



Appendix A

RF Test Data for BT V4.2(DSS) (Conducted Measurement)

Product Name: Laser Engraver

Trade Mark: N/A

Test Model: ZBT_37370

Environmental Conditions

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



A.1 20dB Emission Bandwidth

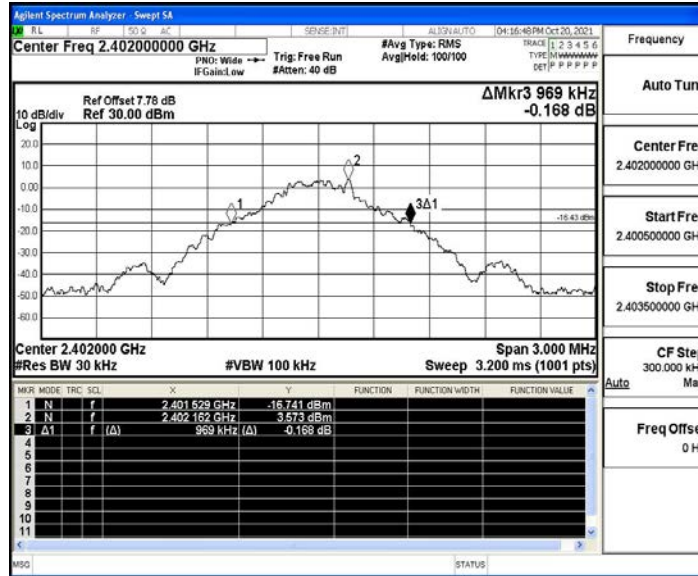
Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.969	2401.529	2402.498	---	PASS
		2441	1.035	2440.463	2441.498	---	PASS
		2480	1.014	2479.484	2480.498	---	PASS
2DH5	Ant1	2402	1.278	2401.367	2402.645	---	PASS
		2441	1.320	2440.337	2441.657	---	PASS
		2480	1.359	2479.322	2480.681	---	PASS
3DH5	Ant1	2402	1.296	2401.355	2402.651	---	PASS
		2441	1.284	2440.349	2441.633	---	PASS
		2480	1.320	2479.340	2480.660	---	PASS

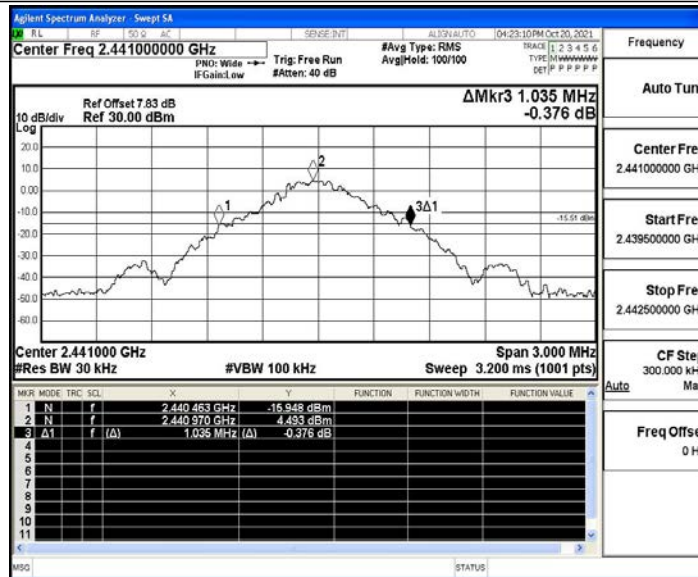


Test Graphs

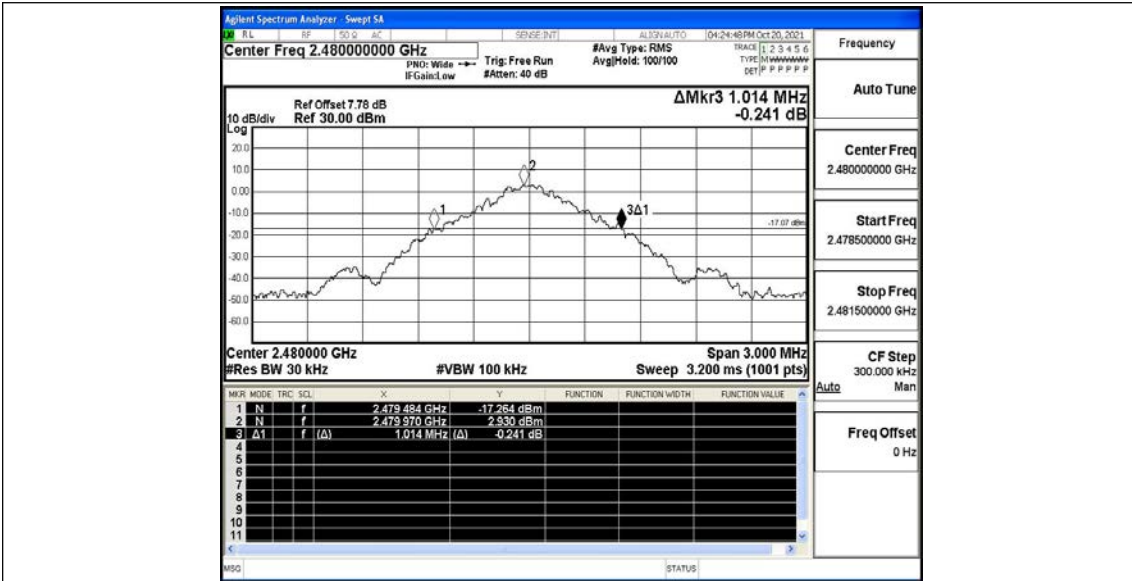
DH5_Ant1_2402



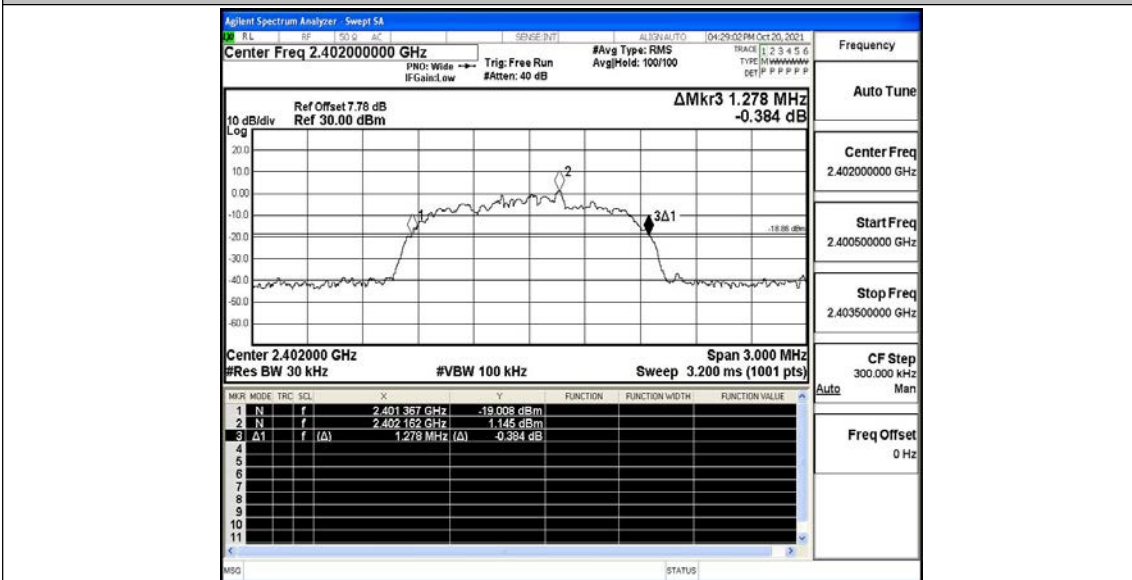
DH5_Ant1_2441



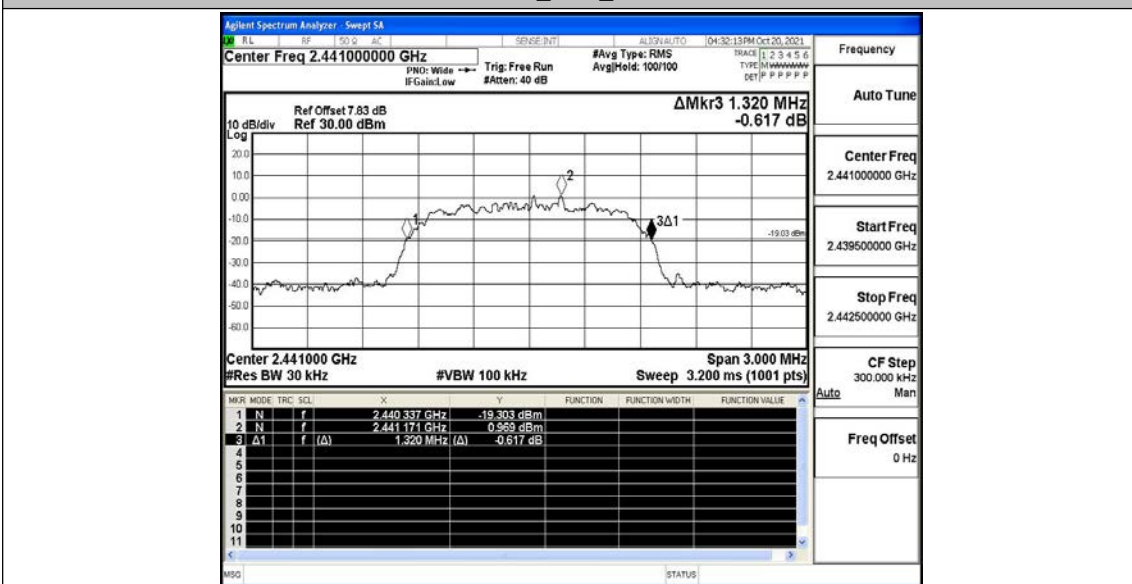
DH5_Ant1_2480



2DH5_Ant1_2402

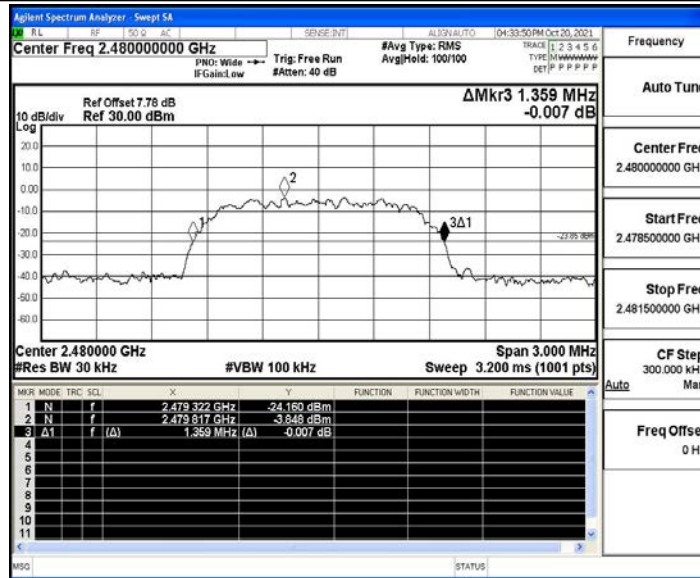


2DH5_Ant1_2441

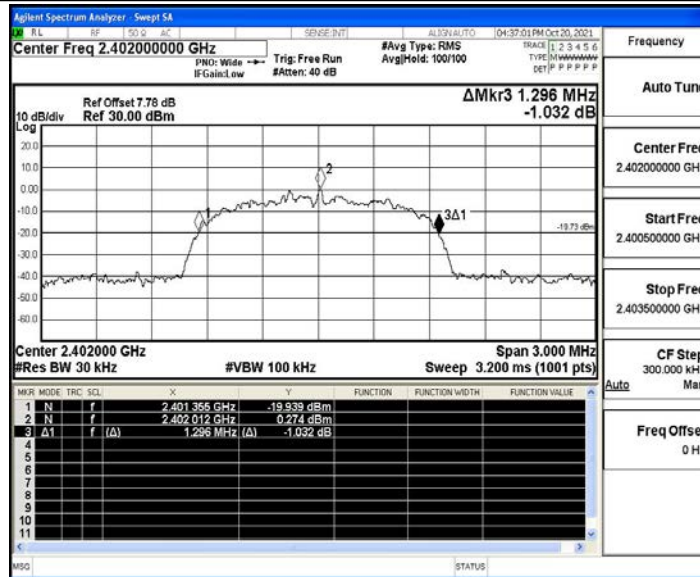




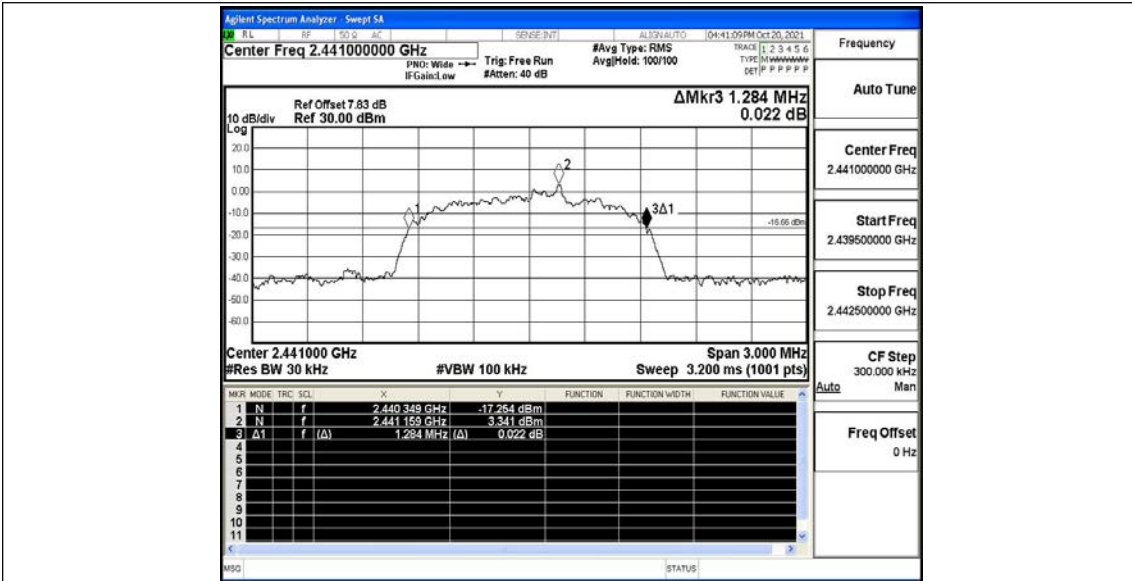
2DH5_Ant1_2480



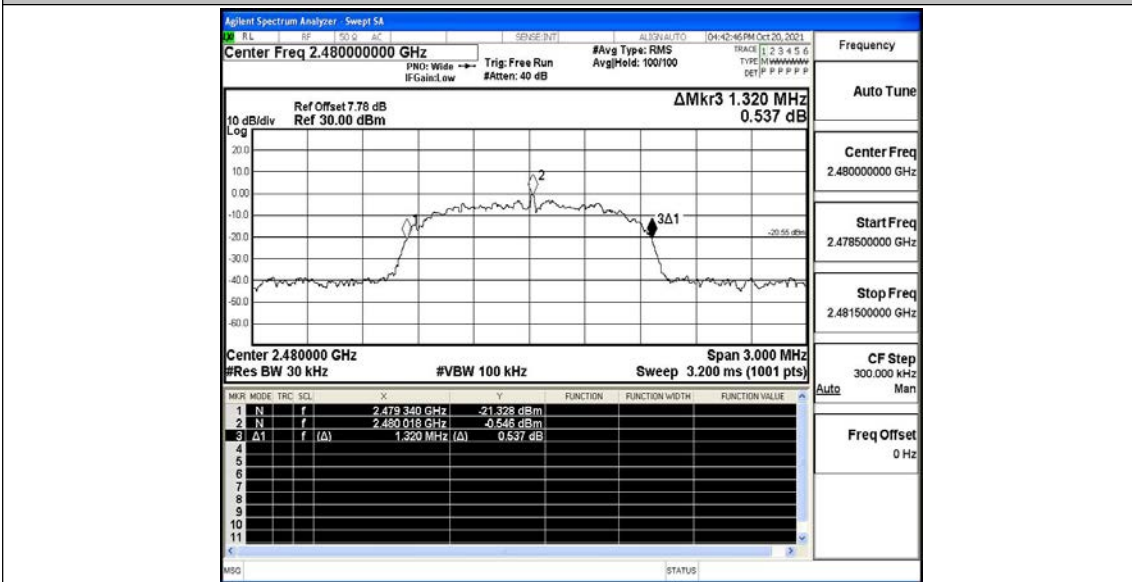
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480





