



## Appendix A

### RF Test Data for BT (Conducted Measurement)

Product Name: Shower Head Speaker

Test Model: AT1817

#### Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Wunder Wu
Supervised by:	Li Huan





## A.1 20dB Emission Bandwidth

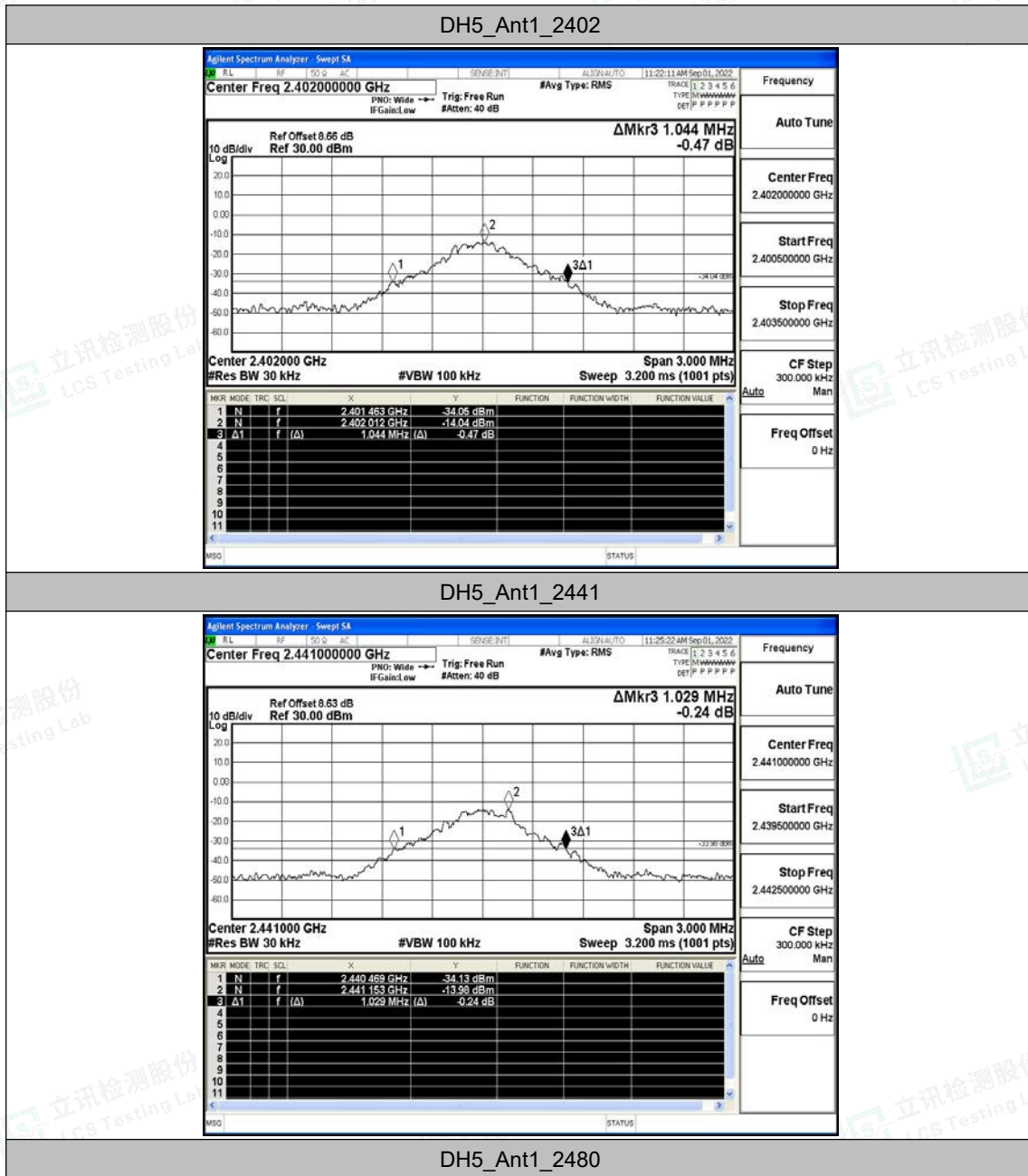
### Test Result

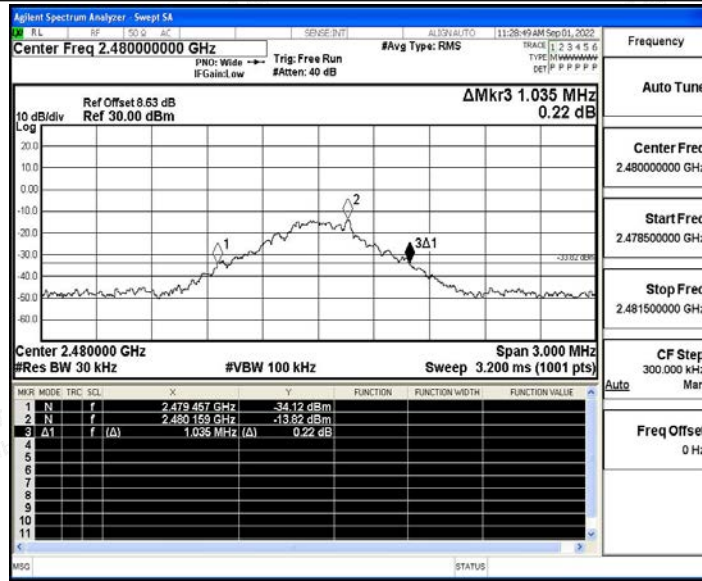
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Verdict
DH5	Ant1	2402	1.044	2401.463	2402.507	---
		2441	1.029	2440.469	2441.498	---
		2480	1.035	2479.457	2480.492	---
2DH5	Ant1	2402	1.320	2401.337	2402.657	---
		2441	1.320	2440.337	2441.657	---
		2480	1.311	2479.337	2480.648	---
3DH5	Ant1	2402	1.317	2401.334	2402.651	---
		2441	1.314	2440.337	2441.651	---
		2480	1.314	2479.340	2480.654	---



