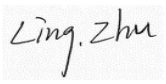
Appendix F for 5.2G WIFI RF Test Data

Product Name: Cellular WiFi Router

Test Model: LT500

Environmental Conditions

Temperature:	23.1° C
Relative Humidity:	53.3%
ATM Pressure:	100.0 kPa
Test Engineer:	 Ling Zhu
Supervised by:	 Li Huan

F.1 Centre Frequencies

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	a	5180	Ant0	5180.03	5.79	20	Pass
NVNT	n20	5180	Ant0	5179.96	-7.72	20	Pass
NVNT	n40	5190	Ant0	5190.03	5.78	20	Pass
NVNT	ac20	5180	Ant0	5179.99	-1.93	20	Pass
NVNT	ac40	5190	Ant0	5190.03	5.78	20	Pass
NVNT	ac80	5210	Ant0	5209.97	-5.76	20	Pass

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVLT	a	5180	Ant0	5180.00	0.00	20	Pass
NVLT	n20	5180	Ant0	5180.03	5.79	20	Pass
NVLT	n40	5190	Ant0	5190.01	1.93	20	Pass
NVLT	ac20	5180	Ant0	5180.04	7.72	20	Pass
NVLT	ac40	5190	Ant0	5190.04	7.71	20	Pass
NVLT	ac80	5210	Ant0	5209.96	-7.68	20	Pass

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVHT	a	5180	Ant0	5180.00	0.00	20	Pass
NVHT	n20	5180	Ant0	5180.00	0.00	20	Pass
NVHT	n40	5190	Ant0	5190.01	1.93	20	Pass
NVHT	ac20	5180	Ant0	5180.01	1.93	20	Pass
NVHT	ac40	5190	Ant0	5190.03	5.78	20	Pass
NVHT	ac80	5210	Ant0	5209.99	-1.92	20	Pass

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	a	5180	Ant1	5179.99	-1.93	20	Pass
NVNT	n20	5180	Ant1	5180.04	7.72	20	Pass
NVNT	n40	5190	Ant1	5189.98	-3.85	20	Pass
NVNT	ac20	5180	Ant1	5180.02	3.86	20	Pass
NVNT	ac40	5190	Ant1	5189.96	-7.71	20	Pass
NVNT	ac80	5210	Ant1	5210.00	0.00	20	Pass

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVLT	a	5180	Ant1	5180.02	3.86	20	Pass
NVLT	n20	5180	Ant1	5180.03	5.79	20	Pass
NVLT	n40	5190	Ant1	5190.02	3.85	20	Pass
NVLT	ac20	5180	Ant1	5180.01	1.93	20	Pass
NVLT	ac40	5190	Ant1	5189.96	-7.71	20	Pass
NVLT	ac80	5210	Ant1	5210.00	0.00	20	Pass

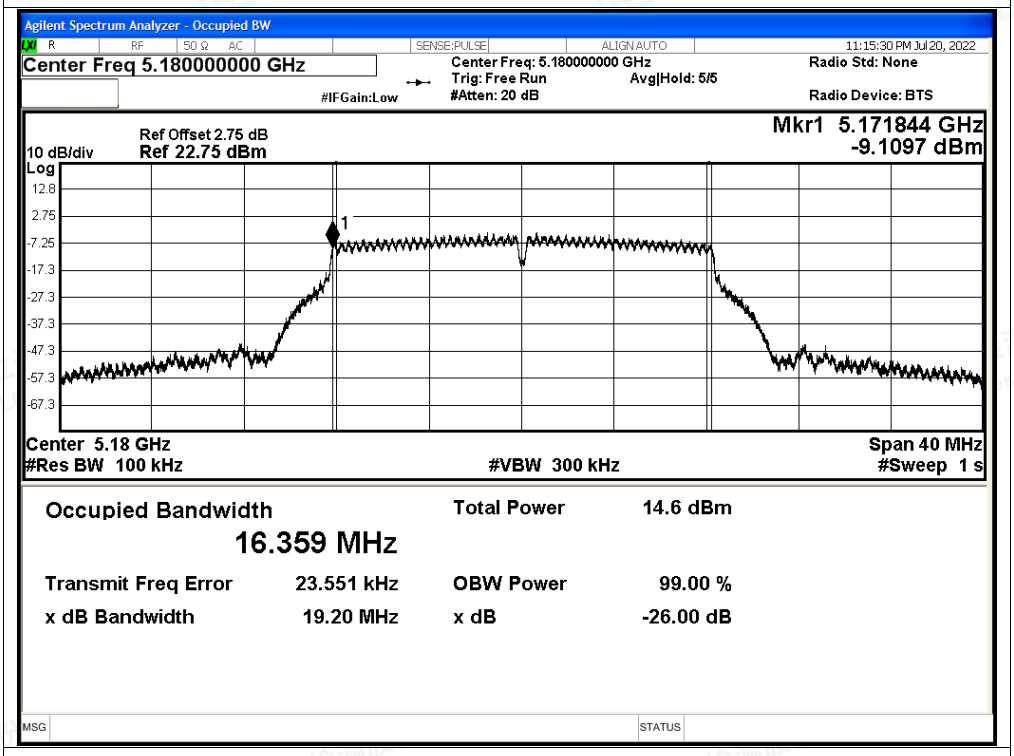
Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVHT	a	5180	Ant1	5180.01	1.93	20	Pass
NVHT	n20	5180	Ant1	5180.01	1.93	20	Pass
NVHT	n40	5190	Ant1	5190.04	7.71	20	Pass
NVHT	ac20	5180	Ant1	5180.02	3.86	20	Pass
NVHT	ac40	5190	Ant1	5190.01	1.93	20	Pass
NVHT	ac80	5210	Ant1	5209.97	-5.76	20	Pass

F.2 Nominal Channel Bandwidth and Occupied Channel Bandwidth

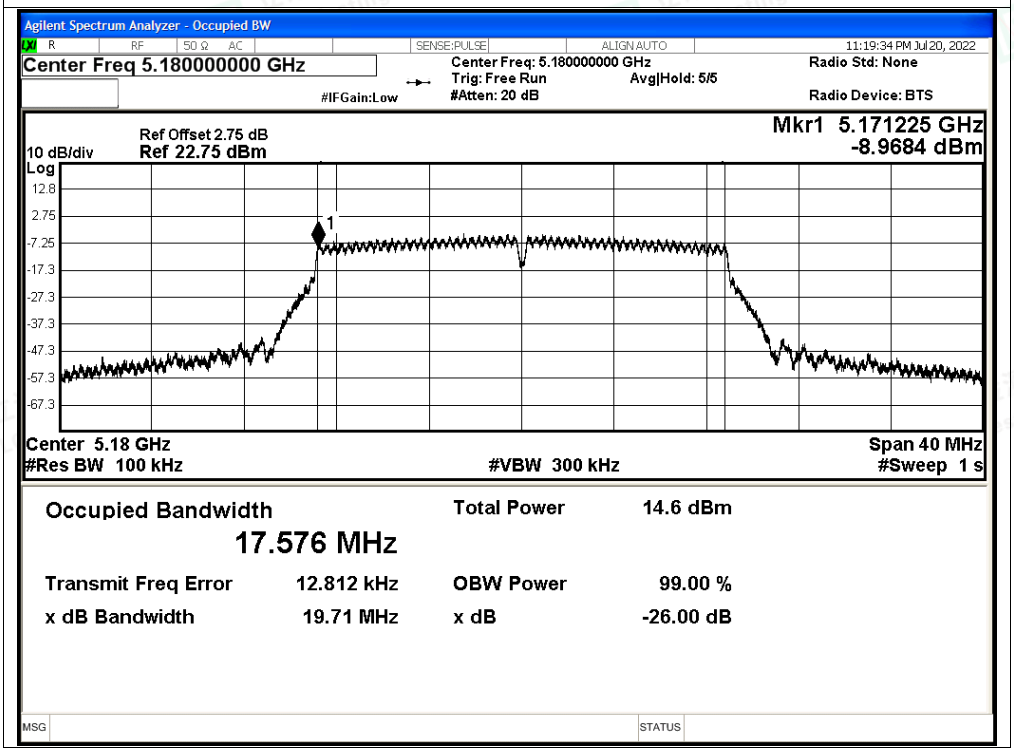
Condition	Mode	Frequency (MHz)	Antenna	Center Frequency (MHz)	OBW (MHz)	Verdict
NVNT	a	5180	Ant0	5180.024	16.359	Pass
NVNT	n20	5180	Ant0	5180.013	17.576	Pass
NVNT	n40	5190	Ant0	5190.006	35.781	Pass
NVNT	ac20	5180	Ant0	5180.008	17.574	Pass
NVNT	ac40	5190	Ant0	5190.001	35.783	Pass
NVNT	ac80	5210	Ant0	5209.969	74.989	Pass

Test Graphs

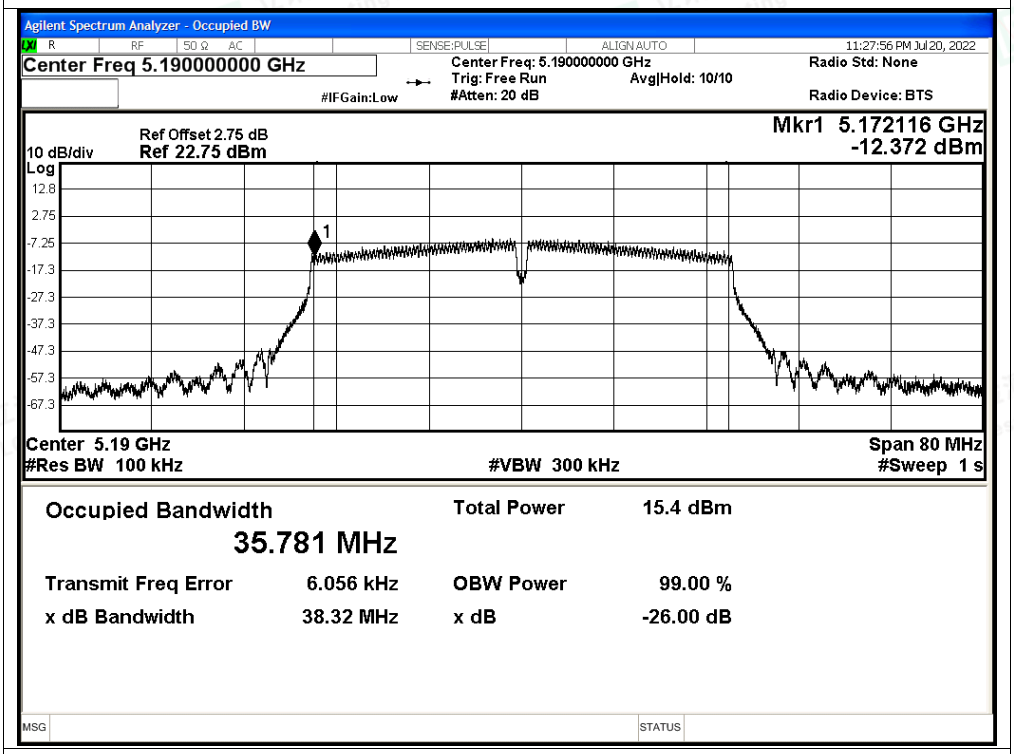
OBW NVNT a 5180MHz Ant0



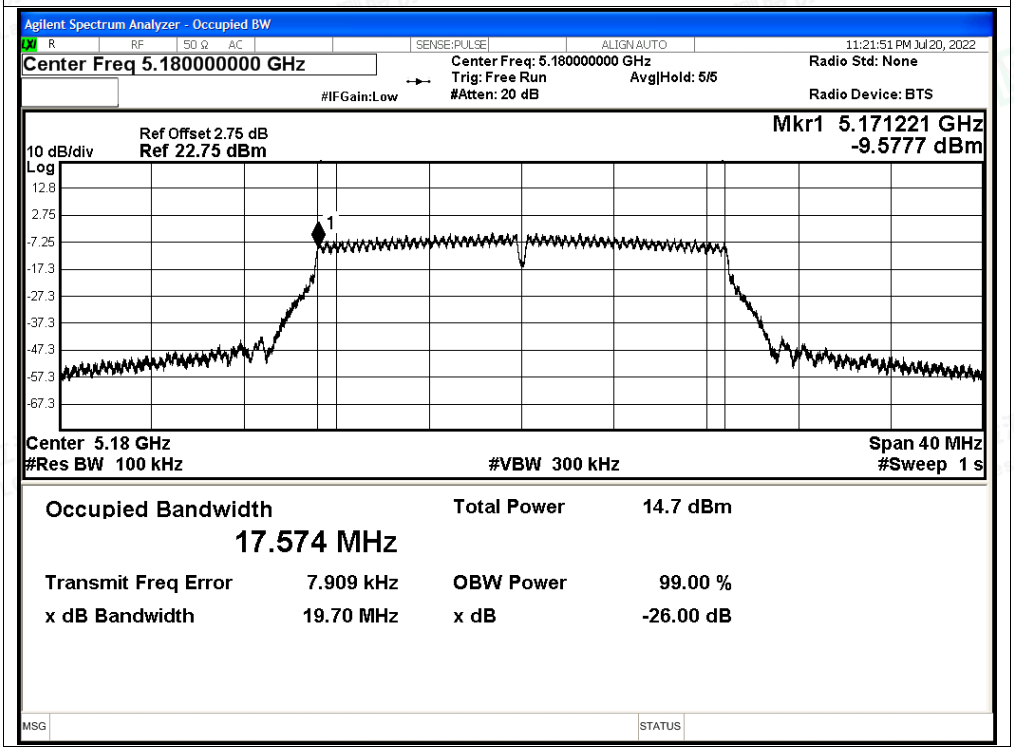
OBW NVNT n20 5180MHz Ant0



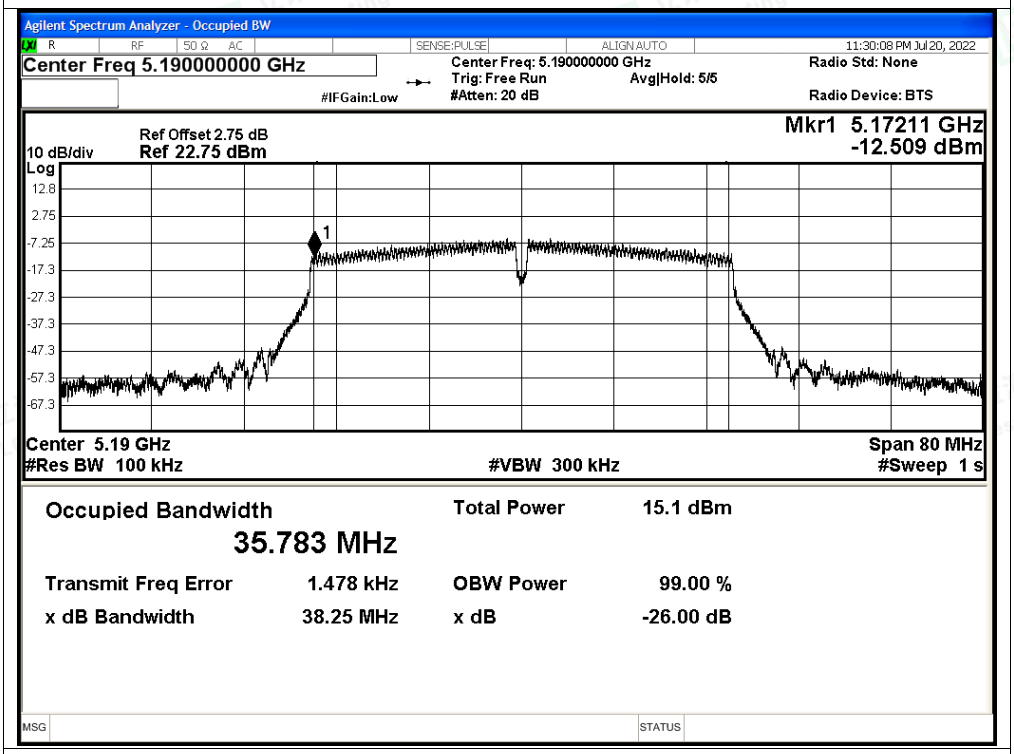
OBW NVNT n40 5190MHz Ant0



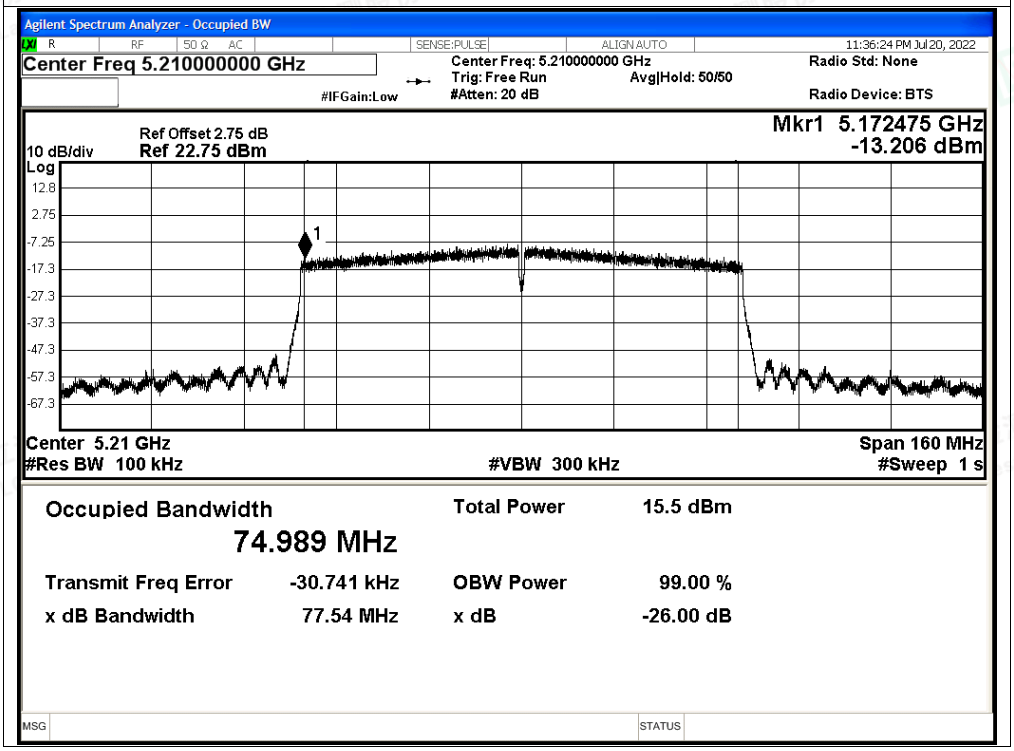
OBW NVNT ac20 5180MHz Ant0



OBW NVNT ac40 5190MHz Ant0



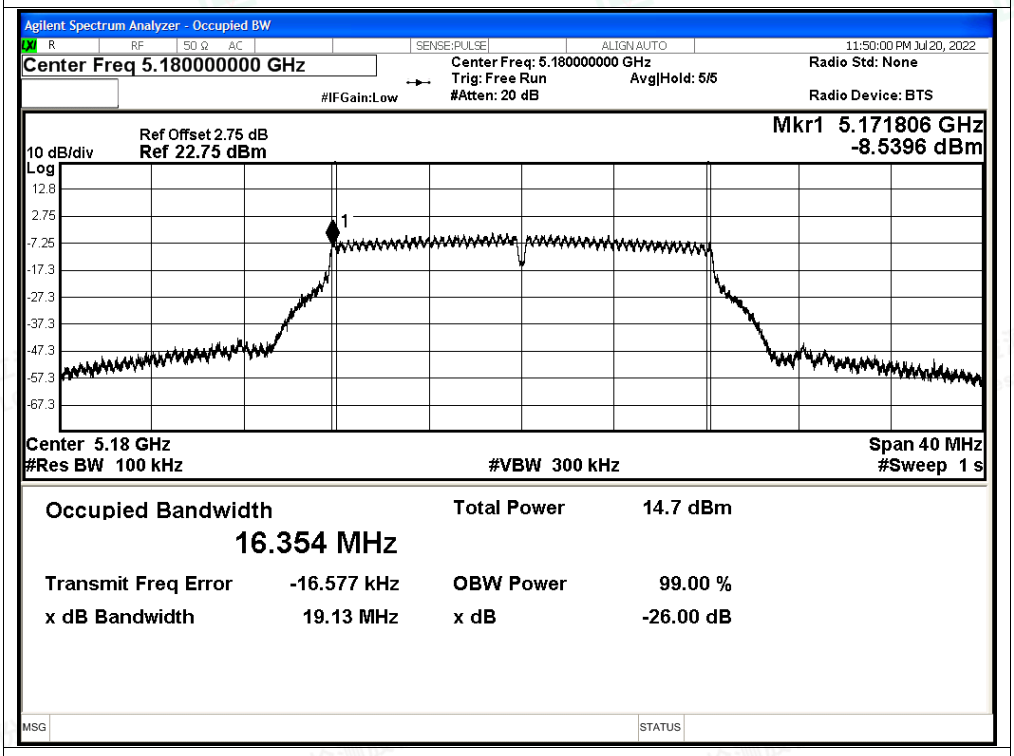
OBW NVNT ac80 5210MHz Ant0



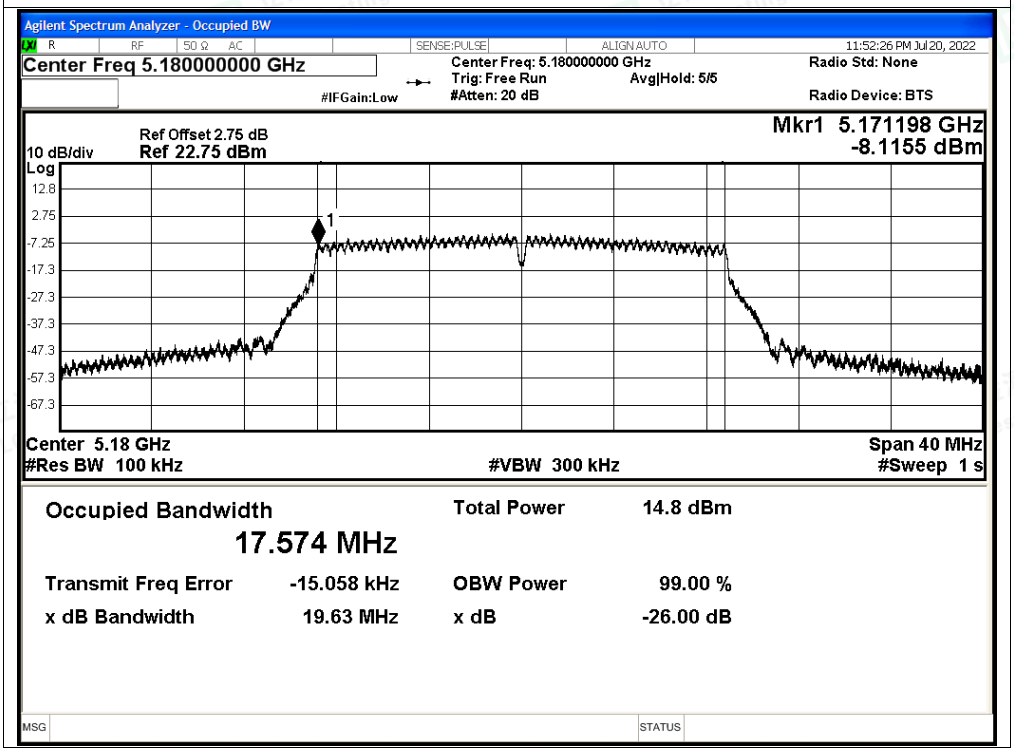
Condition	Mode	Frequency (MHz)	Antenna	Center Frequency (MHz)	OBW (MHz)	Verdict
NVNT	a	5180	Ant1	5179.983	16.354	Pass
NVNT	n20	5180	Ant1	5179.985	17.574	Pass
NVNT	n40	5190	Ant1	5189.979	35.786	Pass
NVNT	ac20	5180	Ant1	5179.98	17.567	Pass
NVNT	ac40	5190	Ant1	5189.981	35.773	Pass
NVNT	ac80	5210	Ant1	5209.841	74.96	Pass

