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Annex for Bluetooth low Energy

Test Report No.: CTL2607022041-MIC02

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MIC: 219-269515

1. Frequency Error

1.1 Test Result

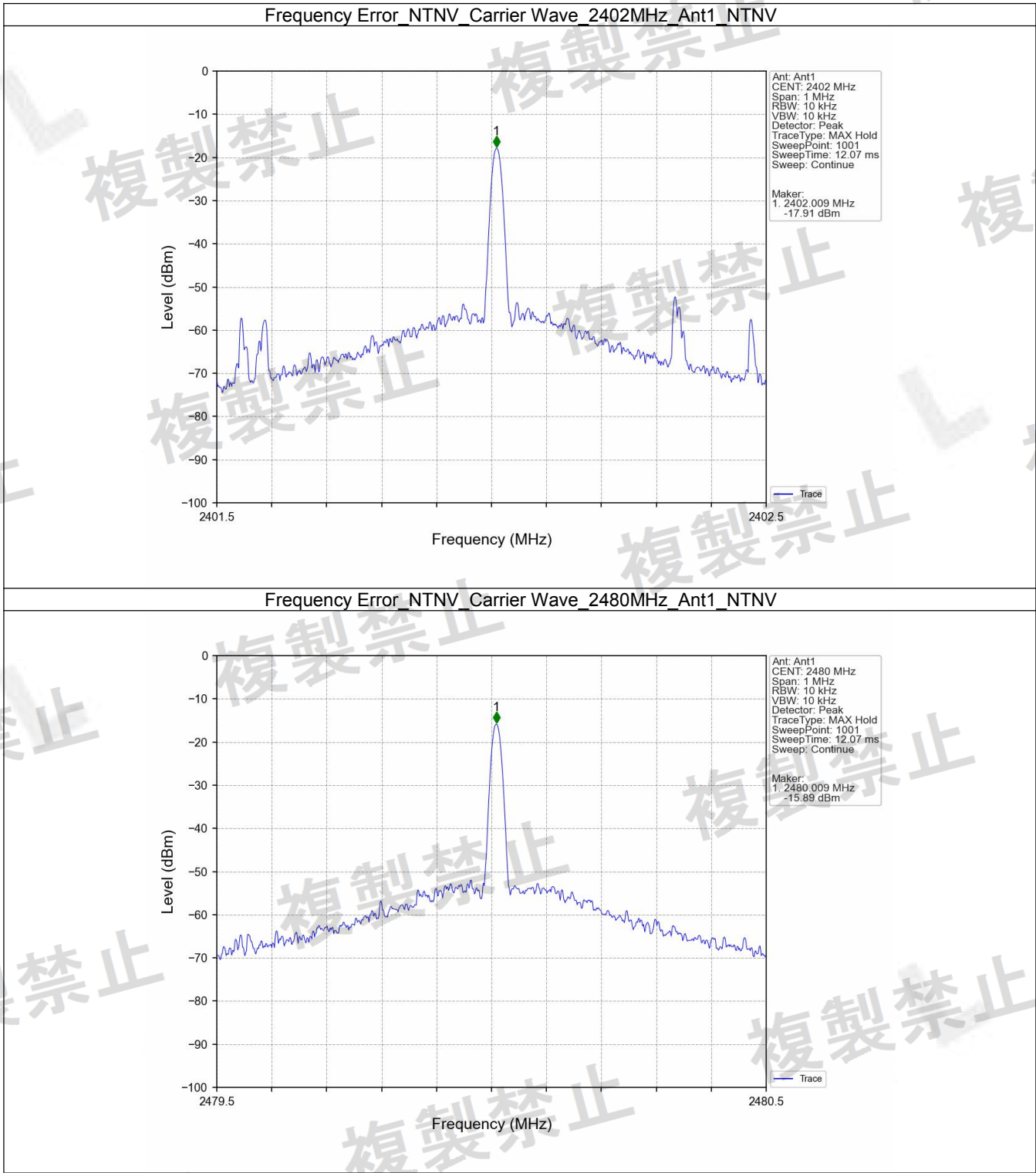
1.1.1 Ant1

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2402	2402.009	3.75	-50 to 50	Pass
			2480	2480.009	3.63	-50 to 50	Pass
NTLV	Carrier Wave	SISO	2402	2402.009	3.75	-50 to 50	Pass
			2480	2480.009	3.63	-50 to 50	Pass
NTHV	Carrier Wave	SISO	2402	2402.009	3.75	-50 to 50	Pass
			2480	2480.009	3.63	-50 to 50	Pass

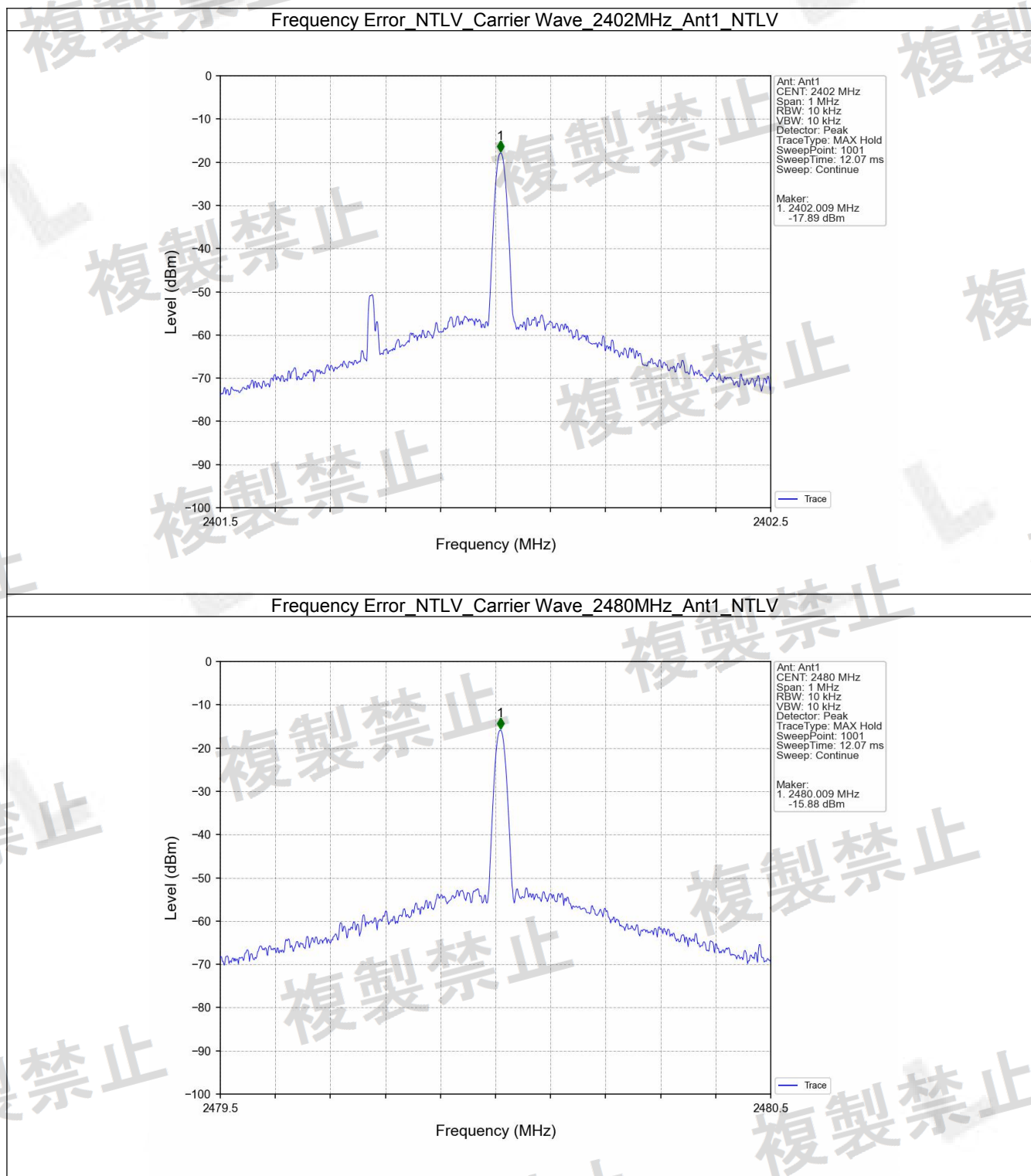
MIC: 219-269515

1.2 Test Graph

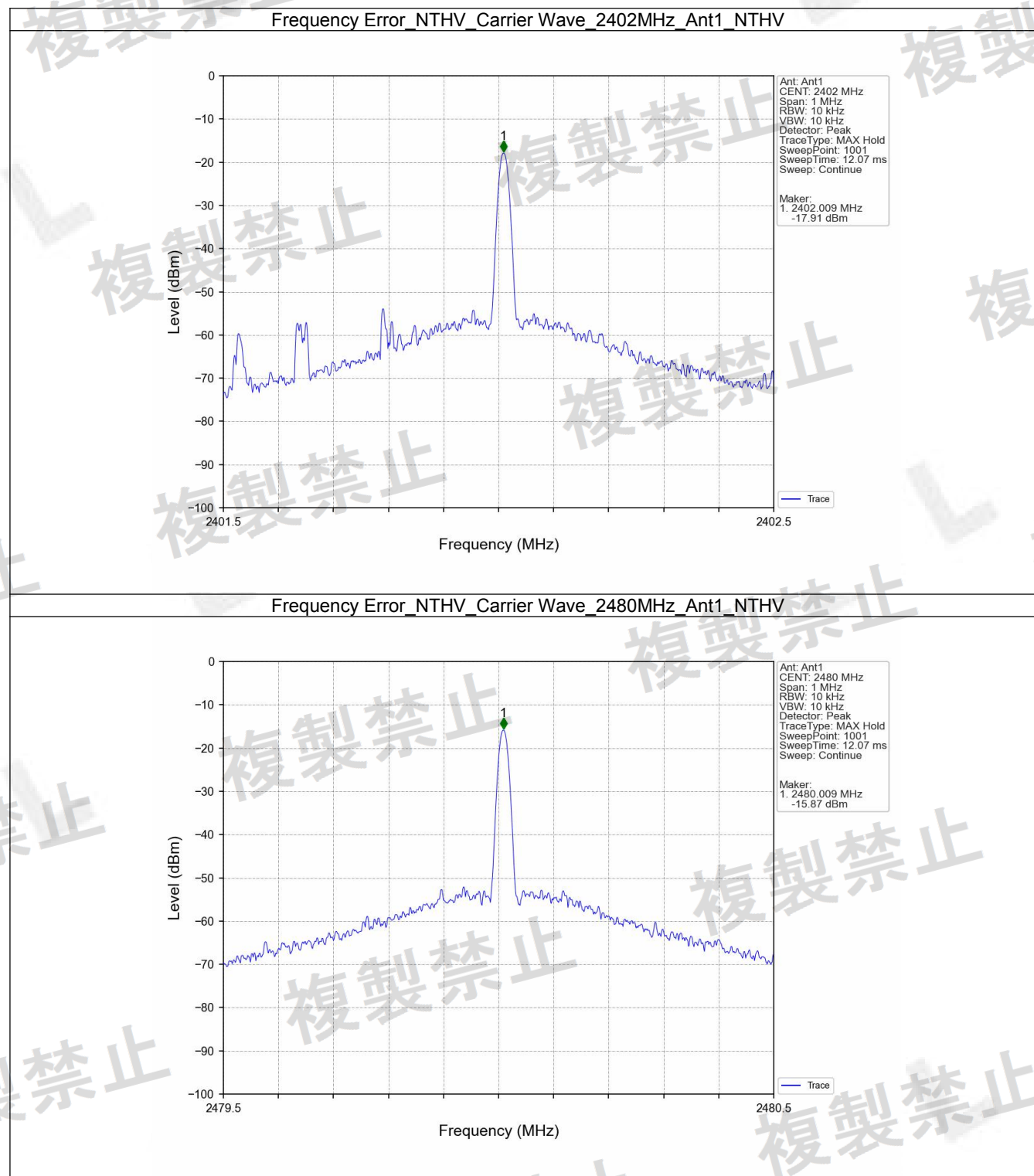
1.2.1 Ant1



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2. Occupied Bandwidth

2.1 Test Result

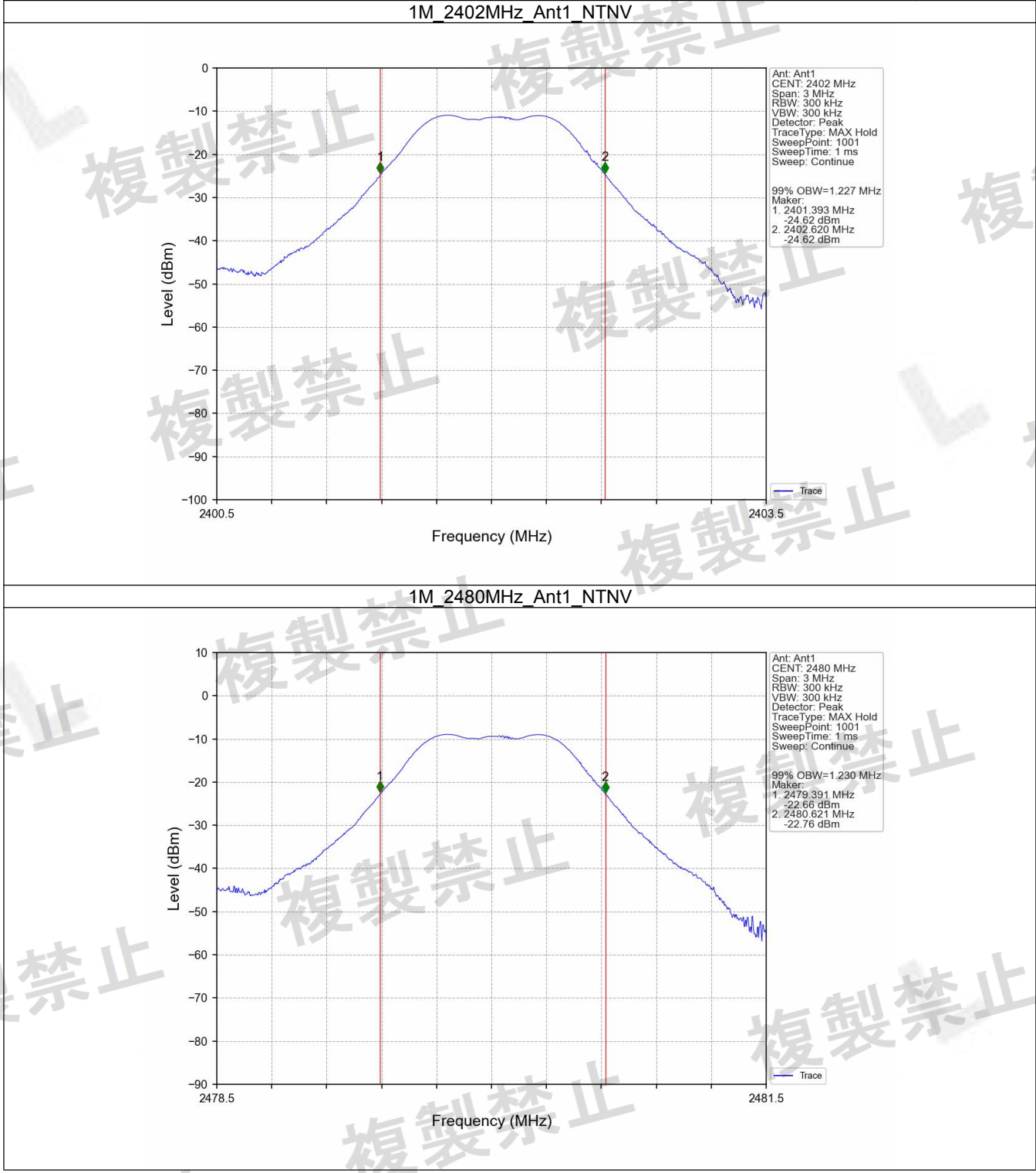
2.1.1 OBW

ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	1M	SISO	2402	1.227	<=26	Pass
			2480	1.230	<=26	Pass
	2M	SISO	2402	2.160	<=26	Pass
			2480	2.162	<=26	Pass
NTLV	1M	SISO	2402	1.228	<=26	Pass
			2480	1.230	<=26	Pass
	2M	SISO	2402	2.160	<=26	Pass
			2480	2.162	<=26	Pass
NTHV	1M	SISO	2402	1.228	<=26	Pass
			2480	1.230	<=26	Pass
	2M	SISO	2402	2.158	<=26	Pass
			2480	2.163	<=26	Pass

