

Appendix A for 2.4G Test Data

Product Name: 2.4G wireless module

Test Model: RF02

Environmental Conditions

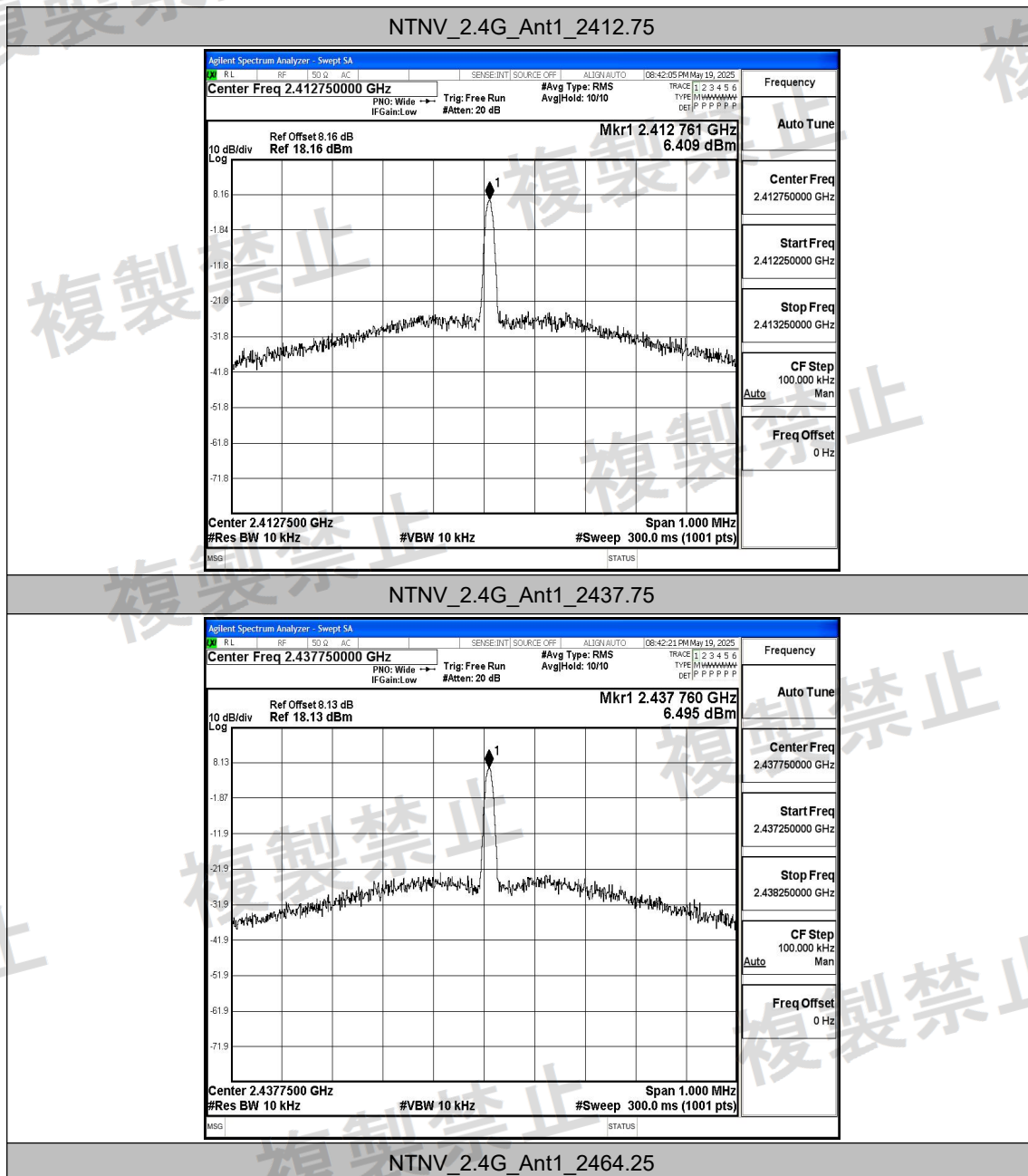
Temperature:	23.1° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Suichao Lai
Supervised by:	Lifeng Le

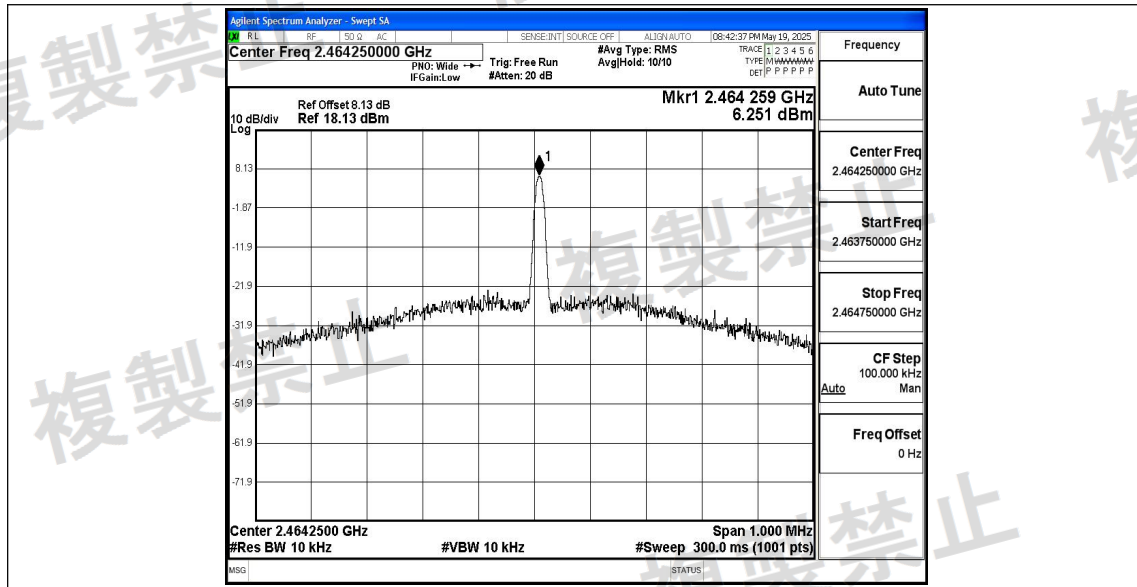
A.1 Frequency Error

Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	Frequency Error	Ant1	2412.75	4.55911	±50	PASS
			2437.75	4.10214	±50	PASS
			2464.25	3.65223	±50	PASS

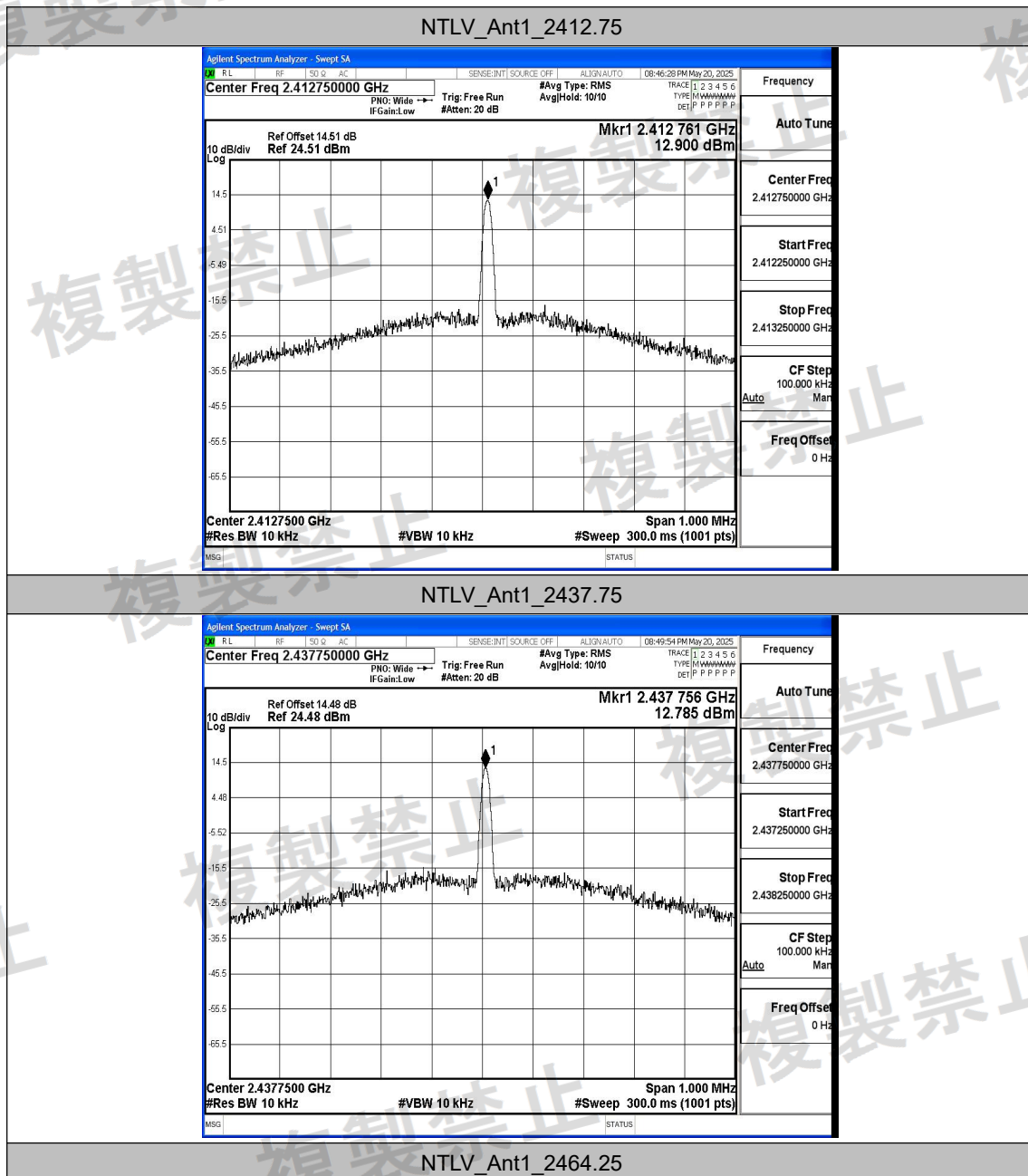
Test Graphs

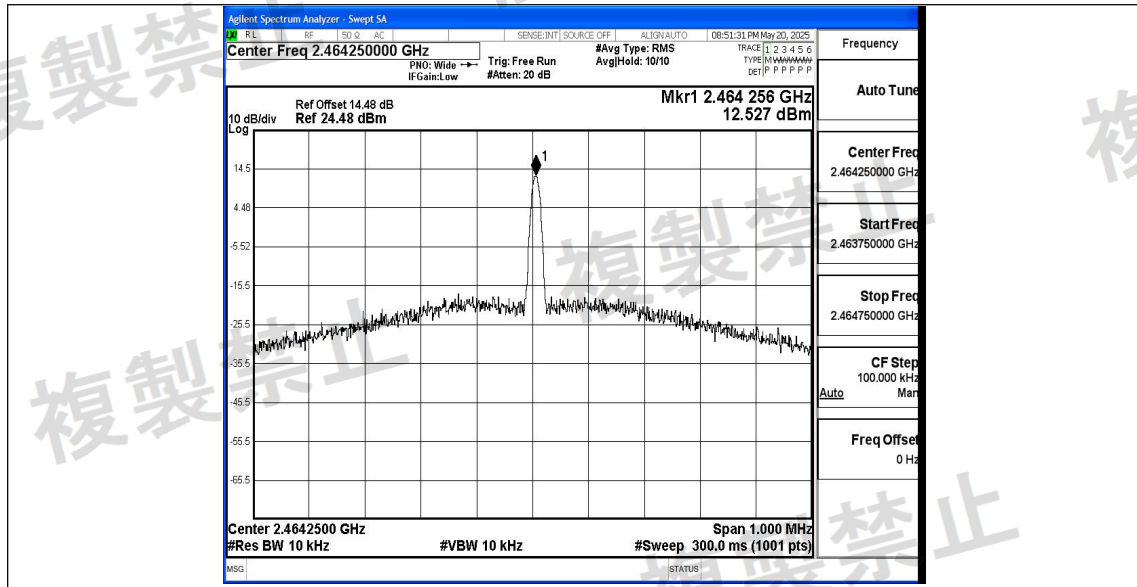




TestCondition	TestMode	Antenna	Channel	Result[ppm]	Limit[ppm]	Verdict
NTLV	Frequency_Error	Ant1	2412.75	4.55911	±50	PASS
			2437.75	2.46129	±50	PASS
			2464.25	2.43482	±50	PASS

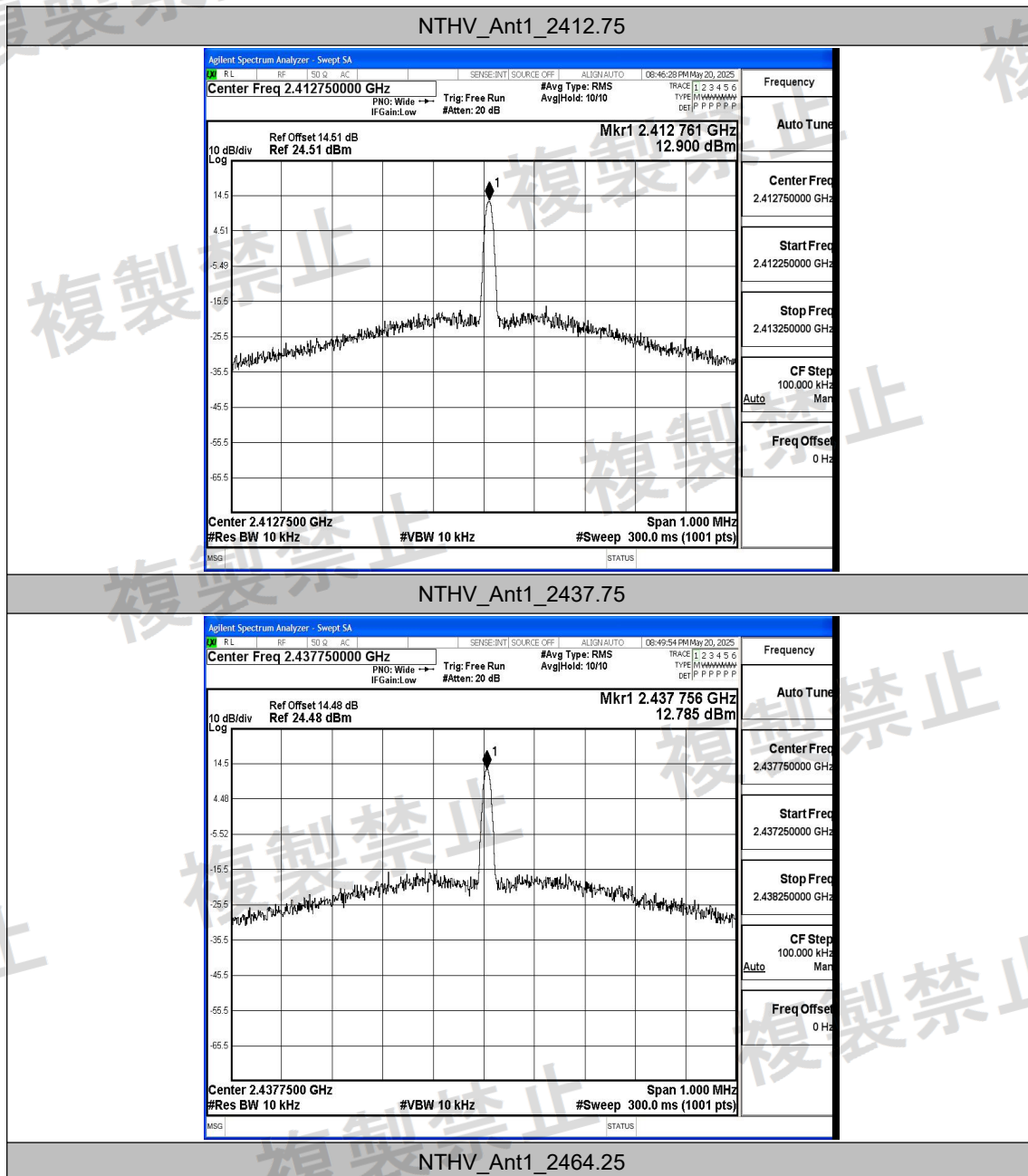
Test Graphs

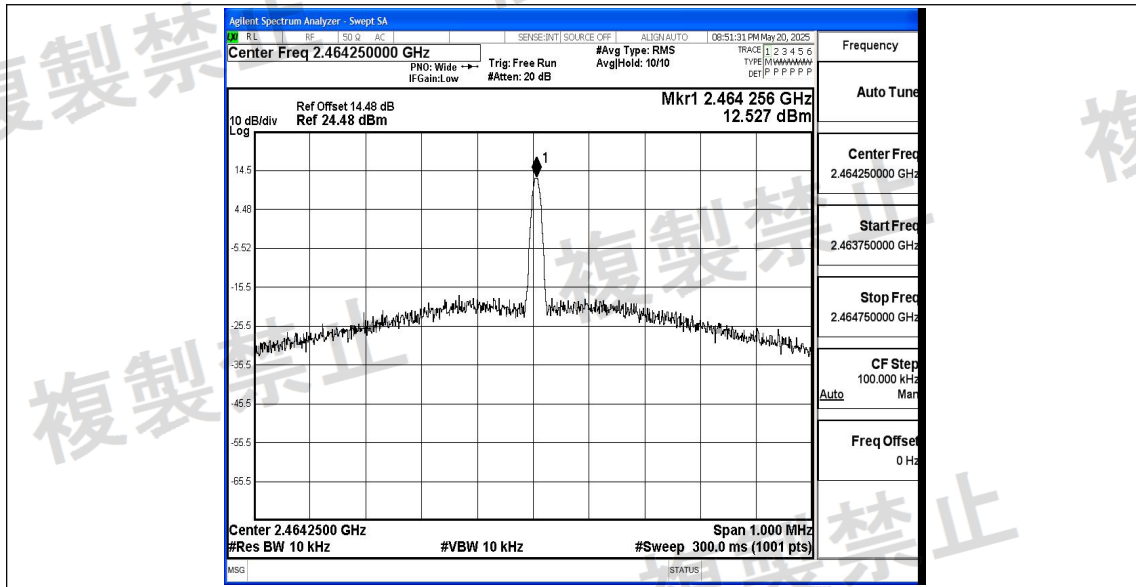




TestCondition	TestMode	Antenna	Channel	Result[ppm]	Limit[ppm]	Verdict
NTHV	2.4G	Ant1	2412.75	4.55911	±50	PASS
			2437.75	2.46129	±50	PASS
			2464.25	2.43482	±50	PASS

Test Graphs





A.2 Antenna Power

Test Result

Antenna Power							
TestCondition	TestMode	Antenna	Frequency[MHz]	Result(dBm)	Result(mW)	Limit(mW)	Verdict
NTNV	2.4G	Ant1	2412.75	6.21	4.1783	≤10	PASS
			2437.75	6.45	4.4157	≤10	PASS
			2464.25	6.33	4.2954	≤10	PASS

Tolerance								
Test Condition	Test Mode	Antenna	Frequency[MHz]	Power (mW)	RatedPower (mW)	Result (%)	Limit (%)	Verdict
NTNV	2.4G	Ant1	2412.75	4.1783	5.0	-16.43	+20	PASS
			2437.75	4.4157	5.0	-11.69	+20	PASS
			2464.25	4.2954	5.0	-14.09	+20	PASS

Antenna Power							
TestCondition	TestMode	Antenna	Frequency[MHz]	Result(dBm)	Result(mW)	Limit(mW)	Verdict
NTLV	2.4G	Ant1	2412.75	6.20	4.1687	≤10	PASS
			2437.75	6.44	4.4055	≤10	PASS
			2464.25	6.30	4.2658	≤10	PASS

Tolerance								
Test Condition	Test Mode	Antenna	Frequency[MHz]	Power (mW)	RatedPower (mW)	Result (%)	Limit (%)	Verdict
NTLV	2.4G	Ant1	2412.75	4.1687	5.0	-16.63	+20	PASS
			2437.75	4.4055	5.0	-11.89	+20	PASS
			2464.25	4.2658	5.0	-14.69	+20	PASS

Antenna Power							
TestCondition	TestMode	Antenna	Frequency[MHz]	Result(dBm)	Result(mW)	Limit(mW)	Verdict
NTHV	2.4G	Ant1	2412.75	6.17	4.1400	≤10	PASS
			2437.75	6.44	4.4055	≤10	PASS
			2464.25	6.32	4.2855	≤10	PASS

