

Appendix A for BT Test Data

Product Name: Smart Watch Tough

Test Model: SMT-W010

Environmental Conditions

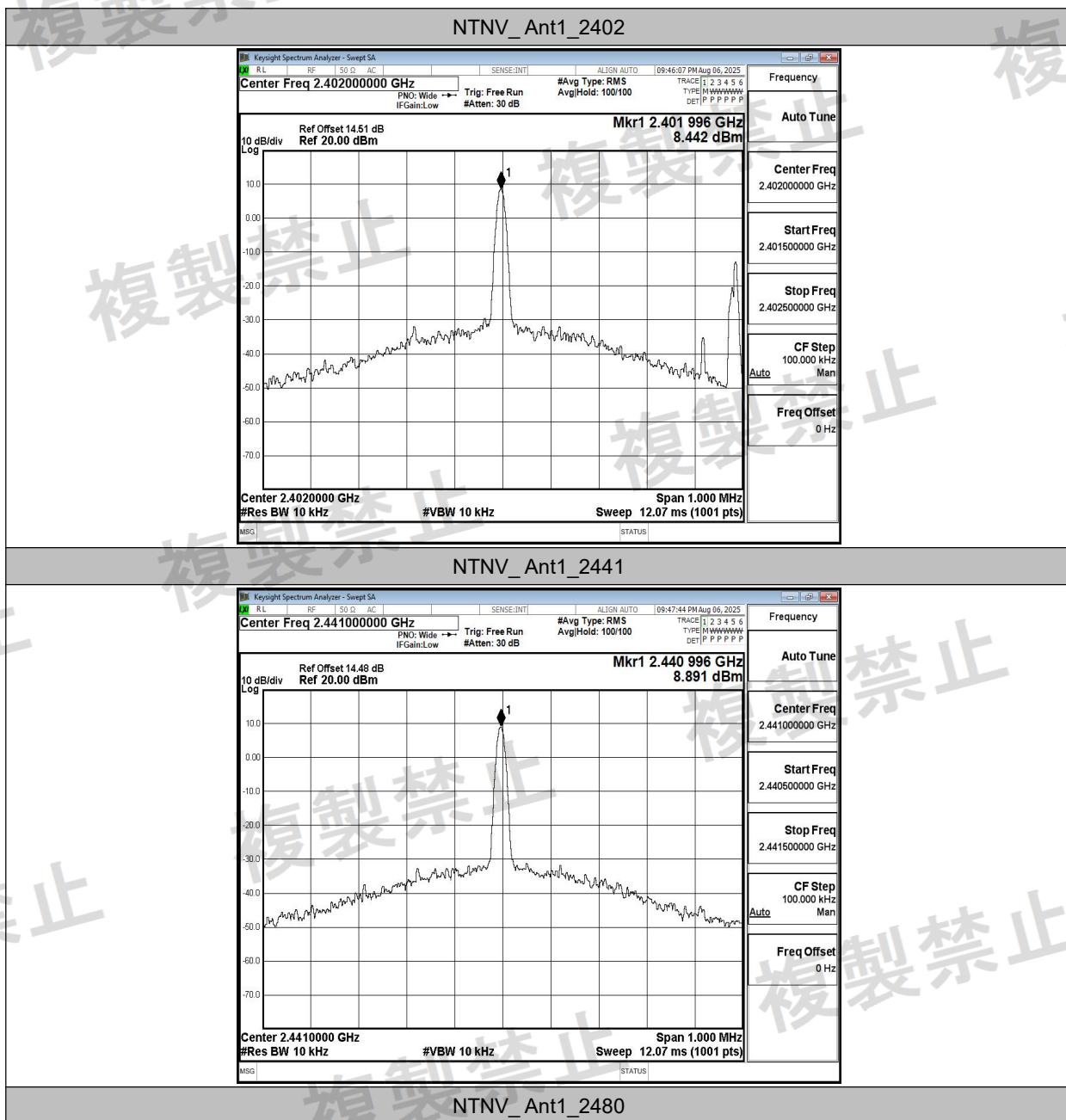
Temperature:	23.5°C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Suichao Lai
Supervised by:	Yan Chen

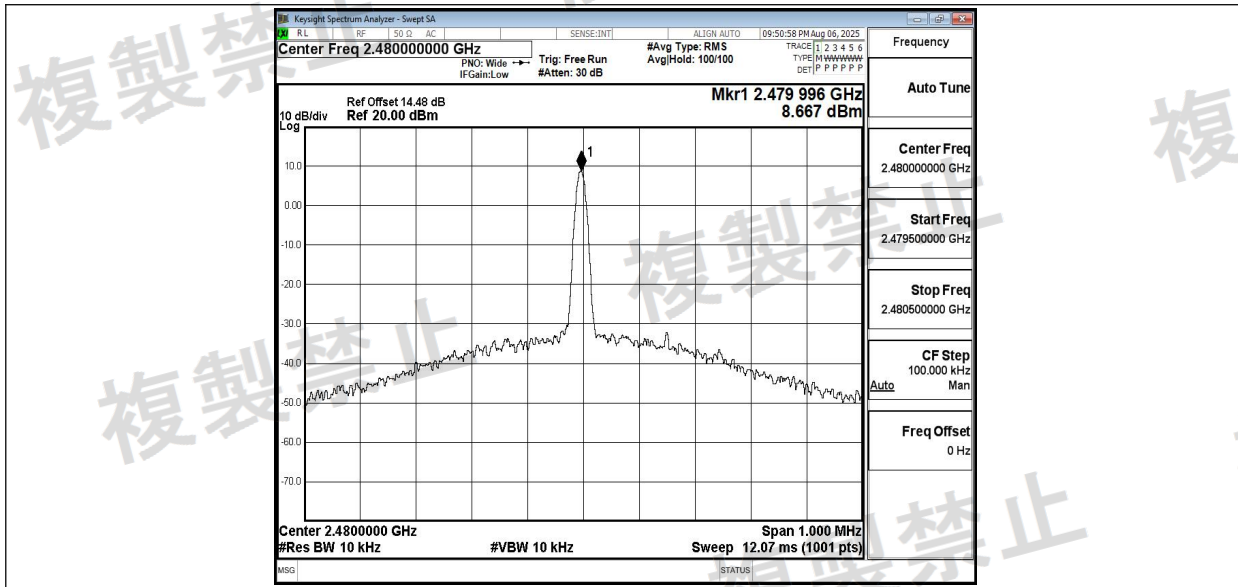
A.1 Frequency_Error

Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	Frequency_Error	Ant1	2402	-1.66528	±50	PASS
			2441	-1.63867	±50	PASS
			2480	-1.61290	±50	PASS

Test Graphs





A.2 Antenna Power

Test Result

Test Voltage				Normal Voltage			
Mode	Declared power	Average Result	Average Result	Result	Limit	Tolerance	Limit
	(mW/MHz)	(dBm)	(mW)	(mW/MHz)	(mW/MHz)	/	/
Hopping-Tx (1Mbps)	0.03	1.16	1.306	0.024	3	-20.00%	+20%
Hopping-Tx (2Mbps)	0.03	0.92	1.236	0.022	3	-26.67%	+20%
Hopping-Tx (3Mbps)	0.03	1.07	1.279	0.023	3	-23.33%	+20%
Conclusion: PASS							

Result power= Average value / (Duty Cycle * Spreading bandwidth)

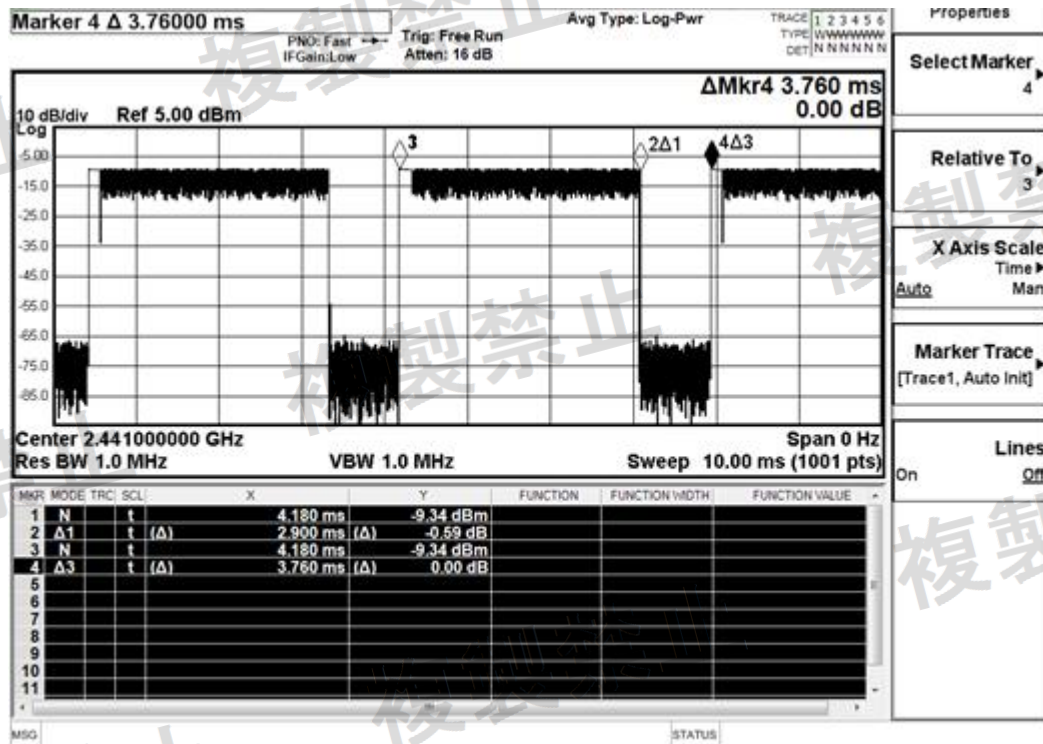
Antenna power Result = Measured Power / Spreading bandwidth

Spread Bandwidth (DH5) = 71.270MHz, Spread Bandwidth (2DH5) = 71.414MHz,

Spread Bandwidth (3DH5) = 71.385MHz

Duty cycle=77.1%

Duty cycle= [Ton/ (Ton+Toff)]*100%=2.900/3.760*100%=77.1%



A.3 Occupied Bandwidth

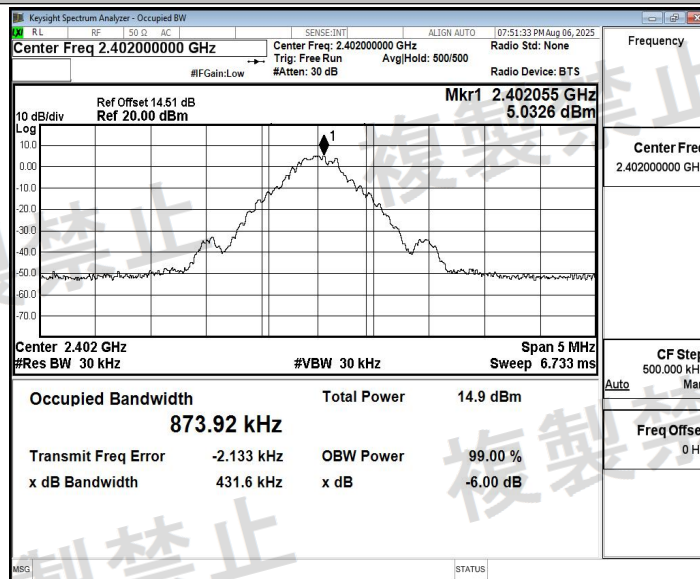
Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	2402	0.874	≤83.5	PASS
			2441	0.875	≤83.5	PASS
			2480	0.875	≤83.5	PASS
	2DH5	Ant1	2402	1.168	≤83.5	PASS
			2441	1.168	≤83.5	PASS
			2480	1.167	≤83.5	PASS
	3DH5	Ant1	2402	1.171	≤83.5	PASS
			2441	1.172	≤83.5	PASS
			2480	1.171	≤83.5	PASS

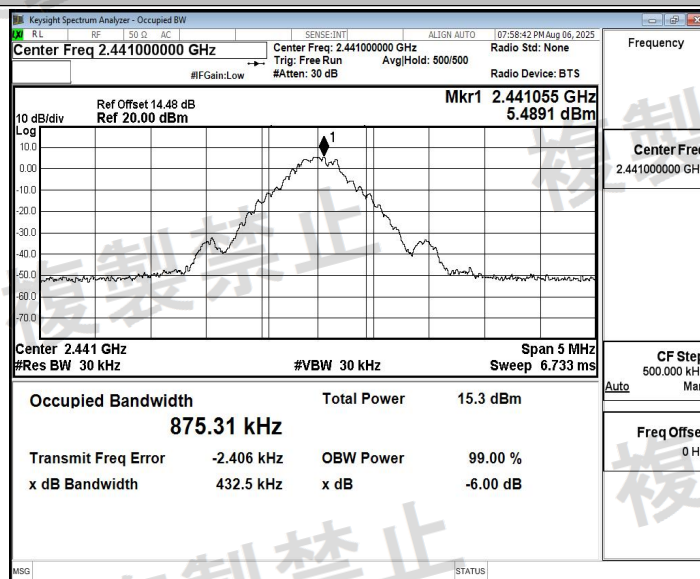
TestCondition	TestMode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	78.697	≤83.5	PASS
	2DH5	Ant1	Hop	78.728	≤83.5	PASS
	3DH5	Ant1	Hop	78.725	≤83.5	PASS

