

Appendix - BLE

BLE-L

1. Frequency Error

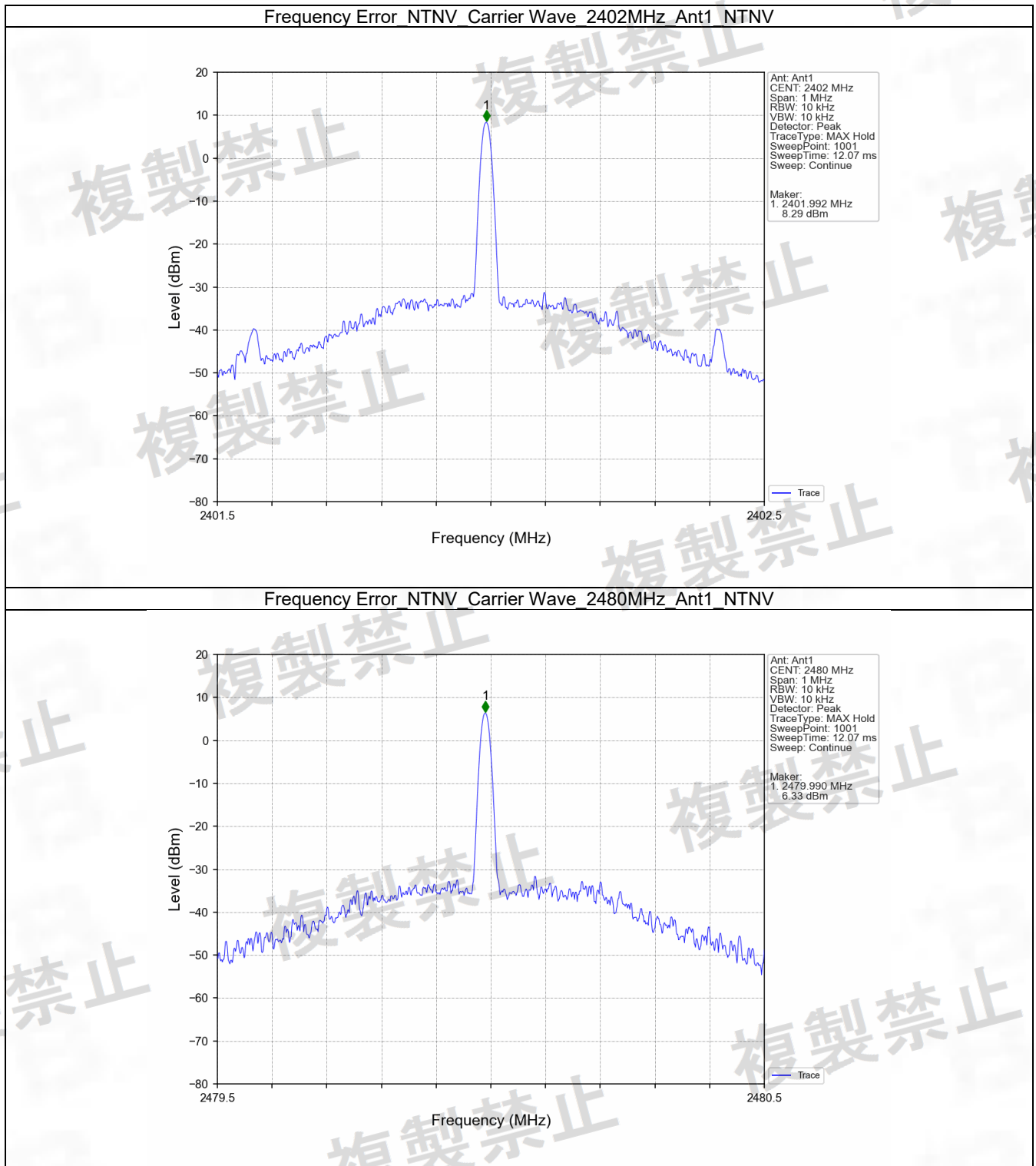
1.1 Test Result

1.1.1 Ant1

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2402	2401.992	-3.33	-50 to 50	Pass
			2480	2479.990	-4.03	-50 to 50	Pass

1.2 Test Graph

1.2.1 Ant1



2. Occupied Bandwidth

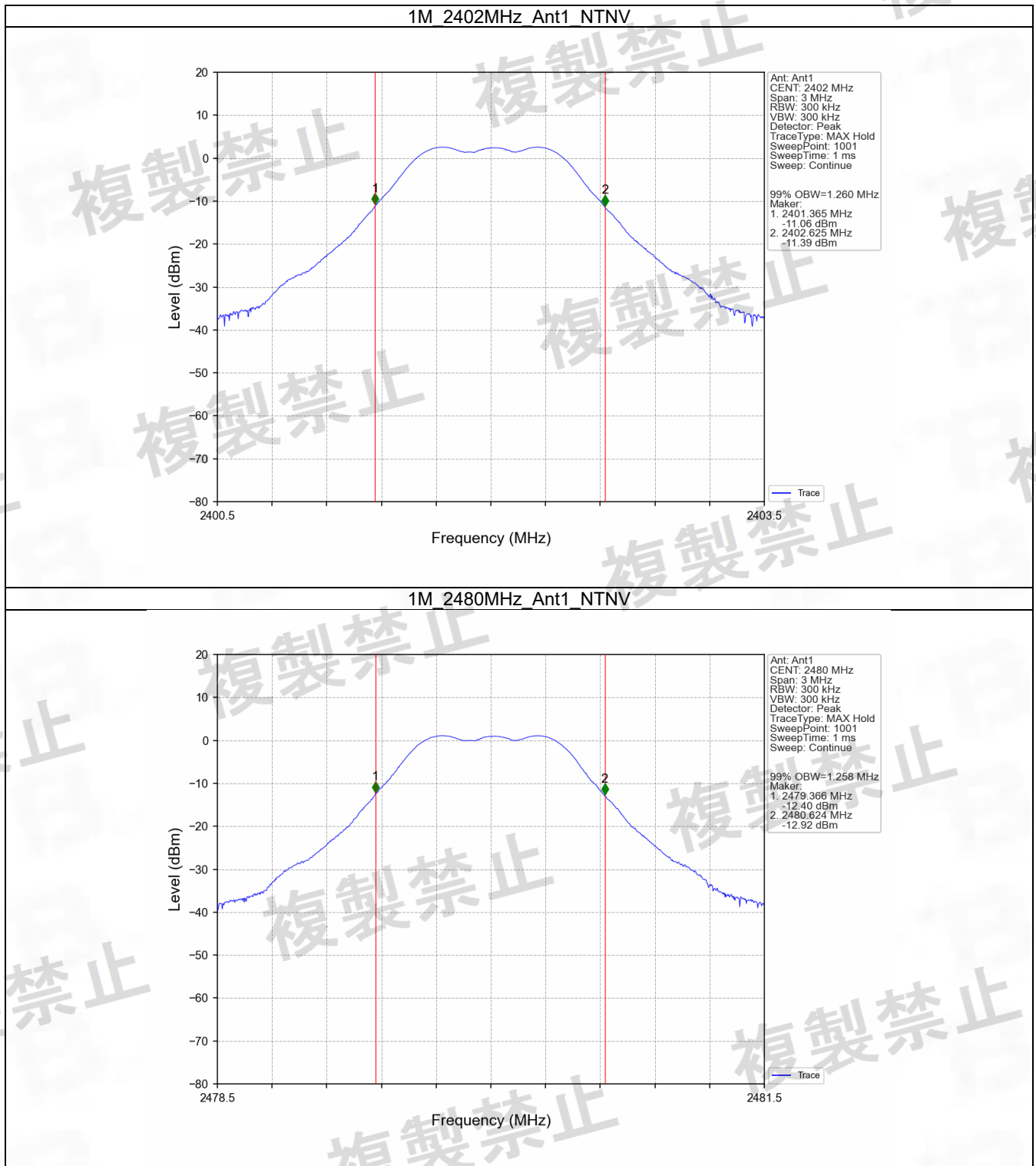
2.1 Test Result

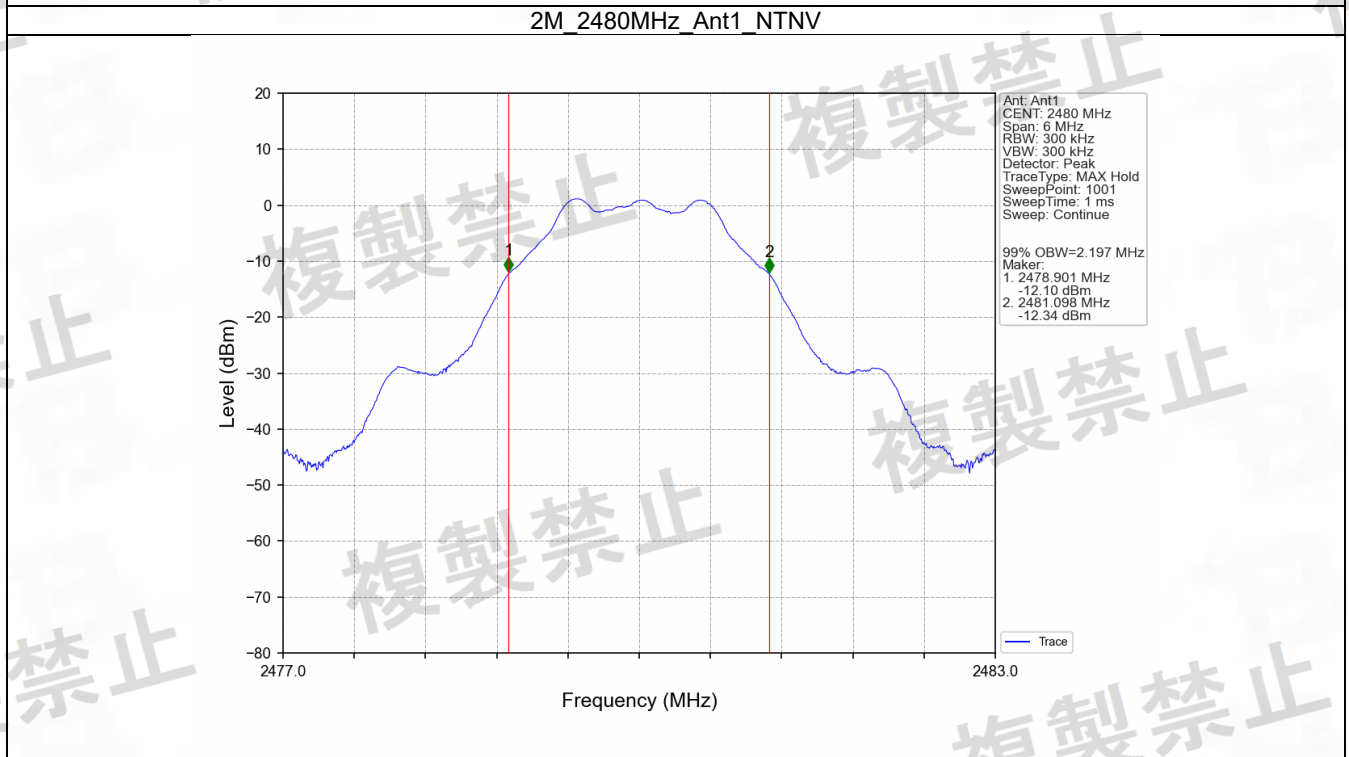
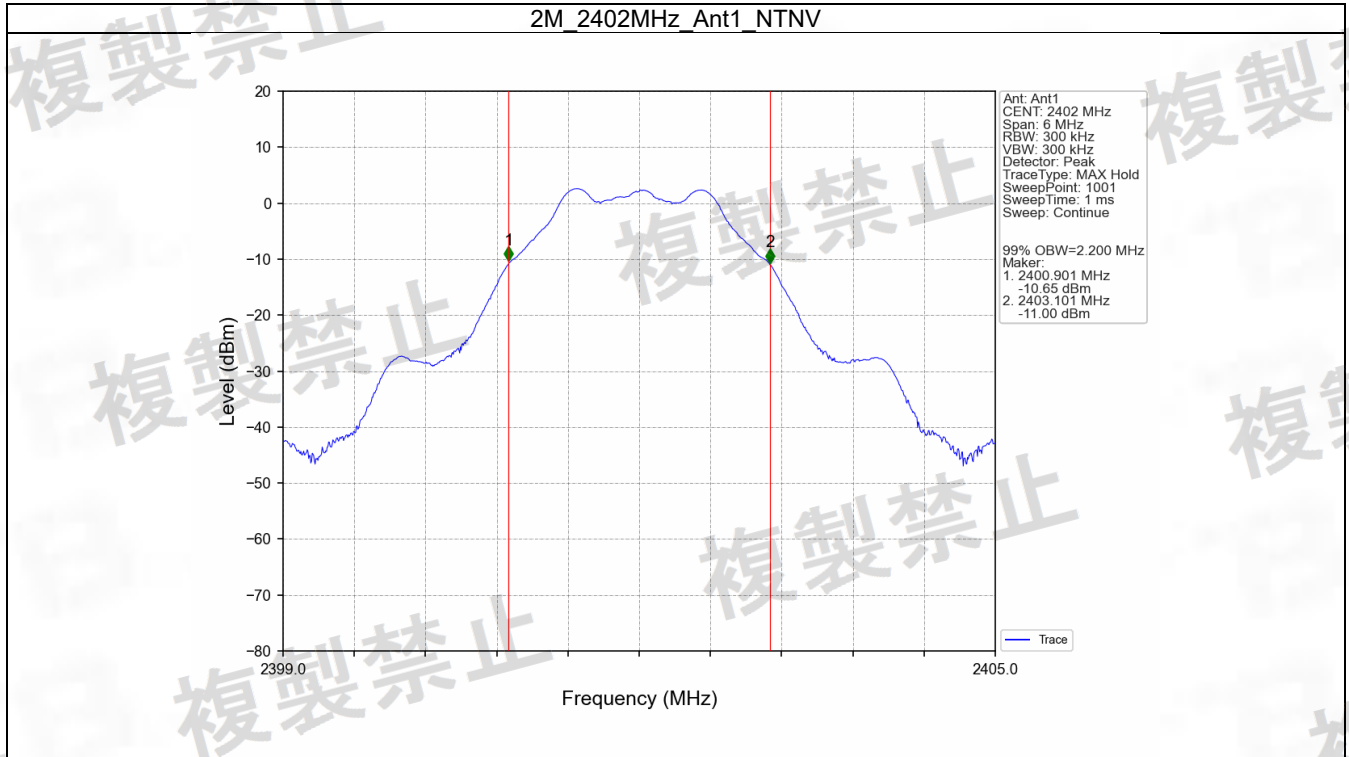
2.1.1 OBW

ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	1M	SISO	2402	1.260	≤ 26	Pass
			2480	1.258	≤ 26	Pass
	2M	SISO	2402	2.200	≤ 26	Pass
			2480	2.197	≤ 26	Pass

2.2 Test Graph

2.2.1 OBW





3. Antenna Power

3.1 Test Result

3.1.1 Power

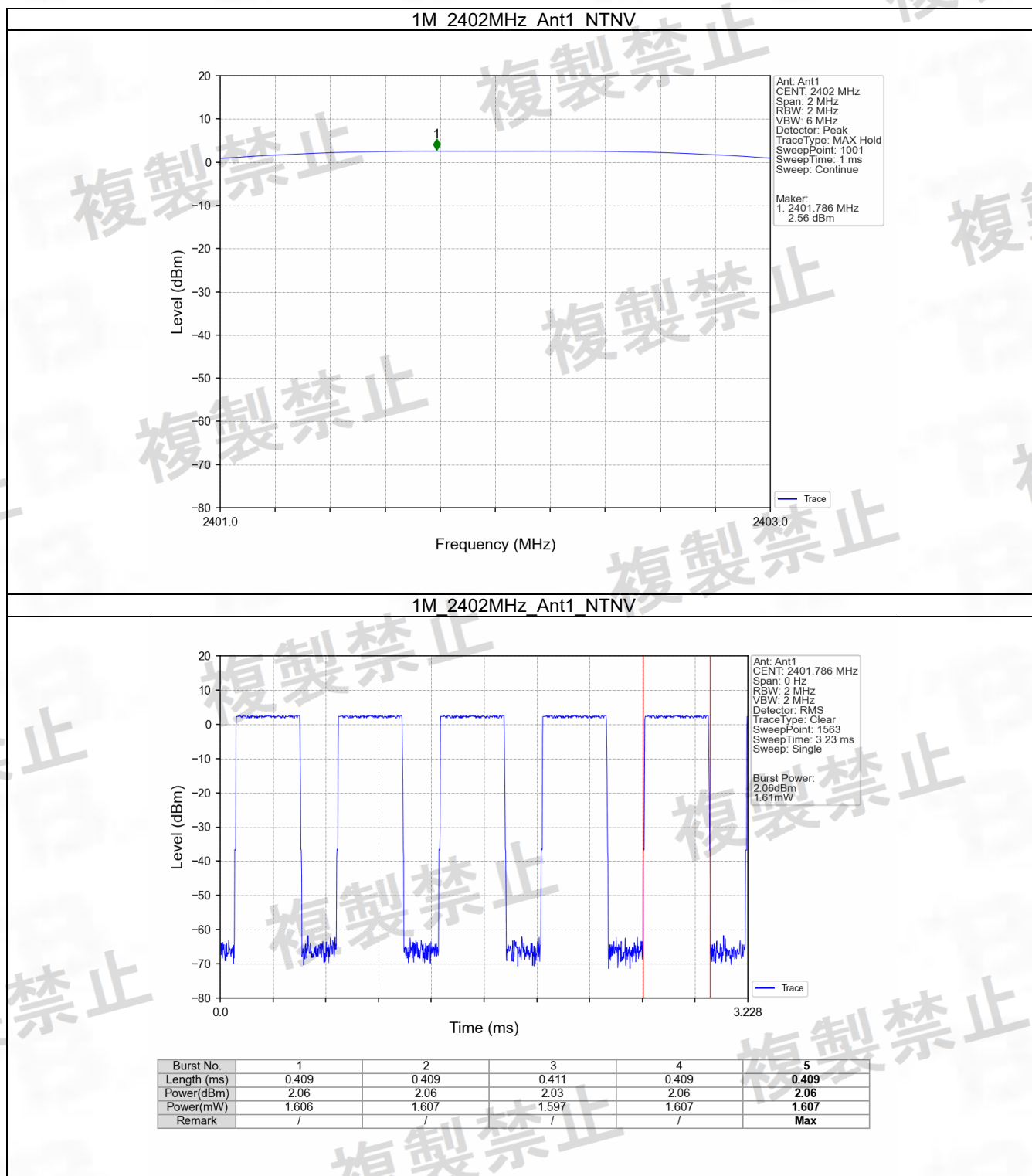
ENV	Mode	TX Type	Frequency (MHz)	ANT	Antenna Power (mW)		Nominal Power (mW)	Tolerance (%)		Verdict
					Measured	Limit		Measured	Limit	
NTNV	1M	SISO	2402	1	1.607	<=10.00	1.600	0.44	<=20	Pass
			2480	1	1.142	<=10.00	1.100	3.82	<=20	Pass
	2M	SISO	2402	1	1.461	<=10.00	1.500	-2.60	<=20	Pass
			2480	1	1.063	<=10.00	1.100	-3.36	<=20	Pass

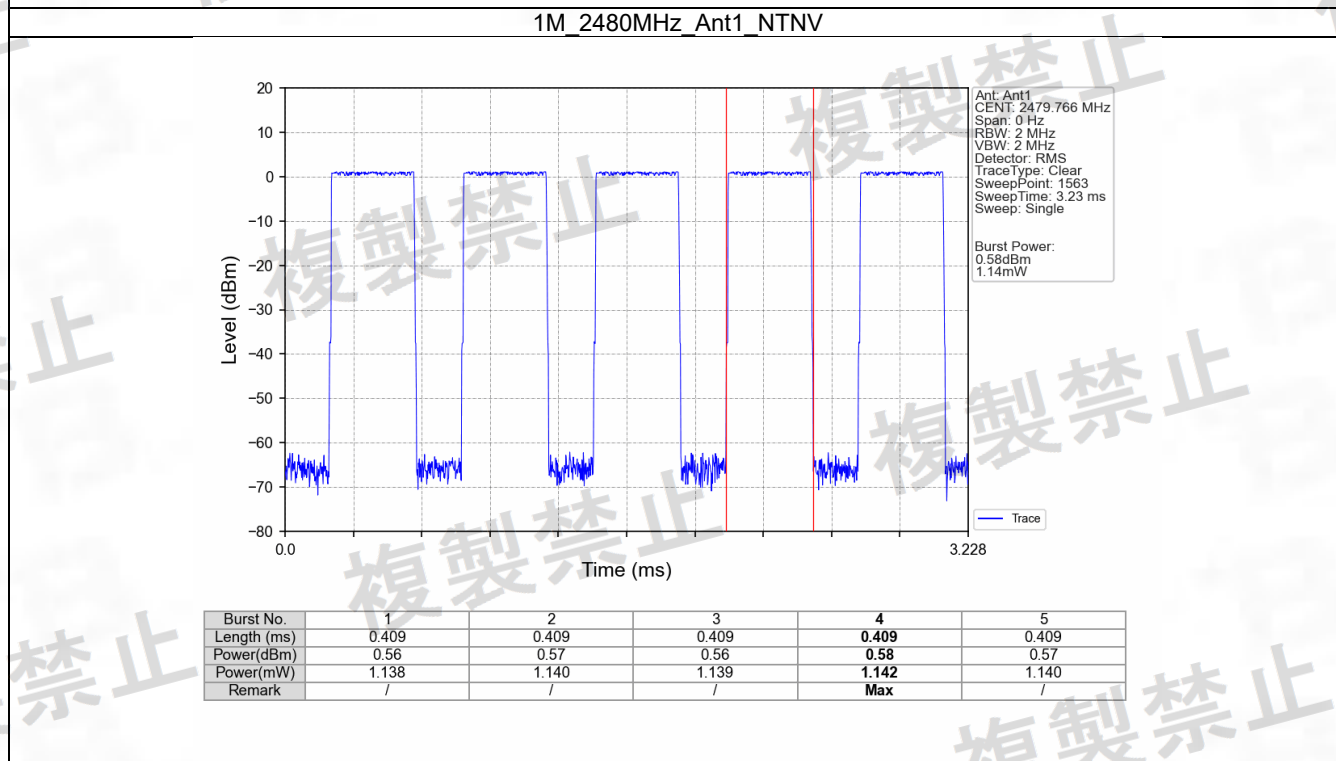
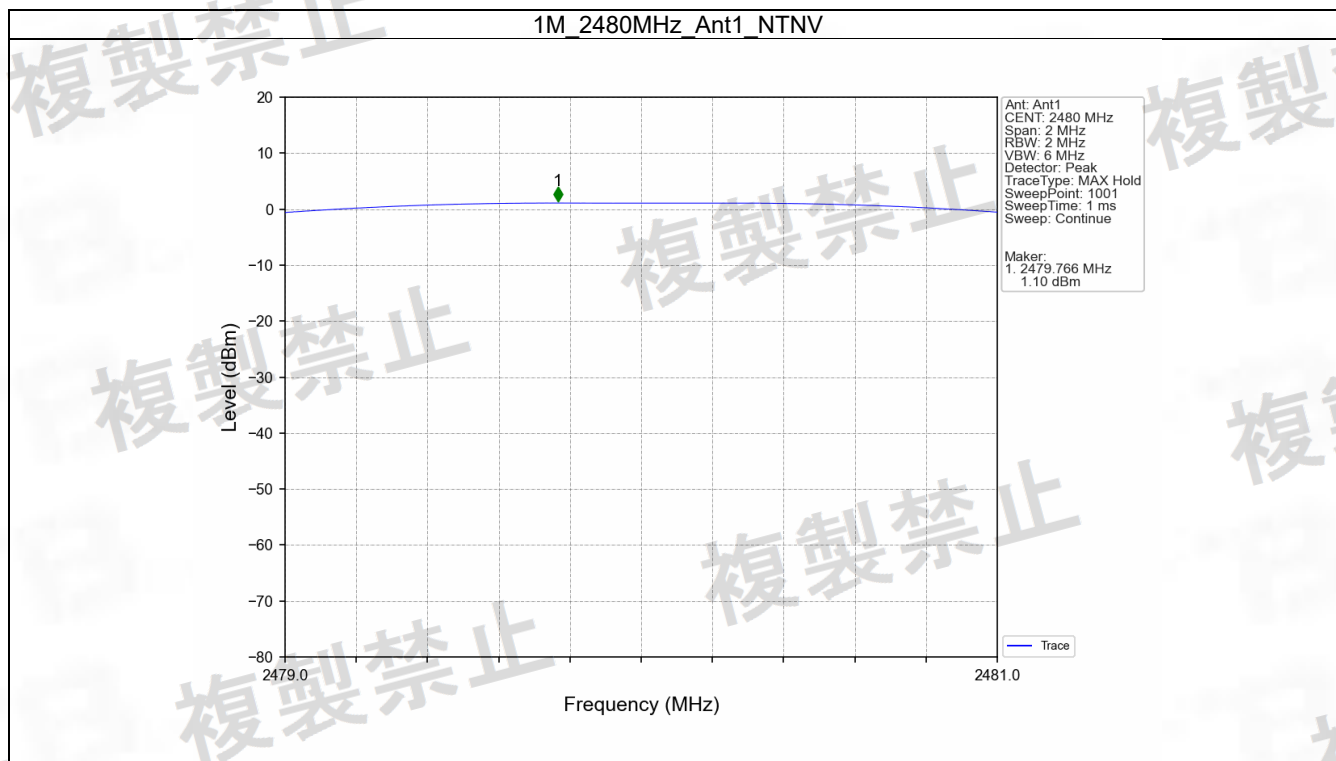
3.1.2 EIRP

