

Case No. : CTA24053000101	
Ambient Condition: 23 °C, 48 %RH	
According Standard: ■Part15C	
Test Date: 2024.6.5	Test Engineer: Evan ouyang

Appendix A.1: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]
DH1	Ant1	2402	1.041	2401.478	2402.519
		2441	1.038	2440.478	2441.516
		2480	1.038	2479.478	2480.516
2DH1	Ant1	2402	1.359	2401.307	2402.666
		2441	1.356	2440.310	2441.666
		2480	1.365	2479.304	2480.669
3DH1	Ant1	2402	1.299	2401.331	2402.630
		2441	1.299	2440.331	2441.630
		2480	1.302	2479.331	2480.633



2DH1_Ant1_2402



2DH1_Ant1_2441



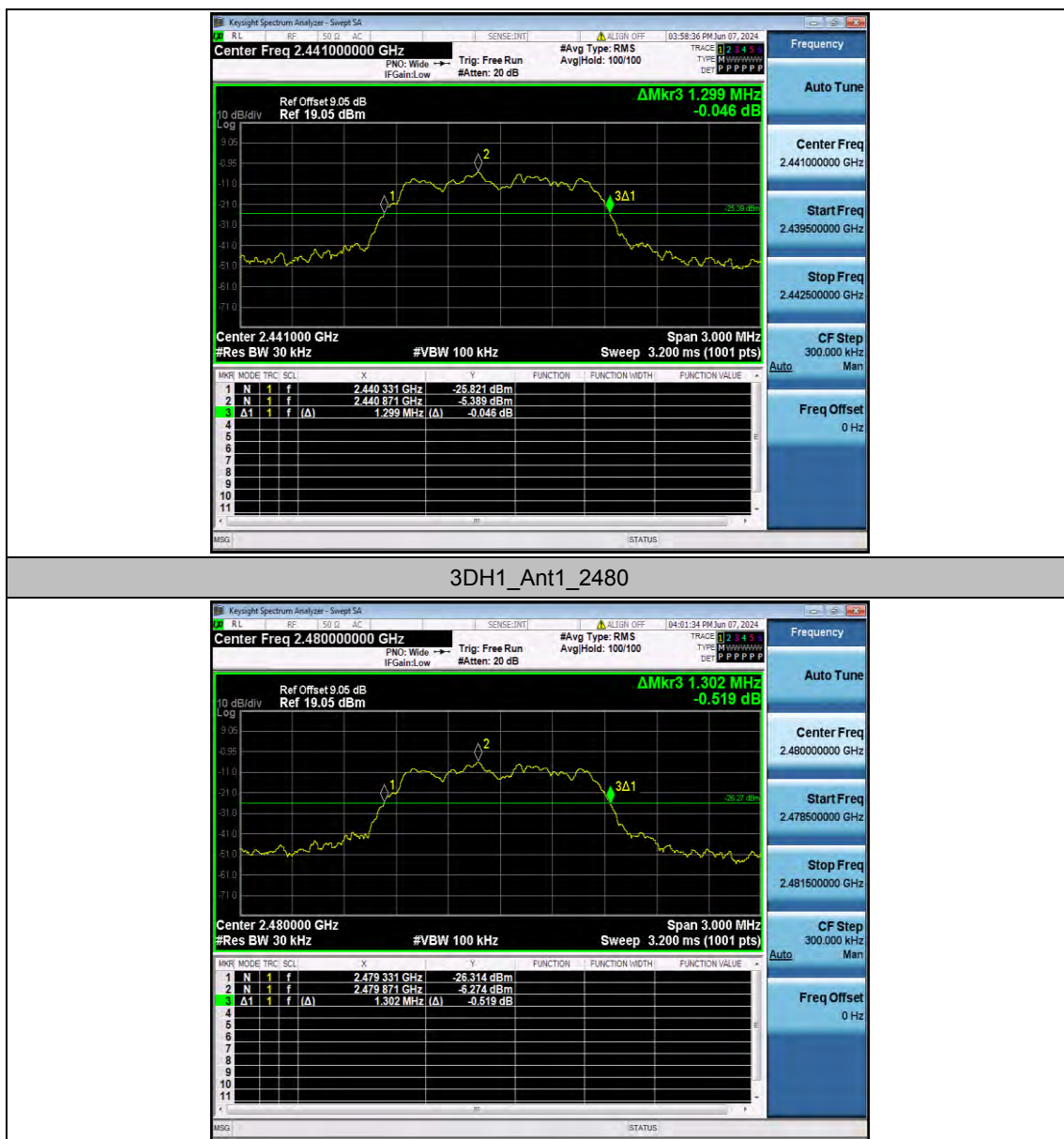
2DH1_Ant1_2480



3DH1_Ant1_2402



3DH1_Ant1_2441



Appendix A.2: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
DH1	Ant1	2402	0.93217	2401.5145	2402.4466
		2441	0.93304	2440.5143	2441.4473
		2480	0.92929	2479.5129	2480.4421
2DH1	Ant1	2402	1.1882	2401.3912	2402.5794
		2441	1.1891	2440.3895	2441.5786
		2480	1.1908	2479.3875	2480.5783
3DH1	Ant1	2402	1.1804	2401.3948	2402.5752
		2441	1.1807	2440.3940	2441.5747
		2480	1.1780	2479.3955	2480.5735

Test Graphs

DH1_Ant1_2402



DH1_Ant1_2441



DH1_Ant1_2480



2DH1_Ant1_2402



2DH1_Ant1_2441



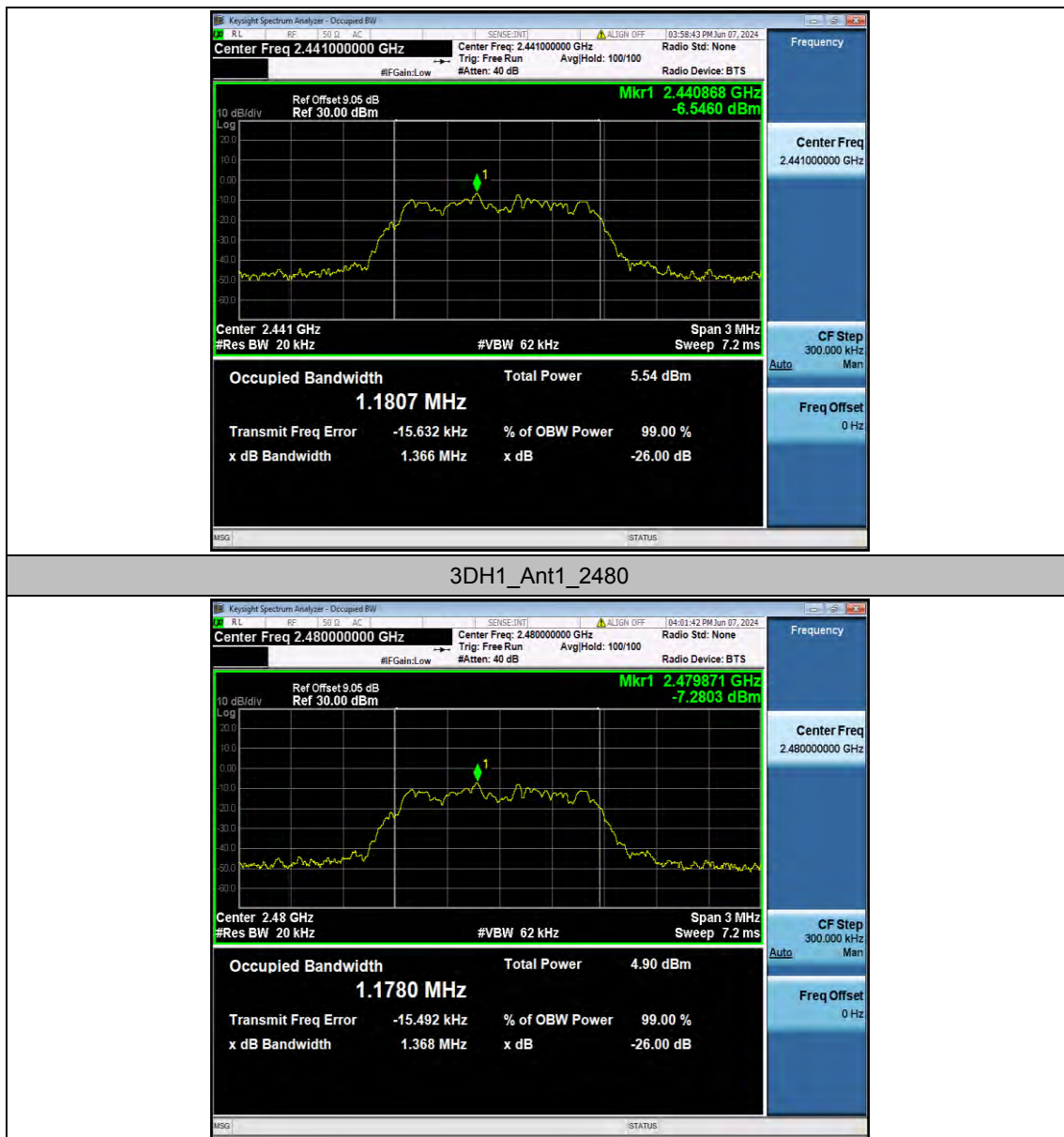
2DH1_Ant1_2480



3DH1_Ant1_2402



3DH1_Ant1_2441



Appendix A.3: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH1	Ant1	2402	1.70	≤ 20.97	PASS
		2441	2.11	≤ 20.97	PASS
		2480	1.52	≤ 20.97	PASS
2DH1	Ant1	2402	2.93	≤ 20.97	PASS
		2441	3.53	≤ 20.97	PASS
		2480	2.82	≤ 20.97	PASS
3DH1	Ant1	2402	3.13	≤ 20.97	PASS
		2441	3.77	≤ 20.97	PASS
		2480	2.92	≤ 20.97	PASS

Appendix A.4: Carrier frequency separation

Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop_2402	1.336	≥ 0.694	PASS
		Hop_2441	1.014	≥ 0.694	PASS
		Hop_2480	1.012	≥ 0.694	PASS
2DH1	Ant1	Hop_2402	0.998	≥ 0.910	PASS
		Hop_2441	1.012	≥ 0.910	PASS
		Hop_2480	1.018	≥ 0.910	PASS
3DH1	Ant1	Hop_2402	1.004	≥ 0.868	PASS
		Hop_2441	1.03	≥ 0.868	PASS
		Hop_2480	0.992	≥ 0.868	PASS

