

Appendix: Bluetooth Classic

Contents

Appendix A: Frequency_Error	3
Test Result	3
Test Graphs	4
Appendix B: Antenna Power	6
Test Result	6
Appendix C: Occupied Bandwidth	7
Test Result	7
Test Graphs	8
Appendix D: Spread Bandwidth	10
Test Result	10
Test Graphs	11
Appendix E: Spurious Emission of TX	16
Test Result	16
Test Graphs	18
Appendix F: Spurious Emission of RX	41
Test Result	41
Test Graphs	42
Appendix G: Dwell Time	51
Test Result	51
Test Graphs	52

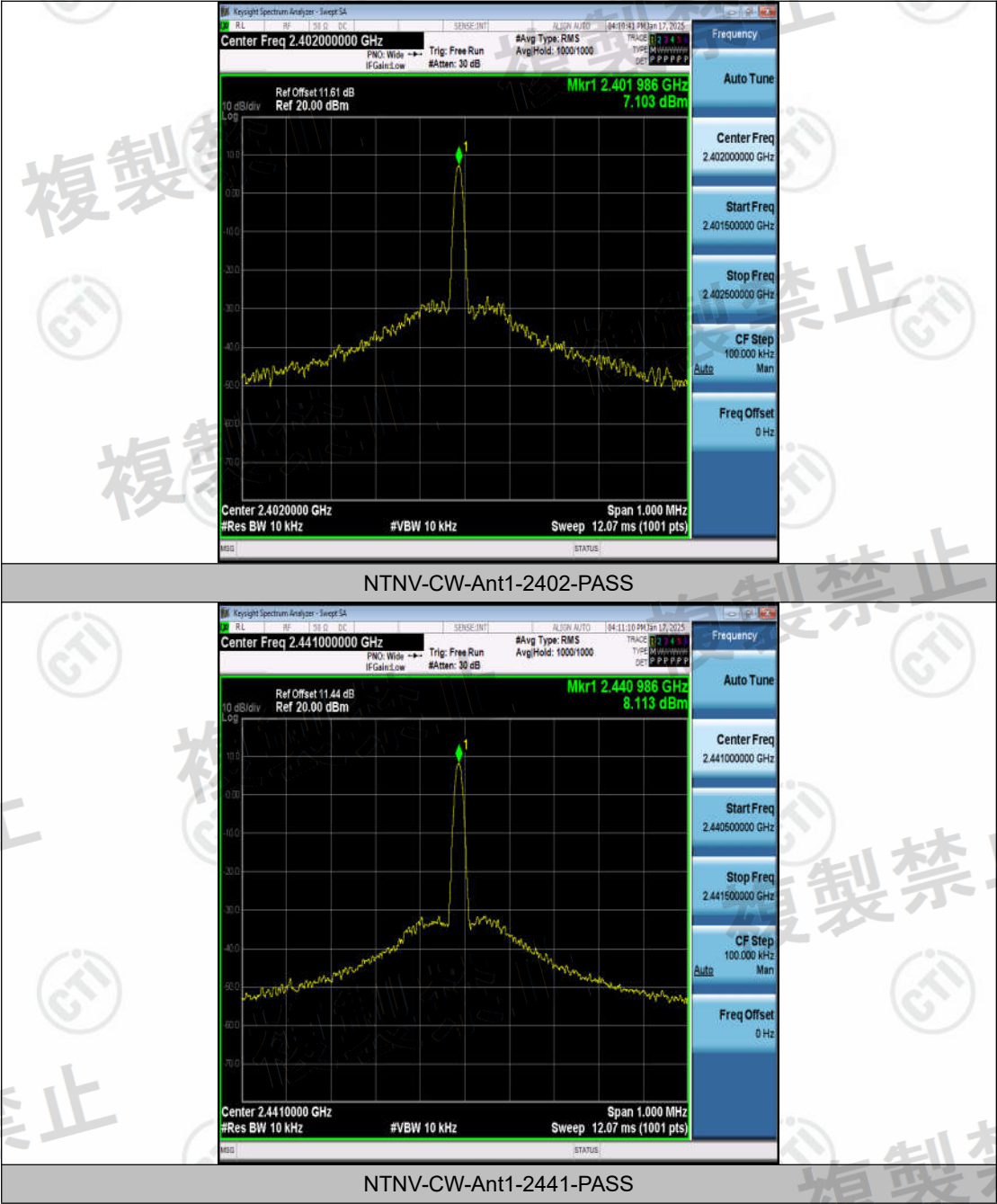
Appendix A: Frequency_Error

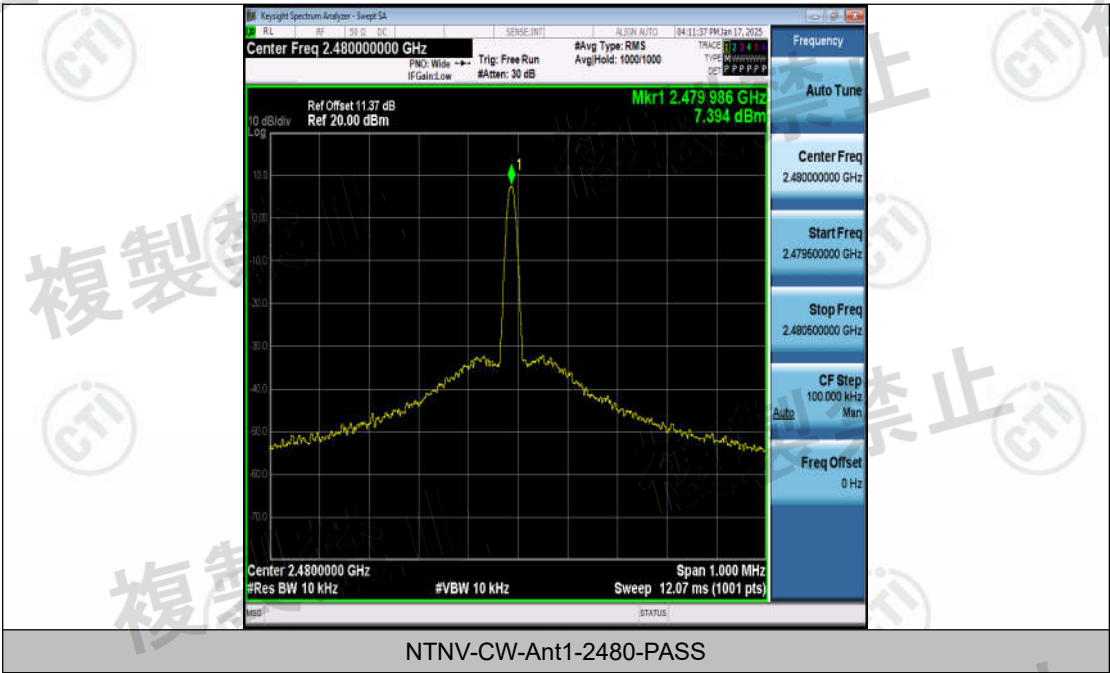
Test Result

Test Condition	Test Mode	Antenna	Frequency[MHz]	CenterFreq [MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	CW	Ant1	2402	2401.986	-5.82848	±50	PASS
NTNV	CW	Ant1	2441	2440.986	-5.73535	±50	PASS
NTNV	CW	Ant1	2480	2479.986	-5.64516	±50	PASS

Note: Result[ppm]= (CenterFreq - Channel)/Channel*1000000

Test Graphs





Appendix B: Antenna Power

Test Result

Test Condition	Test Mode	Antenna	Frequency [MHz]	Conducted Sensor power[dBm]	Conducted Sensor power[mW]	Dwell Time (%)	SpreadBW [MHz]	Result [mW/MHz]	Limit [mW/MHz]	Verdict
NTLV	DH5	Ant1	Hop	-1.13	0.7709	58	70.169	0.019	≤3	PASS
NTNV	2DH5	Ant1	Hop	-4.22	0.3784	58	70.346	0.009	≤3	PASS
NTHV	3DH5	Ant1	Hop	-4.31	0.3707	58.2	68.858	0.009	≤3	PASS

Note:

- ① Output power density(mW/MHz)= Conducted Sensor power (mW)/Burst Ratio/SpreadBW(MHz);
② For burst ratio, please refer to Dwell Time(ON Time/OFF Time).

Test Condition	Test Mode	Antenna	Freq (MHz)	Power (mW/MHz)	Rated Power (mW/MHz)	Result (%)	Limit (%)	Verdict
NTNV	DH5	Ant1	Hop	0.019	0.02	-5	+20	PASS
NTNV	2DH5	Ant1	Hop	0.009	0.01	-10	+20	PASS
NTNV	3DH5	Ant1	Hop	0.009	0.01	-10	+20	PASS

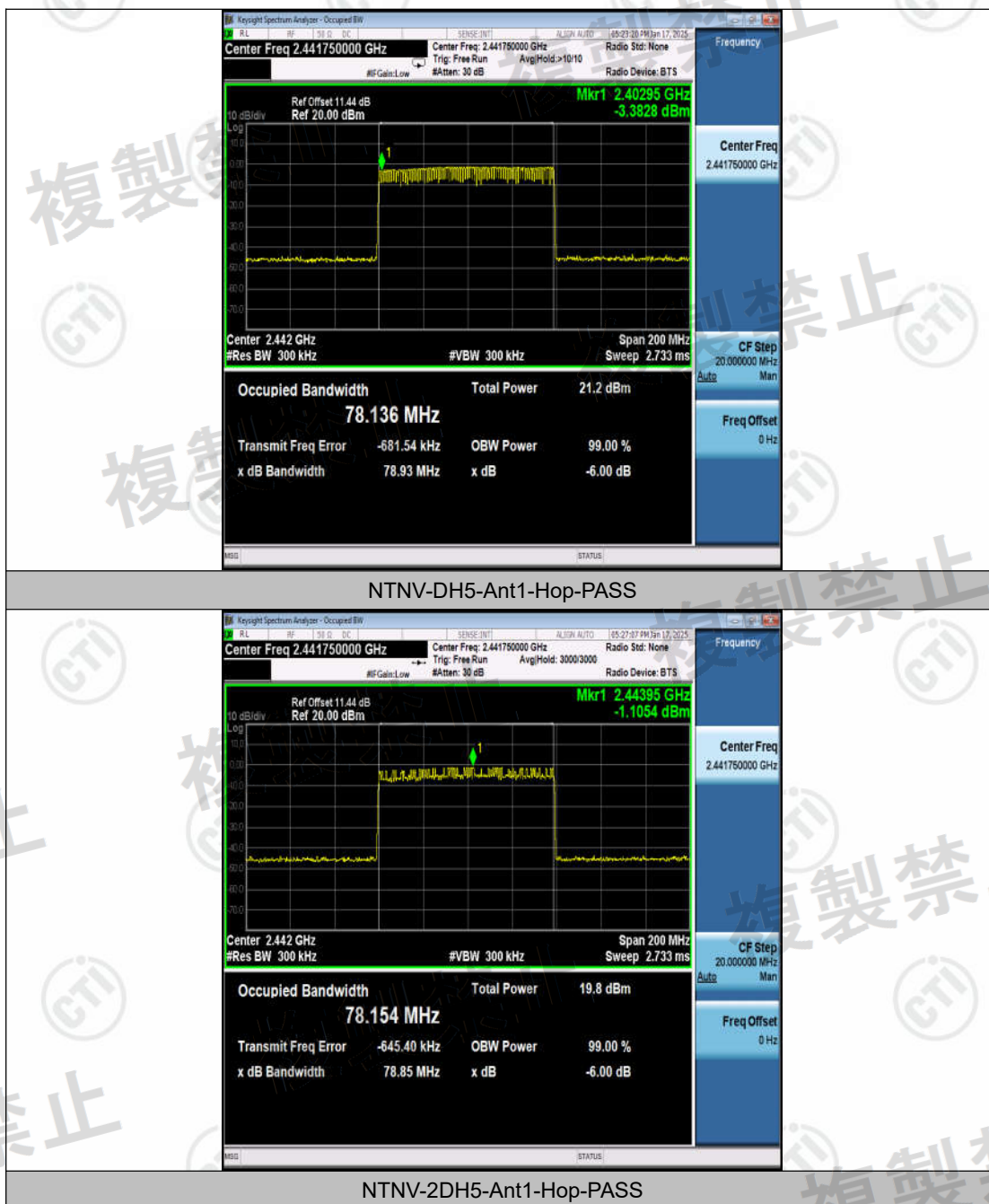
Test Condition	Test Mode	Antenna	Freq (MHz)	Result(dBm/MHz)	Antenna gain(dBi)	EIRP(dBm/MHz)	Limit(dBm/MHz)	Verdict
NTNV	DH5	Ant1	Hop	-17.21	1.79	-15.42	≤6.91	PASS
NTNV	2DH5	Ant1	Hop	-20.46	1.79	-18.67	≤6.91	PASS
NTNV	3DH5	Ant1	Hop	-20.46	1.79	-18.67	≤6.91	PASS

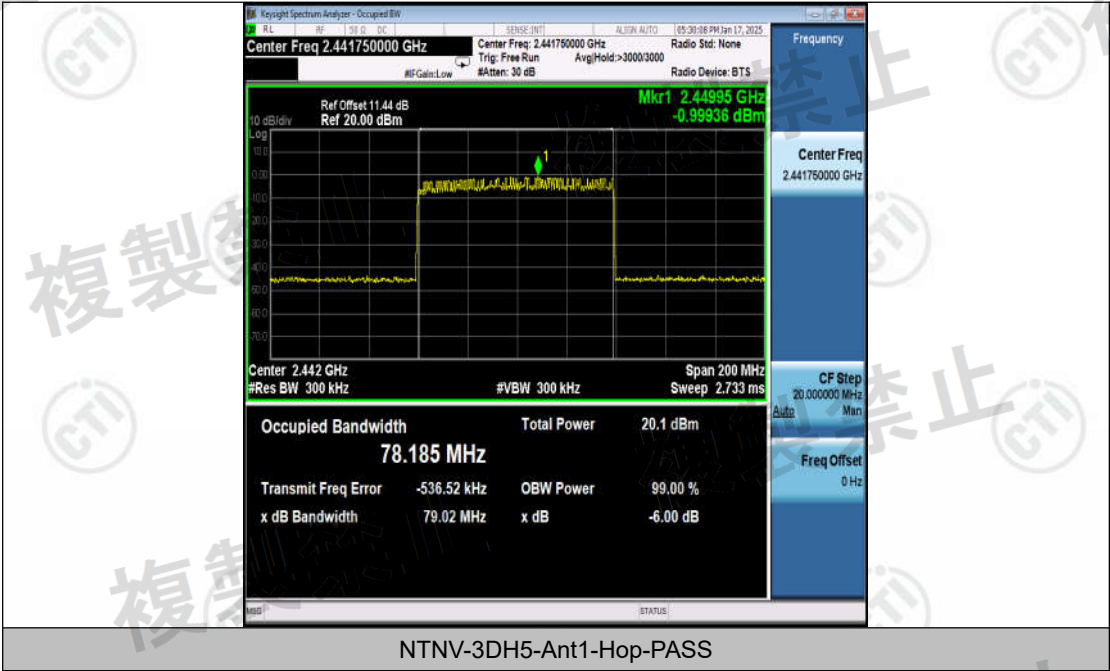
Appendix C: Occupied Bandwidth

Test Result

Test Condition	Test Mode	Antenna	Frequency[MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	78.136	≤83.5	PASS
NTNV	2DH5	Ant1	Hop	78.154	≤83.5	PASS
NTNV	3DH5	Ant1	Hop	78.185	≤83.5	PASS

Test Graphs



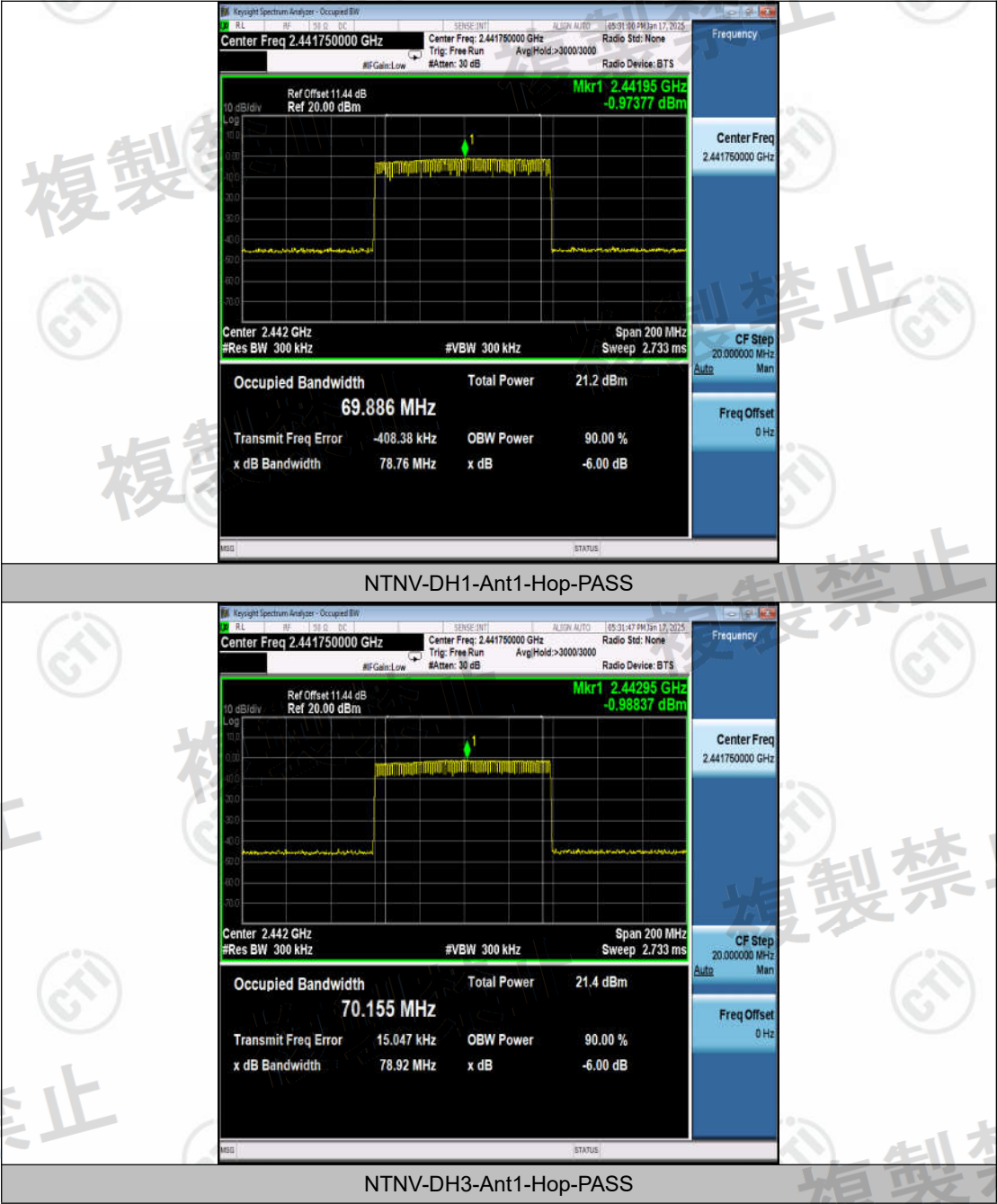


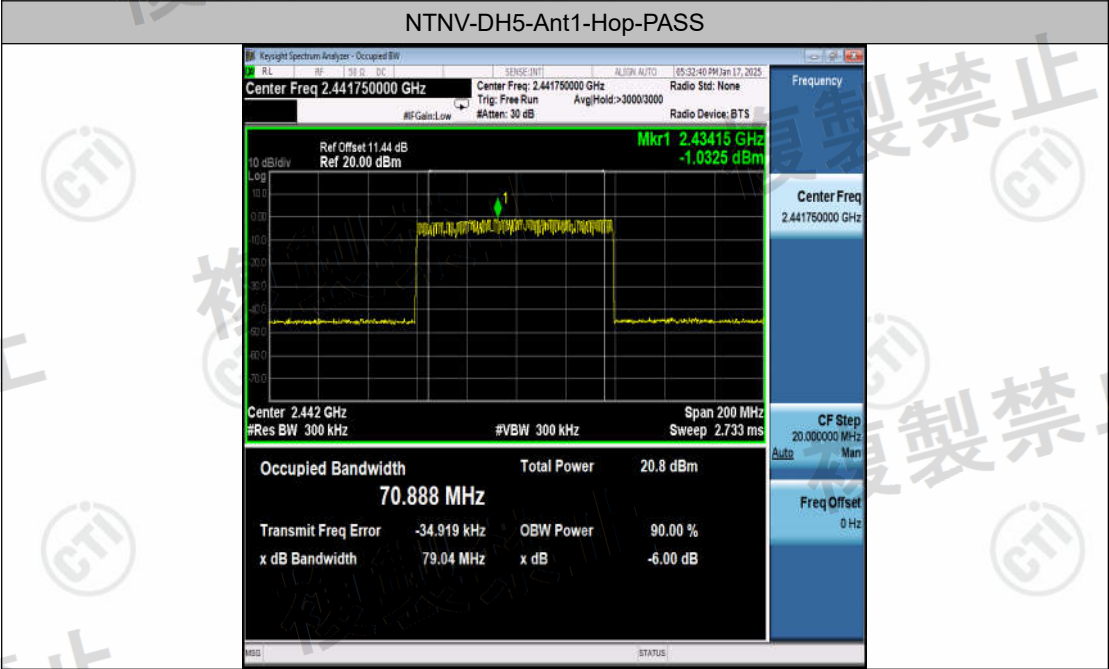
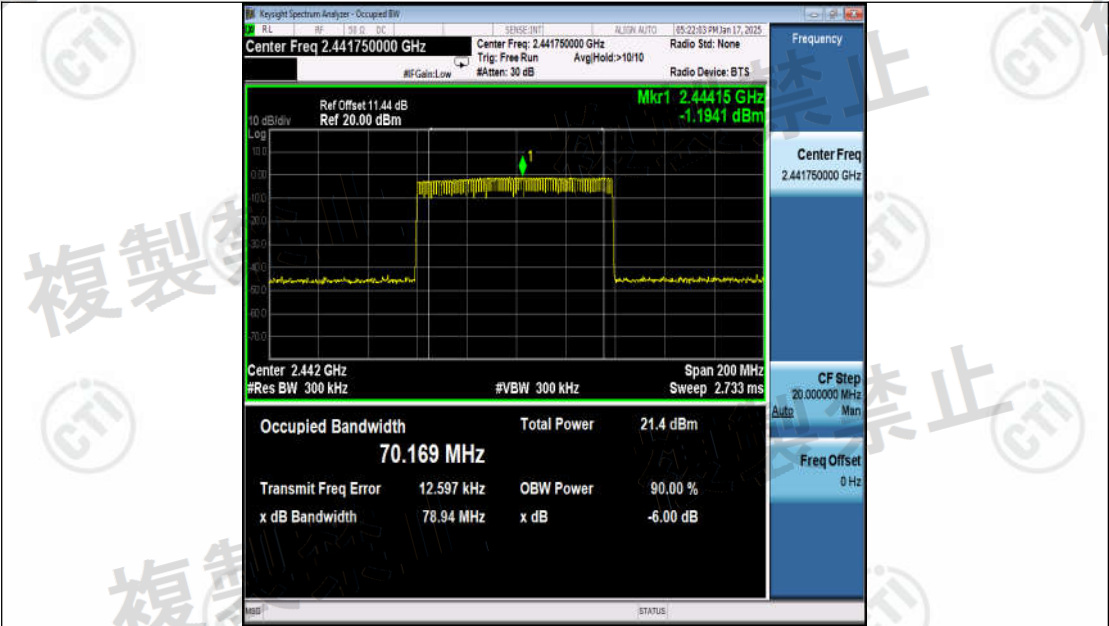
Appendix D: Spread Bandwidth

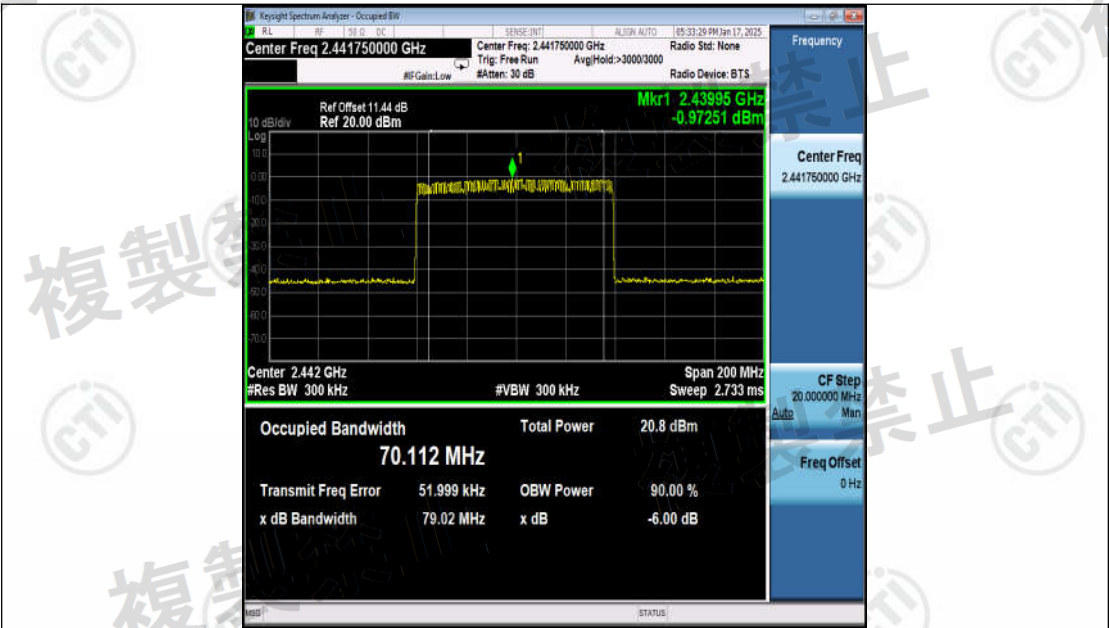
Test Result

Test Condition	Test Mode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Spread Factor	Limit	Verdict
NTNV	DH1	Ant1	Hop	69.886	≥0.5	69.886	>5	PASS
NTNV	DH3	Ant1	Hop	70.115	≥0.5	70.115	>5	PASS
NTNV	DH5	Ant1	Hop	70.169	≥0.5	70.169	>5	PASS
NTNV	2DH1	Ant1	Hop	70.888	≥0.5	70.888	>5	PASS
NTNV	2DH3	Ant1	Hop	70.112	≥0.5	70.112	>5	PASS
NTNV	2DH5	Ant1	Hop	70.346	≥0.5	70.346	>5	PASS
NTNV	3DH1	Ant1	Hop	70.859	≥0.5	70.859	>5	PASS
NTNV	3DH3	Ant1	Hop	70.137	≥0.5	70.137	>5	PASS
NTNV	3DH5	Ant1	Hop	68.858	≥0.5	68.858	>5	PASS

