

Appendix B for BT Test Data

Product Name: SMART BT MACARON RGB OSRAM

Test Model: SMART BT MACARON RGB YELLOW

Environmental Conditions

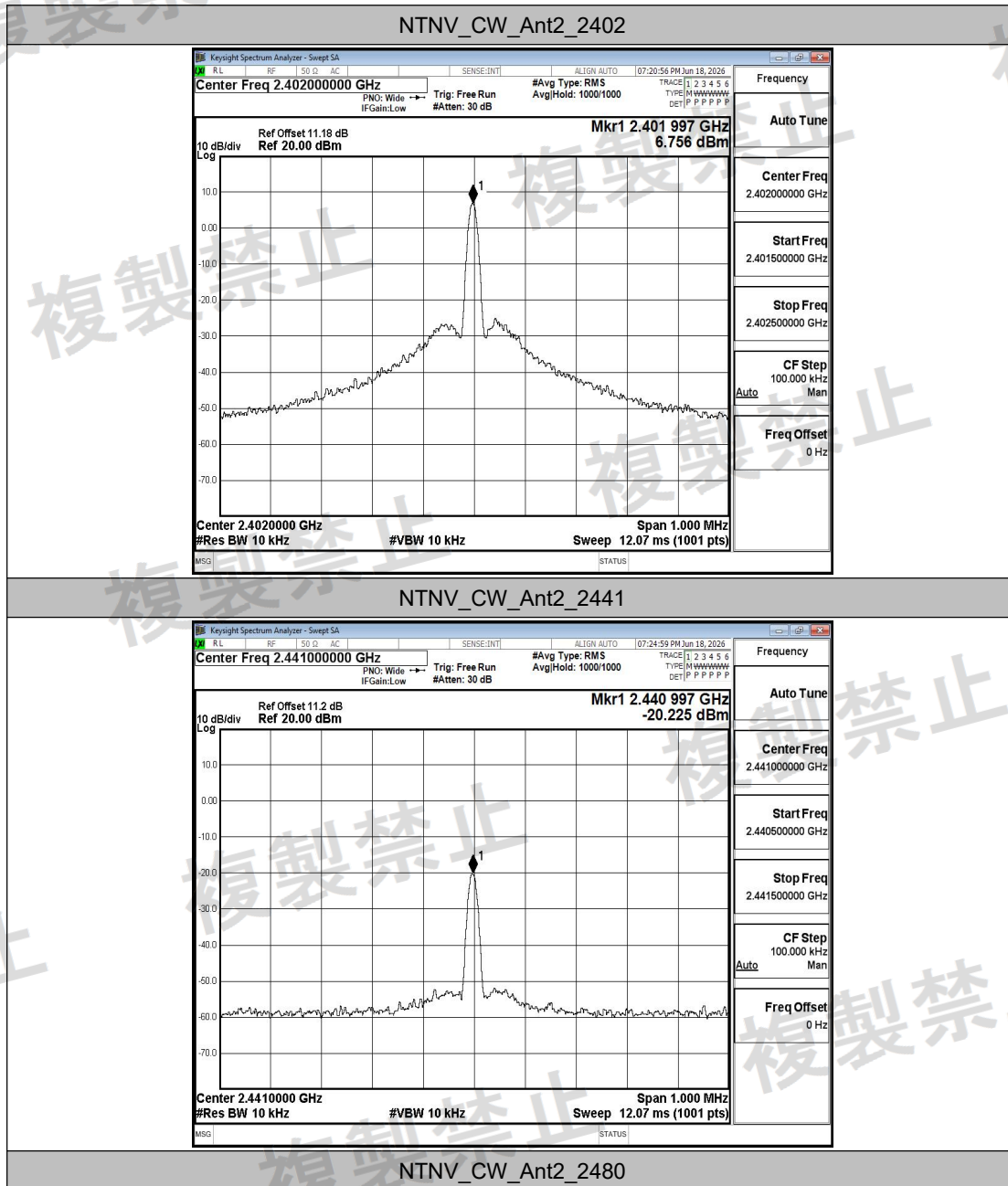
Temperature:	23.2° C
Relative Humidity:	52.5%
ATM Pressure:	100.0 kPa
Test Engineer:	Zhang hai
Supervised by:	Fengliu Tang

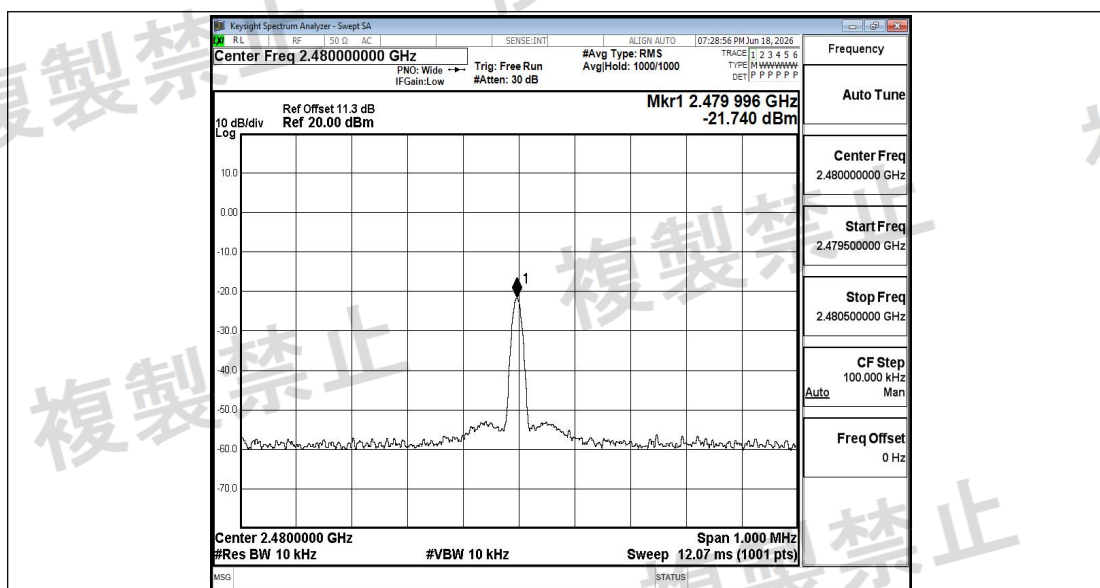
B.1 Frequency_Error

Test Result

Test Condition	Test Mode	Antenna	Freq(MHz)	Result[ppm]	Limit[ppm]	Verdict
NTNV	CW	Ant2	2402	-1.24896	±50	PASS
			2441	-1.22901	±50	PASS
			2480	-1.61290	±50	PASS

Test Graphs





B.2 Antenna Power

Test Result

Test Voltage				Normal Voltage			
Mode	Declared power	Total Power	Total Power	Result	Limit	Tolerance	Limit
	(mW/MHz)	(dBm)	(mW)	(mW/MHz)	(mW/MHz)	/	/
Hopping-Tx (1Mbps)	2.0	19.2	83.18	1.525	3	-23.75 %	+20%
Hopping-Tx (2Mbps)	2.0	20.1	102.33	1.876	3	-6.20%	+20%
Hopping-Tx (3Mbps)	2.0	19.9	97.72	1.786	3	-10.70%	+20%
Conclusion: PASS							

1.Measure the total power by the Power Meter in a state of hopping mode.

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

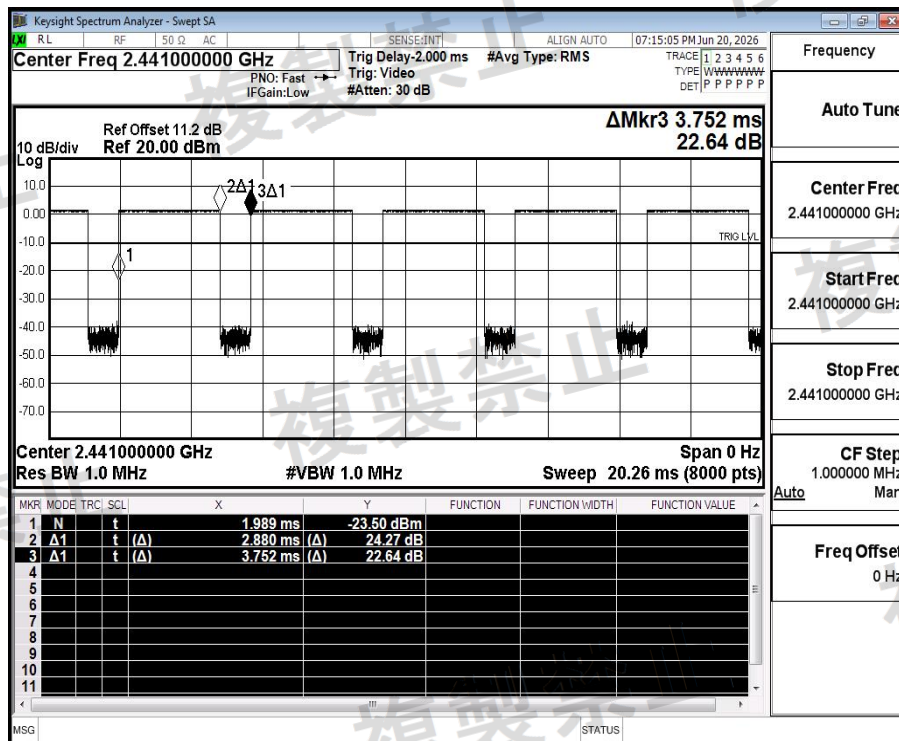
BT ANTenna power Result = Measured Power / Spreading bandwidth

Spread Bandwidth (DH5) = 69.770MHz, Spread Bandwidth (2DH5) = 69.770MHz,

Spread Bandwidth (3DH5) = 69.770MHz

Duty cycle=77.60%

Duty cycle= [Ton/ (Ton+Toff)]*100%=2.88/3.75*100%=77.60%



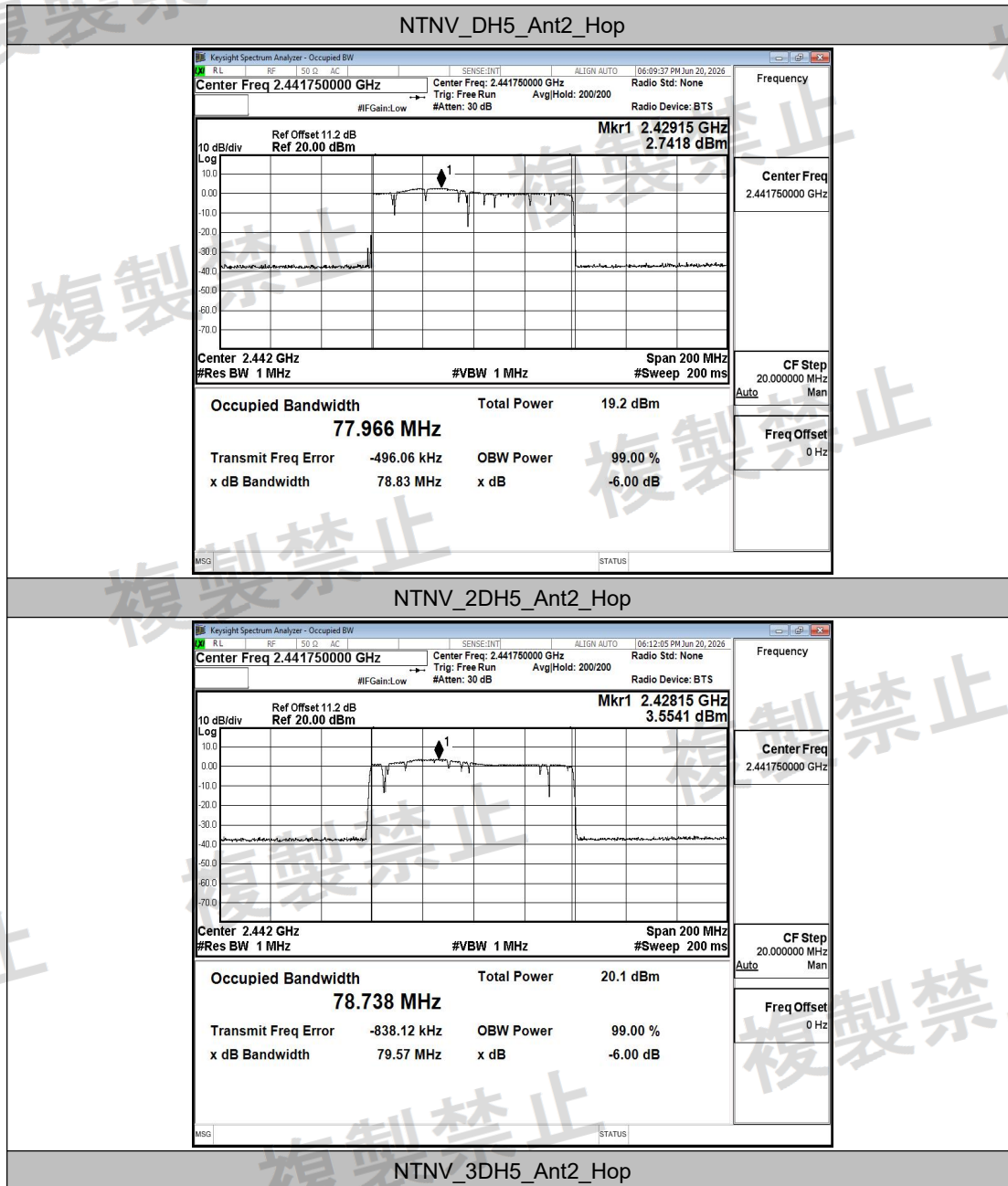
EIRP								
Test Condition	Antenna	Mode	Result (mW/MHz)	Result (dBm/MHz)	Antenna Gain(dBi)	EIRP (dBm/MHz)	Limit (dBm/MHz)	Verdict
NTNV	Ant2	Hopping-Tx (1Mbps)	1.525	1.83	3.71	5.54	≤6.91	PASS
NTNV		Hopping-Tx (2Mbps)	1.876	2.73	3.71	6.44	≤6.91	PASS
NTNV		Hopping-Tx (3Mbps)	1.786	2.52	3.71	6.23	≤6.91	PASS

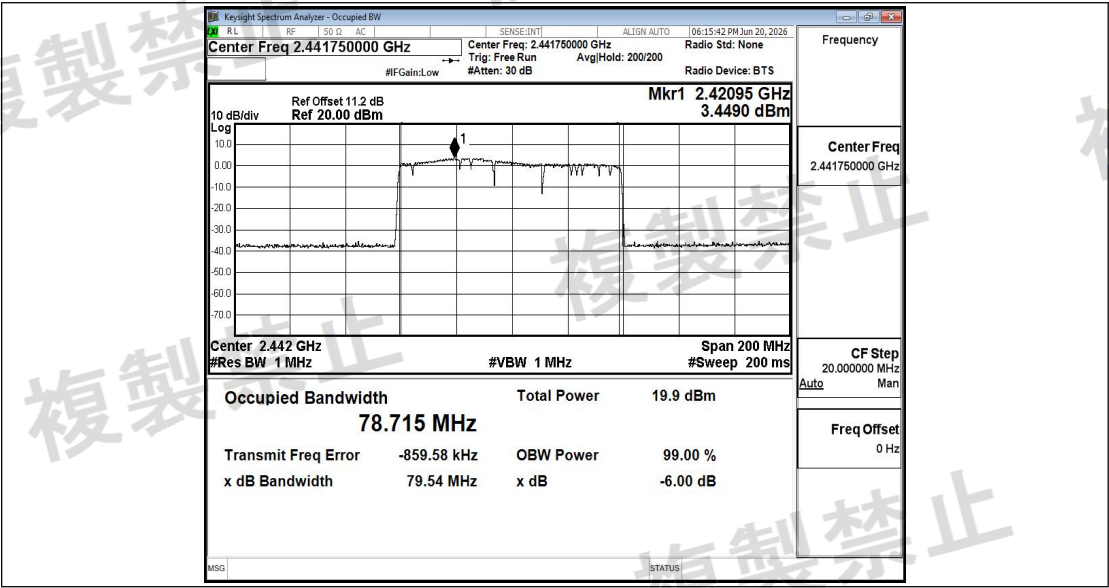
B.3 Occupied Bandwidth

Test Result

Test Condition	Test Mode	Antenna	Freq(MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant2	Hop	77.966	≤83.5	PASS
	2DH5	Ant2	Hop	78.738	≤83.5	PASS
	3DH5	Ant2	Hop	78.715	≤83.5	PASS

