

Appendix A for BT Test Data

Product Name: Bone Conduction Headphonesw/ Swappable Drivers

Test Model: PB1-COM

Environmental Conditions

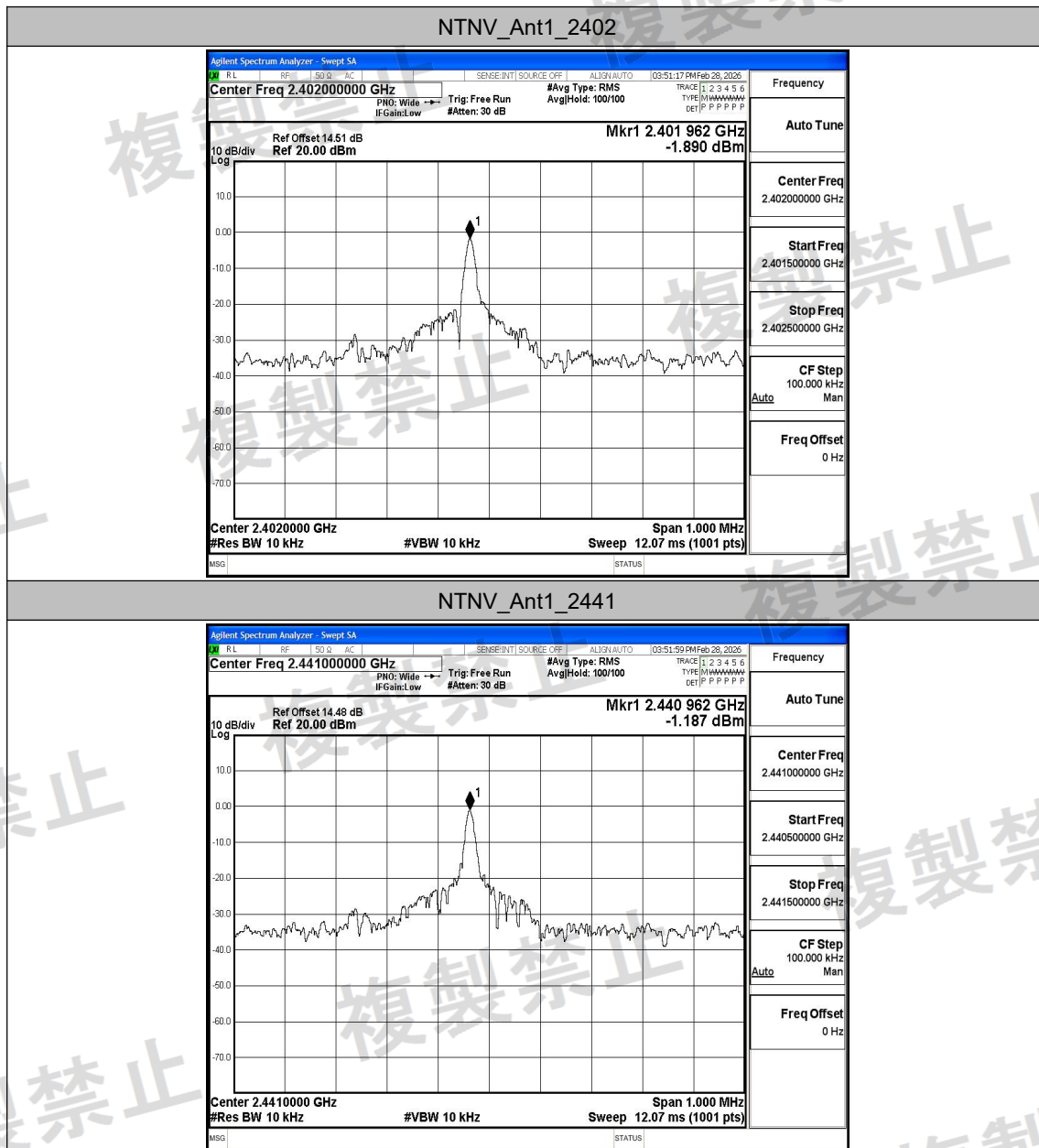
Temperature:	23.8°C
Relative Humidity:	53.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Zhang hai
Supervised by:	Fengliu Tang

A.1 Frequency_Error

Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	Frequency_Error	Ant1	2402	-15.82015	±50	PASS
			2441	-15.56739	±50	PASS
			2480	-15.72581	±50	PASS

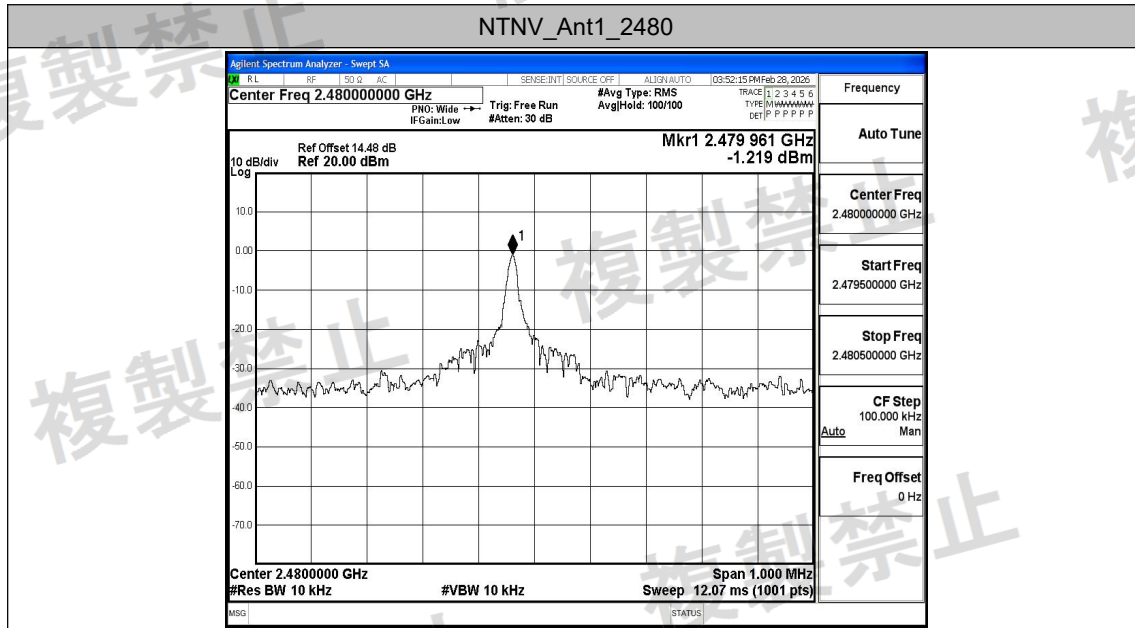
Test Graphs



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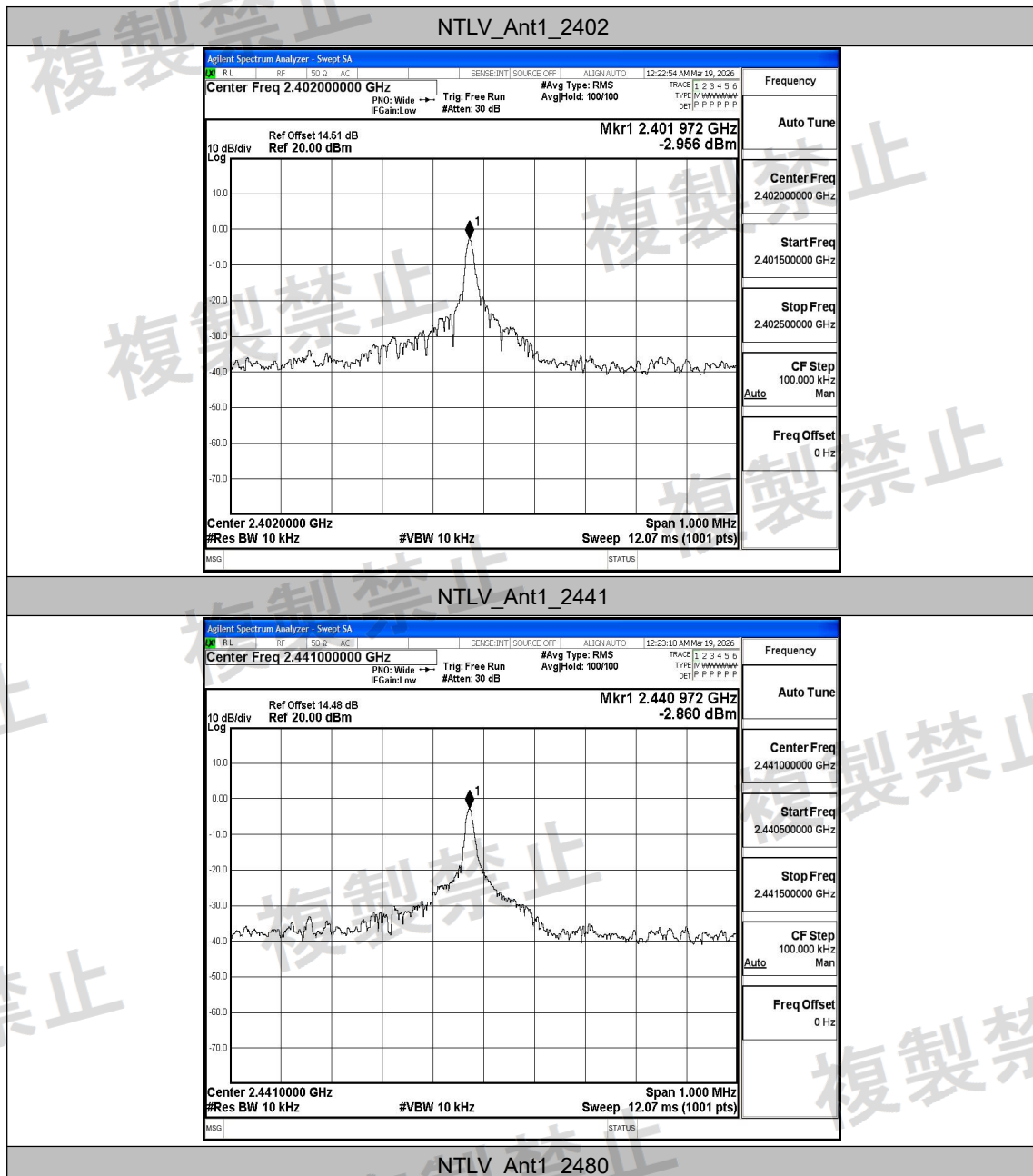
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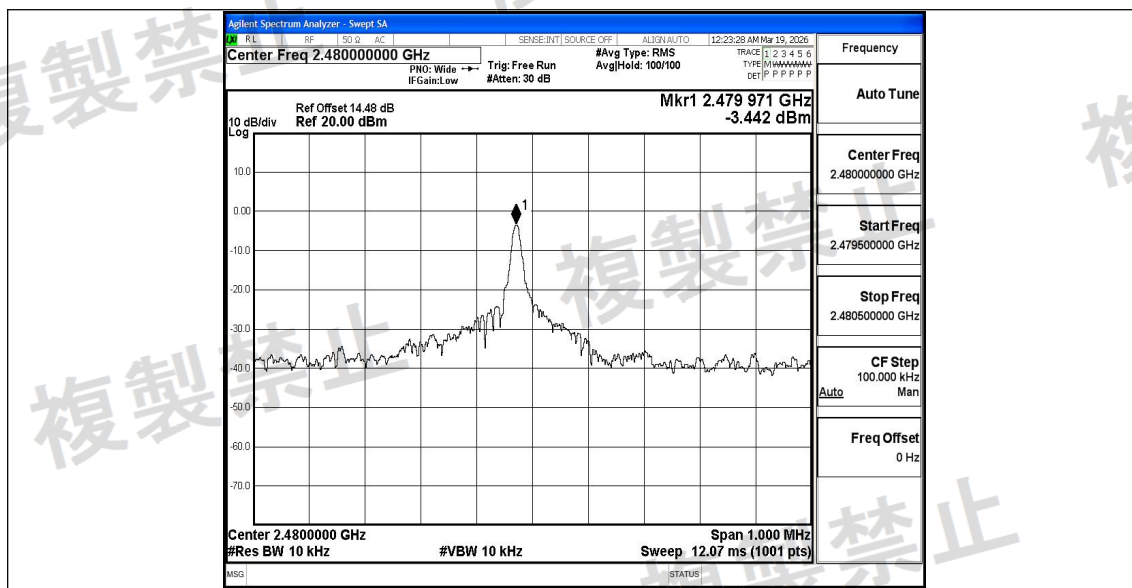
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TestCondition	TestMode	Antenna	Channel	Result[ppm]	Limit[ppm]	Verdict
NTLV	Frequency_Error	Ant1	2402	-11.65695	±50	PASS
			2441	-11.47071	±50	PASS
			2480	-11.69355	±50	PASS

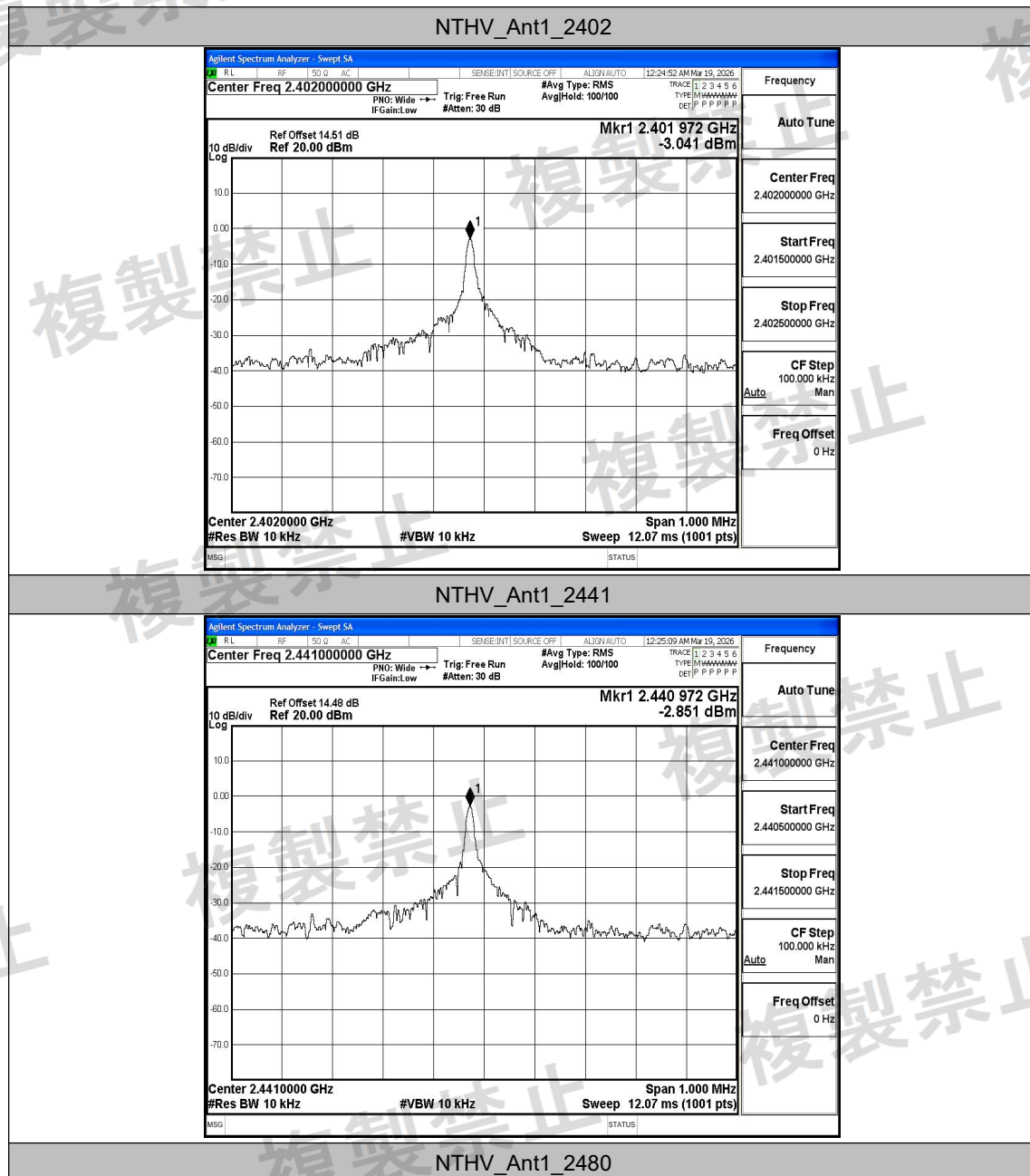
Test Graphs

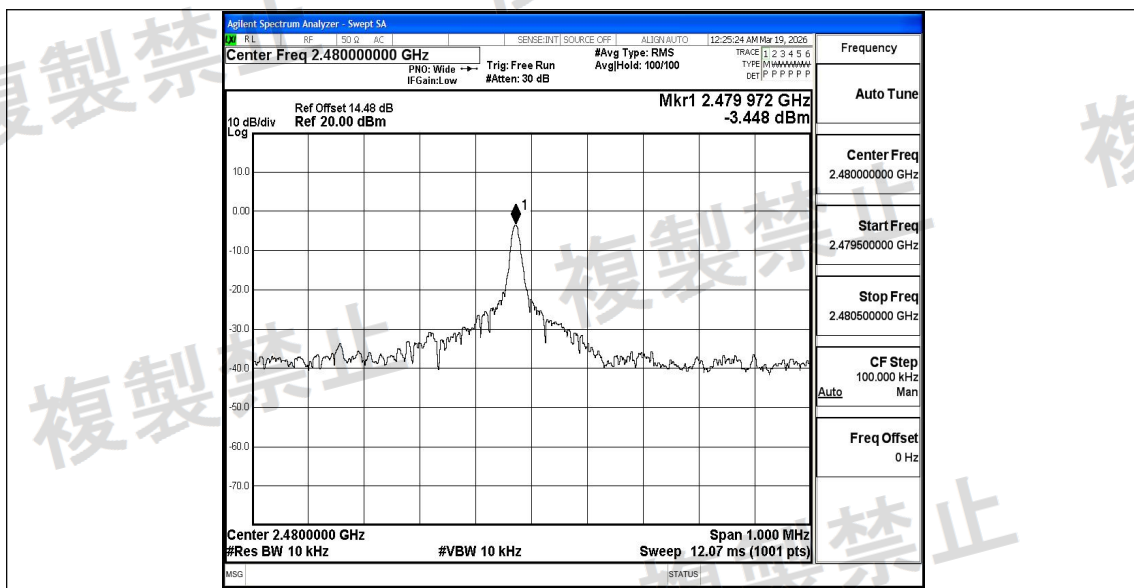




TestCondition	TestMode	Antenna	Channel	Result[ppm]	Limit[ppm]	Verdict
NTHV	Frequency_Error	Ant1	2402	-11.65695	±50	PASS
			2441	-11.47071	±50	PASS
			2480	-11.29032	±50	PASS

Test Graphs





A.2 Antenna Power & EIRP

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)	0.05	3.38	2.178	0.049	3	-2.00%	+20%
Hopping-Tx (2Mbps)	0.05	2.29	1.694	0.038	3	-24.00%	+20%
Conclusion: PASS							

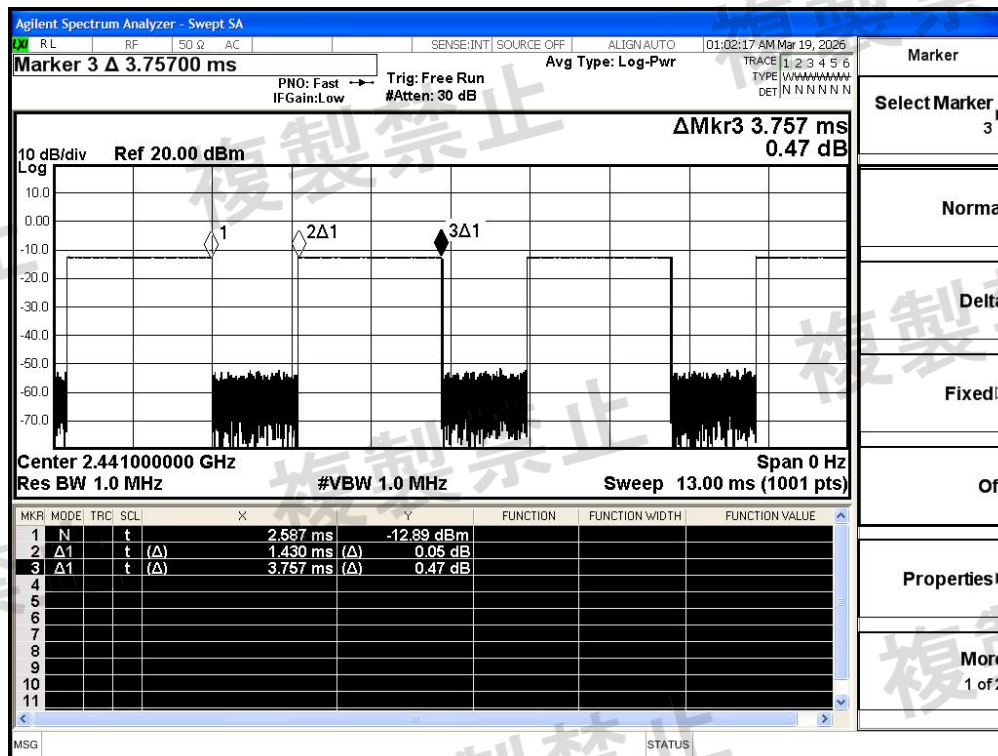
Result power= Average value / (Duty Cycle * Spreading bandwidth)

BT ANTenna power Result = Measured Power / Spreading bandwidth

Spread Bandwidth (DH5) = 71.393MHz, Spread Bandwidth (2DH5) = 71.442MHz,

Duty cycle=61.9%

Duty cycle= [Ton/ (Ton+Toff)]*100%=2.327/3.757*100%=61.9%



Test Voltage				Low Voltage			
Mode	Declared power	Average Result	Average Result	Result	Limit	Tolerance	Limit
	(mW/MHz)	(dBm)	(mW)	(mW/MHz)	(mW/MHz)	/	/
Hopping-Tx (1Mbps)	0.05	3.27	2.123	0.048	3	-4.00%	+20%
Hopping-Tx (2Mbps)	0.05	2.30	1.698	0.038	3	-24.00%	+20%
Conclusion: PASS							

