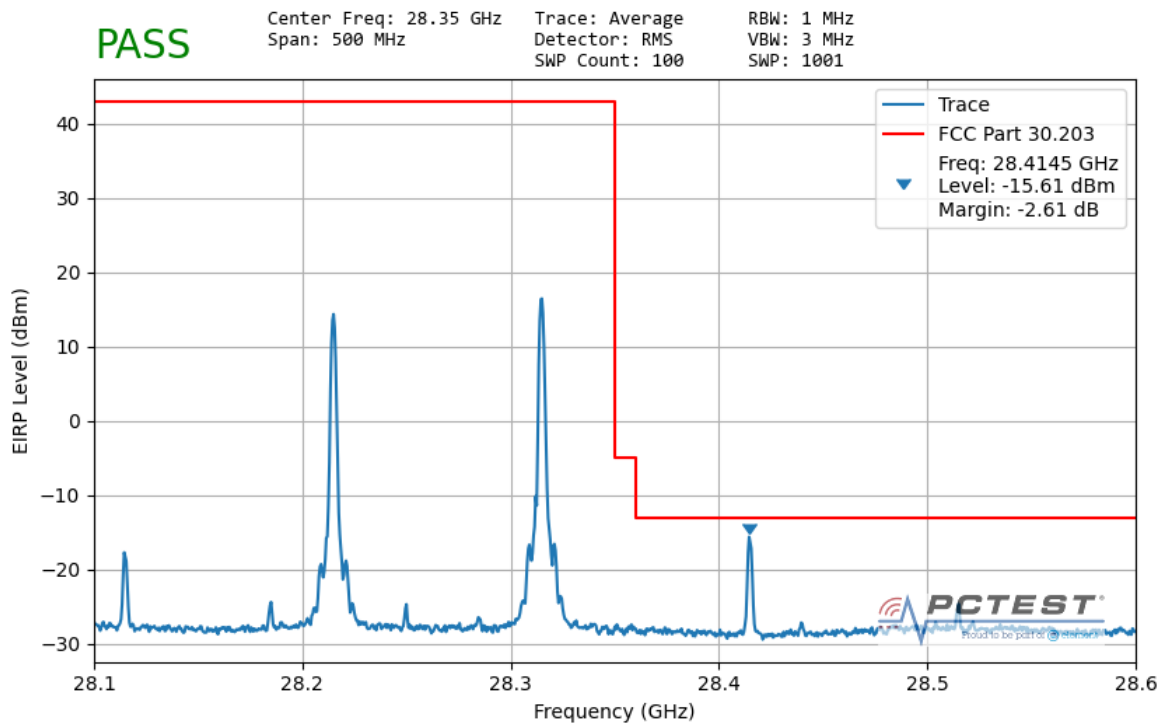


Plot 7-76. Ant 2 Lower Band Edge (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2009230152-06-R1.A3L	Test Dates: 10/5/2020-11/20/2020	EUT Type: Portable Handset		Page 80 of 97



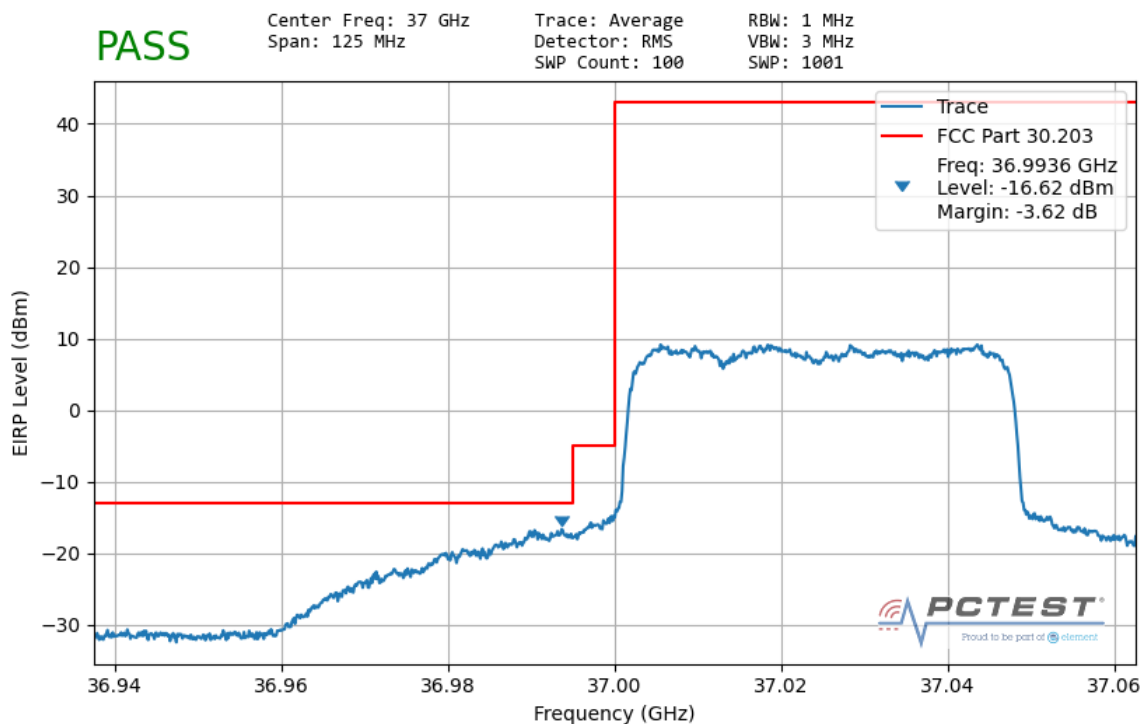
Plot 7-77. Ant 2 Upper Band Edge (100MHz-1CC – QPSK Full RB)



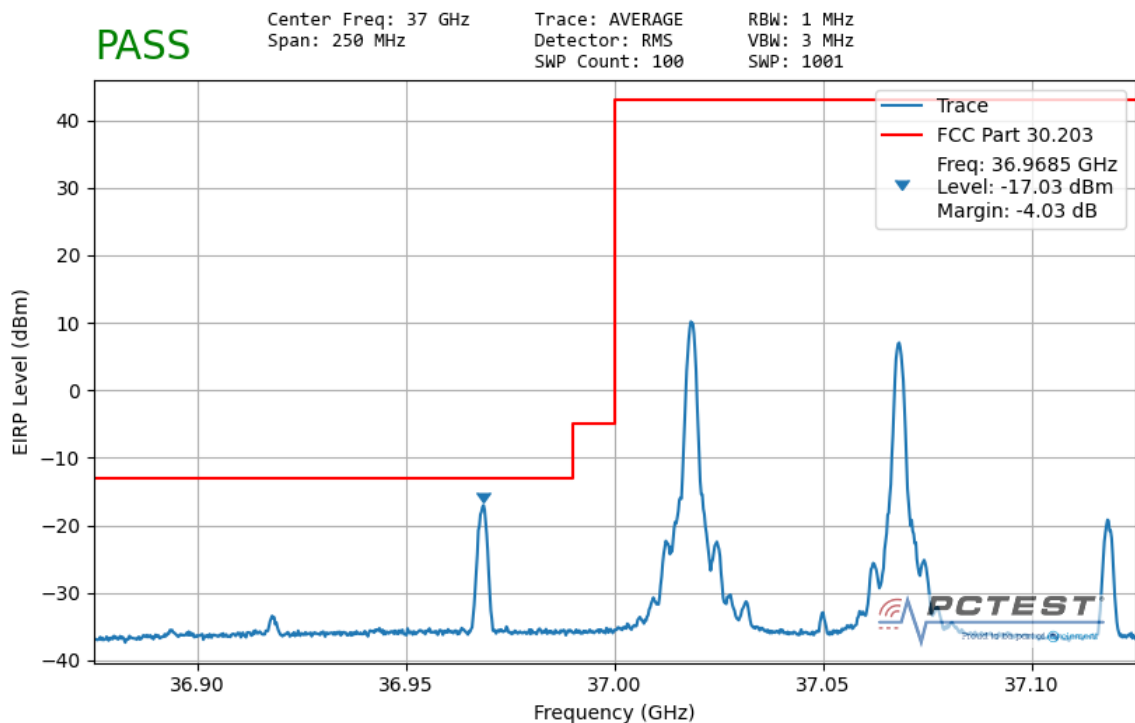
Plot 7-78. Ant 2 Upper Band Edge (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Band n260 – Worst Case

