



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Key cutting machine

Trade Mark: XTOOL

Test Model: KNC81

Environmental Conditions

Temperature:	21.1° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Monkey Li
Supervised by:	Li Huan

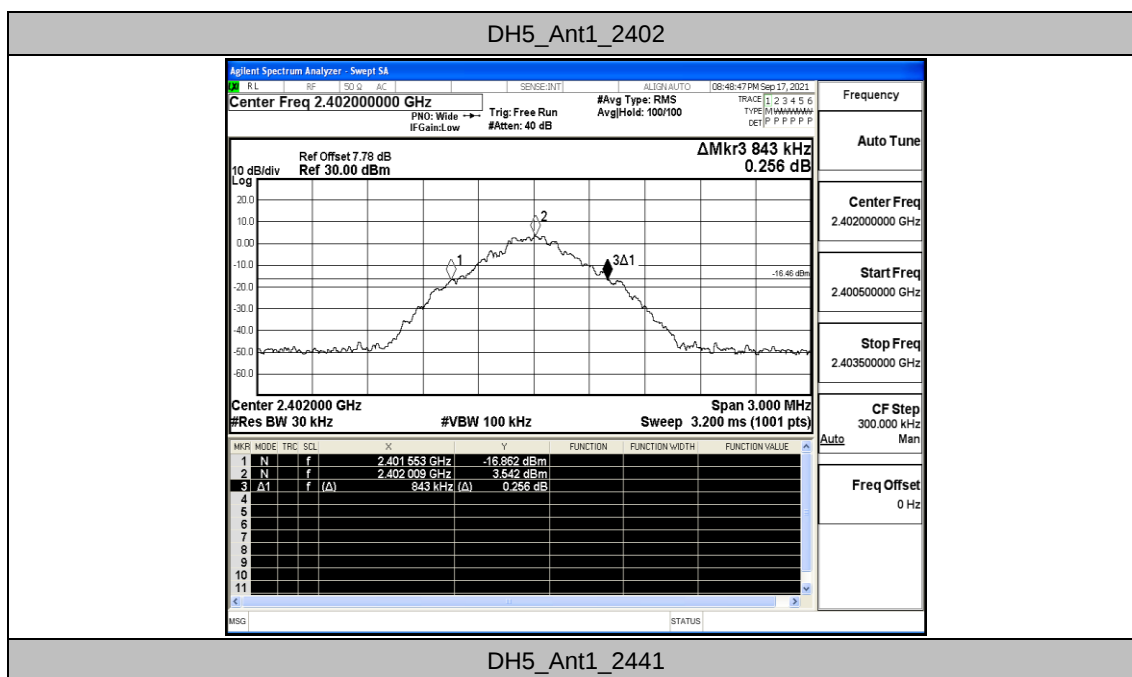


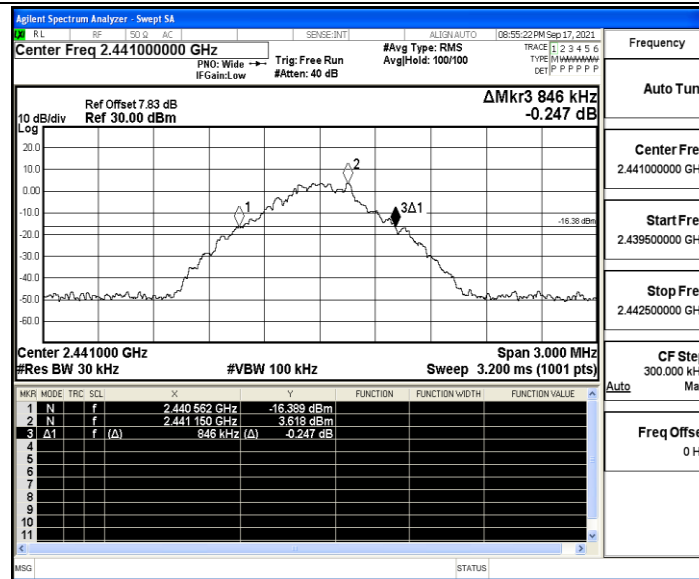
A.1 20dB Emission Bandwidth

Test Result

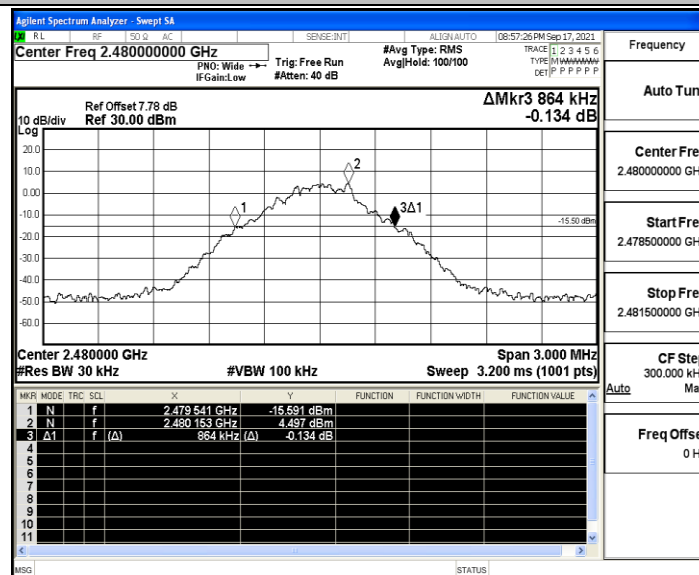
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.843	2401.553	2402.396	---	PASS
		2441	0.846	2440.562	2441.408	---	PASS
		2480	0.864	2479.541	2480.405	---	PASS
2DH5	Ant1	2402	1.281	2401.358	2402.639	---	PASS
		2441	1.356	2440.313	2441.669	---	PASS
		2480	1.311	2479.334	2480.645	---	PASS
3DH5	Ant1	2402	1.314	2401.340	2402.654	---	PASS
		2441	1.302	2440.340	2441.642	---	PASS
		2480	1.281	2479.346	2480.627	---	PASS

Test Graphs

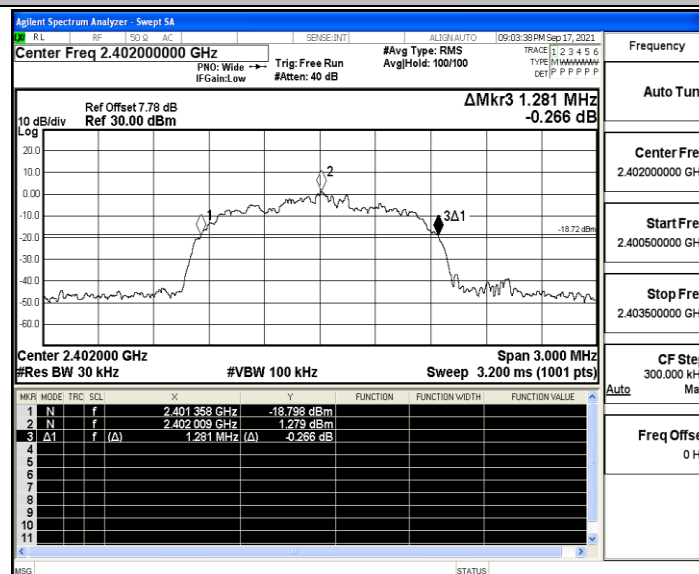




DH5_Ant1_2480

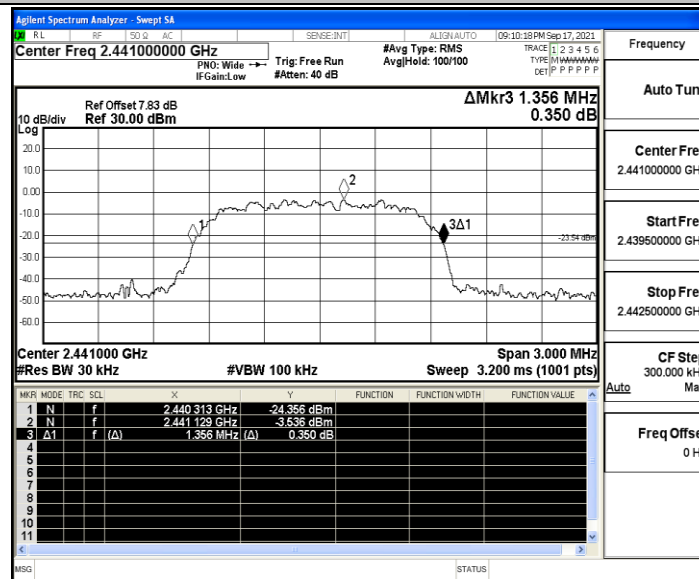


2DH5_Ant1_2402

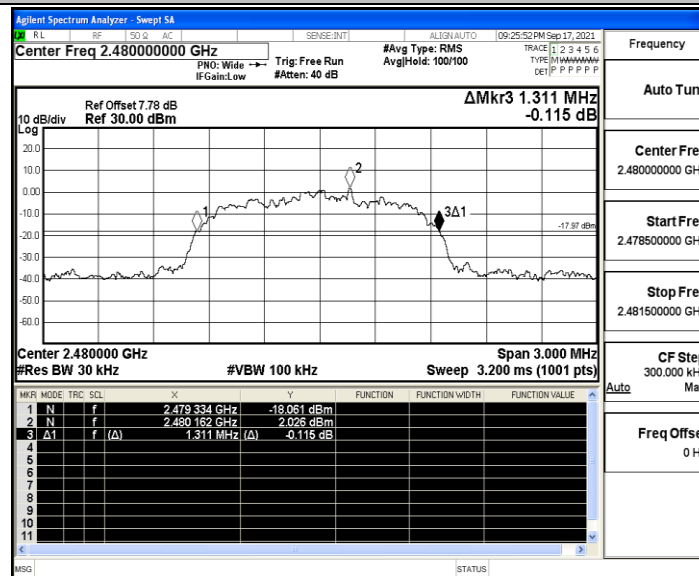




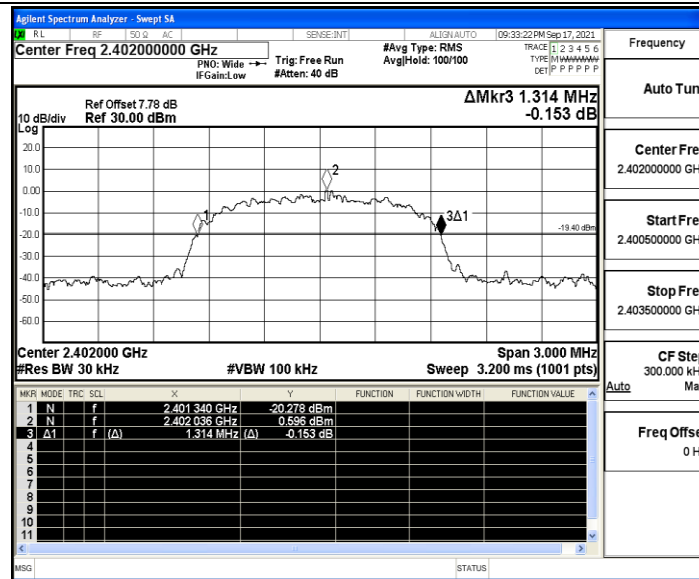
2DH5_Ant1_2441



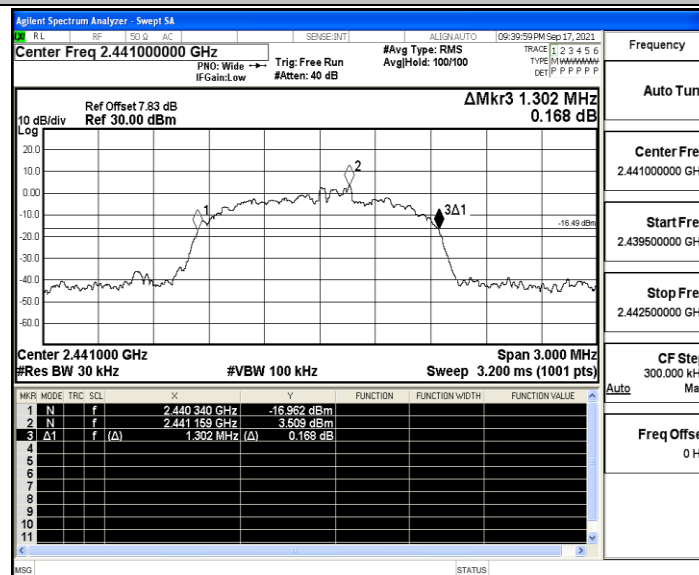
2DH5_Ant1_2480



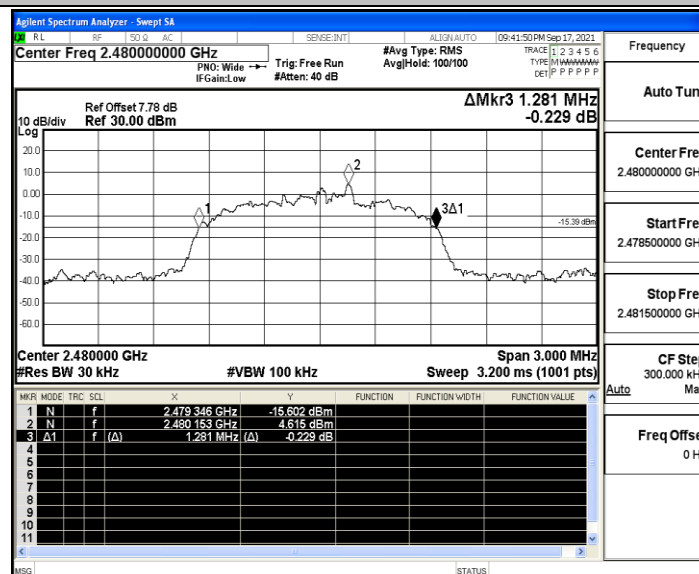
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