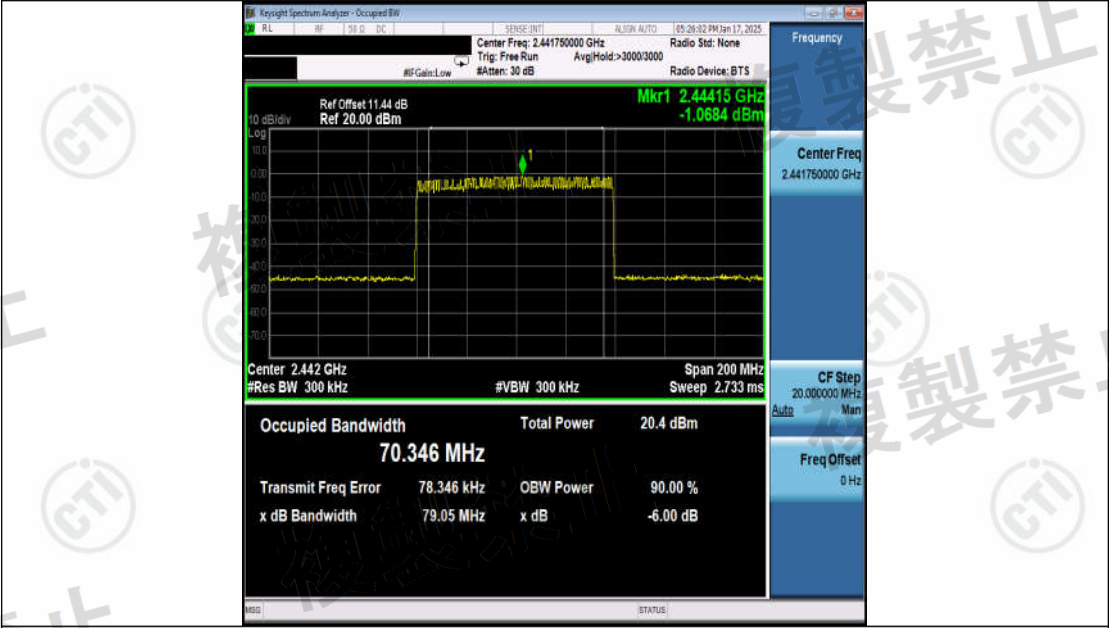
Test Graphs



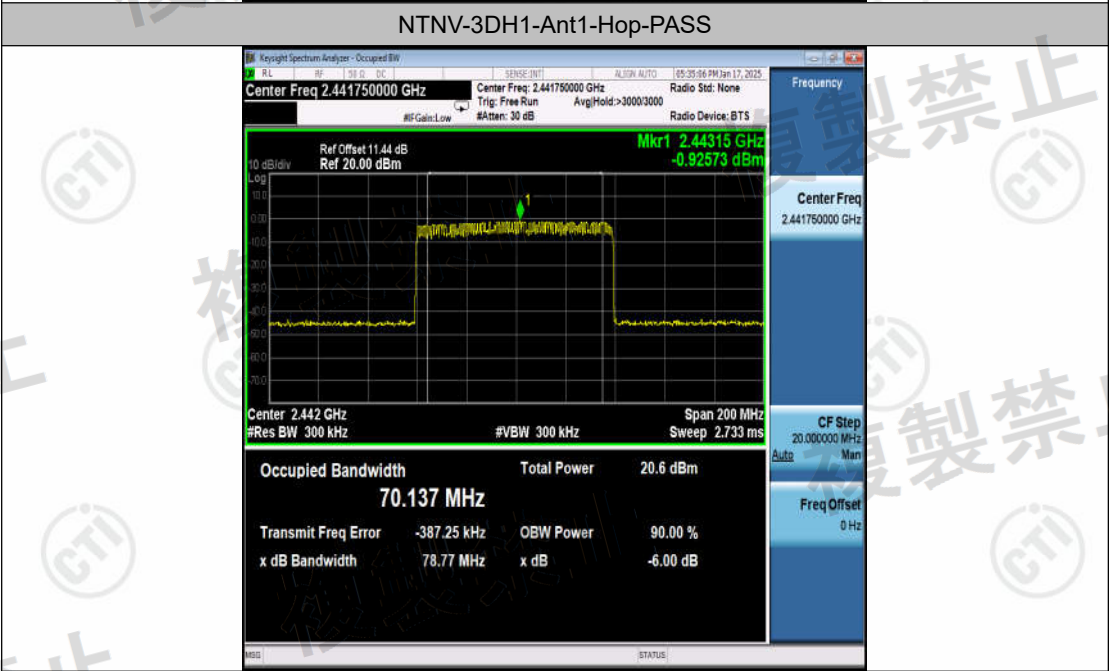
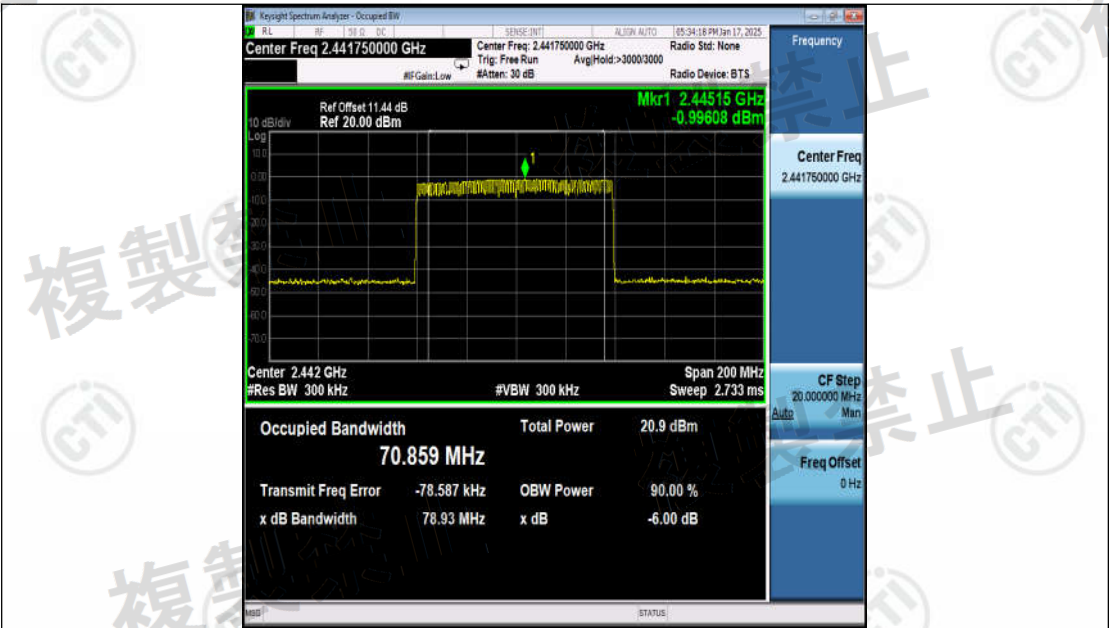


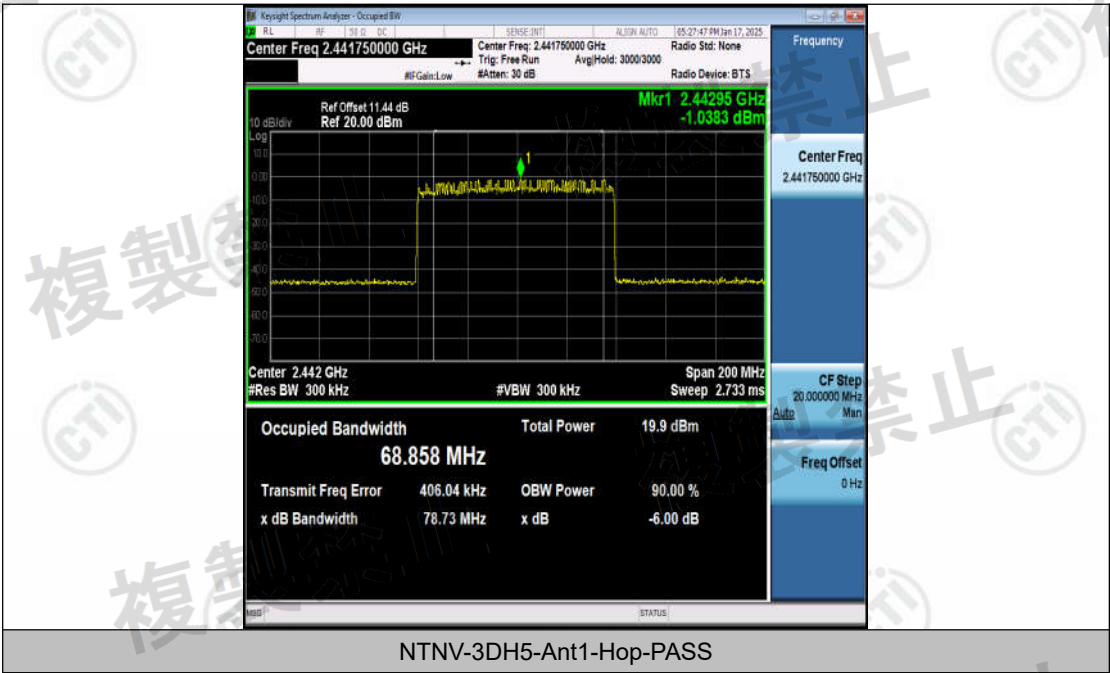


NTNV-2DH3-Ant1-Hop-PASS



NTNV-2DH5-Ant1-Hop-PASS





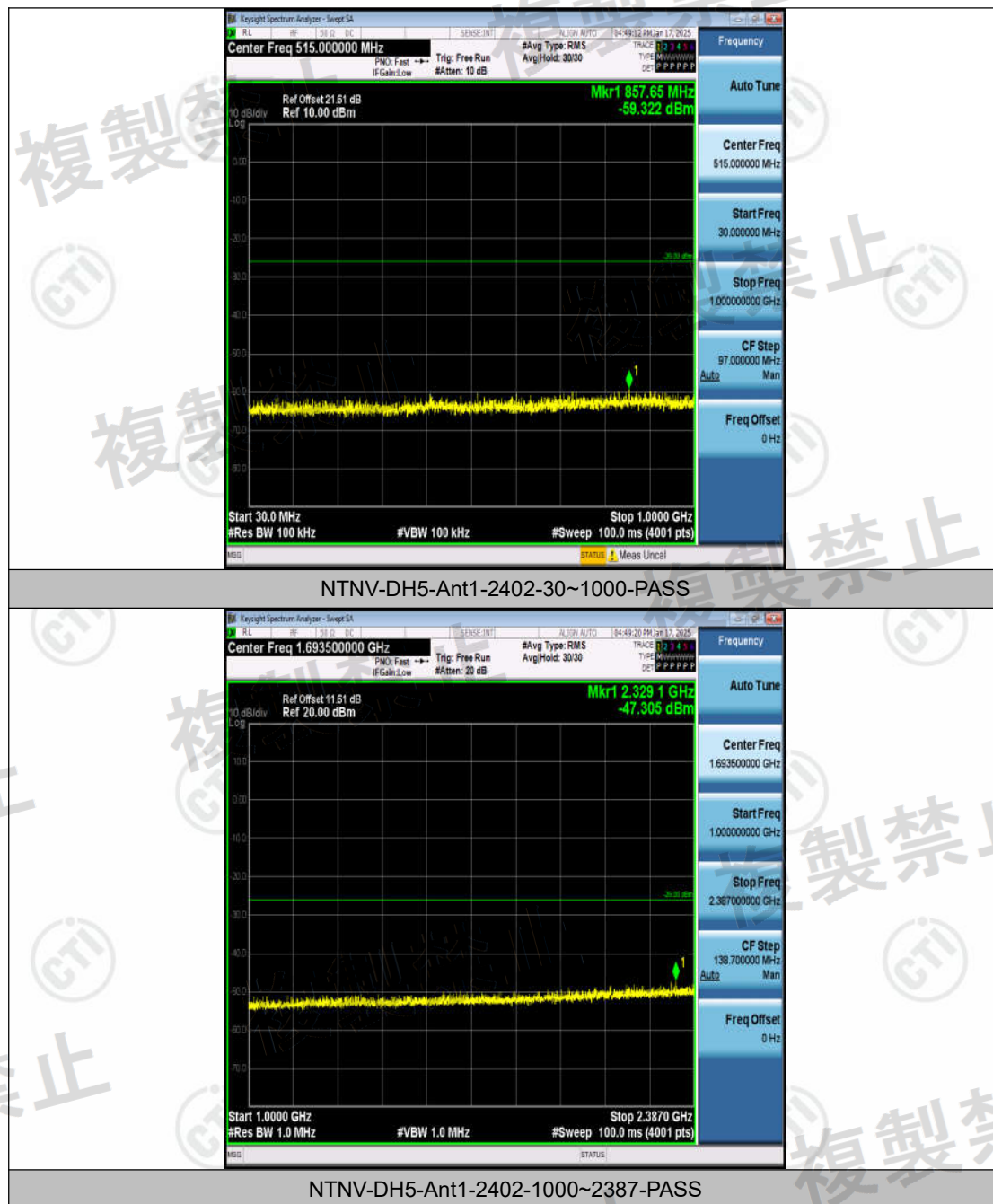
Appendix E: Spurious Emission of TX

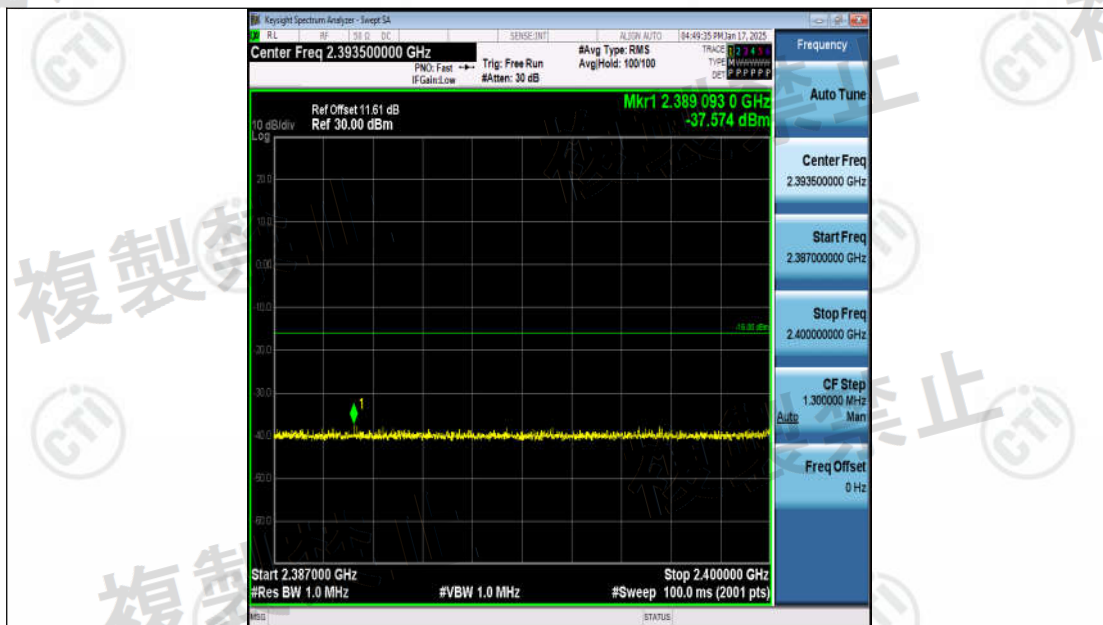
Test Result

Test Condition	Test Mode	Antenna	Frequency [MHz]	Freq. Range [MHz]	Freq [MHz]	Result [dBm/MHz]	Result [μ W/MHz]	Limit [μ W/MHz]	Verdict
NTNV	DH5	Ant1	2402	30~1000	857.65	-59.32	0.00117	≤ 2.5	PASS
NTNV	DH5	Ant1	2402	1000~2387	2329.09	-47.31	0.01858	≤ 2.5	PASS
NTNV	DH5	Ant1	2402	2387~2400	2389.09	-37.57	0.17498	≤ 25	PASS
NTNV	DH5	Ant1	2402	2483.5~2496.5	2483.93	-37.73	0.16866	≤ 25	PASS
NTNV	DH5	Ant1	2402	2496.5~13000	3751.14	-44.04	0.03945	≤ 2.5	PASS
NTNV	DH5	Ant1	2441	30~1000	924.58	-59.11	0.00123	≤ 2.5	PASS
NTNV	DH5	Ant1	2441	1000~2387	2356.83	-48.03	0.01574	≤ 2.5	PASS
NTNV	DH5	Ant1	2441	2387~2400	2390.11	-38.10	0.15488	≤ 25	PASS
NTNV	DH5	Ant1	2441	2483.5~2496.5	2487.75	-37.60	0.17378	≤ 25	PASS
NTNV	DH5	Ant1	2441	2496.5~13000	5116.07	-45.34	0.02924	≤ 2.5	PASS
NTNV	DH5	Ant1	2480	30~1000	841.89	-59.86	0.00103	≤ 2.5	PASS
NTNV	DH5	Ant1	2480	1000~2387	2373.48	-47.80	0.01660	≤ 2.5	PASS
NTNV	DH5	Ant1	2480	2387~2400	2395.17	-37.96	0.15996	≤ 25	PASS
NTNV	DH5	Ant1	2480	2483.5~2496.5	2484.36	-37.55	0.17579	≤ 25	PASS
NTNV	DH5	Ant1	2480	2496.5~13000	3760.60	-45.61	0.02748	≤ 2.5	PASS
NTNV	2DH5	Ant1	2402	30~1000	794.36	-59.75	0.00106	≤ 2.5	PASS
NTNV	2DH5	Ant1	2402	1000~2387	2382.15	-47.71	0.01694	≤ 2.5	PASS
NTNV	2DH5	Ant1	2402	2387~2400	2399.99	-35.60	0.27542	≤ 25	PASS
NTNV	2DH5	Ant1	2402	2483.5~2496.5	2487.27	-37.47	0.17906	≤ 25	PASS
NTNV	2DH5	Ant1	2402	2496.5~13000	3793.16	-44.27	0.03741	≤ 2.5	PASS
NTNV	2DH5	Ant1	2441	30~1000	865.17	-59.79	0.00105	≤ 2.5	PASS
NTNV	2DH5	Ant1	2441	1000~2387	2340.54	-48.10	0.01549	≤ 2.5	PASS
NTNV	2DH5	Ant1	2441	2387~2400	2389.16	-38.17	0.15241	≤ 25	PASS
NTNV	2DH5	Ant1	2441	2483.5~2496.5	2493.51	-37.93	0.16106	≤ 25	PASS
NTNV	2DH5	Ant1	2441	2496.5~13000	4689.11	-44.57	0.03491	≤ 2.5	PASS
NTNV	2DH5	Ant1	2480	30~1000	605.45	-58.80	0.00132	≤ 2.5	PASS
NTNV	2DH5	Ant1	2480	1000~2387	2220.21	-48.30	0.01479	≤ 2.5	PASS
NTNV	2DH5	Ant1	2480	2387~2400	2388.50	-37.77	0.16711	≤ 25	PASS
NTNV	2DH5	Ant1	2480	2483.5~2496.5	2490.21	-37.77	0.16711	≤ 25	PASS
NTNV	2DH5	Ant1	2480	2496.5~13000	3794.73	-45.66	0.02716	≤ 2.5	PASS
NTNV	3DH5	Ant1	2402	30~1000	883.60	-58.33	0.00147	≤ 2.5	PASS
NTNV	3DH5	Ant1	2402	1000~2387	2385.96	-47.72	0.01690	≤ 2.5	PASS
NTNV	3DH5	Ant1	2402	2387~2400	2400.00	-35.26	0.29785	≤ 25	PASS

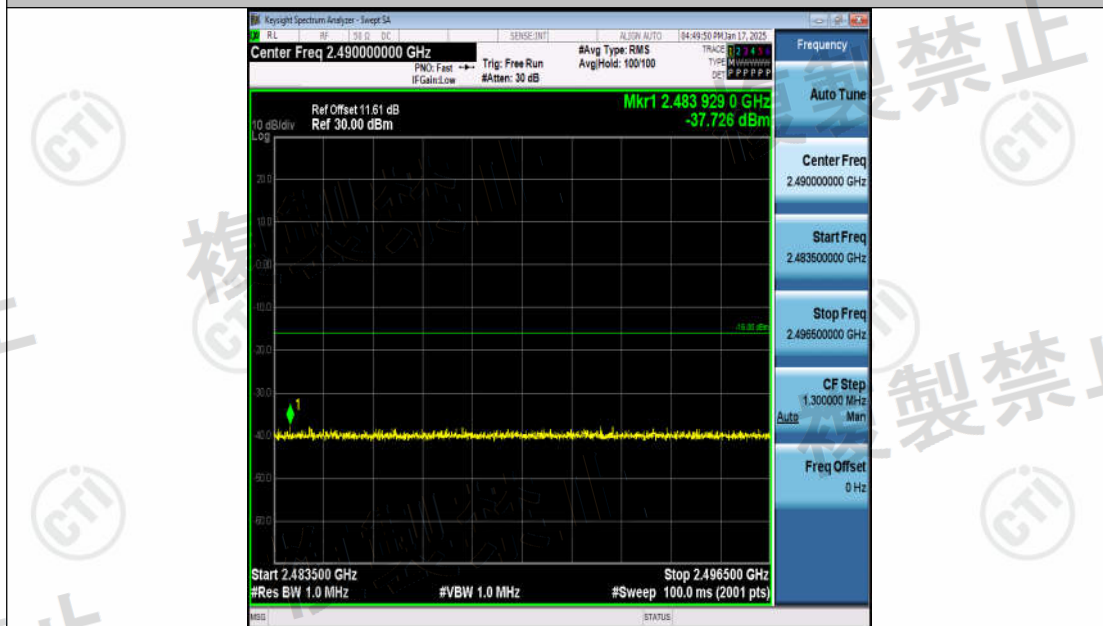
NTNV	3DH5	Ant1	2402	2483.5~2496.5	2495.59	-37.81	0.16558	≤25	PASS
NTNV	3DH5	Ant1	2402	2496.5~13000	3769.00	-44.57	0.03491	≤2.5	PASS
NTNV	3DH5	Ant1	2441	30~1000	874.14	-59.42	0.00114	≤2.5	PASS
NTNV	3DH5	Ant1	2441	1000~2387	2293.03	-47.79	0.01663	≤2.5	PASS
NTNV	3DH5	Ant1	2441	2387~2400	2390.39	-38.08	0.15560	≤25	PASS
NTNV	3DH5	Ant1	2441	2483.5~2496.5	2496.28	-37.84	0.16444	≤25	PASS
NTNV	3DH5	Ant1	2441	2496.5~13000	3771.62	-45.06	0.03119	≤2.5	PASS
NTNV	3DH5	Ant1	2480	30~1000	750.95	-59.80	0.00105	≤2.5	PASS
NTNV	3DH5	Ant1	2480	1000~2387	2045.80	-47.88	0.01629	≤2.5	PASS
NTNV	3DH5	Ant1	2480	2387~2400	2395.20	-37.90	0.16218	≤25	PASS
NTNV	3DH5	Ant1	2480	2483.5~2496.5	2485.08	-37.66	0.17140	≤25	PASS
NTNV	3DH5	Ant1	2480	2496.5~13000	3833.60	-45.94	0.02547	≤2.5	PASS