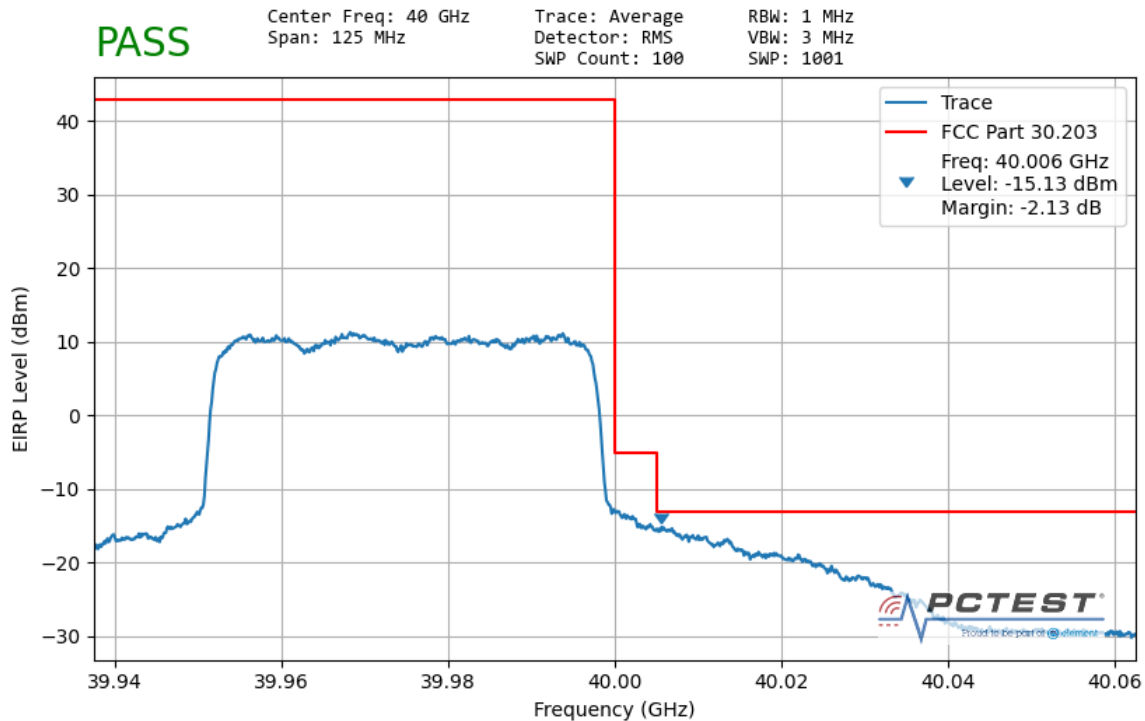


Plot 7-79. Ant 1 Lower Band Edge (50MHz-1CC – QPSK Full RB)

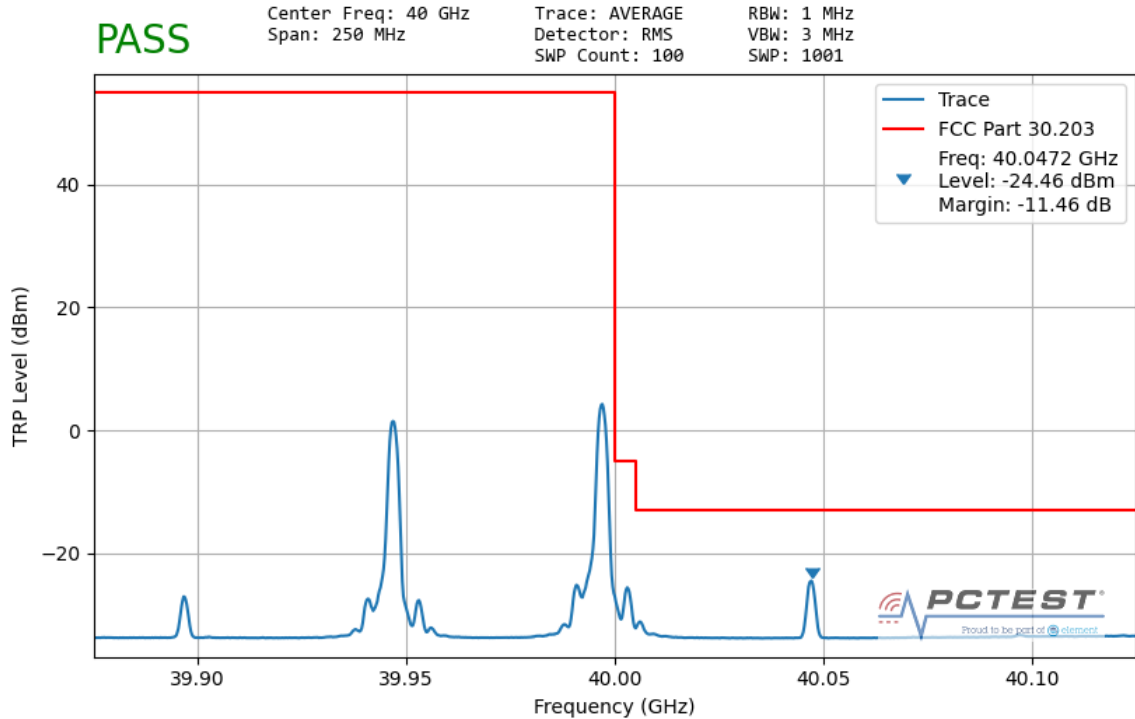


FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-80. Ant 1 Lower Band Edge (50MHz-2CC – QPSK 1 RB)

