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Annex for Bluetooth Low Energy

Test Report No.: CTL2601202042-MIC

TABLE OF CONTENTS

1. Frequency Error.....	3
1.1 Test Result.....	3
1.1.1 Ant1.....	3
1.2 Test Graph.....	4
1.2.1 Ant1.....	4
2. Occupied Bandwidth.....	7
2.1 Test Result.....	7
2.1.1 OBW.....	7
2.2 Test Graph.....	8
2.2.1 OBW.....	8
3. Antenna Power.....	14
3.1 Test Result.....	14
3.1.1 Power.....	14
3.1.2 EIRP.....	14

3.2 Test Graph.....	15
3.2.1 Power.....	15
4. Spurious Emission Intensity.....	27
4.1 Test Result.....	27
4.1.1 TxSe_NTNV.....	27
4.1.2 TxSe_NTLV.....	27
4.1.3 TxSe_NTHV.....	28
4.2 Test Graph.....	29
4.2.1 TxSe_NTNV.....	29
4.2.2 TxSe_NTLV.....	33
4.2.3 TxSe_NTHV.....	38
5. Secondary Radiated Emission.....	43
5.1 Test Result.....	43
5.1.1 RxSe_NTNV.....	43
5.1.2 RxSe_NTLV.....	43
5.1.3 RxSe_NTHV.....	43
5.2 Test Graph.....	44
5.2.1 RxSe_NTNV.....	44
5.2.2 RxSe_NTLV.....	48
5.2.3 RxSe_NTHV.....	52

1. Frequency Error

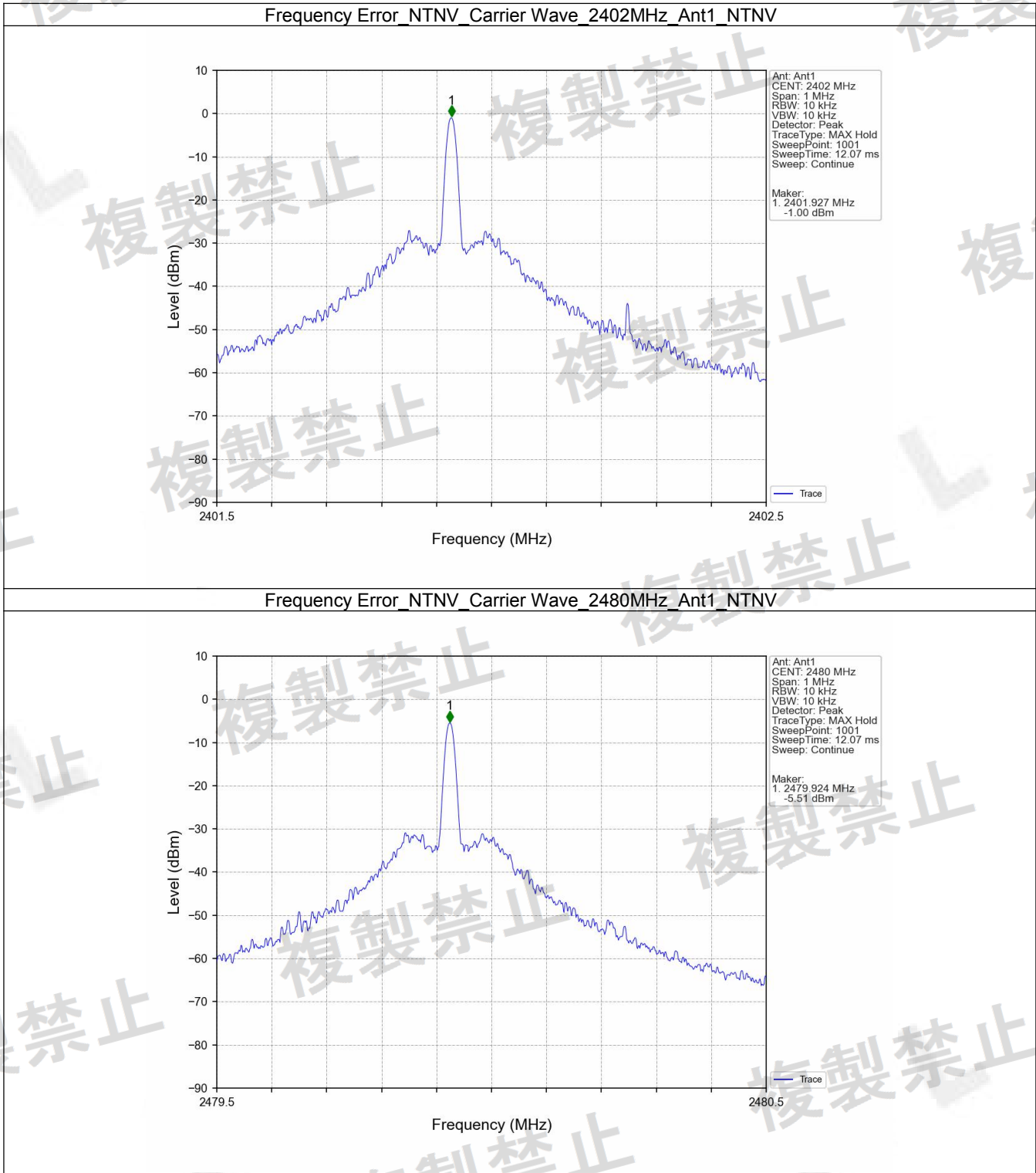
1.1 Test Result

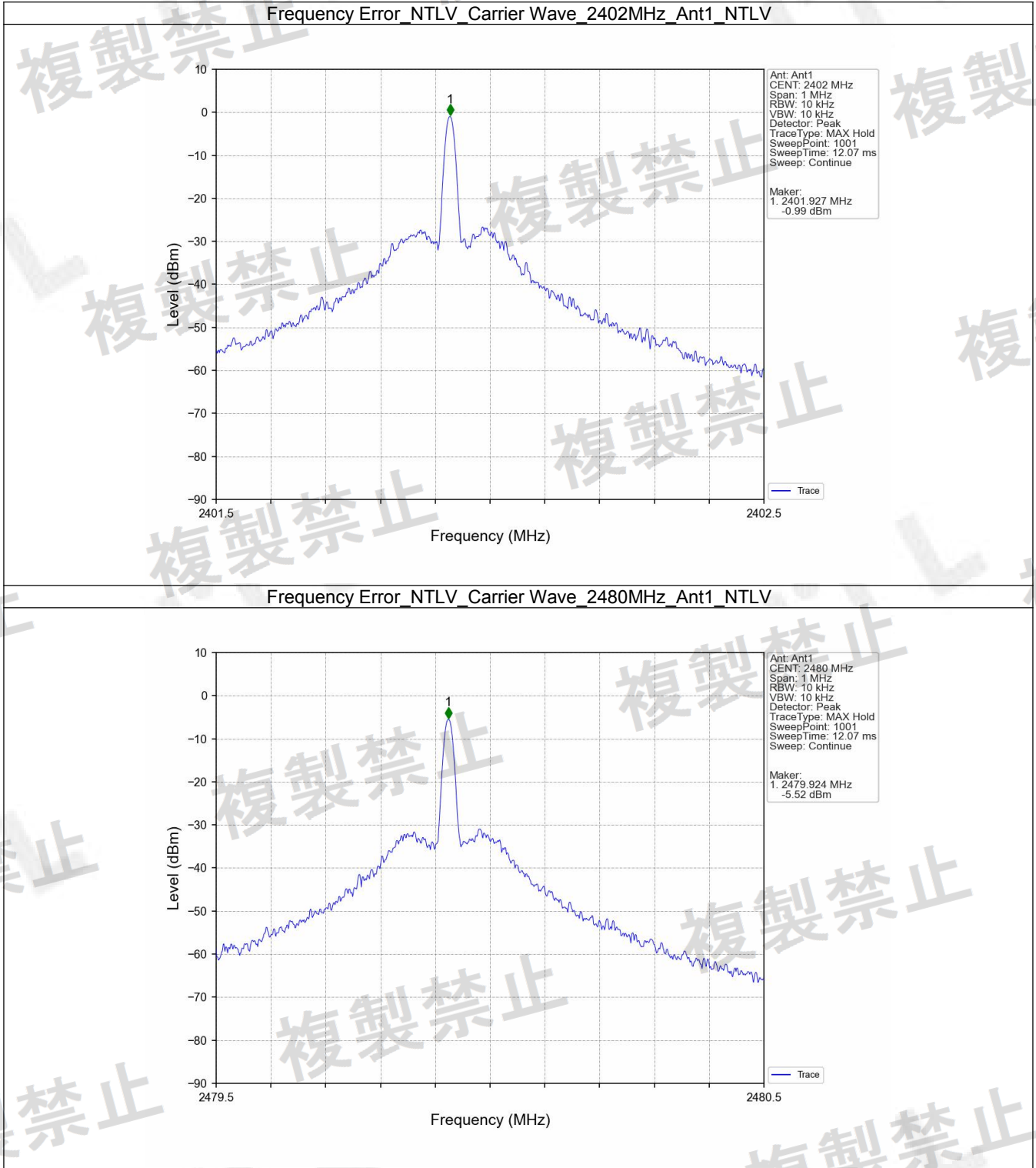
1.1.1 Ant1

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2402	2401.927	-30.39	-50 to 50	Pass
			2480	2479.924	-30.65	-50 to 50	Pass
NTLV	Carrier Wave	SISO	2402	2401.927	-30.39	-50 to 50	Pass
			2480	2479.924	-30.65	-50 to 50	Pass
NTHV	Carrier Wave	SISO	2402	2401.927	-30.39	-50 to 50	Pass
			2480	2479.924	-30.65	-50 to 50	Pass

