

Appendix Test Data for BT(BDR/EDR) (Conducted Measurement)

Product Name: Wireless Earbuds
 Trade Mark: LOGIC, UNONU, ISWAG
 Test Model: LOGIC TW7
 FCC ID: O55TW73323

Environmental Conditions

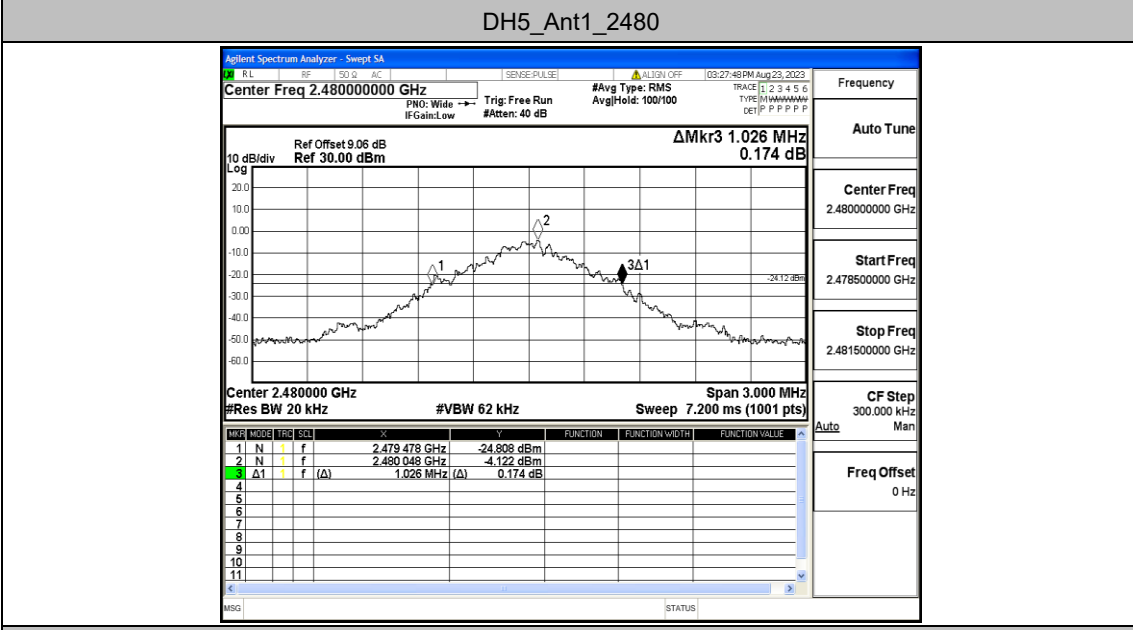
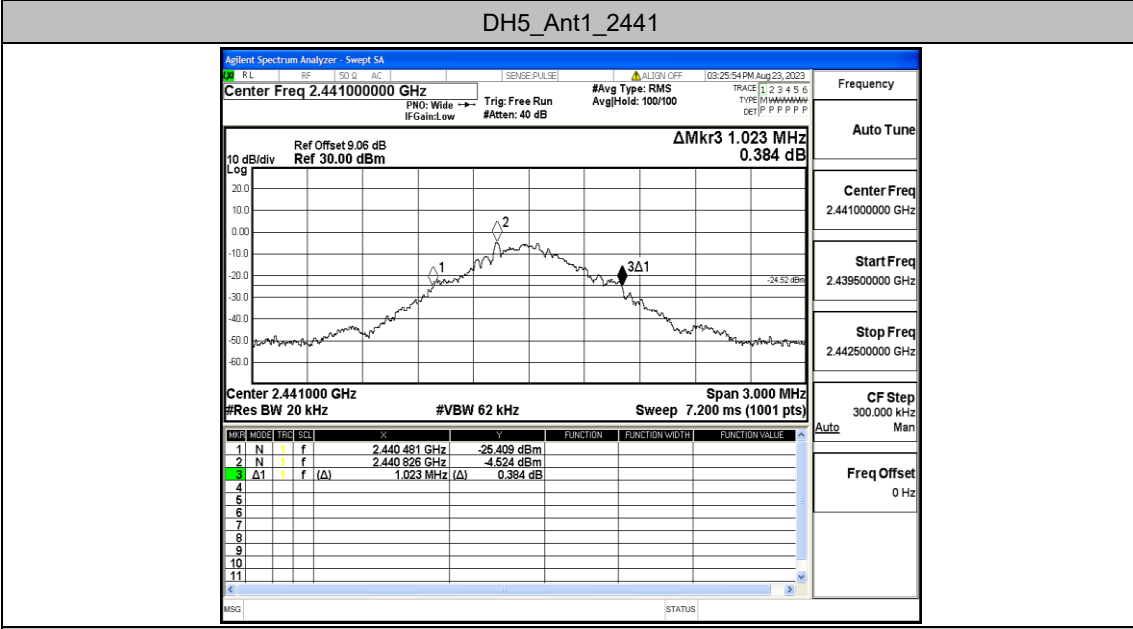
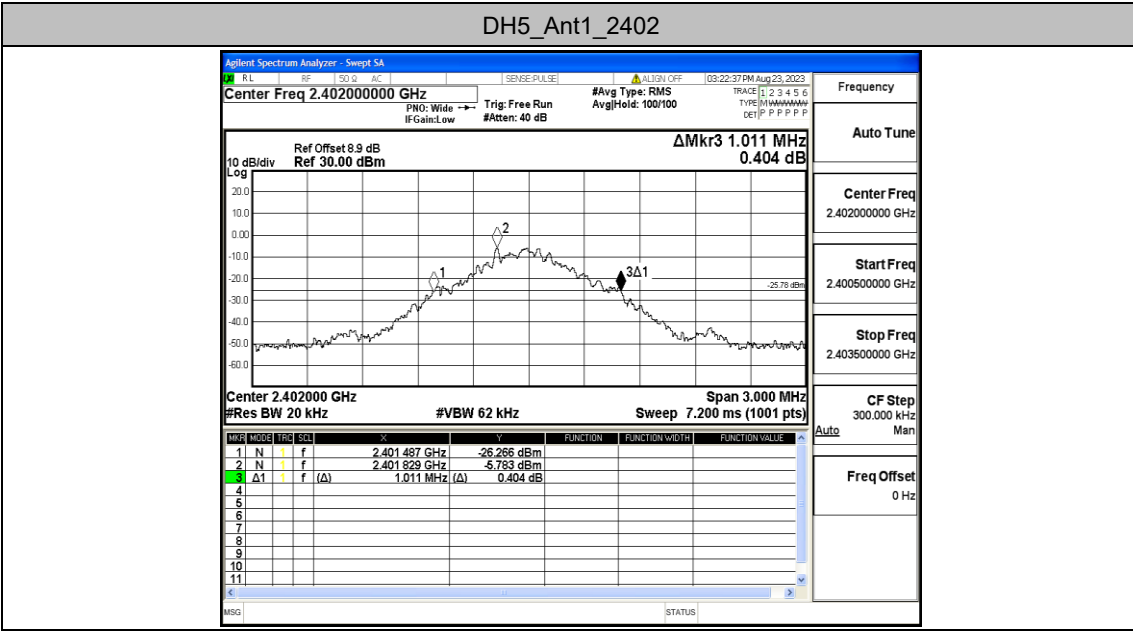
Temperature:	25.5°C
Relative Humidity:	55%
ATM Pressure:	100.0 kPa
Test Engineer:	Anna Hu
Supervised by:	Hugo Chen
NOTE	N/A

Appendix A: 20dB Emission Bandwidth

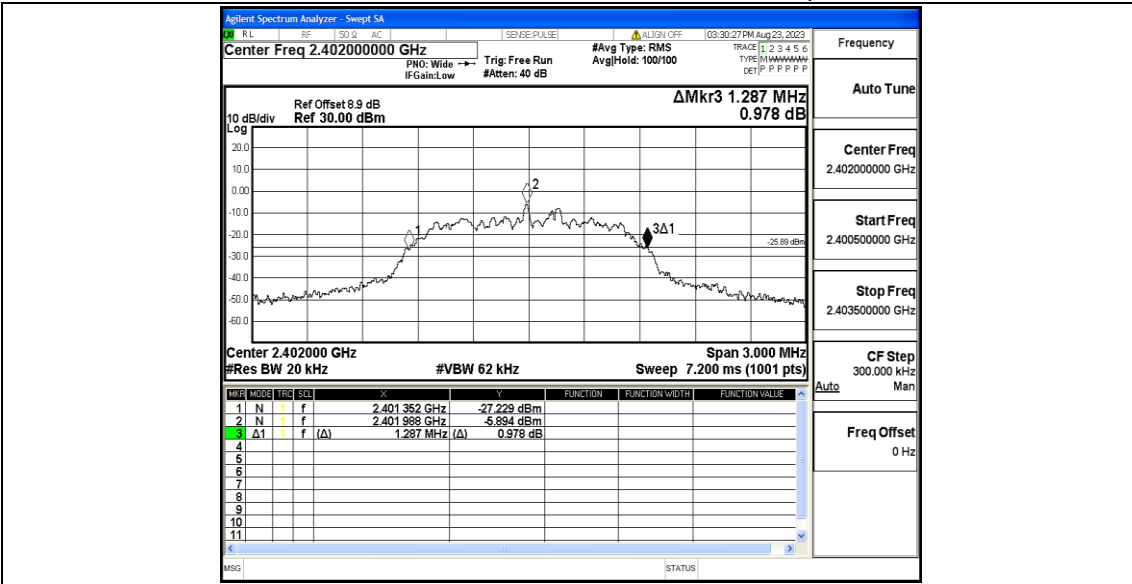
Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	1.011	2401.487	2402.498	---	---
		2441	1.023	2440.481	2441.504	---	---
		2480	1.026	2479.478	2480.504	---	---
2DH5	Ant1	2402	1.287	2401.352	2402.639	---	---
		2441	1.341	2440.322	2441.663	---	---
		2480	1.344	2479.322	2480.666	---	---

