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Annex for Bluetooth low Energy

Test Report No.: CTL2606052111-MIC

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1. Frequency Error

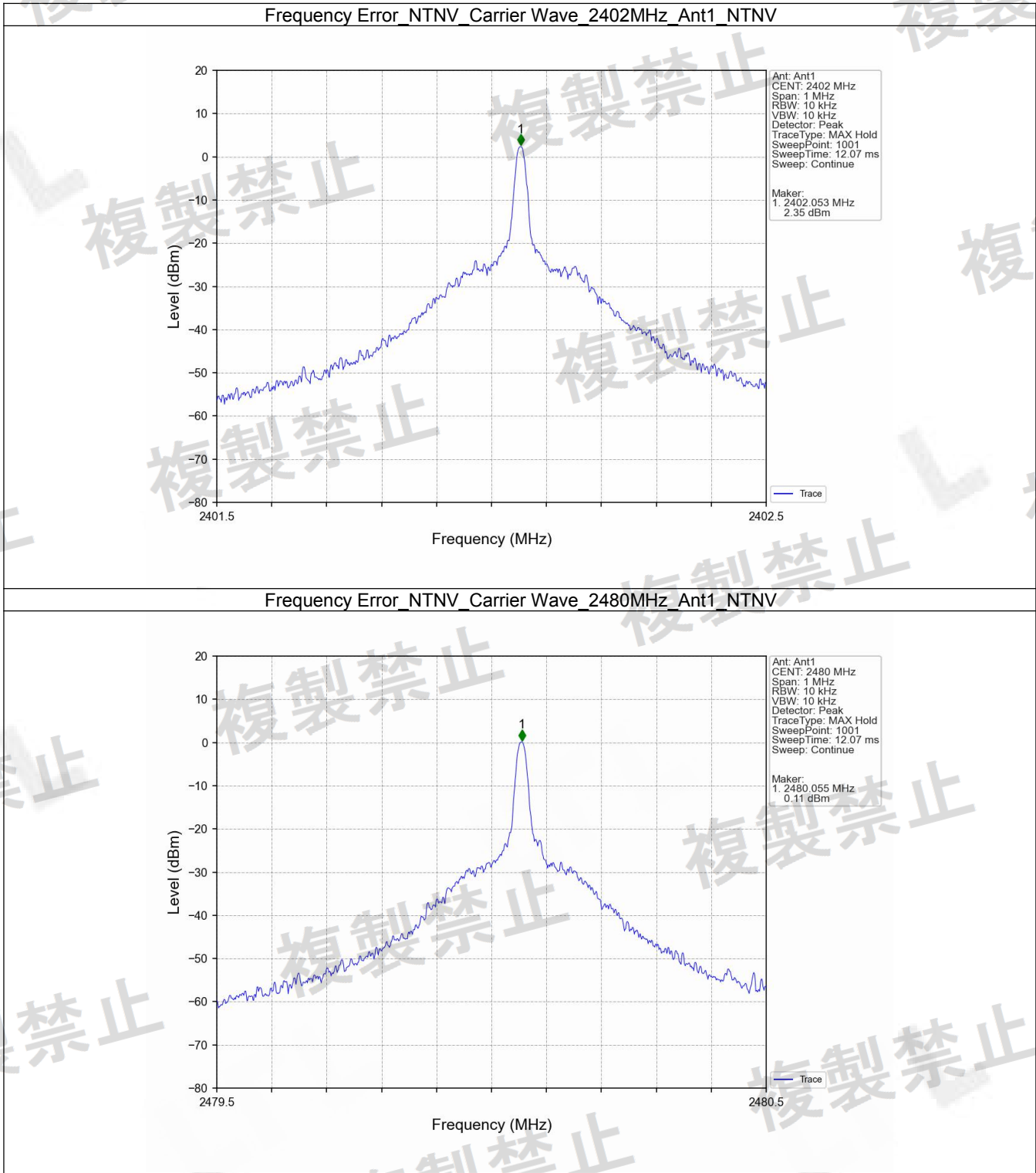
1.1 Test Result

1.1.1 Ant1

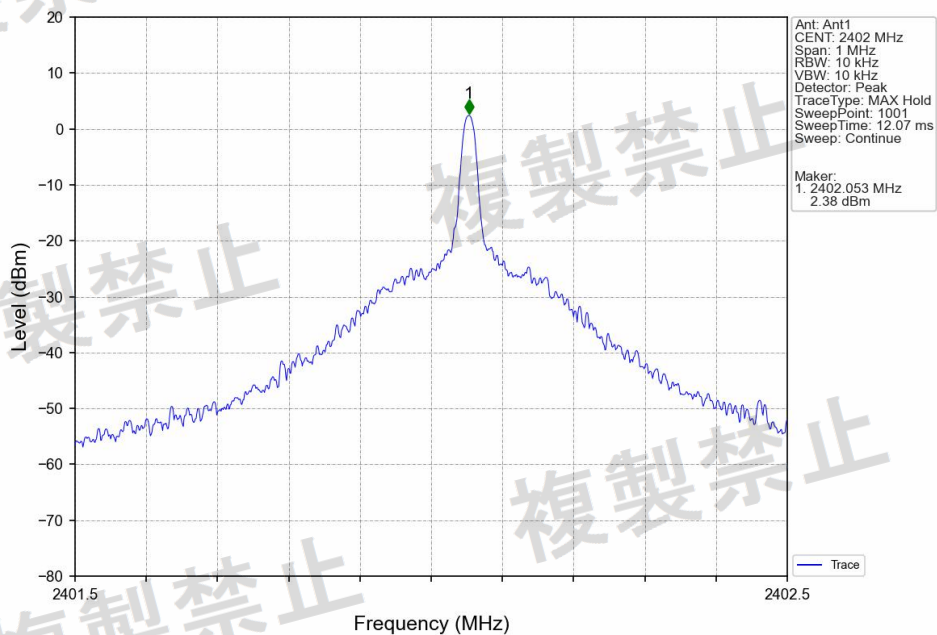
Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2402	2402.053	22.06	-50 to 50	Pass
			2480	2480.055	22.18	-50 to 50	Pass
NTLV	Carrier Wave	SISO	2402	2402.053	22.06	-50 to 50	Pass
			2480	2480.055	22.18	-50 to 50	Pass
NTHV	Carrier Wave	SISO	2402	2402.053	22.06	-50 to 50	Pass
			2480	2480.055	22.18	-50 to 50	Pass

1.2 Test Graph

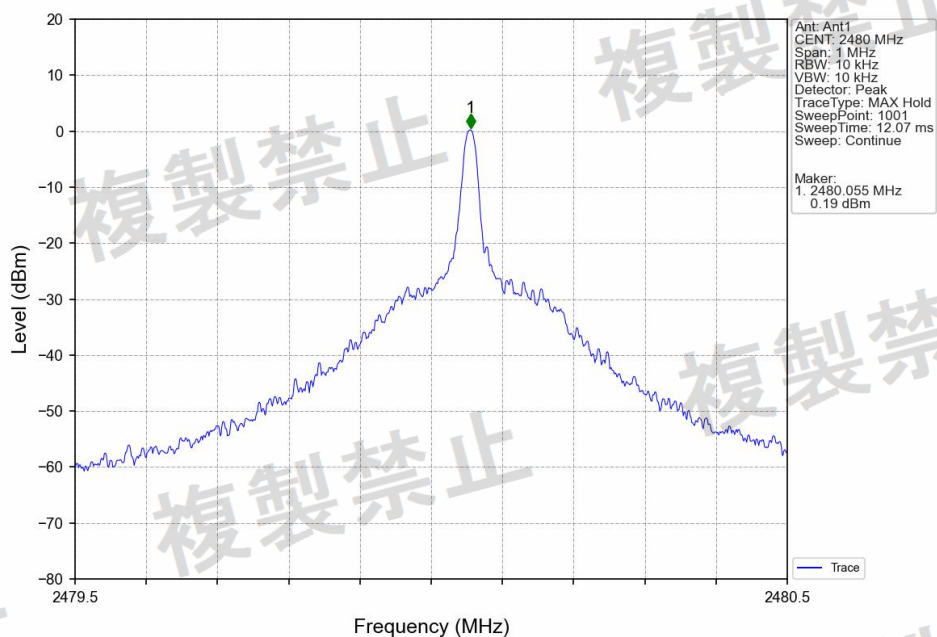
1.2.1 Ant1

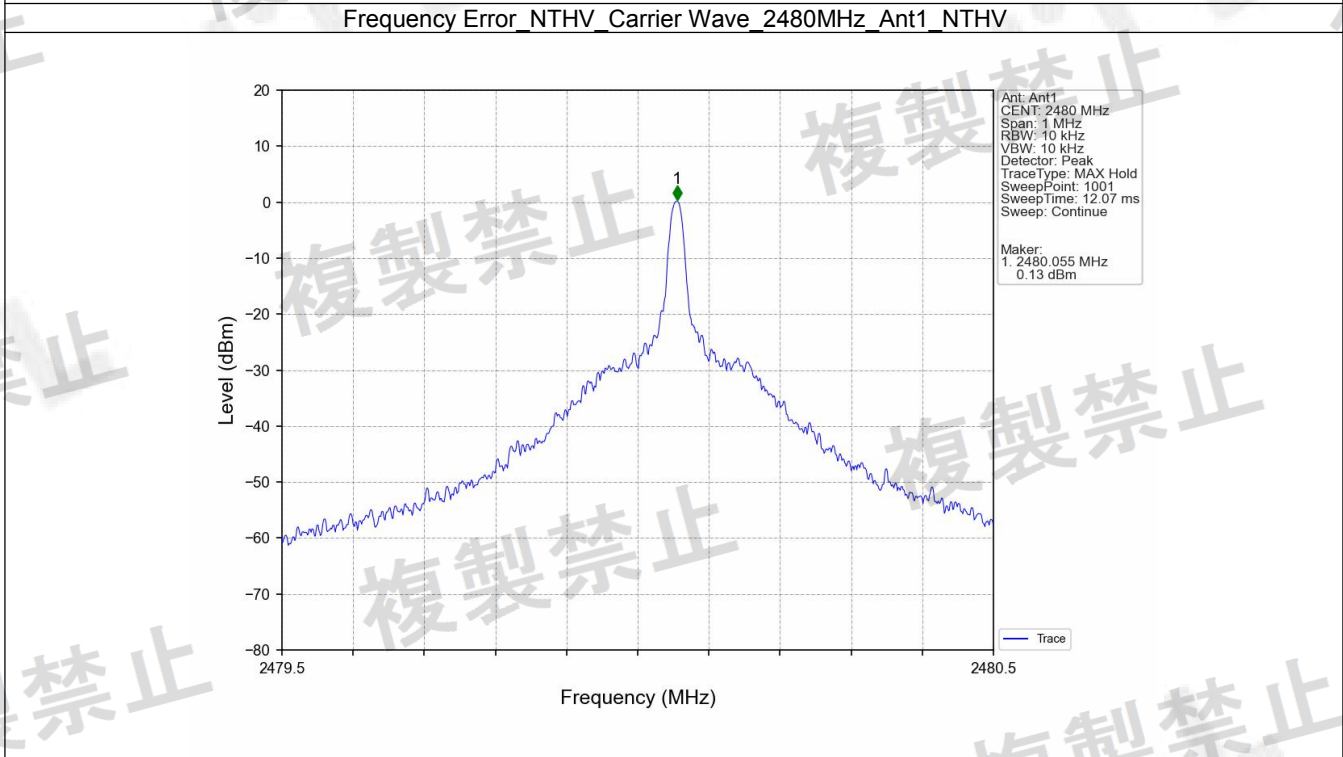
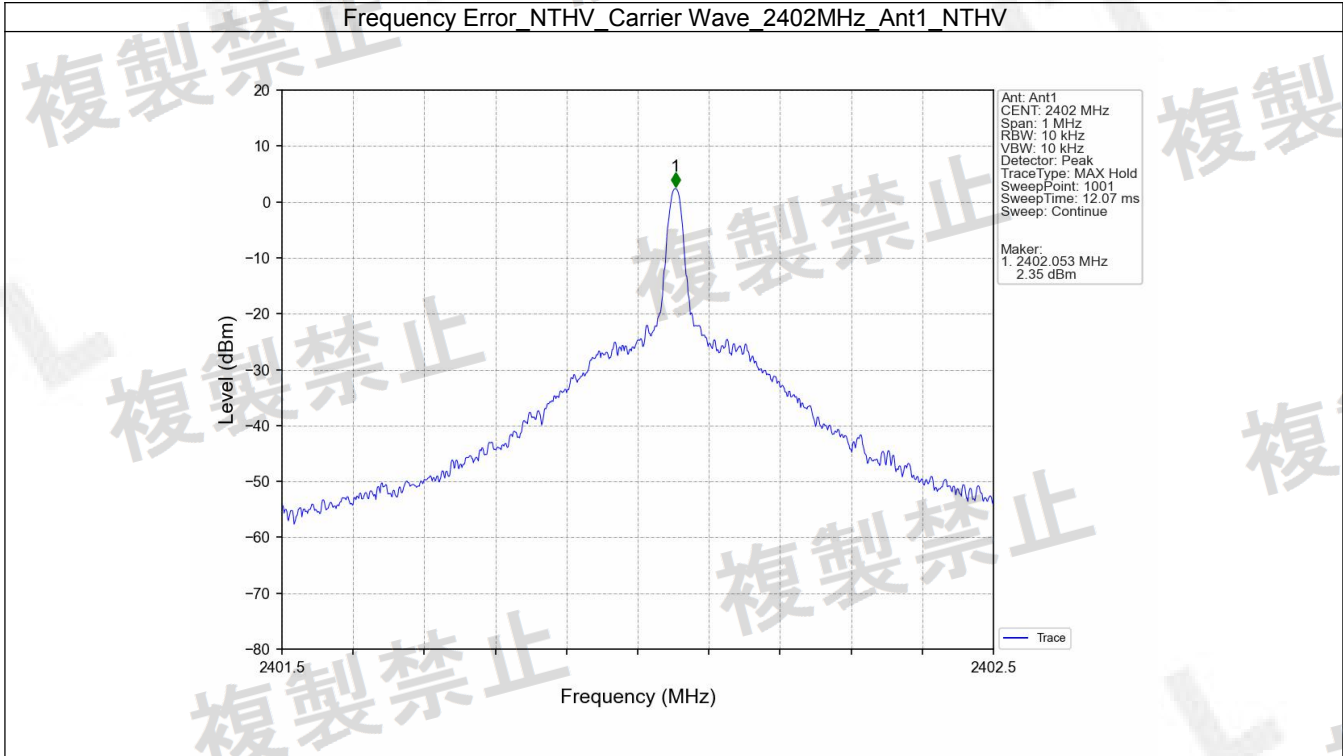


