

Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Wireless neckband speaker
Test Model: A21

Environmental Conditions

Temperature:	23.8°C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Zhang Hai
Supervised by:	Yan Chen

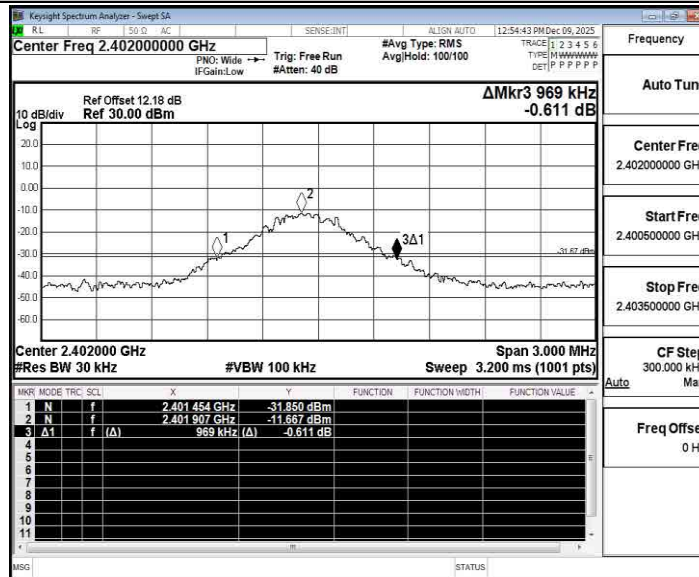
A.1 -20dB Bandwidth

Test Result

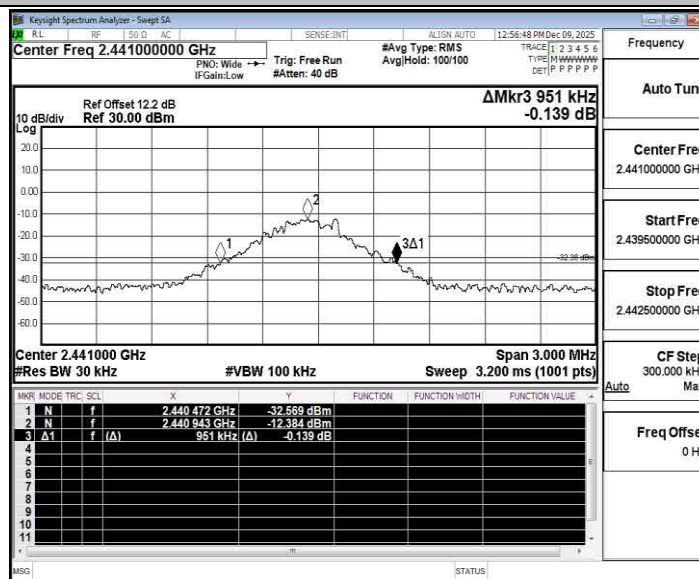
TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.969	2401.454	2402.423	---	---
		2441	0.951	2440.472	2441.423	---	---
		2480	0.957	2479.463	2480.420	---	---
2DH5	Ant1	2402	1.365	2401.253	2402.618	---	---
		2441	1.326	2440.265	2441.591	---	---
		2480	1.284	2479.298	2480.582	---	---
3DH5	Ant1	2402	1.335	2401.259	2402.594	---	---
		2441	1.296	2440.286	2441.582	---	---
		2480	1.299	2479.283	2480.582	---	---

Test Graphs

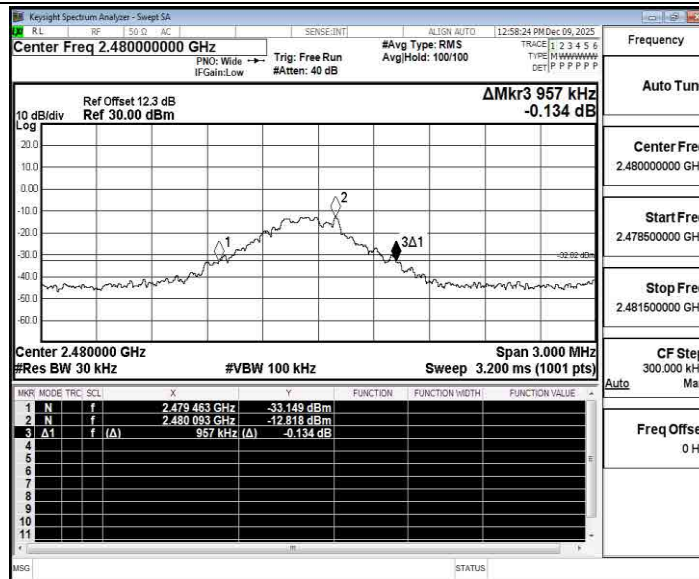
DH5_Ant1_2402



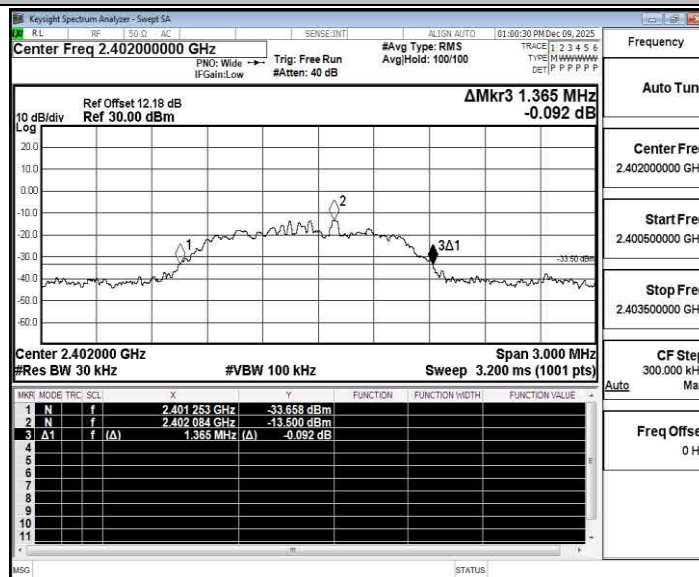
DH5_Ant1_2441



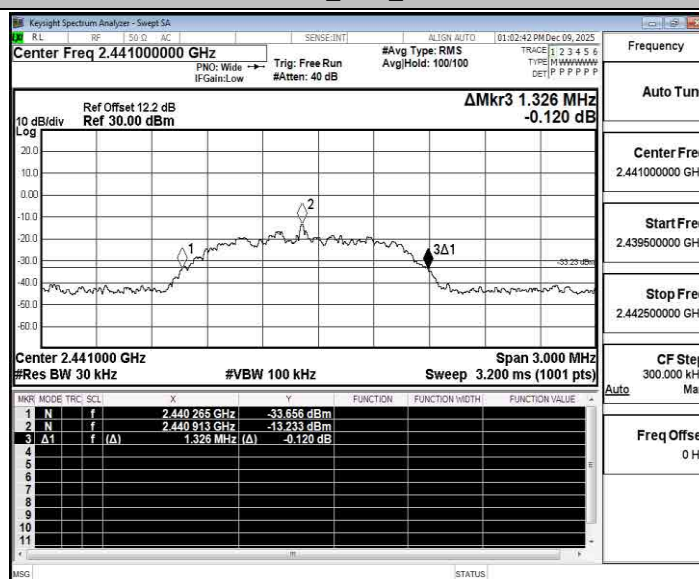
DH5_Ant1_2480



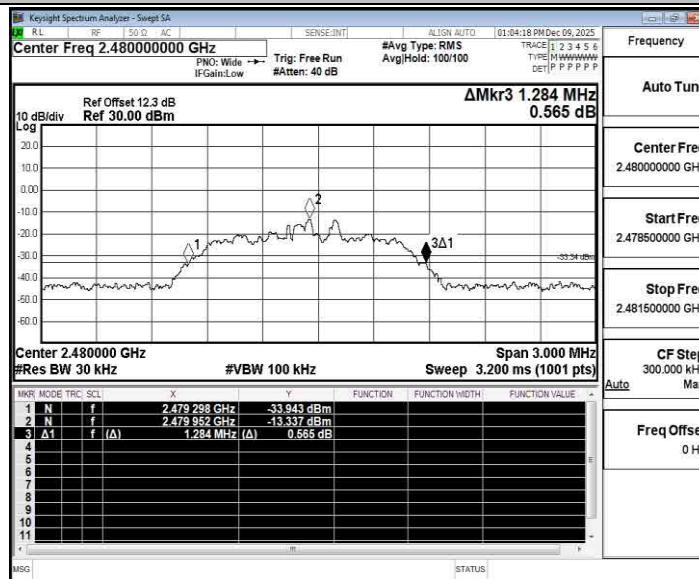
2DH5_Ant1_2402



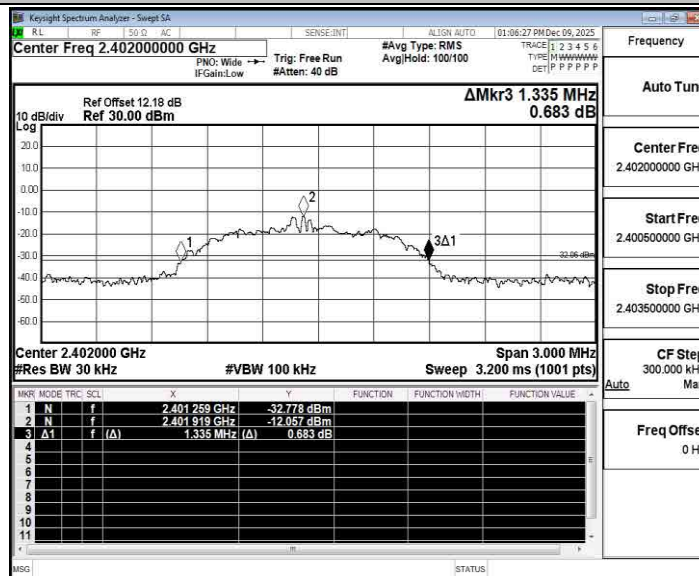
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441

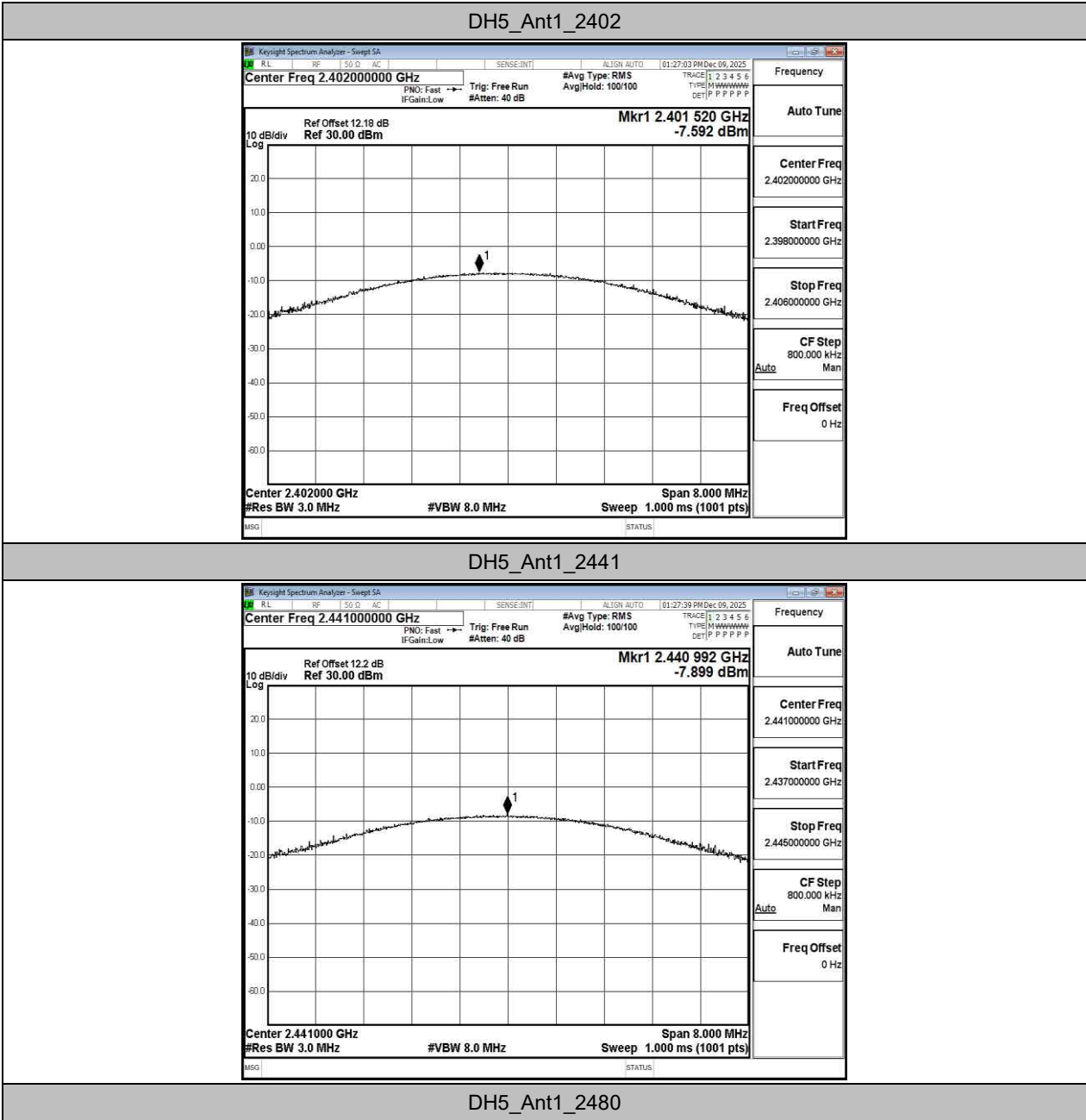


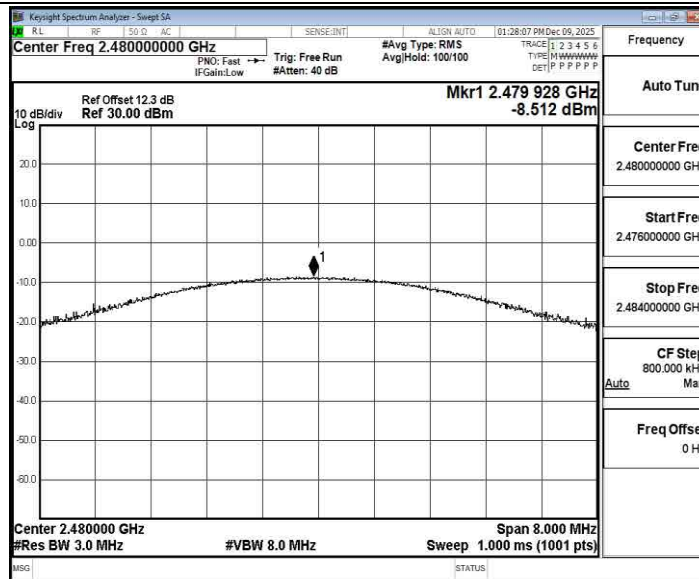
A.2 Maximum Peak Conducted Output Power

Test Result Peak

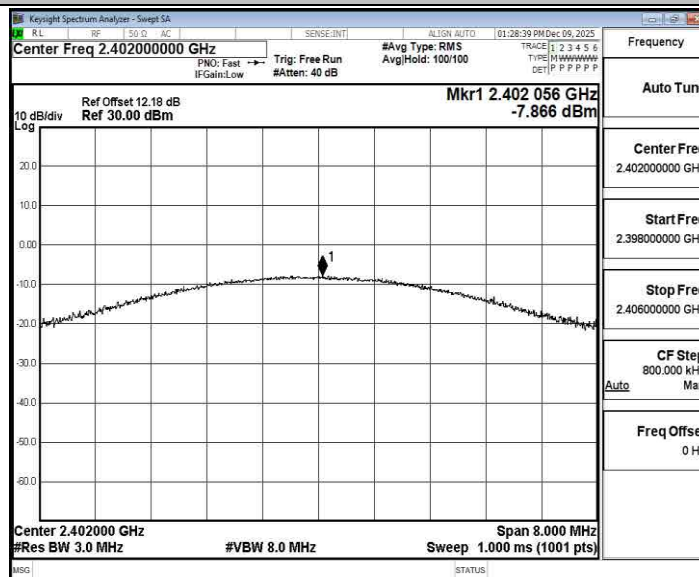
Test Mode	Antenna	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	-7.59	≤20.97	PASS
		2441	-7.90	≤20.97	PASS
		2480	-8.51	≤20.97	PASS
2DH5	Ant1	2402	-7.87	≤20.97	PASS
		2441	-8.65	≤20.97	PASS
		2480	-8.97	≤20.97	PASS
3DH5	Ant1	2402	-7.89	≤20.97	PASS
		2441	-8.56	≤20.97	PASS
		2480	-8.90	≤20.97	PASS