ENV	Mode	TX Type	Frequency (MHz)	ANT	Gain (dBi)	EIRP (dBm)		Verdict
						Result	Limit	
NTNV	1M	SISO	2402	1	-0.25	1.81	<=12.14	Pass
			2480	1	-0.25	0.33	<=12.14	Pass
	2M	SISO	2402	1	-0.25	1.40	<=12.14	Pass
			2480	1	-0.25	0.02	<=12.14	Pass

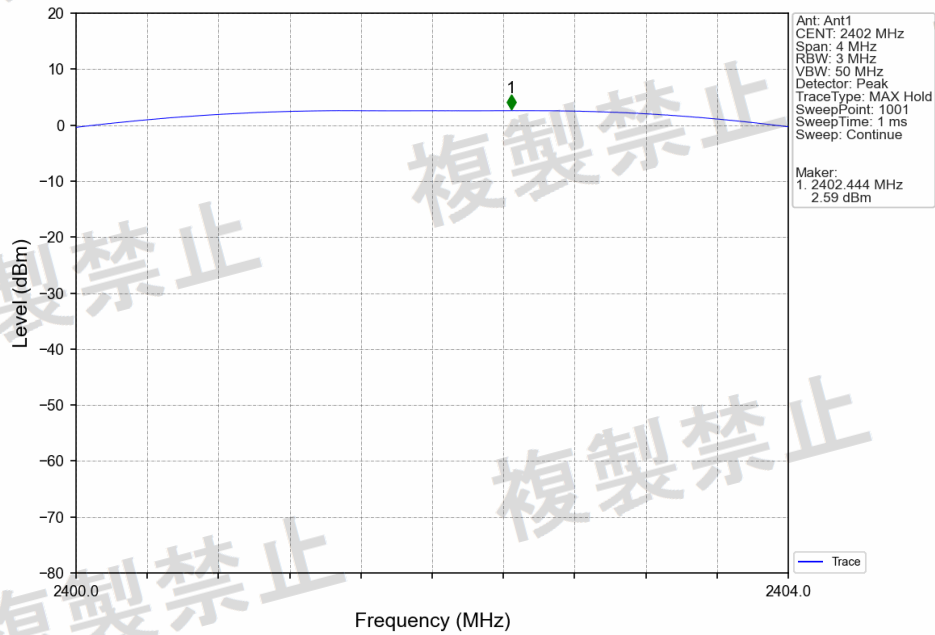
3.2 Test Graph

3.2.1 Power

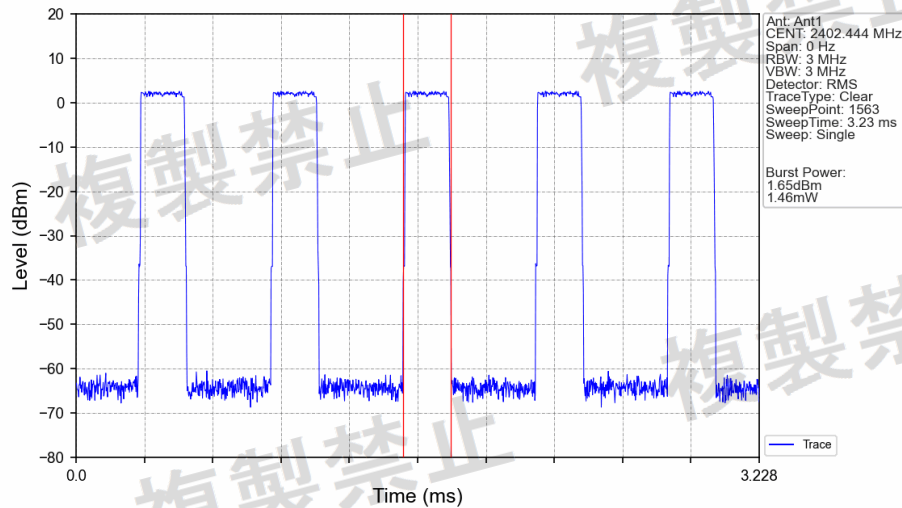




2M_2402MHz_Ant1_NTNV

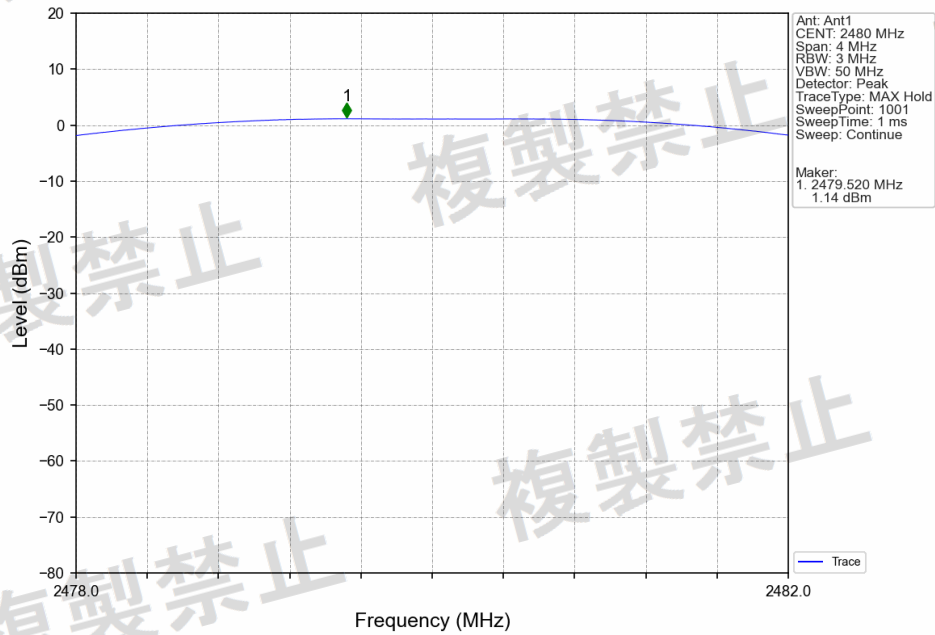


2M_2402MHz_Ant1_NTNV

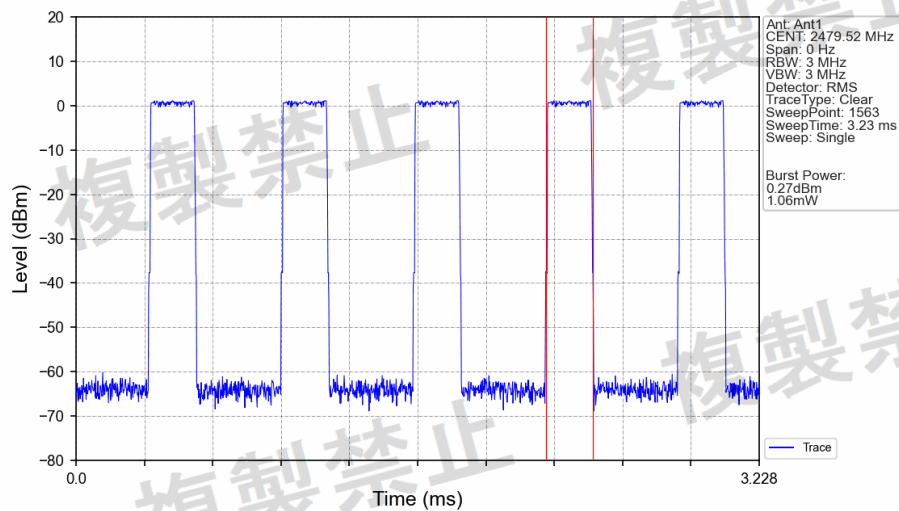


Burst No.	1	2	3	4	5
Length (ms)	0.225	0.225	0.225	0.225	0.225
Power(dBm)	1.64	1.64	1.65	1.65	1.64
Power(mW)	1.459	1.460	1.461	1.461	1.459
Remark	/	/	Max	/	/

2M_2480MHz_Ant1_NTNV



2M_2480MHz_Ant1_NTNV



Burst No.	1	2	3	4	5
Length (ms)	0.225	0.225	0.225	0.223	0.225
Power(dBm)	0.22	0.22	0.22	0.27	0.22
Power(mW)	1.053	1.052	1.052	1.063	1.052
Remark	/	/	/	Max	/

4. Spurious Emission Intensity

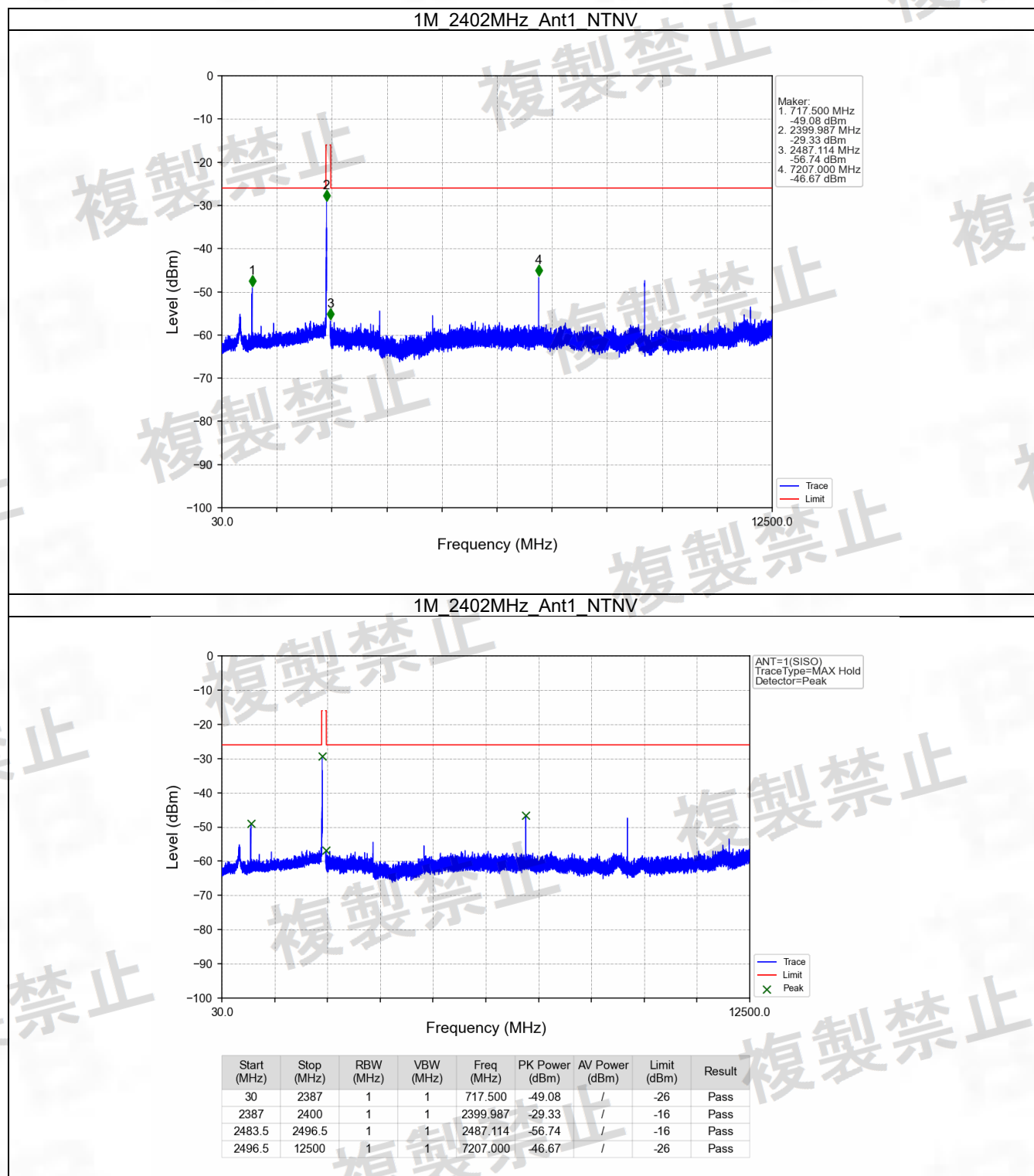
4.1 Test Result

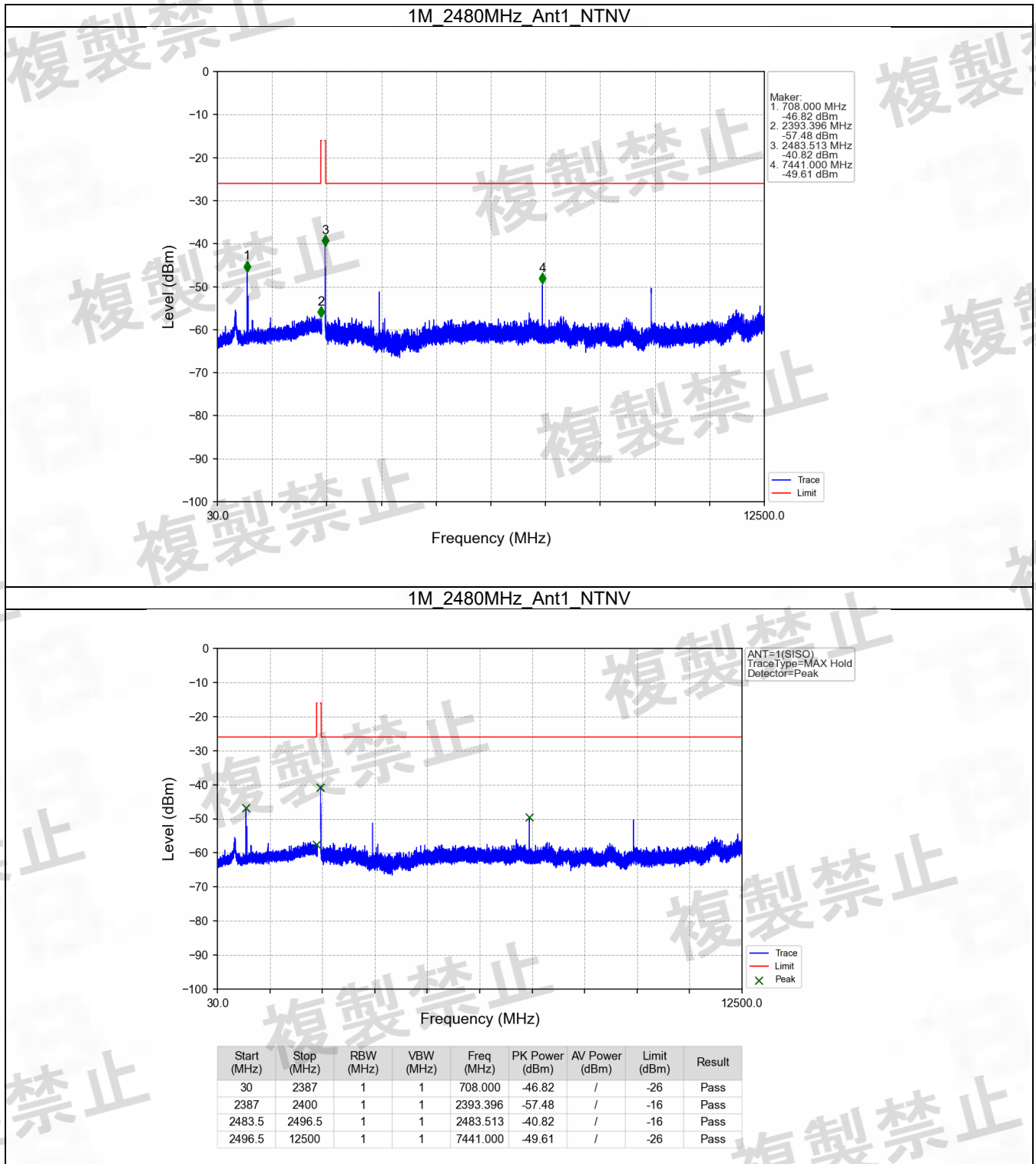
4.1.1 TxSe_NTNV

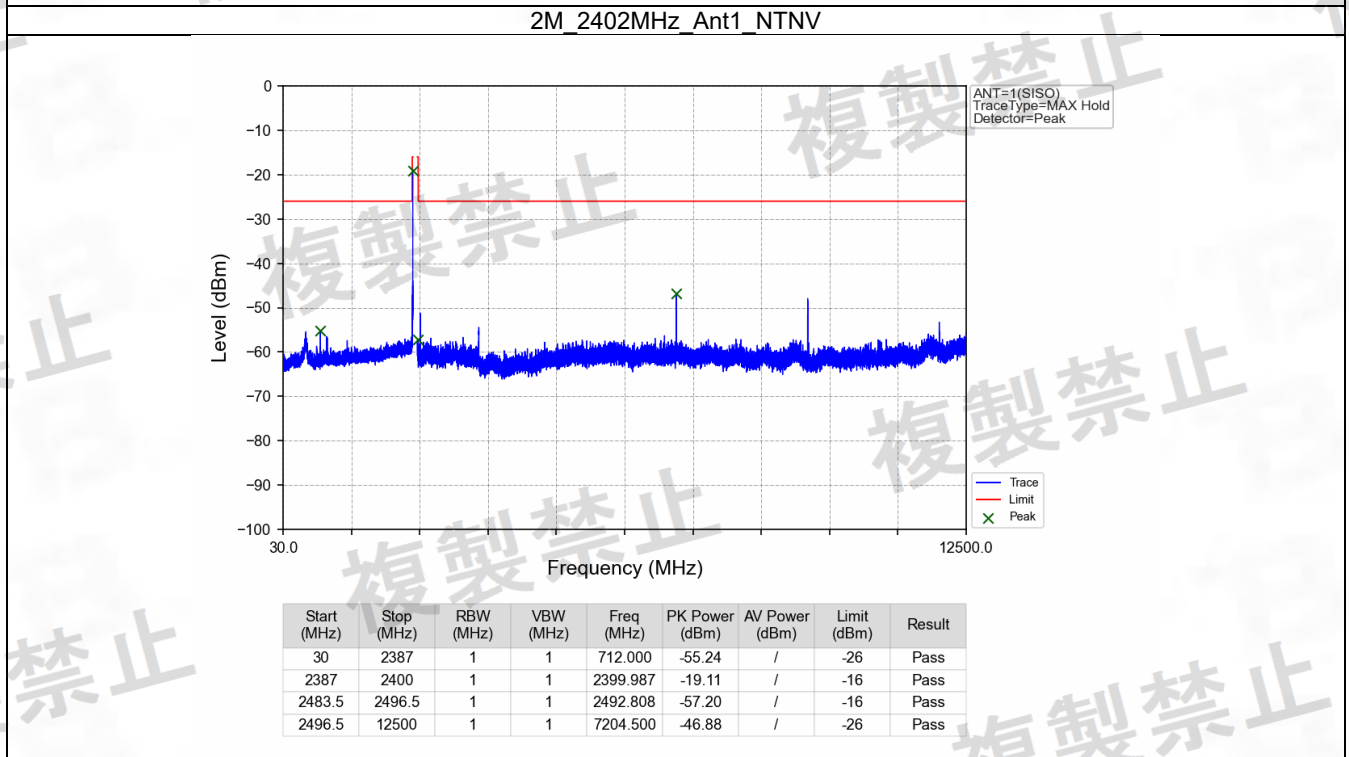
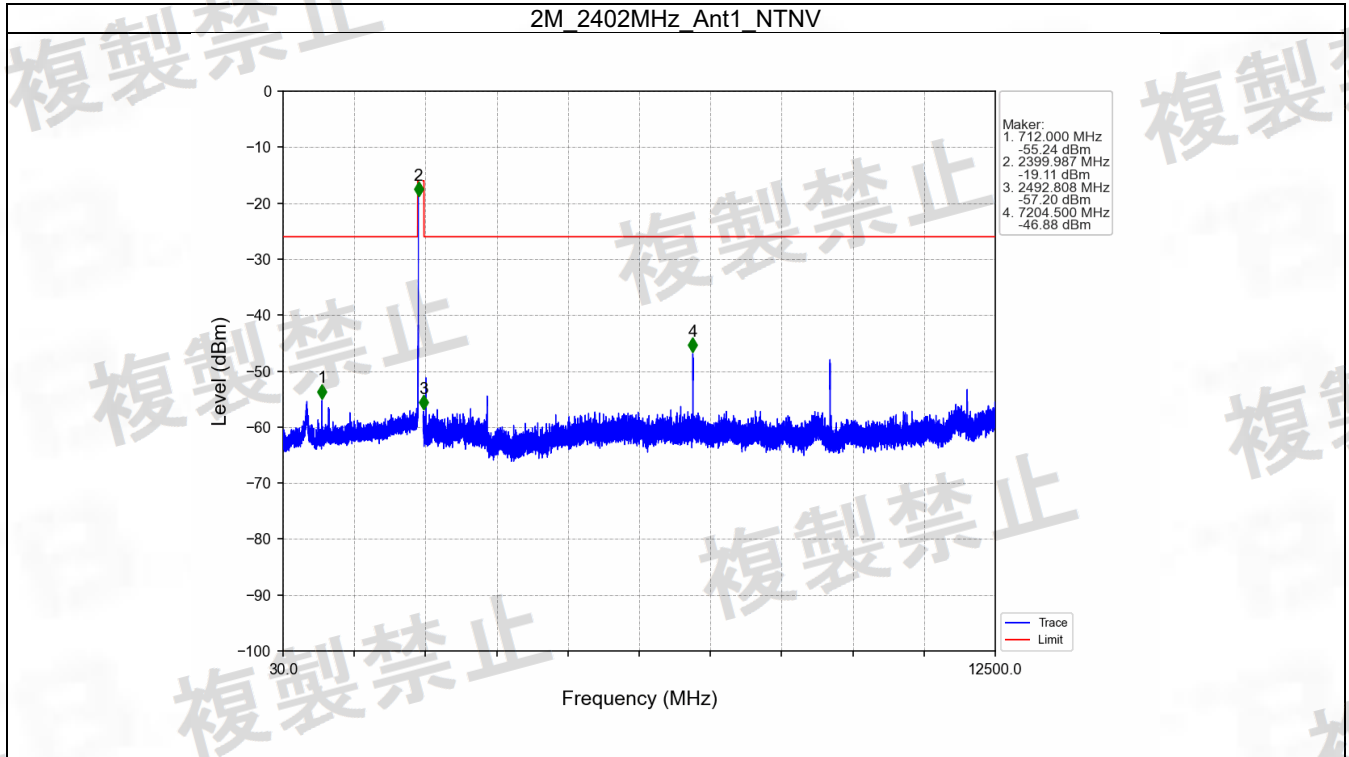
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
1M	SISO	2402	1	30	2387	717.5	-49.08	0.012	/	/	2.5	Pass
				2387	2400	2399.987	-29.33	1.167	/	/	25	Pass
				2483.5	2496.5	2487.114	-56.74	0.002	/	/	25	Pass
				2496.5	12500	7207	-46.67	0.022	/	/	2.5	Pass
		2480	1	30	2387	708	-46.82	0.021	/	/	2.5	Pass
				2387	2400	2393.396	-57.48	0.002	/	/	25	Pass
				2483.5	2496.5	2483.513	-40.82	0.083	/	/	25	Pass
				2496.5	12500	7441	-49.61	0.011	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	712	-55.24	0.003	/	/	2.5	Pass
				2387	2400	2399.987	-19.11	12.274	/	/	25	Pass
				2483.5	2496.5	2492.808	-57.20	0.002	/	/	25	Pass
				2496.5	12500	7204.5	-46.88	0.021	/	/	2.5	Pass
		2480	1	30	2387	447	-55.64	0.003	/	/	2.5	Pass
				2387	2400	2391.355	-57.07	0.002	/	/	25	Pass
				2483.5	2496.5	2483.565	-40.35	0.092	/	/	25	Pass
				2496.5	12500	7439	-49.70	0.011	/	/	2.5	Pass

4.2 Test Graph

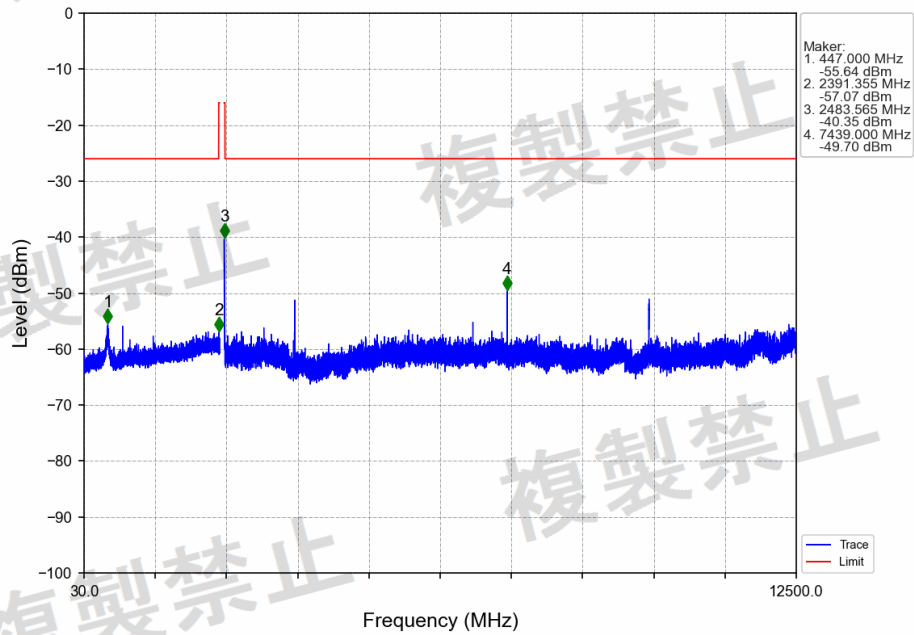
4.2.1 TxSe_NTNV



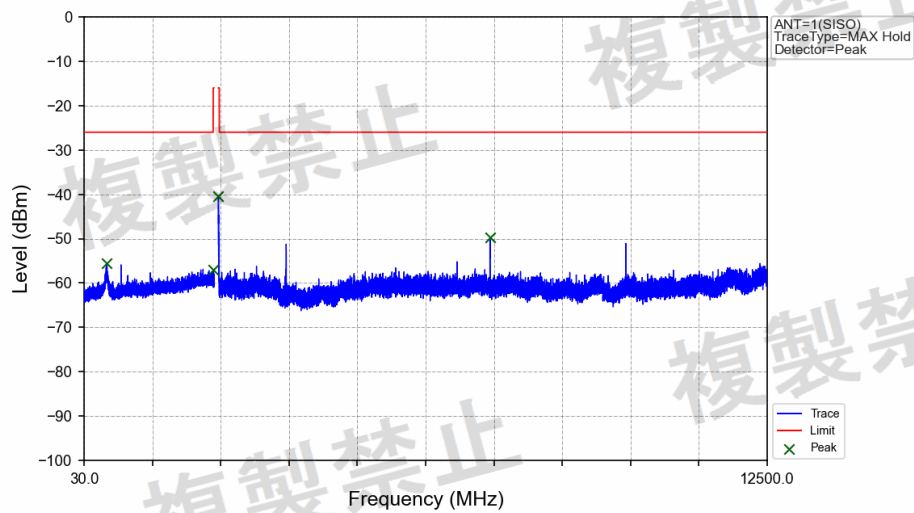




2M_2480MHz_Ant1_NTNV



2M_2480MHz_Ant1_NTNV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	447.000	-55.64	/	-26	Pass
2387	2400	1	1	2391.355	-57.07	/	-16	Pass
2483.5	2496.5	1	1	2483.565	-40.35	/	-16	Pass
2496.5	12500	1	1	7439.000	-49.70	/	-26	Pass