Frequency Error_NTLV_Carrier Wave_2402MHz_Ant1_NTLV



Frequency Error_NTLV_Carrier Wave_2480MHz_Ant1_NTLV





2. Occupied Bandwidth

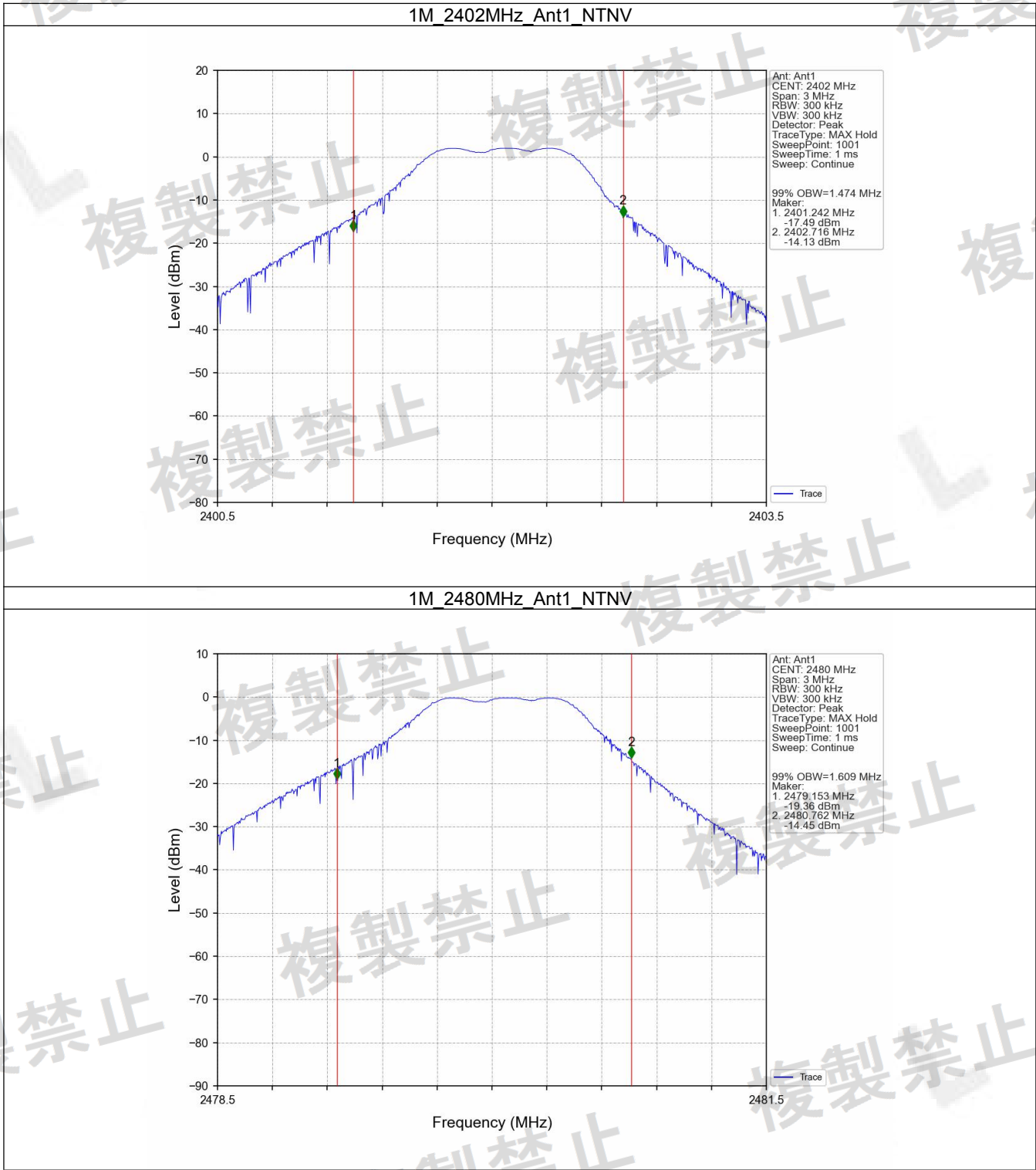
2.1 Test Result

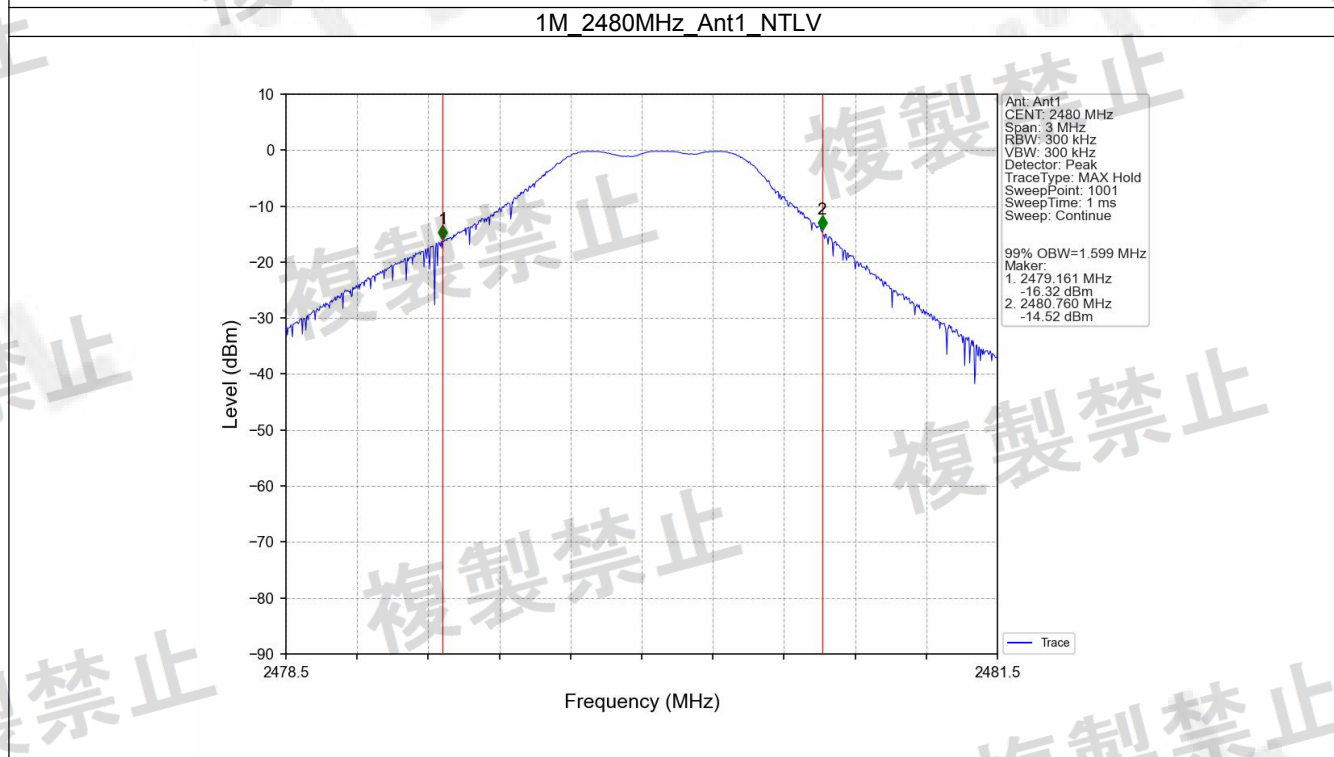
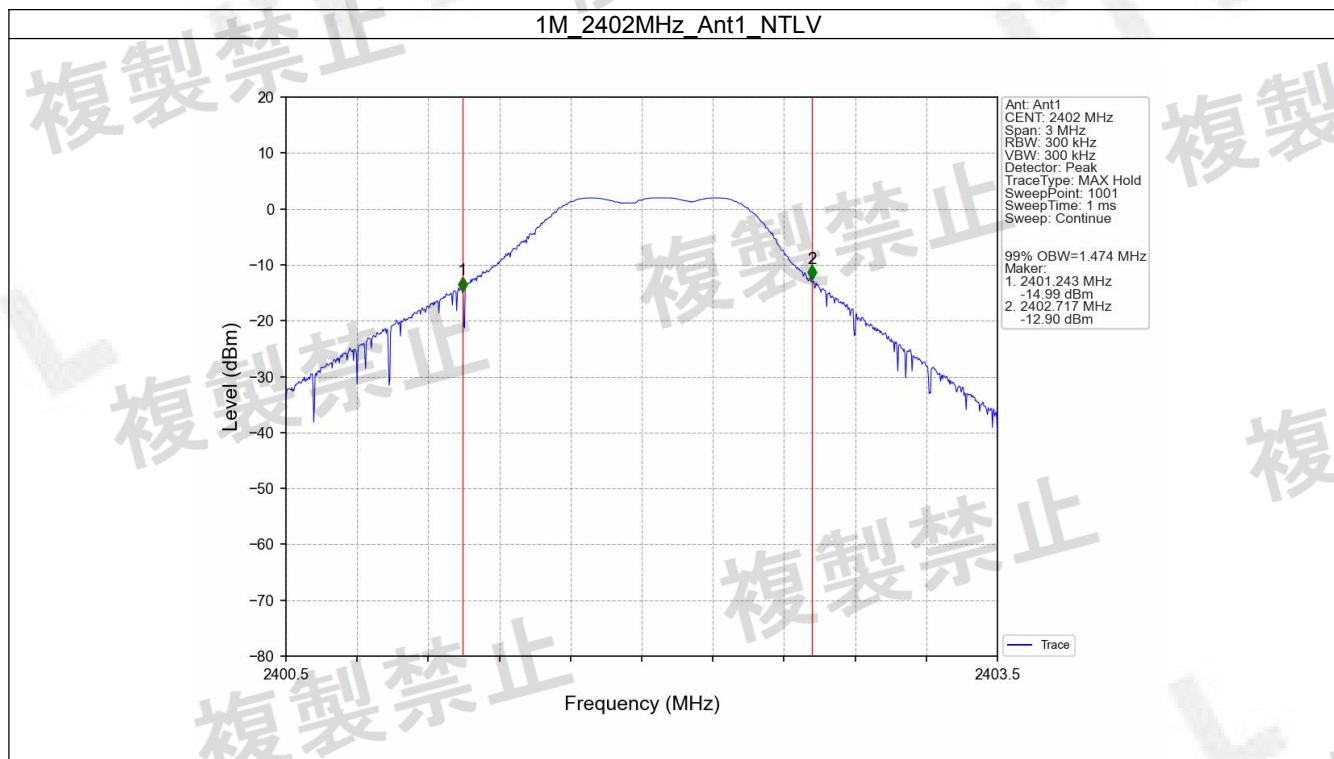
2.1.1 OBW

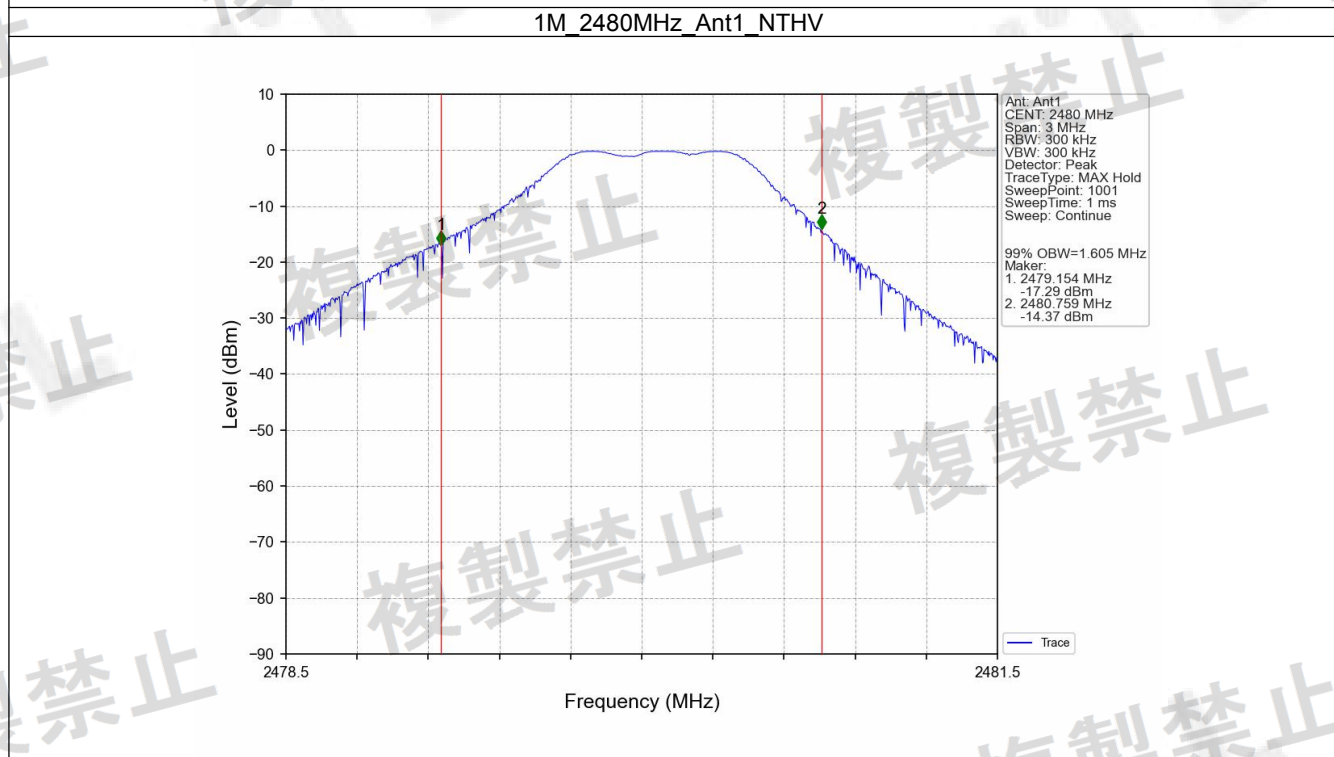
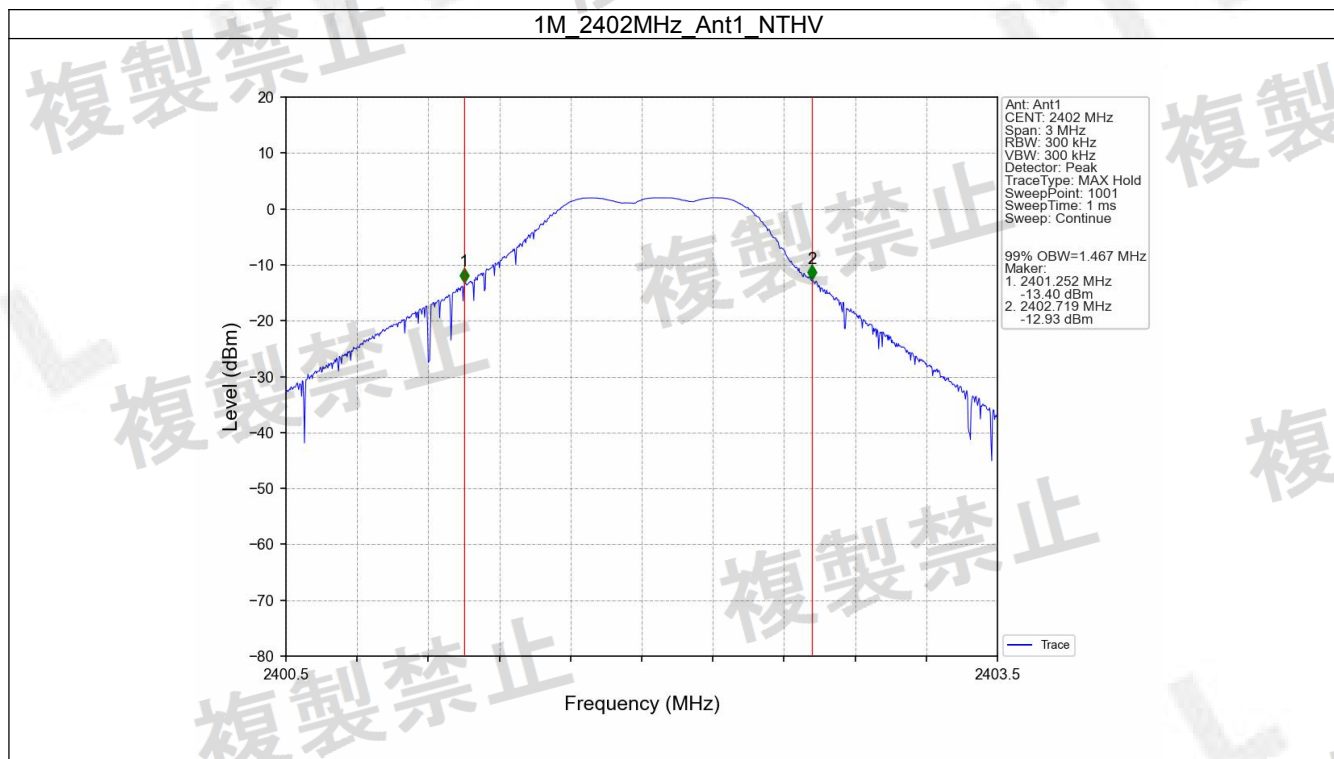
ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	1M	SISO	2402	1.474	<=26	Pass
			2480	1.609	<=26	Pass
NTLV	1M	SISO	2402	1.474	<=26	Pass
			2480	1.599	<=26	Pass
NTHV	1M	SISO	2402	1.467	<=26	Pass
			2480	1.605	<=26	Pass

