



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: ROCKIN ROLLER 4 MAX, ROCKIN ROLLER 4 MAX +

Test Model: MNRR4MX

Environmental Conditions

Temperature:	23.8 °C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	<i>monkey.Li</i> Monkey Li
Supervised by:	<i>Li huan</i> Li huan





A.1 20dB Emission Bandwidth

Test Result

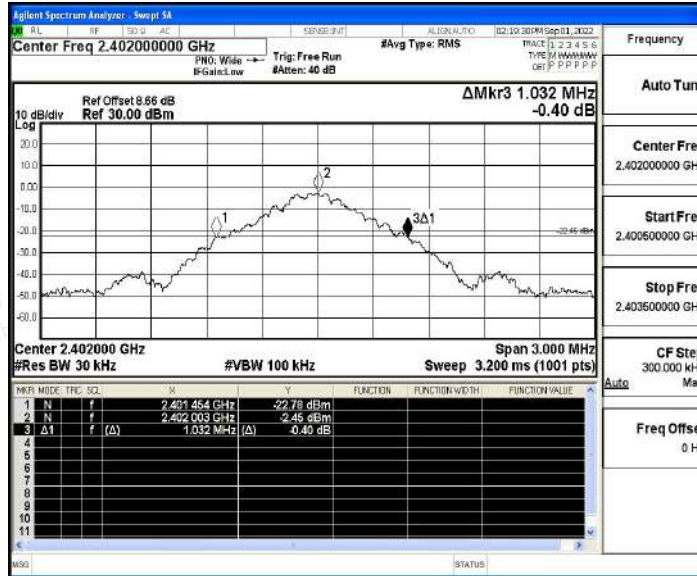
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Verdict
DH5	Ant1	2402	1.032	2401.454	2402.486	---
		2441	0.966	2440.523	2441.489	---
		2480	1.020	2479.463	2480.483	---
2DH5	Ant1	2402	1.356	2401.307	2402.663	---
		2441	1.290	2440.349	2441.639	---
		2480	1.302	2479.343	2480.645	---
3DH5	Ant1	2402	1.284	2401.346	2402.630	---
		2441	1.311	2440.334	2441.645	---
		2480	1.278	2479.346	2480.624	---



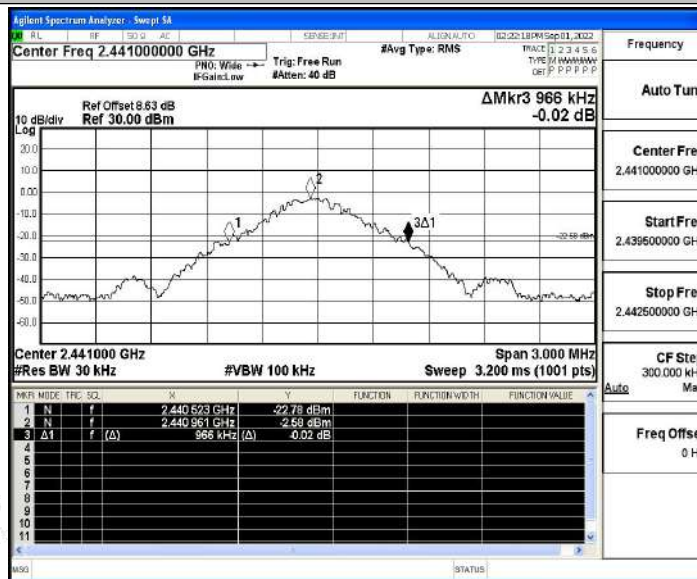


Test Graphs

DH5_Ant1_2402

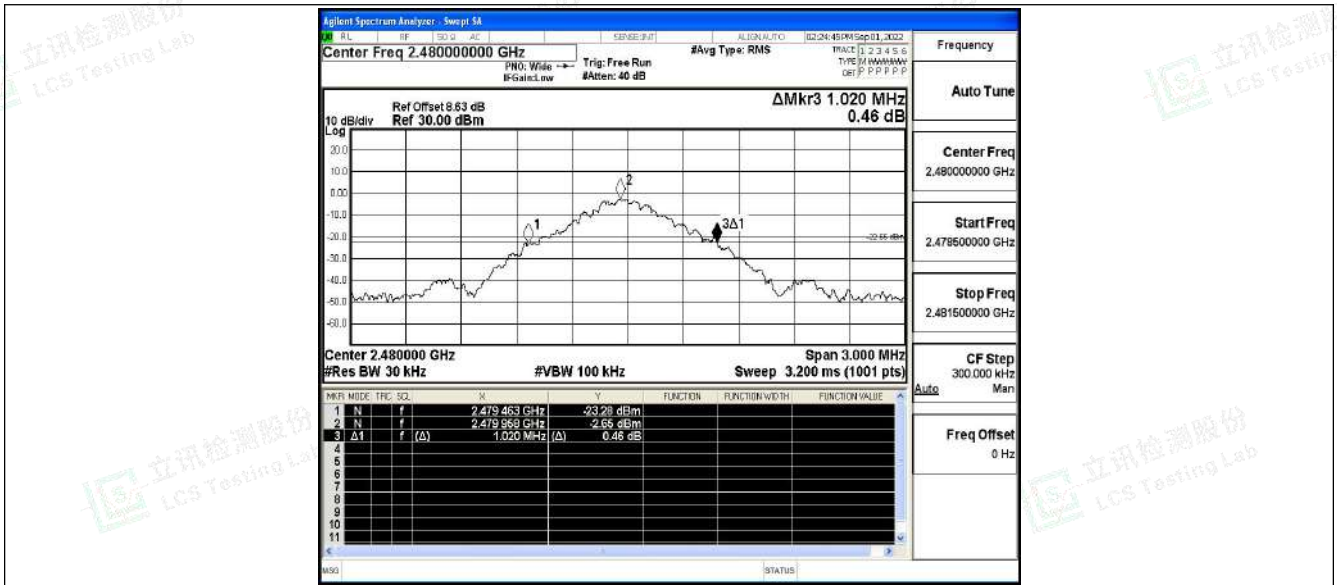


DH5_Ant1_2441

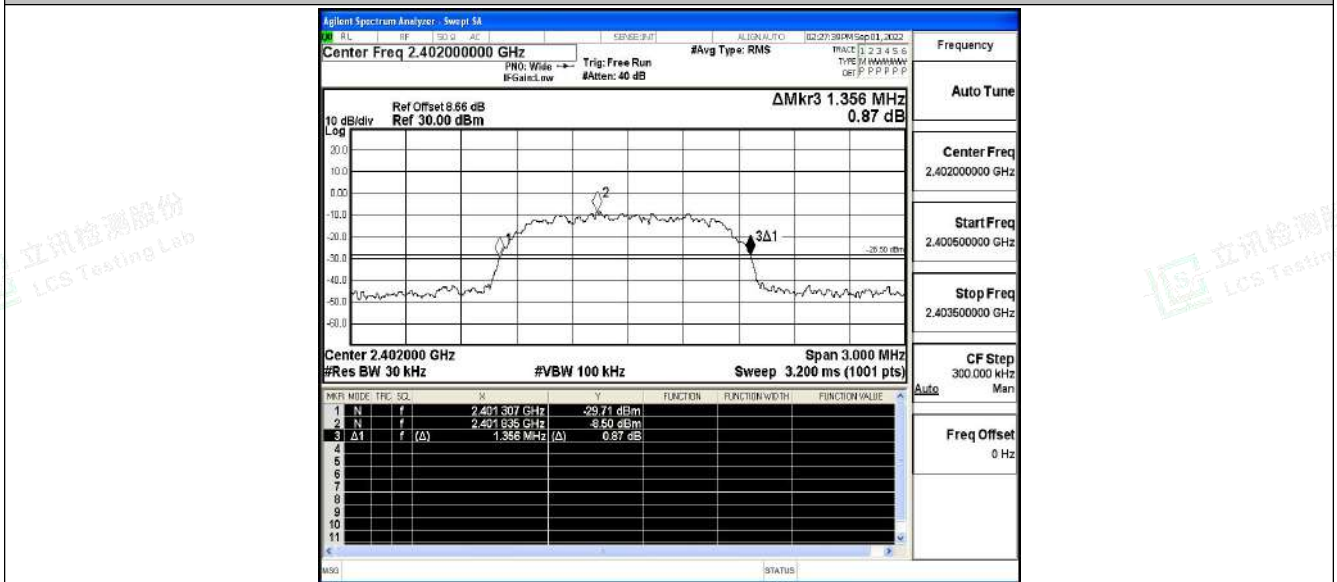


DH5_Ant1_2480



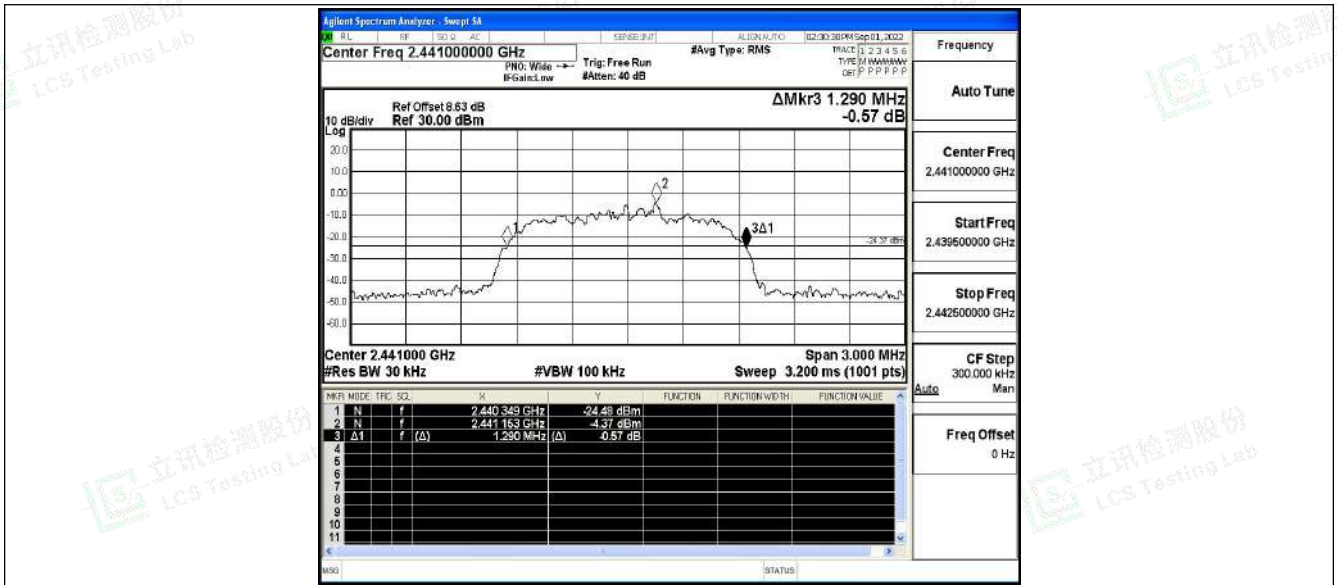


2DH5_Ant1_2402

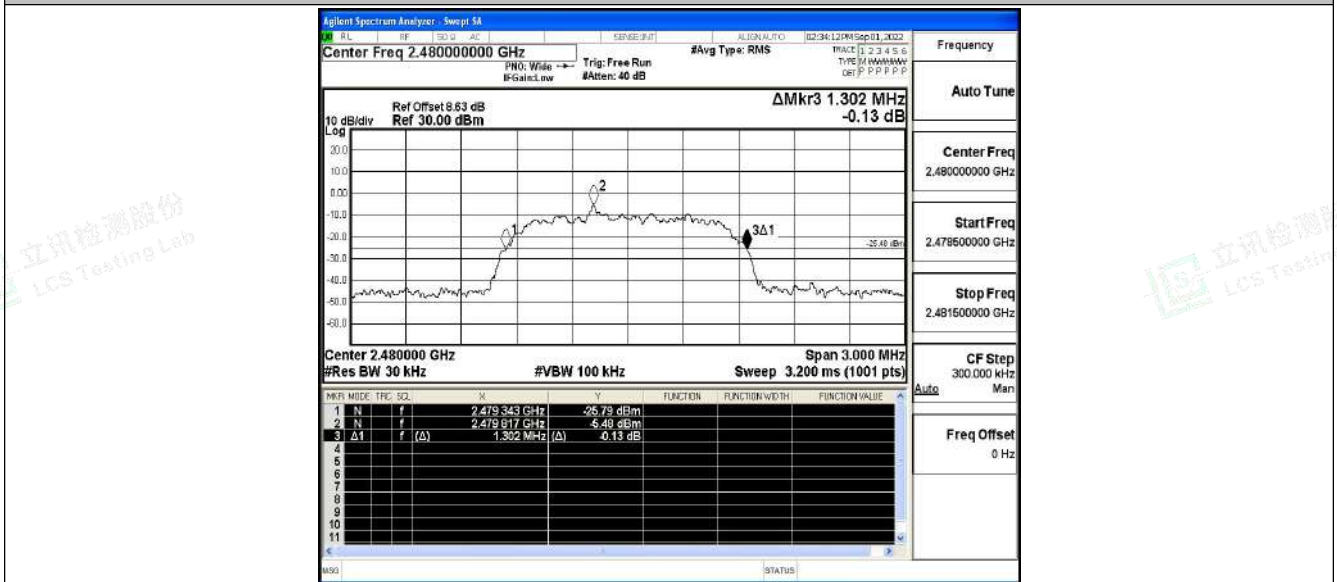


2DH5_Ant1_2441



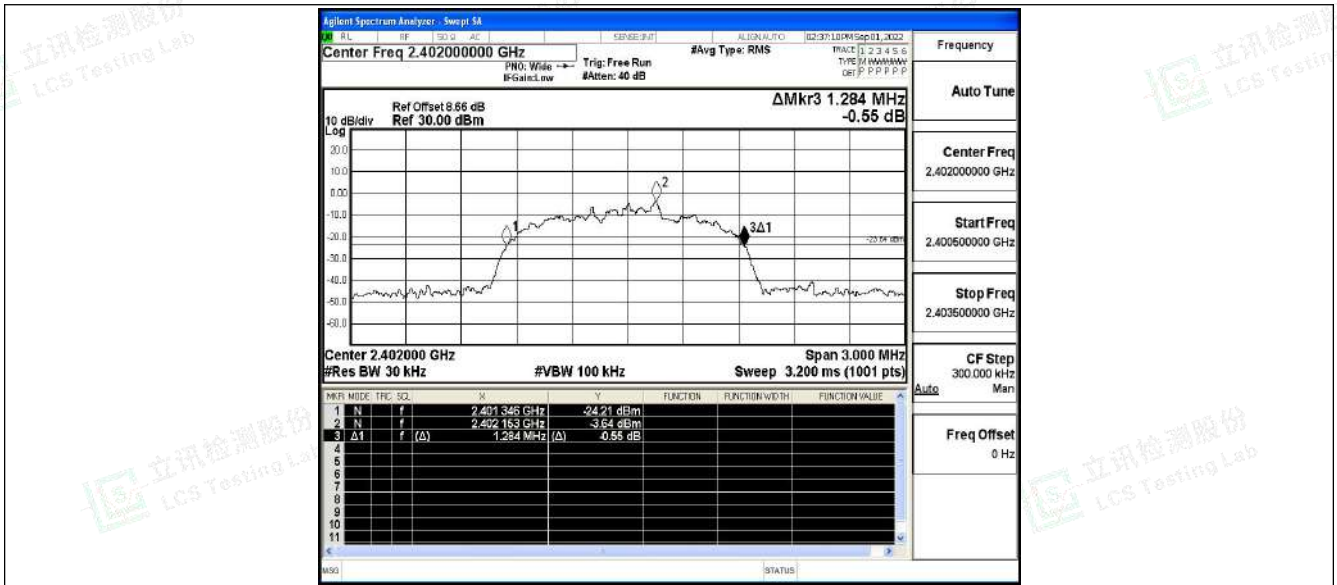


2D H5_Ant1_2480

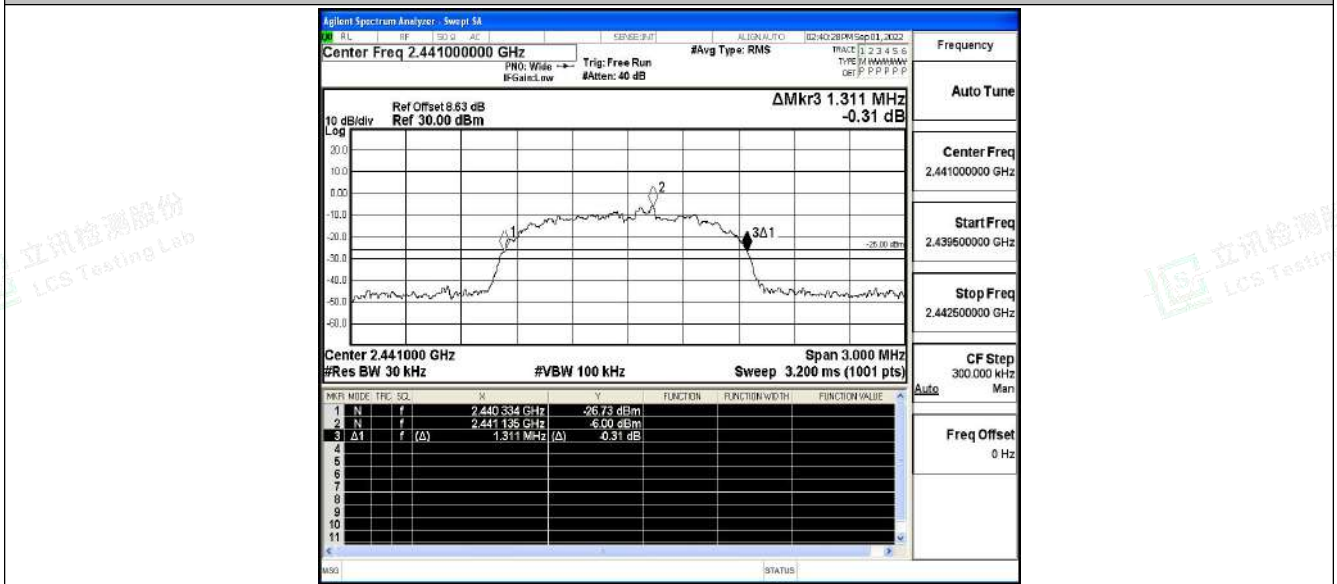


3D H5_Ant1_2402



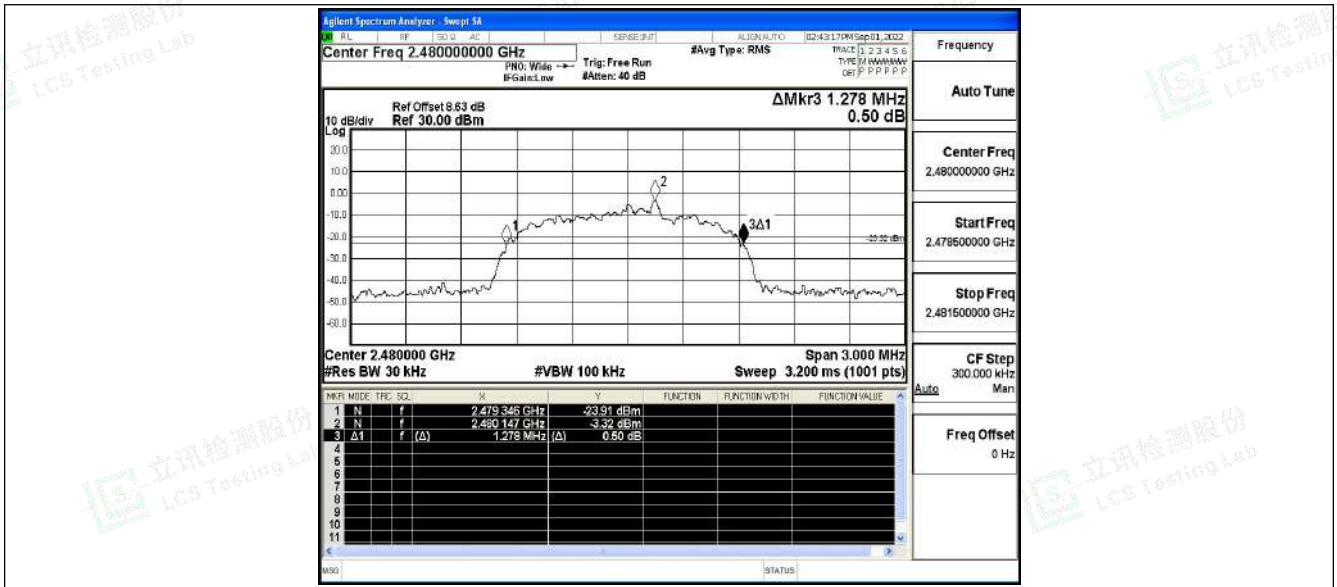


3DH5_Ant1_2441



3DH5_Ant1_2480







A.2 Occupied Channel Bandwidth

Test Result

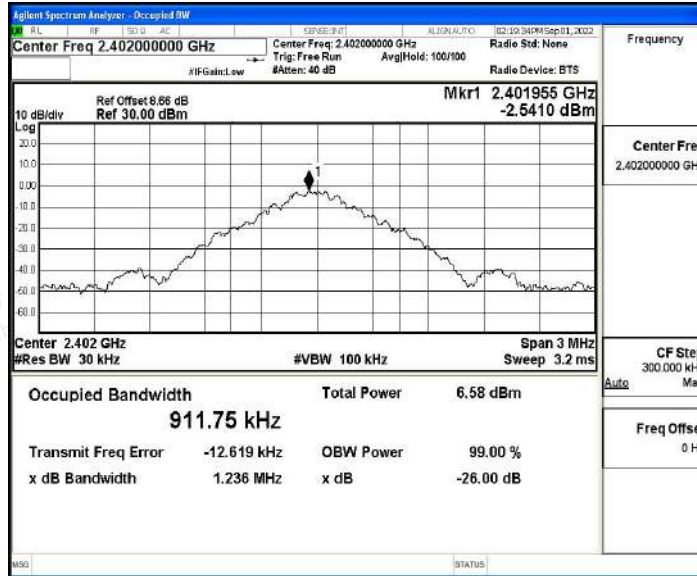
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.91175	2401.5315	2402.4433	---	---
		2441	0.91405	2440.5316	2441.4457	---	---
		2480	0.91949	2479.5271	2480.4466	---	---
2DH5	Ant1	2402	1.1748	2401.3965	2402.5713	---	---
		2441	1.1769	2440.3948	2441.5717	---	---
		2480	1.1871	2479.3908	2480.5779	---	---
3DH5	Ant1	2402	1.1819	2401.3983	2402.5802	---	---
		2441	1.1846	2440.3952	2441.5798	---	---
		2480	1.1864	2479.3916	2480.5780	---	---