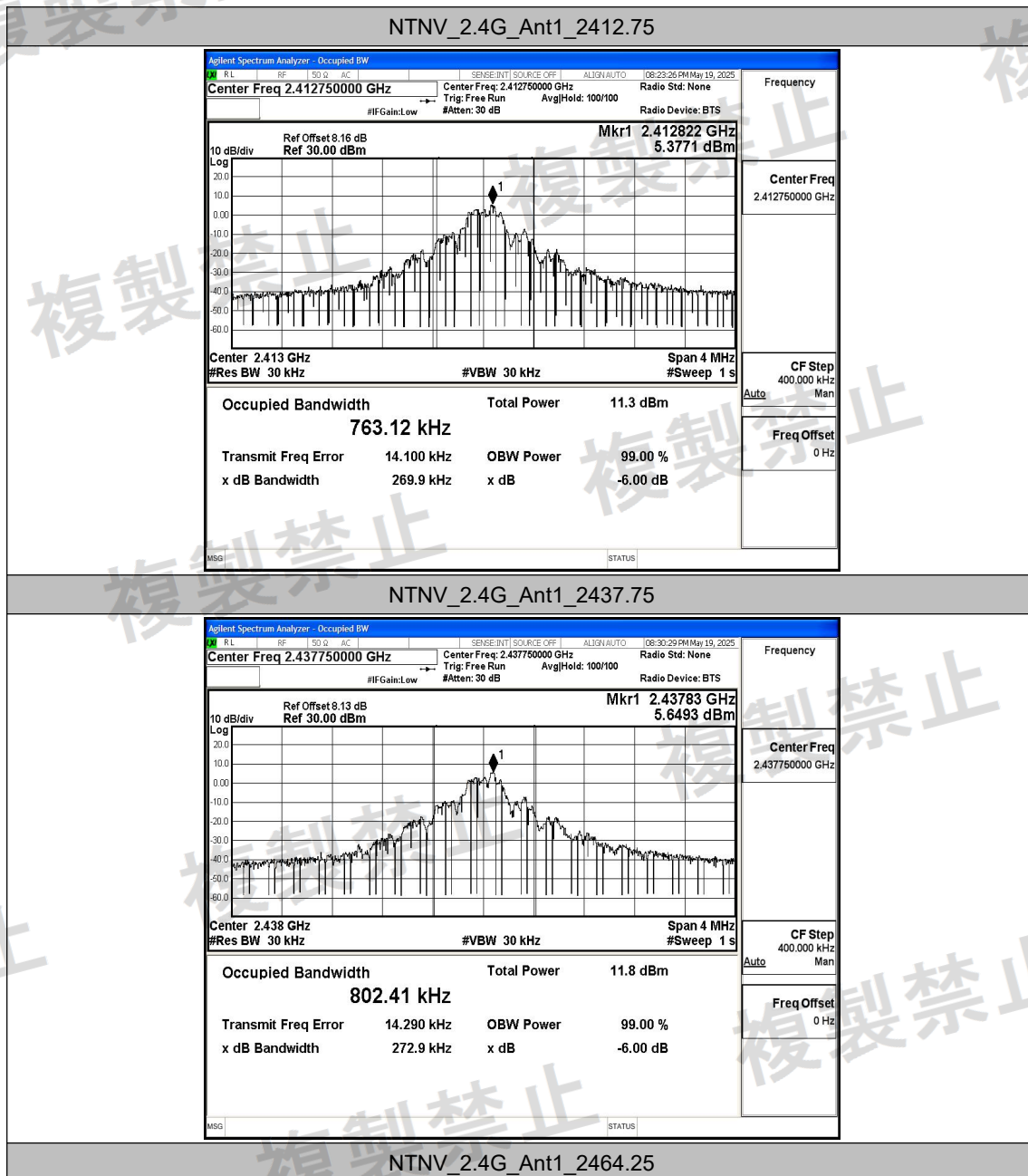
Tolerance								
Test Condition	Test Mode	Antenna	Frequency[MHz]	Power (mW)	RatedPower (mW)	Result (%)	Limit (%)	Verdict
NTHV	2.4G	Ant1	2412.75	4.1400	5.0	-17.2	+20	PASS
			2437.75	4.4055	5.0	-11.89	+20	PASS
			2464.25	4.2855	5.0	-14.29	+20	PASS

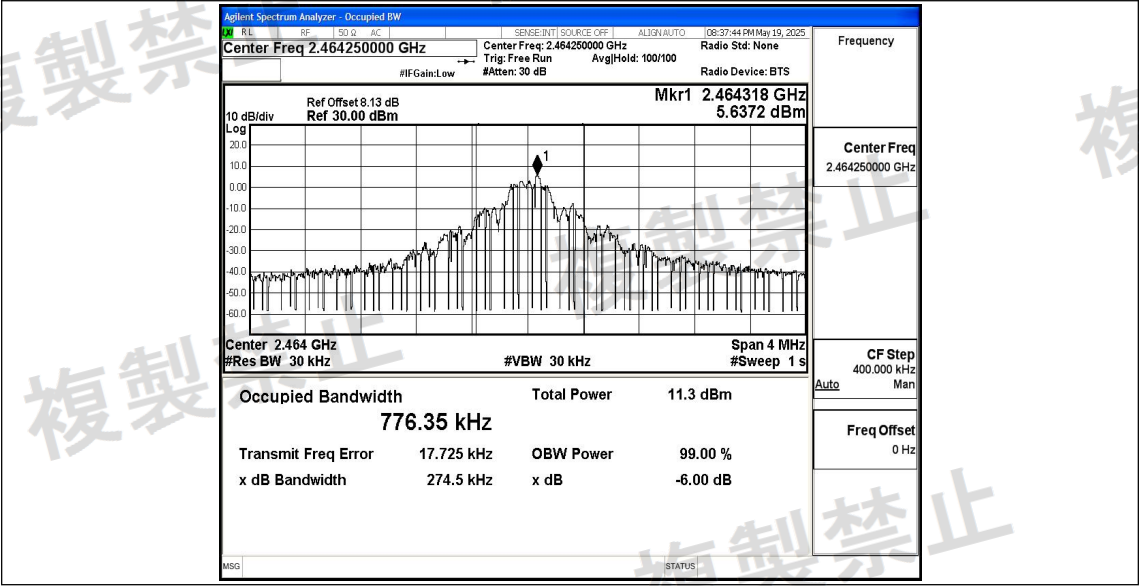
A.3 Occupied Bandwidth

Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	2.4G	Ant1	2412.75	0.763	≤26	PASS
			2437.75	0.802	≤26	PASS
			2464.25	0.776	≤26	PASS

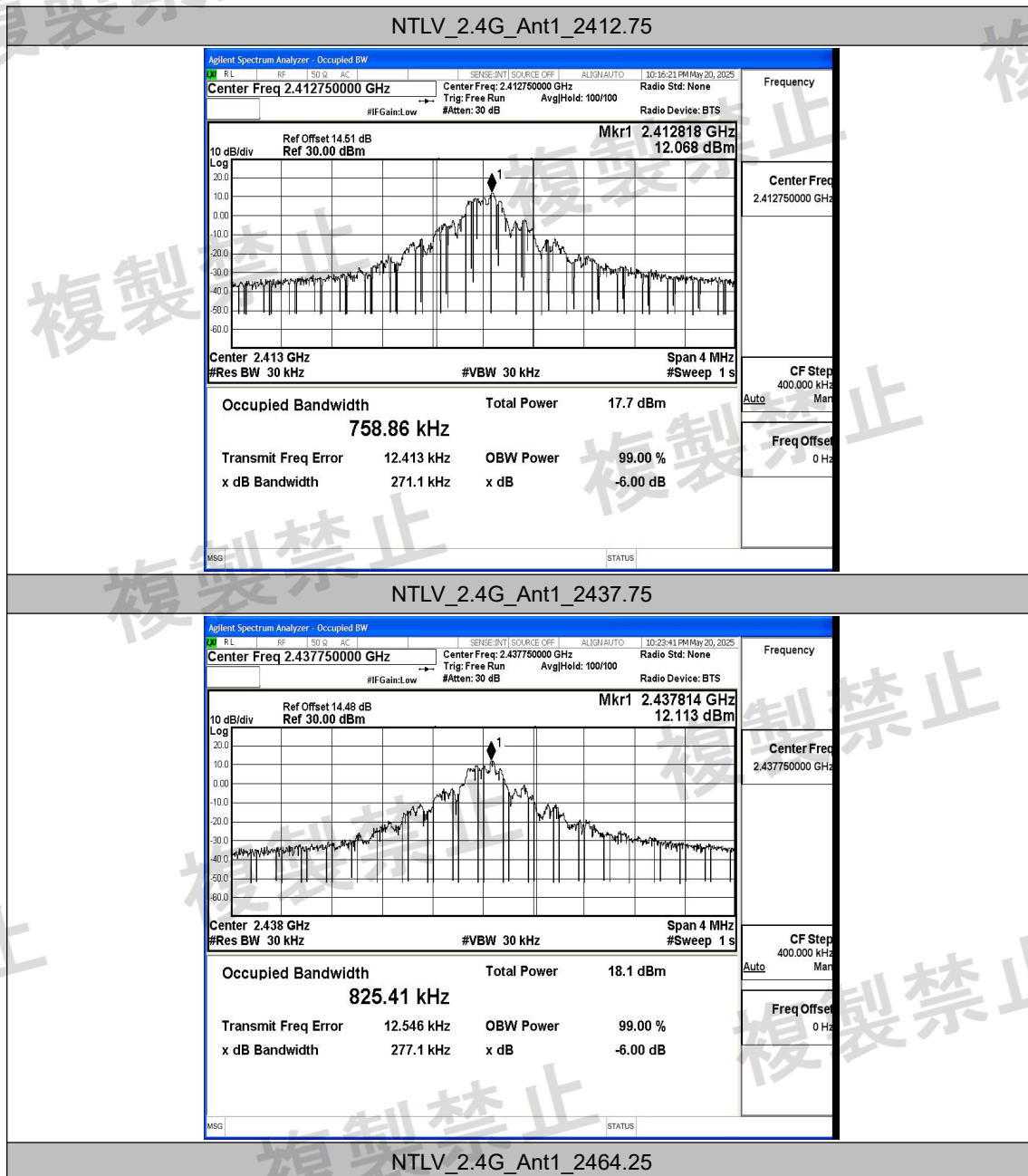
Test Graphs

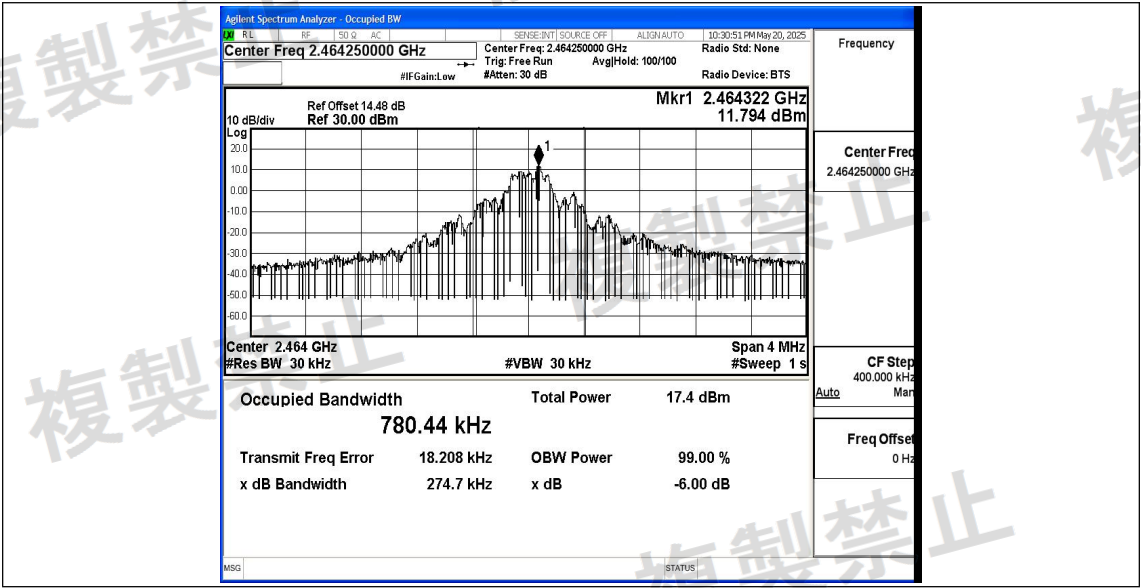




TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTLV	2.4G	Ant1	2412.75	0.759	≤26	PASS
			2437.75	0.825	≤26	PASS
			2464.25	0.780	≤26	PASS

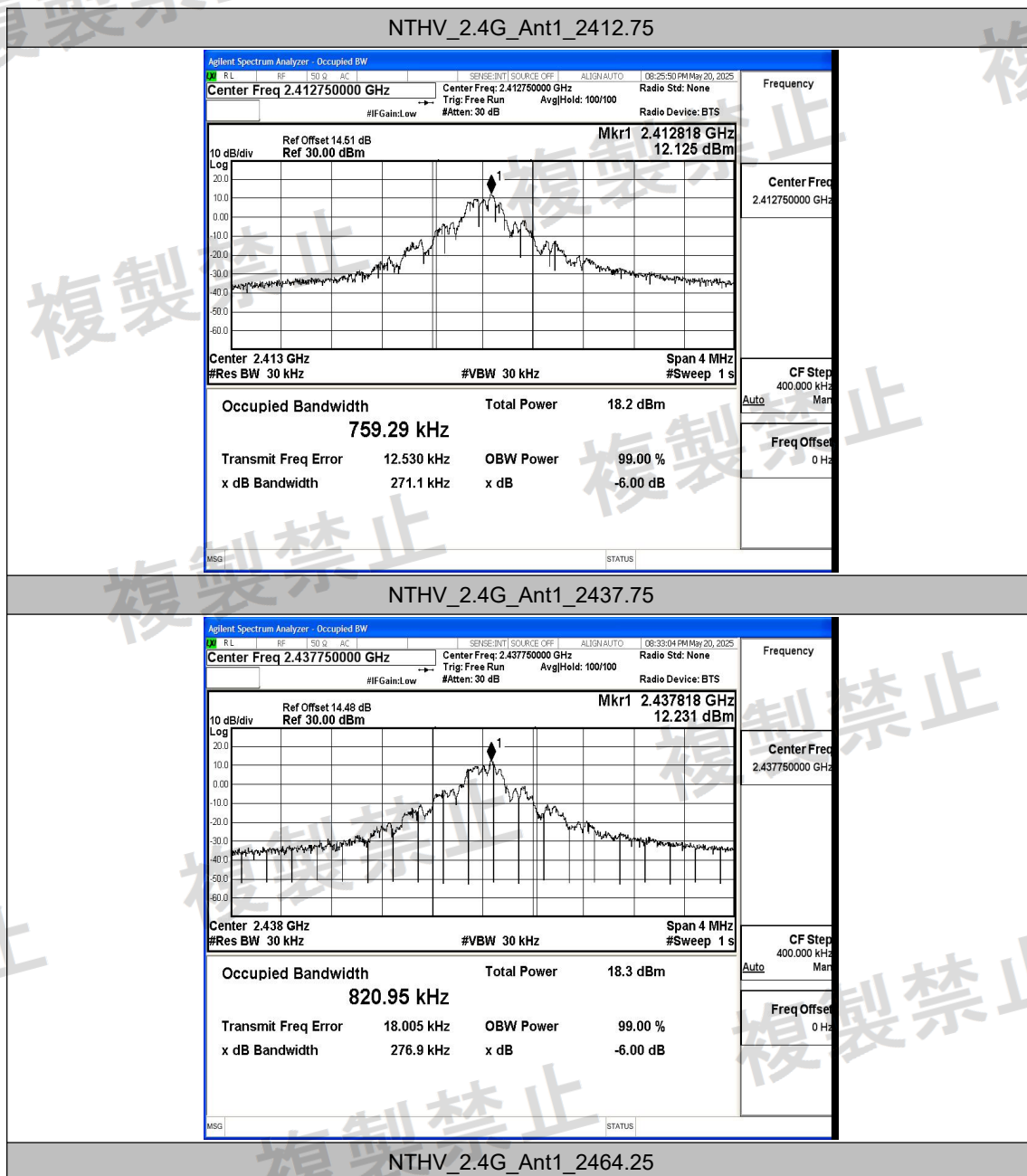
Test Graphs

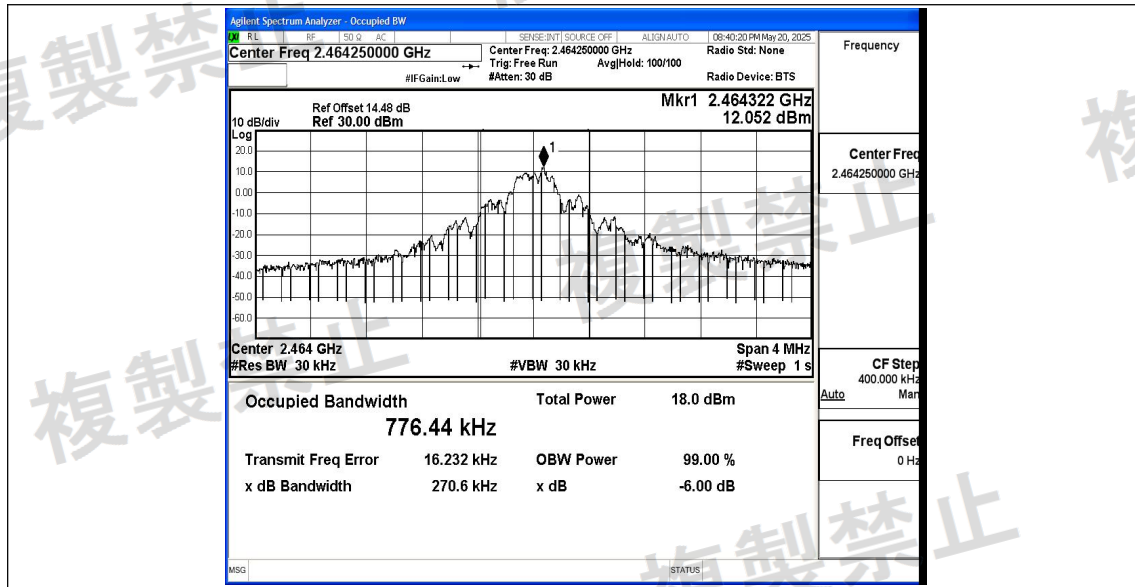




TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTHV	2.4G	Ant1	2412.75	0.759	≤26	PASS
			2437.75	0.821	≤26	PASS
			2464.25	0.776	≤26	PASS

Test Graphs



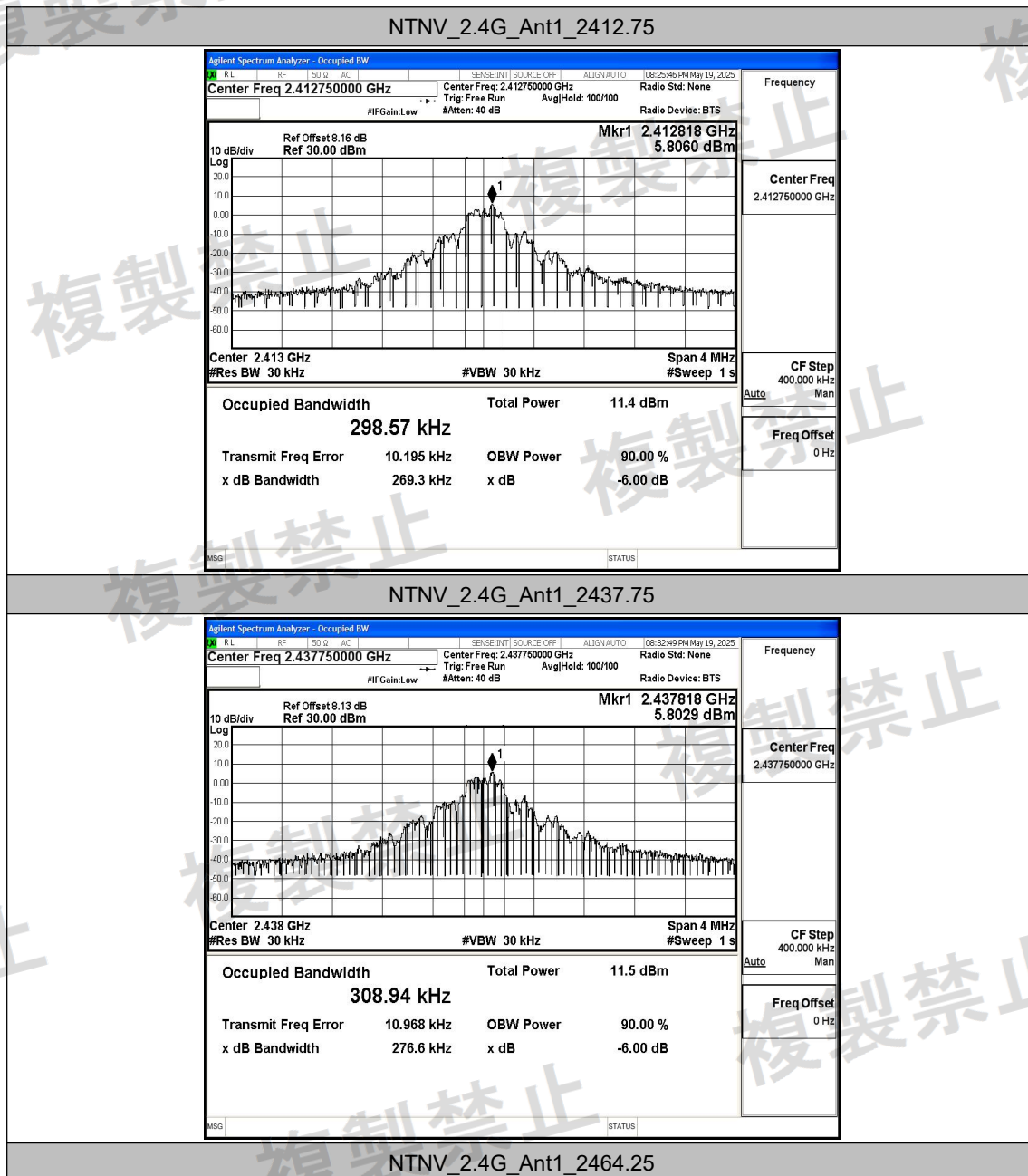


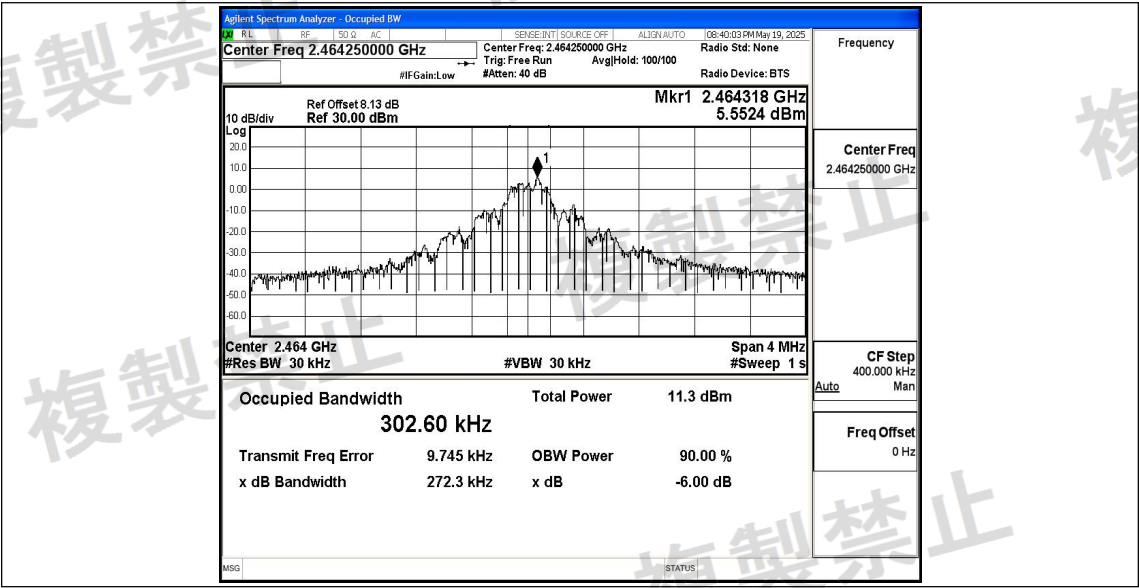
A.4 Spread Bandwidth

Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	2.4G	Ant1	2412.75	0.299	N/A	PASS
			2437.75	0.309	N/A	PASS
			2464.25	0.303	N/A	PASS