5. Secondary Radiated Emission

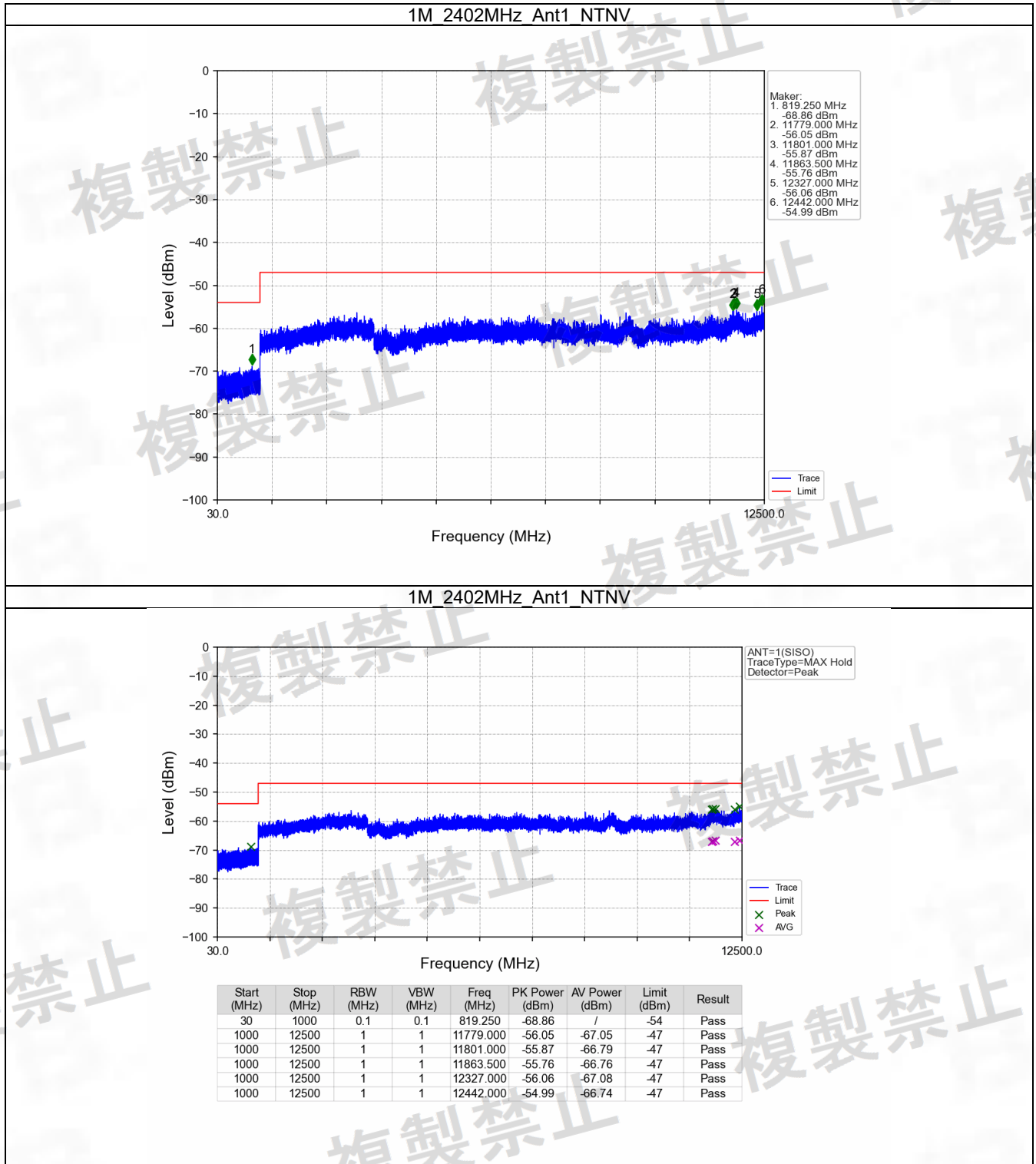
5.1 Test Result

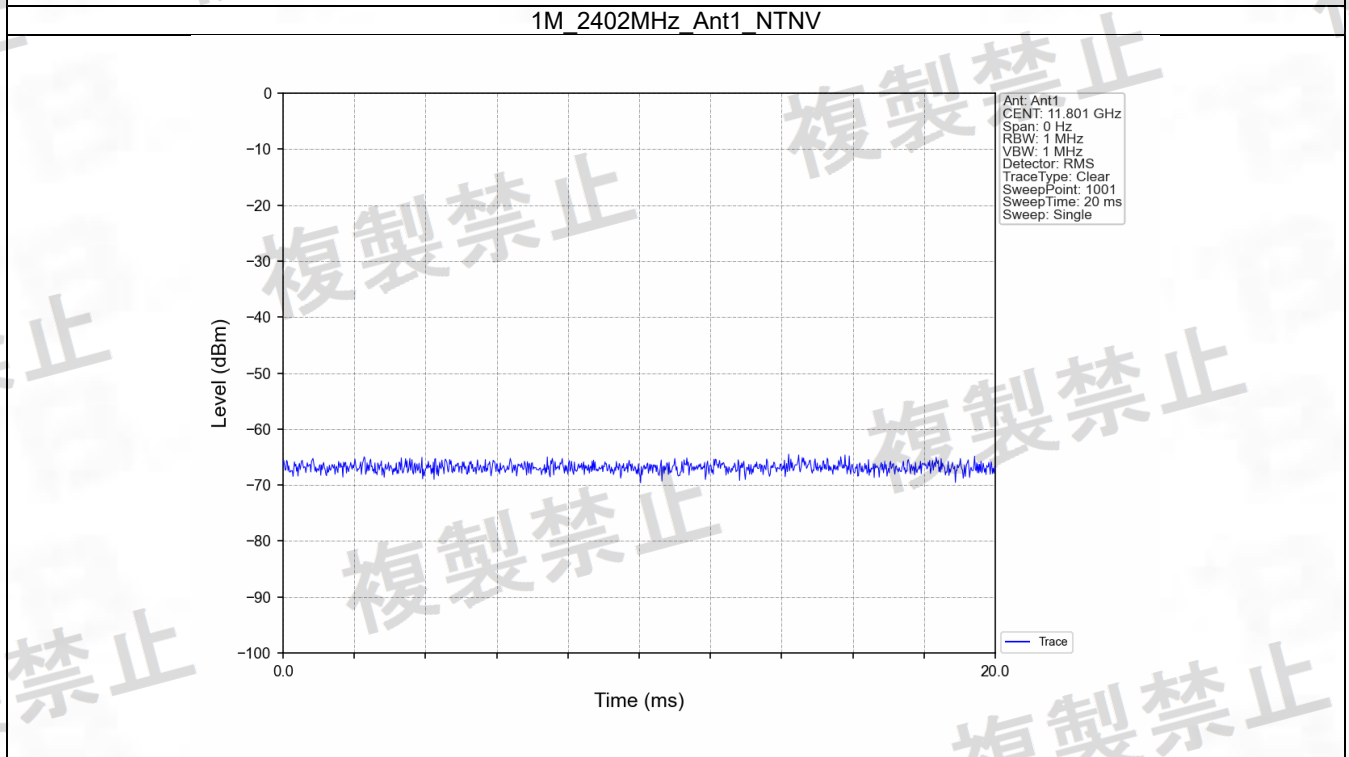
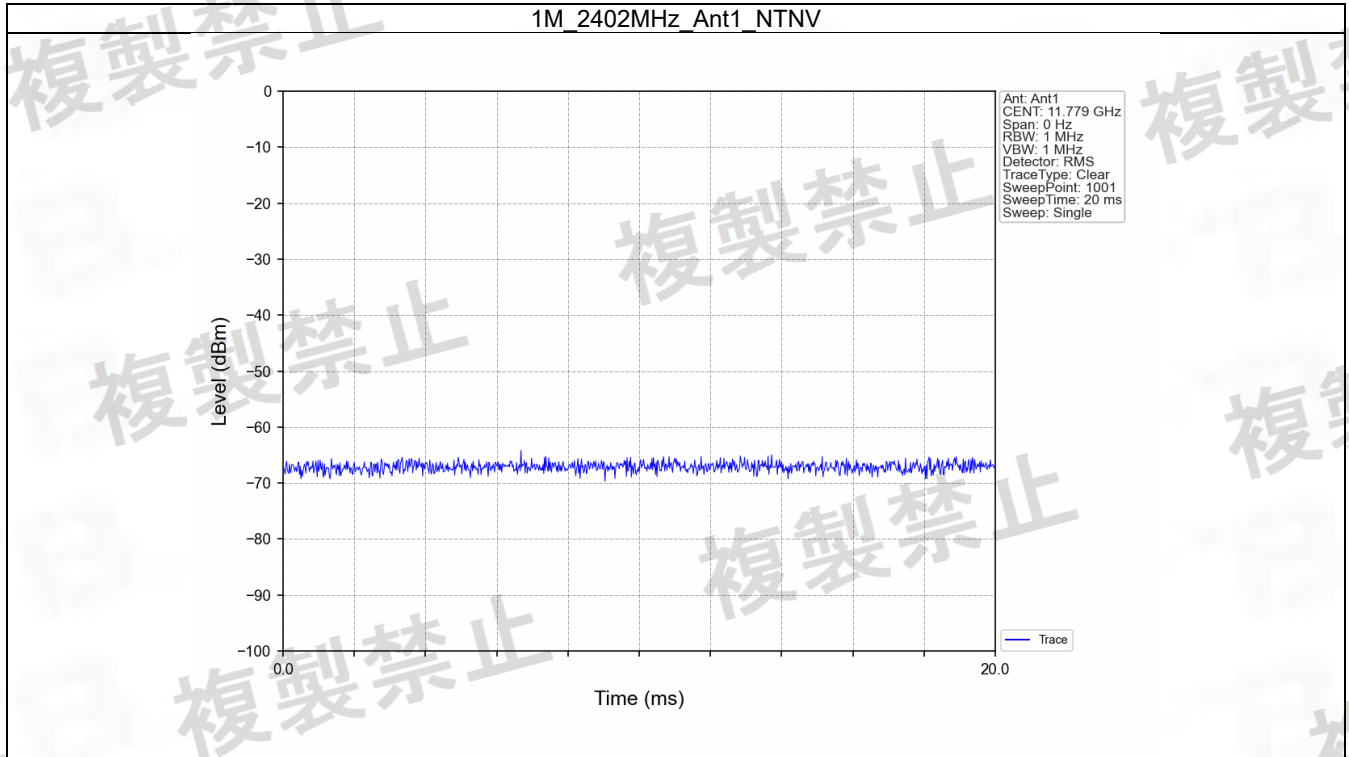
5.1.1 RxSe_NTNV

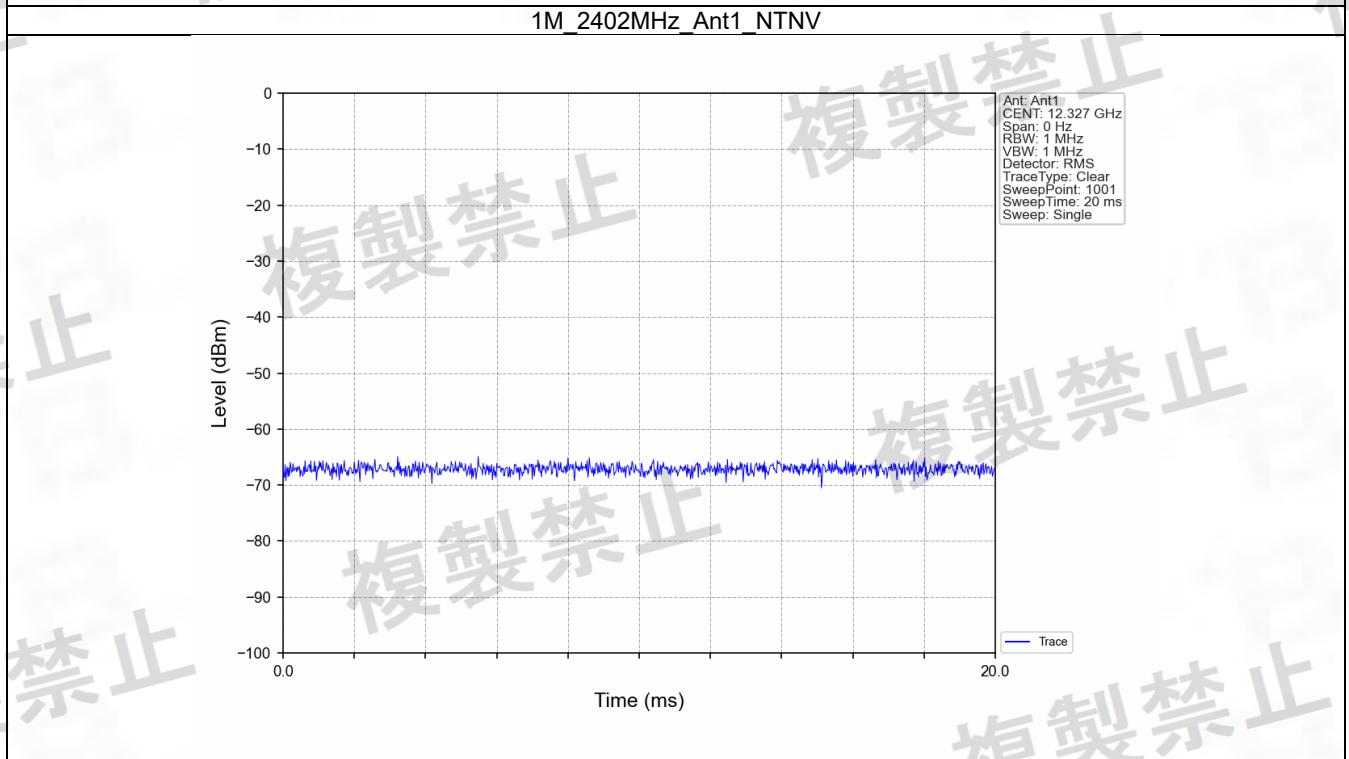
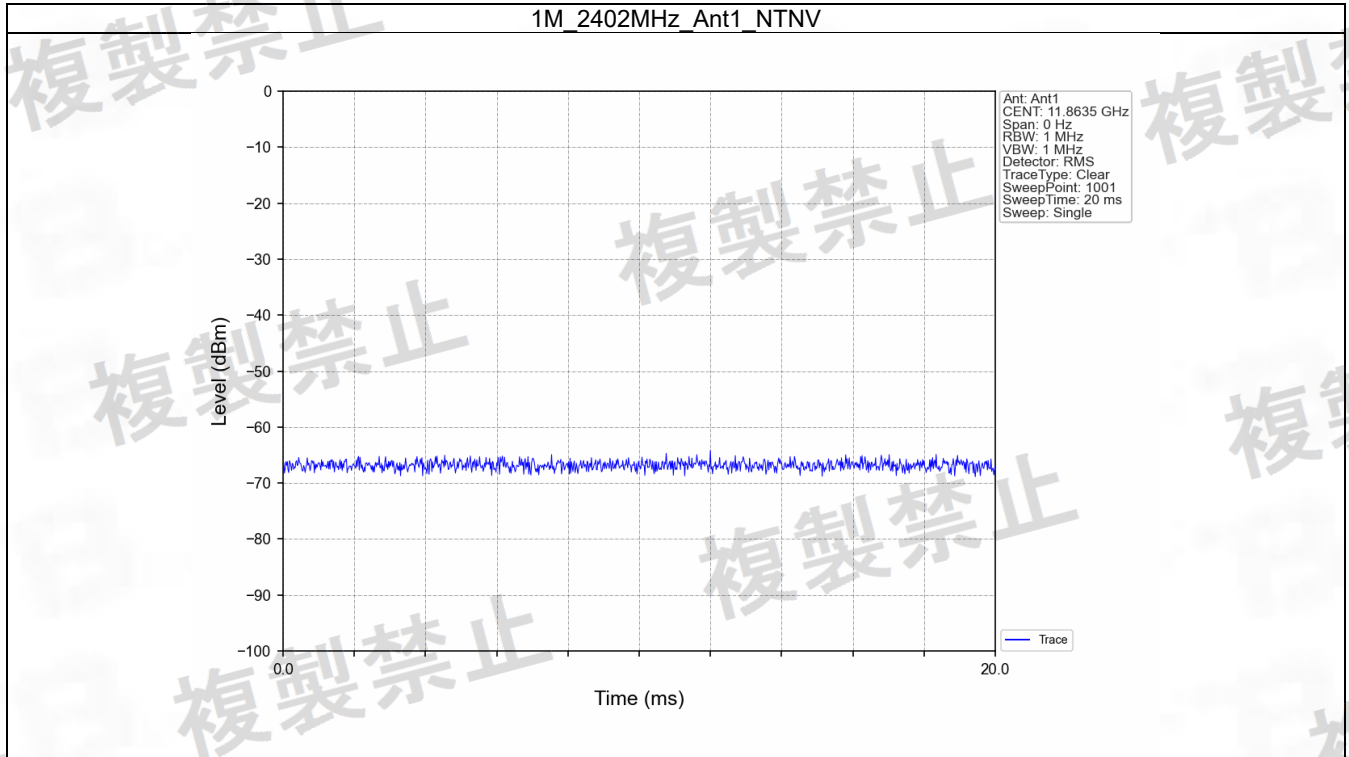
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
1M	SISO	2402	1	30	1000	819.25	-68.86	0.130	/	/	4	Pass
				1000	12500	11779	-56.05	2.483	-67.05	0.197	20	Pass
						11801	-55.87	2.588	-66.79	0.209	20	Pass
						11863.5	-55.76	2.655	-66.76	0.211	20	Pass
						12327	-56.06	2.477	-67.08	0.196	20	Pass
						12442	-54.99	3.170	-66.74	0.212	20	Pass
		2480	1	30	1000	781.2	-68.79	0.132	/	/	4	Pass
				1000	12500	12240	-55.77	2.649	-67.39	0.182	20	Pass
						12374	-55.98	2.523	-66.89	0.205	20	Pass
						12428.5	-56.01	2.506	-66.83	0.207	20	Pass
						12443	-56.14	2.432	-66.79	0.209	20	Pass
						12483	-56.16	2.421	-66.75	0.211	20	Pass
		2480	1	30	1000	842.2	-68.45	0.143	/	/	4	Pass
				1000	12500	11903.5	-55.43	2.864	-66.80	0.209	20	Pass
						12290.5	-55.43	2.864	-67.09	0.195	20	Pass
						12385	-55.13	3.069	-66.88	0.205	20	Pass
						12395.5	-55.45	2.851	-66.86	0.206	20	Pass
						12494.5	-55.24	2.992	-66.78	0.210	20	Pass
2M	SISO	2402	1	30	1000	530	-69.01	0.126	/	/	4	Pass
				1000	12500	11829	-55.52	2.805	-66.87	0.206	20	Pass
						11887.5	-55.57	2.773	-66.73	0.212	20	Pass
						11901.5	-55.84	2.606	-66.74	0.212	20	Pass
						11919.5	-55.80	2.630	-66.94	0.202	20	Pass
						12390	-55.98	2.523	-66.88	0.205	20	Pass
		2480	1	1000	12500							

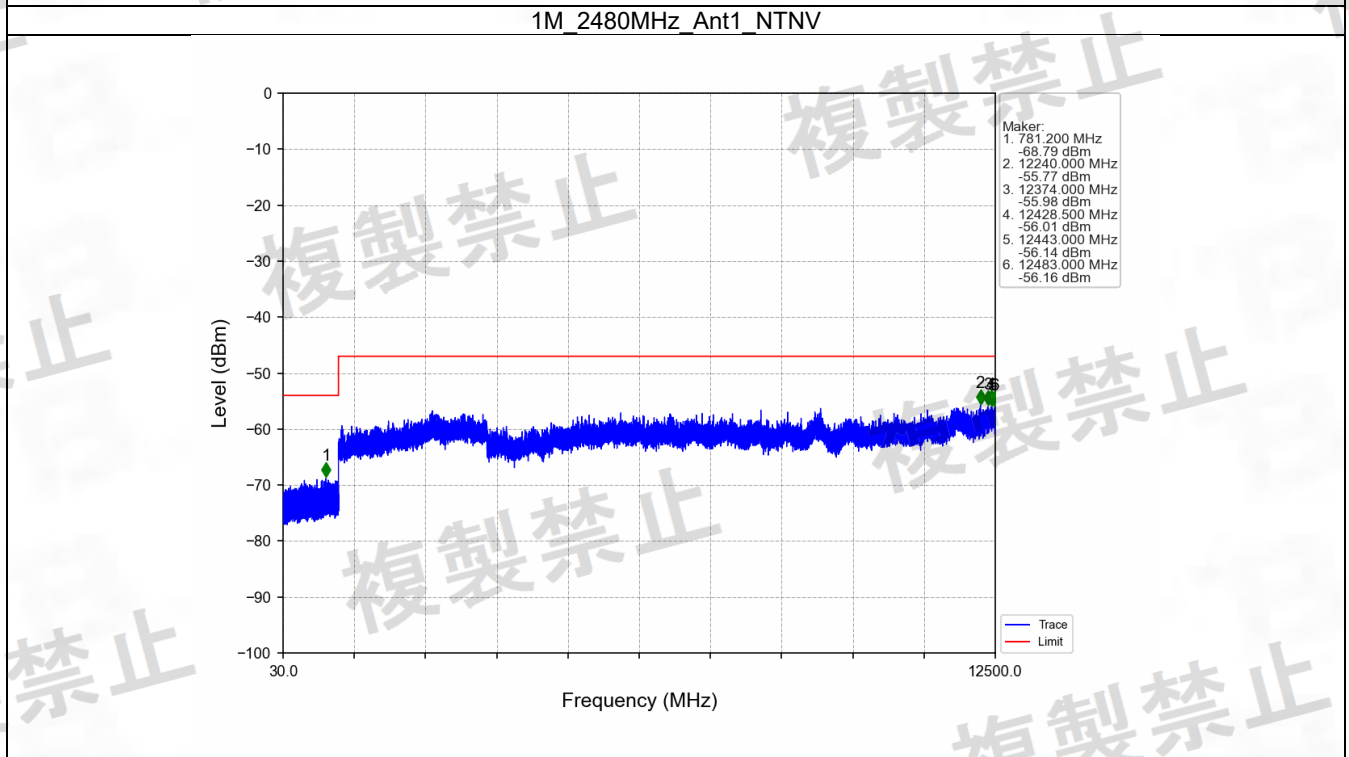
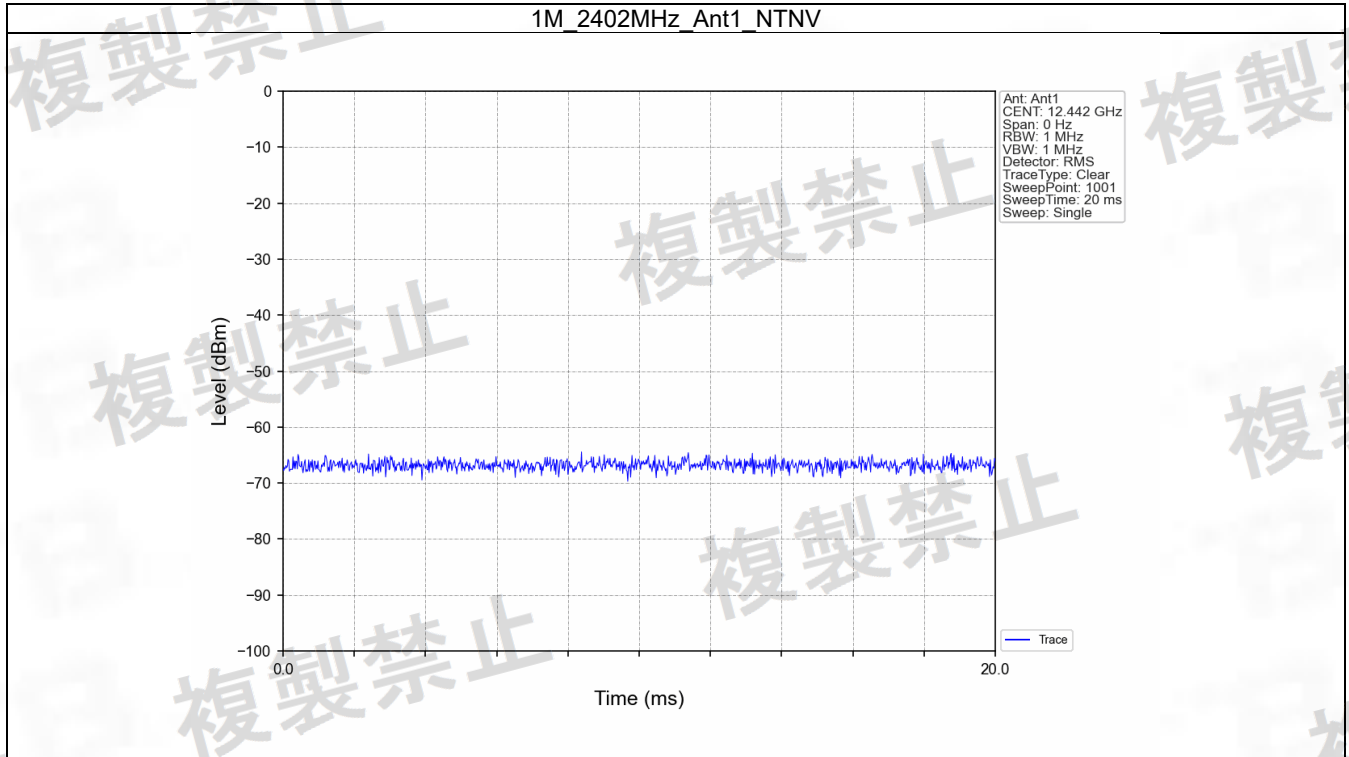
5.2 Test Graph

