

Appendix for KSCR2307001146AT

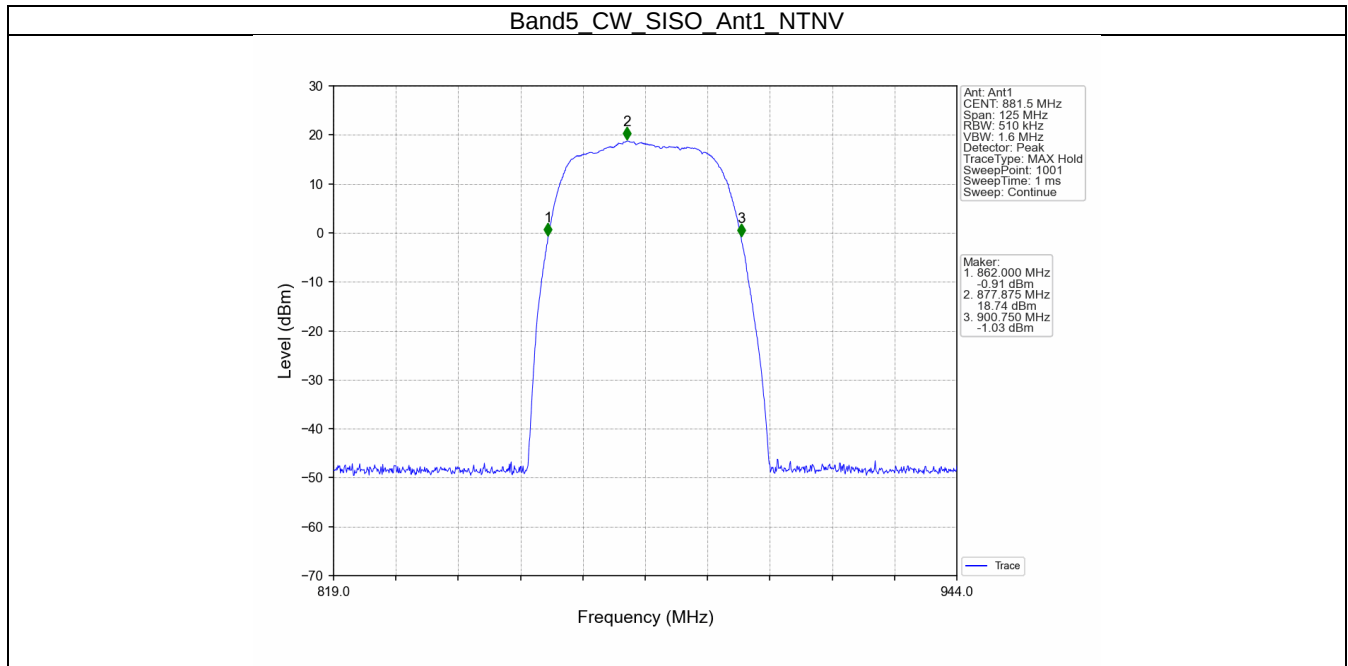
1. Out of band rejection

1.1 Band5

1.1.1 Test Result

Band: 5 / NTNV							
Signal	Sweep Frequency Range (MHz)	TX Type	ANT	F0 (MHz)	FL (MHz)	FH (MHz)	Verdict
CW	819 - 944	SISO	1	877.875	862.000	900.750	Pass

1.1.2 Test Graph



2. AGC threshold

2.1 Band5

2.1.1 Test Result

Band: 5 / NTNV					
Signal	Frequency (MHz)	TX Type	ANT	AGC Threshold (dBm)	Verdict
AWGN	877.875	SISO	1	-5.00	Pass
GMSK	877.875	SISO	1	-5.00	Pass

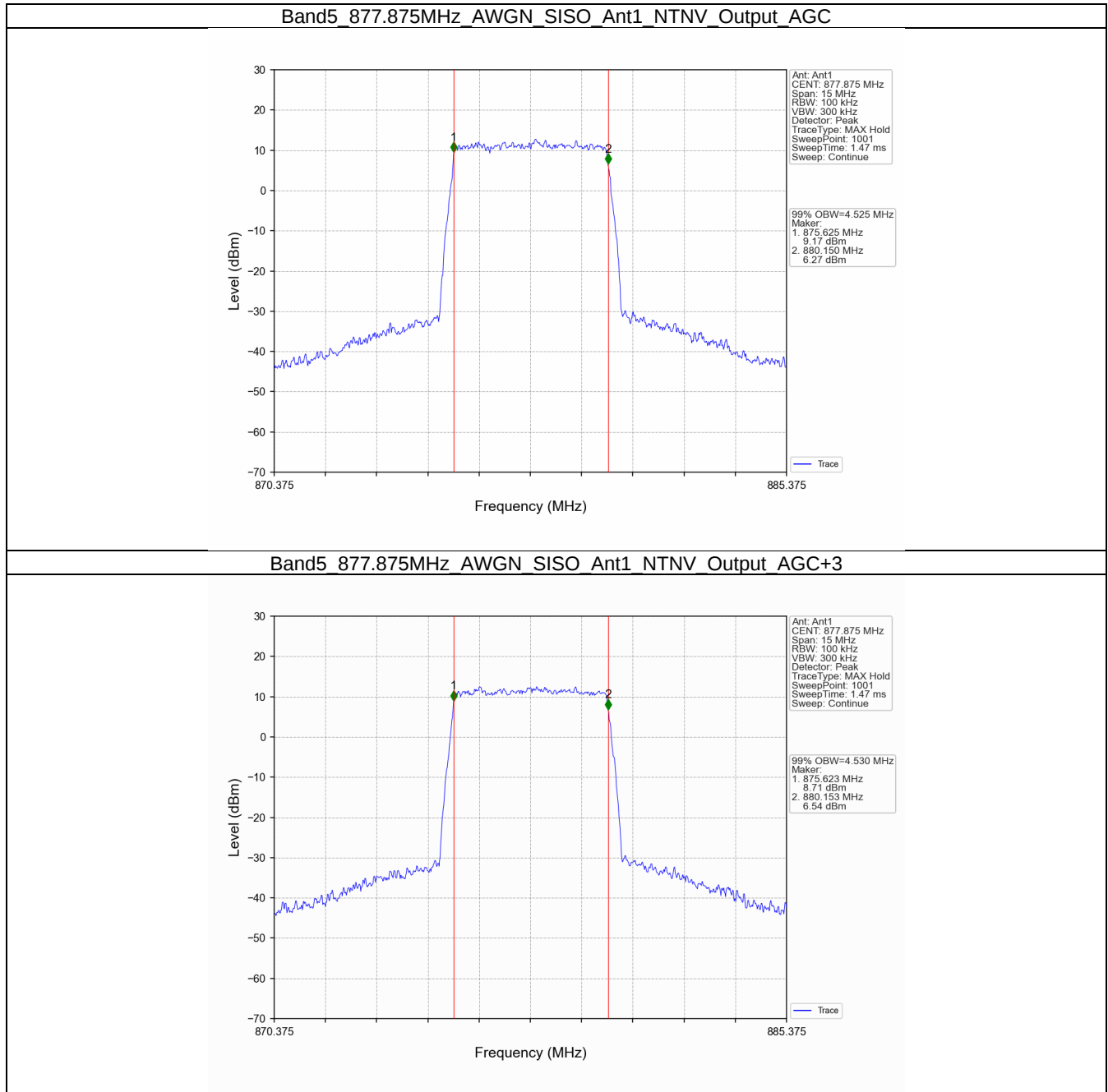
3. Input-versus-output signal comparison

3.1 Band5_OBW

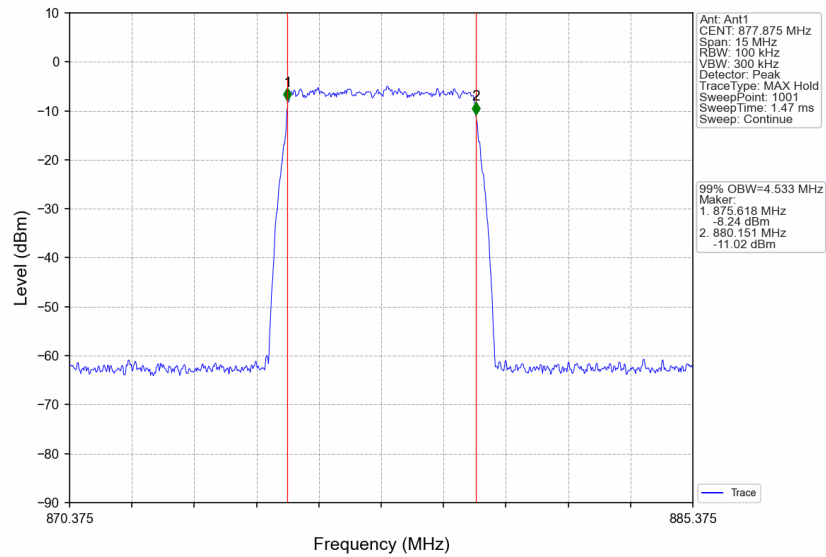
3.1.1 Test Result

Band: 5 / NTNV									
Signal			TX Type	ANT	99% OBW (MHz)		Discrepancy (%)	Limit (%)	Verdict
Type	Level (dBm)	Frequency (MHz)			Output	Input			
AWGN	-5	877.875	SISO	1	4.525	4.533	-0.1760	5	Pass
	-2	877.875	SISO	1	4.530	4.541	-0.2420	5	Pass
GMSK	-5	877.875	SISO	1	0.245	0.244	0.4098	5	Pass
	-2	877.875	SISO	1	0.243	0.244	-0.4100	5	Pass

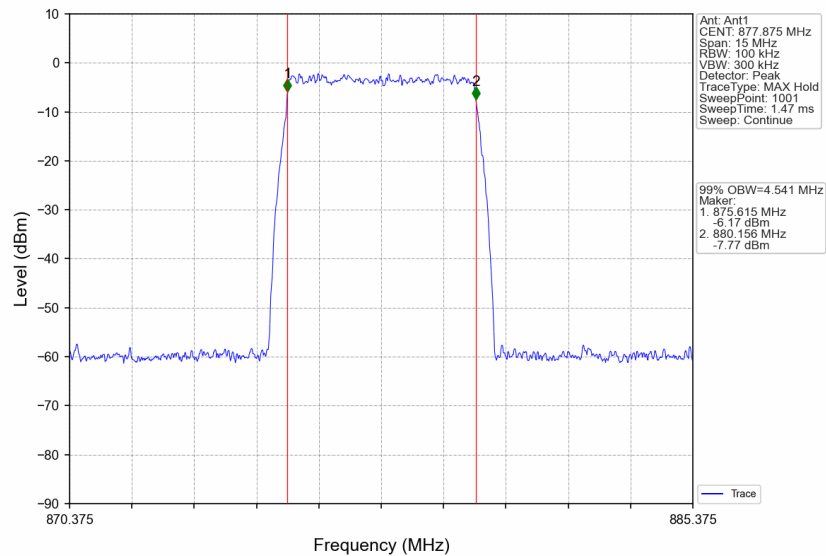
3.1.2 Test Graph



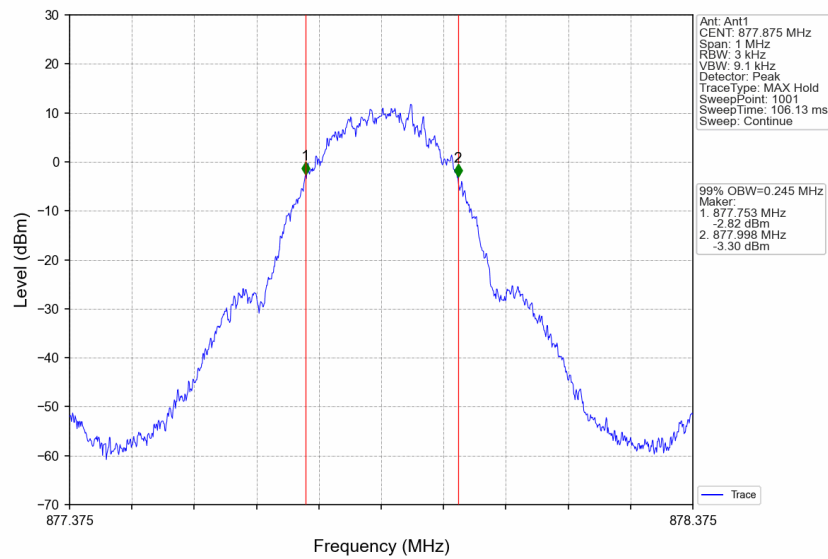
Band5_877.875MHz_AWGN_SISO_Ant1_NTNV_Input_AGC



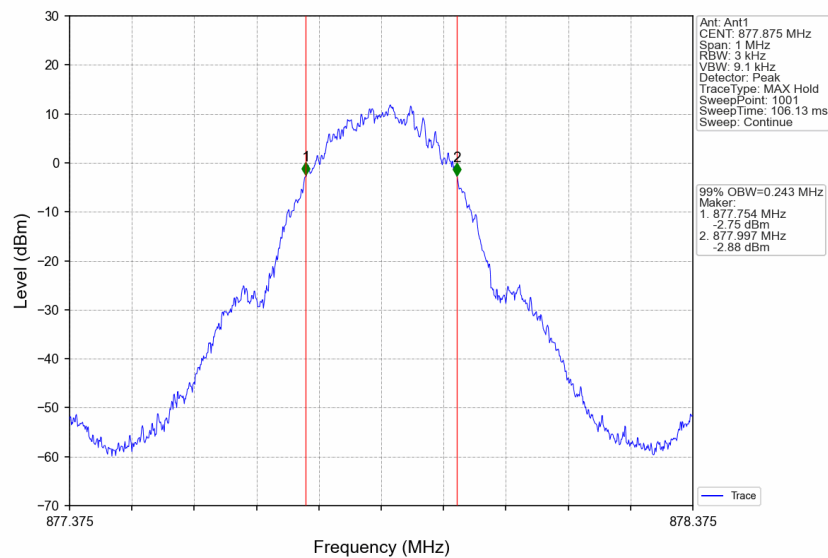
Band5_877.875MHz_AWGN_SISO_Ant1_NTNV_Input_AGC+3