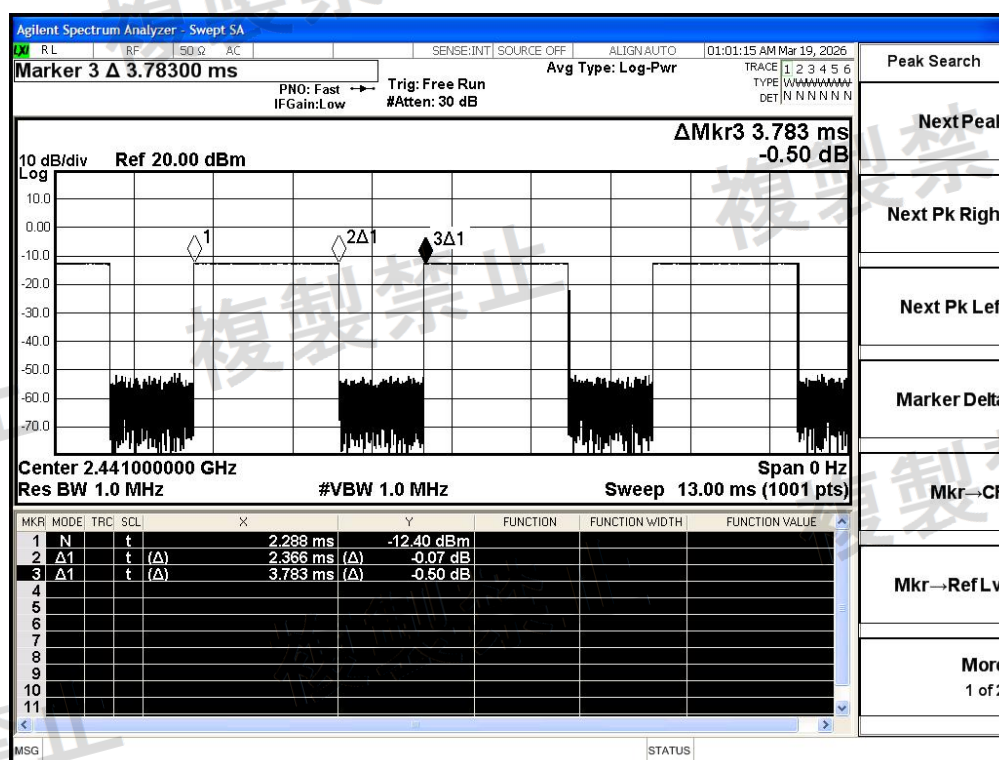
Result power= Average value / (Duty Cycle * Spreading bandwidth)

BT ANTenna power Result = Measured Power / Spreading bandwidth

Spread Bandwidth (DH5) = 71.228MHz, Spread Bandwidth (2DH5) = 71.303MHz,

Duty cycle=62.5%

Duty cycle= [Ton/ (Ton+Toff)]*100%=2.366/3.783*100%=62.5%



Test Voltage				High Voltage			
Mode	Declared power	Average Result	Average Result	Result	Limit	Tolerance	Limit
	(mW/MHz)	(dBm)	(mW)	(mW/MHz)	(mW/MHz)	/	/
Hopping-Tx (1Mbps)	0.05	3.36	2.168	0.049	3	-2.00%	+20%
Hopping-Tx (2Mbps)	0.05	2.25	1.679	0.038	3	-24.00%	+20%
Conclusion: PASS							

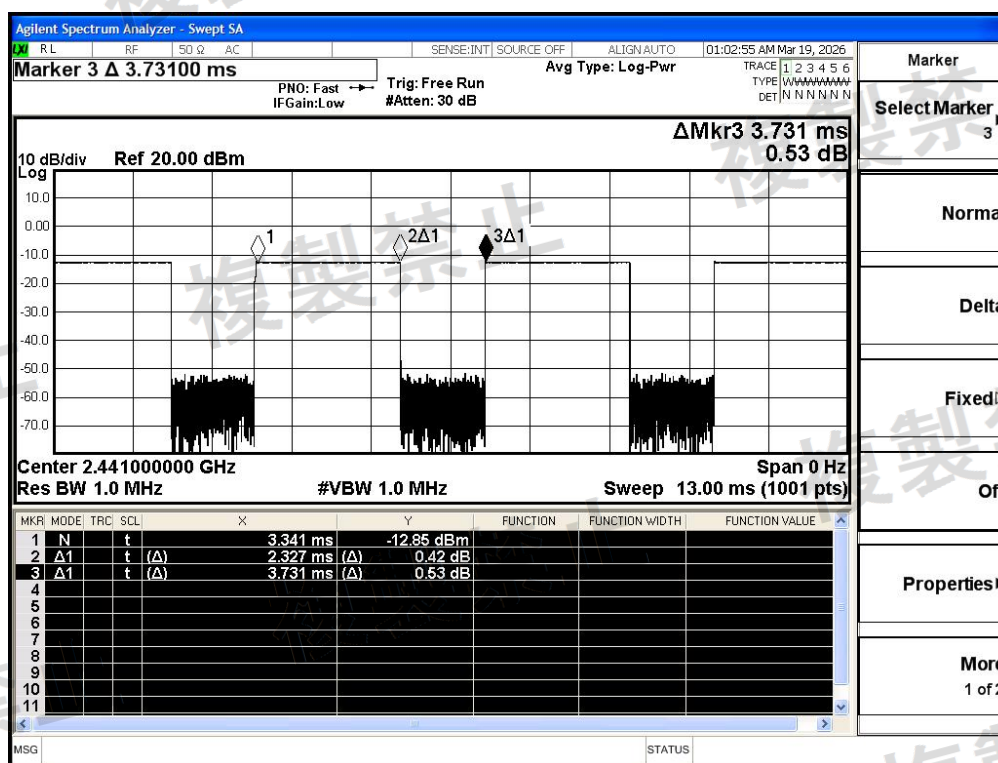
Result power= Average value / (Duty Cycle * Spreading bandwidth)

BT ANTenna power Result = Measured Power / Spreading bandwidth

Spread Bandwidth (DH5) = 71.214MHz, Spread Bandwidth (2DH5) = 71.315MHz,

Duty cycle=62.4%

Duty cycle= [Ton/ (Ton+Toff)]*100%=2.327/3.731*100%=62.4%



EIRP							
Test Condition	Antenna	Mode	Measured Power (dBm/MHz)	Antenna gain (dBi)	Limit (dBm/MHz)	Limit (dBm/MHz)	Verdict
NTNV	Ant1	Hopping-Tx (1Mbps)	-13.10	2.84	-10.26	≤6.91	PASS
NTNV	Ant1	Hopping-Tx (2Mbps)	-14.20	2.84	-11.36	≤6.91	PASS

EIRP							
Test Condition	Antenna	Mode	Measured Power (dBm/MHz)	Antenna gain (dBi)	Limit (dBm/MHz)	Limit (dBm/MHz)	Verdict
NTLV	Ant1	Hopping-Tx (1Mbps)	-13.19	2.84	-10.35	≤6.91	PASS
NTLV	Ant1	Hopping-Tx (2Mbps)	-14.20	2.84	-11.36	≤6.91	PASS

EIRP							
Test Condition	Antenna	Mode	Measured Power (dBm/MHz)	Antenna gain (dBi)	Limit (dBm/MHz)	Limit (dBm/MHz)	Verdict
NTHV	Ant1	Hopping-Tx (1Mbps)	-13.10	2.84	-10.26	≤6.91	PASS
NTHV	Ant1	Hopping-Tx (2Mbps)	-14.20	2.84	-11.36	≤6.91	PASS

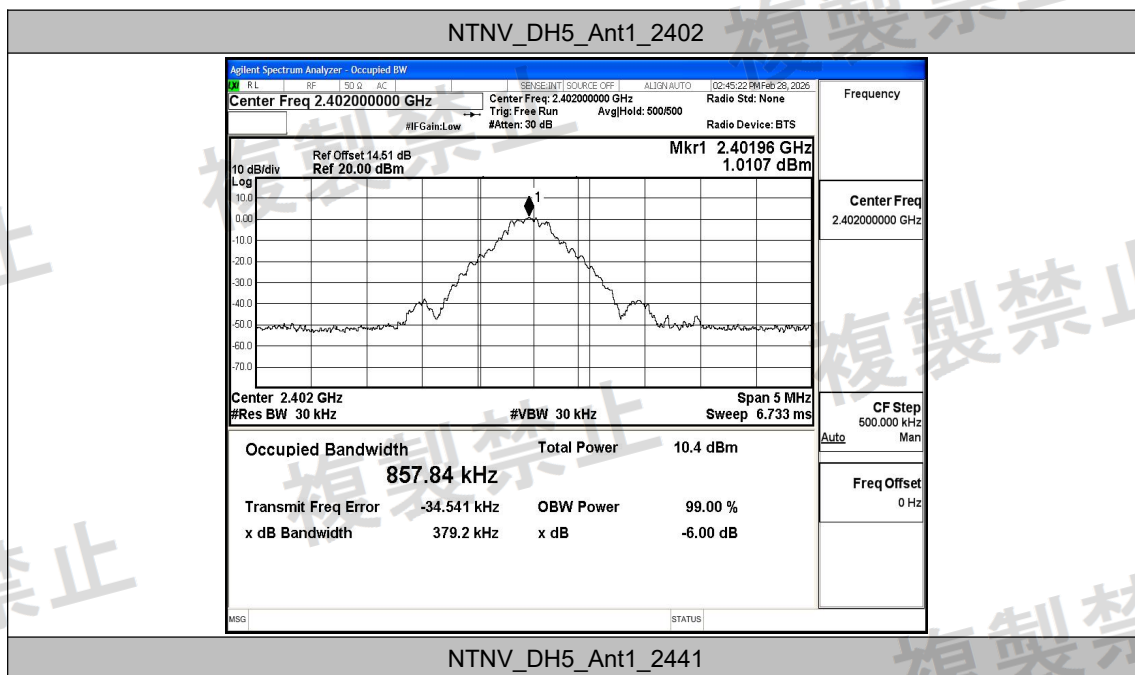
A.3 Occupied Bandwidth

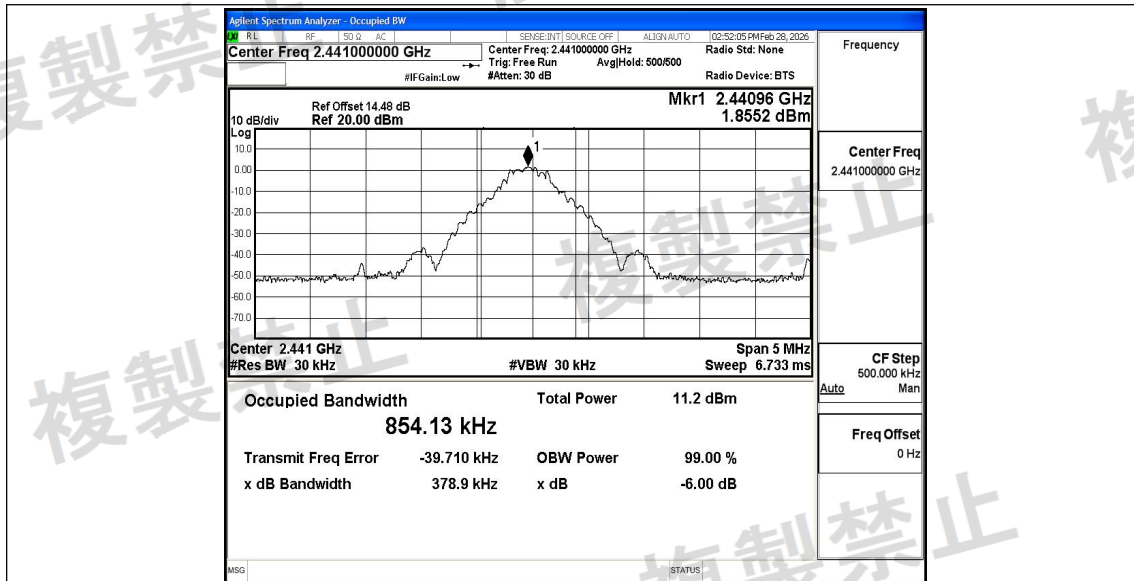
Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	2402	0.858	≤83.5	PASS
			2441	0.854	≤83.5	PASS
			2480	0.853	≤83.5	PASS
	2DH5	Ant1	2402	1.177	≤83.5	PASS
			2441	1.174	≤83.5	PASS
			2480	1.176	≤83.5	PASS

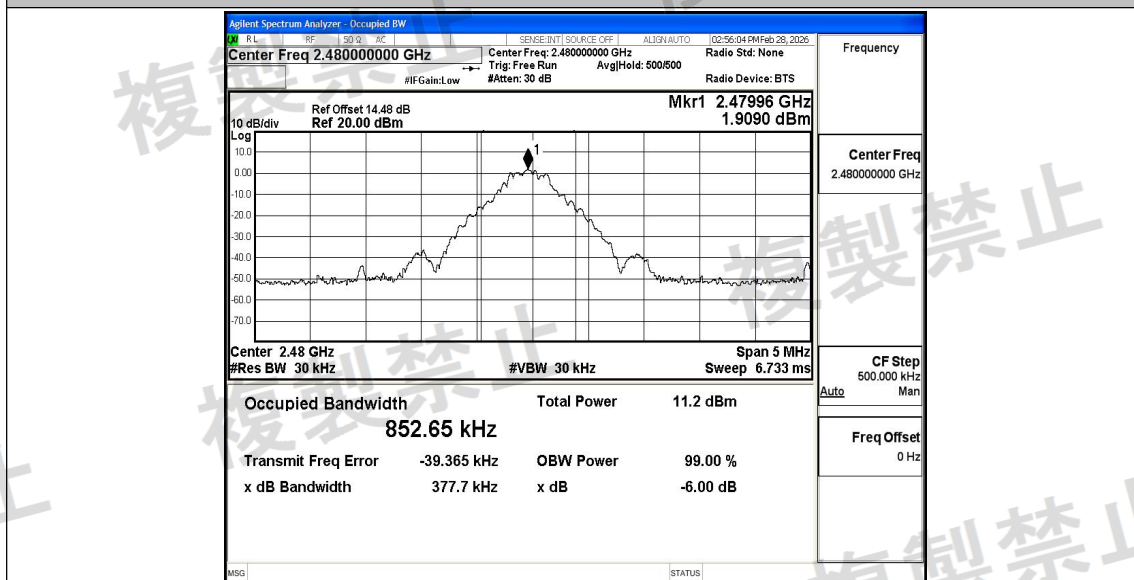
TestCondition	TestMode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	78.672	≤83.5	PASS
	2DH5	Ant1	Hop	78.786	≤83.5	PASS

Test Graphs

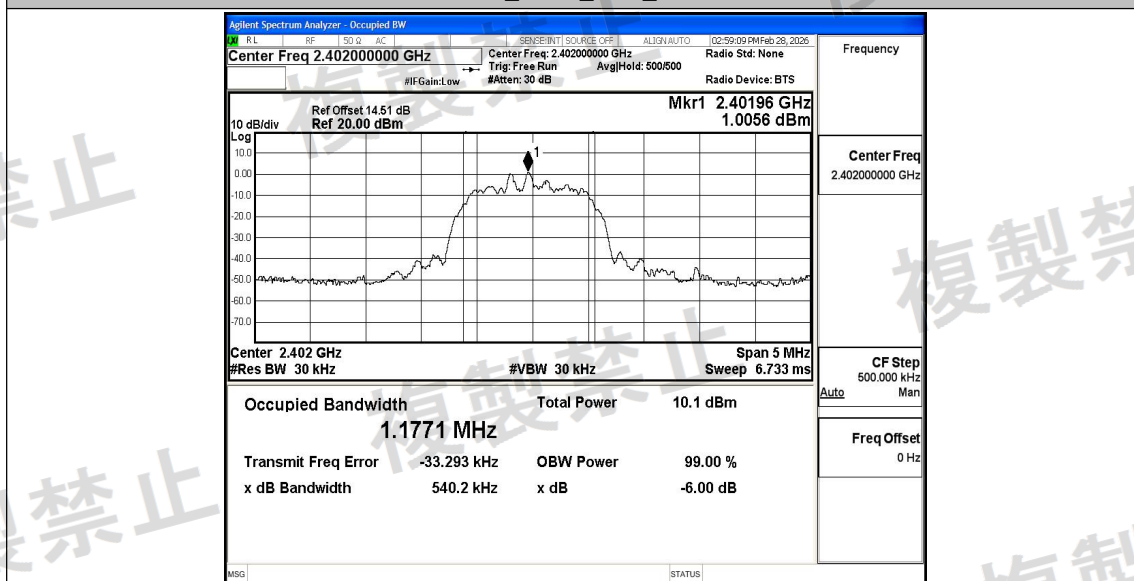


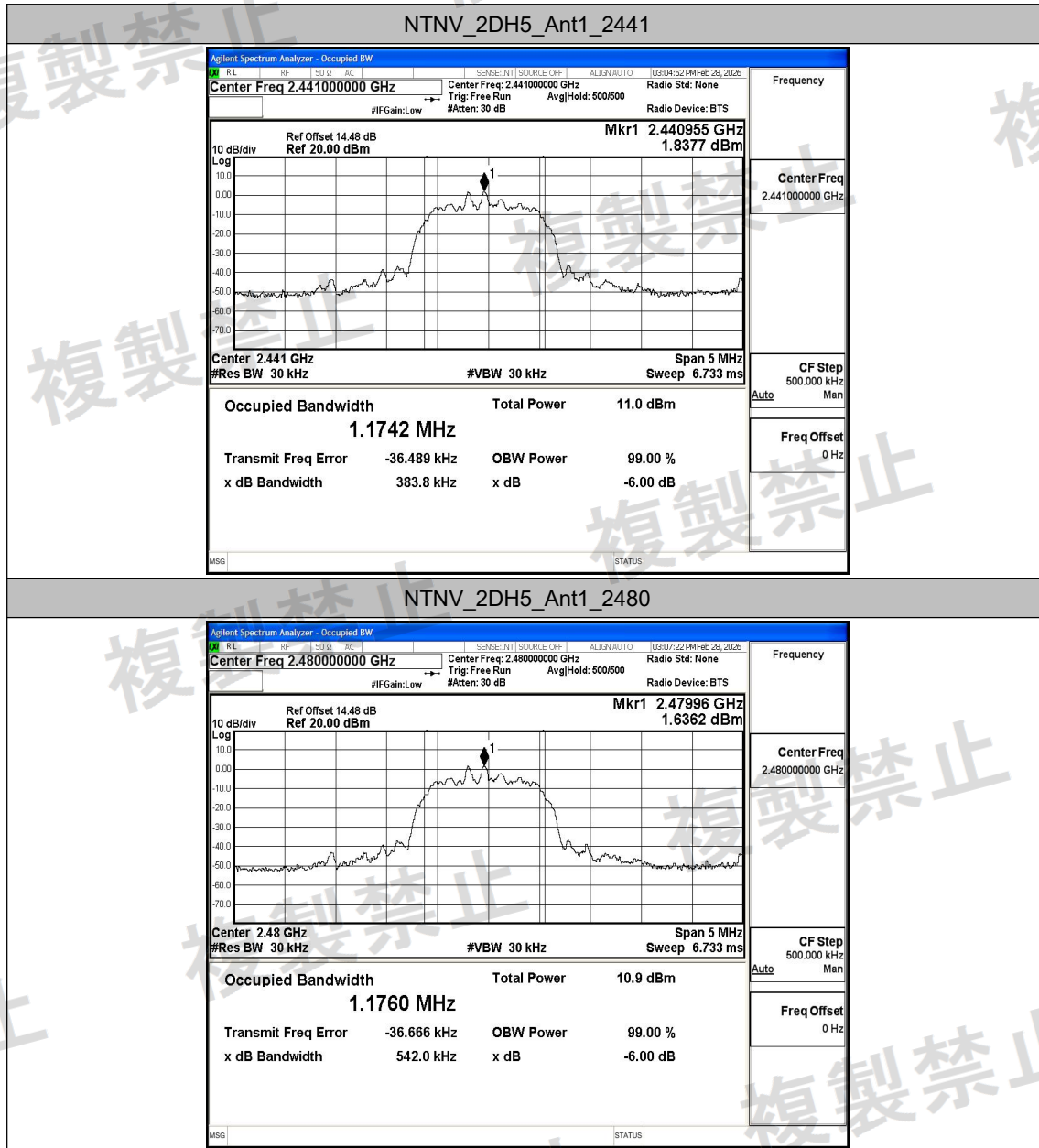


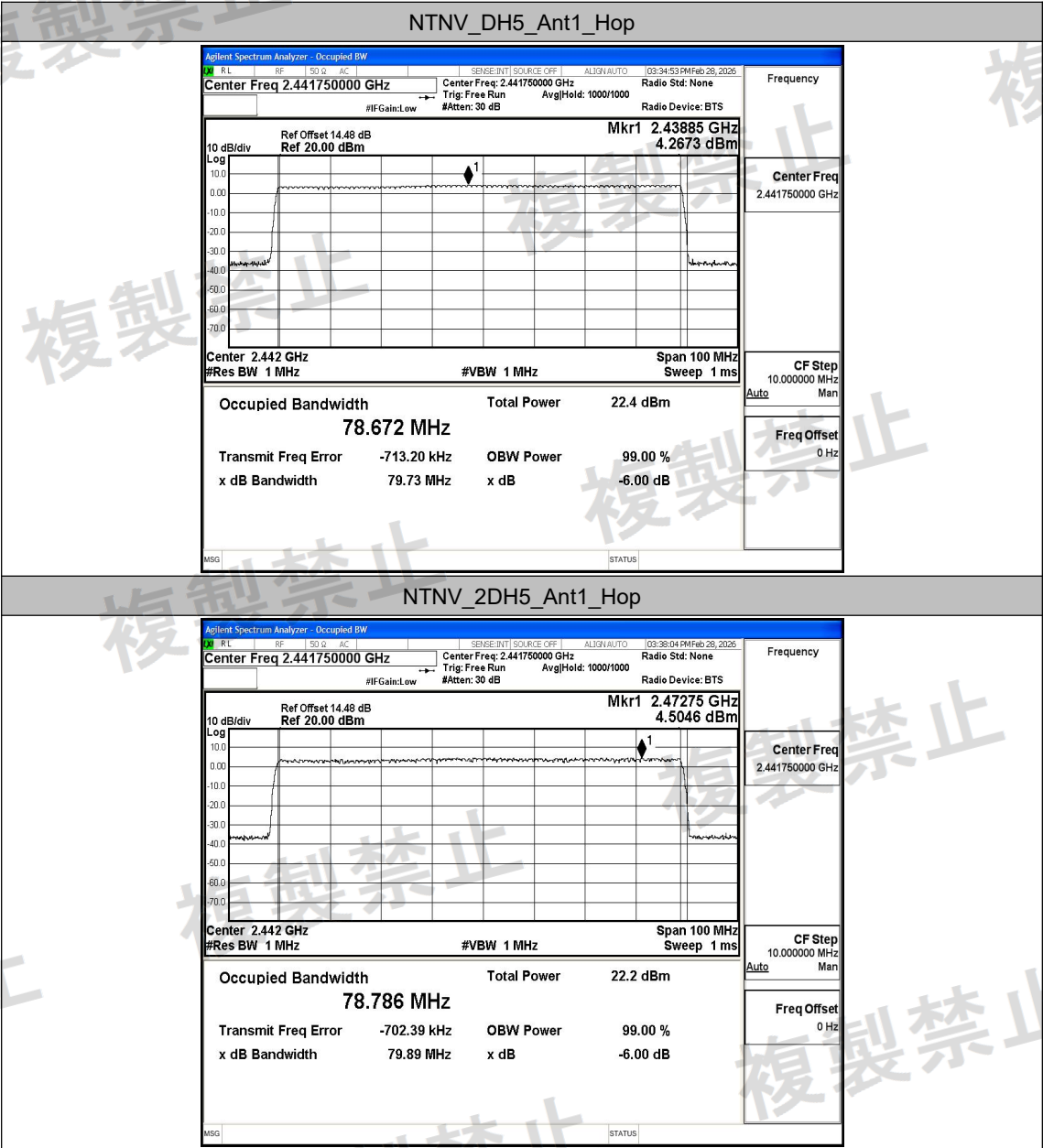
NTNV_DH5_Ant1_2480



NTNV_2DH5_Ant1_2402



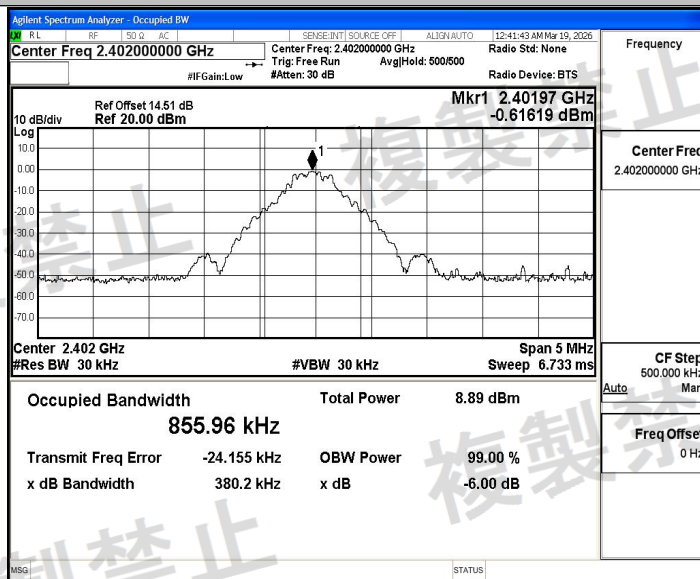




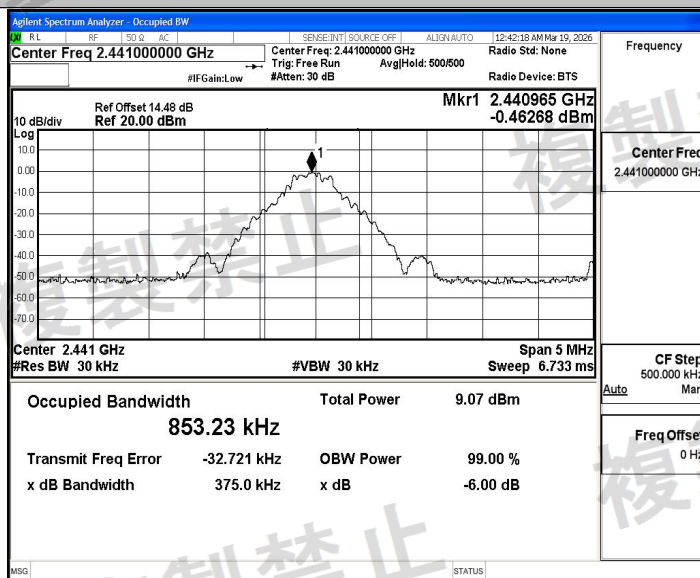
TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTLV	DH5	Ant1	2402	0.856	≤83.5	PASS
			2441	0.853	≤83.5	PASS
			2480	0.855	≤83.5	PASS
	2DH5	Ant1	2402	1.177	≤83.5	PASS
			2441	1.176	≤83.5	PASS
			2480	1.175	≤83.5	PASS

TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTLV	DH5	Ant1	Hop	78.659	≤83.5	PASS
	2DH5	Ant1	Hop	78.748	≤83.5	PASS

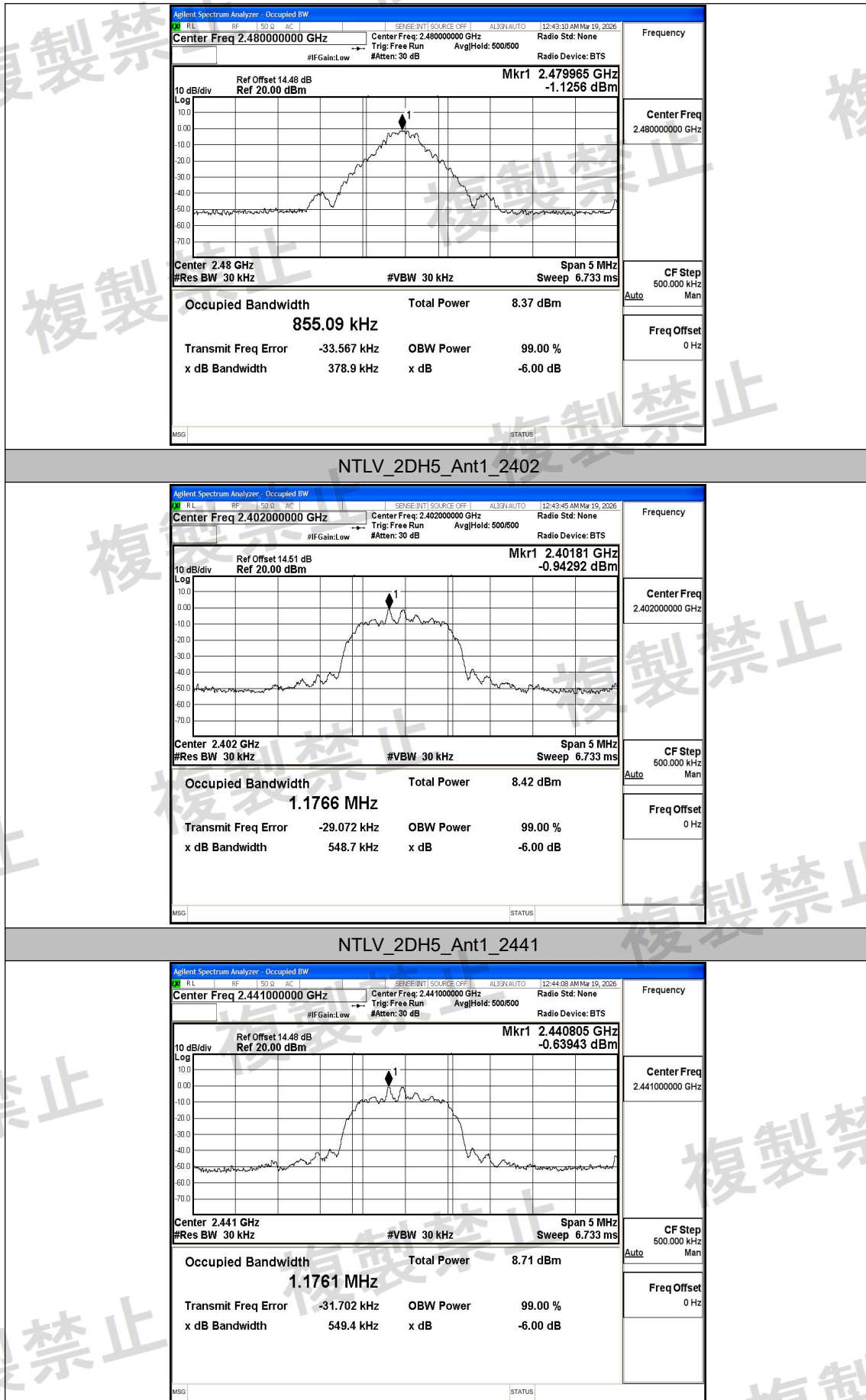
NTLV DH5 Ant1 2402



NTLV DH5 Ant1 2441



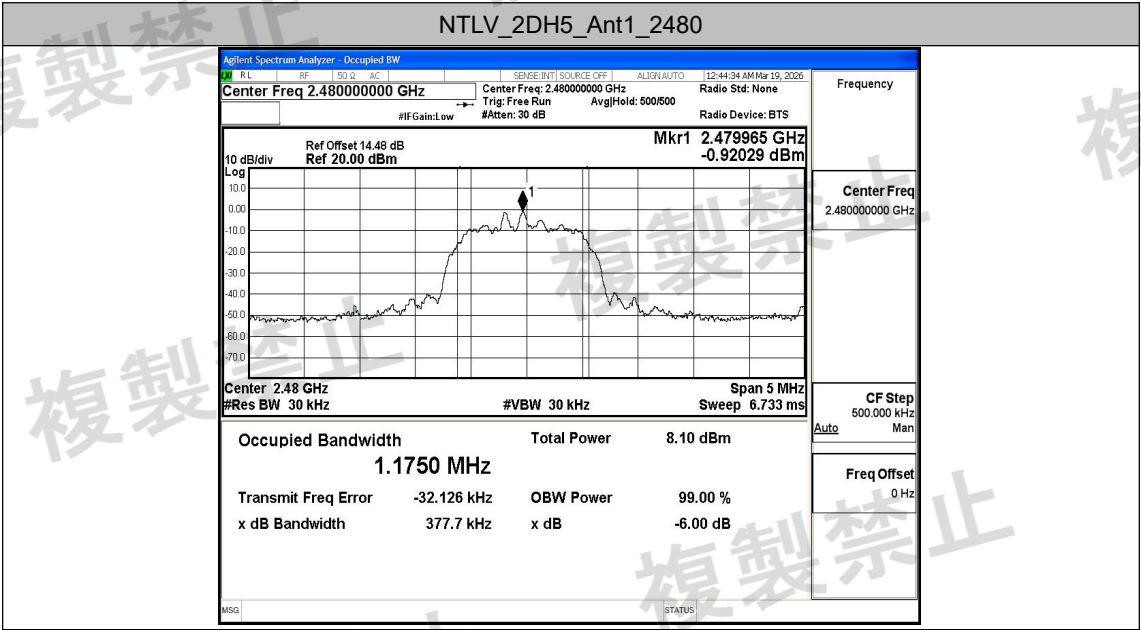
NTLV DH5 Ant1 2480



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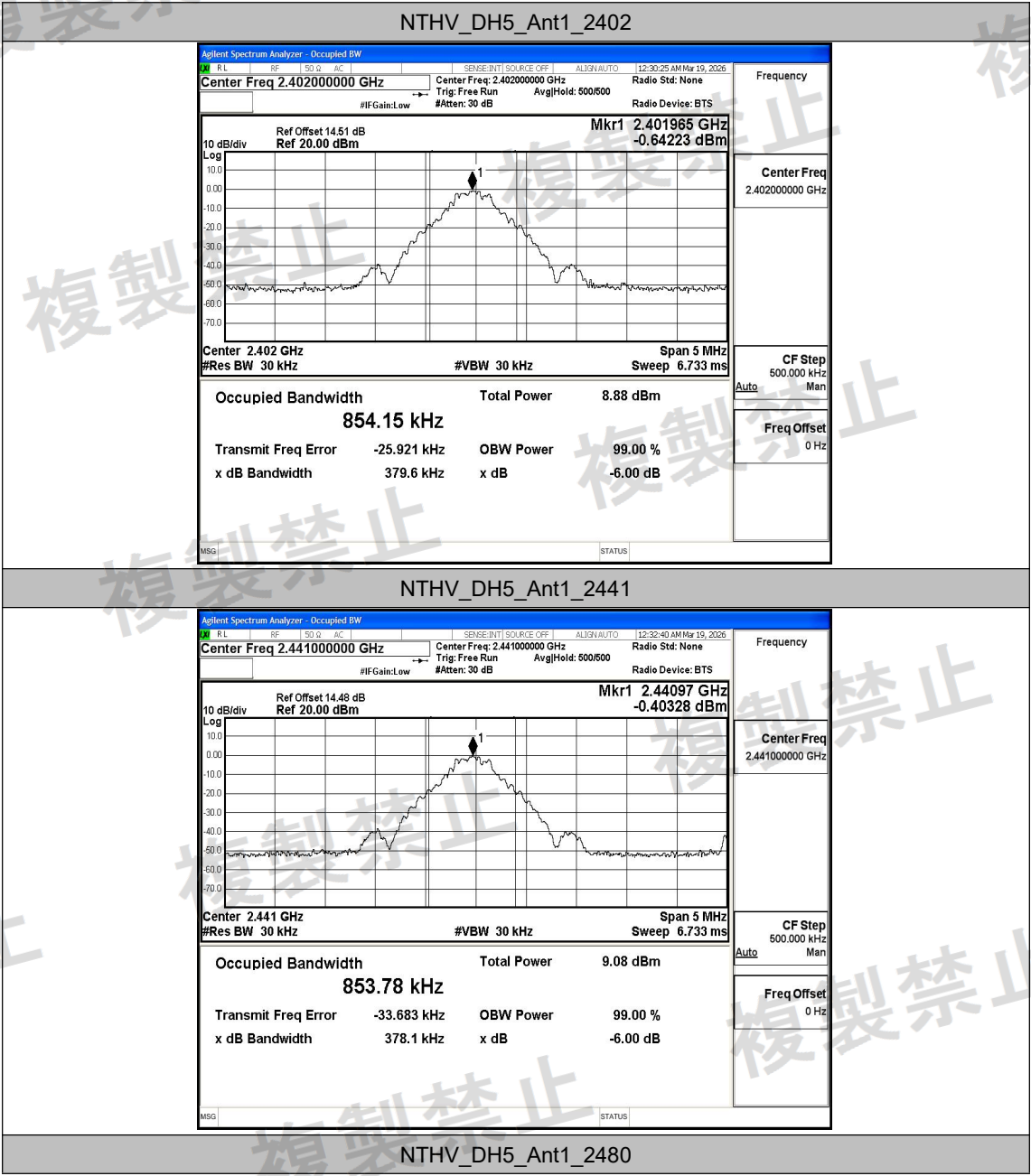


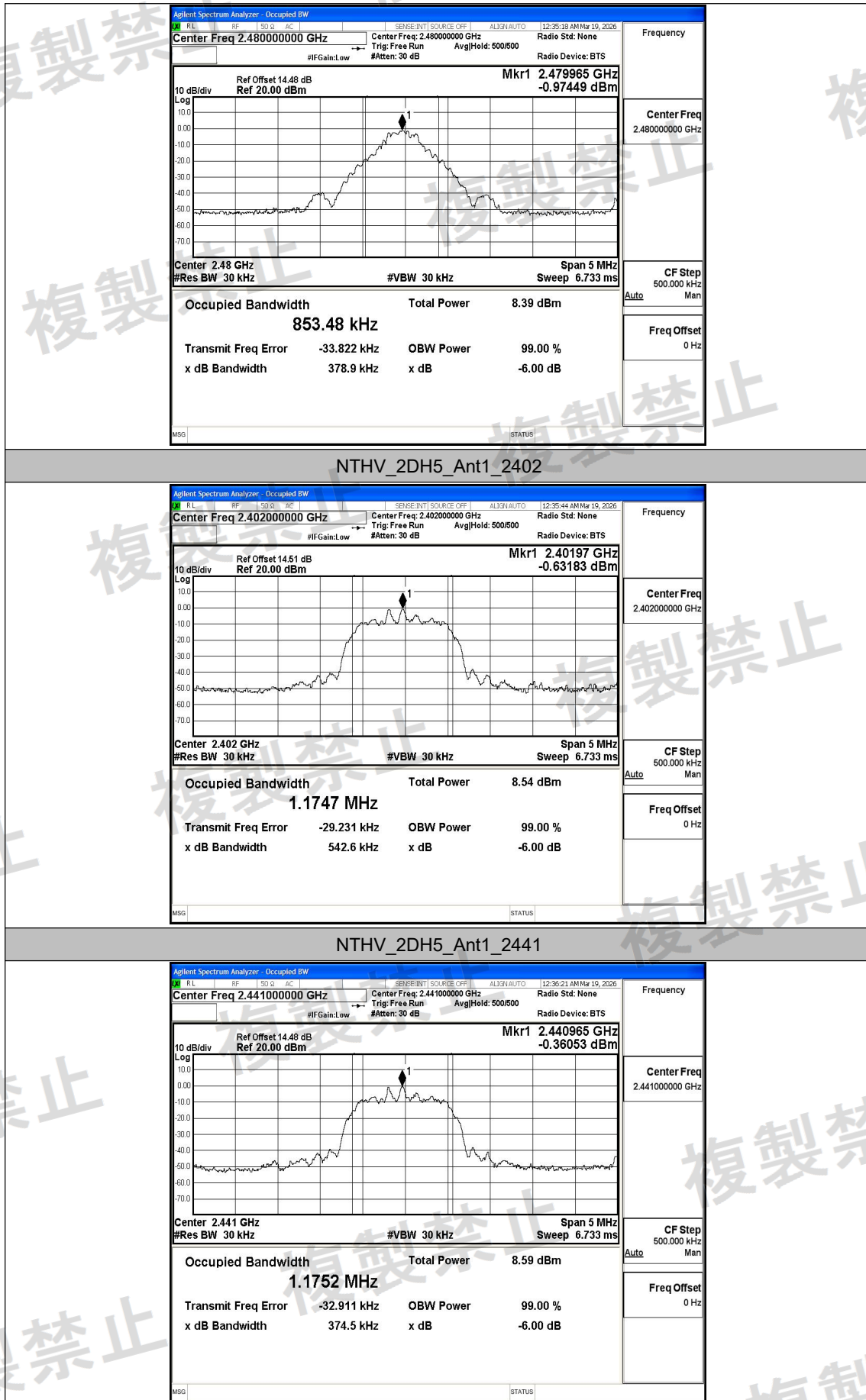


TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTHV	DH5	Ant1	2402	0.854	≤83.5	PASS
			2441	0.854	≤83.5	PASS
			2480	0.853	≤83.5	PASS
	2DH5	Ant1	2402	1.175	≤83.5	PASS
			2441	1.175	≤83.5	PASS
			2480	1.179	≤83.5	PASS

TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTHV	DH5	Ant1	Hop	78.678	≤83.5	PASS
	2DH5	Ant1	Hop	78.719	≤83.5	PASS

Test Graphs

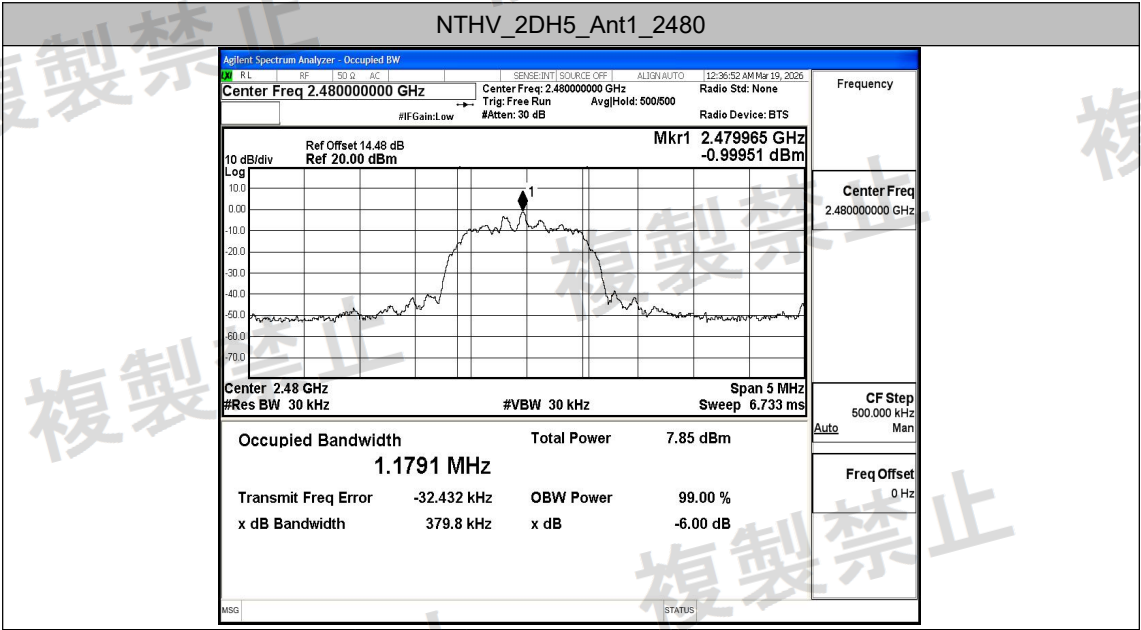




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A.4 Spread Bandwidth

Test Result

TestCondition	TestMode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	71.393	---	PASS
	2DH5	Ant1	Hop	71.442	---	PASS

Test Graphs



TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTLV	DH5	Ant1	Hop	71.228	≥0.5	PASS
	2DH5	Ant1	Hop	71.303	≥0.5	PASS

Test Graphs



TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTHV	DH5	Ant1	Hop	71.214	≥0.5	PASS
	2DH5	Ant1	Hop	71.315	≥0.5	PASS

