



Appendix A for BT Test Data

Product Name: Smart Watch Tough

Test Model: GH-SMWGD

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Jerry Chu
Supervised by:	Nick Peng





A.1 Frequency_Error

Test Result

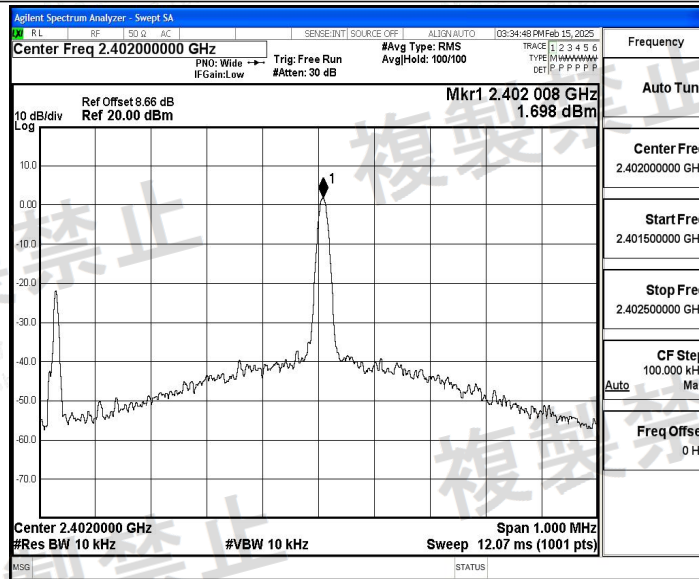
TestCondition	TestMode	Antenna	Frequency[MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	Frequency_Error	Ant1	2402	3.33056	±50	PASS
			2441	3.27735	±50	PASS
			2480	3.22581	±50	PASS



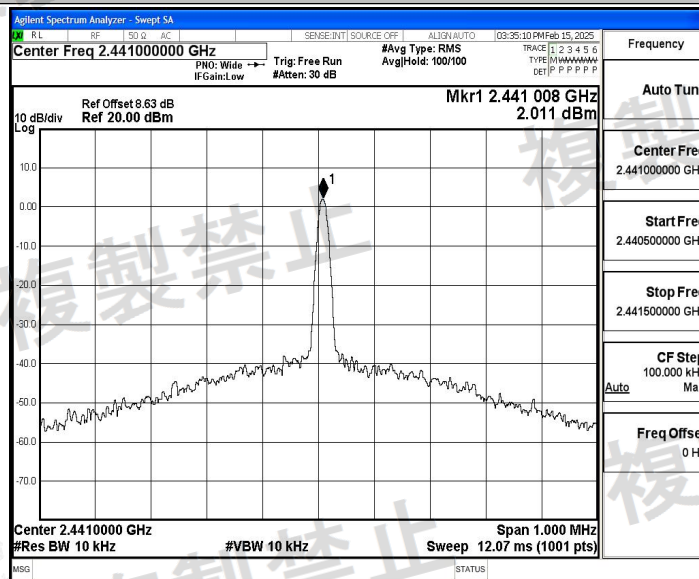


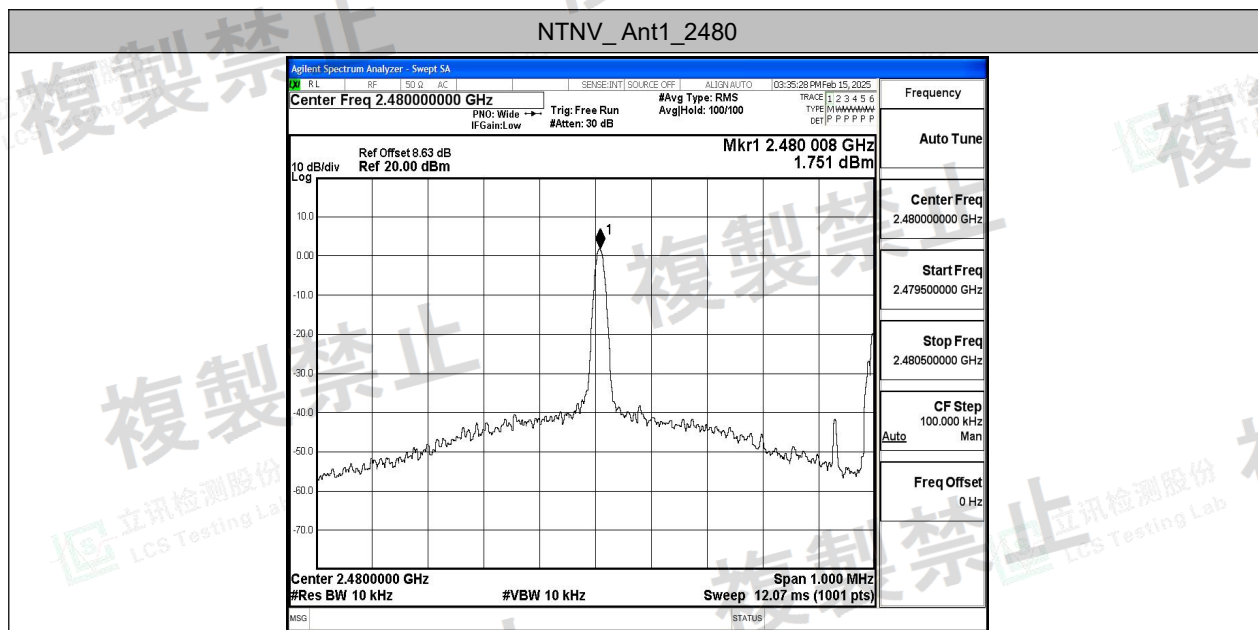
Test Graphs

NTNV_Ant1_2402



NTNV_Ant1_2441





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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)	0.02	0.66	1.164	0.021	3	5.00%	+20%
Hopping-Tx (2Mbps)	0.02	0.55	1.135	0.021	3	5.00%	+20%
Hopping-Tx (3Mbps)	0.02	0.49	1.119	0.020	3	5.00%	+20%
Conclusion: PASS							

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

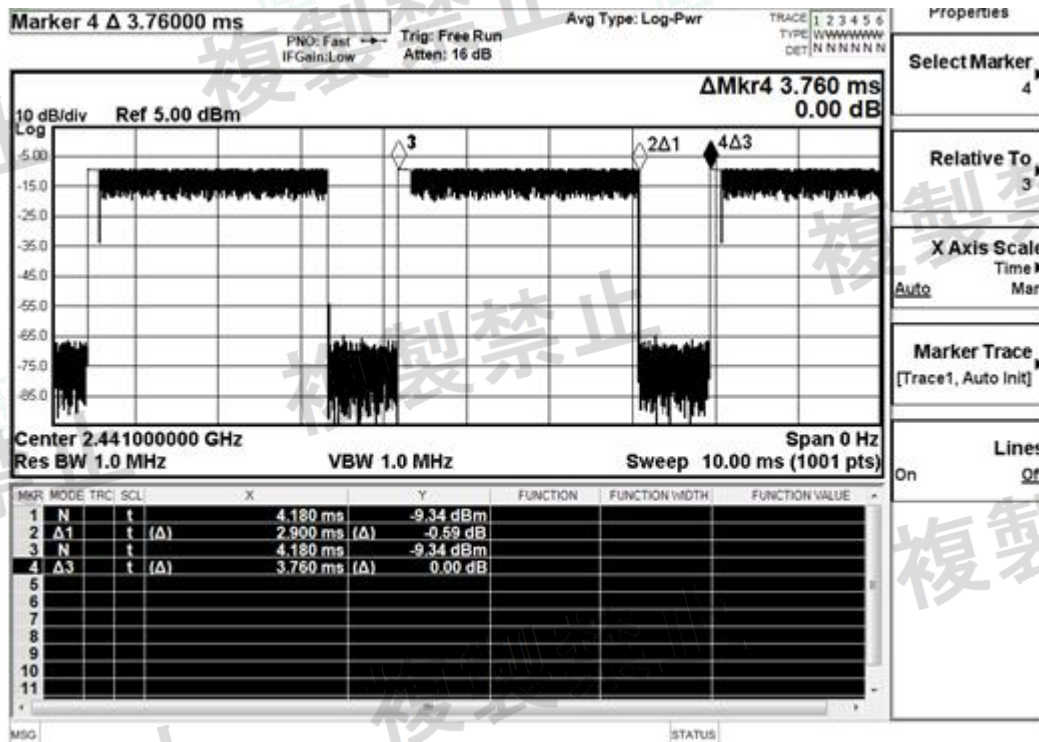
Antenna power Result = Measured Power / Spreading bandwidth

Spread Bandwidth (DH5) = 71.294MHz, Spread Bandwidth (2DH5) = 71.422MHz,

Spread Bandwidth (3DH5) = 71.437MHz

Duty cycle=77.1%

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



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A.3 Occupied Bandwidth

Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	2402	0.869	≤83.5	PASS
			2441	0.868	≤83.5	PASS
			2480	0.866	≤83.5	PASS
	2DH5	Ant1	2402	1.170	≤83.5	PASS
			2441	1.172	≤83.5	PASS
			2480	1.169	≤83.5	PASS
	3DH5	Ant1	2402	1.166	≤83.5	PASS
			2441	1.168	≤83.5	PASS
			2480	1.164	≤83.5	PASS

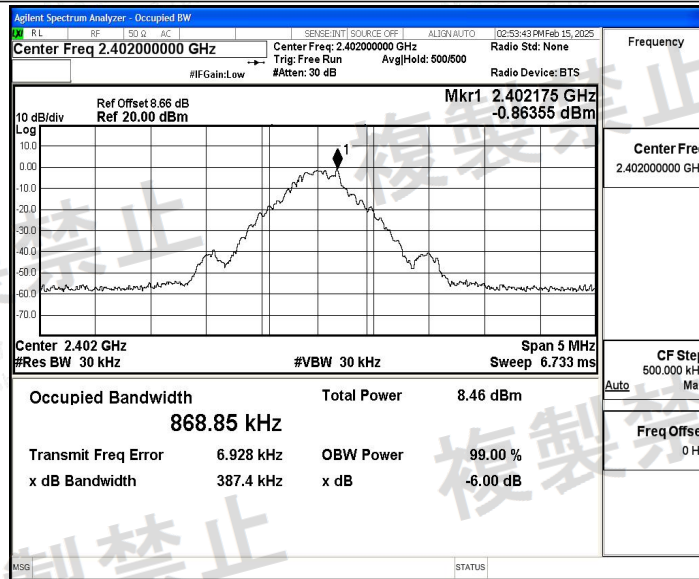
TestCondition	TestMode	Antenna	Frequency[MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	78.707	≤83.5	PASS
	2DH5	Ant1	Hop	78.720	≤83.5	PASS
	3DH5	Ant1	Hop	78.740	≤83.5	PASS



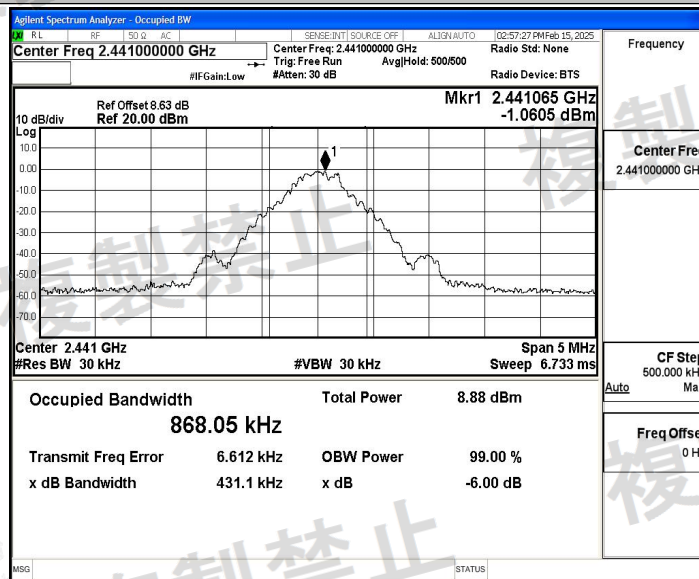


Test Graphs

NTNV_DH5_Ant1_2402



NTNV_DH5_Ant1_2441



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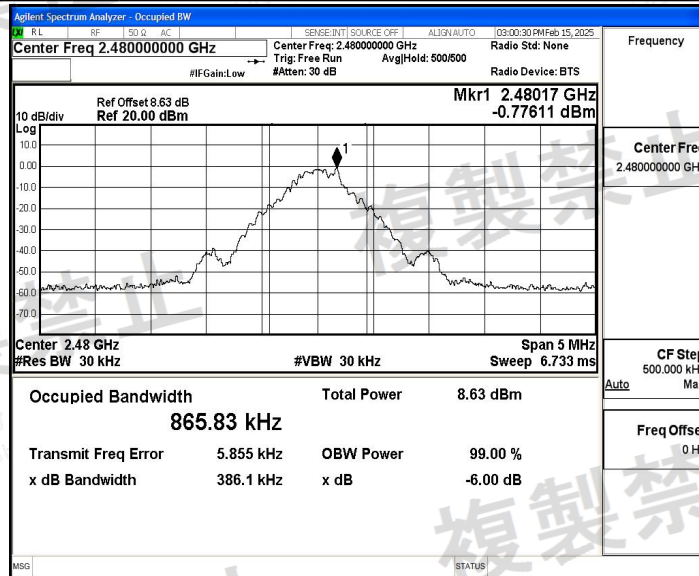
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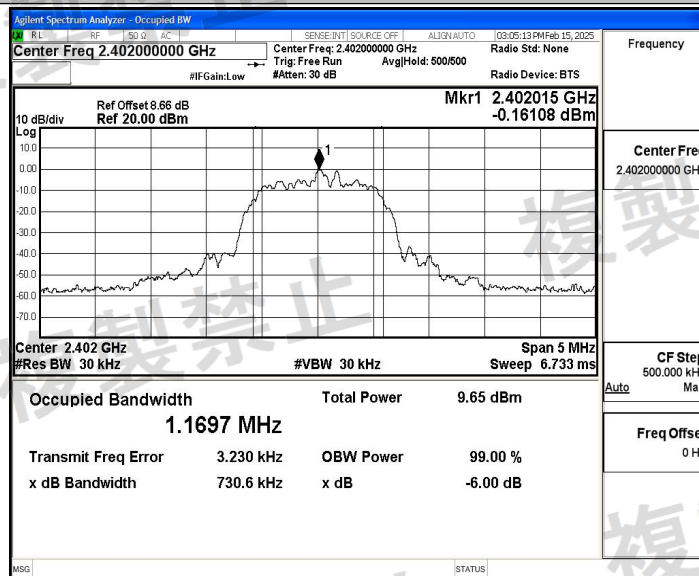
Scan code to check authenticity