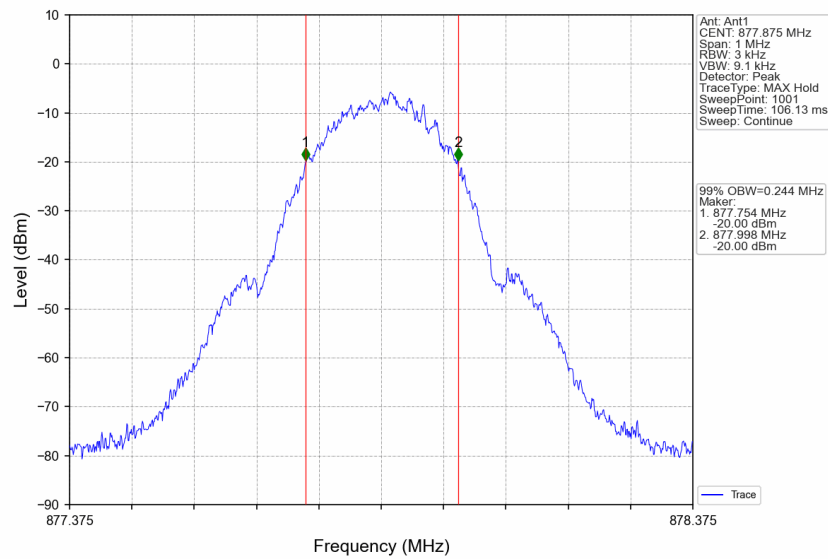
Band5_877.875MHz_GMSK_SISO_Ant1_NTNV_Output_AGC



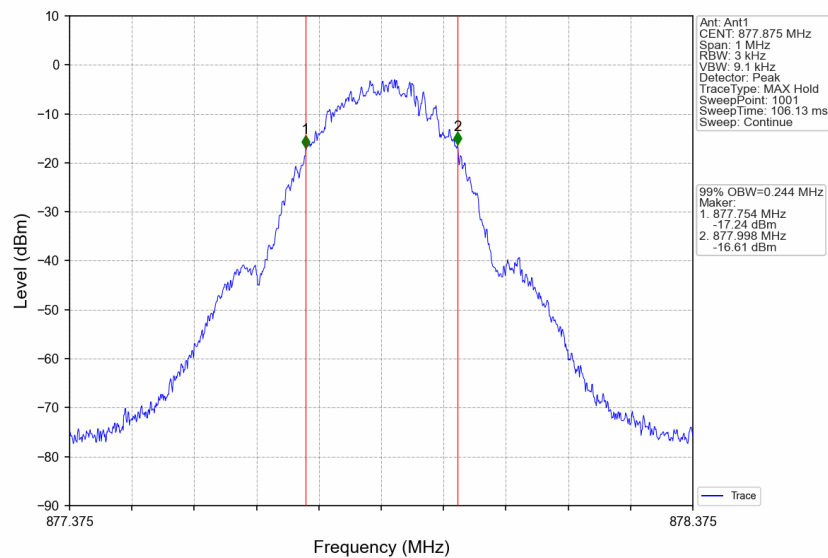
Band5_877.875MHz_GMSK_SISO_Ant1_NTNV_Output_AGC+3



Band5 877.875MHz GMSK SISO Ant1 NTN_V Input AGC



Band5_877.875MHz_GMSK_SISO_Ant1_NTN_V_Input_AGC+3

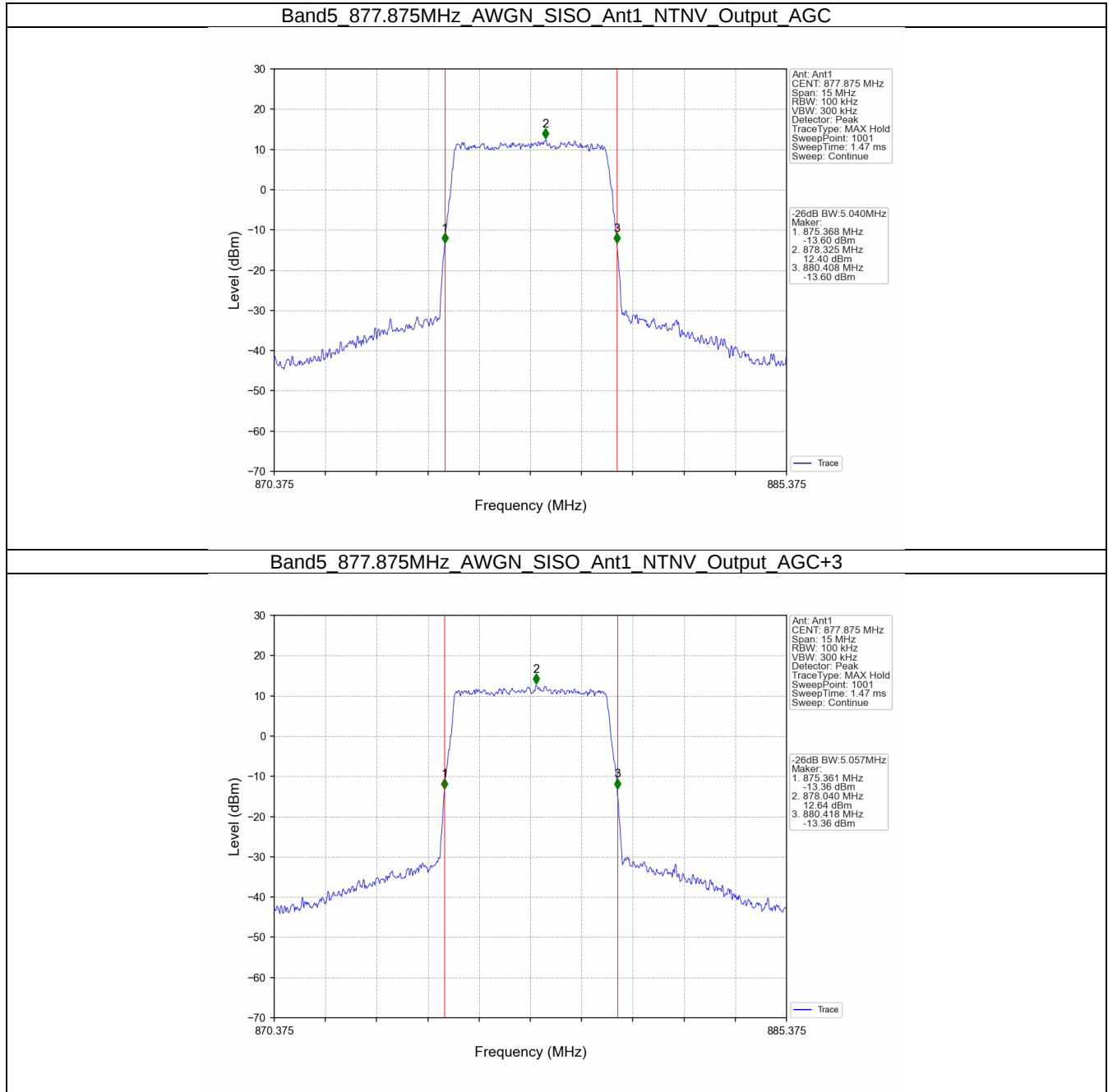


3.2 Band5_EBW

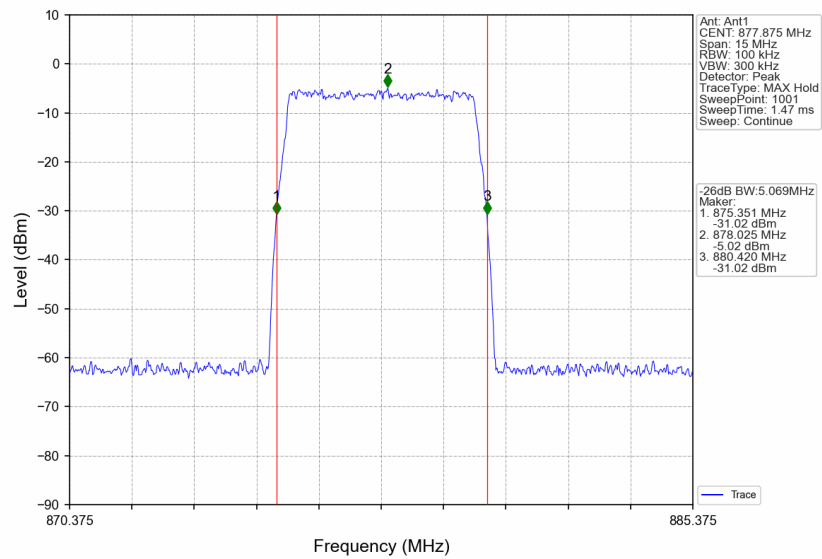
3.2.1 Test Result

Band: 5 / NTNV									
Signal			TX Type	ANT	26dB EBW (MHz)		Discrepancy (%)	Limit (%)	Verdict
Type	Level (dBm)	Frequency (MHz)			Output	Input			
AWGN	-5	877.875	SISO	1	5.040	5.069	-0.5720	5	Pass
	-2	877.875	SISO	1	5.057	5.056	0.0198	5	Pass
GMSK	-5	877.875	SISO	1	0.314	0.313	0.3195	5	Pass
	-2	877.875	SISO	1	0.313	0.316	-0.9490	5	Pass

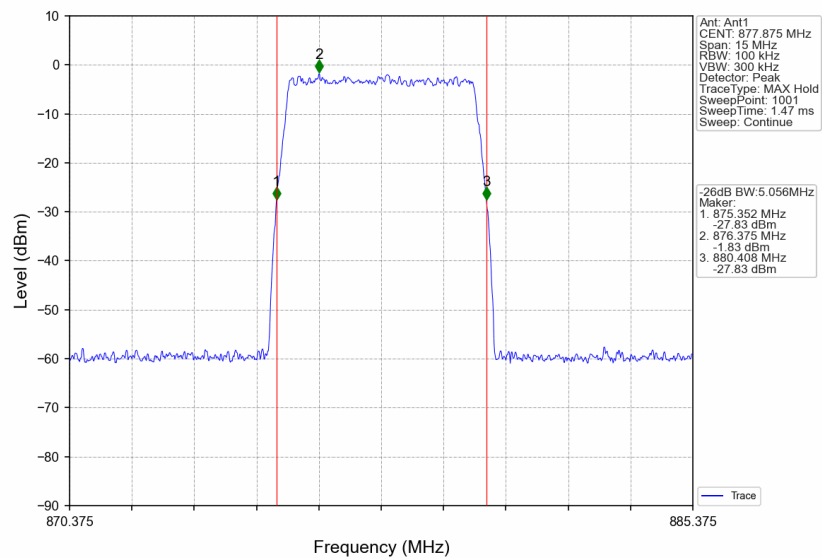
3.2.2 Test Graph



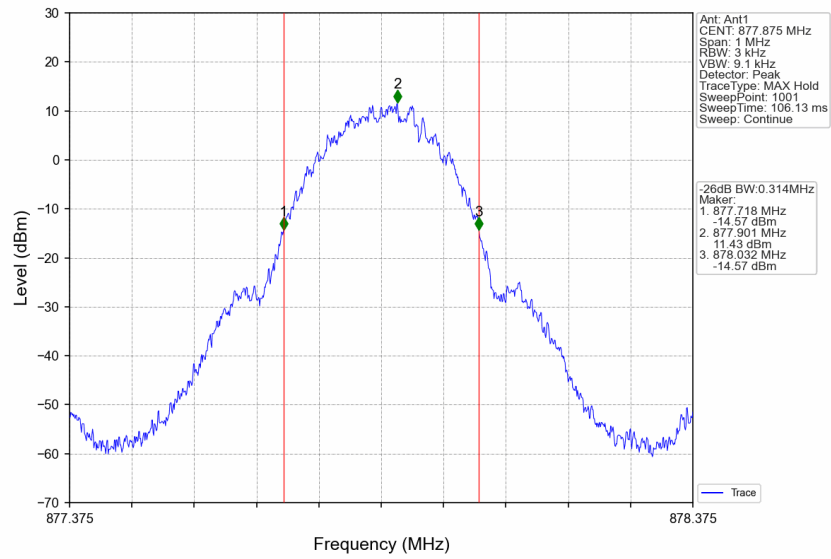
Band5_877.875MHz_AWGN_SISO_Ant1_NTNV_Input_AGC



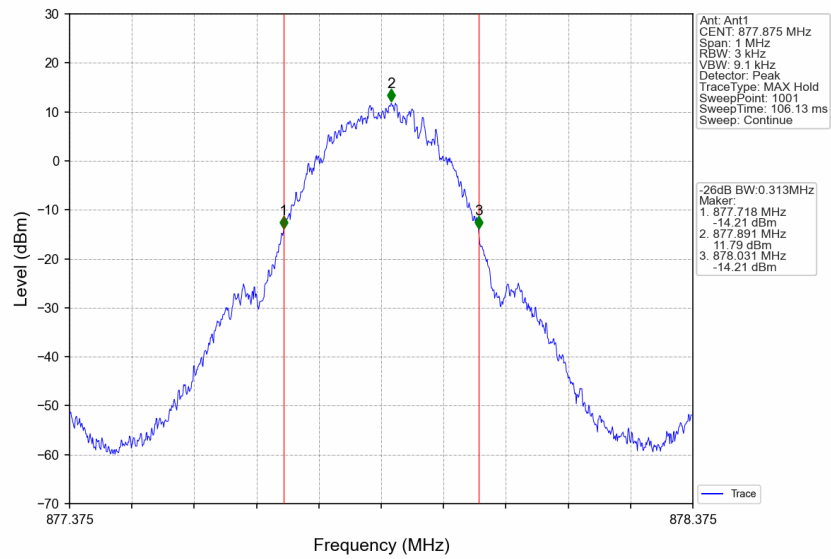
Band5_877.875MHz_AWGN_SISO_Ant1_NTNV_Input_AGC+3



