

Case No. : <u>GTS20241108022-2-01</u>	
Ambient Condition: <u>22</u> °C, <u>48</u> %RH	
According Standard: ■Part15C	
Test Date: <u>2024.12.23</u>	Test Engineer: <u>Evan ouyang</u>

Appendix A.1: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.939	2401.523	2402.462	---	---
		2441	0.945	2440.517	2441.462	---	---
		2480	0.939	2479.517	2480.456	---	---
2DH1	Ant1	2402	1.302	2401.334	2402.636	---	---
		2441	1.320	2440.322	2441.642	---	---
		2480	1.293	2479.316	2480.609	---	---
3DH1	Ant1	2402	1.266	2401.352	2402.618	---	---
		2441	1.266	2440.352	2441.618	---	---
		2480	1.278	2479.343	2480.621	---	---

Test Graphs

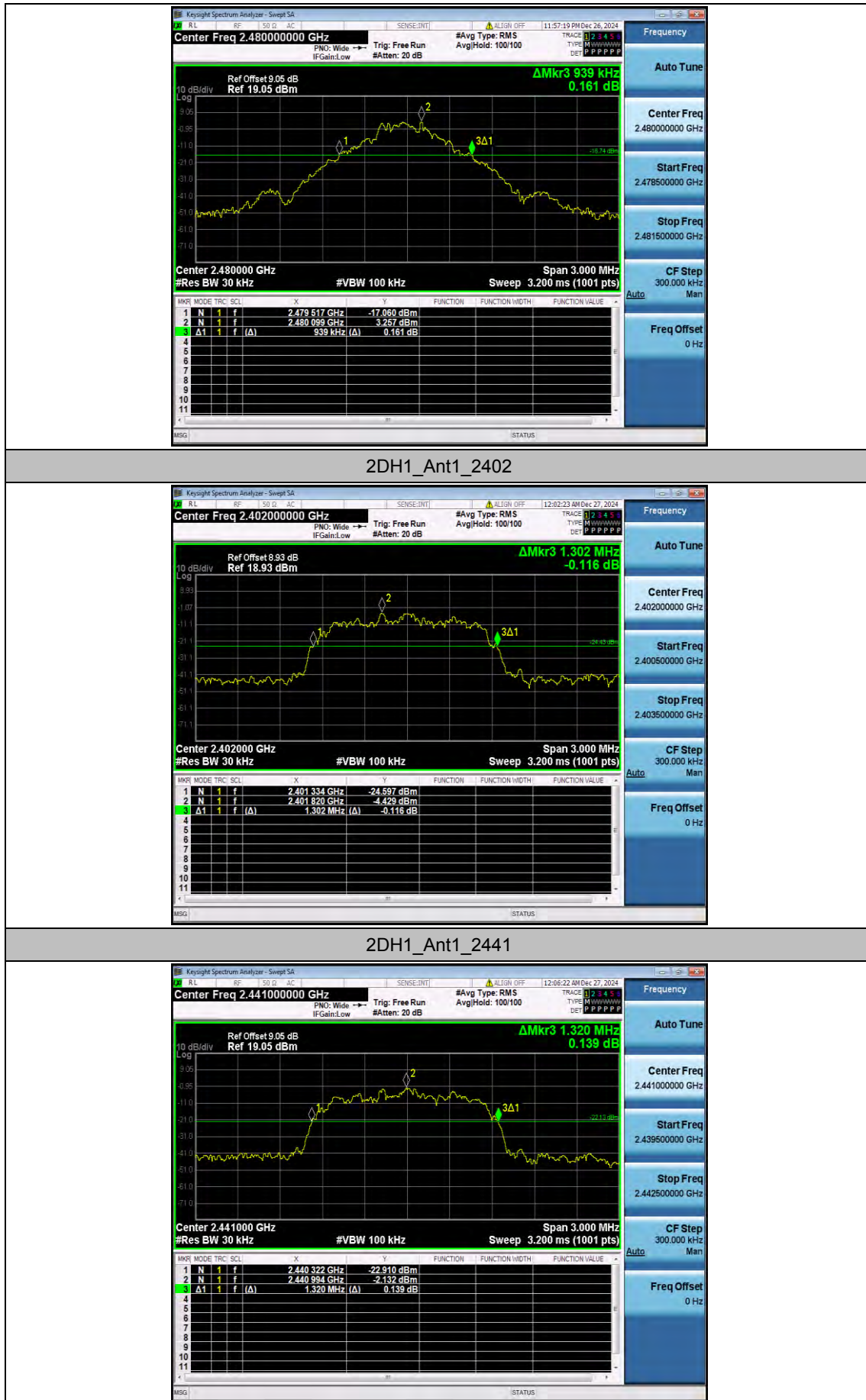