Test Graphs

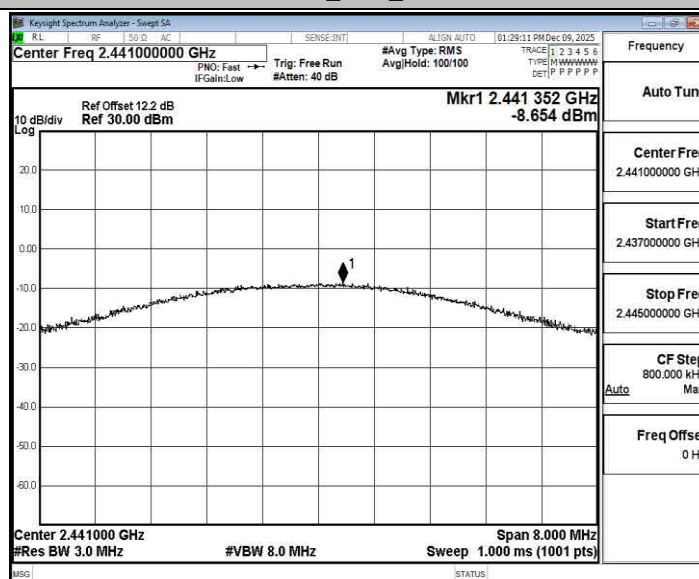




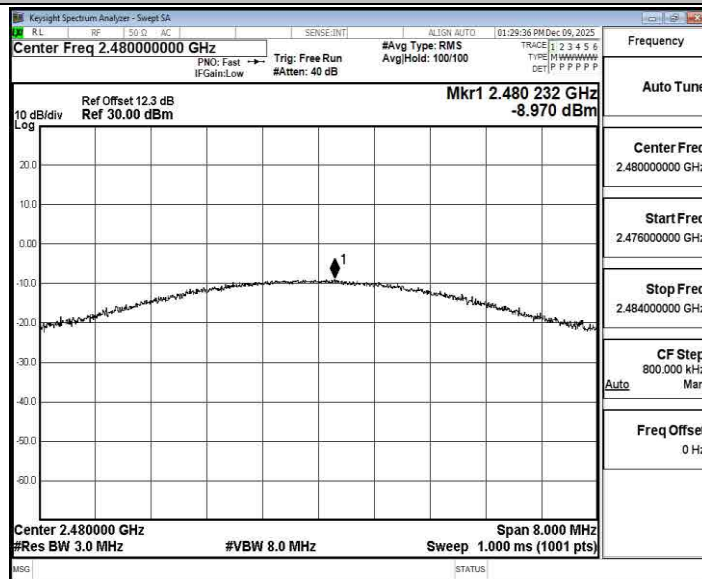
2DH5_Ant1_2402



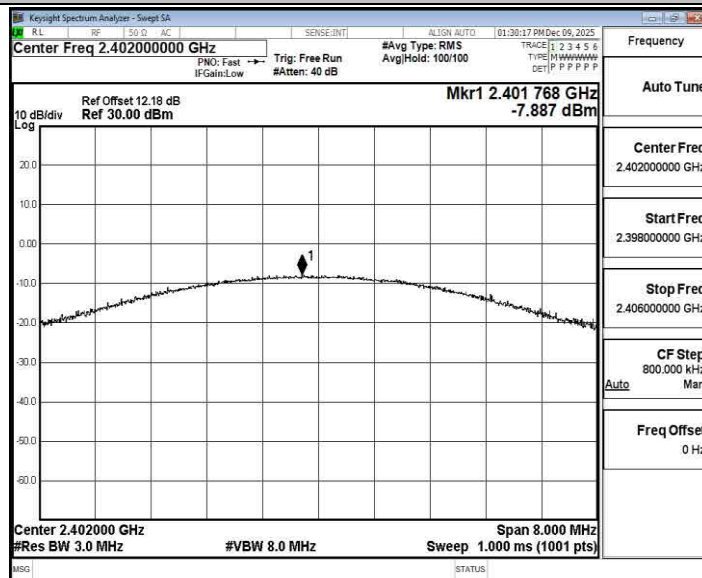
2DH5_Ant1_2441



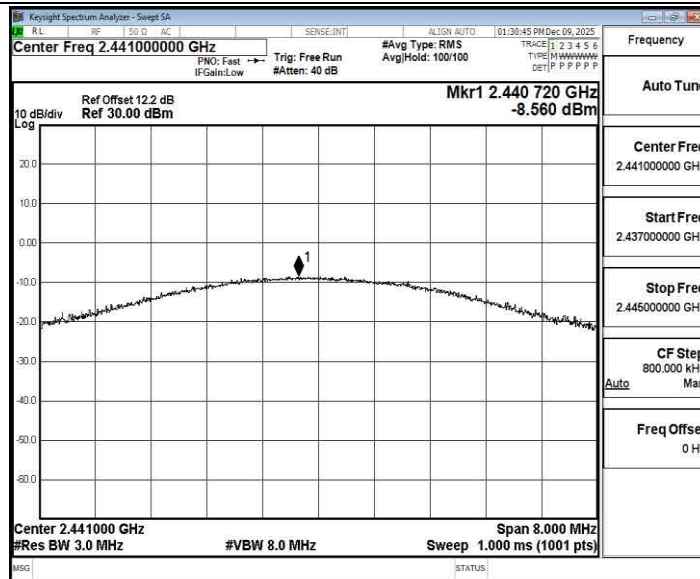
2DH5_Ant1_2480



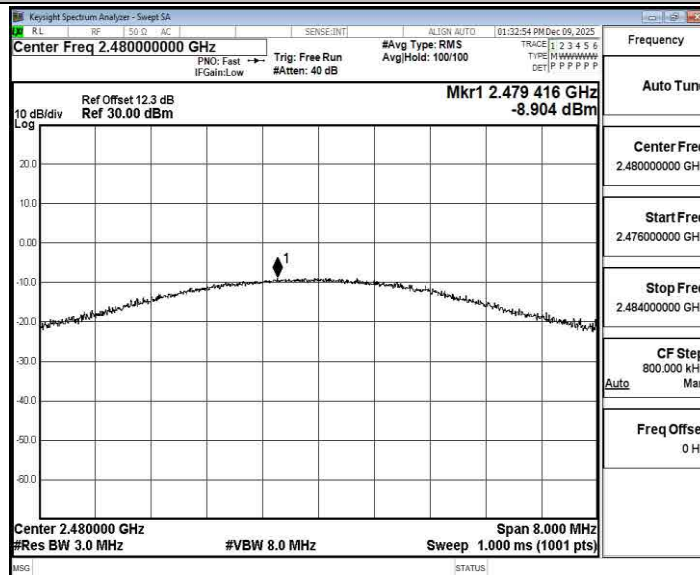
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

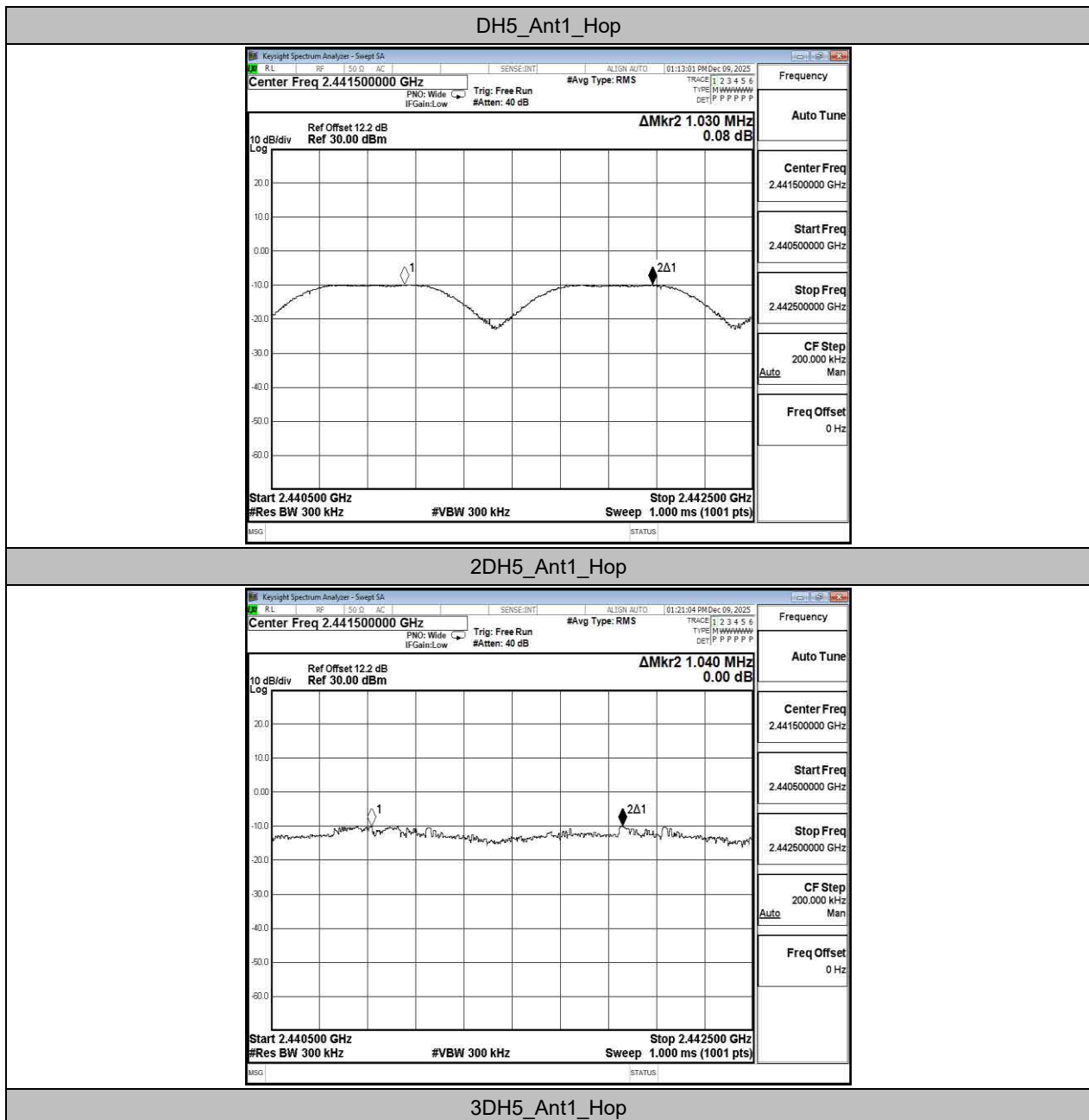


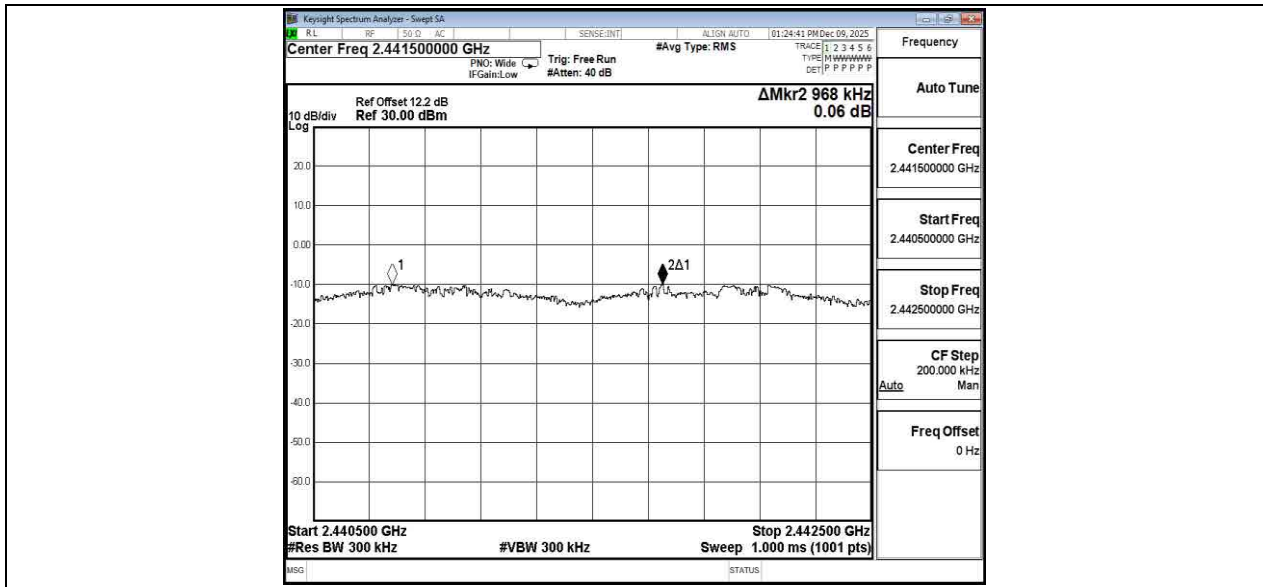
A.3 Carrier Frequencies Separation

Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.03	≥0.969	PASS
2DH5	Ant1	Hop	1.04	≥0.910	PASS
3DH5	Ant1	Hop	0.968	≥0.890	PASS