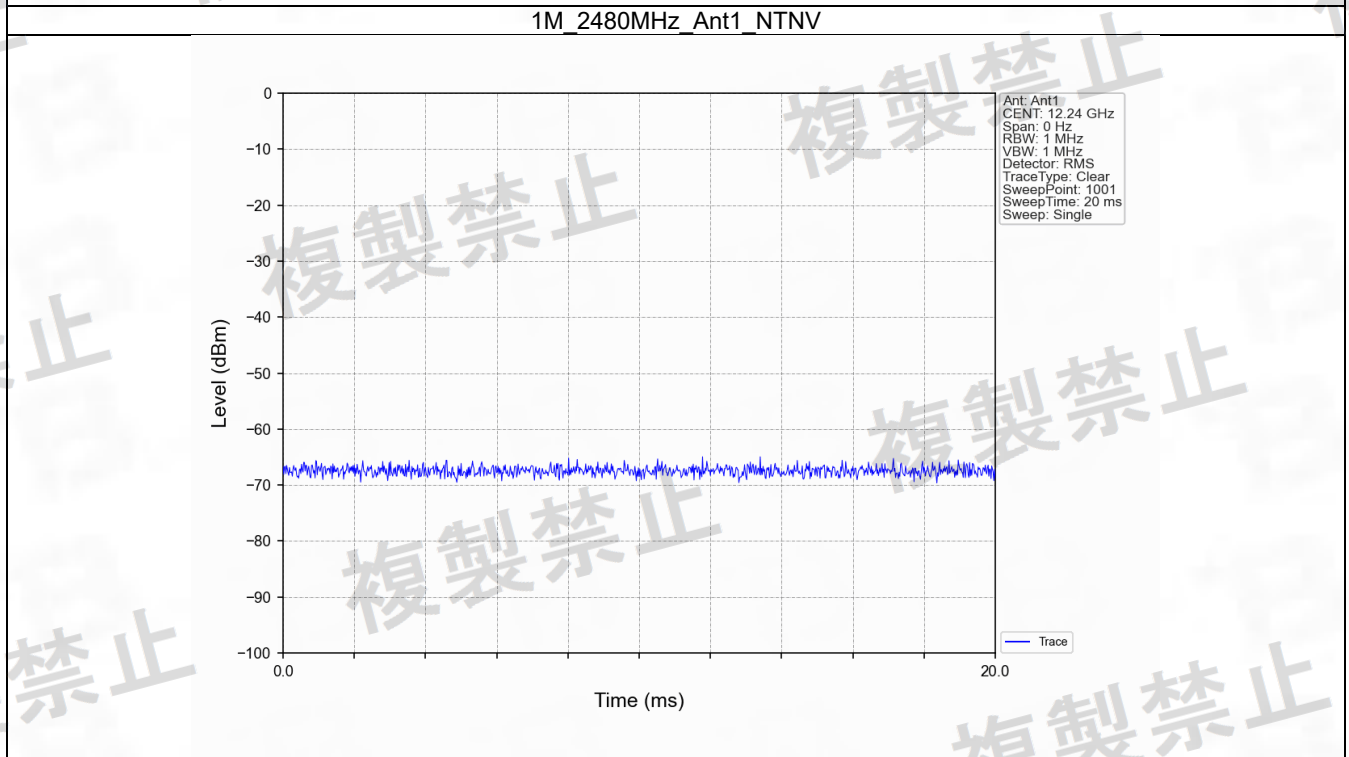
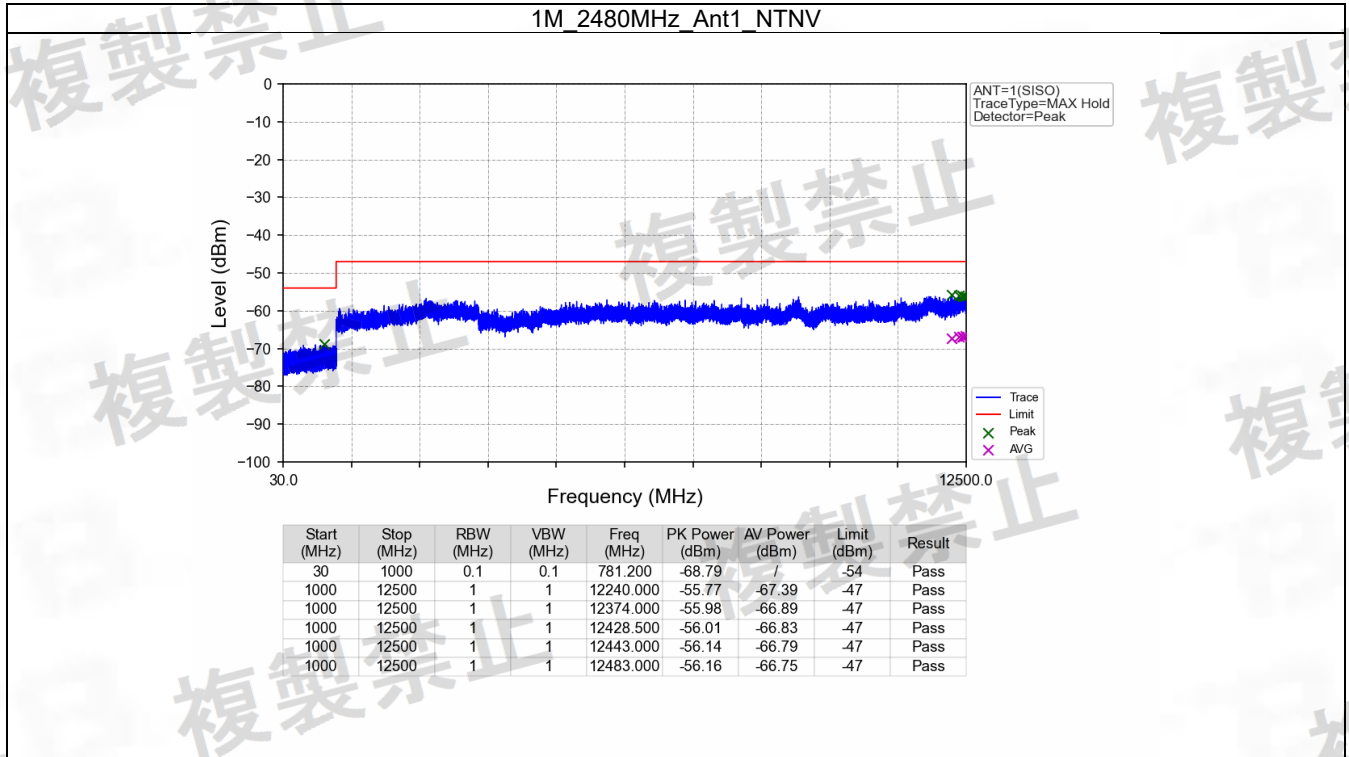
5.2.1 RxSe_NTNV

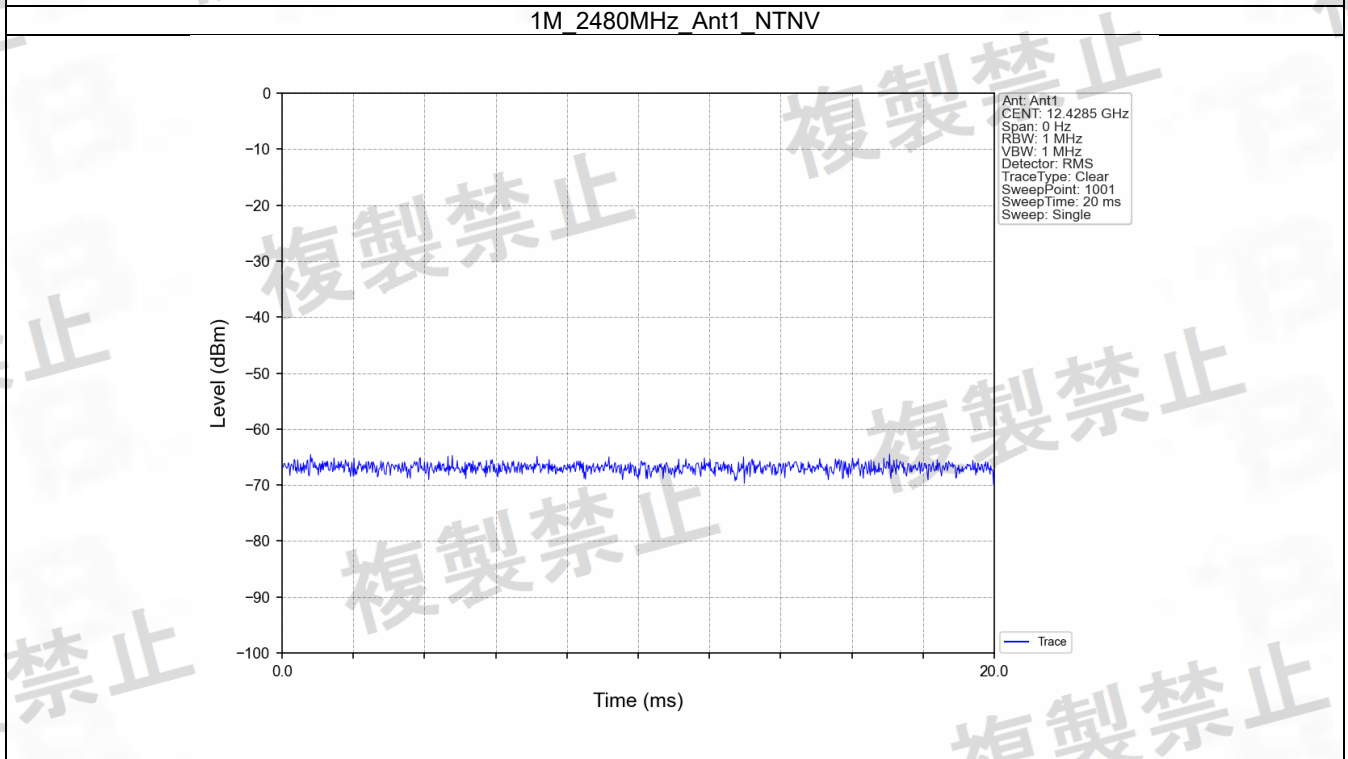
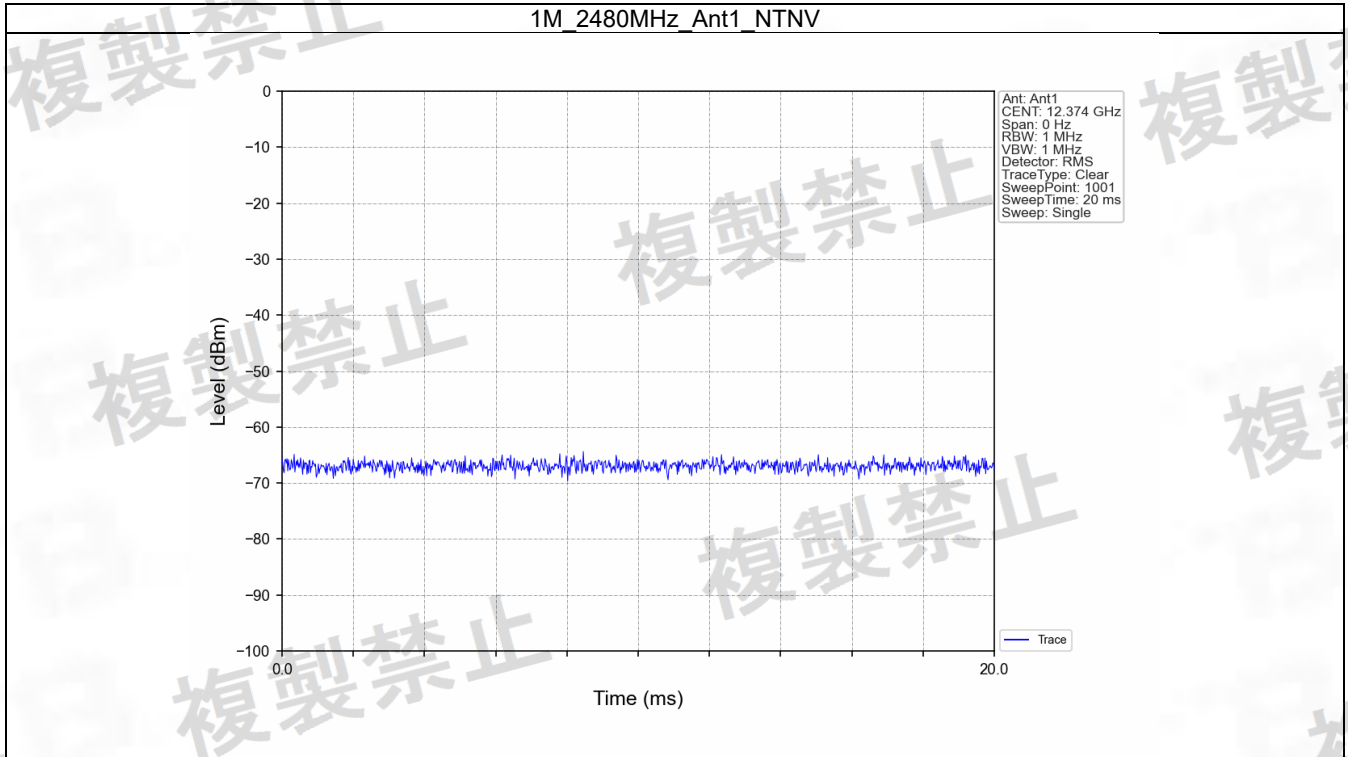


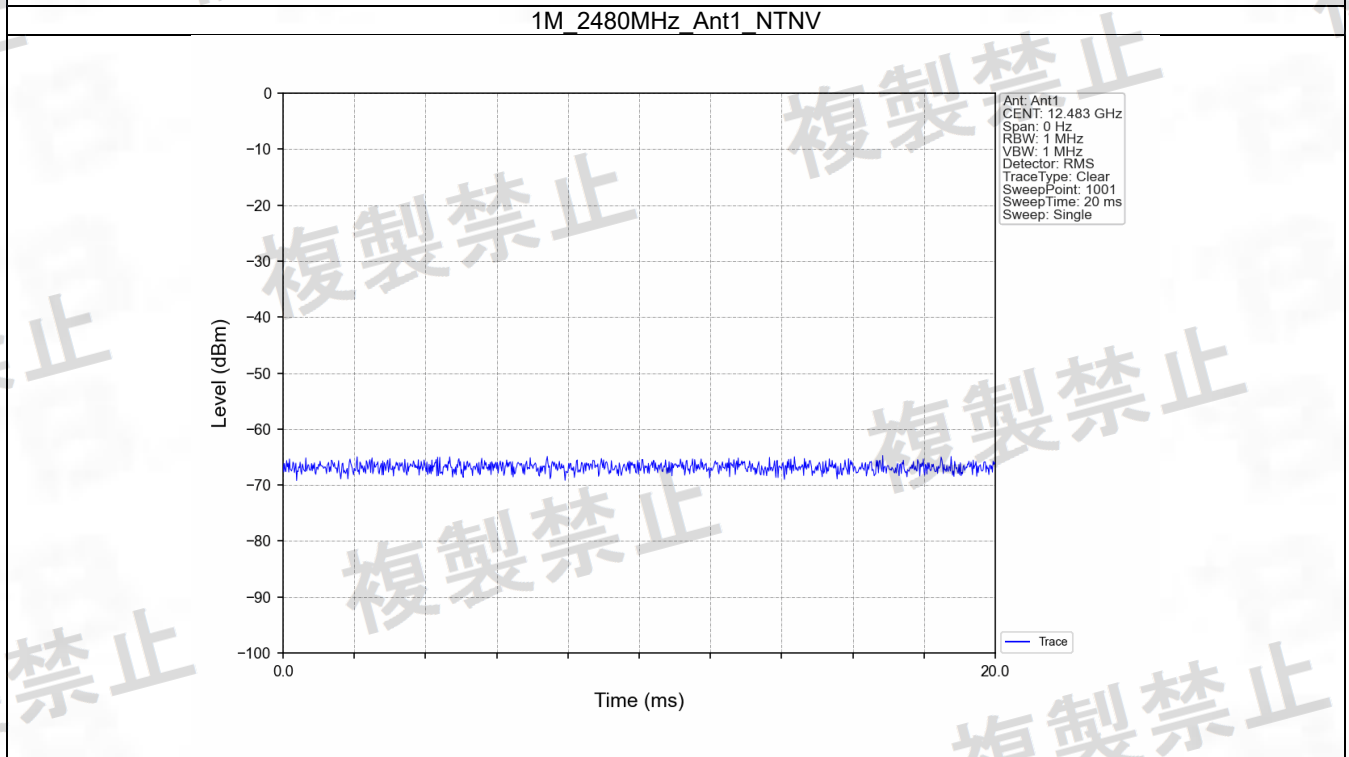
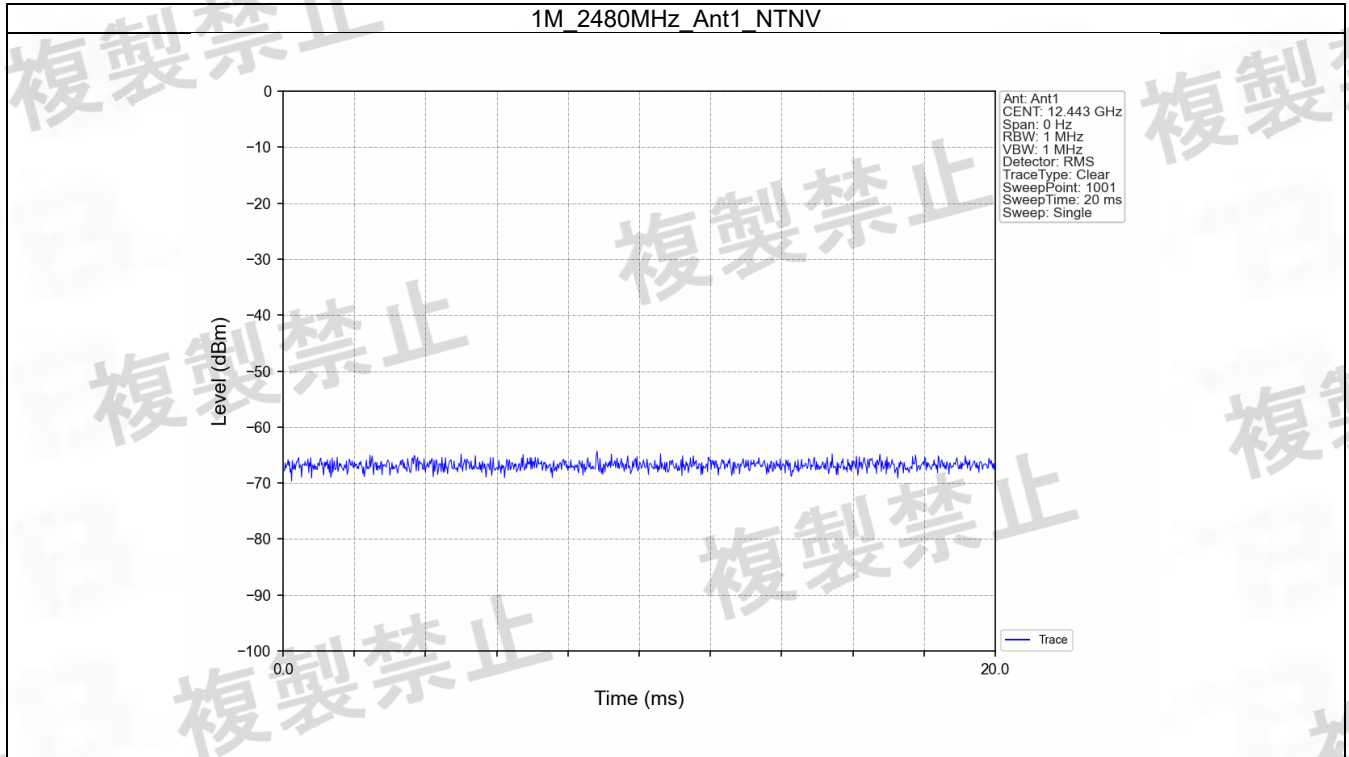


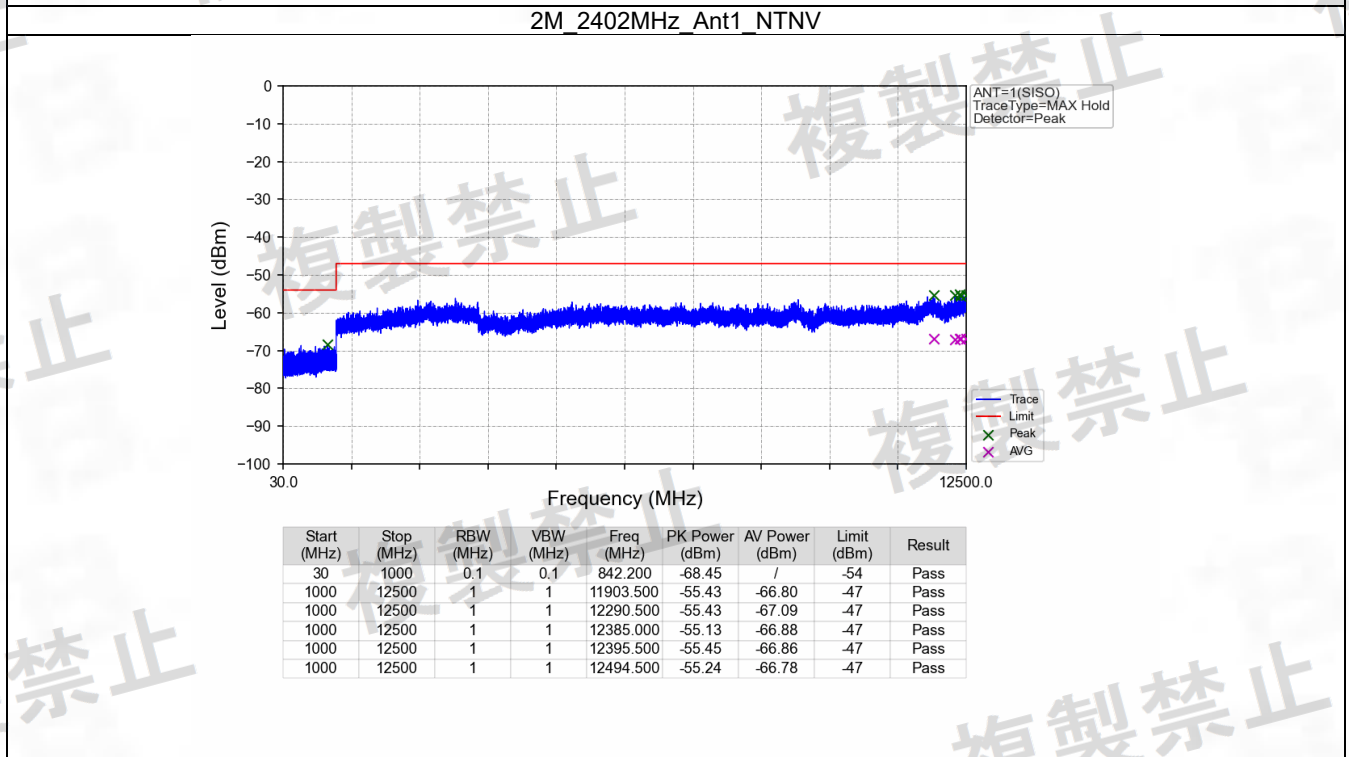
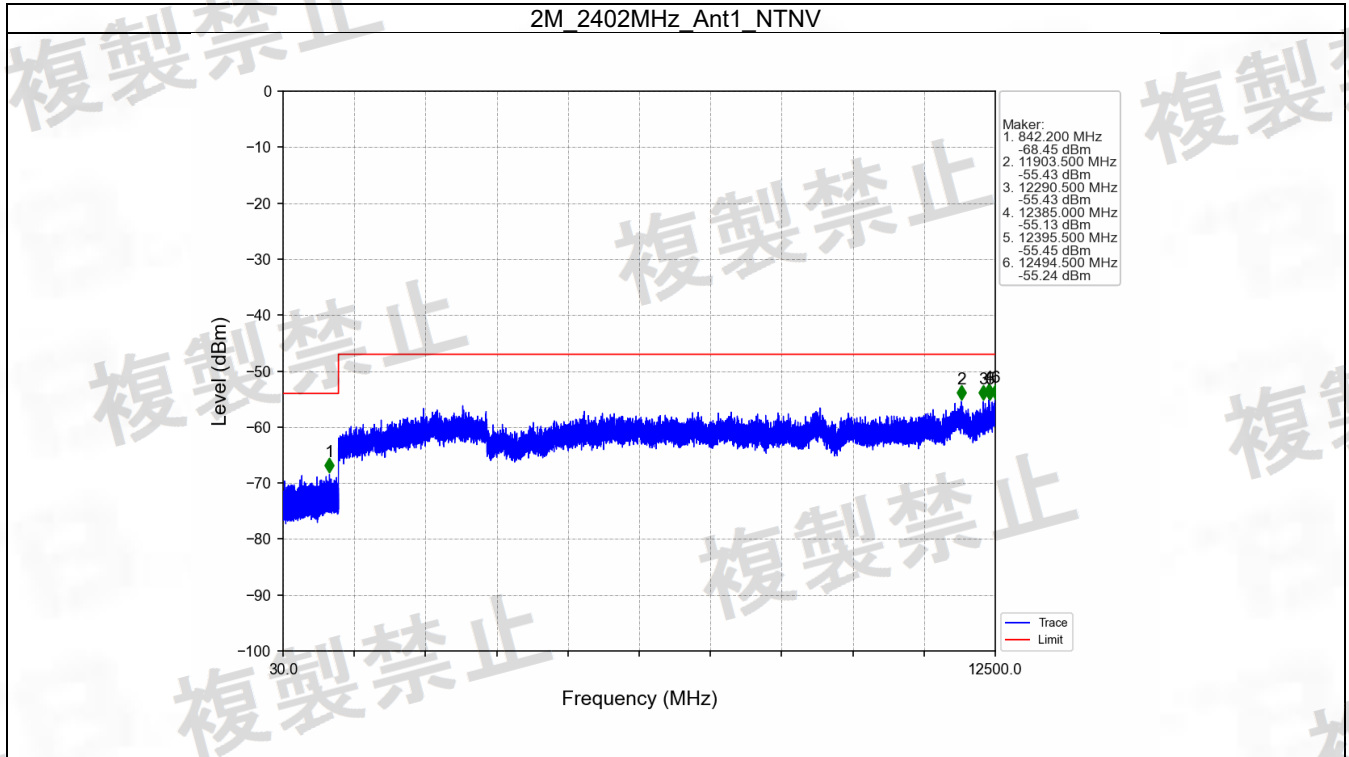