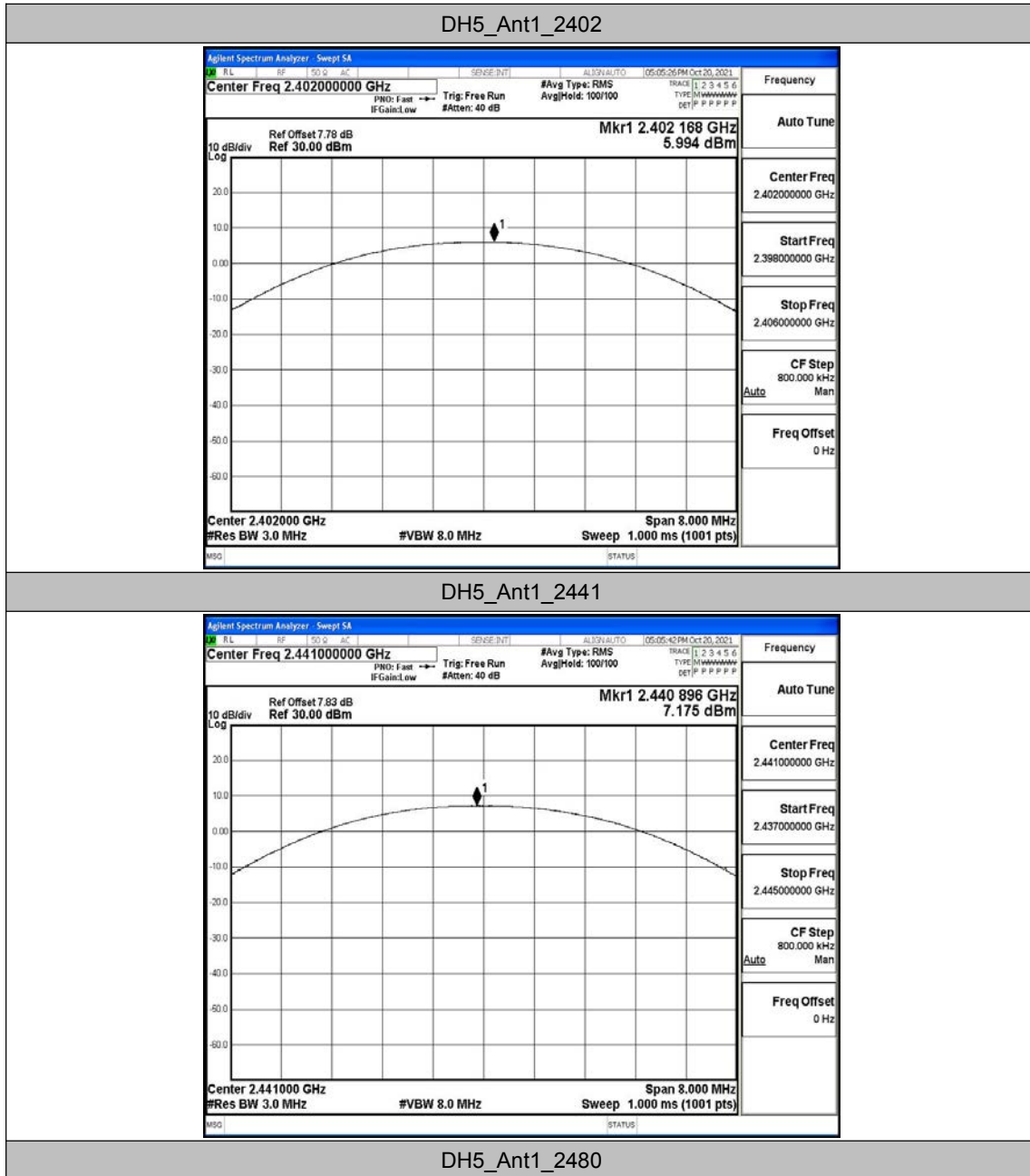
A.2 Maximum conducted output power

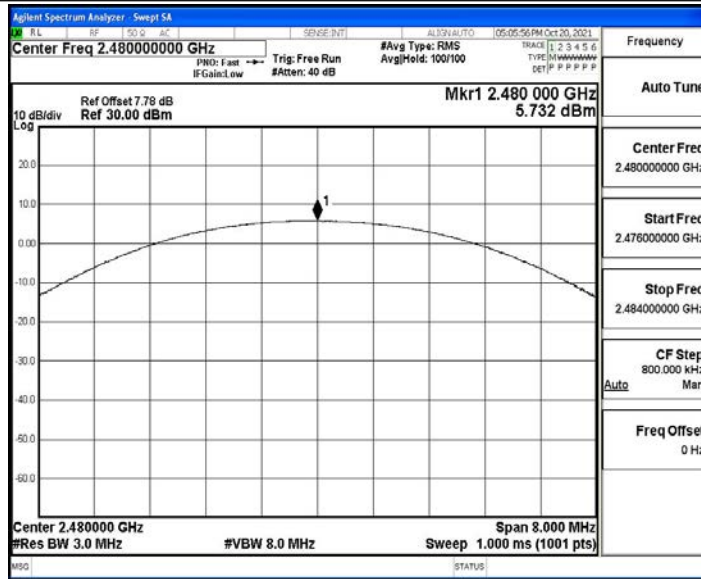
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	5.99	≤20.97	PASS
		2441	7.18	≤20.97	PASS
		2480	5.73	≤20.97	PASS
2DH5	Ant1	2402	5.11	≤20.97	PASS
		2441	6.3	≤20.97	PASS
		2480	4.88	≤20.97	PASS
3DH5	Ant1	2402	5.23	≤20.97	PASS
		2441	6.45	≤20.97	PASS
		2480	5.04	≤20.97	PASS

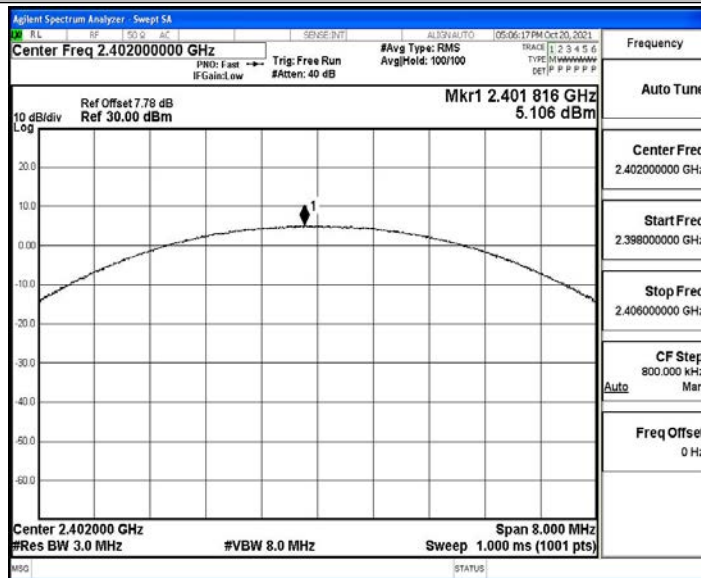


Test Graphs

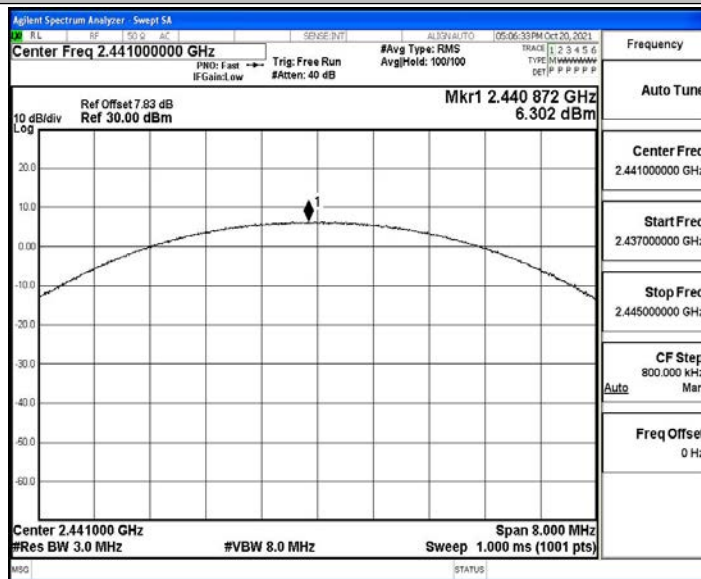




2DH5_Ant1_2402

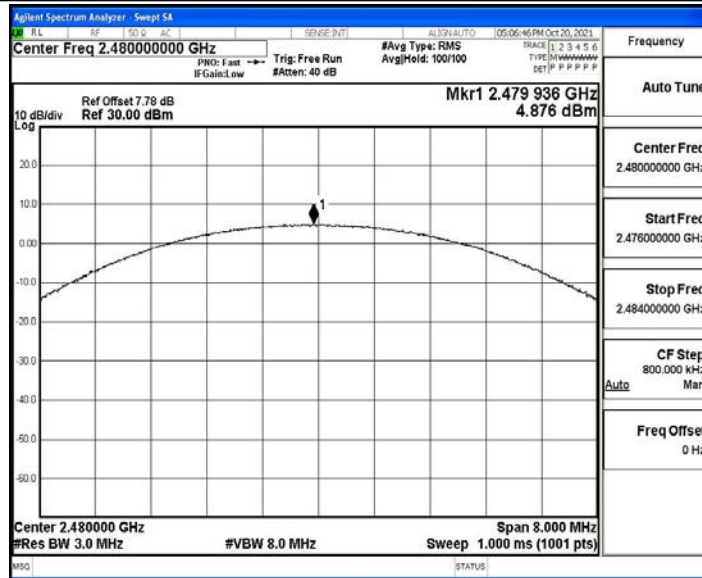


2DH5_Ant1_2441

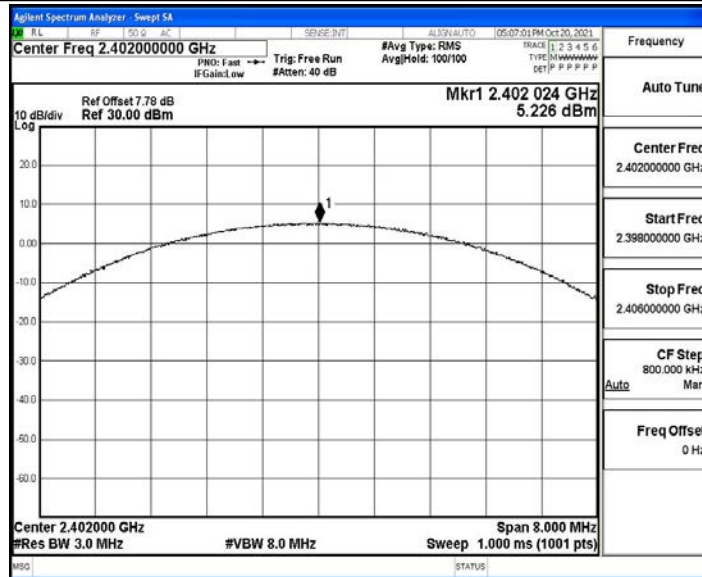




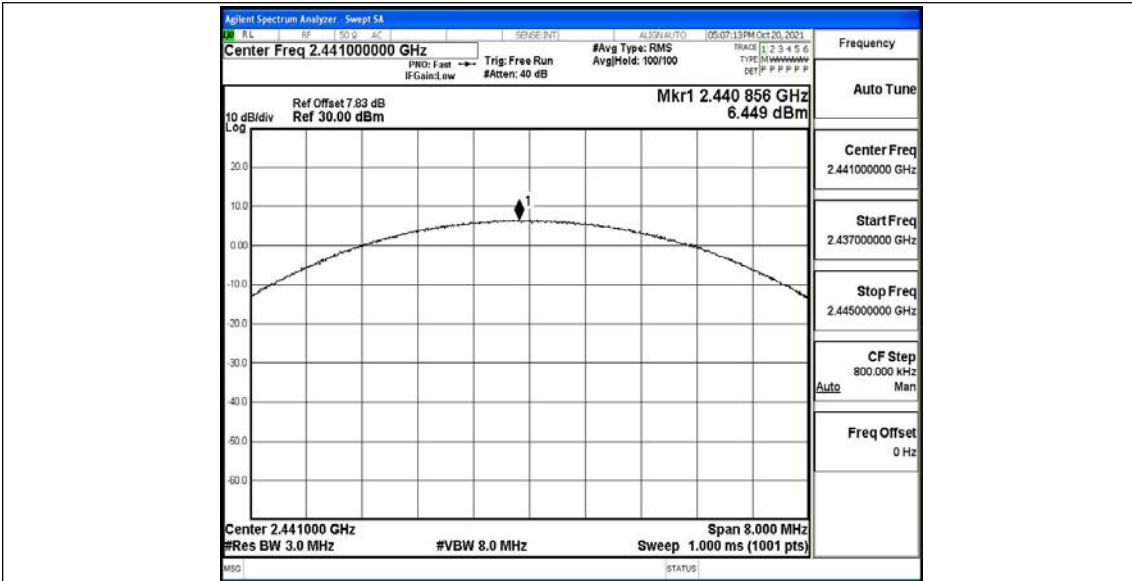
2DH5_Ant1_2480



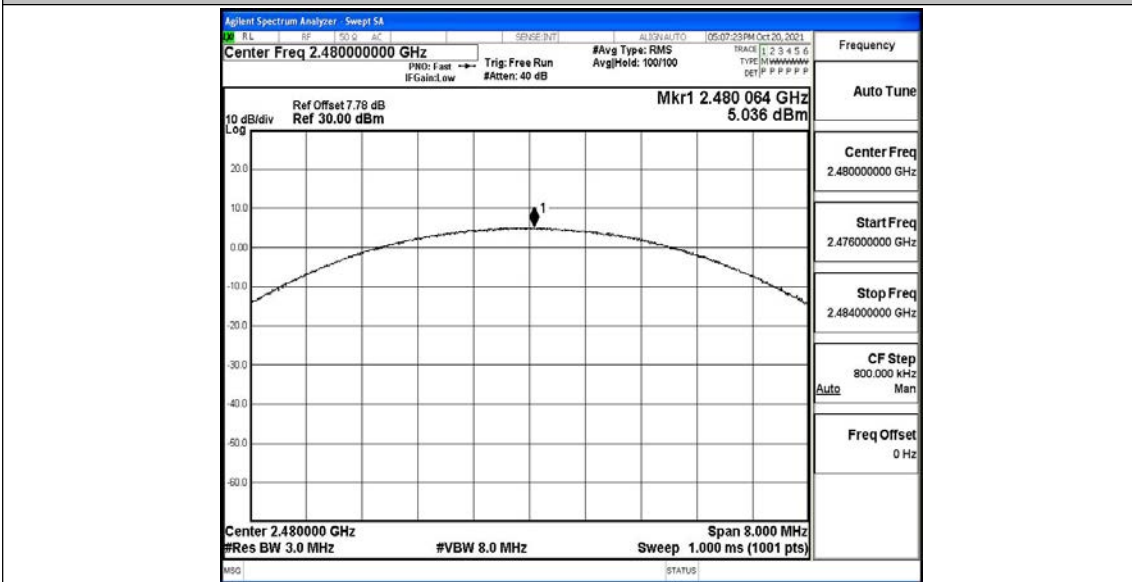
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480





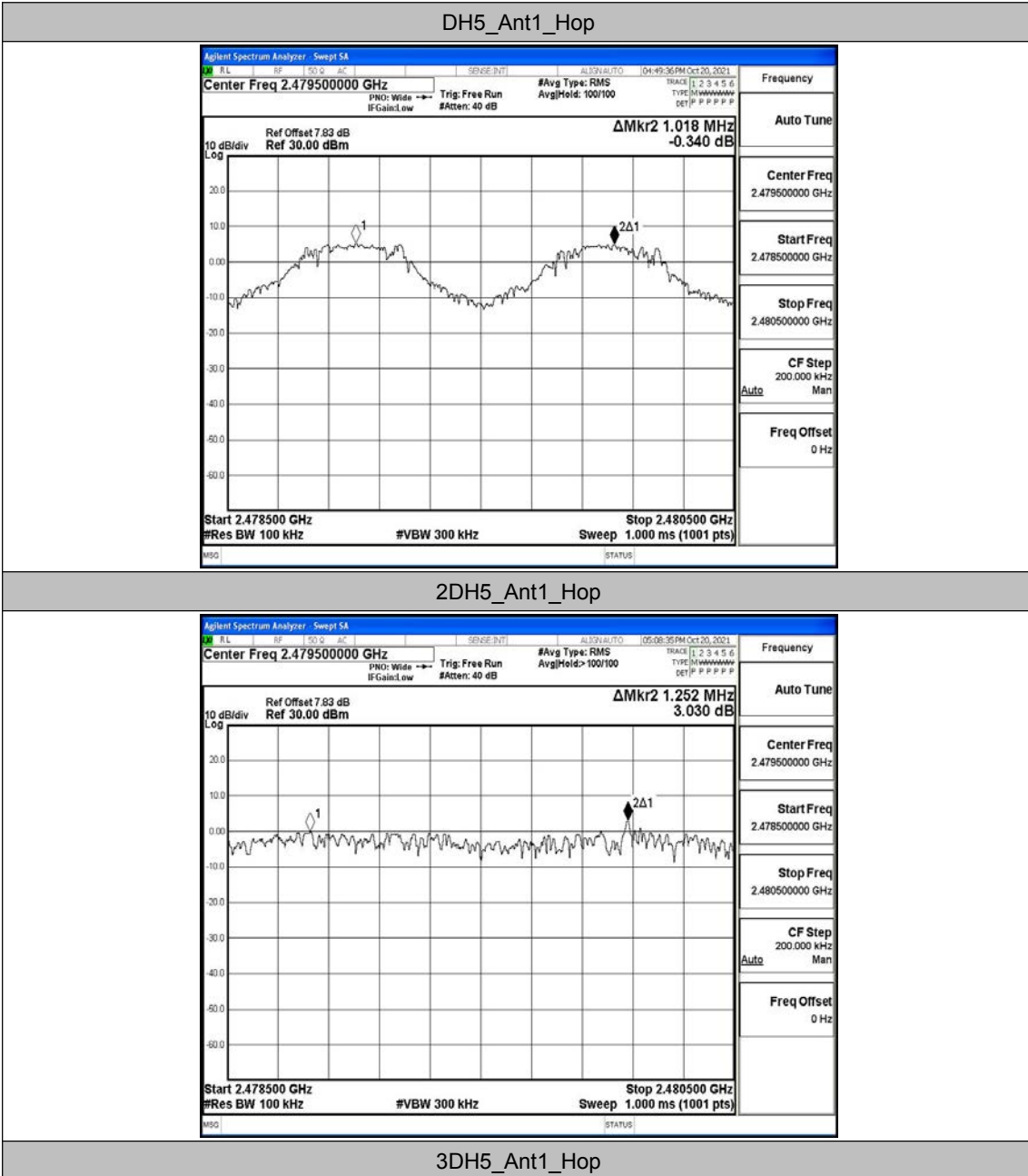
A.3 Carrier frequency separation

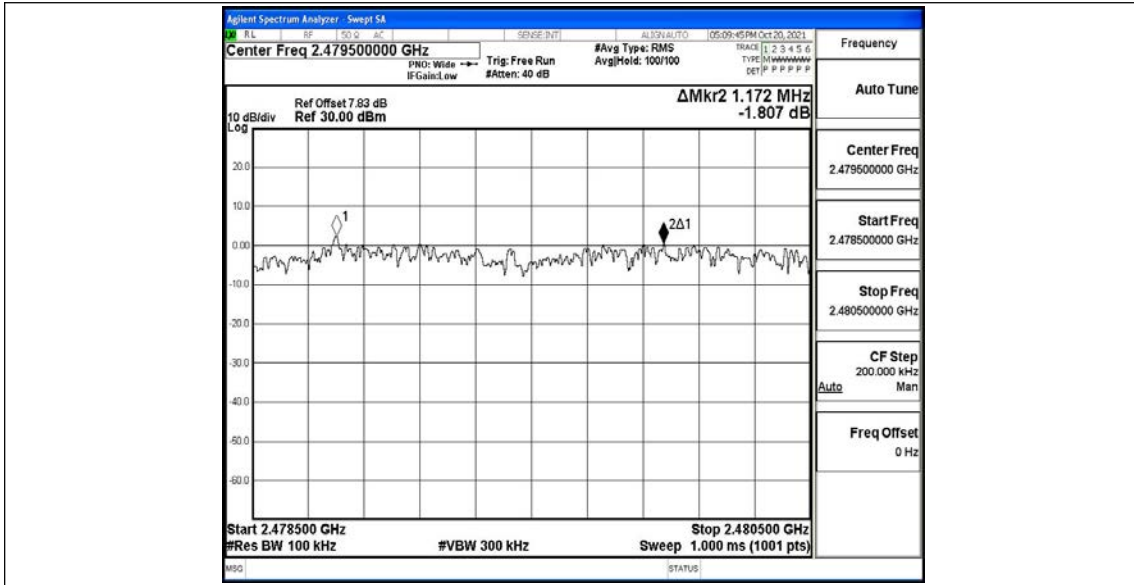
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	Hop	1.018	≥ 0.690	PASS
2DH5	Ant1	Hop	1.252	≥ 0.906	PASS
3DH5	Ant1	Hop	1.172	≥ 0.880	PASS



