



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: PISEN P1 True Wireless Bluetooth Earphones

Test Model: BHD-TW4

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Paddi Chen
Supervised by:	Ling Zhu





A.1 20dB Emission Bandwidth

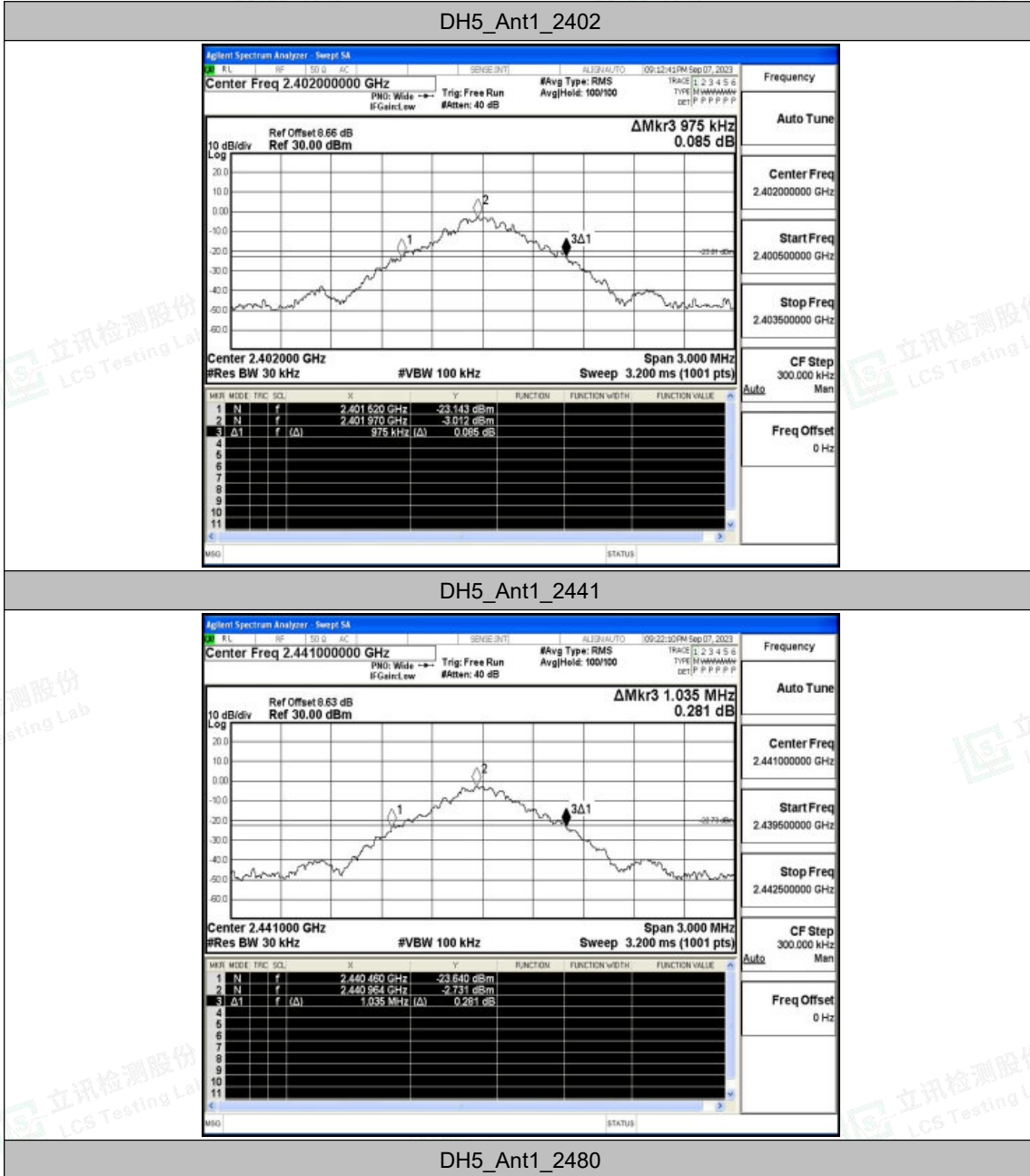
Test Result

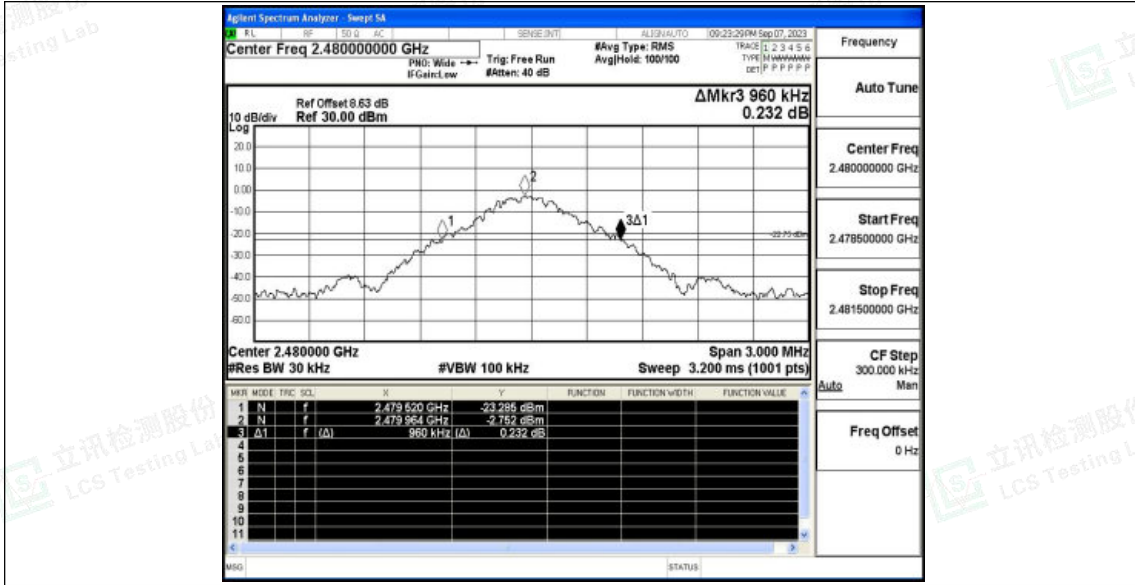
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Verdict
DH5	Ant1	2402	0.975	2401.520	2402.495	---
		2441	1.035	2440.460	2441.495	---
		2480	0.960	2479.520	2480.480	---
2DH5	Ant1	2402	1.287	2401.352	2402.639	---
		2441	1.317	2440.328	2441.645	---
		2480	1.338	2479.319	2480.657	---
3DH5	Ant1	2402	1.269	2401.343	2402.612	---
		2441	1.281	2440.337	2441.618	---
		2480	1.290	2479.340	2480.630	---



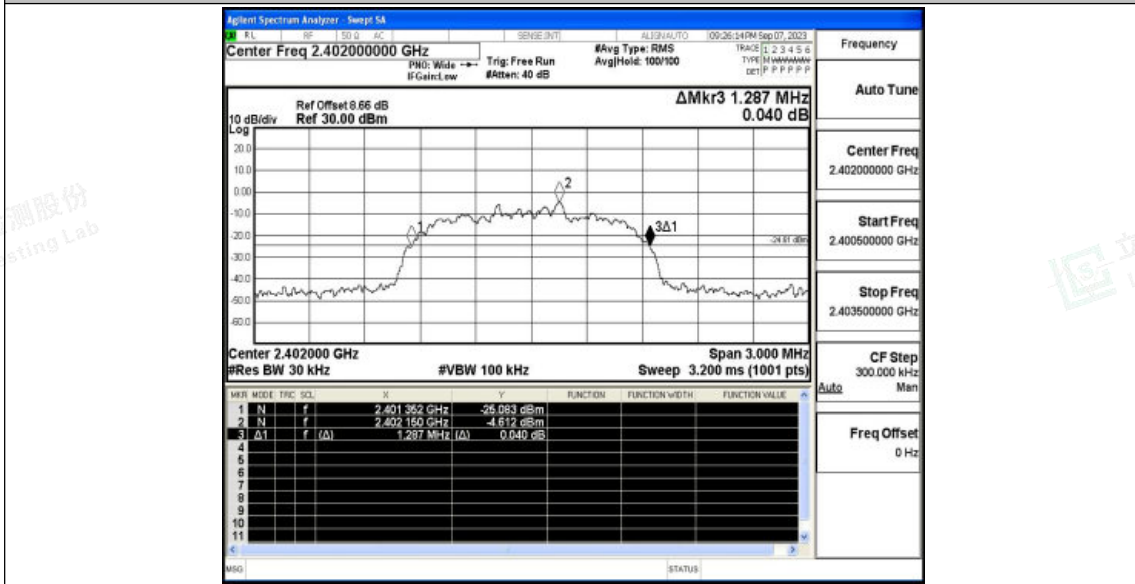


Test Graphs



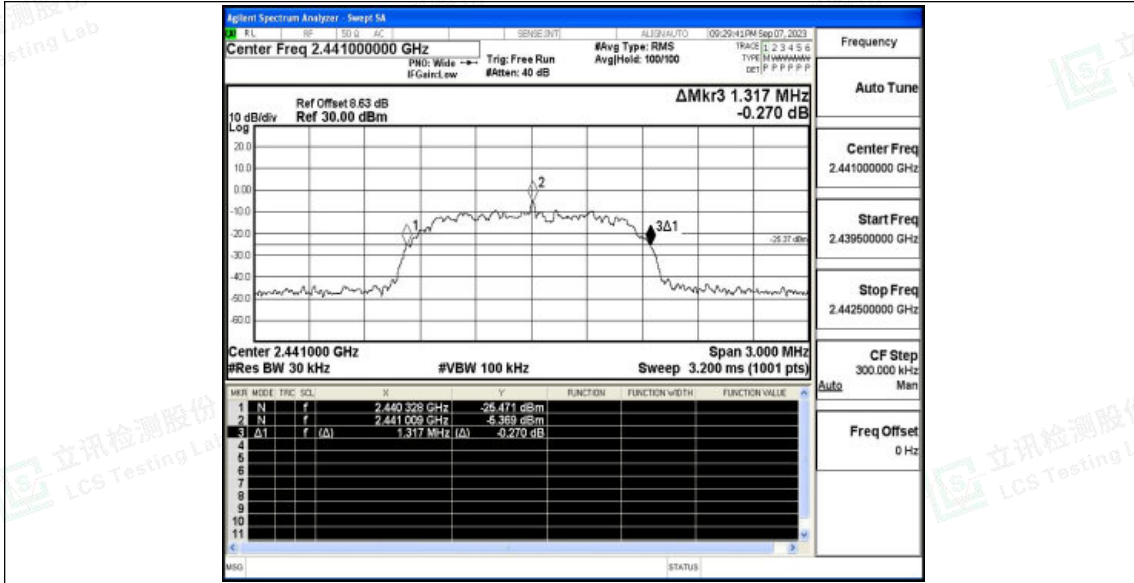


2DH5_Ant1_2402

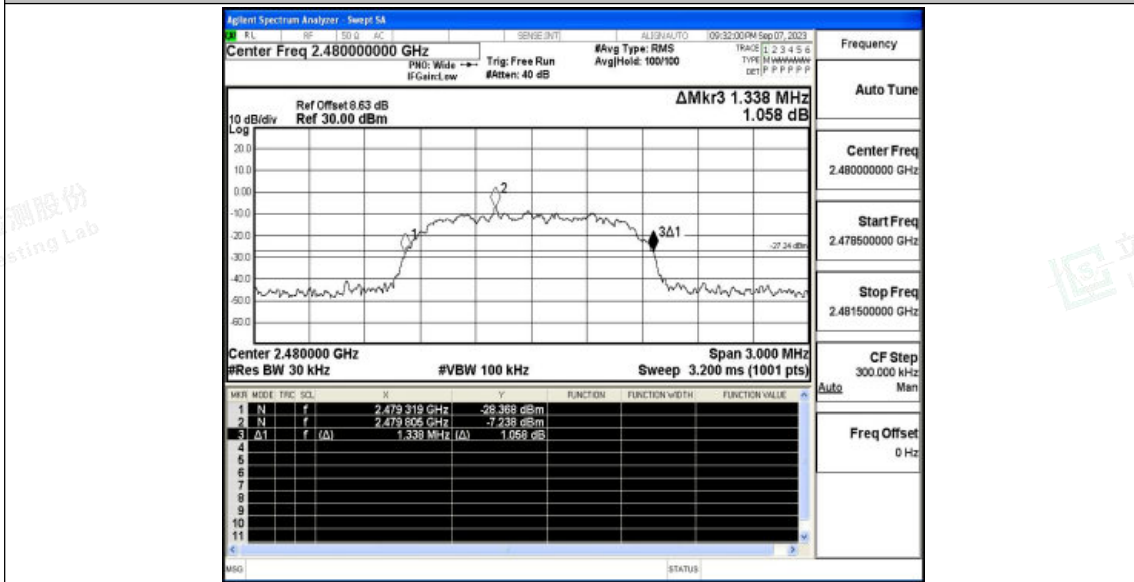


2DH5_Ant1_2441



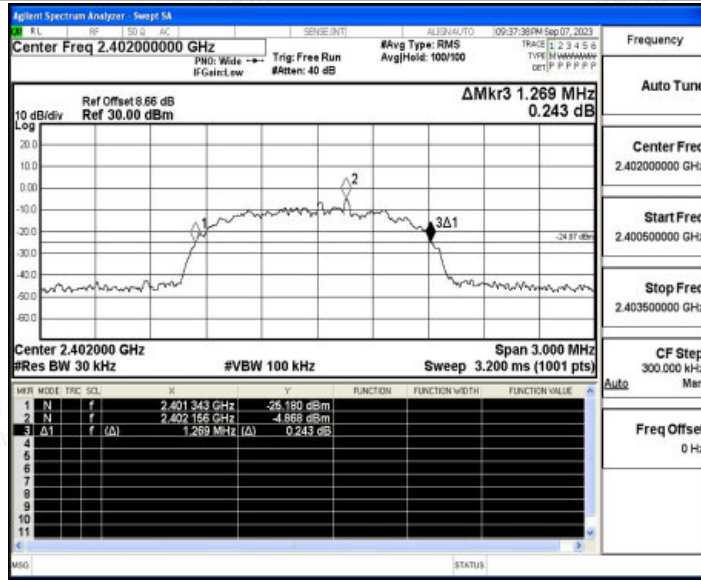


2DH5_Ant1_2480

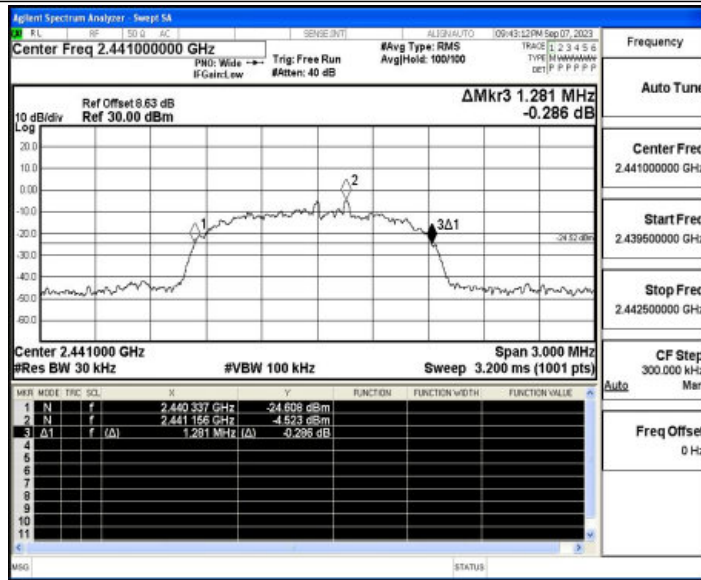


3DH5_Ant1_2402



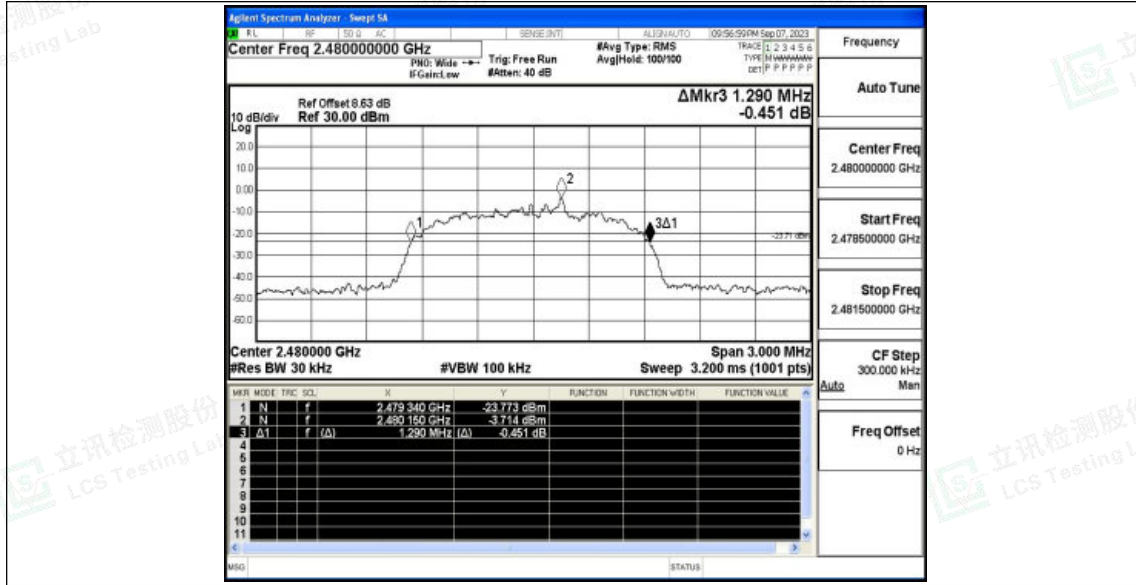


3DH5_Ant1_2441



3DH5_Ant1_2480







A.2 Maximum conducted output power

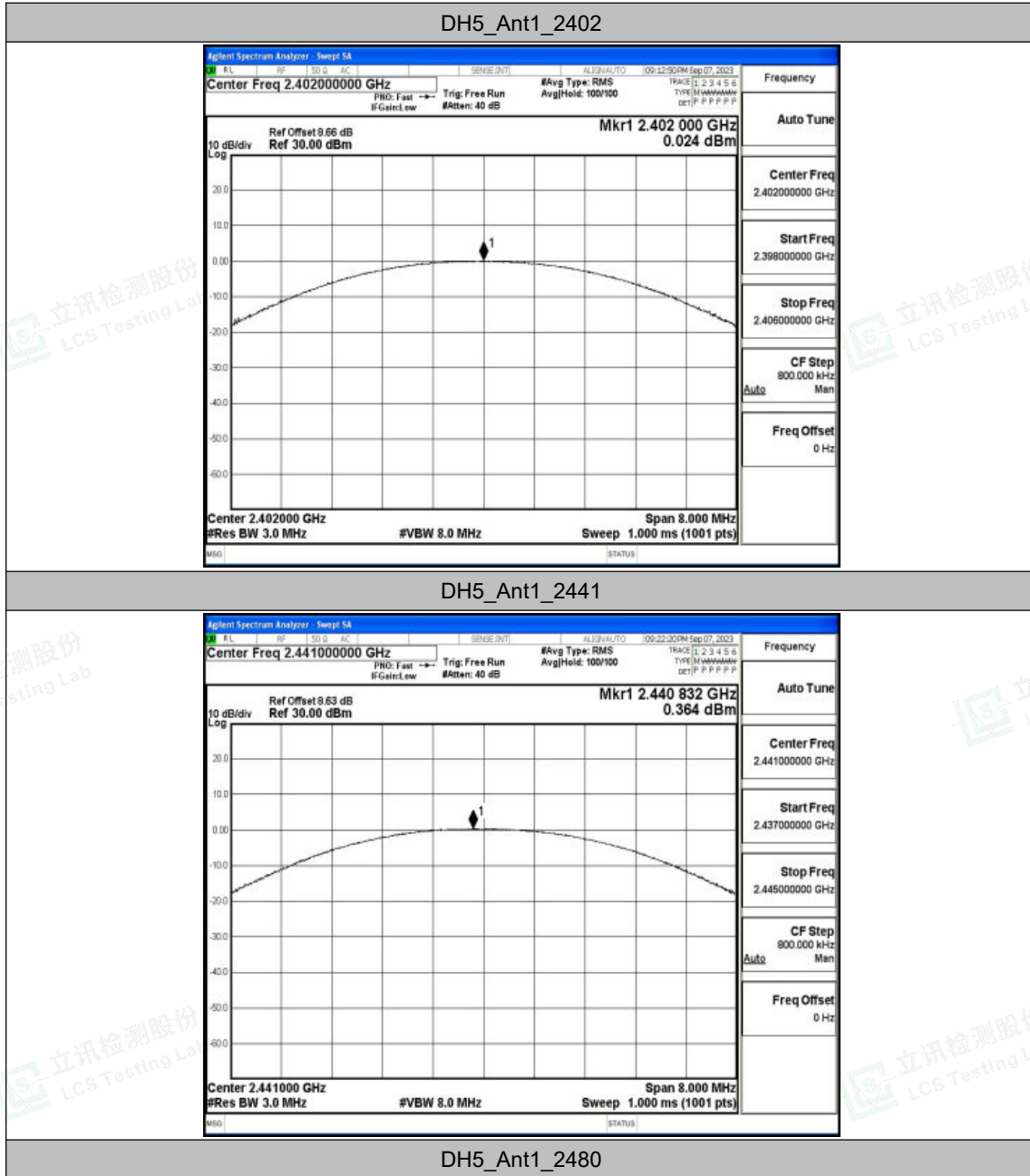
Test Result

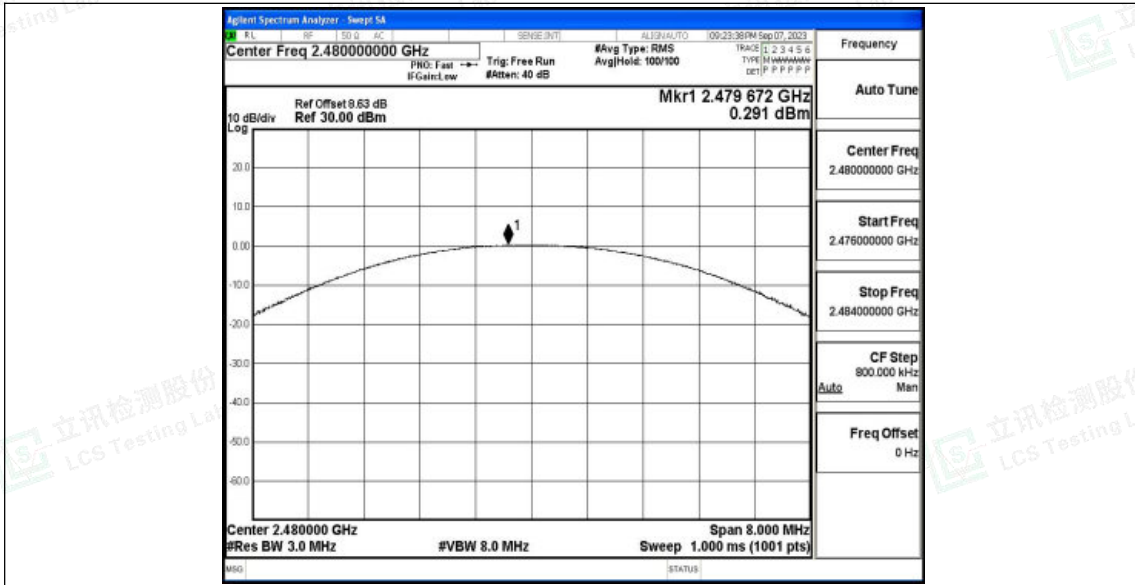
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	0.02	≤21	PASS
		2441	0.36	≤21	PASS
		2480	0.29	≤21	PASS
2DH5	Ant1	2402	-0.32	≤21	PASS
		2441	-0.07	≤21	PASS
		2480	-0.26	≤21	PASS
3DH5	Ant1	2402	-0.08	≤21	PASS
		2441	-0.08	≤21	PASS
		2480	-0.03	≤21	PASS