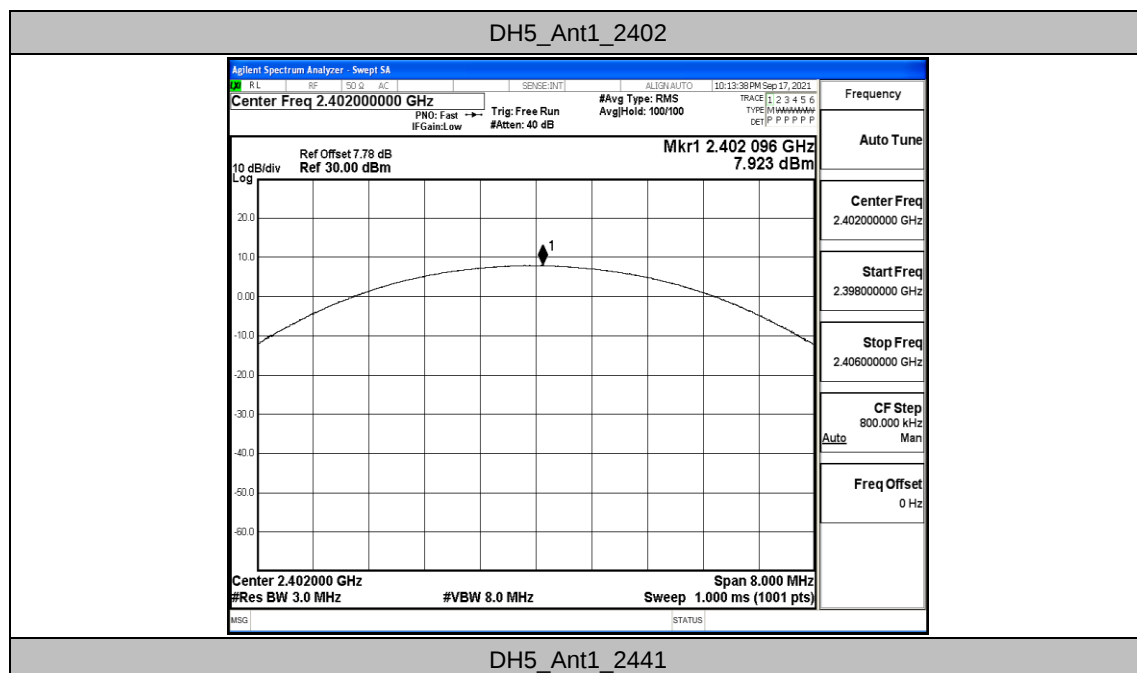


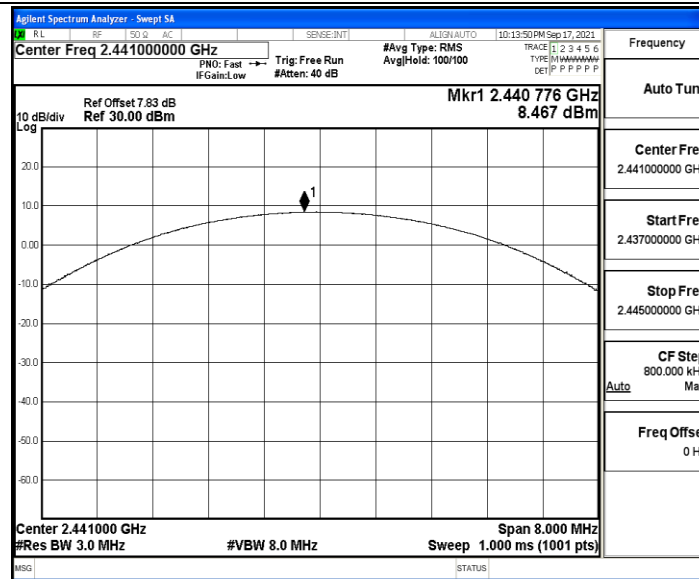
A.2 Maximum conducted output power

Test Result

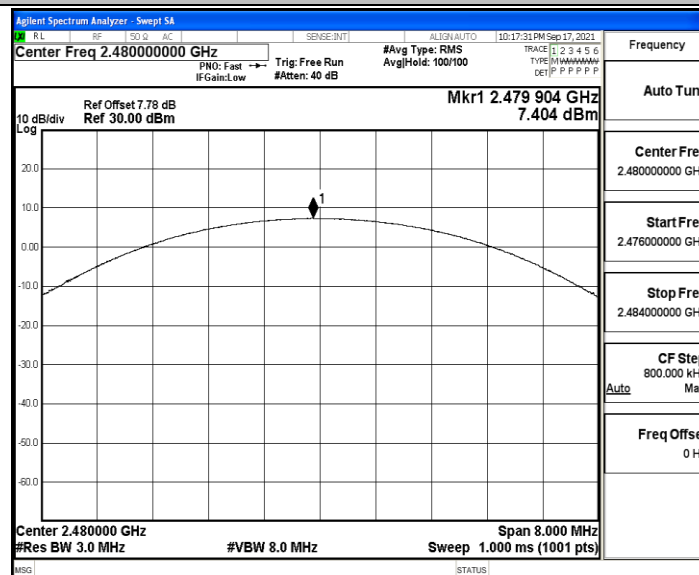
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	7.92	≤30	PASS
		2441	8.47	≤30	PASS
		2480	7.4	≤30	PASS
2DH5	Ant1	2402	7.15	≤30	PASS
		2441	7.9	≤30	PASS
		2480	7.29	≤30	PASS
3DH5	Ant1	2402	7.27	≤30	PASS
		2441	7.87	≤30	PASS
		2480	7.49	≤30	PASS

Test Graphs

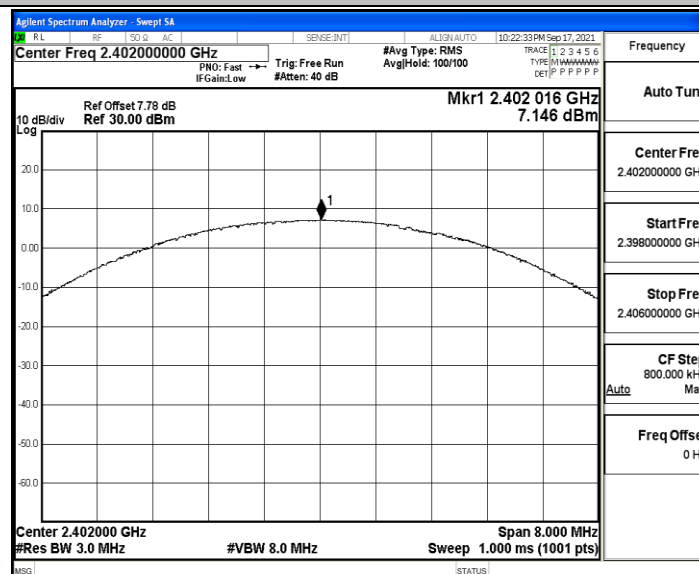




DH5_Ant1_2480

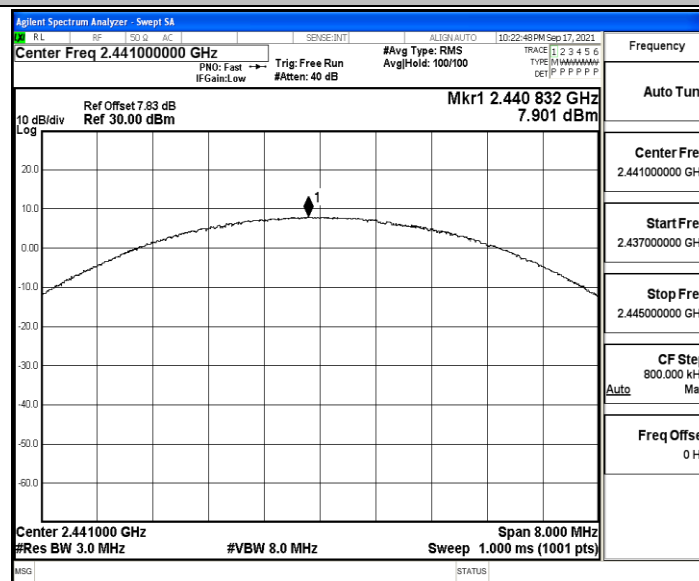


2DH5_Ant1_2402

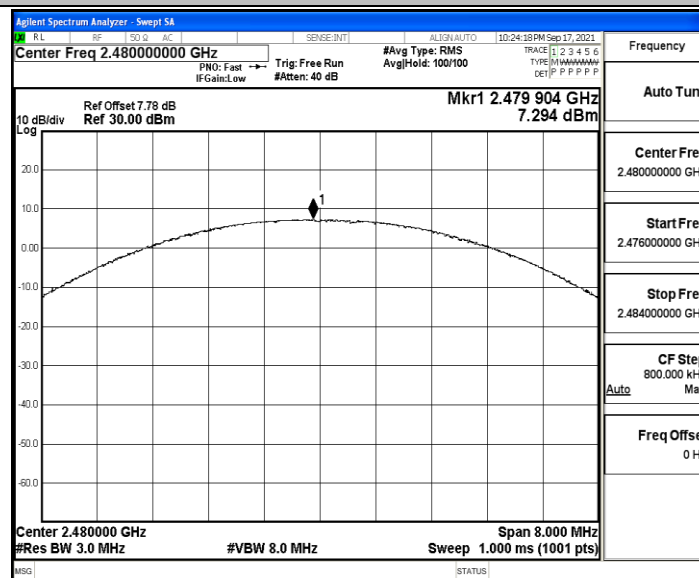




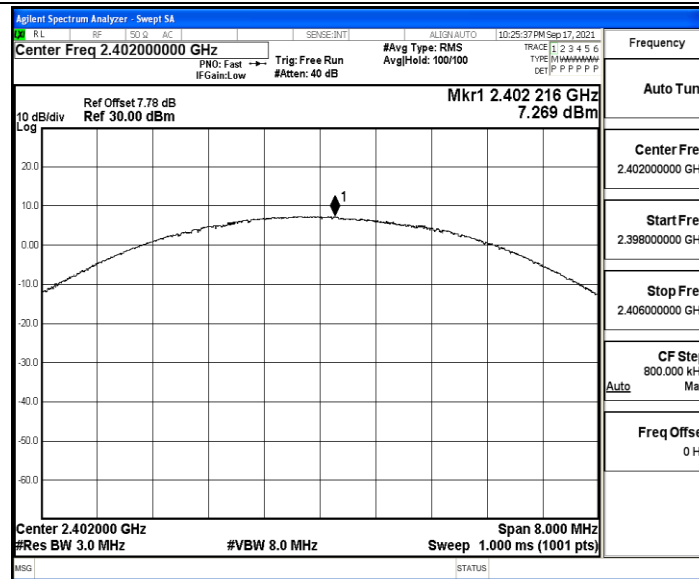
2DH5_Ant1_2441



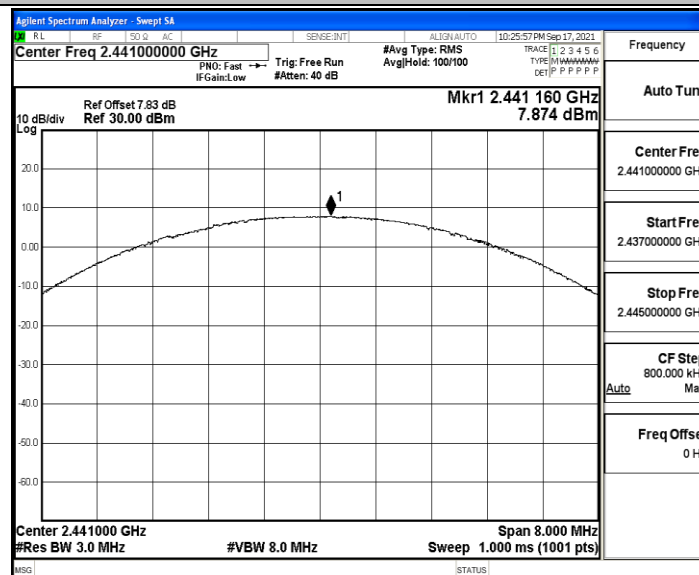
2DH5_Ant1_2480



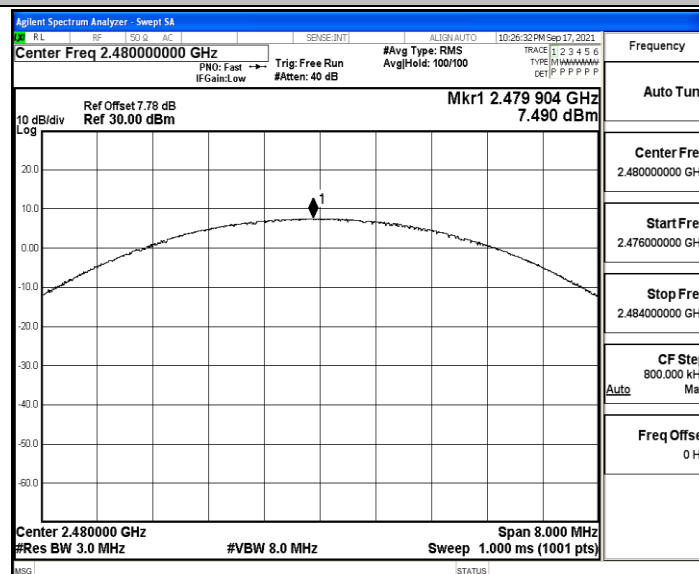
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



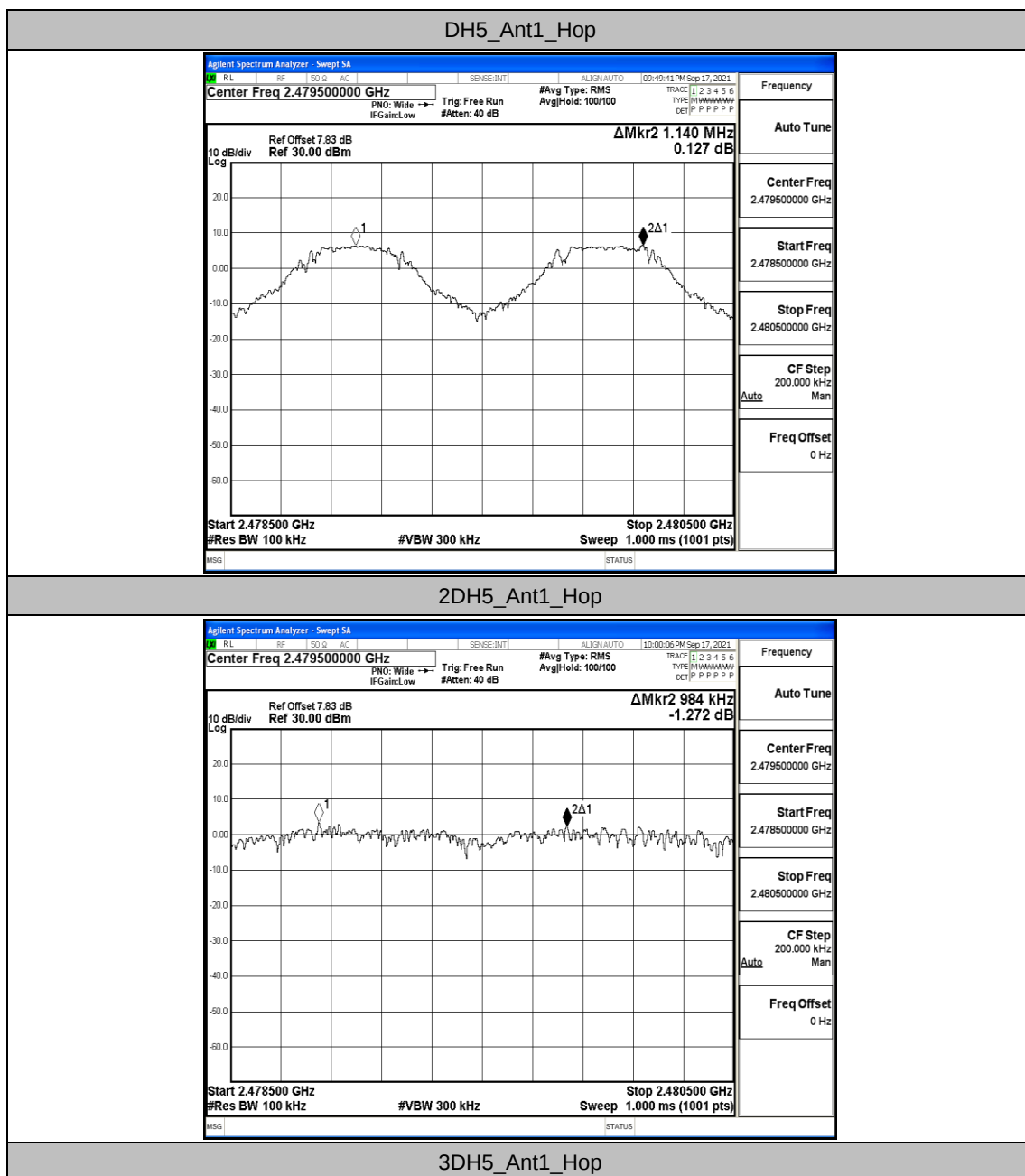


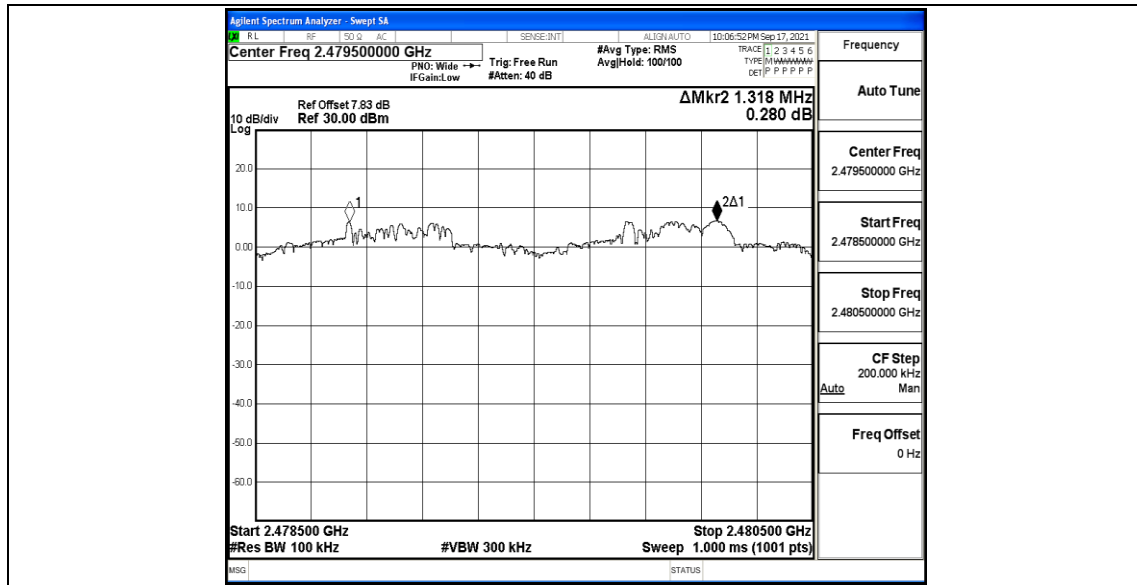
A.3 Carrier frequency separation

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	Hop	1.14	≥ 0.864	PASS
2DH5	Ant1	Hop	0.984	≥ 0.904	PASS
3DH5	Ant1	Hop	1.318	≥ 1.314	PASS