Test Graphs



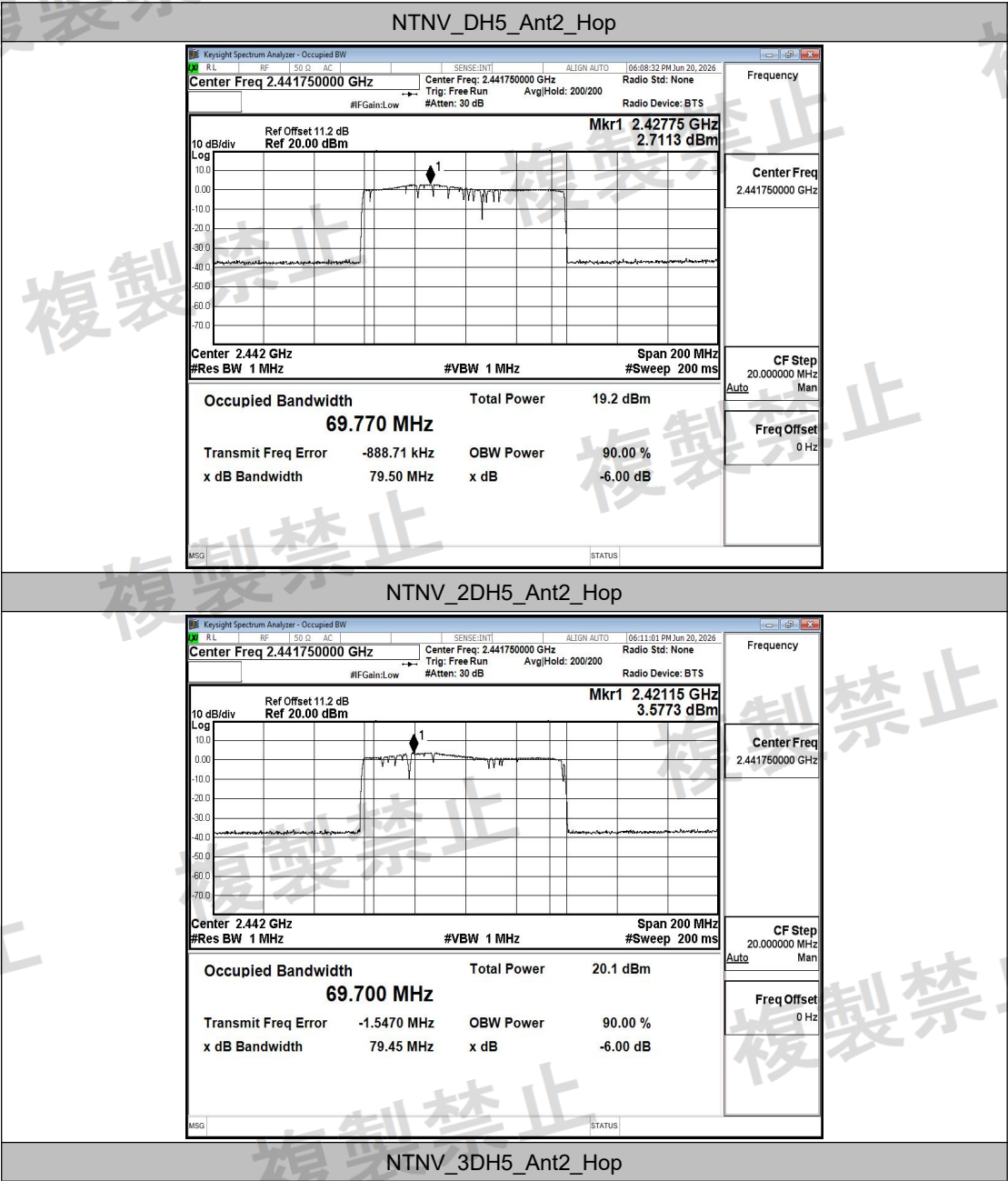


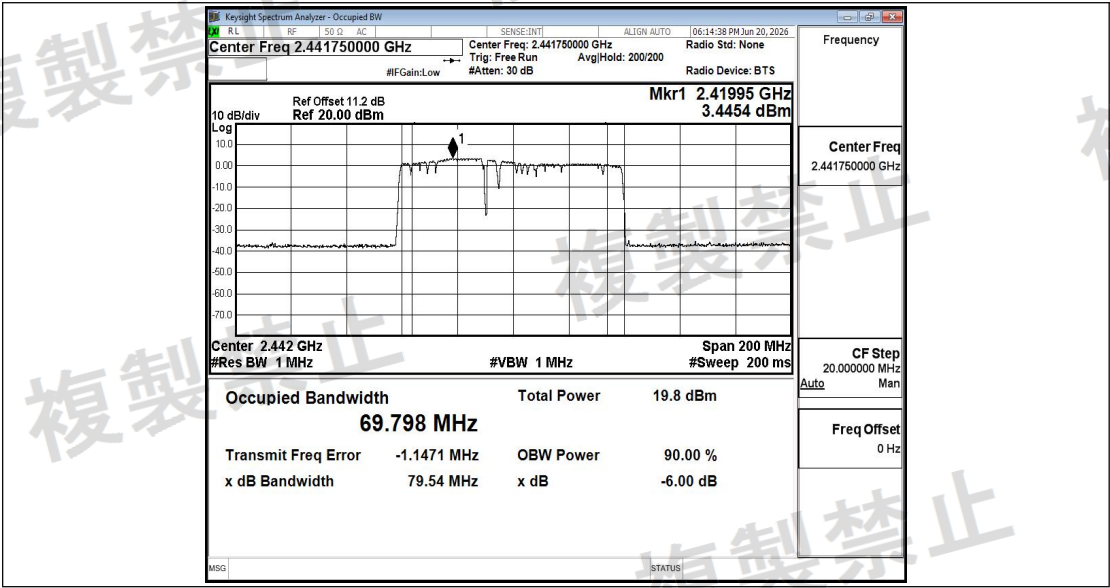
B.4 Spread Bandwidth

Test Result

Test Condition	Test Mode	Antenna	Freq(MHz)	Result [MHz]	Limit [MHz]	Spread Factor	Limit	Verdict
NTNV	DH5	Ant2	Hop	69.770	---	---	---	PASS
	2DH5	Ant2	Hop	69.700	---	---	---	PASS
	3DH5	Ant2	Hop	69.770	---	---	---	PASS

Test Graphs





B.5 Spurious Emission of TX

Test Result

Test Condition	Test Mode	Antenna	Freq(M Hz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	DH5	Ant2	2402	30~1000	44.07	-45.92	≤-26	0.02559	≤2.5	PASS
				1000~2387	2358.91	-44.68	≤-26	0.03404	≤2.5	PASS
				2387~2400	2400.00	-28.75	≤-16	1.33352	≤25	PASS
				2483.5~2496.5	2490.70	-35.27	≤-16	0.29717	≤25	PASS
				2496.5~13000	2699.74	-44.65	≤-26	0.03428	≤2.5	PASS
			2441	30~1000	43.10	-45.88	≤-26	0.02582	≤2.5	PASS
				1000~2387	2358.91	-44.40	≤-26	0.03631	≤2.5	PASS
				2387~2400	2393.96	-35.00	≤-16	0.31623	≤25	PASS
				2483.5~2496.5	2484.74	-35.76	≤-16	0.26546	≤25	PASS
				2496.5~13000	3159.27	-44.75	≤-26	0.03350	≤2.5	PASS
		2480		30~1000	890.88	-47.52	≤-26	0.01770	≤2.5	PASS
				1000~2387	2170.63	-46.03	≤-26	0.02495	≤2.5	PASS
				2387~2400	2387.10	-35.44	≤-16	0.28576	≤25	PASS
				2483.5~2496.5	2483.73	-29.57	≤-16	1.10408	≤25	PASS
				2496.5~13000	4960.10	-41.59	≤-26	0.06934	≤2.5	PASS
	2DH5	Ant2	2402	30~1000	778.84	-46.56	≤-26	0.02208	≤2.5	PASS
				1000~2387	2322.85	-45.78	≤-26	0.02642	≤2.5	PASS
				2387~2400	2399.99	-25.70	≤-16	2.69153	≤25	PASS
				2483.5~2496.5	2493.55	-35.66	≤-16	0.27164	≤25	PASS
				2496.5~13000	2572.65	-44.63	≤-26	0.03443	≤2.5	PASS
			2441	30~1000	760.65	-47.14	≤-26	0.01932	≤2.5	PASS
				1000~2387	2225.07	-41.15	≤-26	0.07674	≤2.5	PASS
				2387~2400	2388.51	-35.83	≤-16	0.26122	≤25	PASS
				2483.5~2496.5	2492.67	-35.71	≤-16	0.26853	≤25	PASS
				2496.5~13000	6144.37	-44.84	≤-26	0.03281	≤2.5	PASS
			2480	30~1000	768.66	-47.74	≤-26	0.01683	≤2.5	PASS
				1000~2387	2296.85	-45.47	≤-26	0.02838	≤2.5	PASS
				2387~2400	2390.26	-35.60	≤-16	0.27542	≤25	PASS
				2483.5~2496.5	2496.06	-35.14	≤-16	0.30620	≤25	PASS
				2496.5~13000	4960.10	-42.65	≤-26	0.05433	≤2.5	PASS
	3DH5	Ant2	2402	30~1000	859.59	-47.68	≤-26	0.01706	≤2.5	PASS
				1000~2387	2322.85	-45.77	≤-26	0.02649	≤2.5	PASS
				2387~2400	2400.00	-34.44	≤-16	0.35975	≤25	PASS
				2483.5~2496.5	2494.41	-35.61	≤-16	0.27479	≤25	PASS
				2496.5~13000	2665.08	-44.43	≤-26	0.03606	≤2.5	PASS
			2441	30~1000	829.28	-47.61	≤-26	0.01734	≤2.5	PASS
				1000~2387	2330.13	-45.75	≤-26	0.02661	≤2.5	PASS

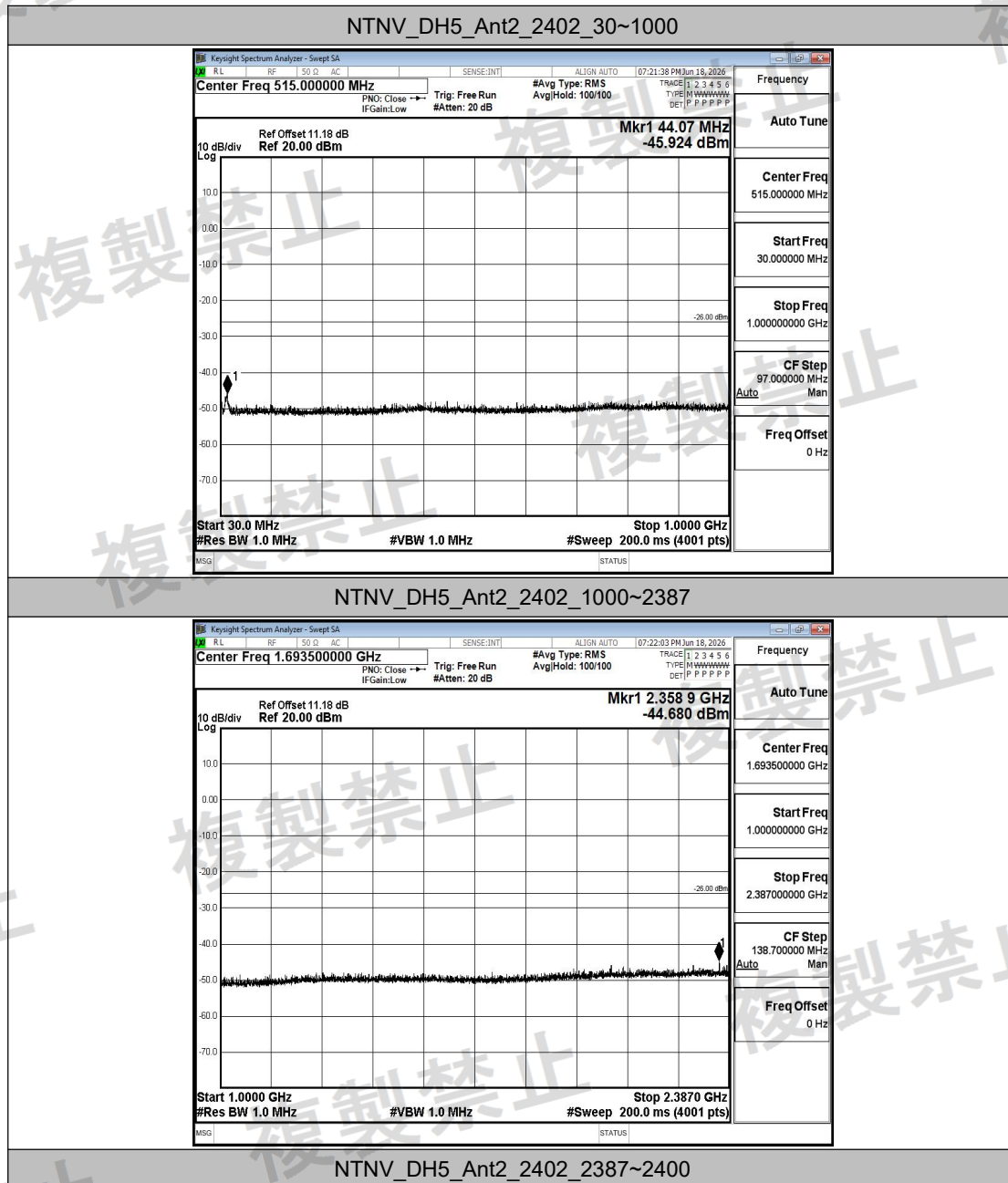
Guangzhou LCS Compliance Testing Laboratory Ltd.

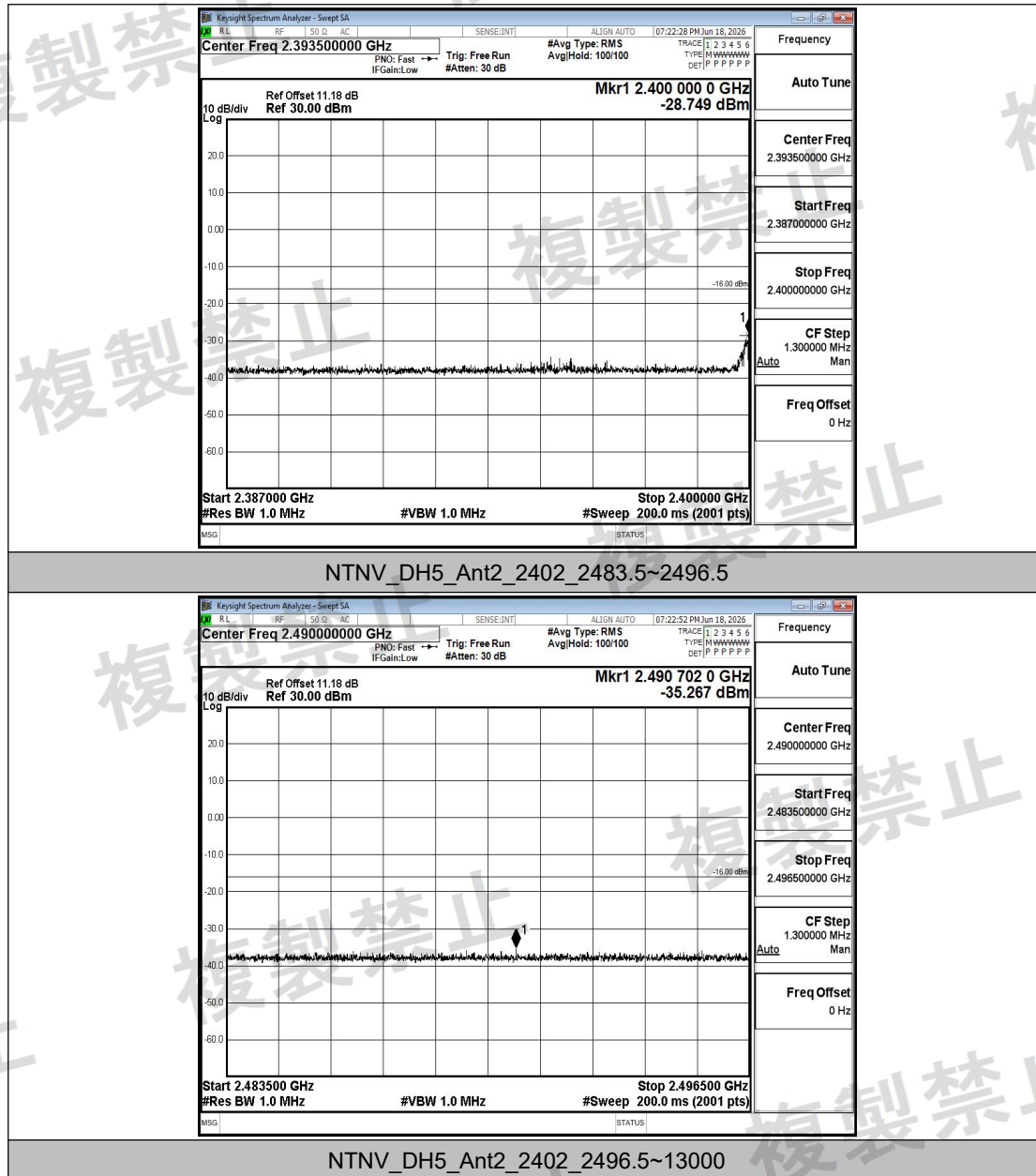
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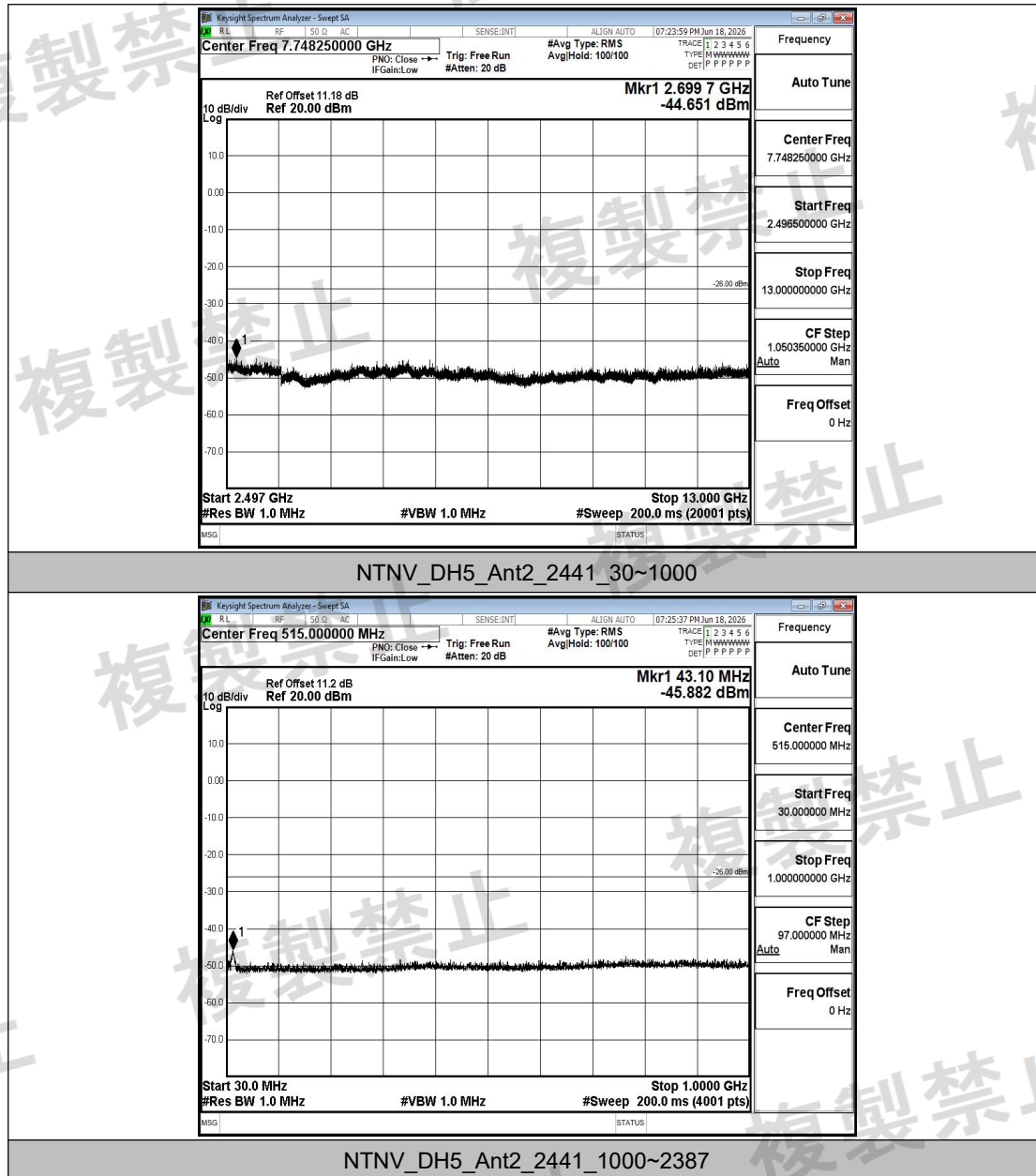
Tel: +(86) 020-39166689 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