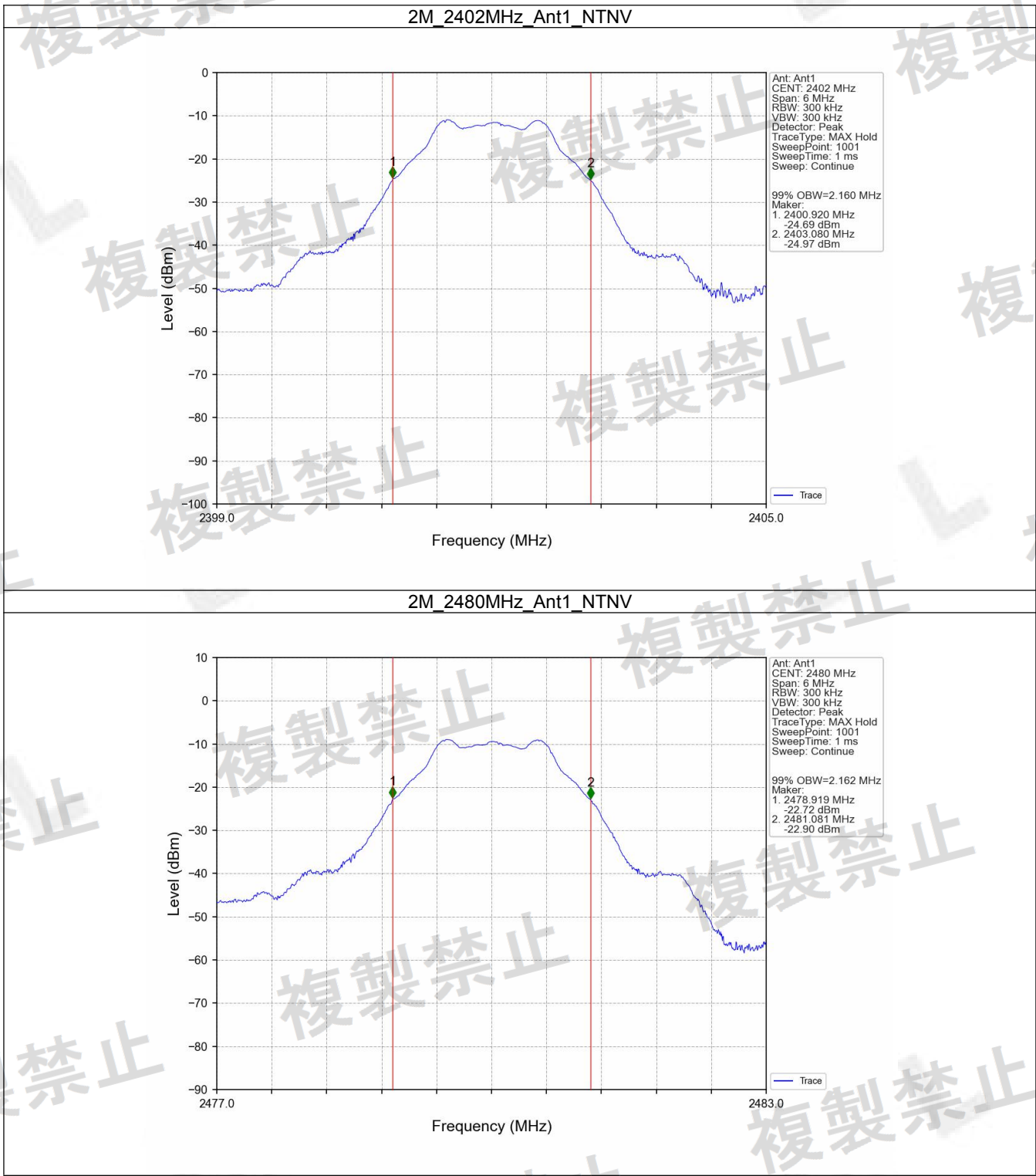
MIC: 219-269515

2.2 Test Graph

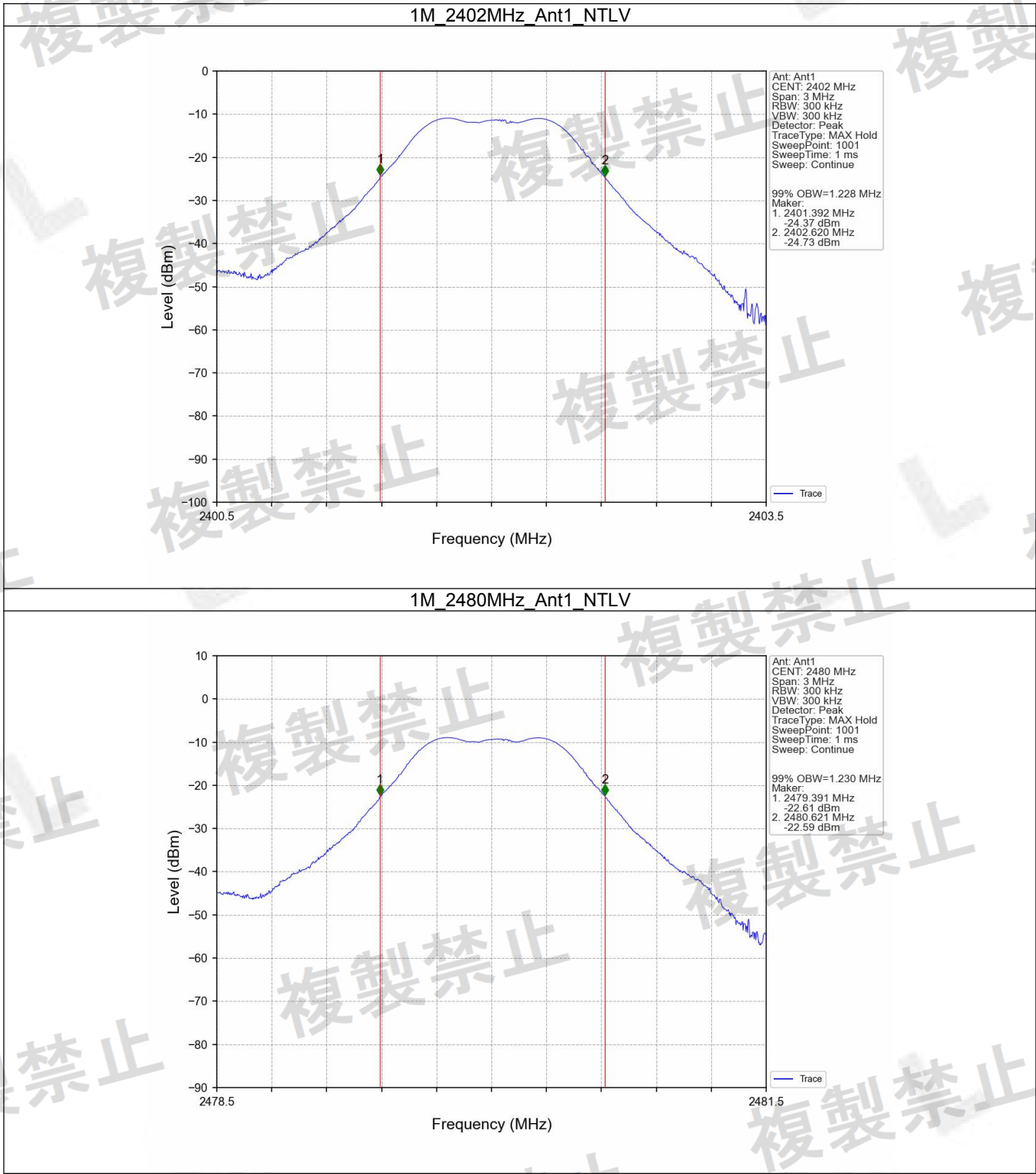
2.2.1 OBW



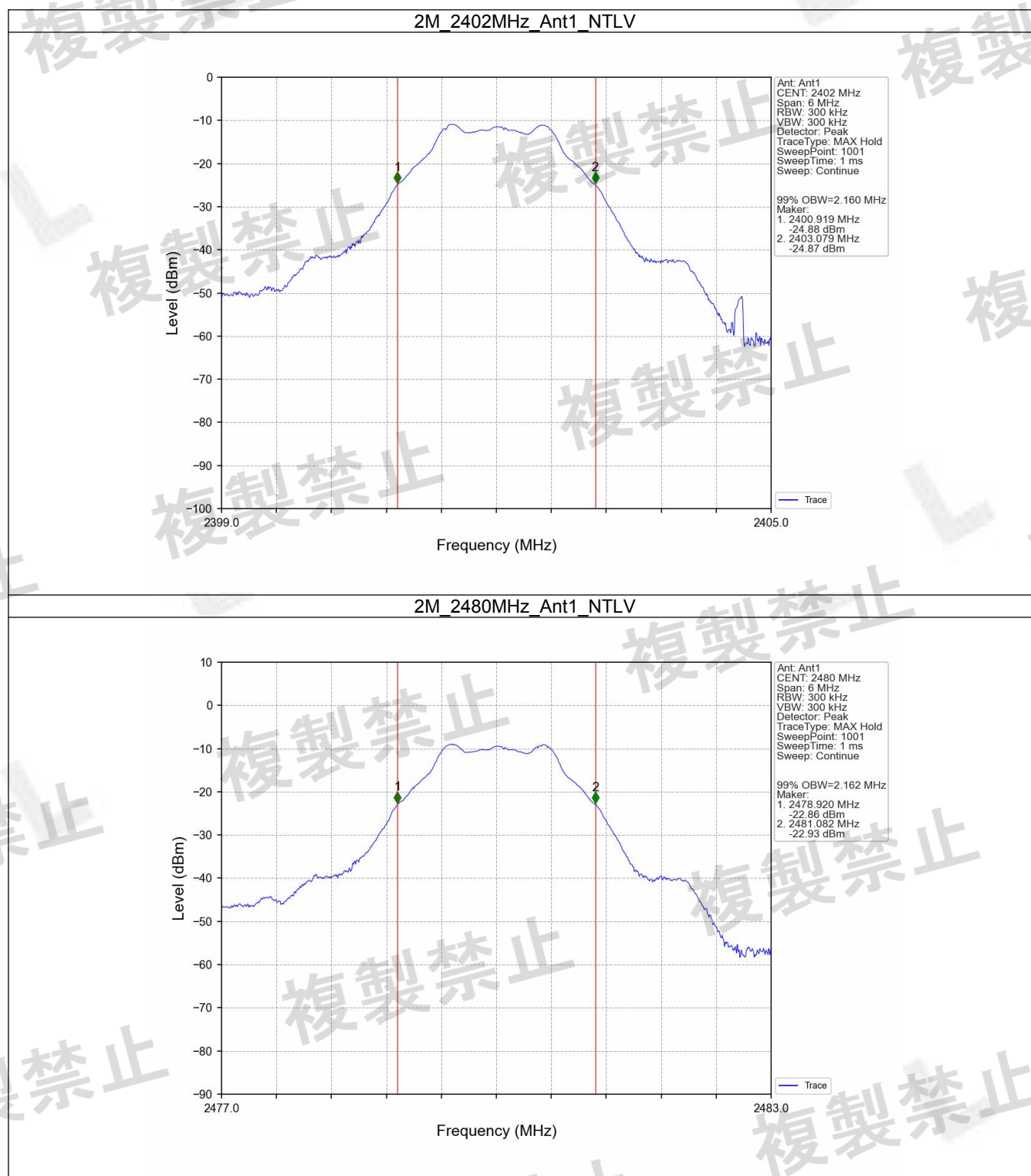
MIC: 219-269515



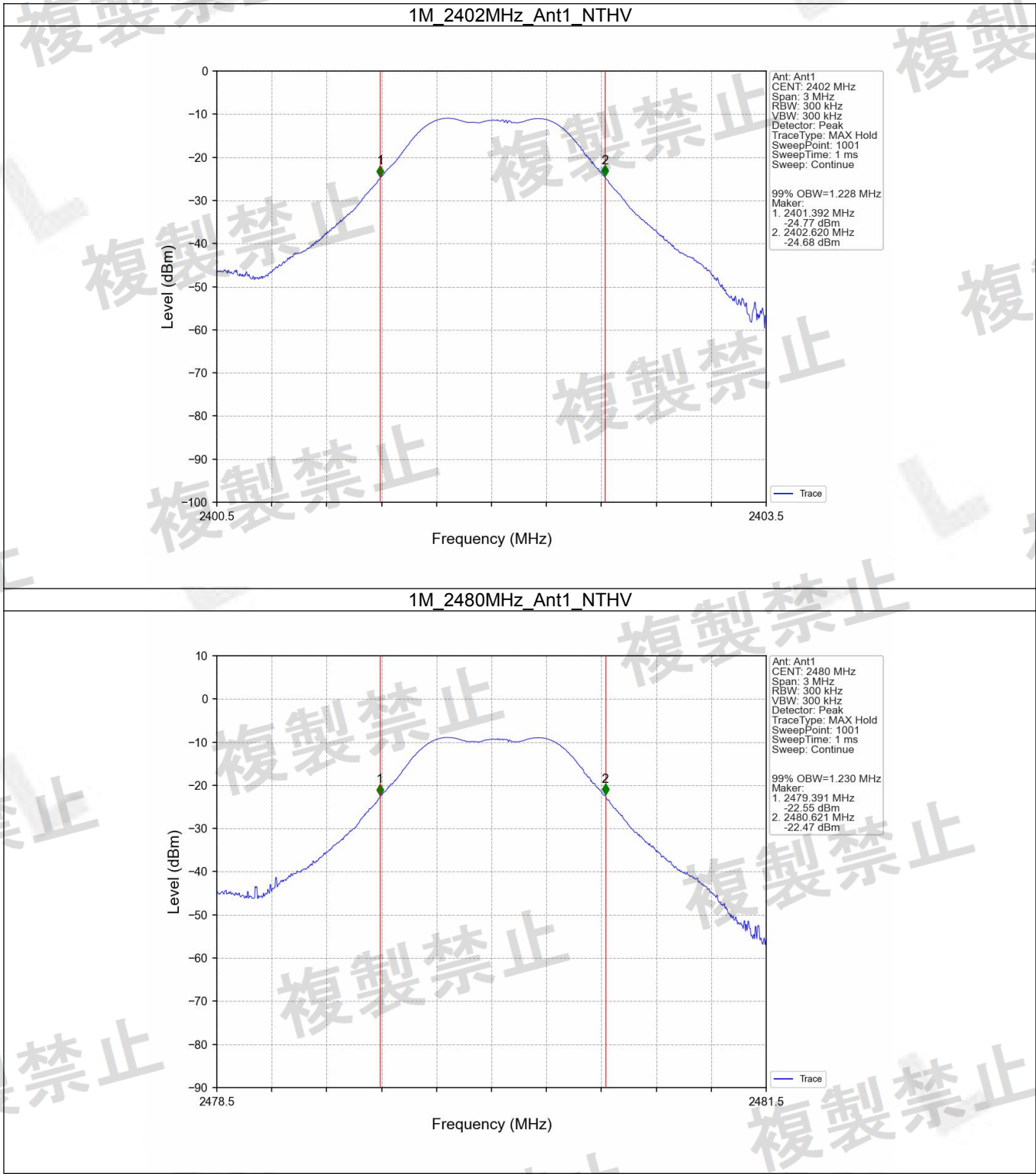
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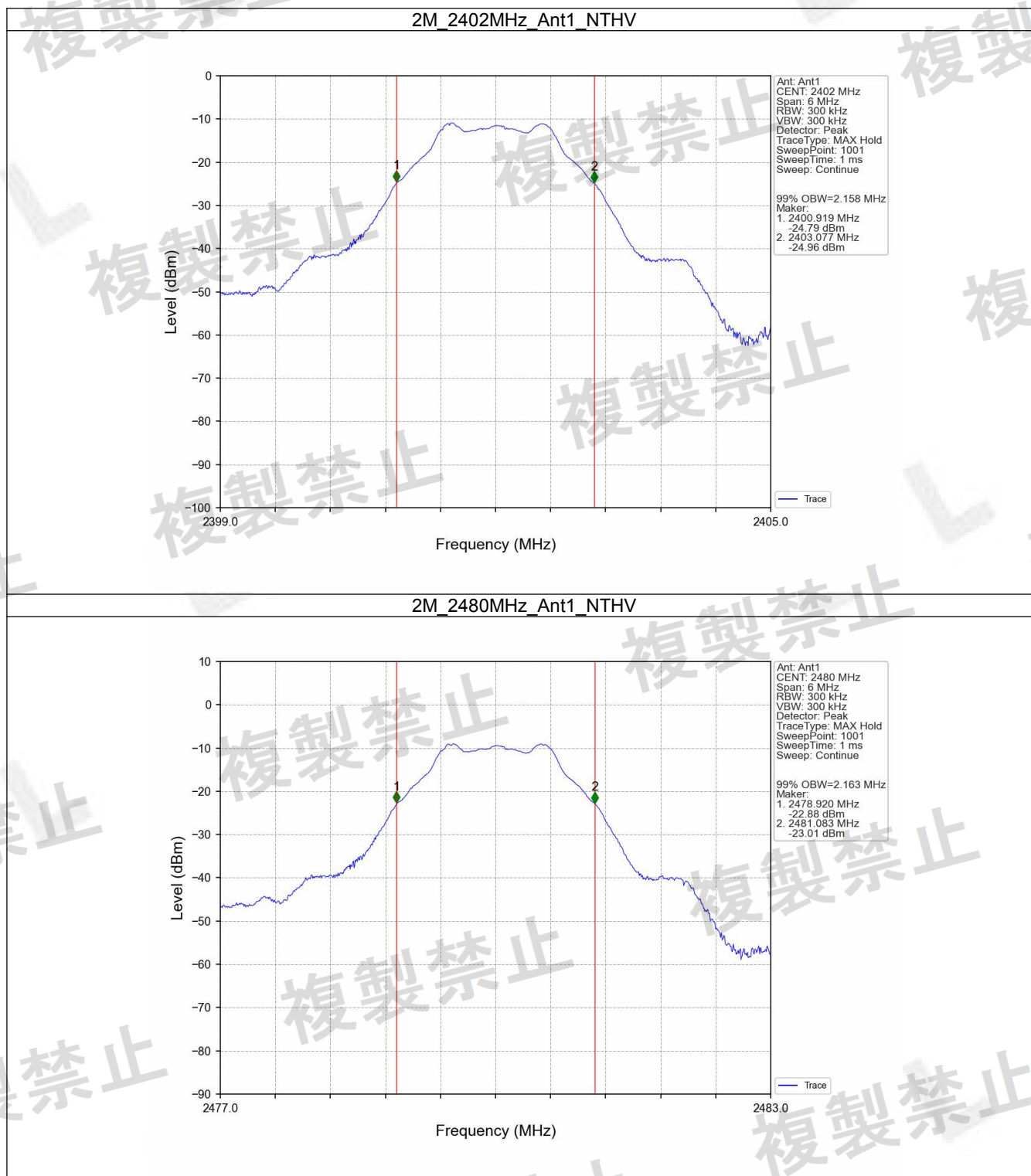
MIC: 219-269515



MIC: 219-269515



MIC: 219-269515



MIC: 219-269515

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	0.075	<=10.00	0.120	-37.50	<=20	Pass
			2480	1	0.121	<=10.00	0.120	0.83	<=20	Pass
	2M	SISO	2402	1	0.067	<=10.00	0.120	-44.17	<=20	Pass
			2480	1	0.117	<=10.00	0.120	-2.50	<=20	Pass
NTLV	1M	SISO	2402	1	0.080	<=10.00	0.120	-33.33	<=20	Pass
			2480	1	0.122	<=10.00	0.120	1.67	<=20	Pass
	2M	SISO	2402	1	0.074	<=10.00	0.120	-38.33	<=20	Pass
			2480	1	0.110	<=10.00	0.120	-8.33	<=20	Pass
NTHV	1M	SISO	2402	1	0.077	<=10.00	0.120	-35.83	<=20	Pass
			2480	1	0.124	<=10.00	0.120	3.33	<=20	Pass
	2M	SISO	2402	1	0.075	<=10.00	0.120	-37.50	<=20	Pass
			2480	1	0.115	<=10.00	0.120	-4.17	<=20	Pass

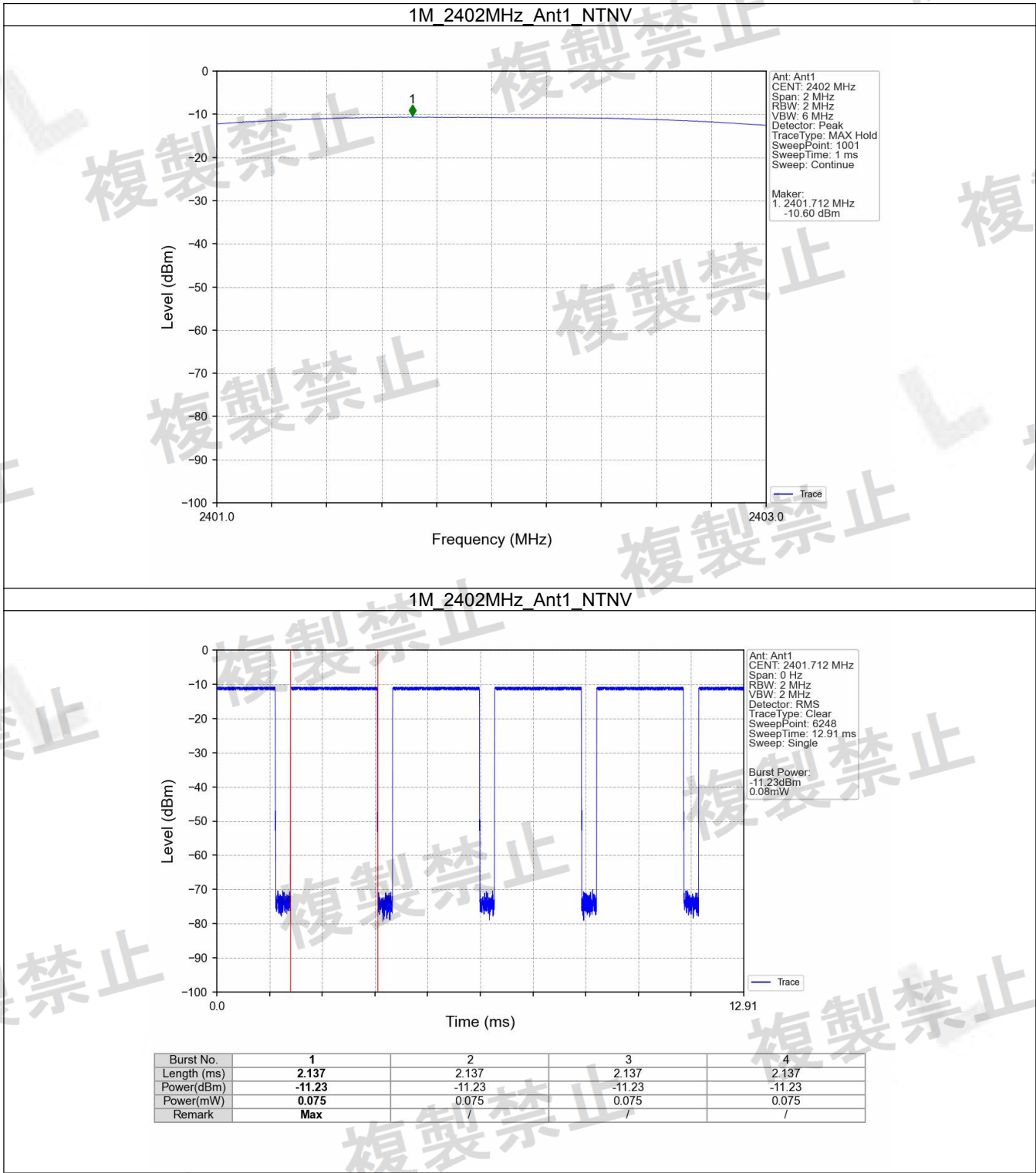
3.1.2 EIRP

ENV	Mode	TX Type	Frequency (MHz)	ANT	Gain (dBi)	EIRP (dBm)		Verdict
						Result	Limit	
NTNV	1M	SISO	2402	1	2.27	-8.96	<=12.14	Pass
			2480	1	2.27	-6.91	<=12.14	Pass
	2M	SISO	2402	1	2.27	-9.46	<=12.14	Pass
			2480	1	2.27	-7.04	<=12.14	Pass
NTLV	1M	SISO	2402	1	2.27	-8.72	<=12.14	Pass
			2480	1	2.27	-6.86	<=12.14	Pass
	2M	SISO	2402	1	2.27	-9.01	<=12.14	Pass
			2480	1	2.27	-7.33	<=12.14	Pass
NTHV	1M	SISO	2402	1	2.27	-8.86	<=12.14	Pass
			2480	1	2.27	-6.80	<=12.14	Pass
	2M	SISO	2402	1	2.27	-8.98	<=12.14	Pass
			2480	1	2.27	-7.13	<=12.14	Pass