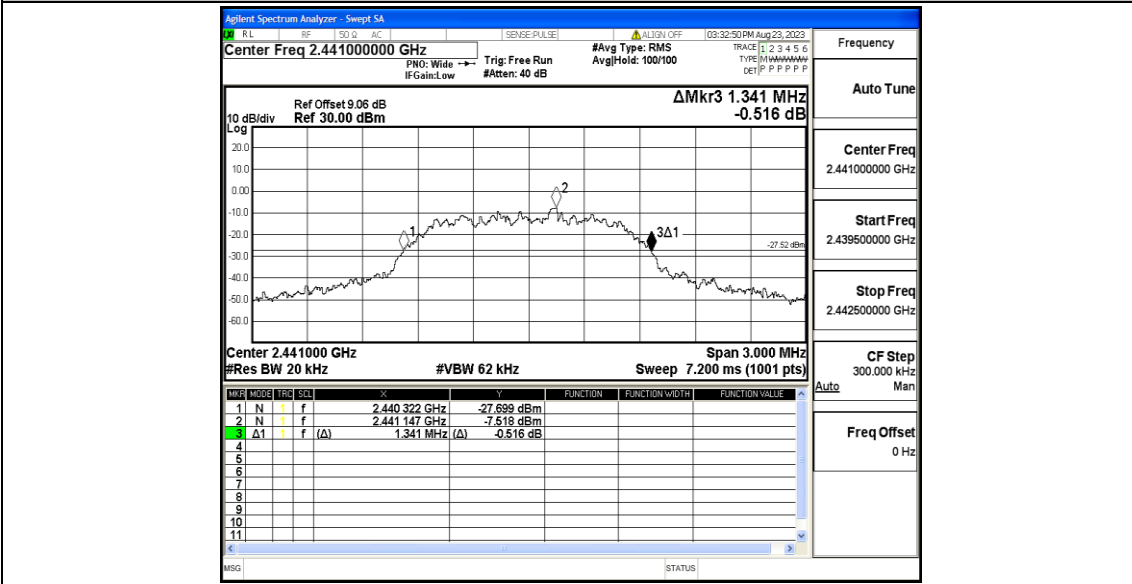
Test Graphs



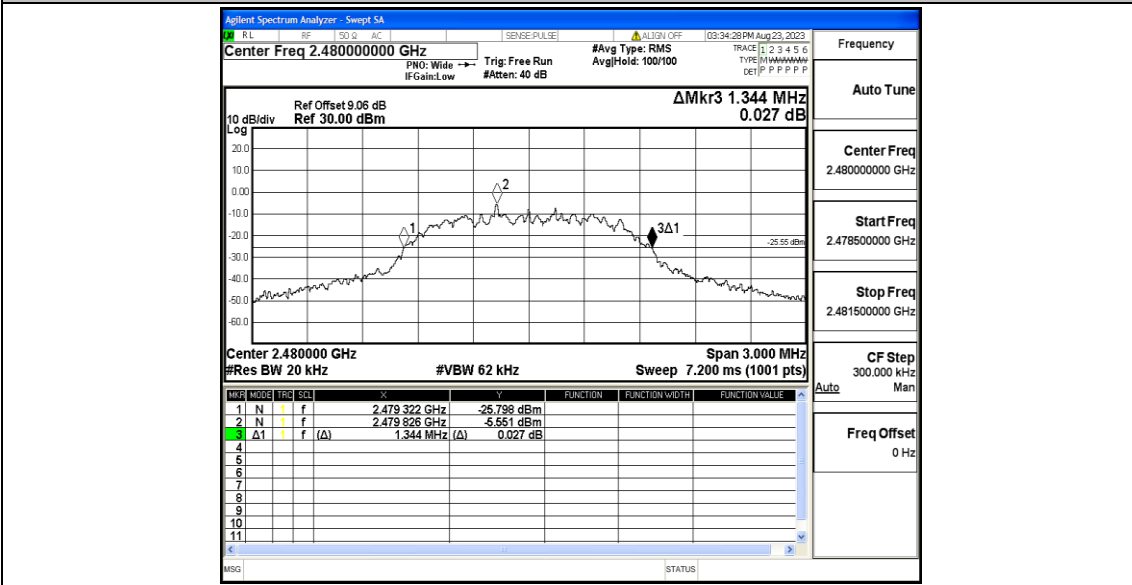
2DH5_Ant1_2402



2DH5_Ant1_2441



2DH5_Ant1_2480

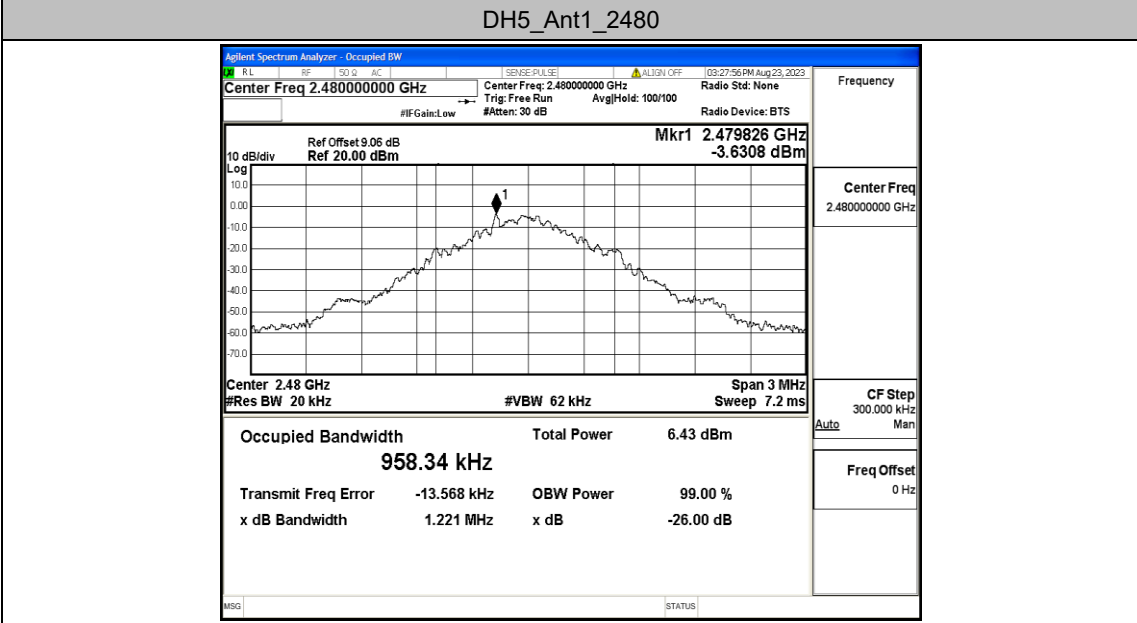
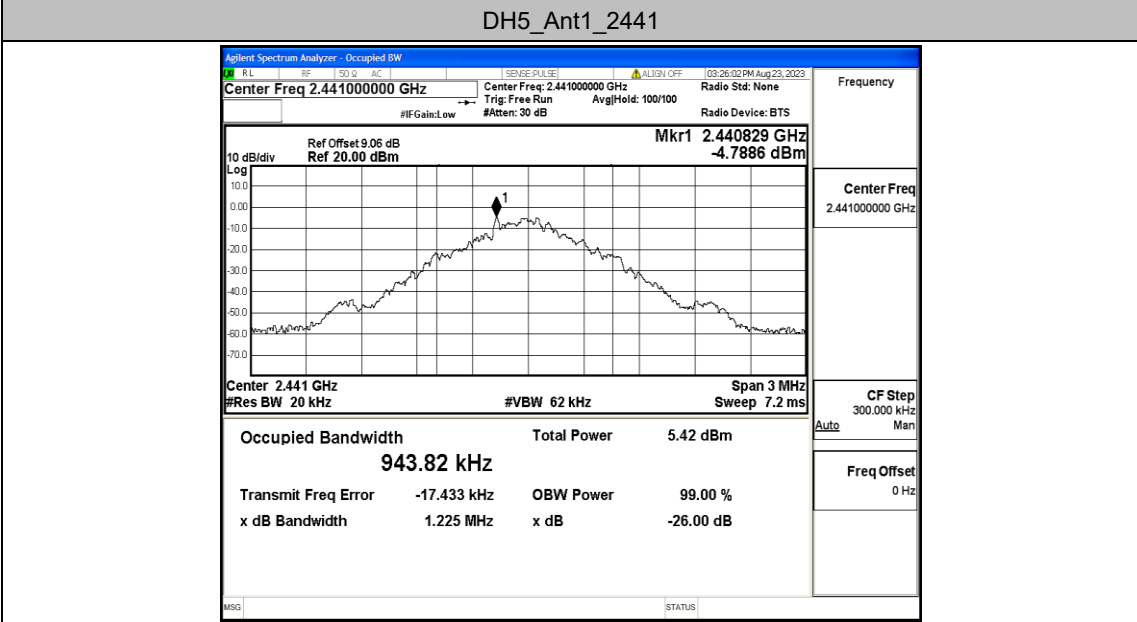
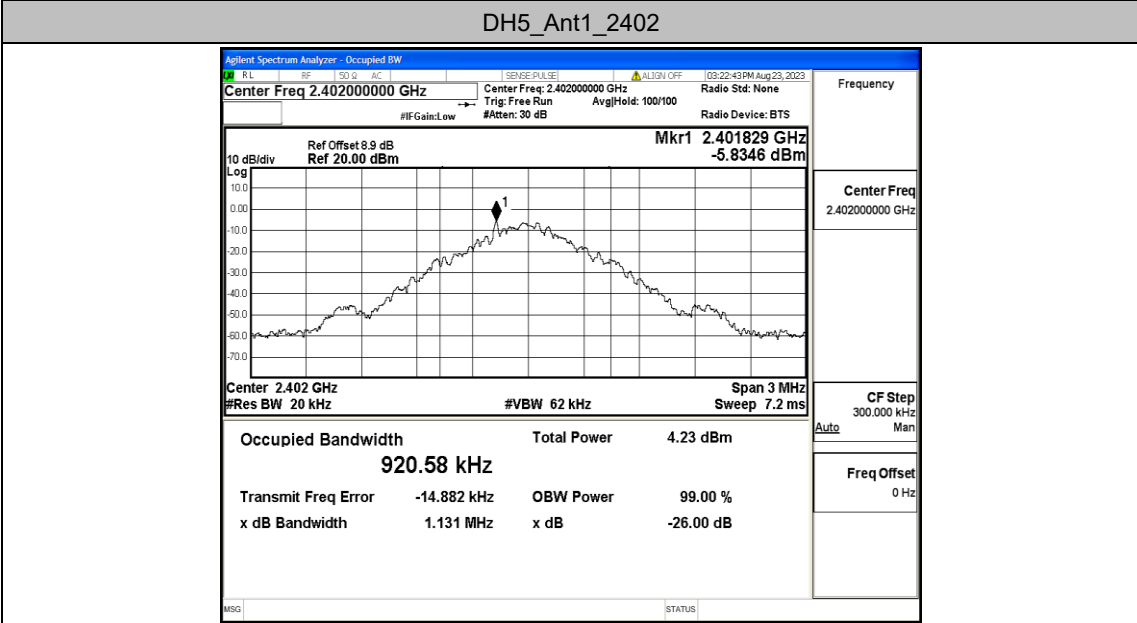


Appendix B: Occupied Channel Bandwidth

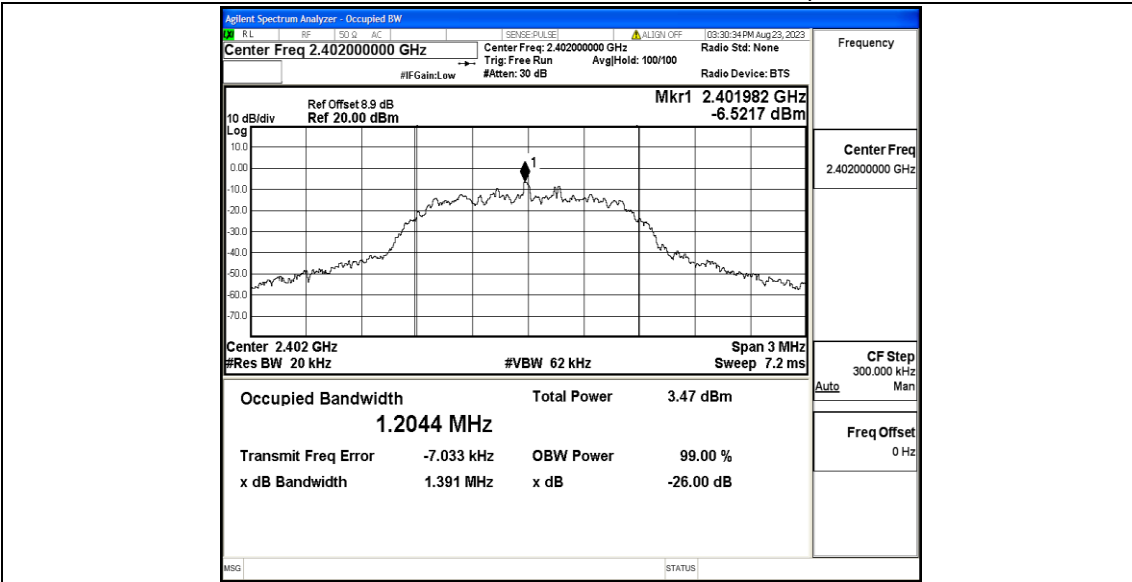
Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.92058	2401.5248	2402.4454	---	---
		2441	0.94382	2440.5107	2441.4545	---	---
		2480	0.95834	2479.5073	2480.4656	---	---
2DH5	Ant1	2402	1.2044	2401.3908	2402.5952	---	---
		2441	1.2116	2440.3907	2441.6023	---	---
		2480	1.2120	2479.3848	2480.5968	---	---

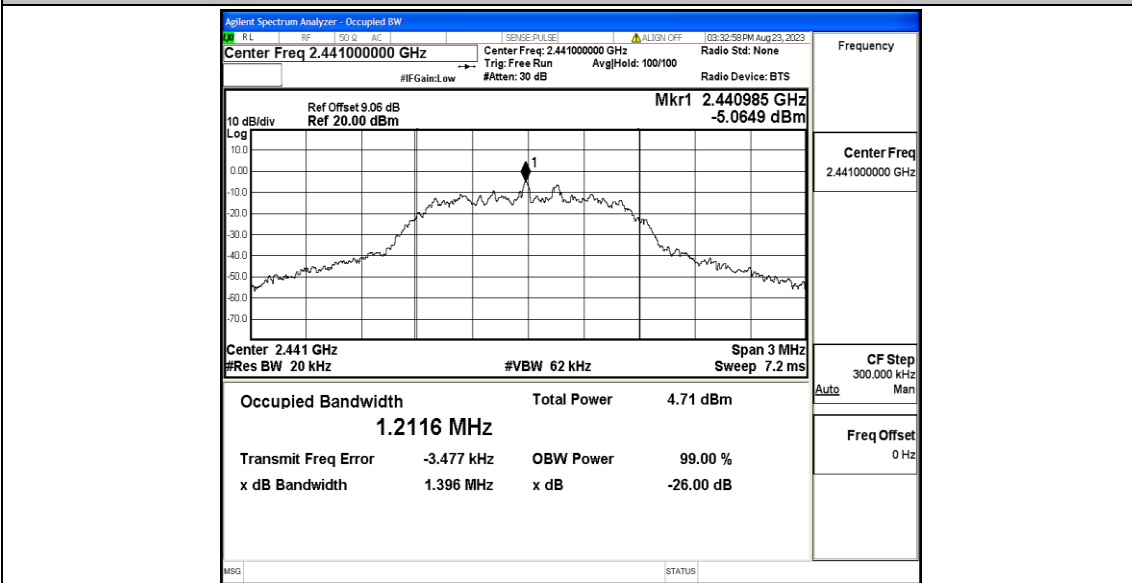
Test Graphs



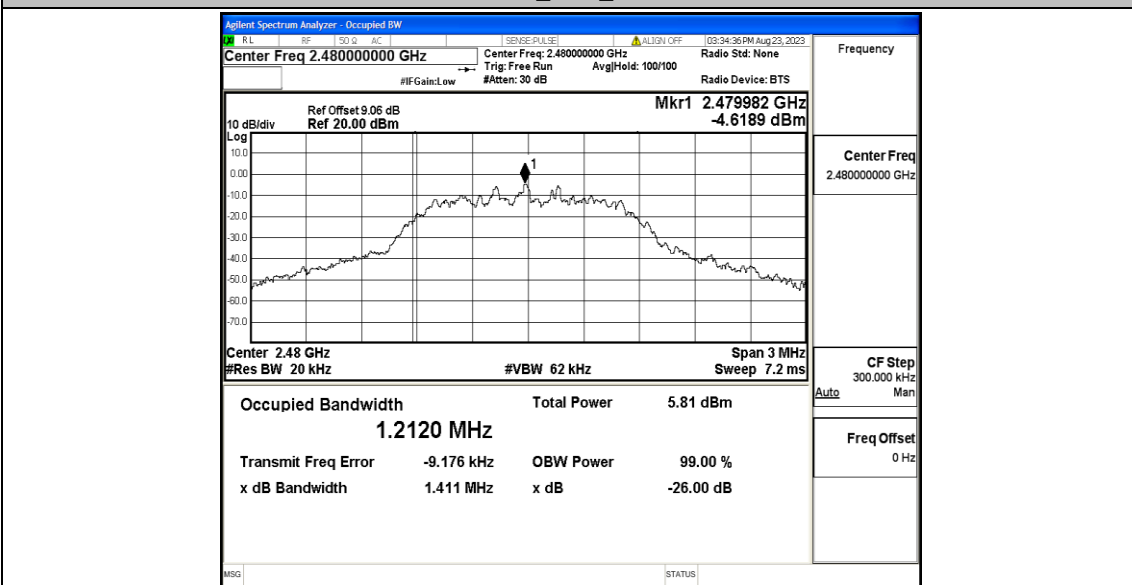
2DH5_Ant1_2402



2DH5_Ant1_2441



2DH5_Ant1_2480



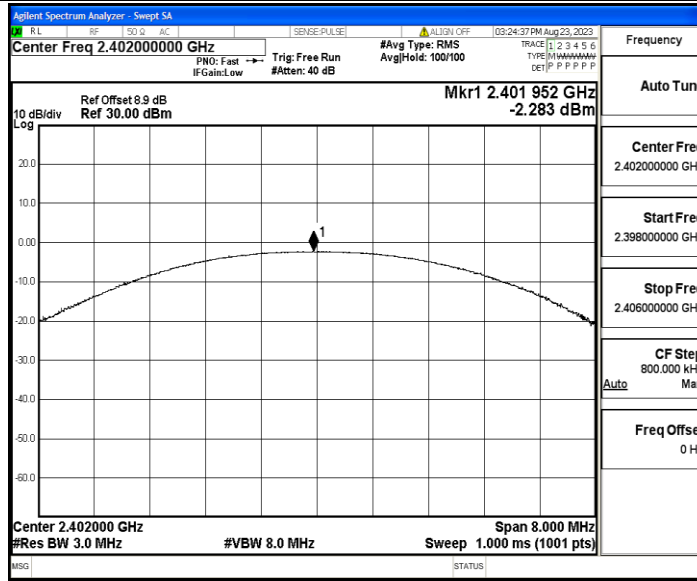
Appendix C: Maximum Peak conducted output power

Test Result

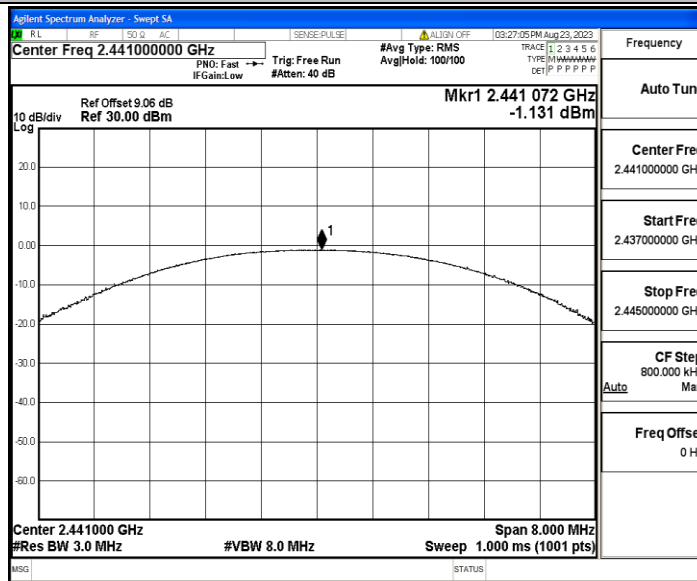
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	-2.28	≤30	PASS
		2441	-1.13	≤30	PASS
		2480	-0.28	≤30	PASS
2DH5	Ant1	2402	-1.39	≤20.97	PASS
		2441	-0.33	≤20.97	PASS
		2480	0.55	≤20.97	PASS