Test Graphs



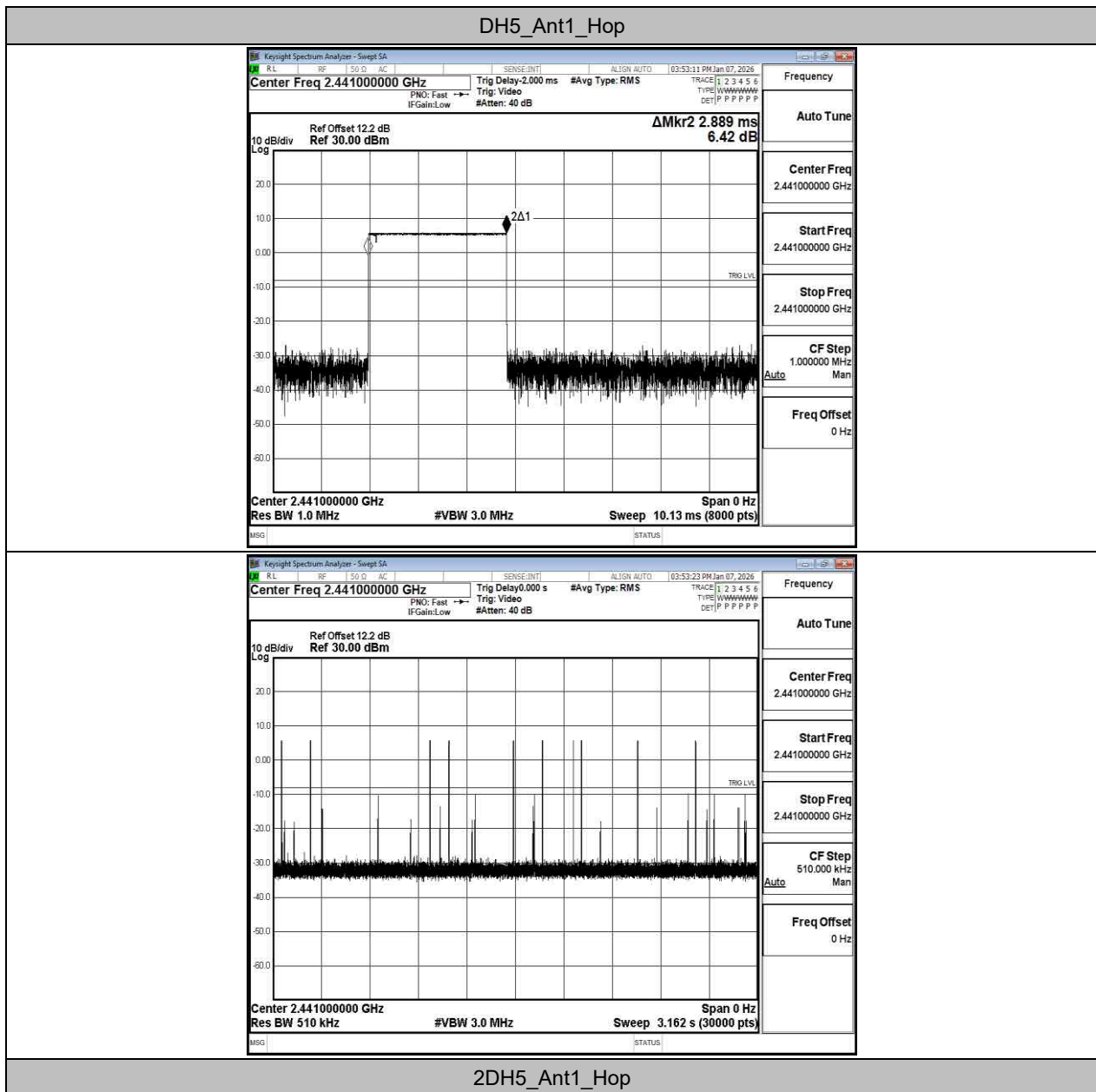


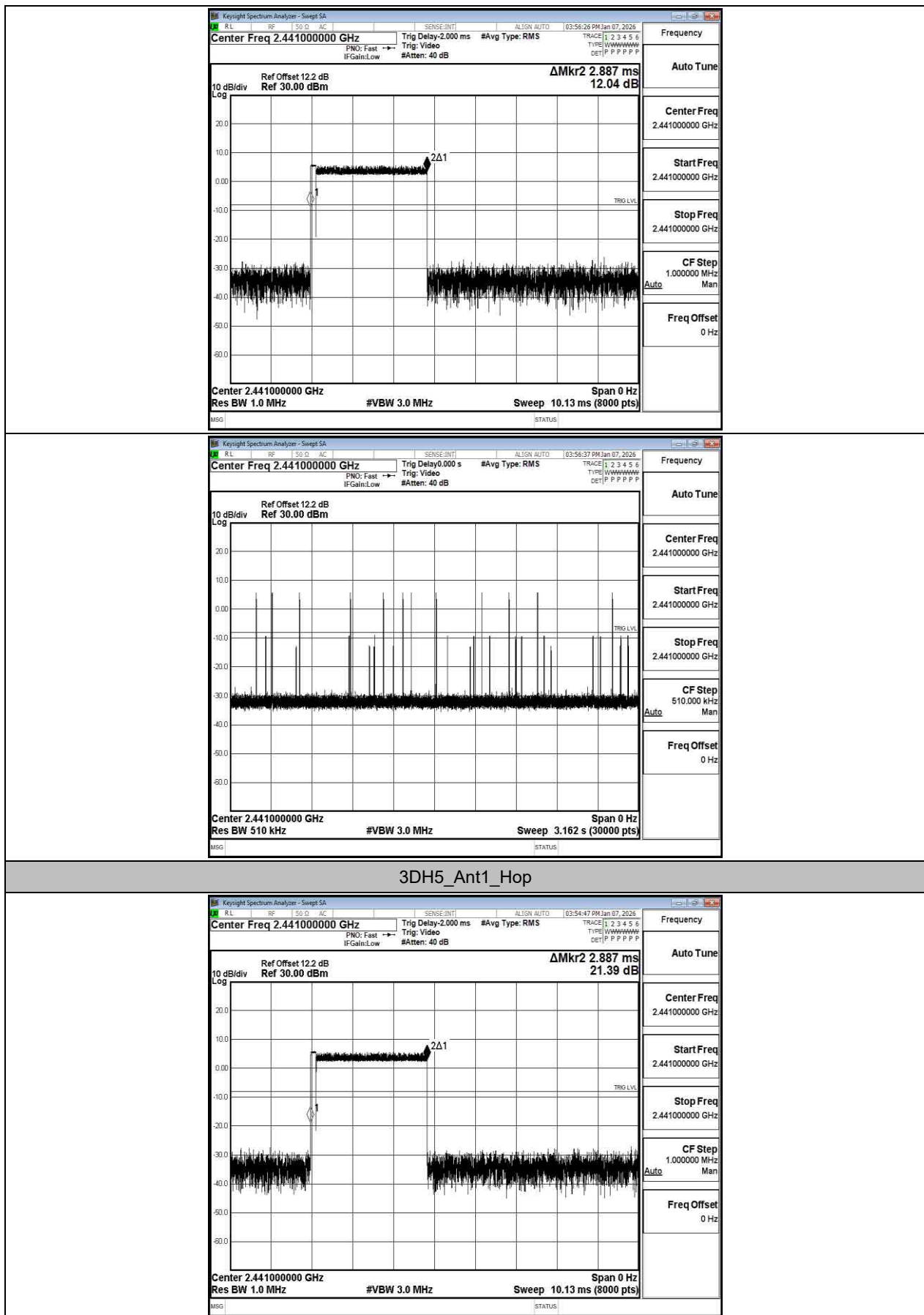
A.4 Dwell Time

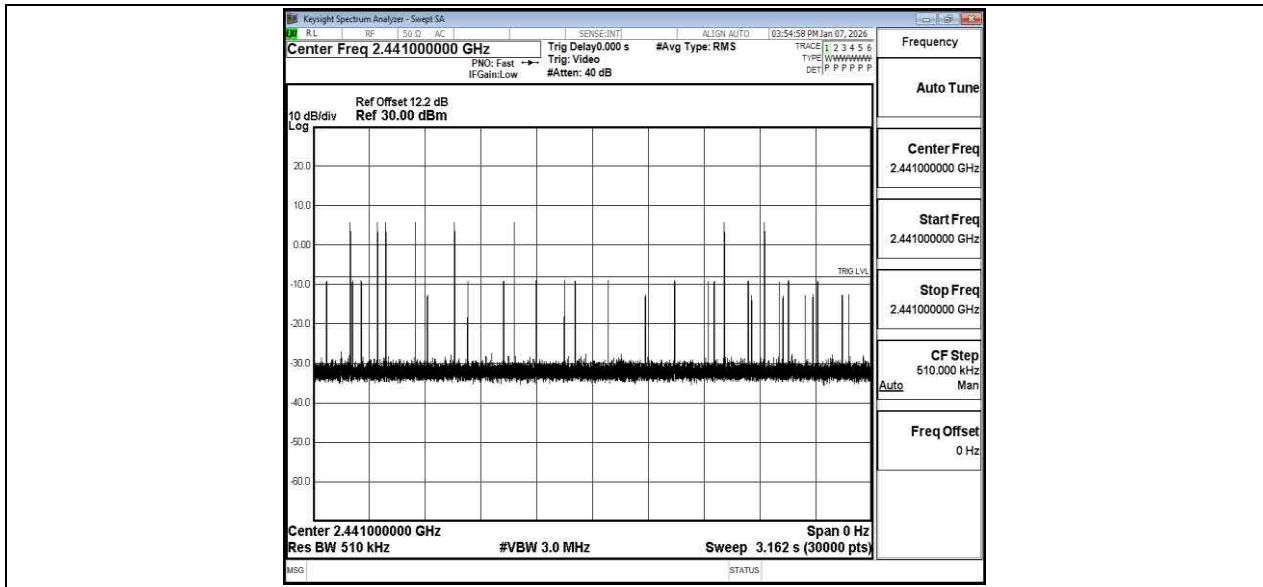
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.889	110	0.318	≤0.4	PASS
2DH5	Ant1	Hop	2.887	130	0.375	≤0.4	PASS
3DH5	Ant1	Hop	2.887	90	0.26	≤0.4	PASS

Test Graphs







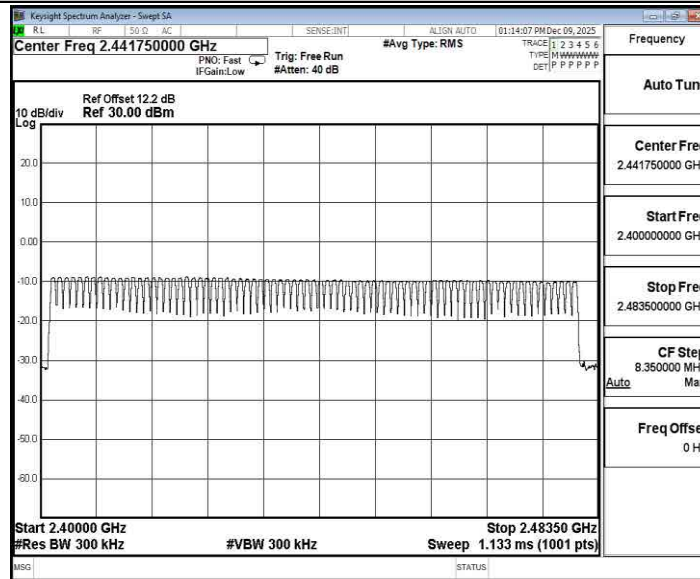
A.5 Number of Hopping Channel

Test Result

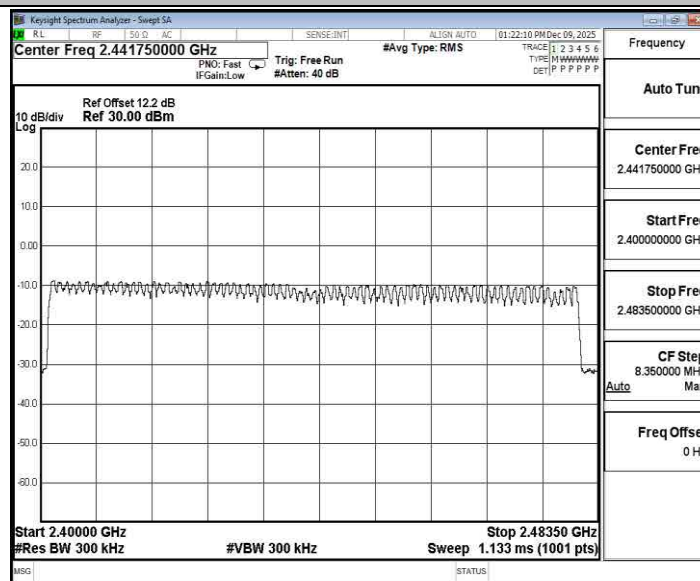
TestMode	Antenna	Freq(MHz)	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

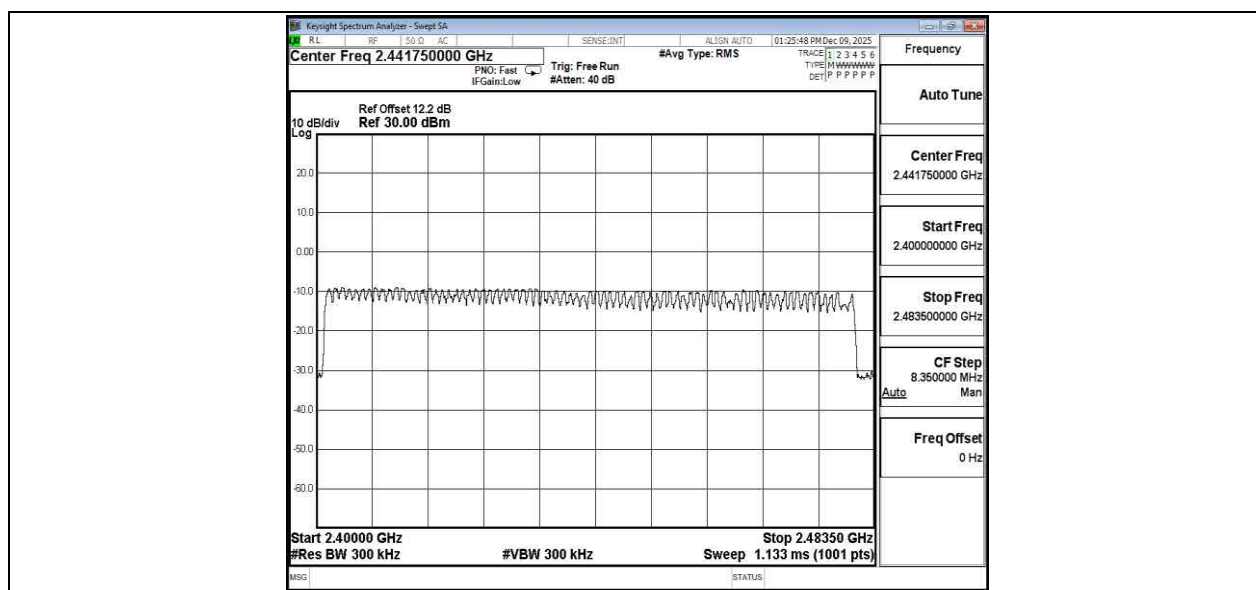
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop



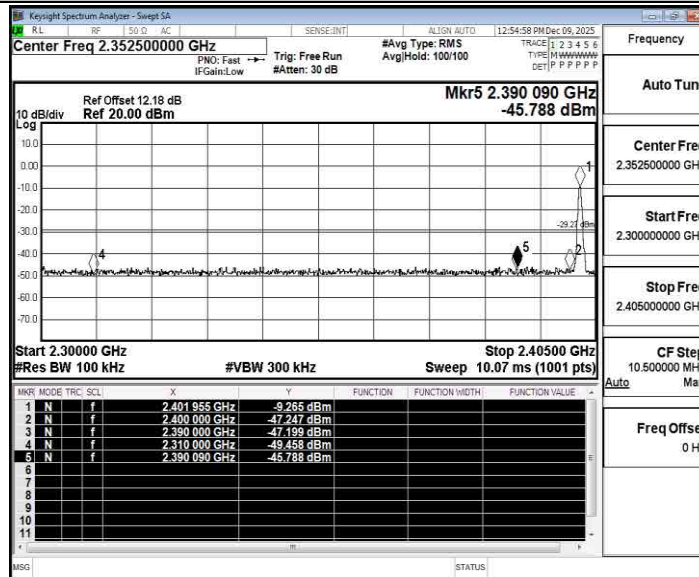
A.6 Band Edge

Test Result

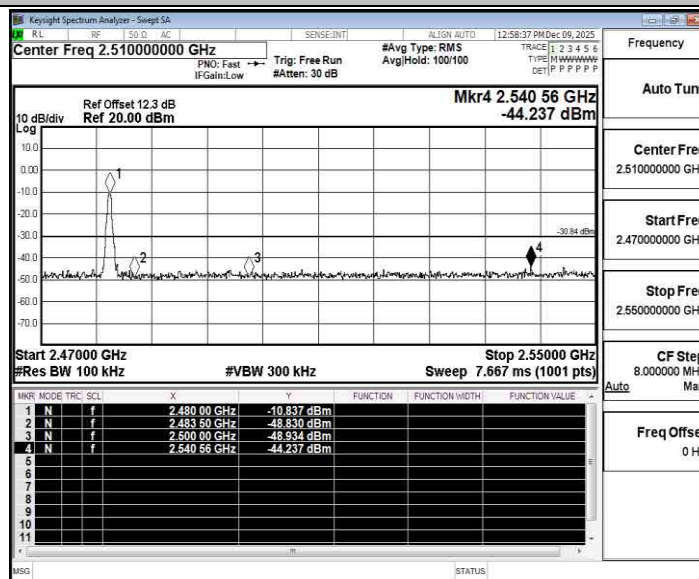
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-9.27	-45.79	≤ -29.27	PASS
		High	2480	-10.84	-44.24	≤ -30.84	PASS
		Low	Hop_2402	-12.09	-45.46	≤ -32.09	PASS
		High	Hop_2480	-11.88	-44.43	≤ -31.88	PASS
2DH5	Ant1	Low	2402	-11.07	-44.18	≤ -31.07	PASS
		High	2480	-10.51	-45.07	≤ -30.51	PASS
		Low	Hop_2402	-14.44	-45.37	≤ -34.44	PASS
		High	Hop_2480	-12.41	-44.99	≤ -32.41	PASS
3DH5	Ant1	Low	2402	-10.71	-44.42	≤ -30.71	PASS
		High	2480	-12.77	-44.55	≤ -32.77	PASS
		Low	Hop_2402	-13.42	-44.28	≤ -33.42	PASS
		High	Hop_2480	-14.70	-44.67	≤ -34.7	PASS