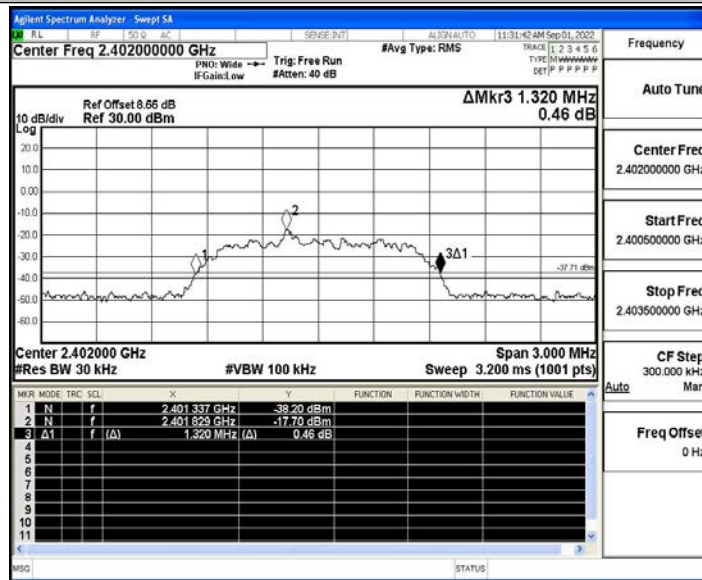


### Test Graphs



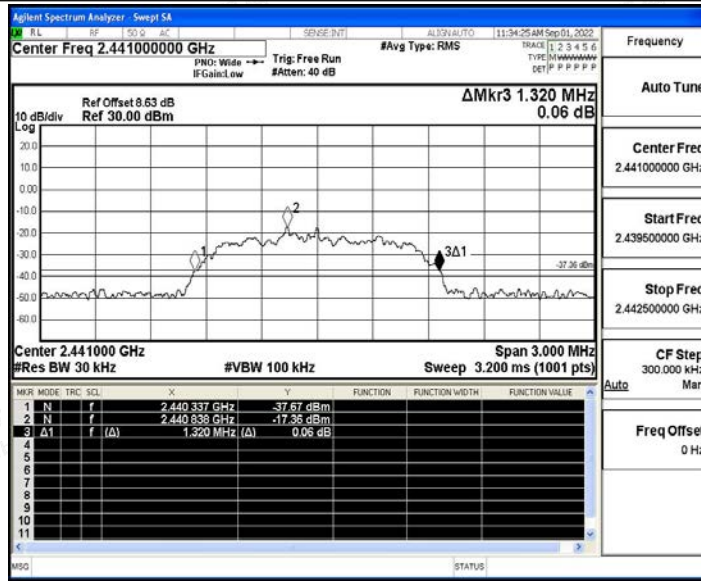


2DH5\_Ant1\_2402

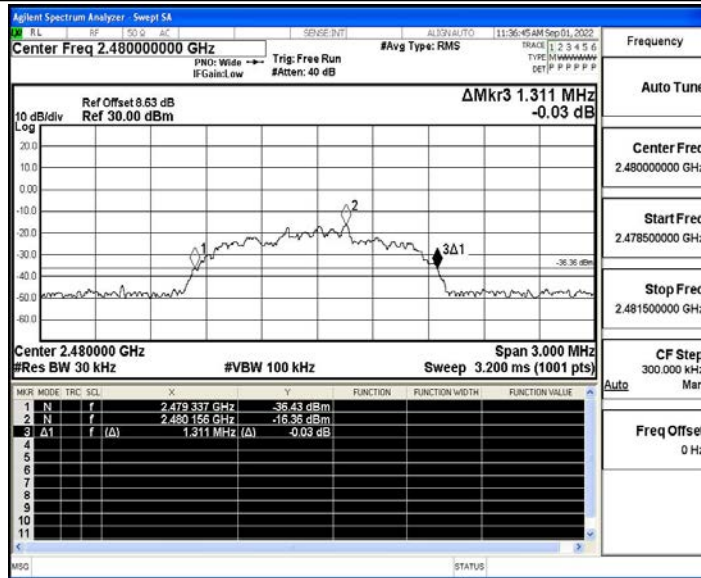


2DH5\_Ant1\_2441



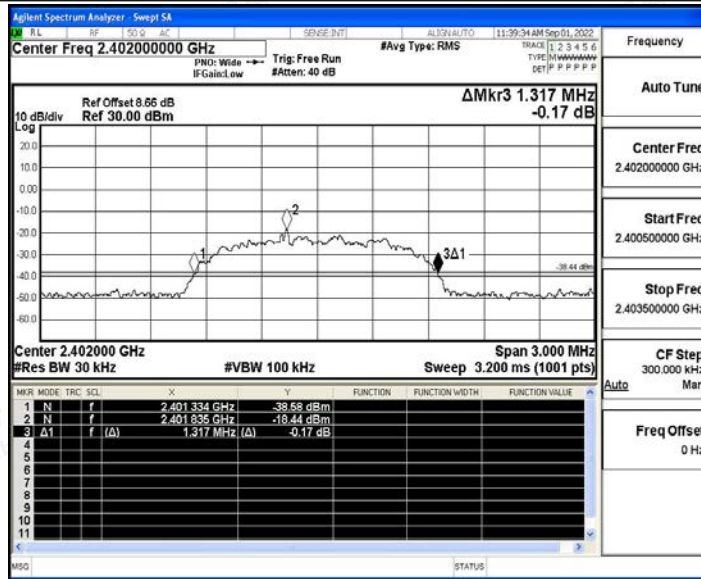


2DH5\_Ant1\_2480

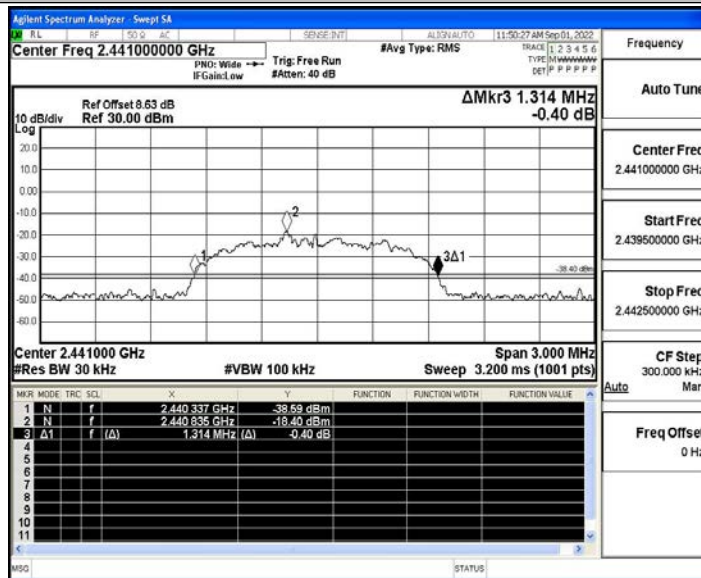


3DH5\_Ant1\_2402



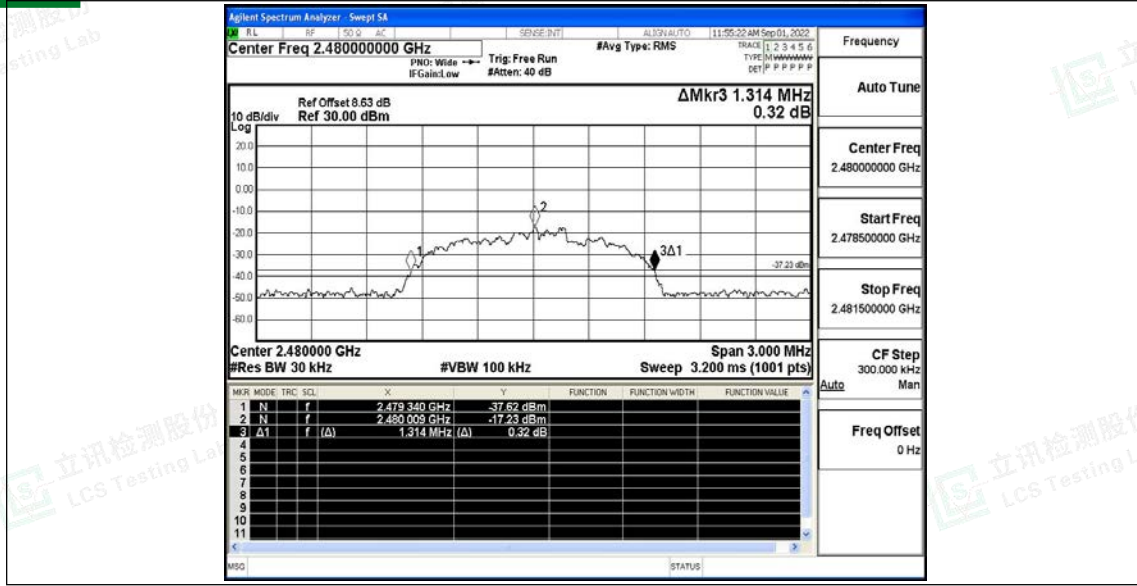


3DH5\_Ant1\_2441



3DH5\_Ant1\_2480







## A.2 Maximum conducted output power

### Test Result

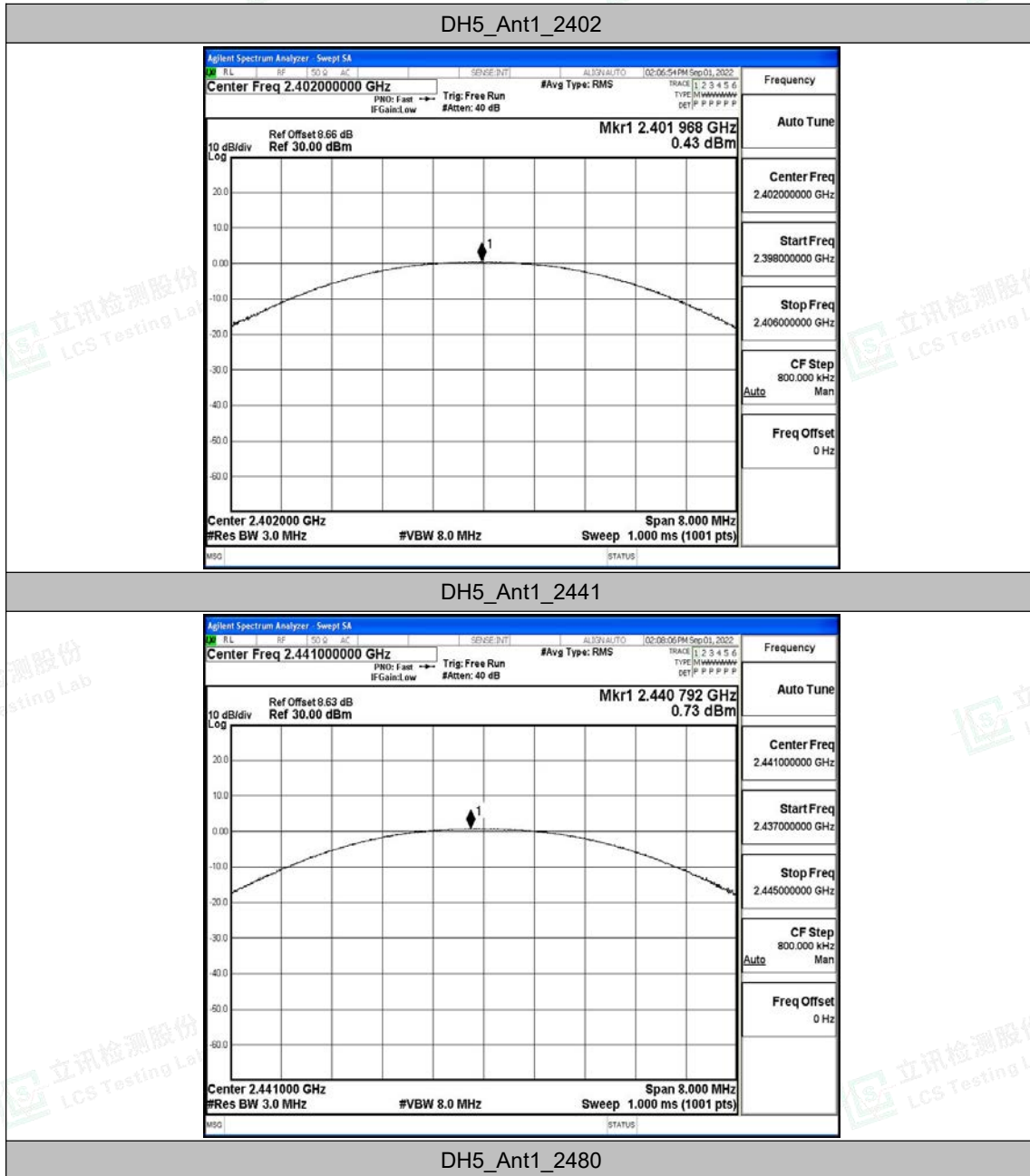
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	0.43	≤20.97	PASS
		2441	0.73	≤20.97	PASS
		2480	0.75	≤20.97	PASS
2DH5	Ant1	2402	0.42	≤20.97	PASS
		2441	0.41	≤20.97	PASS
		2480	0.37	≤20.97	PASS
3DH5	Ant1	2402	0.51	≤20.97	PASS
		2441	0.5	≤20.97	PASS
		2480	0.36	≤20.97	PASS

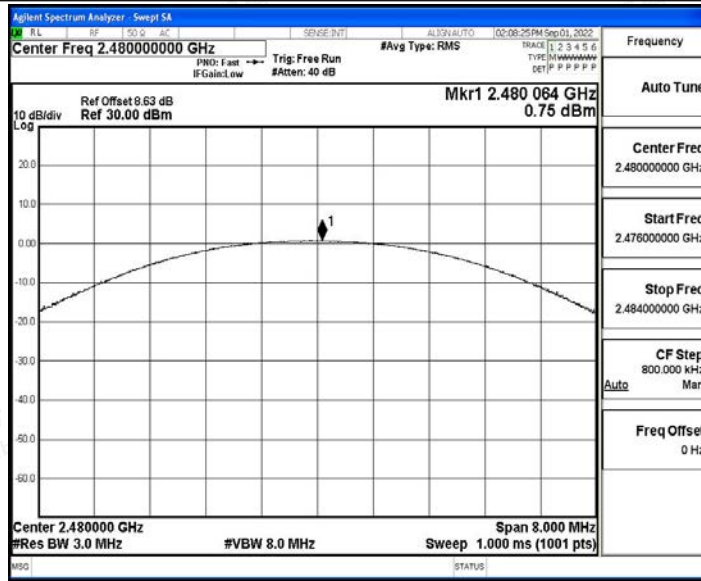




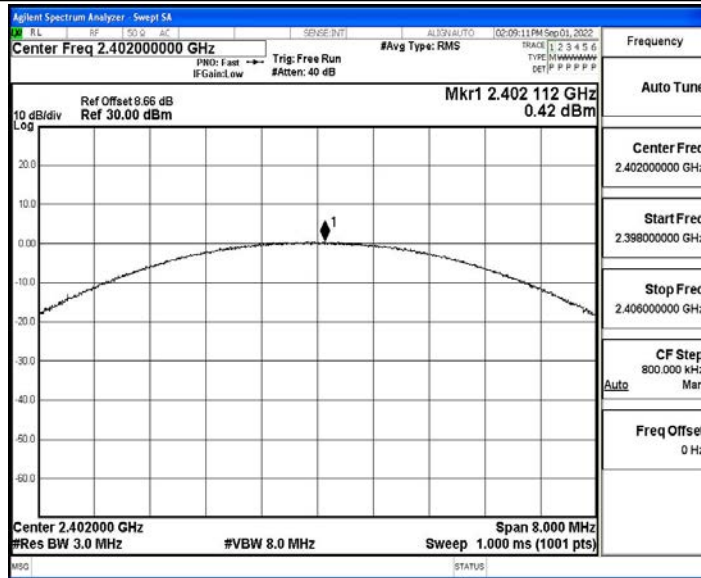


### Test Graphs



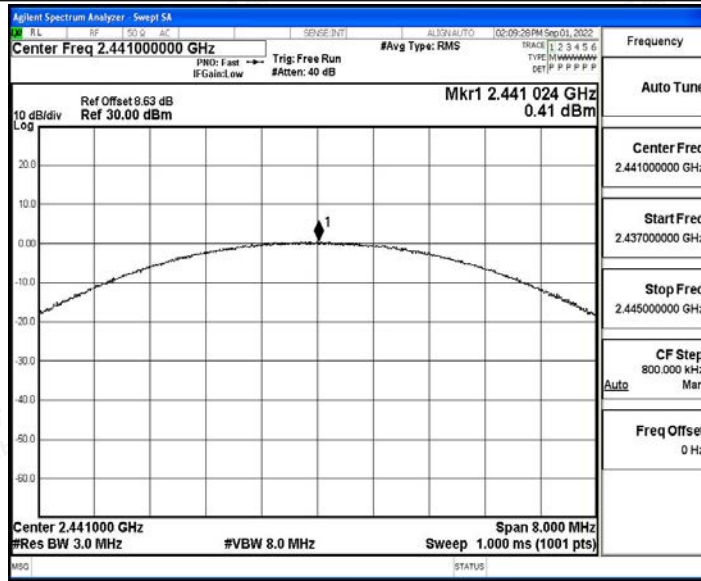


2DH5\_Ant1\_2402

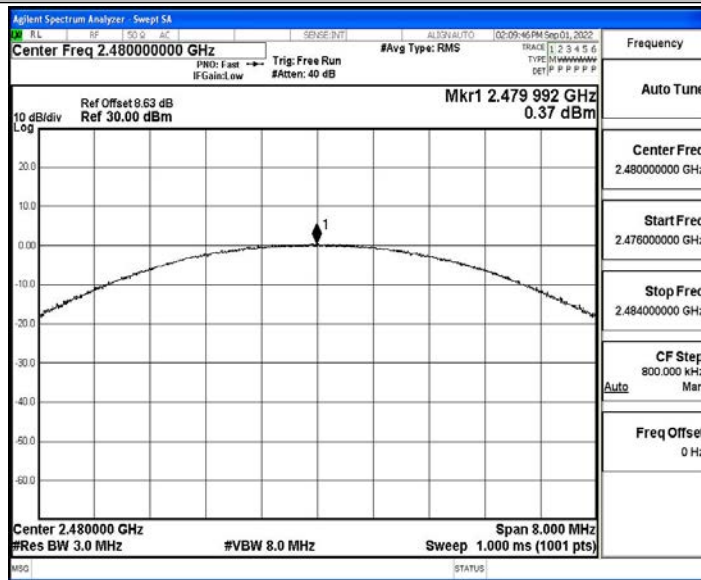


2DH5\_Ant1\_2441



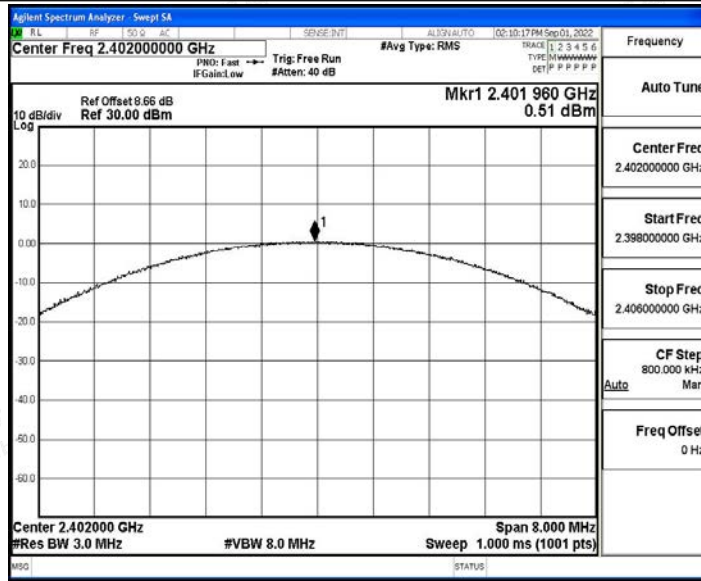


2DH5\_Ant1\_2480

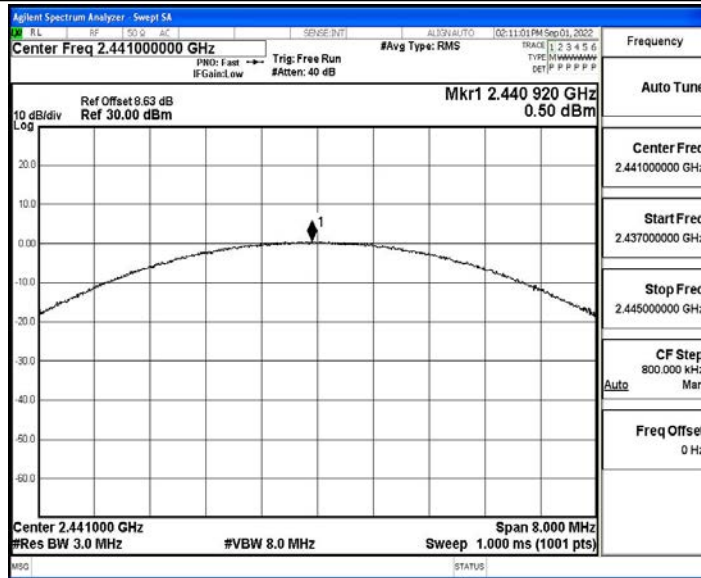


3DH5\_Ant1\_2402



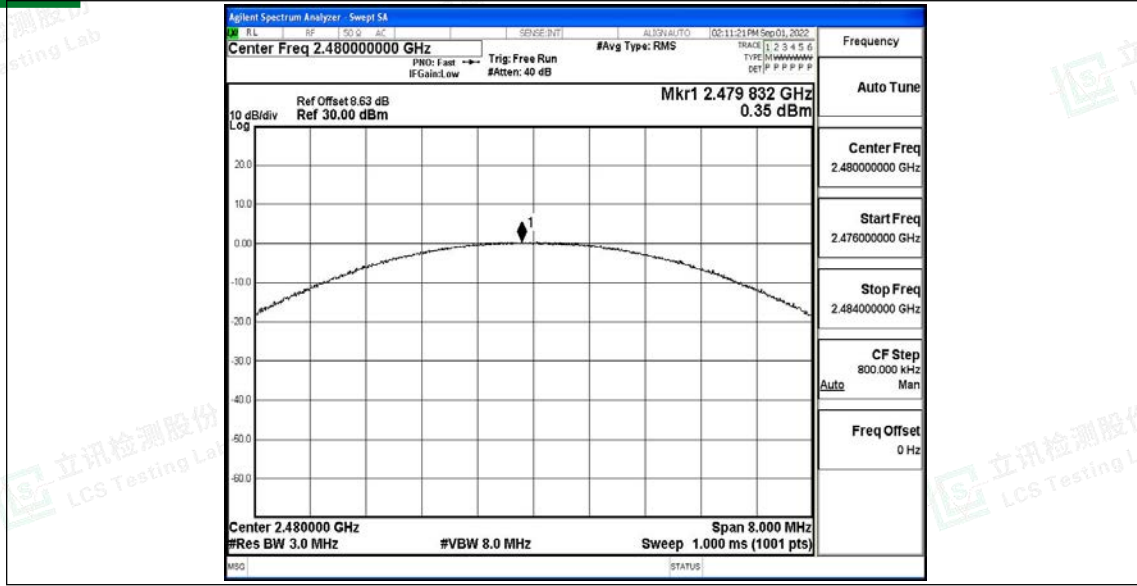


3DH5\_Ant1\_2441



3DH5\_Ant1\_2480







### A.3 Carrier frequency separation

#### Test Result

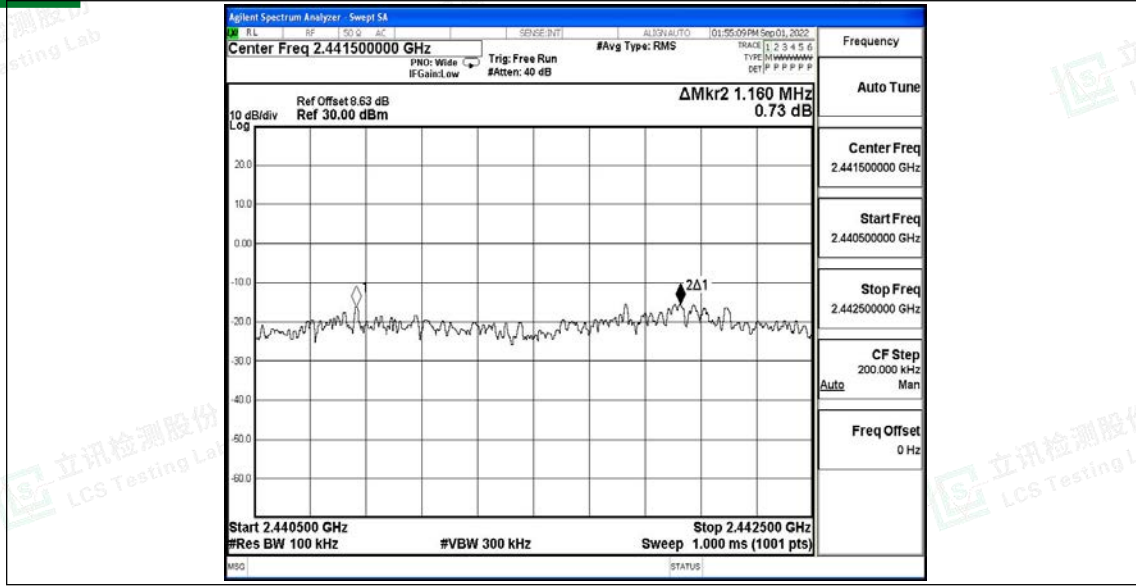
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.738	≥0.696	PASS
2DH5	Ant1	Hop	1.182	≥0.880	PASS
3DH5	Ant1	Hop	1.16	≥0.878	PASS





