

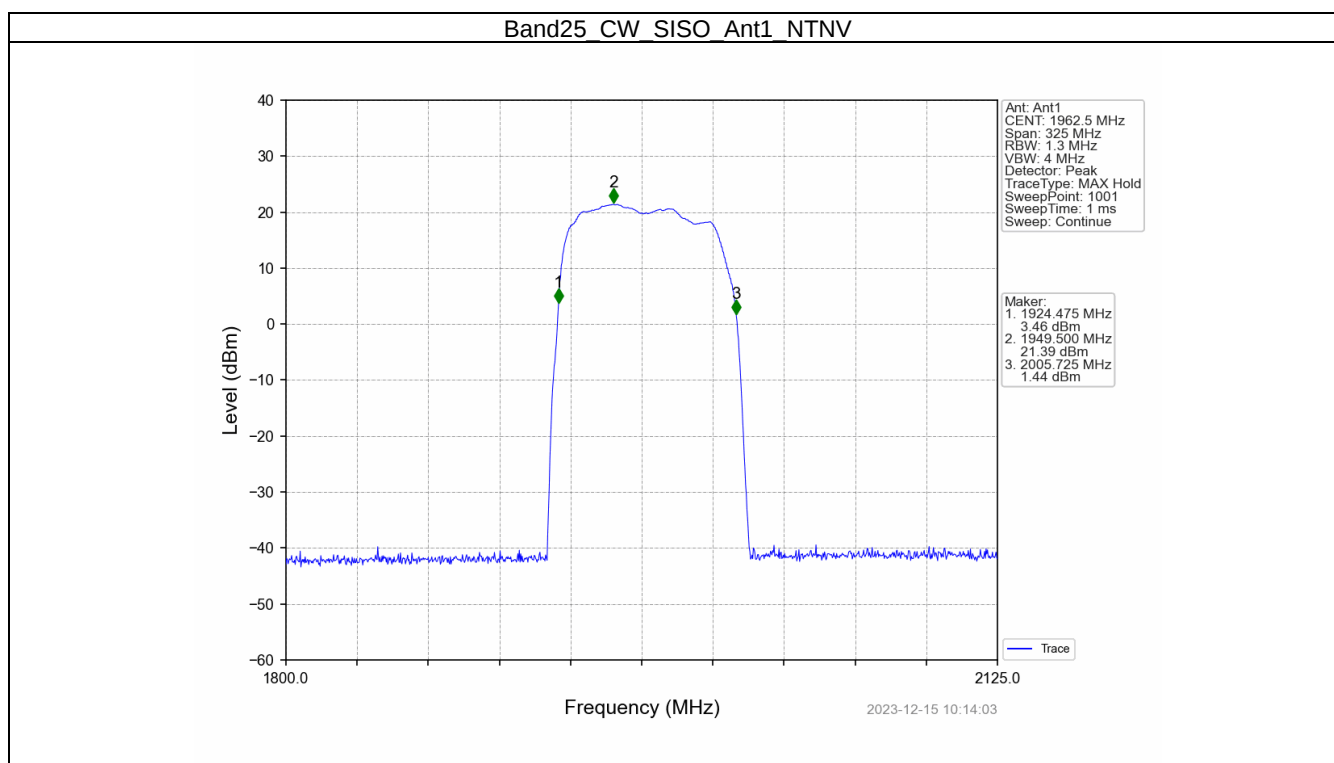
1. Out of band rejection

1.1 Band25

1.1.1 Test Result

Band: 25 / NTNV							
Signal	Sweep Frequency Range (MHz)	TX Type	ANT	F0 (MHz)	FL (MHz)	FH (MHz)	Verdict
CW	1800 - 2125	SISO	1	1949.500	1924.475	2005.725	Pass

1.1.2 Test Graph



2. AGC threshold

2.1 Band25

2.1.1 Test Result

Band: 25 / NTNV					
Signal	Frequency (MHz)	TX Type	ANT	AGC Threshold (dBm)	Verdict
GMSK 0.2MHz	1949.5	SISO	1	-3.50	Pass
AWGN 5MHz	1949.5	SISO	1	-3.50	Pass

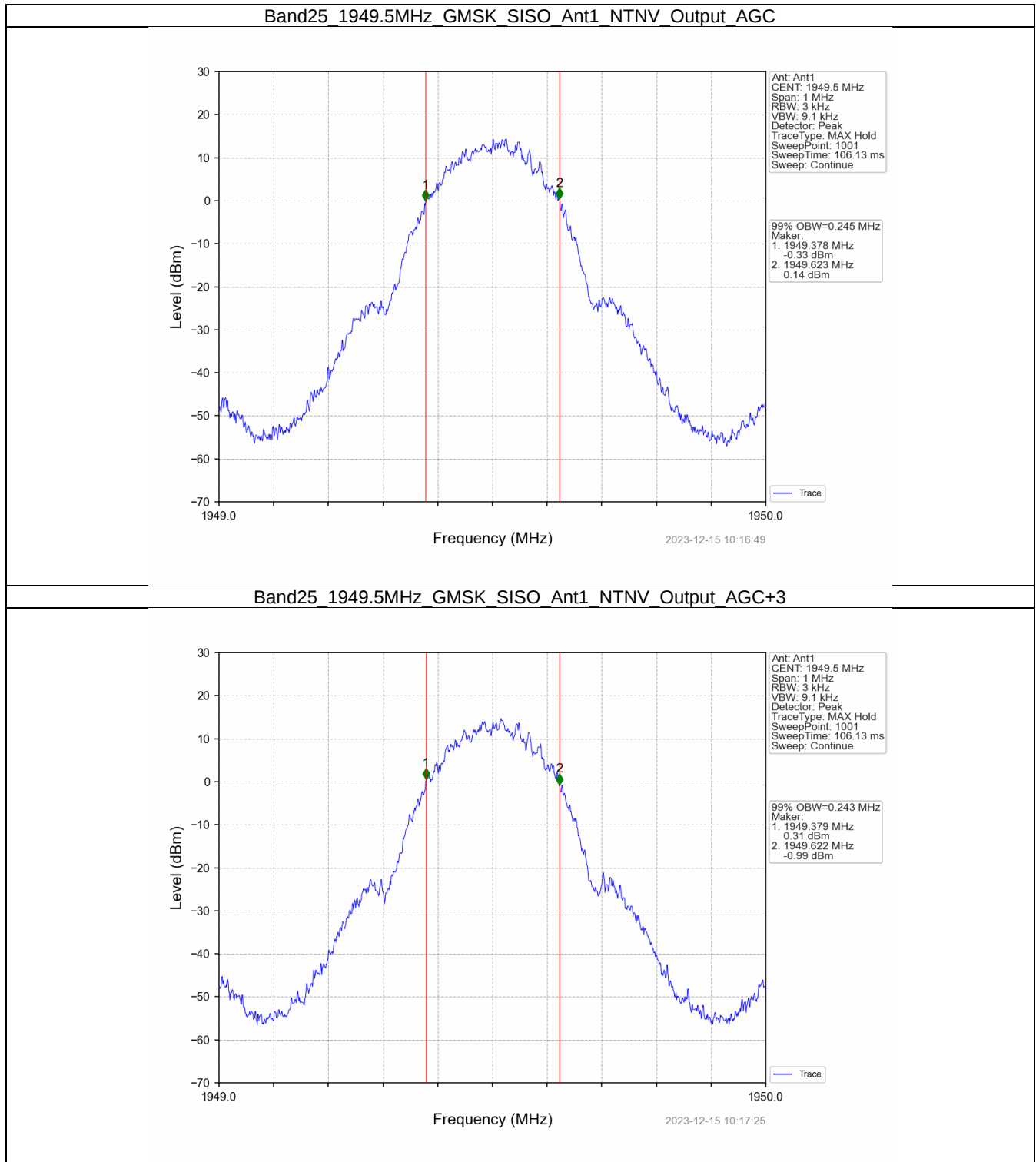
3. Input-versus-output signal comparison

3.1 Band25_OBW

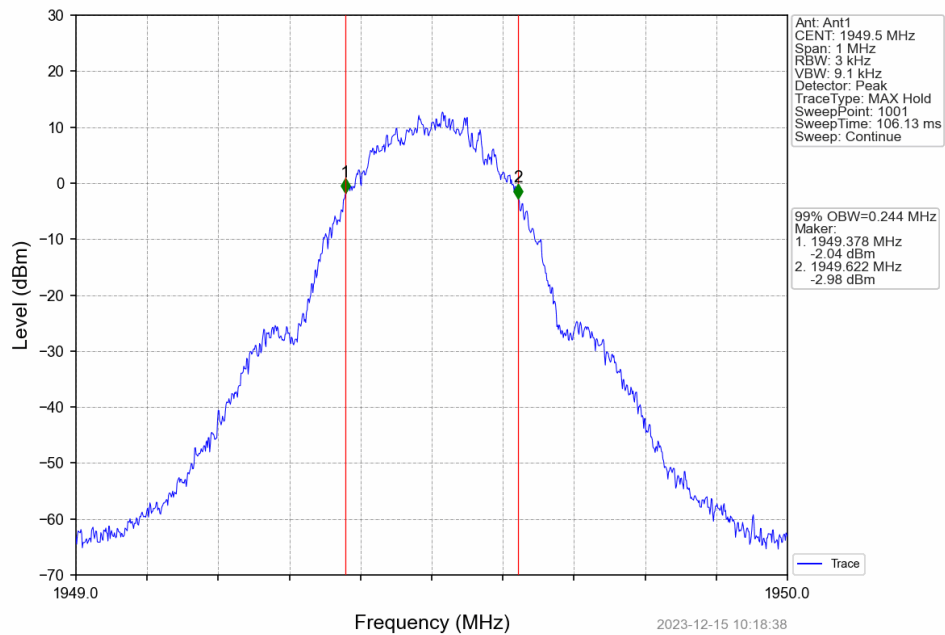
3.1.1 Test Result

Band: 25 / NTNV							
Signal			TX Type	ANT	99% OBW (MHz)		Verdict
Type	Level (dBm)	Frequency (MHz)			Output	Input	
GMSK 0.2MHz	-0.5	1949.5	SISO	1	0.245	0.244	Pass
	-3.5	1949.5	SISO	1	0.243	0.243	Pass
AWGN 5MHz	-0.5	1949.5	SISO	1	4.533	4.537	Pass
	-3.5	1949.5	SISO	1	4.531	4.529	Pass

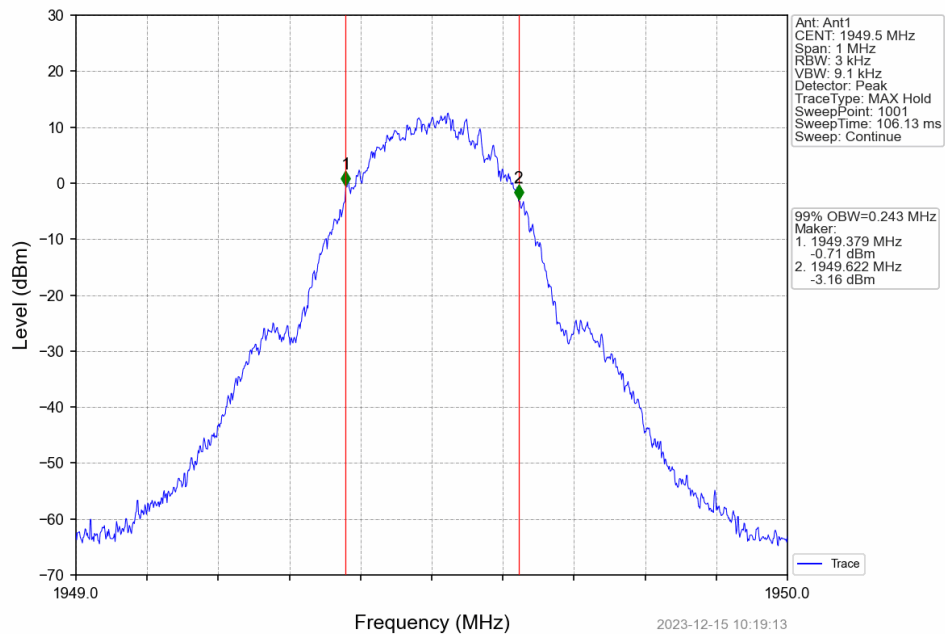
3.1.2 Test Graph



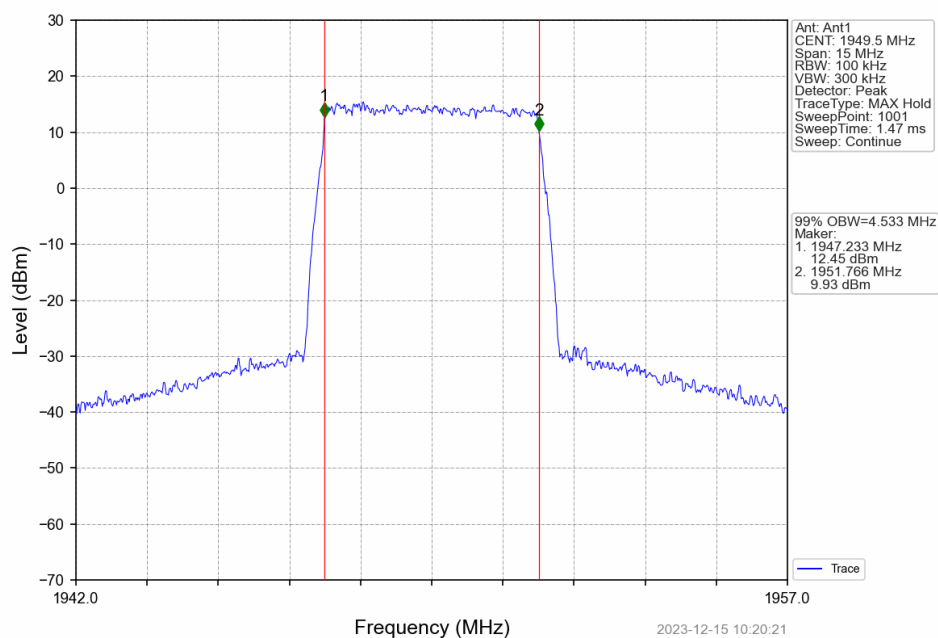
Band25_1949.5MHz_GMSK_SISO_Ant1_NTNV_Input_AGC



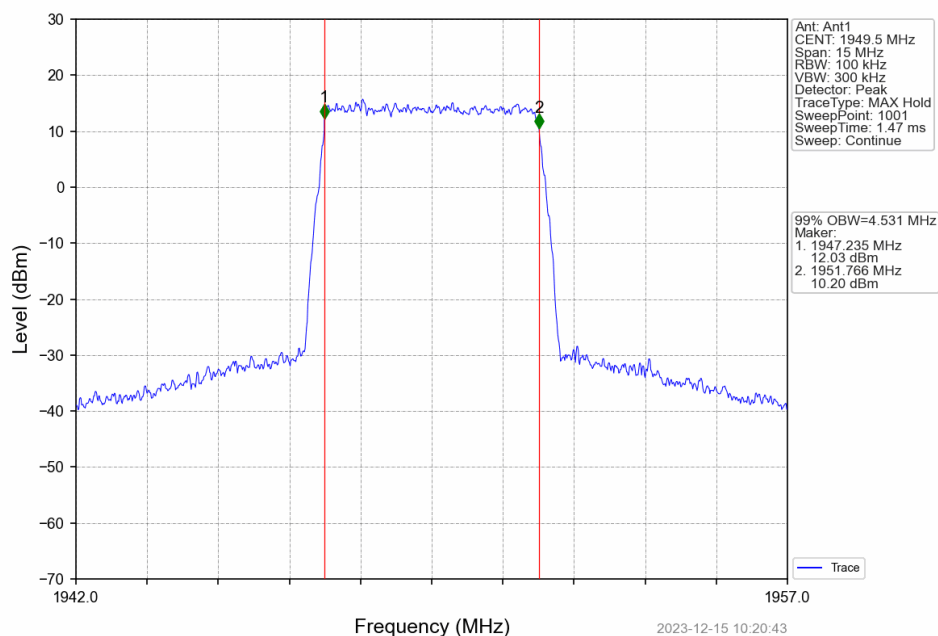
Band25_1949.5MHz_GMSK_SISO_Ant1_NTNV_Input_AGC+3



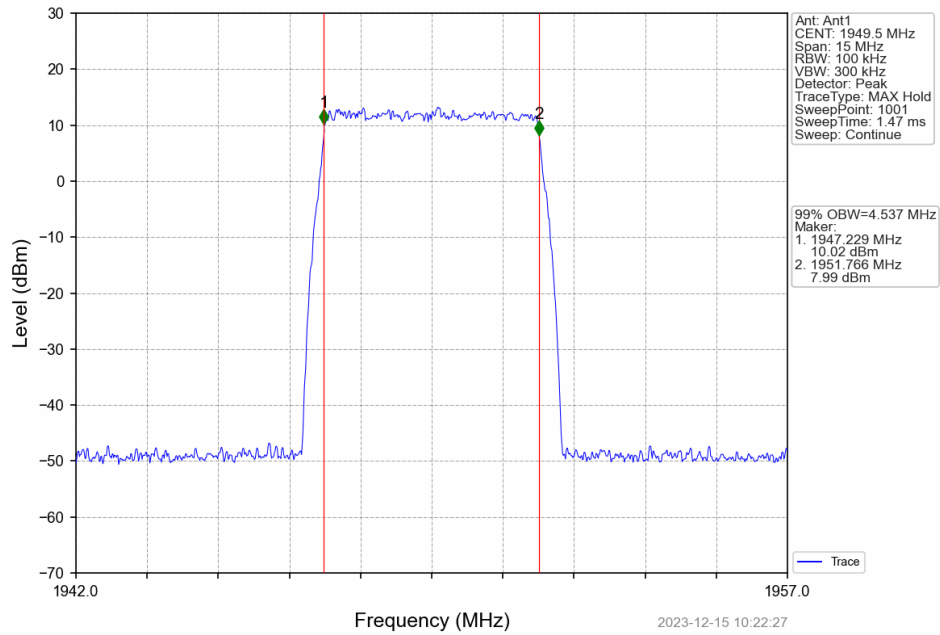
Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Output_AGC