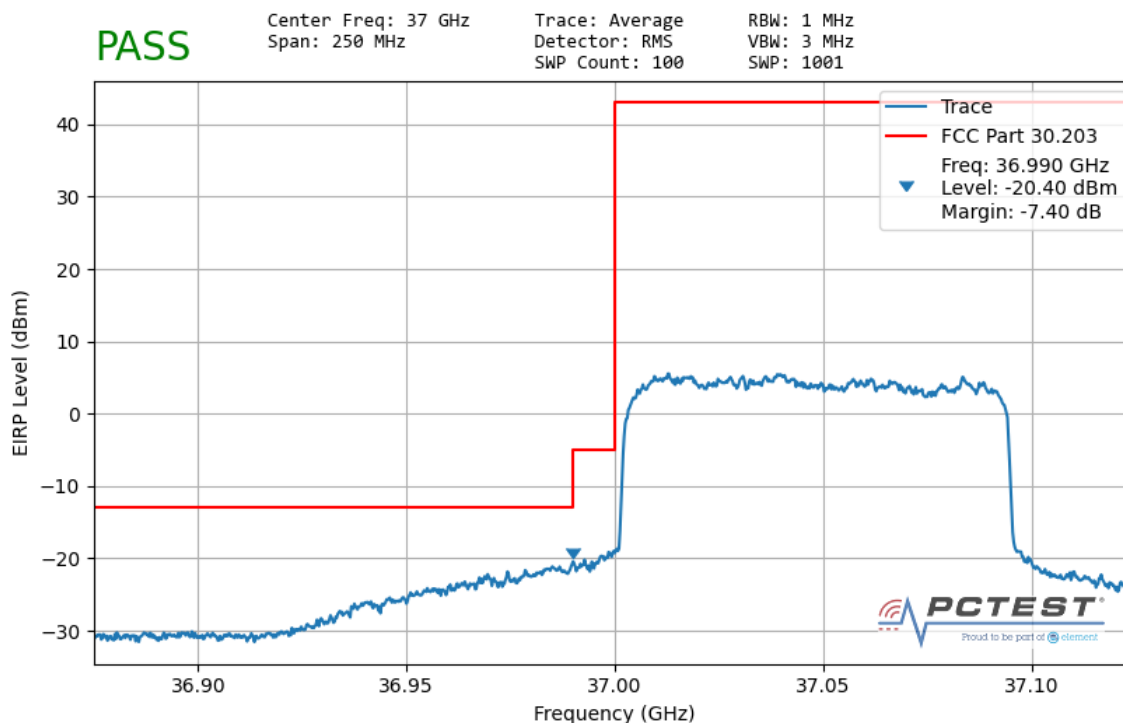


Plot 7-81. Ant 1 Upper Band Edge (50MHz-1CC – QPSK Full RB)

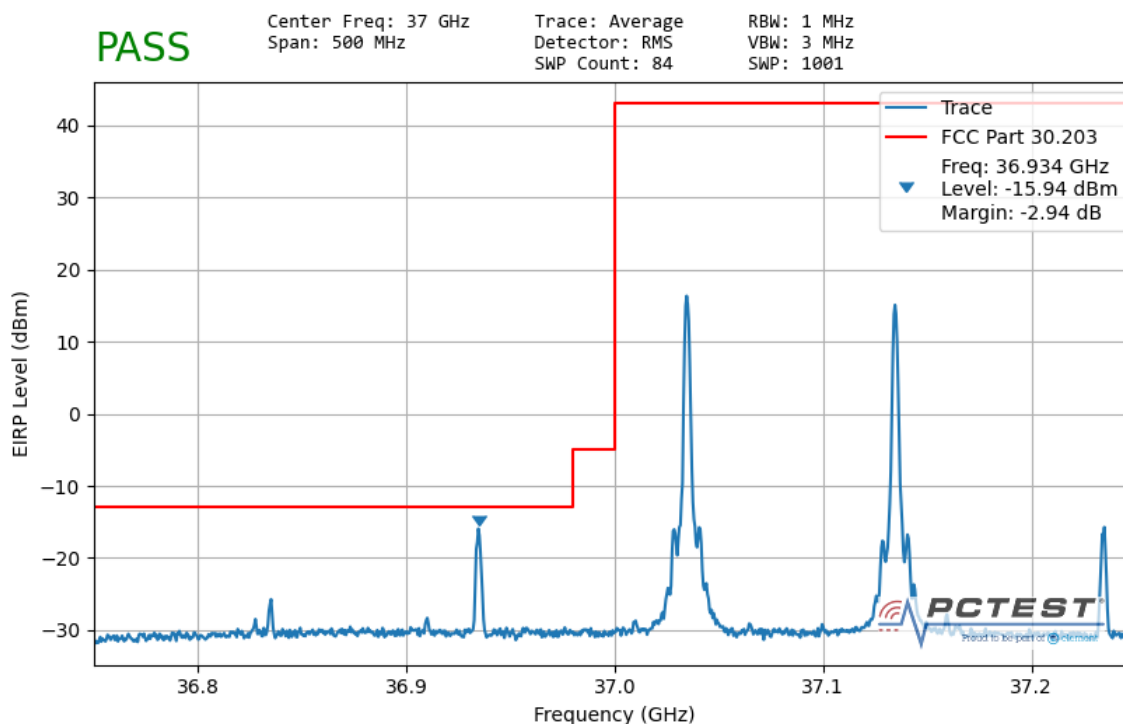


Plot 7-82. Ant 1 Upper Band Edge – TRP (50MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2009230152-06-R1.A3L	Test Dates: 10/5/2020-11/20/2020	EUT Type: Portable Handset		Page 83 of 97

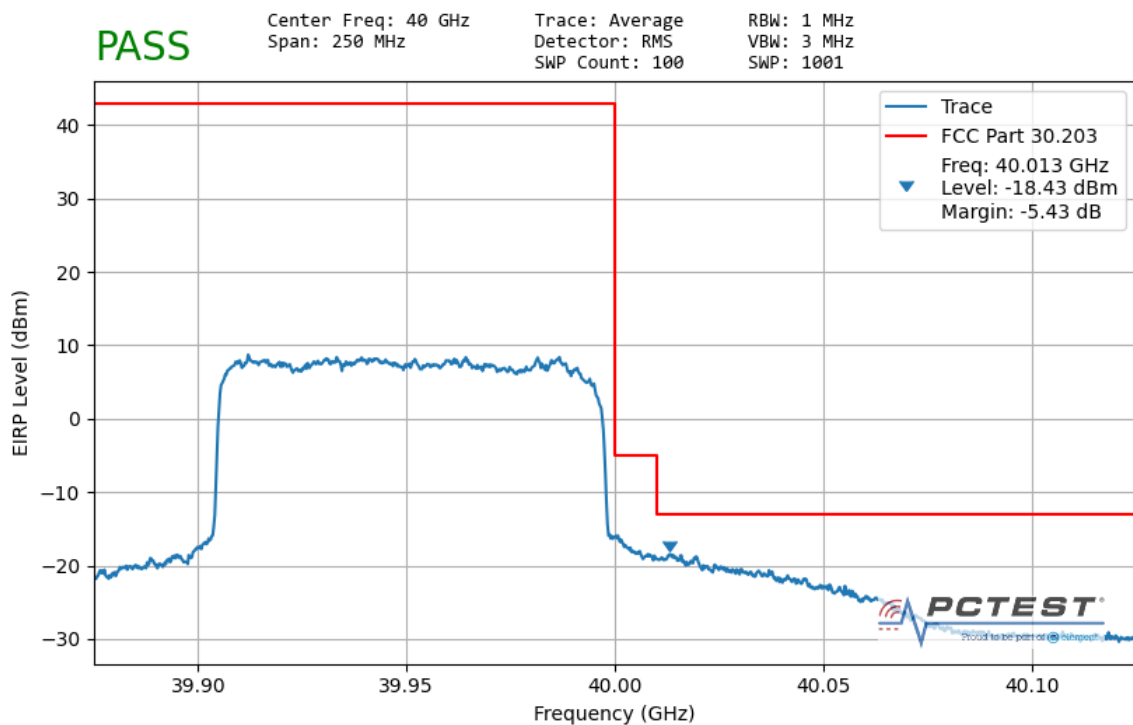


Plot 7-83. Ant 1 Lower Band Edge (100MHz-1CC – QPSK Full RB)