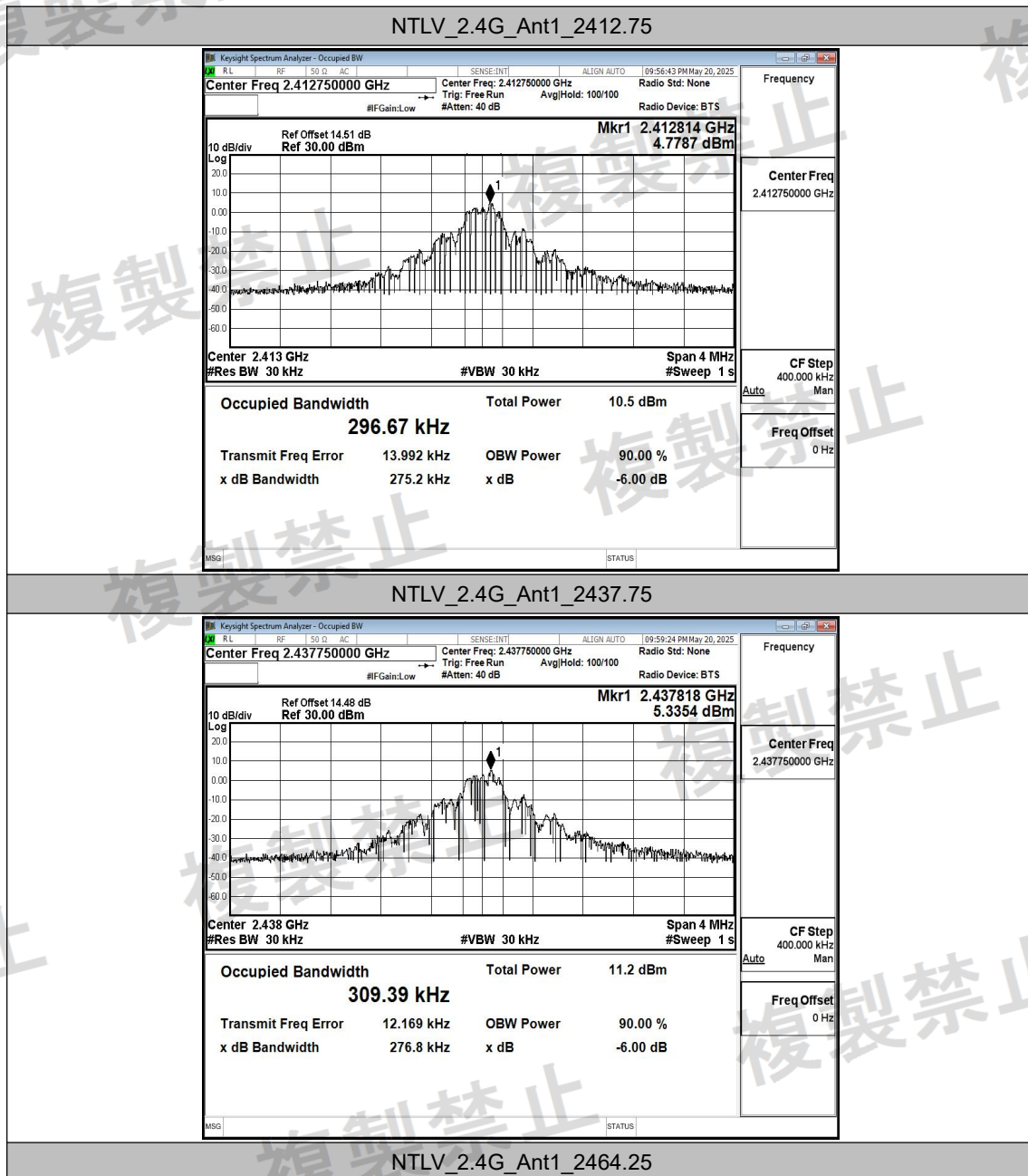
Test Graphs

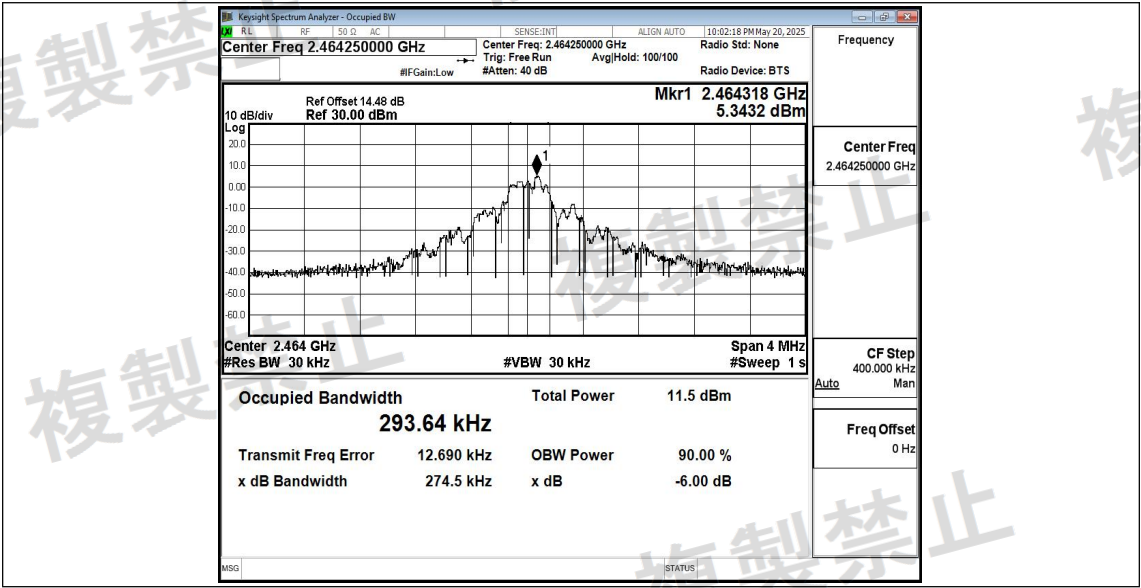




TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTLV	2.4G	Ant1	2412.75	0.297	N/A	PASS
			2437.75	0.309	N/A	PASS
			2464.25	0.294	N/A	PASS

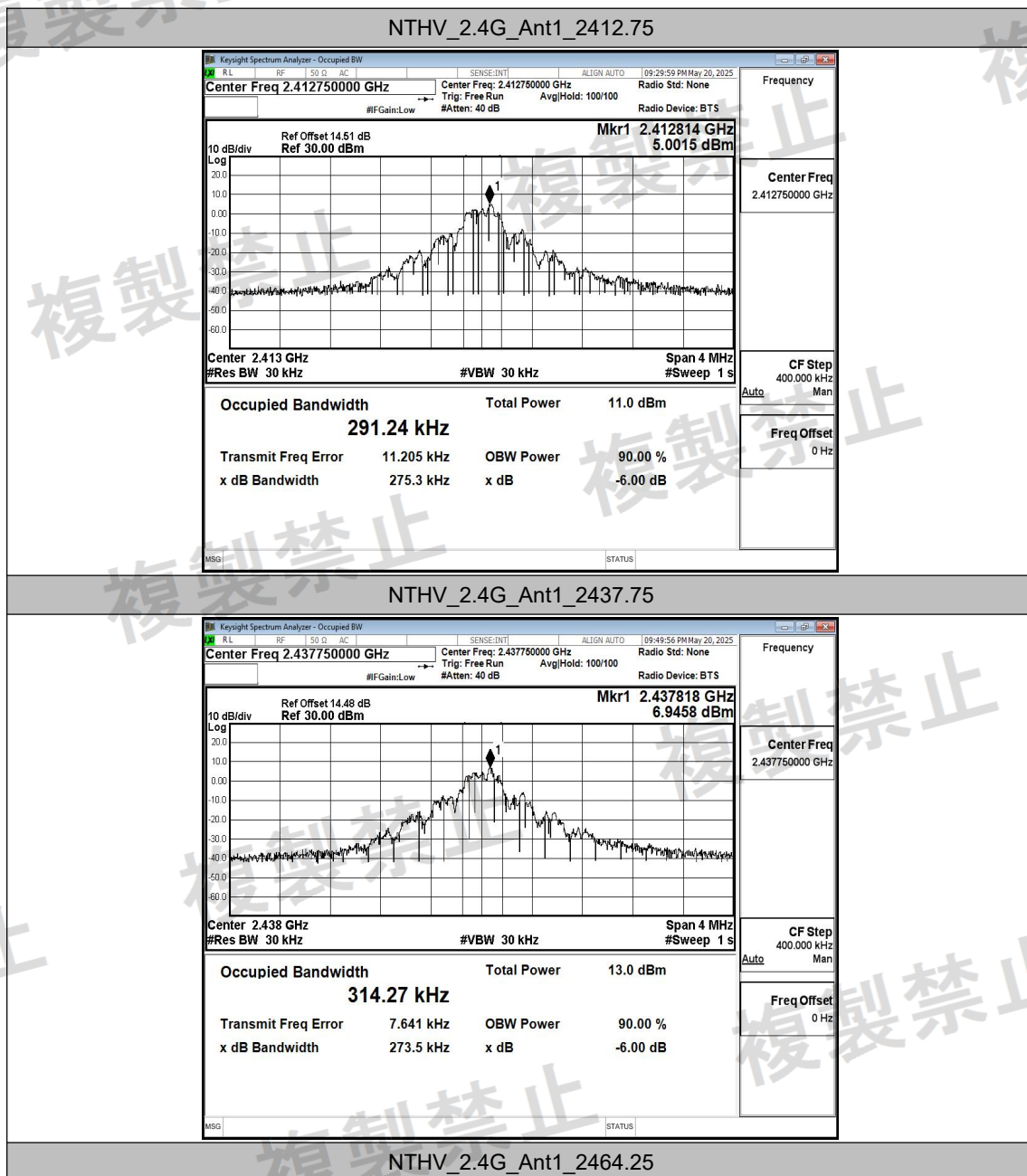
Test Graphs

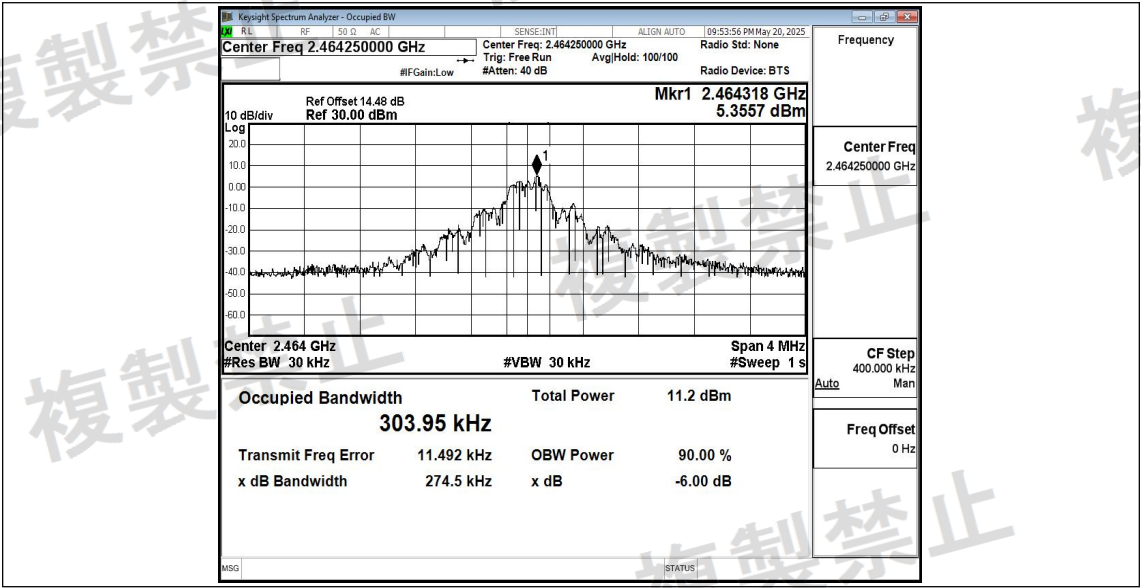




TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTHV	2.4G	Ant1	2412.75	0.291	N/A	PASS
			2437.75	0.314	N/A	PASS
			2464.25	0.304	N/A	PASS