Test Graphs

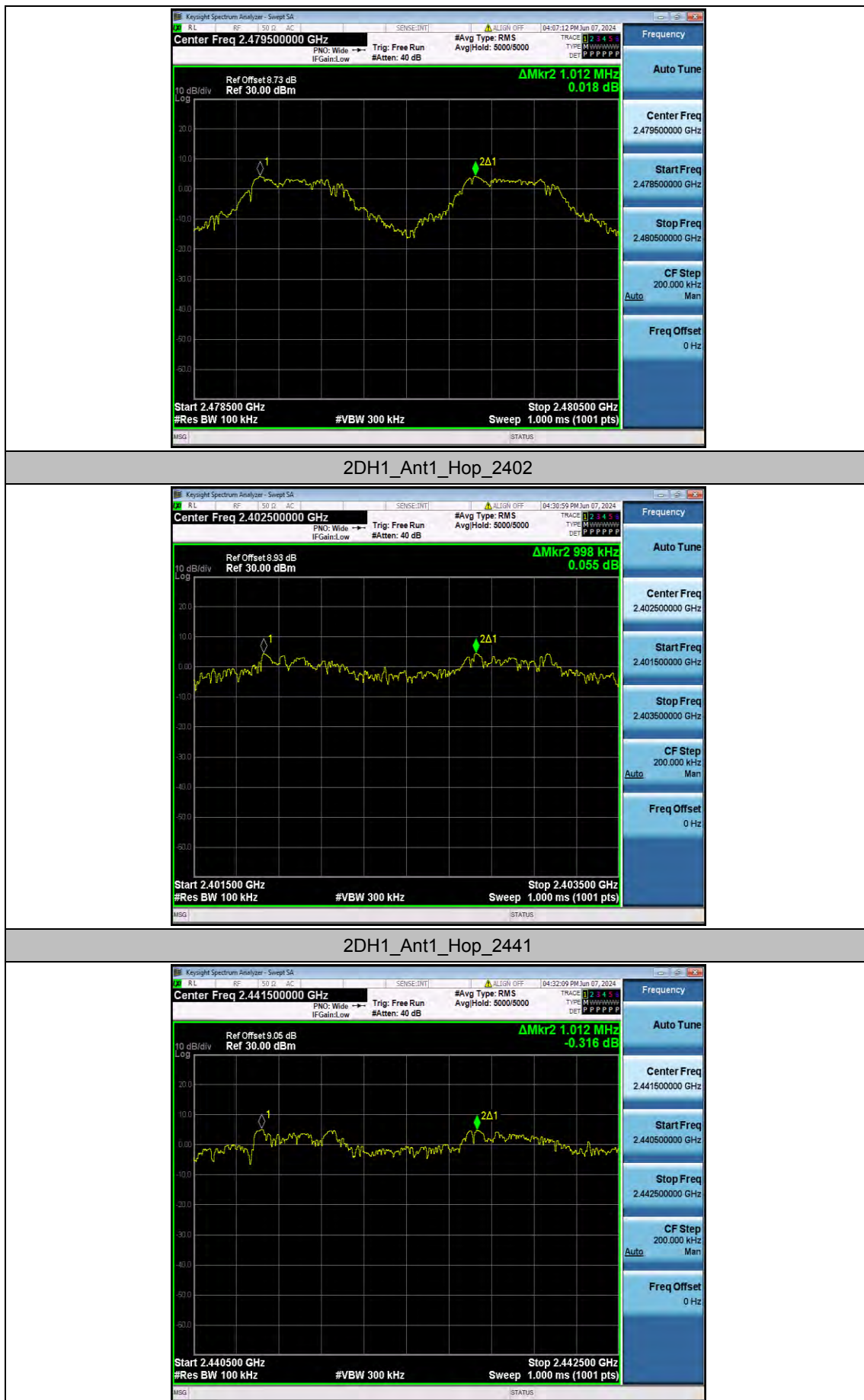
DH1_Ant1_Hop_2402



DH1_Ant1_Hop_2441



DH1_Ant1_Hop_2480



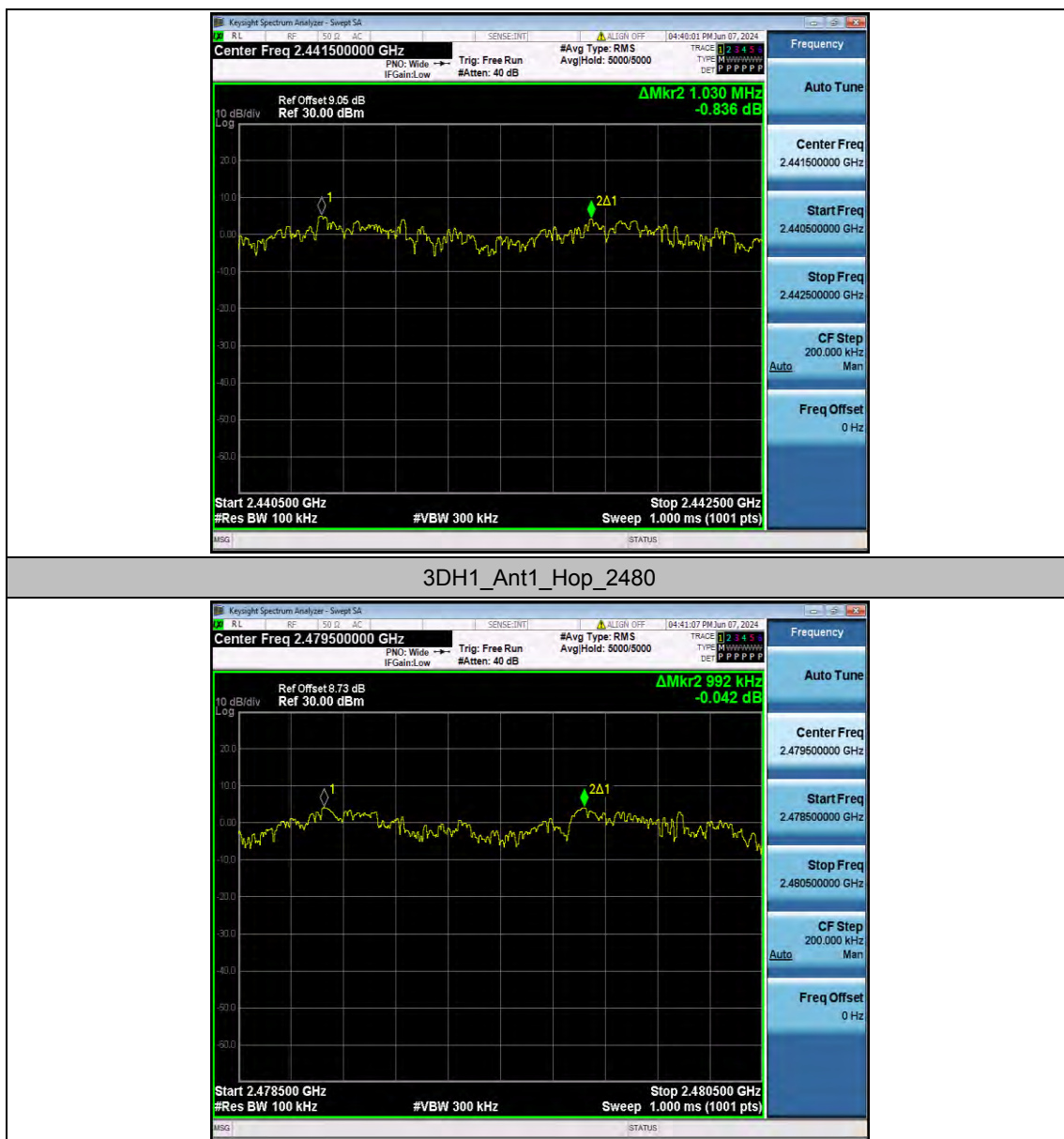
2DH1_Ant1_Hop_2480



3DH1_Ant1_Hop_2402



3DH1_Ant1_Hop_2441

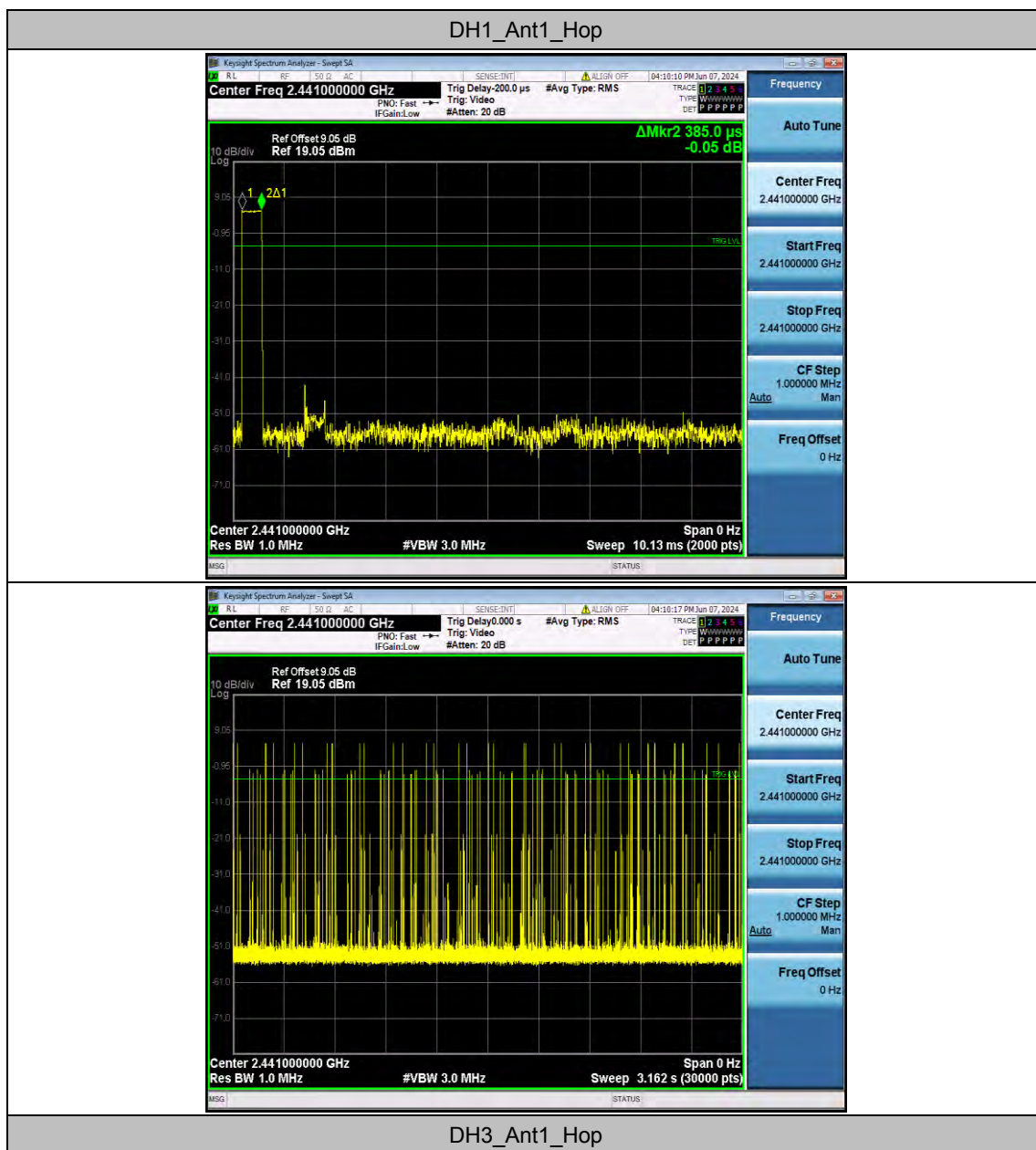


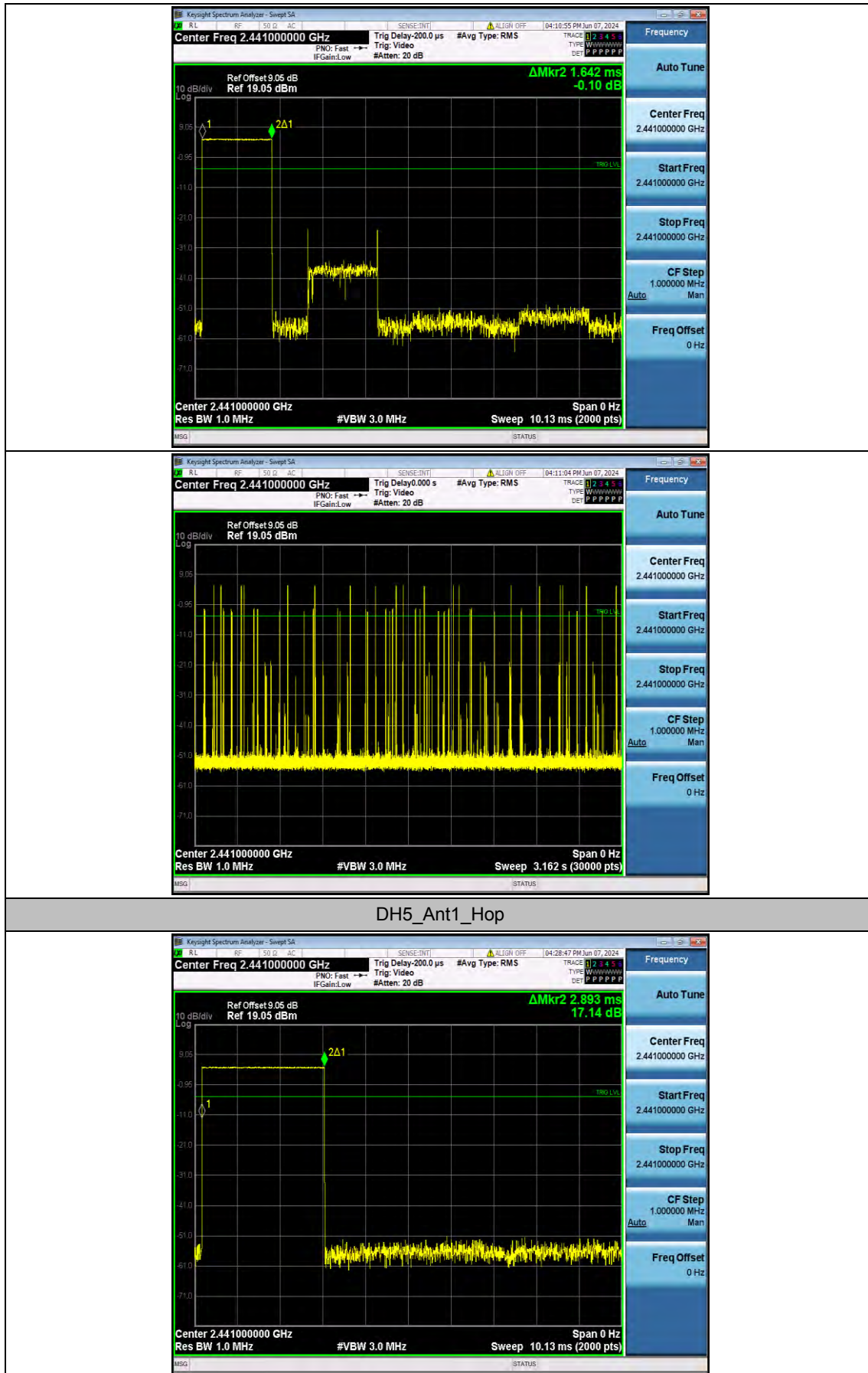
Appendix A.5: Time of occupancy

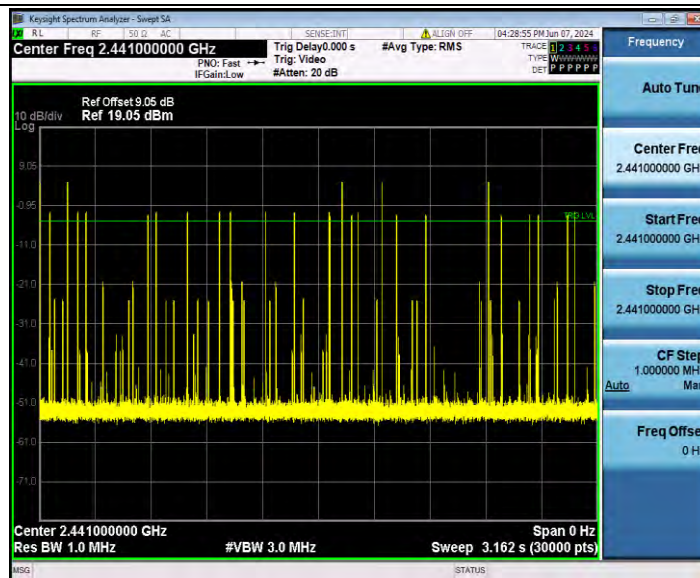
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.385	330	0.127	≤0.4	PASS
DH3	Ant1	Hop	1.642	200	0.328	≤0.4	PASS
DH5	Ant1	Hop	2.893	50	0.145	≤0.4	PASS
2DH1	Ant1	Hop	0.395	320	0.126	≤0.4	PASS
2DH3	Ant1	Hop	1.647	170	0.28	≤0.4	PASS
2DH5	Ant1	Hop	2.898	70	0.203	≤0.4	PASS
3DH1	Ant1	Hop	0.395	310	0.122	≤0.4	PASS
3DH3	Ant1	Hop	1.647	200	0.329	≤0.4	PASS
3DH5	Ant1	Hop	2.898	120	0.348	≤0.4	PASS