NTNV_DH5_Ant1_2480



NTNV_2DH5_Ant1_2402



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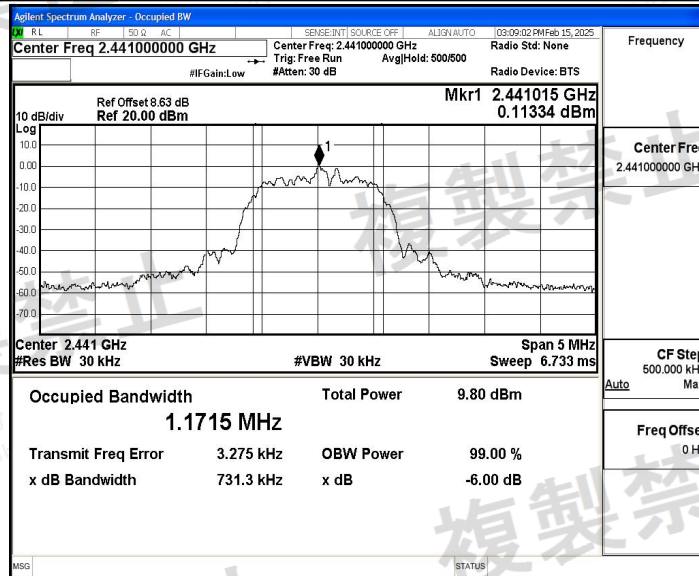
Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

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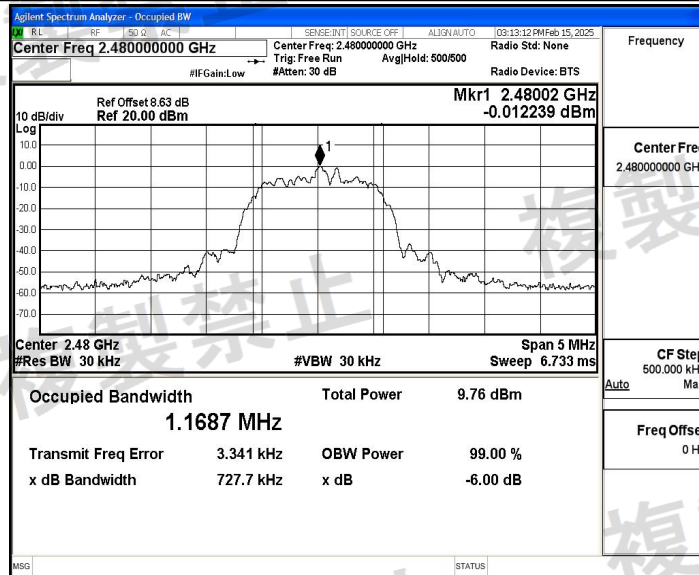
Scan code to check authenticity



NTNV_2DH5_Ant1_2441

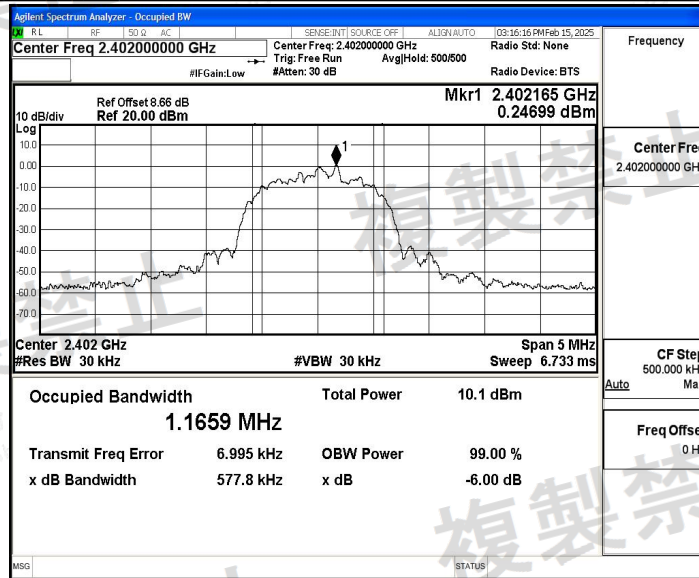


NTNV_2DH5_Ant1_2480

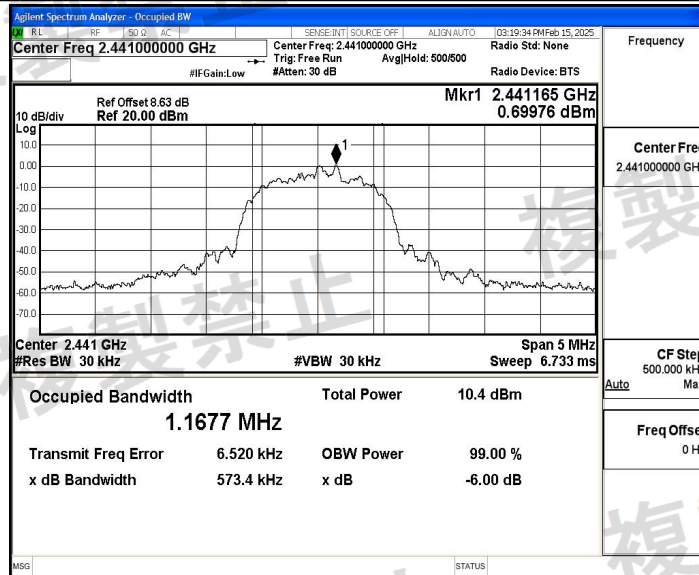


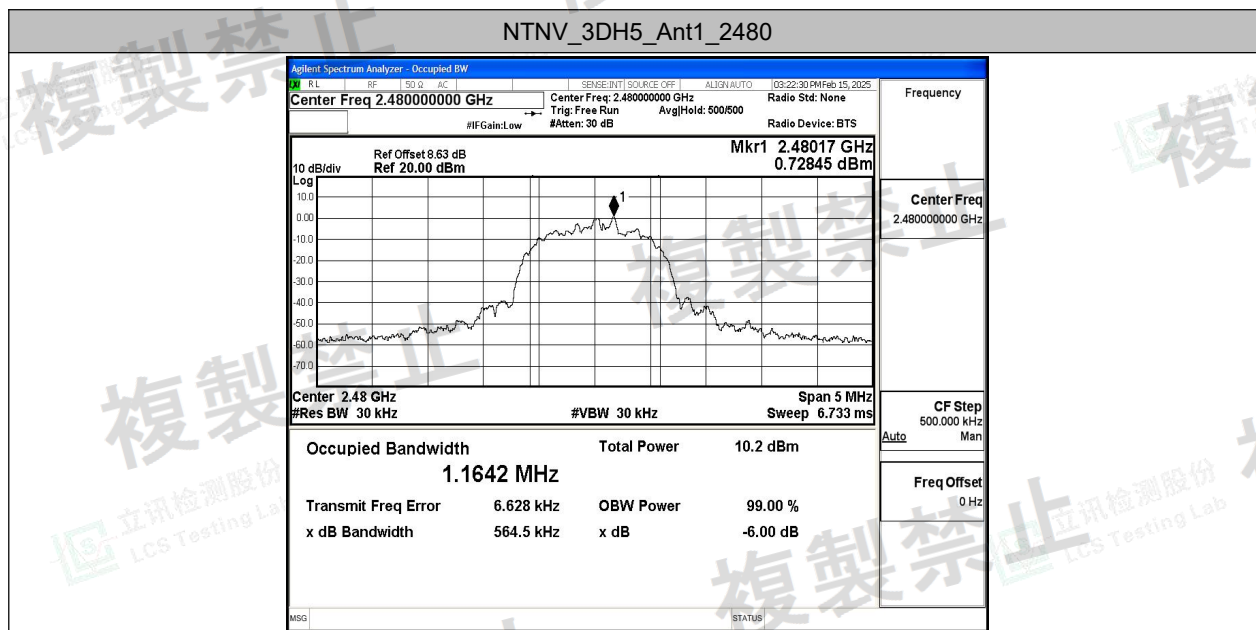


NTNV_3DH5_Ant1_2402



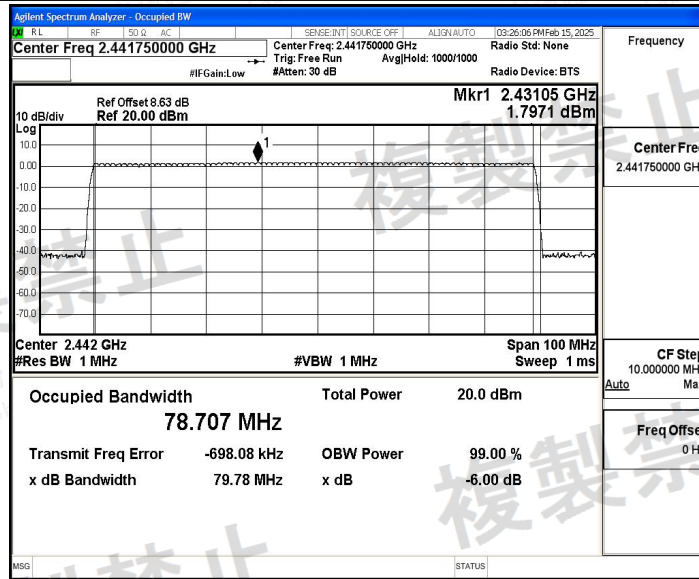
NTNV_3DH5_Ant1_2441



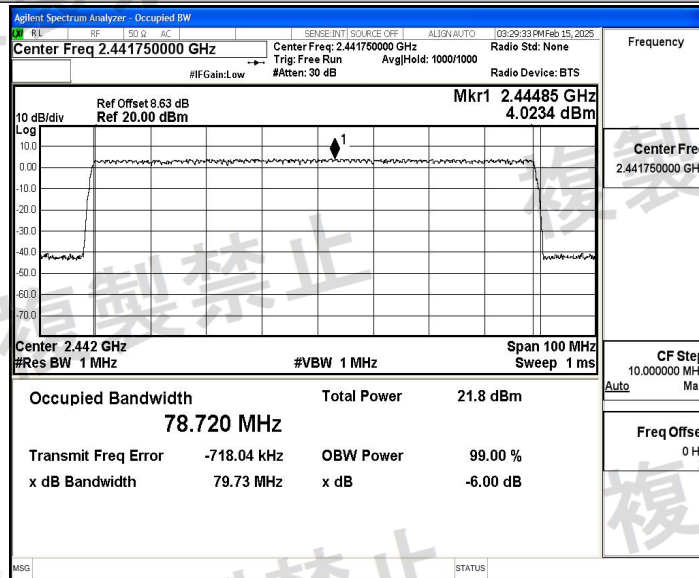


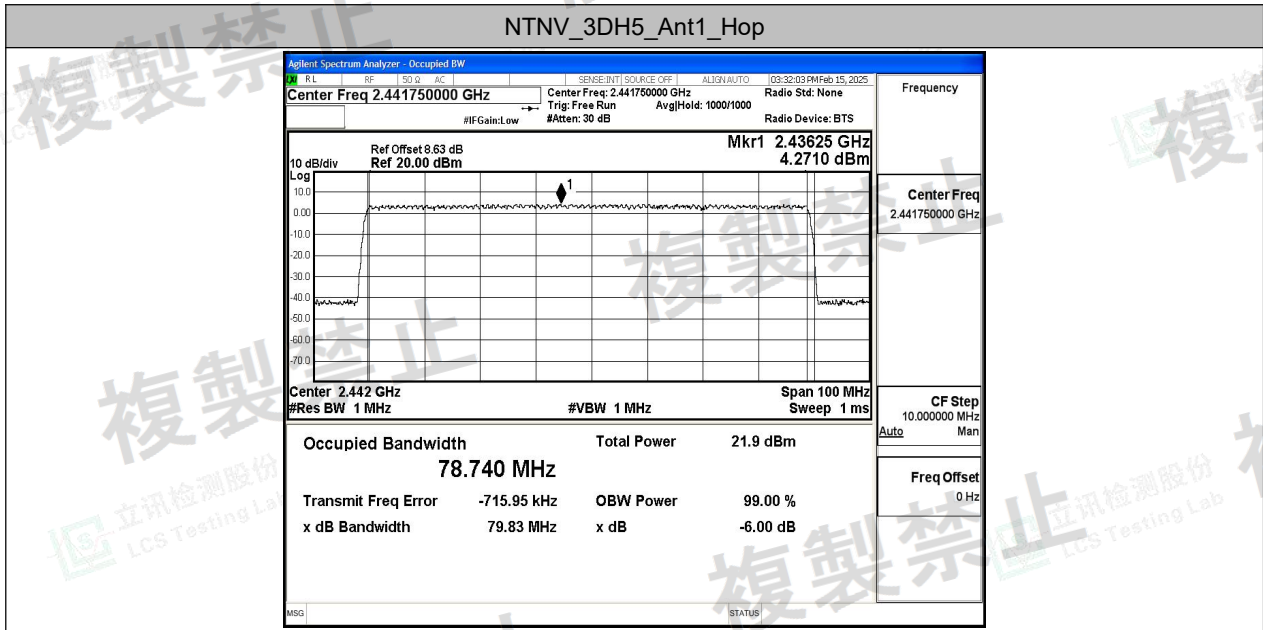


NTNV_DH5_Ant1_Hop



NTNV_2DH5_Ant1_Hop







A.4 Spread Bandwidth

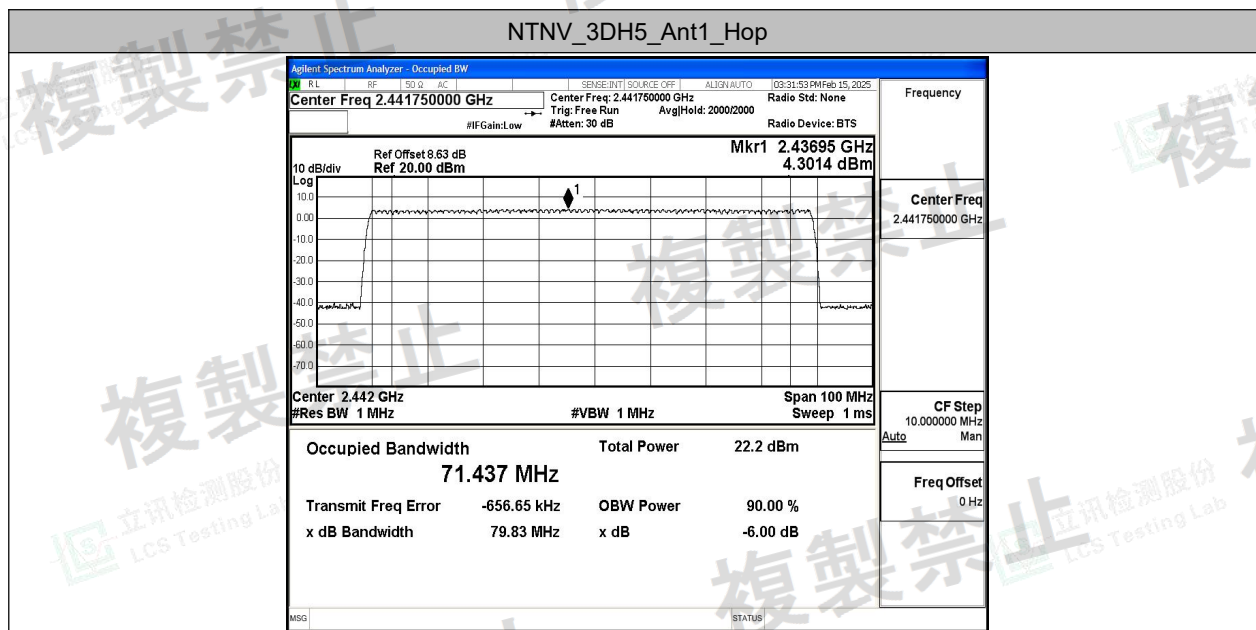
Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	71.294	---	PASS
	2DH5	Ant1	Hop	71.422	---	PASS
	3DH5	Ant1	Hop	71.437	---	PASS