Test Graphs







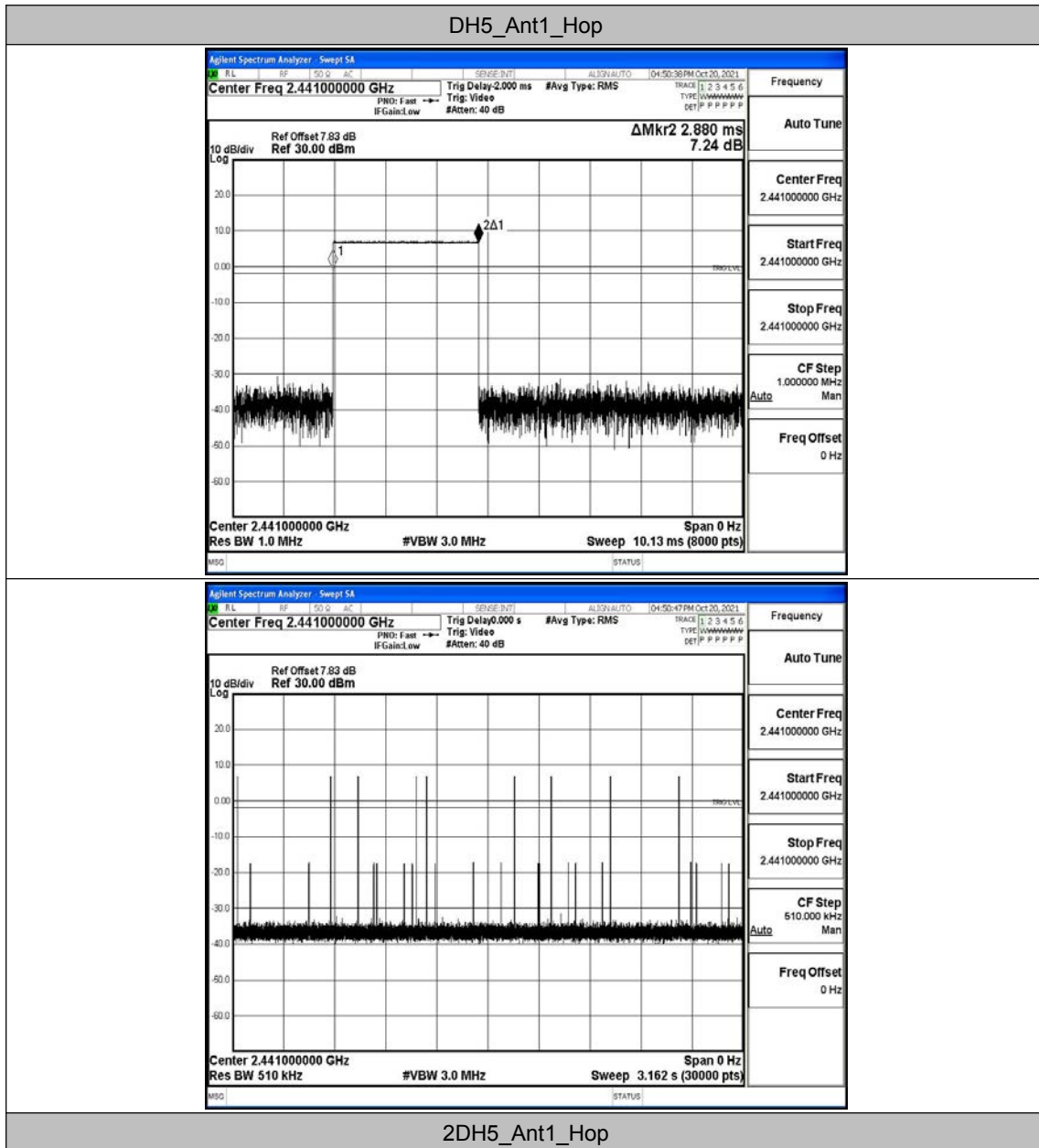
A.4 Time of occupancy

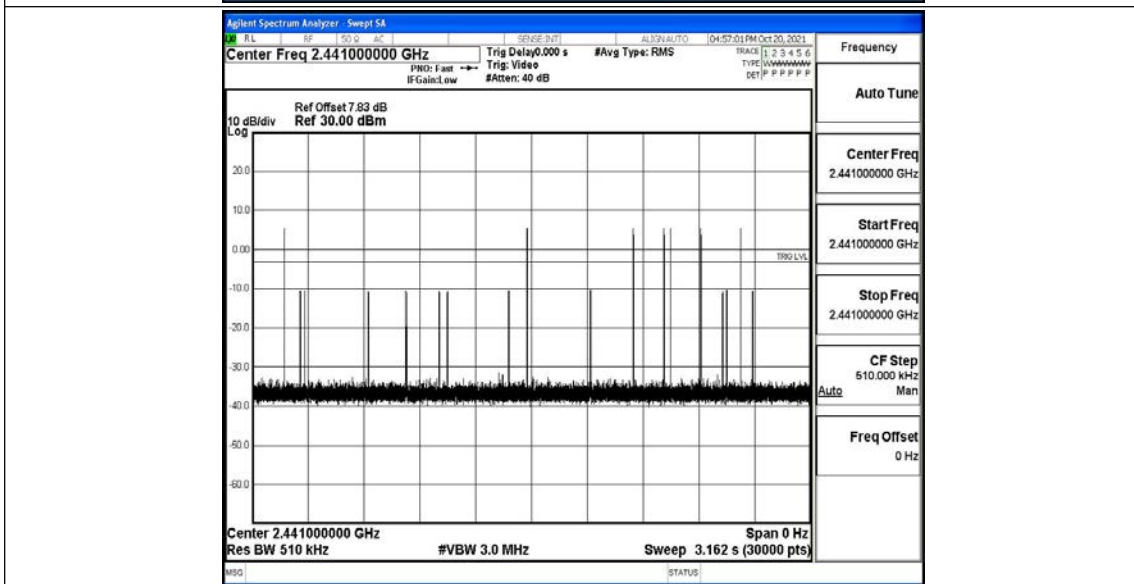
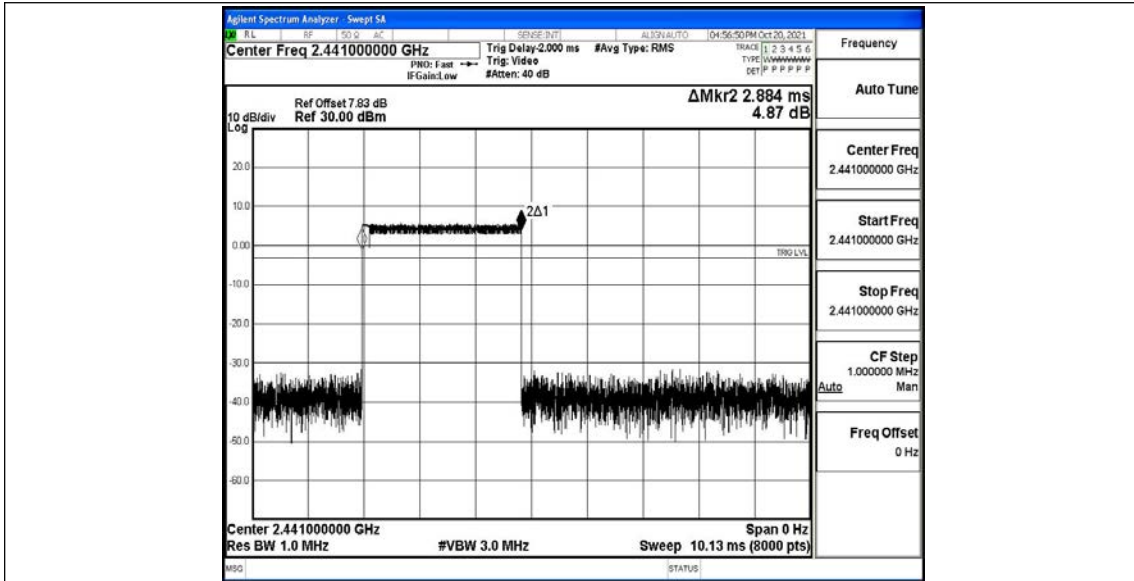
Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.88	110	0.317	≤0.4	PASS
2DH5	Ant1	Hop	2.88	80	0.231	≤0.4	PASS
3DH5	Ant1	Hop	2.89	70	0.202	≤0.4	PASS