### Test Graphs









## A.4 Time of occupancy

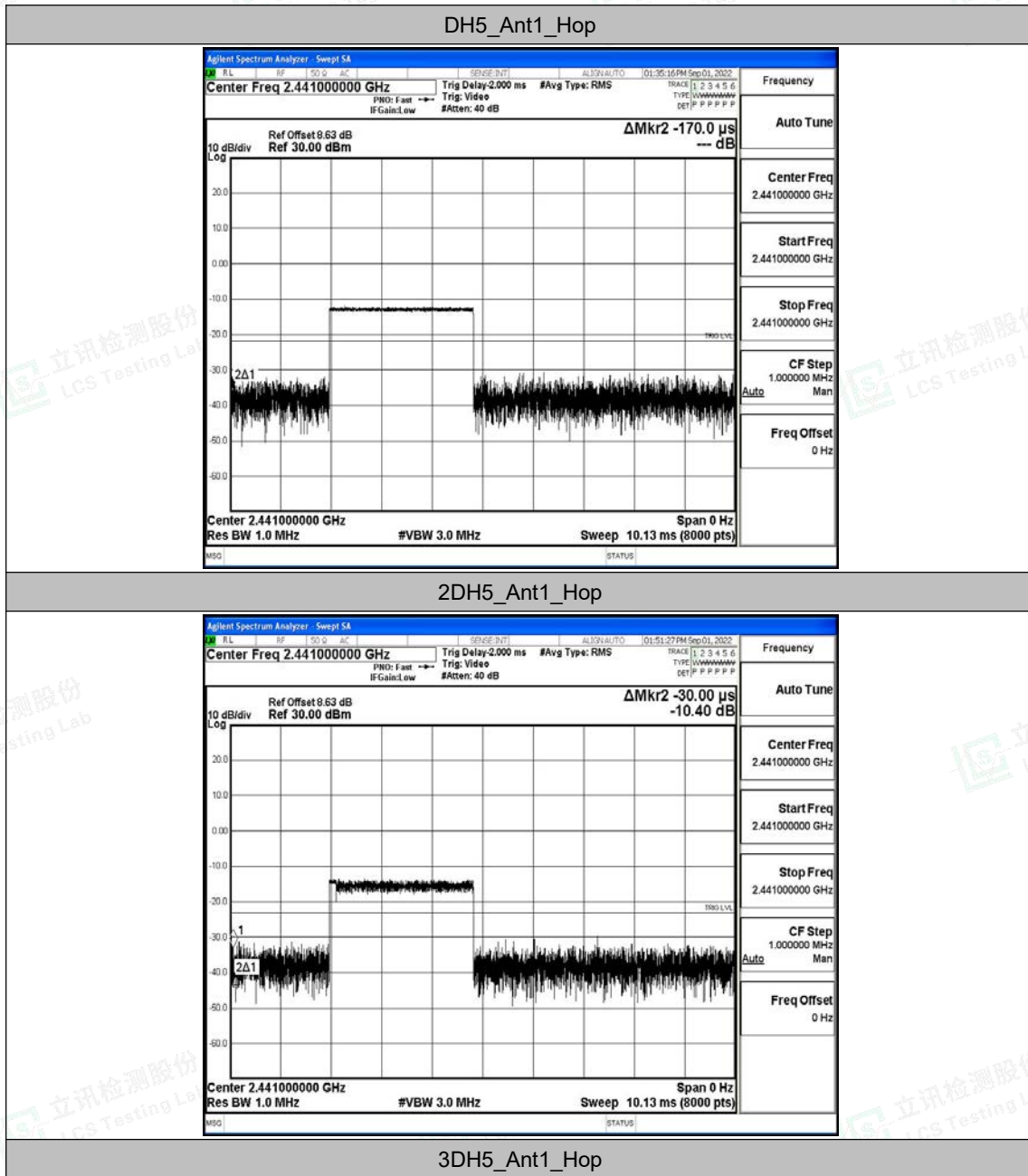
### Test Result

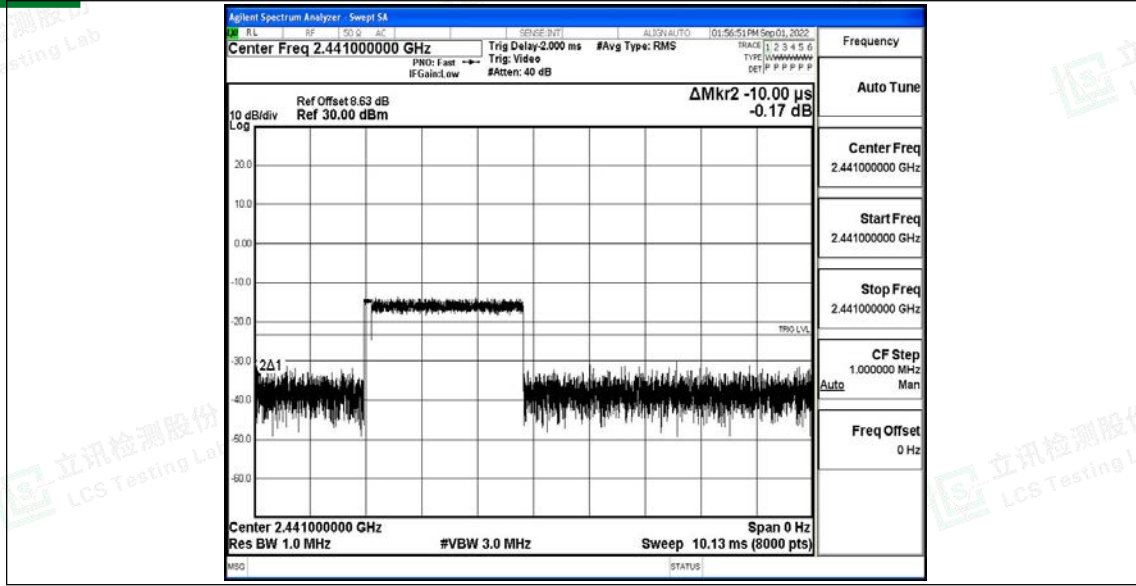
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	-0.17	106.67	-0.018	≤0.4	PASS
2DH5	Ant1	Hop	-0.03	106.67	-0.003	≤0.4	PASS
3DH5	Ant1	Hop	-0.01	106.67	-0.001	≤0.4	PASS





### Test Graphs







## A.5 Number of hopping channels

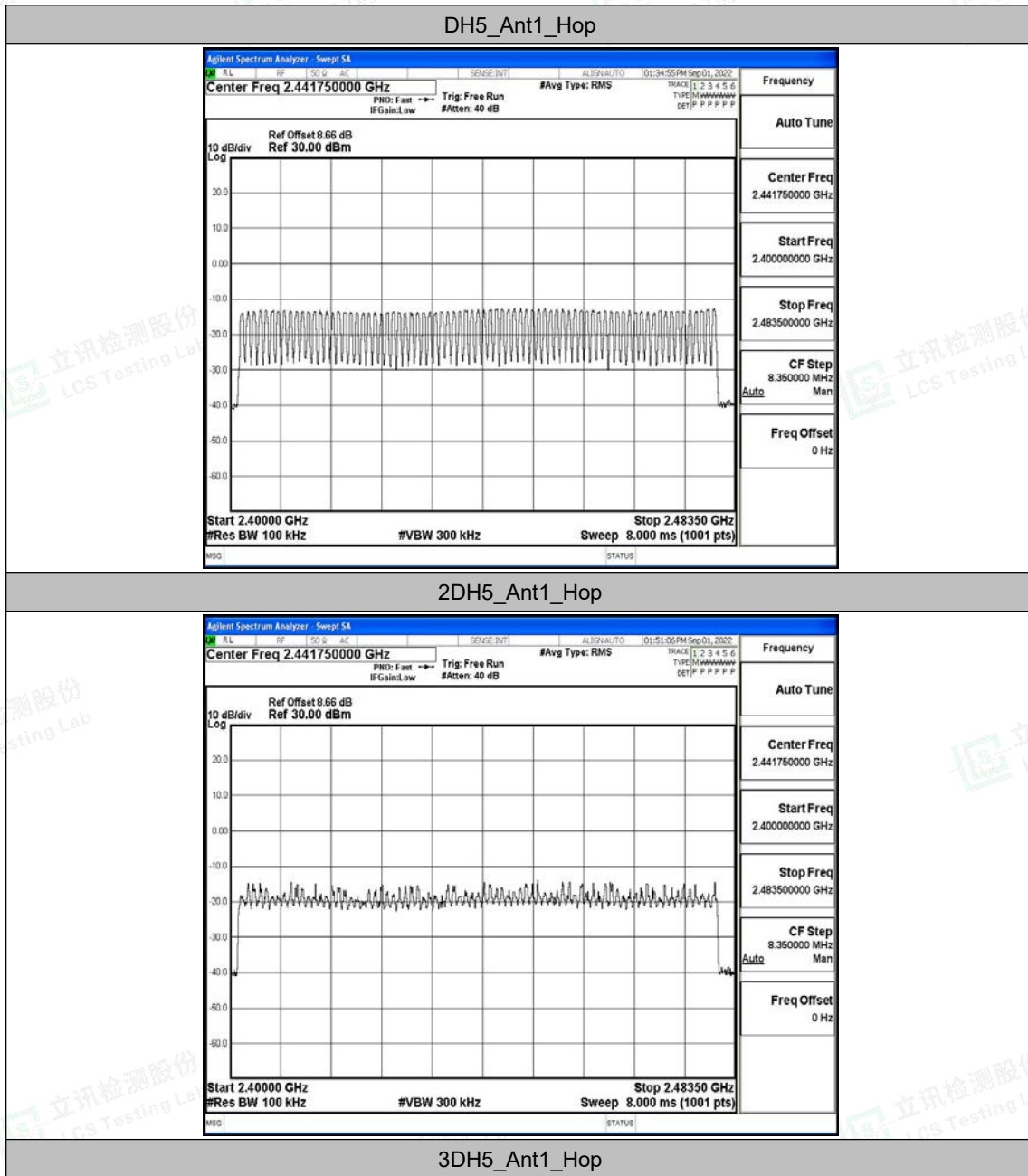
### Test Result

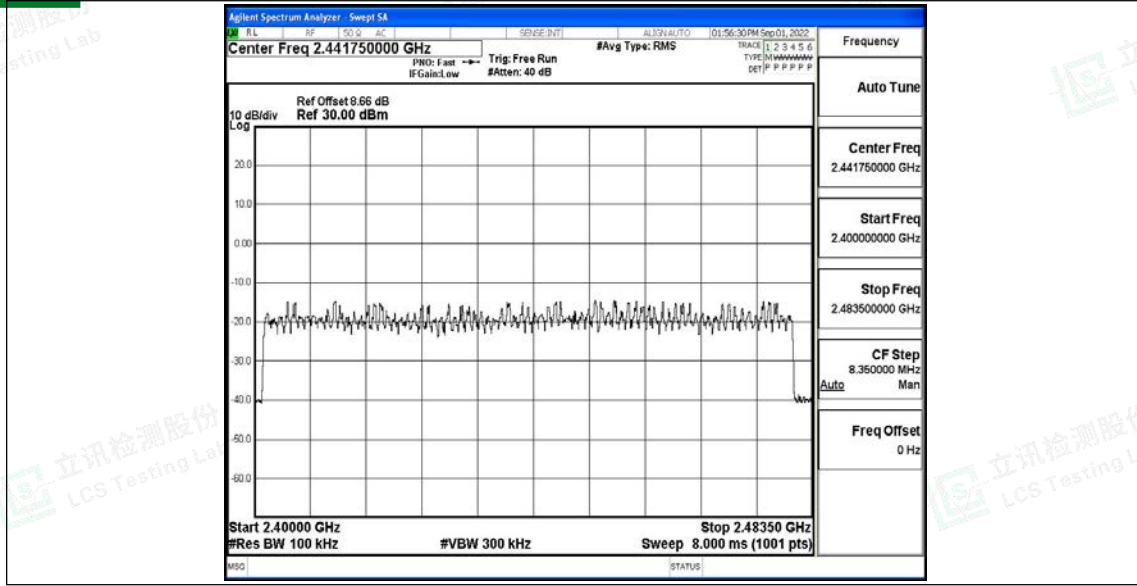
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS





### Test Graphs







## A.6 Band edge measurements

### Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-11.94	-59.79	≤-31.94	PASS
		High	2480	-12.45	-58.54	≤-32.45	PASS
		Low	Hop_2402	-13.77	-58.42	≤-33.77	PASS
		High	Hop_2480	-13.19	-57.28	≤-33.19	PASS
2DH5	Ant1	Low	2402	-18.50	-59.23	≤-38.5	PASS
		High	2480	-15.73	-59.27	≤-35.73	PASS
		Low	Hop_2402	-18.29	-59.07	≤-38.29	PASS
		High	Hop_2480	-15.32	-57.57	≤-35.32	PASS
3DH5	Ant1	Low	2402	-17.54	-59.65	≤-37.54	PASS
		High	2480	-14.12	-58.97	≤-34.12	PASS
		Low	Hop_2402	-17.21	-58.88	≤-37.21	PASS
		High	Hop_2480	-16.88	-56.48	≤-36.88	PASS



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

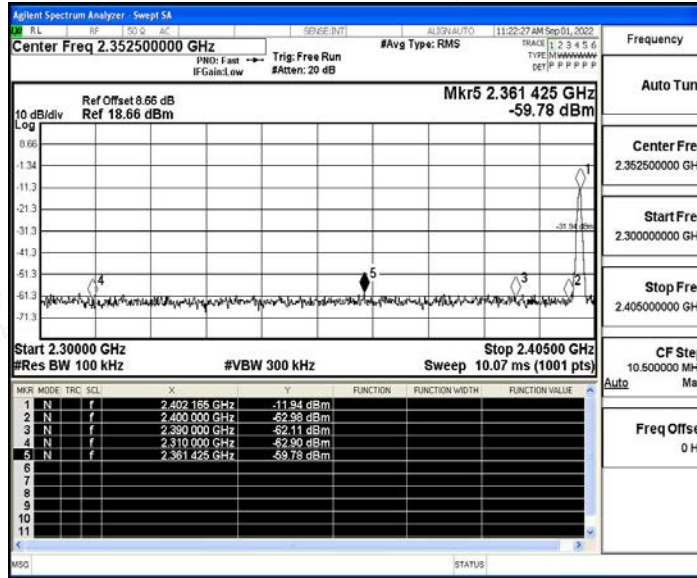
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