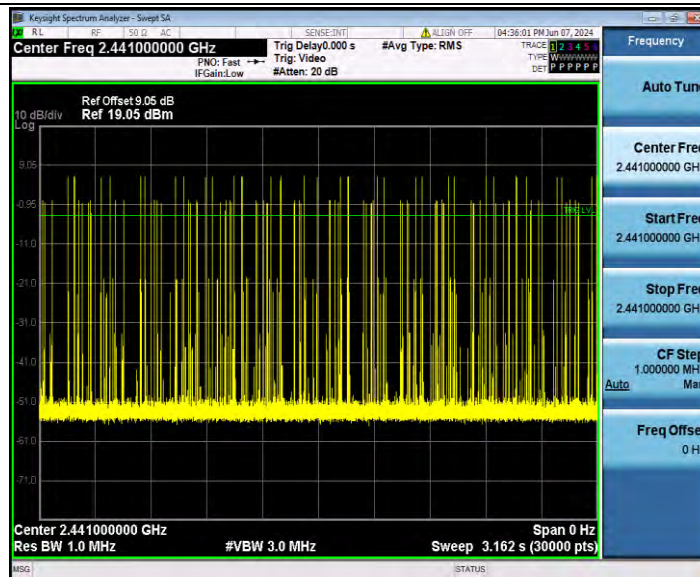
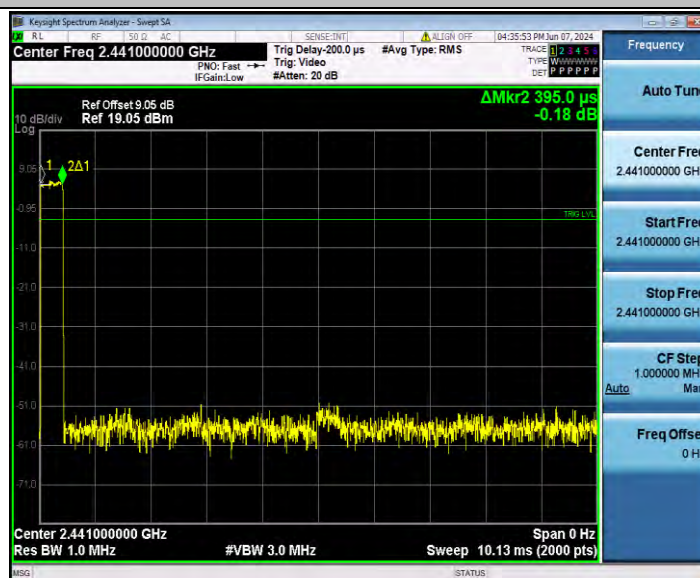
Test Graphs



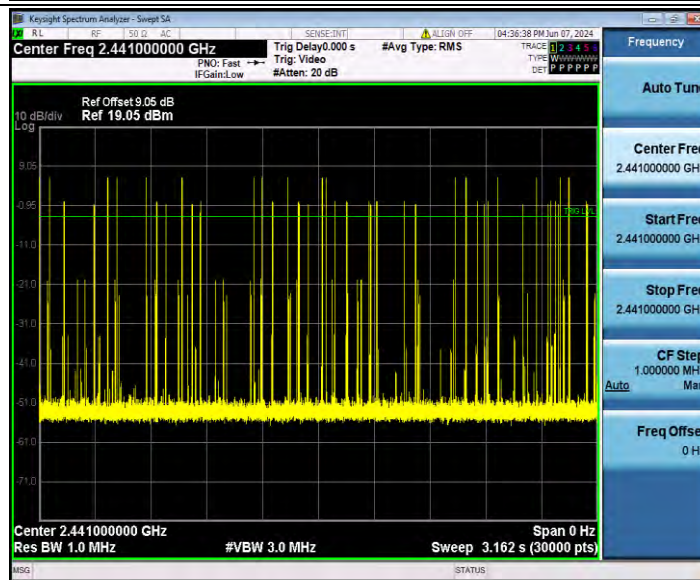




2DH1_Ant1_Hop



2DH3_Ant1_Hop



Keysight Spectrum Analyzer - Swept SA

SENSE: TWT | ALIGN: OFF | 04:50:02 PM Jun 07, 2024

Center Freq 2.441000000 GHz | Trig Delay: 200.0 μ s | #Avg Type: RMS | TRACE 1 | 2 + 1 + 5 | TYPE: WWWWWWW | DET: P P P P P P

PN0: Fast | IF Gain: Low | Trig: Video | #Atten: 20 dB

Ref Offset: 9.05 dB | Ref 19.05 dBm | Δ Mkr2 2.898 ms | 0.33 dB

10 dB/div | Log

1 | 2 Δ 1

THRU LVL

Center 2.441000000 GHz | Res BW 1.0 MHz | #VBW 3.0 MHz | Span 0 Hz | Sweep 10.13 ms (2000 pts)

Auto Tune

Center Freq 2.441000000 GHz

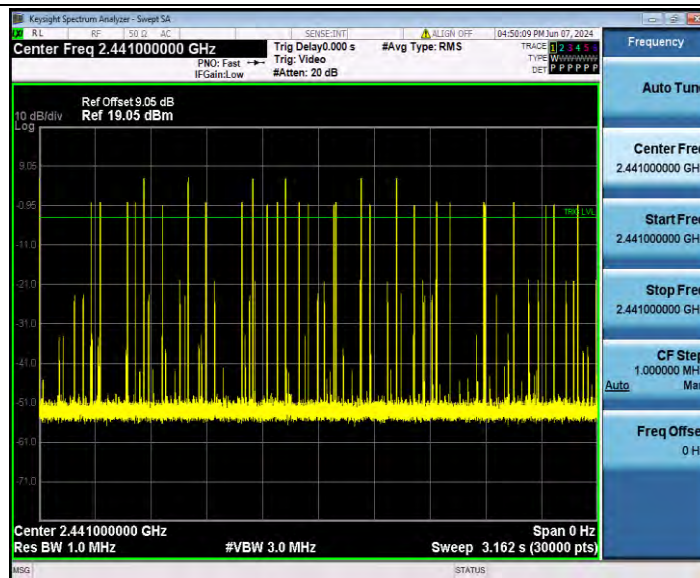
Start Freq 2.441000000 GHz

Stop Freq 2.441000000 GHz

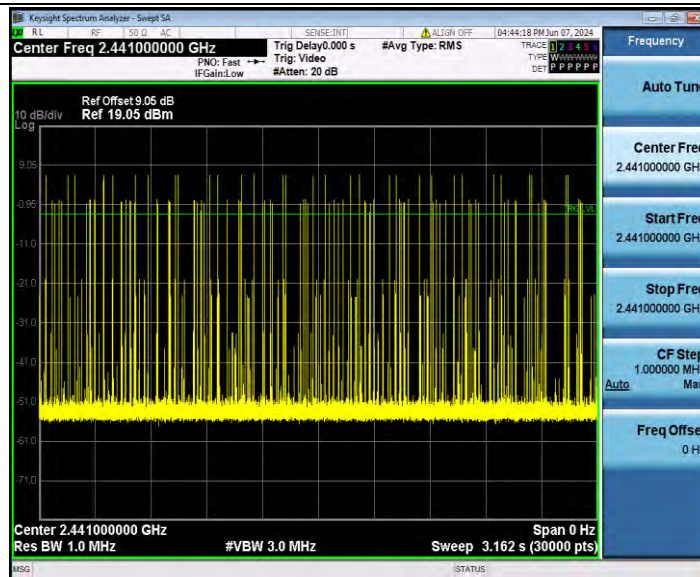
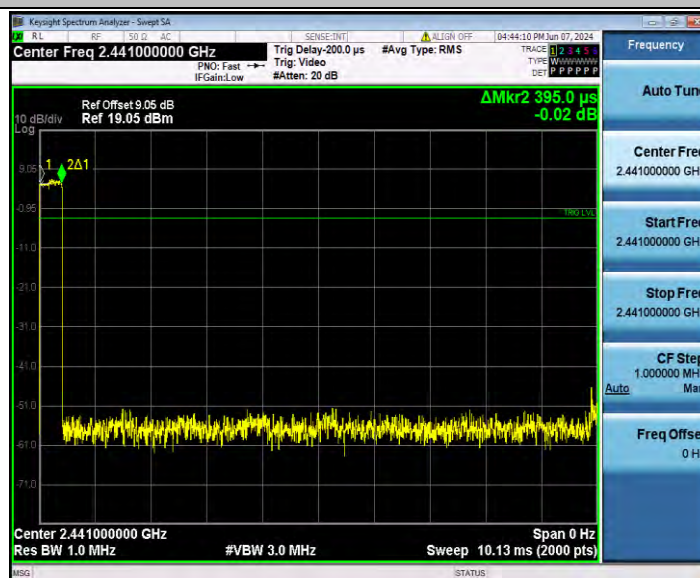
CF Step 1.000000 MHz | Auto | Man