2.2 Test Graph

2.2.1 OBW







3. Antenna Power

3.1 Test Result

3.1.1 Power

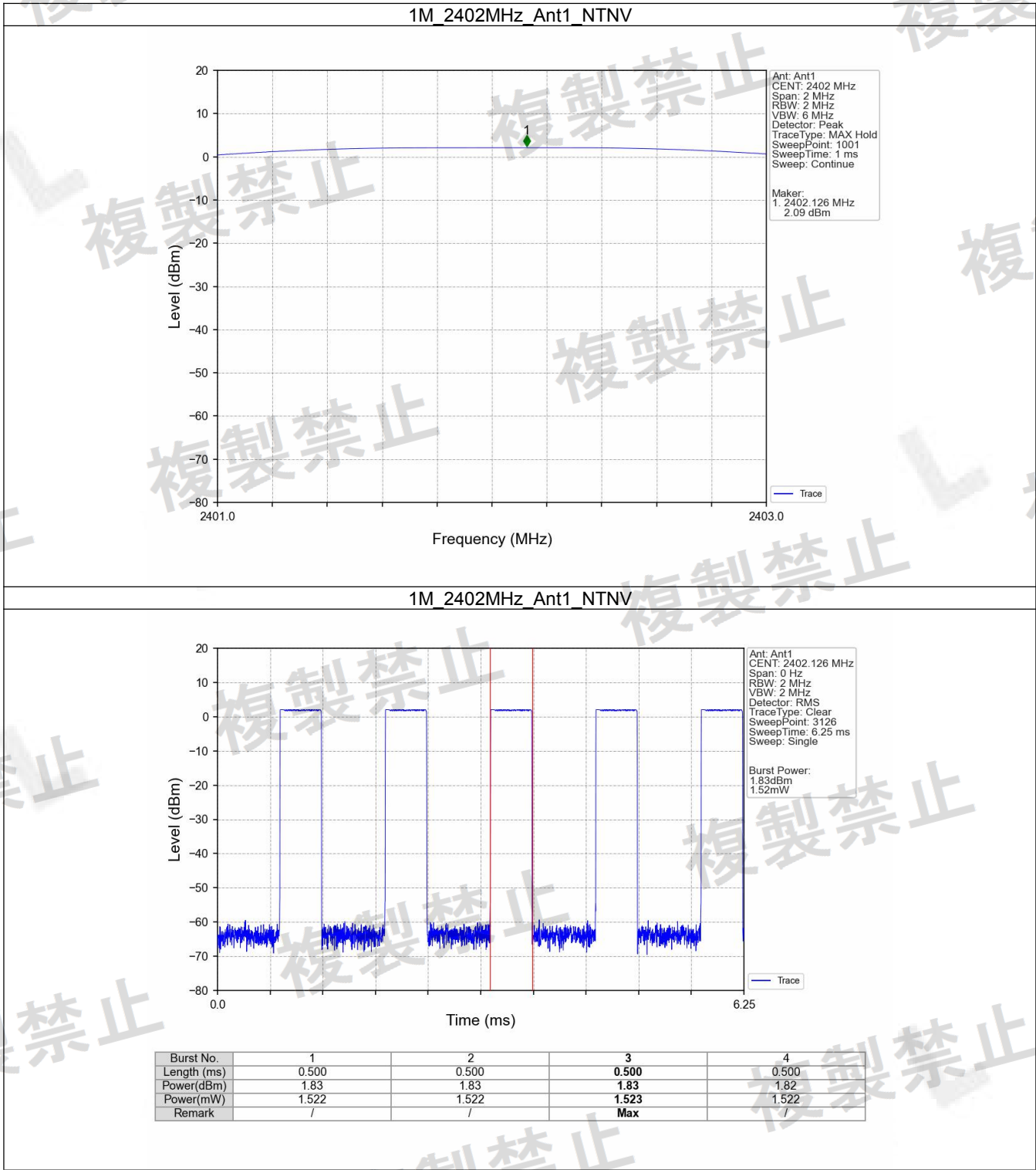
ENV	Mode	TX Type	Frequency (MHz)	ANT	Antenna Power (mW)		Nominal Power (mW)	Tolerance (%)		Verdict
					Measured	Limit		Measured	Limit	
NTNV	1M	SISO	2402	1	1.523	≤ 10.00	1.500	1.53	≤ 20	Pass
			2480	1	0.937	≤ 10.00	1.500	-37.53	≤ 20	Pass
NTLV	1M	SISO	2402	1	1.488	≤ 10.00	1.500	-0.80	≤ 20	Pass
			2480	1	0.932	≤ 10.00	1.500	-37.87	≤ 20	Pass
NTHV	1M	SISO	2402	1	1.513	≤ 10.00	1.500	0.87	≤ 20	Pass
			2480	1	0.934	≤ 10.00	1.500	-37.73	≤ 20	Pass

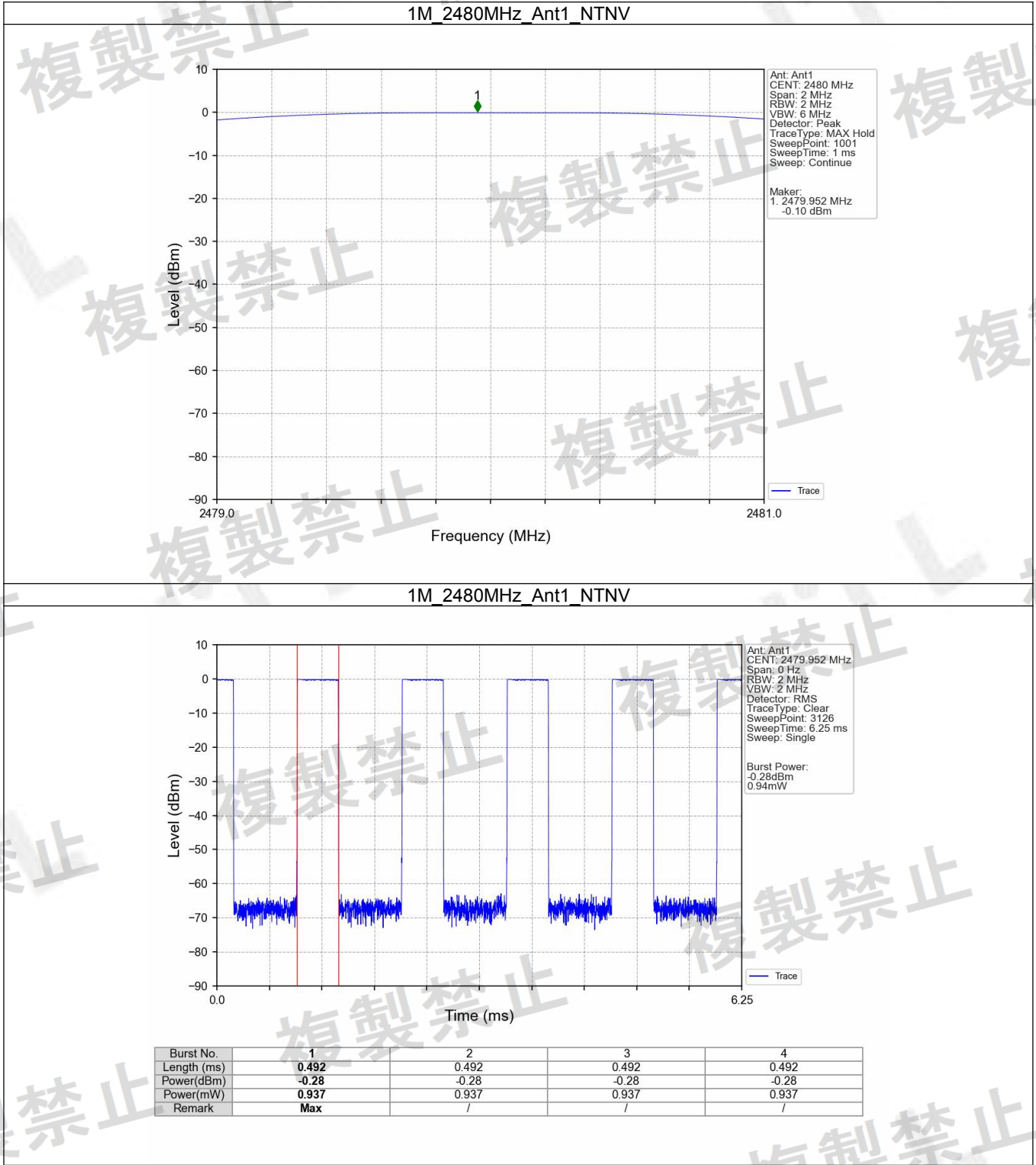
3.1.2 EIRP

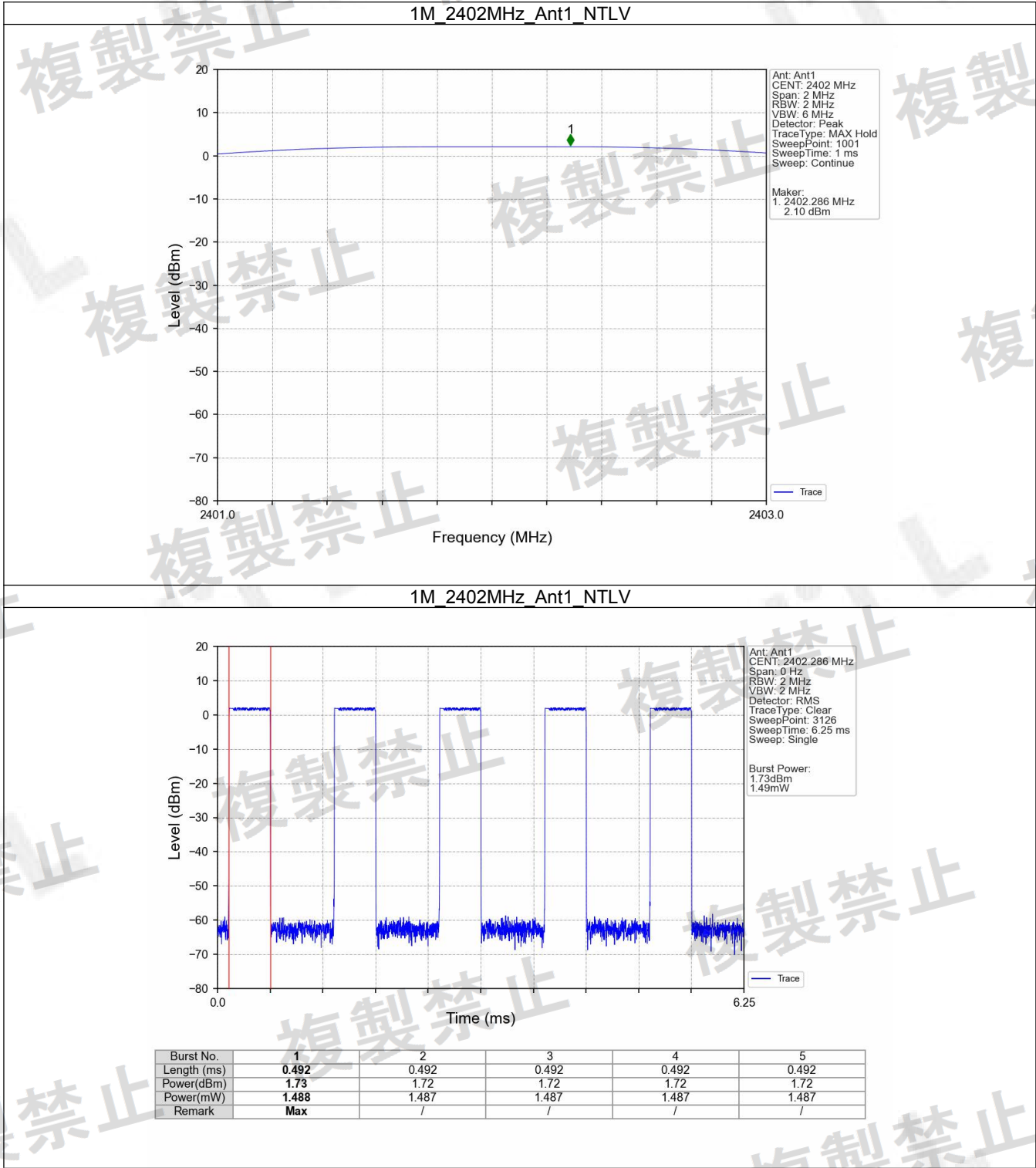
ENV	Mode	TX Type	Frequency (MHz)	ANT	Gain (dBi)	EIRP (dBm)		Verdict
						Result	Limit	
NTNV	1M	SISO	2402	1	0.00	1.83	≤ 12.14	Pass
			2480	1	0.00	-0.28	≤ 12.14	Pass
NTLV	1M	SISO	2402	1	0.00	1.73	≤ 12.14	Pass
			2480	1	0.00	-0.31	≤ 12.14	Pass
NTHV	1M	SISO	2402	1	0.00	1.80	≤ 12.14	Pass
			2480	1	0.00	-0.30	≤ 12.14	Pass