Test Graphs

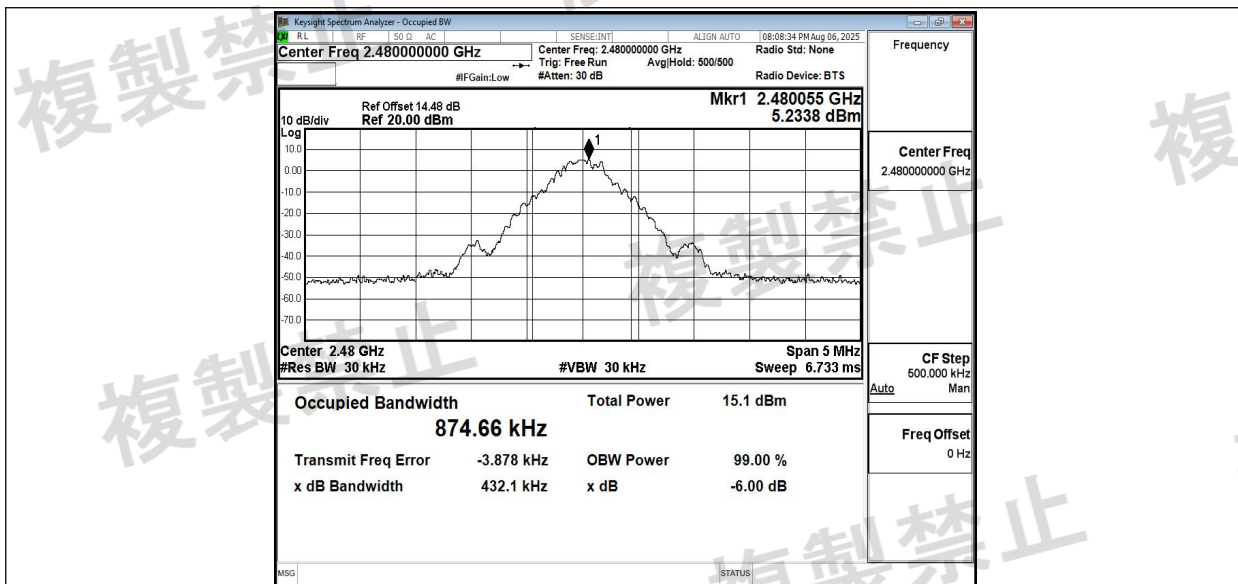
NTNV_DH5_Ant1_2402



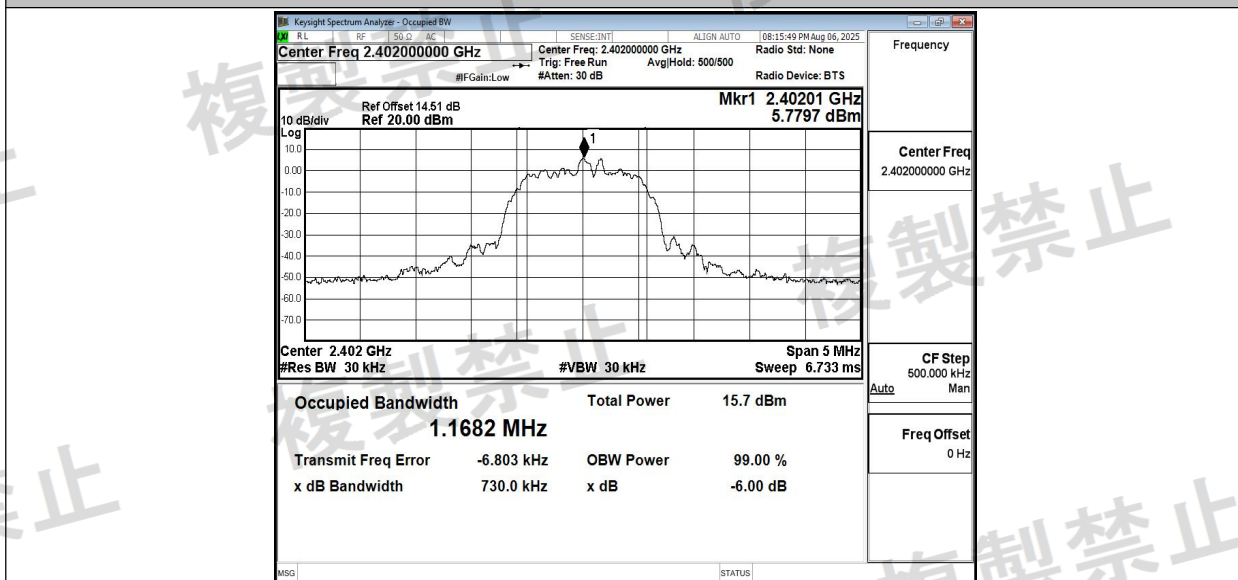
NTNV_DH5_Ant1_2441



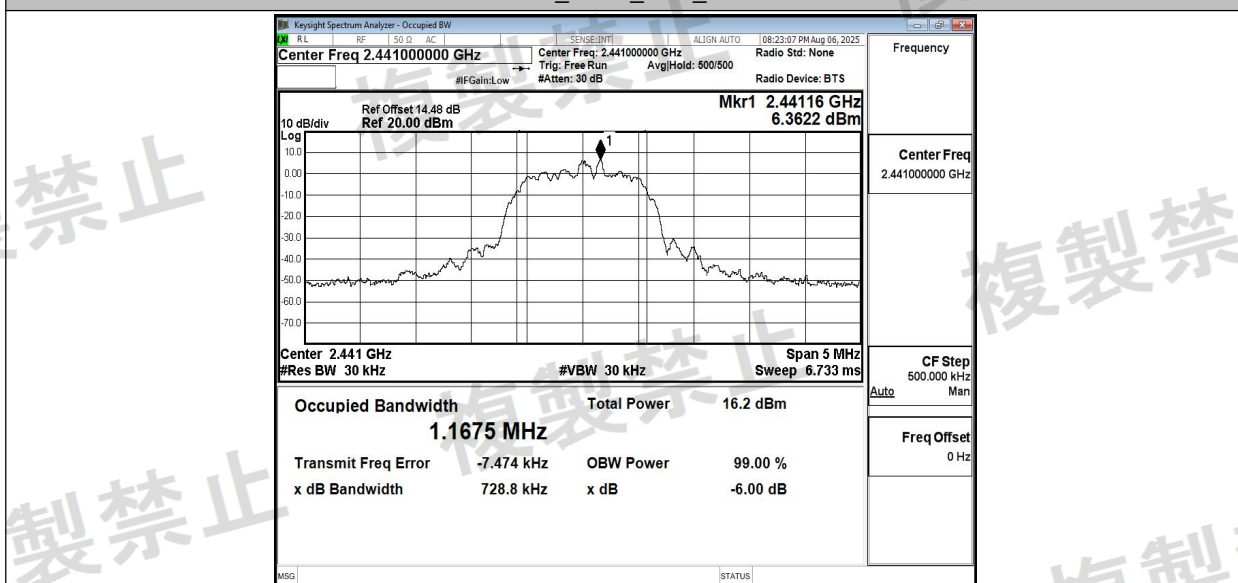
NTNV_DH5_Ant1_2480



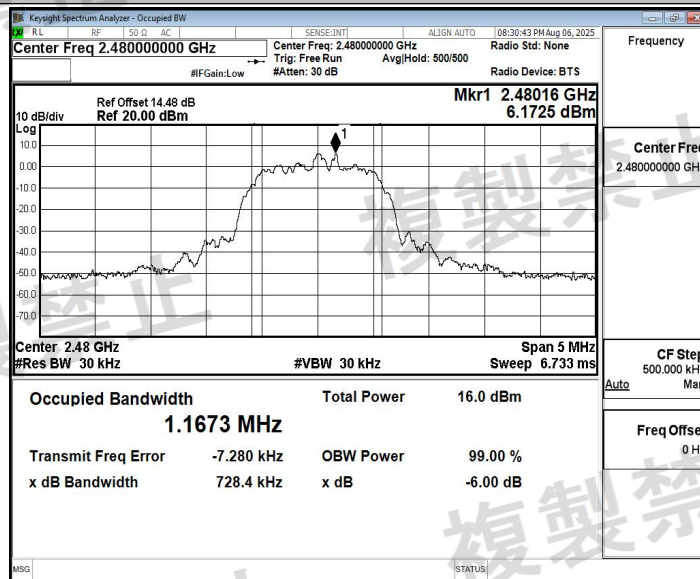
NTNV_2DH5_Ant1_2402



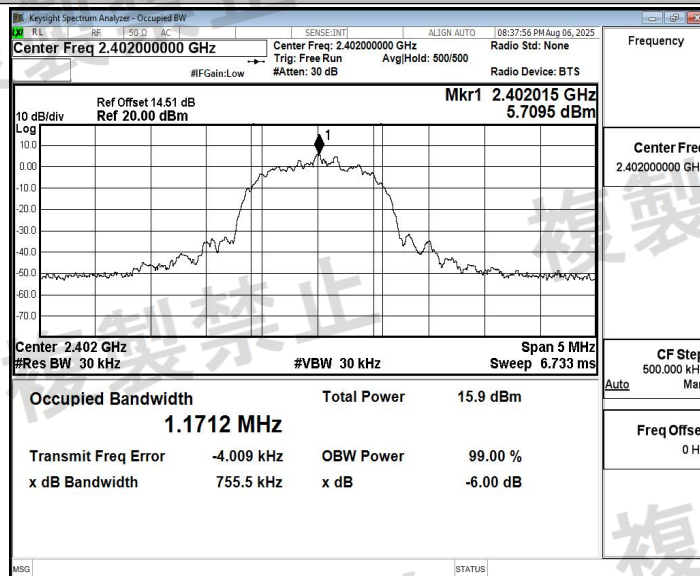
NTNV_2DH5_Ant1_2441



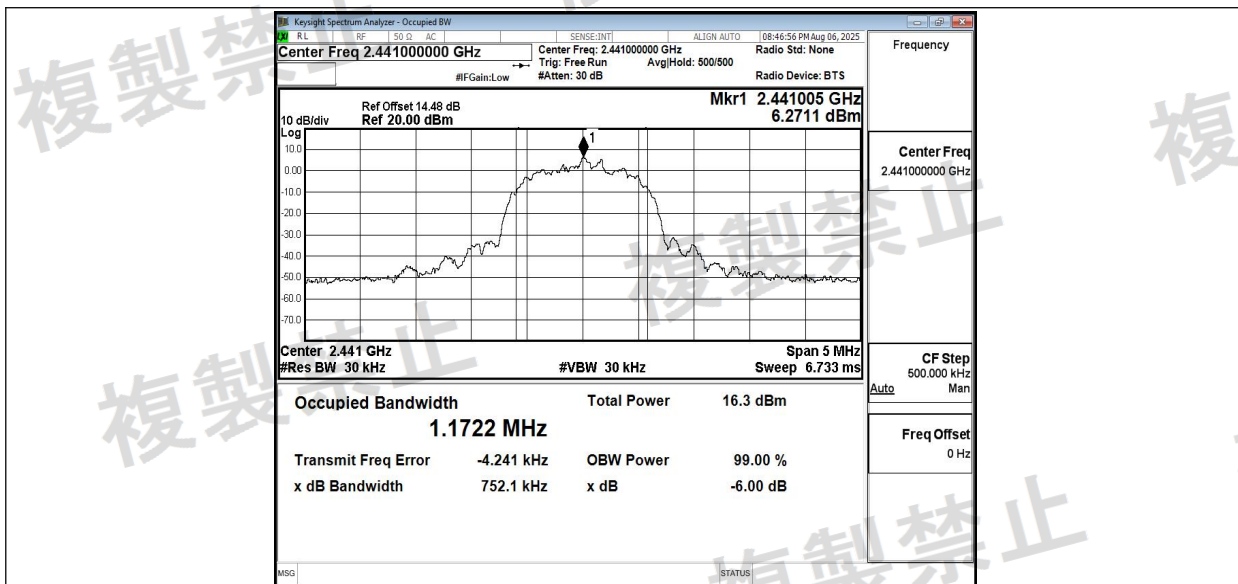
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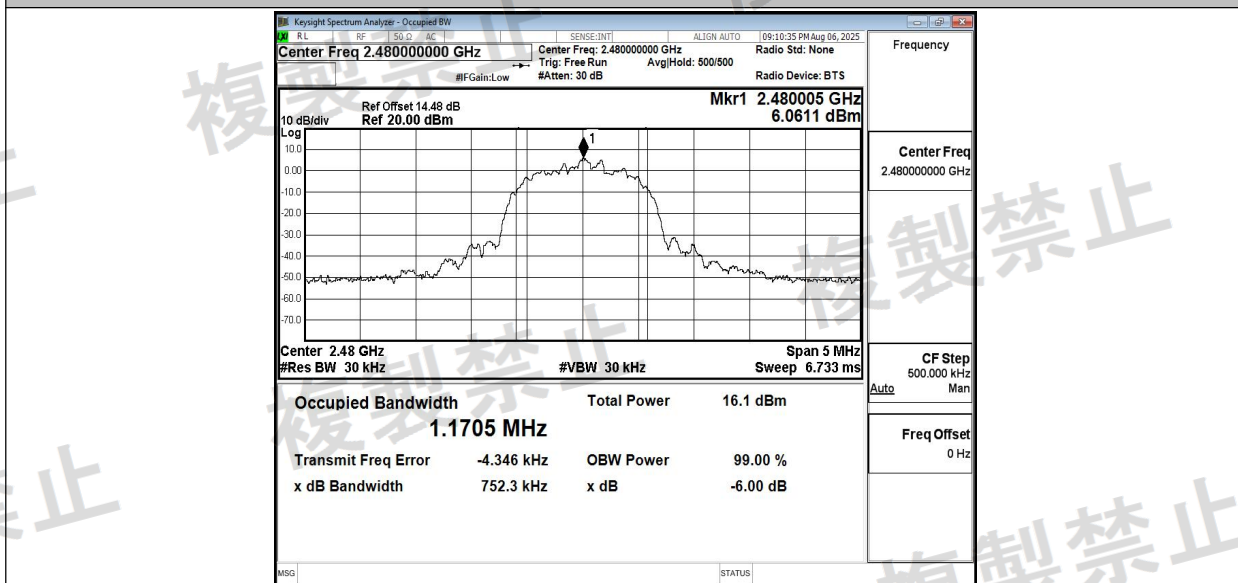
NTNV_3DH5_Ant1_2402



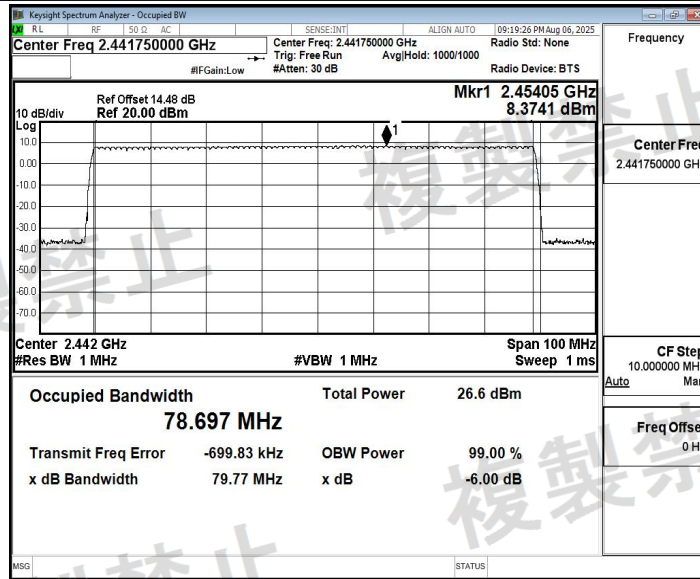
NTNV_3DH5_Ant1_2441



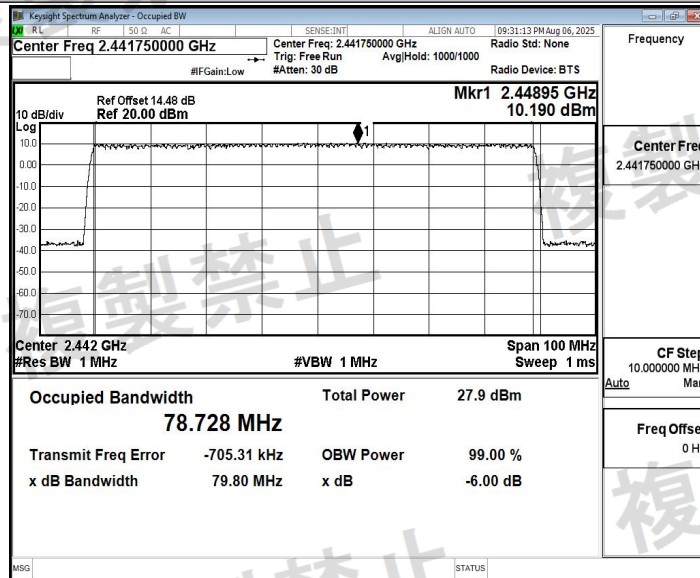
NTNV_3DH5_Ant1_2480



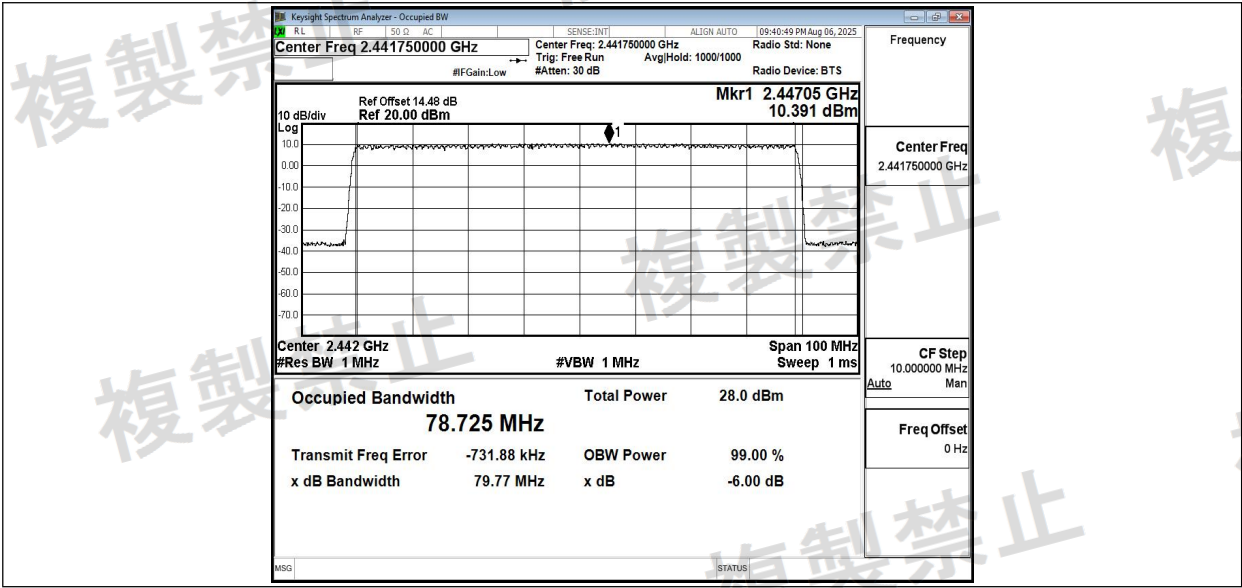
NTNV_DH5_Ant1_Hop



NTNV_2DH5_Ant1_Hop



NTNV_3DH5_Ant1_Hop



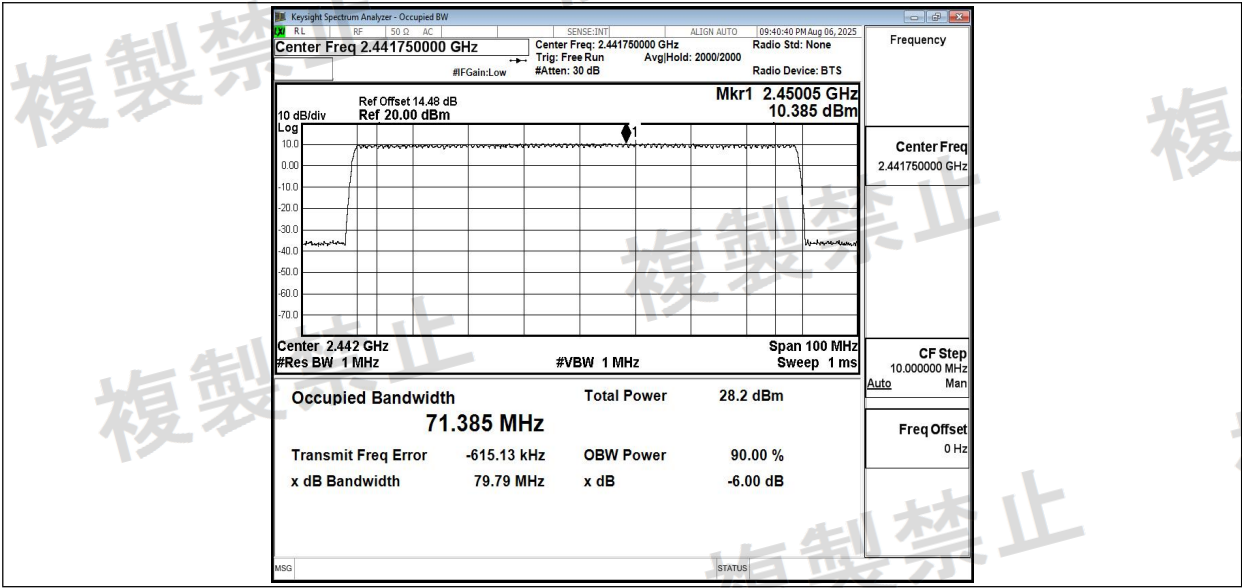
A.4 Spread Bandwidth

Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	71.270	---	PASS
	2DH5	Ant1	Hop	71.414	---	PASS
	3DH5	Ant1	Hop	71.385	---	PASS