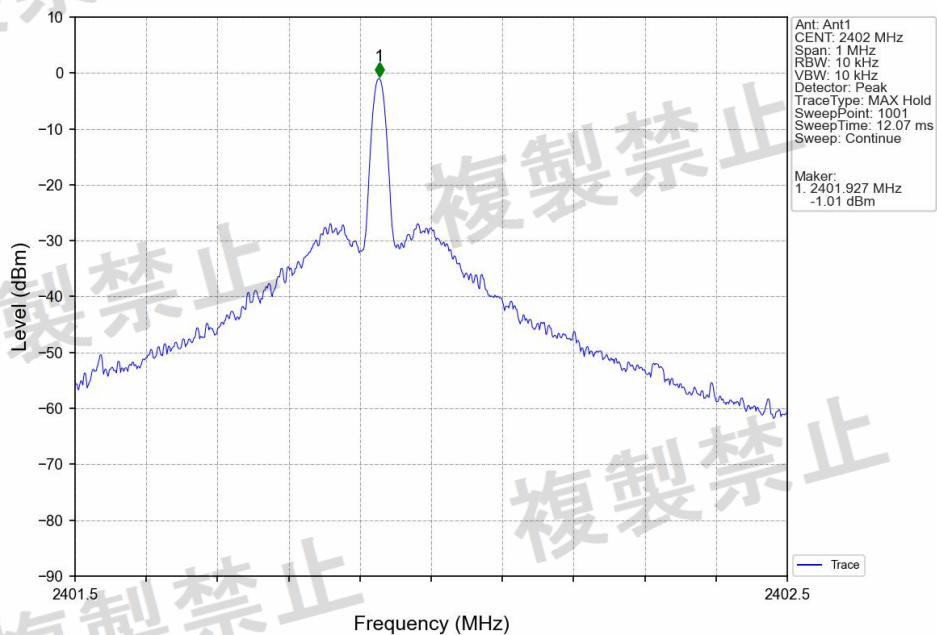
1.2 Test Graph

1.2.1 Ant1

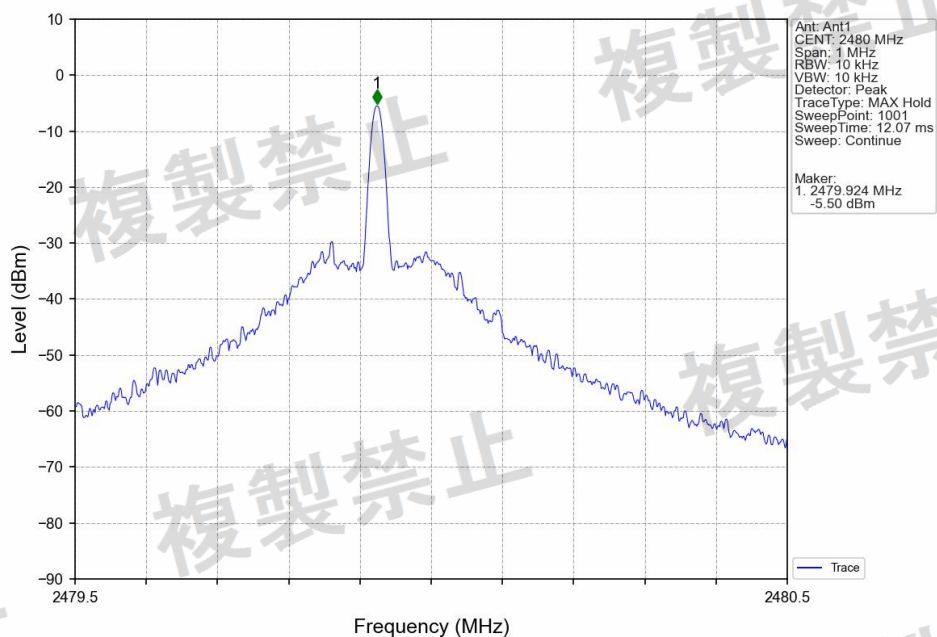




Frequency Error_NTHV_Carrier Wave_2402MHz_Ant1_NTHV



Frequency Error_NTHV_Carrier Wave_2480MHz_Ant1_NTHV



2. Occupied Bandwidth

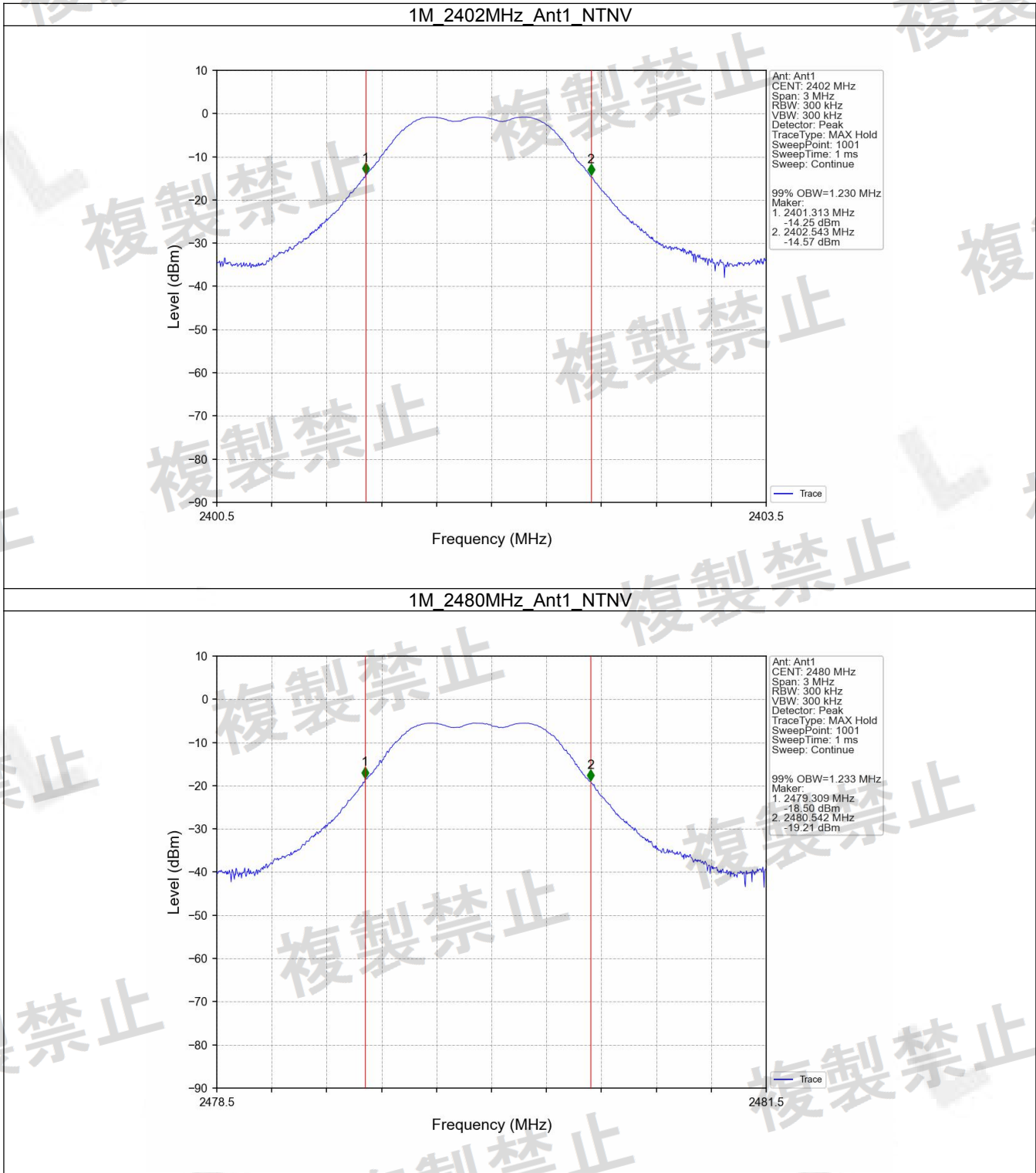
2.1 Test Result

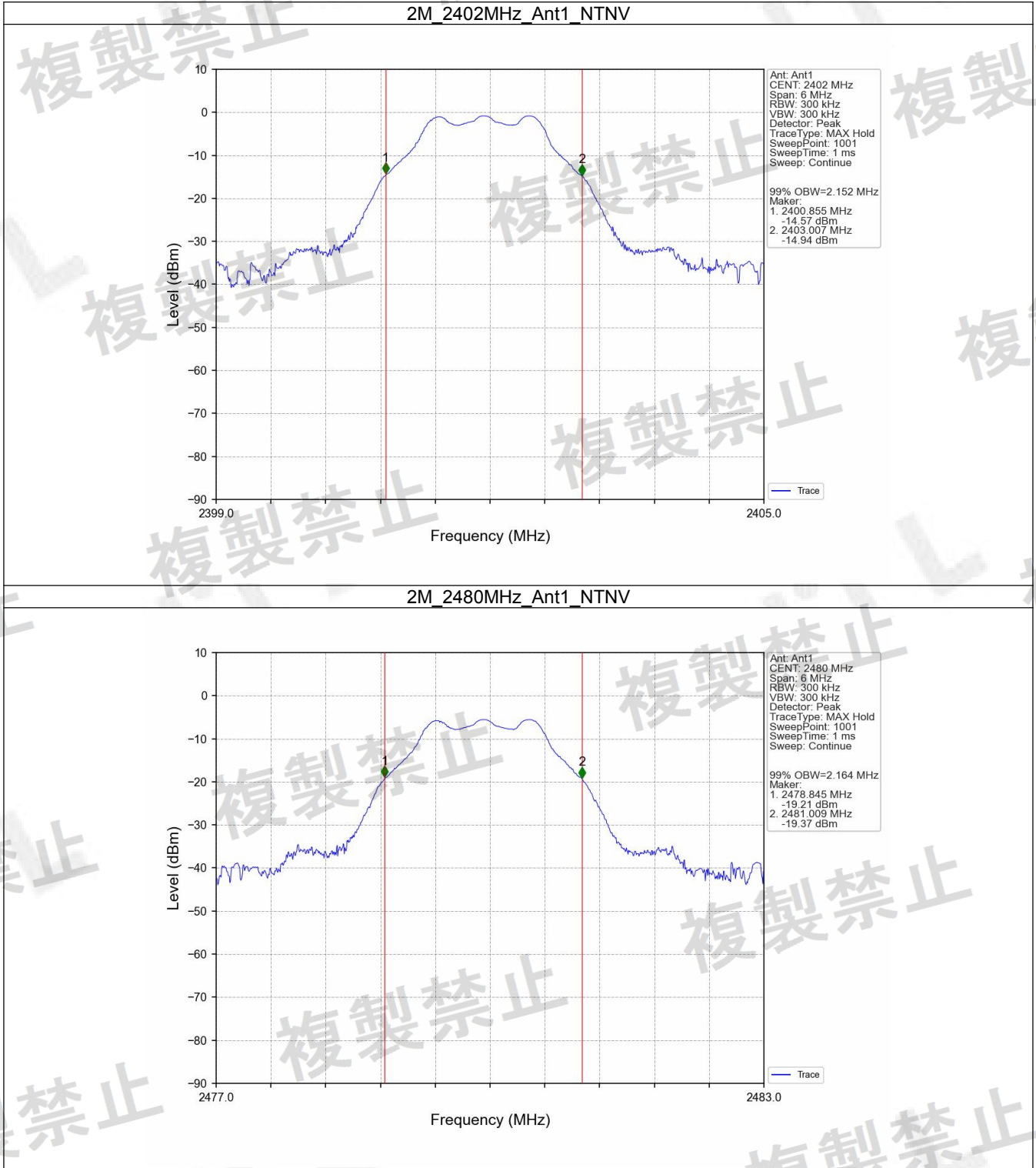
2.1.1 OBW

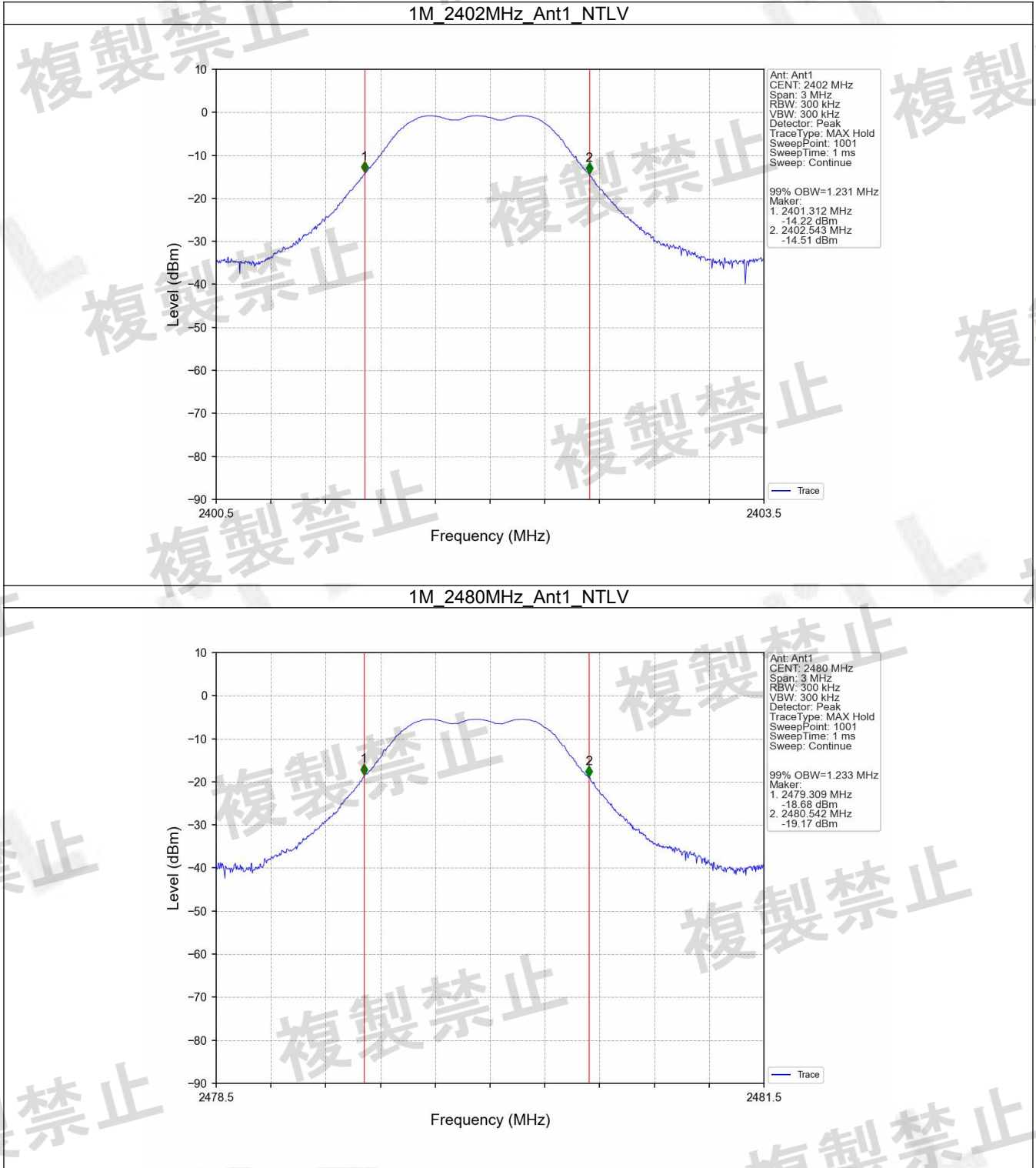
ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	1M	SISO	2402	1.230	<=26	Pass
			2480	1.233	<=26	Pass
	2M	SISO	2402	2.152	<=26	Pass
			2480	2.164	<=26	Pass
NTLV	1M	SISO	2402	1.231	<=26	Pass
			2480	1.233	<=26	Pass
	2M	SISO	2402	2.149	<=26	Pass
			2480	2.167	<=26	Pass
NTHV	1M	SISO	2402	1.230	<=26	Pass
			2480	1.234	<=26	Pass
	2M	SISO	2402	2.149	<=26	Pass
			2480	2.163	<=26	Pass

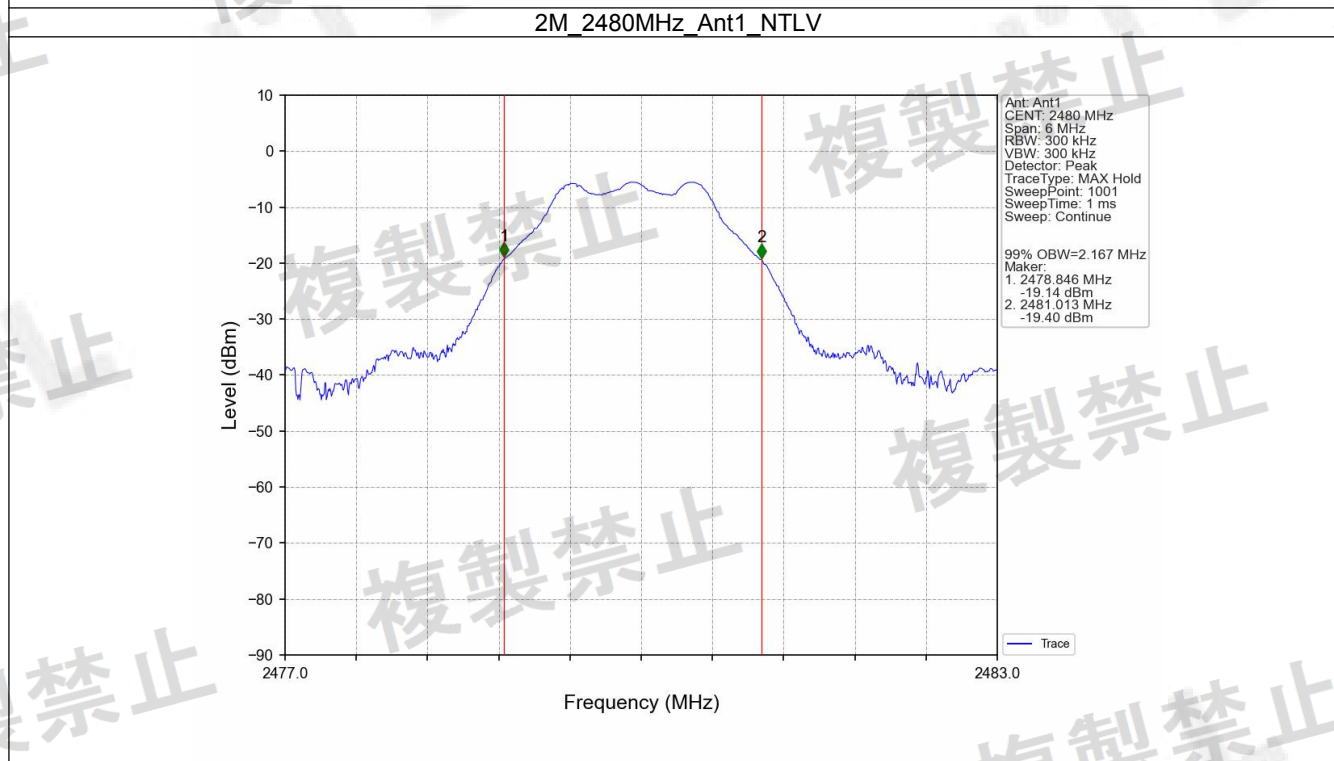
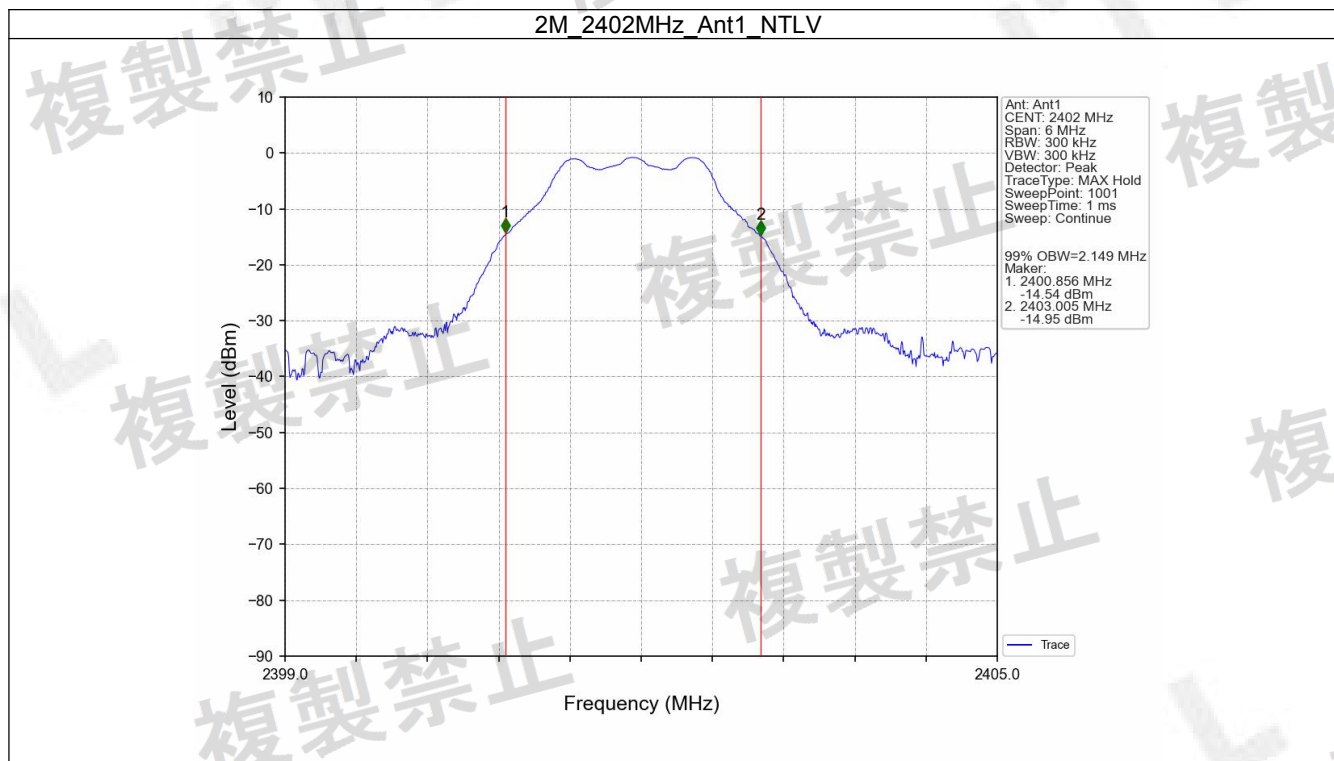
2.2 Test Graph

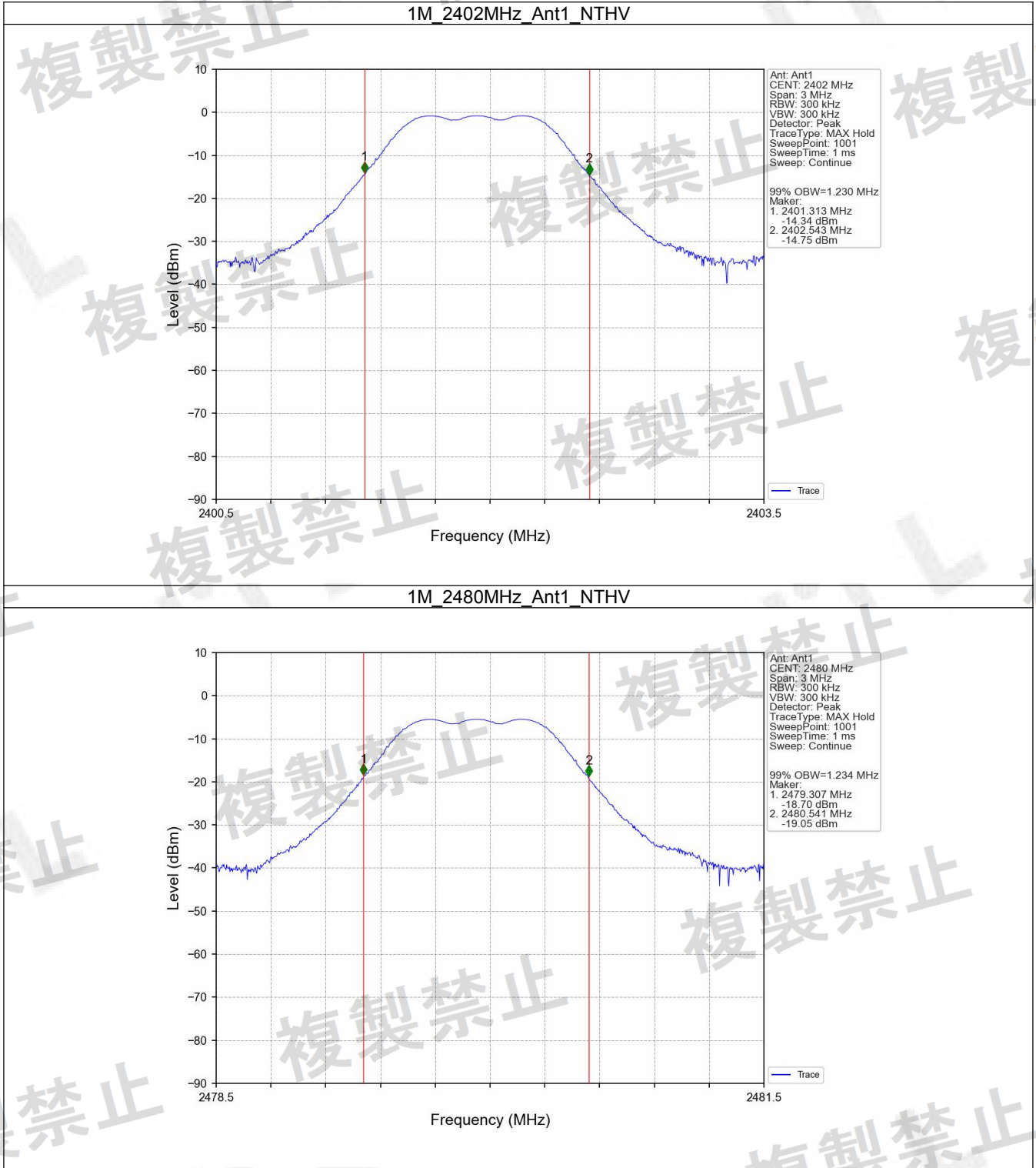
2.2.1 OBW

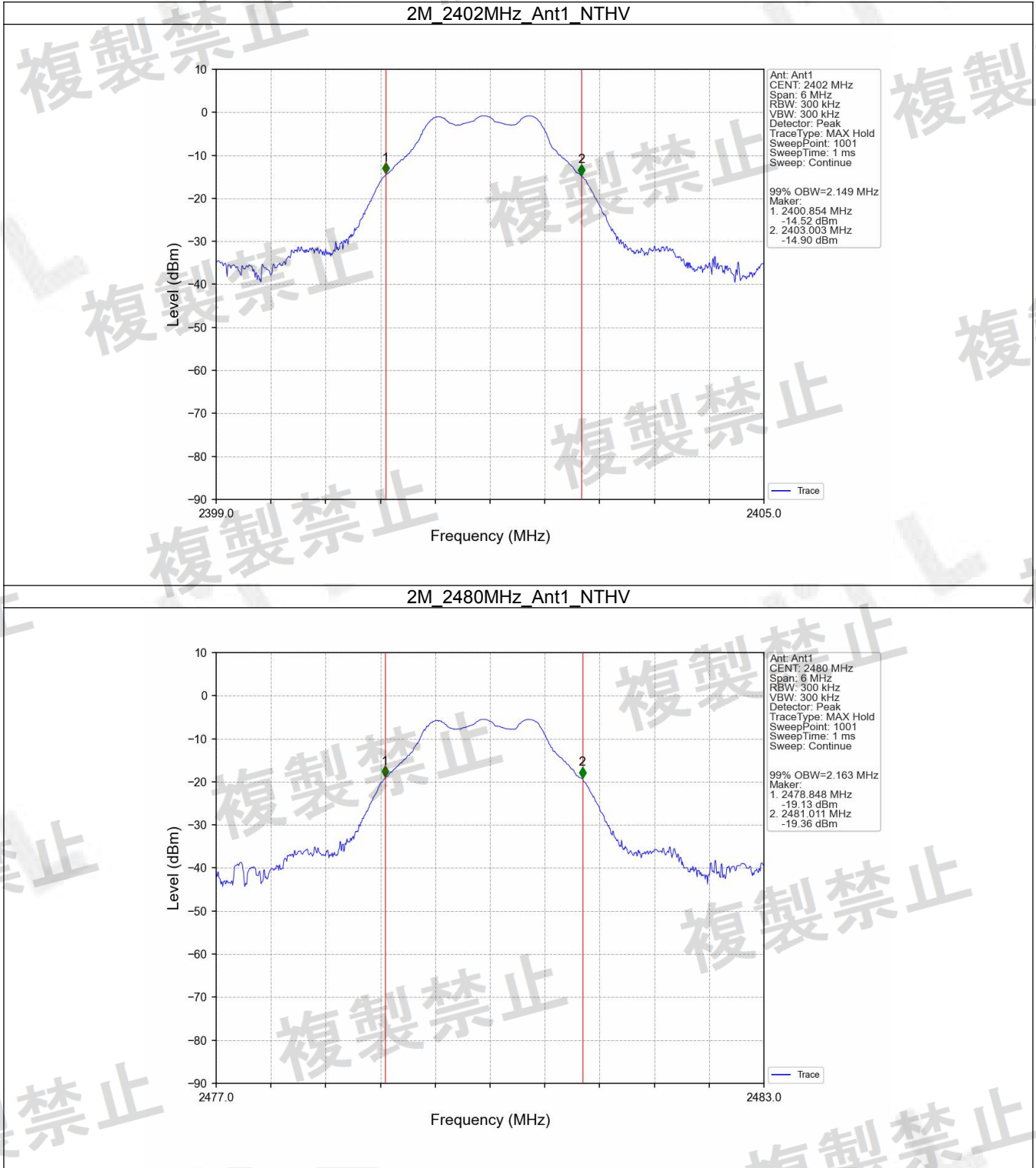












3. Antenna Power

3.1 Test Result

3.1.1 Power

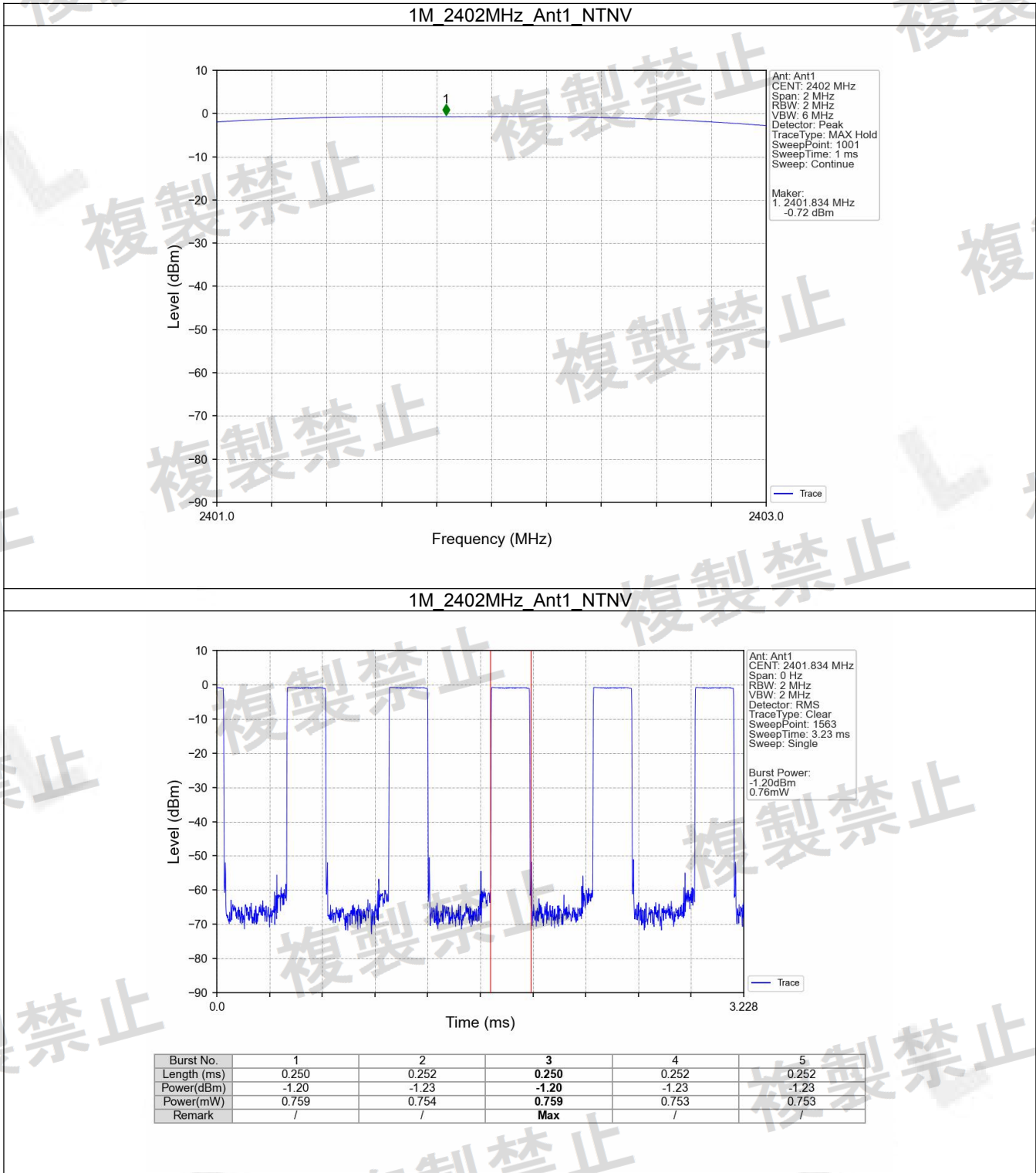
ENV	Mode	TX Type	Frequency (MHz)	ANT	Antenna Power (mW)		Nominal Power (mW)	Tolerance (%)		Verdict
					Measured	Limit		Measured	Limit	
NTNV	1M	SISO	2402	1	0.759	<=10.00	0.770	-1.43	<=20	Pass
			2480	1	0.253	<=10.00	0.770	-67.14	<=20	Pass
	2M	SISO	2402	1	0.761	<=10.00	0.770	-1.17	<=20	Pass
			2480	1	0.236	<=10.00	0.770	-69.35	<=20	Pass
NTLV	1M	SISO	2402	1	0.747	<=10.00	0.770	-2.99	<=20	Pass
			2480	1	0.267	<=10.00	0.770	-65.32	<=20	Pass
	2M	SISO	2402	1	0.719	<=10.00	0.770	-6.62	<=20	Pass
			2480	1	0.259	<=10.00	0.770	-66.36	<=20	Pass
NTHV	1M	SISO	2402	1	0.771	<=10.00	0.770	0.13	<=20	Pass
			2480	1	0.263	<=10.00	0.770	-65.84	<=20	Pass
	2M	SISO	2402	1	0.684	<=10.00	0.770	-11.17	<=20	Pass
			2480	1	0.255	<=10.00	0.770	-66.88	<=20	Pass