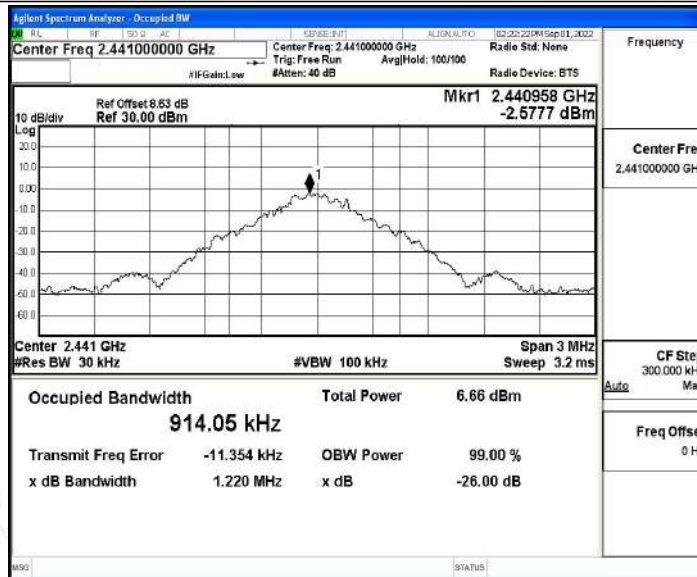


Test Graphs

DH5_Ant1_2402



DH5_Ant1_2441

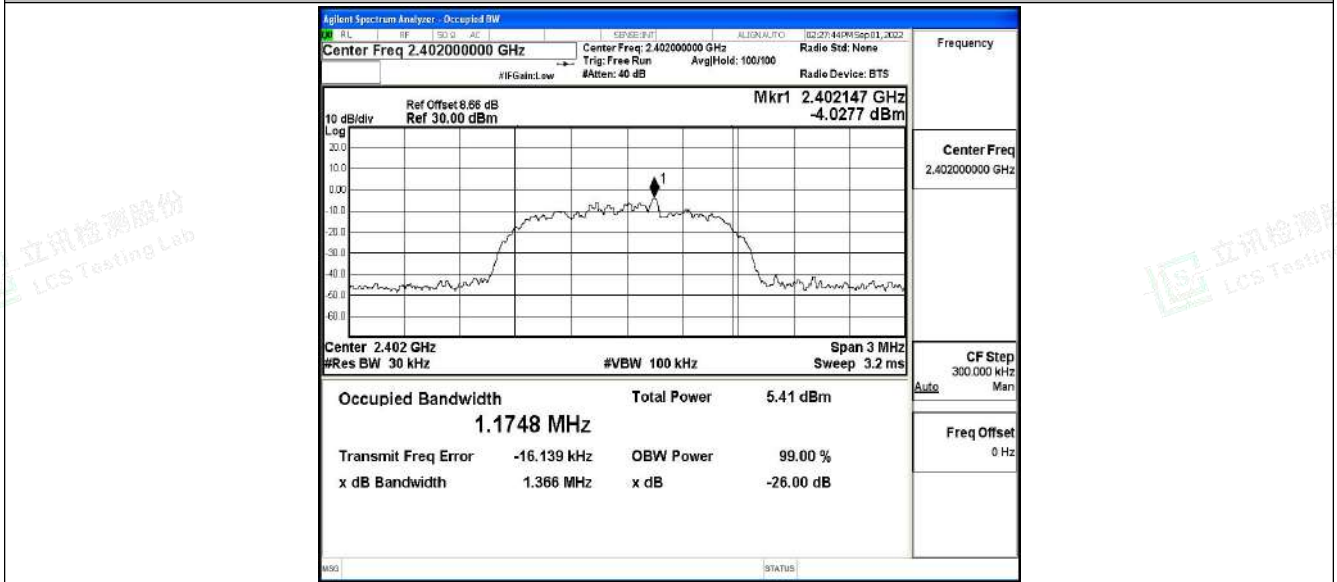


DH5_Ant1_2480



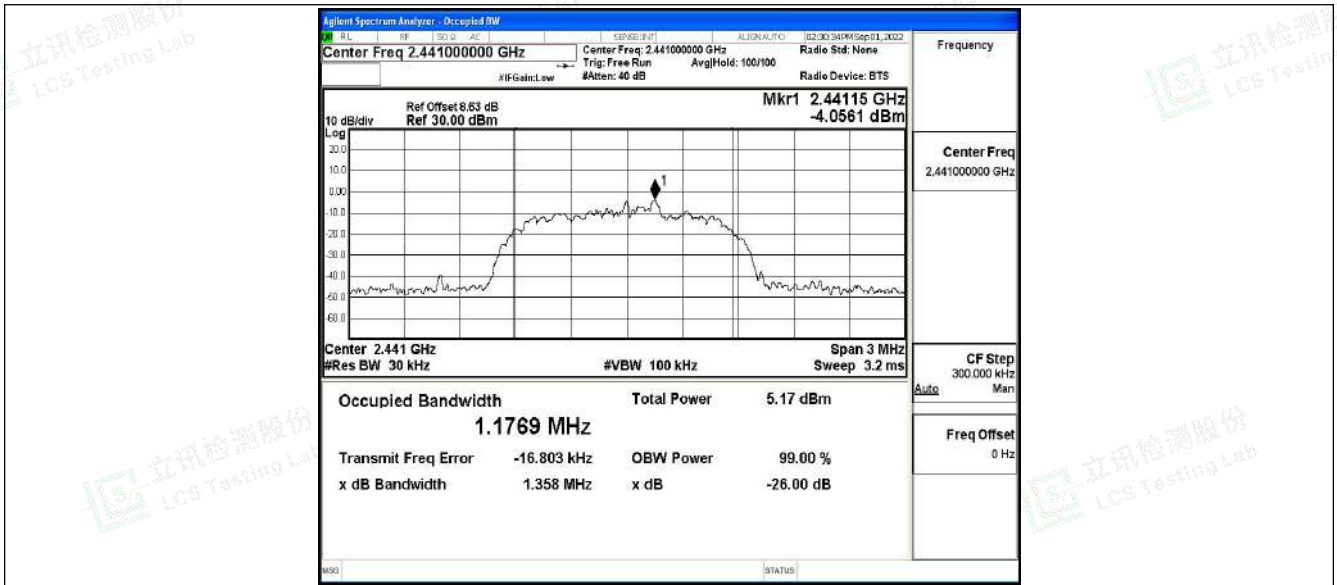


2DH5_Ant1_2402

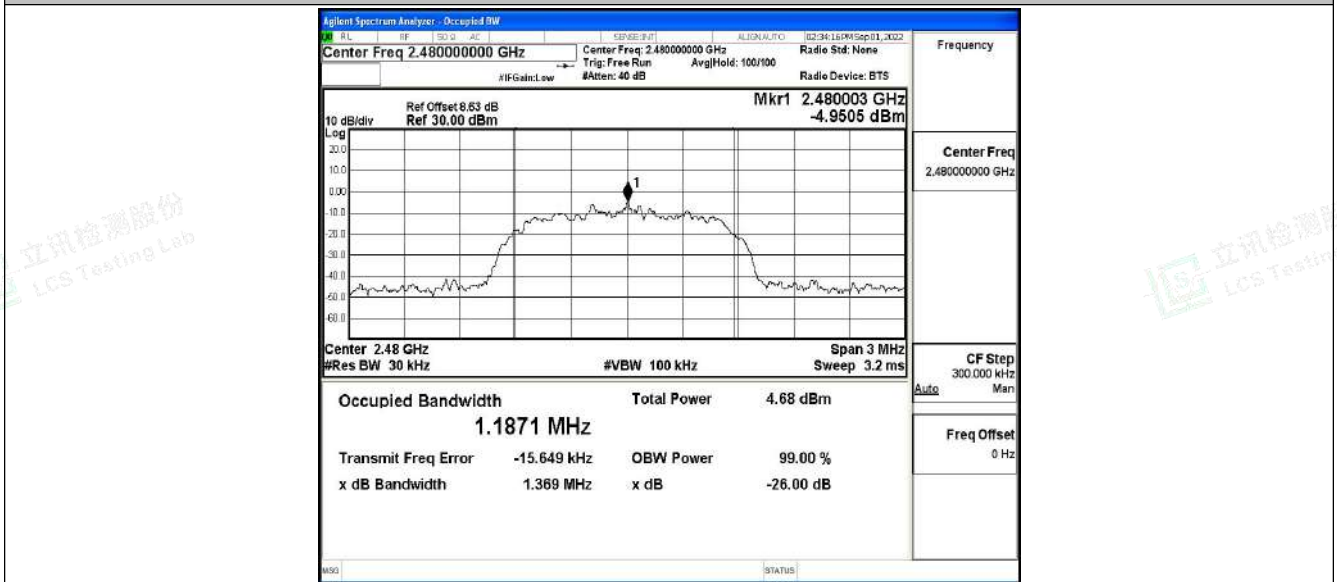


2DH5_Ant1_2441





2DH5_Ant1_2480

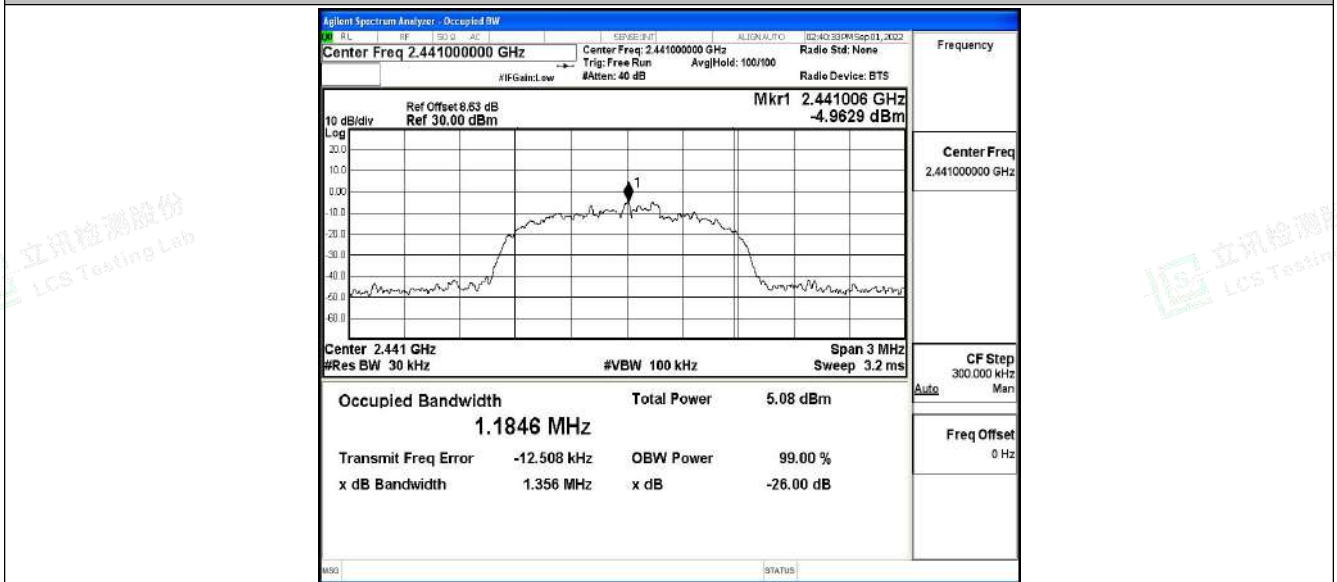


3DH5_Ant1_2402



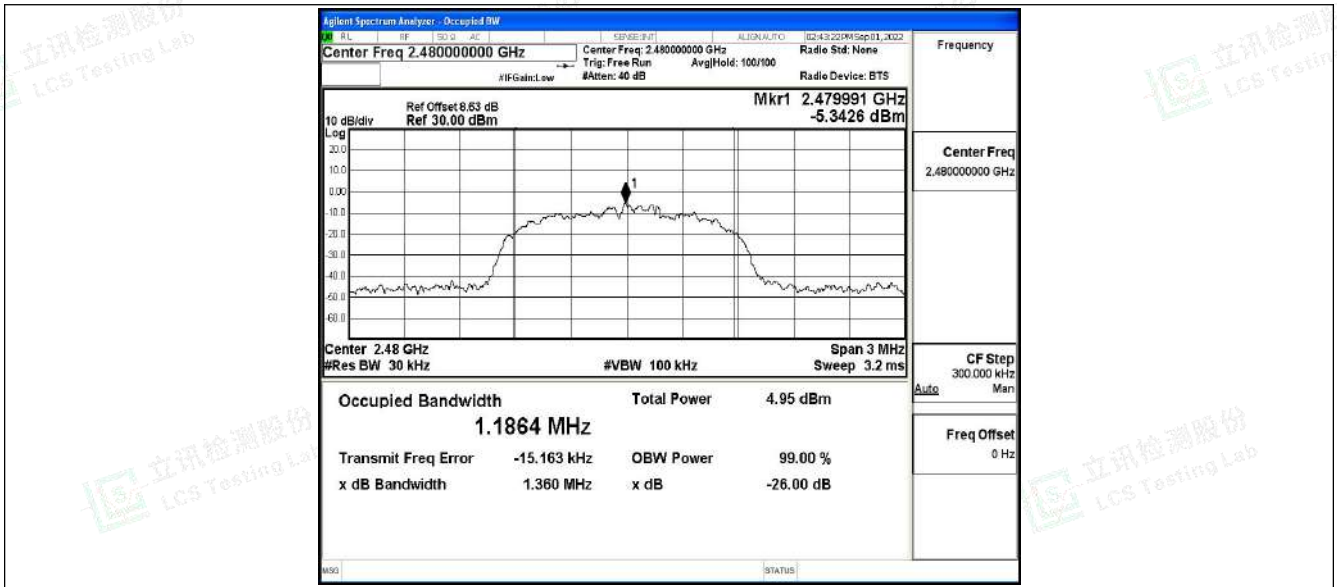


3DH5_Ant1_2441



3DH5_Ant1_2480







A.3 Maximum peak conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	0.55	≤20.97	PASS
		2441	0.52	≤20.97	PASS
		2480	0.39	≤20.97	PASS
2DH5	Ant1	2402	0.24	≤20.97	PASS
		2441	0.2	≤20.97	PASS
		2480	0.11	≤20.97	PASS
3DH5	Ant1	2402	0.22	≤20.97	PASS
		2441	0.23	≤20.97	PASS
		2480	0.09	≤20.97	PASS

EIRP

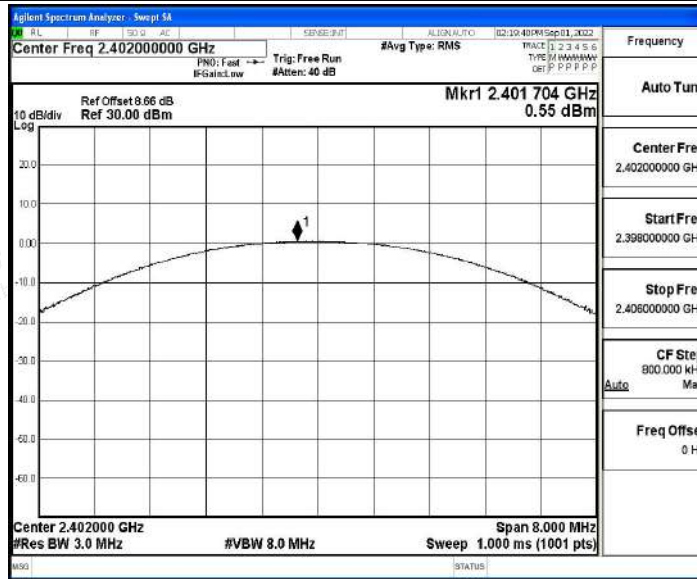
Mode	Channel	Maximum Peak Output Power [dBm]	Antenna Gain	Report EIRP Power(dBm)	Limit [dBm]	Verdict
DH5	2402	0.55	1.68	2.23	36	PASS
	2441	0.52	1.68	2.2	36	PASS
	2480	0.39	1.68	2.07	36	PASS
2DH5	2402	0.24	1.68	1.92	36	PASS
	2441	0.2	1.68	1.88	36	PASS
	2480	0.11	1.68	1.79	36	PASS
3DH5	2402	0.22	1.68	1.9	36	PASS
	2441	0.23	1.68	1.91	36	PASS
	2480	0.09	1.68	1.77	36	PASS