Test Graphs

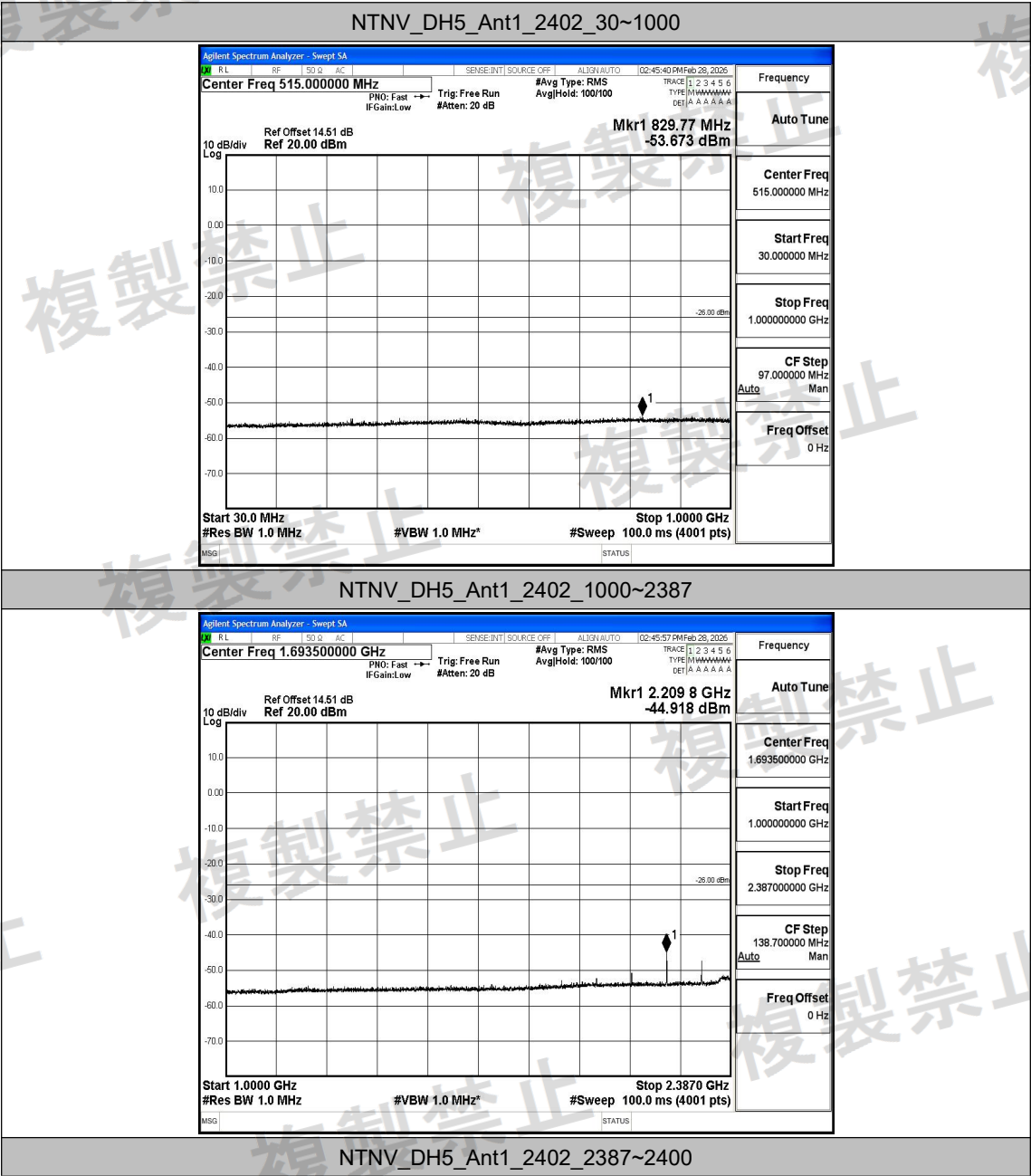


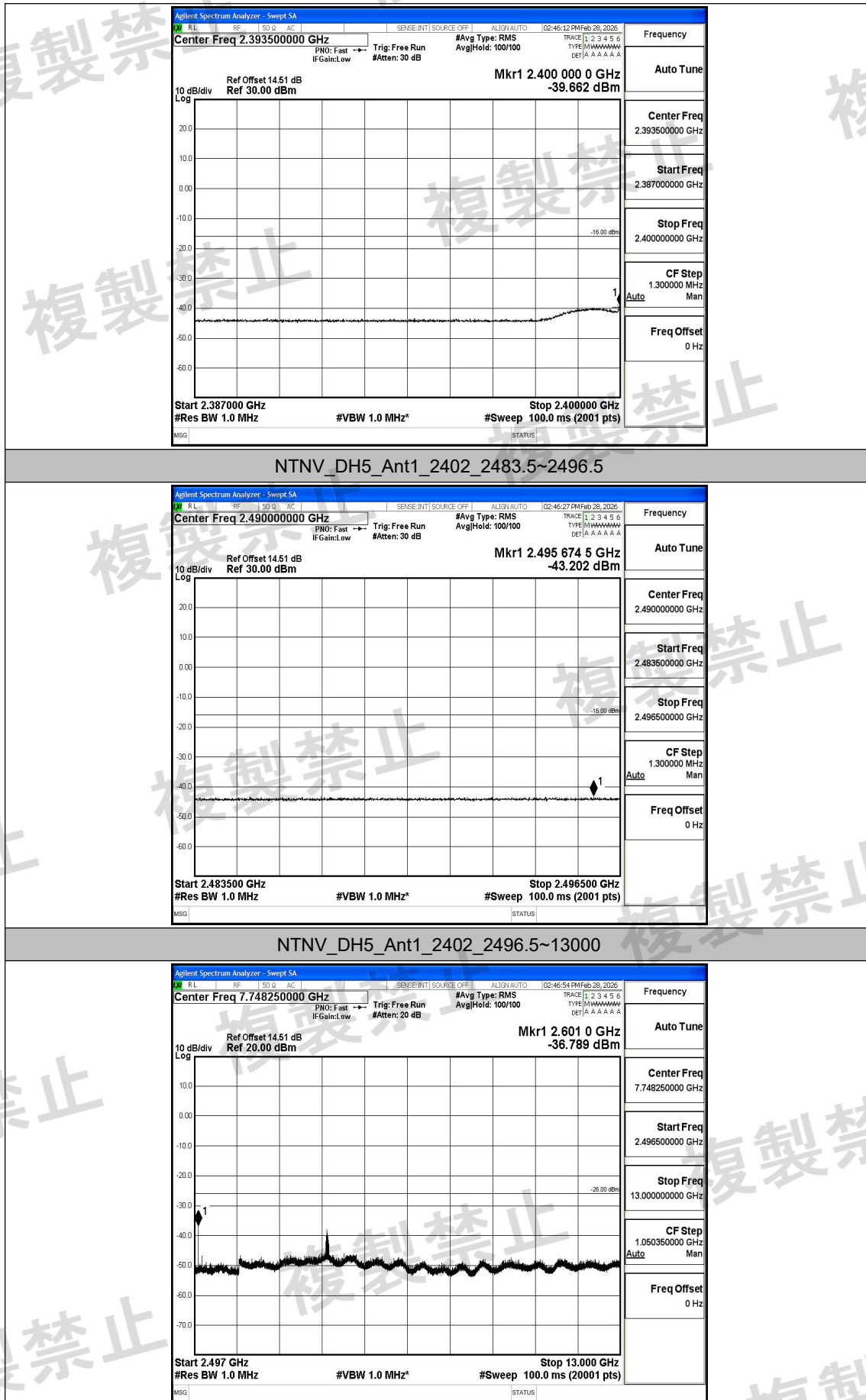
A.5 Spurious Emission of TX

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	-53.67	≤-26	0.00430	≤2.5	PASS
				1000~2387	-44.92	≤-26	0.03221	≤2.5	PASS
				2387~2400	-39.66	≤-16	0.10814	≤25	PASS
				2483.5~2496.5	-43.20	≤-16	0.04786	≤25	PASS
				2496.5~13000	-36.79	≤-26	0.20941	≤2.5	PASS
			2441	30~1000	-53.95	≤-26	0.00403	≤2.5	PASS
				1000~2387	-43.30	≤-26	0.04677	≤2.5	PASS
				2387~2400	-43.29	≤-16	0.04688	≤25	PASS
				2483.5~2496.5	-43.32	≤-16	0.04656	≤25	PASS
				2496.5~13000	-39.69	≤-26	0.10740	≤2.5	PASS
		2480		30~1000	-53.71	≤-26	0.00426	≤2.5	PASS
				1000~2387	-42.26	≤-26	0.05943	≤2.5	PASS
				2387~2400	-43.47	≤-16	0.04498	≤25	PASS
				2483.5~2496.5	-41.15	≤-16	0.07674	≤25	PASS
				2496.5~13000	-40.32	≤-26	0.09290	≤2.5	PASS
	2DH5	Ant1	2402	30~1000	-53.77	≤-26	0.00420	≤2.5	PASS
				1000~2387	-45.29	≤-26	0.02958	≤2.5	PASS
				2387~2400	-33.47	≤-16	0.44978	≤25	PASS
				2483.5~2496.5	-43.28	≤-16	0.04699	≤25	PASS
				2496.5~13000	-31.55	≤-26	0.69984	≤2.5	PASS
			2441	30~1000	-53.99	≤-26	0.00399	≤2.5	PASS
				1000~2387	-41.08	≤-26	0.07798	≤2.5	PASS
				2387~2400	-42.97	≤-16	0.05047	≤25	PASS
				2483.5~2496.5	-43.10	≤-16	0.04898	≤25	PASS
				2496.5~13000	-40.68	≤-26	0.08551	≤2.5	PASS
		2480		30~1000	-53.67	≤-26	0.00430	≤2.5	PASS
				1000~2387	-42.40	≤-26	0.05754	≤2.5	PASS
				2387~2400	-43.46	≤-16	0.04508	≤25	PASS
				2483.5~2496.5	-41.89	≤-16	0.06471	≤25	PASS
				2496.5~13000	-35.54	≤-26	0.27925	≤2.5	PASS

Test Graphs

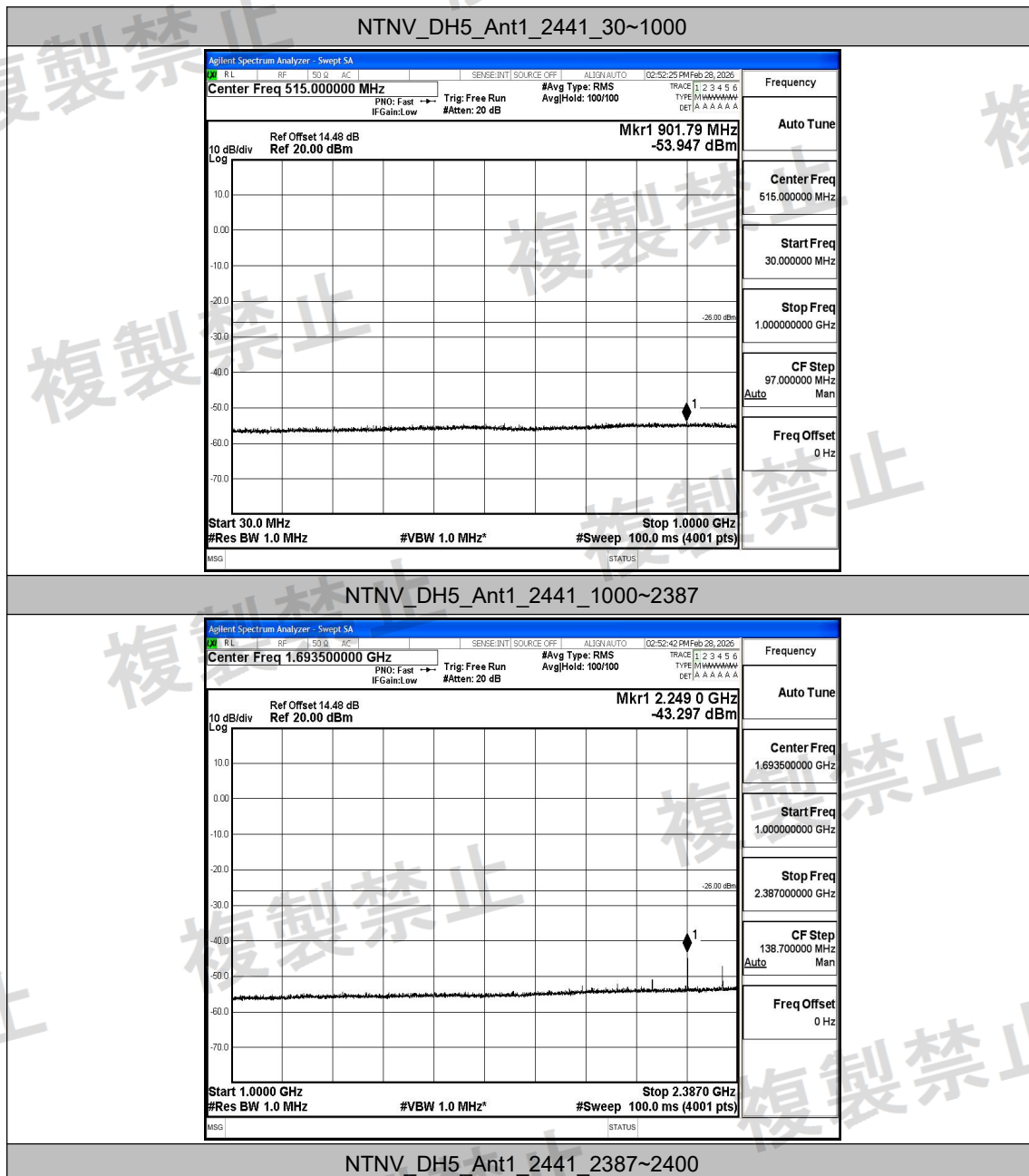


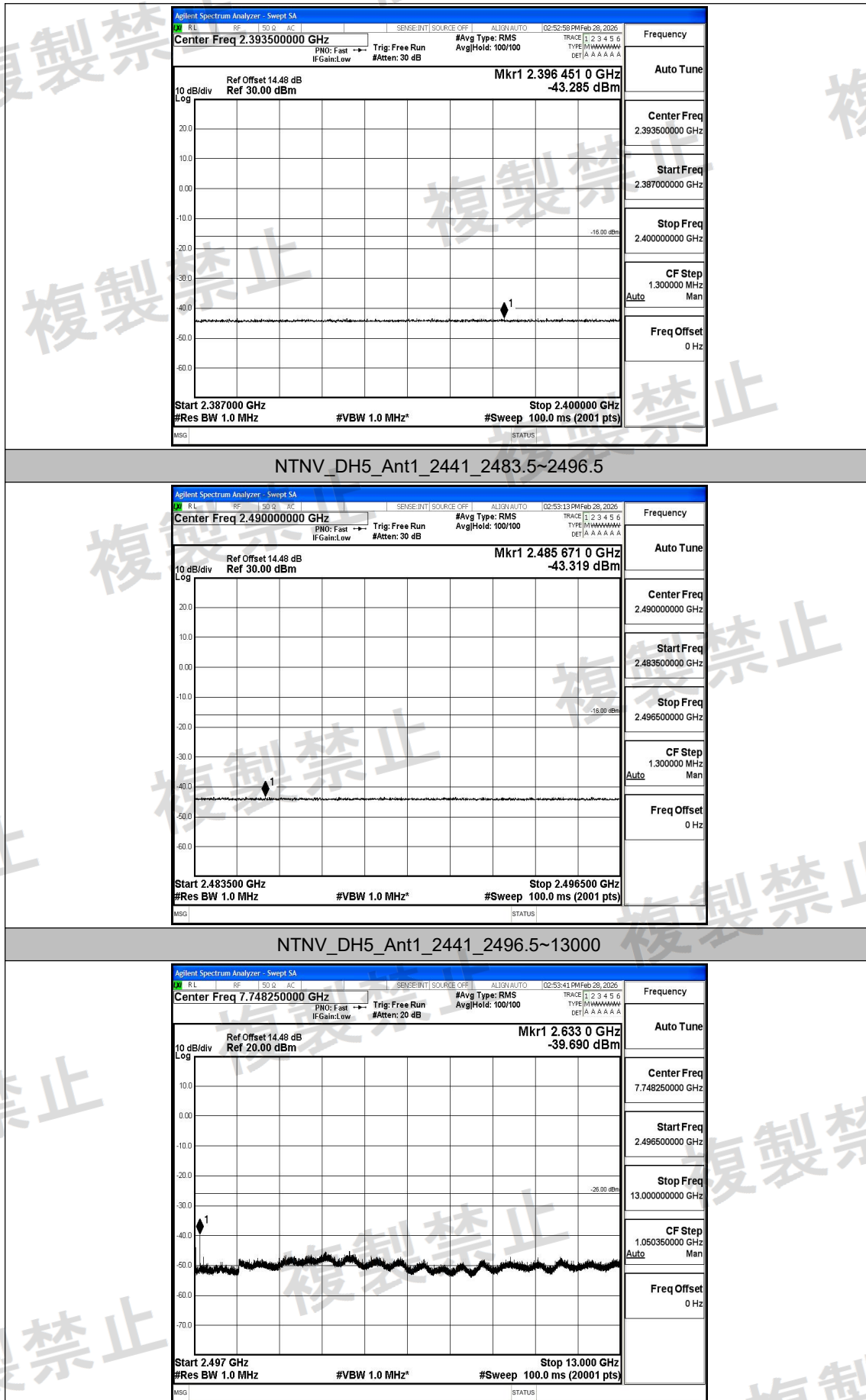


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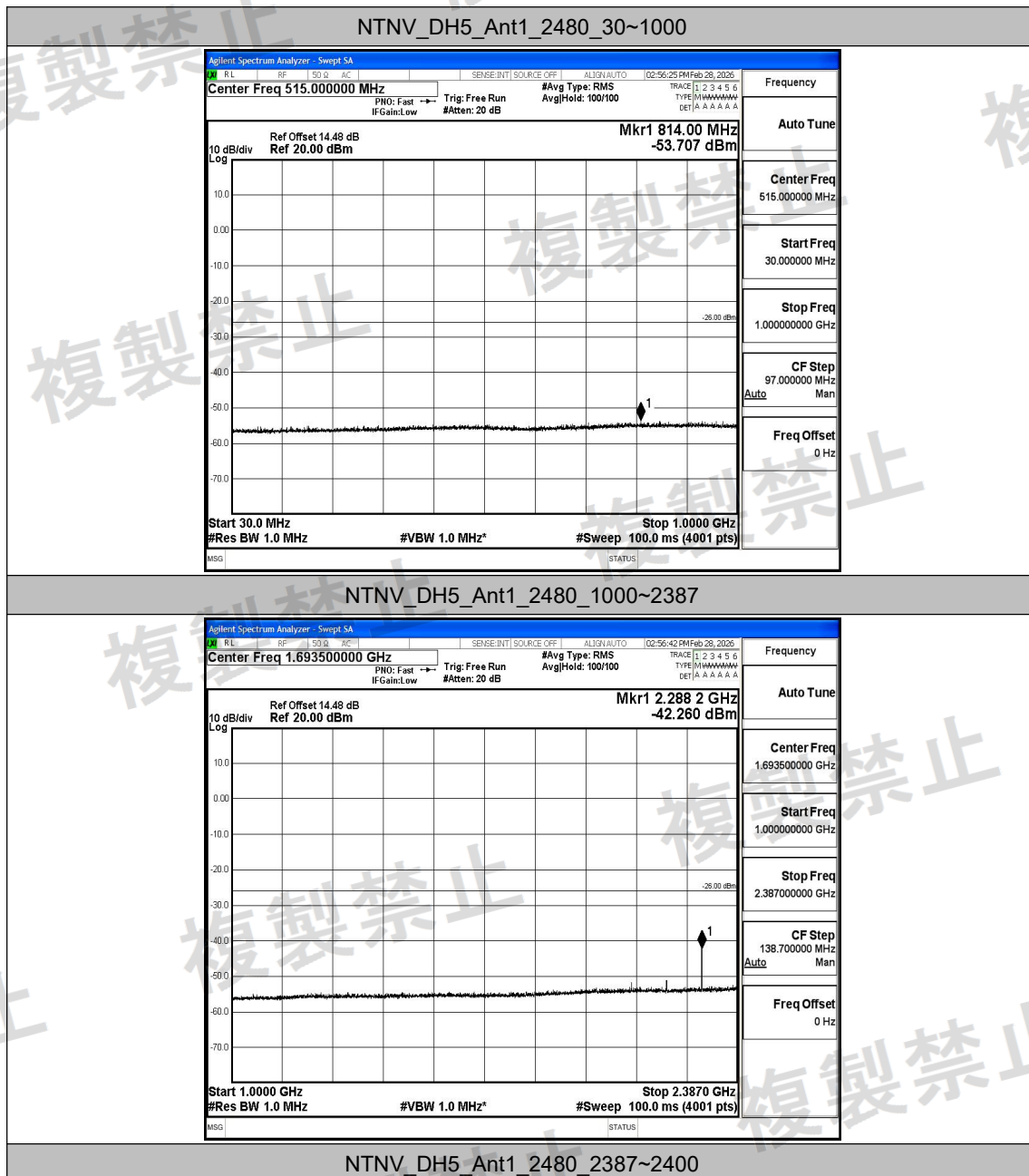


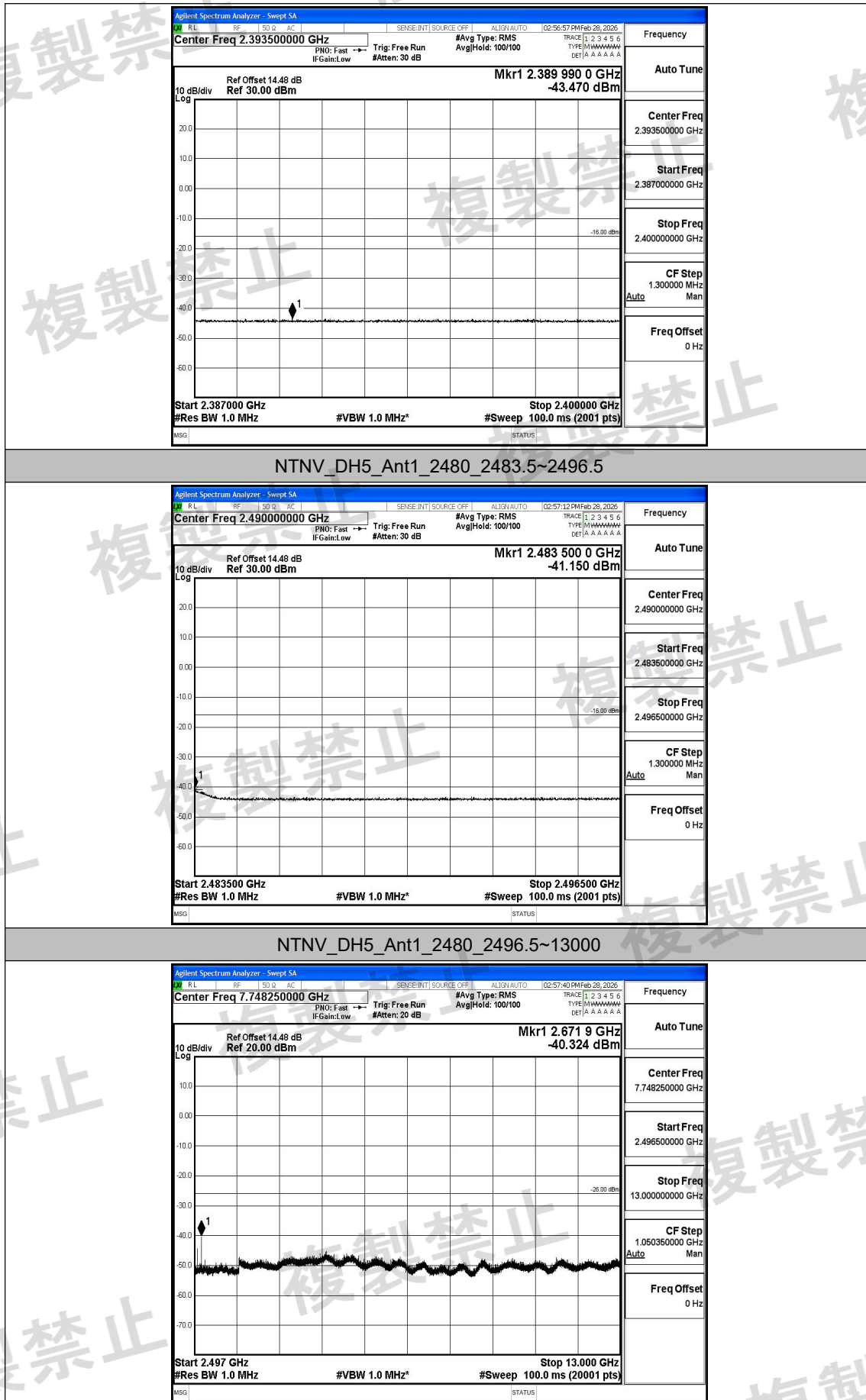


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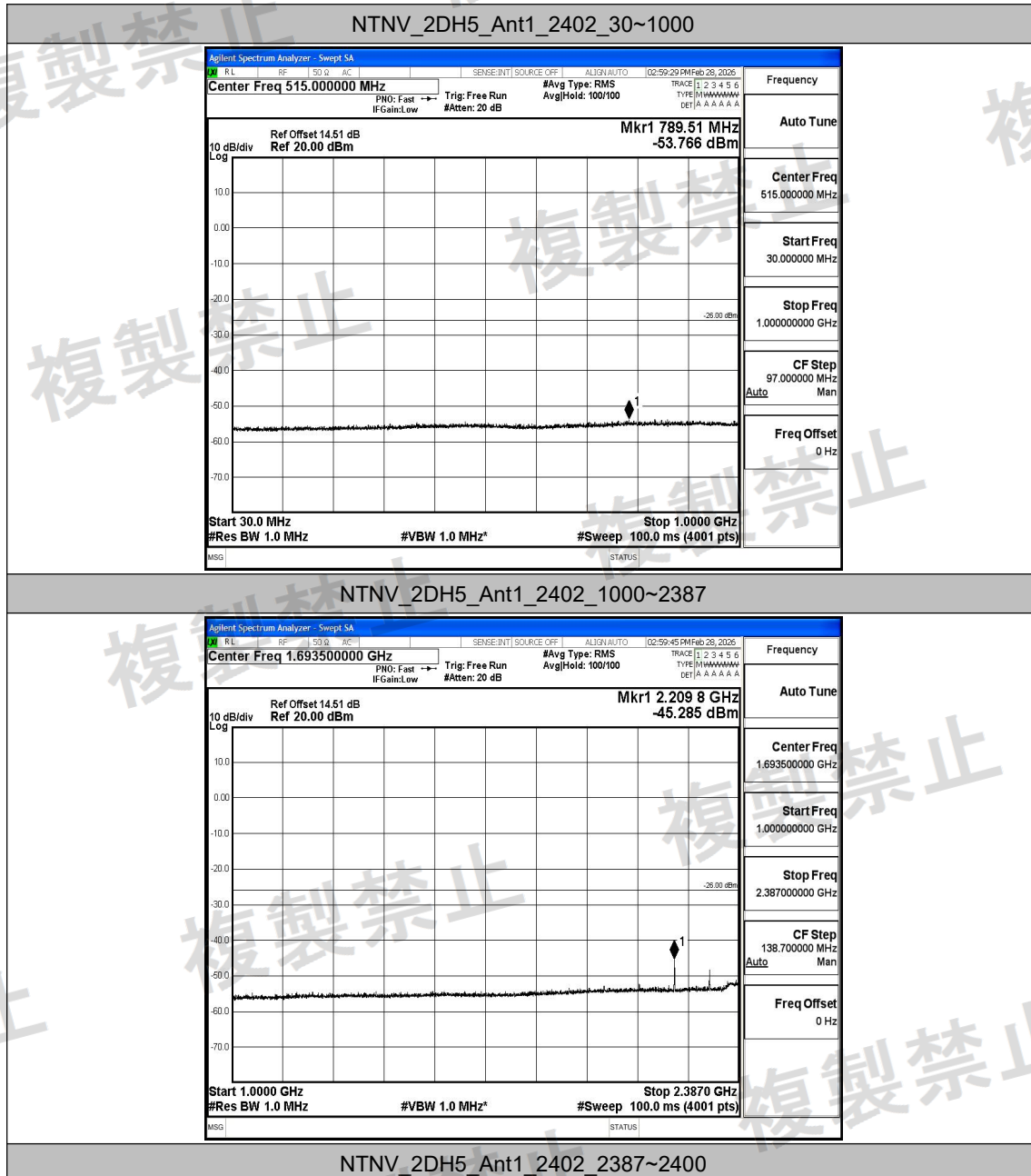