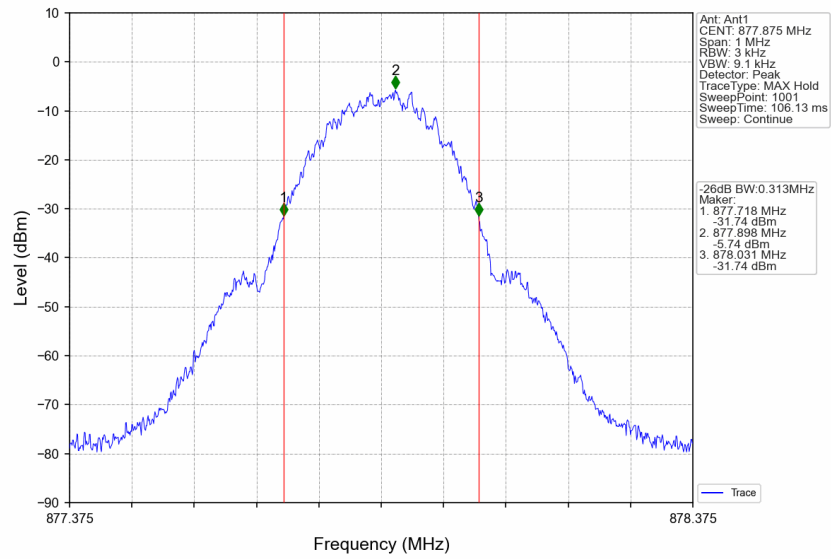
Band5_877.875MHz_GMSK_SISO_Ant1_NTNV_Output_AGC



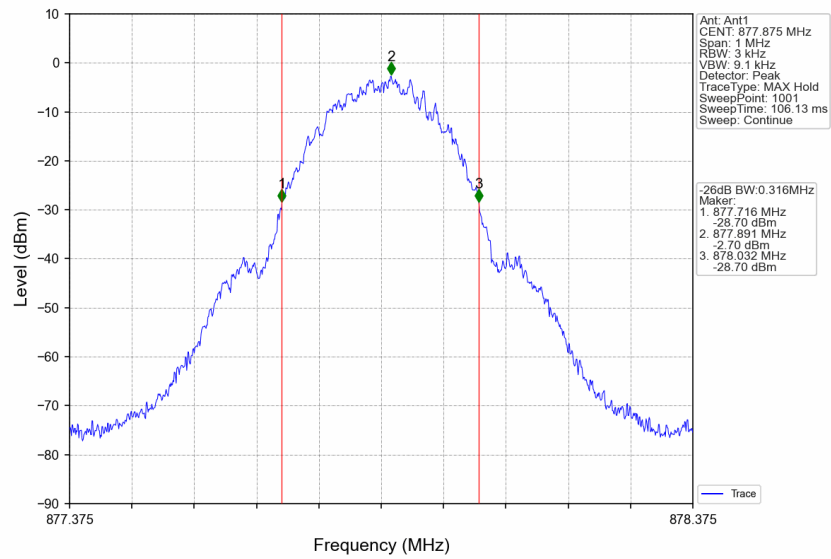
Band5_877.875MHz_GMSK_SISO_Ant1_NTNV_Output_AGC+3



Band5 877.875MHz GMSK SISO Ant1 NTN Input AGC



Band5 877.875MHz GMSK SISO Ant1 NTN Input AGC+3



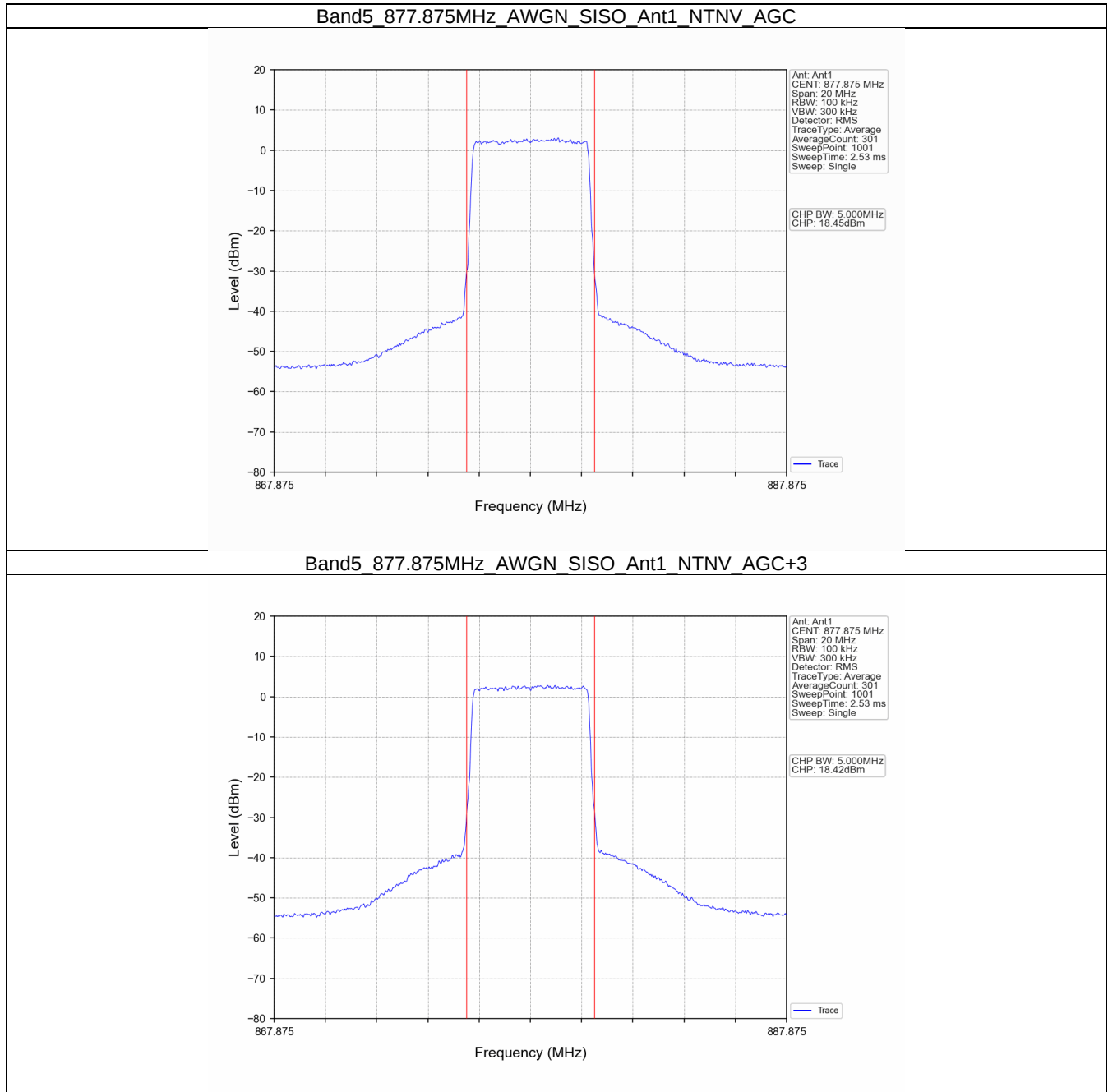
4. Input/output power and amplifier/booster gain

4.1 Band5_ERP

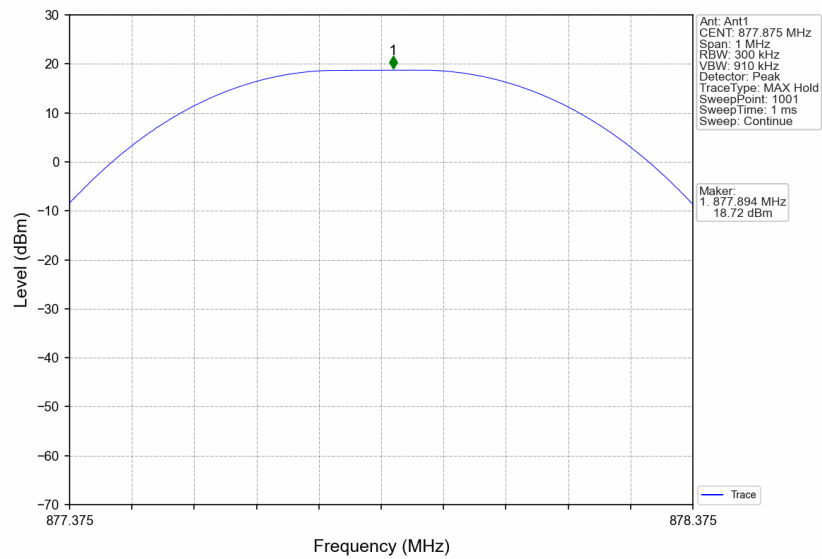
4.1.1 Test Result

Band: 5 / NTNV										
Signal			TX Type	ANT	Conducted Power (dBm)		ERP (dBm)		Booster Gain (dB)	Verdict
Type	Level (dBm)	Frequency (MHz)			Output	Input	Result	Limit		
AWGN	-5	877.875	SISO	1	18.45	-6.05	18.93	<=56.99	24.50	Pass
	-2	877.875	SISO	1	18.42	-2.07	18.90	<=56.99	/	Pass
GMSK	-5	877.875	SISO	1	18.72	-6.11	19.20	<=56.99	24.83	Pass
	-2	877.875	SISO	1	18.76	-2.92	19.24	<=56.99	/	Pass

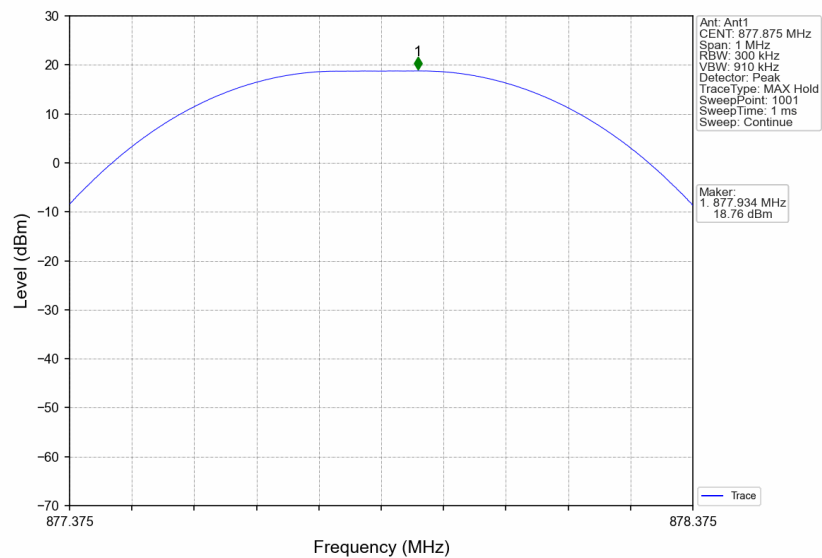
4.1.2 Test Graph



Band5 877.875MHz GMSK SISO Ant1 NTN AGC



Band5 877.875MHz GMSK SISO Ant1 NTN AGC+3





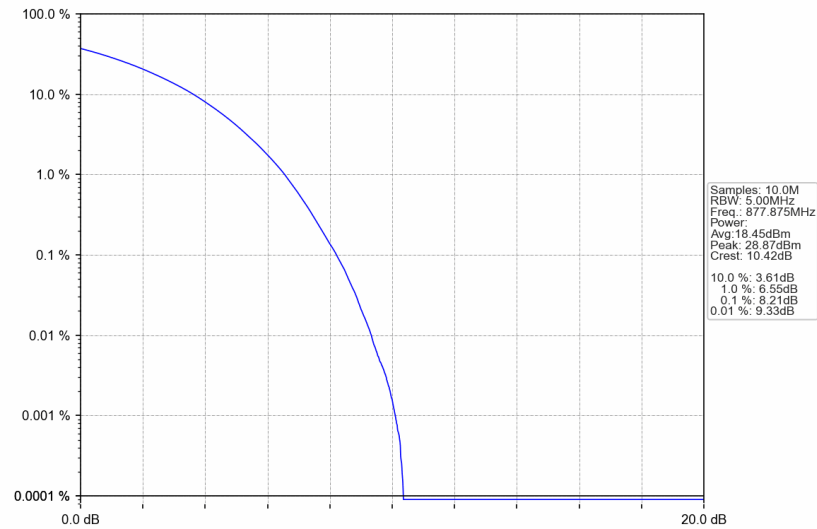
4.2 Band5_PAPR

4.2.1 Test Result

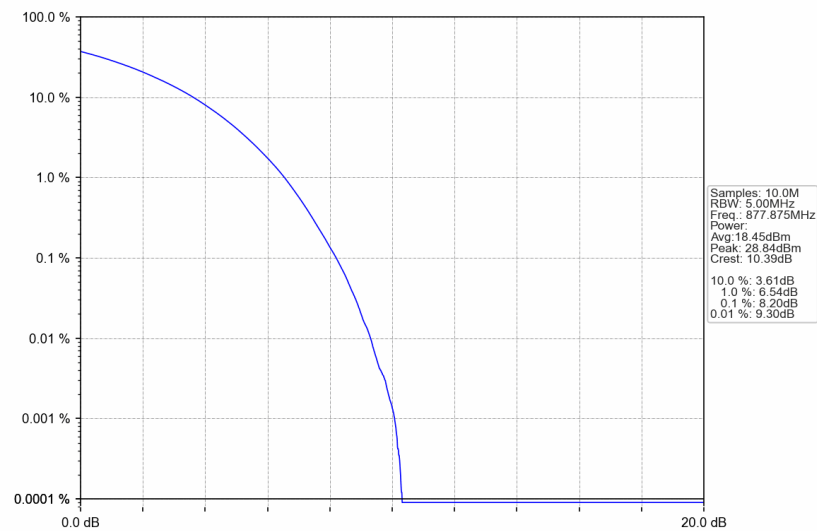
Band: 5 / NTNV							
Signal			TX Type	ANT	PAPR (dB)		Verdict
Type	Level (dBm)	Frequency (MHz)			Result	Limit	
AWGN	-5	877.875	SISO	1	8.21	<=13	Pass
	-2	877.875	SISO	1	8.20	<=13	Pass
GMSK	-5	877.875	SISO	1	0.53	<=13	Pass
	-2	877.875	SISO	1	0.35	<=13	Pass