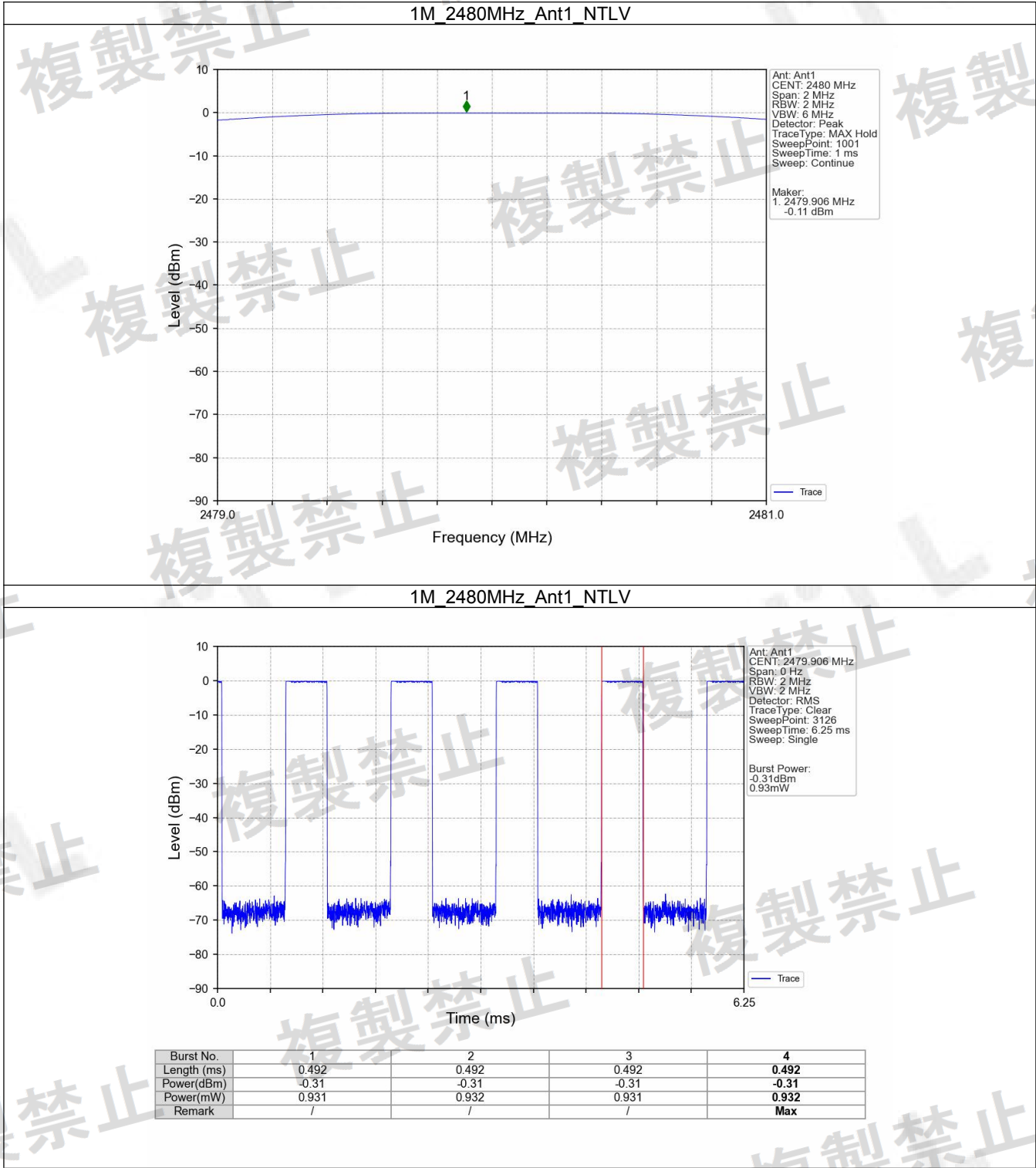
3.2 Test Graph

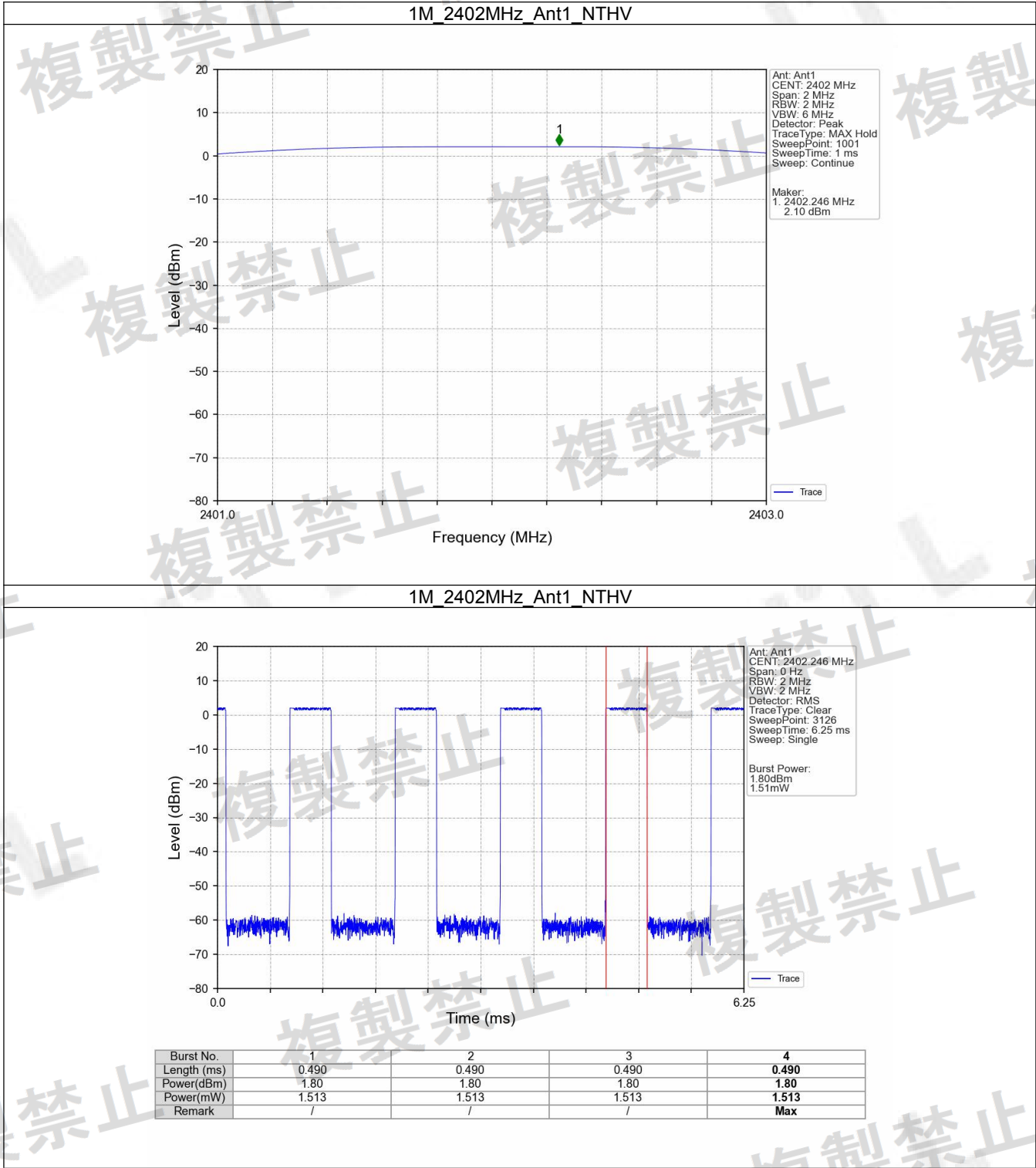
3.2.1 Power

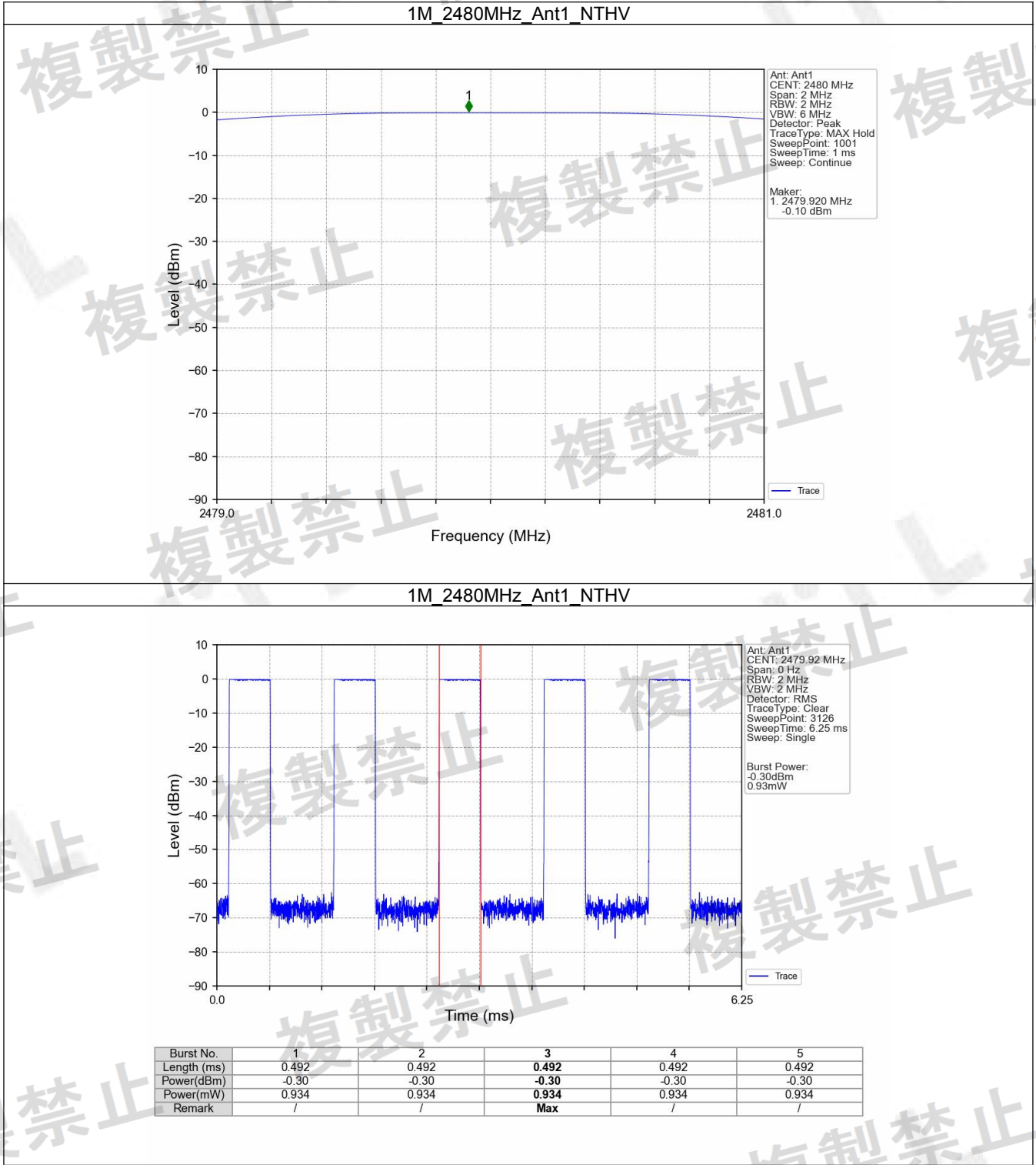












4. Spurious Emission Intensity

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	2339	-36.25	0.237	/	/	2.5	Pass
				2387	2400	2399.974	-25.21	3.013	/	/	25	Pass
				2483.5	2496.5	2492.418	-58.30	0.001	/	/	25	Pass
				2496.5	12500	5743.5	-44.08	0.039	/	/	2.5	Pass
		2480	1	30	2387	2352.5	-47.68	0.017	/	/	2.5	Pass
				2387	2400	2397.673	-57.73	0.002	/	/	25	Pass
				2483.5	2496.5	2495.278	-55.37	0.003	/	/	25	Pass
				2496.5	12500	2545	-39.20	0.120	/	/	2.5	Pass