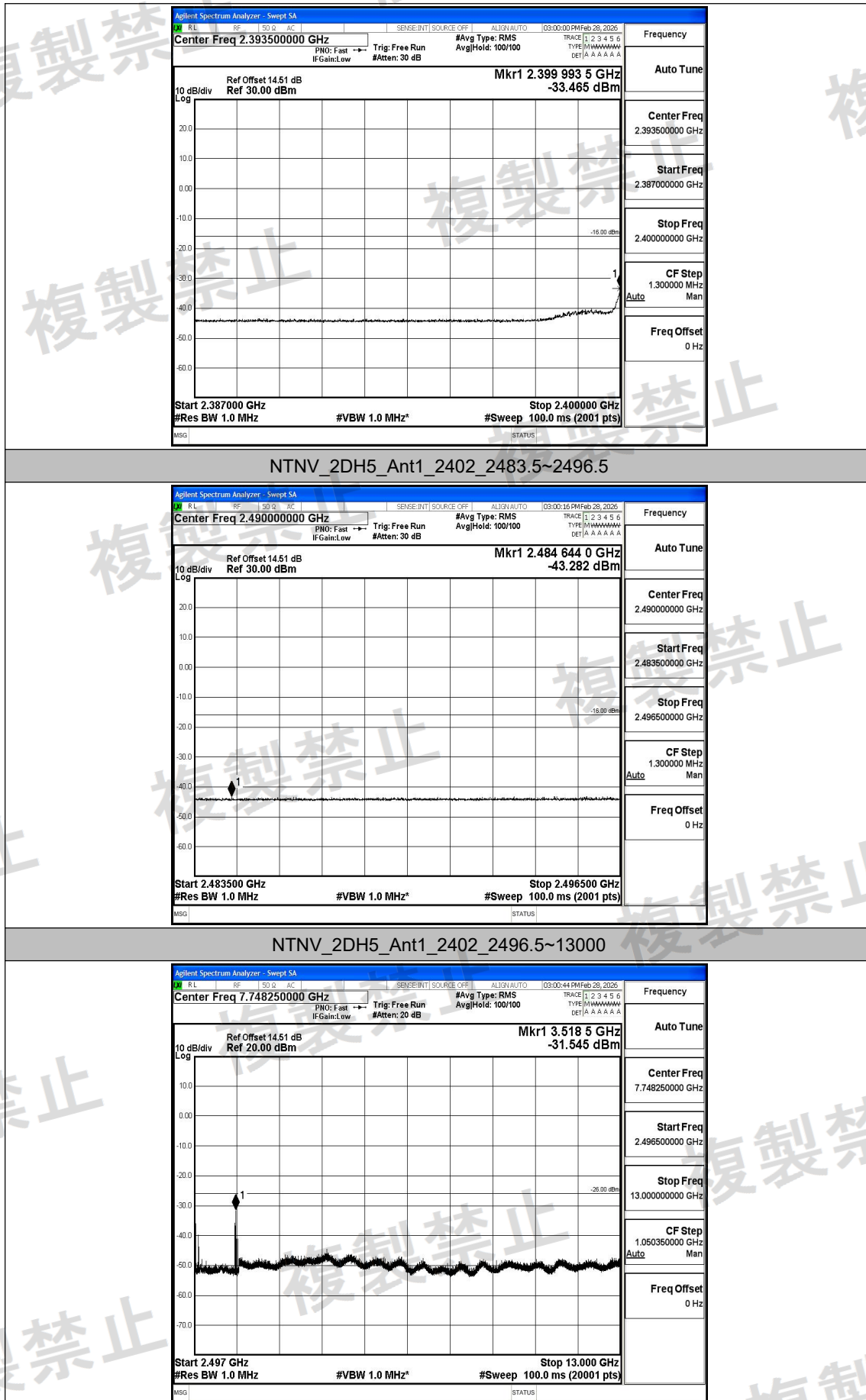


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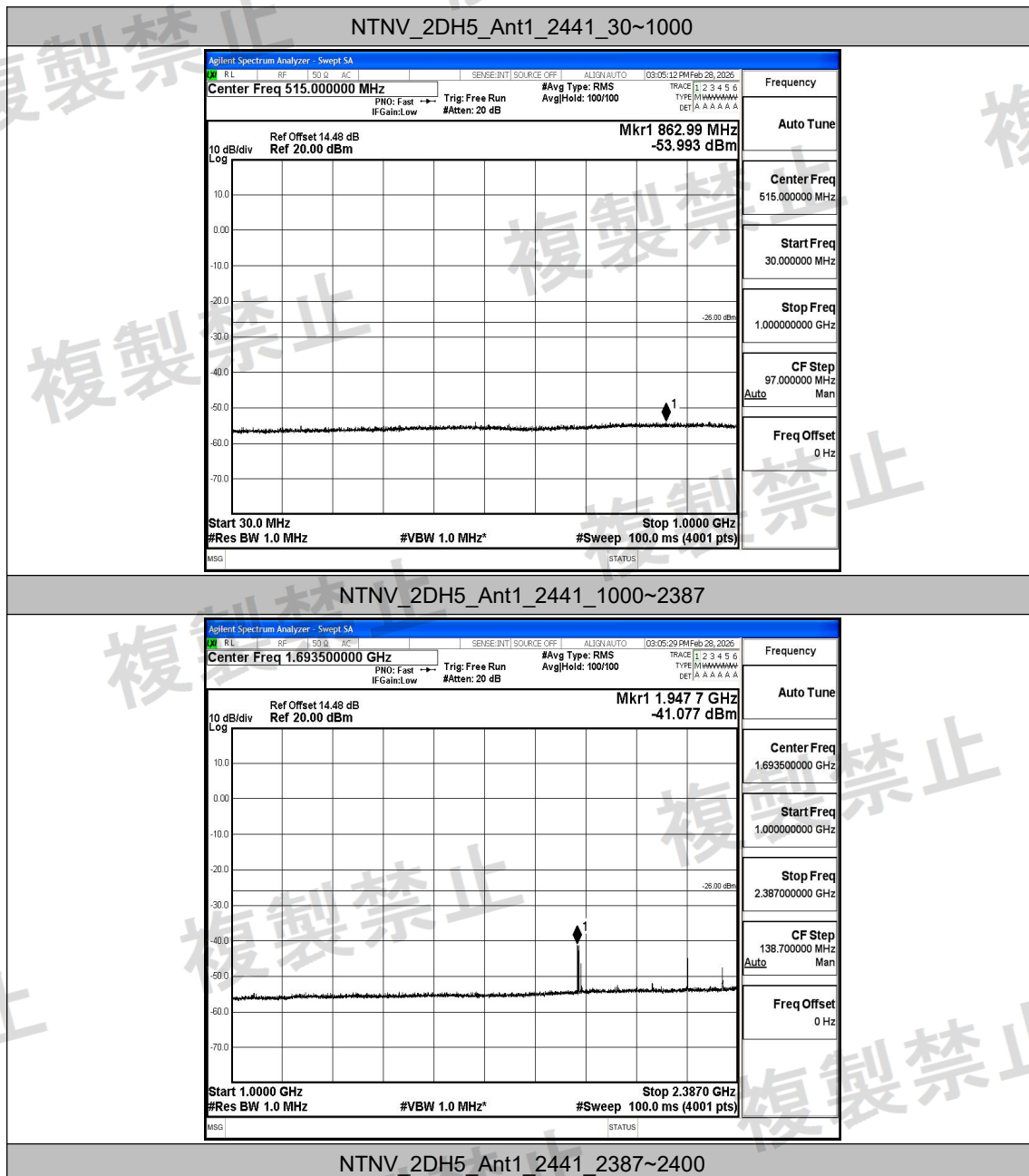


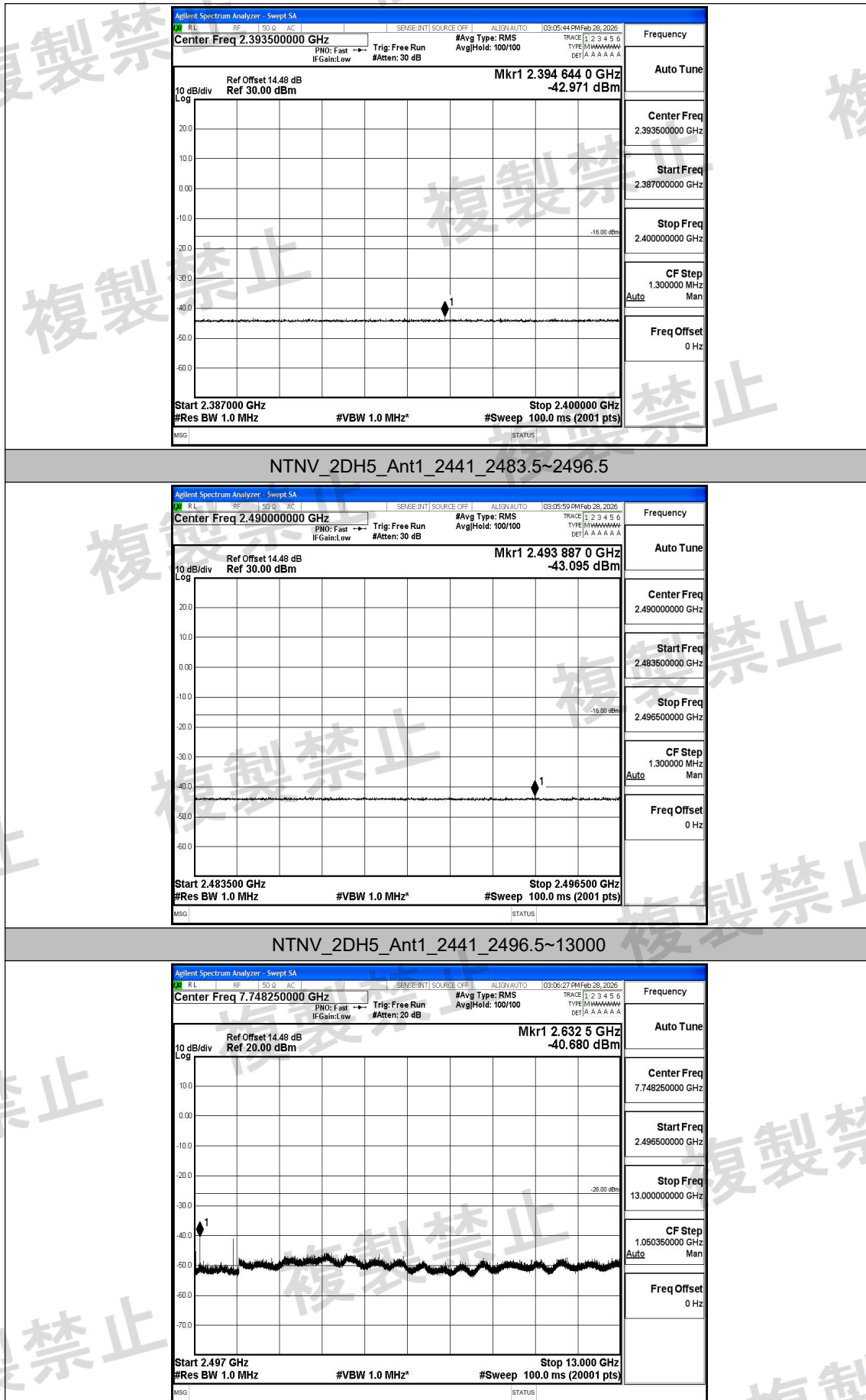


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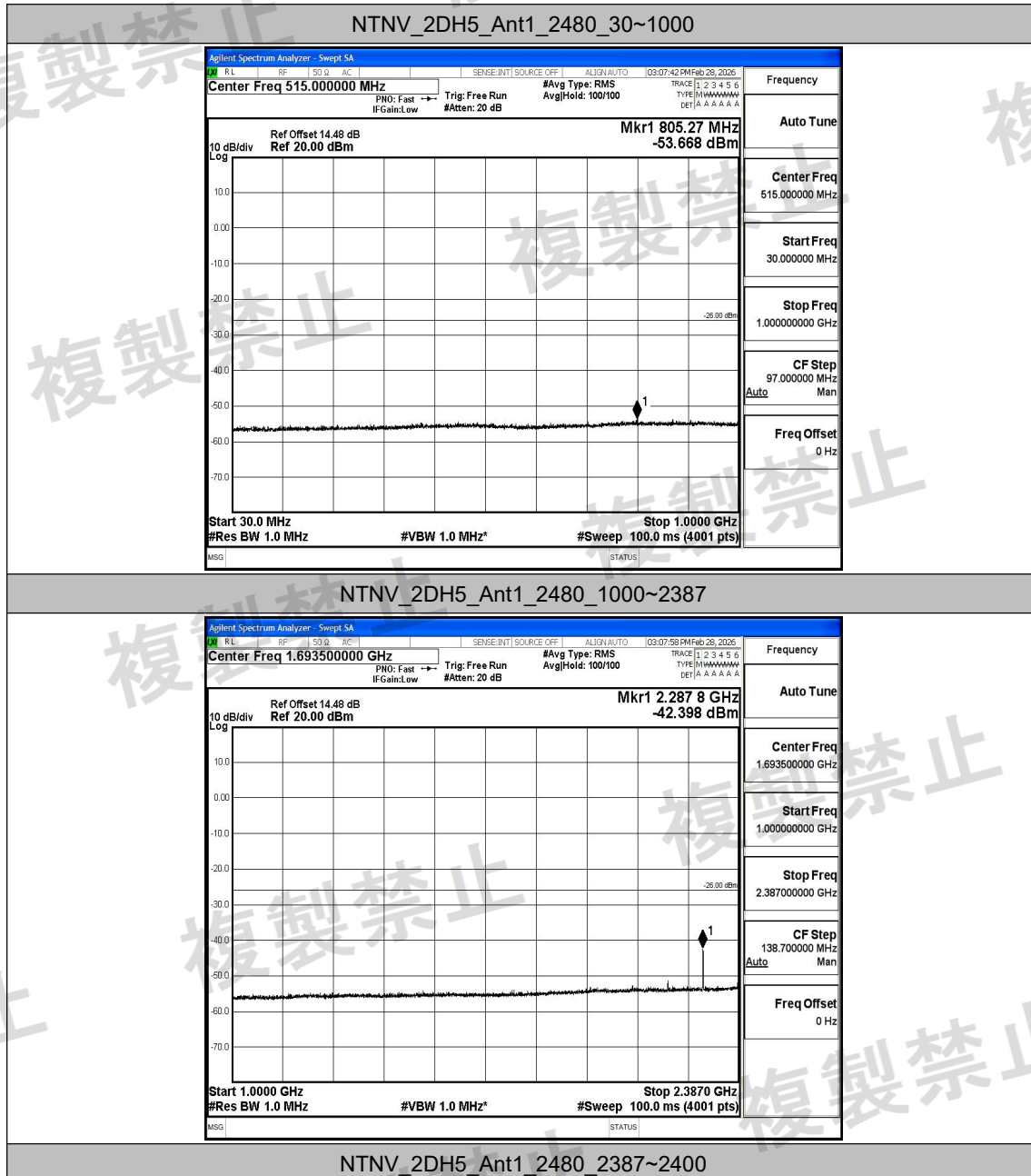