Test Graphs

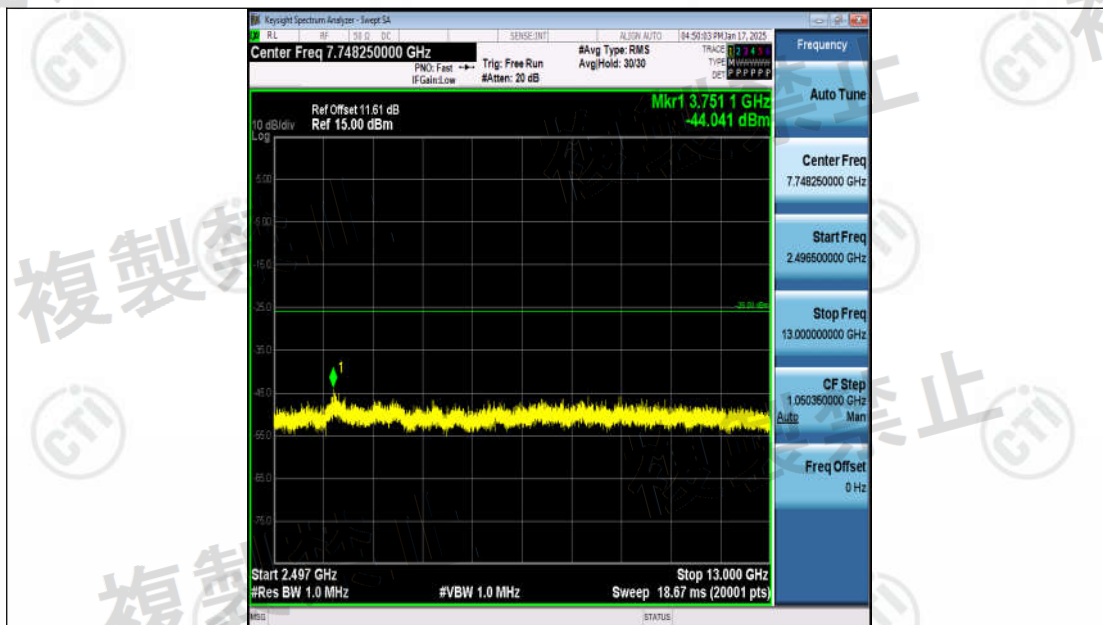




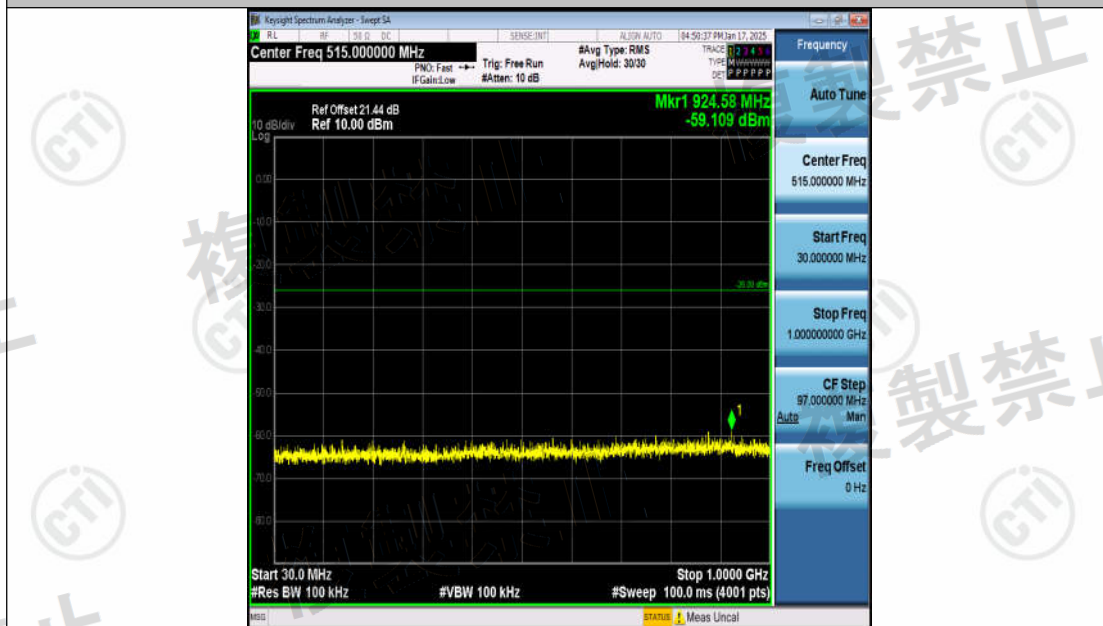
NTNV-DH5-Ant1-2402-2387~2400-PASS



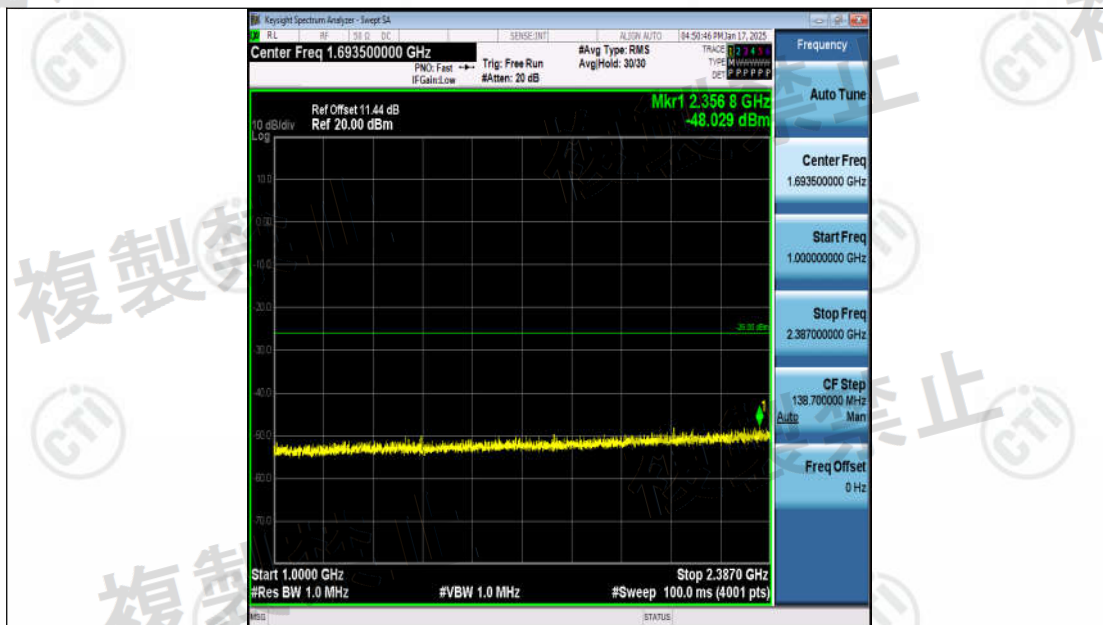
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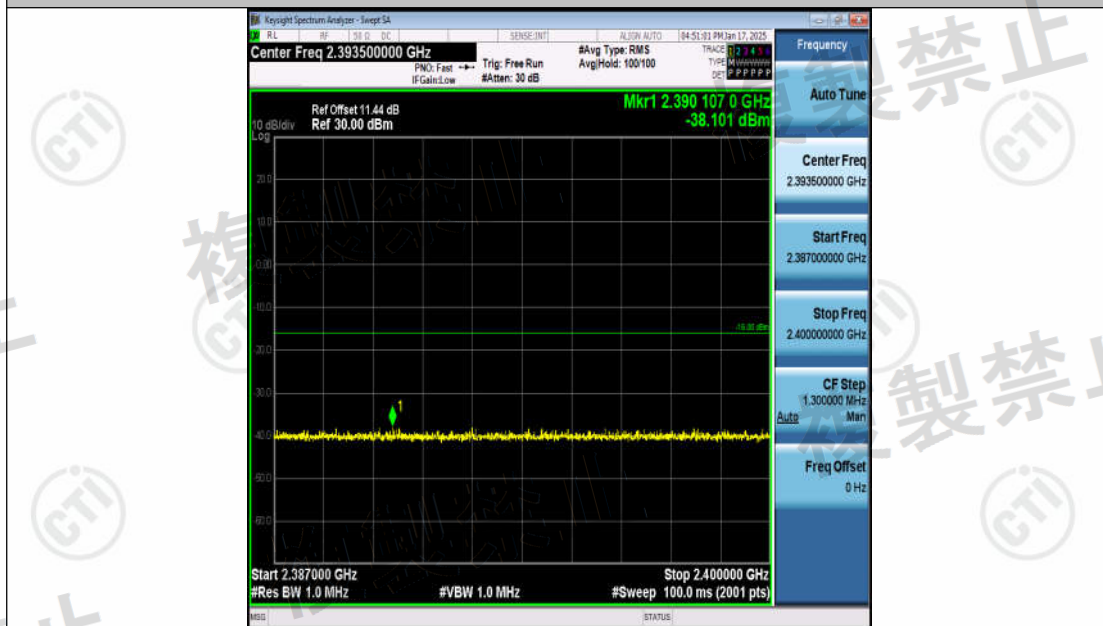
NTNV-DH5-Ant1-2402-2496.5~13000-PASS



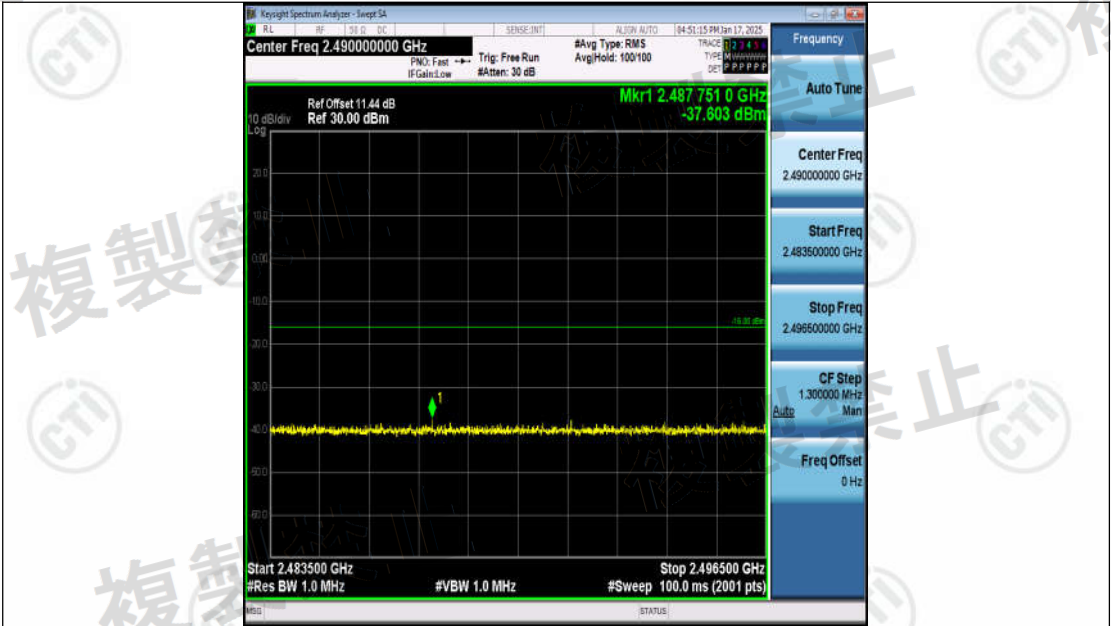
NTNV-DH5-Ant1-2441-30~1000-PASS



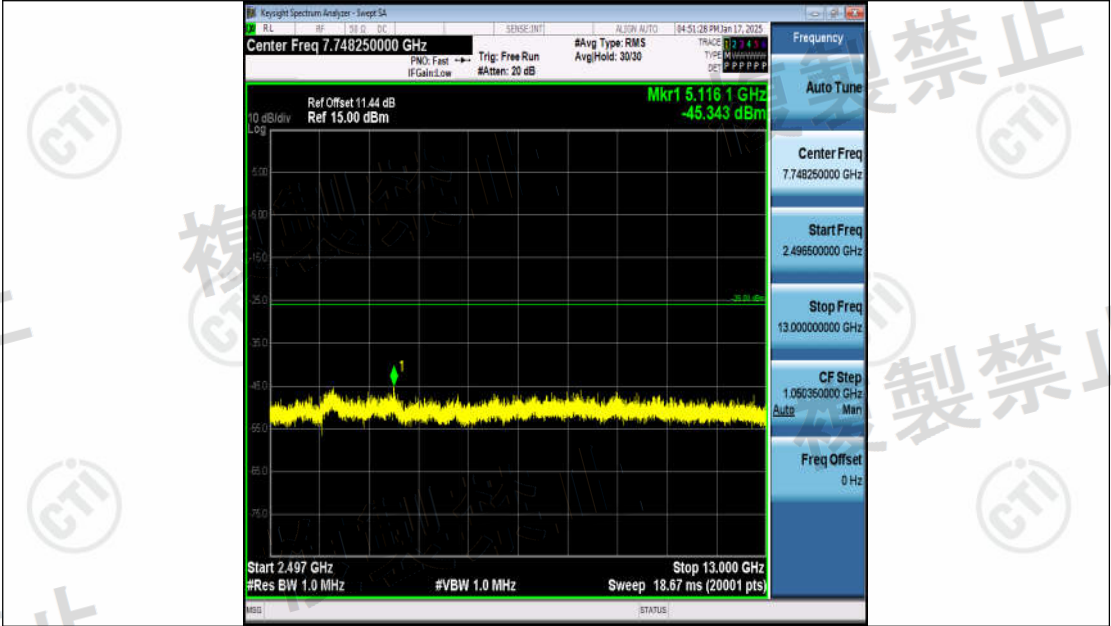
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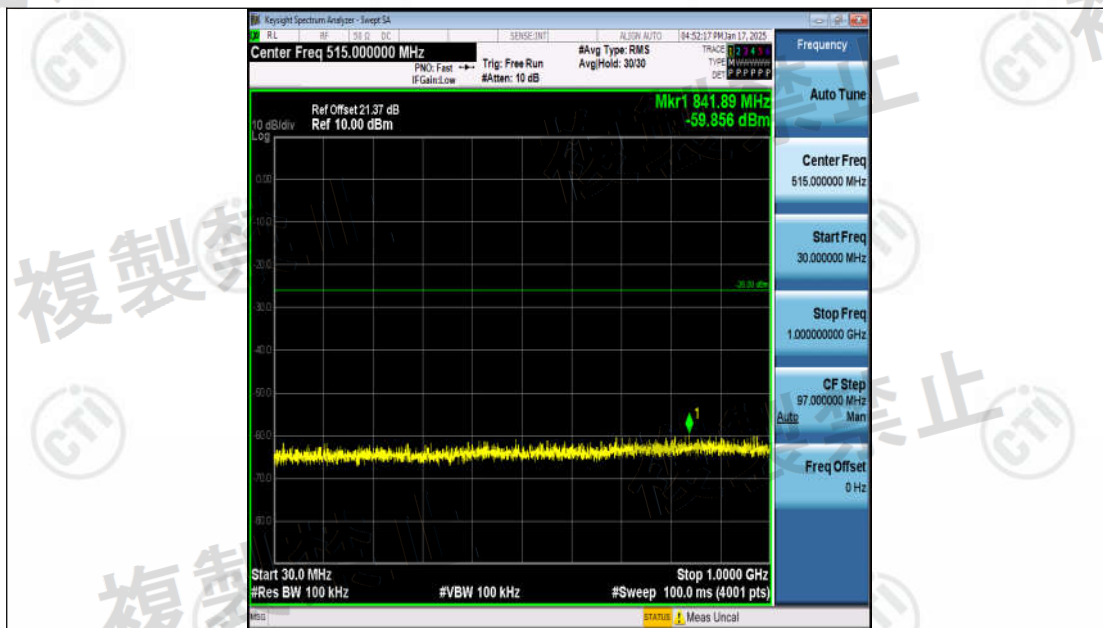
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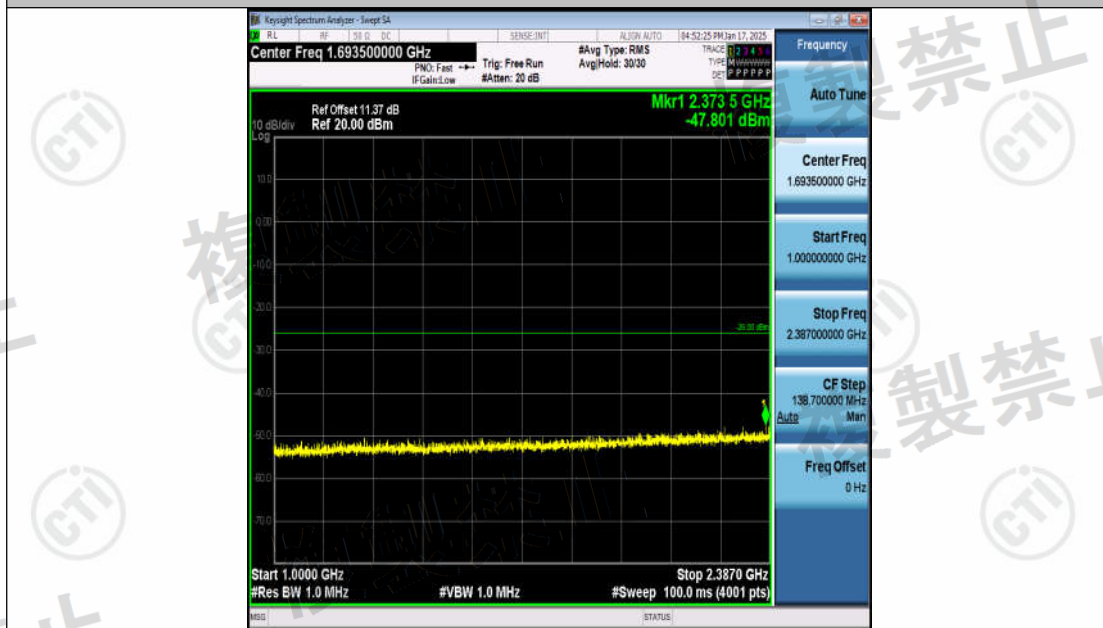
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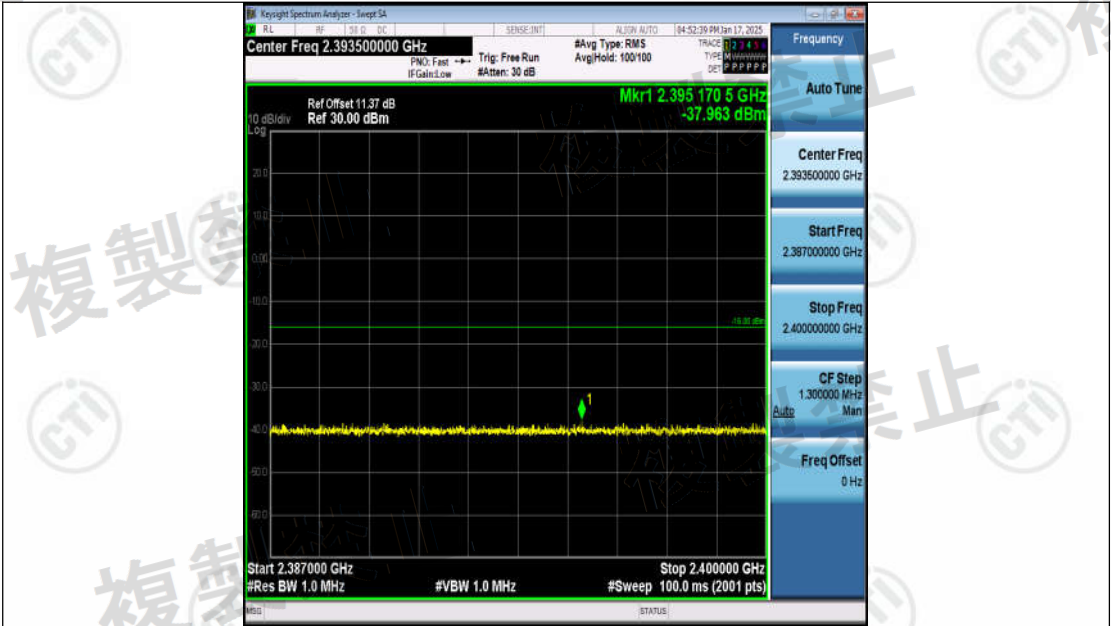
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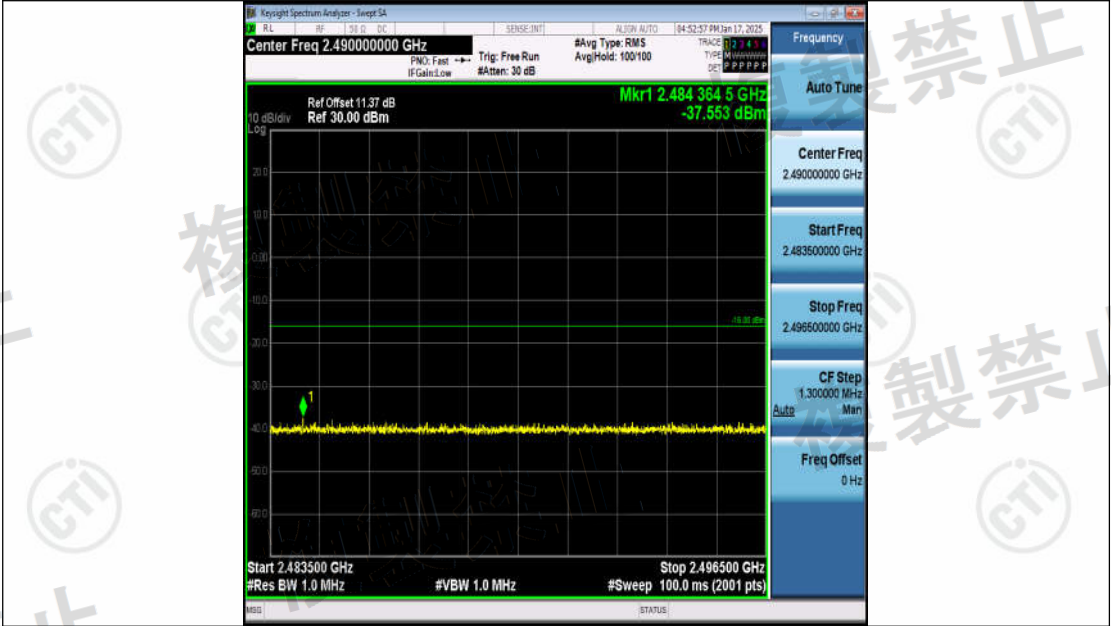
NTNV-DH5-Ant1-2480-30~1000-PASS



