



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: P4 Wireless Controller

Test Model: P4-101

Environmental Conditions

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



A.1 20dB Emission Bandwidth

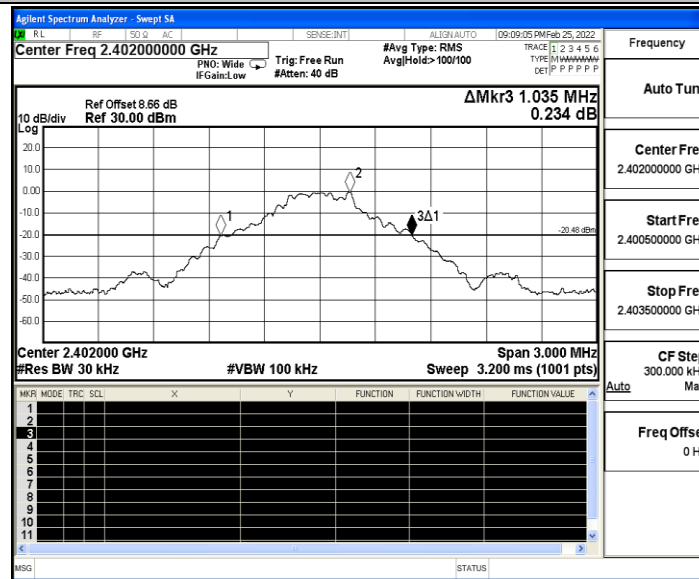
Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	1.035	2401.463	2402.498	---	---
		2441	1.041	2440.460	2441.501	---	---
		2480	1.038	2479.457	2480.495	---	---
2DH5	Ant1	2402	1.293	2401.355	2402.648	---	---
		2441	1.290	2440.358	2441.648	---	---
		2480	1.290	2479.358	2480.648	---	---
3DH5	Ant1	2402	1.308	2401.340	2402.648	---	---
		2441	1.290	2440.346	2441.636	---	---
		2480	1.296	2479.343	2480.639	---	---

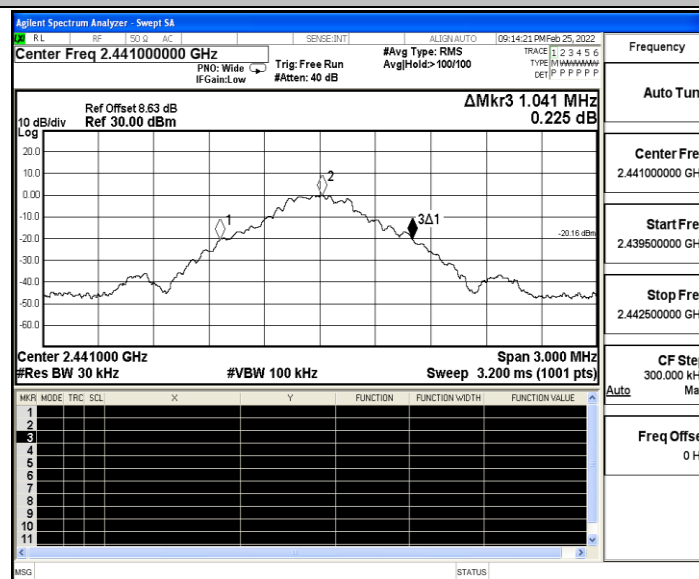


Test Graphs

DH5_Ant1_2402

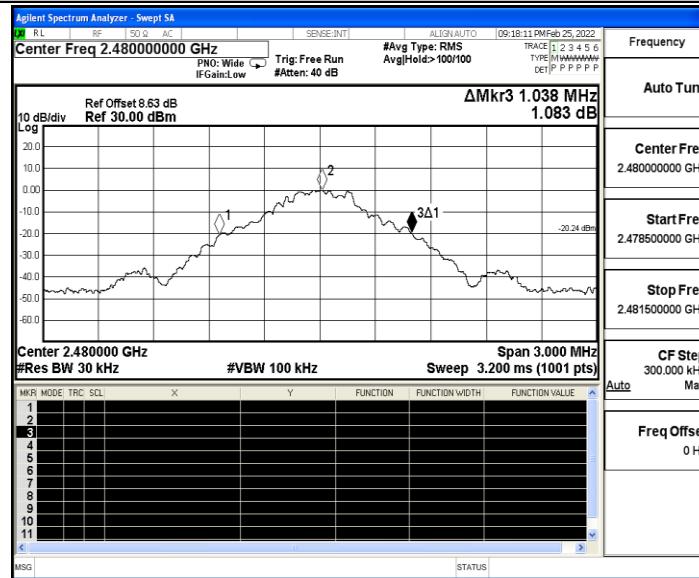


DH5_Ant1_2441

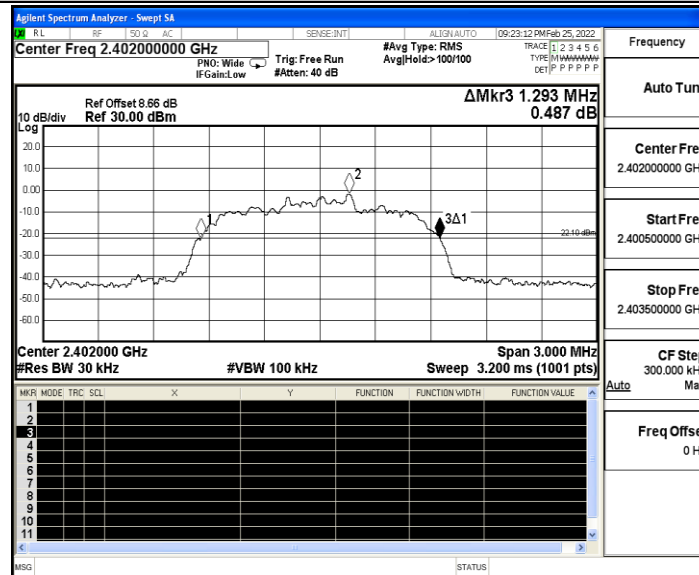




DH5_Ant1_2480

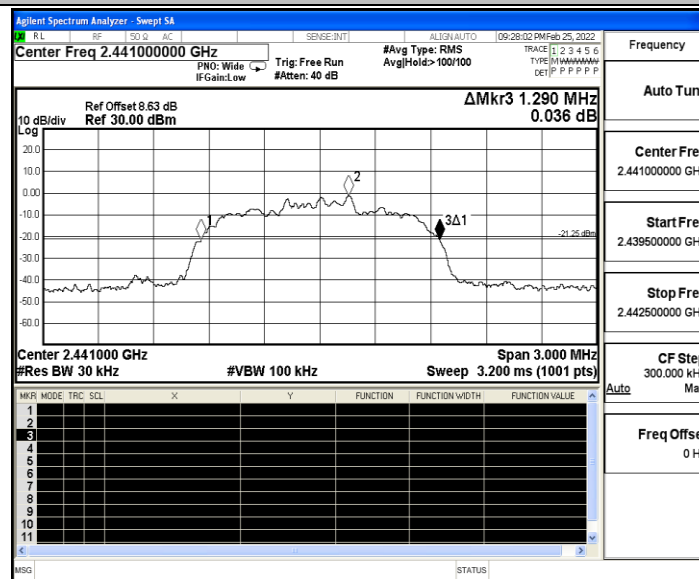


2DH5_Ant1_2402

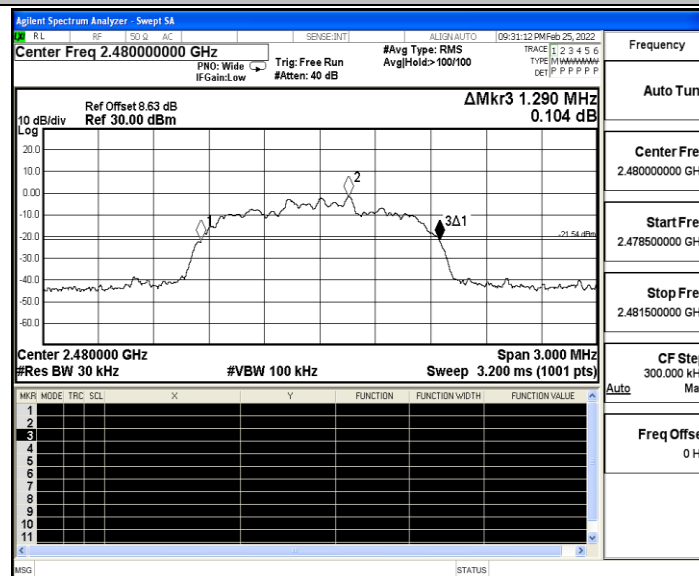




2DH5_Ant1_2441

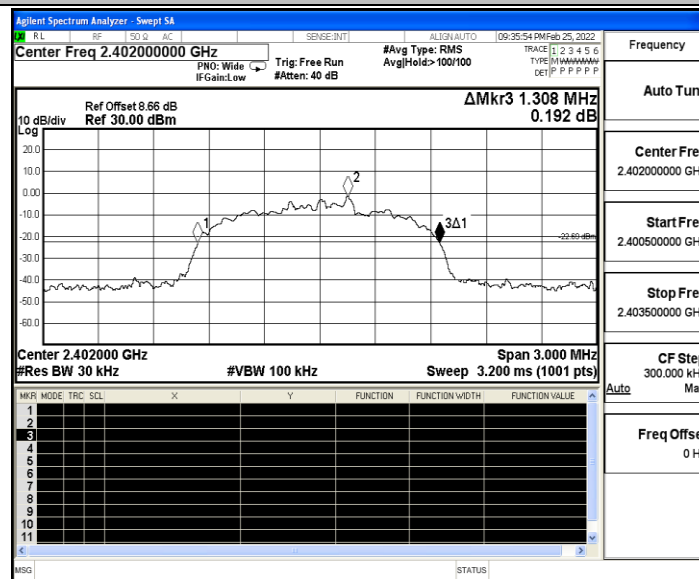


2DH5_Ant1_2480

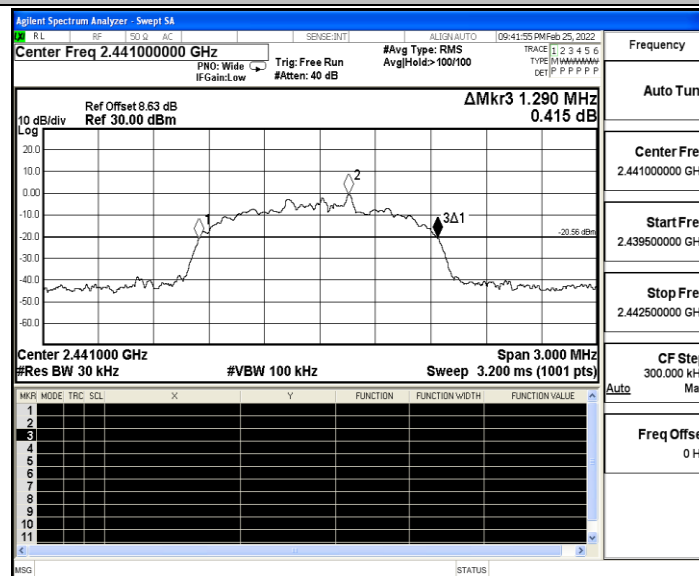




3DH5_Ant1_2402

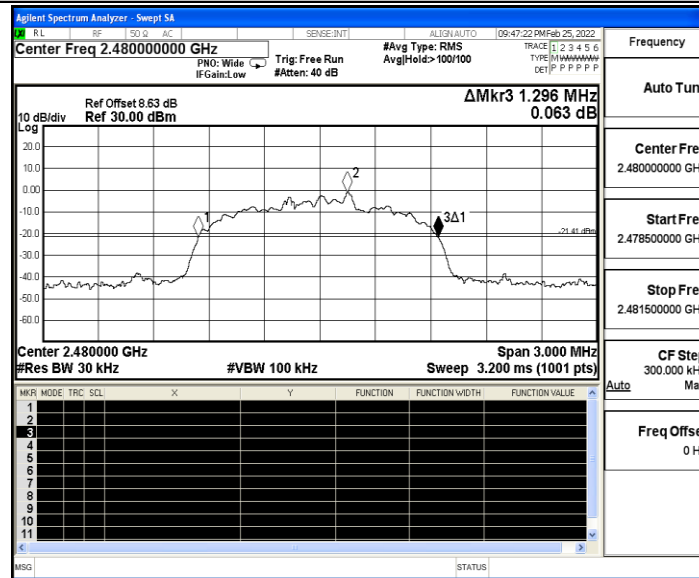


3DH5_Ant1_2441





3DH5_Ant1_2480





A.2 Maximum peak conducted output power

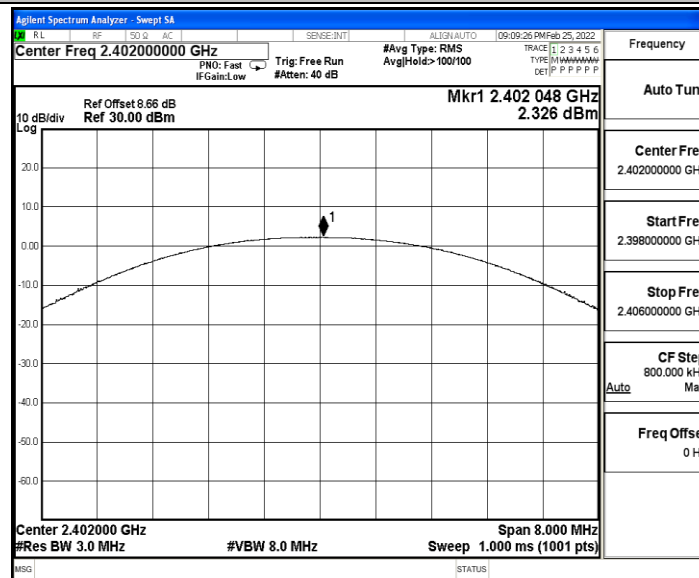
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	2.33	≤20.97	PASS
		2441	2.79	≤20.97	PASS
		2480	2.79	≤20.97	PASS
2DH5	Ant1	2402	2.24	≤20.97	PASS
		2441	2.84	≤20.97	PASS
		2480	2.54	≤20.97	PASS
3DH5	Ant1	2402	2.28	≤20.97	PASS
		2441	2.94	≤20.97	PASS
		2480	2.67	≤20.97	PASS