Test Graphs





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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	-59.70	≤-26	0.00107	≤2.5	PASS
				1000~2387	-49.47	≤-26	0.01130	≤2.5	PASS
				2387~2400	-44.39	≤-16	0.03639	≤25	PASS
				2483.5~2496.5	-49.08	≤-16	0.01236	≤25	PASS
				2496.5~13000	-51.25	≤-26	0.00750	≤2.5	PASS
			2441	30~1000	-59.61	≤-26	0.00109	≤2.5	PASS
				1000~2387	-40.71	≤-26	0.08492	≤2.5	PASS
				2387~2400	-49.24	≤-16	0.01191	≤25	PASS
				2483.5~2496.5	-49.11	≤-16	0.01227	≤25	PASS
				2496.5~13000	-49.25	≤-26	0.01189	≤2.5	PASS
		2480	2480	30~1000	-59.66	≤-26	0.00108	≤2.5	PASS
				1000~2387	-58.32	≤-26	0.00147	≤2.5	PASS
				2387~2400	-49.17	≤-16	0.01211	≤25	PASS
				2483.5~2496.5	-49.03	≤-16	0.01250	≤25	PASS
				2496.5~13000	-50.69	≤-26	0.00853	≤2.5	PASS
	2DH5	Ant1	2402	30~1000	-58.36	≤-26	0.00146	≤2.5	PASS
				1000~2387	-51.43	≤-26	0.00719	≤2.5	PASS
				2387~2400	-35.87	≤-16	0.25882	≤25	PASS
				2483.5~2496.5	-48.74	≤-16	0.01337	≤25	PASS
				2496.5~13000	-51.14	≤-26	0.00769	≤2.5	PASS
			2441	30~1000	-59.03	≤-26	0.00125	≤2.5	PASS
				1000~2387	-41.70	≤-26	0.06761	≤2.5	PASS
				2387~2400	-49.15	≤-16	0.01216	≤25	PASS
				2483.5~2496.5	-48.85	≤-16	0.01303	≤25	PASS
				2496.5~13000	-49.16	≤-26	0.01213	≤2.5	PASS
		2480	2480	30~1000	-57.53	≤-26	0.00177	≤2.5	PASS
				1000~2387	-43.20	≤-26	0.04786	≤2.5	PASS
				2387~2400	-49.05	≤-16	0.01245	≤25	PASS
				2483.5~2496.5	-48.84	≤-16	0.01306	≤25	PASS
				2496.5~13000	-51.53	≤-26	0.00703	≤2.5	PASS
	3DH5	Ant1	2402	30~1000	-58.27	≤-26	0.00149	≤2.5	PASS
				1000~2387	-48.91	≤-26	0.01285	≤2.5	PASS
				2387~2400	-35.97	≤-16	0.25293	≤25	PASS
				2483.5~2496.5	-49.05	≤-16	0.01245	≤25	PASS
				2496.5~13000	-51.45	≤-26	0.00716	≤2.5	PASS
			2441	30~1000	-59.33	≤-26	0.00117	≤2.5	PASS



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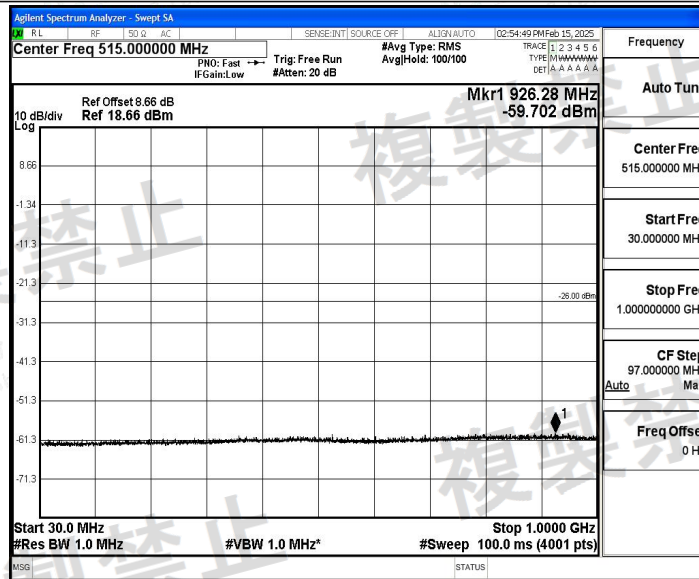
			1000~2387	-51.84	≤-26	0.00655	≤2.5	PASS
			2387~2400	-49.10	≤-16	0.01230	≤25	PASS
			2483.5~2496.5	-49.03	≤-16	0.01250	≤25	PASS
			2496.5~13000	-51.50	≤-26	0.00708	≤2.5	PASS
		2480	30~1000	-58.32	≤-26	0.00147	≤2.5	PASS
			1000~2387	-54.32	≤-26	0.00370	≤2.5	PASS
			2387~2400	-49.25	≤-16	0.01189	≤25	PASS
			2483.5~2496.5	-48.88	≤-16	0.01294	≤25	PASS
			2496.5~13000	-51.70	≤-26	0.00676	≤2.5	PASS