Test Graphs





A.5 Spurious Emission of TX

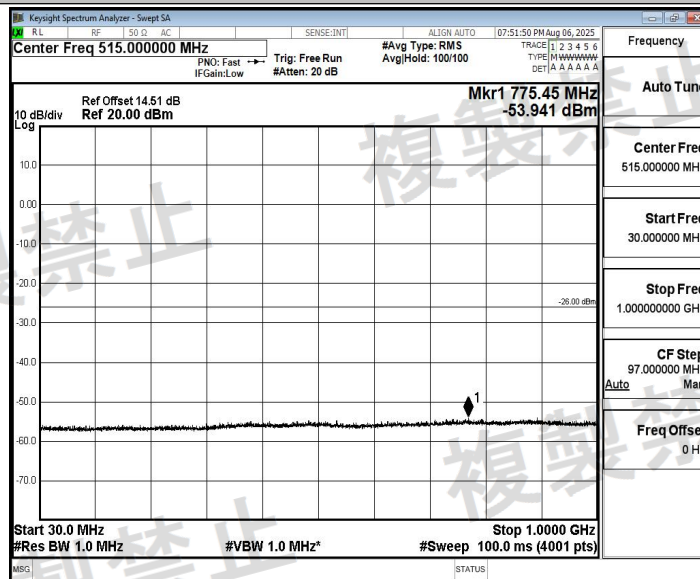
Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	DH5	Ant1	2402	30~1000	-53.94	≤-26	0.00404	≤2.5	PASS
				1000~2387	-52.02	≤-26	0.00628	≤2.5	PASS
				2387~2400	-37.22	≤-16	0.18967	≤25	PASS
				2483.5~2496.5	-43.51	≤-16	0.04457	≤25	PASS
				2496.5~13000	-47.12	≤-26	0.01941	≤2.5	PASS
			2441	30~1000	-53.88	≤-26	0.00409	≤2.5	PASS
				1000~2387	-52.31	≤-26	0.00587	≤2.5	PASS
				2387~2400	-43.55	≤-16	0.04416	≤25	PASS
				2483.5~2496.5	-43.43	≤-16	0.04539	≤25	PASS
				2496.5~13000	-47.76	≤-26	0.01675	≤2.5	PASS
			2480	30~1000	-54.19	≤-26	0.00381	≤2.5	PASS
				1000~2387	-52.32	≤-26	0.00586	≤2.5	PASS
				2387~2400	-43.59	≤-16	0.04375	≤25	PASS
				2483.5~2496.5	-43.39	≤-16	0.04581	≤25	PASS
				2496.5~13000	-35.84	≤-26	0.26062	≤2.5	PASS
	2DH5	Ant1	2402	30~1000	-53.26	≤-26	0.00472	≤2.5	PASS
				1000~2387	-52.23	≤-26	0.00598	≤2.5	PASS
				2387~2400	-29.46	≤-16	1.13240	≤25	PASS
				2483.5~2496.5	-43.41	≤-16	0.04560	≤25	PASS
				2496.5~13000	-47.37	≤-26	0.01832	≤2.5	PASS
			2441	30~1000	-53.24	≤-26	0.00474	≤2.5	PASS
				1000~2387	-41.99	≤-26	0.06324	≤2.5	PASS
				2387~2400	-43.65	≤-16	0.04315	≤25	PASS
				2483.5~2496.5	-43.59	≤-16	0.04375	≤25	PASS
				2496.5~13000	-42.12	≤-26	0.06138	≤2.5	PASS
			2480	30~1000	-53.16	≤-26	0.00483	≤2.5	PASS
				1000~2387	-47.07	≤-26	0.01963	≤2.5	PASS
				2387~2400	-43.54	≤-16	0.04426	≤25	PASS
				2483.5~2496.5	-43.27	≤-16	0.04710	≤25	PASS
				2496.5~13000	-47.56	≤-26	0.01754	≤2.5	PASS
	3DH5	Ant1	2402	30~1000	-52.93	≤-26	0.00509	≤2.5	PASS
				1000~2387	-51.92	≤-26	0.00643	≤2.5	PASS
				2387~2400	-29.64	≤-16	1.08643	≤25	PASS
				2483.5~2496.5	-43.52	≤-16	0.04446	≤25	PASS
				2496.5~13000	-39.38	≤-26	0.11535	≤2.5	PASS
			2441	30~1000	-53.54	≤-26	0.00443	≤2.5	PASS

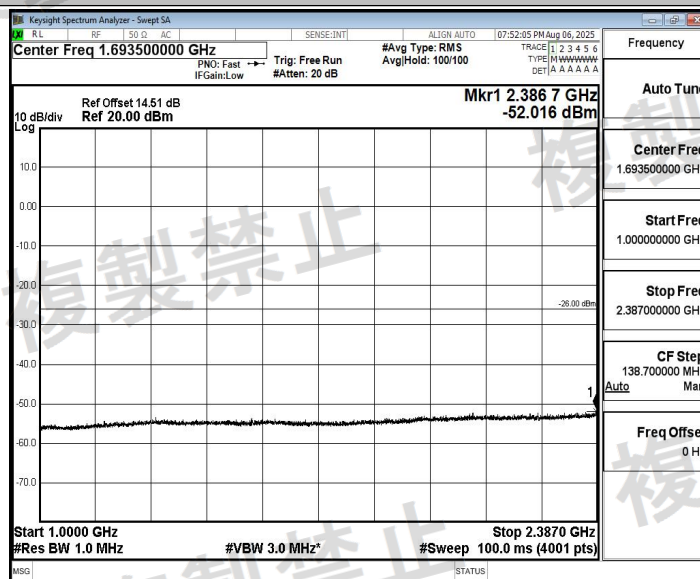
			1000~2387	-52.34	≤-26	0.00583	≤2.5	PASS
			2387~2400	-43.48	≤-16	0.04487	≤25	PASS
			2483.5~2496.5	-43.58	≤-16	0.04385	≤25	PASS
			2496.5~13000	-47.09	≤-26	0.01954	≤2.5	PASS
		2480	30~1000	-53.02	≤-26	0.00499	≤2.5	PASS
			1000~2387	-52.30	≤-26	0.00589	≤2.5	PASS
			2387~2400	-43.55	≤-16	0.04416	≤25	PASS
			2483.5~2496.5	-43.15	≤-16	0.04842	≤25	PASS
			2496.5~13000	-42.55	≤-26	0.05559	≤2.5	PASS