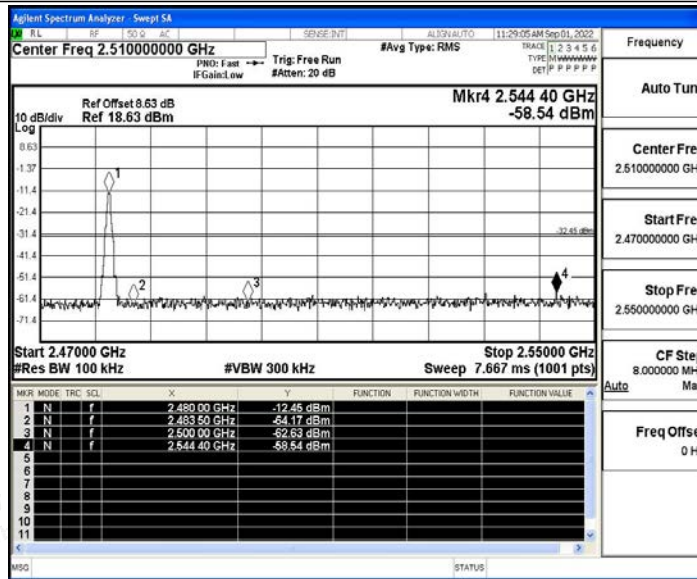


### Test Graphs

#### DH5\_Ant1\_Low\_2402



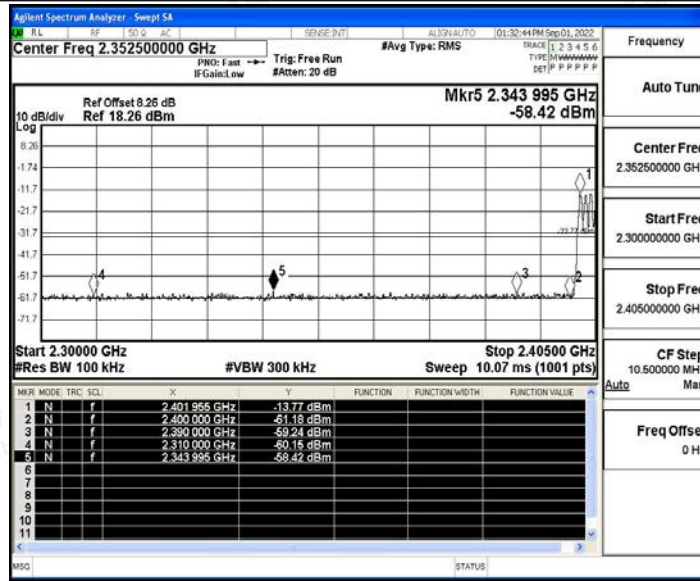
#### DH5\_Ant1\_High\_2480



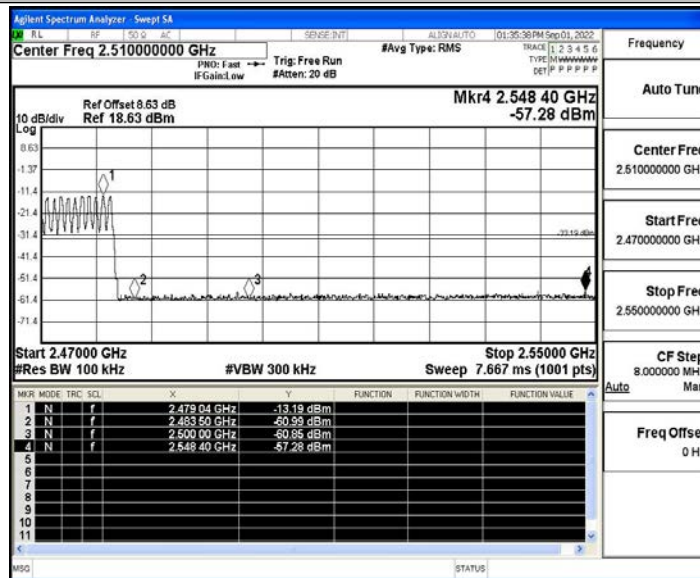
#### DH5\_Ant1\_Low\_Hop\_2402





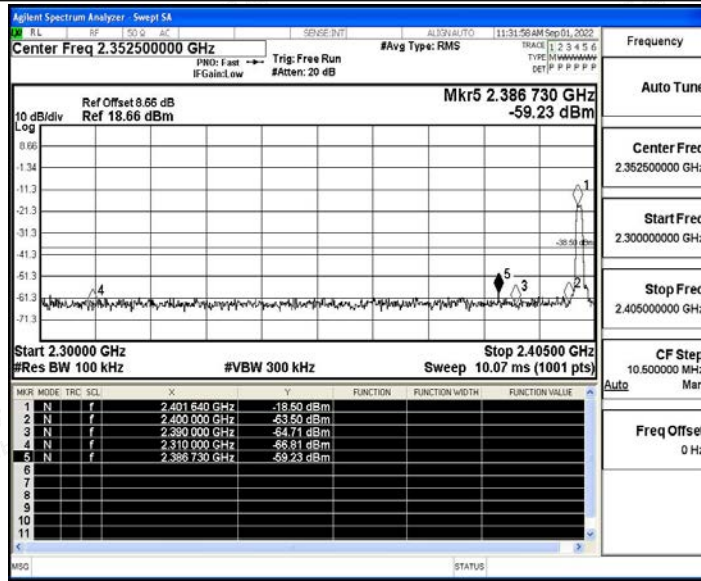


DH5\_Ant1\_High\_Hop\_2480

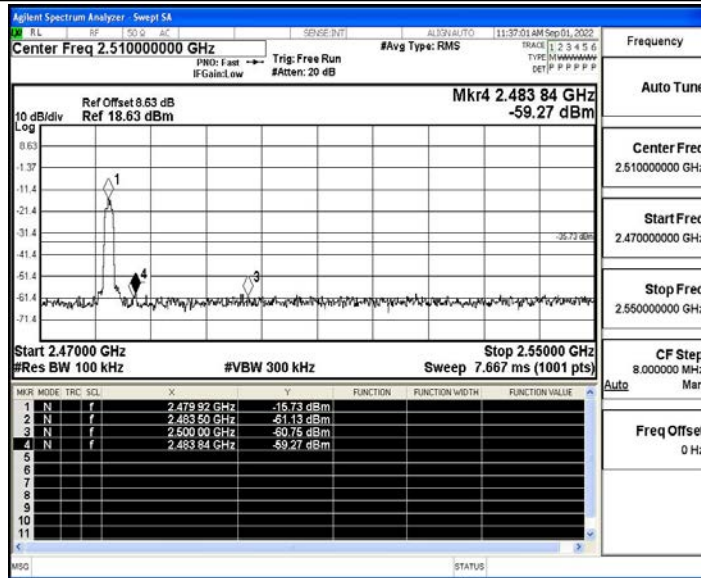


2DH5\_Ant1\_Low\_2402



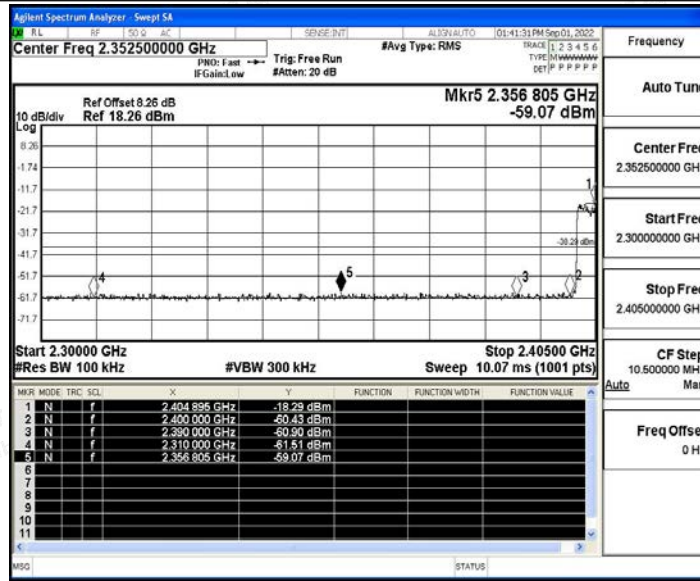


2DH5\_Ant1\_High\_2480

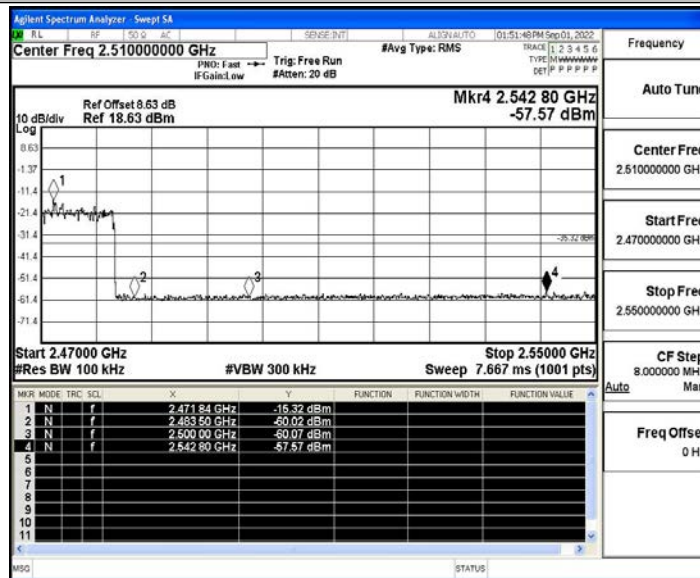


2DH5\_Ant1\_Low\_Hop\_2402



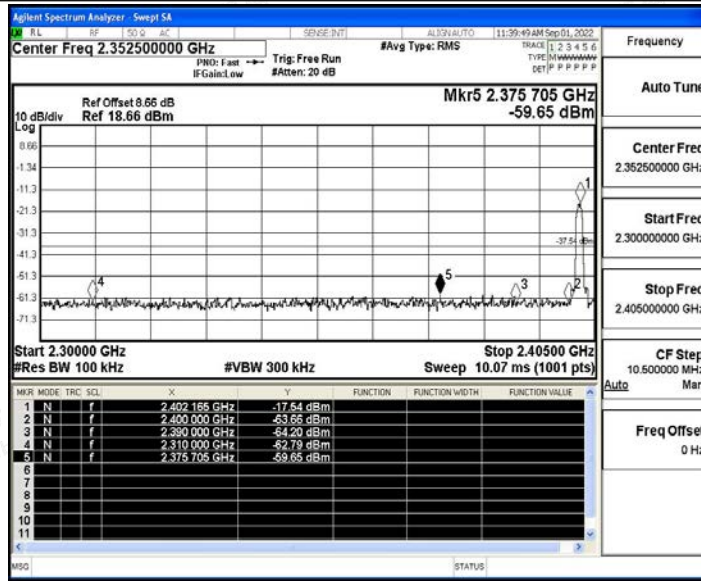


2DH5\_Ant1\_High\_Hop\_2480

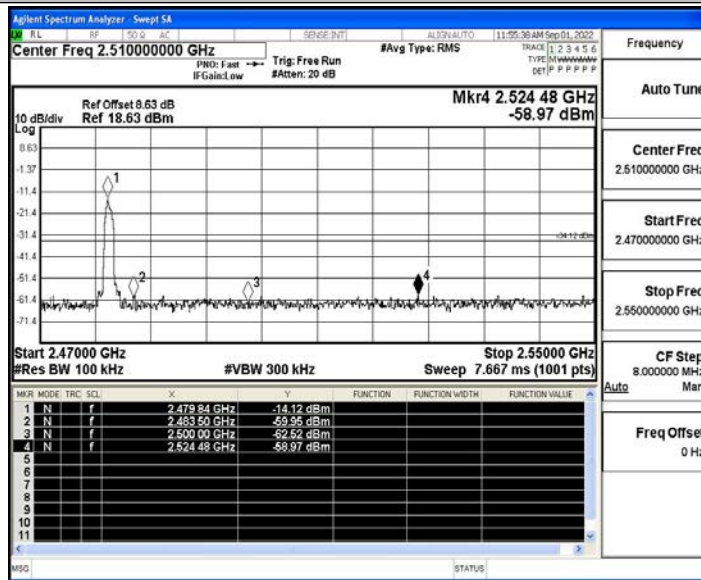


3DH5\_Ant1\_Low\_2402



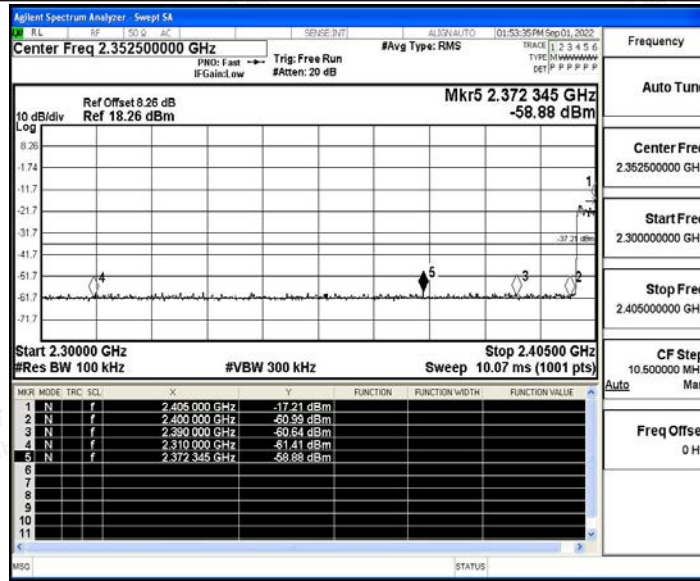


3DH5\_Ant1\_High\_2480

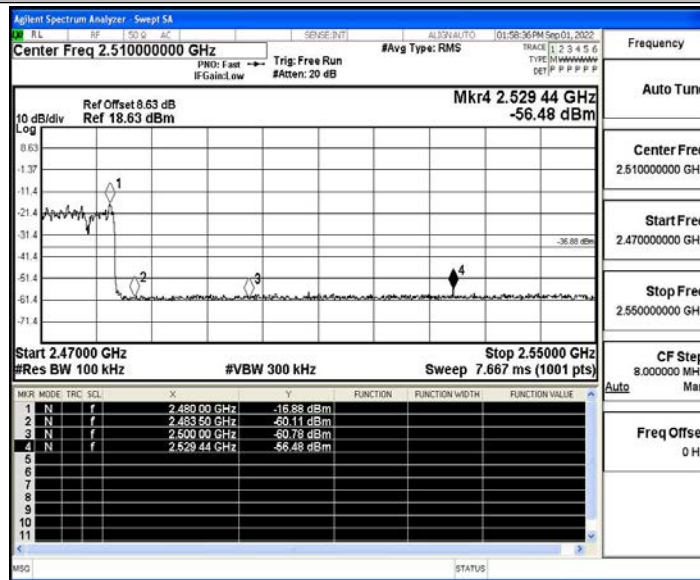


3DH5\_Ant1\_Low\_Hop\_2402





3DH5\_Ant1\_High\_Hop\_2480





## A.7 Conducted Spurious Emission

### Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-12.61	-12.61	---	PASS
			30~1000	-12.61	-60.8	≤-32.61	PASS
			1000~26500	-12.61	-45.11	≤-32.61	PASS
		2441	Reference	-12.48	-12.48	---	PASS
			30~1000	-12.48	-60.77	≤-32.48	PASS
			1000~26500	-12.48	-46.15	≤-32.48	PASS
		2480	Reference	-12.71	-12.71	---	PASS
			30~1000	-12.71	-60.47	≤-32.71	PASS
			1000~26500	-12.71	-45.69	≤-32.71	PASS
2DH5	Ant1	2402	Reference	-17.23	-17.23	---	PASS
			30~1000	-17.23	-60.55	≤-37.23	PASS
			1000~26500	-17.23	-45.7	≤-37.23	PASS
		2441	Reference	-13.42	-13.42	---	PASS
			30~1000	-13.42	-60.64	≤-33.42	PASS
			1000~26500	-13.42	-46.16	≤-33.42	PASS
		2480	Reference	-16.85	-16.85	---	PASS
			30~1000	-16.85	-59.98	≤-36.85	PASS
			1000~26500	-16.85	-46.16	≤-36.85	PASS
3DH5	Ant1	2402	Reference	-18.58	-18.58	---	PASS
			30~1000	-18.58	-59.79	≤-38.58	PASS
			1000~26500	-18.58	-46.13	≤-38.58	PASS
		2441	Reference	-18.47	-18.47	---	PASS
			30~1000	-18.47	-60.1	≤-38.47	PASS
			1000~26500	-18.47	-46.4	≤-38.47	PASS
		2480	Reference	-18.56	-18.56	---	PASS
			30~1000	-18.56	-60.77	≤-38.56	PASS
			1000~26500	-18.56	-45.86	≤-38.56	PASS



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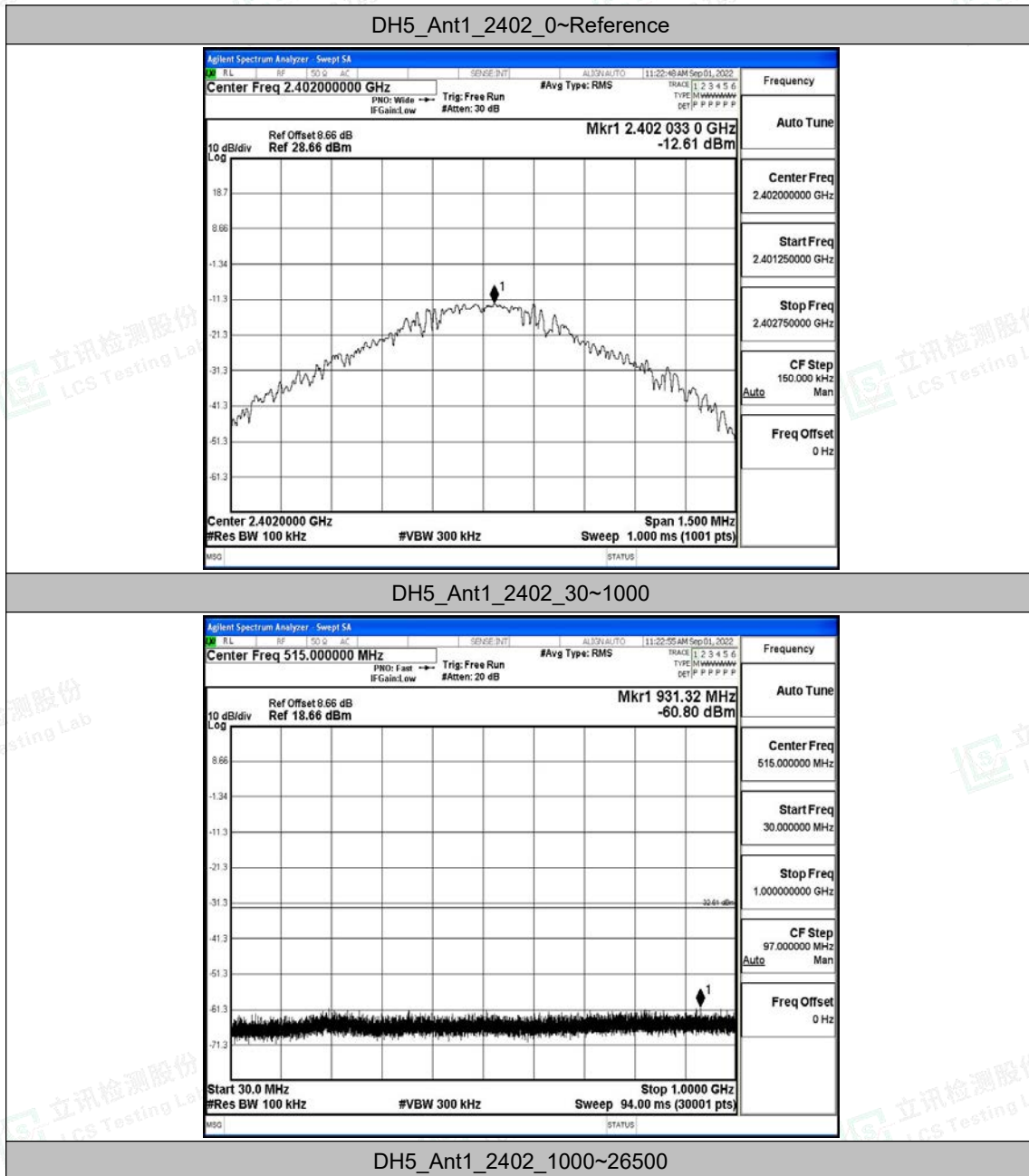
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