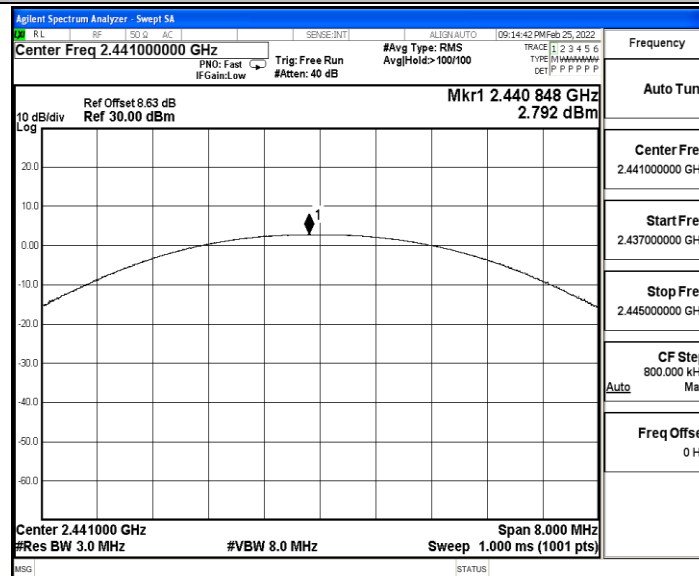


Test Graphs

DH5_Ant1_2402

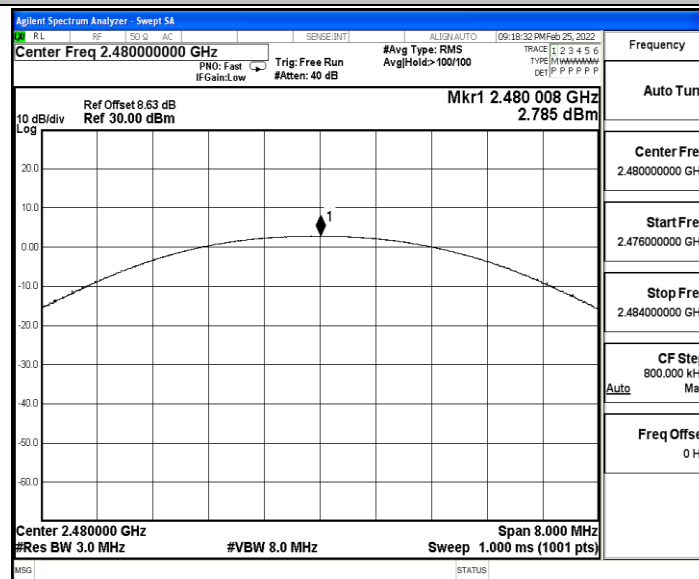


DH5_Ant1_2441

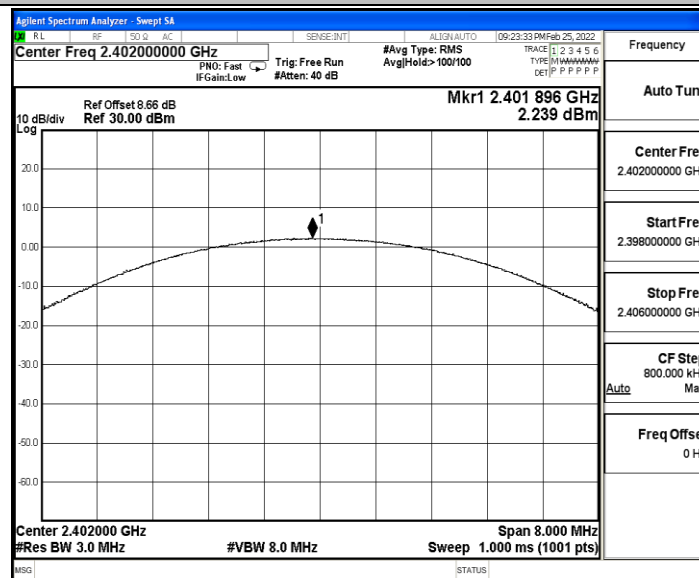




DH5_Ant1_2480

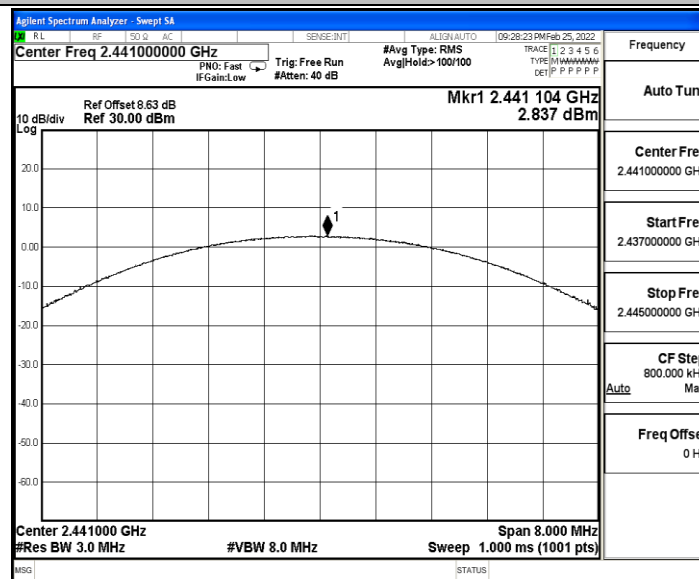


2DH5_Ant1_2402

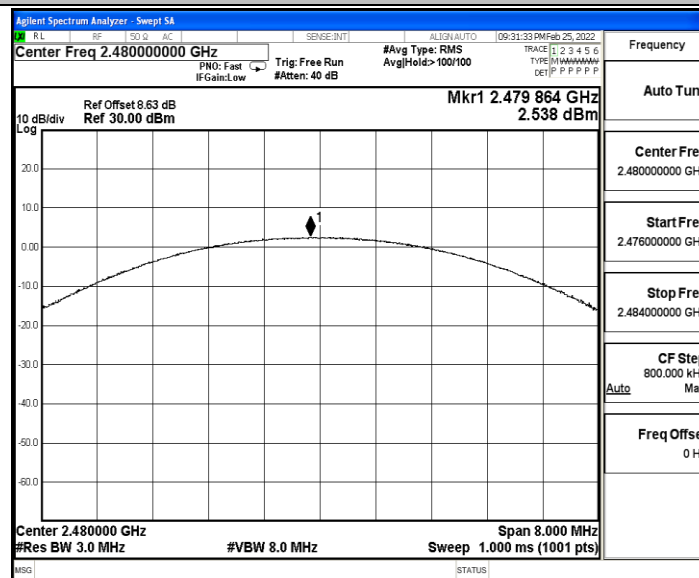




2DH5_Ant1_2441

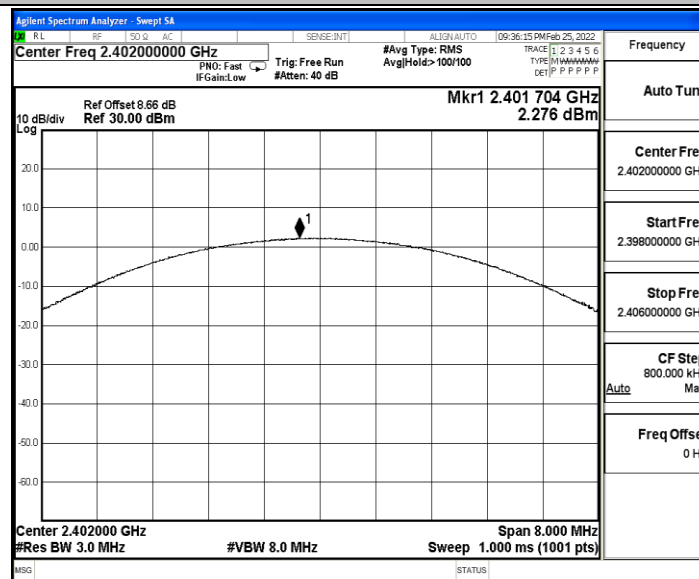


2DH5_Ant1_2480

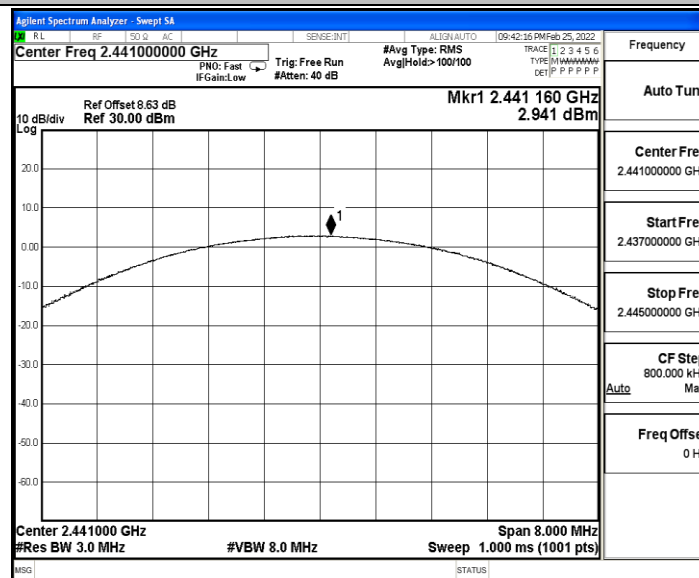




3DH5_Ant1_2402

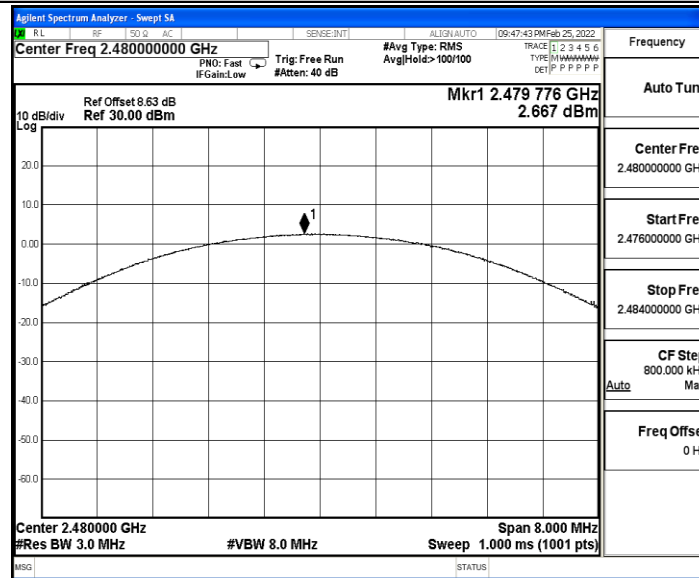


3DH5_Ant1_2441





3DH5_Ant1_2480





A.3 Carrier frequency separation

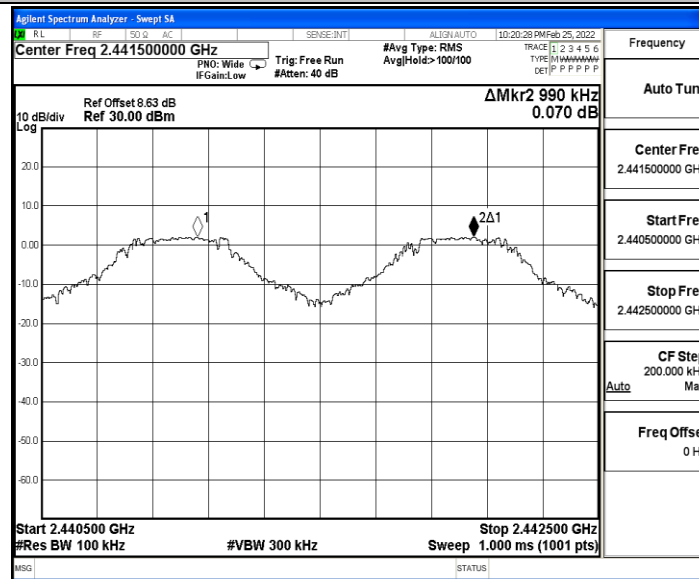
Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.99	≥ 0.694	PASS
2DH5	Ant1	Hop	1.114	≥ 0.862	PASS
3DH5	Ant1	Hop	0.94	≥ 0.872	PASS