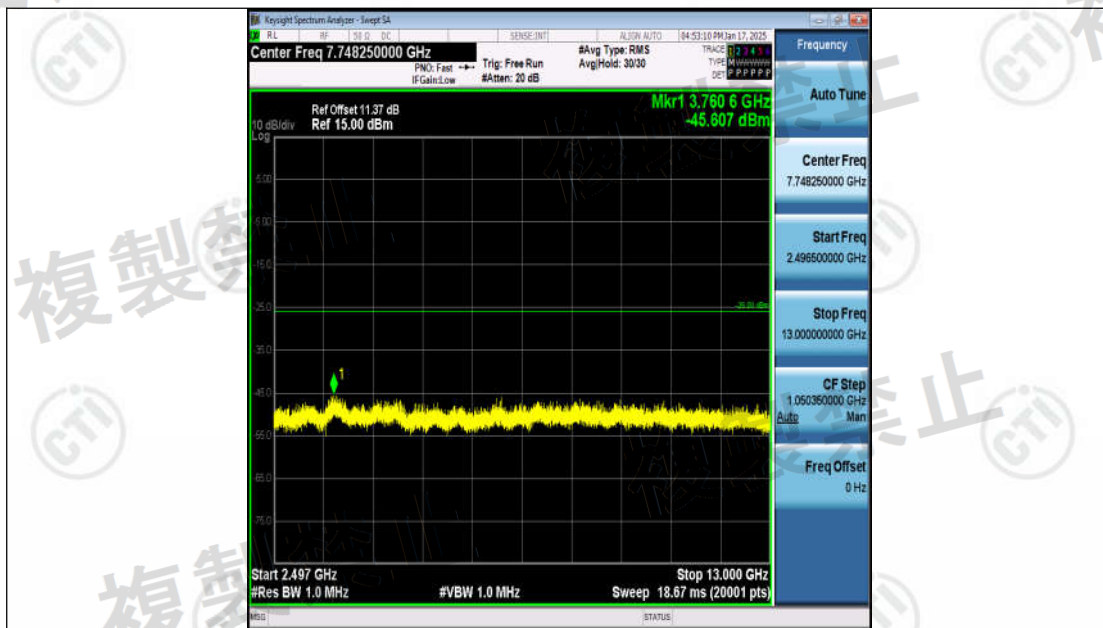
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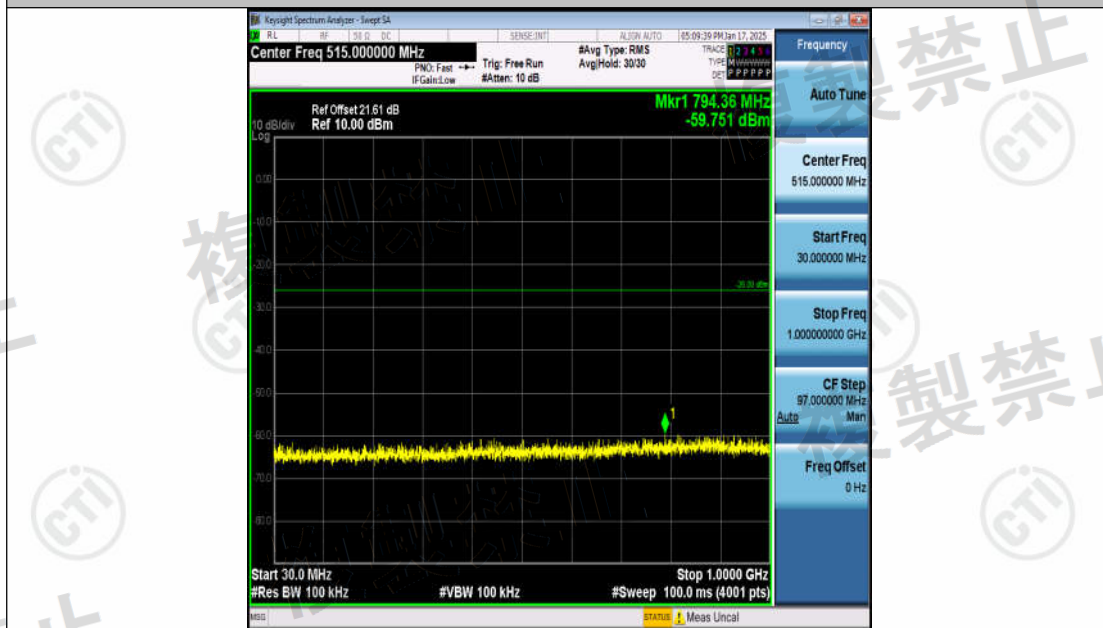
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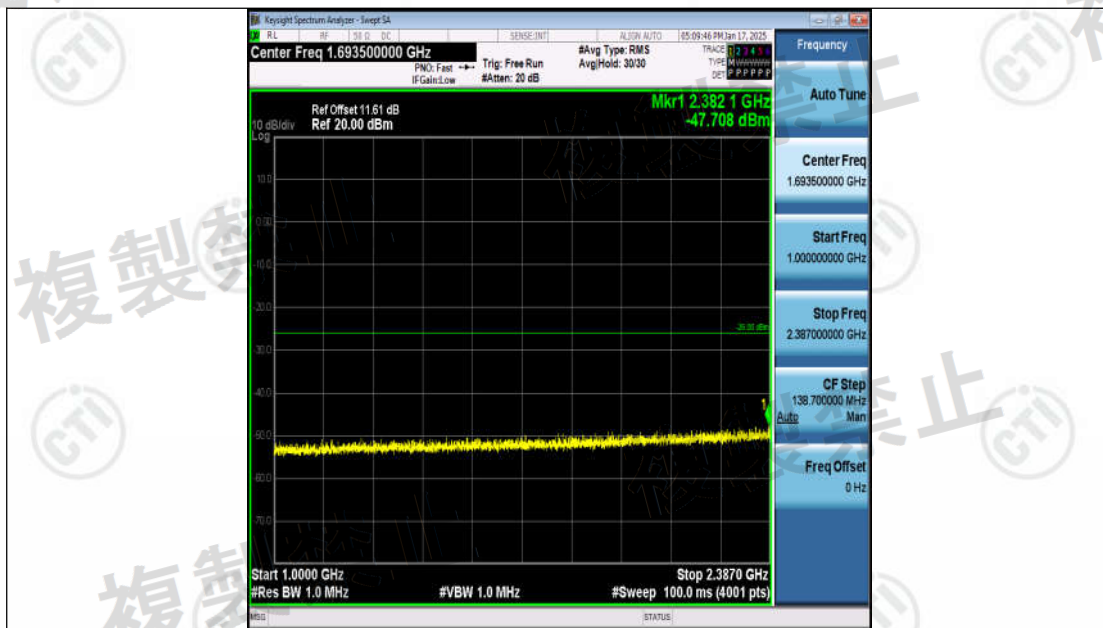
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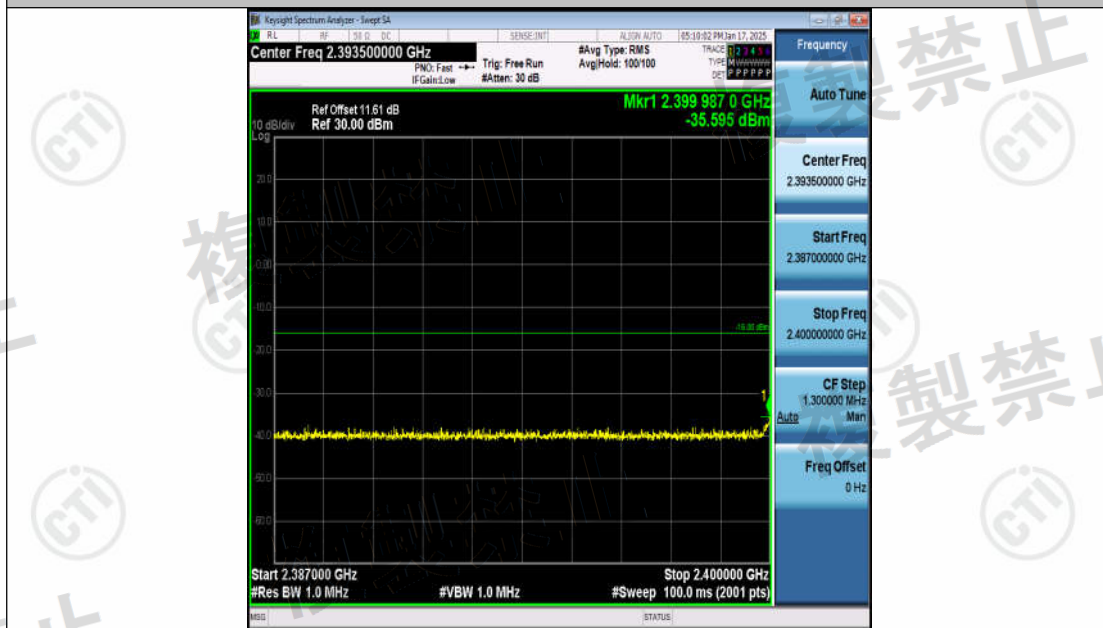
NTNV-DH5-Ant1-2480-2496.5~13000-PASS



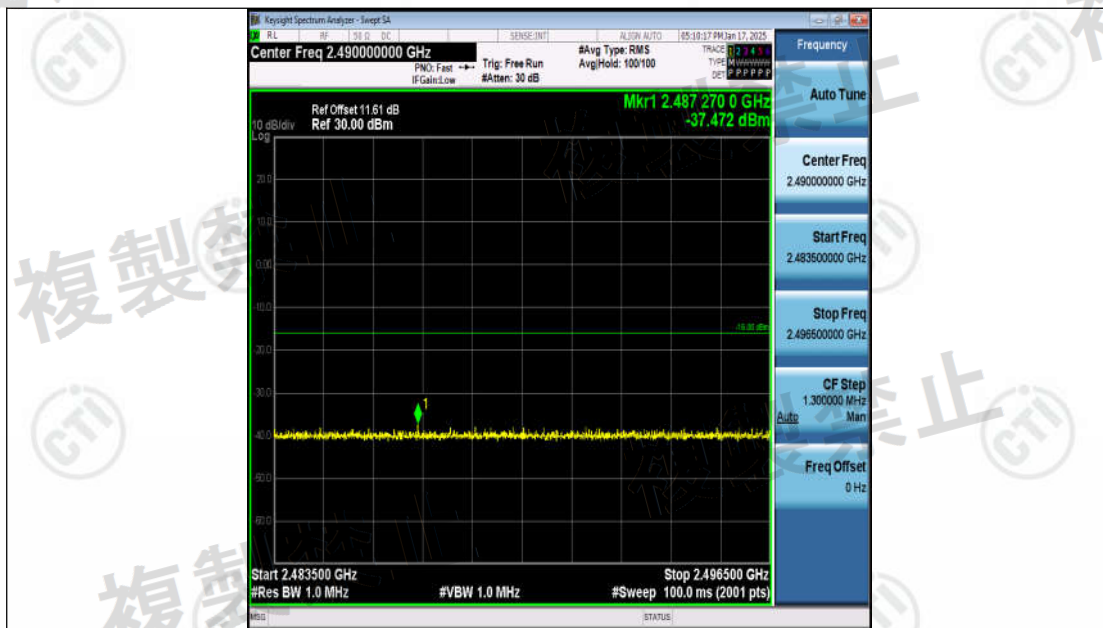
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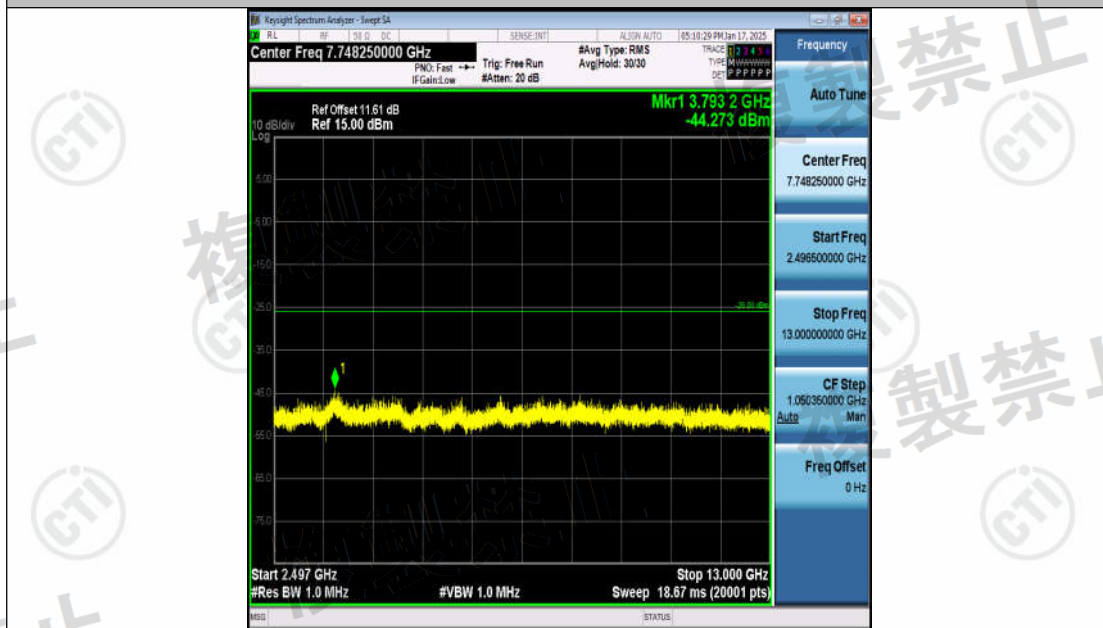
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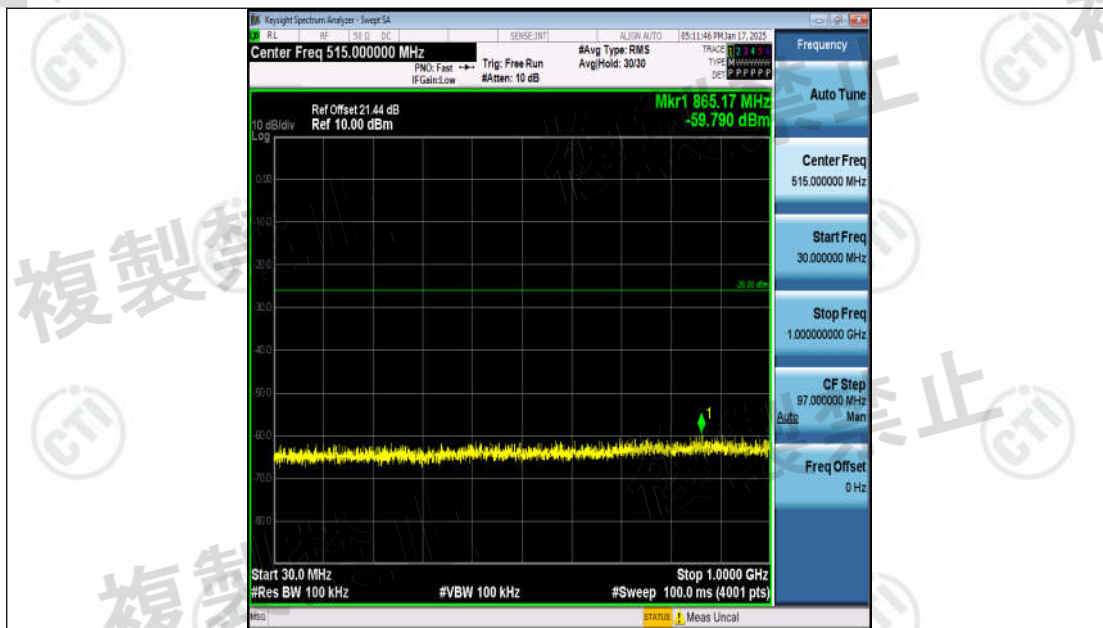
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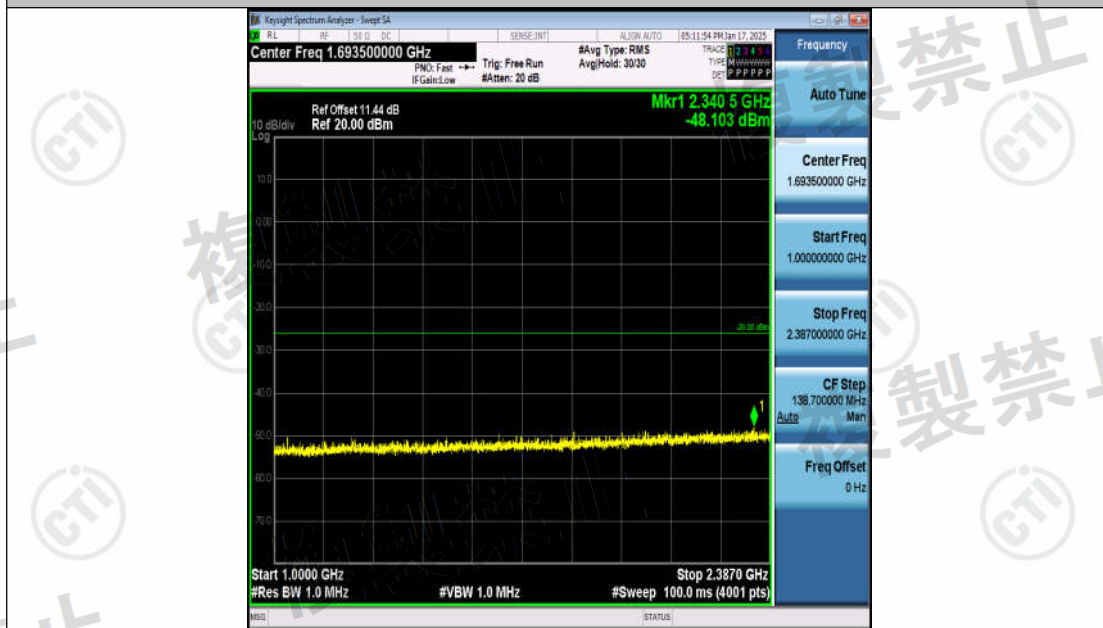
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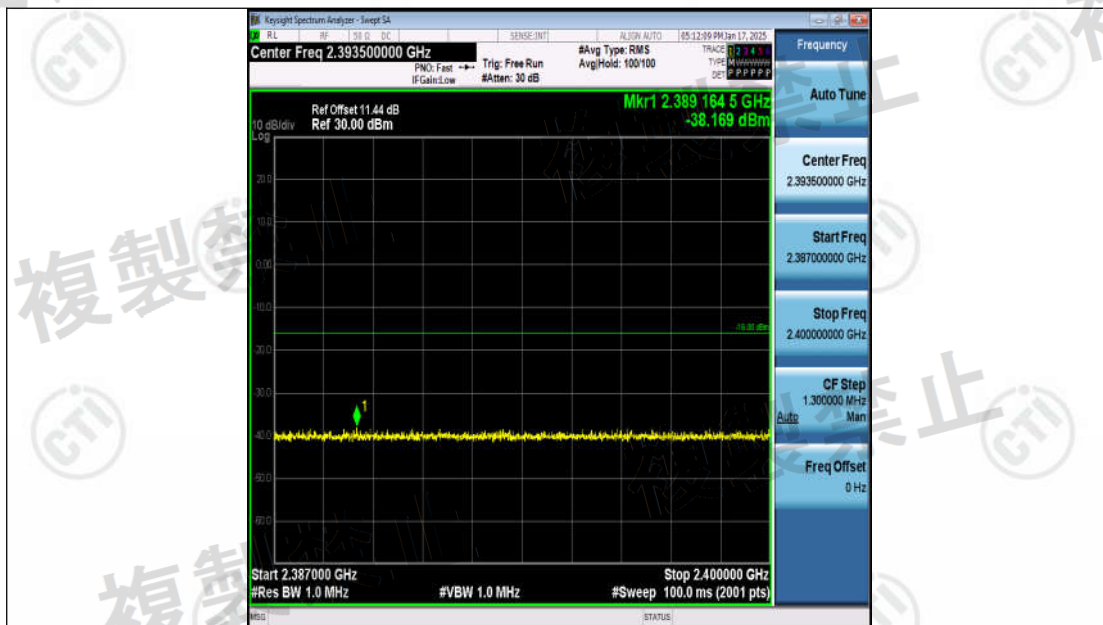
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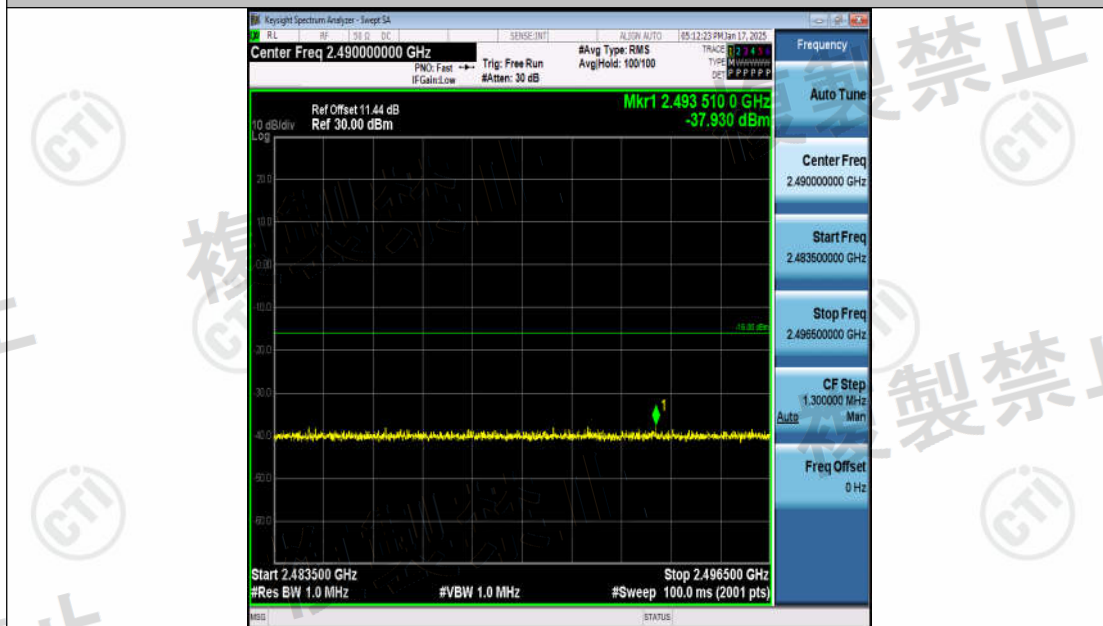
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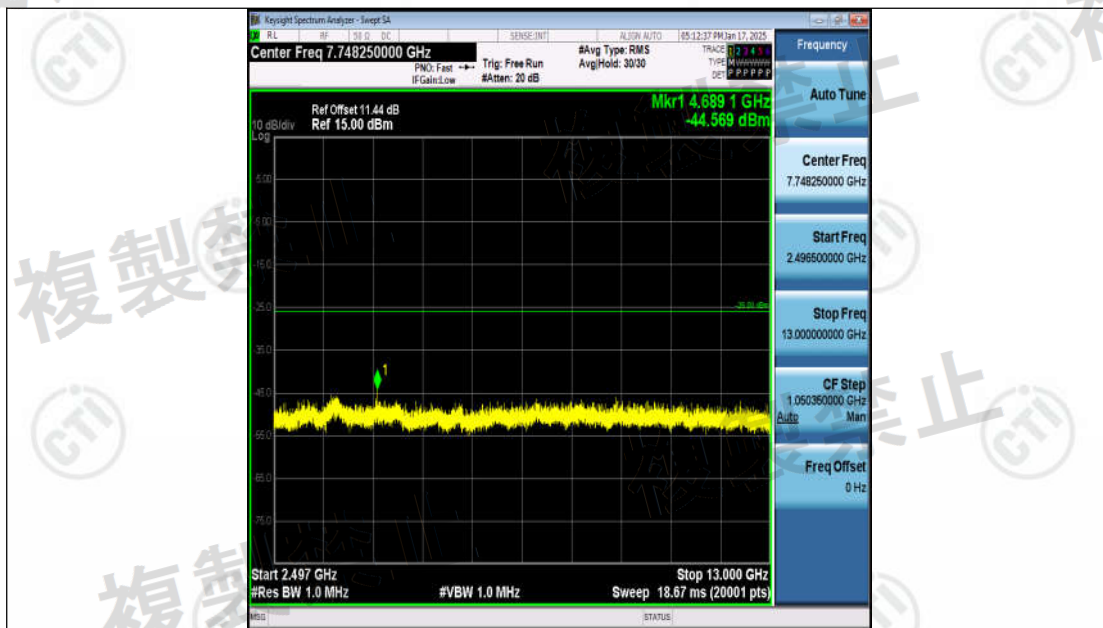
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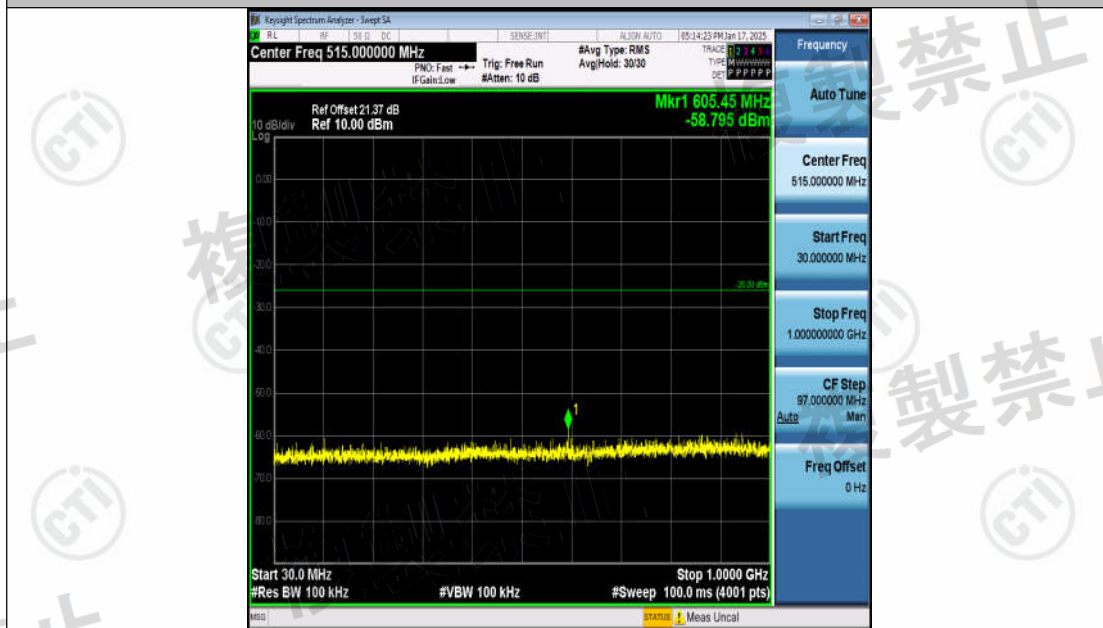
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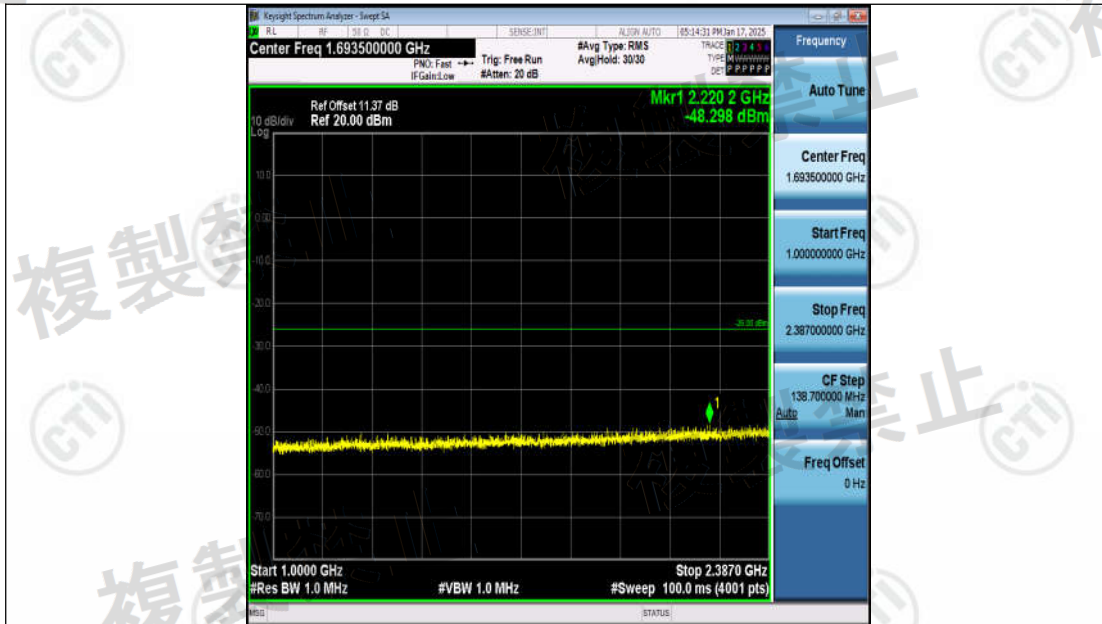
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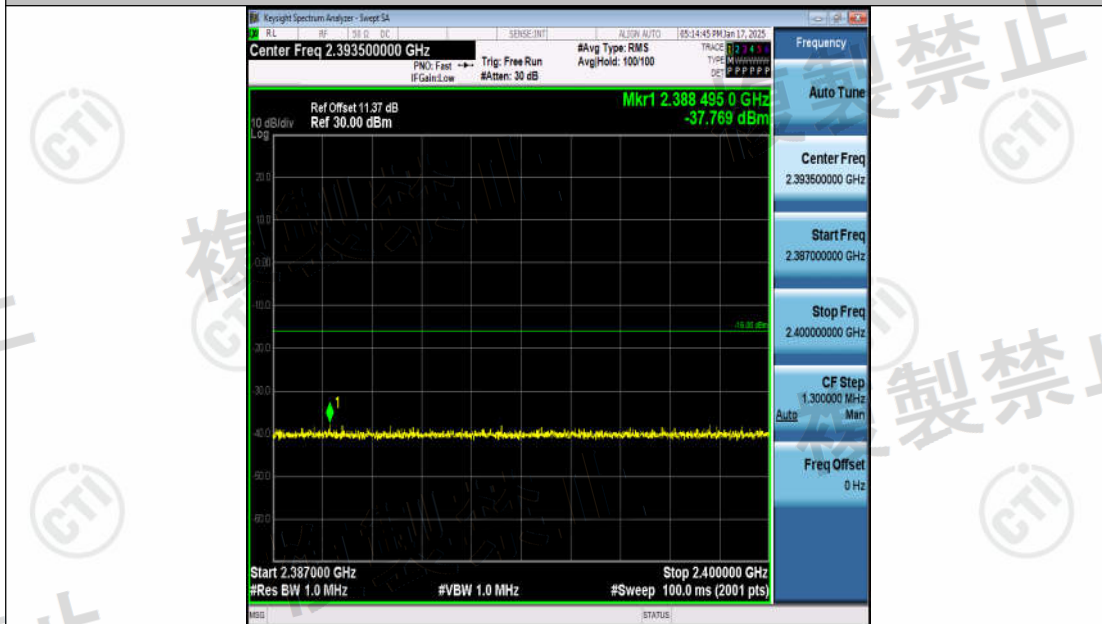
NTNV-2DH5-Ant1-2441-2496.5~13000-PASS