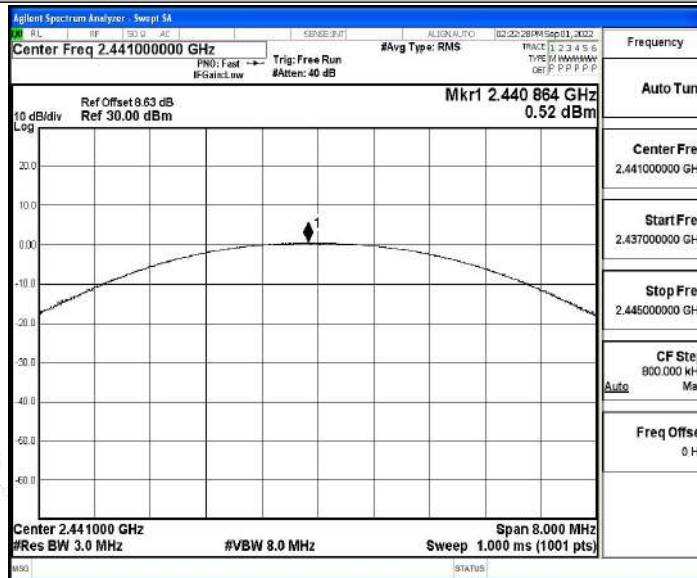


Test Graphs

DH5_Ant1_2402

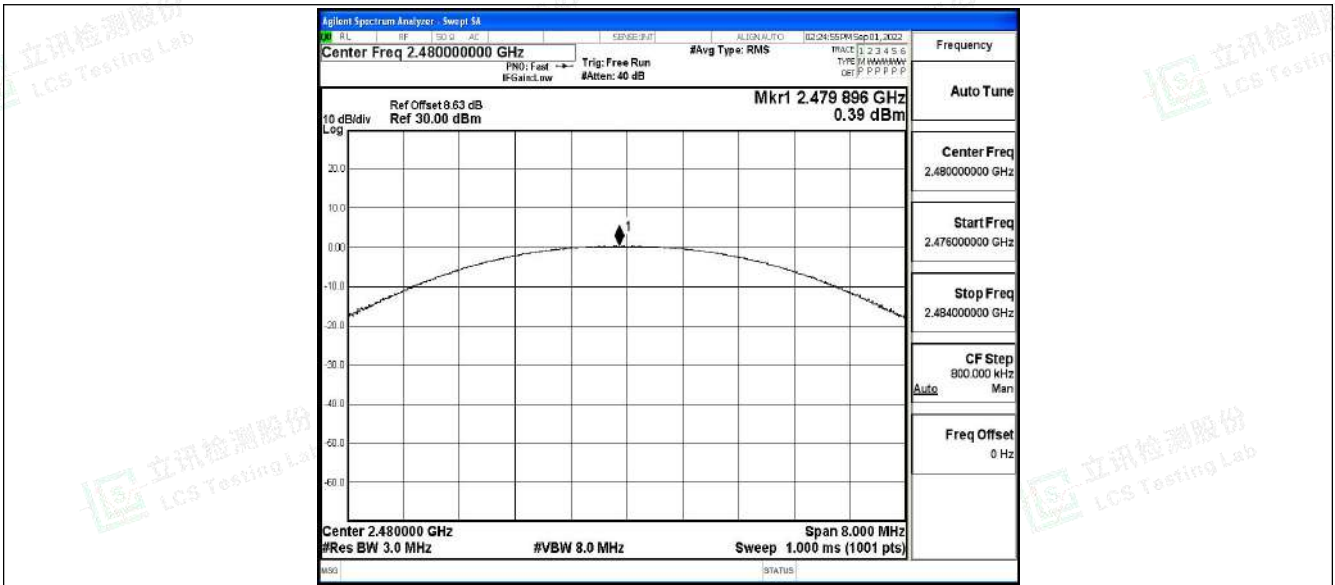


DH5_Ant1_2441

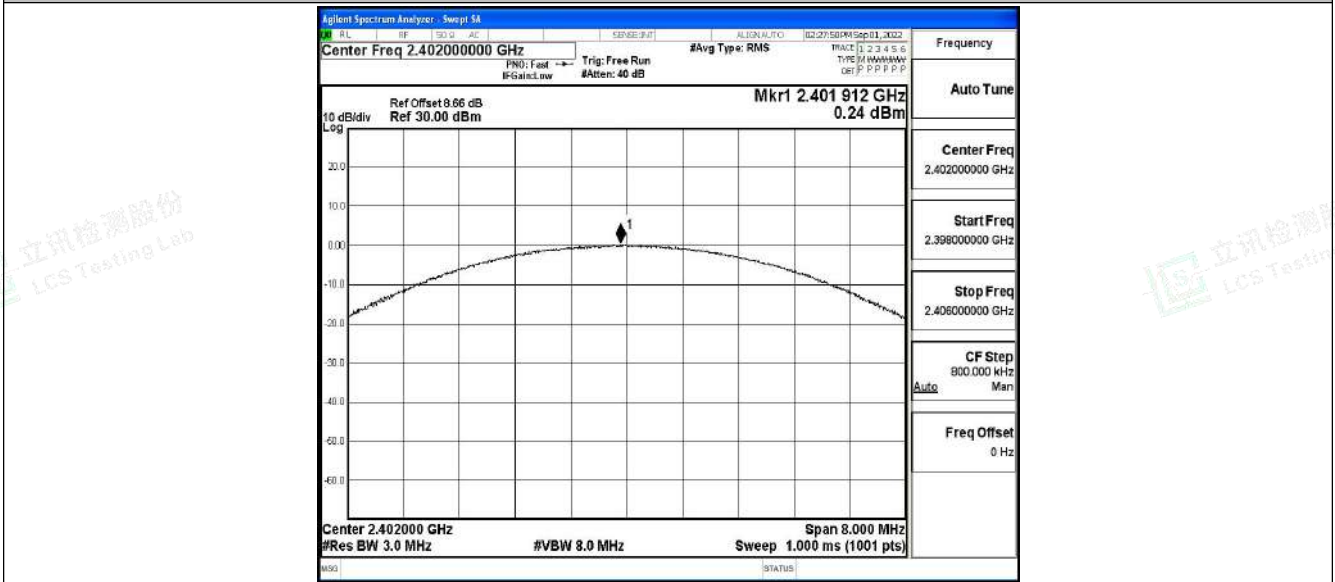


DH5_Ant1_2480



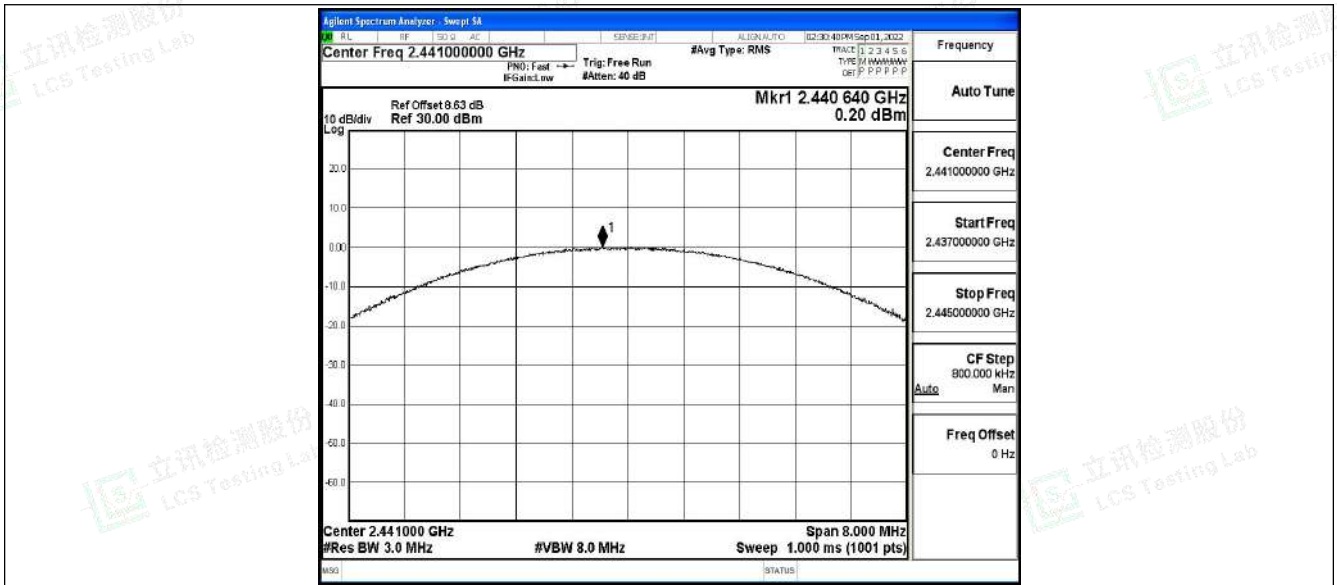


2DH5_Ant1_2402

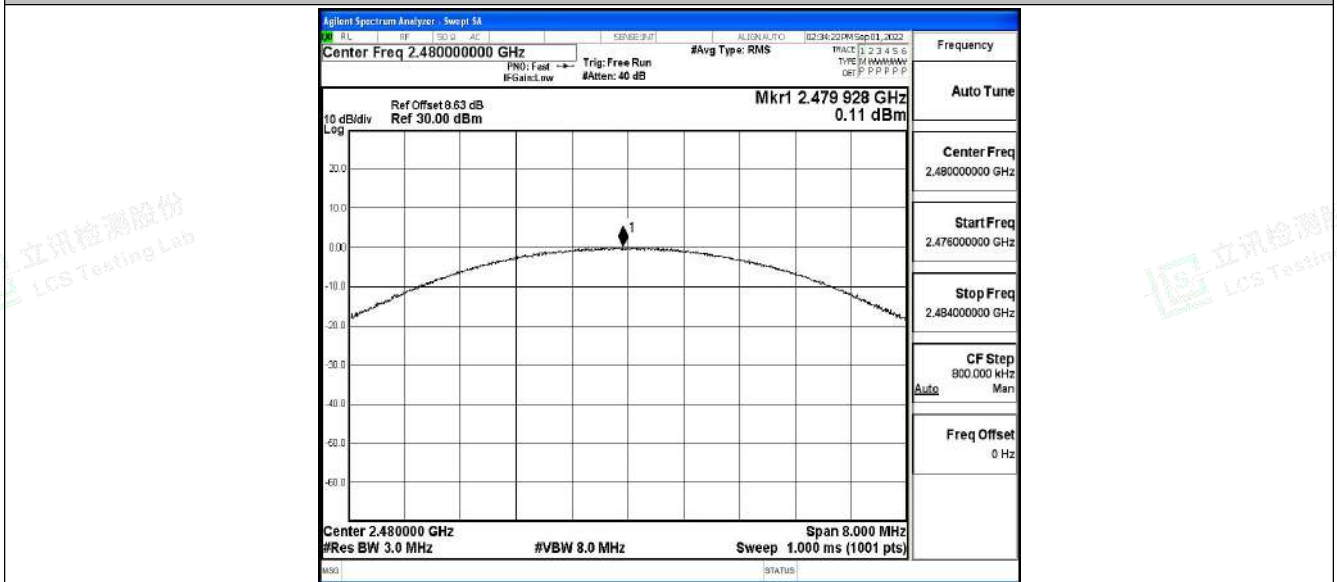


2DH5_Ant1_2441



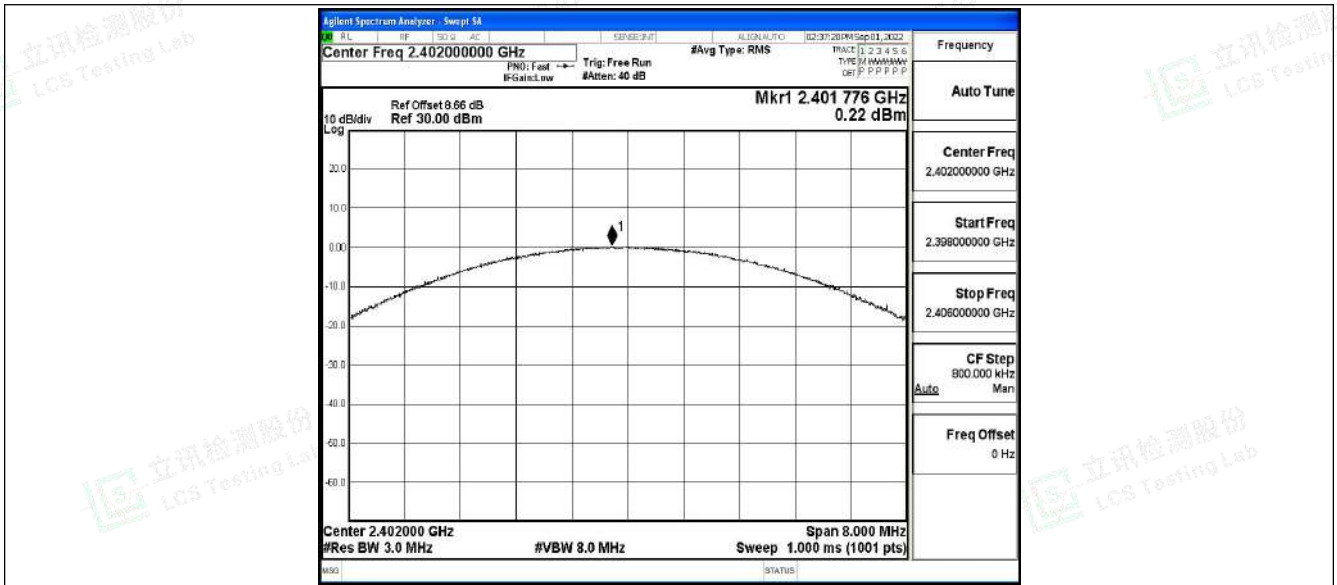


2DH5_Ant1_2480

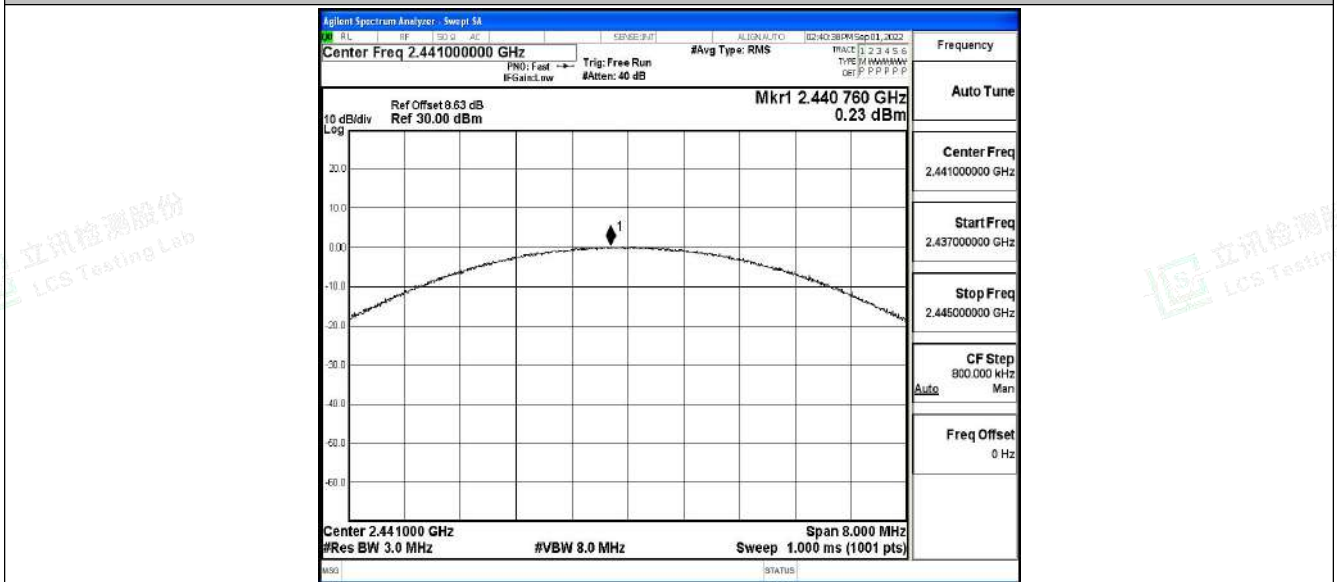


3DH5_Ant1_2402



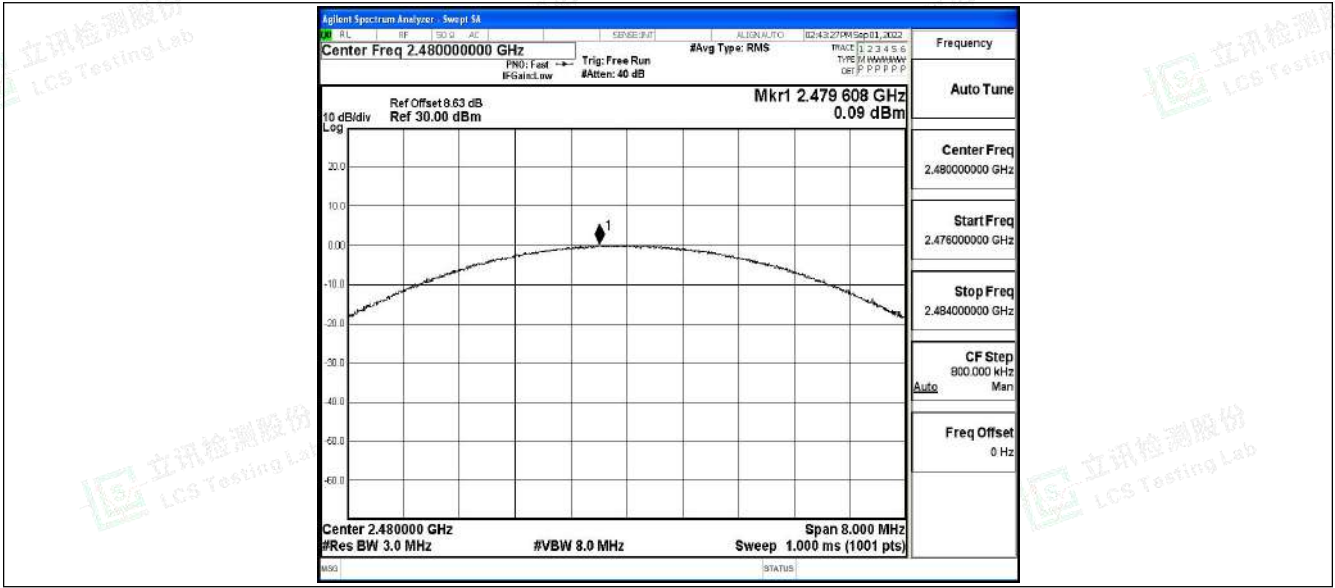


3DH5_Ant1_2441



3DH5_Ant1_2480







A.4 Carrier frequency separation

Test Result

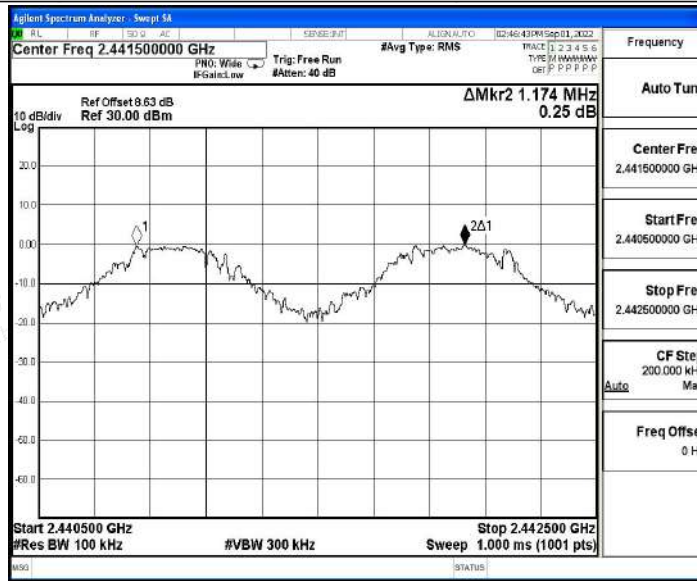
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.174	≥0.688	PASS
2DH5	Ant1	Hop	0.952	≥0.904	PASS
3DH5	Ant1	Hop	1.204	≥0.874	PASS



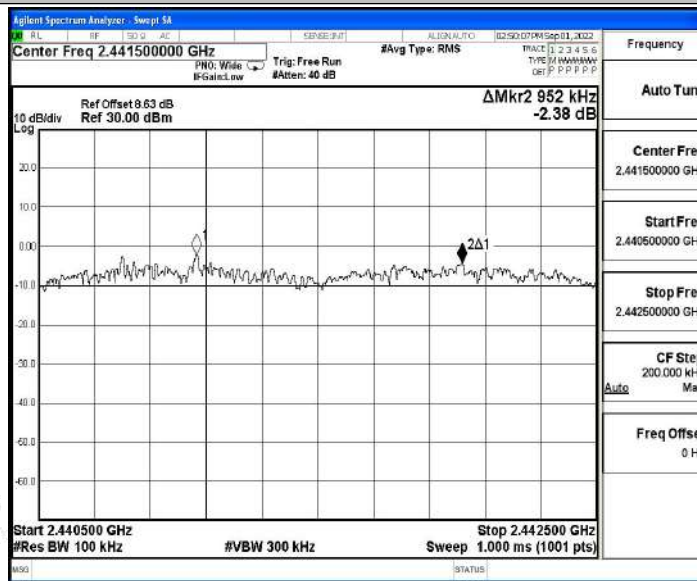


Test Graphs

DH5_Ant1_Hop

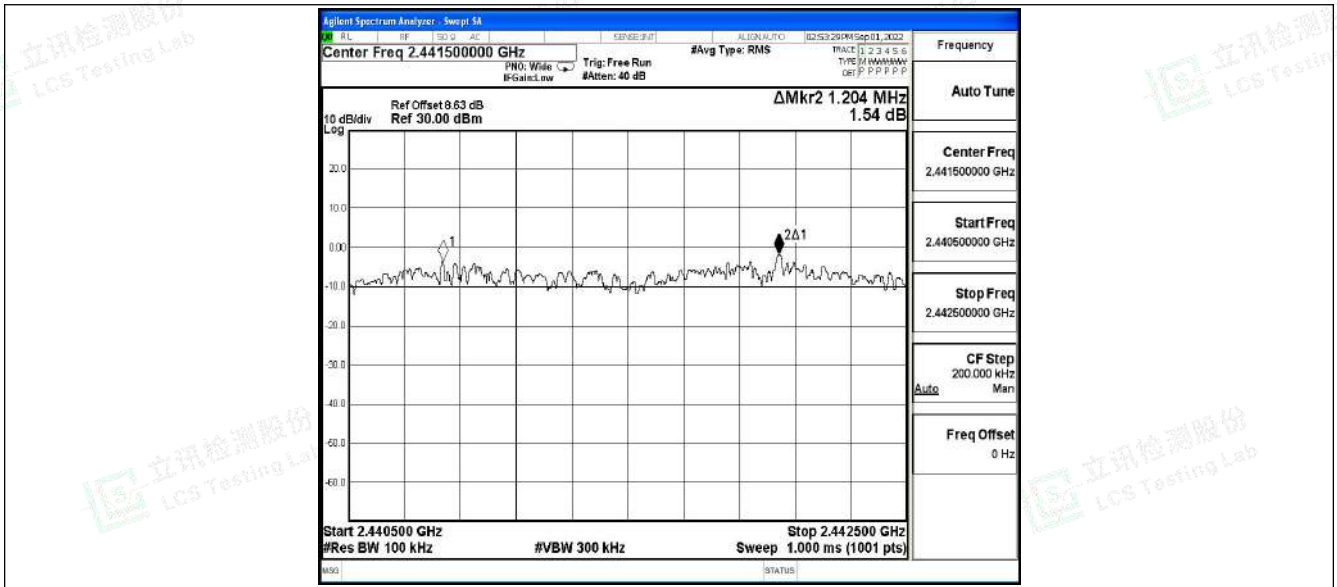


2DH5_Ant1_Hop



3DH5_Ant1_Hop







A.5 Time of occupancy

Test Result

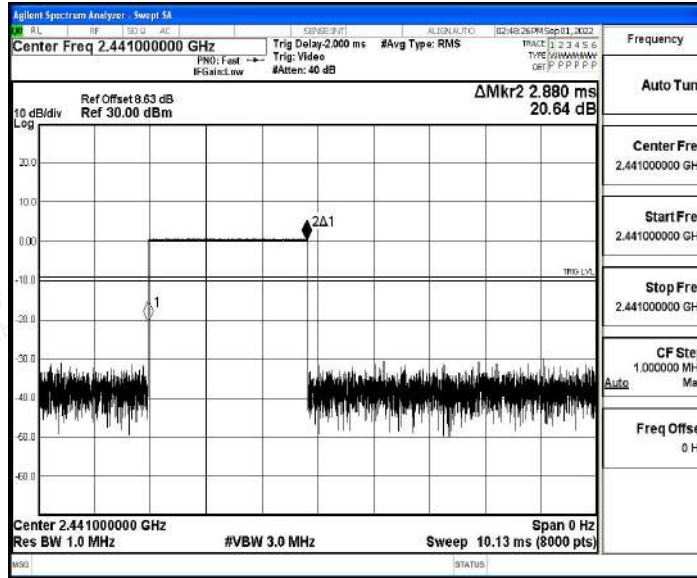
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.88	106.67	0.307	≤0.4	PASS
2DH5	Ant1	Hop	2.88	106.67	0.307	≤0.4	PASS
3DH5	Ant1	Hop	2.89	106.67	0.308	≤0.4	PASS



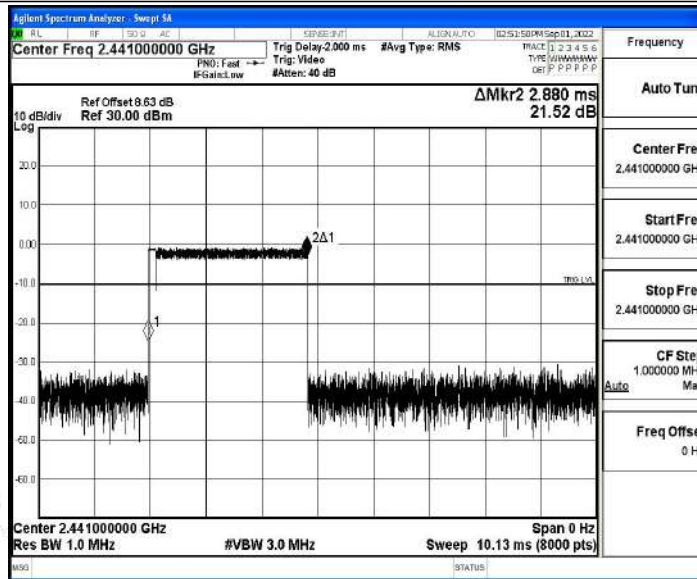


Test Graphs

DH5_Ant1_Hop

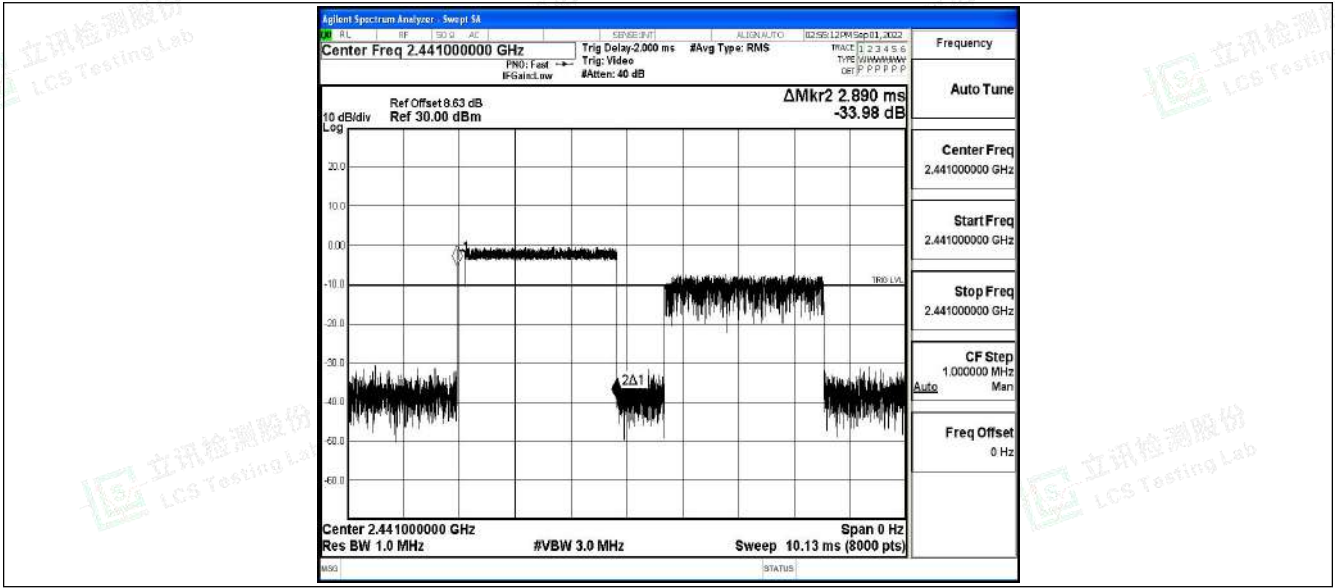


2DH5_Ant1_Hop



3DH5_Ant1_Hop







A.6 Number of hopping channels

Test Result

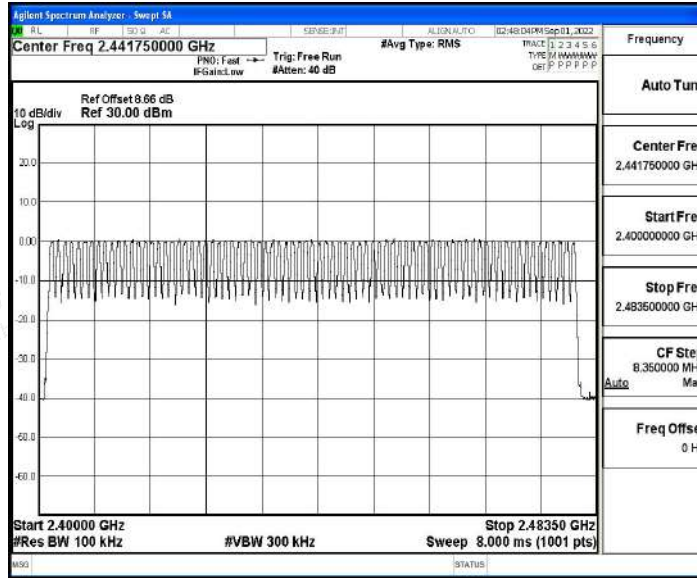
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS



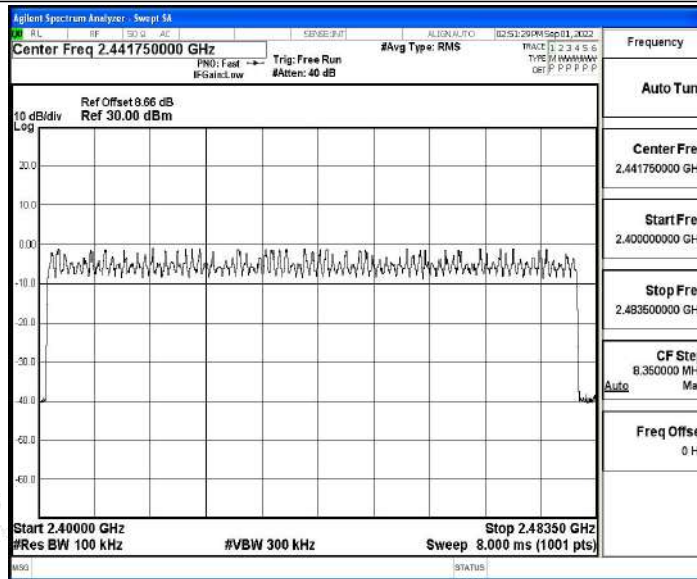


Test Graphs

DH5_Ant1_Hop

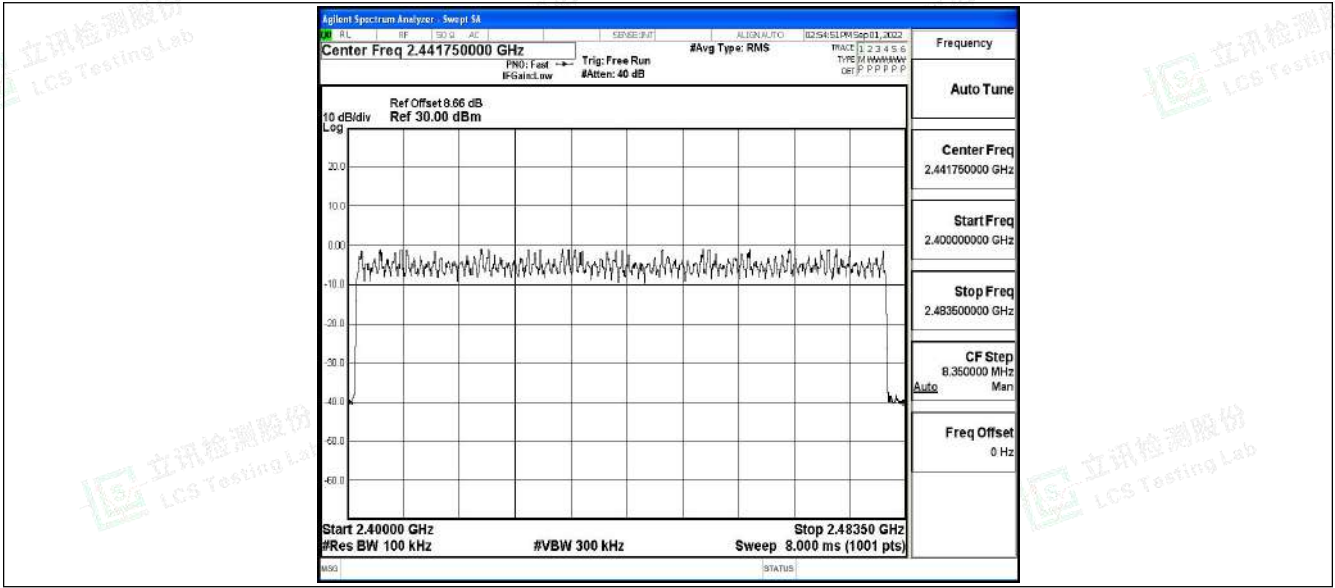


2DH5_Ant1_Hop



3DH5_Ant1_Hop







A.7 Band edge measurements

Test Result

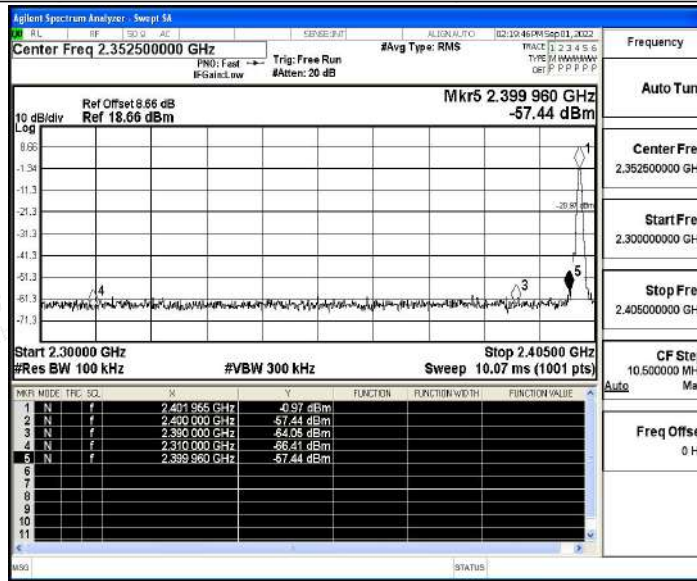
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-0.97	-57.44	≤-20.97	PASS
		High	2480	-1.03	-58.33	≤-21.03	PASS
		Low	Hop_2402	-0.50	-58.72	≤-20.5	PASS
		High	Hop_2480	0.03	-57.59	≤-19.97	PASS
2DH5	Ant1	Low	2402	-4.45	-58.97	≤-24.45	PASS
		High	2480	-2.32	-58.83	≤-22.32	PASS
		Low	Hop_2402	-4.84	-59.25	≤-24.84	PASS
		High	Hop_2480	-1.87	-57.02	≤-21.87	PASS
3DH5	Ant1	Low	2402	-4.76	-56.94	≤-24.76	PASS
		High	2480	-3.90	-59.59	≤-23.9	PASS
		Low	Hop_2402	-2.35	-58.34	≤-22.35	PASS
		High	Hop_2480	-2.03	-57.48	≤-22.03	PASS



