



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: TLAMP

Test Model: TLAMP-1

Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan





A.1 20dB Emission Bandwidth

Test Result

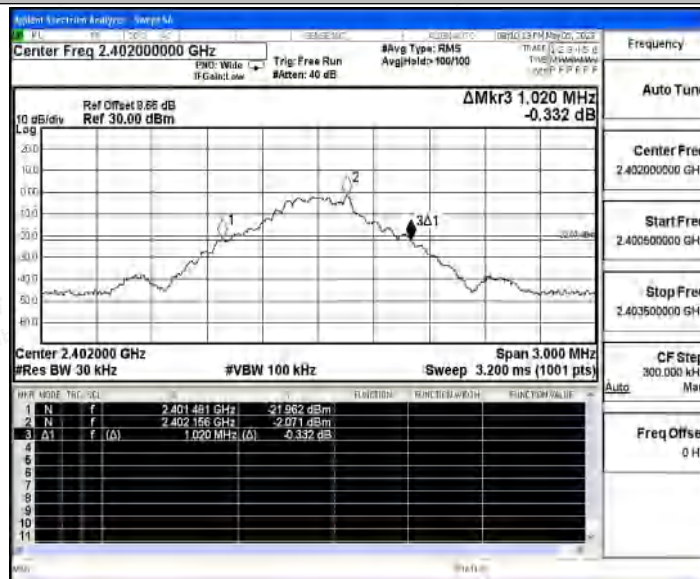
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	1.020	2401.481	2402.501	---	---
		2441	1.029	2440.466	2441.495	---	---
		2480	1.044	2479.457	2480.501	---	---
2DH5	Ant1	2402	1.290	2401.358	2402.648	---	---
		2441	1.314	2440.337	2441.651	---	---
		2480	1.290	2479.355	2480.645	---	---
3DH5	Ant1	2402	1.287	2401.346	2402.633	---	---
		2441	1.296	2440.343	2441.639	---	---
		2480	1.290	2479.346	2480.636	---	---



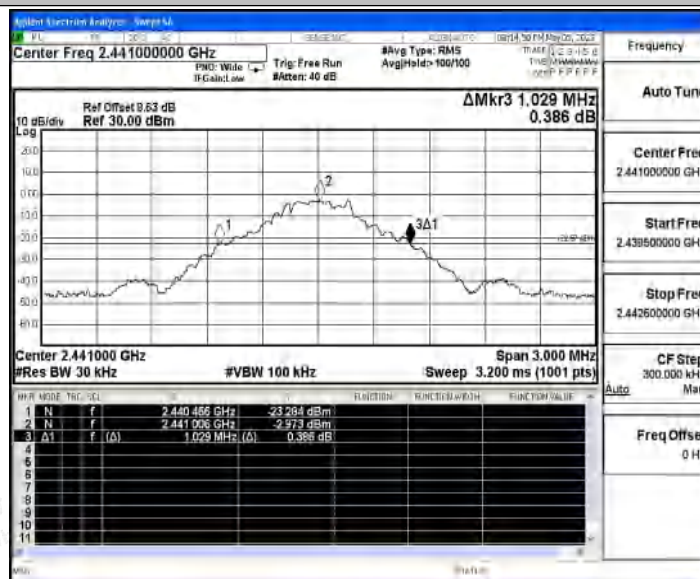


Test Graphs

DH5_Ant1_2402



DH5_Ant1_2441



DH5_Ant1_2480

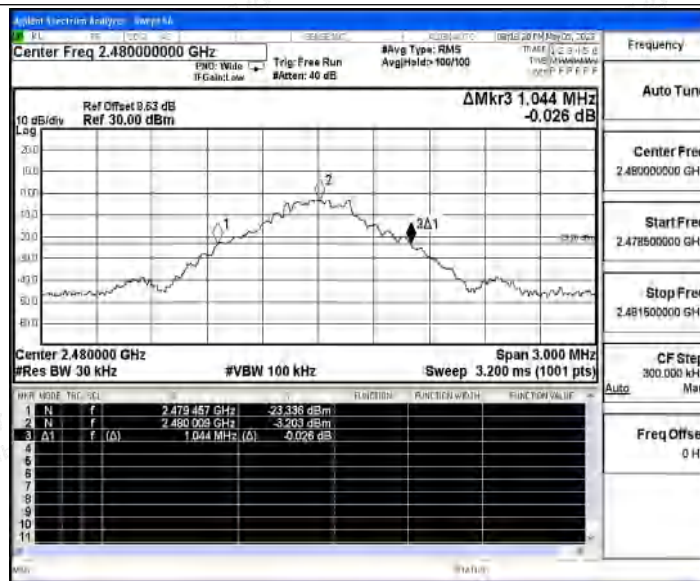


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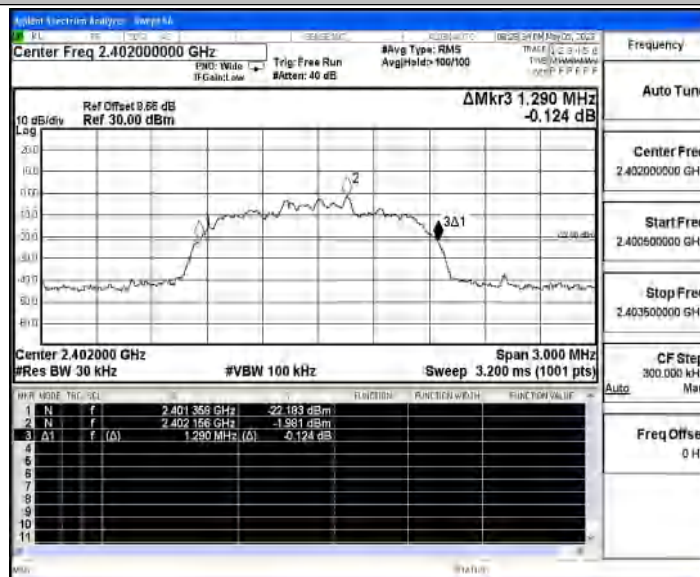
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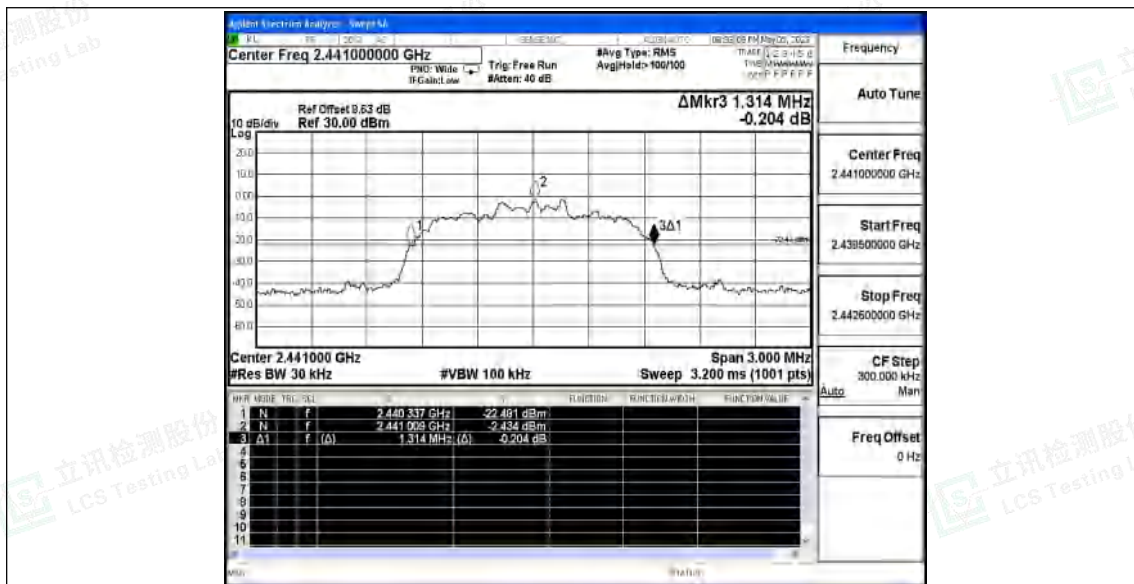