4.2.2 Test Graph

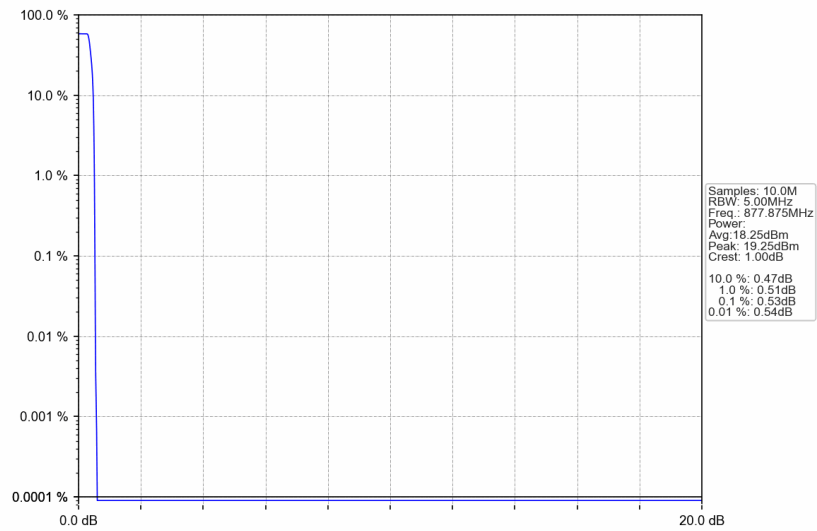
Band5 877.875MHz_AWGN_SISO_Ant1_NTNV_AGC



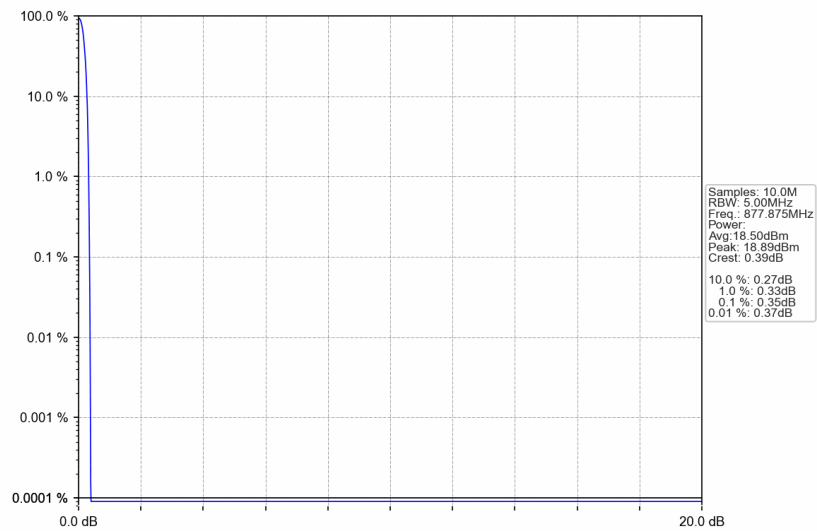
Band5_877.875MHz_AWGN_SISO_Ant1_NTNV_AGC+3



Band5 877.875MHz GMSK SISO Ant1 NTN AGC



Band5 877.875MHz GMSK SISO Ant1 NTN AGC+3



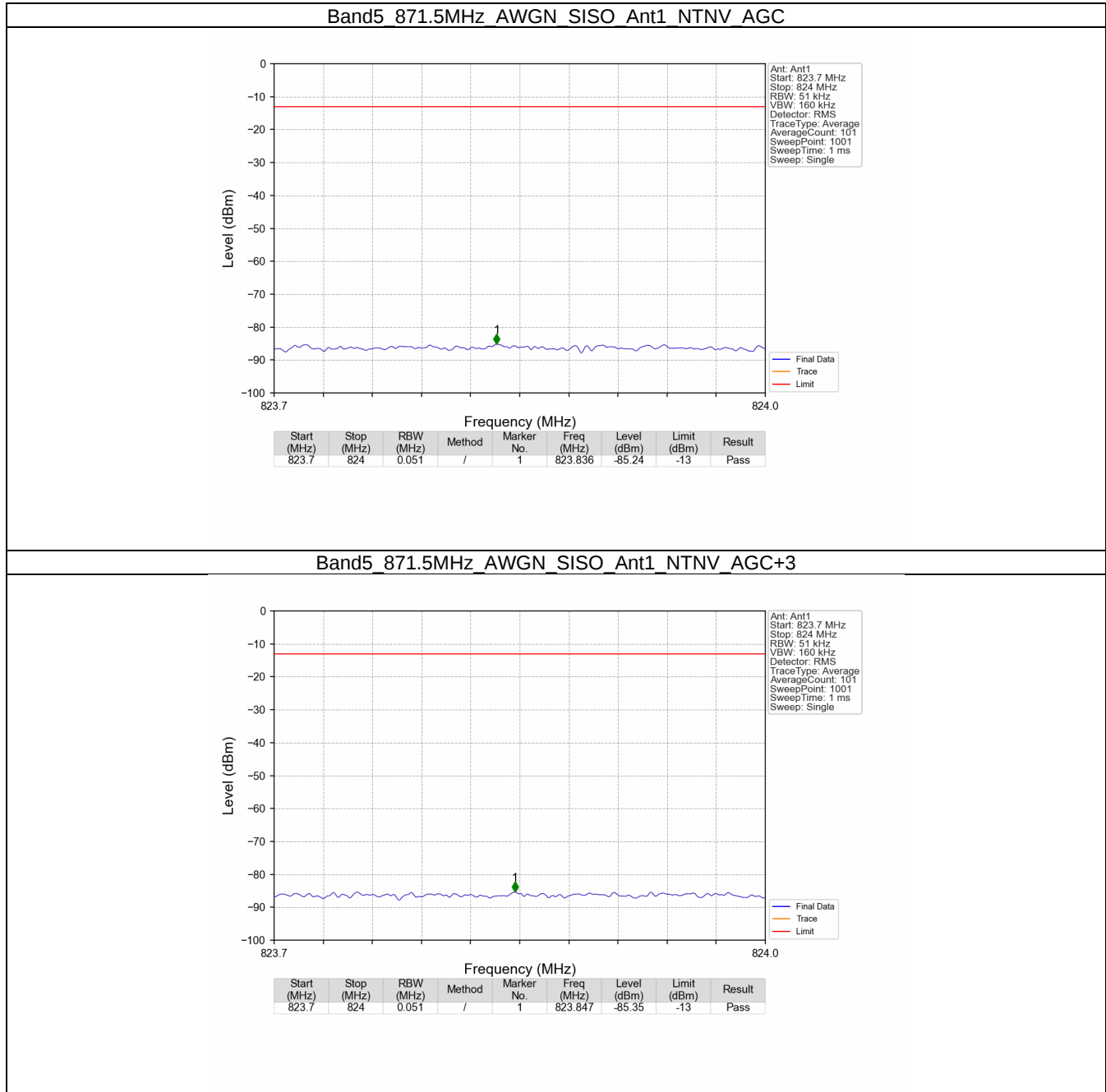
5. Out-of-band/out-of-block (including intermodulation) emissions

5.1 Band5

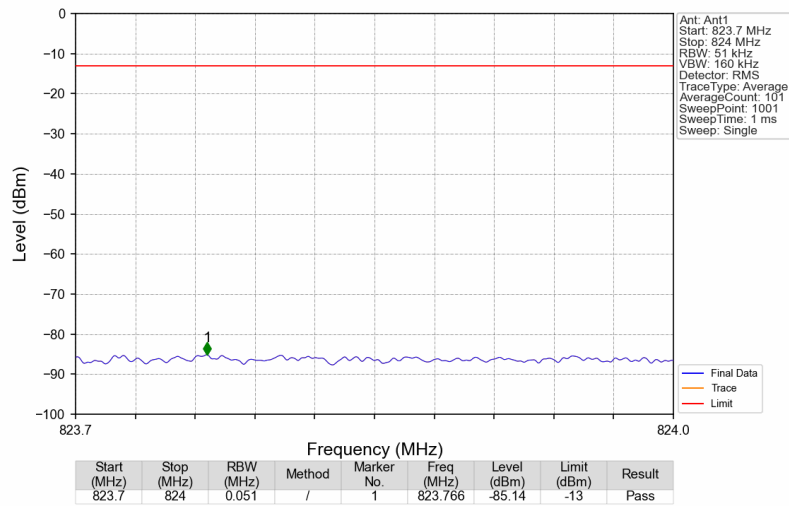
5.1.1 Test Result

Band: 5 / NTNV									
Signal				Channel	TX Type	ANT	OOB (dBm)		Verdict
Input	Type	Level (dBm)	Frequency (MHz)				Result	Limit	
Two	AWGN	-5	871.5	LCH	SISO	1	-85.24	Refer To Test Graph	Pass
		-2	871.5	LCH	SISO	1	-85.35	Refer To Test Graph	Pass
One	AWGN	-5	871.5	LCH	SISO	1	-85.14	Refer To Test Graph	Pass
		-2	871.5	LCH	SISO	1	-85.42	Refer To Test Graph	Pass
Two	AWGN	-5	891.5	HCH	SISO	1	-85.29	Refer To Test Graph	Pass
		-2	891.5	HCH	SISO	1	-85.63	Refer To Test Graph	Pass
One	AWGN	-5	891.5	HCH	SISO	1	-85.60	Refer To Test Graph	Pass
		-2	891.5	HCH	SISO	1	-85.24	Refer To Test Graph	Pass
Two	GMSK	-5	869.1	LCH	SISO	1	-97.28	Refer To Test Graph	Pass
		-2	869.1	LCH	SISO	1	-97.11	Refer To Test Graph	Pass
One	GMSK	-5	869.1	LCH	SISO	1	-97.23	Refer To Test Graph	Pass
		-2	869.1	LCH	SISO	1	-97.16	Refer To Test Graph	Pass
Two	GMSK	-5	893.9	HCH	SISO	1	-97.55	Refer To Test Graph	Pass
		-2	893.9	HCH	SISO	1	-97.46	Refer To Test Graph	Pass
One	GMSK	-5	893.9	HCH	SISO	1	-97.39	Refer To Test Graph	Pass
		-2	893.9	HCH	SISO	1	-97.46	Refer To Test Graph	Pass