Test Graphs

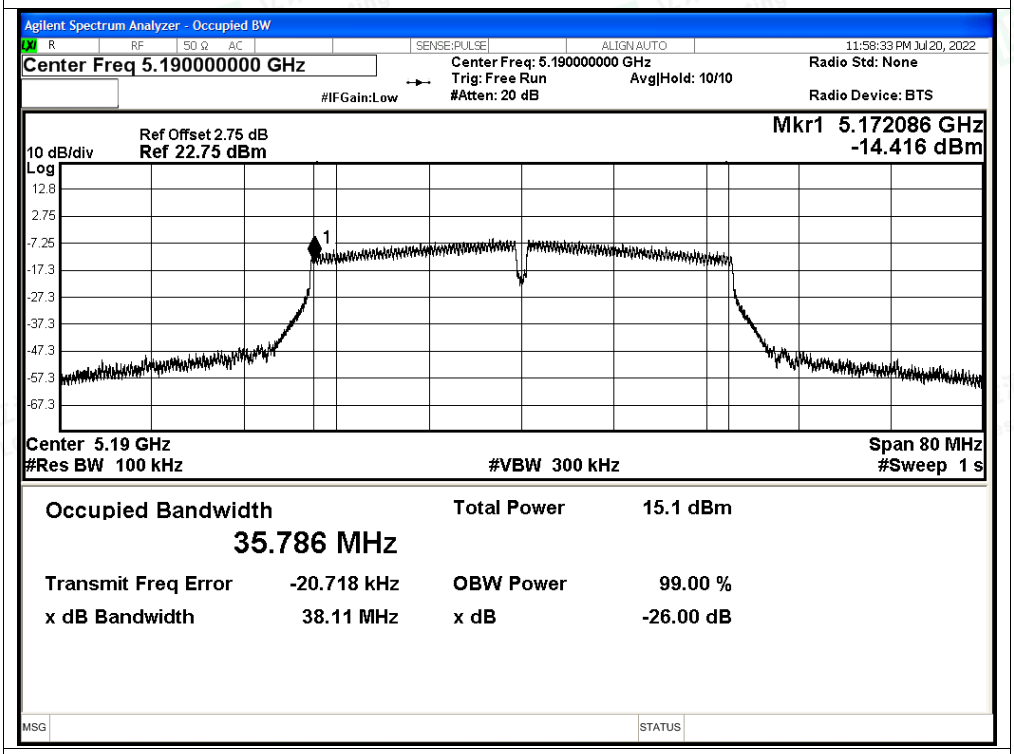
OBW NVNT a 5180MHz Ant1



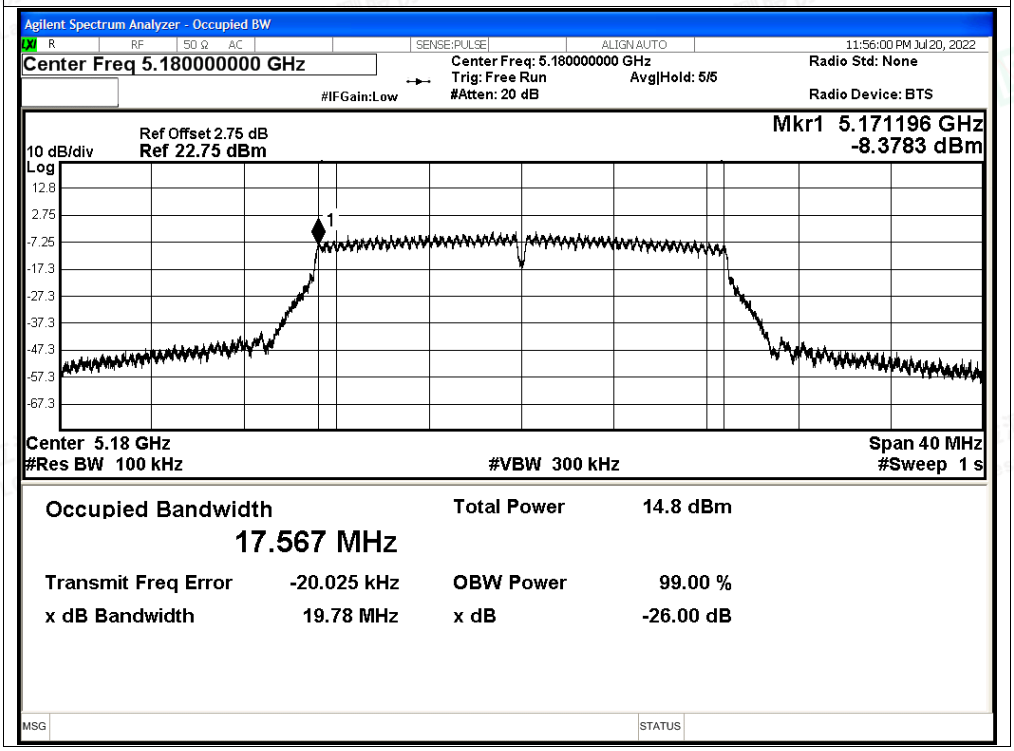
OBW NVNT n20 5180MHz Ant1



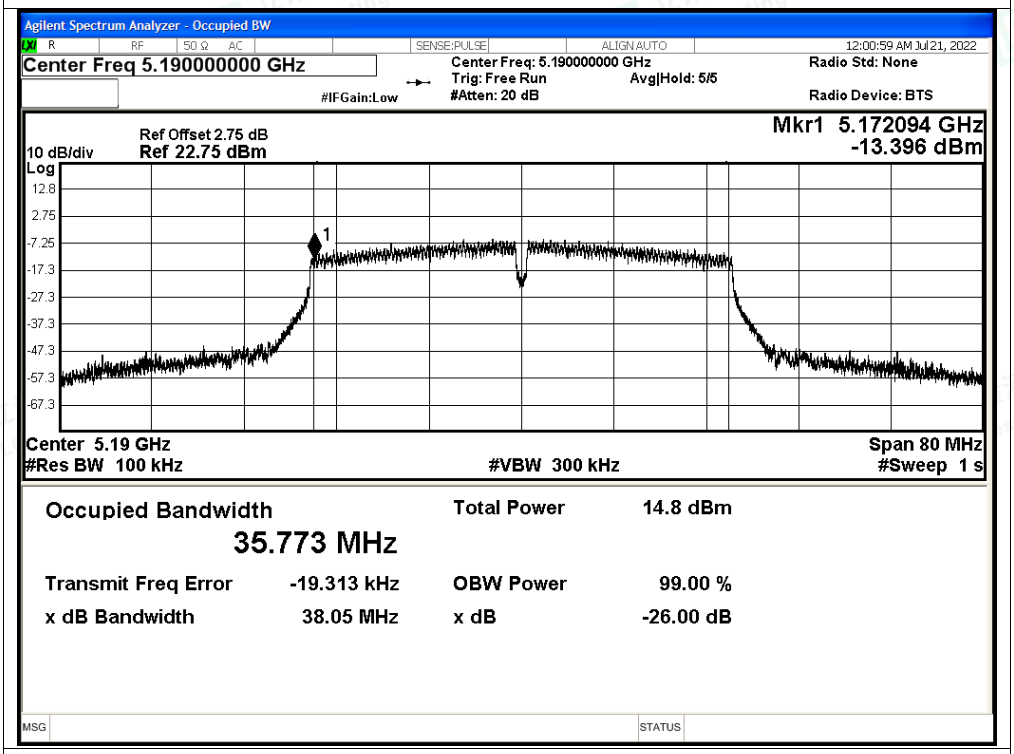
OBW NVNT n40 5190MHz Ant1



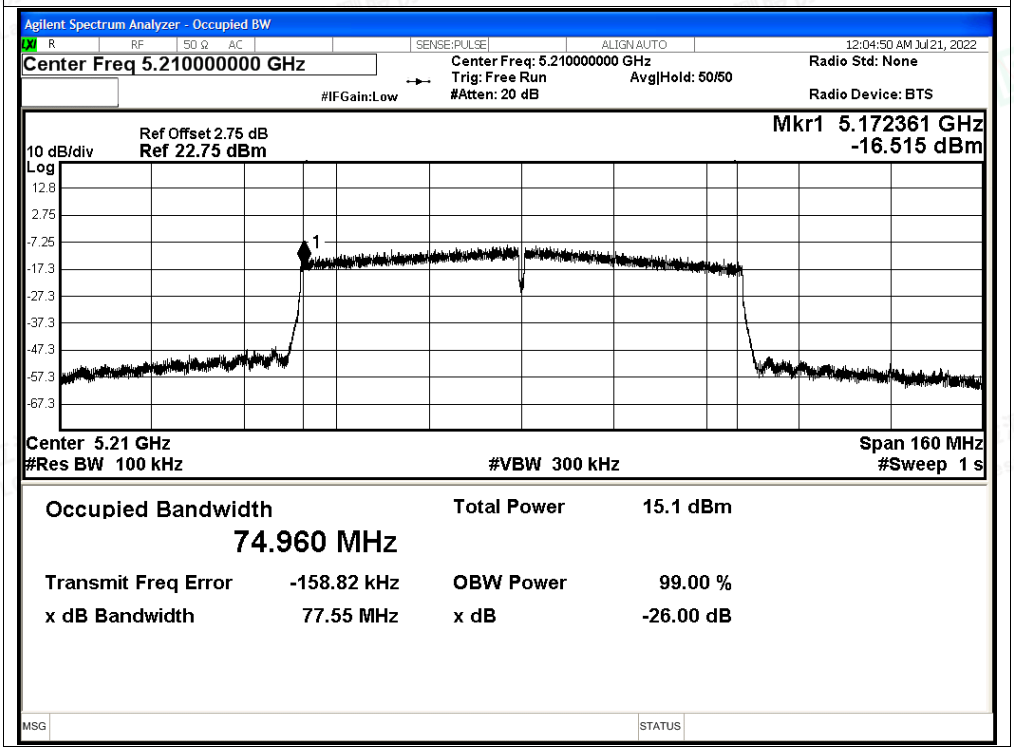
OBW NVNT ac20 5180MHz Ant1



OBW NVNT ac40 5190MHz Ant1



OBW NVNT ac80 5210MHz Ant1



F.3 RF Output Power

Condition	Mode	Frequency (MHz)	Max EIRP (dBm)			Limit (dBm)	Verdict
			ANT0	ANT1	ANT0+ANT1		
NVNT	a	5180	13.39	13.44	/	23	Pass
NVNT	n20	5180	13.3	13.37	16.35	23	Pass
NVNT	n40	5190	13.63	13.65	16.65	23	Pass
NVNT	ac20	5180	13.37	13.39	16.39	23	Pass
NVNT	ac40	5190	13.77	13.65	16.72	23	Pass
NVNT	ac80	5210	13.82	13.37	16.61	23	Pass

Condition	Mode	Frequency (MHz)	Max EIRP (dBm)			Limit (dBm)	Verdict
			ANT0	ANT1	ANT0+ANT1		
NVLT	a	5180	13.38	13.34	/	23	Pass
NVLT	n20	5180	13.25	13.28	16.28	23	Pass
NVLT	n40	5190	13.59	13.59	16.60	23	Pass
NVLT	ac20	5180	13.30	13.32	16.32	23	Pass
NVLT	ac40	5190	13.73	13.59	16.67	23	Pass
NVLT	ac80	5210	13.78	13.31	16.56	23	Pass

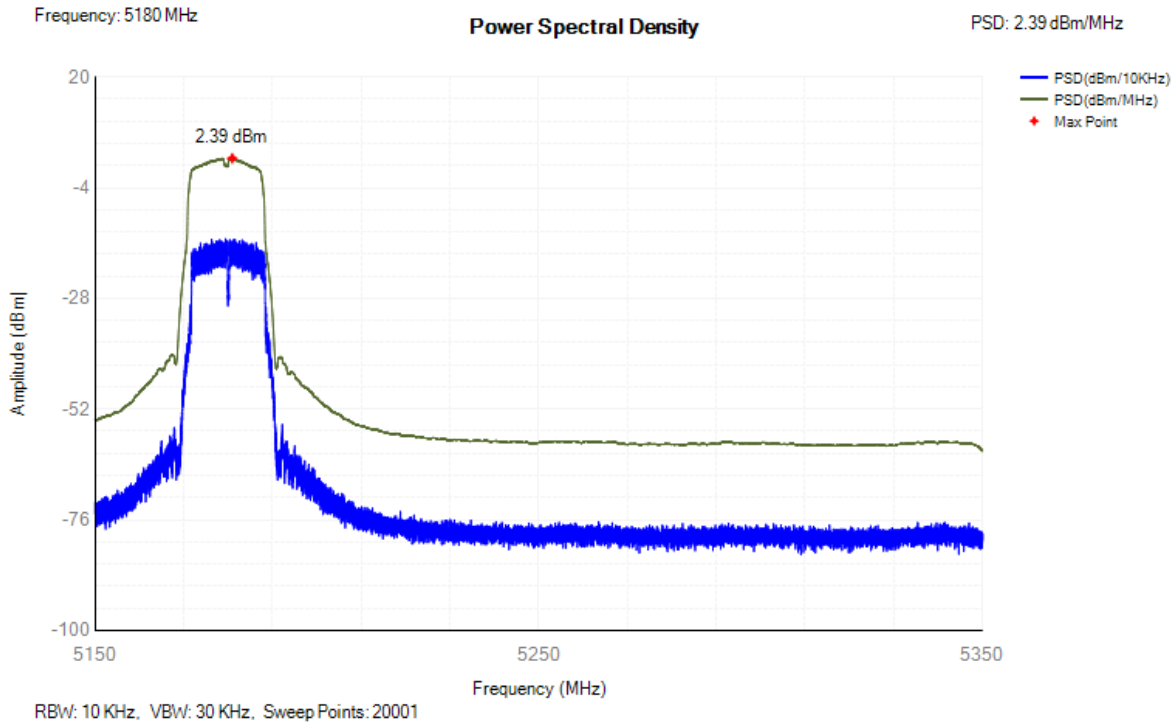
Condition	Mode	Frequency (MHz)	Max EIRP (dBm)			Limit (dBm)	Verdict
			ANT0	ANT1	ANT0+ANT1		
NVHT	a	5180	13.30	13.24	/	23	Pass
NVHT	n20	5180	13.20	13.22	16.22	23	Pass
NVHT	n40	5190	13.54	13.50	16.53	23	Pass
NVHT	ac20	5180	13.24	13.29	16.28	23	Pass
NVHT	ac40	5190	13.71	13.53	16.63	23	Pass
NVHT	ac80	5210	13.74	13.29	16.53	23	Pass

***Note: 20 bursts had been captured for power measurement.

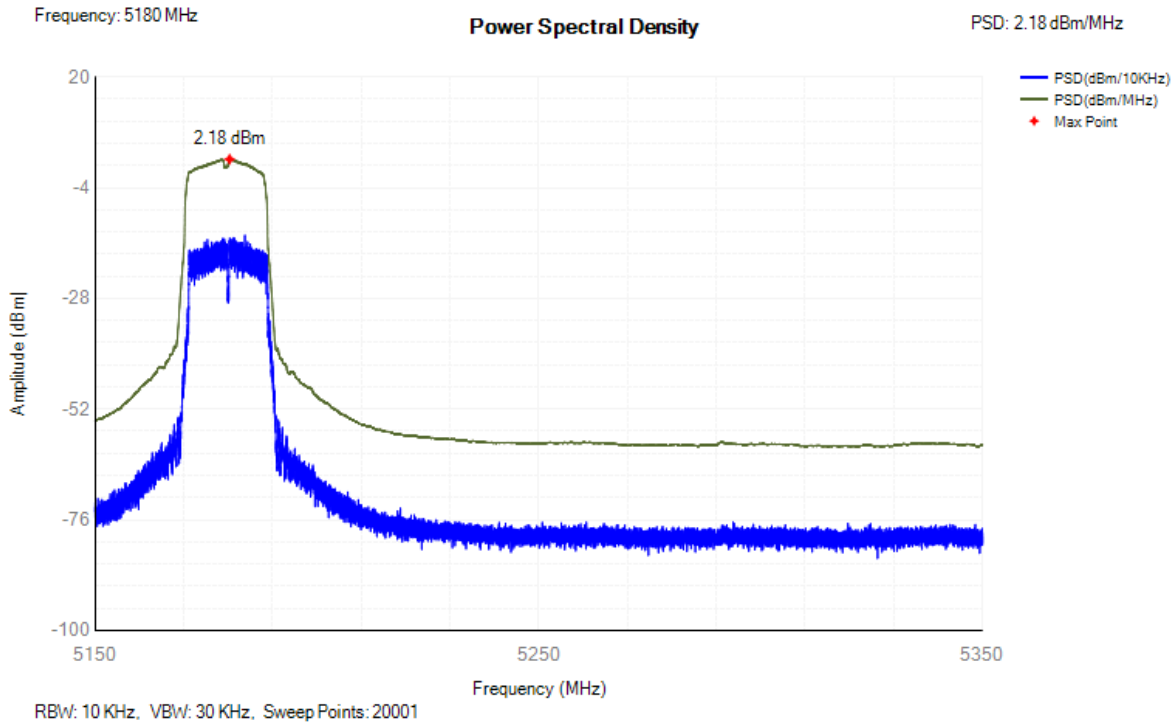
F.4 Power Spectral Density

Condition	Mode	Frequency (MHz)	Max PSD (dBm/MHz)			Limit (dBm/MHz)	Verdict
			ANT0	ANT1	ANT0+ANT1		
NVNT	a	5180	2.39	2.65	/	10	Pass
NVNT	n20	5180	2.18	2.35	5.28	10	Pass
NVNT	n40	5190	0.37	0.26	3.33	10	Pass
NVNT	ac20	5180	2.35	2.4	5.39	10	Pass
NVNT	ac40	5190	0.5	0.27	3.40	10	Pass
NVNT	ac80	5210	-2.36	-2.77	0.45	10	Pass