Freq Offset 0 Hz

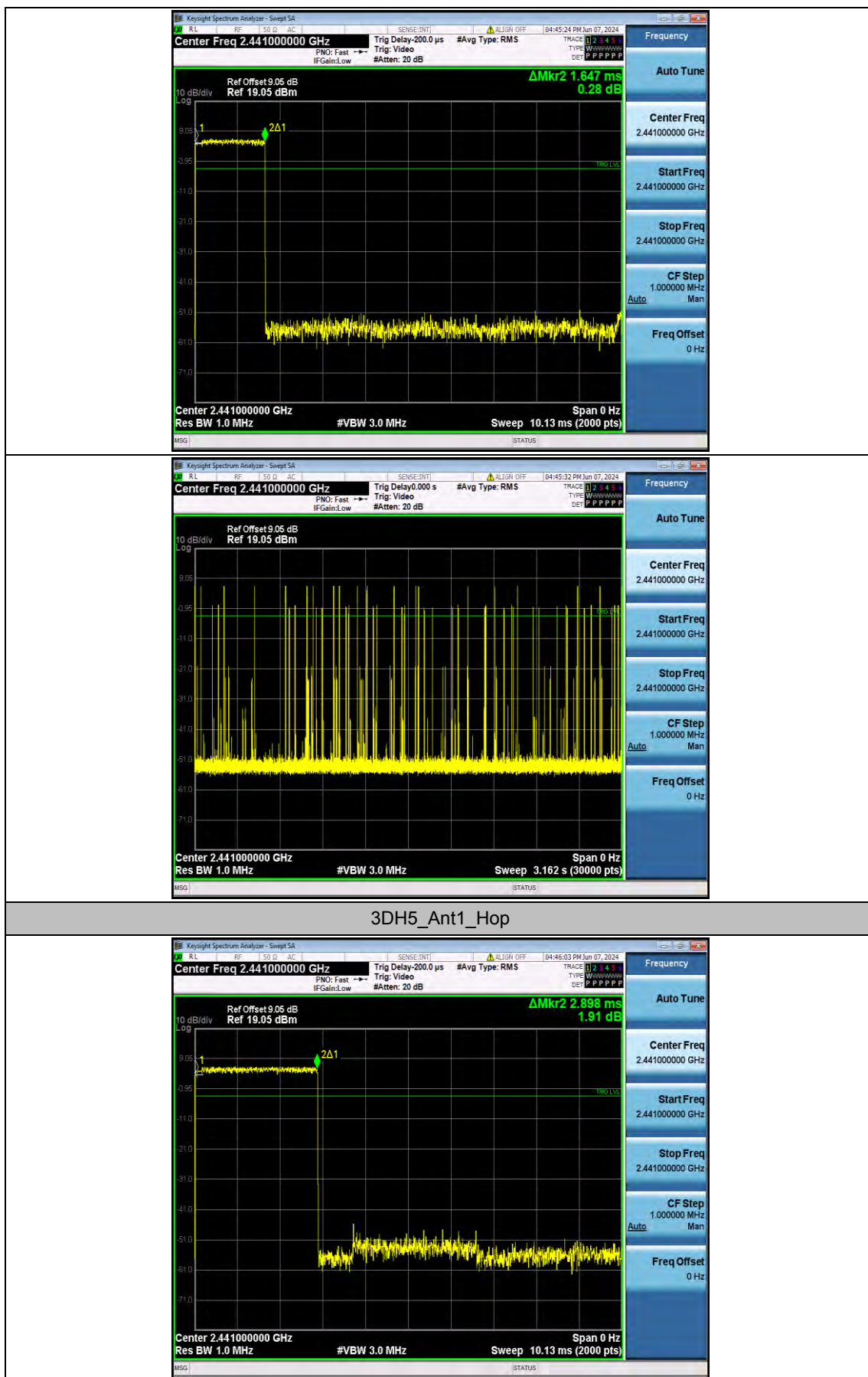
MSG | STATUS

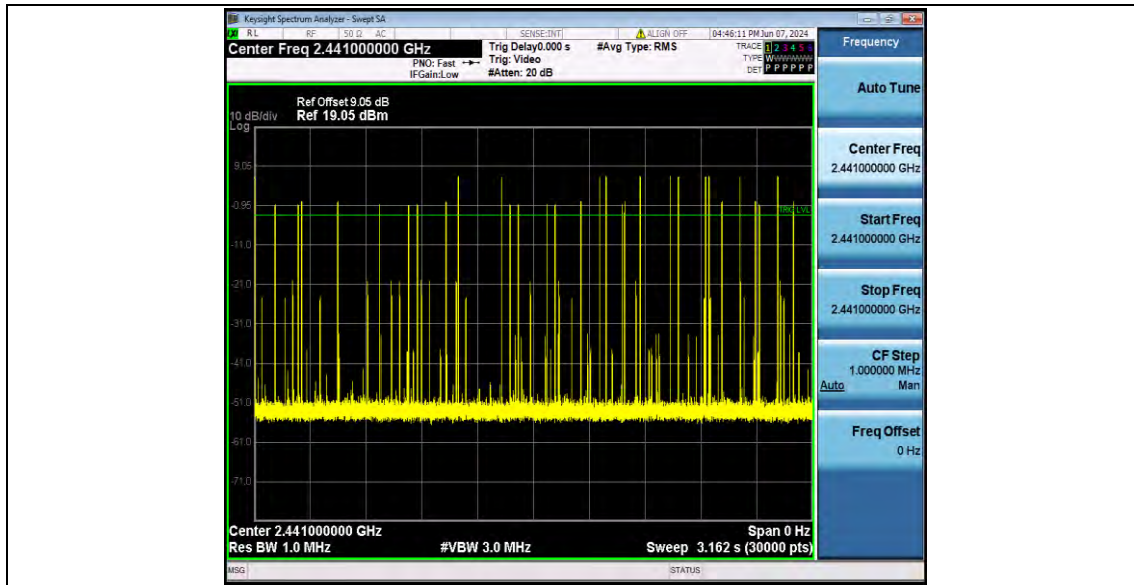


3DH1_Ant1_Hop



3DH3_Ant1_Hop



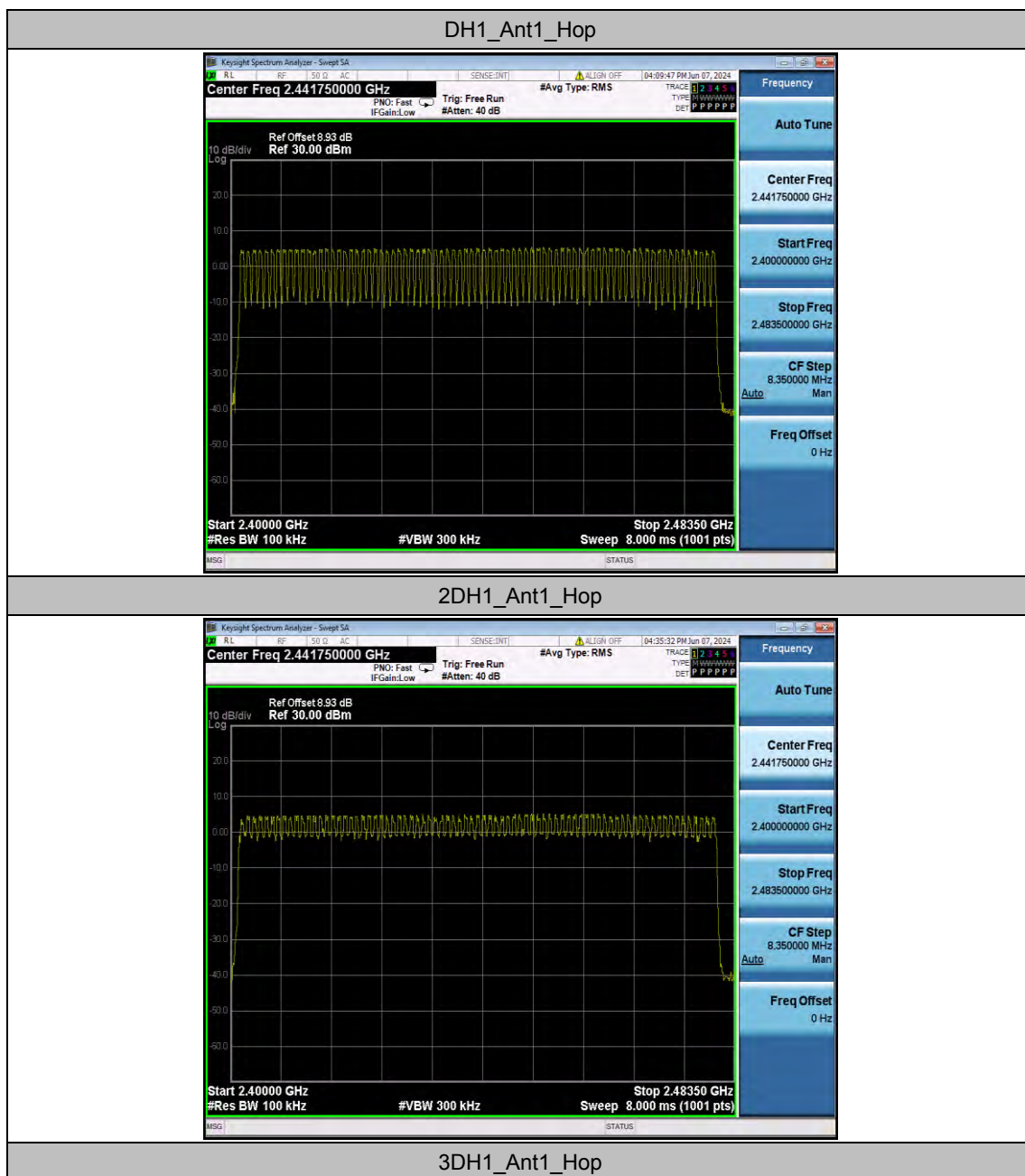


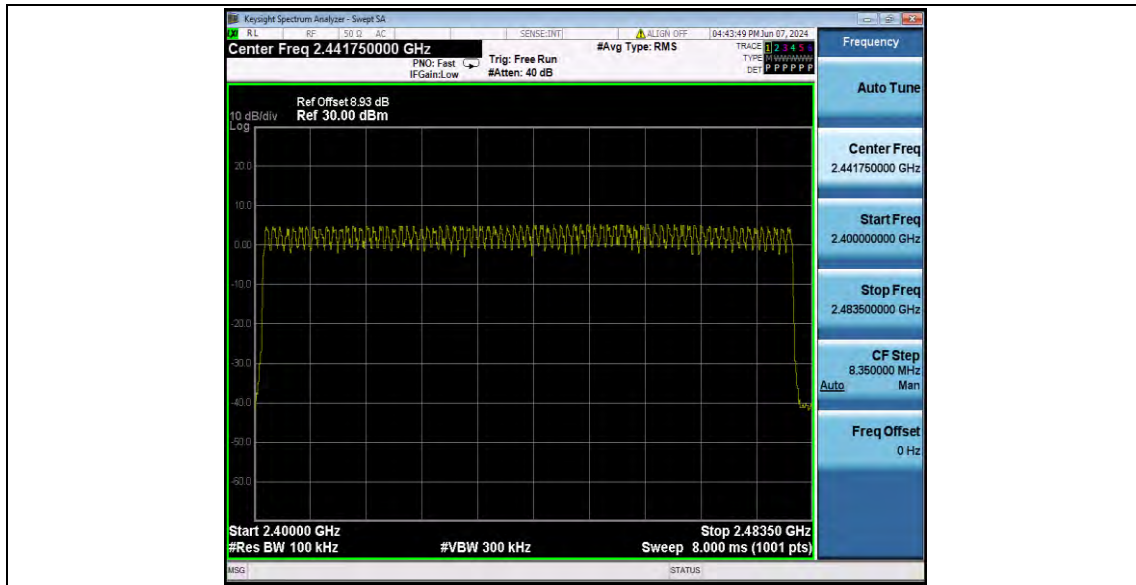
Appendix A.6: Number of hopping channels

Test Result

TestMode	Antenna	Freq(MHz)	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Hop	79	≥15	PASS
2DH1	Ant1	Hop	79	≥15	PASS
3DH1	Ant1	Hop	79	≥15	PASS

Test Graphs





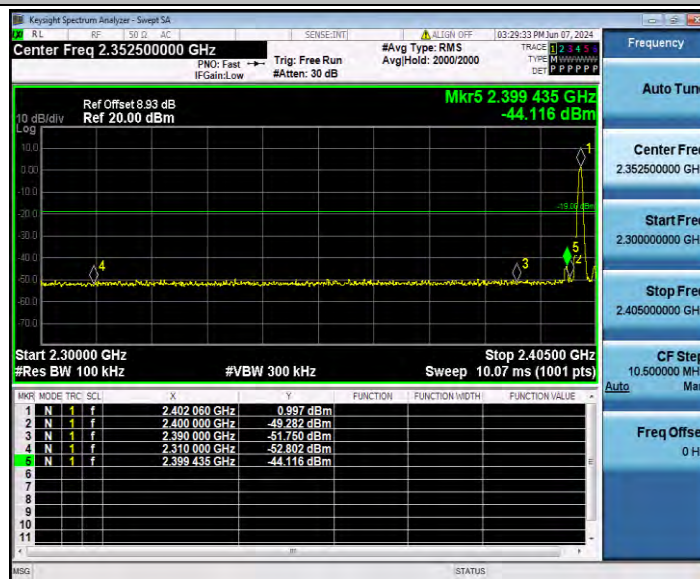
Appendix A.7: Band edge measurements

Test Result

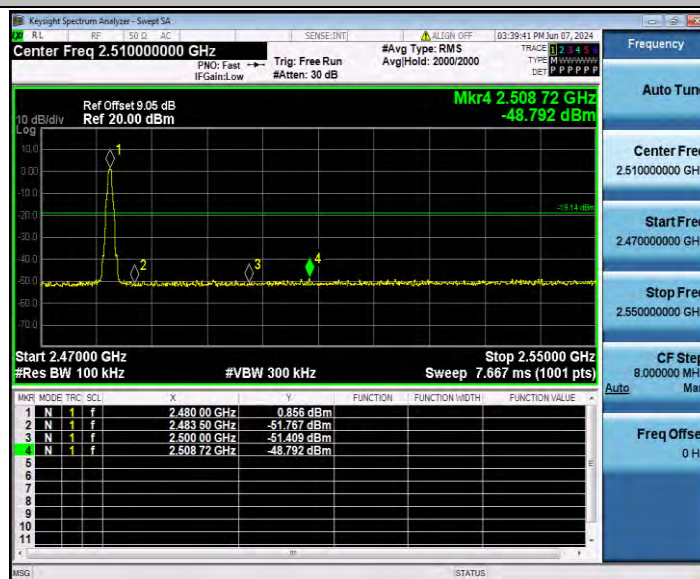
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	1.00	-44.12	≤ -19	PASS
		High	2480	0.86	-48.79	≤ -19.14	PASS
		Low	Hop_2402	4.49	-42.75	≤ -15.51	PASS
		High	Hop_2480	4.23	-48.85	≤ -15.77	PASS
2DH1	Ant1	Low	2402	-1.71	-46.64	≤ -21.71	PASS
		High	2480	-1.75	-49.06	≤ -21.75	PASS
		Low	Hop_2402	4.29	-43.29	≤ -15.71	PASS
		High	Hop_2480	3.58	-48.21	≤ -16.42	PASS
3DH1	Ant1	Low	2402	-1.72	-45.92	≤ -21.72	PASS
		High	2480	-1.67	-49.29	≤ -21.67	PASS
		Low	Hop_2402	3.97	-43.44	≤ -16.03	PASS
		High	Hop_2480	4.13	-48.67	≤ -15.87	PASS