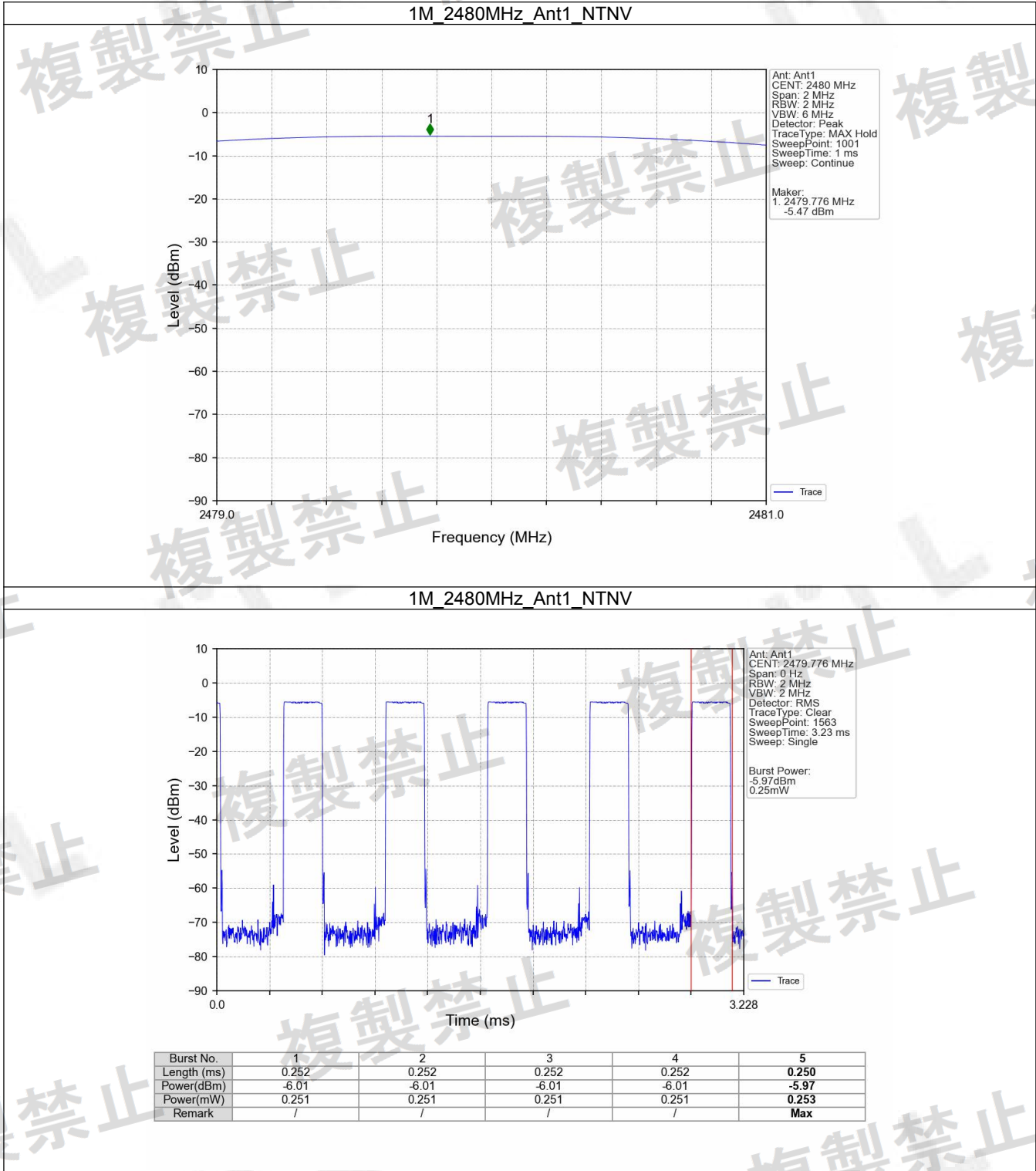
3.1.2 EIRP

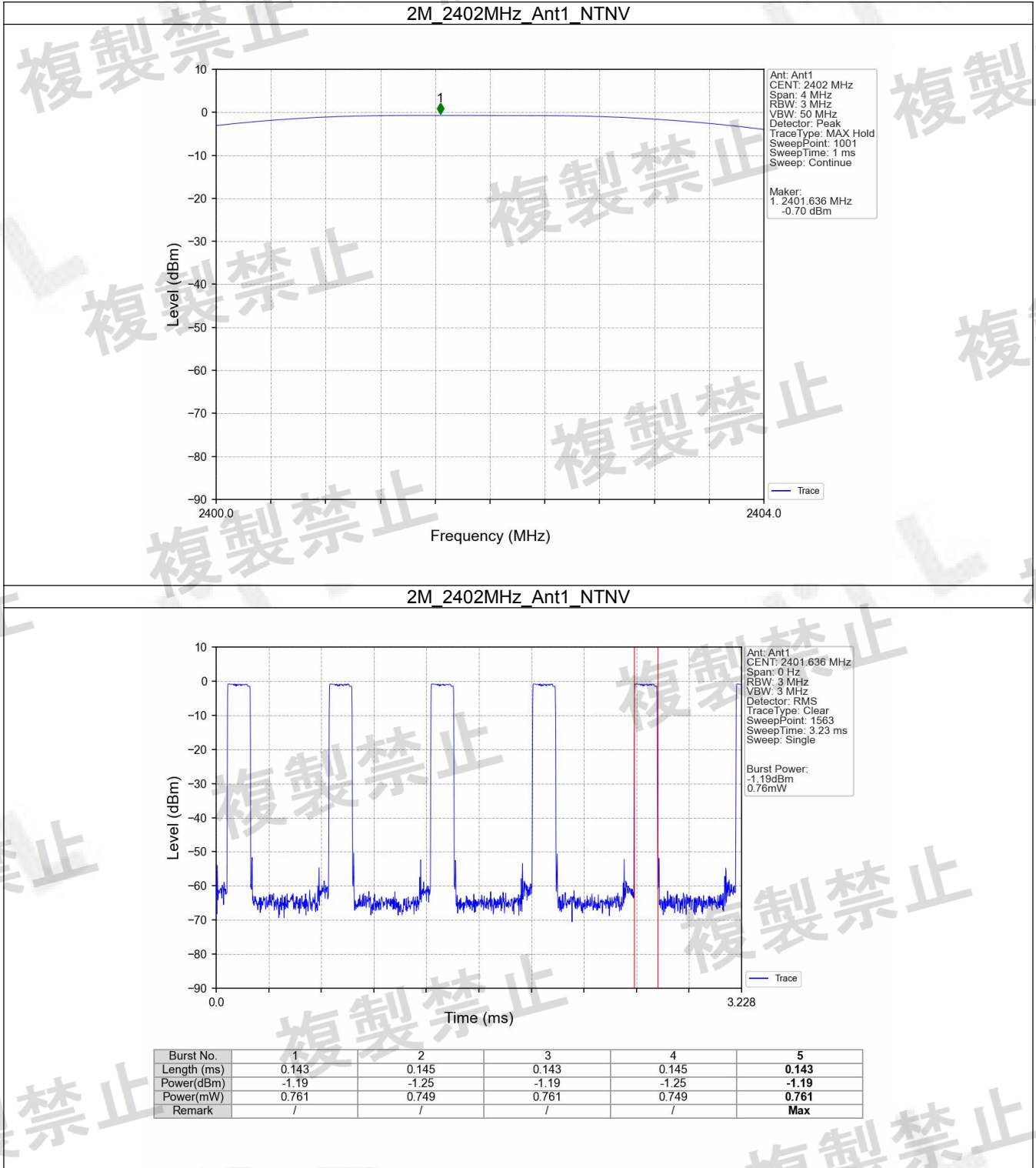
ENV	Mode	TX Type	Frequency (MHz)	ANT	Gain (dBi)	EIRP (dBm)		Verdict
						Result	Limit	
NTNV	1M	SISO	2402	1	5.15	3.95	<=12.14	Pass
			2480	1	5.15	-0.82	<=12.14	Pass
	2M	SISO	2402	1	5.15	3.96	<=12.14	Pass
			2480	1	5.15	-1.12	<=12.14	Pass
NTLV	1M	SISO	2402	1	5.15	3.89	<=12.14	Pass
			2480	1	5.15	-0.58	<=12.14	Pass
	2M	SISO	2402	1	5.15	3.72	<=12.14	Pass
			2480	1	5.15	-0.72	<=12.14	Pass
NTHV	1M	SISO	2402	1	5.15	4.02	<=12.14	Pass
			2480	1	5.15	-0.66	<=12.14	Pass
	2M	SISO	2402	1	5.15	3.50	<=12.14	Pass
			2480	1	5.15	-0.78	<=12.14	Pass