Test Graphs





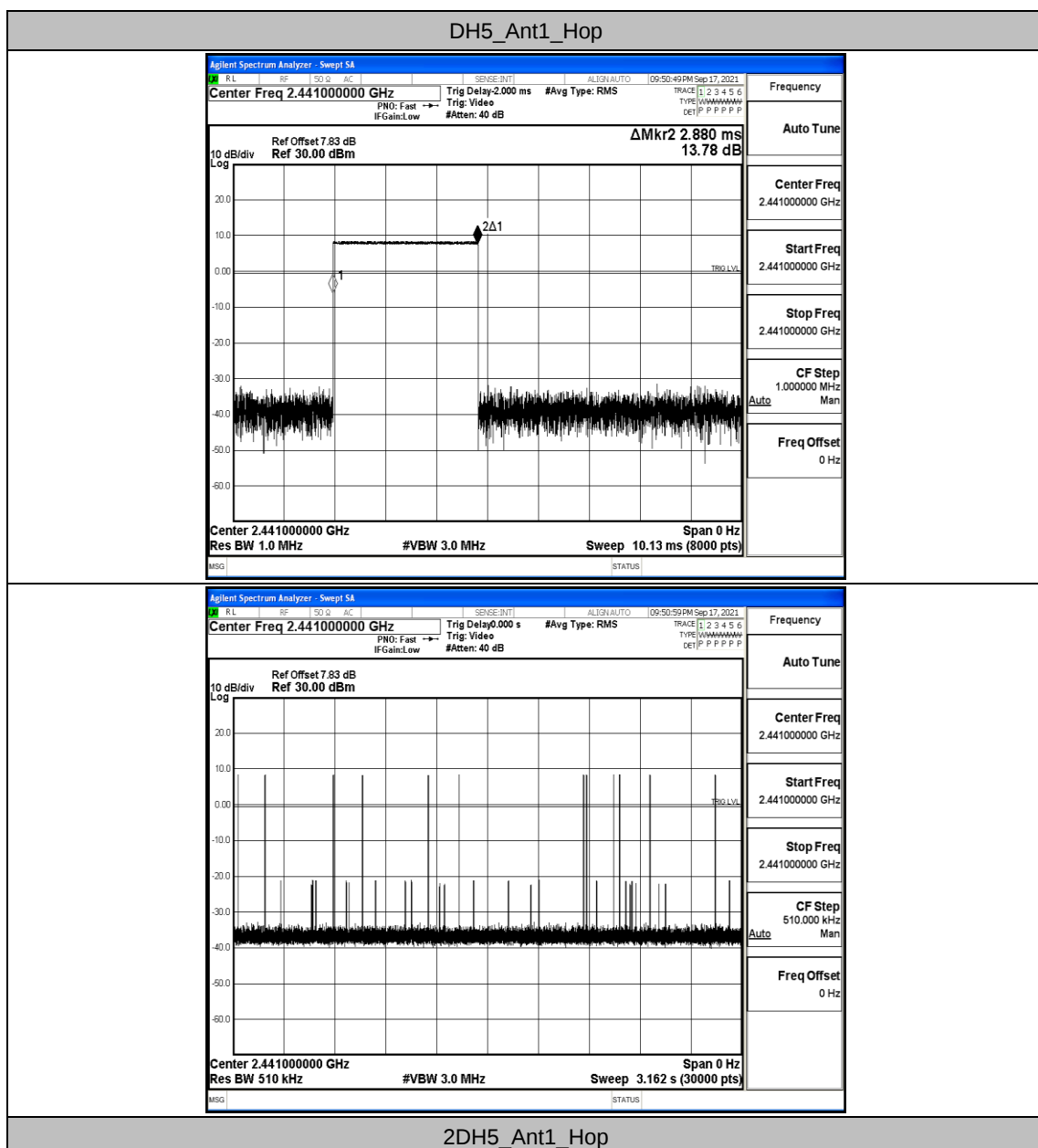


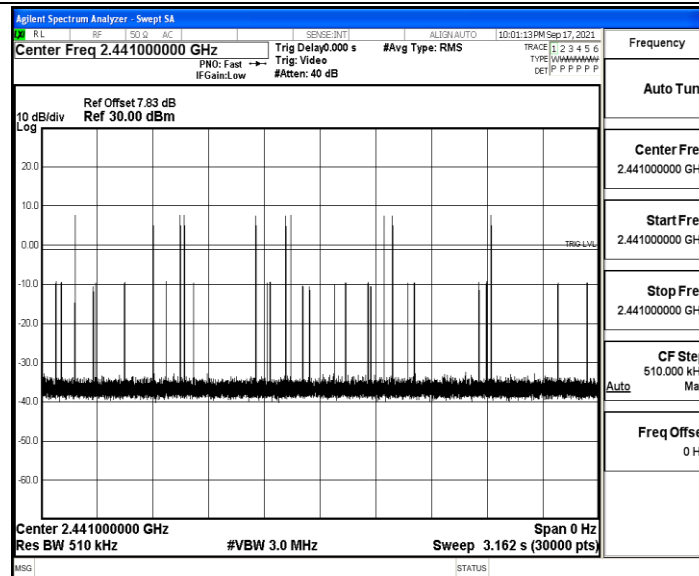
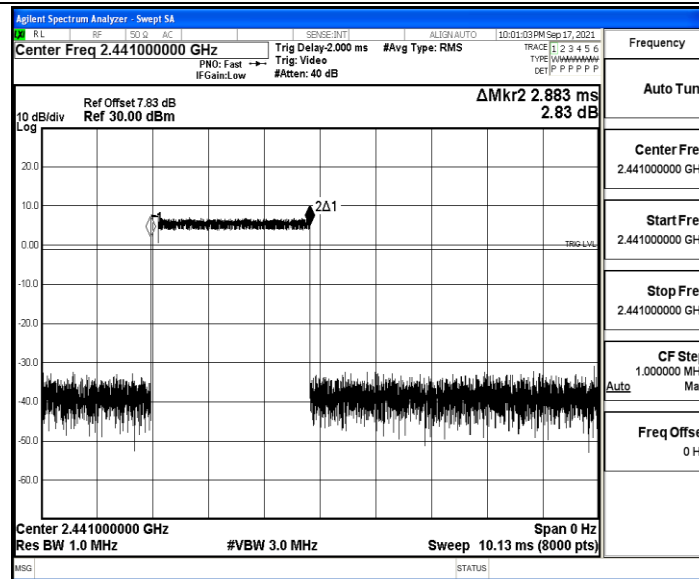
A.4 Time of occupancy

Test Result

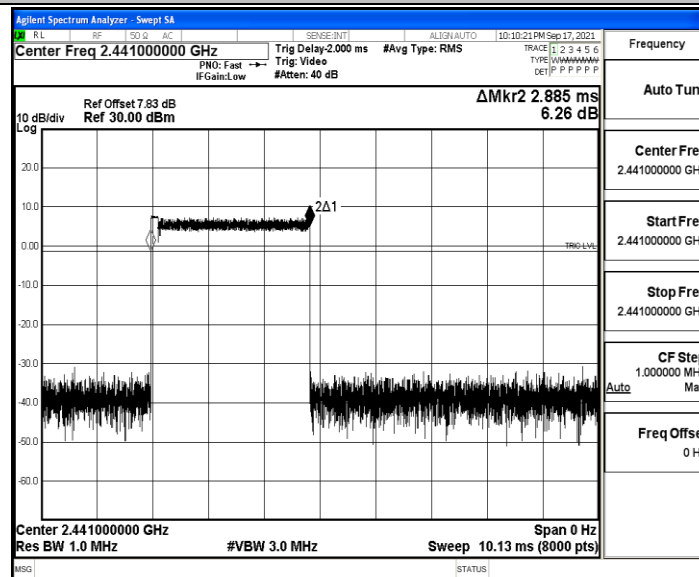
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.88	130	0.374	≤0.4	PASS
2DH5	Ant1	Hop	2.88	110	0.317	≤0.4	PASS
3DH5	Ant1	Hop	2.89	60	0.173	≤0.4	PASS