Test Graphs

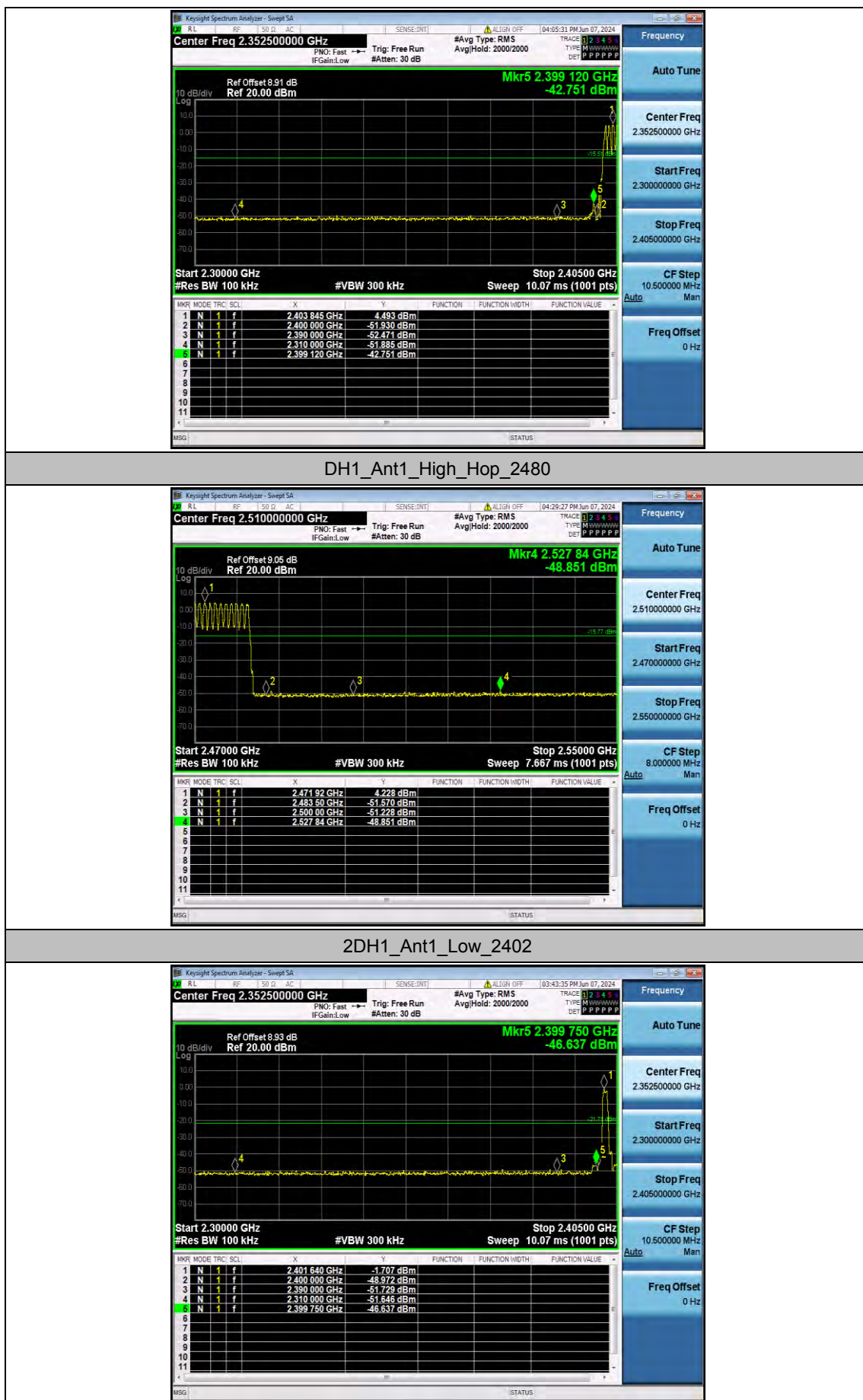
DH1_Ant1_Low_2402



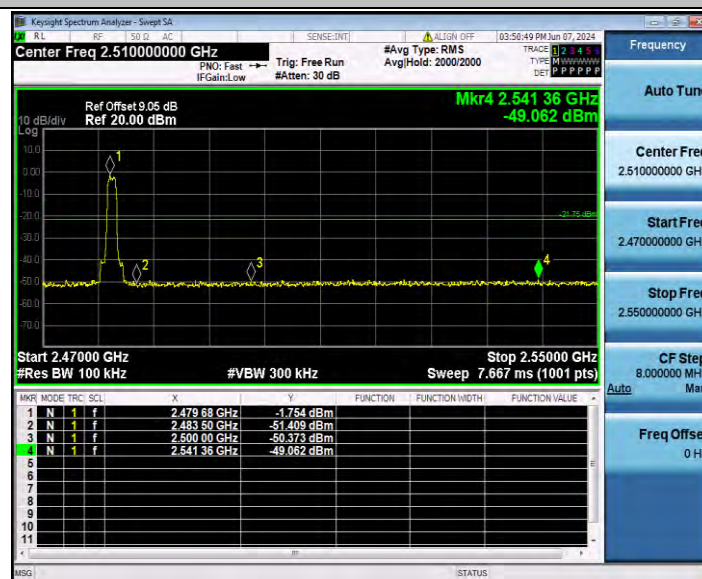
DH1_Ant1_High_2480



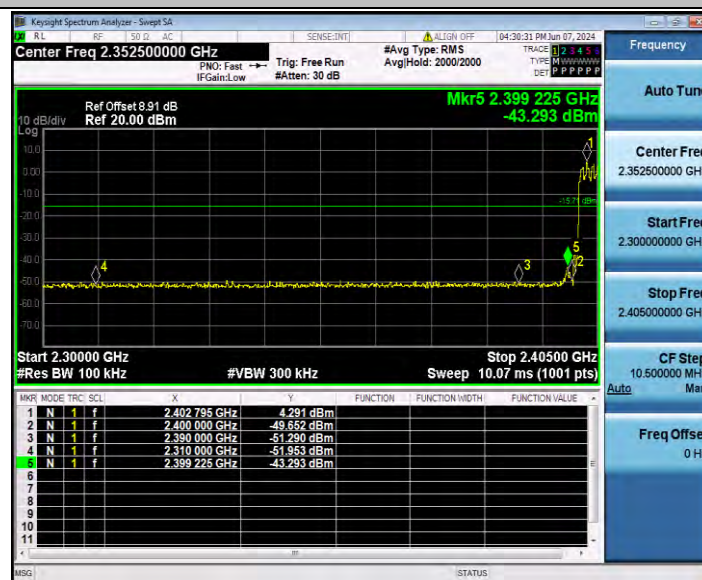
DH1_Ant1_Low_Hop_2402



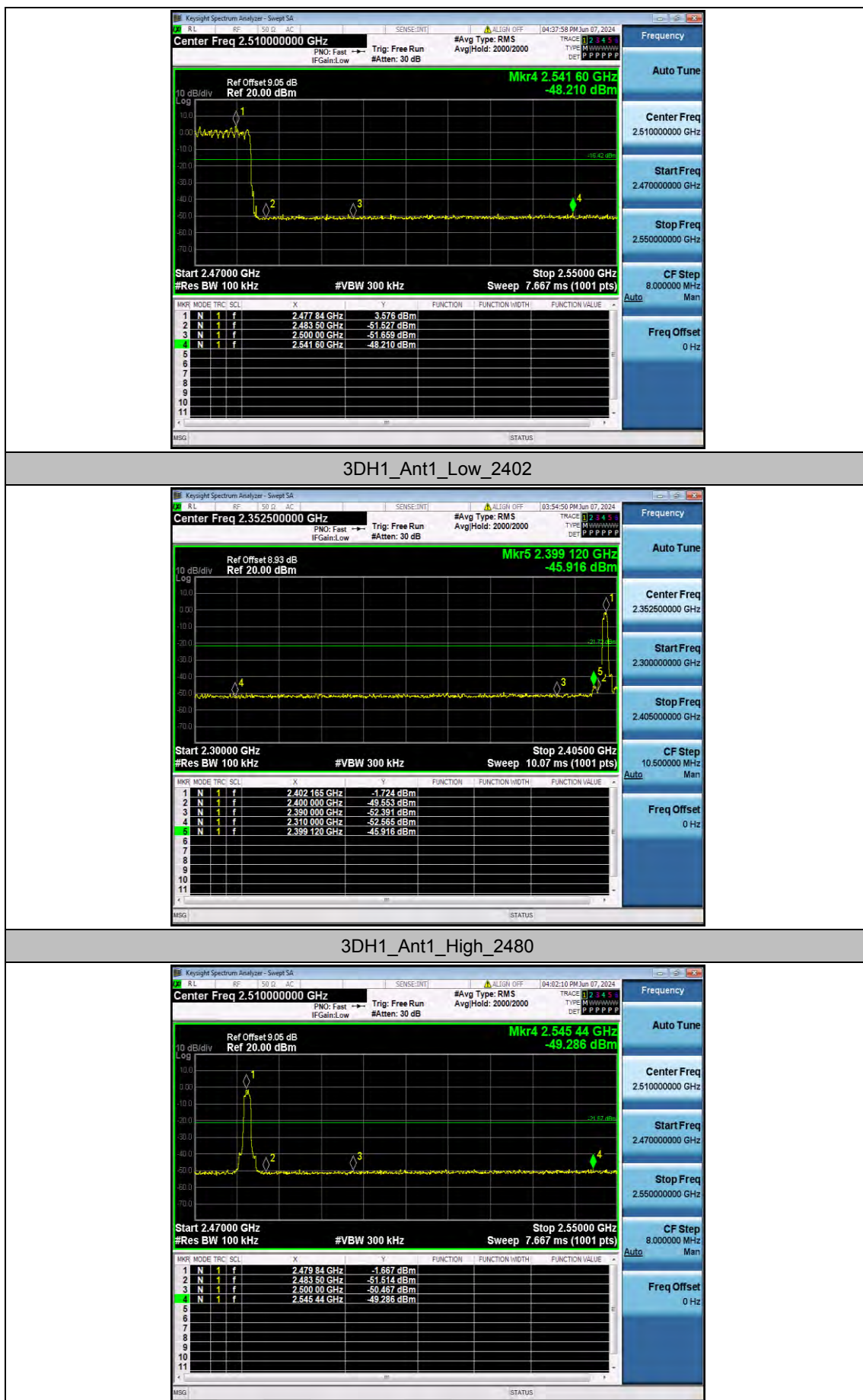
2DH1_Ant1_High_2480



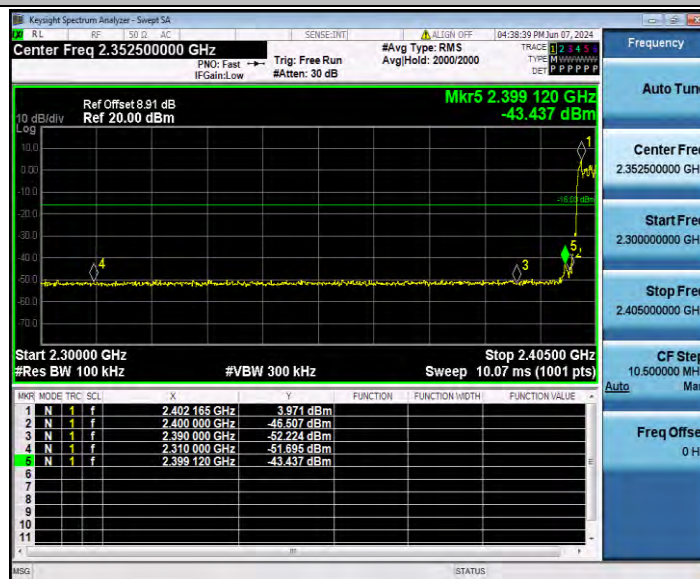
2DH1_Ant1_Low_Hop_2402



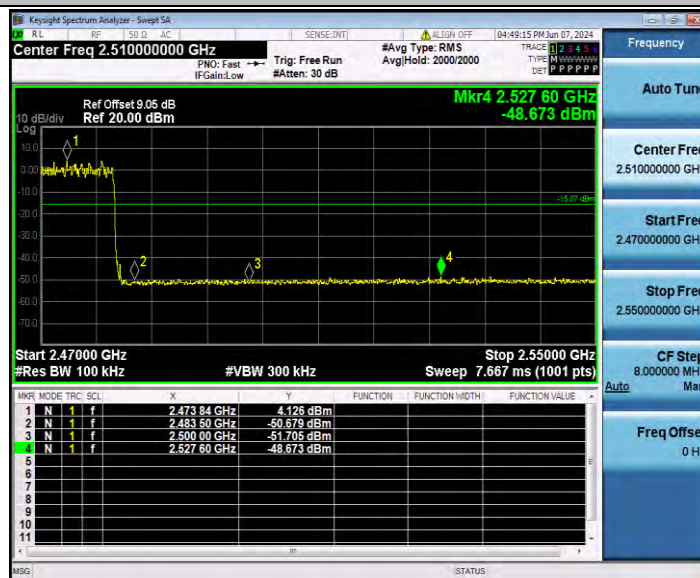
2DH1_Ant1_High_Hop_2480



3DH1_Ant1_Low_Hop_2402



3DH1_Ant1_High_Hop_2480

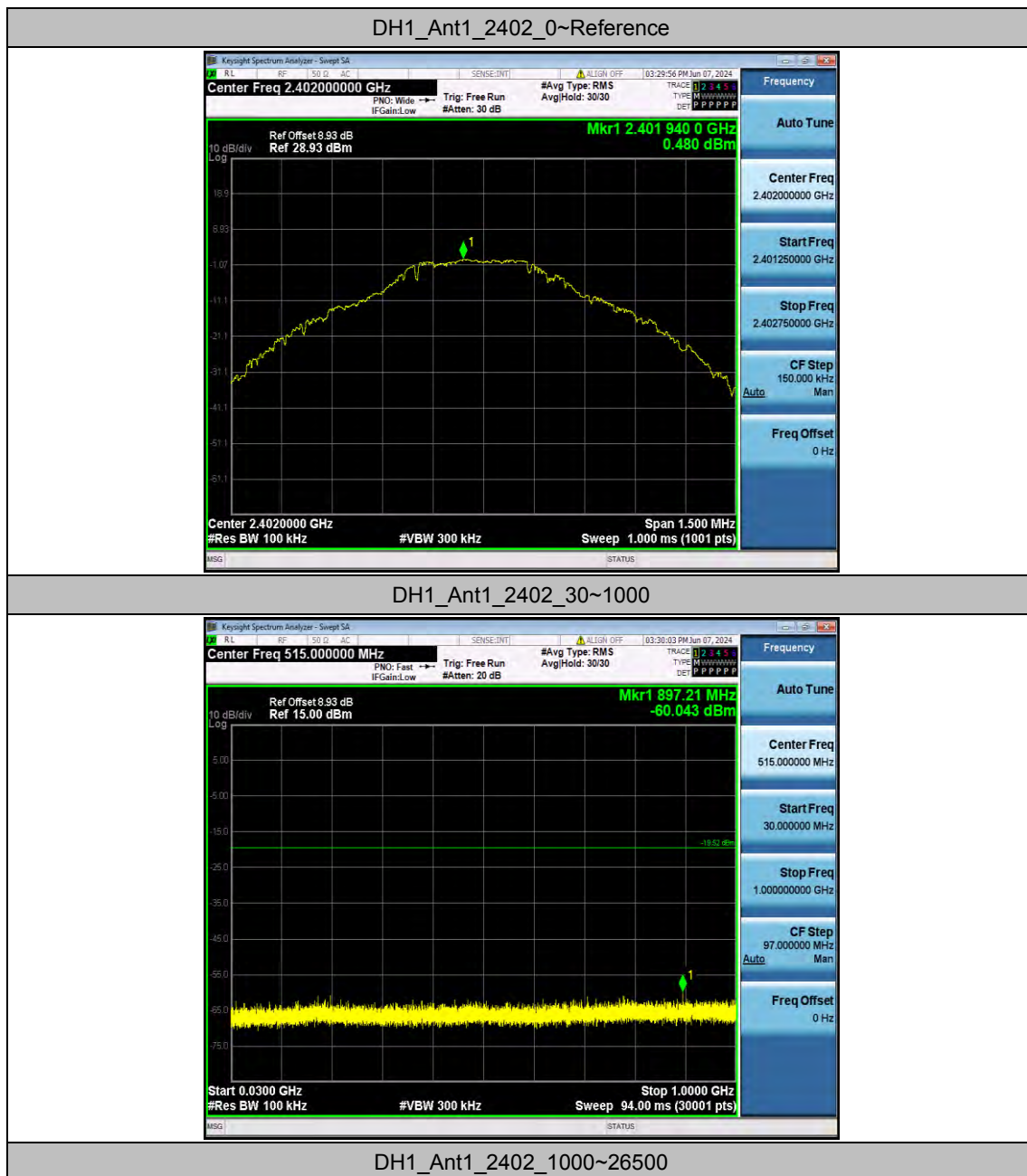


Appendix A.8: Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	2402	Reference	0.48	0.48	---	PASS
			30~1000	0.48	-60.04	≤ -19.52	PASS
			1000~26500	0.48	-47.84	≤ -19.52	PASS
		2441	Reference	1.00	1.00	---	PASS
			30~1000	1.00	-60.95	≤ -19	PASS
			1000~26500	1.00	-48.18	≤ -19	PASS
		2480	Reference	0.27	0.27	---	PASS
			30~1000	0.27	-60.77	≤ -19.73	PASS
			1000~26500	0.27	-48.13	≤ -19.73	PASS
2DH1	Ant1	2402	Reference	-2.03	-2.03	---	PASS
			30~1000	-2.03	-60.67	≤ -22.03	PASS
			1000~26500	-2.03	-48.09	≤ -22.03	PASS
		2441	Reference	-1.45	-1.45	---	PASS
			30~1000	-1.45	-60.06	≤ -21.45	PASS
			1000~26500	-1.45	-45.01	≤ -21.45	PASS
		2480	Reference	-1.97	-1.97	---	PASS
			30~1000	-1.97	-61.05	≤ -21.97	PASS
			1000~26500	-1.97	-46.97	≤ -21.97	PASS
3DH1	Ant1	2402	Reference	-2.21	-2.21	---	PASS
			30~1000	-2.21	-60.66	≤ -22.21	PASS
			1000~26500	-2.21	-47.5	≤ -22.21	PASS
		2441	Reference	-1.60	-1.60	---	PASS
			30~1000	-1.60	-60.77	≤ -21.6	PASS
			1000~26500	-1.60	-48.05	≤ -21.6	PASS
		2480	Reference	-2.23	-2.23	---	PASS
			30~1000	-2.23	-60.45	≤ -22.23	PASS
			1000~26500	-2.23	-47.85	≤ -22.23	PASS