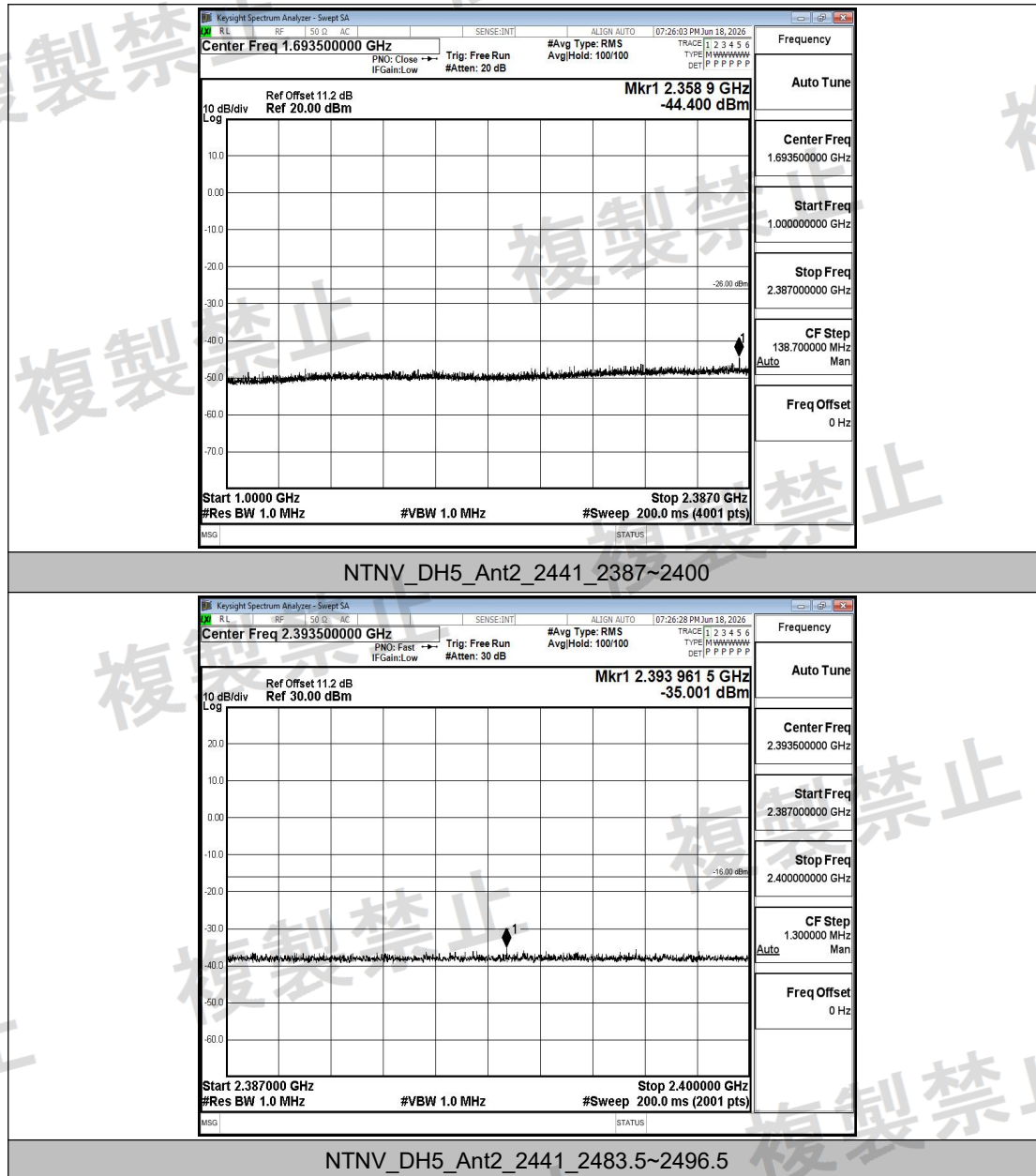
			2387~2400	2390.52	-35.97	≤-16	0.25293	≤25	PASS
			2483.5~2496.5	2493.78	-35.36	≤-16	0.29107	≤25	PASS
			2496.5~13000	2695.02	-44.44	≤-26	0.03597	≤2.5	PASS
		2480	30~1000	802.61	-47.45	≤-26	0.01799	≤2.5	PASS
			1000~2387	2364.81	-45.58	≤-26	0.02767	≤2.5	PASS
			2387~2400	2393.49	-34.83	≤-16	0.32885	≤25	PASS
			2483.5~2496.5	2486.60	-31.37	≤-16	0.72946	≤25	PASS
			2496.5~13000	3061.06	-44.61	≤-26	0.03459	≤2.5	PASS