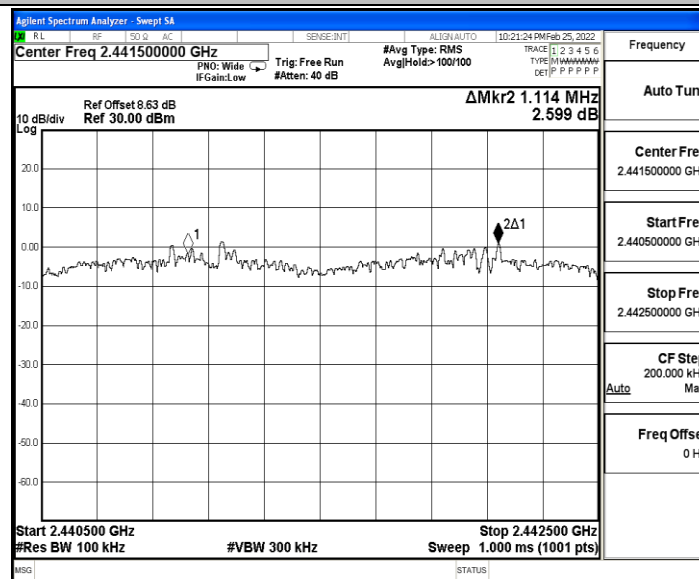


Test Graphs

DH5_Ant1_Hop

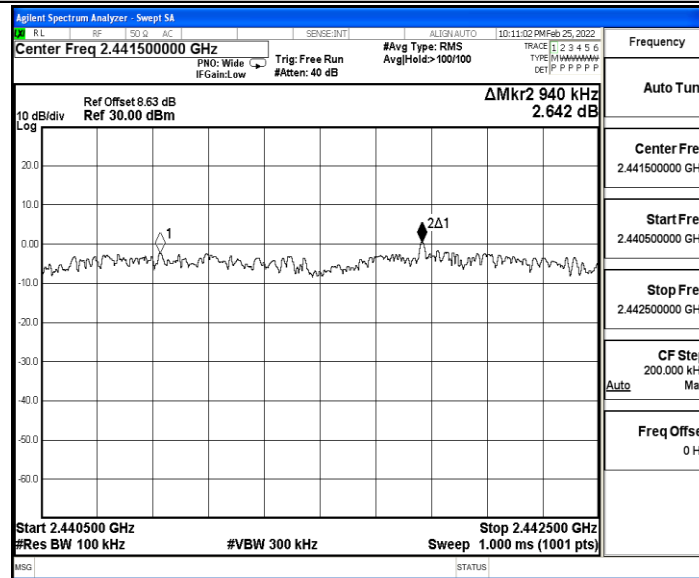


2DH5_Ant1_Hop





3DH5_Ant1_Hop





A.4 Time of occupancy

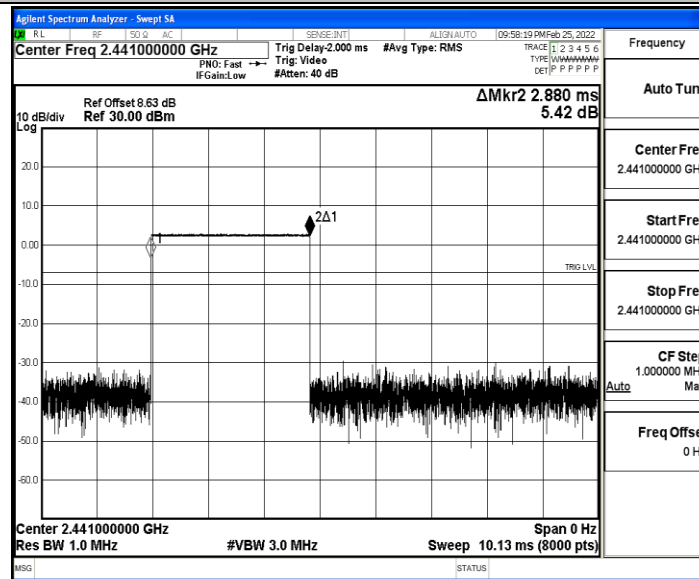
Test Result

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

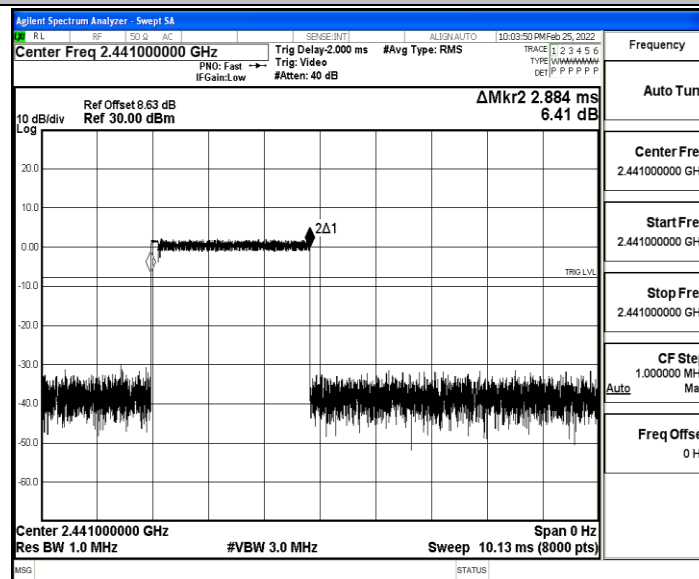


Test Graphs

DH5_Ant1_Hop

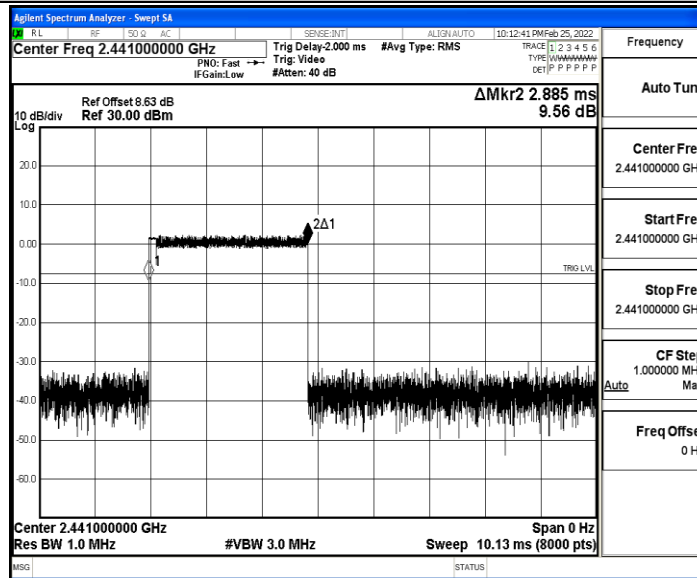


2DH5_Ant1_Hop





3DH5_Ant1_Hop





A.5 Number of hopping channels

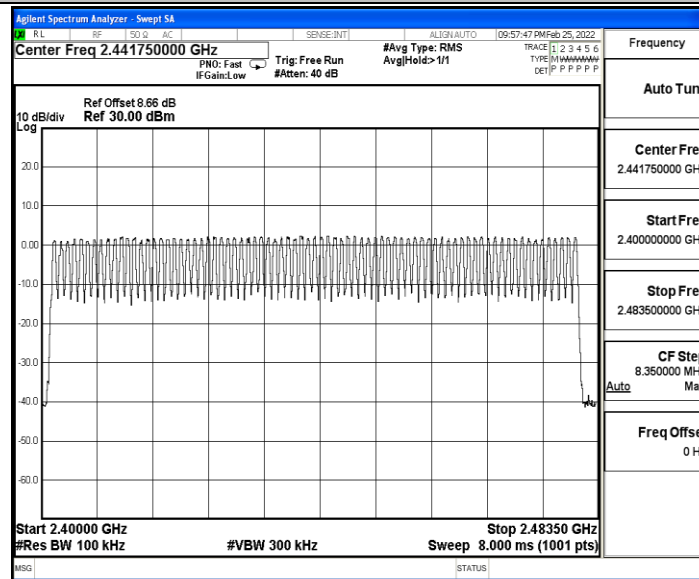
Test Result

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

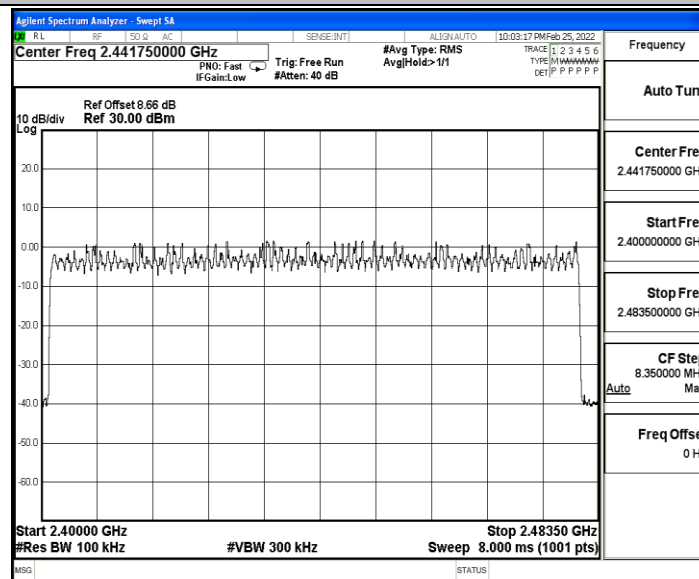


Test Graphs

DH5_Ant1_Hop

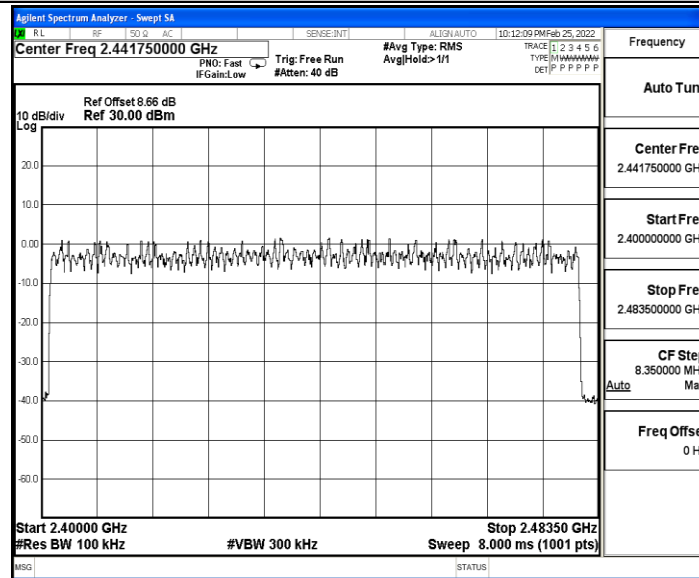


2DH5_Ant1_Hop





3DH5_Ant1_Hop





A.6 Band edge measurements

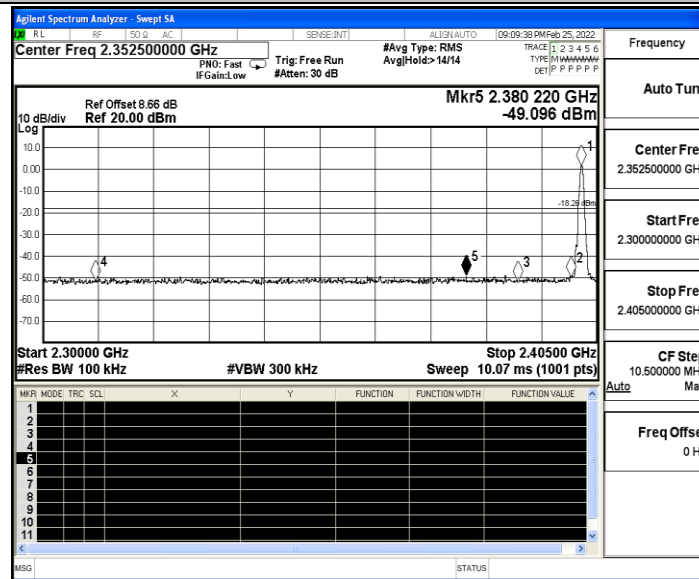
Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	1.72	-49.1	≤ -18.28	PASS
		High	2480	2.34	-47.31	≤ -17.66	PASS
		Low	Hop_2402	1.15	-49.04	≤ -18.85	PASS
		High	Hop_2480	1.99	-47.81	≤ -18.01	PASS
2DH5	Ant1	Low	2402	0.76	-47.68	≤ -19.24	PASS
		High	2480	1.26	-48.36	≤ -18.74	PASS
		Low	Hop_2402	-1.49	-49.51	≤ -21.49	PASS
		High	Hop_2480	0.93	-47.5	≤ -19.07	PASS
3DH5	Ant1	Low	2402	-1.38	-48.16	≤ -21.38	PASS
		High	2480	1.33	-47.93	≤ -18.67	PASS
		Low	Hop_2402	0.29	-49.25	≤ -19.71	PASS
		High	Hop_2480	1.24	-47.72	≤ -18.76	PASS