Test Graphs

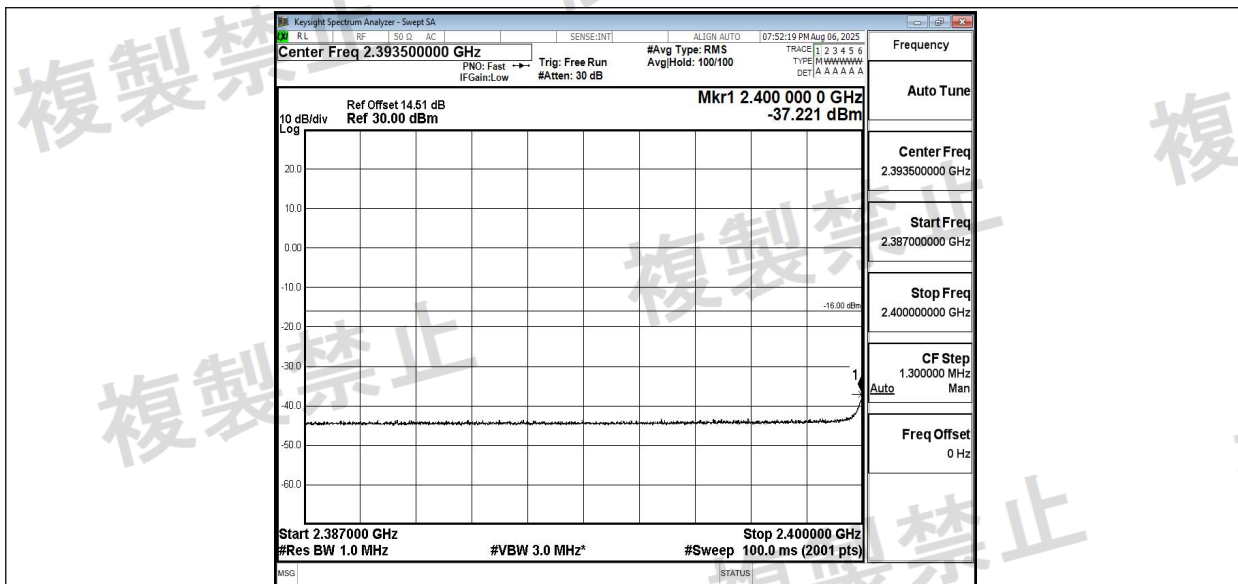
NTNV_DH5_Ant1_2402_30~1000



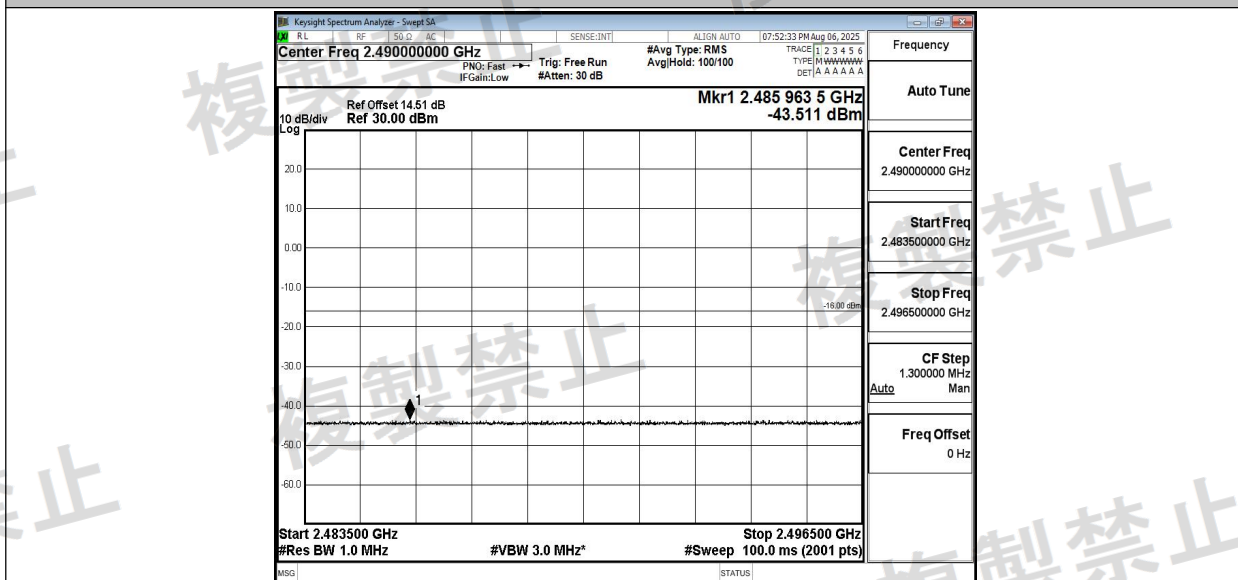
NTNV_DH5_Ant1_2402_1000~2387



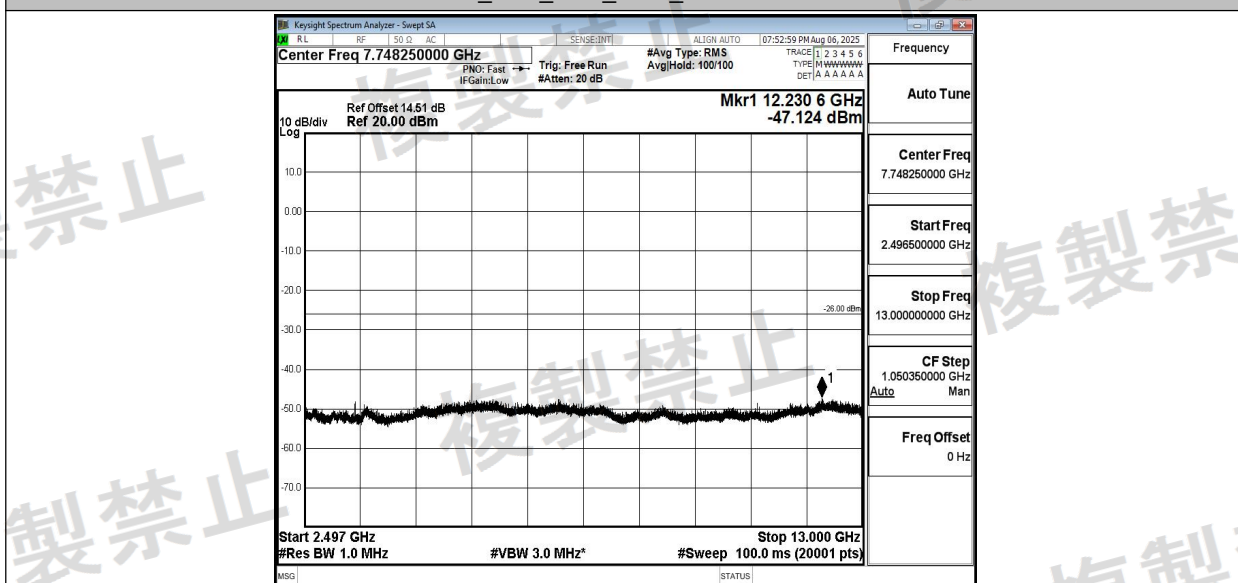
NTNV_DH5_Ant1_2402_2387~2400



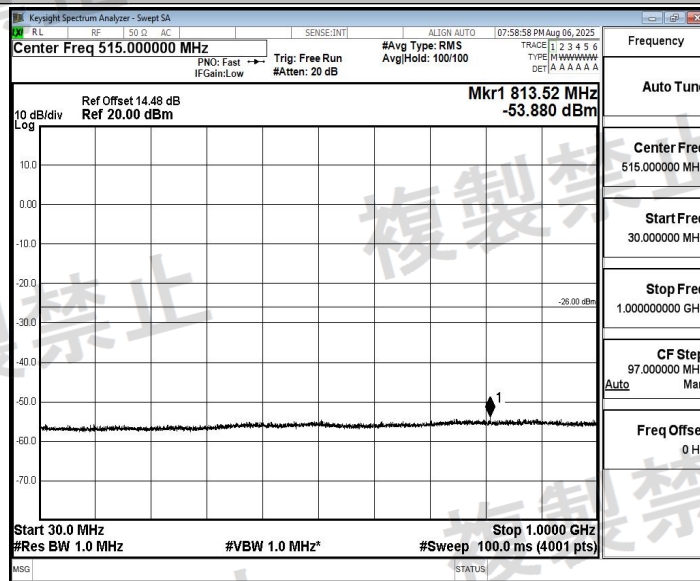
NTNV_DH5_Ant1_2402_2483.5~2496.5



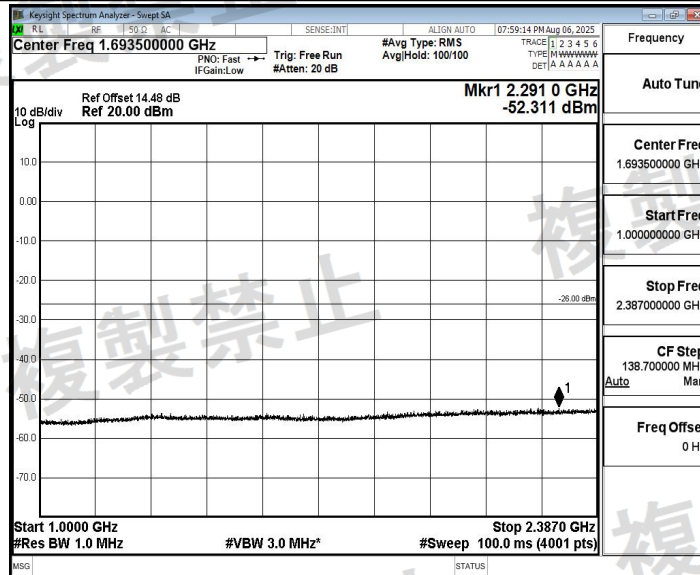
NTNV_DH5_Ant1_2402_2496.5~13000



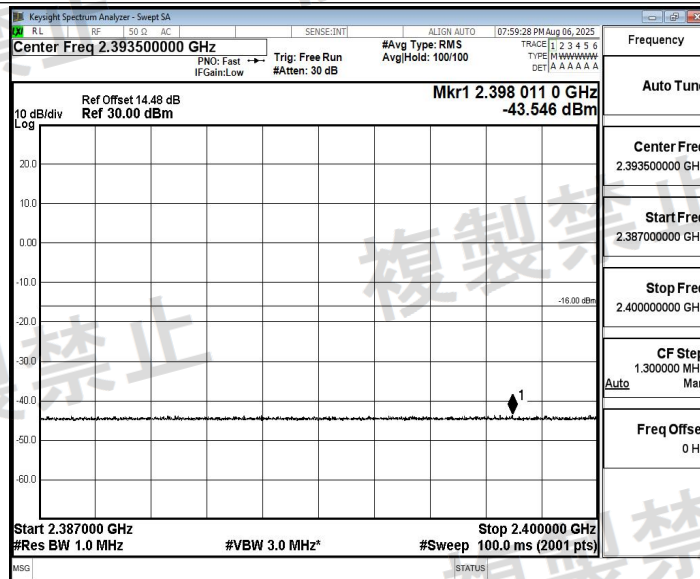
NTNV_DH5_Ant1_2441_30~1000



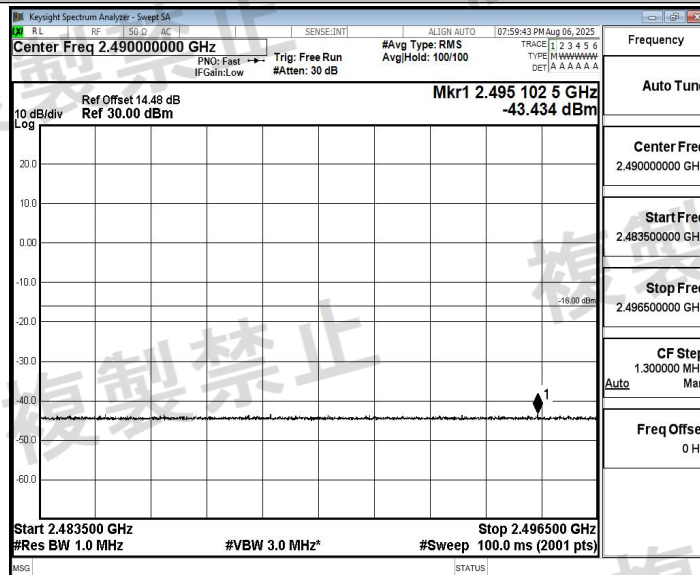
NTNV_DH5_Ant1_2441_1000~2387



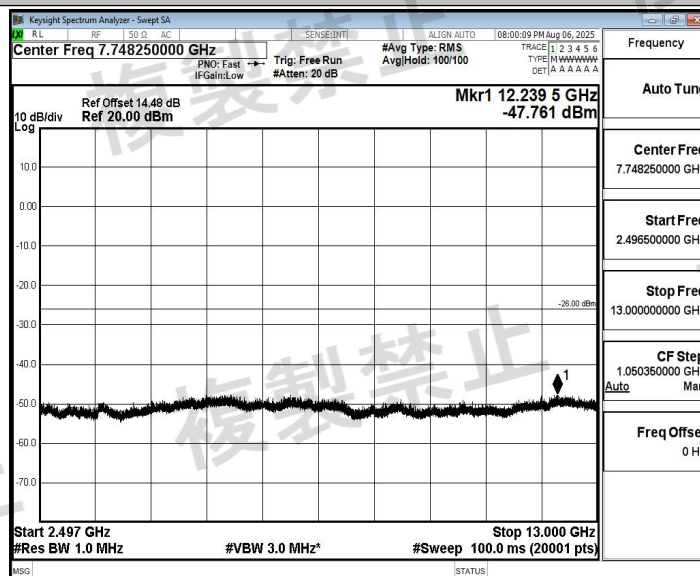
NTNV_DH5_Ant1_2441_2387~2400



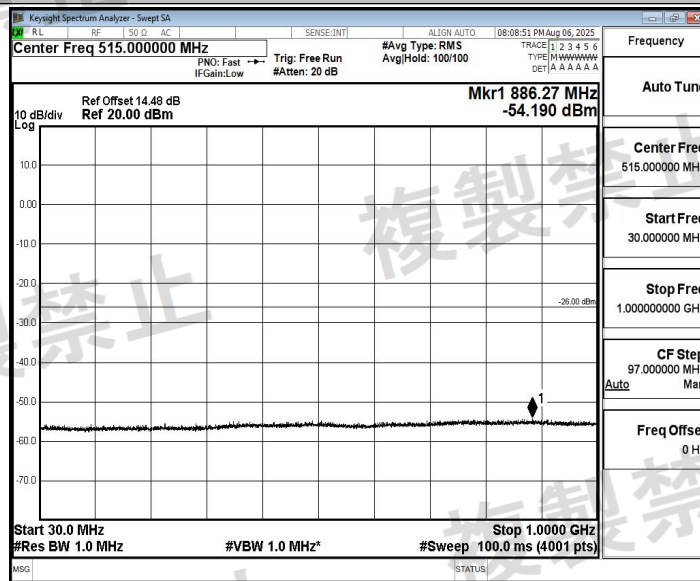
NTNV_DH5_Ant1_2441_2483.5~2496.5



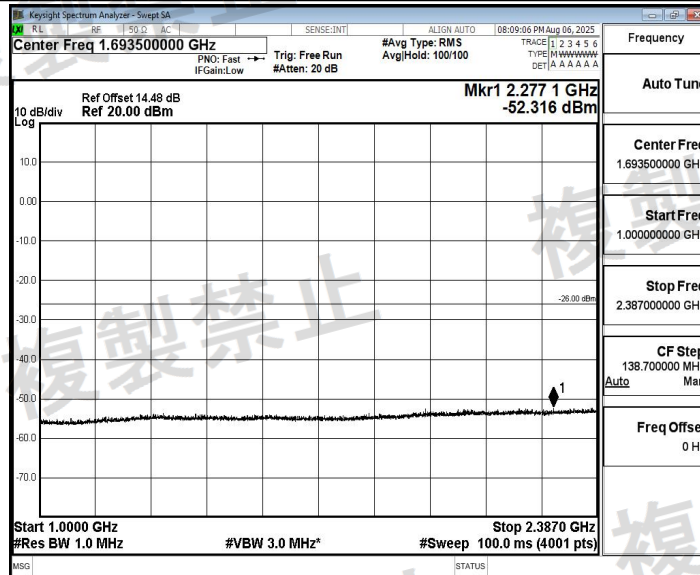