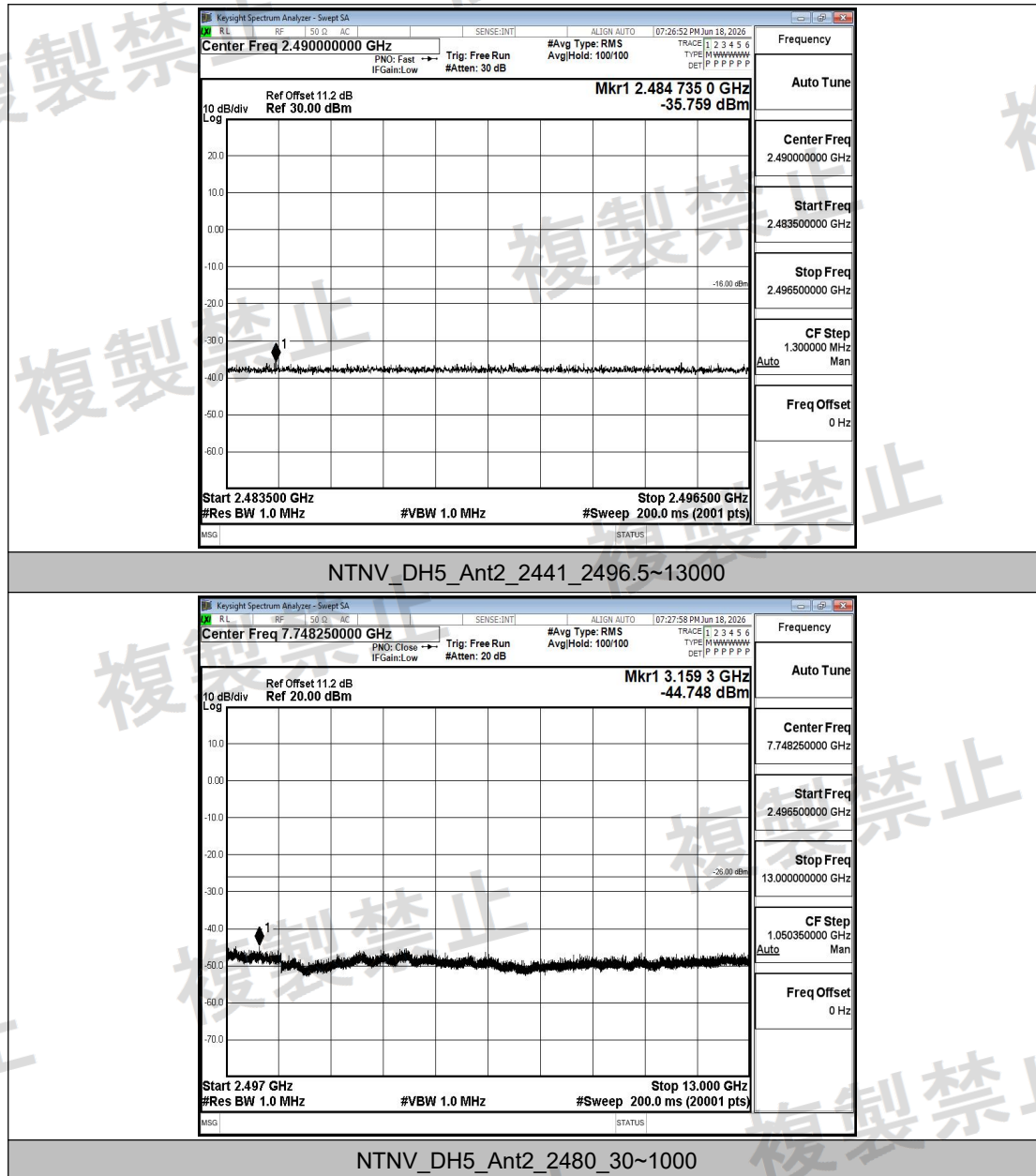
Test Graphs

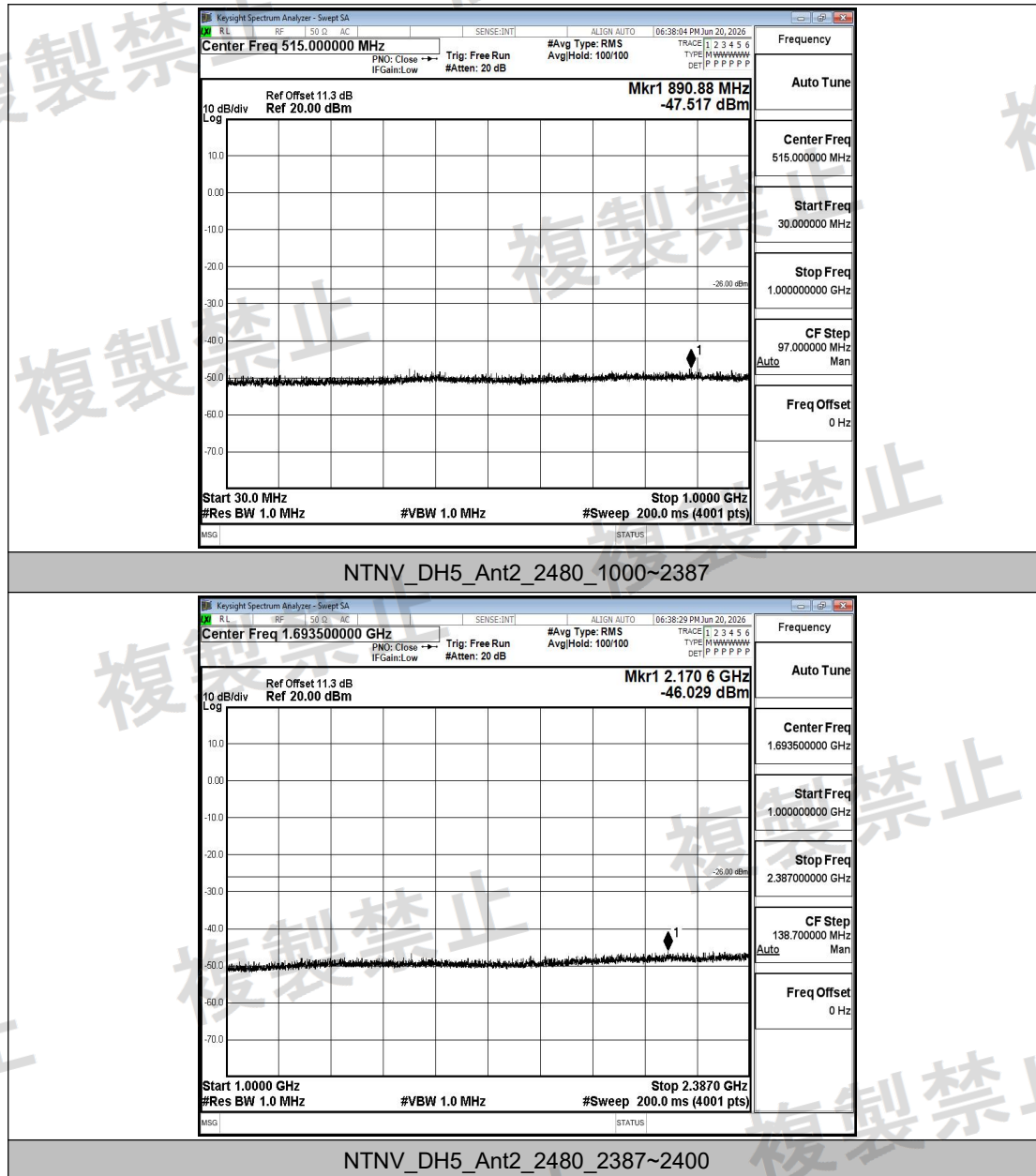


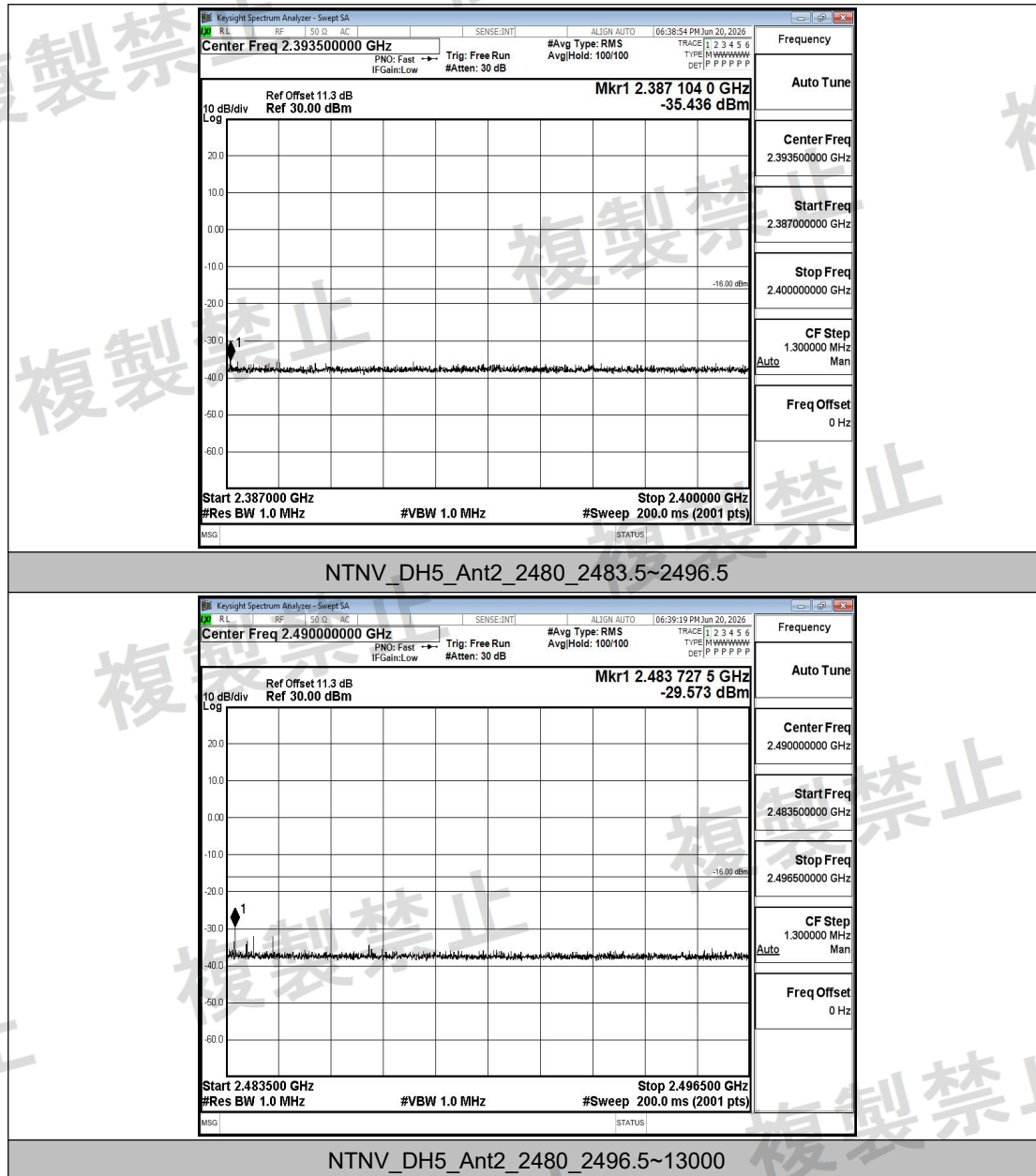


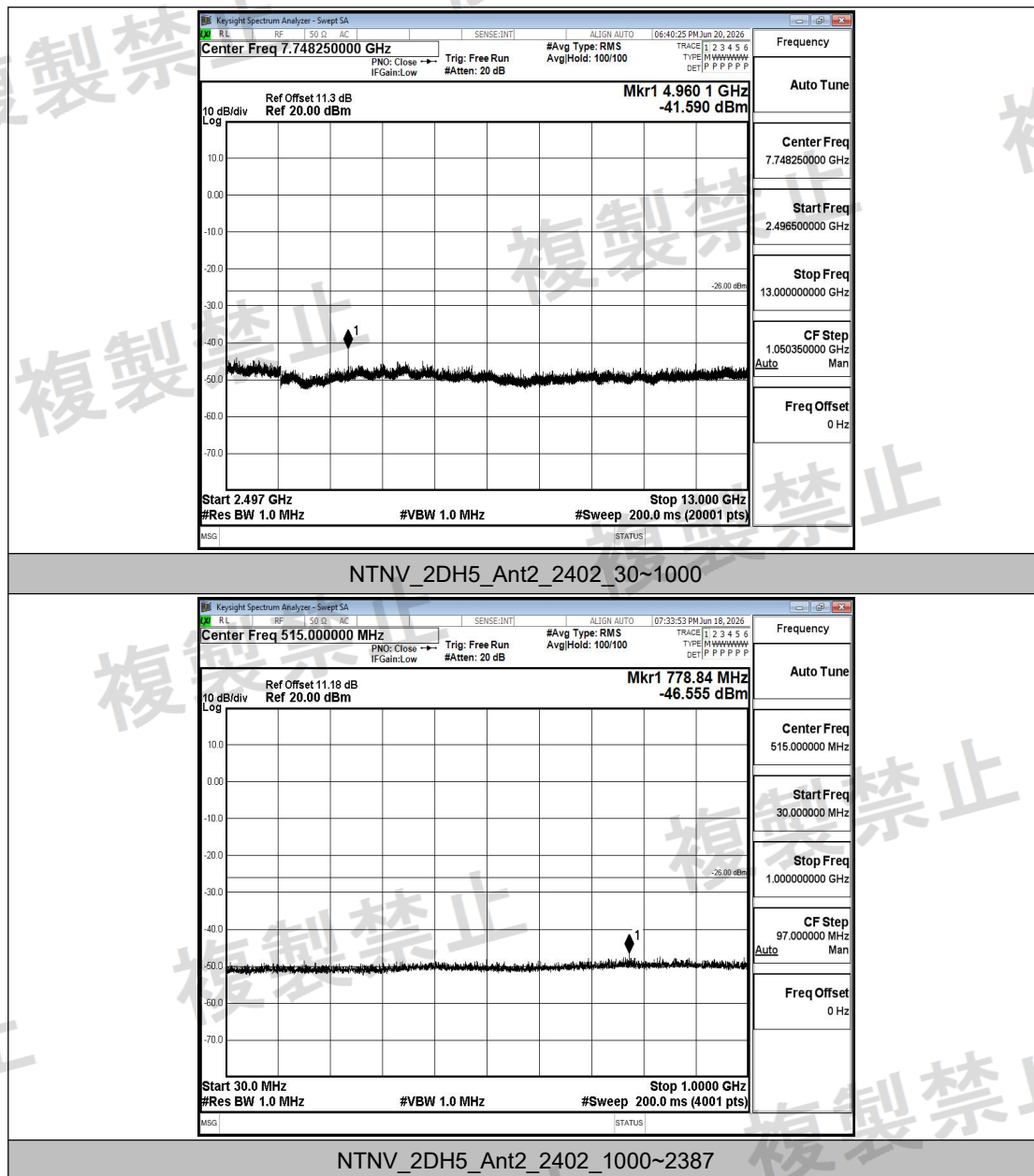


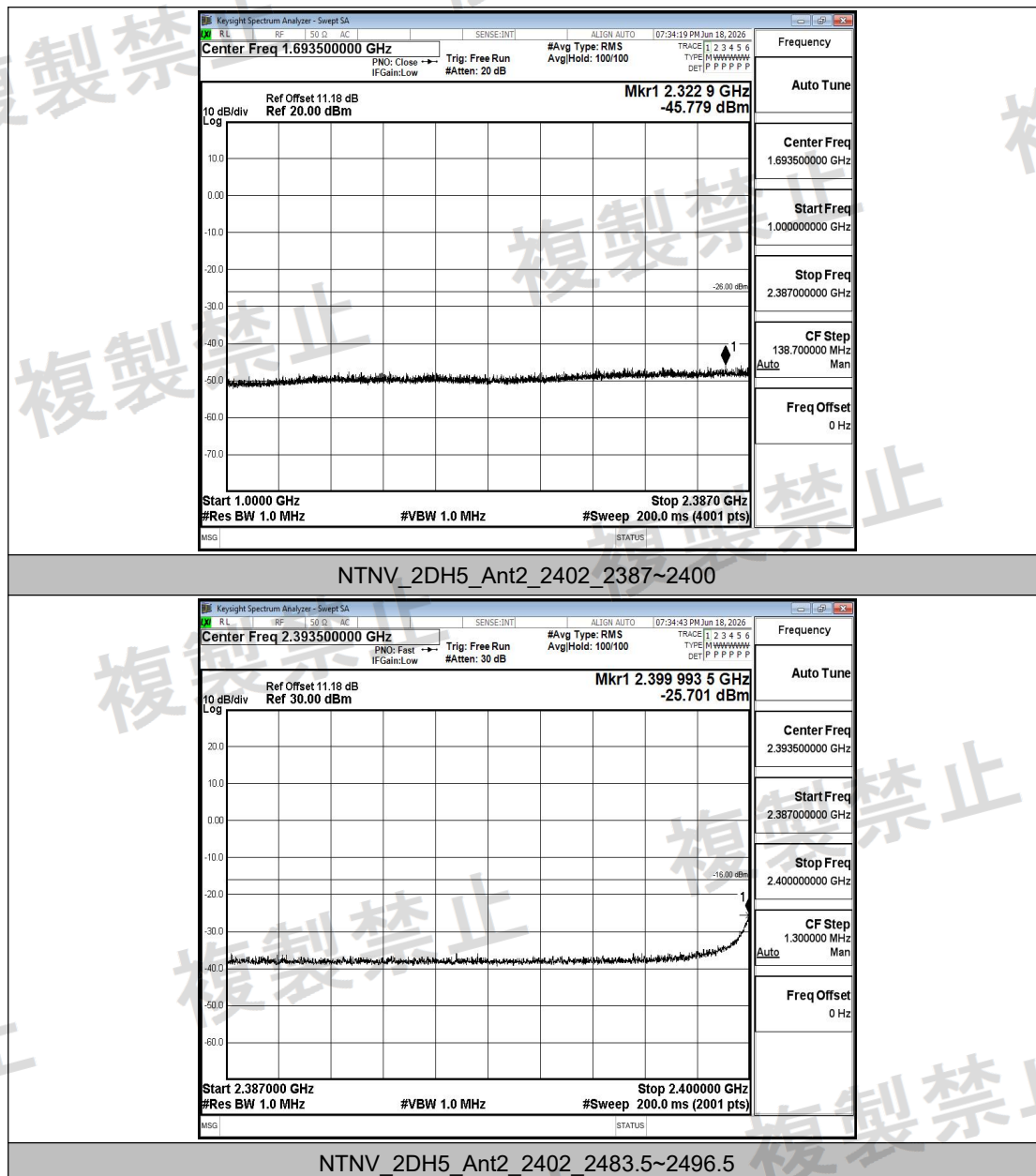


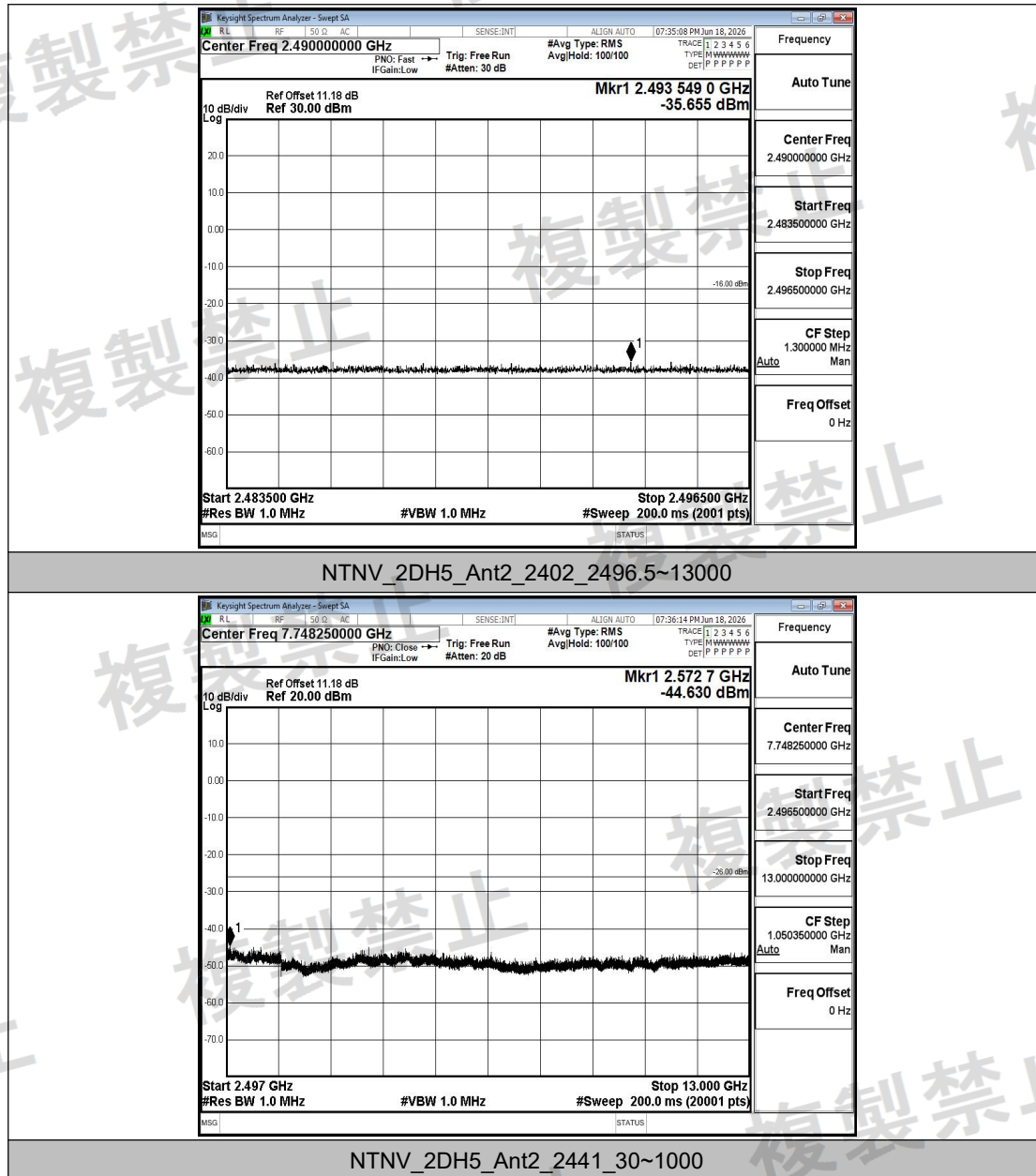


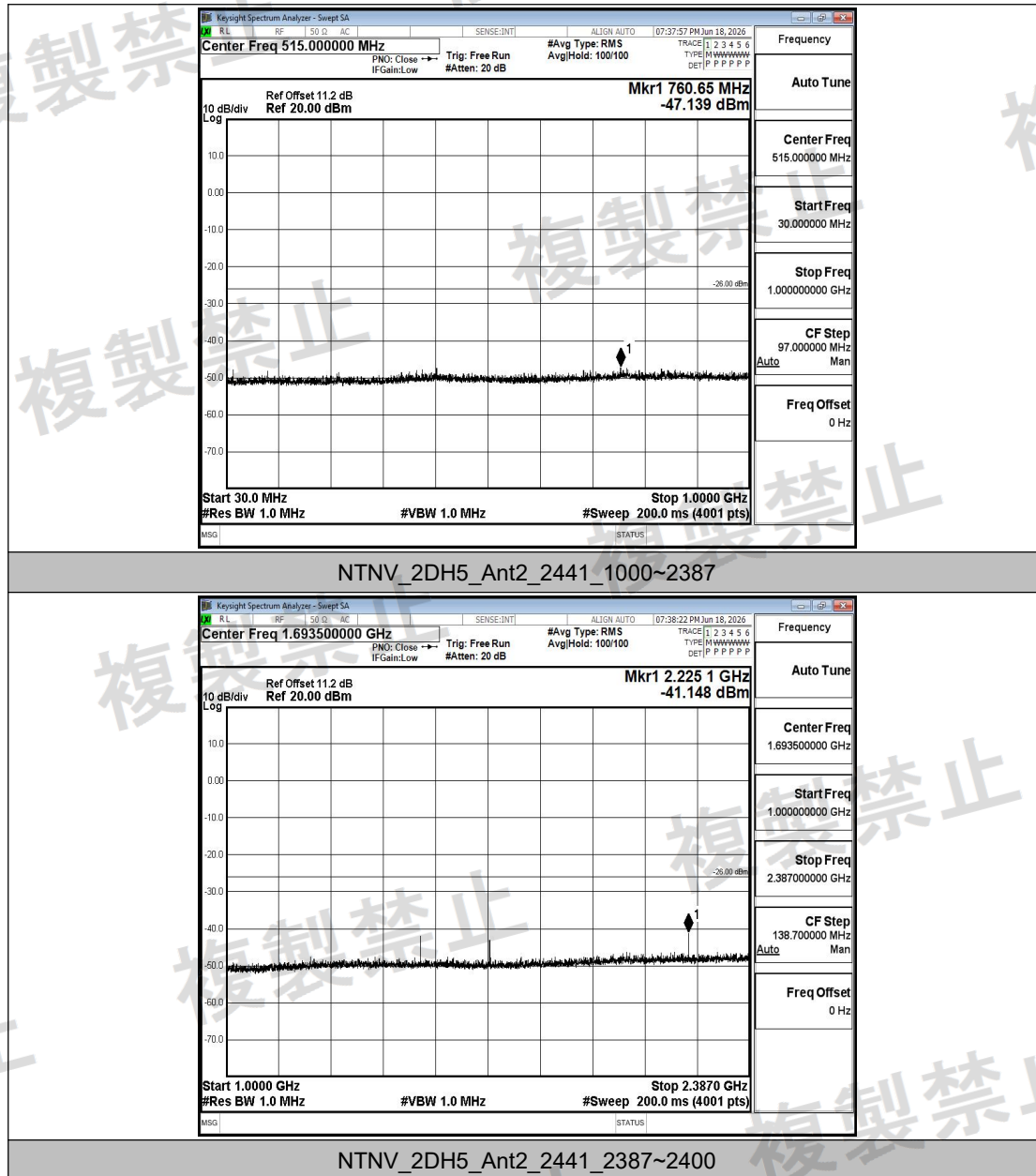


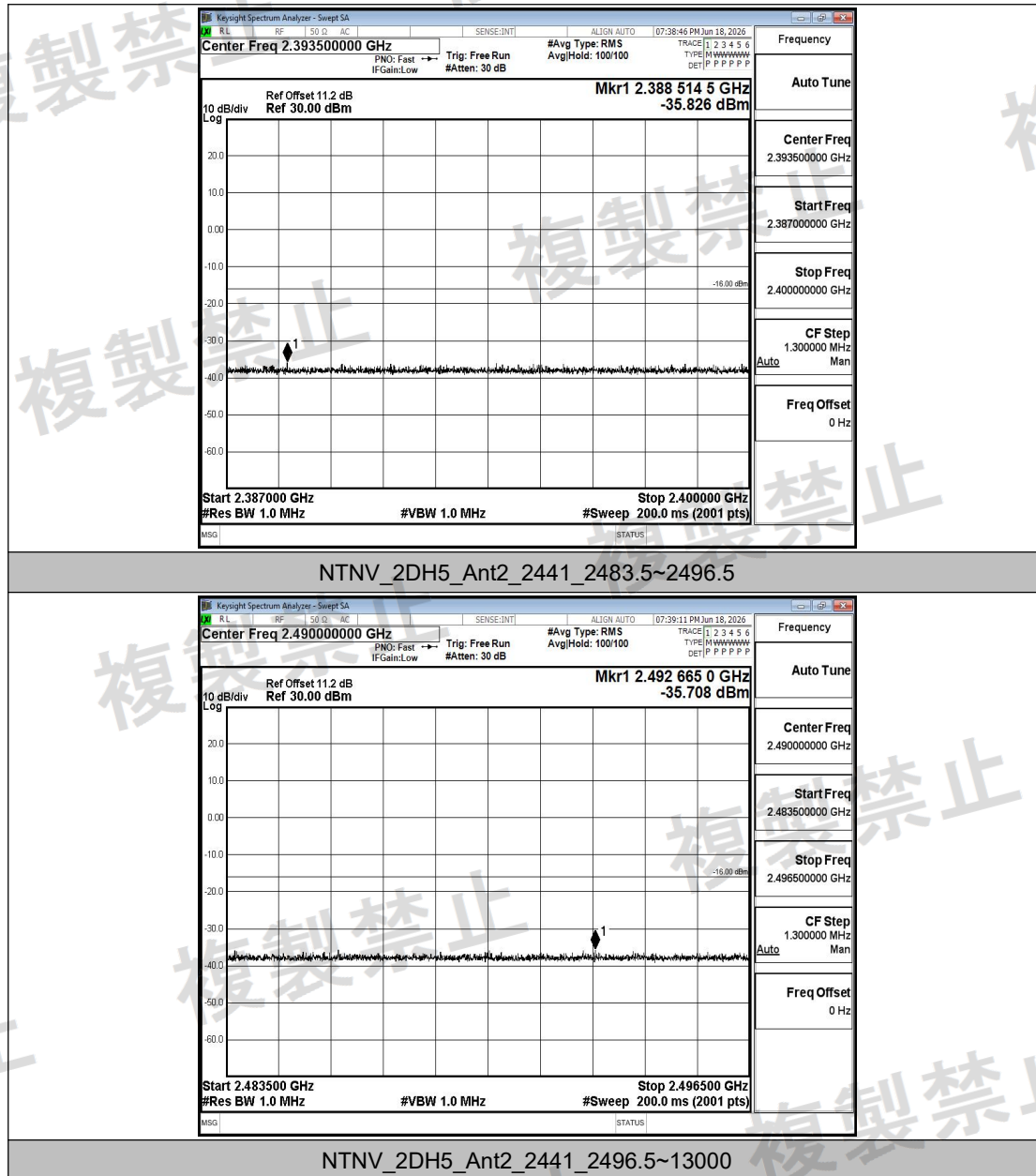


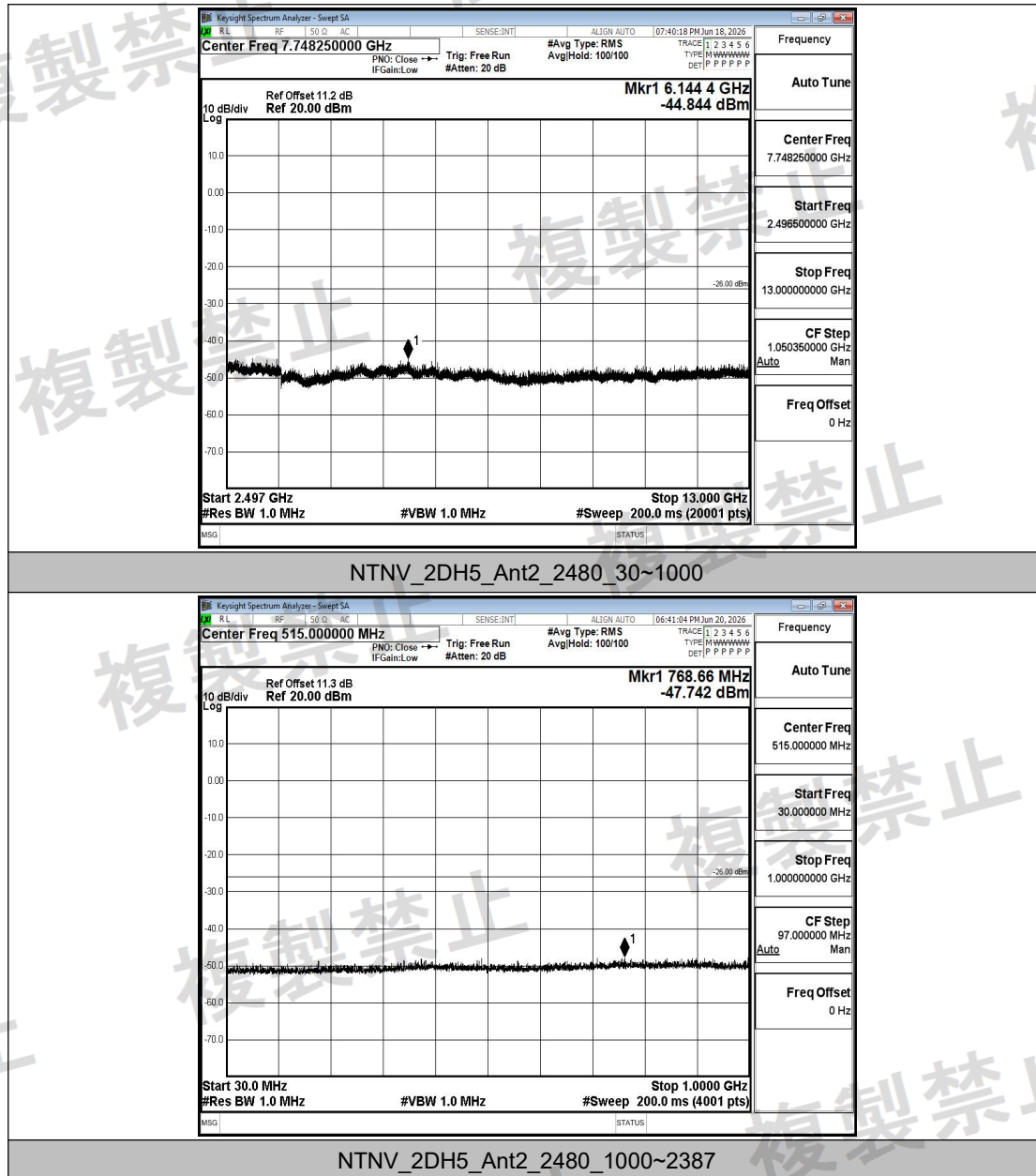


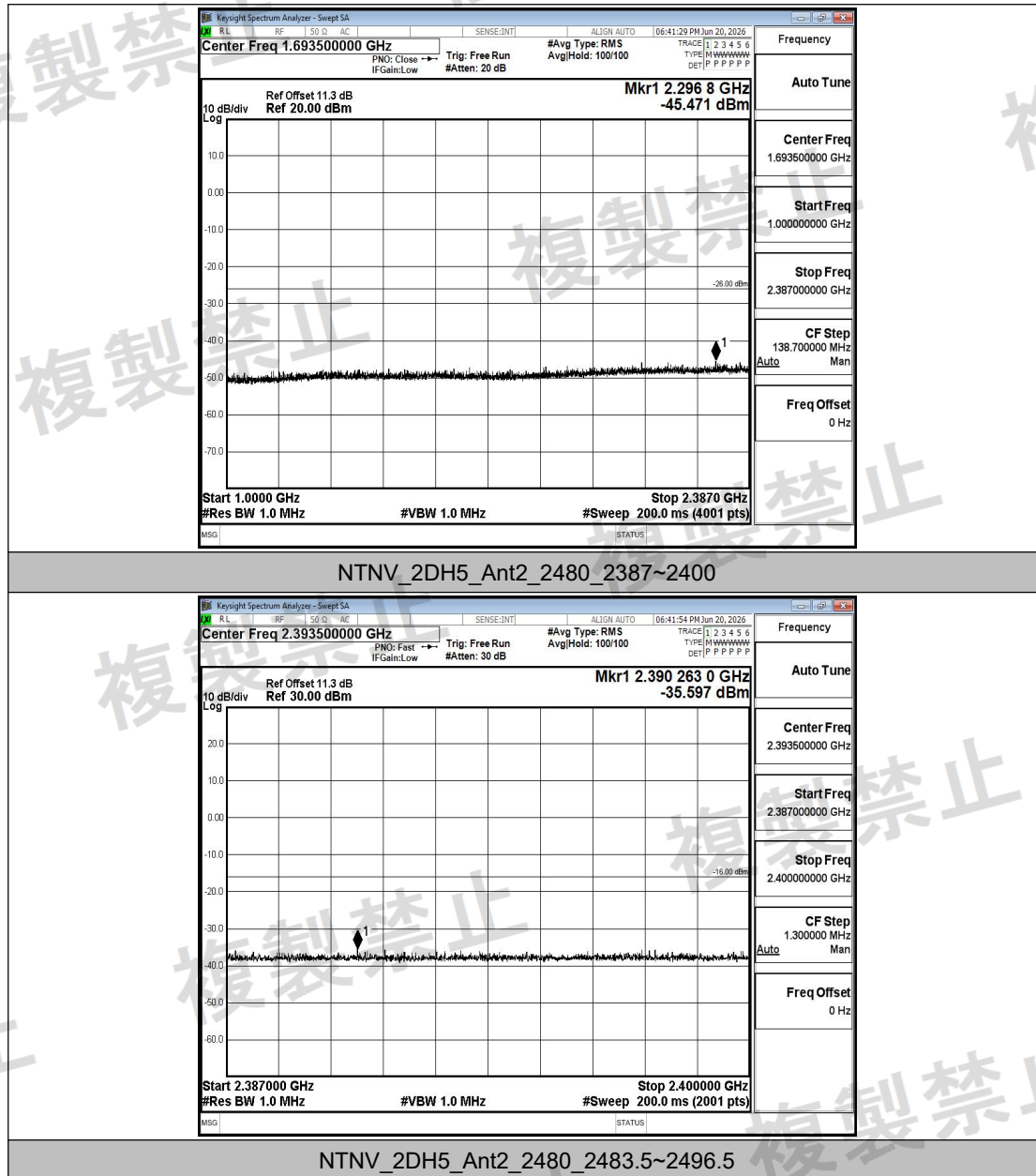


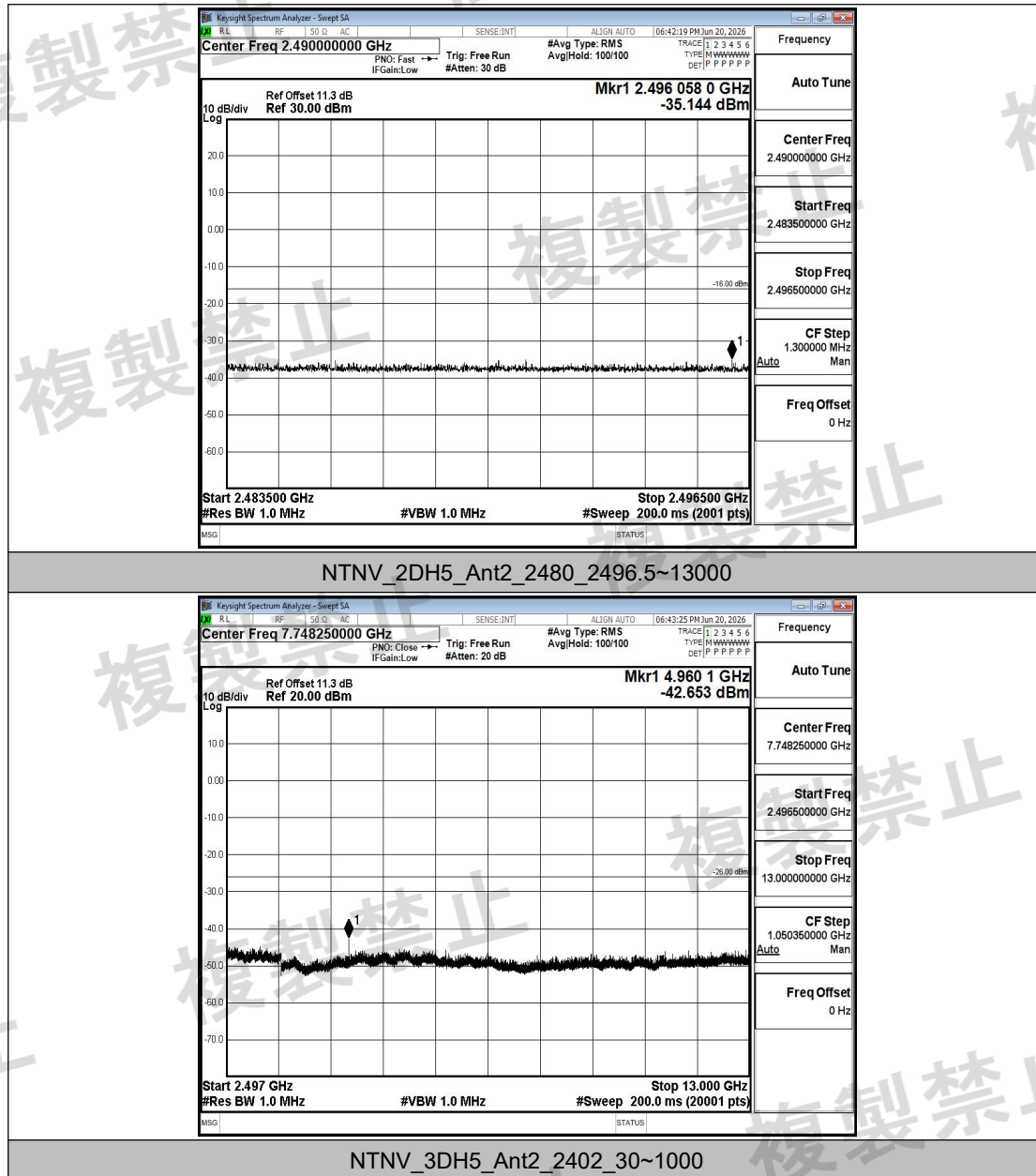


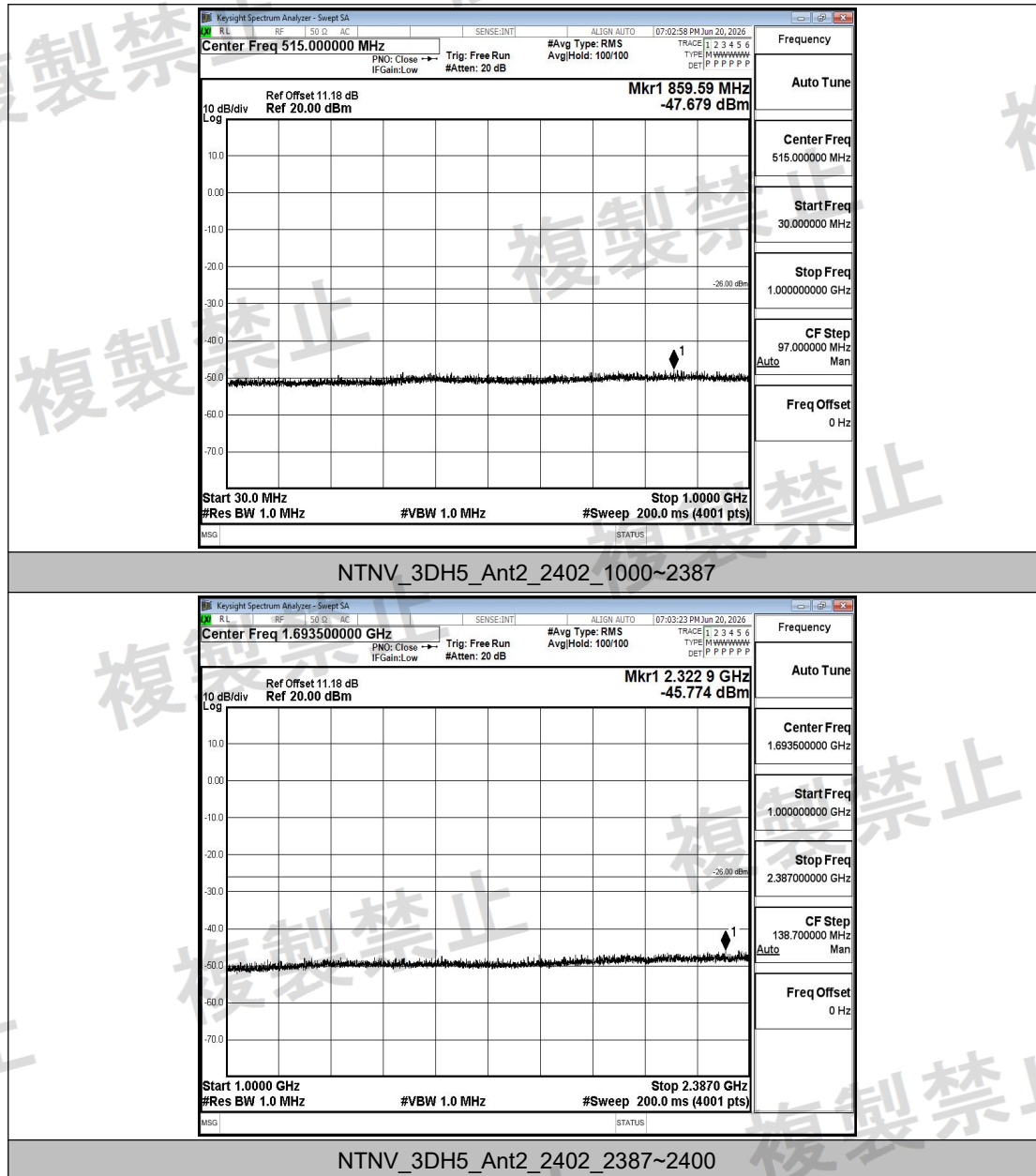