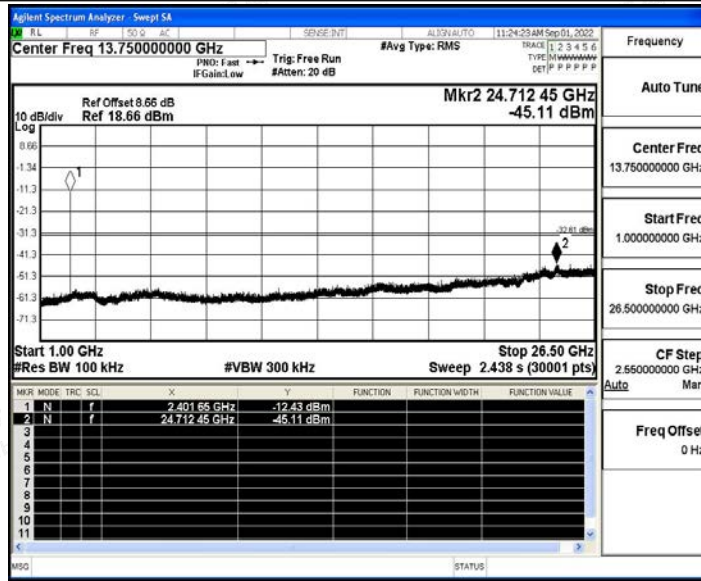
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