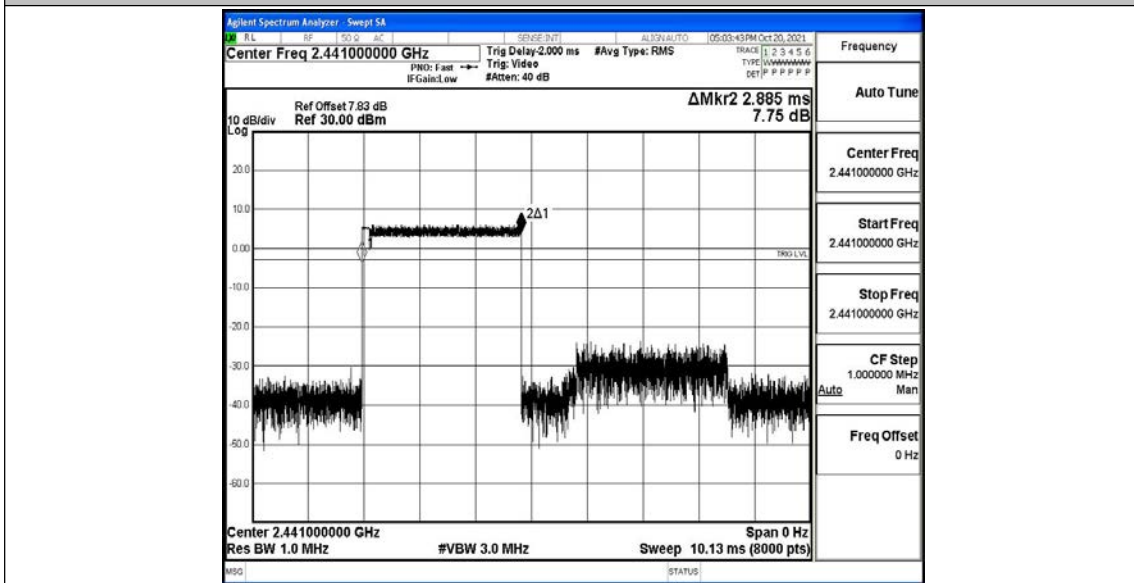


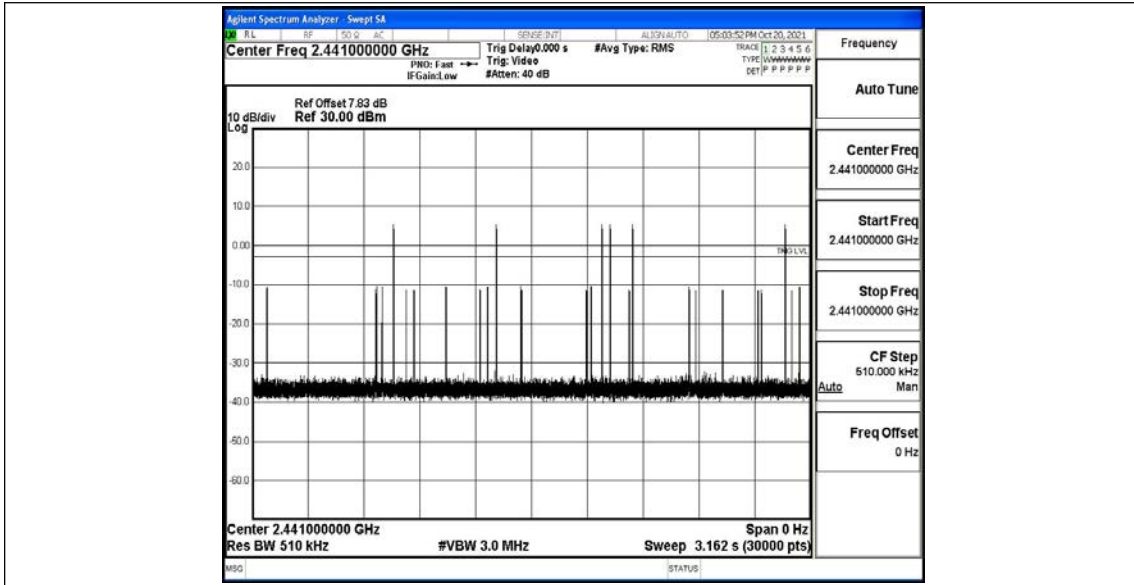
Test Graphs





3DH5_Ant1_Hop







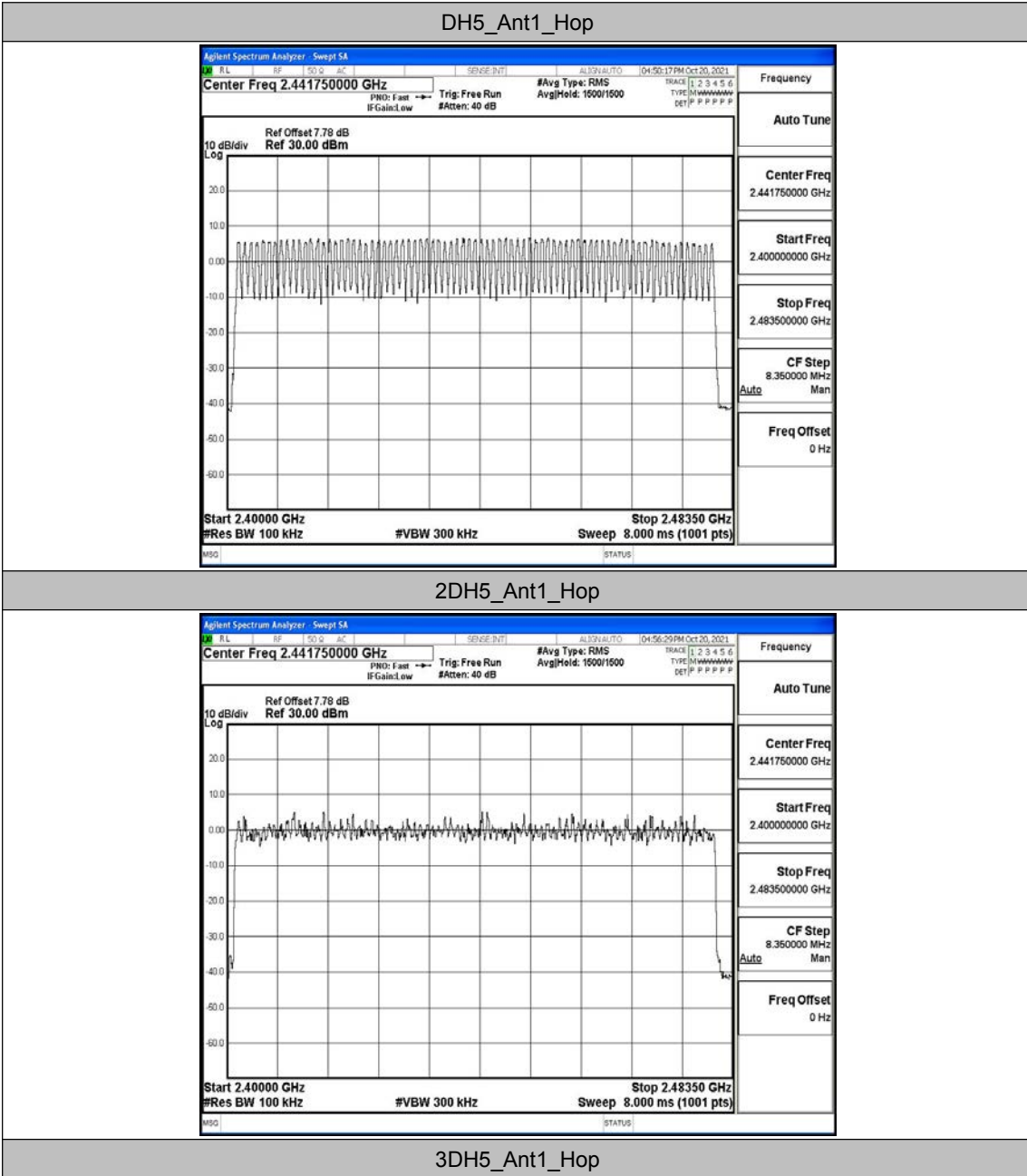
A.5 Number of hopping channels

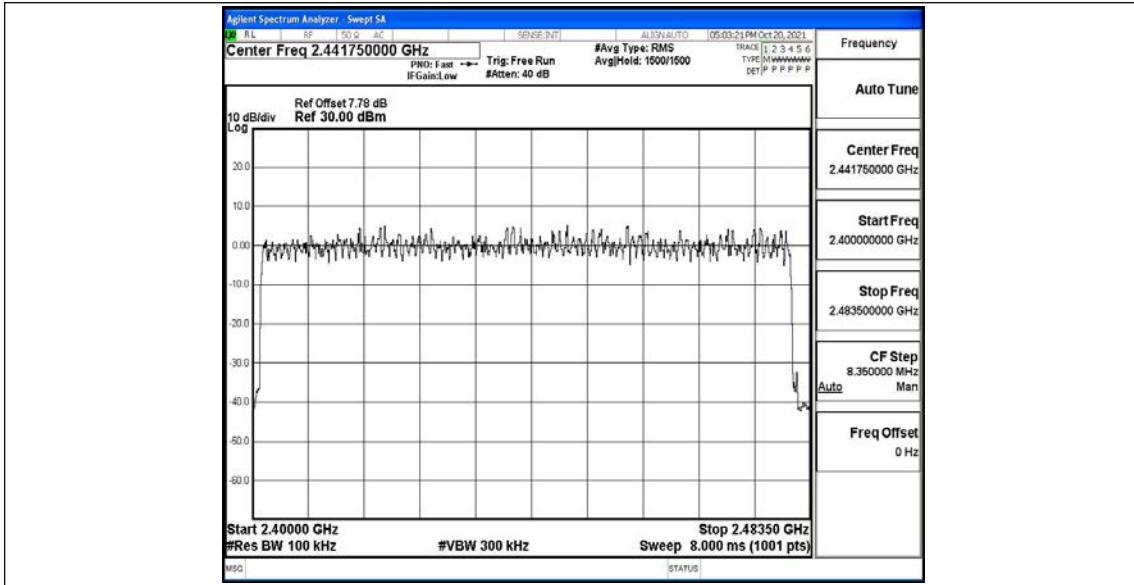
Test Result

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







A.6 Band edge measurements

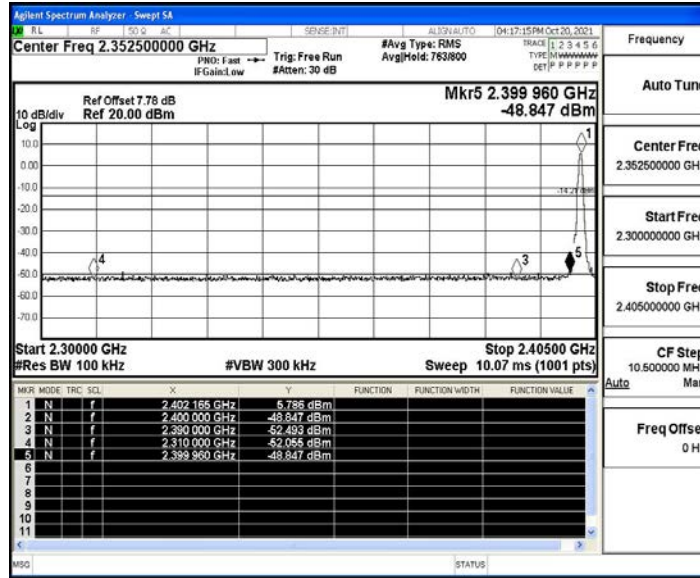
Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	5.79	-48.85	≤-14.21	PASS
		High	2480	5.45	-47.98	≤-14.55	PASS
		Low	Hop_2402	5.60	-49.43	≤-14.4	PASS
		High	Hop_2480	5.48	-48.22	≤-14.52	PASS
2DH5	Ant1	Low	2402	3.96	-49.23	≤-16.04	PASS
		High	2480	4.16	-47.48	≤-15.84	PASS
		Low	Hop_2402	0.48	-49.86	≤-19.52	PASS
		High	Hop_2480	1.39	-48.4	≤-18.61	PASS
3DH5	Ant1	Low	2402	4.29	-48.27	≤-15.71	PASS
		High	2480	3.98	-48.43	≤-16.02	PASS
		Low	Hop_2402	4.34	-49.97	≤-15.66	PASS
		High	Hop_2480	1.57	-48.24	≤-18.43	PASS