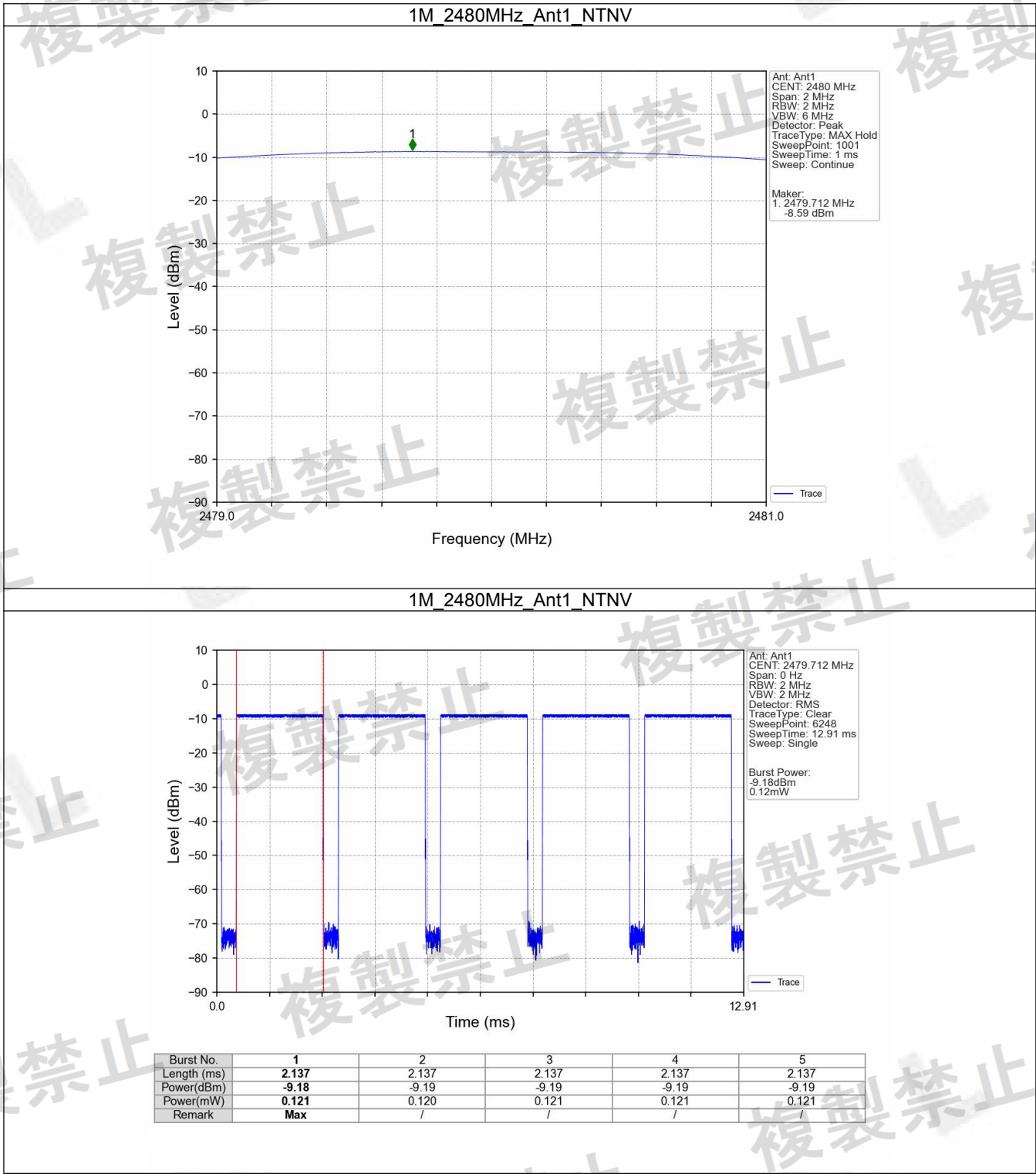
MIC: 219-269515

3.2 Test Graph

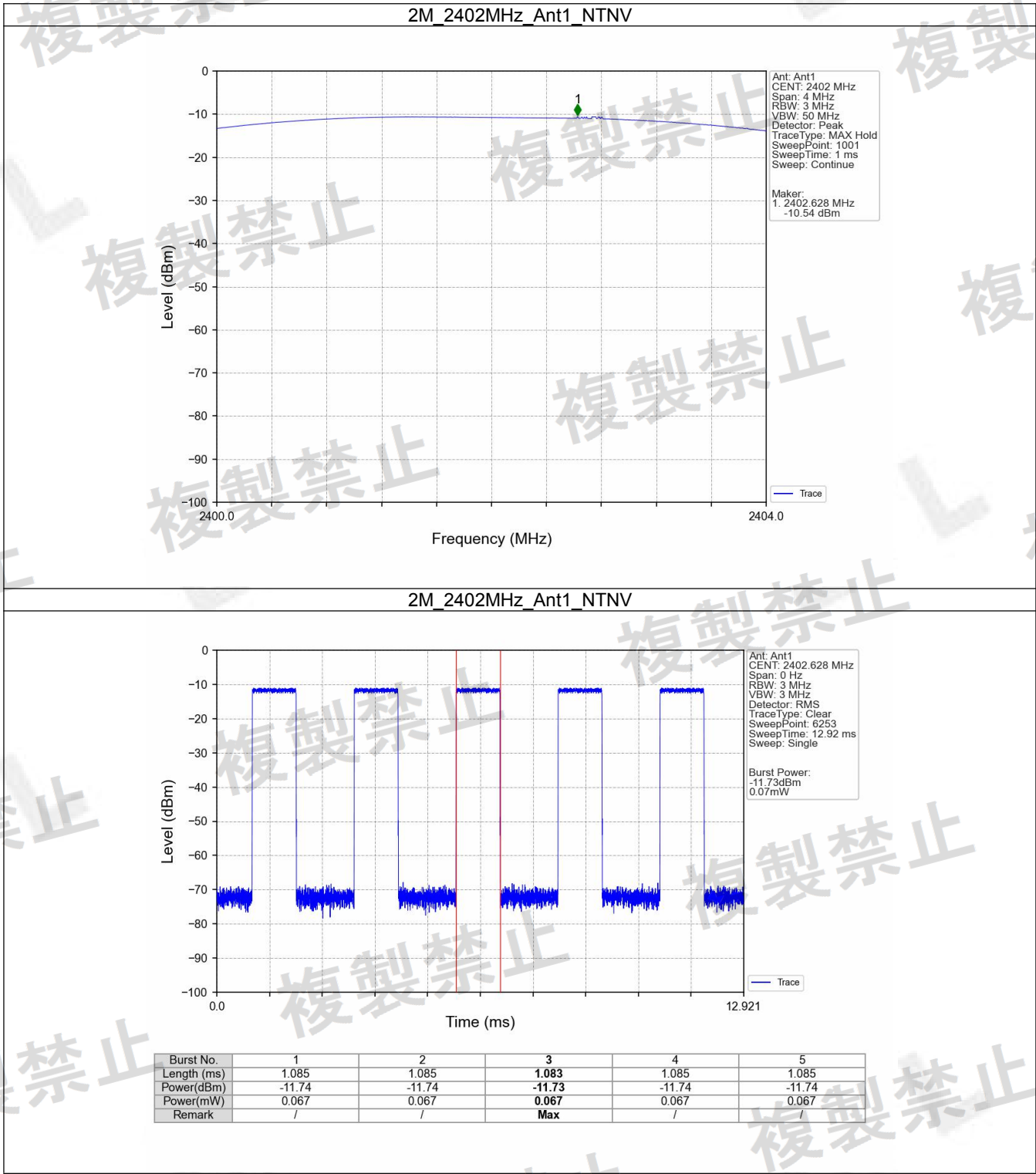
3.2.1 Power



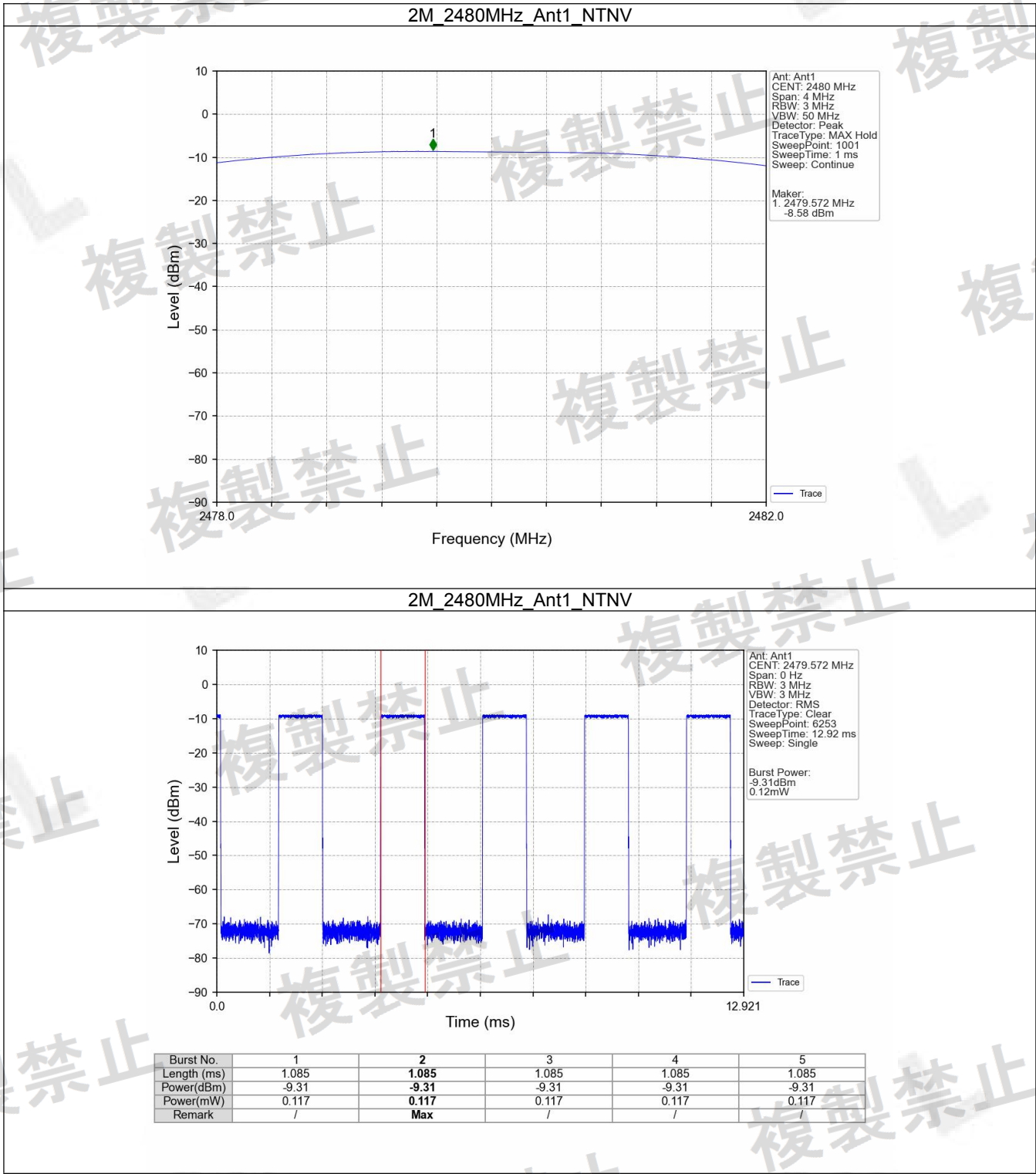
MIC: 219-269515



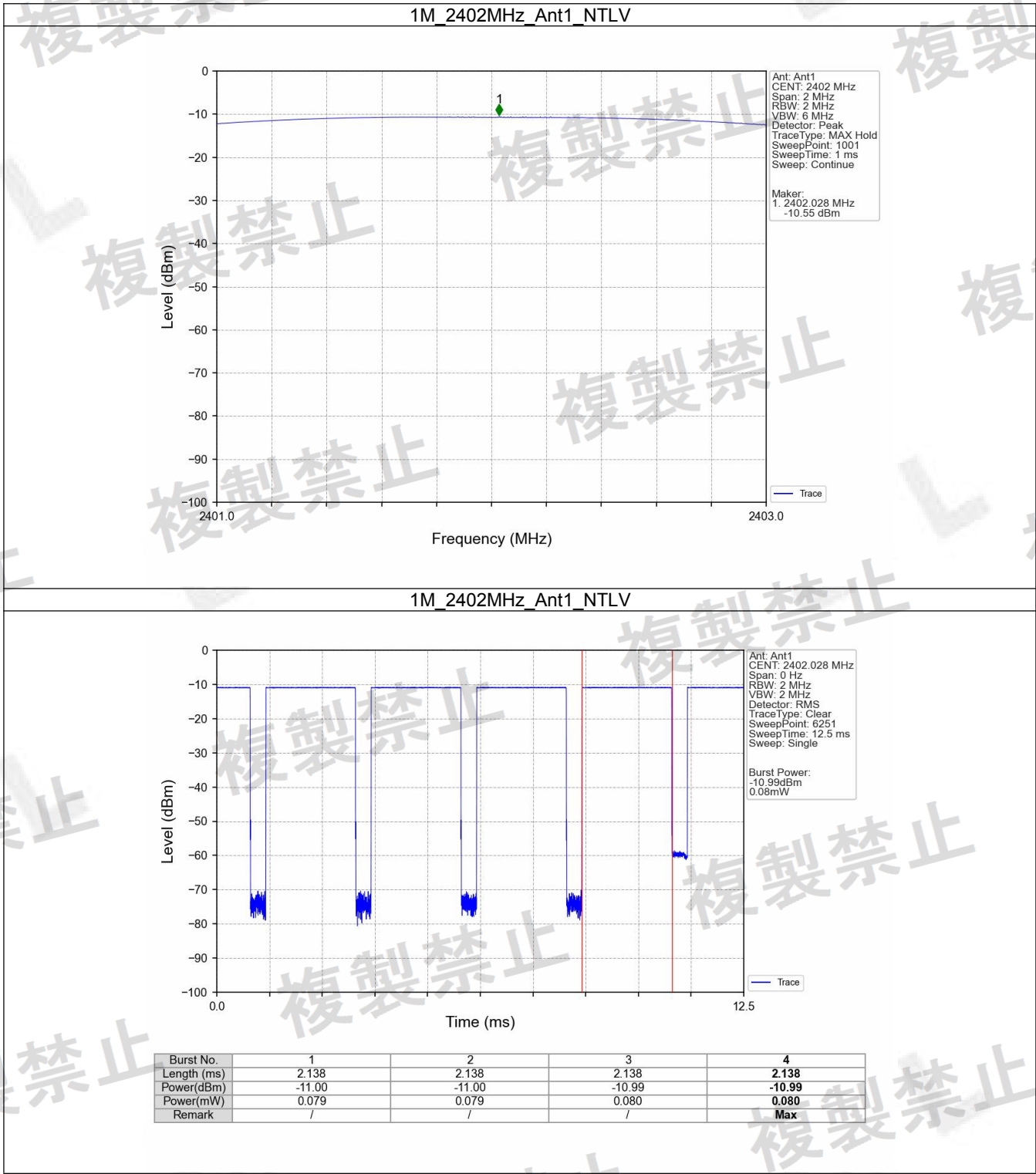
MIC: 219-269515



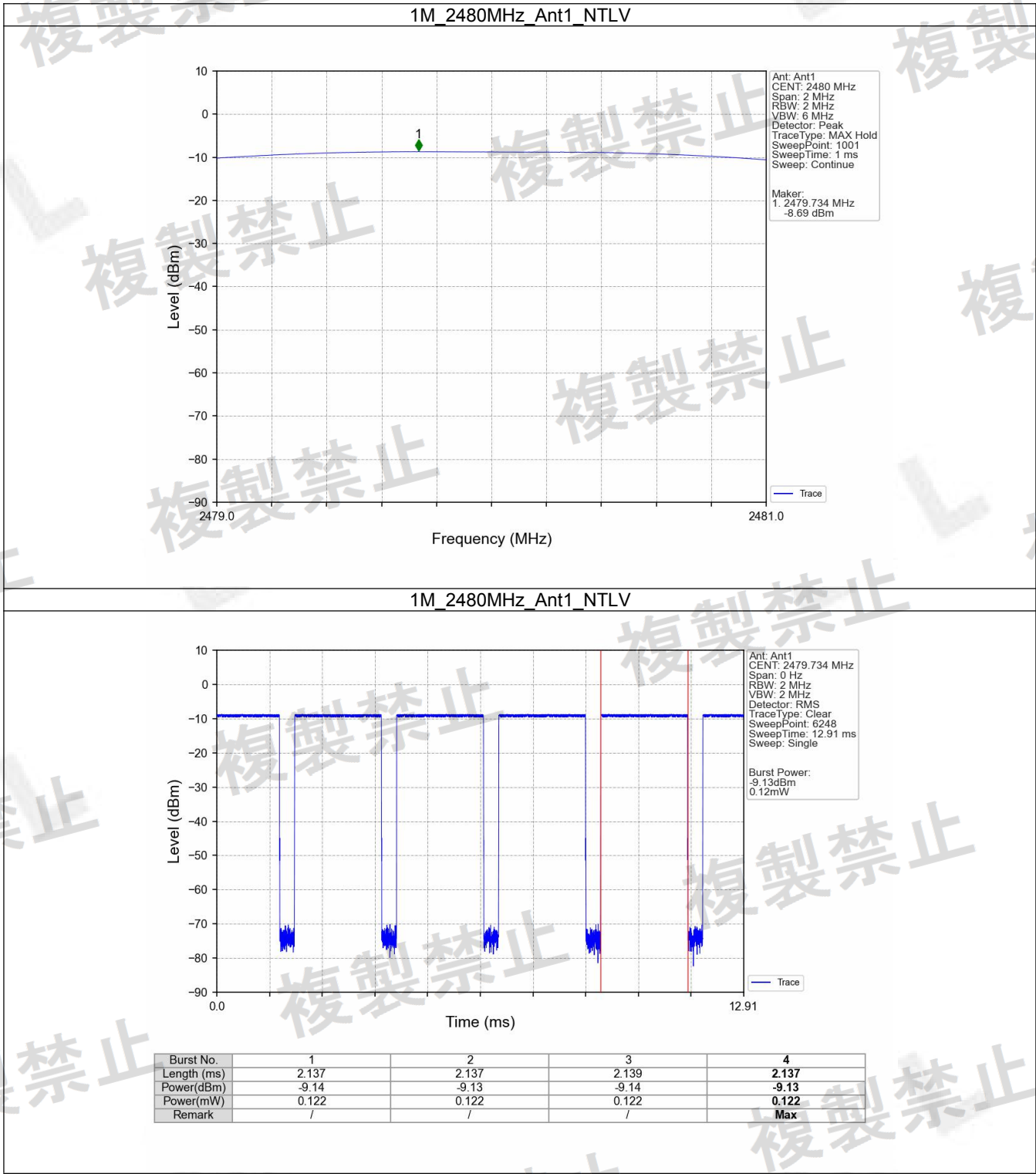
MIC: 219-269515



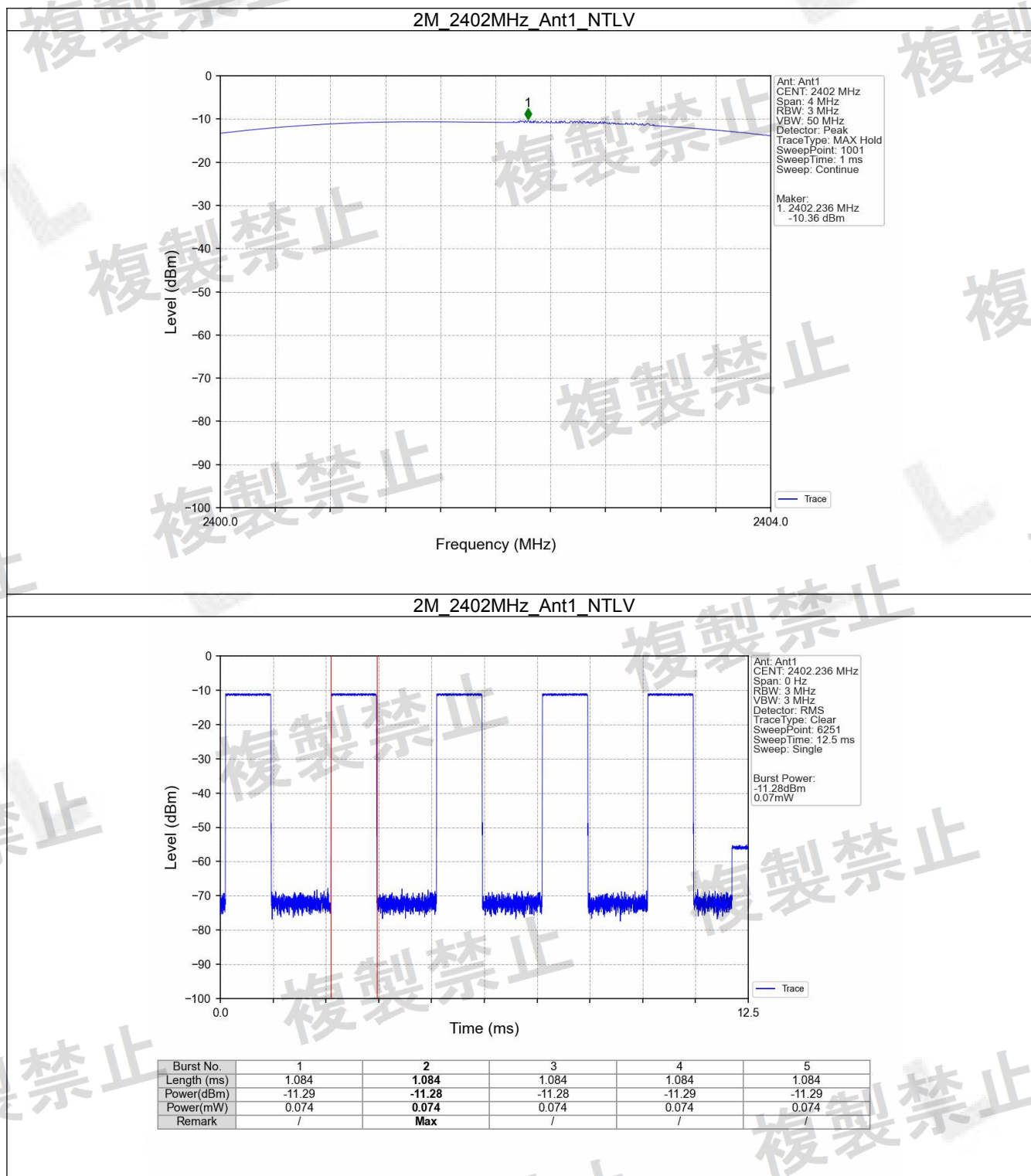
MIC: 219-269515



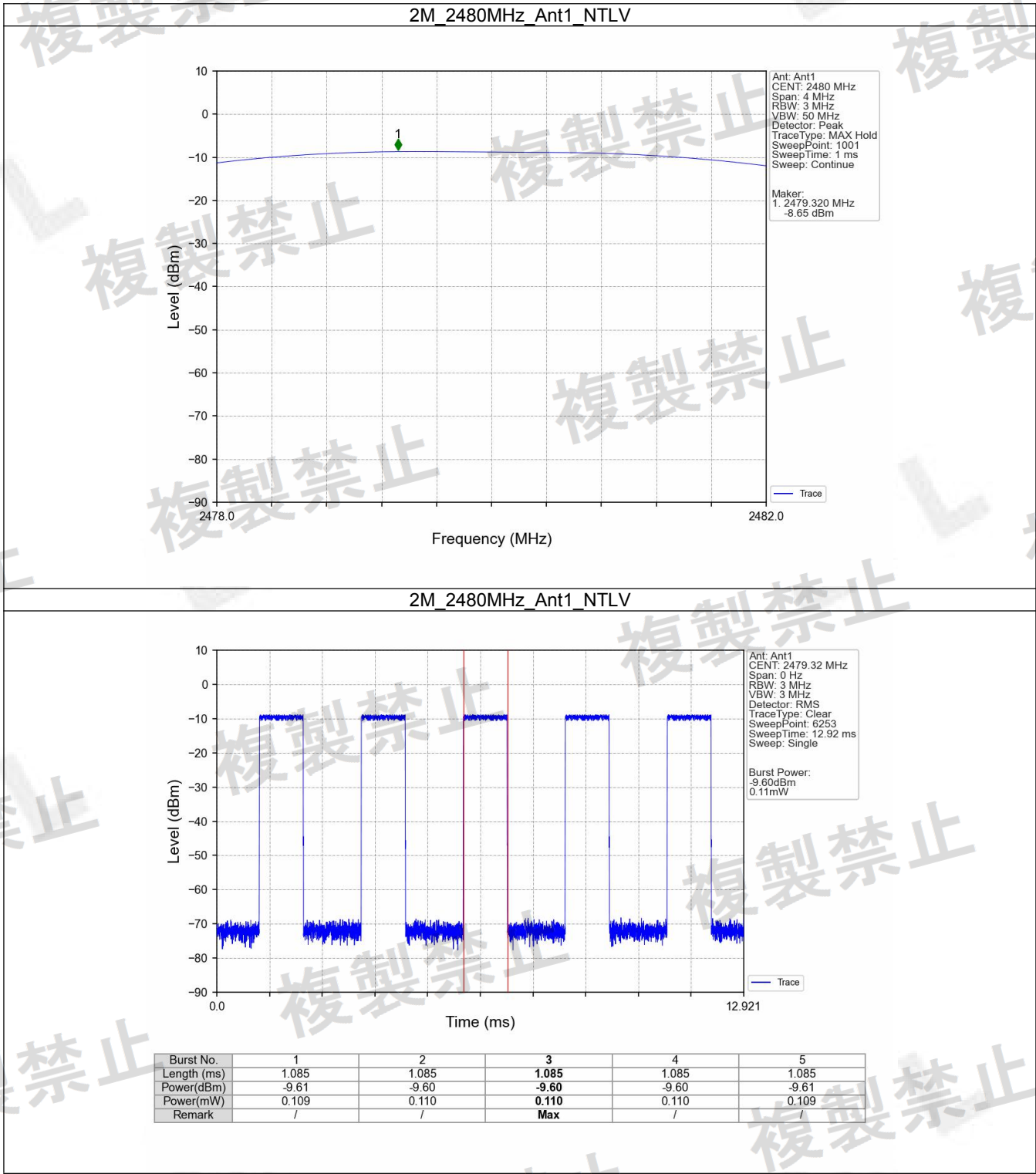
MIC: 219-269515



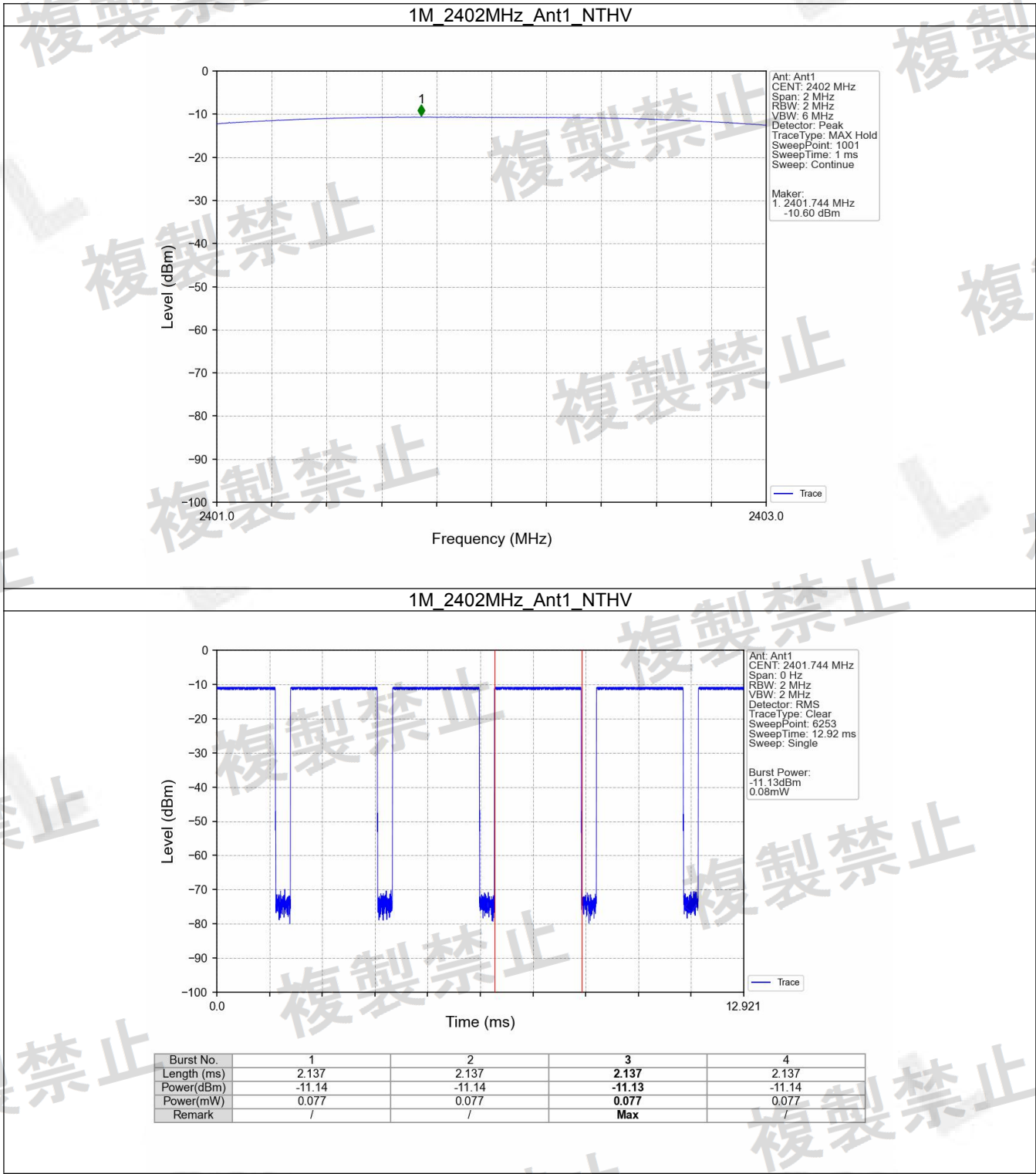
MIC: 219-269515



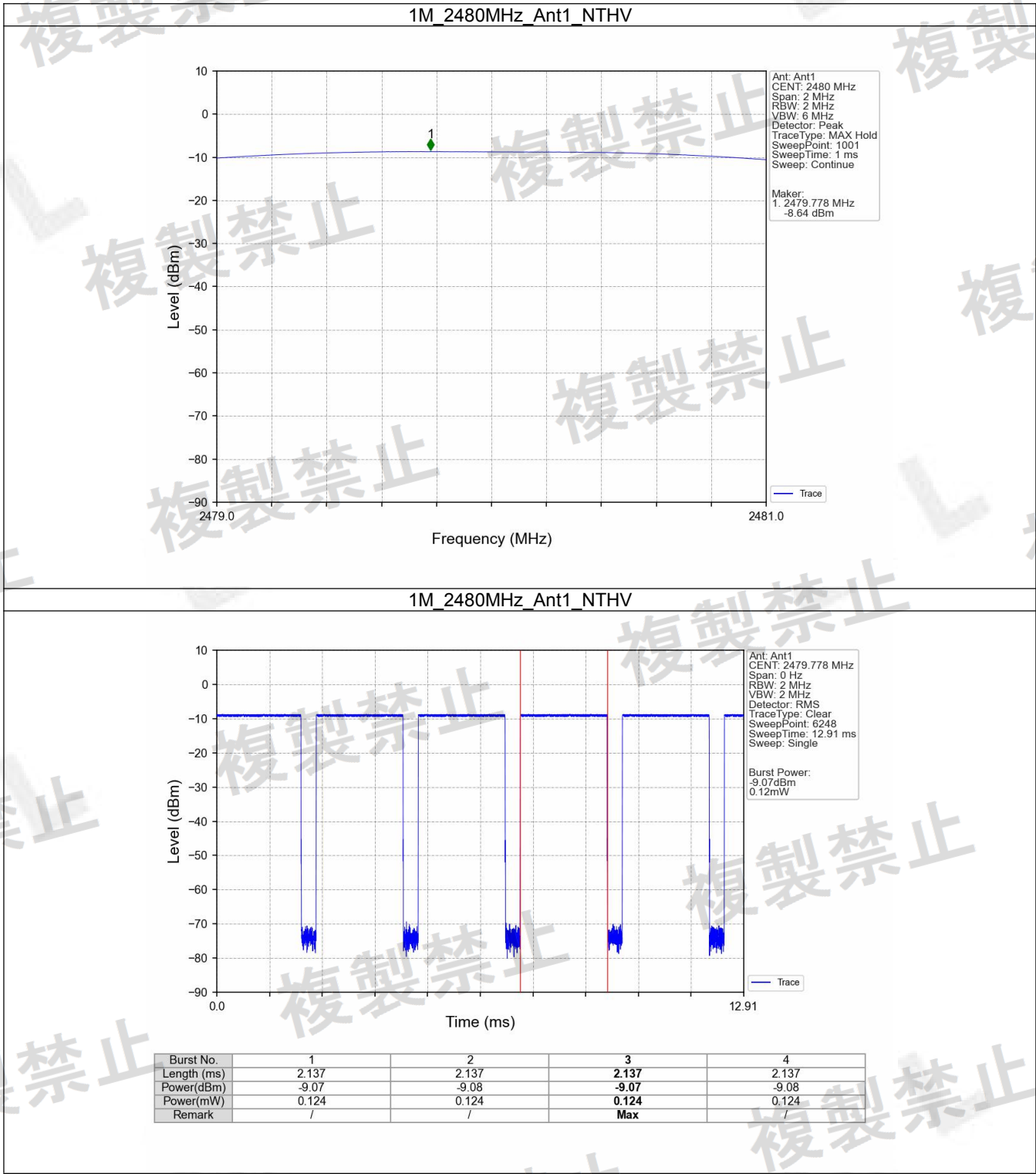
MIC: 219-269515



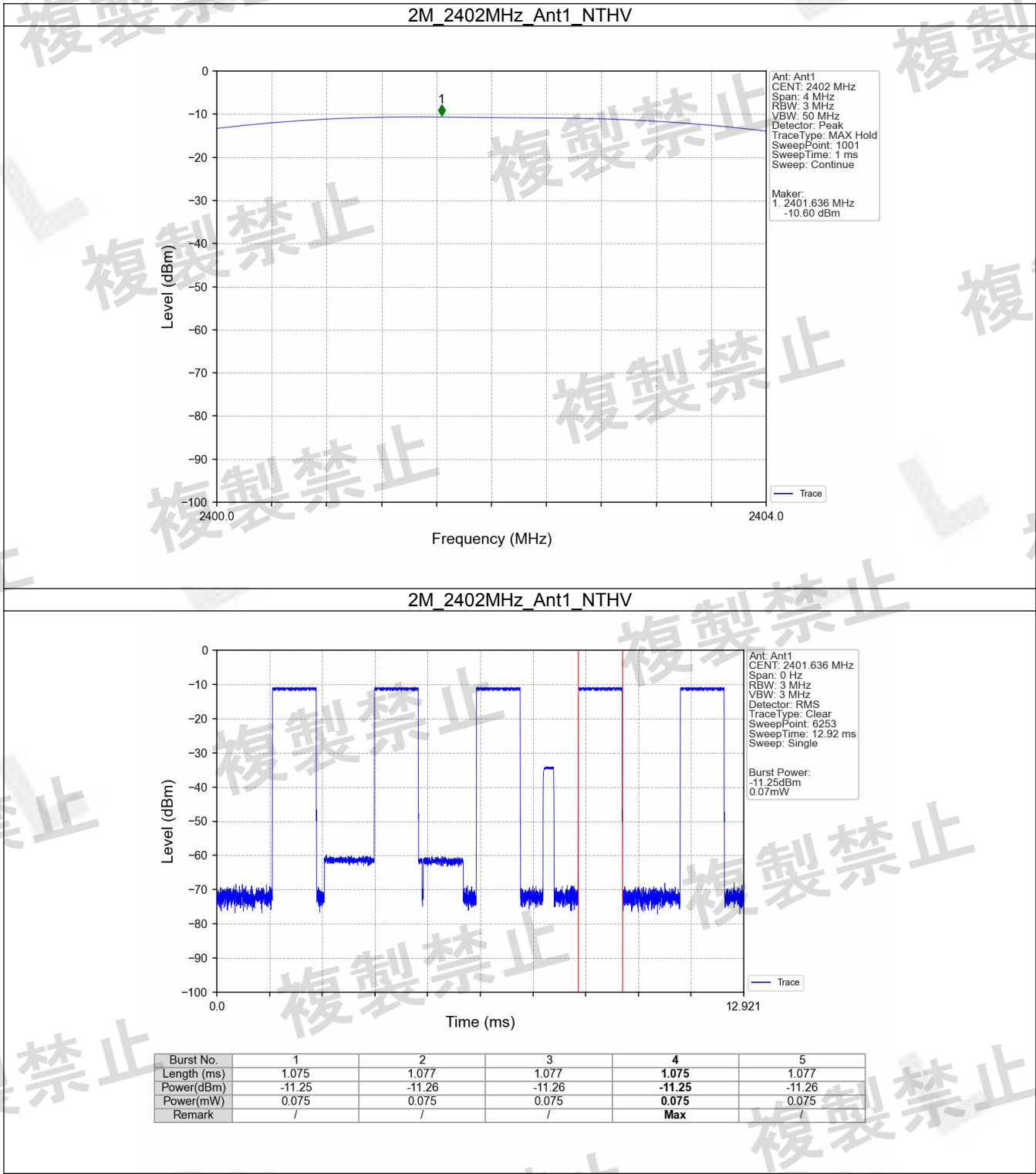
MIC: 219-269515



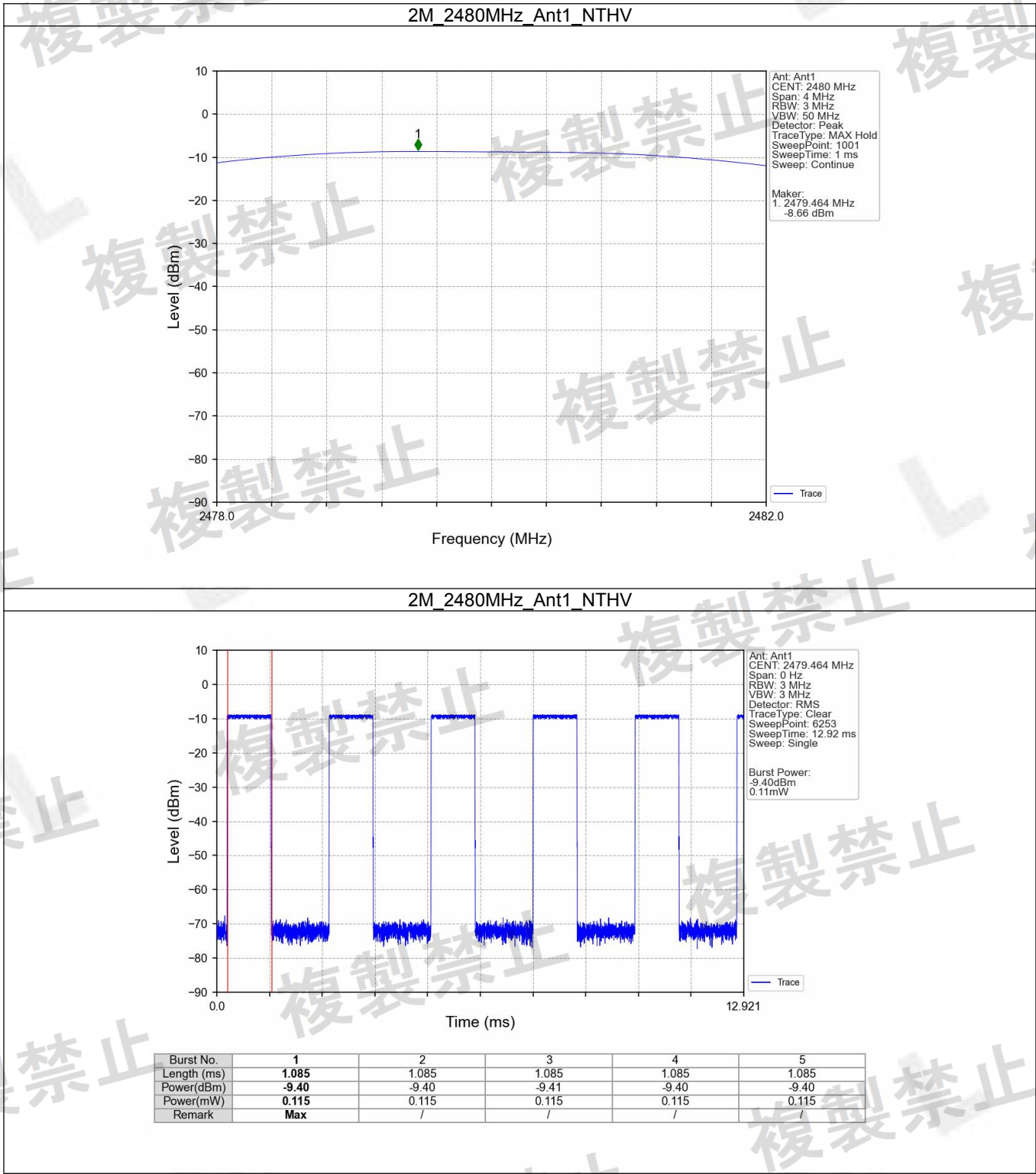
MIC: 219-269515



MIC: 219-269515



MIC: 219-269515



MIC: 219-269515

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	49	-32.22	0.600	/	/	2.5	Pass
				2387	2400	2399.974	-43.10	0.049	/	/	25	Pass
				2483.5	2496.5	2485.84	-59.48	0.001	/	/	25	Pass
				2496.5	12500	5771.5	-43.60	0.044	/	/	2.5	Pass
		2480	1	30	2387	49	-33.42	0.455	/	/	2.5	Pass
				2387	2400	2396.308	-61.08	0.001	/	/	25	Pass
				2483.5	2496.5	2483.513	-50.27	0.009	/	/	25	Pass
				2496.5	12500	2576.5	-48.51	0.014	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	49	-33.21	0.478	/	/	2.5	Pass
				2387	2400	2399.987	-32.33	0.585	/	/	25	Pass