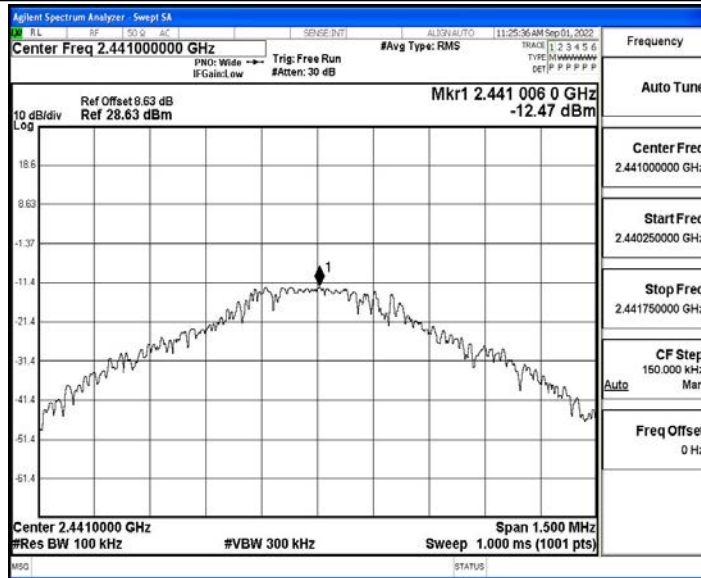


### Test Graphs





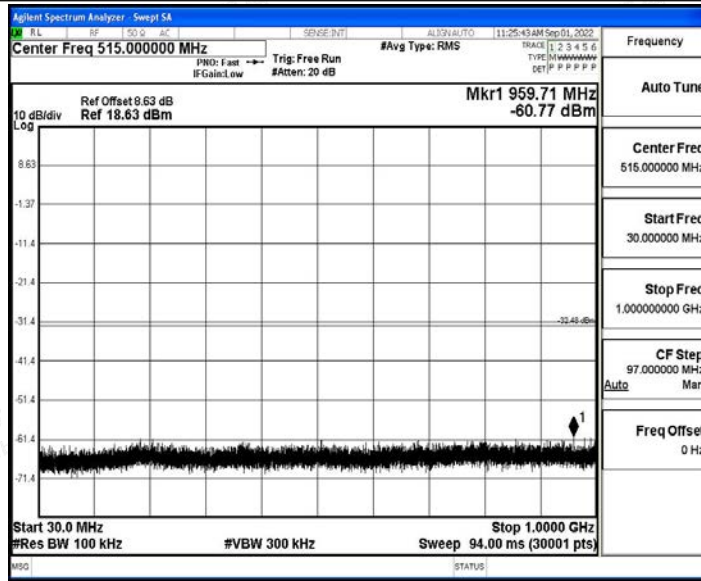
DH5\_Ant1\_2441\_0~Reference



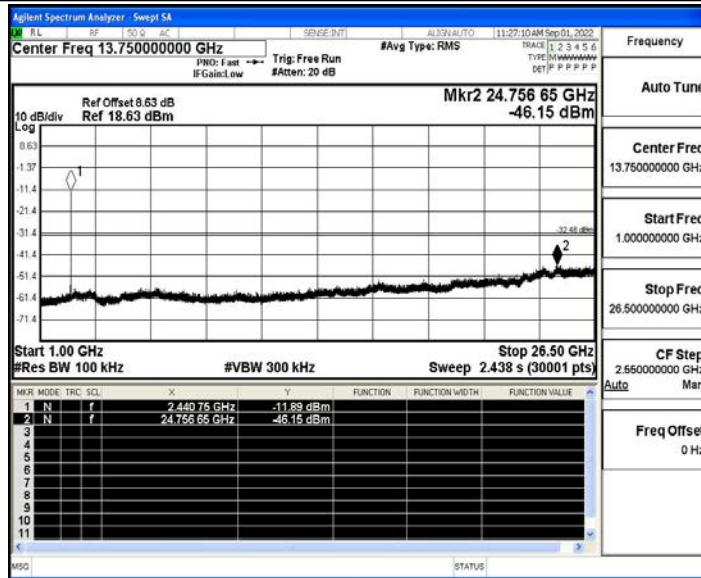
DH5\_Ant1\_2441\_30~1000





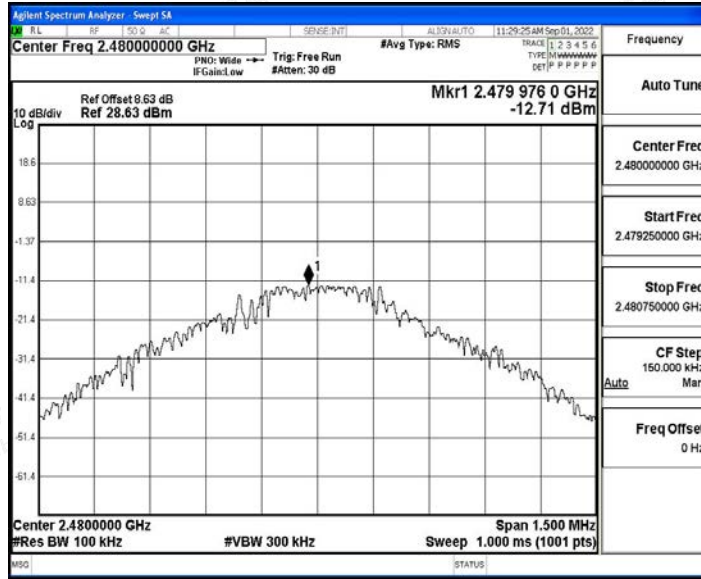


DH5\_Ant1\_2441\_1000~26500

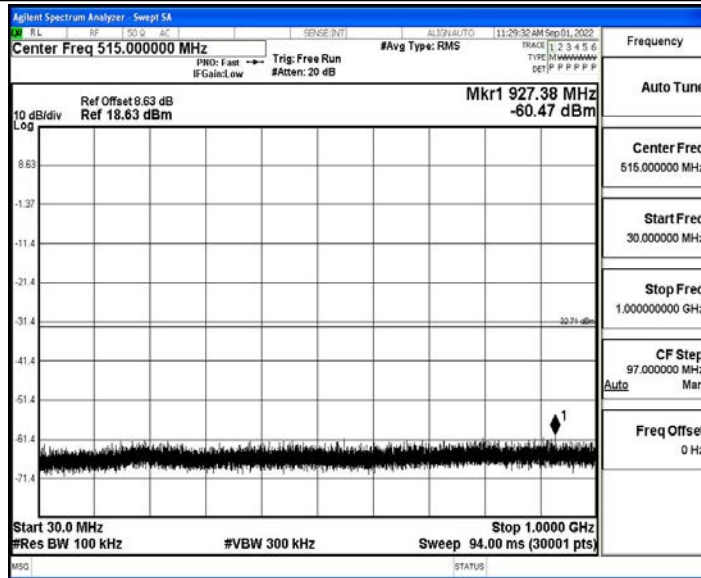


DH5\_Ant1\_2480\_0~Reference



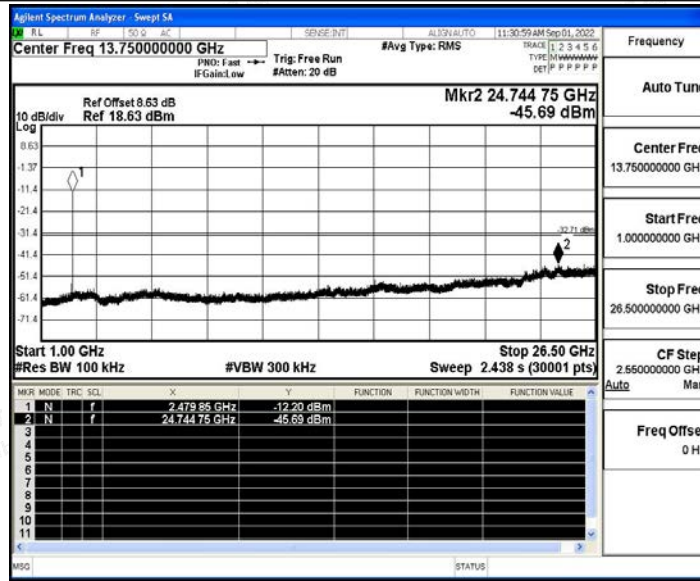


DH5\_Ant1\_2480\_30~1000

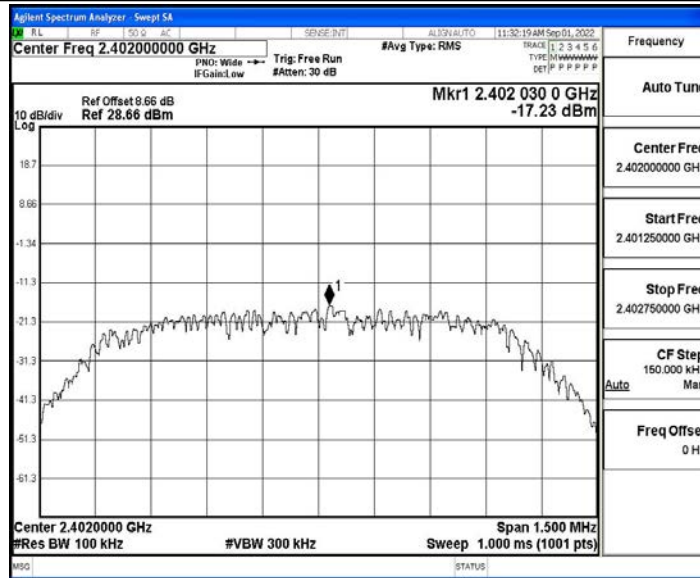


DH5\_Ant1\_2480\_1000~26500



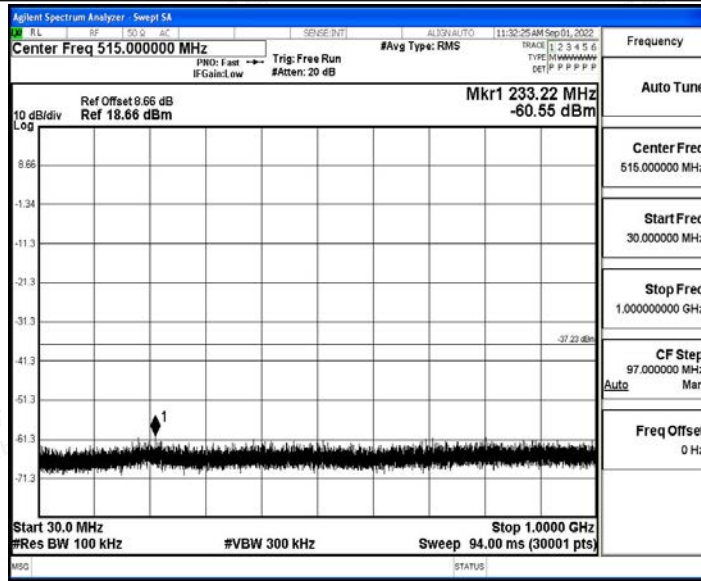


2DH5\_Ant1\_2402\_0~Reference

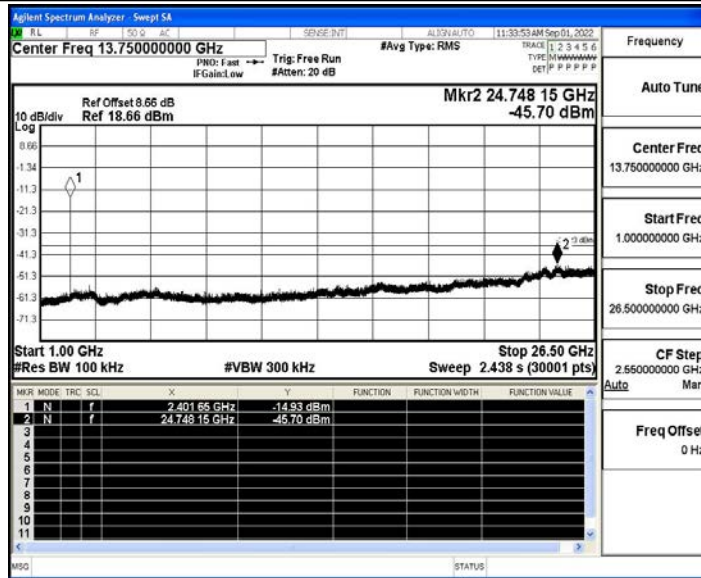


2DH5\_Ant1\_2402\_30~1000



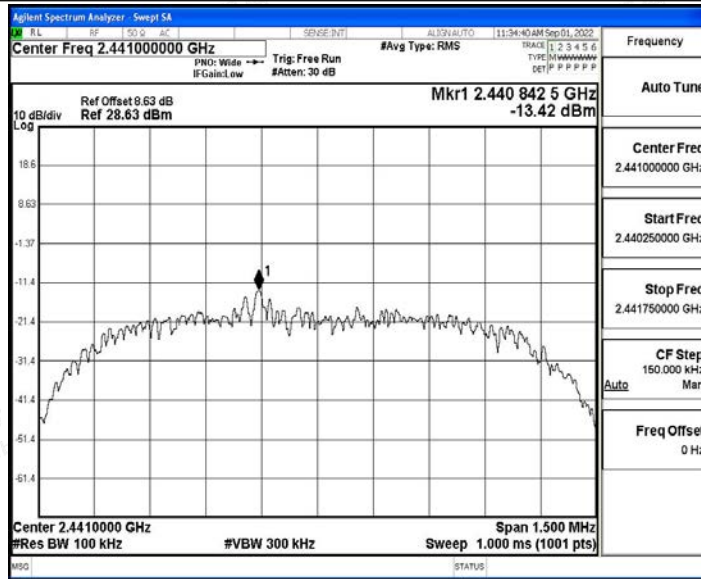


2DH5\_Ant1\_2402\_1000~26500

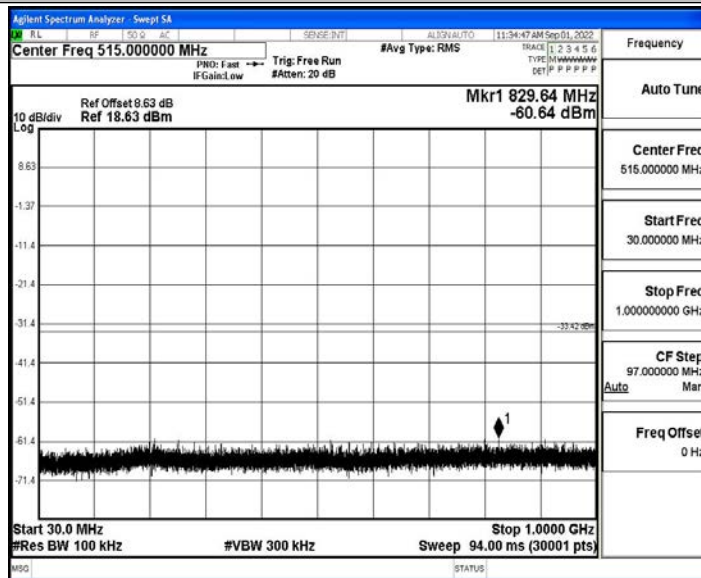


2DH5\_Ant1\_2441\_0~Reference



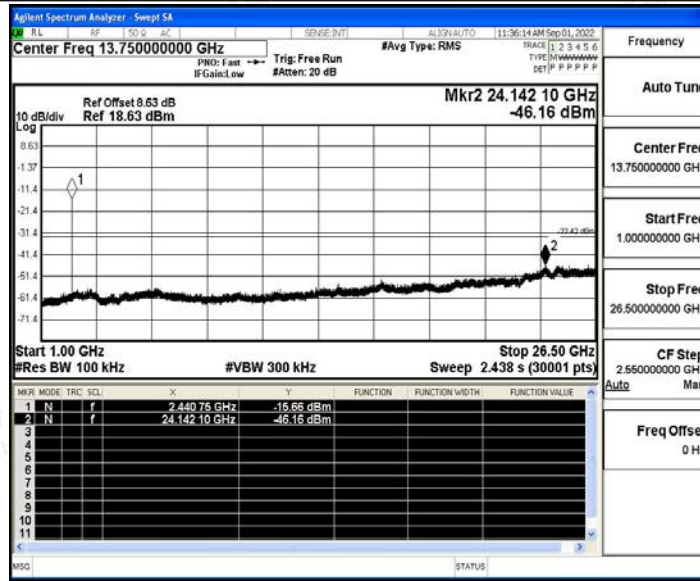


2DH5\_Ant1\_2441\_30~1000

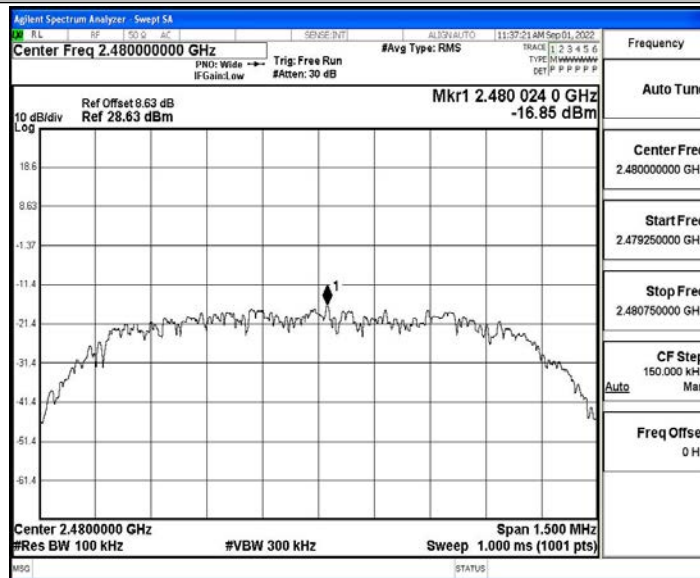


2DH5\_Ant1\_2441\_1000~26500



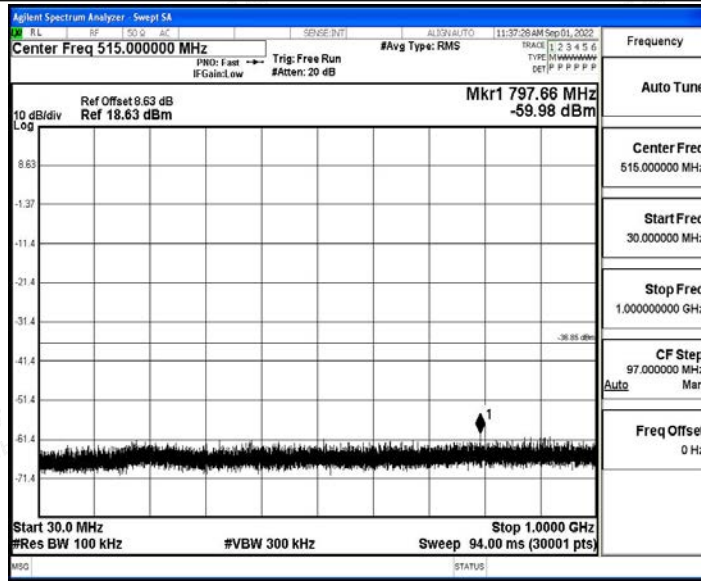


2DH5\_Ant1\_2480\_0~Reference

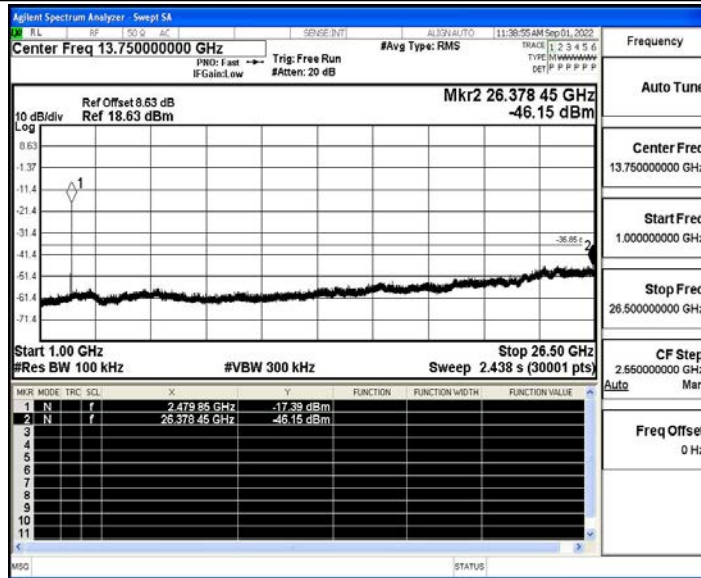


2DH5\_Ant1\_2480\_30~1000



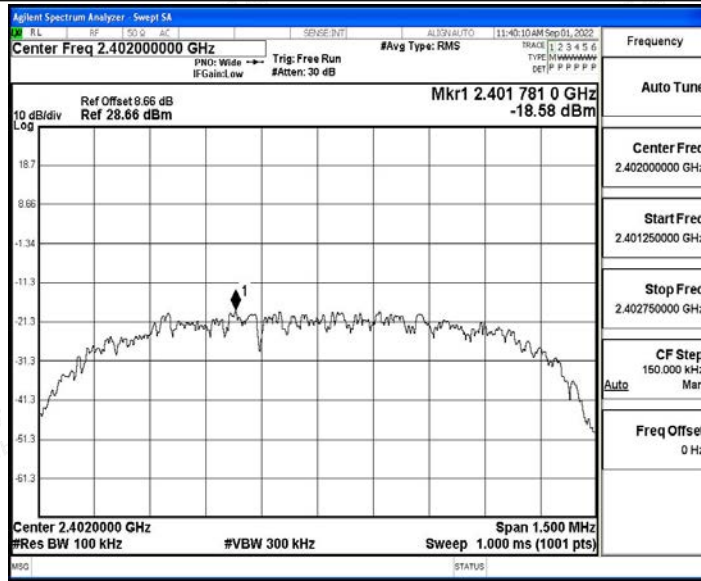


2DH5\_Ant1\_2480\_1000~26500

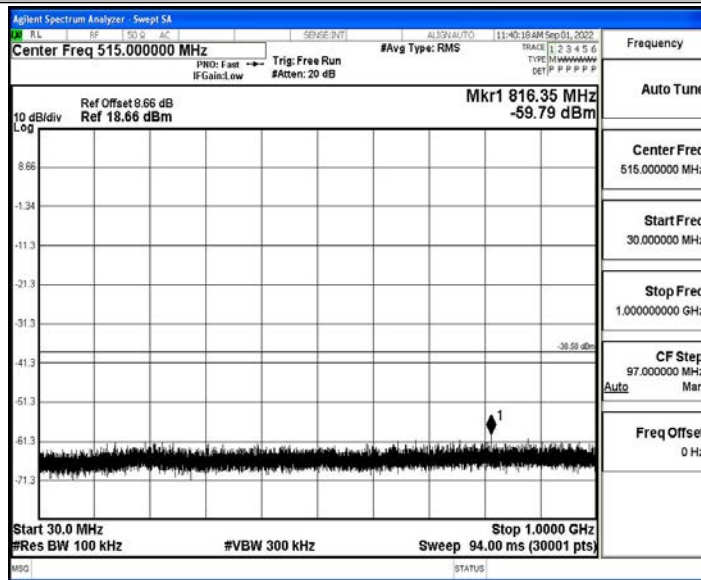


3DH5\_Ant1\_2402\_0~Reference





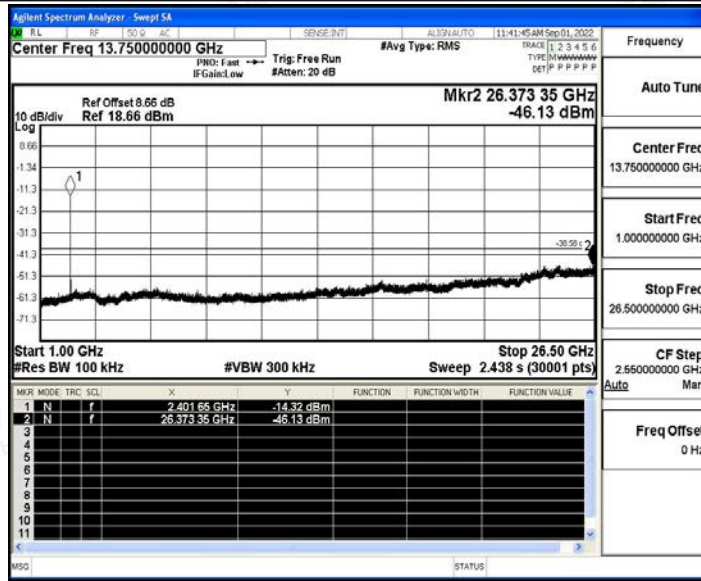
3DH5\_Ant1\_2402\_30~1000



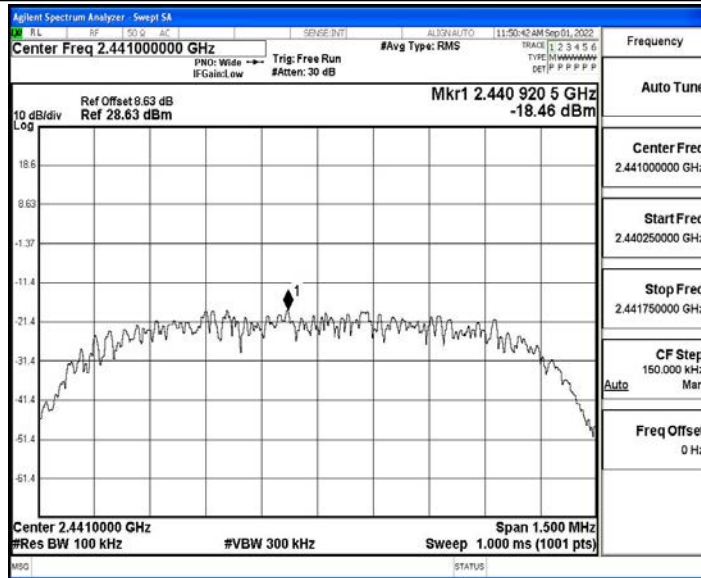
3DH5\_Ant1\_2402\_1000~26500





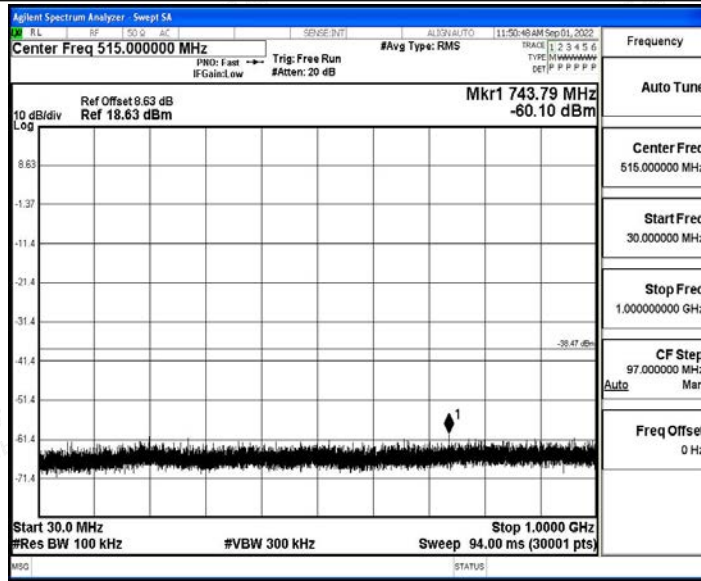


3DH5\_Ant1\_2441\_0~Reference

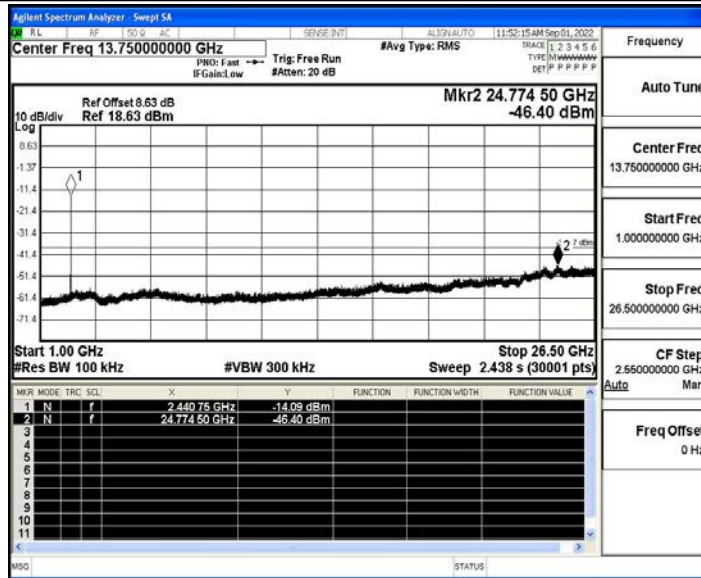


3DH5\_Ant1\_2441\_30~1000



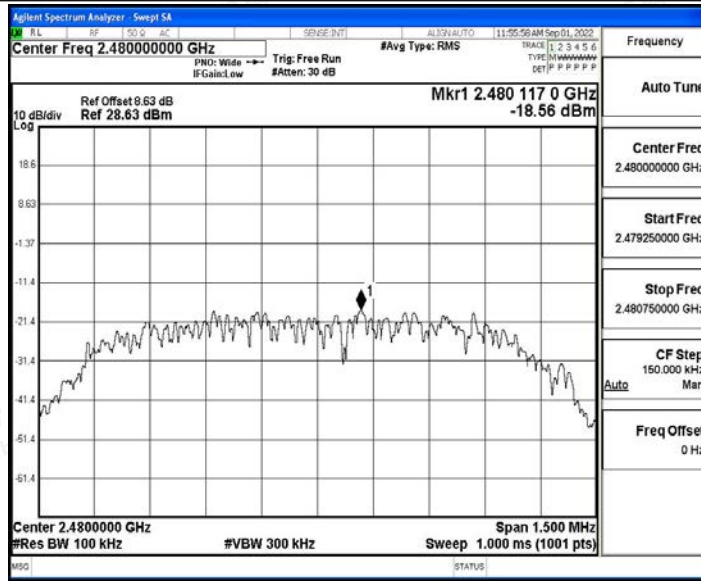


3DH5\_Ant1\_2441\_1000~26500

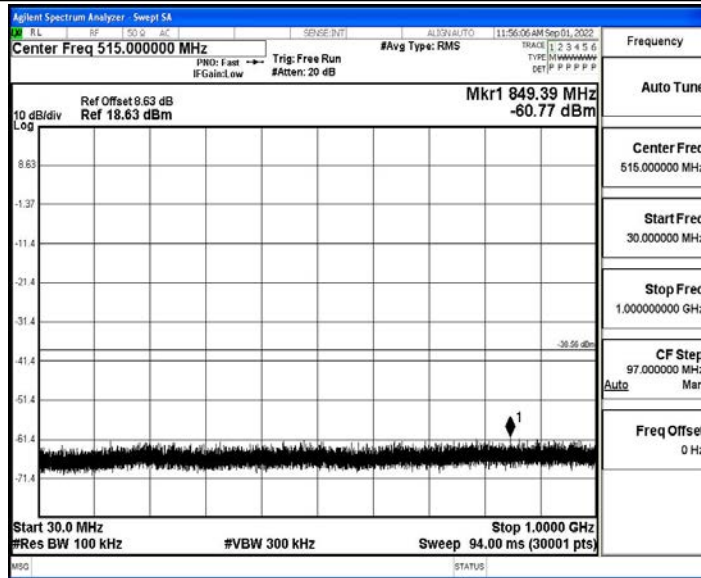


3DH5\_Ant1\_2480\_0~Reference



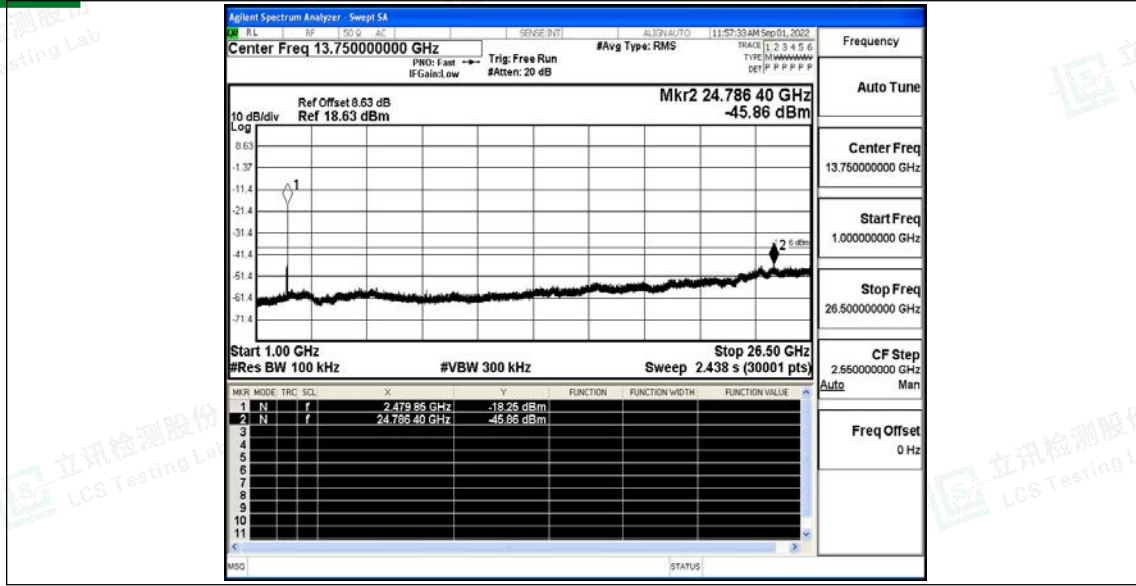


3DH5\_Ant1\_2480\_30~1000



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	-58.28	≤-41.20	36.92	≤54	PASS		
				AV	2374.550	-57.6	≤-41.20	37.60	≤54	PASS		
				AV	2390.000	-57.84	≤-41.20	37.36	≤54	PASS		
				Peak	2310.000	-53.96	≤-21.20	41.24	≤74	PASS		
				Peak	2350.400	-48.53	≤-21.20	46.67	≤74	PASS		
				Peak	2390.000	-52.12	≤-21.20	43.08	≤74	PASS		
		High	2480	AV	2483.500	-57.39	≤-41.20	37.81	≤54	PASS		
				AV	2498.800	-57.14	≤-41.20	38.06	≤54	PASS		
				AV	2500.000	-57.28	≤-41.20	37.92	≤54	PASS		
				Peak	2483.500	-51.69	≤-21.20	43.51	≤74	PASS		
				Peak	2496.640	-48.41	≤-21.20	46.79	≤74	PASS		
				Peak	2500.000	-51.26	≤-21.20	43.94	≤74	PASS		