2DH5_Ant1_2402

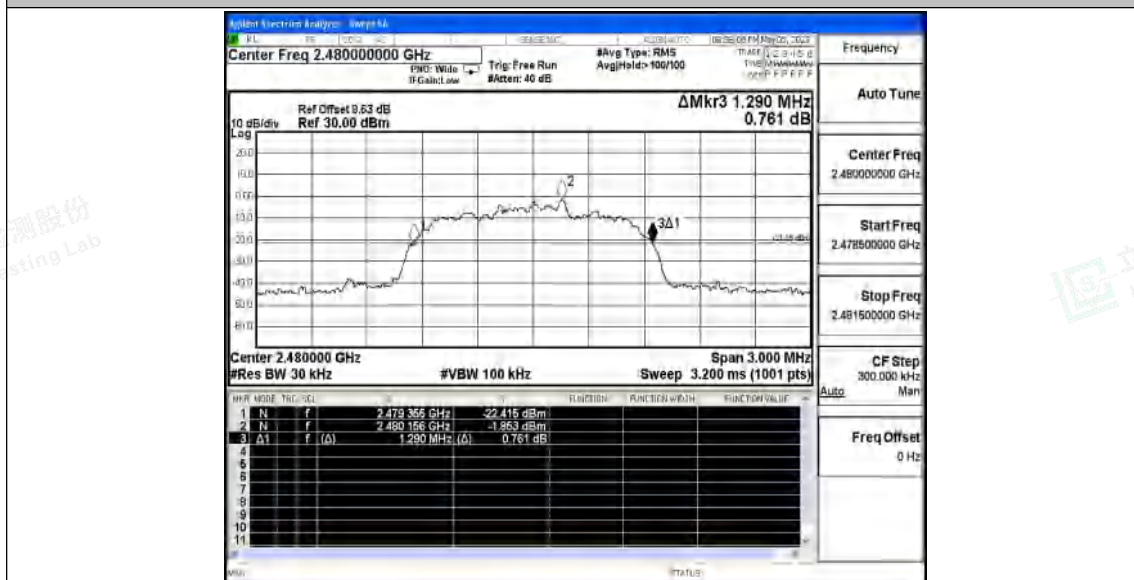


2DH5_Ant1_2441



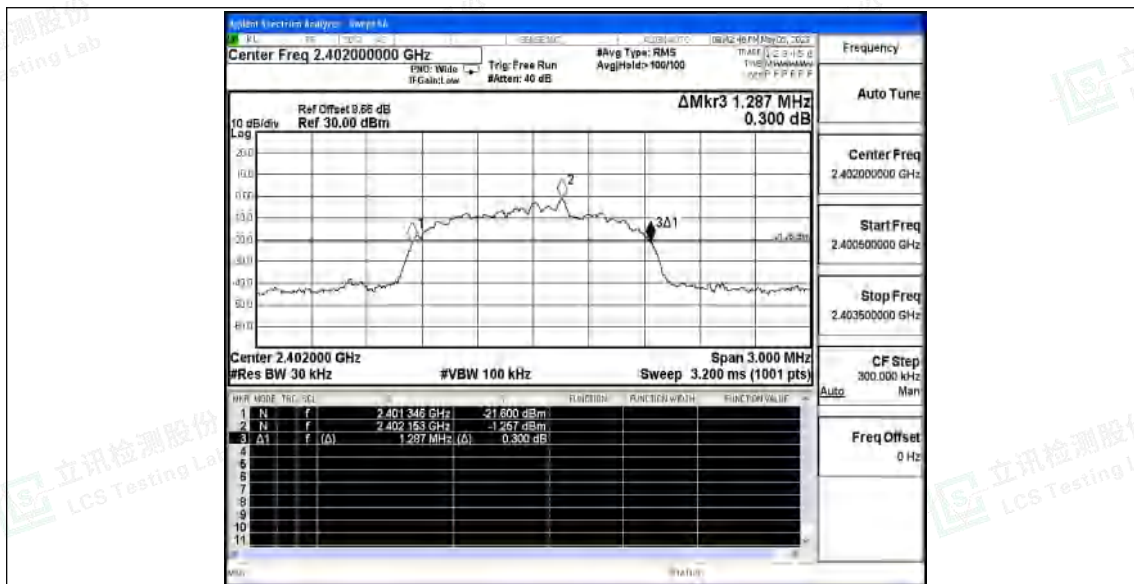


2DH5_Ant1_2480

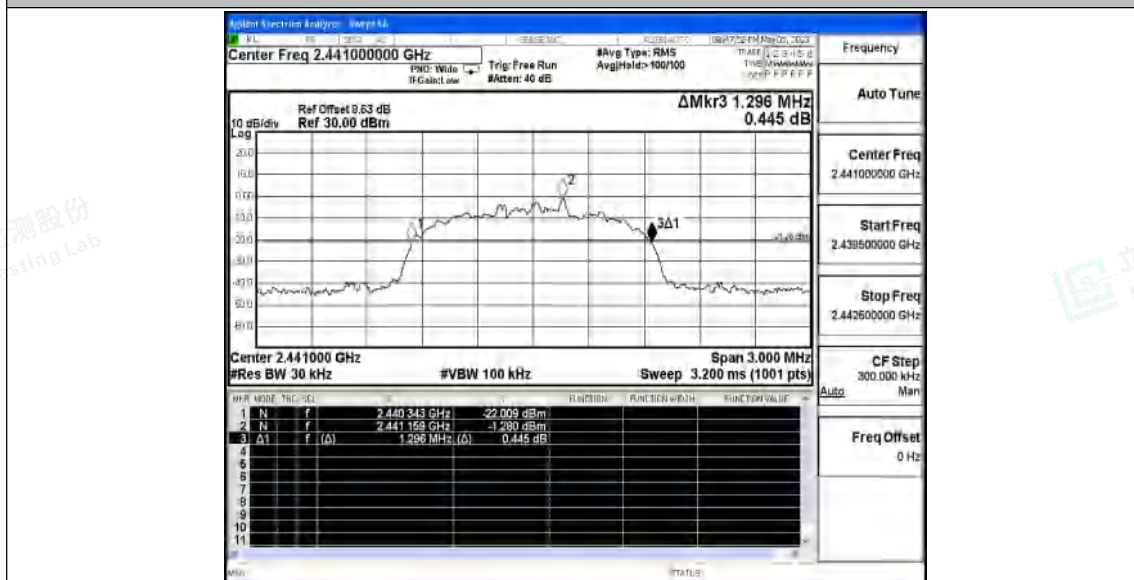


3DH5_Ant1_2402



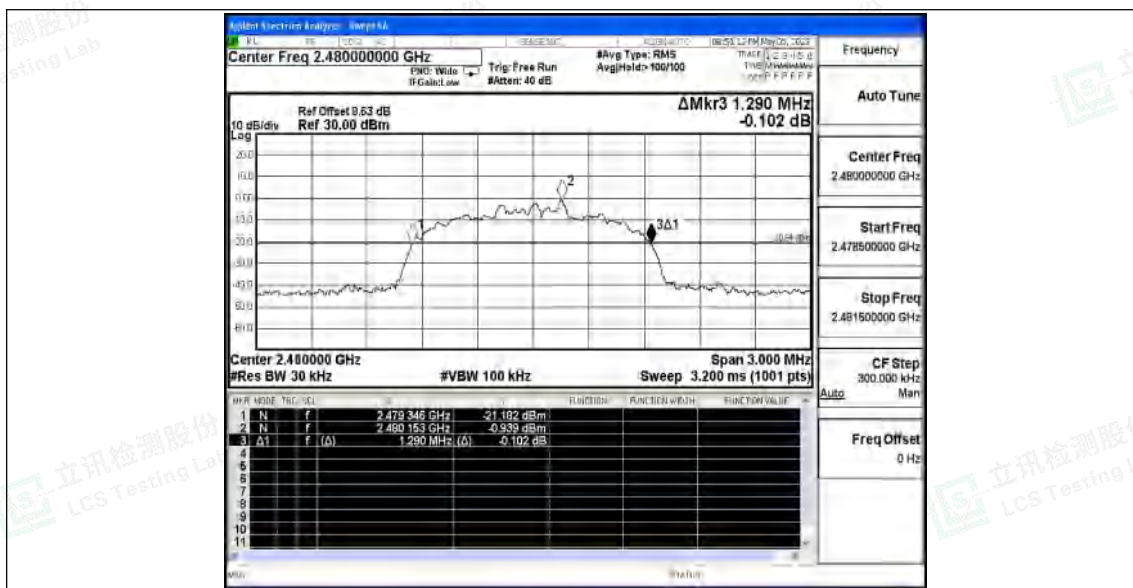


3DH5_Ant1_2441



3DH5_Ant1_2480







A.2 Maximum conducted output power

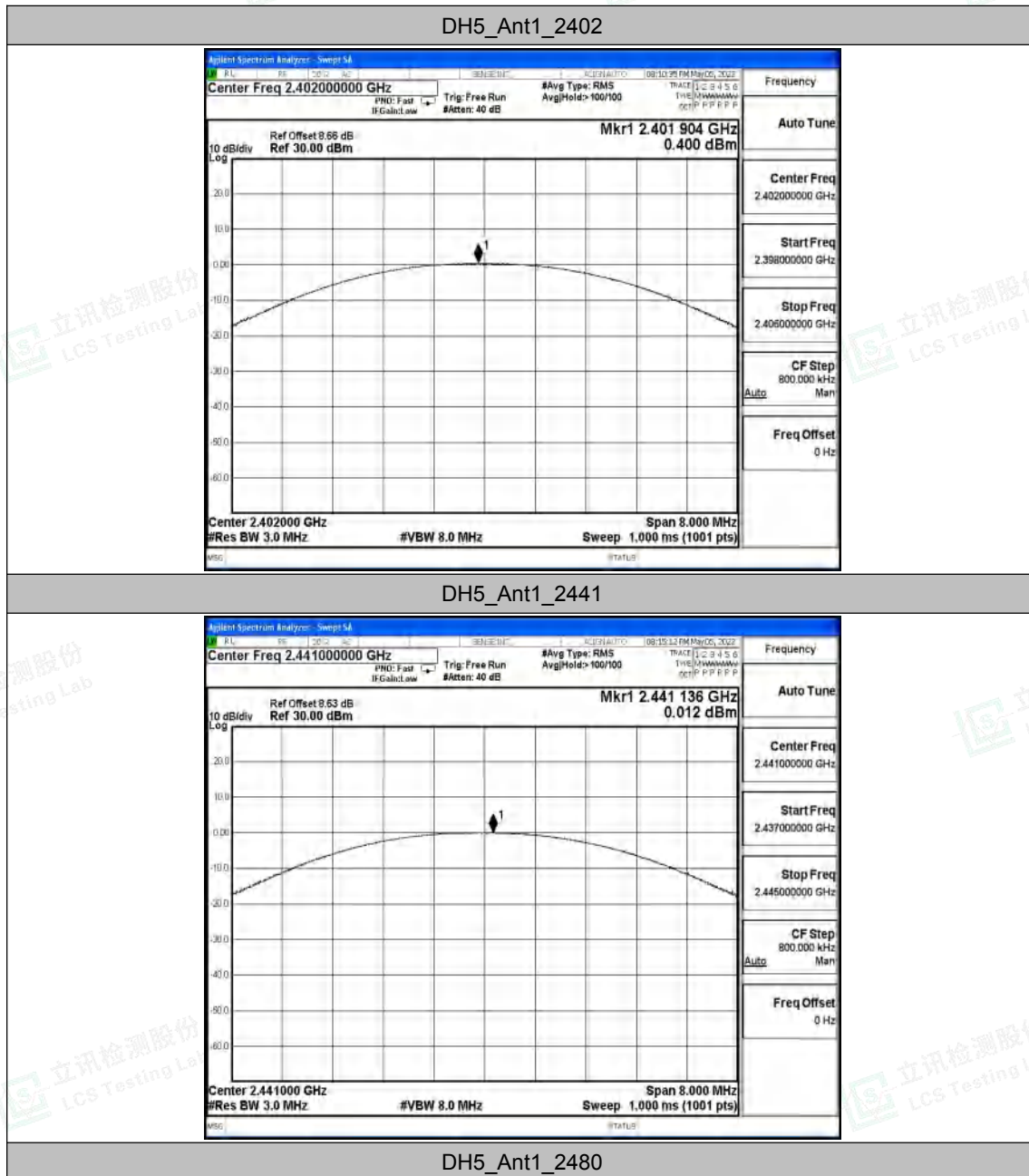
Test Result

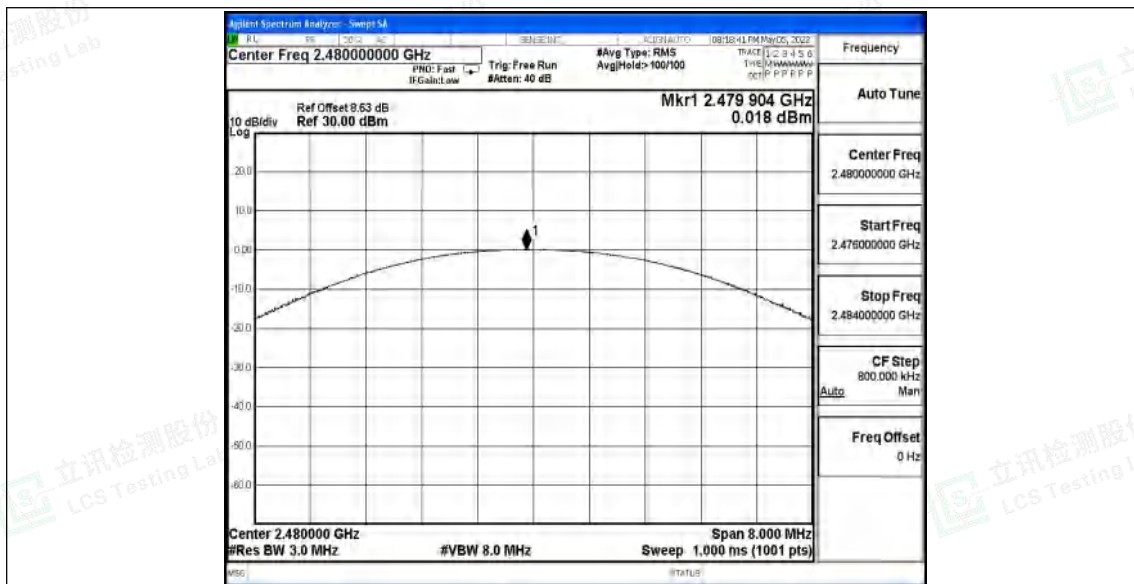
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	0.4	≤20.97	PASS
		2441	0.01	≤20.97	PASS
		2480	-0.21	≤20.97	PASS
2DH5	Ant1	2402	2.02	≤20.97	PASS
		2441	2.43	≤20.97	PASS
		2480	2.51	≤20.97	PASS
3DH5	Ant1	2402	2.14	≤20.97	PASS
		2441	2.51	≤20.97	PASS
		2480	2.55	≤20.97	PASS



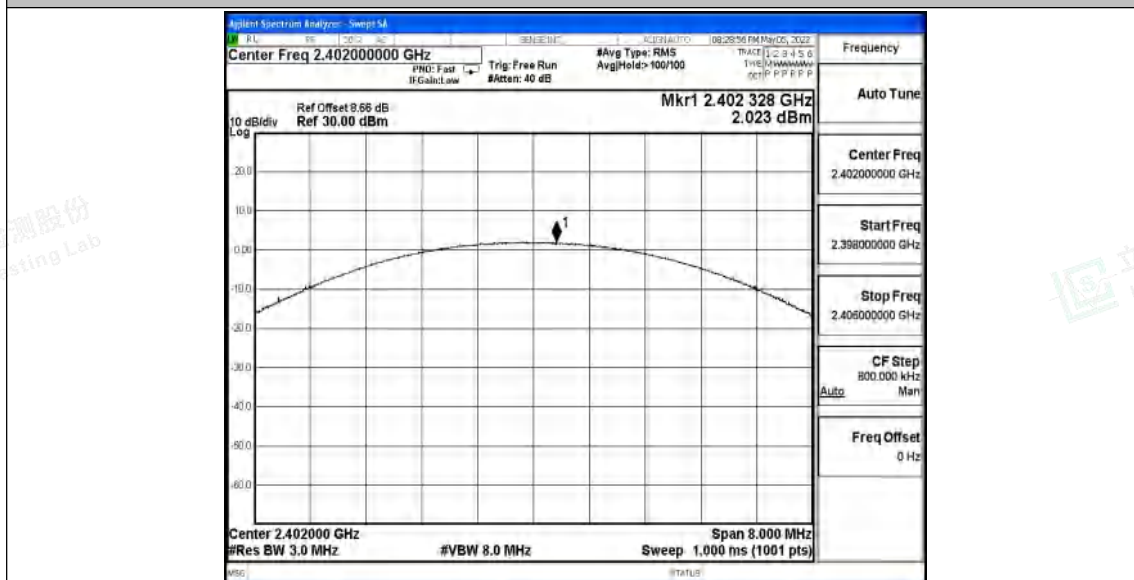


Test Graphs



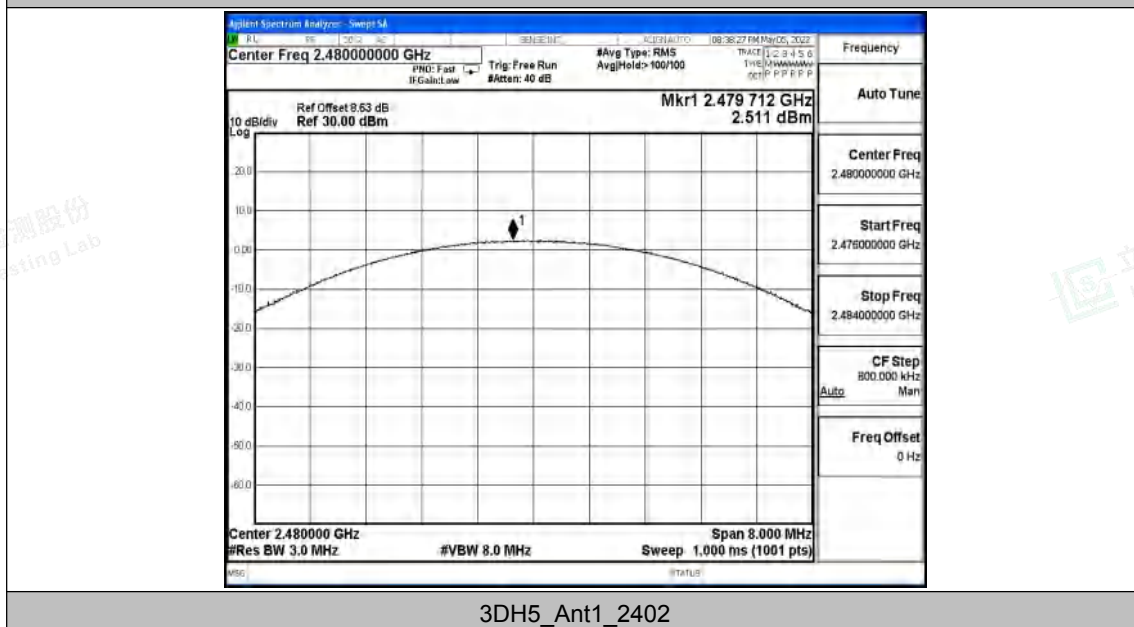
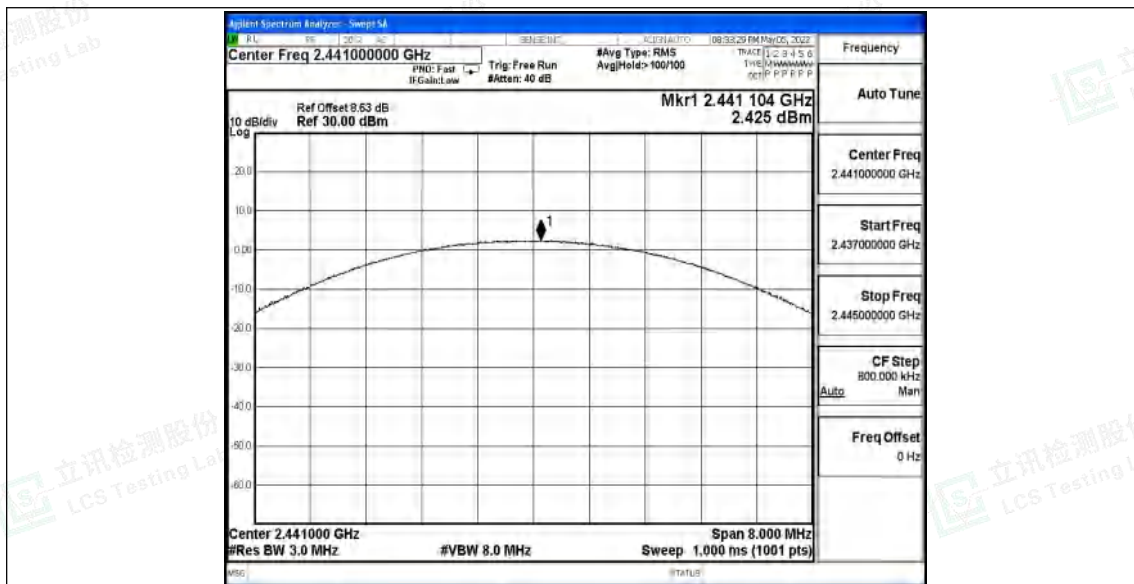


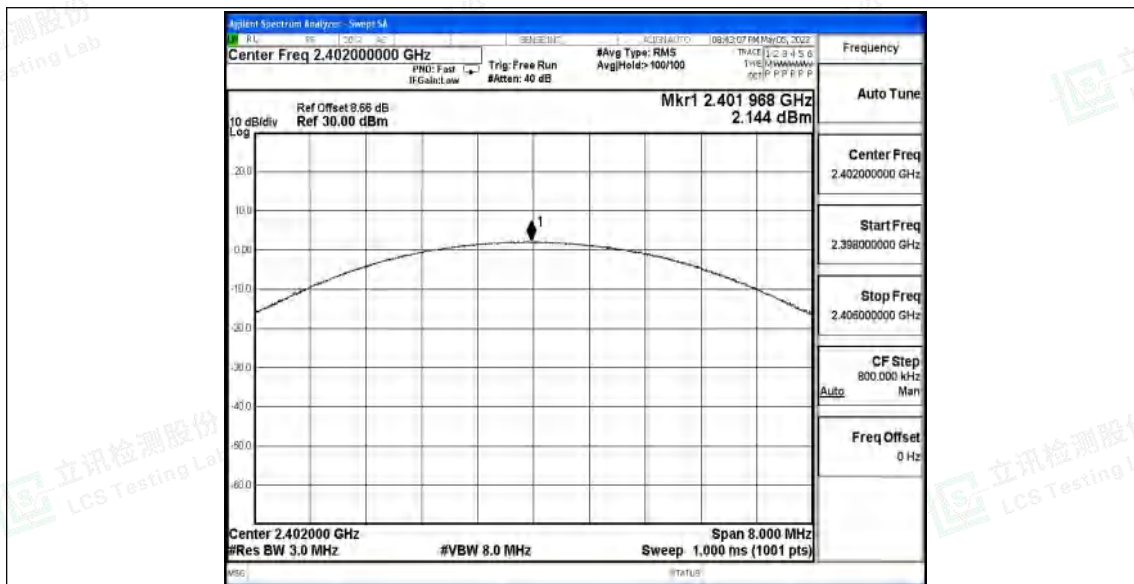
2DH5_Ant1_2402



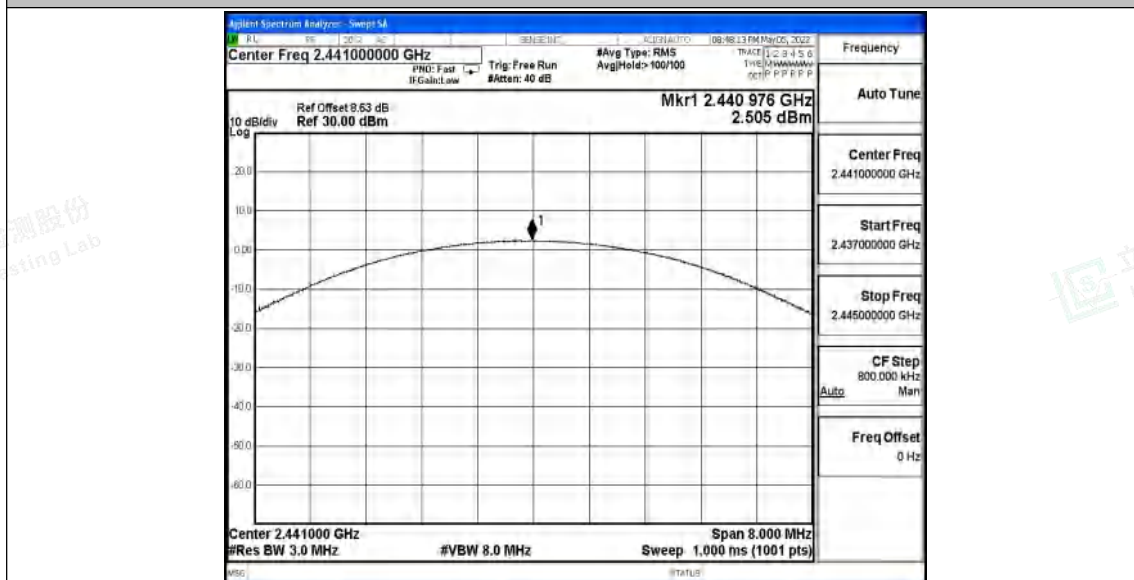
2DH5_Ant1_2441





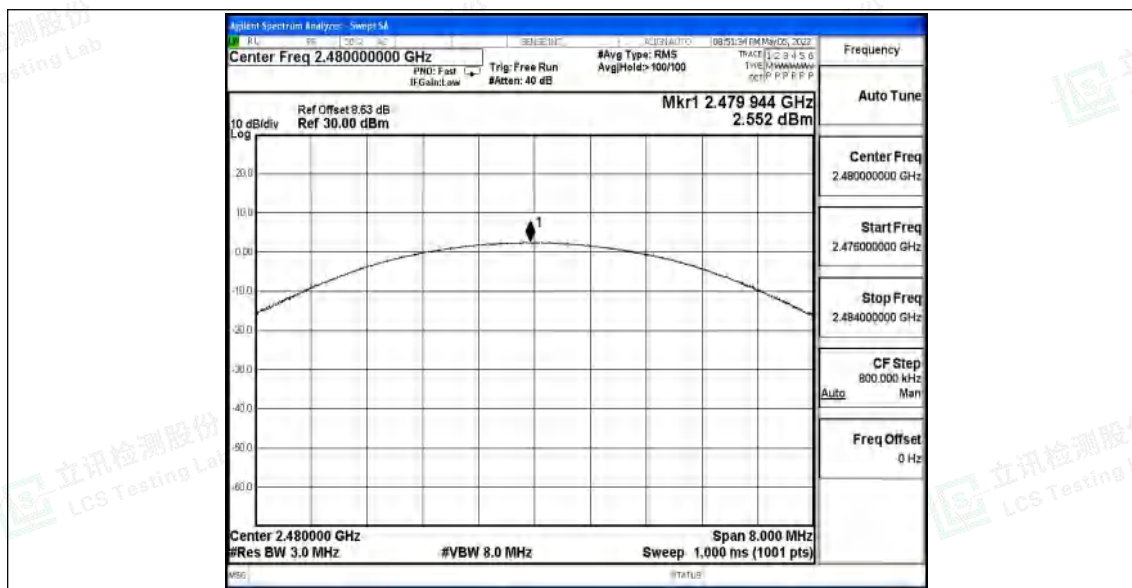


3DH5_Ant1_2441



3DH5_Ant1_2480







A.3 Carrier frequency separation

Test Result

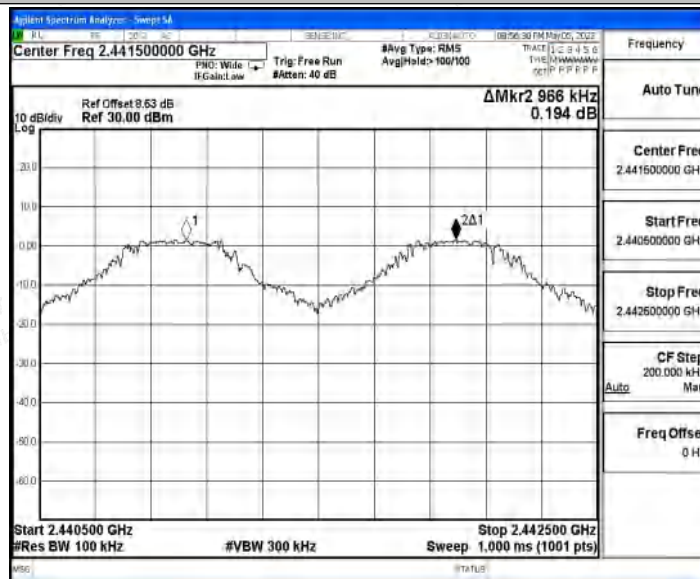
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.966	≥ 0.696	PASS
2DH5	Ant1	Hop	1.164	≥ 0.876	PASS
3DH5	Ant1	Hop	1.064	≥ 0.864	PASS