Test Graphs



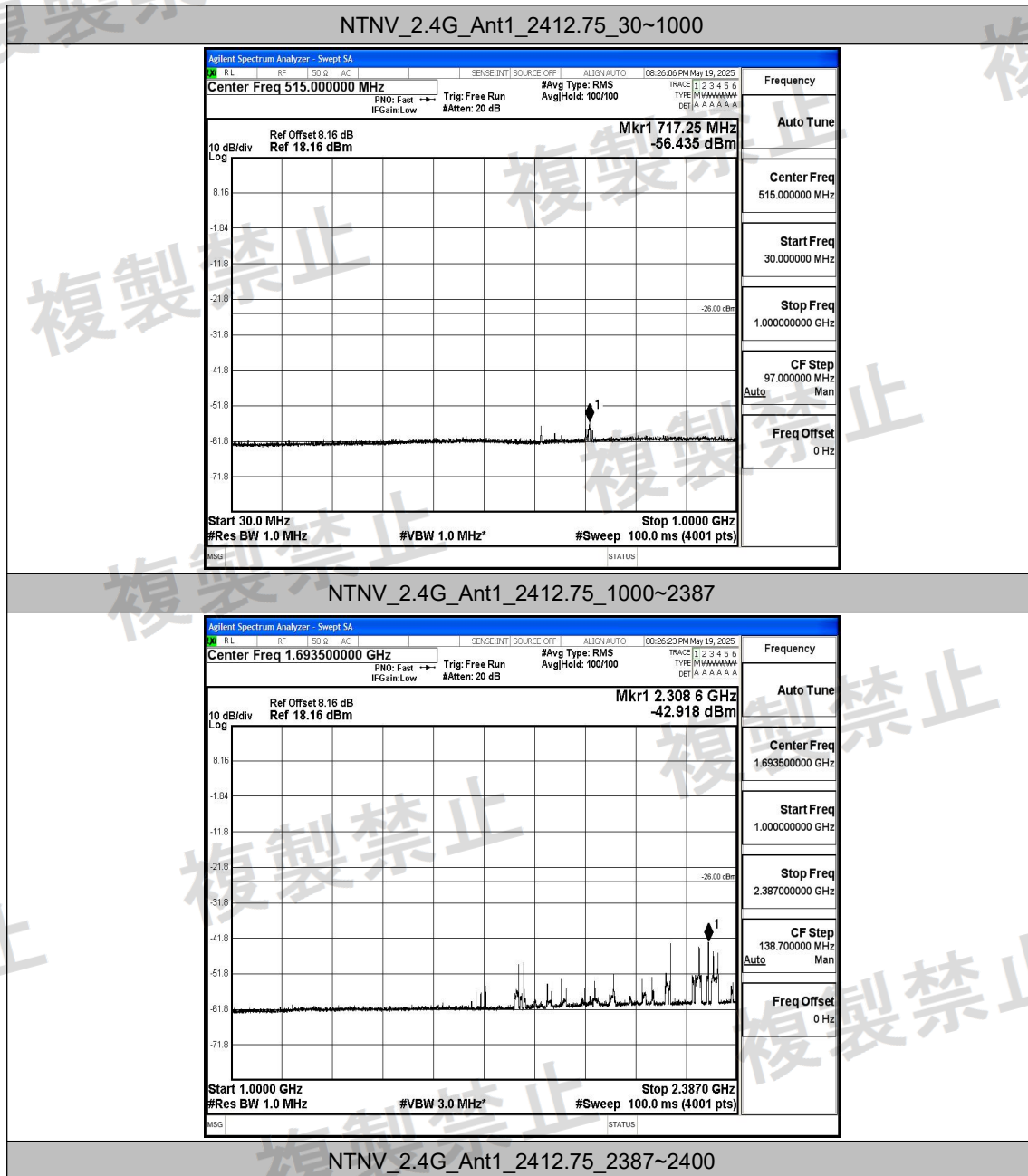


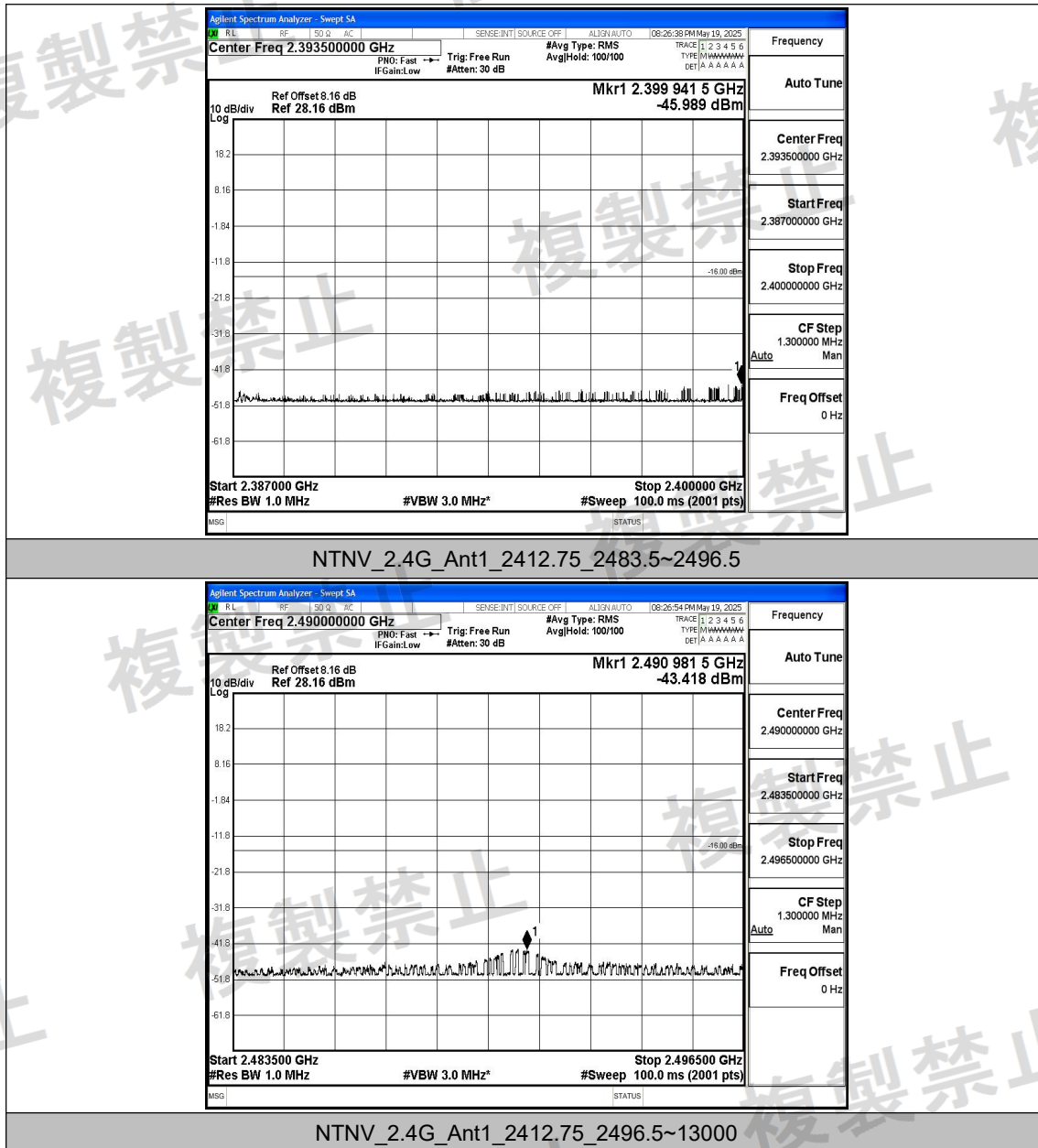
A.5 Spurious Emission of TX

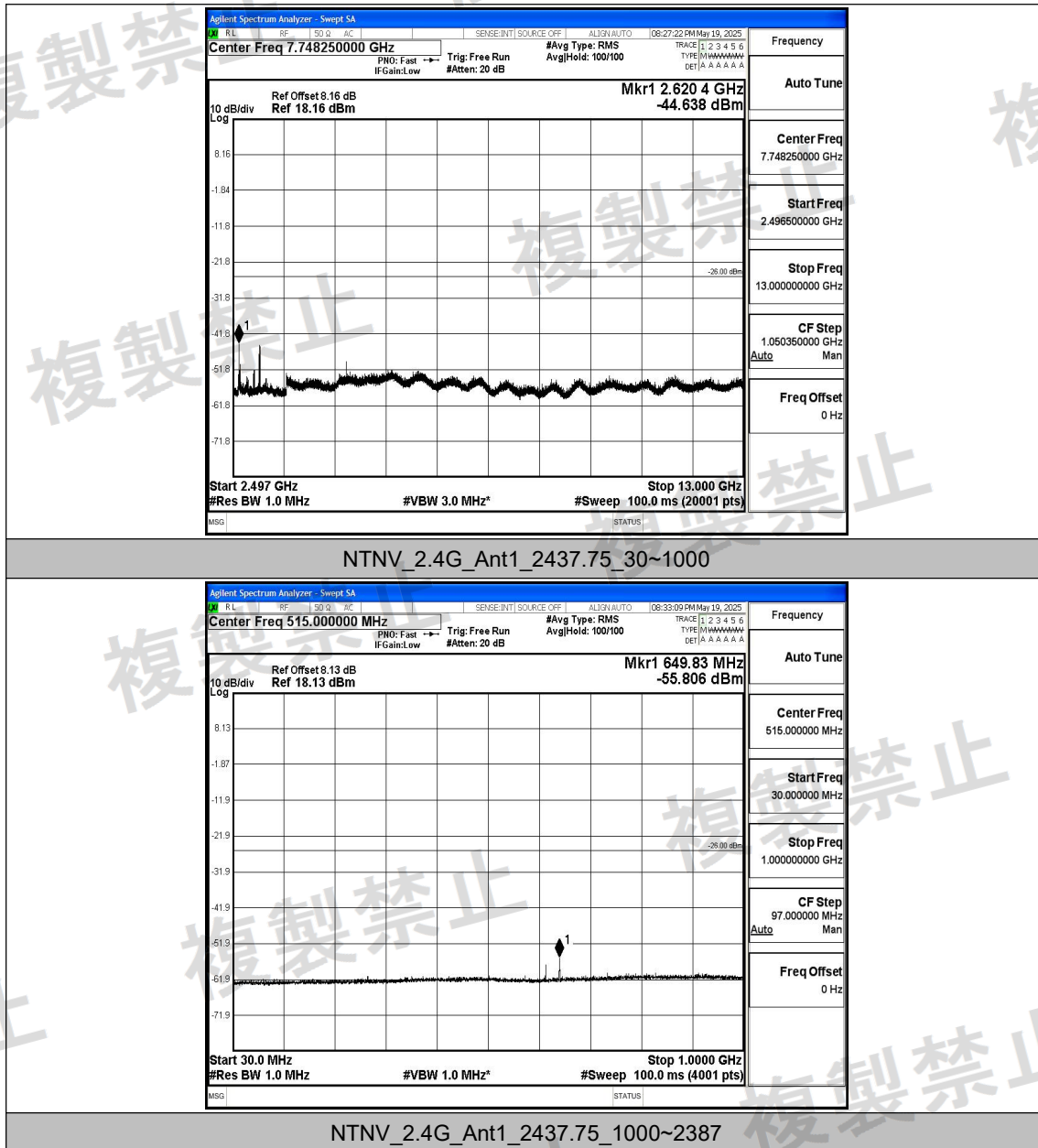
Test Result

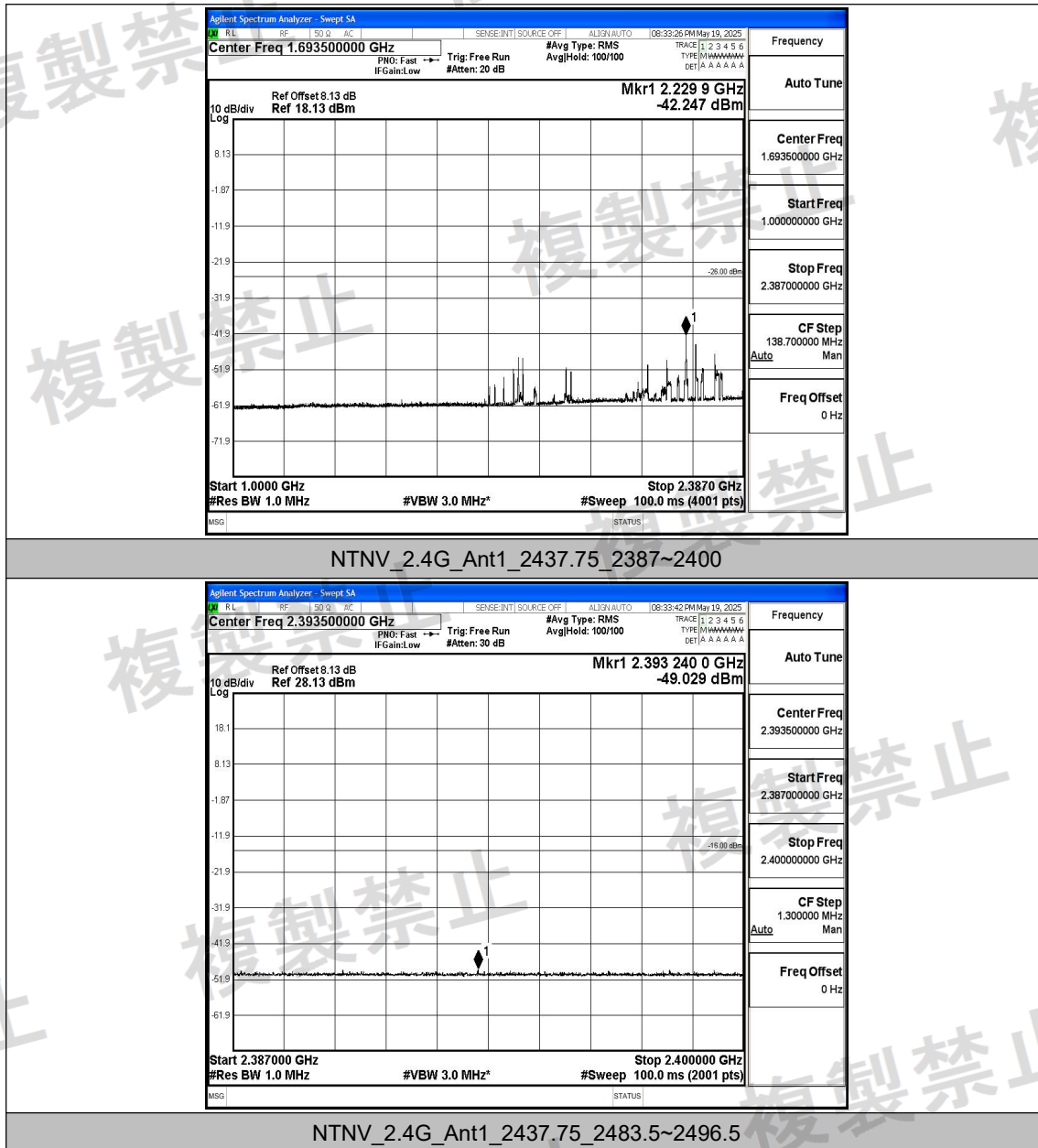
TestCondition	TestMode	Antenna	Frequency[MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	2.4G	Ant1	2412.75	30~1000	-56.44	≤-26	0.00227	≤2.5	PASS
				1000~2387	-42.92	≤-26	0.05105	≤2.5	PASS
				2387~2400	-45.99	≤-16	0.02518	≤25	PASS
				2483.5~2496.5	-43.42	≤-16	0.04550	≤25	PASS
				2496.5~13000	-44.64	≤-26	0.03436	≤2.5	PASS
			2437.75	30~1000	-55.81	≤-26	0.00262	≤2.5	PASS
				1000~2387	-42.25	≤-26	0.05957	≤2.5	PASS
				2387~2400	-49.03	≤-16	0.01250	≤25	PASS
				2483.5~2496.5	-47.32	≤-16	0.01854	≤25	PASS
				2496.5~13000	-44.08	≤-26	0.03908	≤2.5	PASS
			2464.25	30~1000	-57.43	≤-26	0.00181	≤2.5	PASS
				1000~2387	-42.70	≤-26	0.05370	≤2.5	PASS
				2387~2400	-47.84	≤-16	0.01644	≤25	PASS
				2483.5~2496.5	-44.07	≤-16	0.03917	≤25	PASS
				2496.5~13000	-38.43	≤-26	0.14355	≤2.5	PASS