Test Graphs

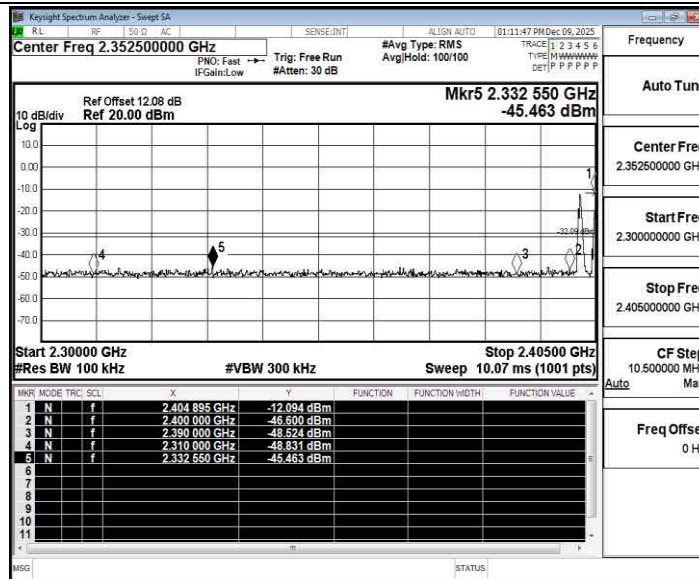
DH5_Ant1_Low_2402



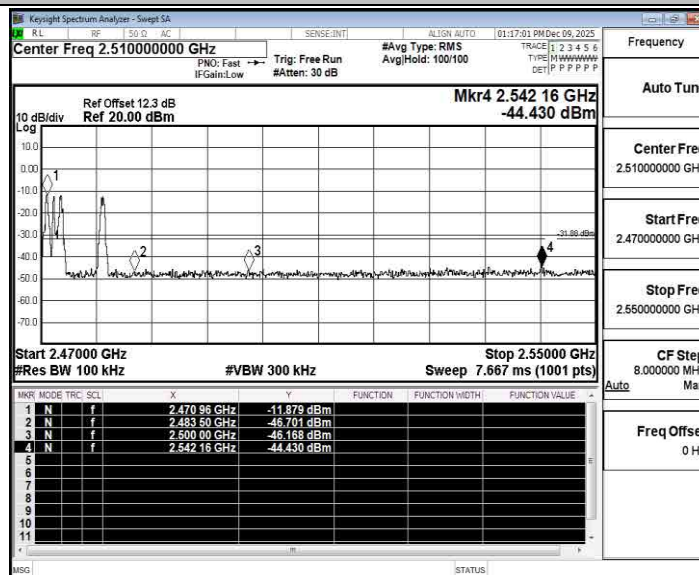
DH5_Ant1_High_2480



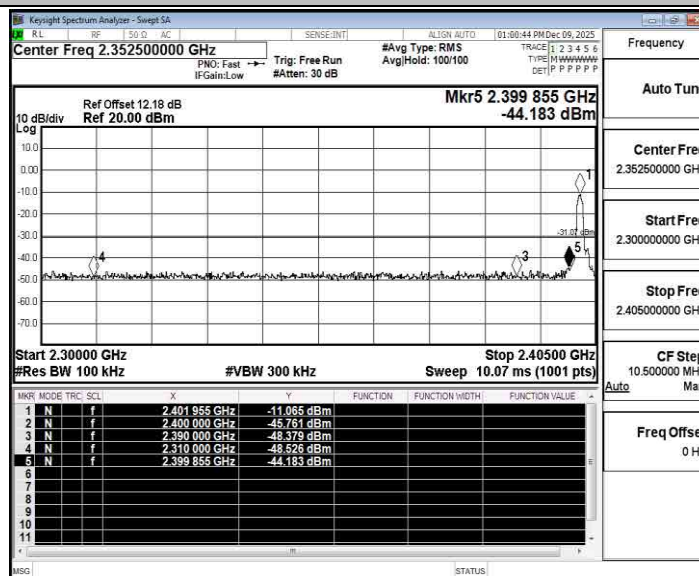
DH5_Ant1_Low_Hop_2402



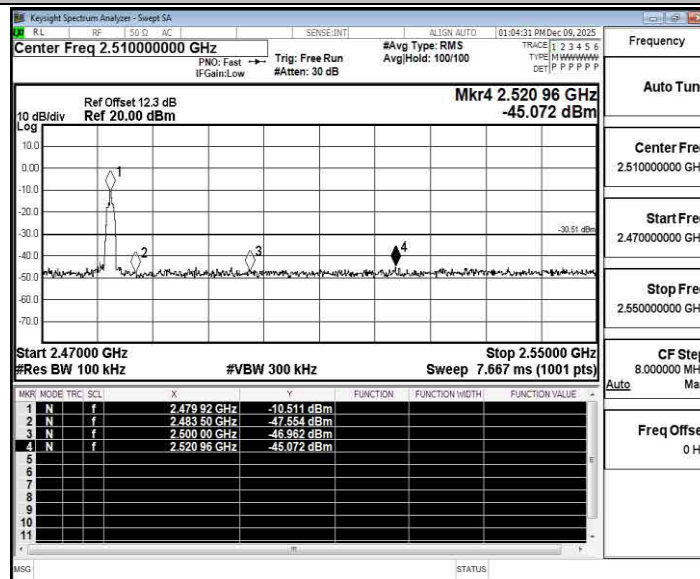
DH5_Ant1_High_Hop_2480



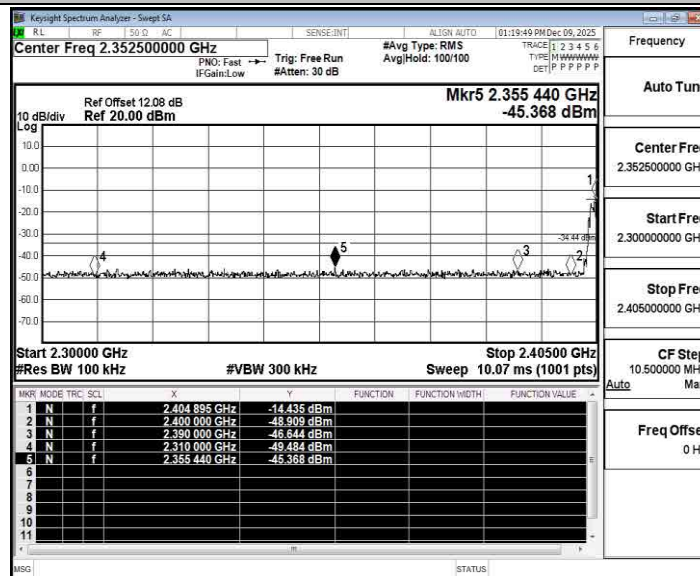
2DH5_Ant1_Low_2402



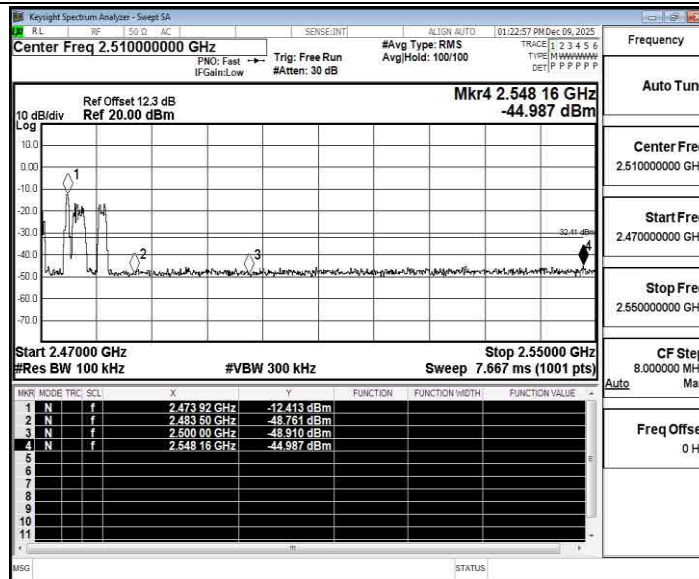
2DH5_Ant1_High_2480



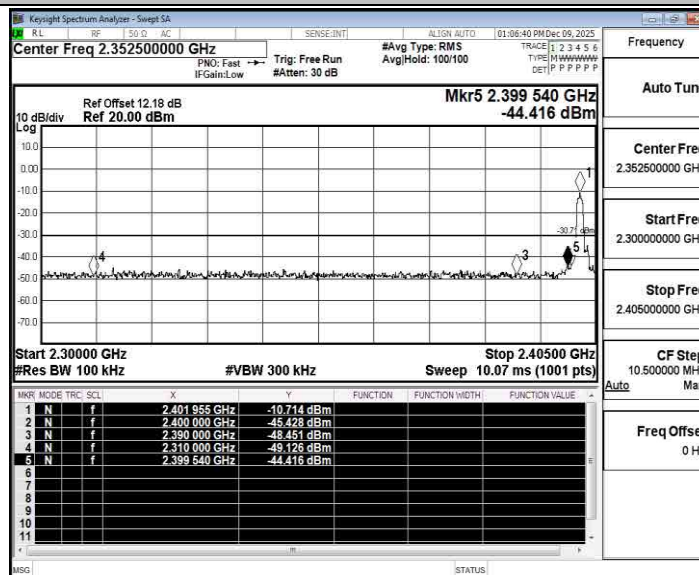
2DH5_Ant1_Low_Hop_2402



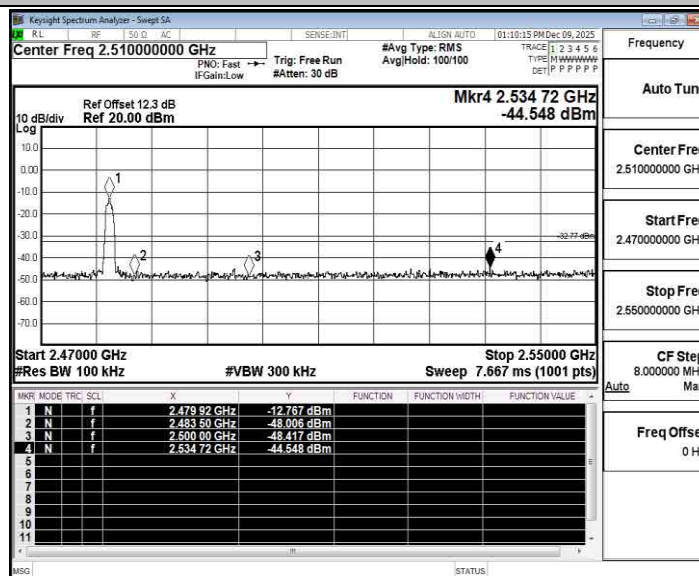
2DH5_Ant1_High_Hop_2480



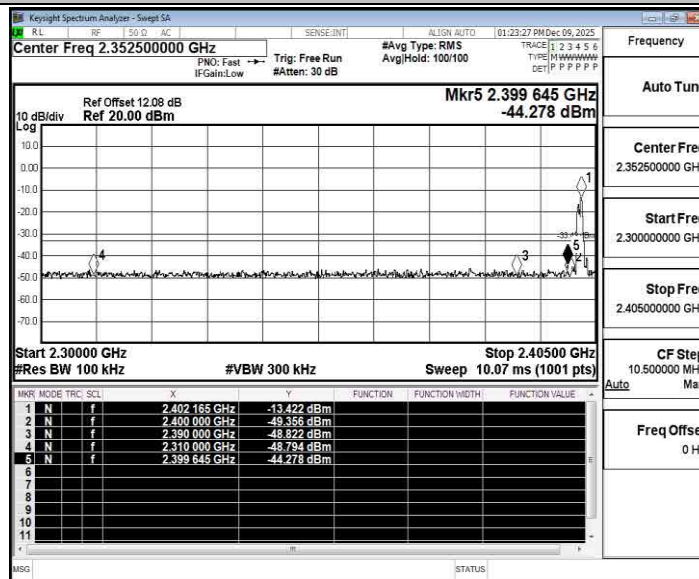
3DH5_Ant1_Low_2402



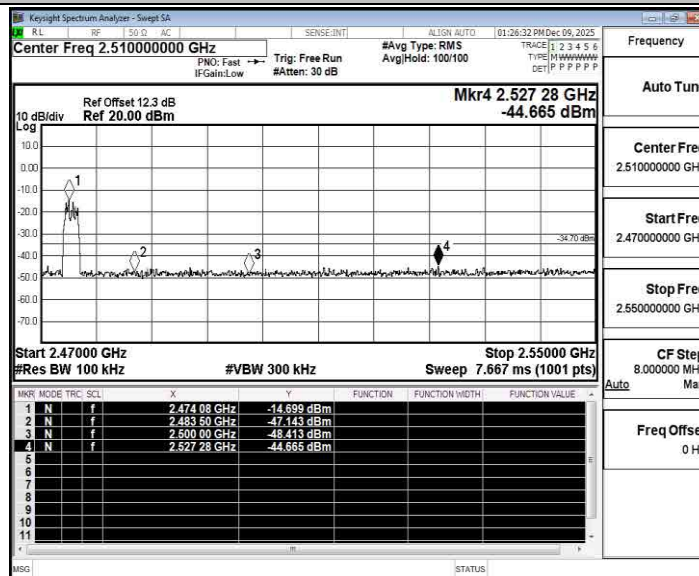
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



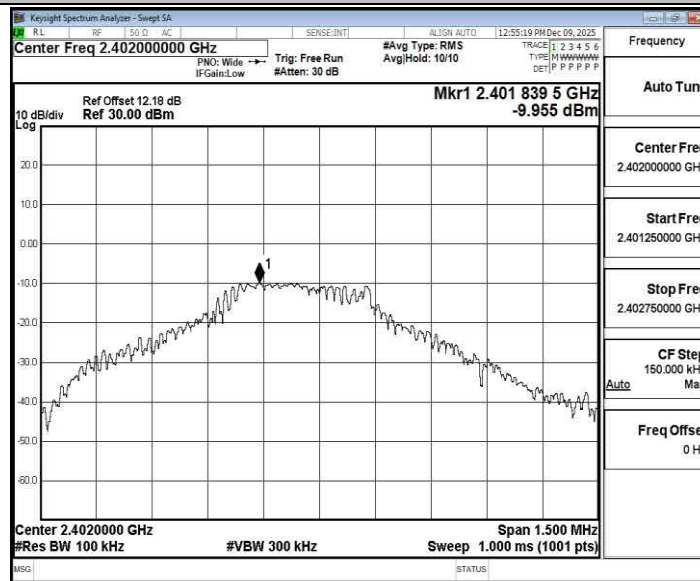
A.7 Conducted RF Spurious Emission

Test Result

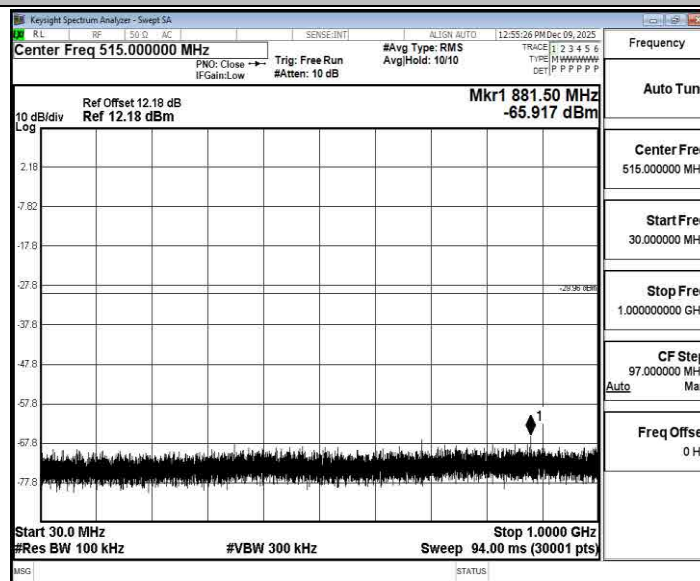
TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-9.96	-9.96	---	PASS
			30~1000	-9.96	-65.92	≤-29.96	PASS
			1000~26500	-9.96	-34.17	≤-29.96	PASS
		2441	Reference	-10.88	-10.88	---	PASS
			30~1000	-10.88	-67.71	≤-30.88	PASS
			1000~26500	-10.88	-41.78	≤-30.88	PASS
		2480	Reference	-11.14	-11.14	---	PASS
			30~1000	-11.14	-67.29	≤-31.14	PASS
			1000~26500	-11.14	-48.48	≤-31.14	PASS
2DH5	Ant1	2402	Reference	-12.14	-12.14	---	PASS
			30~1000	-12.14	-67.74	≤-32.14	PASS
			1000~26500	-12.14	-43.03	≤-32.14	PASS
		2441	Reference	-14.67	-14.67	---	PASS
			30~1000	-14.67	-67.59	≤-34.67	PASS
			1000~26500	-14.67	-49.49	≤-34.67	PASS
		2480	Reference	-15.85	-15.85	---	PASS
			30~1000	-15.85	-67.61	≤-35.85	PASS
			1000~26500	-15.85	-47.21	≤-35.85	PASS
3DH5	Ant1	2402	Reference	-12.70	-12.70	---	PASS
			30~1000	-12.70	-66.4	≤-32.7	PASS
			1000~26500	-12.70	-39.4	≤-32.7	PASS
		2441	Reference	-14.18	-14.18	---	PASS
			30~1000	-14.18	-67.77	≤-34.18	PASS
			1000~26500	-14.18	-46.05	≤-34.18	PASS
		2480	Reference	-15.81	-15.81	---	PASS
			30~1000	-15.81	-67.9	≤-35.81	PASS
			1000~26500	-15.81	-54.49	≤-35.81	PASS