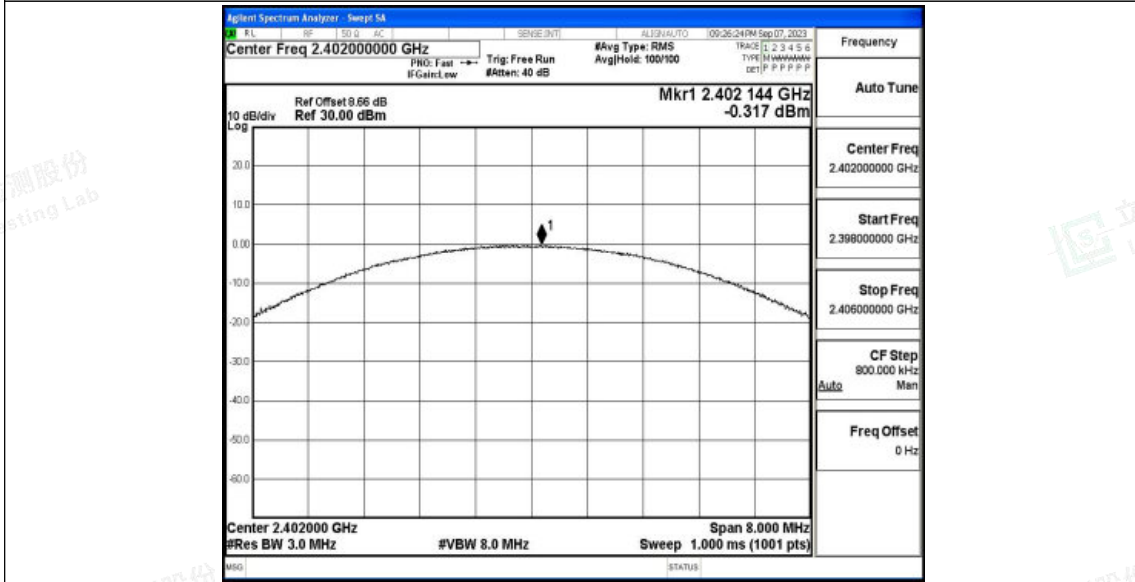


Test Graphs



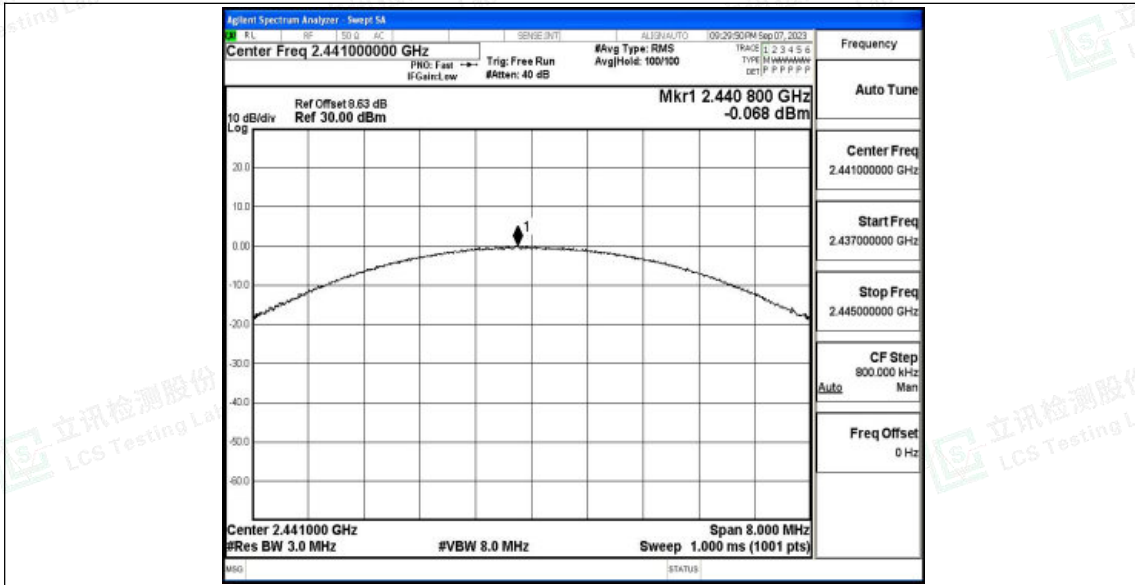


2DH5_Ant1_2402

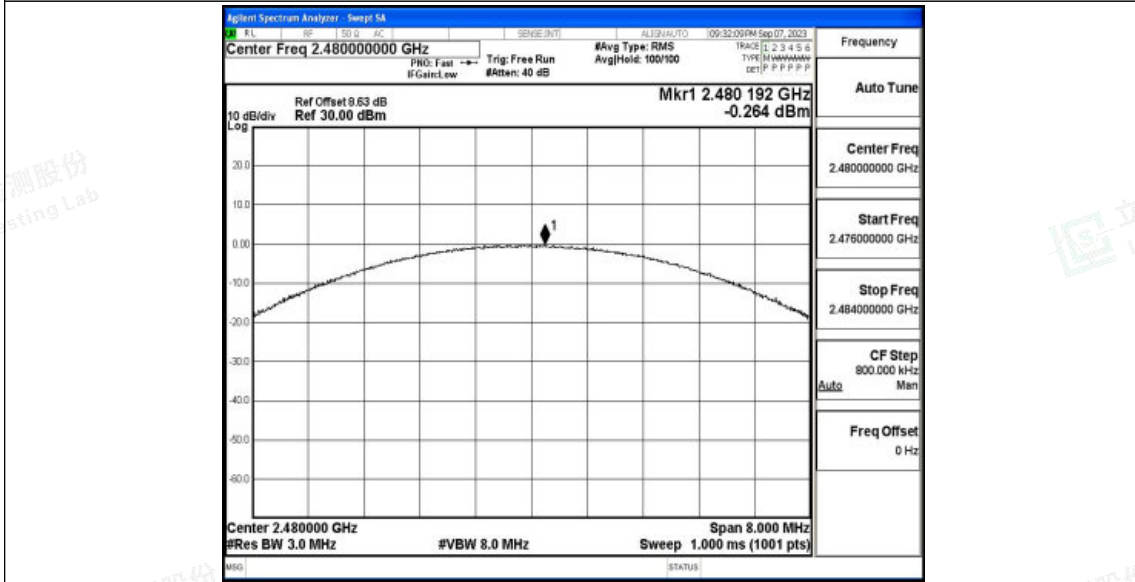


2DH5_Ant1_2441





2DH5_Ant1_2480

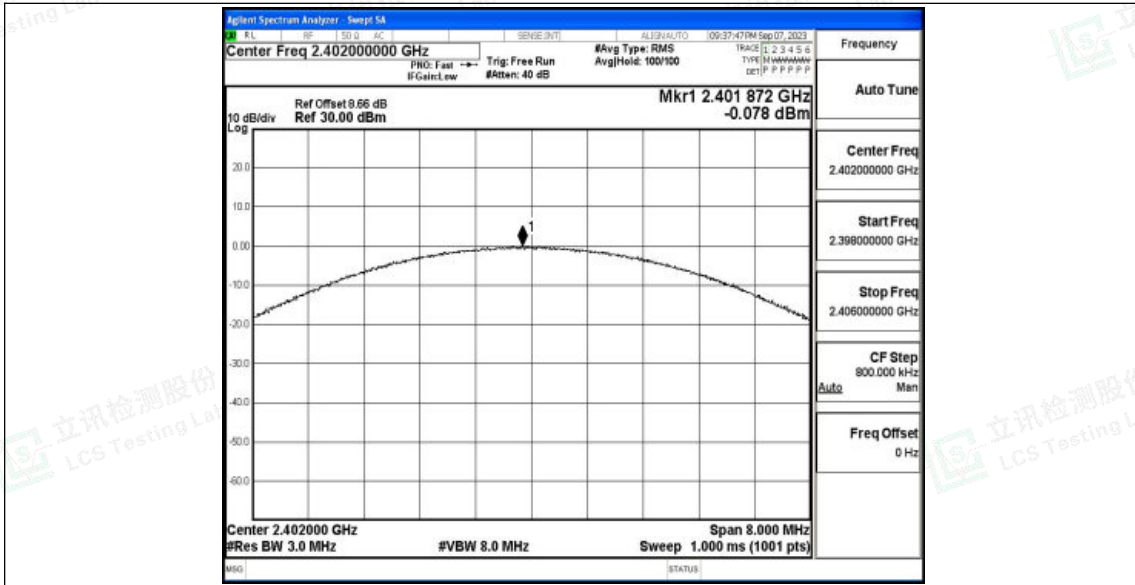


3DH5_Ant1_2402

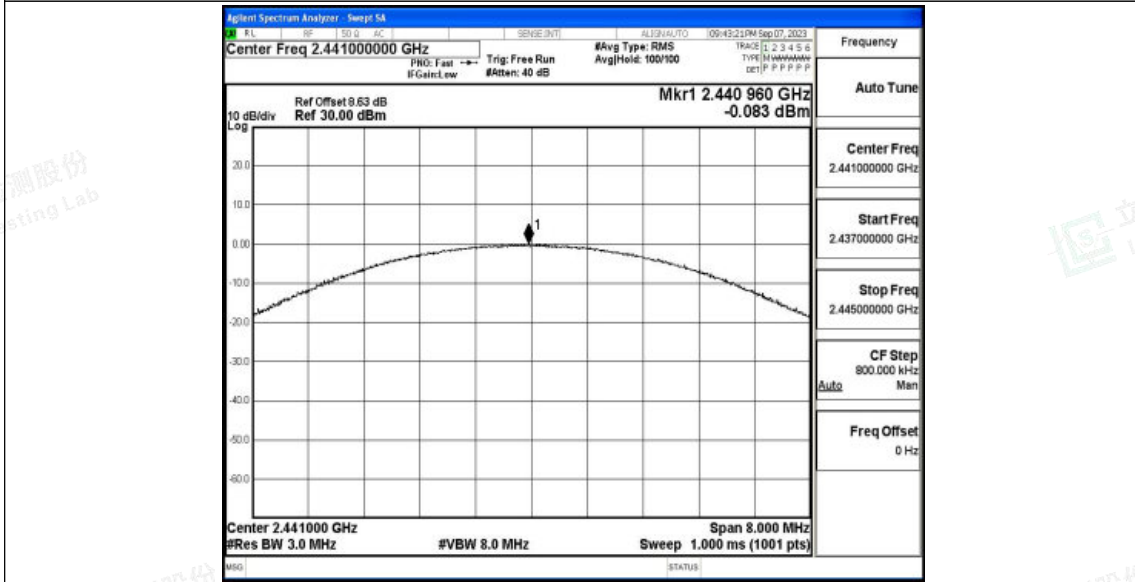




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3DH5_Ant1_2441

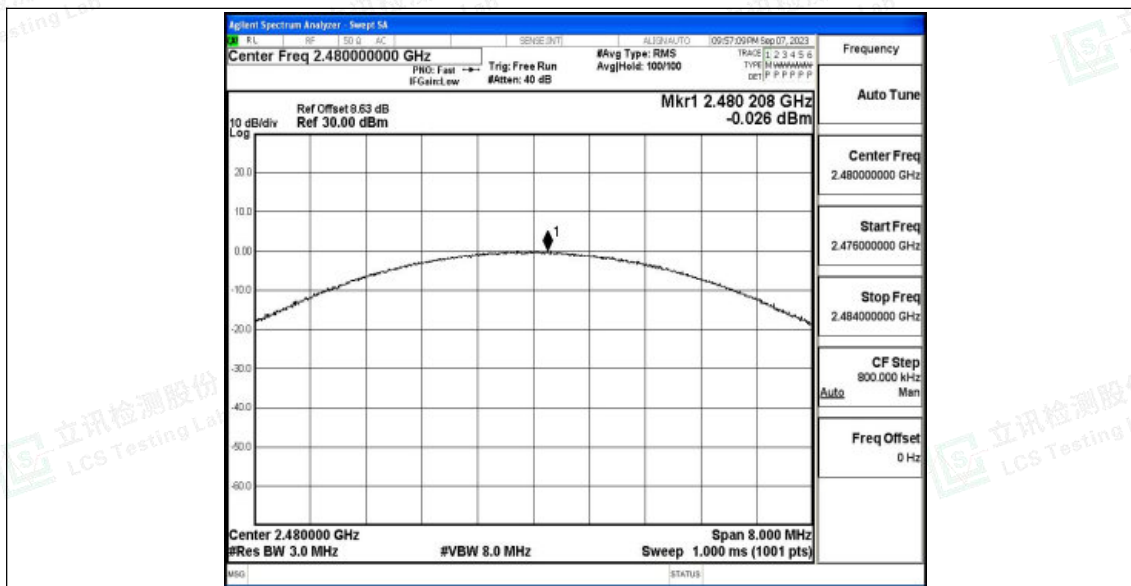


3DH5_Ant1_2480





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A.3 Carrier frequency separation

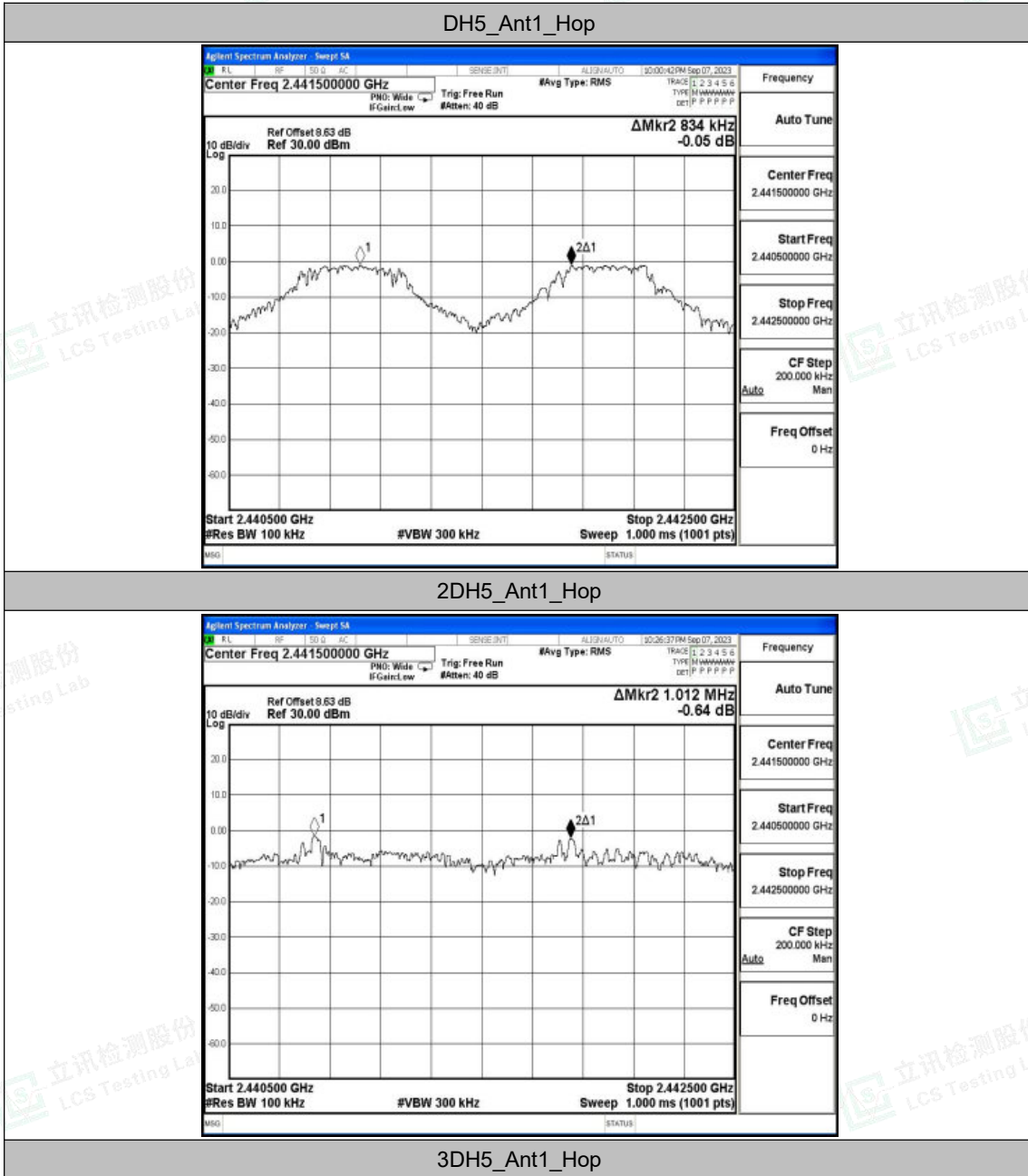
Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.834	≥0.690	PASS
2DH5	Ant1	Hop	1.012	≥0.892	PASS
3DH5	Ant1	Hop	1.108	≥0.860	PASS



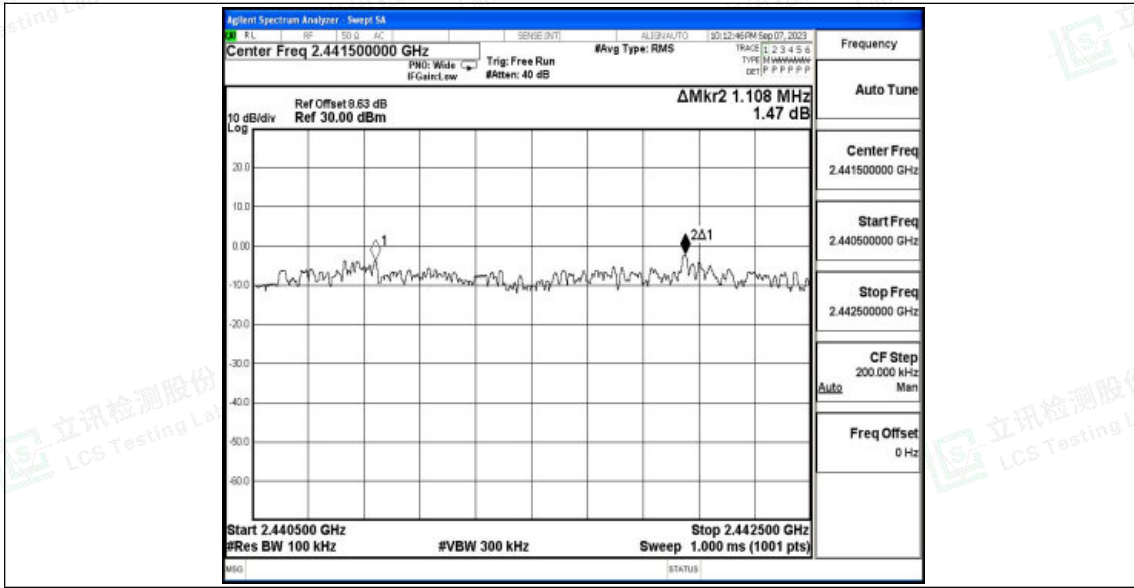


Test Graphs





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A.4 Time of occupancy

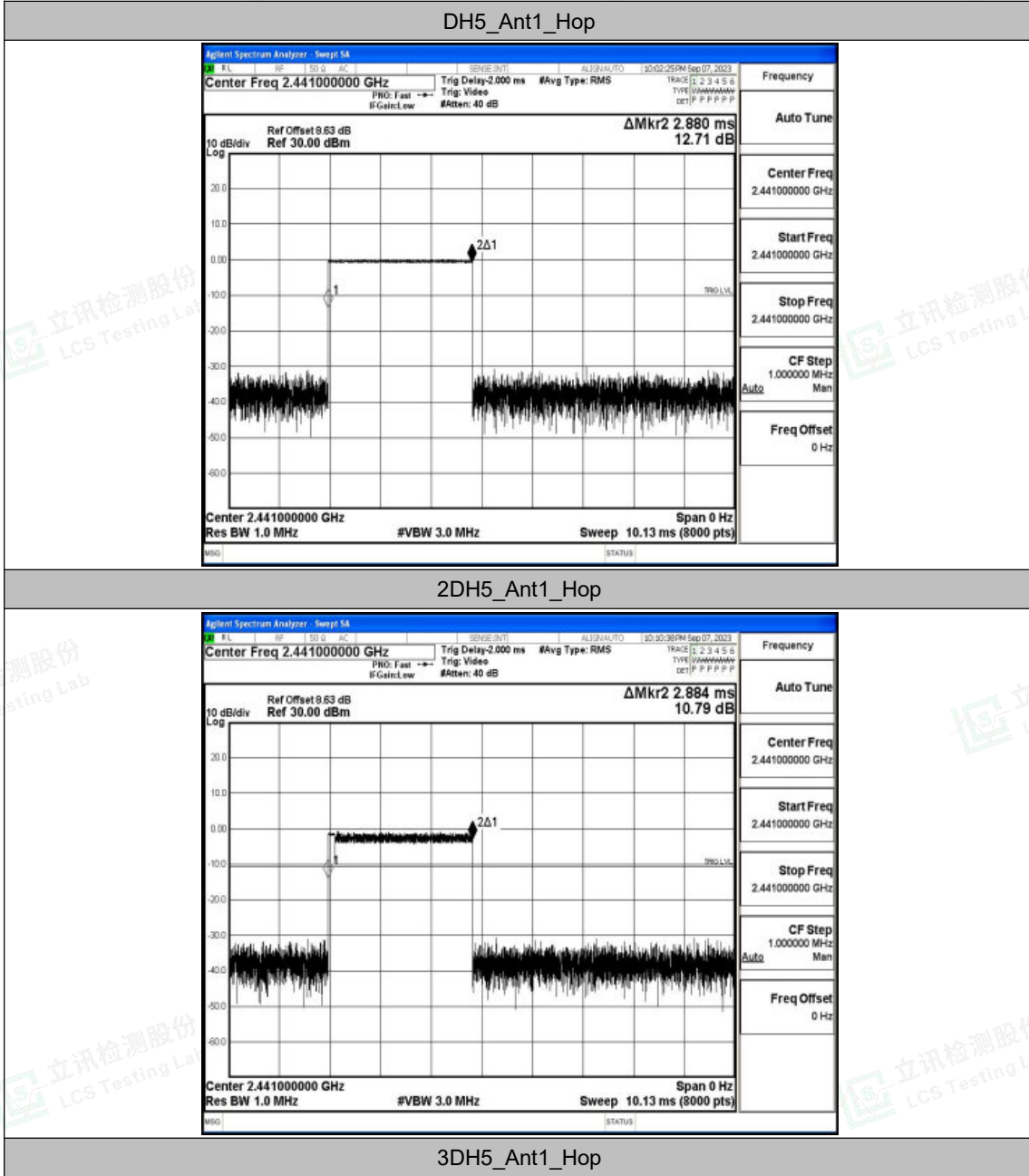
Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.880	106.67	0.307	≤0.4	PASS
2DH5	Ant1	Hop	2.884	106.67	0.308	≤0.4	PASS
3DH5	Ant1	Hop	2.885	106.67	0.308	≤0.4	PASS