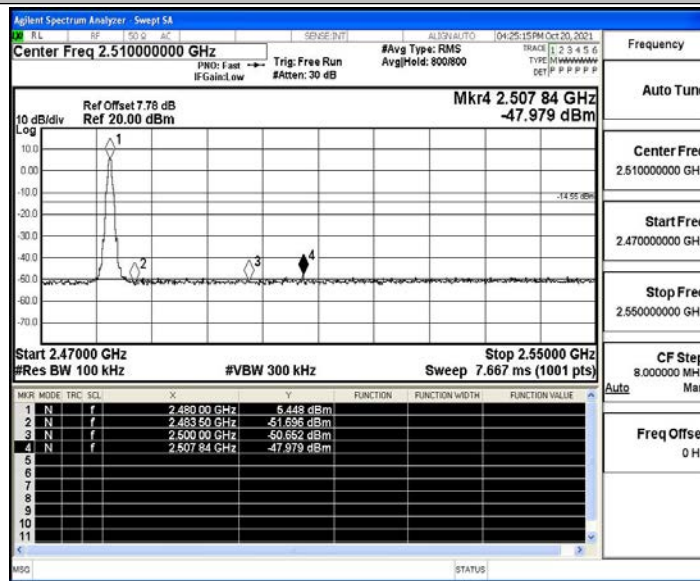


Test Graphs

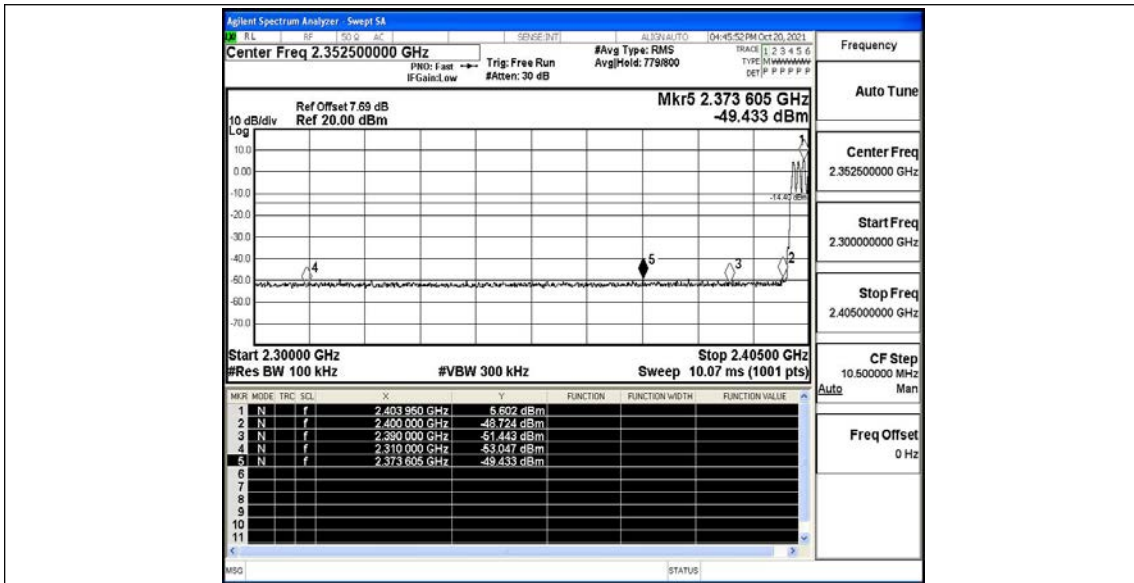
DH5_Ant1_Low_2402



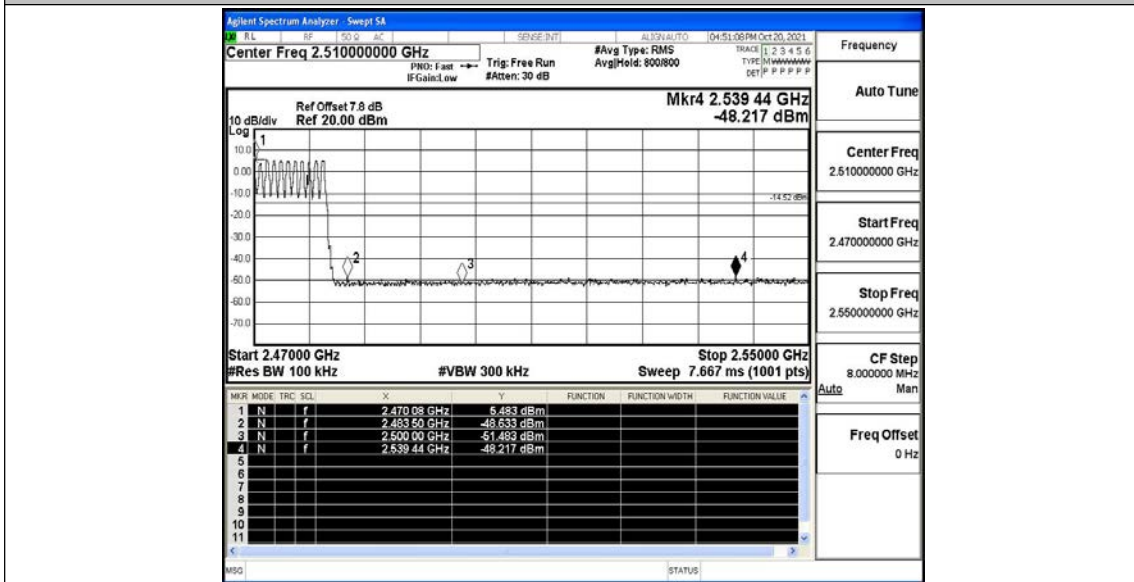
DH5_Ant1_High_2480



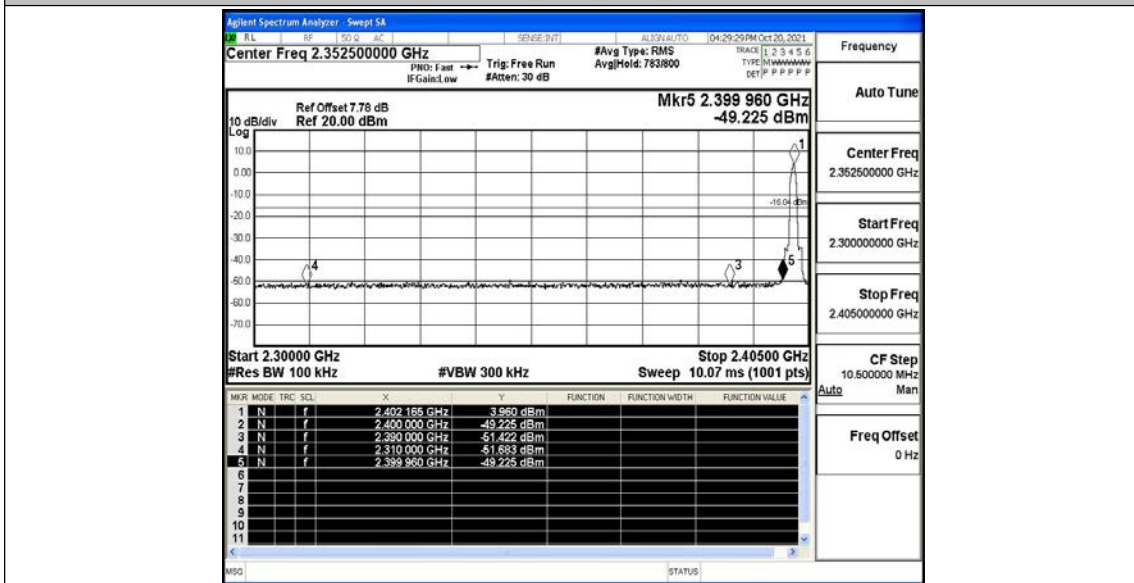
DH5_Ant1_Low_Hop_2402



DH5_Ant1_High_Hop_2480

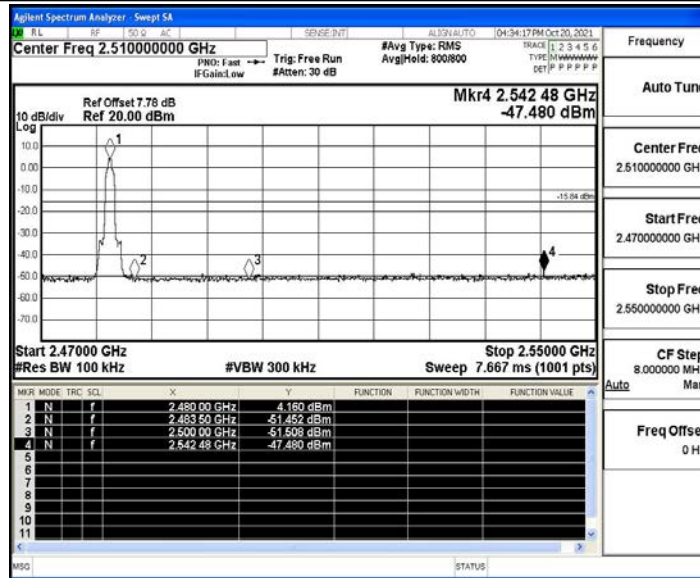


2DH5_Ant1_Low_2402

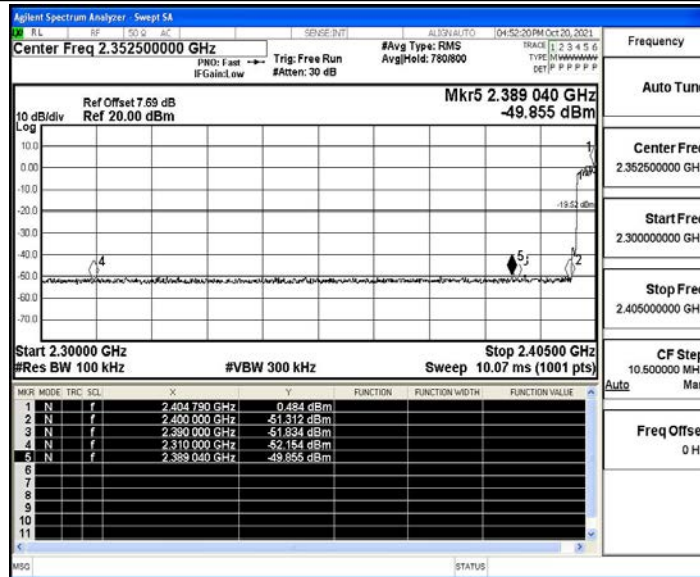




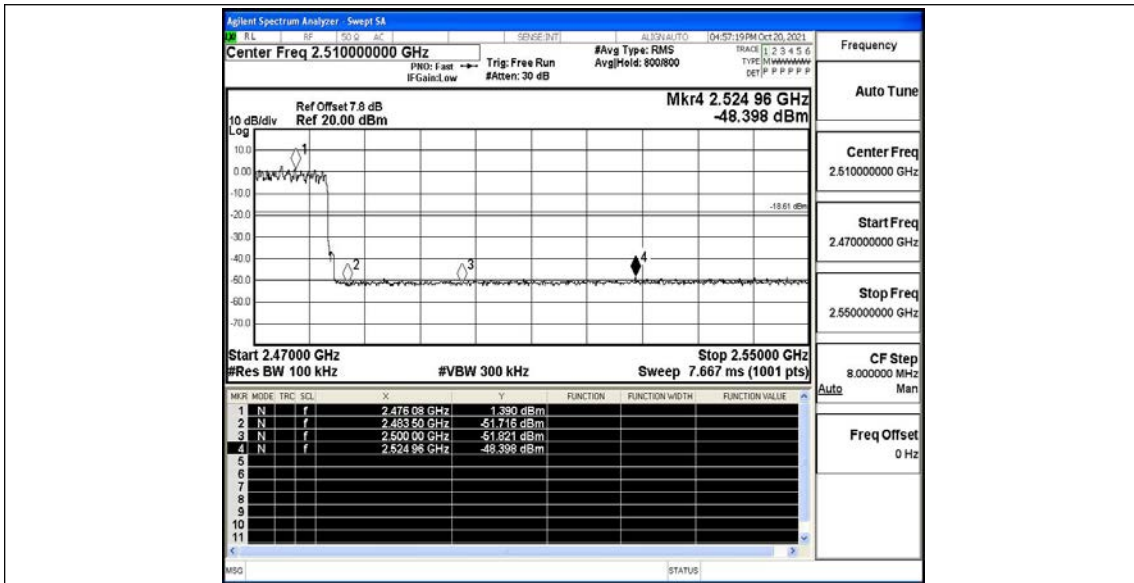
2DH5_Ant1_High_2480



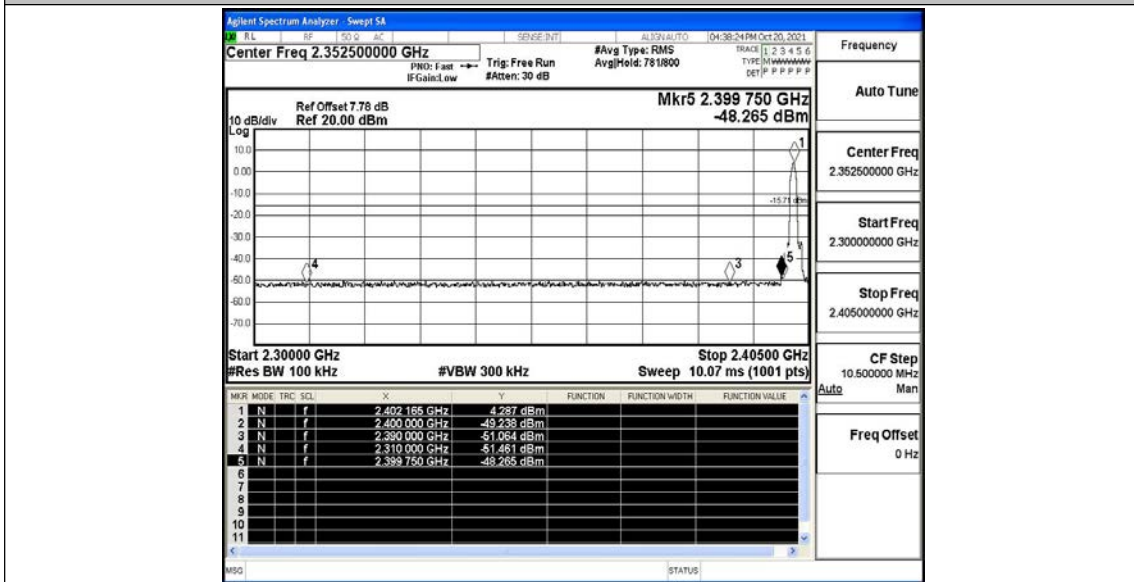
2DH5_Ant1_Low_Hop_2402



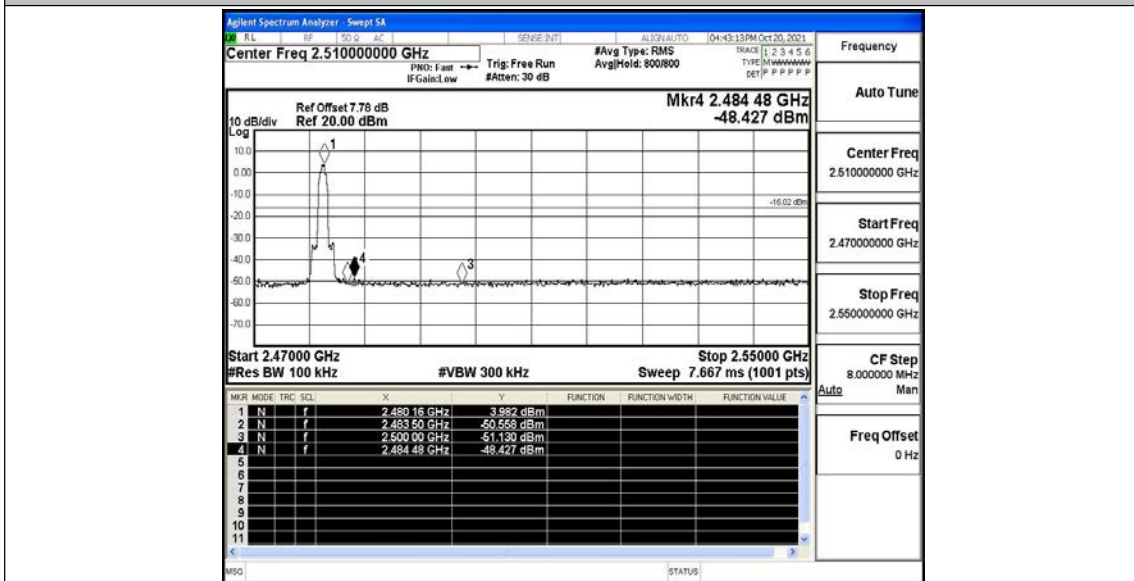
2DH5_Ant1_High_Hop_2480



3DH5_Ant1_Low_2402

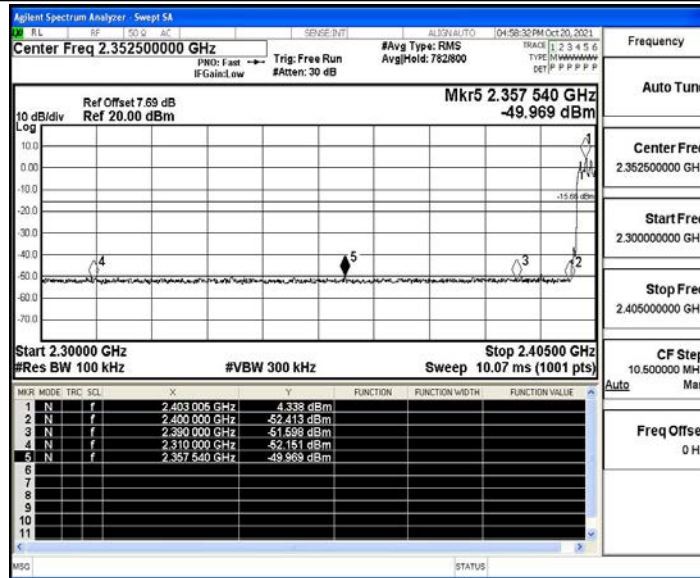


3DH5_Ant1_High_2480

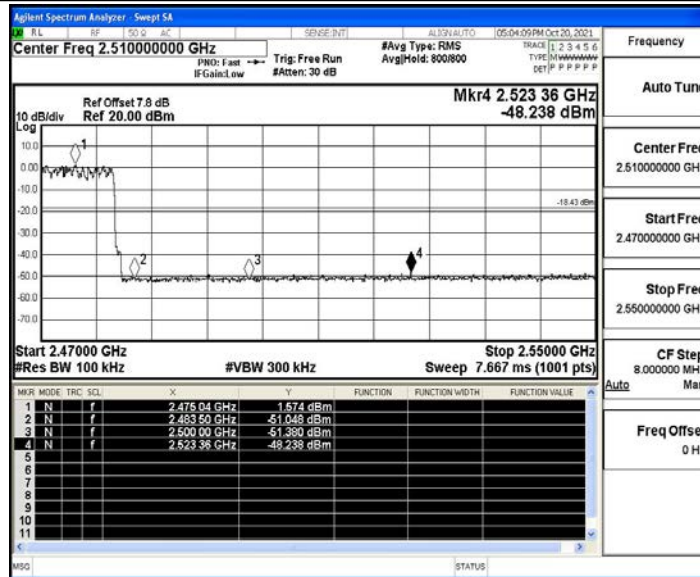




3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480





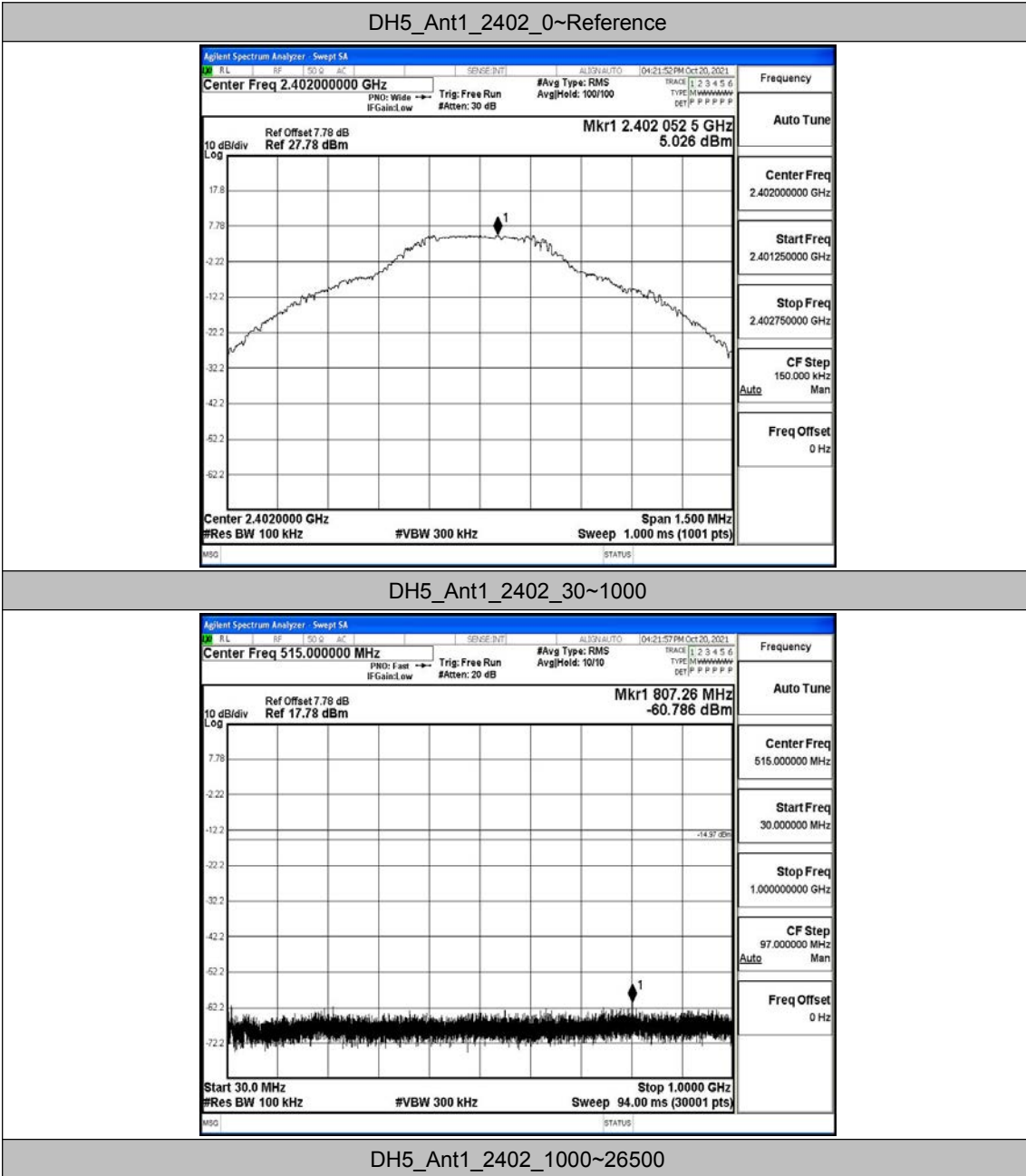
A.7 Conducted Spurious Emission

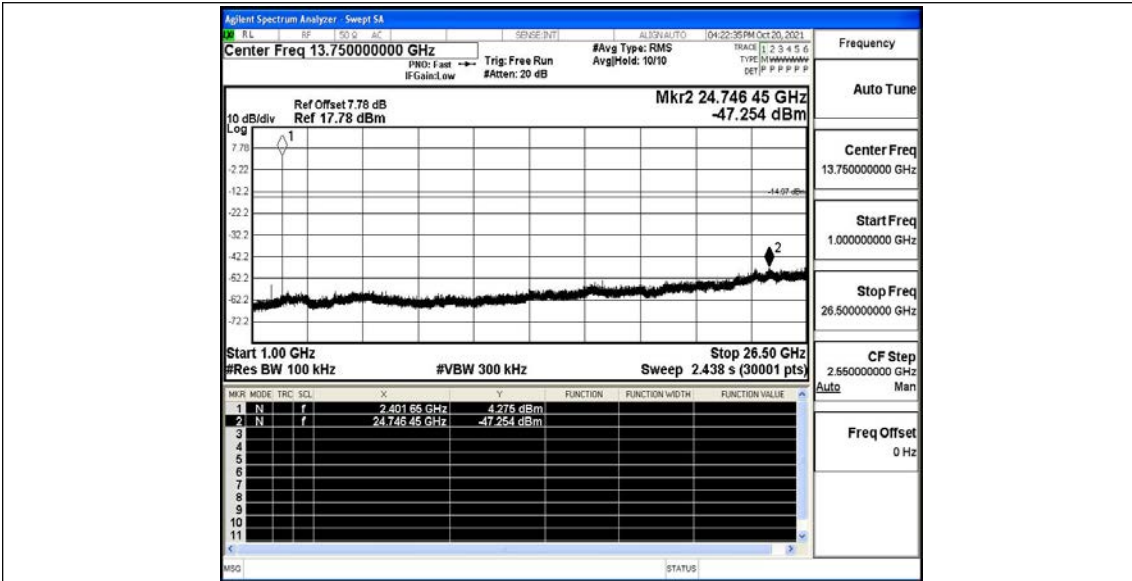
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	5.03	5.03	---	PASS
			30~1000	5.03	-60.79	≤-14.97	PASS
			1000~26500	5.03	-47.25	≤-14.97	PASS
		2441	Reference	6.72	6.72	---	PASS
			30~1000	6.72	-61.42	≤-13.28	PASS
			1000~26500	6.72	-46.86	≤-13.28	PASS
		2480	Reference	4.90	4.90	---	PASS
			30~1000	4.90	-62.05	≤-15.1	PASS
			1000~26500	4.90	-47.13	≤-15.1	PASS
2DH5	Ant1	2402	Reference	4.03	4.03	---	PASS
			30~1000	4.03	-61.65	≤-15.97	PASS
			1000~26500	4.03	-47.5	≤-15.97	PASS
		2441	Reference	4.44	4.44	---	PASS
			30~1000	4.44	-61.48	≤-15.56	PASS
			1000~26500	4.44	-46.66	≤-15.56	PASS
		2480	Reference	3.82	3.82	---	PASS
			30~1000	3.82	-61.57	≤-16.18	PASS
			1000~26500	3.82	-46.63	≤-16.18	PASS
3DH5	Ant1	2402	Reference	4.00	4.00	---	PASS
			30~1000	4.00	-61.11	≤-16	PASS
			1000~26500	4.00	-47.18	≤-16	PASS
		2441	Reference	5.33	5.33	---	PASS
			30~1000	5.33	-61.03	≤-14.67	PASS
			1000~26500	5.33	-47.4	≤-14.67	PASS
		2480	Reference	3.82	3.82	---	PASS
			30~1000	3.82	-61.75	≤-16.18	PASS
			1000~26500	3.82	-46.88	≤-16.18	PASS