DH1_Ant1_2402



DH1_Ant1_2441



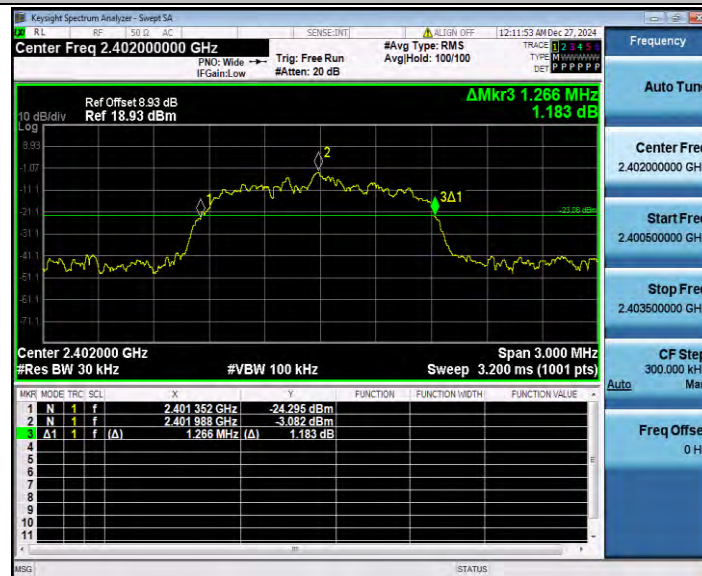
DH1_Ant1_2480



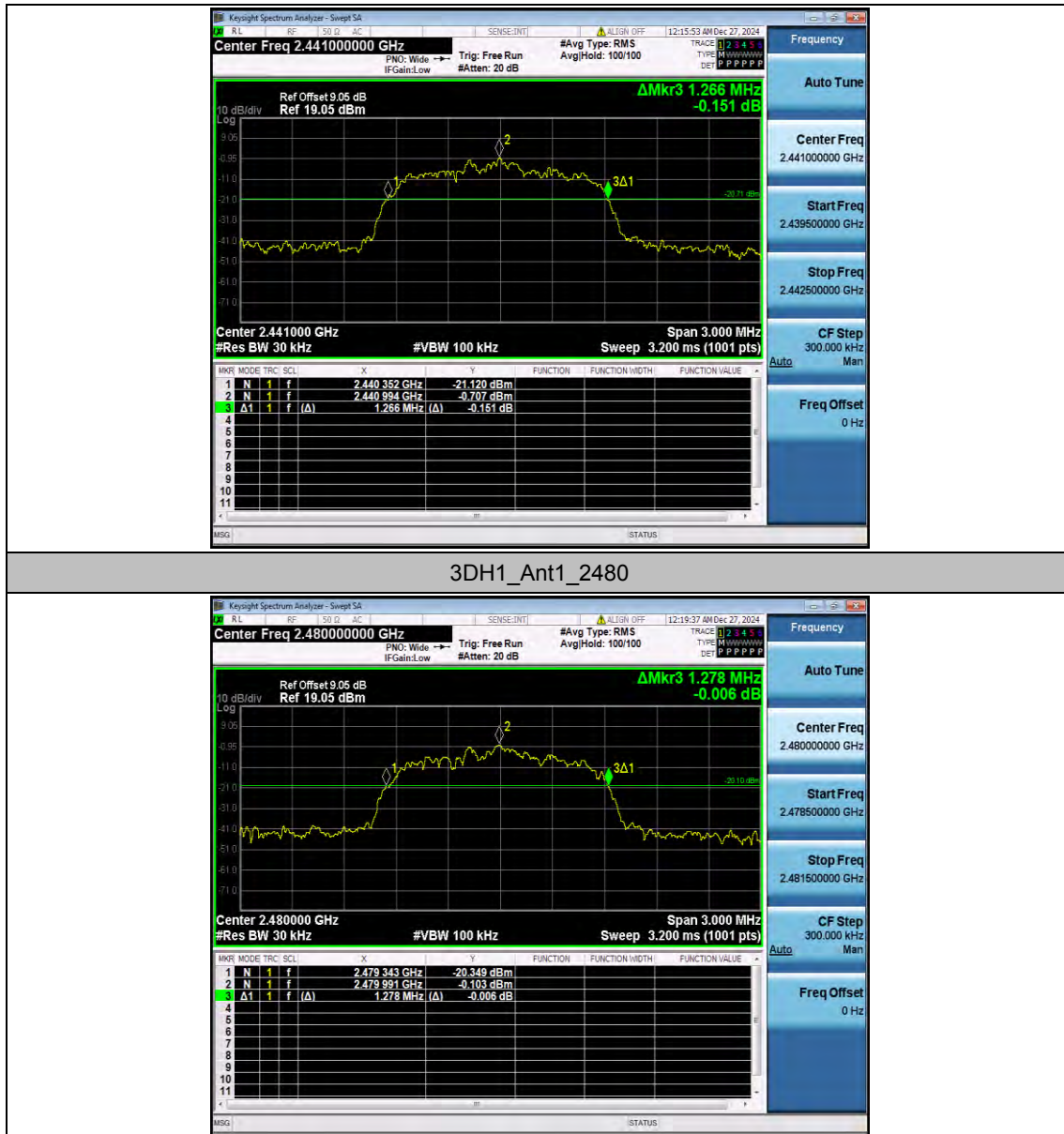
2DH1_Ant1_2480



3DH1_Ant1_2402



3DH1_Ant1_2441



Appendix A.2: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.85660	2401.5565	2402.4131	---	---
		2441	0.84198	2440.5616	2441.4035	---	---
		2480	0.84441	2479.5625	2480.4070	---	---
2DH1	Ant1	2402	1.1799	2401.3883	2402.5682	---	---
		2441	1.1746	2440.3854	2441.5600	---	---
		2480	1.1765	2479.3872	2480.5637	---	---
3DH1	Ant1	2402	1.1623	2401.4151	2402.5774	---	---
		2441	1.1671	2440.4118	2441.5789	---	---
		2480	1.1631	2479.4123	2480.5754	---	---