NTNV_DH5_Ant1_2441_2496.5~13000



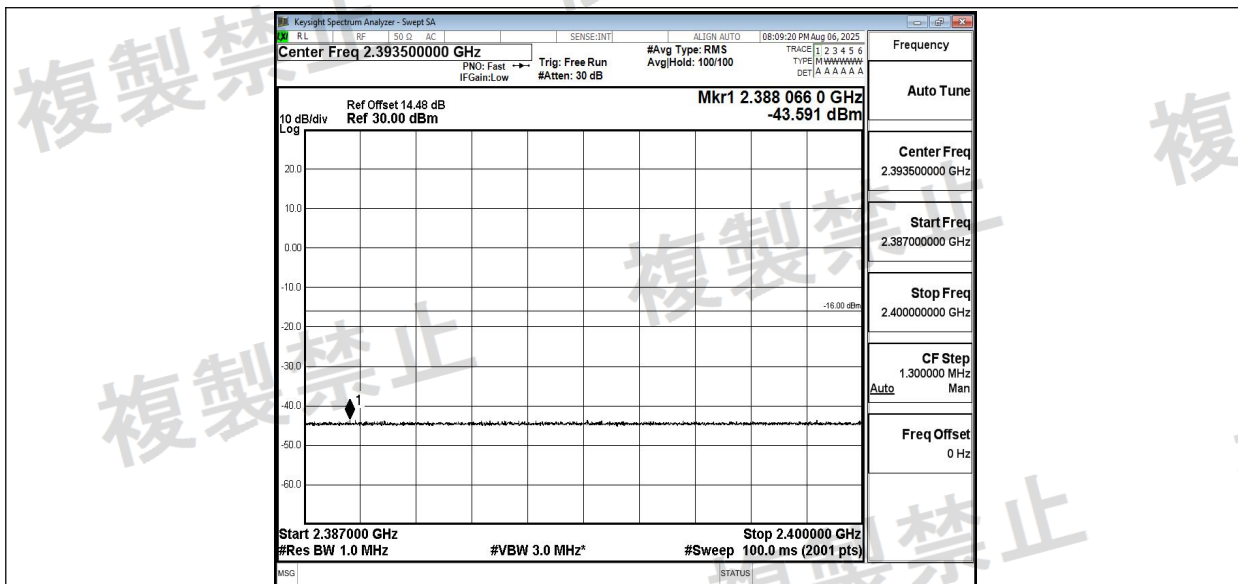
NTNV_DH5_Ant1_2480_30~1000



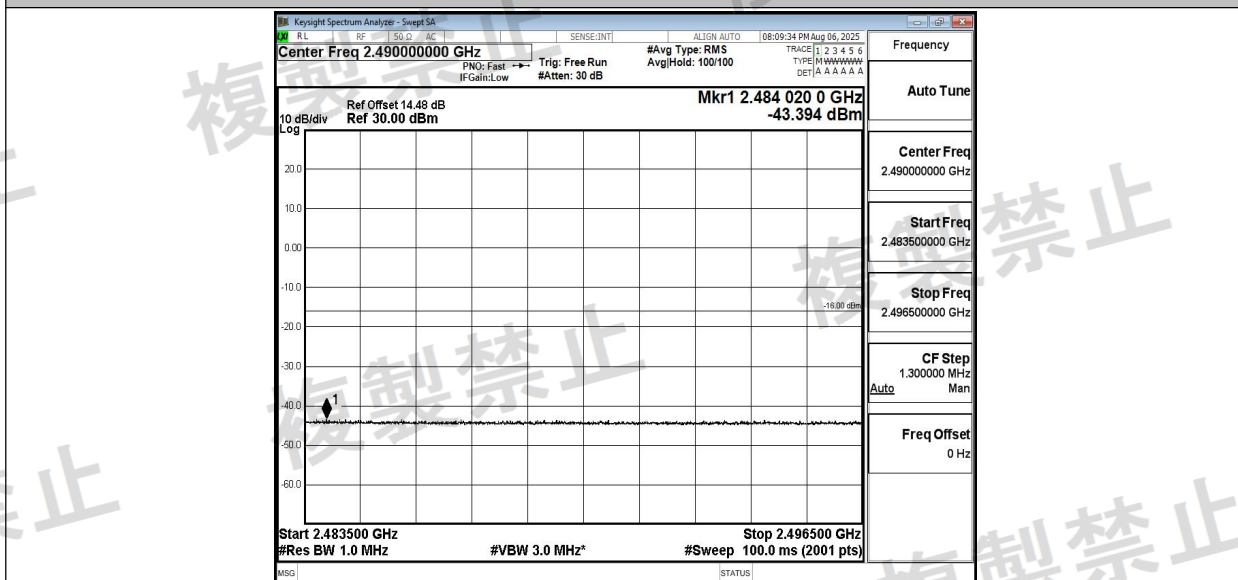
NTNV_DH5_Ant1_2480_1000~2387



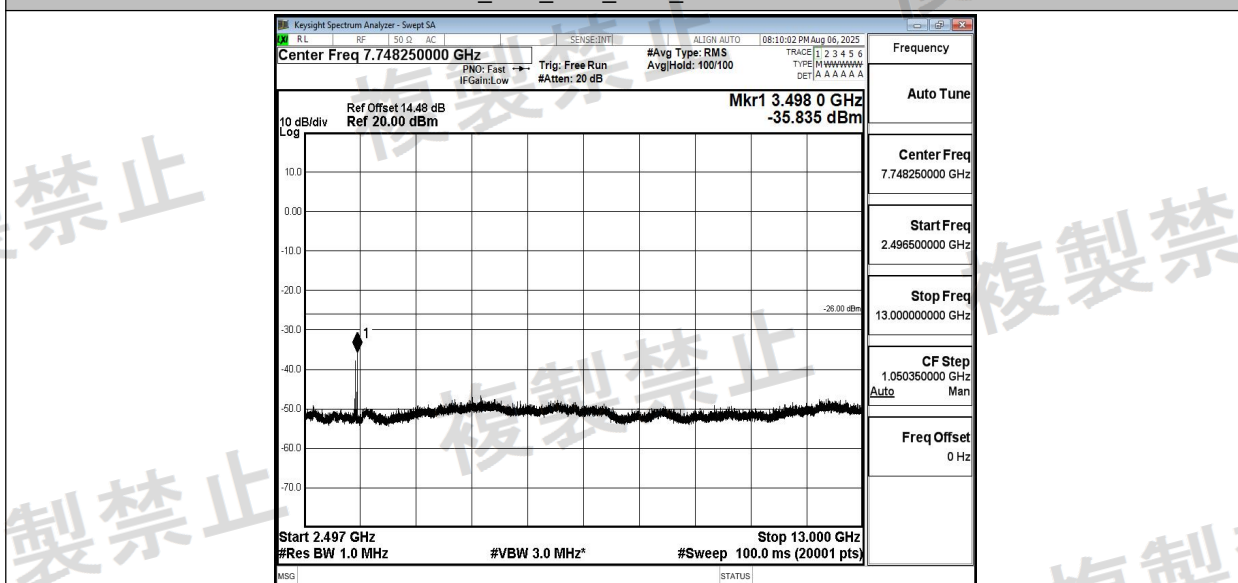
NTNV_DH5_Ant1_2480_2387~2400



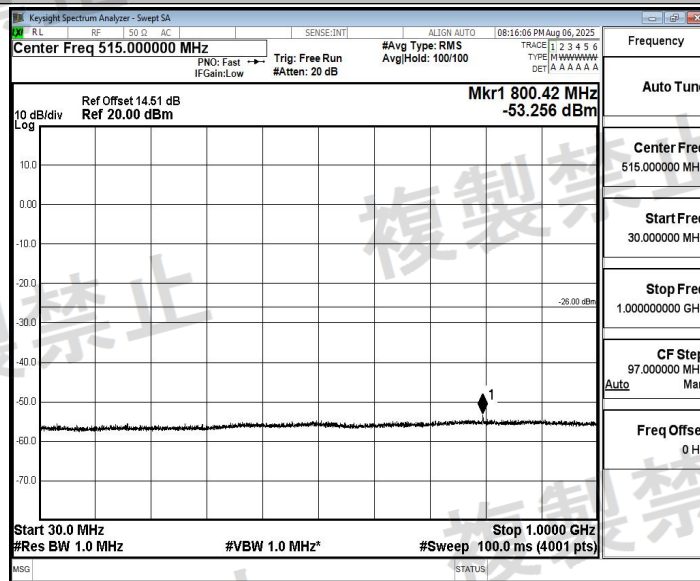
NTNV_DH5_Ant1_2480_2483.5~2496.5



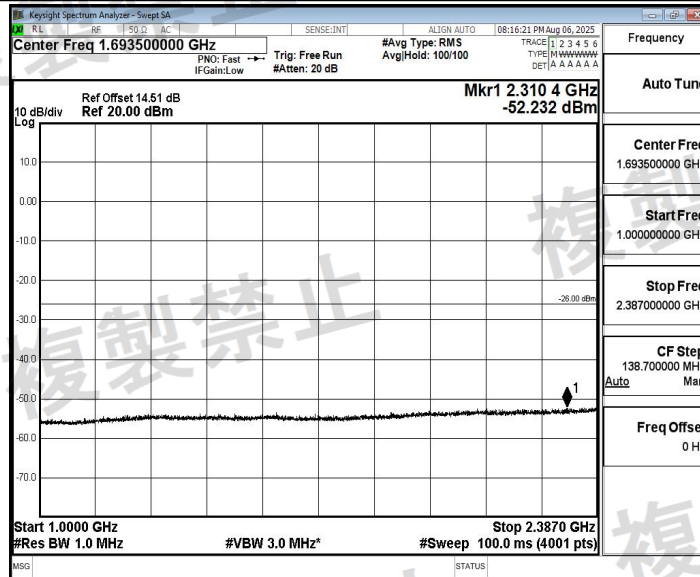
NTNV_DH5_Ant1_2480_2496.5~13000



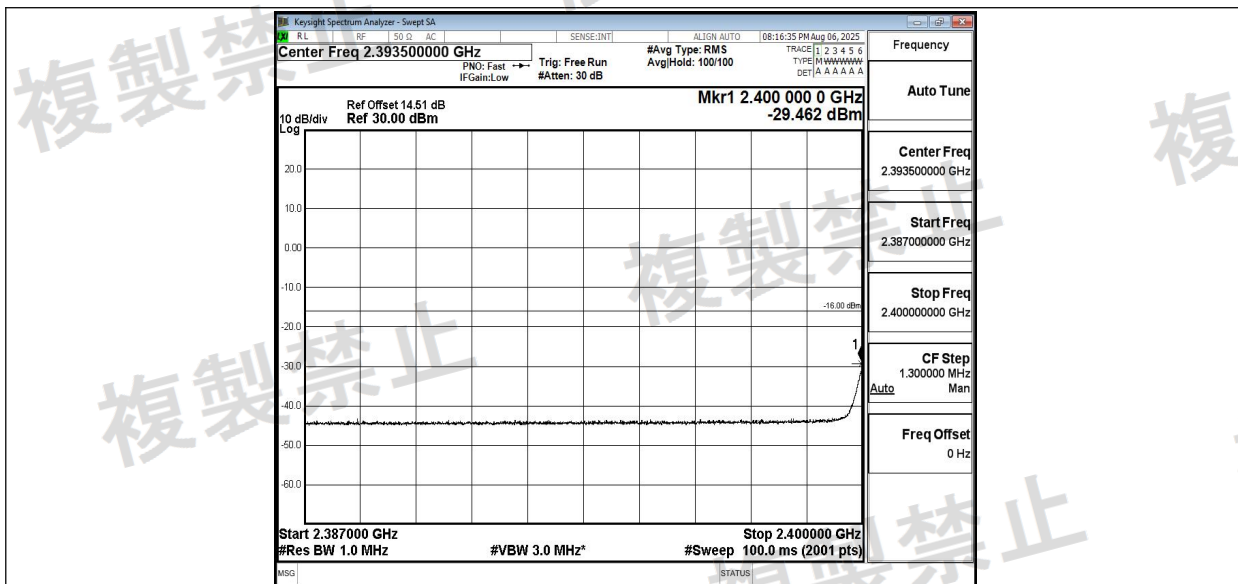
NTNV_2DH5_Ant1_2402_30~1000



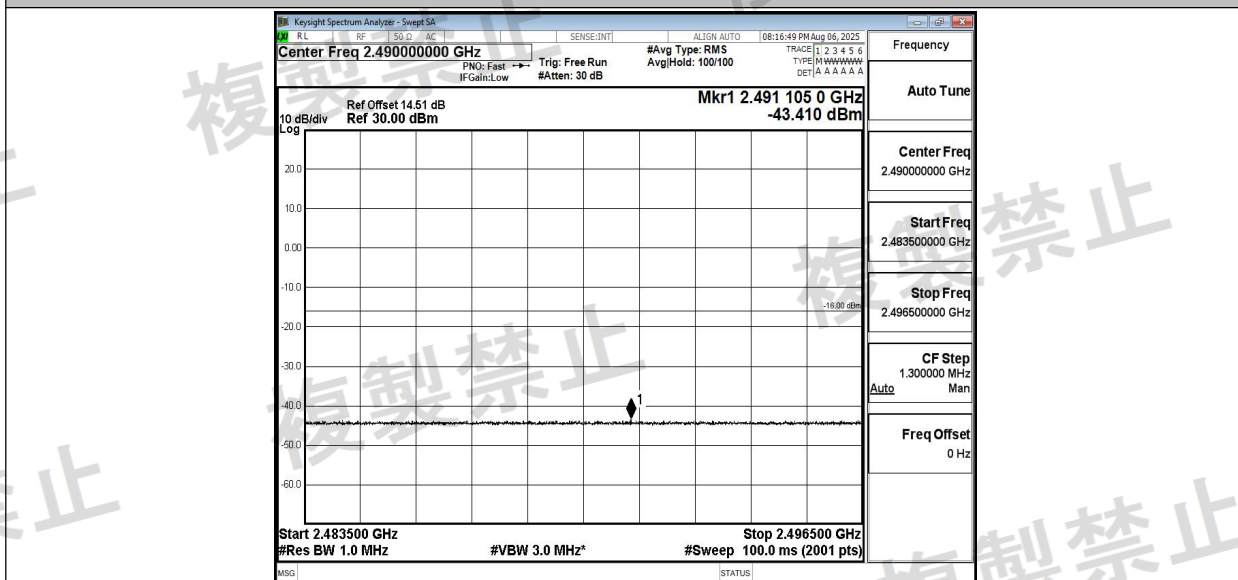
NTNV_2DH5_Ant1_2402_1000~2387



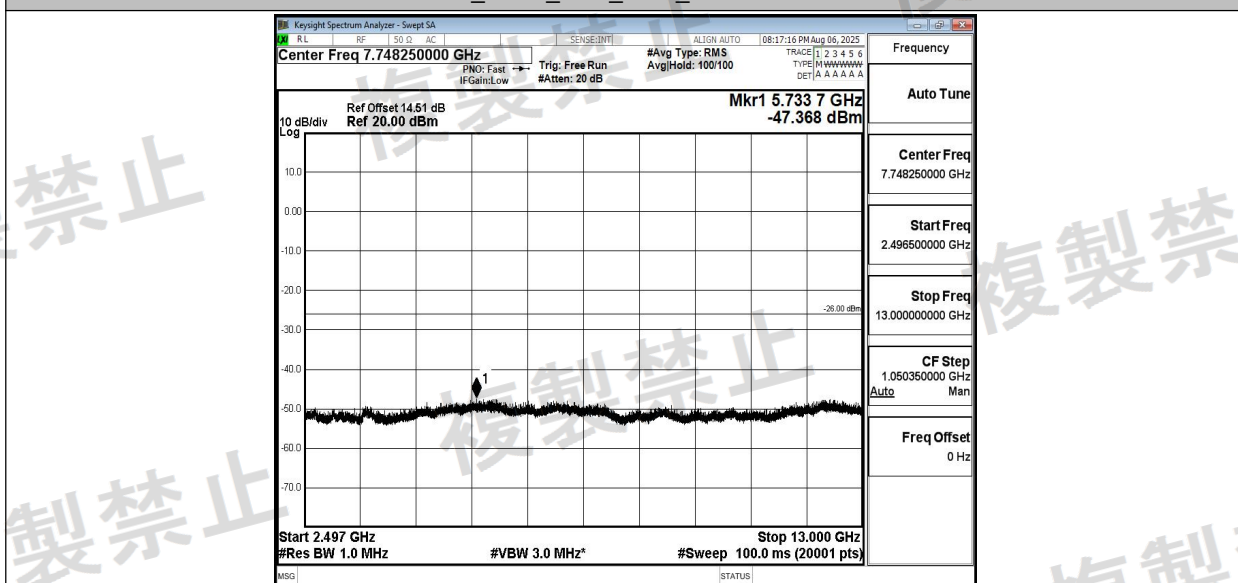
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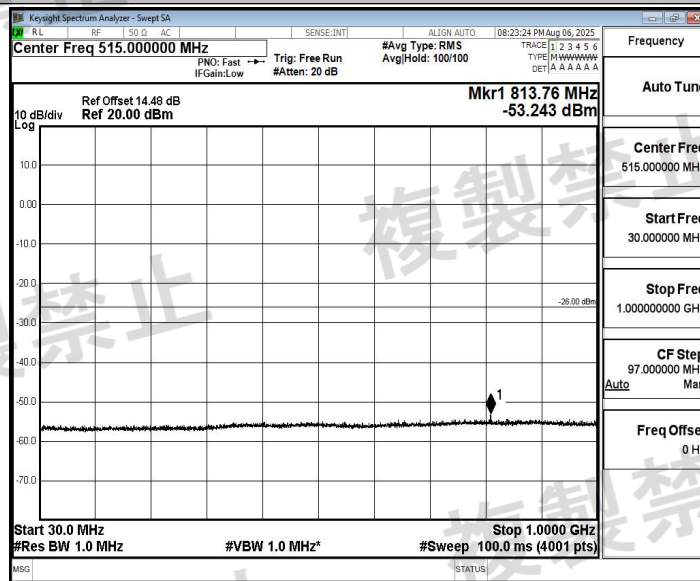
NTNV_2DH5_Ant1_2402_2483.5~2496.5