Test Graphs

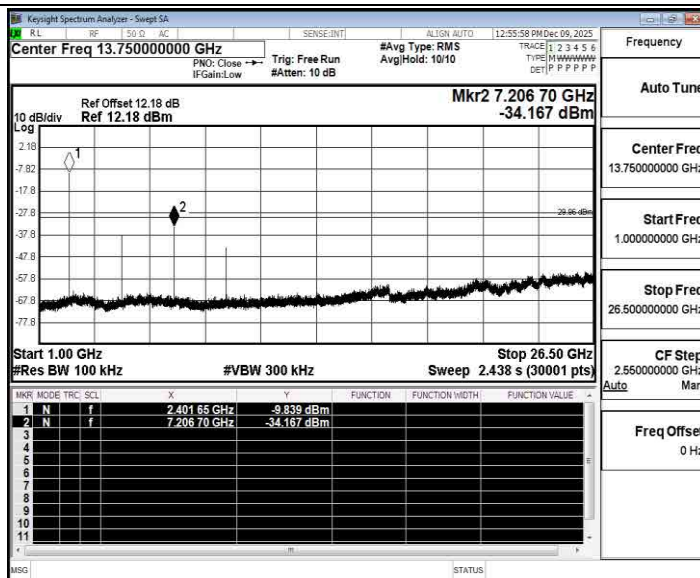
DH5_Ant1_2402_0~Reference



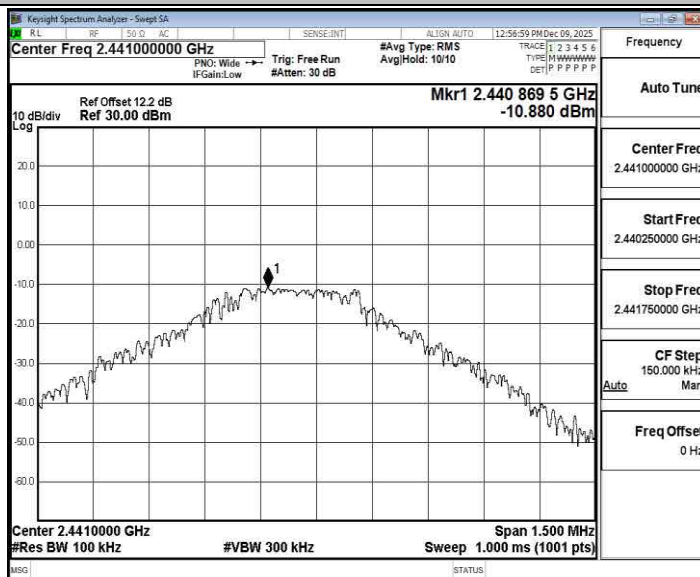
DH5_Ant1_2402_30~1000



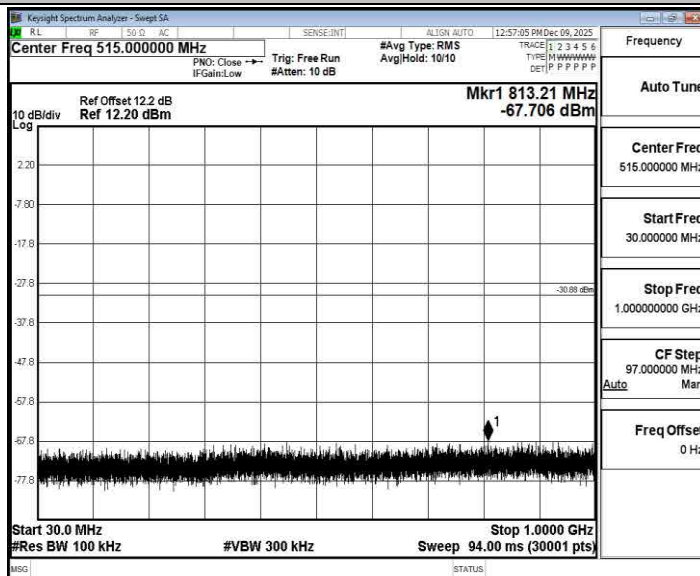
DH5_Ant1_2402_1000~26500



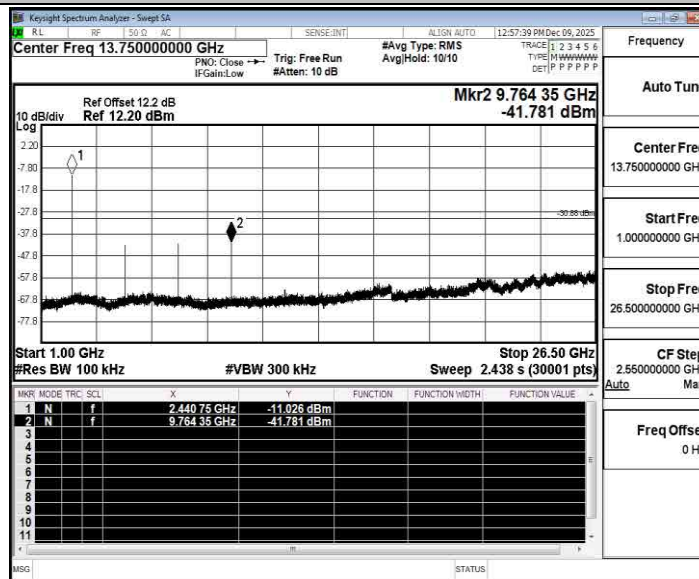
DH5 Ant1 2441 0~Reference



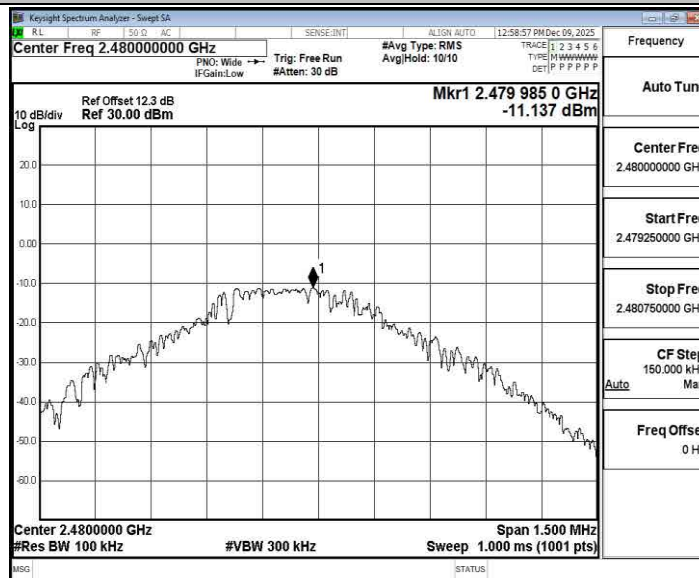
DH5 Ant1 2441 30~1000



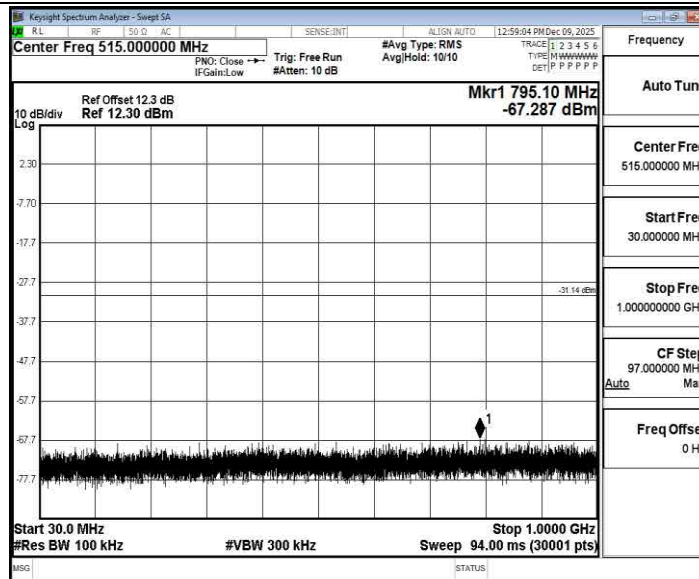
DH5_Ant1_2441_1000~26500



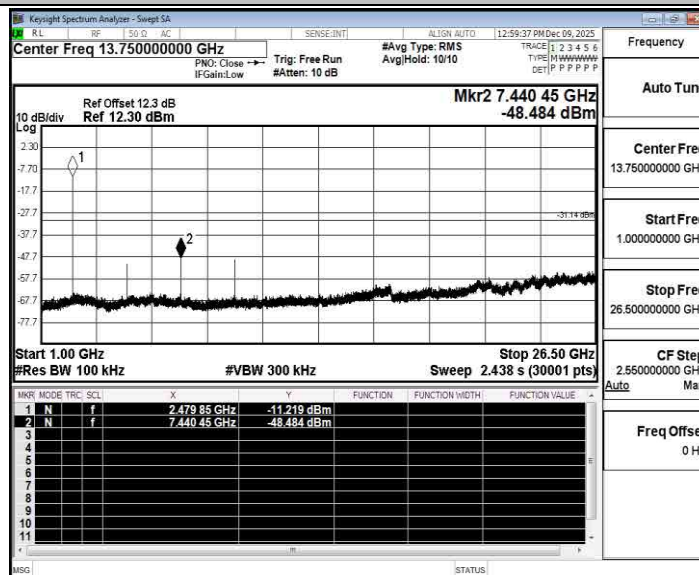
DH5_Ant1_2480_0~Reference



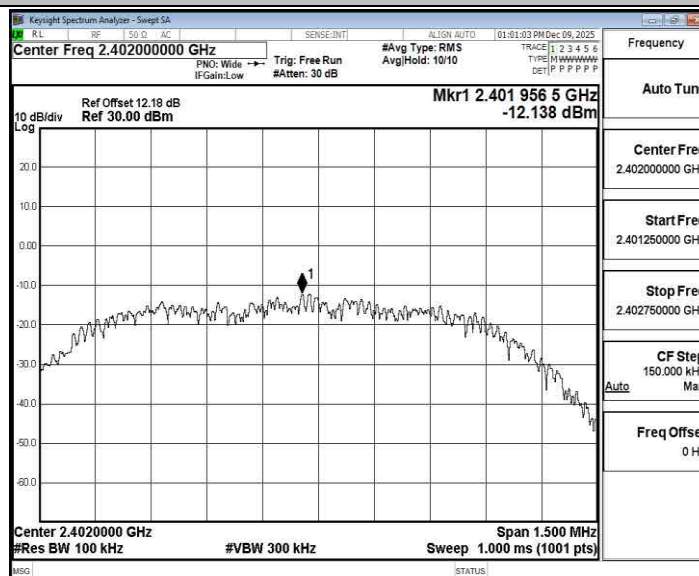
DH5_Ant1_2480_30~1000

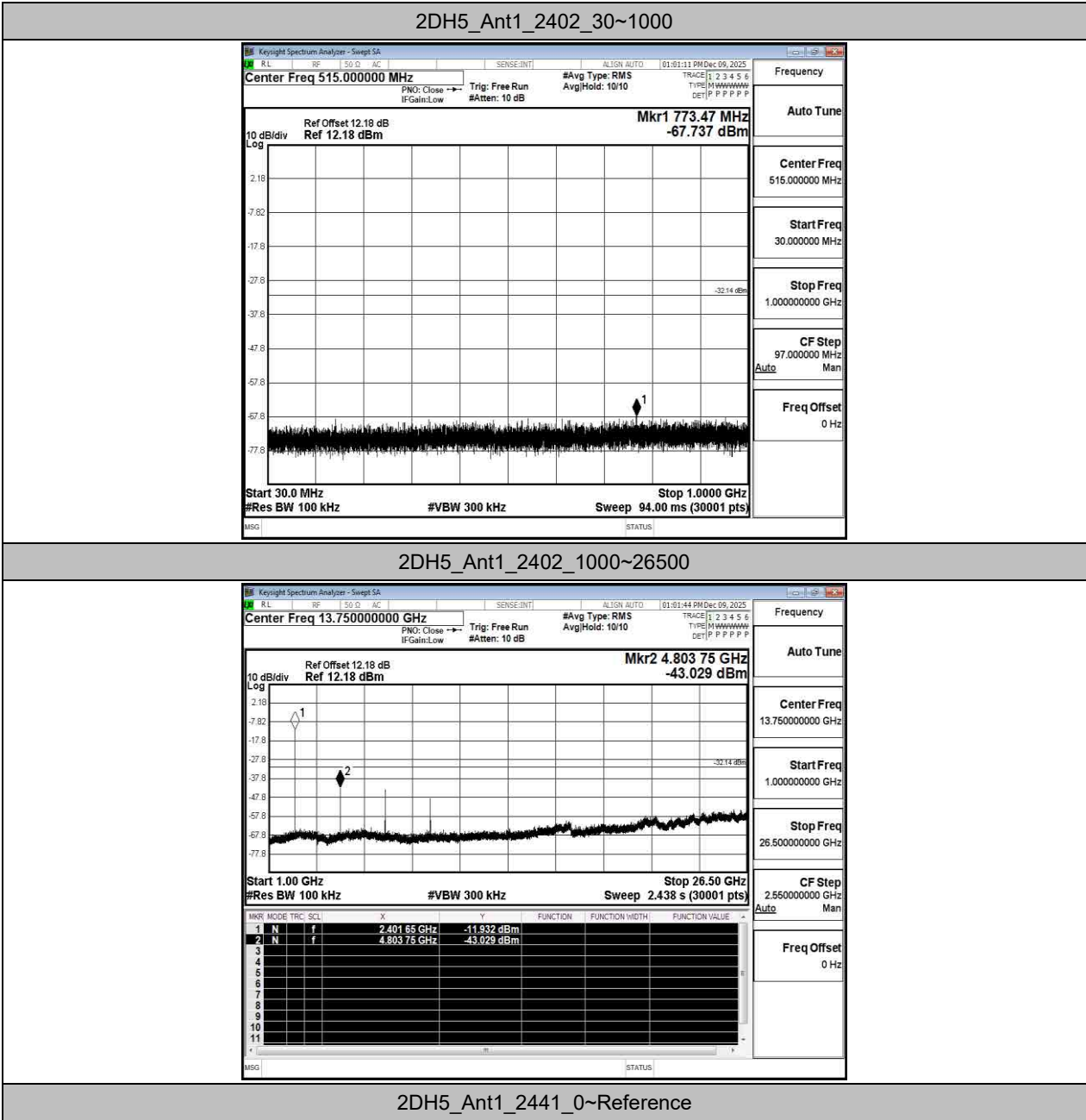


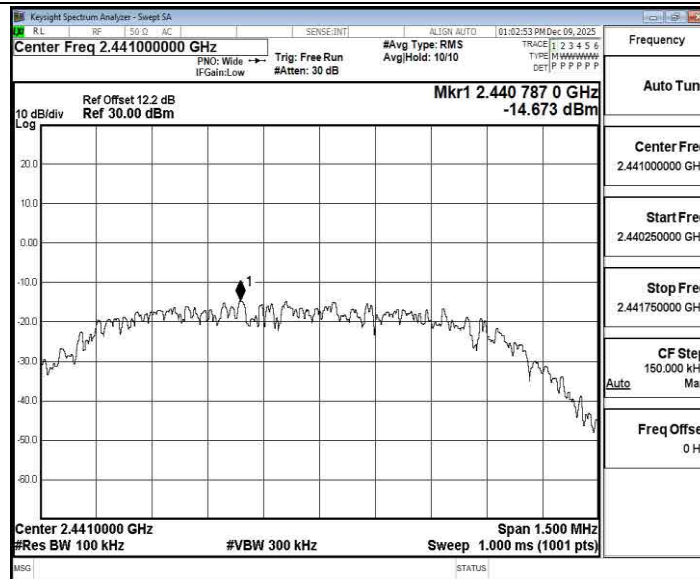
DH5_Ant1_2480_1000~26500



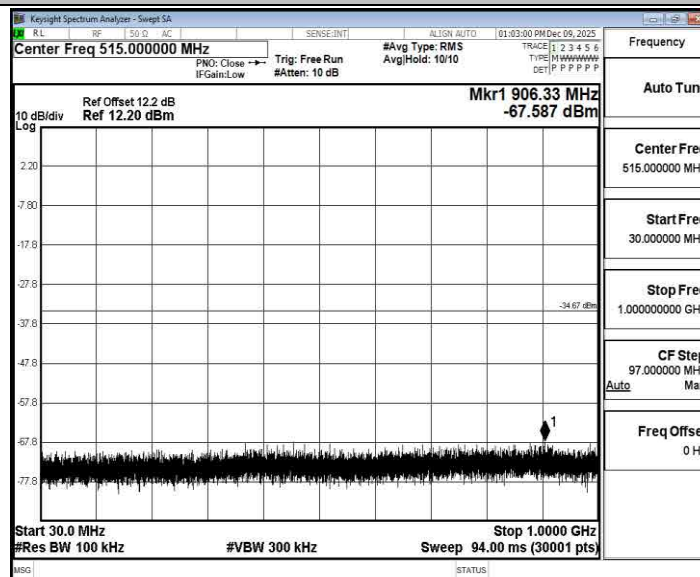
2DH5_Ant1_2402_0~Reference



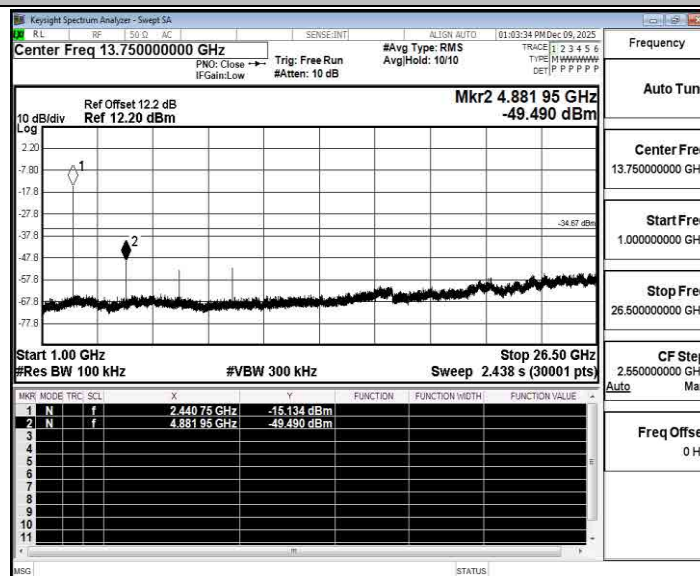




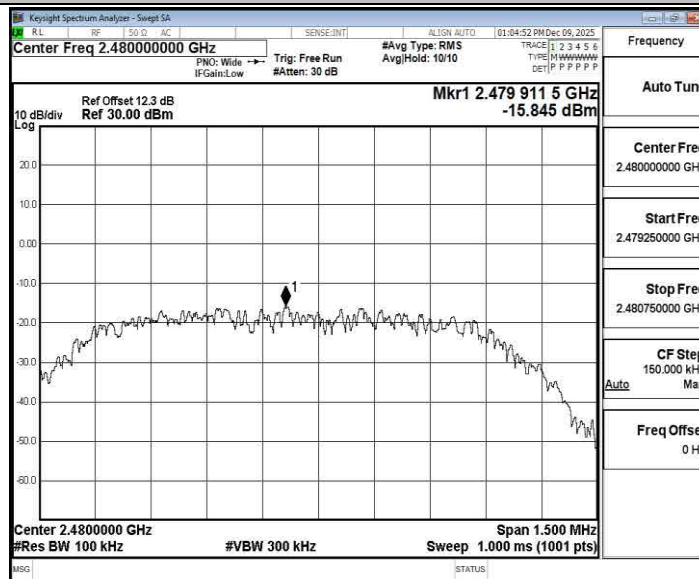
2DH5_Ant1_2441_30~1000



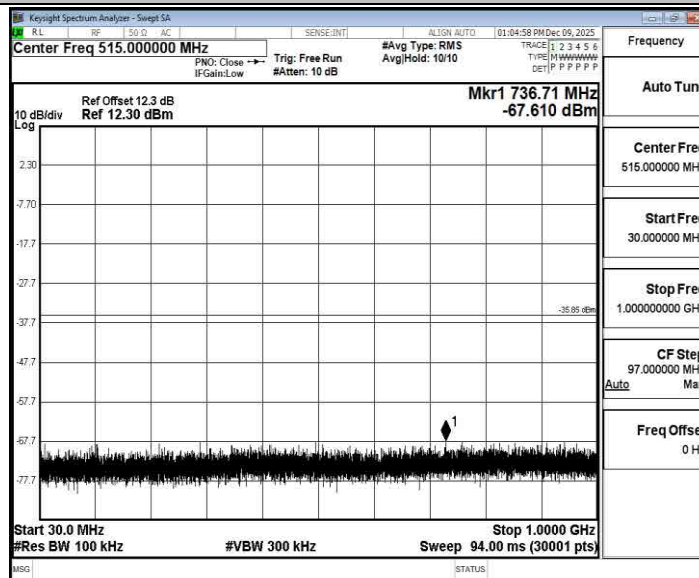
2DH5_Ant1_2441_1000~26500



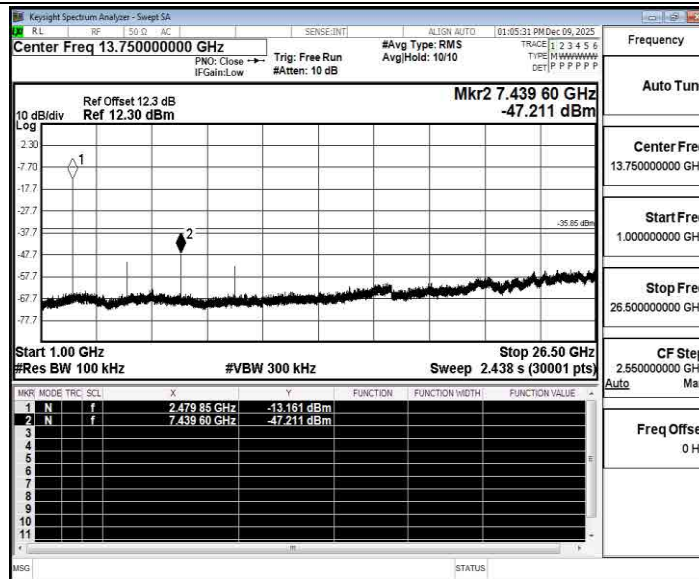
2DH5_Ant1_2480_0~Reference



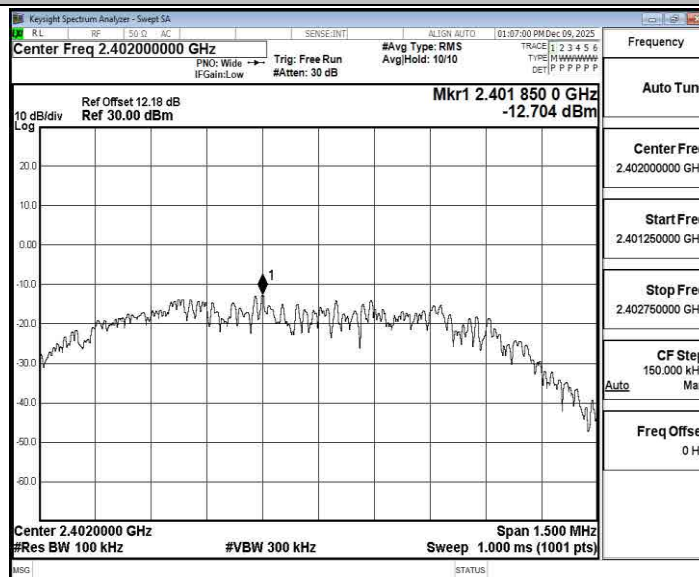
2DH5_Ant1_2480_30~1000



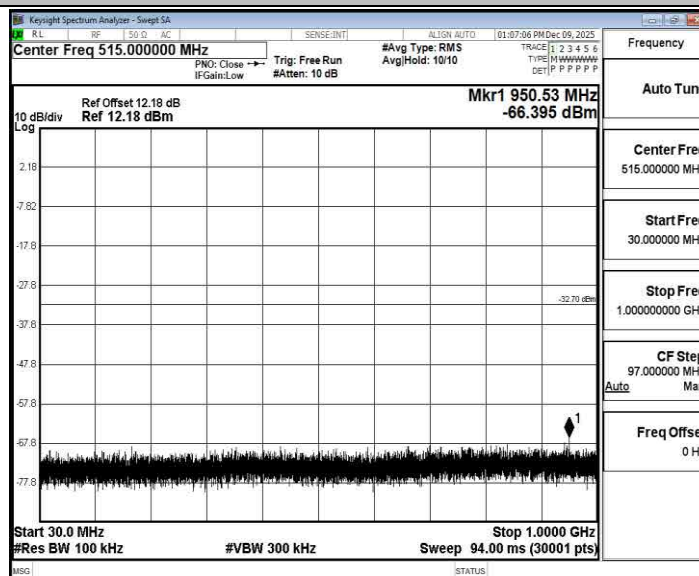