		Low	Hop_24 02	Peak	2310.000	-49.49	≤-21.20	45.71	≤74	PASS		
				Peak	2326.775	-47.27	≤-21.20	47.93	≤74	PASS		
				Peak	2390.000	-50.69	≤-21.20	44.51	≤74	PASS		
		High	Hop_24 80	Peak	2483.500	-47.9	≤-21.20	47.30	≤74	PASS		
				Peak	2490.240	-46.13	≤-21.20	49.07	≤74	PASS		
				Peak	2500.000	-48.19	≤-21.20	47.01	≤74	PASS		
		2DH5	Ant1	Low	2402	AV	2310.000	-58.2	≤-41.20	37.00	≤54	PASS
						AV	2382.635	-57.64	≤-41.20	37.56	≤54	PASS
						AV	2390.000	-57.87	≤-41.20	37.33	≤54	PASS
Peak	2310.000					-51.91	≤-21.20	43.29	≤74	PASS		
Peak	2367.200					-48.19	≤-21.20	47.01	≤74	PASS		
Peak	2390.000					-52.88	≤-21.20	42.32	≤74	PASS		
High	2480			AV	2483.500	-57.37	≤-41.20	37.83	≤54	PASS		
				AV	2496.800	-57.15	≤-41.20	38.05	≤54	PASS		
				AV	2500.000	-57.33	≤-41.20	37.87	≤54	PASS		
				Peak	2483.500	-52.39	≤-21.20	42.81	≤74	PASS		
				Peak	2491.600	-48.52	≤-21.20	46.68	≤74	PASS		
				Peak	2500.000	-52.77	≤-21.20	42.43	≤74	PASS		
Low	Hop_24 02			Peak	2310.000	-50.58	≤-21.20	44.62	≤74	PASS		
				Peak	2313.125	-46.66	≤-21.20	48.54	≤74	PASS		
				Peak	2390.000	-50.14	≤-21.20	45.06	≤74	PASS		
High	Hop_24 80			Peak	2483.500	-49.18	≤-21.20	46.02	≤74	PASS		
				Peak	2494.000	-47.03	≤-21.20	48.17	≤74	PASS		



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Scan code to check authenticity



3DH5	Ant1	Low	2402	Peak	2500.000	-48.05	≤-21.20	47.15	≤74	PASS
				AV	2310.000	-58.24	≤-41.20	36.96	≤54	PASS
				AV	2389.985	-57.71	≤-41.20	37.49	≤54	PASS
				AV	2390.000	-57.71	≤-41.20	37.49	≤54	PASS
				Peak	2310.000	-51.91	≤-21.20	43.29	≤74	PASS
				Peak	2349.455	-48.65	≤-21.20	46.55	≤74	PASS
		High	2480	AV	2483.500	-57.33	≤-41.20	37.87	≤54	PASS
				AV	2499.920	-57.05	≤-41.20	38.15	≤54	PASS
				AV	2500.000	-57.12	≤-41.20	38.08	≤54	PASS
				Peak	2483.500	-50.98	≤-21.20	44.22	≤74	PASS
				Peak	2498.880	-48.76	≤-21.20	46.44	≤74	PASS
				Peak	2500.000	-52.89	≤-21.20	42.31	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-49.29	≤-21.20	45.91	≤74	PASS
				Peak	2389.040	-47.89	≤-21.20	47.31	≤74	PASS
				Peak	2390.000	-50.24	≤-21.20	44.96	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-49.13	≤-21.20	46.07	≤74	PASS
				Peak	2492.080	-46.51	≤-21.20	48.69	≤74	PASS
				Peak	2500.000	-49.09	≤-21.20	46.11	≤74	PASS

## Note:

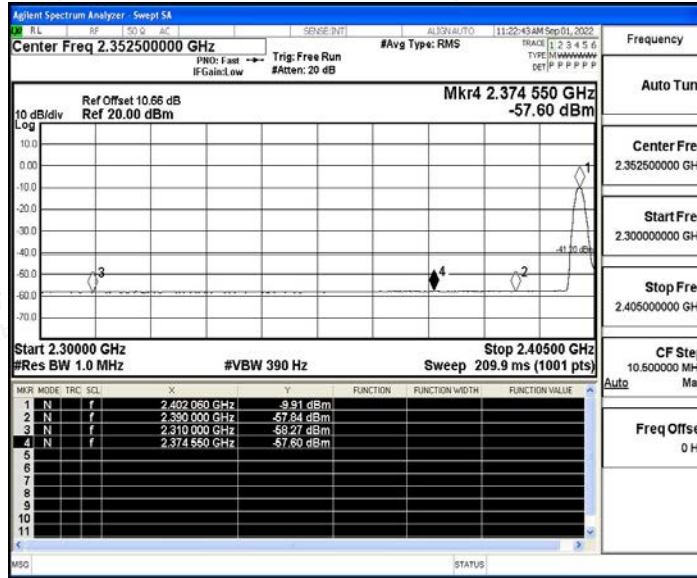
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