Test Graphs

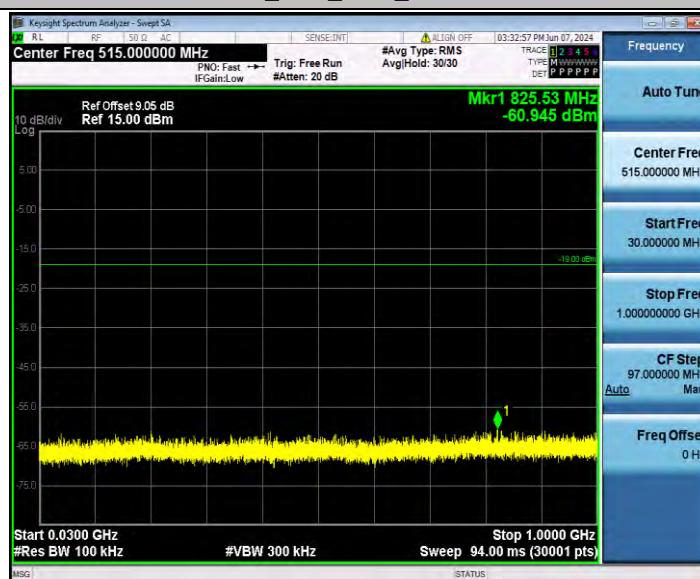




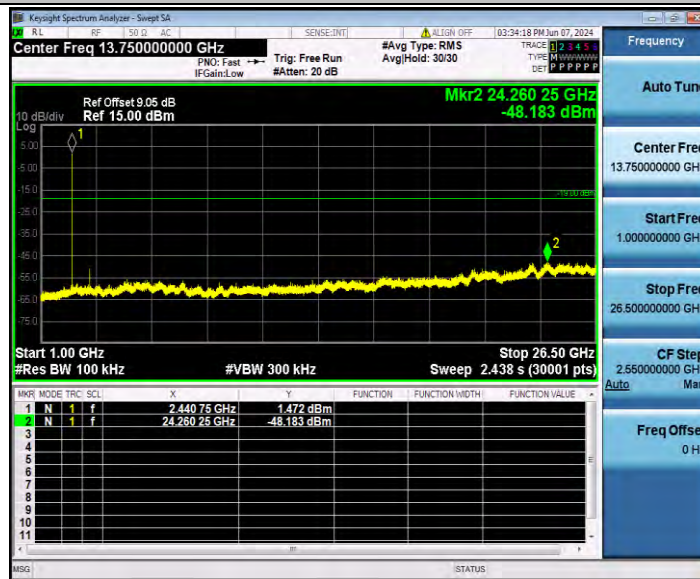
DH1_Ant1_2441_0~Reference



DH1_Ant1_2441_30~1000



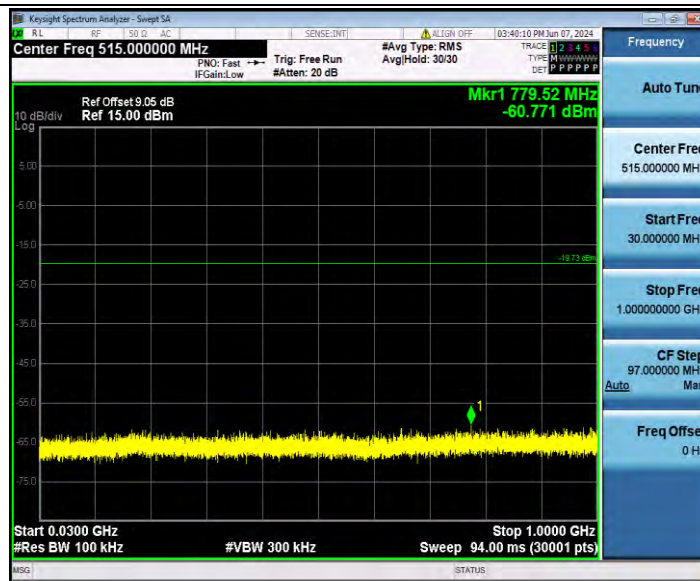
DH1_Ant1_2441_1000~26500



DH1_Ant1_2480_0~Reference



DH1_Ant1_2480_30~1000



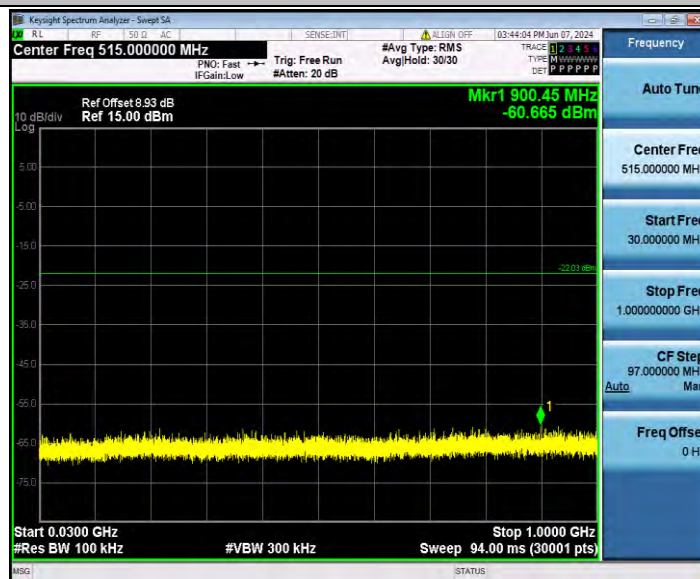
DH1_Ant1_2480_1000~26500



2DH1_Ant1_2402_0~Reference



2DH1_Ant1_2402_30~1000



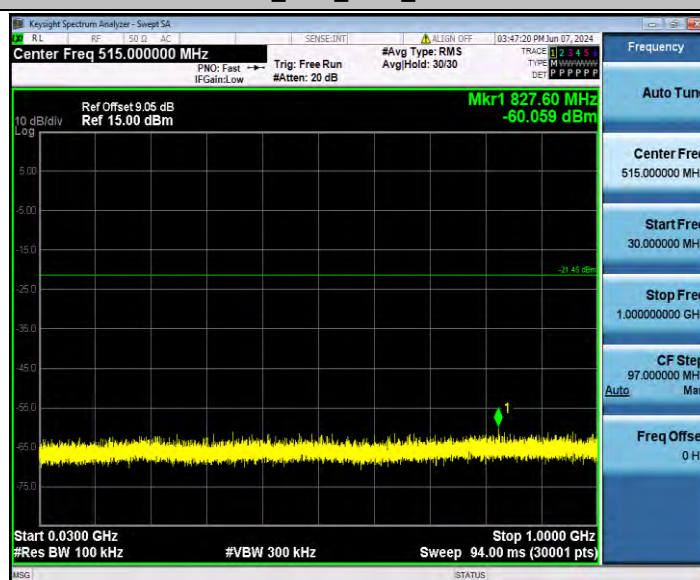
2DH1_Ant1_2402_1000~26500



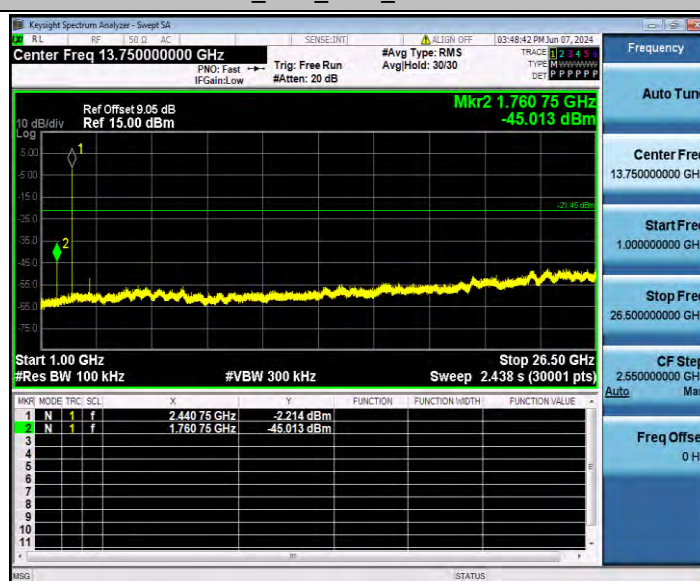
2DH1_Ant1_2441_0~Reference



2DH1_Ant1_2441_30~1000



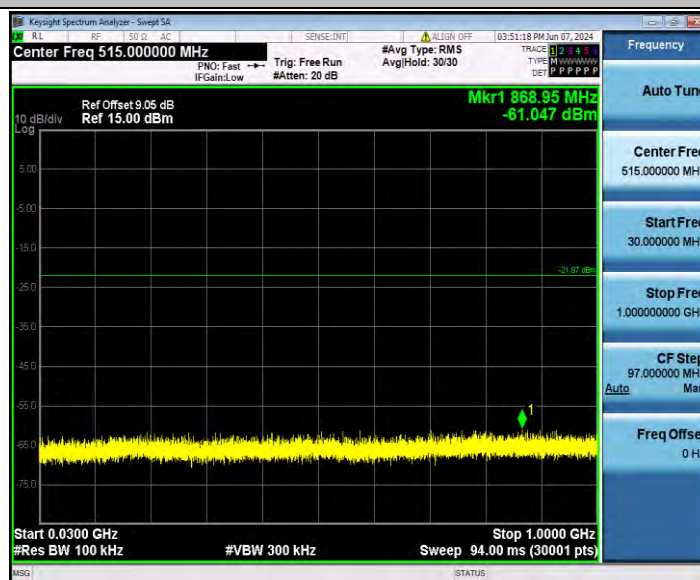
2DH1_Ant1_2441_1000~26500



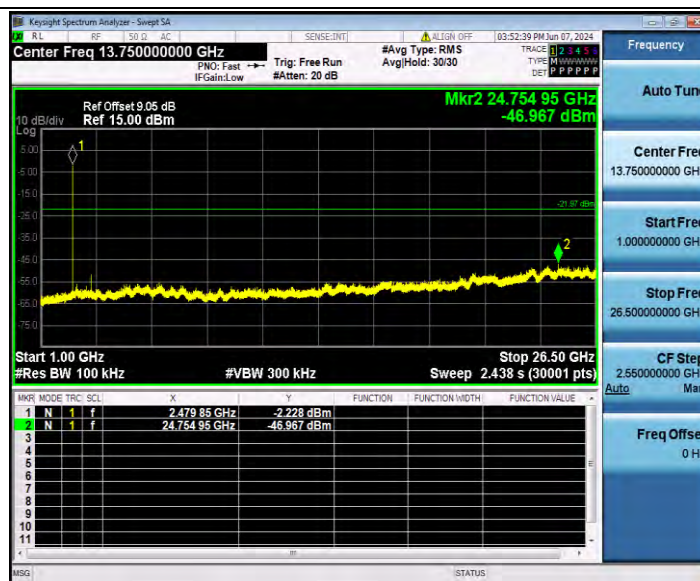
2DH1_Ant1_2480_0~Reference



2DH1_Ant1_2480_30~1000



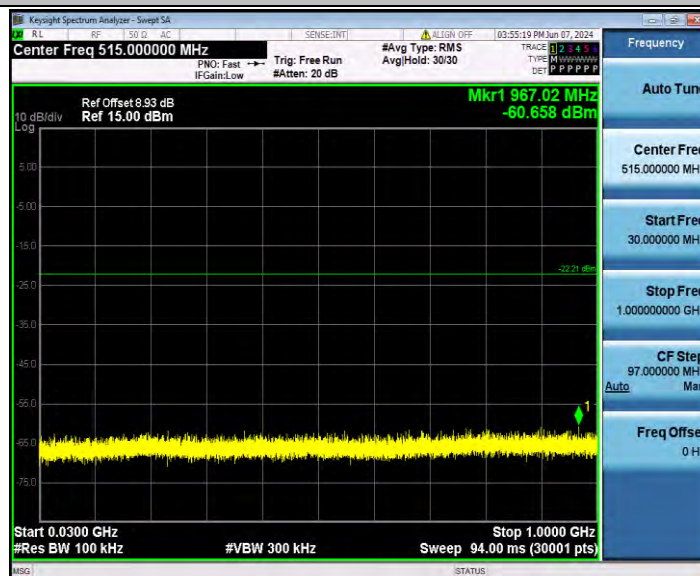
2DH1_Ant1_2480_1000~26500



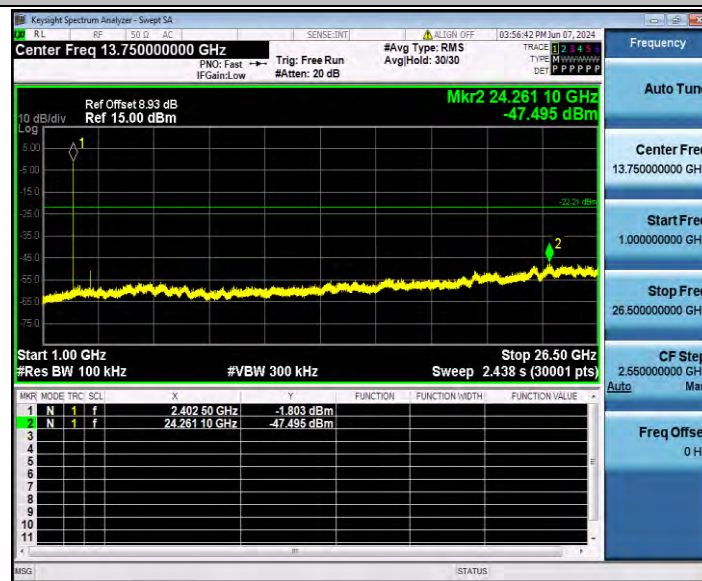
3DH1_Ant1_2402_0~Reference



3DH1_Ant1_2402_30~1000



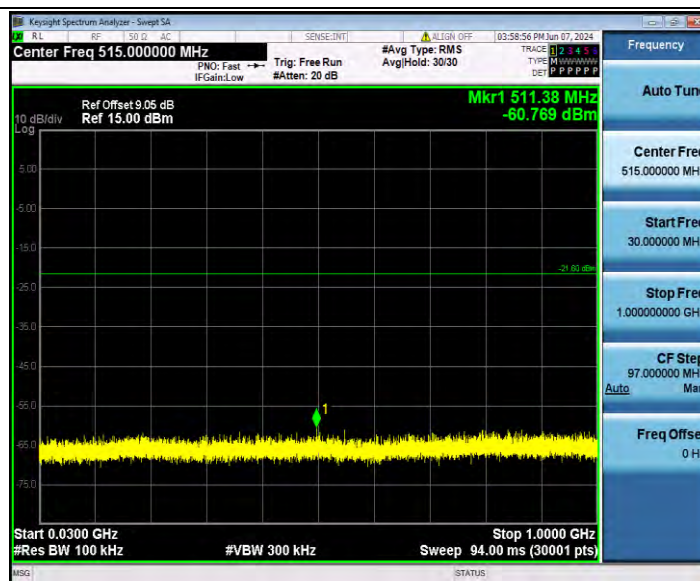
3DH1_Ant1_2402_1000~26500



3DH1_Ant1_2441_0~Reference



3DH1_Ant1_2441_30~1000

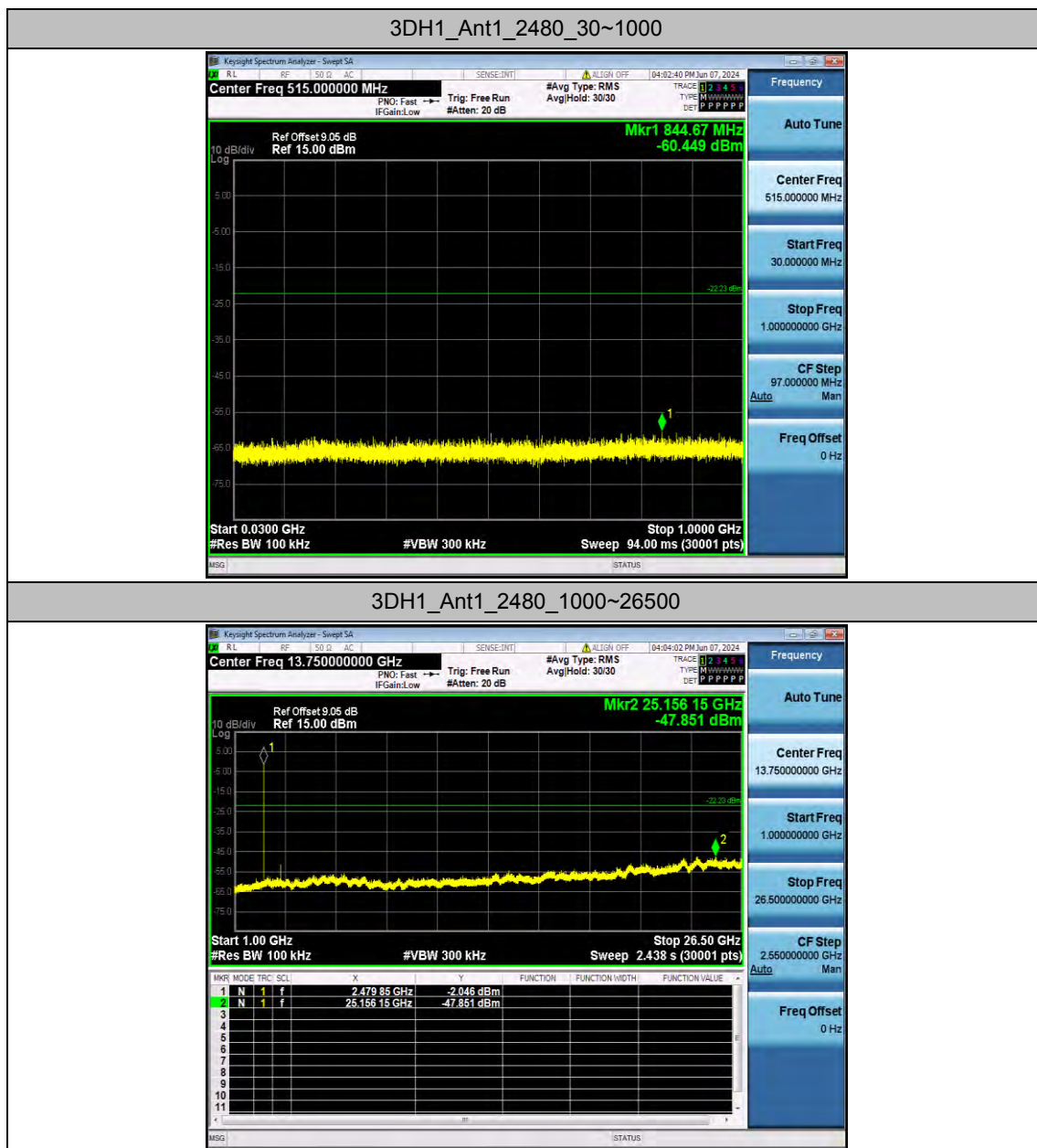


3DH1_Ant1_2441_1000~26500



3DH1_Ant1_2480_0~Reference





Appendix A.9: Emissions in Restricted Bands

Test Result

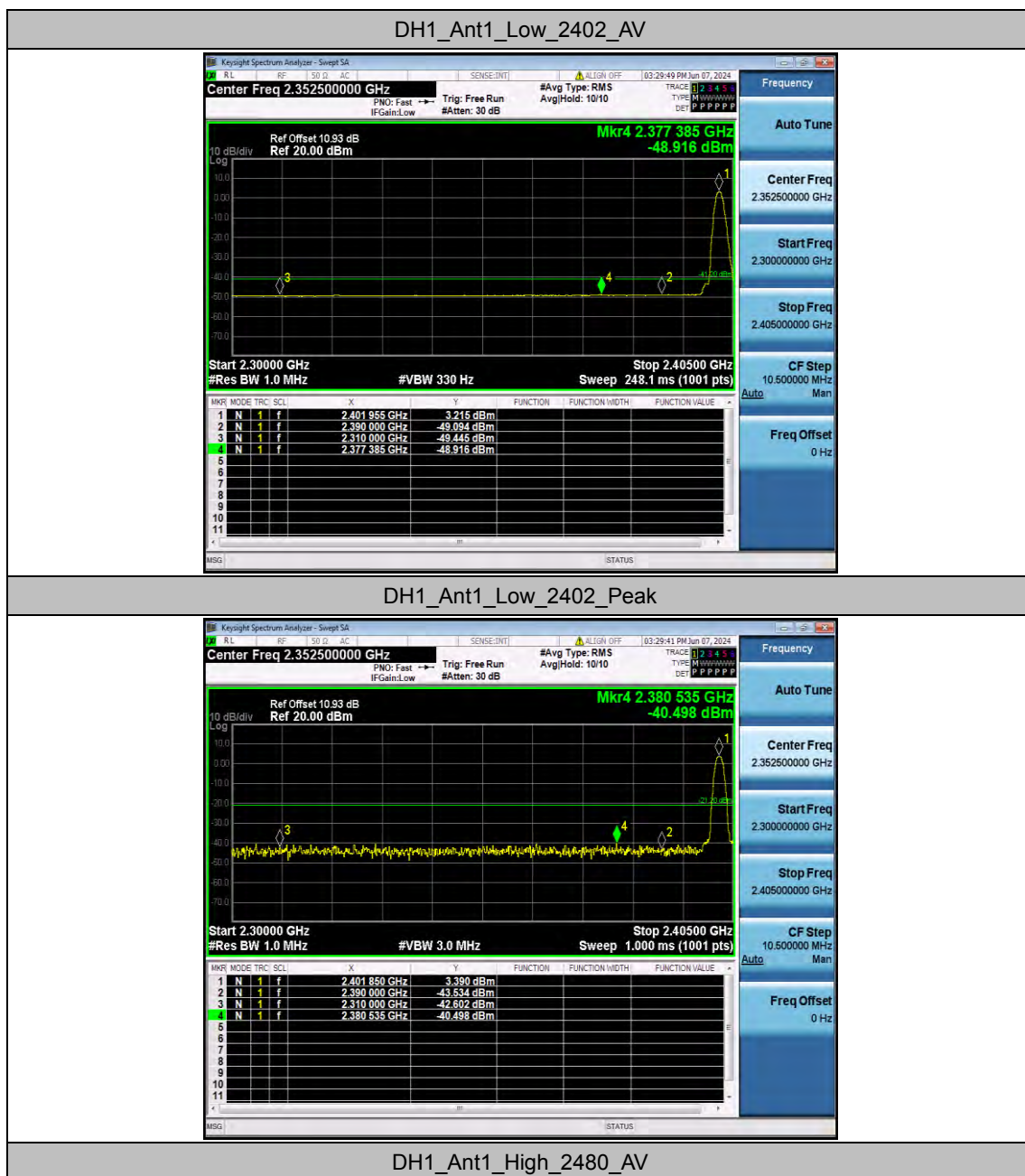
TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH1	Ant1	Low	2402	AV	2310.000	-49.45	≤-41.20	45.75	≤54	PASS
				AV	2377.385	-48.92	≤-41.20	46.28	≤54	PASS
				AV	2390.000	-49.09	≤-41.20	46.11	≤54	PASS
				Peak	2310.000	-42.6	≤-21.20	52.60	≤74	PASS