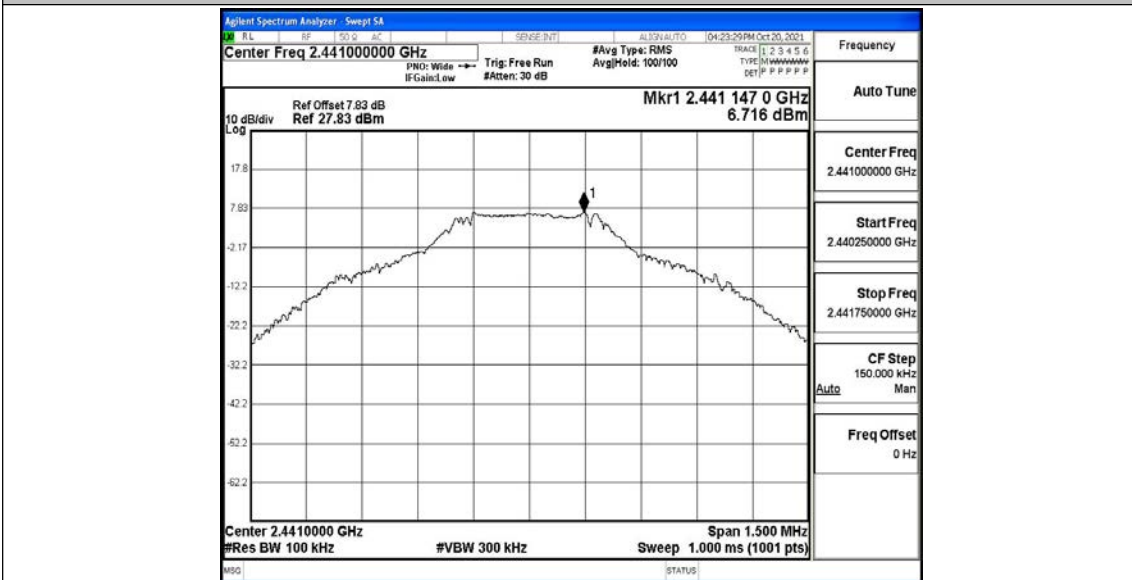


Test Graphs

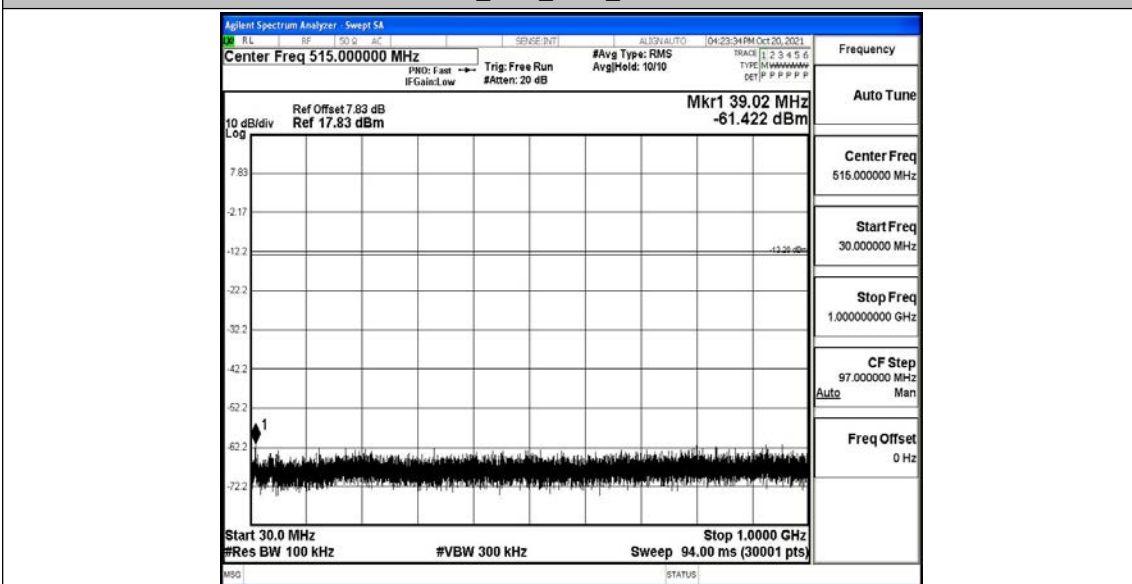




DH5_Ant1_2441_0~Reference

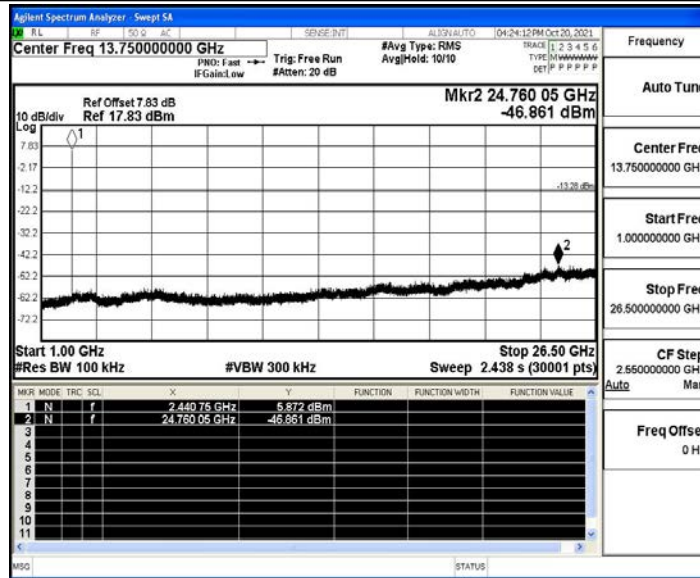


DH5_Ant1_2441_30~1000

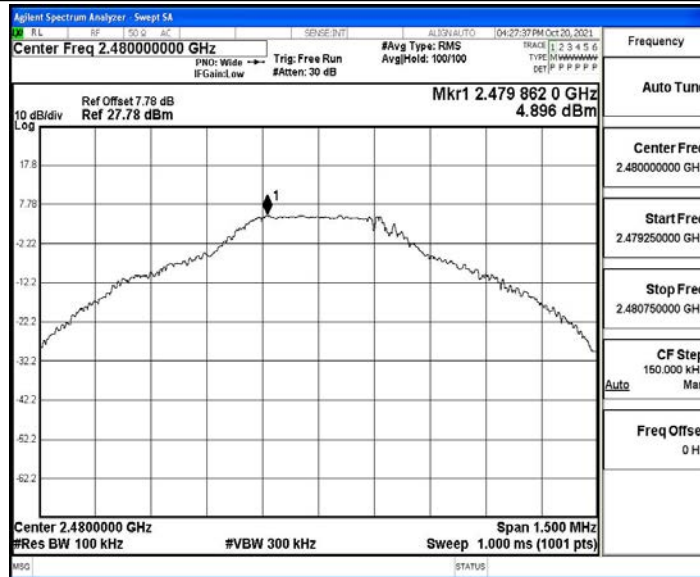




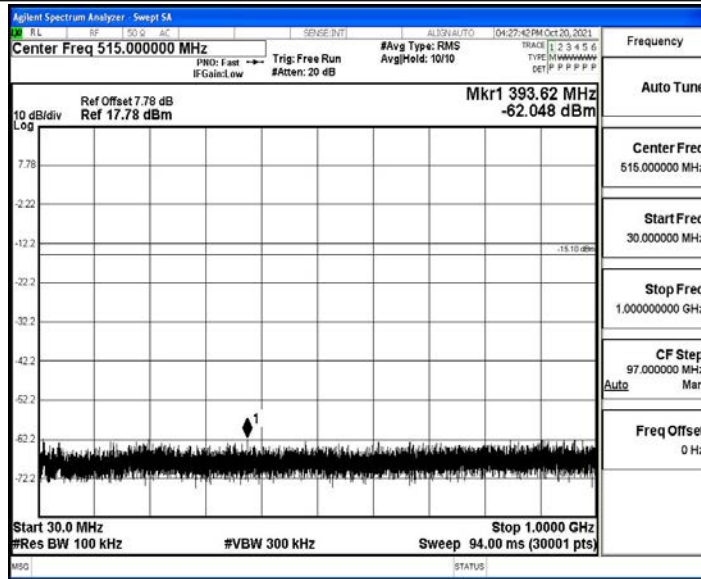
DH5_Ant1_2441_1000~26500



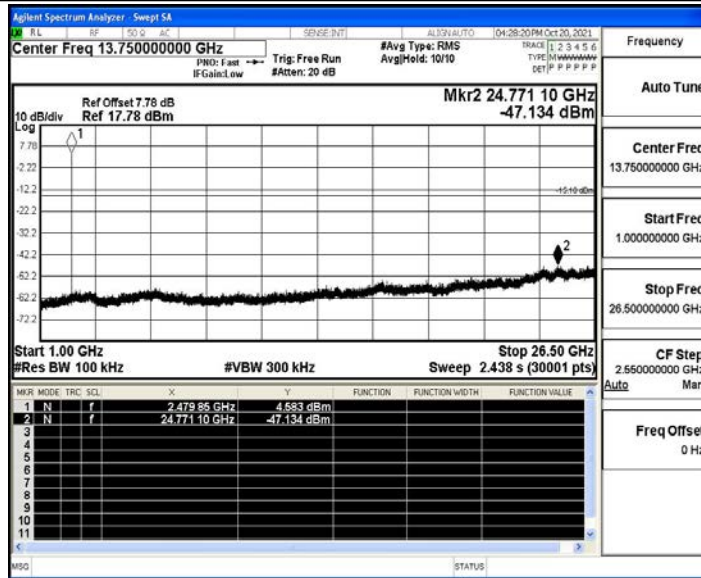
DH5_Ant1_2480_0~Reference



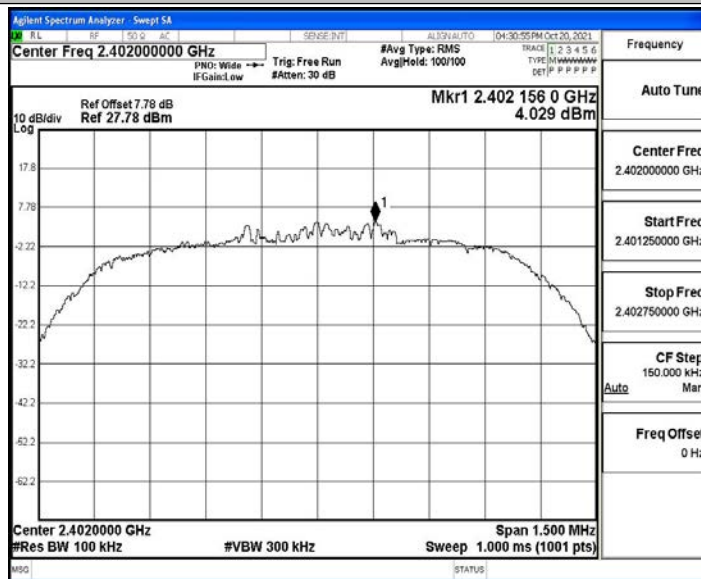
DH5_Ant1_2480_30~1000



DH5_Ant1_2480_1000~26500

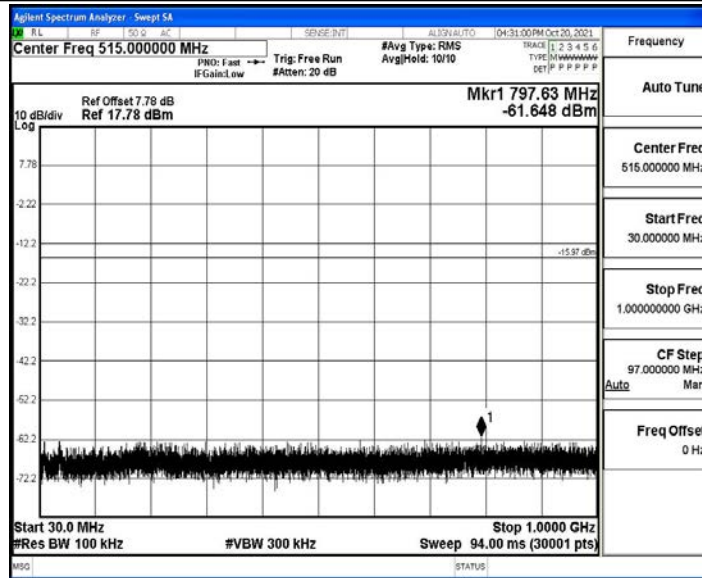


2DH5_Ant1_2402_0~Reference

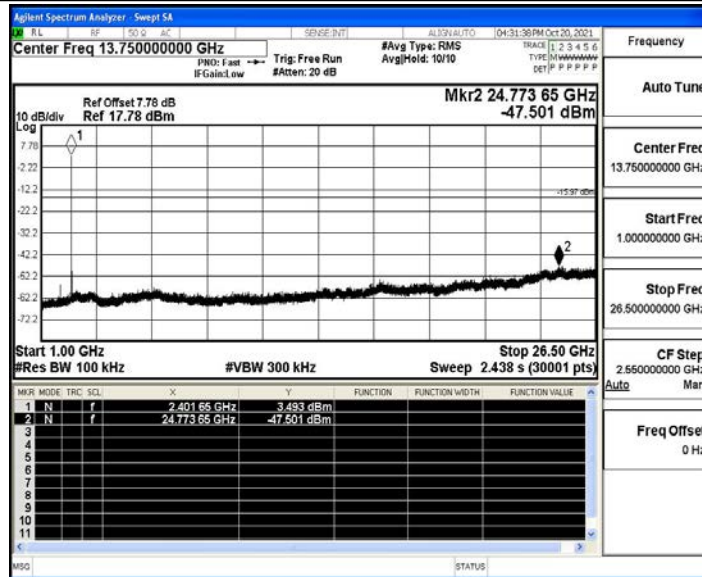




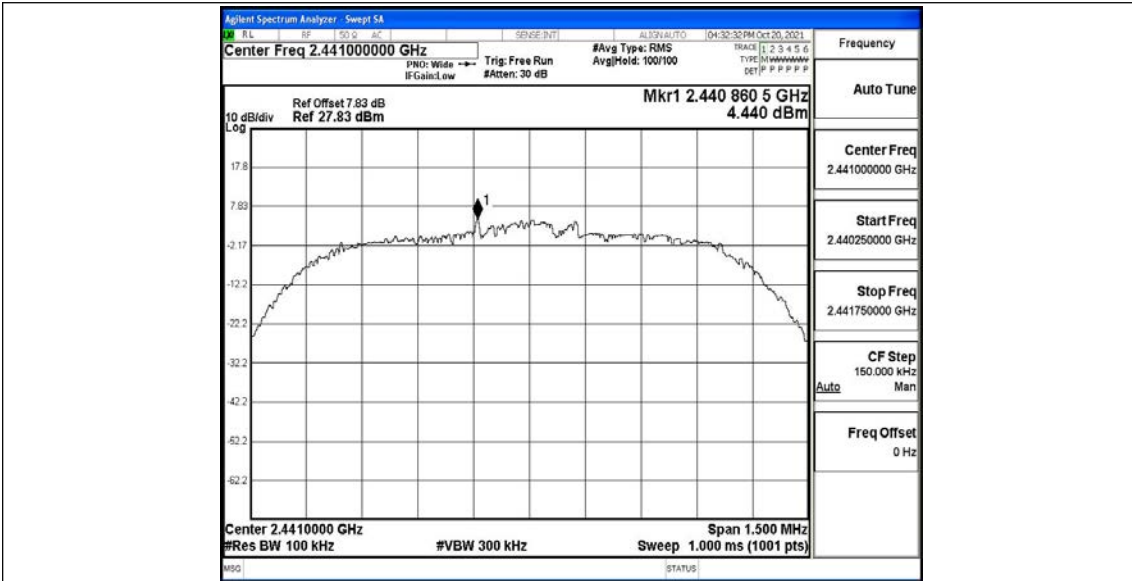
2DH5_Ant1_2402_30~1000



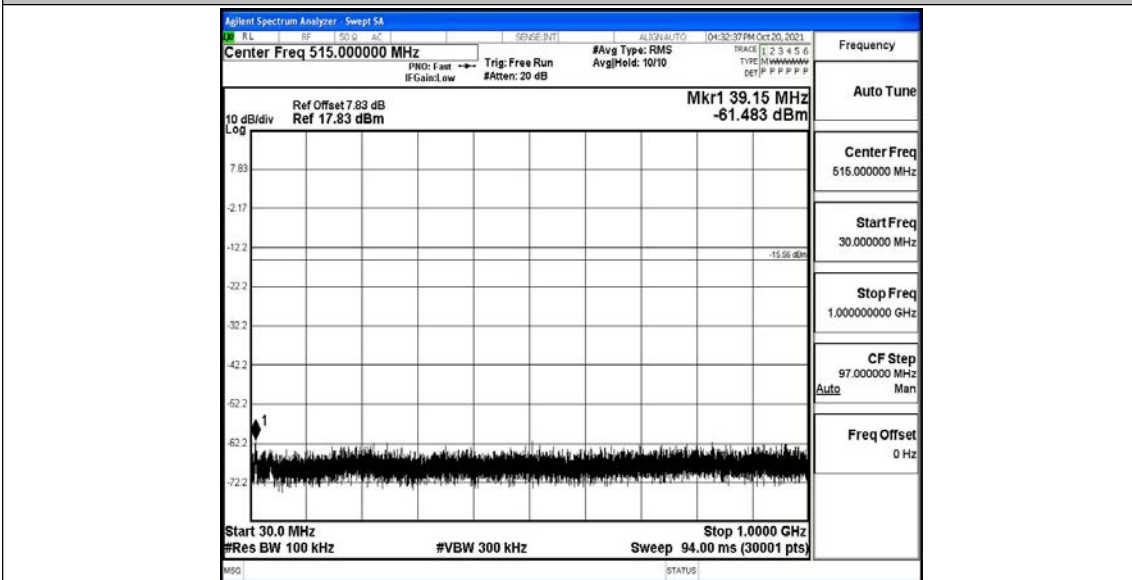
2DH5_Ant1_2402_1000~26500



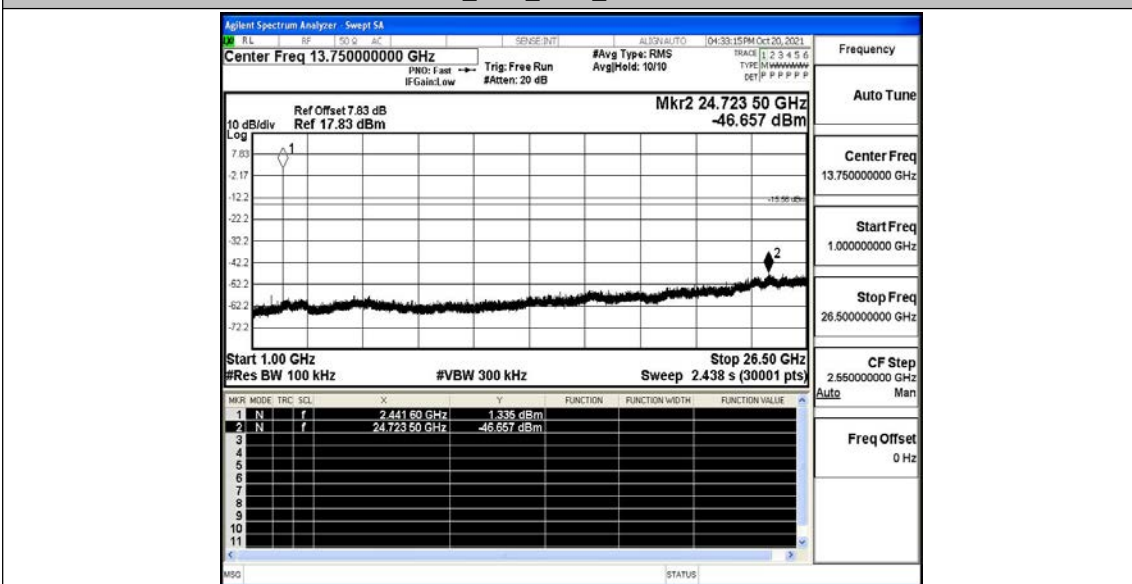
2DH5_Ant1_2441_0~Reference



2DH5_Ant1_2441_30~100

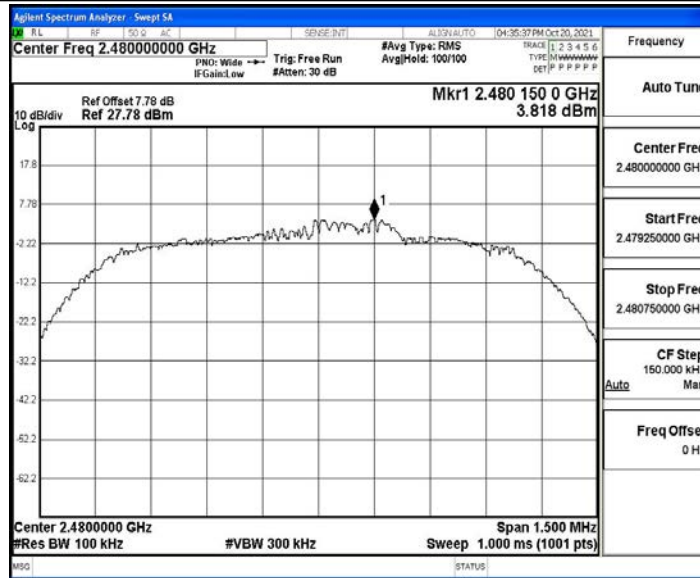


2DH5_Ant1_2441_1000~26500

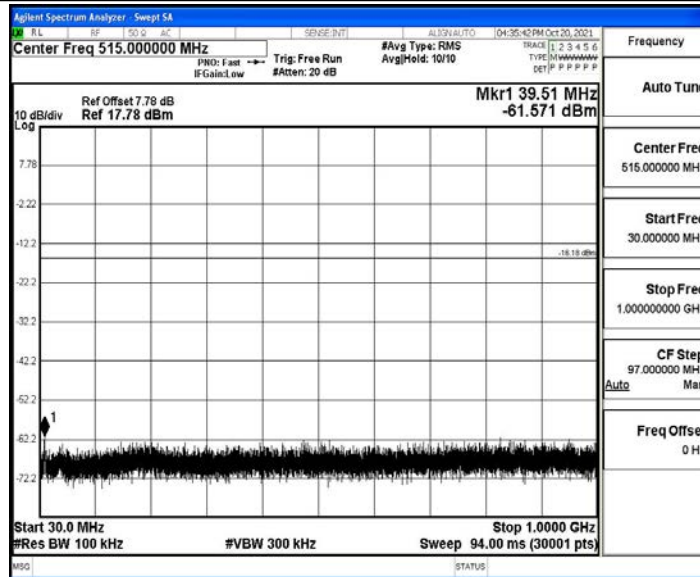




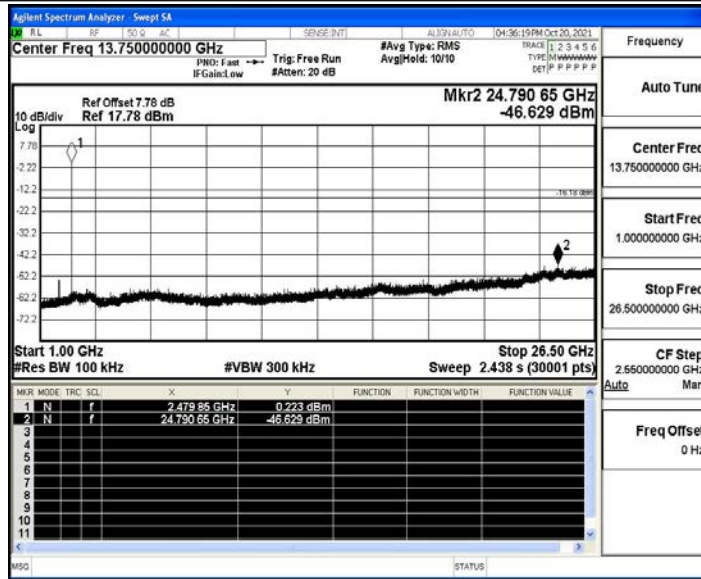
2DH5_Ant1_2480_0~Reference



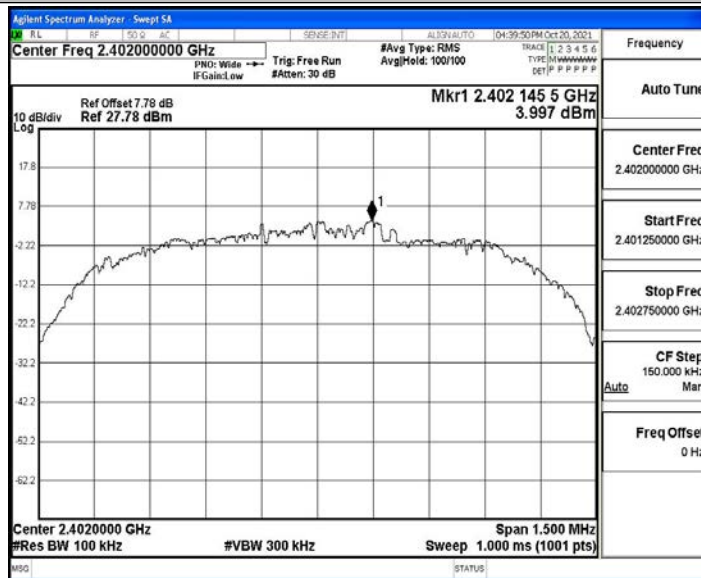
2DH5_Ant1_2480_30~1000



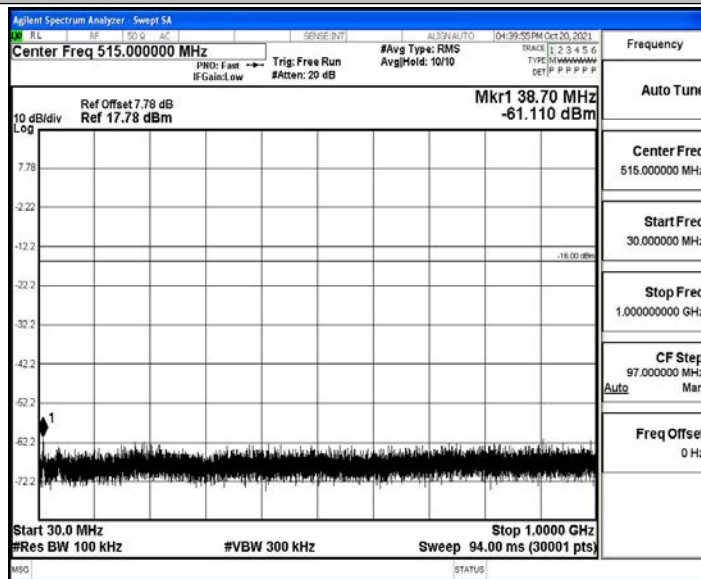
2DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference

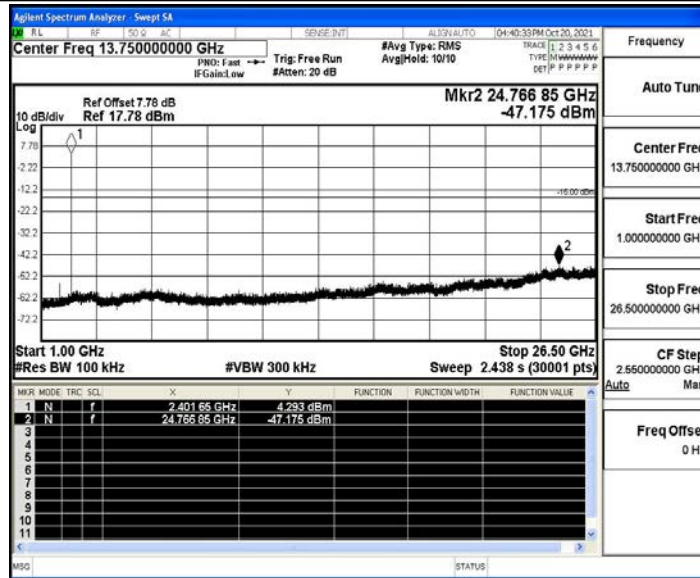


3DH5_Ant1_2402_30~1000

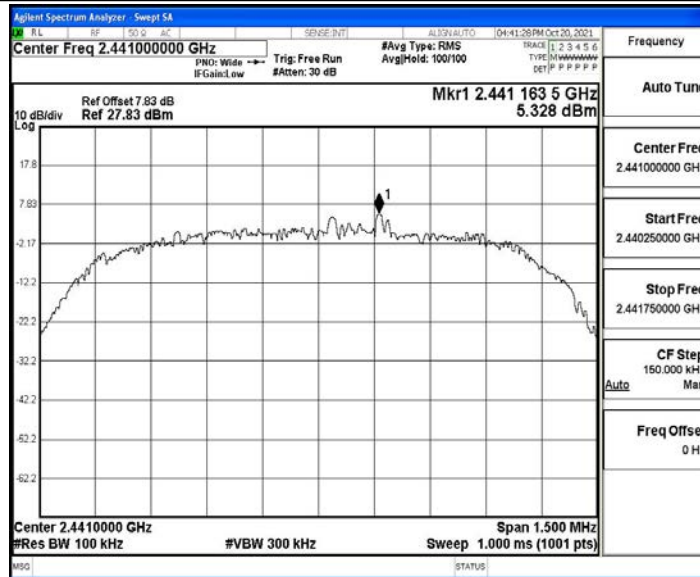




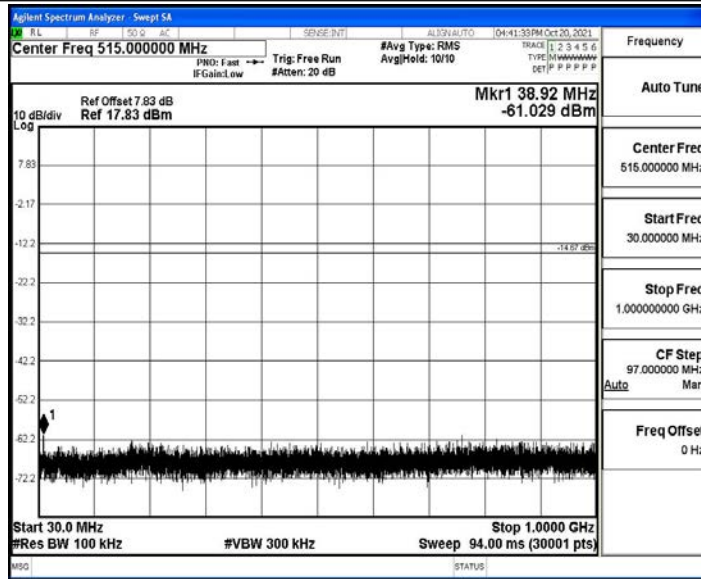
3DH5_Ant1_2402_1000~26500



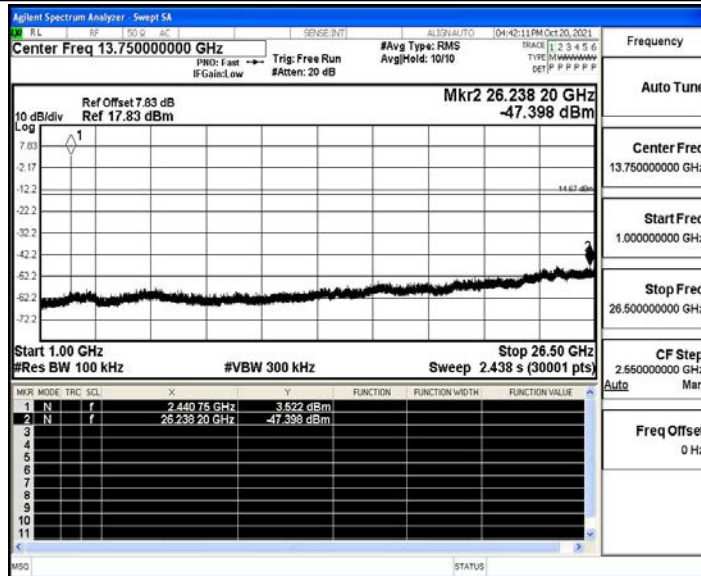
3DH5_Ant1_2441_0~Reference



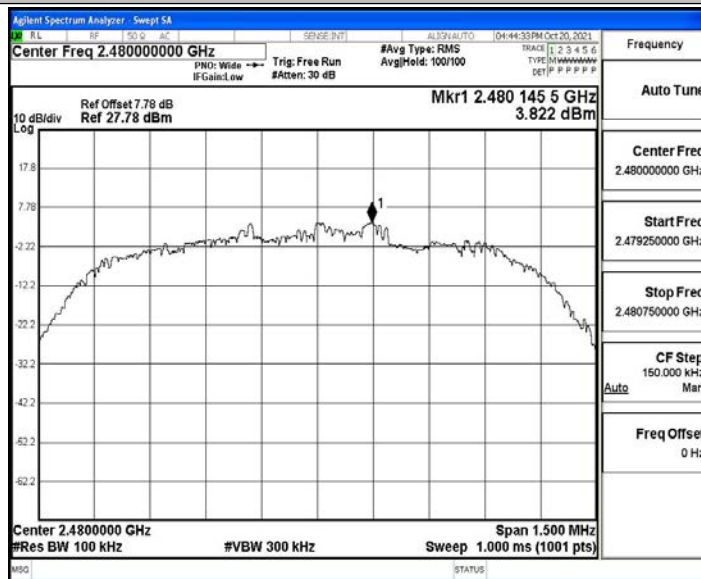
3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500

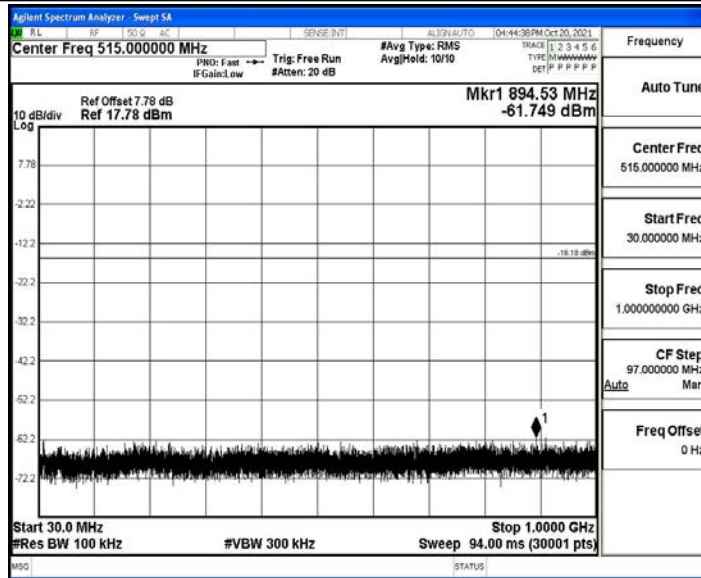


3DH5_Ant1_2480_0~Reference

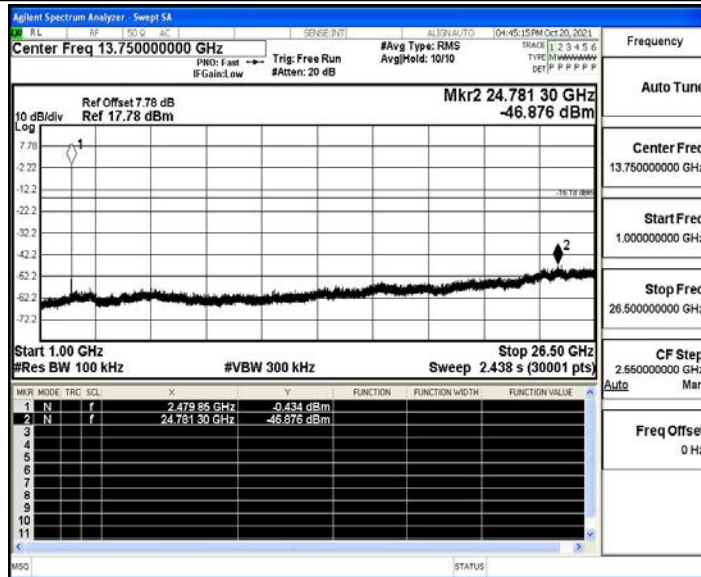




3DH5_Ant1_2480_30~1000



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	-48.85	≤-41.20	46.35	≤54	PASS
				AV	2386.520	-48.39	≤-41.20	46.81	≤54	PASS