Test Graphs

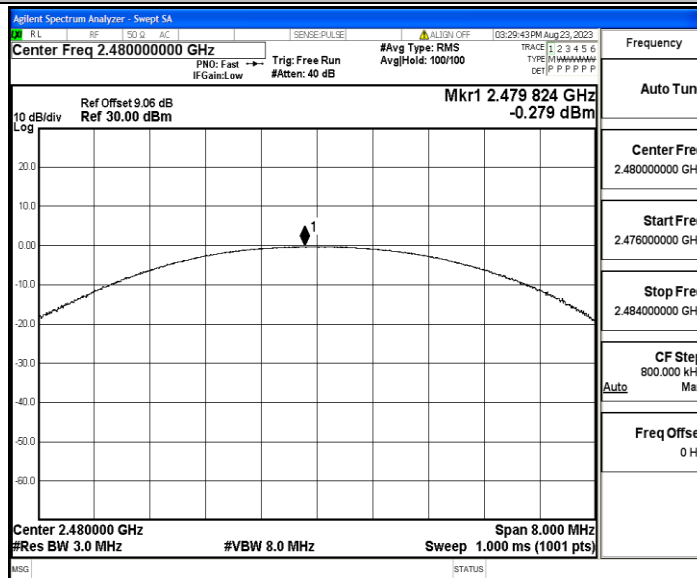
DH5_Ant1_2402



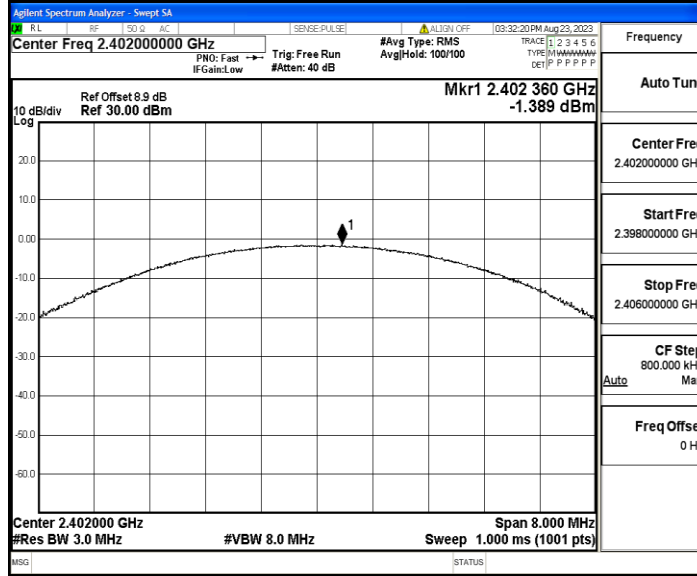
DH5_Ant1_2441



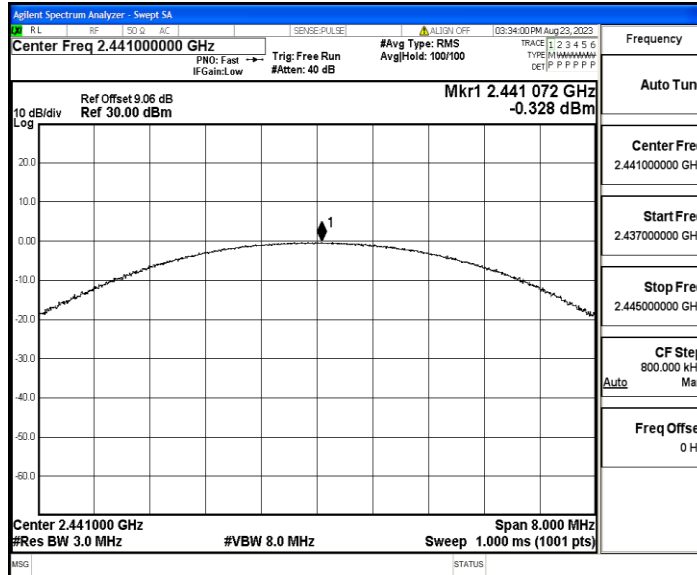
DH5_Ant1_2480



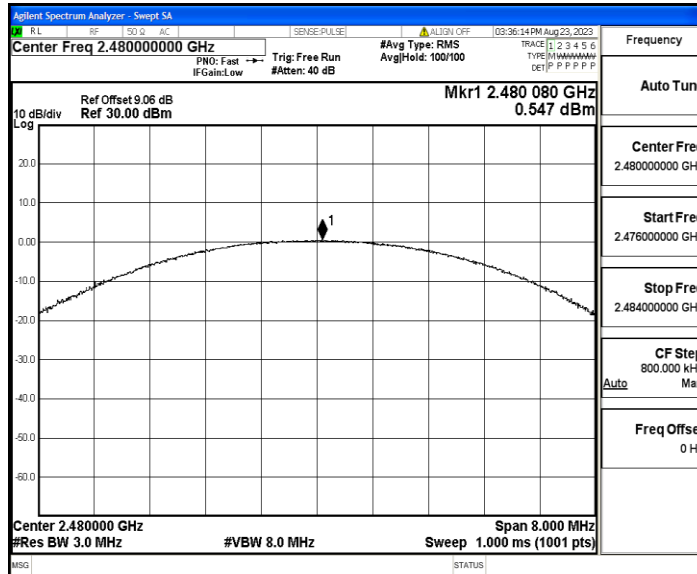
2DH5_Ant1_2402



2DH5_Ant1_2441



2DH5_Ant1_2480

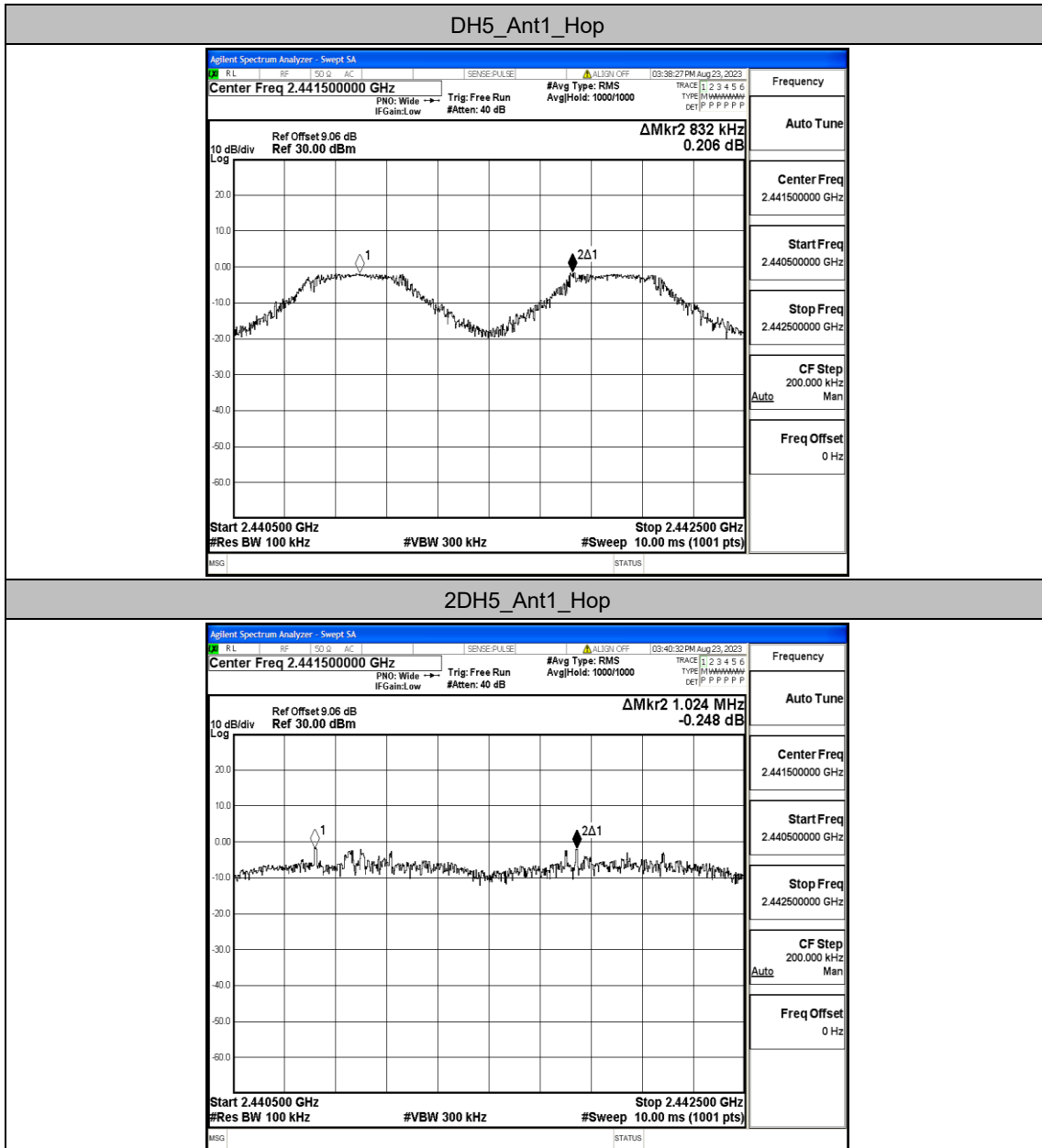


Appendix D: Carrier frequency separation

Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.832	≥ 0.684	PASS
2DH5	Ant1	Hop	1.024	≥ 0.896	PASS

Test Graphs

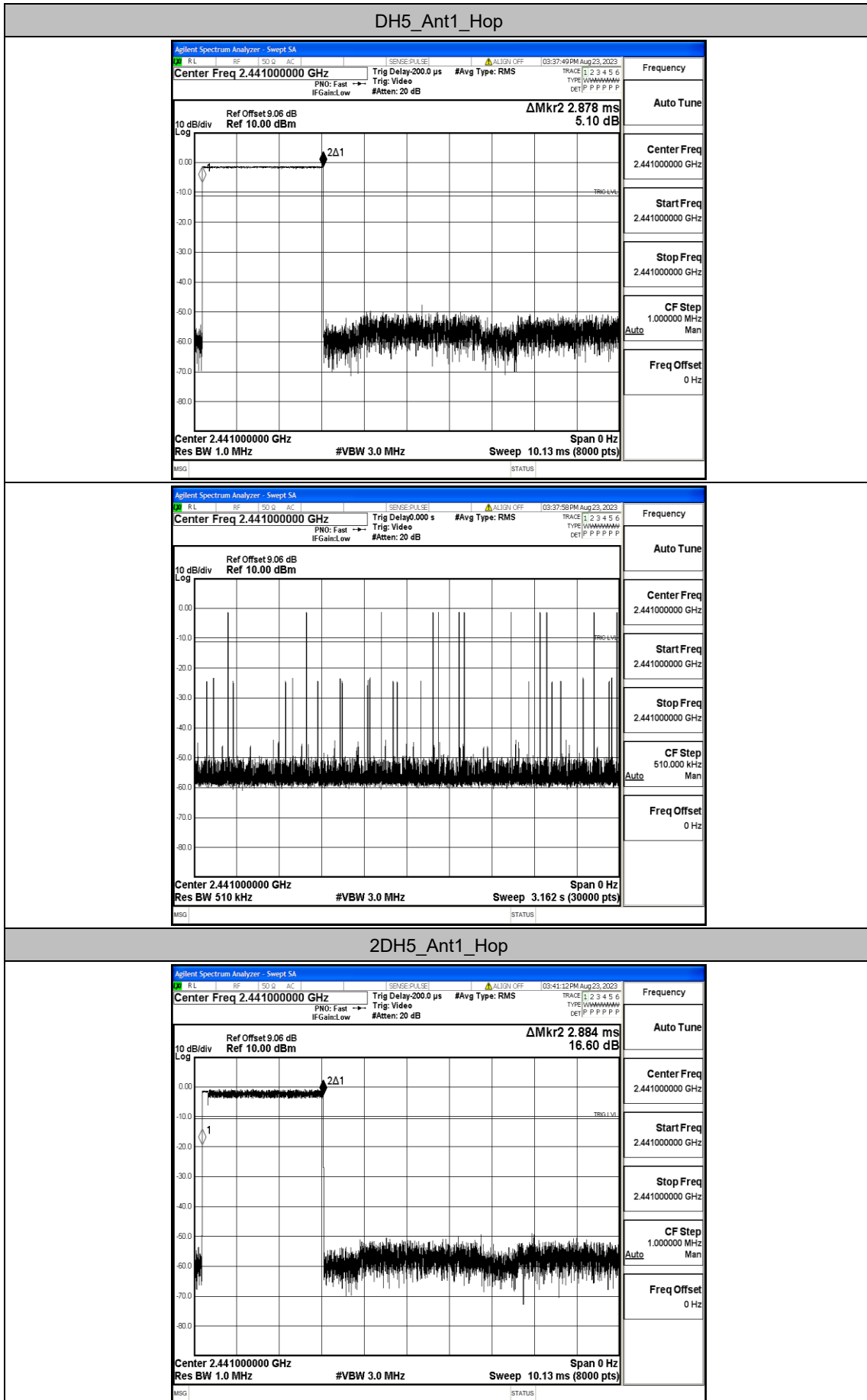


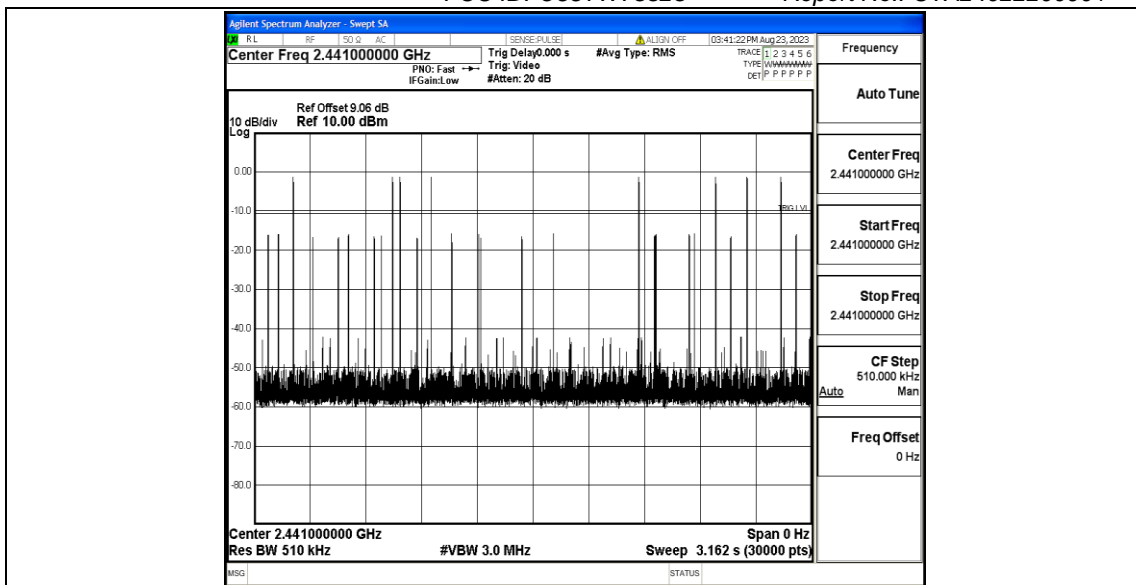
Appendix E: Time of occupancy

Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.878	130	0.374	≤0.4	PASS
2DH5	Ant1	Hop	2.884	100	0.288	≤0.4	PASS