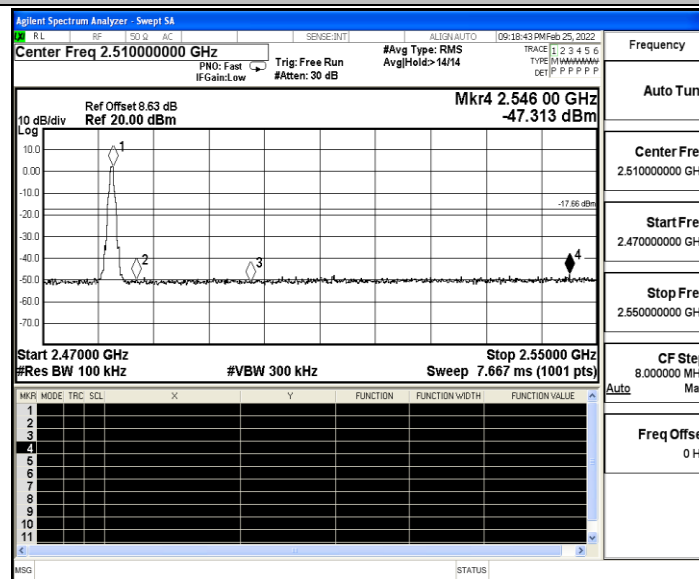


Test Graphs

DH5_Ant1_Low_2402

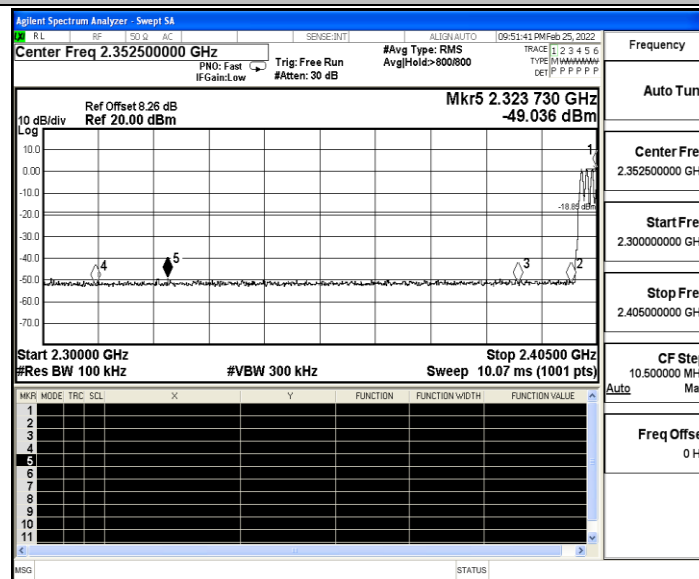


DH5_Ant1_High_2480

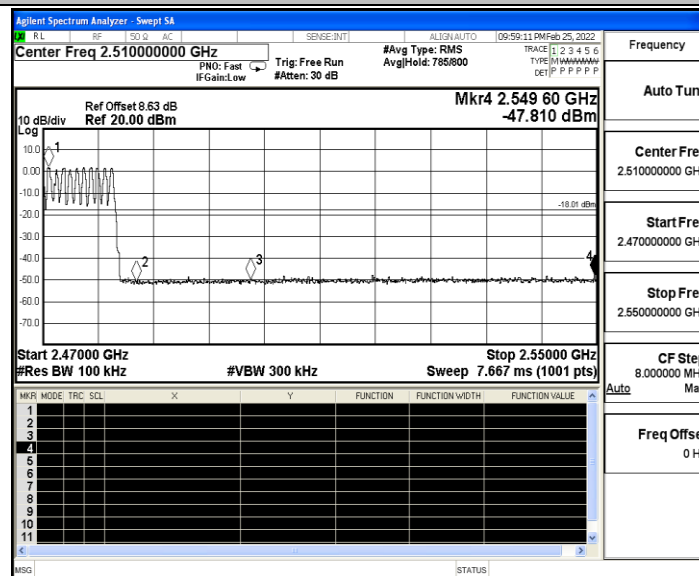




DH5_Ant1_Low_Hop_2402

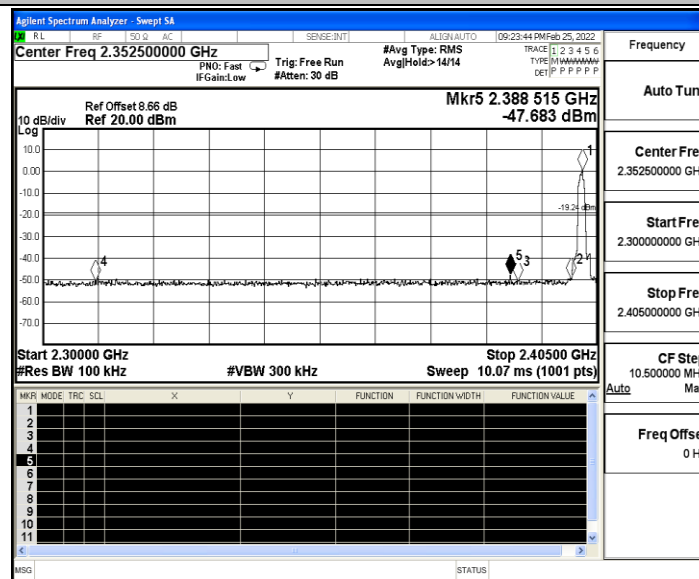


DH5_Ant1_High_Hop_2480

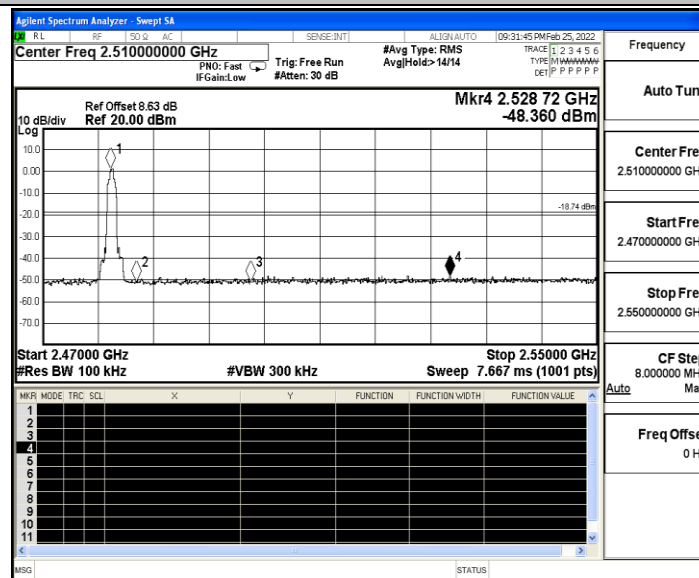




2DH5_Ant1_Low_2402

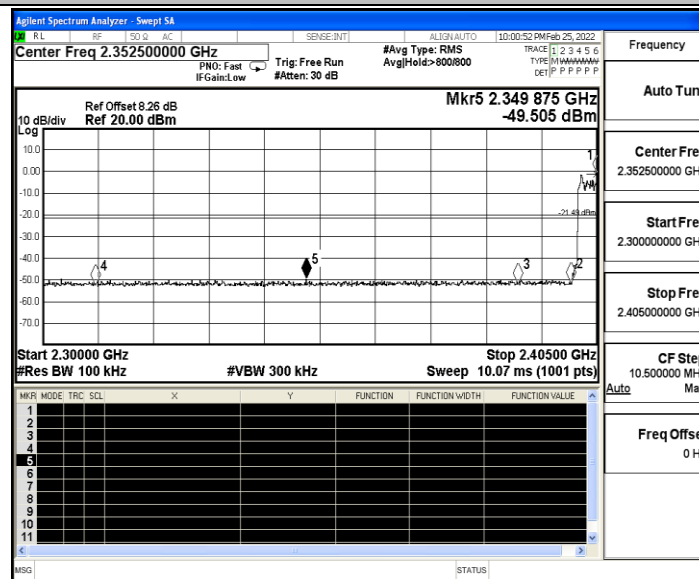


2DH5_Ant1_High_2480

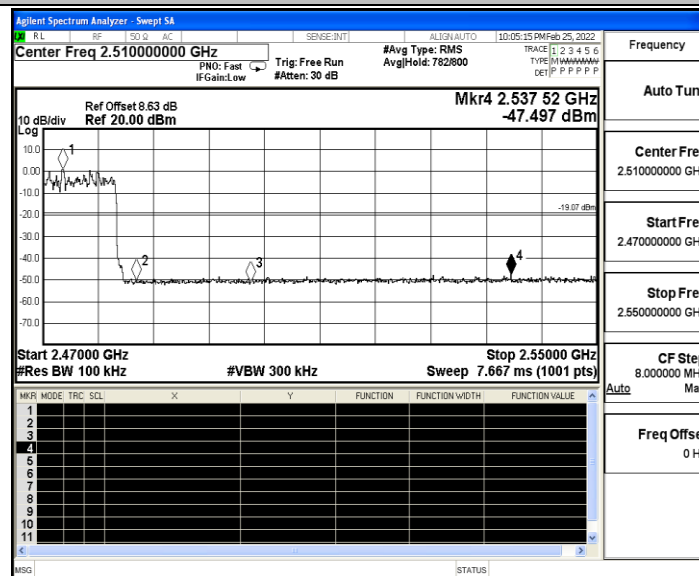




2DH5_Ant1_Low_Hop_2402

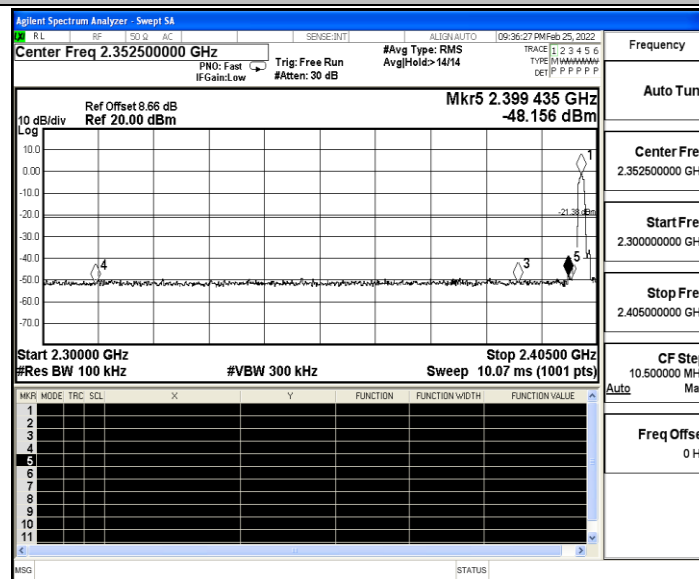


2DH5_Ant1_High_Hop_2480

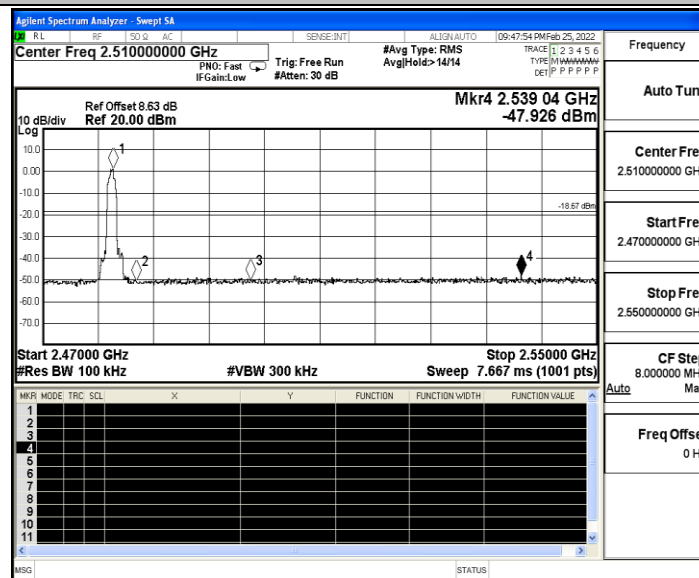




3DH5_Ant1_Low_2402

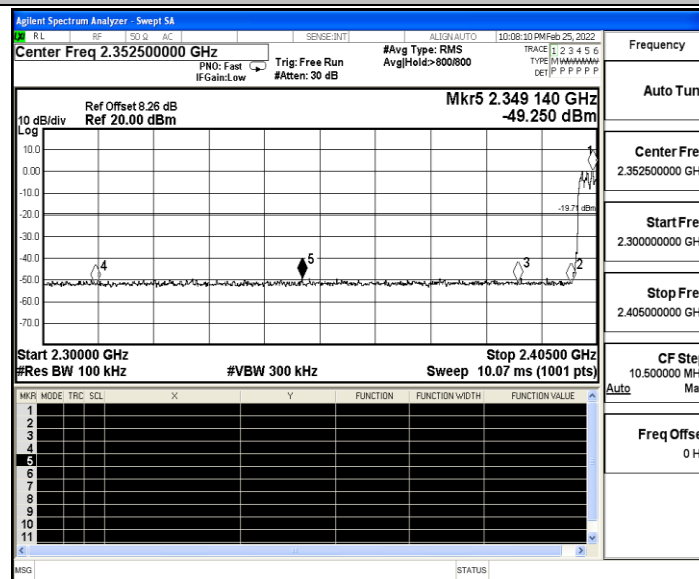


3DH5_Ant1_High_2480

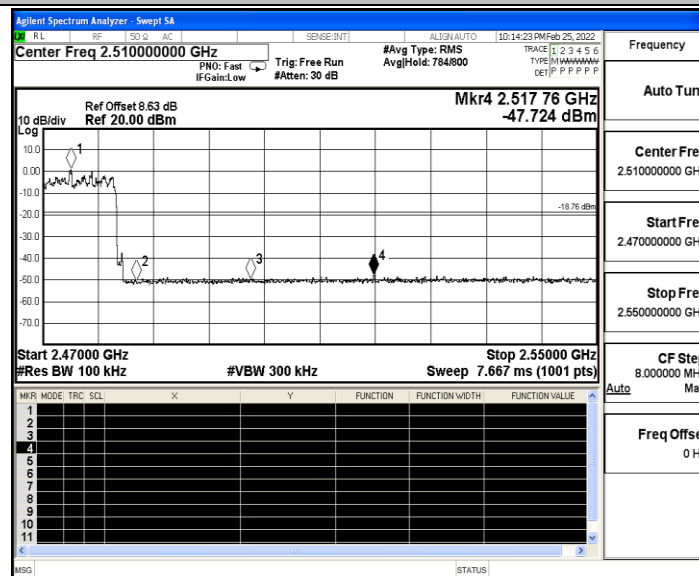




3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480





A.7 Conducted Spurious Emission

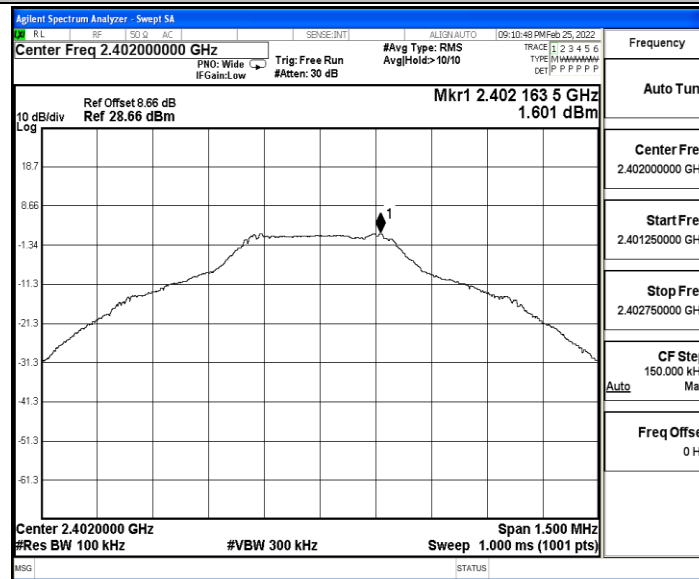
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	1.60	1.60	---	PASS
			30~1000	1.60	-60.14	≤-18.4	PASS
			1000~26500	1.60	-46.36	≤-18.4	PASS
		2441	Reference	2.12	2.12	---	PASS
			30~1000	2.12	-60.95	≤-17.88	PASS
			1000~26500	2.12	-45.65	≤-17.88	PASS
		2480	Reference	2.16	2.16	---	PASS
			30~1000	2.16	-60.59	≤-17.84	PASS
			1000~26500	2.16	-46.72	≤-17.84	PASS
2DH5	Ant1	2402	Reference	0.81	0.81	---	PASS
			30~1000	0.81	-60.64	≤-19.19	PASS
			1000~26500	0.81	-45.21	≤-19.19	PASS
		2441	Reference	1.41	1.41	---	PASS
			30~1000	1.41	-60.89	≤-18.59	PASS
			1000~26500	1.41	-46.15	≤-18.59	PASS
		2480	Reference	1.07	1.07	---	PASS
			30~1000	1.07	-61.22	≤-18.93	PASS
			1000~26500	1.07	-45.34	≤-18.93	PASS
3DH5	Ant1	2402	Reference	0.93	0.93	---	PASS
			30~1000	0.93	-60.12	≤-19.07	PASS
			1000~26500	0.93	-45.34	≤-19.07	PASS
		2441	Reference	1.32	1.32	---	PASS
			30~1000	1.32	-60.93	≤-18.68	PASS
			1000~26500	1.32	-46.4	≤-18.68	PASS
		2480	Reference	1.18	1.18	---	PASS
			30~1000	1.18	-60	≤-18.82	PASS
			1000~26500	1.18	-46.09	≤-18.82	PASS