4.1.2 TxSe_NTLV

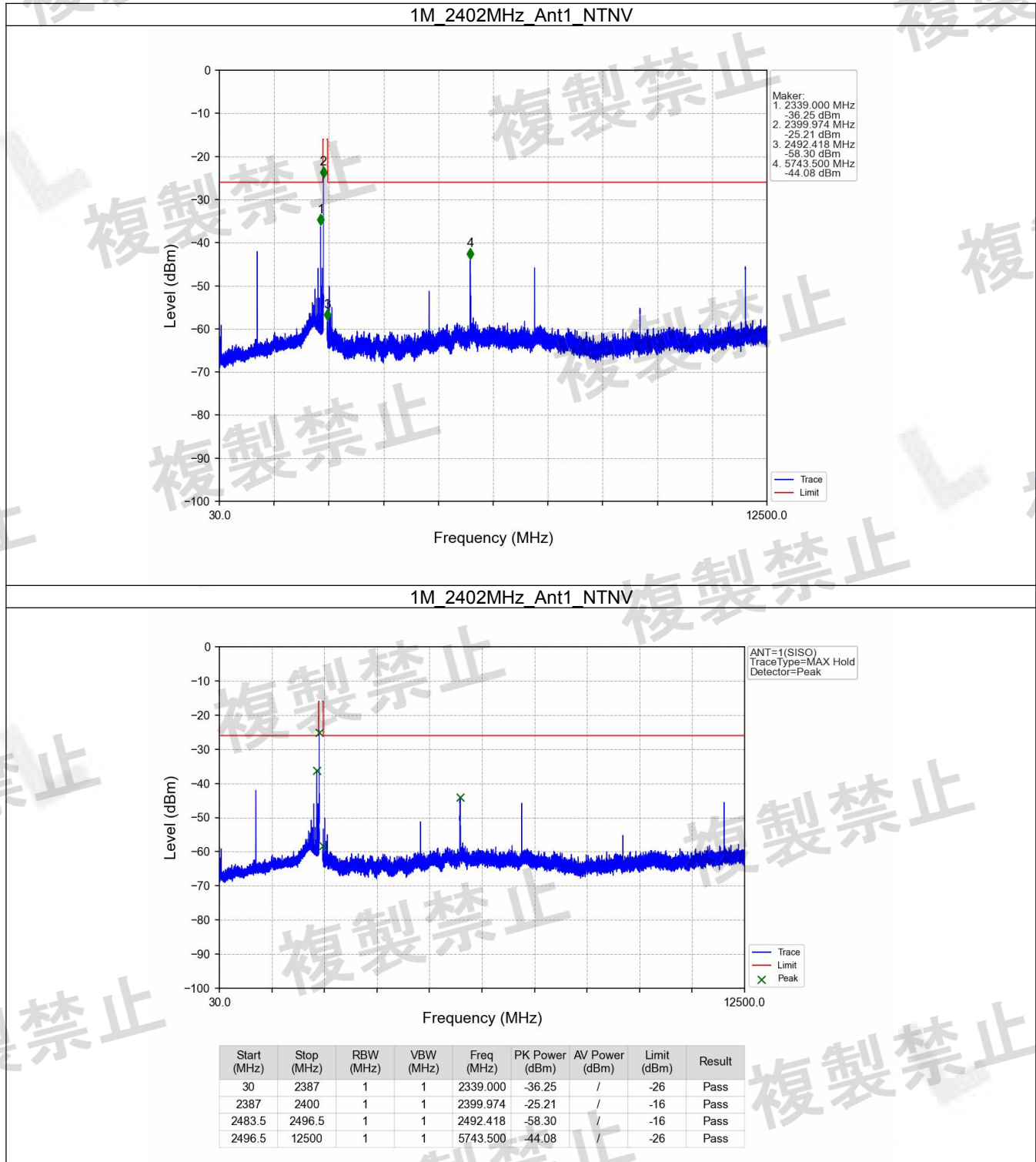
NTLV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
1M	SISO	2402	1	30	2387	2339	-36.22	0.239	/	/	2.5	Pass
				2387	2400	2399.987	-24.96	3.192	/	/	25	Pass
				2483.5	2496.5	2494.771	-59.19	0.001	/	/	25	Pass
				2496.5	12500	2519.5	-37.63	0.173	/	/	2.5	Pass
		2480	1	30	2387	2353	-47.56	0.018	/	/	2.5	Pass
				2387	2400	2398.128	-57.34	0.002	/	/	25	Pass
				2483.5	2496.5	2483.513	-54.96	0.003	/	/	25	Pass
				2496.5	12500	2544.5	-39.27	0.118	/	/	2.5	Pass

4.1.3 TxSe_NTHV

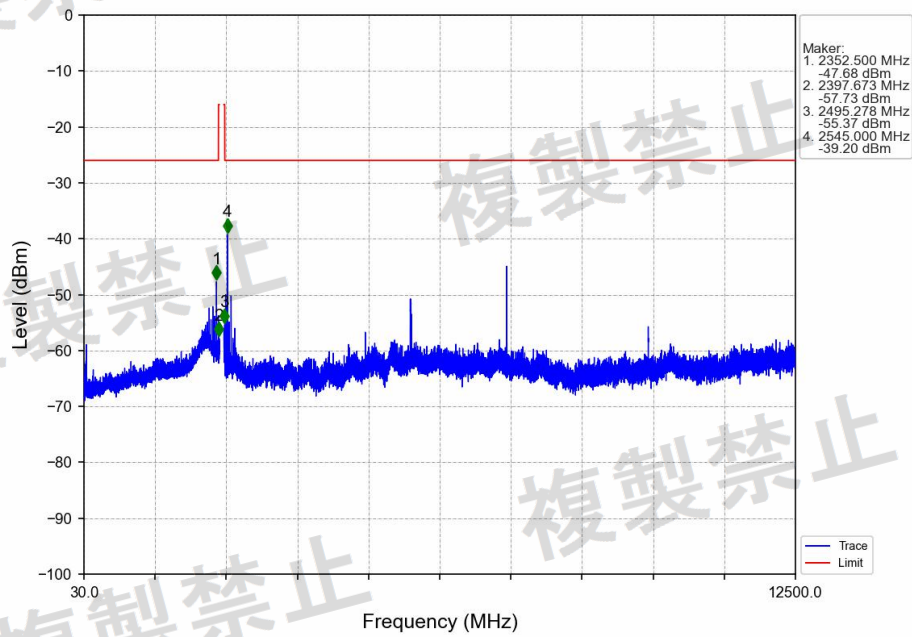
NTHV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
1M	SISO	2402	1	30	2387	2338.5	-36.30	0.234	/	/	2.5	Pass
				2387	2400	2399.974	-25.47	2.838	/	/	25	Pass
				2483.5	2496.5	2490.546	-58.94	0.001	/	/	25	Pass
				2496.5	12500	12012	-44.97	0.032	/	/	2.5	Pass
		2480	1	30	2387	2353	-48.29	0.015	/	/	2.5	Pass
				2387	2400	2396.815	-57.33	0.002	/	/	25	Pass
				2483.5	2496.5	2483.838	-54.92	0.003	/	/	25	Pass
				2496.5	12500	2544.5	-39.32	0.117	/	/	2.5	Pass

4.2 Test Graph

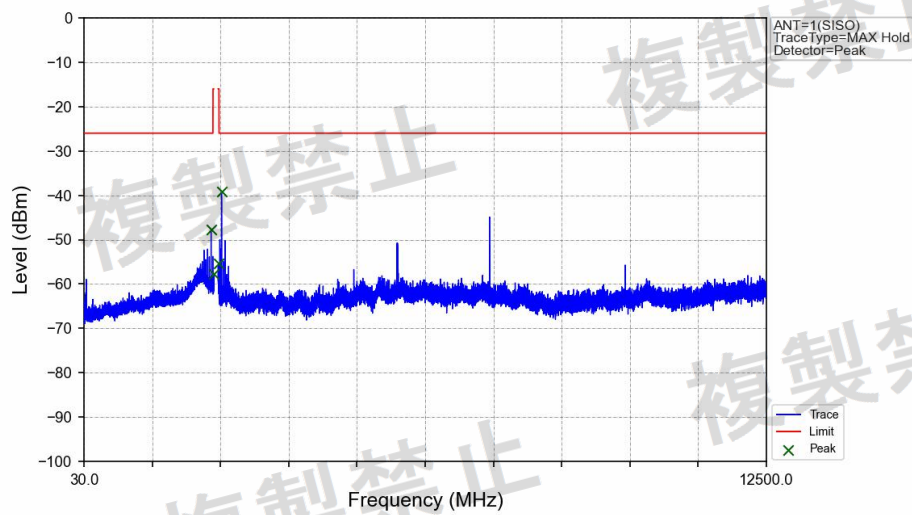
4.2.1 TxSe_NTNV



1M_2480MHz_Ant1_NTNV

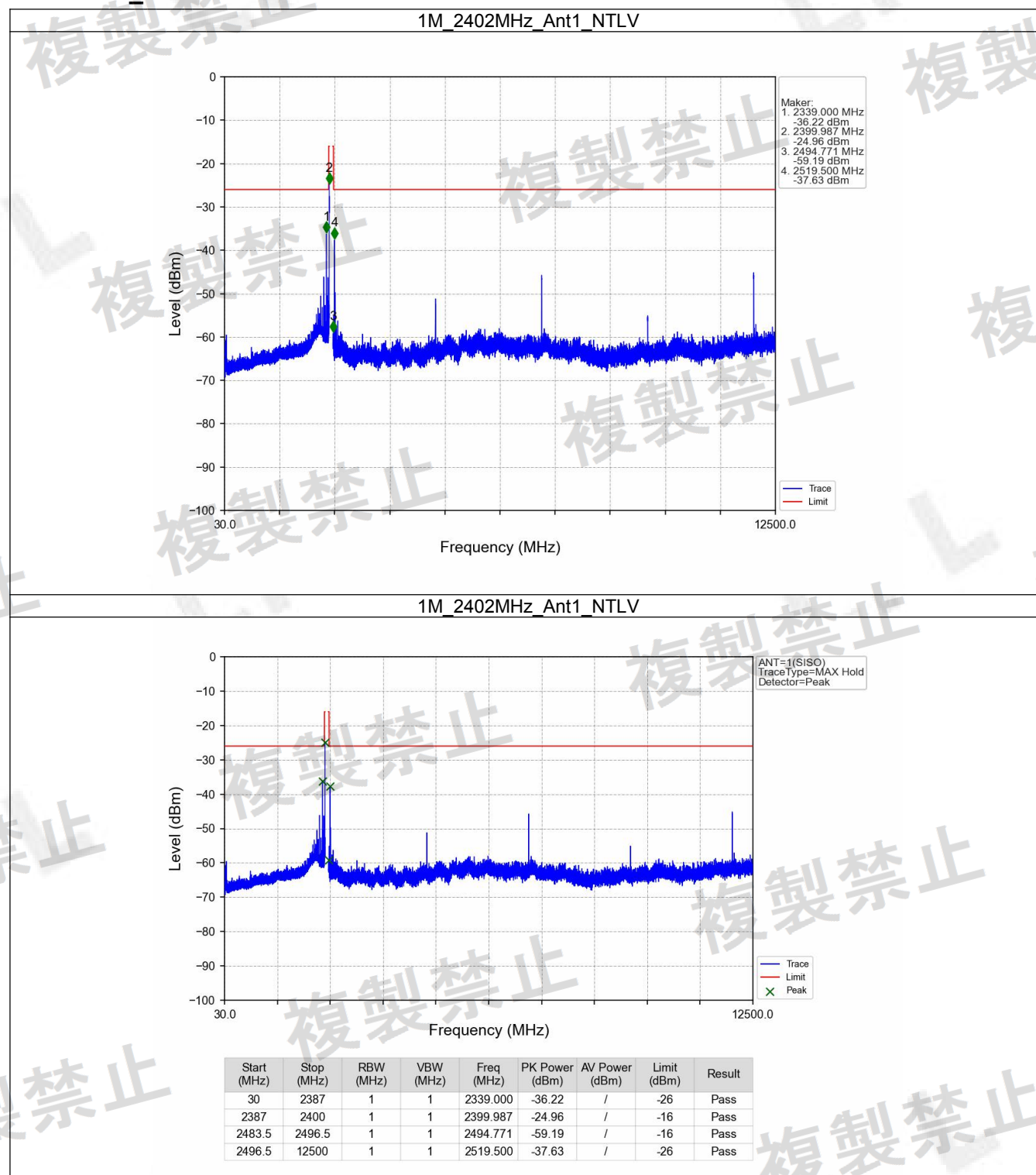


1M_2480MHz_Ant1_NTNV

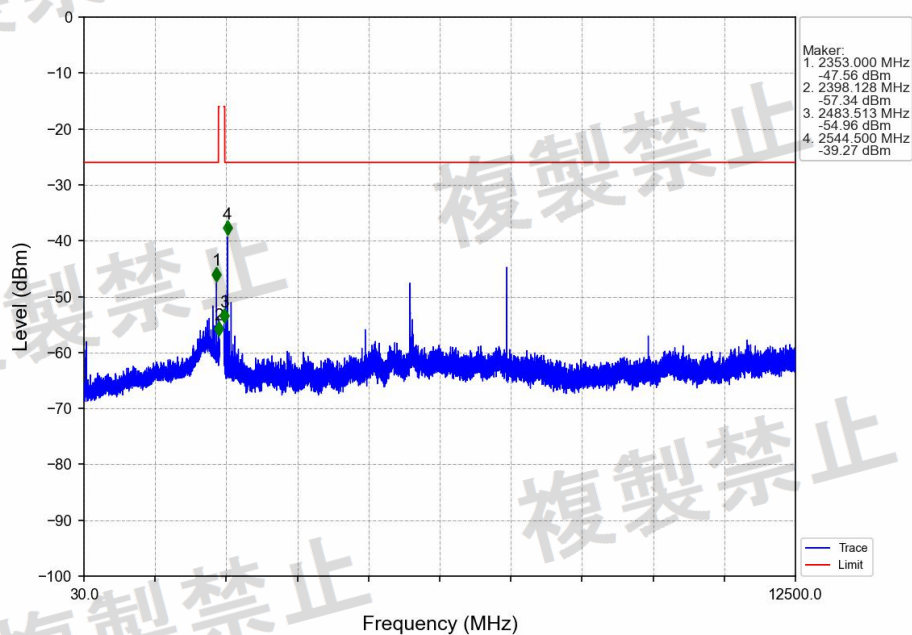


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2352.500	-47.68	/	-26	Pass
2387	2400	1	1	2397.673	-57.73	/	-16	Pass
2483.5	2496.5	1	1	2495.278	-55.37	/	-16	Pass
2496.5	12500	1	1	2545.000	-39.20	/	-26	Pass