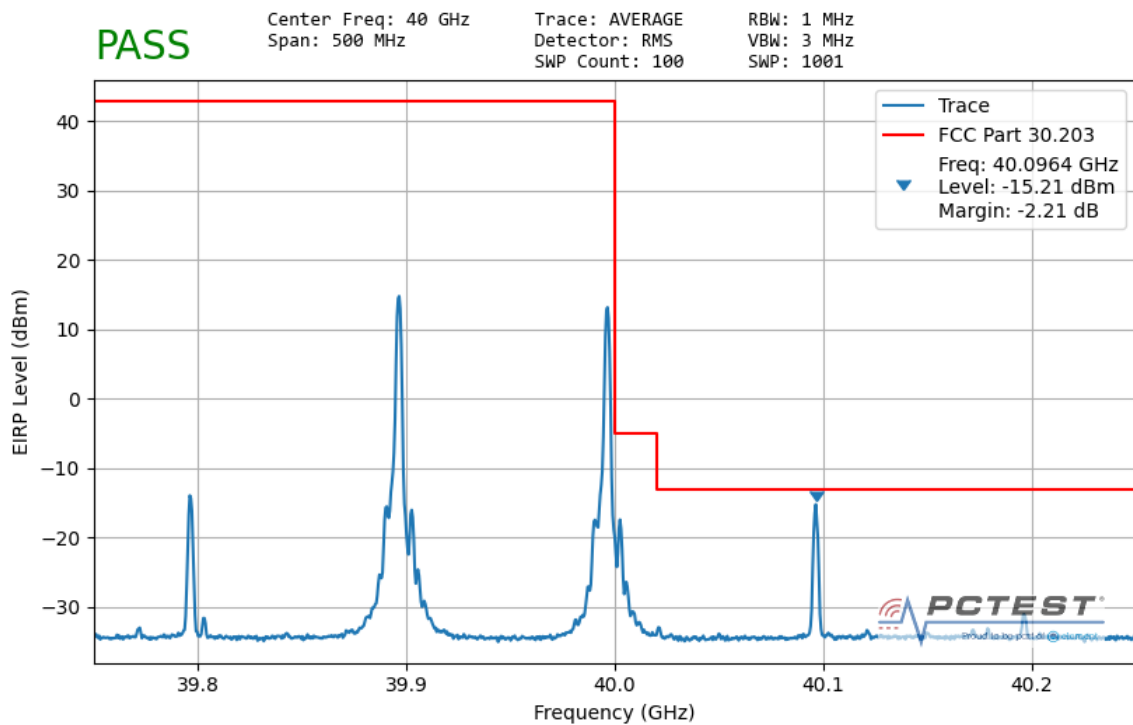


Plot 7-84. Ant 1 Lower Band Edge (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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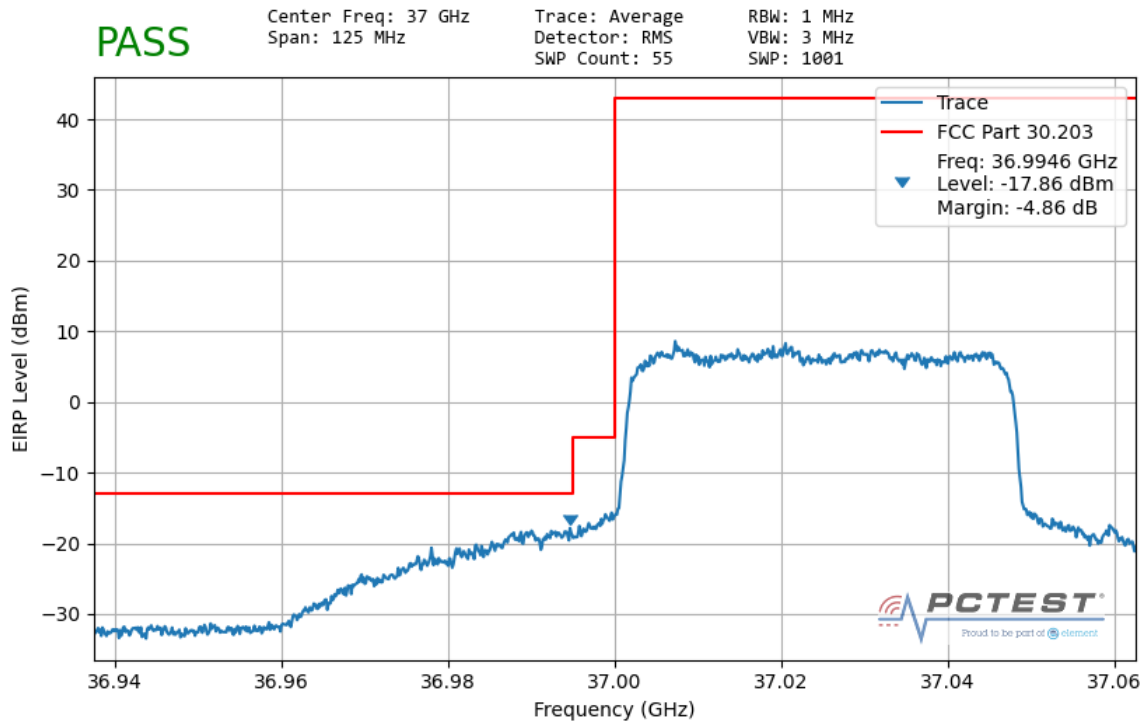


Plot 7-85. Ant 1 Upper Band Edge (100MHz-1CC – QPSK Full RB)