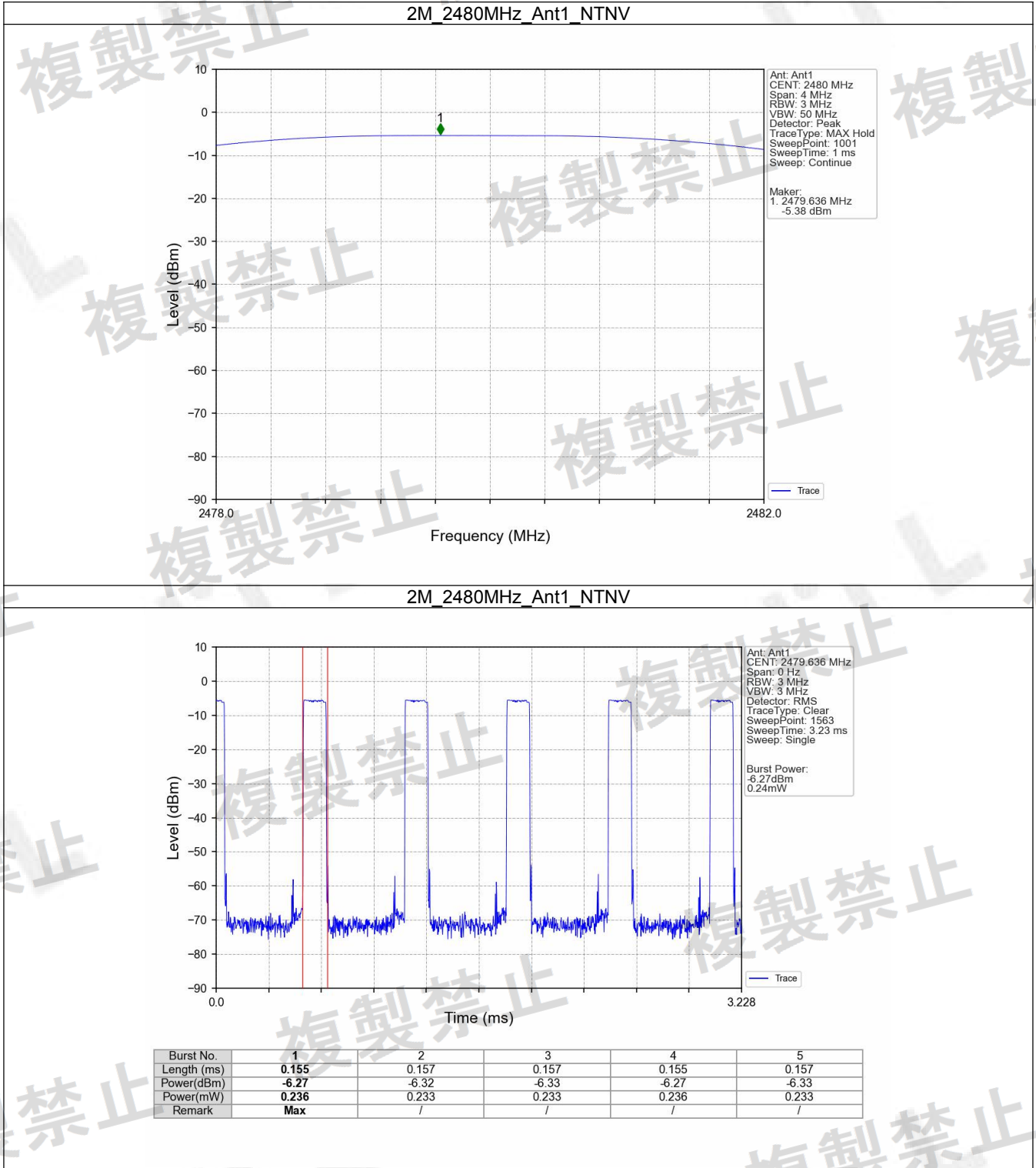
3.2 Test Graph

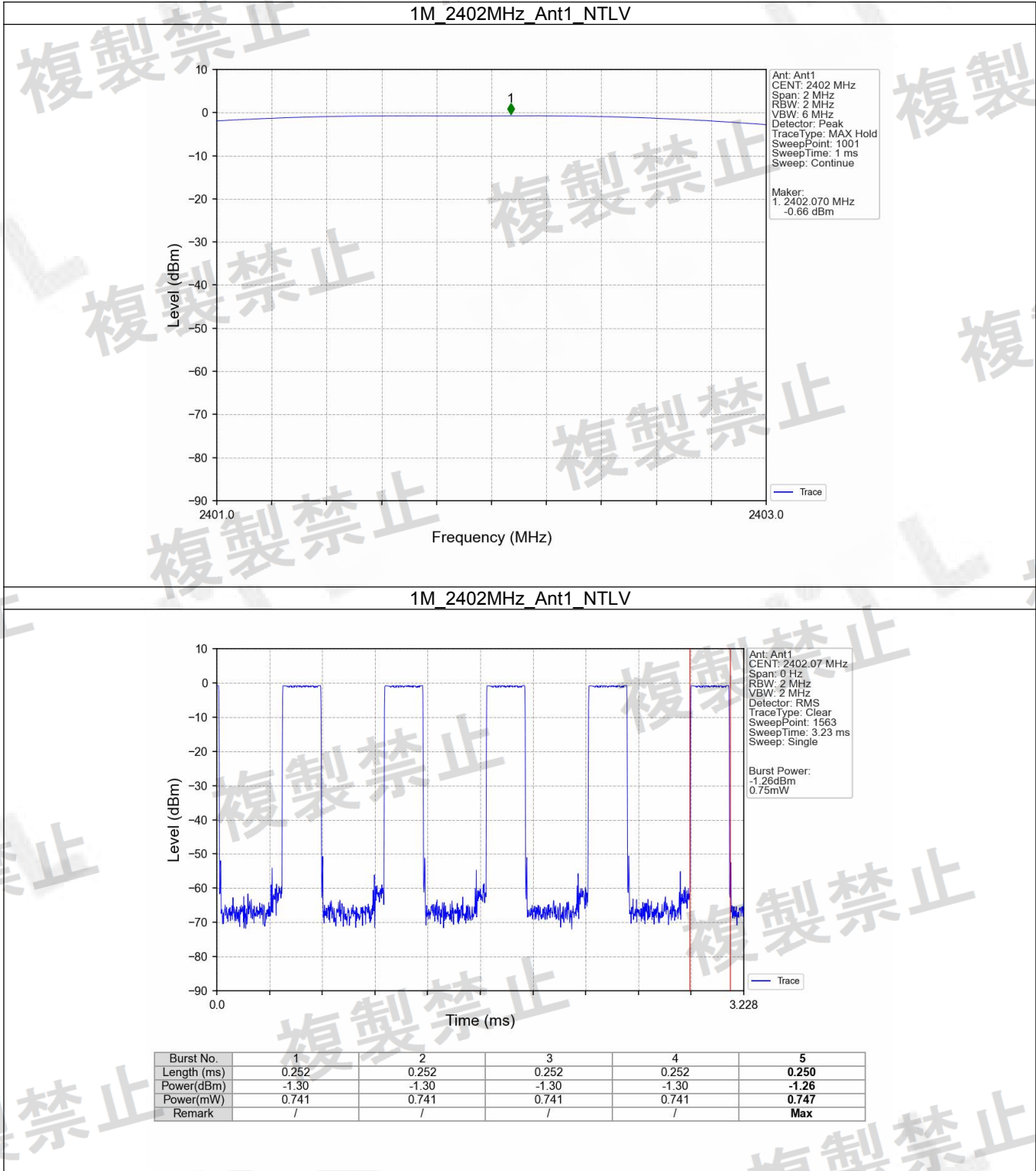
3.2.1 Power

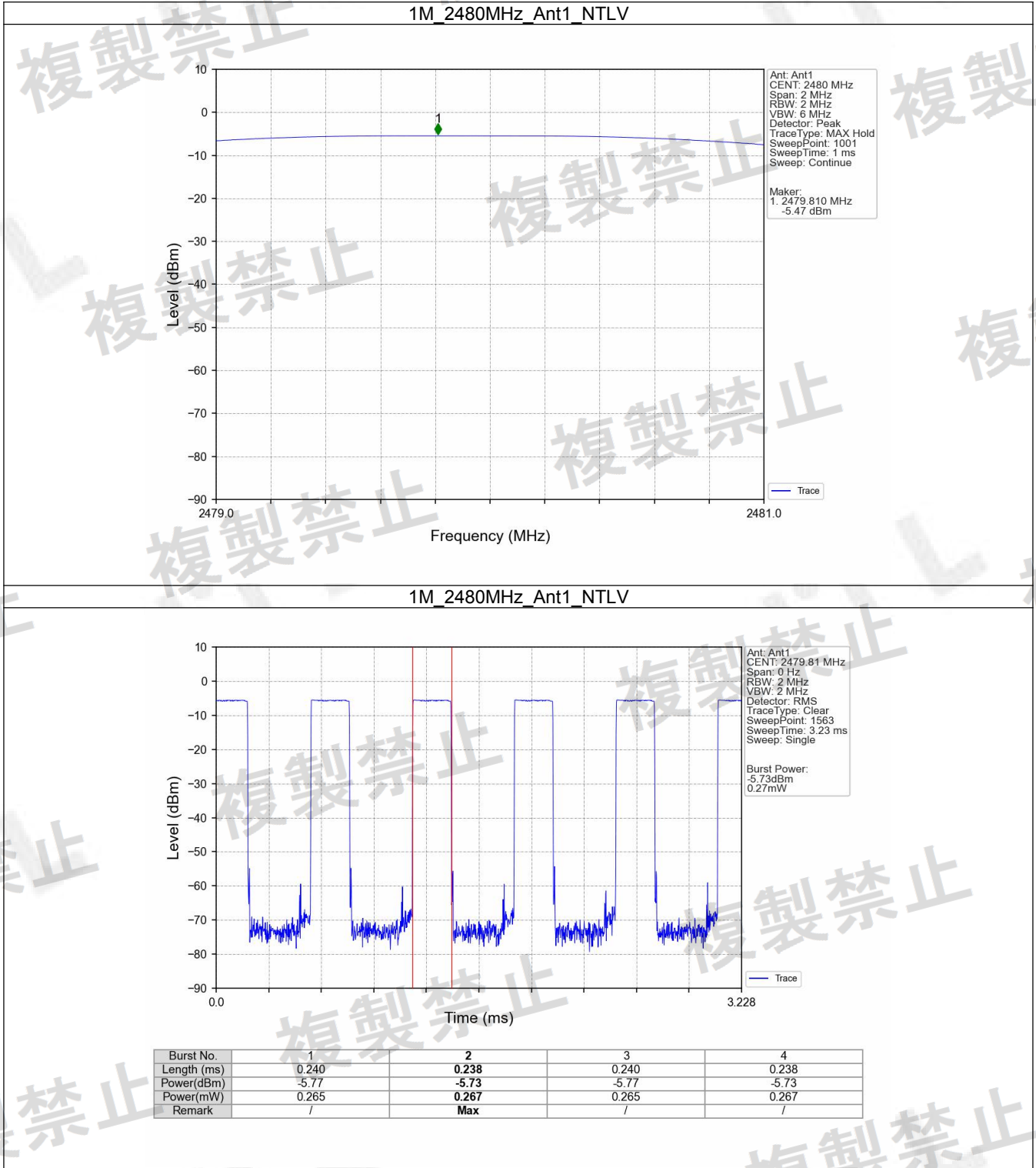


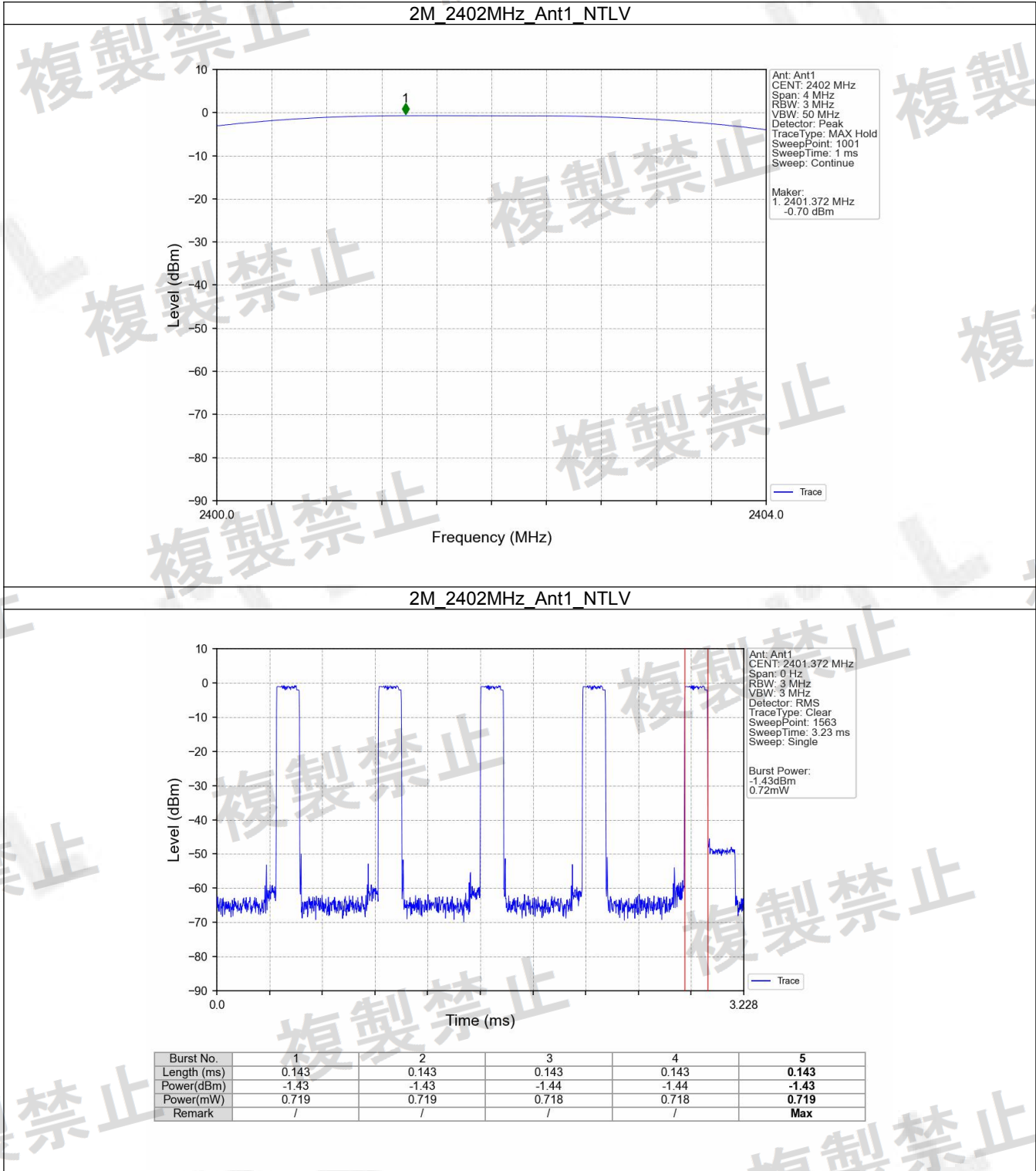


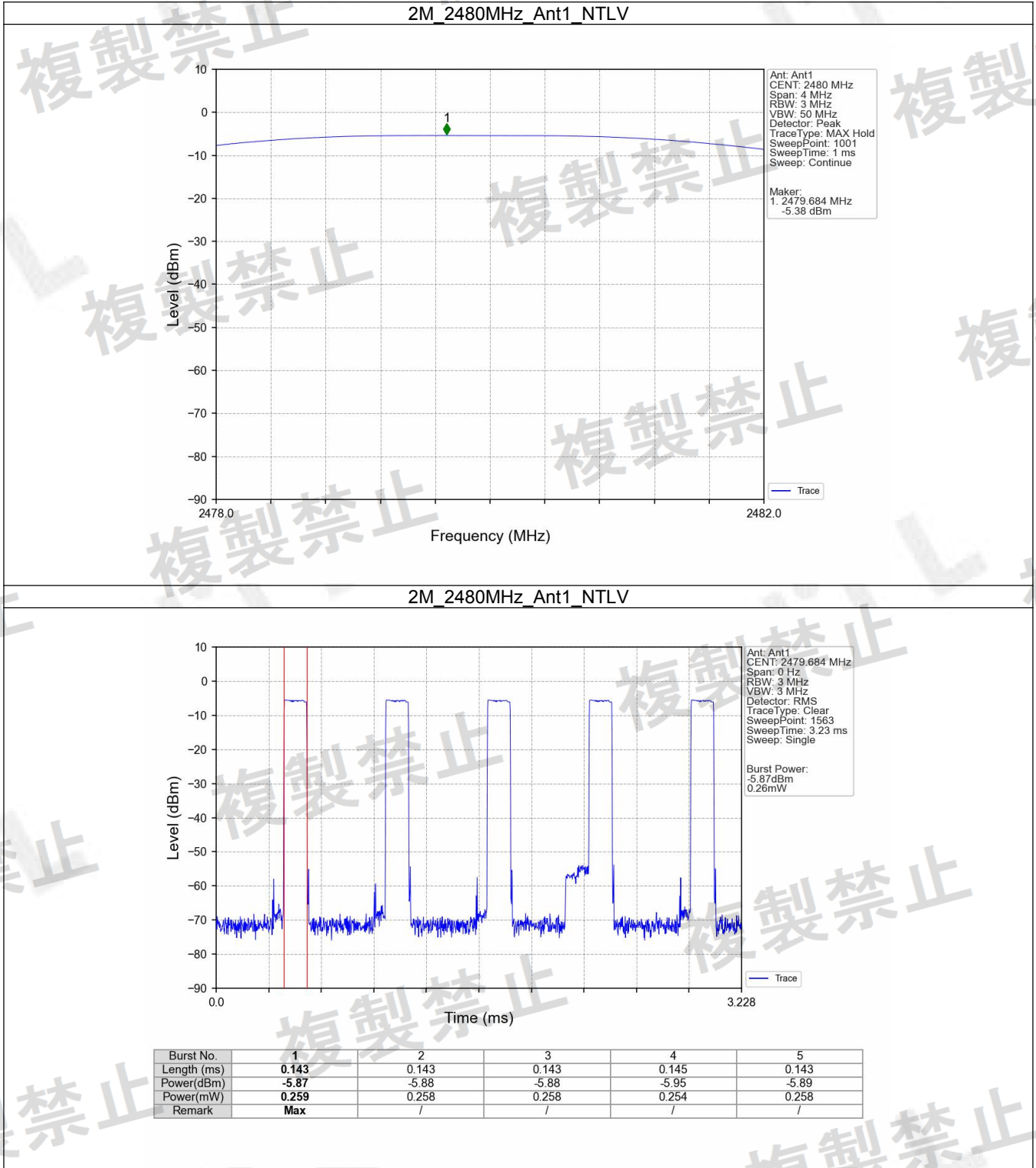


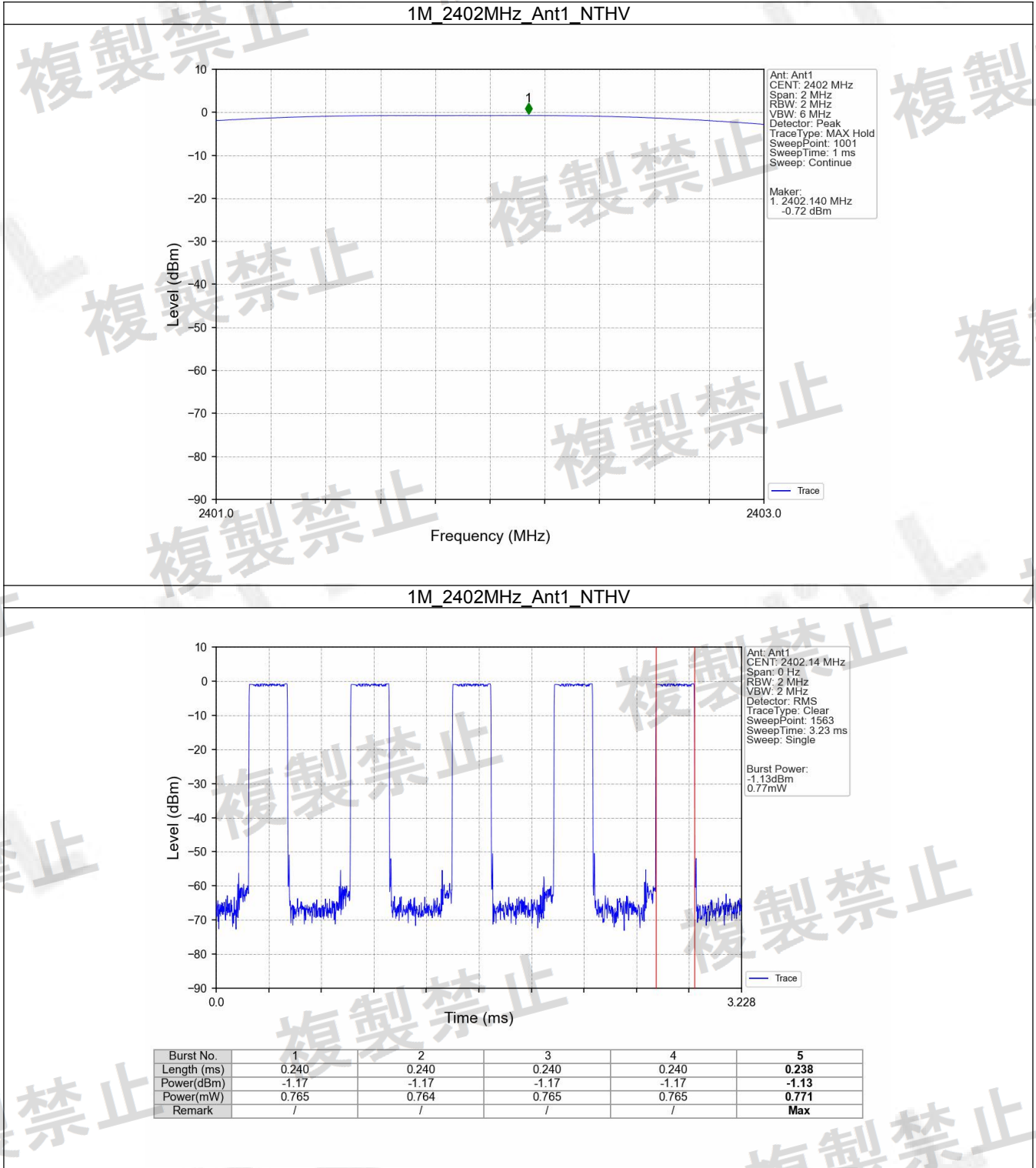


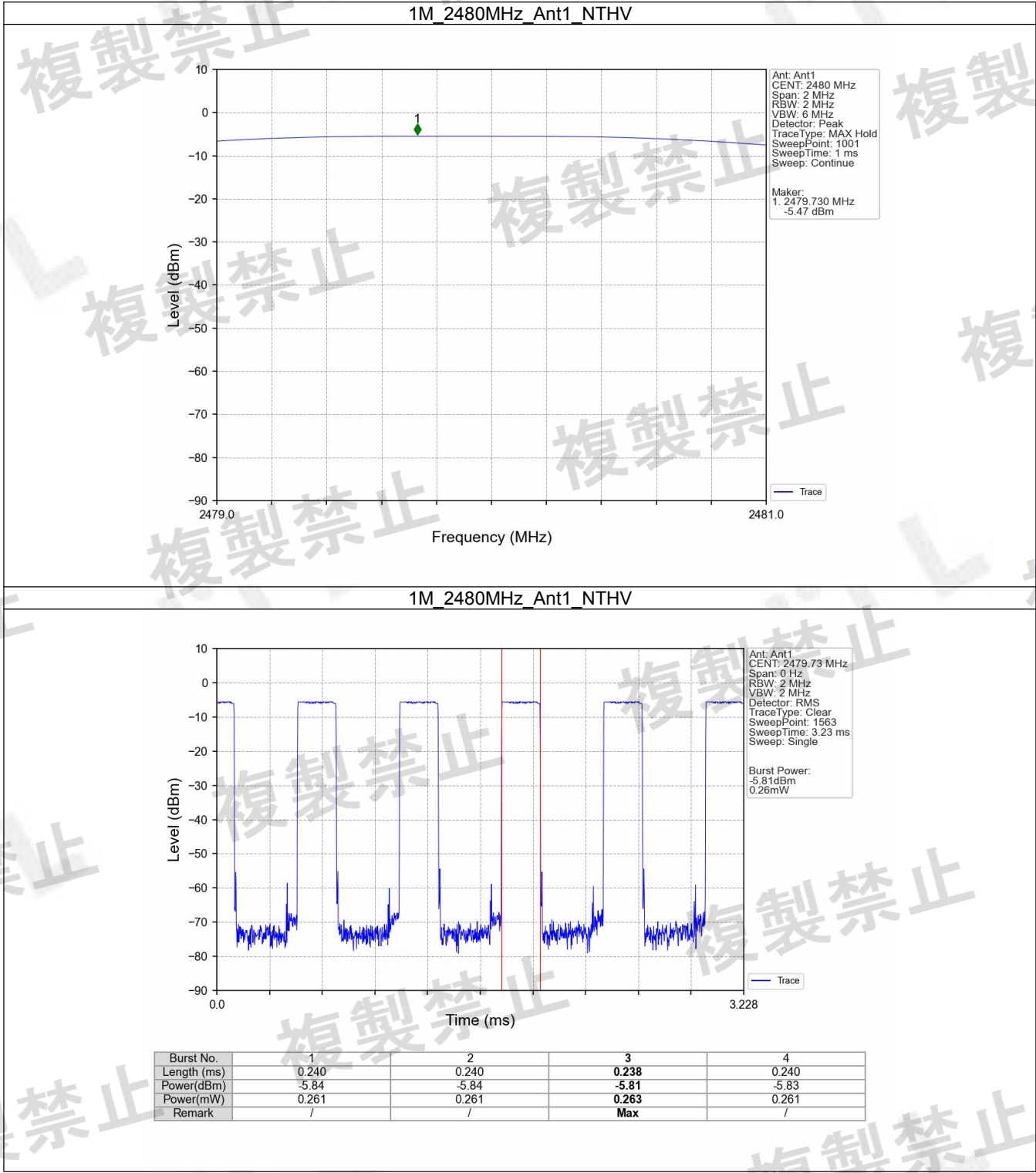


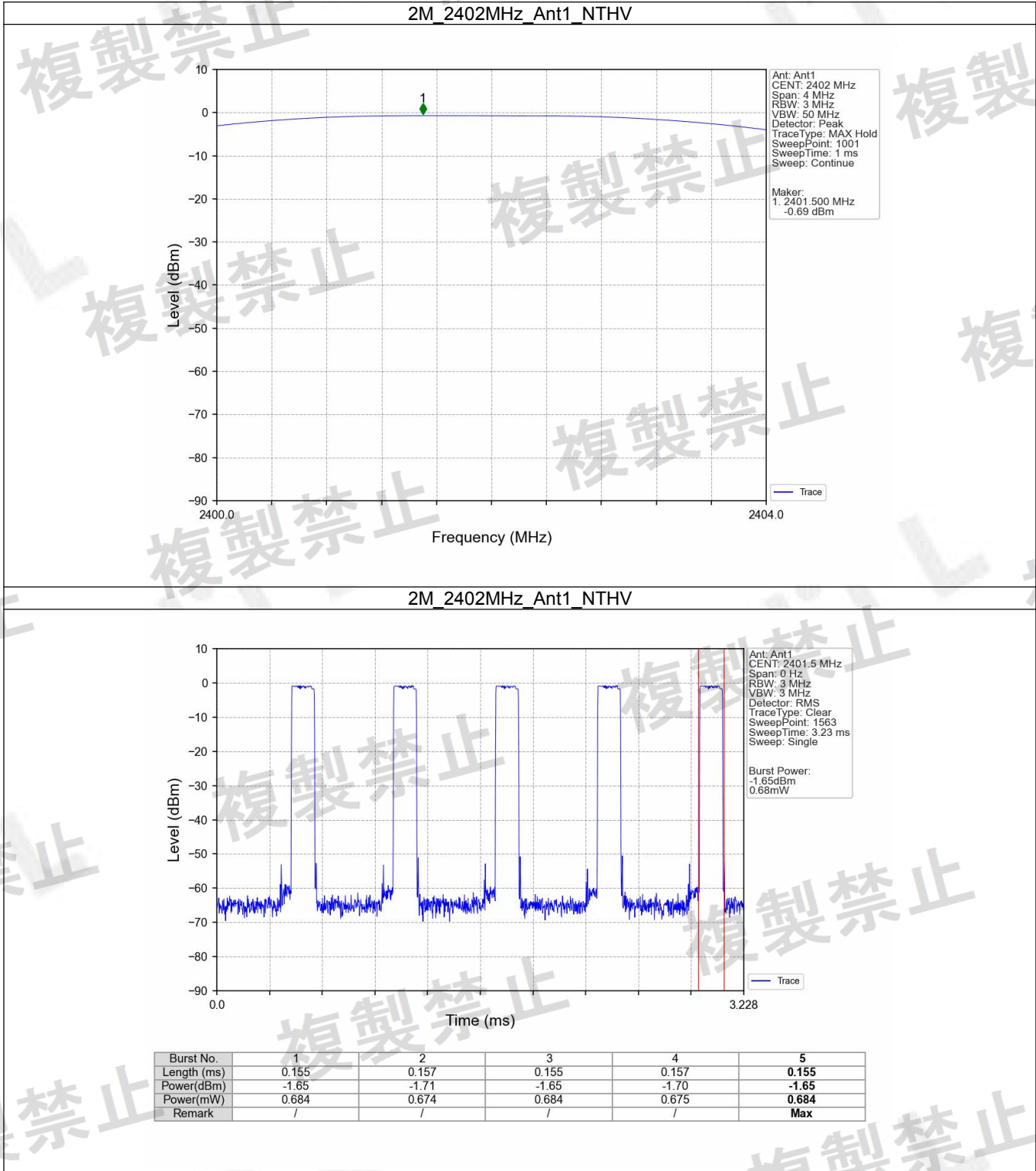


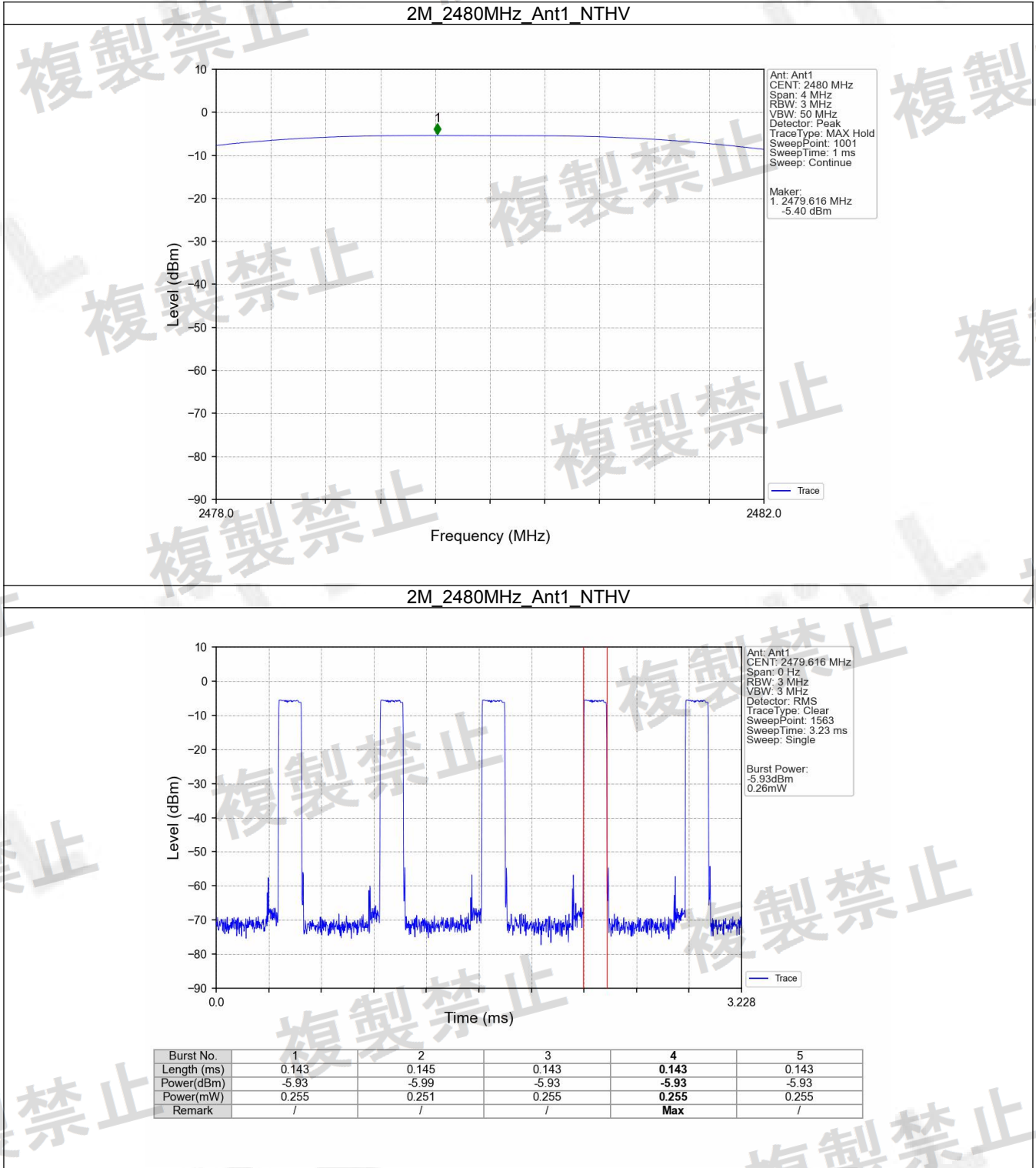












4. Spurious Emission Intensity

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	2386.5	-38.41	0.144	/	/	2.5	Pass
				2387	2400	2397.66	-28.79	1.321	/	/	25	Pass
				2483.5	2496.5	2486.386	-50.71	0.008	/	/	25	Pass
				2496.5	12500	4805	-41.30	0.074	/	/	2.5	Pass
		2480	1	30	2387	2363.5	-43.96	0.040	/	/	2.5	Pass
				2387	2400	2387.013	-45.40	0.029	/	/	25	Pass
				2483.5	2496.5	2483.604	-33.45	0.452	/	/	25	Pass
				2496.5	12500	4961	-39.49	0.112	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	2386	-40.61	0.087	/	/	2.5	Pass
				2387	2400	2399.987	-21.93	6.412	/	/	25	Pass
				2483.5	2496.5	2496.045	-51.02	0.008	/	/	25	Pass
				2496.5	12500	4805.5	-41.05	0.079	/	/	2.5	Pass
		2480	1	30	2387	2363.5	-45.41	0.029	/	/	2.5	Pass
				2387	2400	2387.13	-45.33	0.029	/	/	25	Pass
				2483.5	2496.5	2483.669	-33.39	0.458	/	/	25	Pass
				2496.5	12500	4960.5	-39.30	0.117	/	/	2.5	Pass