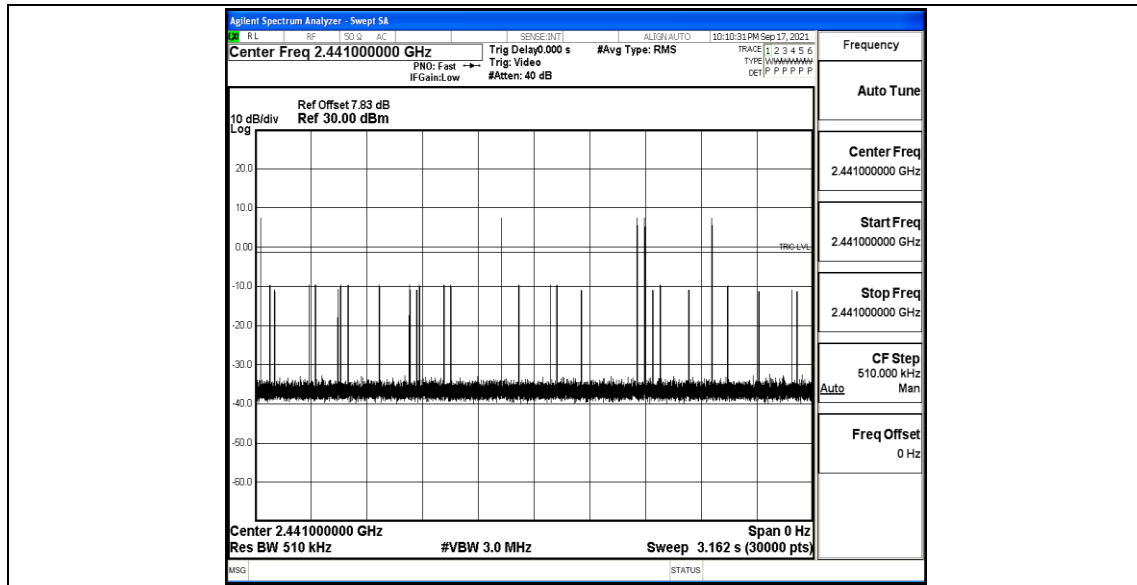
Test Graphs





3DH5_Ant1_Hop





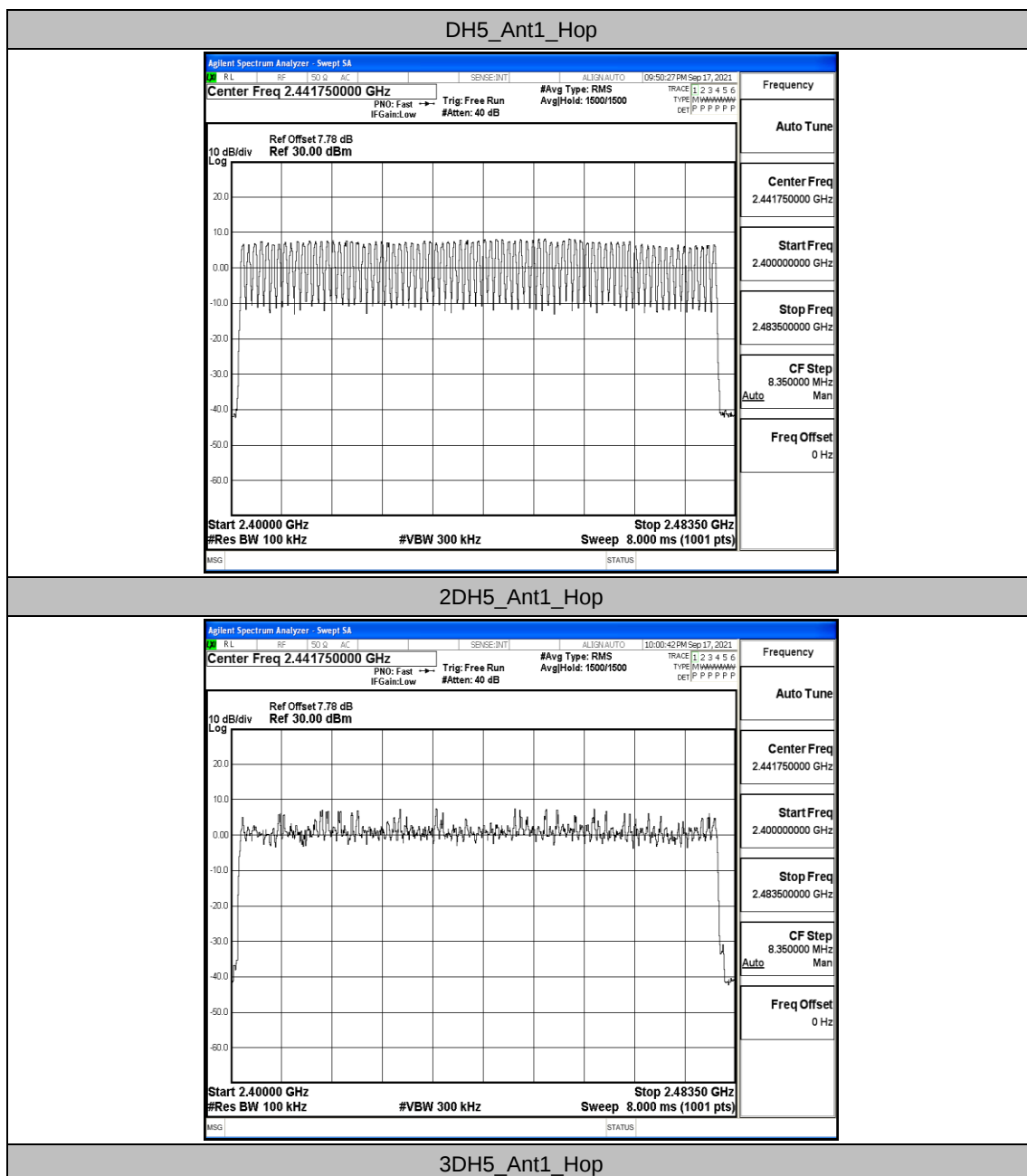


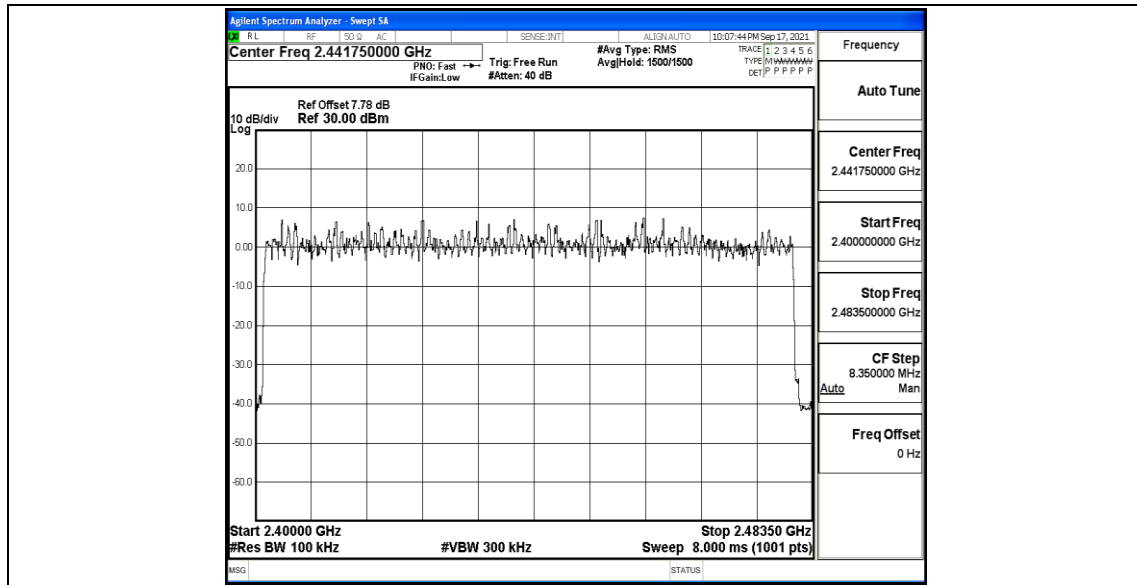
A.5 Number of hopping channels

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

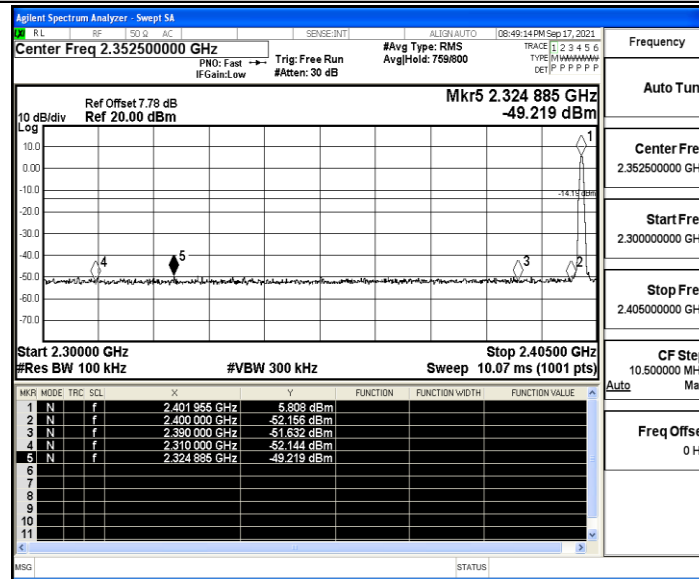
Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	5.81	-49.22	≤ -14.19	PASS
		High	2480	6.81	-48.32	≤ -13.19	PASS
		Low	Hop_2402	7.06	-49.96	≤ -12.94	PASS
		High	Hop_2480	6.81	-48.59	≤ -13.2	PASS
2DH5	Ant1	Low	2402	5.07	-49.29	≤ -14.93	PASS
		High	2480	6.01	-48.04	≤ -13.99	PASS
		Low	Hop_2402	2.18	-49.72	≤ -17.83	PASS
		High	Hop_2480	6.35	-48.51	≤ -13.65	PASS
3DH5	Ant1	Low	2402	6.02	-47.93	≤ -13.98	PASS
		High	2480	6.94	-48.69	≤ -13.06	PASS
		Low	Hop_2402	2.87	-49.35	≤ -17.14	PASS
		High	Hop_2480	5.52	-47.9	≤ -14.49	PASS