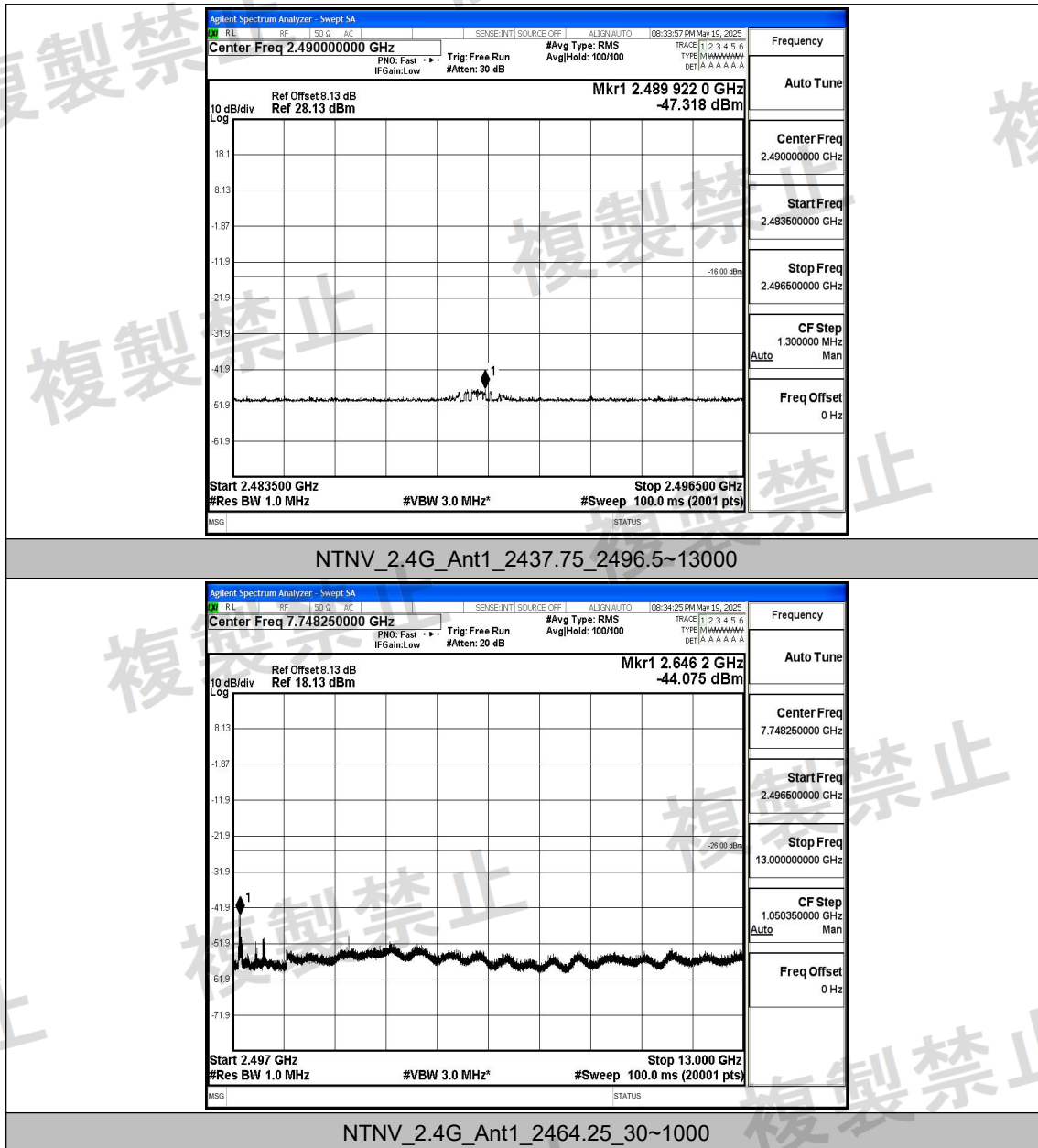
Test Graphs

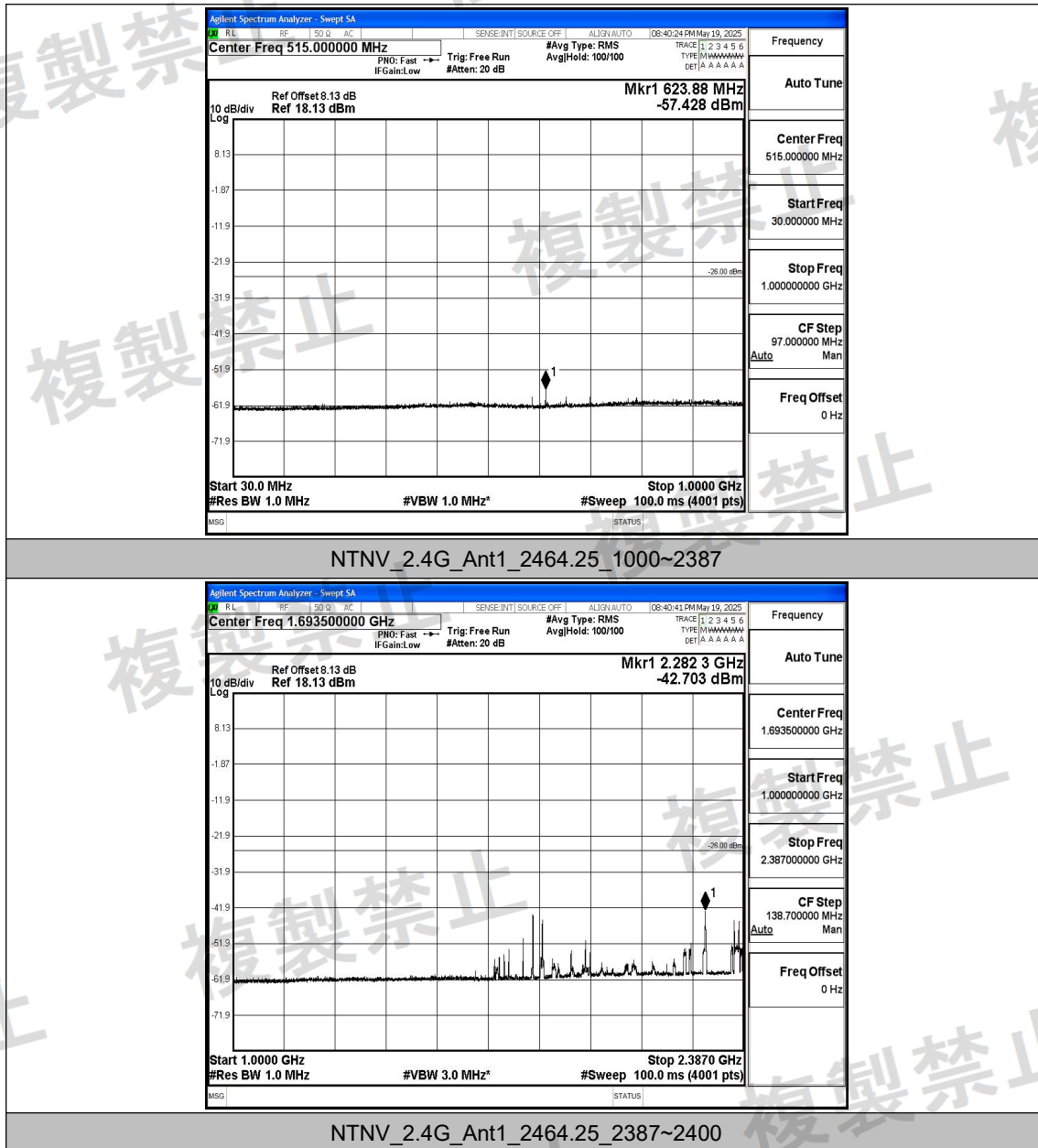


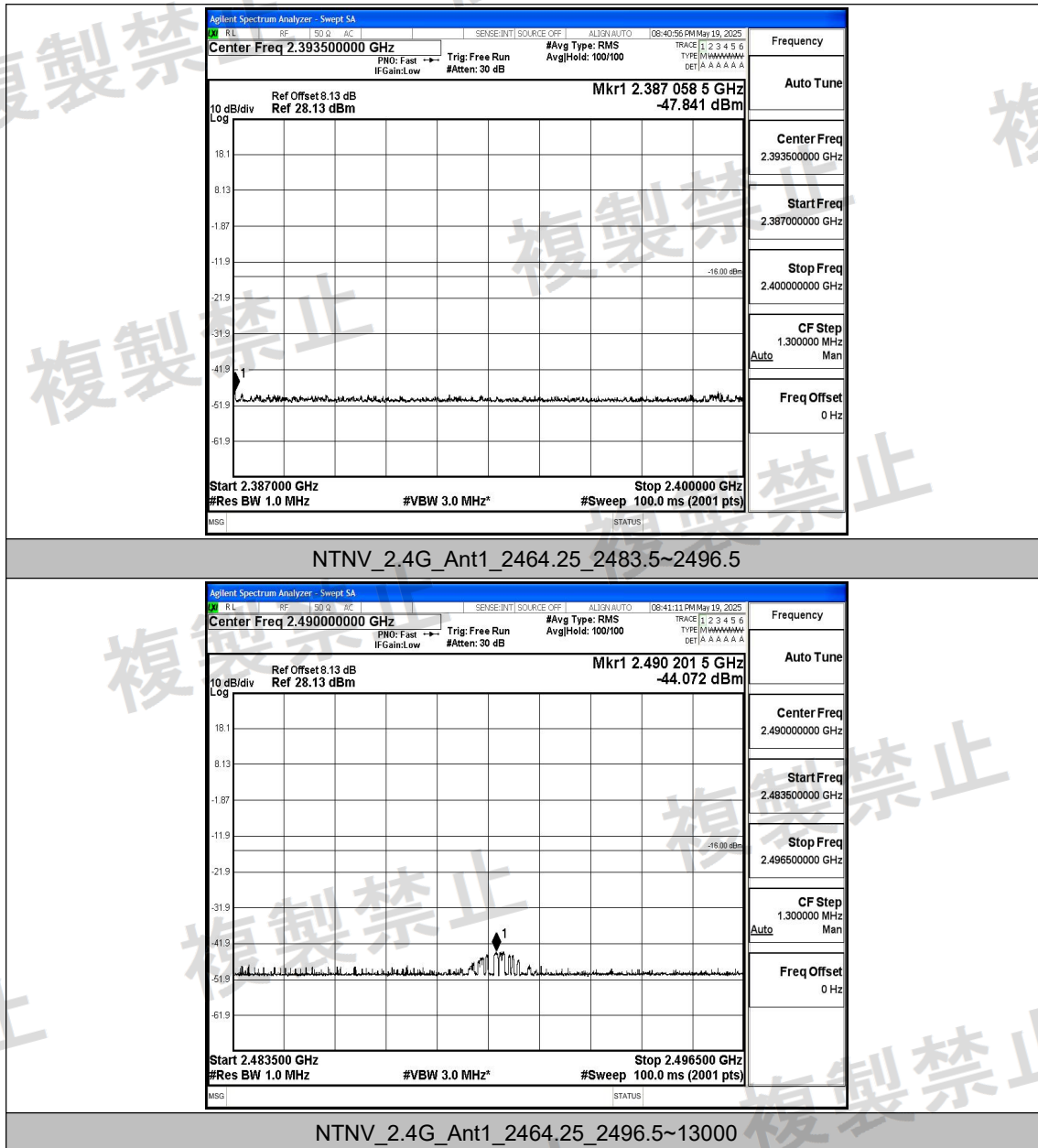


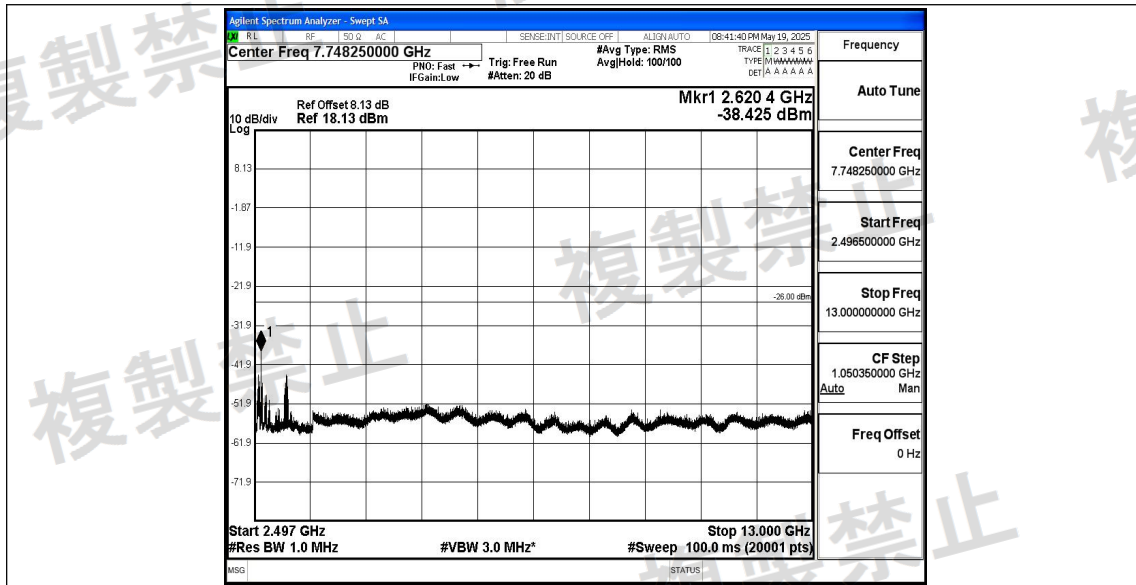






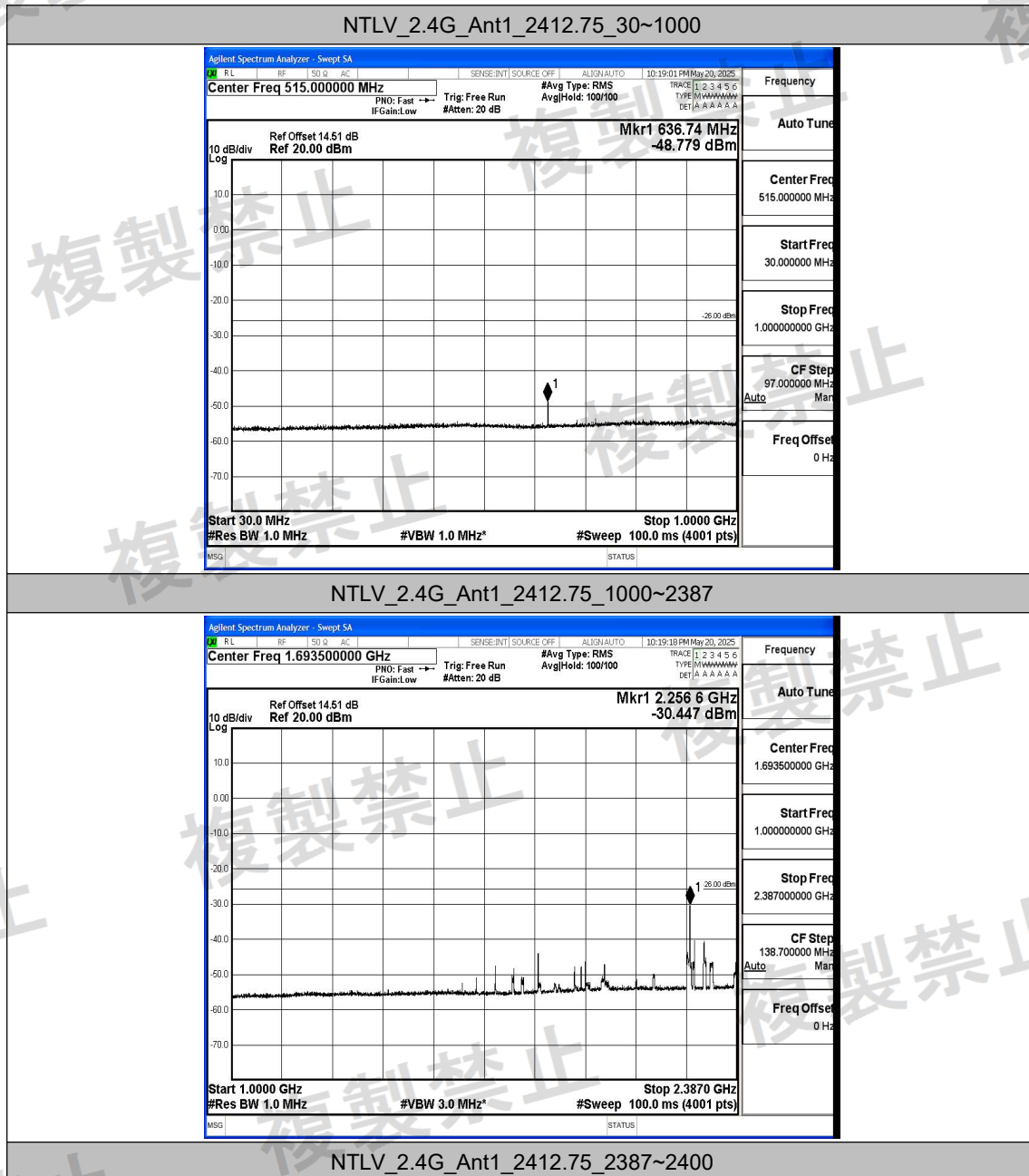


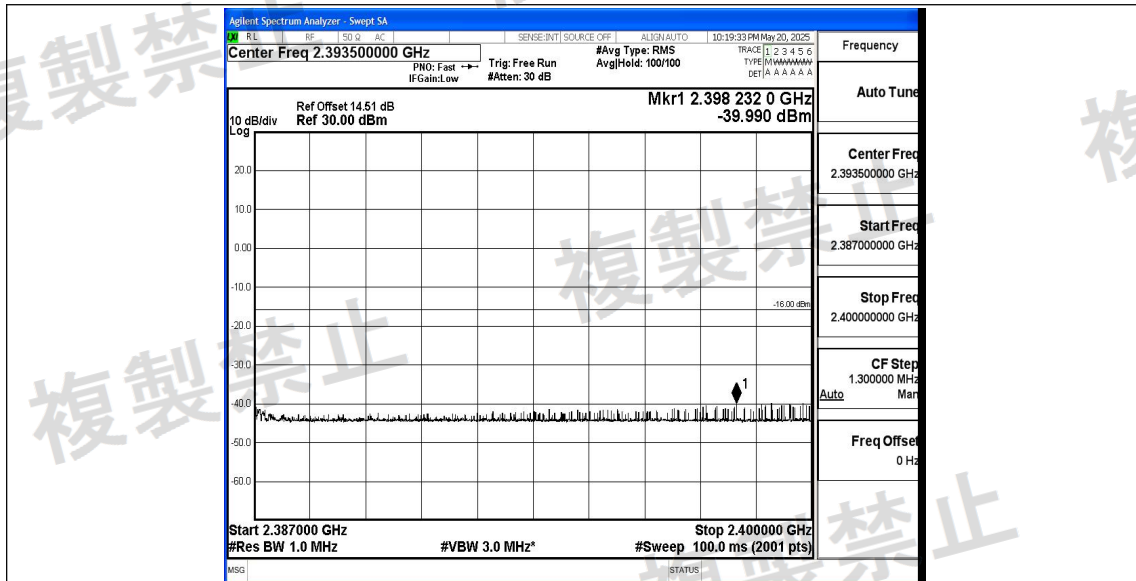




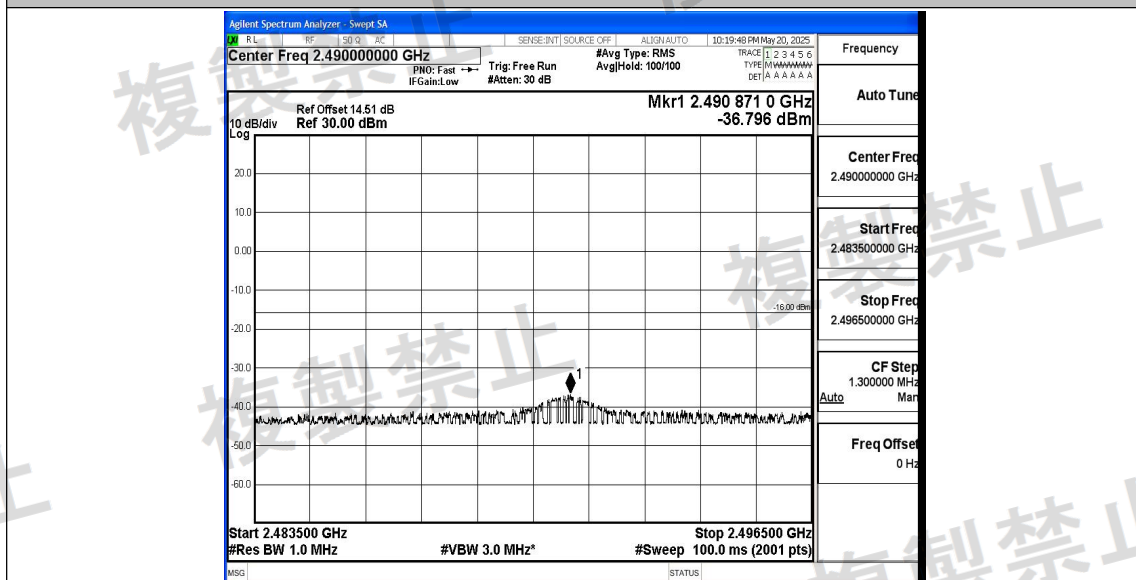
TestCondition	TestMode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTLV	2.4G	Ant1	2412.75	30~1000	-48.78	≤-26	0.01324	≤2.5	PASS
				1000~2387	-30.45	≤-26	0.90157	≤2.5	PASS
				2387~2400	-39.99	≤-16	0.10023	≤25	PASS
				2483.5~2496.5	-36.80	≤-16	0.20893	≤25	PASS
				2496.5~13000	-37.34	≤-26	0.18450	≤2.5	PASS
			2437.75	30~1000	-53.27	≤-26	0.00471	≤2.5	PASS
				1000~2387	-30.64	≤-26	0.86298	≤2.5	PASS
				2387~2400	-43.17	≤-16	0.04819	≤25	PASS
				2483.5~2496.5	-41.24	≤-16	0.07516	≤25	PASS
				2496.5~13000	-36.09	≤-26	0.24604	≤2.5	PASS
			2464.25	30~1000	-48.75	≤-26	0.01334	≤2.5	PASS
				1000~2387	-35.57	≤-26	0.27733	≤2.5	PASS
				2387~2400	-41.68	≤-16	0.06792	≤25	PASS
				2483.5~2496.5	-37.46	≤-16	0.17947	≤25	PASS
				2496.5~13000	-30.54	≤-26	0.88308	≤2.5	PASS