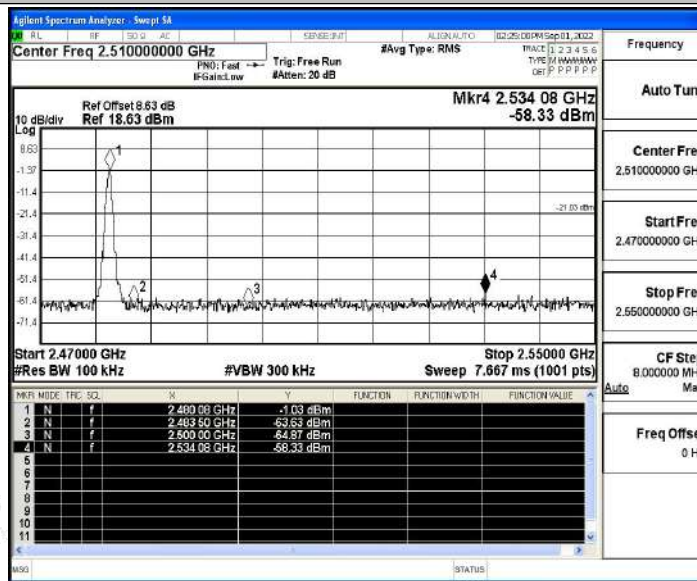


Test Graphs

DH5_Ant1_Low_2402

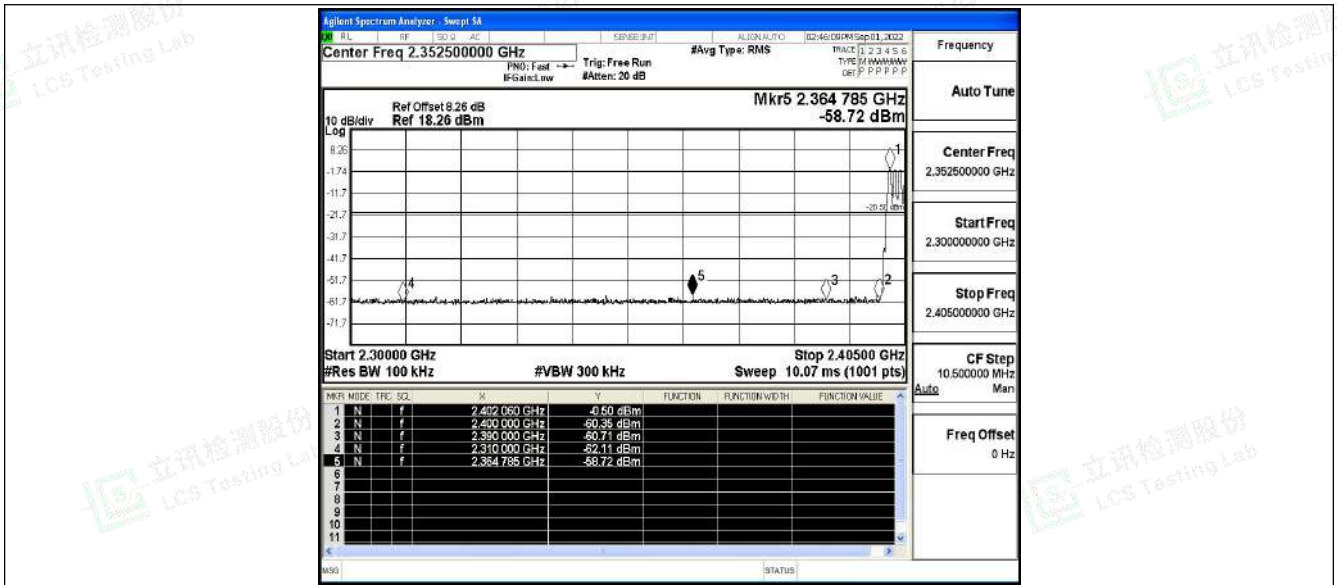


DH5_Ant1_High_2480

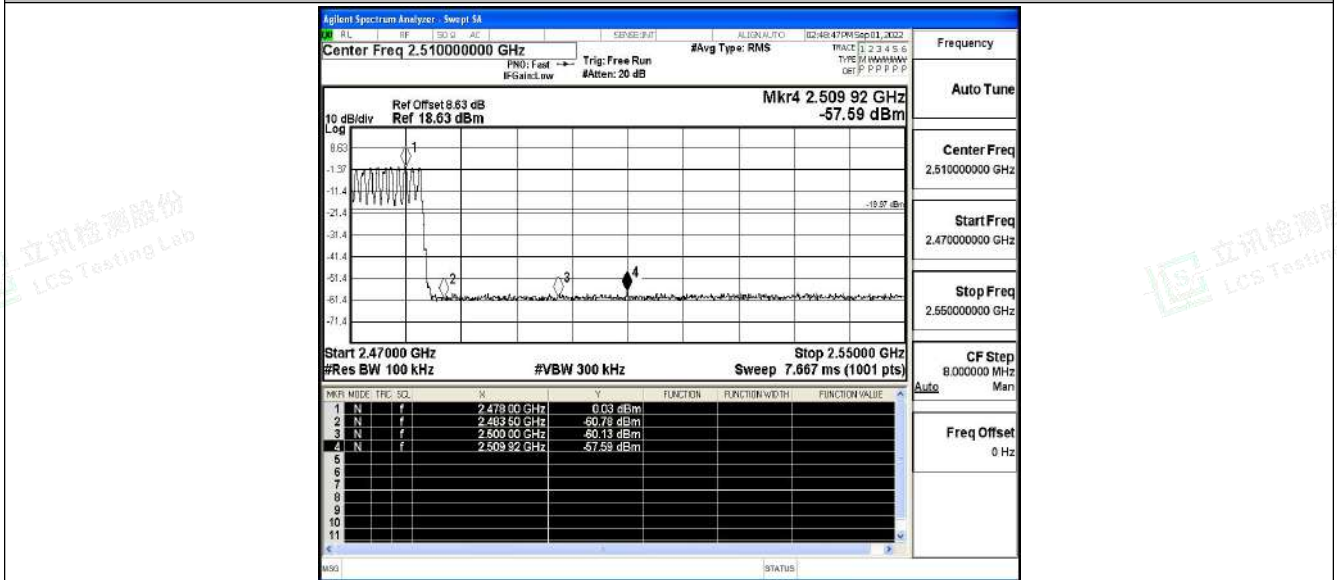


DH5_Ant1_Low_Hop_2402



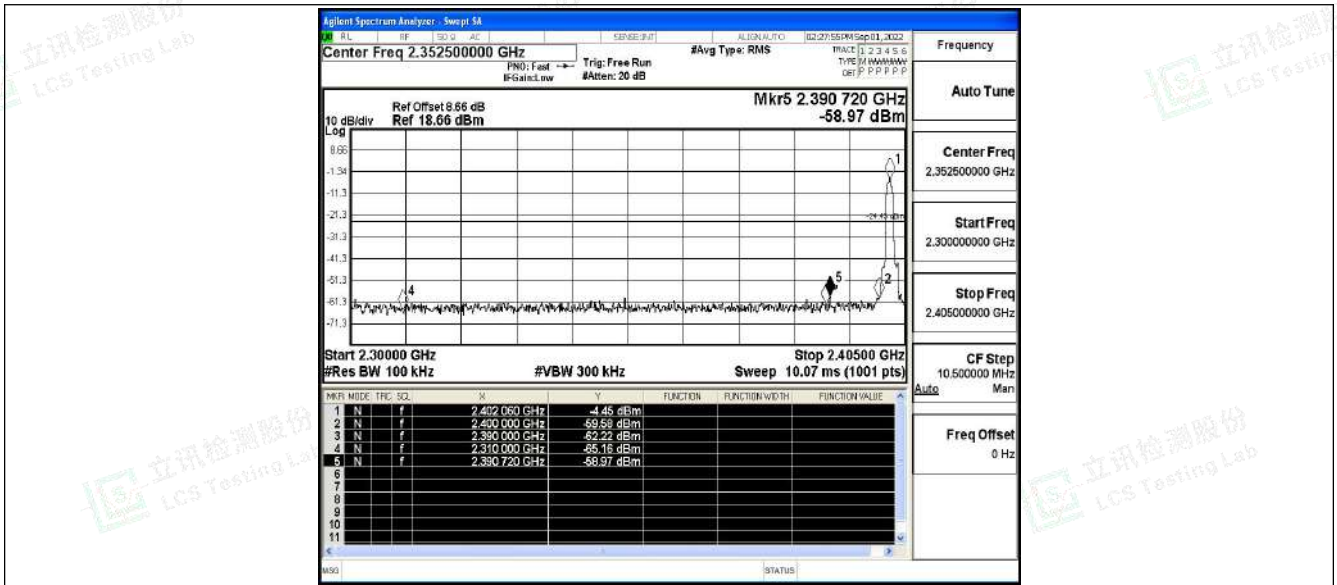


DH5_Ant1_High_Hop_2480

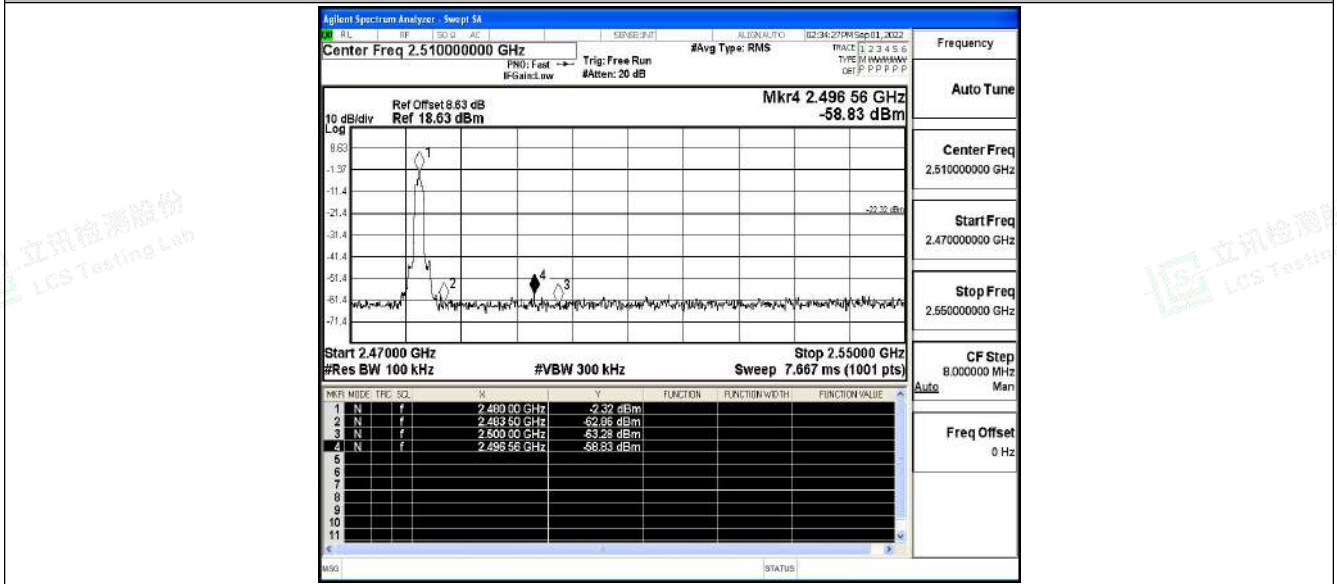


2DH5_Ant1_Low_2402



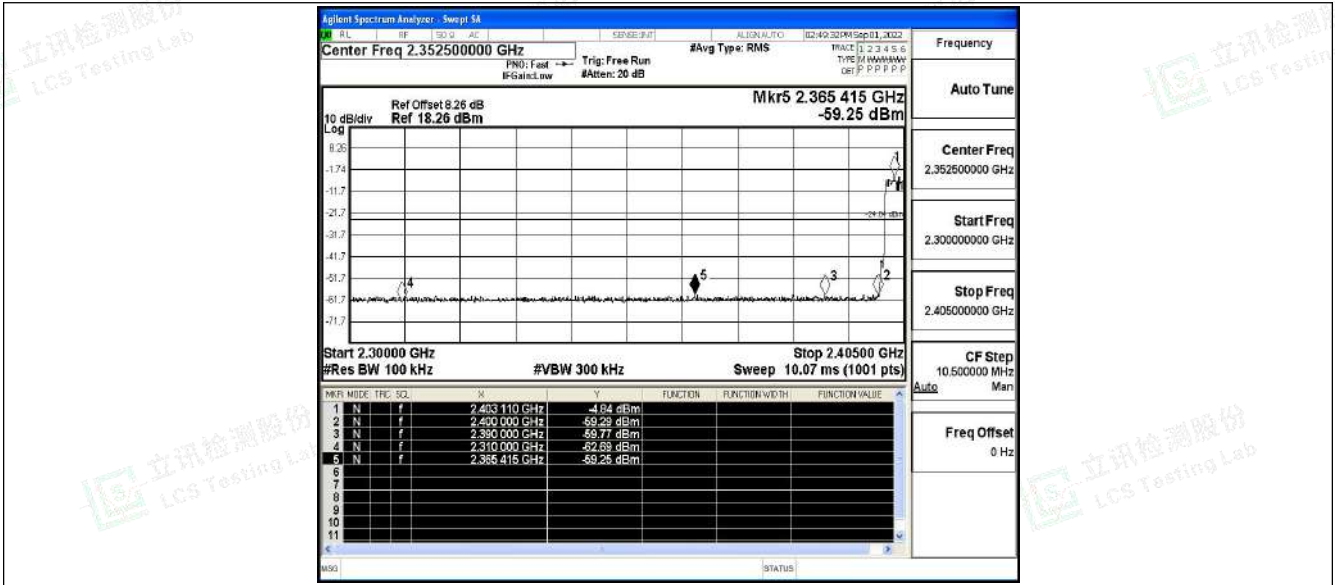


2DH5_Ant1_High_2480

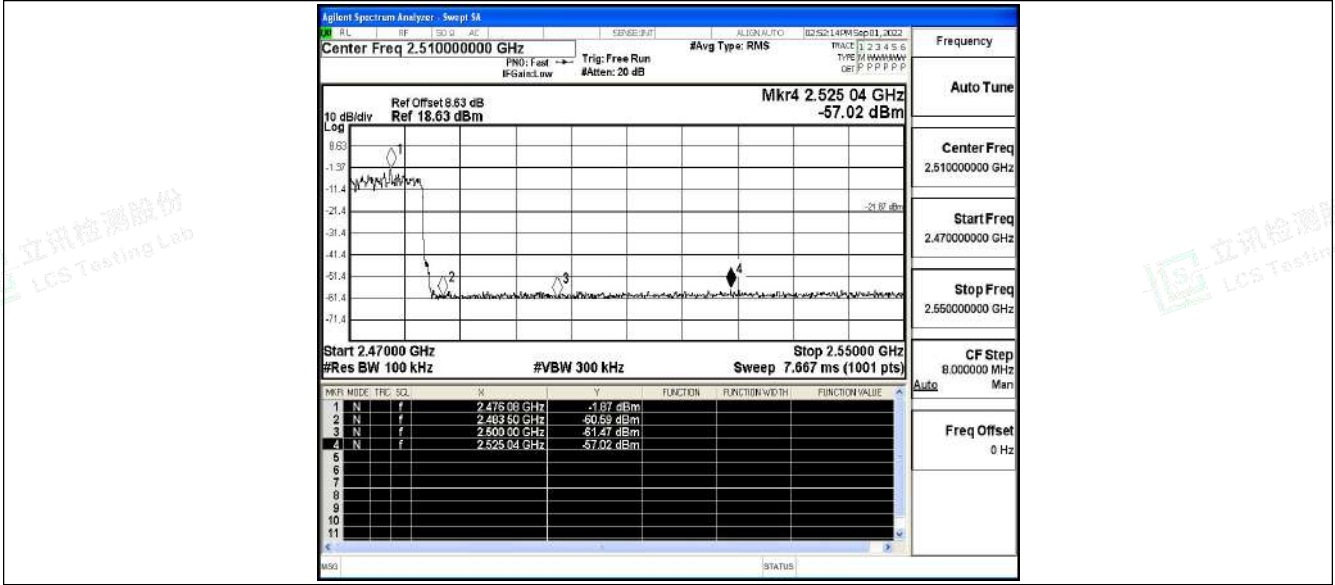


2DH5_Ant1_Low_Hop_2402



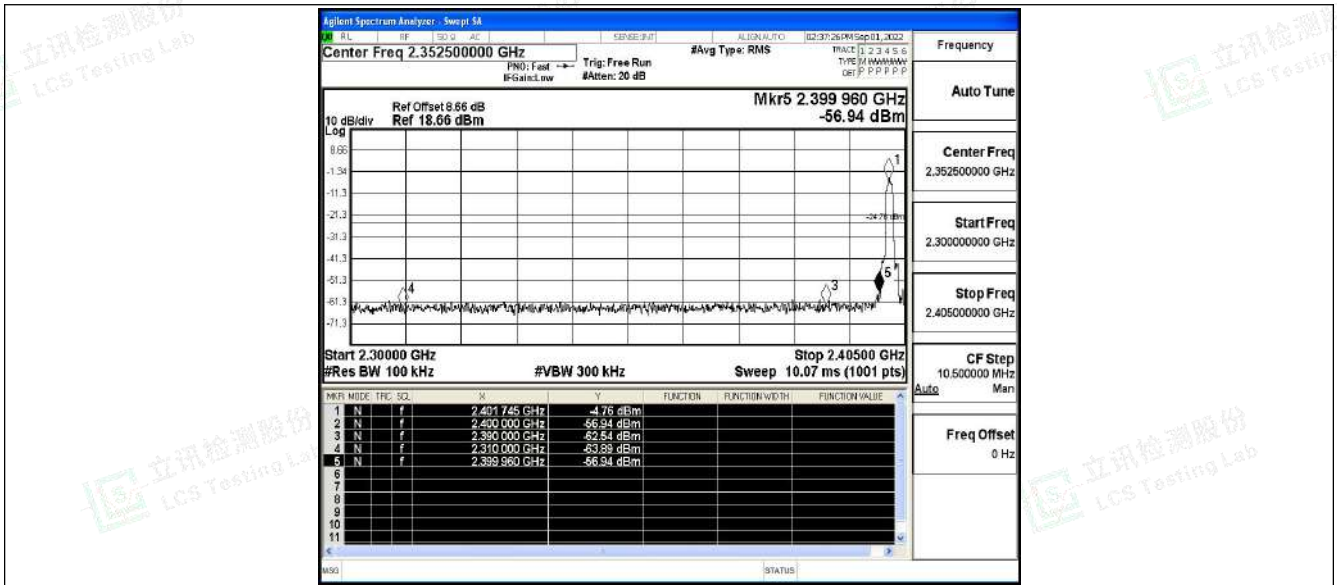


2DH5_Ant1_High_Hop_2480

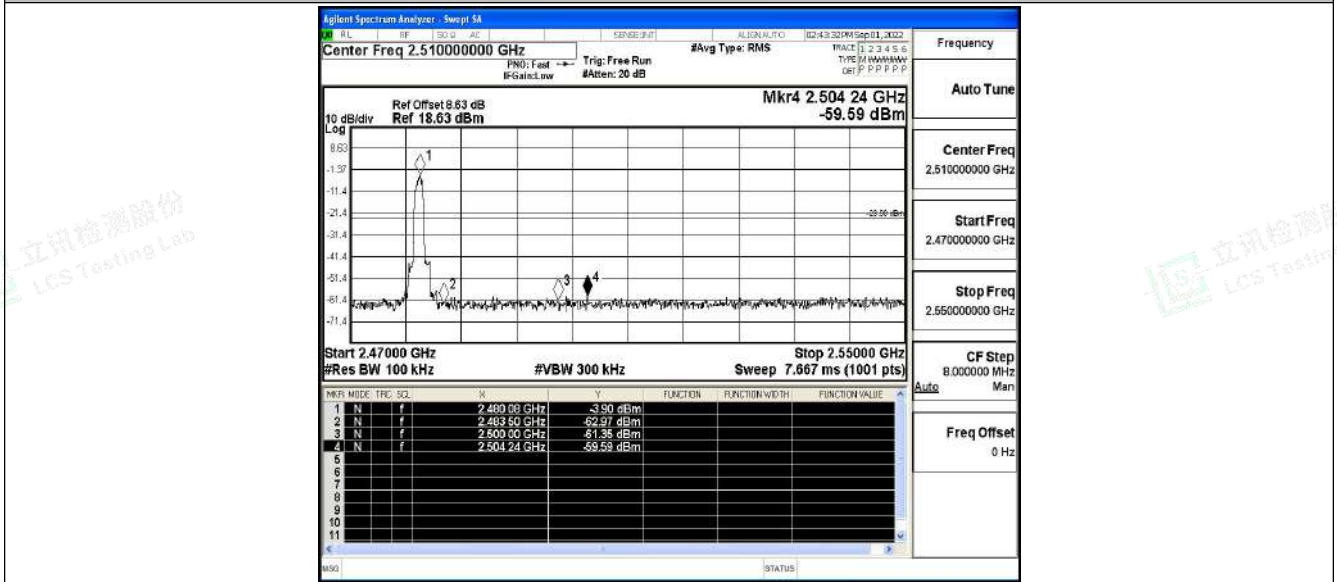


3DH5_Ant1_Low_2402



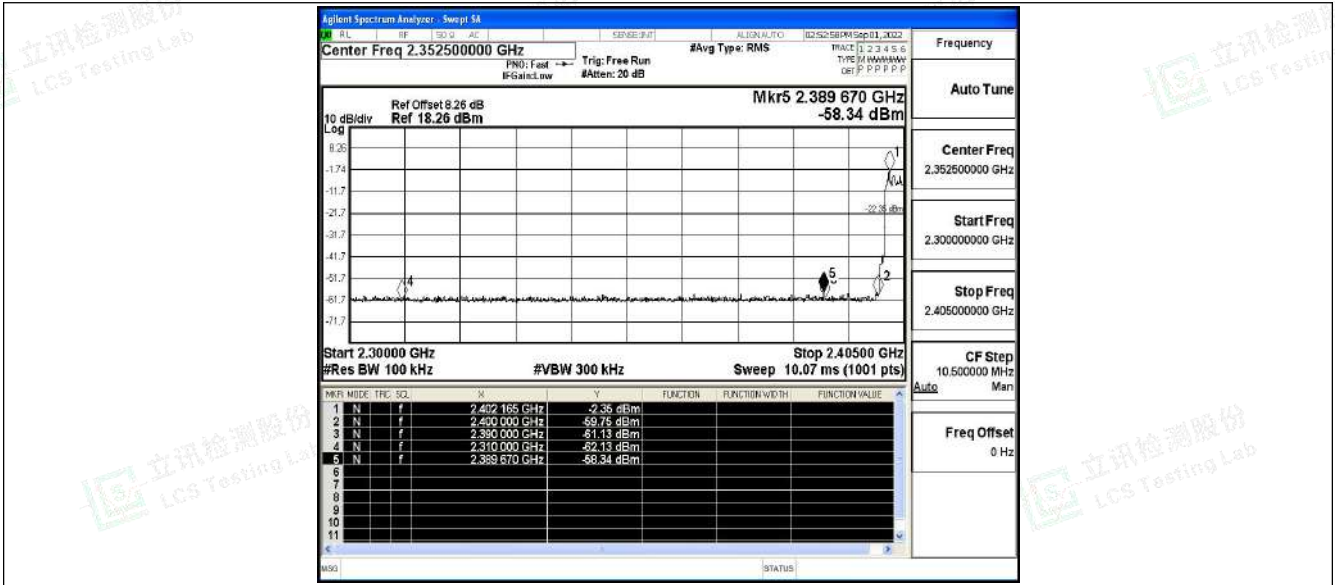


3DH5_Ant1_High_2480

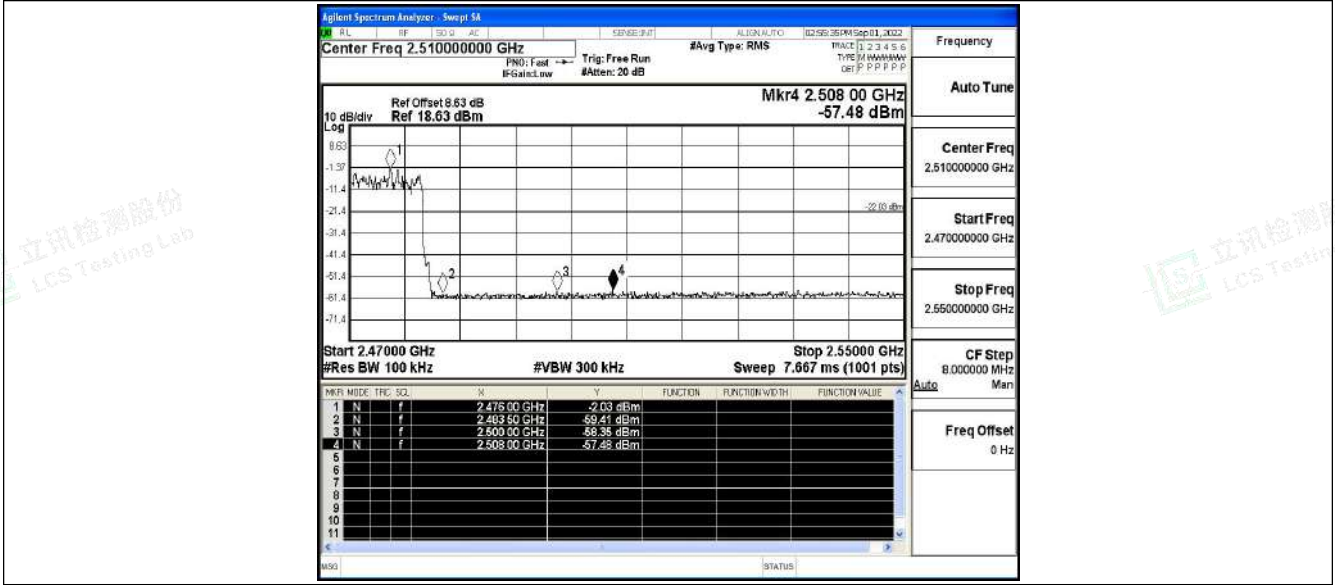


3DH5_Ant1_Low_Hop_2402





3DH5_Ant1_High_Hop_2480





A.8 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-0.78	-0.78	---	PASS
			30~1000	-0.78	-60.41	≤-20.78	PASS
			1000~26500	-0.78	-46.39	≤-20.78	PASS
		2441	Reference	-0.81	-0.81	---	PASS
			30~1000	-0.81	-60.42	≤-20.81	PASS
			1000~26500	-0.81	-45.43	≤-20.81	PASS
		2480	Reference	-0.78	-0.78	---	PASS
			30~1000	-0.78	-58.96	≤-20.78	PASS
			1000~26500	-0.78	-45.52	≤-20.78	PASS
2DH5	Ant1	2402	Reference	-5.27	-5.27	---	PASS
			30~1000	-5.27	-60.51	≤-25.27	PASS
			1000~26500	-5.27	-46.49	≤-25.27	PASS
		2441	Reference	-2.05	-2.05	---	PASS
			30~1000	-2.05	-60.31	≤-22.05	PASS
			1000~26500	-2.05	-46.34	≤-22.05	PASS
		2480	Reference	-4.02	-4.02	---	PASS
			30~1000	-4.02	-61.09	≤-24.02	PASS
			1000~26500	-4.02	-46	≤-24.02	PASS
3DH5	Ant1	2402	Reference	-4.78	-4.78	---	PASS
			30~1000	-4.78	-60.96	≤-24.78	PASS
			1000~26500	-4.78	-44.93	≤-24.78	PASS
		2441	Reference	-4.34	-4.34	---	PASS
			30~1000	-4.34	-61.21	≤-24.34	PASS
			1000~26500	-4.34	-45.44	≤-24.34	PASS
		2480	Reference	-5.25	-5.25	---	PASS
			30~1000	-5.25	-61.08	≤-25.25	PASS
			1000~26500	-5.25	-46.18	≤-25.25	PASS



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

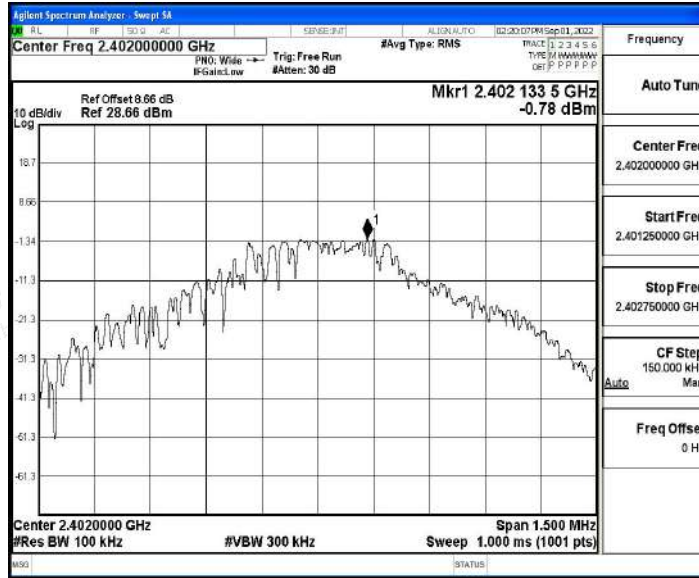
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