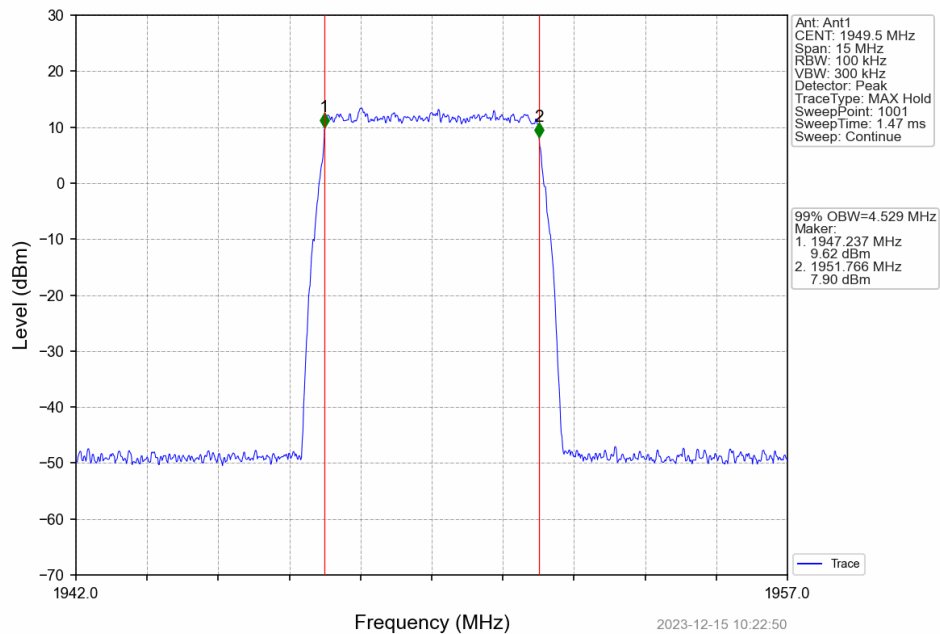
Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Output_AGC+3



Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Input_AGC



Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Input_AGC+3

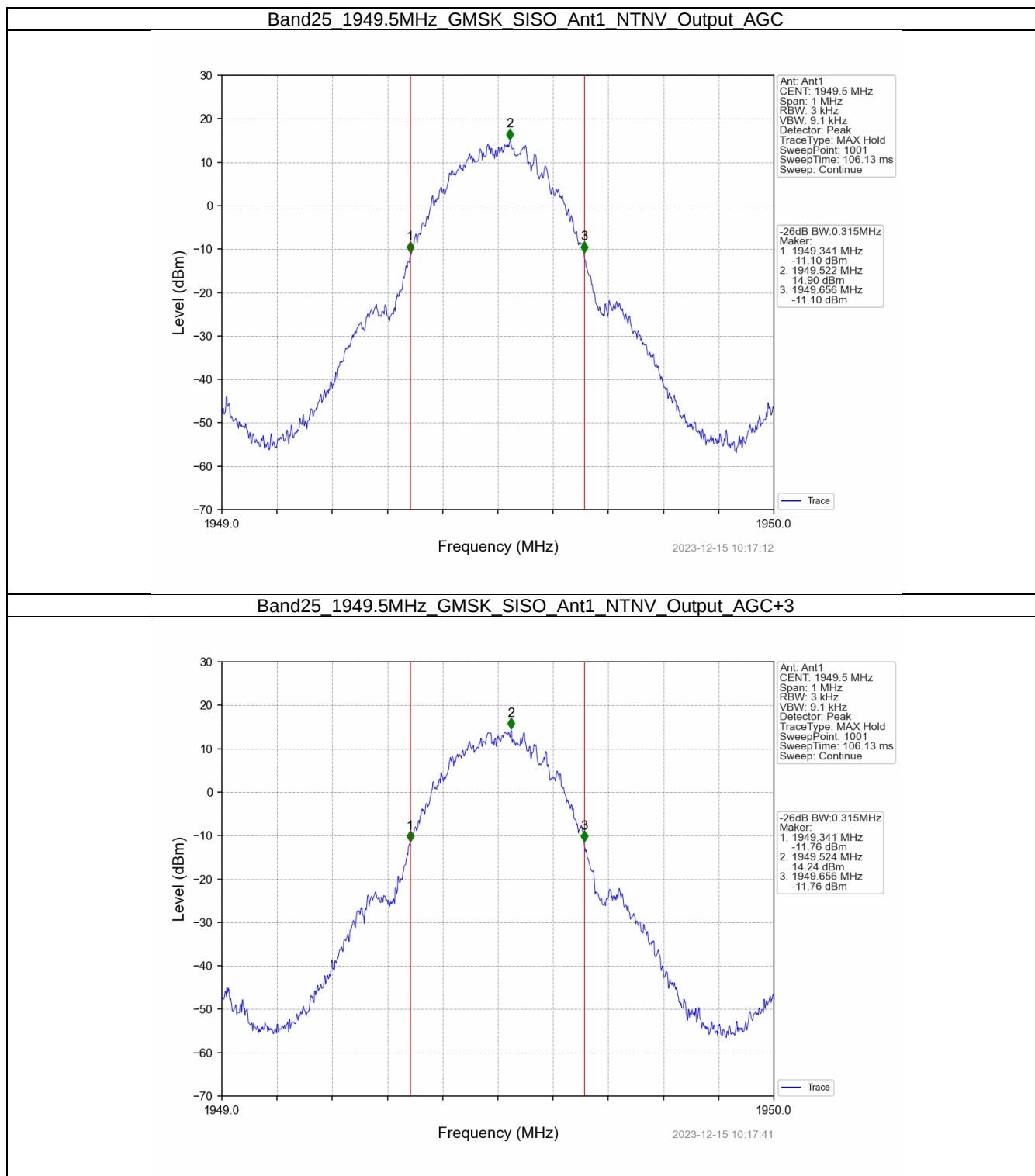


3.2 Band25_EBW

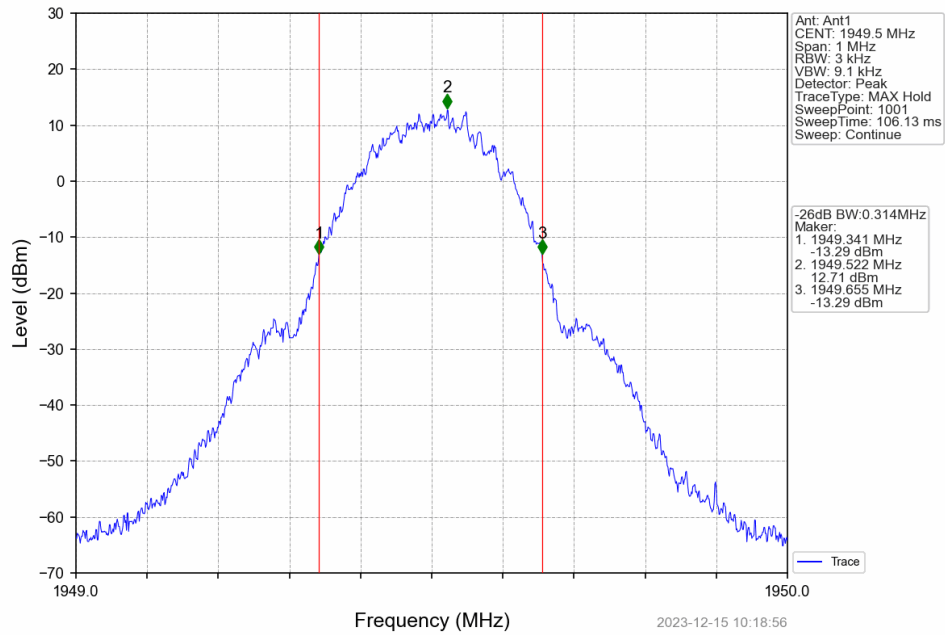
3.2.1 Test Result

Band: 25 / NTNV							
Signal			TX Type	ANT	26dB EBW (MHz)		Verdict
Type	Level (dBm)	Frequency (MHz)			Output	Input	
GMSK 0.2MHz	-0.5	1949.5	SISO	1	0.315	0.314	Pass
	-3.5	1949.5	SISO	1	0.315	0.317	Pass
AWGN 5MHz	-0.5	1949.5	SISO	1	5.071	5.060	Pass
	-3.5	1949.5	SISO	1	5.057	5.053	Pass

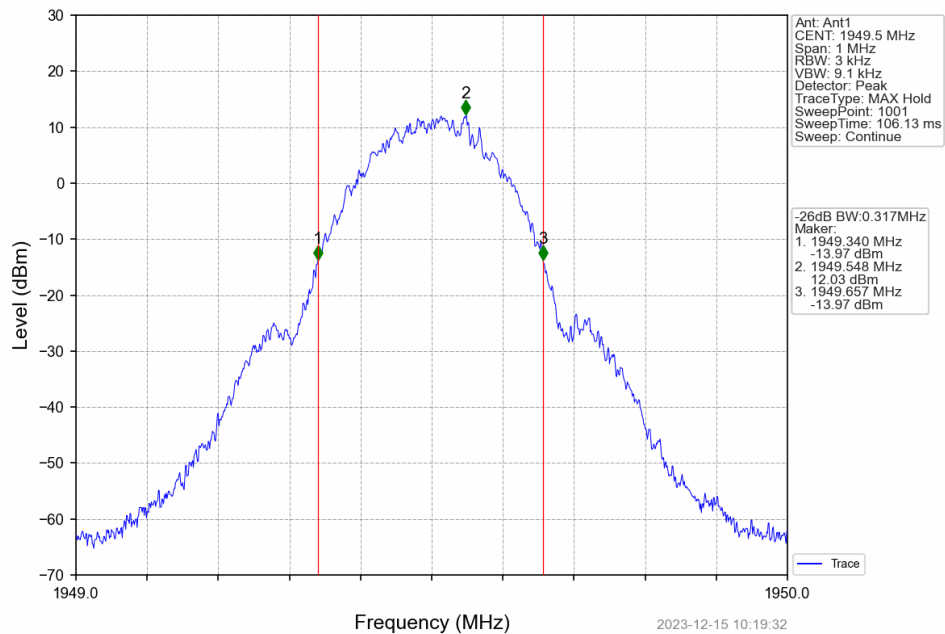
3.2.2 Test Graph



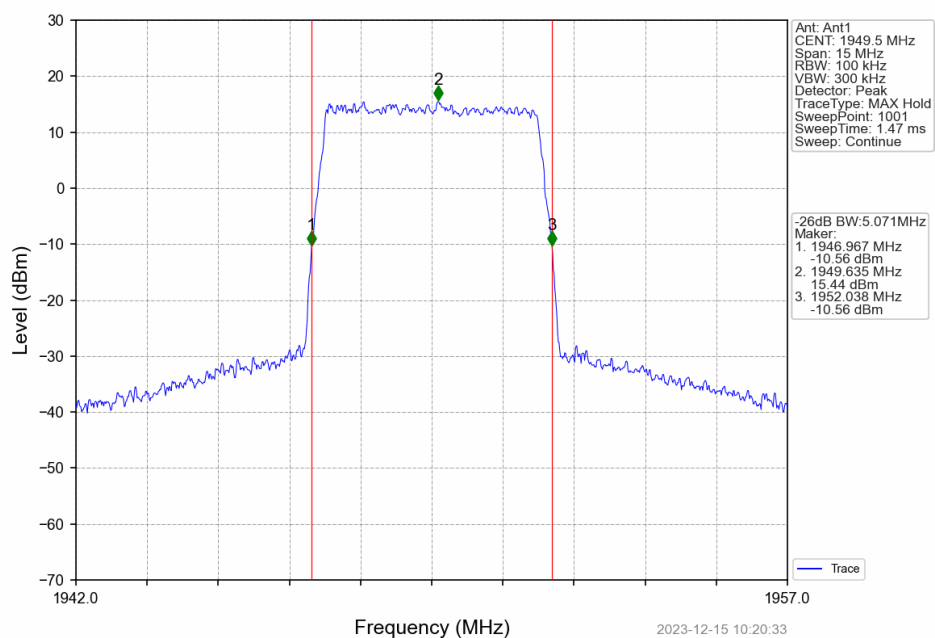
Band25_1949.5MHz_GMSK_SISO_Ant1_NTNV_Input_AGC



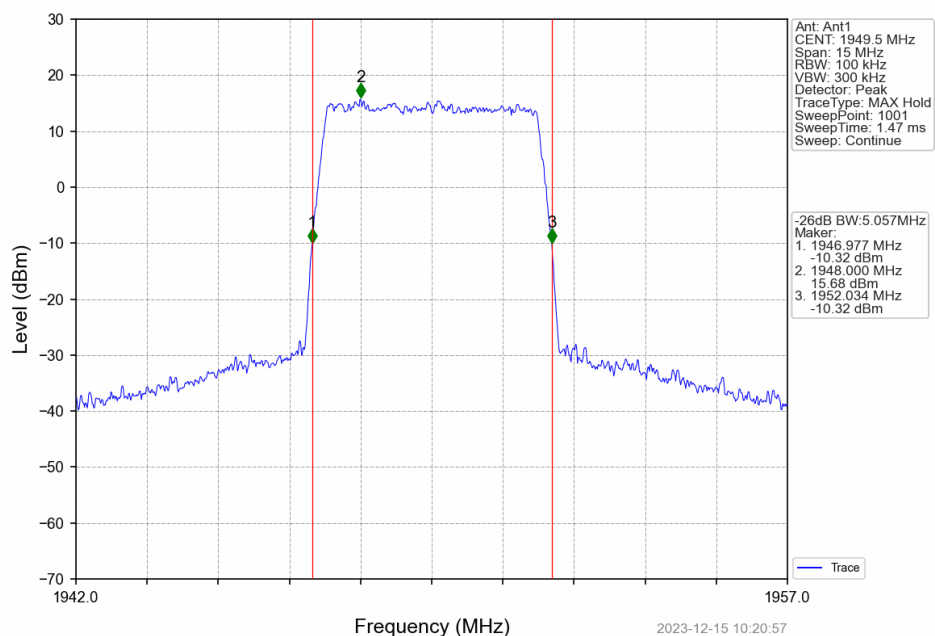
Band25_1949.5MHz_GMSK_SISO_Ant1_NTNV_Input_AGC+3



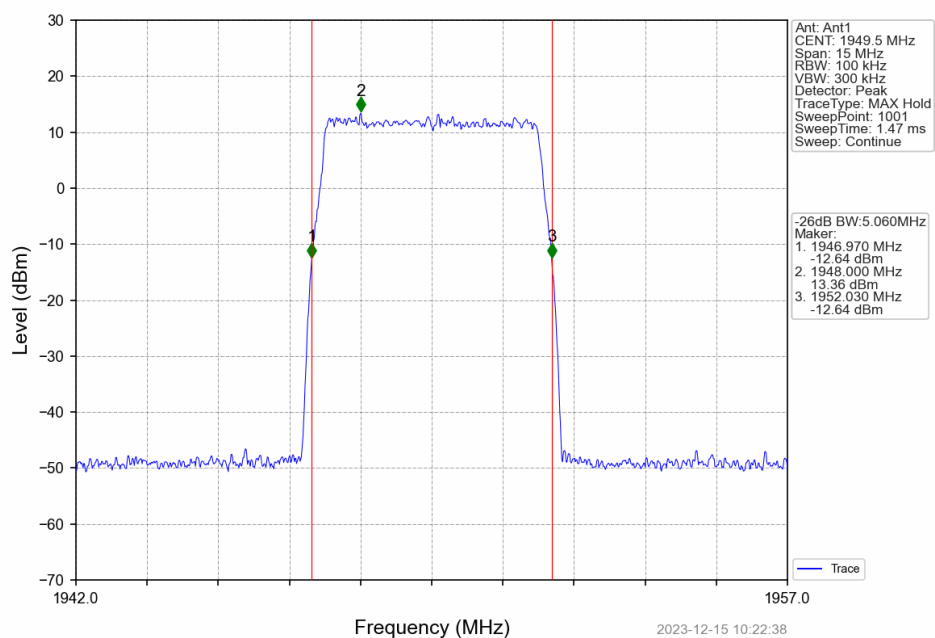
Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Output_AGC



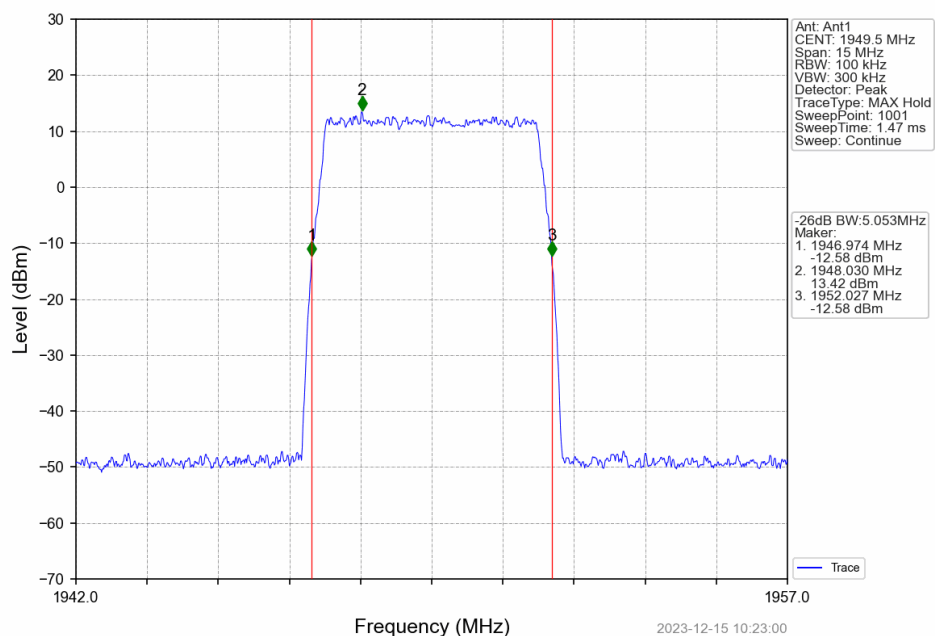
Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Output_AGC+3



Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Input_AGC



Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_Input_AGC+3



4. Input/output power and amplifier/booster gain

4.1 Band25_EIRP

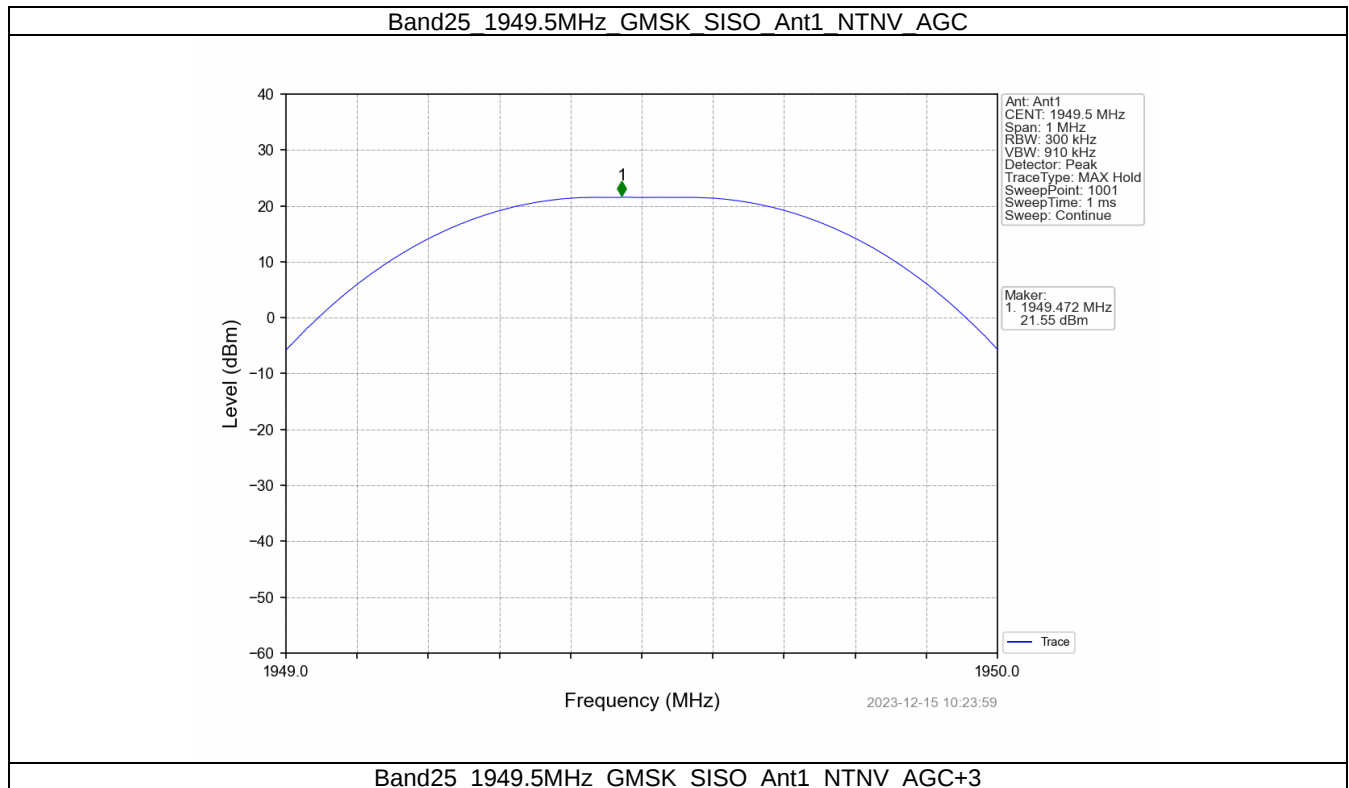
4.1.1 Test Result

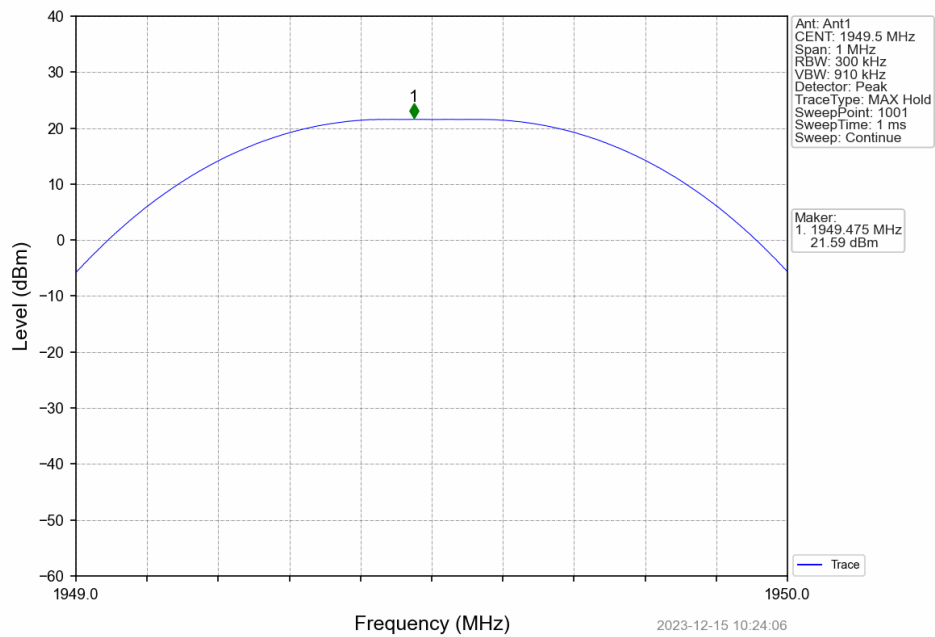
Band: 25 / NTNV										
Signal			TX Type	ANT	Conducted Power (dBm/MHz)		EIRP (dBm/MHz)		Booster Gain (dB)	Verdict
Type	Level (dBm)	Frequency (MHz)			Output	Input	Result	Limit		
GMSK 0.2MHz	-3.5	1949.5	SISO	1	21.55	-2.66	24.55	<=62.15	24.21	Pass
	-0.5	1949.5	SISO	1	21.59	0.36	24.59	<=62.15	/	Pass
AWGN 5MHz	-3.5	1949.5	SISO	1	15.59	-8.63	18.59	<=62.15	24.22	Pass
	-0.5	1949.5	SISO	1	15.78	-5.60	18.78	<=62.15	/	Pass

Band: B25 / NTNV							
Signal			Conducted Power (dBm/MHz)		EIRP (dBm/MHz)		Booster Gain (dB)
Type	Level (dBm)	Frequency (MHz)	SISO	2*2MIMO	SISO	2*2MIMO	
GMSK 0.2MHz	-3.5	1949.5	21.55	24.57	24.55	27.57	/
	-0.5	1949.5	21.59	24.61	24.59	27.61	/
AWGN 5MHz	-3.5	1949.5	15.59	18.61	18.59	21.61	/
	-0.5	1949.5	15.78	18.80	18.78	21.80	/

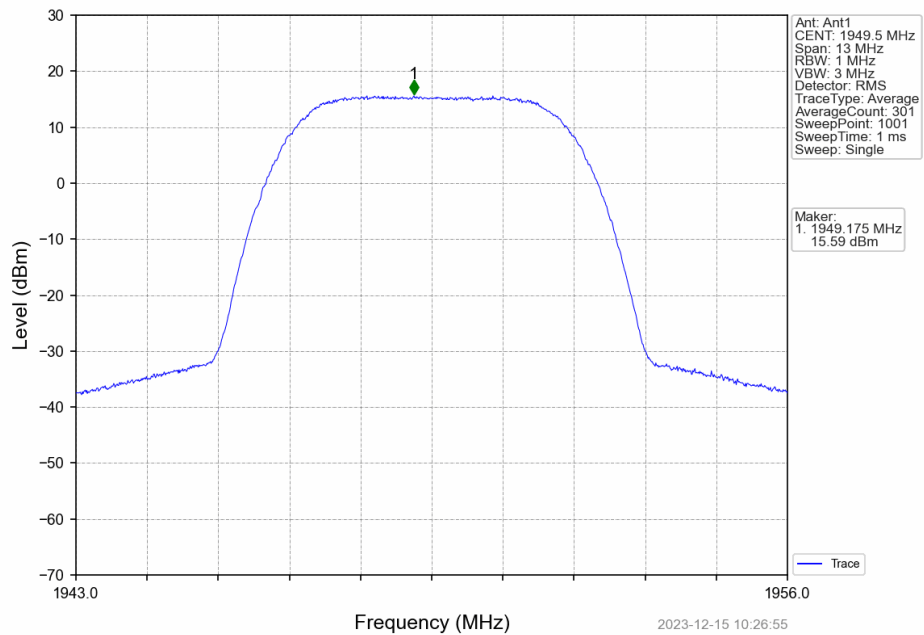
Band: B25 / NTNV									
Operation Band	Frequency (MHz)	Signal	Signal Level	Input Power (dBm)	Total Output Power (dBm)		EIRP(dBm)		Booster Gain (dB)
					SISO	2*2MIMO	SISO	2*2MIMO	
1930MHz-1995MHz	1949.5	AWGN	Pre-AGC	-3.5	21.32	24.34	24.32	27.34	/
			3dB Above AGC	-0.5	21.37	24.39	24.37	27.39	/
	1949.5	GMSK	Pre-AGC	-3.5	21.25	24.27	24.25	27.27	/
			3dB Above AGC	-0.5	21.28	24.30	24.28	27.30	/

4.1.2 Test Graph

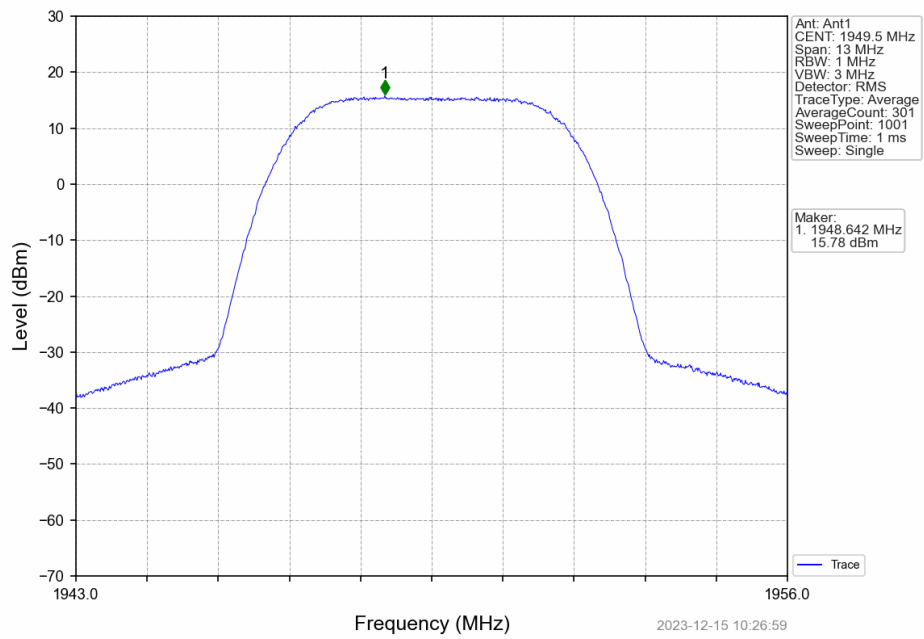




Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_AGC



Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_AGC+3

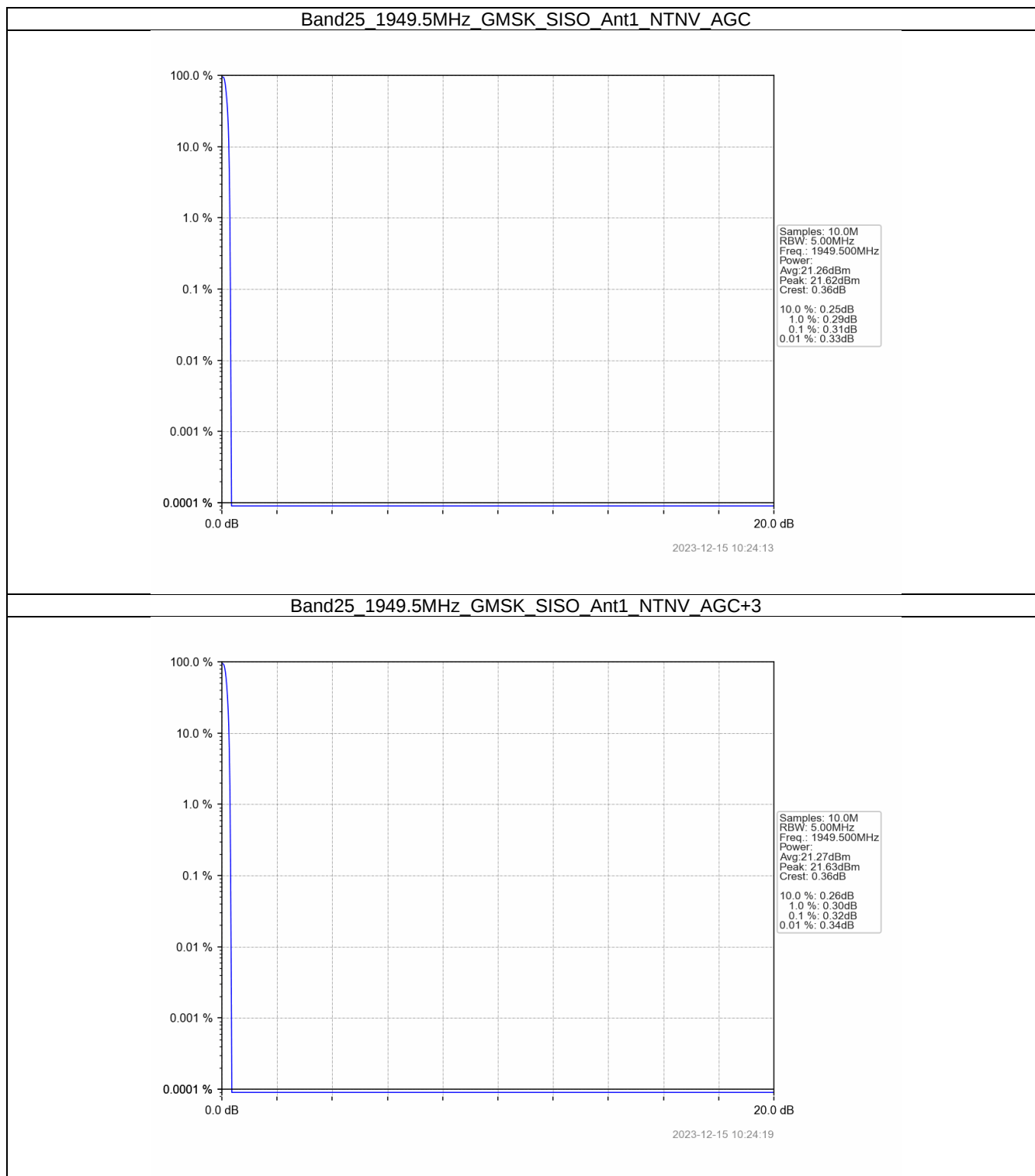


4.2 Band25_PAPR

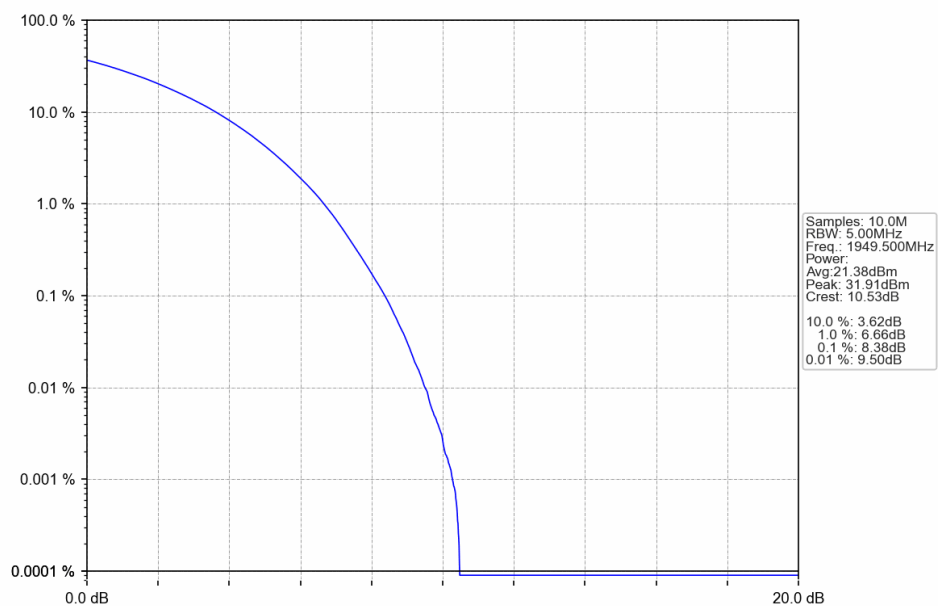
4.2.1 Test Result

Band: 25 / NTNV							
Signal			TX Type	ANT	PAPR (dB)		Verdict
Type	Level (dBm)	Frequency (MHz)			Result	Limit	
GMSK 0.2MHz	-3.5	1949.5	SISO	1	0.31	<=13	Pass
	-0.5	1949.5	SISO	1	0.32	<=13	Pass
AWGN 5MHz	-3.5	1949.5	SISO	1	8.38	<=13	Pass
	-0.5	1949.5	SISO	1	8.28	<=13	Pass