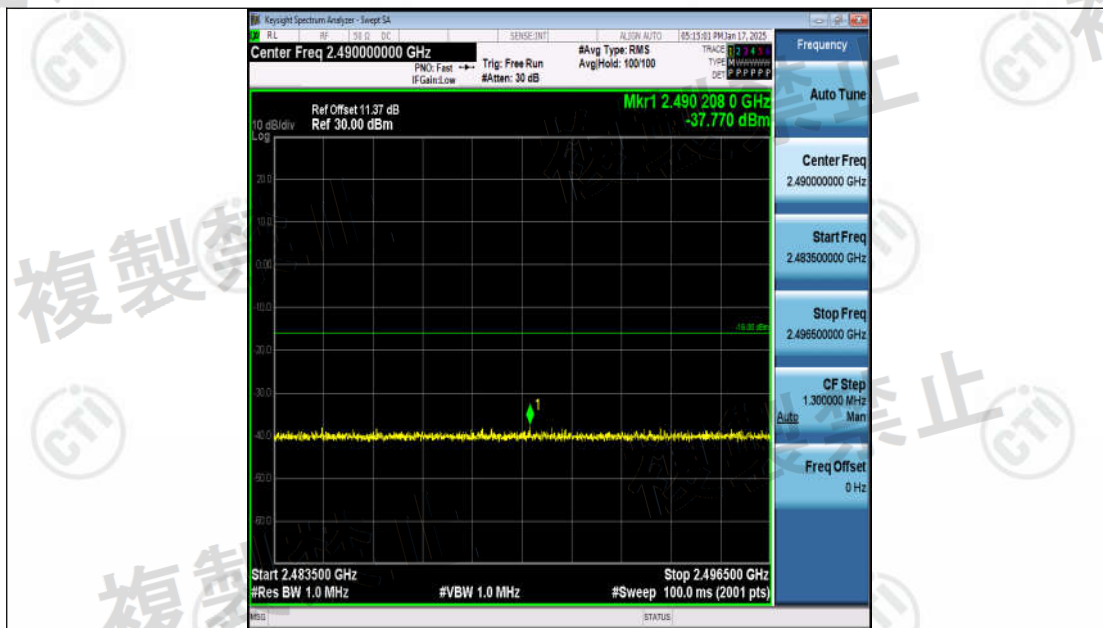
NTNV-2DH5-Ant1-2480-30~1000-PASS



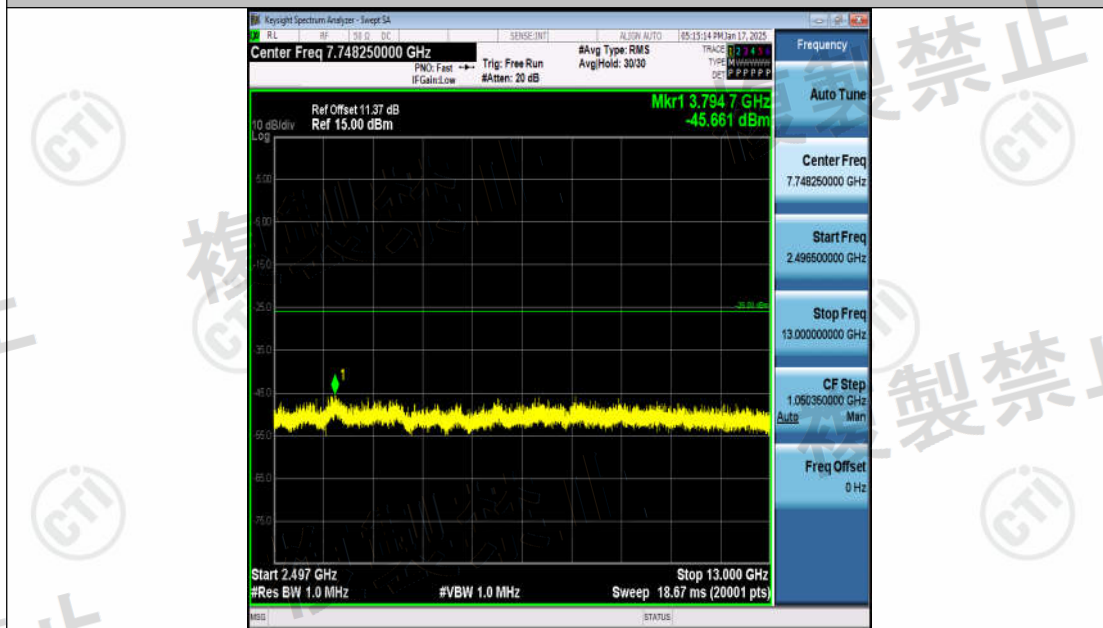
NTNV-2DH5-Ant1-2480-1000~2387-PASS



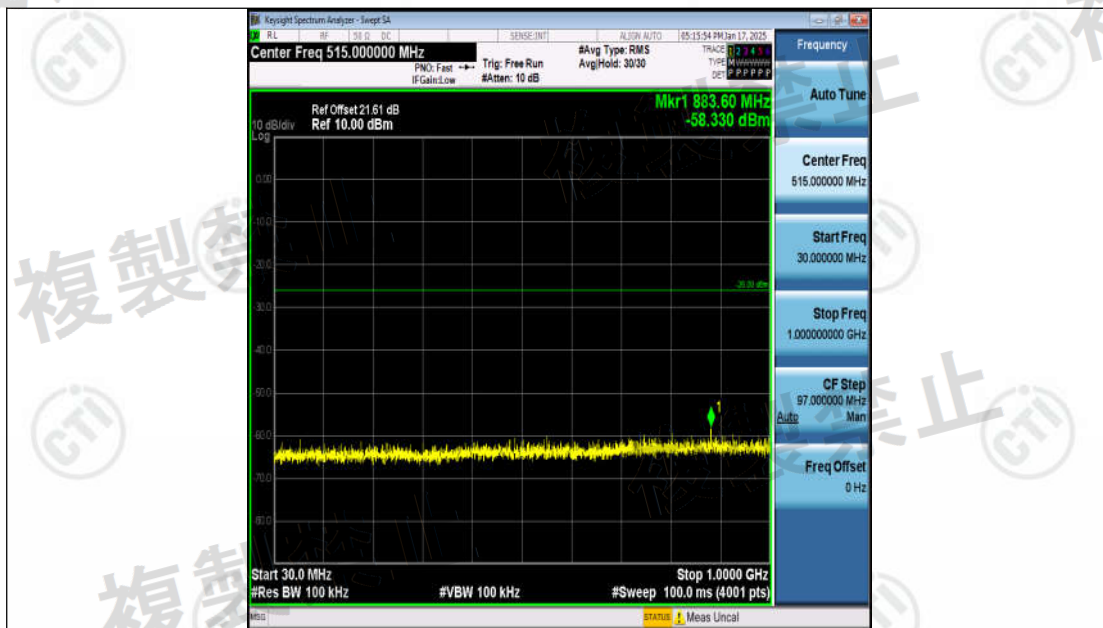
NTNV-2DH5-Ant1-2480-2387~2400-PASS



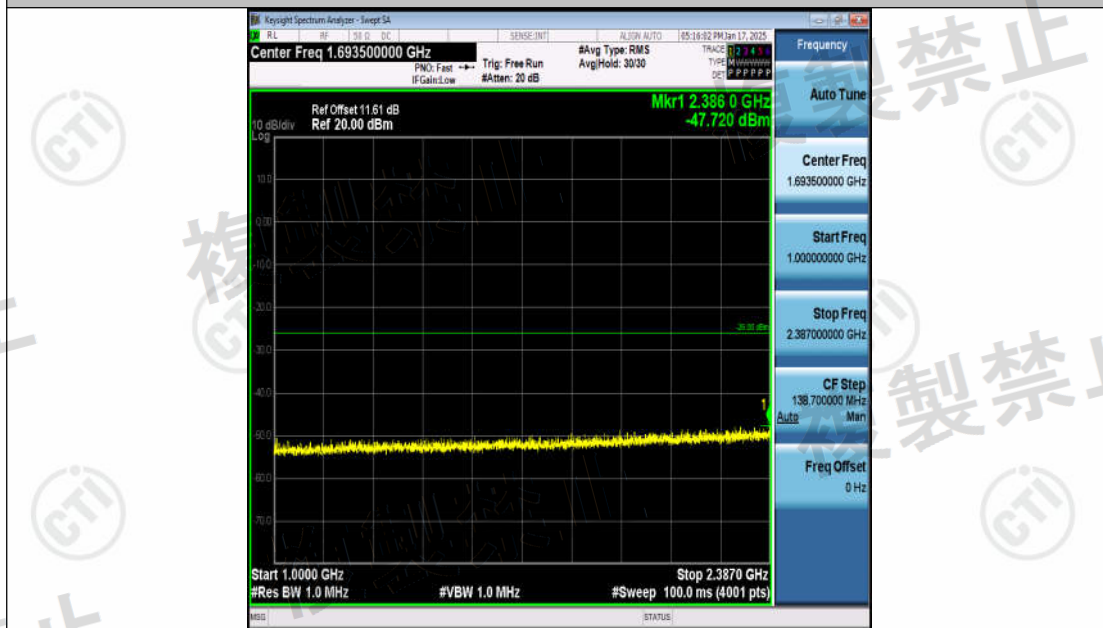
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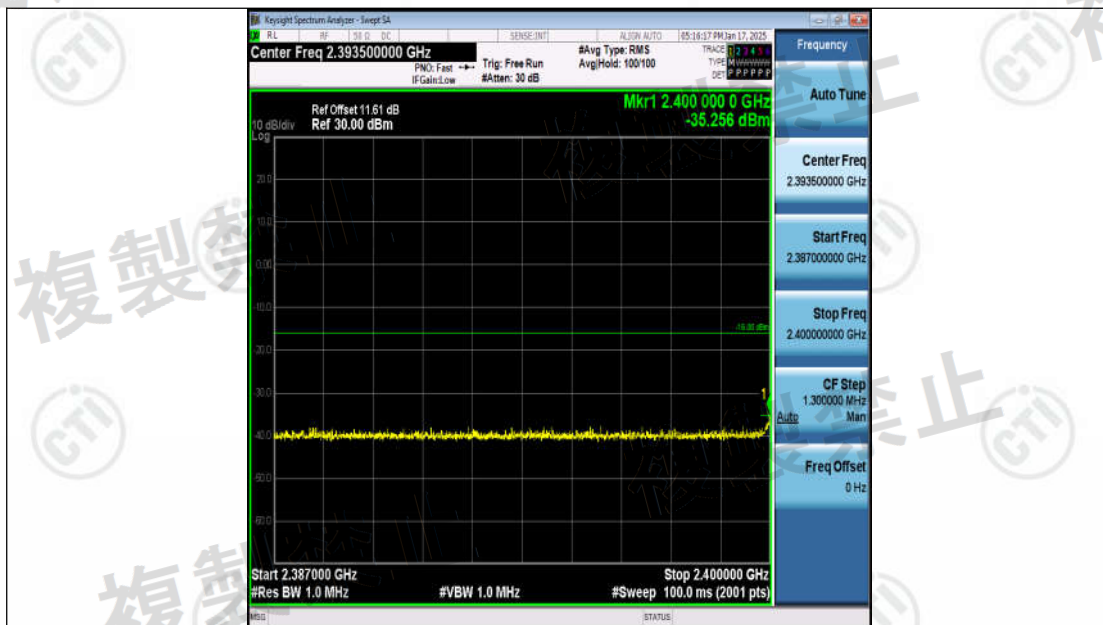
NTNV-2DH5-Ant1-2480-2496.5~13000-PASS



NTNV-3DH5-Ant1-2402-30~1000-PASS



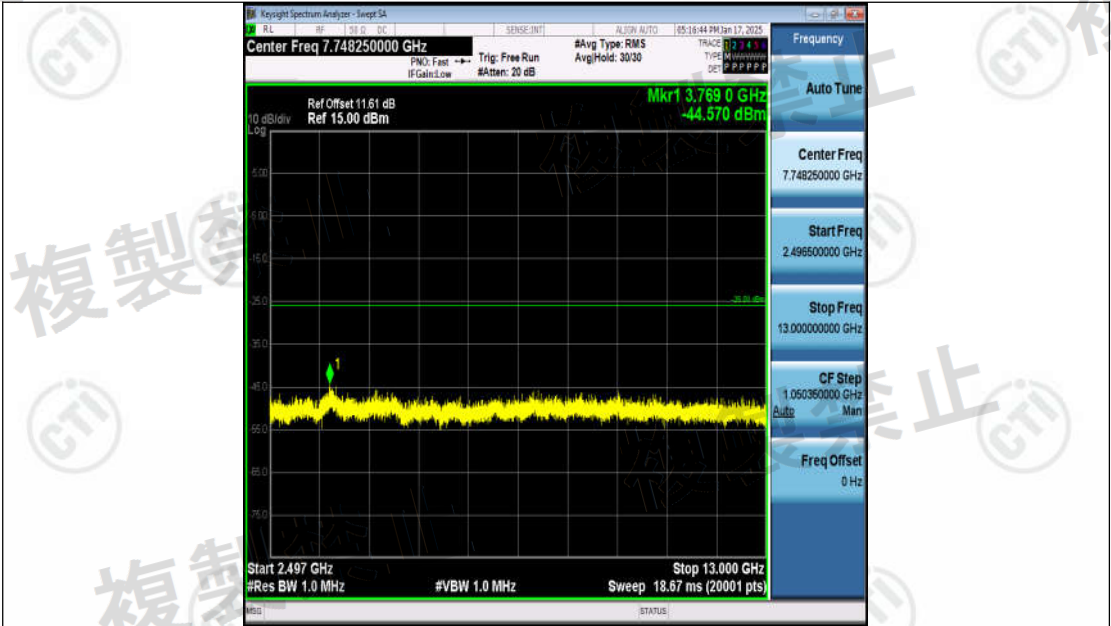
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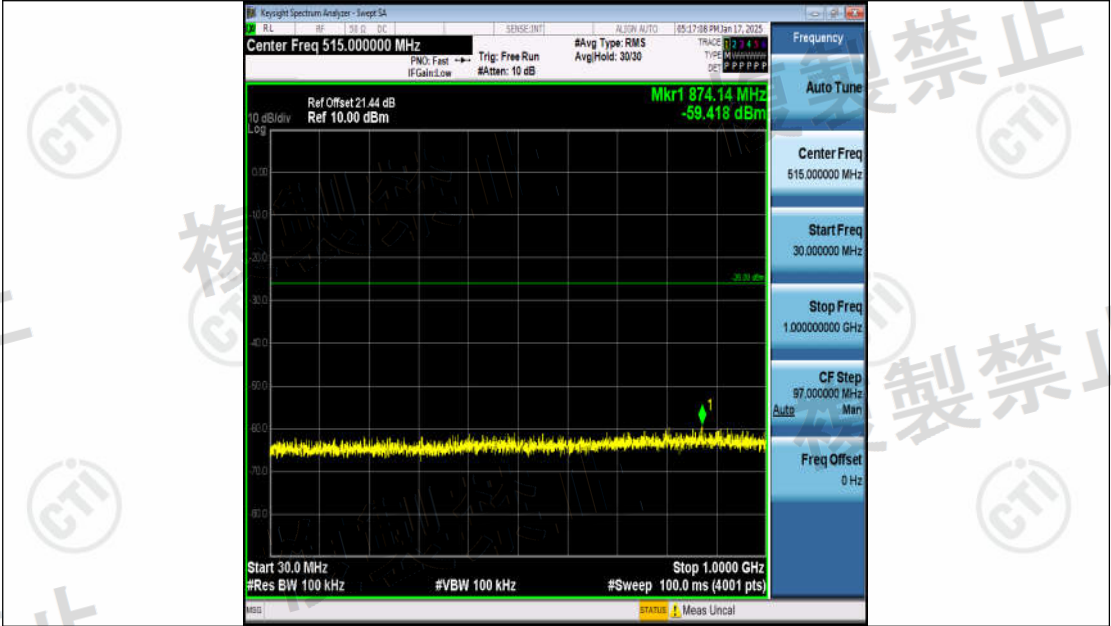
NTNV-3DH5-Ant1-2402-2387~2400-PASS



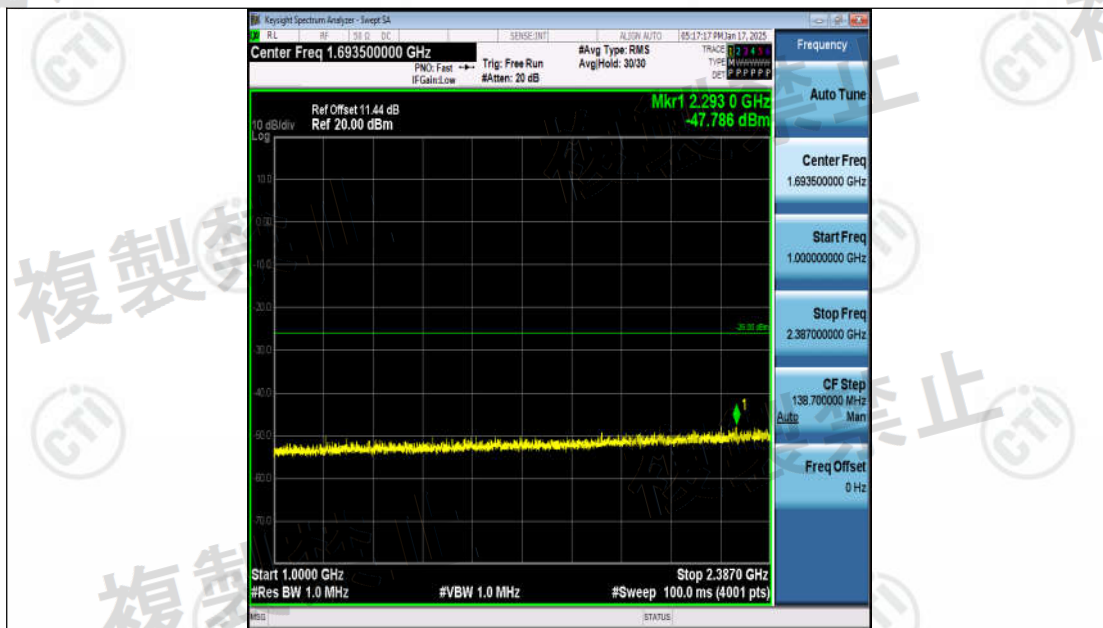
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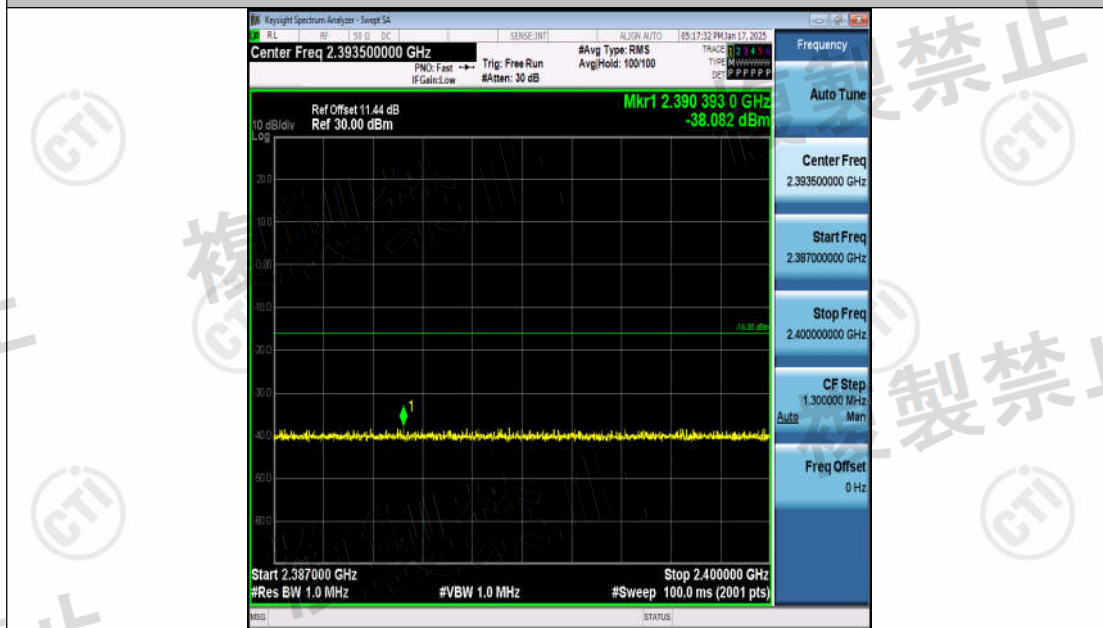
NTNV-3DH5-Ant1-2402-2496.5~13000-PASS