Test Graphs



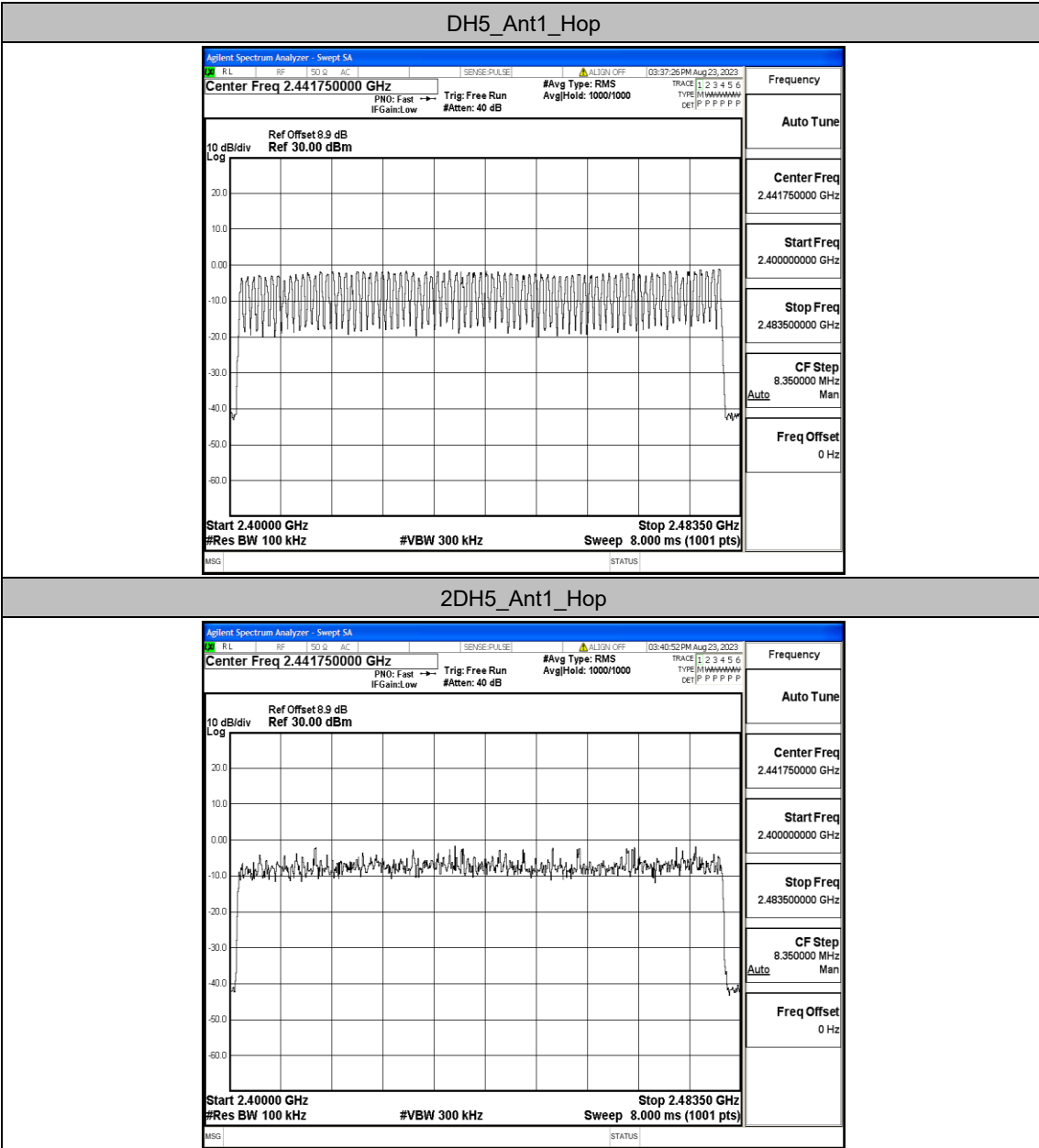


Appendix F: Number of hopping channels

Test Result

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

Test Graphs



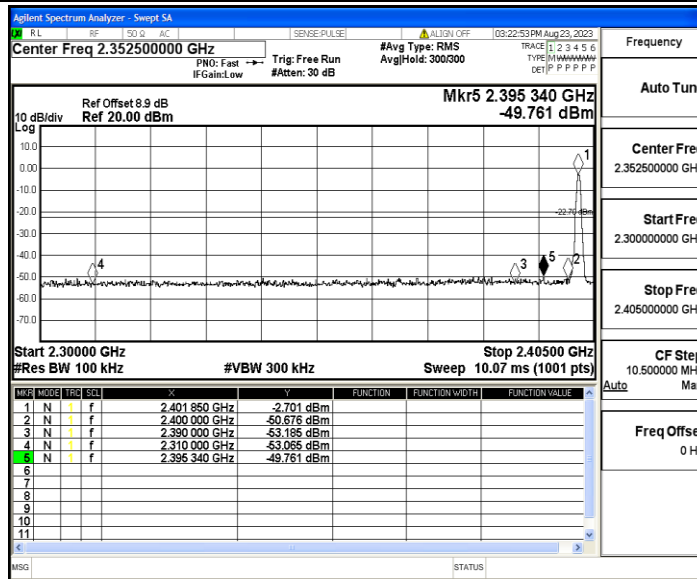
Appendix G: Band edge measurements

Test Result

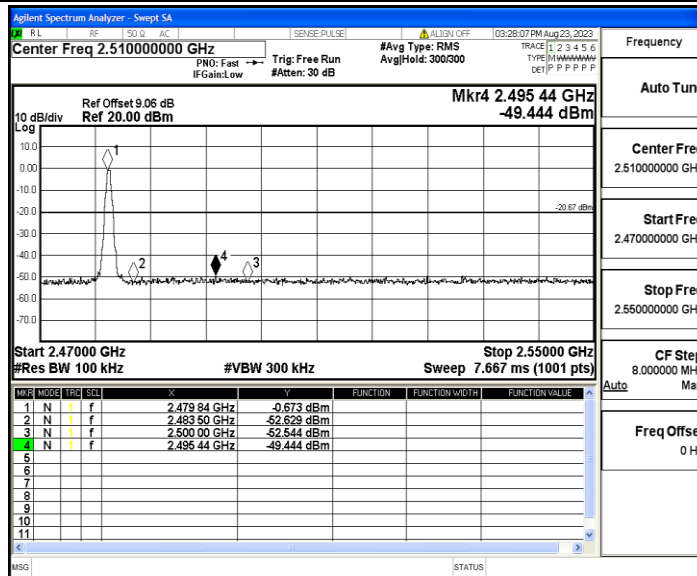
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-2.70	-49.76	≤-22.7	PASS
		High	2480	-0.67	-49.44	≤-20.67	PASS
		Low	Hop_2402	-3.77	-50.74	≤-23.77	PASS
		High	Hop_2480	-0.94	-49.6	≤-20.94	PASS
2DH5	Ant1	Low	2402	-2.70	-50.24	≤-22.7	PASS
		High	2480	-0.78	-49.13	≤-20.78	PASS
		Low	Hop_2402	-7.01	-50.09	≤-27.01	PASS
		High	Hop_2480	-2.98	-49.09	≤-22.98	PASS