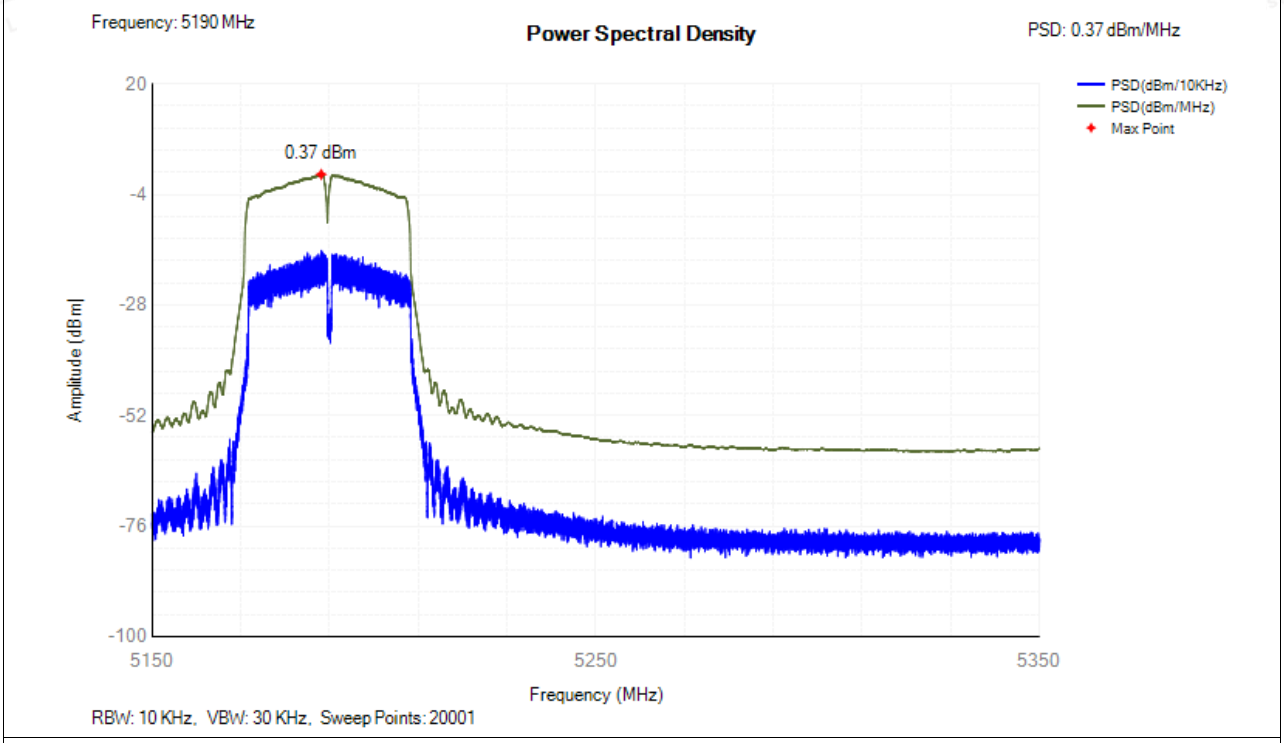
Test Graphs
PSD NVNT a 5180MHz Ant0



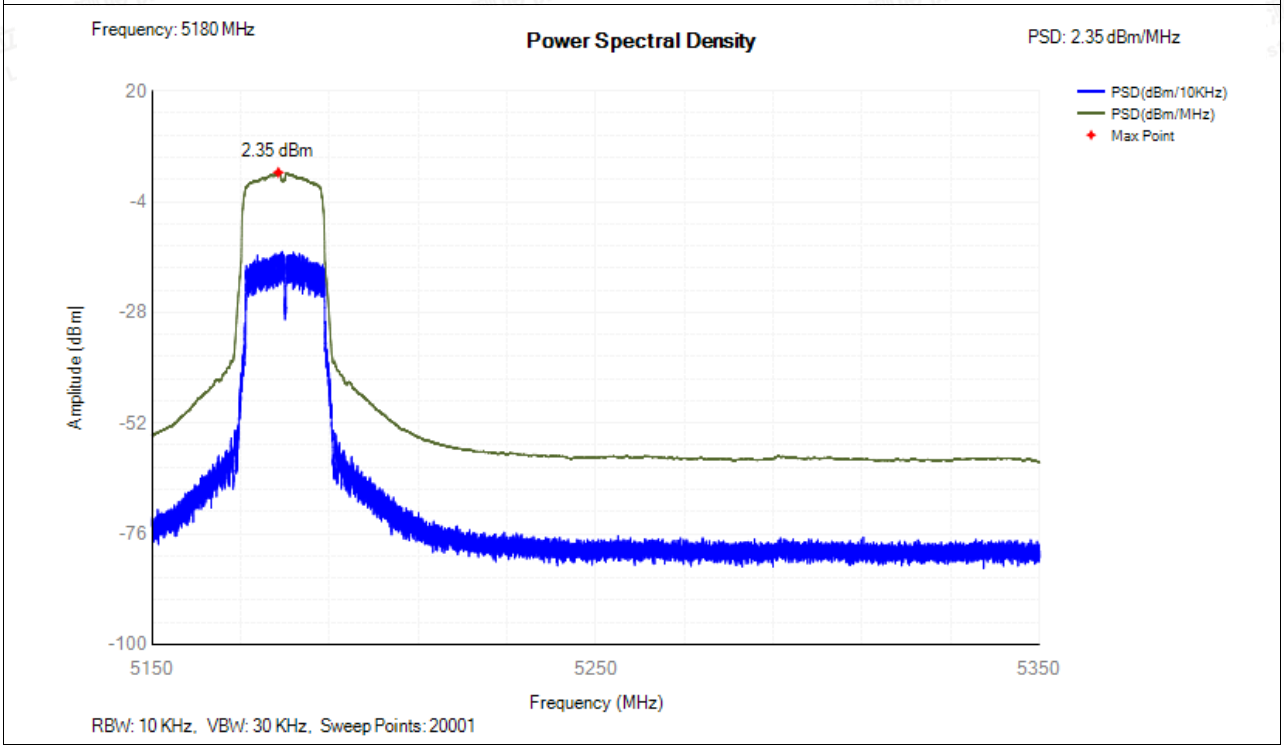
PSD NVNT n20 5180MHz Ant0



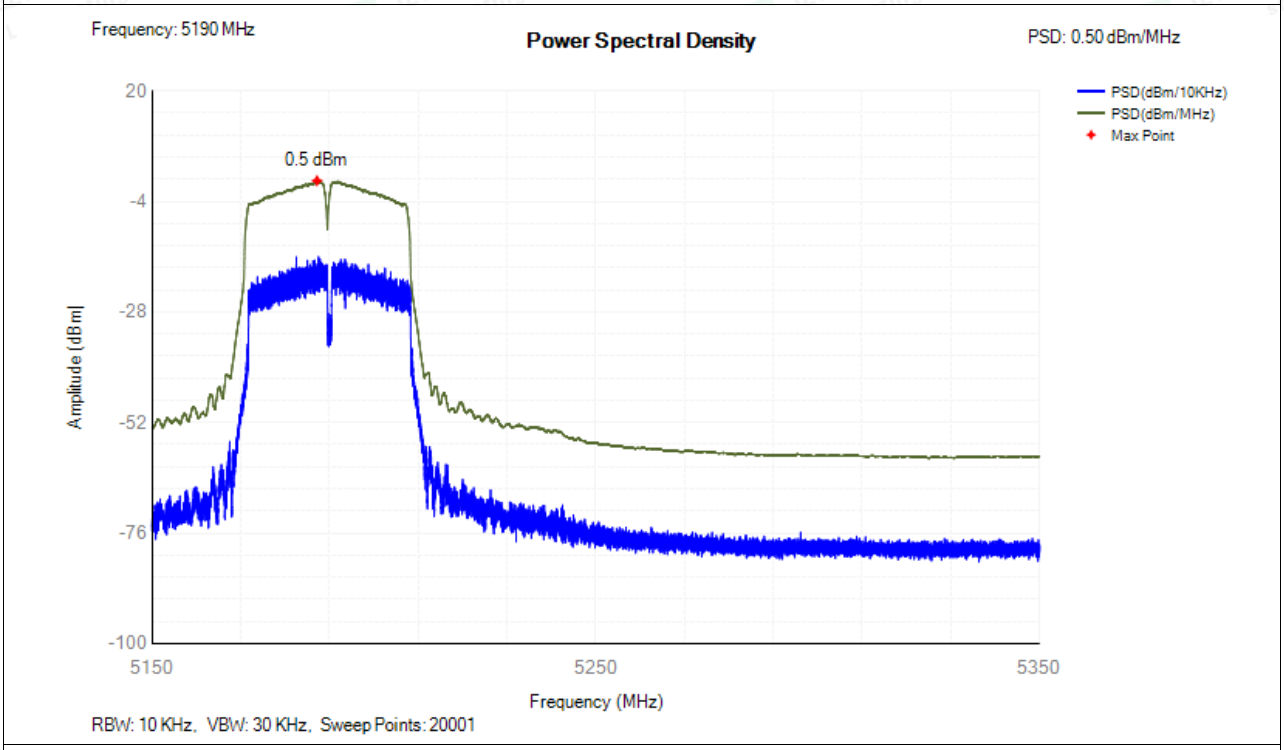
PSD NVNT n40 5190MHz Ant0



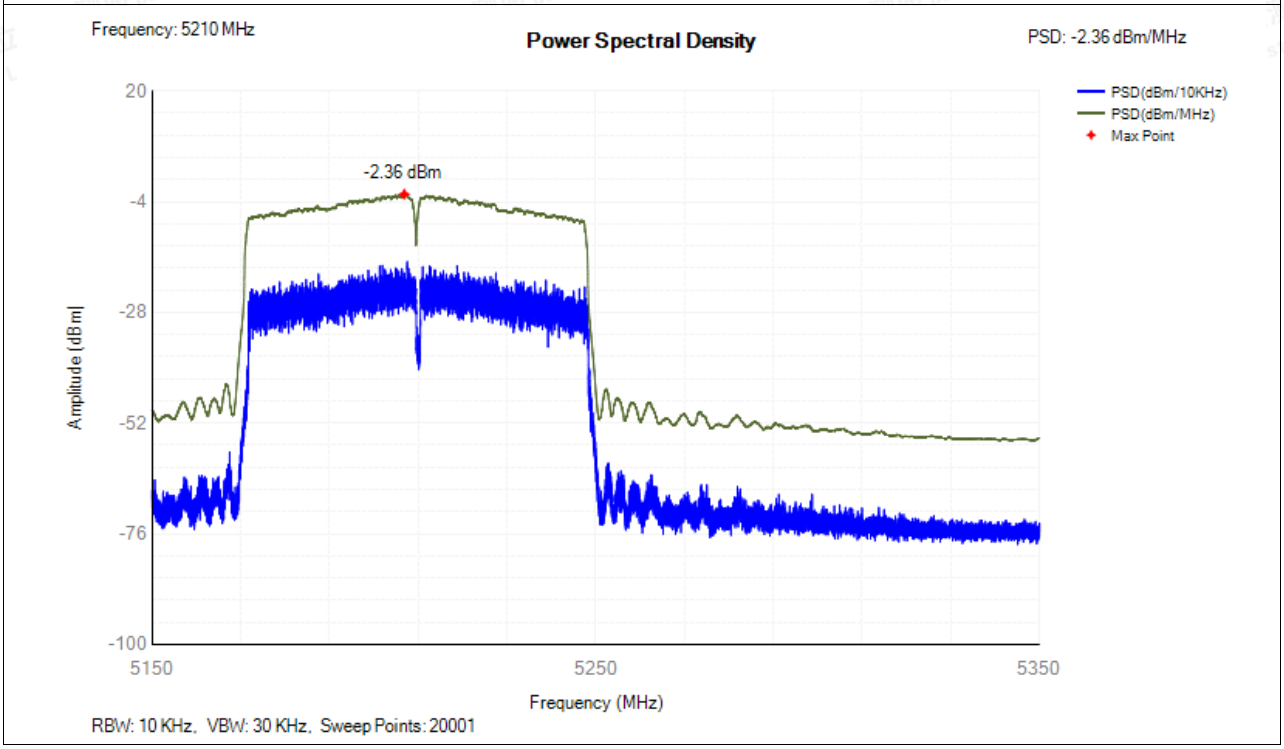
PSD NVNT ac20 5180MHz Ant0



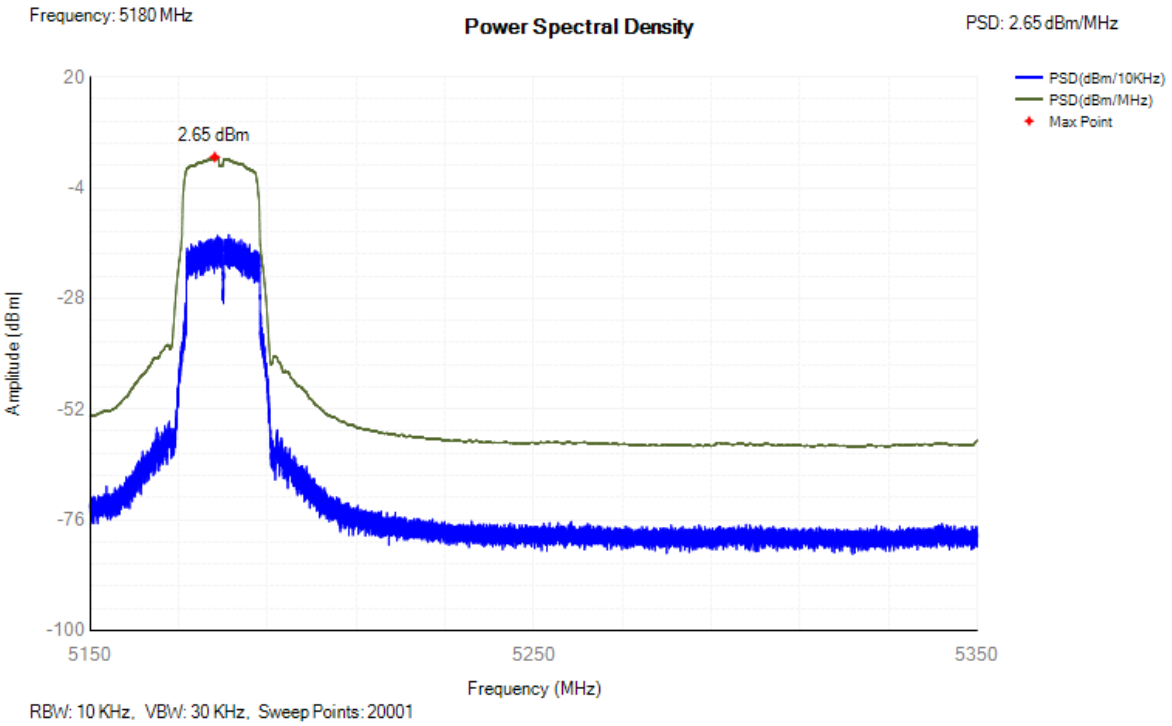
PSD NVNT ac40 5190MHz Ant0



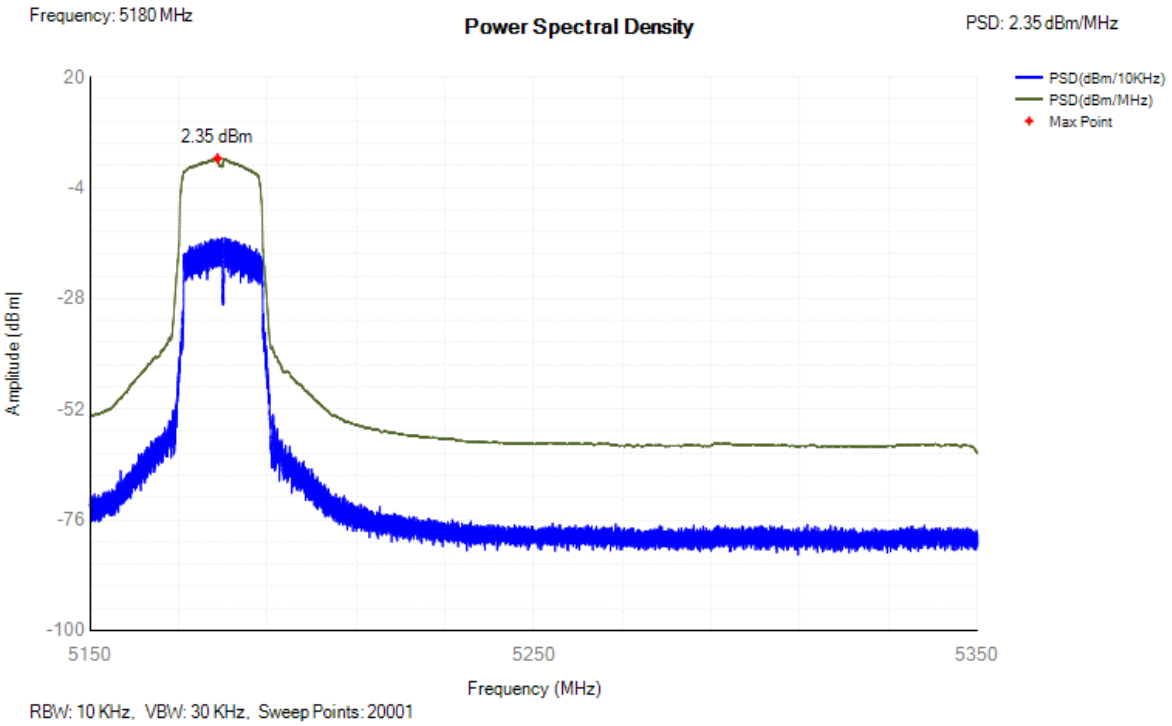
PSD NVNT ac80 5210MHz Ant0



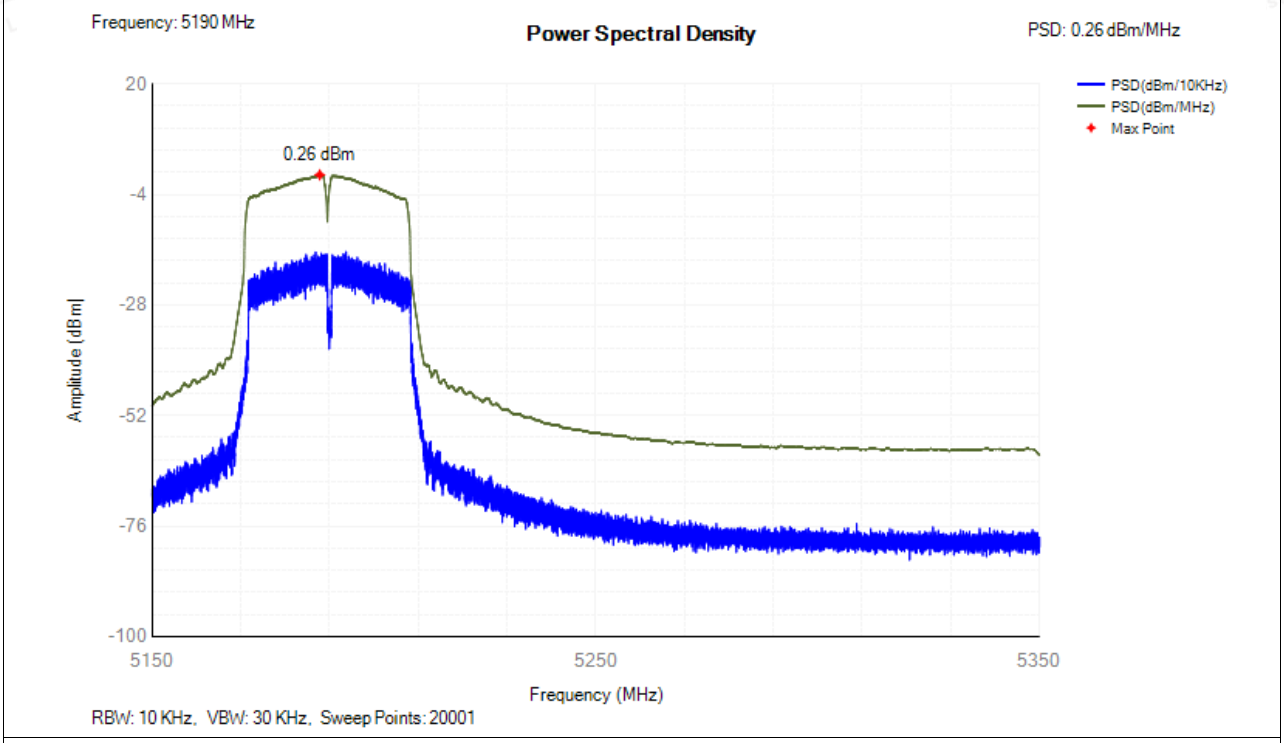
Test Graphs
PSD NVNT a 5180MHz Ant1



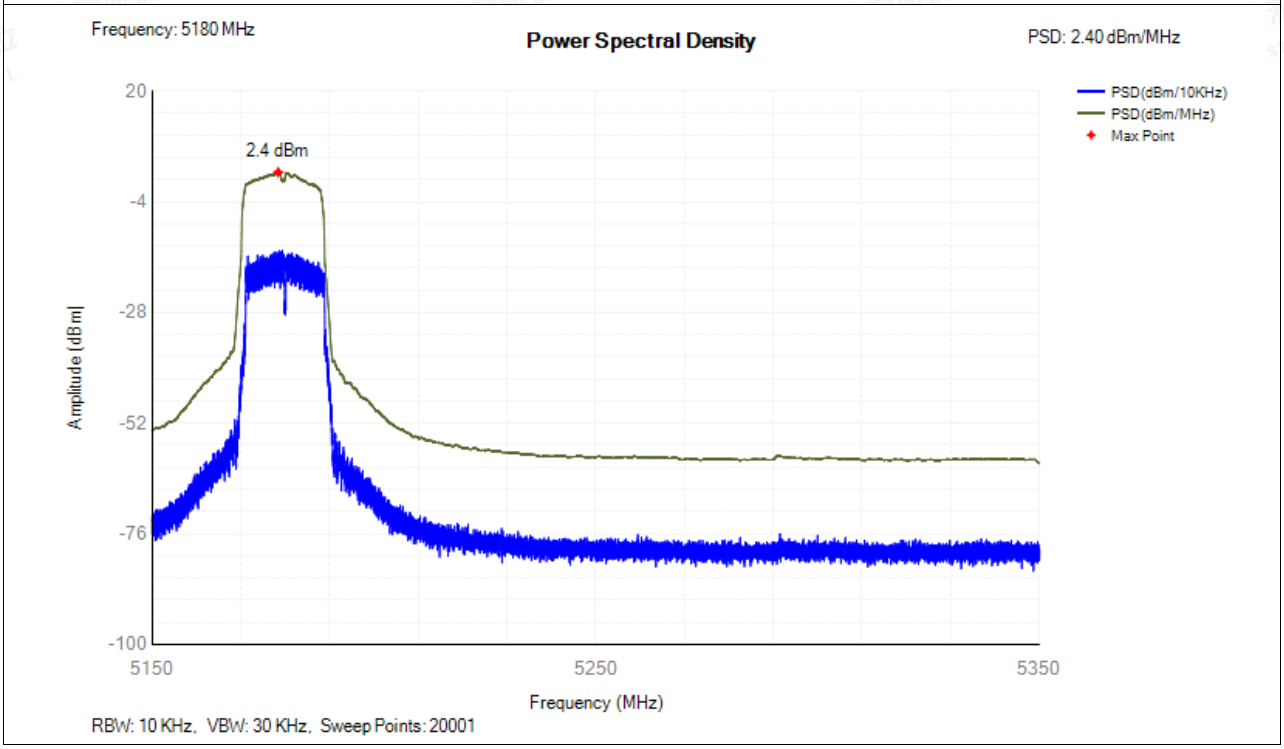
PSD NVNT n20 5180MHz Ant1



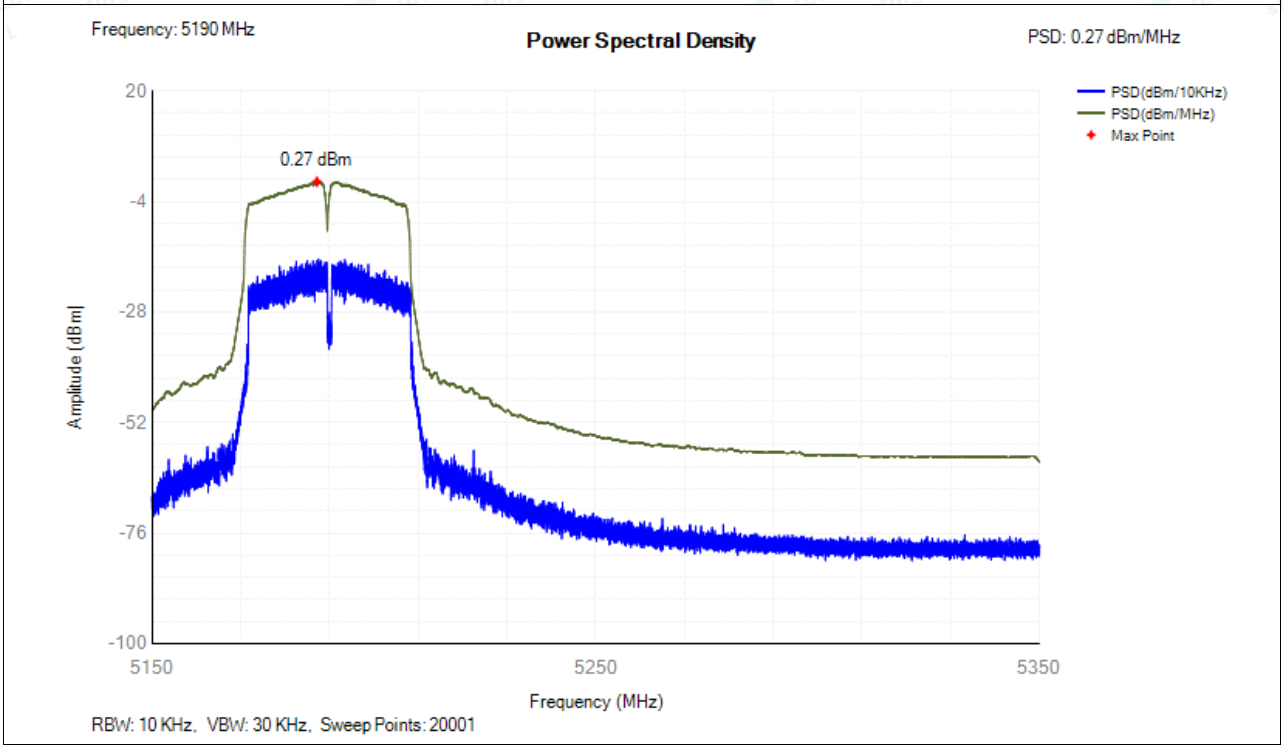
PSD NVNT n40 5190MHz Ant1



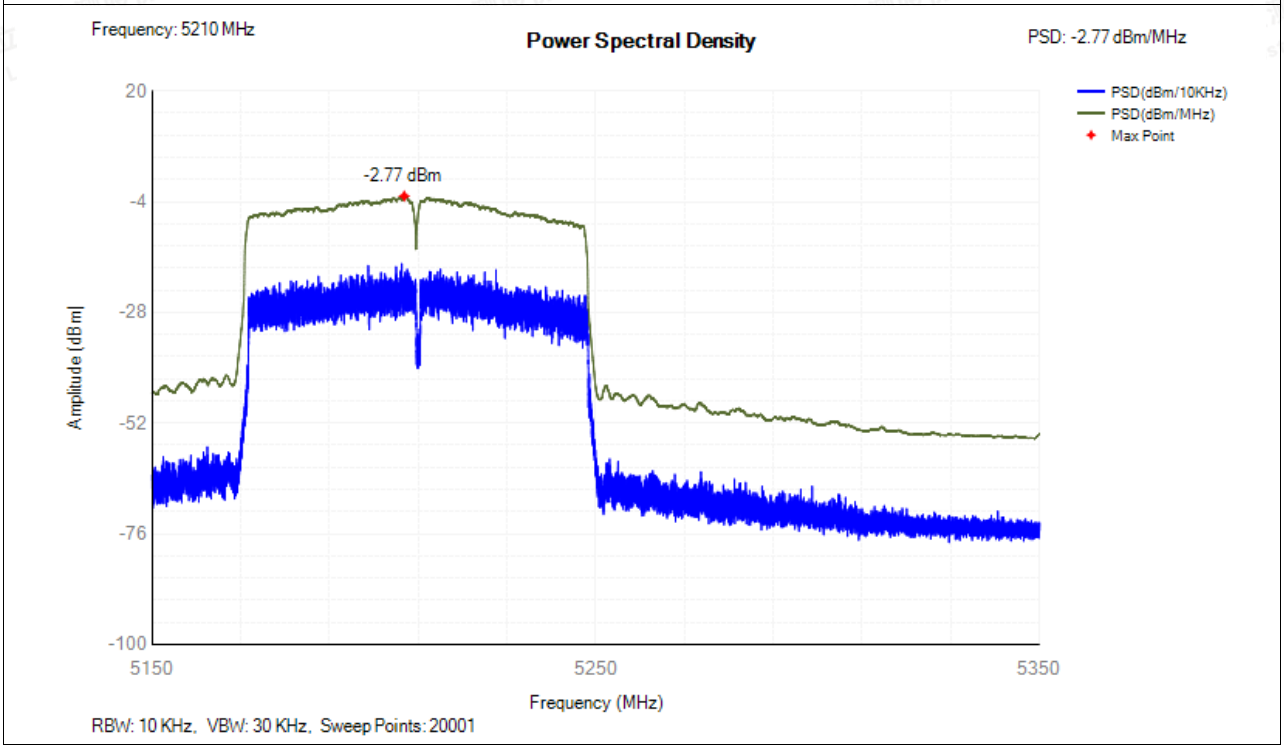
PSD NVNT ac20 5180MHz Ant1



PSD NVNT ac40 5190MHz Ant1



PSD NVNT ac80 5210MHz Ant1



F.5 Transmitter unwanted emissions in the spurious domain

The Worst Case: ANT0

The Worst Test Result For 802.11a					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 36 (5180MHz)					
54.94	H	-84.93	-54.00	-30.93	PK
62.75	V	-74.87	-54.00	-20.87	PK
809.46	H	-77.81	-54.00	-23.81	PK
919.83	V	-76.52	-36.00	-40.52	PK
3473.72	H	-50.48	-30.00	-20.48	PK
3476.53	V	-61.70	-30.00	-31.70	PK
10360.02	H	-54.85	-30.00	-24.85	PK
10360.07	V	-51.39	-30.00	-21.39	PK

The Worst Test Result For 802.11n(20MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 36 (5180MHz)					
58.82	H	-81.54	-54.00	-27.54	PK
65.02	V	-73.91	-54.00	-19.91	PK
810.44	H	-75.83	-54.00	-21.83	PK
924.07	V	-74.42	-36.00	-38.42	PK
3466.57	H	-49.62	-30.00	-19.62	PK
3469.30	V	-60.76	-30.00	-30.76	PK
10360.08	H	-52.62	-30.00	-22.62	PK
10360.07	V	-50.47	-30.00	-20.47	PK

The Worst Test Result For 802.11ac(20MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 36 (5180MHz)					
57.53	H	-81.02	-54.00	-27.02	PK
65.00	V	-73.50	-54.00	-19.50	PK
809.38	H	-75.42	-54.00	-21.42	PK
926.45	V	-74.04	-36.00	-38.04	PK
3470.09	H	-48.94	-30.00	-18.94	PK
3498.11	V	-61.28	-30.00	-31.28	PK
10360.08	H	-52.80	-30.00	-22.80	PK
10360.02	V	-50.40	-30.00	-20.40	PK

The Worst Test Result For 802.11n(40MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 38 (5190MHz)					