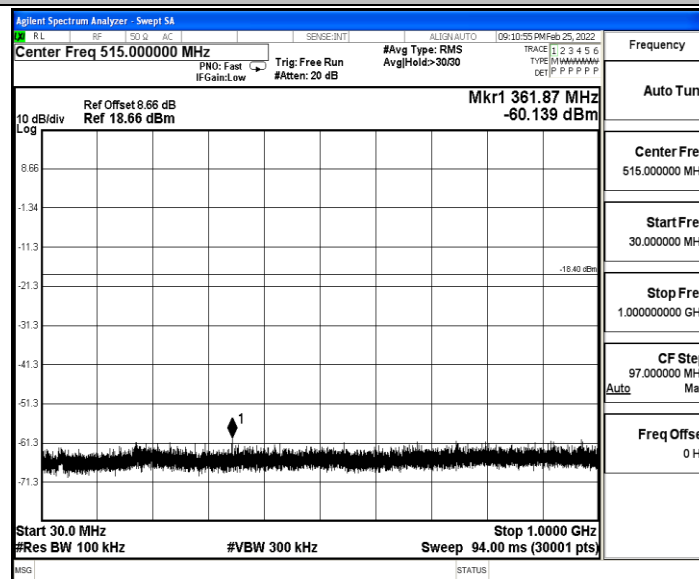


Test Graphs

DH5_Ant1_2402_0~Reference

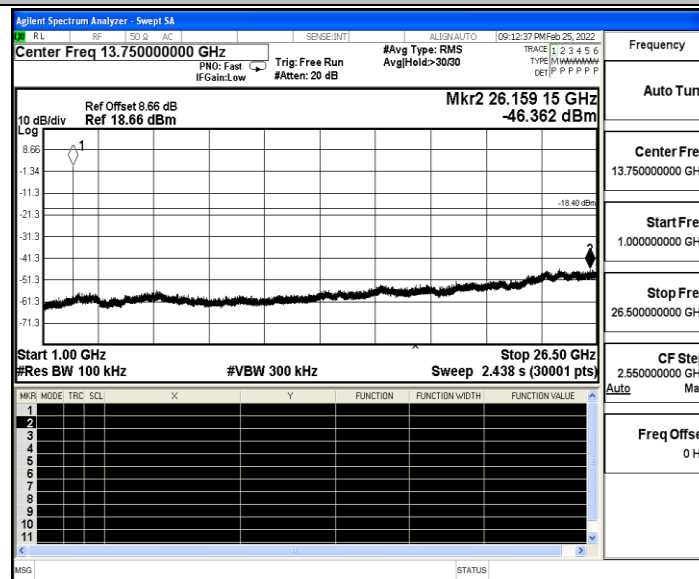


DH5_Ant1_2402_30~1000

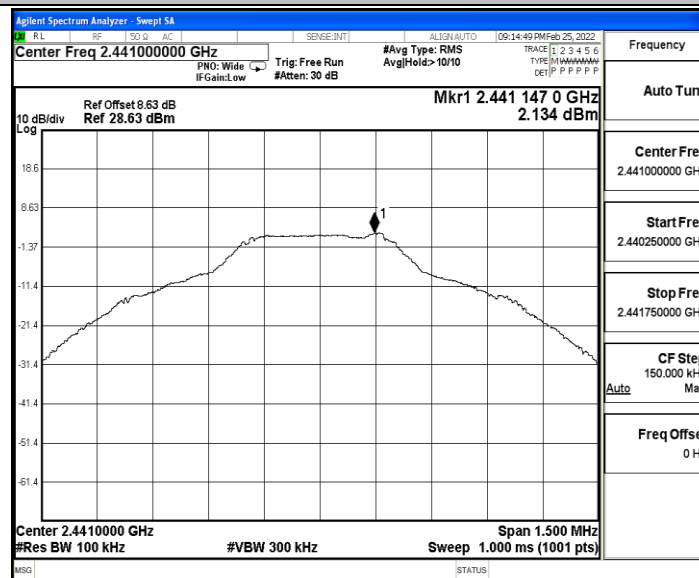




DH5_Ant1_2402_1000~26500

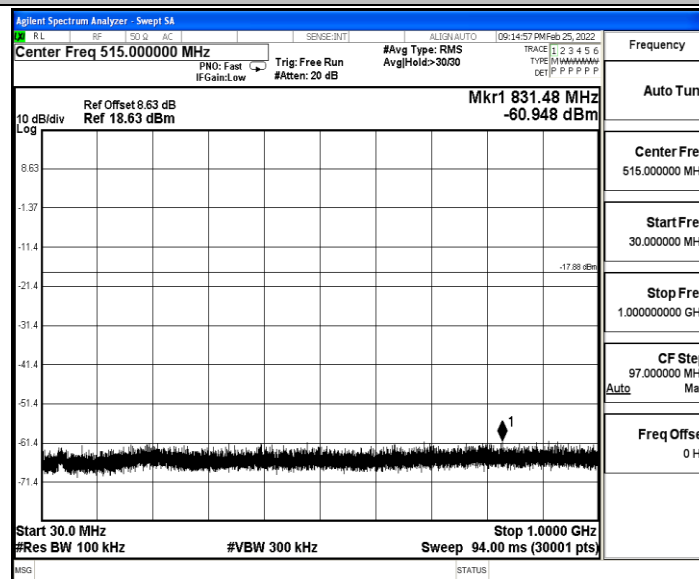


DH5_Ant1_2441_0~Reference

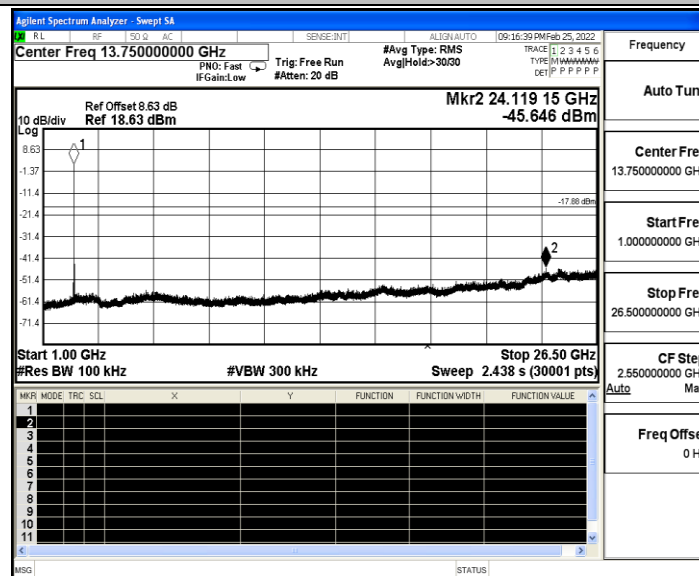




DH5_Ant1_2441_30~1000

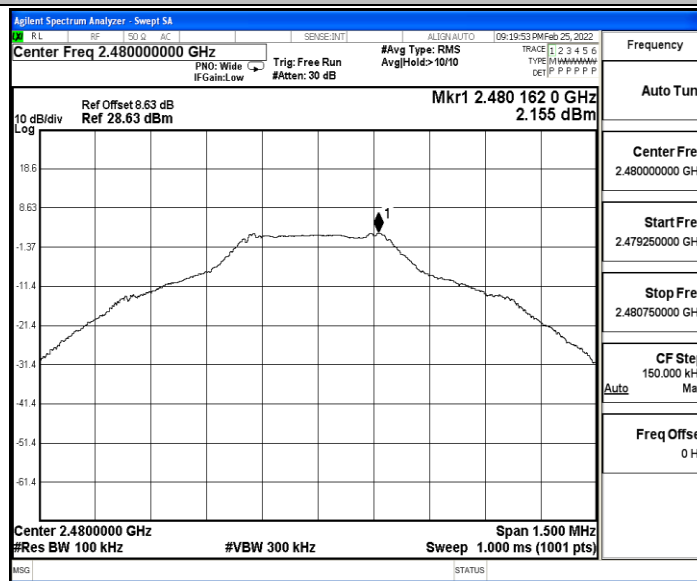


DH5_Ant1_2441_1000~26500

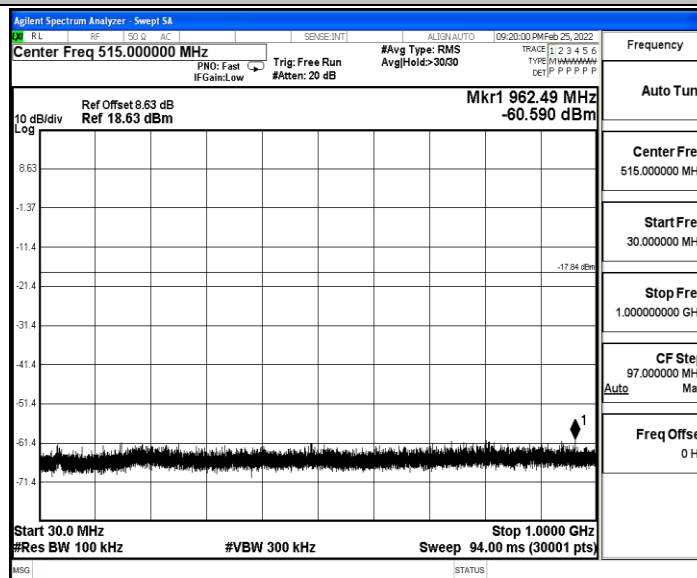


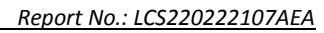


DH5_Ant1_2480_0~Reference



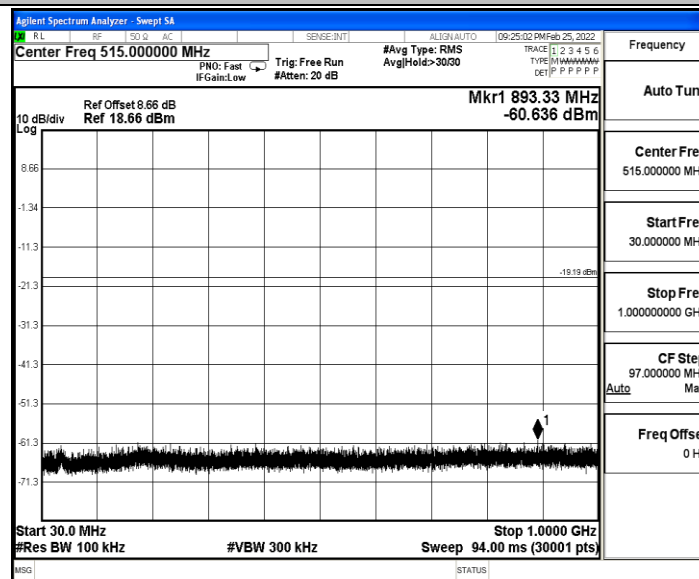
DH5_Ant1_2480_30~1000



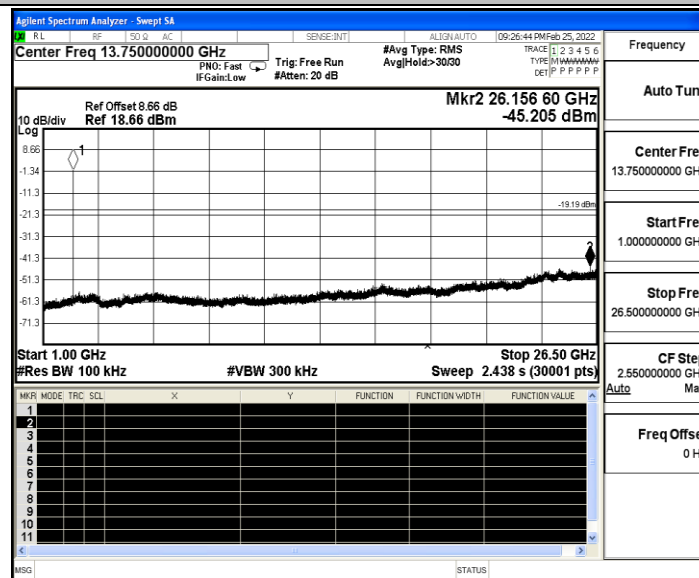




2DH5_Ant1_2402_30~1000

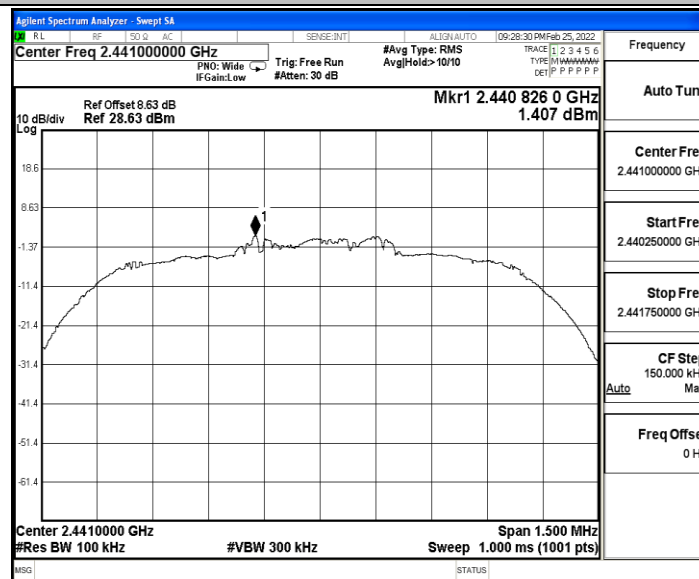


2DH5_Ant1_2402_1000~26500

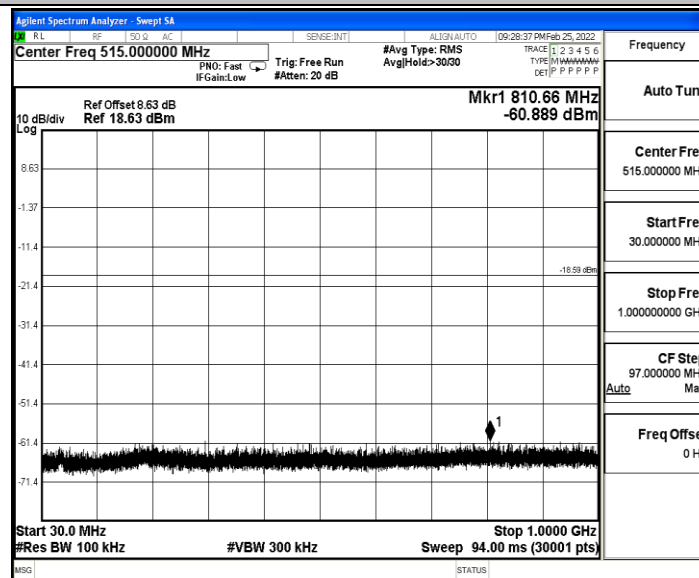




2DH5_Ant1_2441_0~Reference

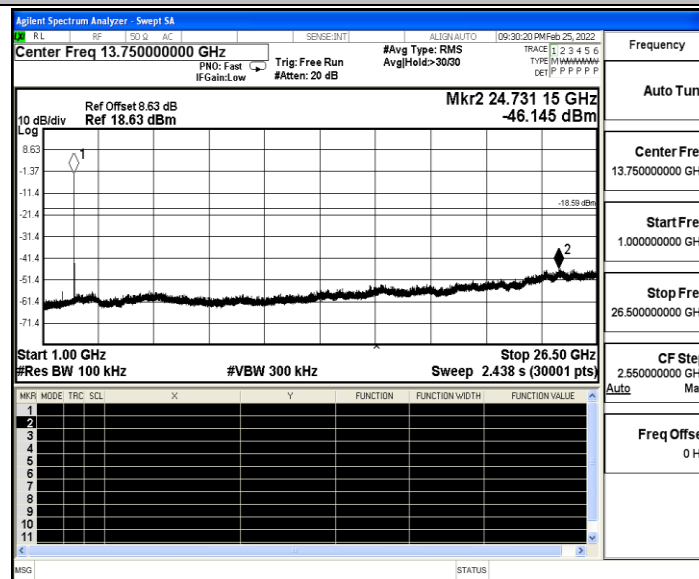


2DH5_Ant1_2441_30~1000

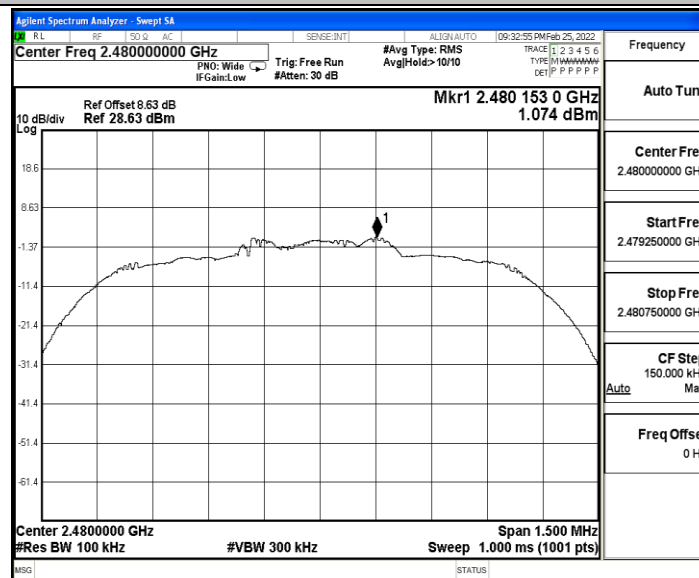




2DH5_Ant1_2441_1000~26500

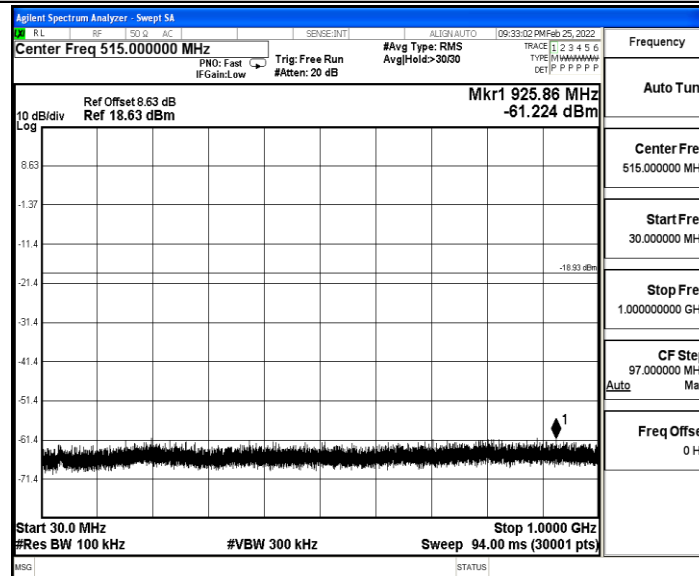


2DH5_Ant1_2480_0~Reference

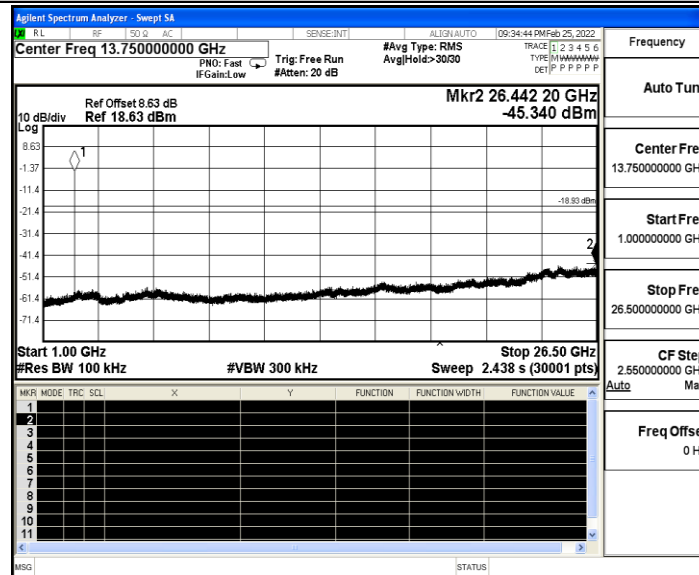




2DH5_Ant1_2480_30~1000

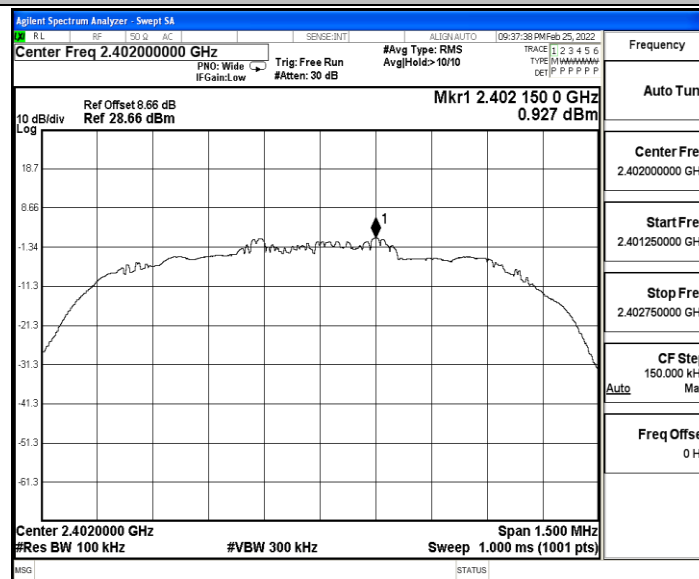


2DH5_Ant1_2480_1000~26500

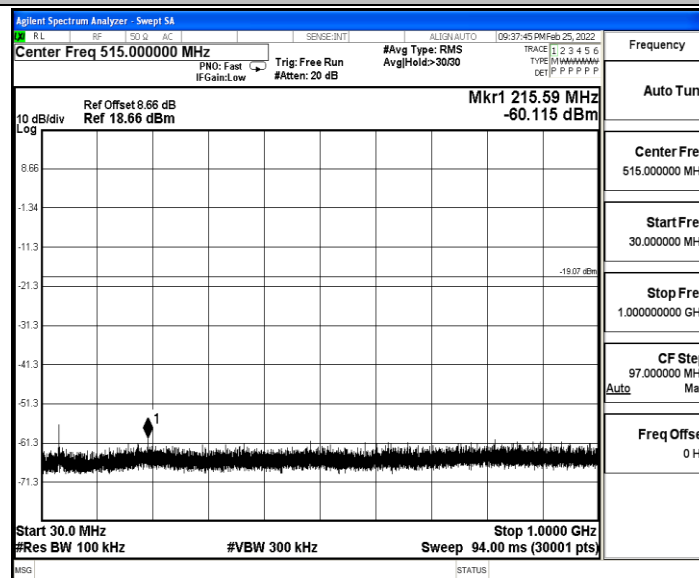




3DH5_Ant1_2402_0~Reference

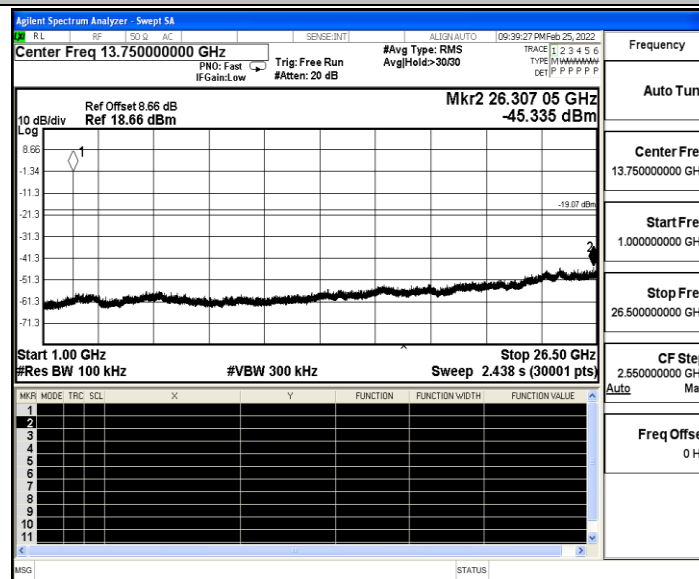


3DH5_Ant1_2402_30~1000

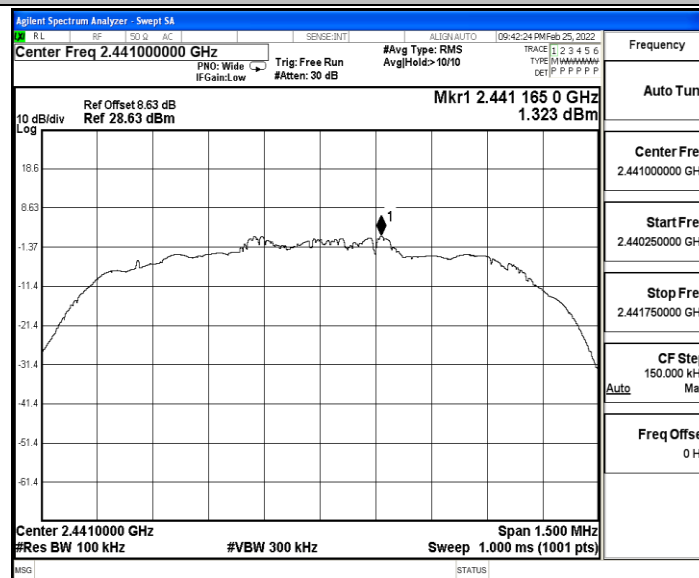




3DH5_Ant1_2402_1000~26500

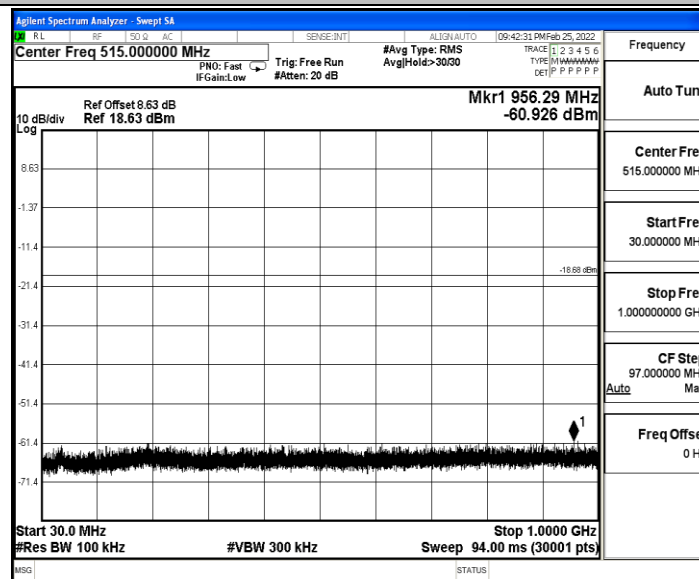


3DH5_Ant1_2441_0~Reference

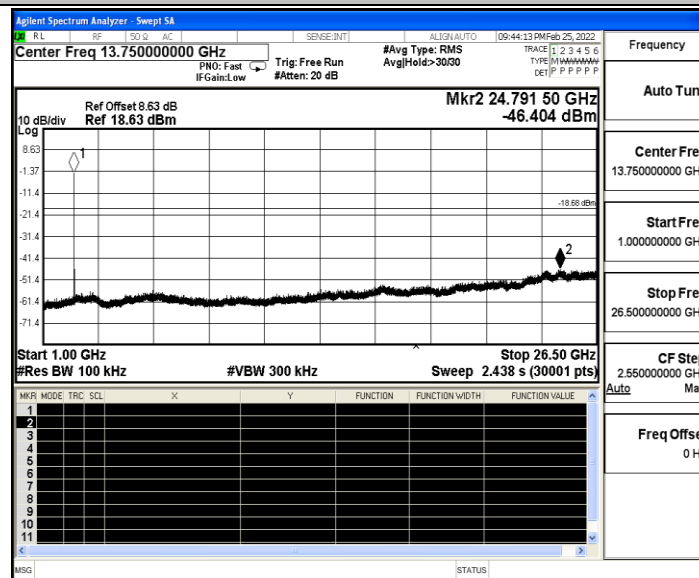




3DH5_Ant1_2441_30~1000

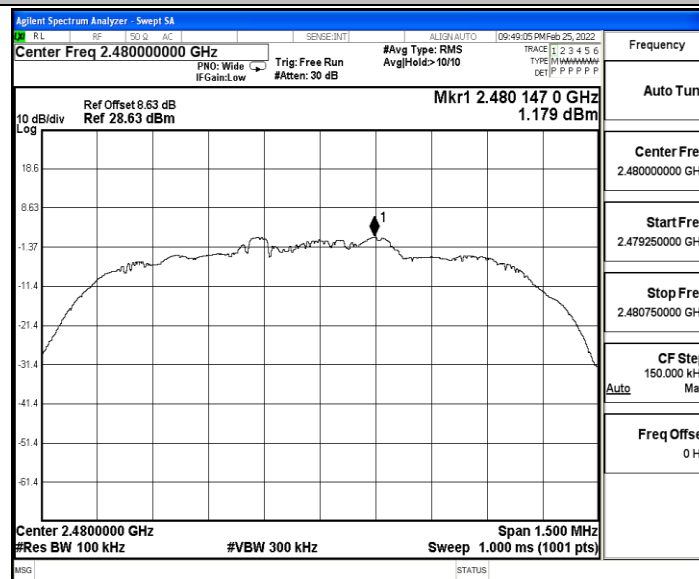