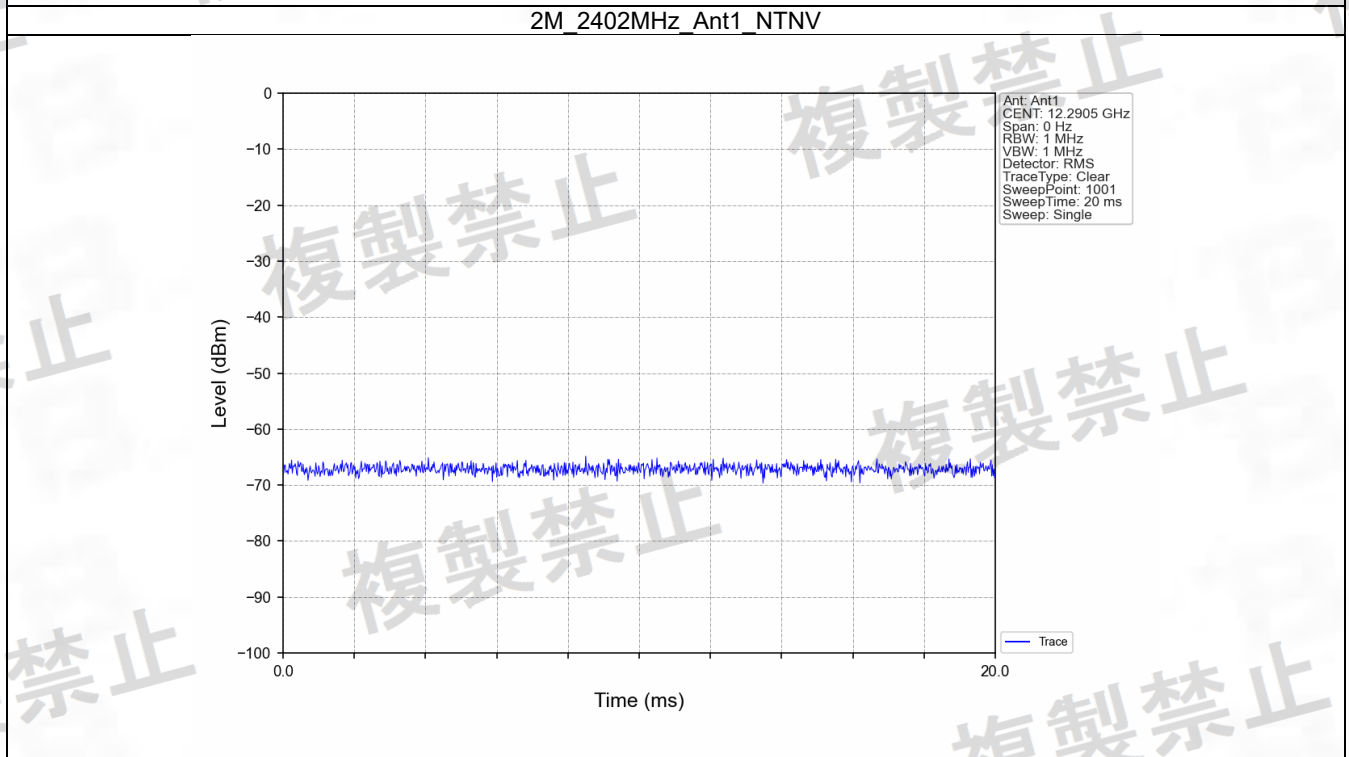
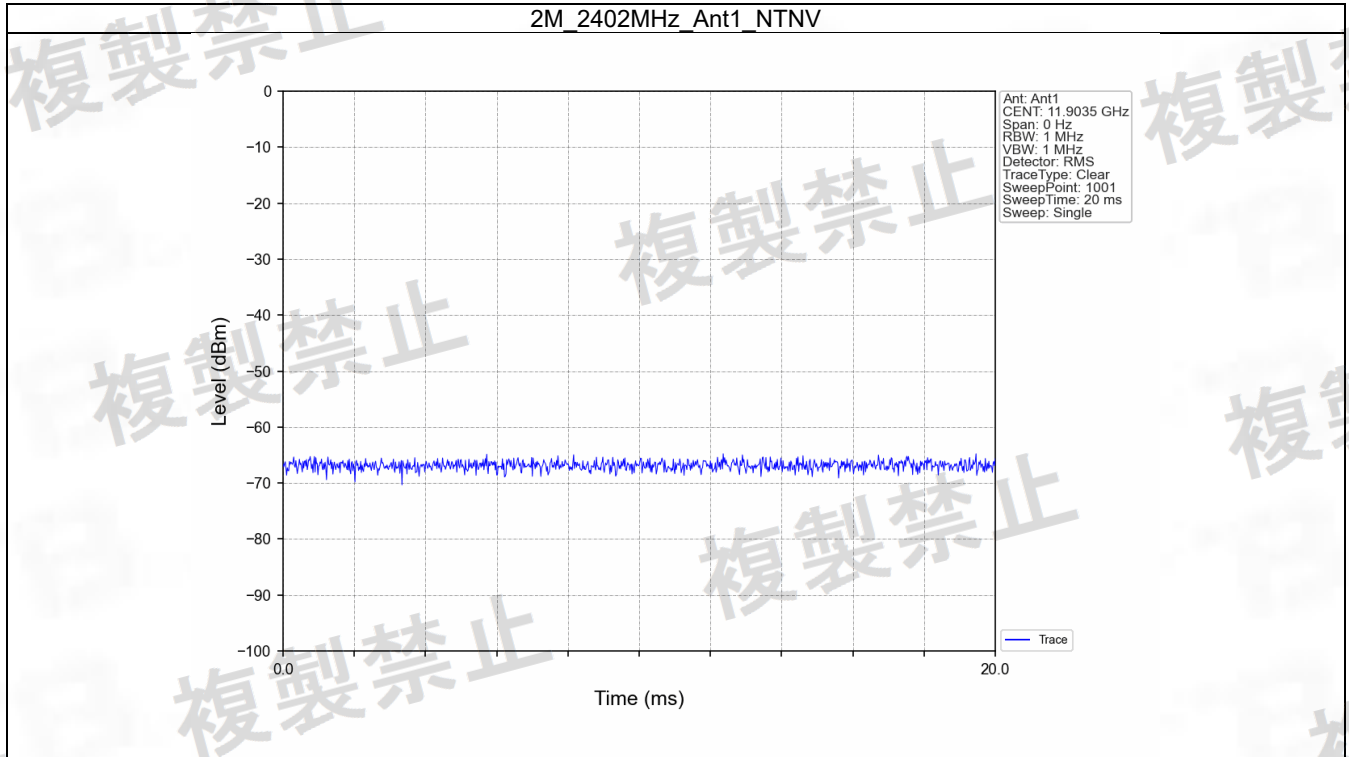


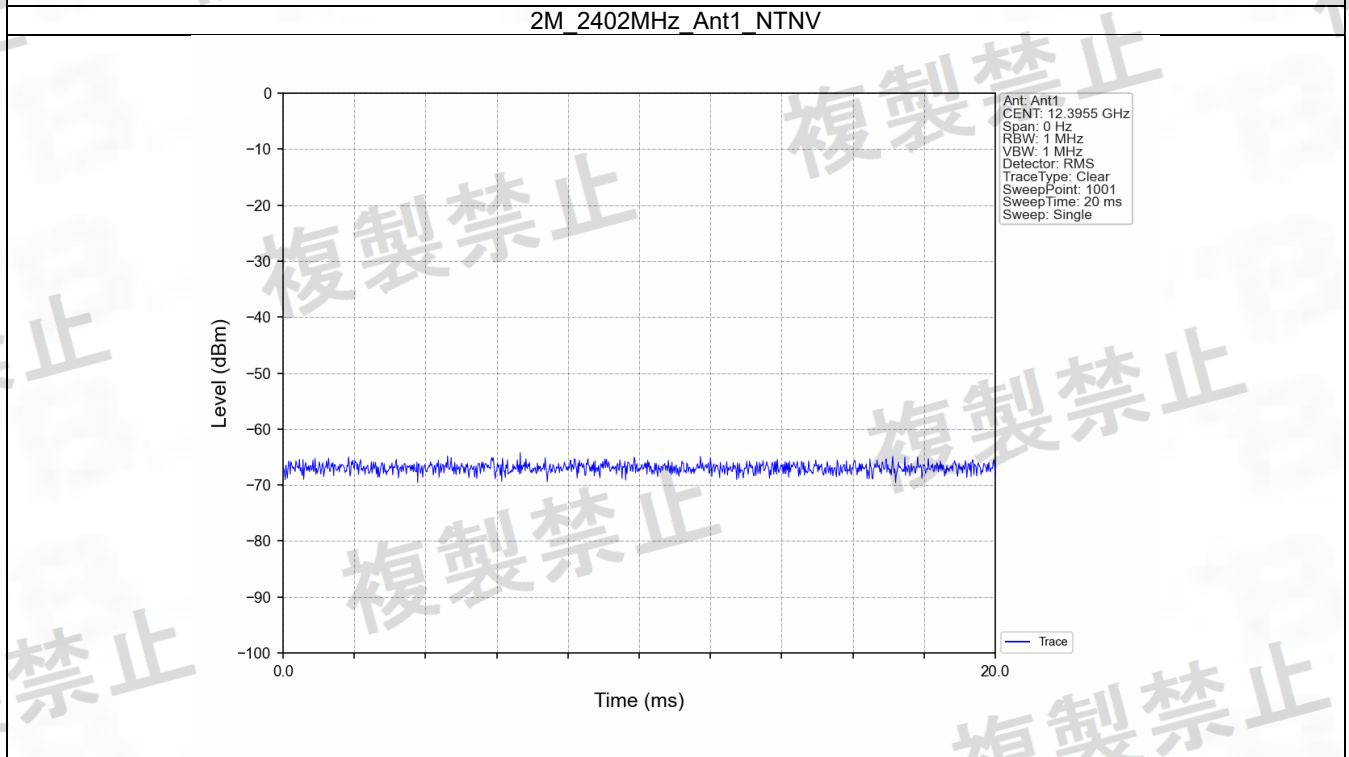
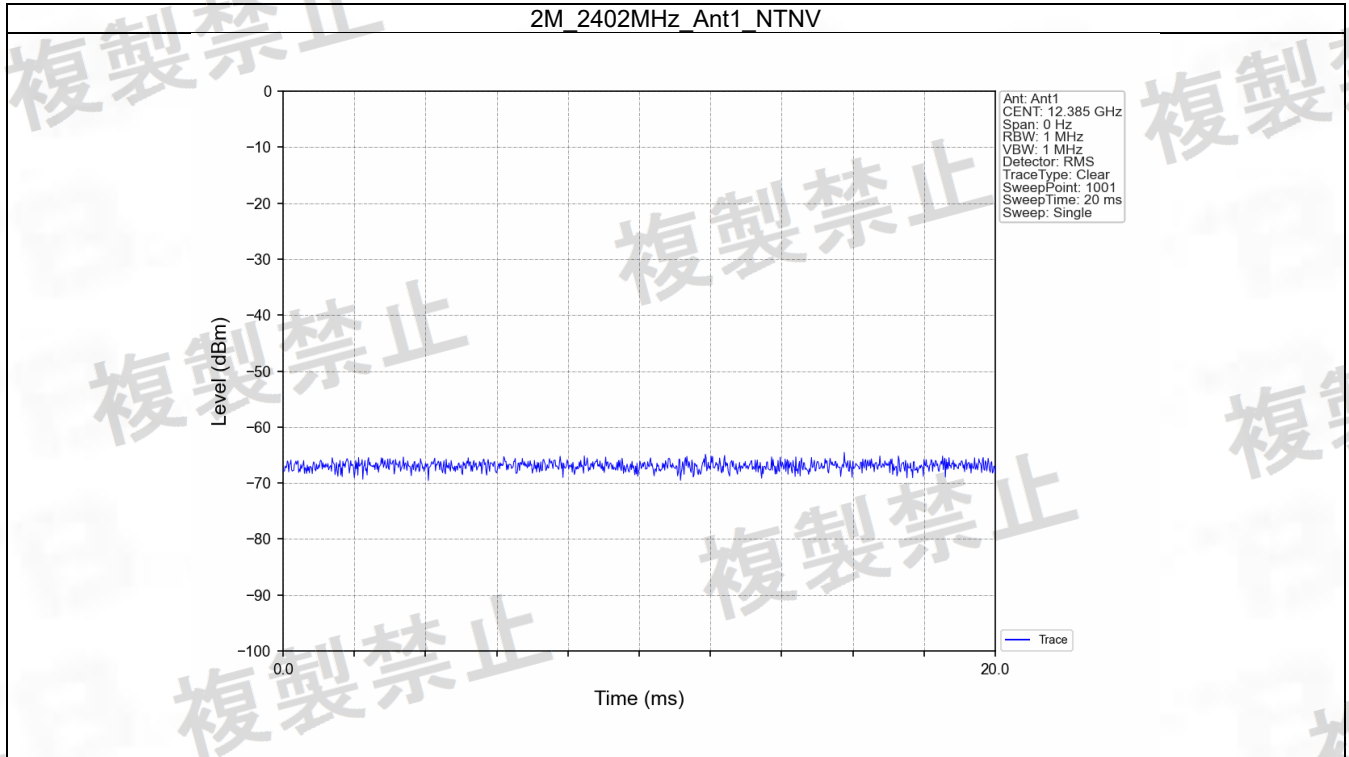


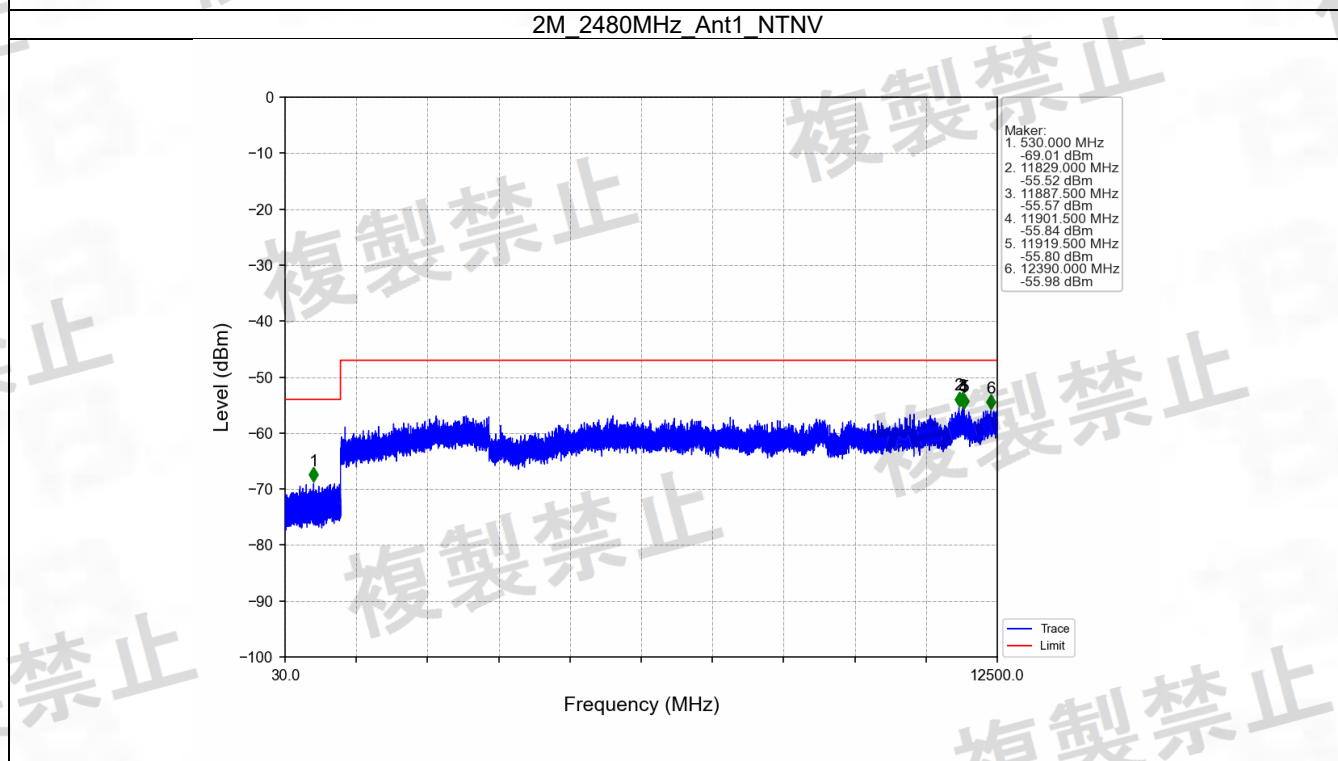
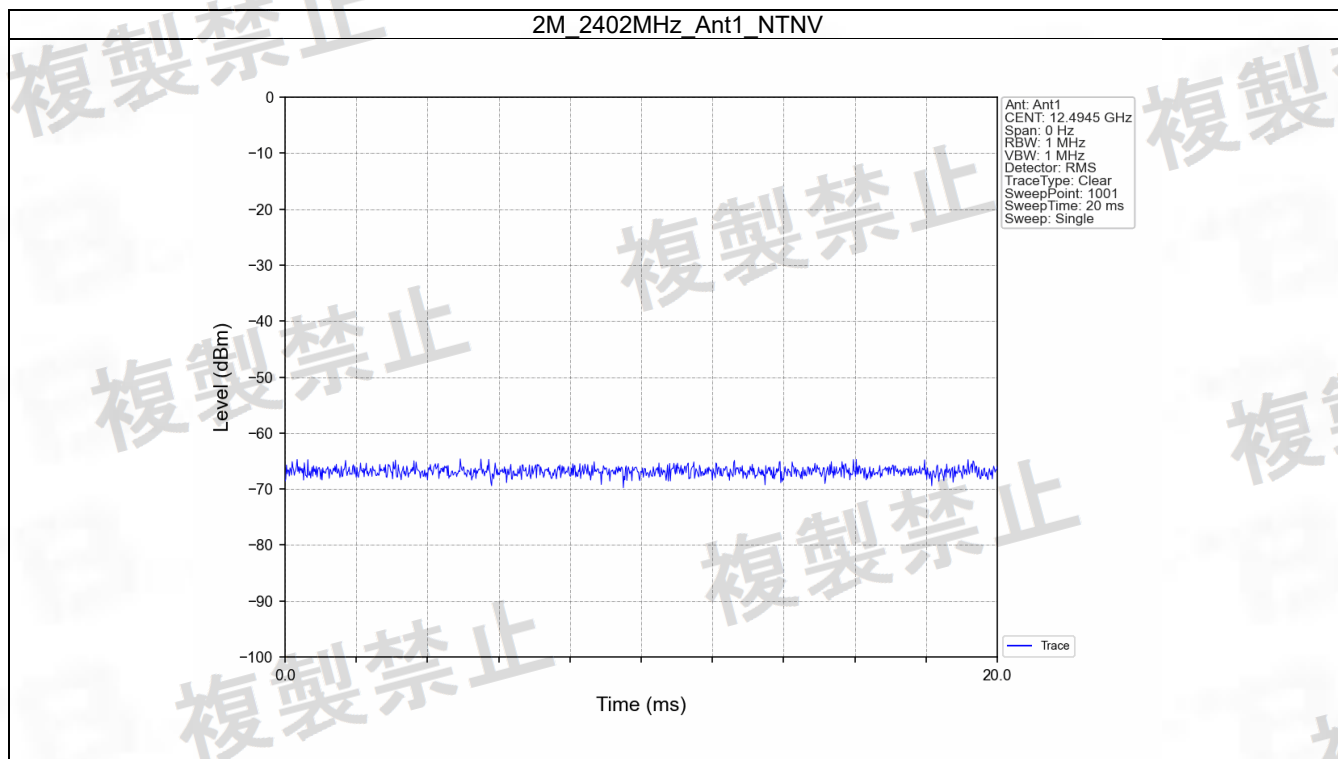