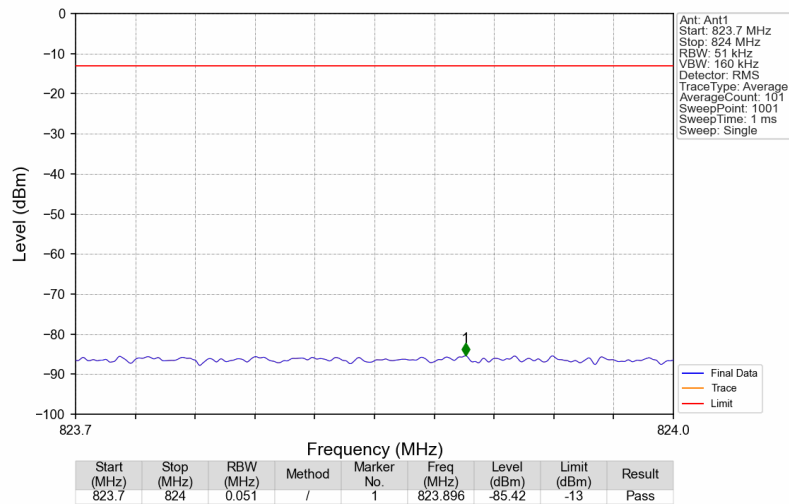
5.1.2 Test Graph



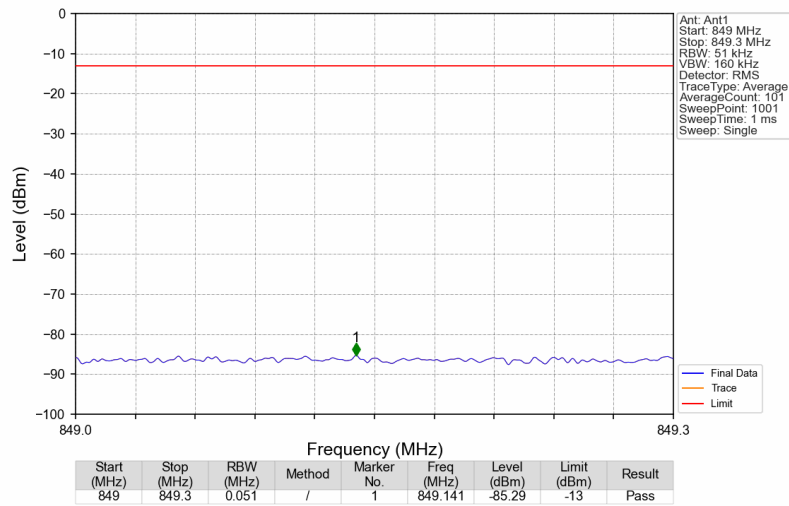
Band5 871.5MHz AWGN SISO Ant1 NTN AGC



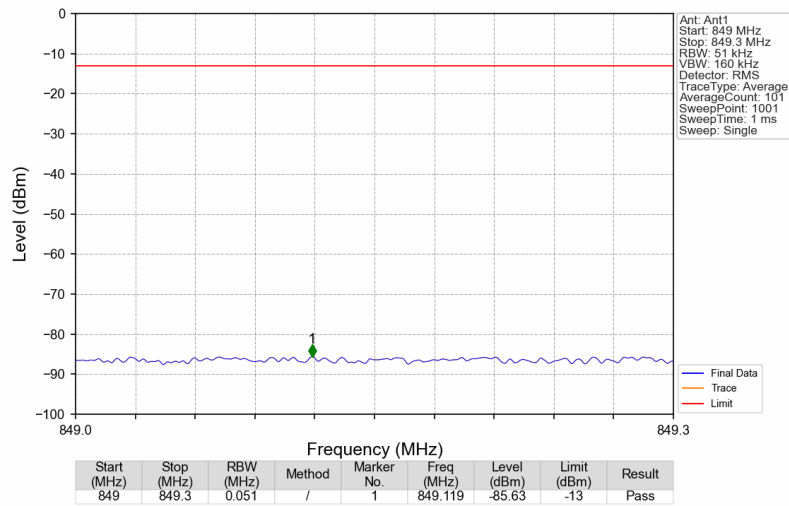
Band5 871.5MHz AWGN SISO Ant1 NTN AGC+3



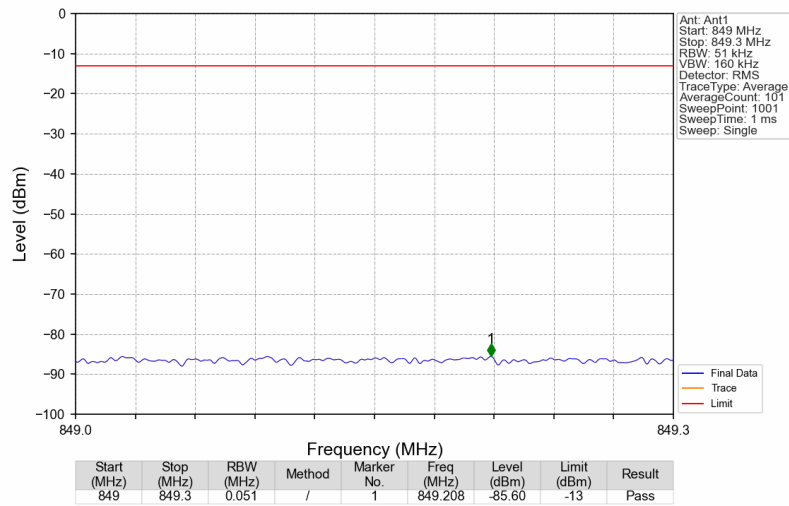
Band5_891.5MHz_AWGN_SISO_Ant1_NTNV_AGC



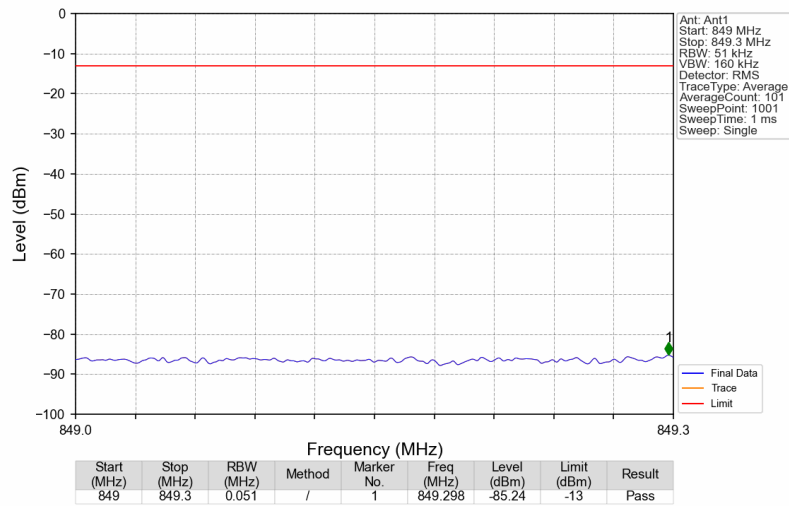
Band5_891.5MHz_AWGN_SISO_Ant1_NTNV_AGC+3



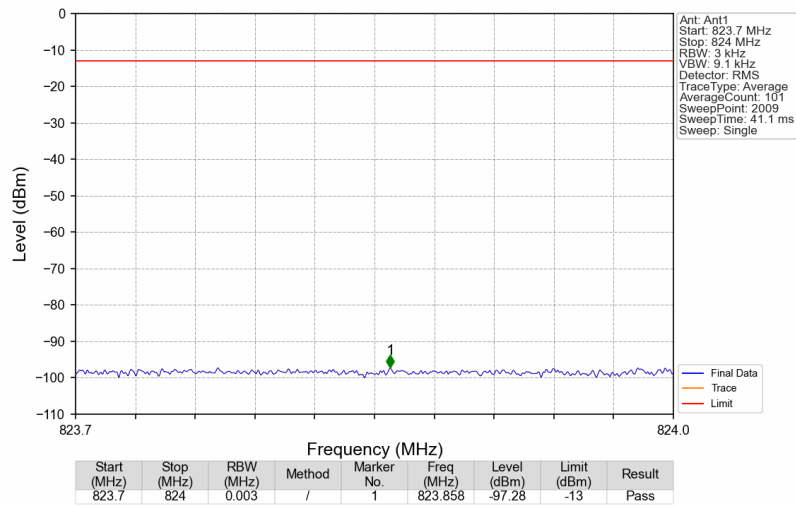
Band5 891.5MHz AWGN SISO Ant1 NTN AGC



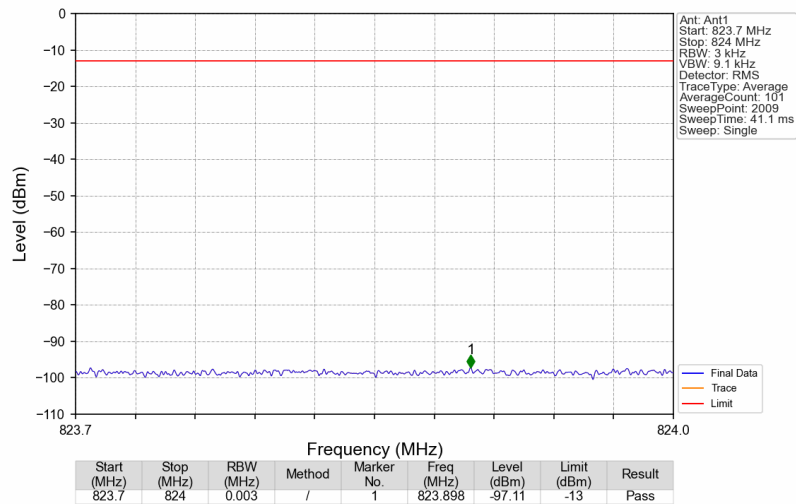
Band5 891.5MHz AWGN SISO Ant1 NTN AGC+3



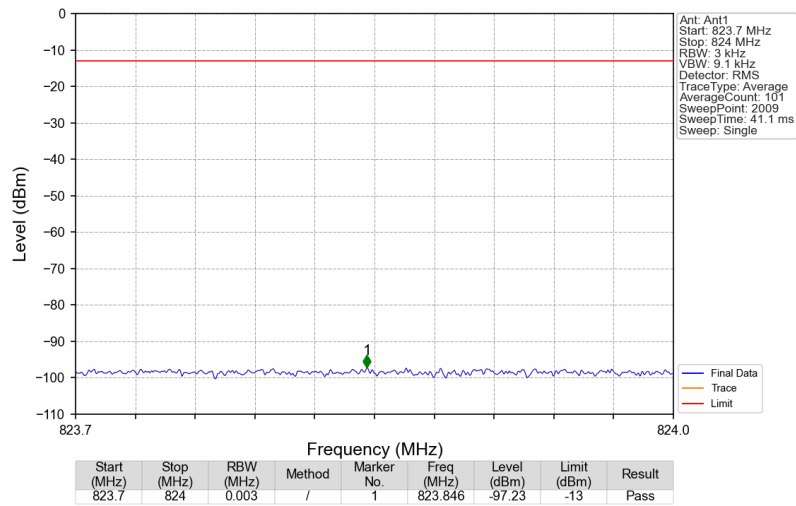
Band5 869.1MHz GMSK SISO Ant1 NTN AGC



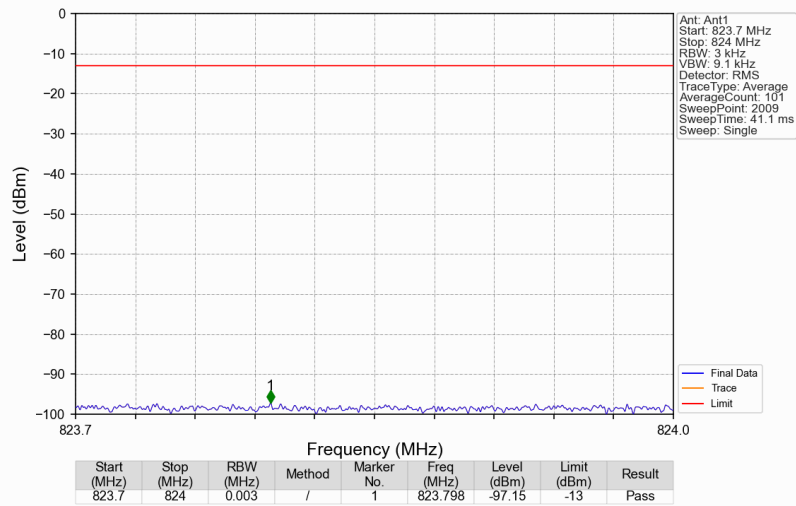
Band5 869.1MHz GMSK SISO Ant1 NTN AGC+3



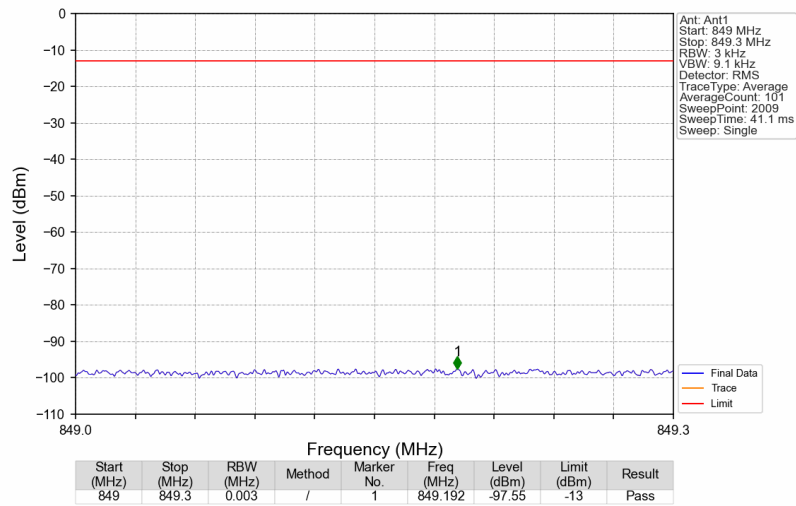
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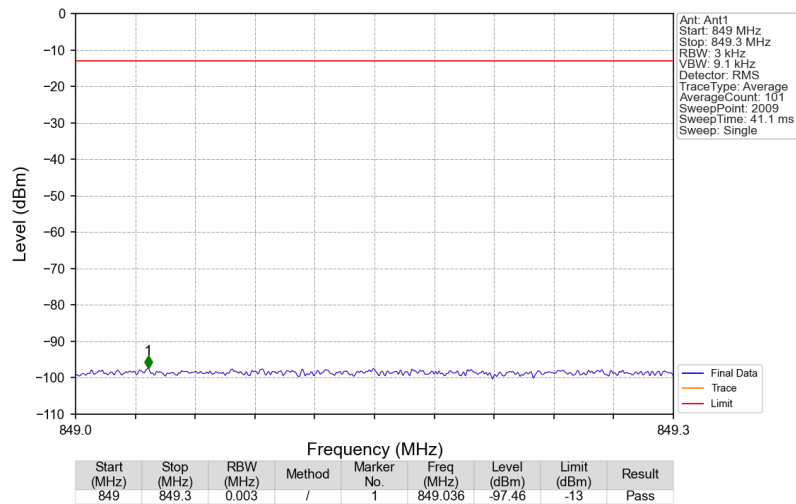
Band5 869.1MHz GMSK SISO Ant1 NTN AGC+3



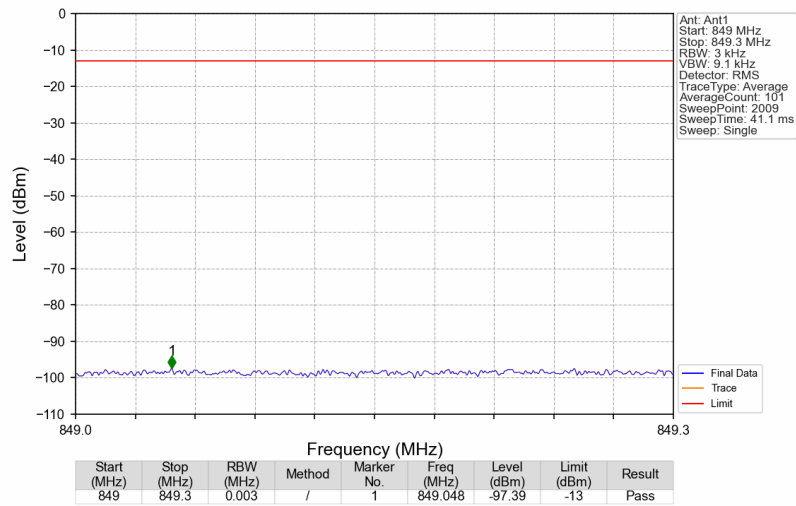
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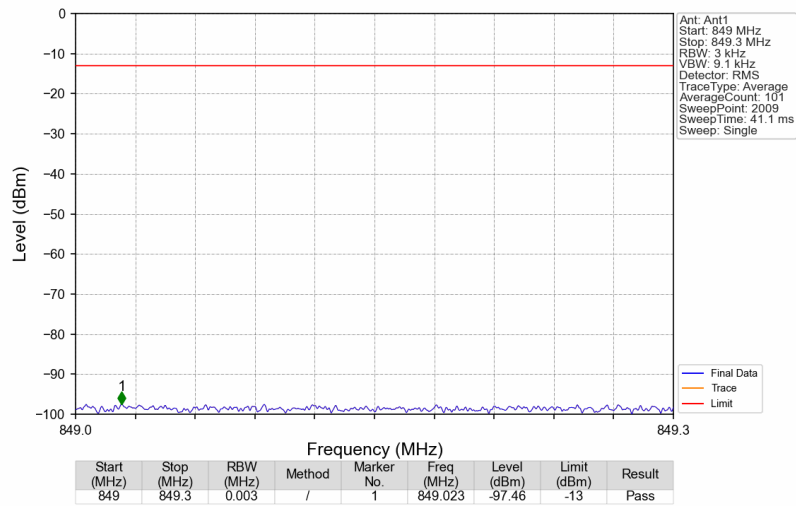
Band5 893.9MHz GMSK SISO Ant1 NTN AGC+3