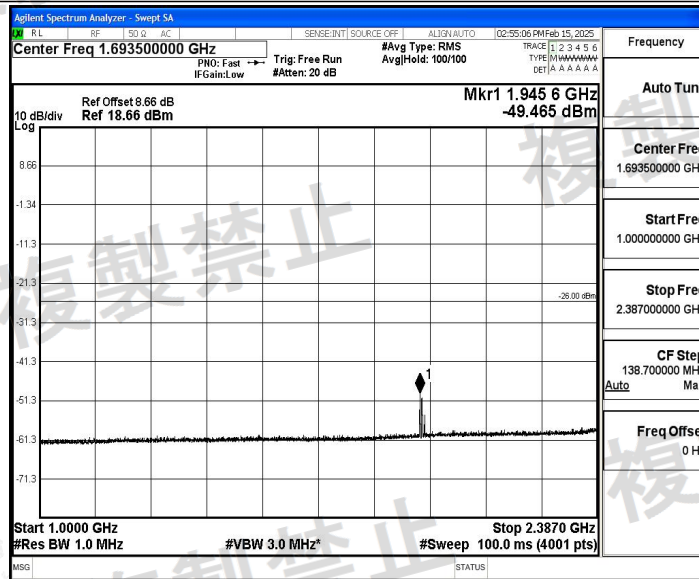


Test Graphs

NTNV_DH5_Ant1_2402_30~1000

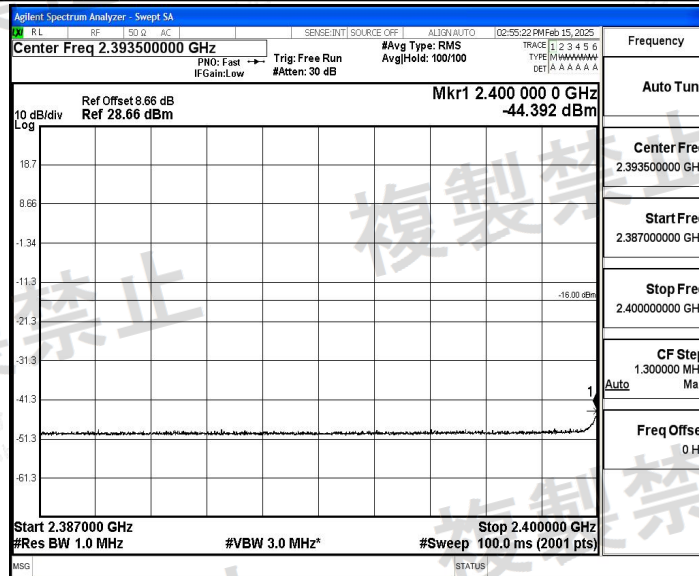


NTNV_DH5_Ant1_2402_1000~2387

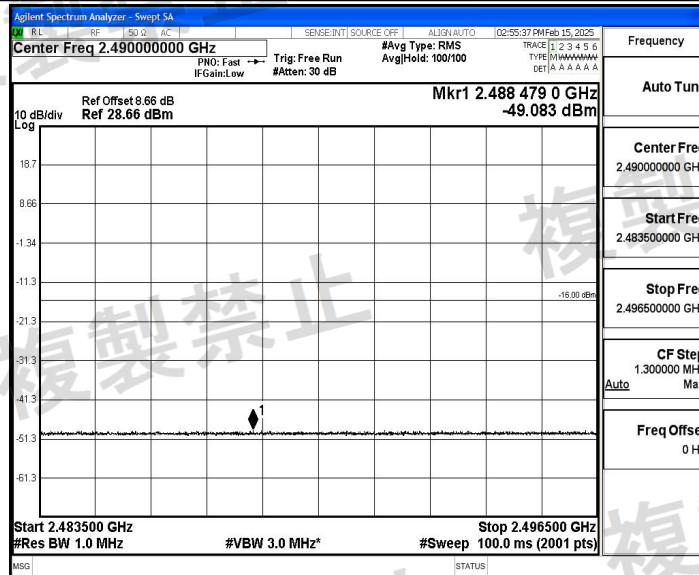




NTNV_DH5_Ant1_2402_2387~2400

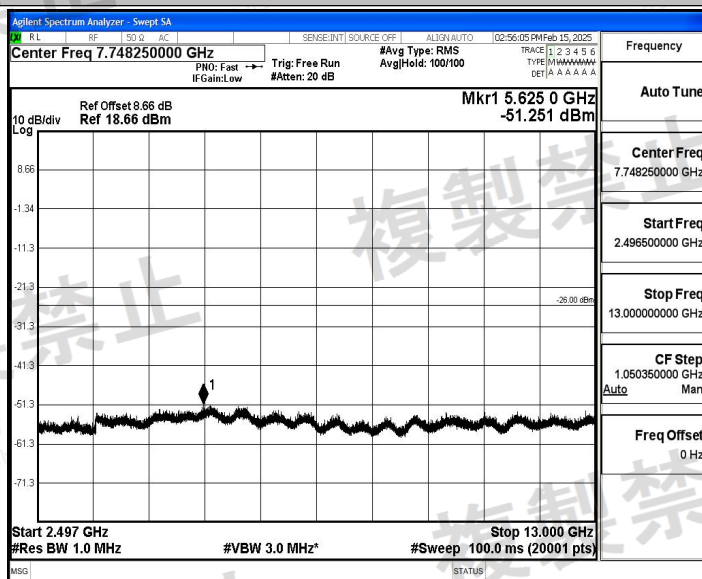


NTNV_DH5_Ant1_2402_2483.5~2496.5

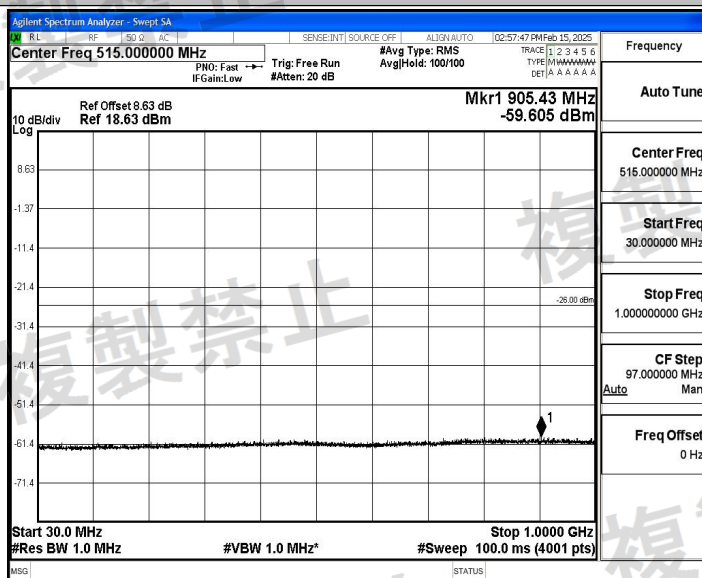




NTNV_DH5_Ant1_2402_2496.5~13000

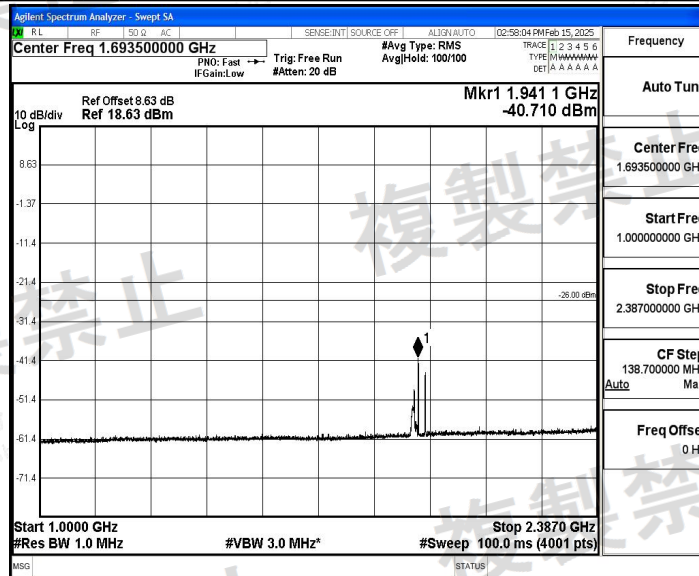


NTNV_DH5_Ant1_2441_30~1000

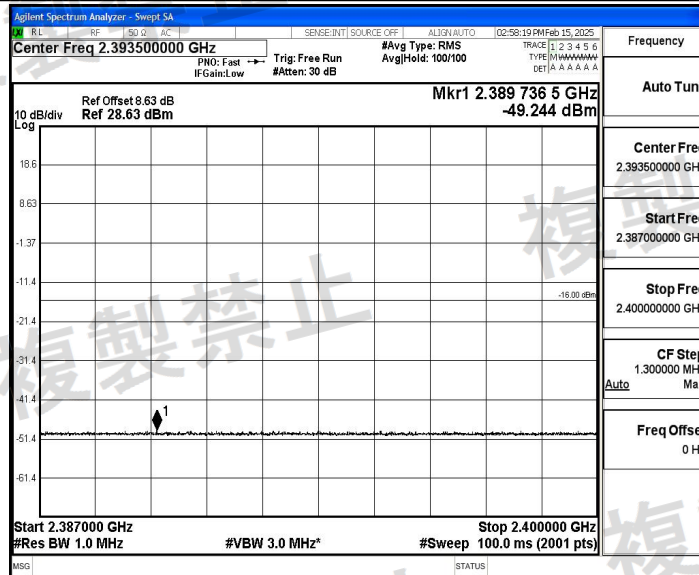




NTNV_DH5_Ant1_2441_1000~2387

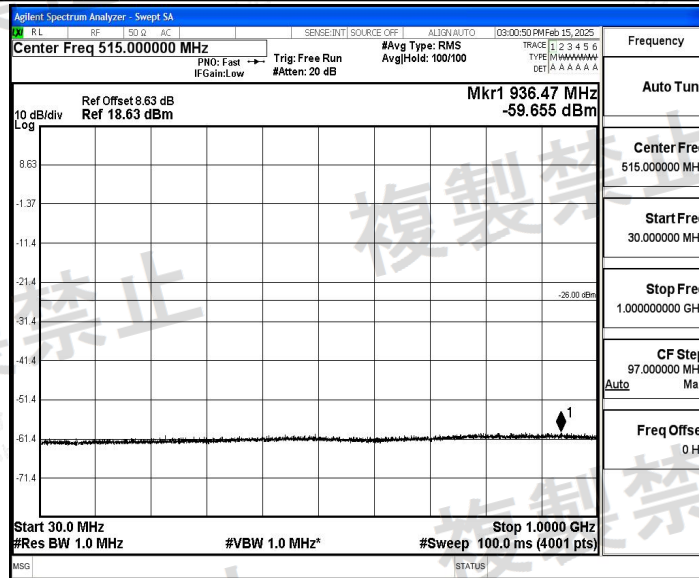


NTNV_DH5_Ant1_2441_2387~2400

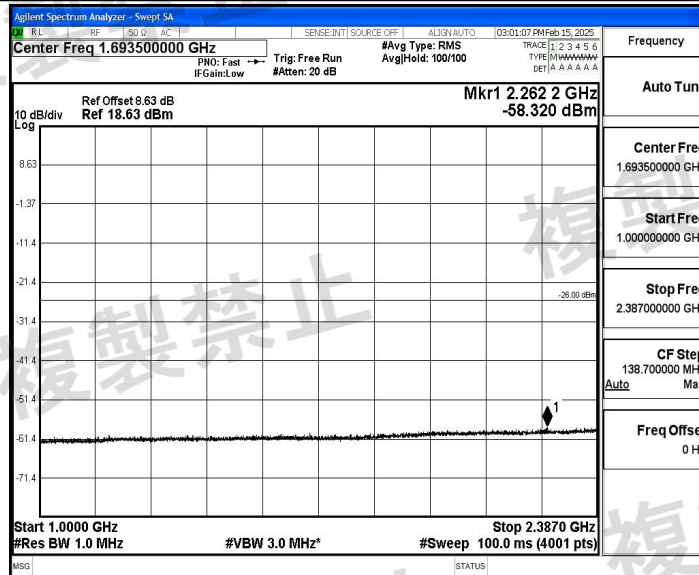




NTNV_DH5_Ant1_2480_30~1000

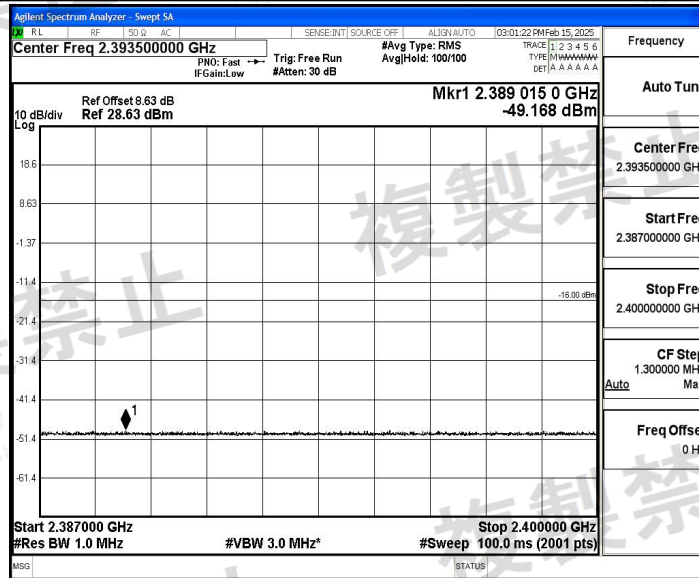


NTNV_DH5_Ant1_2480_1000~2387

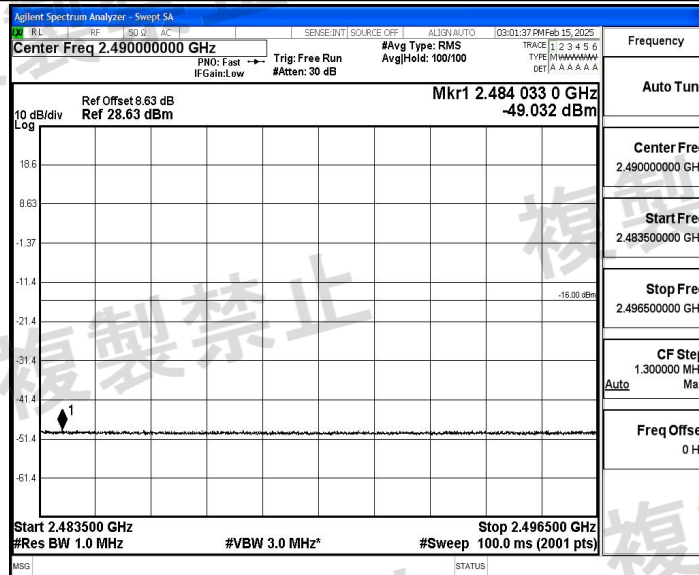




NTNV_DH5_Ant1_2480_2387~2400

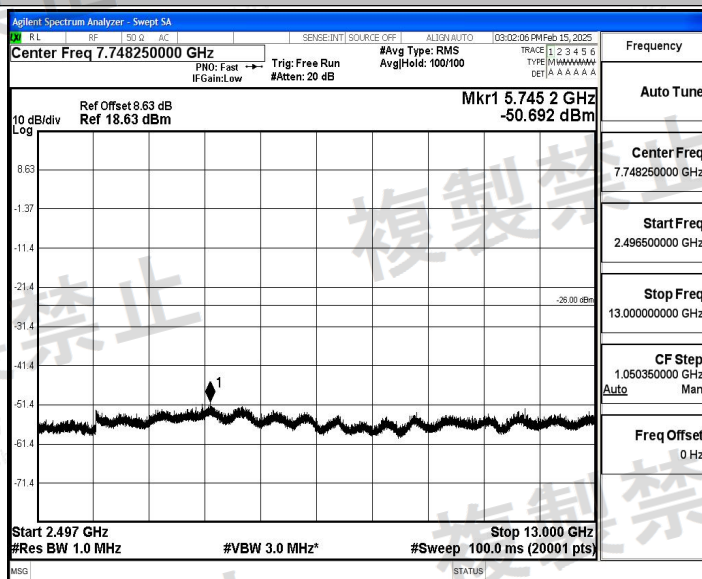


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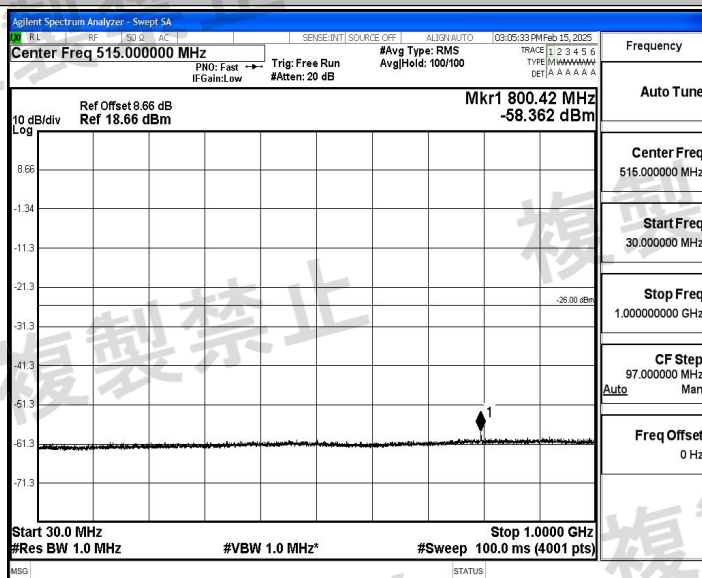