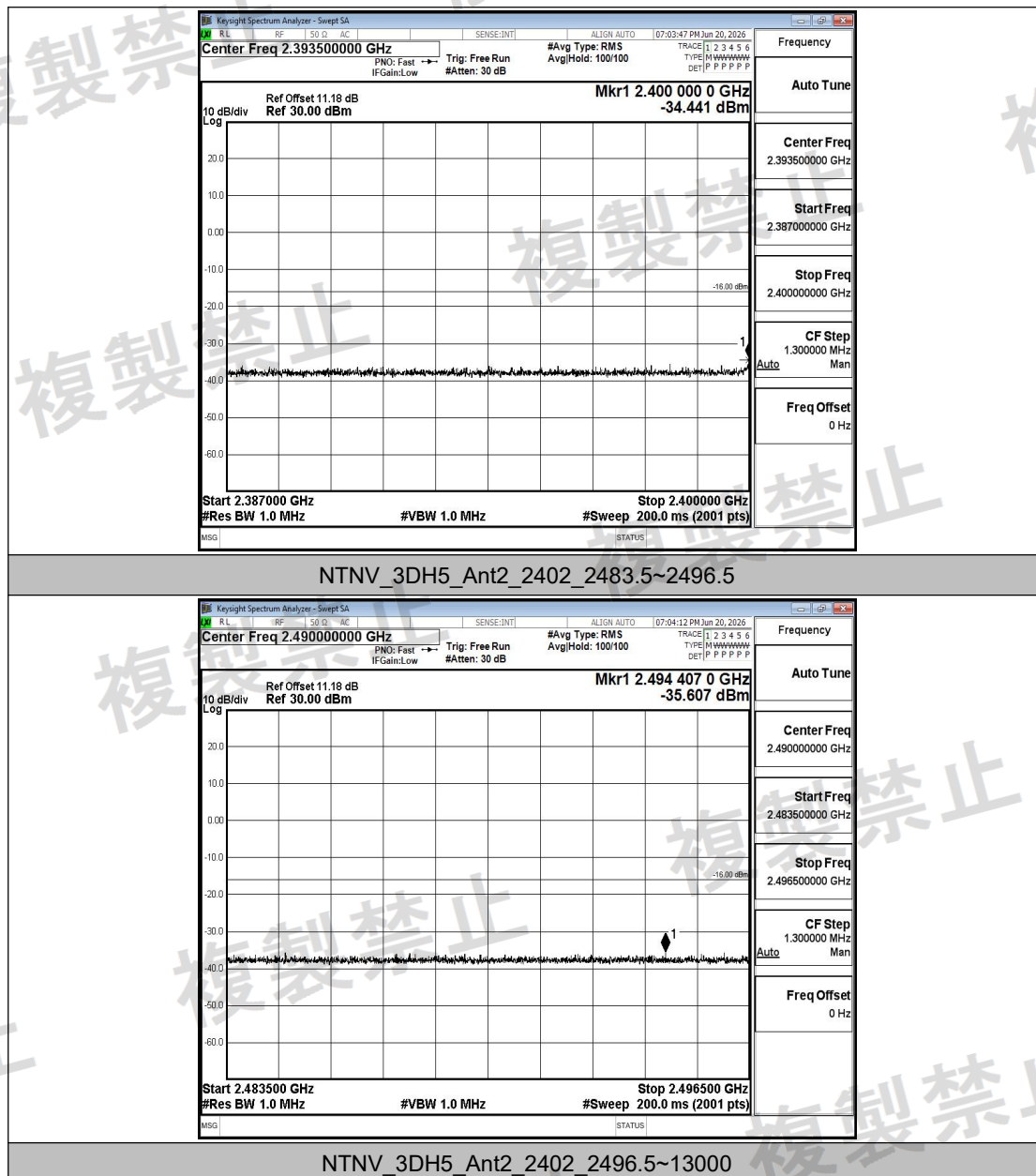


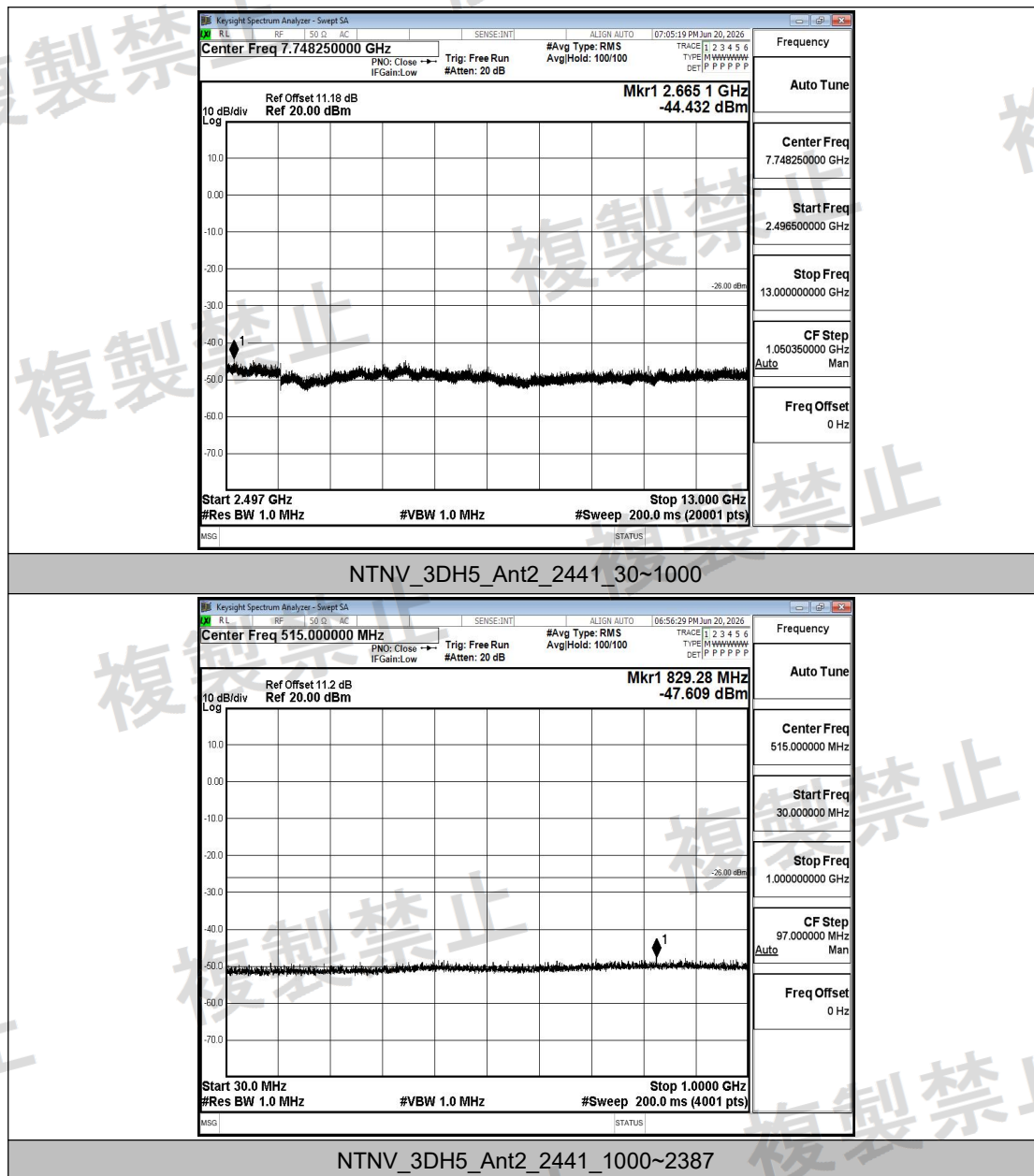


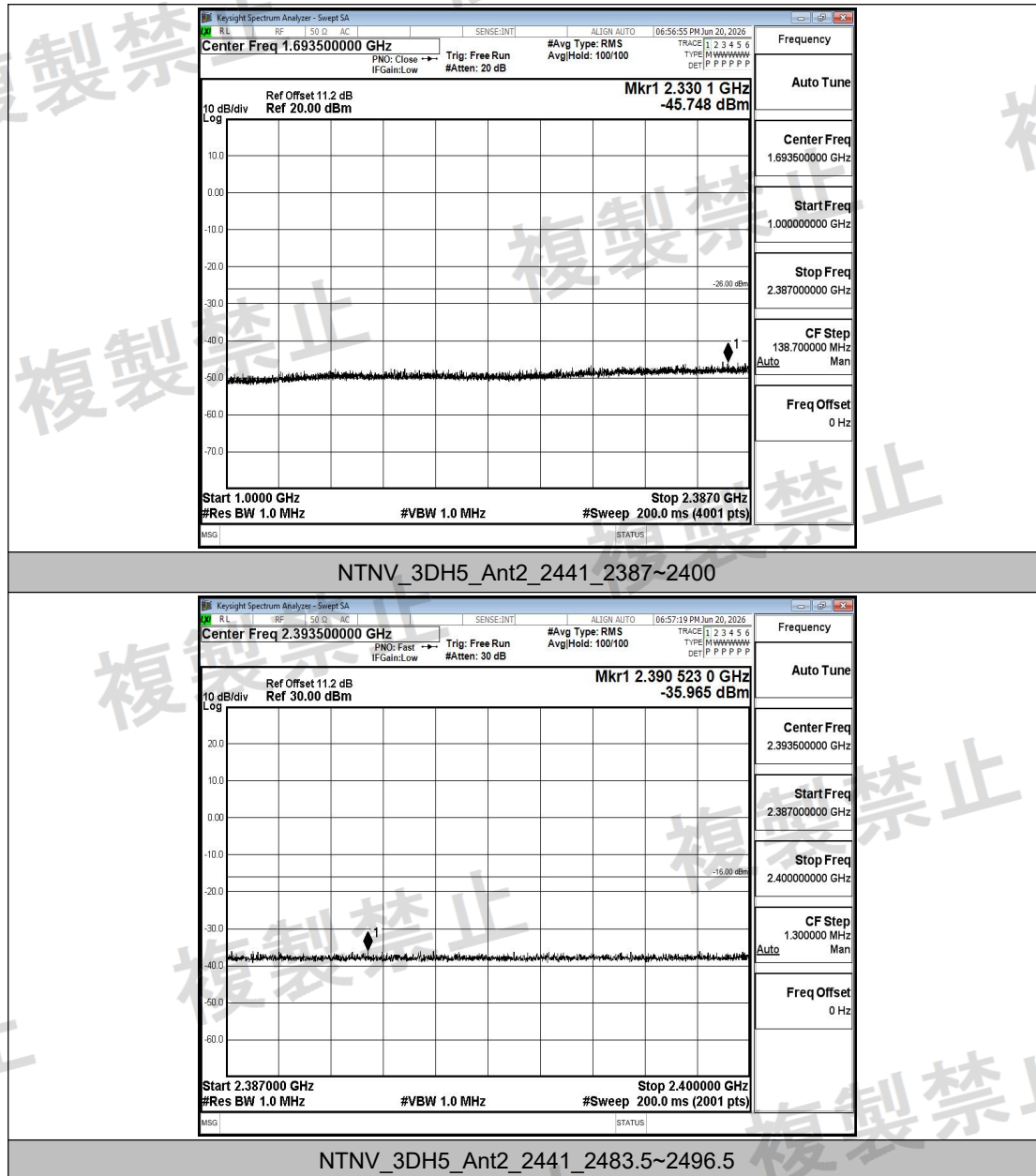


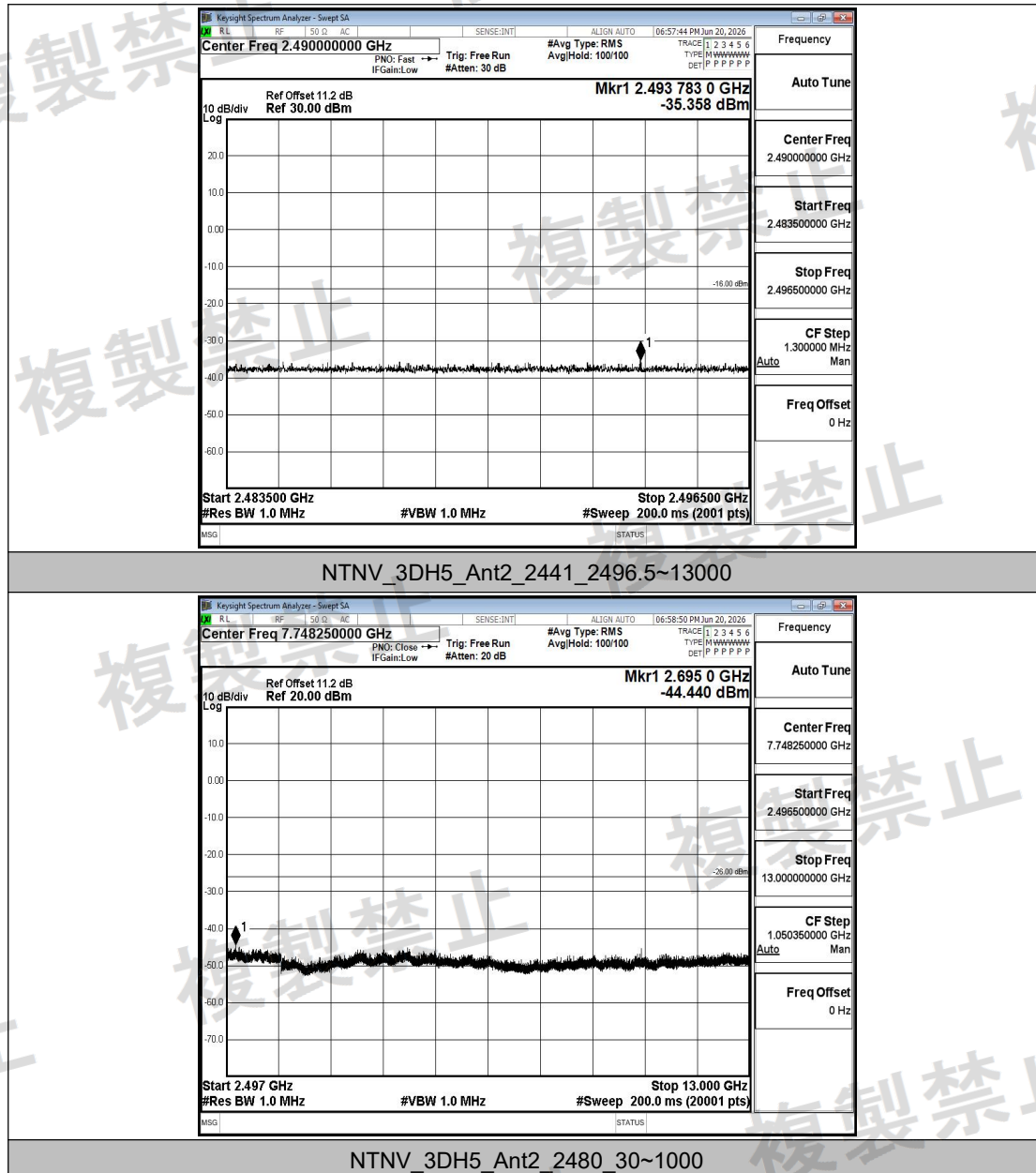


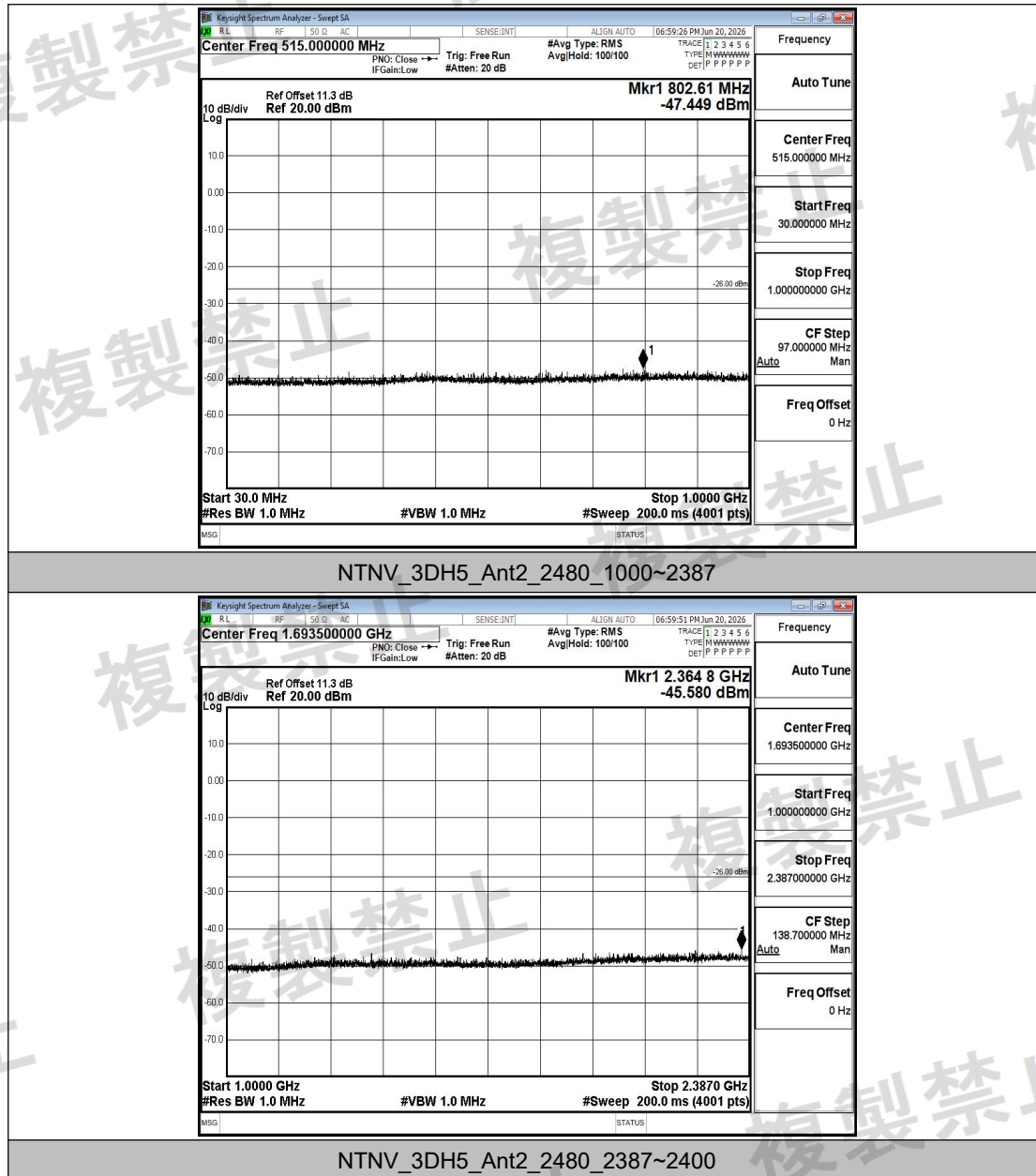


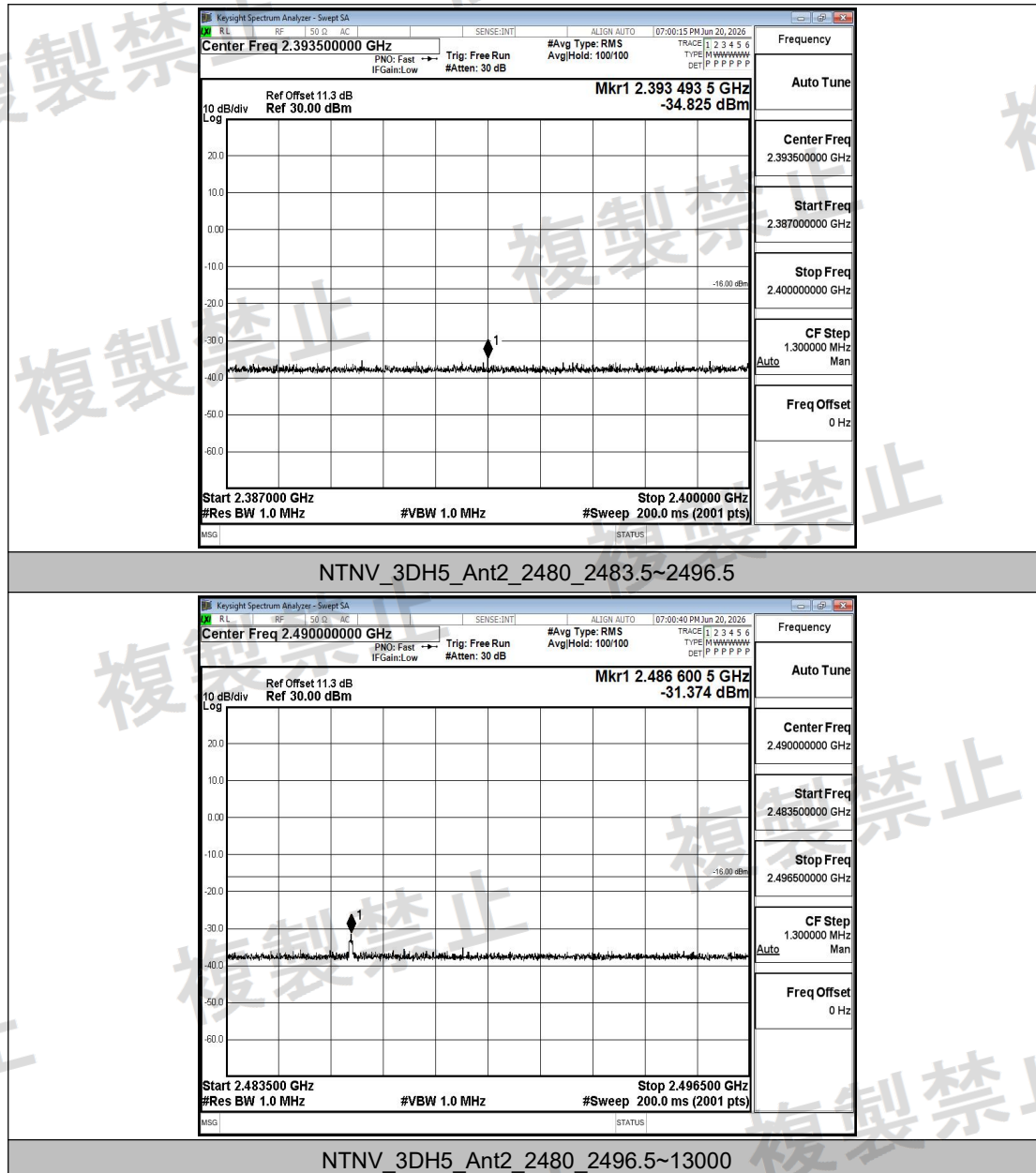


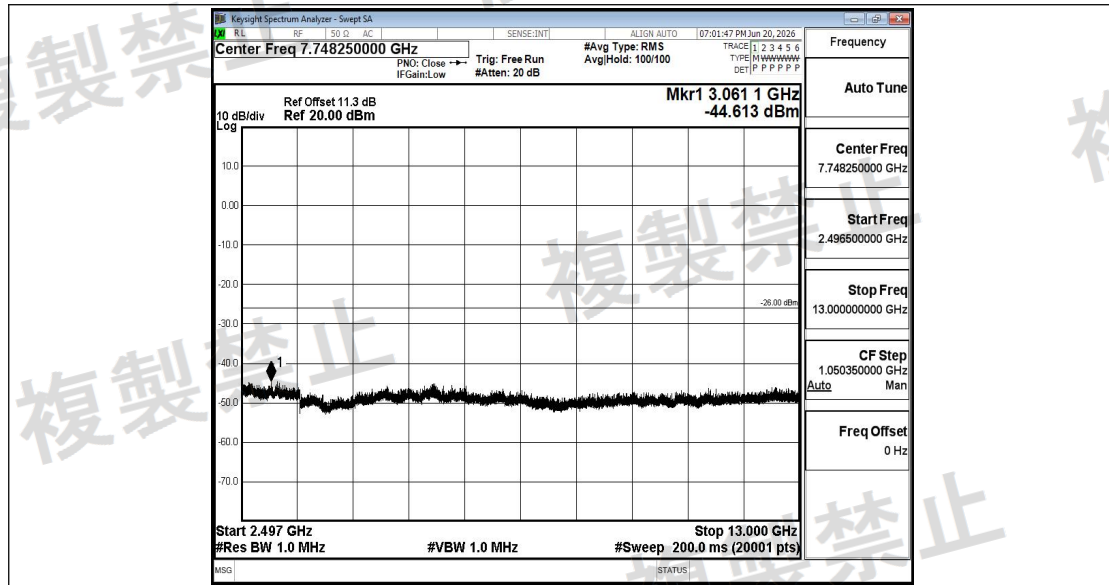










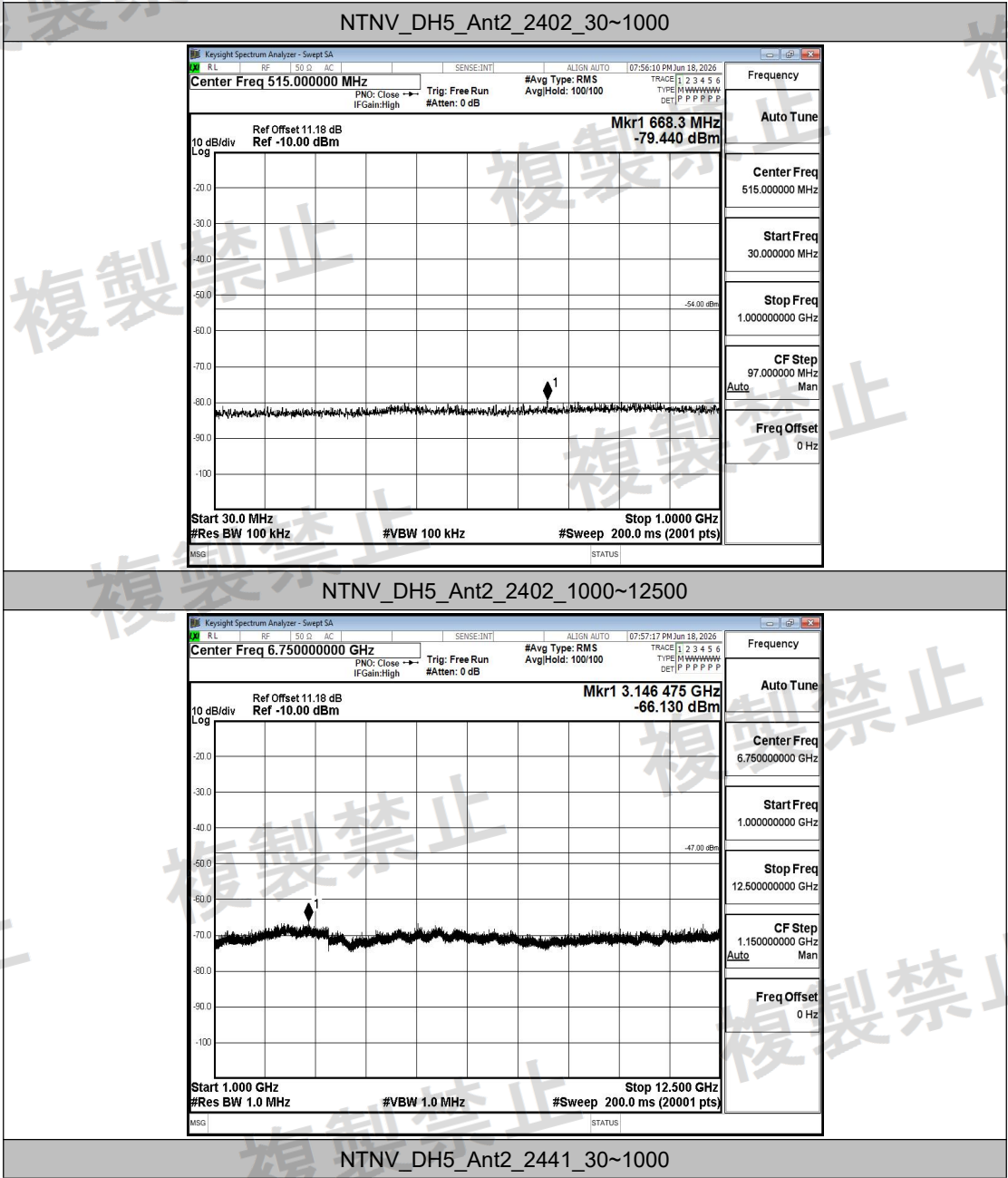


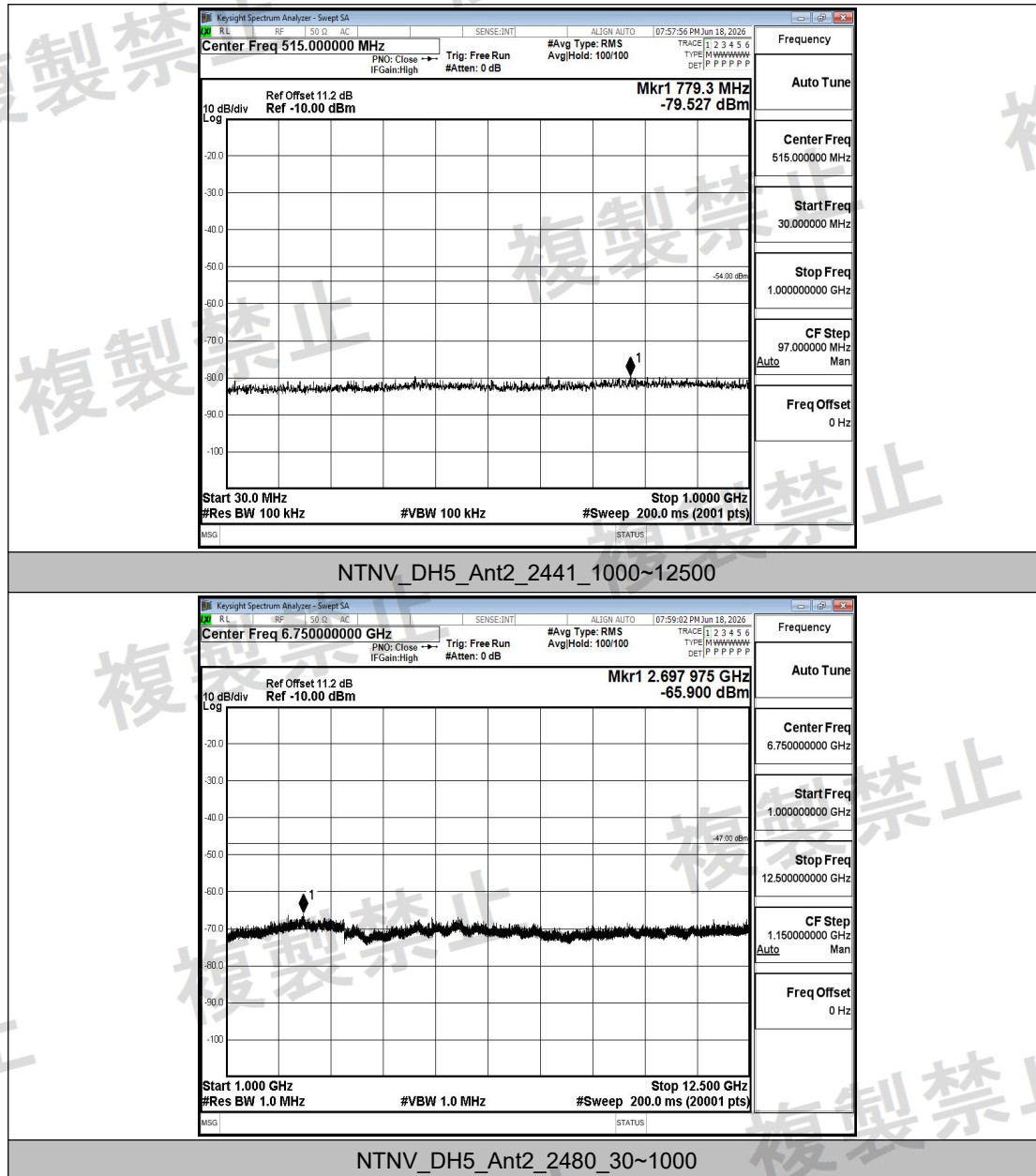
B.6 Spurious Emission of RX

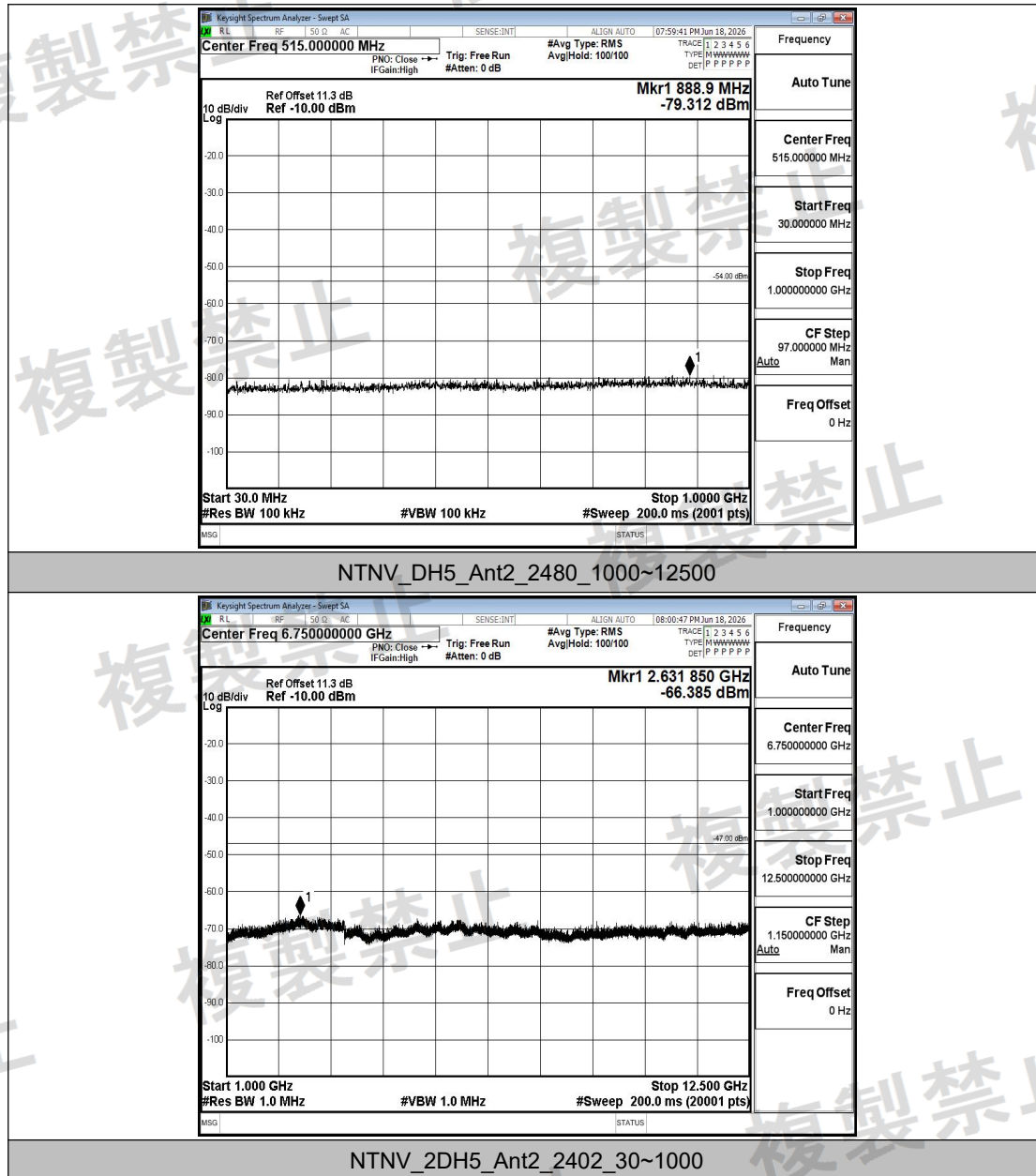
Test Result

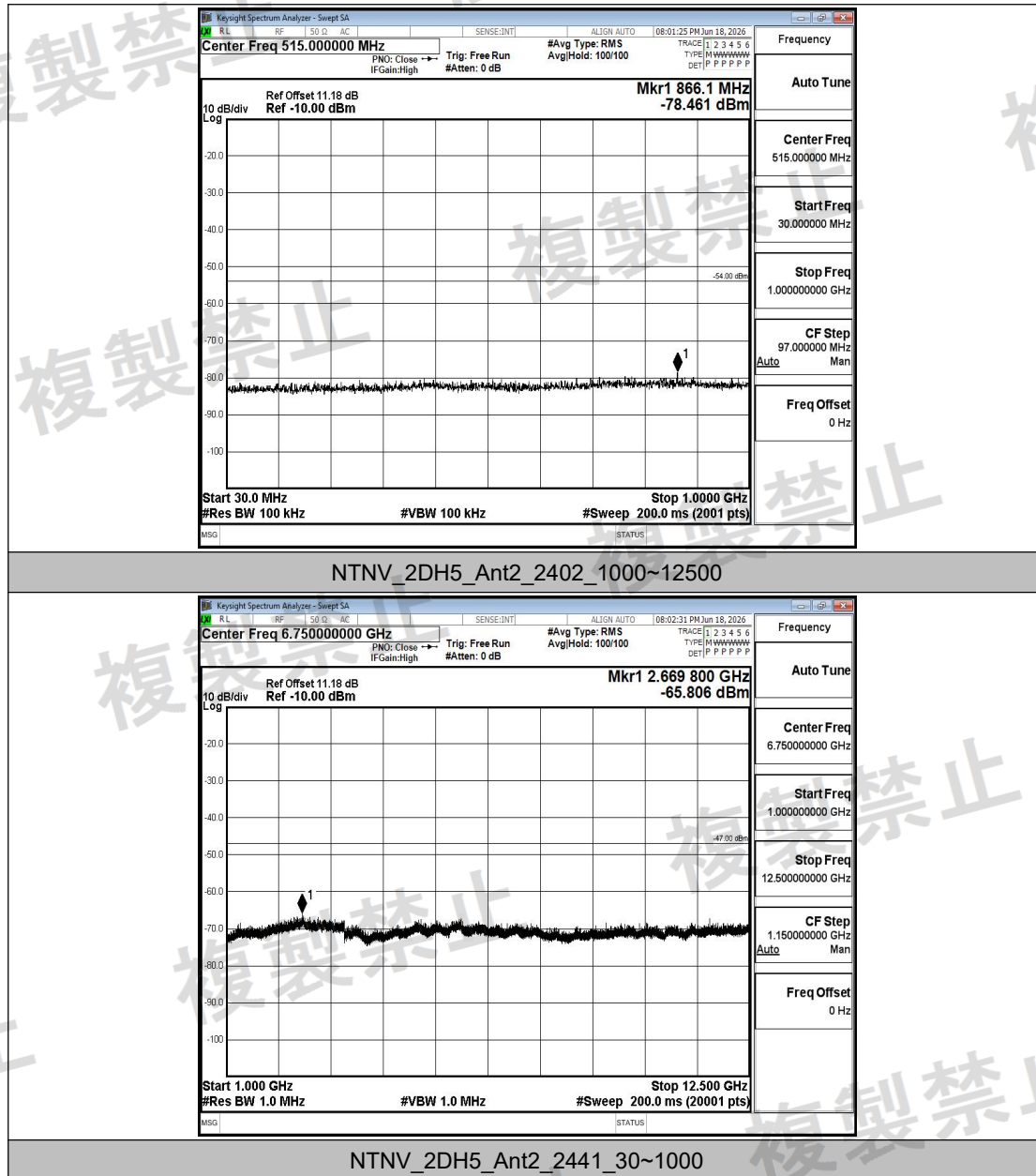