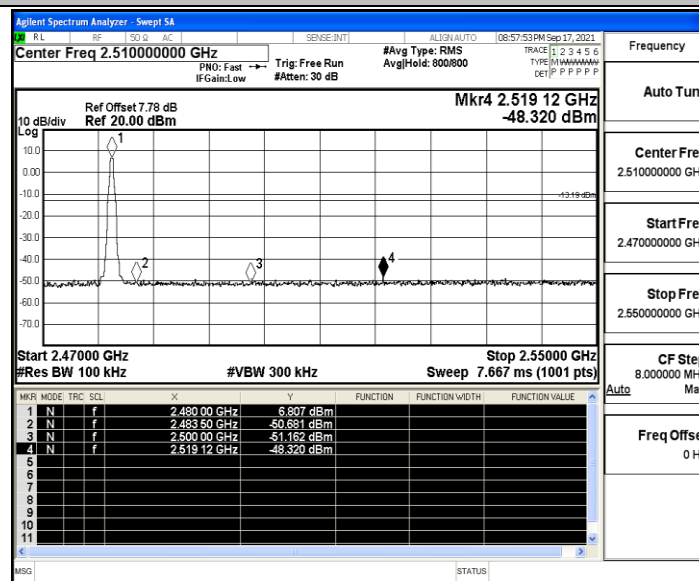


Test Graphs

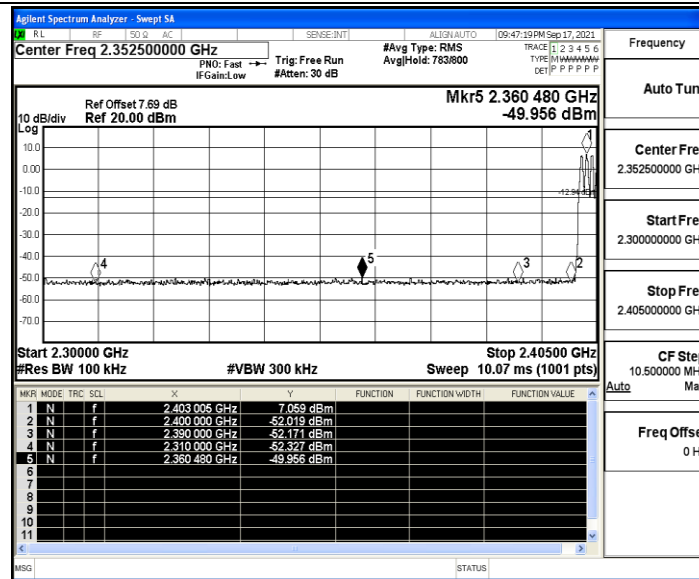
DH5_Ant1_Low_2402



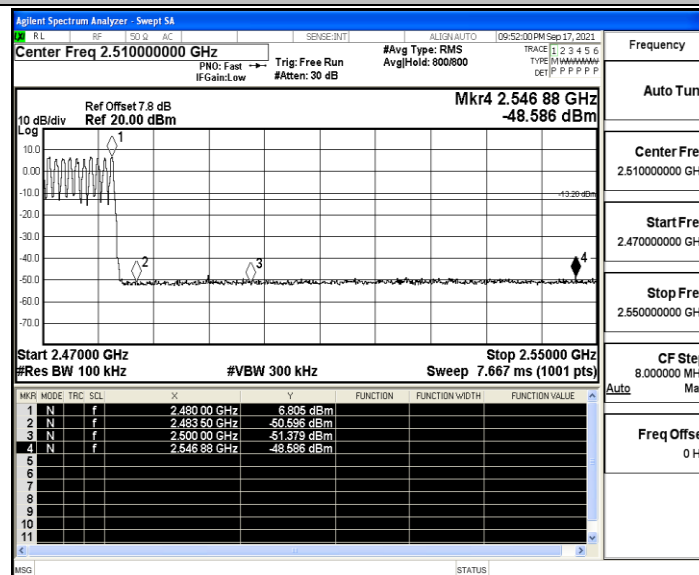
DH5_Ant1_High_2480



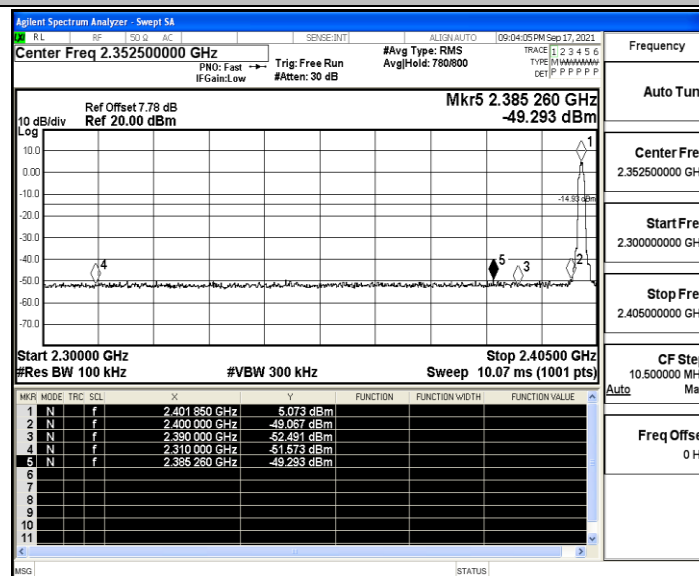
DH5_Ant1_Low_Hop_2402



DH5_Ant1_High_Hop_2480

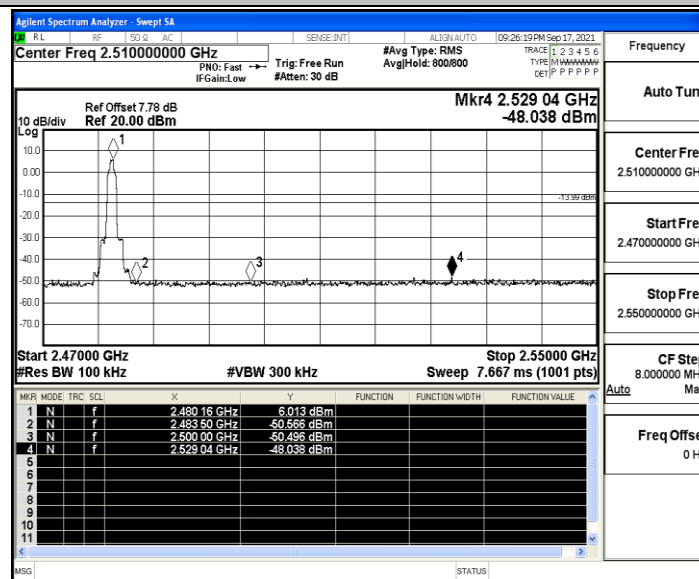


2DH5_Ant1_Low_2402

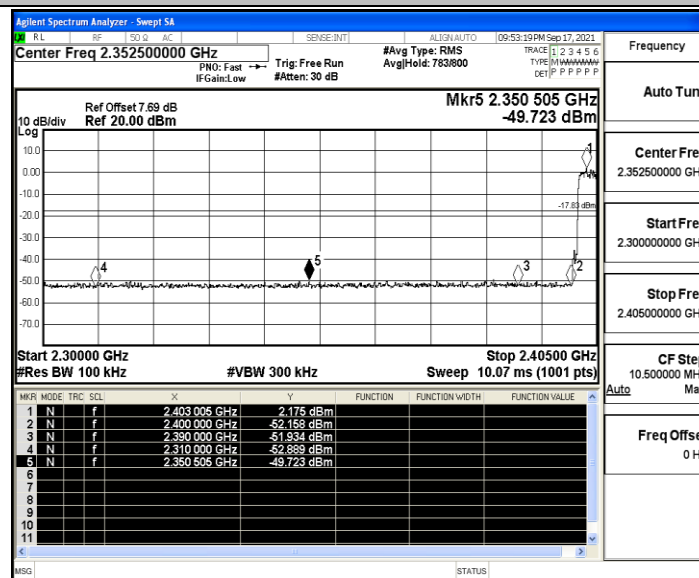




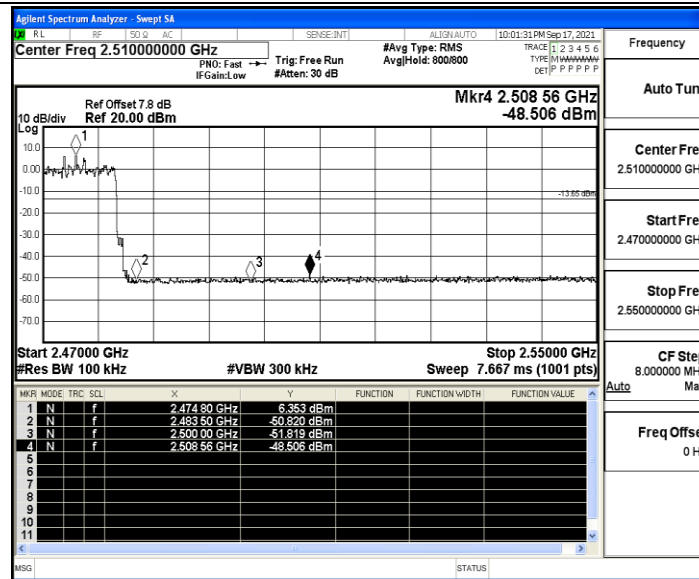
2DH5_Ant1_High_2480



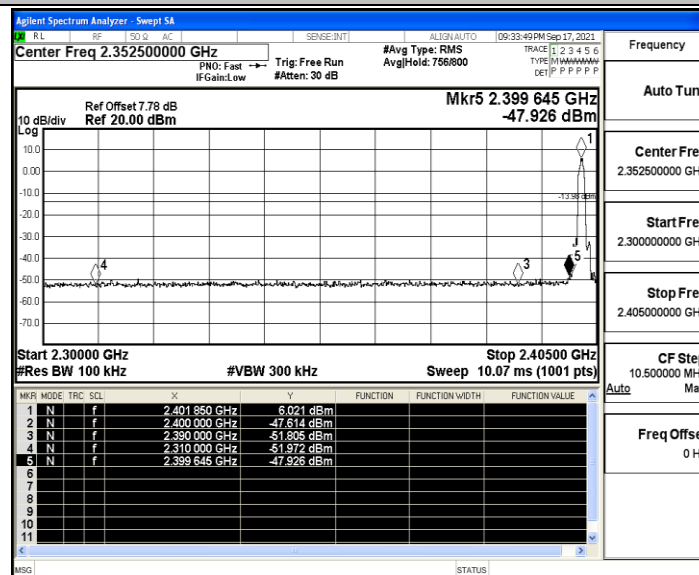
2DH5_Ant1_Low_Hop_2402



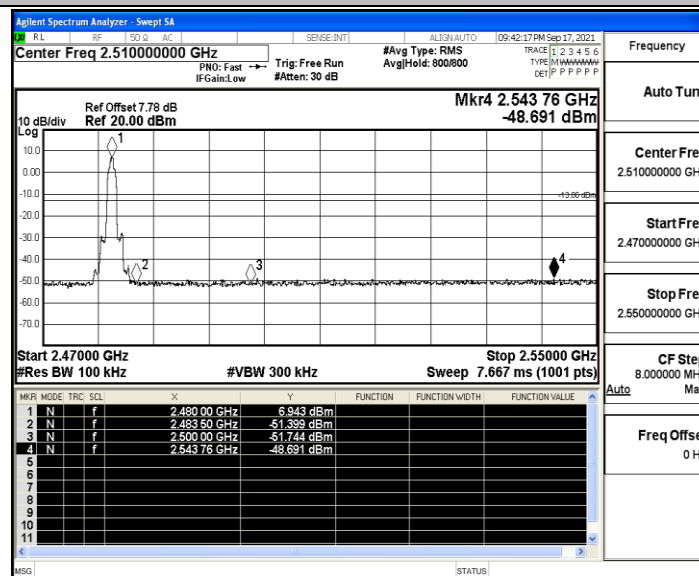
2DH5_Ant1_High_Hop_2480



3DH5_Ant1_Low_2402

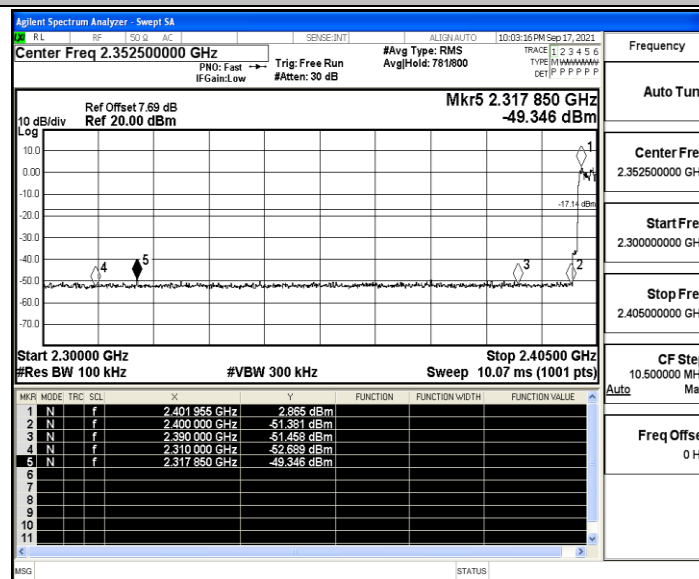


3DH5_Ant1_High_2480

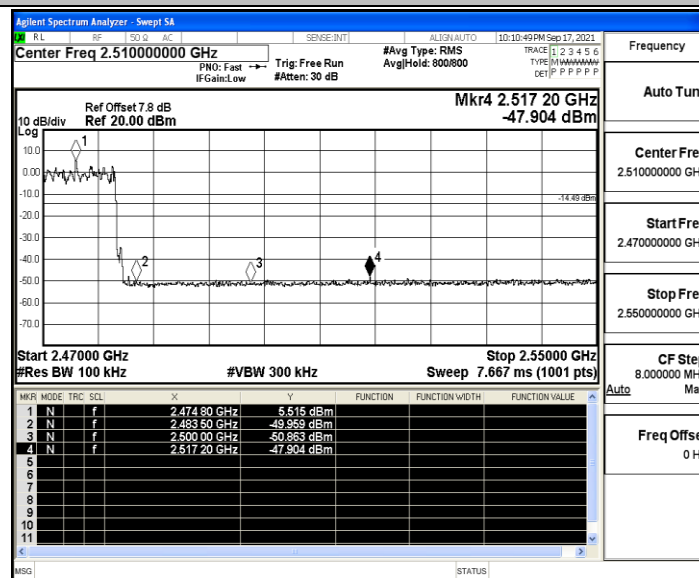




3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480





A.7 Conducted Spurious Emission

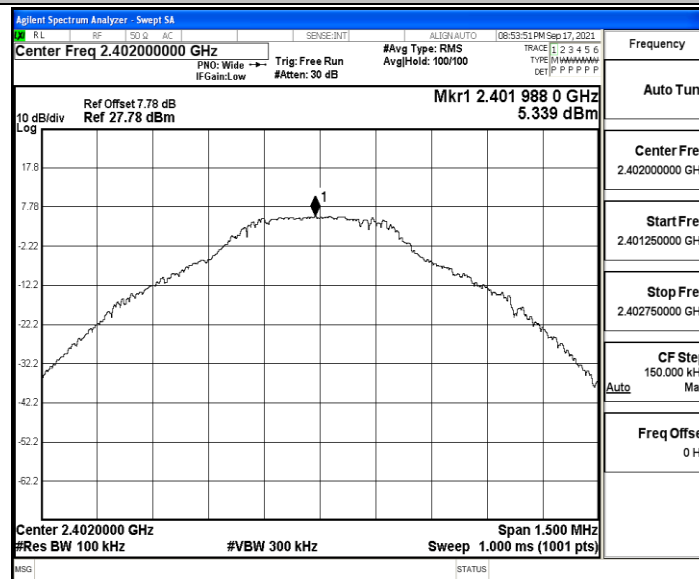
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	5.34	5.34	---	PASS
			30~1000	5.34	-61.38	≤-14.66	PASS
			1000~26500	5.34	-47.78	≤-14.66	PASS
		2441	Reference	5.45	5.45	---	PASS
			30~1000	5.45	-61.79	≤-14.55	PASS
			1000~26500	5.45	-47.98	≤-14.55	PASS
		2480	Reference	6.48	6.48	---	PASS
			30~1000	6.48	-50.77	≤-13.52	PASS
			1000~26500	6.48	-47.51	≤-13.52	PASS
2DH5	Ant1	2402	Reference	0.69	0.69	---	PASS
			30~1000	0.69	-61.11	≤-19.32	PASS
			1000~26500	0.69	-47.47	≤-19.32	PASS
		2441	Reference	5.36	5.36	---	PASS
			30~1000	5.36	-59.52	≤-14.64	PASS
			1000~26500	5.36	-47.41	≤-14.64	PASS
		2480	Reference	5.36	5.36	---	PASS
			30~1000	5.36	-61.93	≤-14.64	PASS
			1000~26500	5.36	-47.53	≤-14.64	PASS
3DH5	Ant1	2402	Reference	6.32	6.32	---	PASS
			30~1000	6.32	-61.43	≤-13.68	PASS
			1000~26500	6.32	-46.8	≤-13.68	PASS
		2441	Reference	3.09	3.09	---	PASS
			30~1000	3.09	-61.55	≤-16.91	PASS
			1000~26500	3.09	-47.74	≤-16.91	PASS
		2480	Reference	2.87	2.87	---	PASS
			30~1000	2.87	-61.77	≤-17.14	PASS
			1000~26500	2.87	-46.88	≤-17.14	PASS