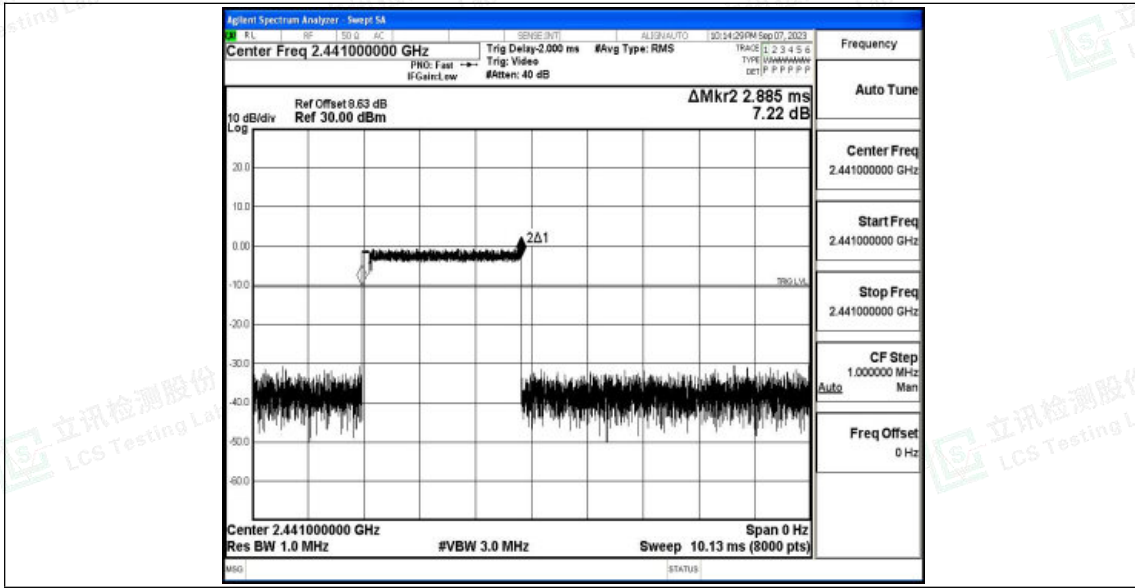


Test Graphs





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A.5 Number of hopping channels

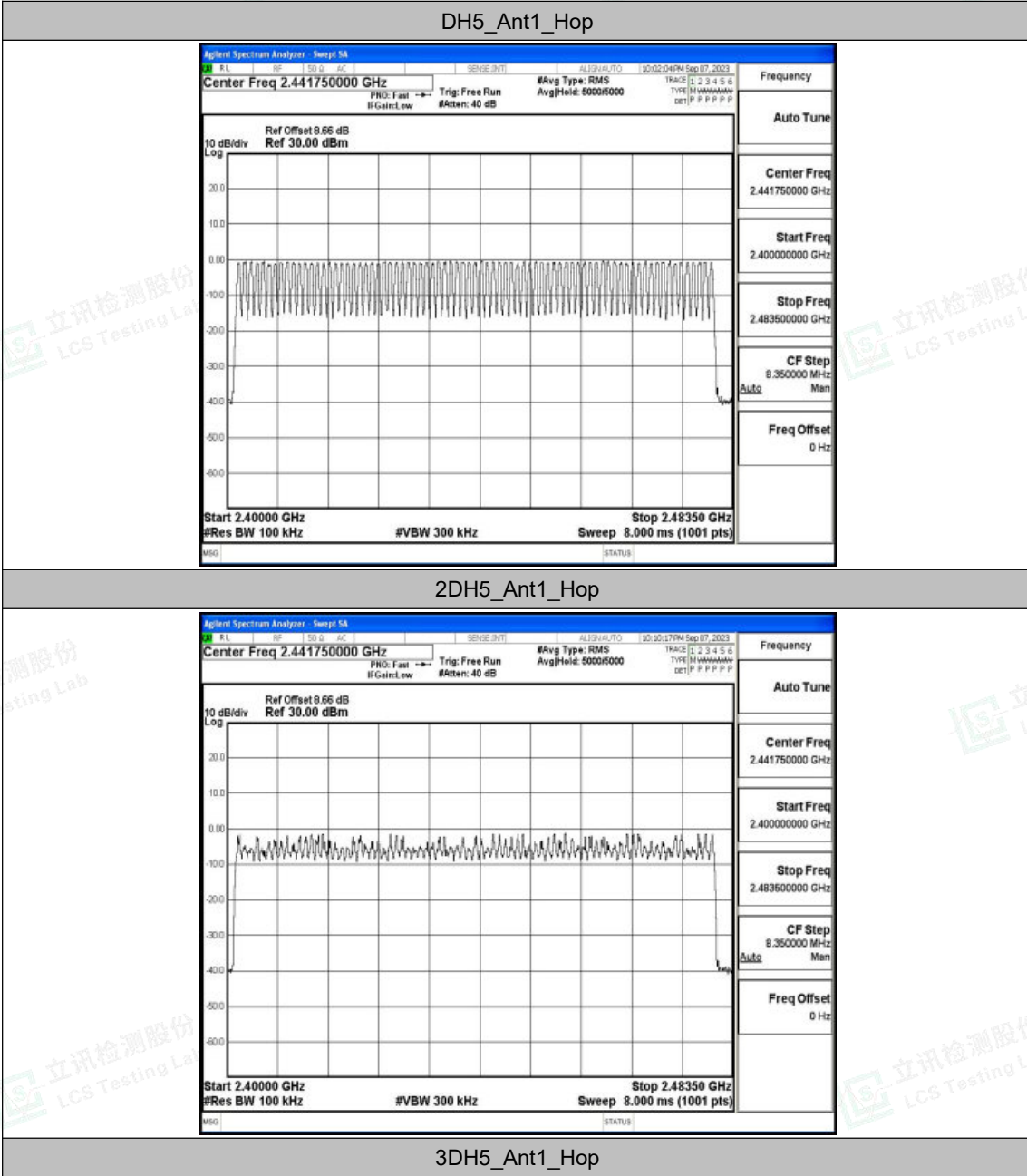
Test Result

TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS



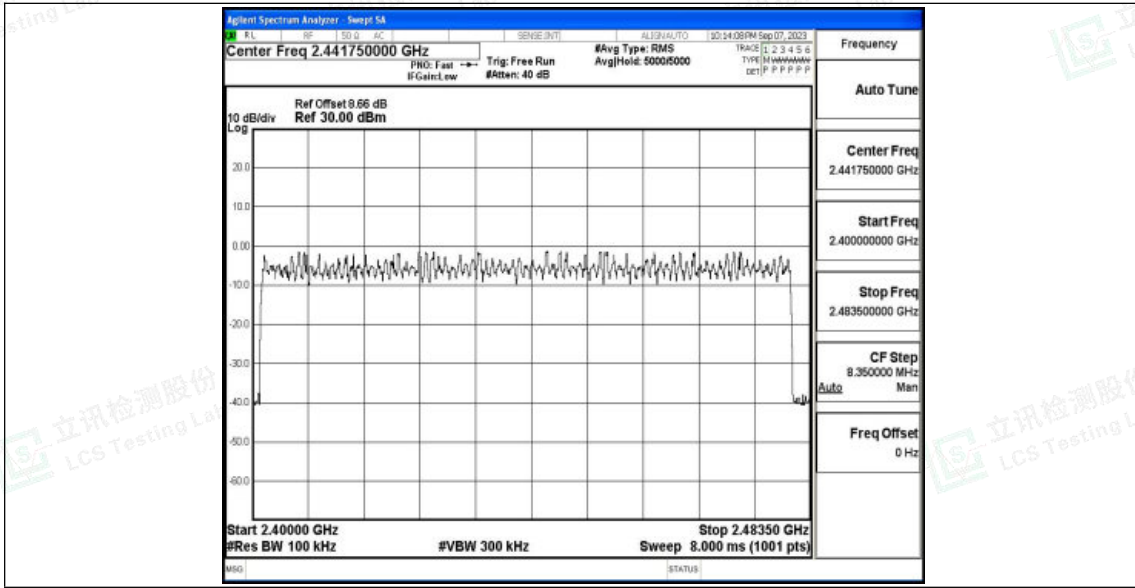


Test Graphs





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A.6 Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-0.58	-50.47	≤-20.58	PASS
		High	2480	-0.93	-47.97	≤-20.93	PASS
		Low	Hop_2402	-1.32	-48.48	≤-21.32	PASS
		High	Hop_2480	-0.68	-47.58	≤-20.68	PASS
2DH5	Ant1	Low	2402	-5.23	-49.5	≤-25.23	PASS
		High	2480	-5.19	-48.84	≤-25.19	PASS
		Low	Hop_2402	-2.45	-49.21	≤-22.45	PASS
		High	Hop_2480	-3.86	-48.07	≤-23.86	PASS
3DH5	Ant1	Low	2402	-5.38	-50.19	≤-25.38	PASS
		High	2480	-3.68	-49.42	≤-23.68	PASS
		Low	Hop_2402	-3.68	-49.37	≤-23.68	PASS
		High	Hop_2480	-1.88	-47.76	≤-21.88	PASS



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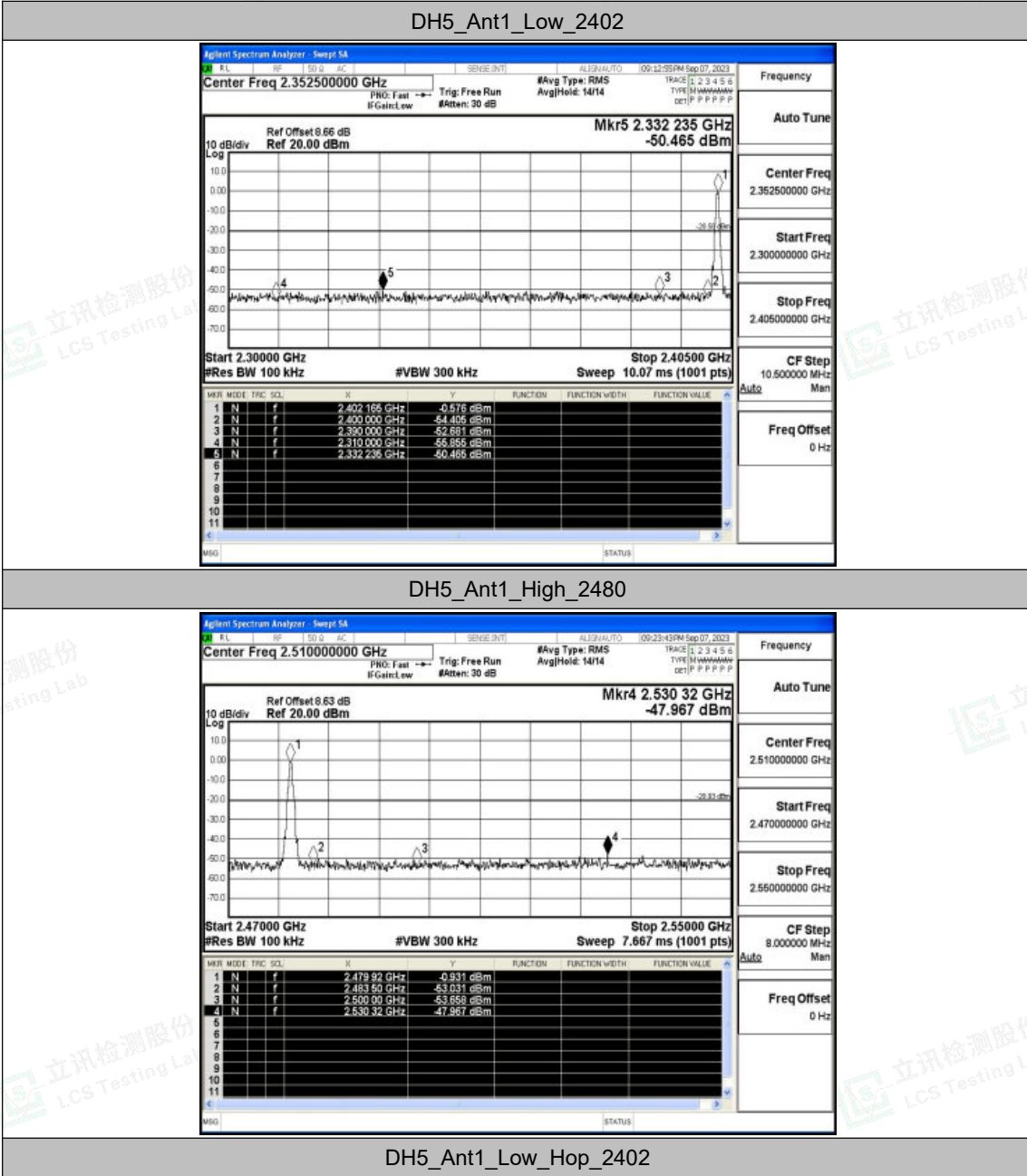
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

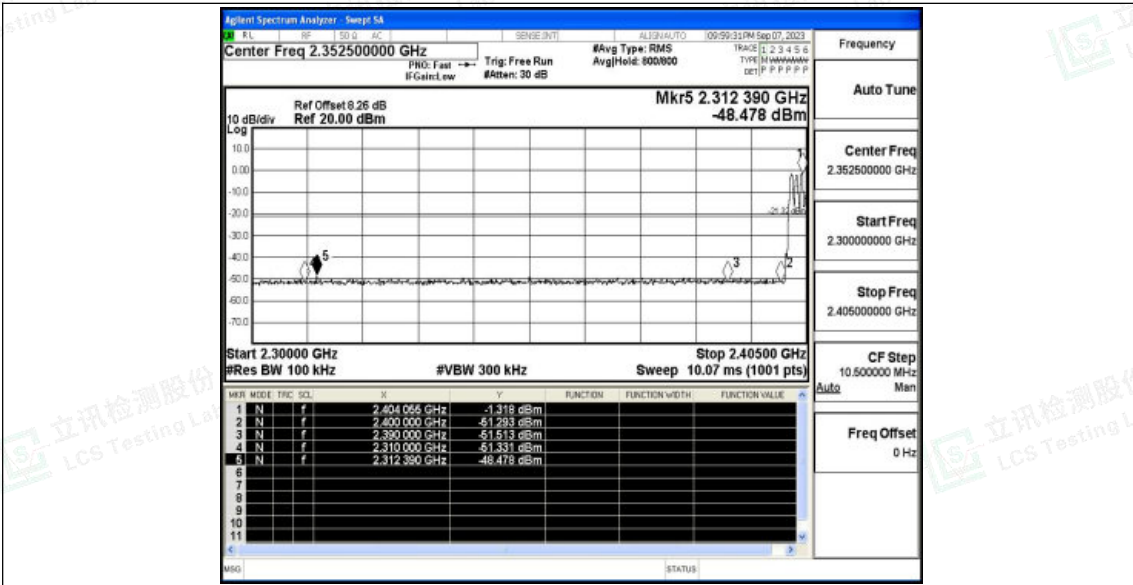
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