NTNV_DH5_Ant1_2480_2496.5~13000

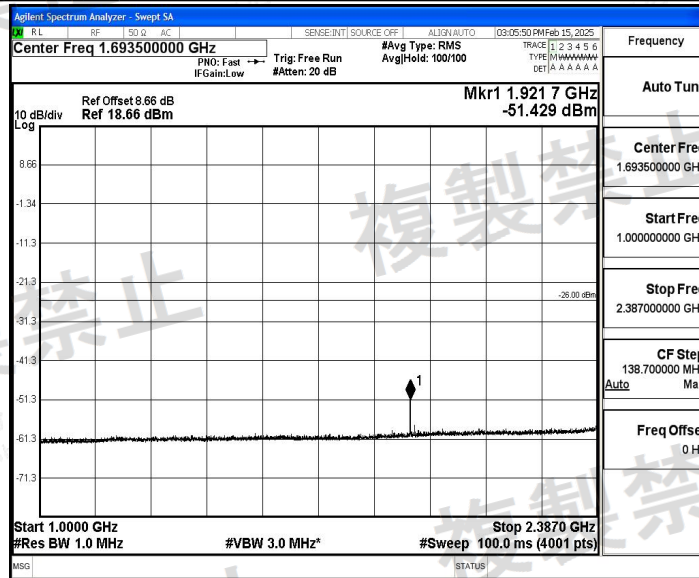


NTNV_2DH5_Ant1_2402_30~1000

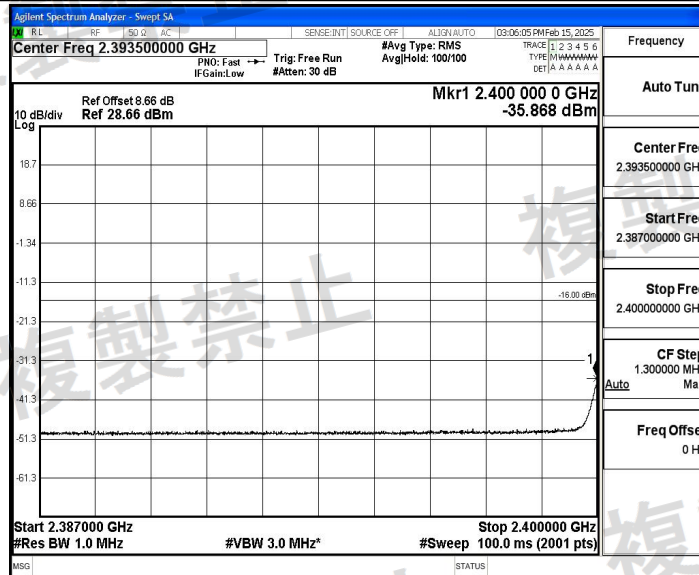




NTNV_2DH5_Ant1_2402_1000~2387

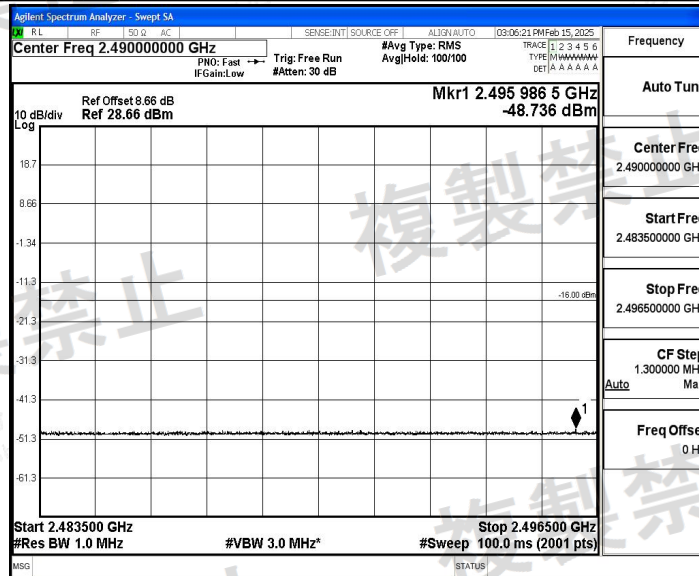


NTNV_2DH5_Ant1_2402_2387~2400

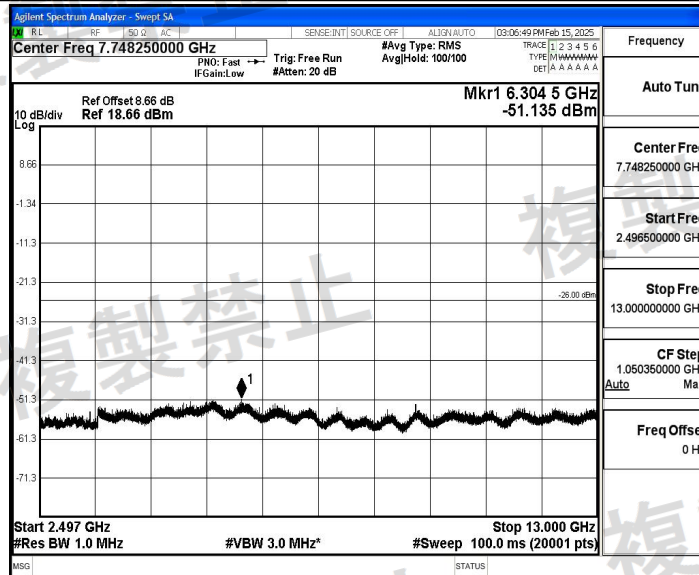




NTNV_2DH5_Ant1_2402_2483.5~2496.5

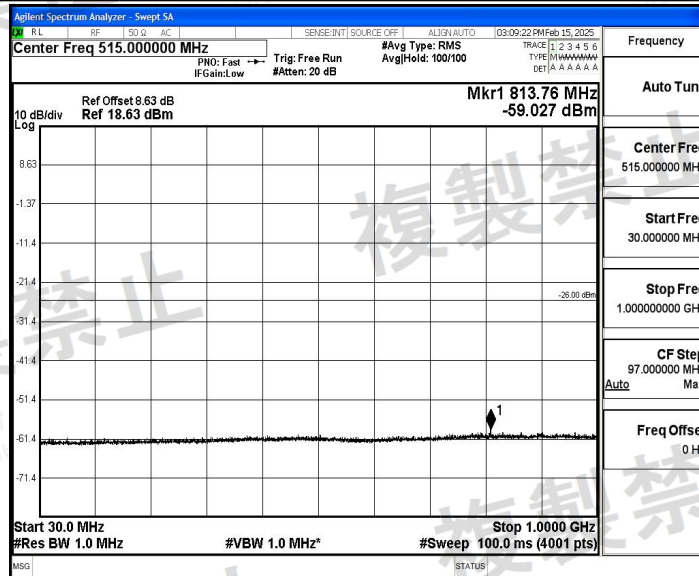


NTNV_2DH5_Ant1_2402_2496.5~13000

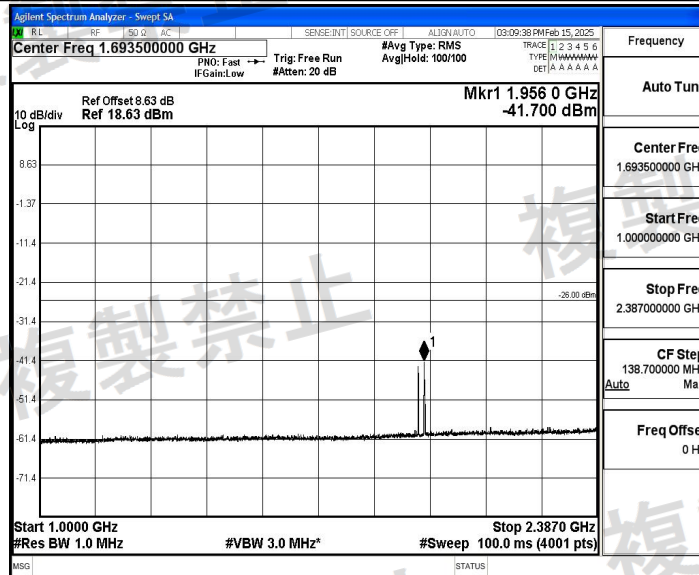




NTNV_2DH5_Ant1_2441_30~1000

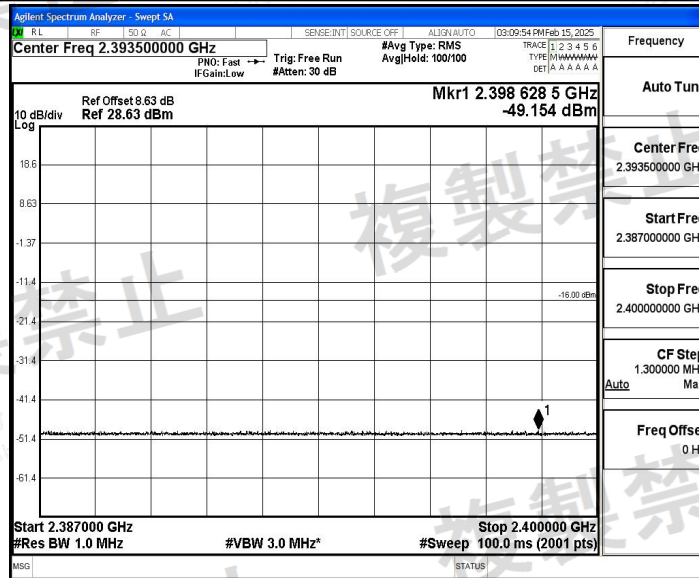


NTNV_2DH5_Ant1_2441_1000~2387

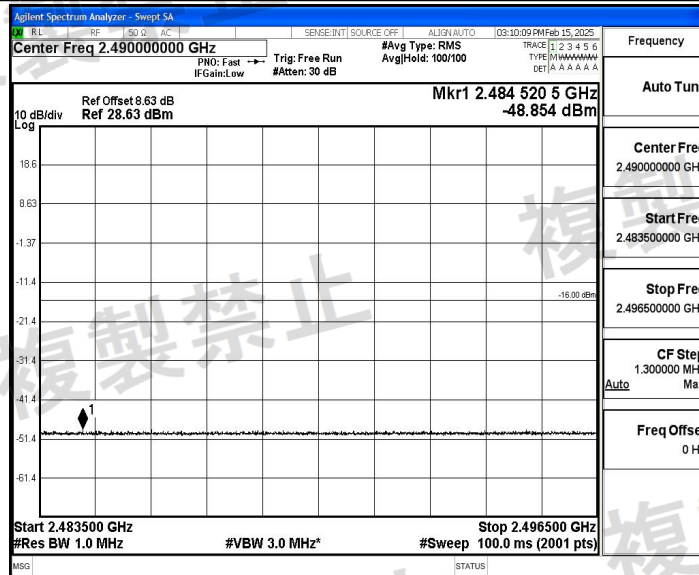




NTNV_2DH5_Ant1_2441_2387~2400

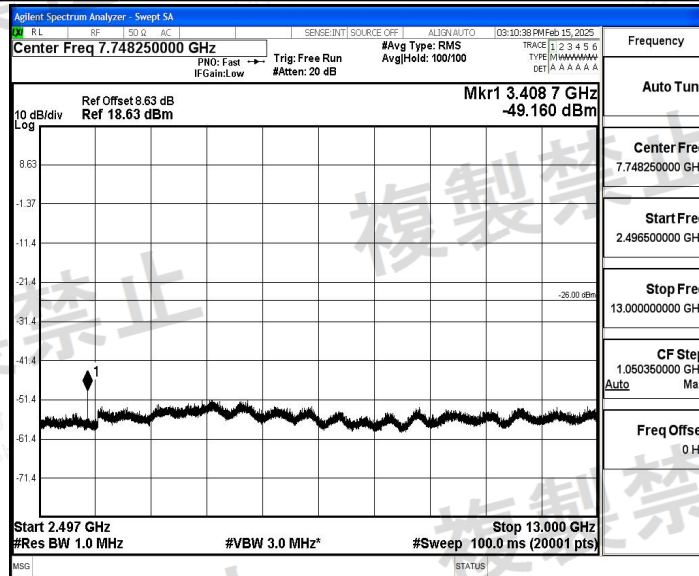


NTNV_2DH5_Ant1_2441_2483.5~2496.5

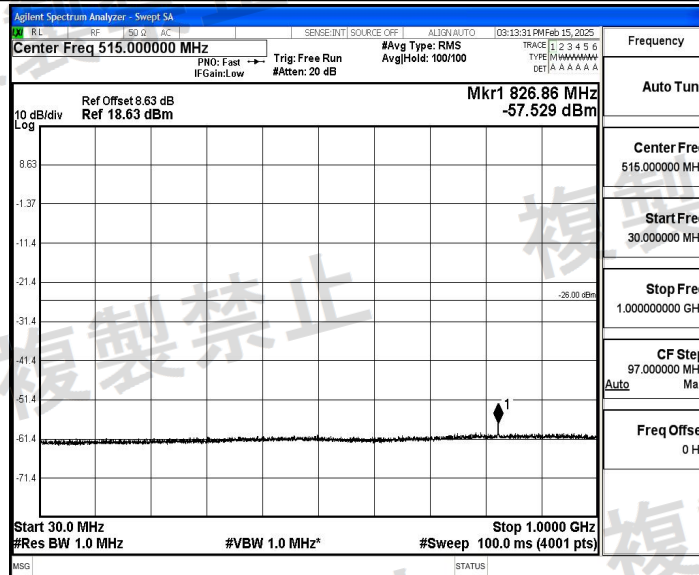




NTNV_2DH5_Ant1_2441_2496.5~13000

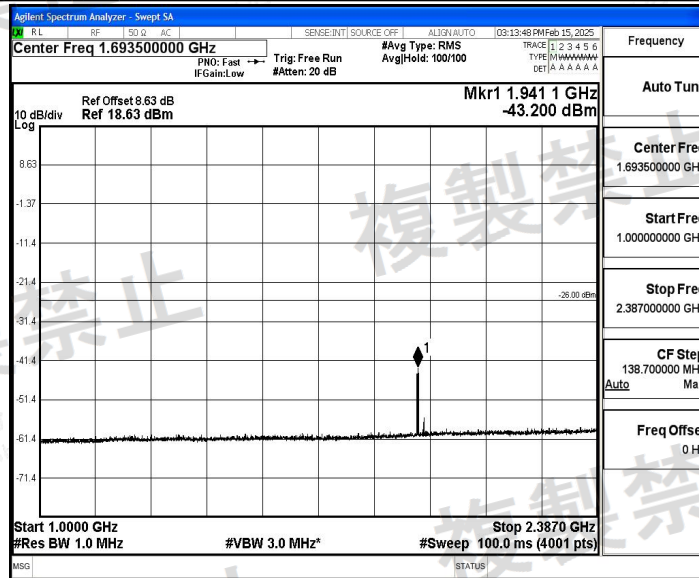


NTNV_2DH5_Ant1_2480_30~1000

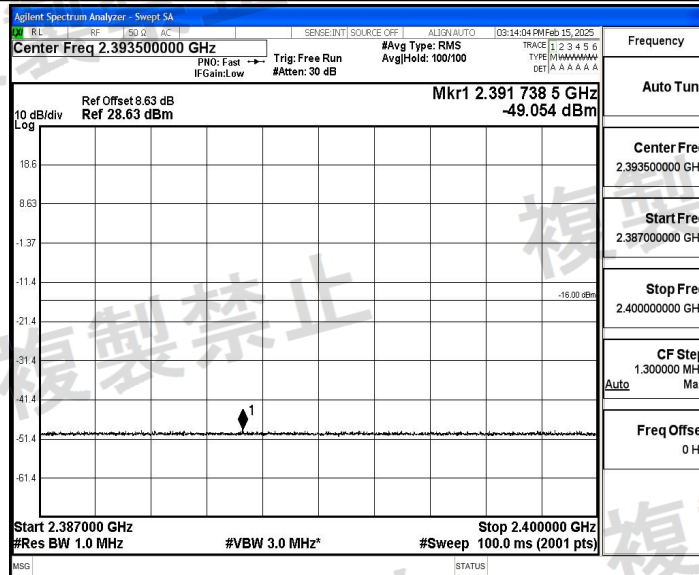




NTNV_2DH5_Ant1_2480_1000~2387

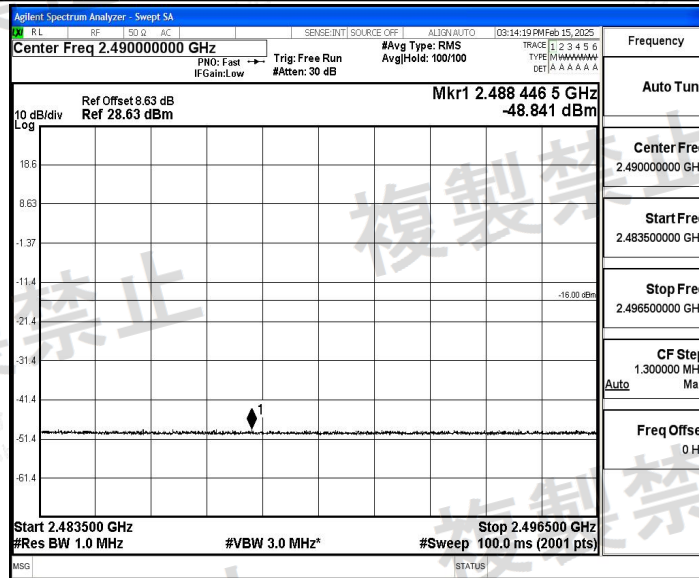


NTNV_2DH5_Ant1_2480_2387~2400

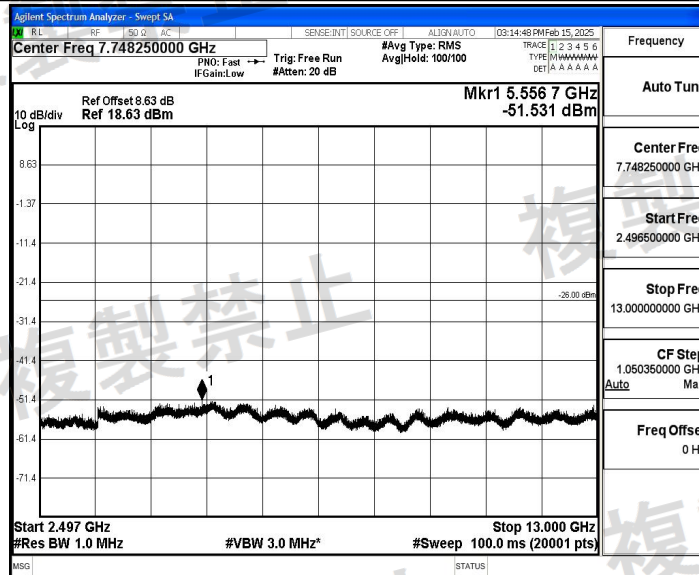




NTNV_2DH5_Ant1_2480_2483.5~2496.5

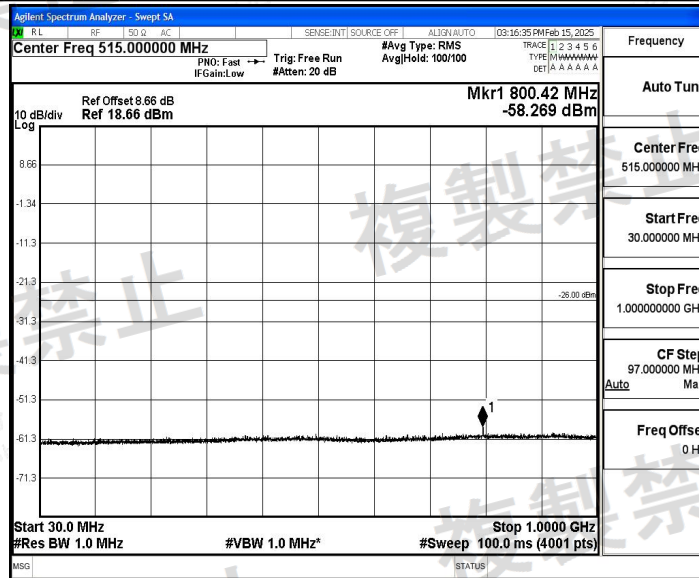


NTNV_2DH5_Ant1_2480_2496.5~13000

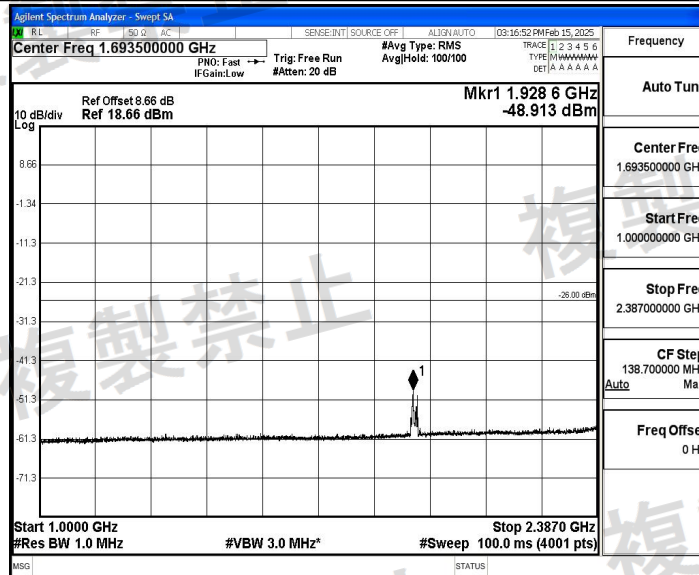




NTNV_3DH5_Ant1_2402_30~1000

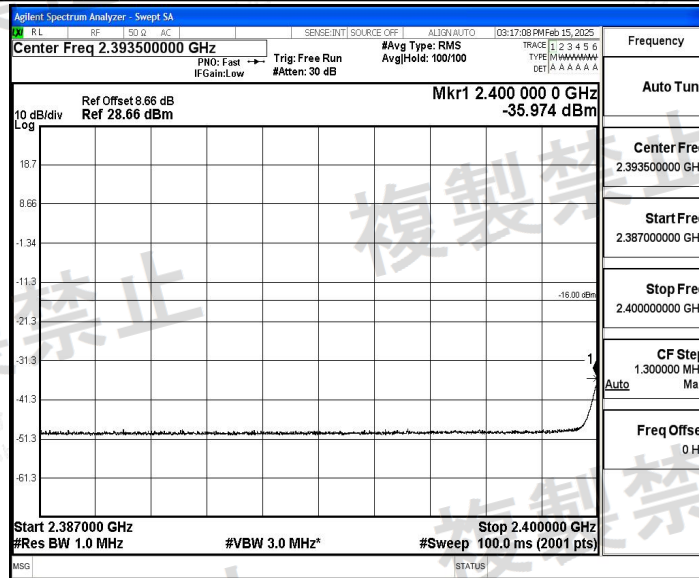


NTNV_3DH5_Ant1_2402_1000~2387

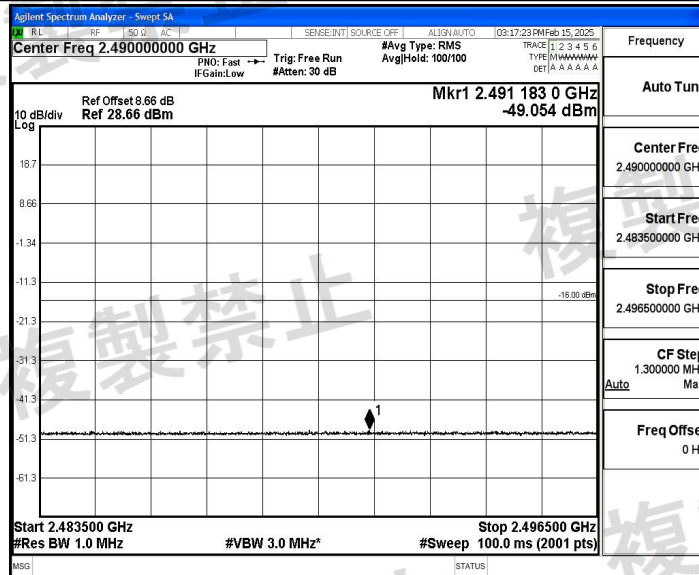




NTNV_3DH5_Ant1_2402_2387~2400

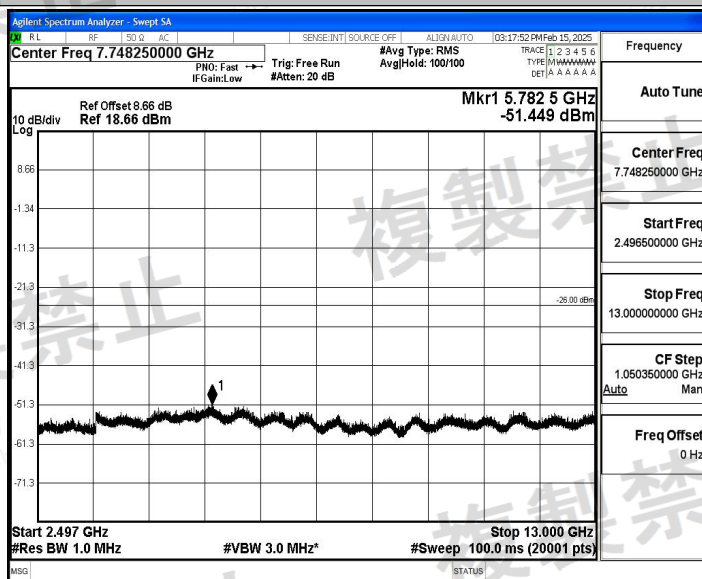


NTNV_3DH5_Ant1_2402_2483.5~2496.5