Test Graphs

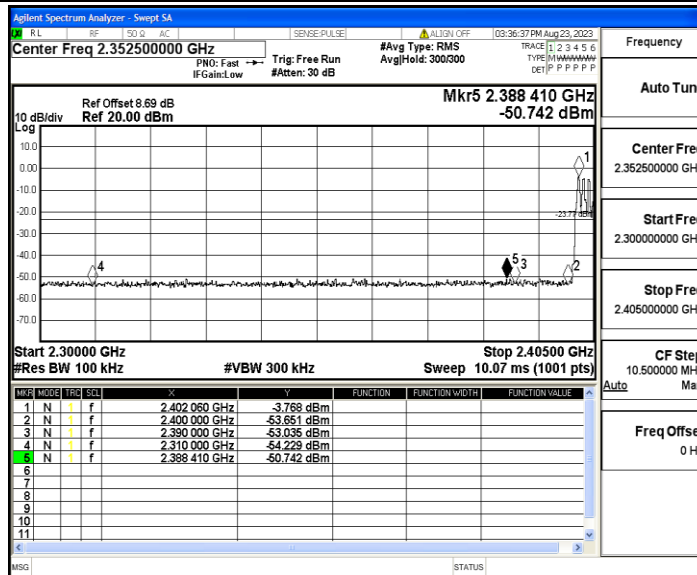
DH5_Ant1_Low_2402



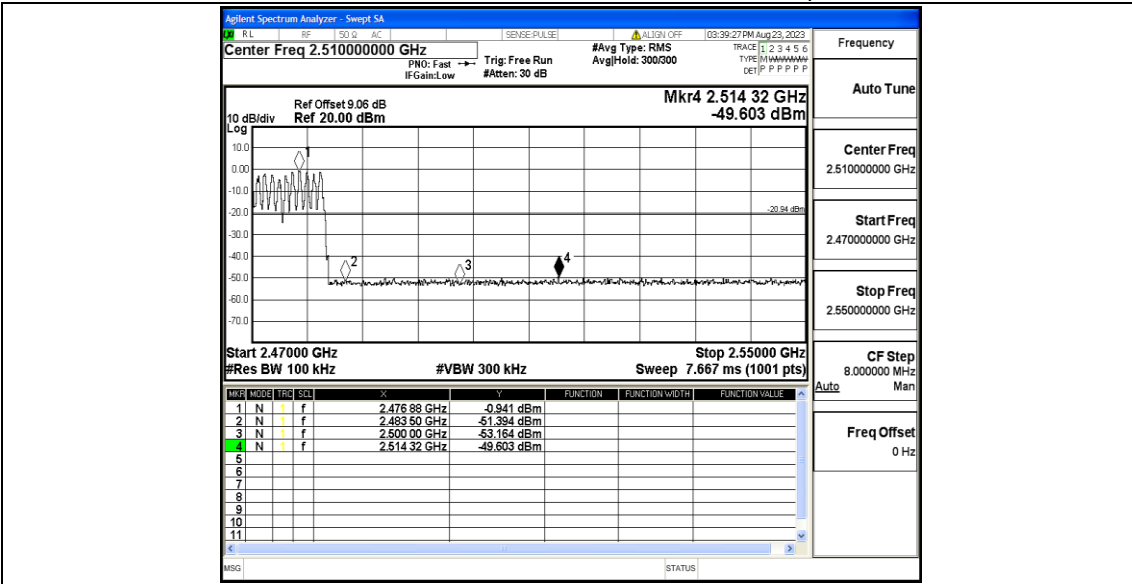
DH5_Ant1_High_2480



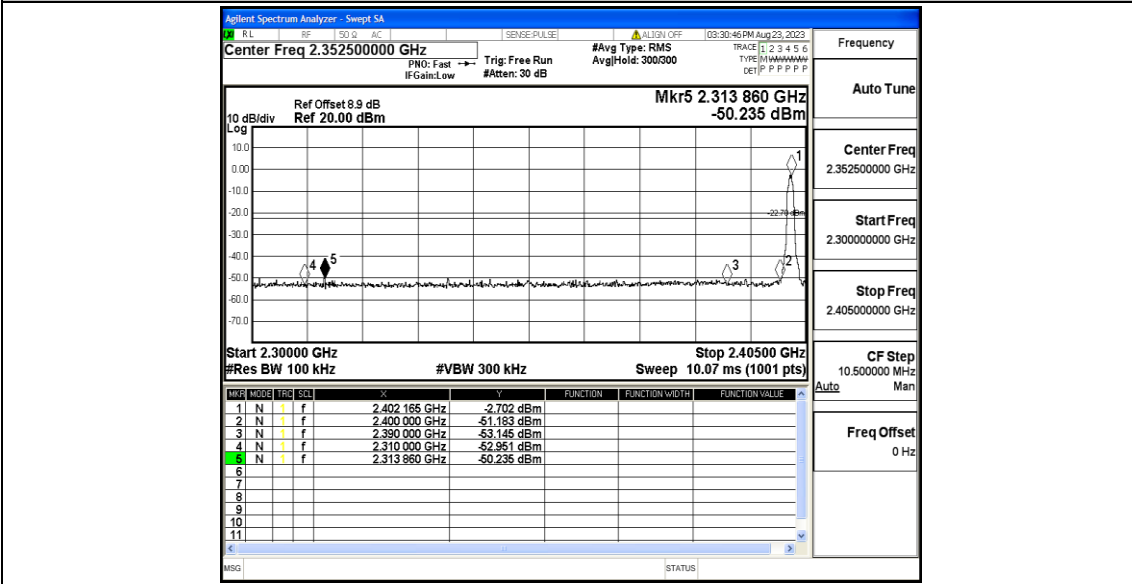
DH5_Ant1_Low_Hop_2402



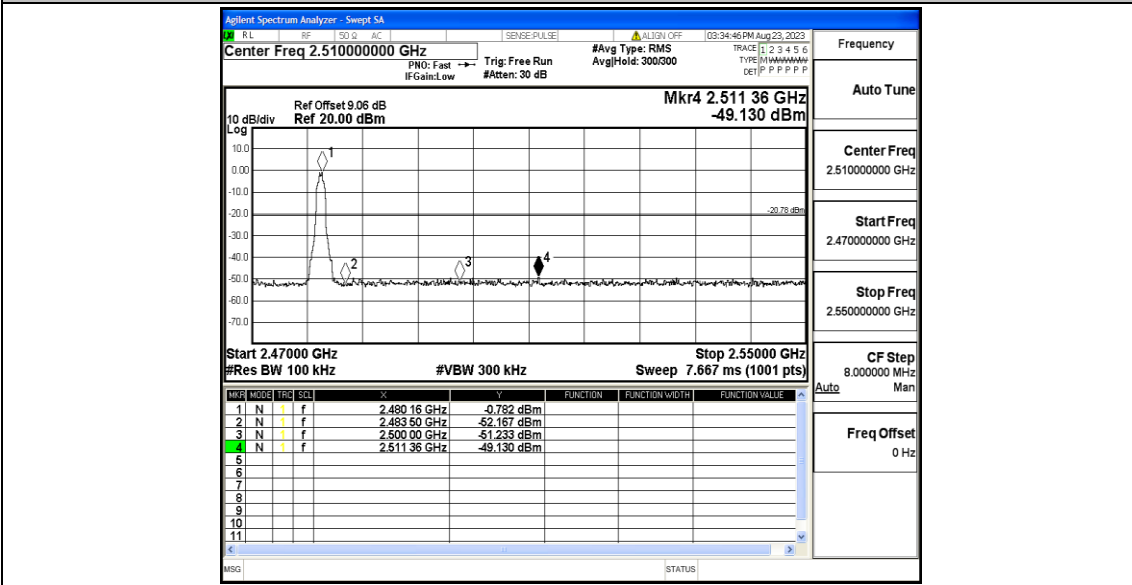
DH5_Ant1_High_Hop_2480



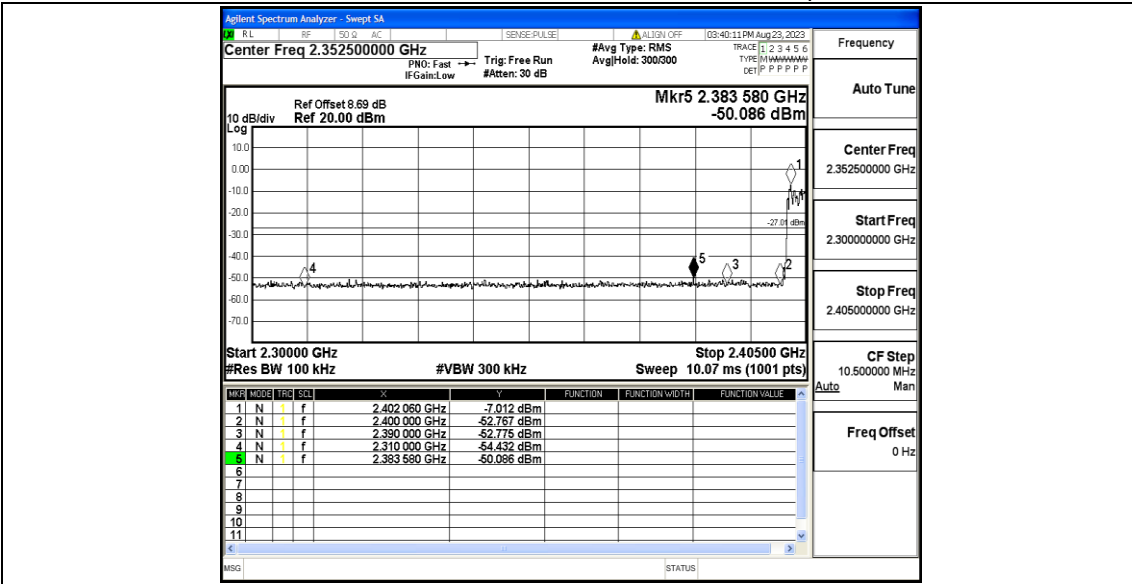
2D5_Ant1_Low_2402



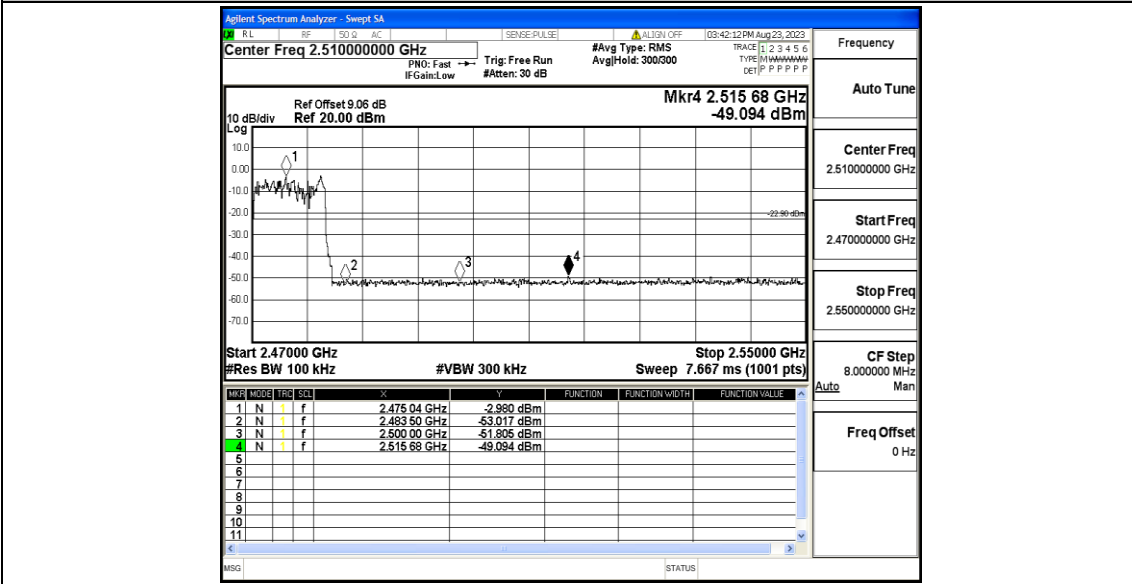
2D5_Ant1_High_2480



2D5_Ant1_Low_Hop_2402



2DH5_Ant1_High_Hop_2480

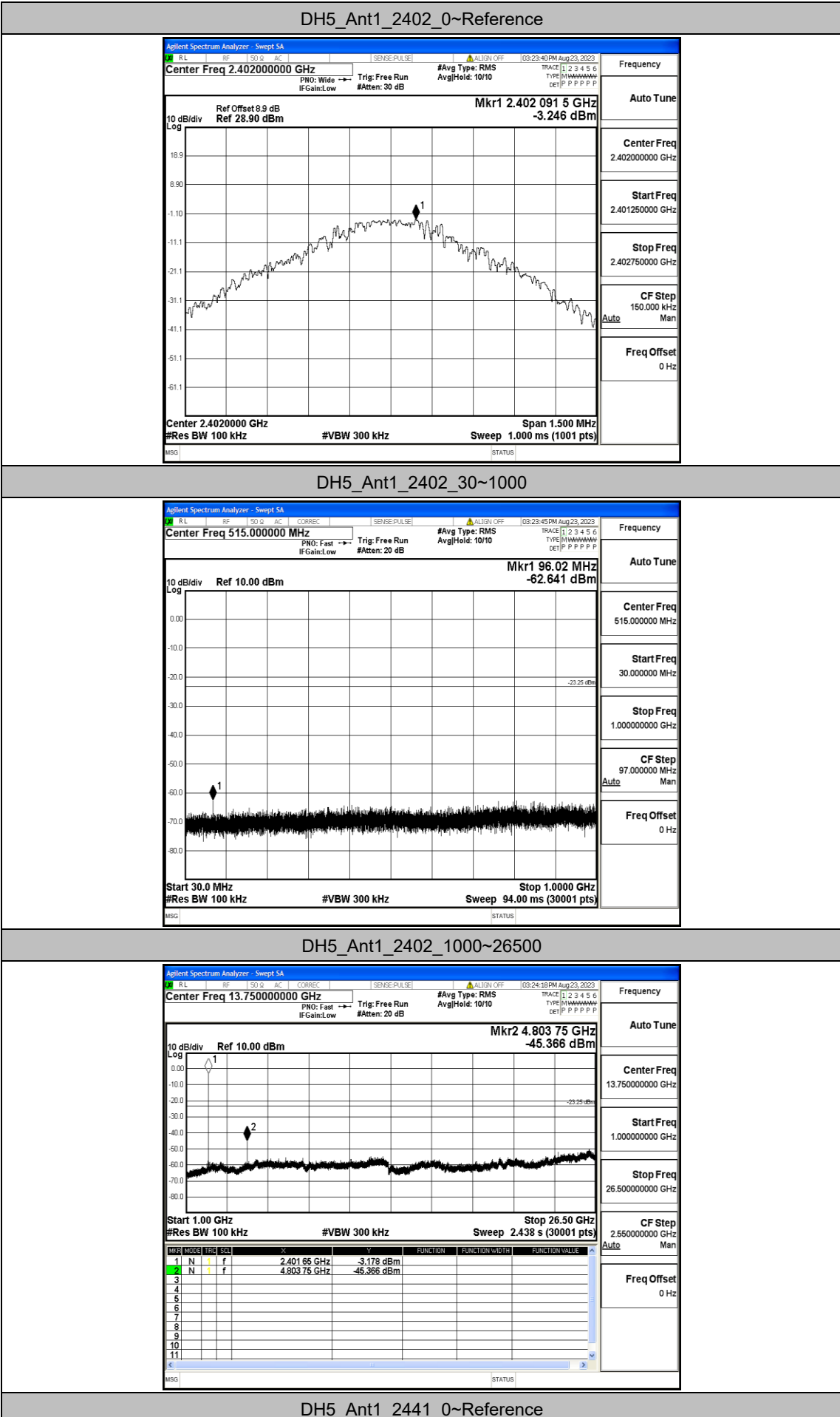


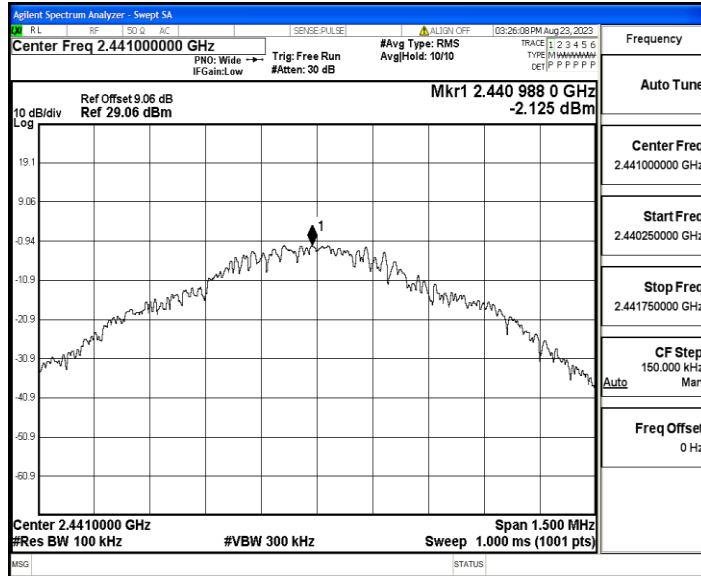
Appendix H: Conducted Spurious Emission

Test Result

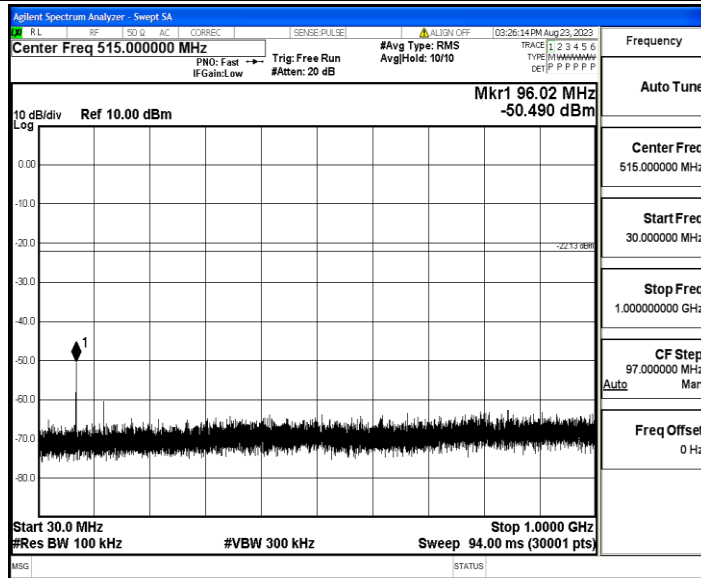
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-3.25	-3.25	---	PASS
			30~1000	-3.25	-62.64	≤-23.25	PASS
			1000~26500	-3.25	-45.37	≤-23.25	PASS
		2441	Reference	-2.13	-2.13	---	PASS
			30~1000	-2.13	-50.49	≤-22.13	PASS
			1000~26500	-2.13	-45.03	≤-22.13	PASS
		2480	Reference	-1.23	-1.23	---	PASS
			30~1000	-1.23	-59	≤-21.23	PASS
			1000~26500	-1.23	-42.8	≤-21.23	PASS
2DH5	Ant1	2402	Reference	-6.15	-6.15	---	PASS
			30~1000	-6.15	-60.91	≤-26.15	PASS
			1000~26500	-6.15	-49.54	≤-26.15	PASS
		2441	Reference	-2.75	-2.75	---	PASS
			30~1000	-2.75	-59.87	≤-22.75	PASS
			1000~26500	-2.75	-47.51	≤-22.75	PASS
		2480	Reference	-3.92	-3.92	---	PASS
			30~1000	-3.92	-62.07	≤-23.92	PASS
			1000~26500	-3.92	-46.36	≤-23.92	PASS