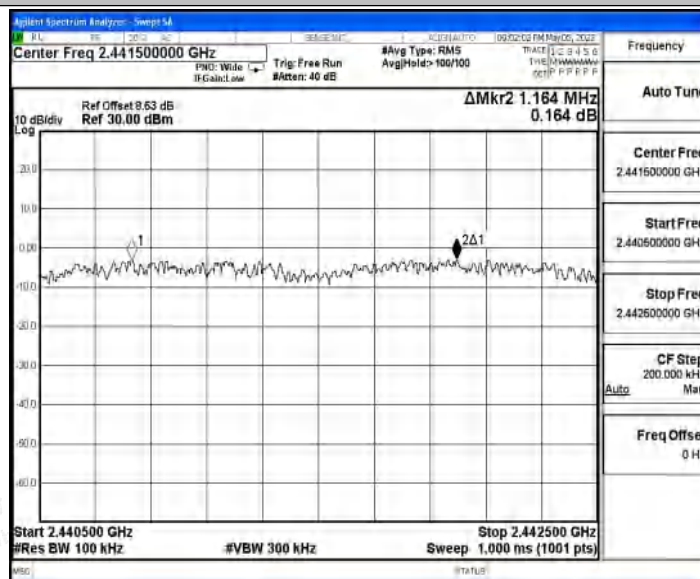


Test Graphs

DH5_Ant1_Hop

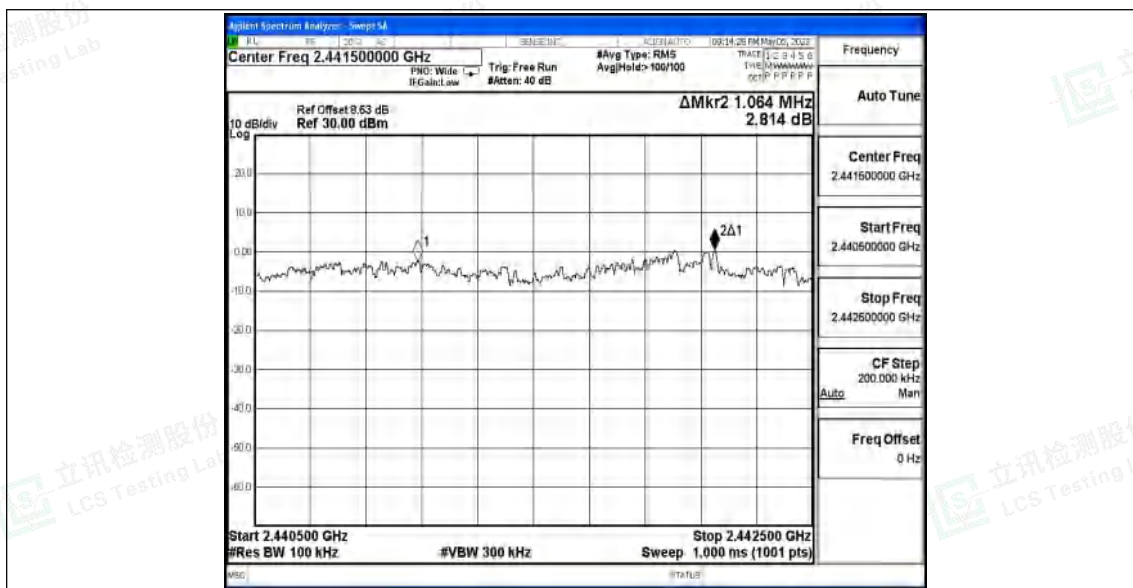


2DH5_Ant1_Hop



3DH5_Ant1_Hop





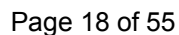


A.4 Time of occupancy

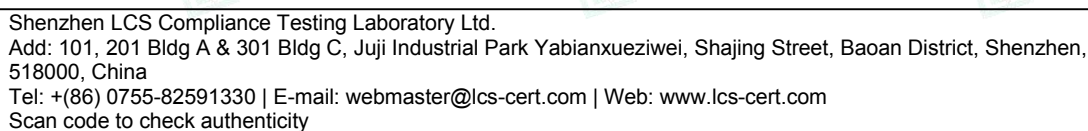
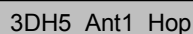
Test Result

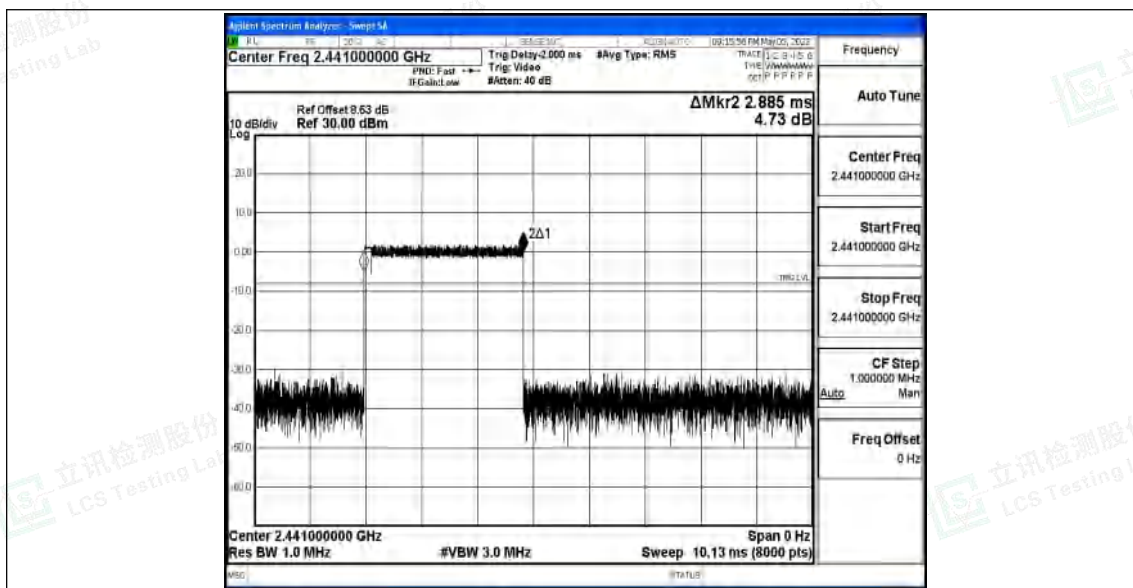
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.88	106.67	0.307	≤0.4	PASS
2DH5	Ant1	Hop	2.88	106.67	0.308	≤0.4	PASS
3DH5	Ant1	Hop	2.89	106.67	0.308	≤0.4	PASS





DH5 Ant1 Hop







A.5 Number of hopping channels

Test Result

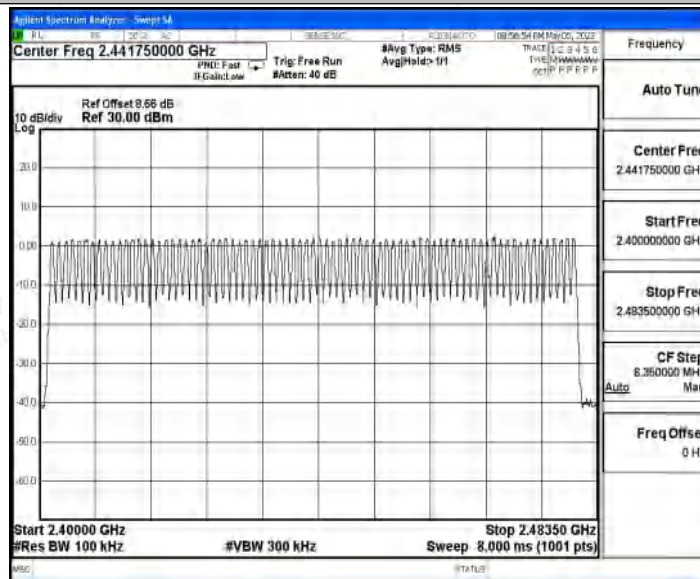
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS



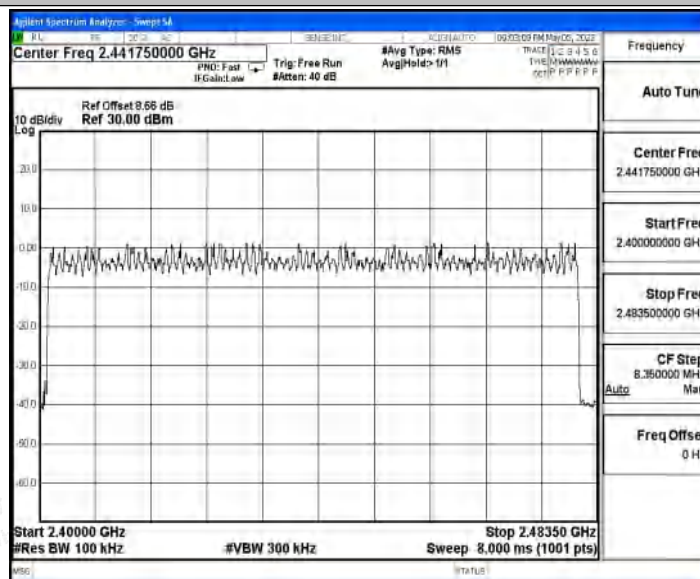


Test Graphs

DH5_Ant1_Hop

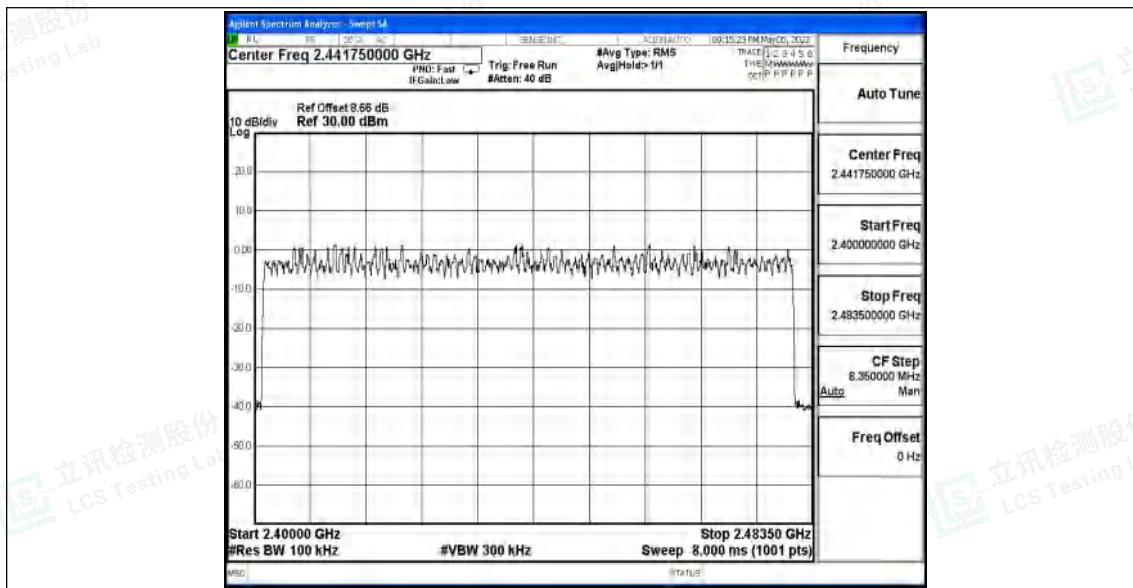


2DH5_Ant1_Hop



3DH5_Ant1_Hop







A.6 Band edge measurements

Test Result

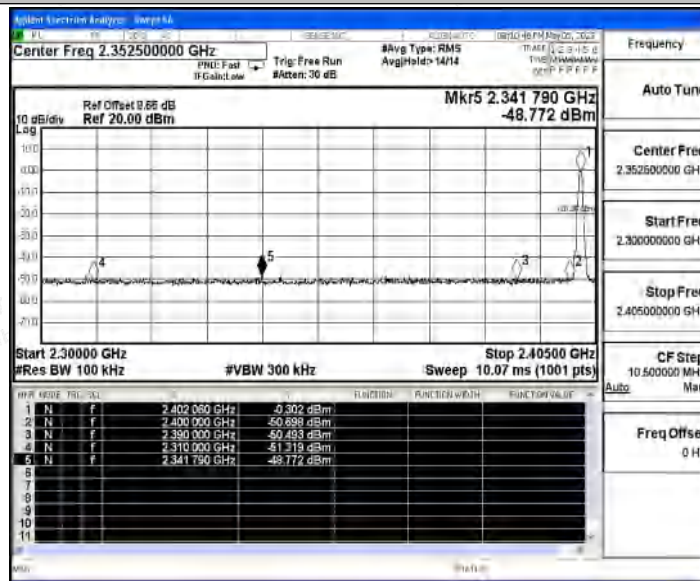
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-0.36	-48.77	≤ -20.36	PASS
		High	2480	-0.87	-47.69	≤ -20.87	PASS
		Low	Hop_2402	1.06	-47.95	≤ -18.94	PASS
		High	Hop_2480	2.22	-47.68	≤ -17.78	PASS
2DH5	Ant1	Low	2402	-2.27	-48.61	≤ -22.27	PASS
		High	2480	1.00	-47.76	≤ -19	PASS
		Low	Hop_2402	-3.53	-49.15	≤ -23.53	PASS
		High	Hop_2480	-0.52	-47.83	≤ -20.52	PASS
3DH5	Ant1	Low	2402	-0.94	-49.16	≤ -20.94	PASS
		High	2480	1.09	-47.4	≤ -18.91	PASS
		Low	Hop_2402	-3.15	-48.67	≤ -23.15	PASS
		High	Hop_2480	-0.25	-48.09	≤ -20.25	PASS



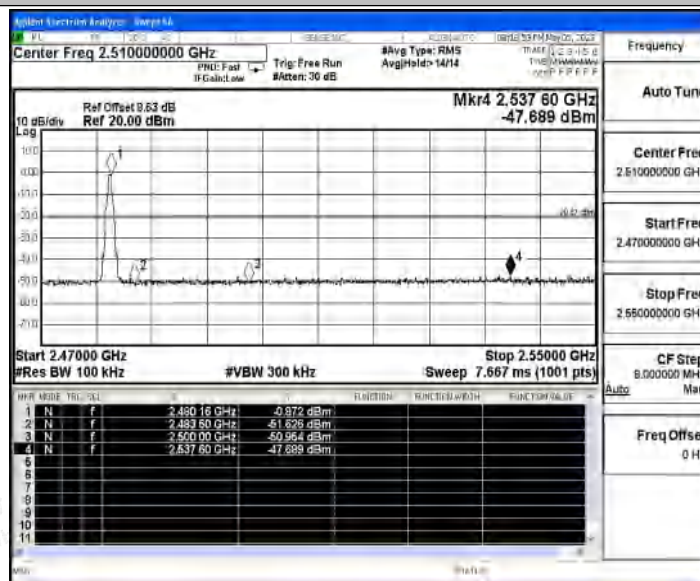


Test Graphs

DH5_Ant1_Low_2402



DH5_Ant1_High_2480



DH5_Ant1_Low_Hop_2402

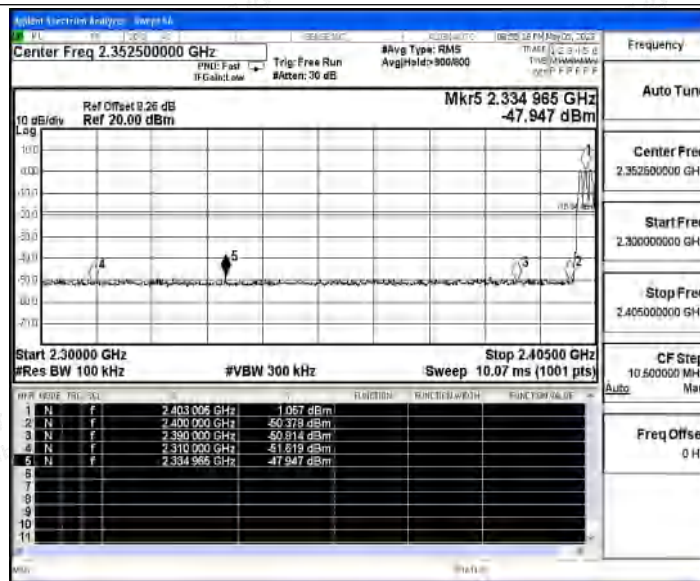


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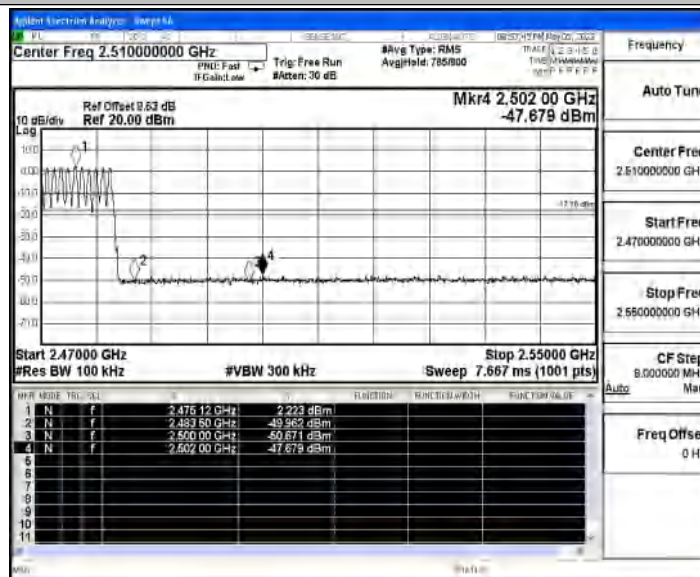
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DH5_Ant1_High_Hop_2480