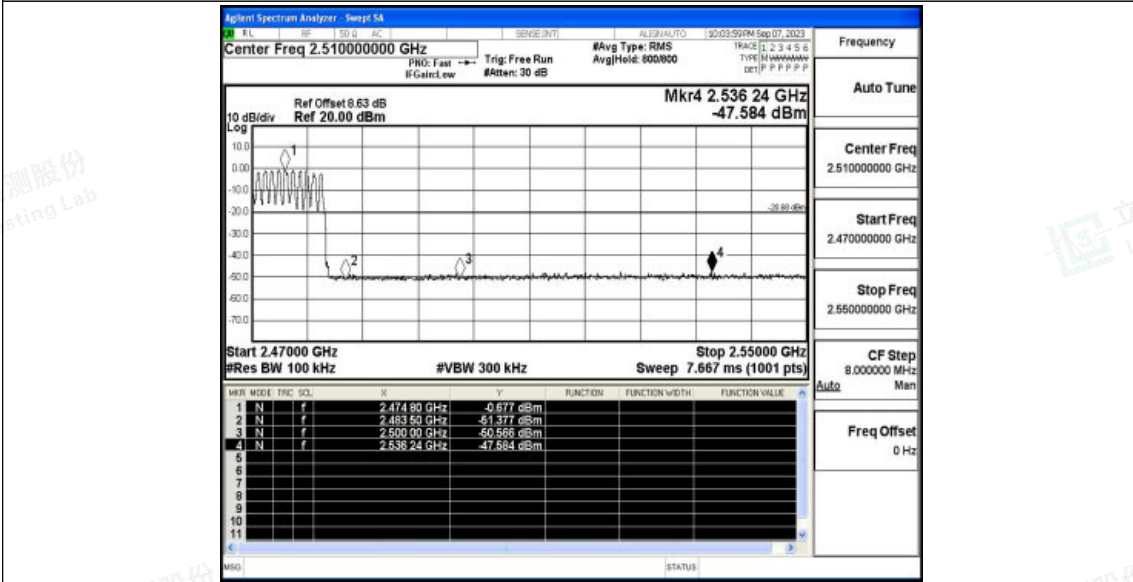


Test Graphs





DH5_Ant1_High_Hop_2480

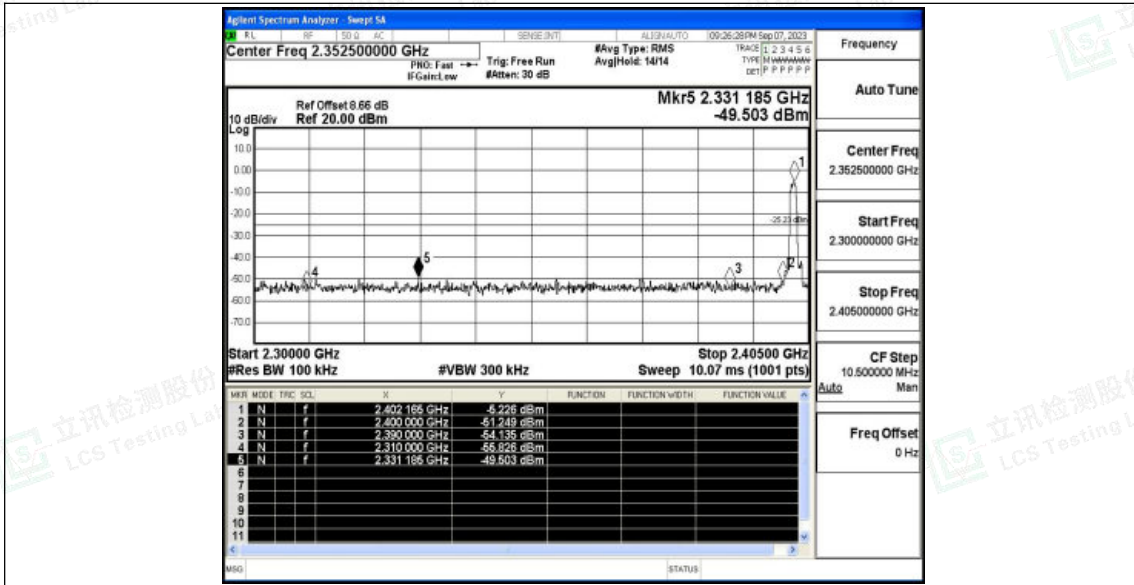


2DH5_Ant1_Low_2402

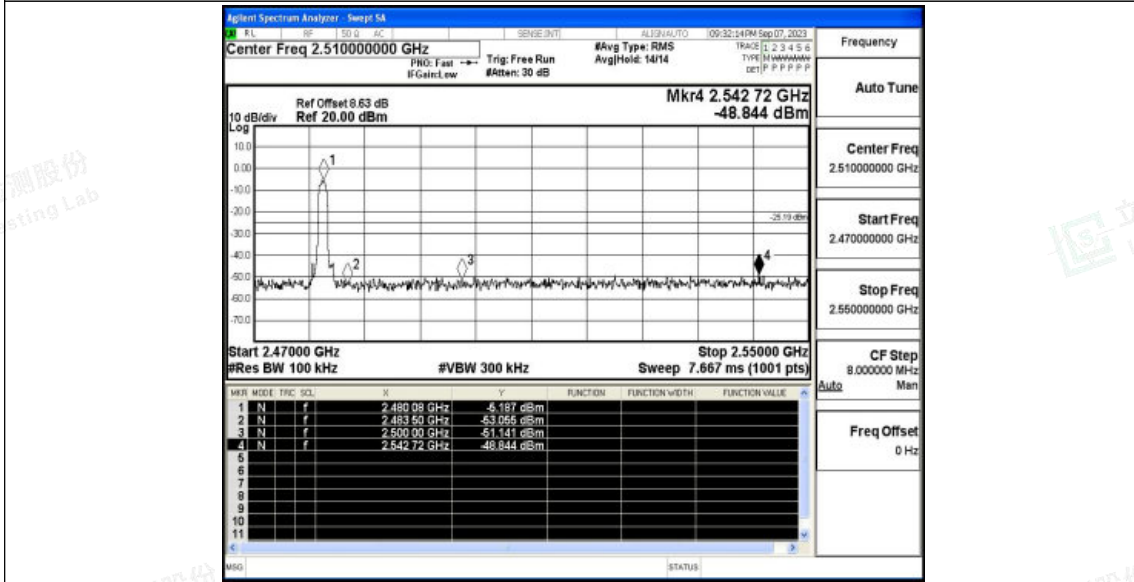




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2DH5_Ant1_High_2480

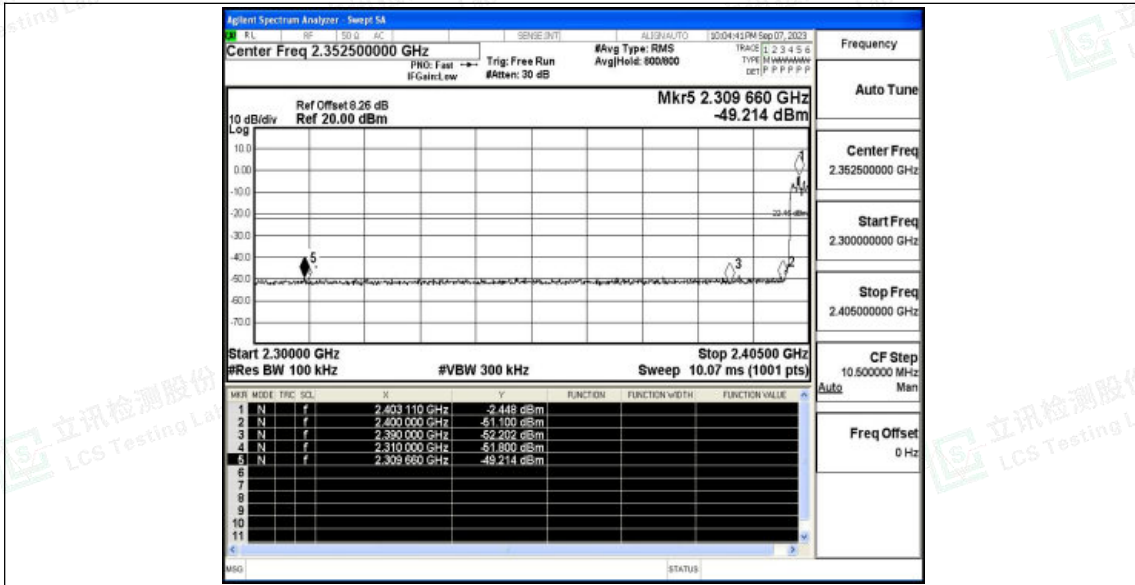


2DH5_Ant1_Low_Hop_2402

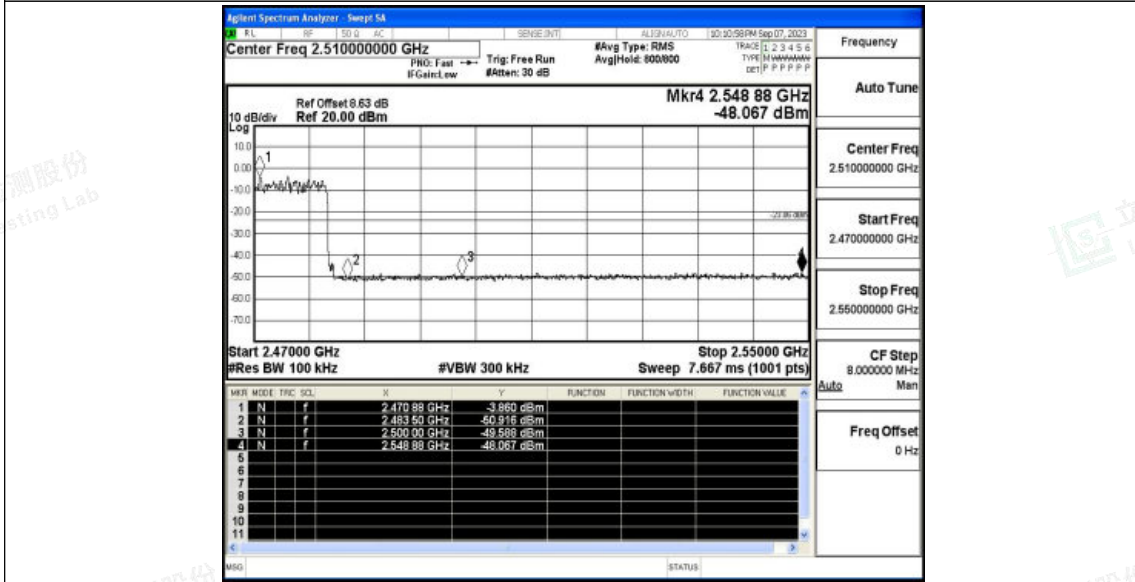




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2DH5_Ant1_High_Hop_2480

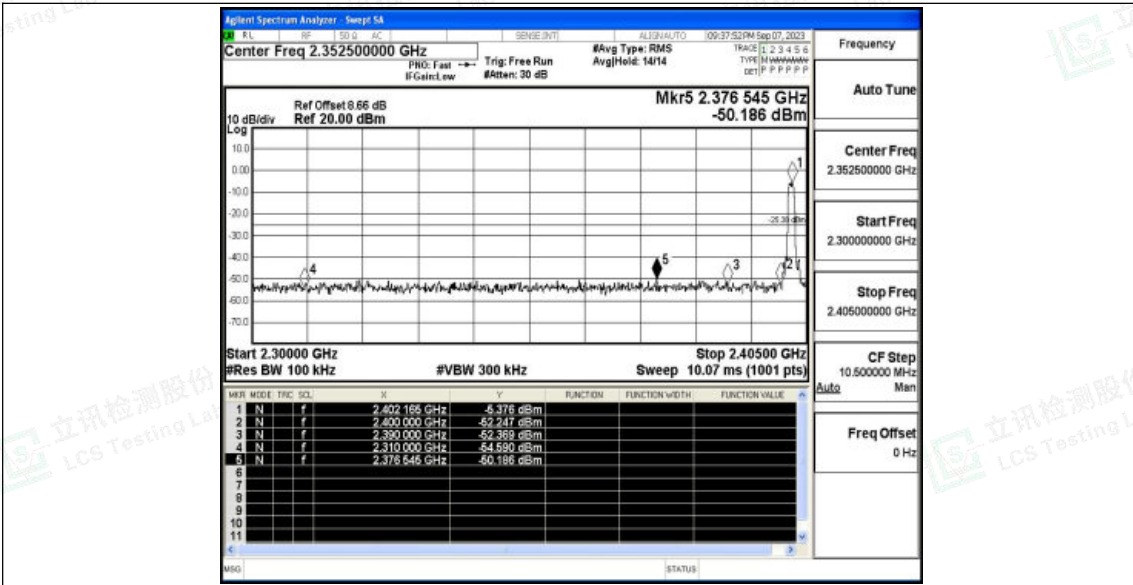


3DH5_Ant1_Low_2402

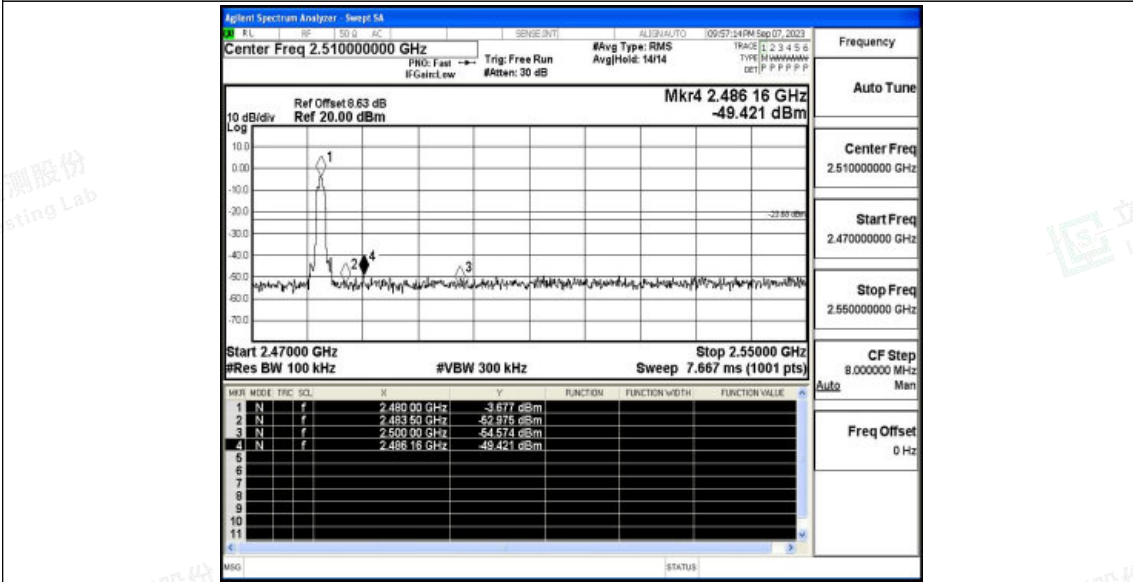




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3DH5_Ant1_High_2480

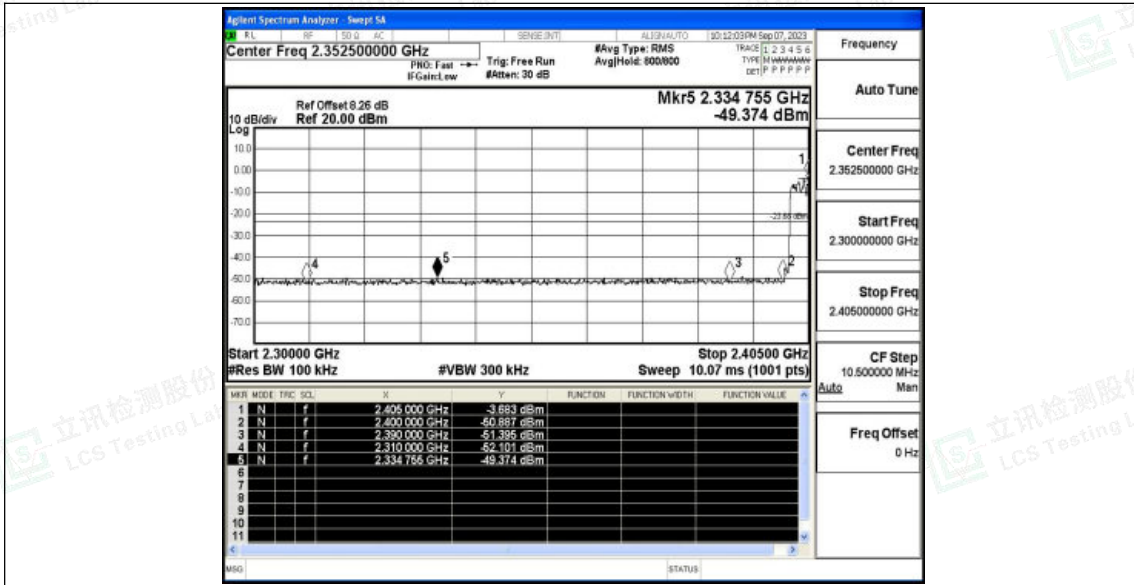


3DH5_Ant1_Low_Hop_2402

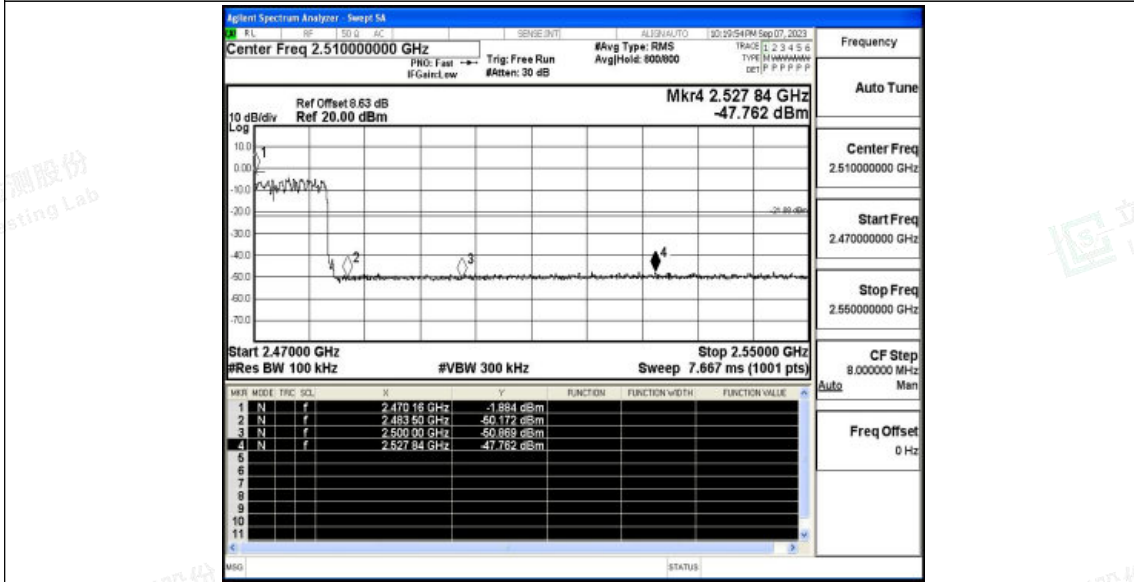




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3DH5_Ant1_High_Hop_2480





A.7 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-0.83	-0.83	---	PASS
			30~1000	-0.83	-60.8	≤-20.83	PASS
			1000~26500	-0.83	-46.36	≤-20.83	PASS
		2441	Reference	-0.81	-0.81	---	PASS
			30~1000	-0.81	-60.67	≤-20.81	PASS
			1000~26500	-0.81	-46.76	≤-20.81	PASS
		2480	Reference	-0.87	-0.87	---	PASS
			30~1000	-0.87	-60.04	≤-20.87	PASS
			1000~26500	-0.87	-45.39	≤-20.87	PASS
2DH5	Ant1	2402	Reference	-1.70	-1.70	---	PASS
			30~1000	-1.70	-60.72	≤-21.7	PASS
			1000~26500	-1.70	-46.12	≤-21.7	PASS
		2441	Reference	-2.17	-2.17	---	PASS
			30~1000	-2.17	-61.01	≤-22.17	PASS
			1000~26500	-2.17	-46.84	≤-22.17	PASS
		2480	Reference	-2.39	-2.39	---	PASS
			30~1000	-2.39	-61.35	≤-22.39	PASS
			1000~26500	-2.39	-45.25	≤-22.39	PASS
3DH5	Ant1	2402	Reference	-2.80	-2.80	---	PASS
			30~1000	-2.80	-71.93	≤-22.8	PASS
			1000~26500	-2.80	-46.03	≤-22.8	PASS
		2441	Reference	-2.16	-2.16	---	PASS
			30~1000	-2.16	-60.68	≤-22.16	PASS
			1000~26500	-2.16	-46.4	≤-22.16	PASS
		2480	Reference	-1.46	-1.46	---	PASS
			30~1000	-1.46	-60.71	≤-21.46	PASS
			1000~26500	-1.46	-45.91	≤-21.46	PASS



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Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

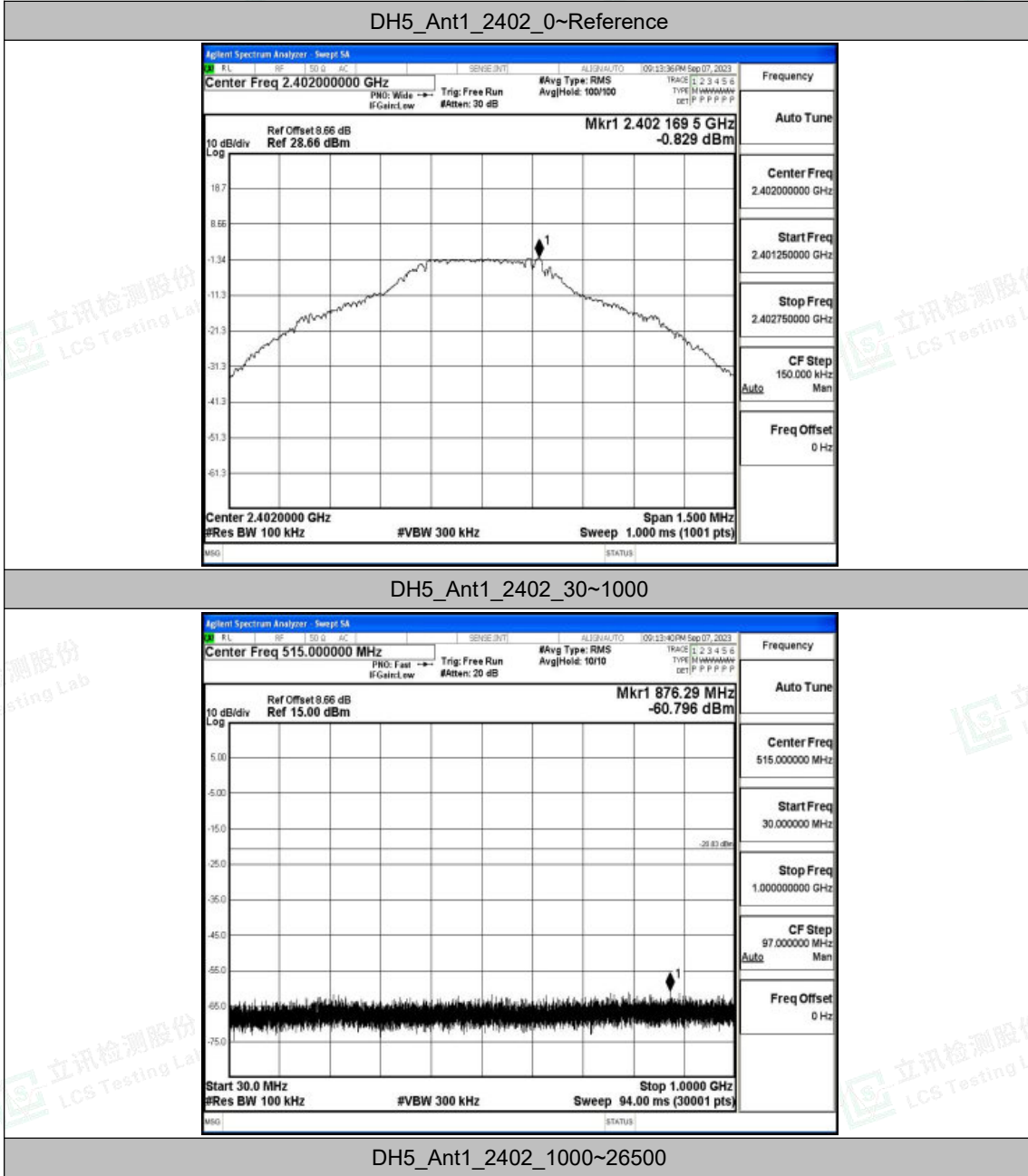
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



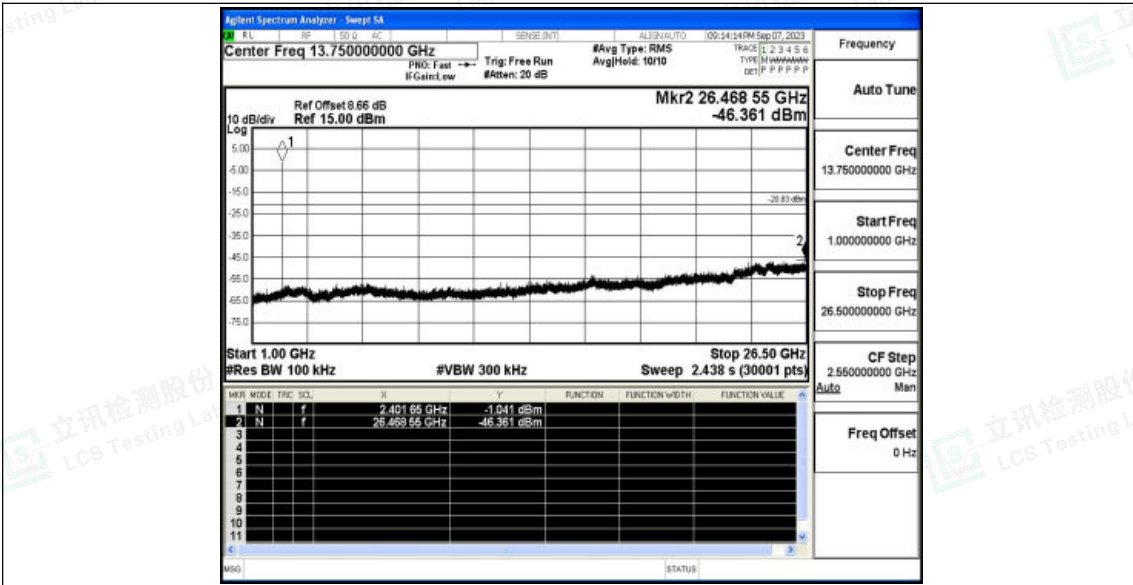
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Test Graphs