4.1.2 TxSe_NTLV

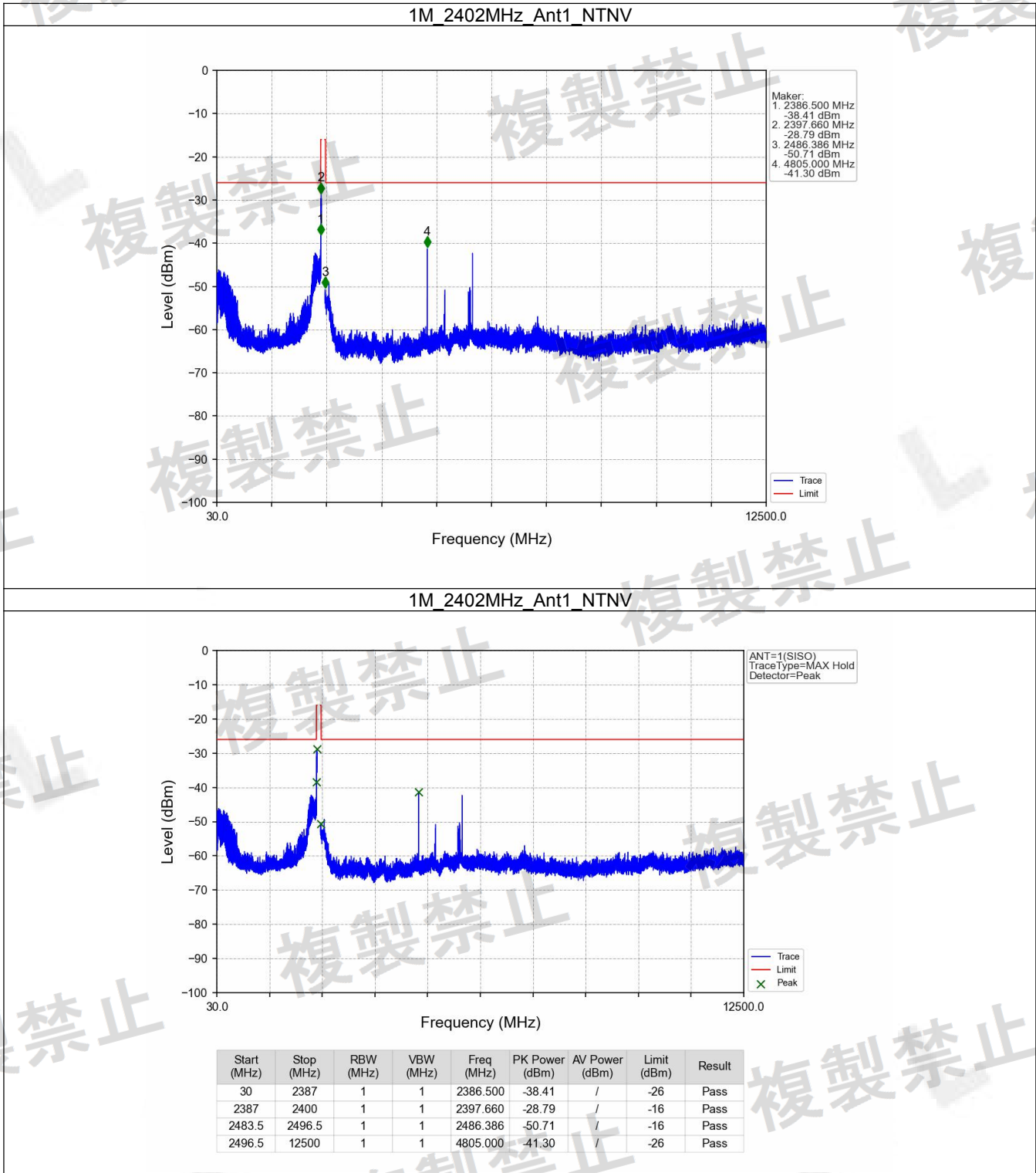
NTLV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
1M	SISO	2402	1	30	2387	895.5	-40.90	0.081	/	/	2.5	Pass
				2387	2400	2397.634	-29.29	1.178	/	/	25	Pass
				2483.5	2496.5	2486.191	-50.86	0.008	/	/	25	Pass
				2496.5	12500	4804.5	-41.23	0.075	/	/	2.5	Pass
		2480	1	30	2387	2360	-44.65	0.034	/	/	2.5	Pass
				2387	2400	2387.806	-45.33	0.029	/	/	25	Pass
				2483.5	2496.5	2483.903	-33.46	0.451	/	/	25	Pass
				2496.5	12500	4960	-39.30	0.117	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	2386	-39.56	0.111	/	/	2.5	Pass
				2387	2400	2399.987	-21.78	6.637	/	/	25	Pass
				2483.5	2496.5	2486.477	-51.19	0.008	/	/	25	Pass
				2496.5	12500	4803.5	-41.37	0.073	/	/	2.5	Pass
		2480	1	30	2387	706	-23.66	4.305	-36.44	0.227	2.5	Pass
						723	-27.09	1.954	-40.28	0.094	2.5	Pass
				2387	2400	2390.913	-45.08	0.031	/	/	25	Pass
				2483.5	2496.5	2483.578	-33.29	0.469	/	/	25	Pass
				2496.5	12500	4961.5	-39.29	0.118	/	/	2.5	Pass

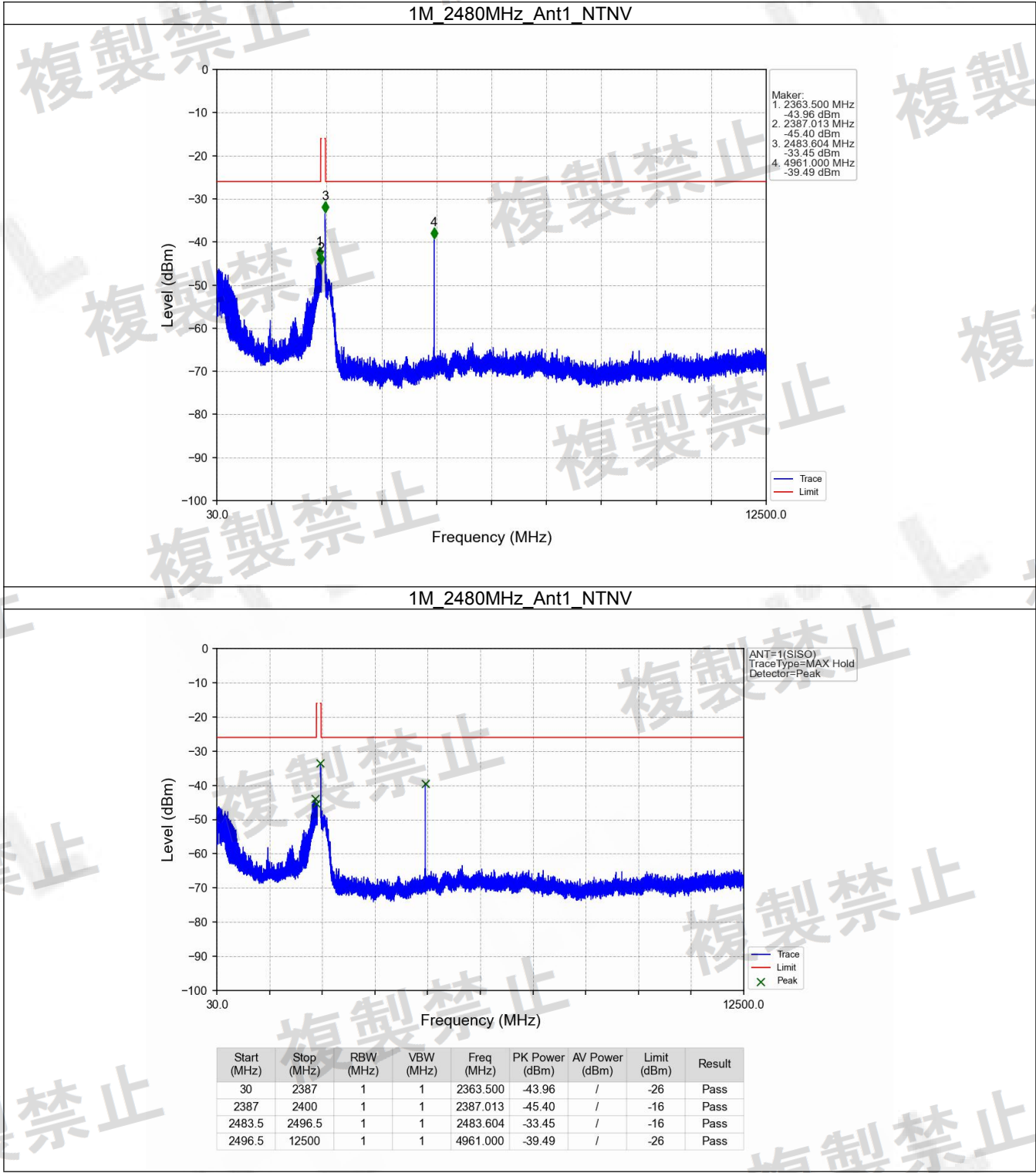
4.1.3 TxSe_NTHV

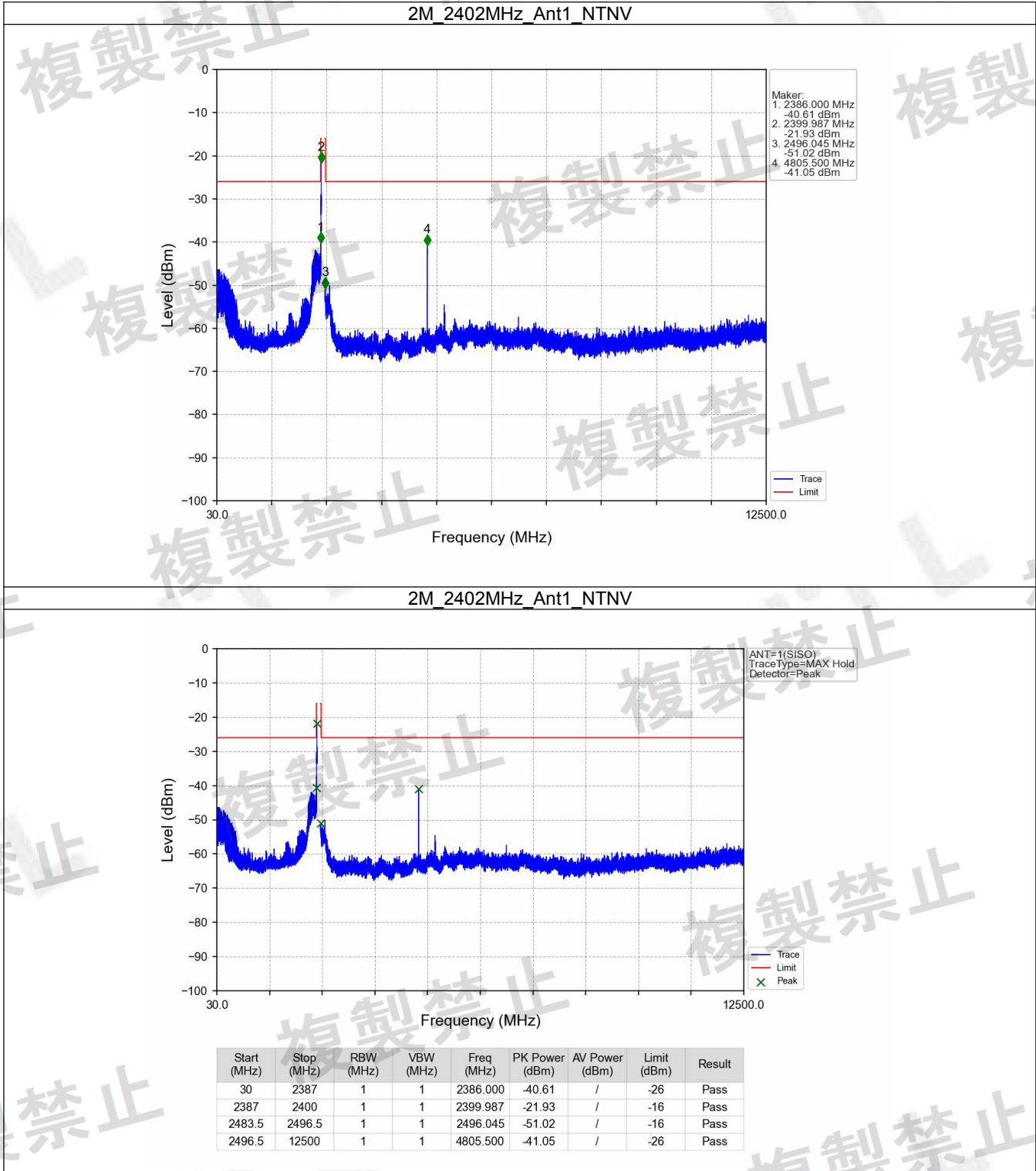
NTHV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
1M	SISO	2402	1	30	2387	2367	-42.06	0.062	/	/	2.5	Pass
				2387	2400	2399.662	-29.70	1.072	/	/	25	Pass
				2483.5	2496.5	2491.183	-50.93	0.008	/	/	25	Pass
				2496.5	12500	4805	-41.33	0.074	/	/	2.5	Pass
		2480	1	30	2387	2339.5	-43.65	0.043	/	/	2.5	Pass
				2387	2400	2387.104	-45.10	0.031	/	/	25	Pass
				2483.5	2496.5	2483.552	-34.02	0.396	/	/	25	Pass
				2496.5	12500	4960.5	-39.32	0.117	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	706	-32.25	0.596	/	/	2.5	Pass
				2387	2400	2399.987	-16.83	20.749	-23.73	4.236	25	Pass
				2483.5	2496.5	2483.63	-46.26	0.024	/	/	25	Pass
				2496.5	12500	2505.5	-50.03	0.010	/	/	2.5	Pass
		2480	1	30	2387	705	-21.84	6.546	-32.95	0.507	2.5	Pass
				2387	2400	2387.442	-45.56	0.028	/	/	25	Pass
				2483.5	2496.5	2483.604	-33.47	0.450	/	/	25	Pass
				2496.5	12500	4960.5	-39.04	0.125	/	/	2.5	Pass