Test Graphs

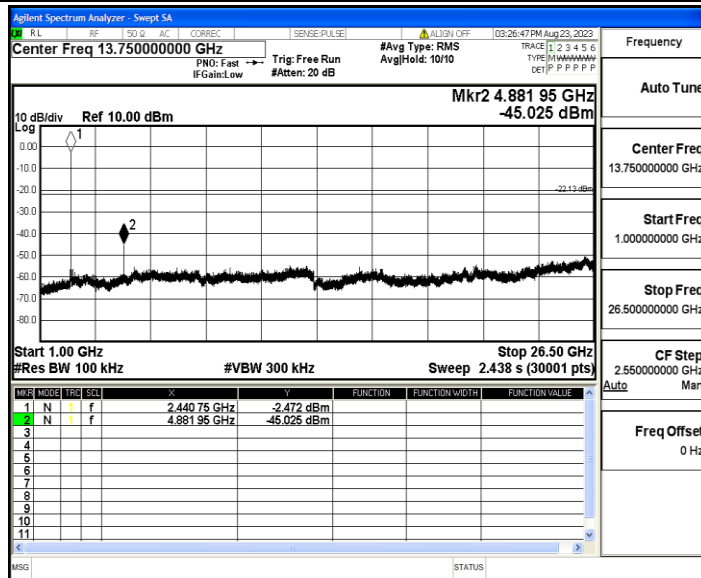




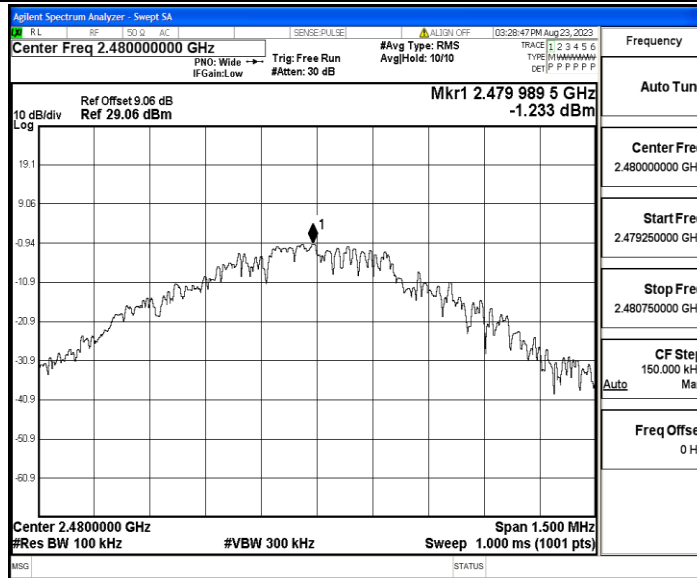
DH5_Ant1_2441_30~1000



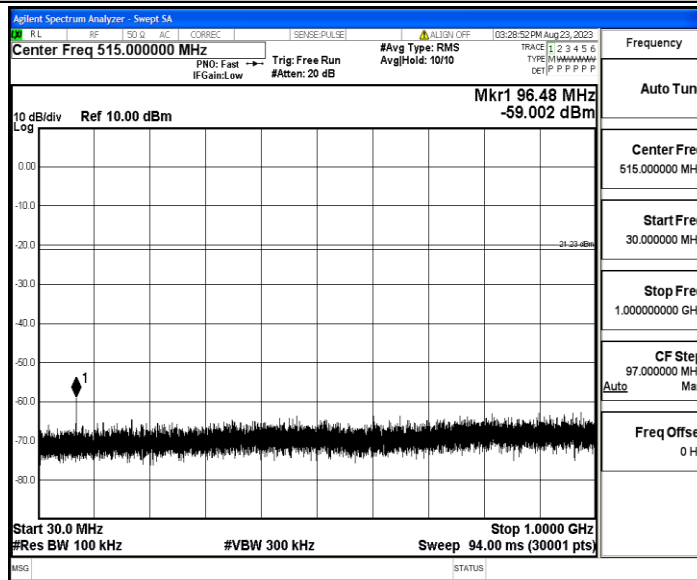
DH5_Ant1_2441_1000~26500



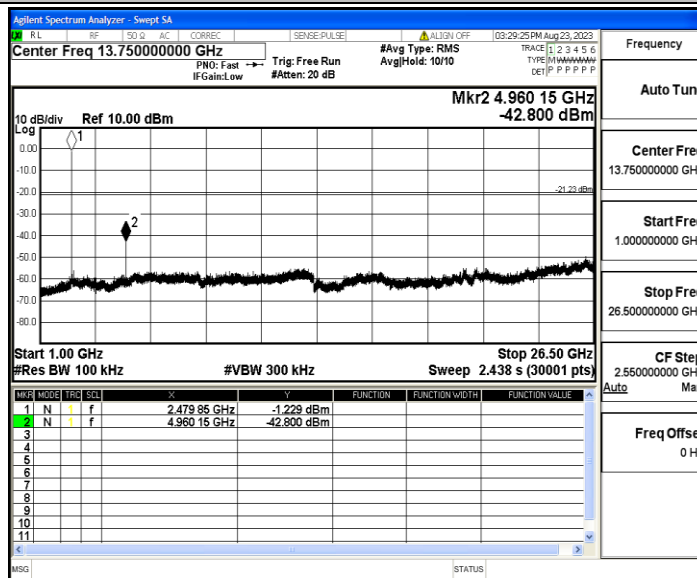
DH5_Ant1_2480_0~Reference



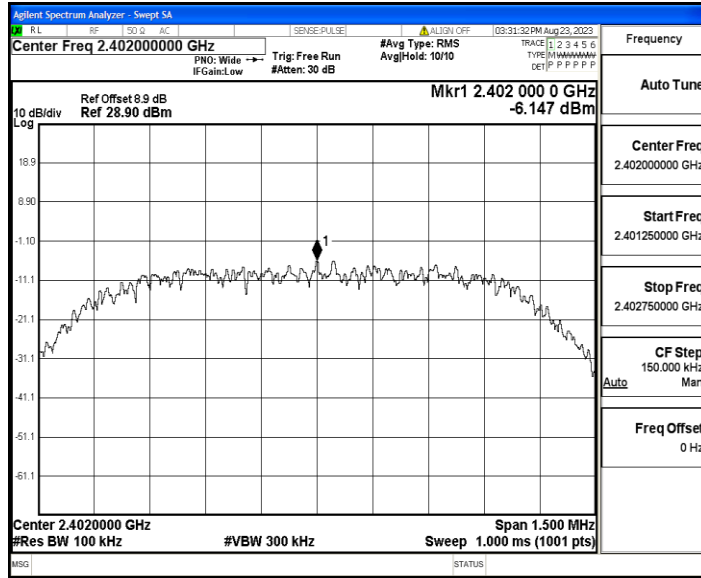
DH5_Ant1_2480_30~1000



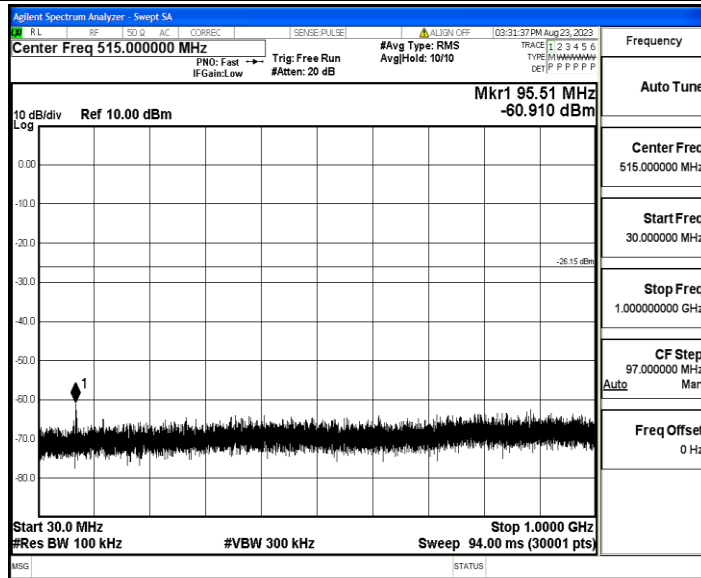
DH5_Ant1_2480_1000~26500



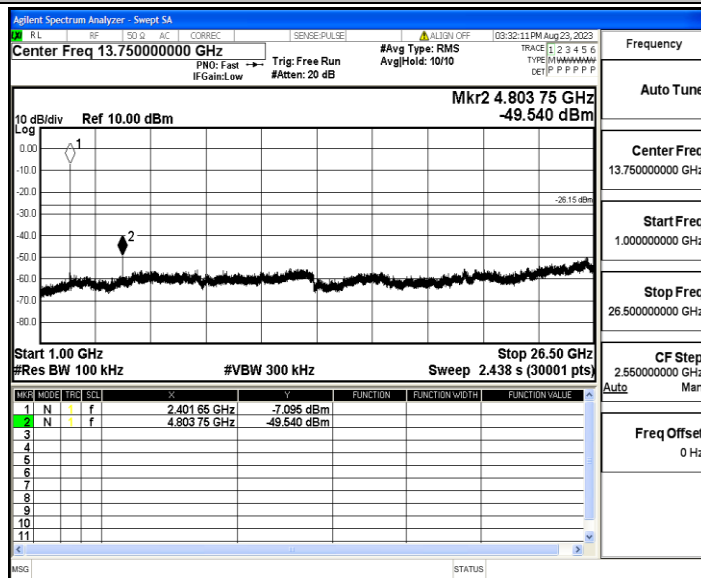
2DH5_Ant1_2402_0~Reference



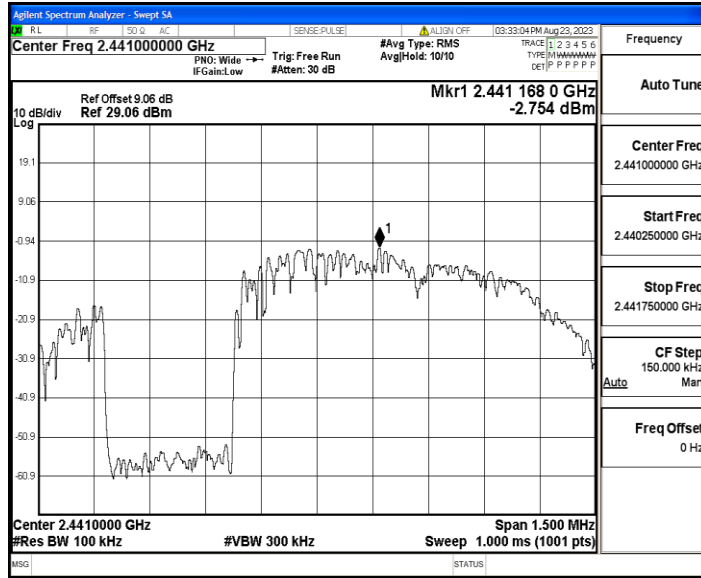
2DH5_Ant1_2402_30~1000



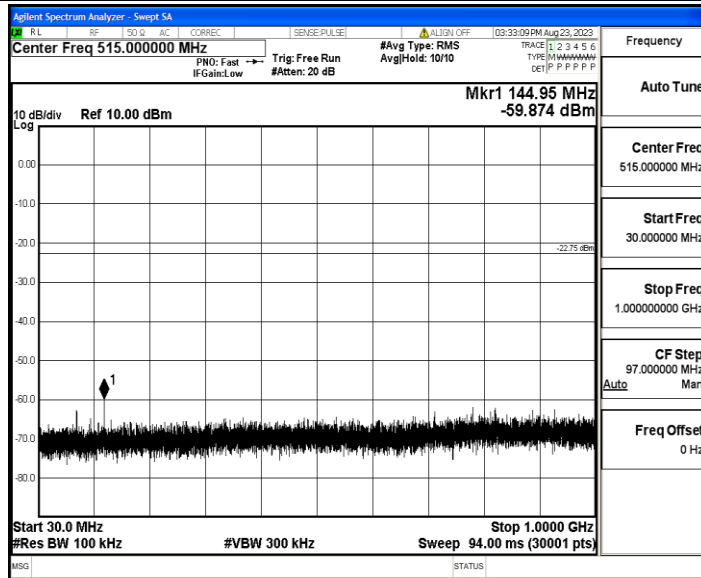
2DH5_Ant1_2402_1000~26500



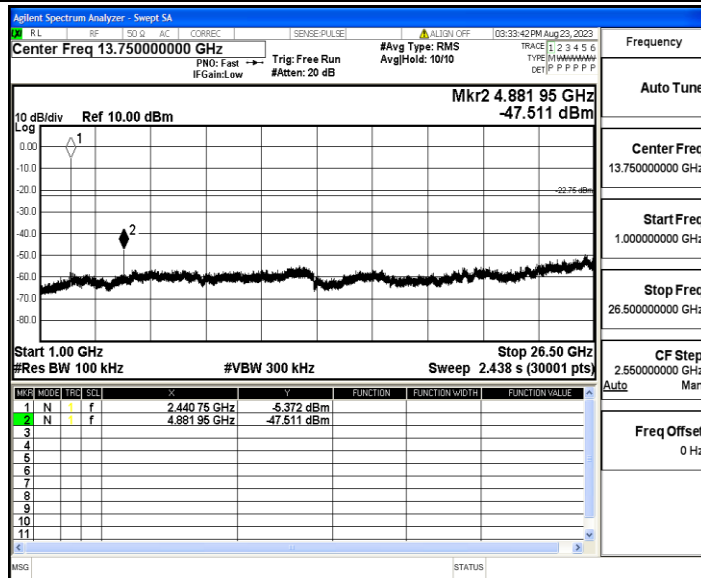
2DH5_Ant1_2441_0~Reference