Band5 893.9MHz GMSK SISO Ant1 NTN AGC



Band5 893.9MHz GMSK SISO Ant1 NTN AGC+3



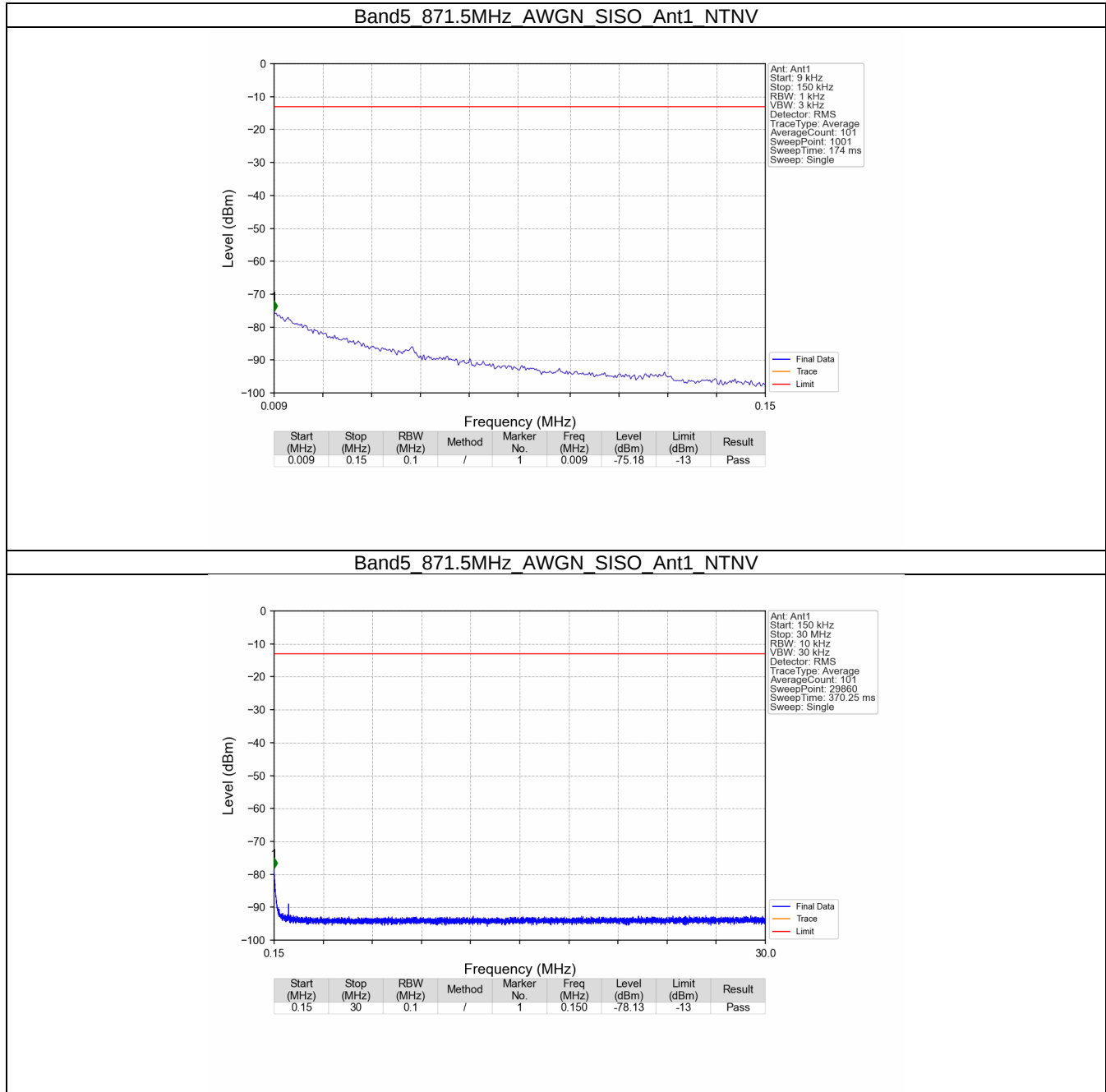
6. Spurious emissions

6.1 Band5

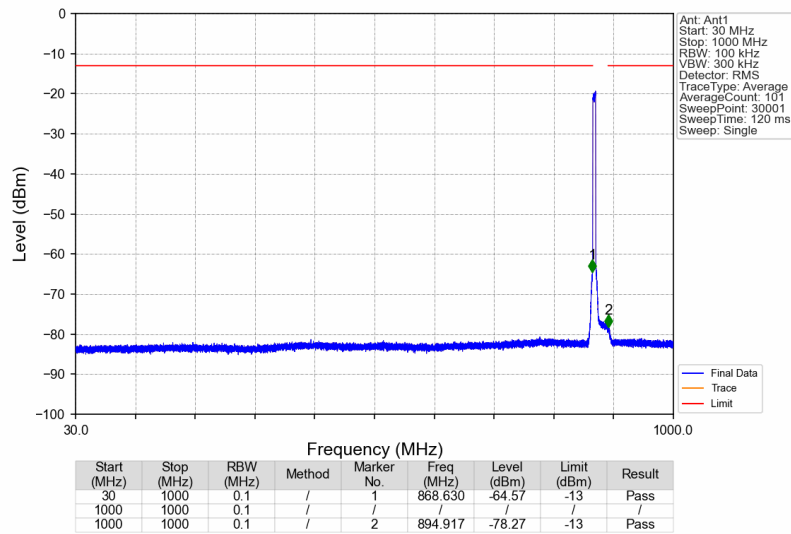
6.1.1 Test Result

Band: 5 / NTNV								
Signal			Channel	TX Type	ANT	SE (dBm)		Verdict
Type	Level (dBm)	Frequency (MHz)				Result	Limit	
AWGN	-5	871.5	LCH	SISO	1	Refer To Test Graph		Pass
		881.5	MCH	SISO	1	Refer To Test Graph		Pass
		891.5	HCH	SISO	1	Refer To Test Graph		Pass
GMSK	-5	869.1	LCH	SISO	1	Refer To Test Graph		Pass
		881.5	MCH	SISO	1	Refer To Test Graph		Pass
		893.9	HCH	SISO	1	Refer To Test Graph		Pass

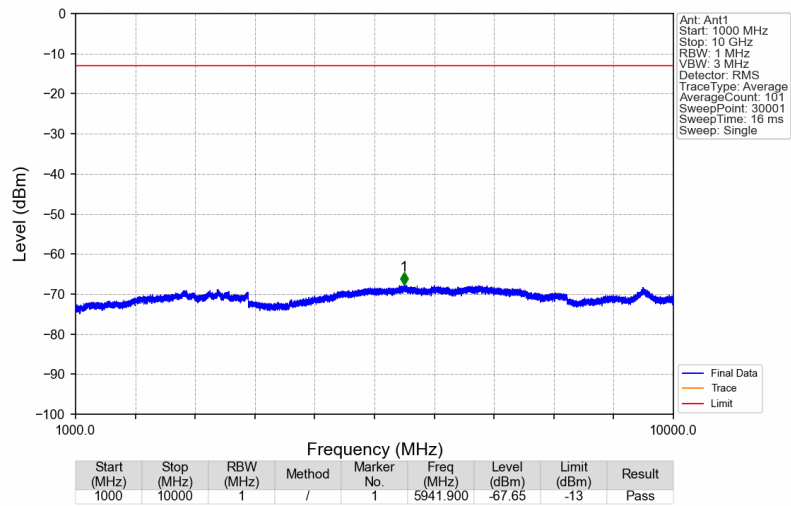
6.1.2 Test Graph



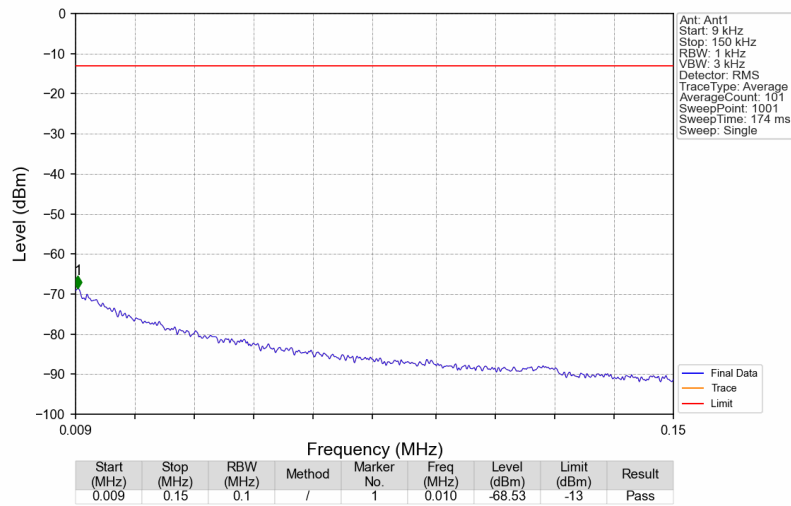
Band5 871.5MHz AWGN SISO Ant1 NTN



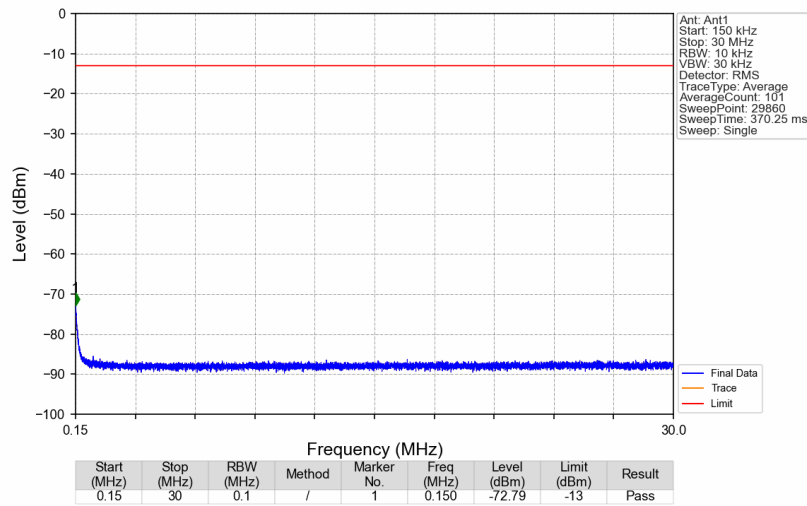
Band5 871.5MHz AWGN SISO Ant1 NTN



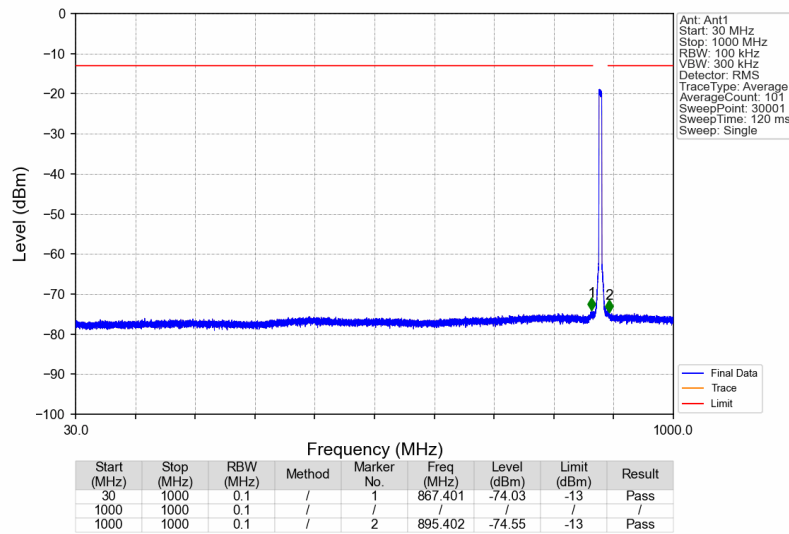
Band5 881.5MHz AWGN SISO Ant1 NTN



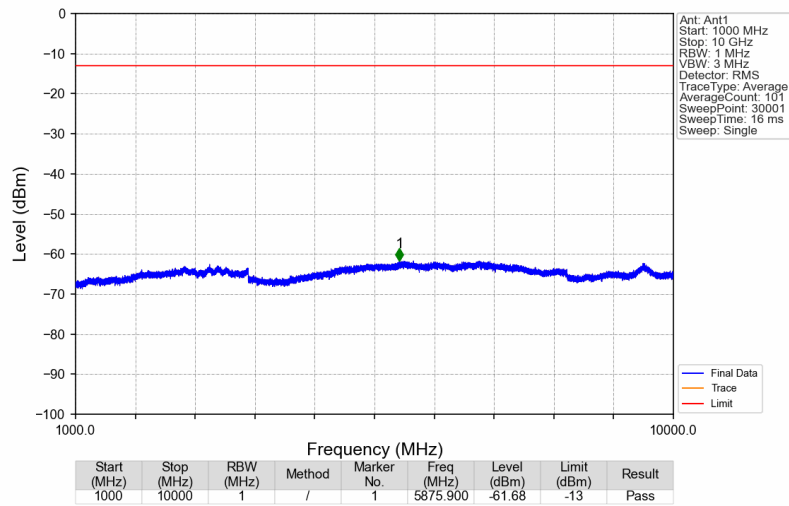
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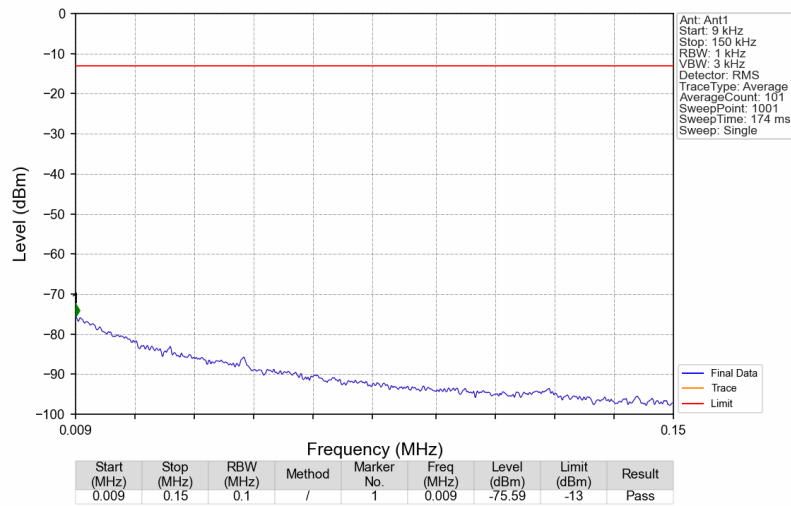
Band5 881.5MHz AWGN SISO Ant1 NTN