2DH5_Ant1_Low_2402

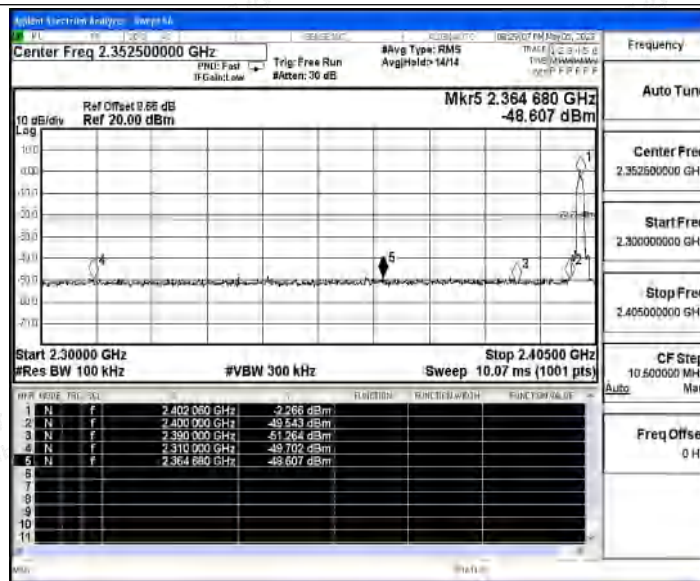


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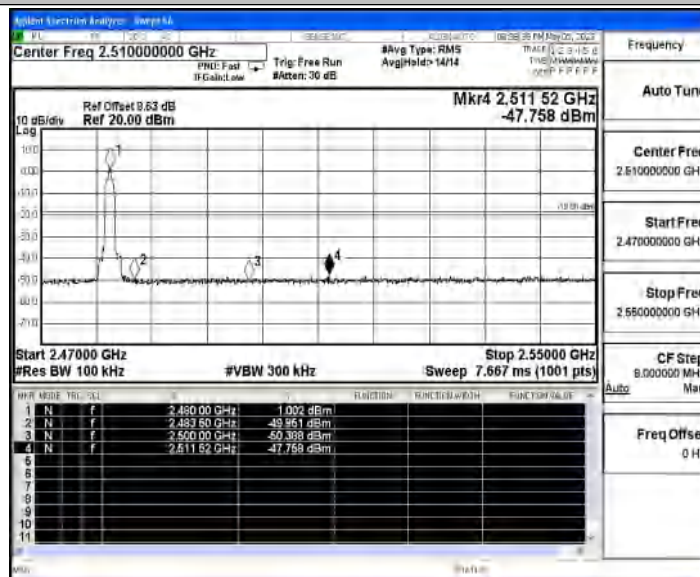
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2DH5_Ant1_High_2480



2DH5_Ant1_Low_Hop_2402

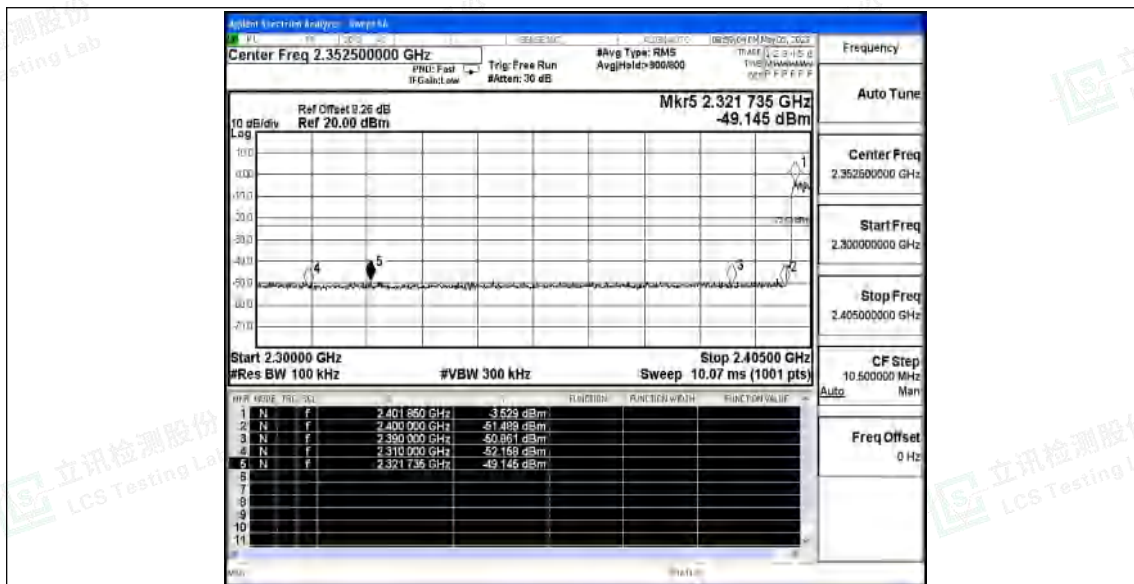


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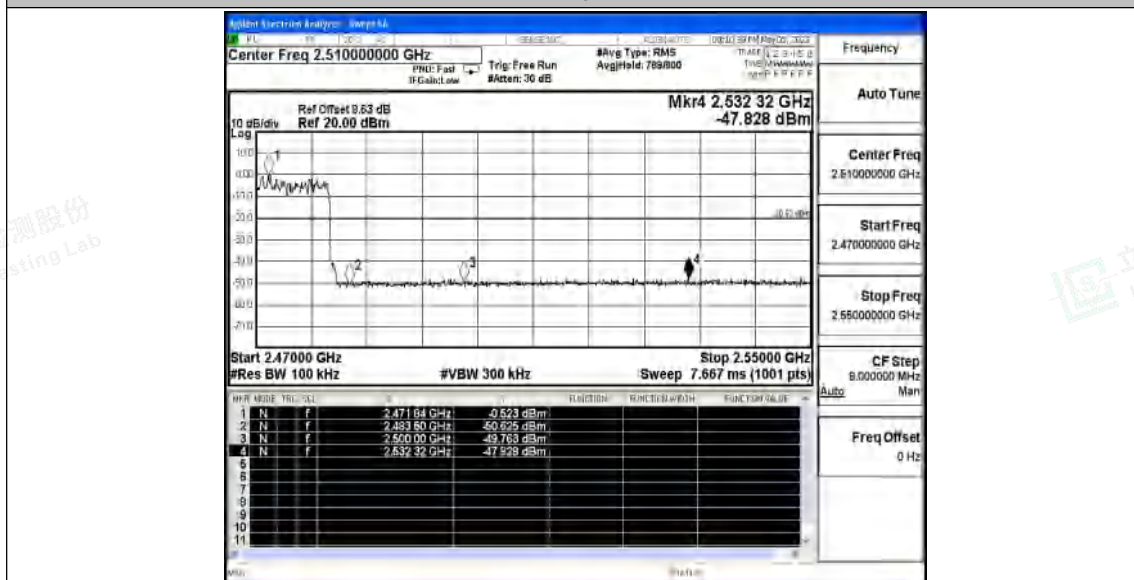
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Scan code to check authenticity

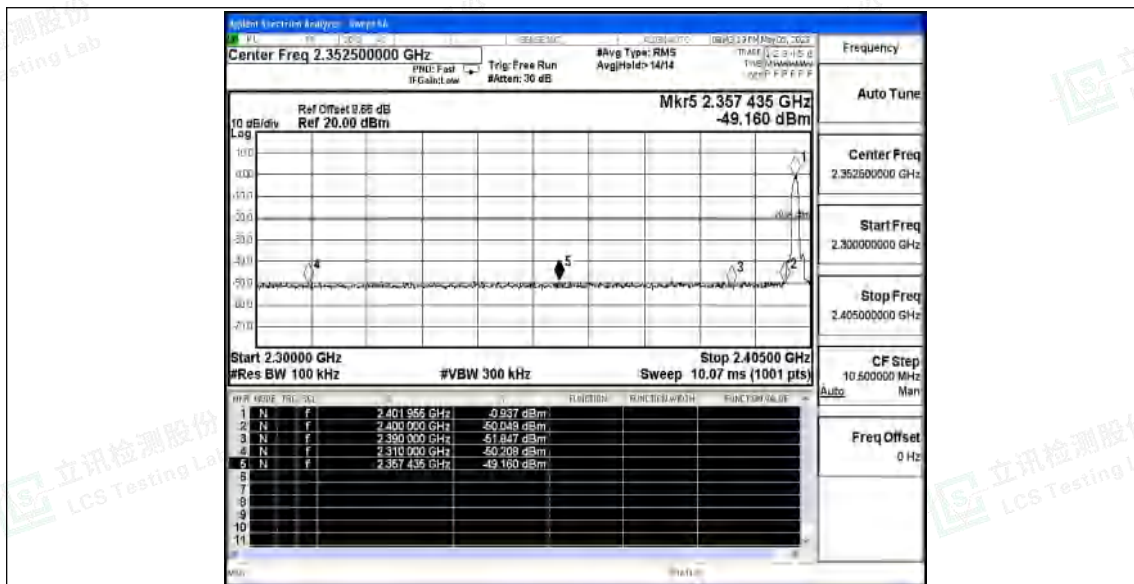


2DH5_Ant1_High_Hop_2480

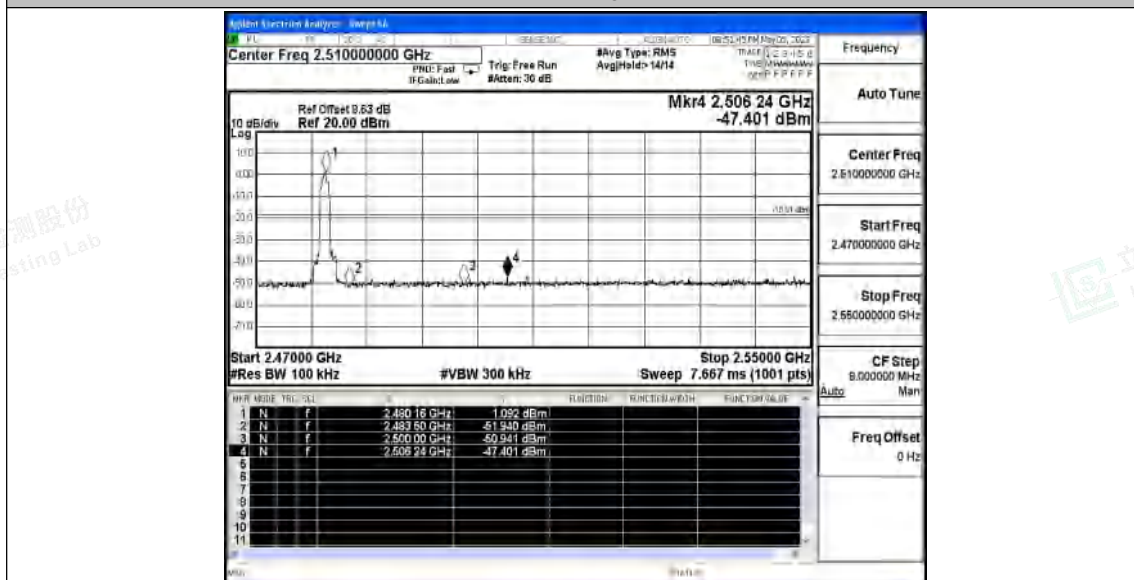


3DH5_Ant1_Low_2402



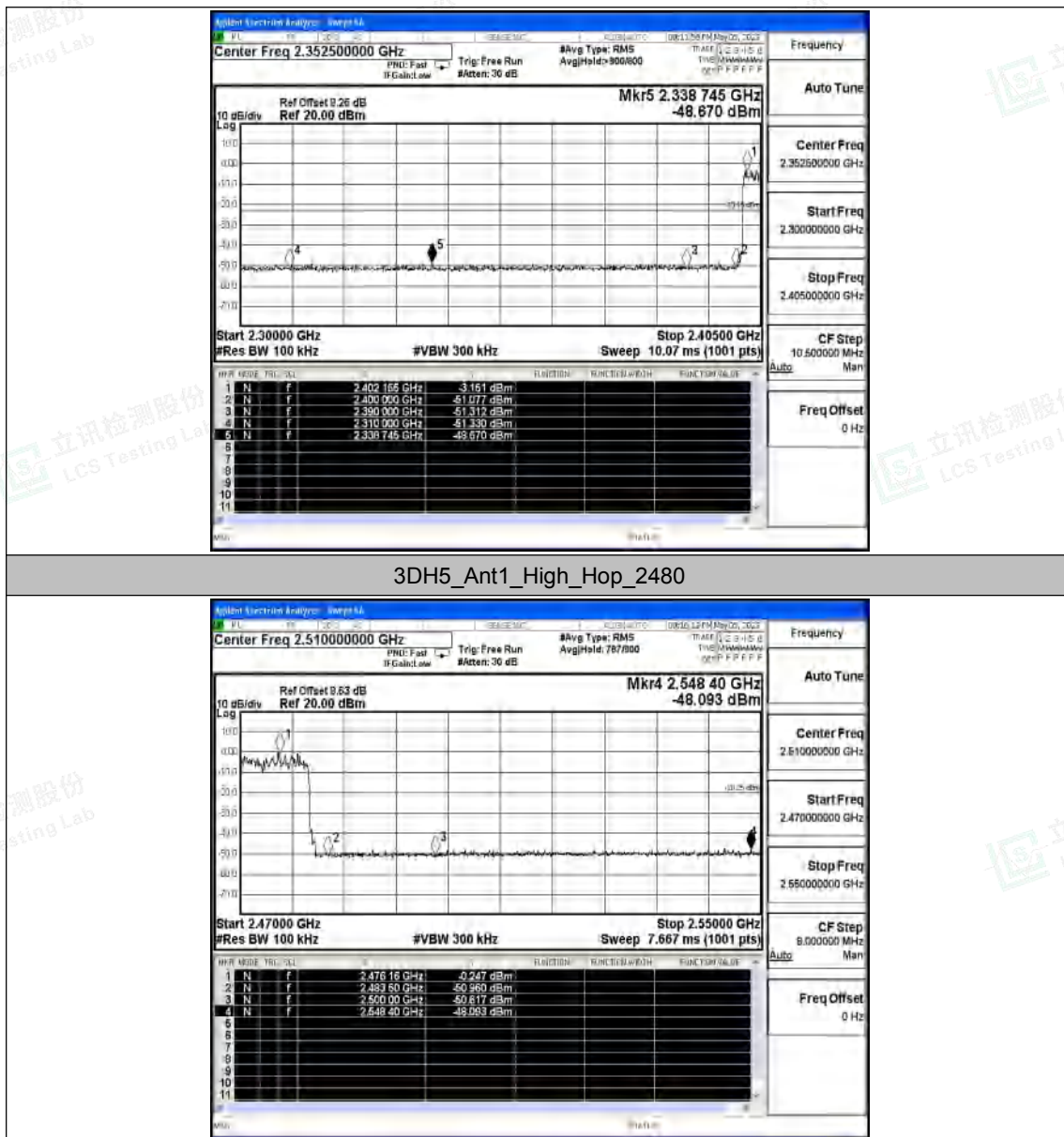


3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402







A.7 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-0.19	-0.19	---	PASS
			30~1000	-0.19	-60.41	≤-20.19	PASS
			1000~26500	-0.19	-46.32	≤-20.19	PASS
		2441	Reference	-0.74	-0.74	---	PASS
			30~1000	-0.74	-60.35	≤-20.74	PASS
			1000~26500	-0.74	-44.86	≤-20.74	PASS
		2480	Reference	-0.75	-0.75	---	PASS
			30~1000	-0.75	-59.97	≤-20.75	PASS
			1000~26500	-0.75	-45.62	≤-20.75	PASS
2DH5	Ant1	2402	Reference	0.76	0.76	---	PASS
			30~1000	0.76	-60.15	≤-19.24	PASS
			1000~26500	0.76	-39.87	≤-19.24	PASS
		2441	Reference	1.04	1.04	---	PASS
			30~1000	1.04	-60.31	≤-18.96	PASS
			1000~26500	1.04	-46.11	≤-18.96	PASS
		2480	Reference	1.20	1.20	---	PASS
			30~1000	1.20	-60.32	≤-18.8	PASS
			1000~26500	1.20	-45.8	≤-18.8	PASS
3DH5	Ant1	2402	Reference	0.77	0.77	---	PASS
			30~1000	0.77	-60.1	≤-19.23	PASS
			1000~26500	0.77	-46.59	≤-19.23	PASS
		2441	Reference	1.09	1.09	---	PASS
			30~1000	1.09	-60.1	≤-18.91	PASS
			1000~26500	1.09	-46.41	≤-18.91	PASS
		2480	Reference	1.16	1.16	---	PASS
			30~1000	1.16	-60.2	≤-18.84	PASS
			1000~26500	1.16	-46.09	≤-18.84	PASS



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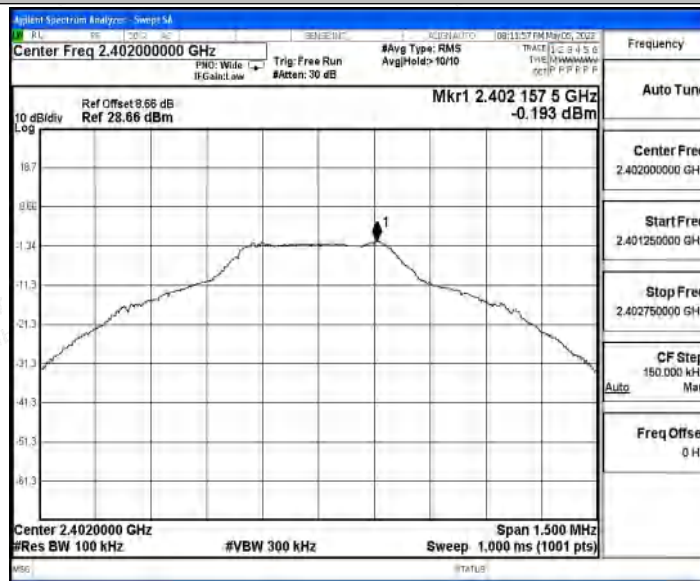
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

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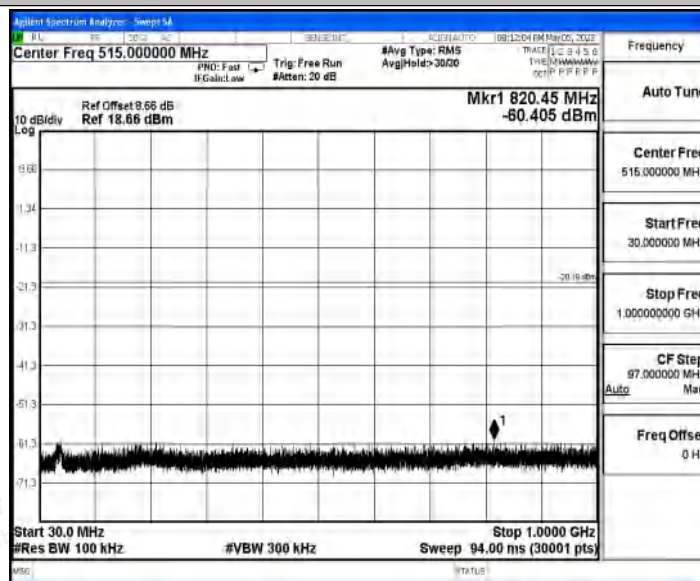