59.79	H	-83.44	-54.00	-29.44	PK
68.24	V	-72.93	-54.00	-18.93	PK
810.38	H	-76.24	-54.00	-22.24	PK
923.05	V	-74.00	-36.00	-38.00	PK
3486.48	H	-48.51	-30.00	-18.51	PK
3477.27	V	-60.06	-30.00	-30.06	PK
10380.09	H	-53.89	-30.00	-23.89	PK
10380.05	V	-50.44	-30.00	-20.44	PK

The Worst Test Result For 802.11ac(40MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 38 (5190MHz)					
59.01	H	-82.59	-54.00	-28.59	PK
65.13	V	-73.64	-54.00	-19.64	PK
810.02	H	-75.51	-54.00	-21.51	PK
923.77	V	-73.95	-36.00	-37.95	PK
3472.85	H	-48.64	-30.00	-18.64	PK
3501.18	V	-60.16	-30.00	-30.16	PK
10380.09	H	-54.03	-30.00	-24.03	PK
10380.07	V	-50.20	-30.00	-20.20	PK

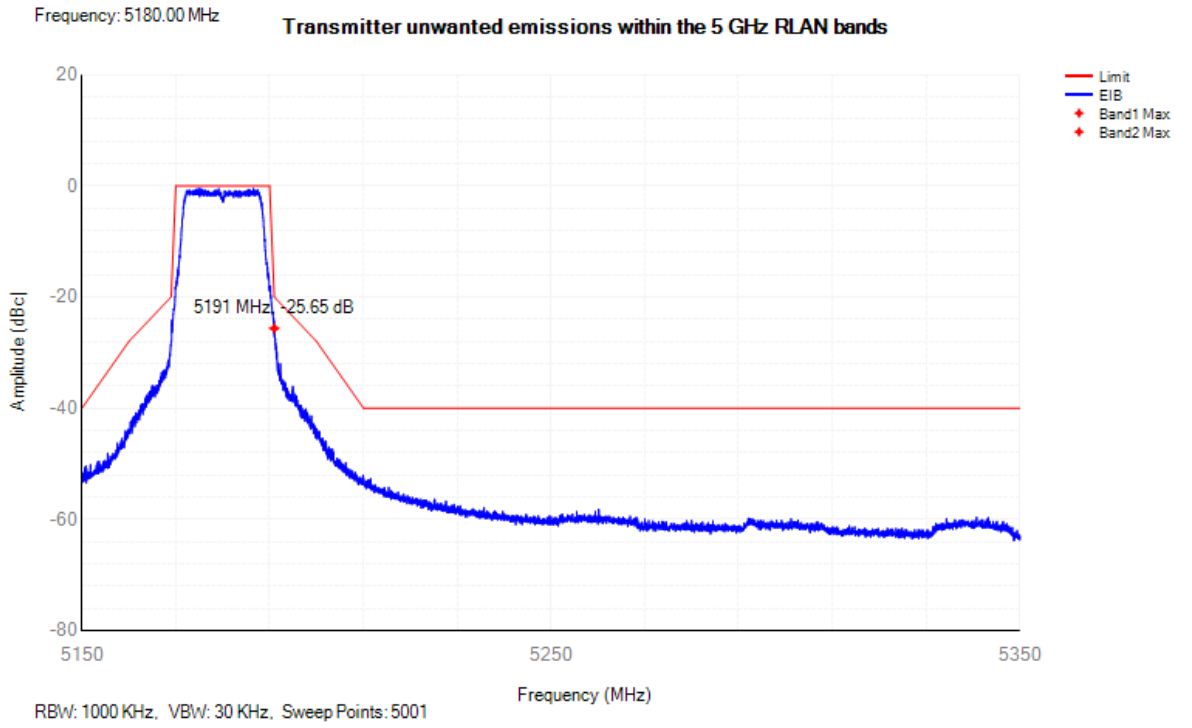
The Worst Test Result For 802.11ac(80MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 42(5210MHz)					
59.03	H	-82.81	-54.00	-28.81	PK
66.11	V	-73.83	-54.00	-19.83	PK
808.48	H	-76.70	-54.00	-22.70	PK
921.63	V	-73.76	-36.00	-37.76	PK
3477.30	H	-49.60	-30.00	-19.60	PK
3479.35	V	-60.43	-30.00	-30.43	PK
10420.10	H	-53.63	-30.00	-23.63	PK
10420.09	V	-50.93	-30.00	-20.93	PK

Note: All test modes were tested, but we only recorded the worst case in this report. (Low Channel)

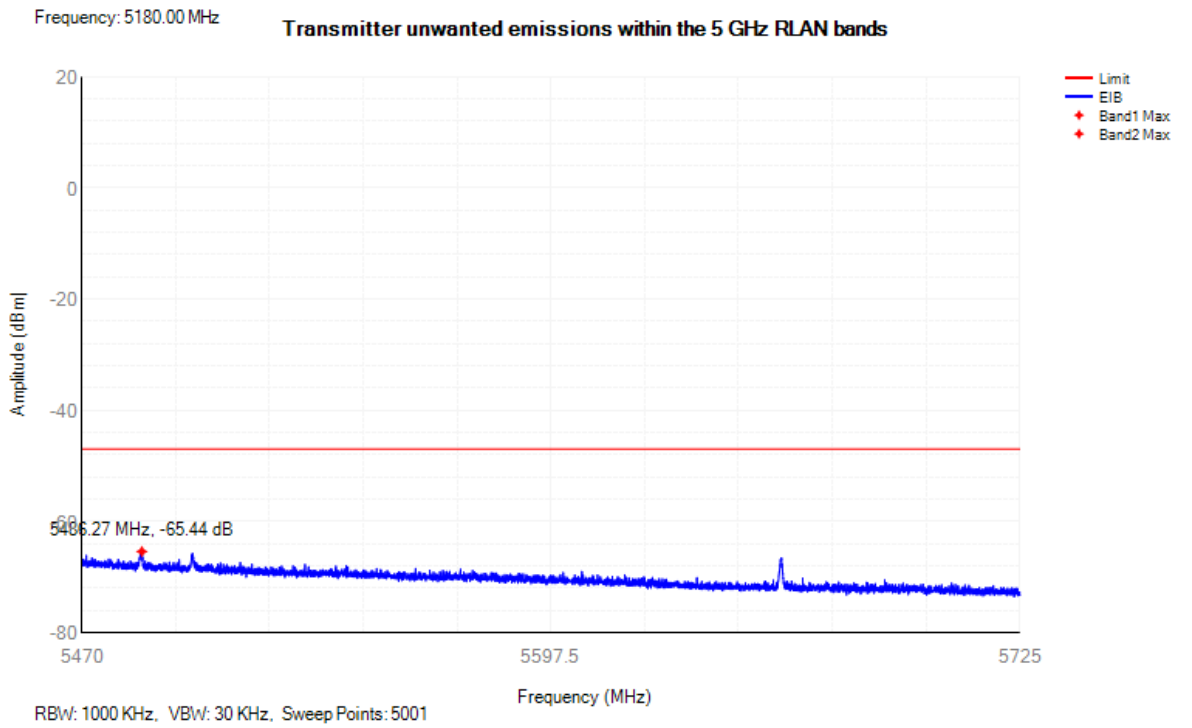
F.6 Transmitter unwanted emissions within the 5 GHz RLAN bands

Condition	Mode	Frequency (MHz)	Antenna	Sub Band	Worst EIB Frequency (MHz)	Level (dB)	Limit (dB)	Verdict
NVNT	a	5180	Ant0	Band1	5191	-25.65	-20	Pass
NVNT	a	5180	Ant0	Band2	5486.27	-65.44	-47	Pass
NVNT	n20	5180	Ant0	Band1	5190.96	-20.46	-19.2	Pass
NVNT	n20	5180	Ant0	Band2	5486.12	-64.99	-47	Pass
NVNT	n40	5190	Ant0	Band1	5250.96	-51.97	-40	Pass
NVNT	n40	5190	Ant0	Band2	5669.87	-66.66	-47	Pass
NVNT	ac20	5180	Ant0	Band1	5169	-20.99	-20	Pass
NVNT	ac20	5180	Ant0	Band2	5486.01	-66.14	-47	Pass
NVNT	ac40	5190	Ant0	Band1	5248.64	-51.22	-39.18	Pass
NVNT	ac40	5190	Ant0	Band2	5669.92	-66.47	-47	Pass
NVNT	ac80	5210	Ant0	Band1	5336.44	-54.25	-40	Pass
NVNT	ac80	5210	Ant0	Band2	5470.51	-61.98	-40	Pass

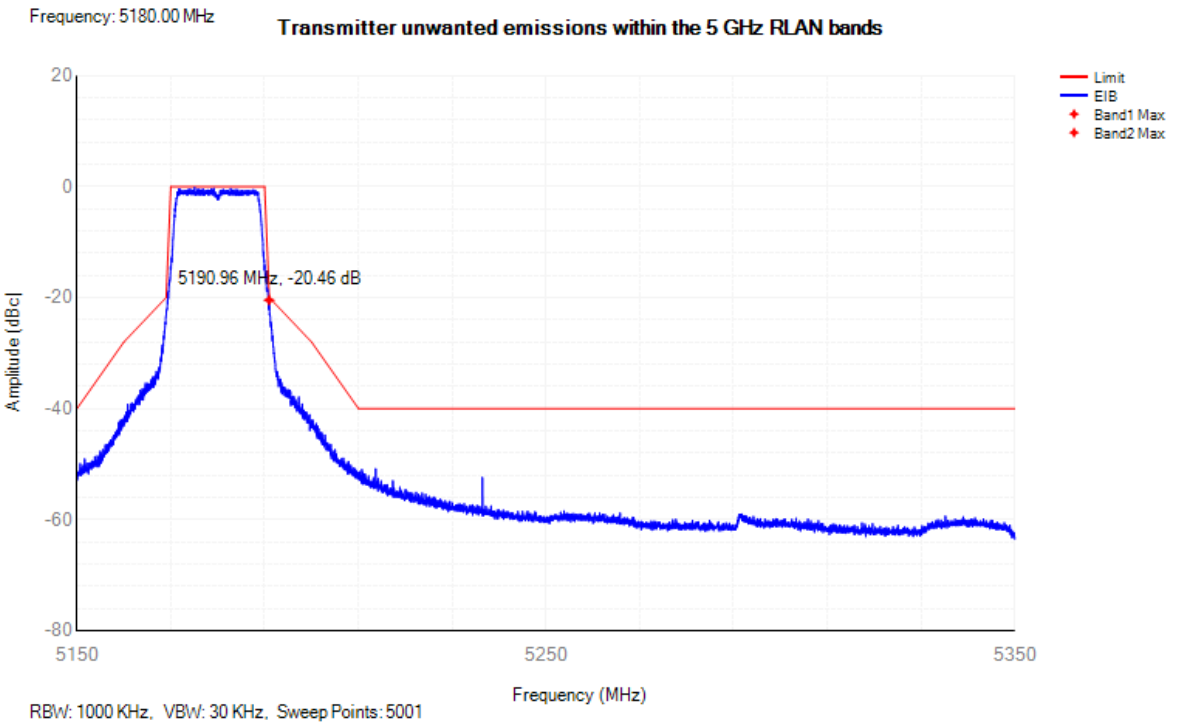
Test Graphs
Tx. Emissions EIB NVNT a 5180MHz Sub Band1