				2483.5	2496.5	2486.061	-60.11	0.001	/	/	25	Pass
				2496.5	12500	4801.5	-52.10	0.006	/	/	2.5	Pass
		2480	1	30	2387	49	-32.09	0.618	/	/	2.5	Pass
				2387	2400	2396.555	-62.54	0.001	/	/	25	Pass
				2483.5	2496.5	2484.397	-51.87	0.007	/	/	25	Pass
				2496.5	12500	5773	-43.16	0.048	/	/	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	49	-32.22	0.600	/	/	2.5	Pass
				2387	2400	2399.987	-42.93	0.051	/	/	25	Pass
				2483.5	2496.5	2485.567	-59.53	0.001	/	/	25	Pass
				2496.5	12500	4801.5	-52.00	0.006	/	/	2.5	Pass
		2480	1	30	2387	49	-33.01	0.500	/	/	2.5	Pass
				2387	2400	2396.451	-61.96	0.001	/	/	25	Pass
				2483.5	2496.5	2483.89	-50.73	0.008	/	/	25	Pass
				2496.5	12500	2576.5	-48.69	0.014	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	48.5	-33.53	0.444	/	/	2.5	Pass
				2387	2400	2399.987	-32.43	0.571	/	/	25	Pass
				2483.5	2496.5	2486.36	-59.89	0.001	/	/	25	Pass
				2496.5	12500	5771.5	-44.41	0.036	/	/	2.5	Pass
		2480	1	30	2387	48.5	-33.06	0.494	/	/	2.5	Pass
				2387	2400	2395.97	-62.38	0.001	/	/	25	Pass
				2483.5	2496.5	2483.877	-51.71	0.007	/	/	25	Pass
				2496.5	12500	4957.5	-49.87	0.010	/	/	2.5	Pass

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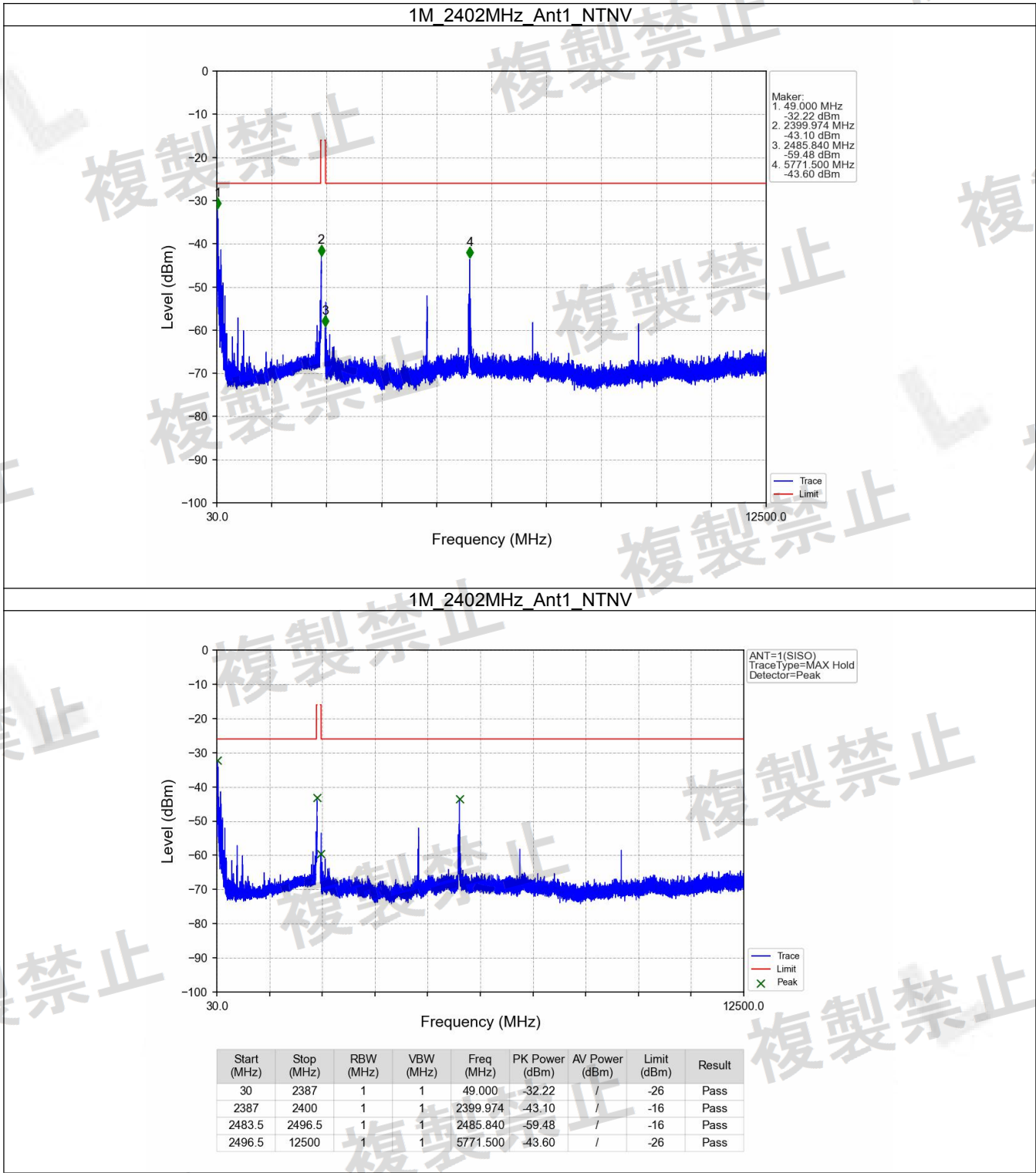
4.1.3 TxSe_NTHV