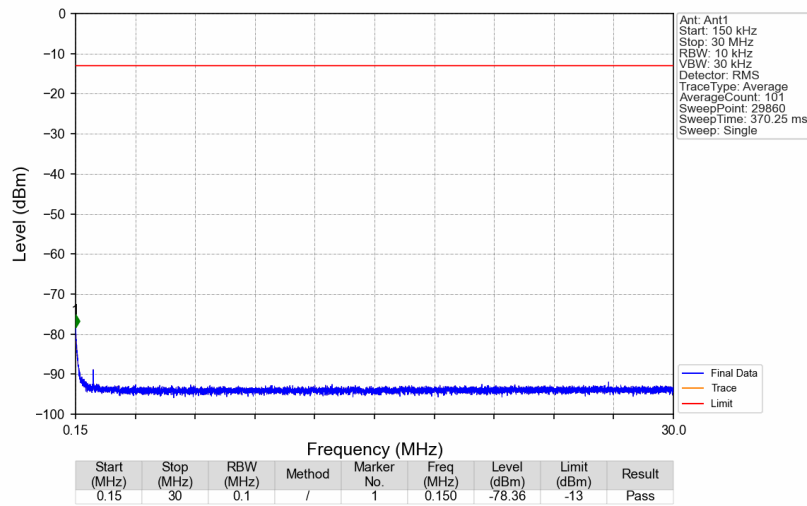
Band5 881.5MHz AWGN SISO Ant1 NTN



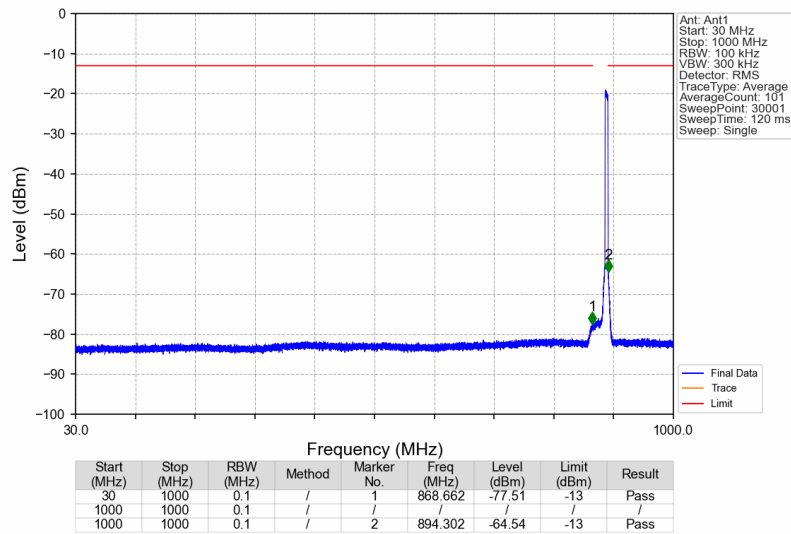
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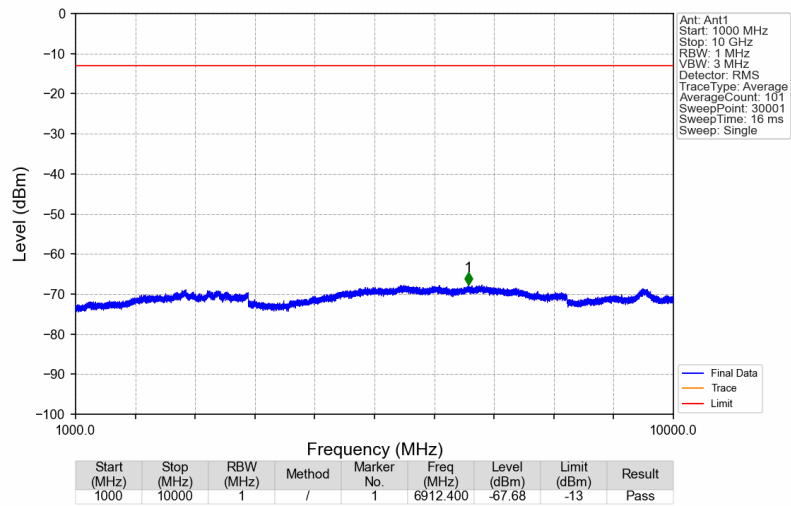
Band5 891.5MHz AWGN SISO Ant1 NTN