Test Graphs

DH5_Ant1_2402_0~Reference

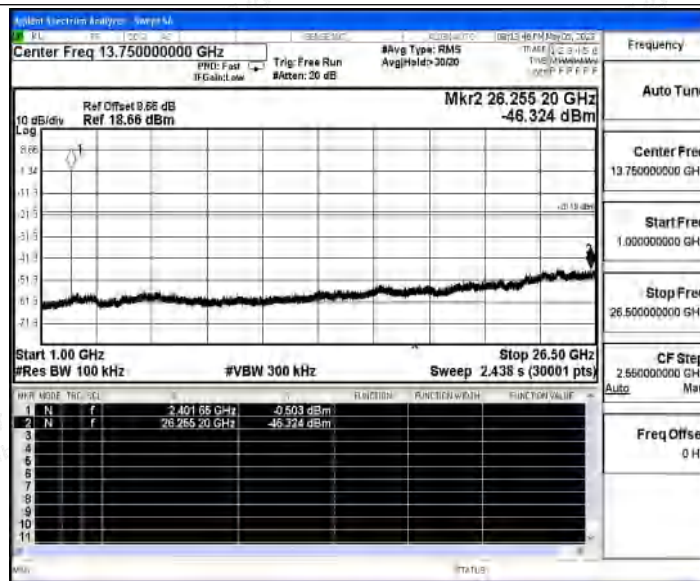


DH5_Ant1_2402_30~1000

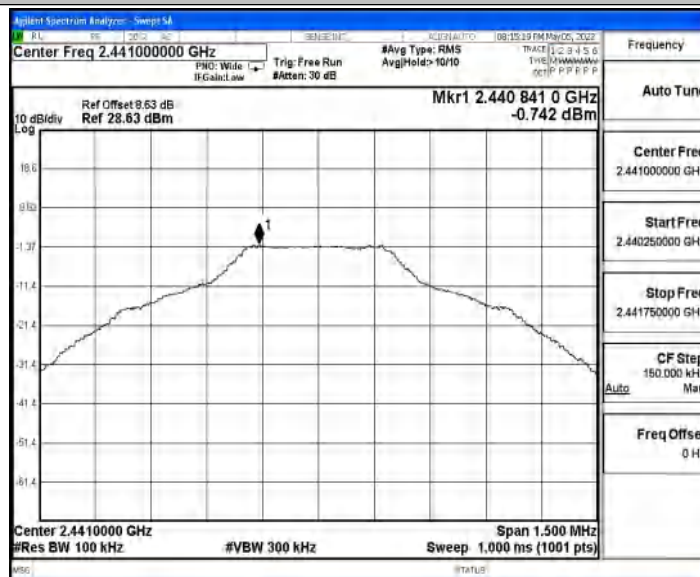


DH5_Ant1_2402_1000~26500





DH5_Ant1_2441_0~Reference



DH5_Ant1_2441_30~1000

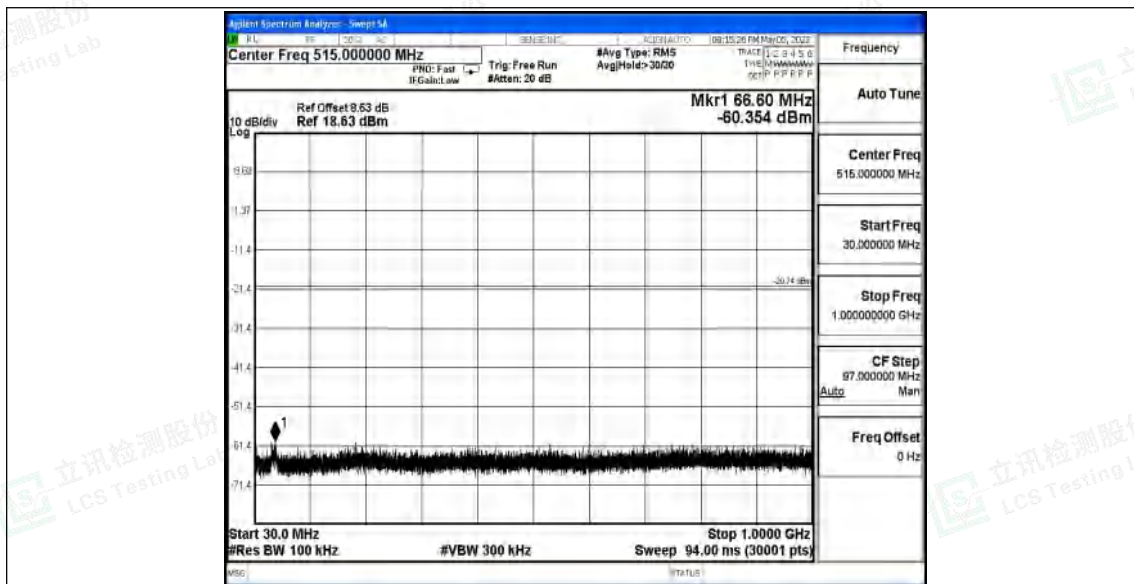


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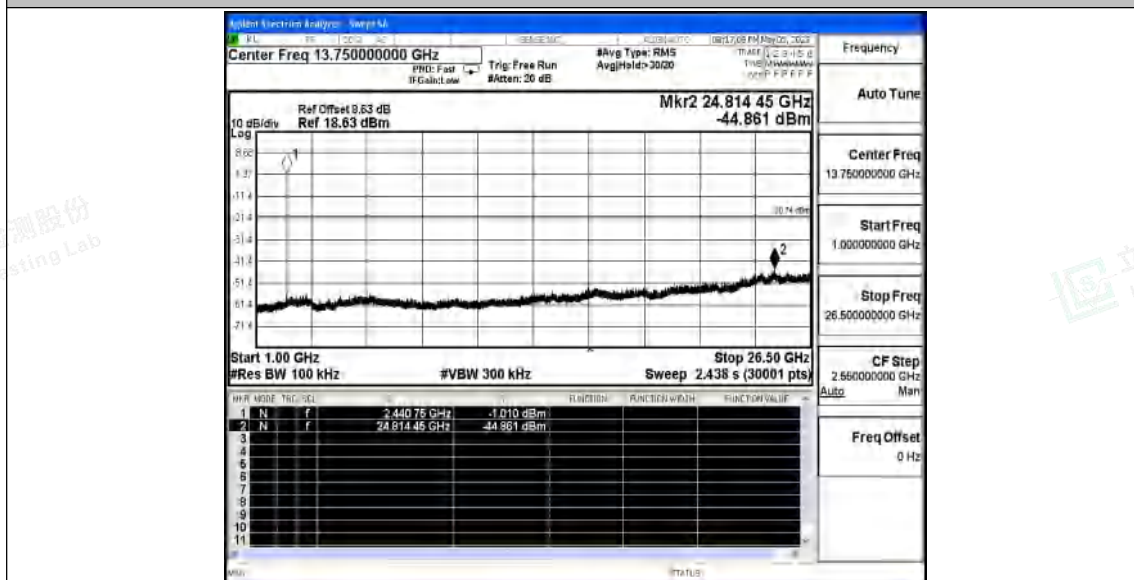
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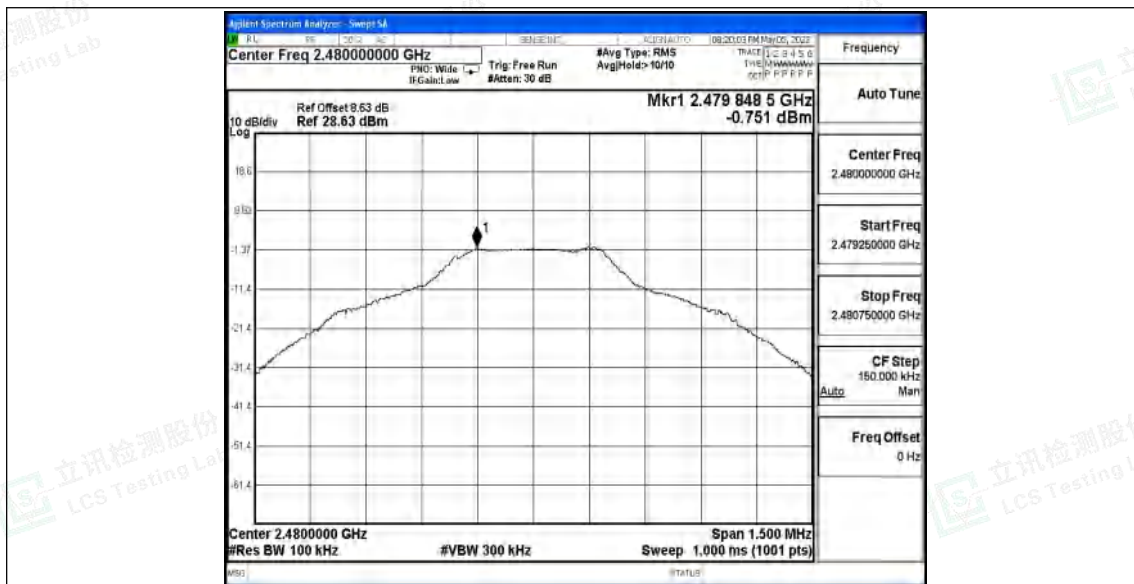


DH5_Ant1_2441_1000~26500

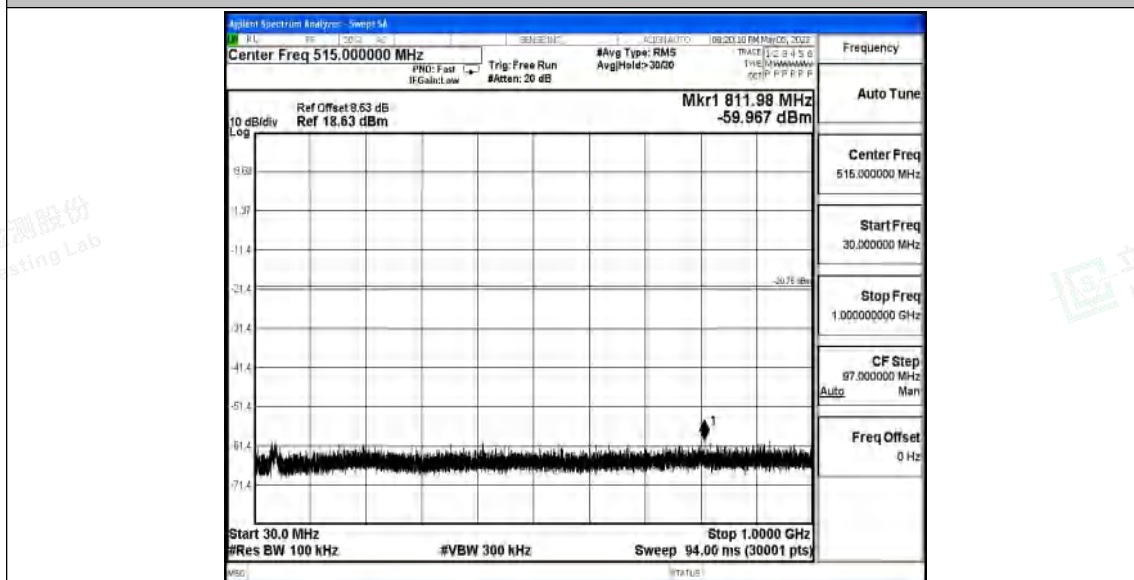


DH5_Ant1_2480_0~Reference



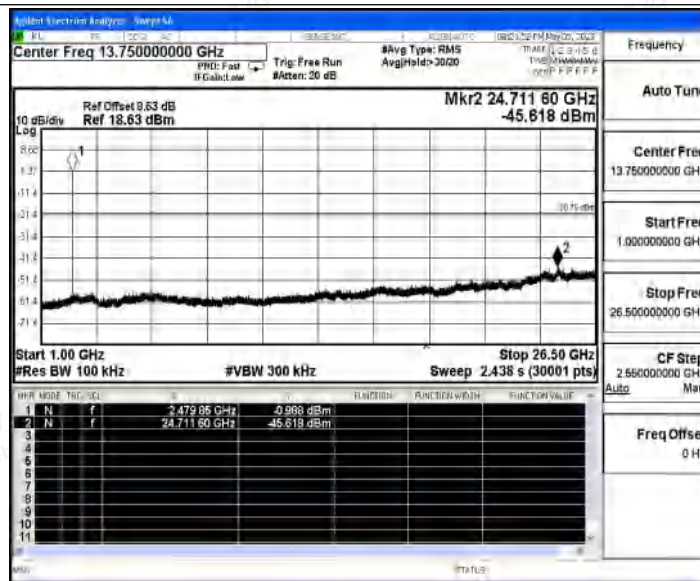


DH5_Ant1_2480_30~1000

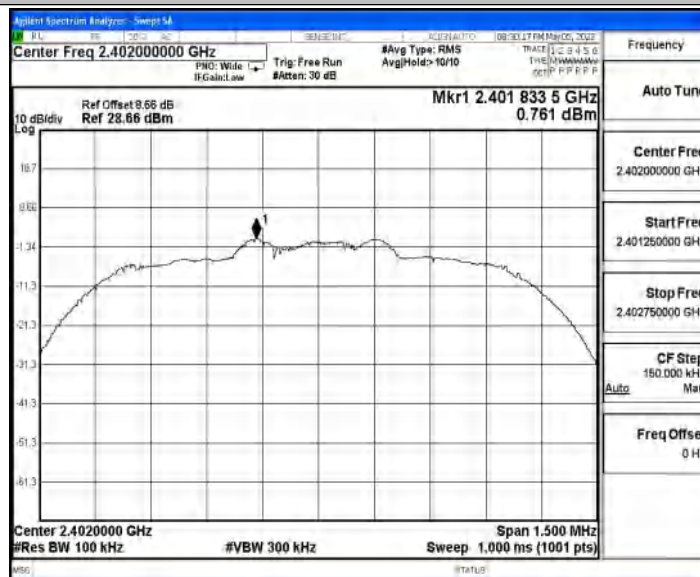


DH5_Ant1_2480_1000~26500





2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

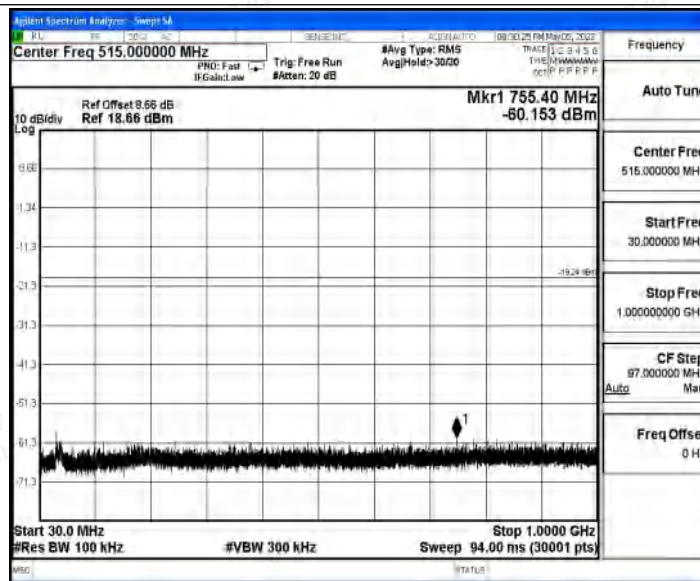


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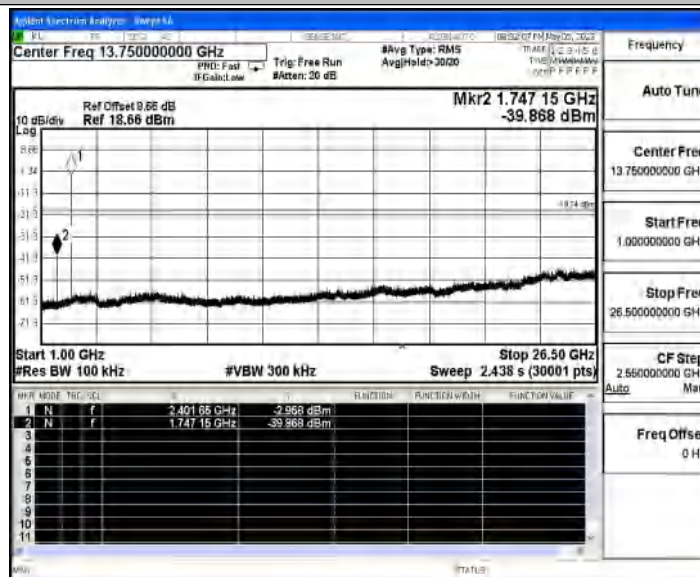
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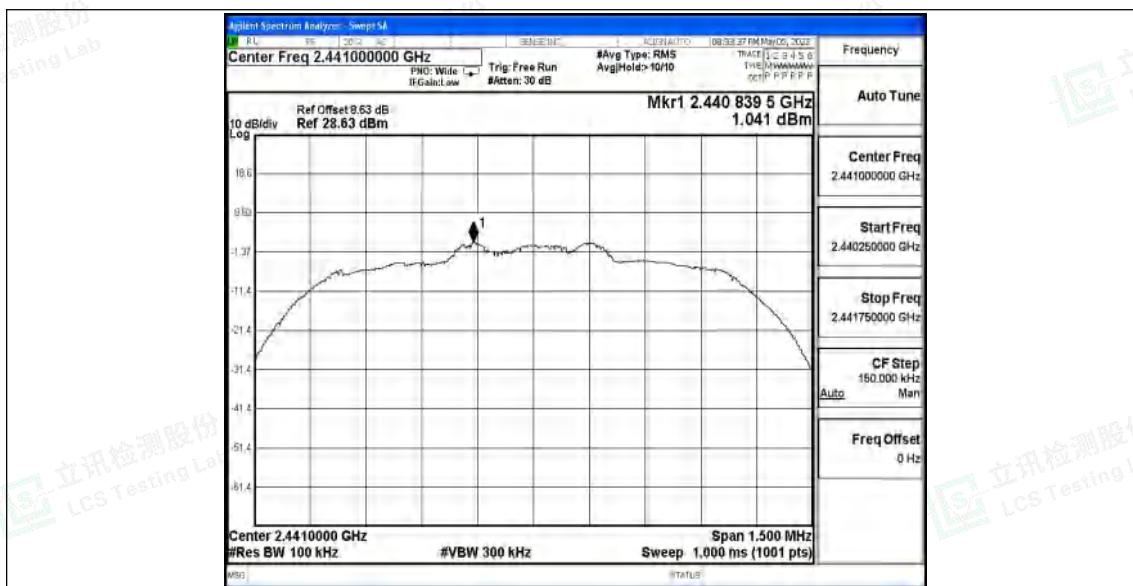