4.2.2 Test Graph

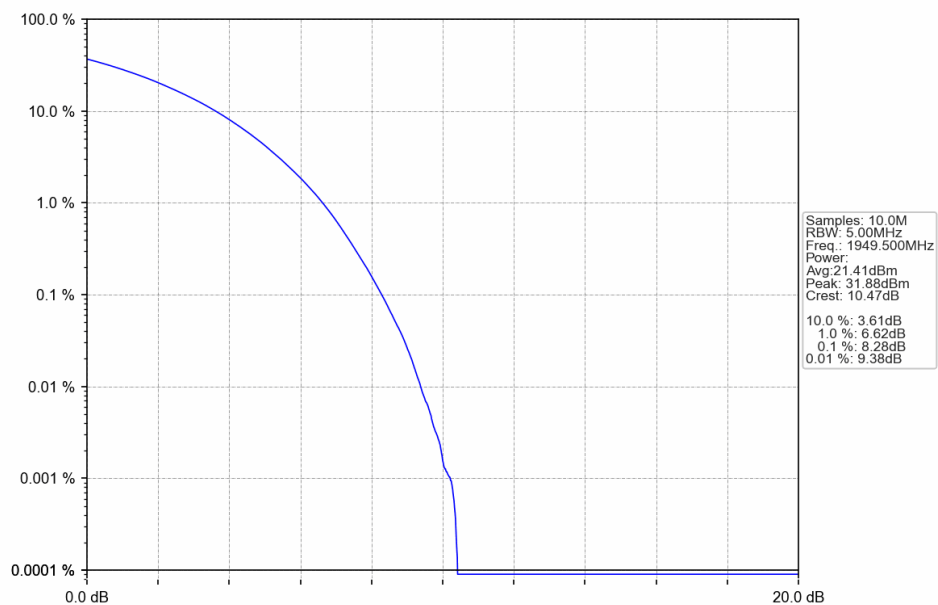


Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_AGC



2023-12-15 10:27:12

Band25_1949.5MHz_AWGN_SISO_Ant1_NTNV_AGC+3



2023-12-15 10:27:26

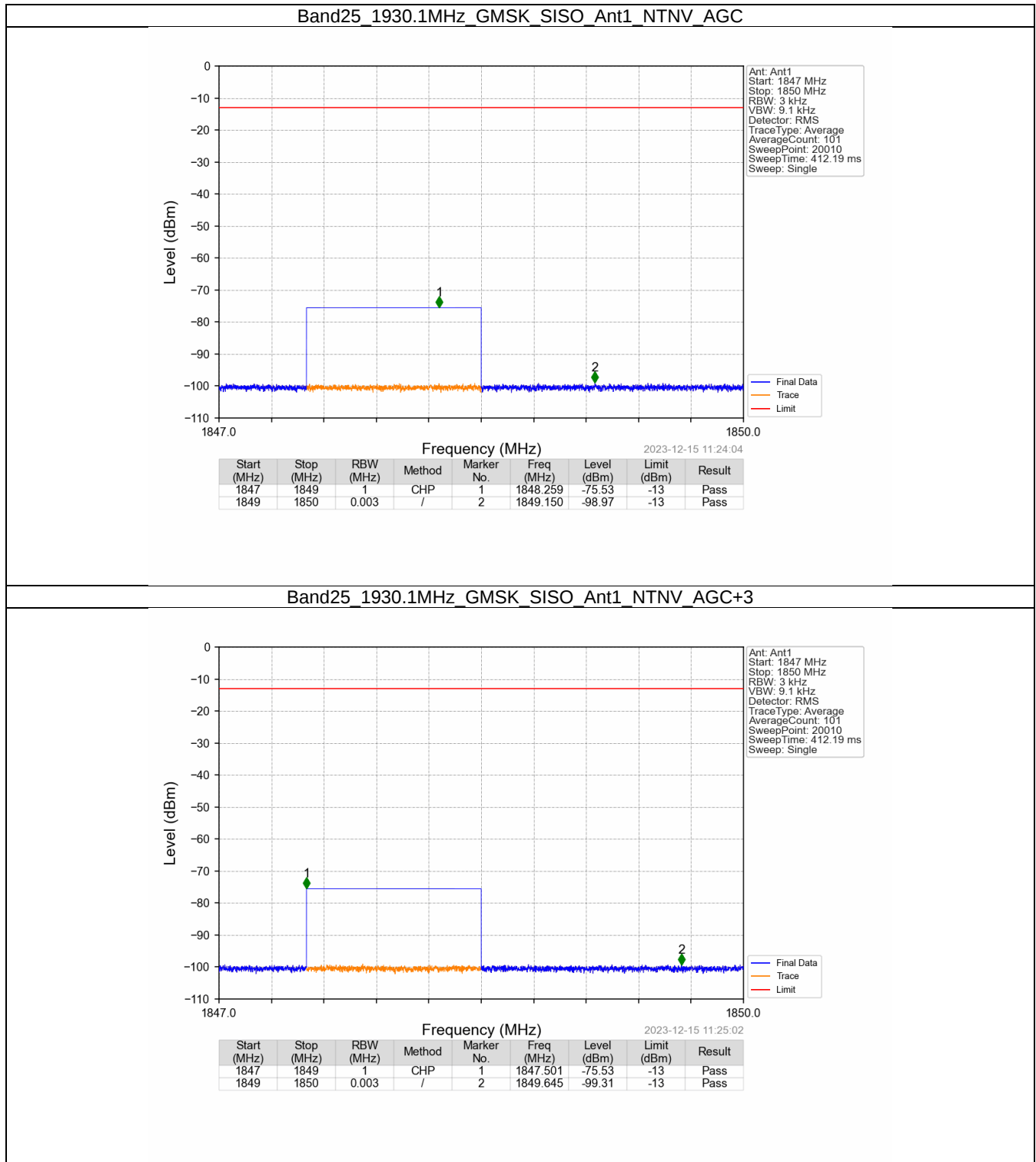
5. Out-of-band/out-of-block (including intermodulation) emissions

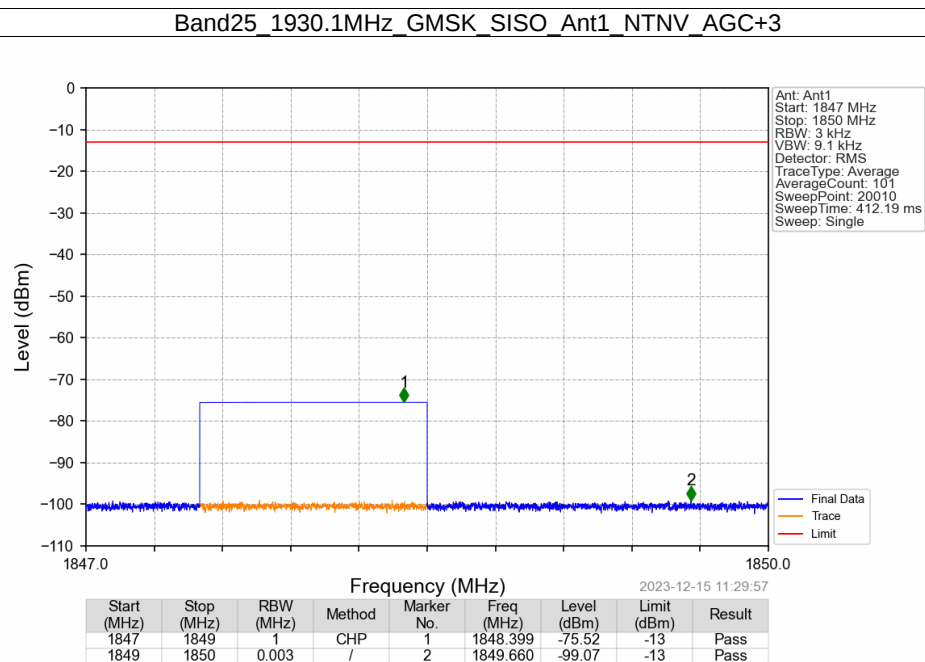
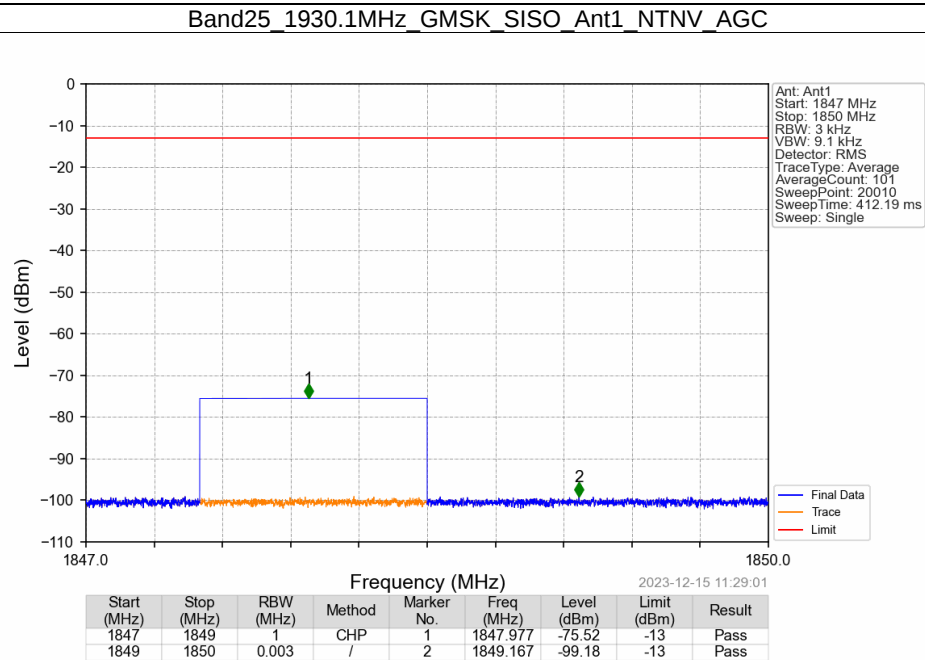
5.1 Band25

5.1.1 Test Result

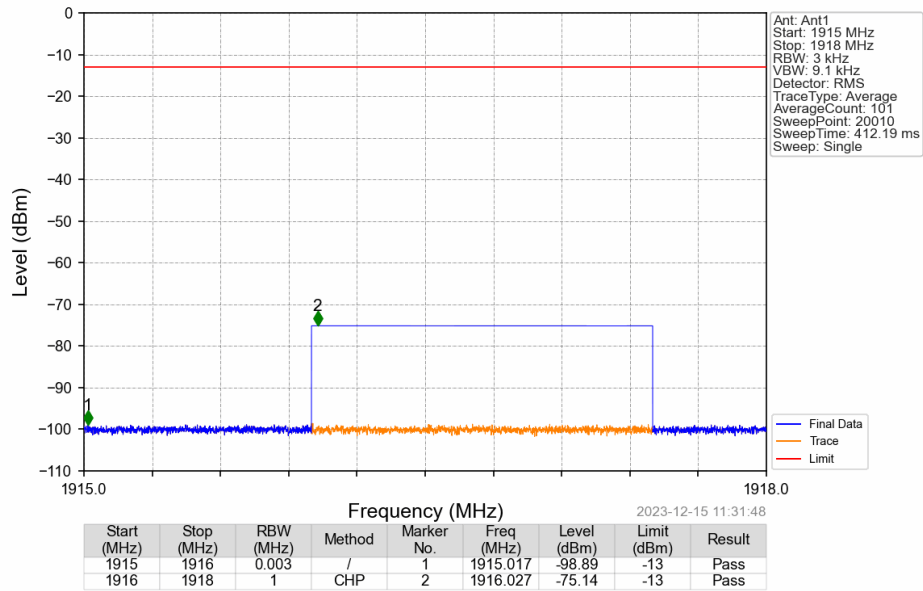
Band: 25 / NTNV									
Signal				Channel	TX Type	ANT	OOB (dBm)		Verdict
Input	Type	Level (dBm)	Frequency (MHz)				Result	Limit	
Two	GMSK 0.2MHz	-3.5	1930.1	LCH	SISO	1	-75.53	Refer To Test Graph	Pass
		-0.5	1930.1	LCH	SISO	1	-75.53	Refer To Test Graph	Pass
One	GMSK 0.2MHz	-3.5	1930.1	LCH	SISO	1	-75.52	Refer To Test Graph	Pass
		-0.5	1930.1	LCH	SISO	1	-75.52	Refer To Test Graph	Pass
Two	GMSK 0.2MHz	-3.5	1994.9	HCH	SISO	1	-75.14	Refer To Test Graph	Pass
		-0.5	1994.9	HCH	SISO	1	-75.09	Refer To Test Graph	Pass
One	GMSK 0.2MHz	-3.5	1994.9	HCH	SISO	1	-75.12	Refer To Test Graph	Pass
		-0.5	1994.9	HCH	SISO	1	-75.07	Refer To Test Graph	Pass
Two	AWGN 5MHz	-3.5	1932.5	LCH	SISO	1	-75.62	Refer To Test Graph	Pass
		-0.5	1932.5	LCH	SISO	1	-75.74	Refer To Test Graph	Pass
One	AWGN 5MHz	-3.5	1932.5	LCH	SISO	1	-75.62	Refer To Test Graph	Pass
		-0.5	1932.5	LCH	SISO	1	-75.61	Refer To Test Graph	Pass
Two	AWGN 5MHz	-3.5	1992.5	HCH	SISO	1	-75.10	Refer To Test Graph	Pass
		-0.5	1992.5	HCH	SISO	1	-75.19	Refer To Test Graph	Pass
One	AWGN 5MHz	-3.5	1992.5	HCH	SISO	1	-75.23	Refer To Test Graph	Pass
		-0.5	1992.5	HCH	SISO	1	-75.16	Refer To Test Graph	Pass

5.1.2 Test Graph

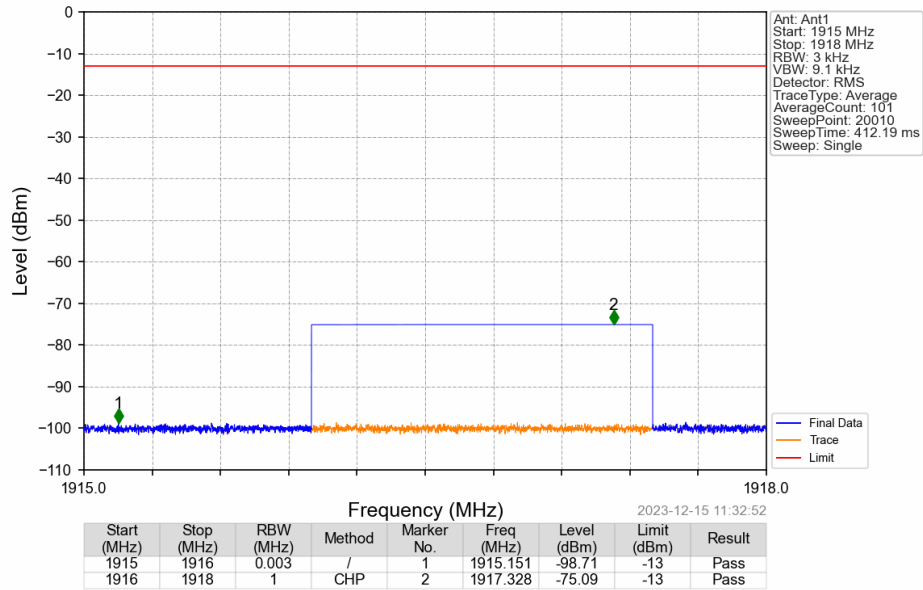




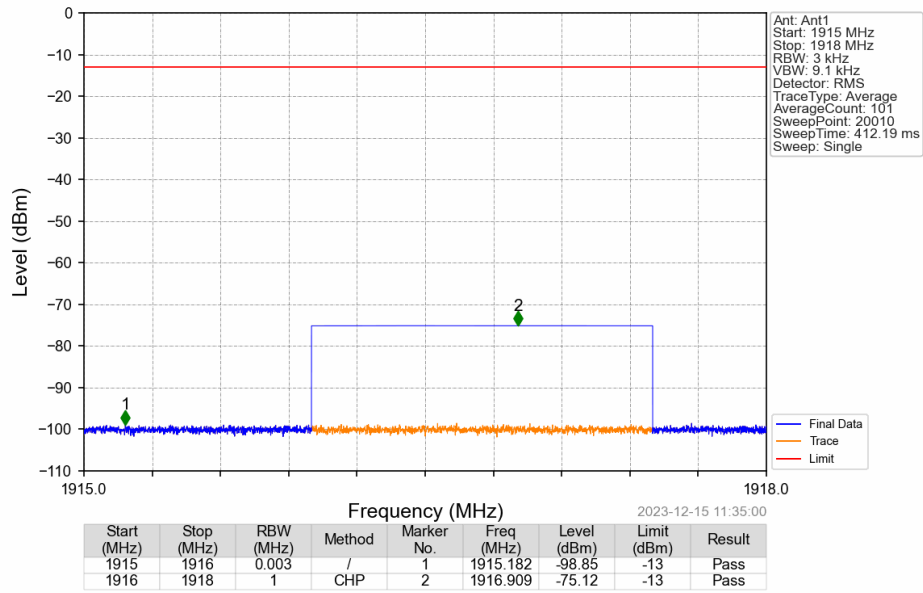
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV_AGC



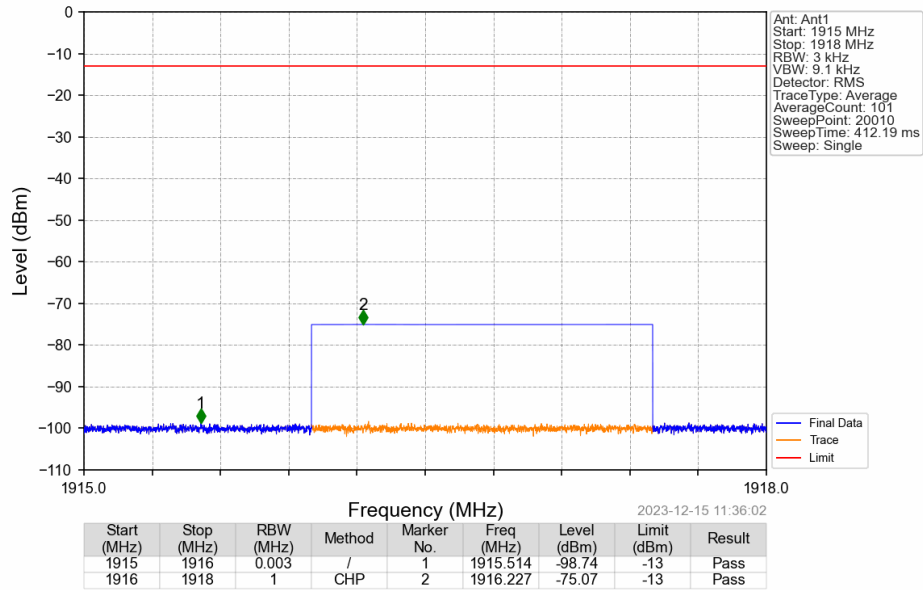
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV_AGC+3