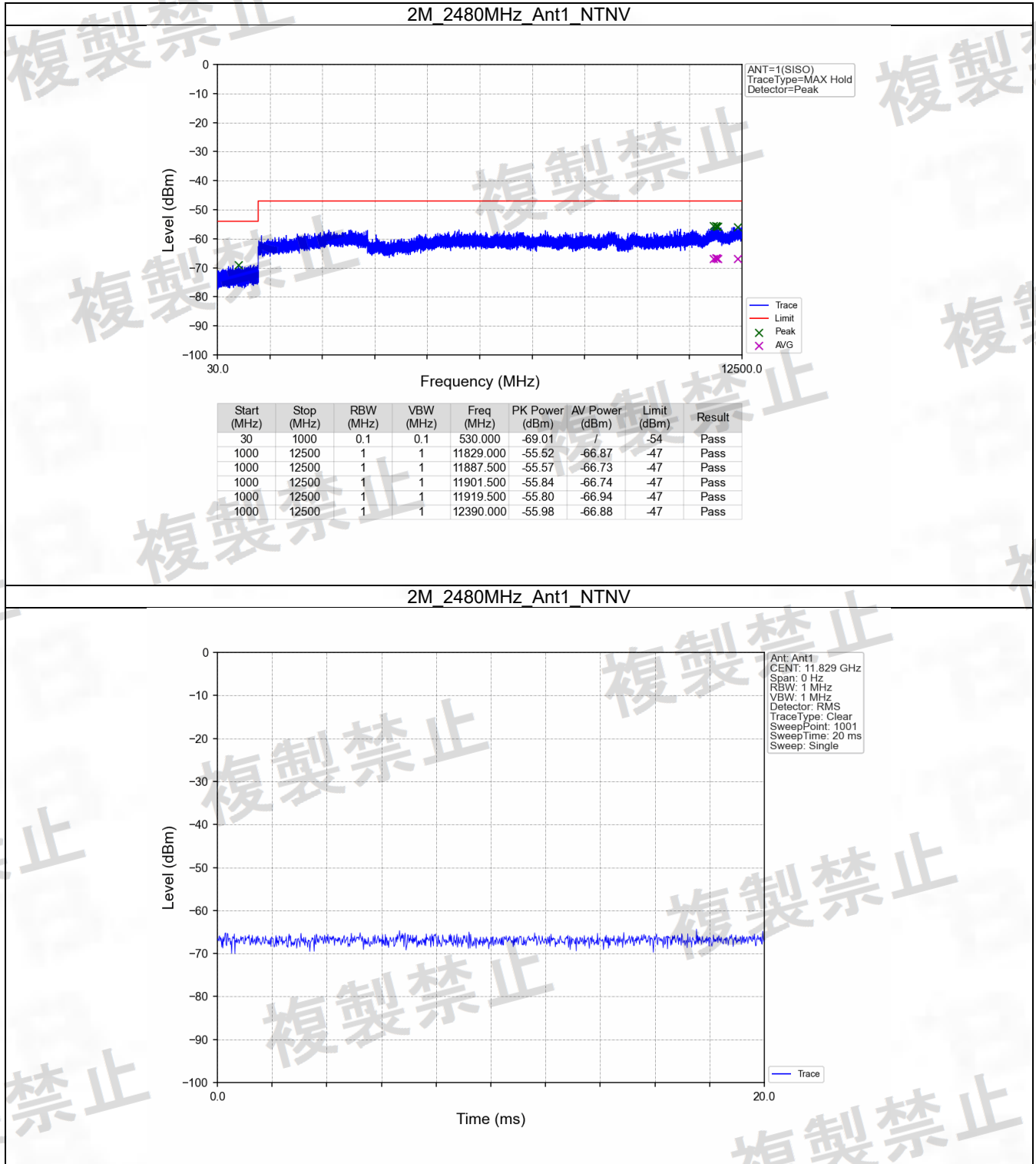


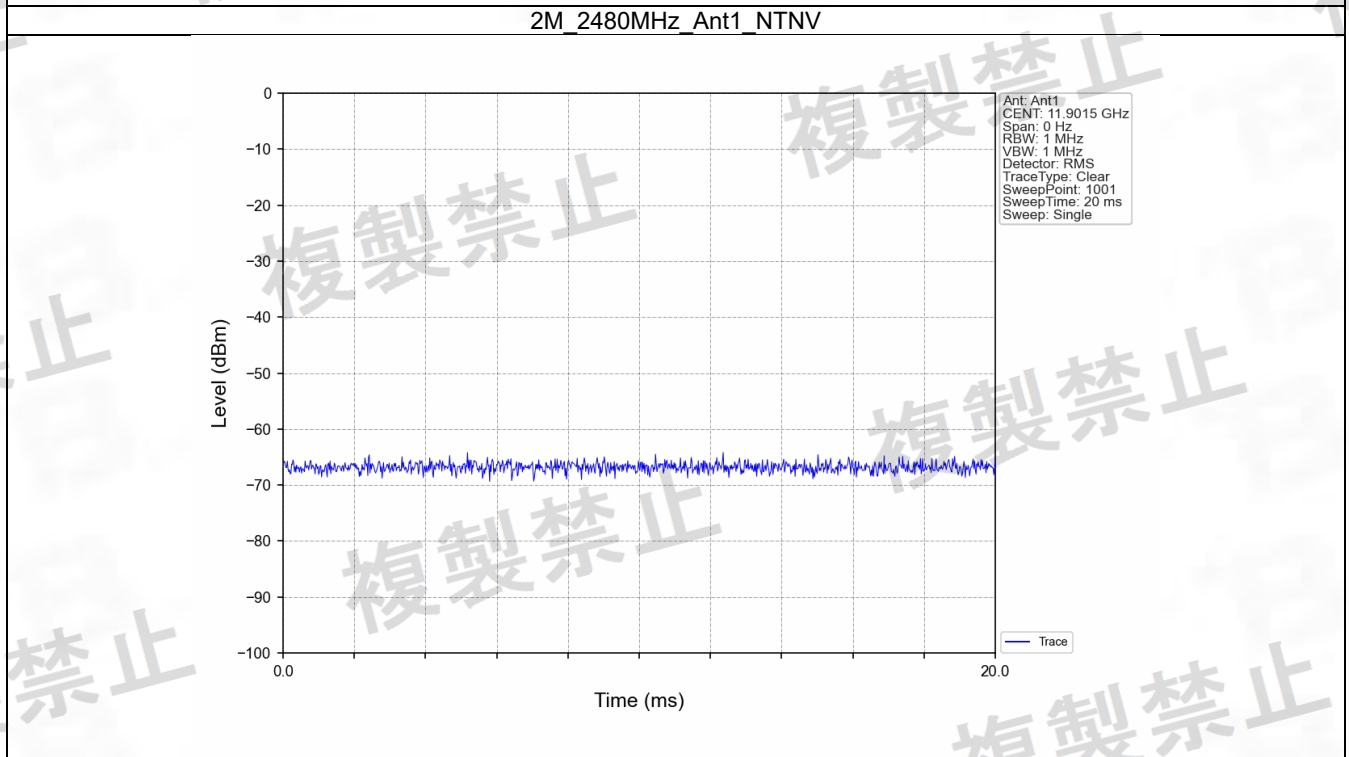
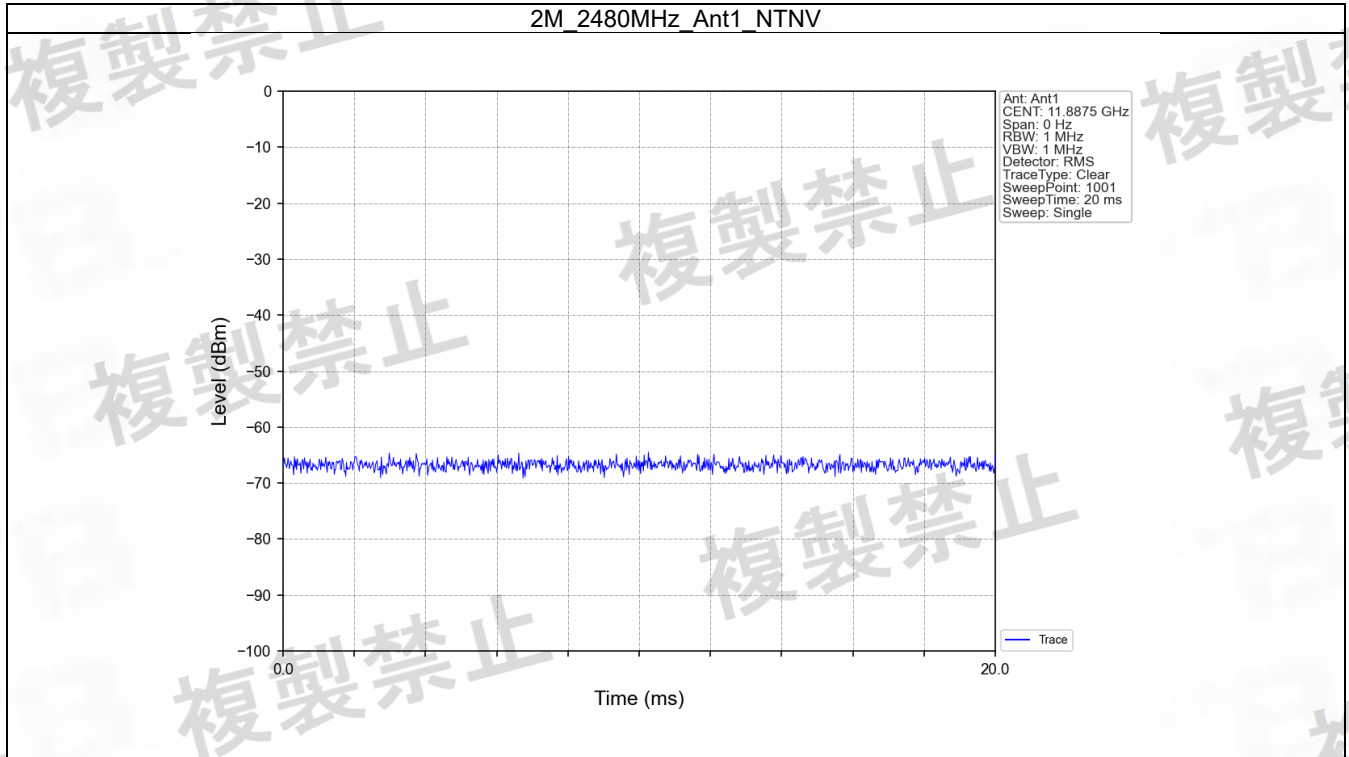


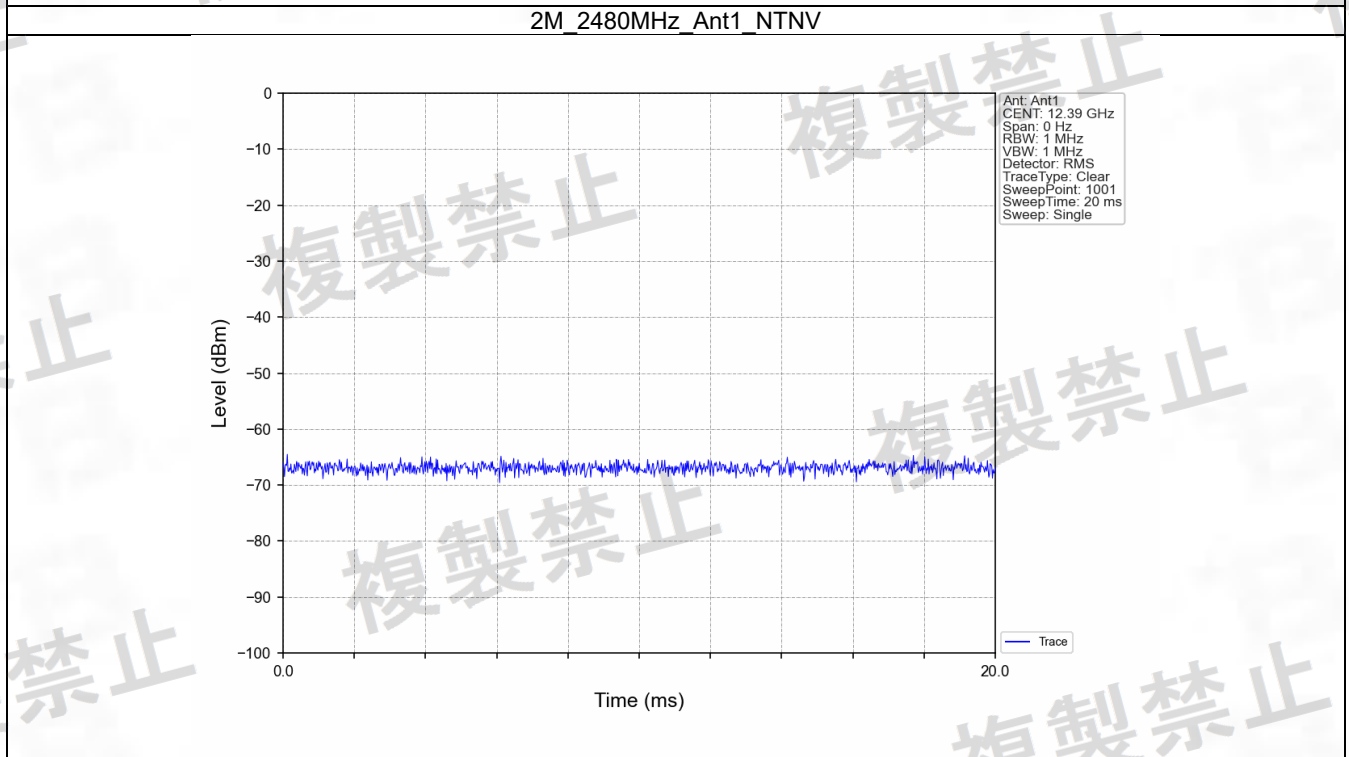
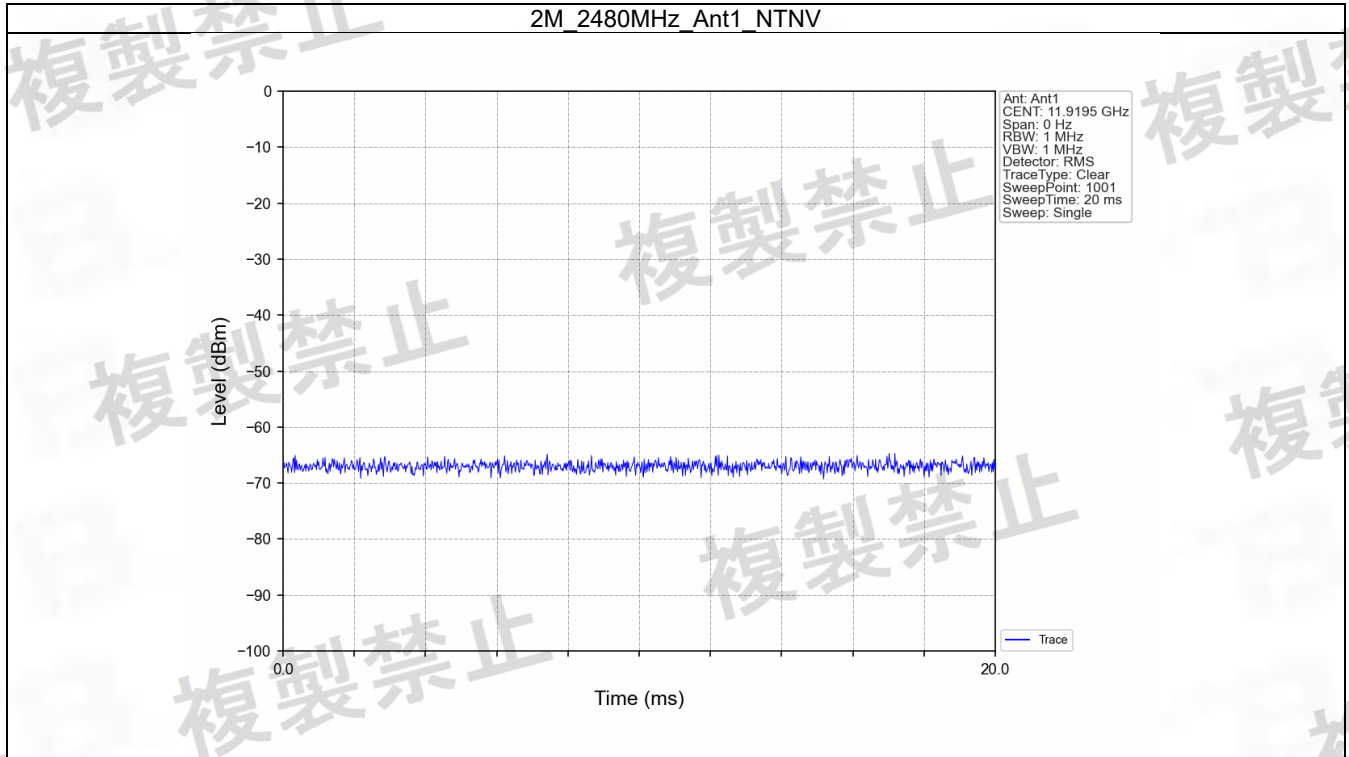










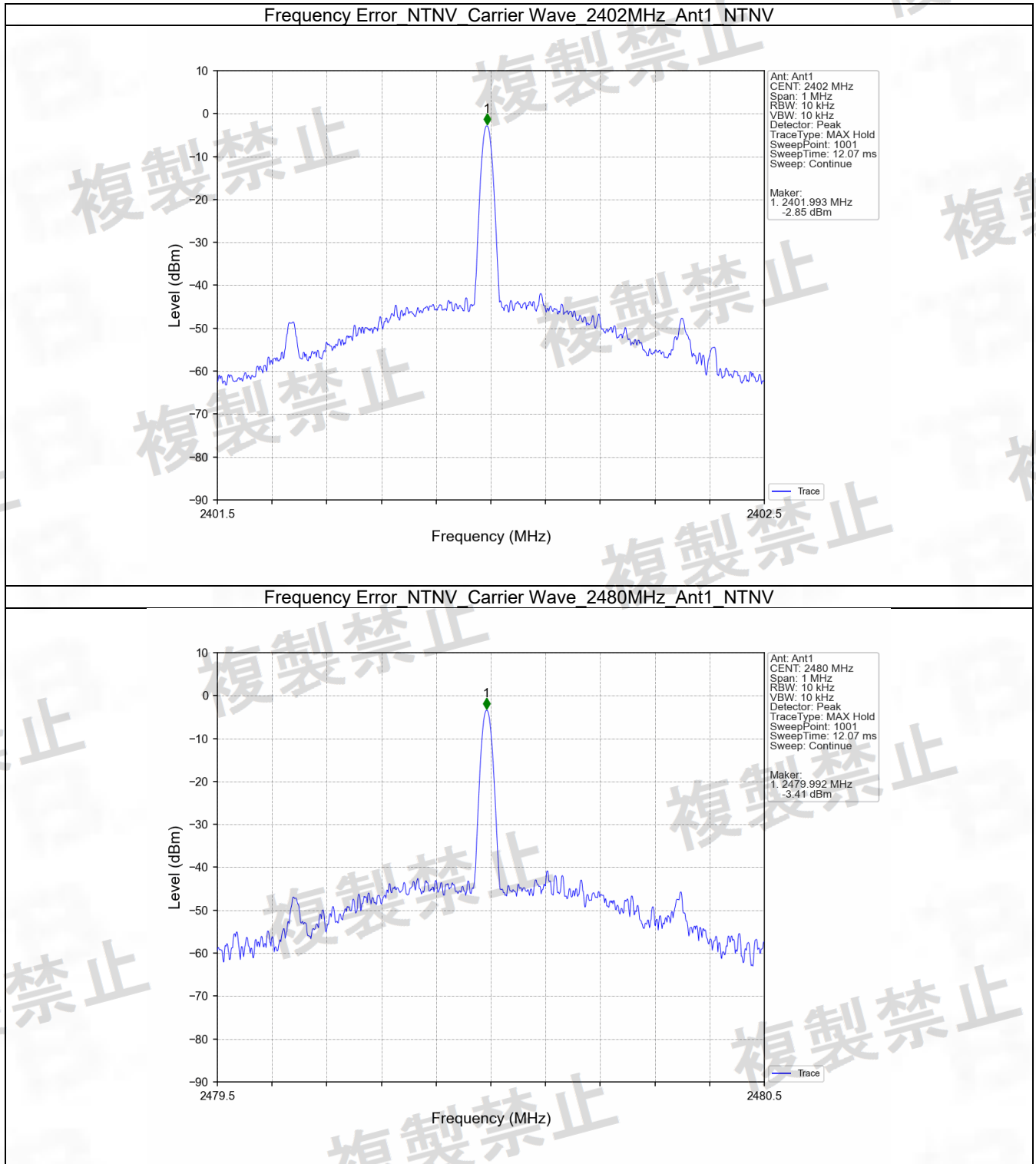


BLE-R**1. Frequency Error****1.1 Test Result****1.1.1 Ant1**

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2402	2401.993	-2.91	-50 to 50	Pass
			2480	2479.992	-3.23	-50 to 50	Pass

1.2 Test Graph

1.2.1 Ant1



2. Occupied Bandwidth

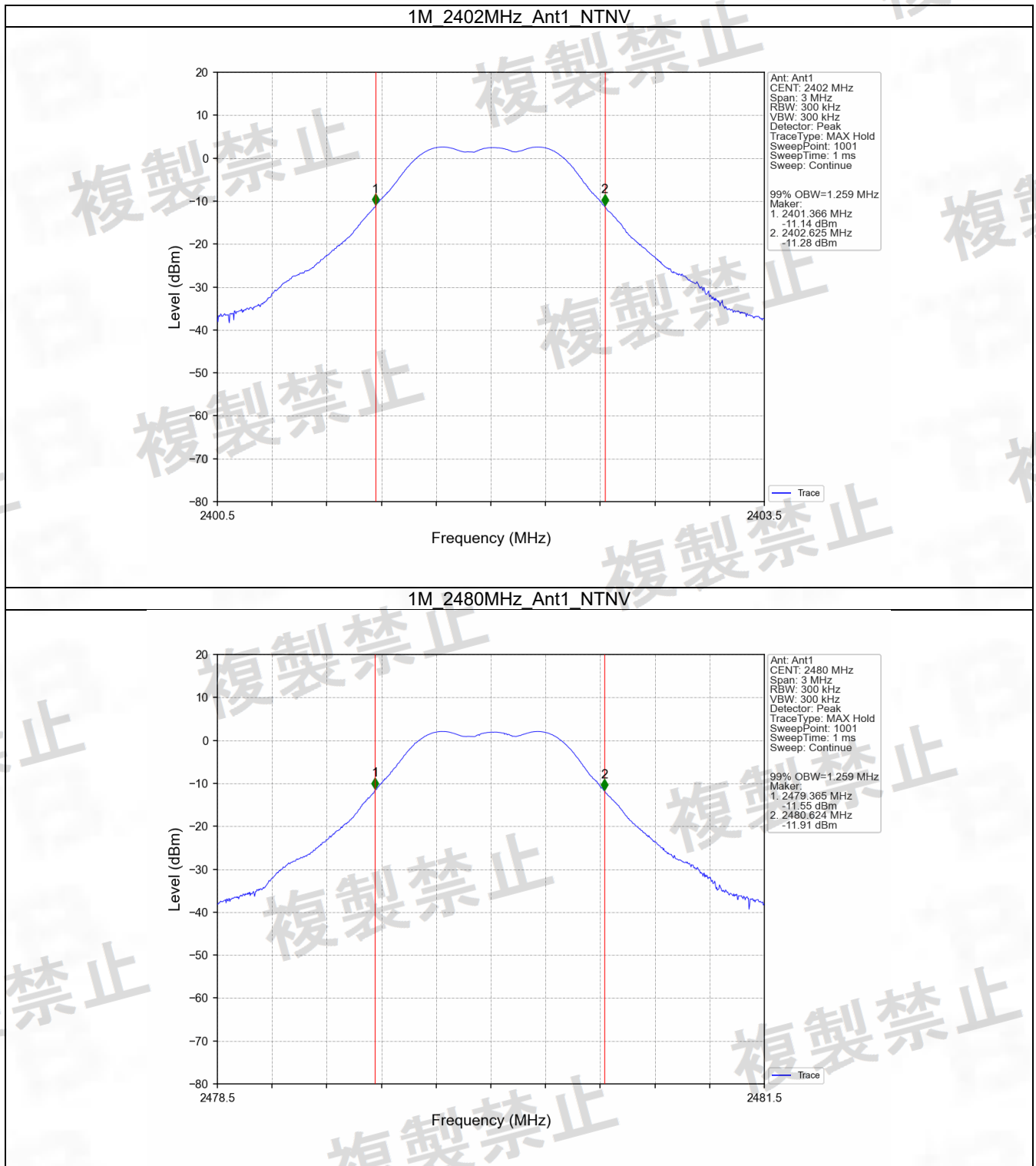
2.1 Test Result

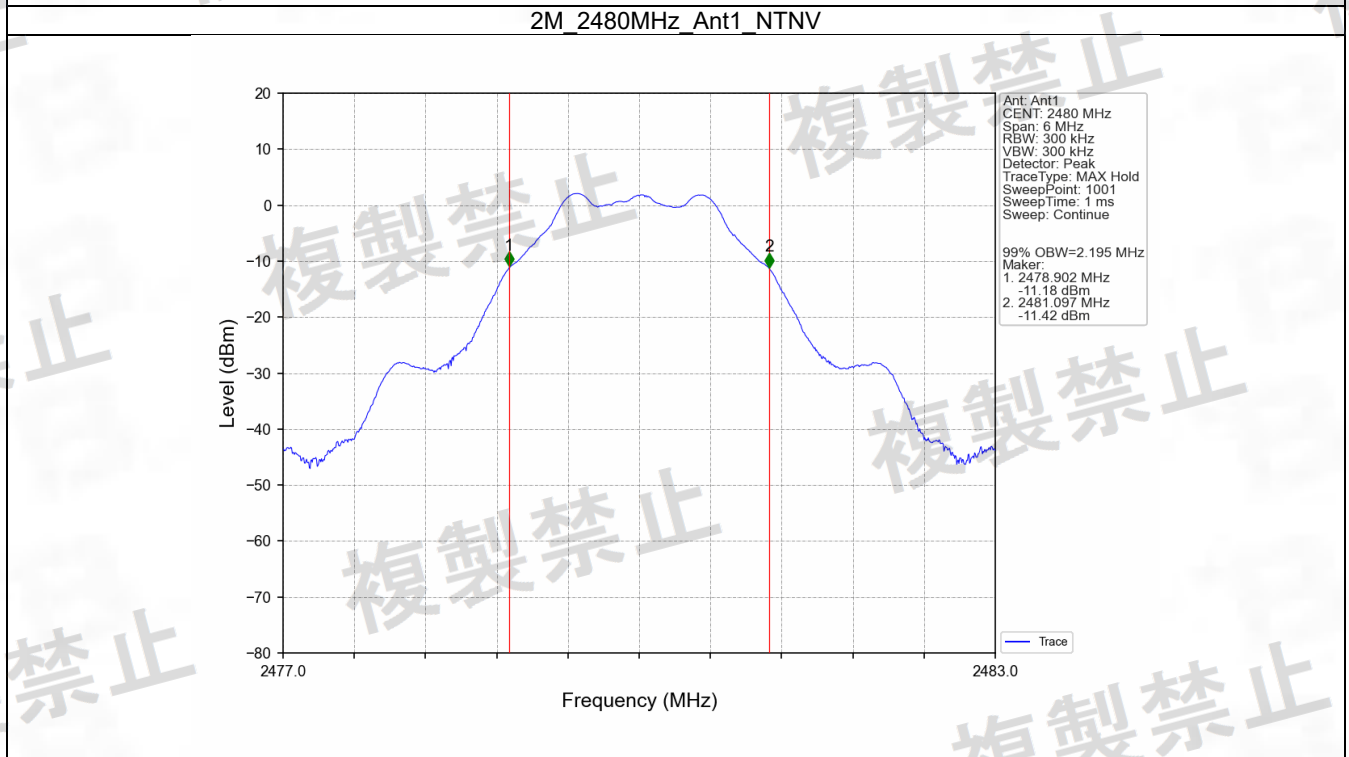
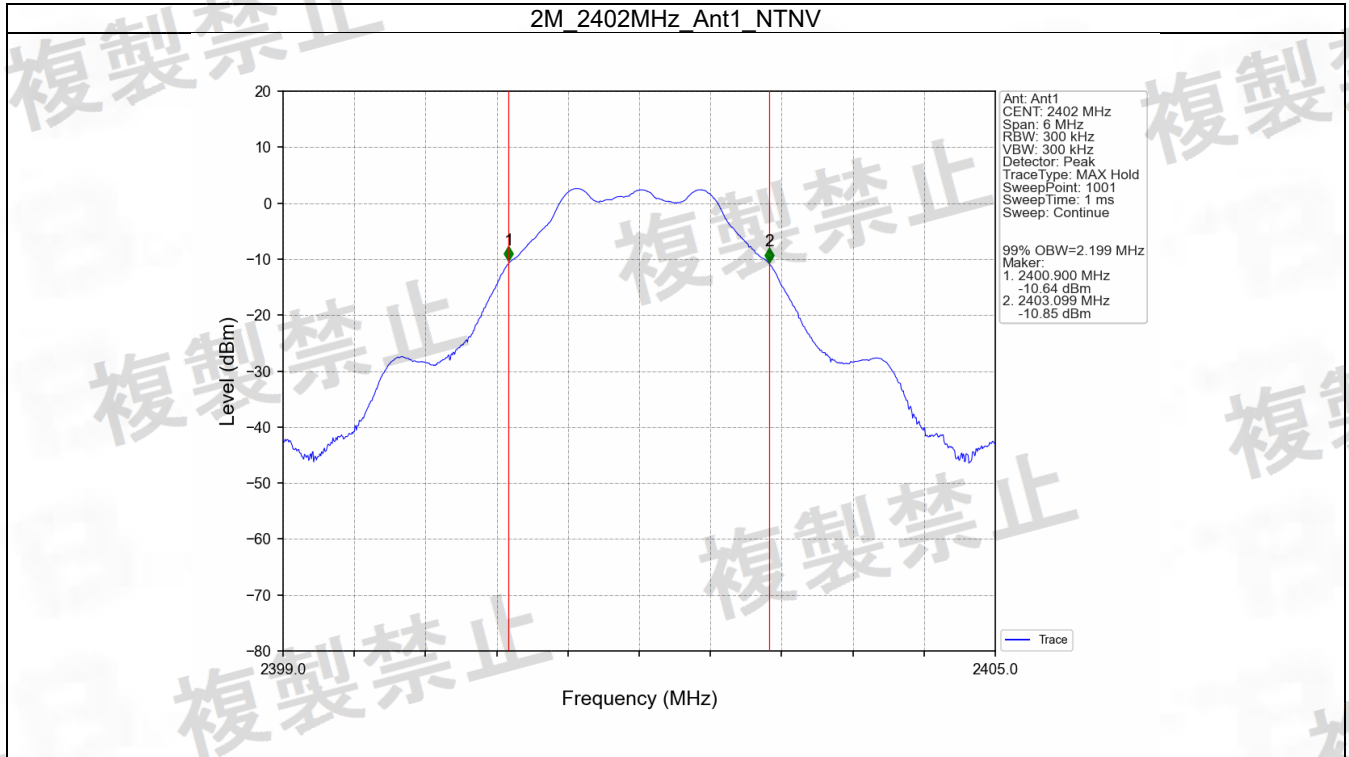
2.1.1 OBW

ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	1M	SISO	2402	1.259	≤ 26	Pass
			2480	1.259	≤ 26	Pass
	2M	SISO	2402	2.199	≤ 26	Pass
			2480	2.195	≤ 26	Pass

2.2 Test Graph

2.2.1 OBW





3. Antenna Power

3.1 Test Result

3.1.1 Power

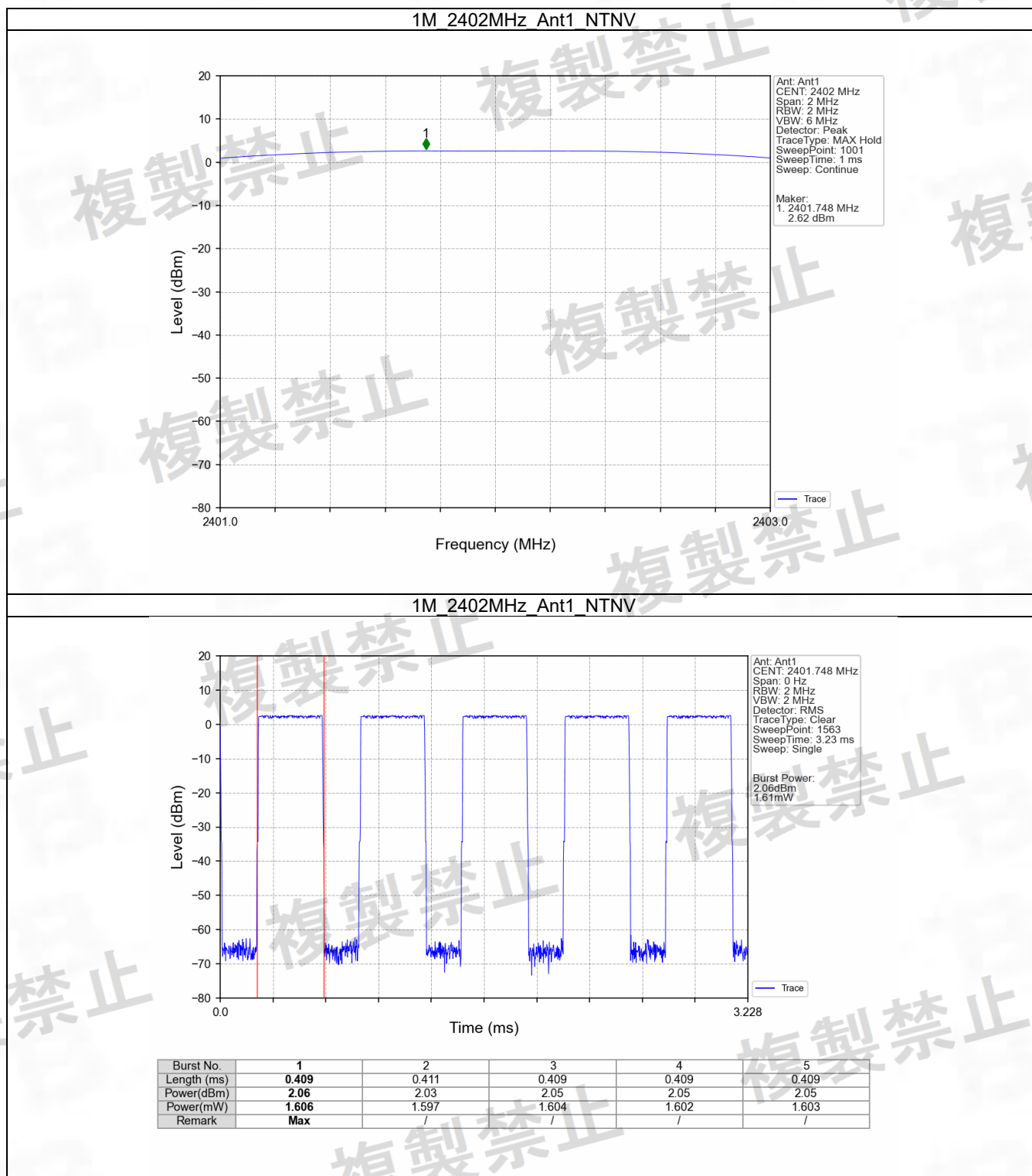
ENV	Mode	TX Type	Frequency (MHz)	ANT	Antenna Power (mW)		Nominal Power (mW)	Tolerance (%)		Verdict
					Measured	Limit		Measured	Limit	
NTNV	1M	SISO	2402	1	1.606	<=10.00	1.600	0.37	<=20	Pass
			2480	1	1.436	<=10.00	1.400	2.57	<=20	Pass
	2M	SISO	2402	1	1.473	<=10.00	1.500	-1.80	<=20	Pass
			2480	1	1.285	<=10.00	1.300	-1.15	<=20	Pass

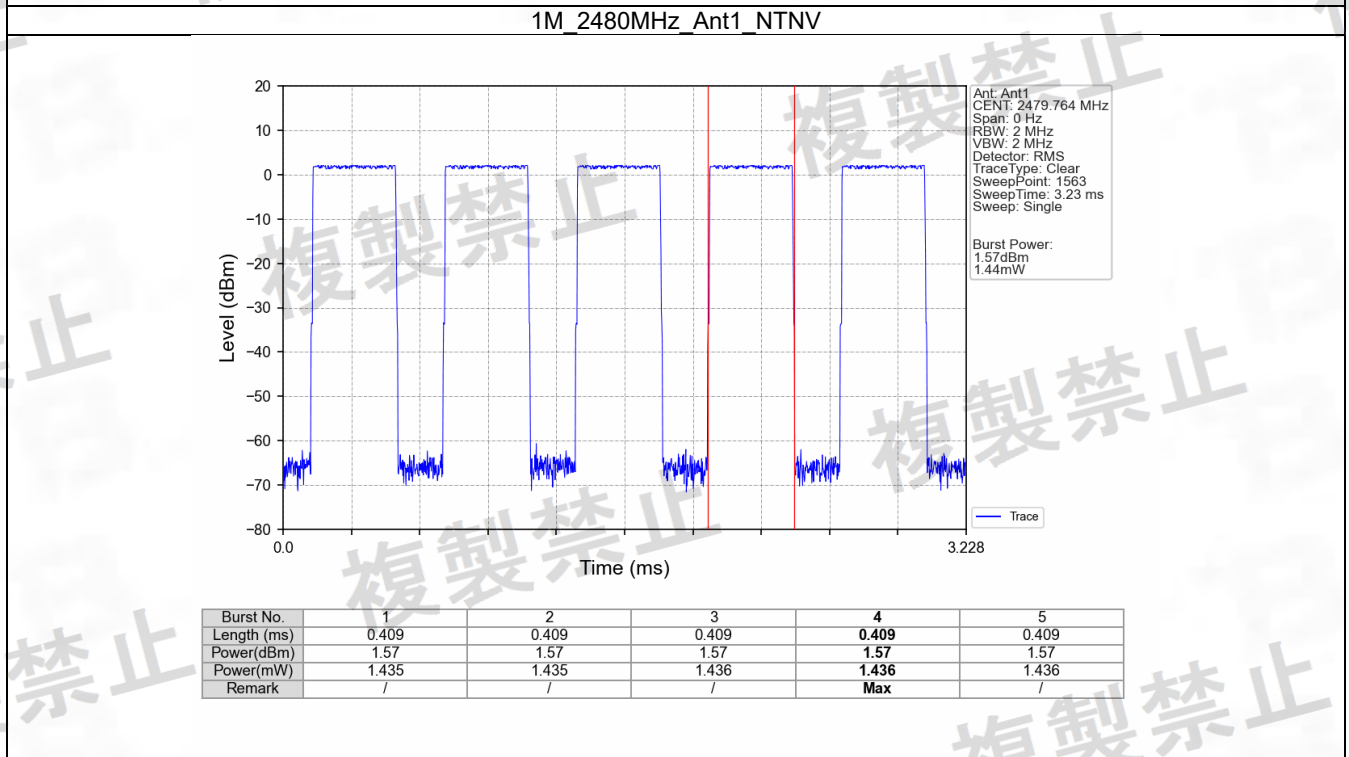
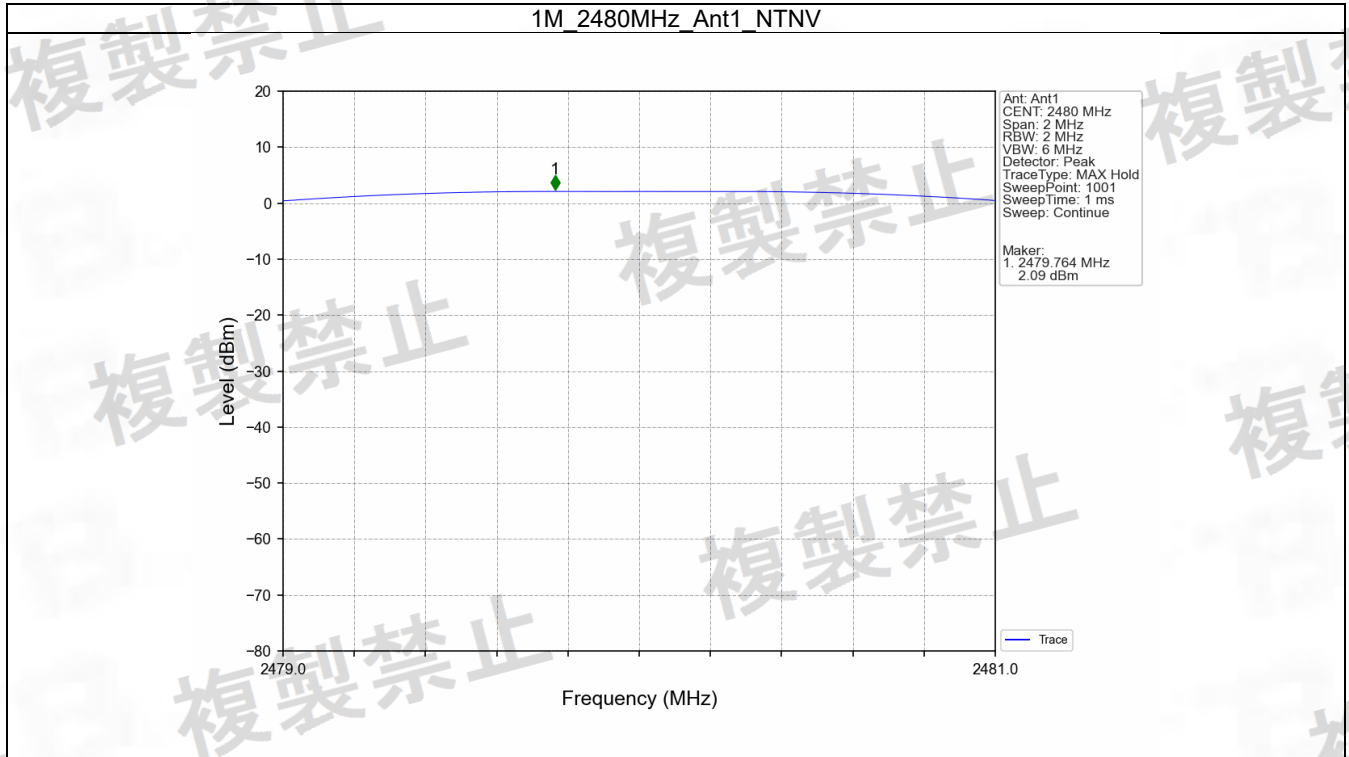
3.1.2 EIRP

ENV	Mode	TX Type	Frequency (MHz)	ANT	Gain (dBi)	EIRP (dBm)		Verdict
						Result	Limit	
NTNV	1M	SISO	2402	1	-2.23	-0.17	<=12.14	Pass
			2480	1	-2.23	-0.66	<=12.14	Pass
	2M	SISO	2402	1	-2.23	-0.55	<=12.14	Pass
			2480	1	-2.23	-1.14	<=12.14	Pass

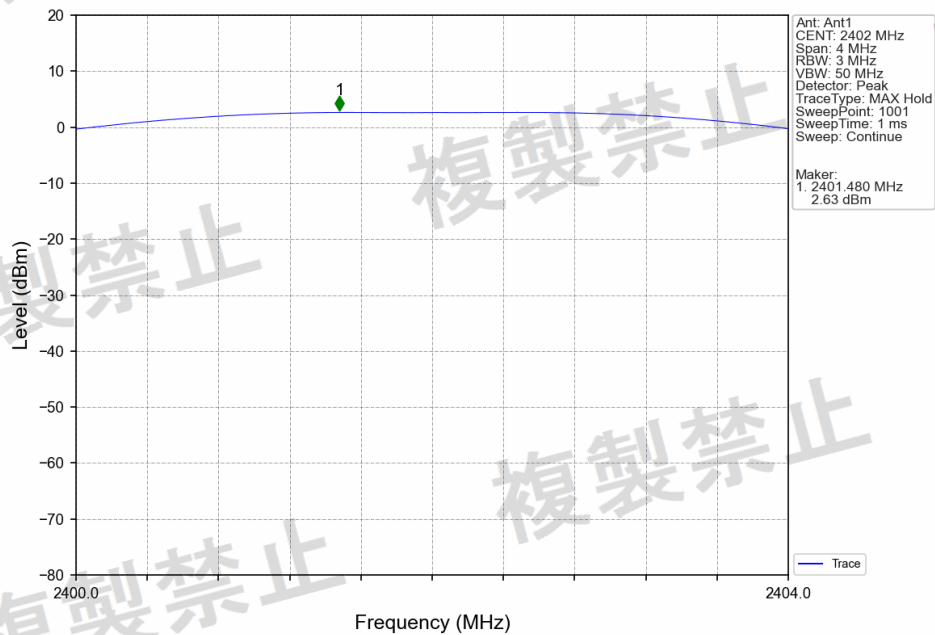
3.2 Test Graph

3.2.1 Power

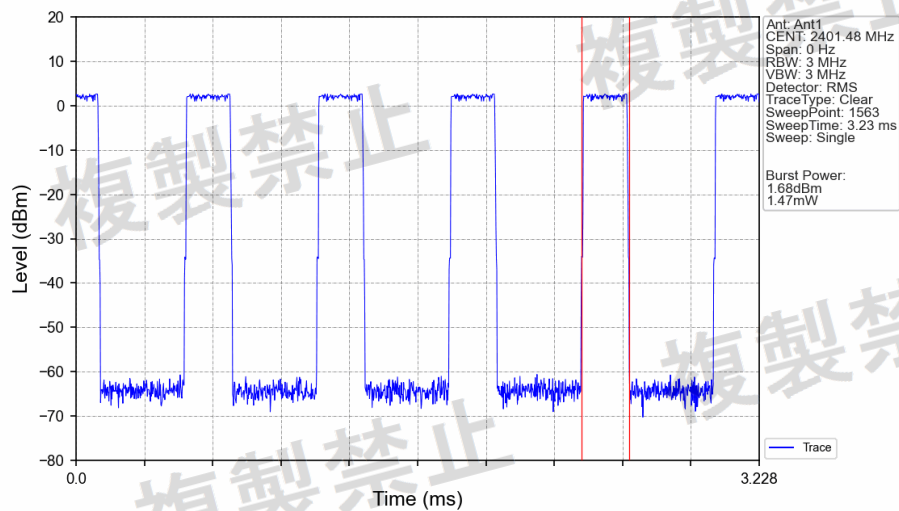




2M_2402MHz_Ant1_NTNV

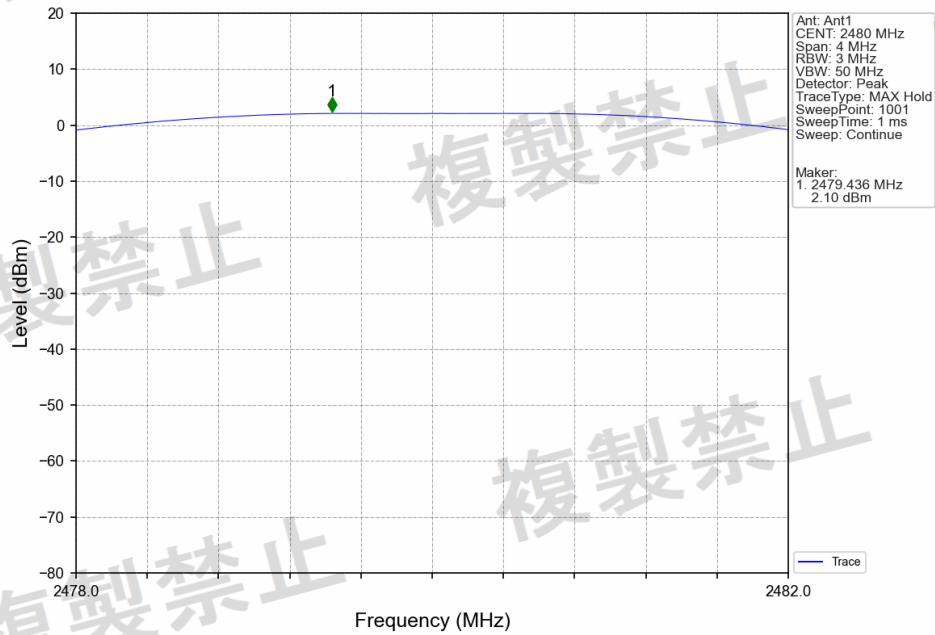


2M_2402MHz_Ant1_NTNV

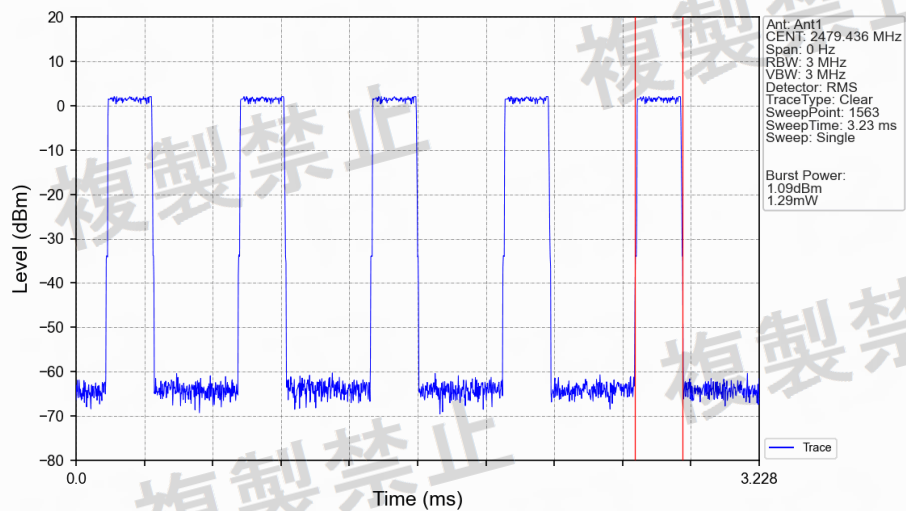


Burst No.	1	2	3	4
Length (ms)	0.225	0.225	0.225	0.225
Power(dBm)	1.68	1.68	1.68	1.68
Power(mW)	1.473	1.471	1.473	1.473
Remark	/	/	/	Max

2M_2480MHz_Ant1_NTNV



2M_2480MHz_Ant1_NTNV



Burst No.	1	2	3	4	5
Length (ms)	0.225	0.225	0.225	0.225	0.225
Power(dBm)	1.08	1.08	1.08	1.09	1.09
Power(mW)	1.283	1.283	1.282	1.284	1.285
Remark	/	/	/	/	Max