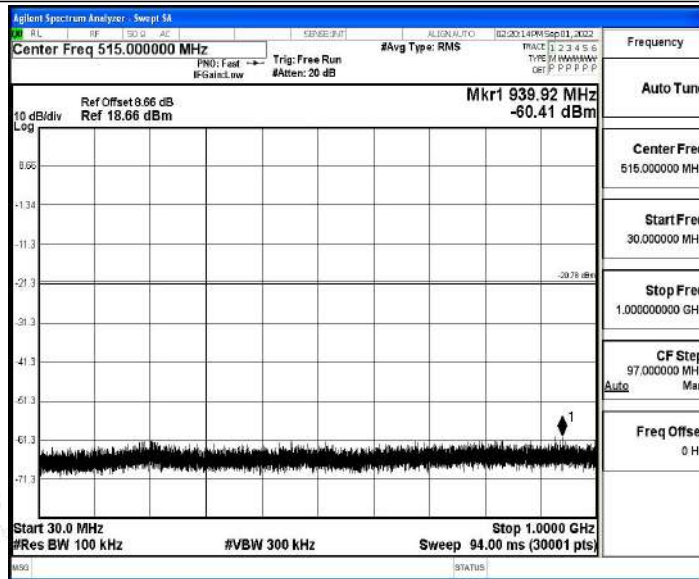


Test Graphs

DH5_Ant1_2402_0~Reference

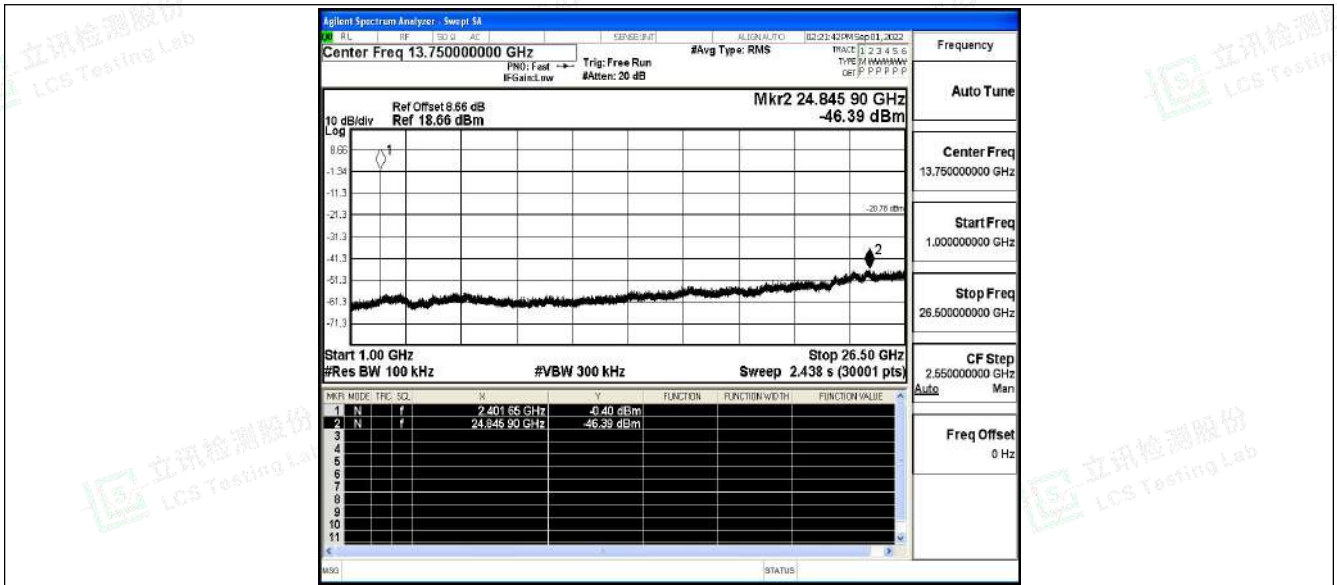


DH5_Ant1_2402_30~1000

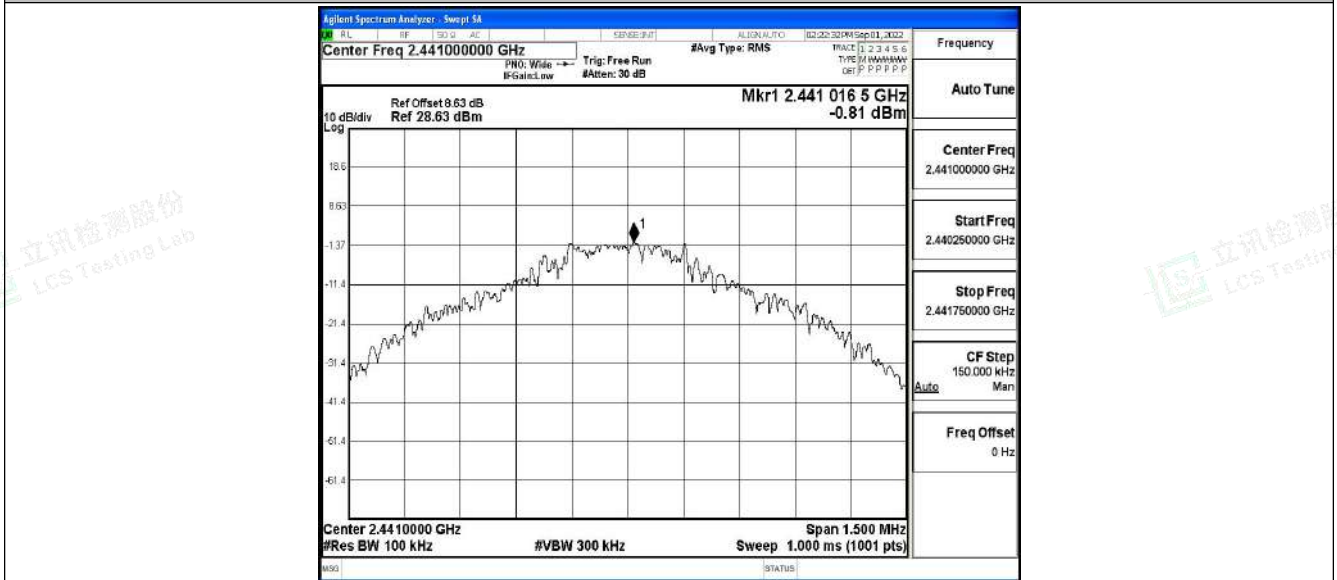


DH5_Ant1_2402_1000~26500



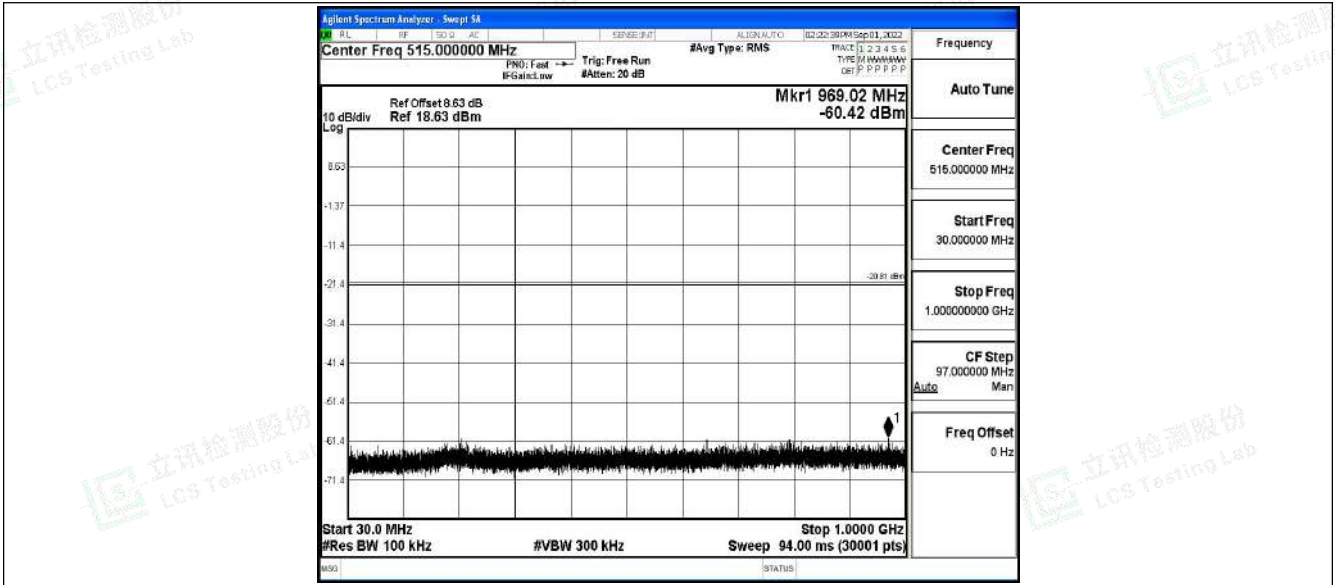


DH5_Ant1_2441_0~Reference

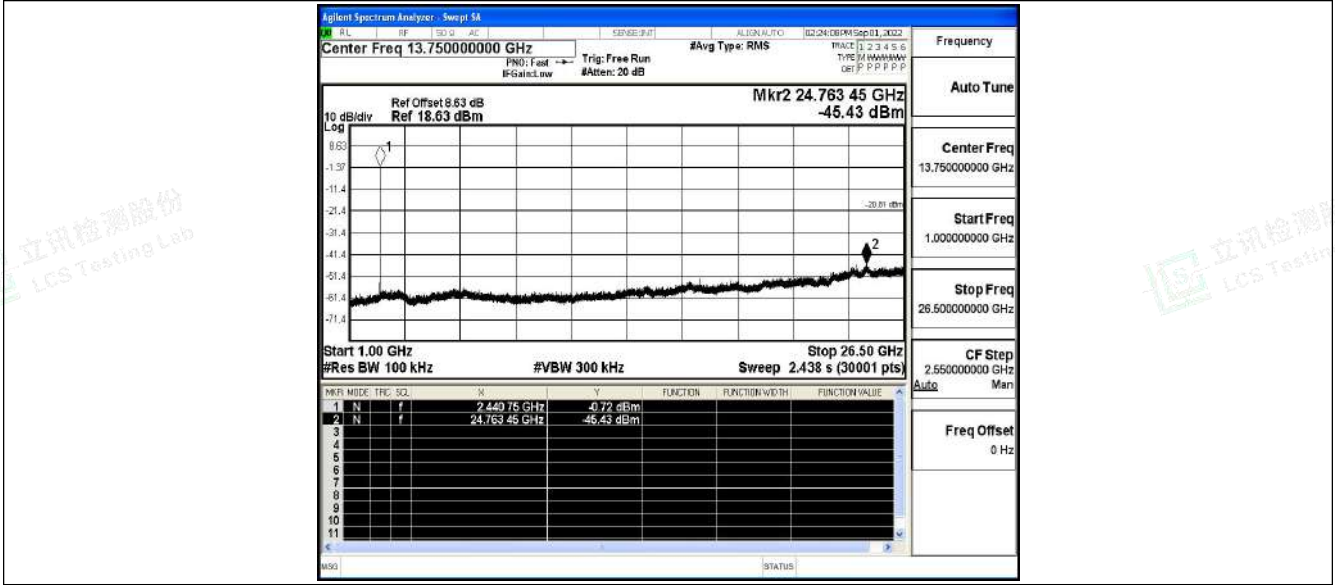


DH5_Ant1_2441_30~1000



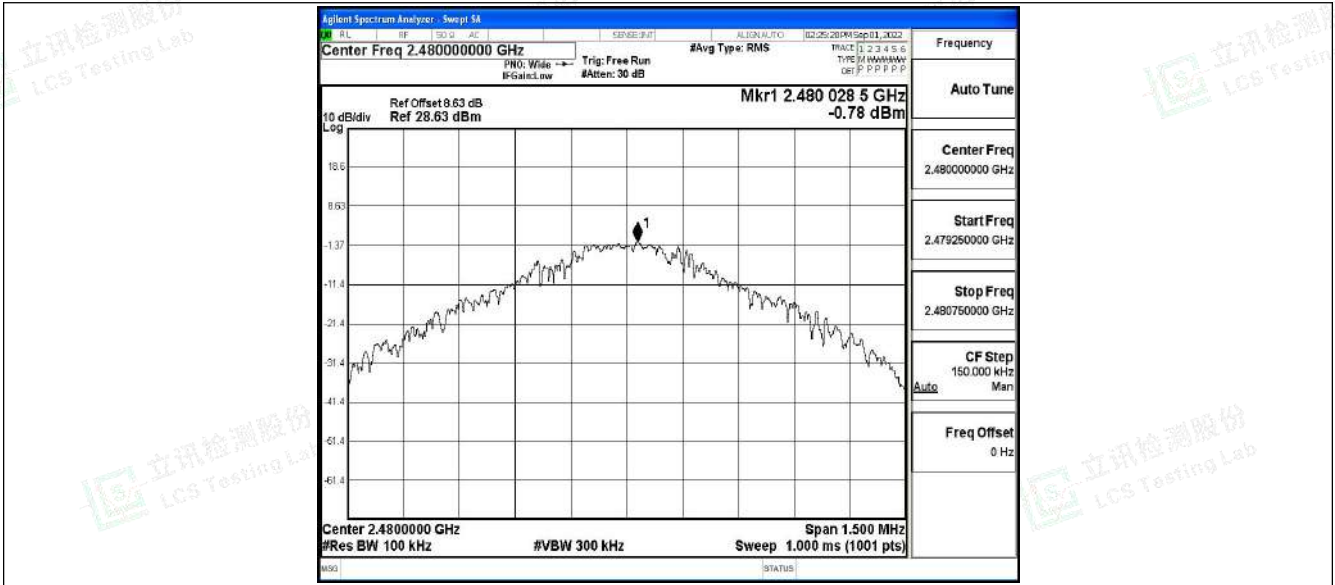


DH5_Ant1_2441_1000~26500

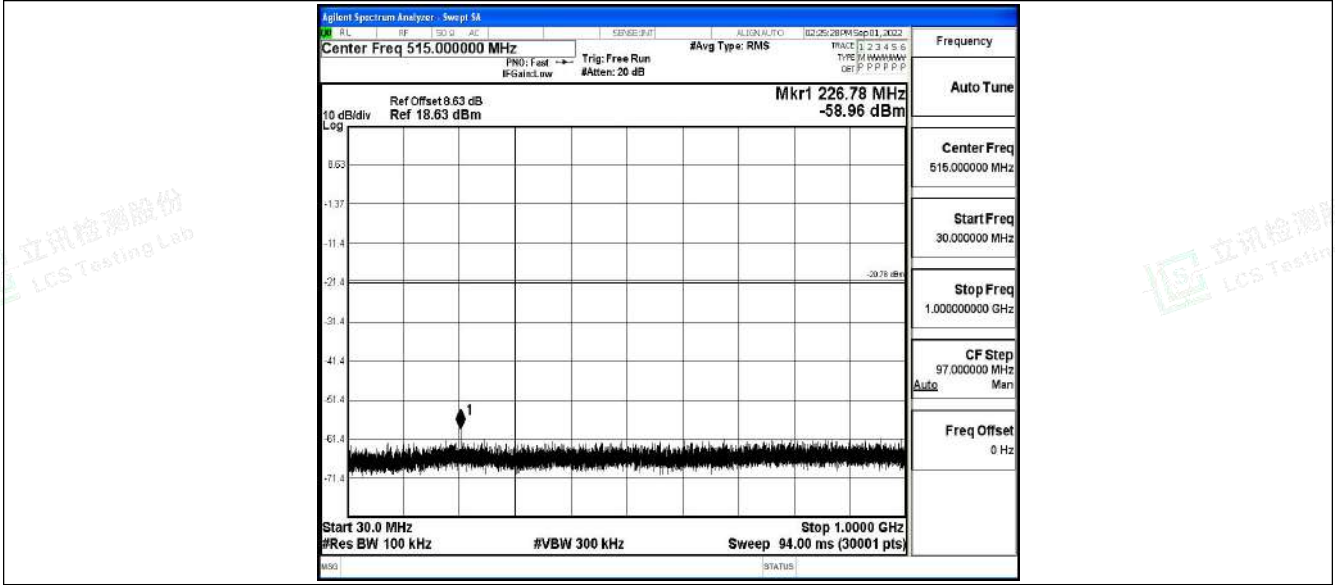


DH5_Ant1_2480_0~Reference



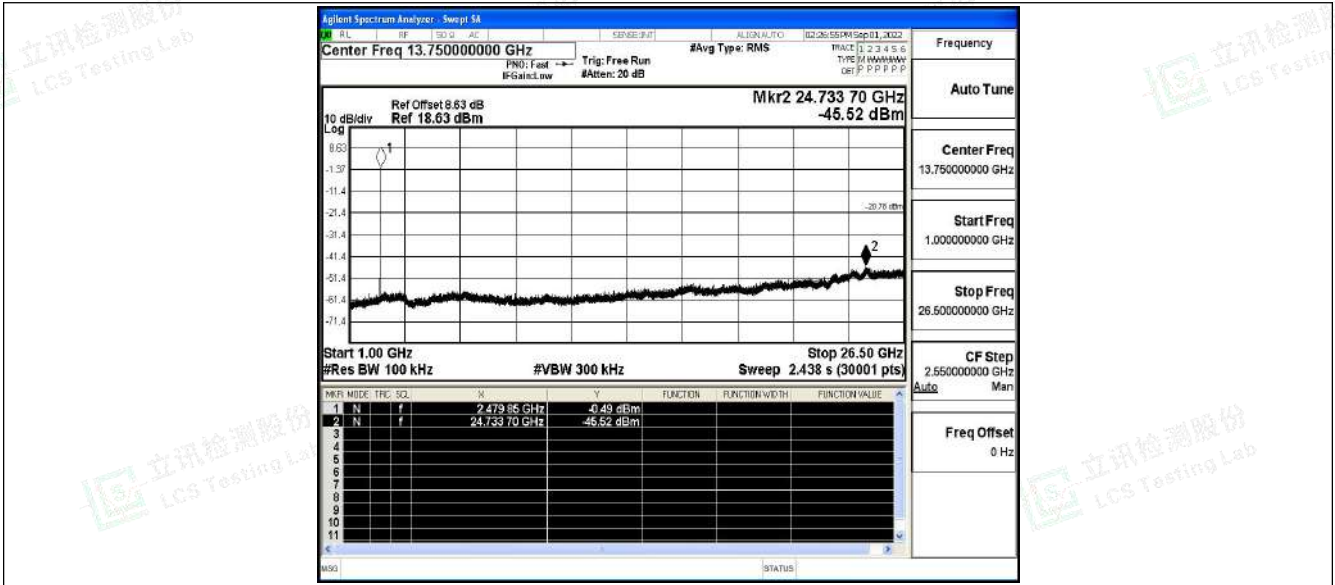


DH5_Ant1_2480_30~1000

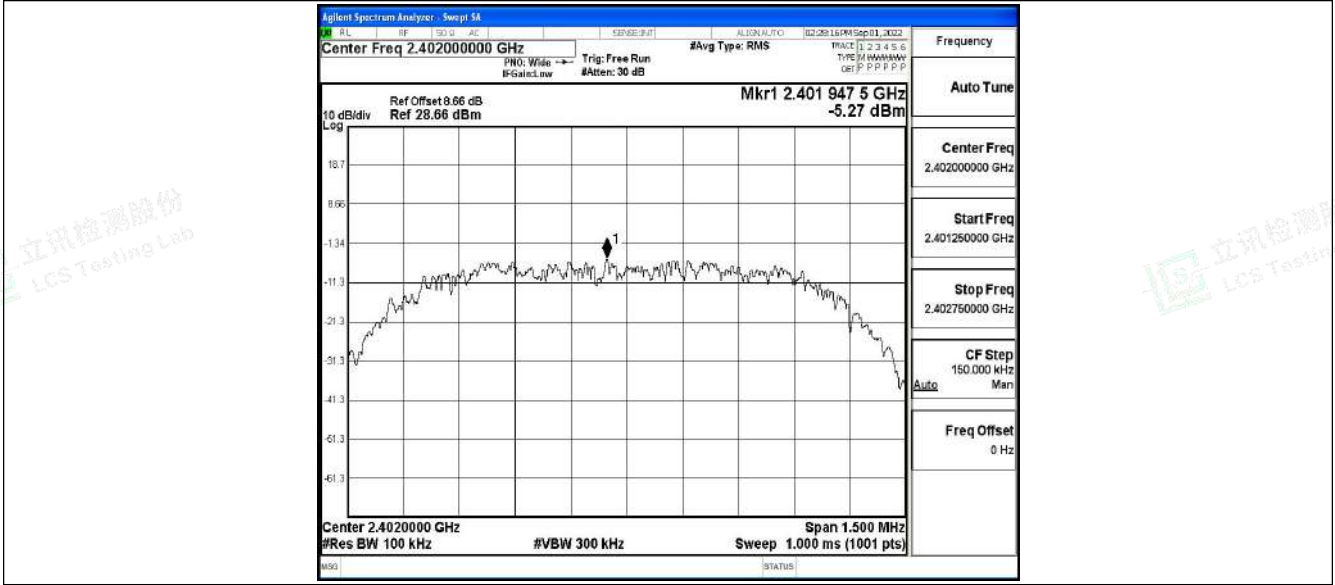


DH5_Ant1_2480_1000~26500



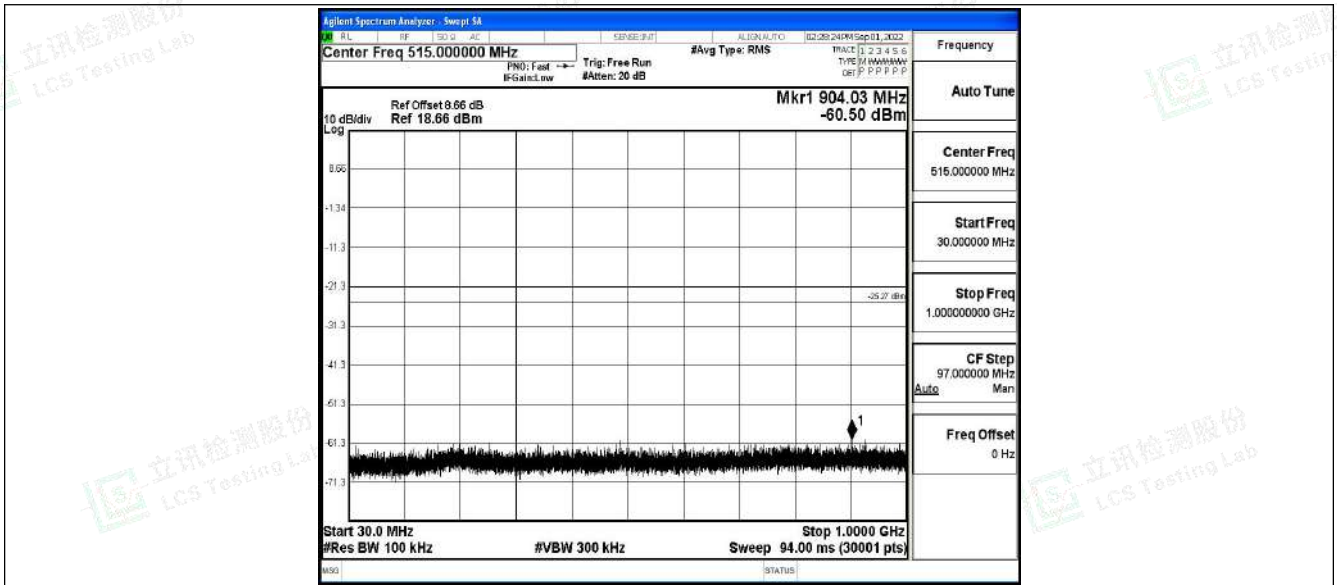


2DH5_Ant1_2402_0~Reference

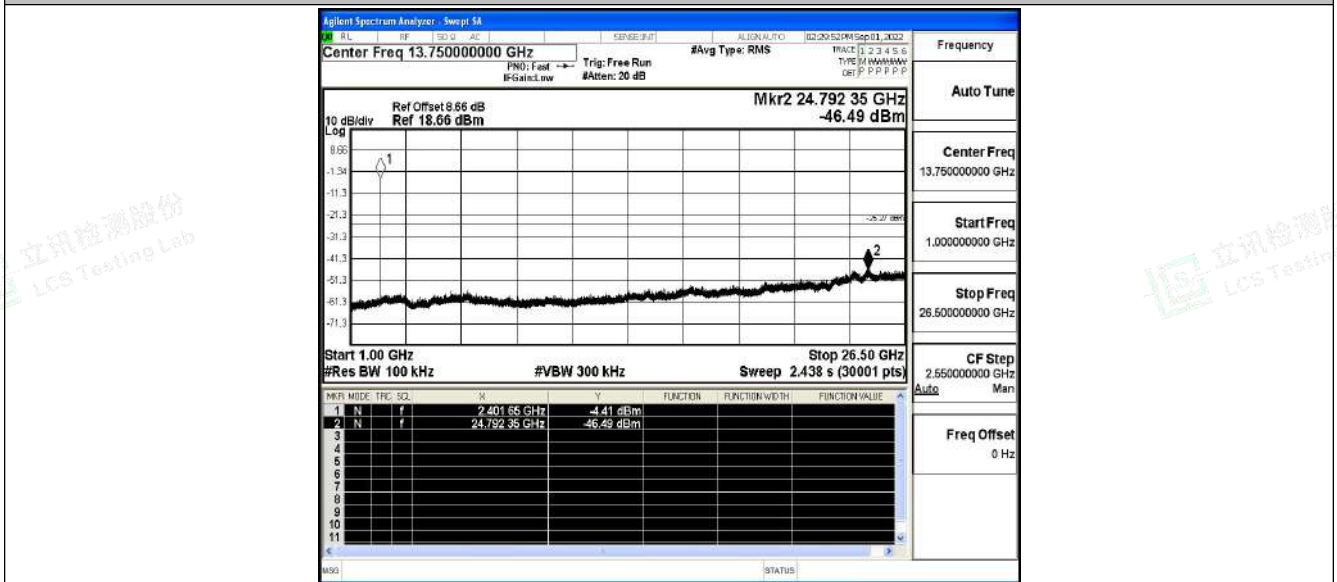


2DH5_Ant1_2402_30~1000



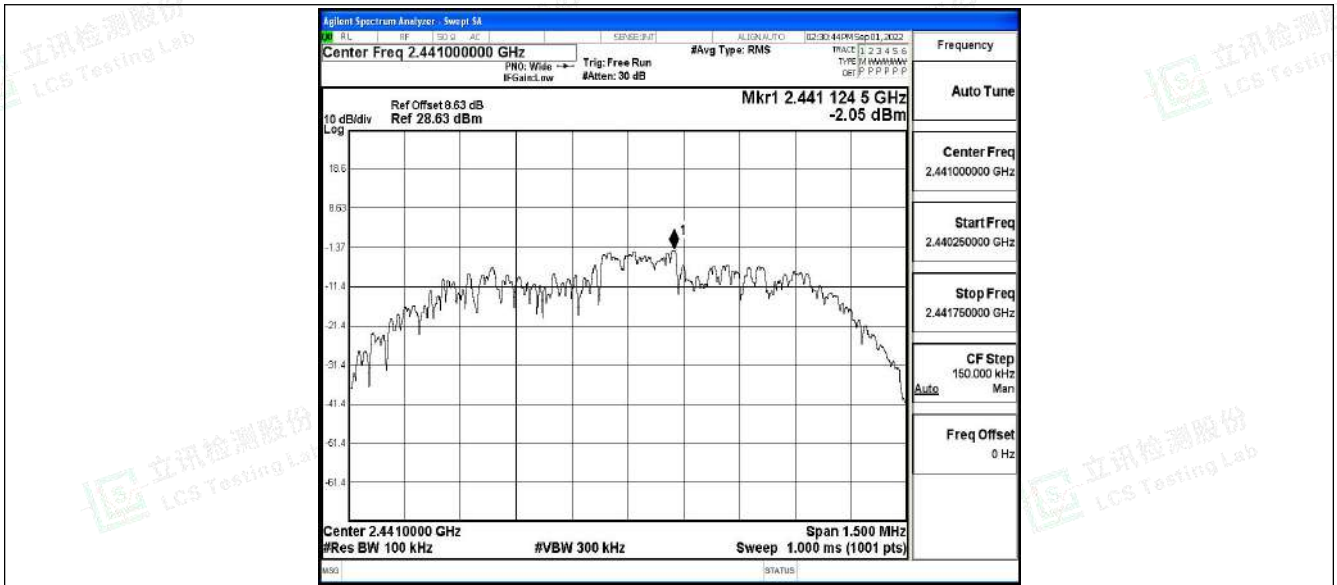


2DH5_Ant1_2402_1000~26500

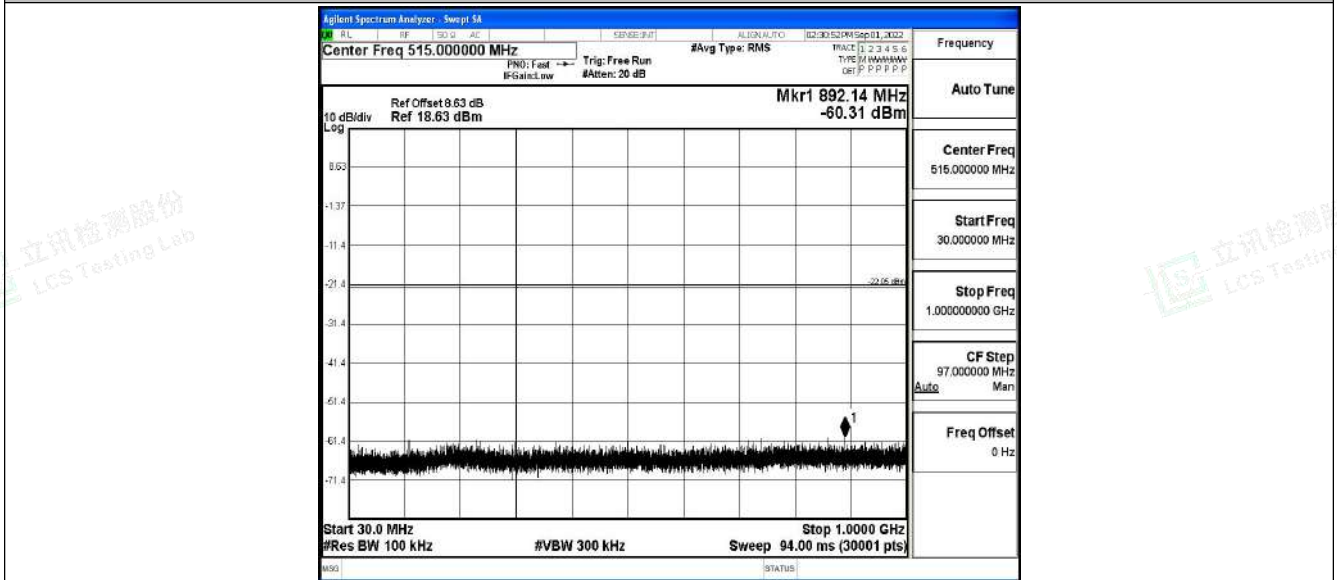


2DH5_Ant1_2441_0~Reference



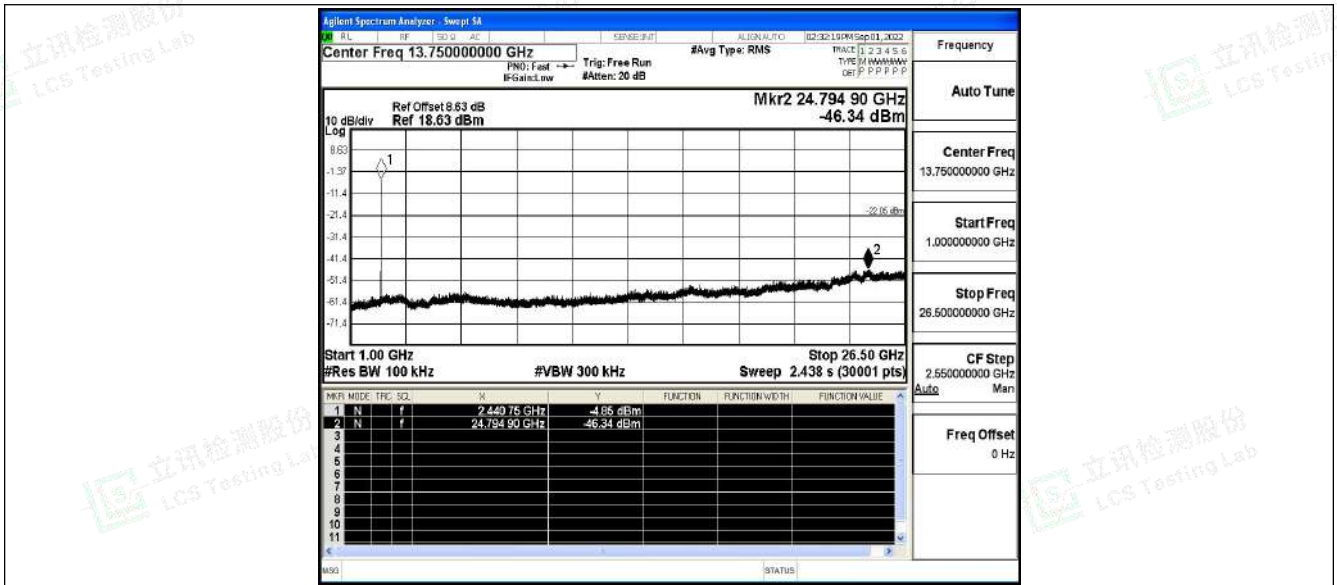


2DH5_Ant1_2441_30~1000

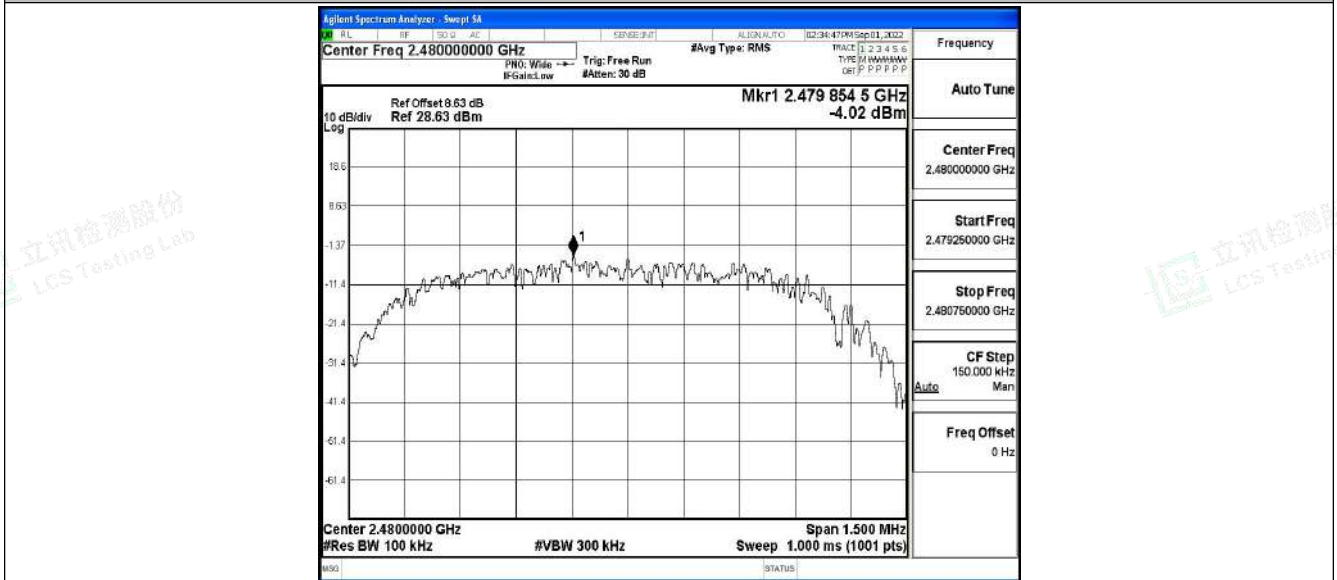


2DH5_Ant1_2441_1000~26500



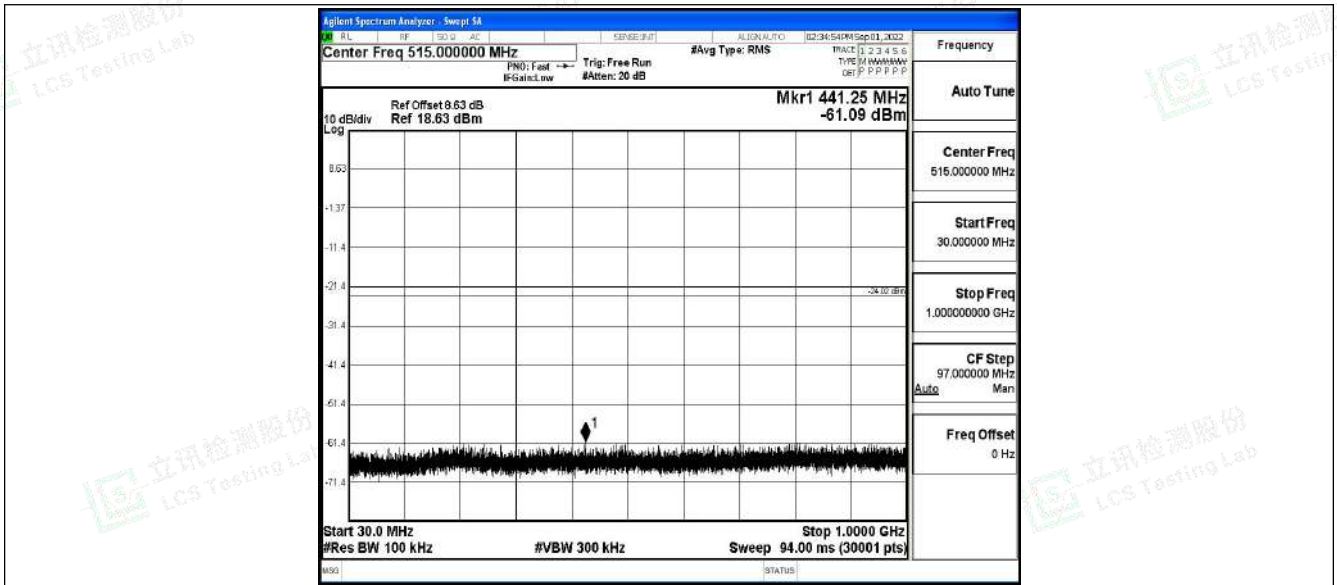


2DH5_Ant1_2480_0~Reference

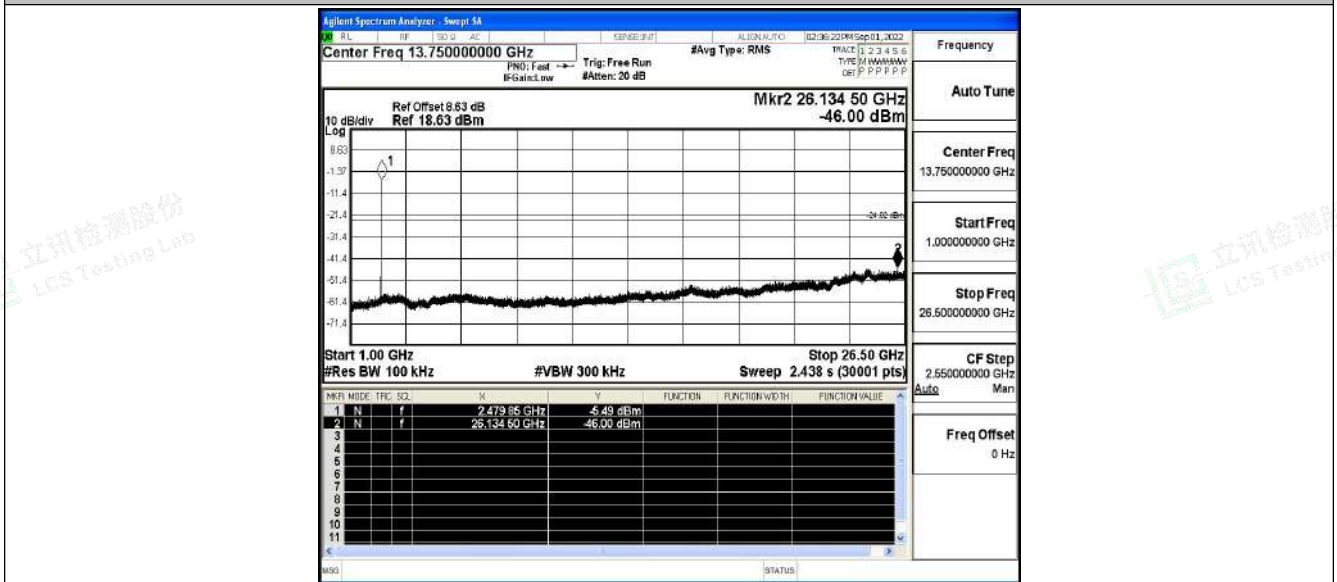


2DH5_Ant1_2480_30~1000



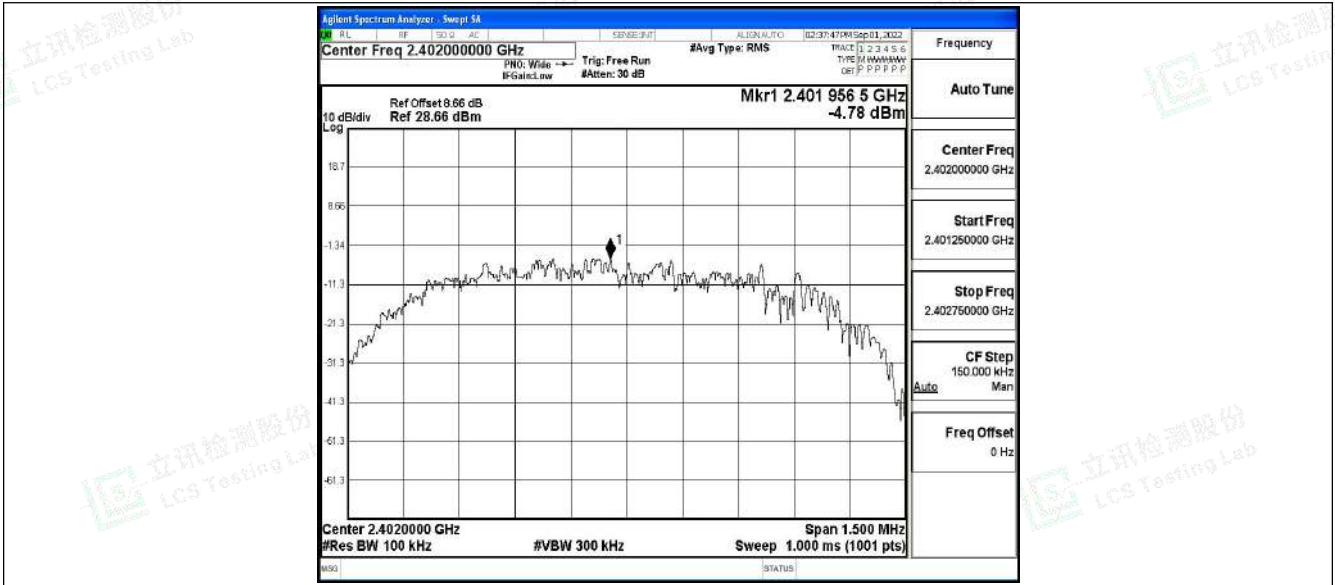


2DH5_Ant1_2480_1000~26500

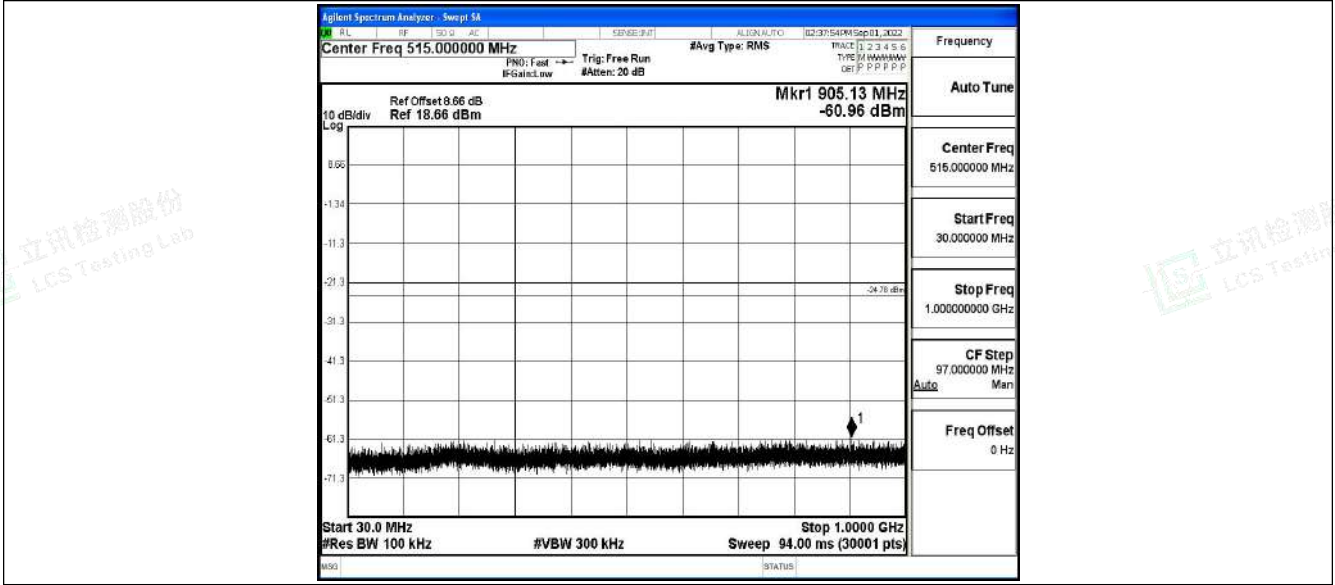


3DH5_Ant1_2402_0~Reference



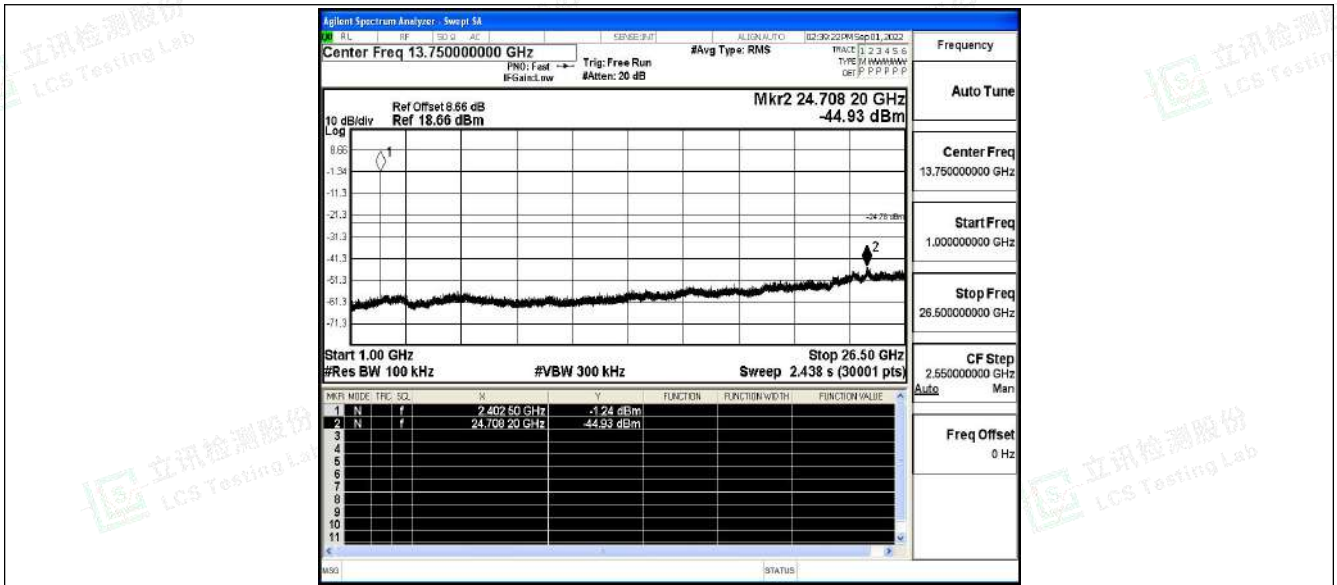


3DH5_Ant1_2402_30~1000

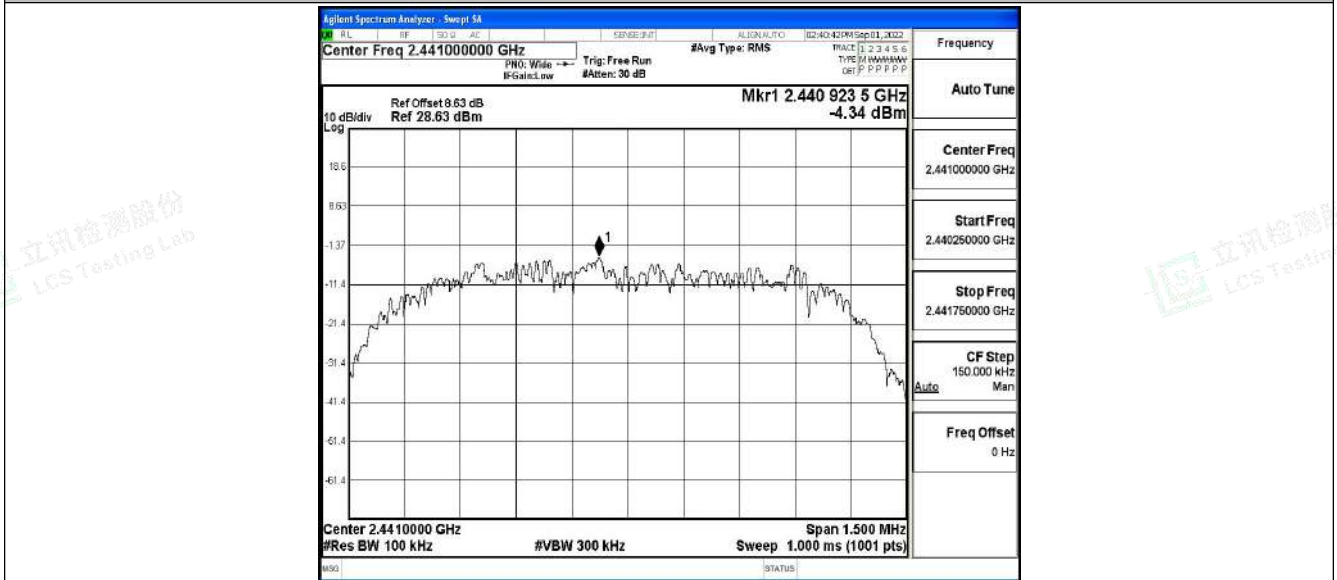


3DH5_Ant1_2402_1000~26500



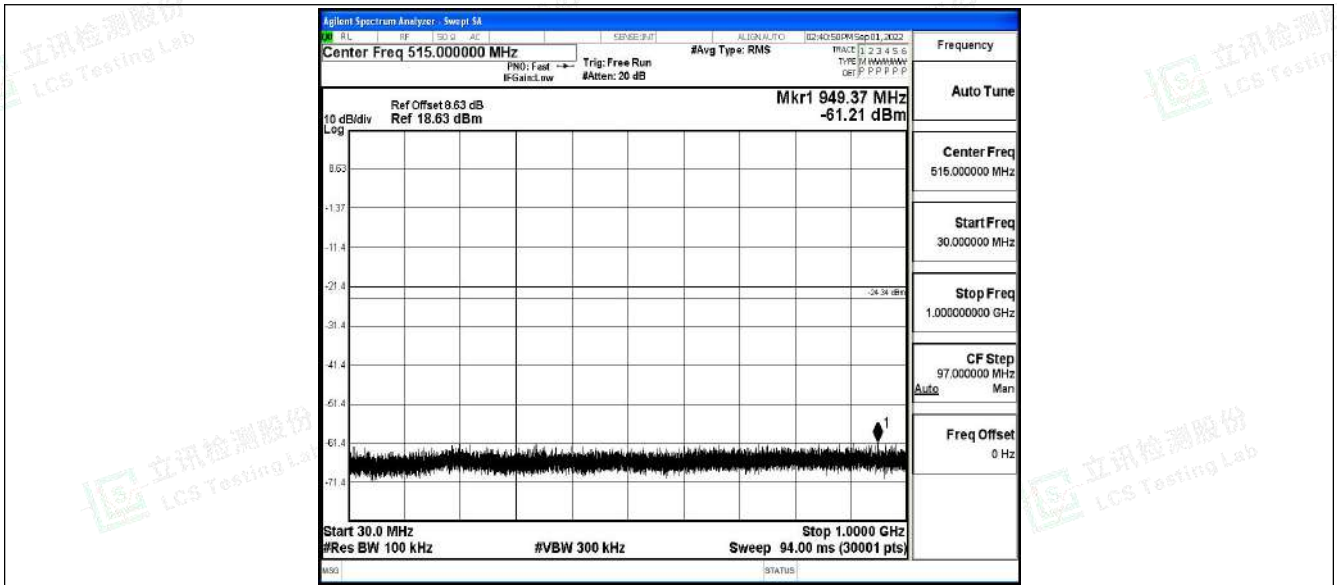


3DH5_Ant1_2441_0~Reference

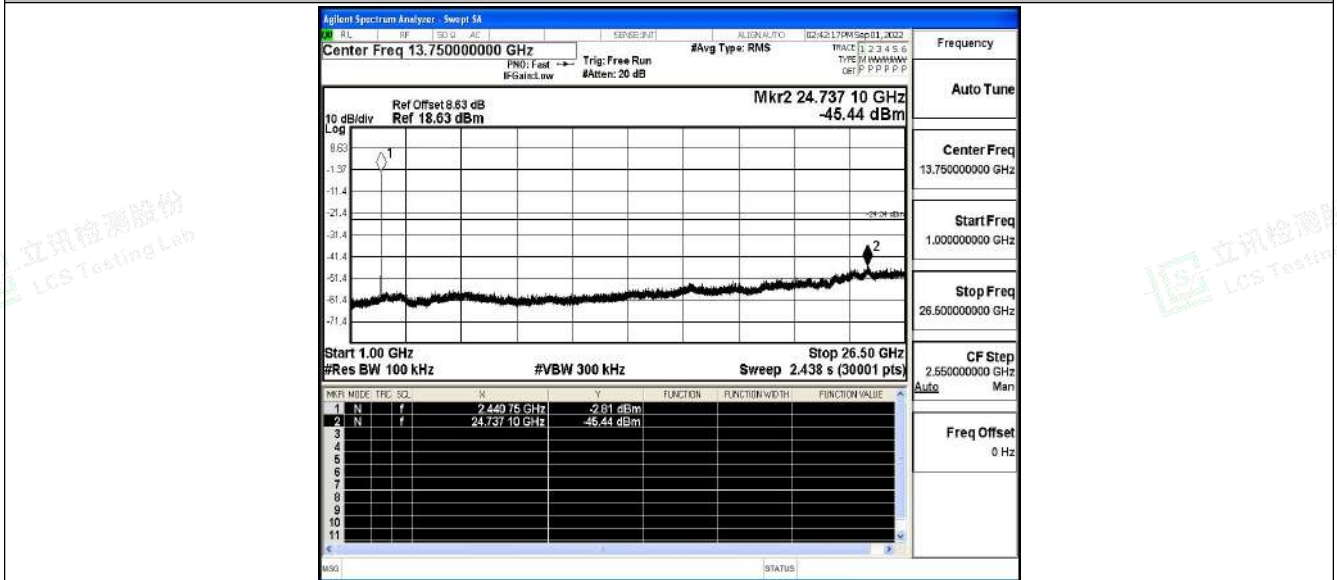