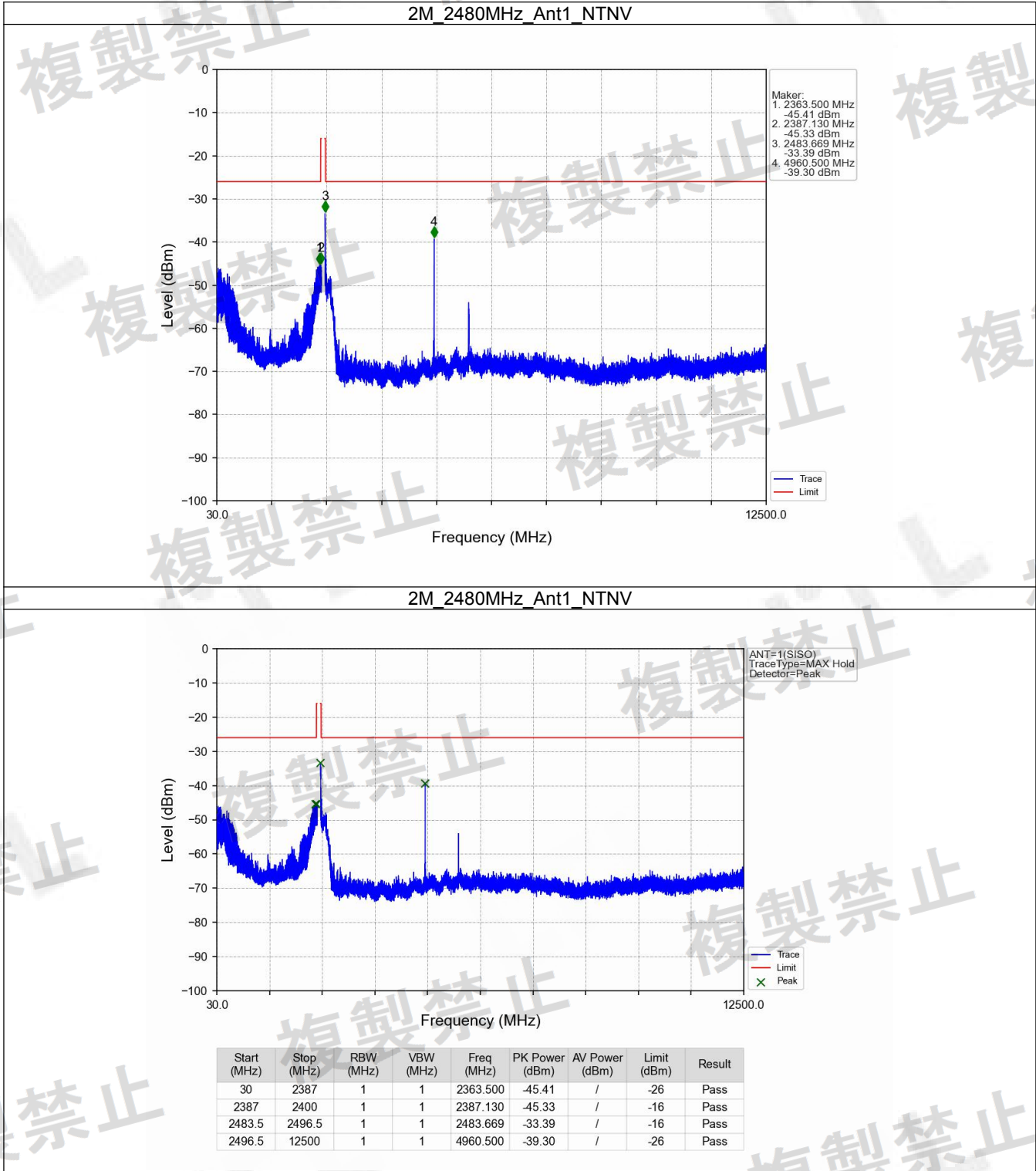
4.2 Test Graph

4.2.1 TxSe_NTNV

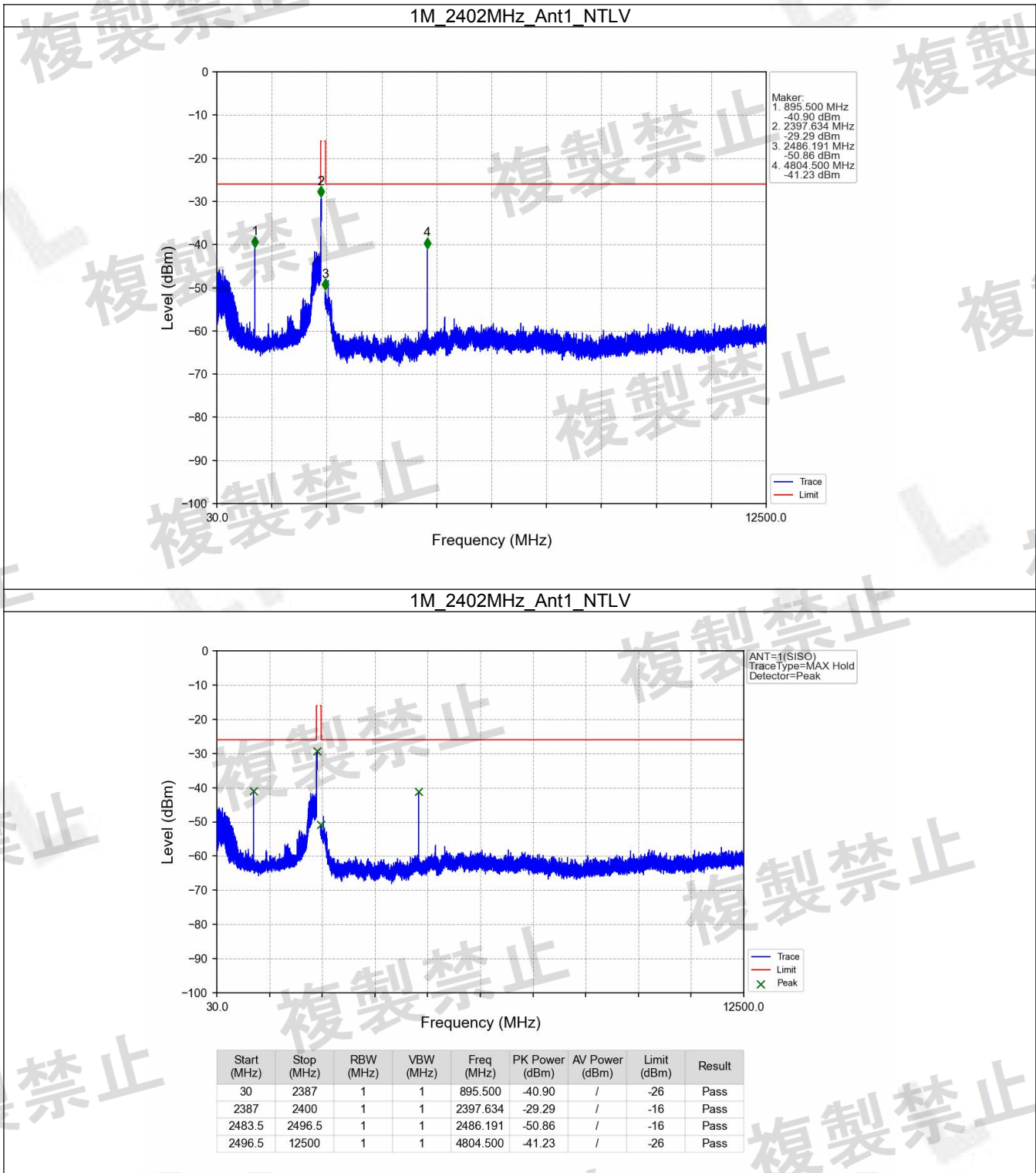


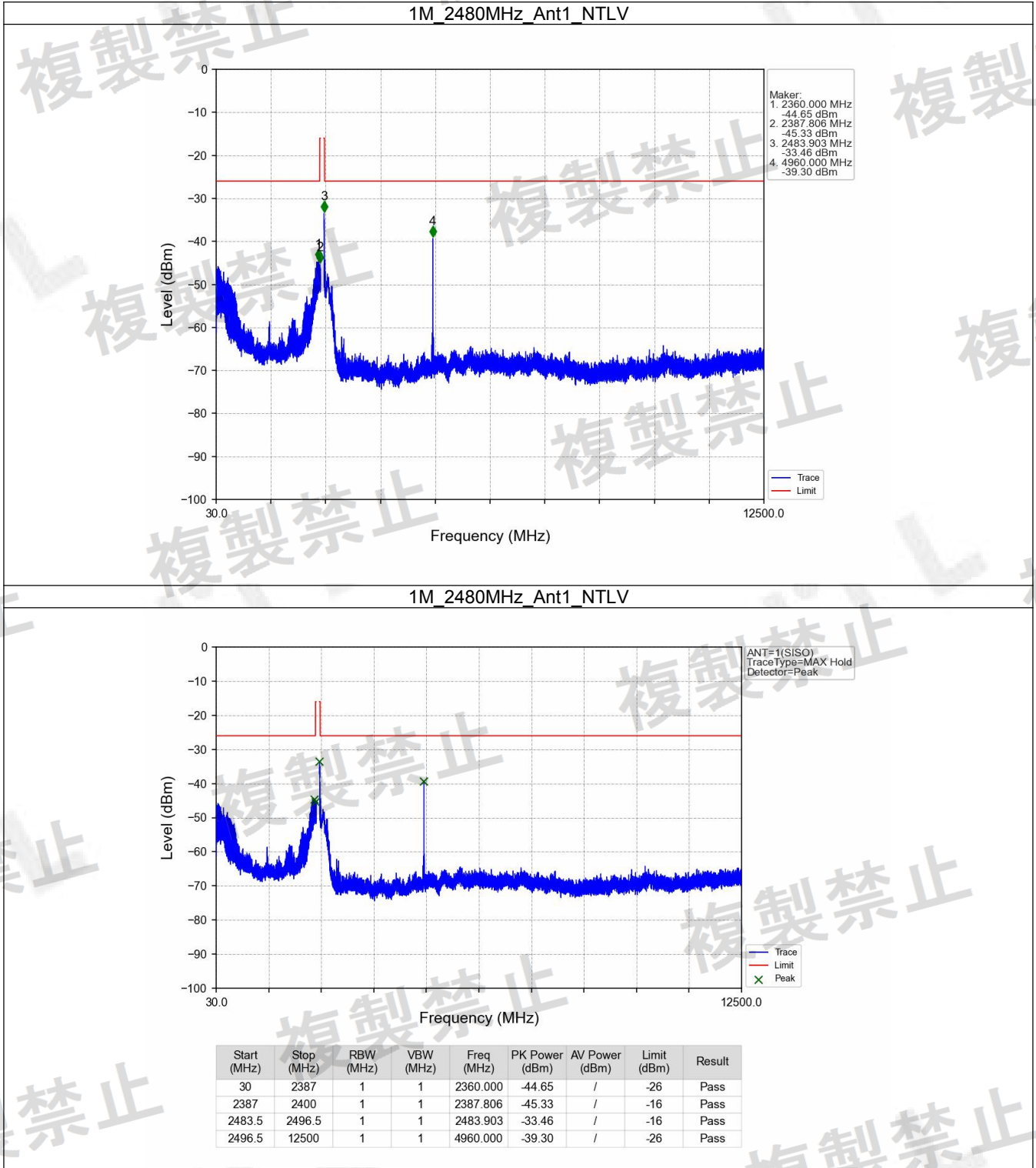


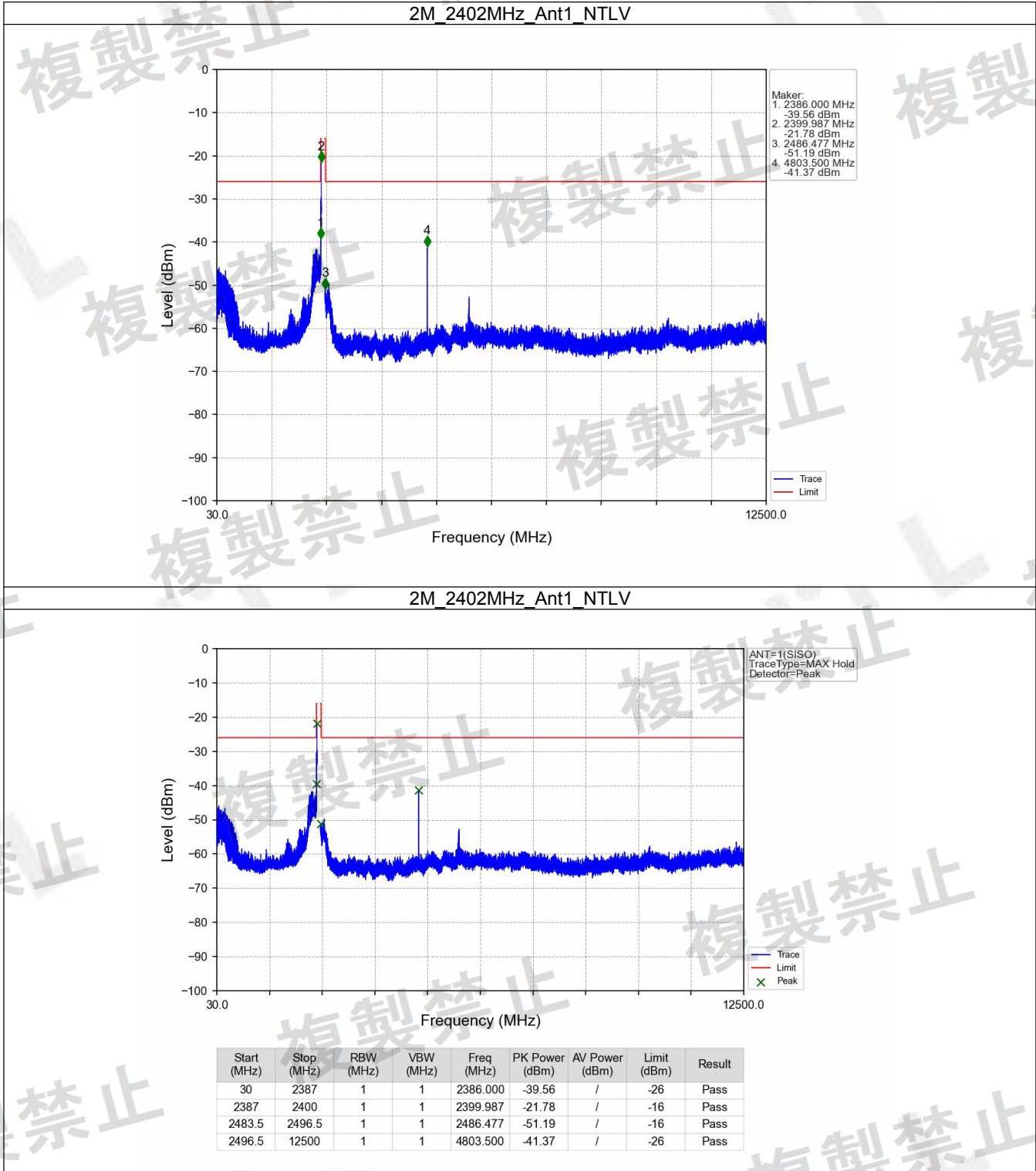




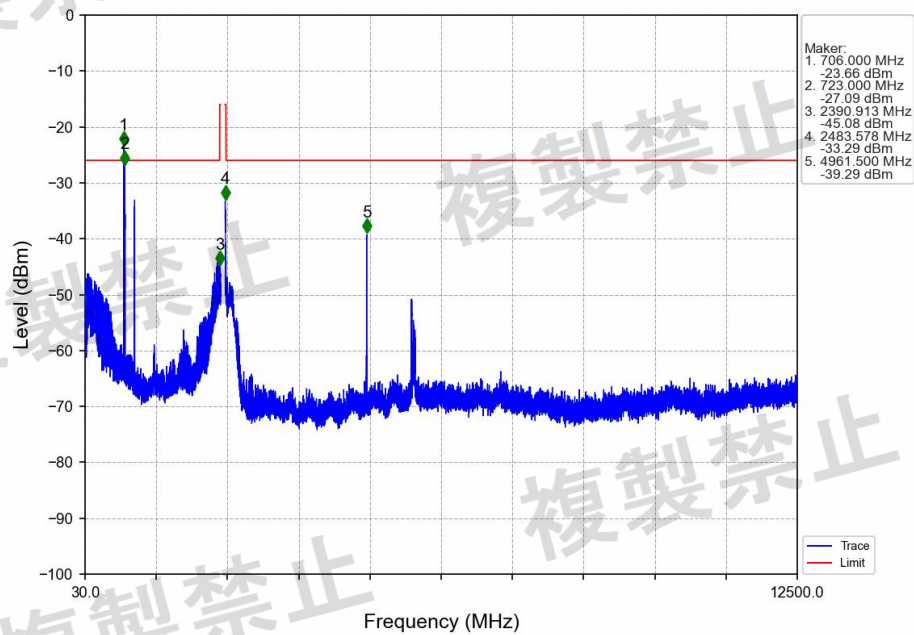
4.2.2 TxSe_NTLV



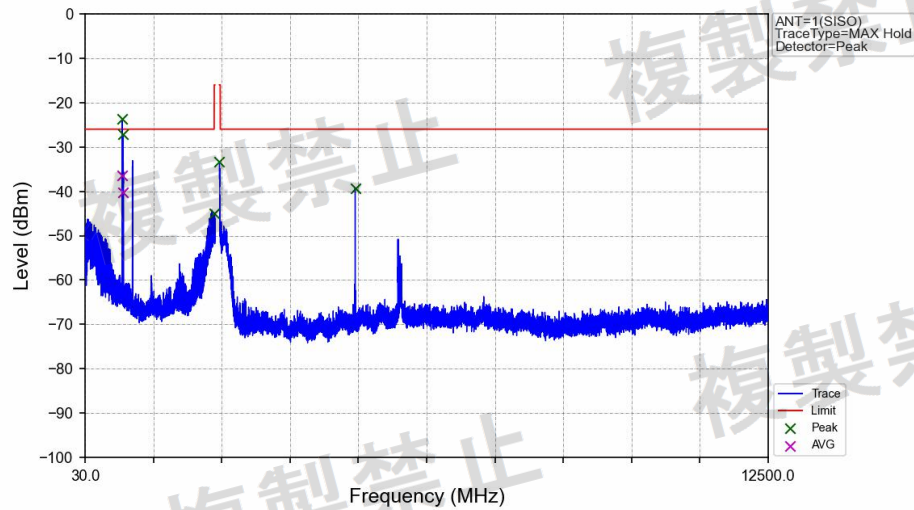




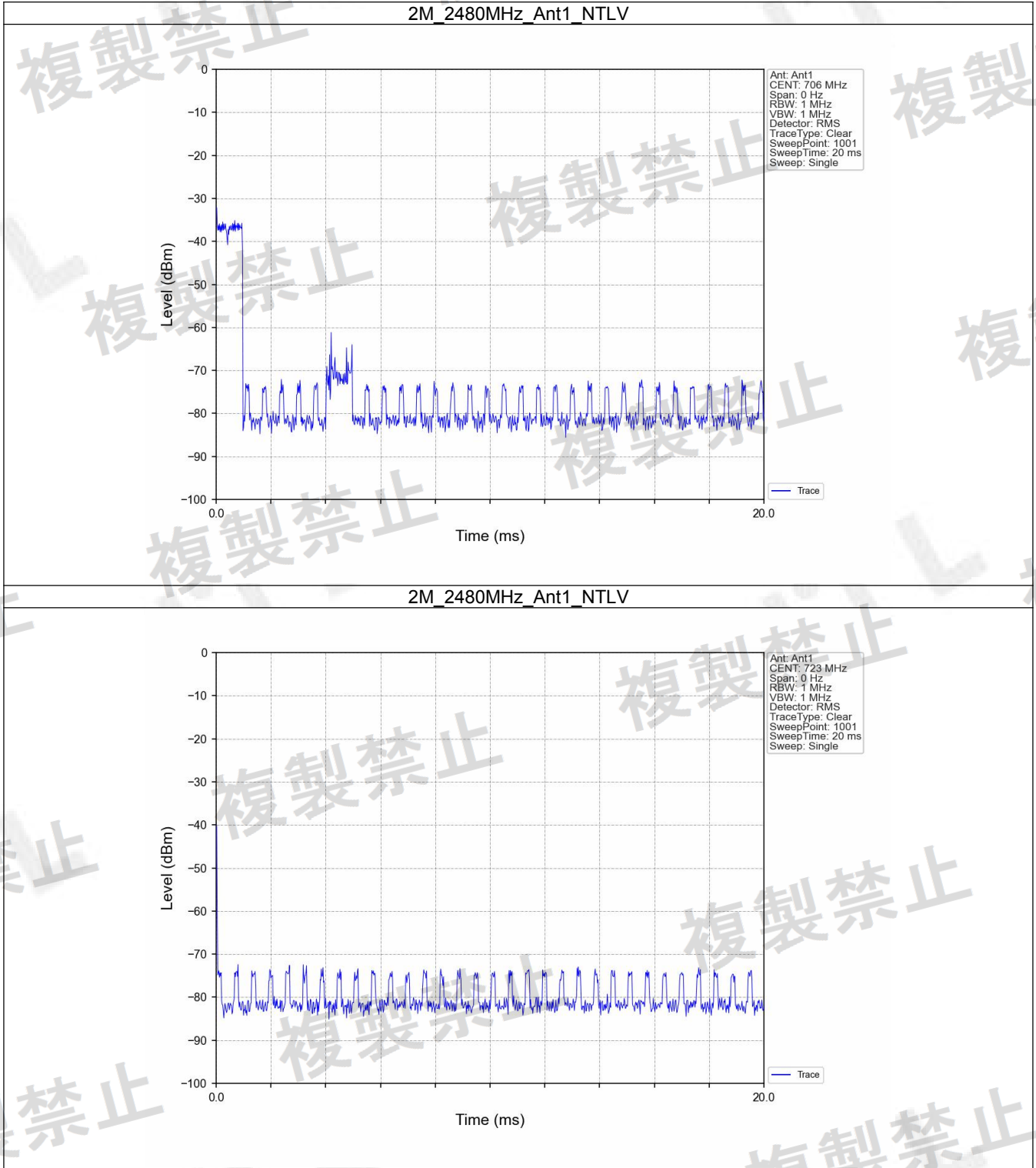
2M_2480MHz_Ant1_NTLV



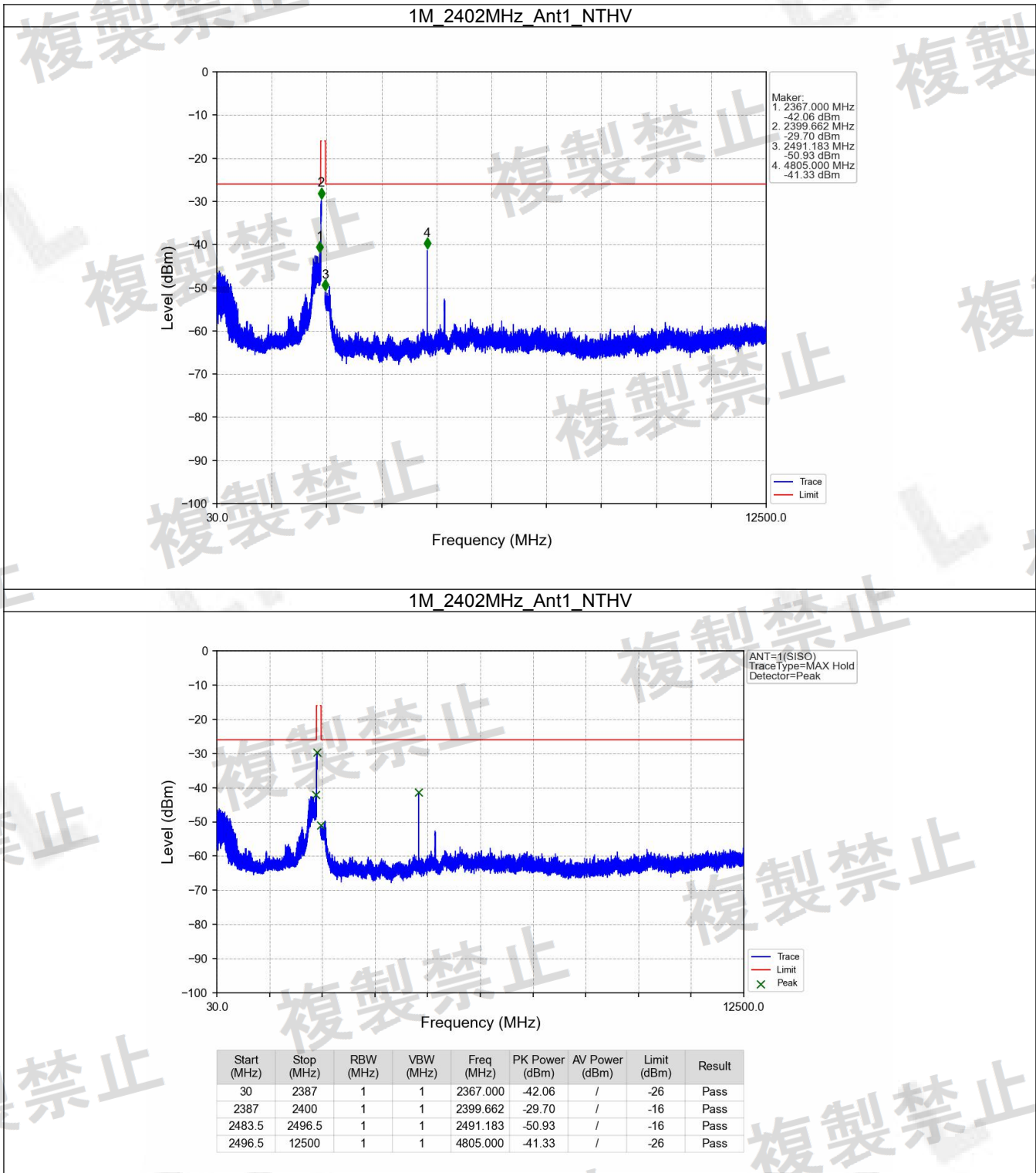
2M_2480MHz_Ant1_NTLV



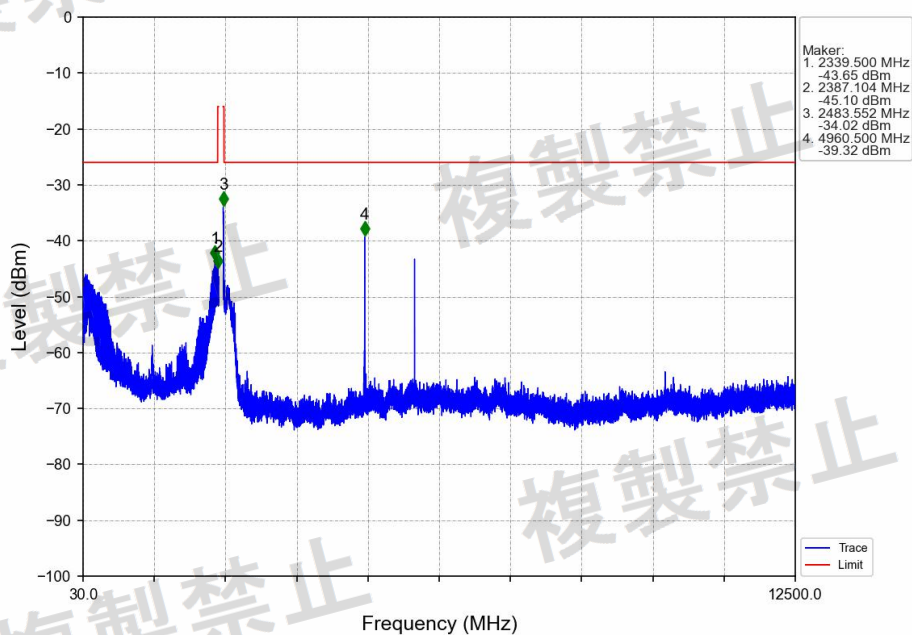
Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	706.000	-23.66	-36.44	-26	Pass
30	2387	1	1	723.000	-27.09	-40.28	-26	Pass
2387	2400	1	1	2390.913	-45.08	/	-16	Pass
2483.5	2496.5	1	1	2483.578	-33.29	/	-16	Pass
2496.5	12500	1	1	4961.500	-39.29	/	-26	Pass