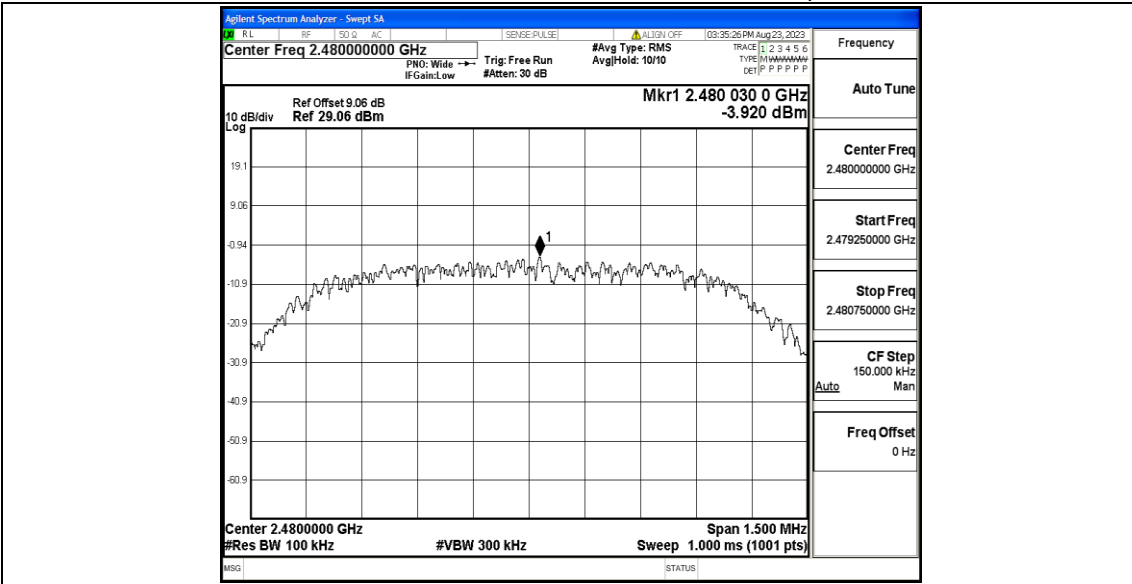
2DH5_Ant1_2441_30~100



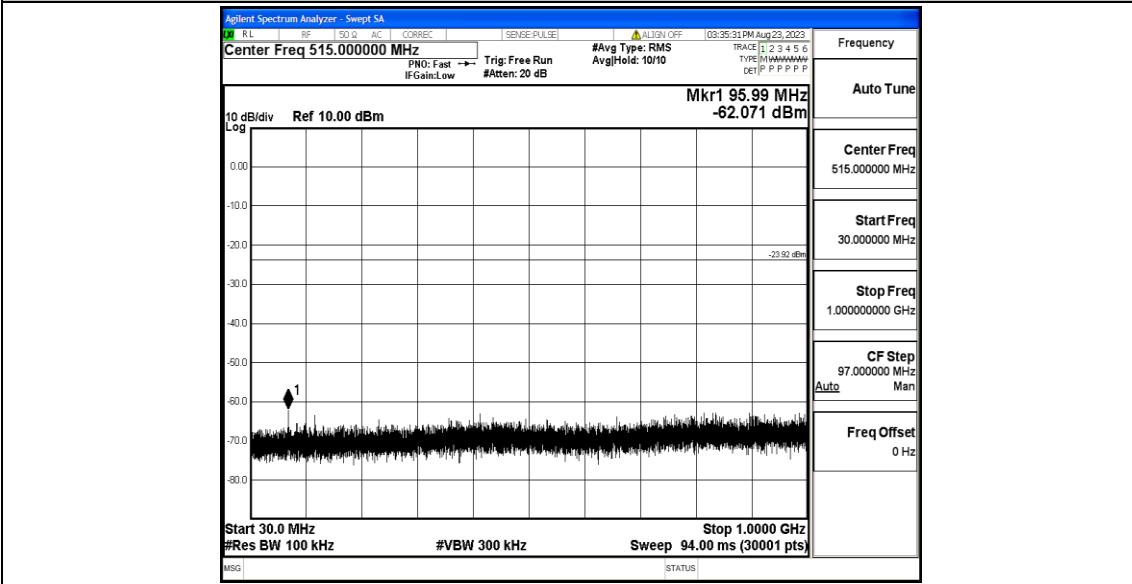
2DH5_Ant1_2441_1000~26500



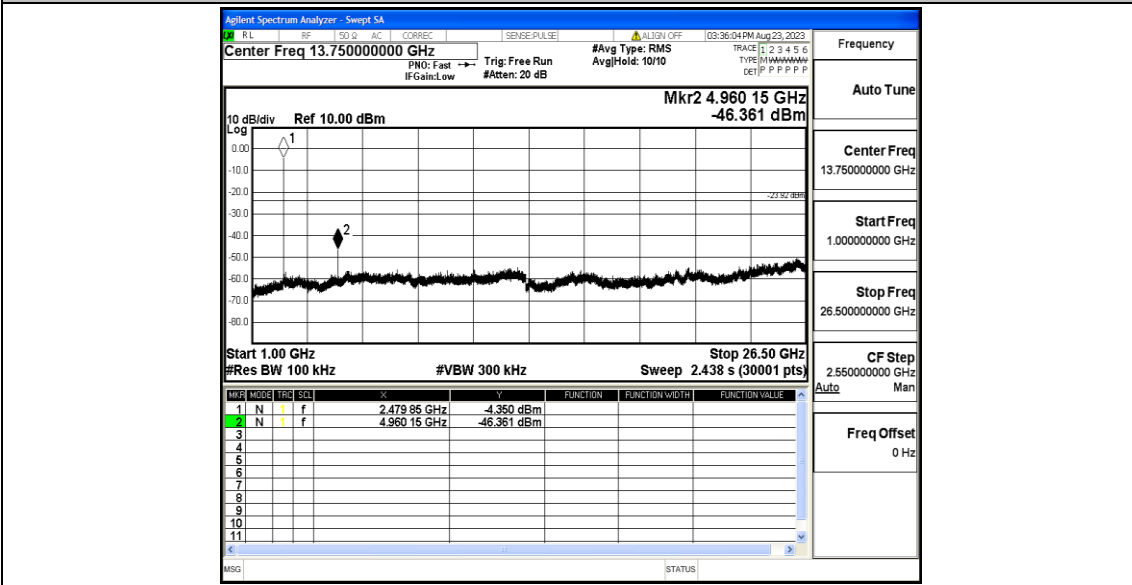
2DH5_Ant1_2480_0~Reference



2DH5_Ant1_2480_30~1000



2DH5_Ant1_2480_1000~26500

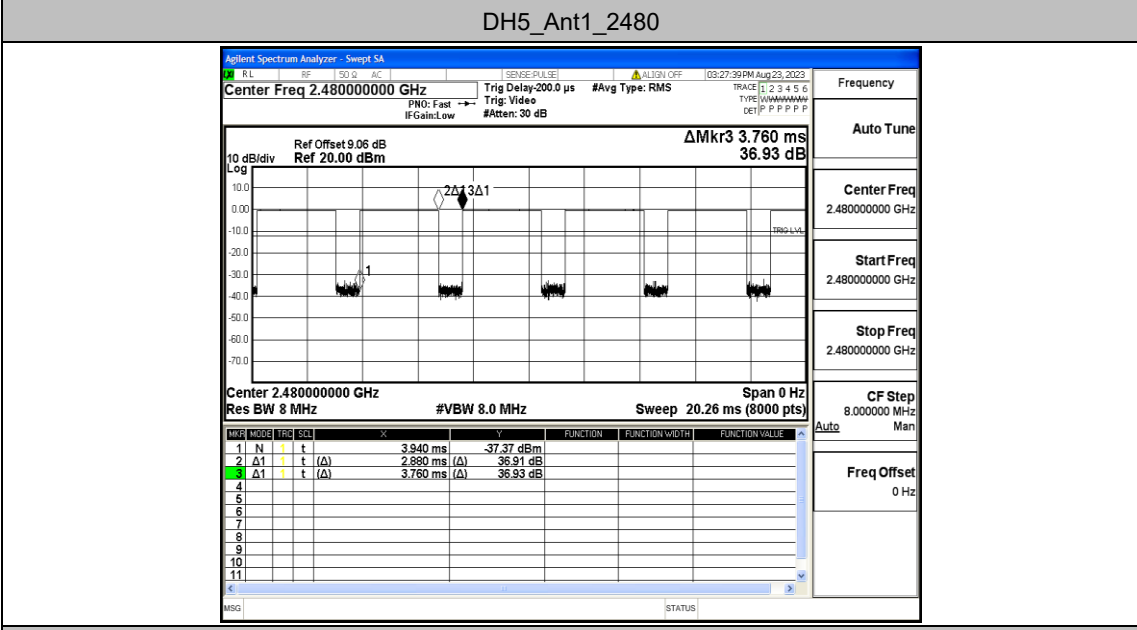
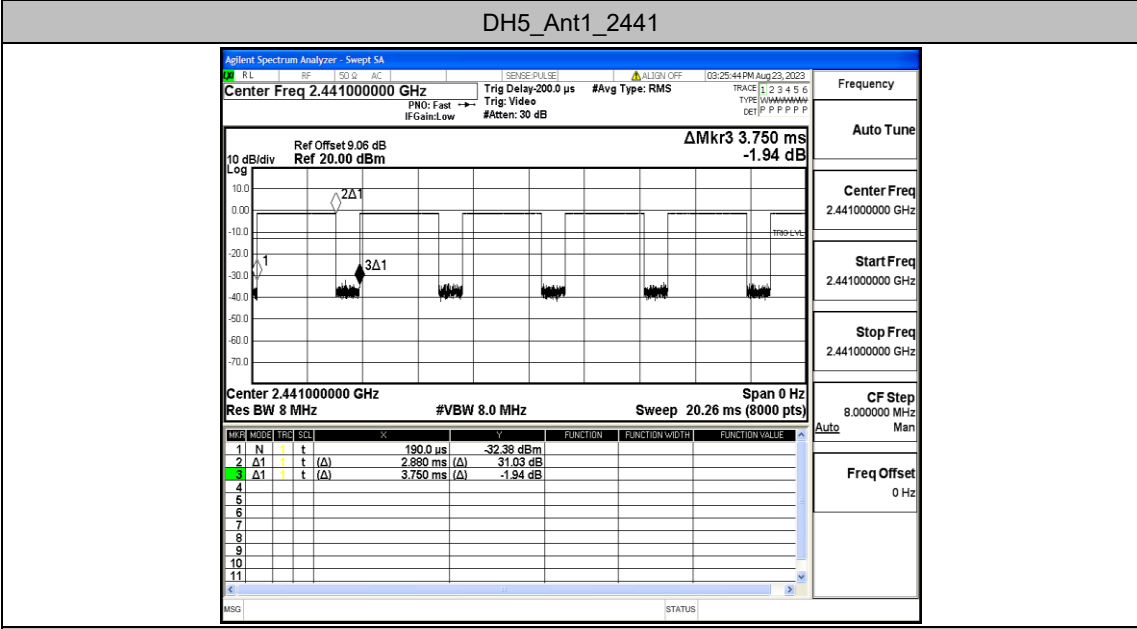
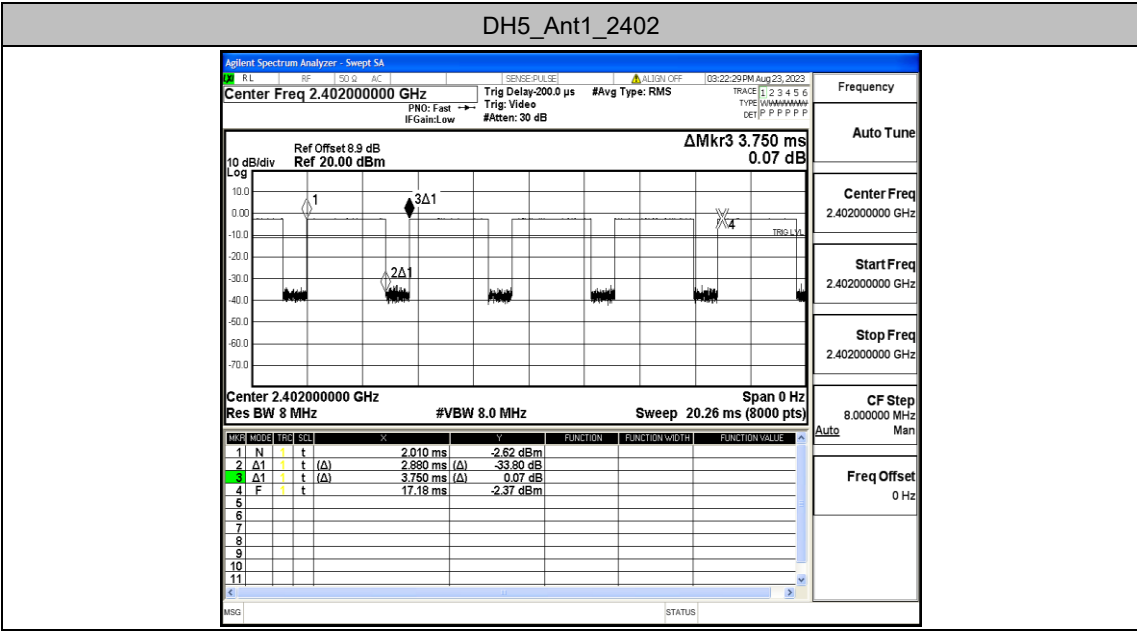


Appendix I: Duty Cycle

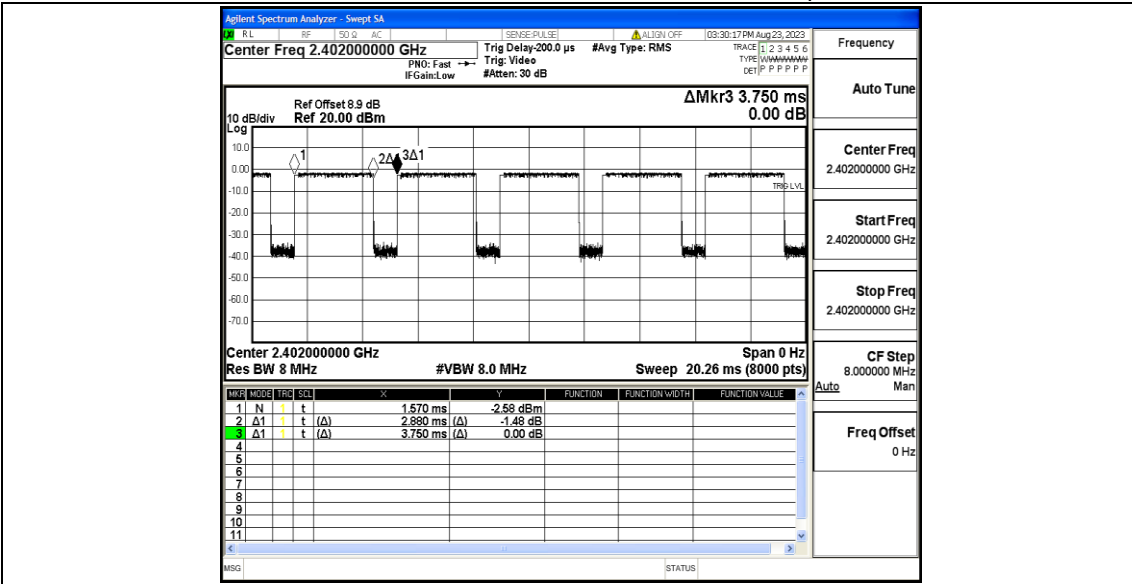
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T[kHz]
DH5	Ant1	2402	2.88	3.75	76.80	0.35
		2441	2.88	3.75	76.80	0.35
		2480	2.88	3.76	76.60	0.35
2DH5	Ant1	2402	2.88	3.75	76.80	0.35
		2441	2.89	3.75	77.07	0.35
		2480	2.88	3.75	76.80	0.35