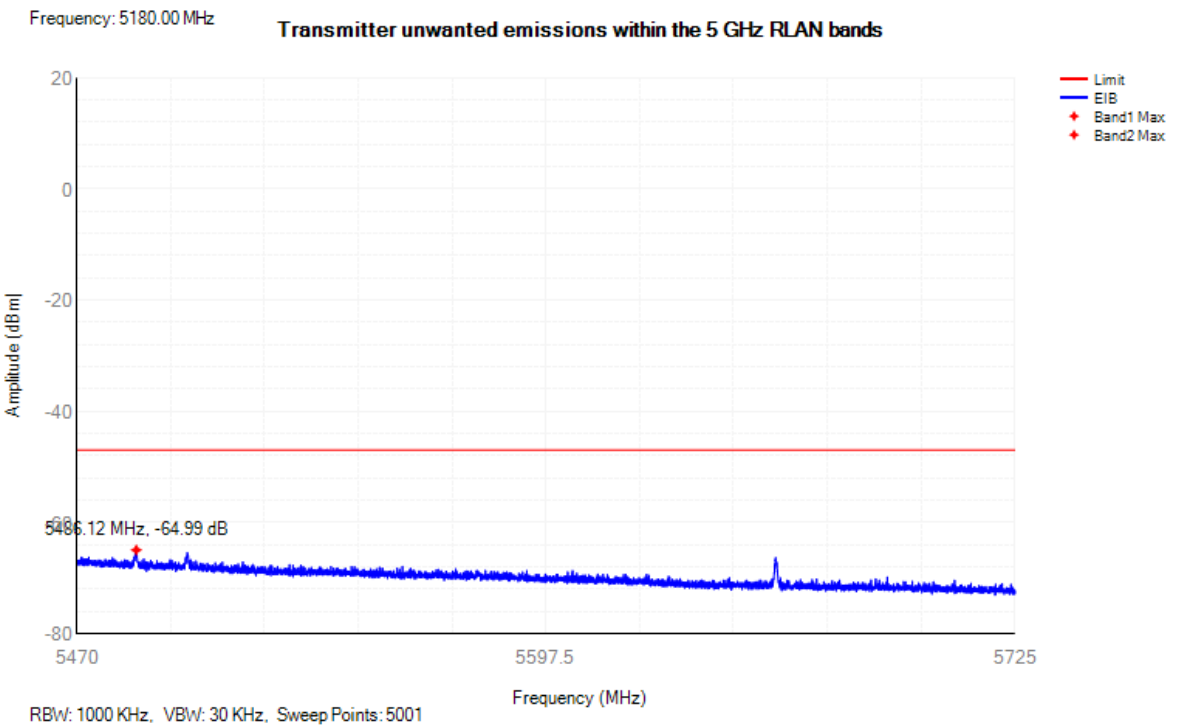
Tx. Emissions EIB NVNT a 5180MHz Sub Band2



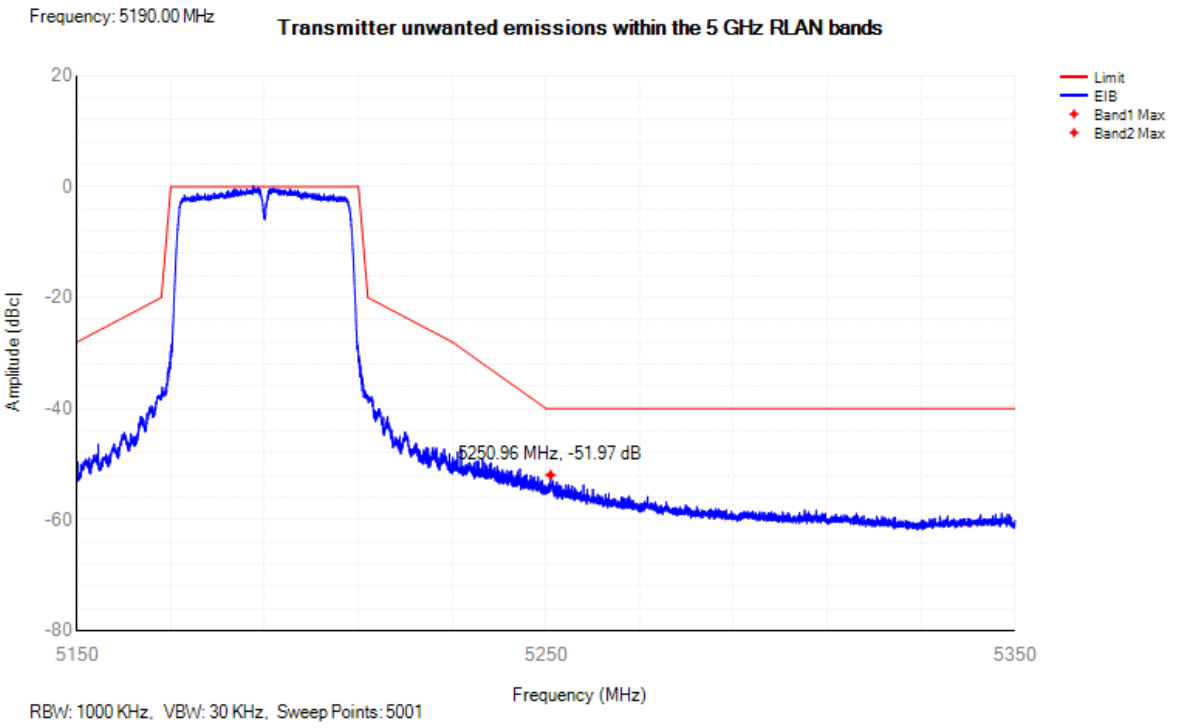
Tx. Emissions EIB NVNT n20 5180MHz Sub Band1



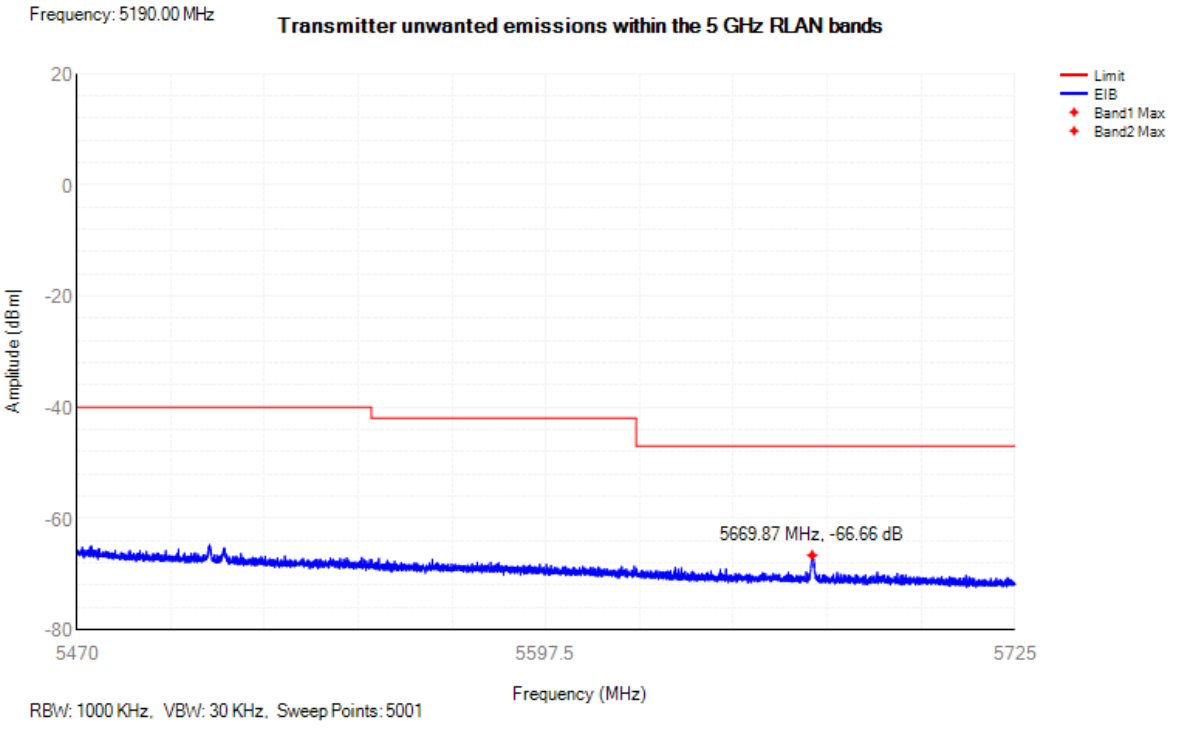
Tx. Emissions EIB NVNT n20 5180MHz Sub Band2



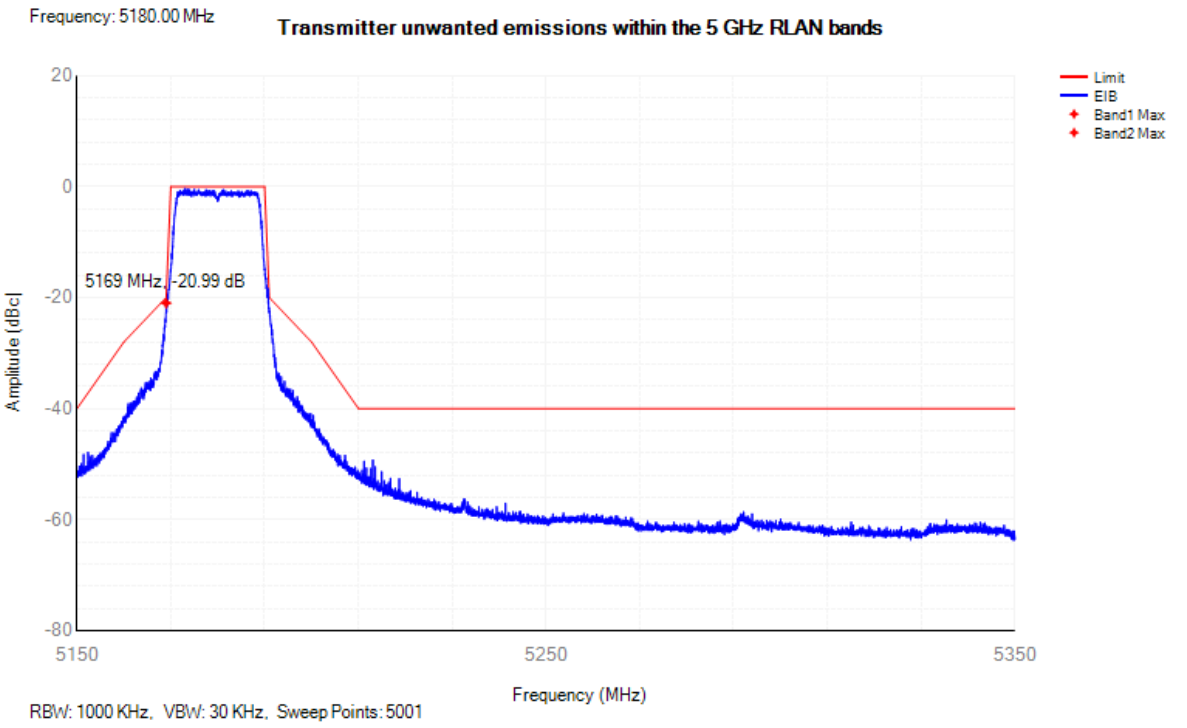
Tx. Emissions EIB NVNT n40 5190MHz Sub Band1



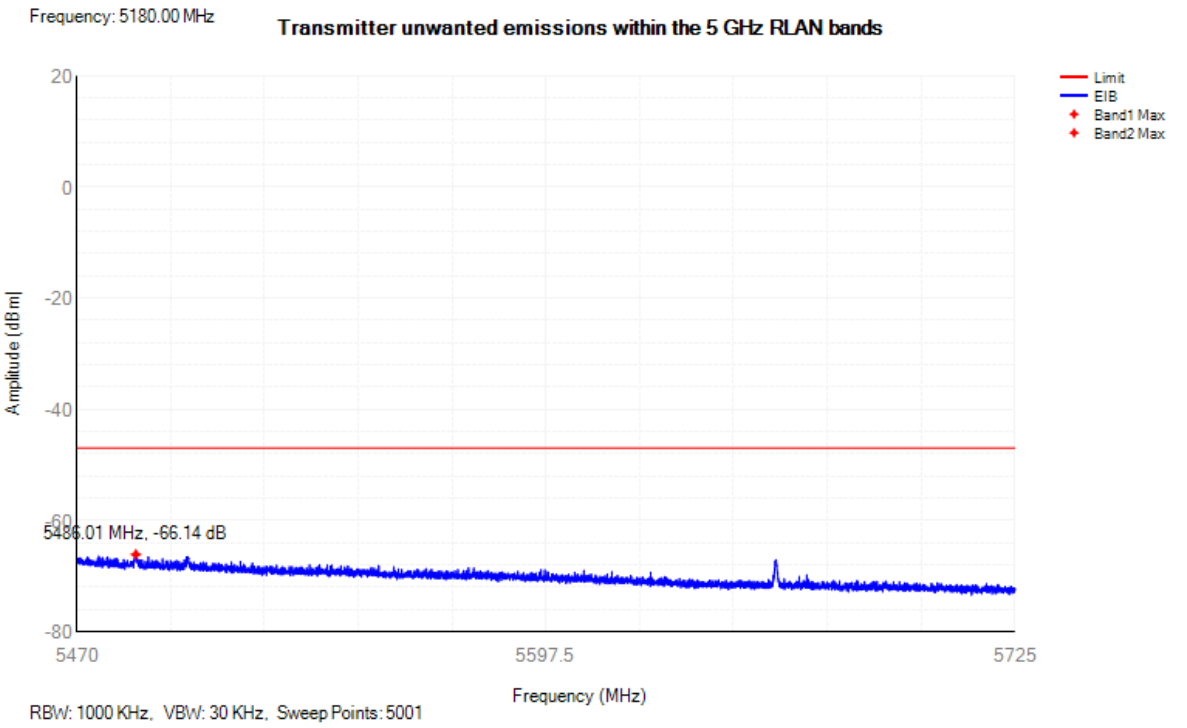
Tx. Emissions EIB NVNT n40 5190MHz Sub Band2



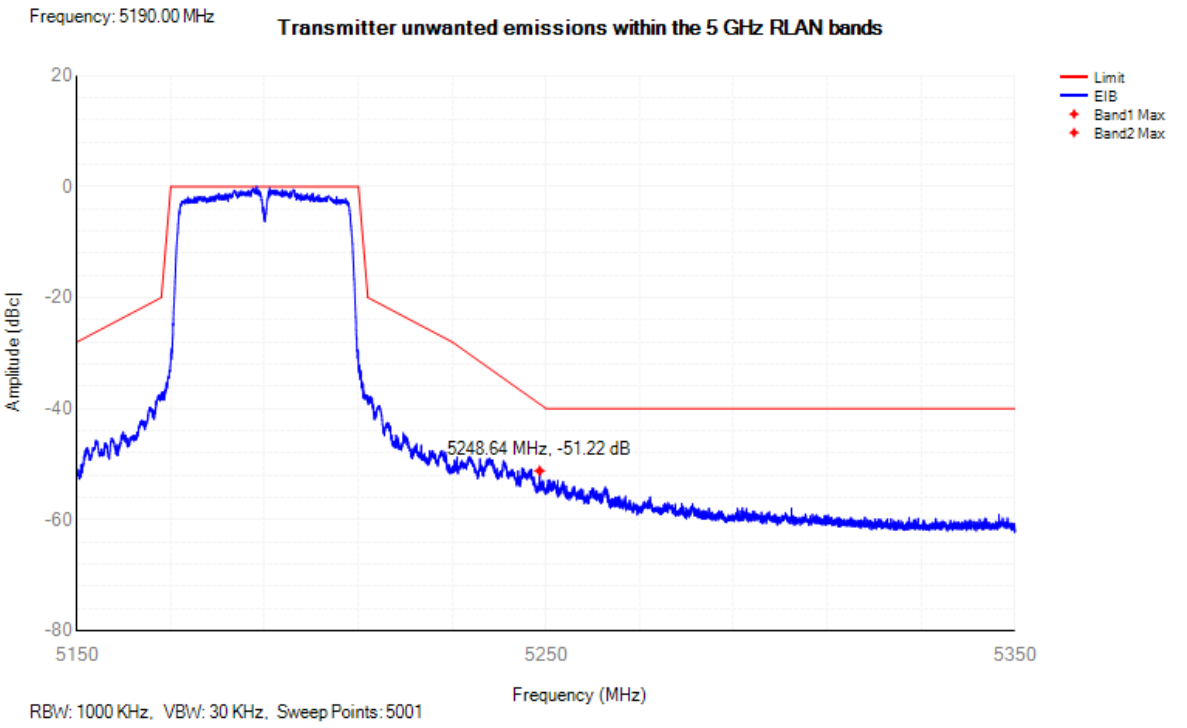
Tx. Emissions EIB NVNT ac20 5180MHz Sub Band1



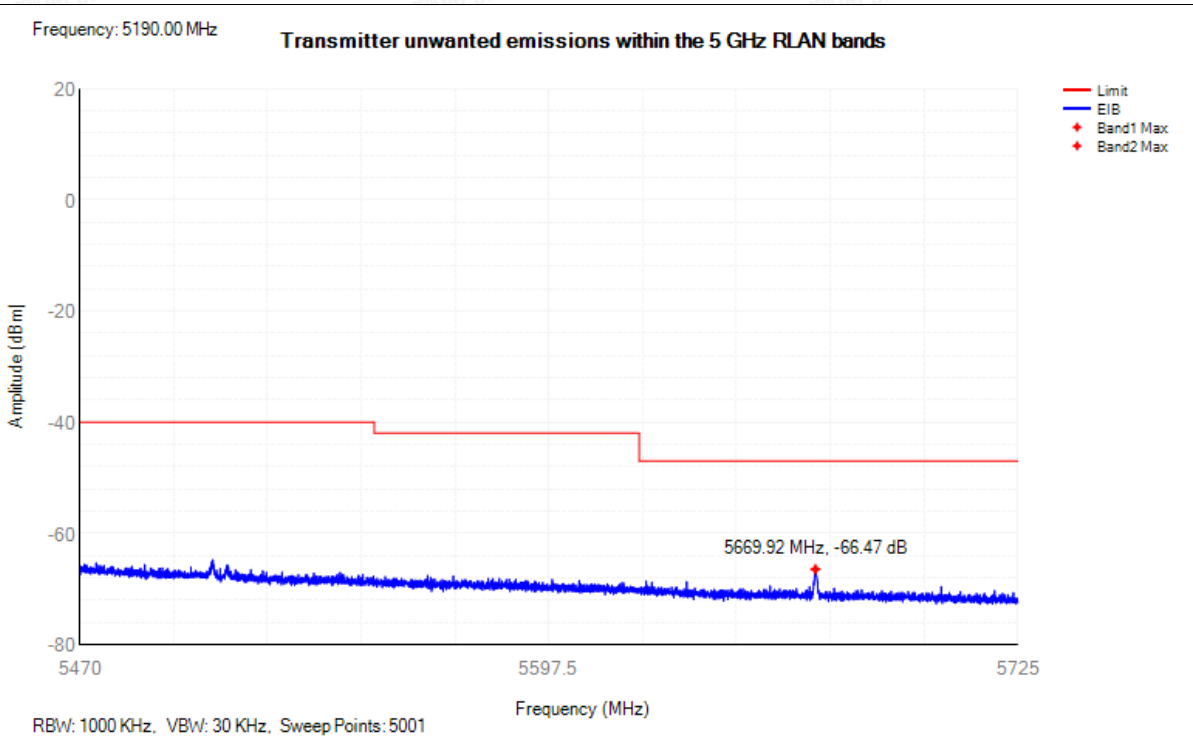
Tx. Emissions EIB NVNT ac20 5180MHz Sub Band2



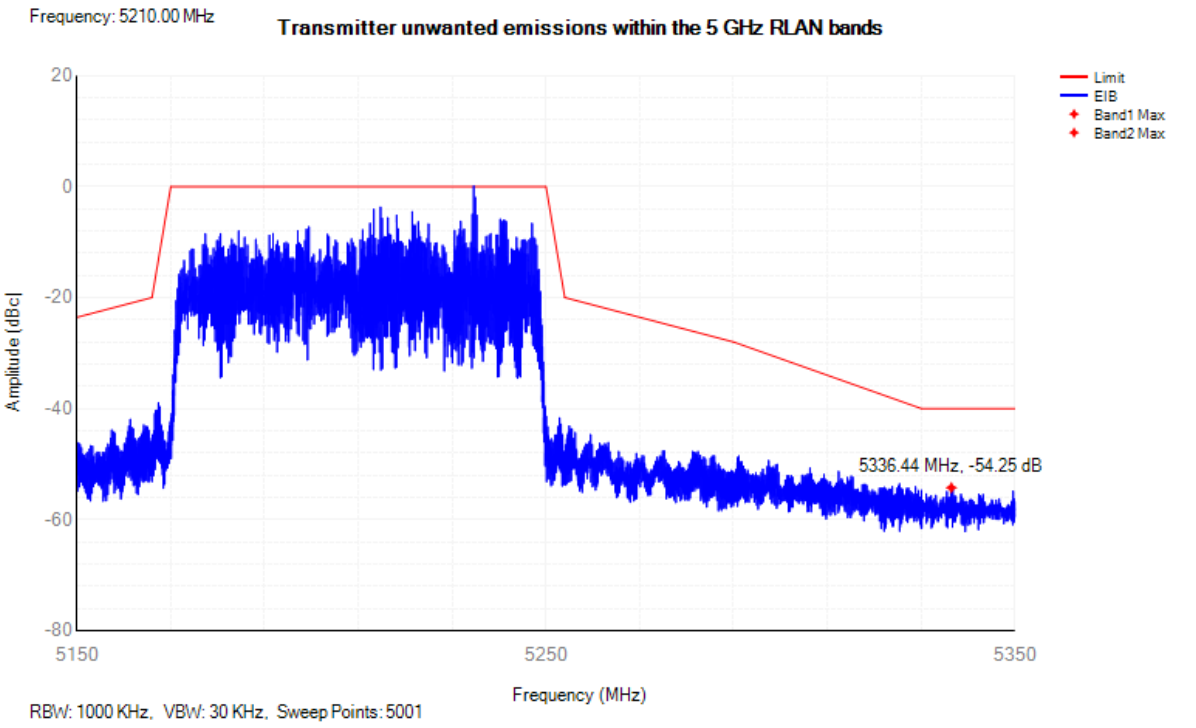
Tx. Emissions EIB NVNT ac40 5190MHz Sub Band1