				Peak	2380.535	-40.5	≤-21.20	54.70	≤74	PASS
				Peak	2390.000	-43.53	≤-21.20	51.67	≤74	PASS
		High	2480	AV	2483.500	-48.26	≤-41.20	46.94	≤54	PASS
				AV	2483.520	-48.26	≤-41.20	46.94	≤54	PASS
				AV	2500.000	-48.79	≤-41.20	46.41	≤54	PASS
				Peak	2483.500	-45.7	≤-21.20	49.50	≤74	PASS
				Peak	2497.600	-40.07	≤-21.20	55.13	≤74	PASS
				Peak	2500.000	-45.29	≤-21.20	49.91	≤74	PASS
2DH1	Ant1	Low	2402	AV	2310.000	-49.43	≤-41.20	45.77	≤54	PASS
				AV	2376.965	-48.87	≤-41.20	46.33	≤54	PASS
				AV	2390.000	-49.08	≤-41.20	46.12	≤54	PASS
				Peak	2310.000	-43.66	≤-21.20	51.54	≤74	PASS
				Peak	2361.005	-39.01	≤-21.20	56.19	≤74	PASS
				Peak	2390.000	-43.11	≤-21.20	52.09	≤74	PASS
		High	2480	AV	2483.500	-47.88	≤-41.20	47.32	≤54	PASS
				AV	2483.520	-47.88	≤-41.20	47.32	≤54	PASS
				AV	2500.000	-48.71	≤-41.20	46.49	≤54	PASS
				Peak	2483.500	-41.59	≤-21.20	53.61	≤74	PASS
				Peak	2487.120	-39.7	≤-21.20	55.50	≤74	PASS
				Peak	2500.000	-43.86	≤-21.20	51.34	≤74	PASS
3DH1	Ant1	Low	2402	AV	2310.000	-49.29	≤-41.20	45.91	≤54	PASS
				AV	2385.995	-48.9	≤-41.20	46.30	≤54	PASS
				AV	2390.000	-49	≤-41.20	46.20	≤54	PASS
				Peak	2310.000	-44.8	≤-21.20	50.40	≤74	PASS
				Peak	2314.910	-38.91	≤-21.20	56.29	≤74	PASS
				Peak	2390.000	-46.85	≤-21.20	48.35	≤74	PASS
		High	2480	AV	2483.500	-47.81	≤-41.20	47.39	≤54	PASS
				AV	2483.520	-47.81	≤-41.20	47.39	≤54	PASS
				AV	2500.000	-48.79	≤-41.20	46.41	≤54	PASS
				Peak	2483.500	-42.02	≤-21.20	53.18	≤74	PASS
				Peak	2498.720	-39.07	≤-21.20	56.13	≤74	PASS