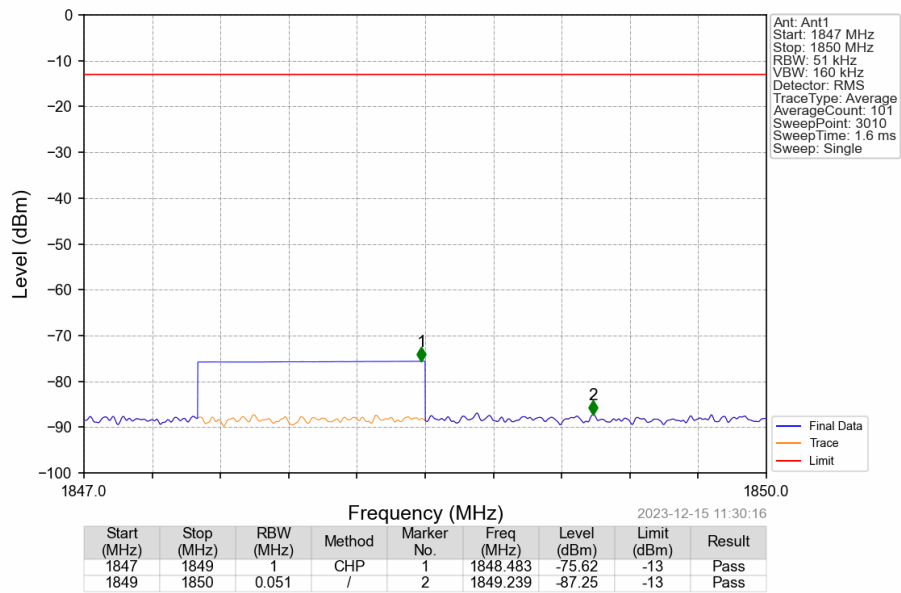
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV_AGC



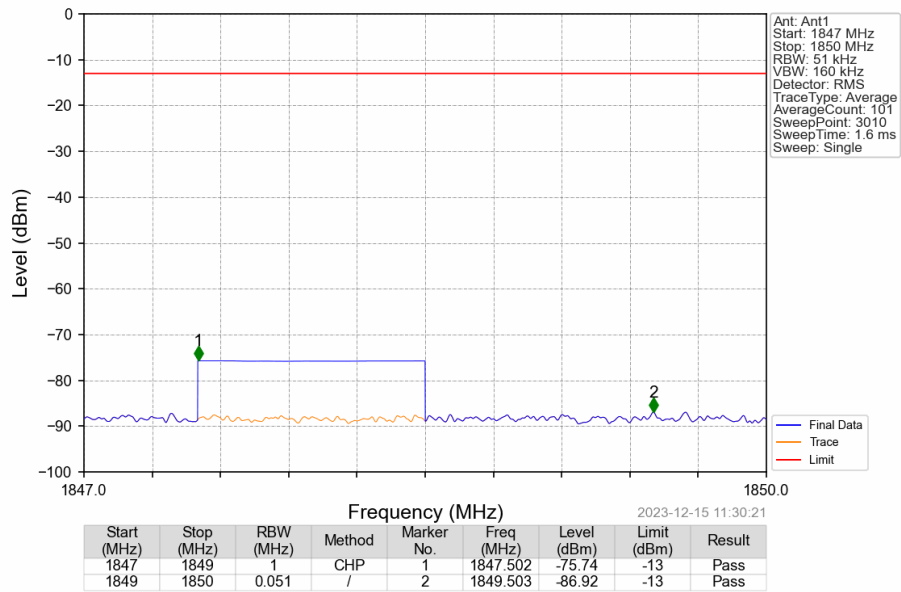
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV_AGC+3



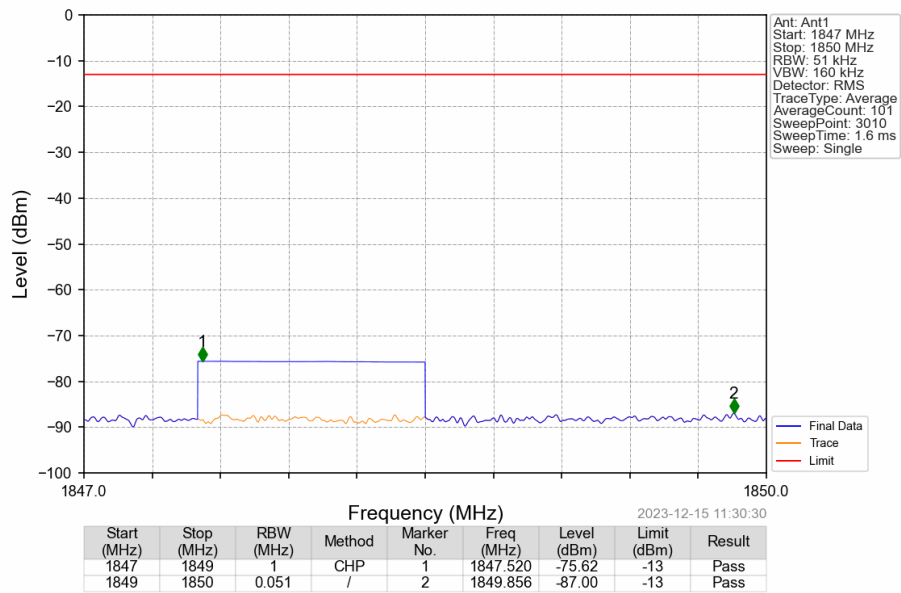
Band25_1932.5MHz_AWGN_SISO_Ant1_NTNV_AGC



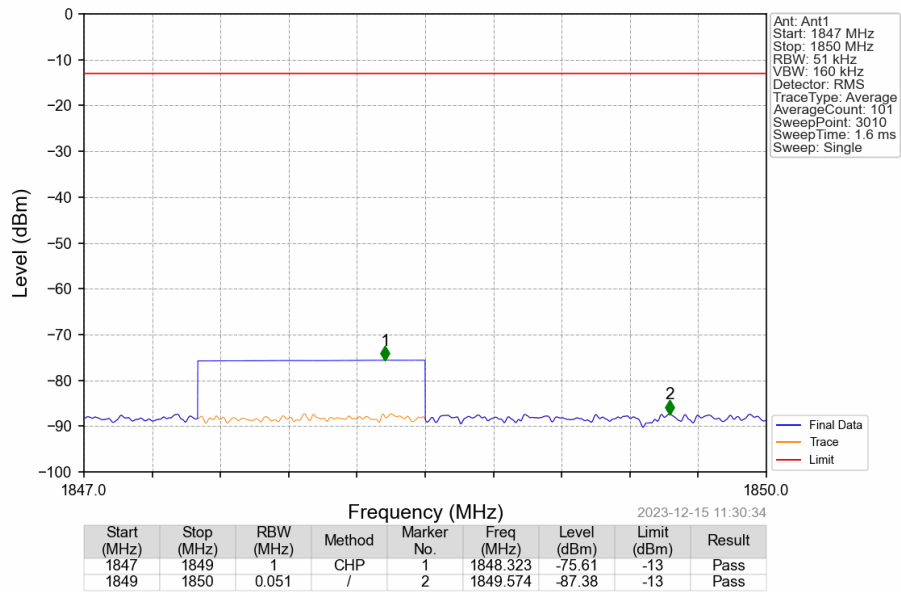
Band25_1932.5MHz_AWGN_SISO_Ant1_NTNV_AGC+3



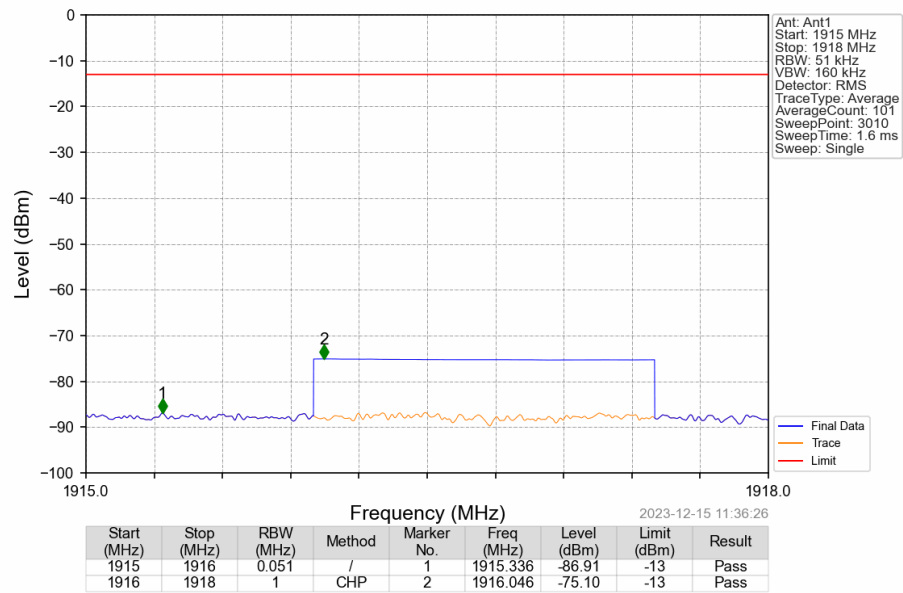
Band25_1932.5MHz_AWGN_SISO_Ant1_NTNV_AGC



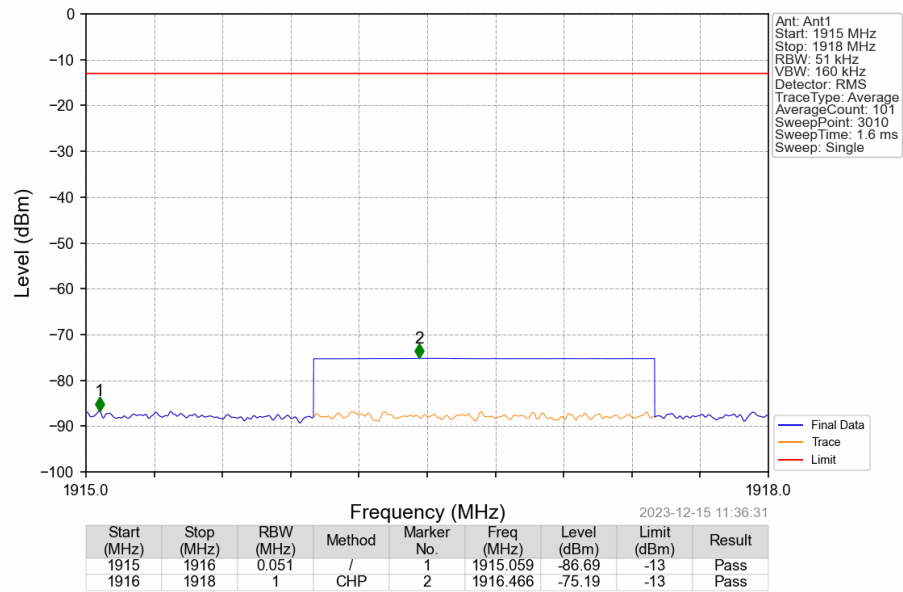
Band25_1932.5MHz_AWGN_SISO_Ant1_NTNV_AGC+3



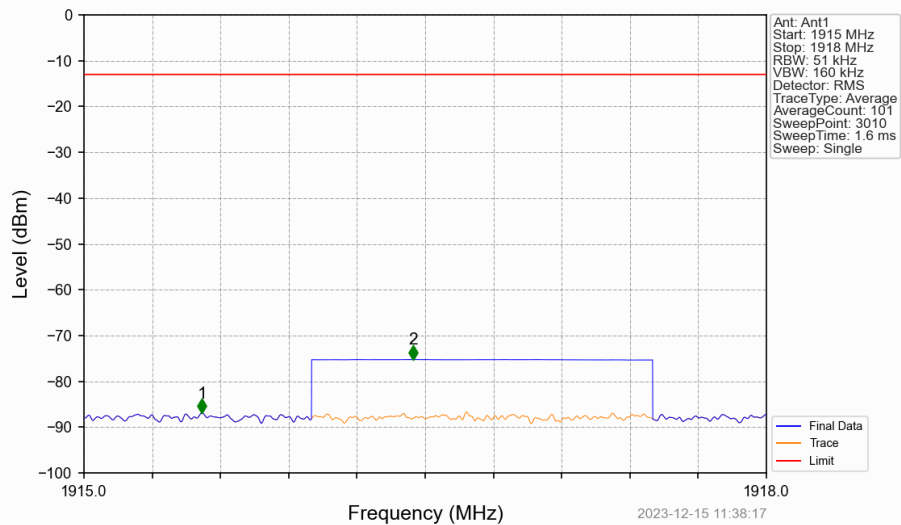
Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV_AGC



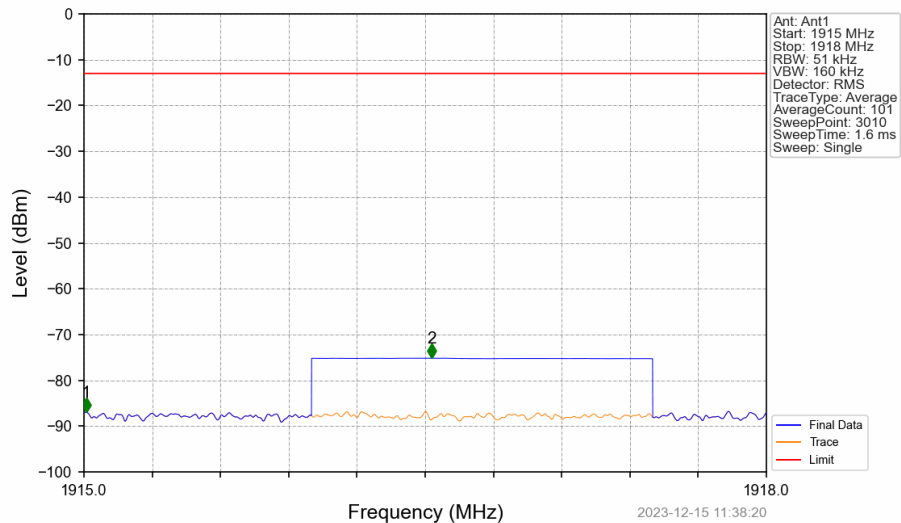
Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV_AGC+3



Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV_AGC



Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV_AGC+3



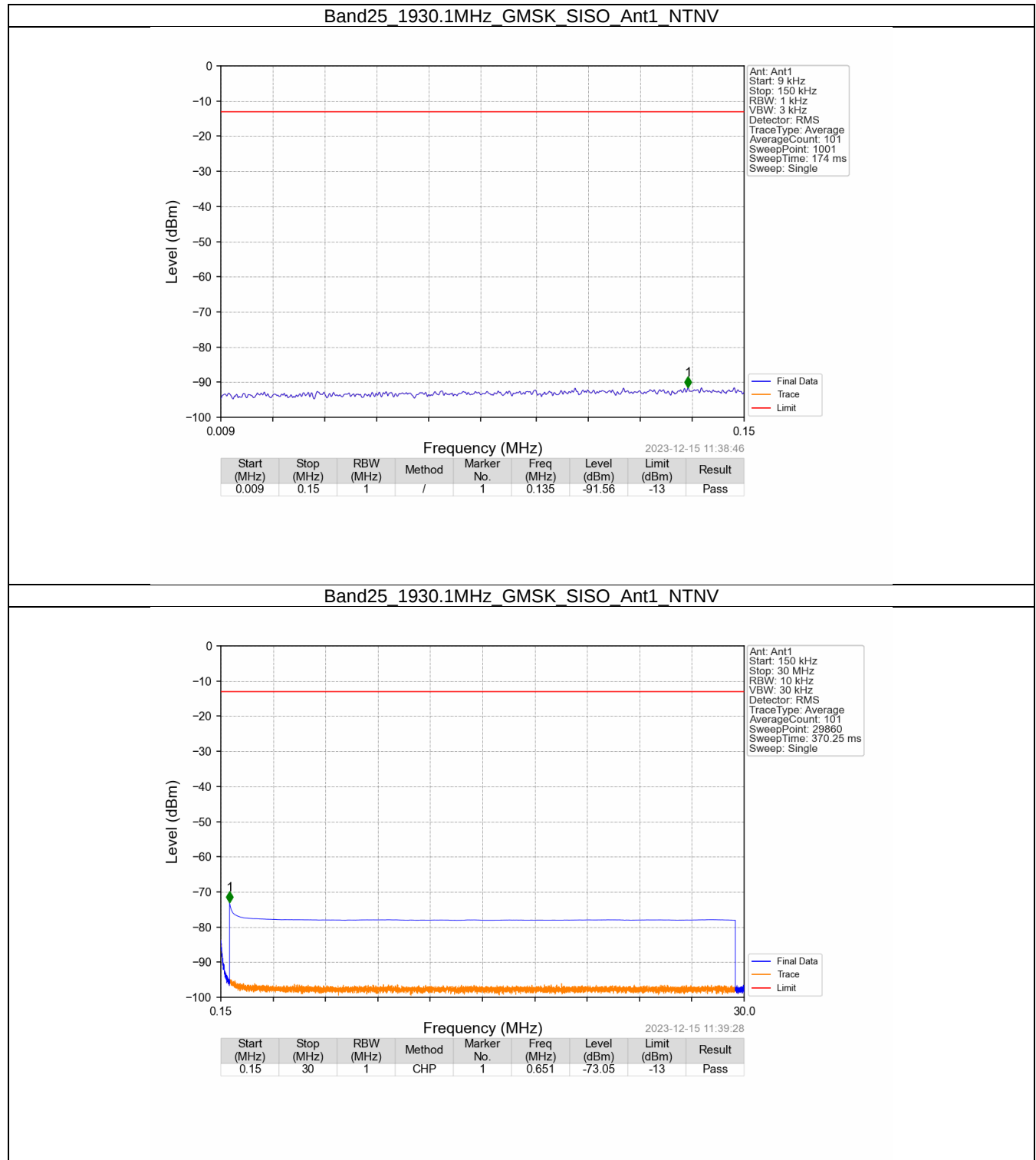
6. Spurious emissions

6.1 Band25

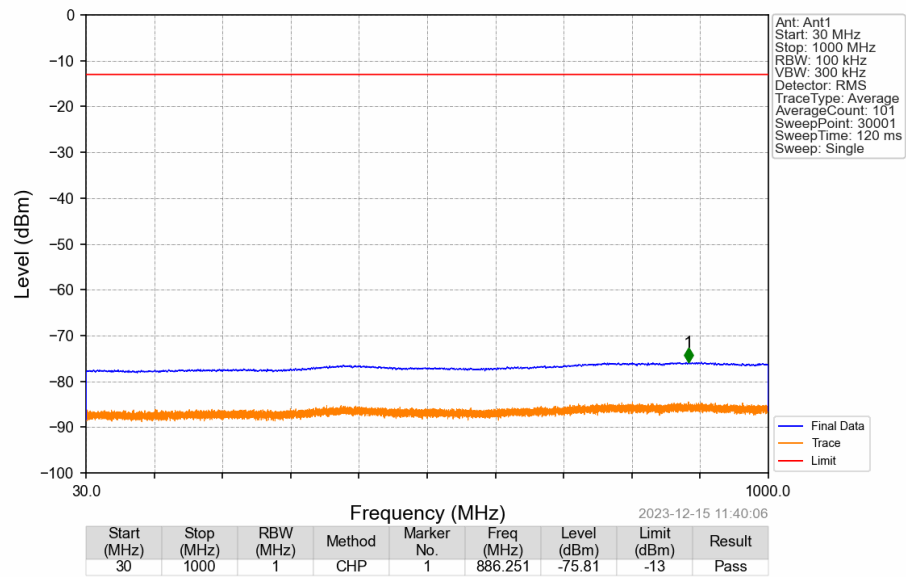
6.1.1 Test Result

Band: 25 / NTNV								
Signal			Channel	TX Type	ANT	SE (dBm)		Verdict
Type	Level (dBm)	Frequency (MHz)				Result	Limit	
GMSK 0.2MHz	-3.5	1930.1	LCH	SISO	1	Refer To Test Graph		Pass
		1962.5	MCH	SISO	1	Refer To Test Graph		Pass
		1994.9	HCH	SISO	1	Refer To Test Graph		Pass
AWGN 5MHz	-3.5	1932.5	LCH	SISO	1	Refer To Test Graph		Pass
		1962.5	MCH	SISO	1	Refer To Test Graph		Pass
		1992.5	HCH	SISO	1	Refer To Test Graph		Pass