2DH5_Ant1_2402_1000~26500

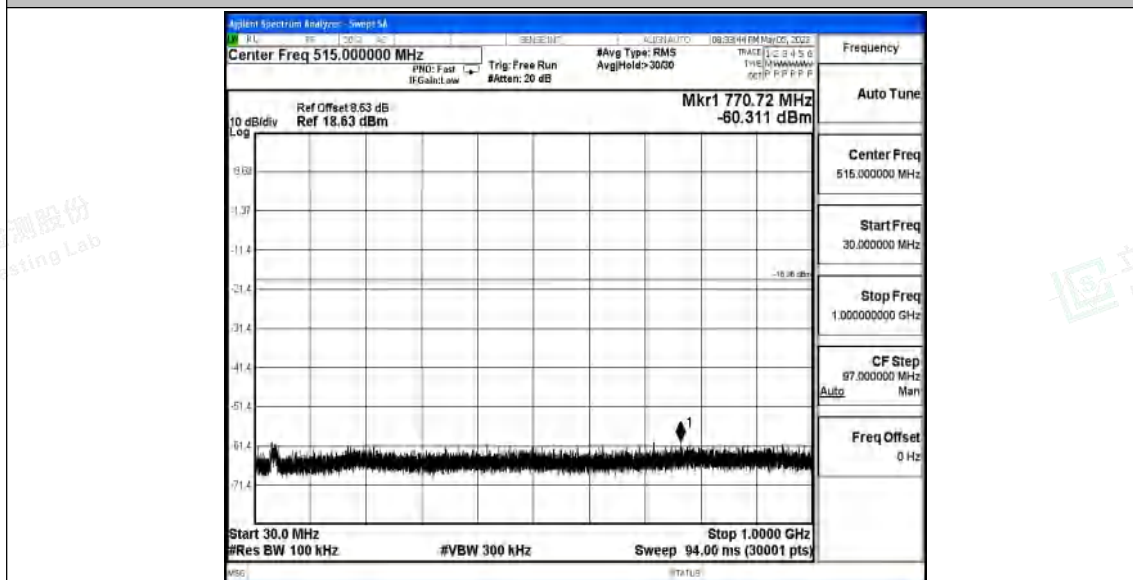


2DH5_Ant1_2441_0~Reference



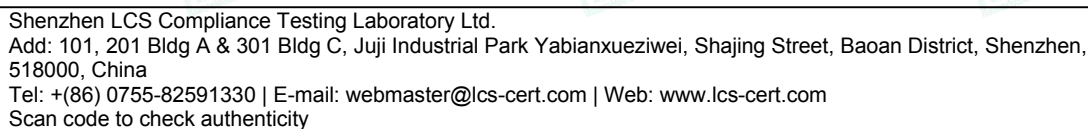
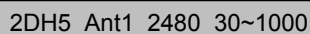
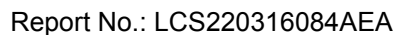


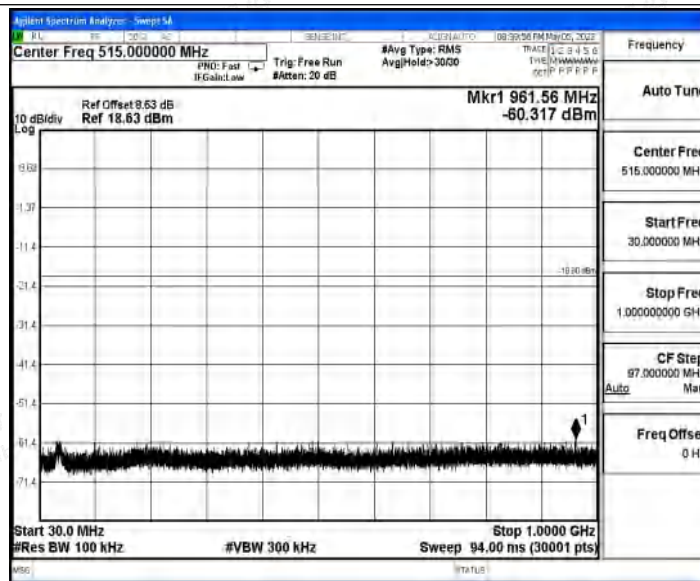
2DH5_Ant1_2441_30~1000



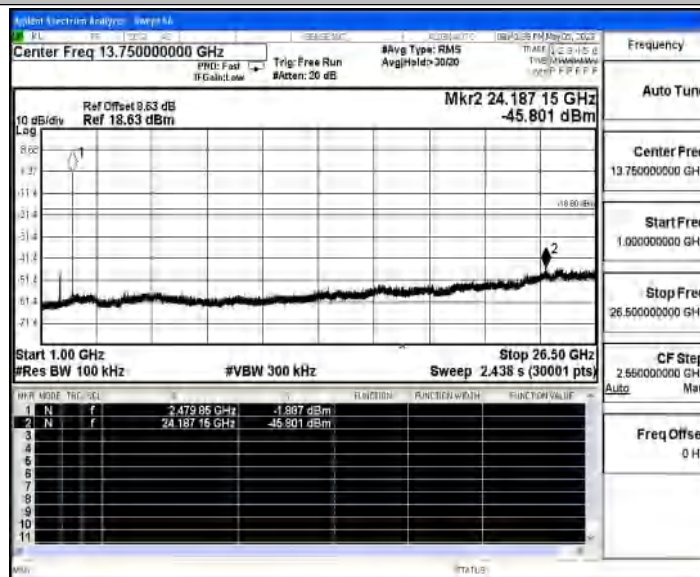
2DH5_Ant1_2441_1000~26500







2DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference

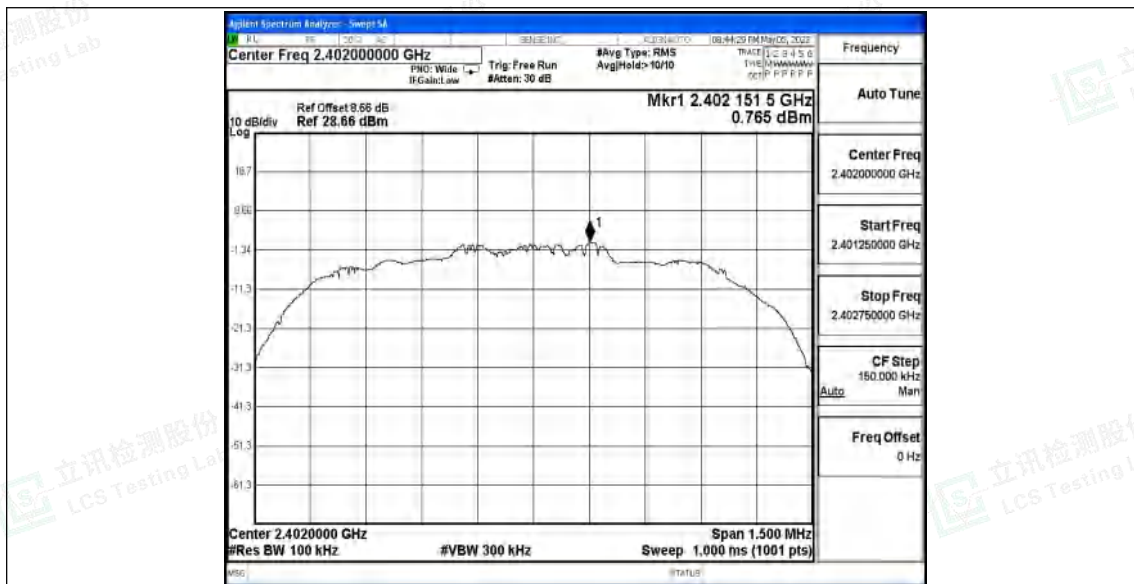


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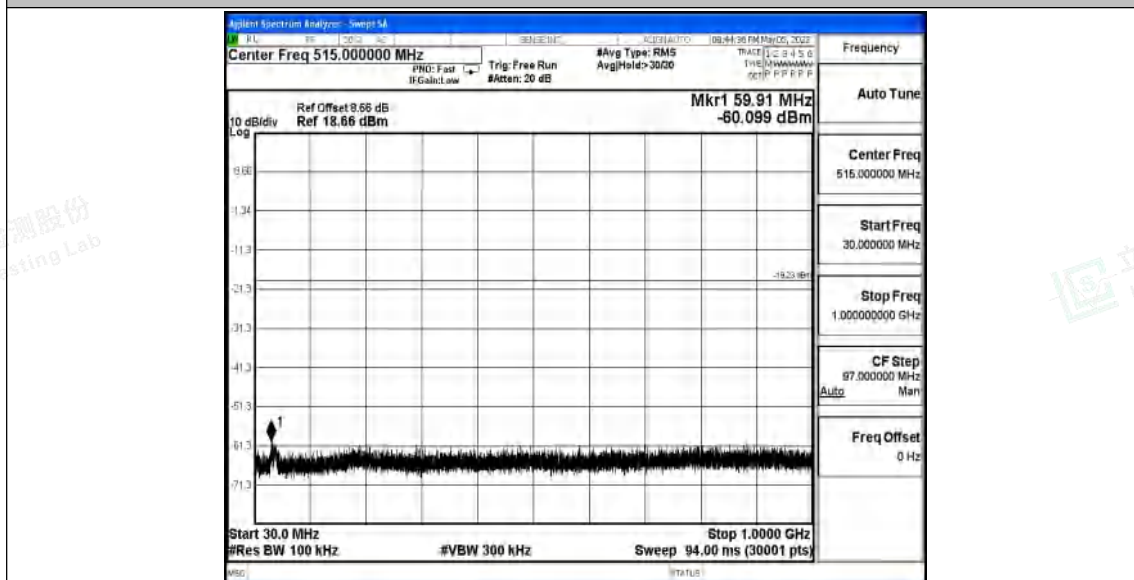
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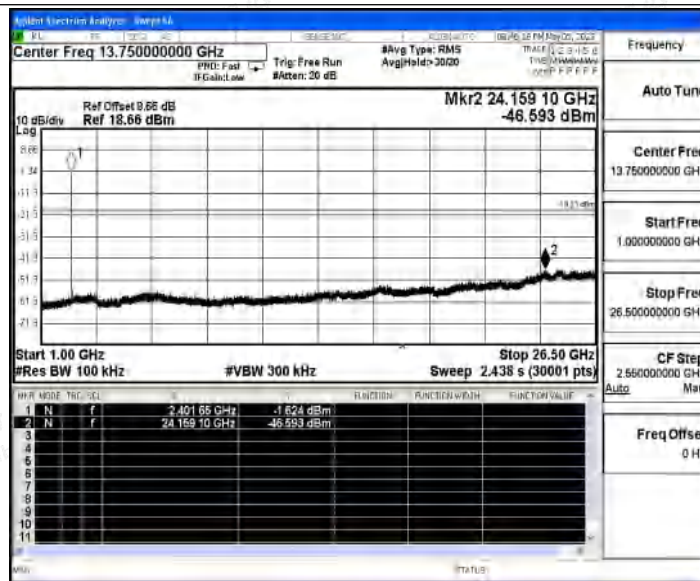


3DH5_Ant1_2402_30~1000

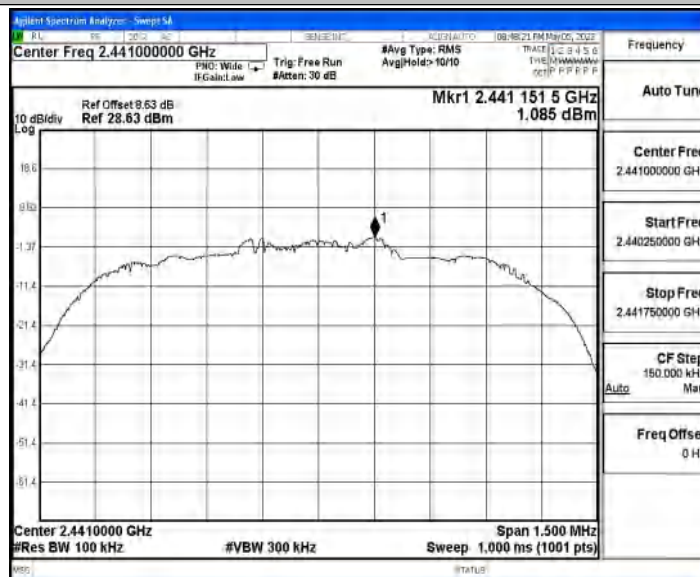


3DH5_Ant1_2402_1000~26500





3DH5_Ant1_2441_0~Reference



3DH5_Ant1_2441_30~1000

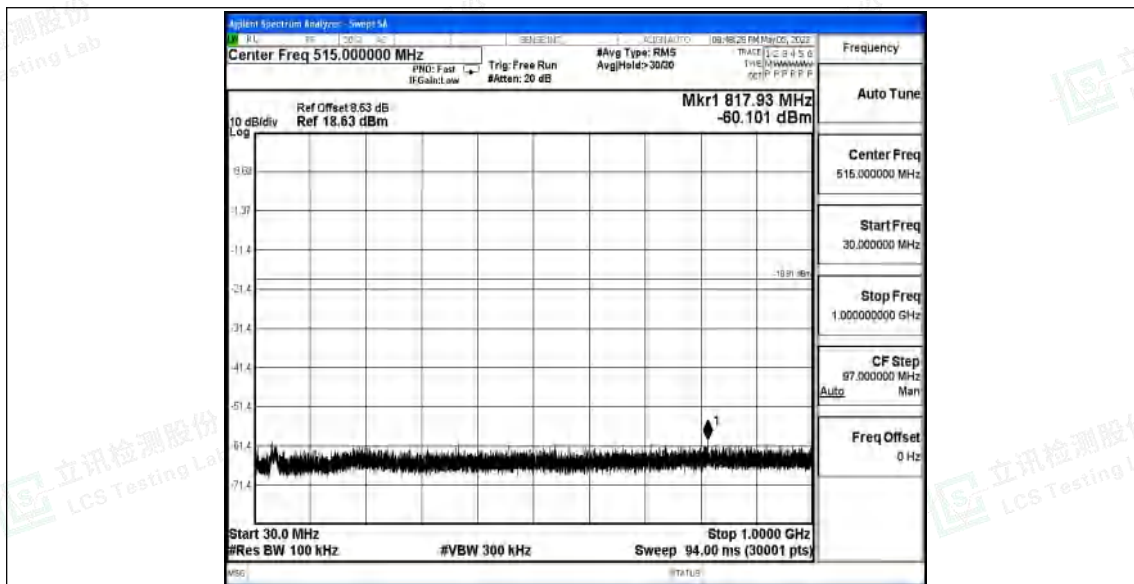


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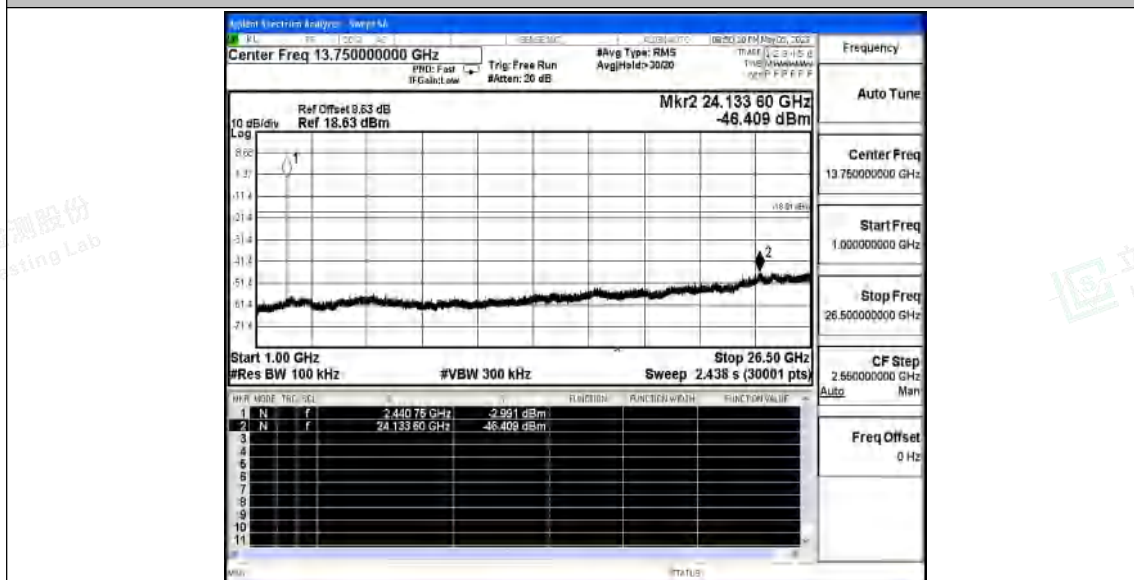
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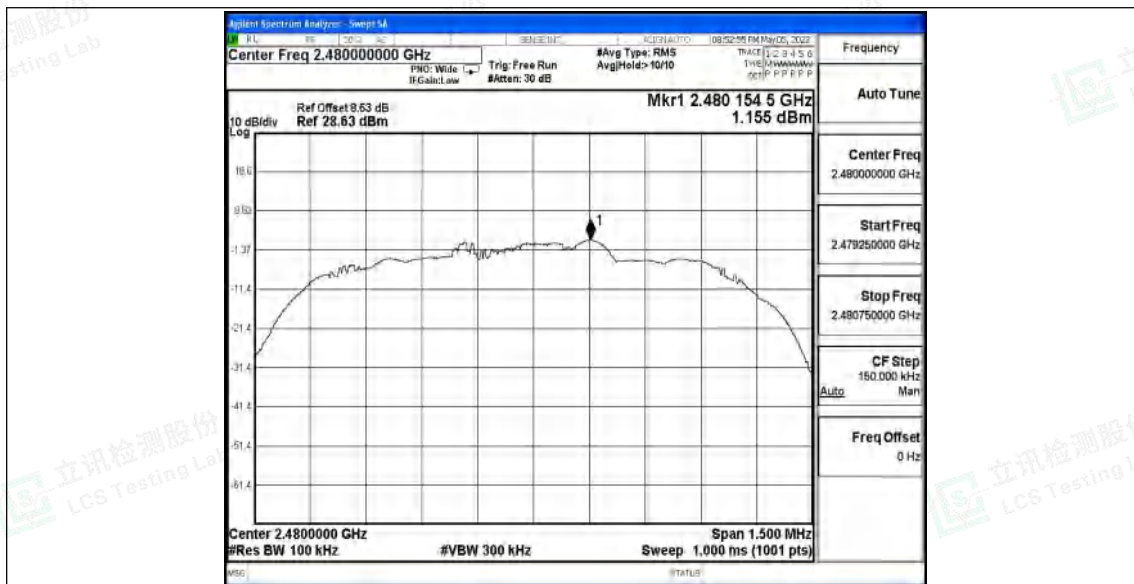