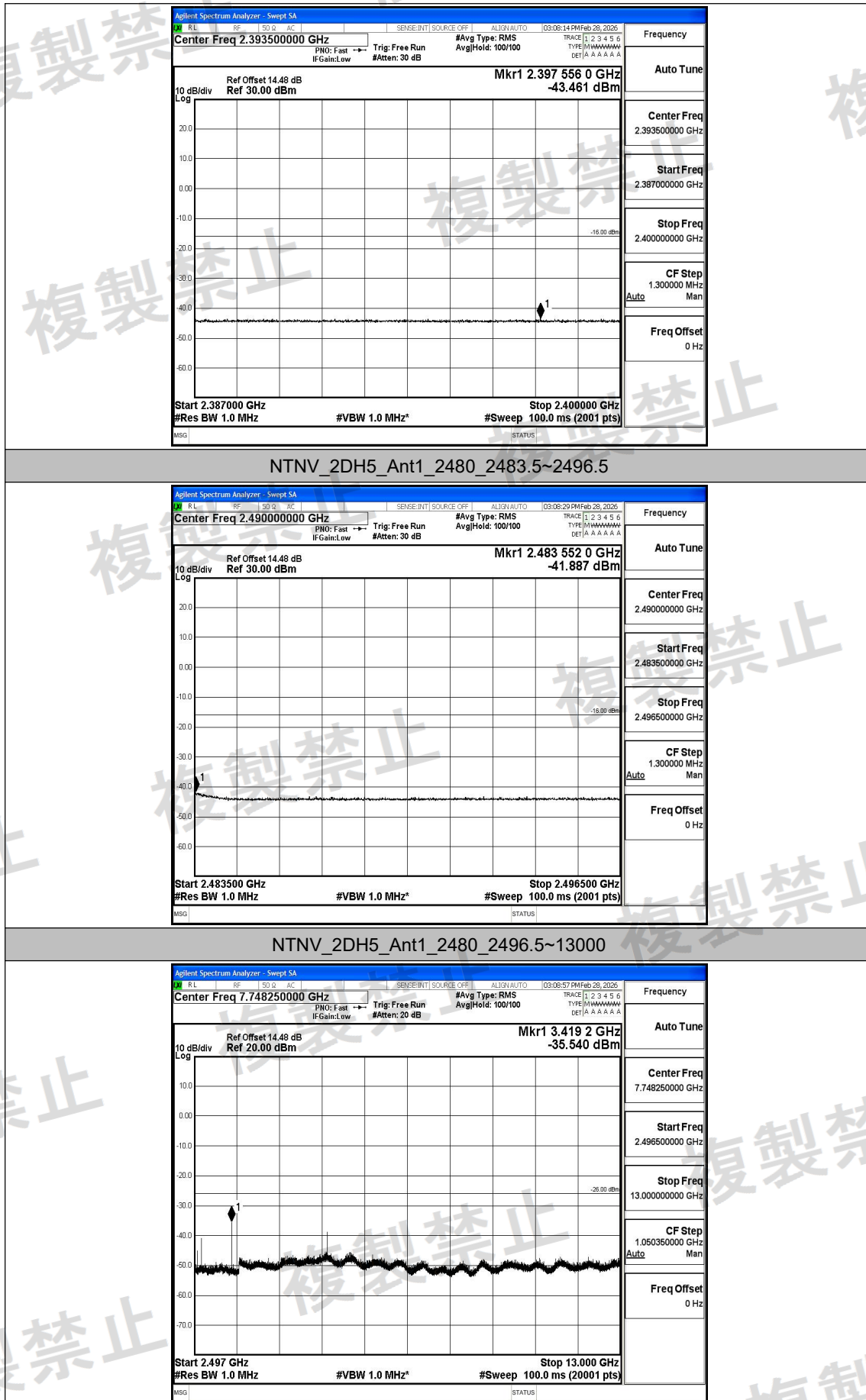


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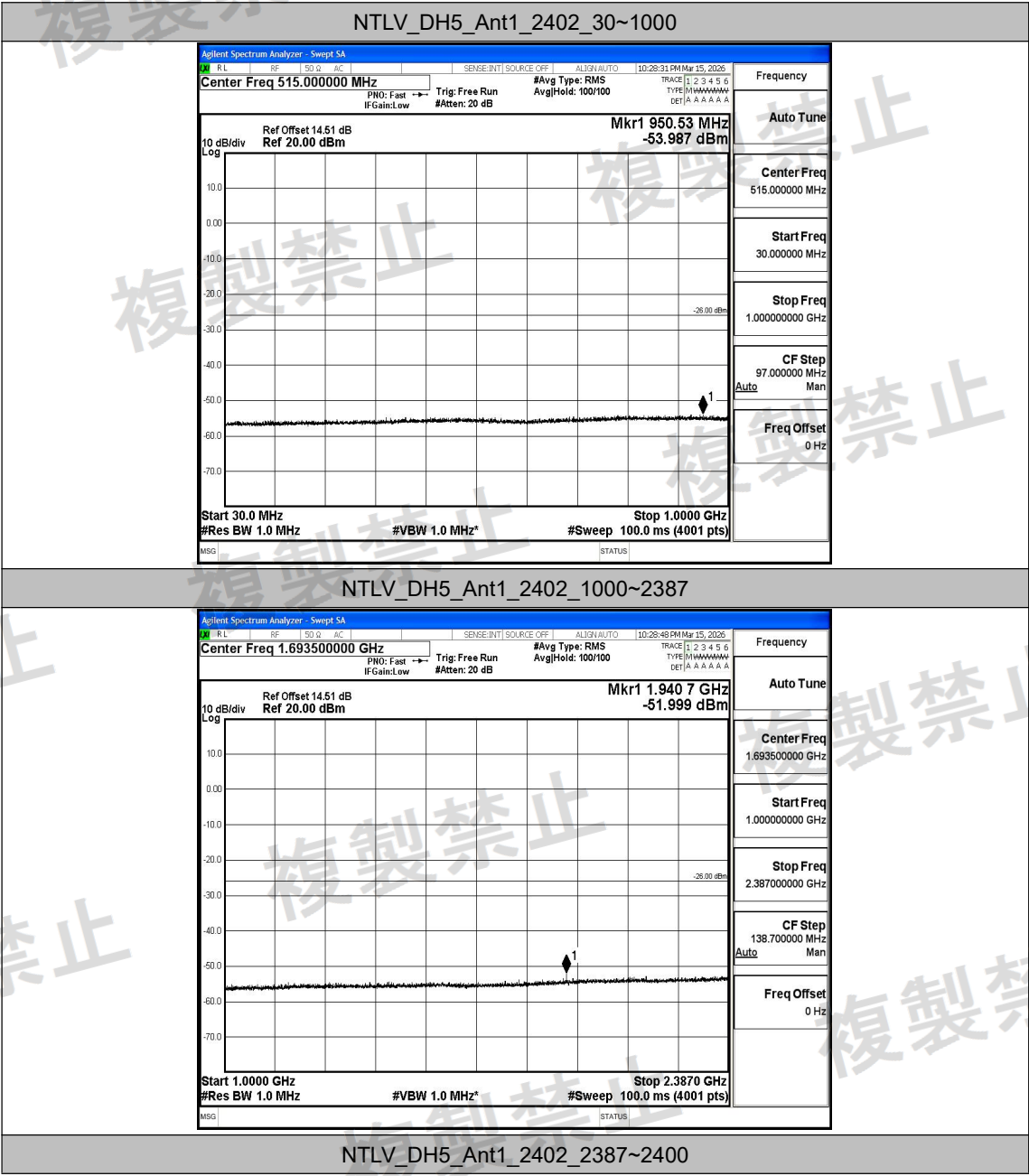
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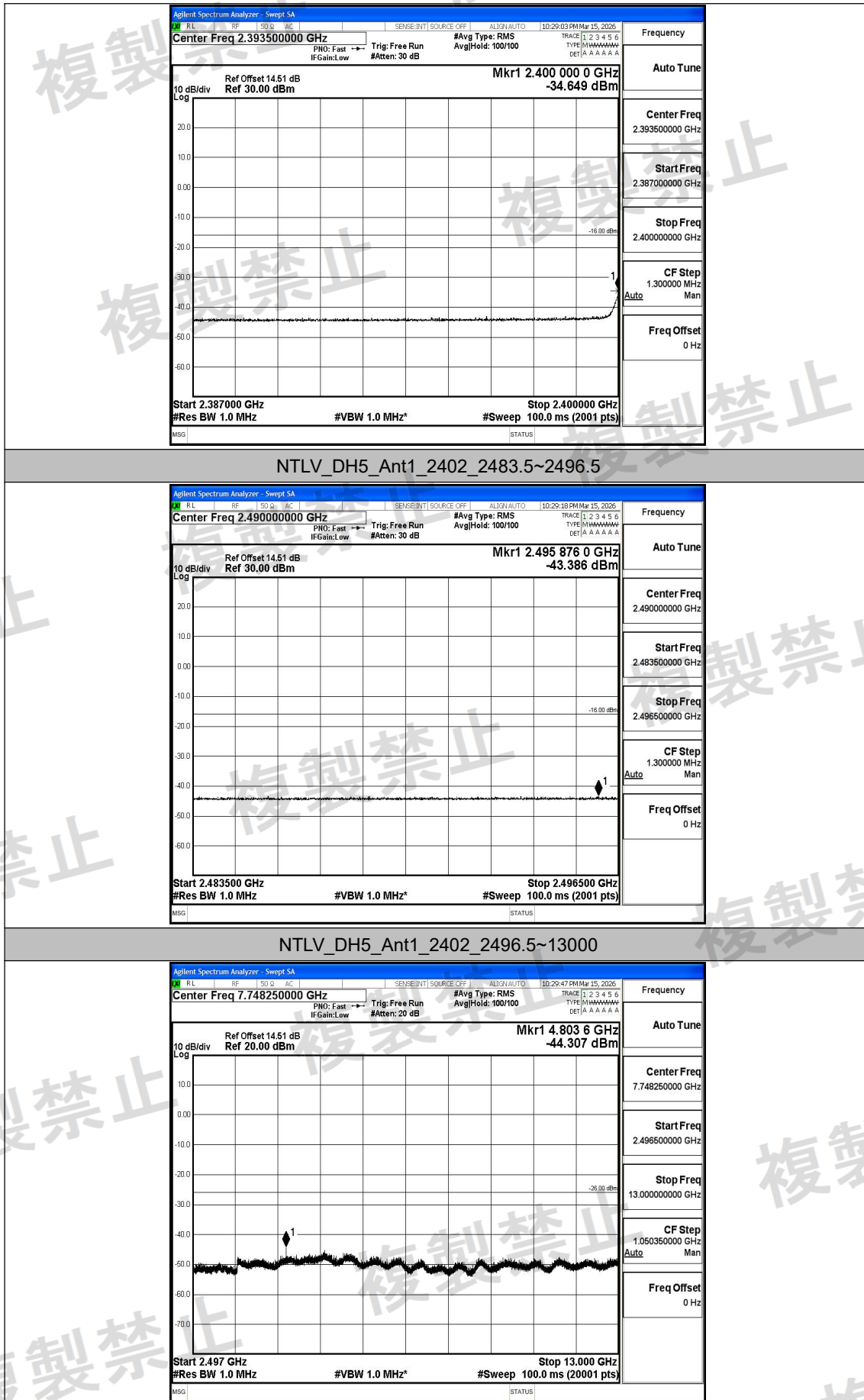
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TestCondition	TestMode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTLV	DH5	Ant1	2402	30~1000	-53.99	≤-26	0.00399	≤2.5	PASS
				1000~2387	-52.00	≤-26	0.00631	≤2.5	PASS
				2387~2400	-34.65	≤-16	0.34277	≤25	PASS
				2483.5~2496.5	-43.39	≤-16	0.04581	≤25	PASS
				2496.5~13000	-44.31	≤-26	0.03707	≤2.5	PASS
			2441	30~1000	-54.13	≤-26	0.00386	≤2.5	PASS
				1000~2387	-52.81	≤-26	0.00524	≤2.5	PASS
				2387~2400	-43.46	≤-16	0.04508	≤25	PASS
				2483.5~2496.5	-43.10	≤-16	0.04898	≤25	PASS
				2496.5~13000	-45.22	≤-26	0.03006	≤2.5	PASS
			2480	30~1000	-53.82	≤-26	0.00415	≤2.5	PASS
				1000~2387	-52.74	≤-26	0.00532	≤2.5	PASS
				2387~2400	-43.25	≤-16	0.04732	≤25	PASS
				2483.5~2496.5	-43.10	≤-16	0.04898	≤25	PASS
				2496.5~13000	-45.53	≤-26	0.02799	≤2.5	PASS
	2DH5	Ant1	2402	30~1000	-53.93	≤-26	0.00405	≤2.5	PASS
				1000~2387	-52.41	≤-26	0.00574	≤2.5	PASS
				2387~2400	-25.15	≤-16	3.05492	≤25	PASS
				2483.5~2496.5	-43.30	≤-16	0.04677	≤25	PASS
				2496.5~13000	-45.05	≤-26	0.03126	≤2.5	PASS
			2441	30~1000	-53.91	≤-26	0.00406	≤2.5	PASS
				1000~2387	-52.72	≤-26	0.00535	≤2.5	PASS
				2387~2400	-43.42	≤-16	0.04550	≤25	PASS
				2483.5~2496.5	-43.26	≤-16	0.04721	≤25	PASS
				2496.5~13000	-45.82	≤-26	0.02618	≤2.5	PASS
			2480	30~1000	-53.92	≤-26	0.00406	≤2.5	PASS
				1000~2387	-52.55	≤-26	0.00556	≤2.5	PASS
				2387~2400	-43.45	≤-16	0.04519	≤25	PASS
				2483.5~2496.5	-40.81	≤-16	0.08299	≤25	PASS
				2496.5~13000	-45.70	≤-26	0.02692	≤2.5	PASS

Test Graphs



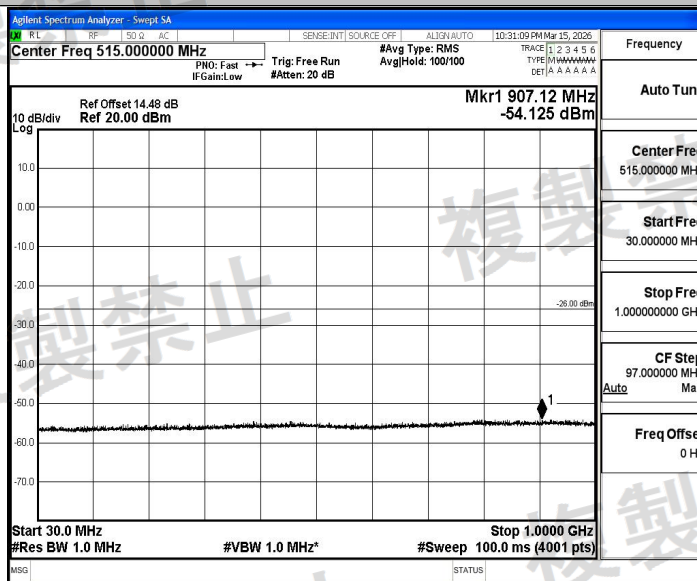


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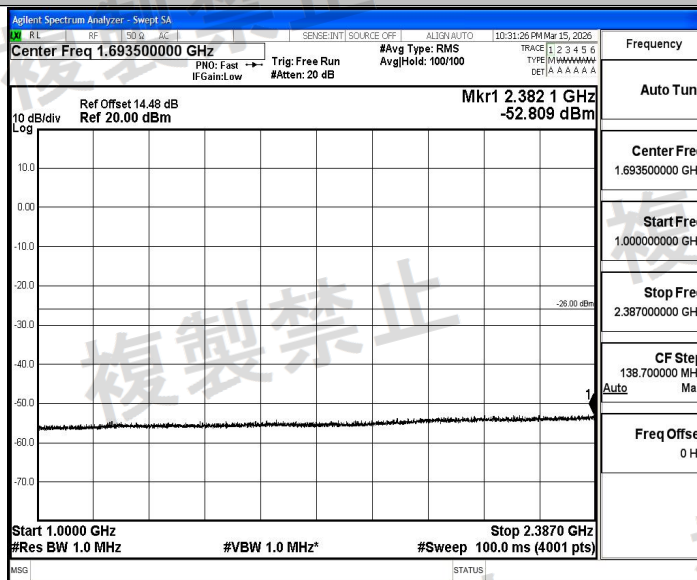
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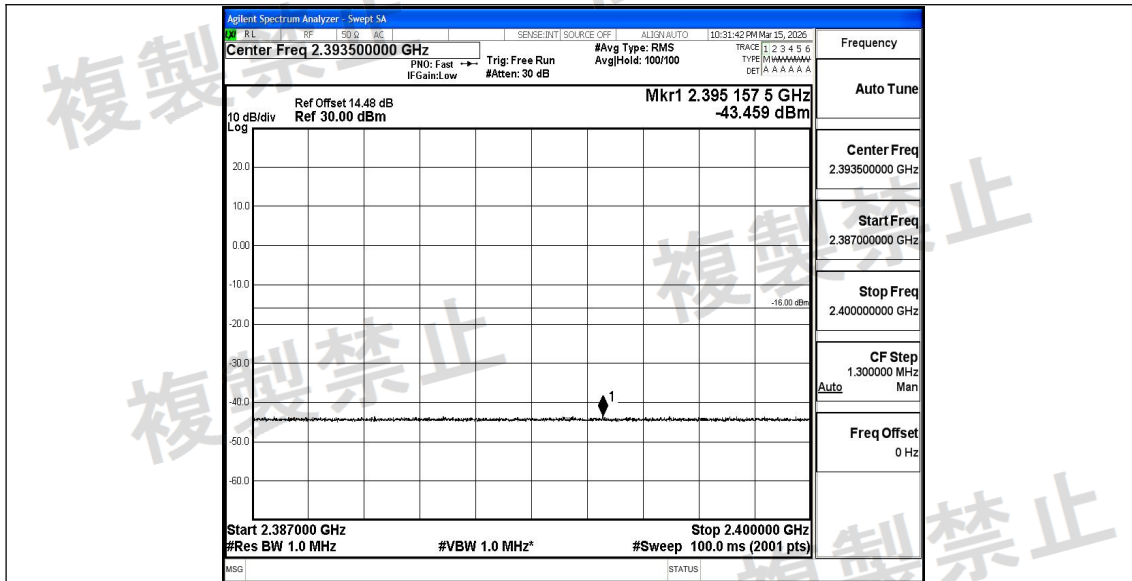
NTLV_DH5_Ant1_2441_30~1000



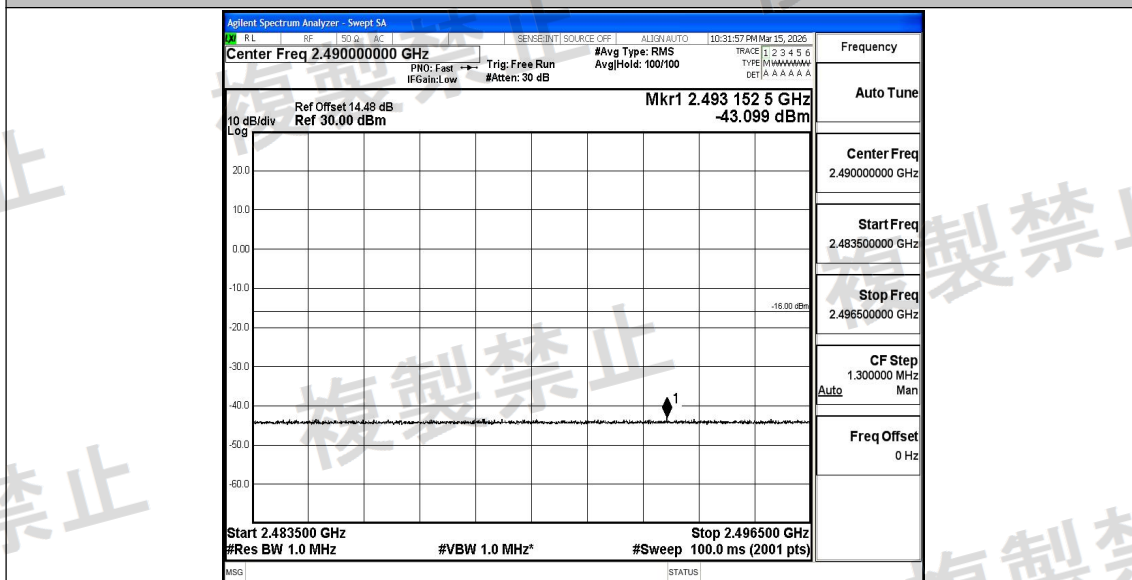
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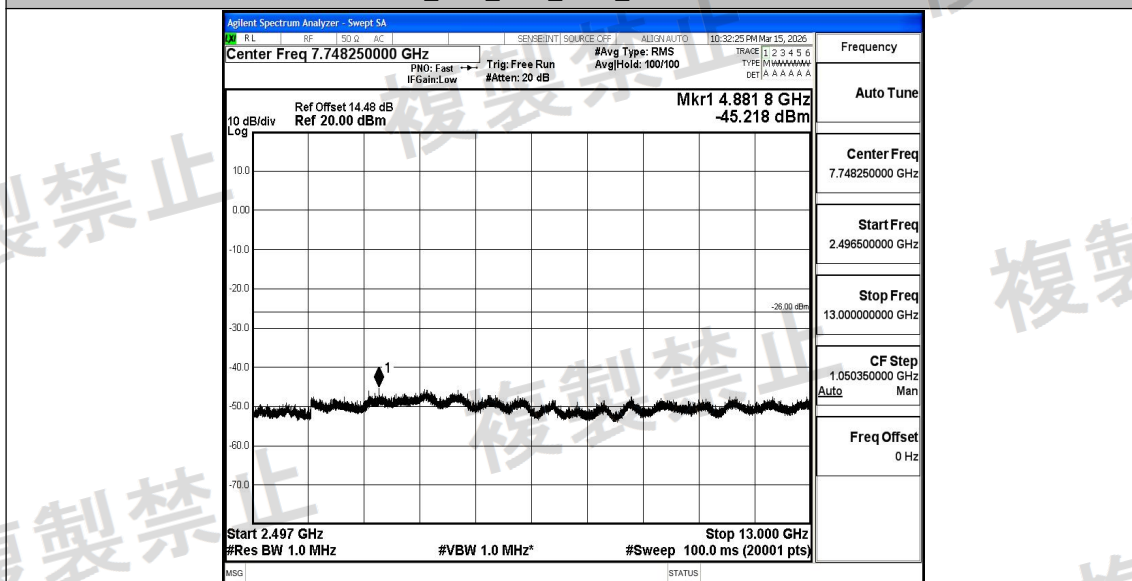
NTLV_DH5_Ant1_2441_2387~2400



NTLV_DH5_Ant1_2441_2483.5~2496.5



NTLV_DH5_Ant1_2441_2496.5~13000

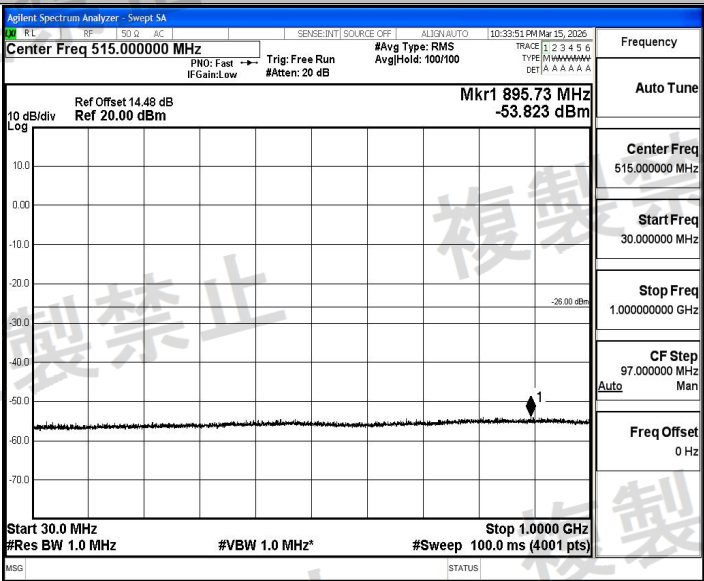


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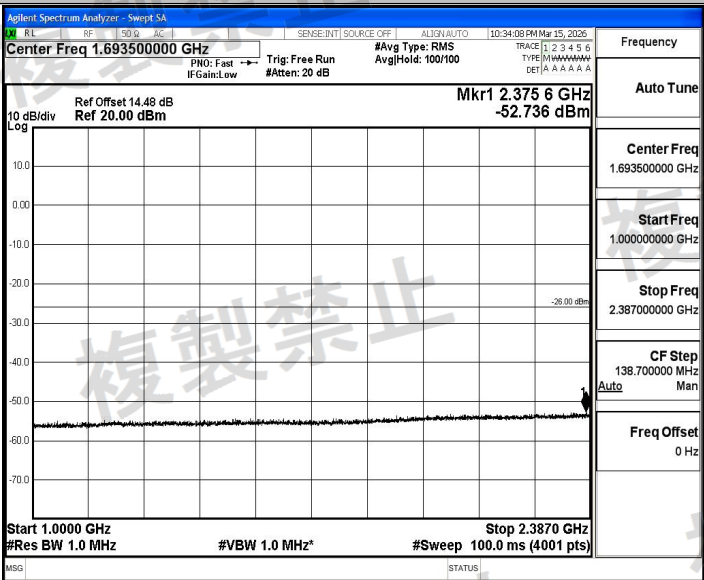
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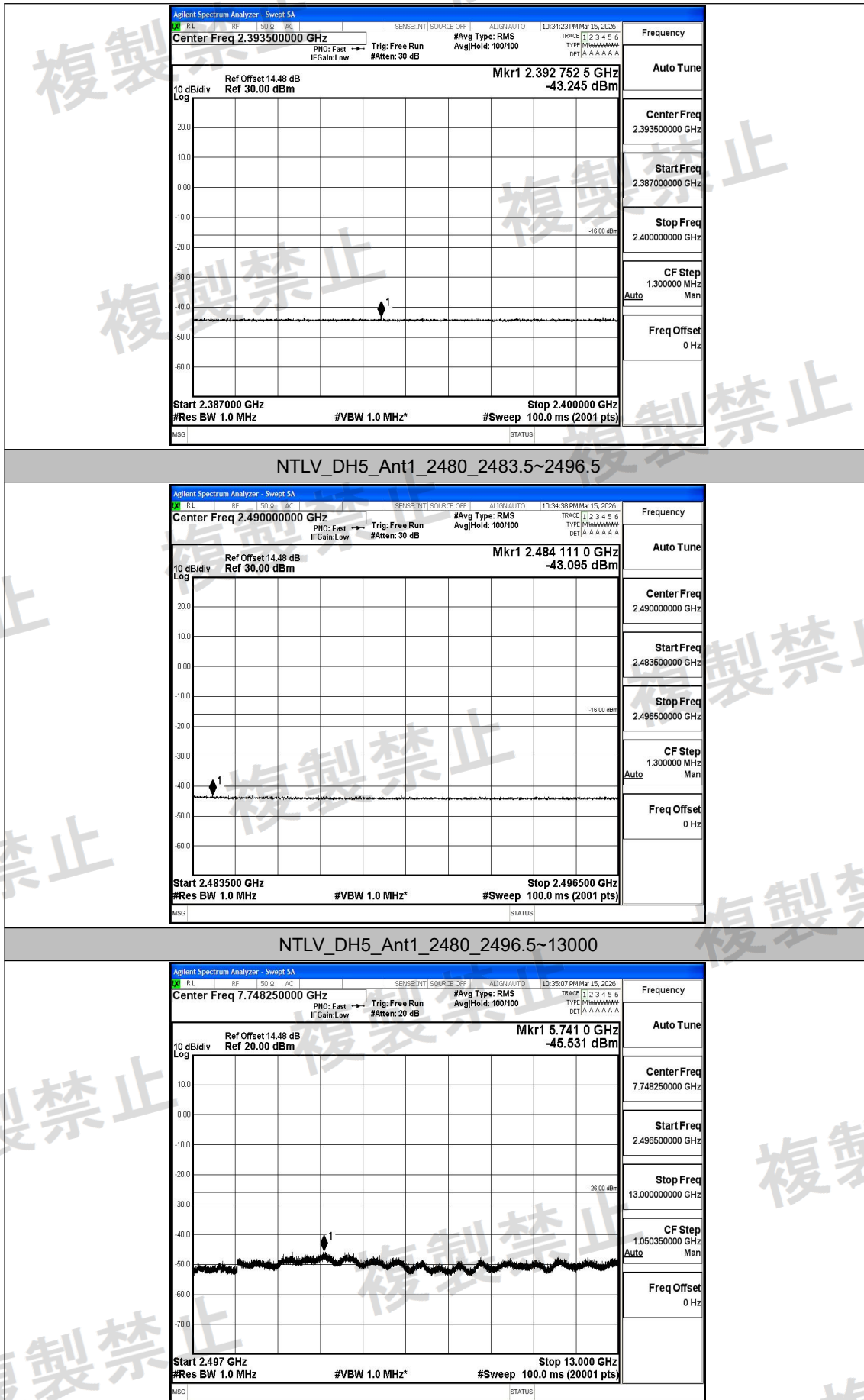
NTLV_DH5_Ant1_2480_30~1000