3DH5_Ant1_2441_30~1000



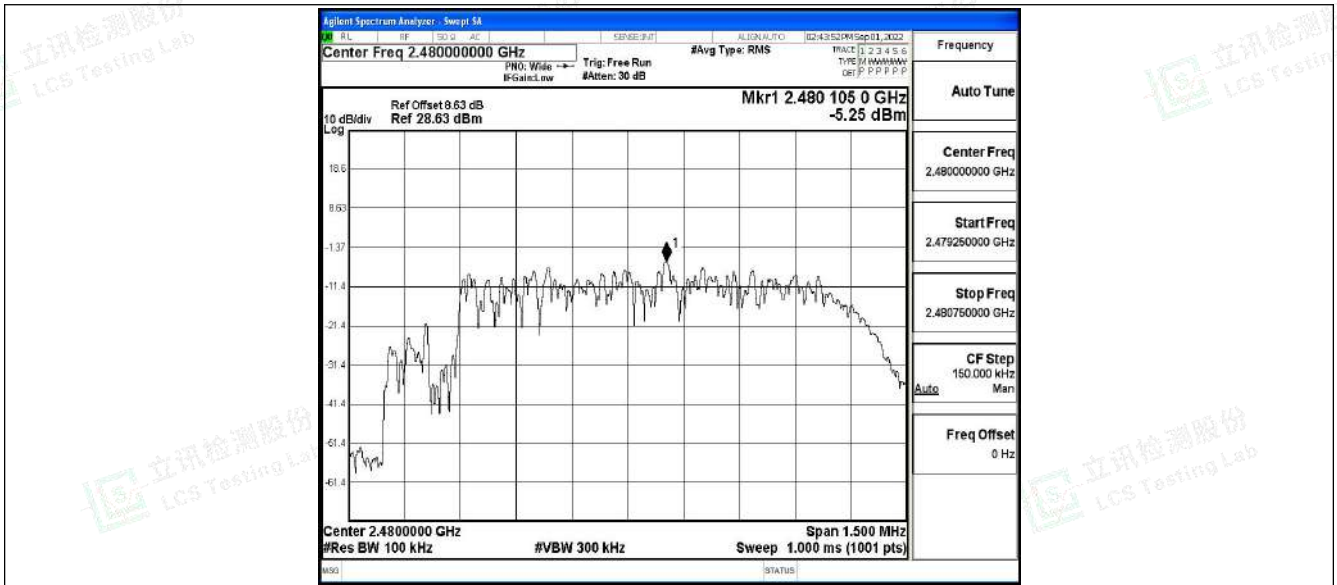


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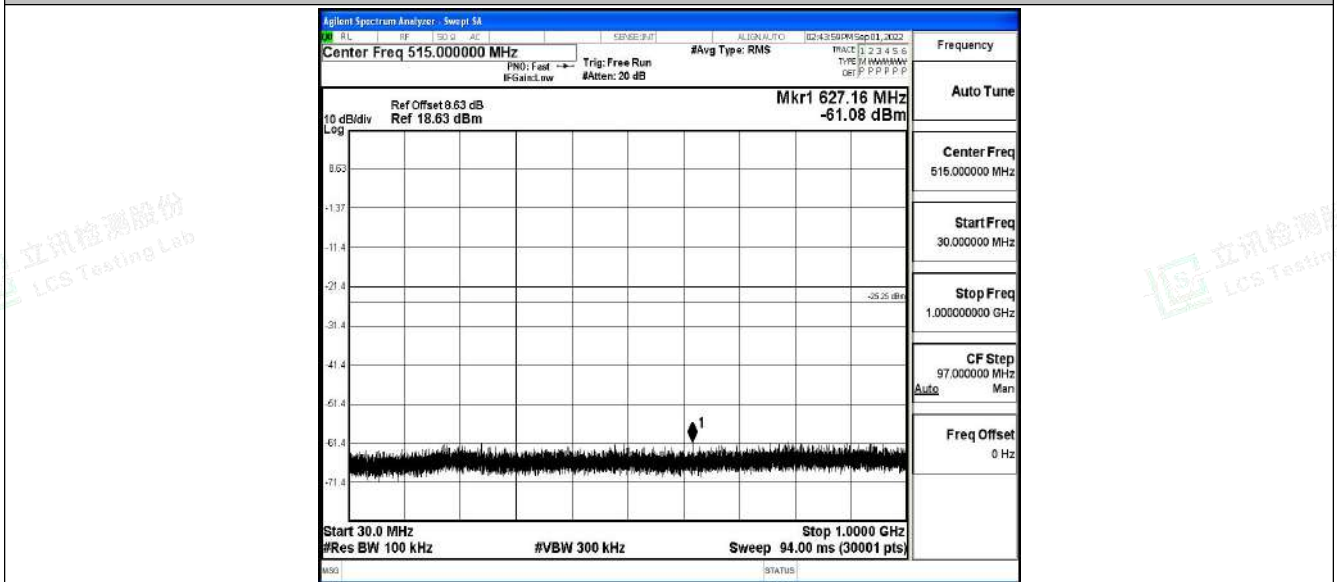


3DH5_Ant1_2480_0~Reference



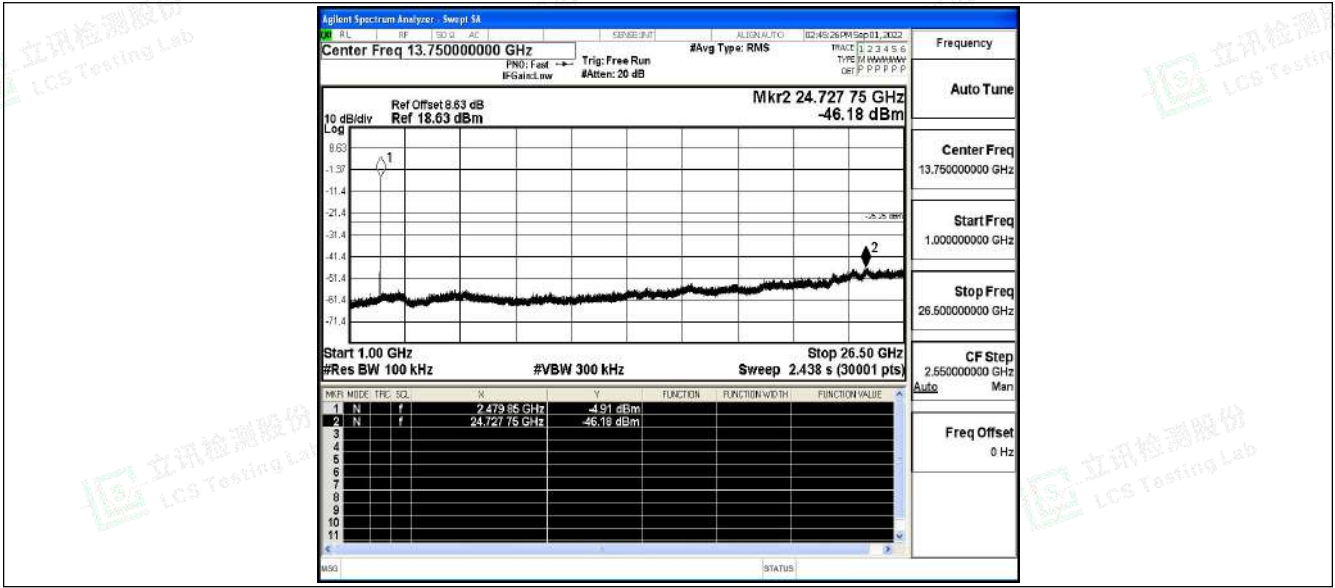


3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500







A.9 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	-58.15	≤-41.20	37.05	≤54	PASS
				AV	2389.880	-57.54	≤-41.20	37.66	≤54	PASS
				AV	2390.000	-57.66	≤-41.20	37.54	≤54	PASS
				Peak	2310.000	-54.52	≤-21.20	40.68	≤74	PASS
				Peak	2353.445	-48.13	≤-21.20	47.07	≤74	PASS
				Peak	2390.000	-53.09	≤-21.20	42.11	≤74	PASS
		High	2480	AV	2483.500	-55.74	≤-41.20	39.46	≤54	PASS
				AV	2483.520	-55.74	≤-41.20	39.46	≤54	PASS
				AV	2500.000	-57.34	≤-41.20	37.86	≤54	PASS
				Peak	2483.500	-51.49	≤-21.20	43.71	≤74	PASS
				Peak	2484.640	-48.69	≤-21.20	46.51	≤74	PASS
				Peak	2500.000	-53.93	≤-21.20	41.27	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-50.39	≤-21.20	44.81	≤74	PASS
				Peak	2358.800	-47.71	≤-21.20	47.49	≤74	PASS
				Peak	2390.000	-49.22	≤-21.20	45.98	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-48.23	≤-21.20	46.97	≤74	PASS
				Peak	2490.800	-46.2	≤-21.20	49.00	≤74	PASS
				Peak	2500.000	-47.59	≤-21.20	47.61	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-58.16	≤-41.20	37.04	≤54	PASS
				AV	2389.250	-57.62	≤-41.20	37.58	≤54	PASS
				AV	2390.000	-57.73	≤-41.20	37.47	≤54	PASS
				Peak	2310.000	-53.63	≤-21.20	41.57	≤74	PASS
				Peak	2335.175	-48.3	≤-21.20	46.90	≤74	PASS
				Peak	2390.000	-51.43	≤-21.20	43.77	≤74	PASS