2DH5_Ant1_2480_1000~26500



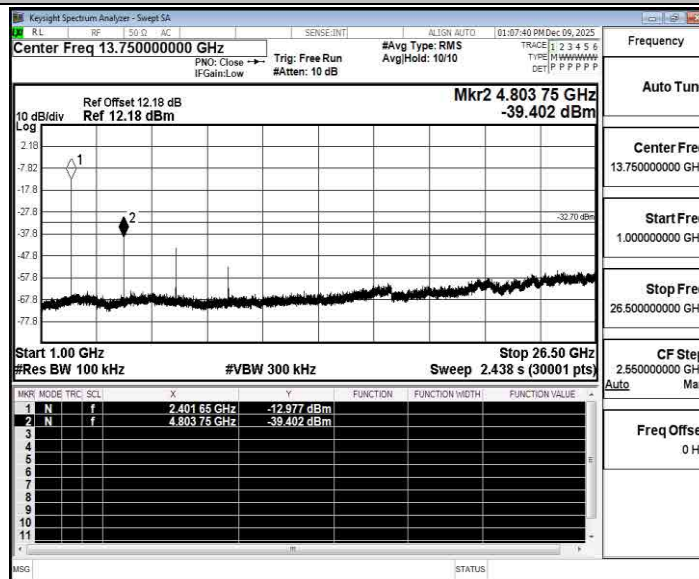
3DH5_Ant1_2402_0~Reference



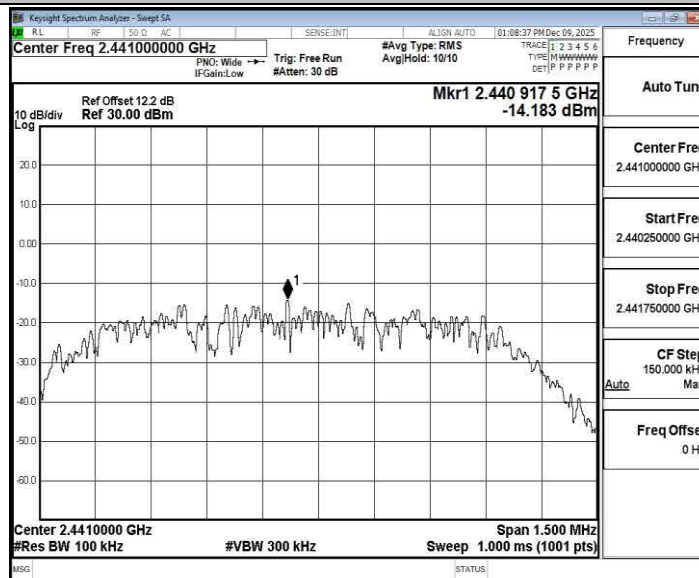
3DH5_Ant1_2402_30~1000



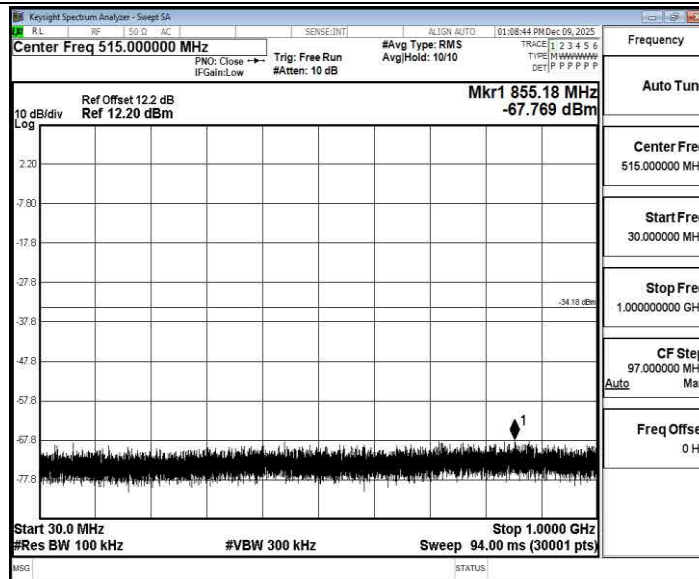
3DH5_Ant1_2402_1000~26500



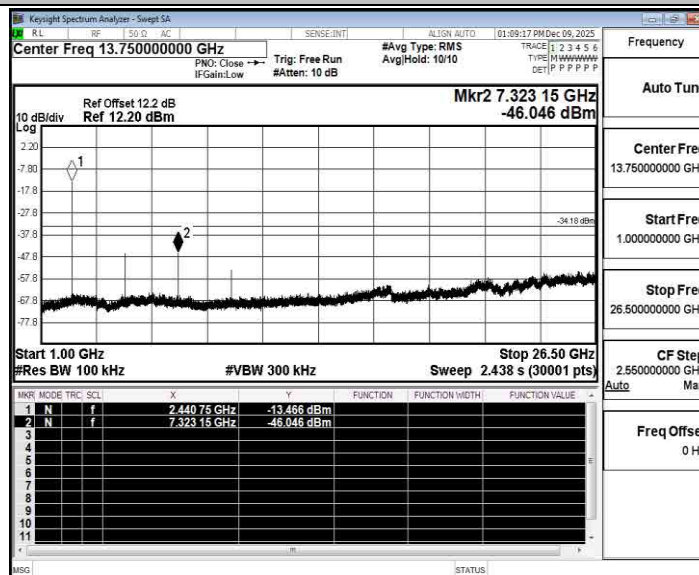
3DH5_Ant1_2441_0~Reference



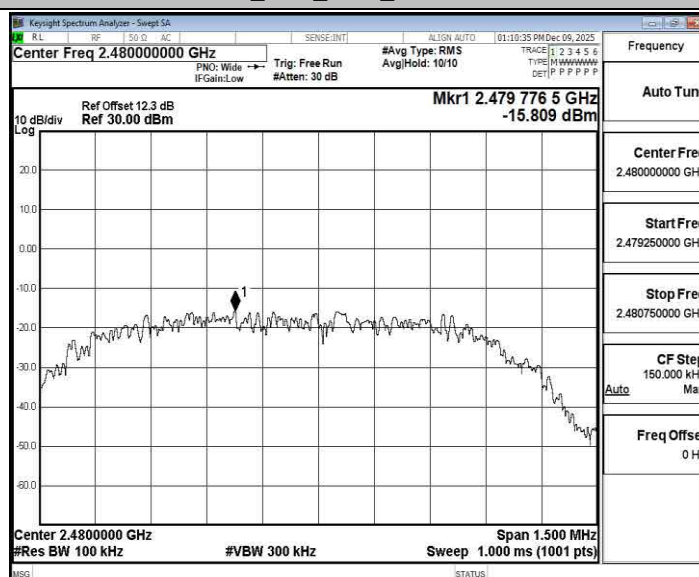
3DH5_Ant1_2441_30~1000



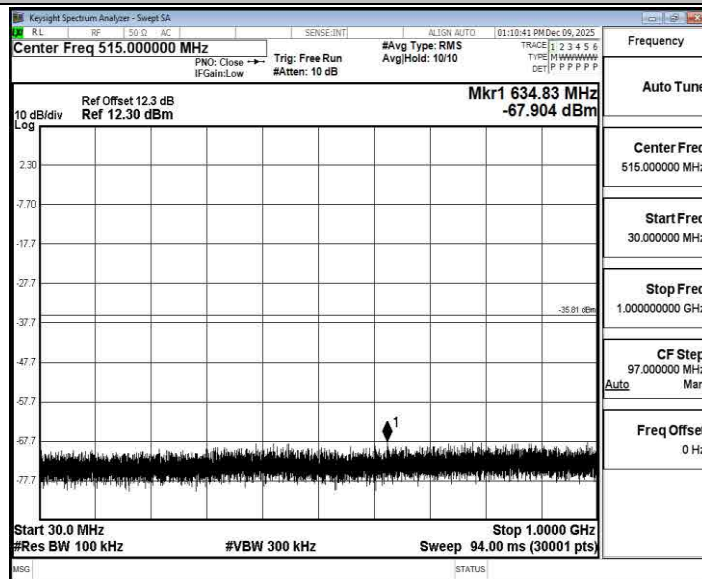
3DH5_Ant1_2441_1000~26500



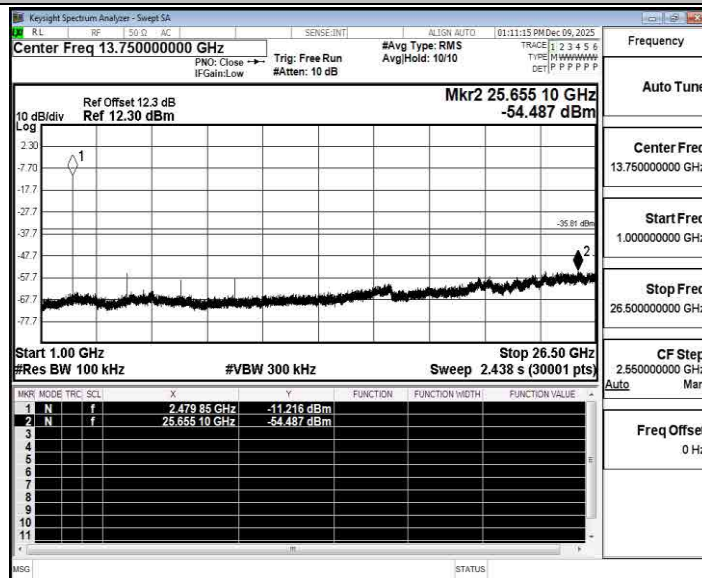
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



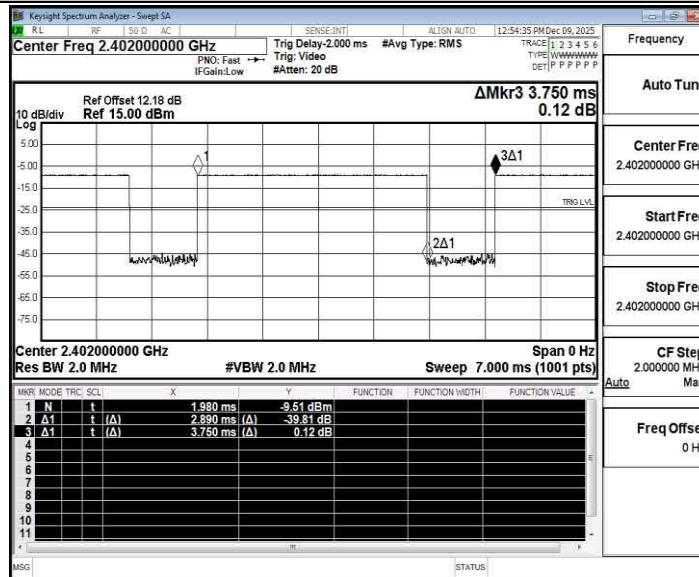
A.8 Duty Cycle

Test Result

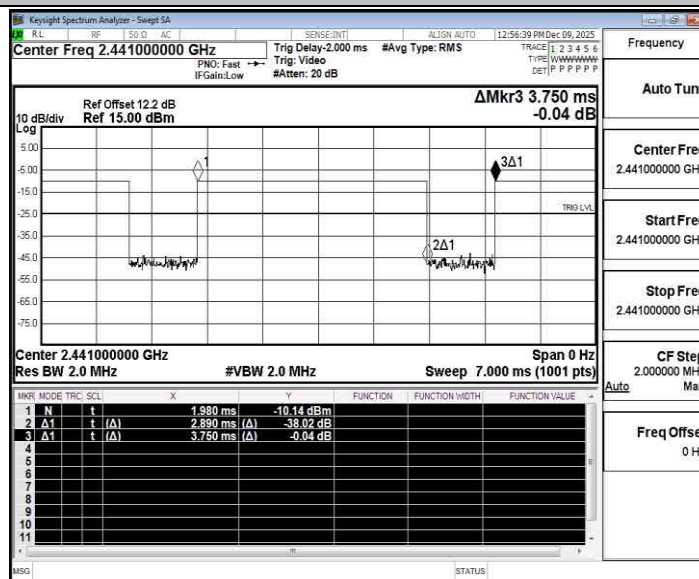
TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	DC [%]	xFactor	Limit	Verdict
DH5	Ant1	2402	2.89	3.75	77.07	1.13	---	---
		2441	2.89	3.75	77.07	1.13	---	---
		2480	2.89	3.76	76.86	1.14	---	---
2DH5	Ant1	2402	2.89	3.75	77.07	1.13	---	---
		2441	2.88	3.74	77.01	1.13	---	---
		2480	2.89	3.75	77.07	1.13	---	---
3DH5	Ant1	2402	2.88	3.74	77.01	1.13	---	---
		2441	2.89	3.75	77.07	1.13	---	---
		2480	2.88	3.74	77.01	1.13	---	---