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	48.5	-31.85	0.653	/	/	2.5	Pass
				2387	2400	2399.974	-43.26	0.047	/	/	25	Pass
				2483.5	2496.5	2486.23	-59.51	0.001	/	/	25	Pass
				2496.5	12500	4801.5	-52.01	0.006	/	/	2.5	Pass
		2480	1	30	2387	49	-32.72	0.535	/	/	2.5	Pass
				2387	2400	2396.607	-62.28	0.001	/	/	25	Pass
				2483.5	2496.5	2483.773	-50.66	0.009	/	/	25	Pass
				2496.5	12500	2576.5	-48.01	0.016	/	/	2.5	Pass
2M	SISO	2402	1	30	2387	49	-32.85	0.519	/	/	2.5	Pass
				2387	2400	2399.987	-32.13	0.612	/	/	25	Pass
				2483.5	2496.5	2485.489	-59.78	0.001	/	/	25	Pass
				2496.5	12500	5772.5	-46.61	0.022	/	/	2.5	Pass
		2480	1	30	2387	49	-32.37	0.579	/	/	2.5	Pass
				2387	2400	2396.1	-62.95	0.001	/	/	25	Pass
				2483.5	2496.5	2484.657	-51.46	0.007	/	/	25	Pass
				2496.5	12500	2576.5	-48.50	0.014	/	/	2.5	Pass