				AV	2390.000	-48.47	≤-41.20	46.73	≤54	PASS
				Peak	2310.000	-40.8	≤-21.20	54.40	≤74	PASS
				Peak	2366.570	-37.99	≤-21.20	57.21	≤74	PASS
				Peak	2390.000	-39.69	≤-21.20	55.51	≤74	PASS
		High	2480	AV	2483.500	-47.19	≤-41.20	48.01	≤54	PASS
				AV	2483.520	-47.19	≤-41.20	48.01	≤54	PASS
				AV	2500.000	-47.96	≤-41.20	47.24	≤54	PASS
				Peak	2483.500	-39.87	≤-21.20	55.33	≤74	PASS
				Peak	2496.640	-38.01	≤-21.20	57.19	≤74	PASS
				Peak	2500.000	-40.04	≤-21.20	55.16	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-48.99	≤-41.20	46.21	≤54	PASS
				AV	2378.225	-48.48	≤-41.20	46.72	≤54	PASS
				AV	2390.000	-48.67	≤-41.20	46.53	≤54	PASS
				Peak	2310.000	-42.12	≤-21.20	53.08	≤74	PASS
				Peak	2370.245	-36.62	≤-21.20	58.58	≤74	PASS
				Peak	2390.000	-41.7	≤-21.20	53.50	≤74	PASS
		High	2480	AV	2483.500	-47.29	≤-41.20	47.91	≤54	PASS
				AV	2483.520	-47.28	≤-41.20	47.92	≤54	PASS
				AV	2500.000	-48.09	≤-41.20	47.11	≤54	PASS
				Peak	2483.500	-41.14	≤-21.20	54.06	≤74	PASS
				Peak	2489.840	-37.27	≤-21.20	57.93	≤74	PASS
				Peak	2500.000	-41.37	≤-21.20	53.83	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-48.78	≤-41.20	46.42	≤54	PASS
				AV	2389.670	-48.43	≤-41.20	46.77	≤54	PASS
				AV	2390.000	-48.56	≤-41.20	46.64	≤54	PASS
				Peak	2310.000	-42.6	≤-21.20	52.60	≤74	PASS
				Peak	2346.830	-38.53	≤-21.20	56.67	≤74	PASS
				Peak	2390.000	-41.53	≤-21.20	53.67	≤74	PASS
		High	2480	AV	2483.500	-47.11	≤-41.20	48.09	≤54	PASS
				AV	2483.520	-47.11	≤-41.20	48.09	≤54	PASS
				AV	2500.000	-48.09	≤-41.20	47.11	≤54	PASS
				Peak	2483.500	-41.21	≤-21.20	53.99	≤74	PASS
				Peak	2488.640	-39.02	≤-21.20	56.18	≤74	PASS
				Peak	2500.000	-41.82	≤-21.20	53.38	≤74	PASS



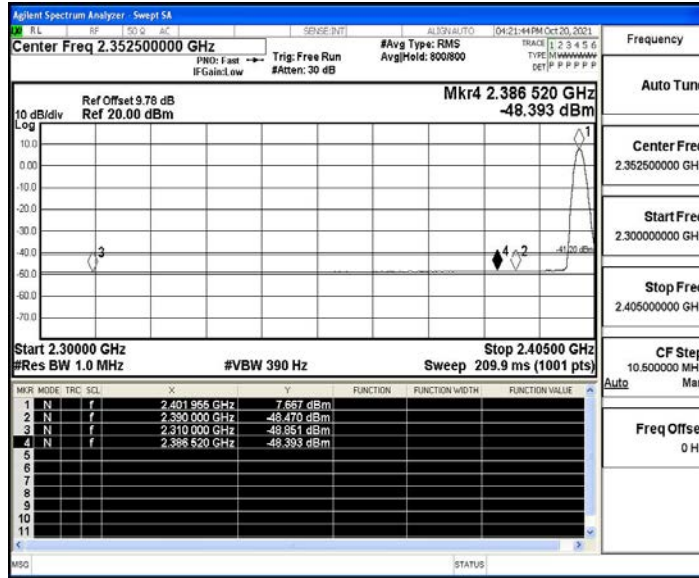
Note:

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.