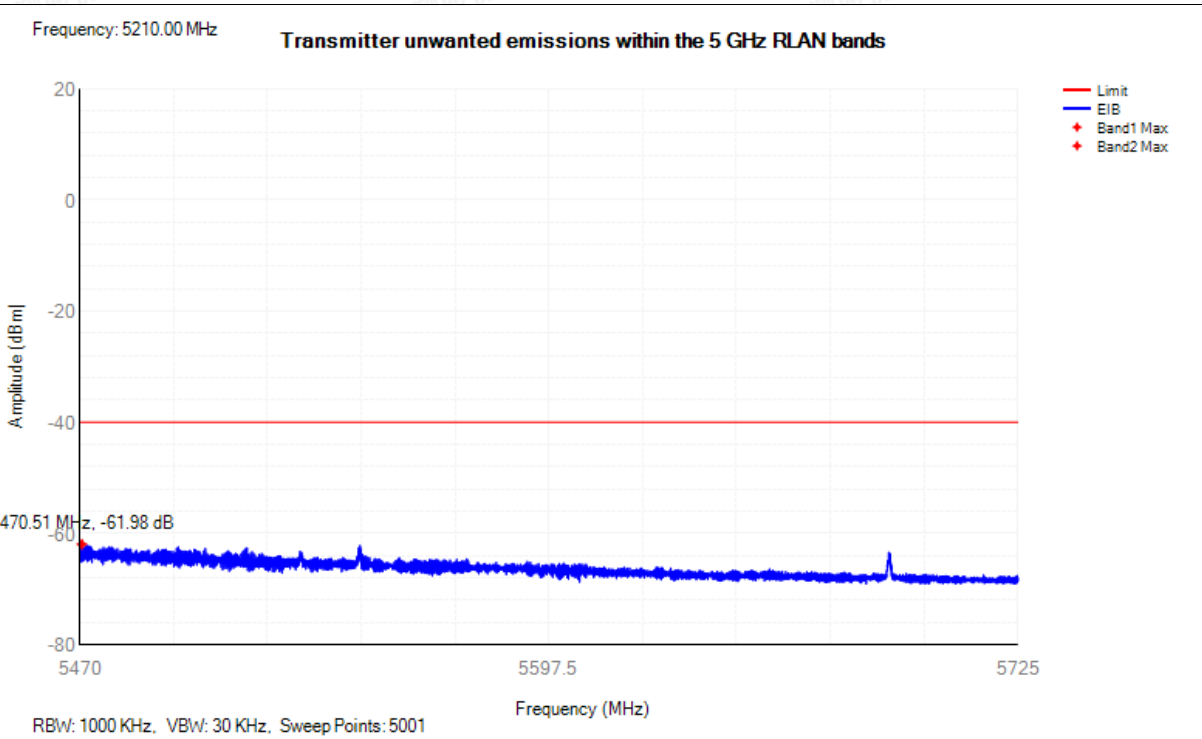
Tx. Emissions EIB NVNT ac40 5190MHz Sub Band2



Tx. Emissions EIB NVNT ac80 5210MHz Sub Band1

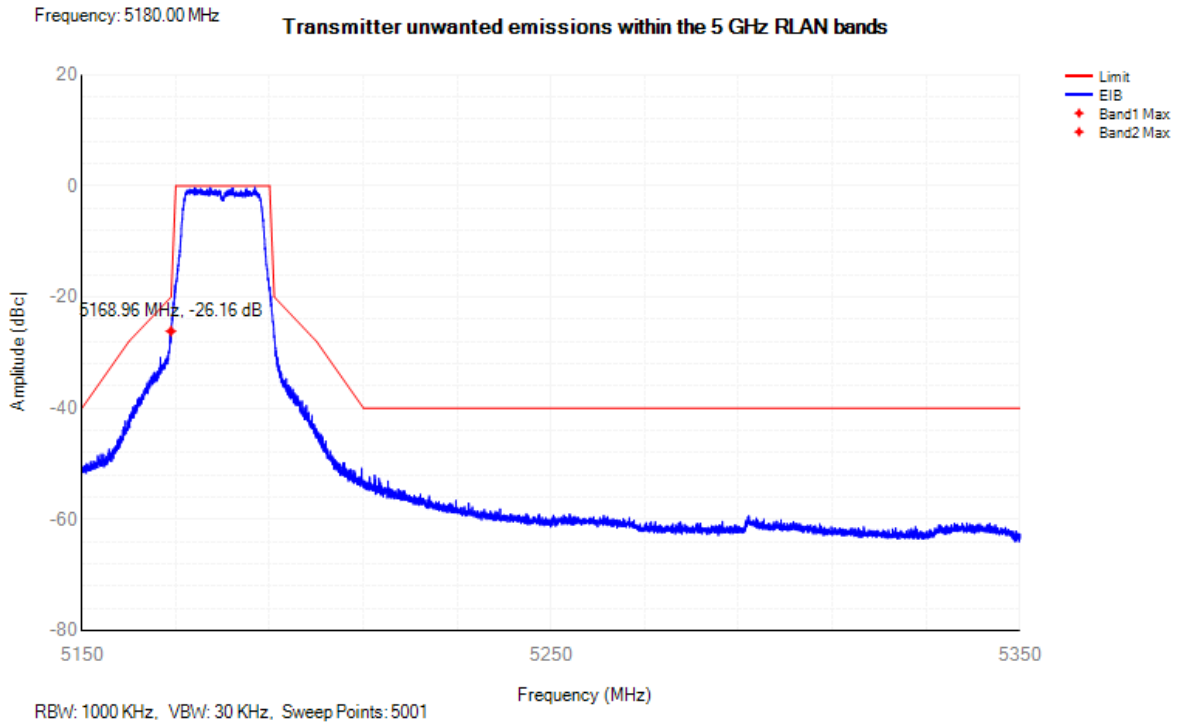


Tx. Emissions EIB NVNT ac80 5210MHz Sub Band2

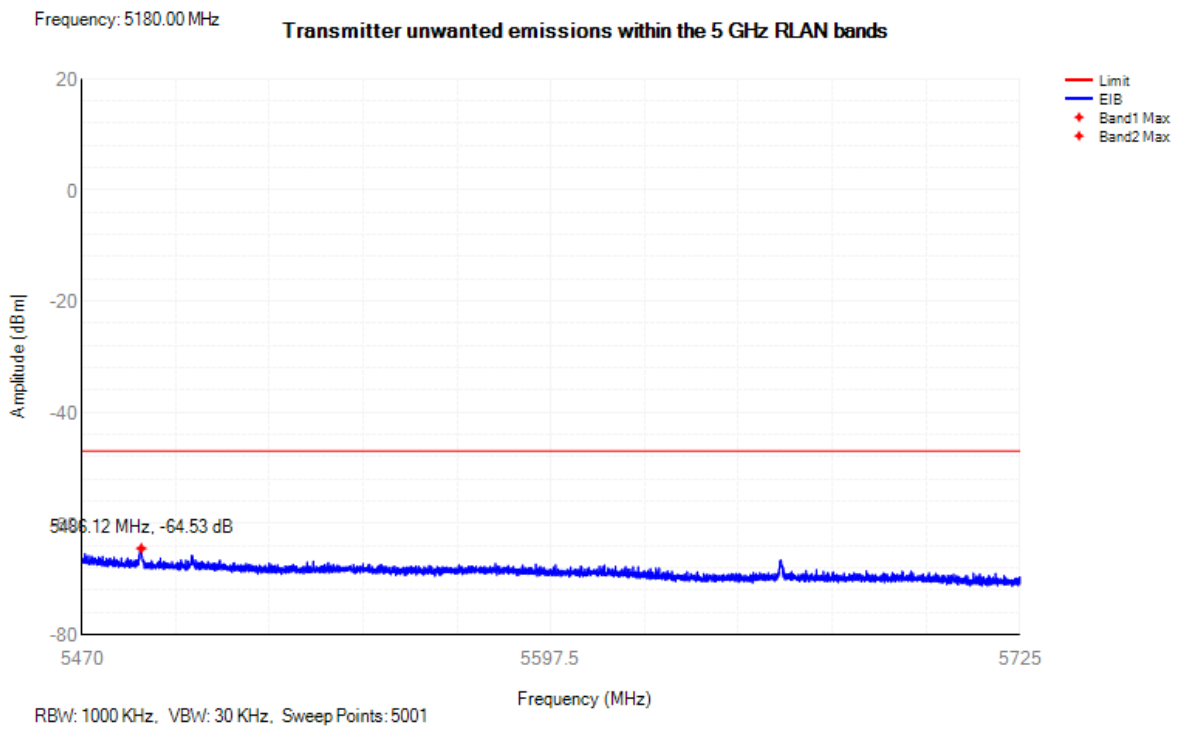


Condition	Mode	Frequency (MHz)	Antenna	Sub Band	Worst EIB Frequency (MHz)	Level (dB)	Limit (dB)	Verdict
NVNT	a	5180	Ant1	Band1	5168.96	-26.16	-20.03	Pass
NVNT	a	5180	Ant1	Band2	5486.12	-64.53	-47	Pass
NVNT	n20	5180	Ant1	Band1	5169	-22.04	-20	Pass
NVNT	n20	5180	Ant1	Band2	5485.96	-64.57	-47	Pass
NVNT	n40	5190	Ant1	Band1	5250.04	-51.18	-40	Pass
NVNT	n40	5190	Ant1	Band2	5670.07	-65.93	-47	Pass
NVNT	ac20	5180	Ant1	Band1	5168.96	-21.76	-20.03	Pass
NVNT	ac20	5180	Ant1	Band2	5486.01	-64.73	-47	Pass
NVNT	ac40	5190	Ant1	Band1	5251.16	-50.63	-40	Pass
NVNT	ac40	5190	Ant1	Band2	5669.97	-65.9	-47	Pass
NVNT	ac80	5210	Ant1	Band1	5341.96	-49.74	-40	Pass
NVNT	ac80	5210	Ant1	Band2	5546.09	-59.35	-40	Pass

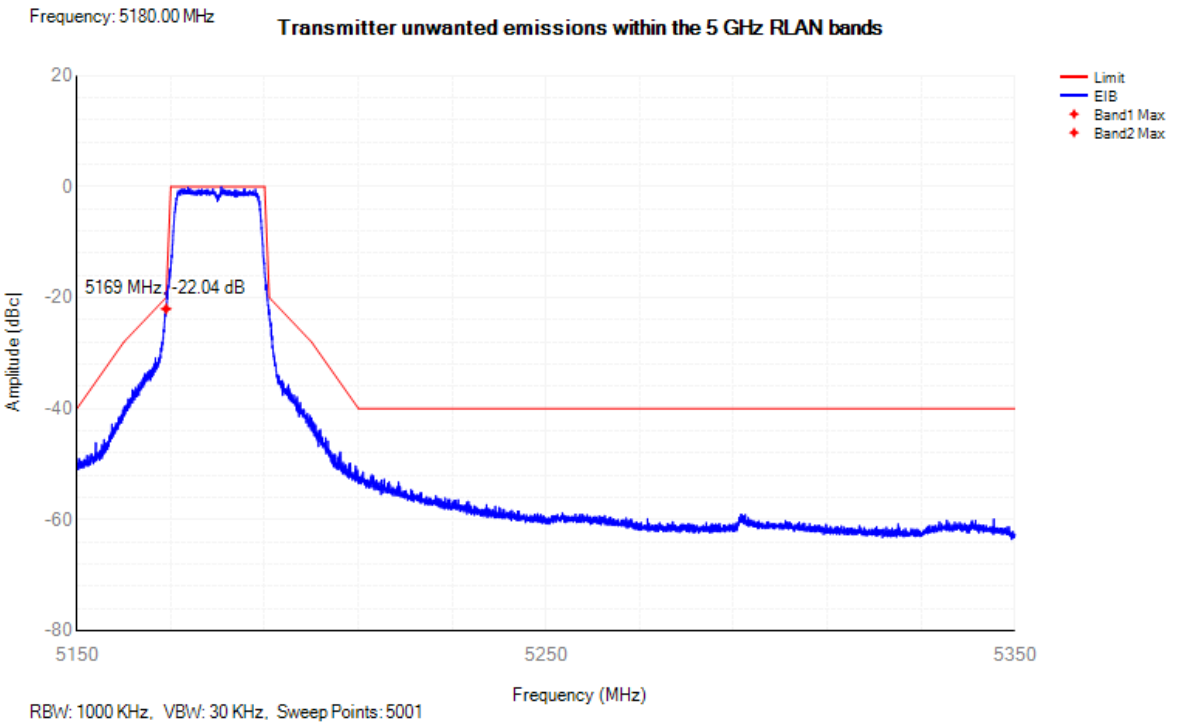
Test Graphs
Tx. Emissions EIB NVNT a 5180MHz Sub Band1



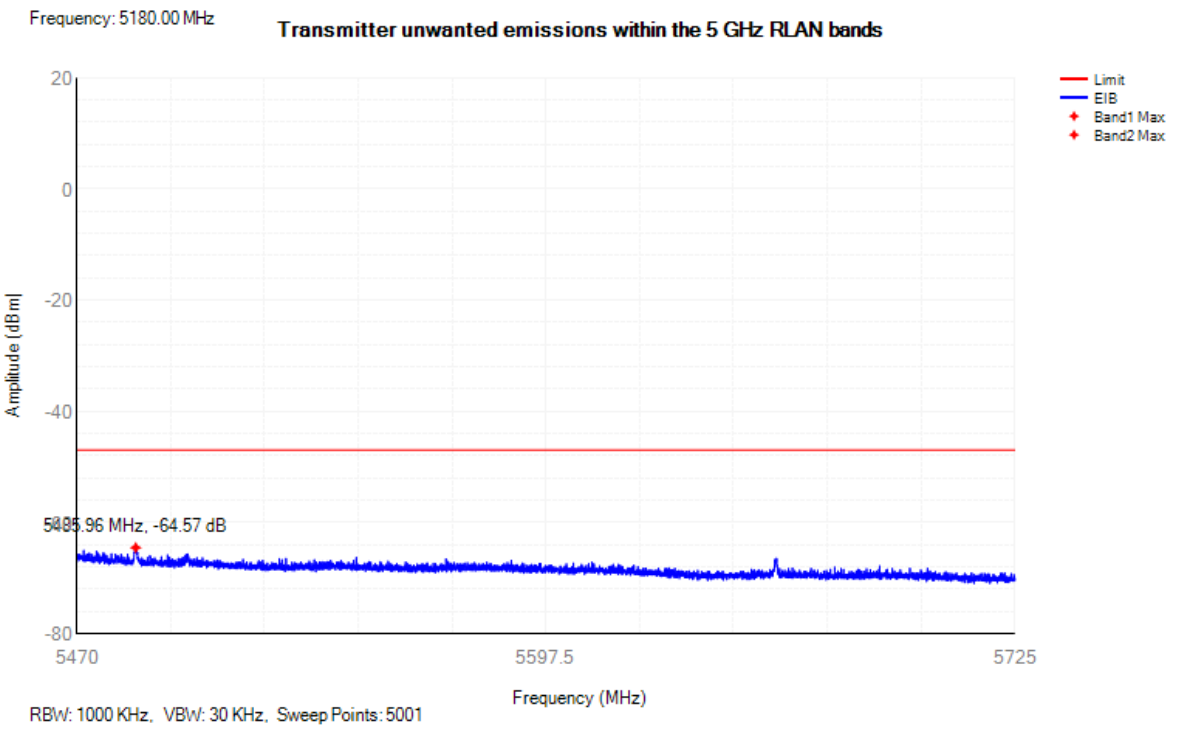
Tx. Emissions EIB NVNT a 5180MHz Sub Band2



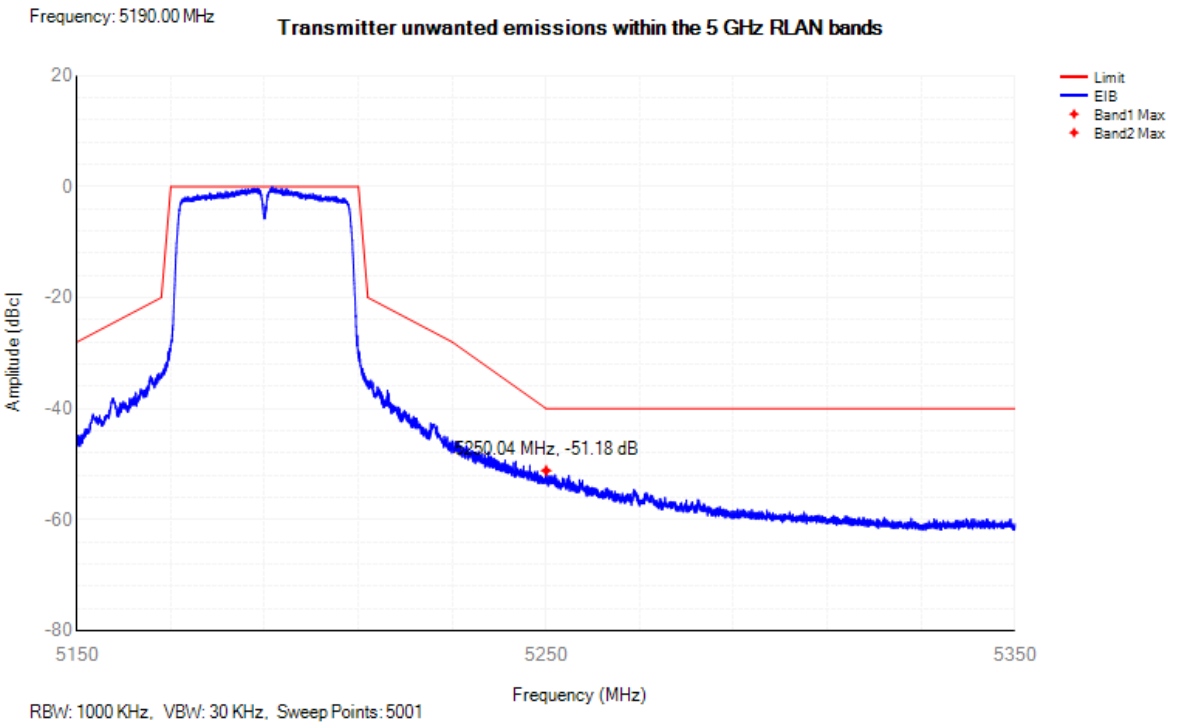
Tx. Emissions EIB NVNT n20 5180MHz Sub Band1