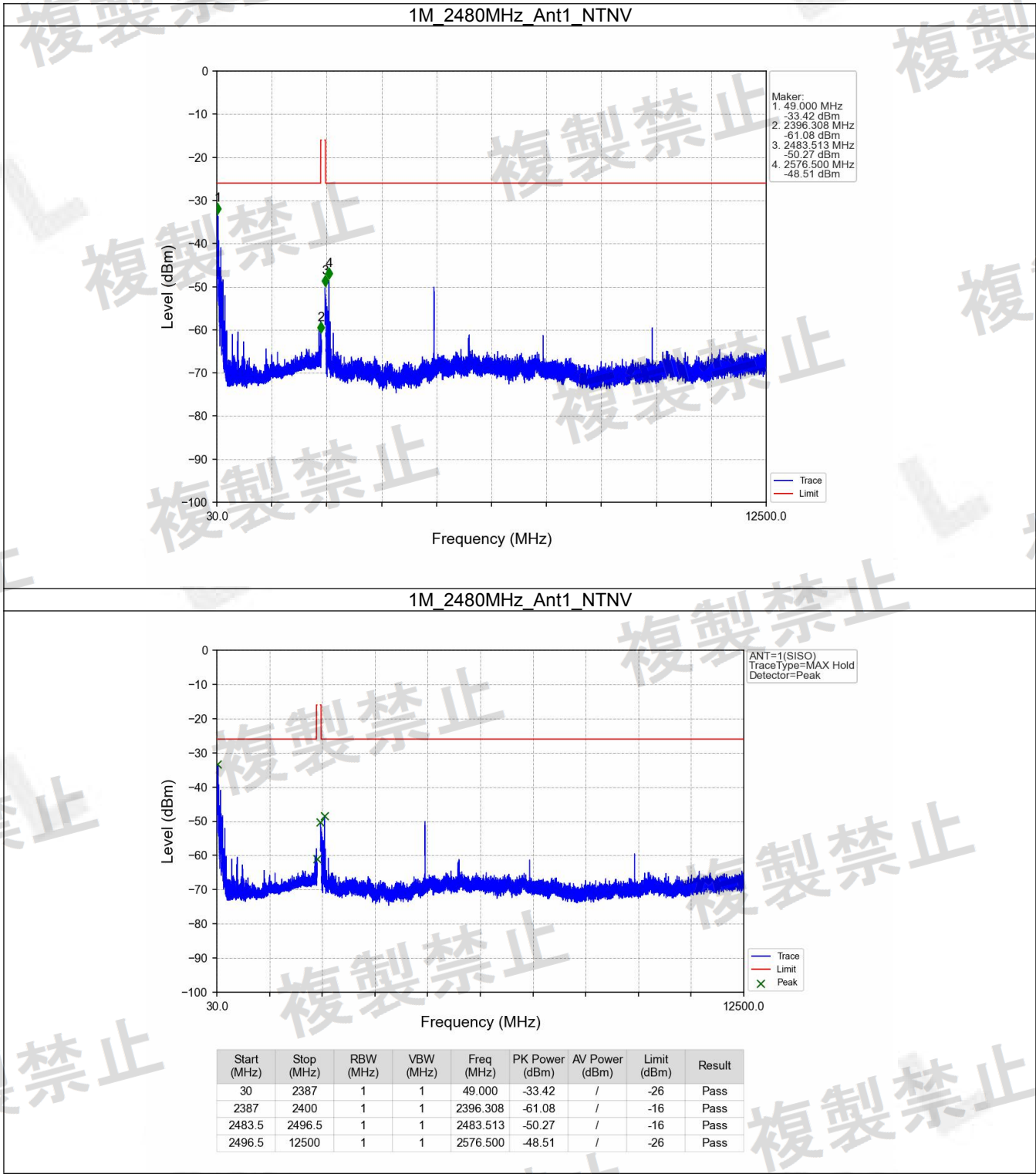
MIC: 219-269515

4.2 Test Graph

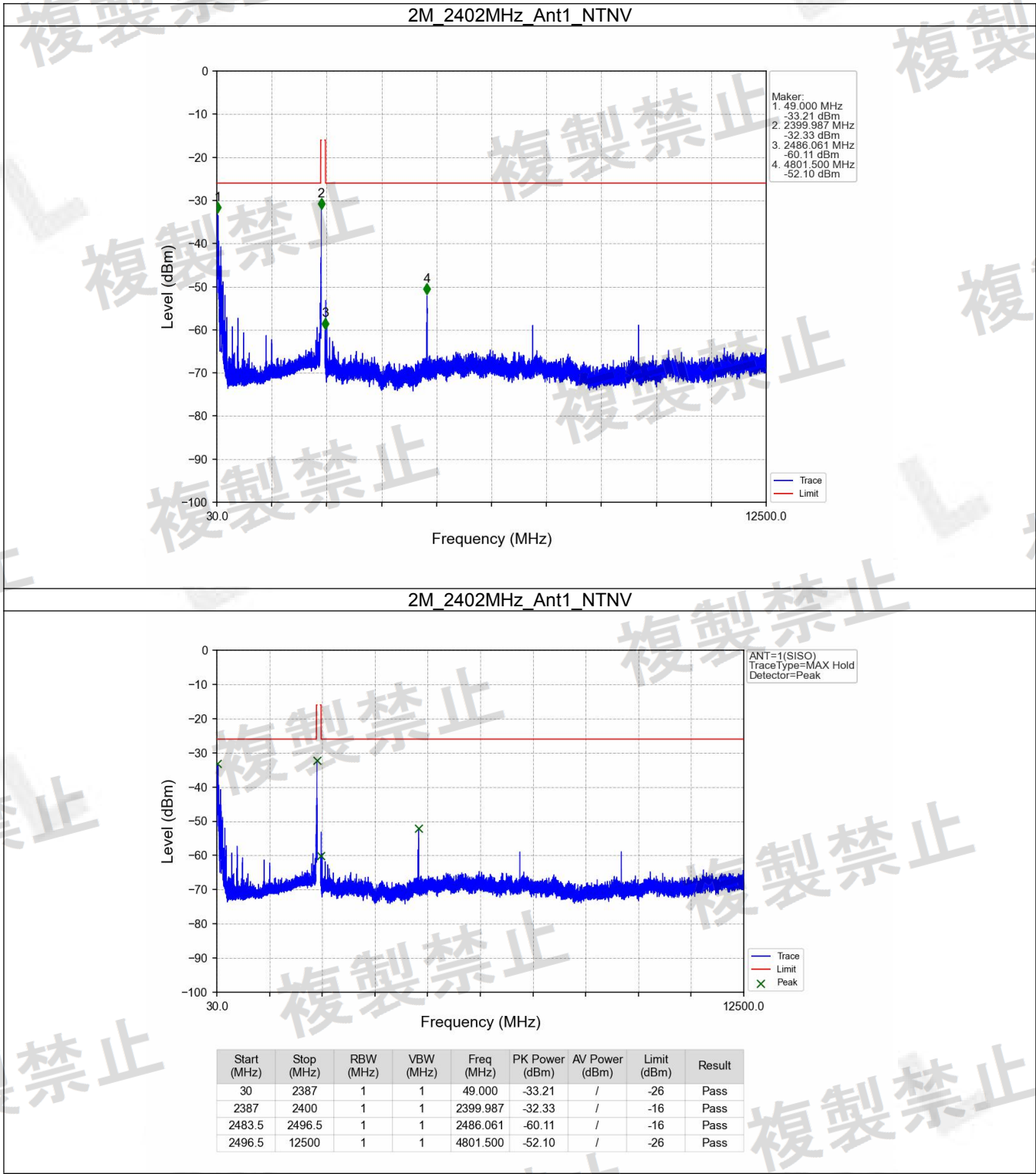
4.2.1 TxSe_NTNV



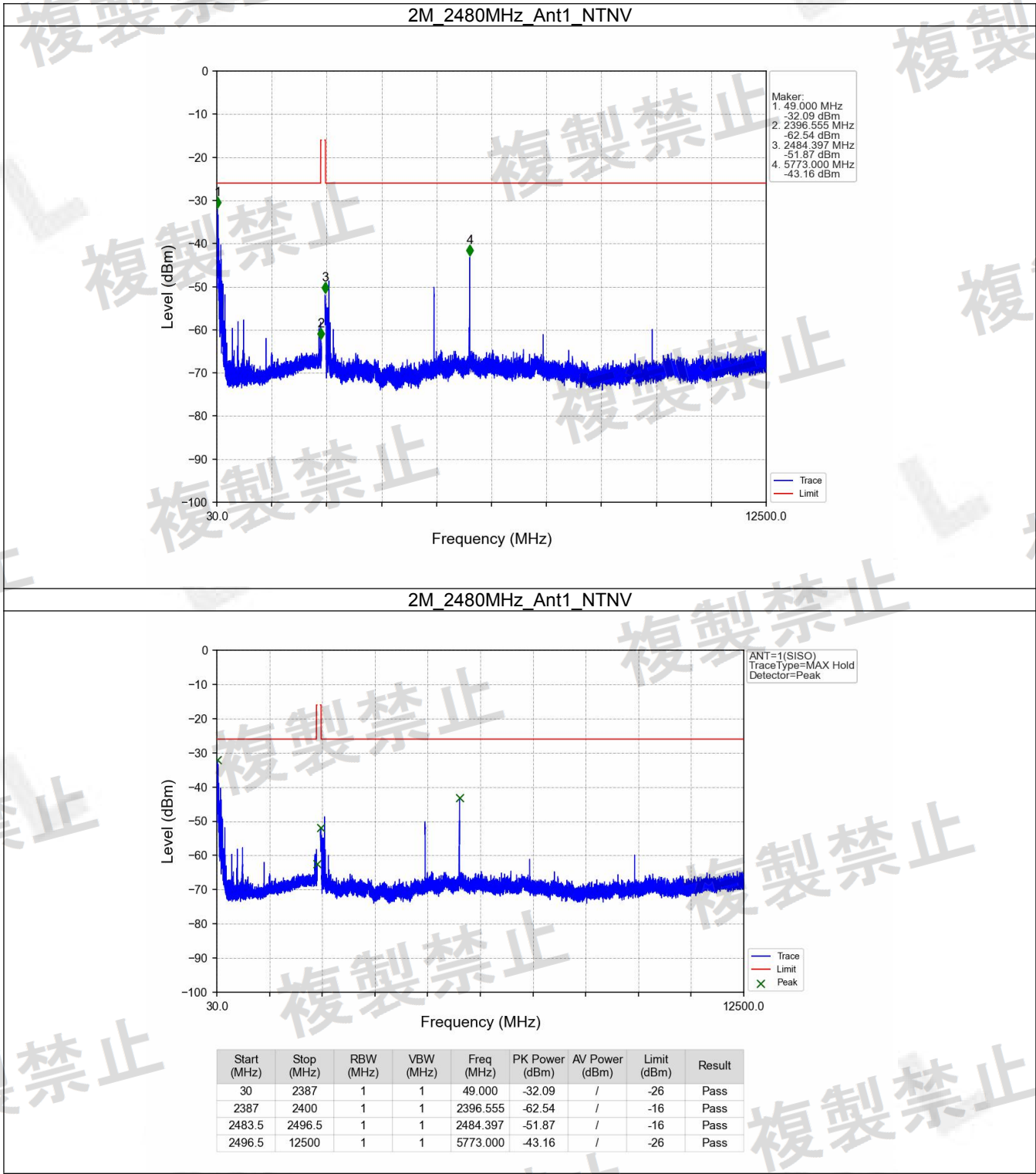
MIC: 219-269515



MIC: 219-269515

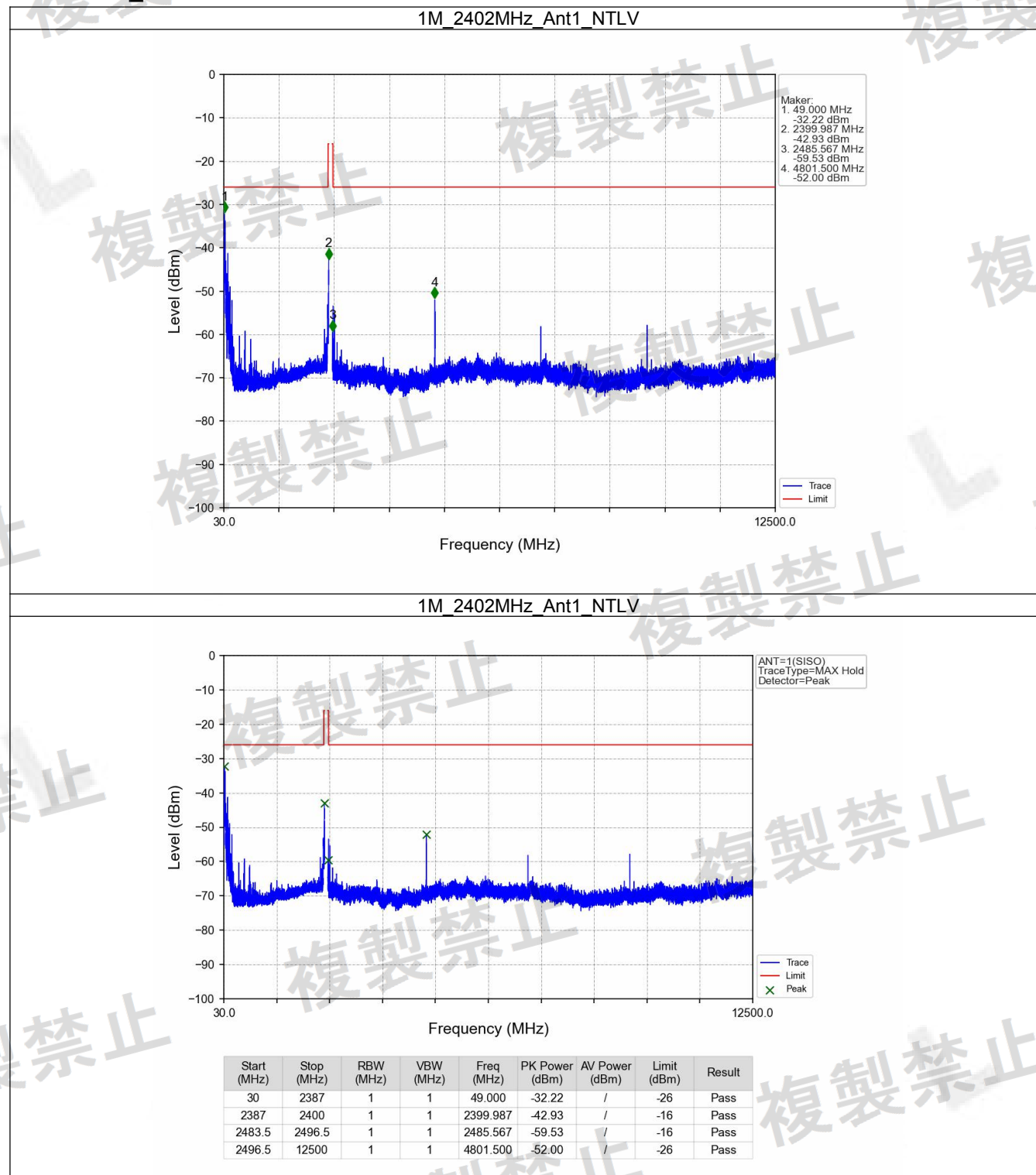


MIC: 219-269515

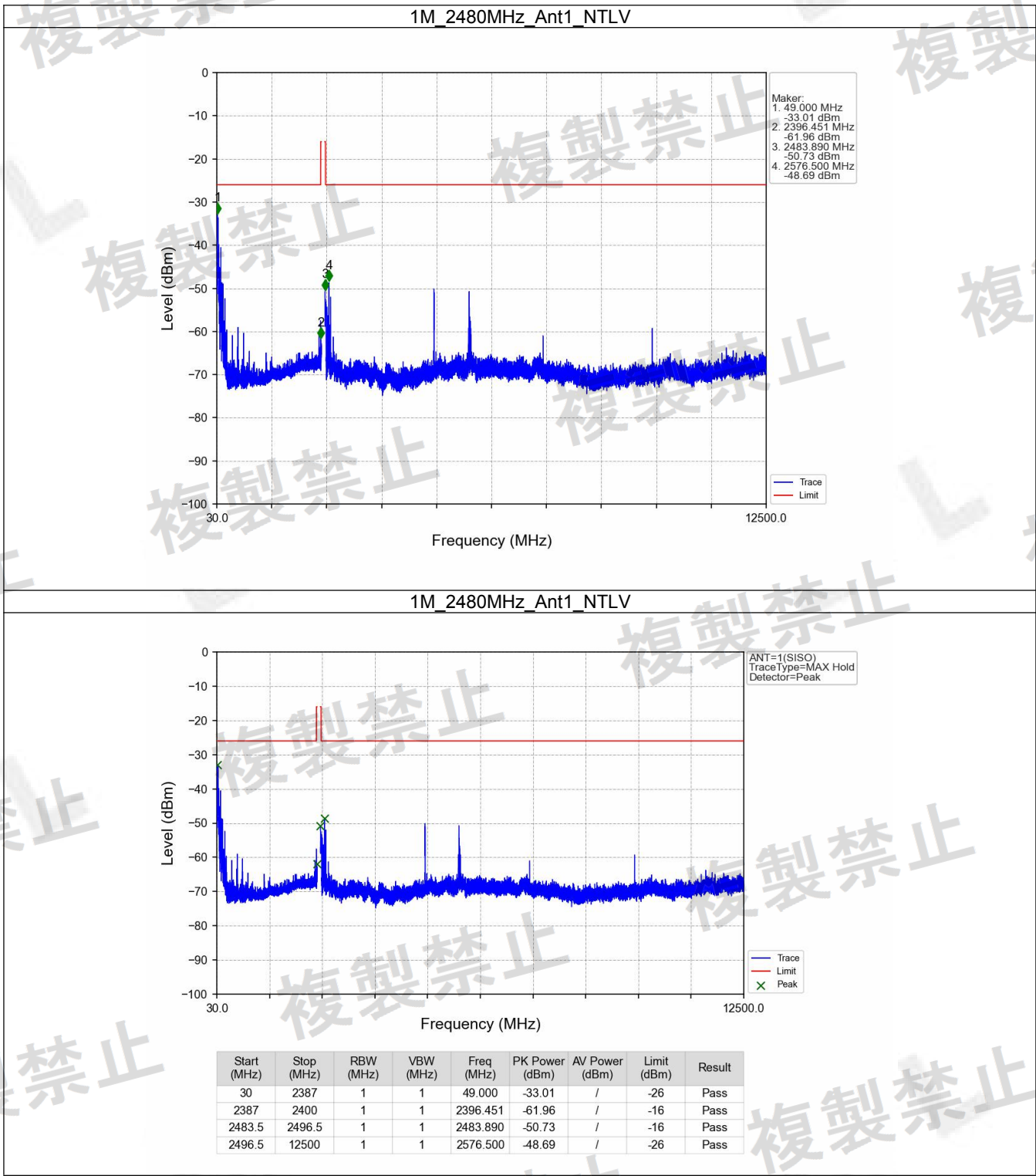


MIC: 219-269515

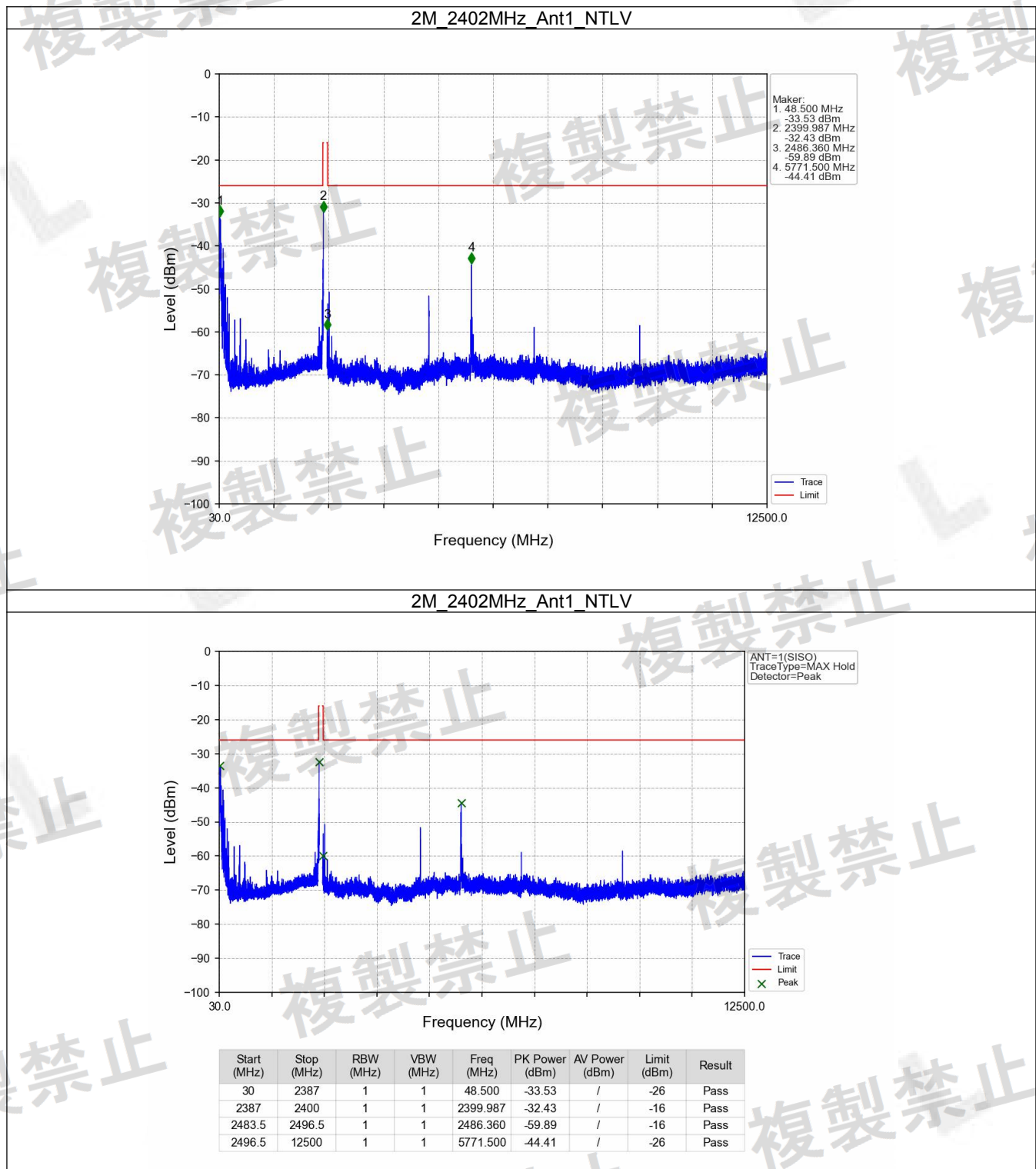
4.2.2 TxSe_NTLV



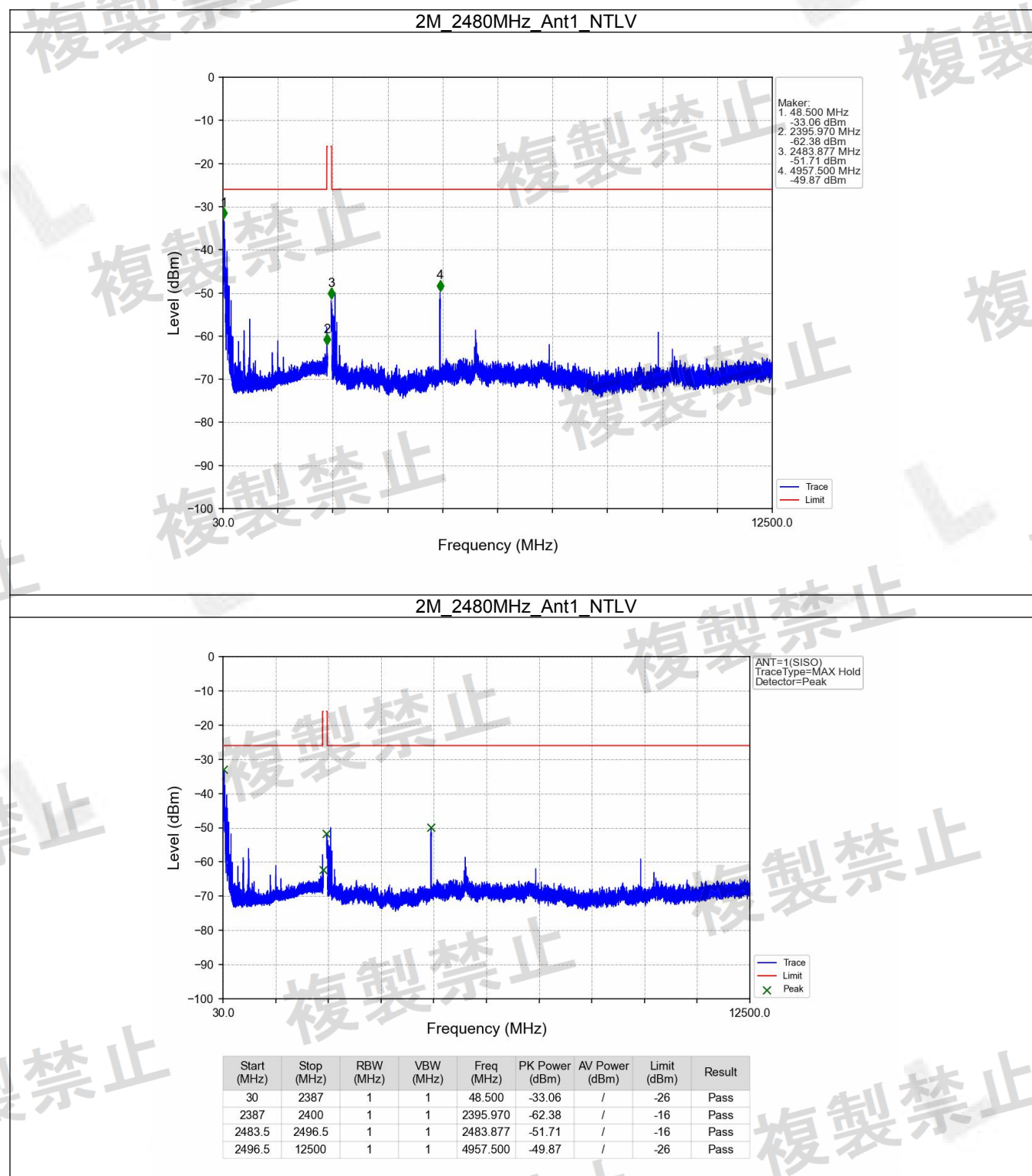
MIC: 219-269515



MIC: 219-269515

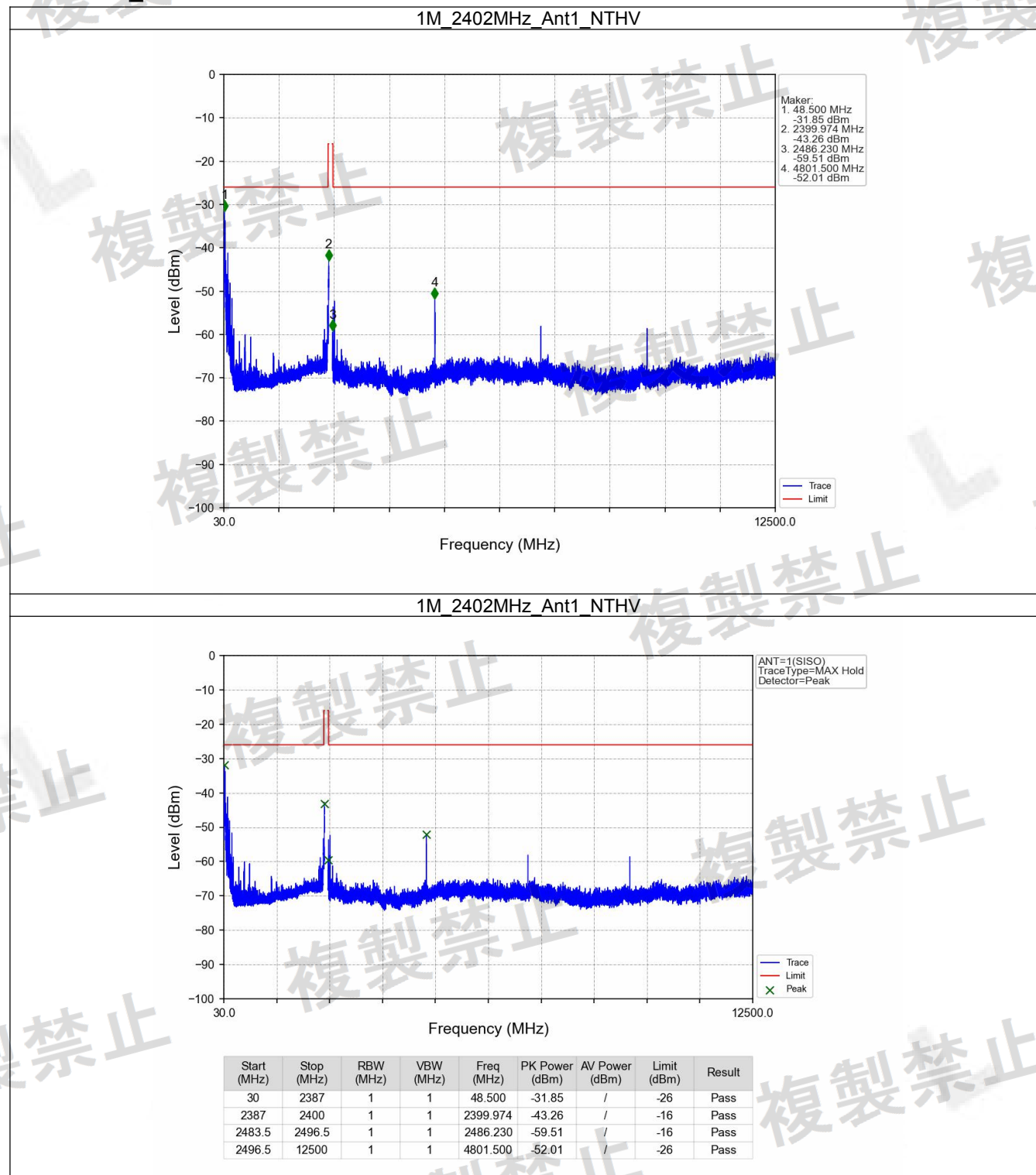


MIC: 219-269515

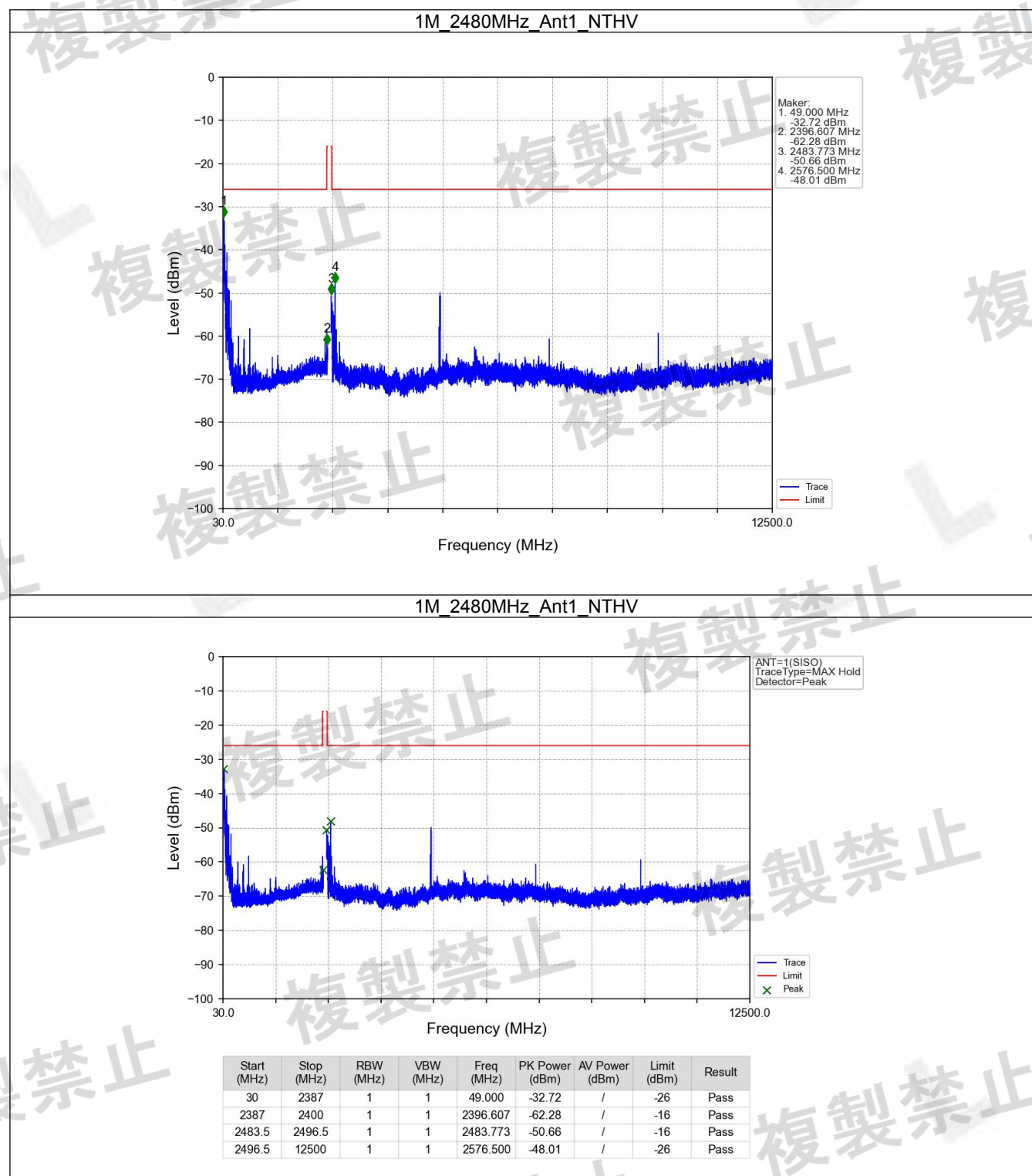


MIC: 219-269515

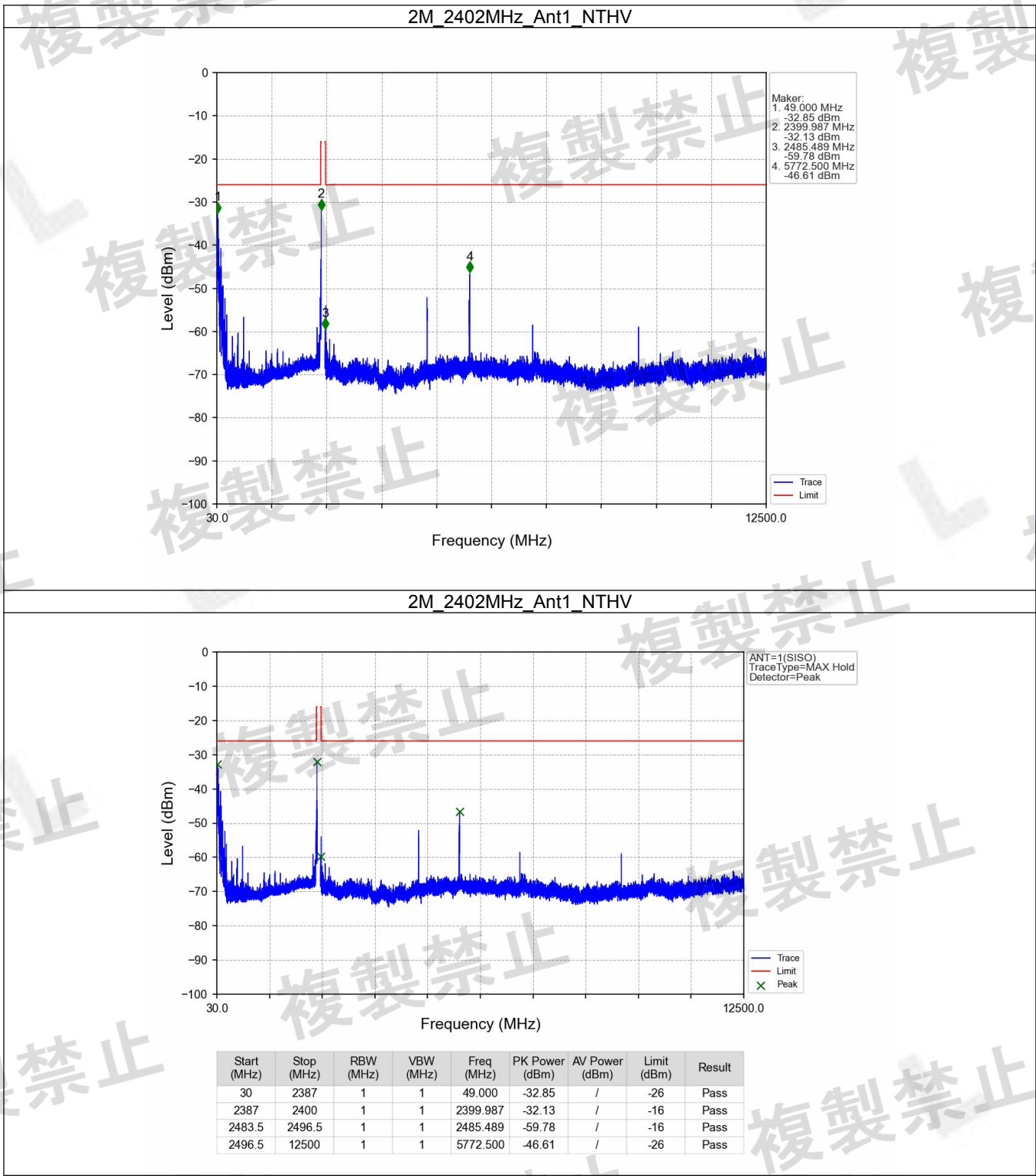
4.2.3 TxSe_NTHV



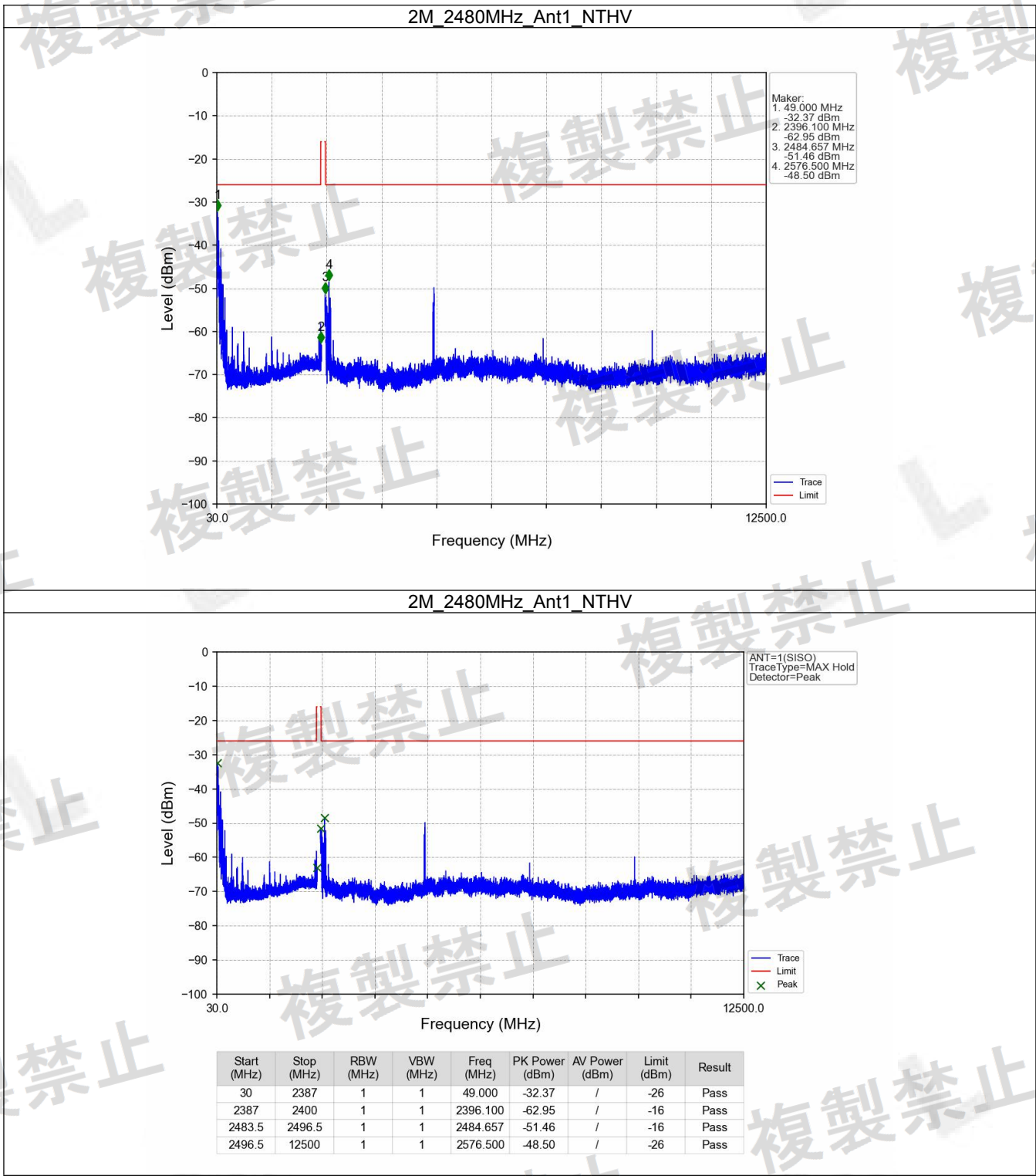
MIC: 219-269515



MIC: 219-269515



MIC: 219-269515



MIC: 219-269515

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	934.45	-77.78	0.017	/	/	4	Pass
				1000	12500	5503	-64.10	0.389	/	/	20	Pass
		2480	1	30	1000	962.85	-78.06	0.016	/	/	4	Pass
				1000	12500	6395.5	-63.80	0.417	/	/	20	Pass
2M	SISO	2402	1	30	1000	925.95	-77.52	0.018	/	/	4	Pass
				1000	12500	5786	-62.69	0.538	/	/	20	Pass
		2480	1	30	1000	844.05	-78.70	0.013	/	/	4	Pass
				1000	12500	6259.5	-63.77	0.420	/	/	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	850.45	-78.51	0.014	/	/	4	Pass
				1000	12500	12000	-63.81	0.416	/	/	20	Pass
		2480	1	30	1000	869.15	-77.58	0.017	/	/	4	Pass
				1000	12500	7267.5	-63.65	0.432	/	/	20	Pass
2M	SISO	2402	1	30	1000	885.2	-78.29	0.015	/	/	4	Pass
				1000	12500	12043	-64.04	0.394	/	/	20	Pass
		2480	1	30	1000	852.9	-78.10	0.015	/	/	4	Pass
				1000	12500	6281.5	-63.52	0.445	/	/	20	Pass