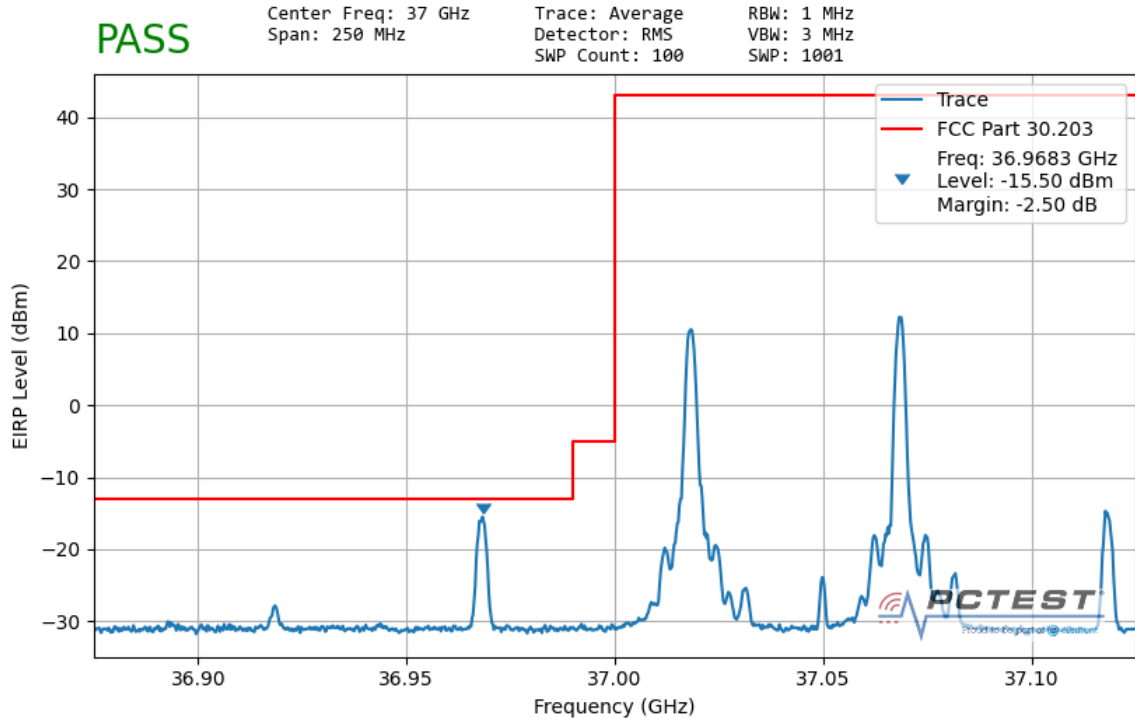


Plot 7-86. Ant 1 Upper Band Edge (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2009230152-06-R1.A3L	Test Dates: 10/5/2020-11/20/2020	EUT Type: Portable Handset		Page 85 of 97

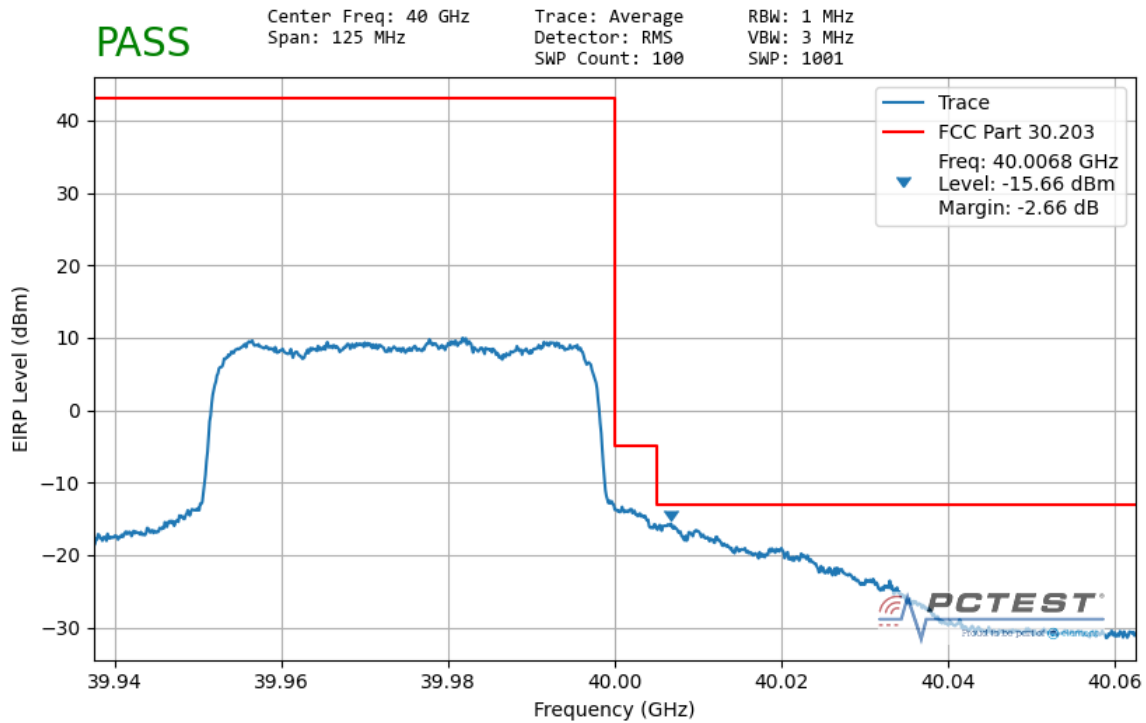


Plot 7-87. Ant 2 Lower Band Edge (50MHz-1CC – QPSK Full RB)

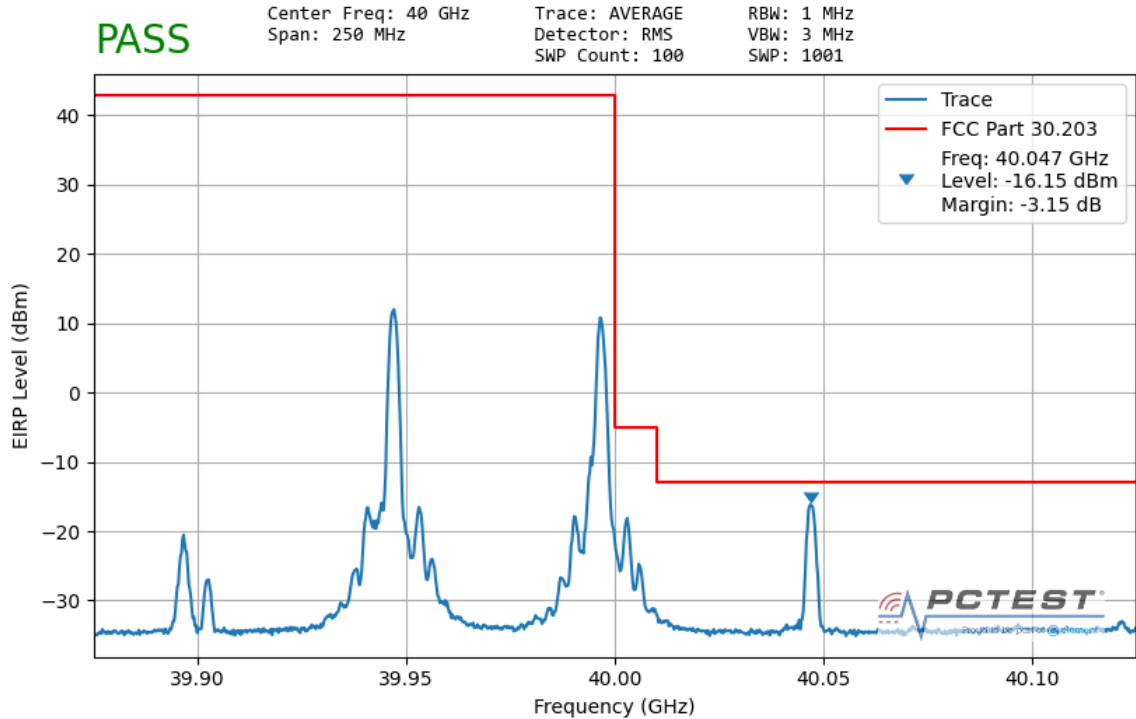


Plot 7-88. Ant 2 Lower Band Edge (50MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2009230152-06-R1.A3L	Test Dates: 10/5/2020-11/20/2020	EUT Type: Portable Handset		Page 86 of 97