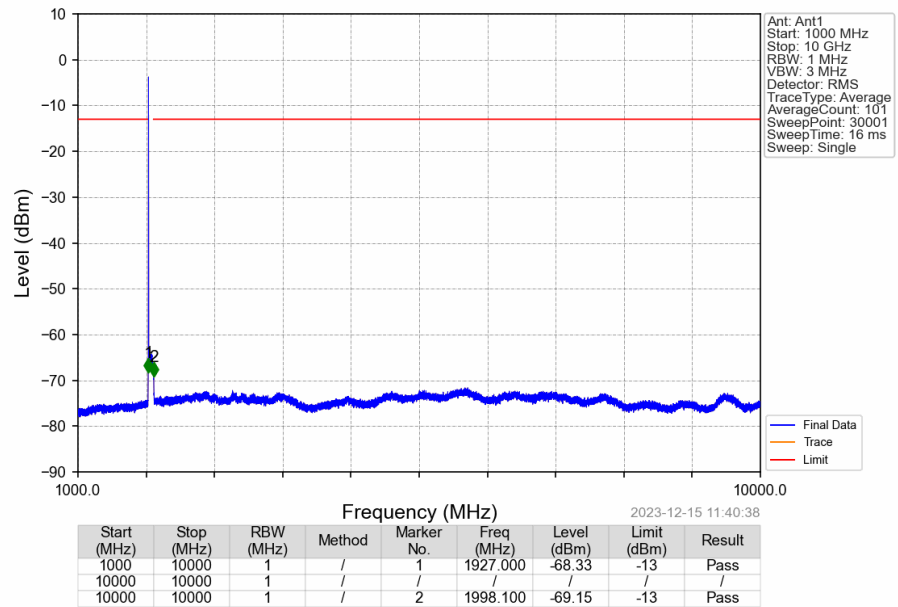
6.1.2 Test Graph



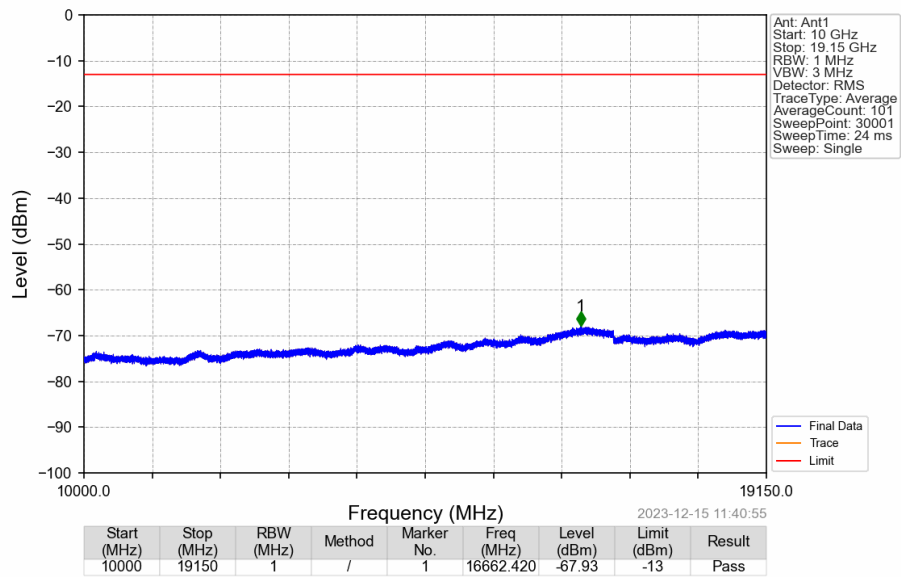
Band25_1930.1MHz_GMSK_SISO_Ant1_NTNV



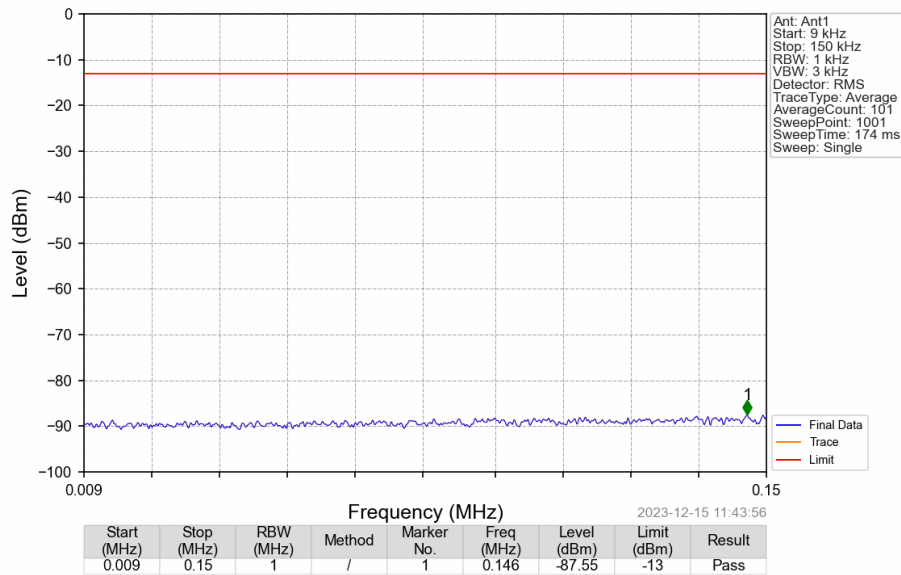
Band25_1930.1MHz_GMSK_SISO_Ant1_NTNV



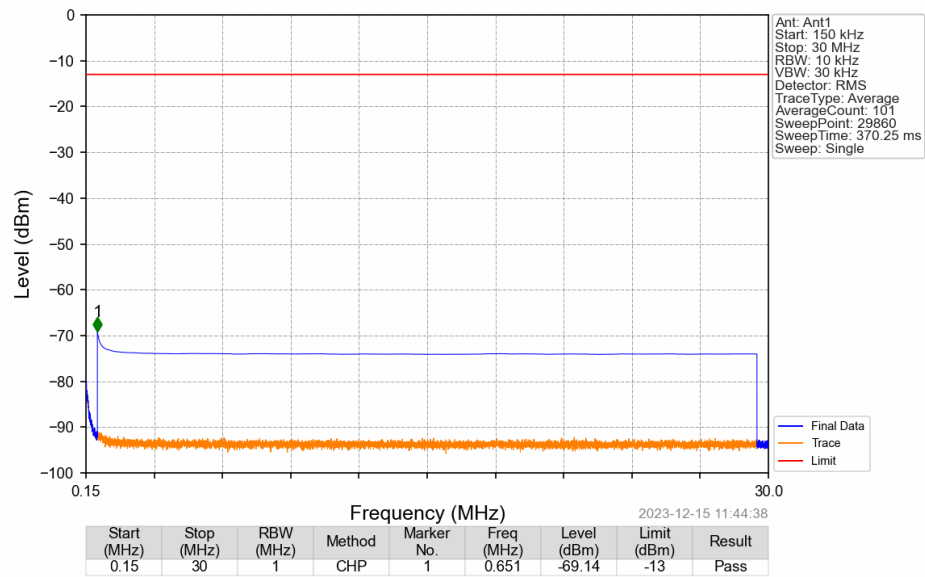
Band25_1930.1MHz_GMSK_SISO_Ant1_NTNV



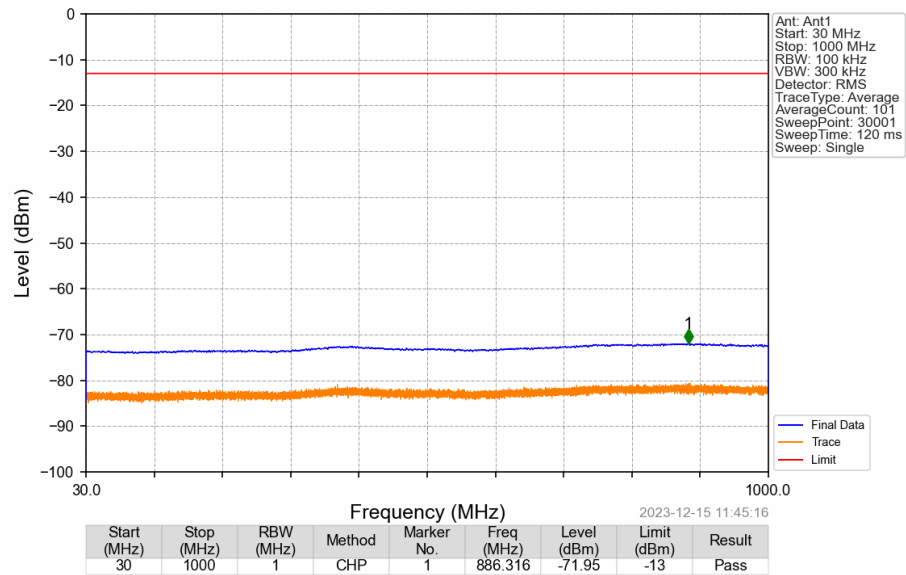
Band25_1962.5MHz_GMSK_SISO_Ant1_NTNV



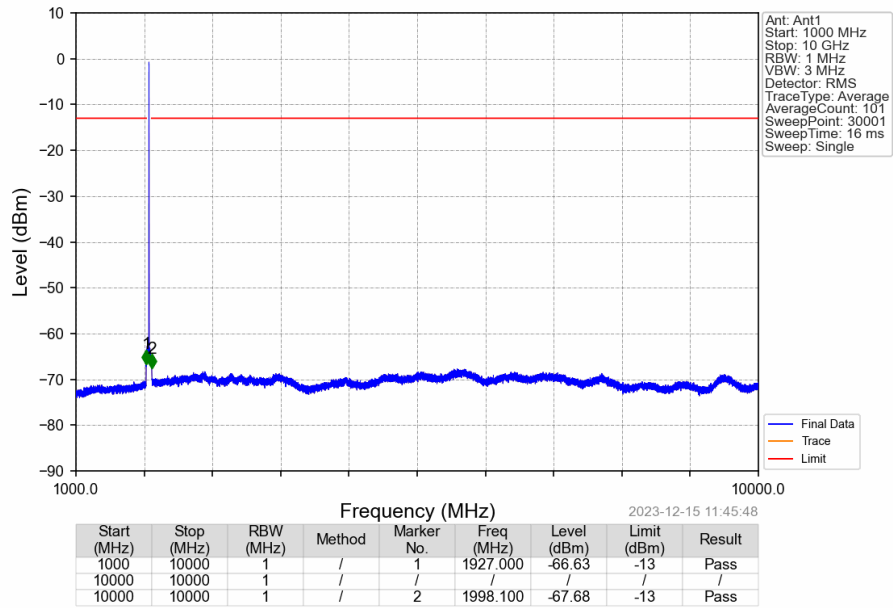
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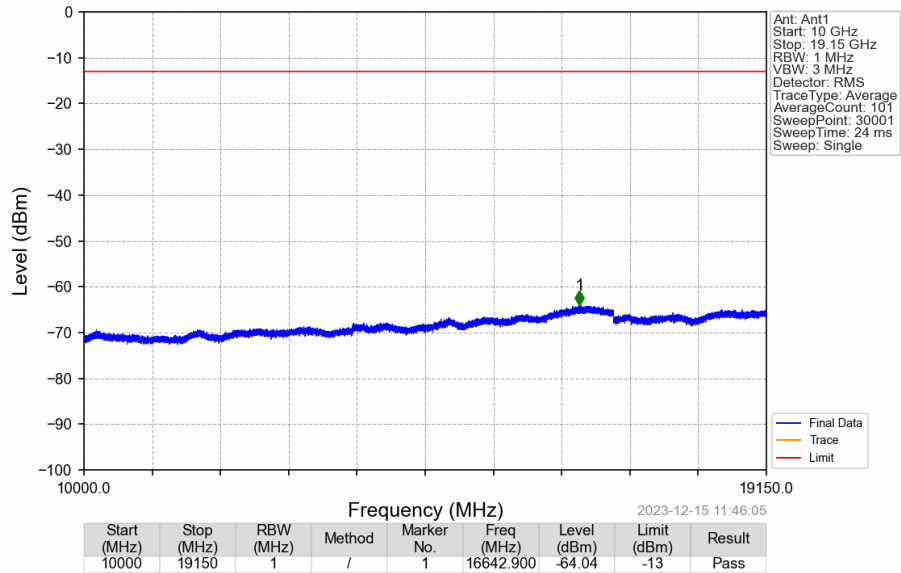
Band25_1962.5MHz_GMSK_SISO_Ant1_NTNV



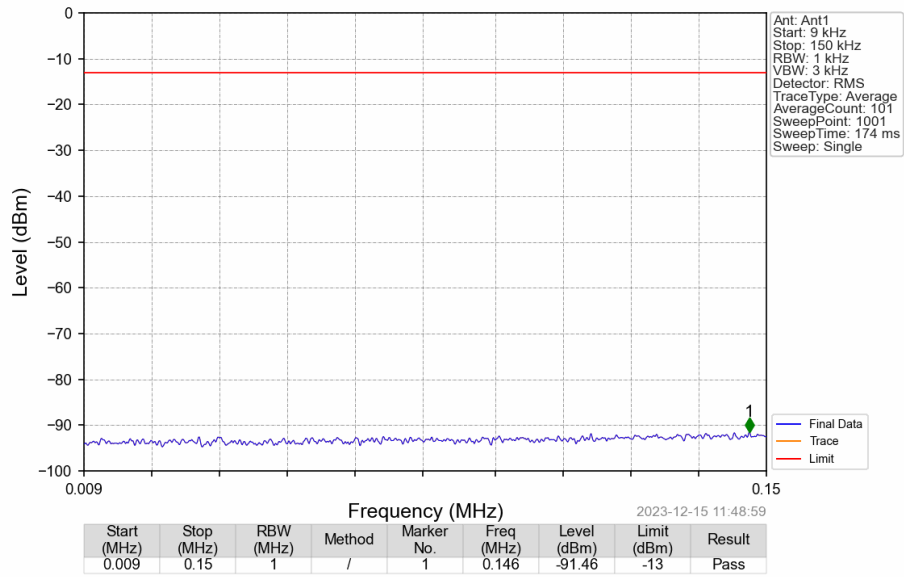
Band25_1962.5MHz_GMSK_SISO_Ant1_NTNV



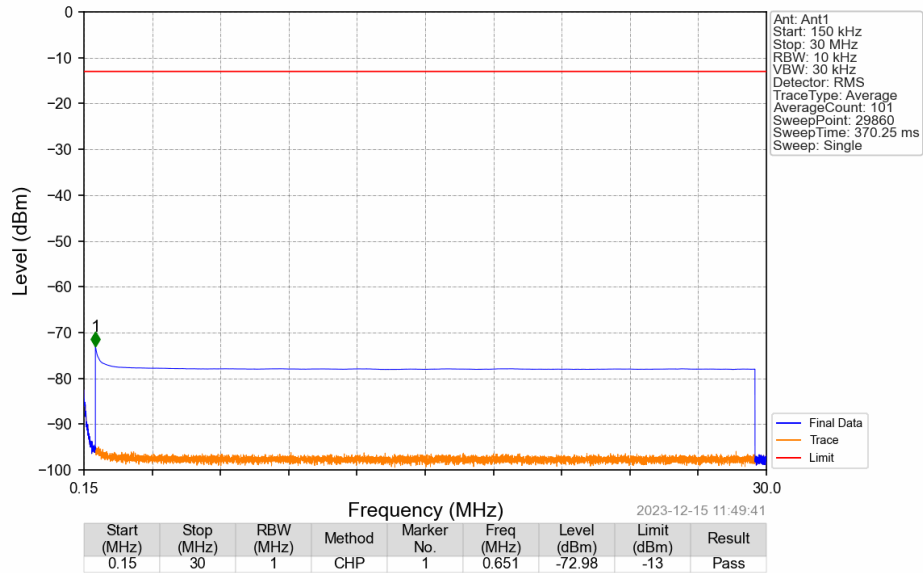
Band25_1962.5MHz_GMSK_SISO_Ant1_NTNV



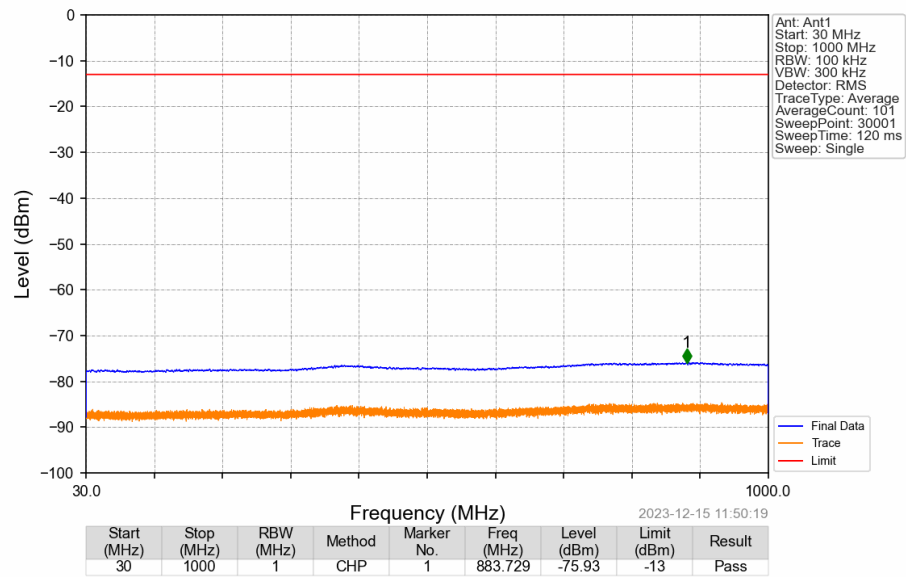
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV