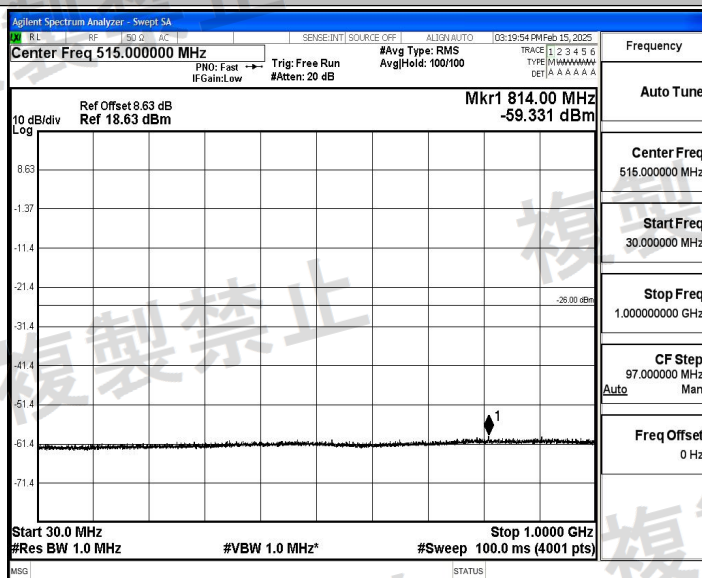




NTNV_3DH5_Ant1_2402_2496.5~13000

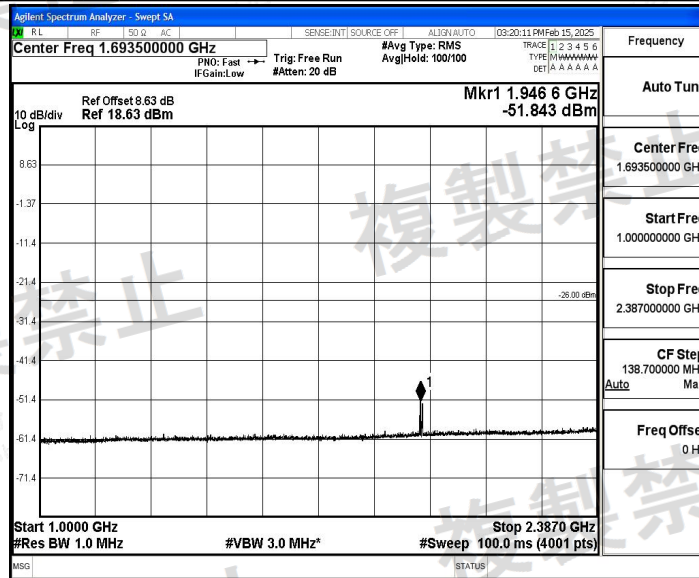


NTNV_3DH5_Ant1_2441_30~1000

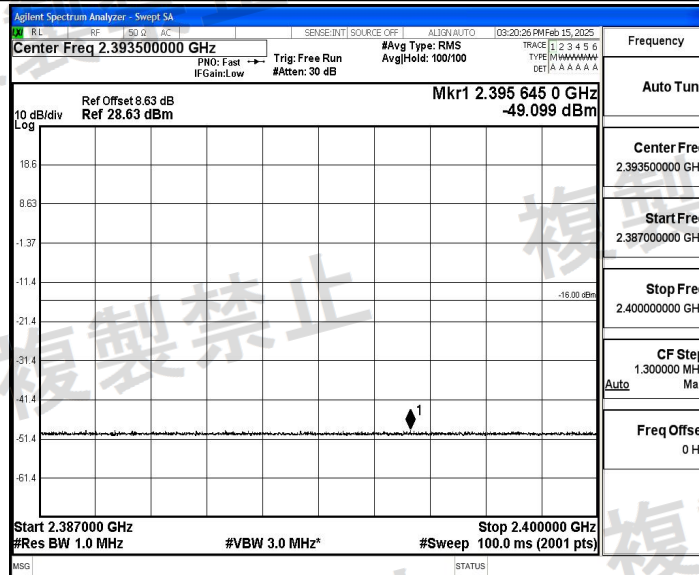




NTNV_3DH5_Ant1_2441_1000~2387

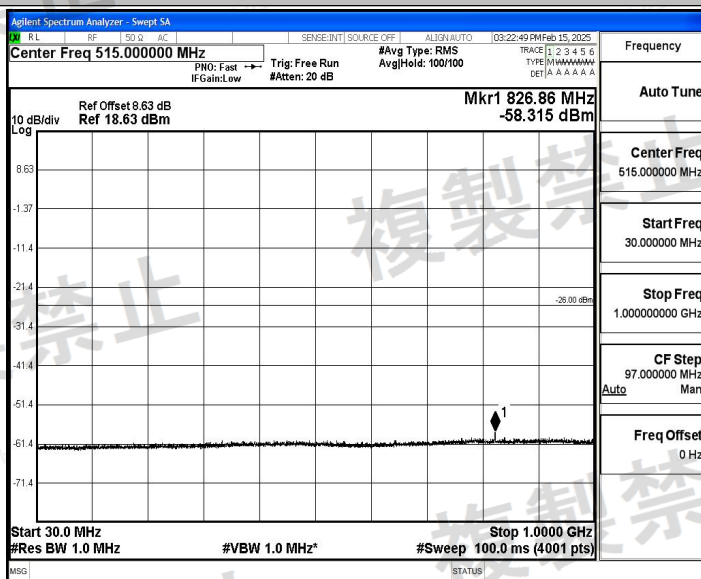


NTNV_3DH5_Ant1_2441_2387~2400

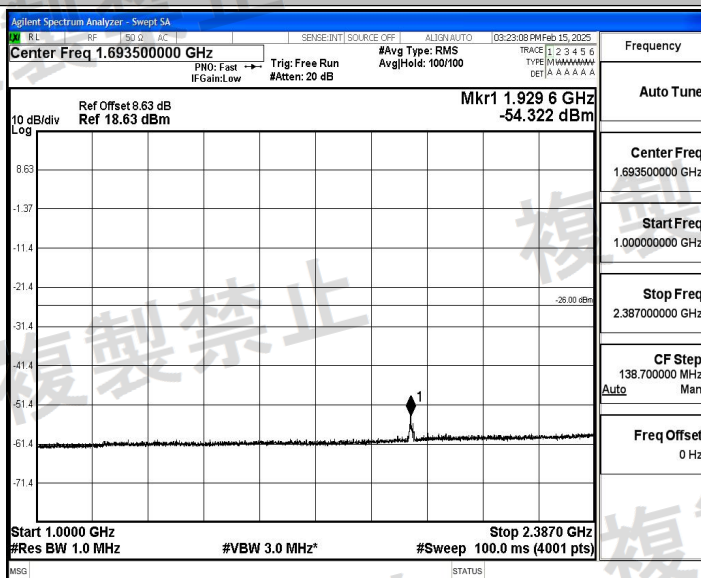




NTNV_3DH5_Ant1_2480_30~1000

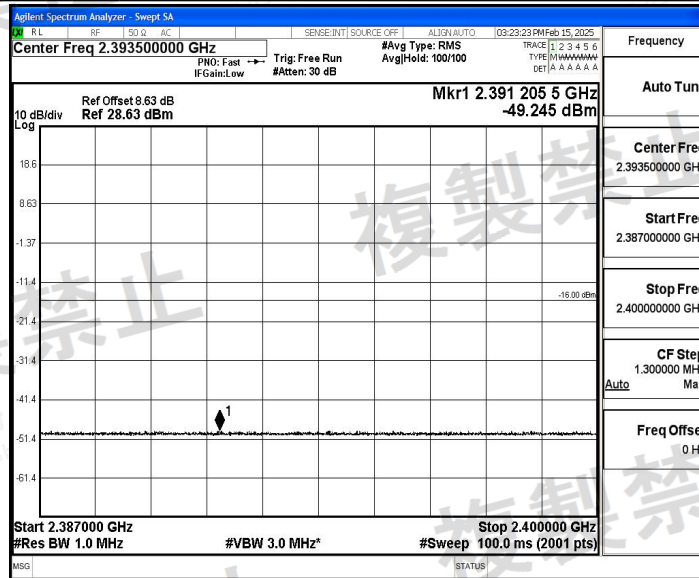


NTNV_3DH5_Ant1_2480_1000~2387

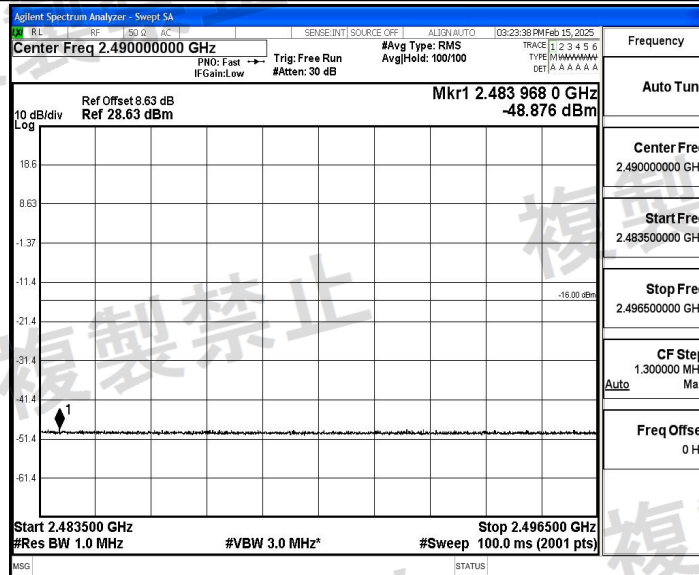


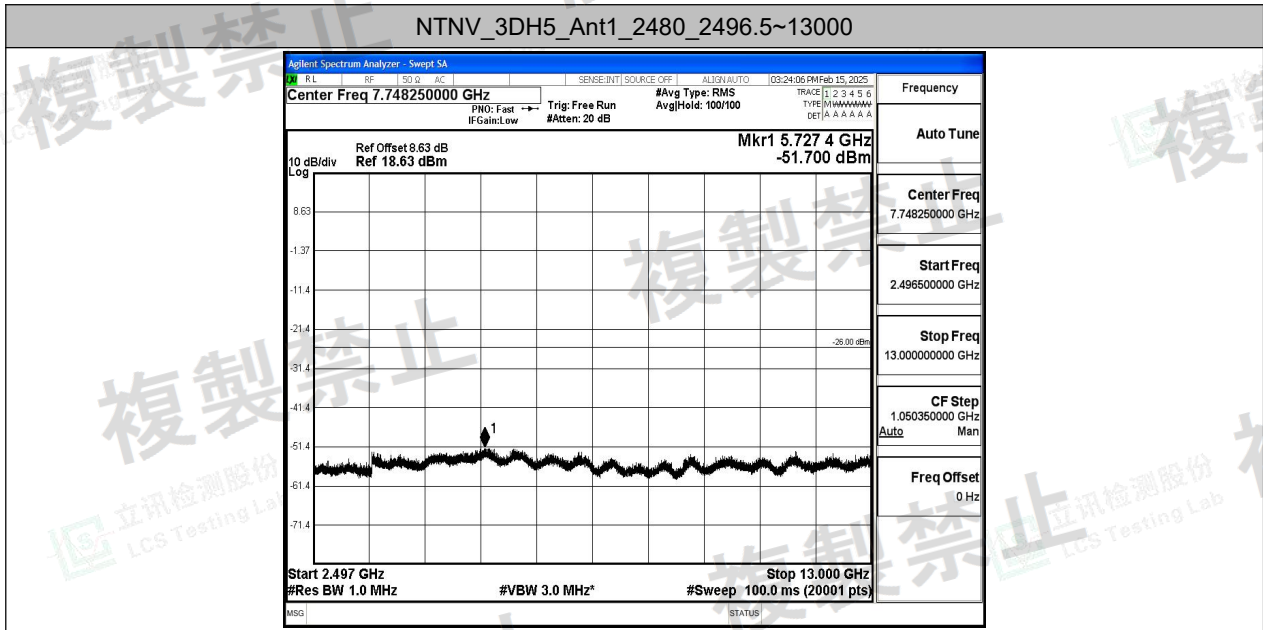


NTNV_3DH5_Ant1_2480_2387~2400



NTNV_3DH5_Ant1_2480_2483.5~2496.5







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	-88.98	≤-54	0.00126	≤4	PASS
				1000~12500	-69.92	≤-47	0.10186	≤20	PASS
			2441	30~1000	-88.32	≤-54	0.00147	≤4	PASS
				1000~12500	-70	≤-47	0.10000	≤20	PASS
			2480	30~1000	-88.98	≤-54	0.00126	≤4	PASS
				1000~12500	-72.45	≤-47	0.05689	≤20	PASS
	2DH5	Ant1	2402	30~1000	-89.03	≤-54	0.00125	≤4	PASS
				1000~12500	-69.47	≤-47	0.11298	≤20	PASS
			2441	30~1000	-89.12	≤-54	0.00122	≤4	PASS
				1000~12500	-69.79	≤-47	0.10495	≤20	PASS
			2480	30~1000	-88.37	≤-54	0.00146	≤4	PASS
				1000~12500	-70.91	≤-47	0.08110	≤20	PASS
	3DH5	Ant1	2402	30~1000	-89.07	≤-54	0.00124	≤4	PASS
				1000~12500	-72.57	≤-47	0.05534	≤20	PASS
			2441	30~1000	-88.51	≤-54	0.00141	≤4	PASS
				1000~12500	-69.43	≤-47	0.11402	≤20	PASS
			2480	30~1000	-88.77	≤-54	0.00133	≤4	PASS
				1000~12500	-70.2	≤-47	0.09550	≤20	PASS