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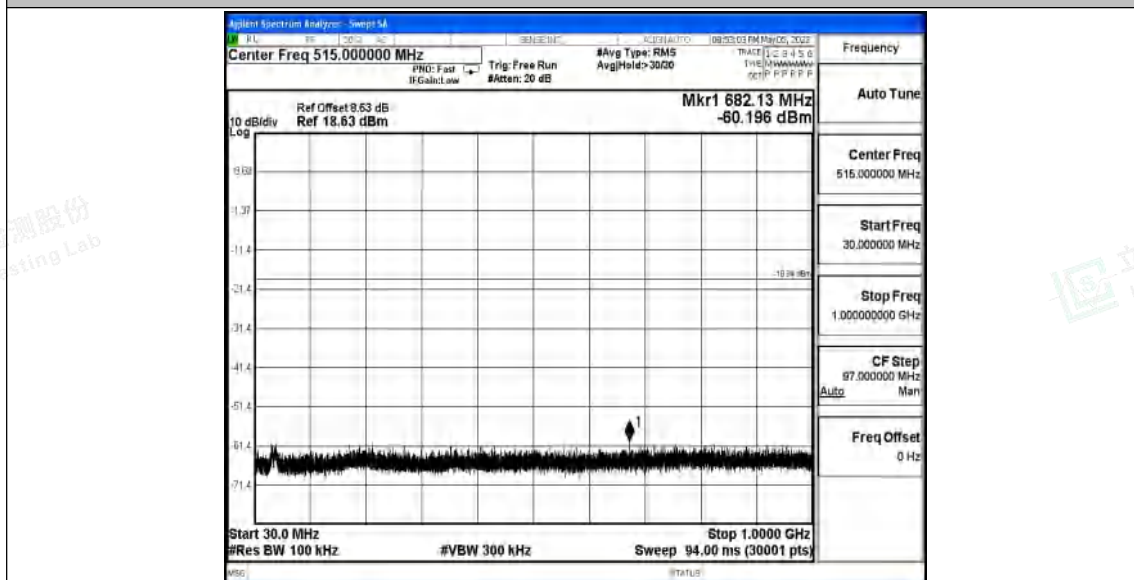


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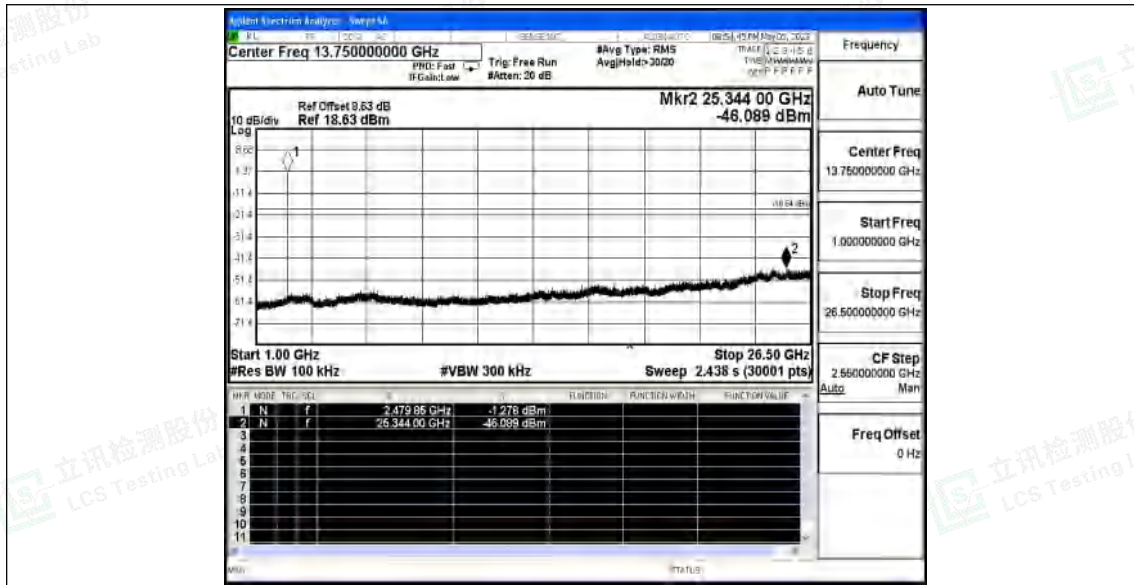


3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500







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	-48.15	≤-41.20	47.05	≤54	PASS
				AV	2381.375	-47.69	≤-41.20	47.51	≤54	PASS
				AV	2390.000	-47.74	≤-41.20	47.46	≤54	PASS
				Peak	2310.000	-39.32	≤-21.20	55.88	≤74	PASS
				Peak	2388.095	-36.78	≤-21.20	58.42	≤74	PASS
				Peak	2390.000	-38.61	≤-21.20	56.59	≤74	PASS
		High	2480	AV	2483.500	-47.3	≤-41.20	47.90	≤54	PASS
				AV	2486.880	-47.07	≤-41.20	48.13	≤54	PASS
				AV	2500.000	-47.27	≤-41.20	47.93	≤54	PASS
				Peak	2483.500	-37.94	≤-21.20	57.26	≤74	PASS
				Peak	2495.440	-36.39	≤-21.20	58.81	≤74	PASS
				Peak	2500.000	-38.47	≤-21.20	56.73	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-38.92	≤-21.20	56.28	≤74	PASS
				Peak	2349.245	-36.32	≤-21.20	58.88	≤74	PASS
				Peak	2390.000	-39.11	≤-21.20	56.09	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-38.07	≤-21.20	57.13	≤74	PASS
				Peak	2490.800	-35.97	≤-21.20	59.23	≤74	PASS
				Peak	2500.000	-37.86	≤-21.20	57.34	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-48.16	≤-41.20	47.04	≤54	PASS
				AV	2388.515	-47.66	≤-41.20	47.54	≤54	PASS
				AV	2390.000	-47.8	≤-41.20	47.40	≤54	PASS
				Peak	2310.000	-38.55	≤-21.20	56.65	≤74	PASS
				Peak	2355.545	-35.66	≤-21.20	59.54	≤74	PASS
				Peak	2390.000	-37.63	≤-21.20	57.57	≤74	PASS
		High	2480	AV	2483.500	-46.99	≤-41.20	48.21	≤54	PASS
				AV	2483.520	-46.99	≤-41.20	48.21	≤54	PASS
				AV	2500.000	-47.23	≤-41.20	47.97	≤54	PASS
				Peak	2483.500	-37.36	≤-21.20	57.84	≤74	PASS
				Peak	2499.360	-35.92	≤-21.20	59.28	≤74	PASS
				Peak	2500.000	-37.57	≤-21.20	57.63	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-39.36	≤-21.20	55.84	≤74	PASS
				Peak	2318.900	-37.13	≤-21.20	58.07	≤74	PASS
				Peak	2390.000	-38.17	≤-21.20	57.03	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-38.15	≤-21.20	57.05	≤74	PASS
				Peak	2498.960	-36.48	≤-21.20	58.72	≤74	PASS



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3DH5	Ant1	Low	2402	Peak	2500.000	-37.89	≤ -21.20	57.31	≤ 74	PASS
				AV	2310.000	-48.19	≤ -41.20	47.01	≤ 54	PASS
				AV	2374.655	-47.69	≤ -41.20	47.51	≤ 54	PASS
				AV	2390.000	-47.87	≤ -41.20	47.33	≤ 54	PASS
				Peak	2310.000	-38.32	≤ -21.20	56.88	≤ 74	PASS
				Peak	2380.850	-36.6	≤ -21.20	58.60	≤ 74	PASS
				Peak	2390.000	-37.89	≤ -21.20	57.31	≤ 74	PASS
		High	2480	AV	2483.500	-47.06	≤ -41.20	48.14	≤ 54	PASS
				AV	2483.520	-47.06	≤ -41.20	48.14	≤ 54	PASS
				AV	2500.000	-47.17	≤ -41.20	48.03	≤ 54	PASS
				Peak	2483.500	-37.21	≤ -21.20	57.99	≤ 74	PASS
				Peak	2488.960	-36.64	≤ -21.20	58.56	≤ 74	PASS
				Peak	2500.000	-37.33	≤ -21.20	57.87	≤ 74	PASS
		Low	Hop_24 02	Peak	2310.000	-38.91	≤ -21.20	56.29	≤ 74	PASS
				Peak	2324.570	-36.58	≤ -21.20	58.62	≤ 74	PASS
				Peak	2390.000	-38.01	≤ -21.20	57.19	≤ 74	PASS
		High	Hop_24 80	Peak	2483.500	-37.93	≤ -21.20	57.27	≤ 74	PASS
				Peak	2486.160	-36.32	≤ -21.20	58.88	≤ 74	PASS
				Peak	2500.000	-37.44	≤ -21.20	57.76	≤ 74	PASS

Note:

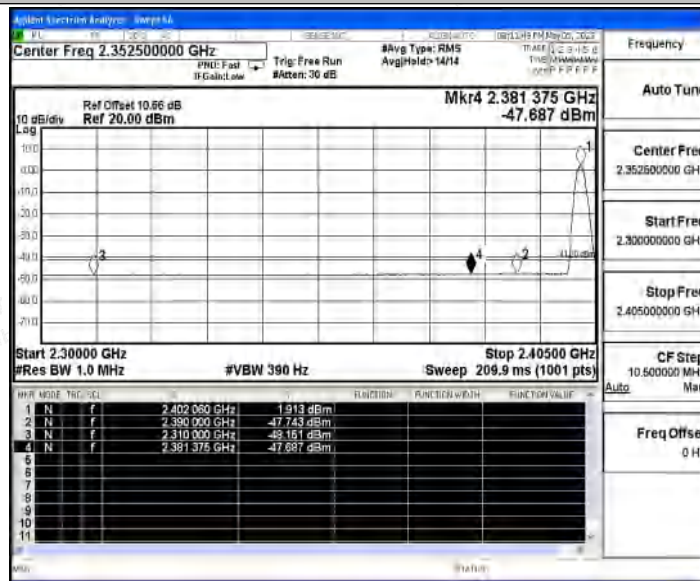
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



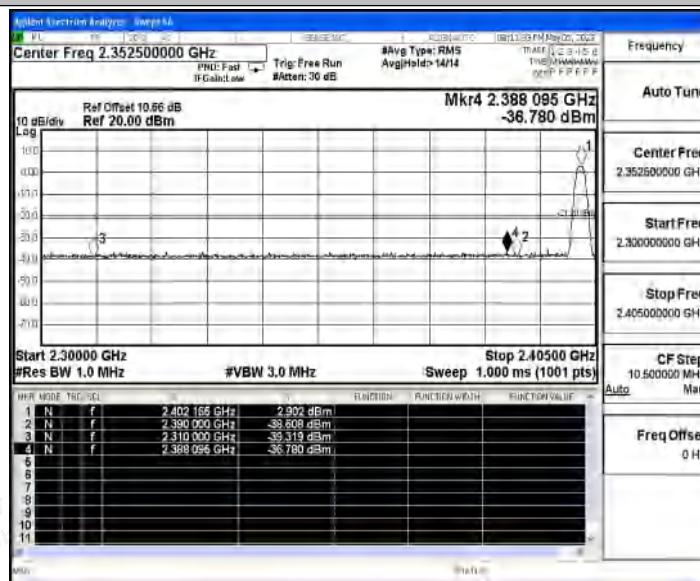


Test Graphs

DH5_Ant1_Low_2402_AV



DH5_Ant1_Low_2402_Peak



DH5_Ant1_High_2480_AV

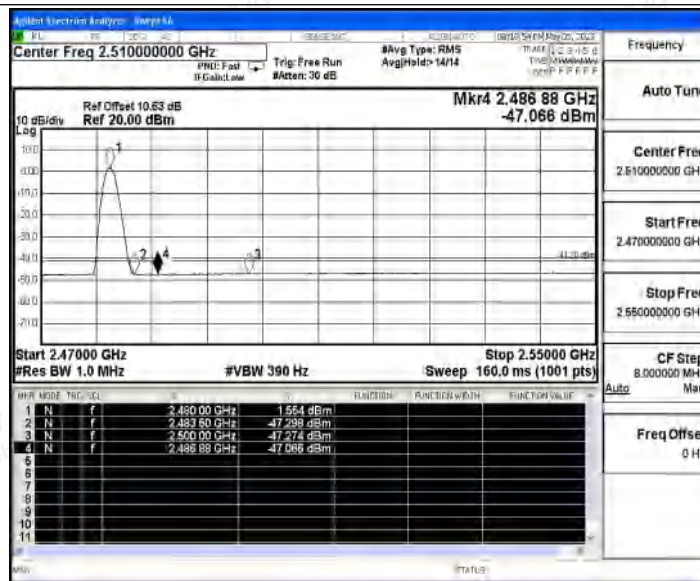


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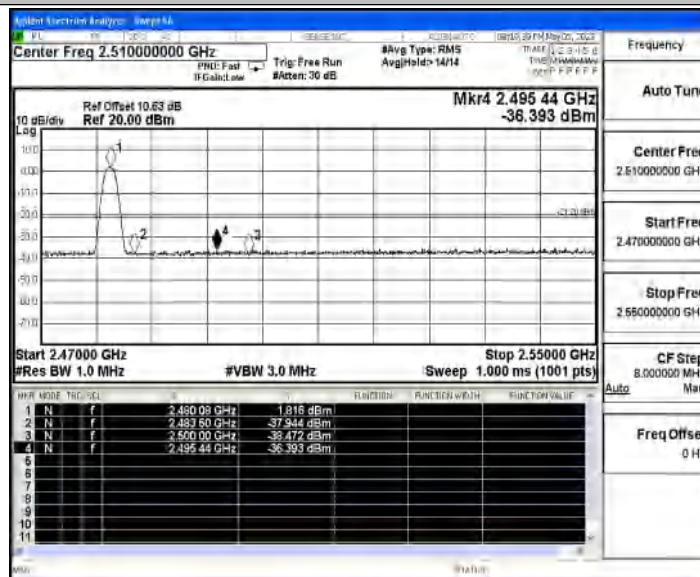
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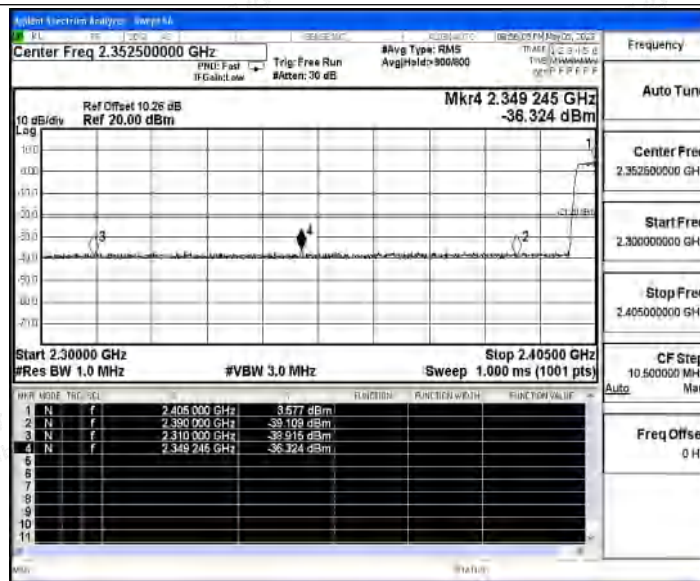


DH5_Ant1_High_2480_Peak

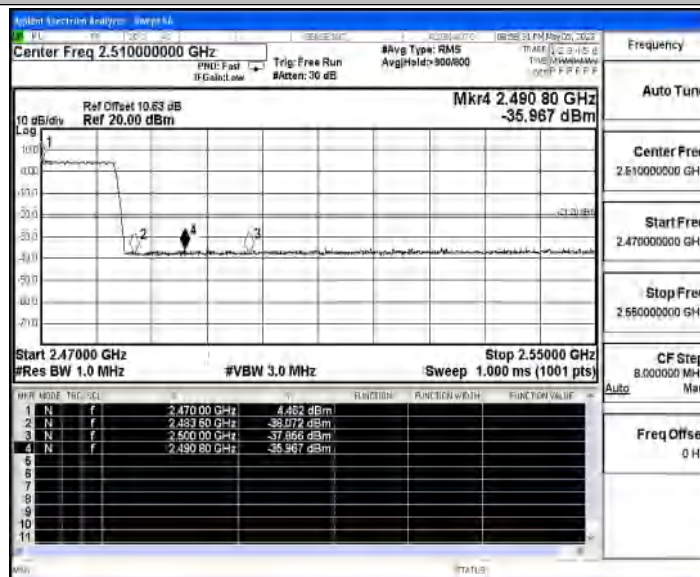


DH5_Ant1_Low_Hop_2402_Peak





DH5_Ant1_High_Hop_2480_Peak



2DH5_Ant1_Low_2402_AV

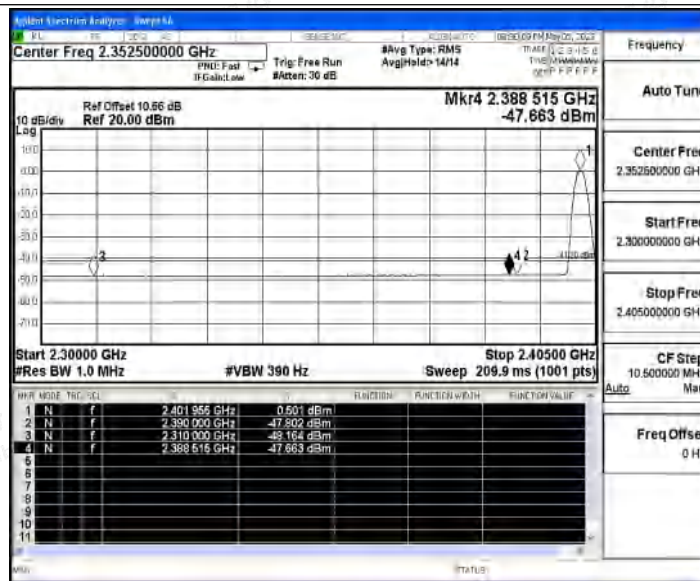


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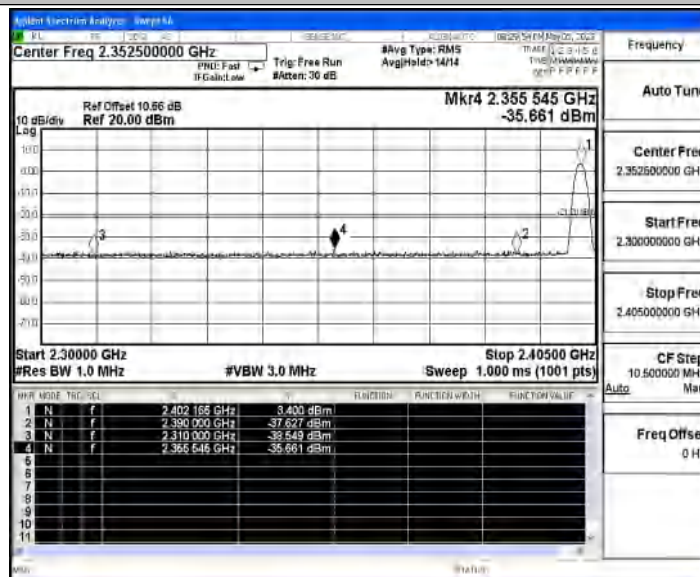
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2DH5_Ant1_Low_2402_Peak