Test Condition	Test Mode	Antenna	Freq(M Hz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	DH5	Ant2	2402	30~1000	668.26	-79.44	≤-54	0.01138	≤4	PASS
				1000~12500	3146.48	-66.13	≤-47	0.24378	≤20	PASS
			2441	30~1000	779.33	-79.53	≤-54	0.01114	≤4	PASS
				1000~12500	2697.98	-65.90	≤-47	0.25704	≤20	PASS
			2480	30~1000	888.94	-79.31	≤-54	0.01172	≤4	PASS
				1000~12500	2631.85	-66.39	≤-47	0.22961	≤20	PASS
	2DH5	Ant2	2402	30~1000	866.14	-78.46	≤-54	0.01426	≤4	PASS
				1000~12500	2669.80	-65.81	≤-47	0.26242	≤20	PASS
			2441	30~1000	402.97	-79.35	≤-54	0.01161	≤4	PASS
				1000~12500	2706.60	-65.18	≤-47	0.30339	≤20	PASS
			2480	30~1000	760.90	-79.26	≤-54	0.01186	≤4	PASS
				1000~12500	2641.05	-66.09	≤-47	0.24604	≤20	PASS
	3DH5	Ant2	2402	30~1000	402.00	-79.00	≤-54	0.01259	≤4	PASS
				1000~12500	3060.80	-66.32	≤-47	0.23335	≤20	PASS
			2441	30~1000	636.25	-78.95	≤-54	0.01274	≤4	PASS
				1000~12500	2665.20	-66.31	≤-47	0.23388	≤20	PASS
			2480	30~1000	882.63	-79.40	≤-54	0.01148	≤4	PASS
				1000~12500	3040.68	-66.00	≤-47	0.25119	≤20	PASS