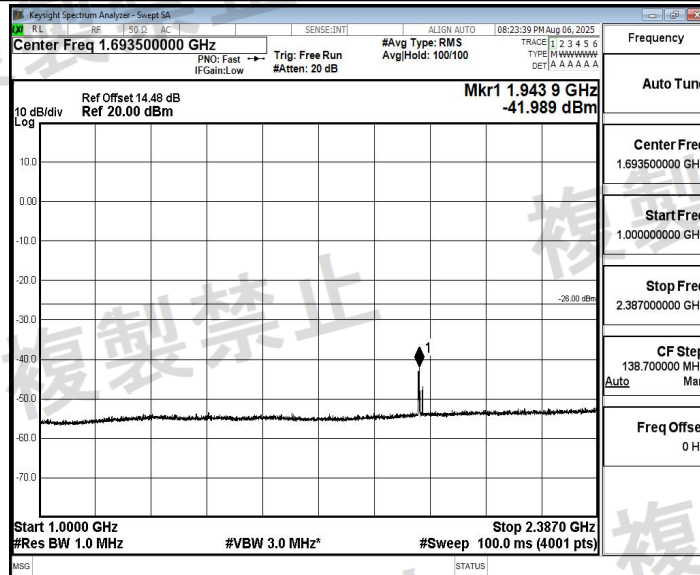
NTNV_2DH5_Ant1_2402_2496.5~13000



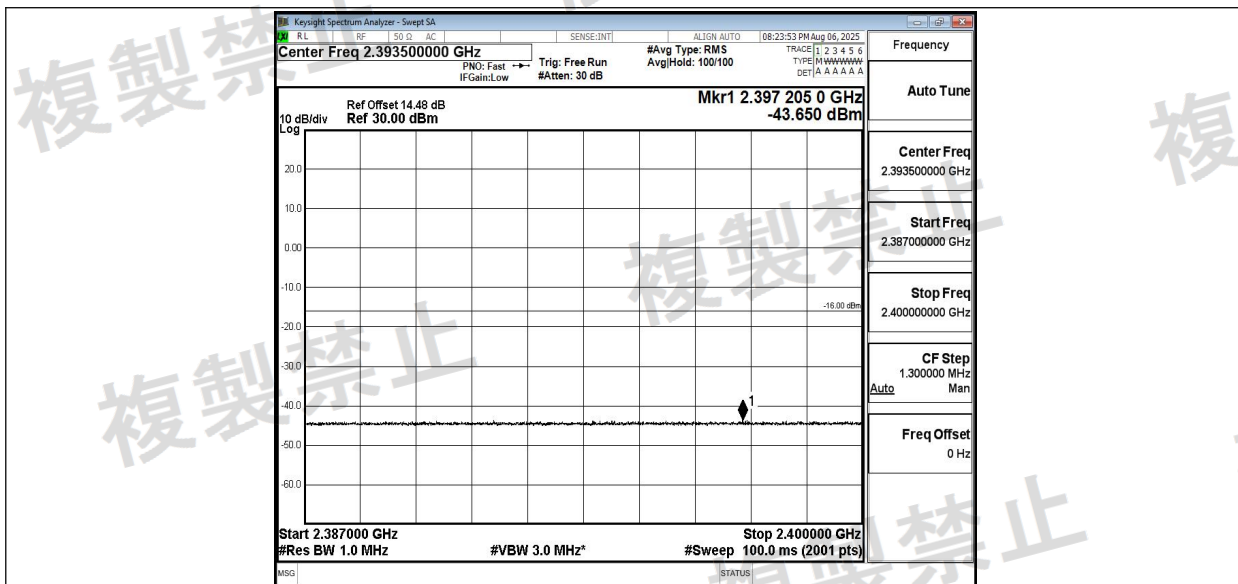
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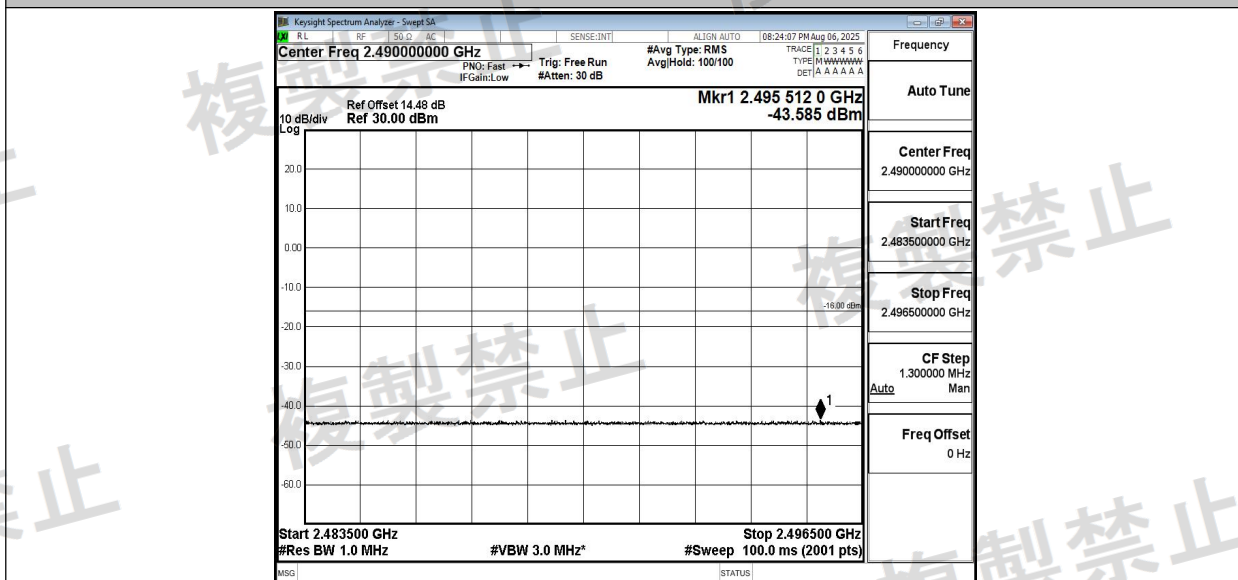
NTNV_2DH5_Ant1_2441_1000~2387



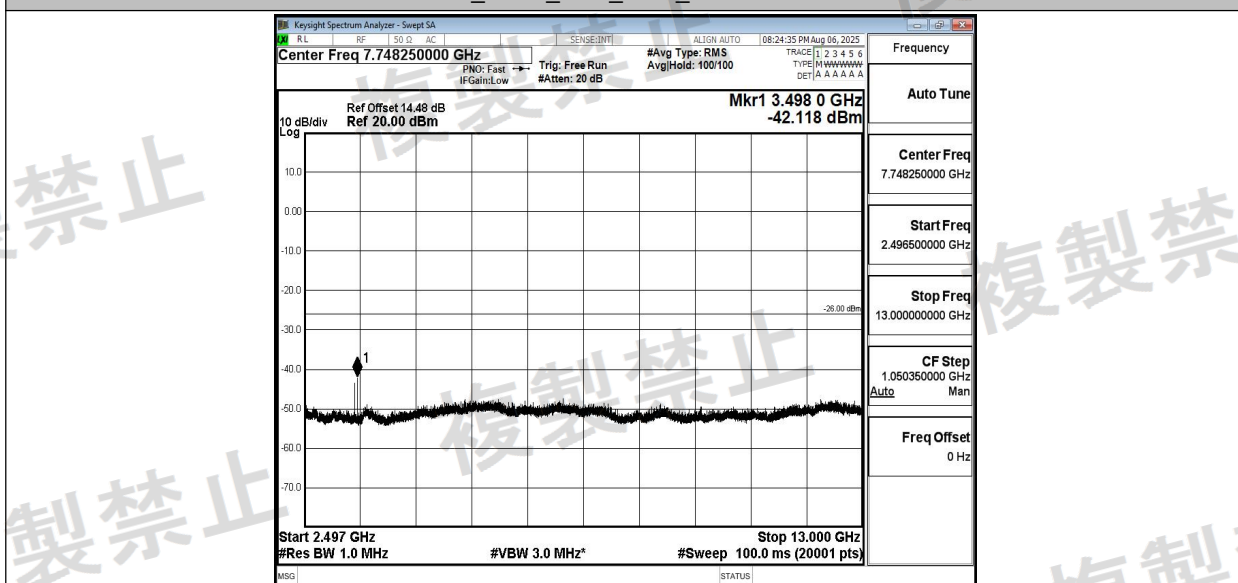
NTNV_2DH5_Ant1_2441_2387~2400



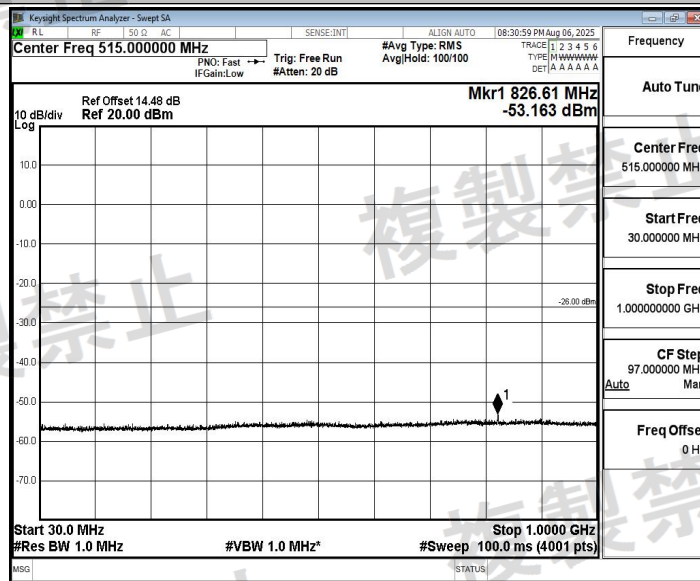
NTNV_2DH5_Ant1_2441_2483.5~2496.5



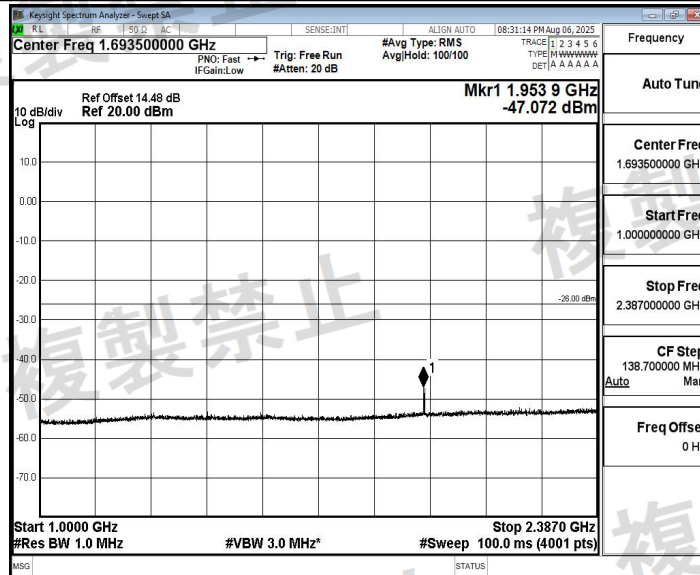
NTNV_2DH5_Ant1_2441_2496.5~13000



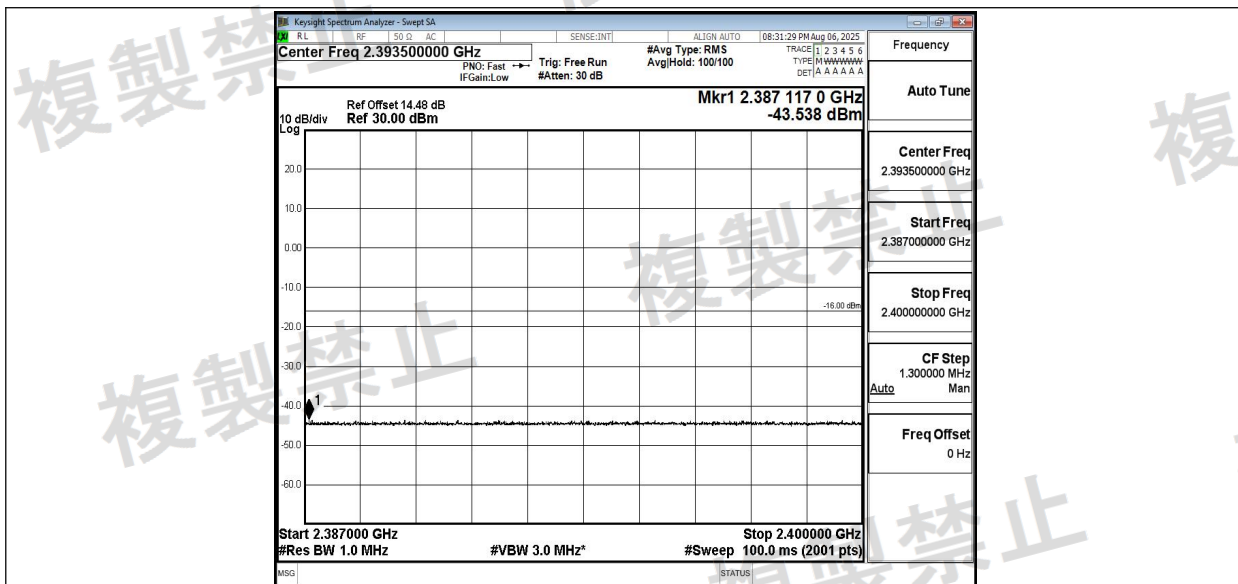
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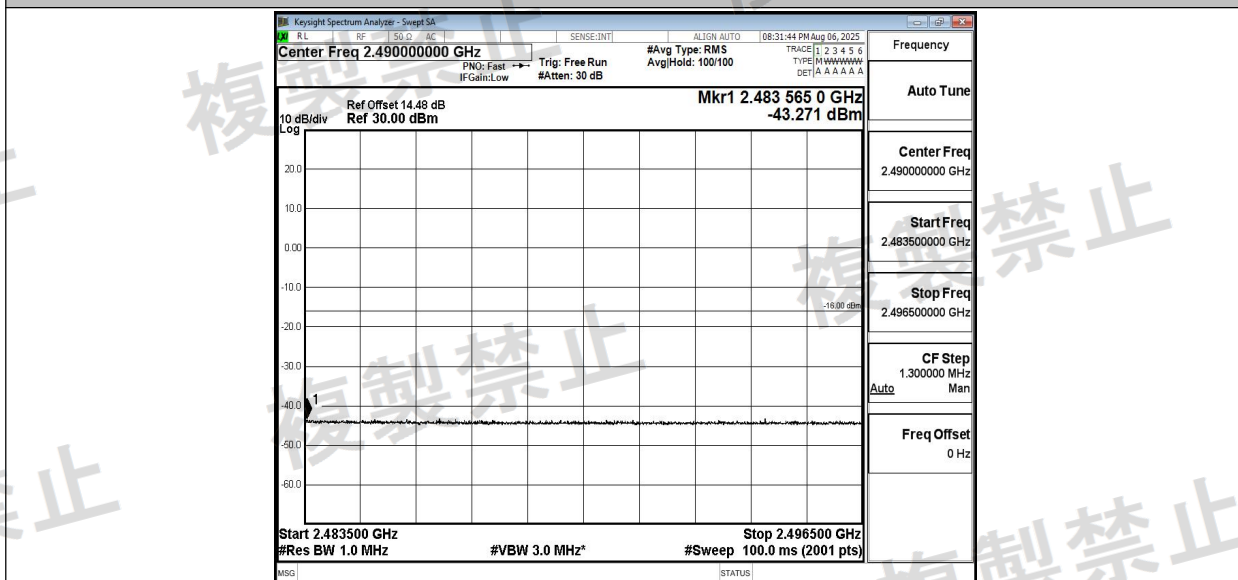
NTNV_2DH5_Ant1_2480_1000~2387