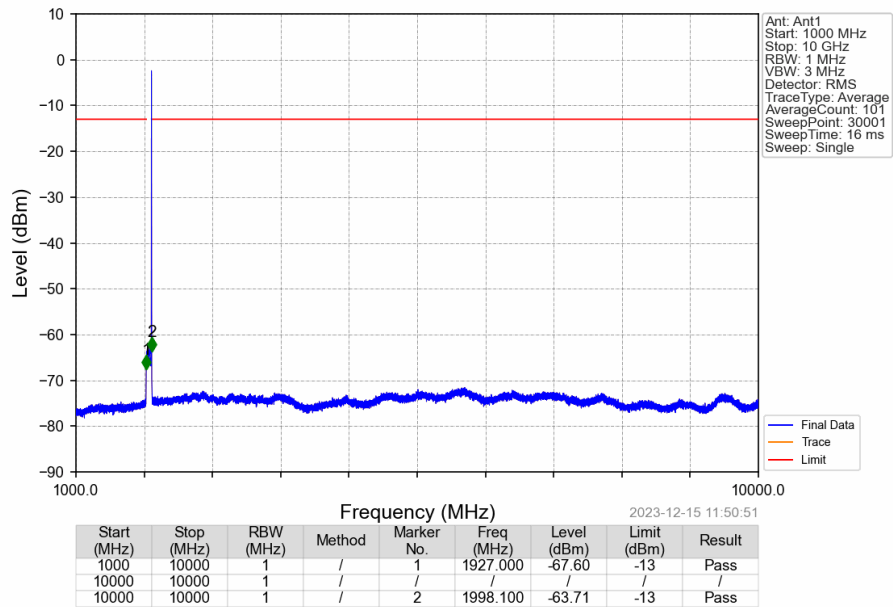
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV



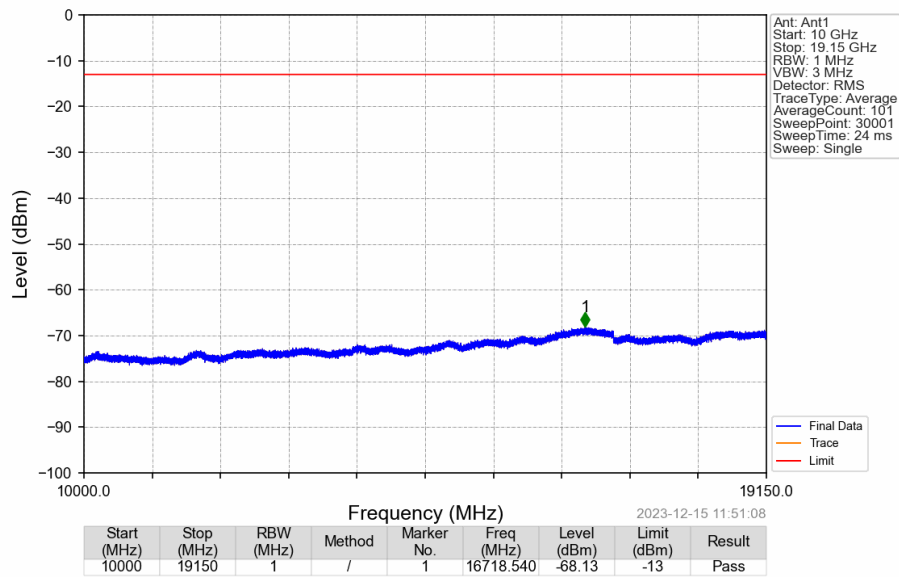
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV



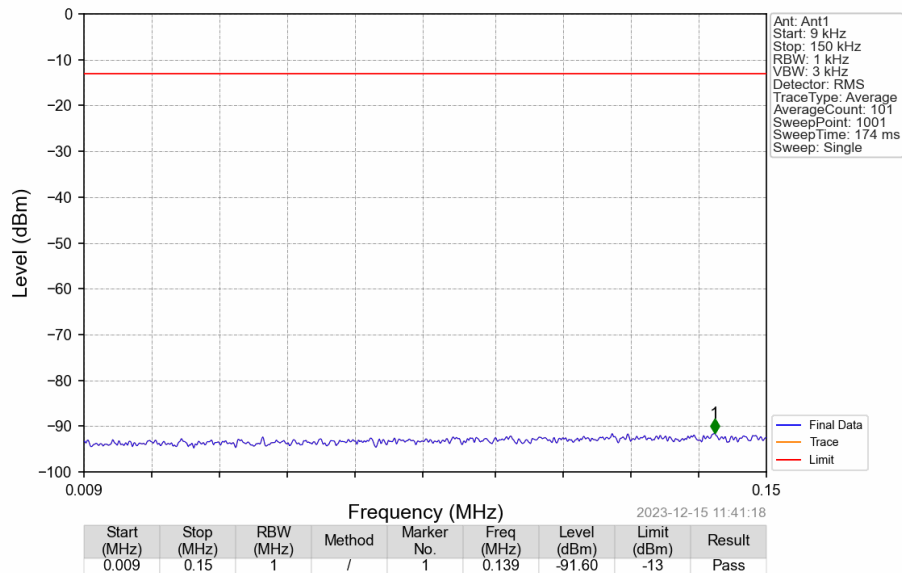
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV



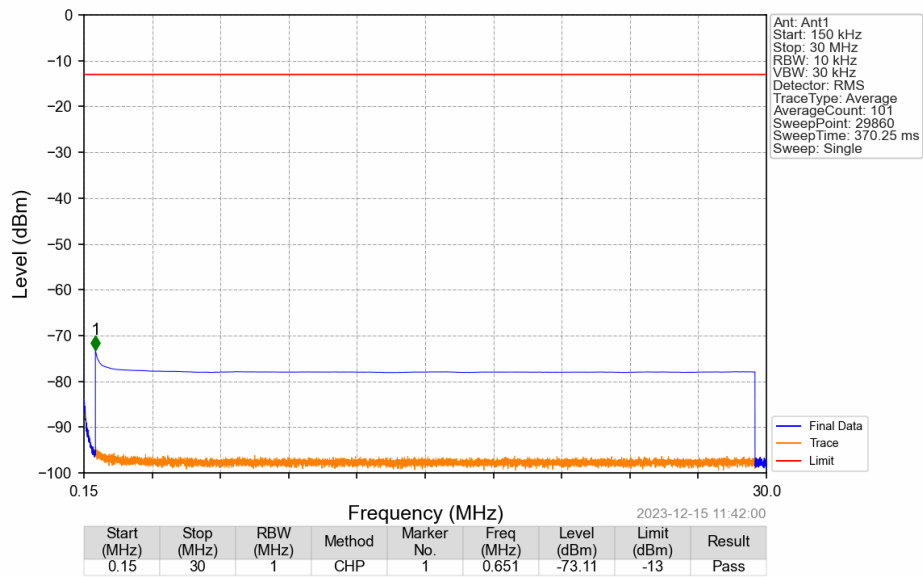
Band25_1994.9MHz_GMSK_SISO_Ant1_NTNV



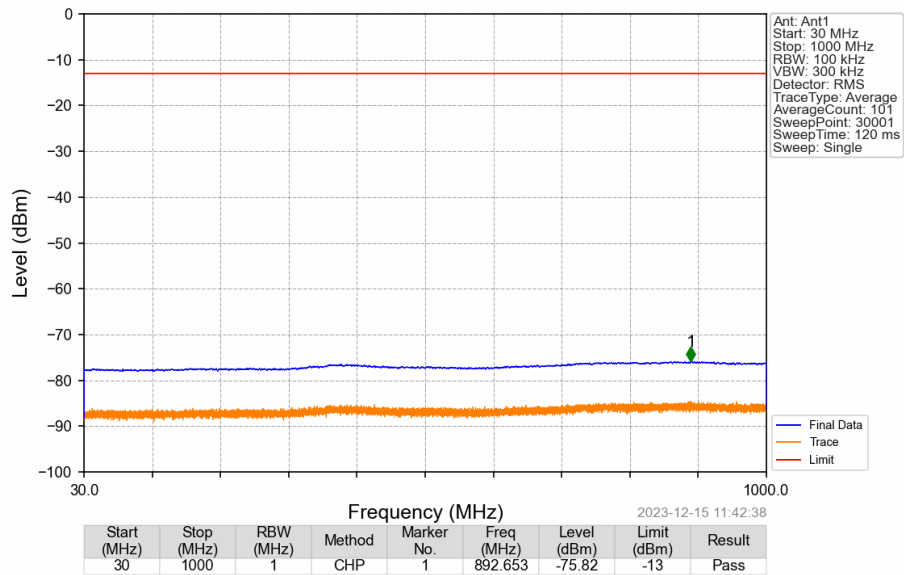
Band25_1932.5MHz_AWGN_SISO_Ant1_NTNV



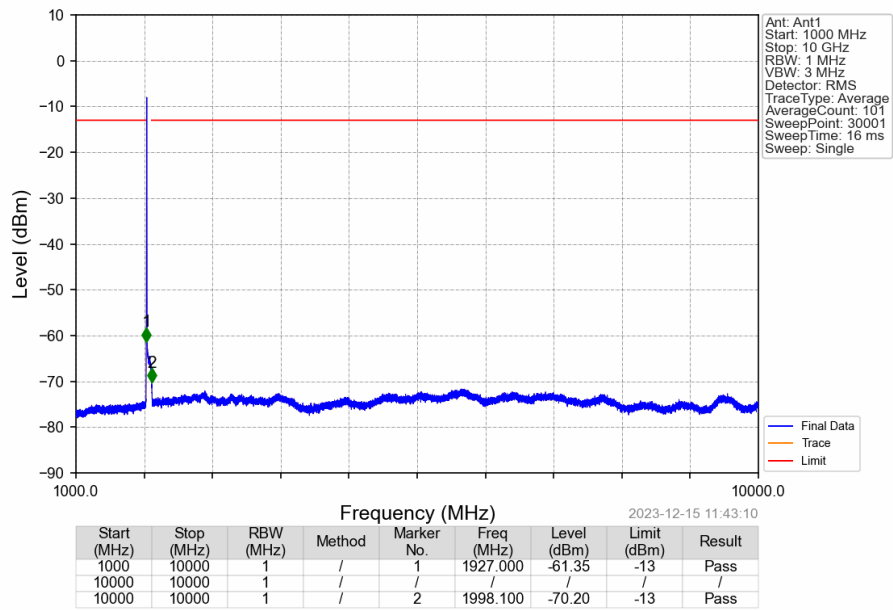
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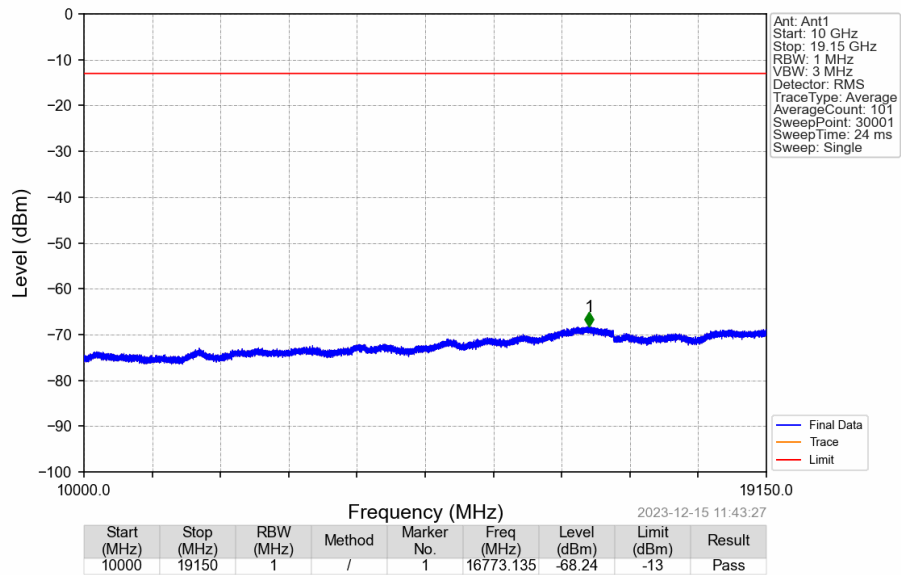
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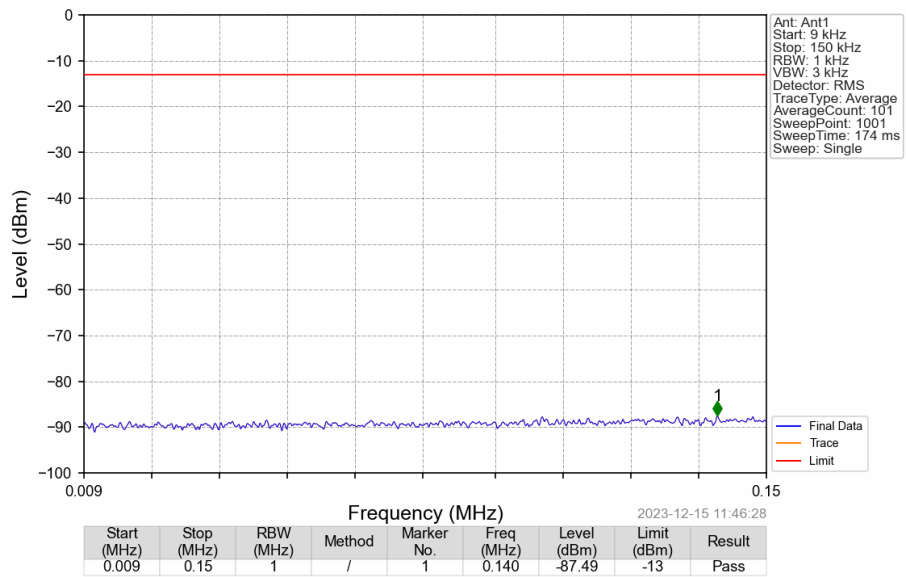
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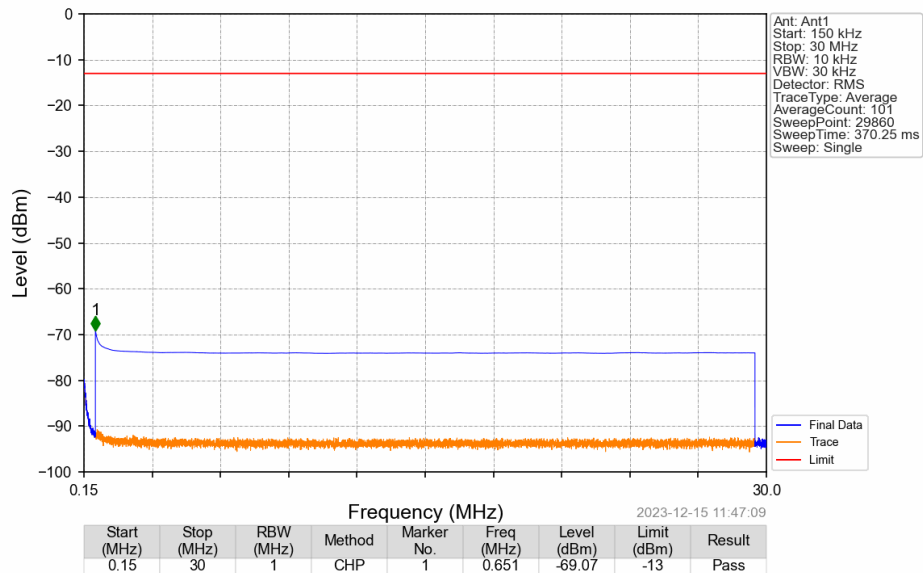
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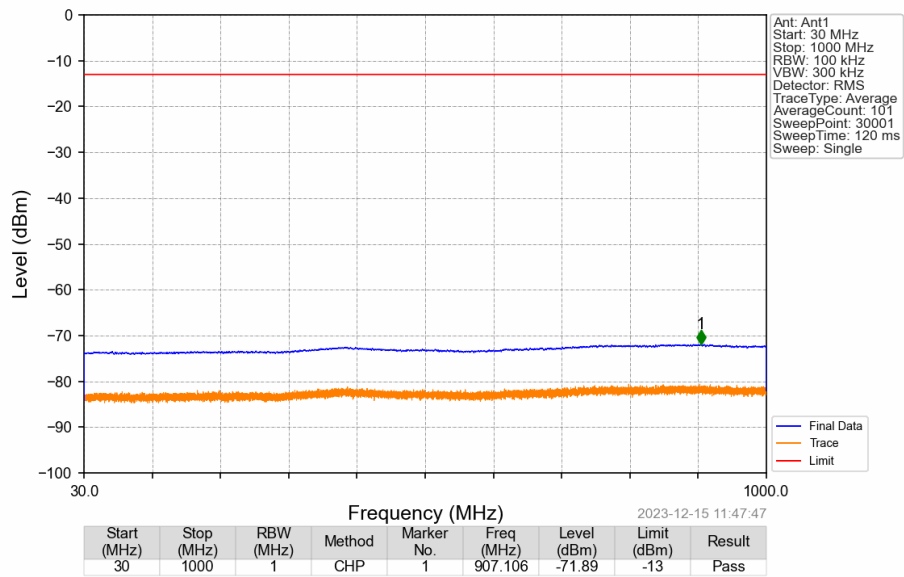
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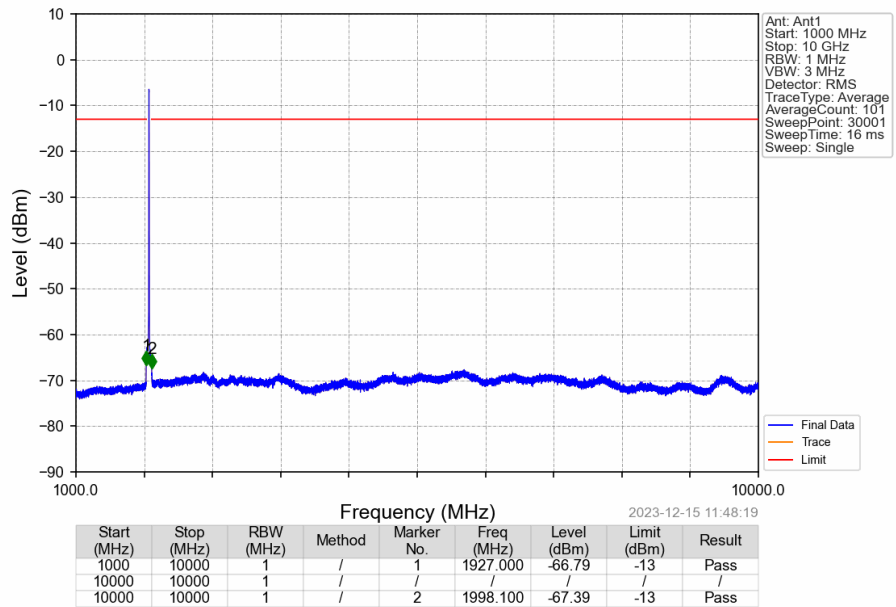
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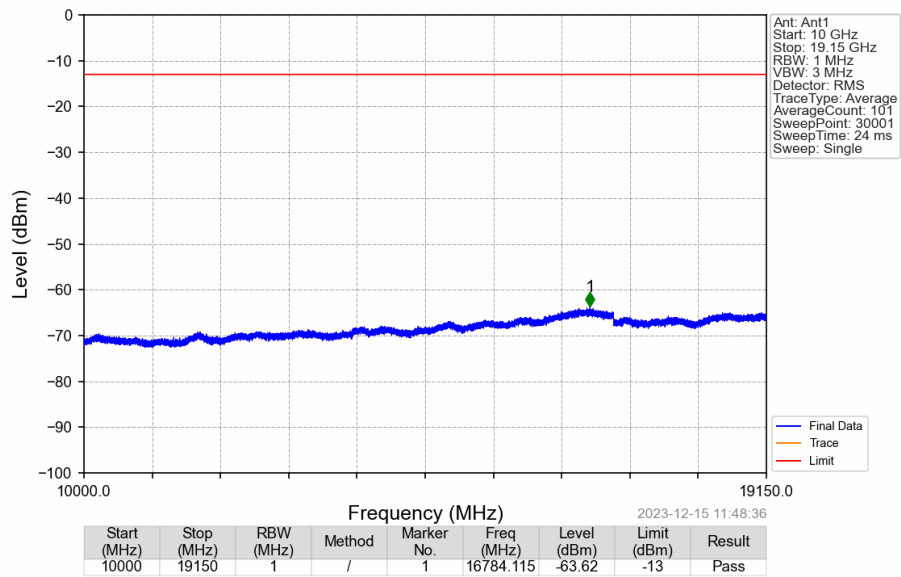
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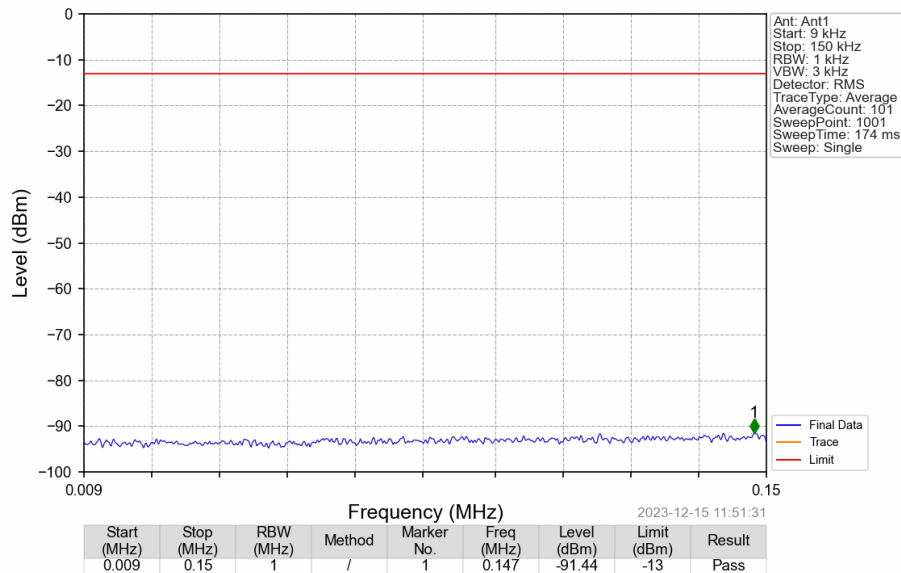
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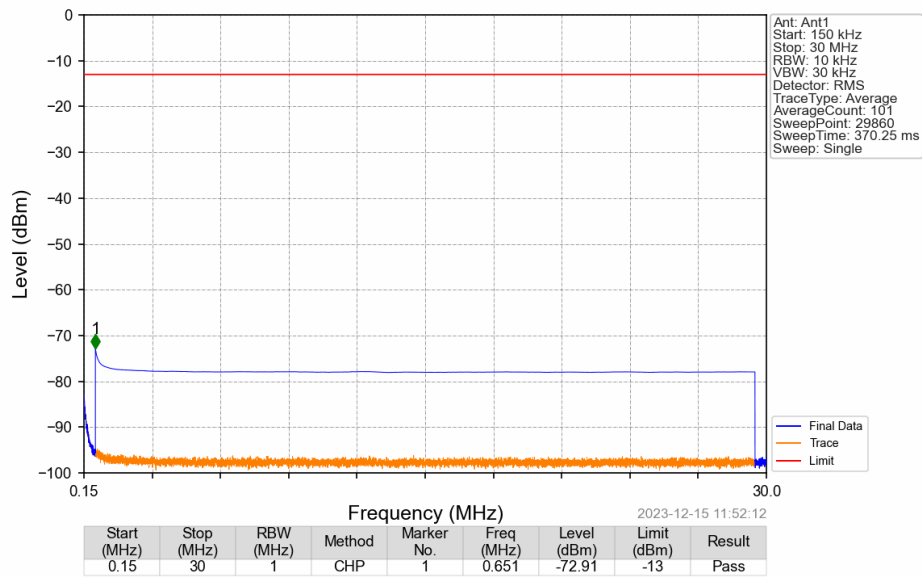
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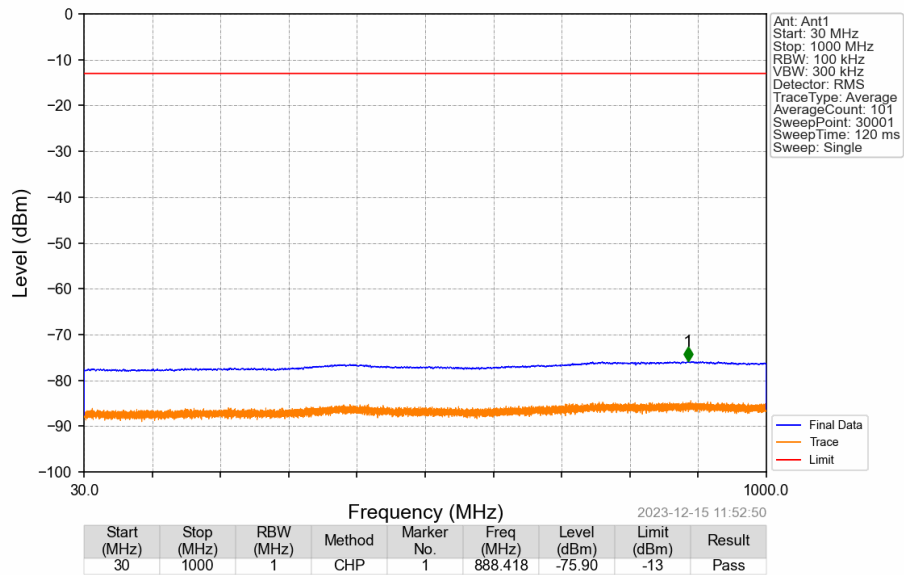
Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV



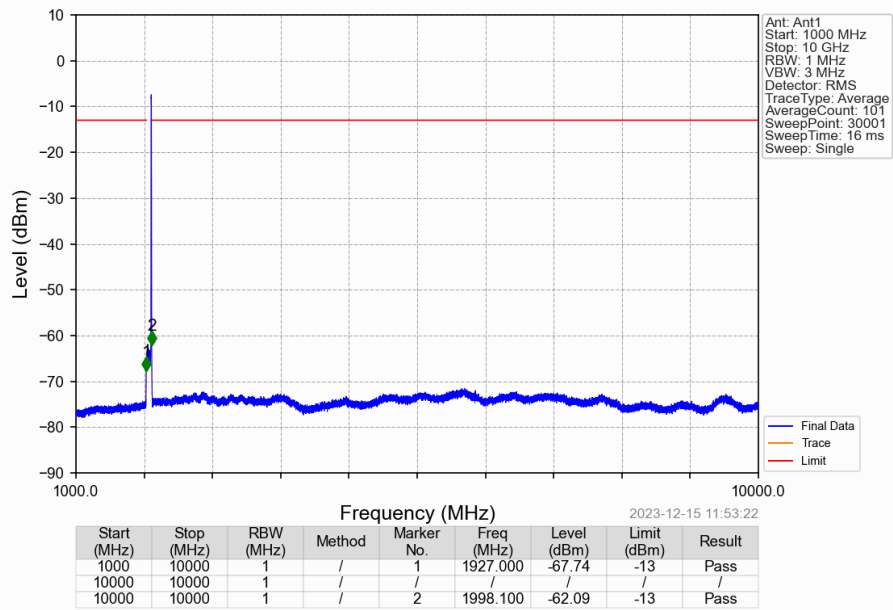
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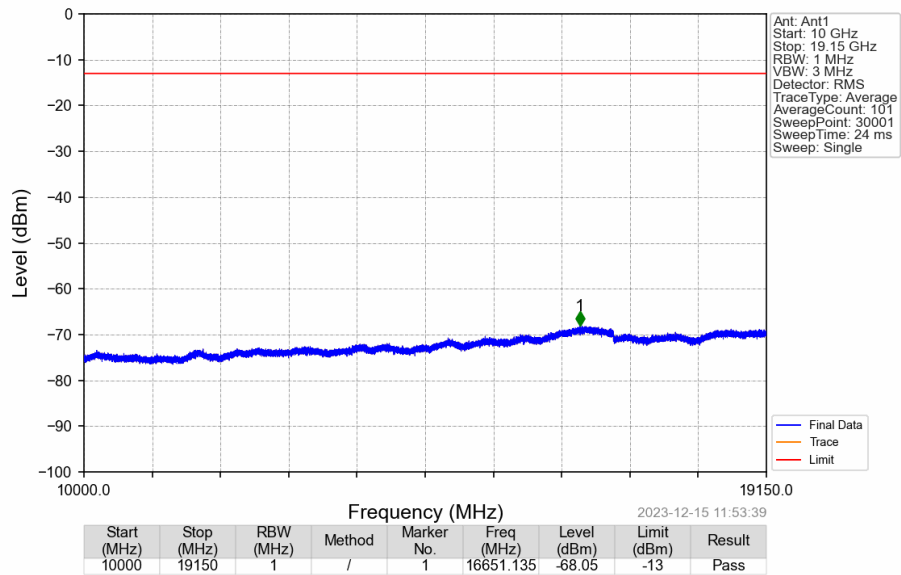
Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV



Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV



Band25_1992.5MHz_AWGN_SISO_Ant1_NTNV



7. Frequency stability measurements

7.1 Band25_Ant1

7.1.1 Test Result

Band: 25 / NTNV							
Signal			Temp (°C)	Voltage (VAC)	Freq. Error (Hz)	Tolerance (ppm)	Verdict
Type	Level (dBm)	Frequency (MHz)					
CW	-3.5	1930.1	20	102	-161	-0.0839	Pass
				120	-161	-0.0839	Pass
				138	-161	-0.0831	Pass
			-40	120	-165	-0.0855	Pass
			-30	120	-161	-0.0830	Pass
			-20	120	-164	-0.0851	Pass
			-10	120	-161	-0.0839	Pass
			0	120	-166	-0.0857	Pass
			10	120	-166	-0.0864	Pass
			30	120	-164	-0.0850	Pass
			40	120	-156	-0.0814	Pass
			55	120	-161	-0.0830	Pass
		1962.5	20	102	-166	-0.0845	Pass
				120	-163	-0.0825	Pass
				138	-160	-0.0818	Pass
			-40	120	-161	-0.0816	Pass
			-30	120	-165	-0.0836	Pass
			-20	120	-158	-0.0804	Pass
			-10	120	-167	-0.0848	Pass
			0	120	-165	-0.0836	Pass
			10	120	-165	-0.0842	Pass
			30	120	-161	-0.0816	Pass
			40	120	-167	-0.0847	Pass
			55	120	-163	-0.0829	Pass



		1994.9	20	102	-162	-0.0810	Pass
				120	-168	-0.0837	Pass
				138	-162	-0.0808	Pass
			-20	120	-166	-0.0826	Pass
			-20	120	-156	-0.0775	Pass
			-20	120	-165	-0.0828	Pass
			-10	120	-165	-0.0829	Pass
			0	120	-160	-0.0805	Pass
			10	120	-160	-0.0797	Pass
			30	120	-161	-0.0810	Pass
			40	120	-156	-0.0775	Pass
			55	120	-166	-0.0826	Pass

8. Radiated Spurious Emissions

8.1 Band25_Ant1

8.1.1 Test Result

AWGN_Low channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
128.82	Horizontal	-69.67	-13	-56.67	pass
325.70	Horizontal	-65.15	-13	-52.15	pass
791.14	Horizontal	-62.67	-13	-49.67	pass
1934.54	Horizontal	-46.73	-13	-33.73	pass
7317.76	Horizontal	-41.47	-13	-28.47	pass
10035.11	Horizontal	-37.11	-13	-24.11	pass
94.70	Vertical	-68.84	-13	-55.84	pass
299.83	Vertical	-65.57	-13	-52.57	pass
785.29	Vertical	-62.51	-13	-49.51	pass
1919.33	Vertical	-47.33	-13	-34.33	pass
7343.99	Vertical	-44.57	-13	-31.57	pass
10012.60	Vertical	-40.30	-13	-27.3	pass

AWGN_Middle channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
95.46	Horizontal	-69.03	-13	-56.03	pass
321.10	Horizontal	-65.56	-13	-52.56	pass
782.56	Horizontal	-62.23	-13	-49.23	pass
1925.21	Horizontal	-46.67	-13	-33.67	pass
7322.42	Horizontal	-44.66	-13	-31.66	pass
10032.44	Horizontal	-39.78	-13	-26.78	pass
127.70	Vertical	-69.38	-13	-56.38	pass
295.23	Vertical	-65.63	-13	-52.63	pass
779.31	Vertical	-62.61	-13	-49.61	pass
1916.89	Vertical	-47.19	-13	-34.19	pass
7325.81	Vertical	-44.03	-13	-31.03	pass
10049.15	Vertical	-40.01	-13	-27.01	pass

AWGN_High channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
119.34	Horizontal	-69.36	-13	-56.36	pass
293.00	Horizontal	-66.13	-13	-53.13	pass
774.89	Horizontal	-62.13	-13	-49.13	pass
2107.18	Horizontal	-46.81	-13	-33.81	pass
8007.95	Horizontal	-43.78	-13	-30.78	pass
12834.25	Horizontal	-40.67	-13	-27.67	pass
119.79	Vertical	-69.64	-13	-56.64	pass
309.60	Vertical	-66.27	-13	-53.27	pass
775.35	Vertical	-62.10	-13	-49.1	pass
2105.06	Vertical	-46.63	-13	-33.63	pass
8007.07	Vertical	-43.99	-13	-30.99	pass
12835.82	Vertical	-39.91	-13	-26.91	pass

GMSK_Low channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
96.23	Horizontal	-64.73	-13	-51.73	pass
306.34	Horizontal	-60.43	-13	-47.43	pass
758.75	Horizontal	-62.37	-13	-49.37	pass
2113.16	Horizontal	-47.07	-13	-34.07	pass
8044.48	Horizontal	-44.45	-13	-31.45	pass
12810.25	Horizontal	-40.66	-13	-27.66	pass
105.42	Vertical	-63.91	-13	-50.91	pass
325.82	Vertical	-65.09	-13	-52.09	pass
799.59	Vertical	-62.68	-13	-49.68	pass
2109.77	Vertical	-46.64	-13	-33.64	pass
8036.27	Vertical	-43.47	-13	-30.47	pass
12850.27	Vertical	-39.66	-13	-26.66	pass

GMSK_Middle channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
112.96	Horizontal	-69.08	-13	-56.08	pass
313.48	Horizontal	-65.14	-13	-52.14	pass
780.84	Horizontal	-62.97	-13	-49.97	pass
2058.57	Horizontal	-47.03	-13	-34.03	pass
8110.42	Horizontal	-43.57	-13	-30.57	pass
12612.36	Horizontal	-39.86	-13	-26.86	pass
91.17	Vertical	-70.03	-13	-57.03	pass
326.66	Vertical	-65.96	-13	-52.96	pass
768.79	Vertical	-63.01	-13	-50.01	pass
2075.72	Vertical	-47.04	-13	-34.04	pass
8107.45	Vertical	-43.40	-13	-30.4	pass
12622.50	Vertical	-39.46	-13	-26.46	pass

GMSK_High channel					
Frequency	Spurious Emission Polarization and Level		Limit	Over limit	Result
MHz	polarization	dBm	dBm	dB	
105.52	Horizontal	-69.80	-13	-56.8	pass
300.53	Horizontal	-65.91	-13	-52.91	pass
778.17	Horizontal	-62.44	-13	-49.44	pass
2187.82	Horizontal	-47.66	-13	-34.66	pass
8199.37	Horizontal	-43.39	-13	-30.39	pass
12680.53	Horizontal	-39.74	-13	-26.74	pass
128.08	Vertical	-69.81	-13	-56.81	pass
314.22	Vertical	-66.15	-13	-53.15	pass
769.24	Vertical	-62.10	-13	-49.1	pass
2182.11	Vertical	-46.66	-13	-33.66	pass
8222.27	Vertical	-44.63	-13	-31.63	pass
12687.62	Vertical	-39.91	-13	-26.91	pass