Test Graphs

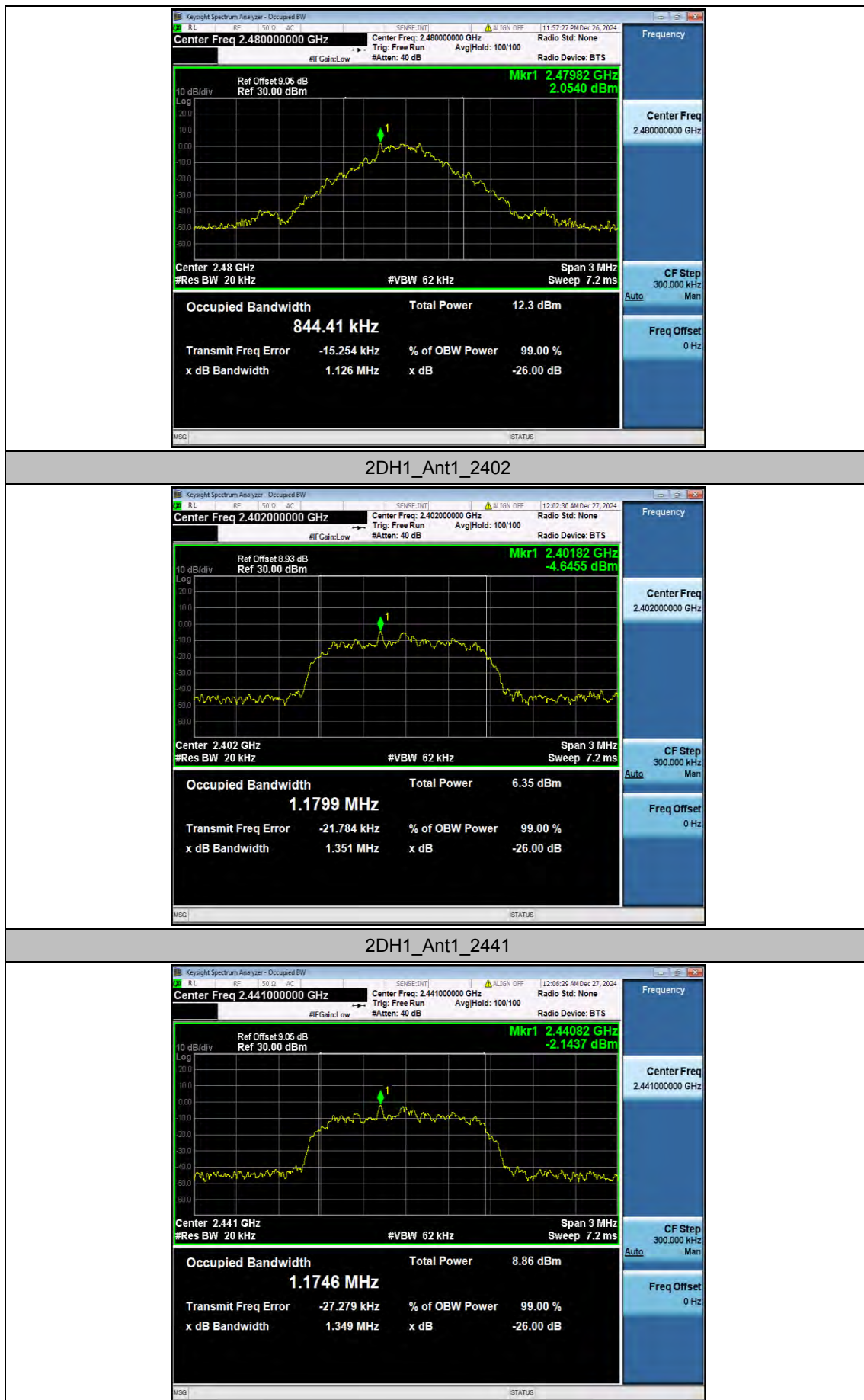
DH1_Ant1_2402



DH1_Ant1_2441



DH1_Ant1_2480



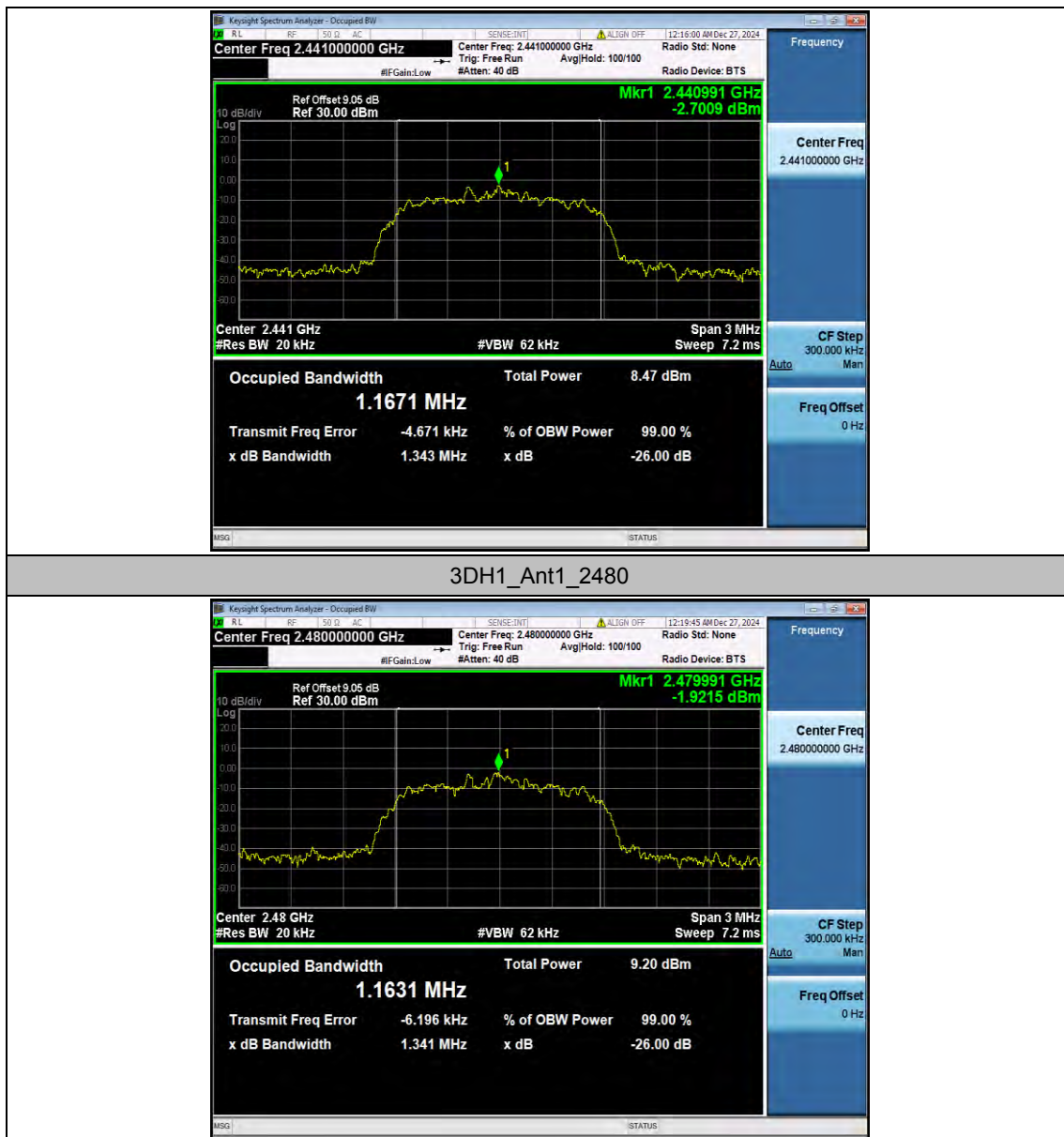
2DH1_Ant1_2480



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	3.87	≤ 20.97	PASS
		2441	7.15	≤ 20.97	PASS
		2480	7.29	≤ 20.97	PASS
2DH1	Ant1	2402	3.05	≤ 20.97	PASS
		2441	5.44	≤ 20.97	PASS
		2480	5.60	≤ 20.97	PASS
3DH1	Ant1	2402	3.39	≤ 20.97	PASS
		2441	5.79	≤ 20.97	PASS
		2480	6.00	≤ 20.97	PASS

Appendix A.4: Carrier frequency separation

Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop_2402	0.99	≥ 0.630	PASS
		Hop_2441	0.662	≥ 0.630	PASS
		Hop_2480	1.022	≥ 0.630	PASS
2DH1	Ant1	Hop_2402	1.172	≥ 0.880	PASS
		Hop_2441	0.99	≥ 0.880	PASS
		Hop_2480	1.002	≥ 0.880	PASS
3DH1	Ant1	Hop_2402	1.002	≥ 0.852	PASS
		Hop_2441	1.016	≥ 0.852	PASS
		Hop_2480	1.014	≥ 0.852	PASS

Test Graphs

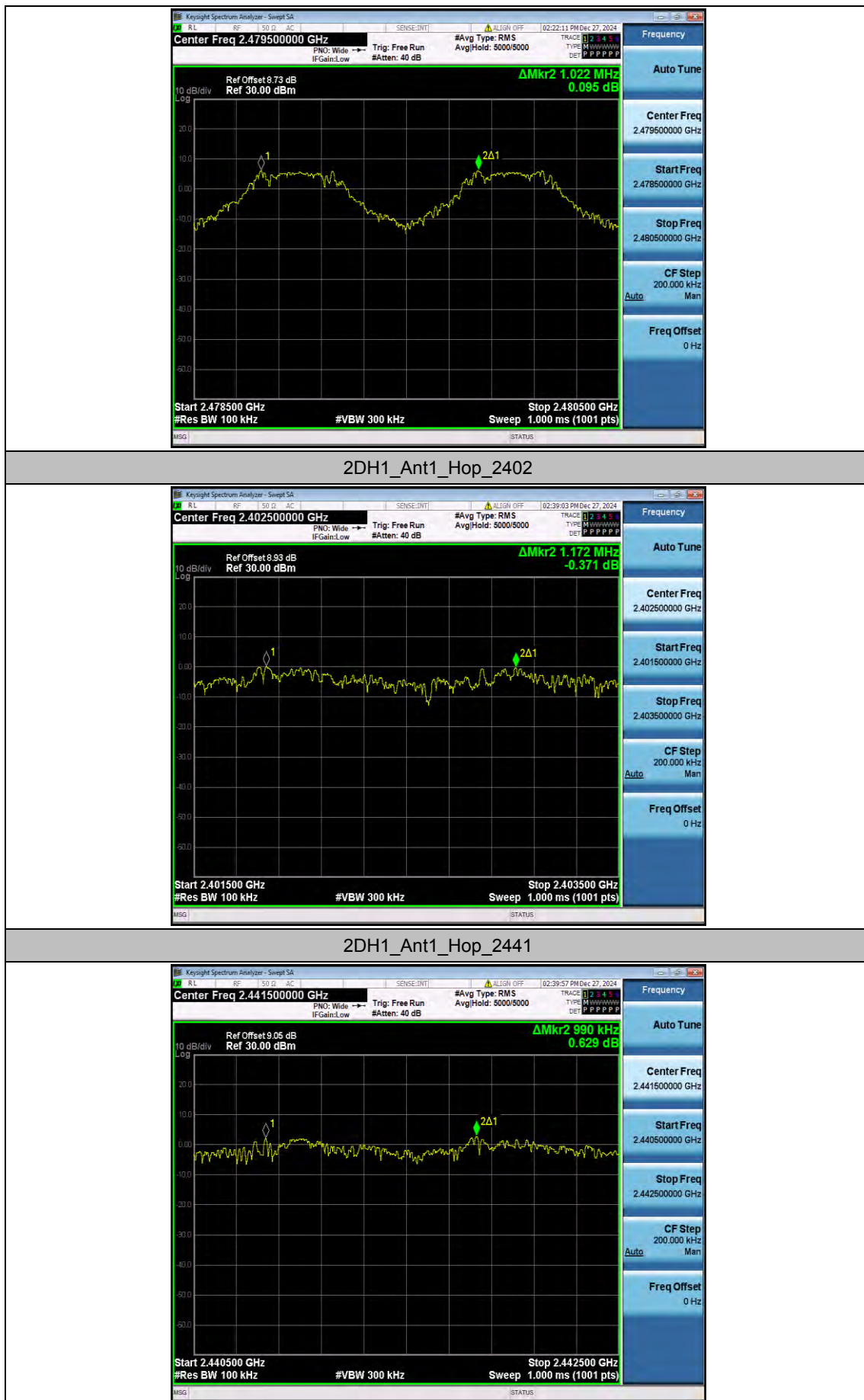
DH1_Ant1_Hop_2402



DH1_Ant1_Hop_2441



DH1_Ant1_Hop_2480



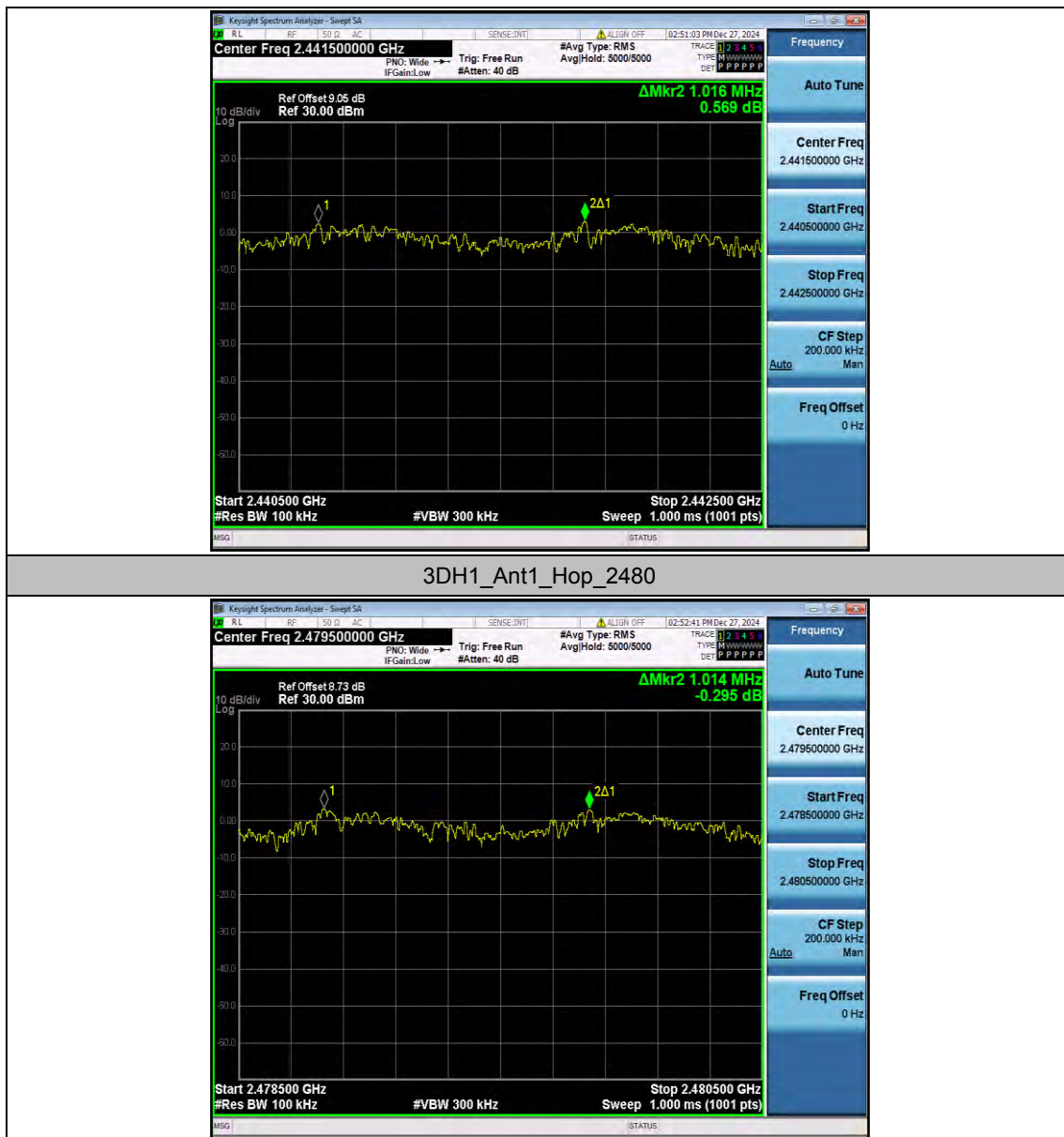
2DH1_Ant1_Hop_2480



3DH1_Ant1_Hop_2402



3DH1_Ant1_Hop_2441

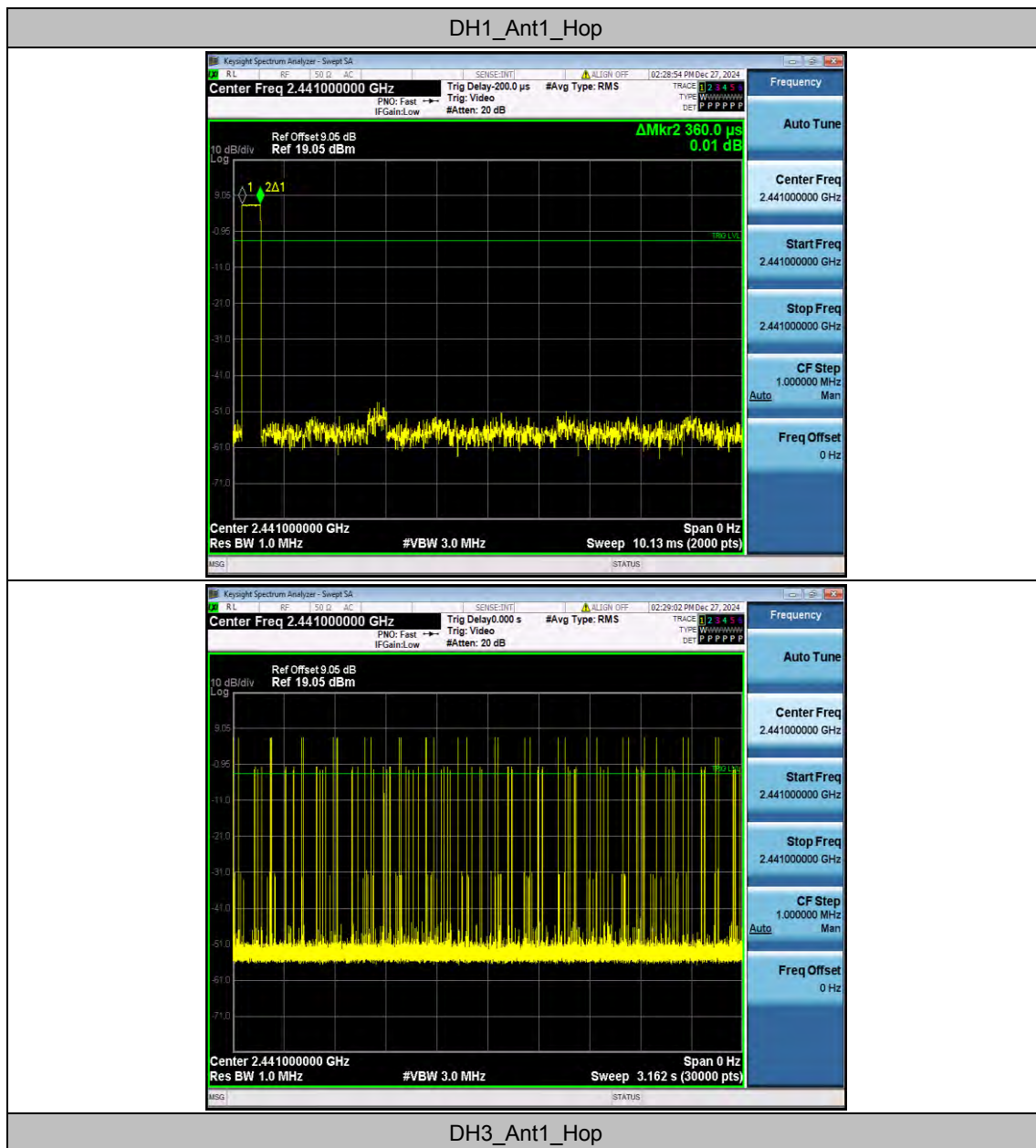


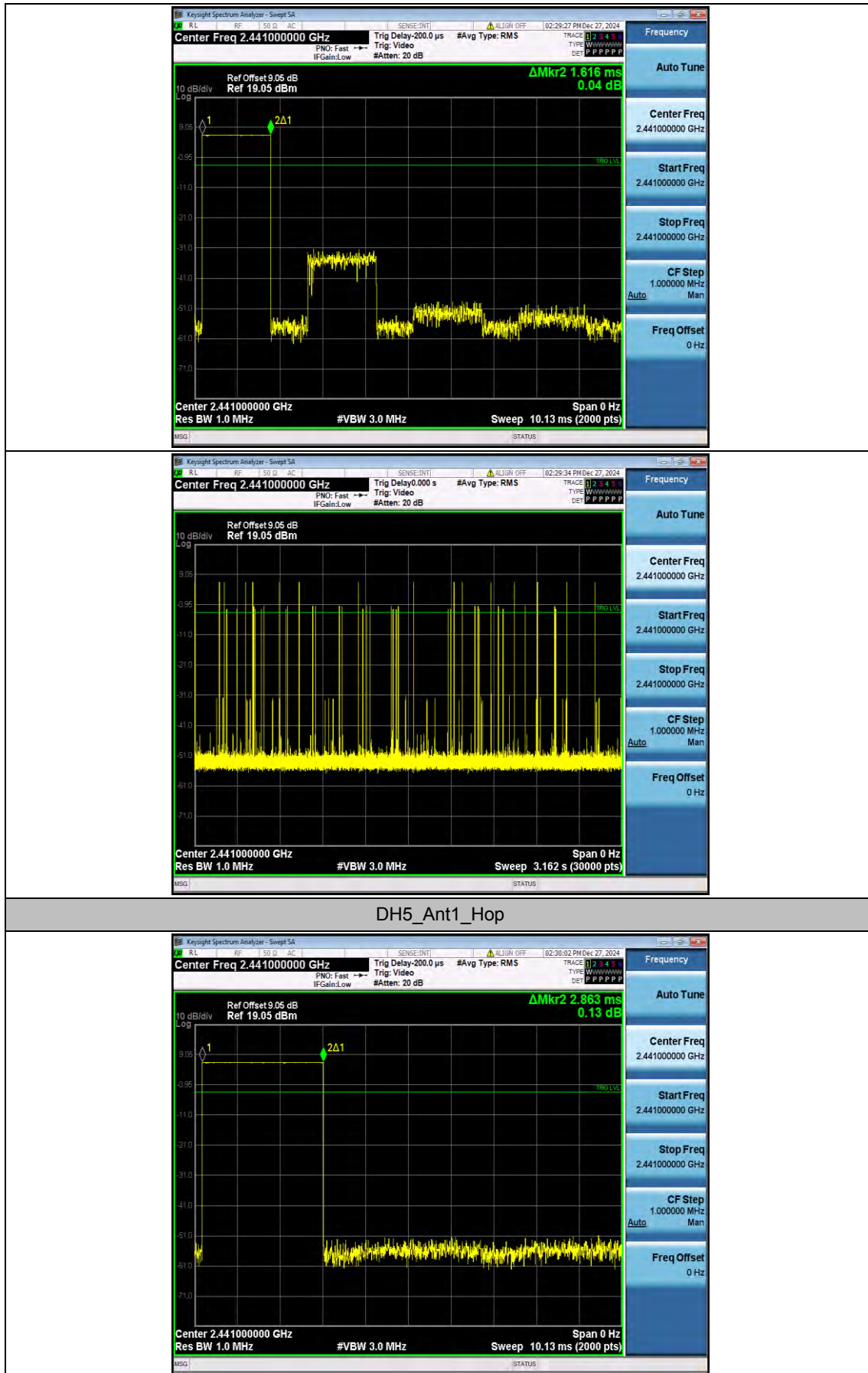
Appendix A.5: Time of occupancy

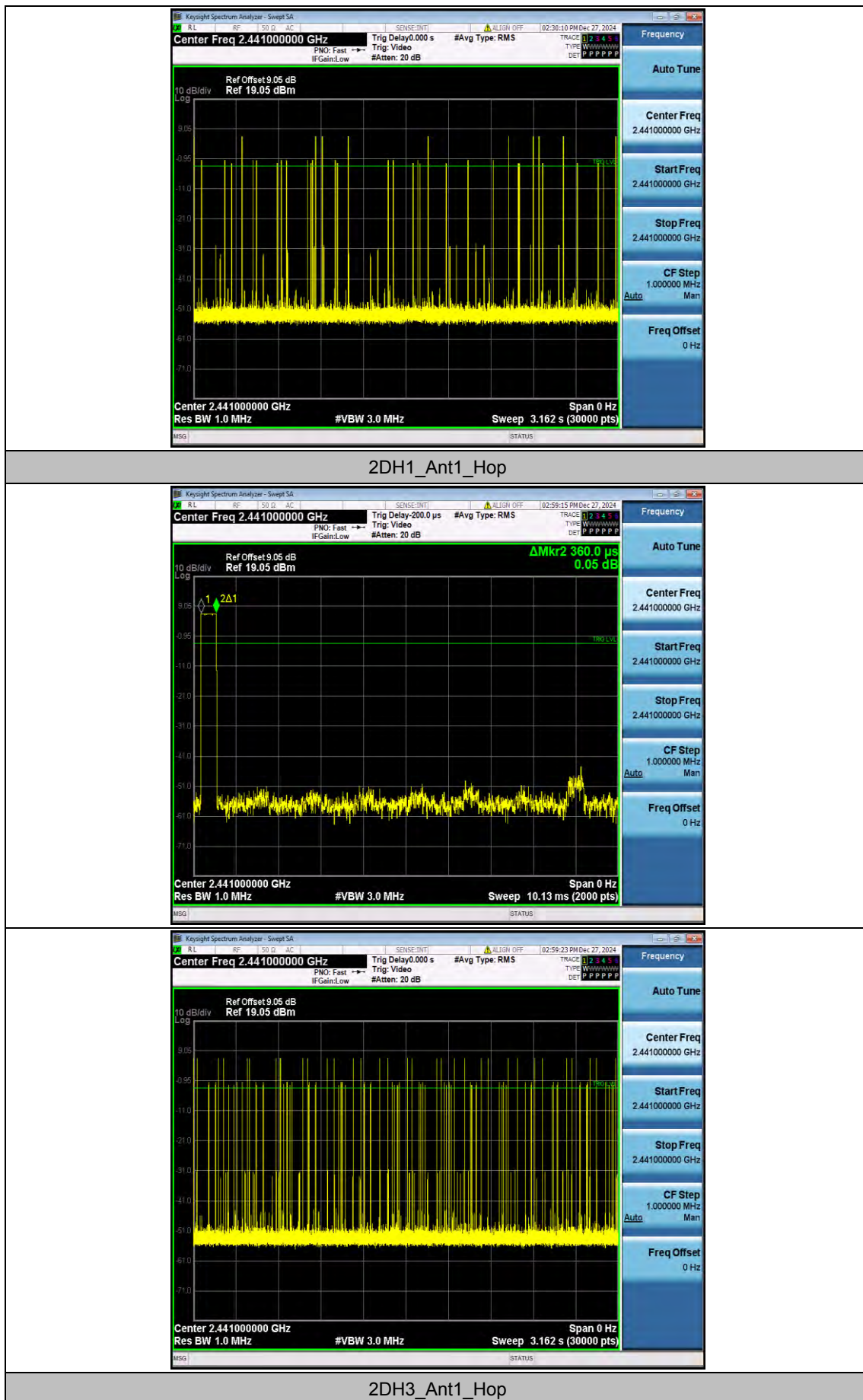
Test Result

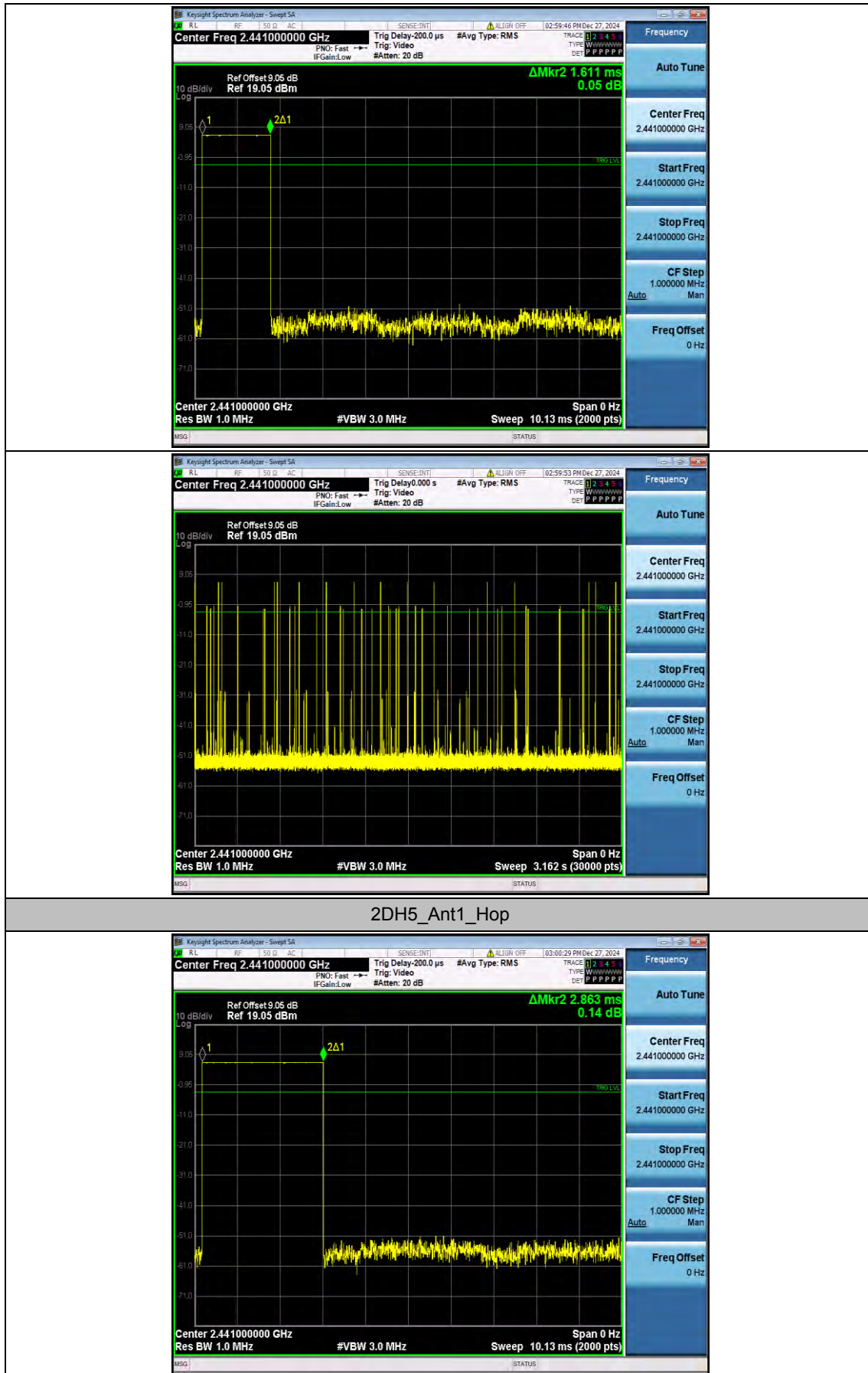
TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.360	330	0.119	≤0.4	PASS
DH3	Ant1	Hop	1.616	160	0.259	≤0.4	PASS
DH5	Ant1	Hop	2.863	110	0.315	≤0.4	PASS
2DH1	Ant1	Hop	0.360	330	0.119	≤0.4	PASS
2DH3	Ant1	Hop	1.611	160	0.258	≤0.4	PASS
2DH5	Ant1	Hop	2.863	110	0.315	≤0.4	PASS
3DH1	Ant1	Hop	0.360	330	0.119	≤0.4	PASS
3DH3	Ant1	Hop	1.616	150	0.242	≤0.4	PASS
3DH5	Ant1	Hop	2.863	80	0.229	≤0.4	PASS