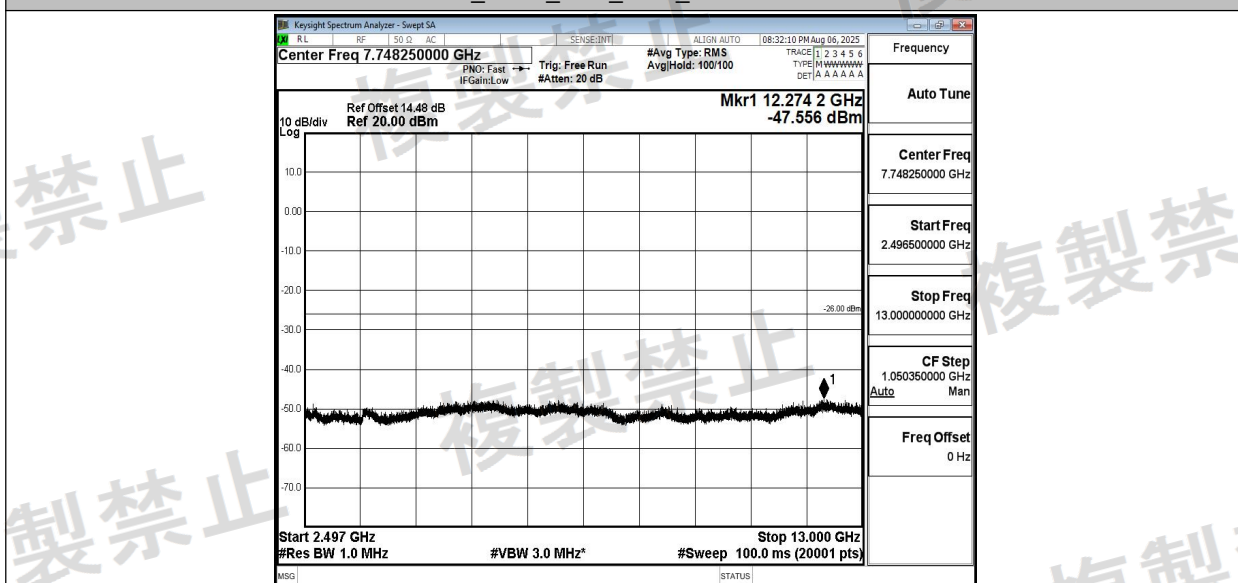
NTNV_2DH5_Ant1_2480_2387~2400



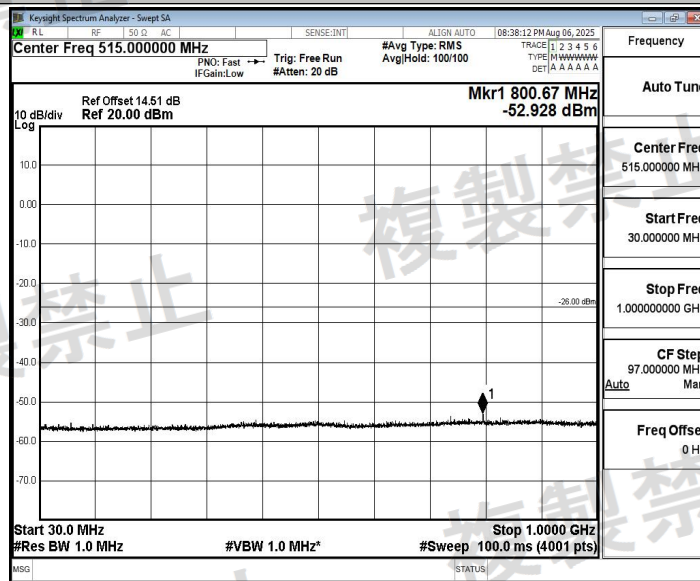
NTNV_2DH5_Ant1_2480_2496.5



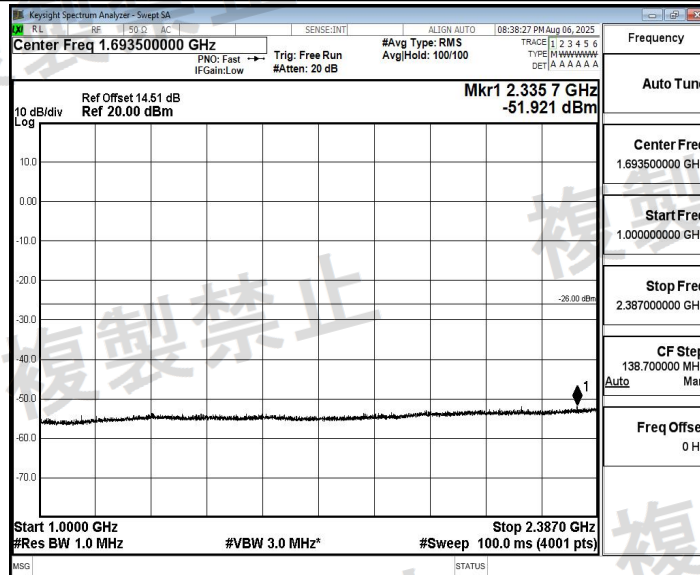
NTNV_2DH5_Ant1_2480_2496.5~13000



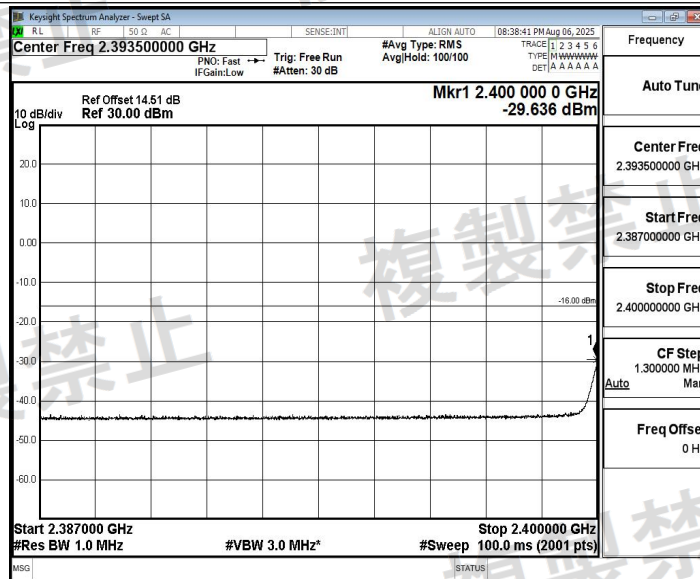
NTNV_3DH5_Ant1_2402_30~1000



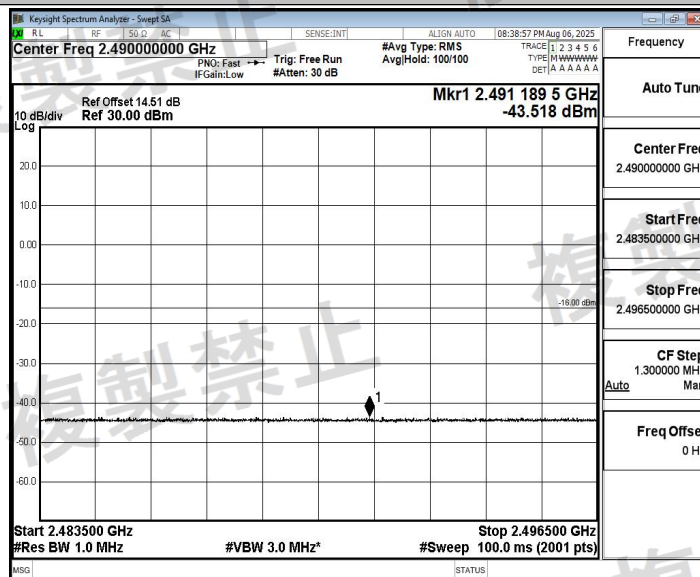
NTNV_3DH5_Ant1_2402_1000~2387



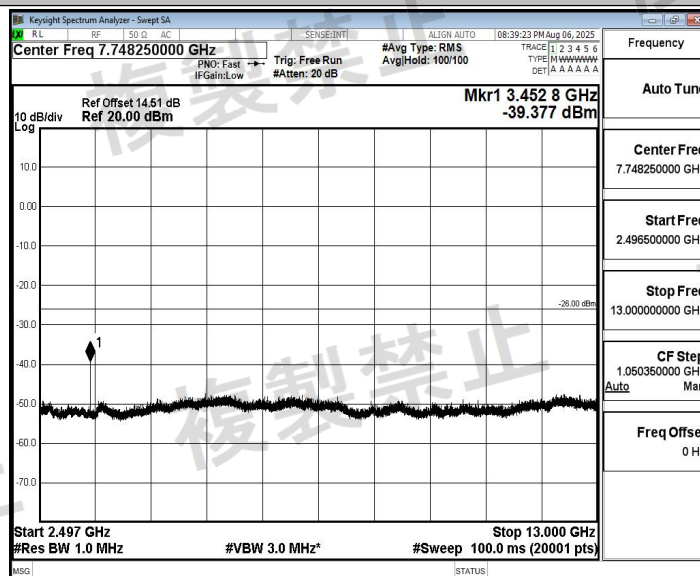
NTNV_3DH5_Ant1_2402_2387~2400



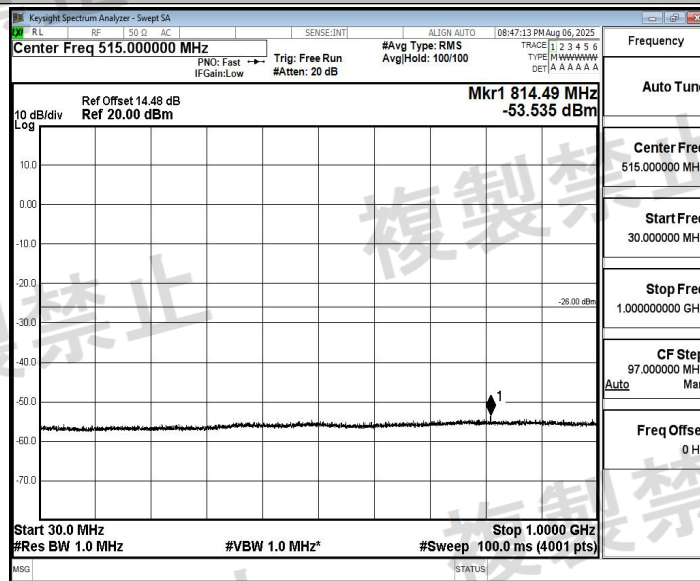
NTNV_3DH5_Ant1_2402_2483.5~2496.5



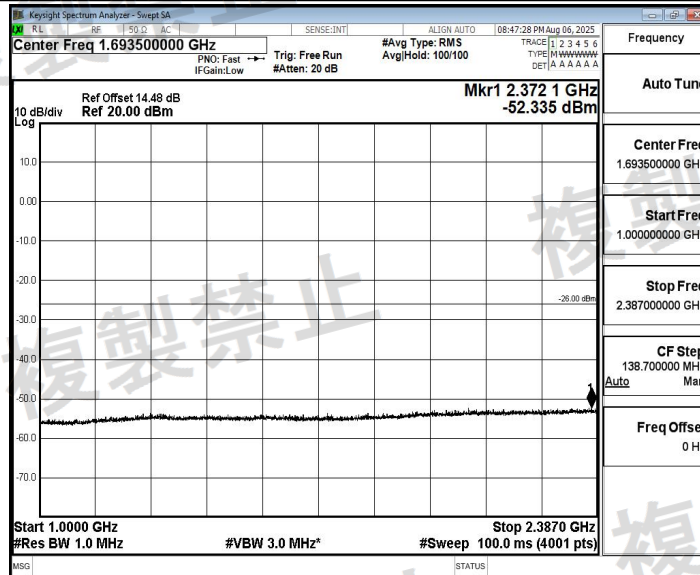
NTNV_3DH5_Ant1_2402_2496.5~13000



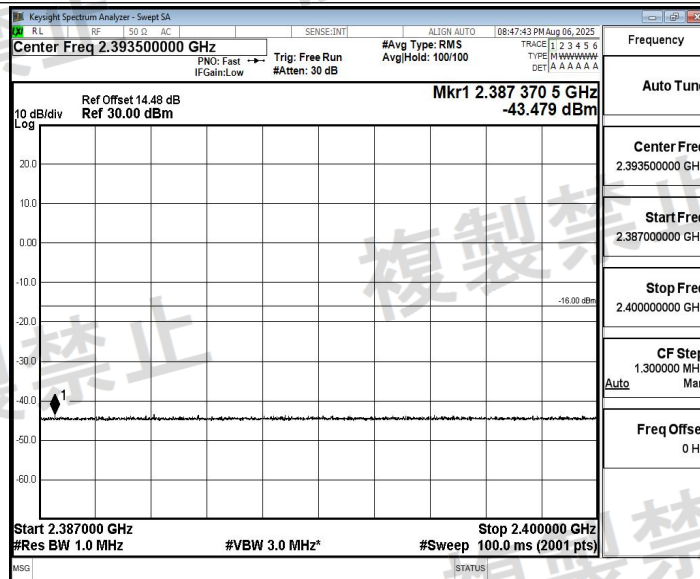
NTNV_3DH5_Ant1_2441_30~1000



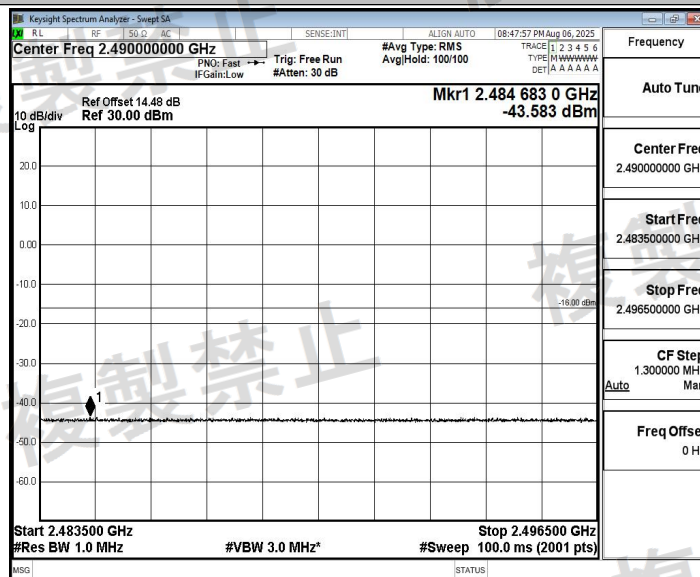
NTNV_3DH5_Ant1_2441_1000~2387



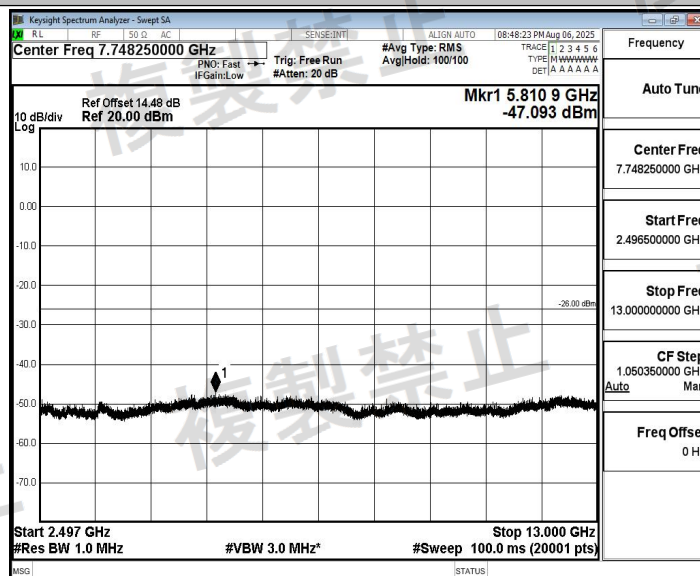
NTNV_3DH5_Ant1_2441_2387~2400



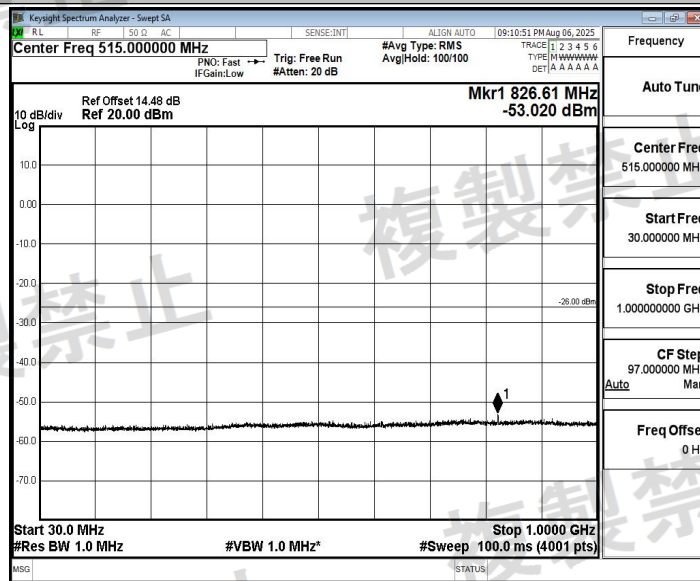
NTNV_3DH5_Ant1_2441_2483.5~2496.5



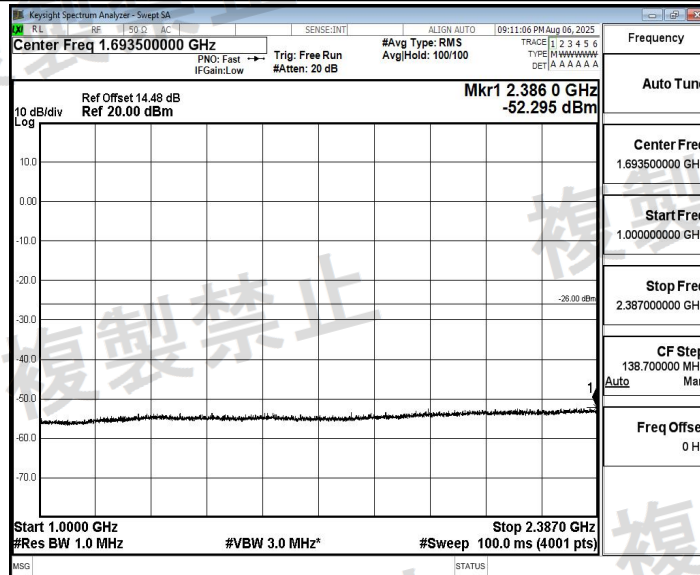
NTNV_3DH5_Ant1_2441_2496.5~13000



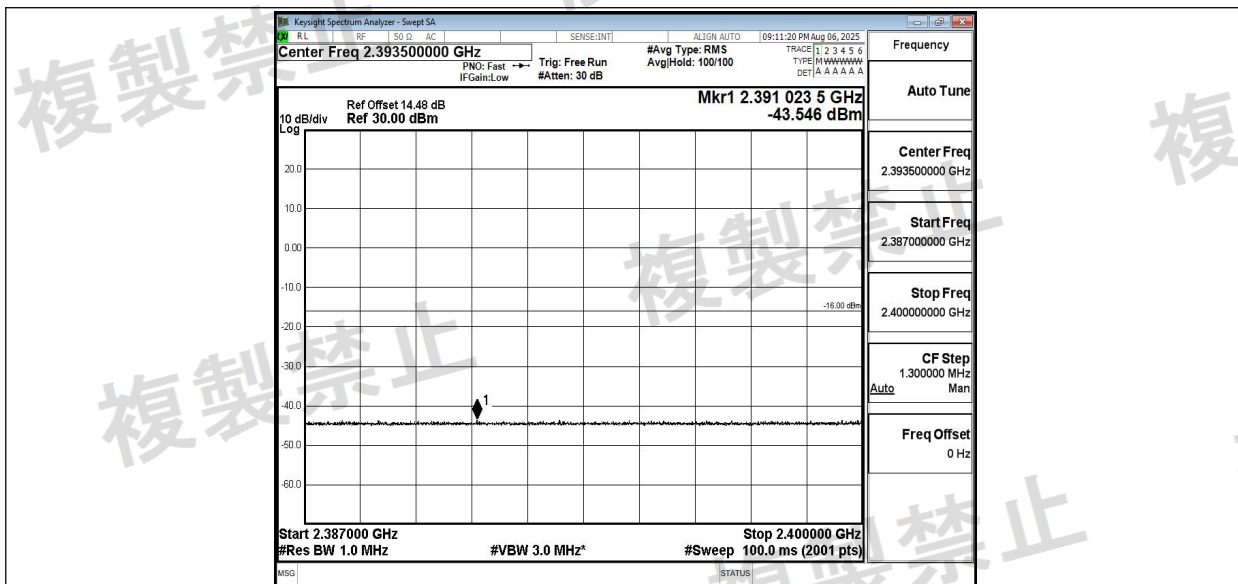
NTNV_3DH5_Ant1_2480_30~1000



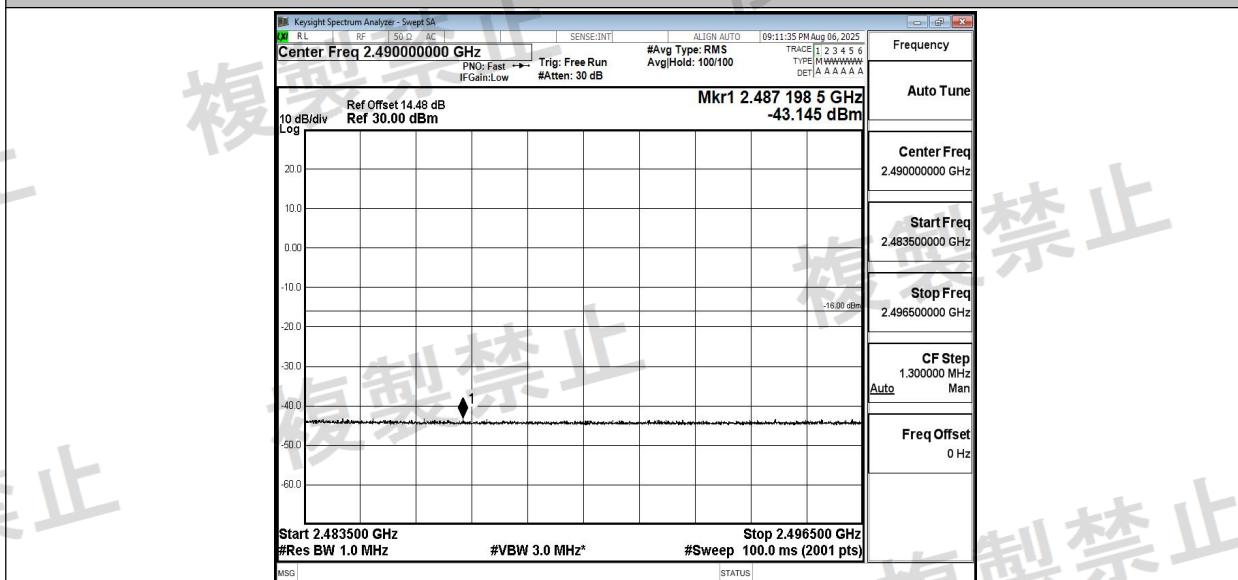
NTNV_3DH5_Ant1_2480_1000~2387



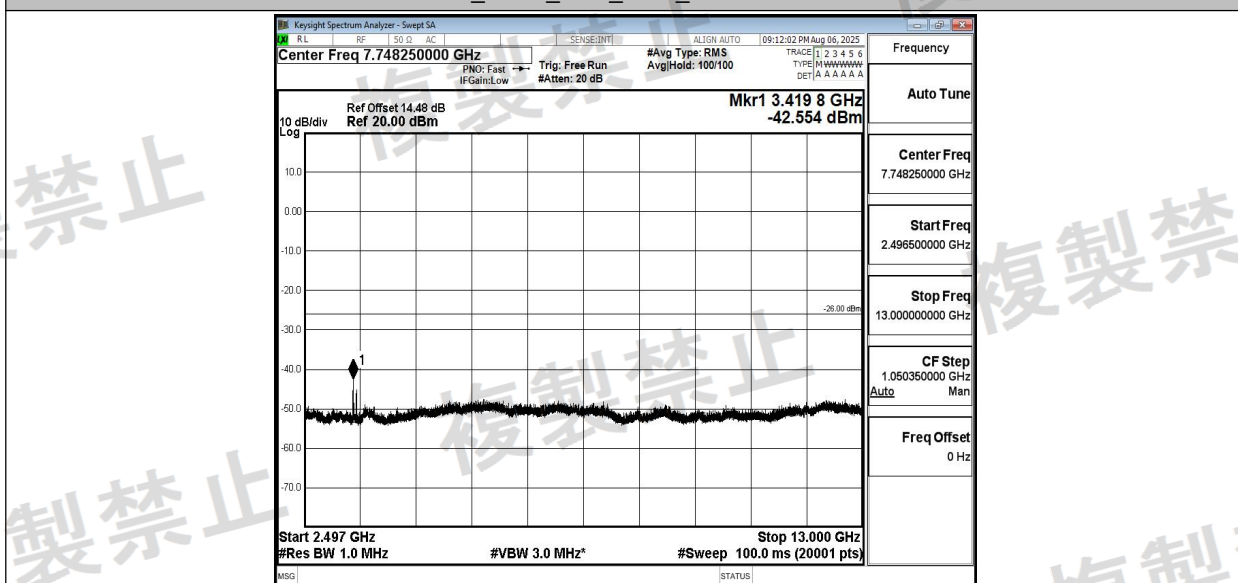
NTNV_3DH5_Ant1_2480_2387~2400



NTNV_3DH5_Ant1_2480_2496.5



NTNV_3DH5_Ant1_2480_2496.5~13000



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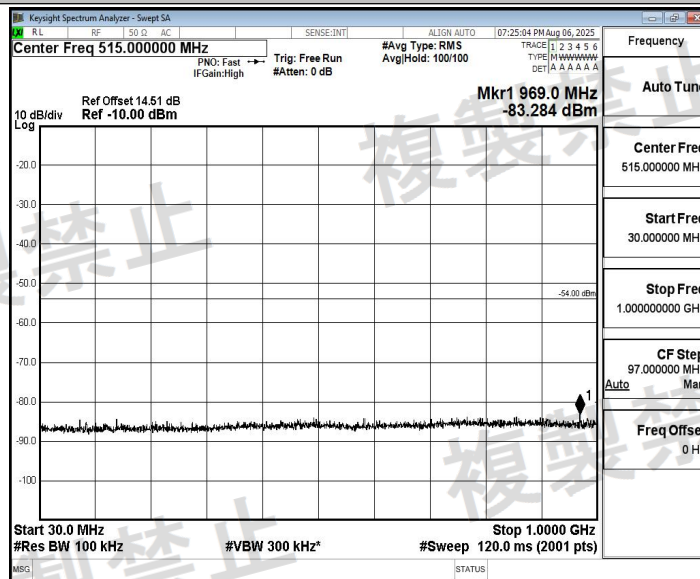
A.6 Spurious Emission of RX

Test Result

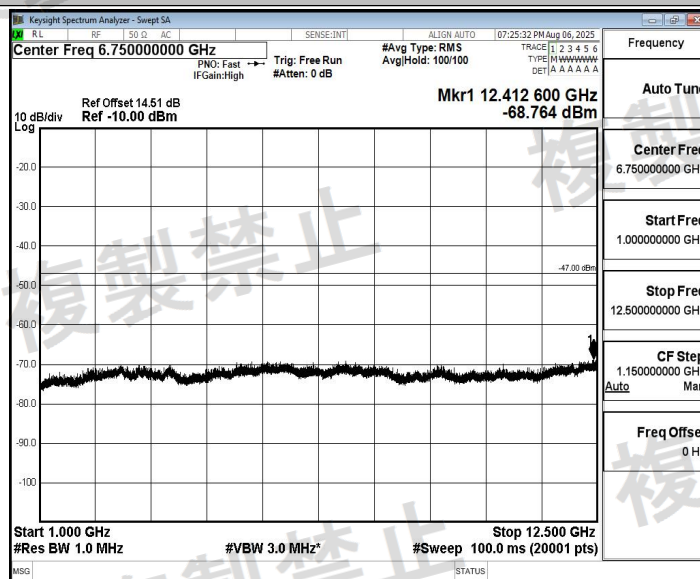
TestCondition	TestMode	Antenna	Frequency [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	DH5	Ant1	2402	30~1000	-83.28	≤-54	0.00470	≤4	PASS
				1000~12500	-68.76	≤-47	0.13305	≤20	PASS
			2441	30~1000	-83.29	≤-54	0.00469	≤4	PASS
				1000~12500	-68.65	≤-47	0.13646	≤20	PASS
			2480	30~1000	-83.54	≤-54	0.00443	≤4	PASS
				1000~12500	-68.88	≤-47	0.12942	≤20	PASS
	2DH5	Ant1	2402	30~1000	-83.72	≤-54	0.00425	≤4	PASS
				1000~12500	-68.48	≤-47	0.14191	≤20	PASS
			2441	30~1000	-82.61	≤-54	0.00548	≤4	PASS
				1000~12500	-69.03	≤-47	0.12503	≤20	PASS
			2480	30~1000	-83.24	≤-54	0.00474	≤4	PASS
				1000~12500	-68.73	≤-47	0.13397	≤20	PASS
	3DH5	Ant1	2402	30~1000	-82.81	≤-54	0.00524	≤4	PASS
				1000~12500	-68.49	≤-47	0.14158	≤20	PASS
			2441	30~1000	-83.95	≤-54	0.00403	≤4	PASS
				1000~12500	-68.71	≤-47	0.13459	≤20	PASS
			2480	30~1000	-79.35	≤-54	0.01161	≤4	PASS
				1000~12500	-68.35	≤-47	0.14622	≤20	PASS