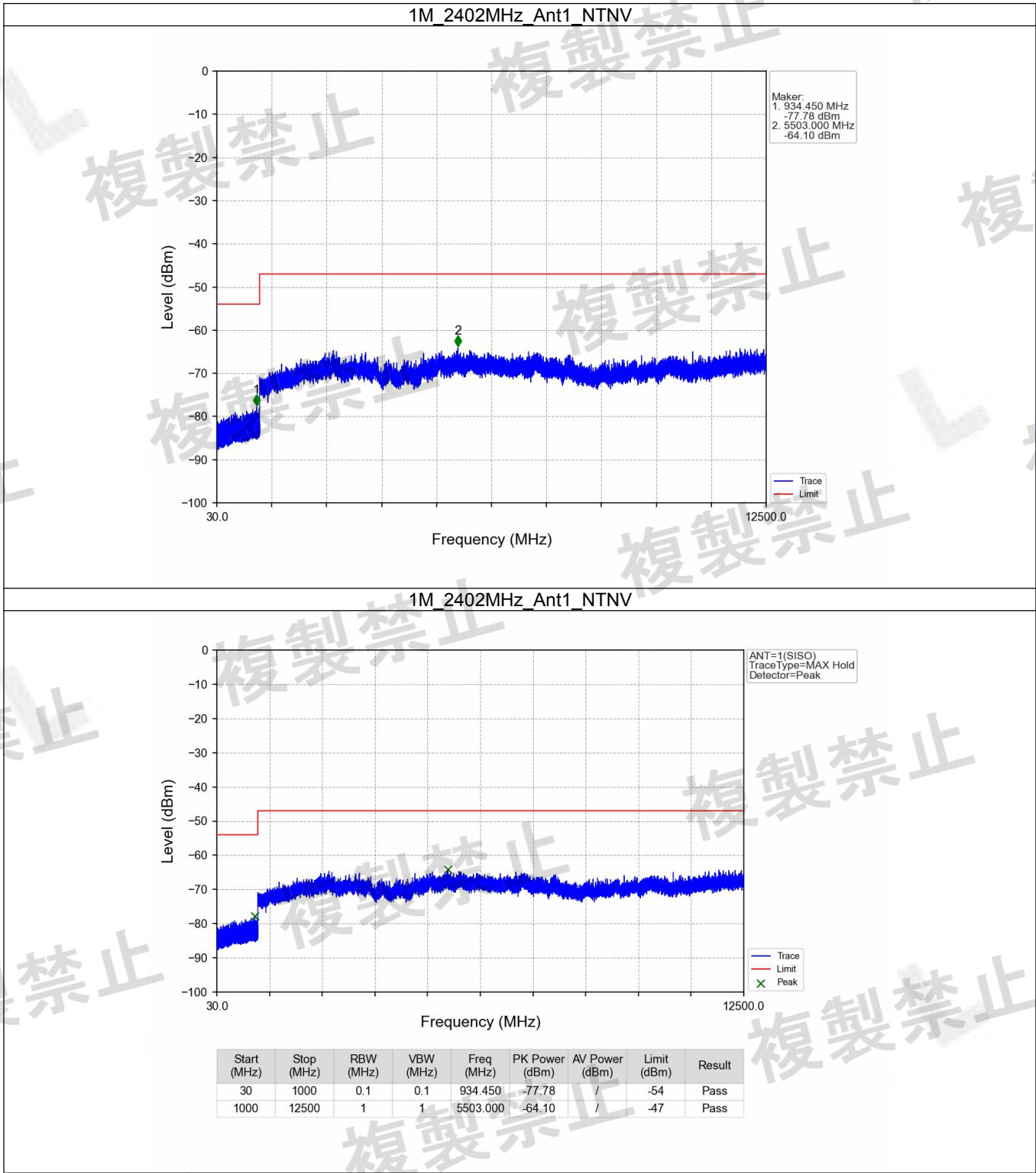
5.1.3 RxSe_NTHV

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	849.55	-77.75	0.017	/	/	4	Pass
				1000	12500	12355	-63.70	0.427	/	/	20	Pass
		2480	1	30	1000	704.05	-76.27	0.024	/	/	4	Pass
				1000	12500	5755.5	-63.18	0.481	/	/	20	Pass
2M	SISO	2402	1	30	1000	932.45	-77.87	0.016	/	/	4	Pass
				1000	12500	5791	-63.72	0.425	/	/	20	Pass
		2480	1	30	1000	978.15	-78.46	0.014	/	/	4	Pass
				1000	12500	5491	-63.98	0.400	/	/	20	Pass

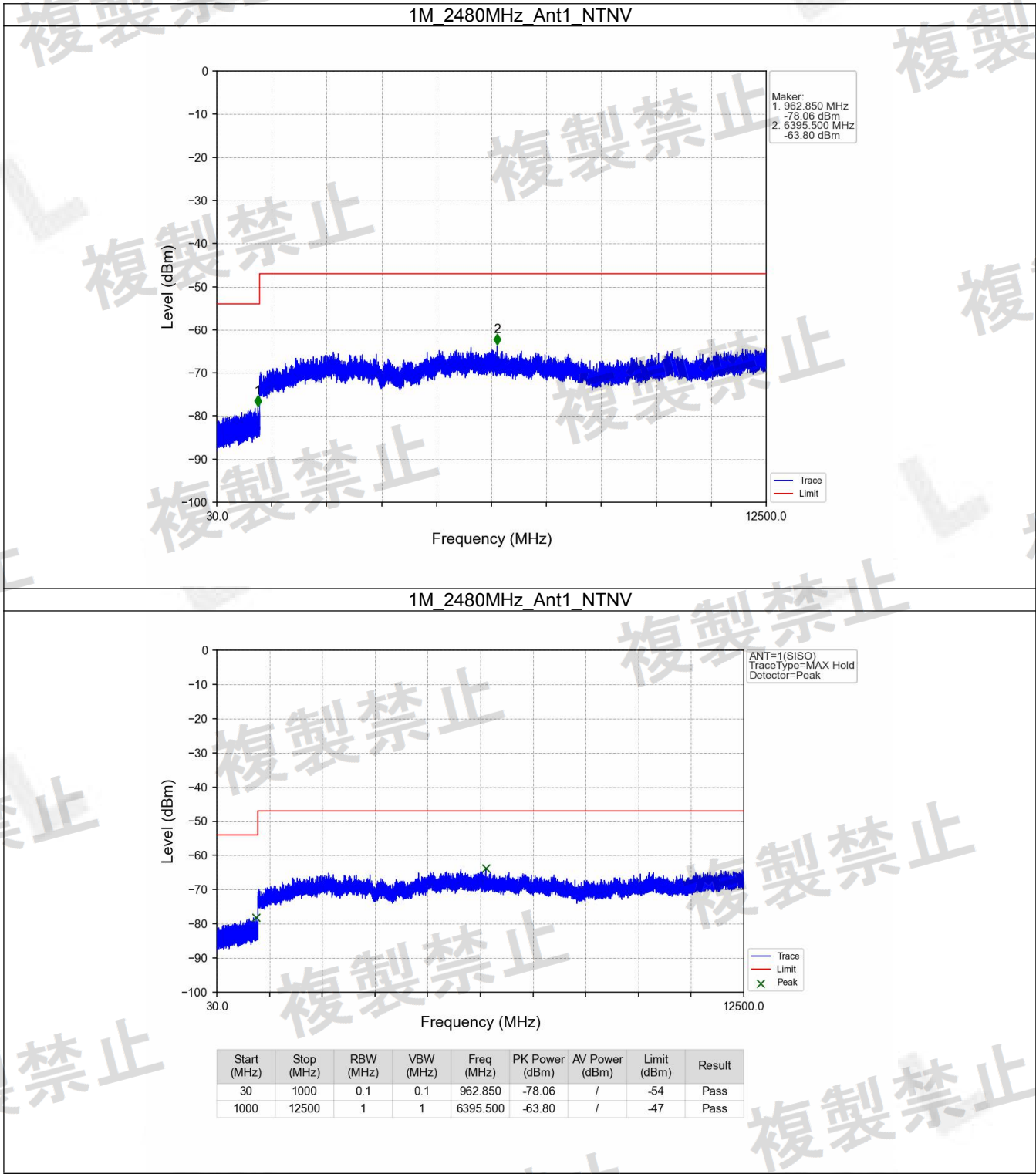
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5.2 Test Graph

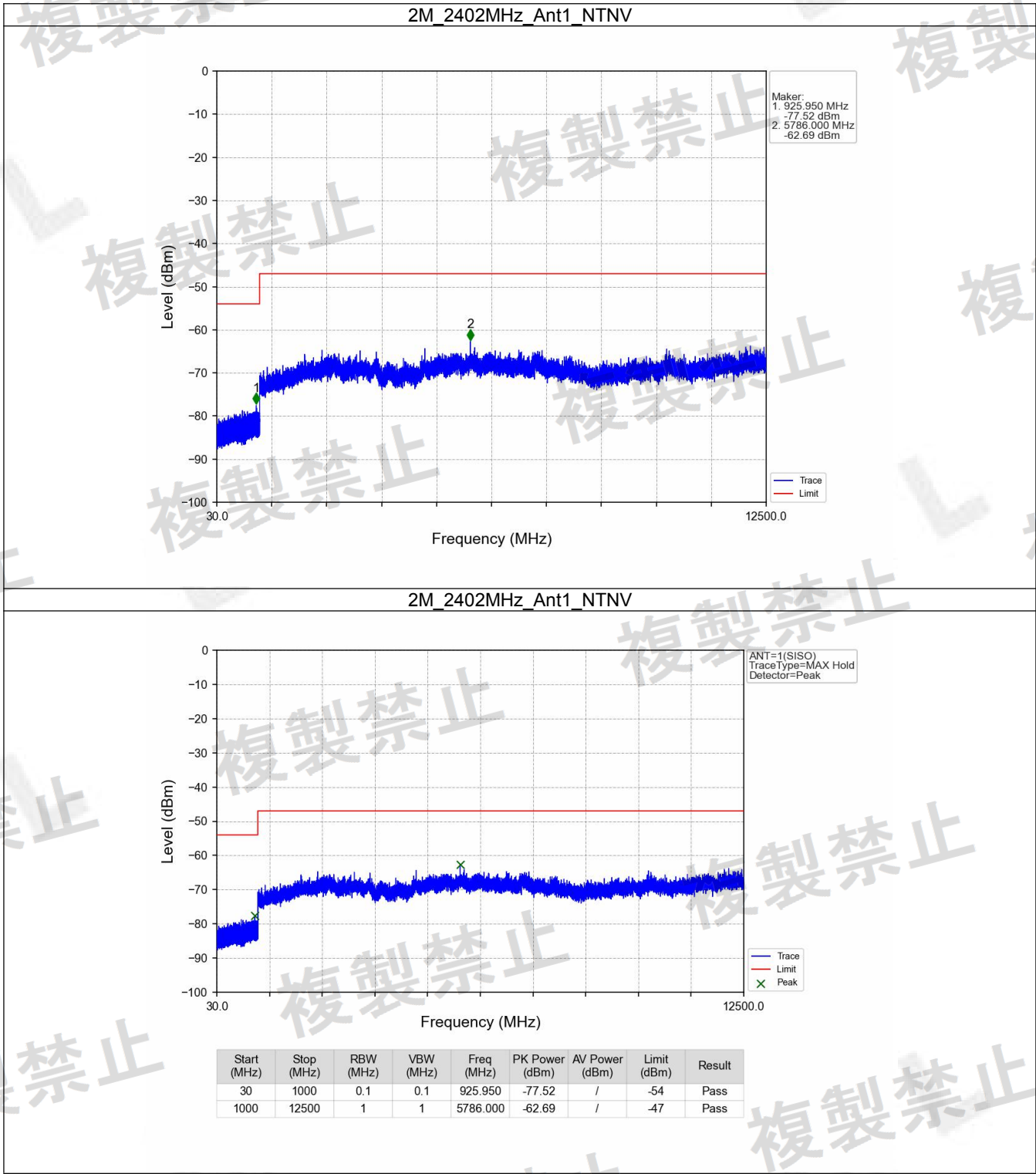
5.2.1 RxSe_NTNV



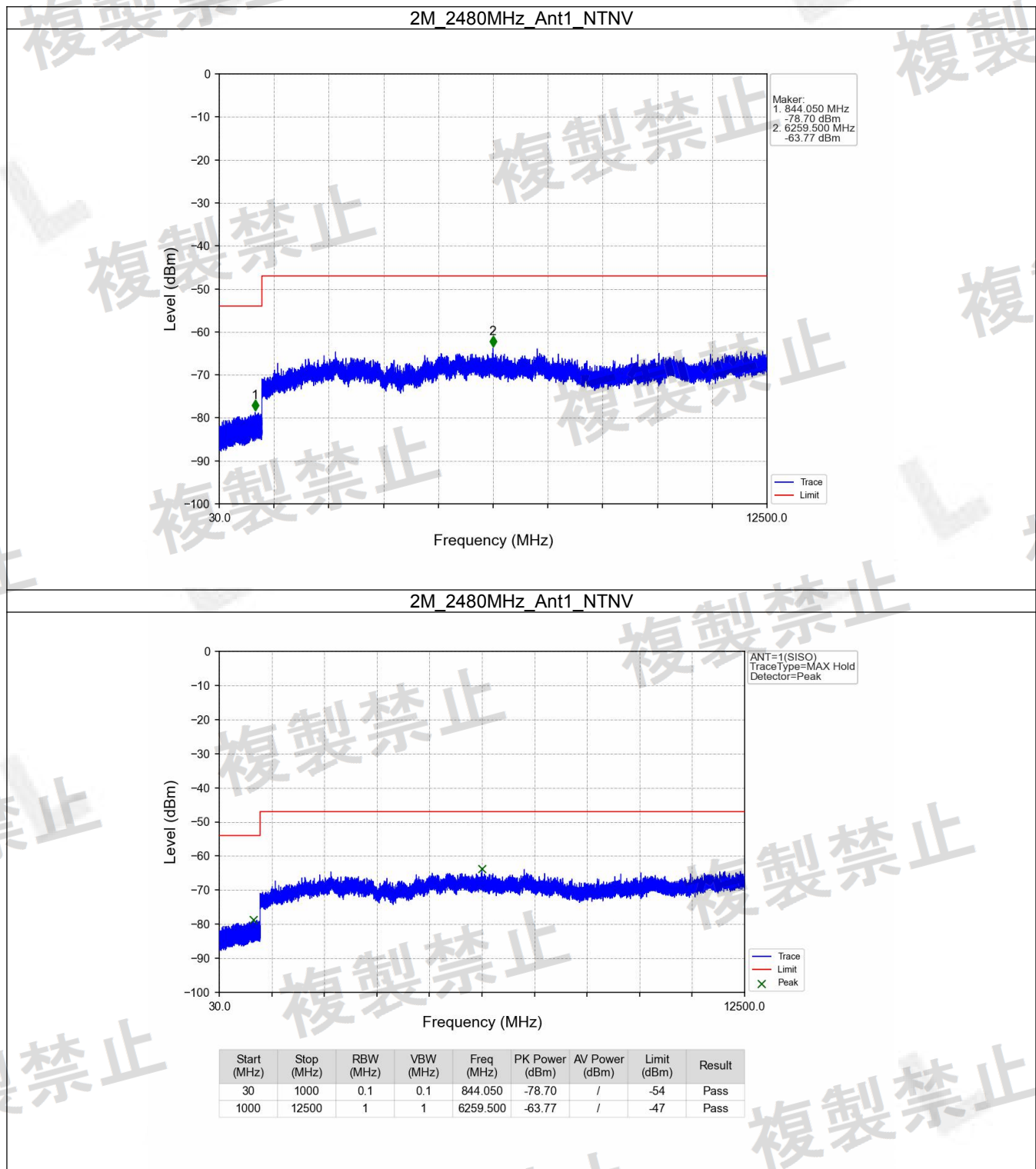
MIC: 219-269515



MIC: 219-269515

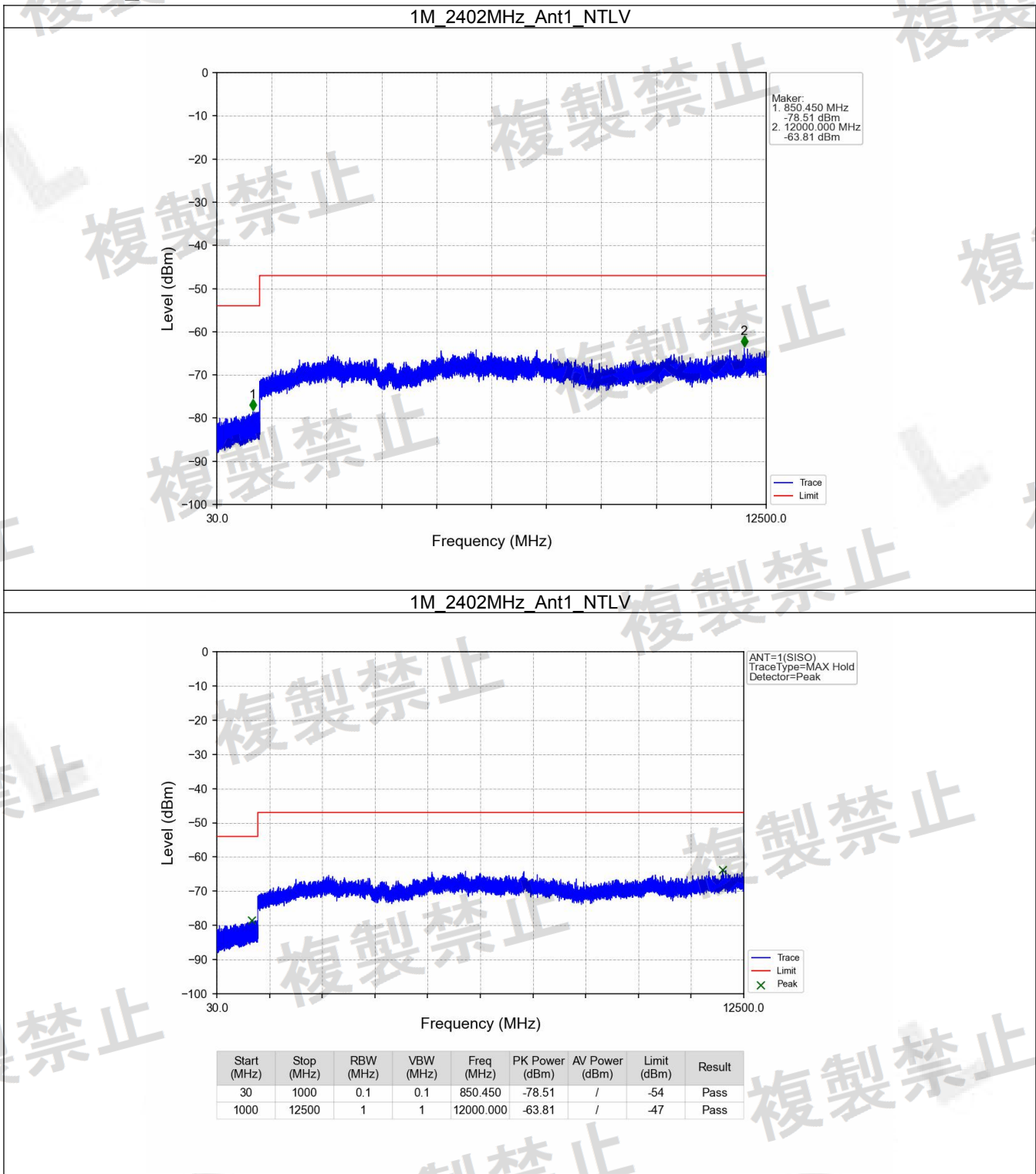


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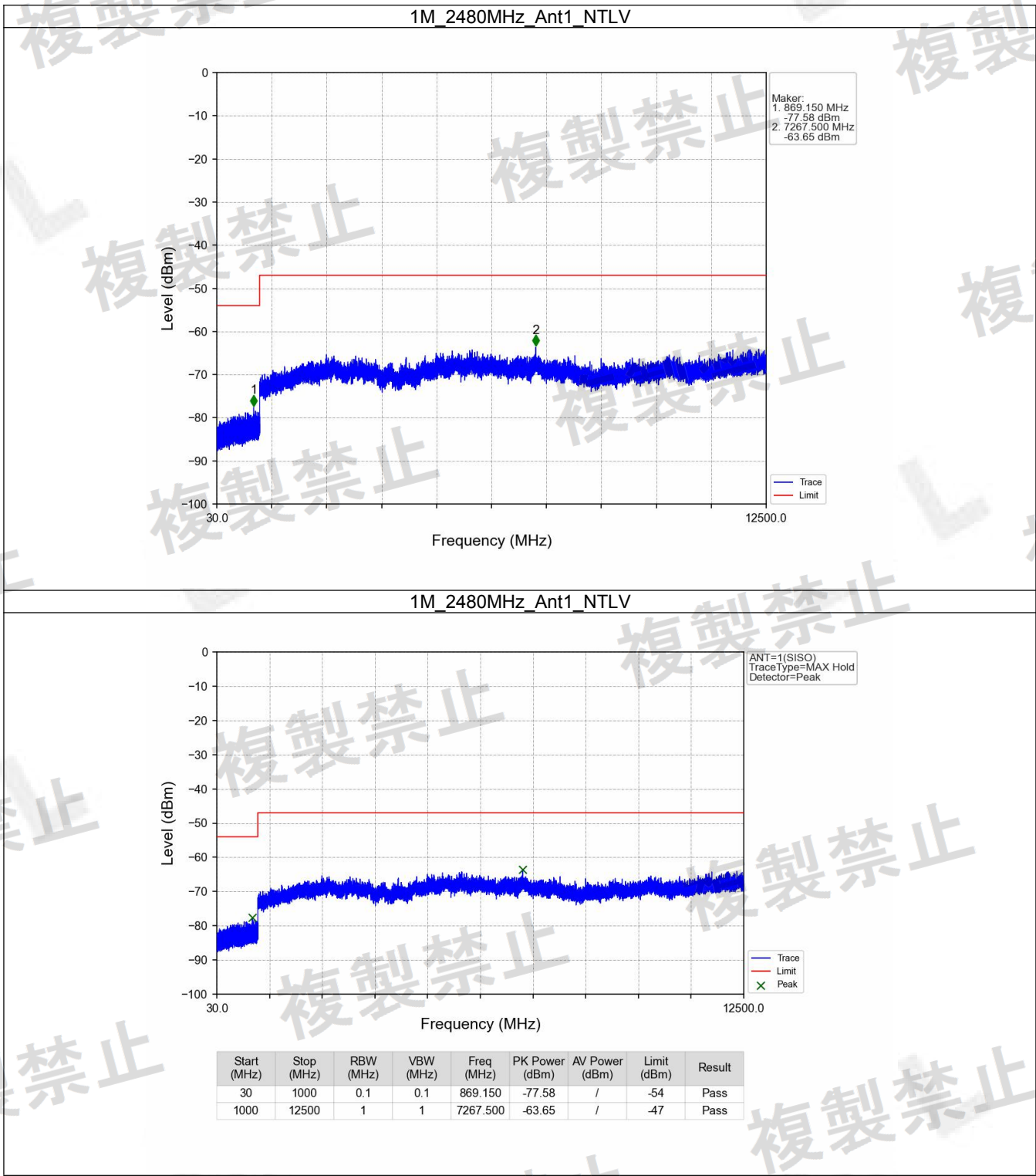