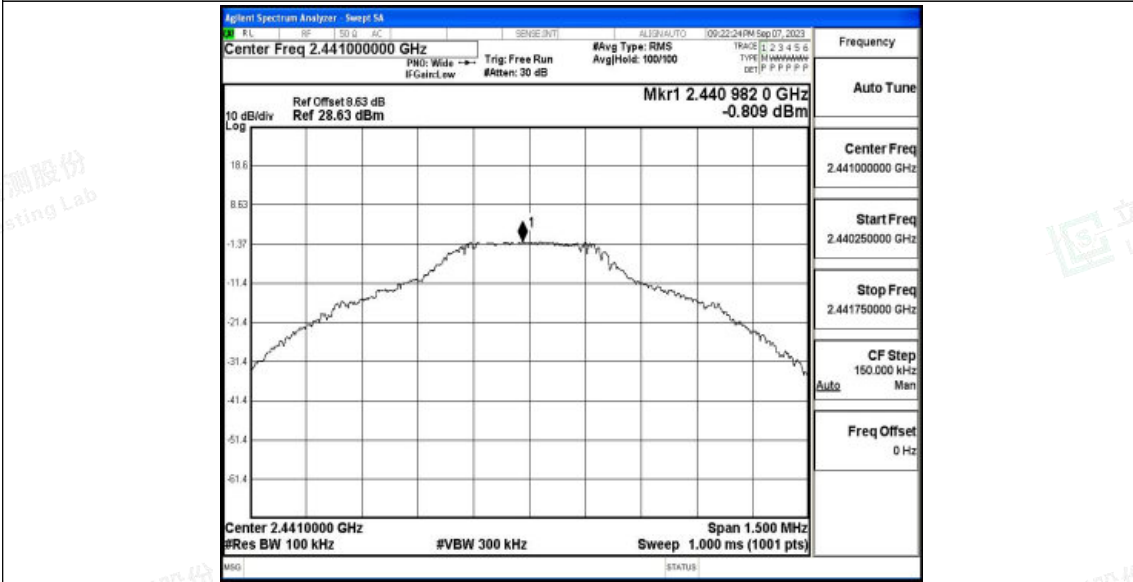




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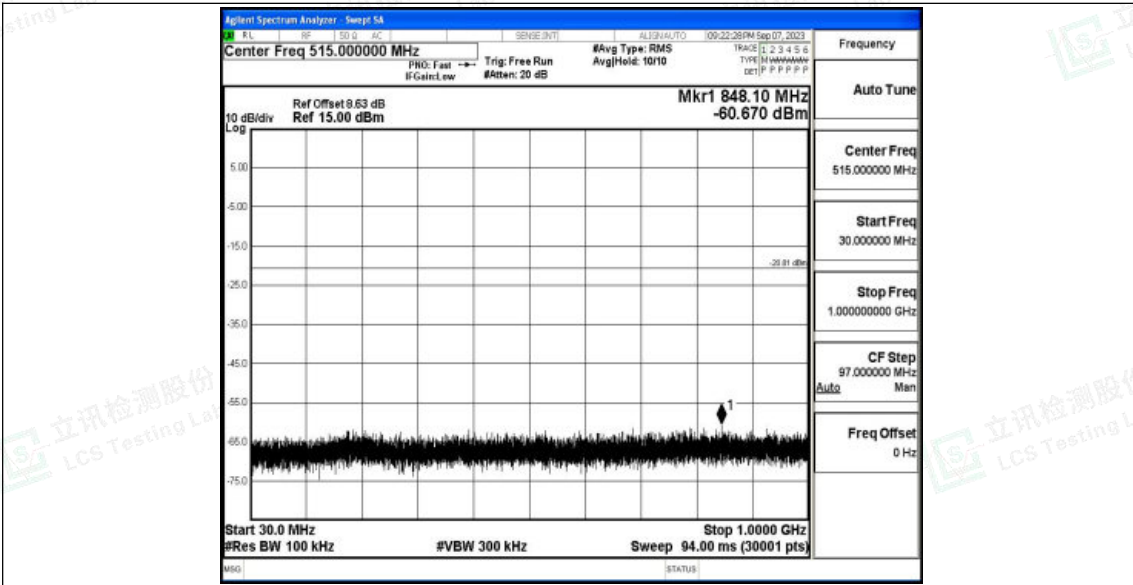