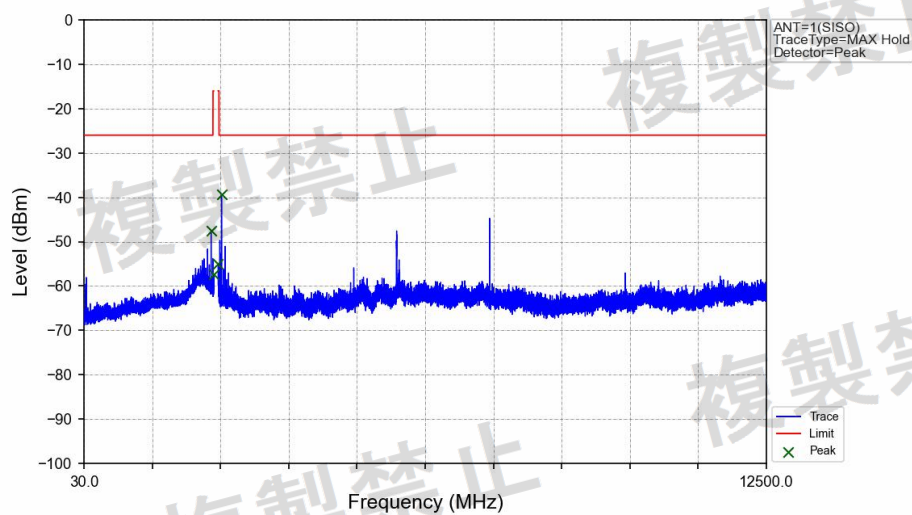
4.2.2 TxSe_NTLV



1M_2480MHz_Ant1_NTLV

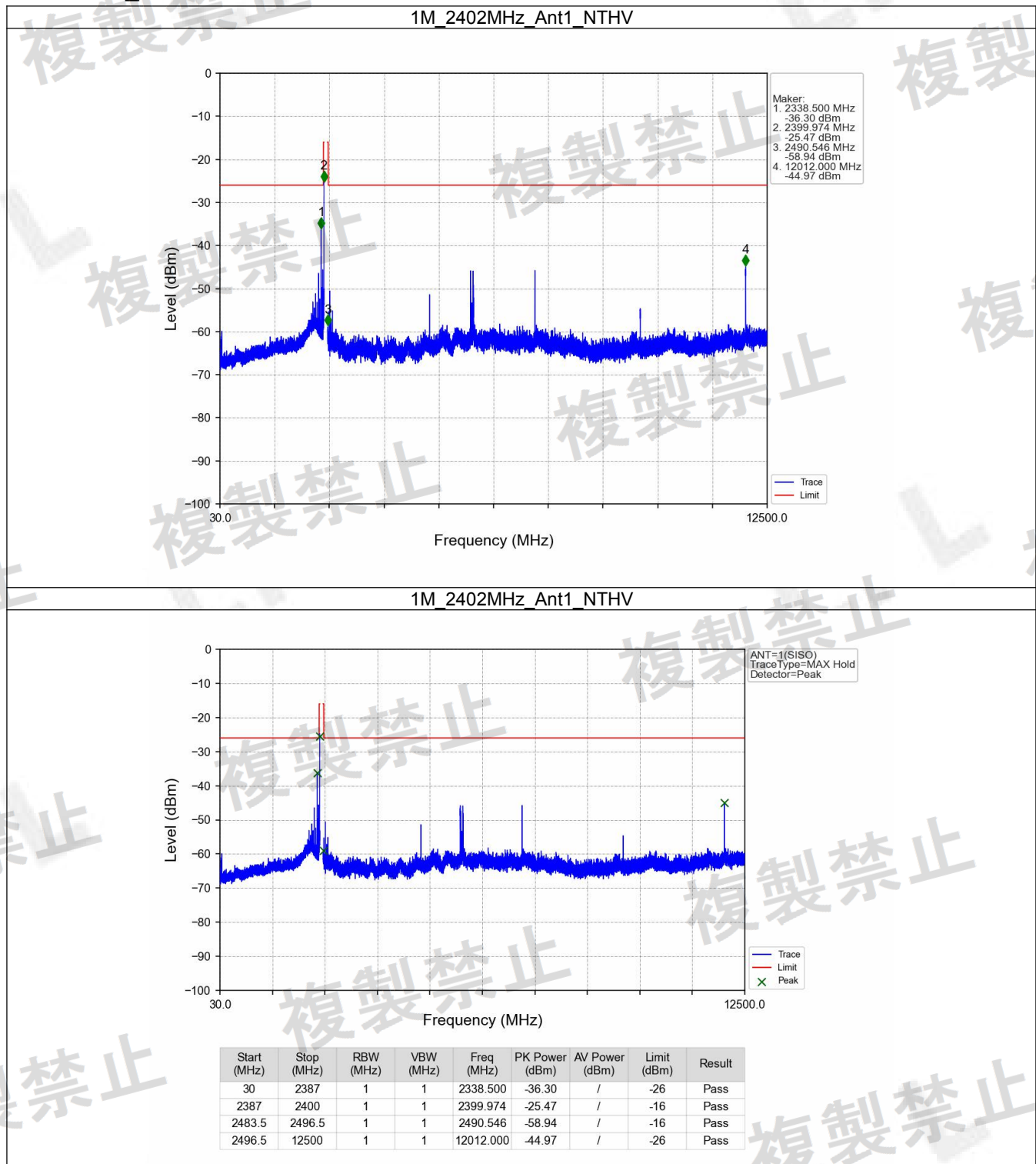


1M_2480MHz_Ant1_NTLV

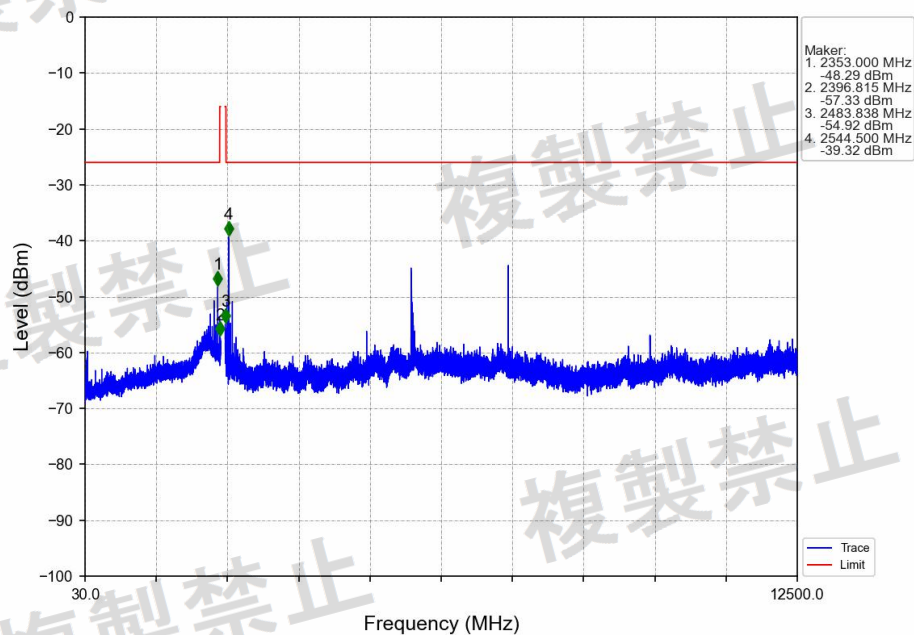


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2353.000	-47.56	/	-26	Pass
2387	2400	1	1	2398.128	-57.34	/	-16	Pass
2483.5	2496.5	1	1	2483.513	-54.96	/	-16	Pass
2496.5	12500	1	1	2544.500	-39.27	/	-26	Pass

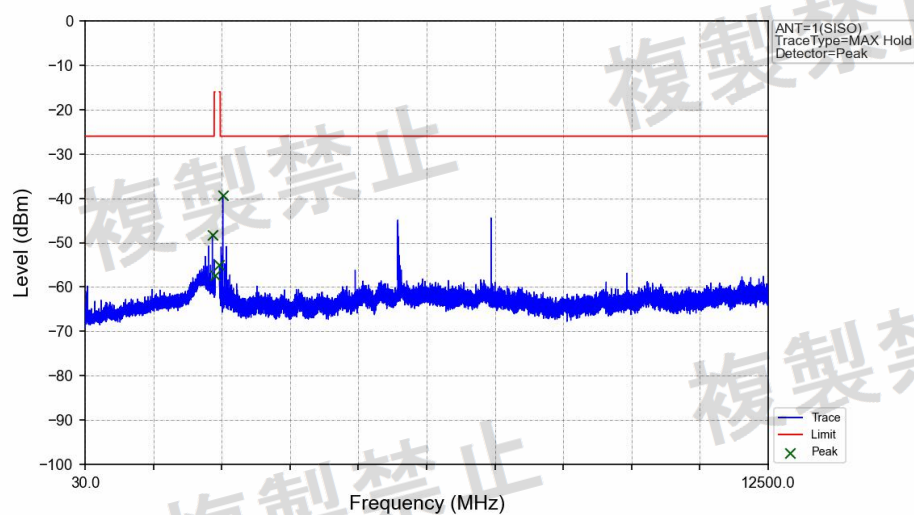
4.2.3 TxSe_NTHV



1M_2480MHz_Ant1_NTHV



1M_2480MHz_Ant1_NTHV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2353.000	-48.29	/	-26	Pass
2387	2400	1	1	2396.815	-57.33	/	-16	Pass
2483.5	2496.5	1	1	2483.838	-54.92	/	-16	Pass
2496.5	12500	1	1	2544.500	-39.32	/	-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	73.95	-65.40	0.288	/	/	4	Pass
						2408	-54.07	3.917	-79.39	0.012	20	Pass
		2480	1	1000	12500	2411	-49.03	12.503	-79.35	0.012	20	Pass
						2416.5	-56.75	2.113	-79.29	0.012	20	Pass
				30	1000	71.15	-65.80	0.263	/	/	4	Pass
				1000	12500	5818	-62.97	0.505	/	/	20	Pass

5.1.2 RxSe_NTLV

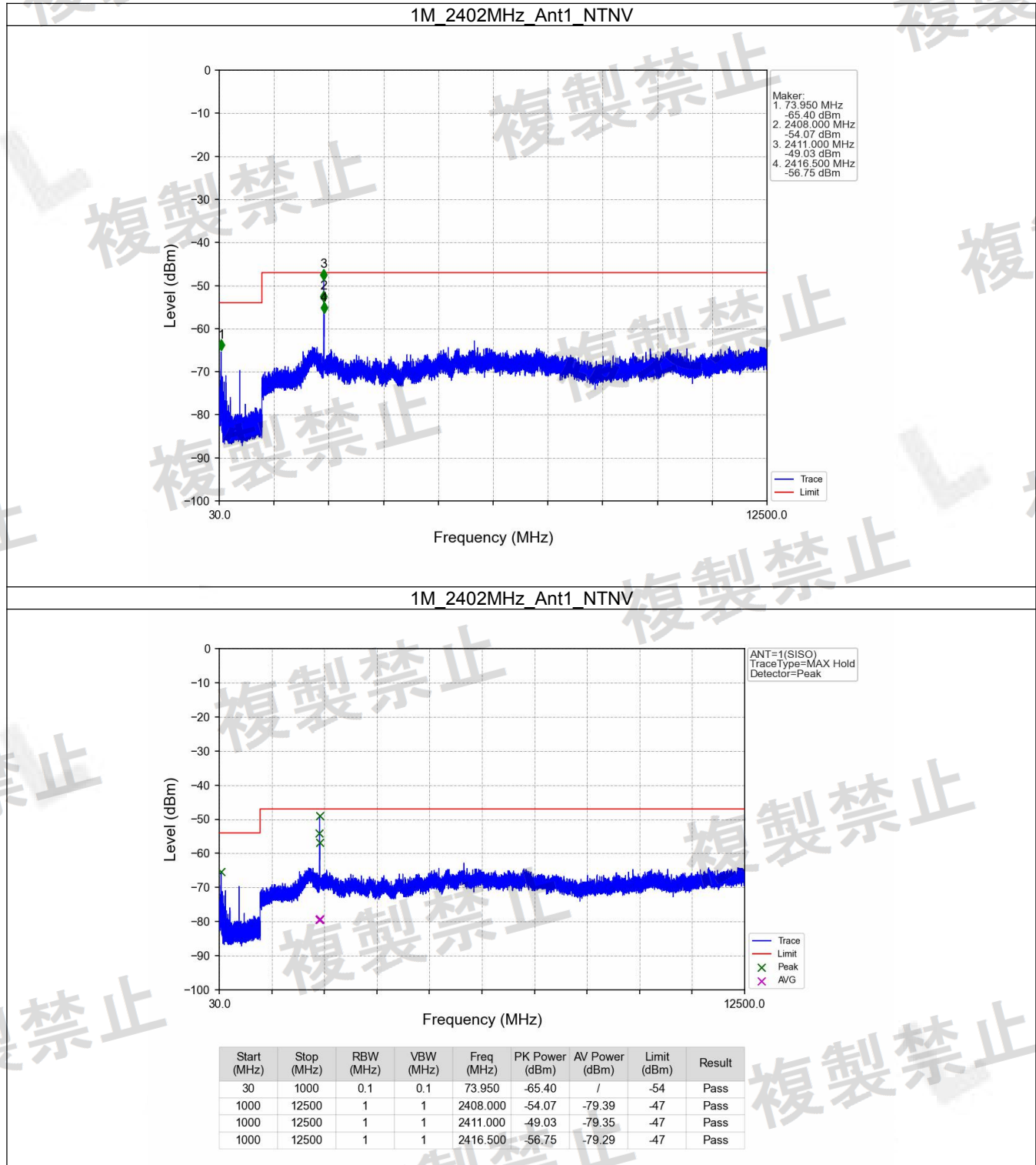
NTLV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
1M	SISO	2402	1	30	1000	74	-65.75	0.266	/	/	4	Pass
						2408	-53.87	4.102	-68.86	0.130	20	Pass
		2480	1	1000	12500	2411	-49.02	12.531	-79.36	0.012	20	Pass
				30	1000	75	-65.62	0.274	/	/	4	Pass
				1000	12500	2410.5	-48.93	12.794	-71.59	0.069	20	Pass