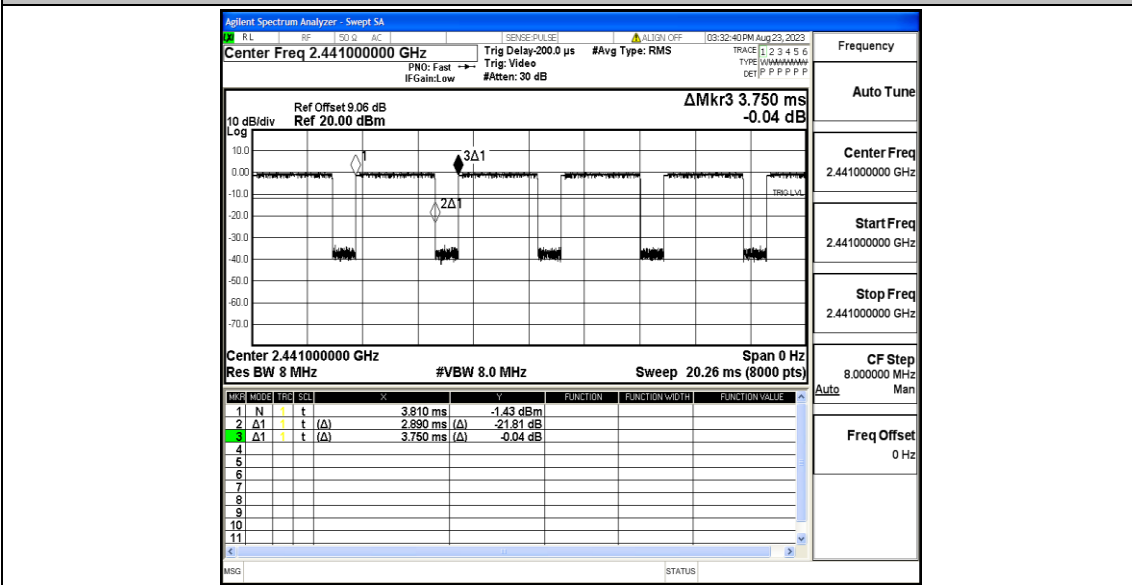
Test Graphs



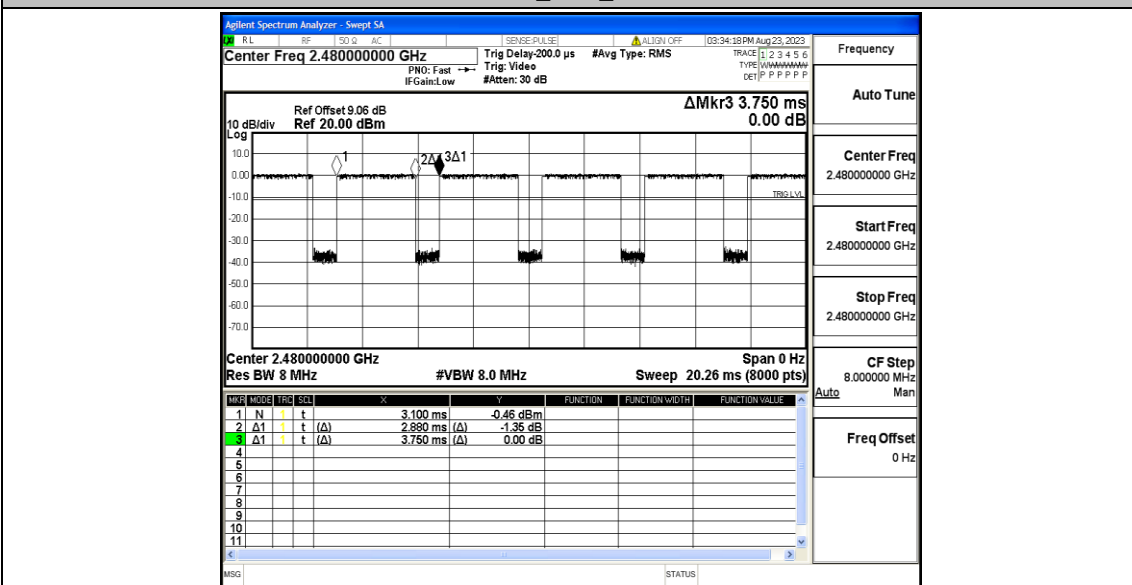
2DH5_Ant1_2402



2DH5_Ant1_2441



2DH5_Ant1_2480



Appendix J: Emissions in Restricted Bands

Test Result

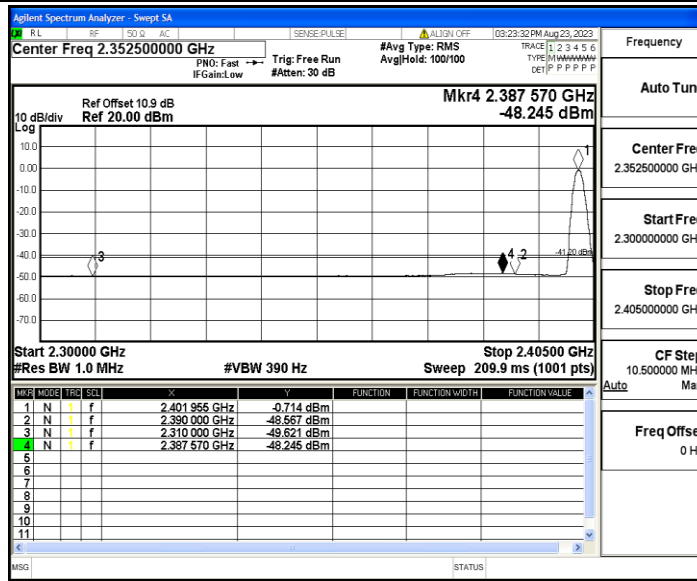
TestMode	Antenna	ChName	Channel	Detector	Freq(MHz)	Result(dBm)	Limit(dBm)	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-49.62	≤-41.20	PASS
				AV	2387.570	-48.25	≤-41.20	PASS
				AV	2390.000	-48.57	≤-41.20	PASS
				Peak	2310.000	-42.57	≤-21.20	PASS
				Peak	2386.730	-38.61	≤-21.20	PASS
				Peak	2390.000	-42.29	≤-21.20	PASS
		High	2480	AV	2483.500	-48.18	≤-41.20	PASS
				AV	2499.680	-47.84	≤-41.20	PASS
				AV	2500.000	-47.96	≤-41.20	PASS
				Peak	2483.500	-41.01	≤-21.20	PASS
				Peak	2493.200	-38.24	≤-21.20	PASS
				Peak	2500.000	-40.67	≤-21.20	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-49.67	≤-41.20	PASS
				AV	2380.745	-48.21	≤-41.20	PASS
				AV	2390.000	-48.66	≤-41.20	PASS
				Peak	2310.000	-42.54	≤-21.20	PASS
				Peak	2377.700	-38.66	≤-21.20	PASS
				Peak	2390.000	-41.78	≤-21.20	PASS
		High	2480	AV	2483.500	-48.13	≤-41.20	PASS
				AV	2498.080	-47.77	≤-41.20	PASS
				AV	2500.000	-47.96	≤-41.20	PASS
				Peak	2483.500	-40.91	≤-21.20	PASS
				Peak	2492.000	-38.67	≤-21.20	PASS
				Peak	2500.000	-41.52	≤-21.20	PASS

Note:

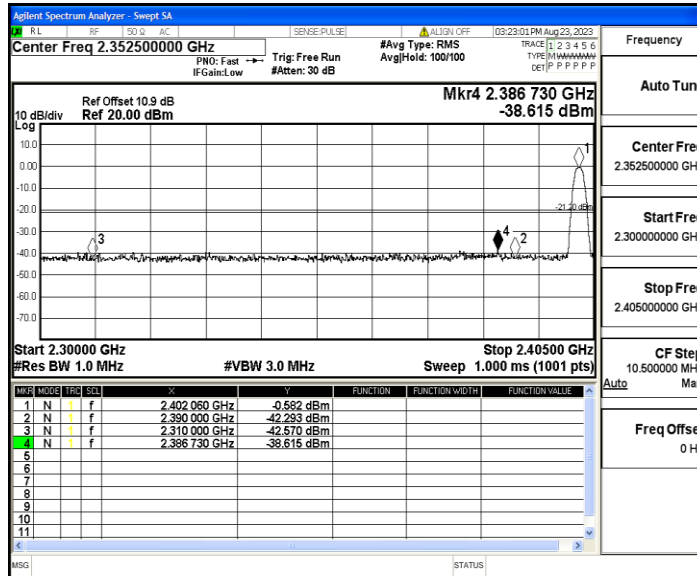
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

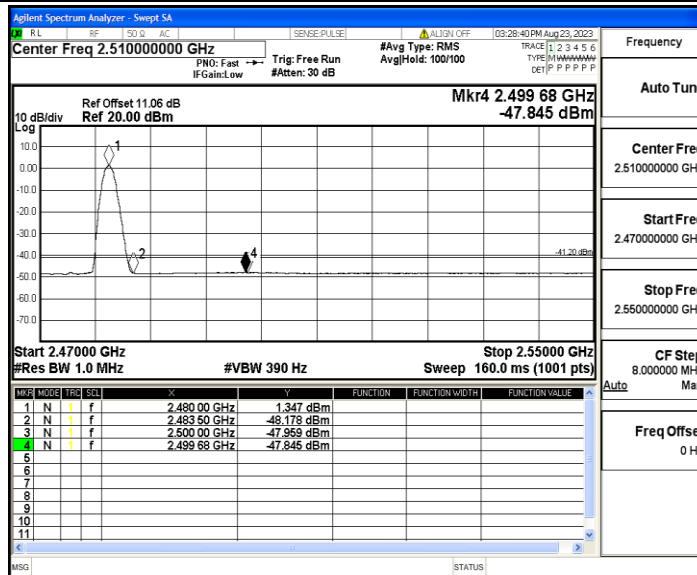
DH5_Ant1_Low_2402_AV



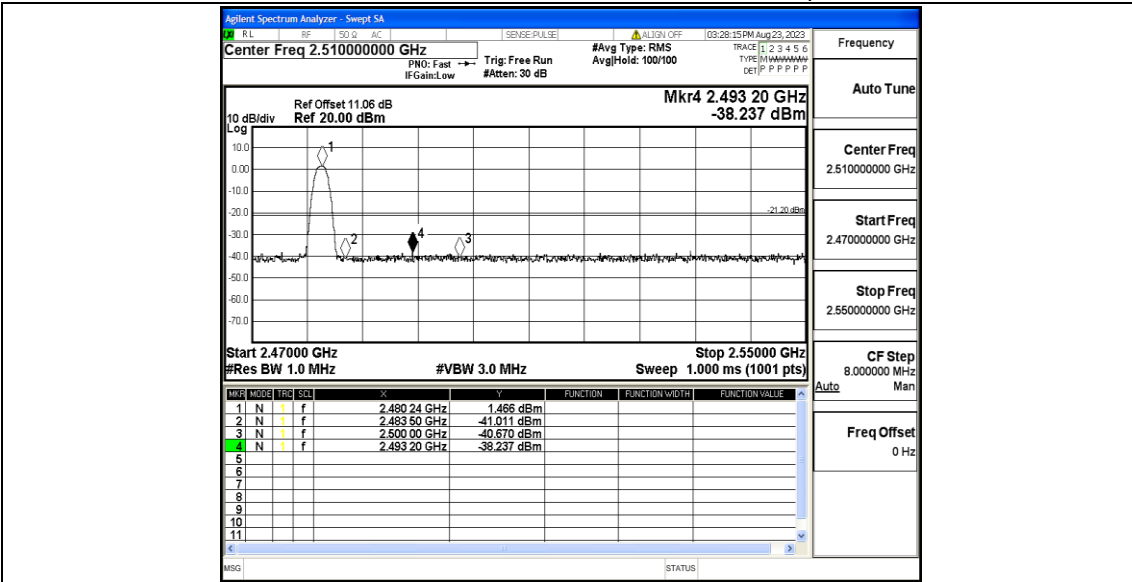
DH5_Ant1_Low_2402_Peak



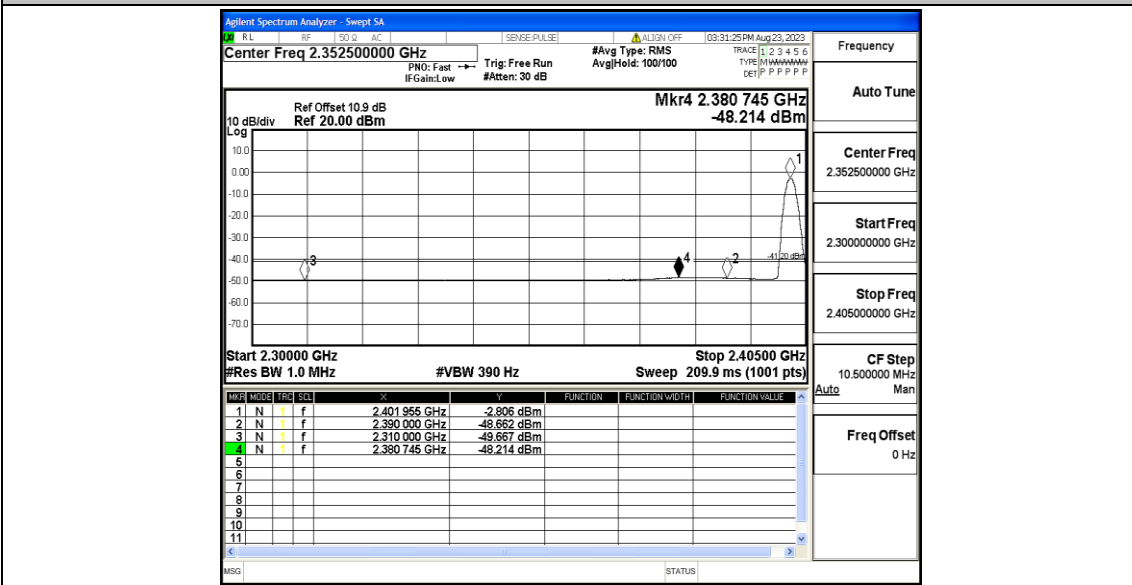
DH5_Ant1_High_2480_AV



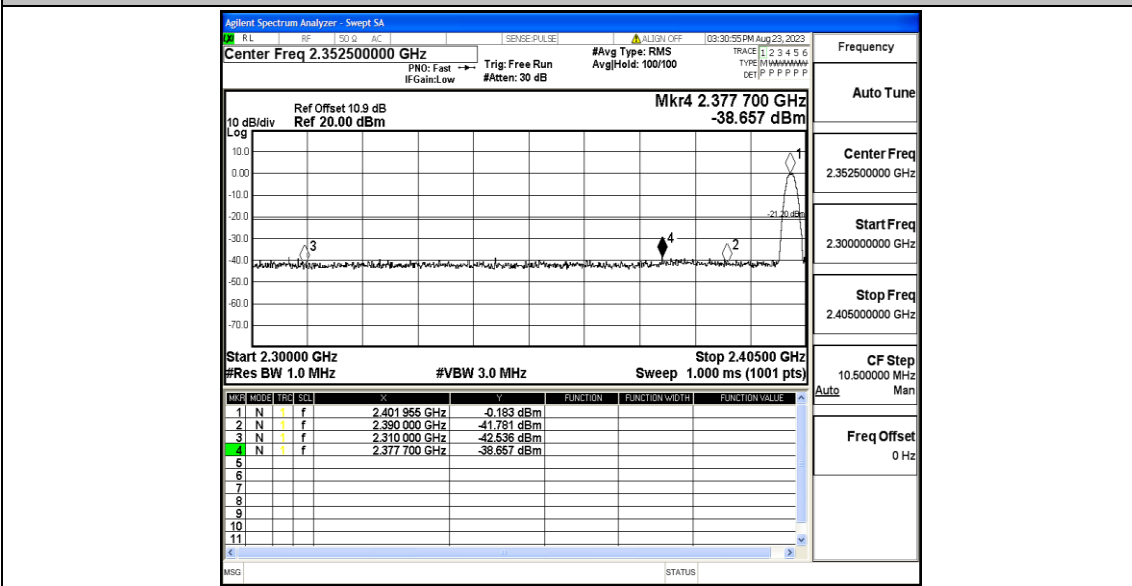
DH5_Ant1_High_2480_Peak



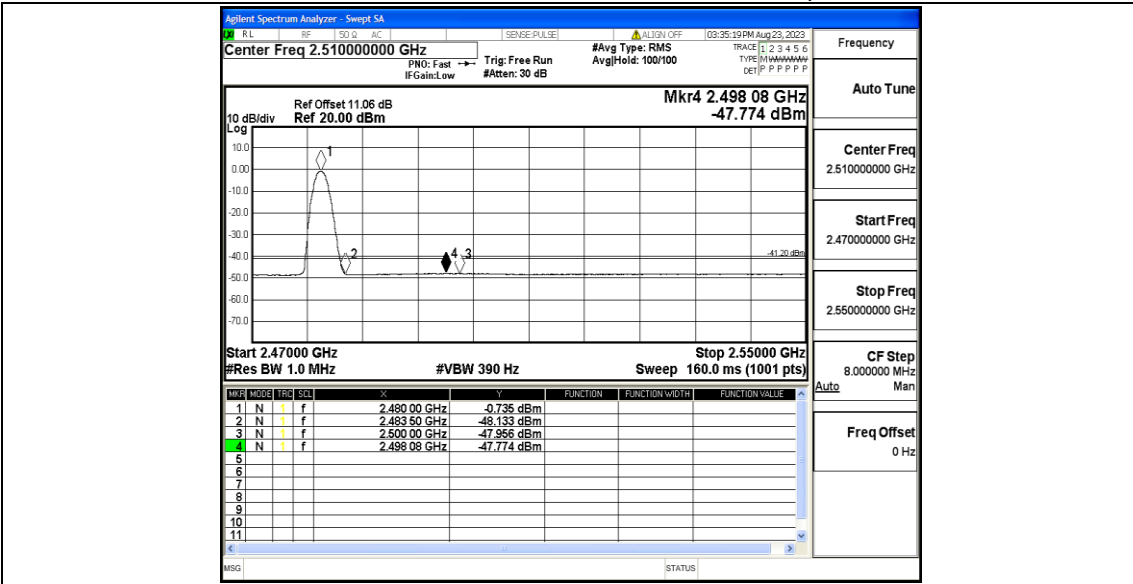
2DH5_Ant1_Low_2402_AV



2DH5_Ant1_Low_2402_Peak



2DH5_Ant1_High_2480_AV



2DH5_Ant1_High_2480_Peak