DH5_Ant1_2441_0~Reference

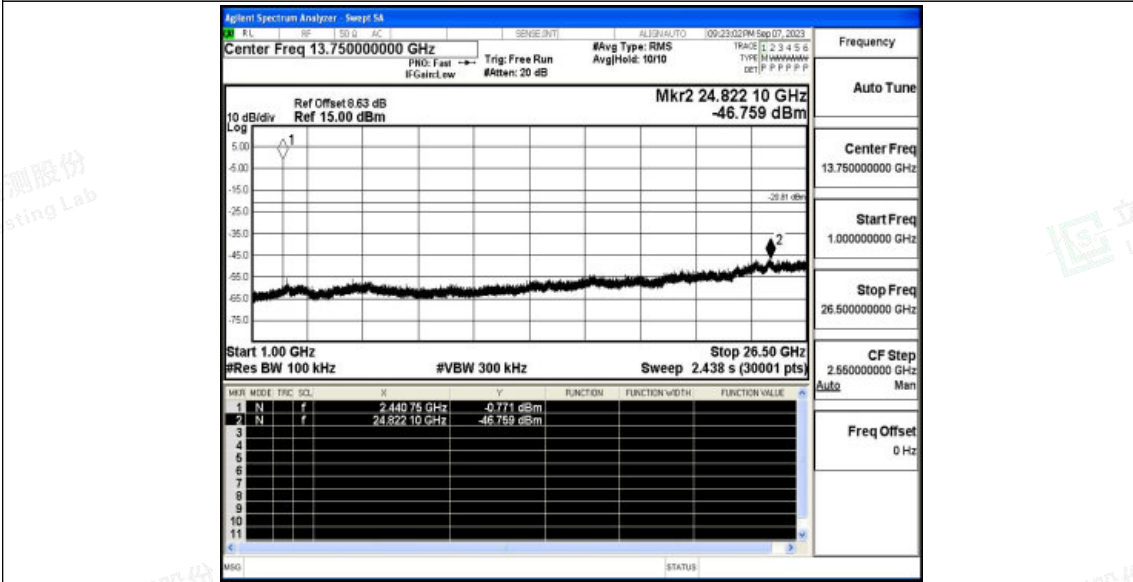


DH5_Ant1_2441_30~1000





DH5_Ant1_2441_1000~26500

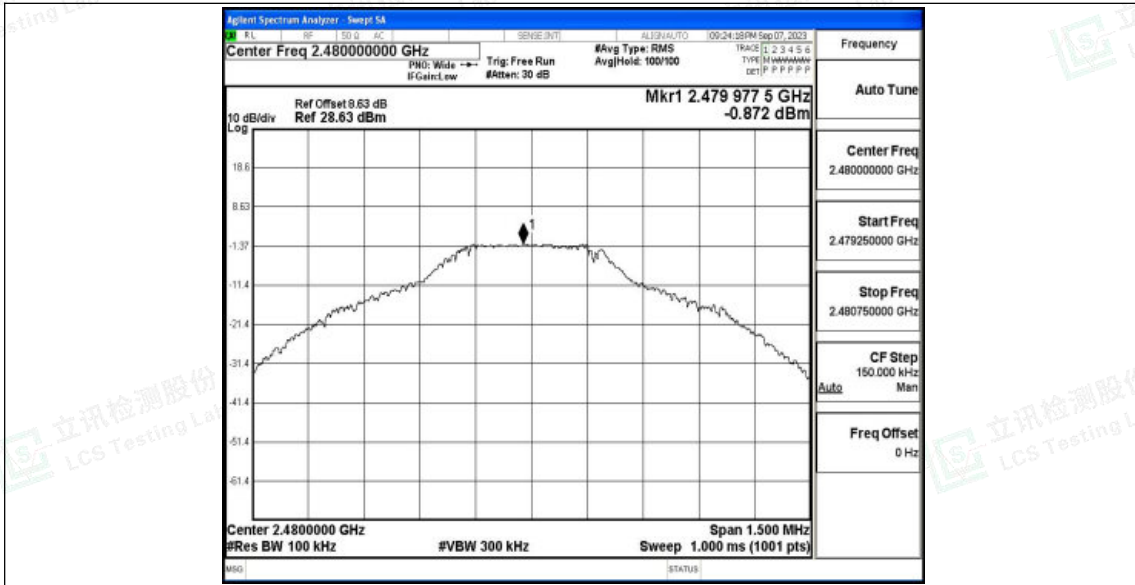


DH5_Ant1_2480_0~Reference

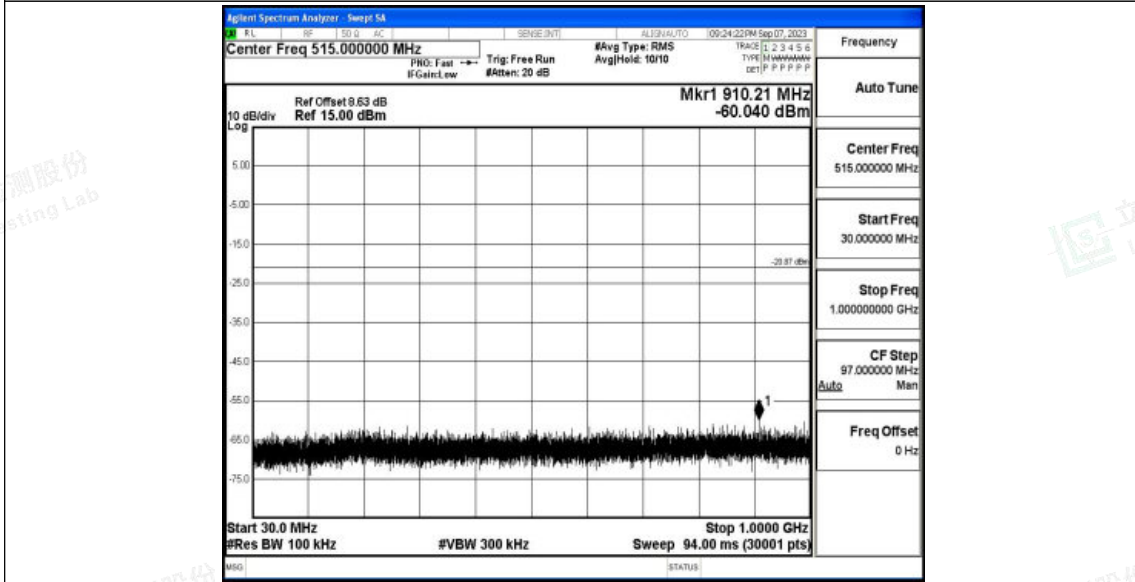




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DH5_Ant1_2480_30~1000

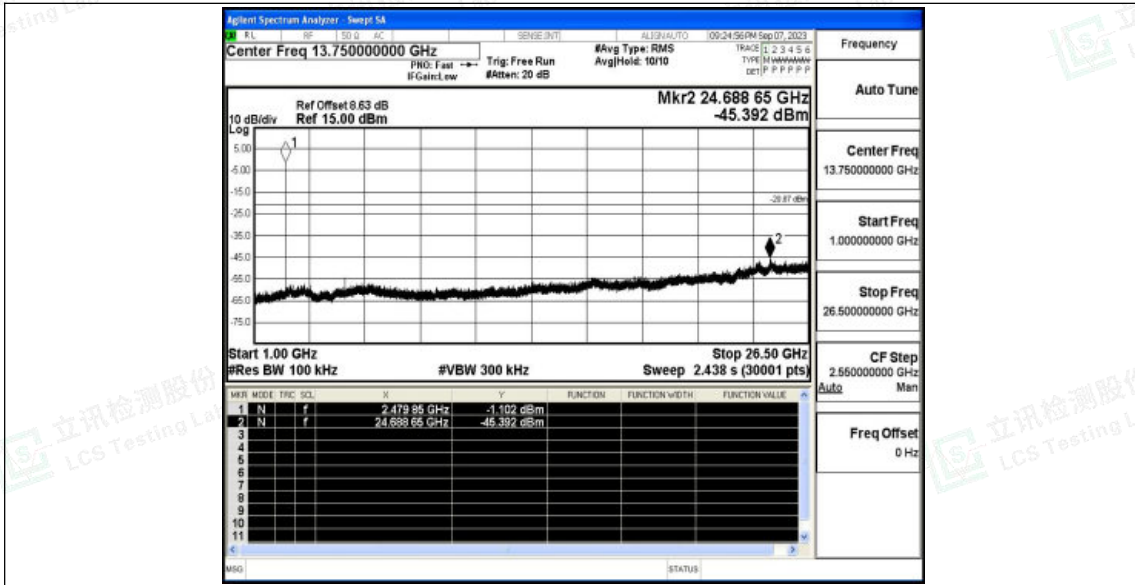


DH5_Ant1_2480_1000~26500

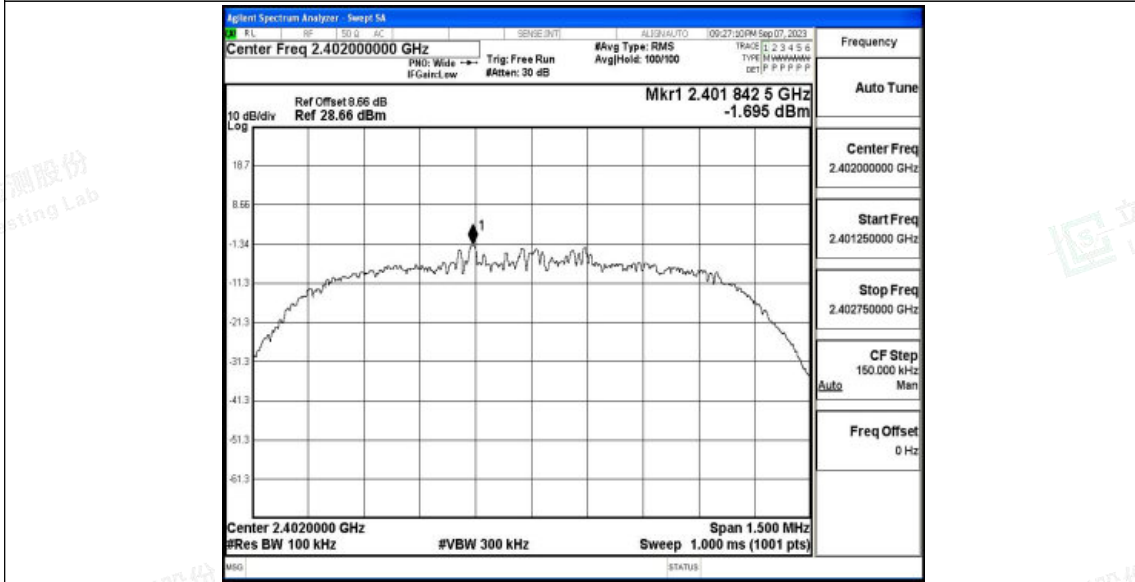




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2DH5_Ant1_2402_0~Reference

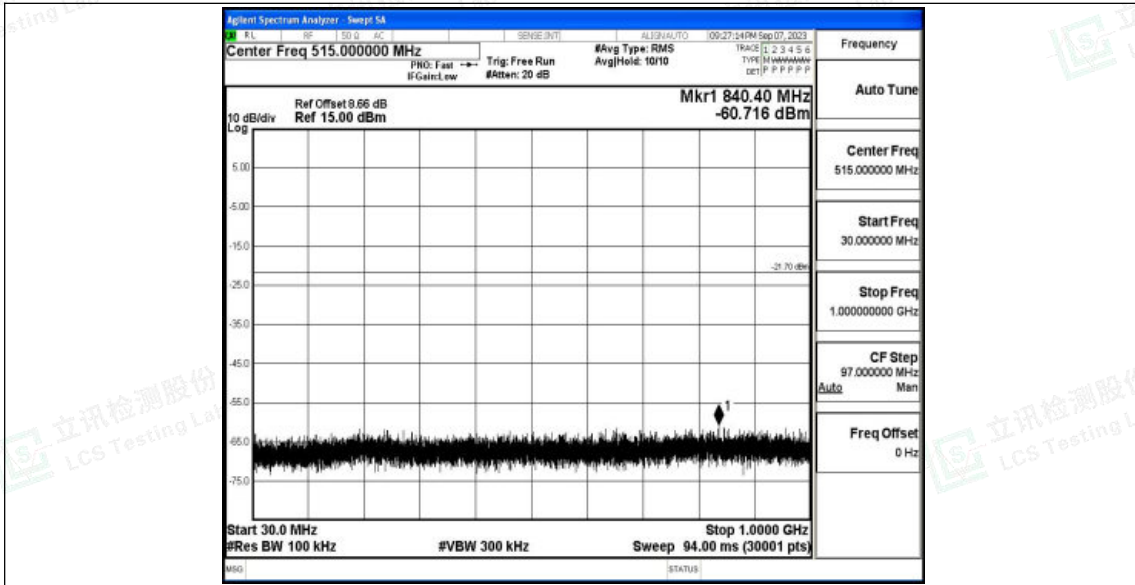


2DH5_Ant1_2402_30~1000

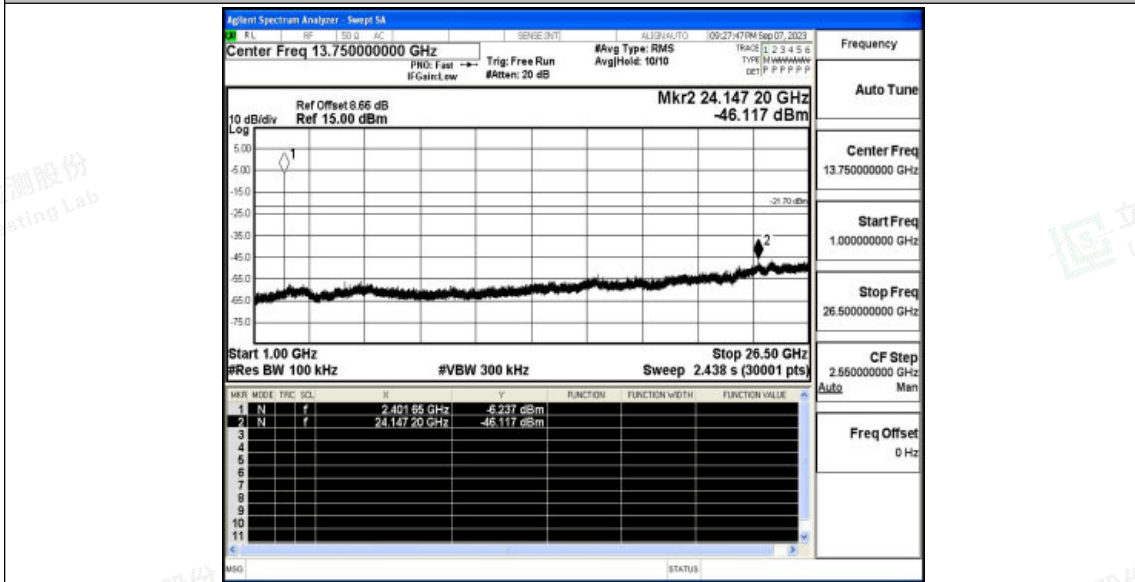




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2DH5_Ant1_2402_1000~26500

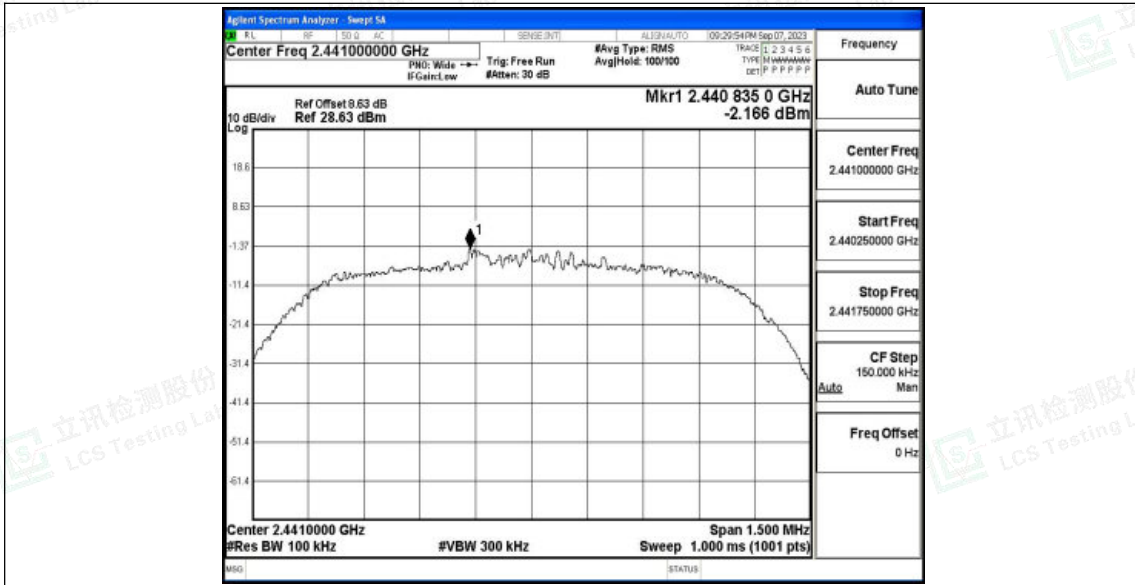


2DH5_Ant1_2441_0~Reference

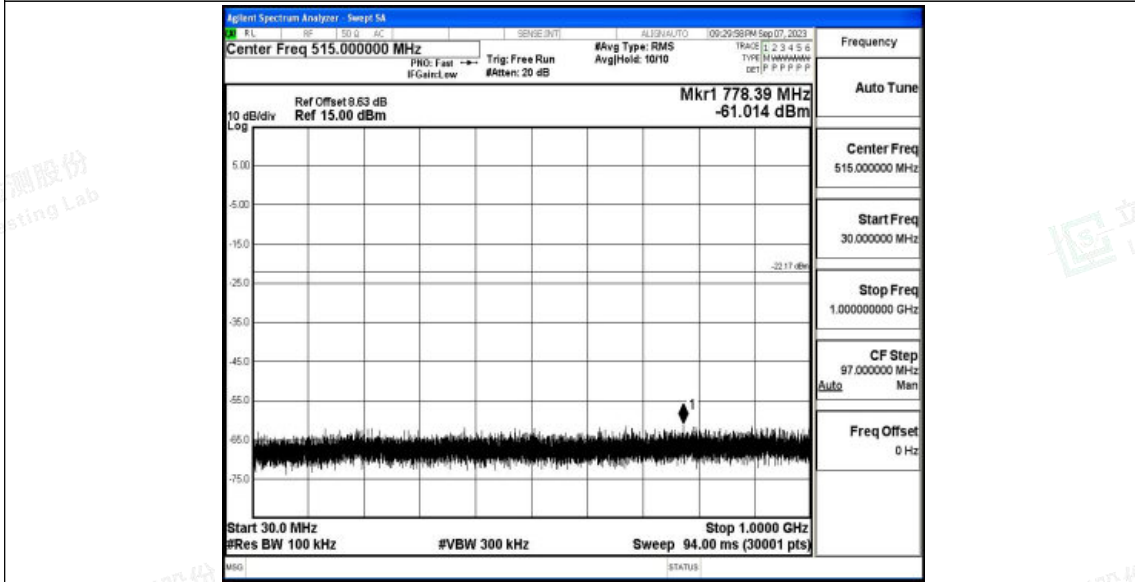




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2DH5_Ant1_2441_30~1000

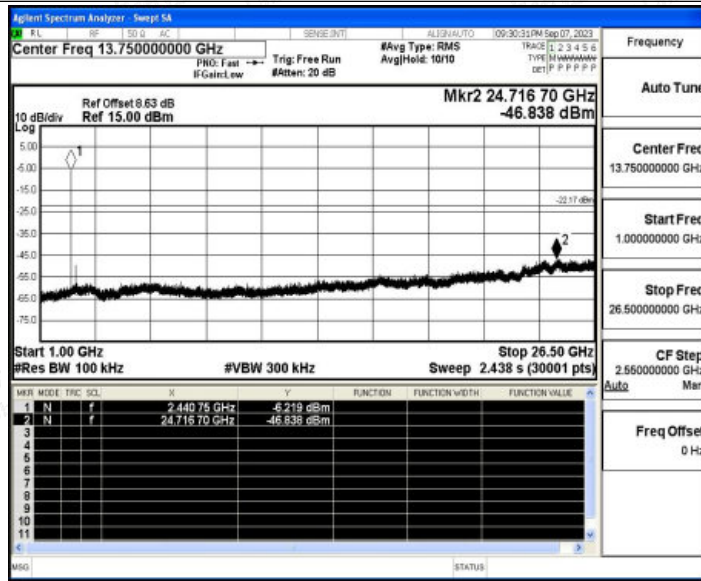


2DH5_Ant1_2441_1000~26500

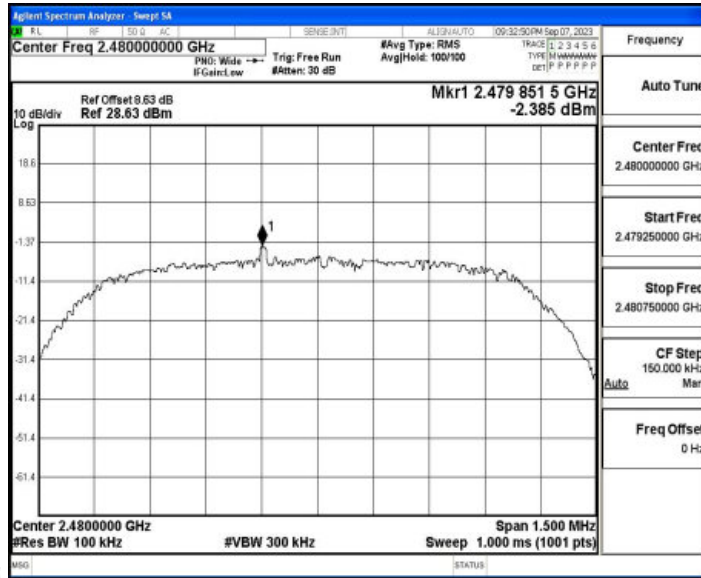




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2DH5_Ant1_2480_0~Reference

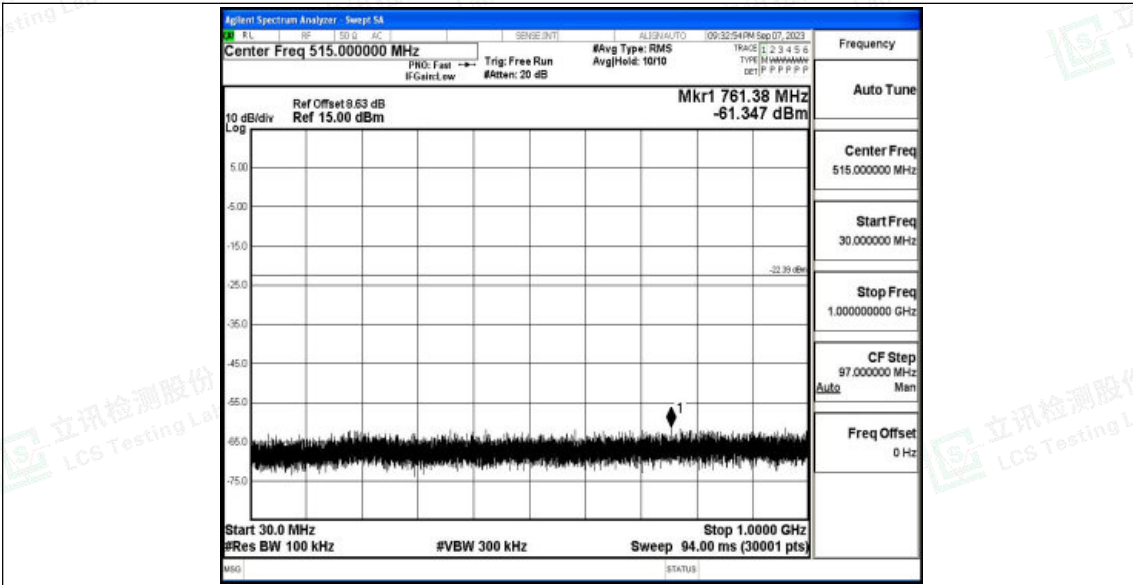


2DH5_Ant1_2480_30~1000

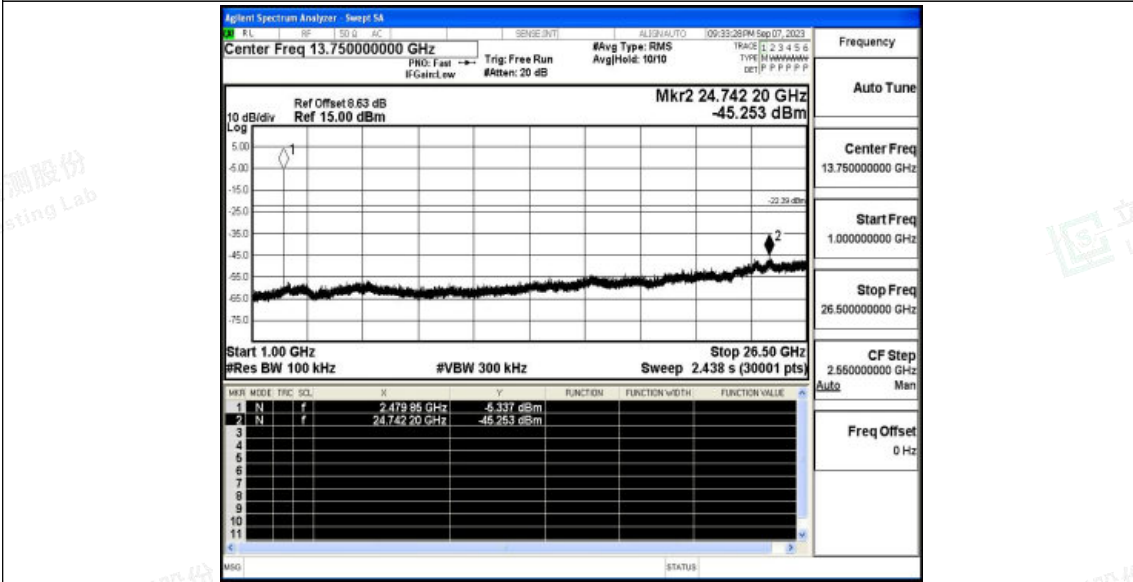




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2DH5_Ant1_2480_1000~26500

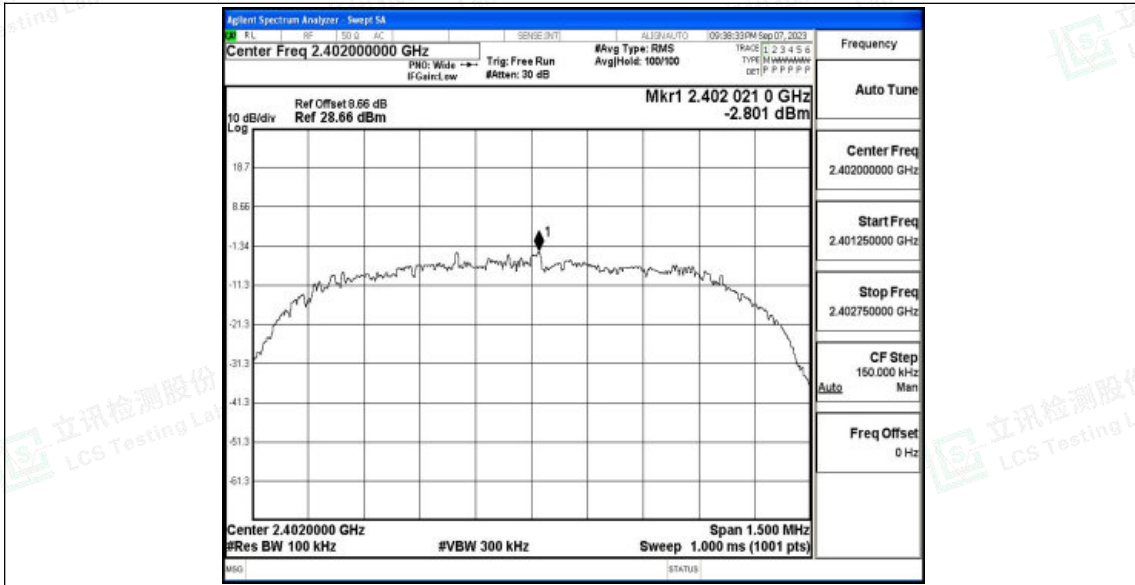


3DH5_Ant1_2402_0~Reference

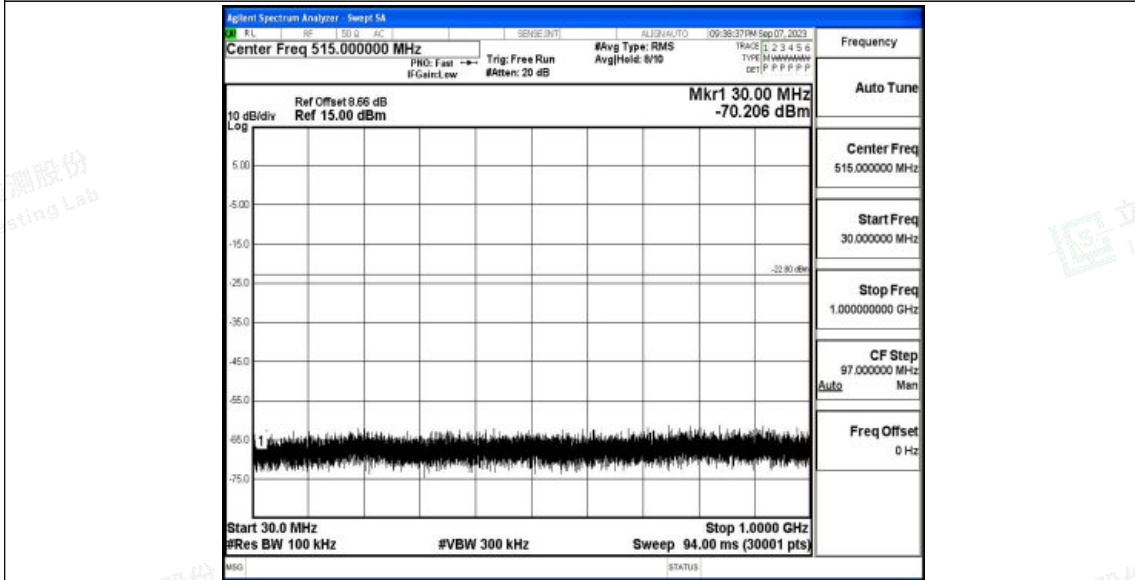




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3DH5_Ant1_2402_30~1000

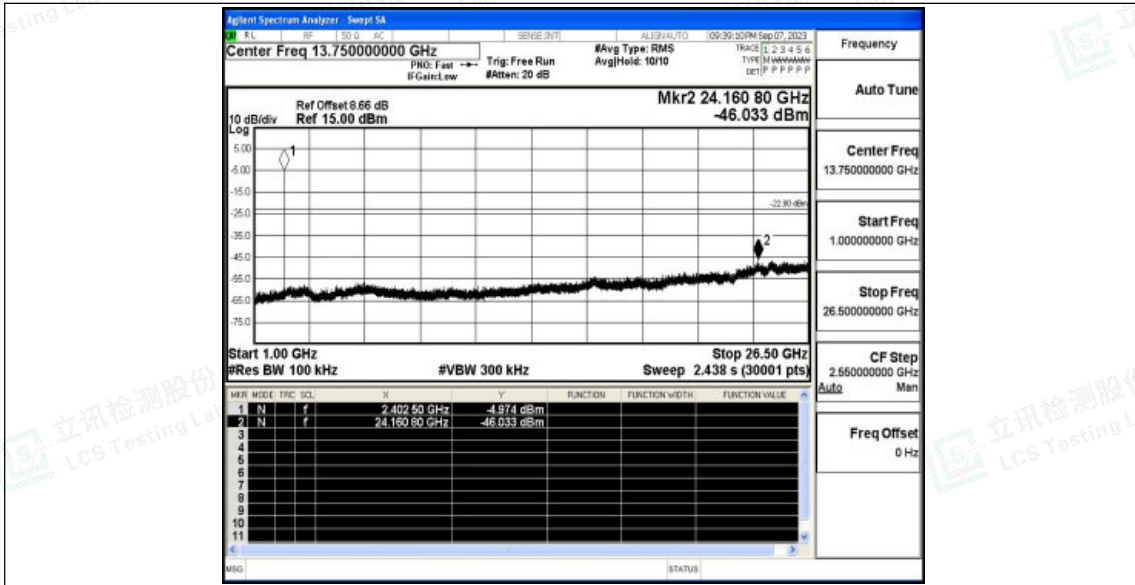


3DH5_Ant1_2402_1000~26500

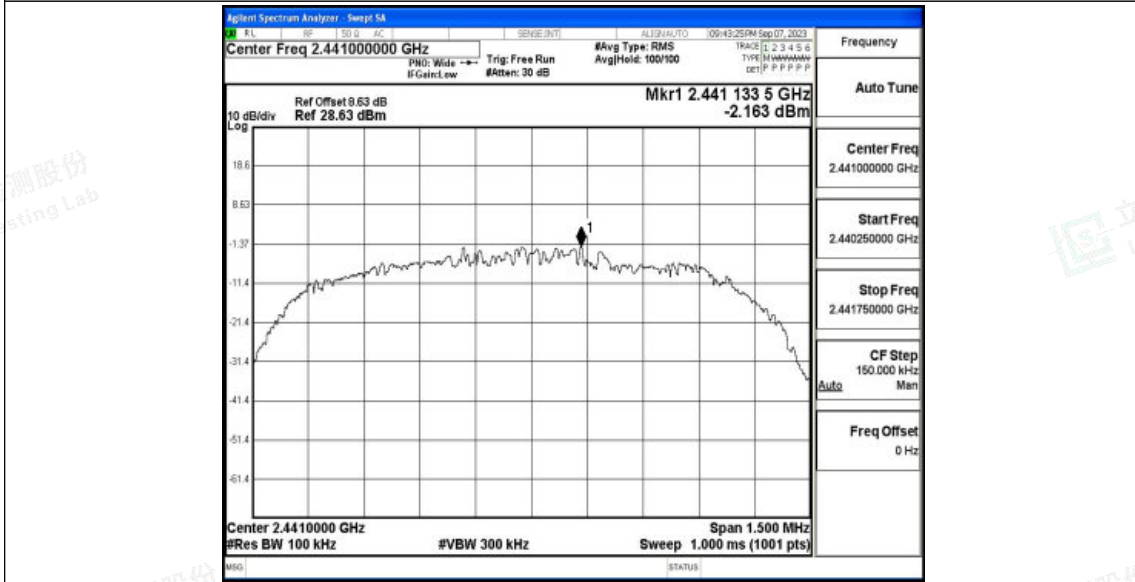




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3DH5_Ant1_2441_0~Reference

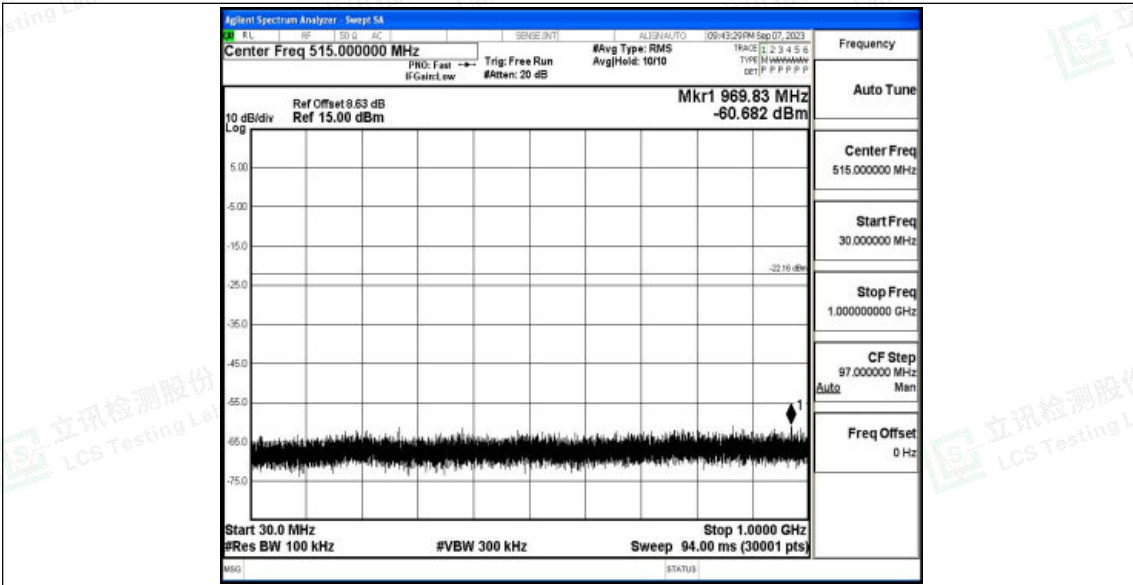


3DH5_Ant1_2441_30~1000

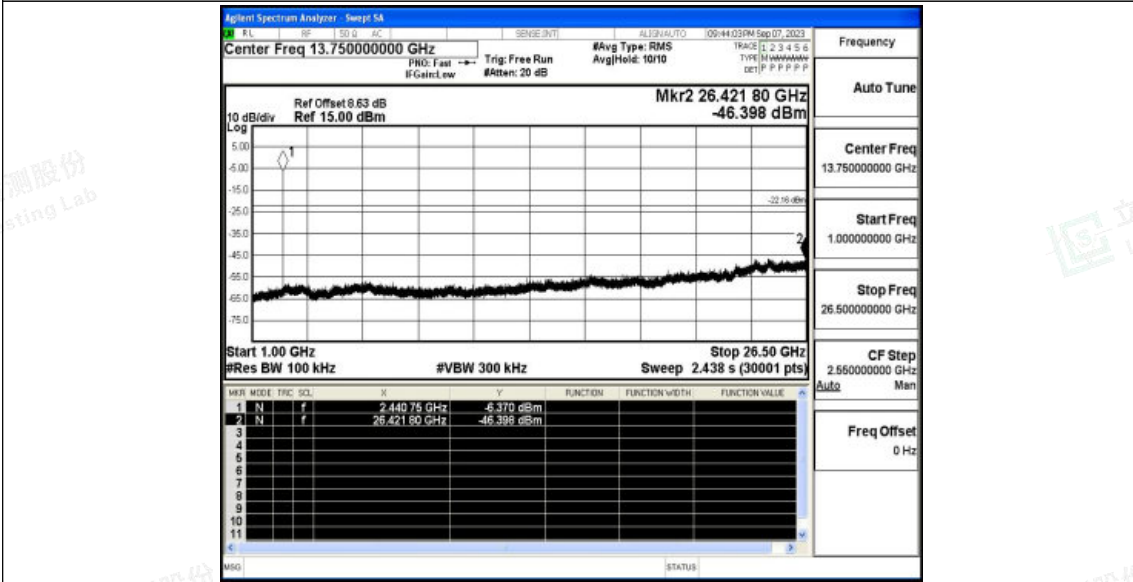




LCSA0013121EA



3DH5_Ant1_2441_1000~26500

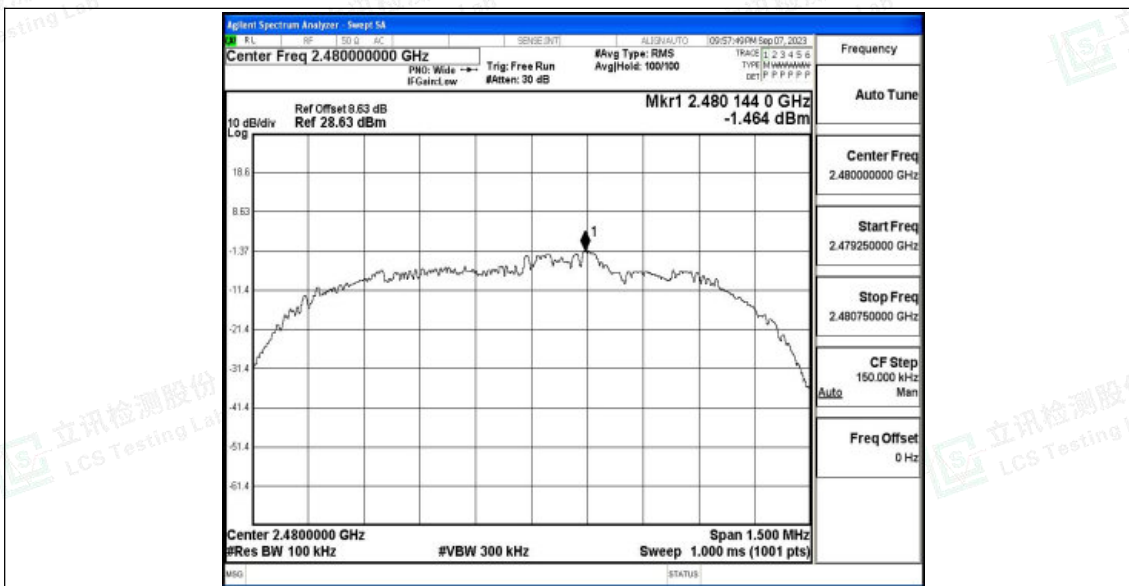


3DH5_Ant1_2480_0~Reference

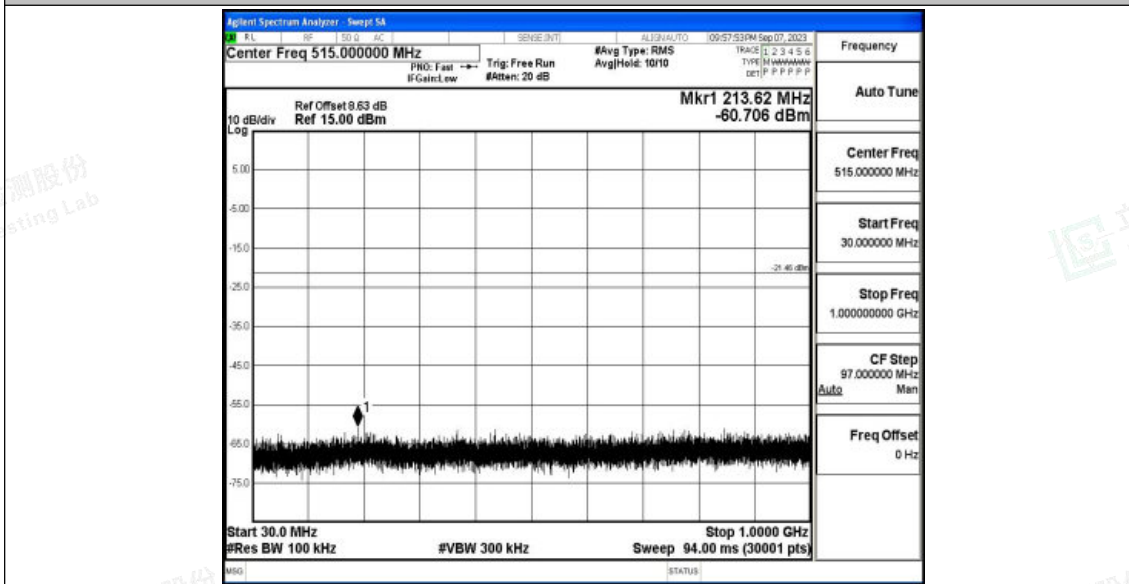




LCSA0013121EA



3DH5_Ant1_2480_30~1000

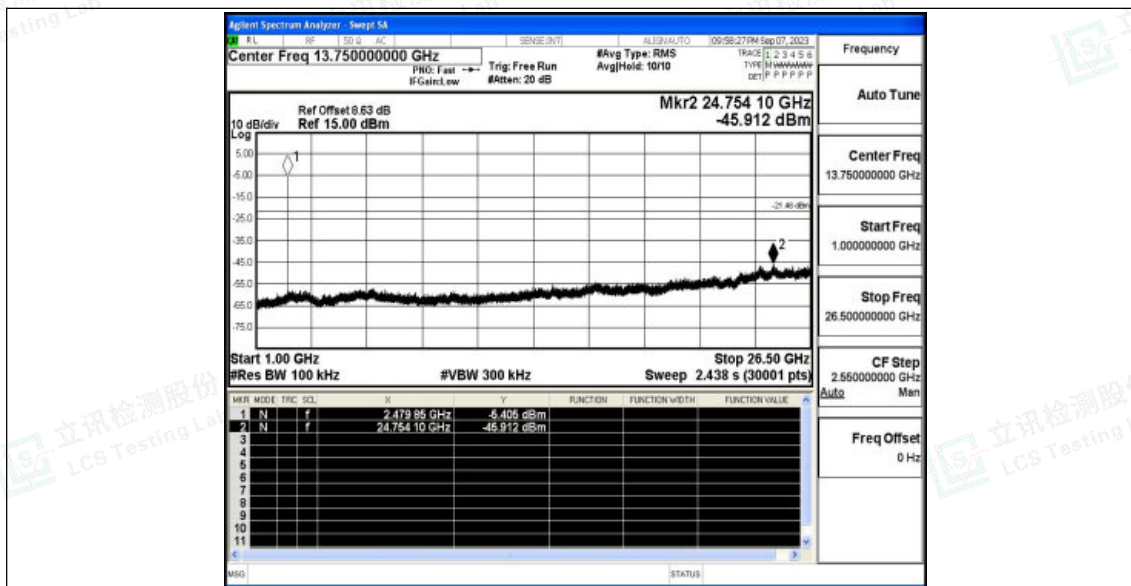


3DH5_Ant1_2480_1000~26500





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A.8 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict		
DH5	Ant1	Low	2402	AV	2310.000	-48.09	≤-41.20	49.67	≤54	PASS		
				AV	2389.355	-47.53	≤-41.20	50.23	≤54	PASS		
				AV	2390.000	-47.79	≤-41.20	49.97	≤54	PASS		
				Peak	2310.000	-43.43	≤-21.20	54.33	≤74	PASS		
				Peak	2316.905	-38.42	≤-21.20	59.34	≤74	PASS		
				Peak	2390.000	-41.53	≤-21.20	56.23	≤74	PASS		
		High	2480	AV	2483.500	-47.14	≤-41.20	50.62	≤54	PASS		
				AV	2489.360	-47.03	≤-41.20	50.73	≤54	PASS		
				AV	2500.000	-47.11	≤-41.20	50.65	≤54	PASS		
				Peak	2483.500	-42.75	≤-21.20	55.01	≤74	PASS		
				Peak	2490.800	-37.43	≤-21.20	60.33	≤74	PASS		