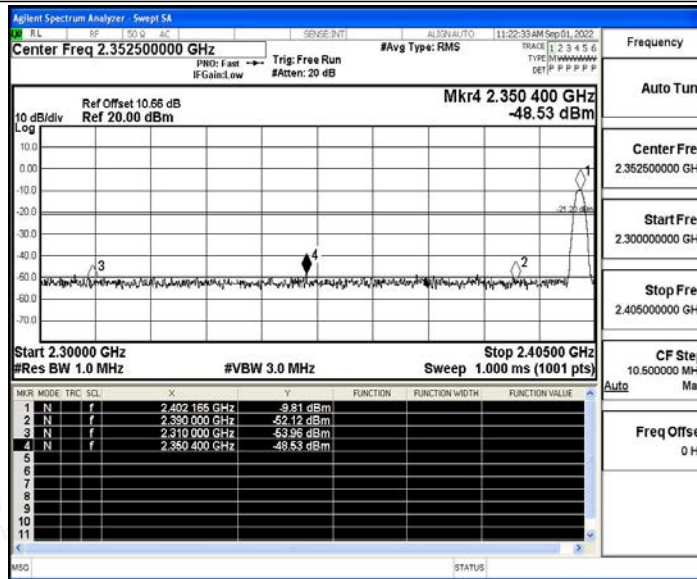


### Test Graphs

#### DH5\_Ant1\_Low\_2402\_AV

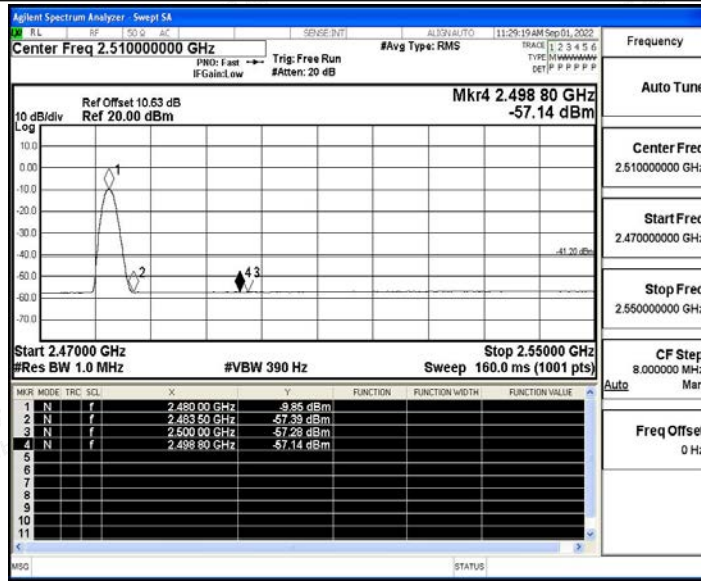


#### DH5\_Ant1\_Low\_2402\_Peak

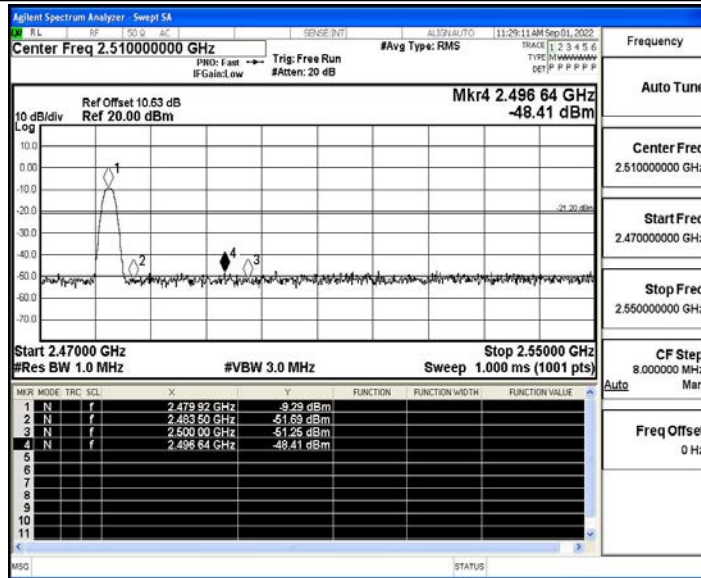


#### DH5\_Ant1\_High\_2480\_AV





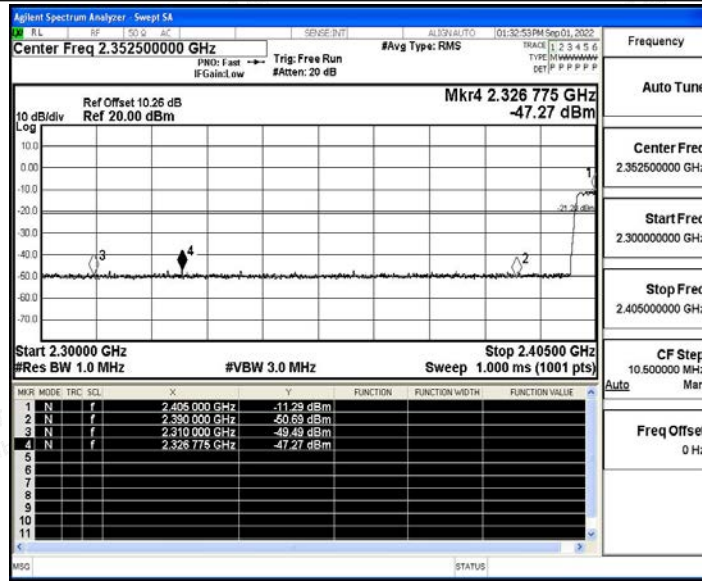
DH5\_Ant1\_High\_2480\_Peak



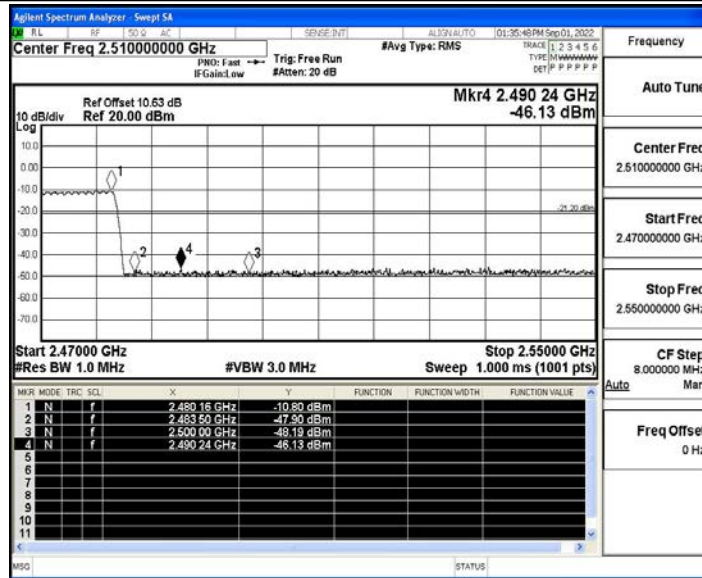
DH5\_Ant1\_Low\_Hop\_2402\_Peak





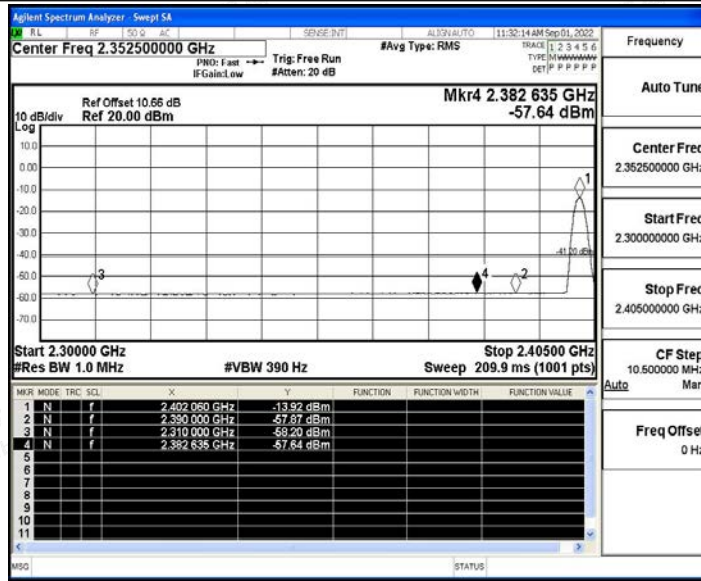


DH5\_Ant1\_High\_Hop\_2480\_Peak

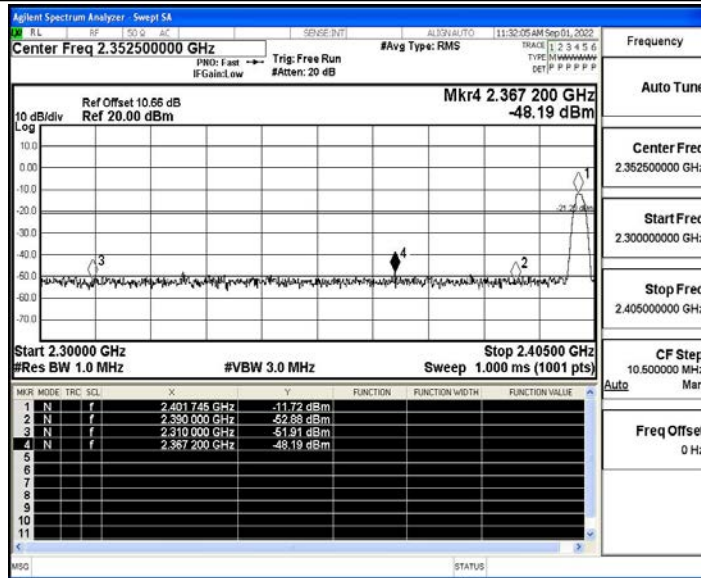


2DH5\_Ant1\_Low\_2402\_AV



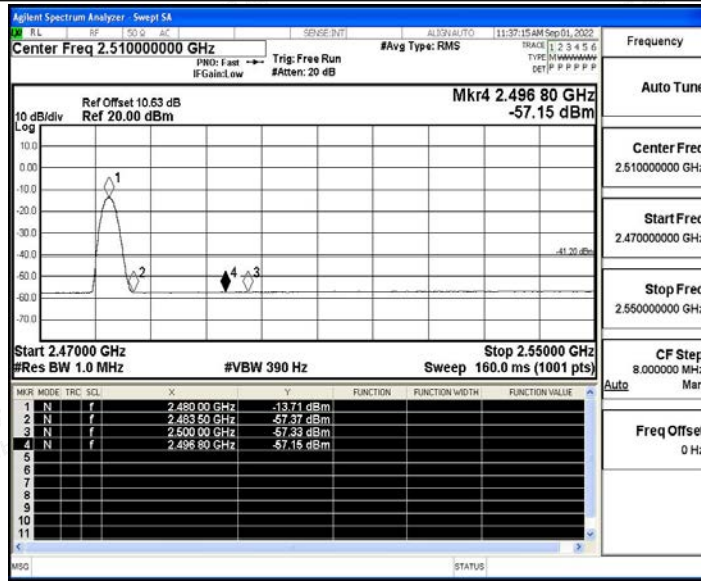


2DH5\_Ant1\_Low\_2402\_Peak

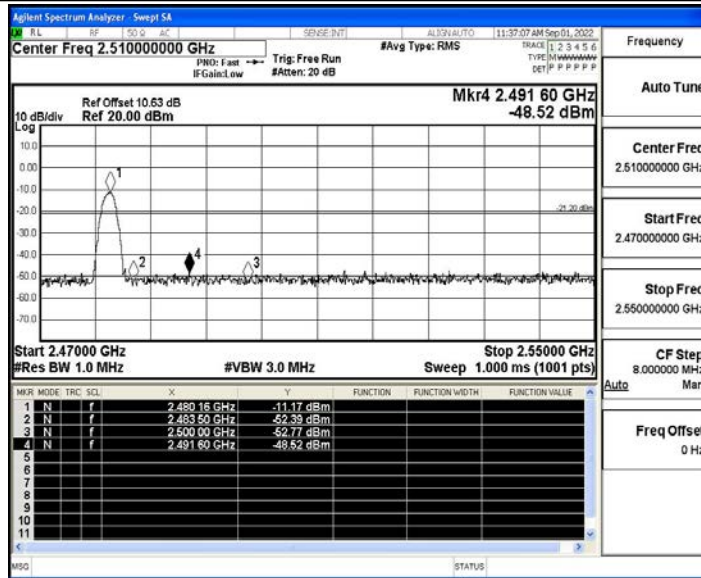


2DH5\_Ant1\_High\_2480\_AV



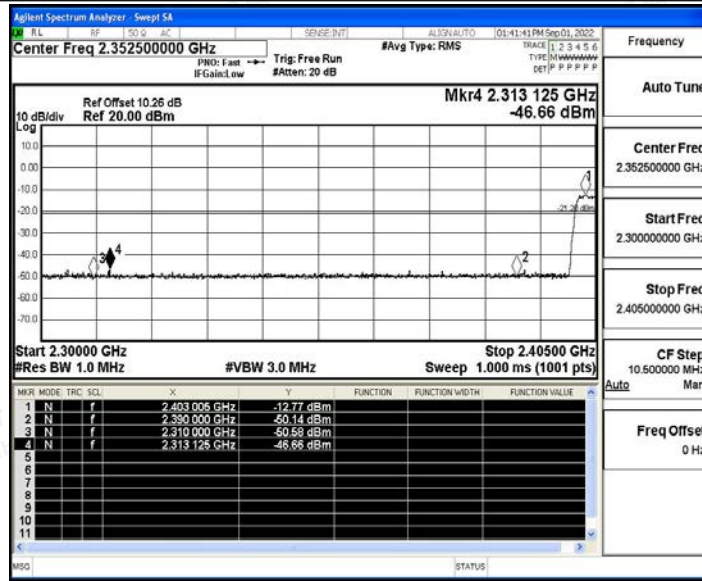


2DH5\_Ant1\_High\_2480\_Peak

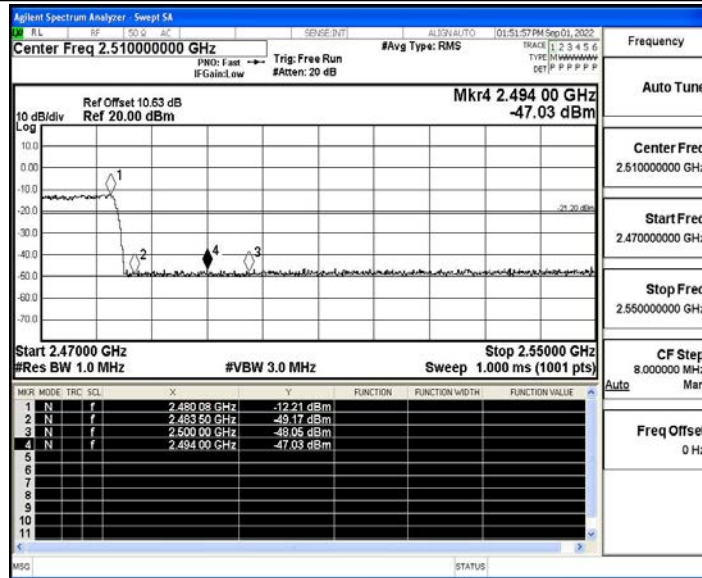


2DH5\_Ant1\_Low\_Hop\_2402\_Peak



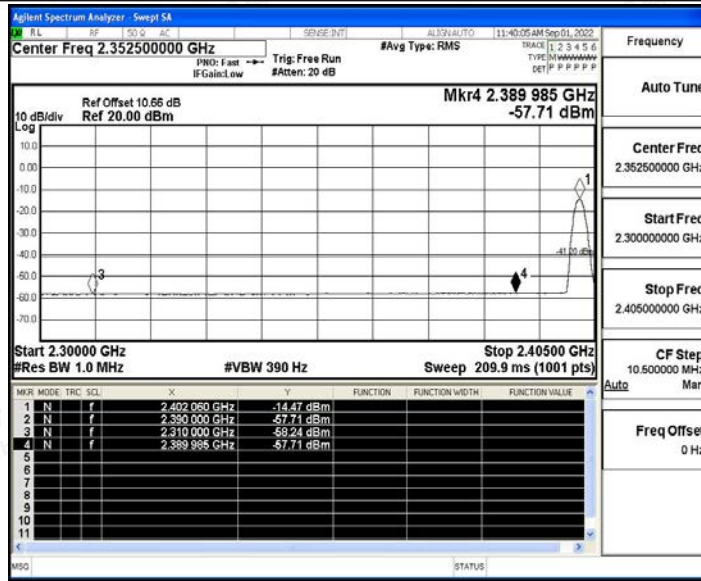


2DH5\_Ant1\_High\_Hop\_2480\_Peak

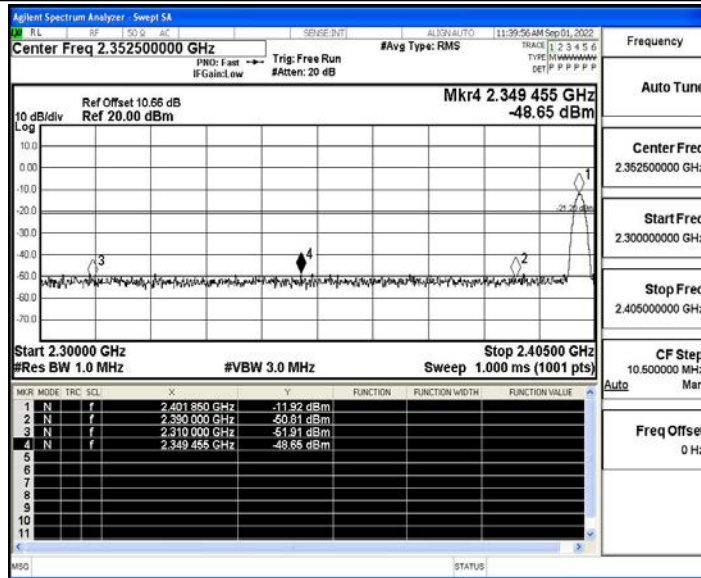


3DH5\_Ant1\_Low\_2402\_AV



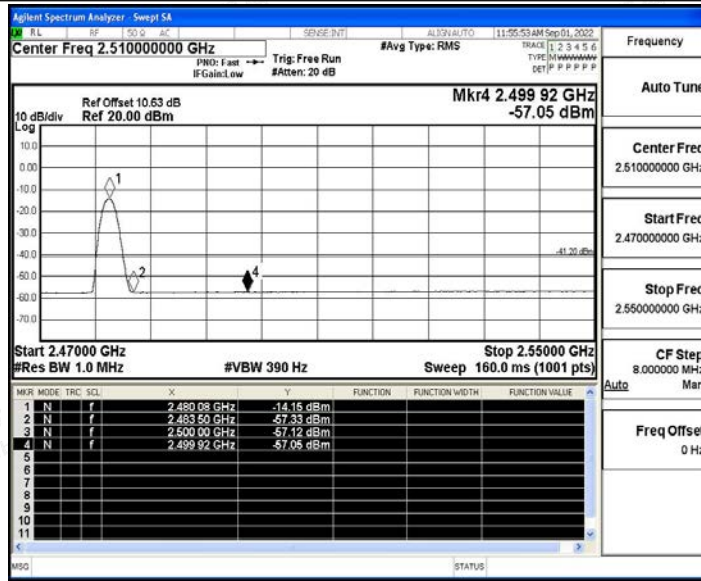


3DH5\_Ant1\_Low\_2402\_Peak

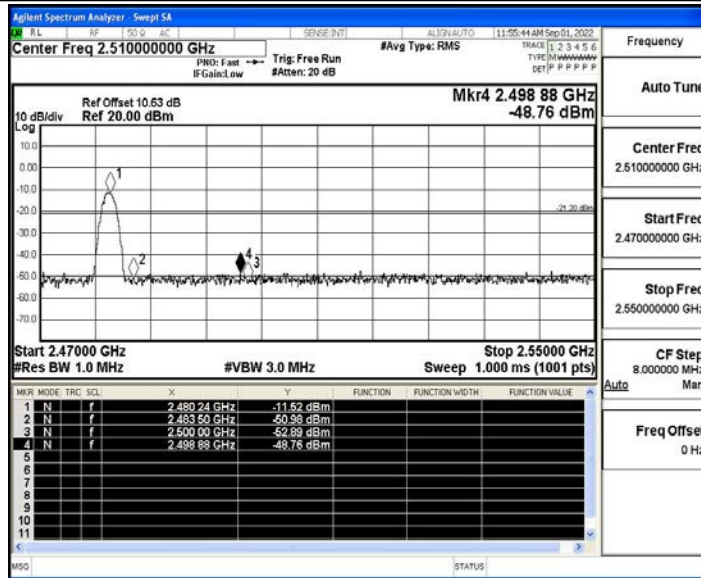


3DH5\_Ant1\_High\_2480\_AV



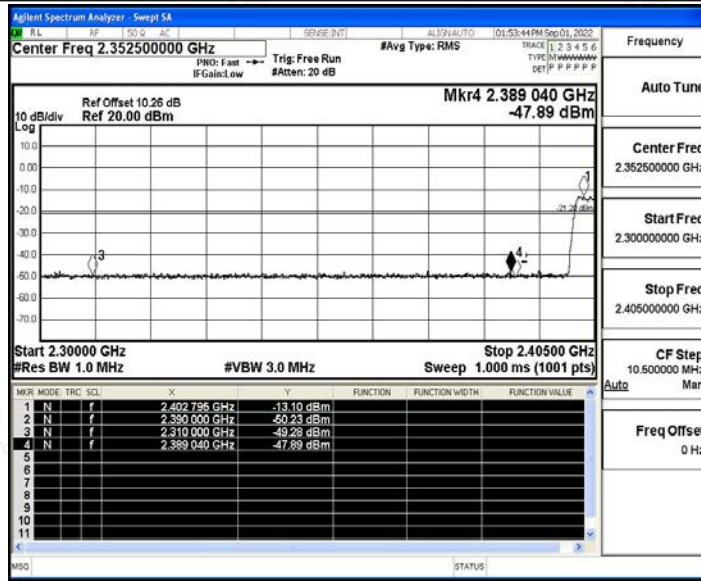


3DH5\_Ant1\_High\_2480\_Peak



3DH5\_Ant1\_Low\_Hop\_2402\_Peak





3DH5\_Ant1\_High\_Hop\_2480\_Peak