Test Graphs

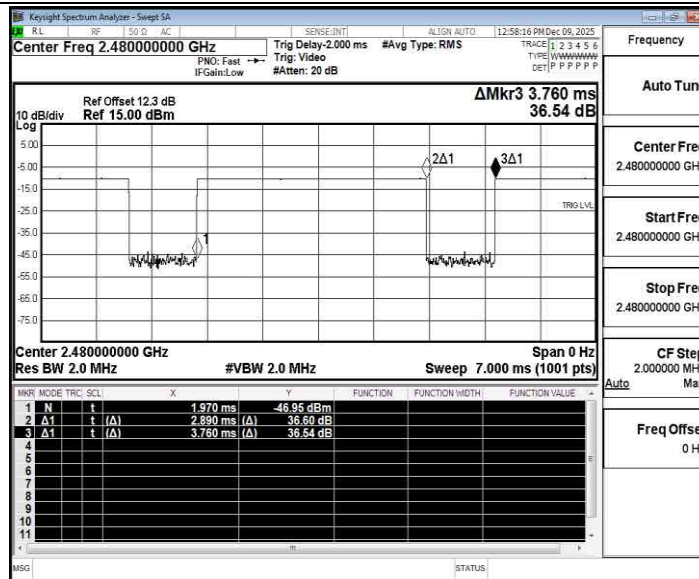
DH5_Ant1_2402



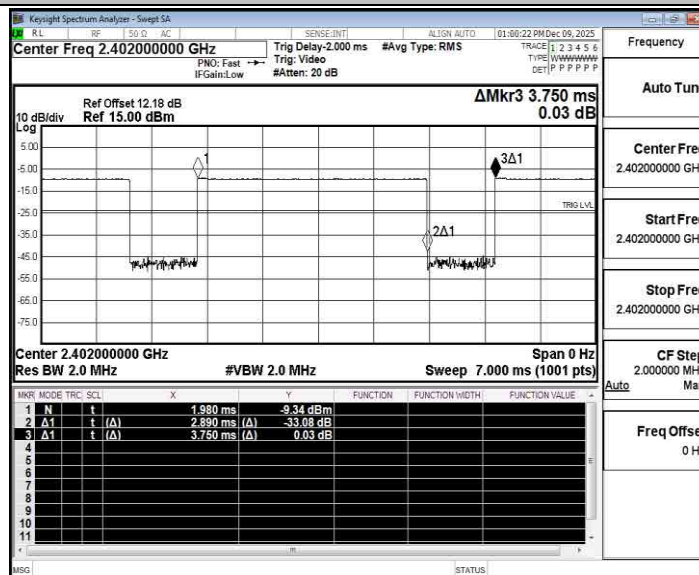
DH5_Ant1_2441



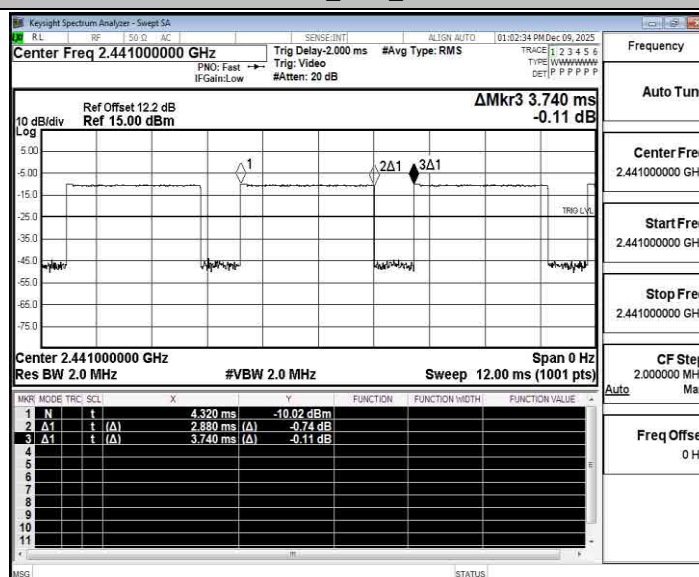
DH5_Ant1_2480



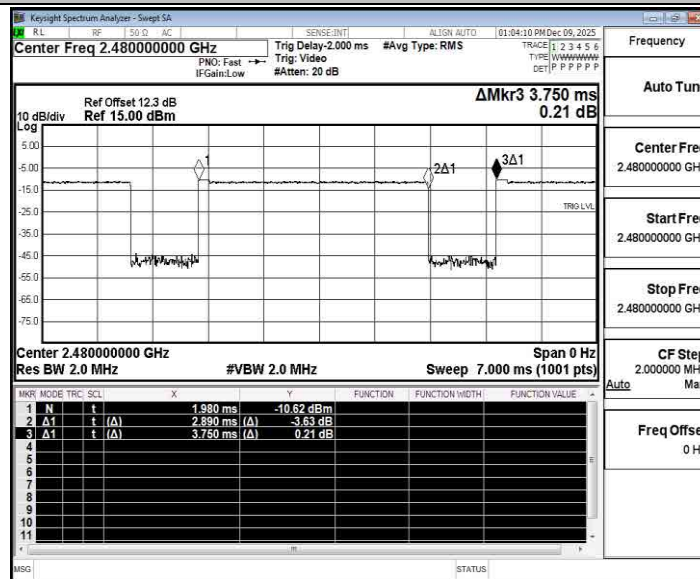
2DH5_Ant1_2402



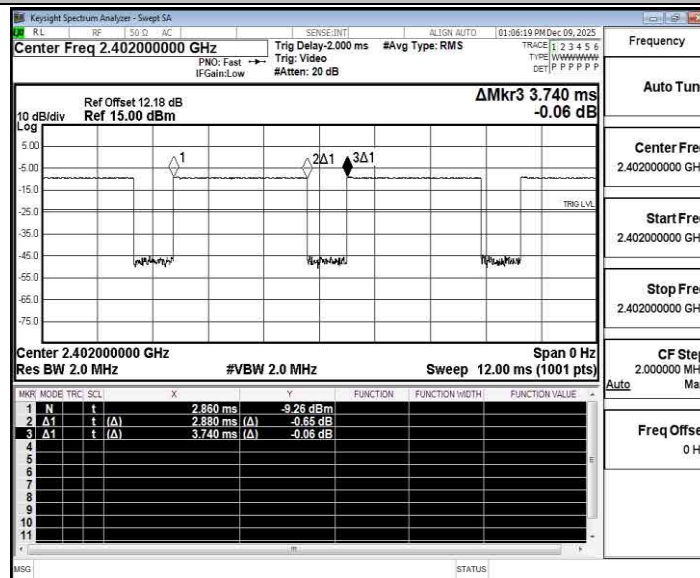
2DH5_Ant1_2441



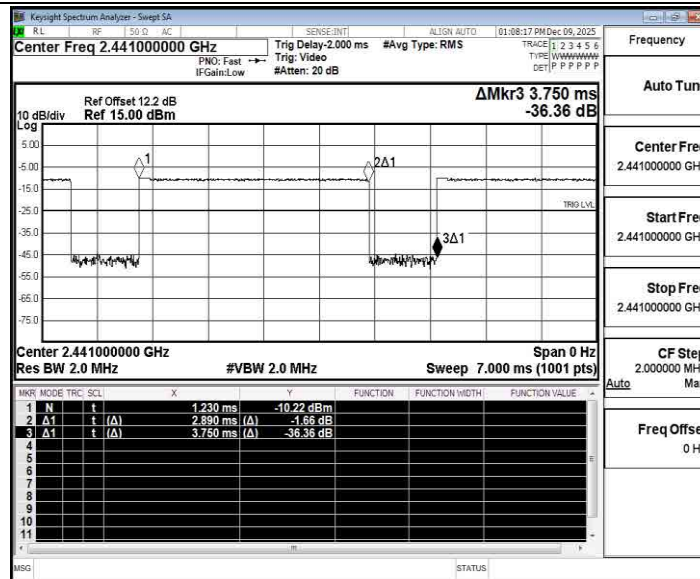
2DH5_Ant1_2480



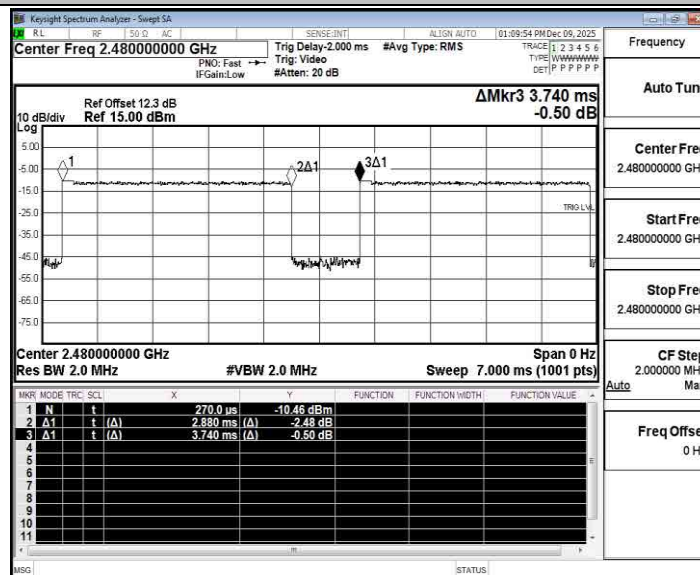
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



A.9 Restrict Band

Test Result

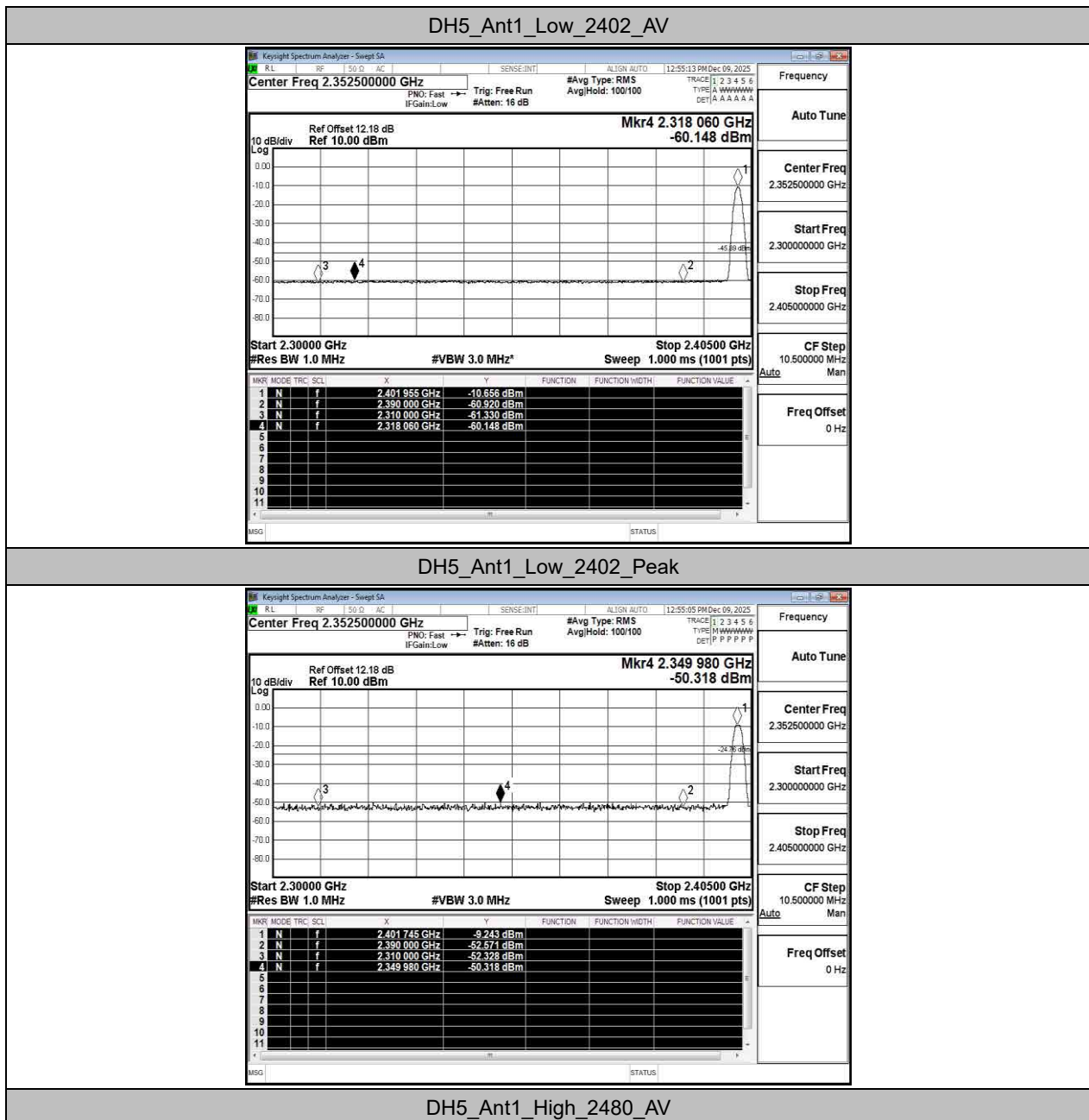
Test Mode	Antenna	ChName	Freq (MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-61.33	≤-45.89	3.56	1.13	38.56	≤54	PASS
				AV	2318.060	-60.15	≤-45.89	3.56	1.13	39.74	≤54	PASS
				AV	2390.000	-60.92	≤-45.89	3.56	1.13	38.97	≤54	PASS
				Peak	2310.000	-52.33	≤-24.76	3.56	0.00	46.43	≤74	PASS
				Peak	2349.980	-50.32	≤-24.76	3.56	0.00	48.44	≤74	PASS
				Peak	2390.000	-52.57	≤-24.76	3.56	0.00	46.19	≤74	PASS
		High	2480	AV	2483.500	-60.35	≤-45.90	3.56	1.14	39.55	≤54	PASS
				AV	2483.680	-59.75	≤-45.90	3.56	1.14	40.15	≤54	PASS
				AV	2500.000	-60.36	≤-45.90	3.56	1.14	39.54	≤54	PASS
				Peak	2483.500	-51.08	≤-24.76	3.56	0.00	47.68	≤74	PASS
				Peak	2484.000	-50.1	≤-24.76	3.56	0.00	48.66	≤74	PASS
				Peak	2500.000	-52.09	≤-24.76	3.56	0.00	46.67	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-53.6	≤-24.76	3.56	0.00	45.16	≤74	PASS
				Peak	2327.300	-49.49	≤-24.76	3.56	0.00	49.27	≤74	PASS
				Peak	2390.000	-53.25	≤-24.76	3.56	0.00	45.51	≤74	PASS
		High	Hop_2480	Peak	2483.500	-52.98	≤-24.76	3.56	0.00	45.78	≤74	PASS
				Peak	2489.120	-49.53	≤-24.76	3.56	0.00	49.23	≤74	PASS
				Peak	2500.000	-52.59	≤-24.76	3.56	0.00	46.17	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-60.77	≤-45.89	3.56	1.13	39.12	≤54	PASS
				AV	2349.560	-60.22	≤-45.89	3.56	1.13	39.67	≤54	PASS
				AV	2390.000	-61.3	≤-45.89	3.56	1.13	38.59	≤54	PASS
				Peak	2310.000	-52.88	≤-24.76	3.56	0.00	45.88	≤74	PASS
				Peak	2376.860	-49.55	≤-24.76	3.56	0.00	49.21	≤74	PASS
				Peak	2390.000	-52.77	≤-24.76	3.56	0.00	45.99	≤74	PASS
		High	2480	AV	2483.500	-59.65	≤-45.89	3.56	1.13	40.24	≤54	PASS
				AV	2483.600	-59.6	≤-45.89	3.56	1.13	40.29	≤54	PASS
				AV	2500.000	-60.35	≤-45.89	3.56	1.13	39.54	≤54	PASS
				Peak	2483.500	-51.47	≤-24.76	3.56	0.00	47.29	≤74	PASS
				Peak	2489.520	-49.75	≤-24.76	3.56	0.00	49.01	≤74	PASS
				Peak	2500.000	-51.49	≤-24.76	3.56	0.00	47.27	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-52.84	≤-24.76	3.56	0.00	45.92	≤74	PASS
				Peak	2314.910	-49.12	≤-24.76	3.56	0.00	49.64	≤74	PASS
				Peak	2390.000	-52.1	≤-24.76	3.56	0.00	46.66	≤74	PASS
		High	Hop_2480	Peak	2483.500	-53.15	≤-24.76	3.56	0.00	45.61	≤74	PASS
				Peak	2490.880	-49.22	≤-24.76	3.56	0.00	49.54	≤74	PASS
				Peak	2500.000	-51.09	≤-24.76	3.56	0.00	47.67	≤74	PASS

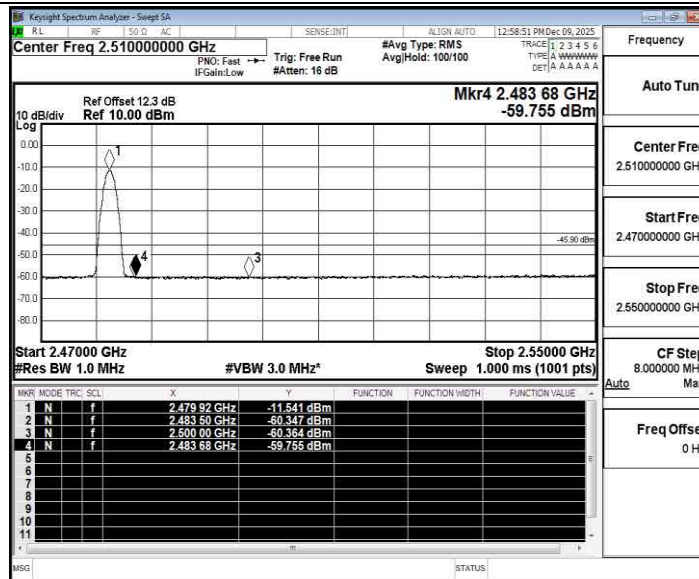
3DH 5	Ant1	Low	2402	AV	2310.000	-60.65	≤-45.89	3.56	1.13	39.24	≤54	PASS
				AV	2377.070	-60.18	≤-45.89	3.56	1.13	39.71	≤54	PASS
				AV	2390.000	-61.32	≤-45.89	3.56	1.13	38.57	≤54	PASS
				Peak	2310.000	-52.11	≤-24.76	3.56	0.00	46.65	≤74	PASS
				Peak	2348.405	-49.42	≤-24.76	3.56	0.00	49.34	≤74	PASS
				Peak	2390.000	-52.04	≤-24.76	3.56	0.00	46.72	≤74	PASS
		High	2480	AV	2483.500	-60.01	≤-45.89	3.56	1.13	39.88	≤54	PASS
				AV	2497.120	-59.61	≤-45.89	3.56	1.13	40.28	≤54	PASS
				AV	2500.000	-60.18	≤-45.89	3.56	1.13	39.71	≤54	PASS
				Peak	2483.500	-52.28	≤-24.76	3.56	0.00	46.48	≤74	PASS
				Peak	2492.080	-49.96	≤-24.76	3.56	0.00	48.80	≤74	PASS
				Peak	2500.000	-52.4	≤-24.76	3.56	0.00	46.36	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-53.17	≤-24.76	3.56	0.00	45.59	≤74	PASS
				Peak	2359.115	-49.57	≤-24.76	3.56	0.00	49.19	≤74	PASS
				Peak	2390.000	-53.55	≤-24.76	3.56	0.00	45.21	≤74	PASS
		High	Hop_2480	Peak	2483.500	-52.66	≤-24.76	3.56	0.00	46.10	≤74	PASS
				Peak	2490.160	-49.72	≤-24.76	3.56	0.00	49.04	≤74	PASS
				Peak	2500.000	-52.45	≤-24.76	3.56	0.00	46.31	≤74	PASS

Note:

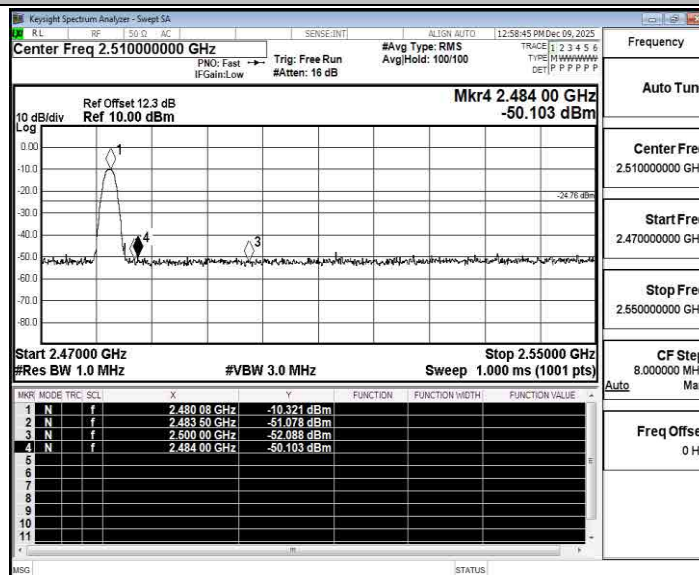
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