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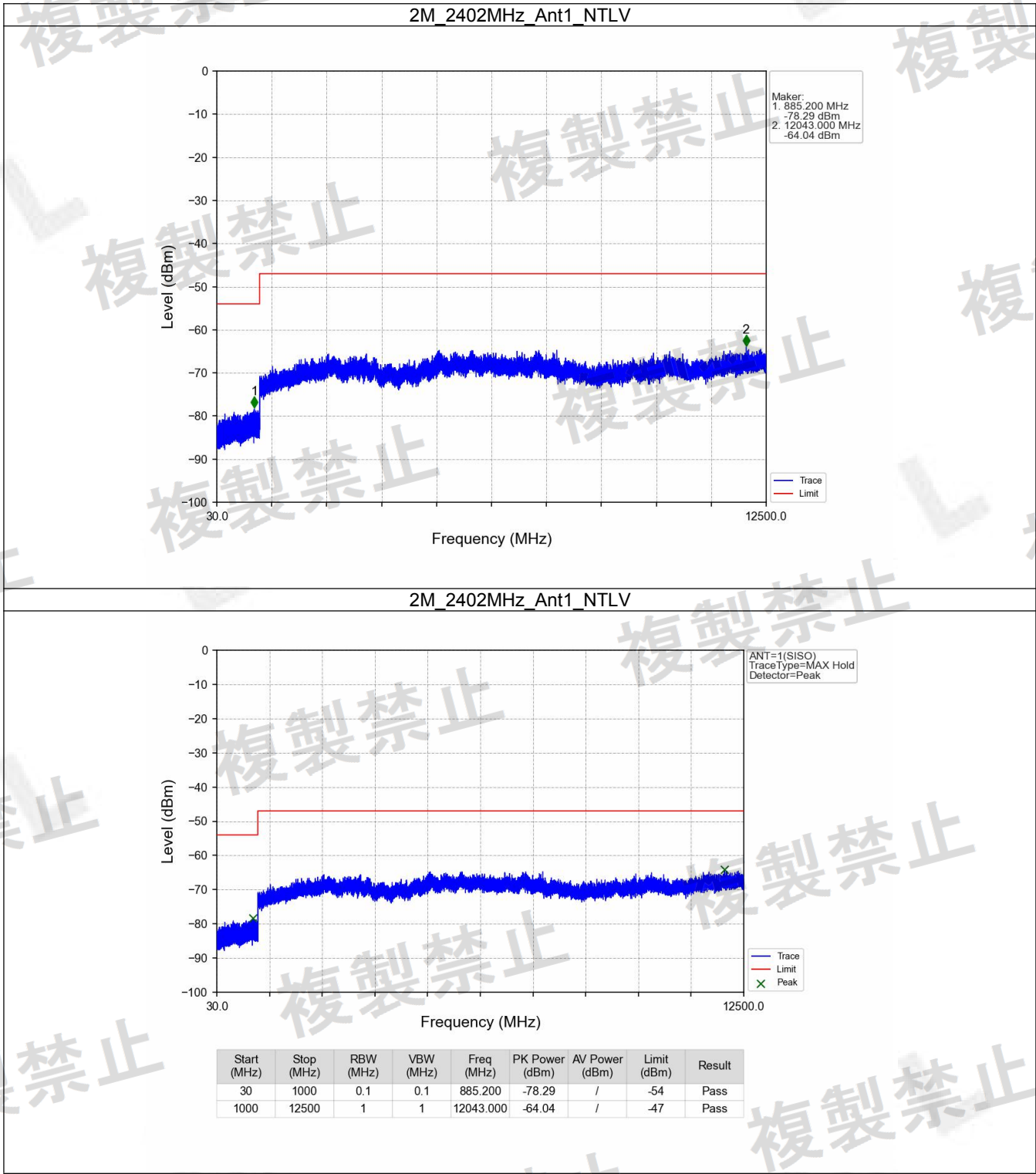
5.2.2 RxSe_NTLV



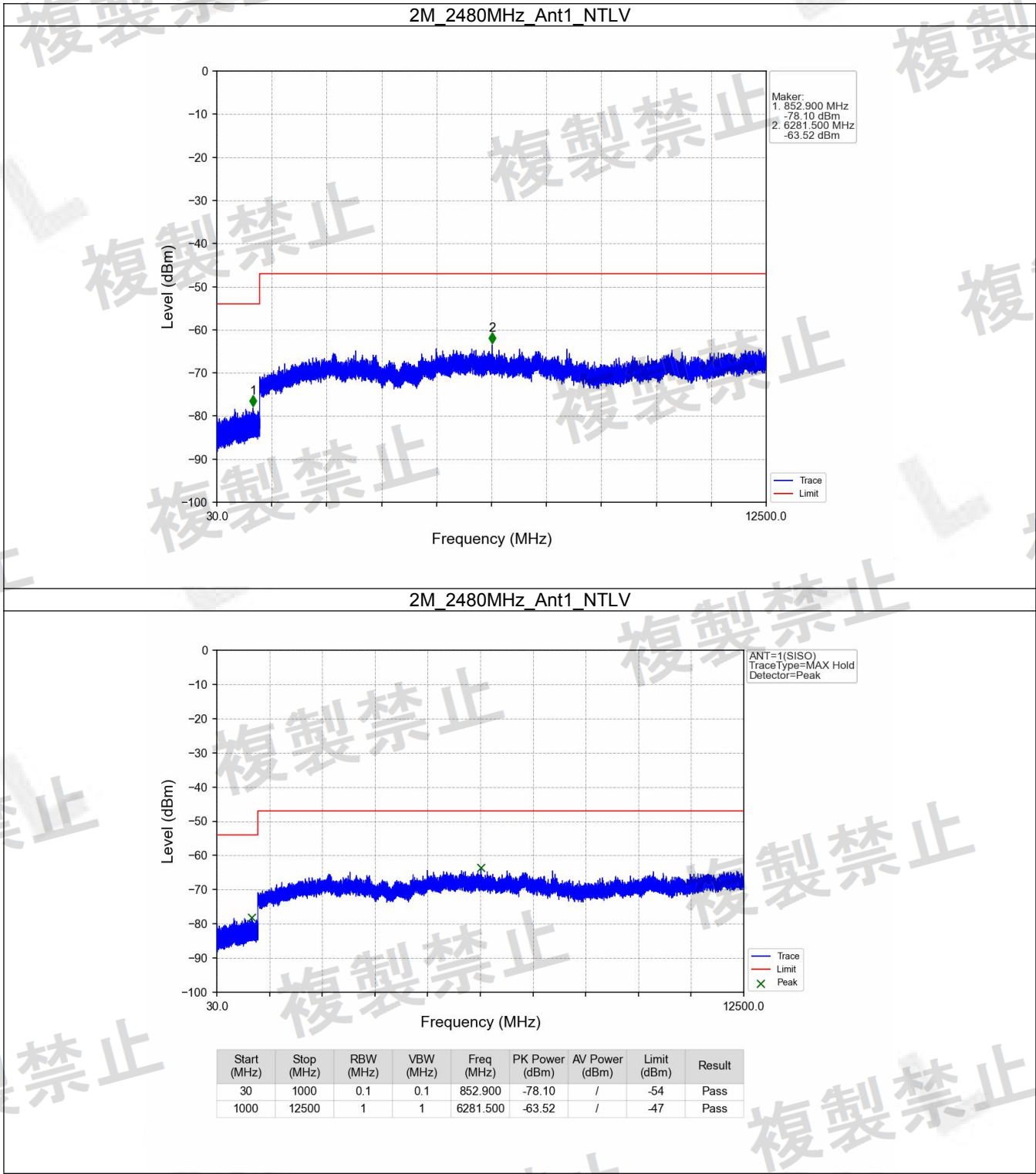
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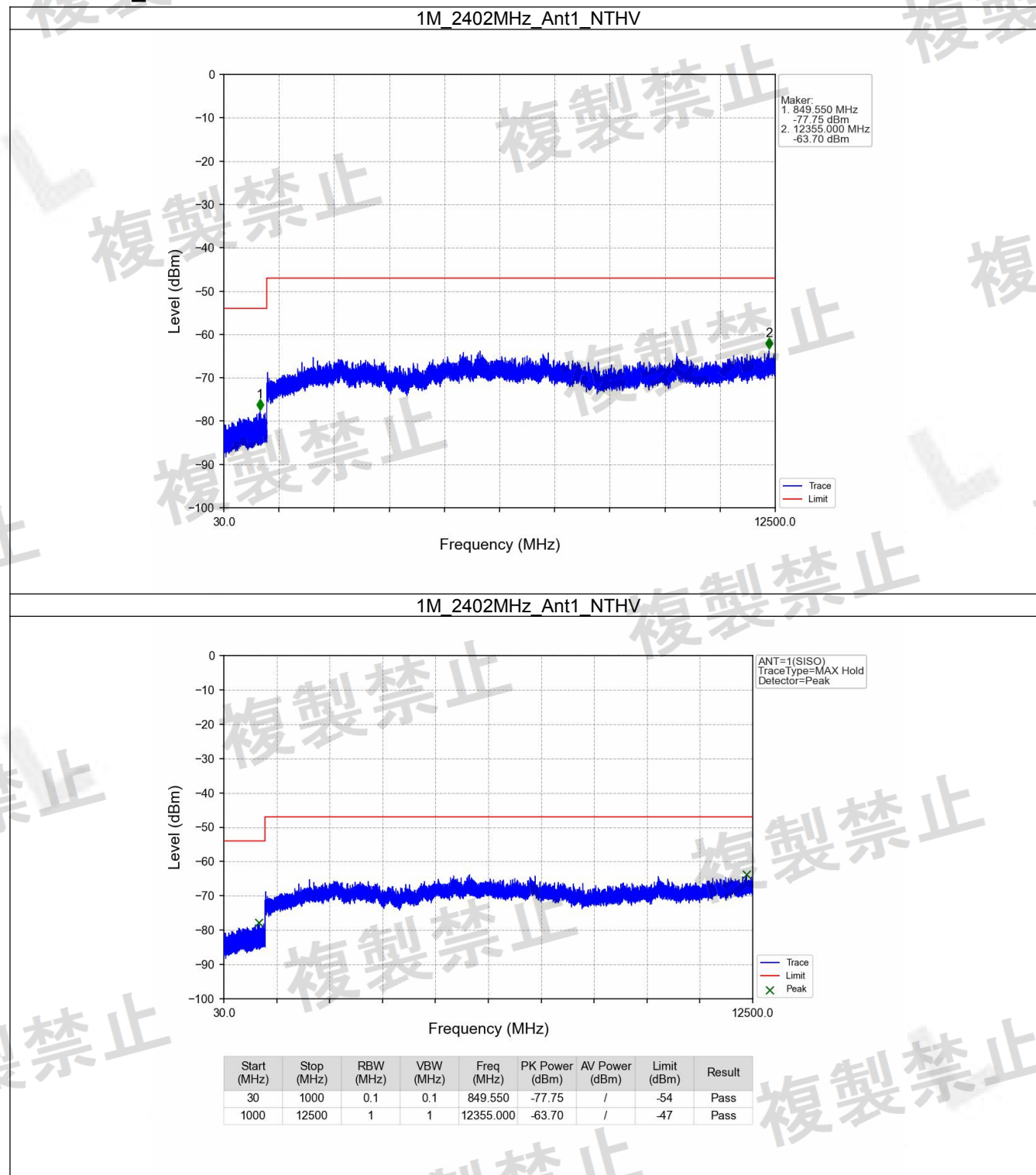


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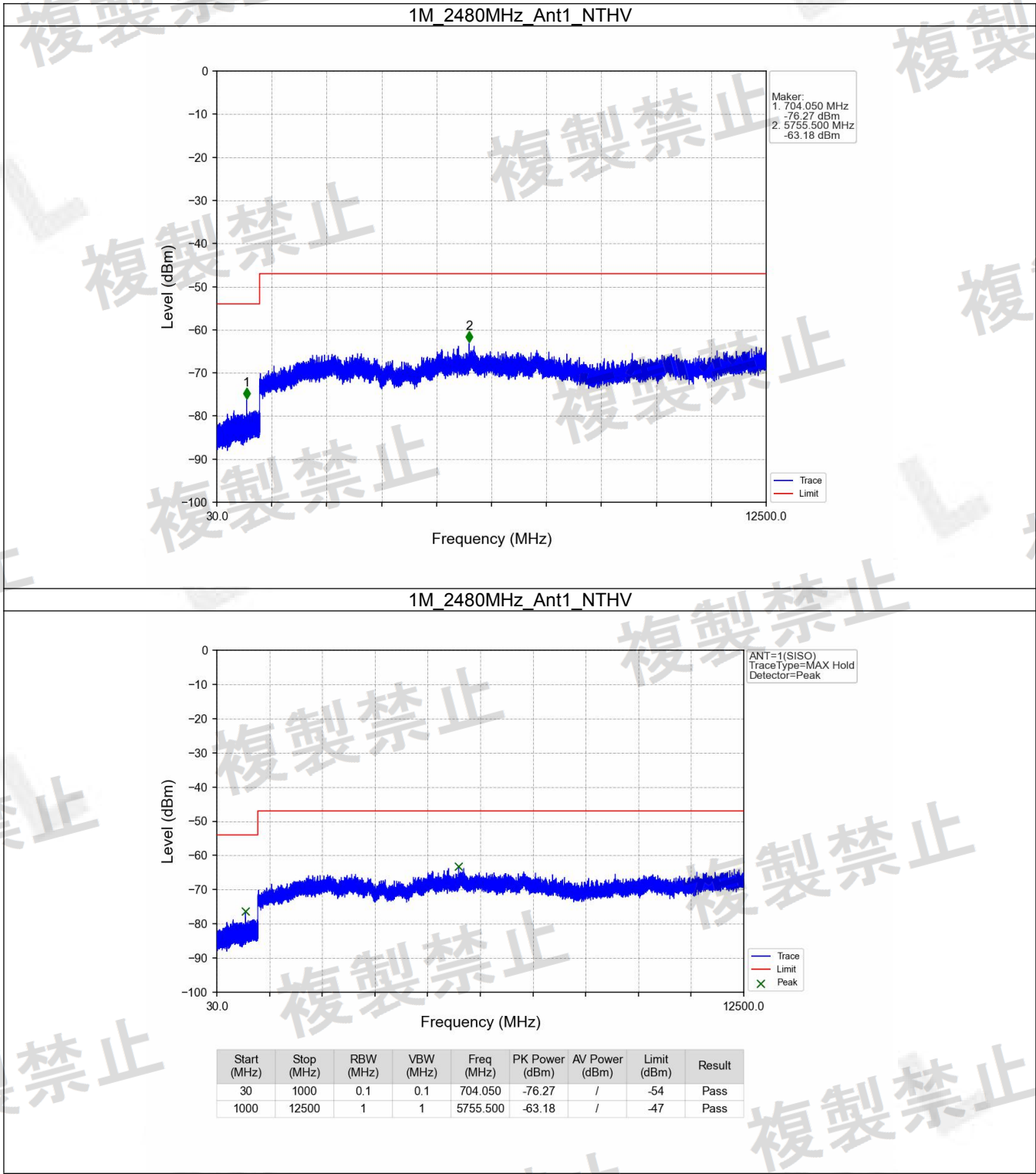


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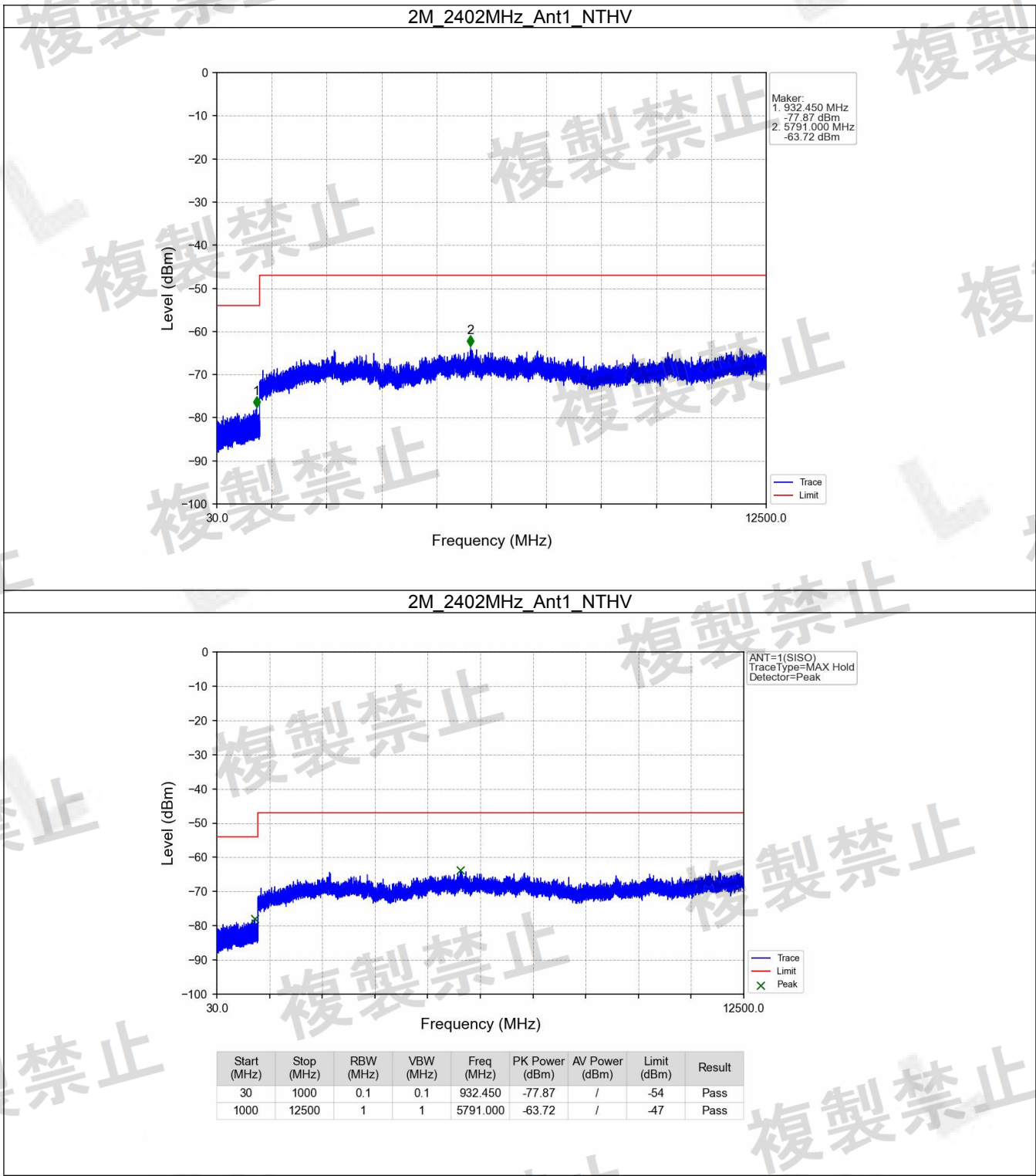
5.2.3 RxSe_NTHV



MIC: 219-269515



MIC: 219-269515



MIC: 219-269515