				Peak	2500.000	-42.82	≤-21.20	54.94	≤74	PASS		
		Low	Hop_2402	Peak	2310.000	-40.16	≤-21.20	57.60	≤74	PASS		
				Peak	2382.530	-37.49	≤-21.20	60.27	≤74	PASS		
				Peak	2390.000	-40.1	≤-21.20	57.66	≤74	PASS		
		High	Hop_2480	Peak	2483.500	-39.34	≤-21.20	58.42	≤74	PASS		
				Peak	2489.600	-36.54	≤-21.20	61.22	≤74	PASS		
				Peak	2500.000	-39.21	≤-21.20	58.55	≤74	PASS		
		2DH5	Ant1	Low	2402	AV	2310.000	-48.13	≤-41.20	49.63	≤54	PASS
						AV	2385.365	-47.48	≤-41.20	50.28	≤54	PASS
						AV	2390.000	-47.68	≤-41.20	50.08	≤54	PASS
Peak	2310.000					-43.76	≤-21.20	54.00	≤74	PASS		
Peak	2389.145					-38.91	≤-21.20	58.85	≤74	PASS		
Peak	2390.000					-43.3	≤-21.20	54.46	≤74	PASS		
High	2480			AV	2483.500	-47.11	≤-41.20	50.65	≤54	PASS		
				AV	2499.360	-47.02	≤-41.20	50.74	≤54	PASS		
				AV	2500.000	-47.22	≤-41.20	50.54	≤54	PASS		
				Peak	2483.500	-42.72	≤-21.20	55.04	≤74	PASS		
				Peak	2491.920	-38.74	≤-21.20	59.02	≤74	PASS		
				Peak	2500.000	-40.36	≤-21.20	57.40	≤74	PASS		
Low	Hop_2402			Peak	2310.000	-39.68	≤-21.20	58.08	≤74	PASS		
				Peak	2310.920	-37.37	≤-21.20	60.39	≤74	PASS		
				Peak	2390.000	-38.34	≤-21.20	59.42	≤74	PASS		
High	Hop_24	Peak	2483.500	-39.39	≤-21.20	58.37	≤74	PASS				



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Scan code to check authenticity



3DH5	Ant1	80	Peak	2485.600	-36.87	≤-21.20	60.89	≤74	PASS	
			Peak	2500.000	-38.98	≤-21.20	58.78	≤74	PASS	
		Low	2402	AV	2310.000	-48.08	≤-41.20	49.68	≤54	PASS
				AV	2388.935	-47.62	≤-41.20	50.14	≤54	PASS
				AV	2390.000	-47.76	≤-41.20	50.00	≤54	PASS
				Peak	2310.000	-43.03	≤-21.20	54.73	≤74	PASS
				Peak	2371.085	-38.05	≤-21.20	59.71	≤74	PASS
				Peak	2390.000	-41.08	≤-21.20	56.68	≤74	PASS
		High	2480	AV	2483.500	-47.1	≤-41.20	50.66	≤54	PASS
				AV	2497.120	-46.95	≤-41.20	50.81	≤54	PASS
				AV	2500.000	-47.13	≤-41.20	50.63	≤54	PASS
				Peak	2483.500	-41.04	≤-21.20	56.72	≤74	PASS
				Peak	2493.120	-38.84	≤-21.20	58.92	≤74	PASS
				Peak	2500.000	-38.94	≤-21.20	58.82	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-40.49	≤-21.20	57.27	≤74	PASS
				Peak	2321.420	-36.98	≤-21.20	60.78	≤74	PASS
				Peak	2390.000	-39.24	≤-21.20	58.52	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-38	≤-21.20	59.76	≤74	PASS
				Peak	2495.760	-35.97	≤-21.20	61.79	≤74	PASS
				Peak	2500.000	-38.84	≤-21.20	58.92	≤74	PASS

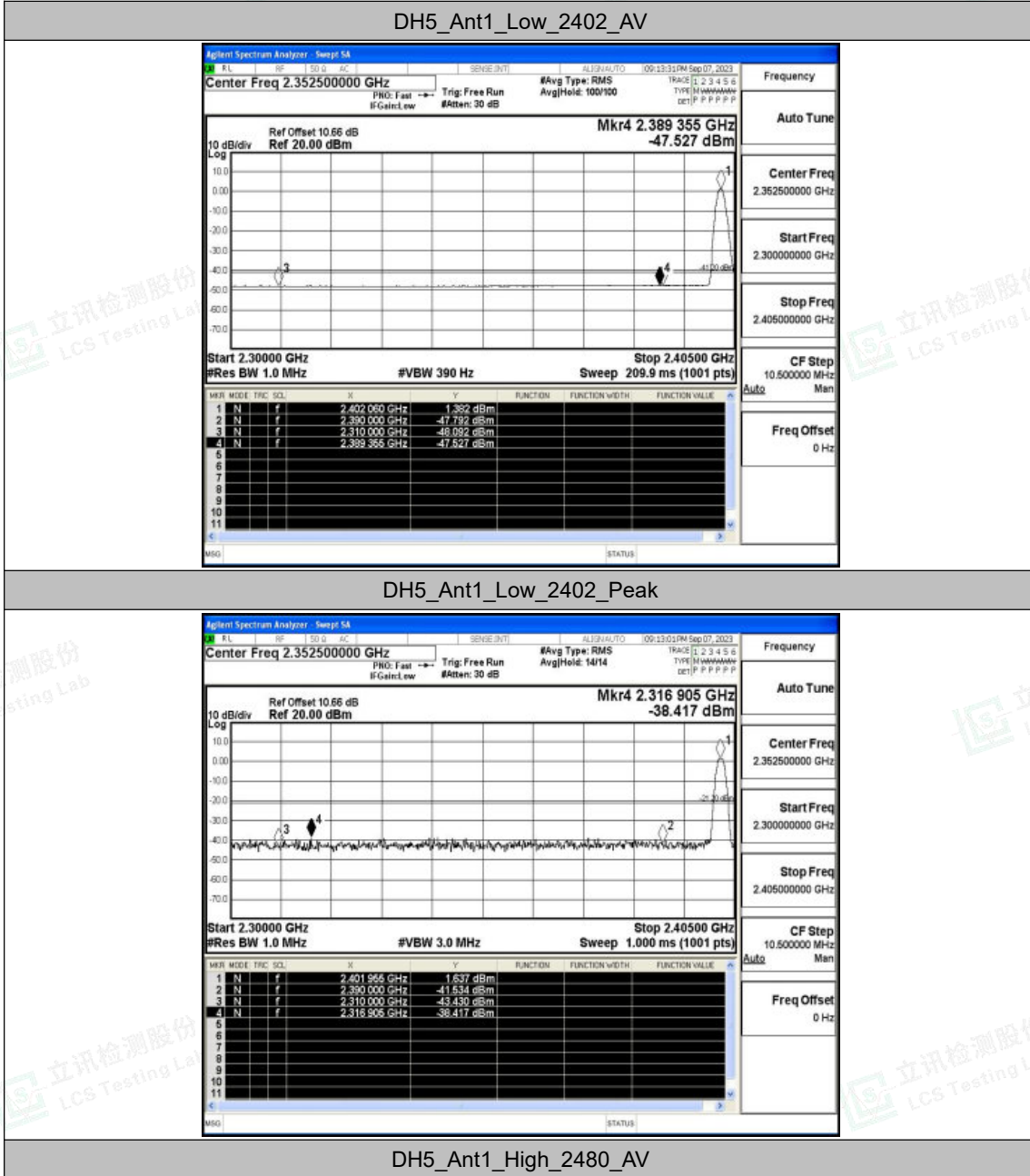
Note:

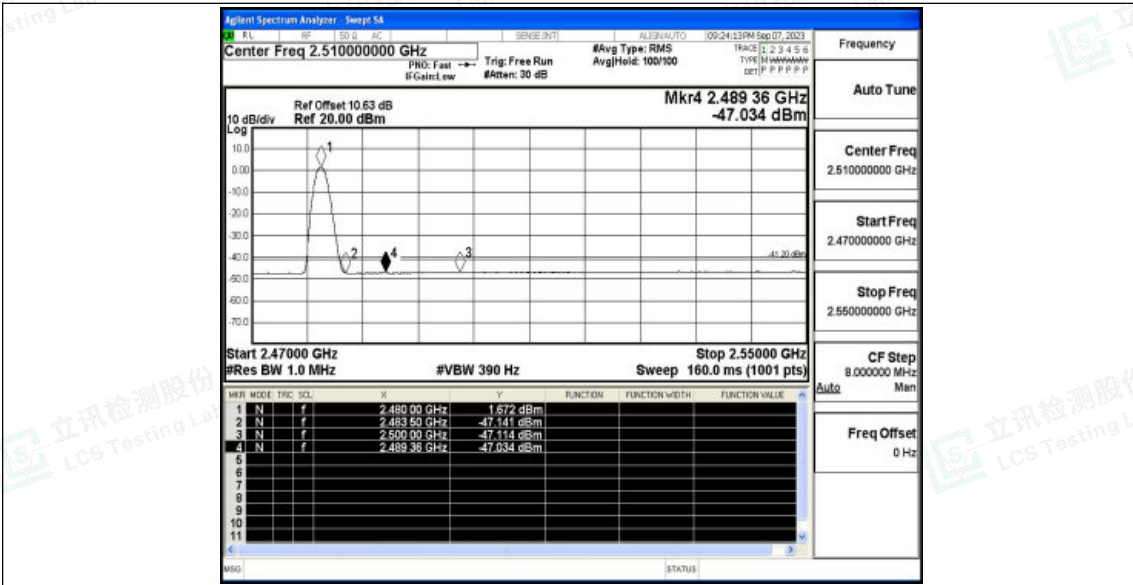
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



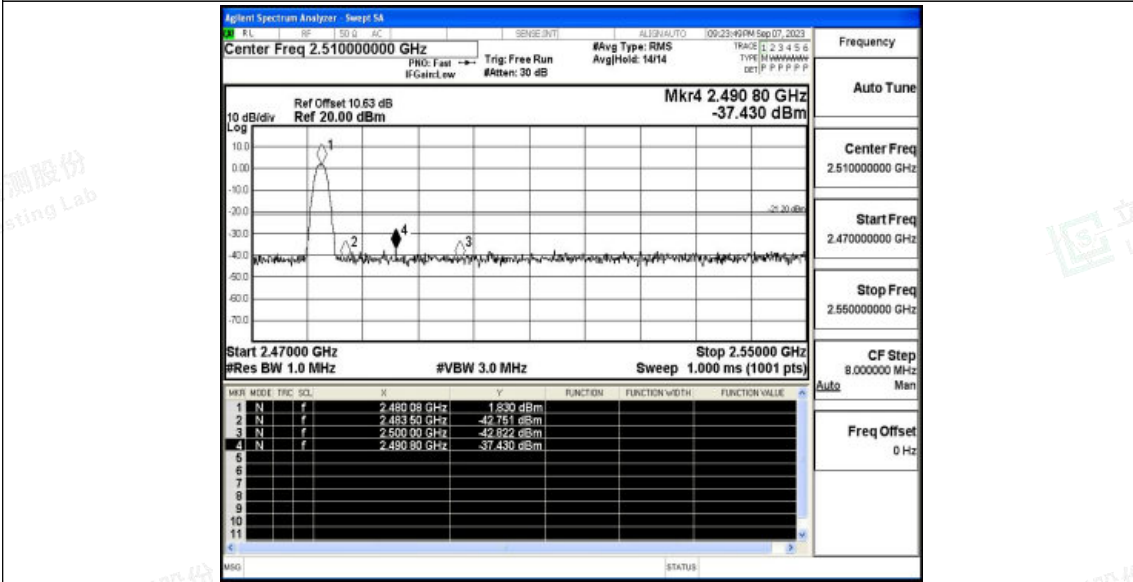


Test Graphs





DH5_Ant1_High_2480_Peak

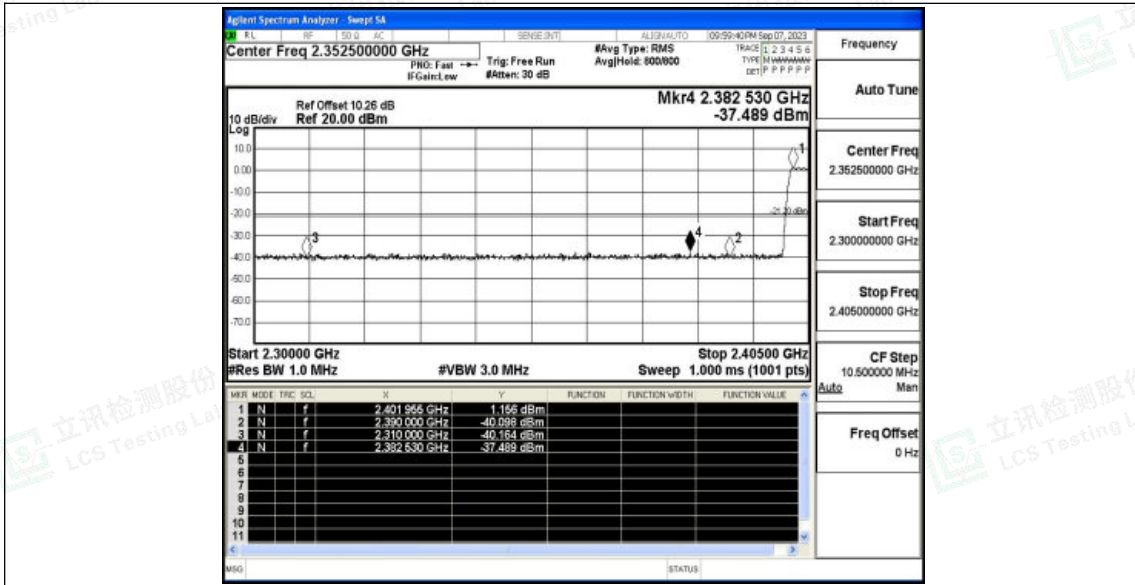


DH5_Ant1_Low_Hop_2402_Peak

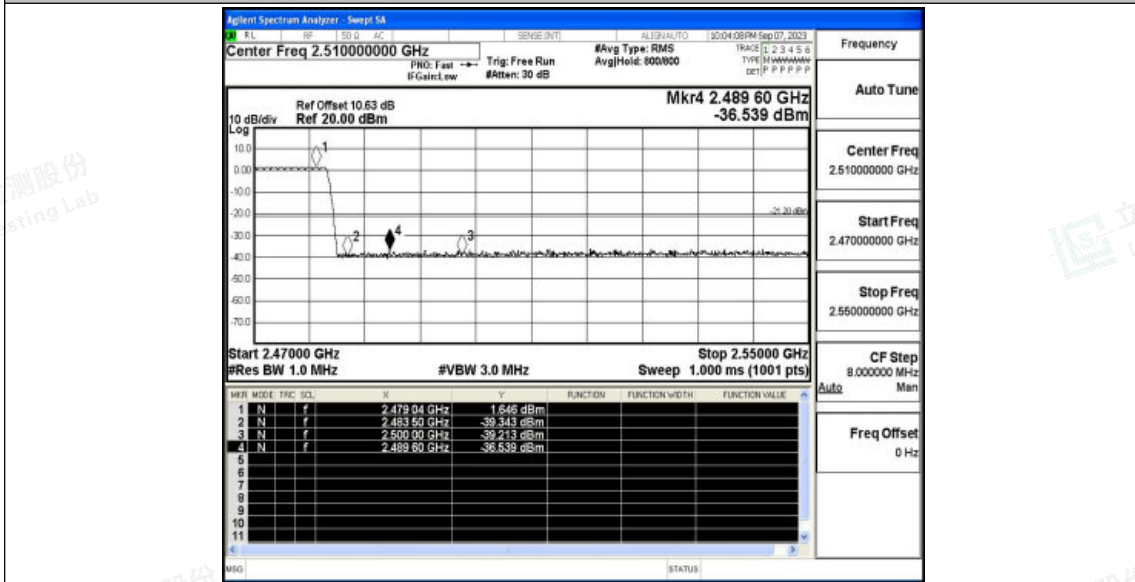




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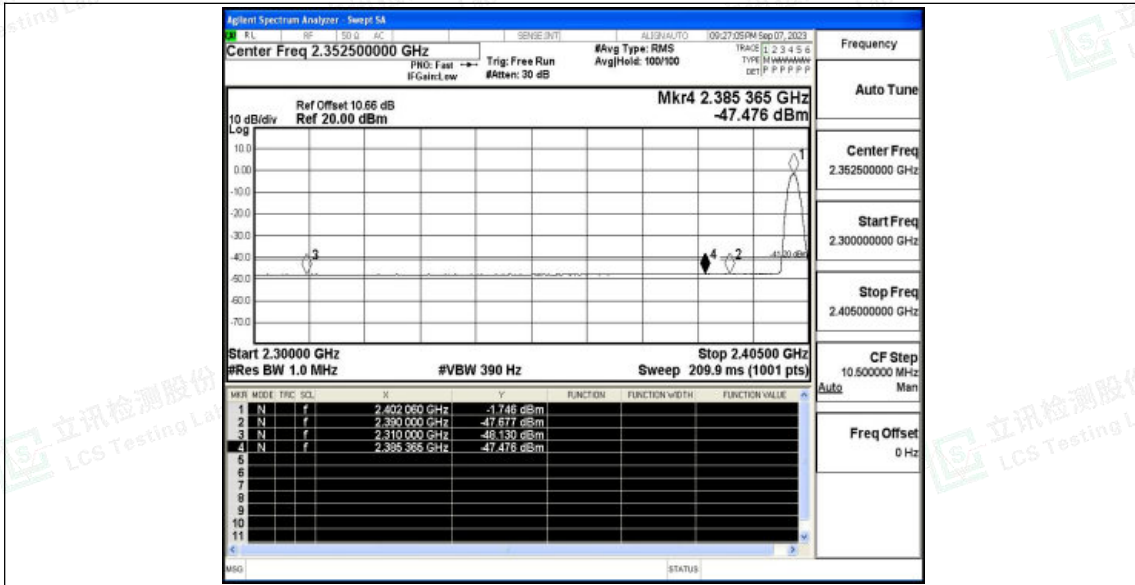