Test Graphs

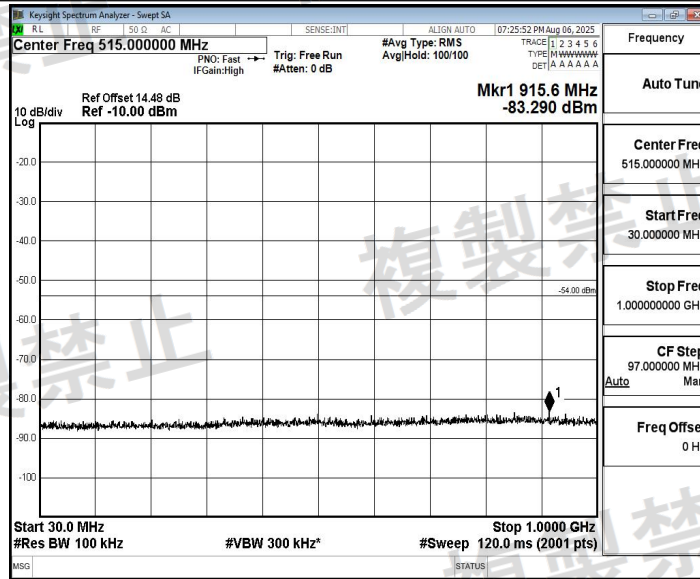
NTNV_DH5_Ant1_2402_30~1000



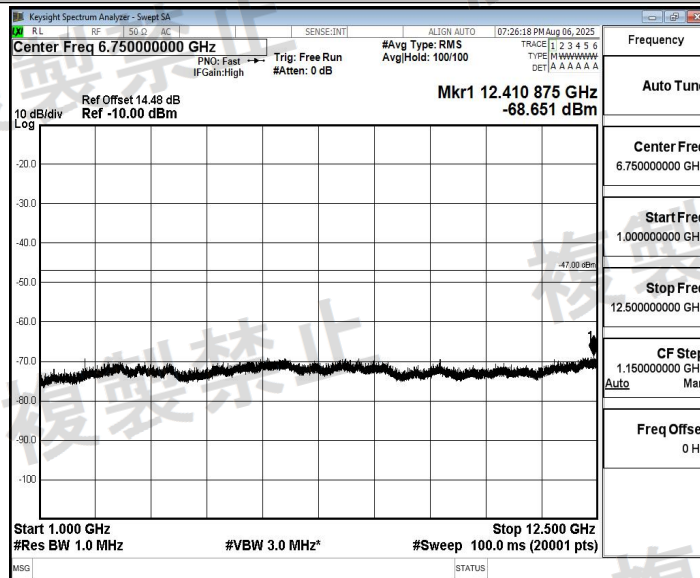
NTNV_DH5_Ant1_2402_1000~12500



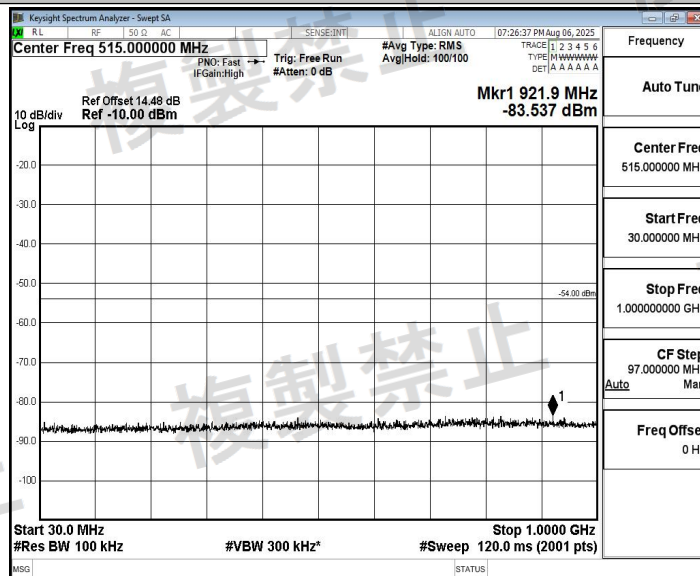
NTNV_DH5_Ant1_2441_30~1000



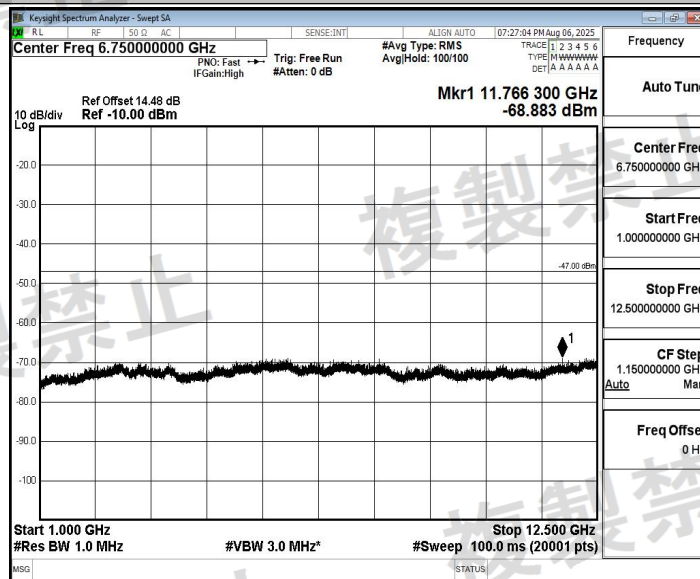
NTNV_DH5_Ant1_2441_1000~12500



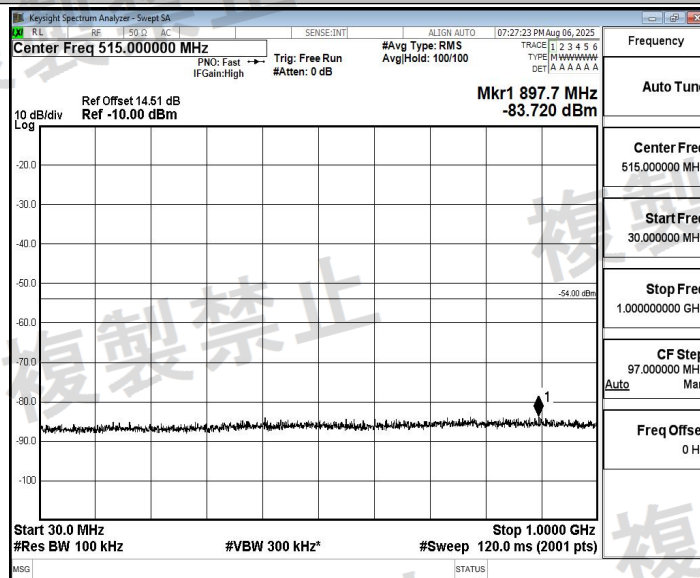
NTNV_DH5_Ant1_2480_30~1000



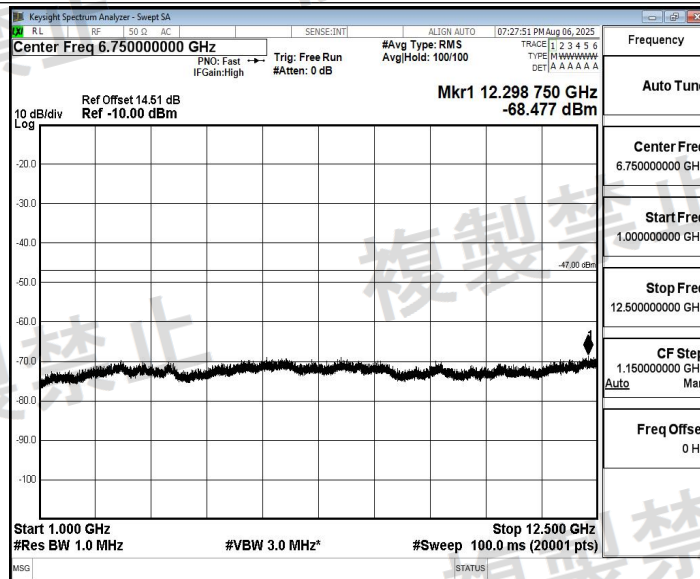
NTNV_DH5_Ant1_2480_1000~12500



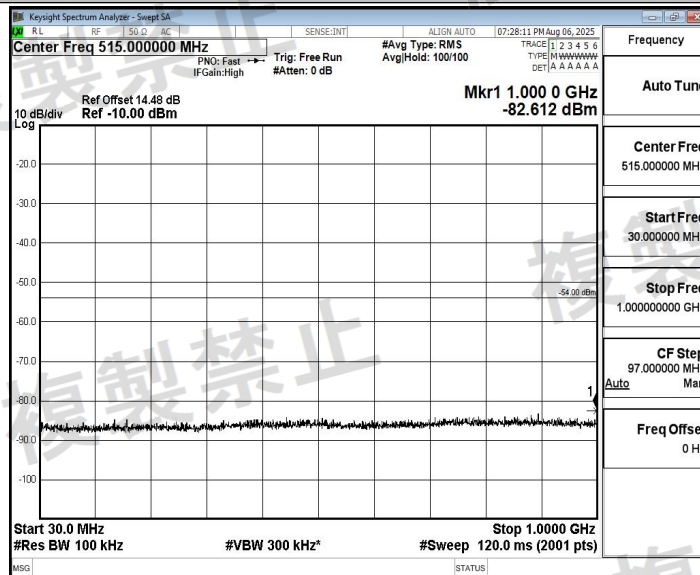
NTNV_2DH5_Ant1_2402_30~1000



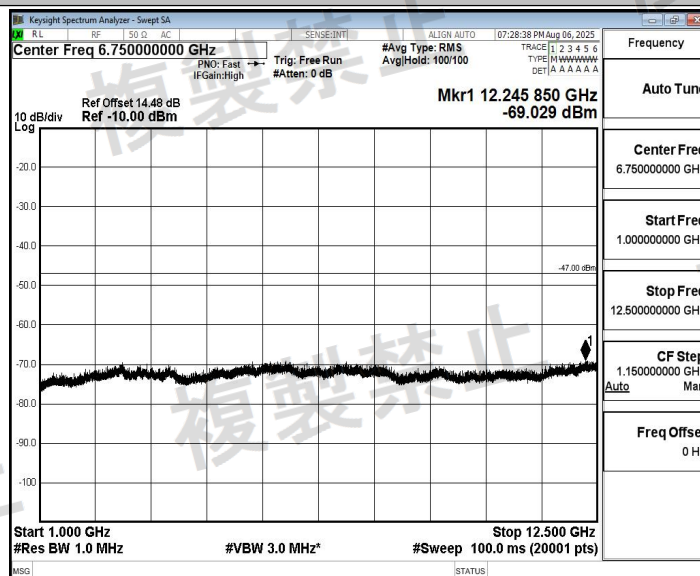
NTNV_2DH5_Ant1_2402_1000~12500



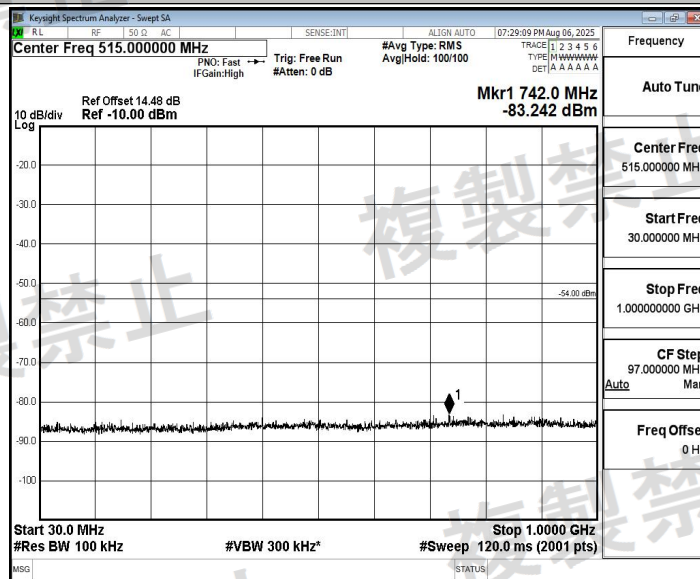
NTNV_2DH5_Ant1_2441_30~1000



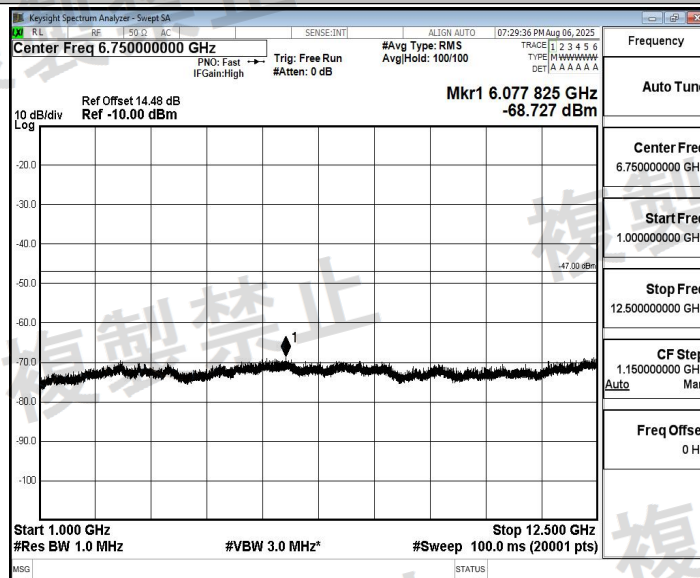
NTNV_2DH5_Ant1_2441_1000~12500



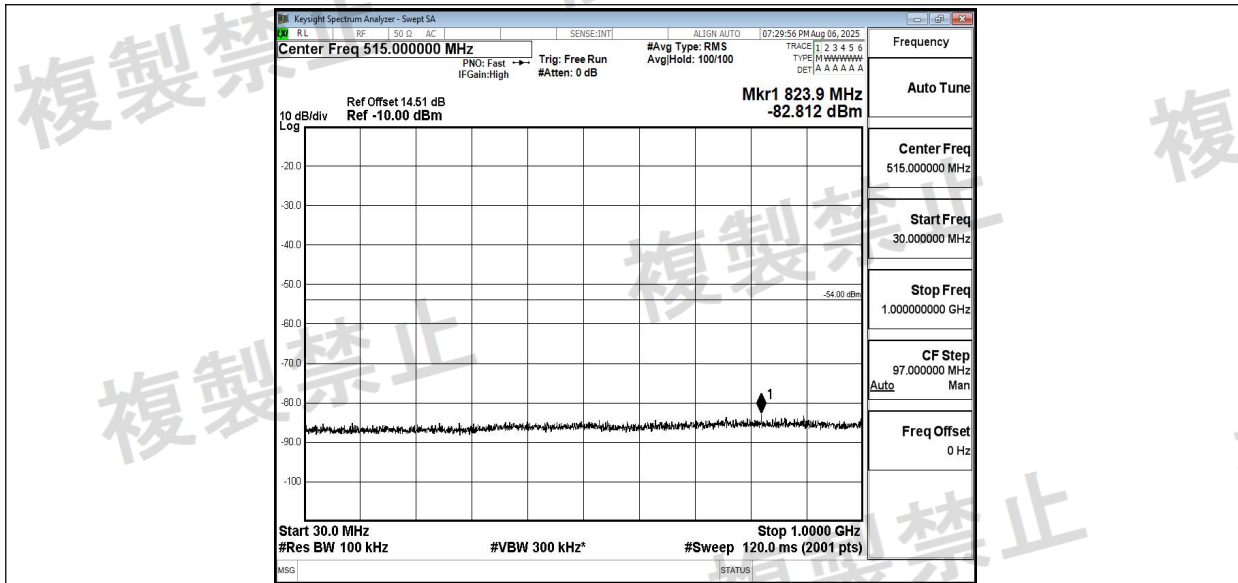
NTNV_2DH5_Ant1_2480_30~1000



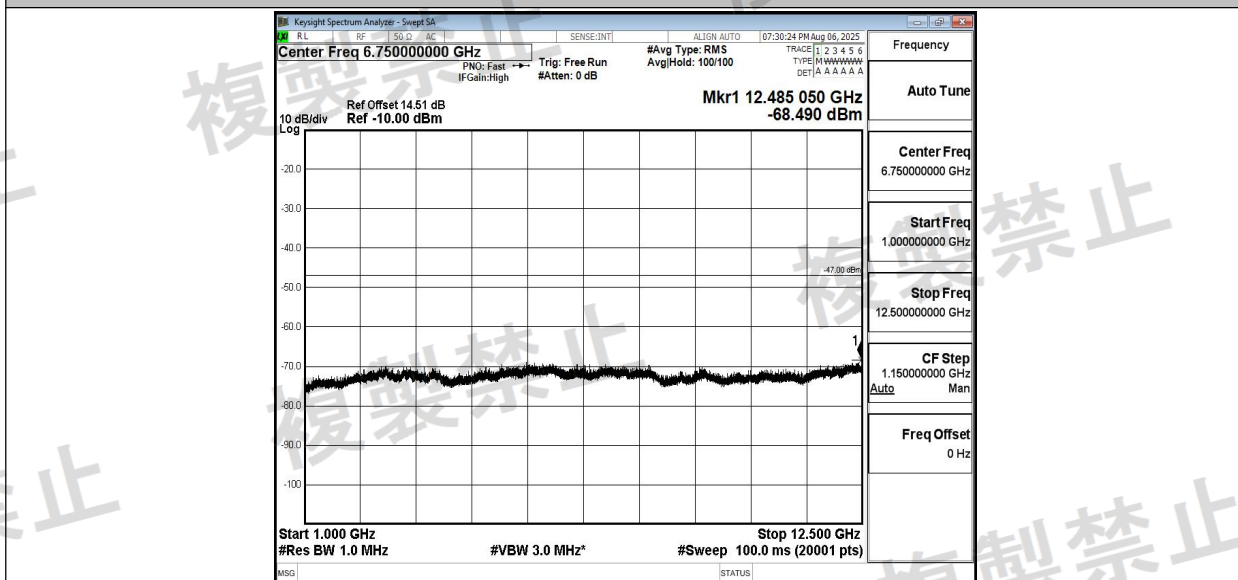
NTNV_2DH5_Ant1_2480_1000~12500



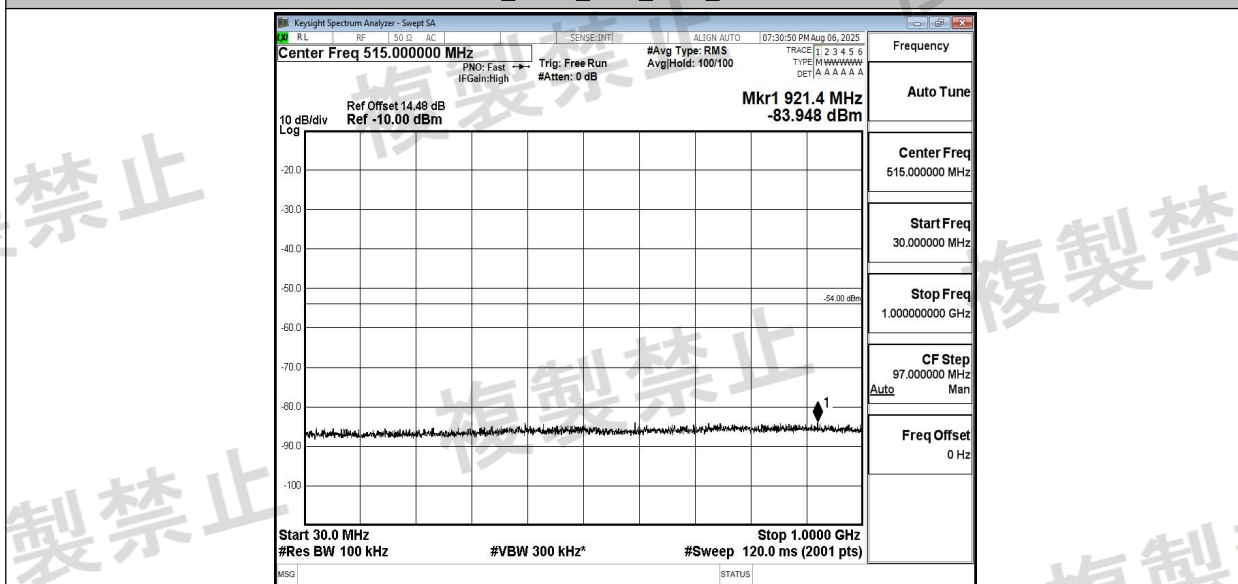
NTNV_3DH5_Ant1_2402_30~1000



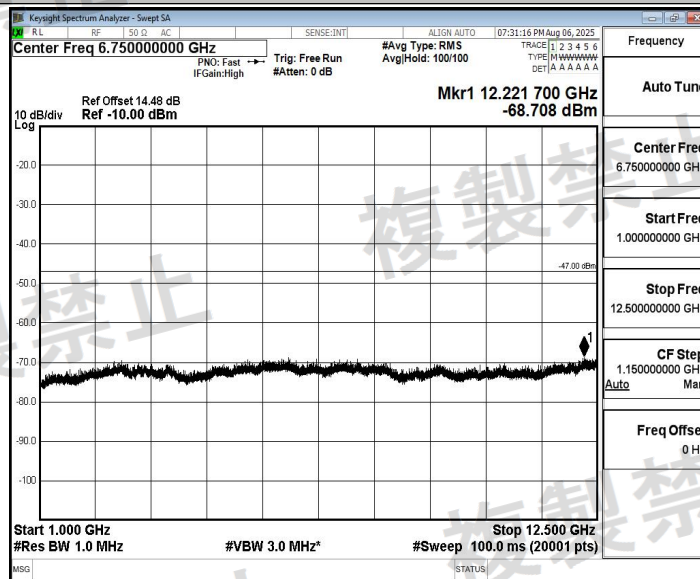
NTNV_3DH5_Ant1_2402_1000~12500



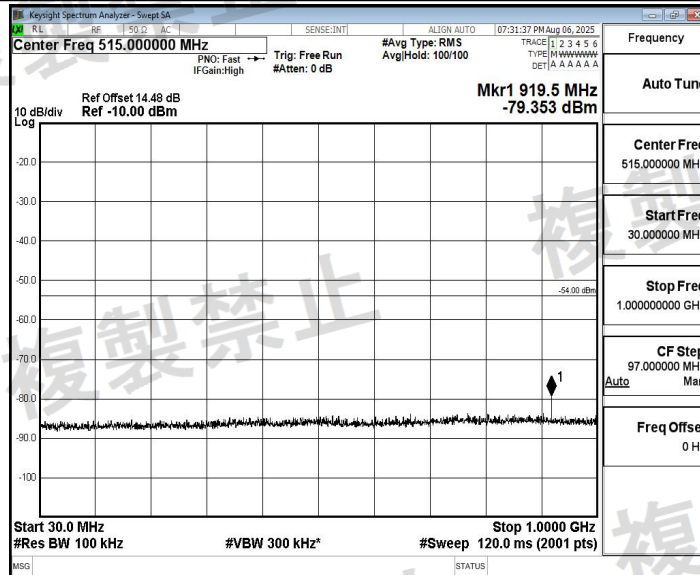
NTNV_3DH5_Ant1_2441_30~1000



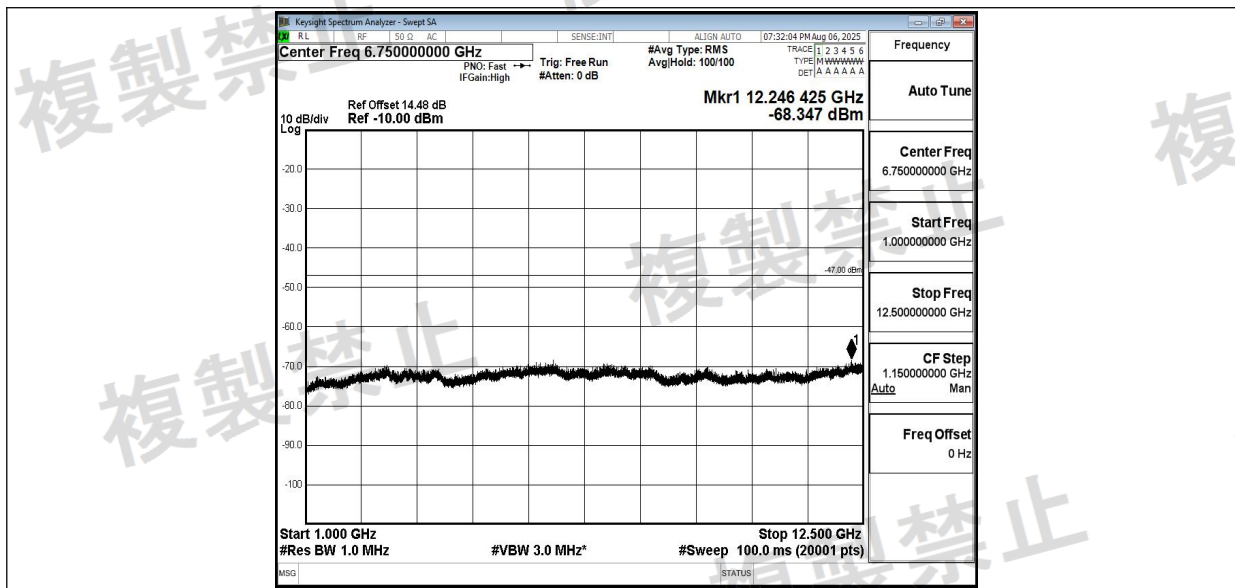
NTNV_3DH5_Ant1_2441_1000~12500



NTNV_3DH5_Ant1_2480_30~1000



NTNV_3DH5_Ant1_2480_1000~12500



A.7 Dwell Time

Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit [s]	Verdict
NTNV	DH5	Ant1	Hop	2.89	110	0.318	≤0.4	PASS
	2DH5	Ant1	Hop	2.89	110	0.318	≤0.4	PASS
	3DH5	Ant1	Hop	2.89	110	0.318	≤0.4	PASS

Test Graphs