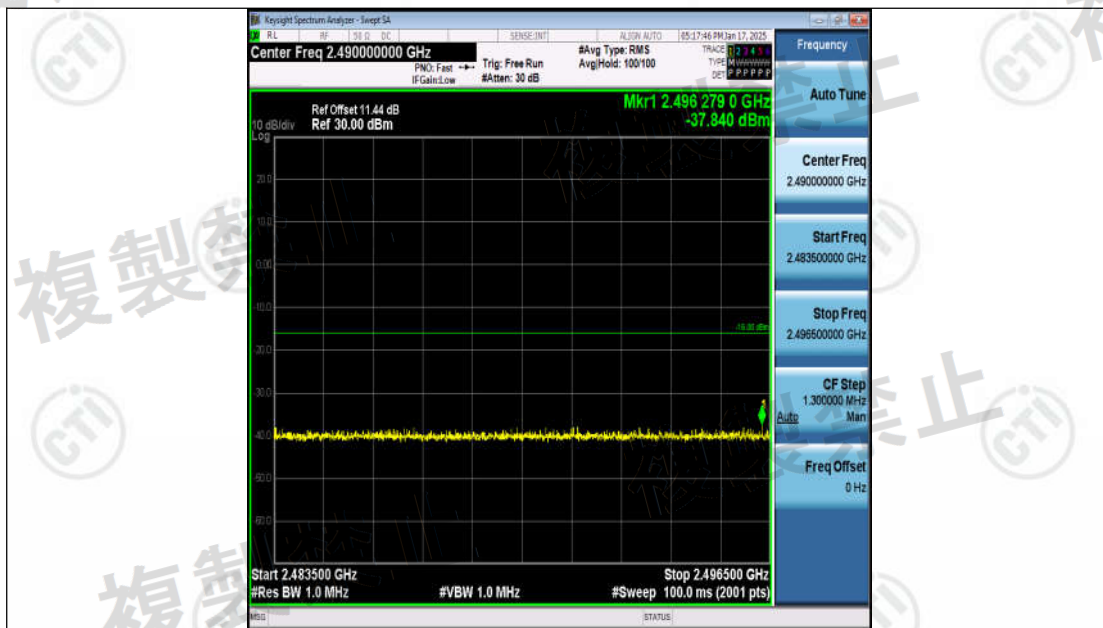
NTNV-3DH5-Ant1-2441-30~1000-PASS



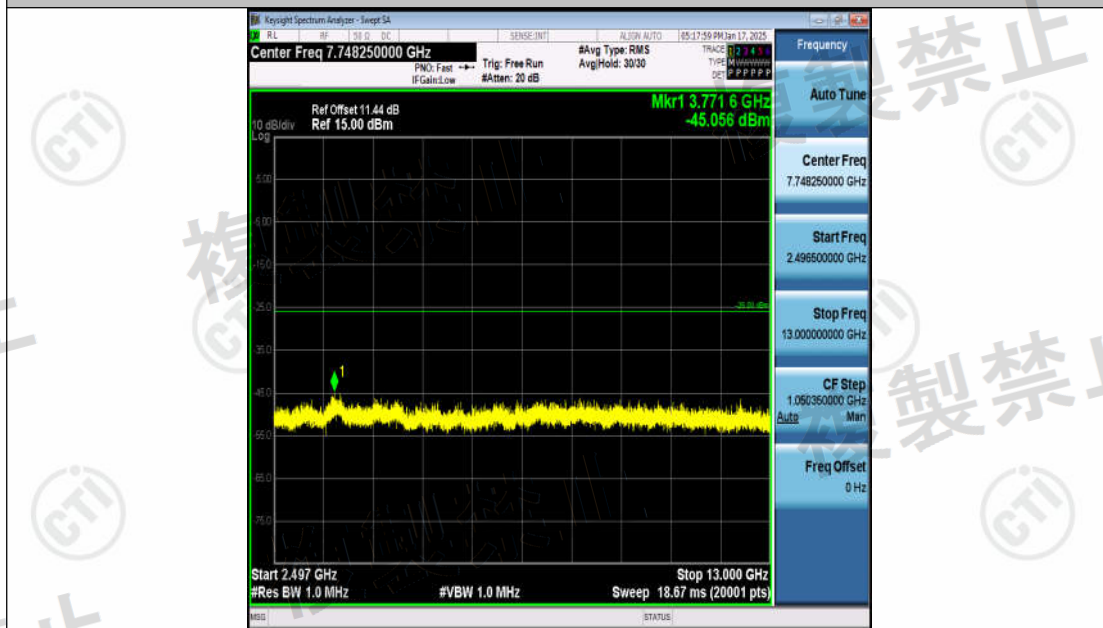
NTNV-3DH5-Ant1-2441-1000~2387-PASS



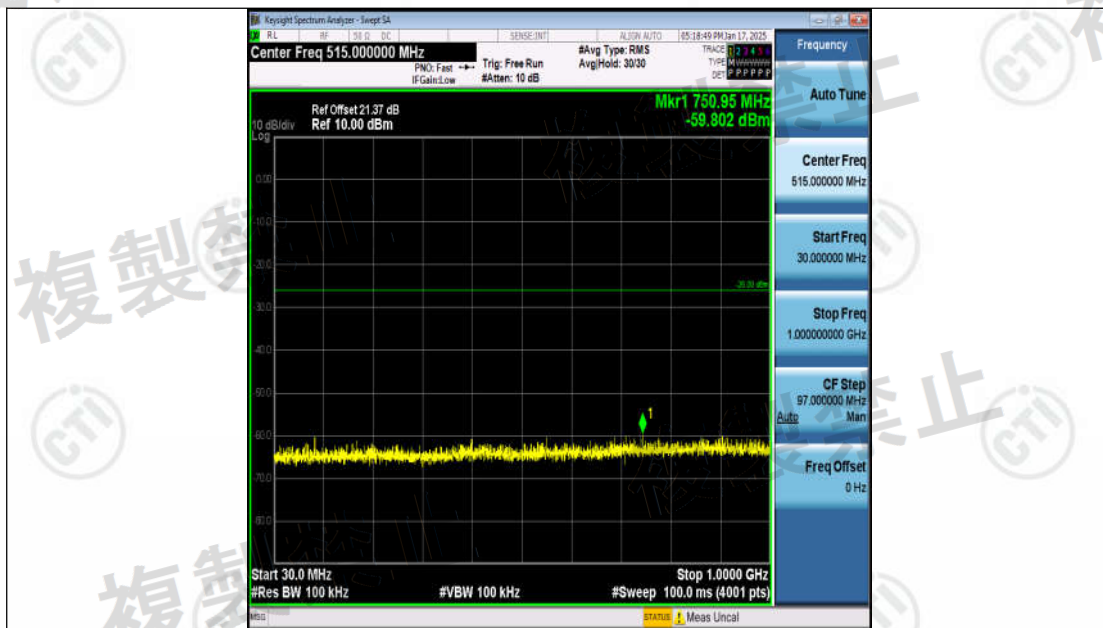
NTNV-3DH5-Ant1-2441-2387~2400-PASS



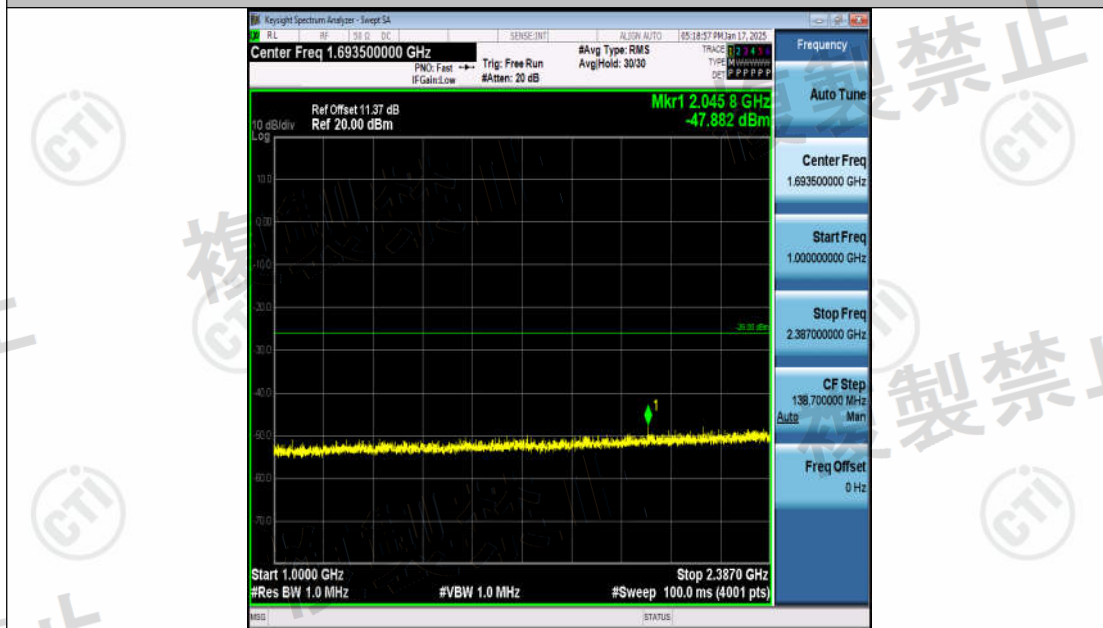
NTNV-3DH5-Ant1-2441-2483.5~2496.5-PASS



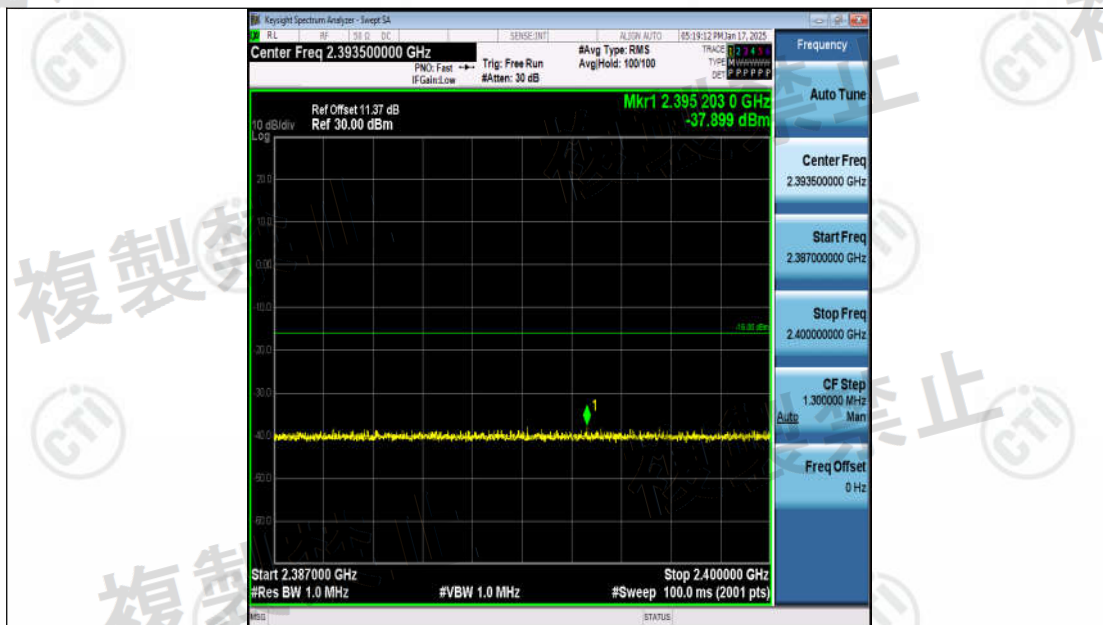
NTNV-3DH5-Ant1-2441-2496.5~13000-PASS



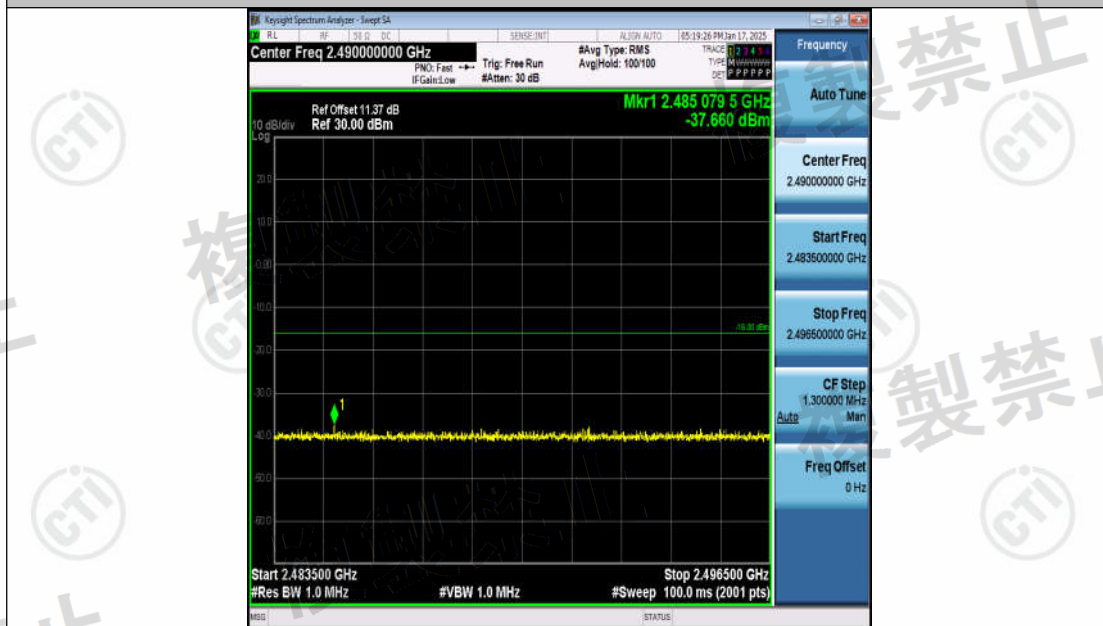
NTNV-3DH5-Ant1-2480-30~1000-PASS



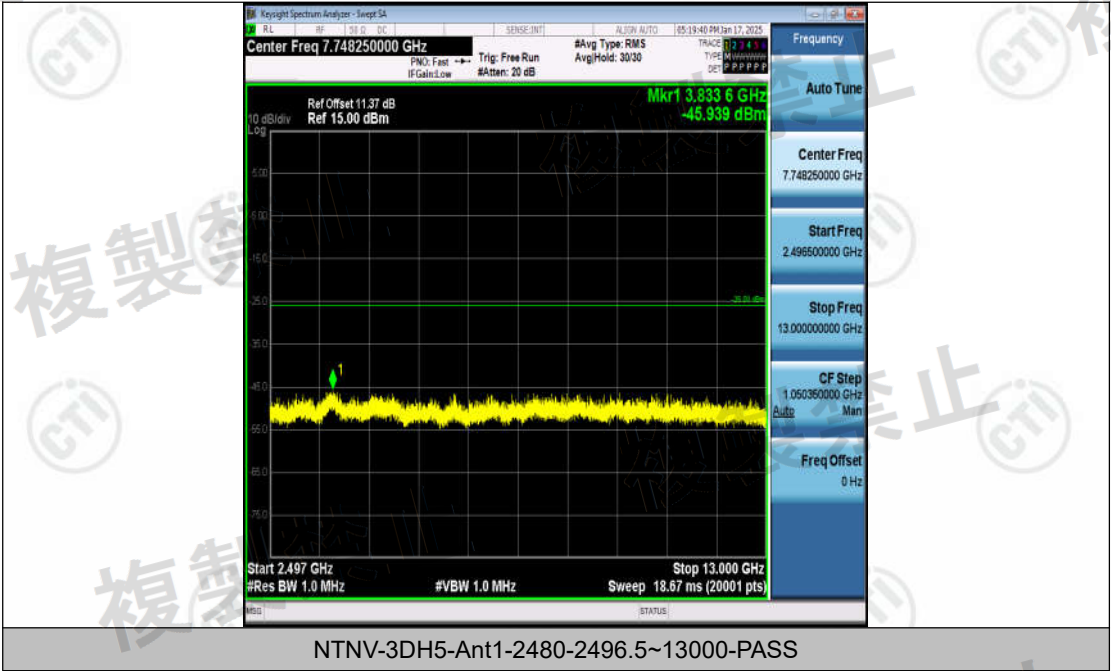
NTNV-3DH5-Ant1-2480-1000~2387-PASS



NTNV-3DH5-Ant1-2480-2387~2400-PASS



NTNV-3DH5-Ant1-2480-2483.5~2496.5-PASS

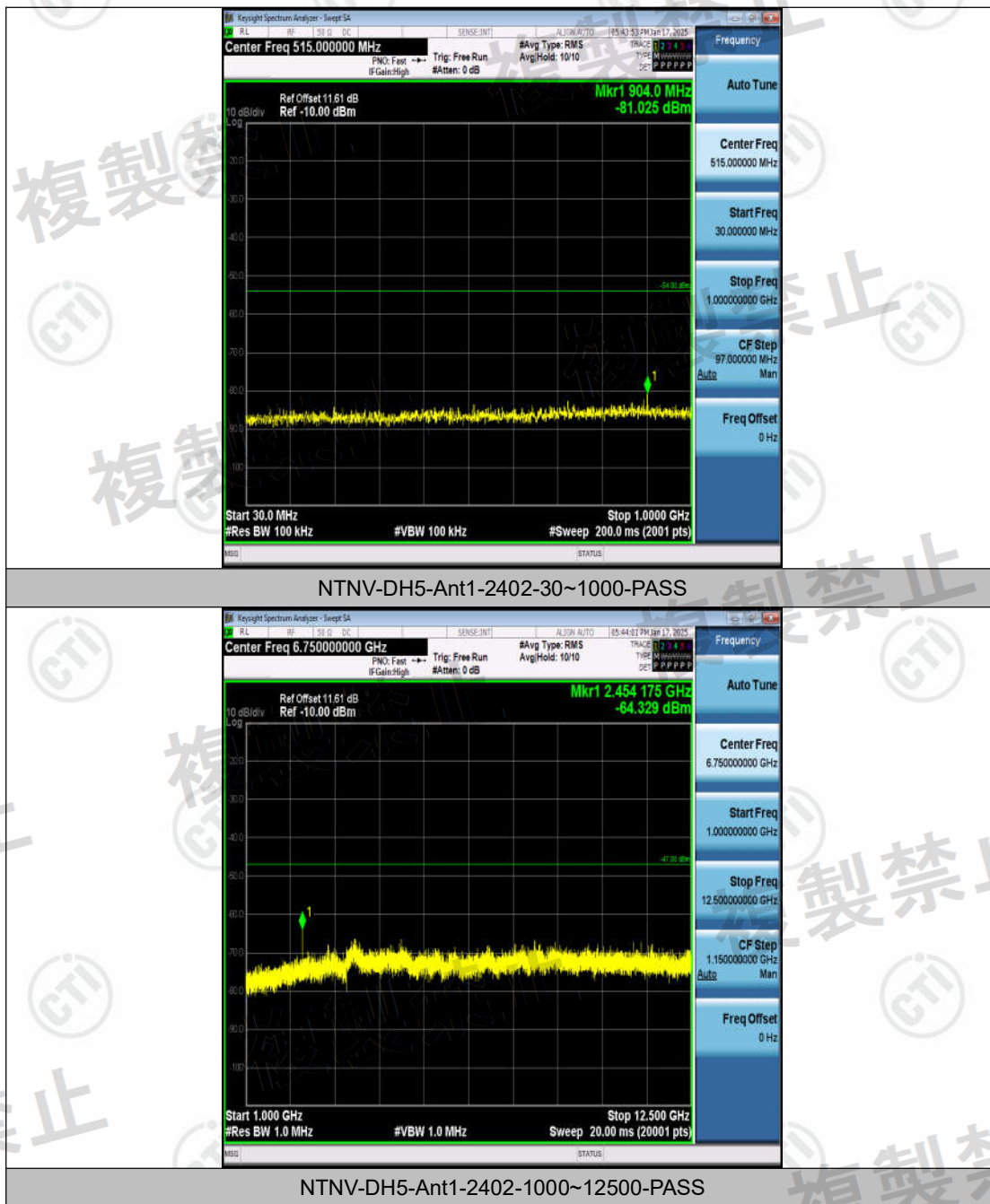


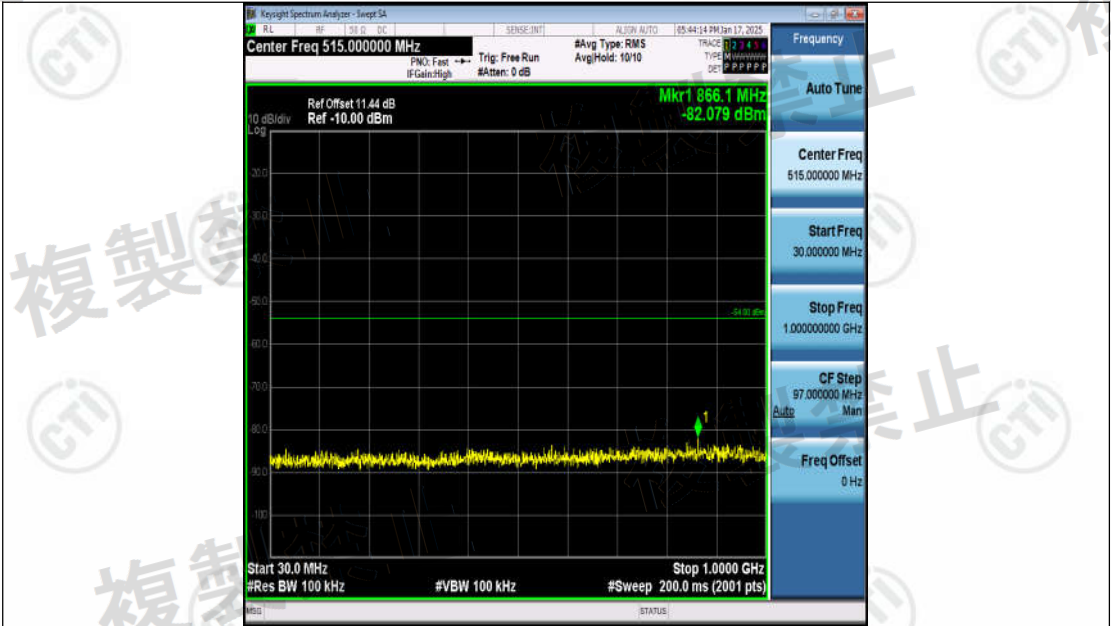
Appendix F: Spurious Emission of RX

Test Result

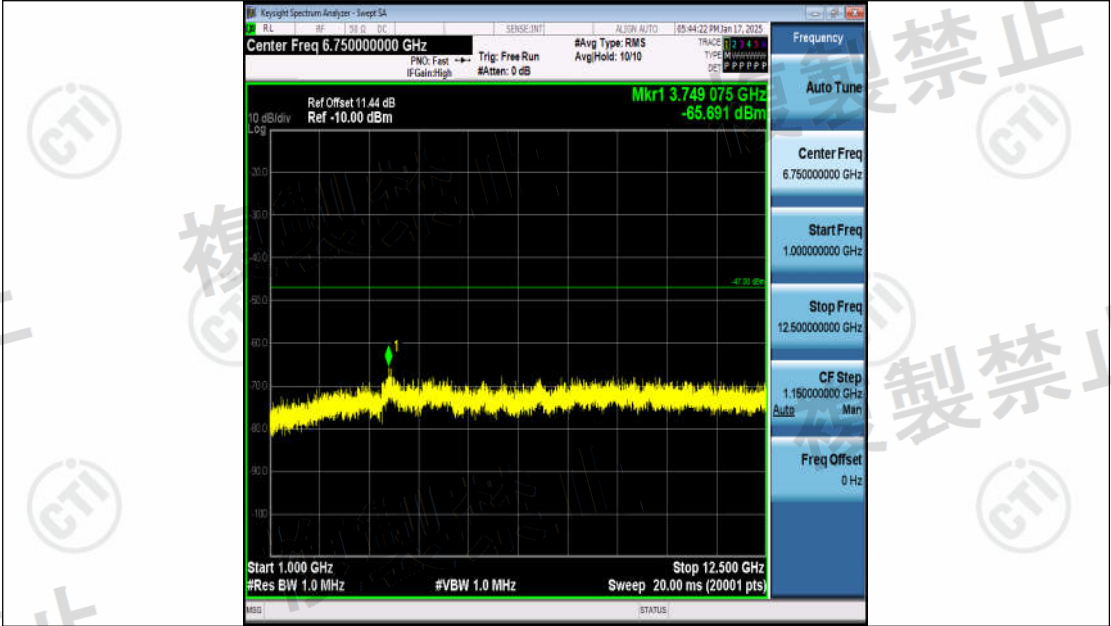
Test Condition	Test Mode	Antenna	Frequency [MHz]	Freq. Range [MHz]	Freq [MHz]	Result [dBm]	Result [μ W]	Limit [μ W]	Verdict
NTNV	DH5	Ant1	2402	30~1000	903.97	-81.03	0.00789	≤ 4	PASS
NTNV	DH5	Ant1	2402	1000~12500	2454.18	-64.33	0.36898	≤ 20	PASS
NTNV	DH5	Ant1	2441	30~1000	866.14	-82.08	0.00619	≤ 4	PASS
NTNV	DH5	Ant1	2441	1000~12500	3749.08	-65.69	0.26977	≤ 20	PASS
NTNV	DH5	Ant1	2480	30~1000	953.44	-82.30	0.00589	≤ 4	PASS
NTNV	DH5	Ant1	2480	1000~12500	8090.90	-66.50	0.22387	≤ 20	PASS
NTNV	2DH5	Ant1	2402	30~1000	665.84	-83.00	0.00501	≤ 4	PASS
NTNV	2DH5	Ant1	2402	1000~12500	3792.78	-67.21	0.19011	≤ 20	PASS
NTNV	2DH5	Ant1	2441	30~1000	917.07	-83.16	0.00483	≤ 4	PASS
NTNV	2DH5	Ant1	2441	1000~12500	8930.40	-66.62	0.21777	≤ 20	PASS
NTNV	2DH5	Ant1	2480	30~1000	733.25	-82.62	0.00547	≤ 4	PASS
NTNV	2DH5	Ant1	2480	1000~12500	2454.18	-60.59	0.87297	≤ 20	PASS
NTNV	3DH5	Ant1	2402	30~1000	917.07	-82.77	0.00528	≤ 4	PASS
NTNV	3DH5	Ant1	2402	1000~12500	3841.65	-66.76	0.21086	≤ 20	PASS
NTNV	3DH5	Ant1	2441	30~1000	775.93	-82.75	0.00531	≤ 4	PASS
NTNV	3DH5	Ant1	2441	1000~12500	3854.88	-66.27	0.23605	≤ 20	PASS
NTNV	3DH5	Ant1	2480	30~1000	945.68	-82.71	0.00536	≤ 4	PASS
NTNV	3DH5	Ant1	2480	1000~12500	3876.15	-66.61	0.21827	≤ 20	PASS