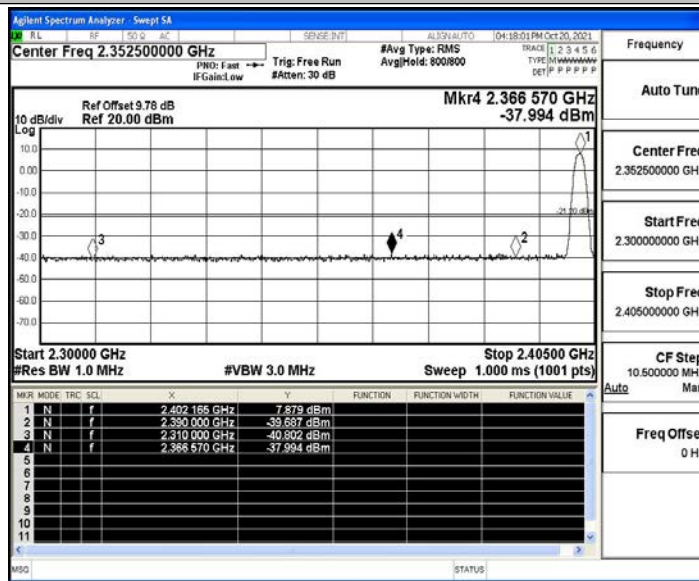


Test Graphs

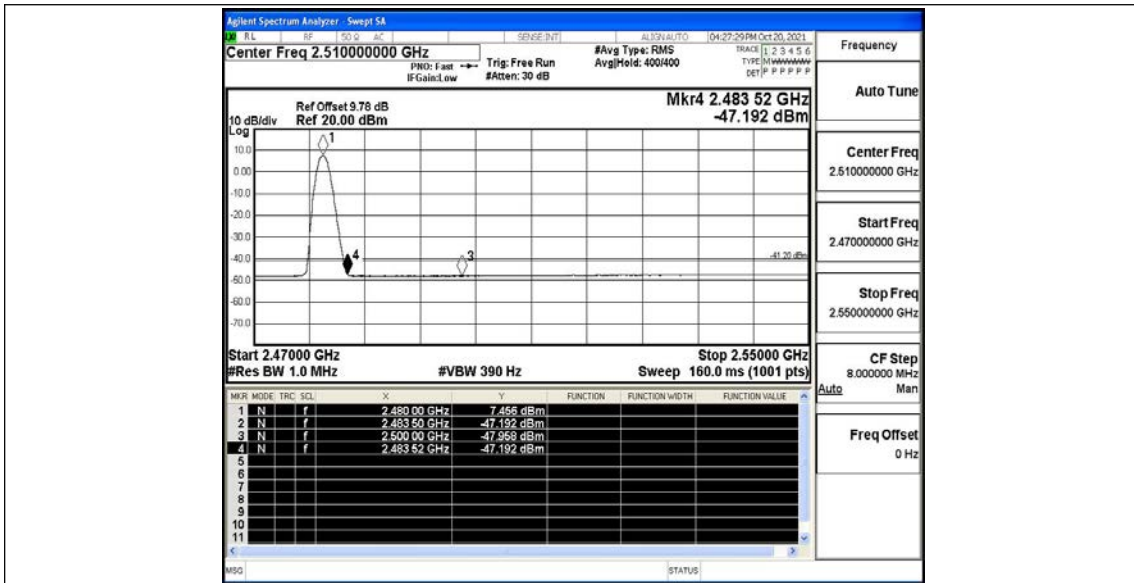
DH5_Ant1_Low_2402_AV



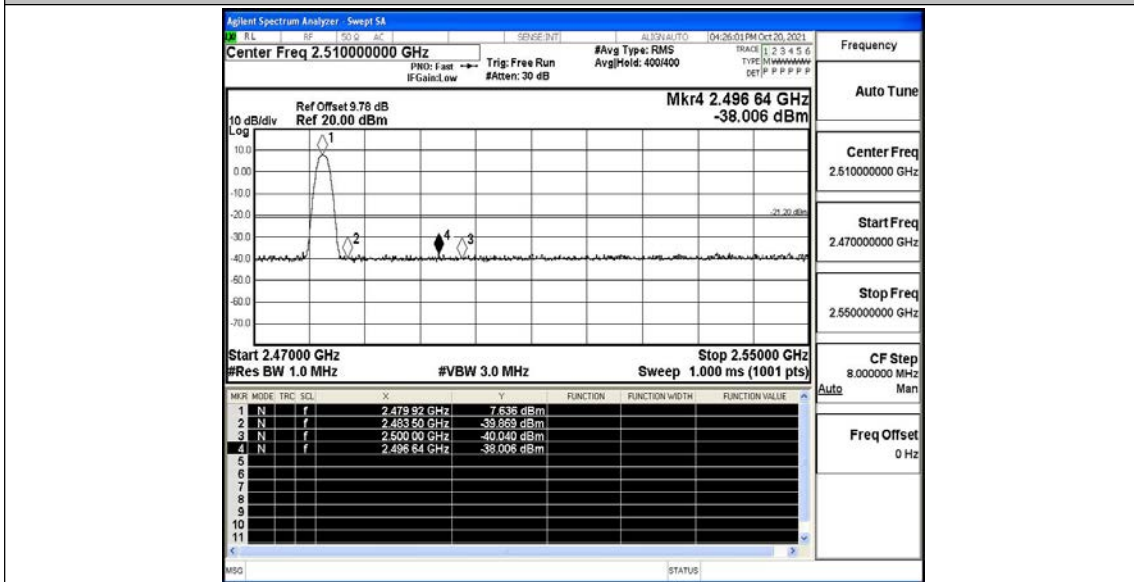
DH5_Ant1_Low_2402_Peak



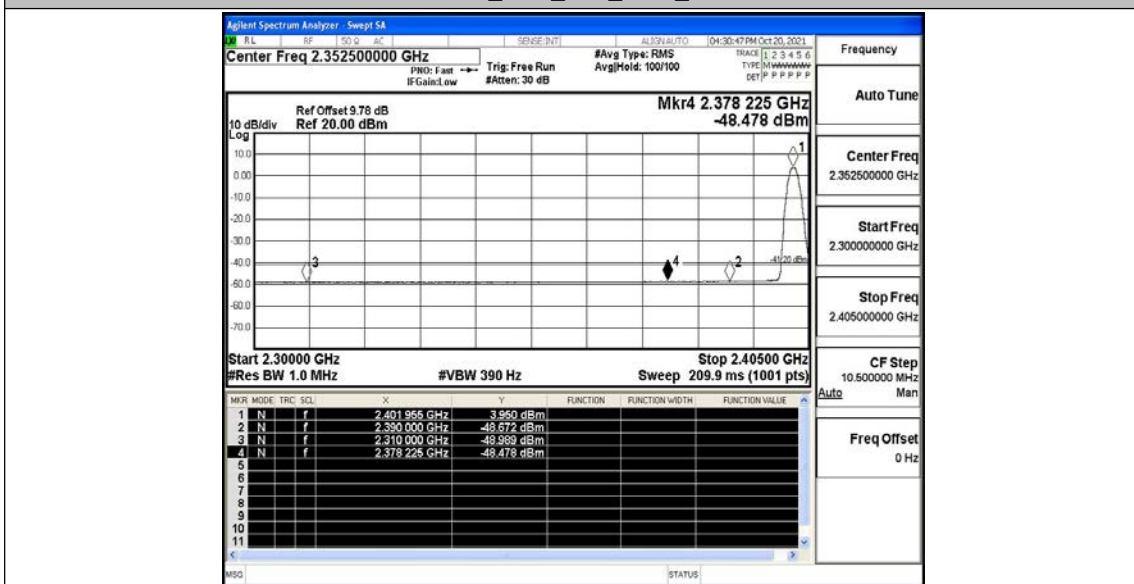
DH5_Ant1_High_2480_AV



DH5_Ant1_High_2480_Peak

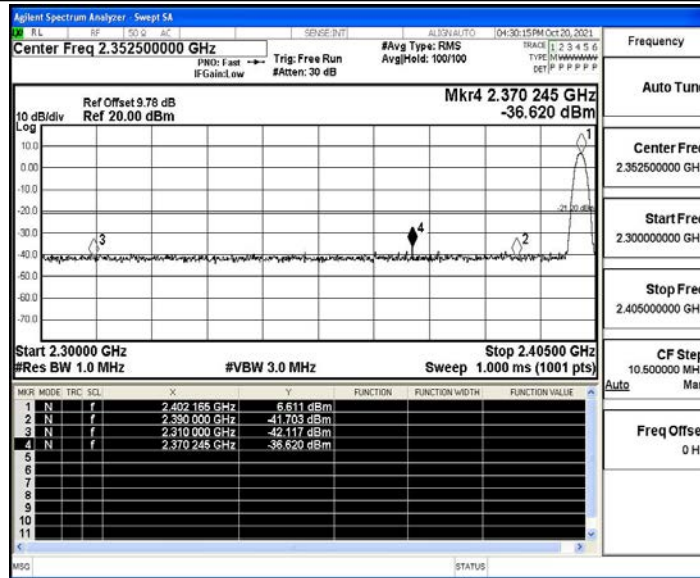


2DH5_Ant1_Low_2402_AV

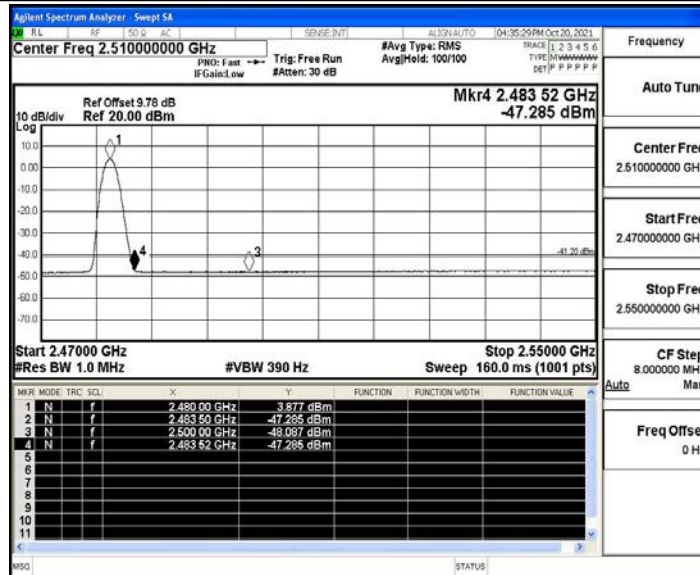




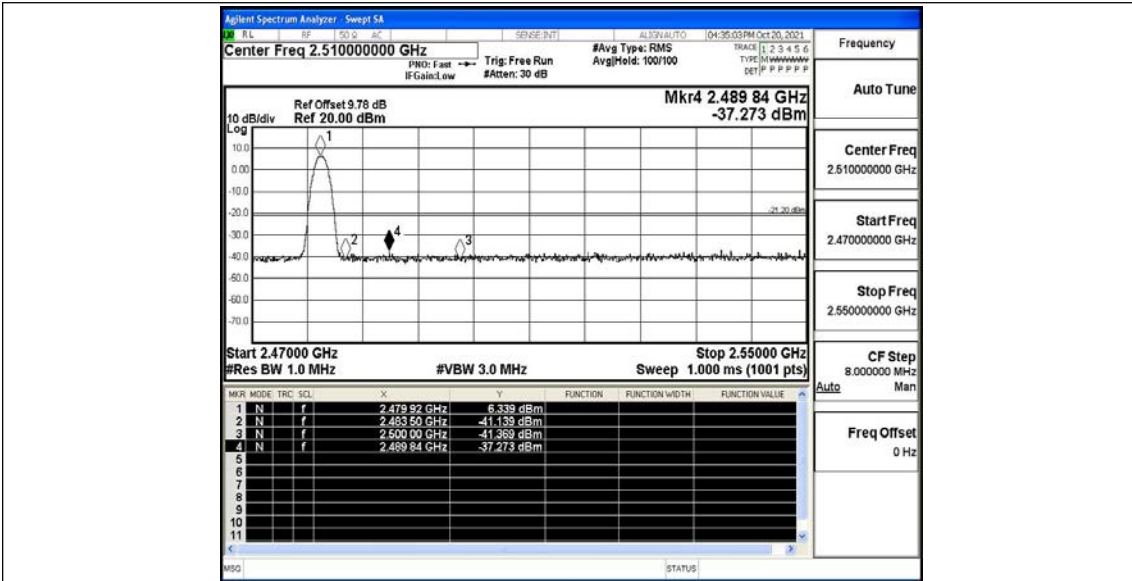
2DH5_Ant1_Low_2402_Peak



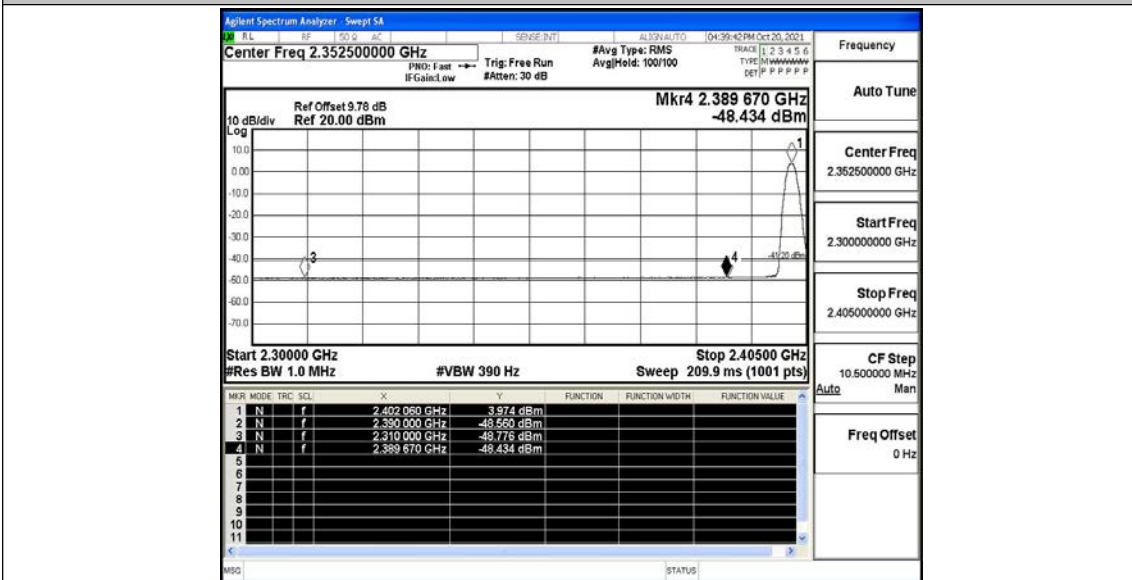
2DH5_Ant1_High_2480_AV



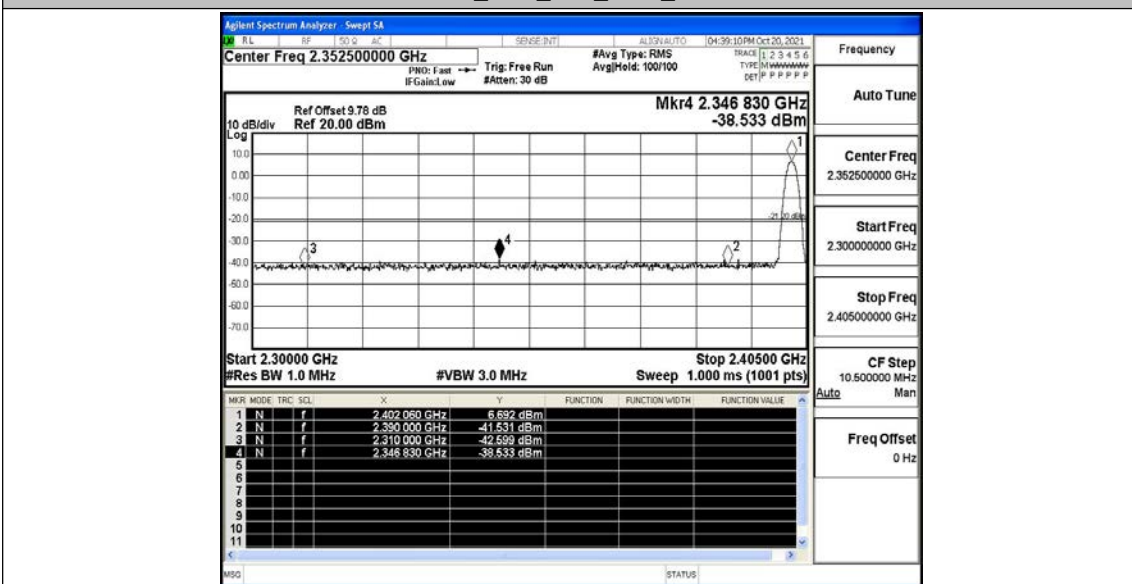
2DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_2402_AV

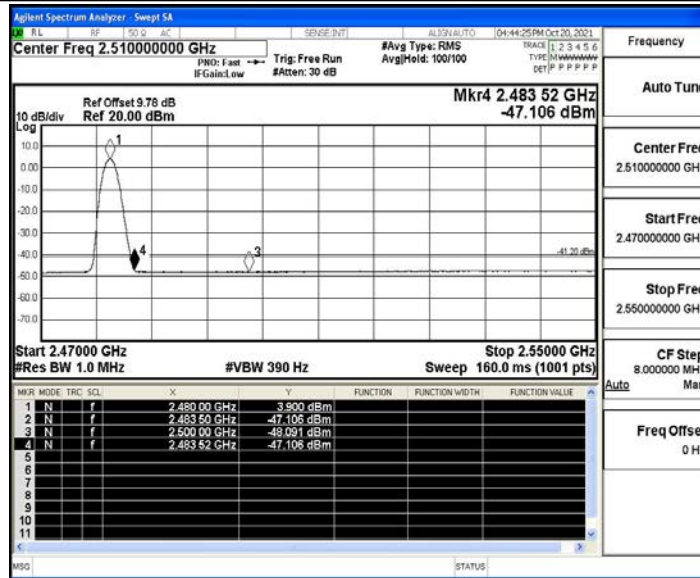


3DH5_Ant1_Low_2402_Peak





3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak