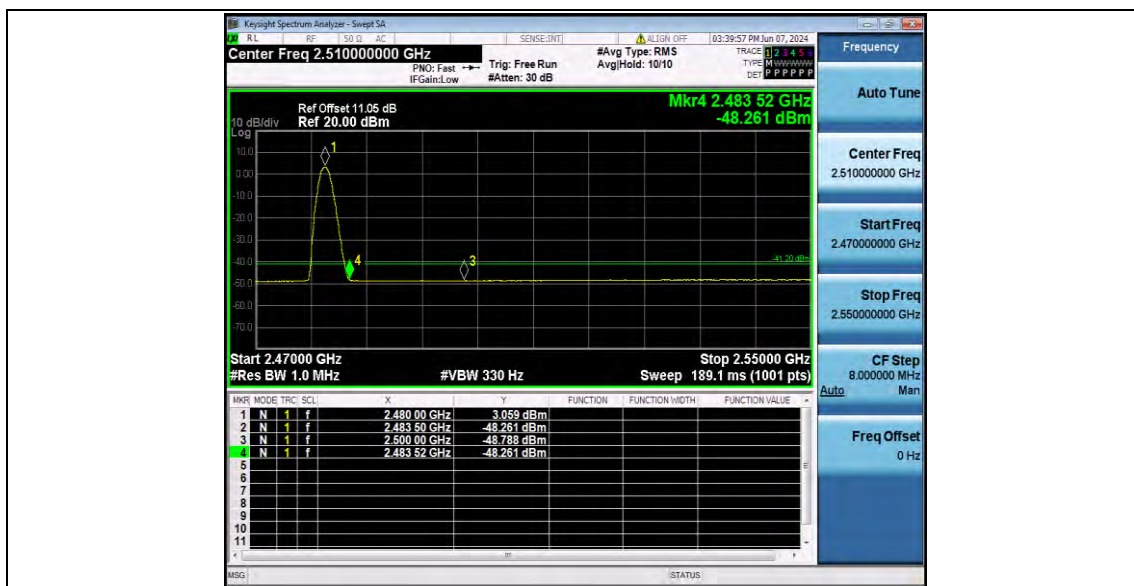
				Peak	2500.000	-44.49	≤-21.20	50.71	≤74	PASS
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Note:

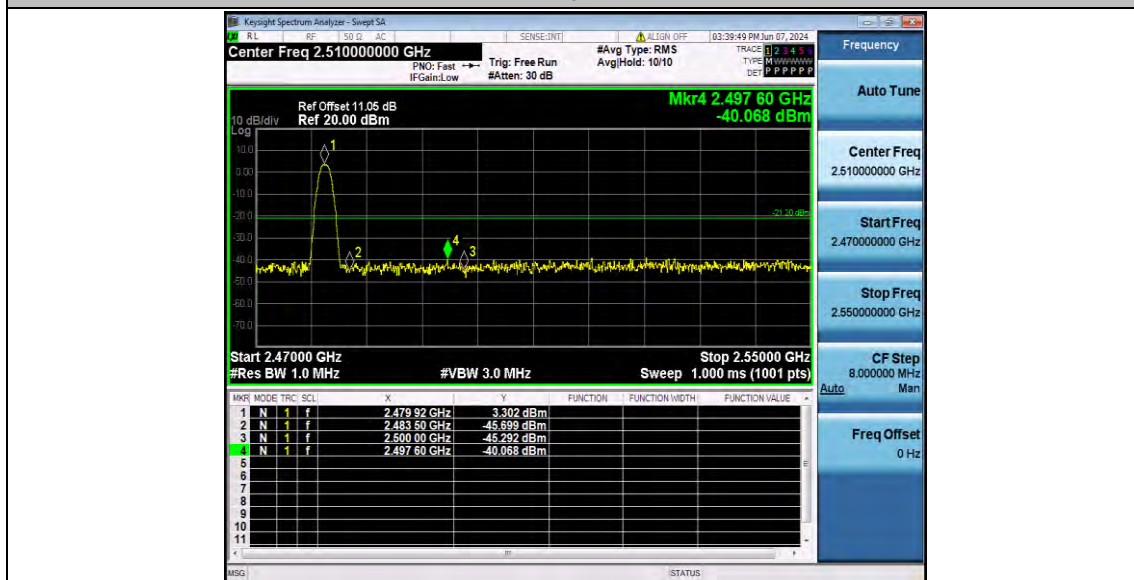
1. The Antenna Gain is compensated in the graph.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

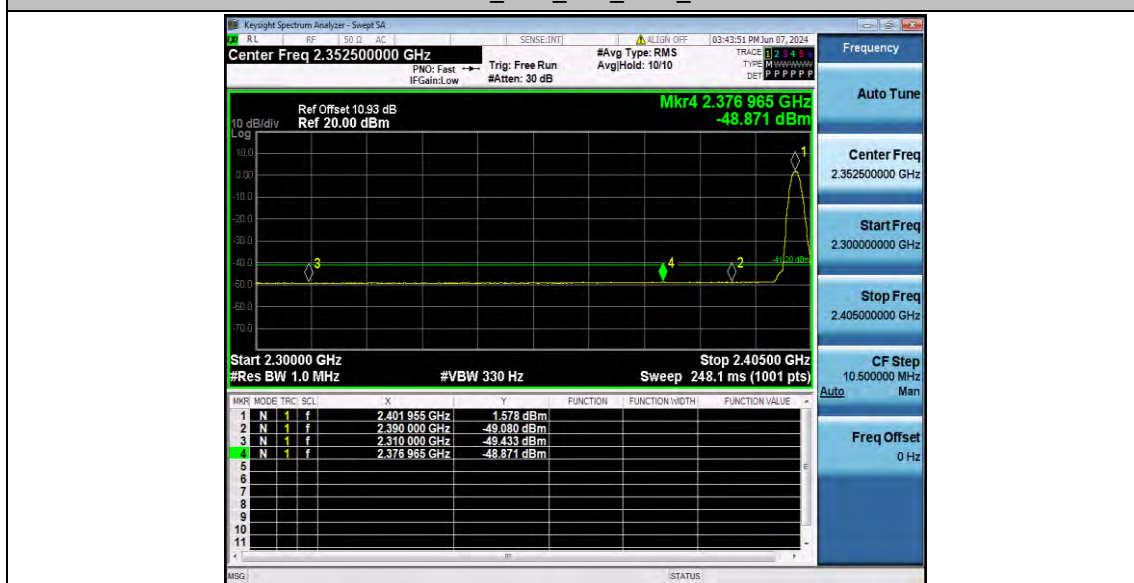




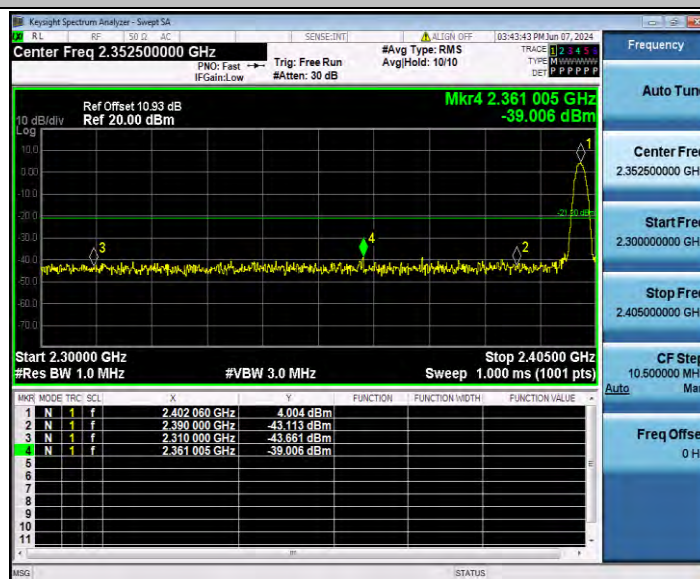
DH1_Ant1_High_2480_Peak



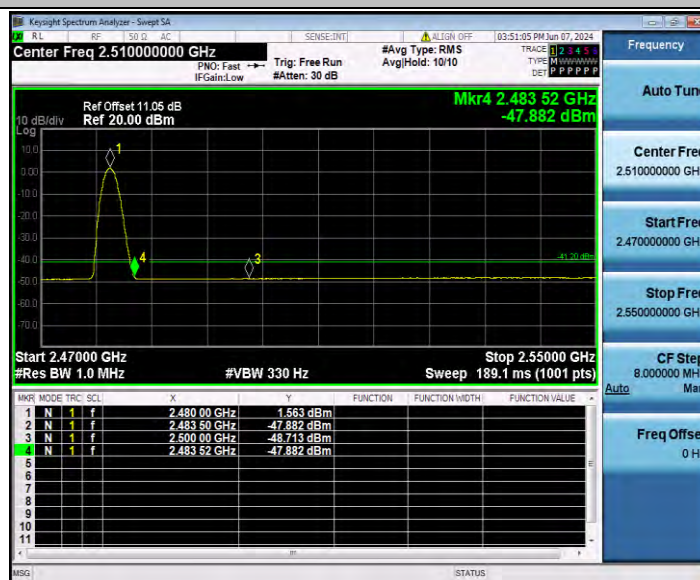
2DH1_Ant1_Low_2402_AV



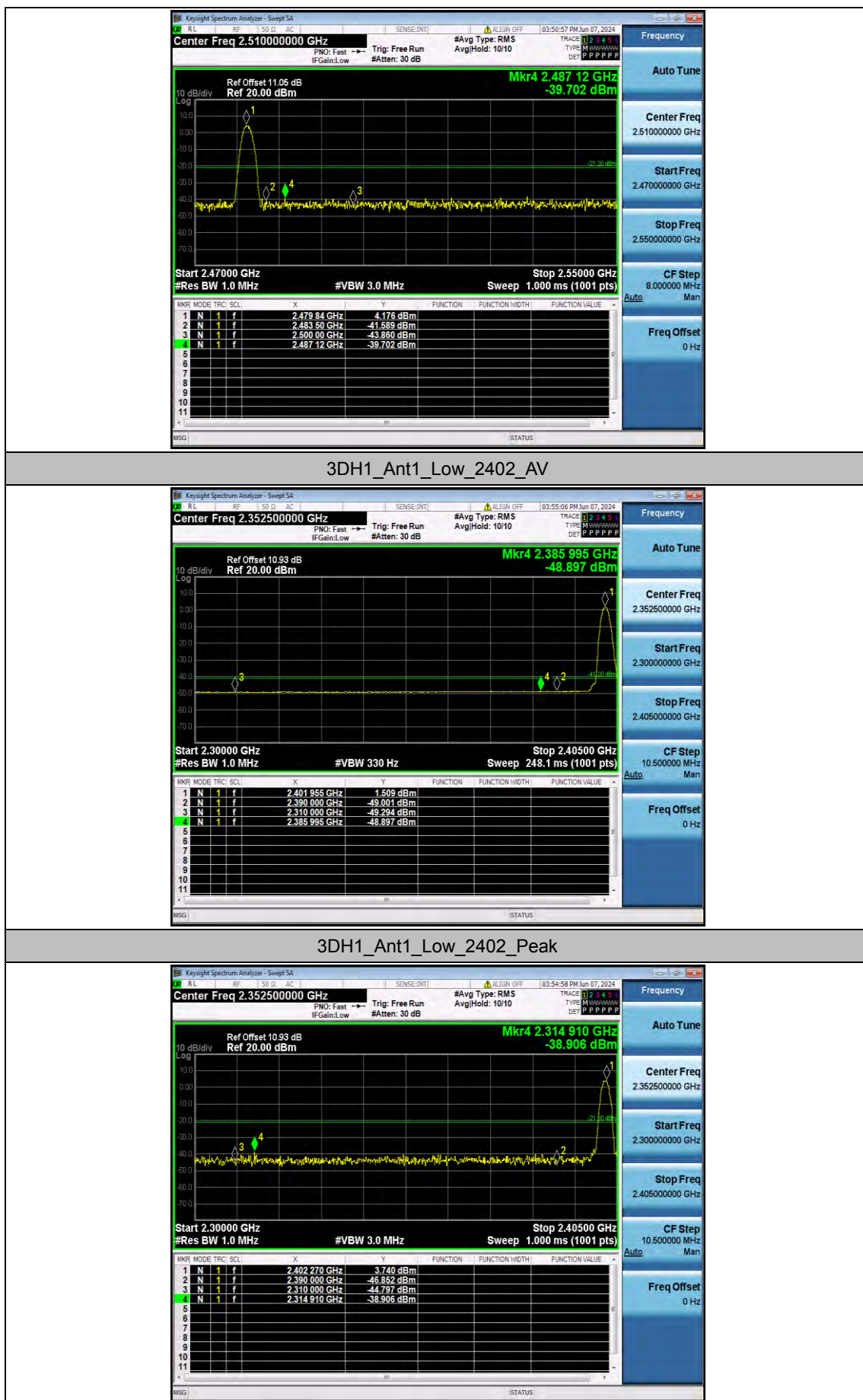
2DH1_Ant1_Low_2402_Peak



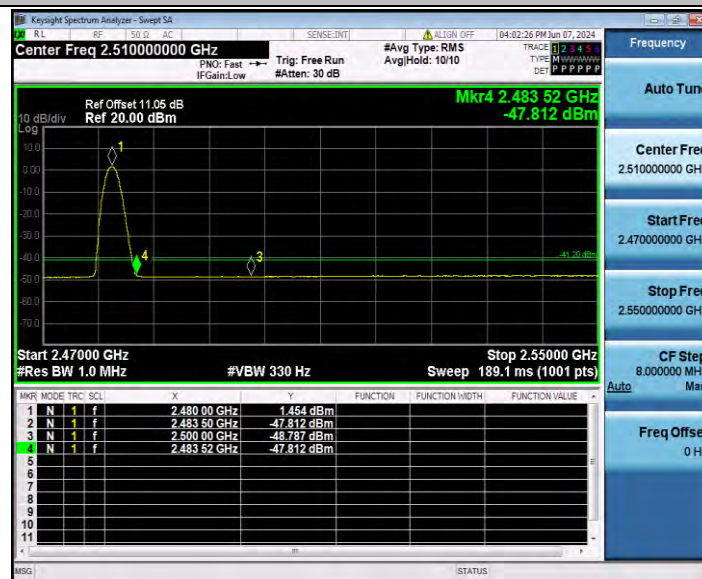
2DH1_Ant1_High_2480_AV



2DH1_Ant1_High_2480_Peak



3DH1_Ant1_High_2480_AV



3DH1_Ant1_High_2480_Peak