Test Graphs

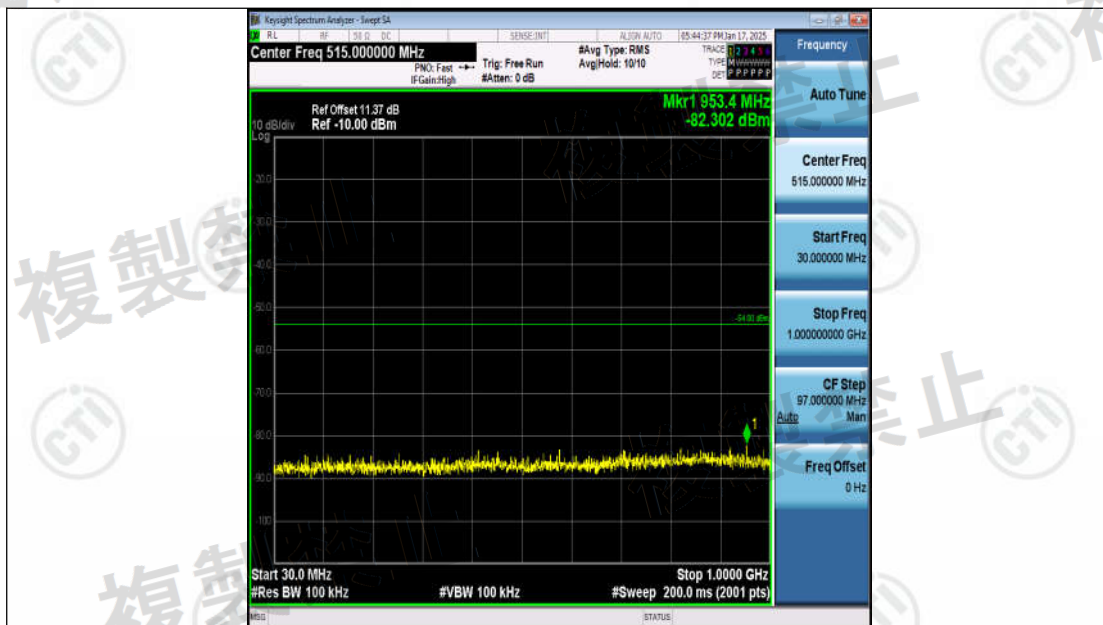




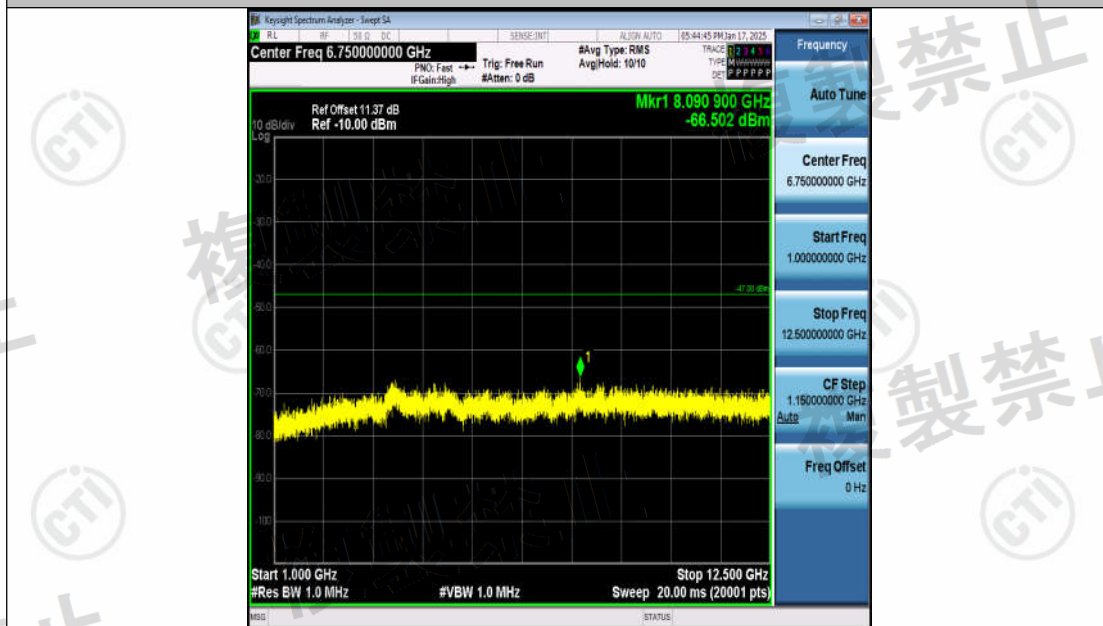
NTNV-DH5-Ant1-2441-30~1000-PASS



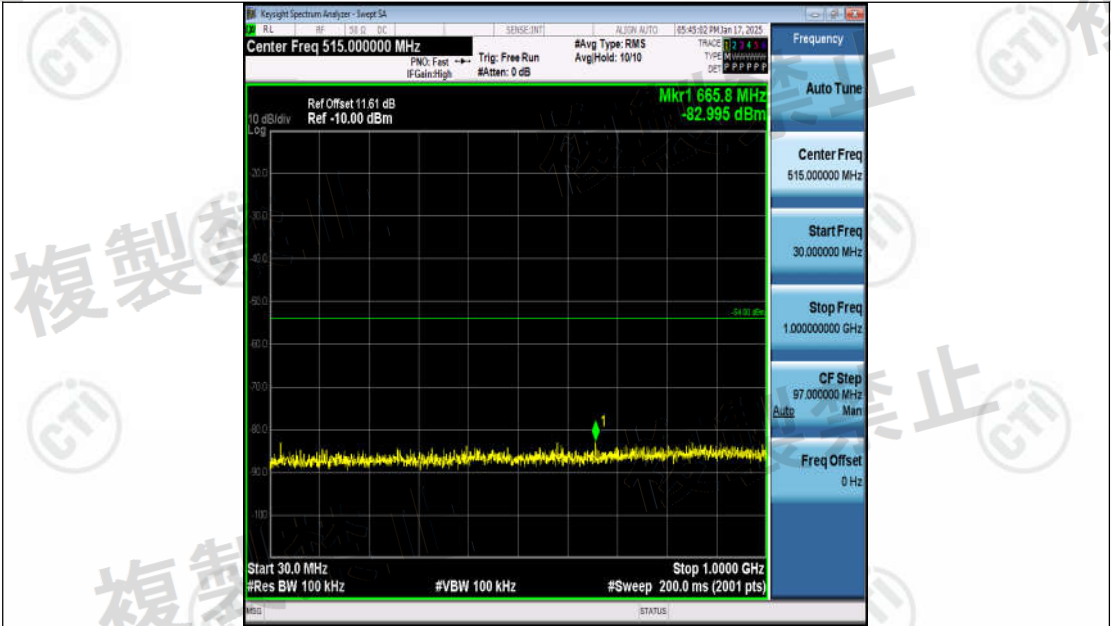
NTNV-DH5-Ant1-2441-1000~12500-PASS



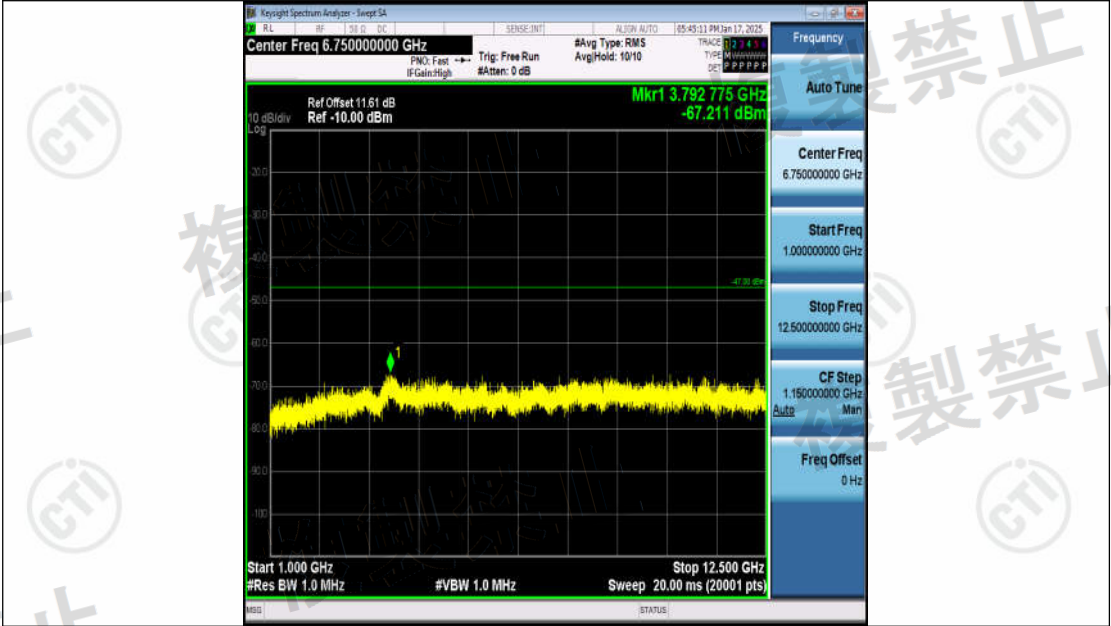
NTNV-DH5-Ant1-2480-30~1000-PASS



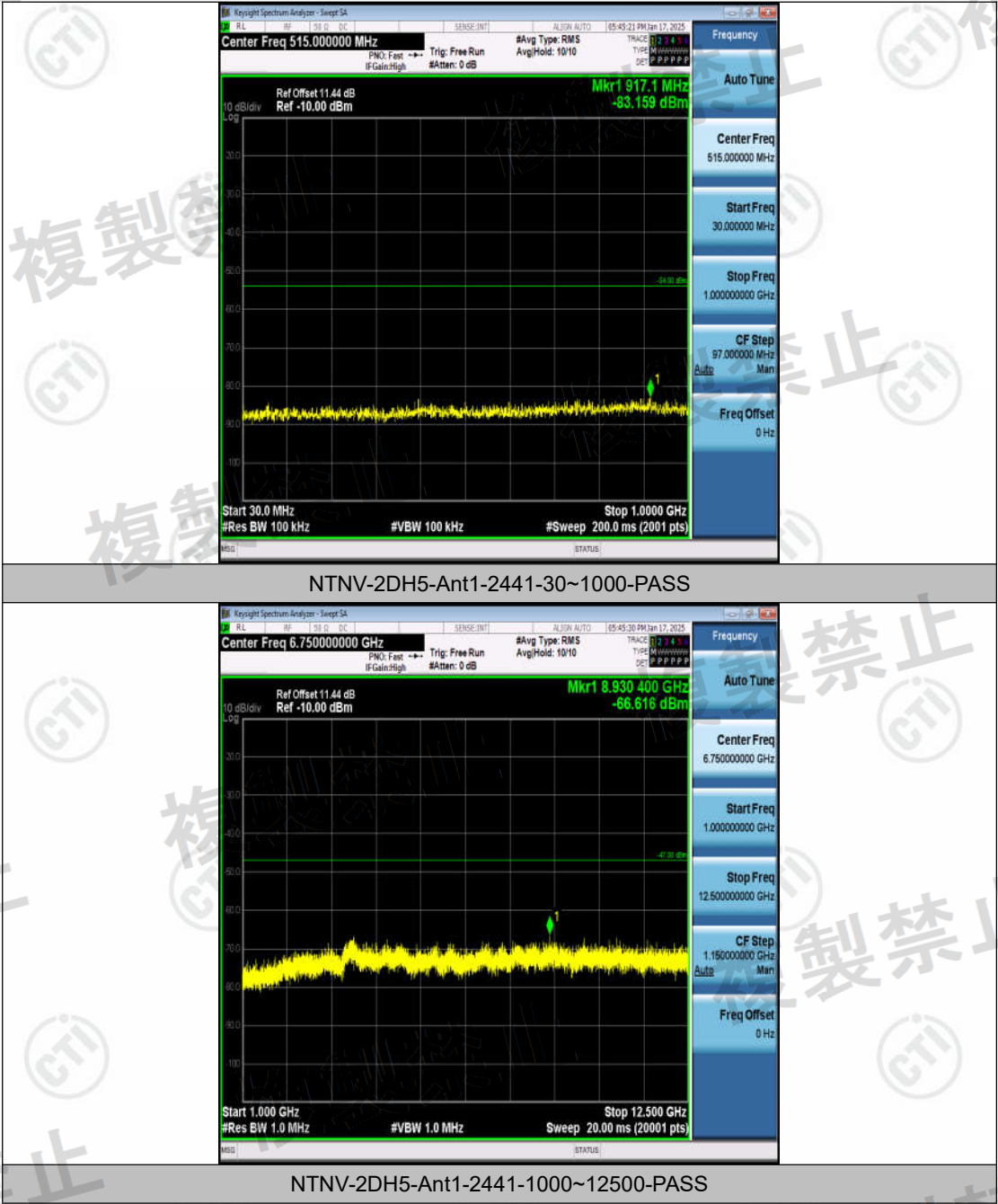
NTNV-DH5-Ant1-2480-1000~12500-PASS

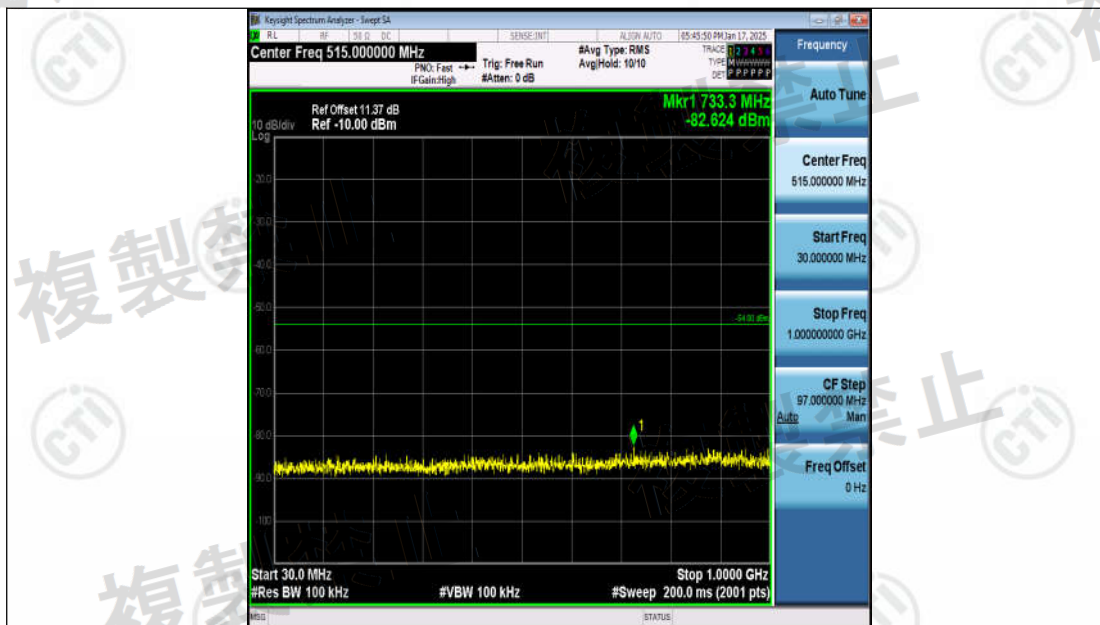


NTNV-2DH5-Ant1-2402-30~1000-PASS

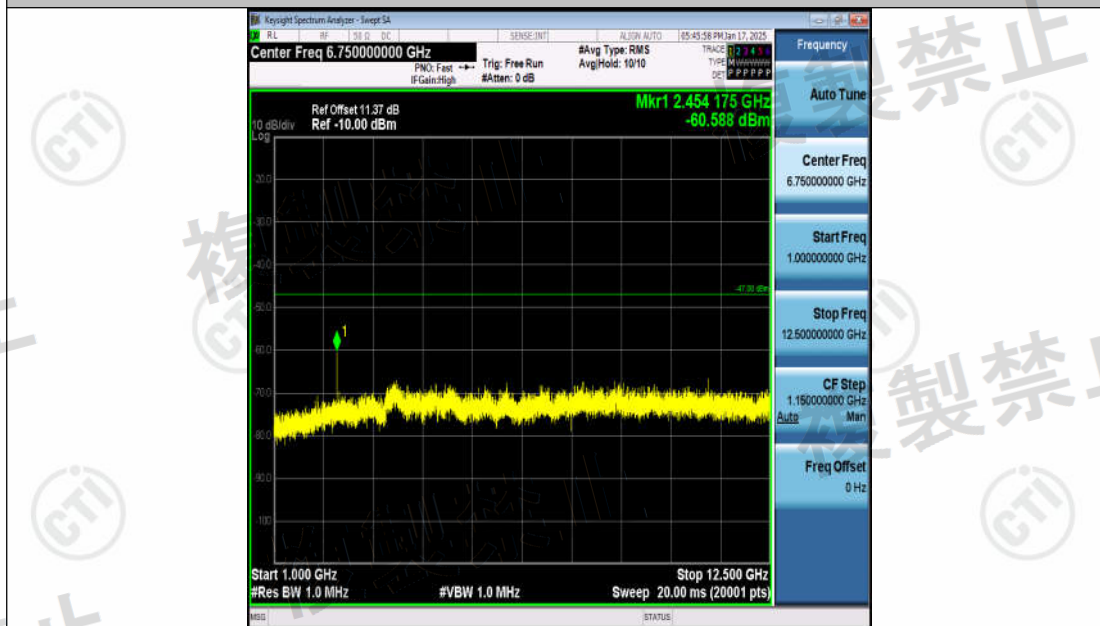


NTNV-2DH5-Ant1-2402-1000~12500-PASS

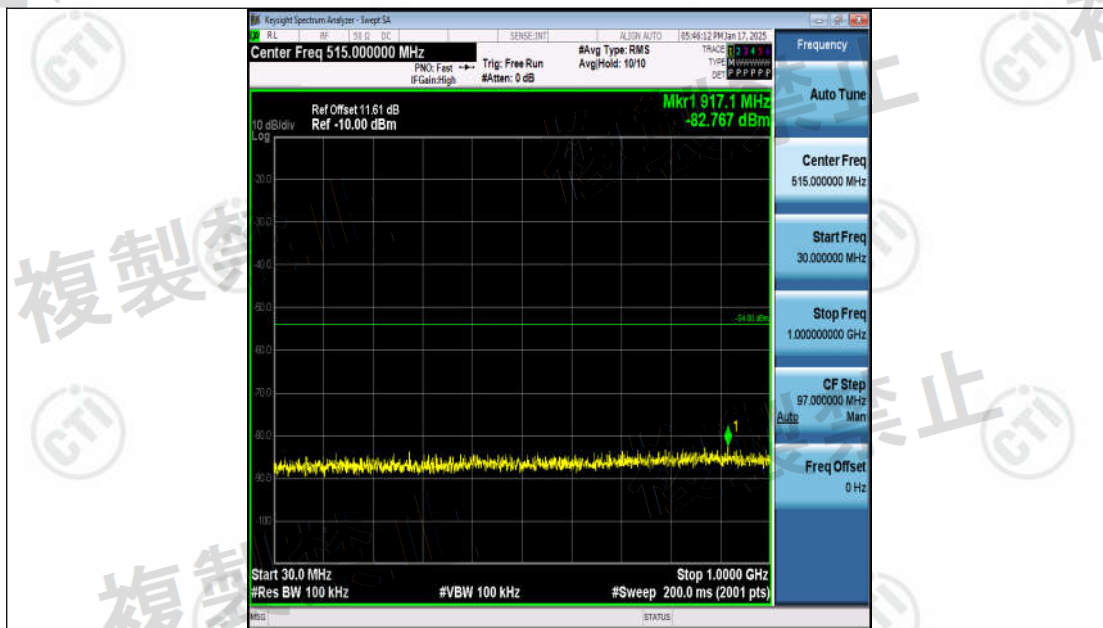




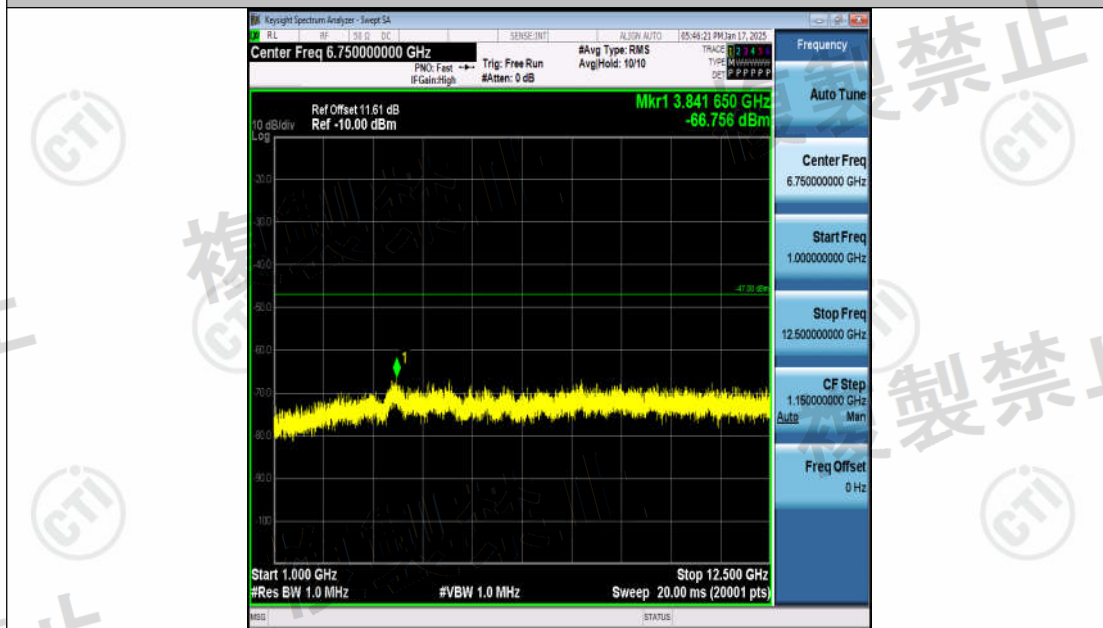
NTNV-2DH5-Ant1-2480-30~1000-PASS



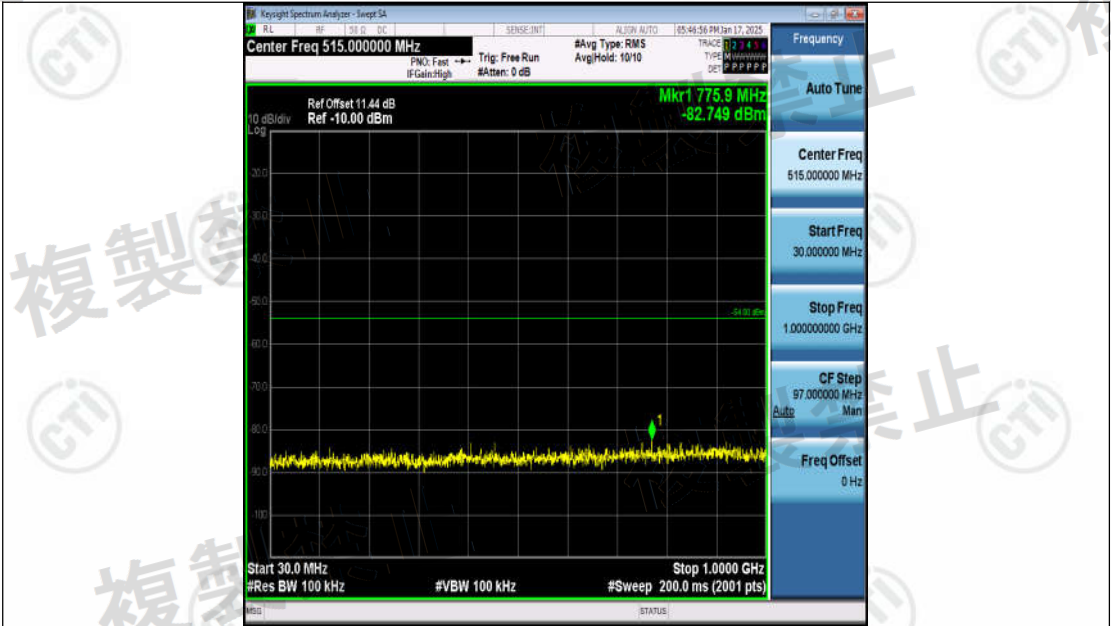
NTNV-2DH5-Ant1-2480-1000~12500-PASS



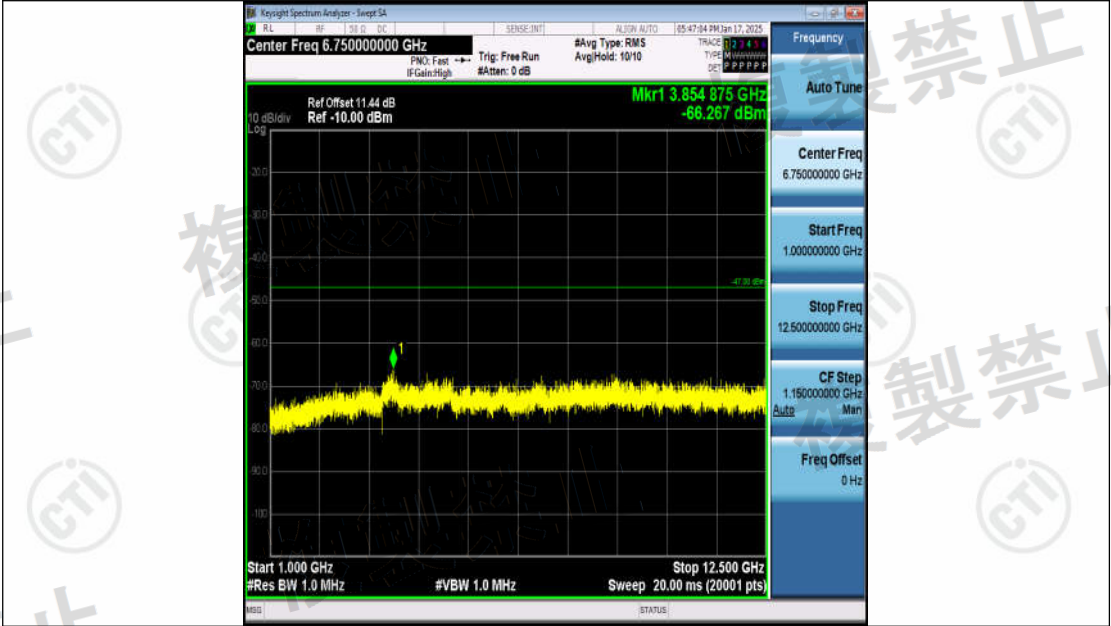
NTNV-3DH5-Ant1-2402-30~1000-PASS



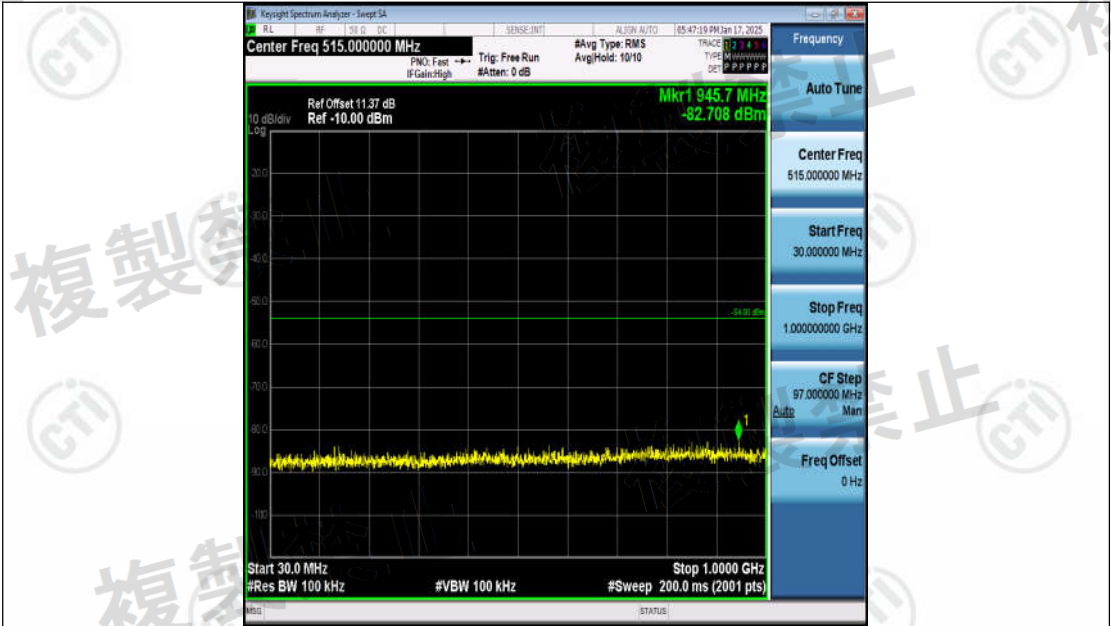
NTNV-3DH5-Ant1-2402-1000~12500-PASS



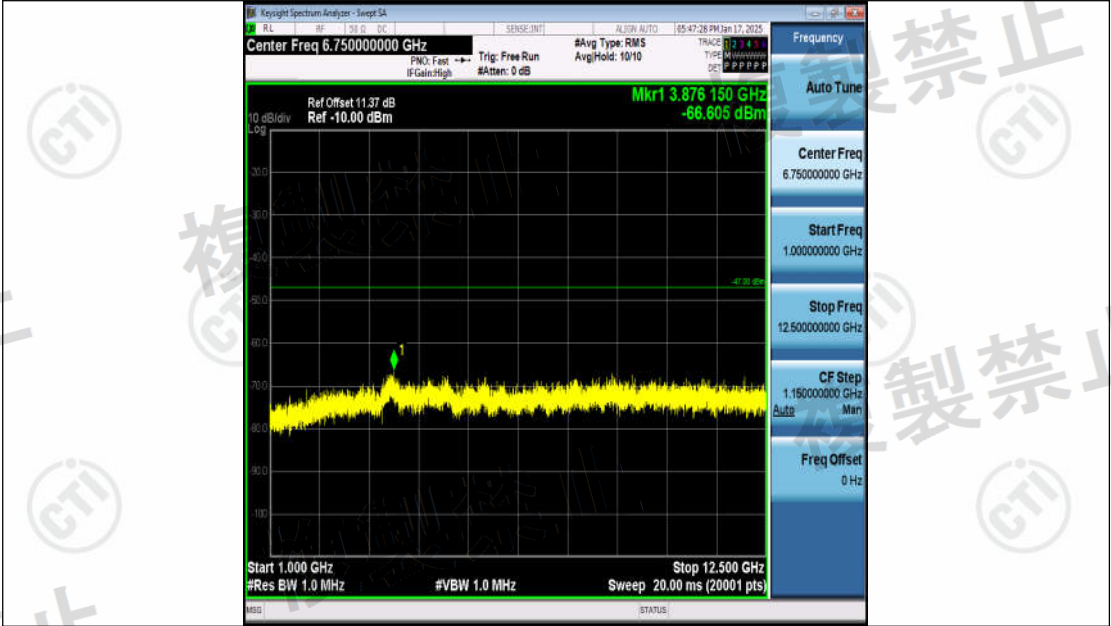
NTNV-3DH5-Ant1-2441-30~1000-PASS



NTNV-3DH5-Ant1-2441-1000~12500-PASS



NTNV-3DH5-Ant1-2480-30~1000-PASS



NTNV-3DH5-Ant1-2480-1000~12500-PASS

Appendix G: Dwell Time

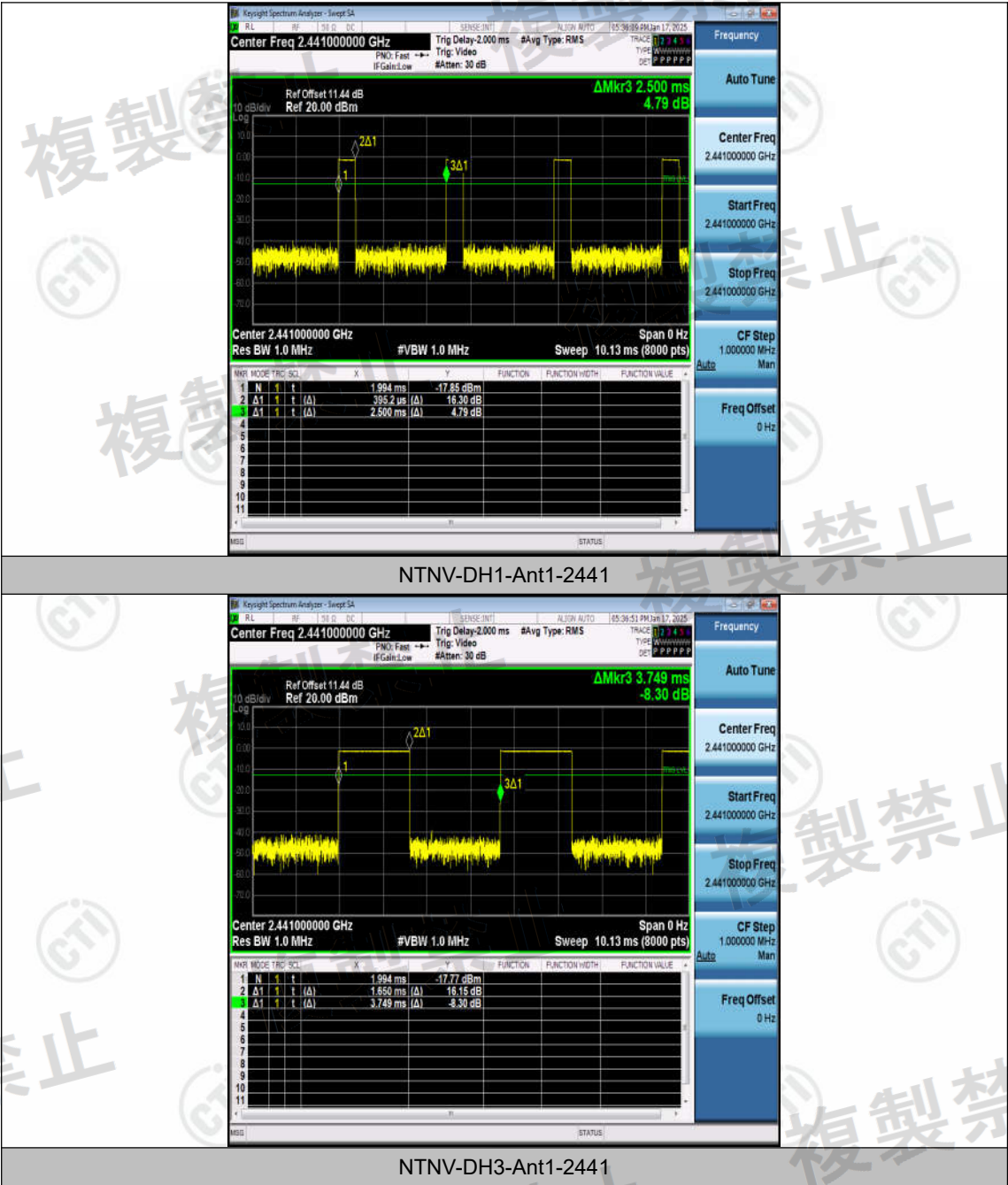
Test Result