DH5_Ant1_High_Hop_2480_Peak

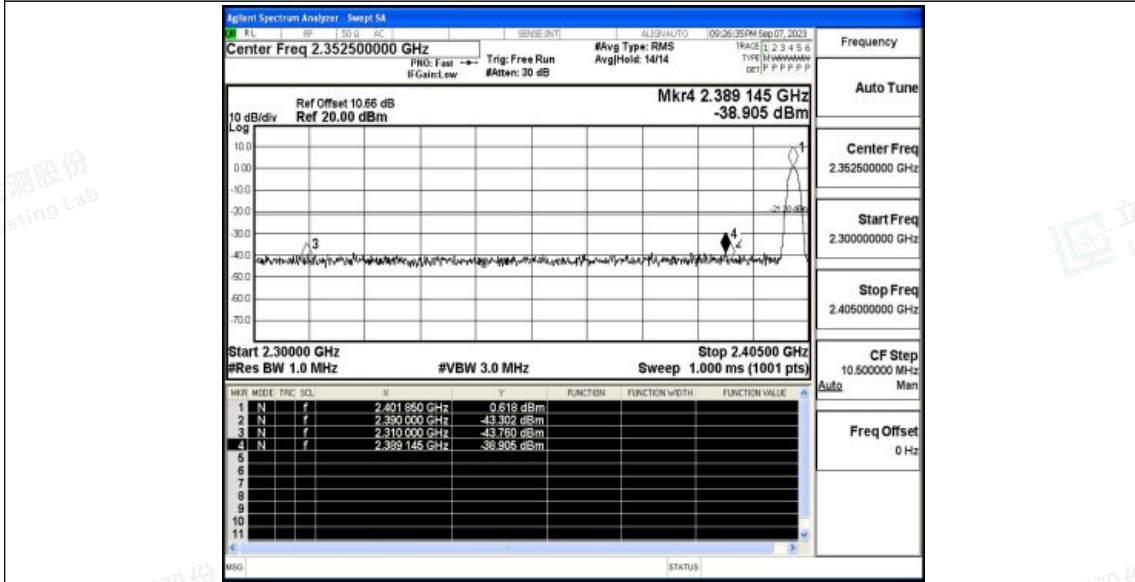


2DH5_Ant1_Low_2402_AV



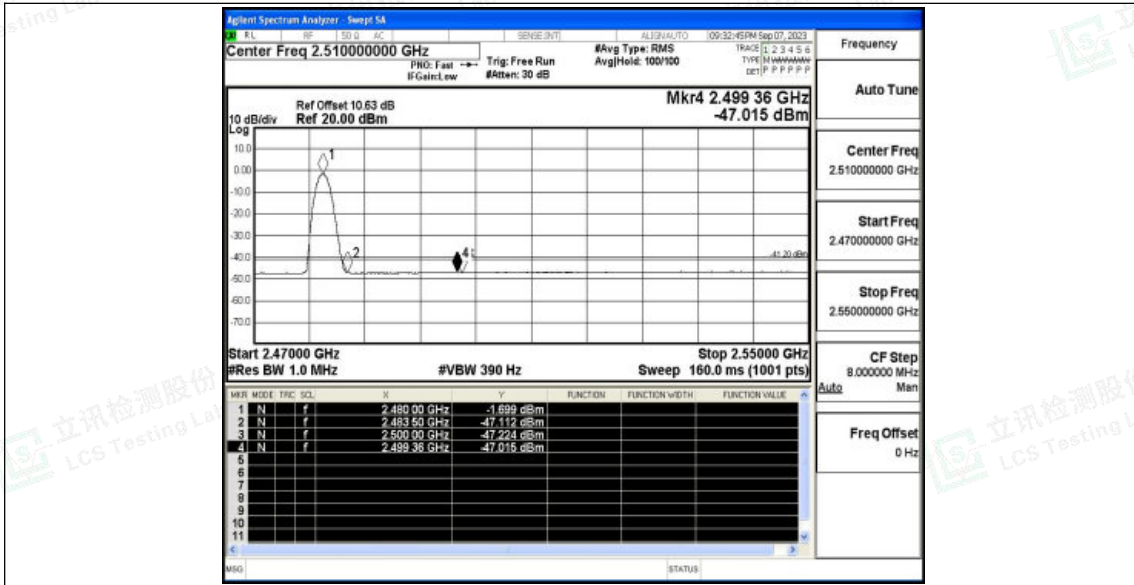


2DH5_Ant1_Low_2402_Peak

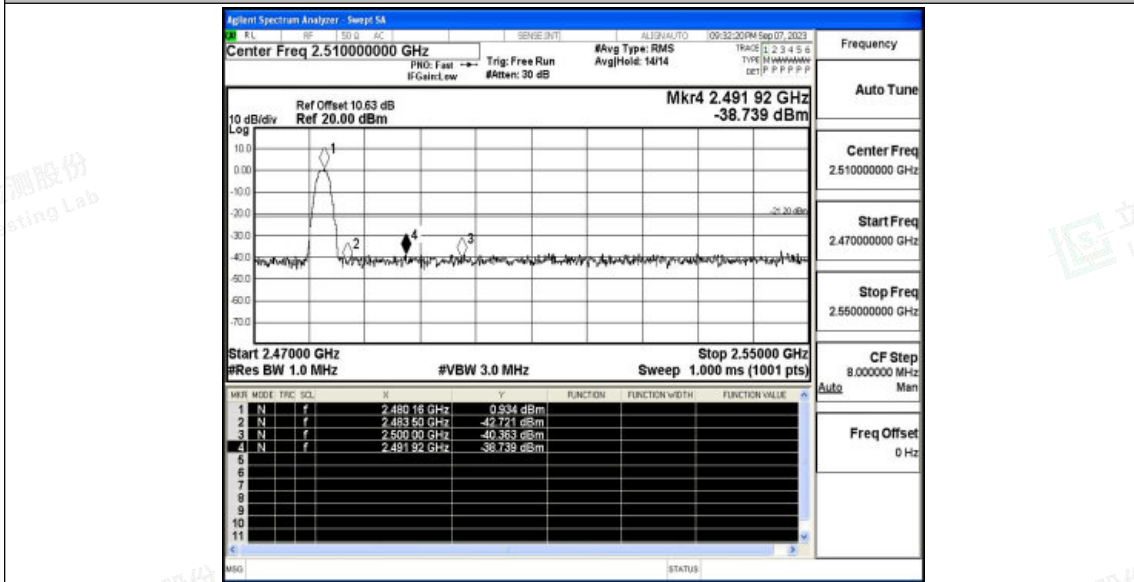


2DH5_Ant1_High_2480_AV



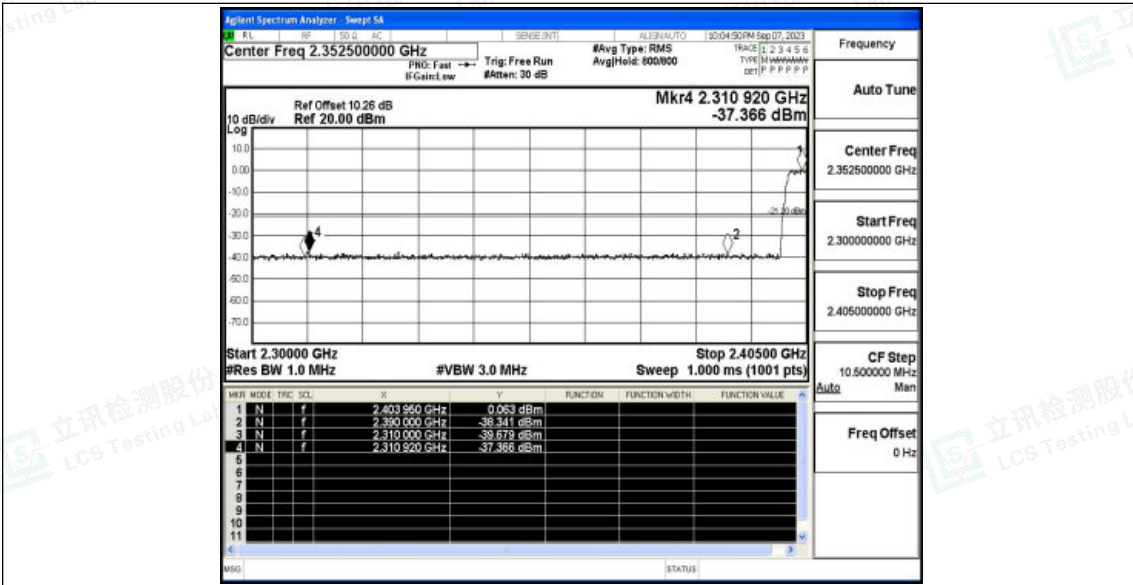


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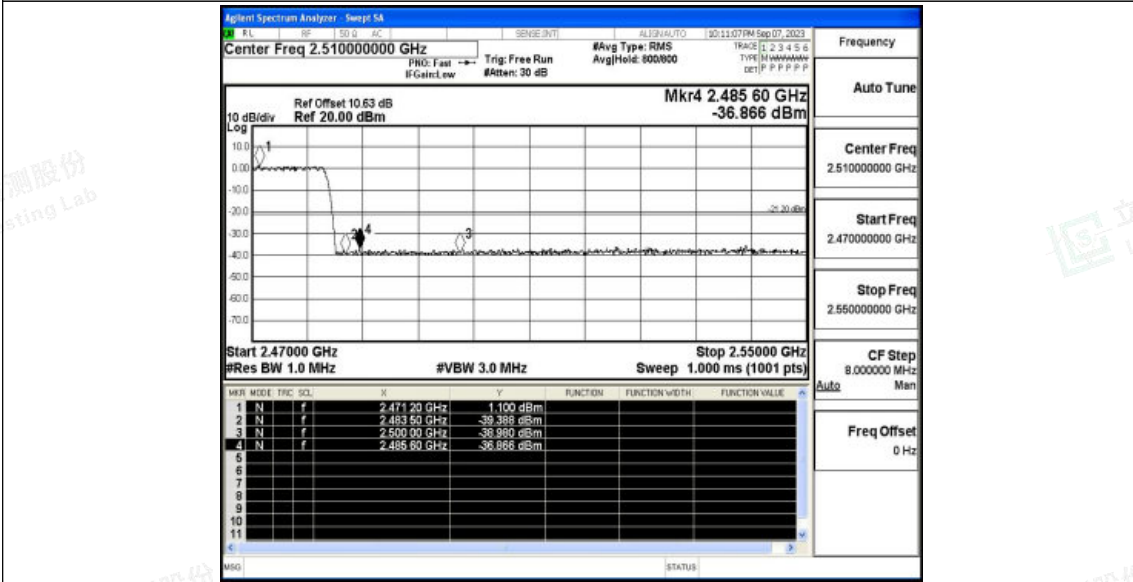


2DH5_Ant1_Low_Hop_2402_Peak





2DH5_Ant1_High_Hop_2480_Peak

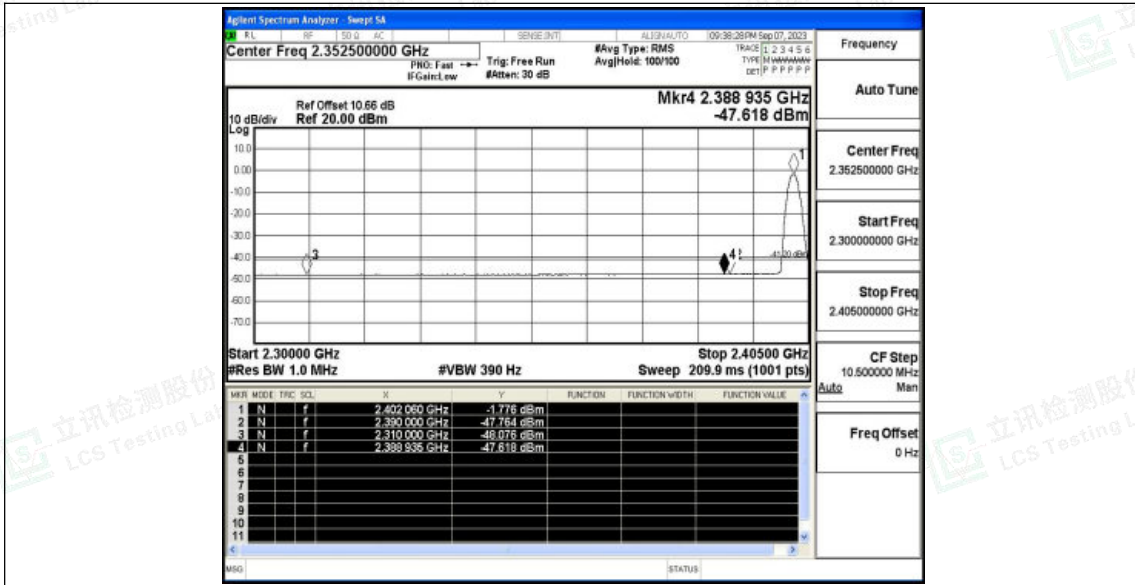


3DH5_Ant1_Low_2402_AV

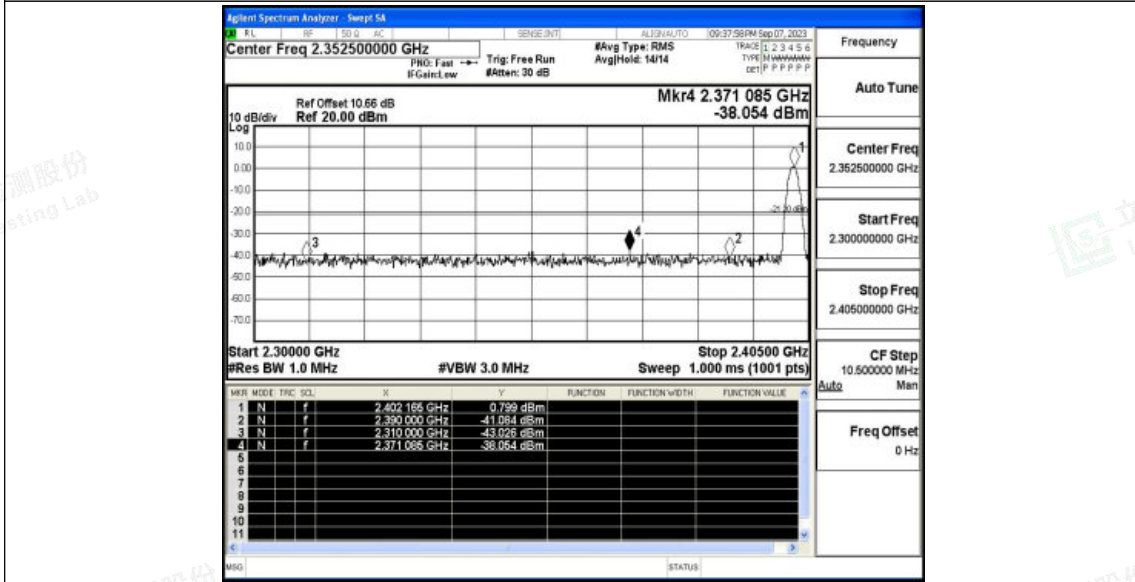




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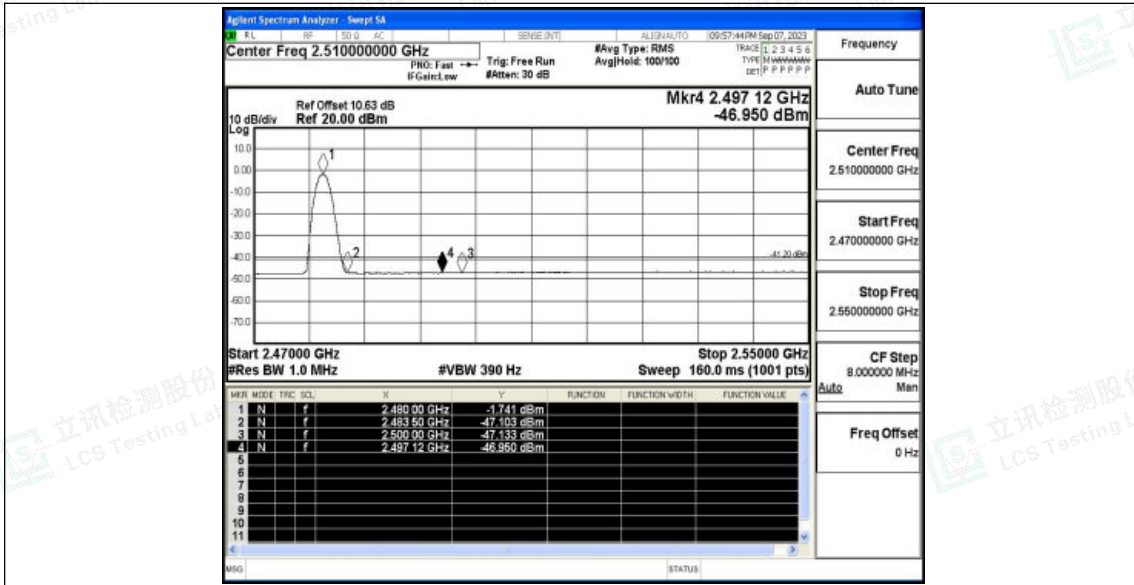


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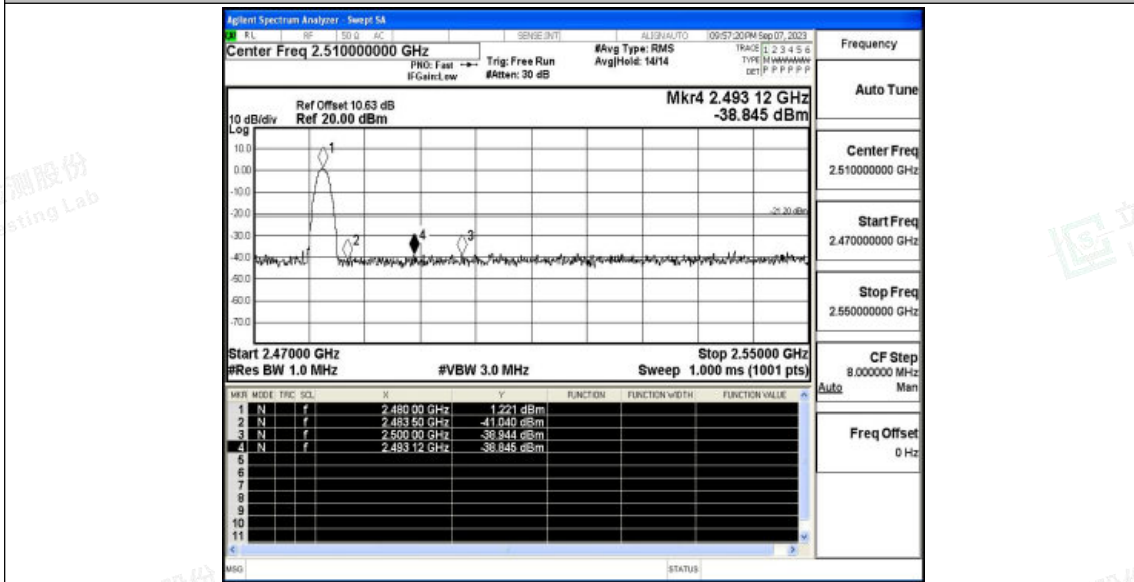


3DH5_Ant1_High_2480_AV



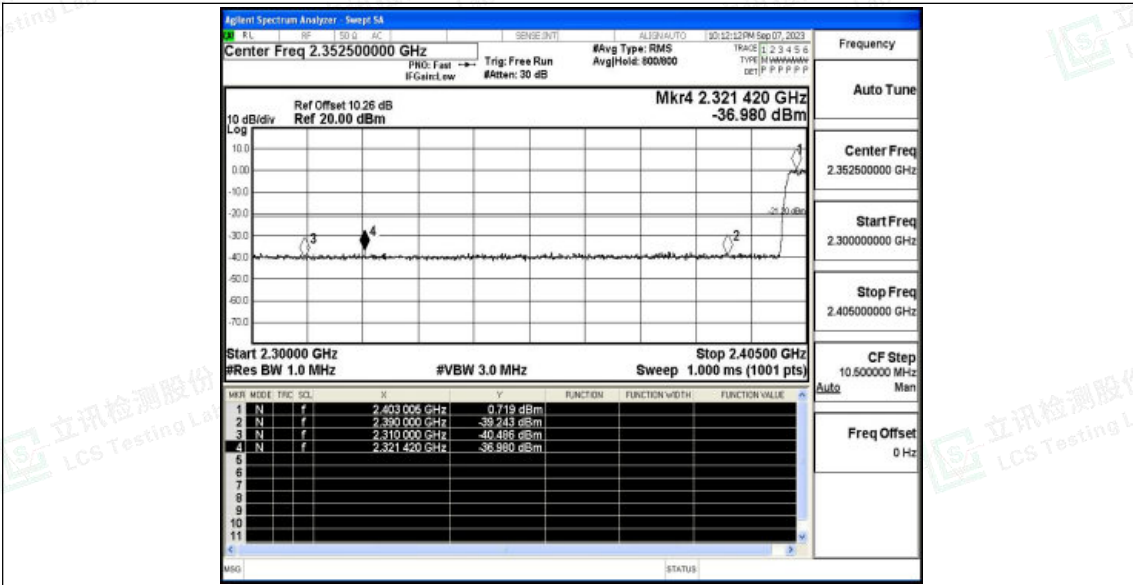


3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak





3DH5_Ant1_High_Hop_2480_Peak