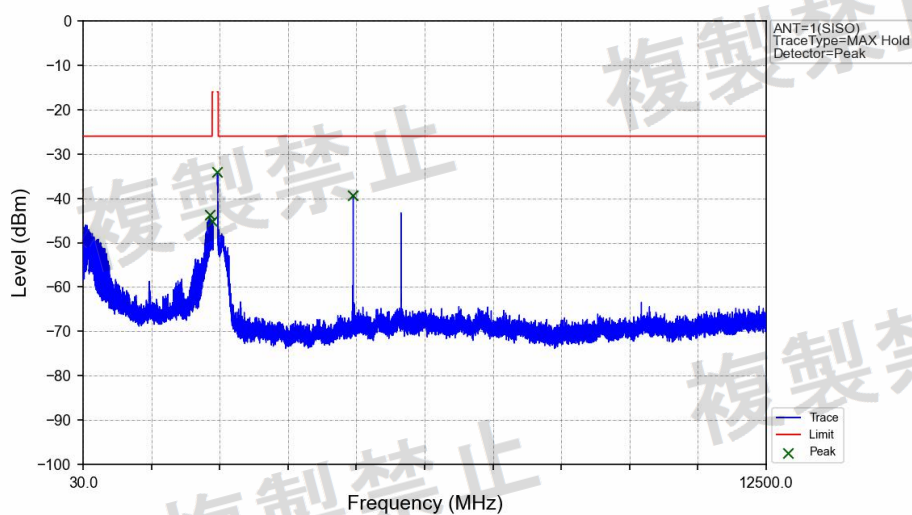
4.2.3 TxSe_NTHV



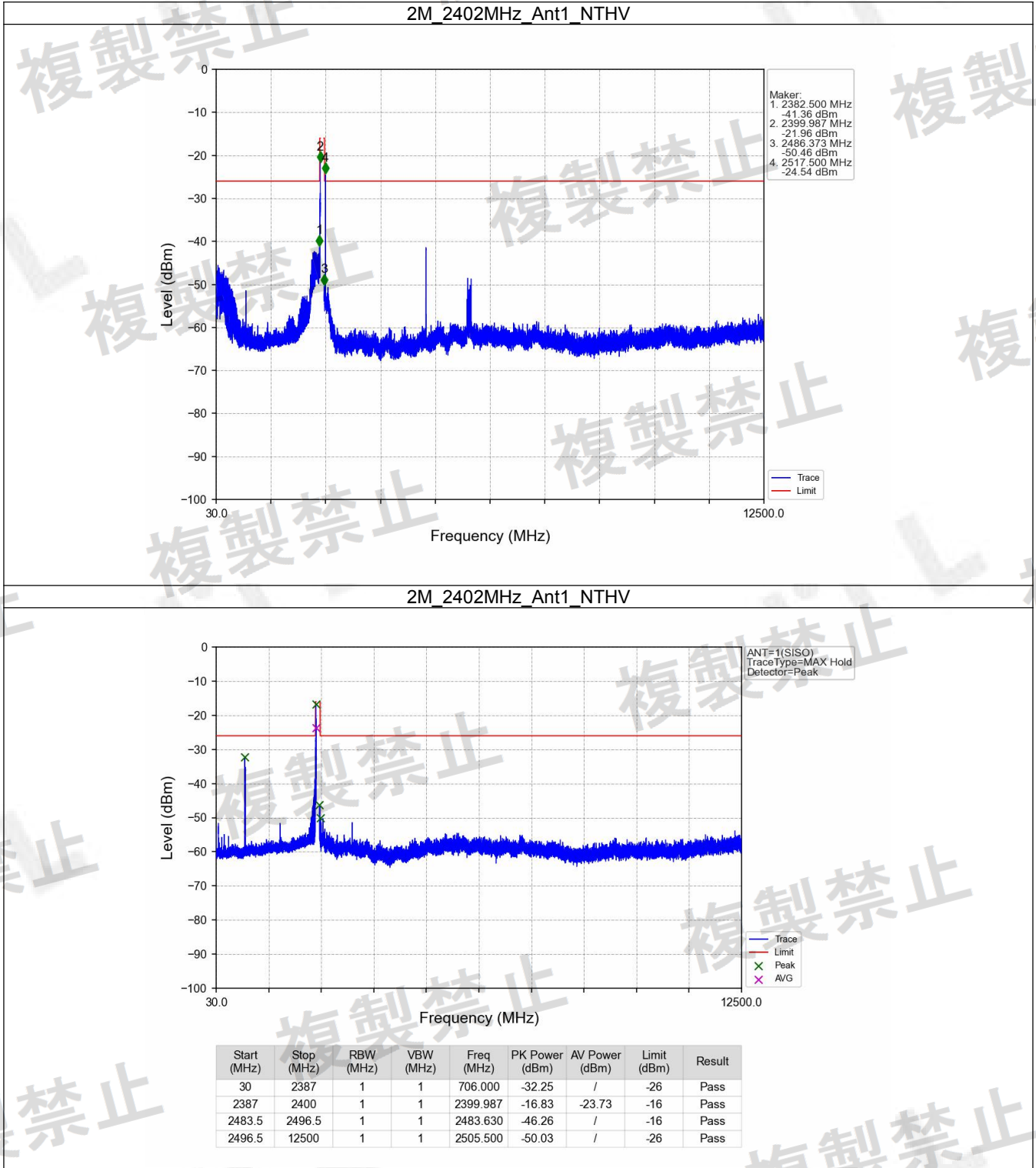
1M_2480MHz_Ant1_NTHV

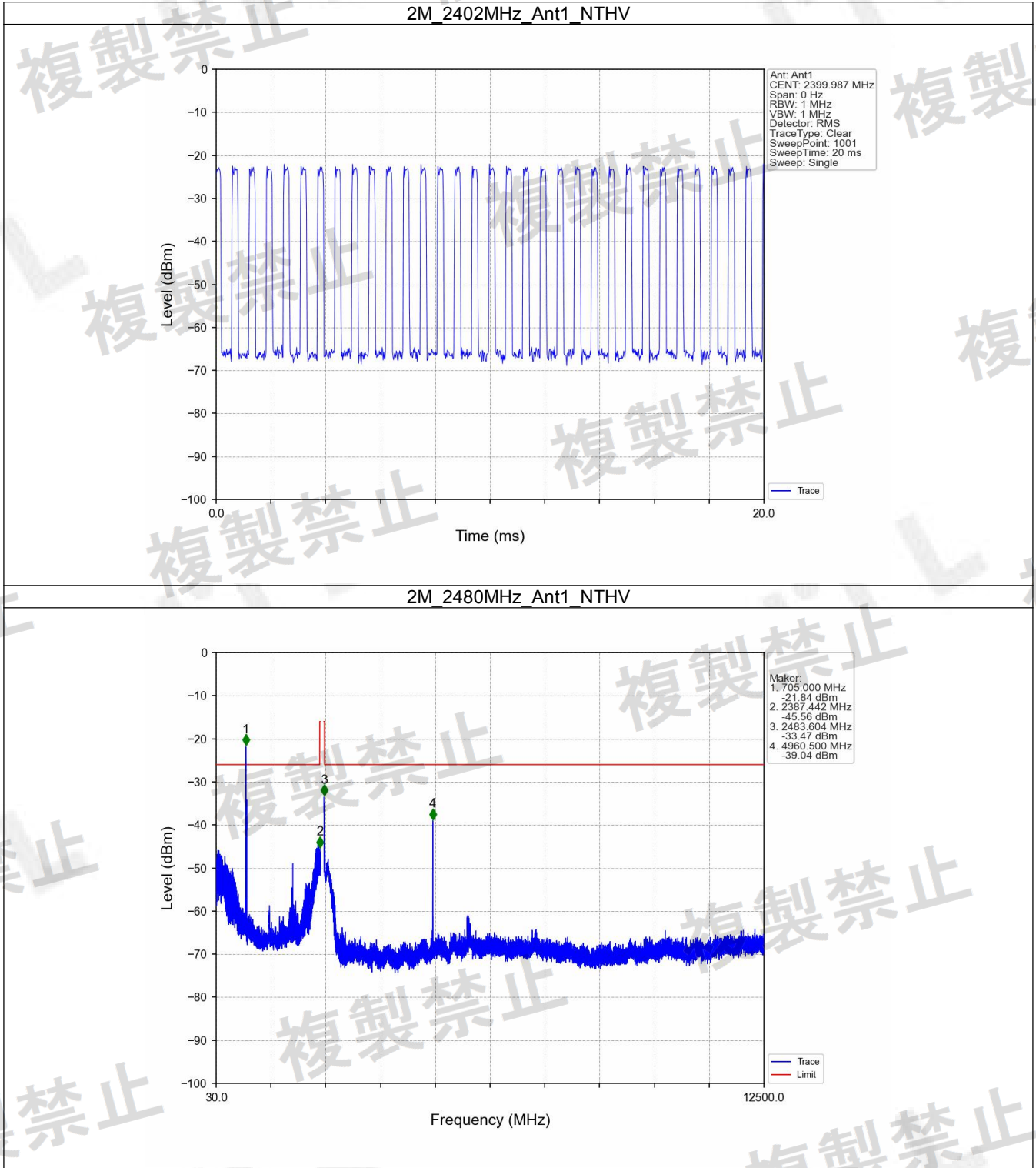


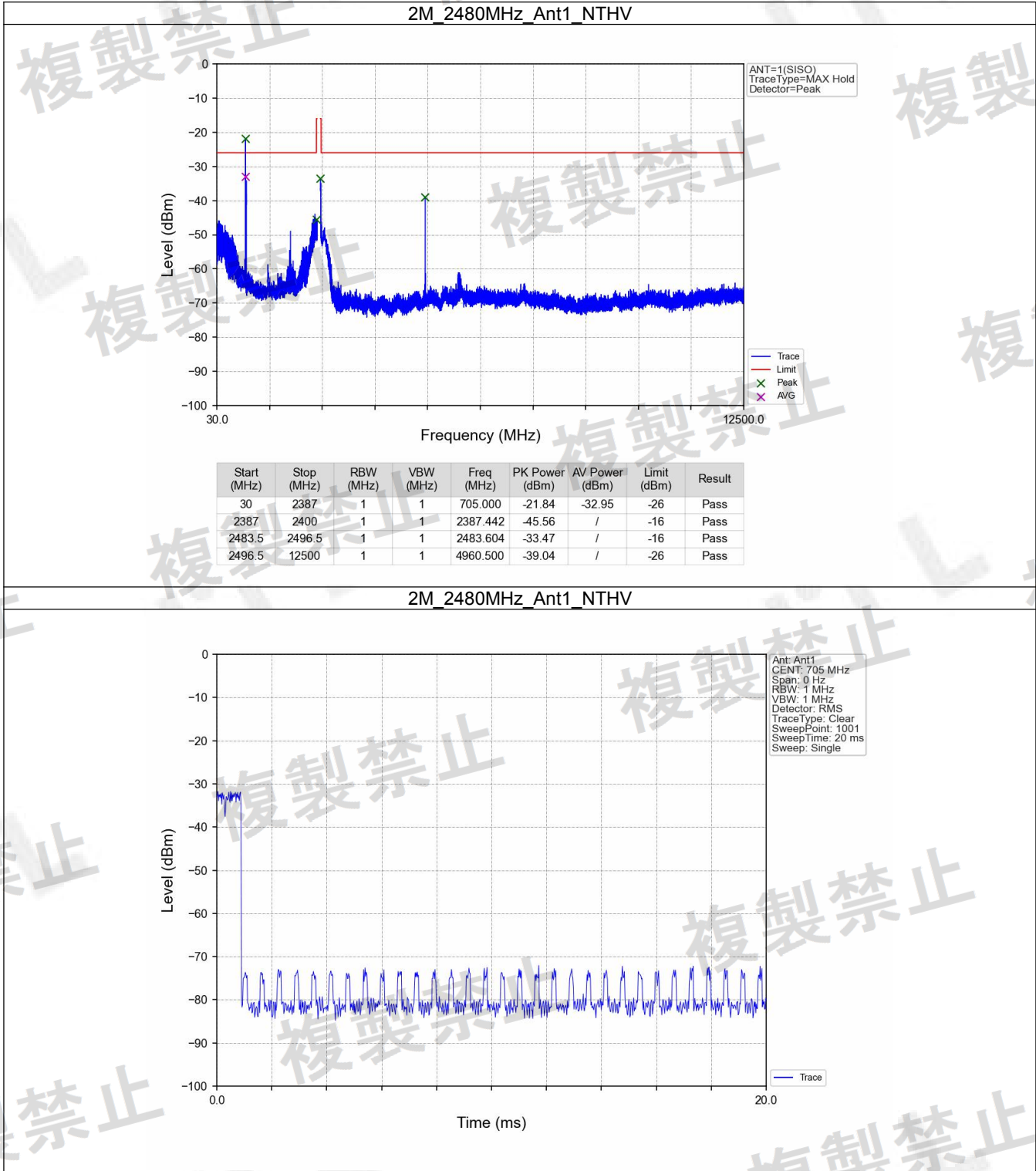
1M_2480MHz_Ant1_NTHV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2339.500	-43.65	/	-26	Pass
2387	2400	1	1	2387.104	-45.10	/	-16	Pass
2483.5	2496.5	1	1	2483.552	-34.02	/	-16	Pass
2496.5	12500	1	1	4960.500	-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	975.45	-78.07	0.016	/	/	4	Pass
				1000	12500	2414	-59.69	1.074	/	/	20	Pass
		2480	1	30	1000	897.3	-77.73	0.017	/	/	4	Pass
				1000	12500	2415.5	-62.30	0.589	/	/	20	Pass
2M	SISO	2402	1	30	1000	895.1	-78.32	0.015	/	/	4	Pass
				1000	12500	2414.5	-58.70	1.349	/	/	20	Pass
		2480	1	30	1000	901.6	-77.84	0.016	/	/	4	Pass
				1000	12500	2414	-57.97	1.596	/	/	20	Pass

5.1.2 RxSe_NTLV

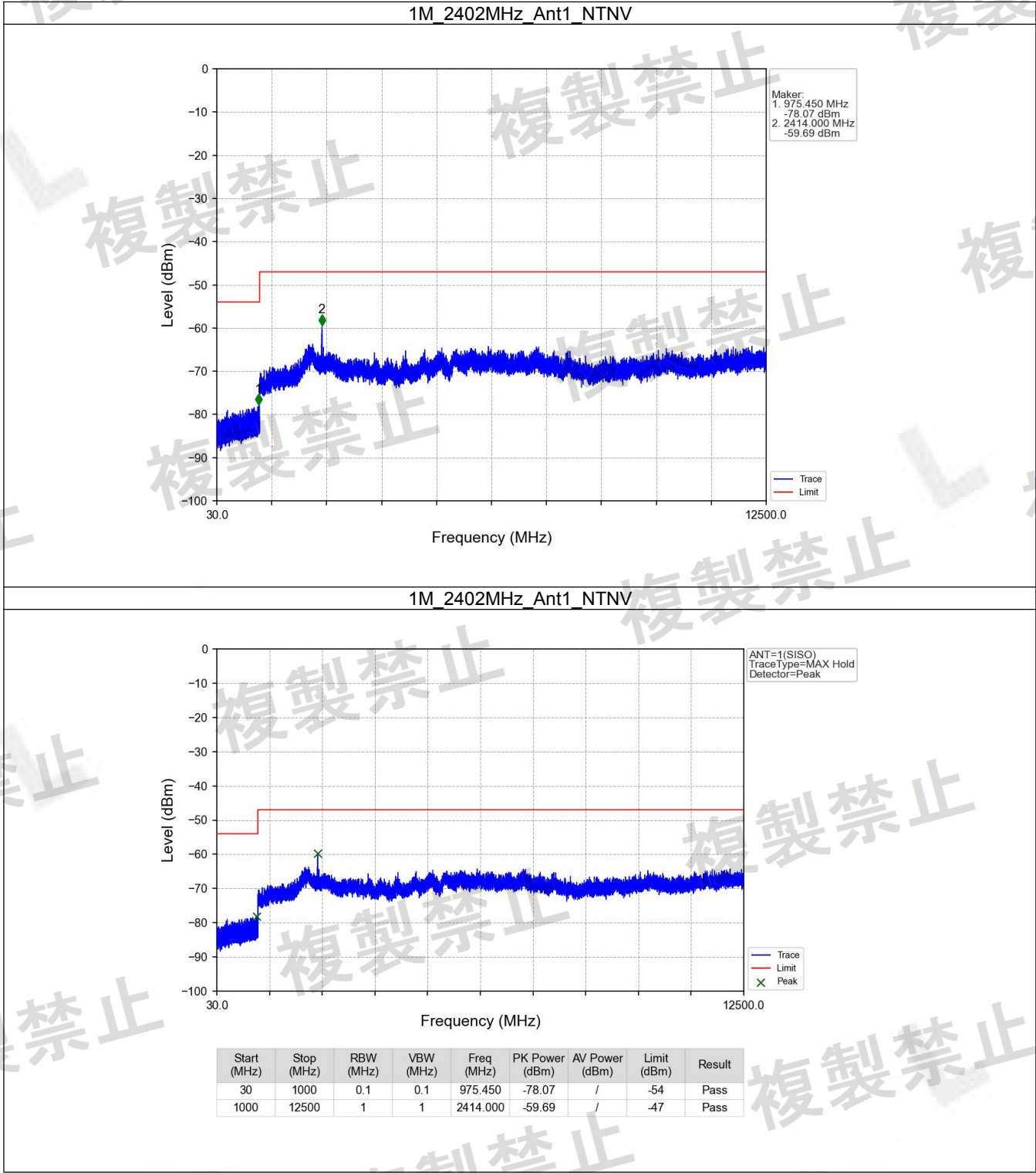
NTLV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
1M	SISO	2402	1	30	1000	901.75	-76.77	0.021	/	/	4	Pass
				1000	12500	2195.5	-62.49	0.564	/	/	20	Pass
		2480	1	30	1000	871	-77.31	0.019	/	/	4	Pass
				1000	12500	2211	-61.76	0.667	/	/	20	Pass
2M	SISO	2402	1	30	1000	949.35	-78.33	0.015	/	/	4	Pass
				1000	12500	2415.5	-59.40	1.148	/	/	20	Pass
		2480	1	30	1000	753	-78.58	0.014	/	/	4	Pass
				1000	12500	2414.5	-57.13	1.936	/	/	20	Pass

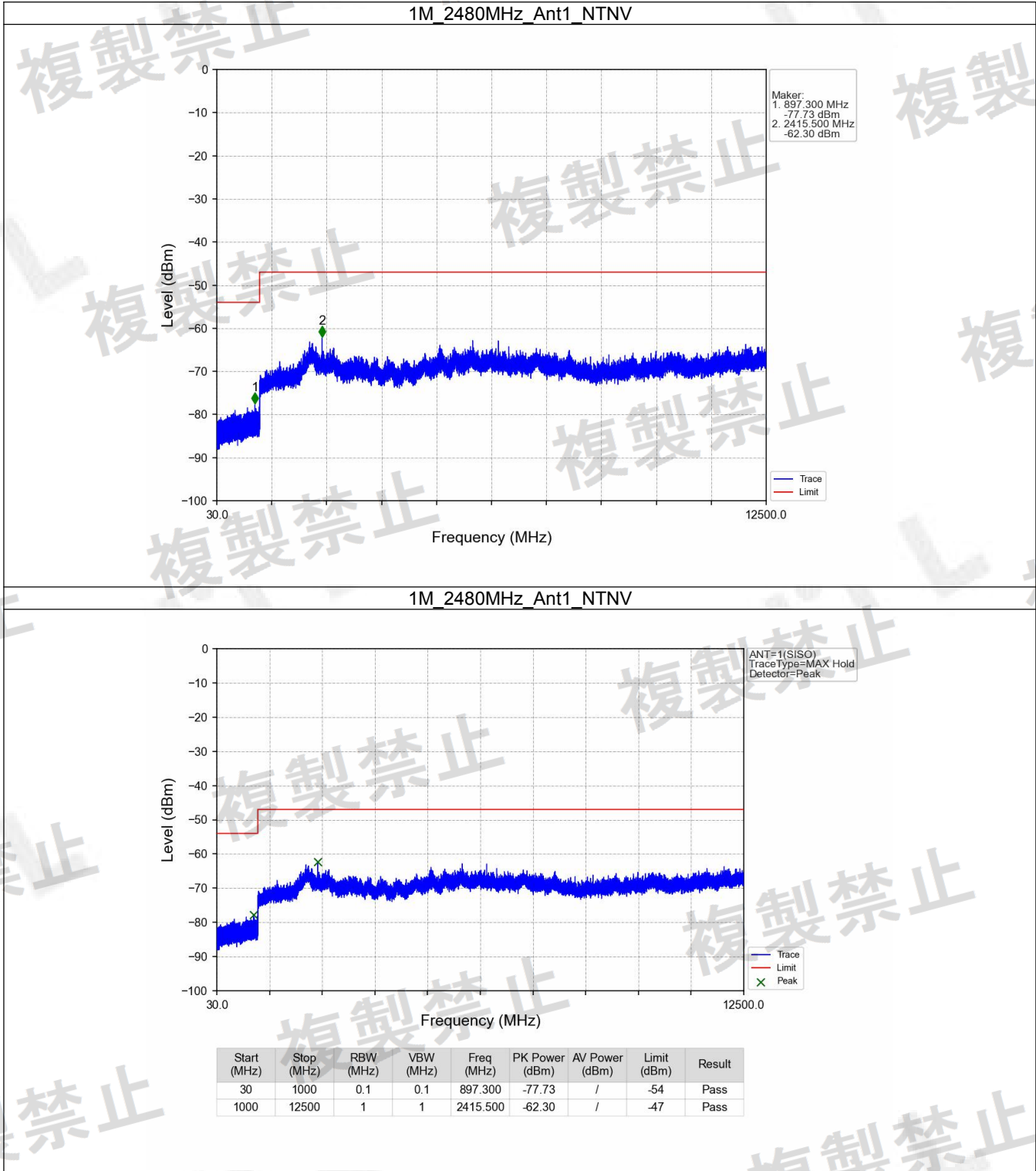
5.1.3 RxSe_NTHV

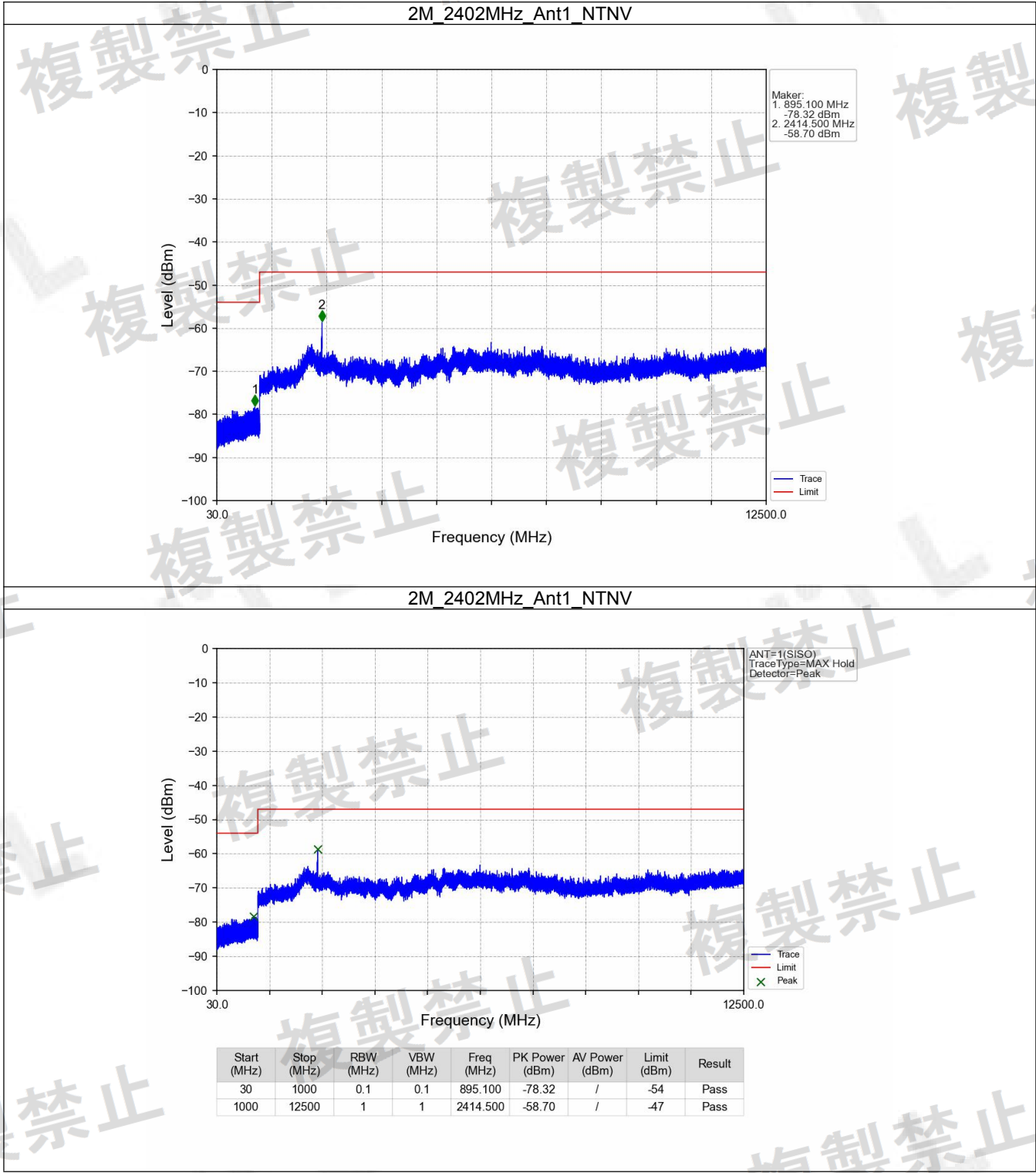
NTHV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
1M	SISO	2402	1	30	1000	894	-77.74	0.017	/	/	4	Pass
				1000	12500	2415	-59.93	1.016	/	/	20	Pass
		2480	1	30	1000	960.25	-78.29	0.015	/	/	4	Pass
				1000	12500	2415.5	-59.35	1.161	/	/	20	Pass
2M	SISO	2402	1	30	1000	940.6	-78.69	0.014	/	/	4	Pass
				1000	12500	2414.5	-58.12	1.542	/	/	20	Pass
		2480	1	30	1000	914.65	-78.08	0.016	/	/	4	Pass
				1000	12500	2414.5	-57.18	1.914	/	/	20	Pass