2DH5_Ant1_High_2480_AV

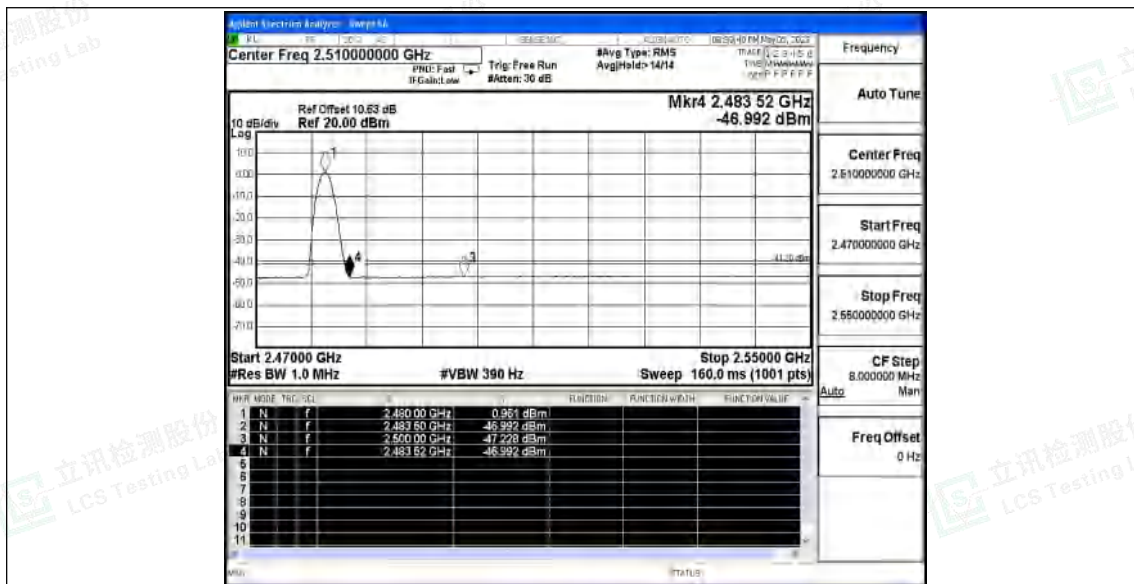


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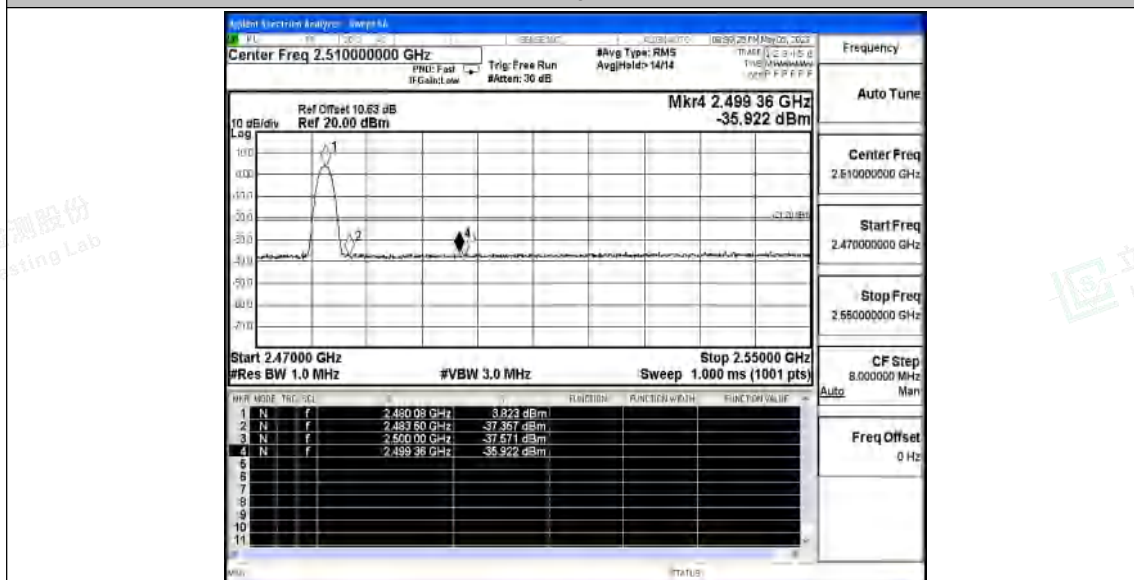
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2DH5_Ant1_High_2480_Peak



2DH5_Ant1_Low_Hop_2402_Peak

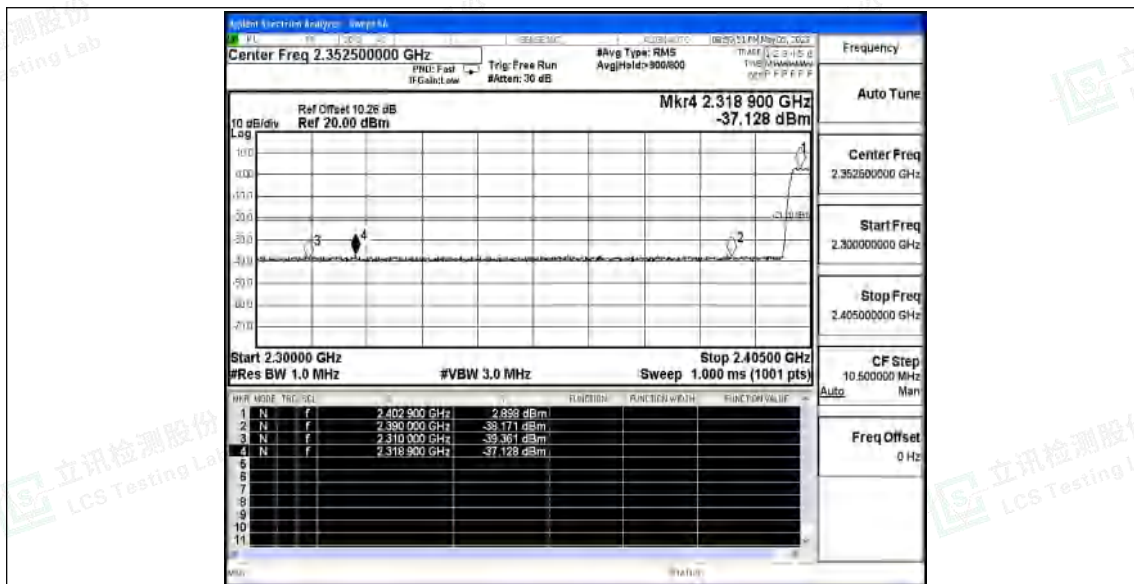


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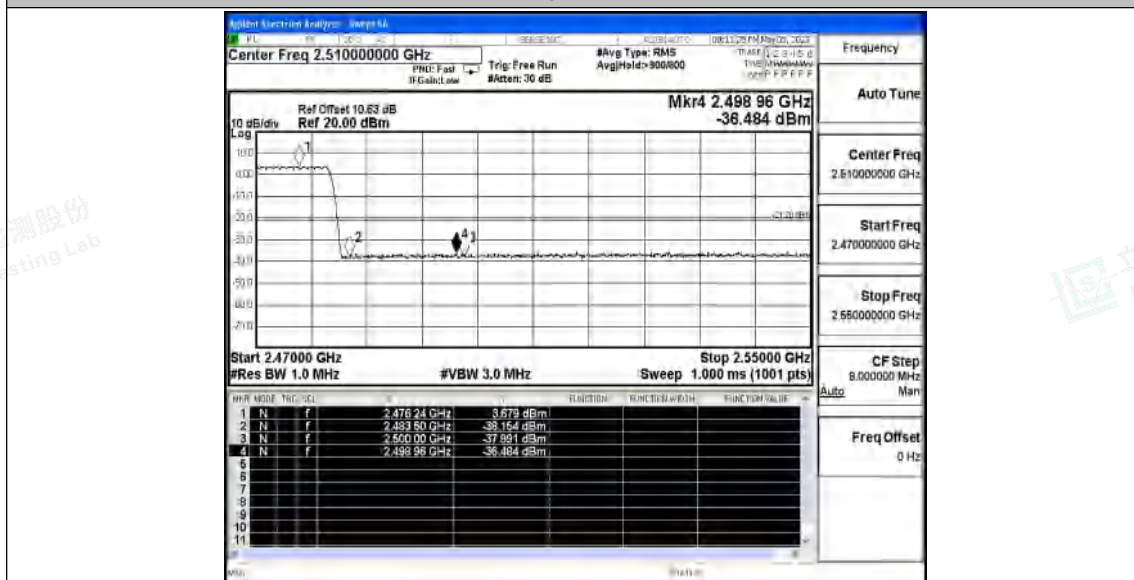
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2DH5_Ant1_High_Hop_2480_Peak



3DH5_Ant1_Low_2402_AV

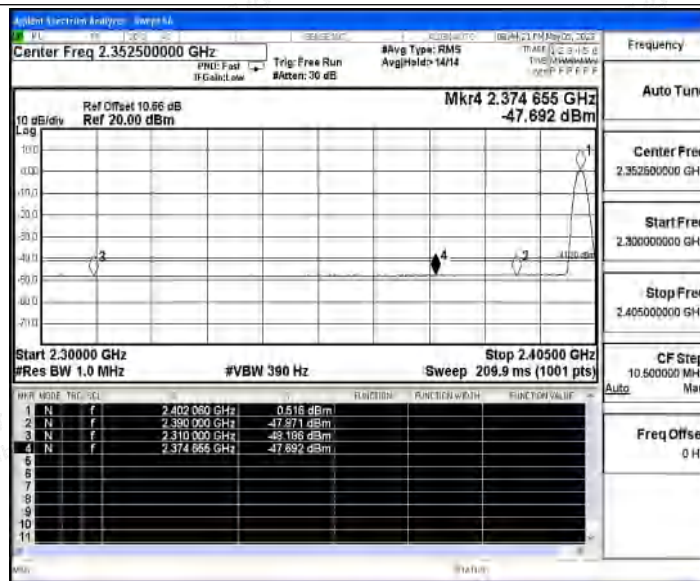


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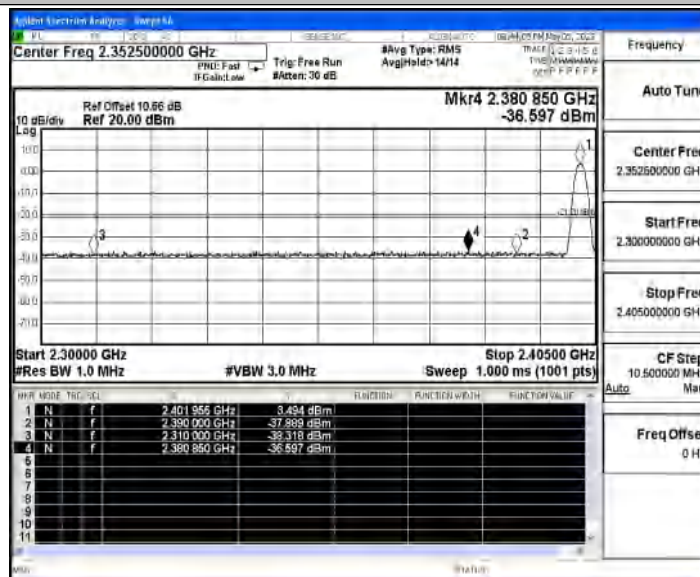
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3DH5_Ant1_Low_2402_Peak



3DH5_Ant1_High_2480_AV

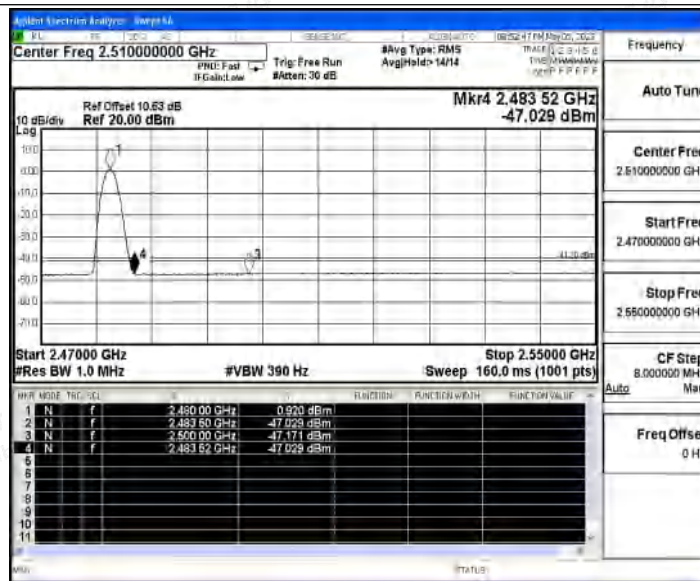


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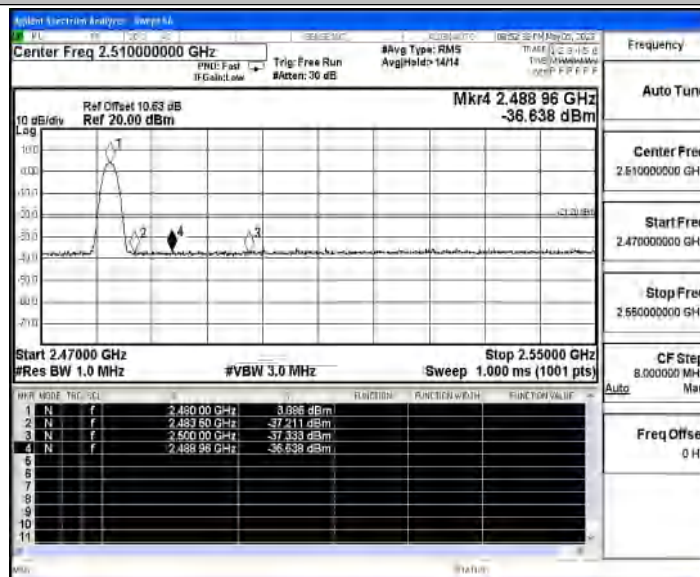
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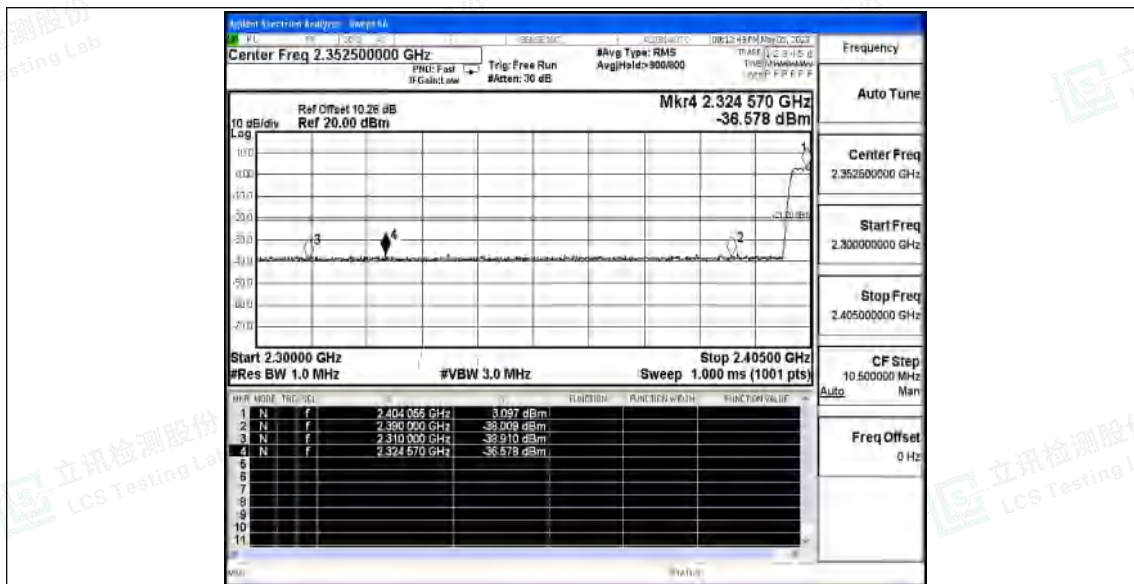


3DH5_Ant1_High_2480_Peak

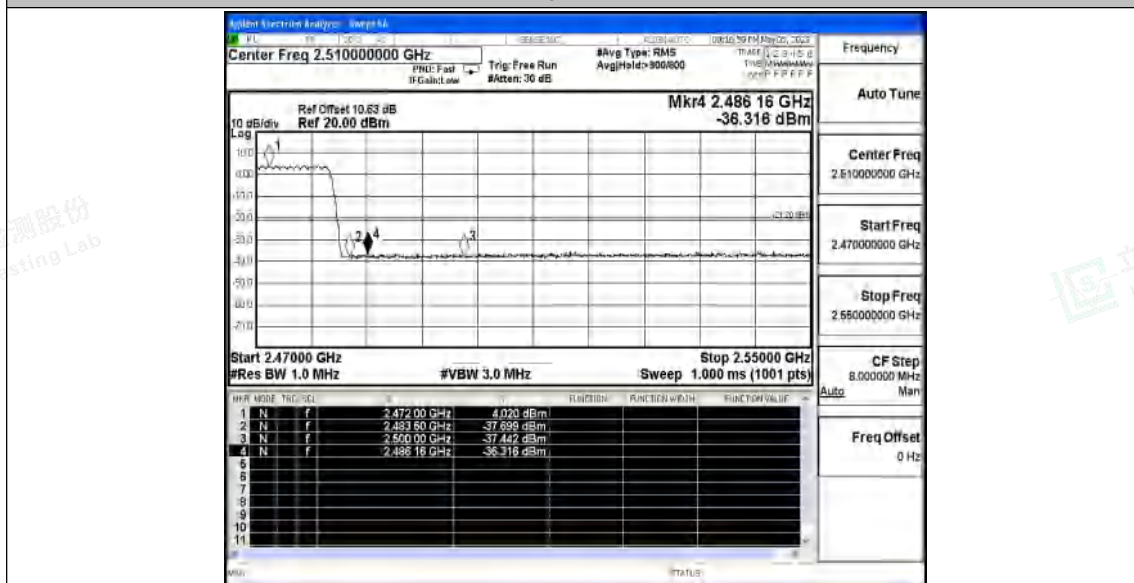


3DH5_Ant1_Low_Hop_2402_Peak





3DH5_Ant1_High_Hop_2480_Peak



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