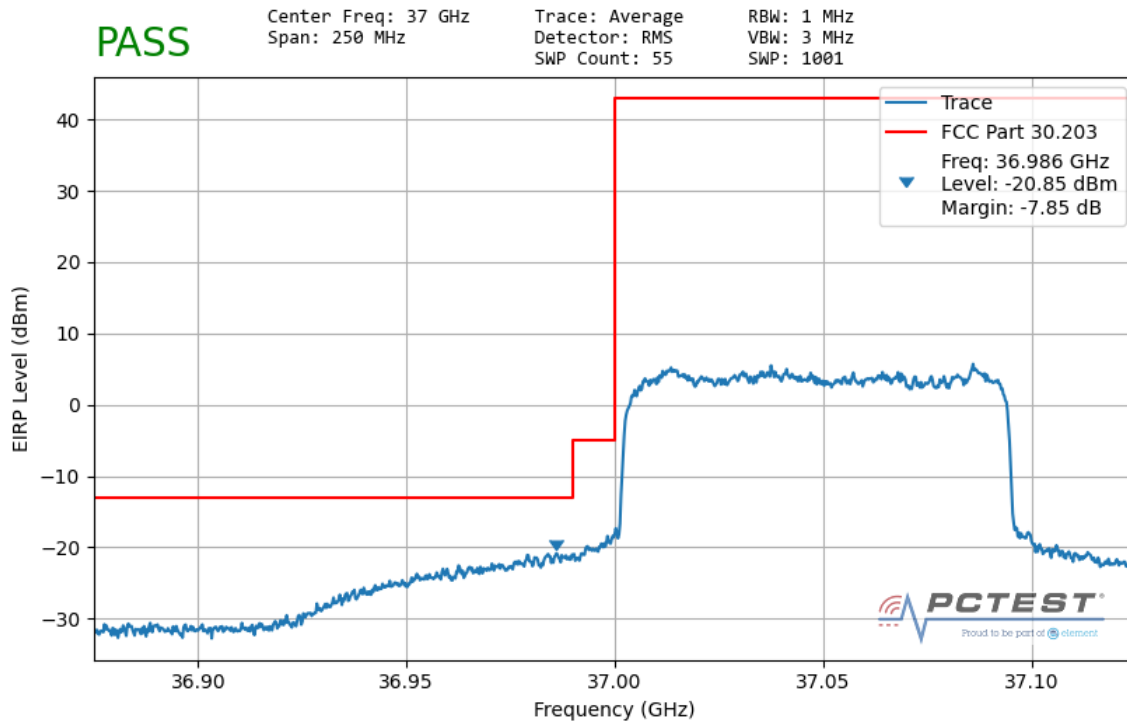


Plot 7-89. Ant 2 Upper Band Edge (50MHz-1CC – QPSK Full RB)

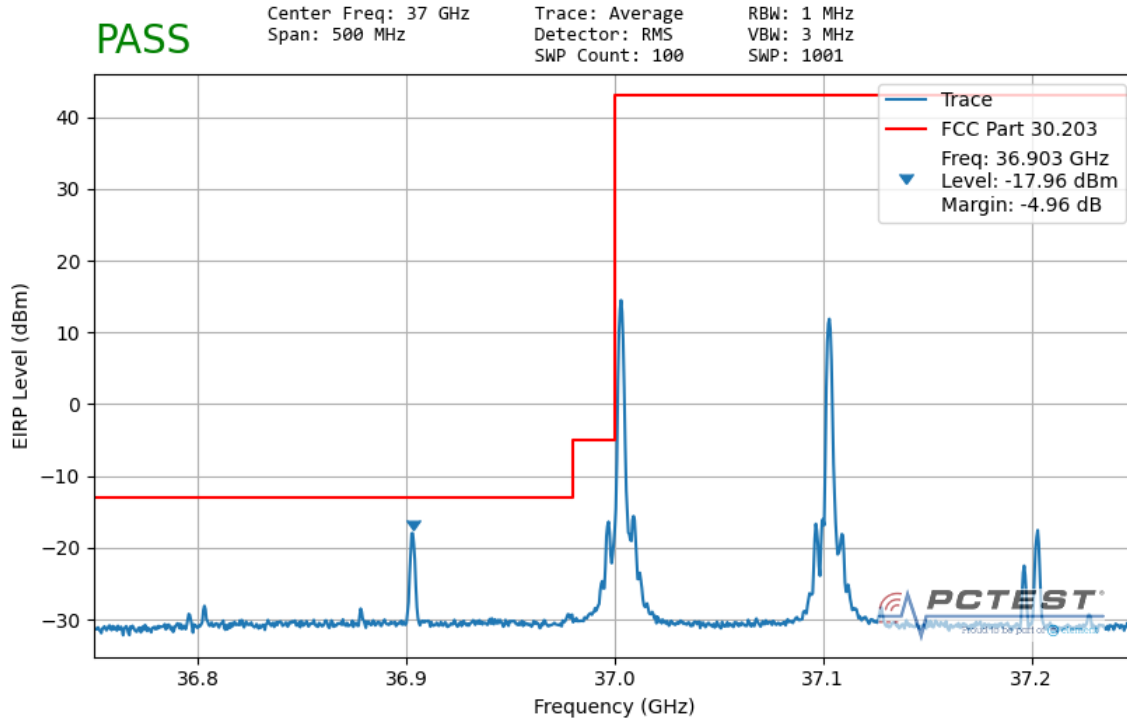


Plot 7-90. Ant 2 Upper Band Edge (50MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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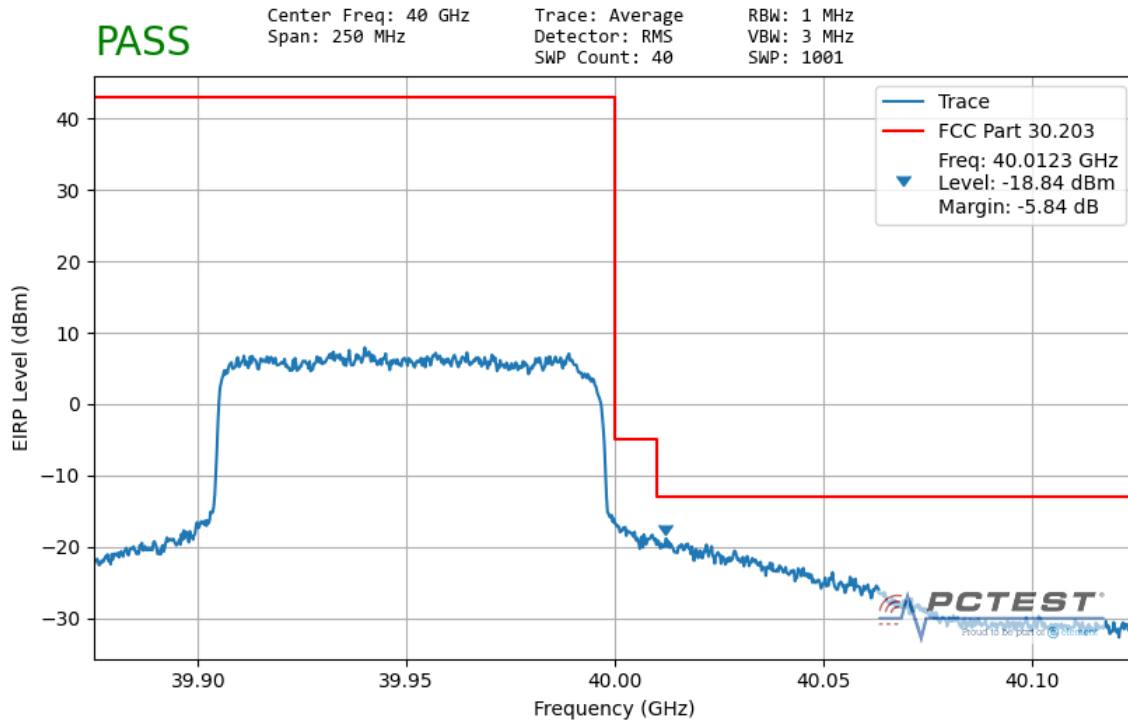