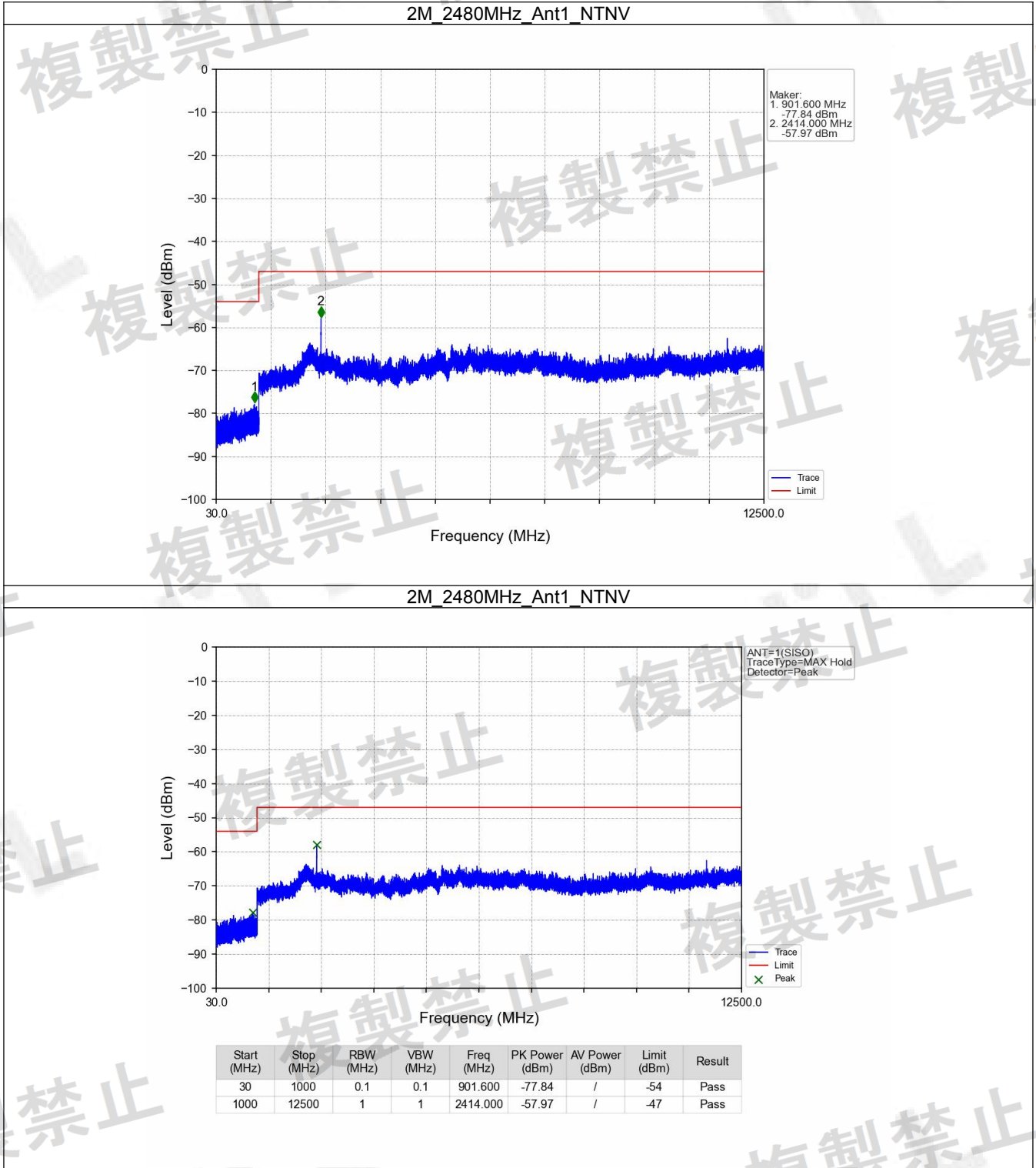
5.2 Test Graph

5.2.1 RxSe_NTNV

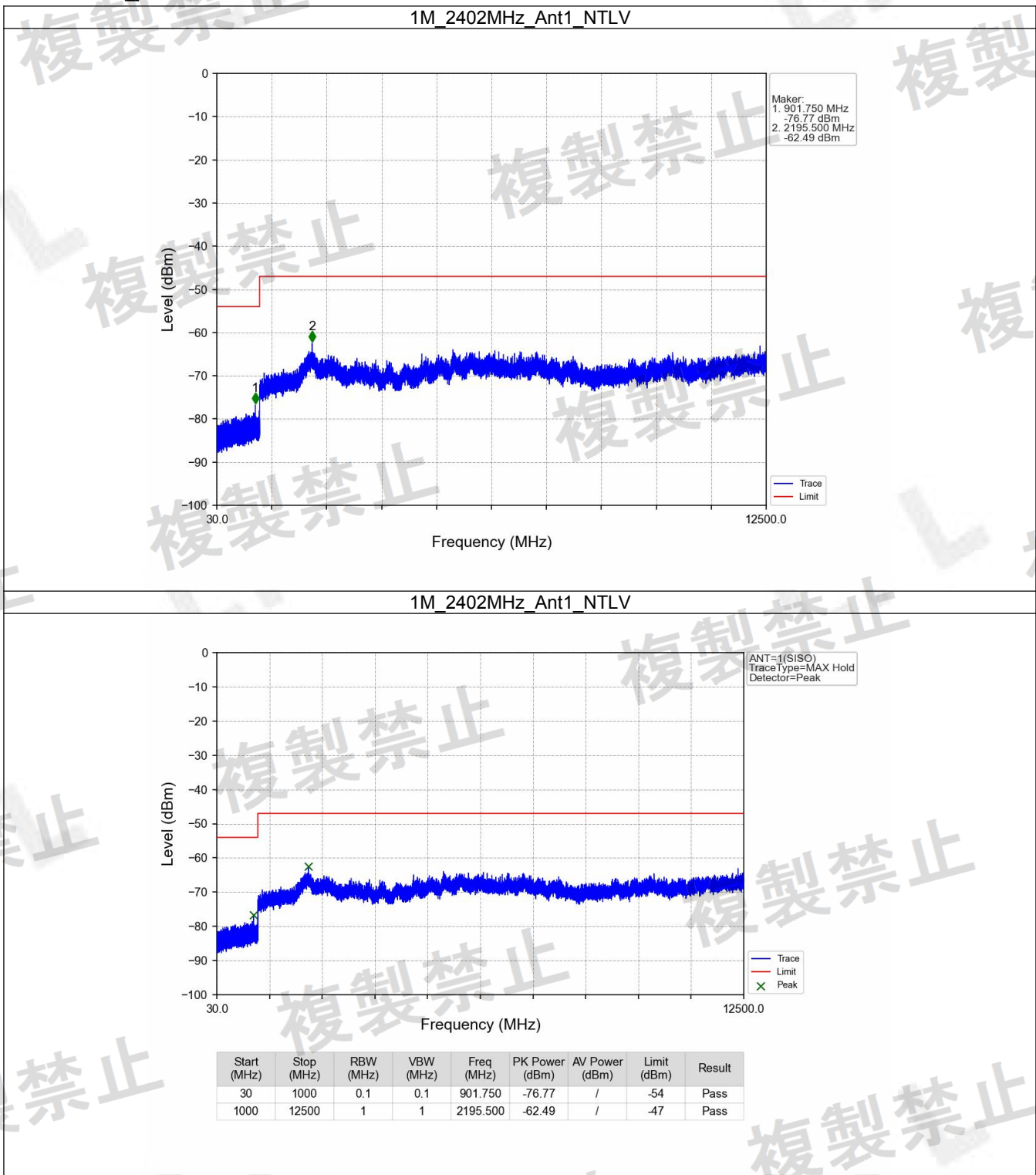


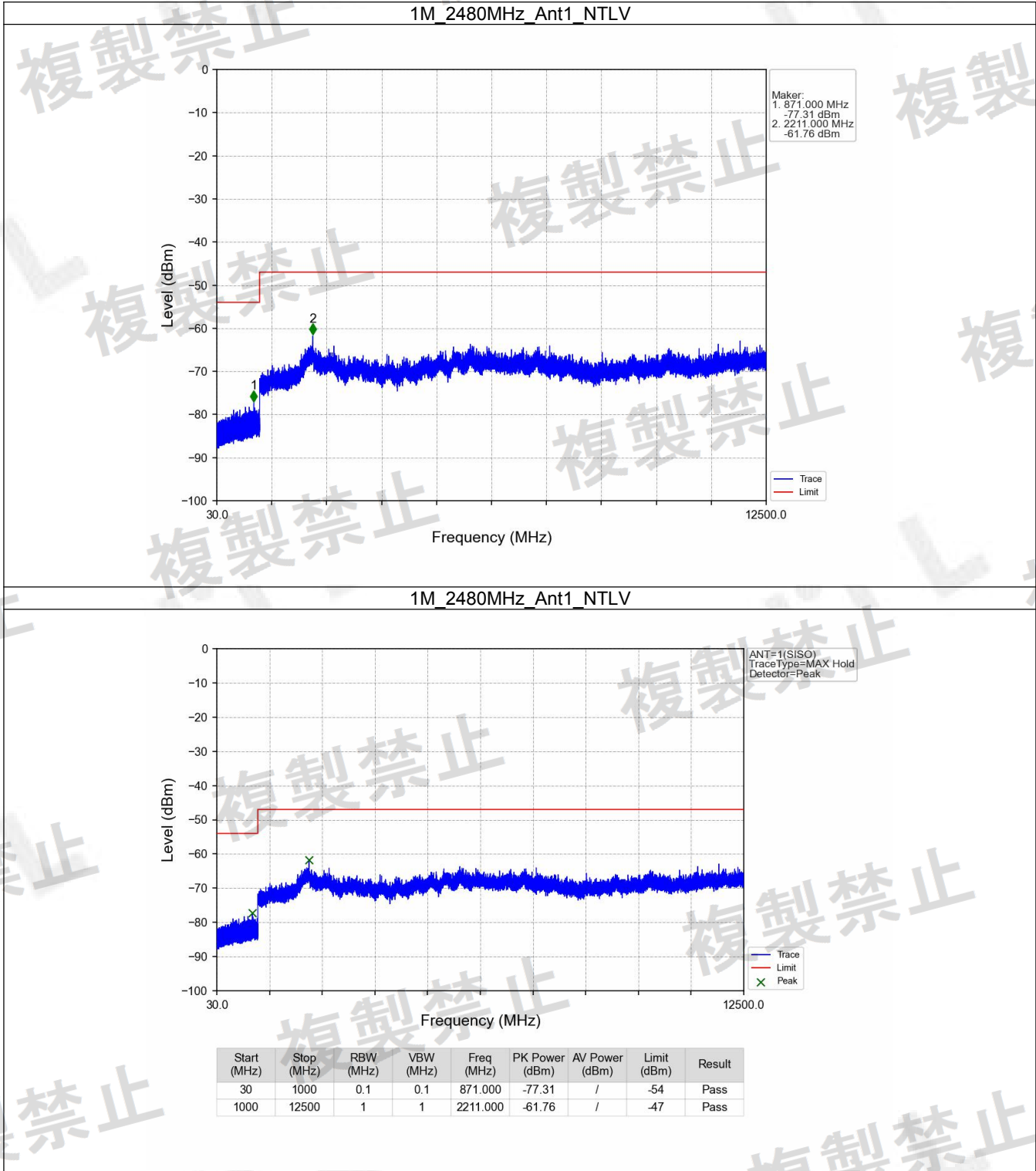


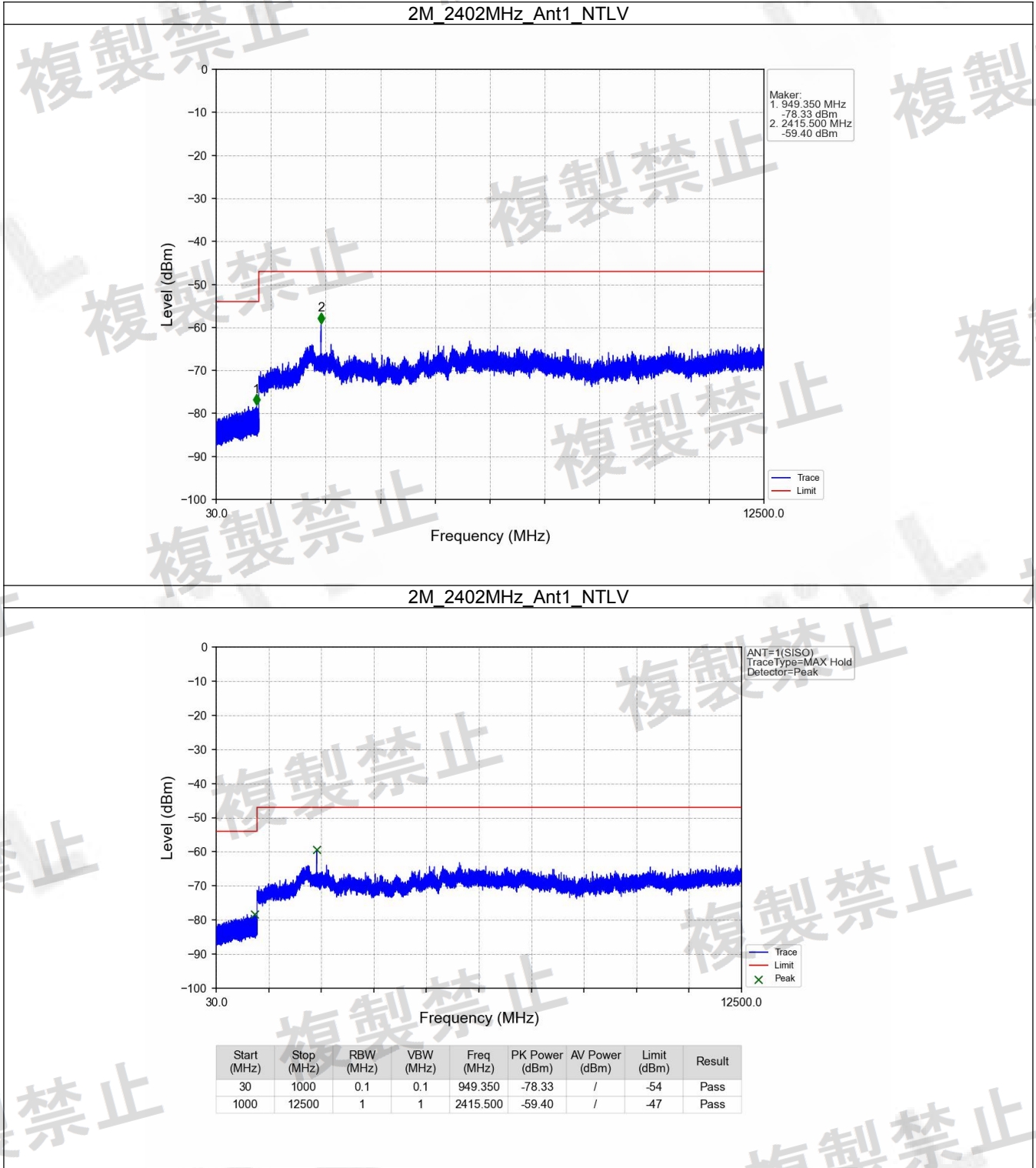


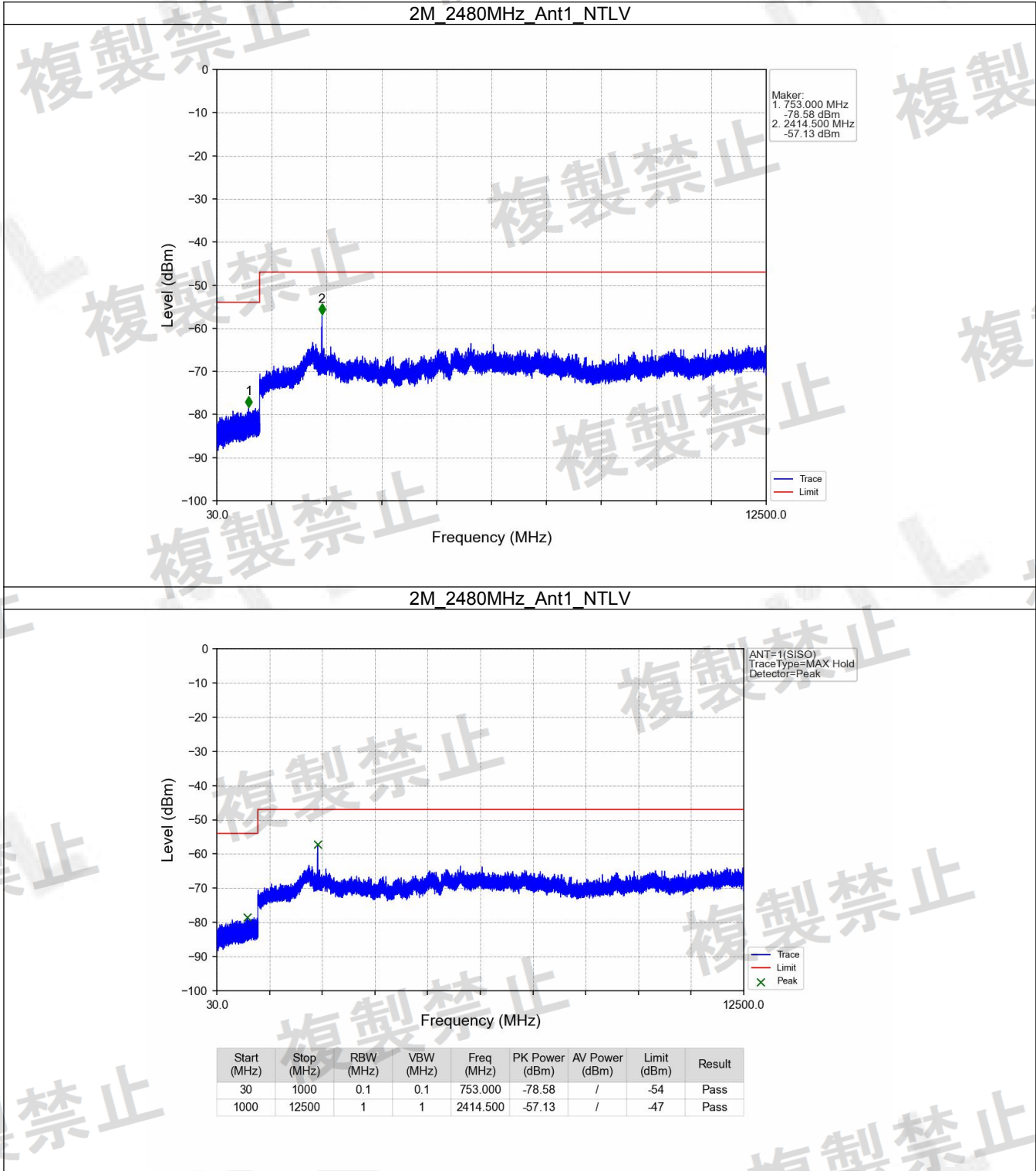


5.2.2 RxSe_NTLV









5.2.3 RxSe_NTHV