4. Spurious Emission Intensity

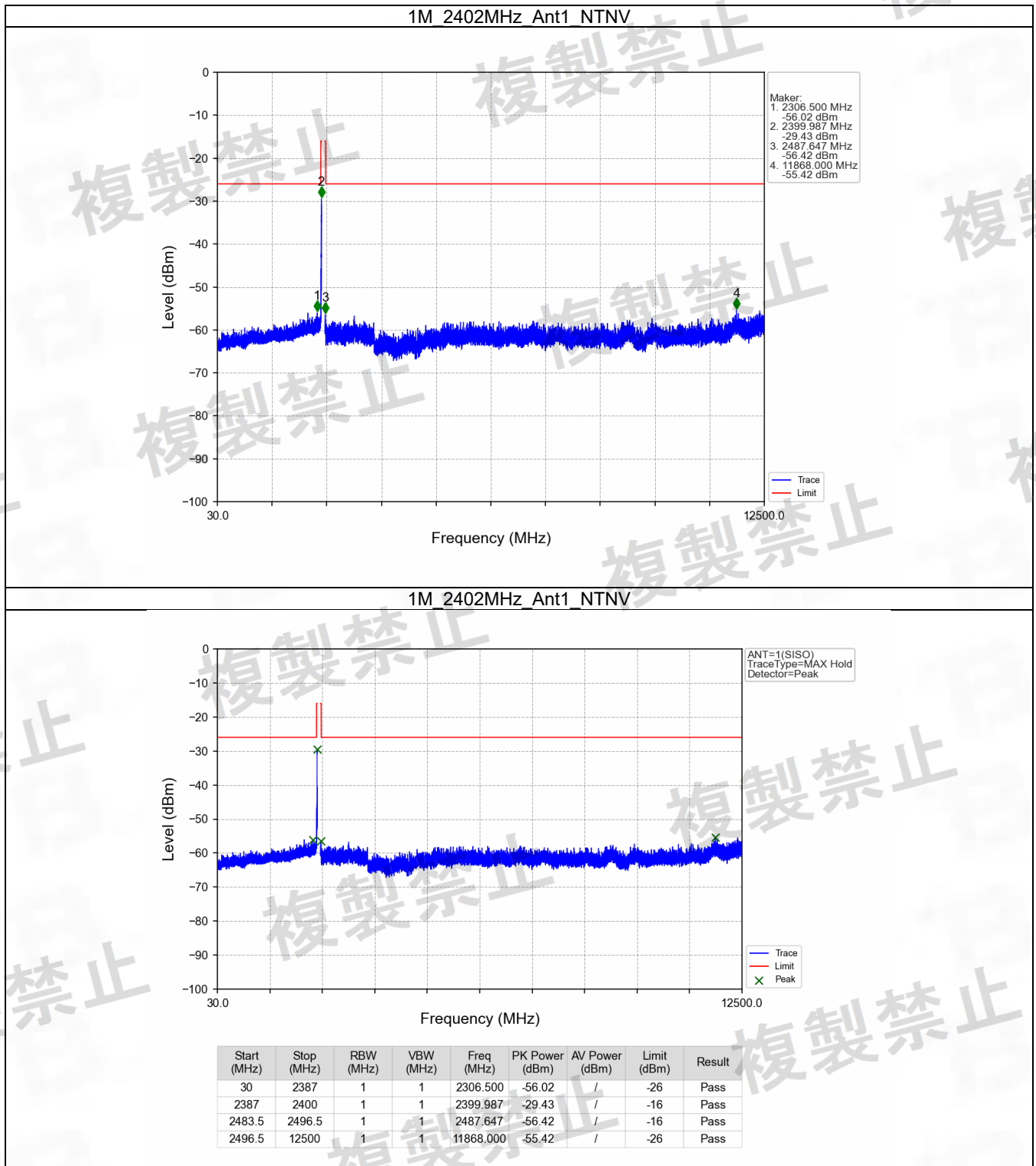
4.1 Test Result

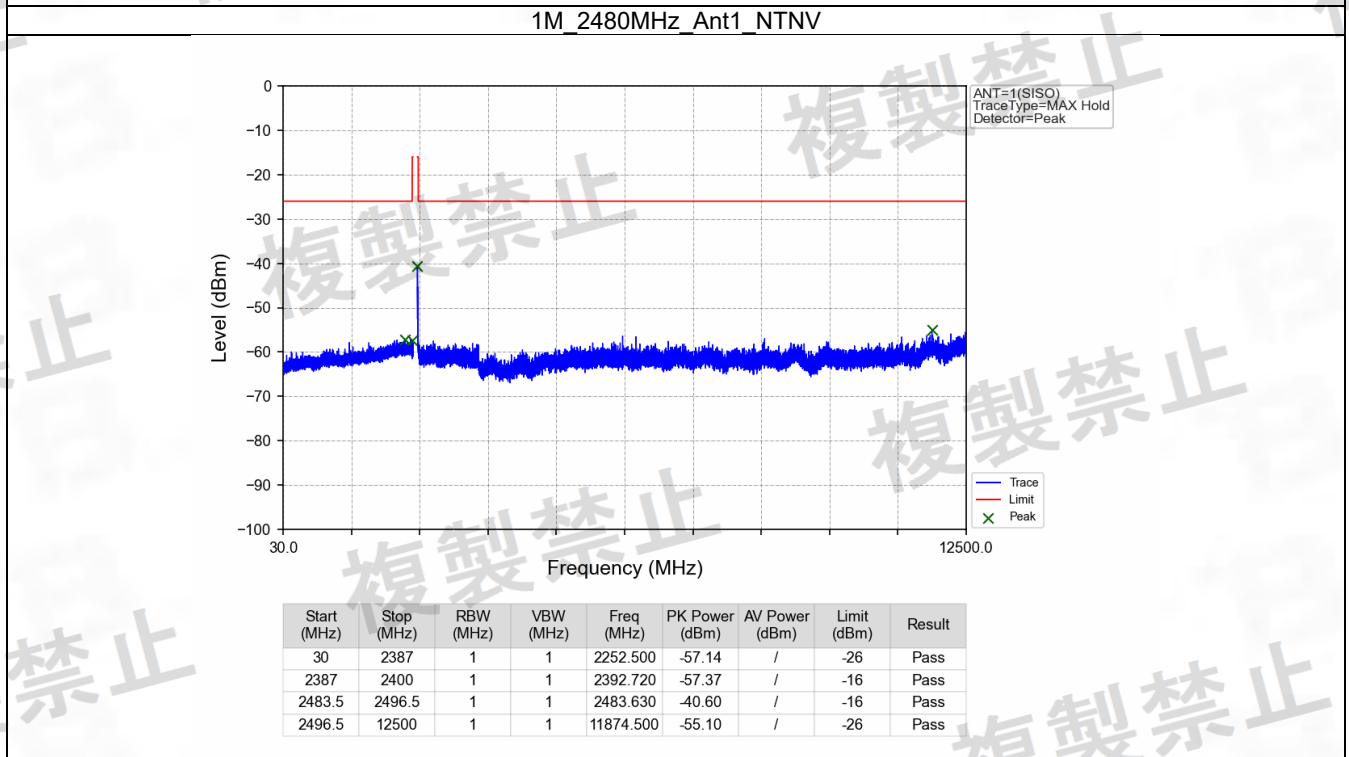
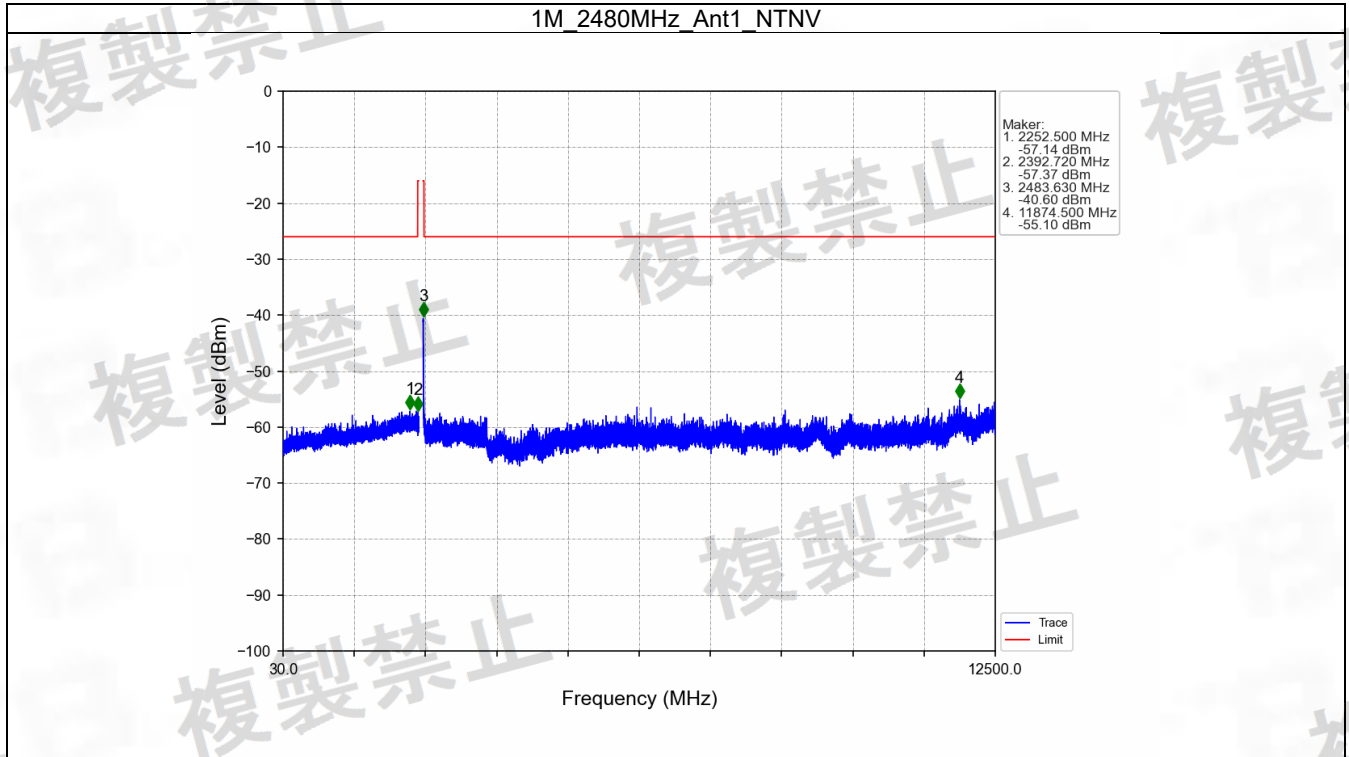
4.1.1 TxSe_NTNV

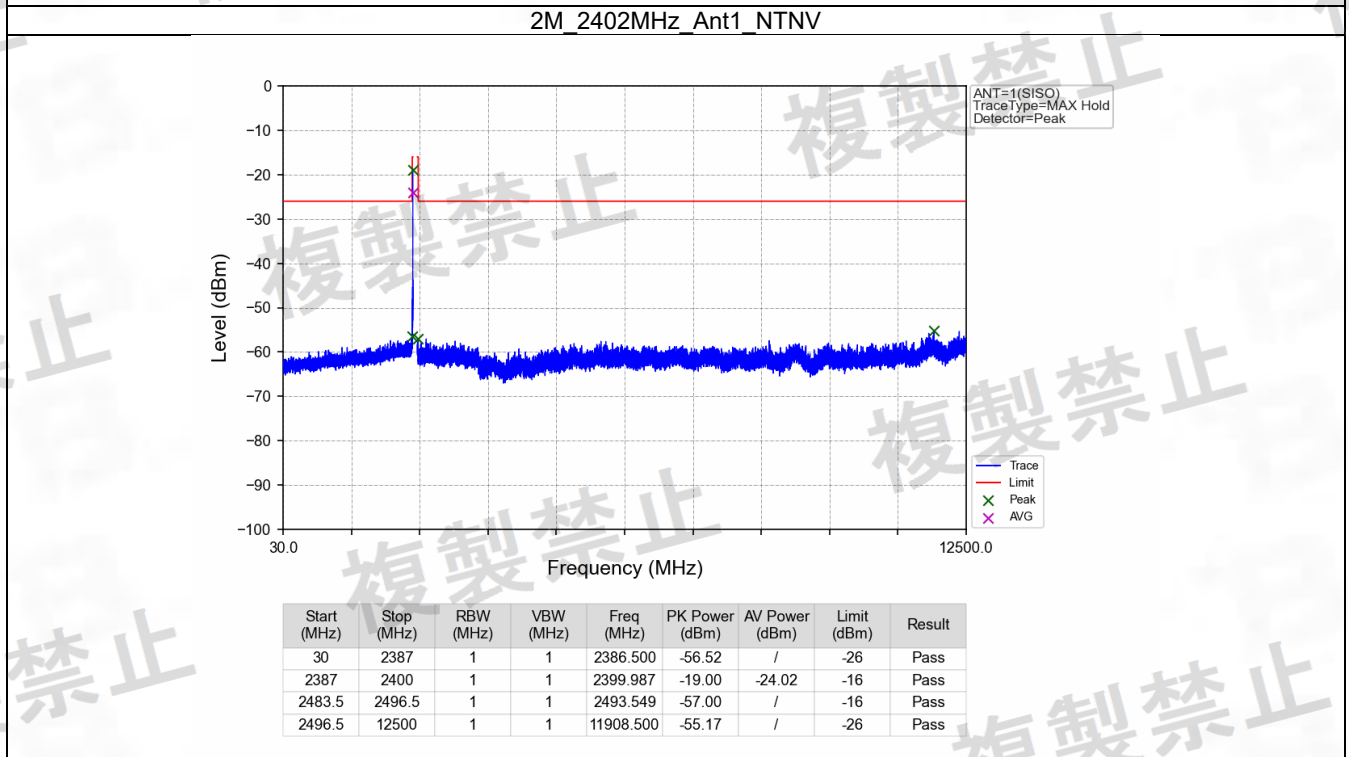
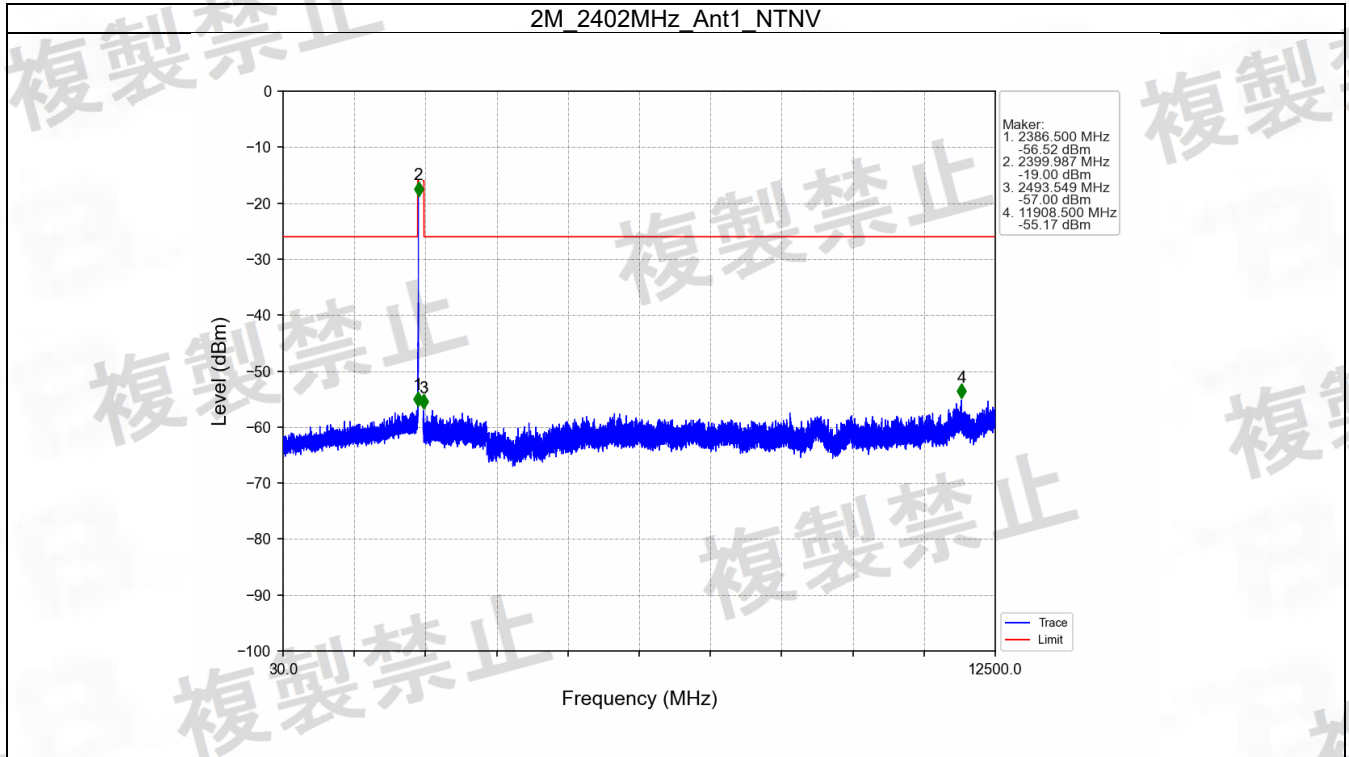
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
1M	SISO	2402	1	30	2387	2306.5	-56.02	0.003	/	/	2.5	Pass
				2387	2400	2399.987	-29.43	1.140	/	/	25	Pass
				2483.5	2496.5	2487.647	-56.42	0.002	/	/	25	Pass
				2496.5	12500	11868	-55.42	0.003	/	/	2.5	Pass
		2480	1	30	2387	2252.5	-57.14	0.002	/	/	2.5	Pass
				2387	2400	2392.72	-57.37	0.002	/	/	25	Pass
				2483.5	2496.5	2483.63	-40.60	0.087	/	/	25	Pass
				2496.5	12500	11874.5	-55.10	0.003	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	2386.5	-56.52	0.002	/	/	2.5	Pass
				2387	2400	2399.987	-19.00	12.589	-24.02	3.963	25	Pass
				2483.5	2496.5	2493.549	-57.00	0.002	/	/	25	Pass
				2496.5	12500	11908.5	-55.17	0.003	/	/	2.5	Pass
		2480	1	30	2387	2230.5	-57.18	0.002	/	/	2.5	Pass
				2387	2400	2396.763	-57.41	0.002	/	/	25	Pass
				2483.5	2496.5	2483.578	-40.22	0.095	/	/	25	Pass
				2496.5	12500	12494	-55.84	0.003	/	/	2.5	Pass

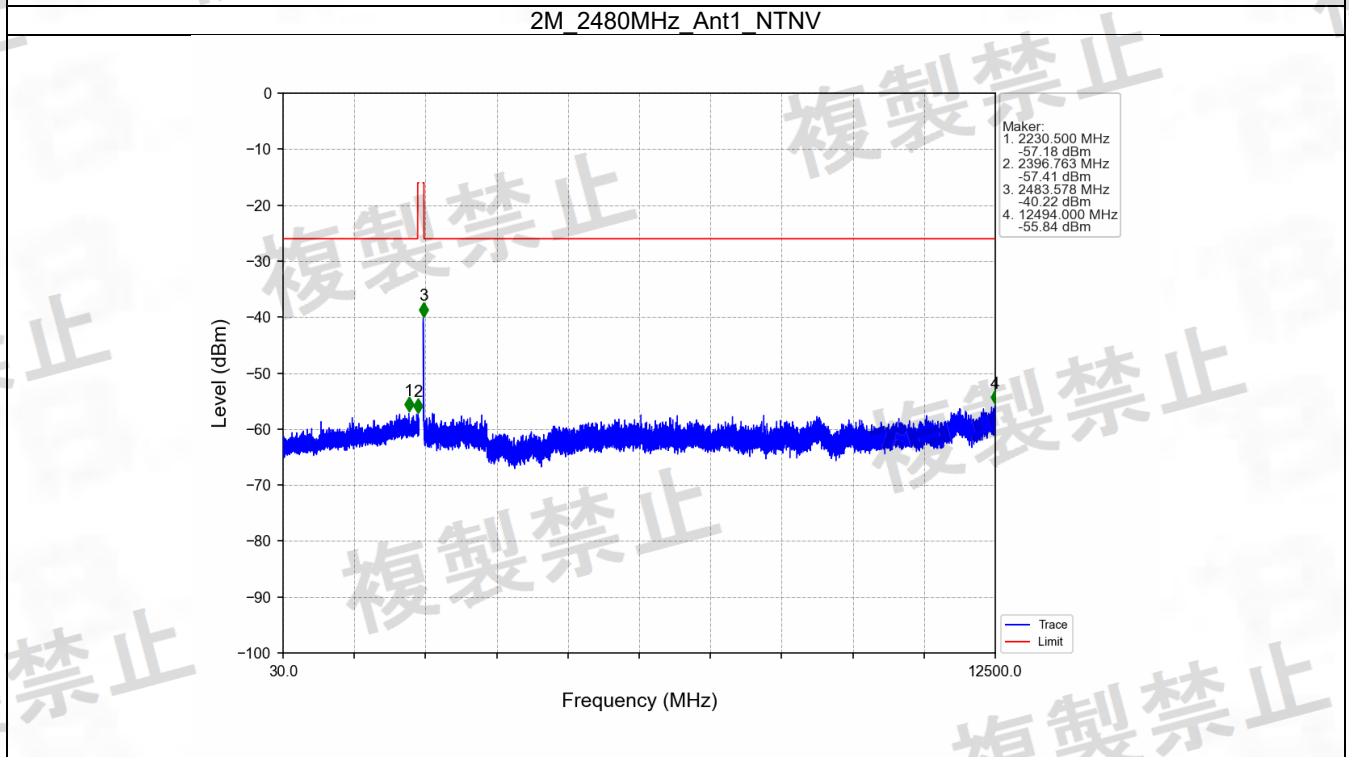
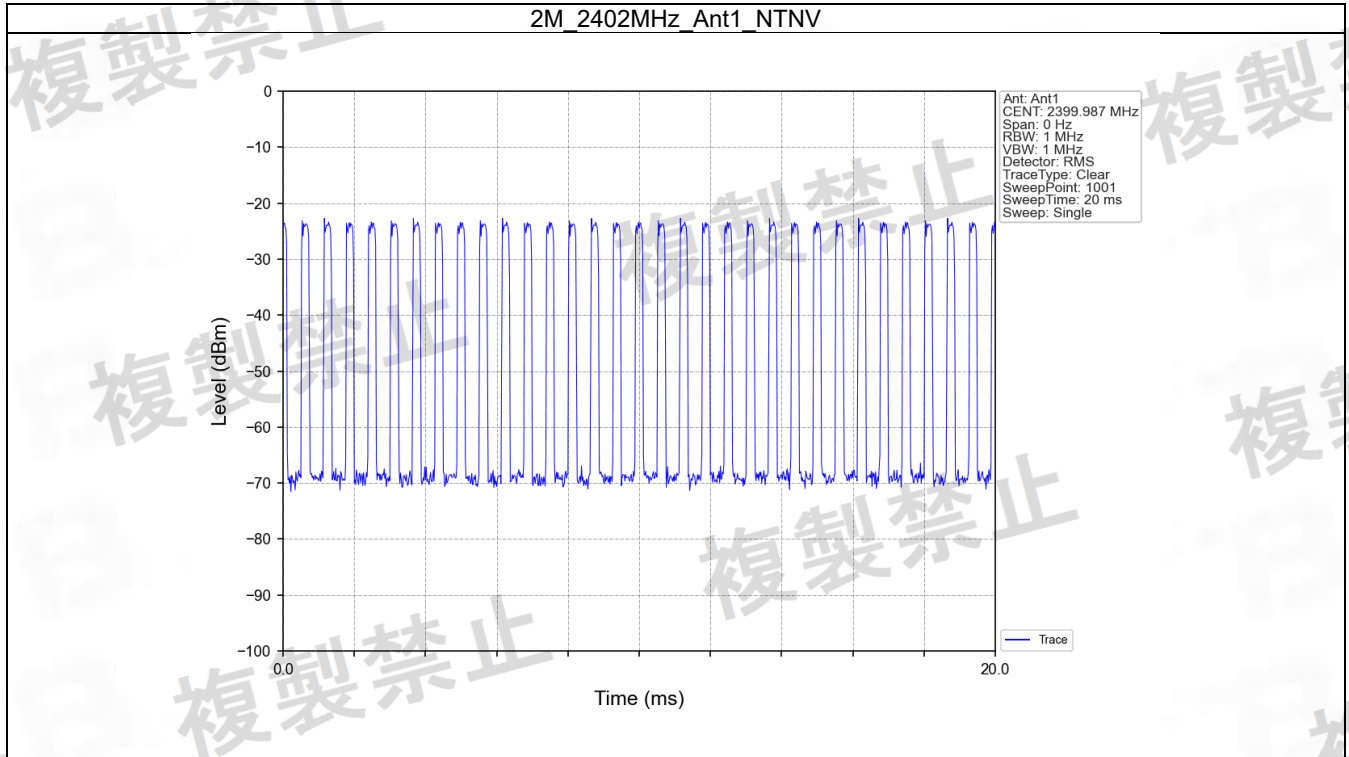
4.2 Test Graph

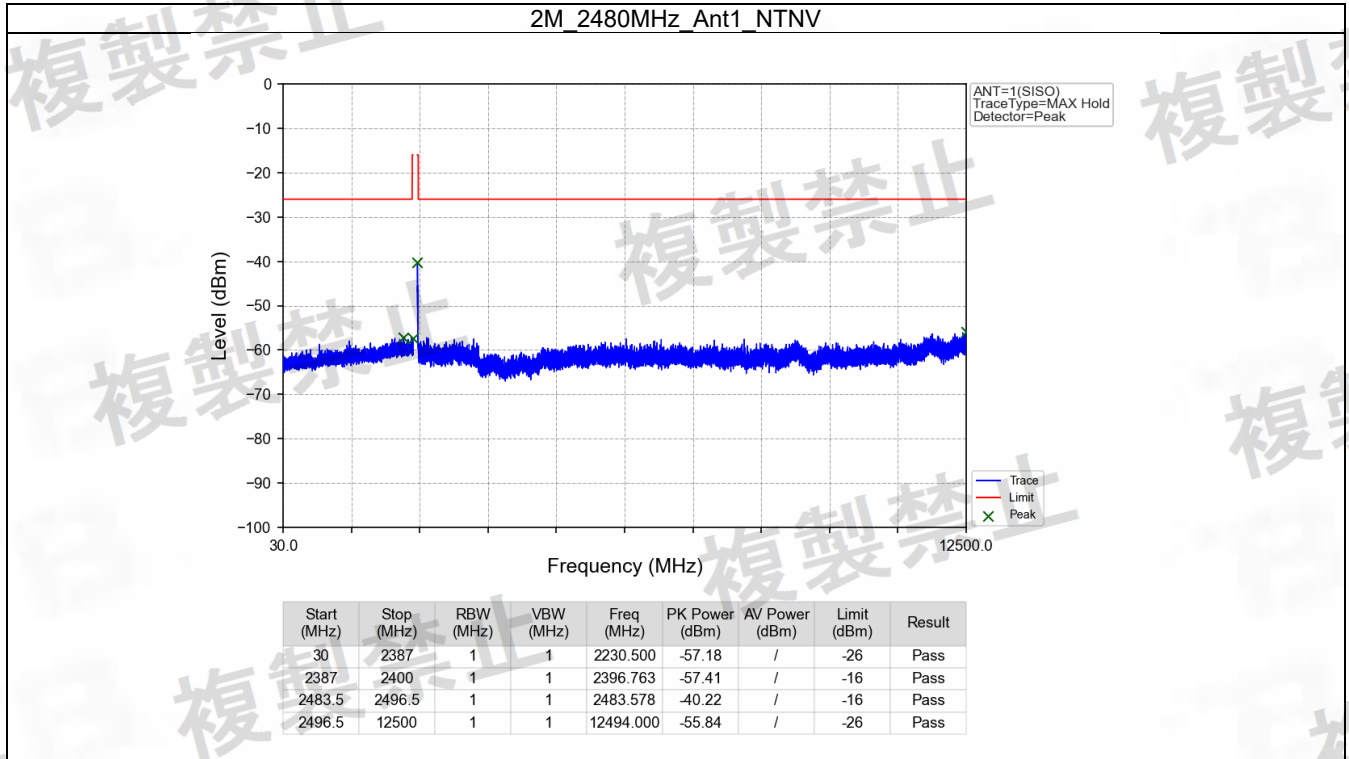
4.2.1 TxSe_NTNV











5. Secondary Radiated Emission

5.1 Test Result

5.1.1 RxSe_NTNV

NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
1M	SISO	2402	1	30	1000	978.4	-85.60	0.003	/	/	4	Pass
				1000	12500	11838	-72.25	0.060	/	/	20	Pass
		2480	1	30	1000	676.75	-85.13	0.003	/	/	4	Pass
				1000	12500	12385	-72.11	0.062	/	/	20	Pass
2M	SISO	2402	1	30	1000	791.8	-84.22	0.004	/	/	4	Pass
				1000	12500	12440	-70.95	0.080	/	/	20	Pass
		2480	1	30	1000	854.3	-84.94	0.003	/	/	4	Pass
				1000	12500	11870	-71.84	0.065	/	/	20	Pass

5.2 Test Graph

5.2.1 RxSe_NTNV