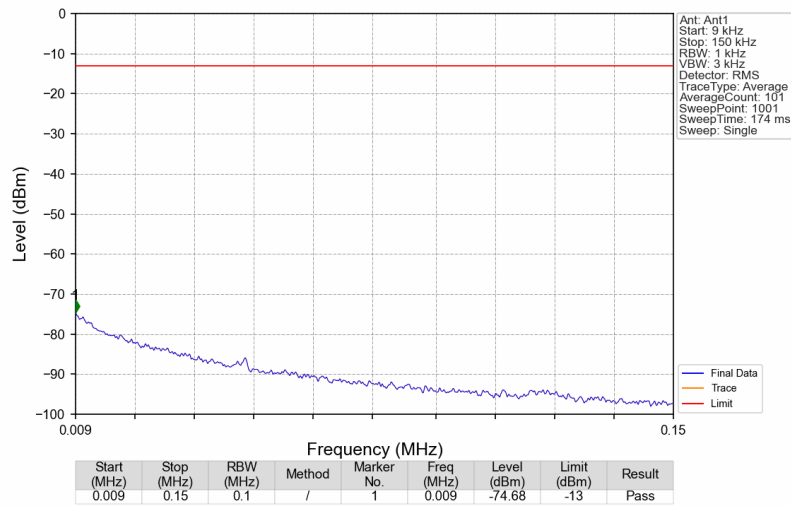
Band5 891.5MHz AWGN SISO Ant1 NTN



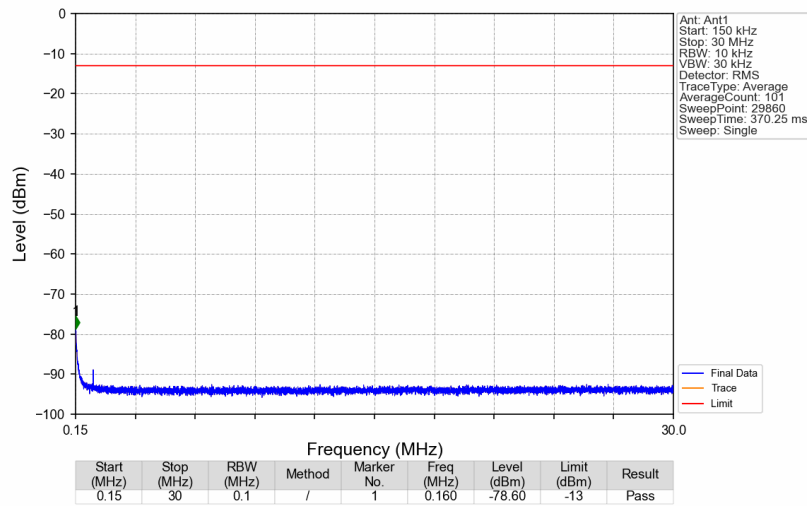
Band5 891.5MHz AWGN SISO Ant1 NTN



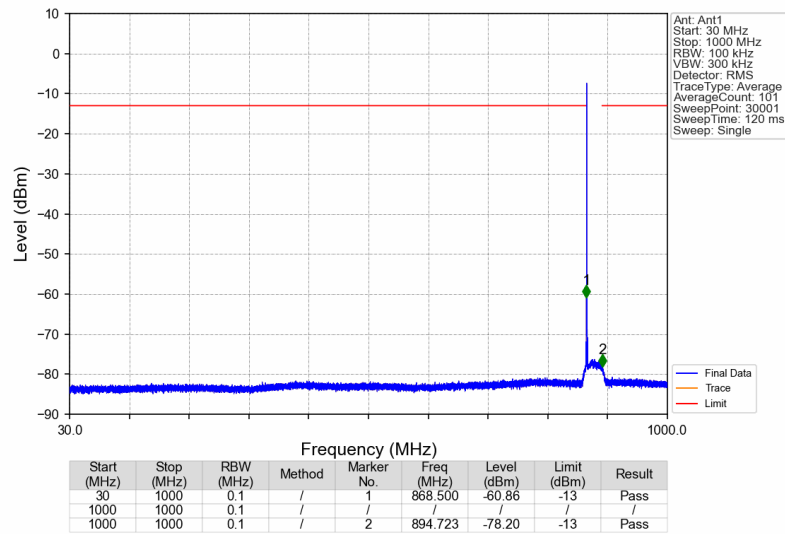
Band5 869.1MHz GMSK SISO Ant1 NTN



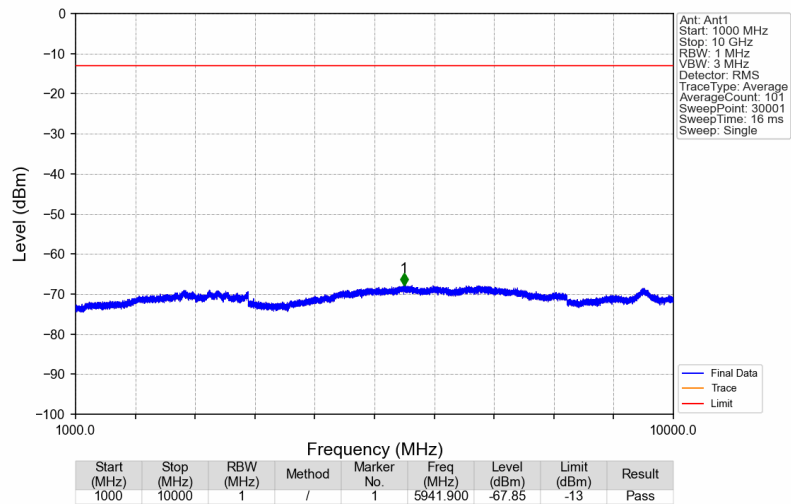
Band5 869.1MHz GMSK SISO Ant1 NTN



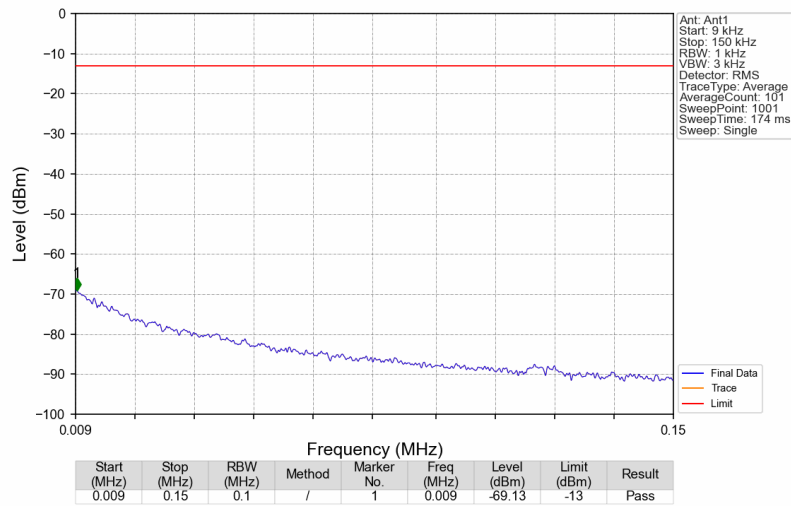
Band5 869.1MHz GMSK SISO Ant1 NTN



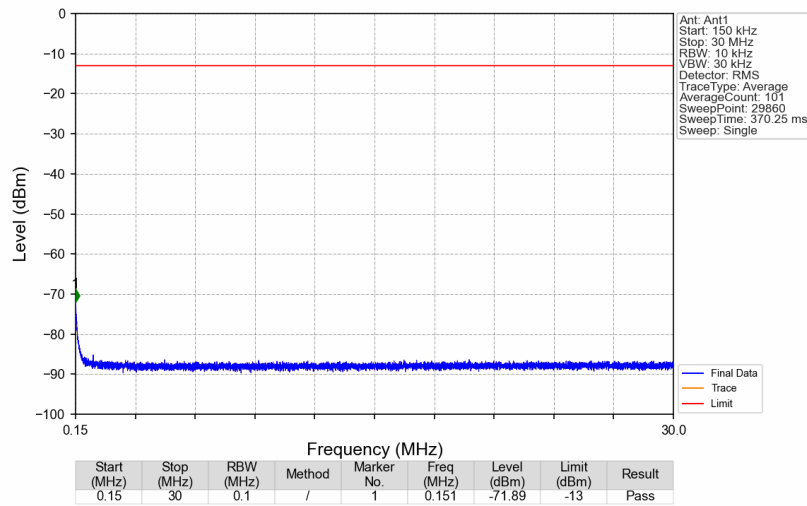
Band5 869.1MHz GMSK SISO Ant1 NTN



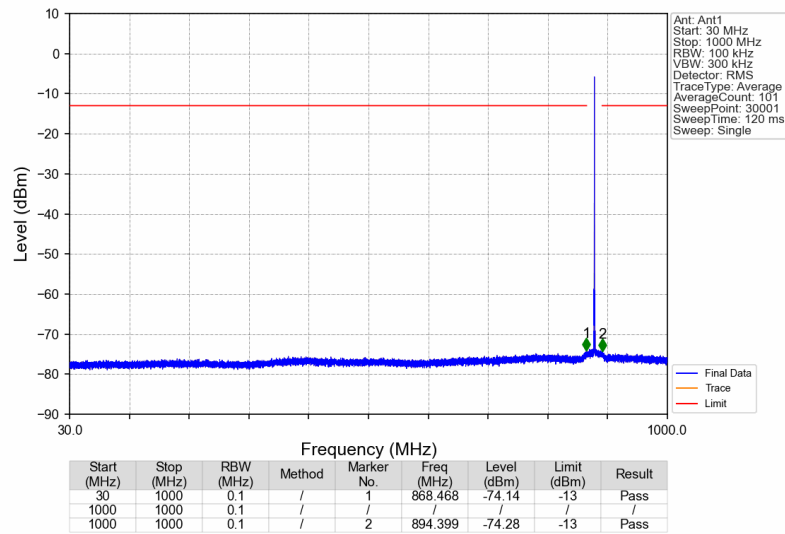
Band5 881.5MHz GMSK SISO Ant1 NTN



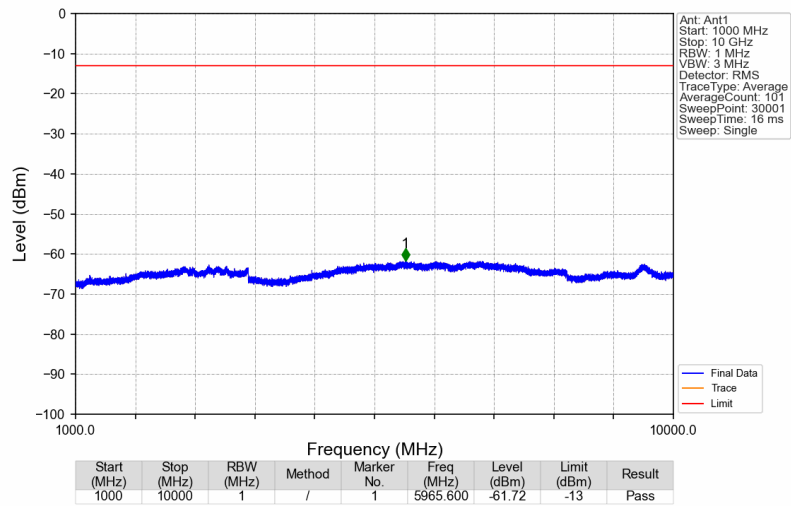
Band5 881.5MHz GMSK SISO Ant1 NTN



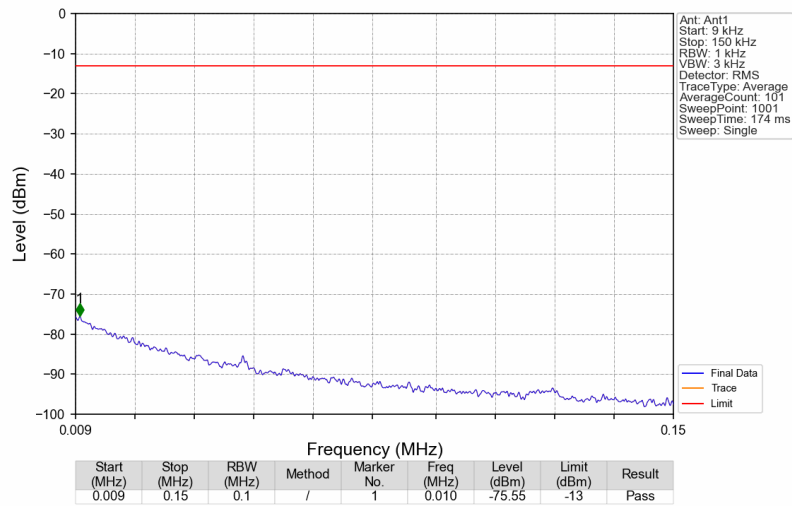
Band5 881.5MHz GMSK SISO Ant1 NTN



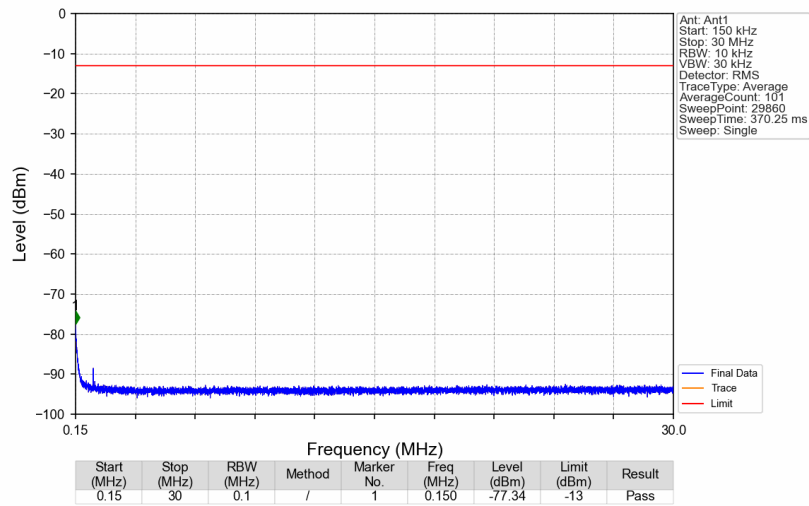
Band5 881.5MHz GMSK SISO Ant1 NTN



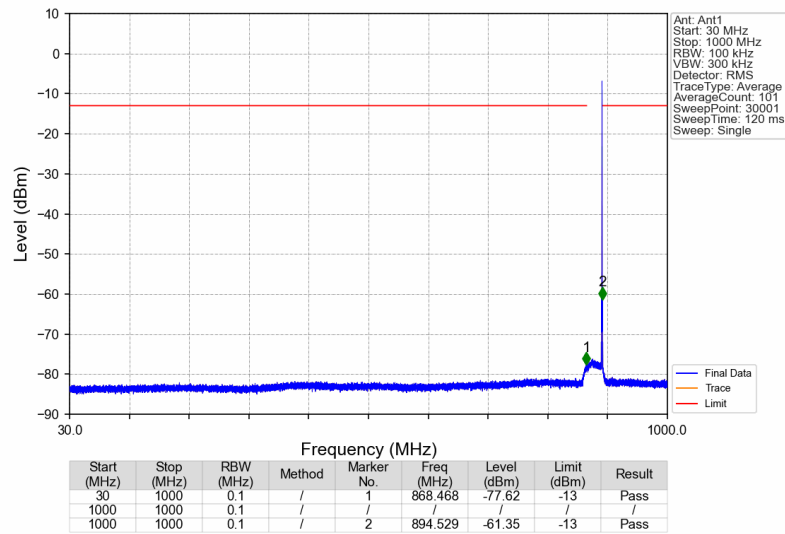
Band5 893.9MHz GMSK SISO Ant1 NTN



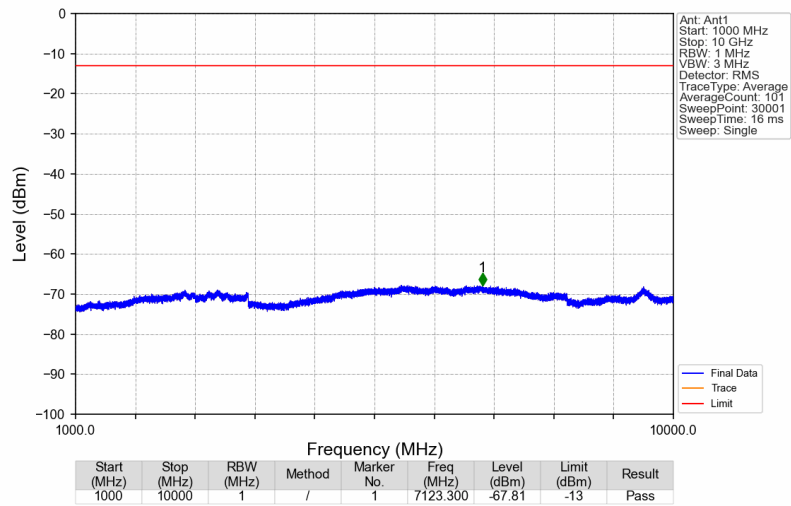
Band5 893.9MHz GMSK SISO Ant1 NTN



Band5 893.9MHz GMSK SISO Ant1 NTN



Band5 893.9MHz GMSK SISO Ant1 NTN



7. Frequency stability measurements

7.1 Band5_Ant1

7.1.1 Test Result

Band: 5 / NTNV							
Signal			Temp (°C)	Voltage (VAC)	Freq. Error (Hz)	Tolerance (ppm)	Verdict
Type	Level (dBm)	Frequency (MHz)					
CW	-5	869.1	20	102	-197	-0.227	Pass
				120	-198	-0.228	Pass
				138	-192	-0.221	Pass
			-30	120	-194	-0.223	Pass
			-20	120	-193	-0.222	Pass
			-10	120	-190	-0.219	Pass
			0	120	-189	-0.217	Pass
			10	120	-188	-0.216	Pass
			30	120	-191	-0.220	Pass
			40	120	-193	-0.222	Pass
			50	120	-194	-0.223	Pass
		881.5	20	102	-189	-0.217	Pass
				120	-188	-0.213	Pass
				138	-187	-0.212	Pass
			-30	120	-196	-0.222	Pass
			-20	120	-193	-0.219	Pass
			-10	120	-197	-0.223	Pass
			0	120	-192	-0.218	Pass
			10	120	-193	-0.219	Pass
			30	120	-199	-0.226	Pass
			40	120	-195	-0.221	Pass
			50	120	-191	-0.217	Pass
		893.9	20	102	-189	-0.214	Pass
				120	-187	-0.212	Pass
				138	-193	-0.216	Pass
			-30	120	-195	-0.218	Pass
			-20	120	-195	-0.218	Pass
			-10	120	-198	-0.222	Pass
			0	120	-193	-0.216	Pass
			10	120	-197	-0.220	Pass
			30	120	-195	-0.218	Pass



			40	120	-189	-0.211	Pass
			50	120	-188	-0.210	Pass

8. Radiated Spurious Emissions

8.1 Band5_Ant1

8.1.1 Test Result

AWGN_Low channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
90.524	Horizontal	-67.81	-13	-54.81	pass
209.208	Horizontal	-59.05	-13	-46.05	pass
626.752	Horizontal	-61.40	-13	-48.40	pass
1411.650	Horizontal	-49.43	-13	-36.43	pass
1994.660	Horizontal	-48.57	-13	-35.57	pass
6315.110	Horizontal	-38.99	-13	-25.99	pass
92.310	Vertical	-68.97	-13	-55.97	pass
160.825	Vertical	-56.36	-13	-43.36	pass
610.919	Vertical	-60.33	-13	-47.33	pass
1408.210	Vertical	-48.13	-13	-35.13	pass
2031.950	Vertical	-54.89	-13	-41.89	pass
6322.680	Vertical	-38.48	-13	-25.48	pass

AWGN_Middle channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
101.004	Horizontal	-69.64	-13	-56.64	pass
199.598	Horizontal	-62.95	-13	-49.95	pass
629.302	Horizontal	-62.23	-13	-49.23	pass
1397.570	Horizontal	-53.49	-13	-40.49	pass
2014.560	Horizontal	-50.42	-13	-37.42	pass
6357.780	Horizontal	-36.45	-13	-23.45	pass
104.910	Vertical	-66.72	-13	-53.72	pass
163.325	Vertical	-60.00	-13	-47.00	pass
592.709	Vertical	-57.07	-13	-44.07	pass
1418.160	Vertical	-50.71	-13	-37.71	pass
2028.300	Vertical	-47.51	-13	-34.51	pass
6330.080	Vertical	-36.93	-13	-23.93	pass

AWGN_High channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
121.640	Horizontal	-69.89	-13	-56.89	pass
156.275	Horizontal	-62.97	-13	-49.97	pass
550.959	Horizontal	-63.28	-13	-50.28	pass
1411.390	Horizontal	-47.45	-13	-34.45	pass
2040.330	Horizontal	-47.58	-13	-34.58	pass
6362.880	Horizontal	-39.98	-13	-26.98	pass
70.534	Vertical	-63.48	-13	-50.48	pass
137.538	Vertical	-61.50	-13	-48.50	pass
485.622	Vertical	-64.12	-13	-51.12	pass
1418.120	Vertical	-53.70	-13	-40.70	pass
1998.490	Vertical	-53.94	-13	-40.94	pass
6317.280	Vertical	-37.05	-13	-24.05	pass

GMSK_Low channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
108.104	Horizontal	-62.68	-13	-49.68	pass
119.648	Horizontal	-59.38	-13	-46.38	pass
486.742	Horizontal	-63.39	-13	-50.39	pass
1382.150	Horizontal	-53.95	-13	-40.95	pass
2165.880	Horizontal	-50.87	-13	-37.87	pass
6208.340	Horizontal	-39.69	-13	-26.69	pass
87.130	Vertical	-66.41	-13	-53.41	pass
173.685	Vertical	-61.26	-13	-48.26	pass
504.709	Vertical	-59.04	-13	-46.04	pass
1373.730	Vertical	-52.79	-13	-39.79	pass
2161.970	Vertical	-48.47	-13	-35.47	pass
6229.340	Vertical	-38.08	-13	-25.08	pass

GMSK_Middle channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
137.686	Horizontal	-65.14	-13	-52.14	pass
302.425	Horizontal	-59.80	-13	-46.80	pass
463.749	Horizontal	-58.12	-13	-45.12	pass
1390.610	Horizontal	-50.26	-13	-37.26	pass
2176.170	Horizontal	-53.07	-13	-40.07	pass
6202.750	Horizontal	-39.70	-13	-26.70	pass
142.325	Vertical	-62.09	-13	-49.09	pass
508.789	Vertical	-57.30	-13	-44.30	pass
527.396	Vertical	-60.02	-13	-47.02	pass
1401.450	Vertical	-54.75	-13	-41.75	pass
2166.480	Vertical	-55.19	-13	-42.19	pass
6193.000	Vertical	-38.21	-13	-25.21	pass

GMSK_High channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
119.146	Horizontal	-67.54	-13	-54.54	pass
312.205	Horizontal	-59.30	-13	-46.30	pass
478.669	Horizontal	-57.72	-13	-44.72	pass
1494.920	Horizontal	-51.10	-13	-38.10	pass
2199.190	Horizontal	-50.61	-13	-37.61	pass
6263.560	Horizontal	-37.55	-13	-24.55	pass
86.840	Vertical	-67.17	-13	-54.17	pass
158.135	Vertical	-58.34	-13	-45.34	pass
532.419	Vertical	-62.74	-13	-49.74	pass
1493.150	Vertical	-53.20	-13	-40.20	pass
2218.750	Vertical	-54.59	-13	-41.59	pass
6240.930	Vertical	-36.74	-13	-23.74	pass