		High	2480	AV	2483.500	-55.18	≤-41.20	40.02	≤54	PASS
				AV	2483.520	-55.18	≤-41.20	40.02	≤54	PASS
				AV	2500.000	-57.17	≤-41.20	38.03	≤54	PASS
				Peak	2483.500	-51.46	≤-21.20	43.74	≤74	PASS
				Peak	2494.720	-48.84	≤-21.20	46.36	≤74	PASS
				Peak	2500.000	-51.77	≤-21.20	43.43	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-49.73	≤-21.20	45.47	≤74	PASS
				Peak	2378.225	-47.45	≤-21.20	47.75	≤74	PASS
				Peak	2390.000	-50.06	≤-21.20	45.14	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-47.4	≤-21.20	47.80	≤74	PASS
				Peak	2497.280	-46.98	≤-21.20	48.22	≤74	PASS





3DH5	Ant1	Low	2402	Peak	2500.000	-48.58	≤-21.20	46.62	≤74	PASS
				AV	2310.000	-58.25	≤-41.20	36.95	≤54	PASS
				AV	2385.260	-57.62	≤-41.20	37.58	≤54	PASS
				AV	2390.000	-57.81	≤-41.20	37.39	≤54	PASS
				Peak	2310.000	-50.91	≤-21.20	44.29	≤74	PASS
				Peak	2318.690	-48.68	≤-21.20	46.52	≤74	PASS
		High	2480	Peak	2390.000	-52.68	≤-21.20	42.52	≤74	PASS
				AV	2483.500	-55.4	≤-41.20	39.80	≤54	PASS
				AV	2483.520	-55.4	≤-41.20	39.80	≤54	PASS
				AV	2500.000	-57.29	≤-41.20	37.91	≤54	PASS
				Peak	2483.500	-51.91	≤-21.20	43.29	≤74	PASS
				Peak	2496.080	-48.08	≤-21.20	47.12	≤74	PASS
		Low	Hop_24 02	Peak	2500.000	-51.21	≤-21.20	43.99	≤74	PASS
				Peak	2310.000	-50.13	≤-21.20	45.07	≤74	PASS
				Peak	2320.370	-47.64	≤-21.20	47.56	≤74	PASS
		High	Hop_24 80	Peak	2390.000	-50.36	≤-21.20	44.84	≤74	PASS
				Peak	2483.500	-46.89	≤-21.20	48.31	≤74	PASS
				Peak	2500.000	-48.78	≤-21.20	46.42	≤74	PASS

Note:

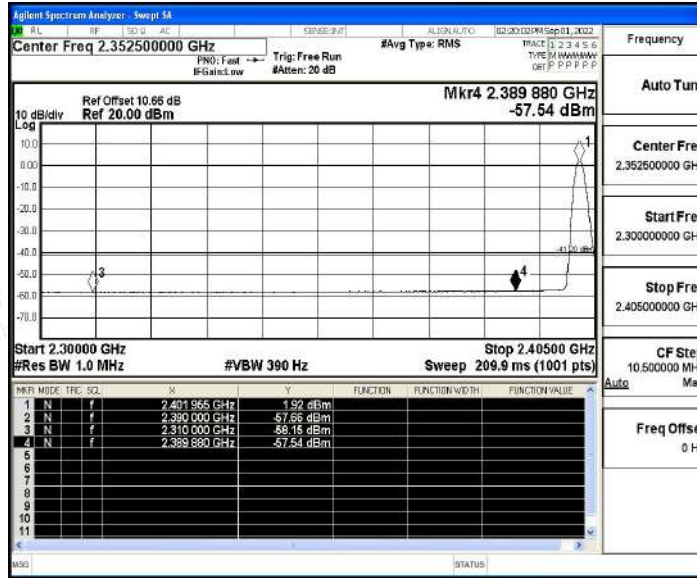
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