NTLV_DH5_Ant1_2480_1000~2387



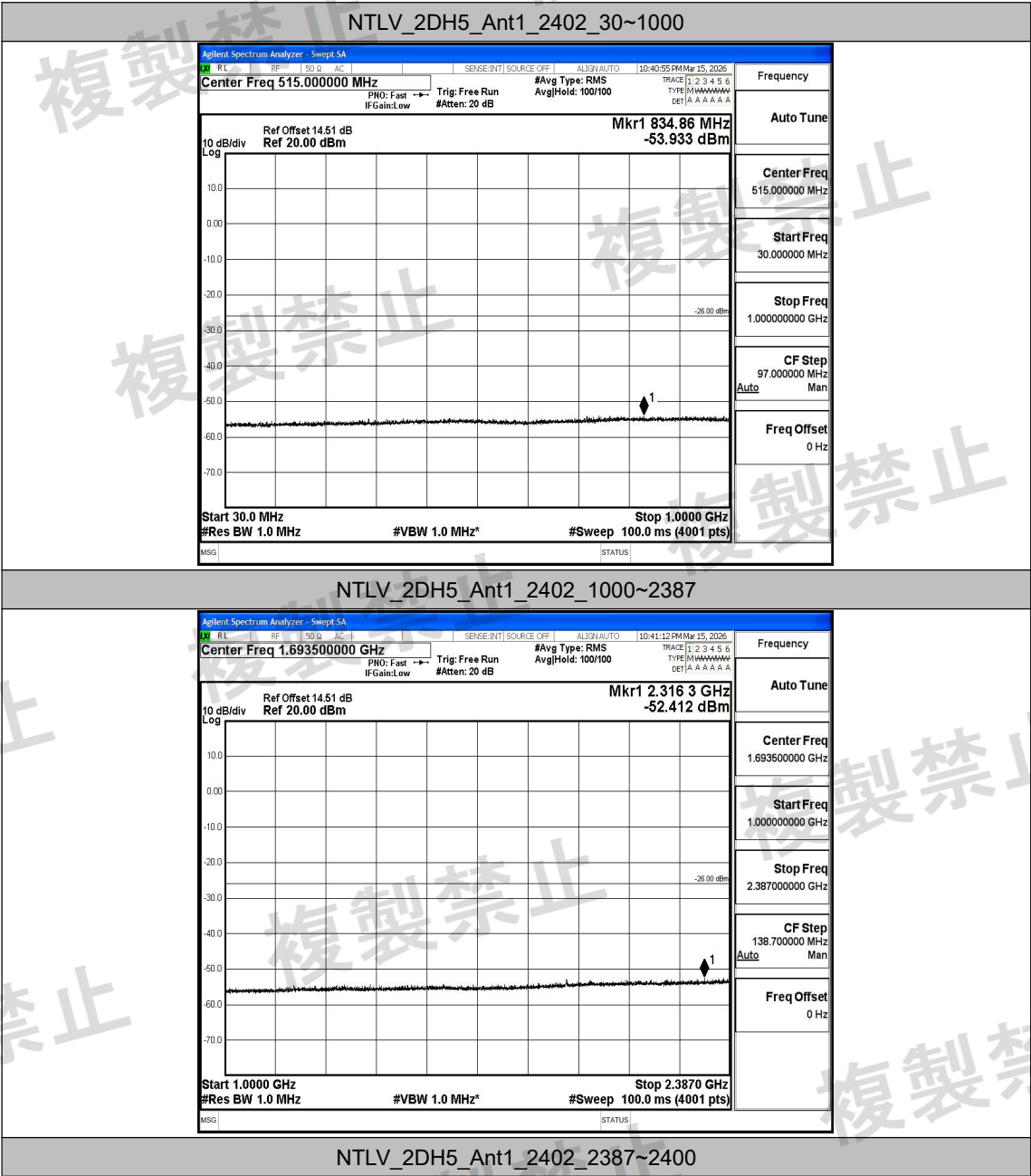
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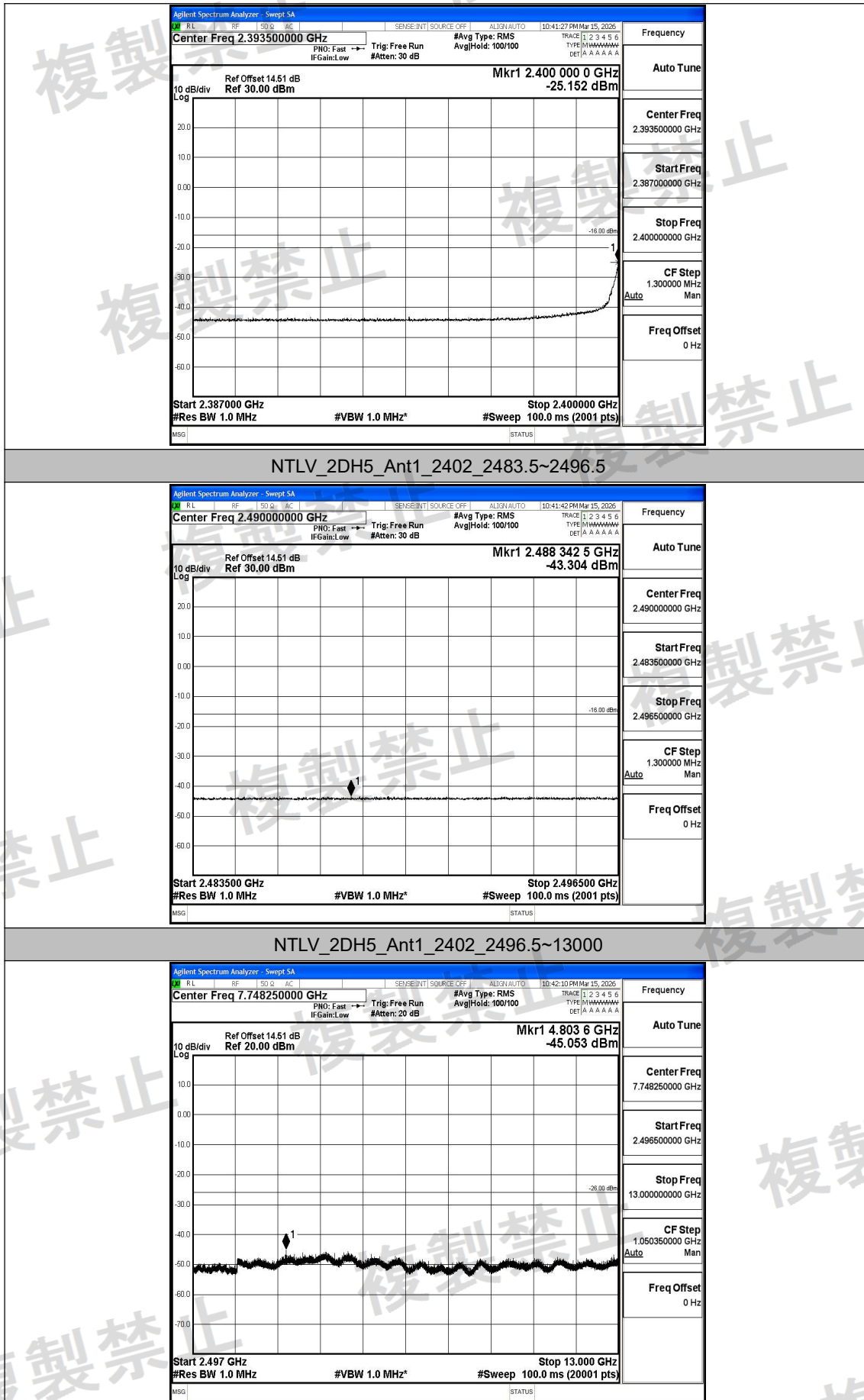


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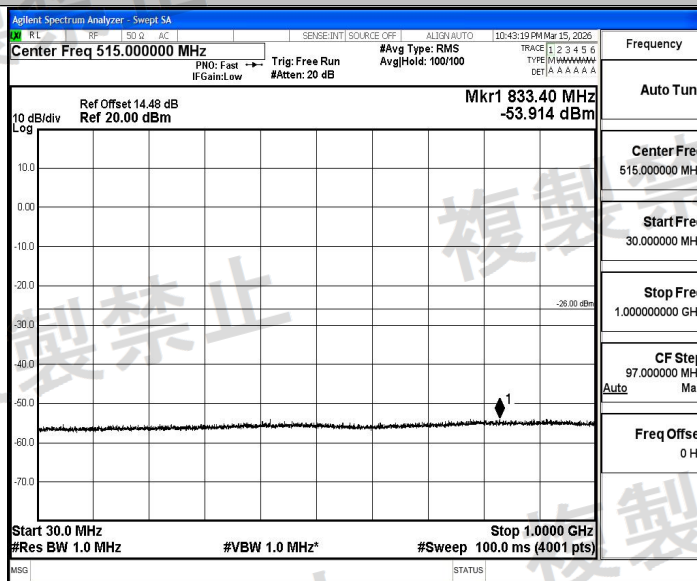


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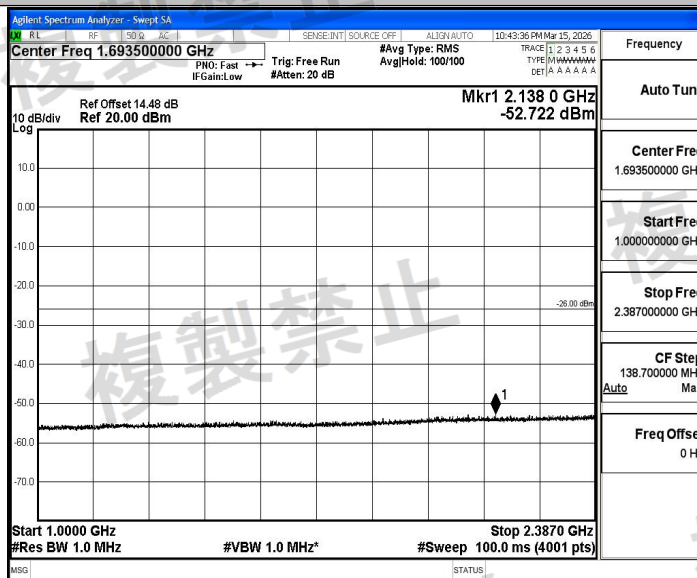
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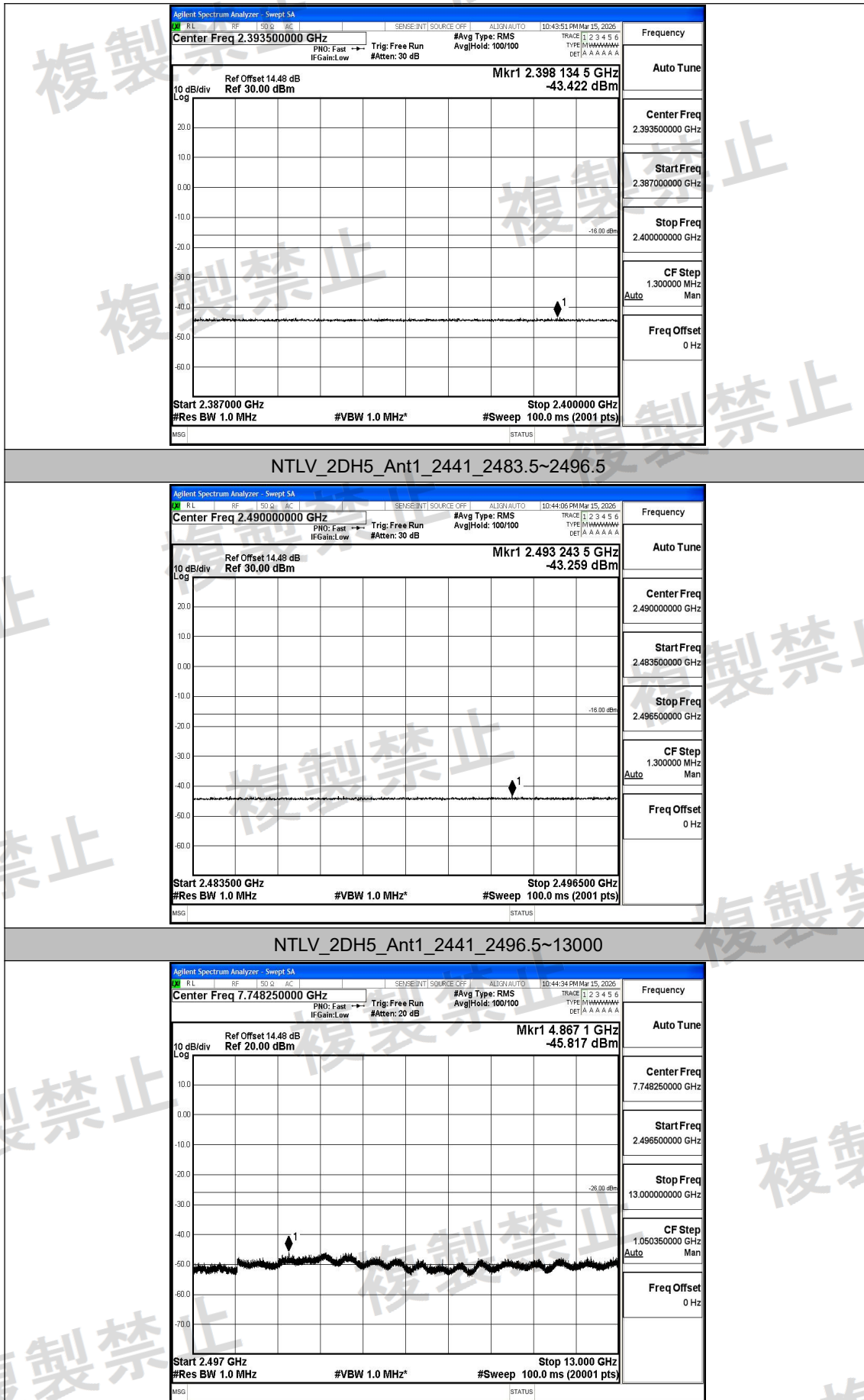
NTLV_2DH5_Ant1_2441_30~1000



NTLV_2DH5_Ant1_2441_1000~2387



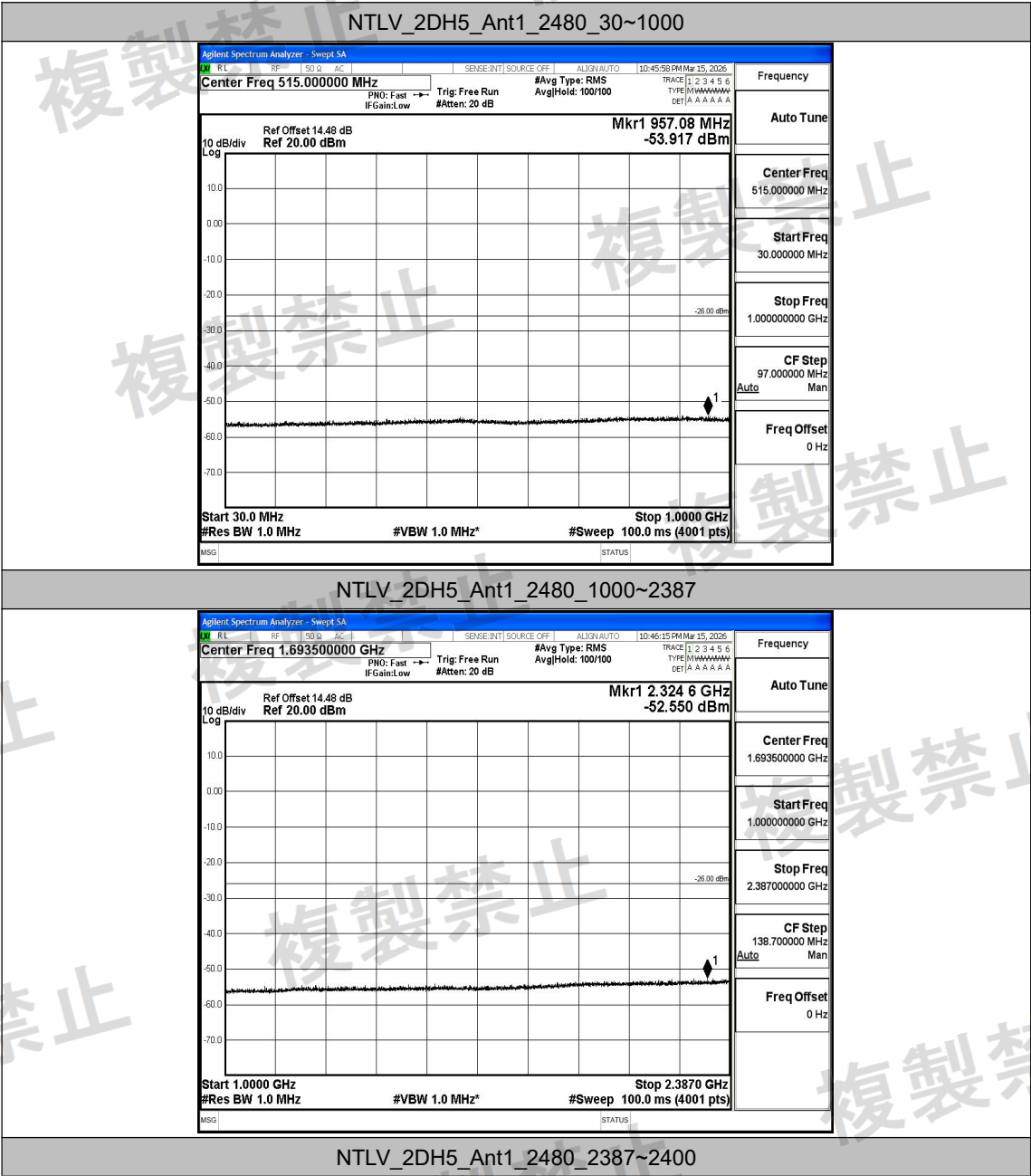
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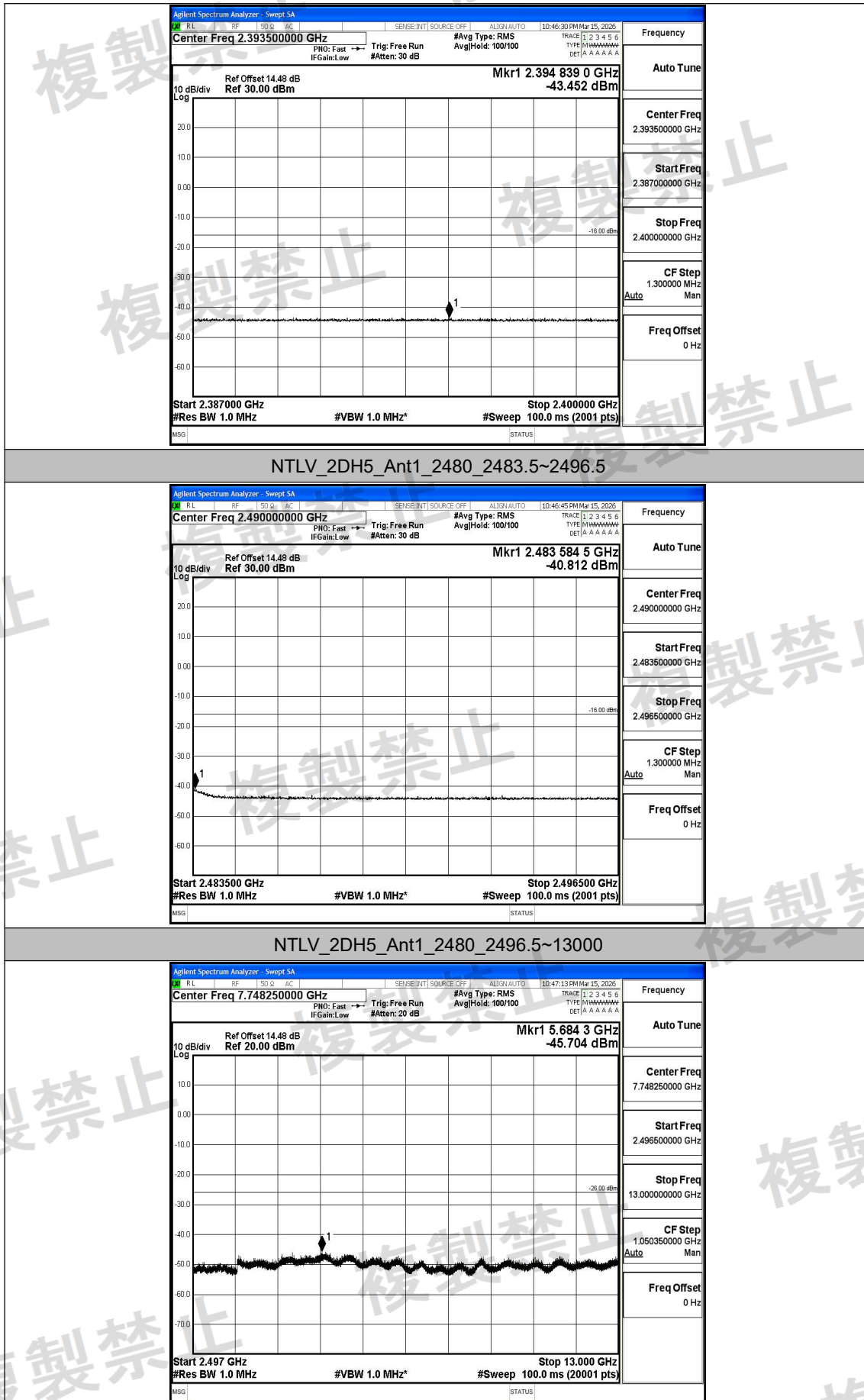