Test Graphs

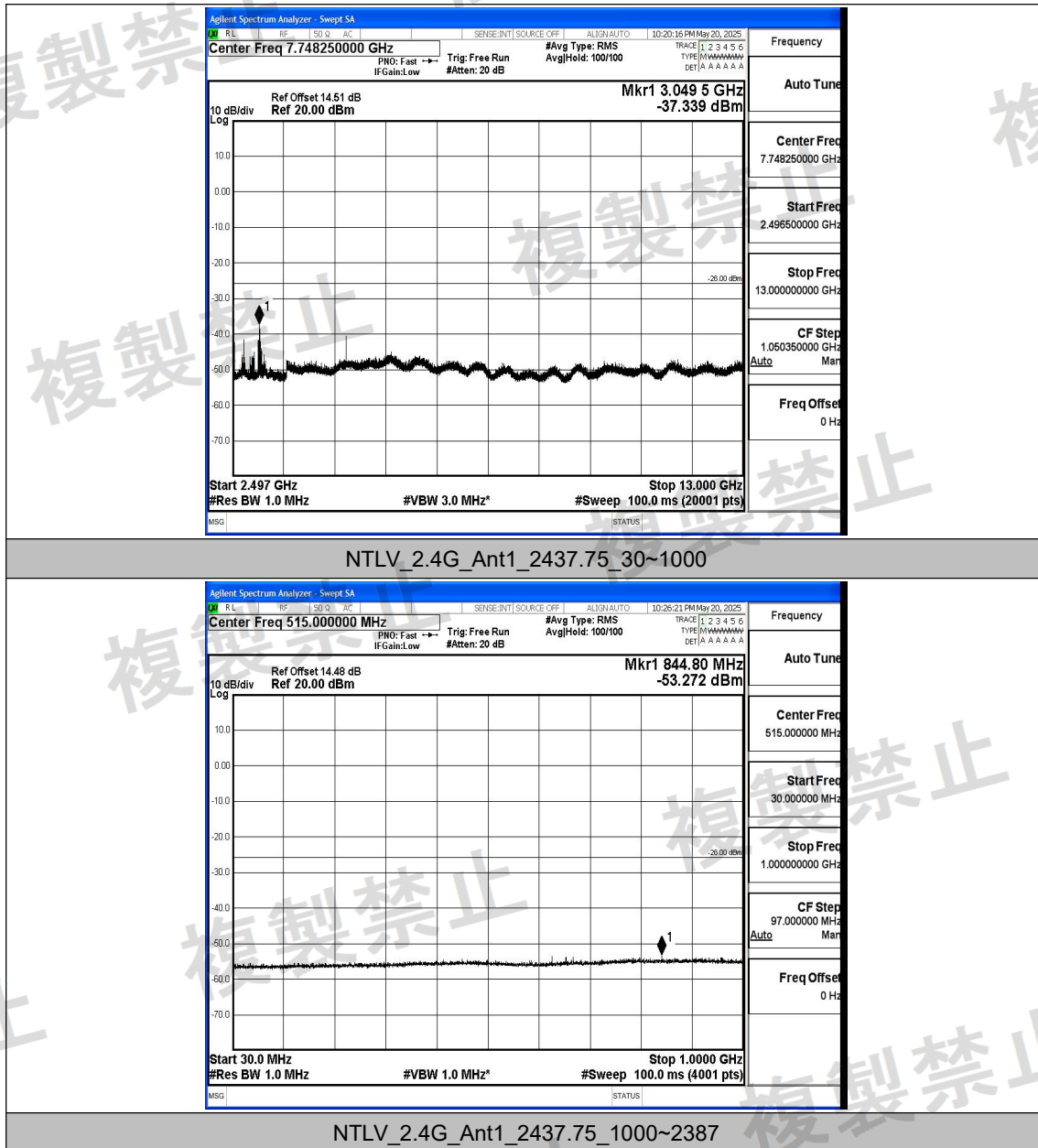


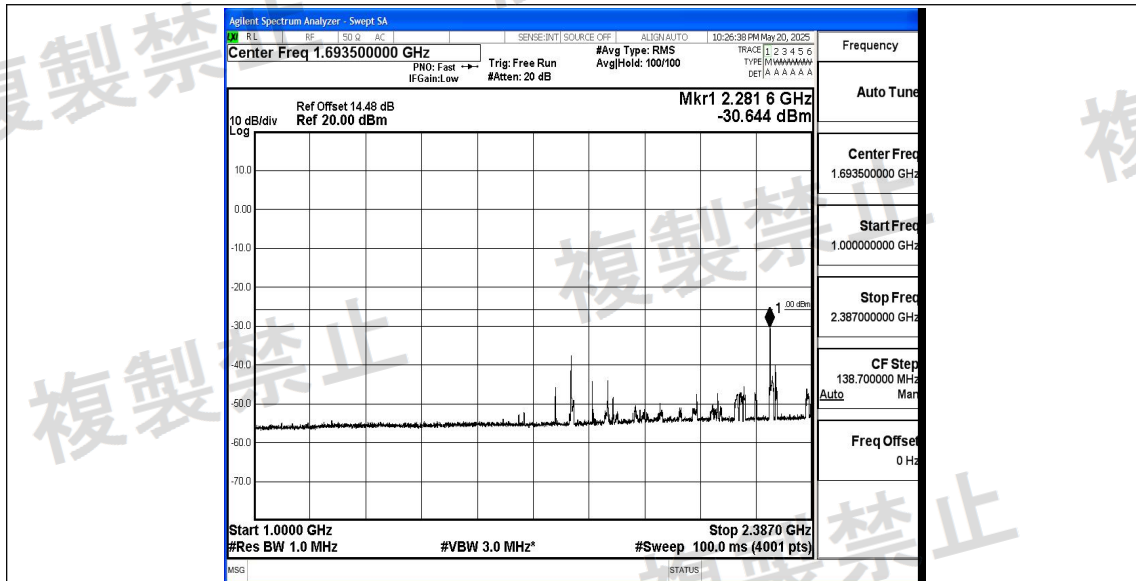


NTLV_2.4G_Ant1_2412.75_2483.5~2496.5

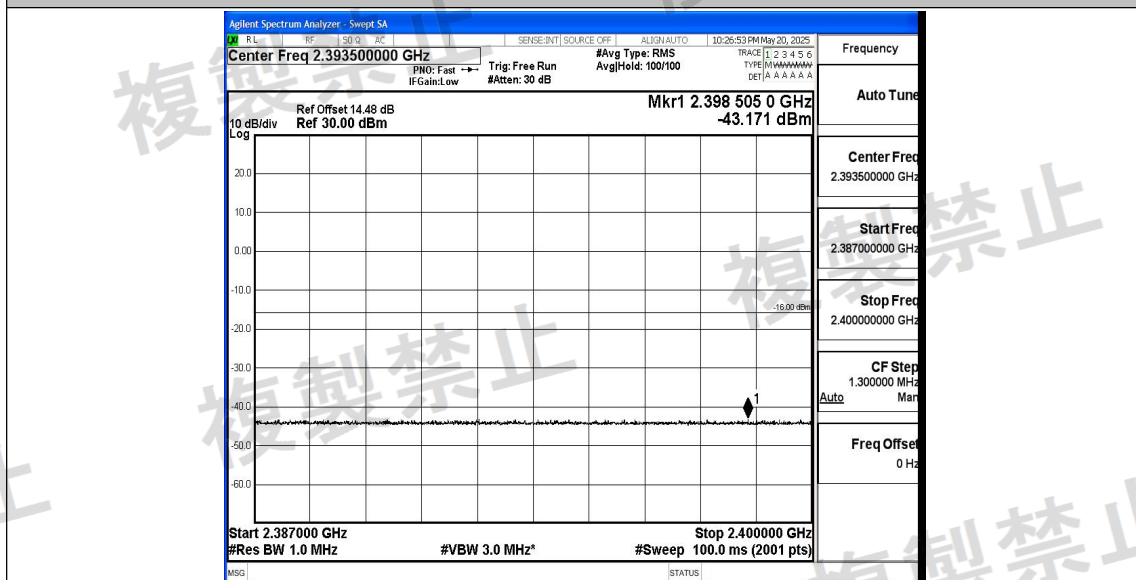


NTLV_2.4G_Ant1_2412.75_2496.5~13000

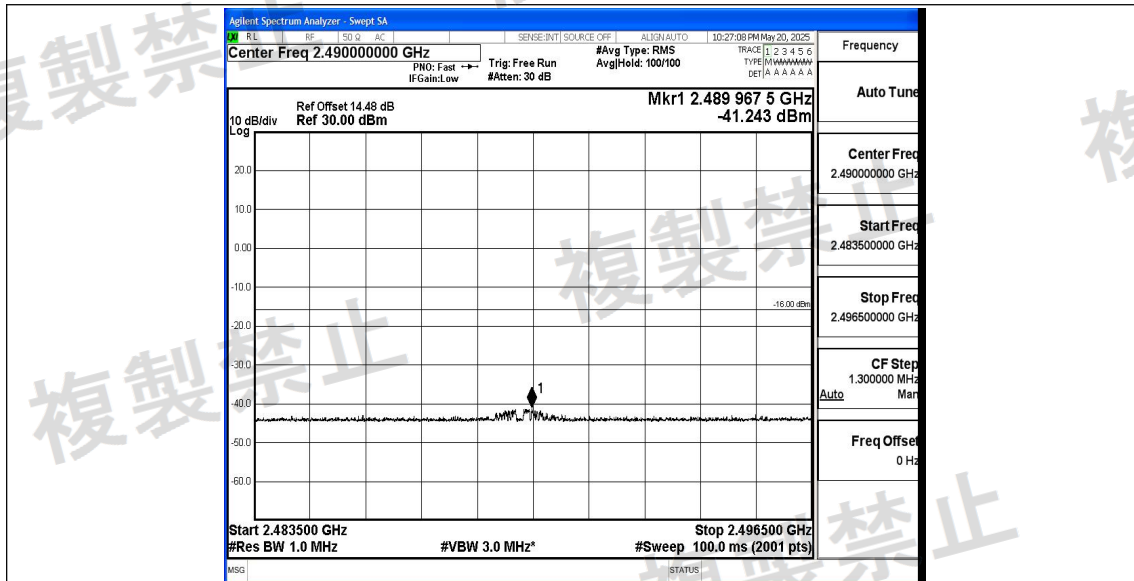




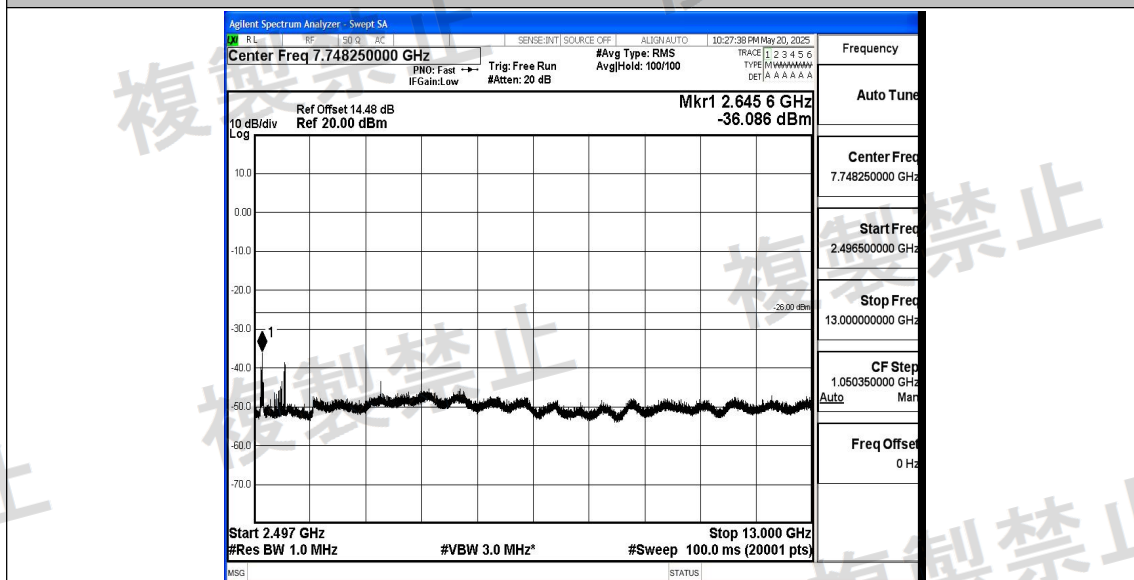
NTLV_2.4G_Ant1_2437.75_2387~2400



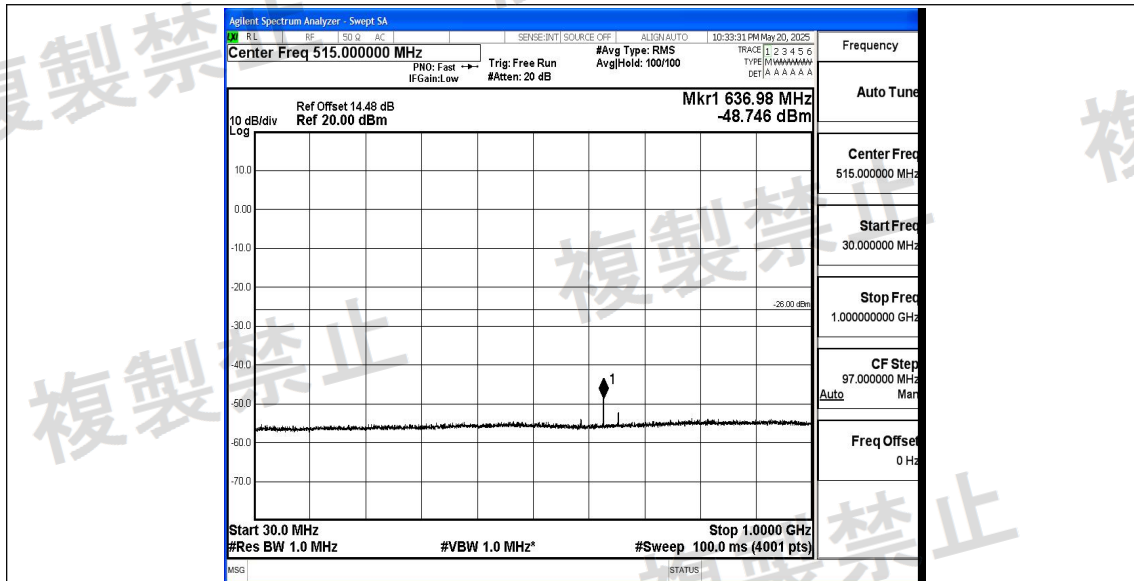
NTLV_2.4G_Ant1_2437.75_2483.5~2496.5



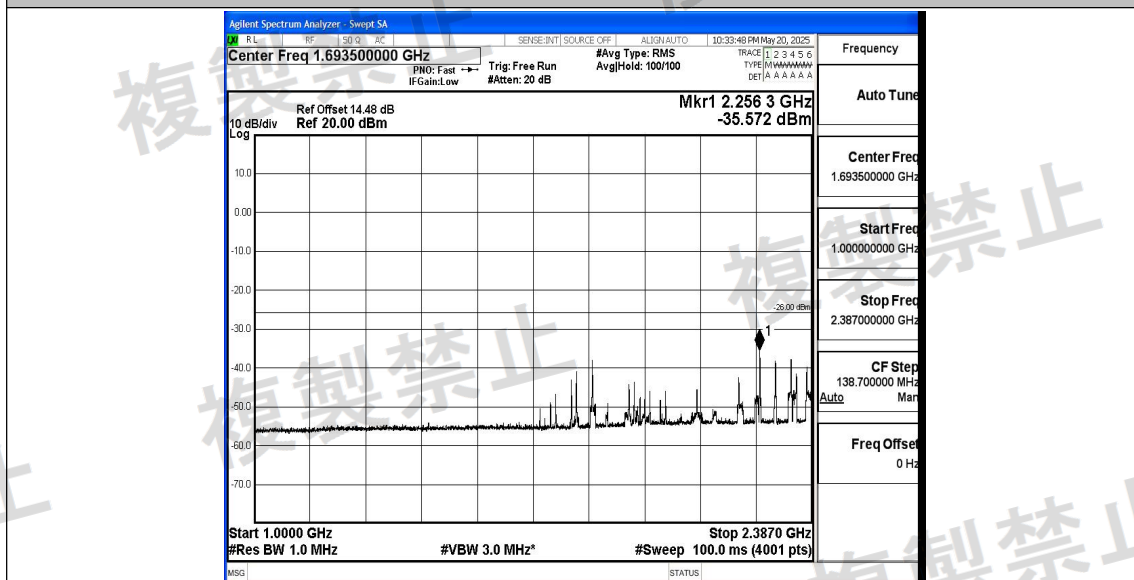
NTLV_2.4G_Ant1_2437.75_2496.5~13000



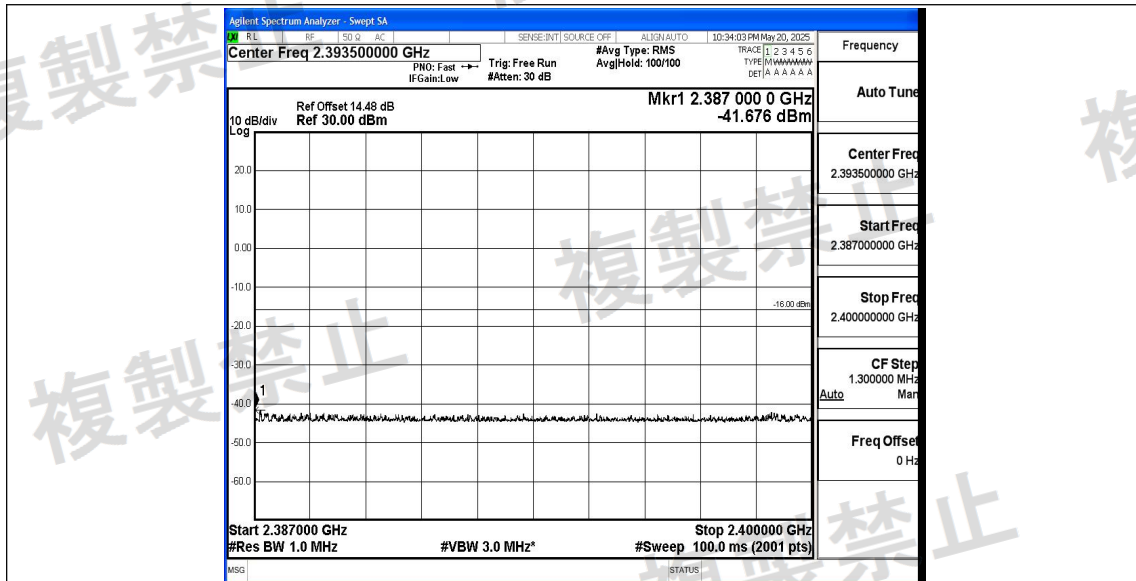
NTLV_2.4G_Ant1_2464.25_30~1000



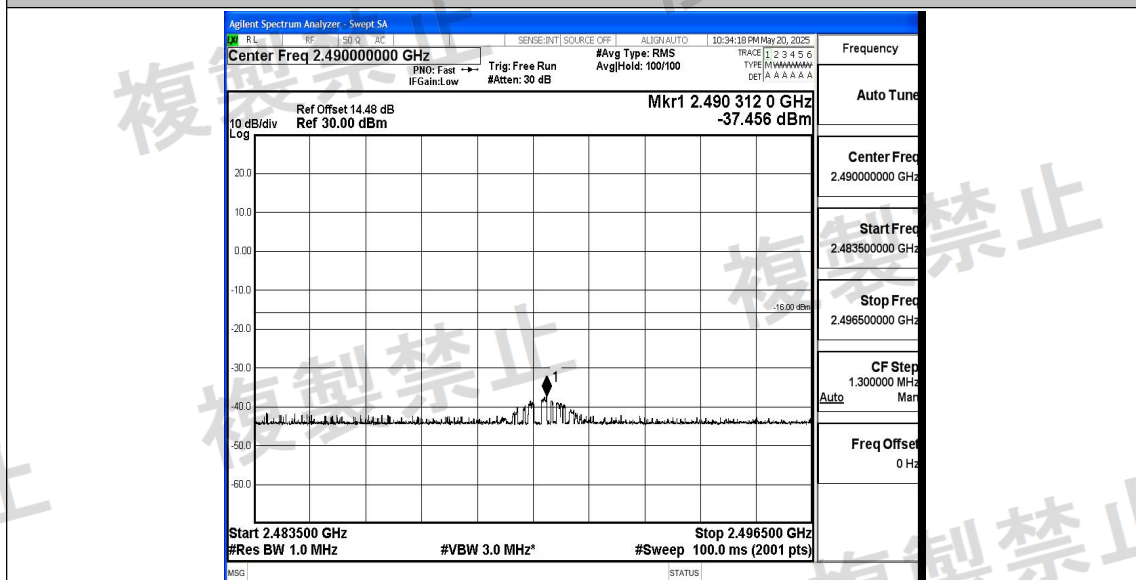
NTLV_2.4G_Ant1_2464.25_1000~2387



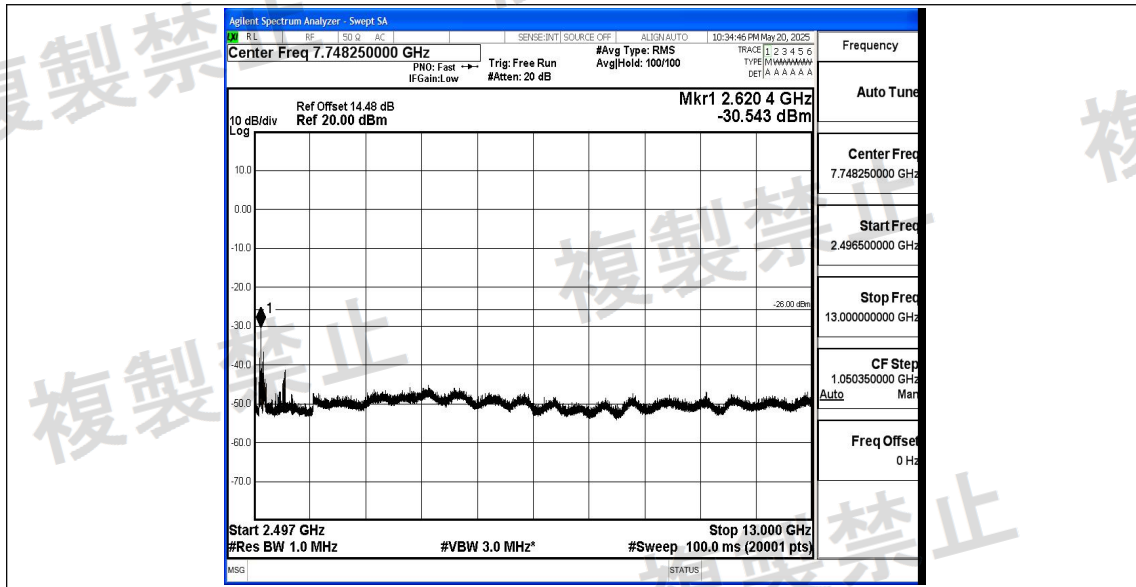
NTLV_2.4G_Ant1_2464.25_2387~2400



NTLV_2.4G_Ant1_2464.25_2483.5~2496.5

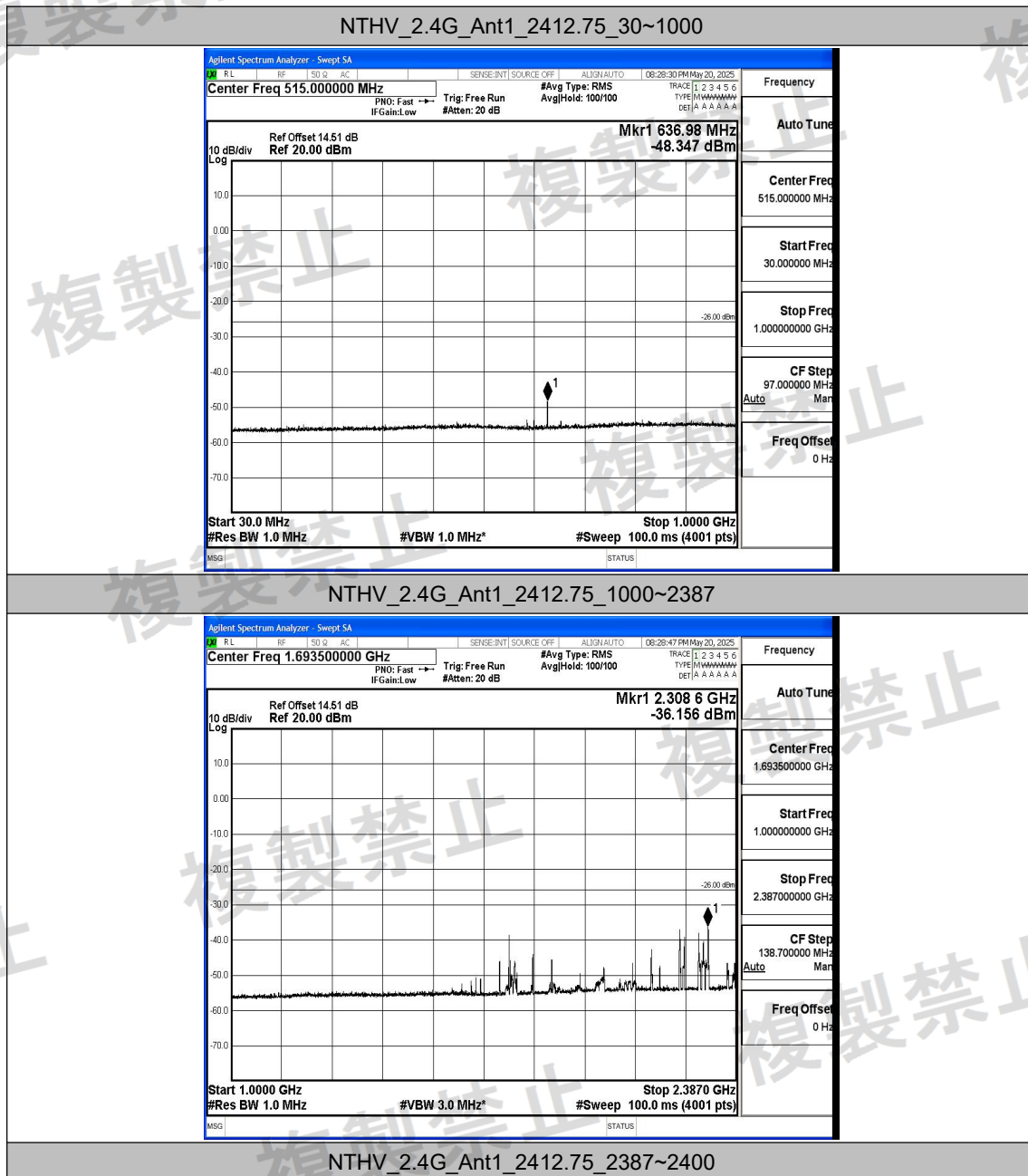


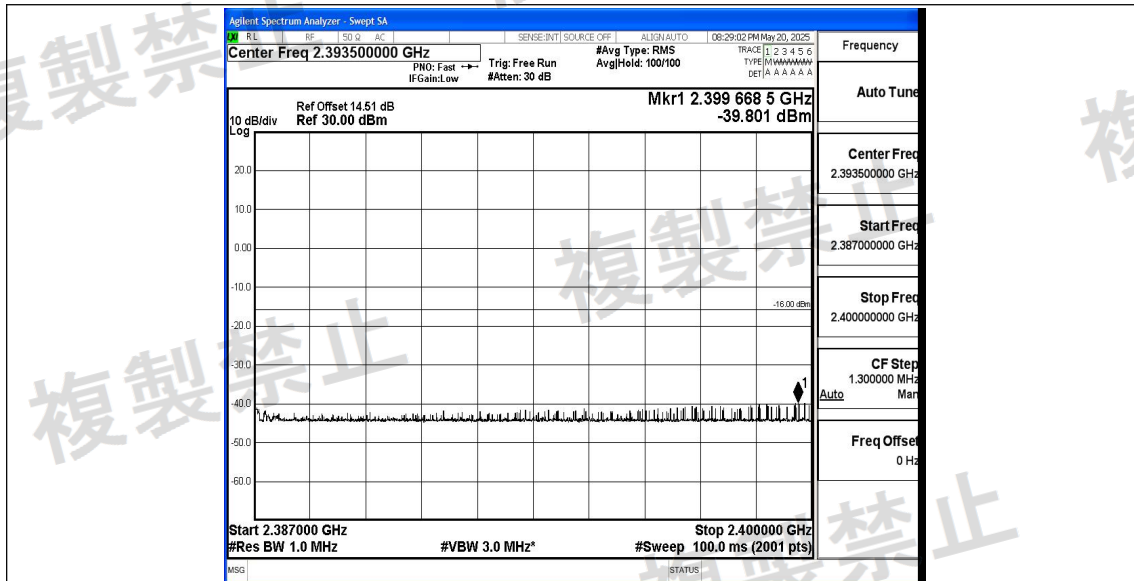
NTLV_2.4G_Ant1_2464.25_2496.5~13000



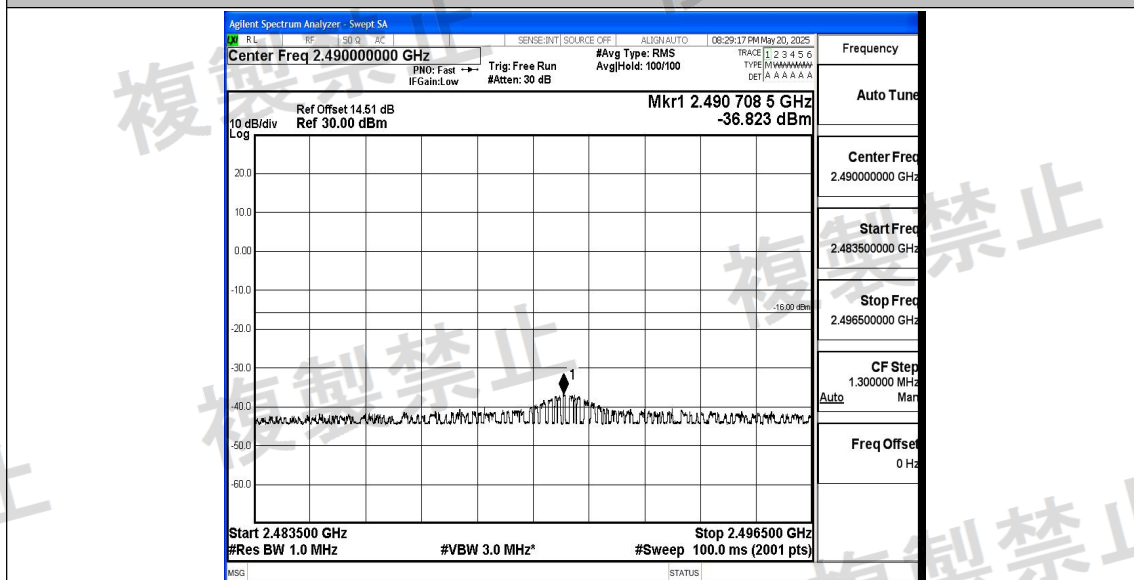
TestCondition	TestMode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTHV	2.4G	Ant1	2412.75	30~1000	-48.35	≤-26	0.01462	≤2.5	PASS
				1000~2387	-36.16	≤-26	0.24210	≤2.5	PASS
				2387~2400	-39.80	≤-16	0.10471	≤25	PASS
				2483.5~2496.5	-36.82	≤-16	0.20797	≤25	PASS
				2496.5~13000	-32.01	≤-26	0.62951	≤2.5	PASS
			2437.75	30~1000	-49.58	≤-26	0.01102	≤2.5	PASS
				1000~2387	-33.19	≤-26	0.47973	≤2.5	PASS
				2387~2400	-43.02	≤-16	0.04989	≤25	PASS
				2483.5~2496.5	-40.60	≤-16	0.08710	≤25	PASS
				2496.5~13000	-37.85	≤-26	0.16406	≤2.5	PASS
			2464.25	30~1000	-47.85	≤-26	0.01641	≤2.5	PASS
				1000~2387	-36.41	≤-26	0.22856	≤2.5	PASS
				2387~2400	-41.37	≤-16	0.07295	≤25	PASS
				2483.5~2496.5	-37.61	≤-16	0.17338	≤25	PASS
				2496.5~13000	-31.16	≤-26	0.76560	≤2.5	PASS