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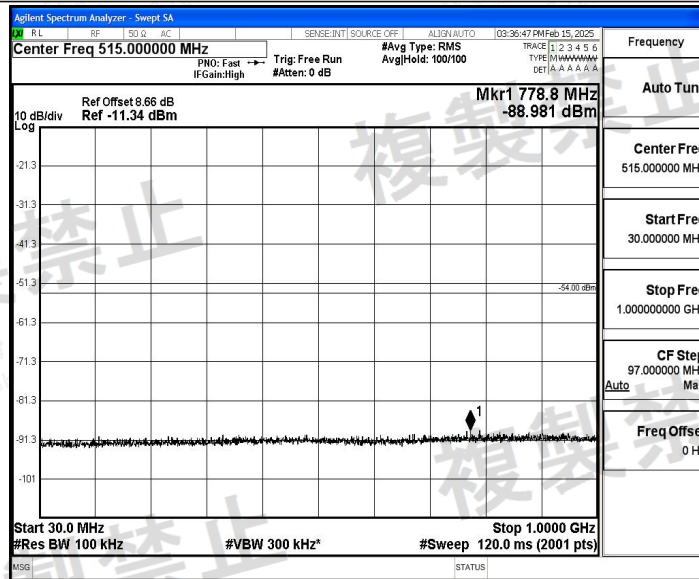
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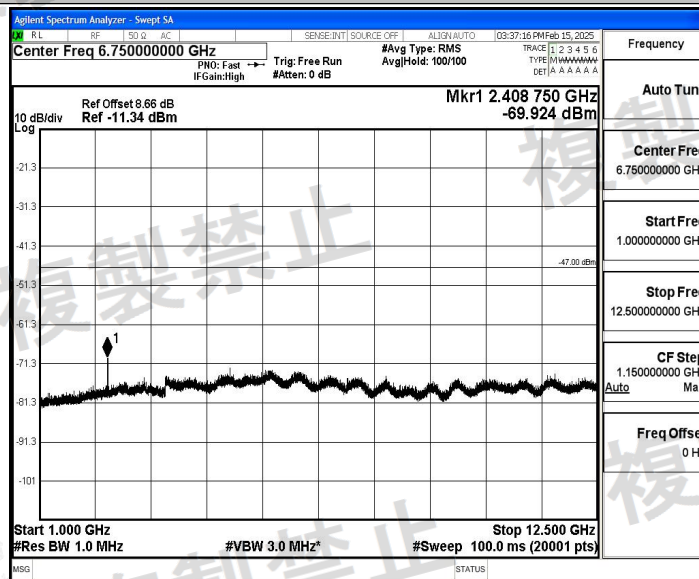


Test Graphs

NTNV_DH5_Ant1_2402_30~1000

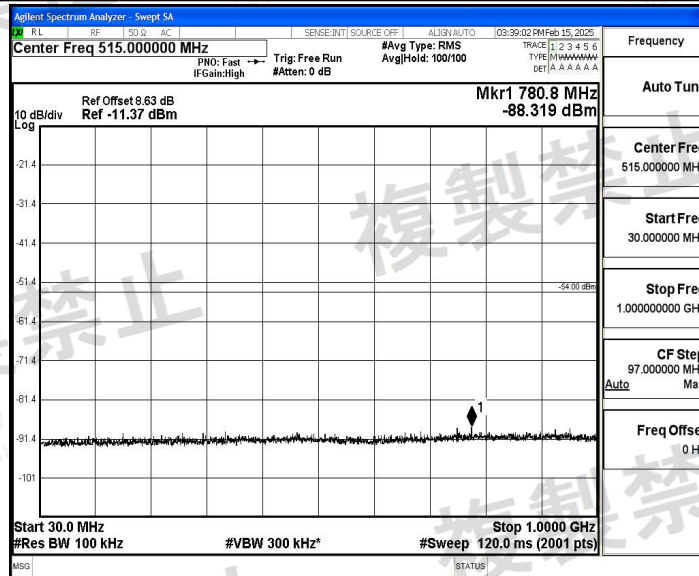


NTNV_DH5_Ant1_2402_1000~12500

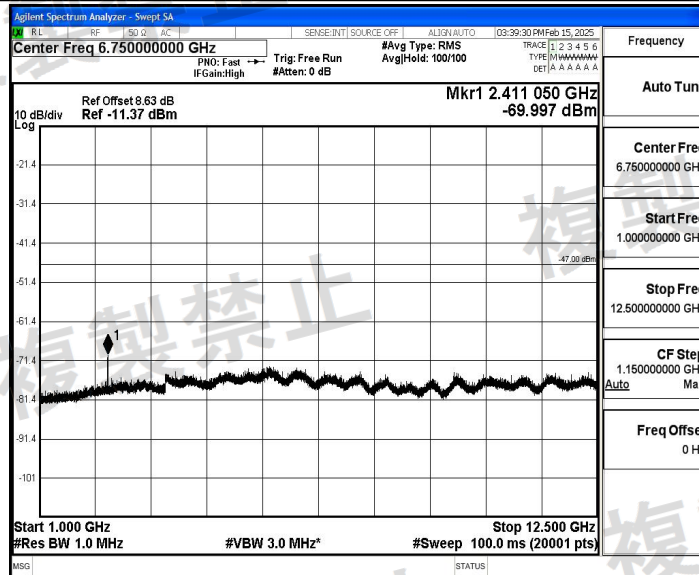




NTNV_DH5_Ant1_2441_30~1000

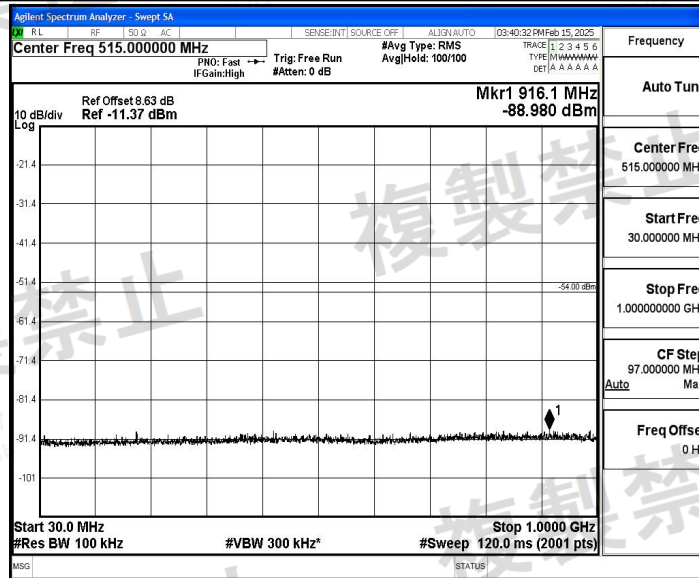


NTNV_DH5_Ant1_2441_1000~12500

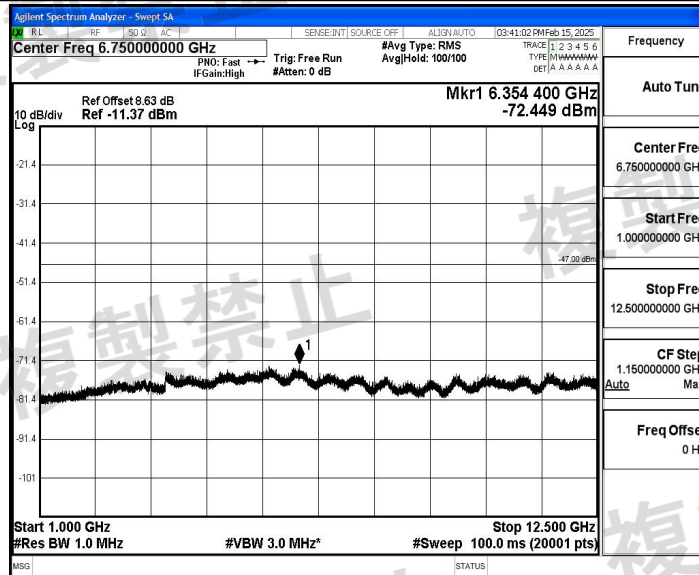




NTNV_DH5_Ant1_2480_30~1000

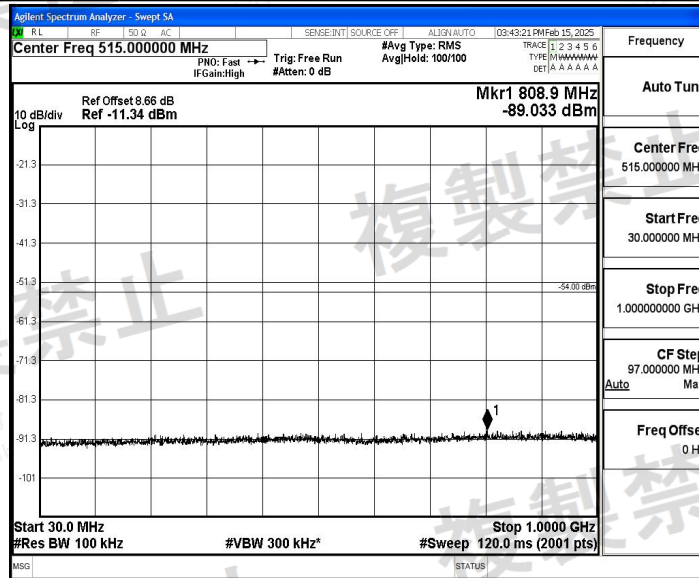


NTNV_DH5_Ant1_2480_1000~12500

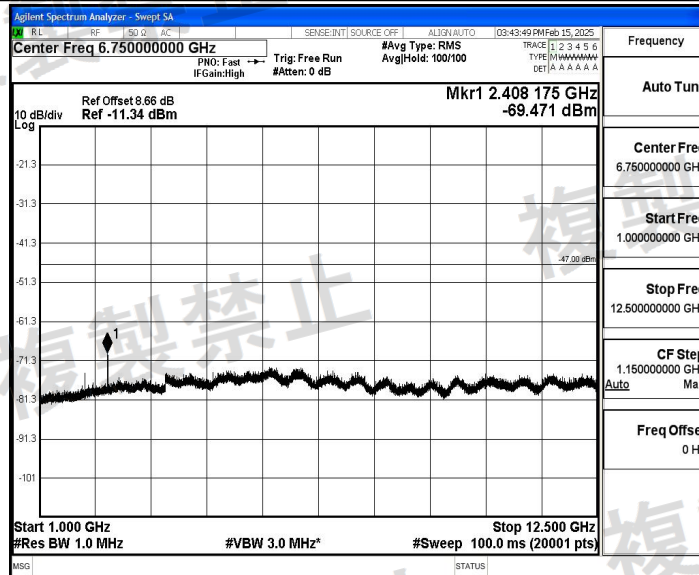




NTNV_2DH5_Ant1_2402_30~1000

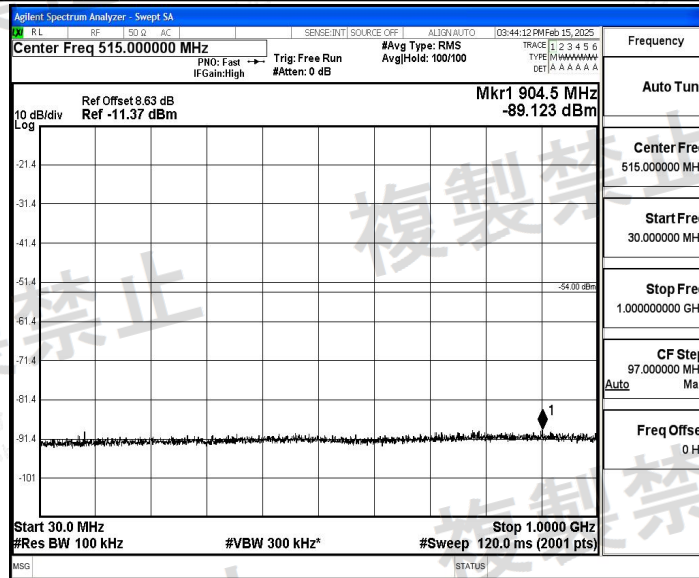


NTNV_2DH5_Ant1_2402_1000~12500

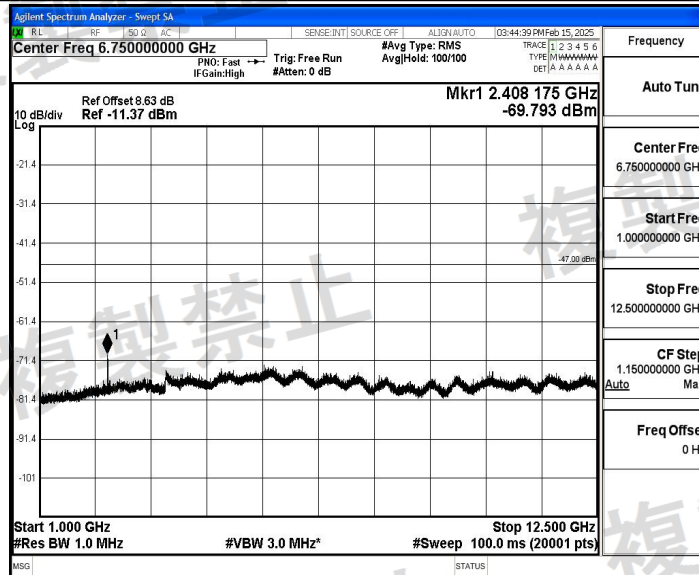




NTNV_2DH5_Ant1_2441_30~1000



NTNV_2DH5_Ant1_2441_1000~12500



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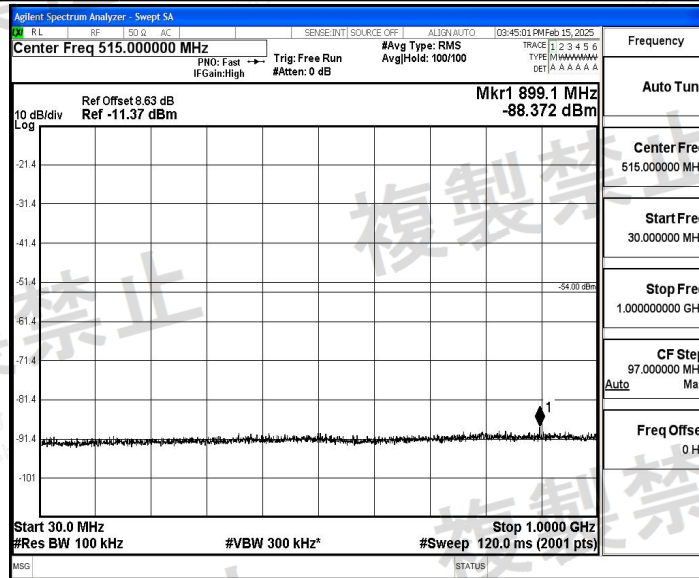
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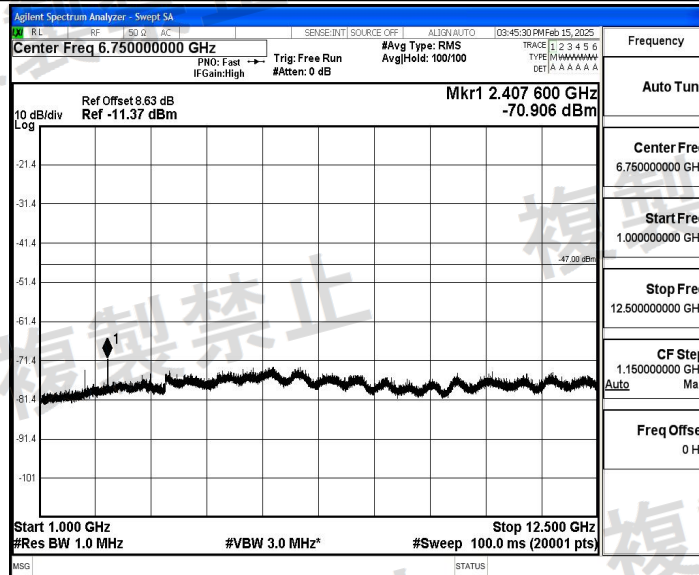
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NTNV_2DH5_Ant1_2480_30~1000