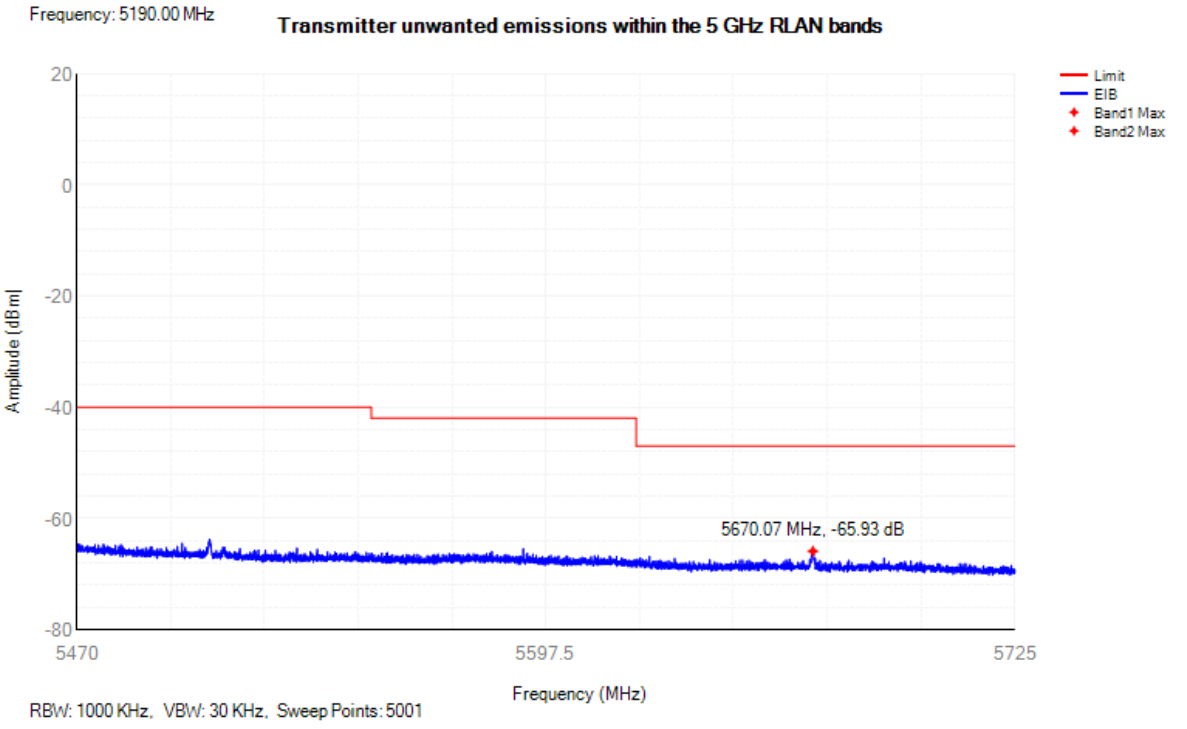
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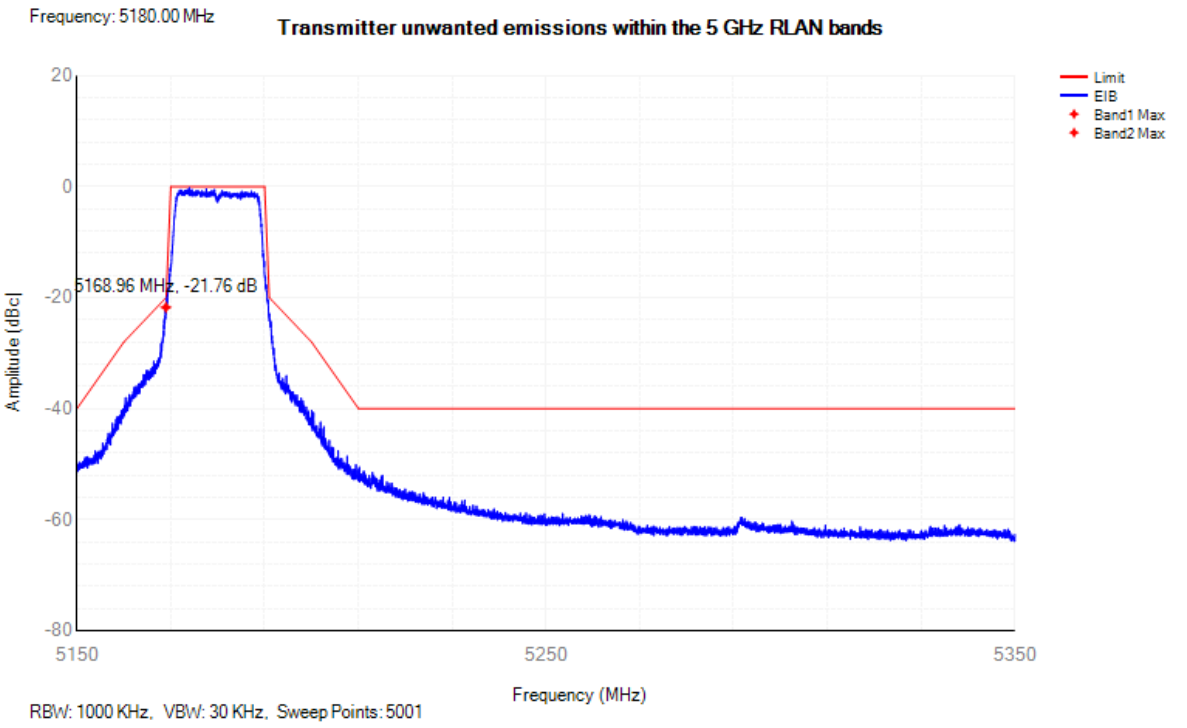
Tx. Emissions EIB NVNT n40 5190MHz Sub Band1



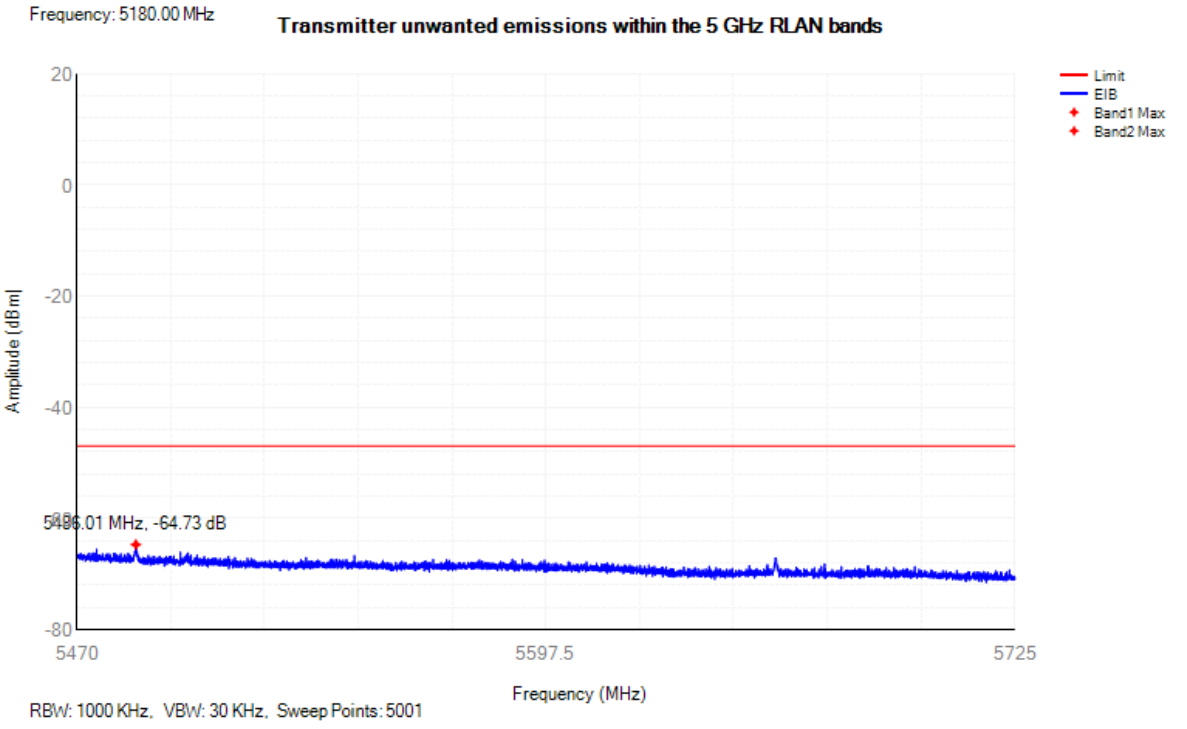
Tx. Emissions EIB NVNT n40 5190MHz Sub Band2



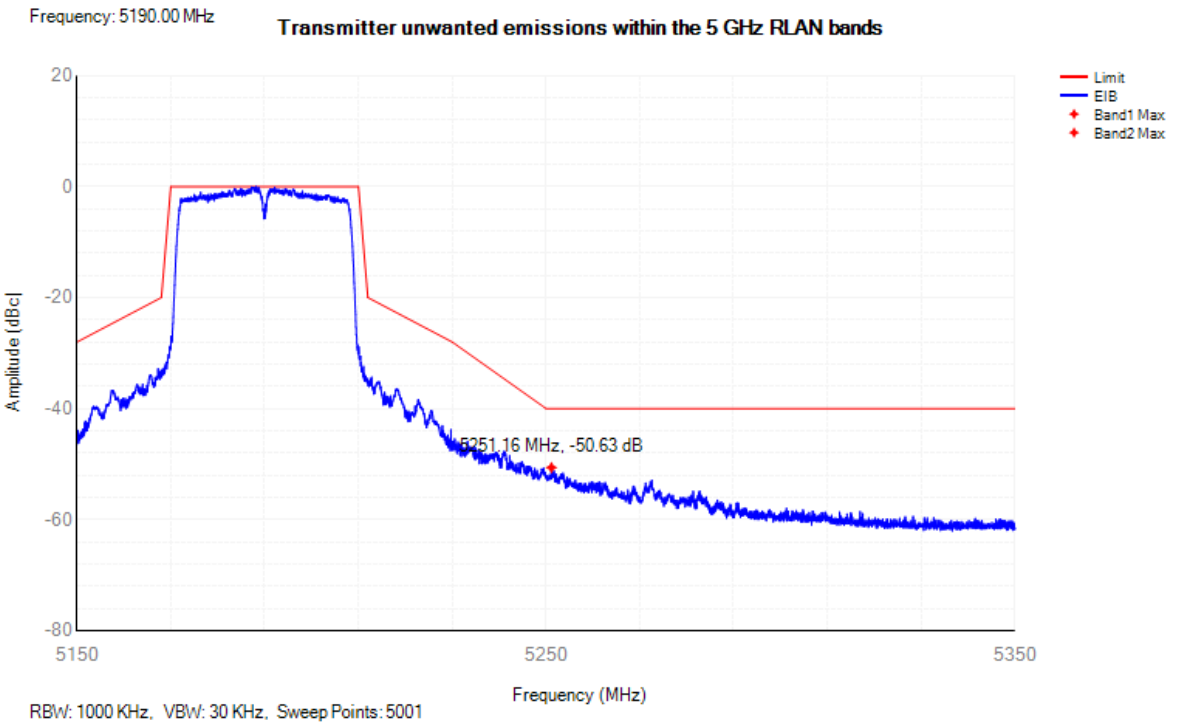
Tx. Emissions EIB NVNT ac20 5180MHz Sub Band1



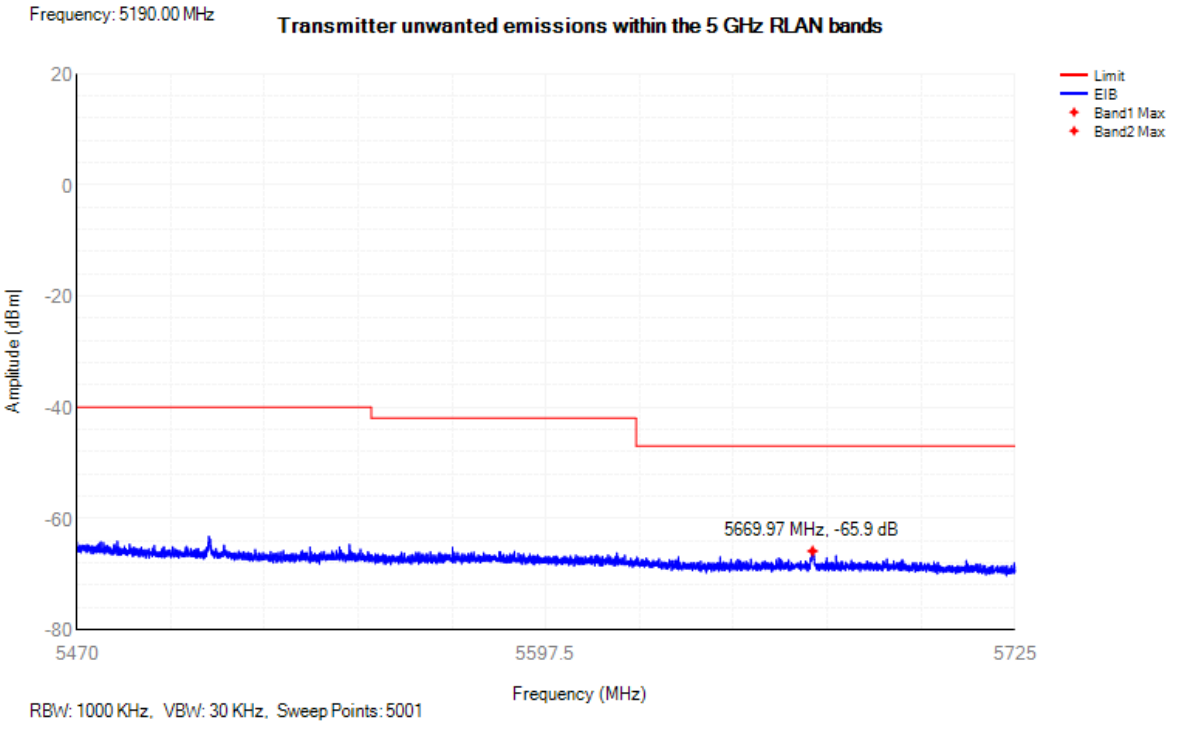
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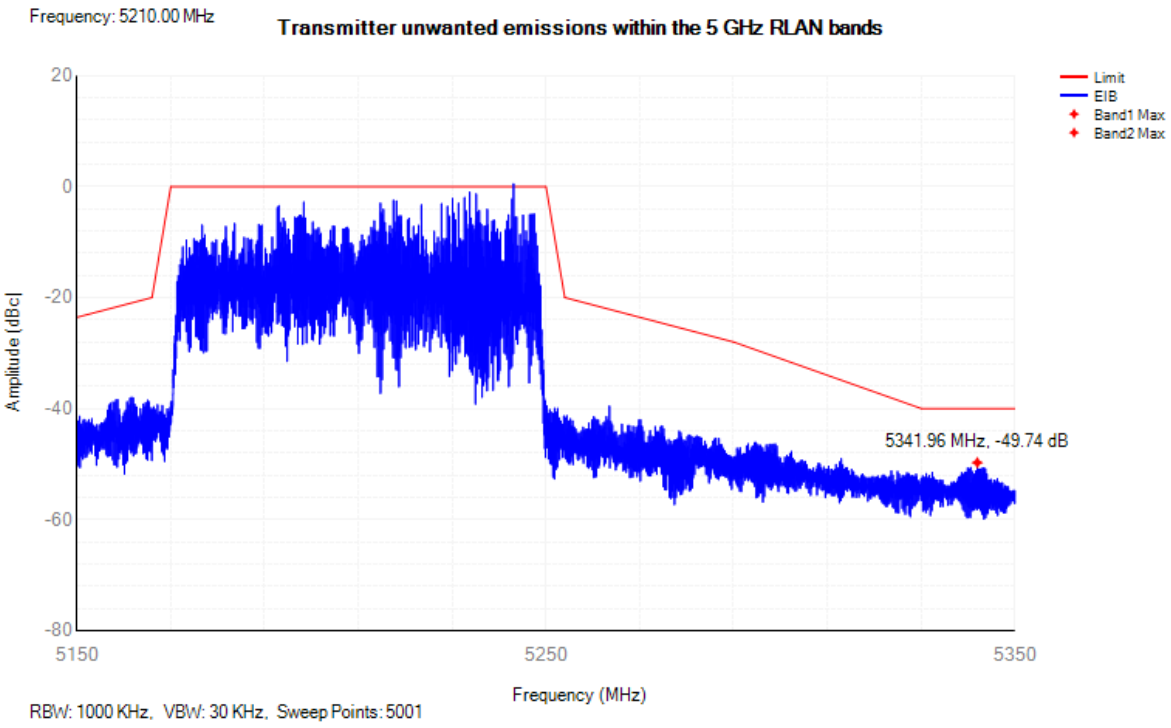
Tx. Emissions EIB NVNT ac40 5190MHz Sub Band1



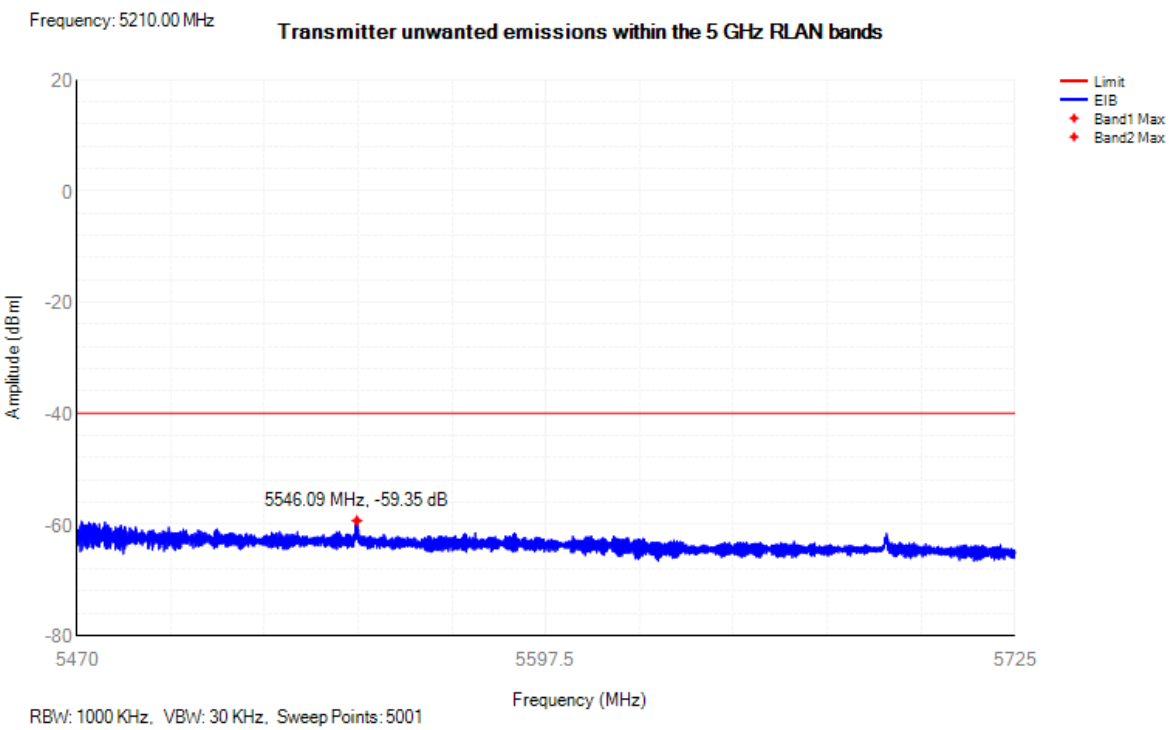
Tx. Emissions EIB NVNT ac40 5190MHz Sub Band2



Tx. Emissions EIB NVNT ac80 5210MHz Sub Band1



Tx. Emissions EIB NVNT ac80 5210MHz Sub Band2



F.7 Receiver Spurious Emissions

The Worst Case: ANT0

The Worst Test Result For 802.11a					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 36 (5180MHz)					
63.53	H	-81.47	-57.00	-24.47	PK
68.00	V	-73.67	-57.00	-16.67	PK
811.29	H	-72.27	-57.00	-15.27	PK
924.52	V	-72.82	-57.00	-15.82	PK
3454.29	H	-61.79	-47.00	-14.79	PK
3463.08	V	-62.82	-47.00	-15.82	PK
10360.09	H	-57.64	-47.00	-10.64	PK
10360.01	V	-57.88	-47.00	-10.88	PK

The Worst Test Result For 802.11n(20MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 36 (5180MHz)					
58.04	H	-82.87	-57.00	-25.87	PK
67.46	V	-73.68	-57.00	-16.68	PK
807.74	H	-74.32	-57.00	-17.32	PK
925.72	V	-74.59	-57.00	-17.59	PK
3476.86	H	-63.25	-47.00	-16.25	PK
3456.64	V	-64.44	-47.00	-17.44	PK
10360.01	H	-58.38	-47.00	-11.38	PK
10360.01	V	-59.48	-47.00	-12.48	PK

The Worst Test Result For 802.11ac(20MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 36 (5180MHz)					
58.85	H	-82.99	-57.00	-25.99	PK
64.22	V	-74.24	-57.00	-17.24	PK
808.88	H	-74.20	-57.00	-17.20	PK
922.63	V	-74.29	-57.00	-17.29	PK
3500.38	H	-62.88	-47.00	-15.88	PK
3482.90	V	-63.94	-47.00	-16.94	PK
10360.10	H	-58.18	-47.00	-11.18	PK
10360.02	V	-59.50	-47.00	-12.50	PK

The Worst Test Result For 802.11n(40MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 38 (5190MHz)					
57.36	H	-82.20	-57.00	-25.20	PK
65.62	V	-74.22	-57.00	-17.22	PK
813.38	H	-74.97	-57.00	-17.97	PK
922.03	V	-74.06	-57.00	-17.06	PK
3477.97	H	-63.49	-47.00	-16.49	PK
3456.91	V	-63.42	-47.00	-16.42	PK
10380.05	H	-58.61	-47.00	-11.61	PK
10380.00	V	-59.36	-47.00	-12.36	PK

The Worst Test Result For 802.11ac(40MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 38 (5190MHz)					
58.28	H	-82.45	-57.00	-25.45	PK
65.91	V	-74.60	-57.00	-17.60	PK
812.26	H	-74.71	-57.00	-17.71	PK
922.72	V	-73.62	-57.00	-16.62	PK
3485.47	H	-63.43	-47.00	-16.43	PK
3470.57	V	-63.49	-47.00	-16.49	PK
10380.06	H	-58.82	-47.00	-11.82	PK
10380.04	V	-59.55	-47.00	-12.55	PK