3DH5_Ant1_2441_1000~26500

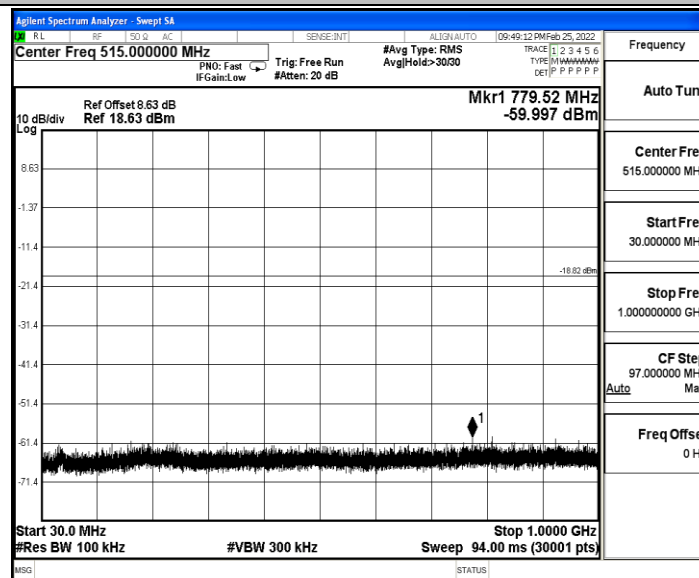




3DH5_Ant1_2480_0~Reference

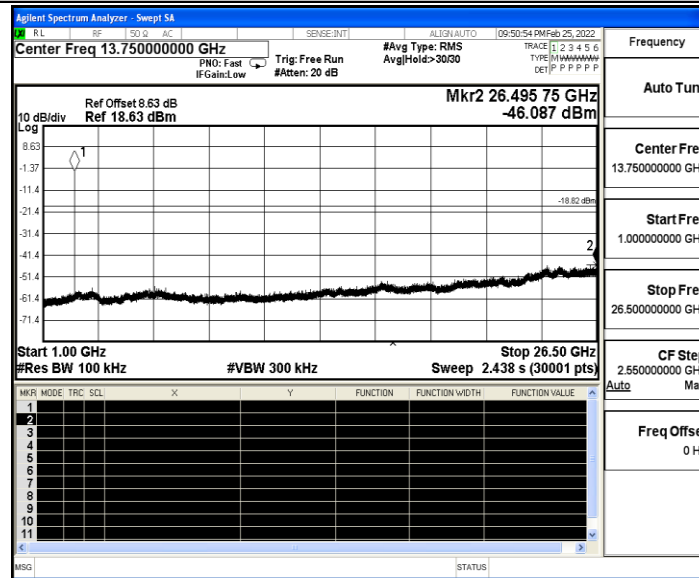


3DH5_Ant1_2480_30~1000





3DH5_Ant1_2480_1000-26500





A.8 Emissions in Restricted Bands

Test Result

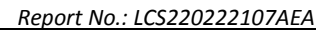
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-48.35	≤-41.20	46.85	≤54	PASS
				AV	2385.785	-47.83	≤-41.20	47.37	≤54	PASS
				AV	2390.000	-47.94	≤-41.20	47.26	≤54	PASS
				Peak	2310.000	-39.65	≤-21.20	55.55	≤74	PASS
				Peak	2388.095	-36.99	≤-21.20	58.21	≤74	PASS
				Peak	2390.000	-37.69	≤-21.20	57.51	≤74	PASS
		High	2480	AV	2483.500	-47.2	≤-41.20	48.00	≤54	PASS
				AV	2483.520	-47.2	≤-41.20	48.00	≤54	PASS
				AV	2500.000	-47.48	≤-41.20	47.72	≤54	PASS
				Peak	2483.500	-37.65	≤-21.20	57.55	≤74	PASS
				Peak	2498.960	-36.55	≤-21.20	58.65	≤74	PASS
				Peak	2500.000	-38.24	≤-21.20	56.96	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-38.68	≤-21.20	56.52	≤74	PASS
				Peak	2356.805	-37.08	≤-21.20	58.12	≤74	PASS
				Peak	2390.000	-38.71	≤-21.20	56.49	≤74	PASS
		High	Hop_2480	Peak	2483.500	-38.36	≤-21.20	56.84	≤74	PASS
				Peak	2497.680	-36.58	≤-21.20	58.62	≤74	PASS
				Peak	2500.000	-37.7	≤-21.20	57.50	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-48.37	≤-41.20	46.83	≤54	PASS
				AV	2389.145	-47.86	≤-41.20	47.34	≤54	PASS
				AV	2390.000	-47.94	≤-41.20	47.26	≤54	PASS
				Peak	2310.000	-38.81	≤-21.20	56.39	≤74	PASS
				Peak	2344.310	-37.13	≤-21.20	58.07	≤74	PASS
				Peak	2390.000	-39.24	≤-21.20	55.96	≤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	-47.53	≤-41.20	47.67	≤54	PASS