Plot 7-91. Ant 2 Lower Band Edge (100MHz-1CC – QPSK Full RB)

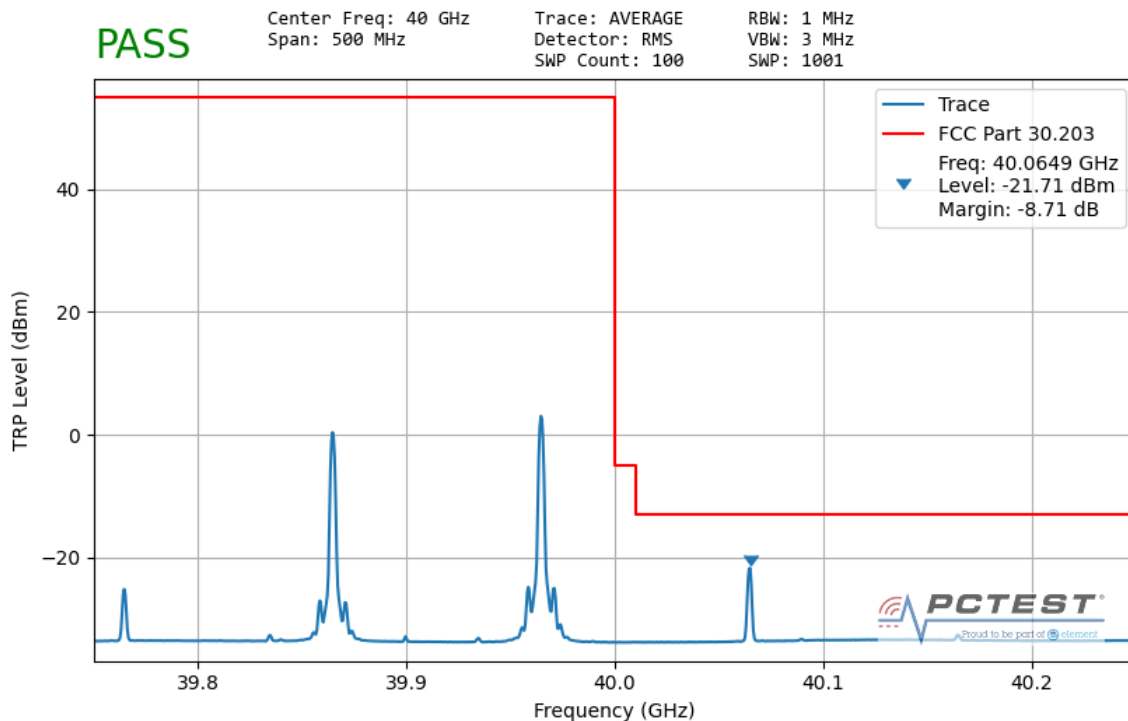


Plot 7-92. Ant 2 Lower Band Edge (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-93. Ant 2 Upper Band Edge (100MHz-1CC – QPSK Full RB)



Plot 7-94. Ant 2 Upper Band Edge – TRP (100MHz-2CC – QPSK 1 RB)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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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 v01r01 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 measured using horn antenna connected to a spectrum analyzer. The EUT was placed inside an environmental chamber. Using a foam plug, 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).

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Frequency Stability Measurements (Band n261)

\$2.1055

OPERATING FREQUENCY: 27,924,960,000 Hz
 CHANNEL: 2254091
 REFERENCE VOLTAGE: 4.18 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	+ 20 (Ref)	28,136,038,700	0	0.0000000
100 %		- 30	27,647,650,513	488,388,187	1.7489307
100 %		- 20	27,824,023,092	312,015,608	1.1173359
100 %		- 10	27,598,181,592	537,857,108	1.9260801
100 %		0	28,139,044,009	-3,005,309	-0.0107621
100 %		+ 10	27,617,641,610	518,397,090	1.8563933
100 %		+ 20	27,933,336,233	202,702,467	0.7258827
100 %		+ 30	27,597,734,938	538,303,762	1.9276796
100 %		+ 40	27,731,752,928	404,285,772	1.4477577
100 %		+ 50	28,144,407,775	-8,369,075	-0.0299699
BATT. ENDPOINT	2.98	+ 20	28,155,142,857	-19,104,157	-0.0684125

Table 7-55. 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.

FCC ID: A3LSMG998U	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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V1.0

Frequency Stability Measurements (Band n261)

§2.1055

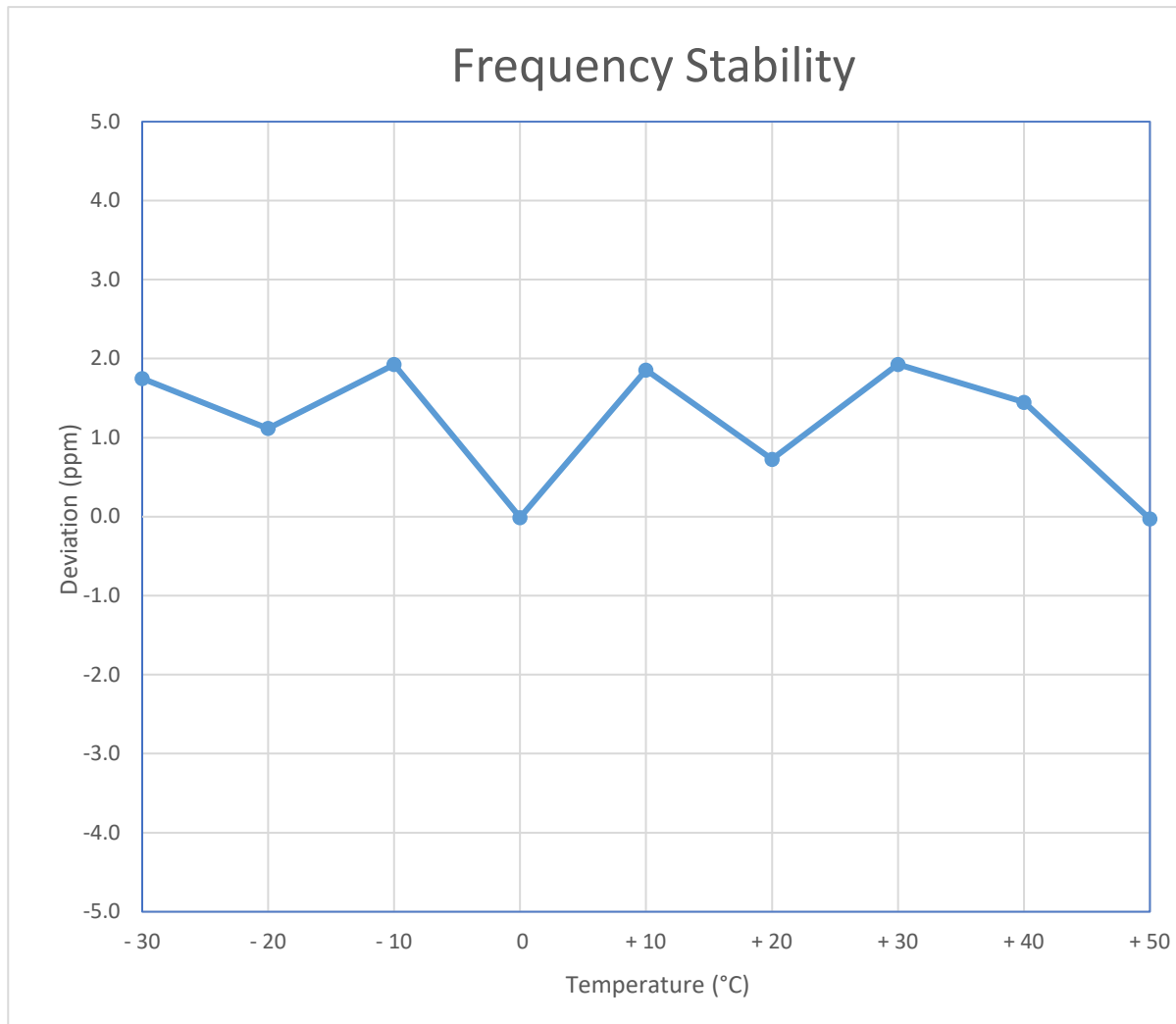


Figure 7-1. Frequency Stability Graph (n261)