Test Graphs

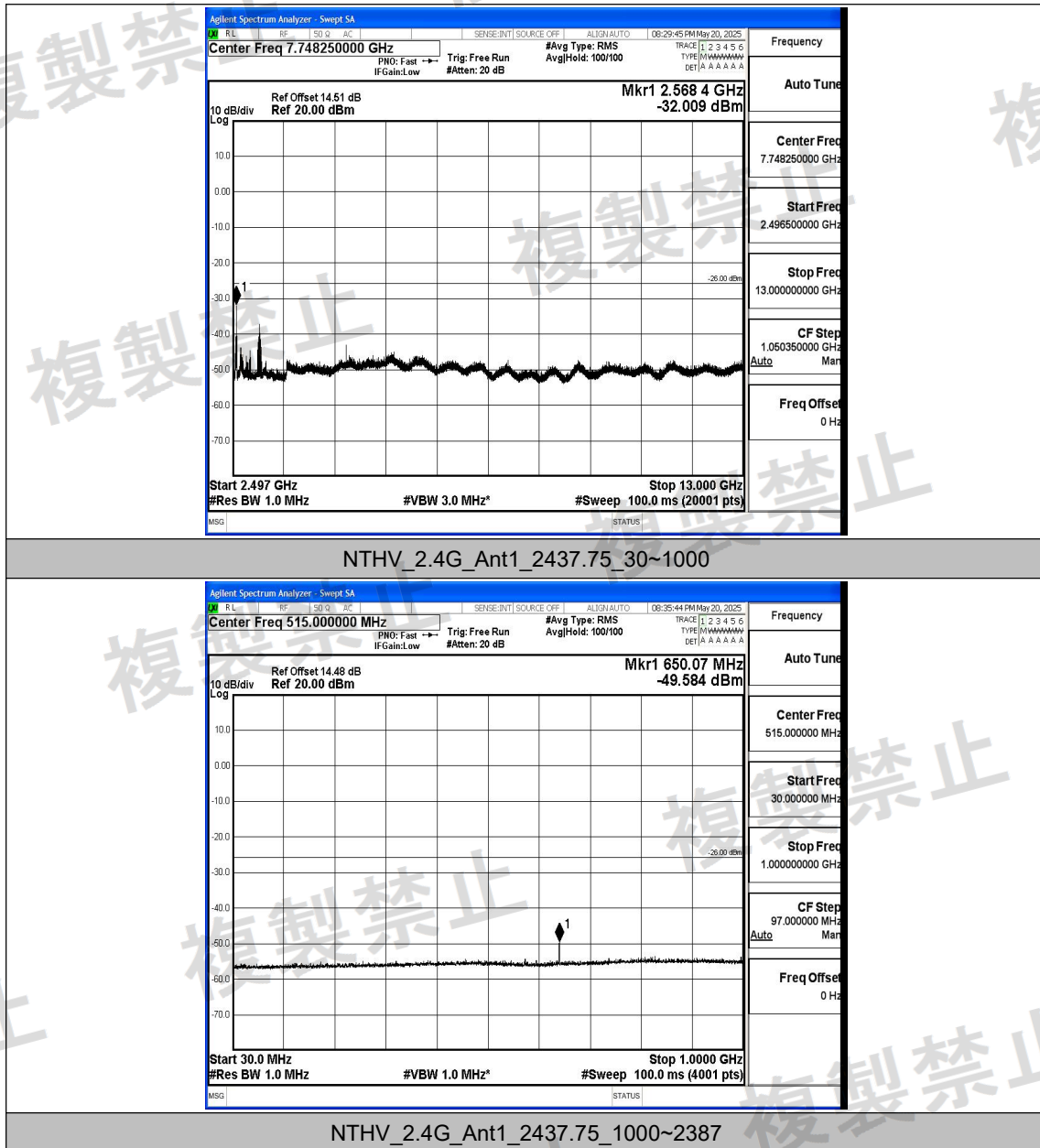


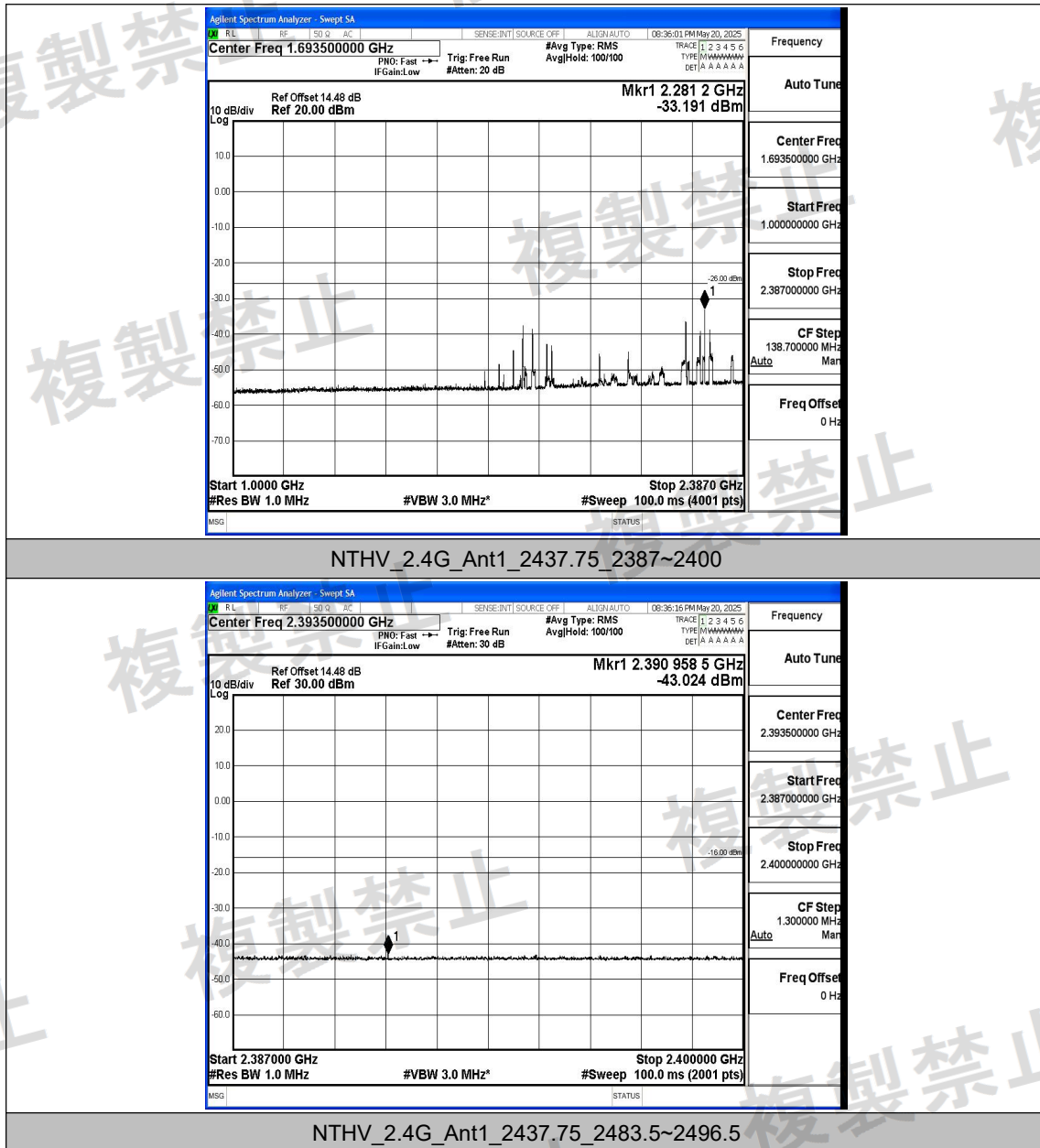


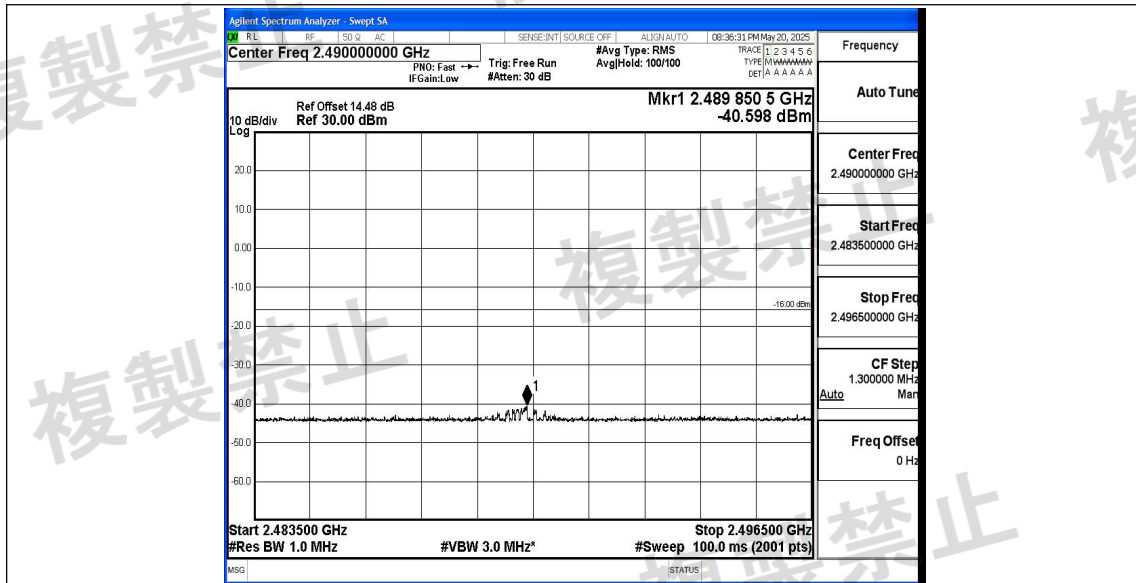
NTHV_2.4G_Ant1_2412.75_2483.5~2496.5



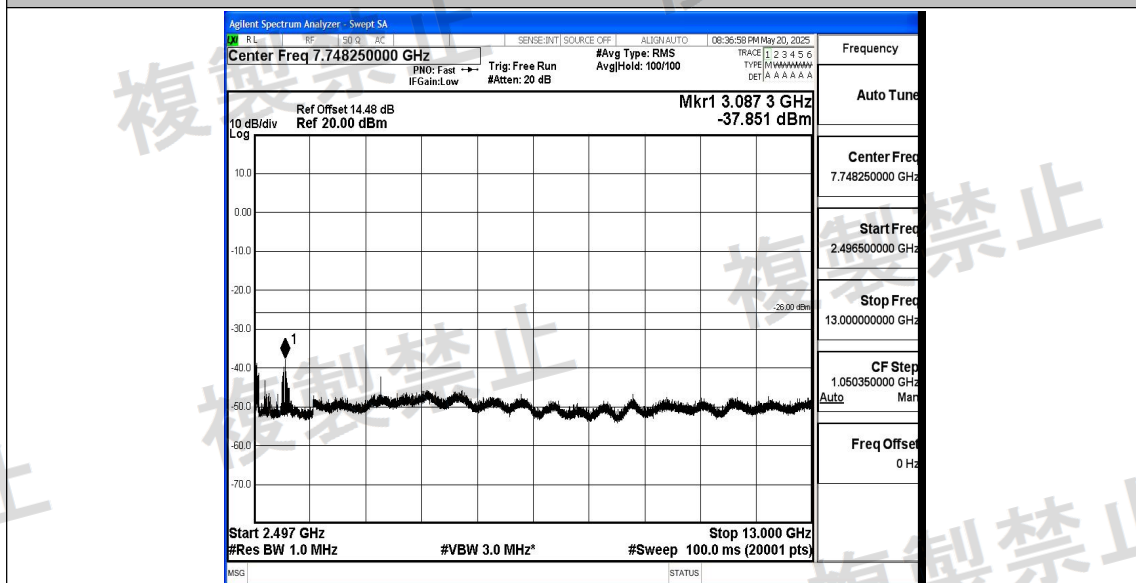
NTHV_2.4G_Ant1_2412.75_2496.5~13000



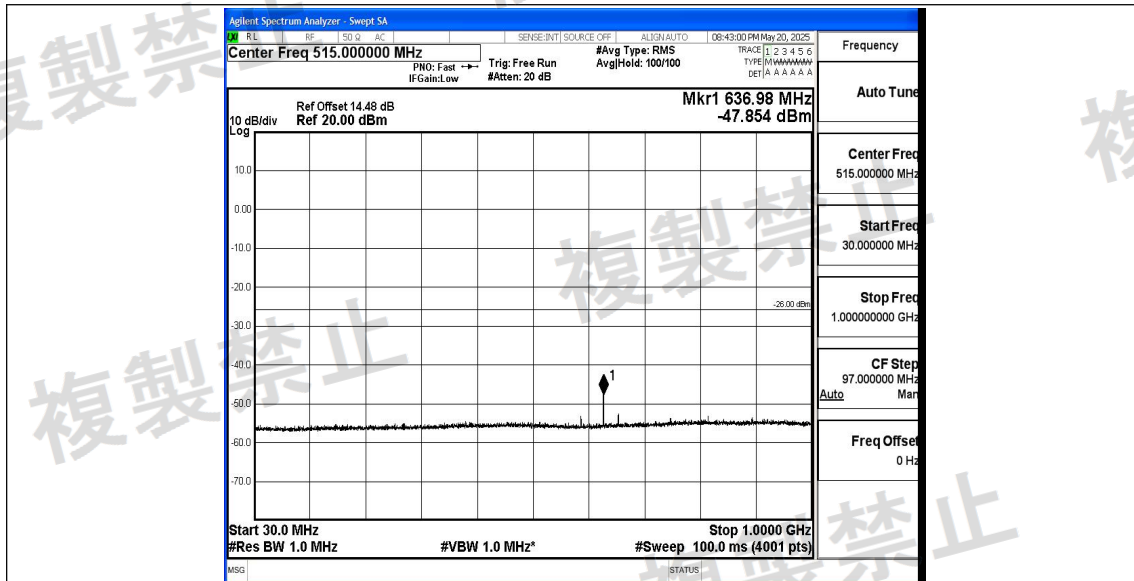




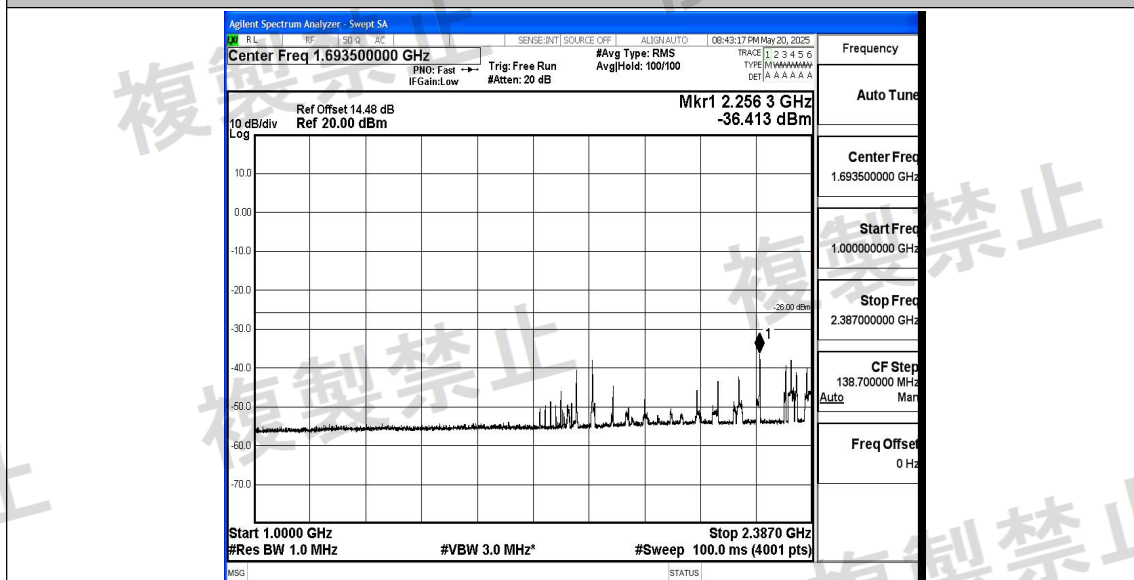
NTHV_2.4G_Ant1_2437.75_2496.5~13000



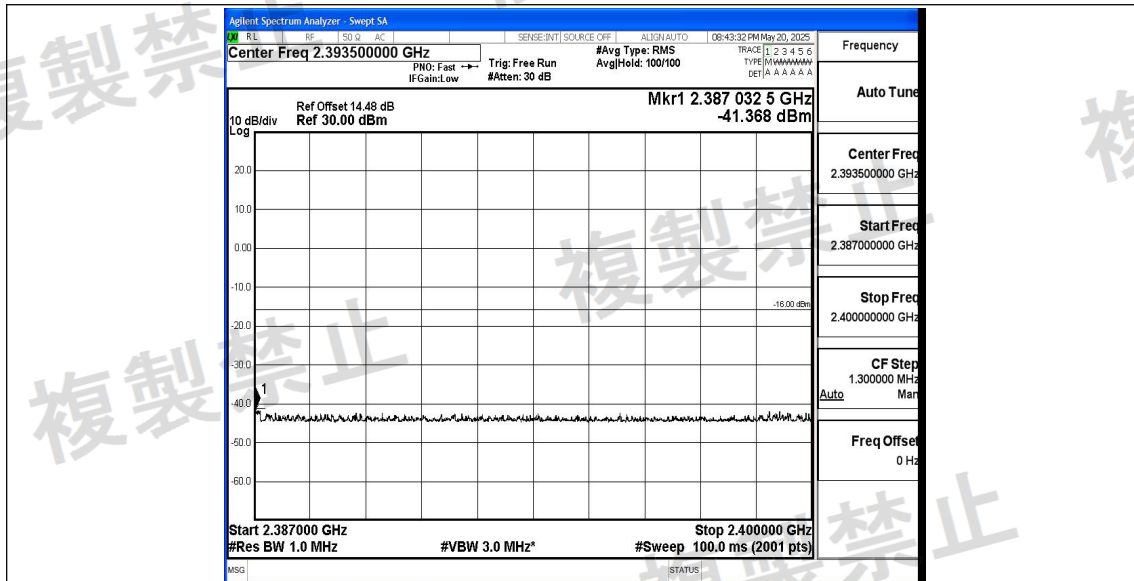
NTHV_2.4G_Ant1_2464.25_30~1000



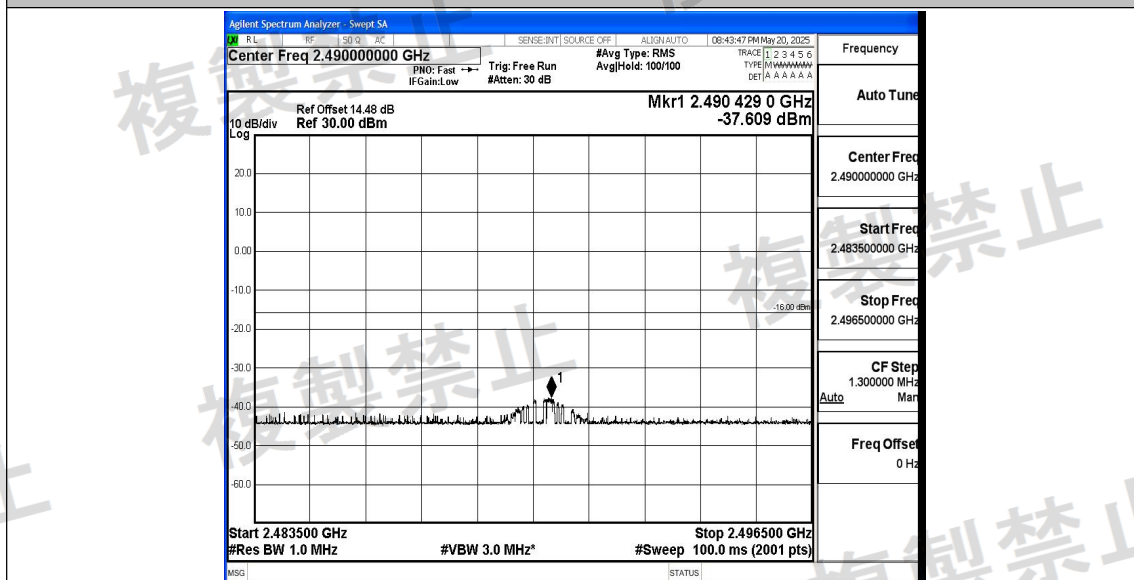
NTHV_2.4G_Ant1_2464.25_1000~2387



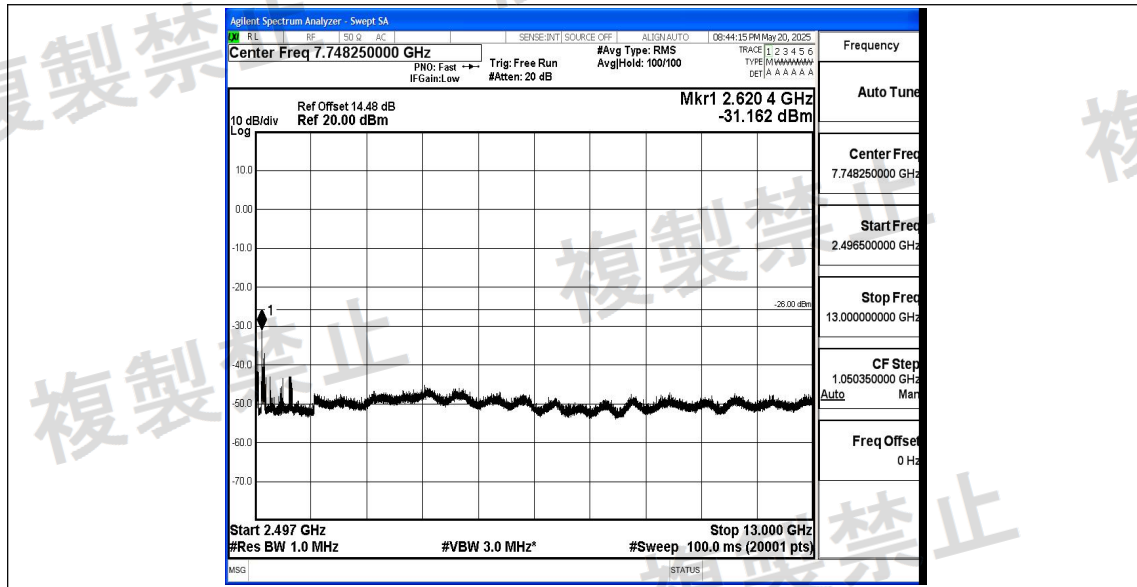
NTHV_2.4G_Ant1_2464.25_2387~2400



NTHV_2.4G_Ant1_2464.25_2483.5~2496.5



NTHV_2.4G_Ant1_2464.25_2496.5~13000

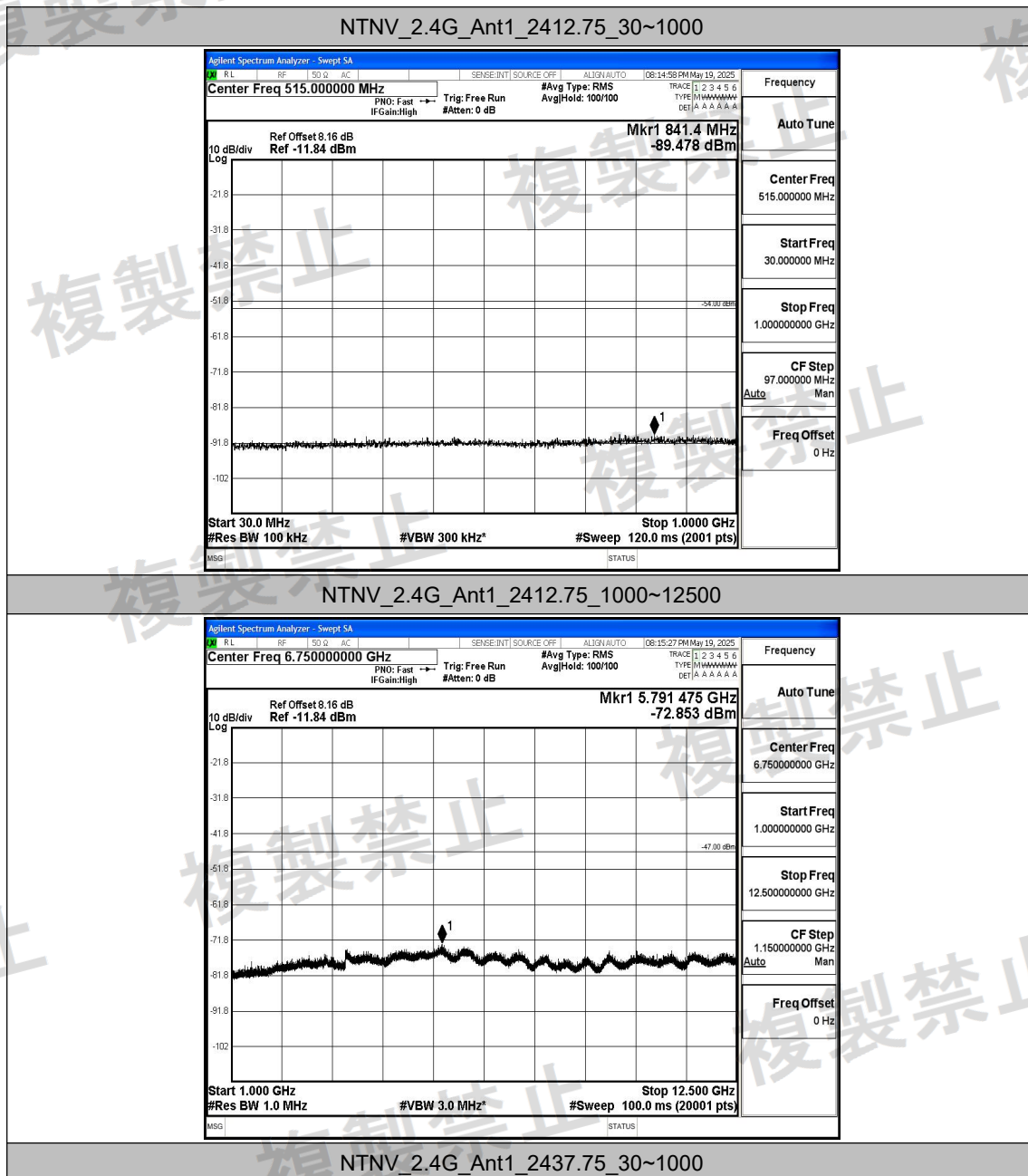


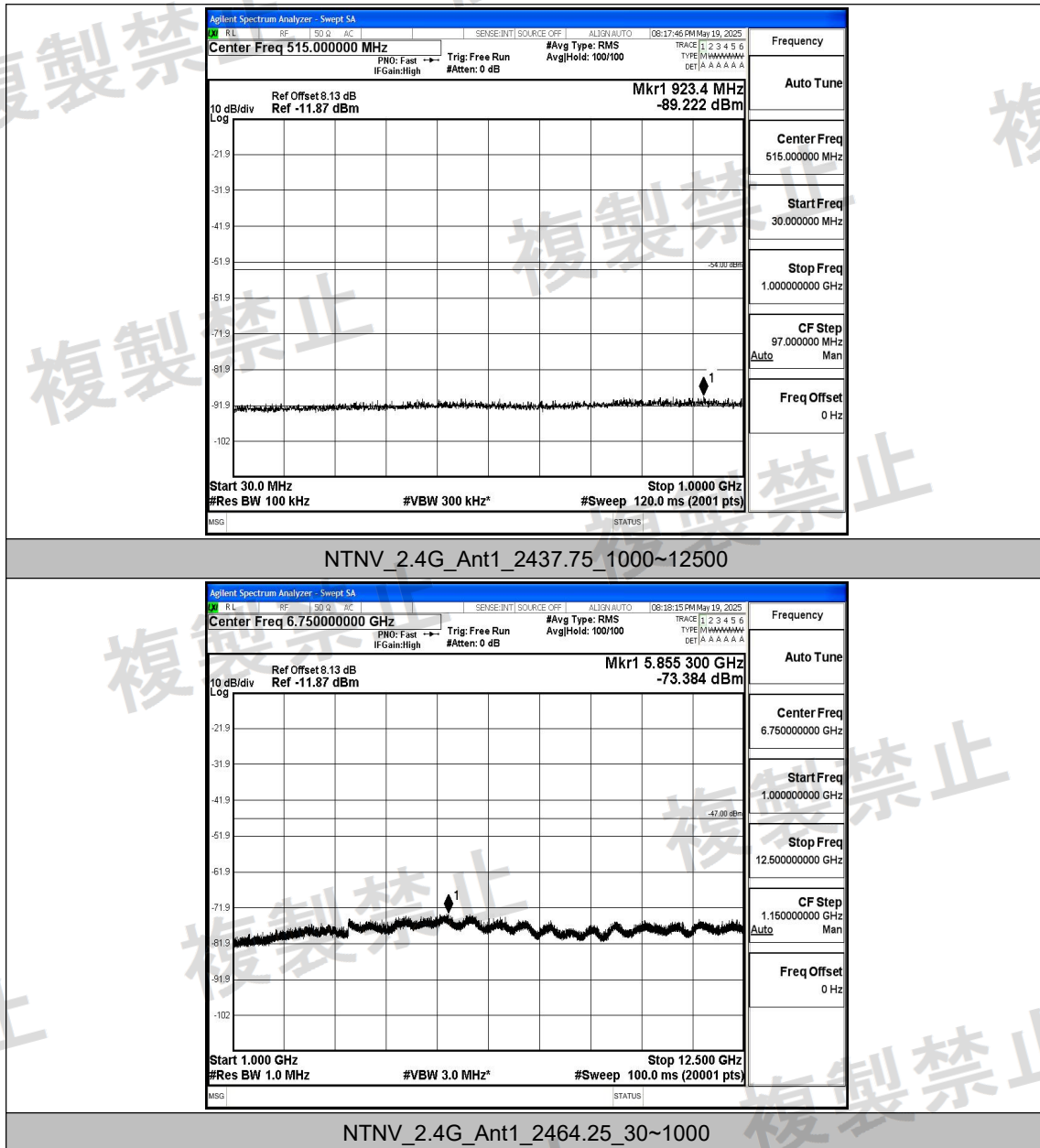
A.6 Spurious Emission of RX

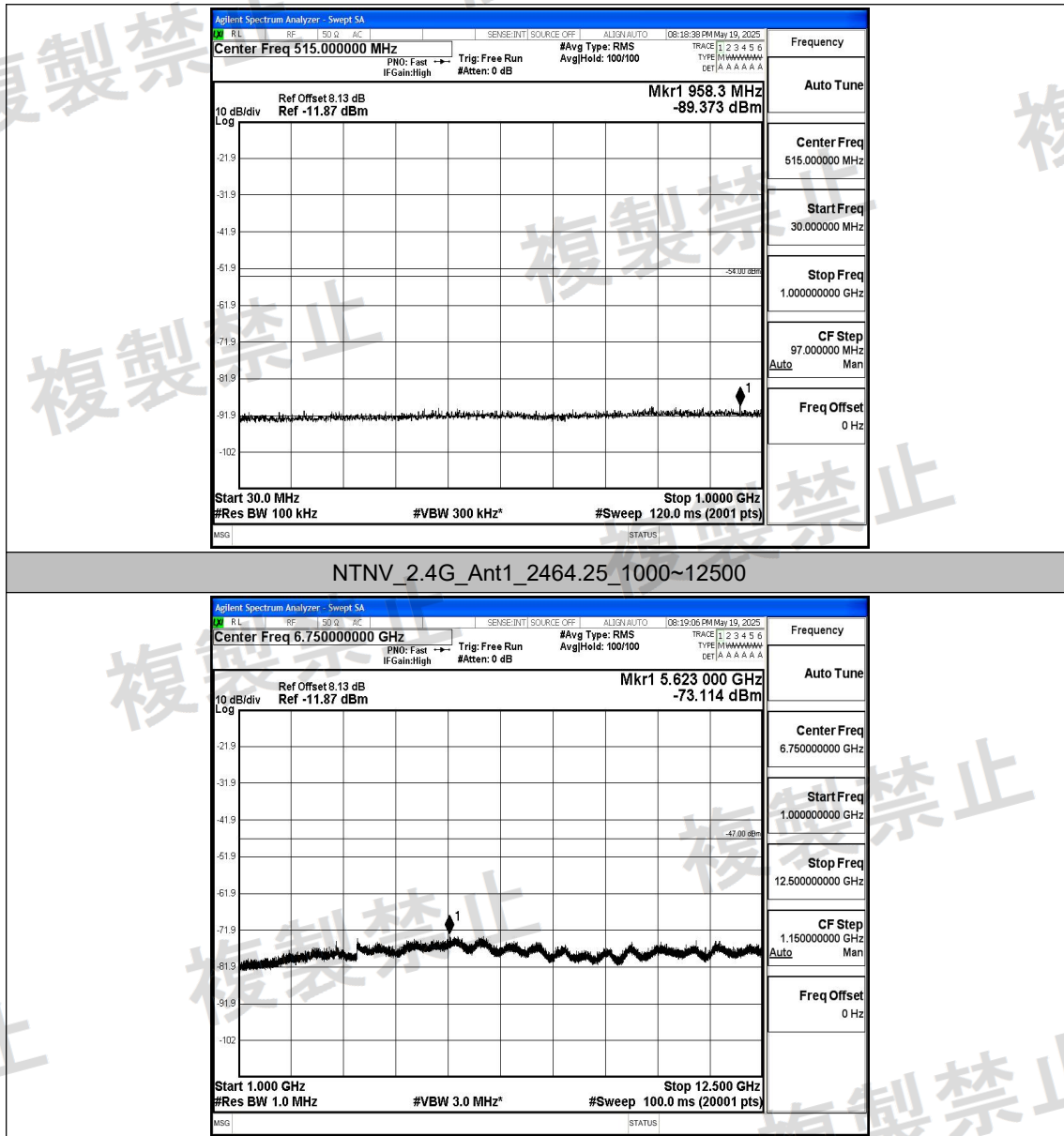
Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	2.4G	Ant1	2412.75	30~1000	-89.48	≤-54	0.00113	≤4	PASS
				1000~12500	-72.85	≤-47	0.05188	≤20	PASS
			2437.75	30~1000	-89.22	≤-54	0.00120	≤4	PASS
				1000~12500	-73.38	≤-47	0.04592	≤20	PASS