				Peak	2483.500	-37.76	≤-21.20	57.44	≤74	PASS
				Peak	2489.520	-36.69	≤-21.20	58.51	≤74	PASS
				Peak	2500.000	-37.87	≤-21.20	57.33	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-39.03	≤-21.20	56.17	≤74	PASS
				Peak	2384.000	-36.72	≤-21.20	58.48	≤74	PASS
				Peak	2390.000	-39.19	≤-21.20	56.01	≤74	PASS
		High	Hop_2480	Peak	2483.500	-37.9	≤-21.20	57.30	≤74	PASS
				Peak	2485.040	-36.6	≤-21.20	58.60	≤74	PASS
				Peak	2500.000	-37.85	≤-21.20	57.35	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-48.43	≤-41.20	46.77	≤54	PASS



				AV	2389.460	-47.84	≤ -41.20	47.36	≤ 54	PASS
				AV	2390.000	-48.09	≤ -41.20	47.11	≤ 54	PASS
				Peak	2310.000	-38.21	≤ -21.20	56.99	≤ 74	PASS
				Peak	2362.370	-36.19	≤ -21.20	59.01	≤ 74	PASS
				Peak	2390.000	-38.96	≤ -21.20	56.24	≤ 74	PASS
		High	2480	AV	2483.500	-47.3	≤ -41.20	47.90	≤ 54	PASS
				AV	2483.520	-47.3	≤ -41.20	47.90	≤ 54	PASS
				AV	2500.000	-47.47	≤ -41.20	47.73	≤ 54	PASS
				Peak	2483.500	-37.02	≤ -21.20	58.18	≤ 74	PASS
				Peak	2487.600	-36.45	≤ -21.20	58.75	≤ 74	PASS
				Peak	2500.000	-38.25	≤ -21.20	56.95	≤ 74	PASS
		Low	Hop_2402	Peak	2310.000	-39.64	≤ -21.20	55.56	≤ 74	PASS
				Peak	2345.780	-37.44	≤ -21.20	57.76	≤ 74	PASS
				Peak	2390.000	-39.03	≤ -21.20	56.17	≤ 74	PASS
		High	Hop_2480	Peak	2483.500	-38.71	≤ -21.20	56.49	≤ 74	PASS
				Peak	2484.800	-35.87	≤ -21.20	59.33	≤ 74	PASS
				Peak	2500.000	-38.29	≤ -21.20	56.91	≤ 74	PASS

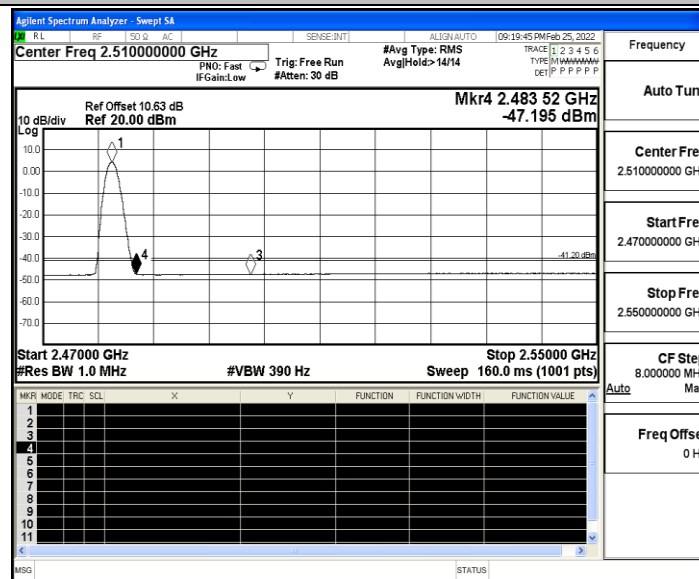
Note:

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.