FCC ID: A3LSMG998U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Frequency Stability Measurements (Band n260)

\$2.1055

OPERATING FREQUENCY: 38,499,960,000 Hz
 CHANNEL: 2254091
 REFERENCE VOLTAGE: 4.18 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	+ 20 (Ref)	38,823,727,258	0	0.0000000
100 %		- 30	38,655,958,640	167,768,618	0.4357631
100 %		- 20	38,277,656,541	546,070,717	1.4183670
100 %		- 10	38,346,840,670	476,886,588	1.2386677
100 %		0	38,595,799,453	227,927,805	0.5920209
100 %		+ 10	38,166,658,276	657,068,982	1.7066745
100 %		+ 20	38,464,351,062	359,376,196	0.9334456
100 %		+ 30	38,274,470,504	549,256,754	1.4266424
100 %		+ 40	38,349,808,565	473,918,693	1.2309589
100 %		+ 50	38,201,302,407	622,424,851	1.6166896
BATT. ENDPOINT	2.98	+ 20	38,687,784,919	135,942,339	0.3530974

Table 7-56. 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.

FCC ID: A3LSMG998U	 PCTEST® Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Frequency Stability Measurements (Band n260)

§2.1055

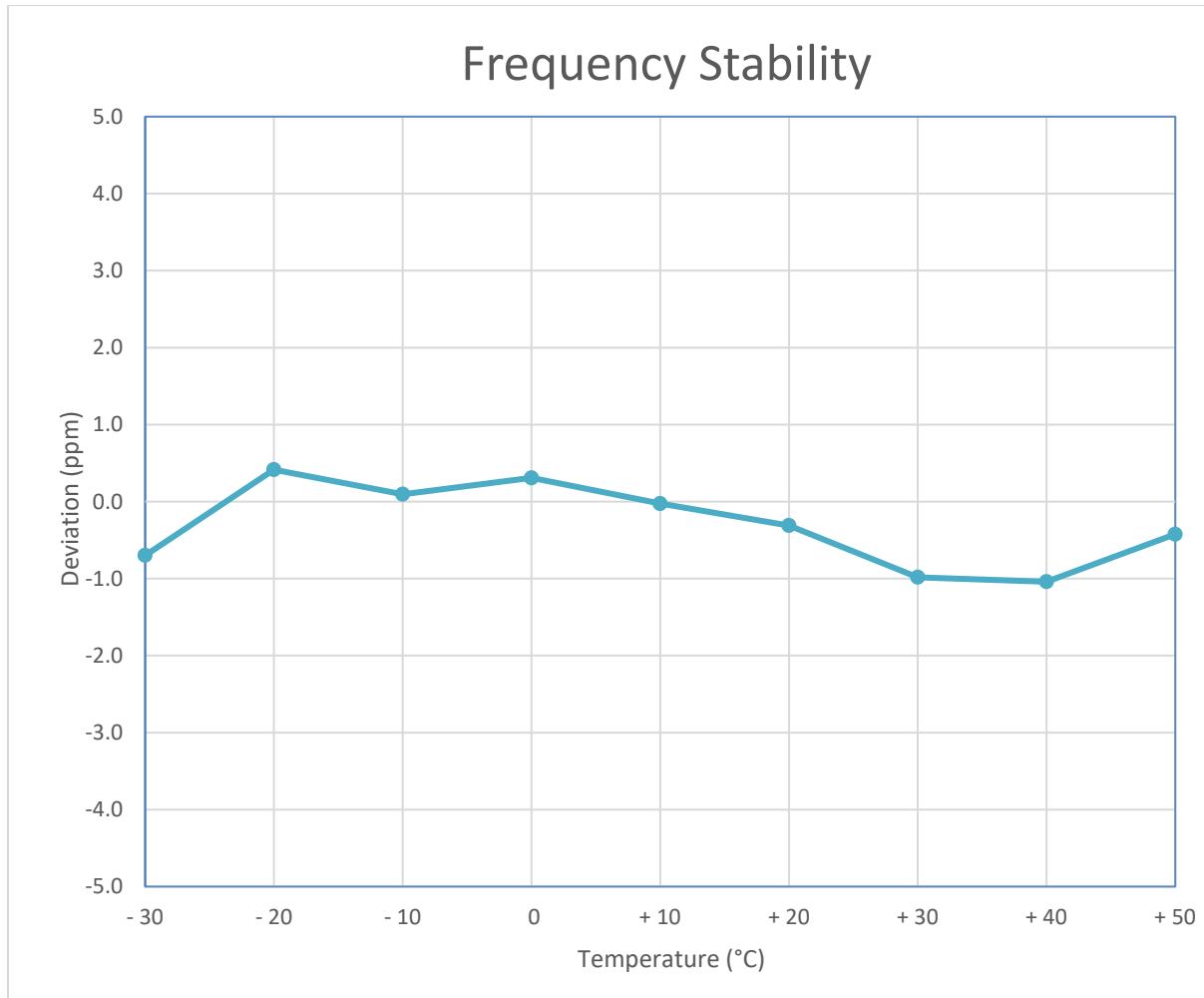


Figure 7-2. Frequency Stability Graph (n260)

FCC ID: A3LSMG998U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG998U** complies with all the requirements of Part 30.

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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

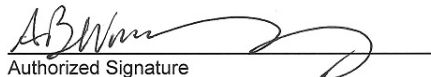
From: Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902

Packing List No: 193065

Today's Date: 10/02/19

Quantity			
Shipped	Unit	Description	Order-Job Number
1	EA	VDIWR19.0SAX WR19SAX / SN: SAX 411	19329-01

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
979 2nd St. SE
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Charlottesville, VA 22902
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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: 193037
Shipping Date: 09/30/19

Today's Date: 09/30/19
PO Number: 190719.DP1R

Quantity Shipped	Unit	Description	Order-Job Number
1	EA	SAX RETEST-WR12SAX WR12SAX / SN: SAX 252	19408-01
1	EA	SAX RETEST-WR8.0SAX WR8.0SAX / SN: SAX 253	19408-02
1	EA	SAX RETEST-WR5.1SAX WR5.1SAX / SN: SAX 254	19408-03

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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FCC ID: A3LSMG998U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2009230152-06-R1.A3L	Test Dates: 10/5/2020-11/20/2020	EUT Type: Portable Handset		Page 97 of 97