			2464.25	30~1000	-89.37	≤-54	0.00116	≤4	PASS
				1000~12500	-73.11	≤-47	0.04887	≤20	PASS

Test Graphs

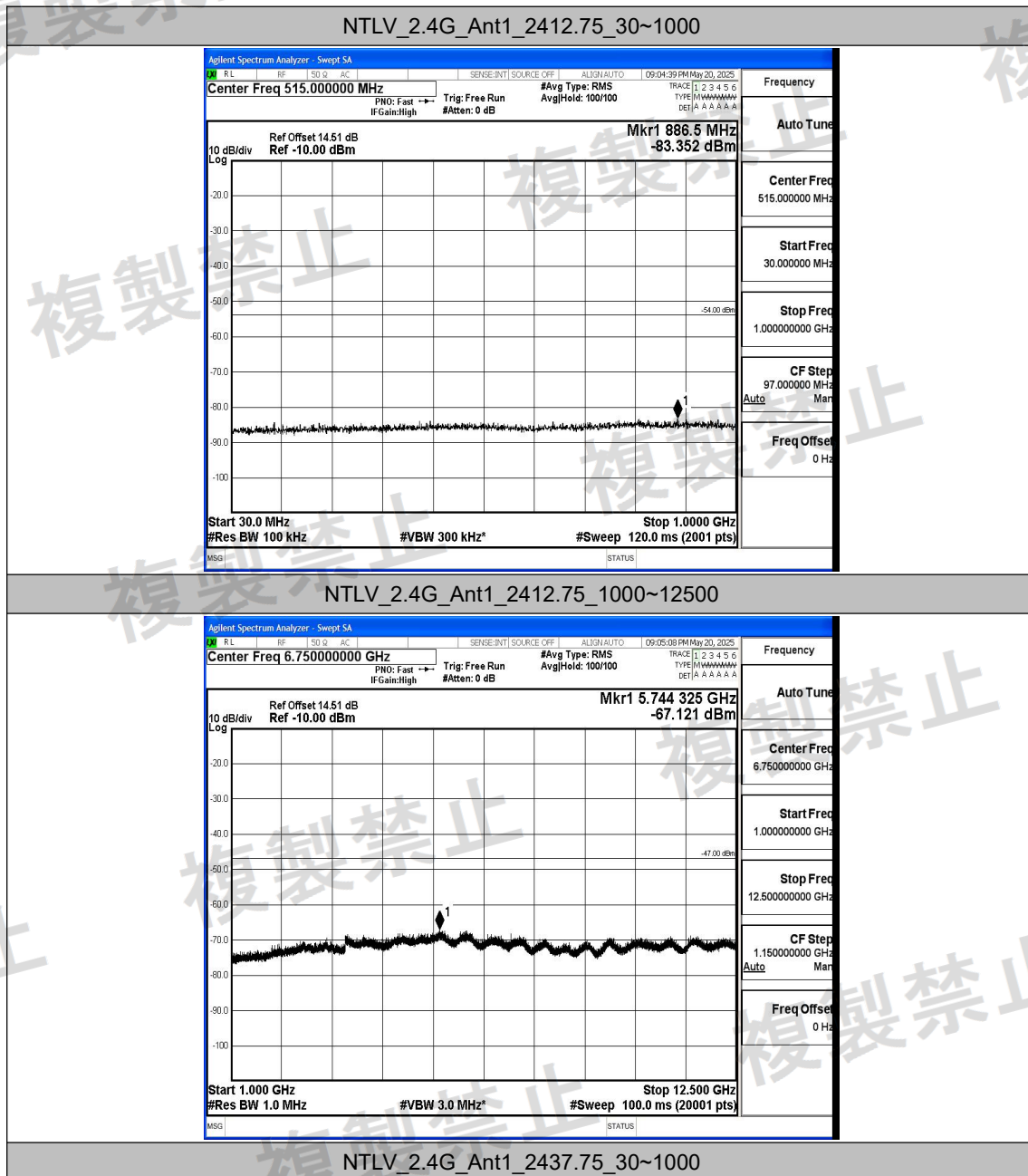


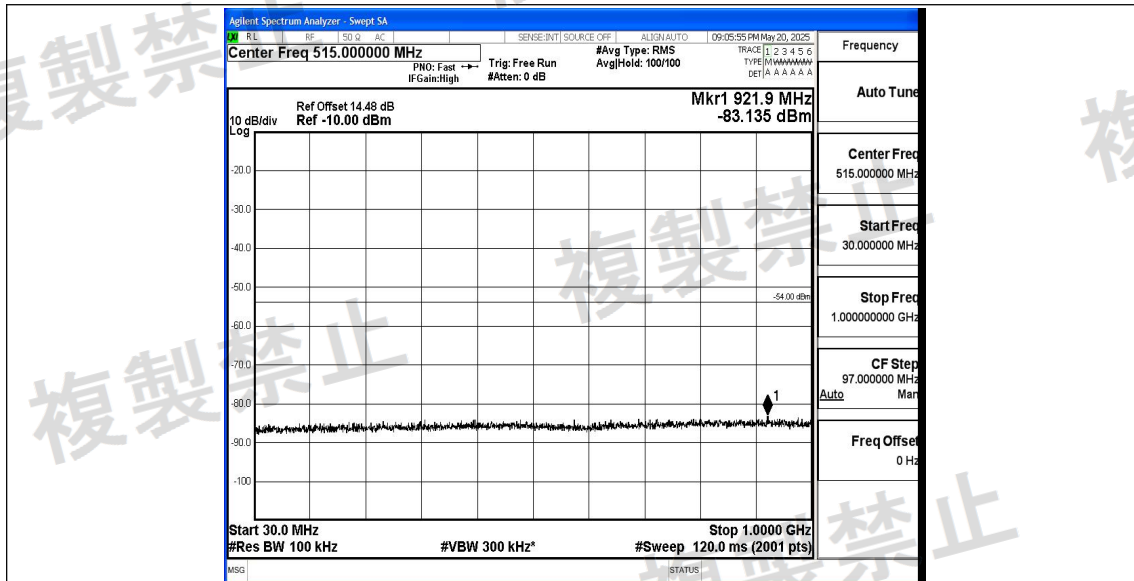




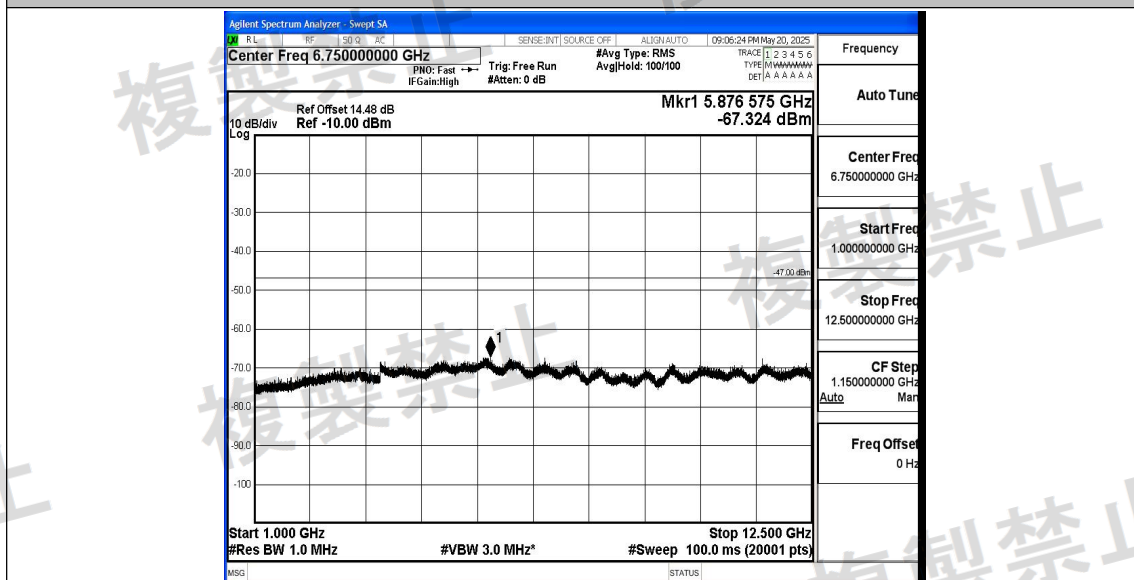
TestCondition	TestMode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTLV	2.4G	Ant1	2412.75	30~1000	-83.35	≤-54	0.00462	≤4	PASS
				1000~12500	-67.12	≤-47	0.19409	≤20	PASS
			2437.75	30~1000	-83.14	≤-54	0.00485	≤4	PASS
				1000~12500	-67.32	≤-47	0.18535	≤20	PASS
			2464.25	30~1000	-83.6	≤-54	0.00437	≤4	PASS
				1000~12500	-66.85	≤-47	0.20654	≤20	PASS

Test Graphs

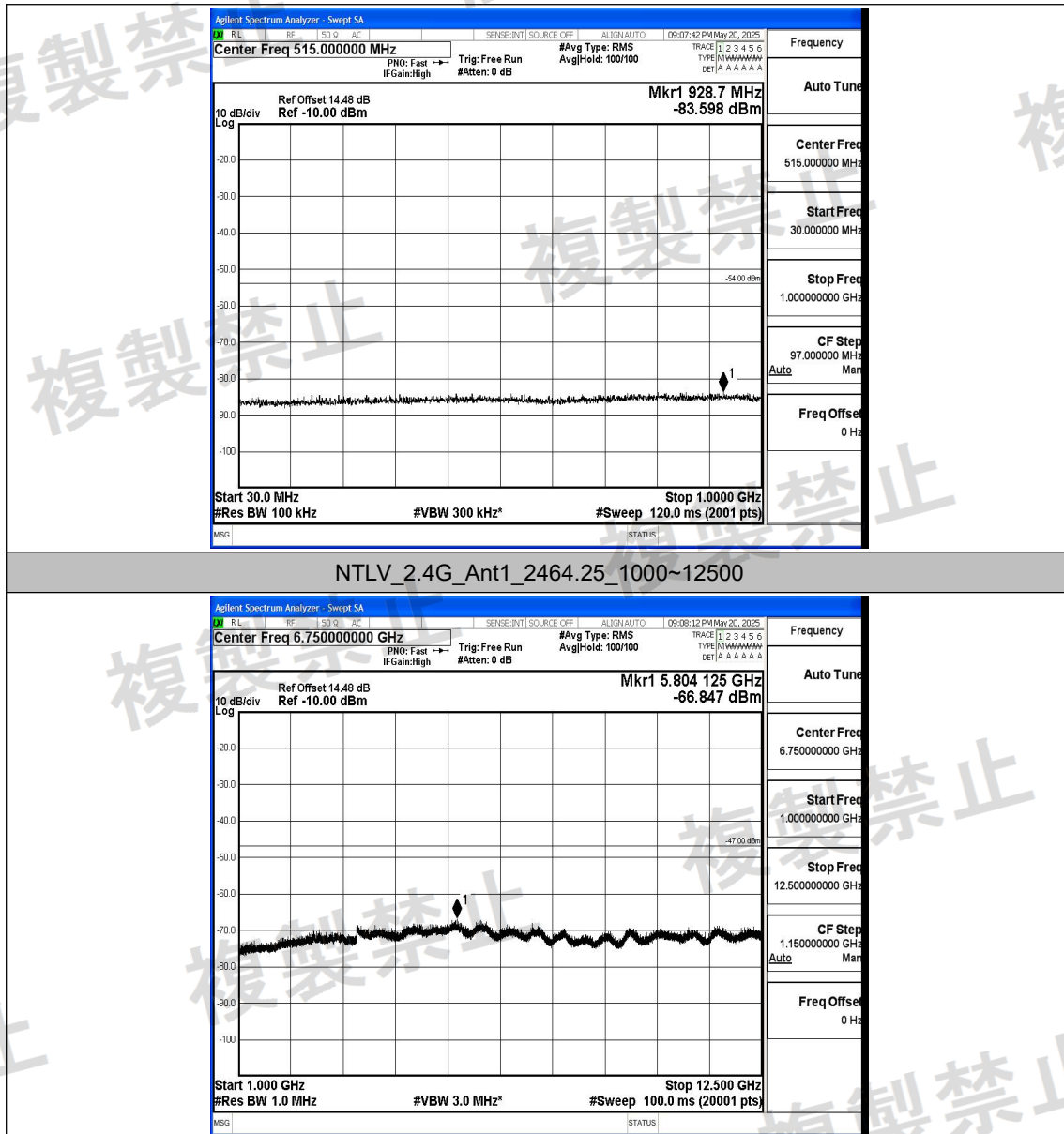




NTLV_2.4G_Ant1_2437.75_1000~12500



NTLV_2.4G_Ant1_2464.25_30~1000



TestCondition	TestMode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTHV	2.4G	Ant1	2412.75	30~1000	-83.22	≤-54	0.00476	≤4	PASS
				1000~12500	-67.26	≤-47	0.18793	≤20	PASS
			2437.75	30~1000	-82.9	≤-54	0.00513	≤4	PASS
				1000~12500	-67.25	≤-47	0.18836	≤20	PASS
			2464.25	30~1000	-83.34	≤-54	0.00463	≤4	PASS
				1000~12500	-66.28	≤-47	0.23550	≤20	PASS

Test Graphs