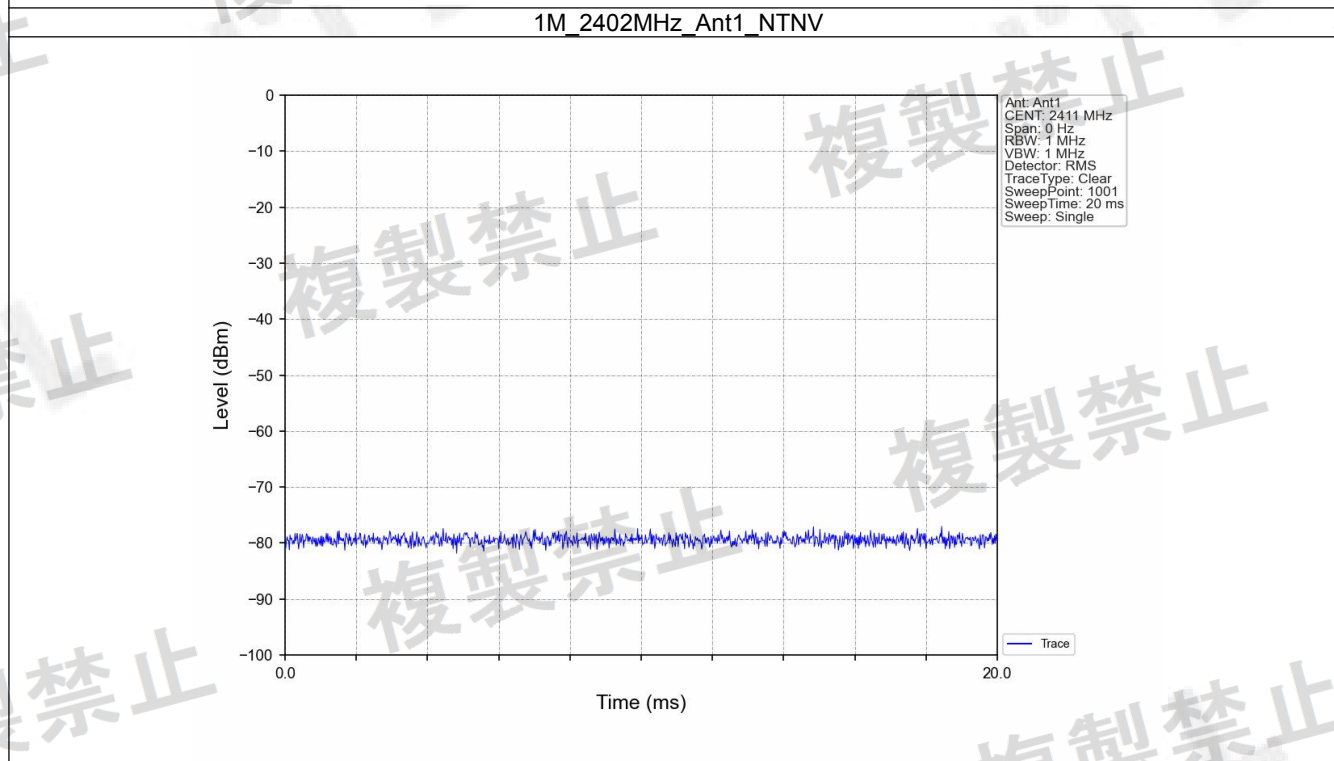
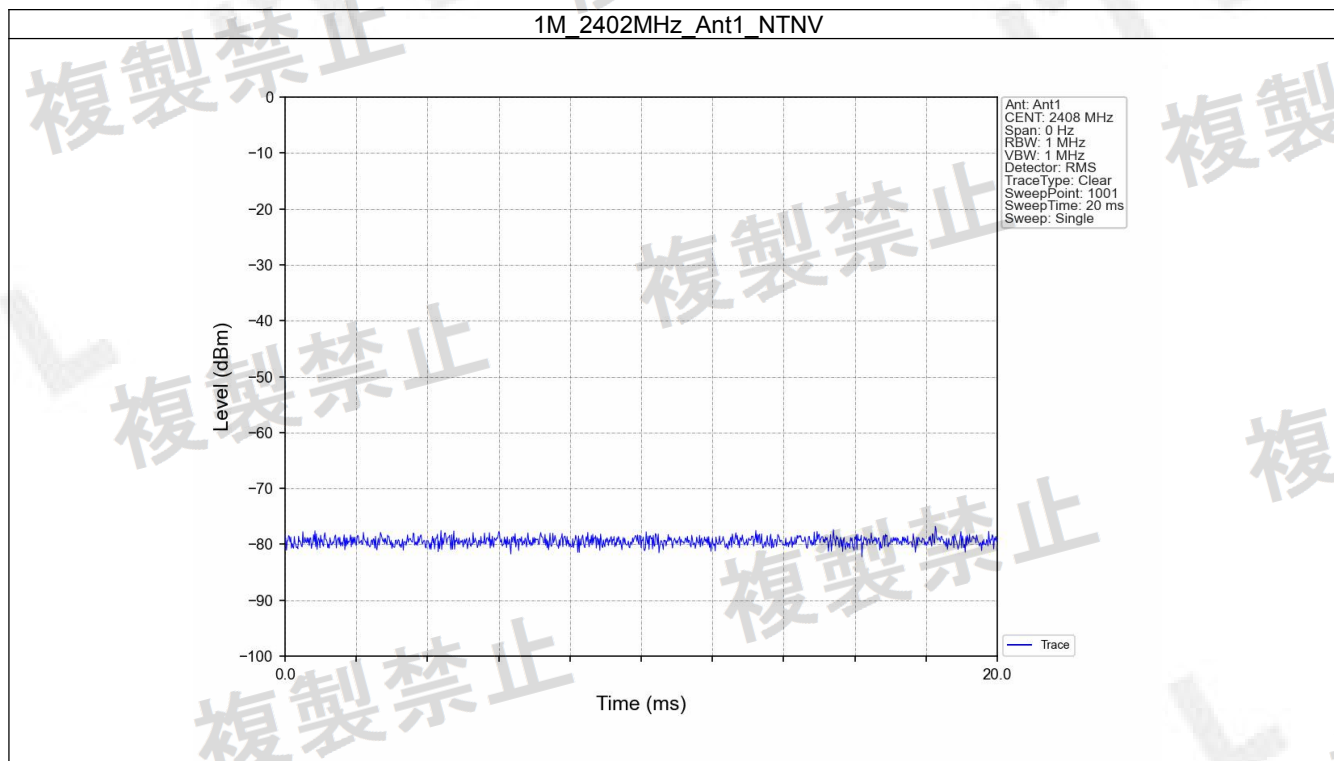
5.1.3 RxSe_NTHV

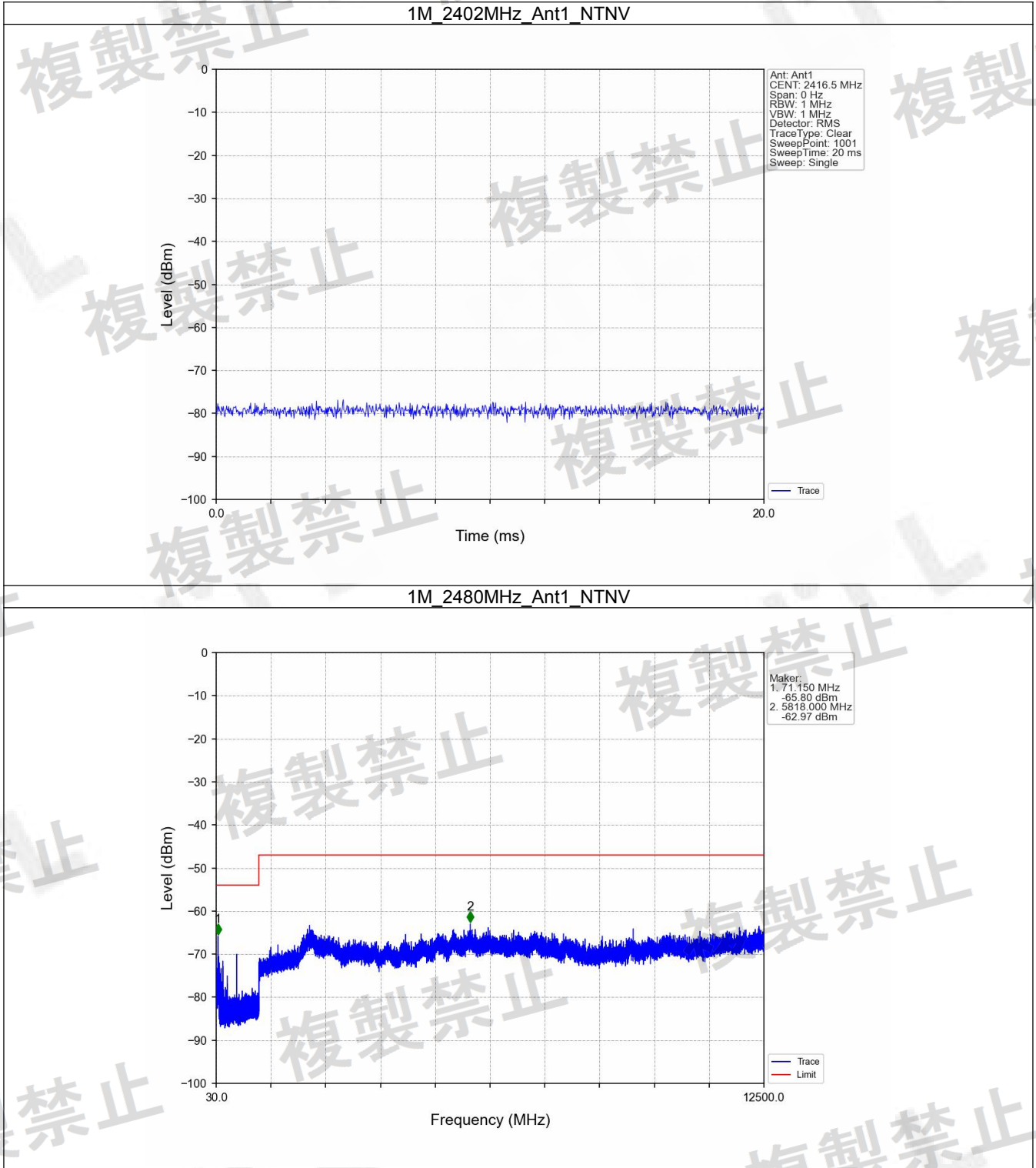
NTHV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
1M	SISO	2402	1	30	1000	75.05	-66.11	0.245	/	/	4	Pass
				1000	12500	12407.5	-62.77	0.528	/	/	20	Pass
		2480	1	30	1000	71.15	-65.60	0.275	/	/	4	Pass
						2408	-54.05	3.936	-79.40	0.011	20	Pass
				1000	12500	2411	-49.01	12.560	-79.31	0.012	20	Pass