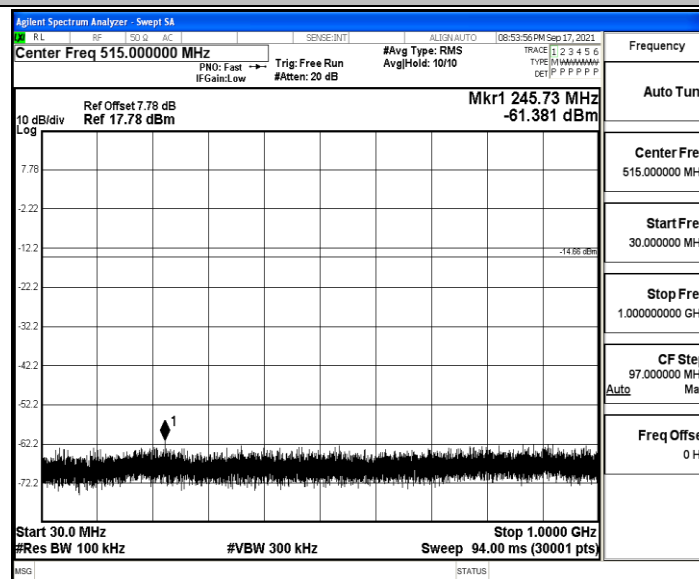


Test Graphs

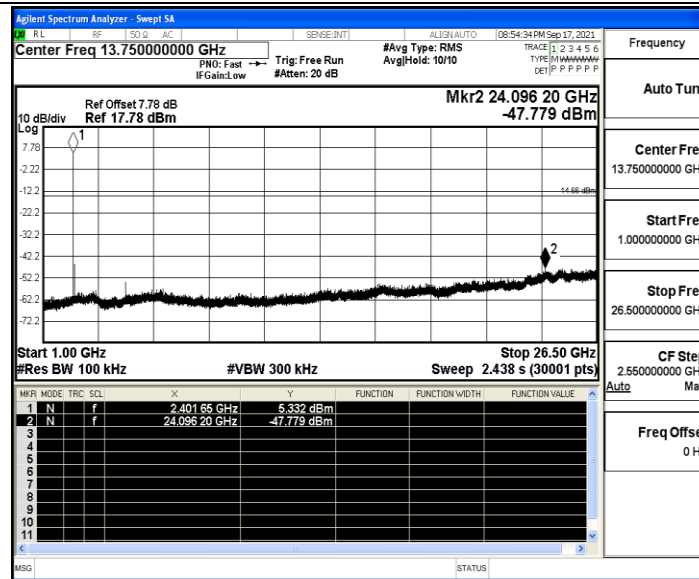
DH5_Ant1_2402_0~Reference



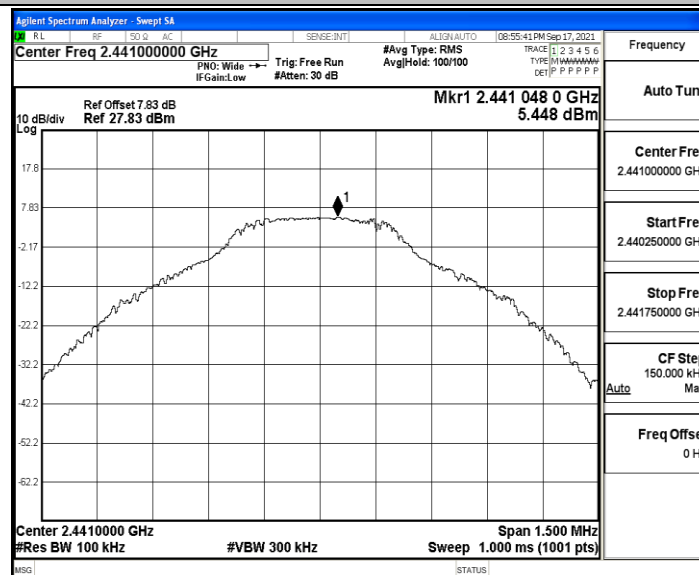
DH5_Ant1_2402_30~1000



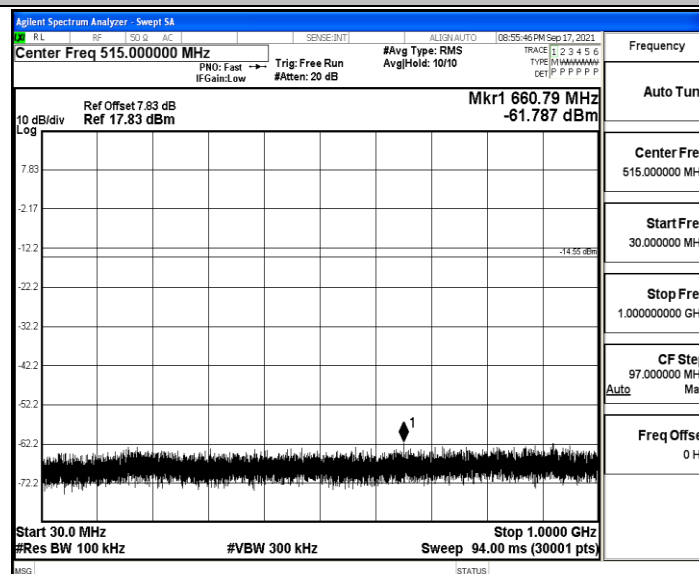
DH5_Ant1_2402_1000~26500



DH5_Ant1_2441_0-Reference

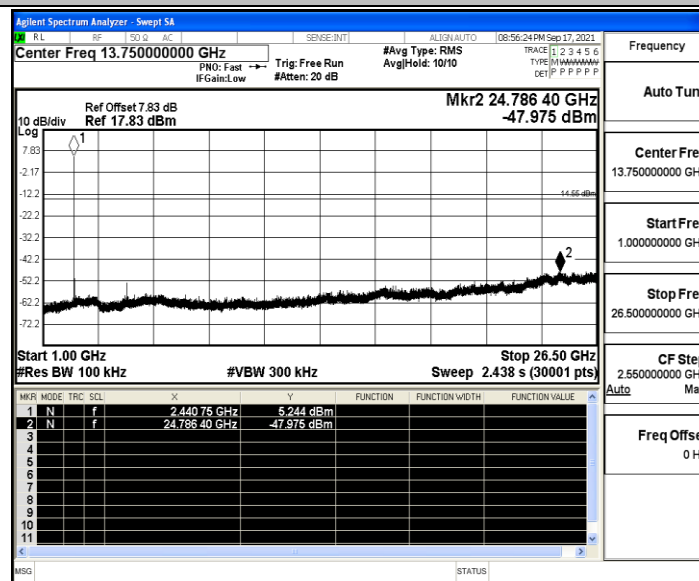


DH5_Ant1_2441_30~1000

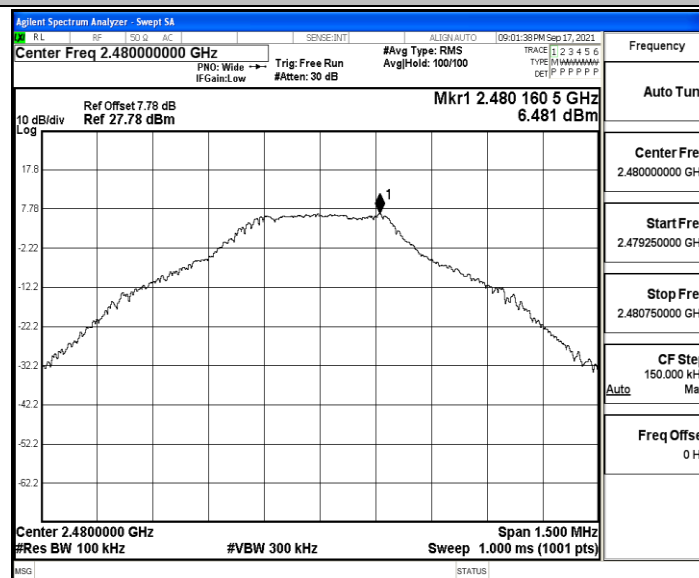




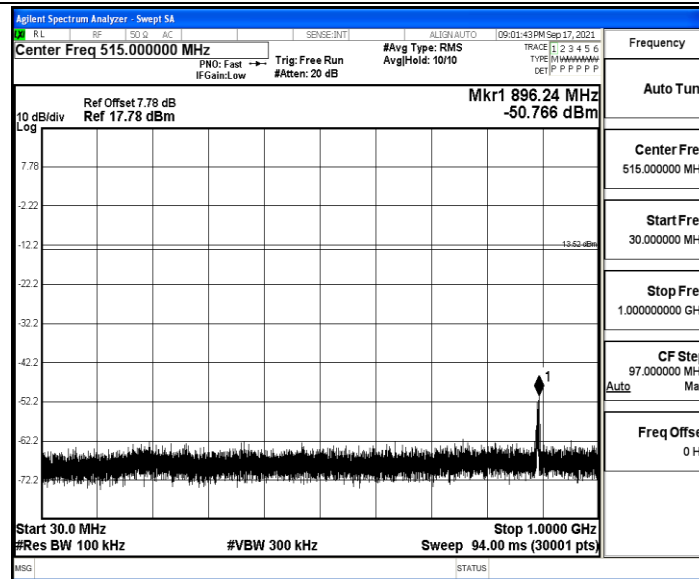
DH5_Ant1_2441_1000~26500



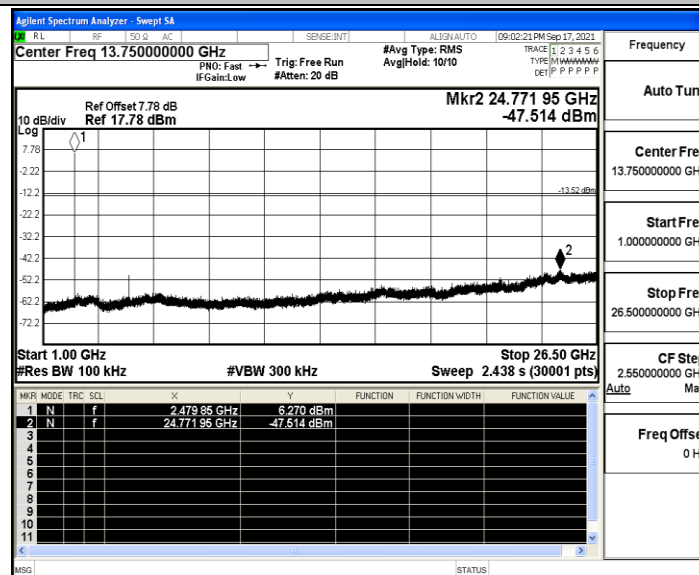
DH5_Ant1_2480_0~Reference



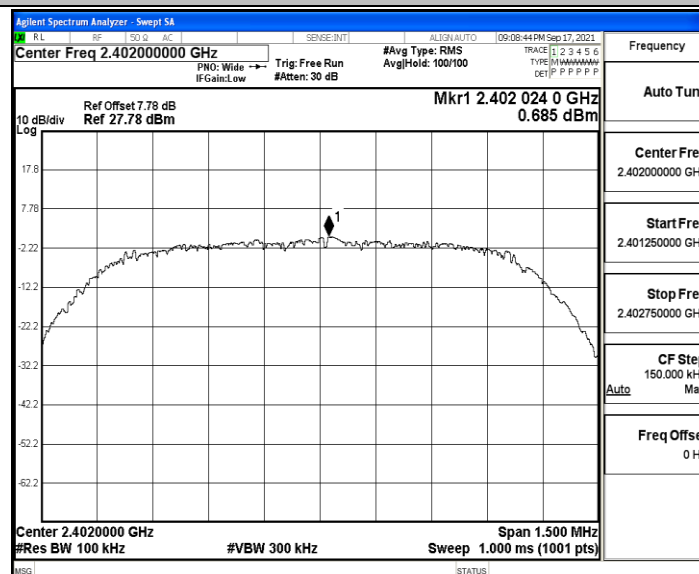
DH5_Ant1_2480_30~1000



DH5_Ant1_2480_1000~26500

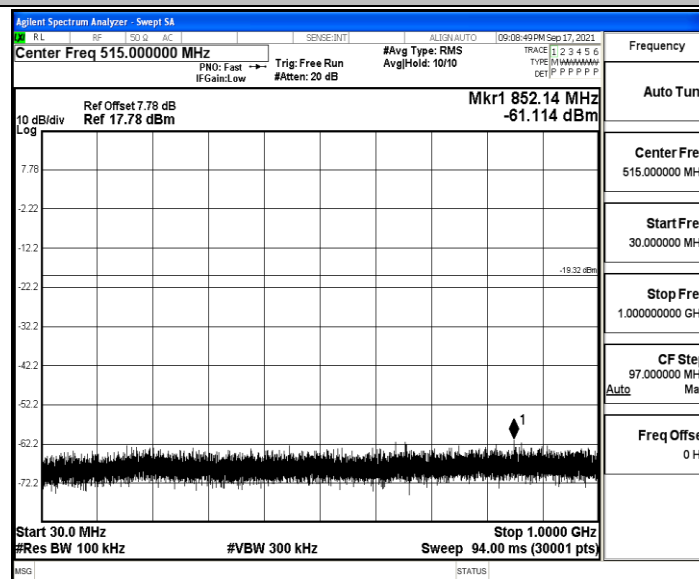


2DH5_Ant1_2402_0~Reference

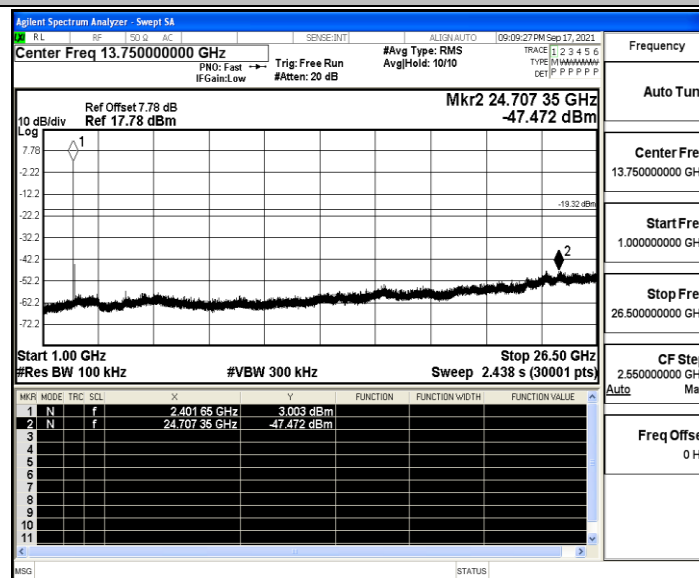




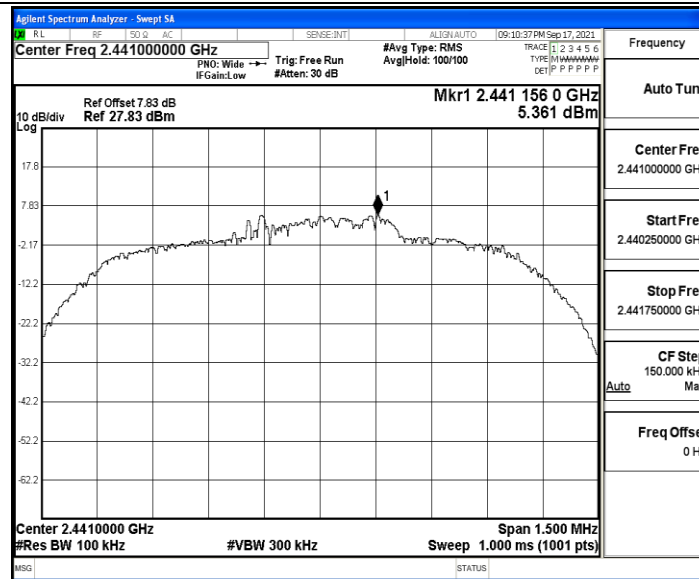
2DH5_Ant1_2402_30~1000



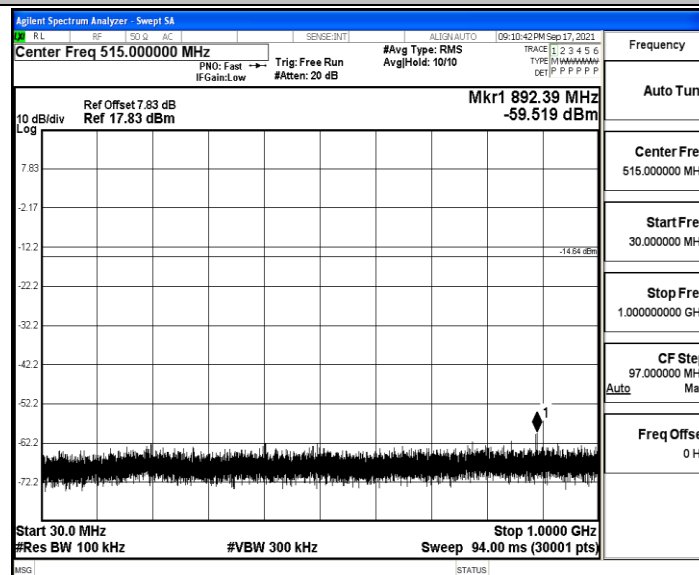
2DH5_Ant1_2402_1000~26500



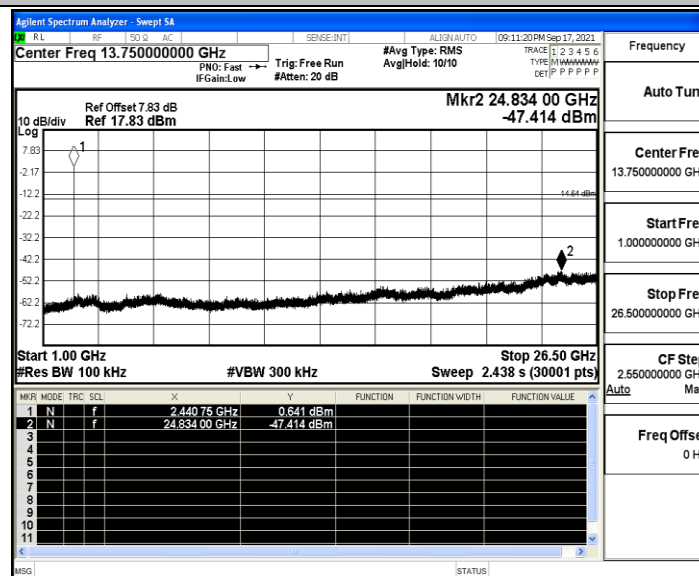
2DH5_Ant1_2441_0~Reference



2DH5_Ant1_2441_30~1000

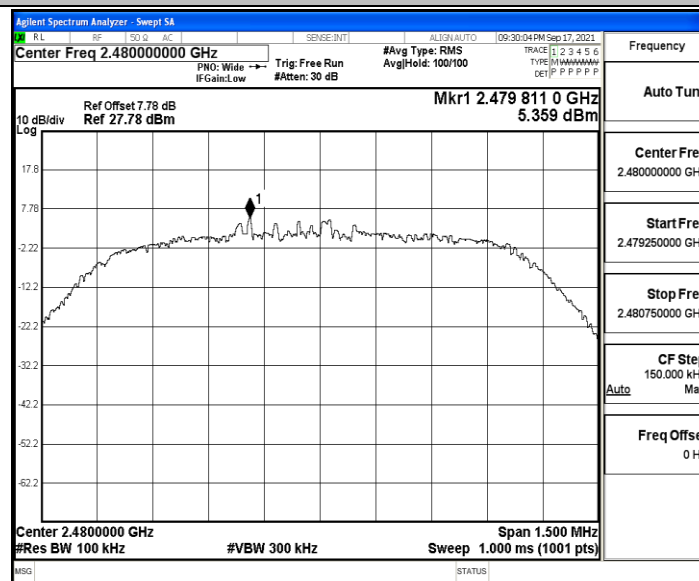


2DH5_Ant1_2441_1000~26500

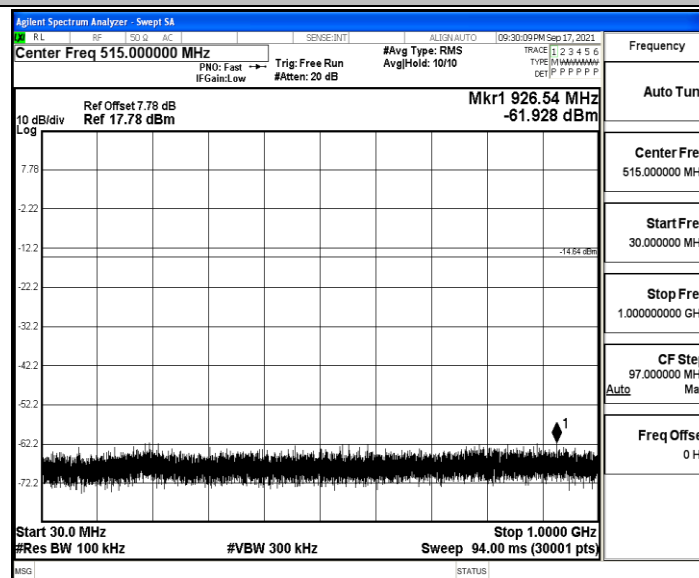




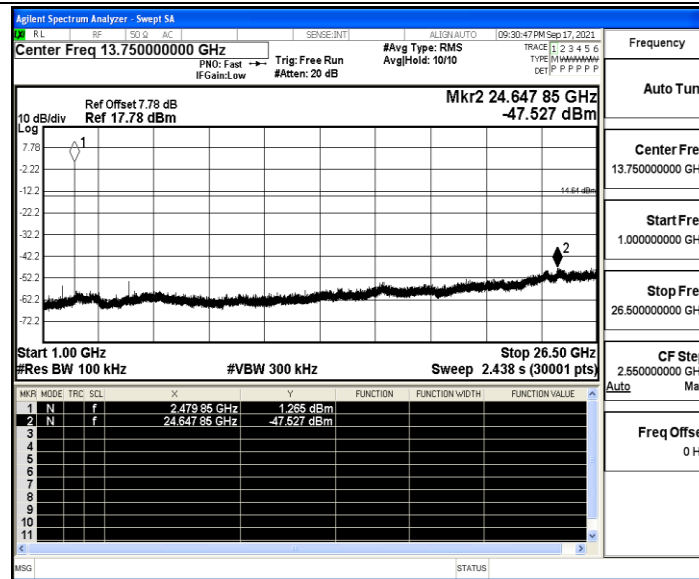
2DH5_Ant1_2480_0~Reference



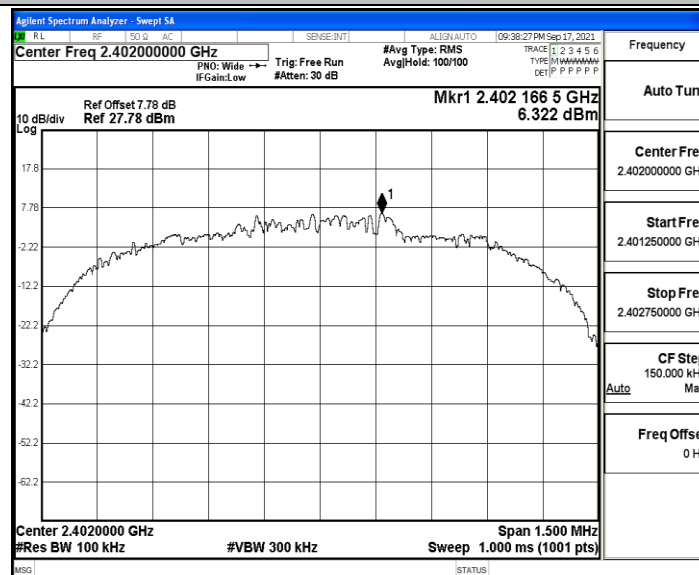
2DH5_Ant1_2480_30~1000



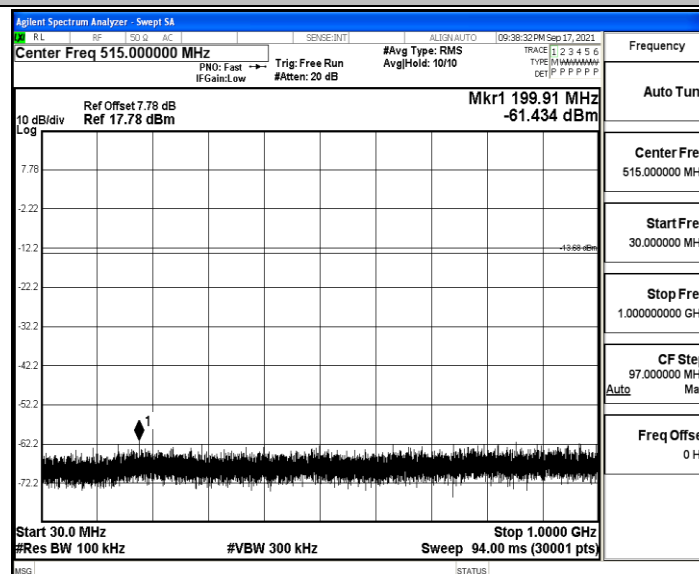
2DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference

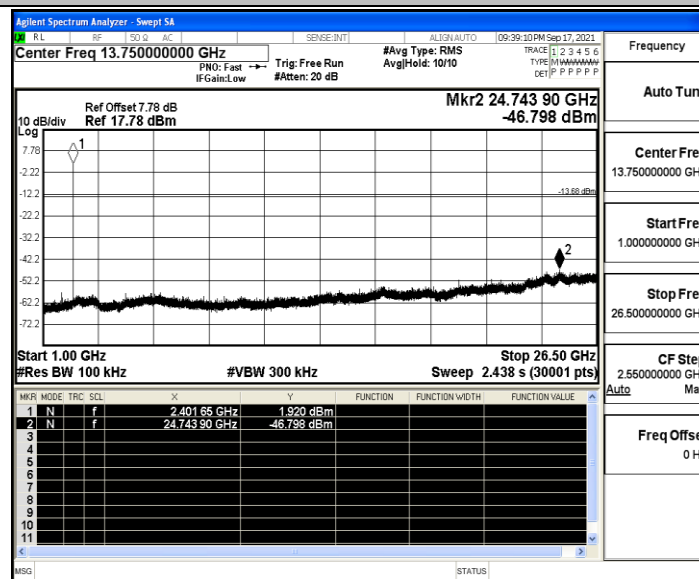


3DH5_Ant1_2402_30~1000

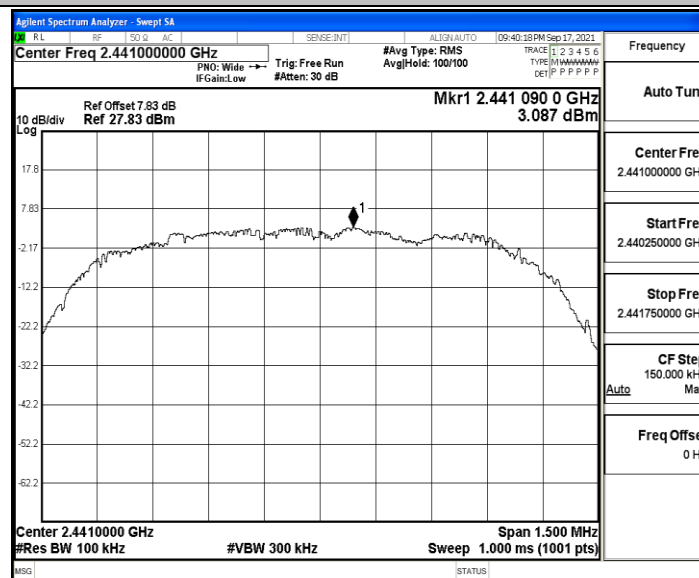




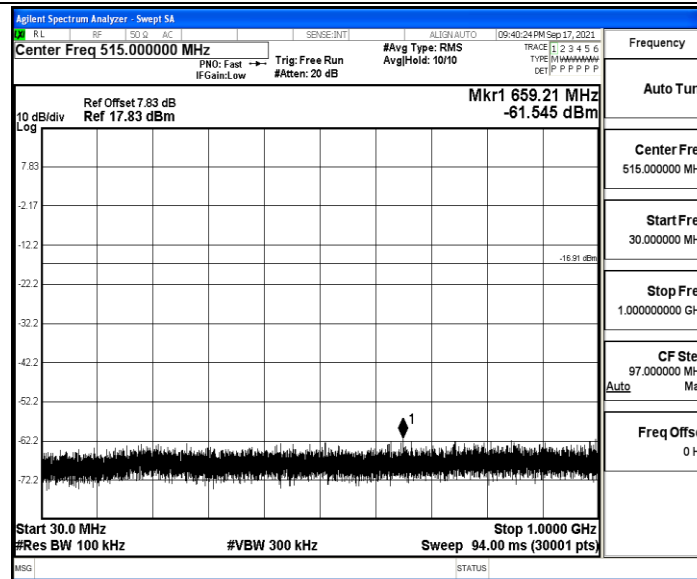
3DH5_Ant1_2402_1000~26500



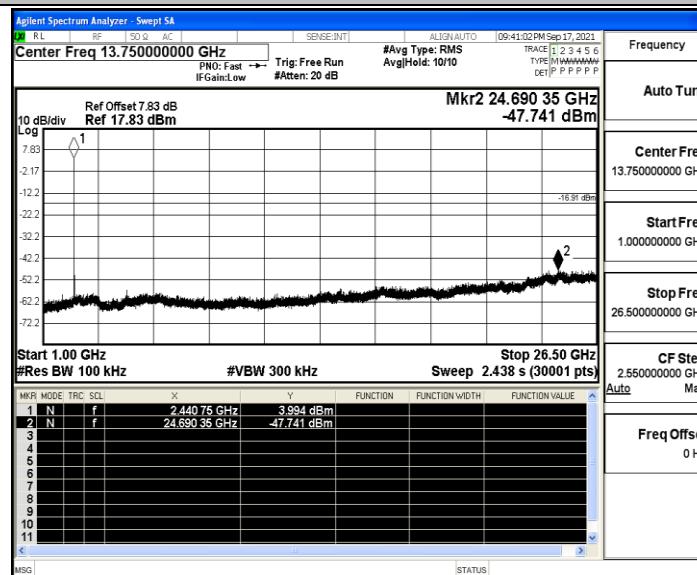
3DH5_Ant1_2441_0~Reference



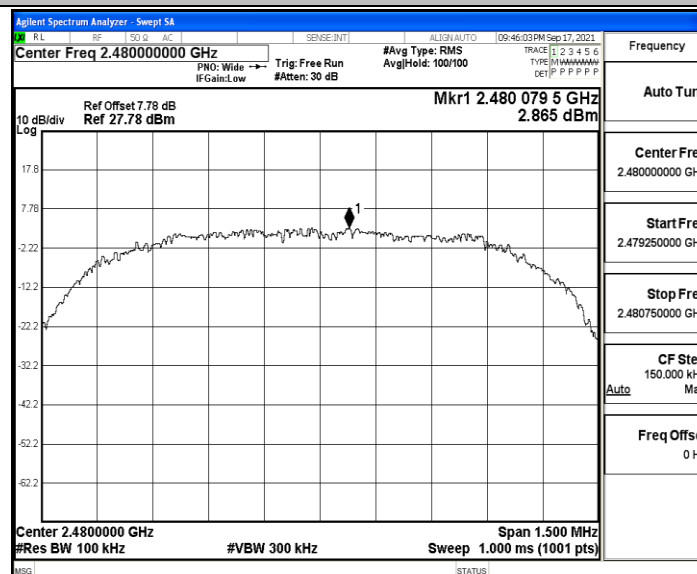
3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500

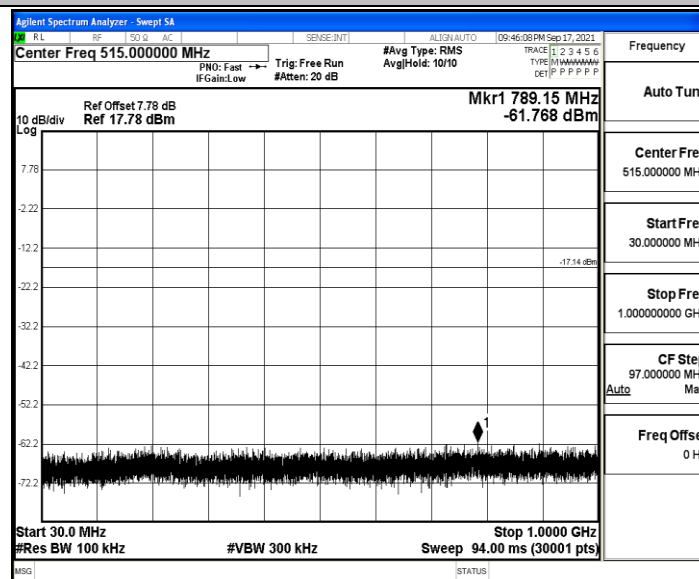


3DH5_Ant1_2480_0~Reference

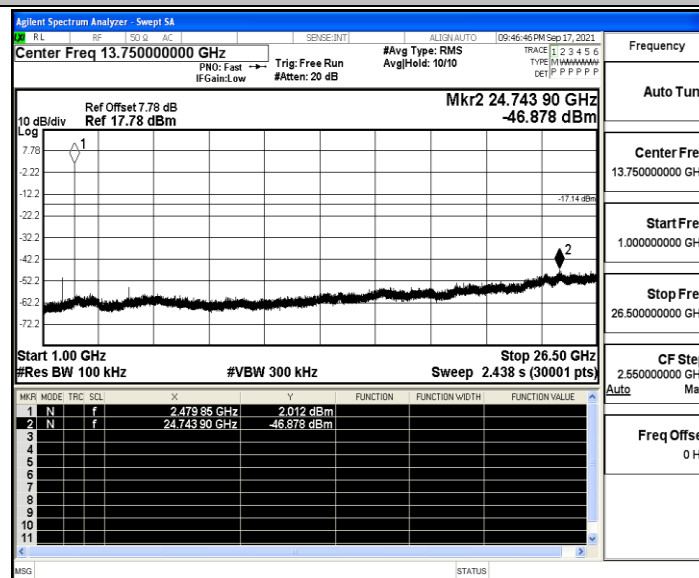




3DH5_Ant1_2480_30~1000



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	-48.94	≤-41.20	46.26	≤54	PASS
				AV	2389.355	-48.39	≤-41.20	46.81	≤54	PASS
				AV	2390.000	-48.65	≤-41.20	46.55	≤54	PASS
				Peak	2310.000	-40.31	≤-21.20	54.89	≤74	PASS
				Peak	2386.940	-38	≤-21.20	57.20	≤74	PASS
				Peak	2390.000	-40	≤-21.20	55.20	≤74	PASS
		High	2480	AV	2483.500	-46.97	≤-41.20	48.23	≤54	PASS
				AV	2483.520	-46.97	≤-41.20	48.23	≤54	PASS
				AV	2500.000	-48.06	≤-41.20	47.14	≤54	PASS
				Peak	2483.500	-39.42	≤-21.20	55.78	≤74	PASS
				Peak	2493.440	-37.88	≤-21.20	57.32	≤74	PASS
				Peak	2500.000	-39.43	≤-21.20	55.77	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-40.15	≤-21.20	55.05	≤74	PASS
				Peak	2378.750	-38.21	≤-21.20	56.99	≤74	PASS
				Peak	2390.000	-40.35	≤-21.20	54.85	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-40.8	≤-21.20	54.40	≤74	PASS
				Peak	2495.760	-37.38	≤-21.20	57.82	≤74	PASS
				Peak	2500.000	-38.98	≤-21.20	56.22	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-48.98	≤-41.20	46.22	≤54	PASS
				AV	2389.985	-48.48	≤-41.20	46.72	≤54	PASS
				AV	2390.000	-48.48	≤-41.20	46.72	≤54	PASS
				Peak	2310.000	-40.96	≤-21.20	54.24	≤74	PASS
				Peak	2311.130	-38.16	≤-21.20	57.04	≤74	PASS
				Peak	2390.000	-39.37	≤-21.20	55.83	≤74	PASS
		High	2480	AV	2483.500	-46.5	≤-41.20	48.70	≤54	PASS
				AV	2483.520	-46.49	≤-41.20	48.71	≤54	PASS
				AV	2500.000	-48.01	≤-41.20	47.19	≤54	PASS
				Peak	2483.500	-39.41	≤-21.20	55.79	≤74	PASS
				Peak	2492.080	-37.69	≤-21.20	57.51	≤74	PASS
				Peak	2500.000	-40	≤-21.20	55.20	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-40.49	≤-21.20	54.71	≤74	PASS
				Peak	2377.385	-38.54	≤-21.20	56.66	≤74	PASS
				Peak	2390.000	-40.87	≤-21.20	54.33	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-40.35	≤-21.20	54.85	≤74	PASS
				Peak	2484.640	-37.66	≤-21.20	57.54	≤74	PASS
				Peak	2500.000	-38.18	≤-21.20	57.02	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-48.96	≤-41.20	46.24	≤54	PASS



				AV	2387.990	-48.43	≤-41.20	46.77	≤54	PASS
				AV	2390.000	-48.5	≤-41.20	46.70	≤54	PASS
				Peak	2310.000	-41.4	≤-21.20	53.80	≤74	PASS
				Peak	2389.250	-38.32	≤-21.20	56.88	≤74	PASS
				Peak	2390.000	-40.57	≤-21.20	54.63	≤74	PASS
		High	2480	AV	2483.500	-46.4	≤-41.20	48.80	≤54	PASS
				AV	2483.520	-46.4	≤-41.20	48.80	≤54	PASS
				AV	2500.000	-48.02	≤-41.20	47.18	≤54	PASS
				Peak	2483.500	-39.17	≤-21.20	56.03	≤74	PASS
				Peak	2489.040	-36.94	≤-21.20	58.26	≤74	PASS
				Peak	2500.000	-39.42	≤-21.20	55.78	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-40.47	≤-21.20	54.73	≤74	PASS
				Peak	2365.625	-37.45	≤-21.20	57.75	≤74	PASS
				Peak	2390.000	-39.77	≤-21.20	55.43	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-39.73	≤-21.20	55.47	≤74	PASS
				Peak	2498.960	-38.11	≤-21.20	57.09	≤74	PASS
				Peak	2500.000	-39.71	≤-21.20	55.49	≤74	PASS

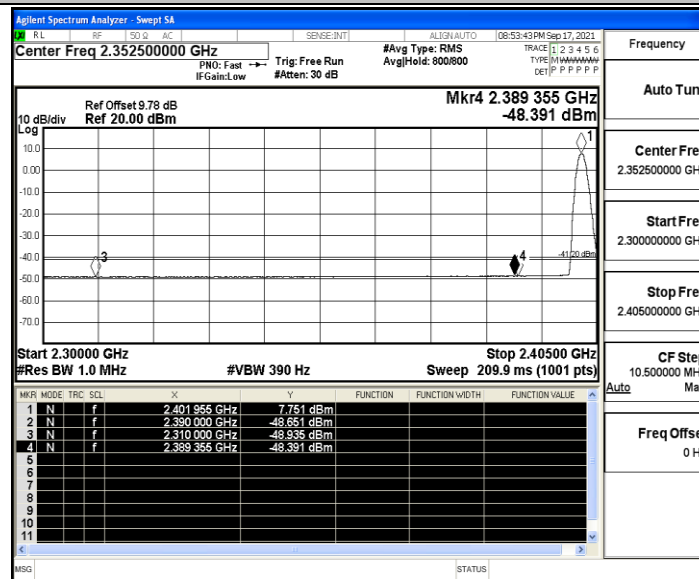
Note:

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.