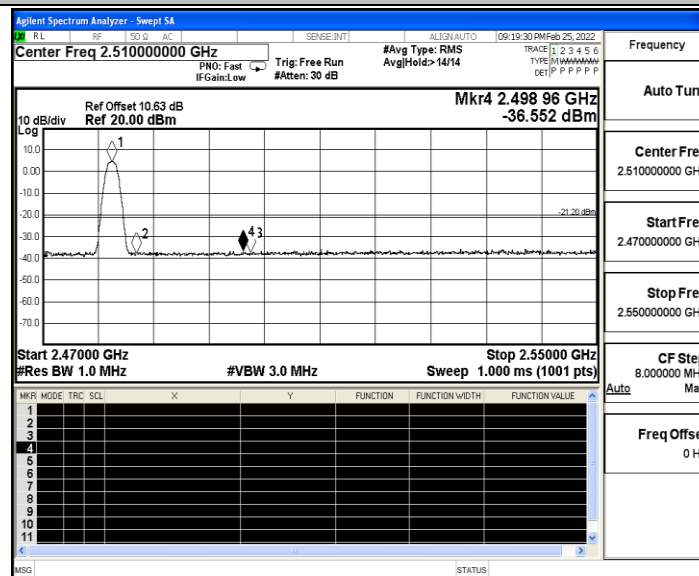




DH5_Ant1_High_2480_AV

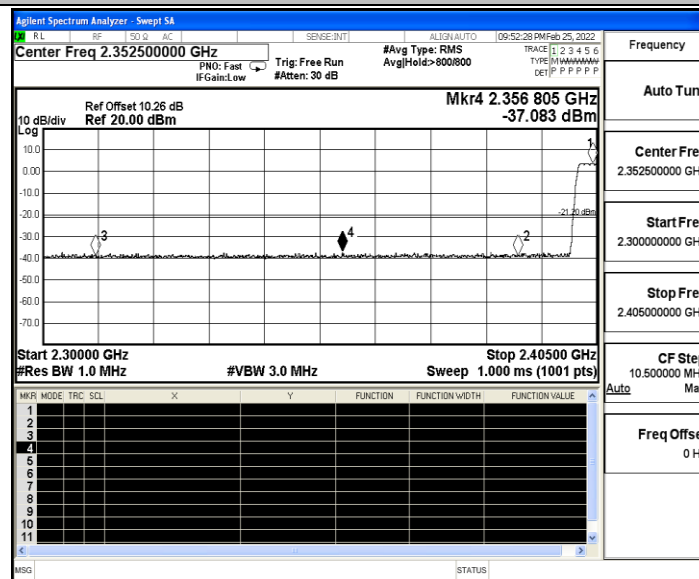


DH5_Ant1_High_2480_Peak

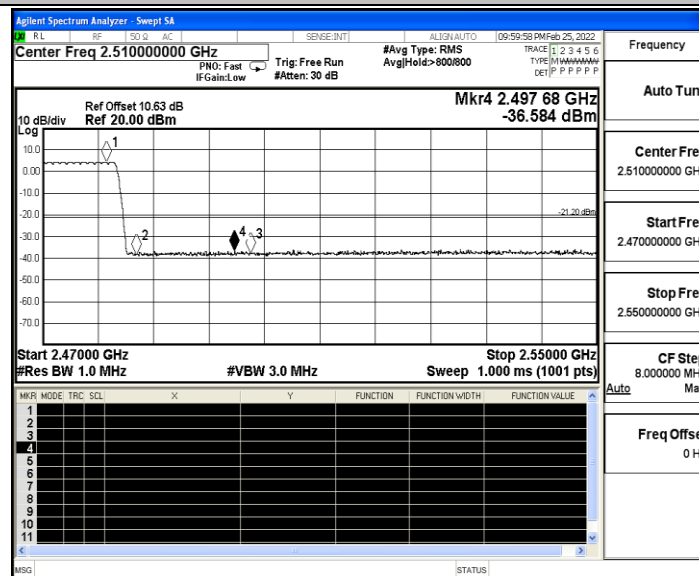




DH5_Ant1_Low_Hop_2402_Peak

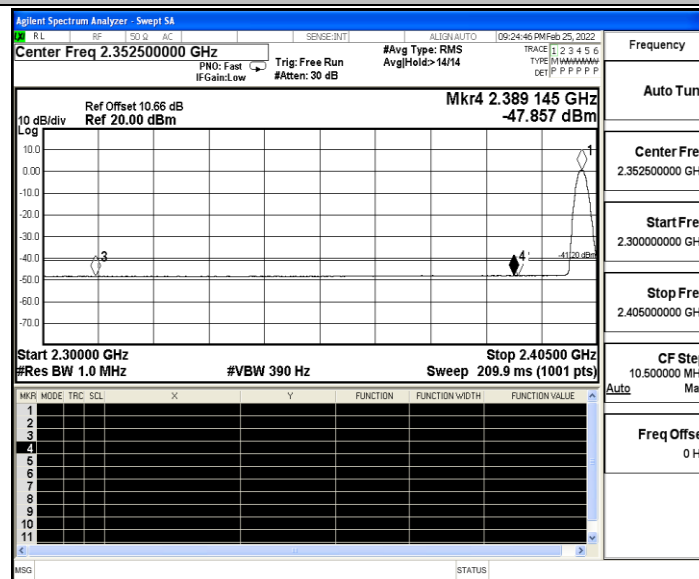


DH5_Ant1_High_Hop_2480_Peak

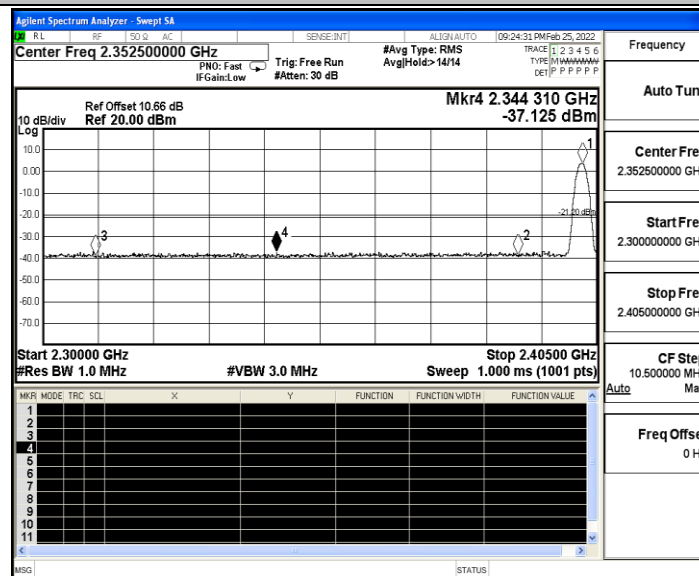




2DH5_Ant1_Low_2402_AV

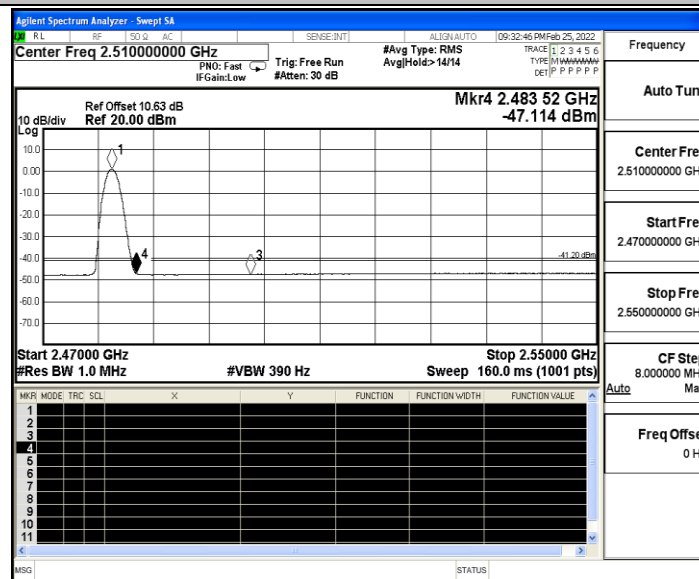


2DH5_Ant1_Low_2402_Peak

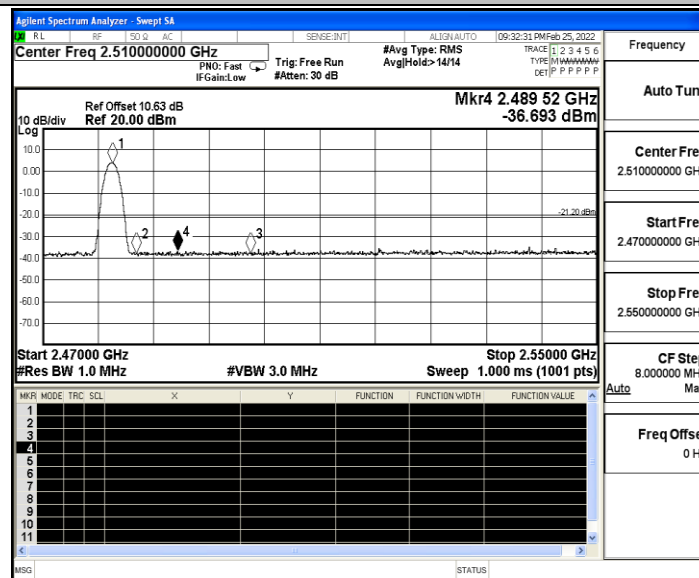




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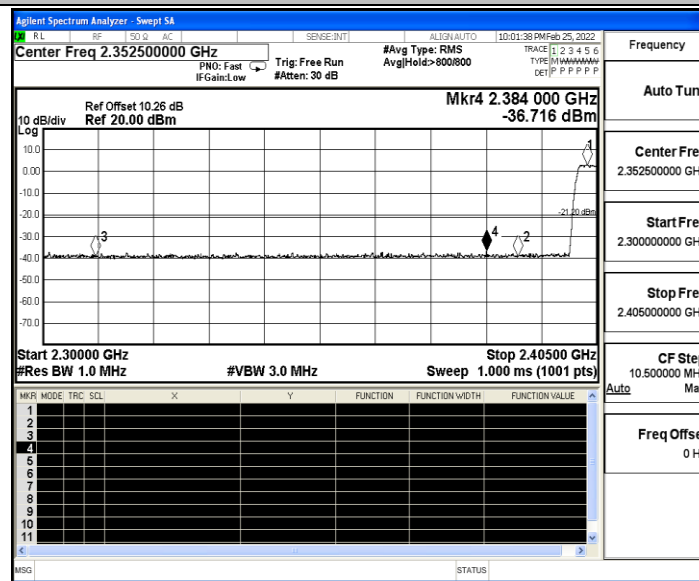


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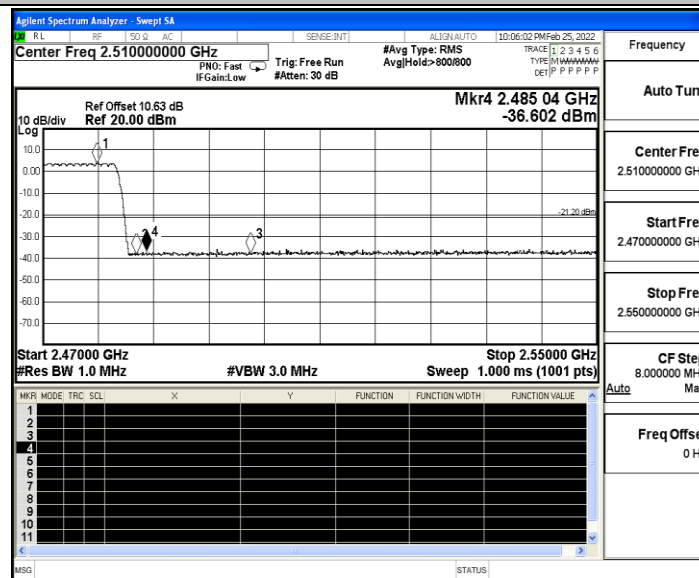




2DH5_Ant1_Low_Hop_2402_Peak

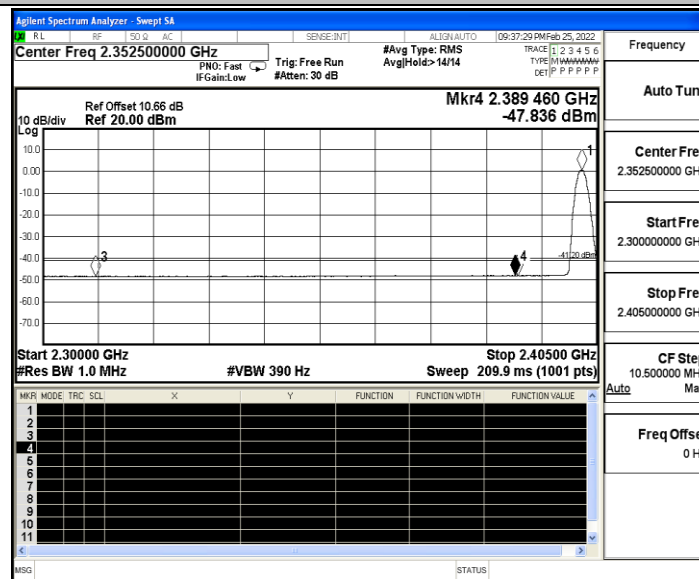


2DH5_Ant1_High_Hop_2480_Peak

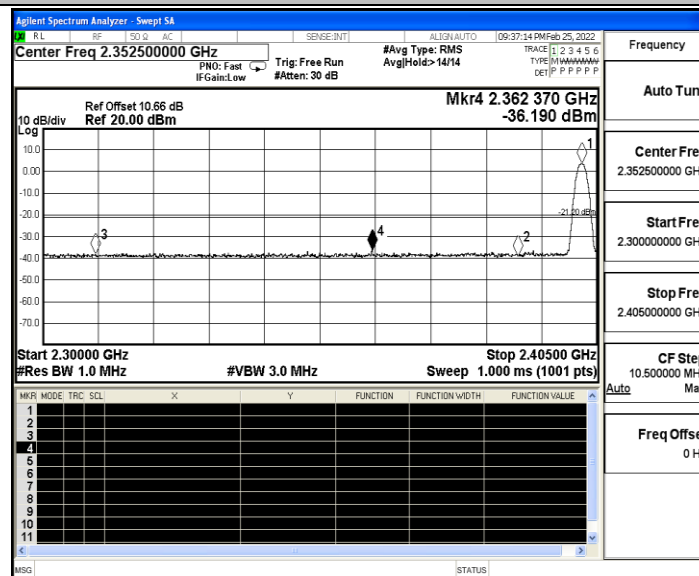




3DH5_Ant1_Low_2402_AV

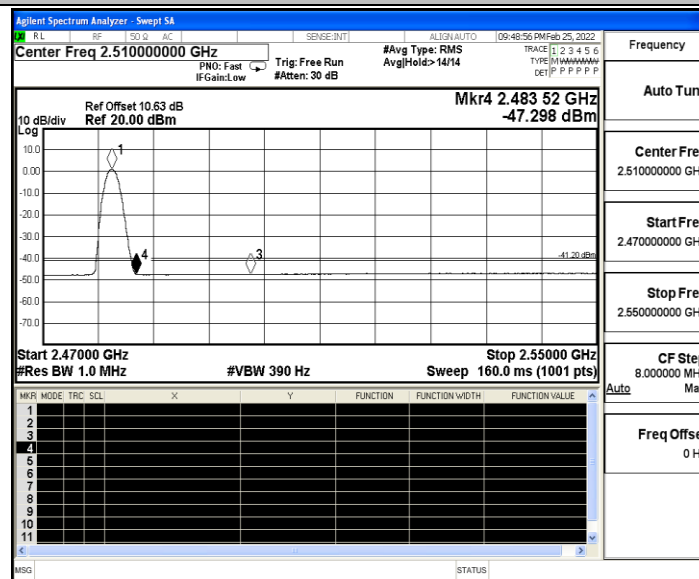


3DH5_Ant1_Low_2402_Peak

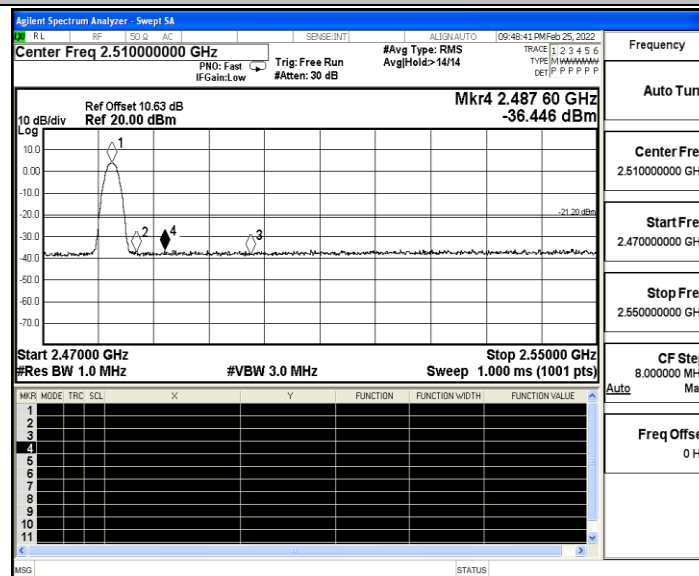




3DH5_Ant1_High_2480_AV

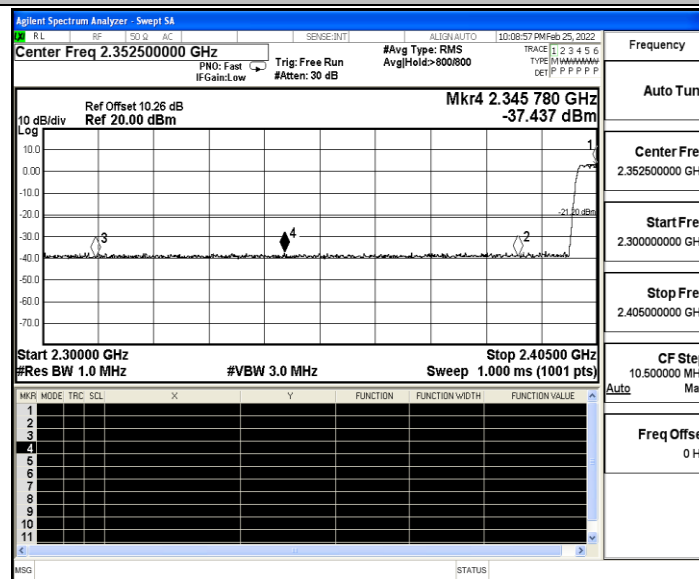


3DH5_Ant1_High_2480_Peak





3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