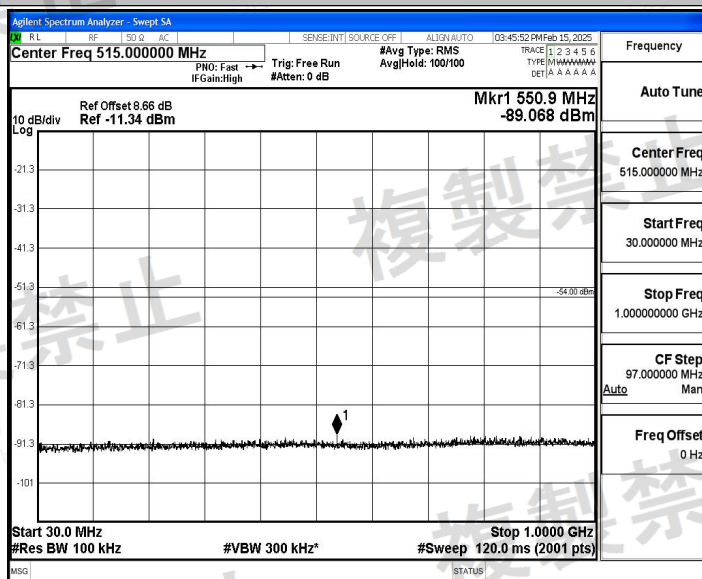


NTNV_2DH5_Ant1_2480_1000~12500

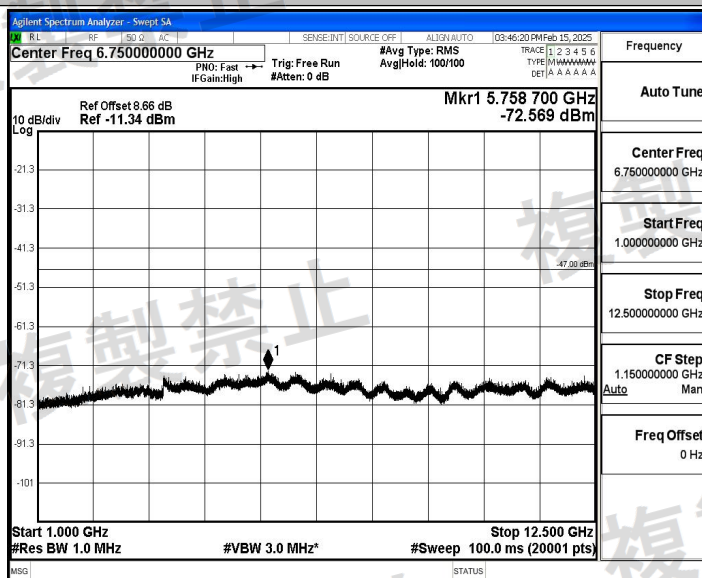




NTNV_3DH5_Ant1_2402_30~1000

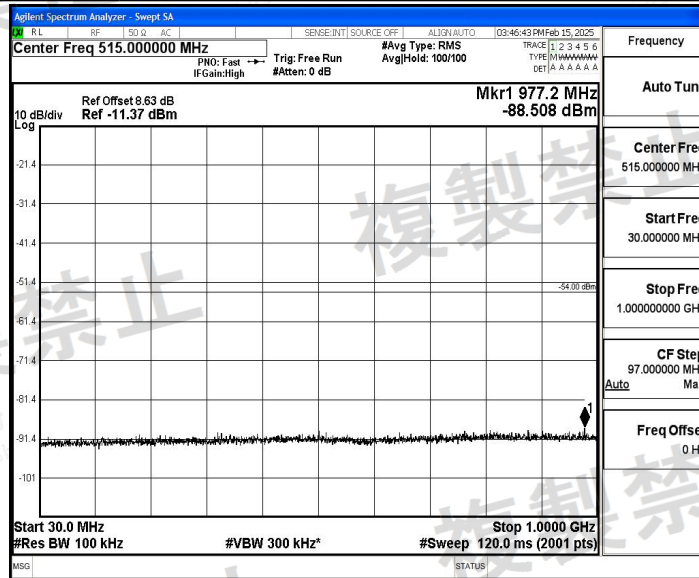


NTNV_3DH5_Ant1_2402_1000~12500

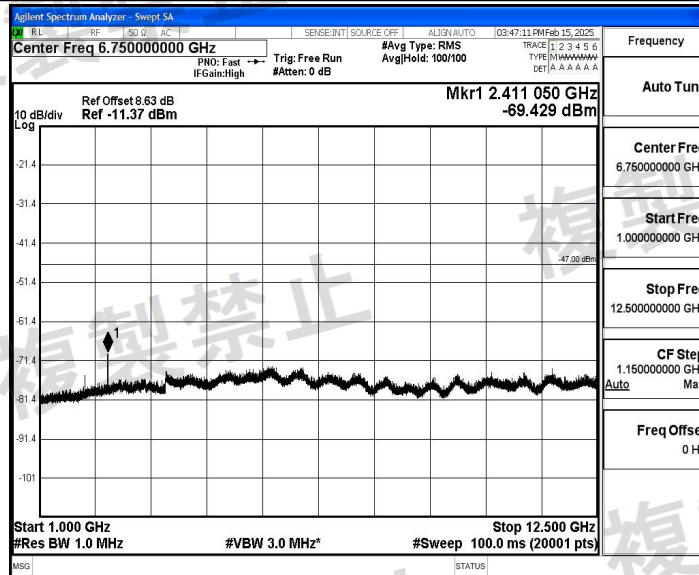




NTNV_3DH5_Ant1_2441_30~1000

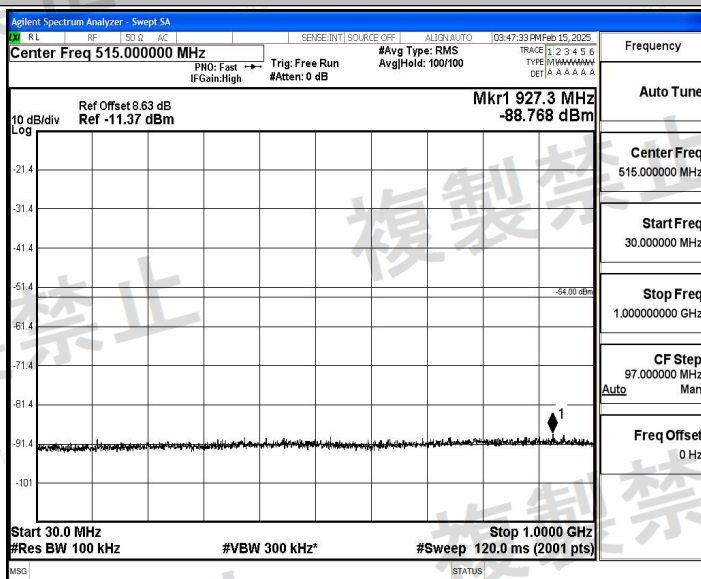


NTNV_3DH5_Ant1_2441_1000~12500

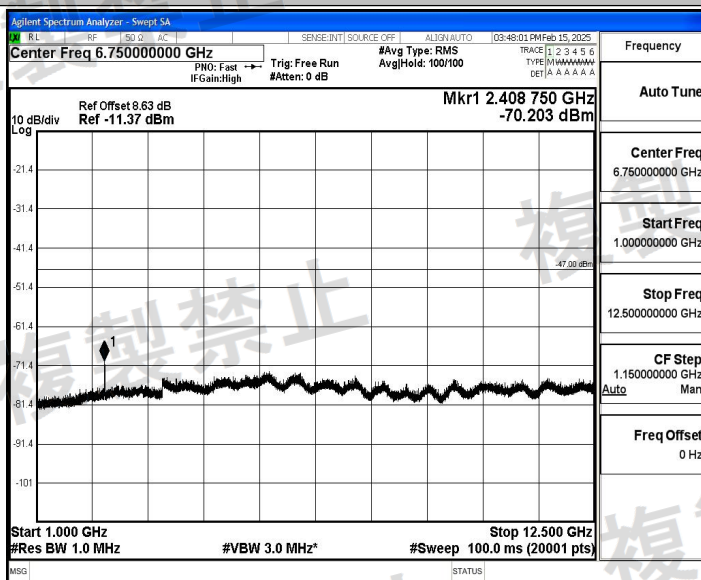




NTNV_3DH5_Ant1_2480_30~1000



NTNV_3DH5_Ant1_2480_1000~12500



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A.7 Dwell Time

Test Result

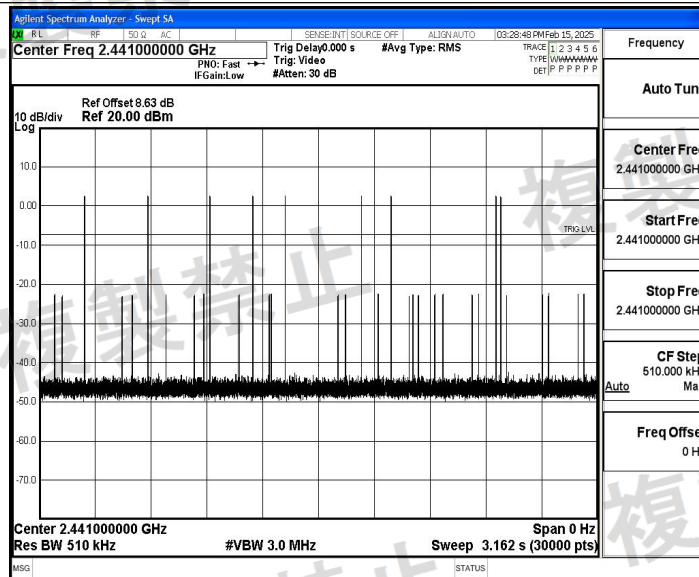
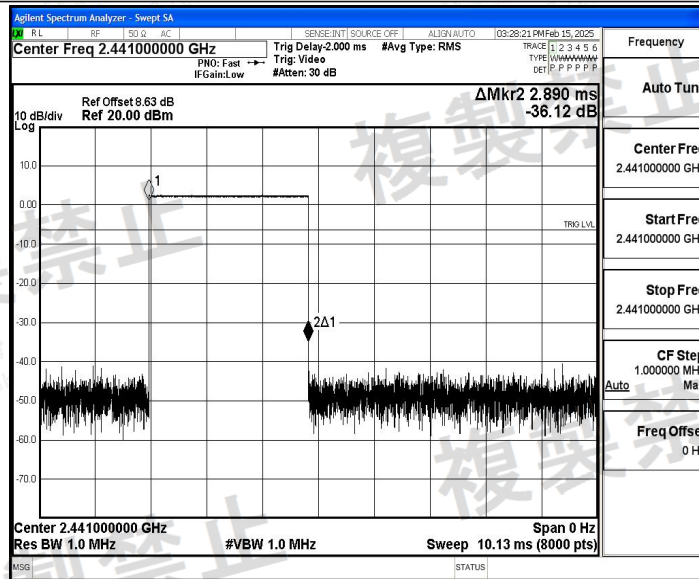
TestCondition	TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit [s]	Verdict
NTNV	DH5	Ant1	Hop	2.89	100	0.289	≤0.4	PASS
	2DH5	Ant1	Hop	2.89	110	0.318	≤0.4	PASS
	3DH5	Ant1	Hop	2.89	130	0.376	≤0.4	PASS





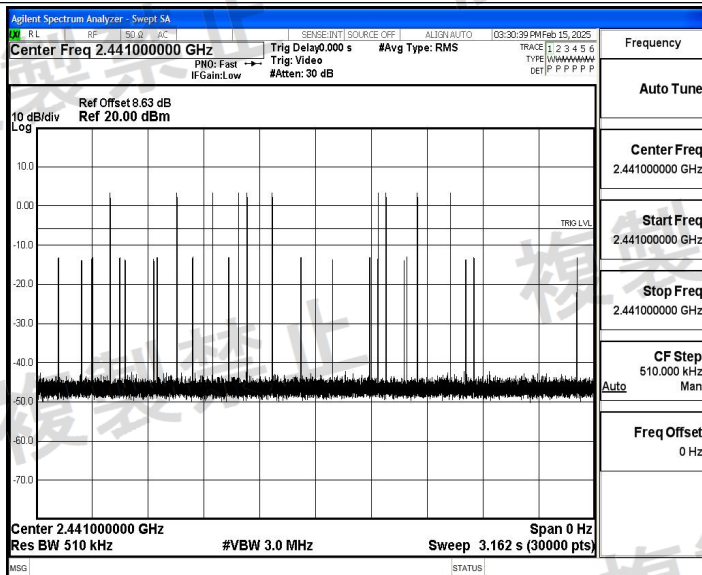
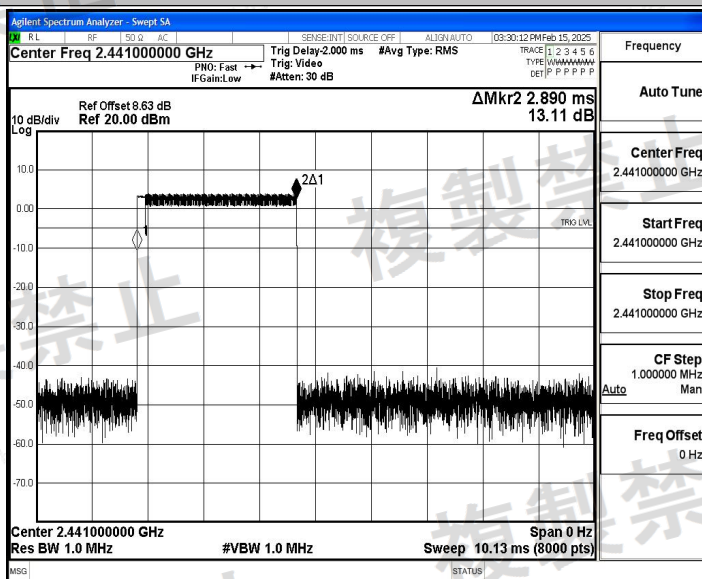
Test Graphs

NTNV_DH5_Ant1_Hop





NTNV_2DH5_Ant1_Hop



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NTNV_3DH5_Ant1_Hop