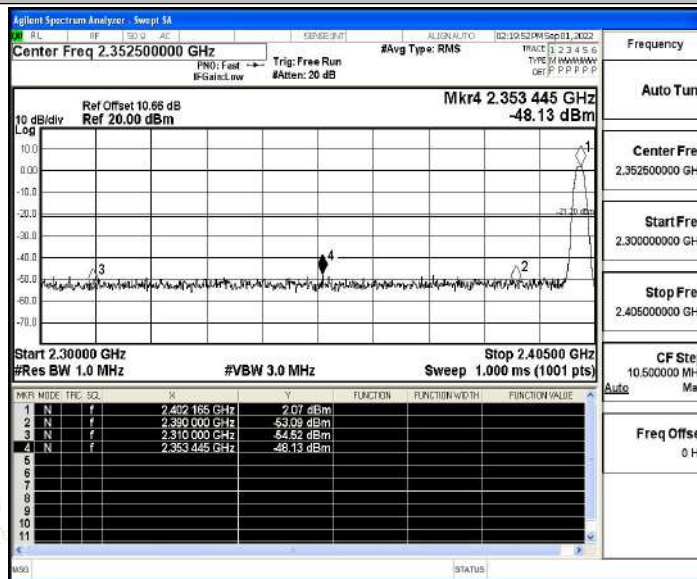


Test Graphs

DH5_Ant1_Low_2402_AV

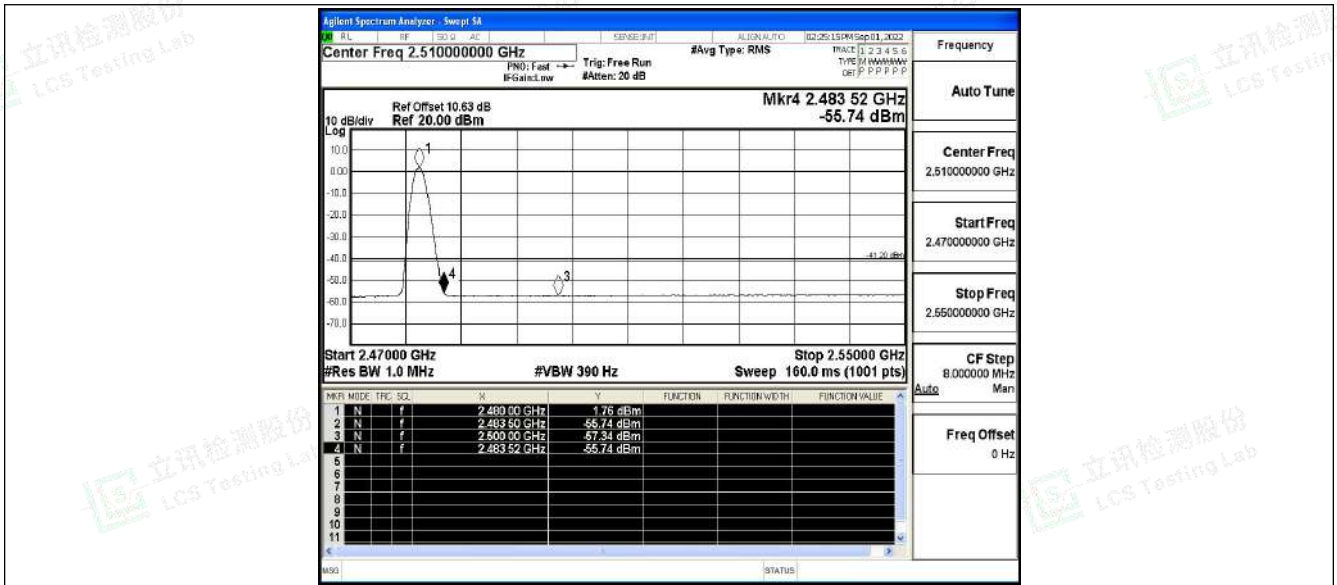


DH5_Ant1_Low_2402_Peak

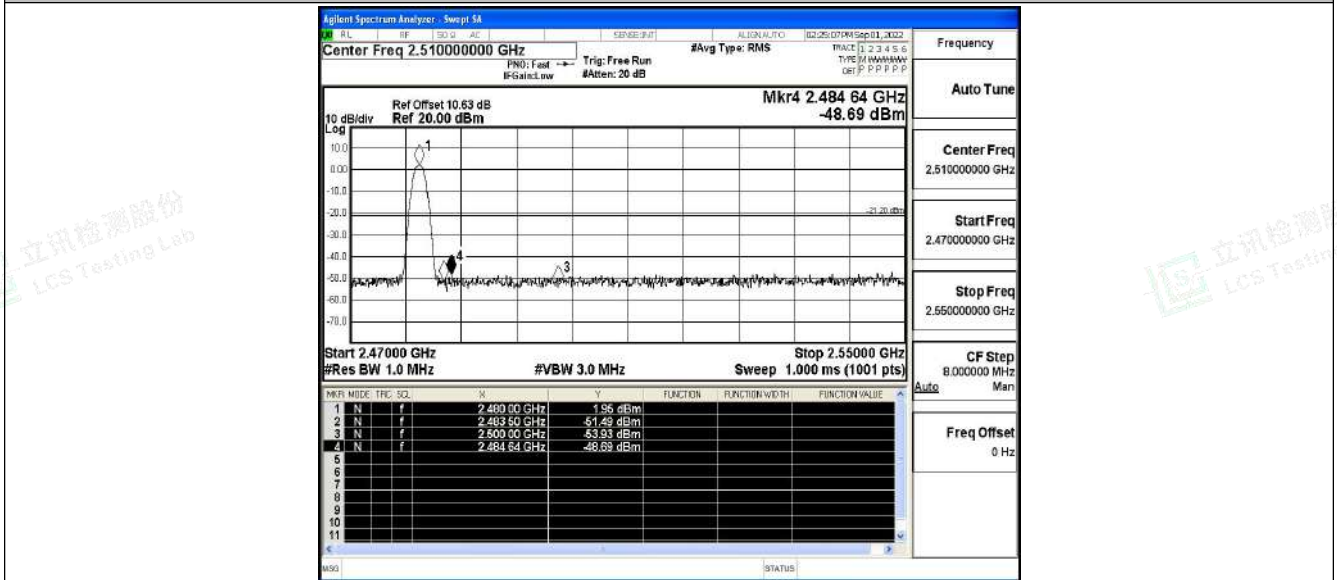


DH5_Ant1_High_2480_AV



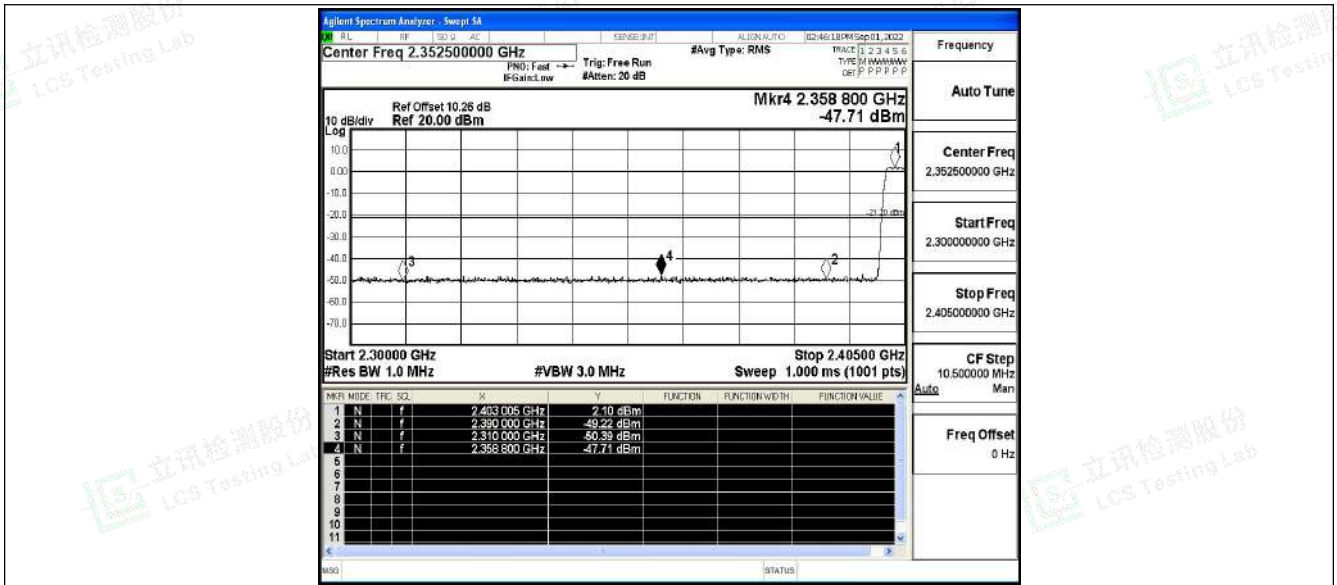


DH5_Ant1_High_2480_Peak

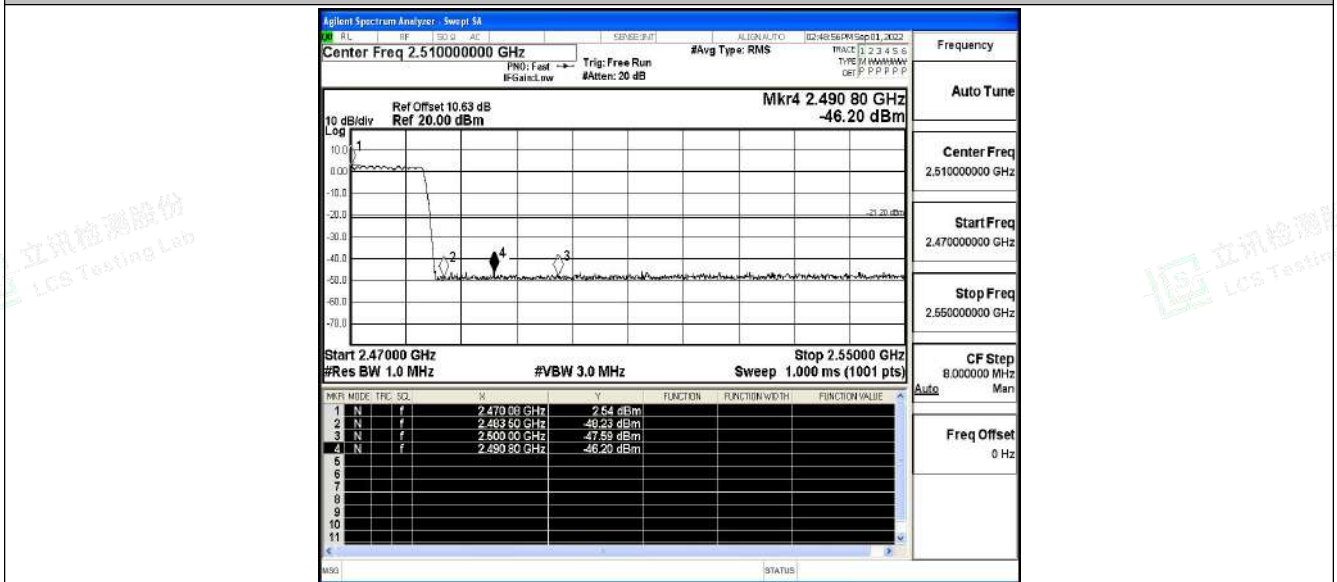


DH5_Ant1_Low_Hop_2402_Peak



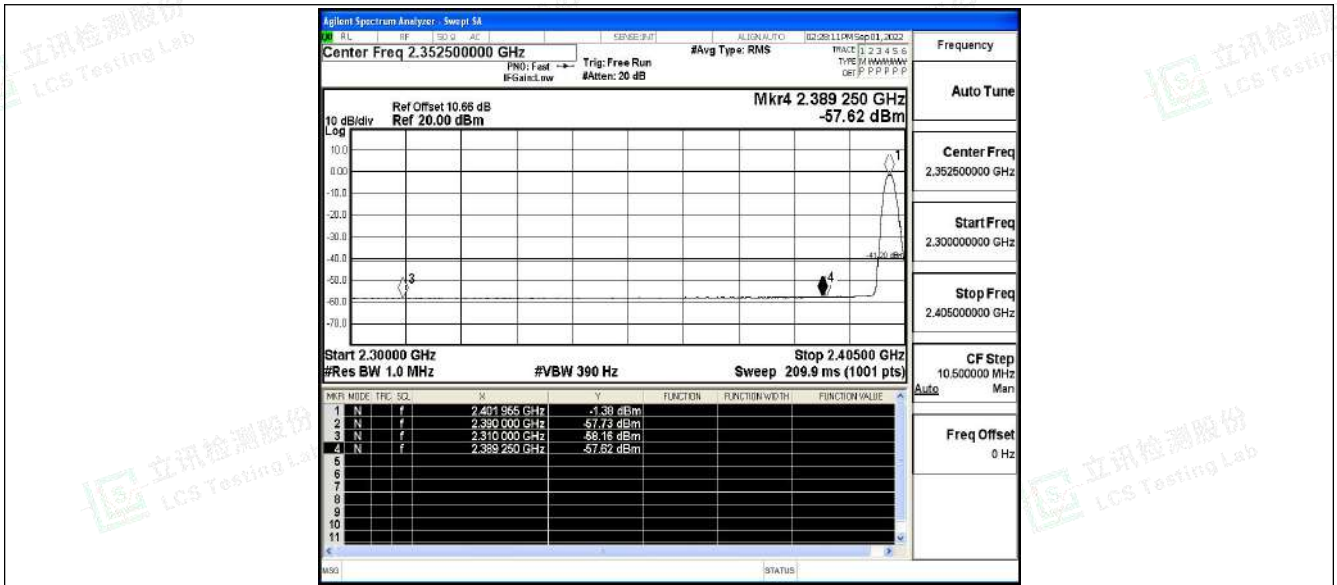


DH5_Ant1_High_Hop_2480_Peak

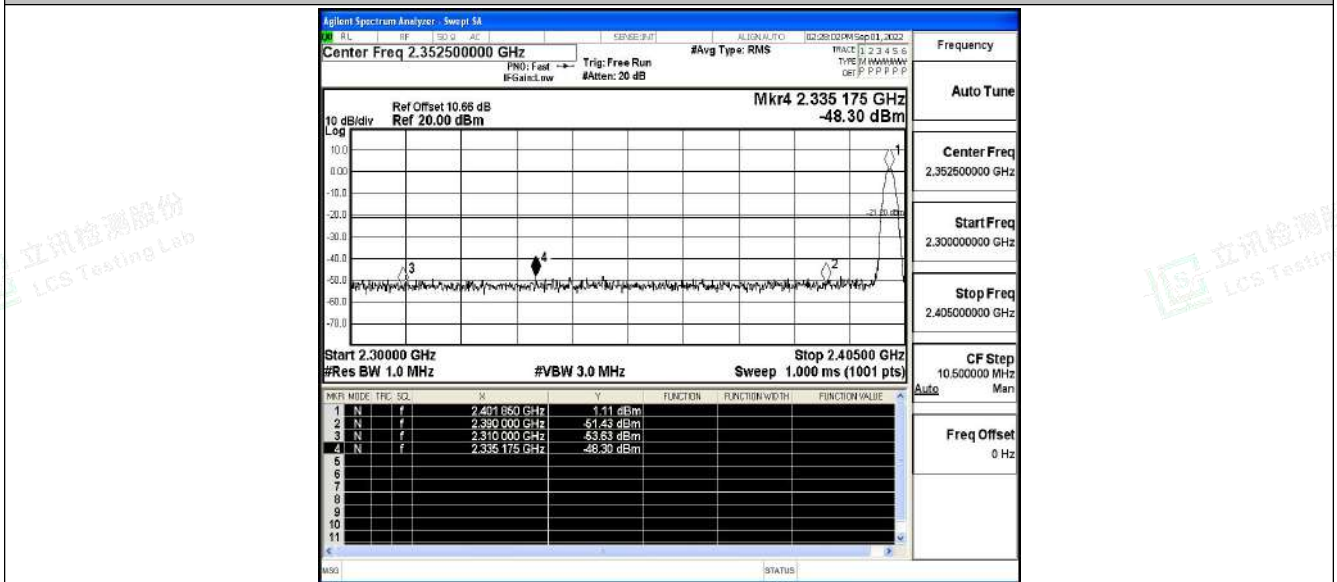


2DH5_Ant1_Low_2402_AV



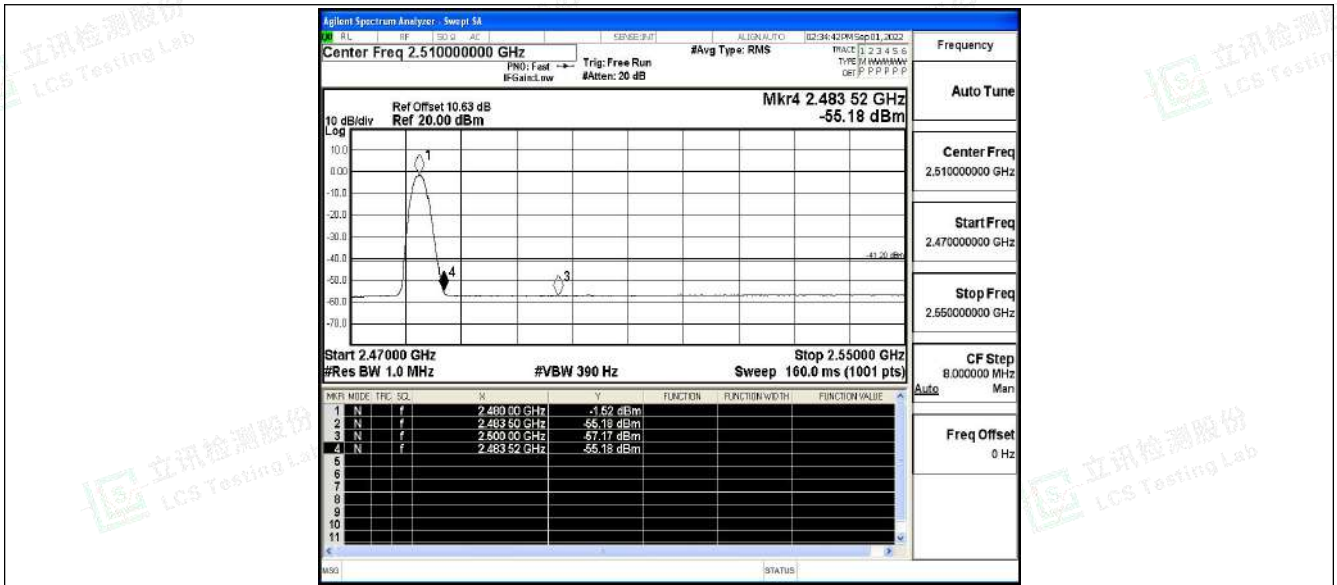


2DH5_Ant1_Low_2402_Peak

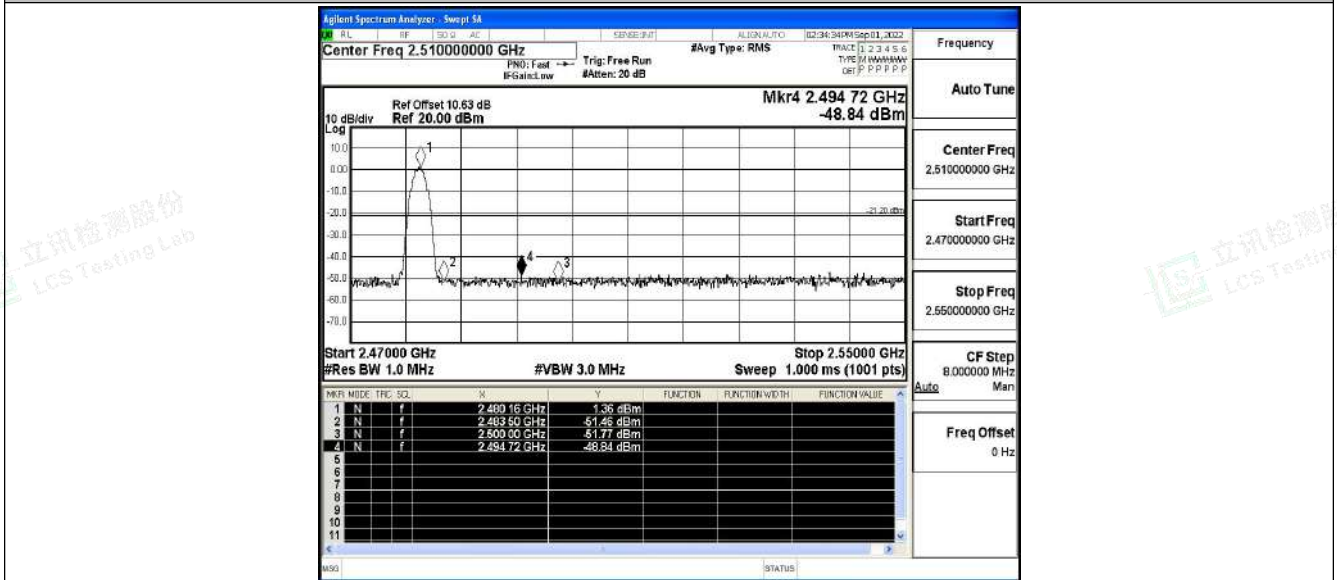


2DH5_Ant1_High_2480_AV



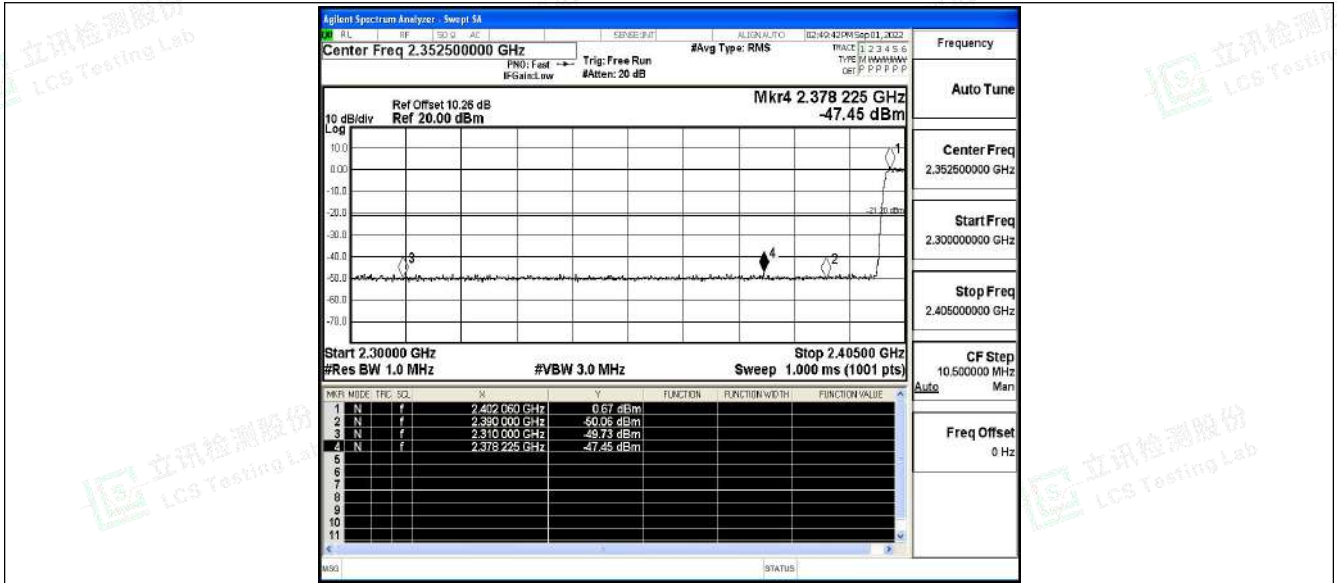


2DH5_Ant1_High_2480_Peak

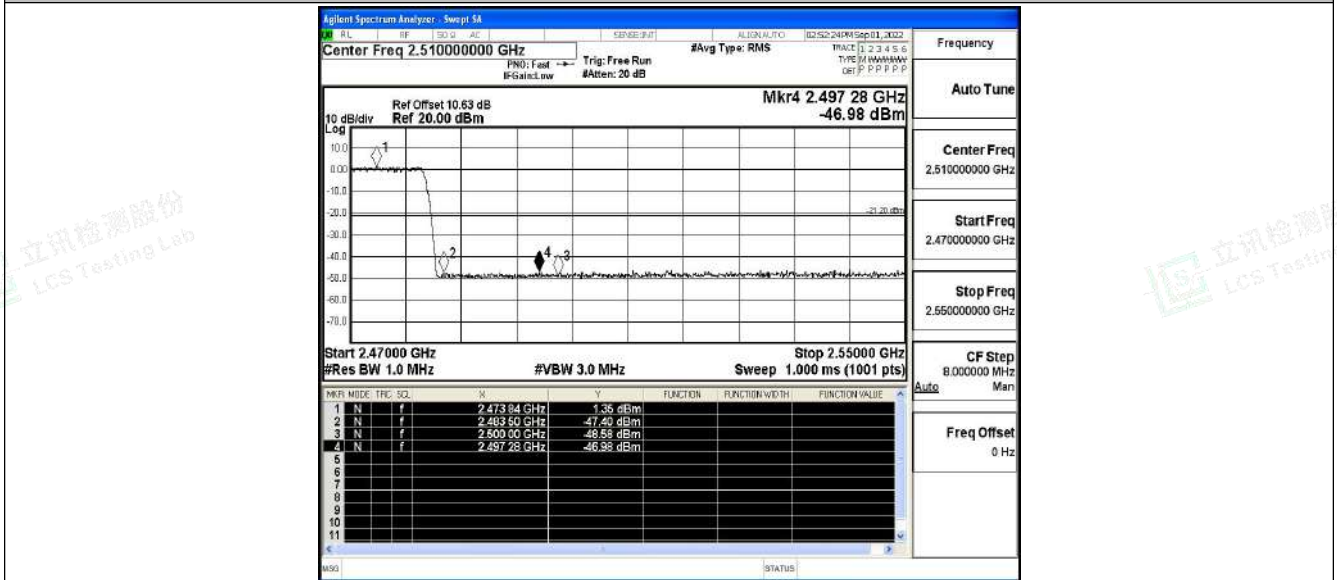


2DH5_Ant1_Low_Hop_2402_Peak



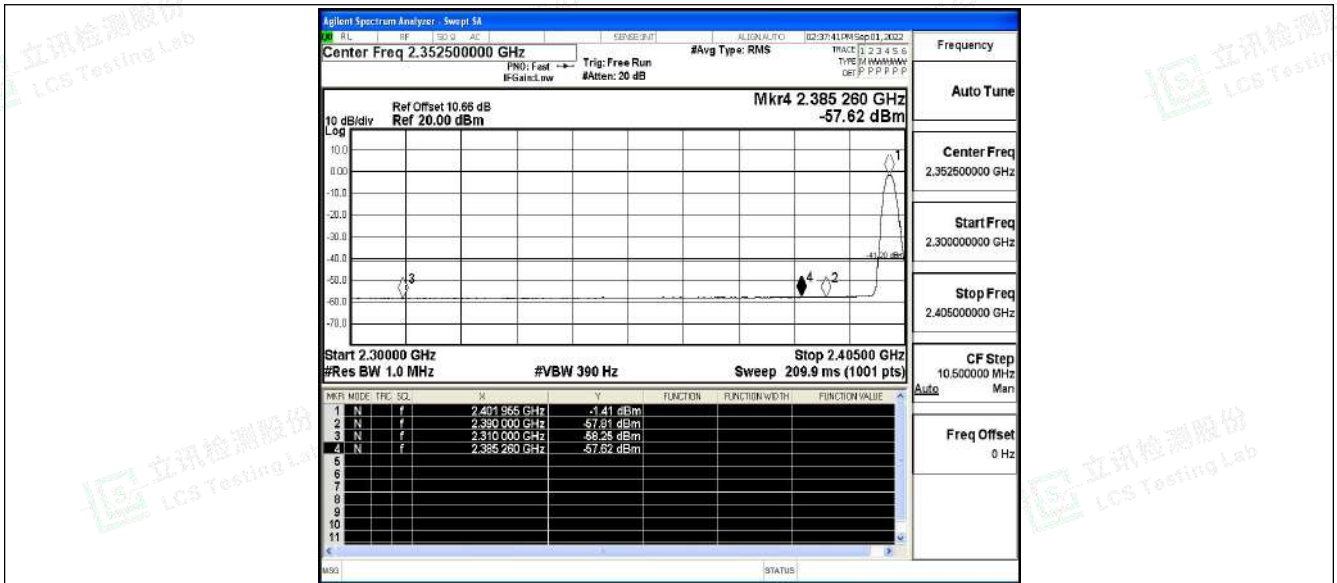


2DH5_Ant1_High_Hop_2480_Peak

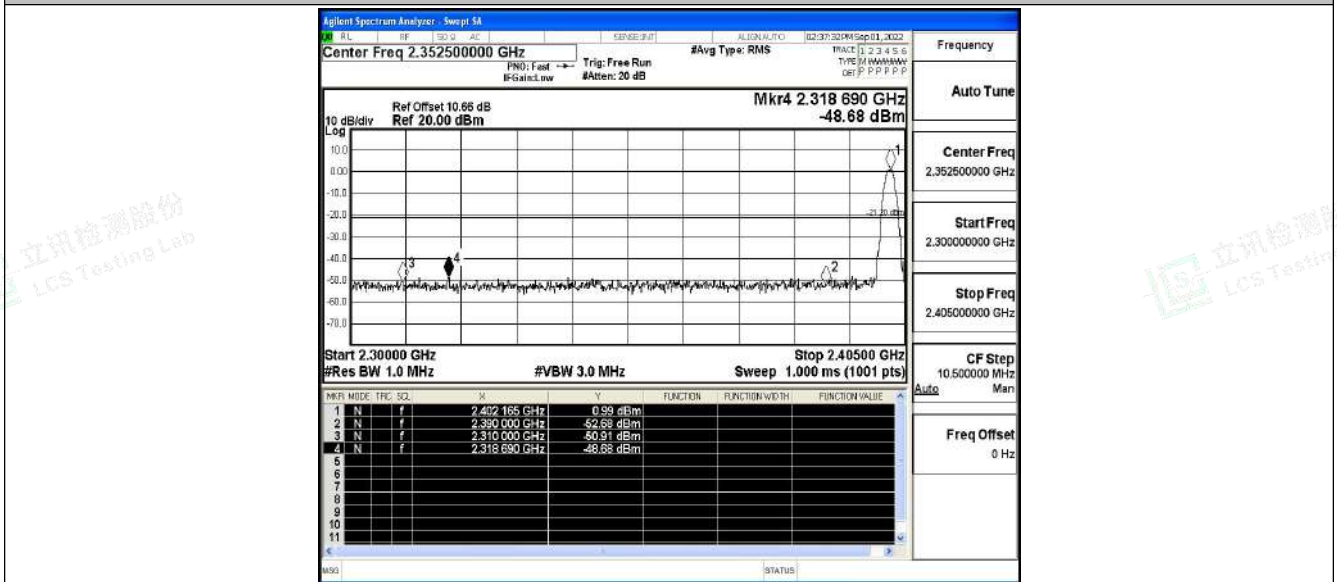


3DH5_Ant1_Low_2402_AV



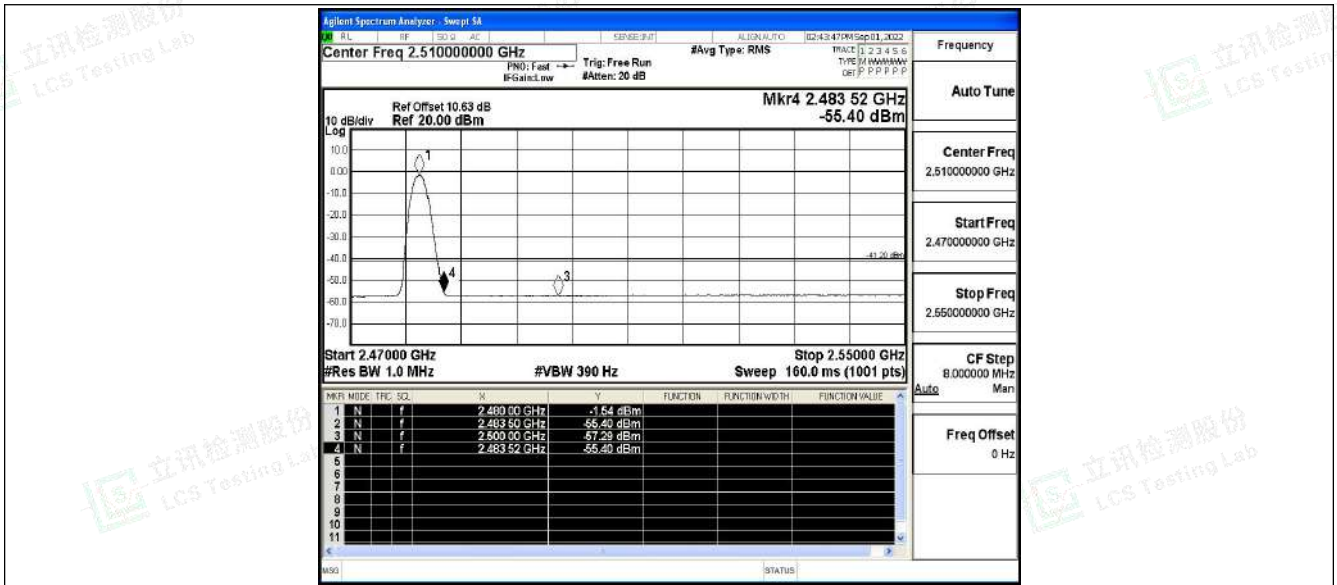


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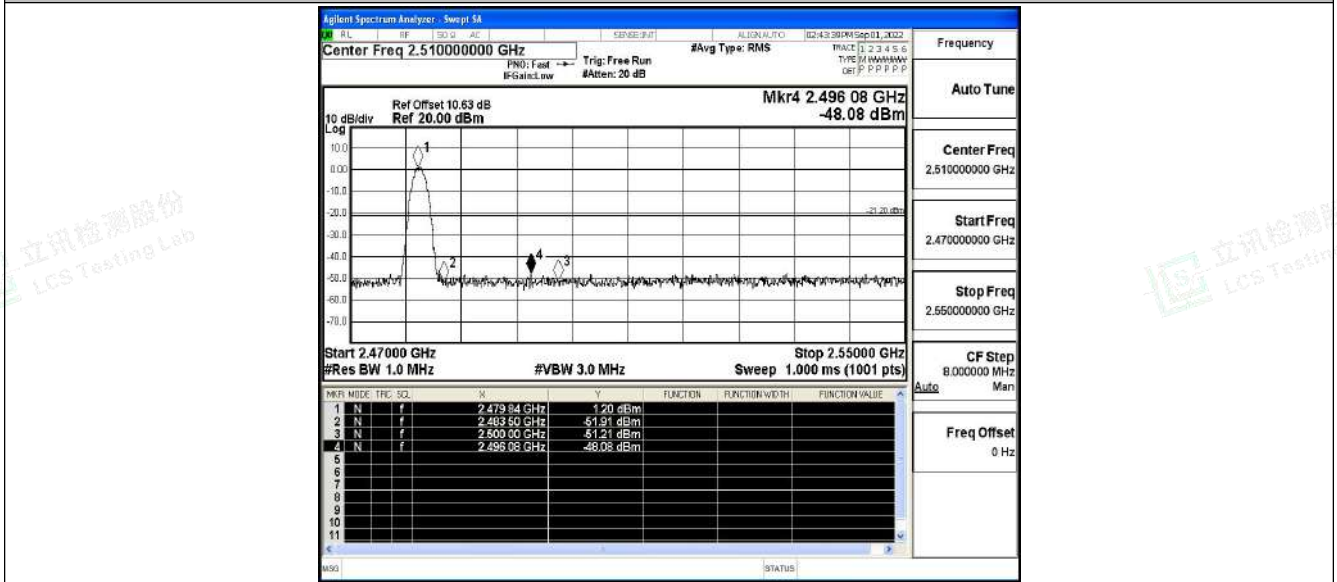


3DH5_Ant1_High_2480_AV



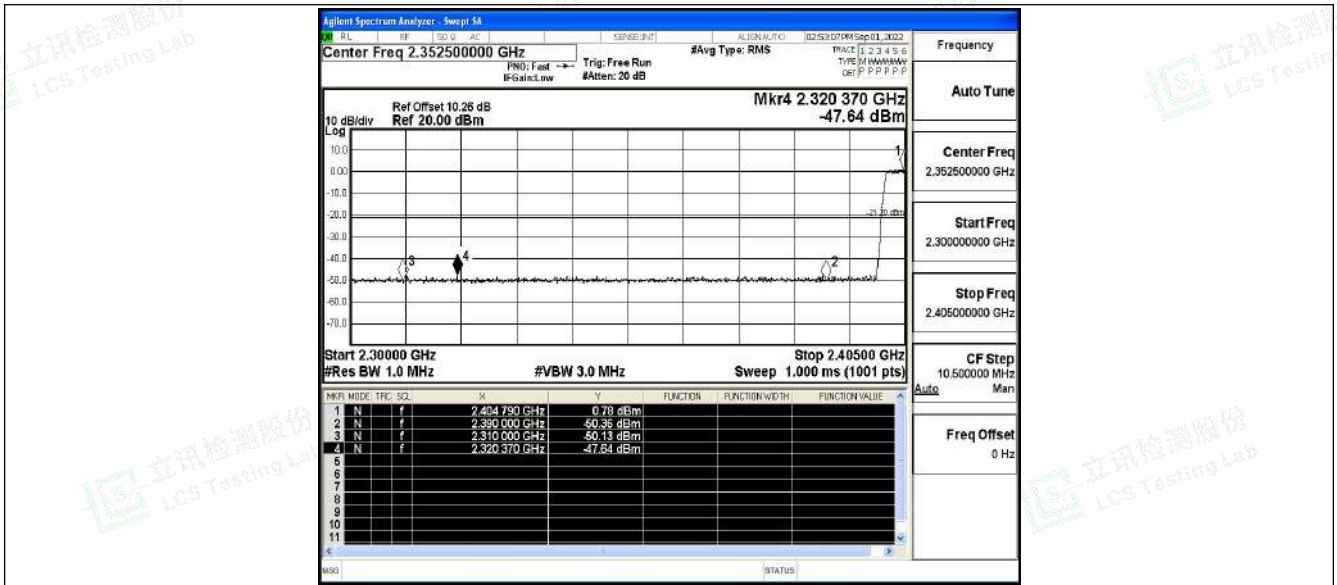


3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak





3DH5_Ant1_High_Hop_2480_Peak