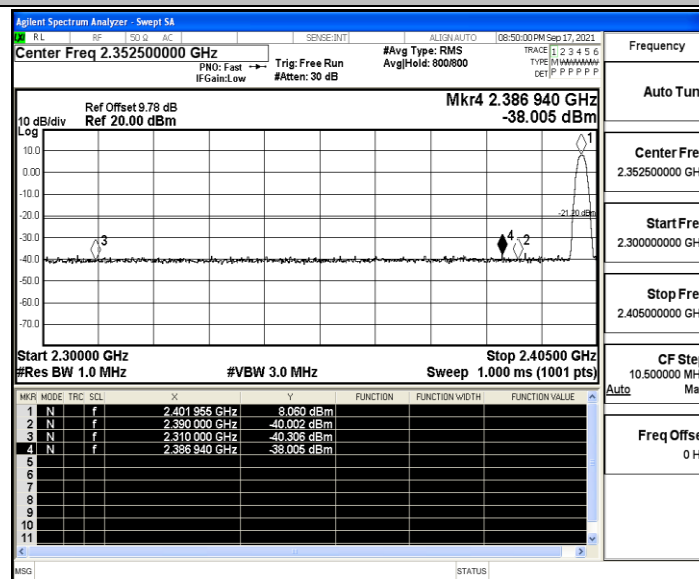


Test Graphs

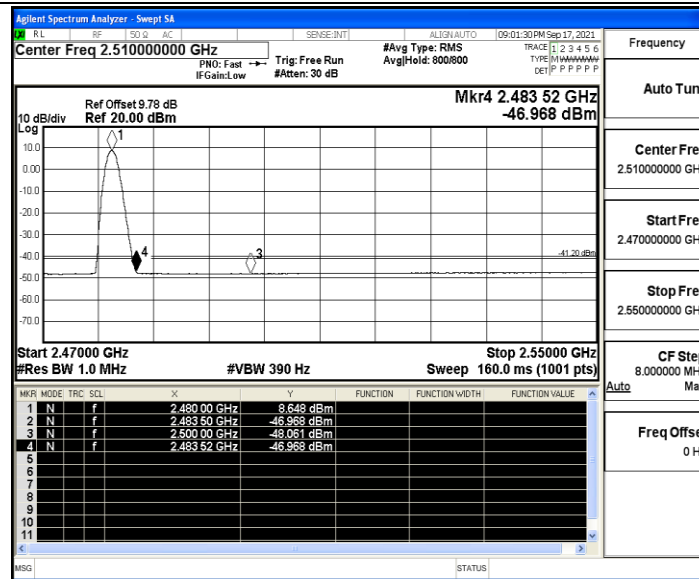
DH5_Ant1_Low_2402_AV



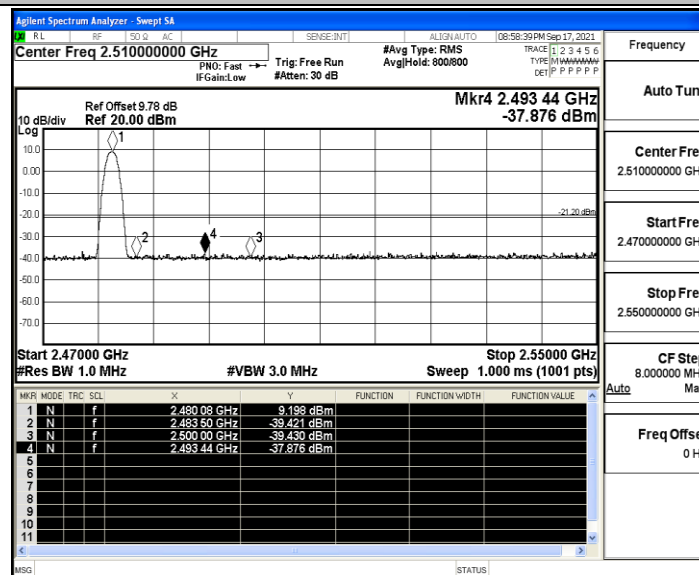
DH5_Ant1_Low_2402_Peak



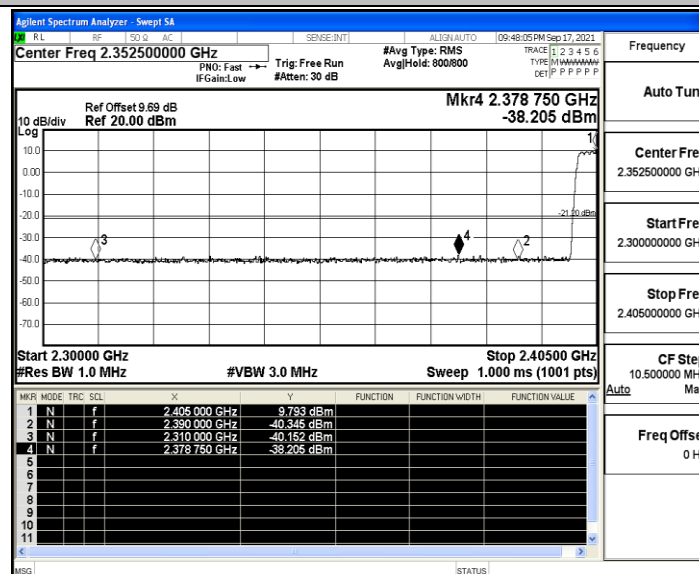
DH5_Ant1_High_2480_AV



DH5_Ant1_High_2480_Peak

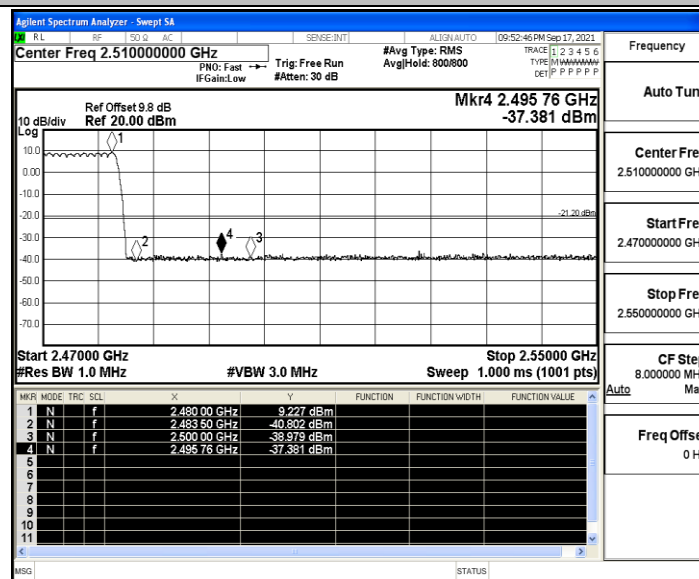


DH5_Ant1_Low_Hop_2402_Peak

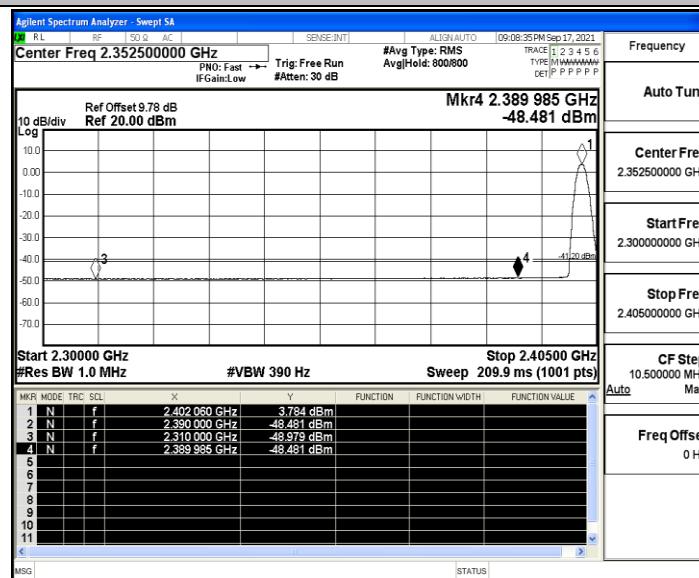




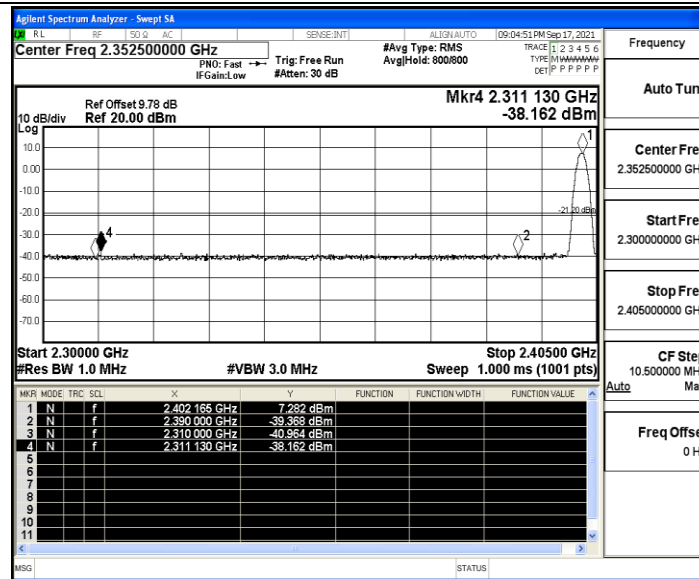
DH5_Ant1_High_Hop_2480_Peak



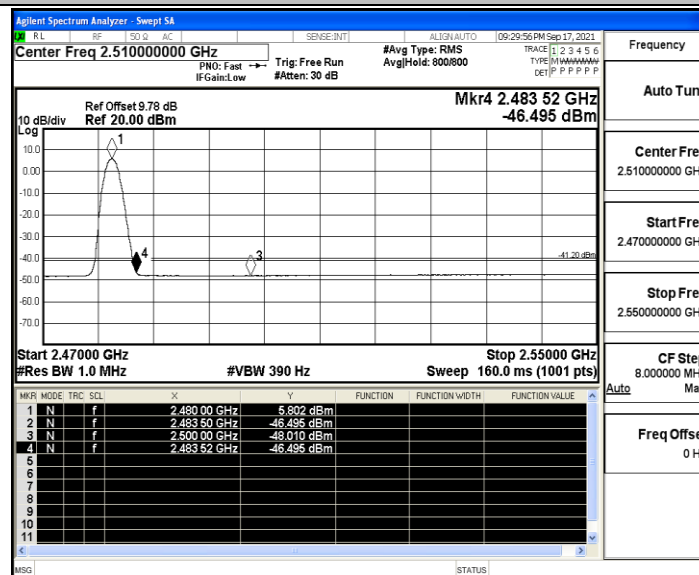
2DH5_Ant1_Low_2402_AV



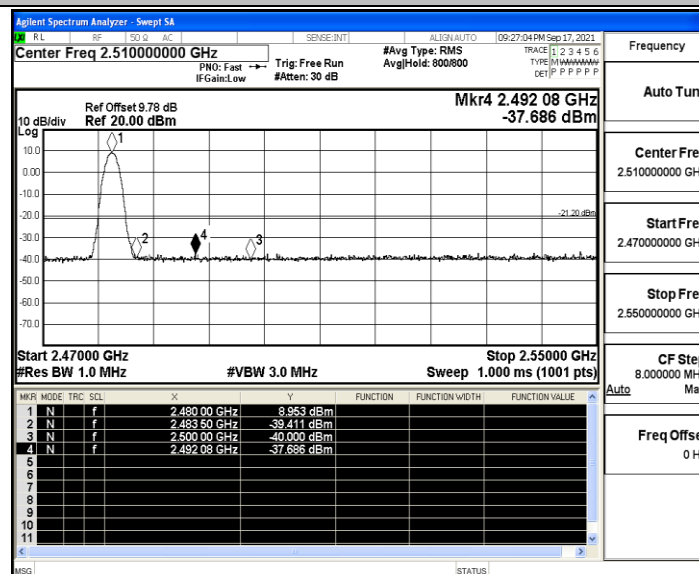
2DH5_Ant1_Low_2402_Peak



2DH5_Ant1_High_2480_AV

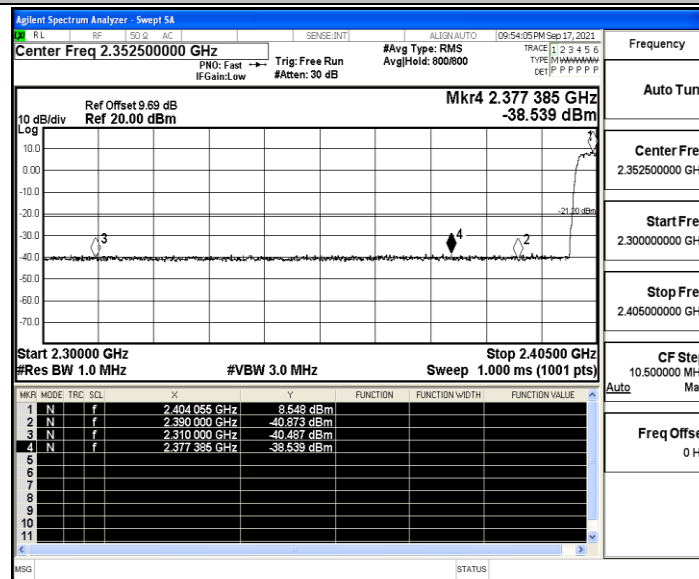


2DH5_Ant1_High_2480_Peak

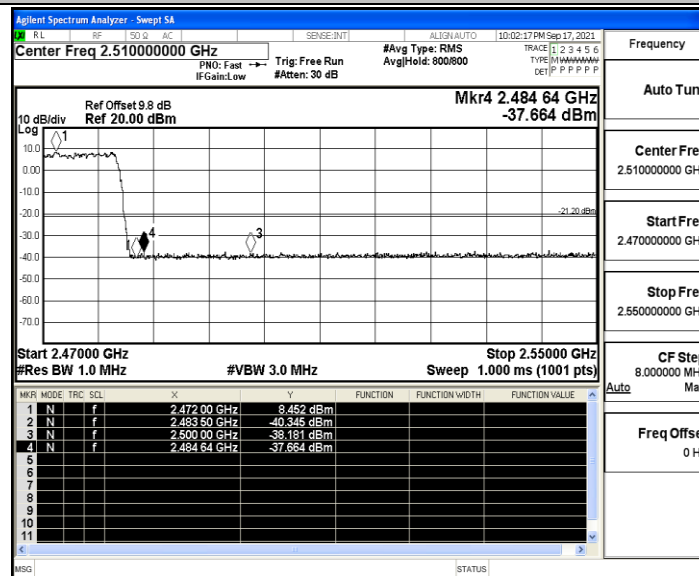




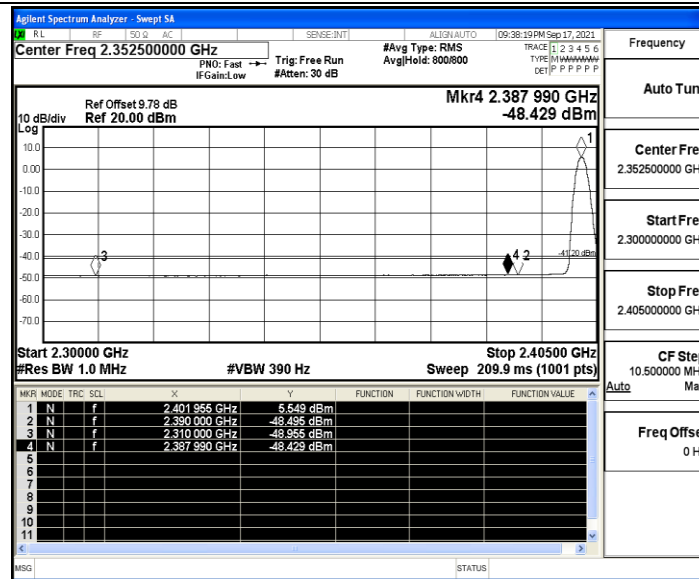
2DH5_Ant1_Low_Hop_2402_Peak



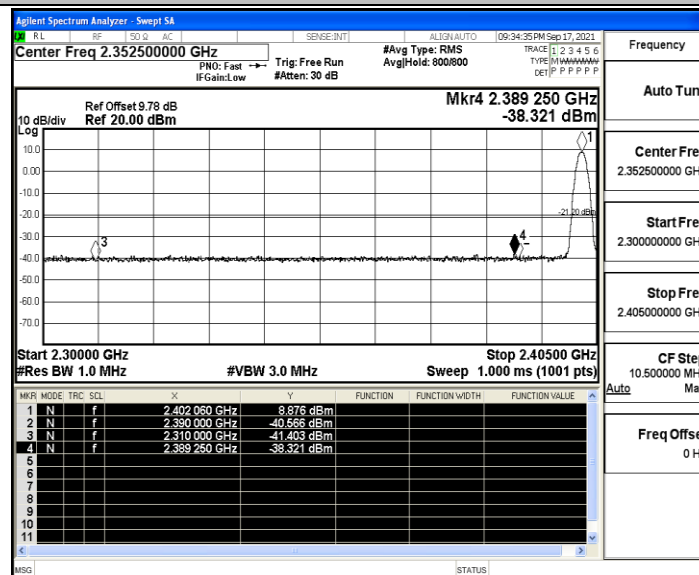
2DH5_Ant1_High_Hop_2480_Peak



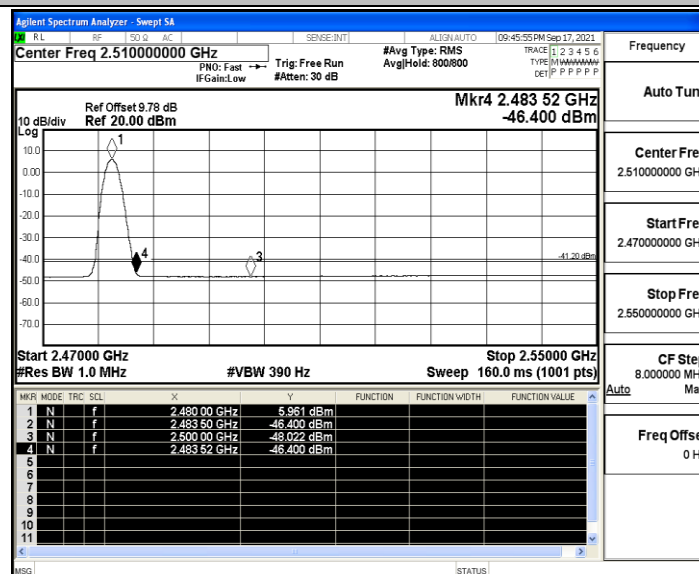
3DH5_Ant1_Low_2402_AV



3DH5_Ant1_Low_2402_Peak

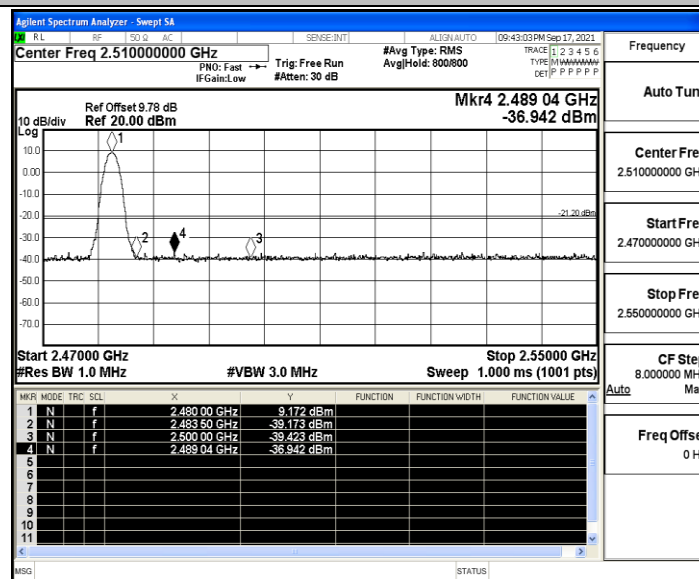


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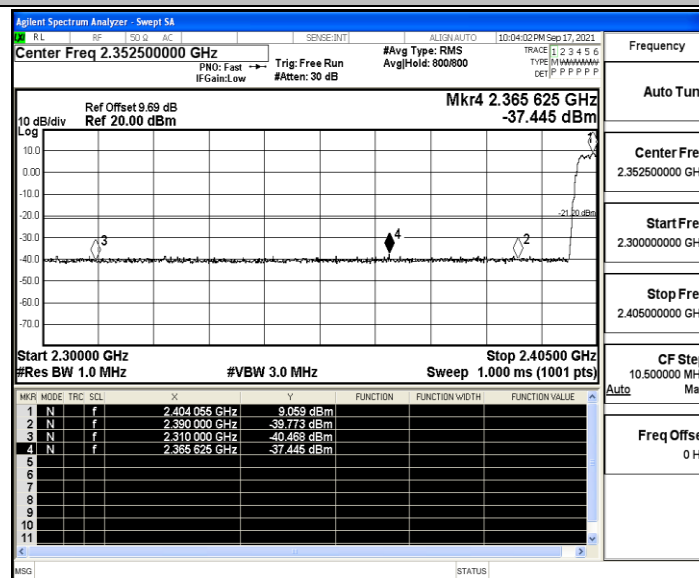




3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