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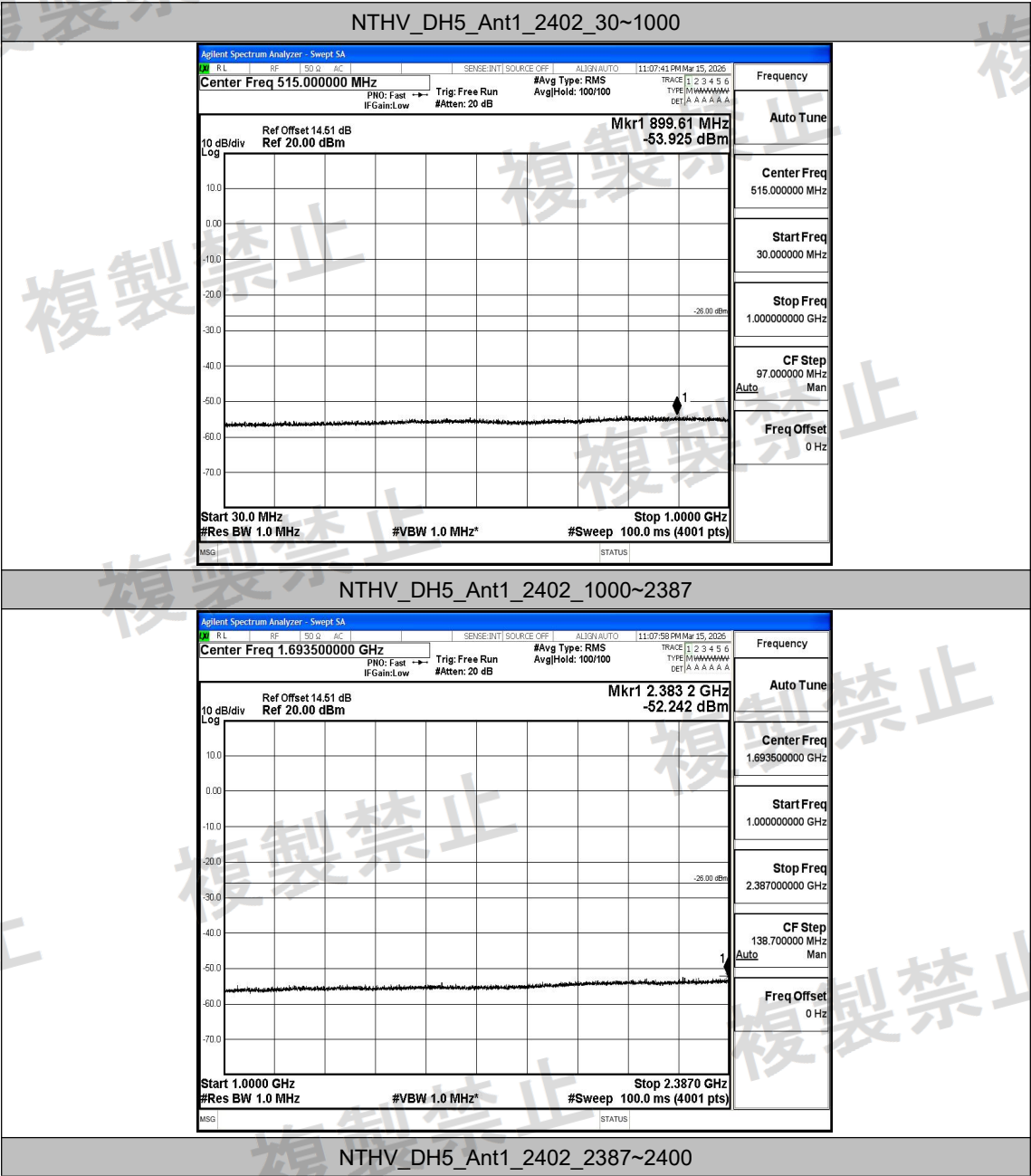
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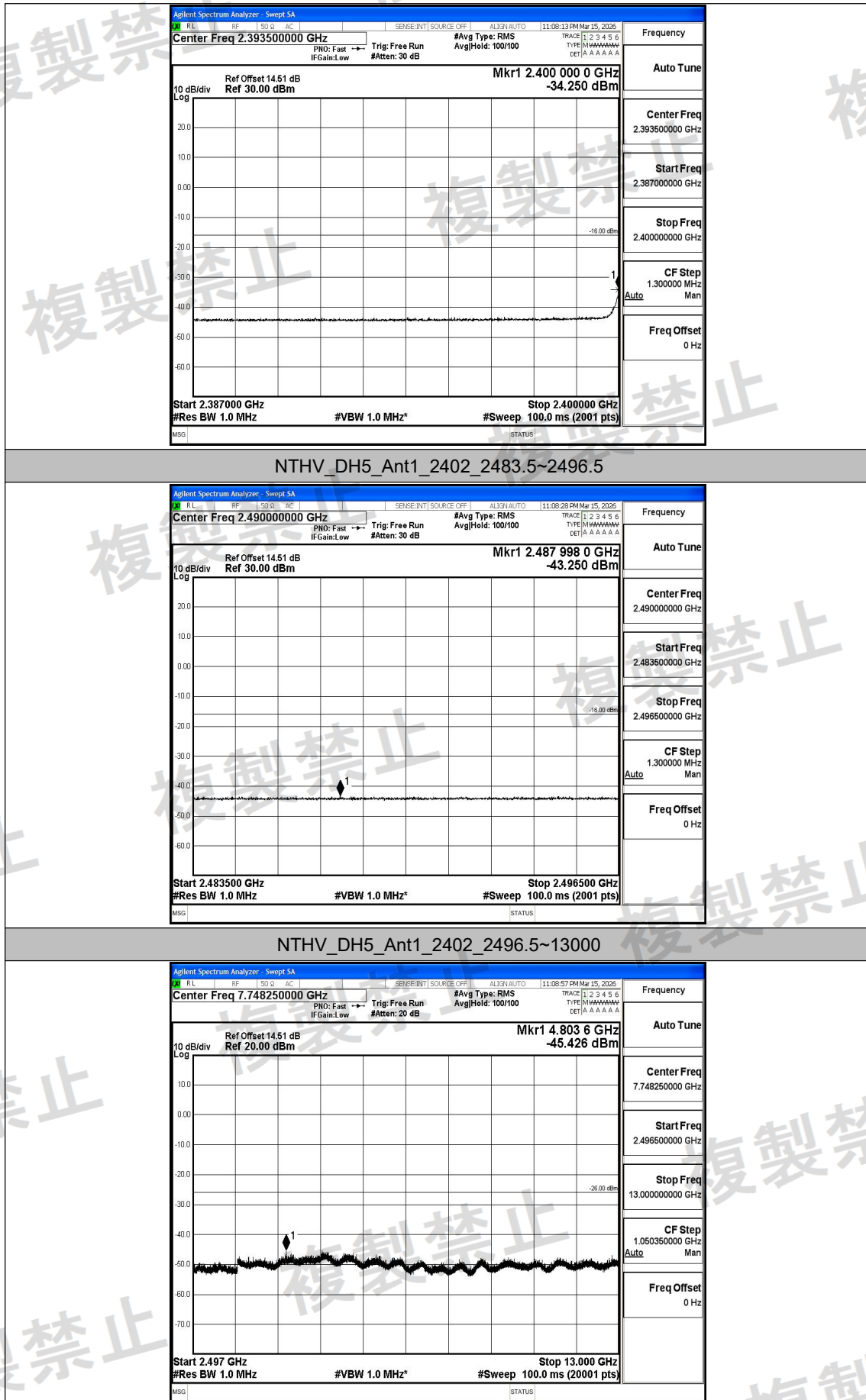
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TestCondition	TestMode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTHV	DH5	Ant1	2402	30~1000	-53.93	≤-26	0.00405	≤2.5	PASS
				1000~2387	-52.24	≤-26	0.00597	≤2.5	PASS
				2387~2400	-34.25	≤-16	0.37584	≤25	PASS
				2483.5~2496.5	-43.25	≤-16	0.04732	≤25	PASS
				2496.5~13000	-45.43	≤-26	0.02864	≤2.5	PASS
			2441	30~1000	-53.69	≤-26	0.00428	≤2.5	PASS
				1000~2387	-52.58	≤-26	0.00552	≤2.5	PASS
				2387~2400	-43.33	≤-16	0.04645	≤25	PASS
				2483.5~2496.5	-43.15	≤-16	0.04842	≤25	PASS
				2496.5~13000	-45.23	≤-26	0.02999	≤2.5	PASS
			2480	30~1000	-54.03	≤-26	0.00395	≤2.5	PASS
				1000~2387	-52.62	≤-26	0.00547	≤2.5	PASS
				2387~2400	-43.32	≤-16	0.04656	≤25	PASS
				2483.5~2496.5	-43.07	≤-16	0.04932	≤25	PASS
				2496.5~13000	-45.83	≤-26	0.02612	≤2.5	PASS
	2DH5	Ant1	2402	30~1000	-53.91	≤-26	0.00406	≤2.5	PASS
				1000~2387	-52.72	≤-26	0.00535	≤2.5	PASS
				2387~2400	-25.54	≤-16	2.79254	≤25	PASS
				2483.5~2496.5	-43.24	≤-16	0.04742	≤25	PASS
				2496.5~13000	-45.27	≤-26	0.02972	≤2.5	PASS
			2441	30~1000	-53.64	≤-26	0.00433	≤2.5	PASS
				1000~2387	-44.95	≤-26	0.03199	≤2.5	PASS
				2387~2400	-43.35	≤-16	0.04624	≤25	PASS
				2483.5~2496.5	-43.42	≤-16	0.04550	≤25	PASS
				2496.5~13000	-45.77	≤-26	0.02649	≤2.5	PASS
			2480	30~1000	-53.92	≤-26	0.00406	≤2.5	PASS
				1000~2387	-52.74	≤-26	0.00532	≤2.5	PASS
				2387~2400	-43.52	≤-16	0.04446	≤25	PASS
				2483.5~2496.5	-40.75	≤-16	0.08414	≤25	PASS
				2496.5~13000	-45.67	≤-26	0.02710	≤2.5	PASS

Test Graphs

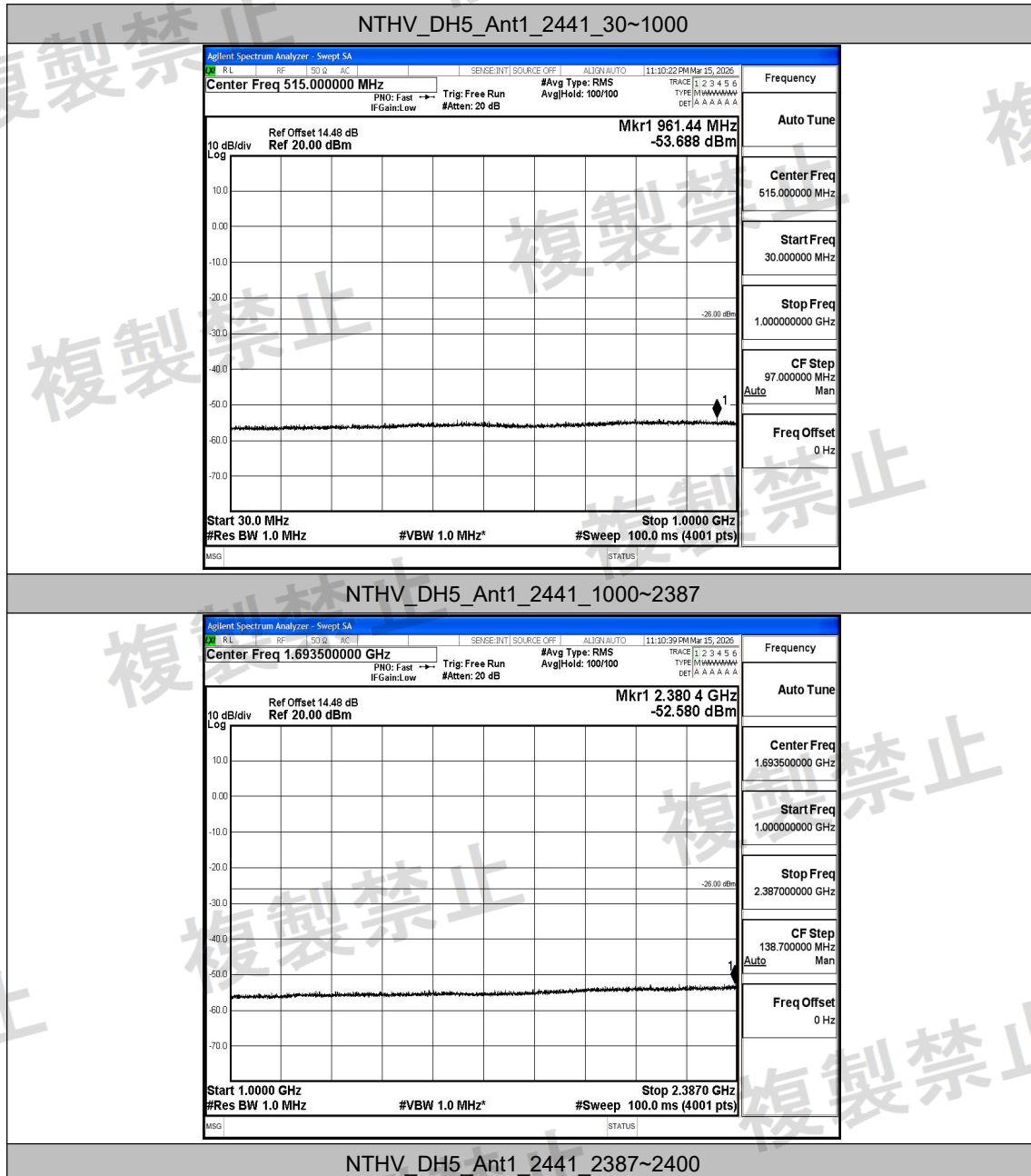


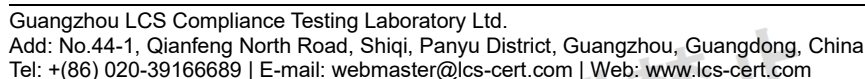
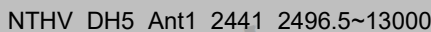
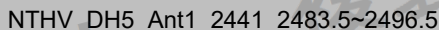


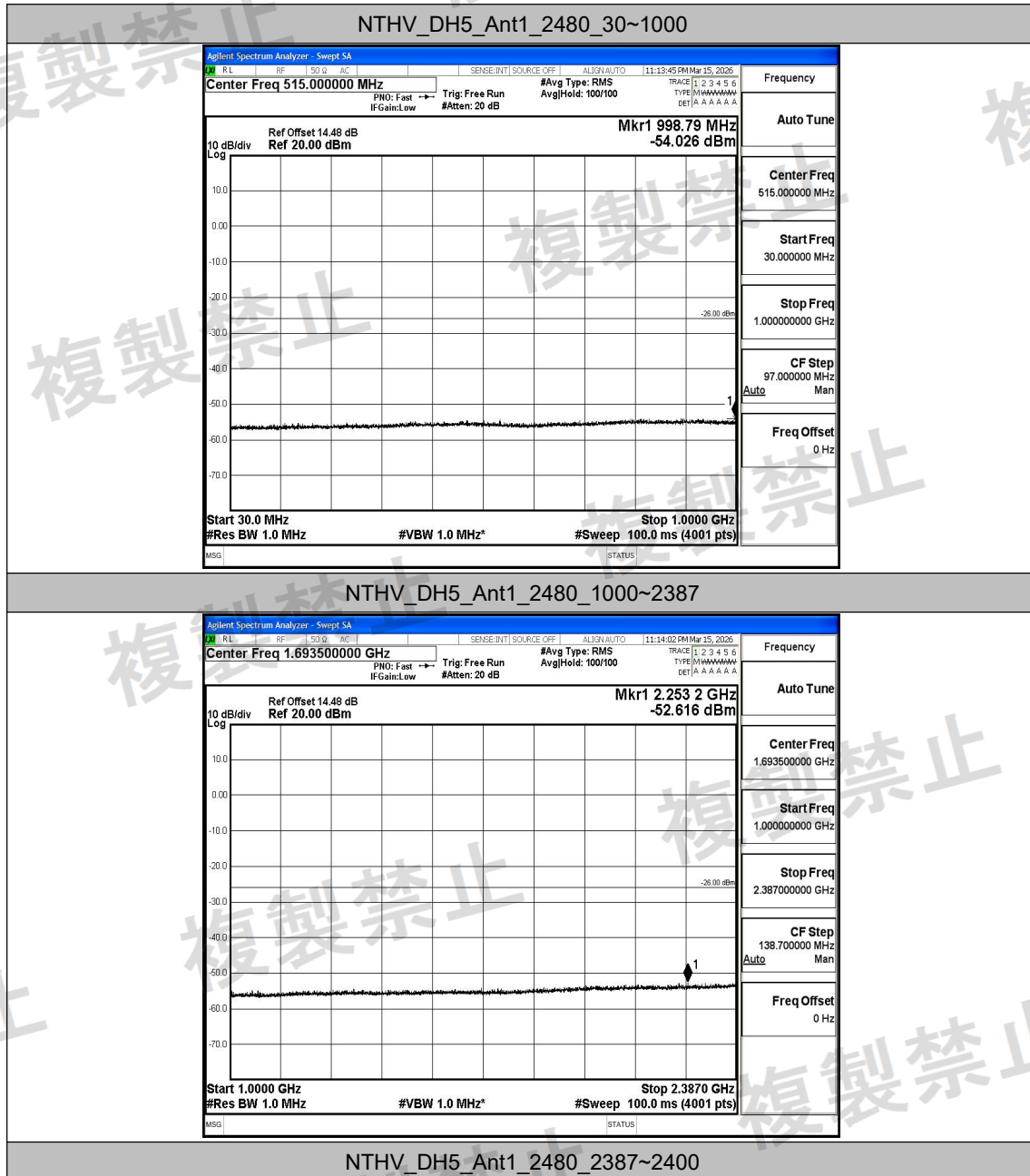
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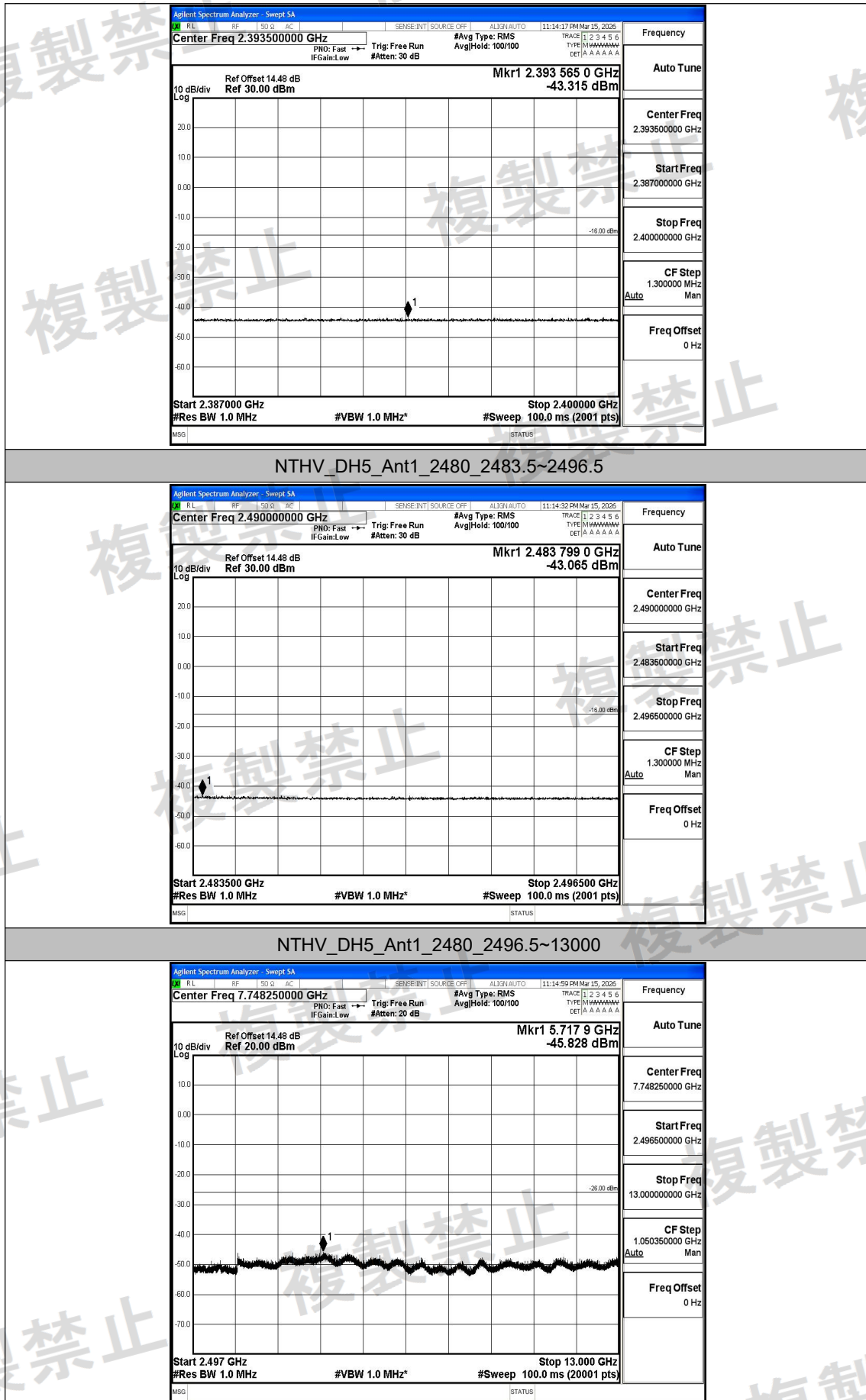
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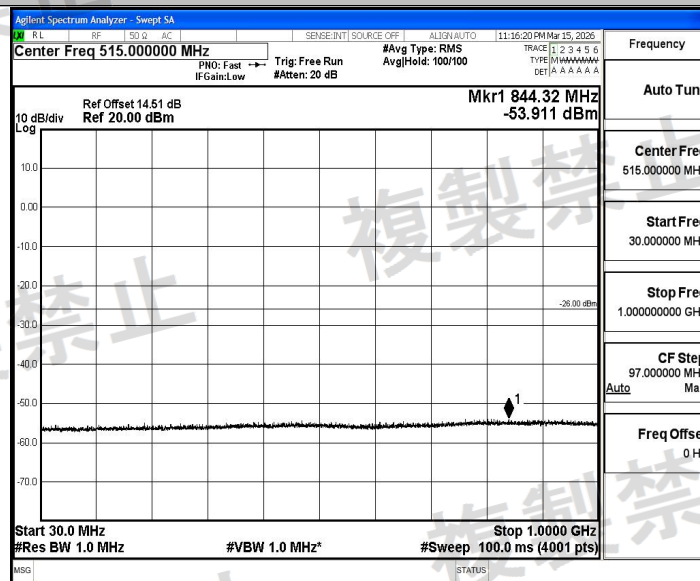


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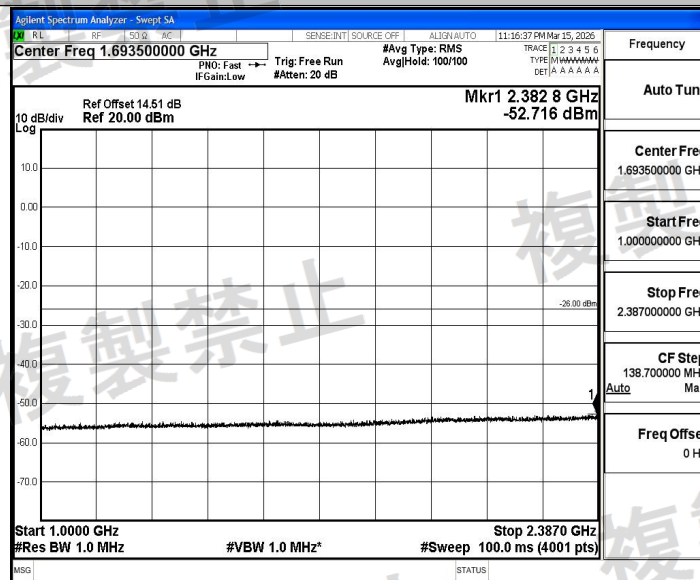
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NTHV_2DH5_Ant1_2402_30~1000



NTHV_2DH5_Ant1_2402_1000~2387



NTHV_2DH5_Ant1_2402_2387~2400