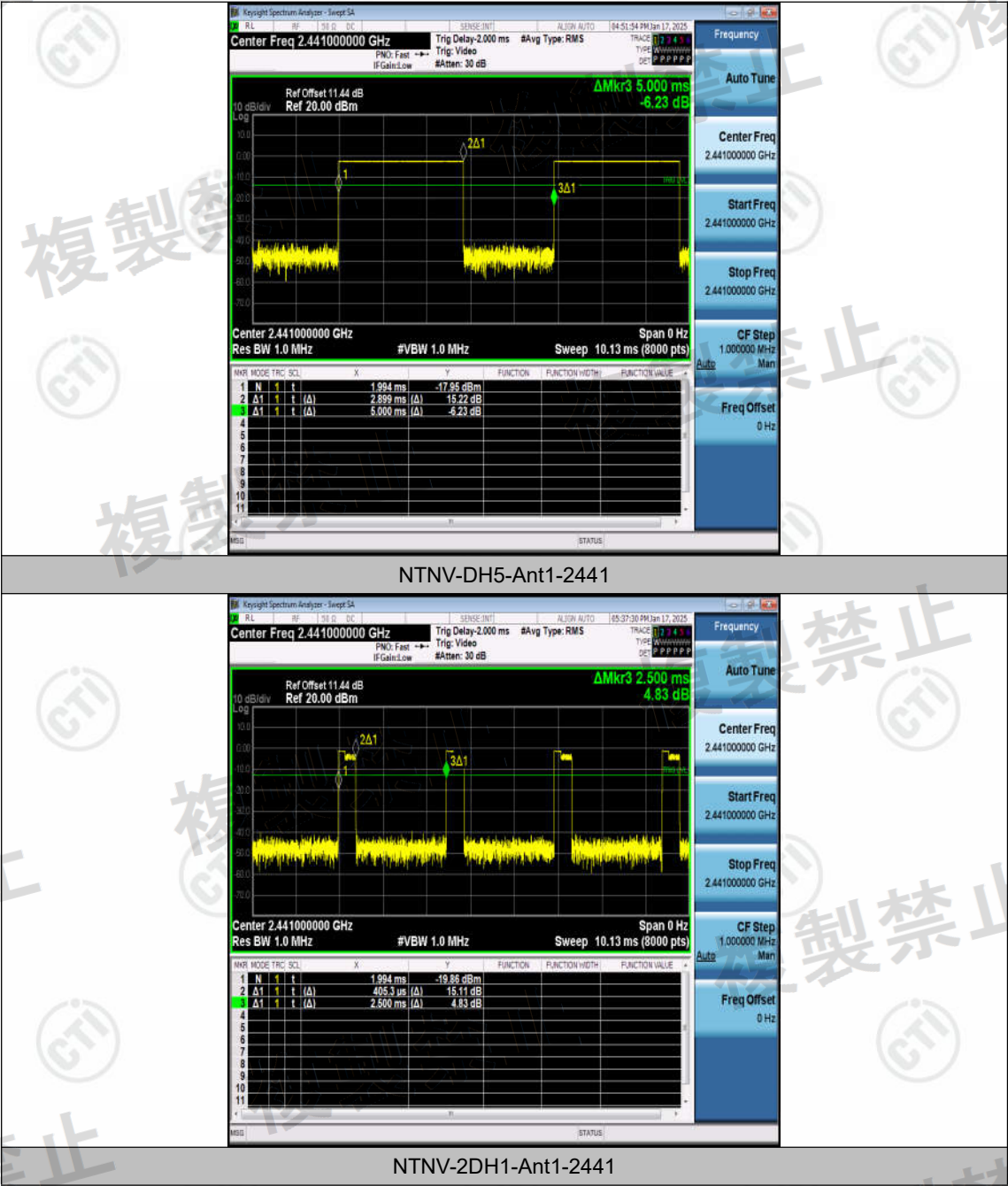
Condition	Mode	Frequency (MHz)	Antenna	T_on(ms)	Period(ms)	Spreading Rate	Hop Number	Dwell Time (ms)	Limit (ms)	Verdict
NTNV	DH1	Ant1	2441	0.4	2.5	69.886	79	56.62	400	Pass
NTNV	DH3	Ant1	2441	1.65	3.75	70.115	79	156.21	400	Pass
NTNV	DH5	Ant1	2441	2.9	5	70.169	79	206.07	400	Pass
NTNV	2DH1	Ant1	2441	0.41	2.5	70.888	79	58.86	400	Pass
NTNV	2DH3	Ant1	2441	1.66	3.75	70.112	79	157.15	400	Pass
NTNV	2DH5	Ant1	2441	2.9	5	70.346	79	206.59	400	Pass
NTNV	3DH1	Ant1	2441	0.41	2.5	70.859	79	58.84	400	Pass
NTNV	3DH3	Ant1	2441	1.65	3.75	70.137	79	156.25	400	Pass
NTNV	3DH5	Ant1	2441	2.91	5	68.858	79	202.91	400	Pass

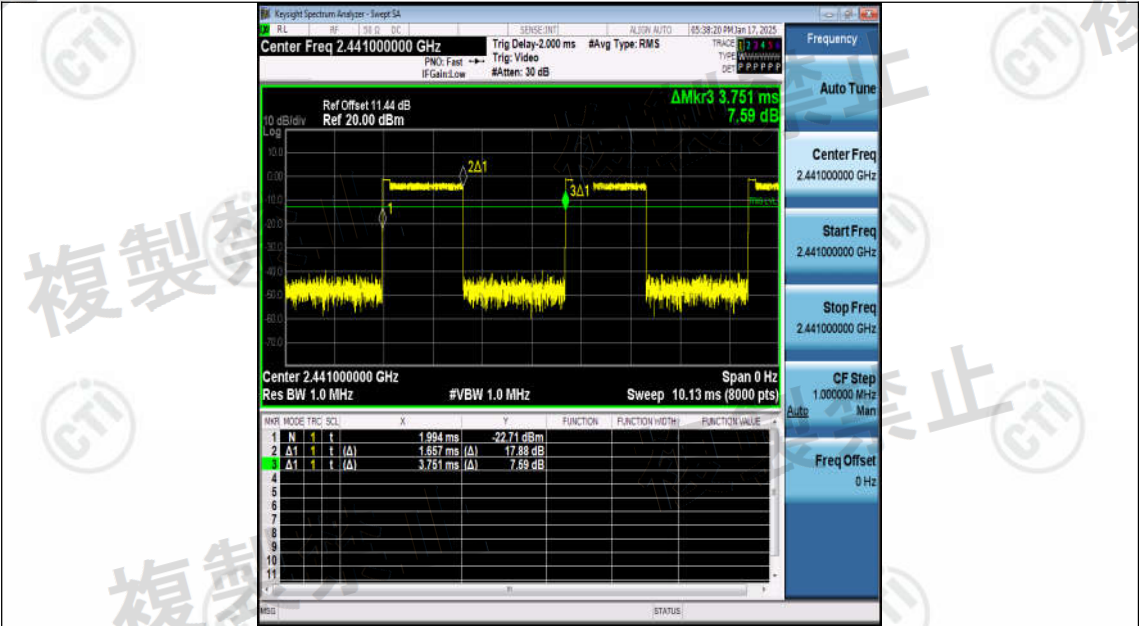
Dwell time=(0.4(s)*[Spreading rate]*[Transmission time of 1 burst(s)])/([Burst cycle(s)]*[No. of hopping channel]);

Note: Spreading rate=[Spread bandwidth(actual measurement value)]/[Transmission rate];

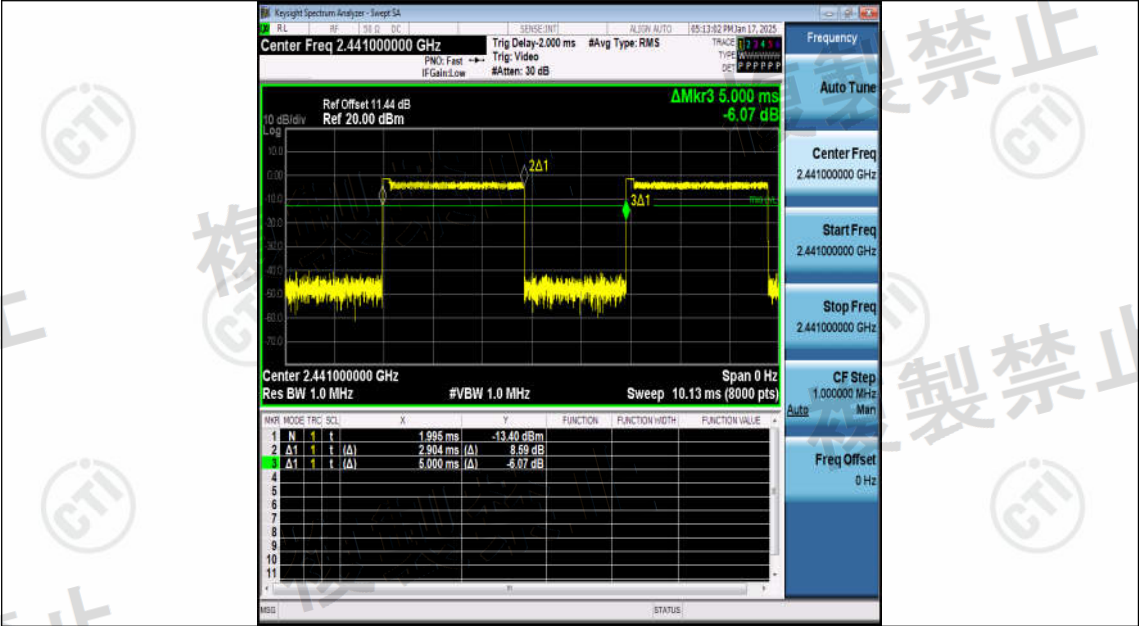
Test Graphs



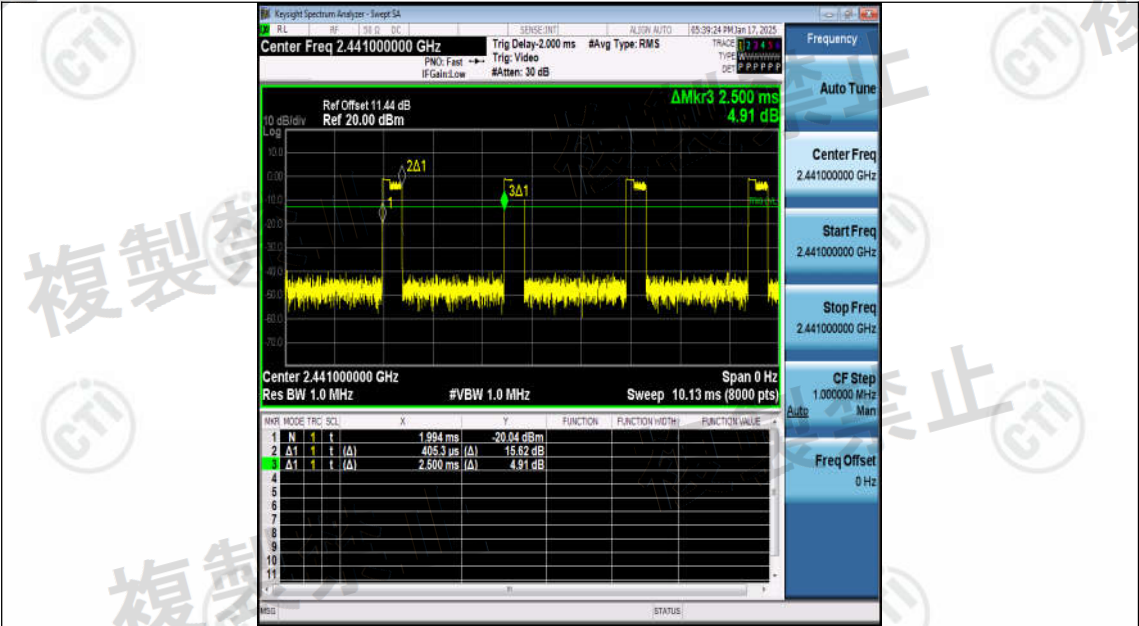




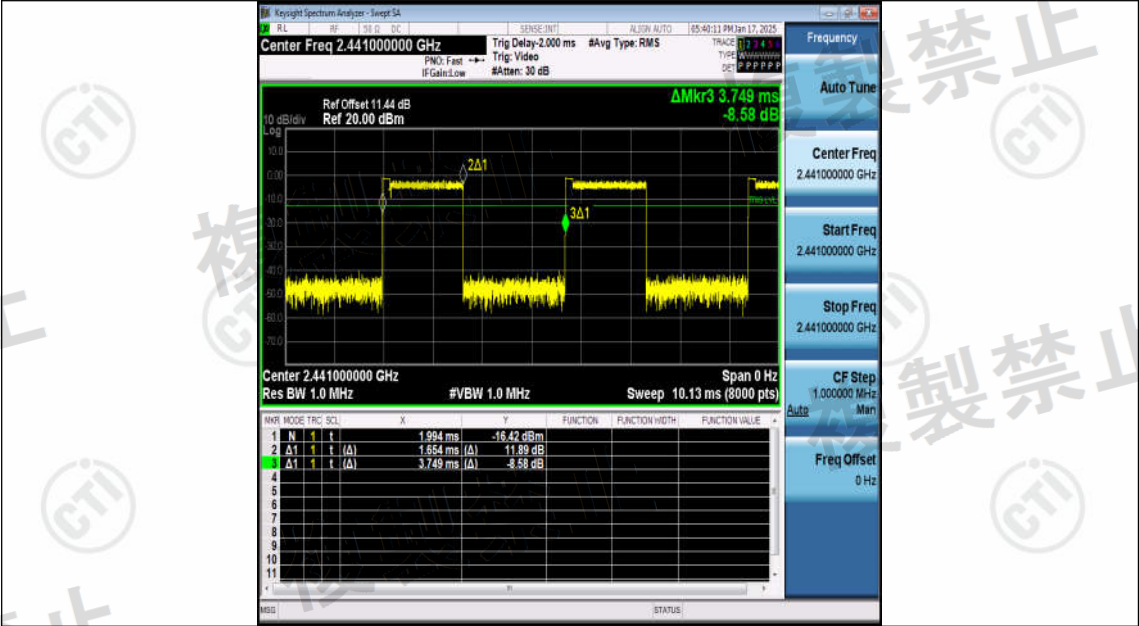
NTVN-2DH3-Ant1-2441



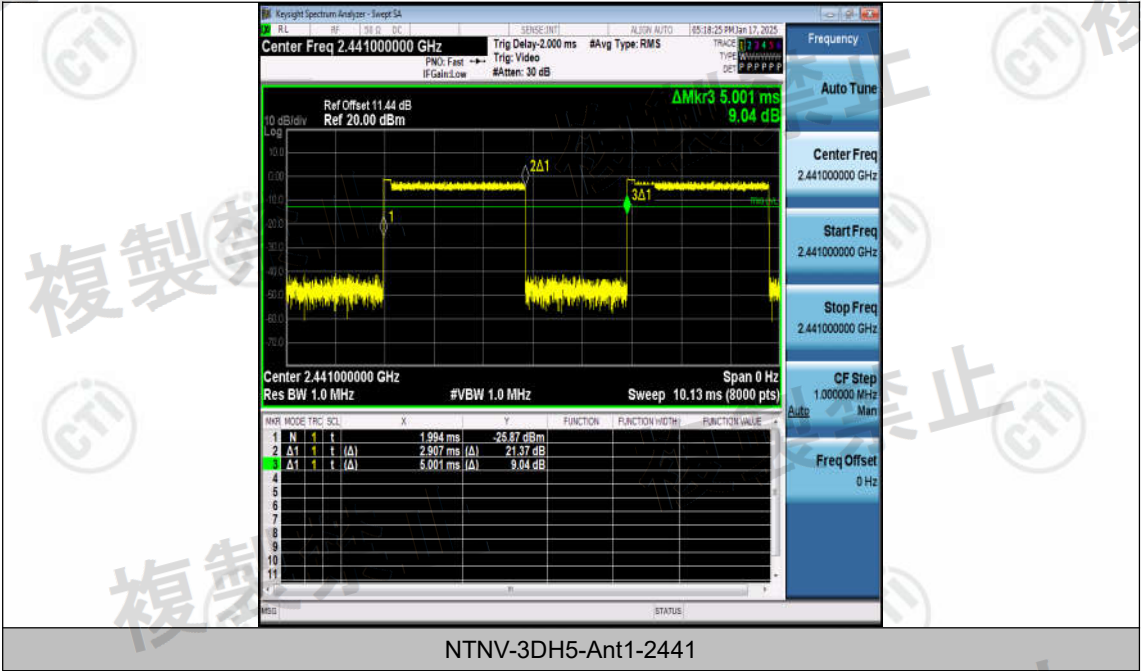
NTVN-2DH5-Ant1-2441



NTVN-3DH1-Ant1-2441



NTVN-3DH3-Ant1-2441



*** End of Report ***