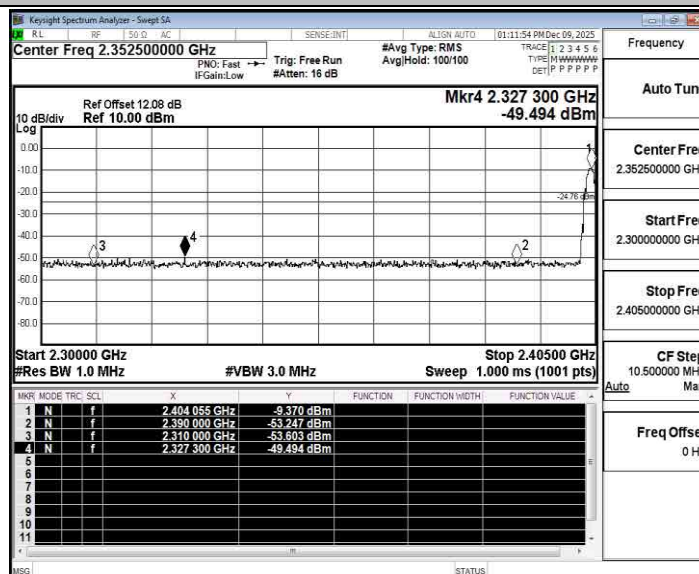




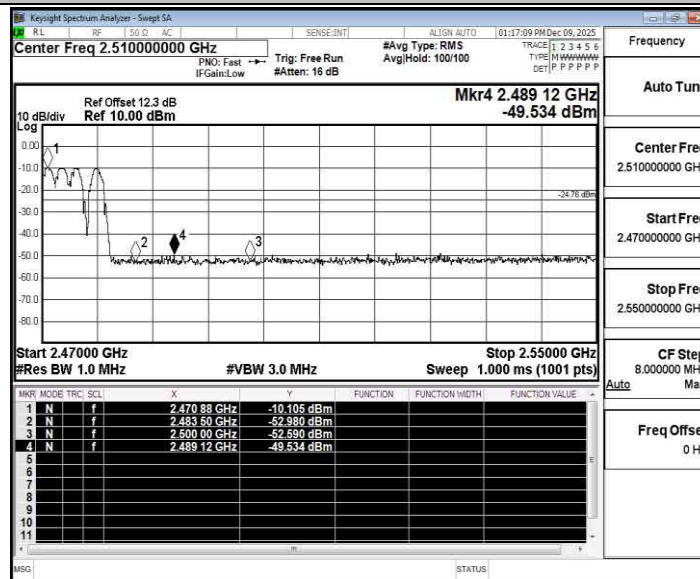
DH5_Ant1_High_2480_Peak



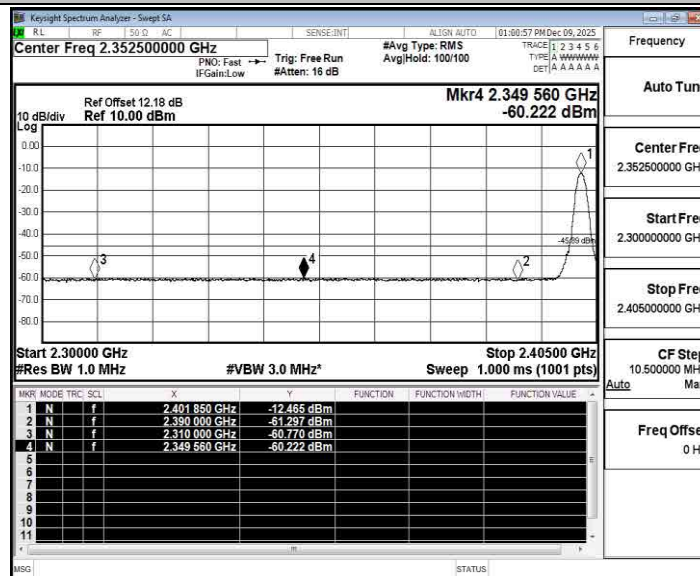
DH5_Ant1_Low_Hop_2402_Peak



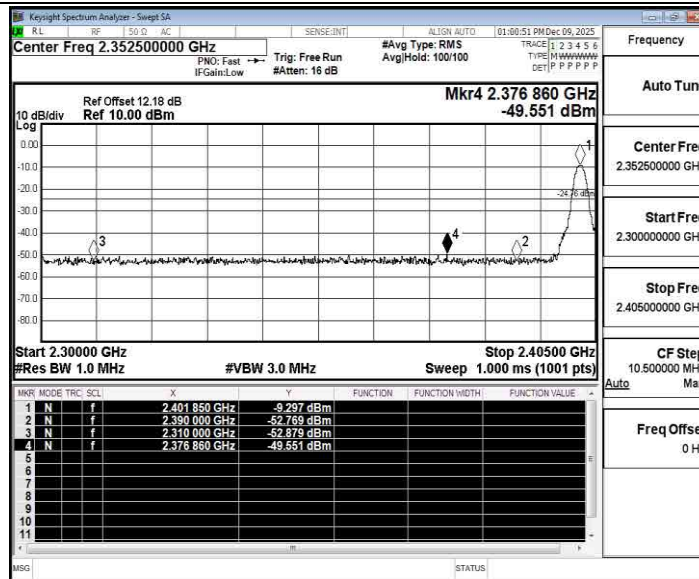
DH5_Ant1_High_Hop_2480_Peak



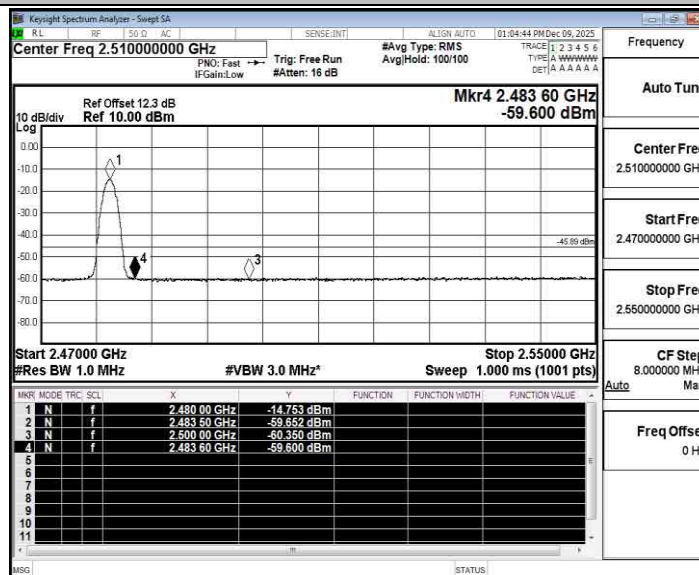
2DH5_Ant1_Low_2402_AV



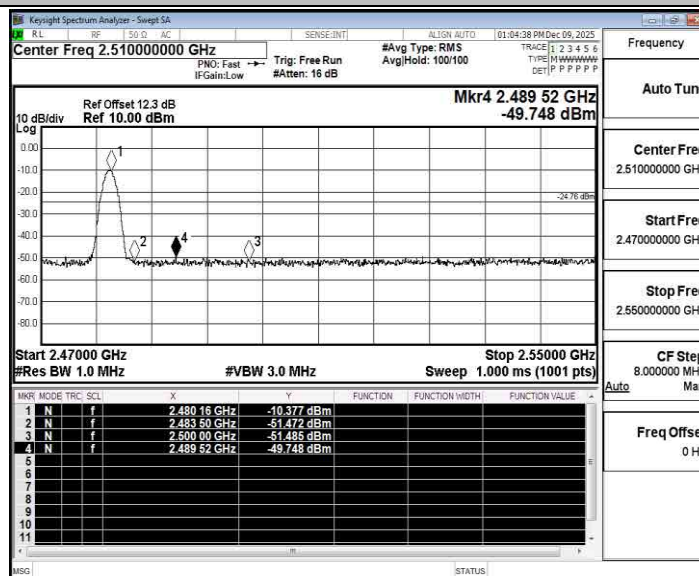
2DH5_Ant1_Low_2402_Peak



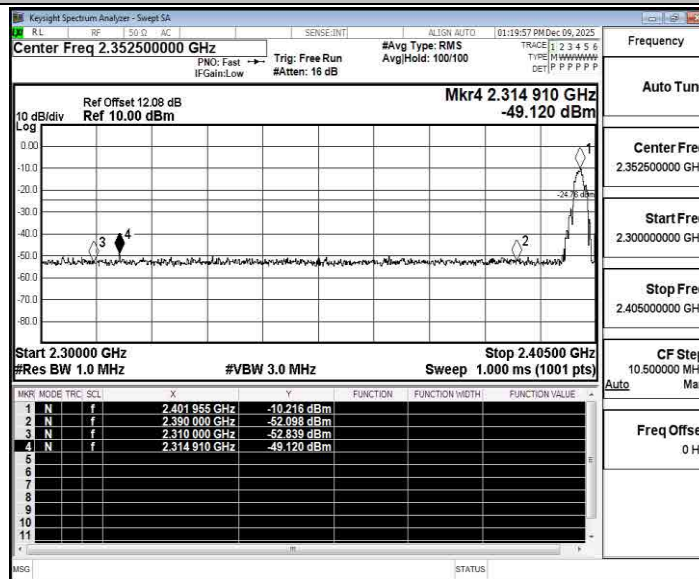
2DH5_Ant1_High_2480_AV



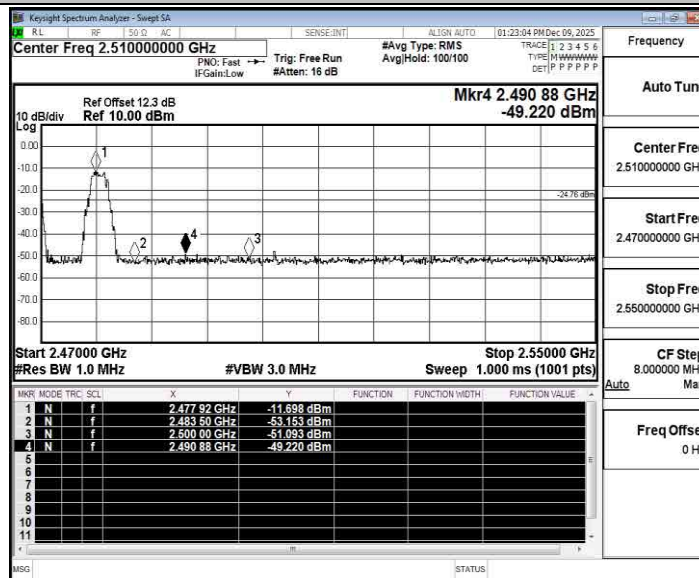
2DH5_Ant1_High_2480_Peak



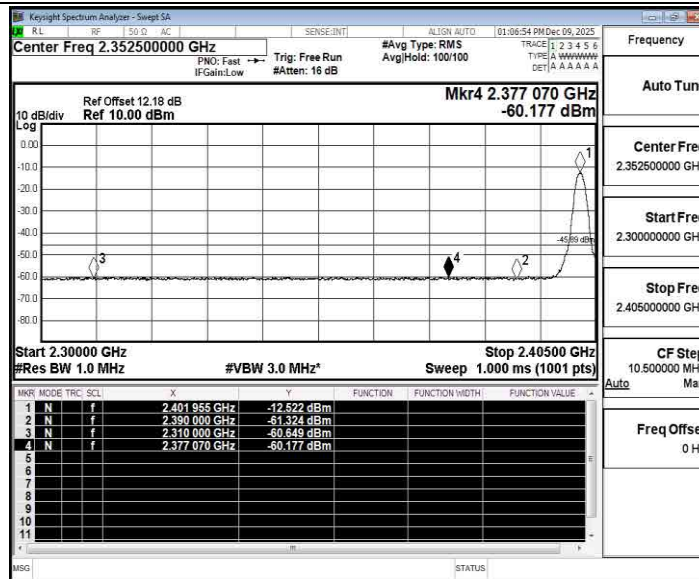
2DH5_Ant1_Low_Hop_2402_Peak



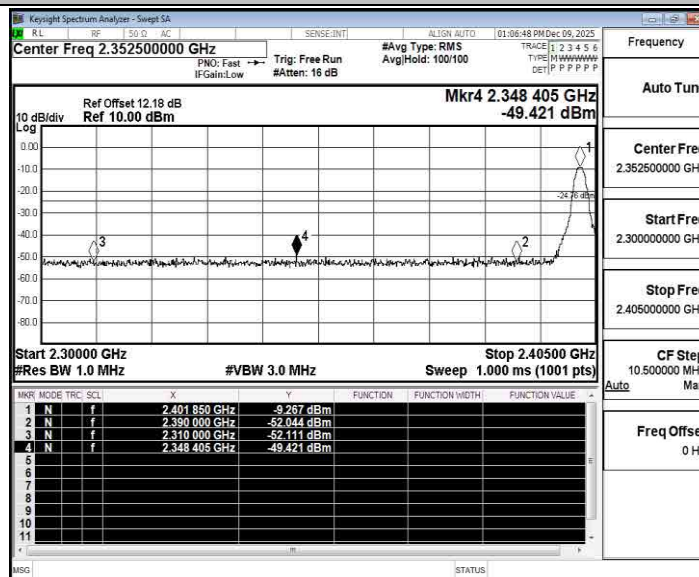
2DH5_Ant1_High_Hop_2480_Peak



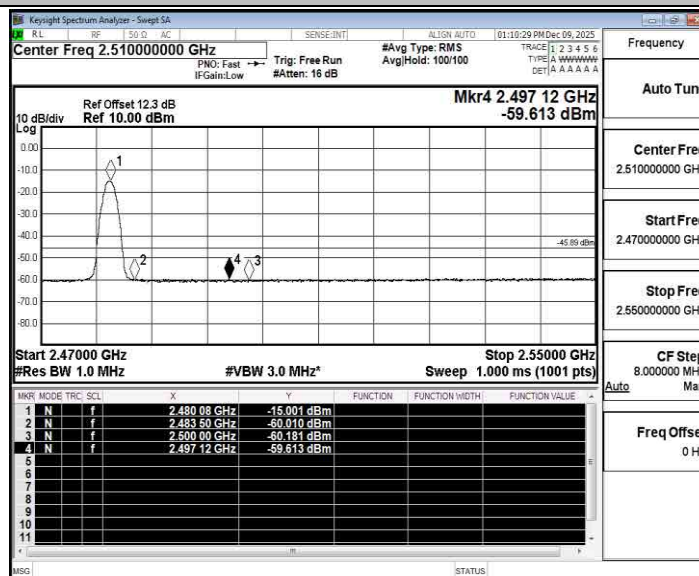
3DH5_Ant1_Low_2402_AV



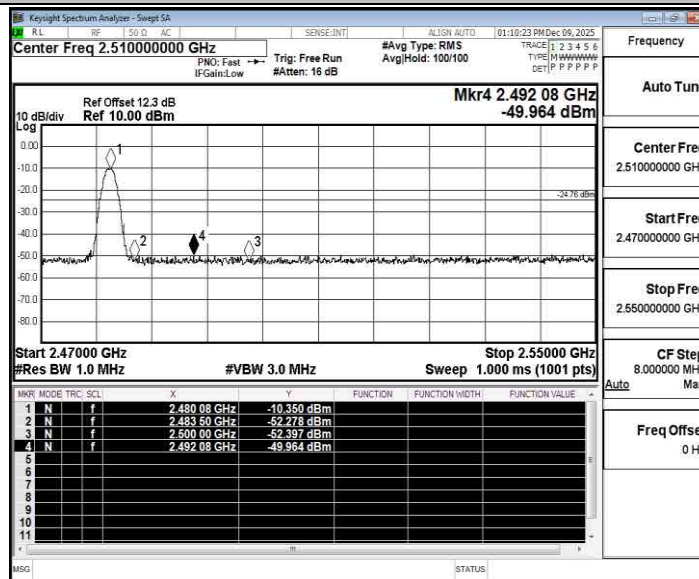
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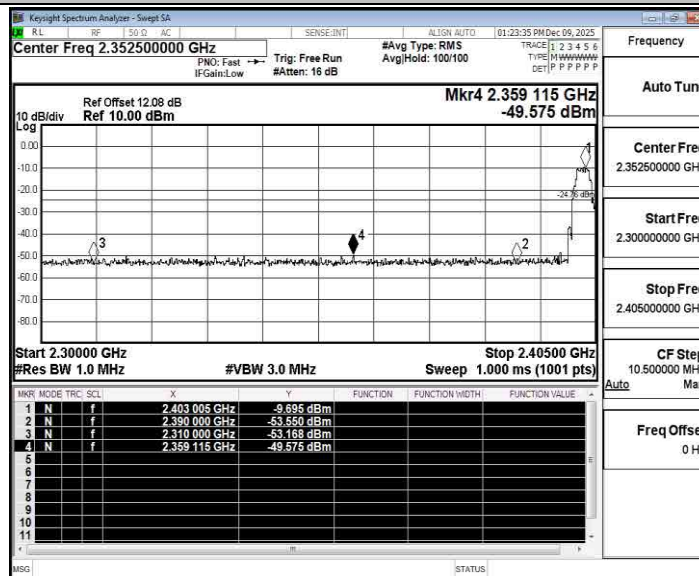
3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