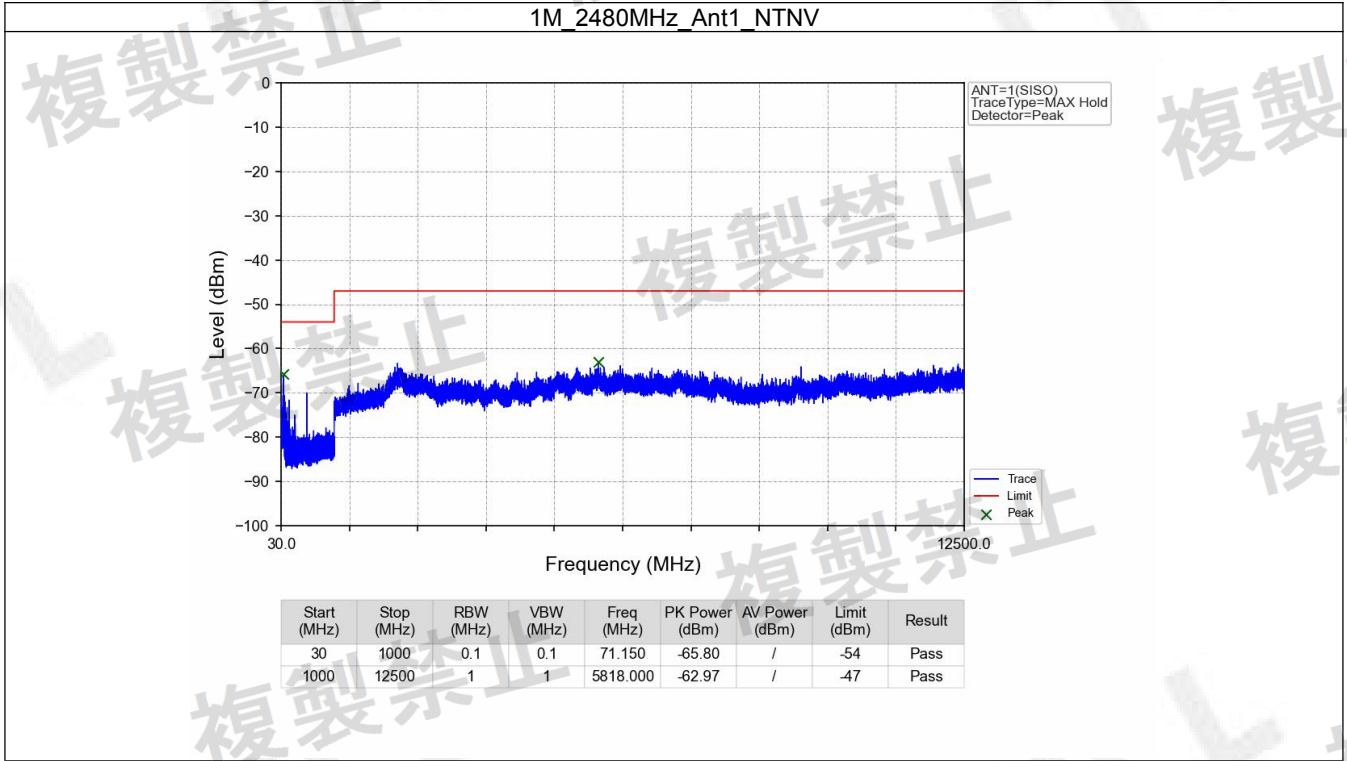
5.2 Test Graph

5.2.1 RxSe_NTNV

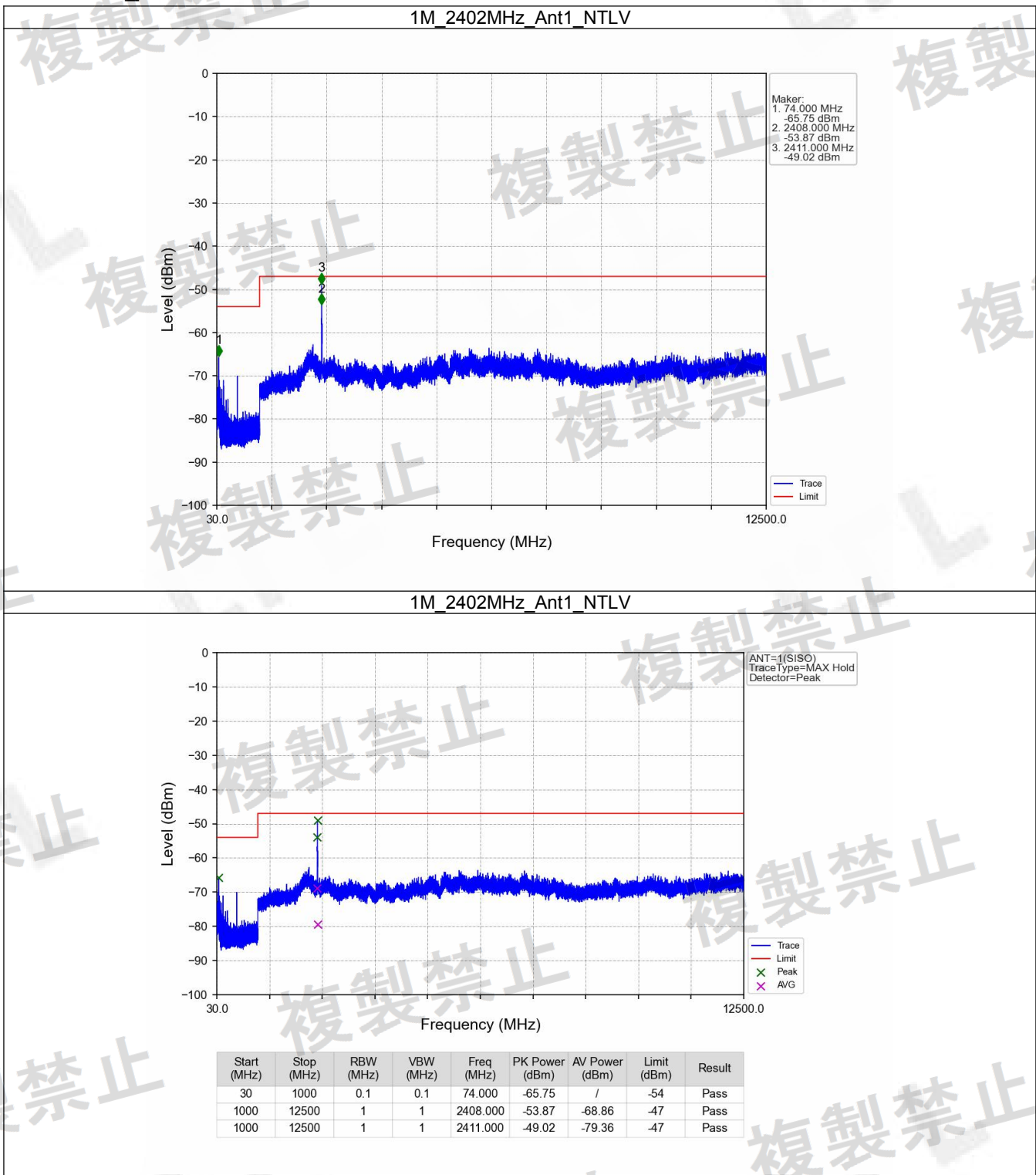


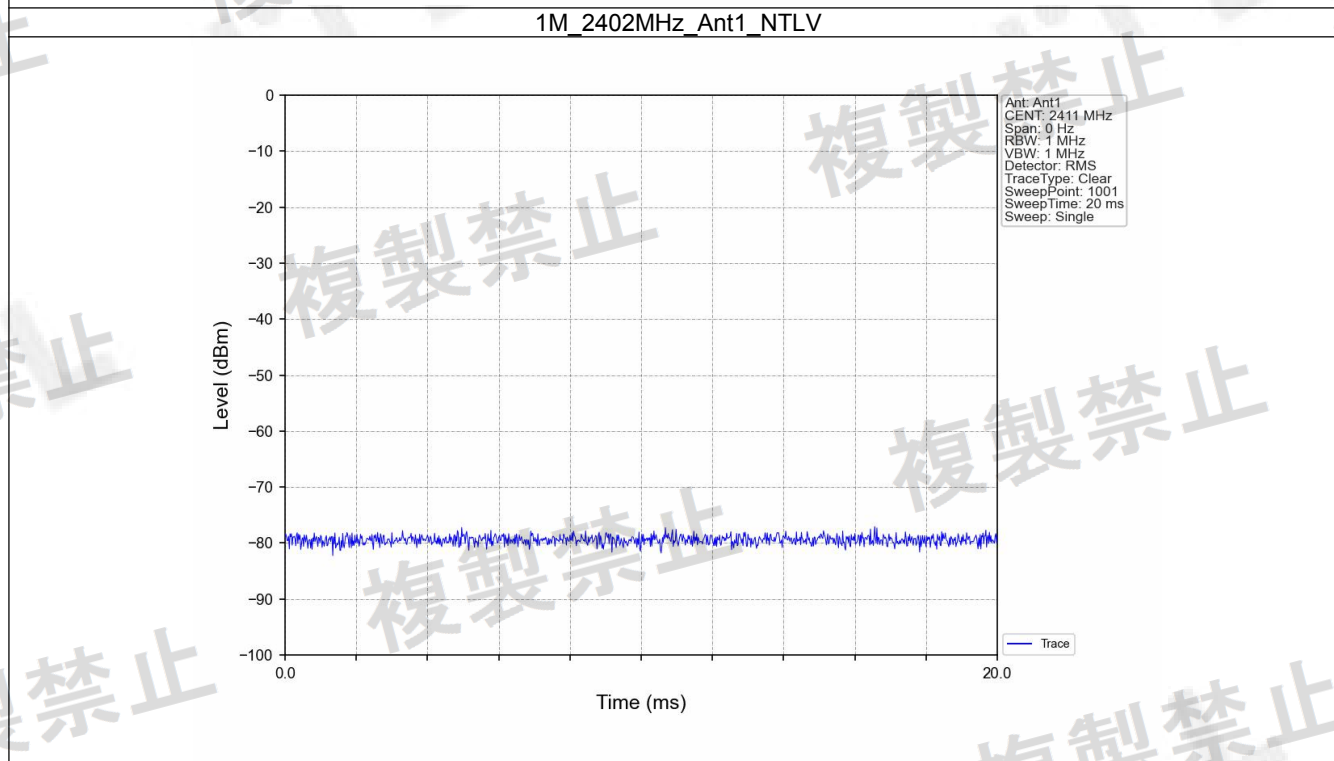
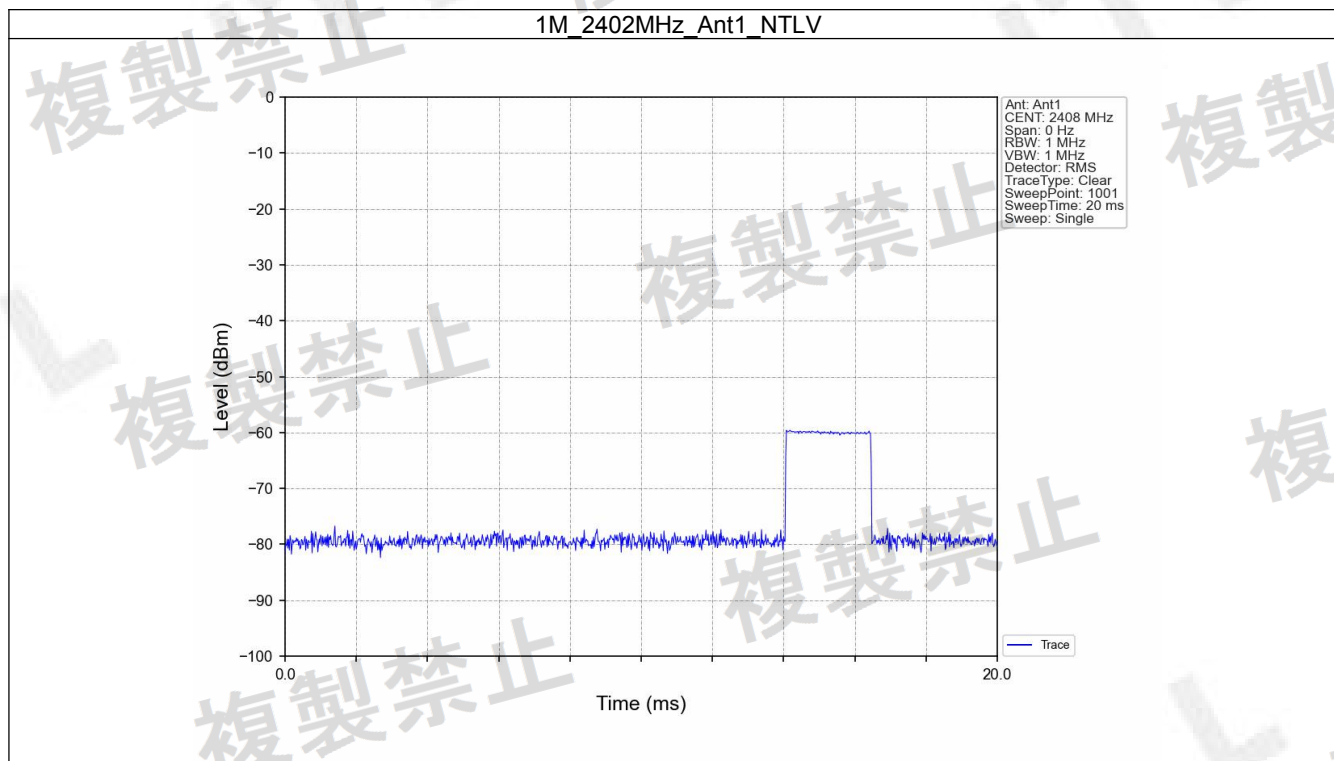


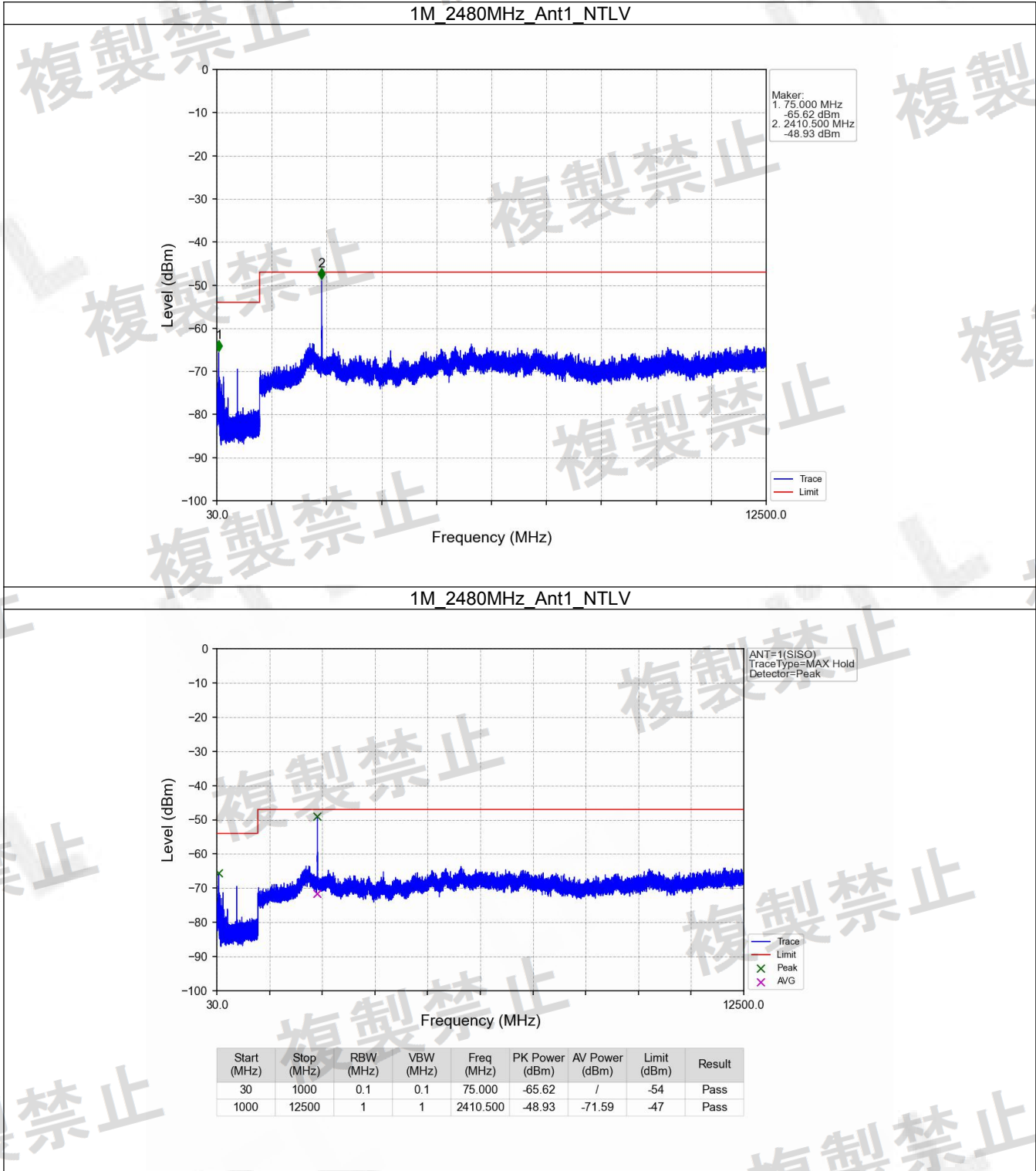


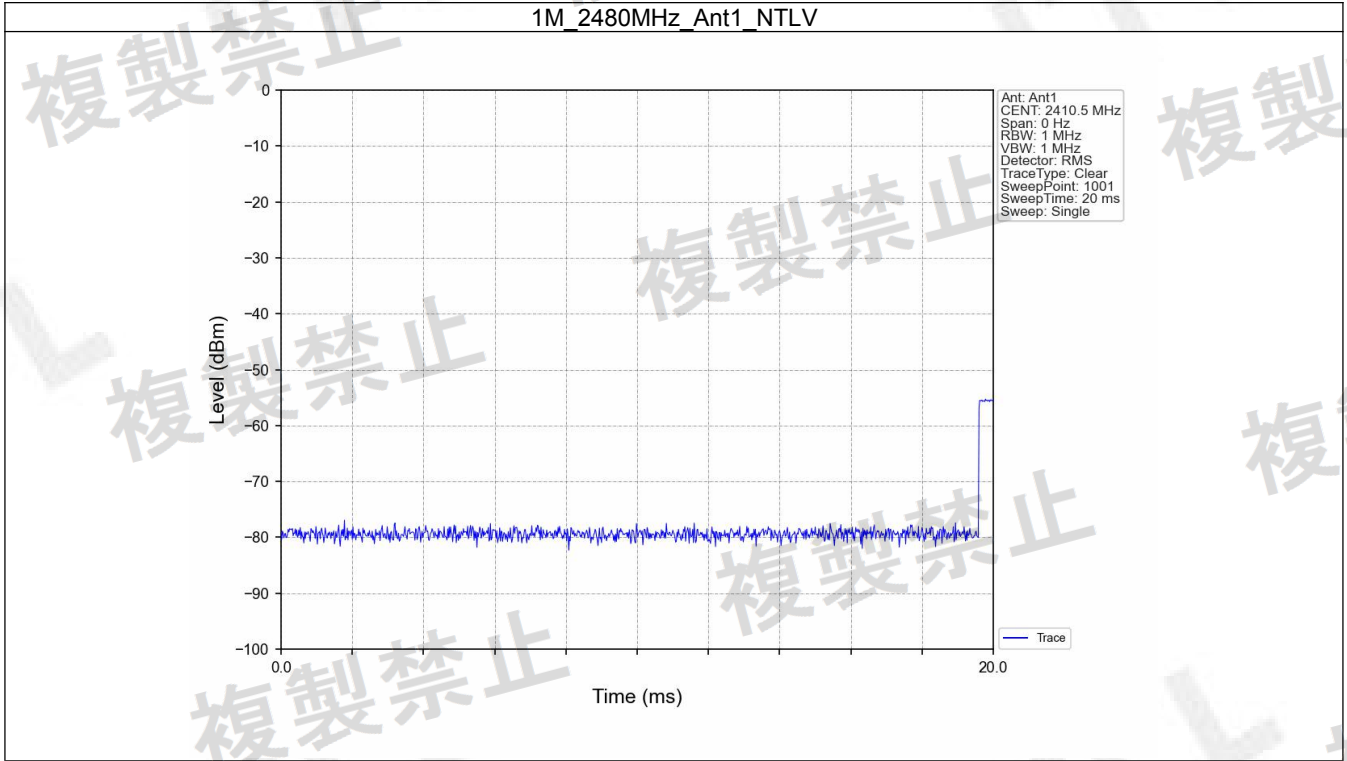


5.2.2 RxSe_NTLV









5.2.3 RxSe_NTHV