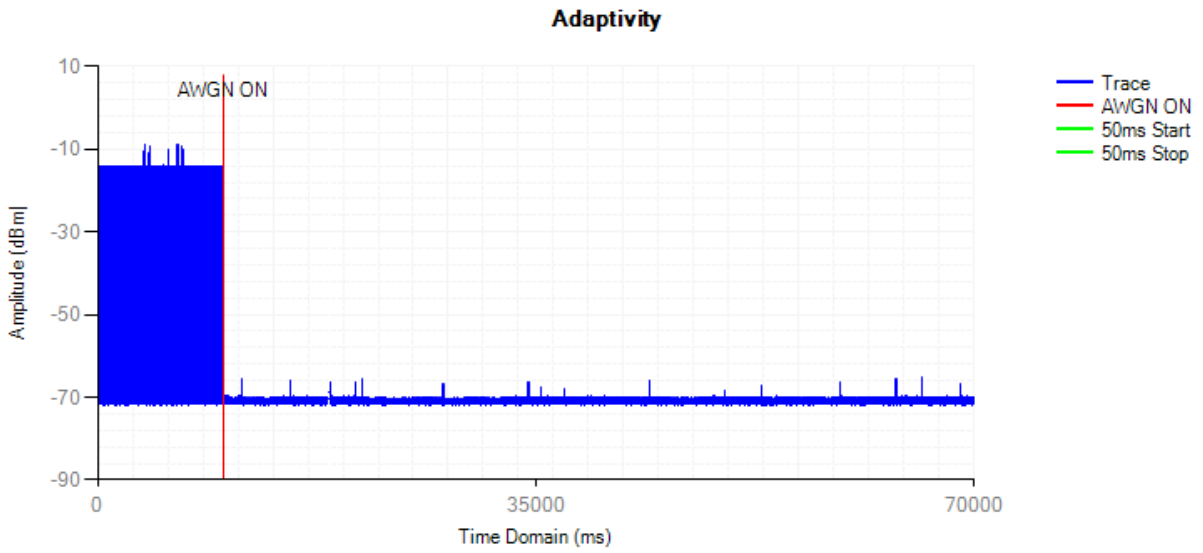
The Worst Test Result For 802.11ac(80MHz)					
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 42 (5210MHz)					
57.60	H	-82.45	-57.00	-25.45	PK
67.22	V	-74.04	-57.00	-17.04	PK
809.20	H	-74.61	-57.00	-17.61	PK
924.00	V	-74.70	-57.00	-17.70	PK
3522.89	H	-63.35	-47.00	-16.35	PK
3495.94	V	-63.50	-47.00	-16.50	PK
10420.01	H	-58.99	-47.00	-11.99	PK
10420.07	V	-60.89	-47.00	-13.89	PK

Note: All test modes were tested, but we only recorded the worst case in this report. (Low Channel)

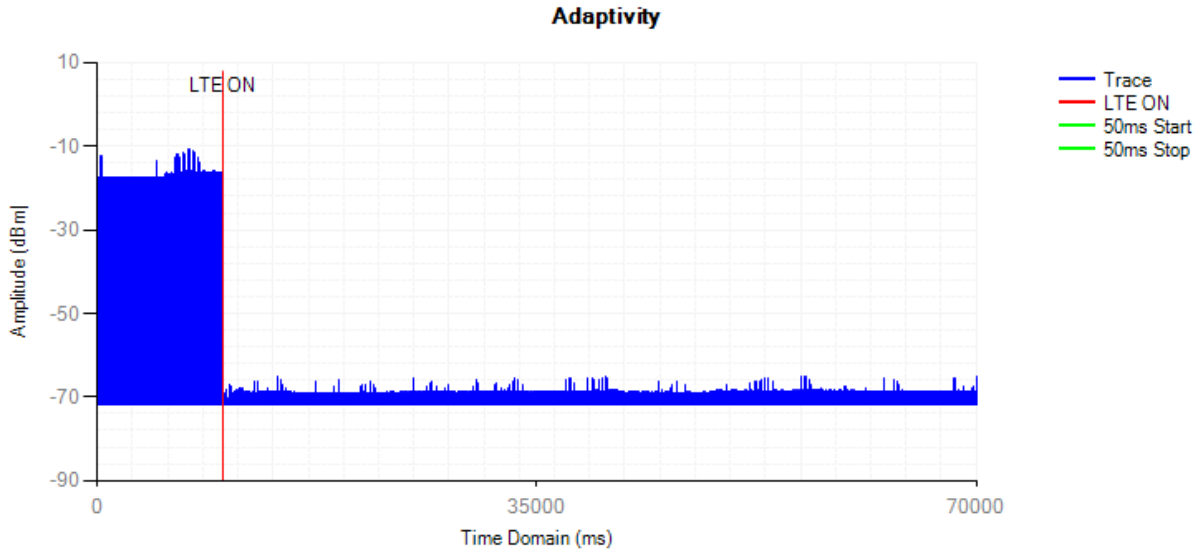
F.8 Adaptivity (Channel Access Mechanism)

Condition	Mode	Frequency (MHz)	Interfer Type	Short Control (ms)	Limit (ms)	Short Control (n)	Limit (n)	Verdict
NVNT	ac20	5180	AWGN	0.38	<=2.5	9	<=50	Pass
NVNT	ac20	5180	LTE	0.34	<=2.5	6	<=50	Pass
NVNT	ac20	5180	OFDM	0.63	<=2.5	3	<=50	Pass
NVNT	ac40	5190	AWGN	0.26	<=2.5	8	<=50	Pass
NVNT	ac40	5190	LTE	0.72	<=2.5	5	<=50	Pass
NVNT	ac40	5190	OFDM	0.56	<=2.5	14	<=50	Pass
NVNT	ac80	5210	AWGN	0.21	<=2.5	7	<=50	Pass
NVNT	ac80	5210	LTE	0.19	<=2.5	13	<=50	Pass
NVNT	ac80	5210	OFDM	0.46	<=2.5	12	<=50	Pass

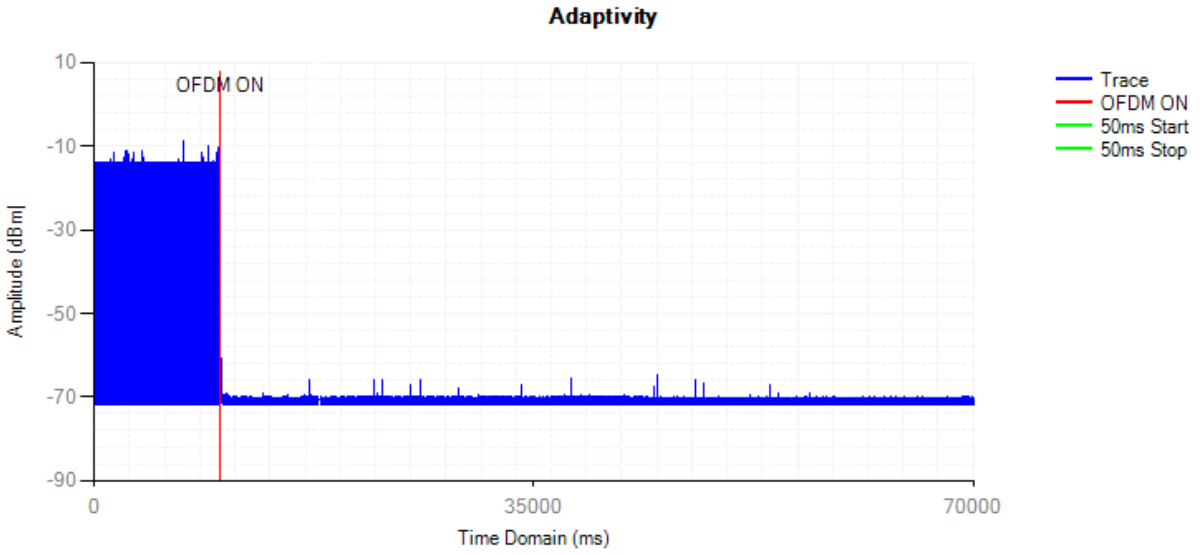
Adaptivity NVNT ac20 5180MHz AWGN



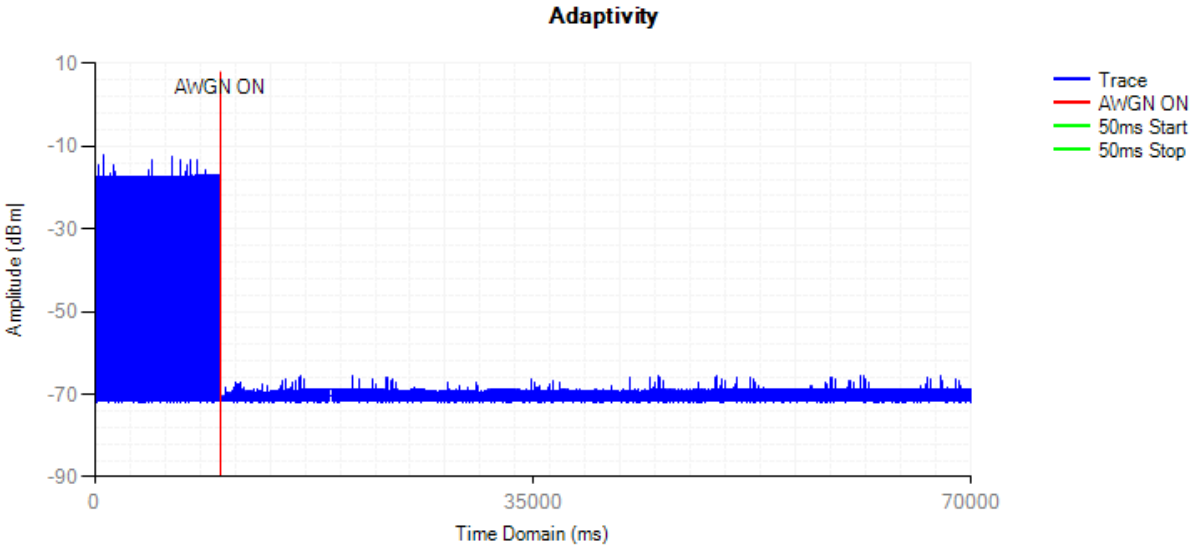
Adaptivity NVNT ac20 5180MHz LTE



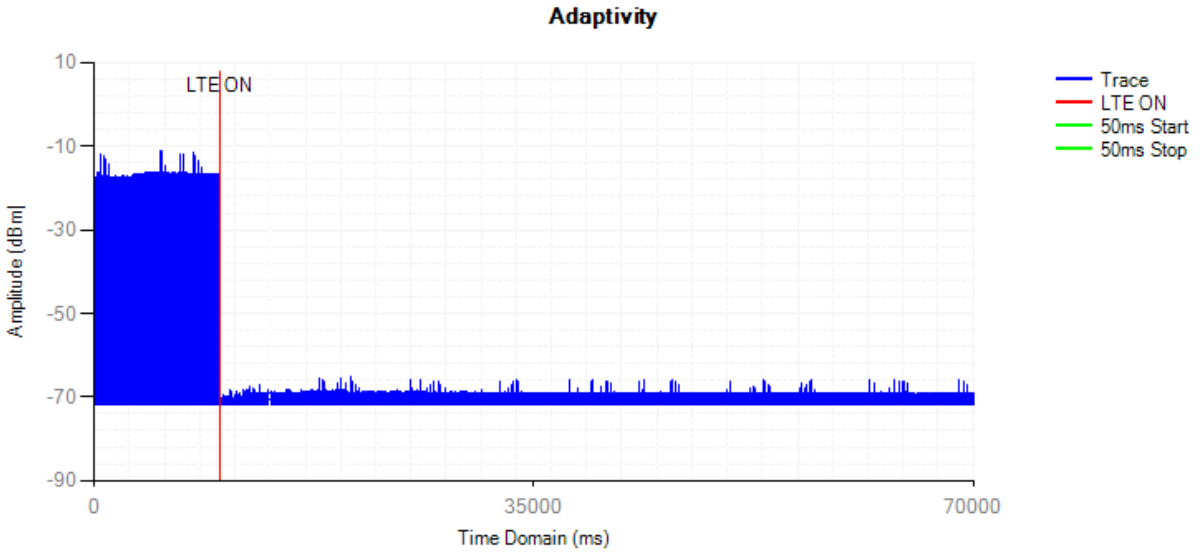
Adaptivity NVNT ac20 5180MHz OFDM



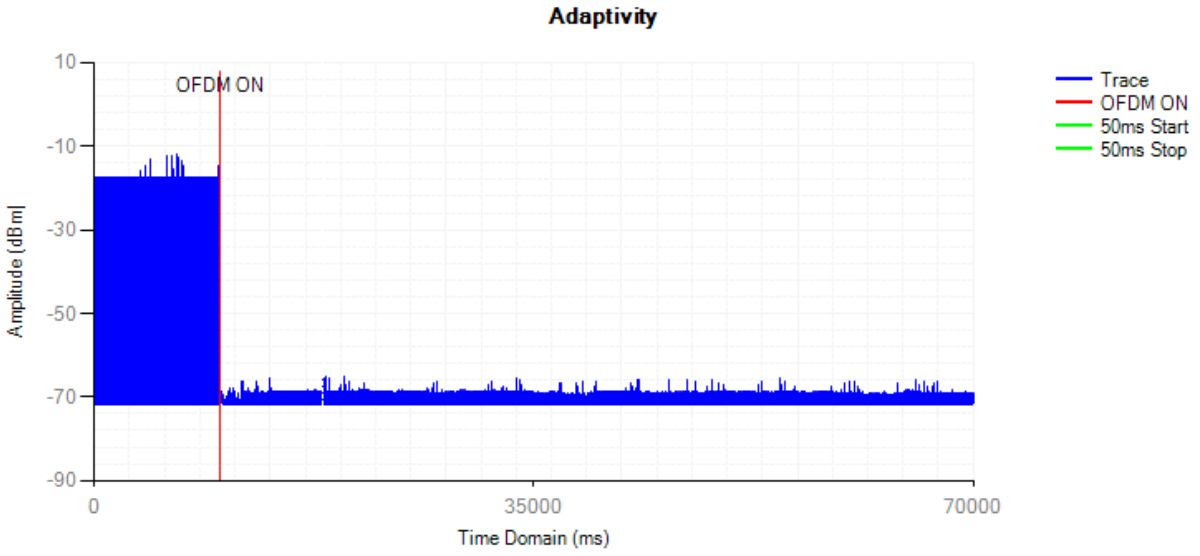
Adaptivity NVNT ac40 5190MHz AWGN



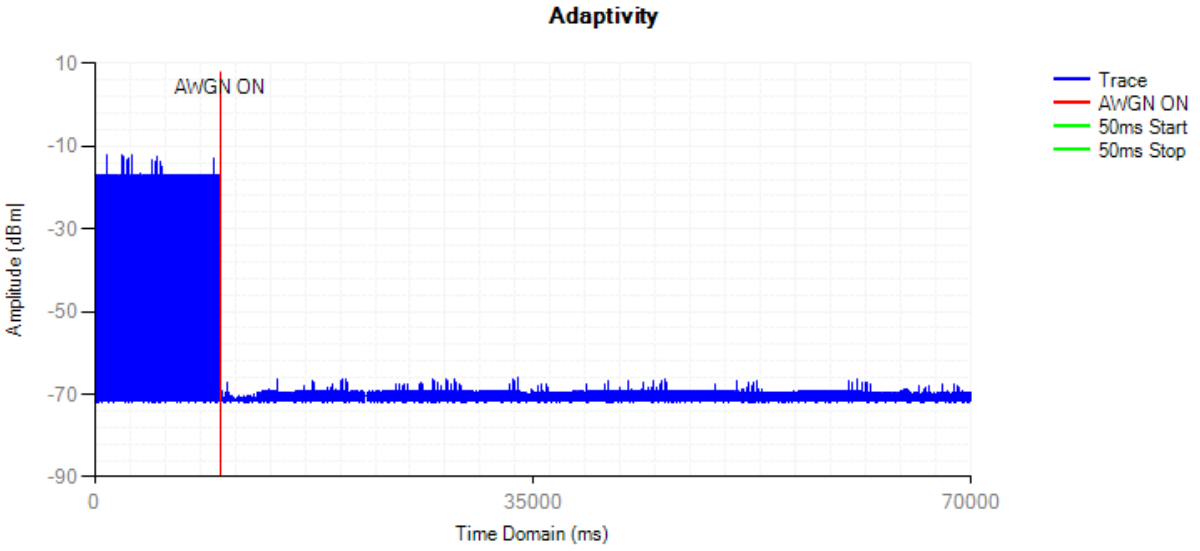
Adaptivity NVNT ac40 5190MHz LTE



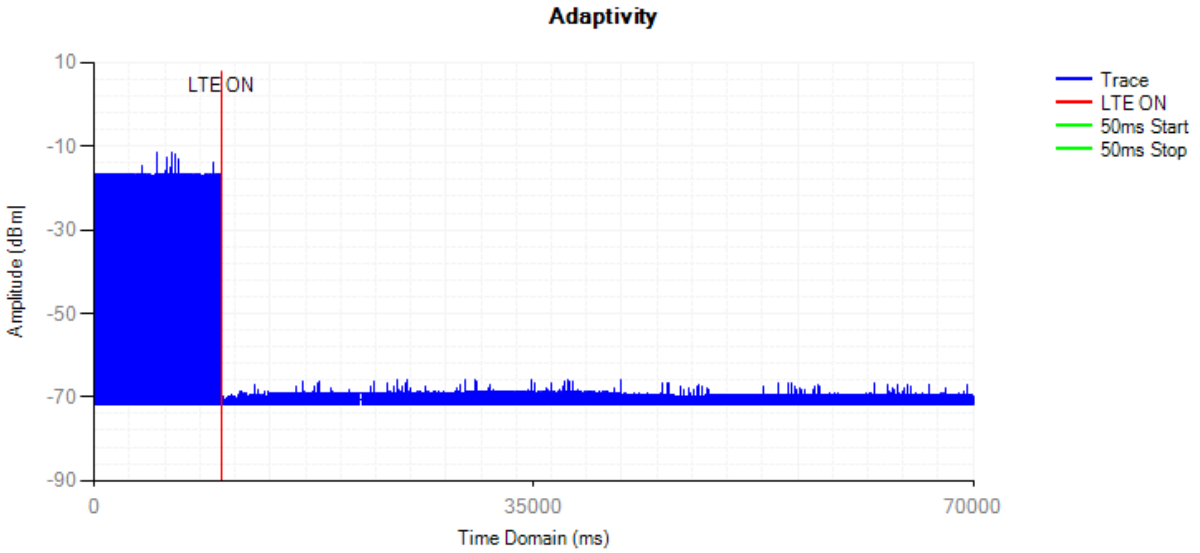
Adaptivity NVNT ac40 5190MHz OFDM



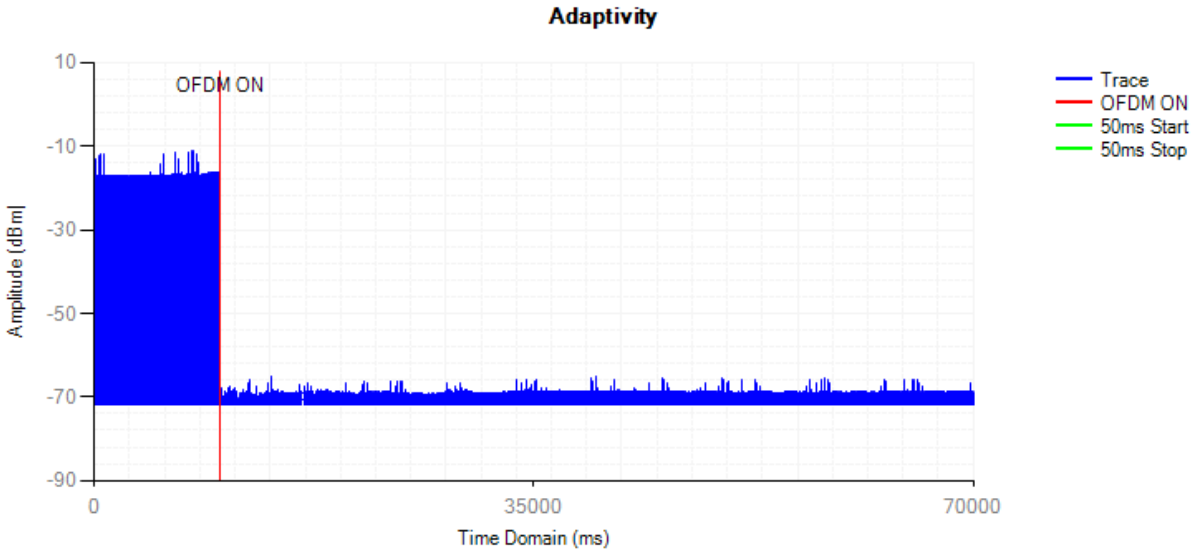
Adaptivity NVNT ac80 5210MHz AWGN



Adaptivity NVNT ac80 5210MHz LTE



Adaptivity NVNT ac80 5210MHz OFDM



F.9 Receiver Blocking

The Worst Case: ANT0

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm)		Type of blocking signal	PER(%)		Test Result
		Test Value	Limit		Test Value	Limit	
Pmin + 6 dB	5100	-56	≥-59	CW	2.32	10	Pass
	4900	-46	≥-53	CW	3.96	10	Pass
	5000	-45	≥-53	CW	3.20	10	Pass
	5975	-47	≥-53	CW	2.31	10	Pass