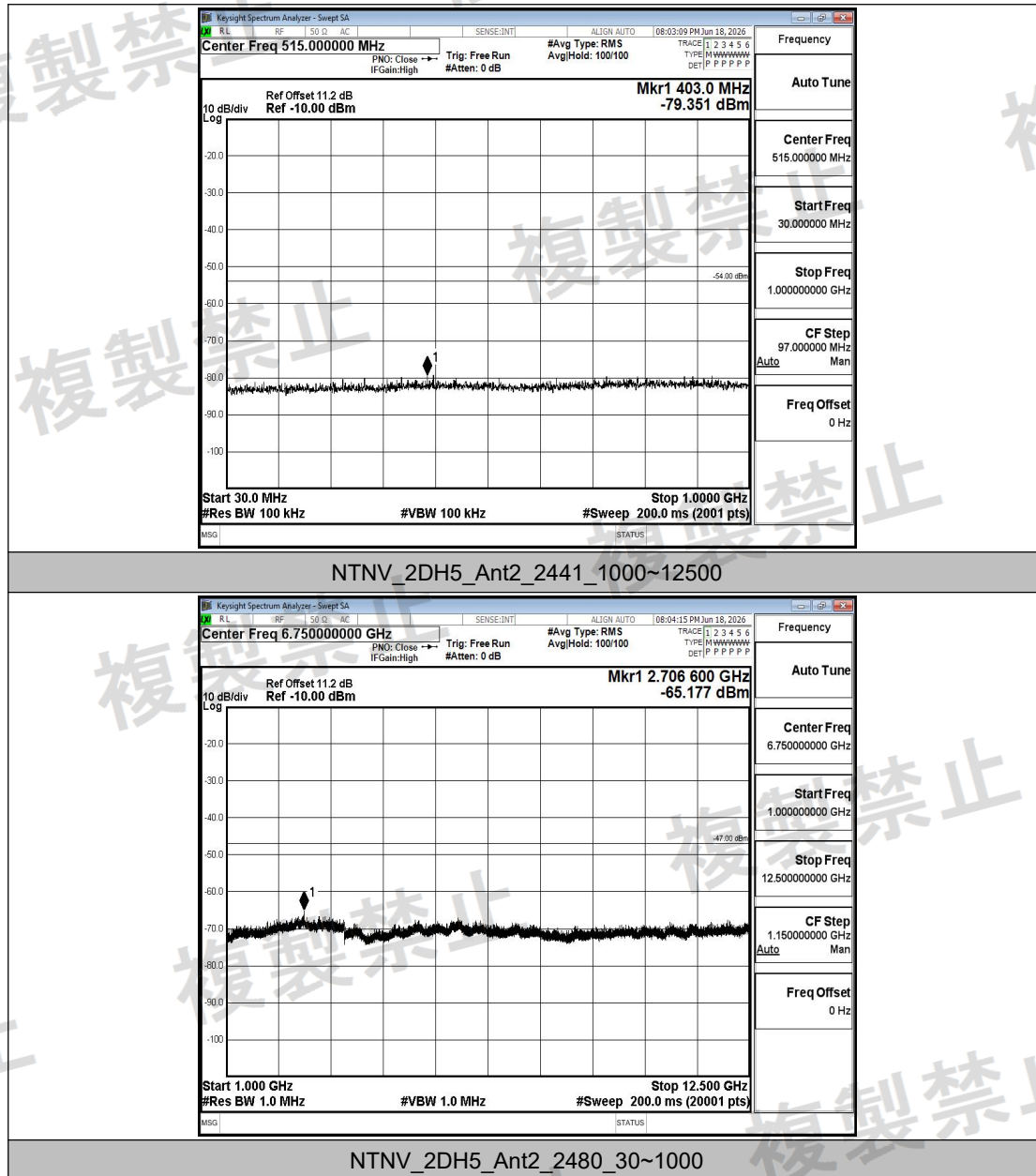
Test Graphs

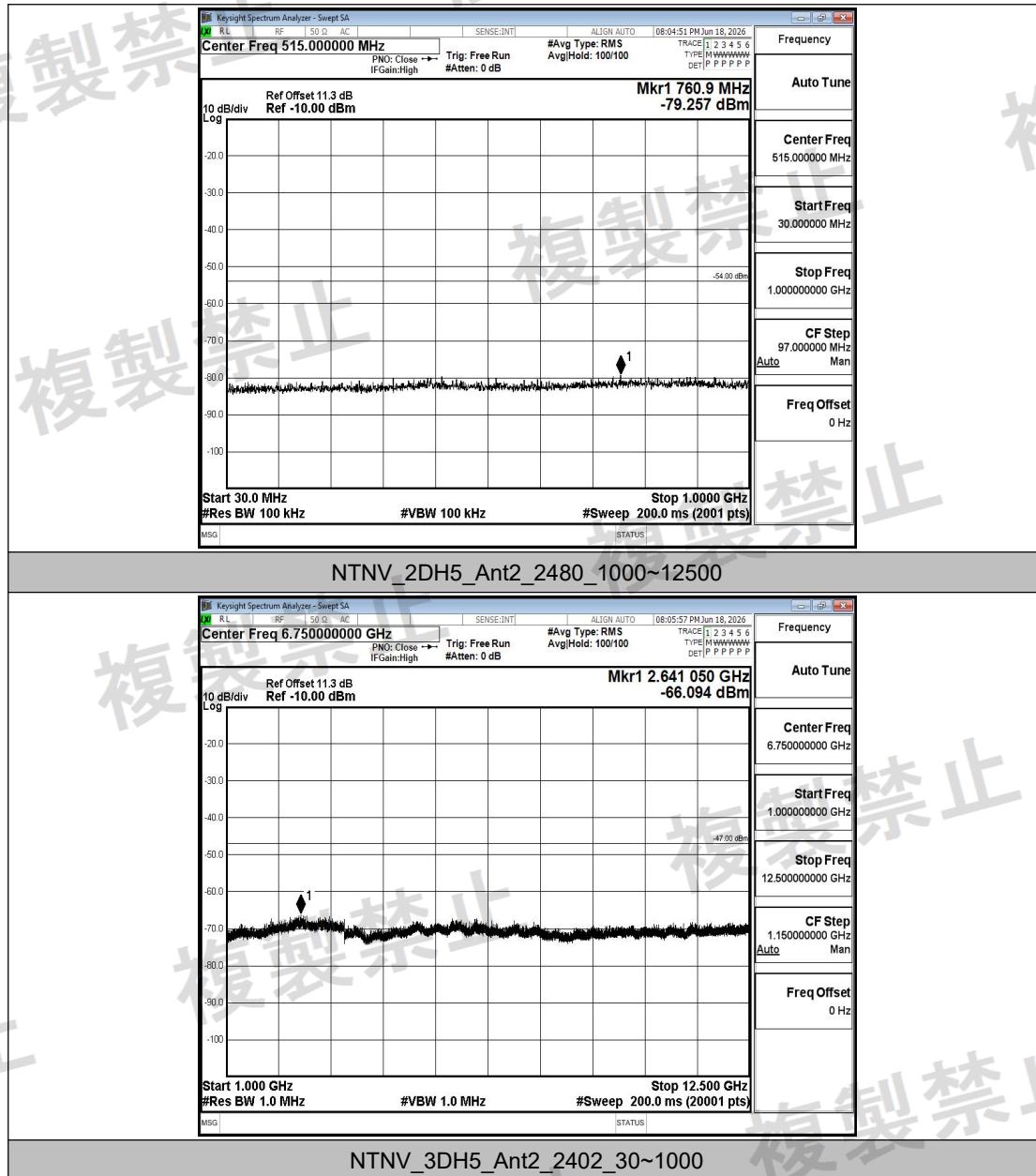


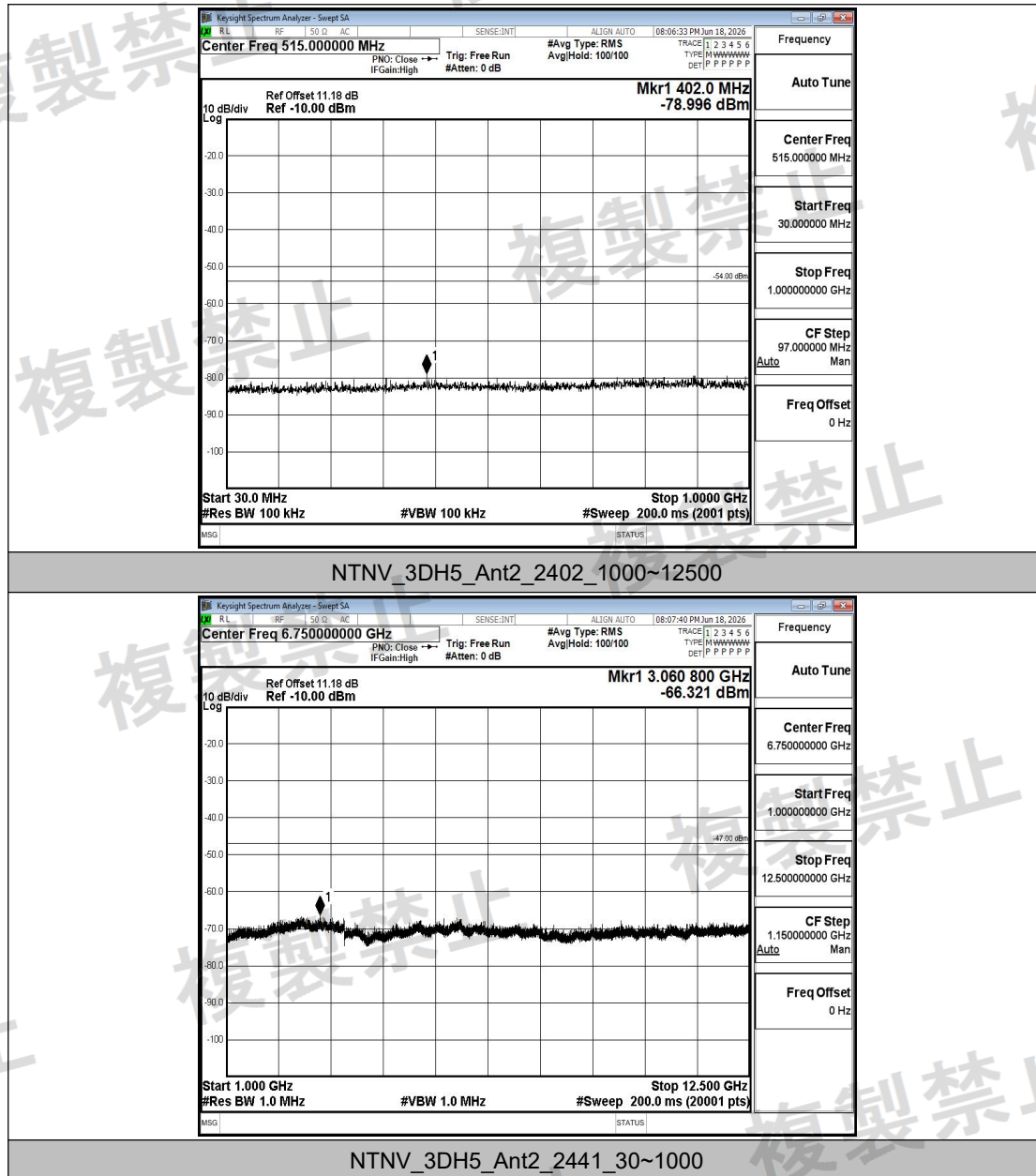


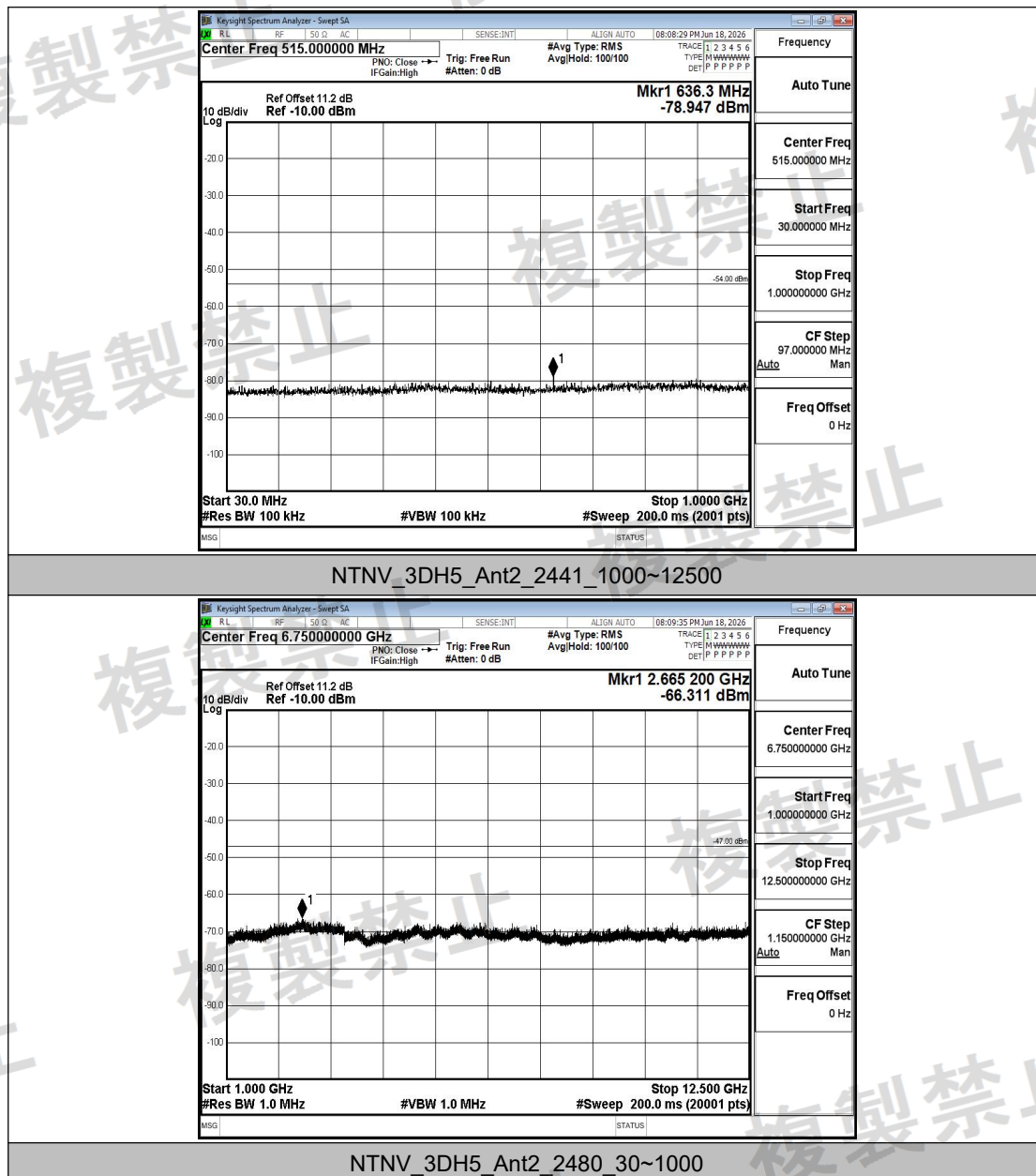


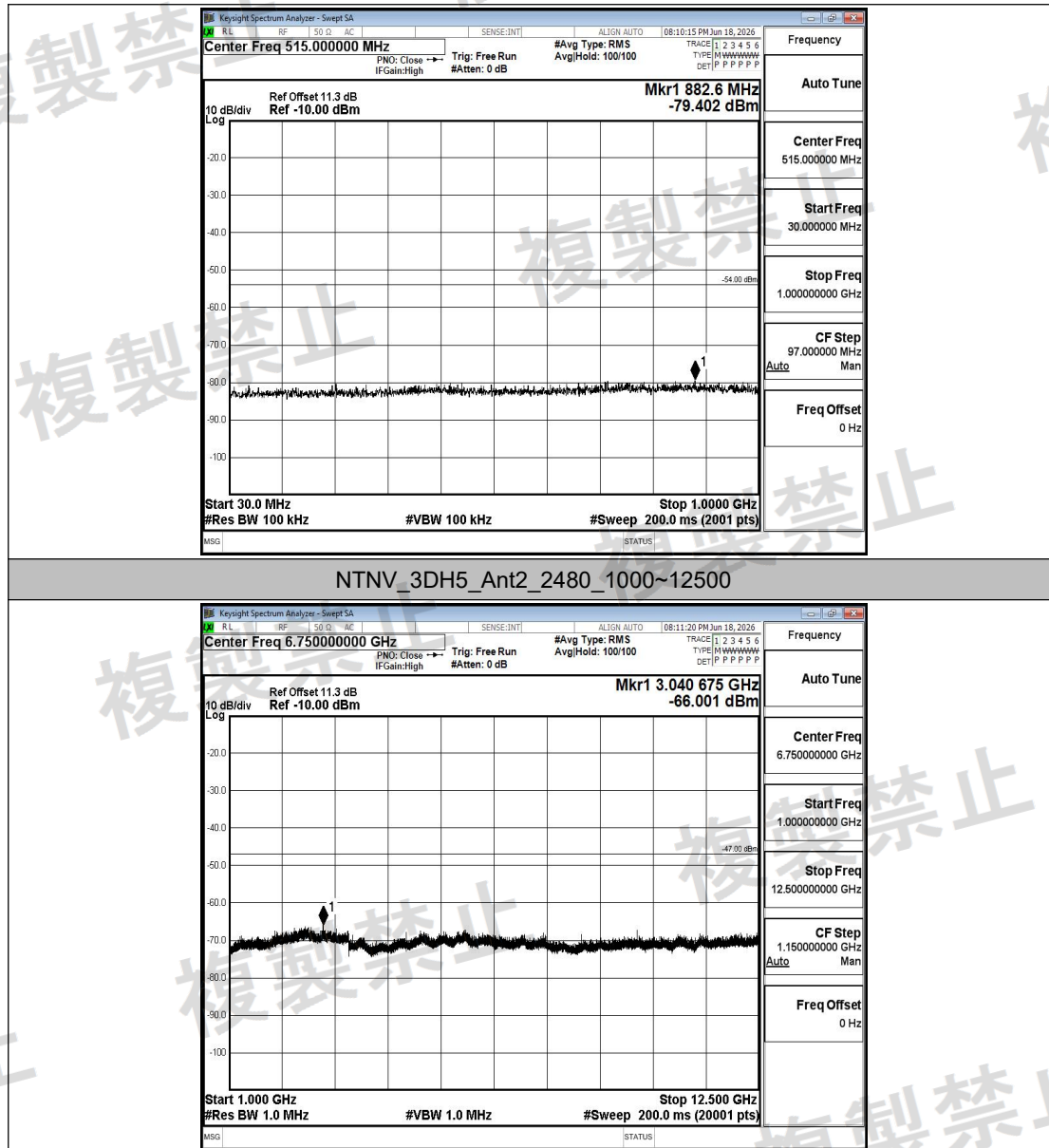










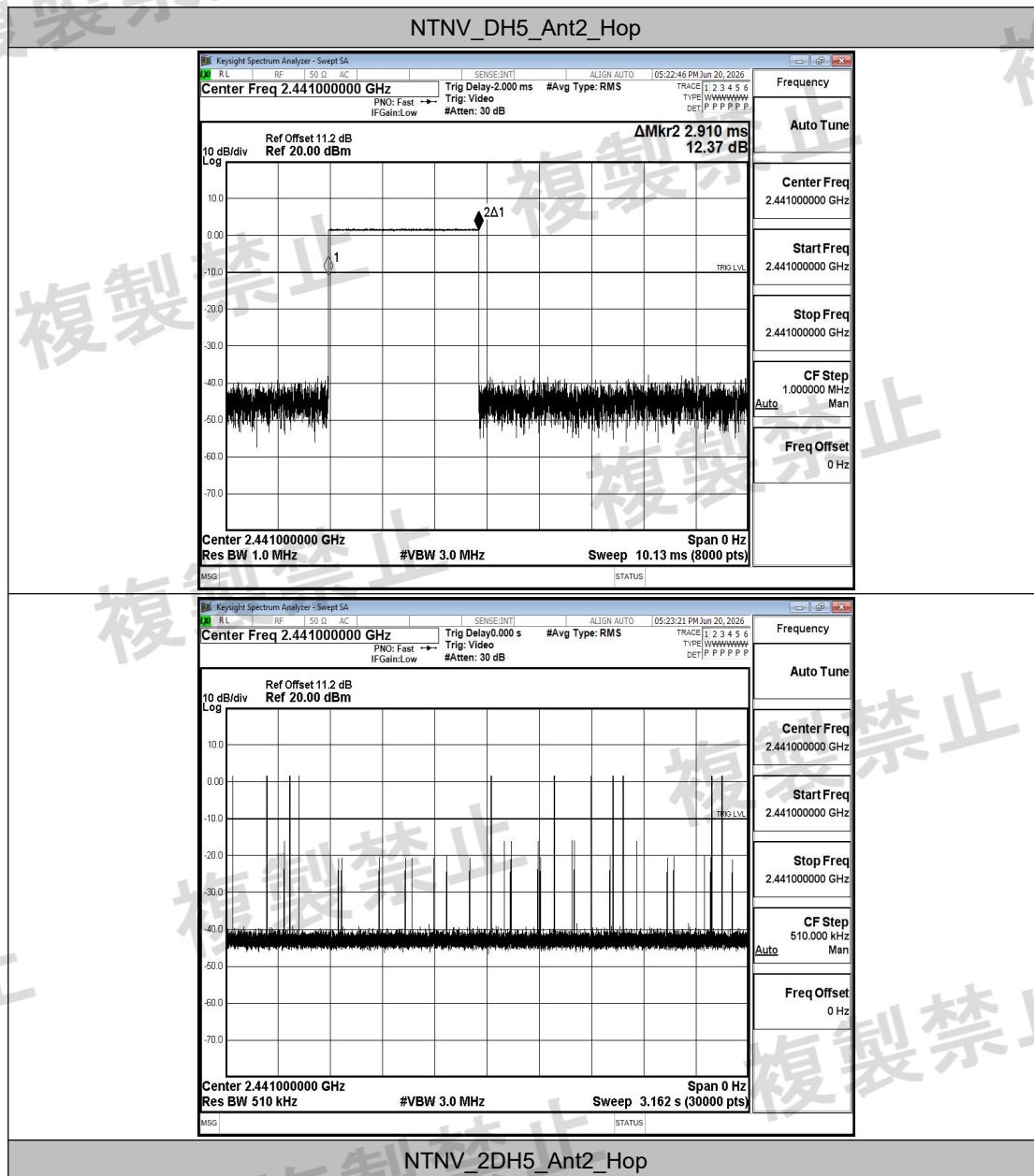


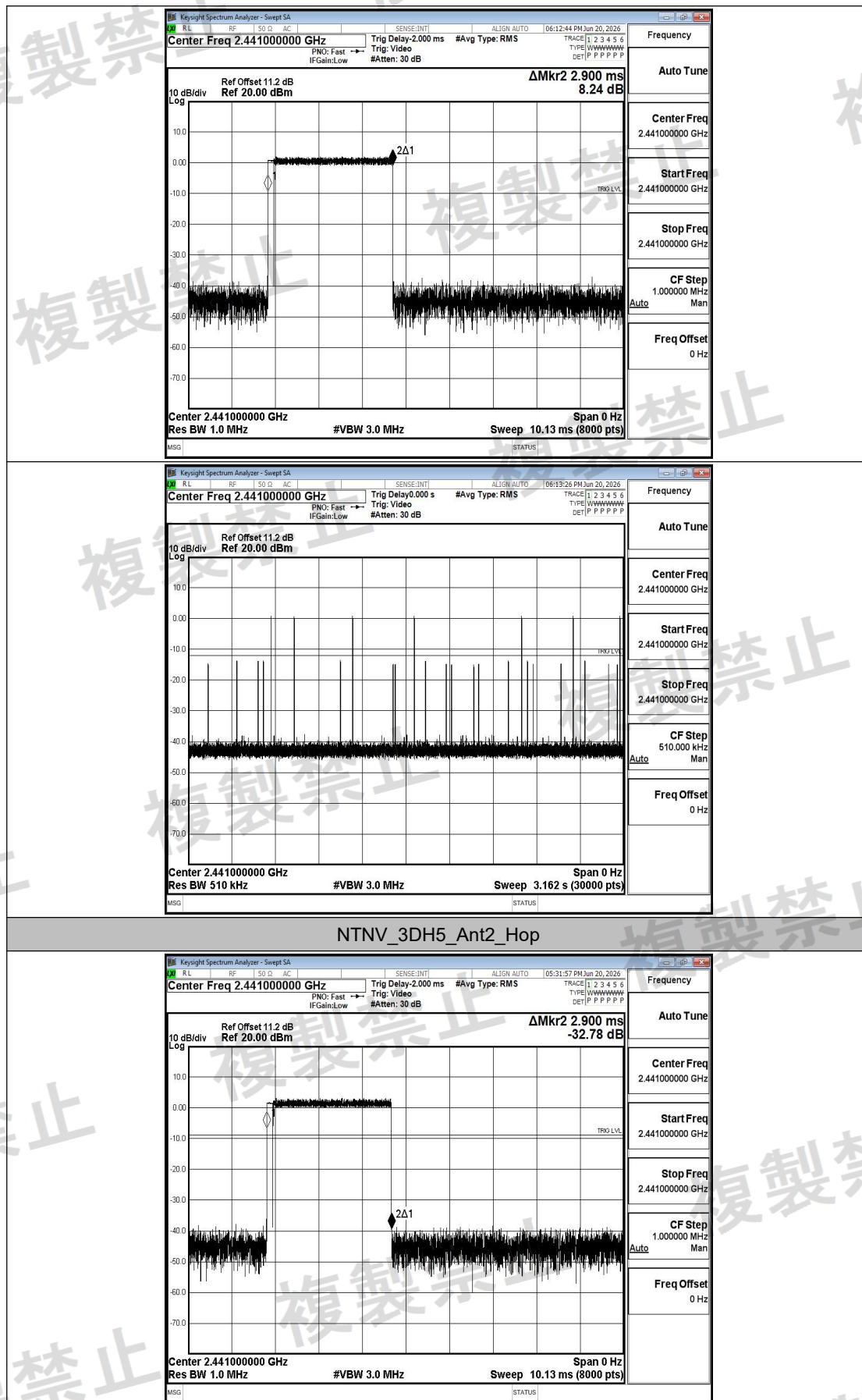
B.7 Dwell Time

Test Result

Test Condition	Test Mode	Antenna	Freq(M Hz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit [s]	Verdict
NTNV	DH5	Ant2	Hop	2.91	120	0.349	≤0.4	PASS
	2DH5	Ant2	Hop	2.90	80	0.232	≤0.4	PASS
	3DH5	Ant2	Hop	2.90	100	0.29	≤0.4	PASS

Test Graphs





Guangzhou LCS Compliance Testing Laboratory Ltd.

Add: No.44-1, Qianfeng North Road, Shiqi, Panyu District, Guangzhou, Guangdong, China

Tel: +(86) 020-39166689 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