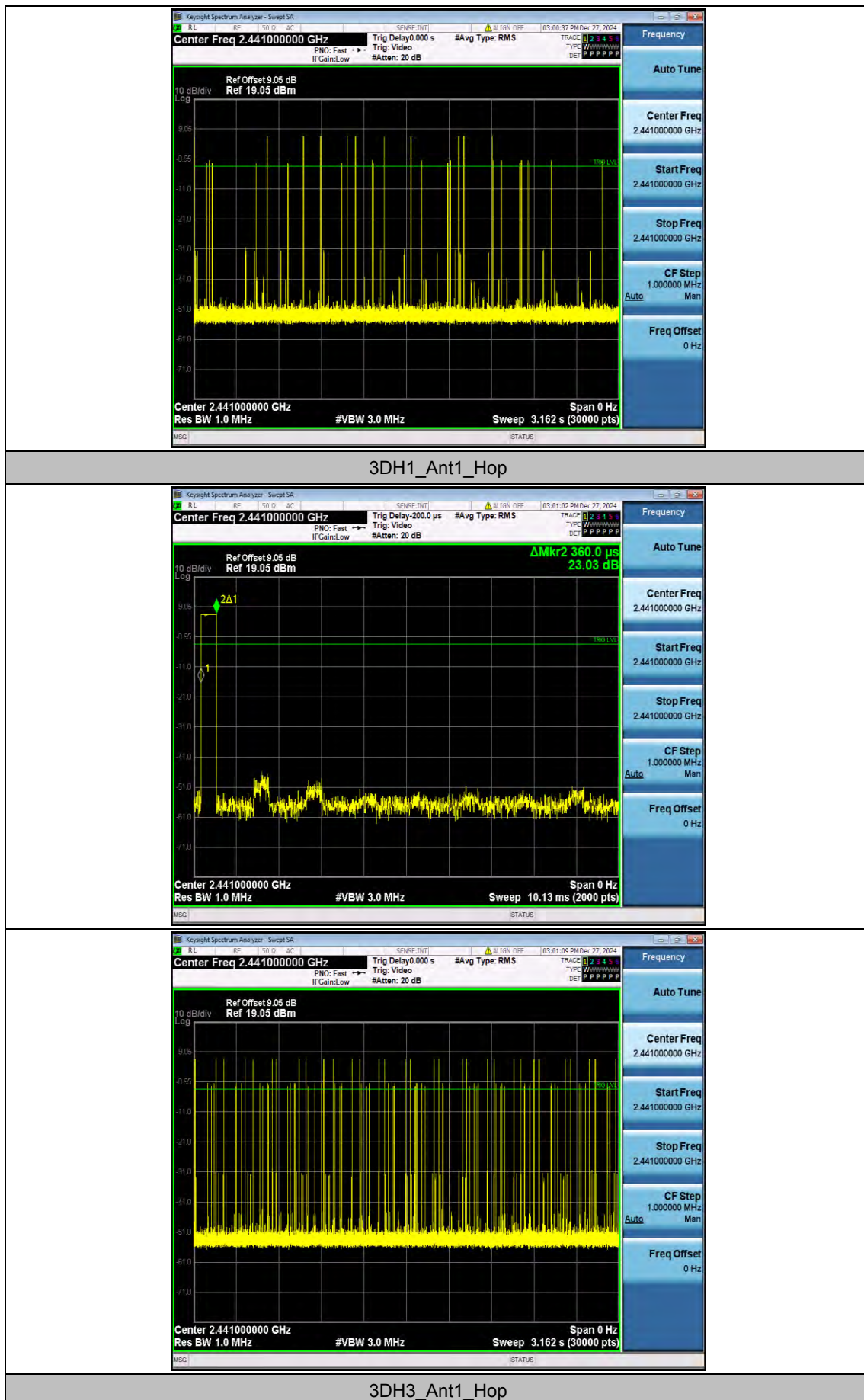
Test Graphs

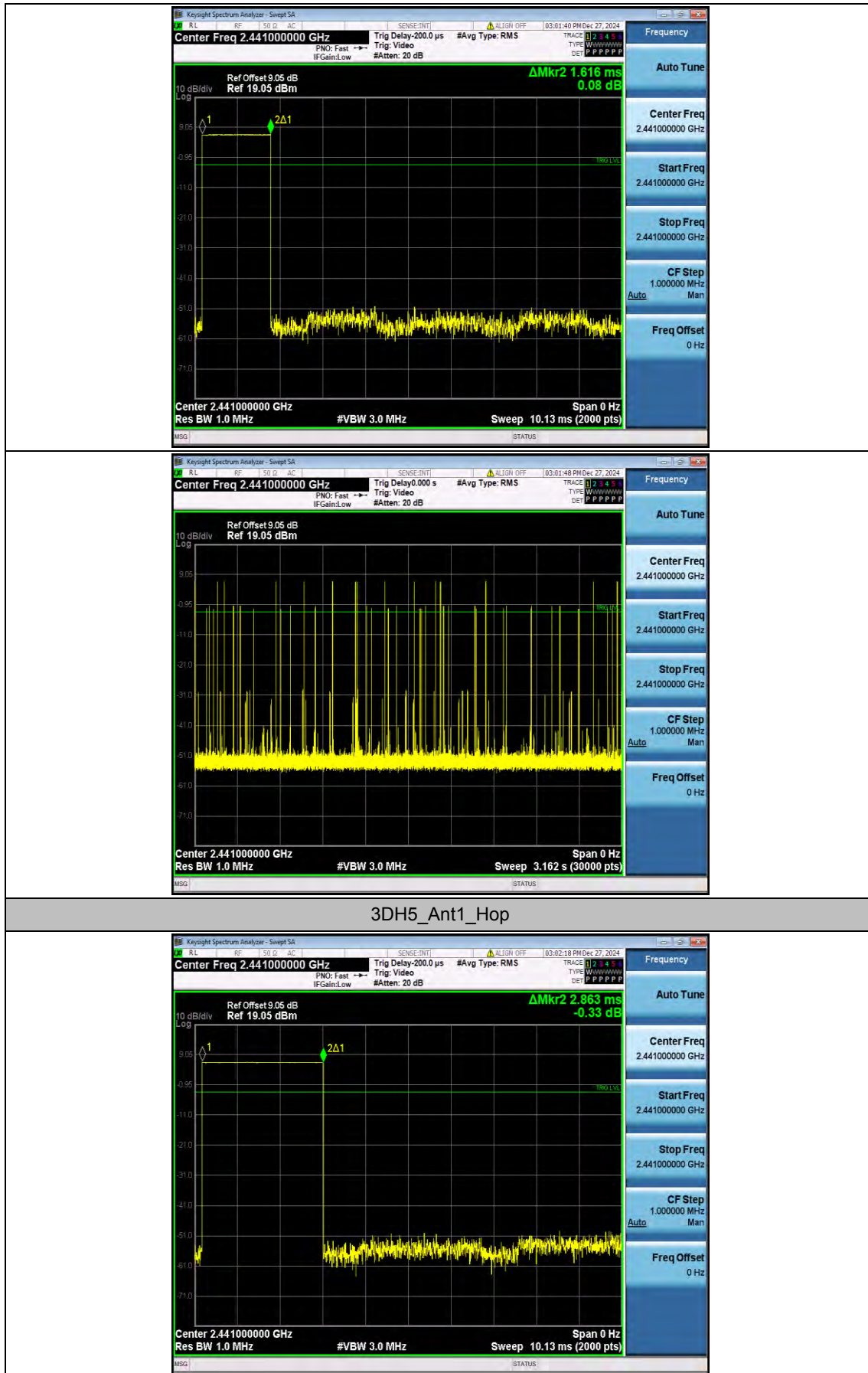


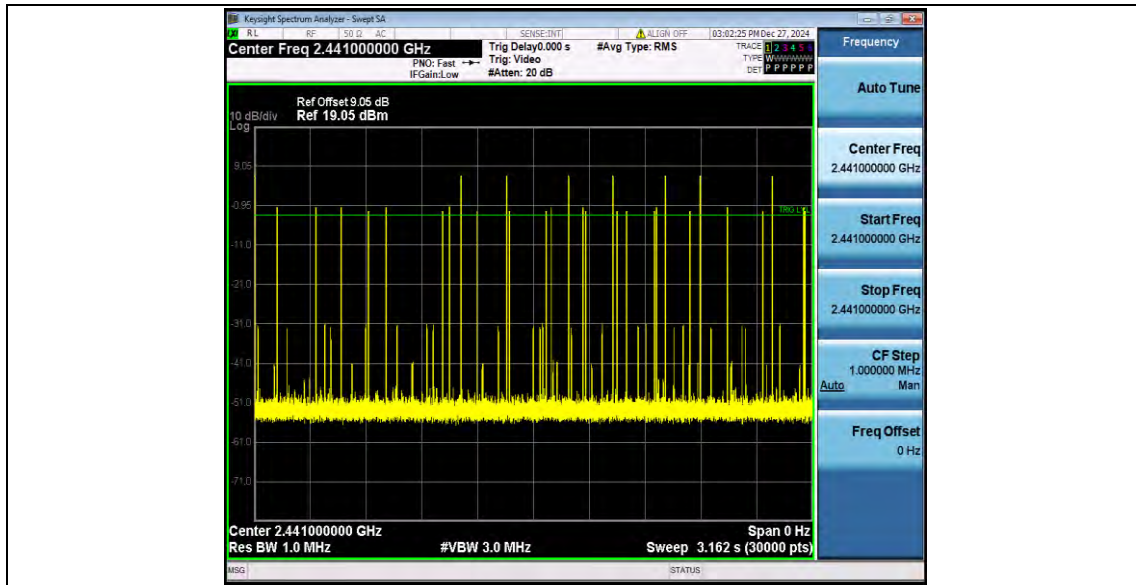










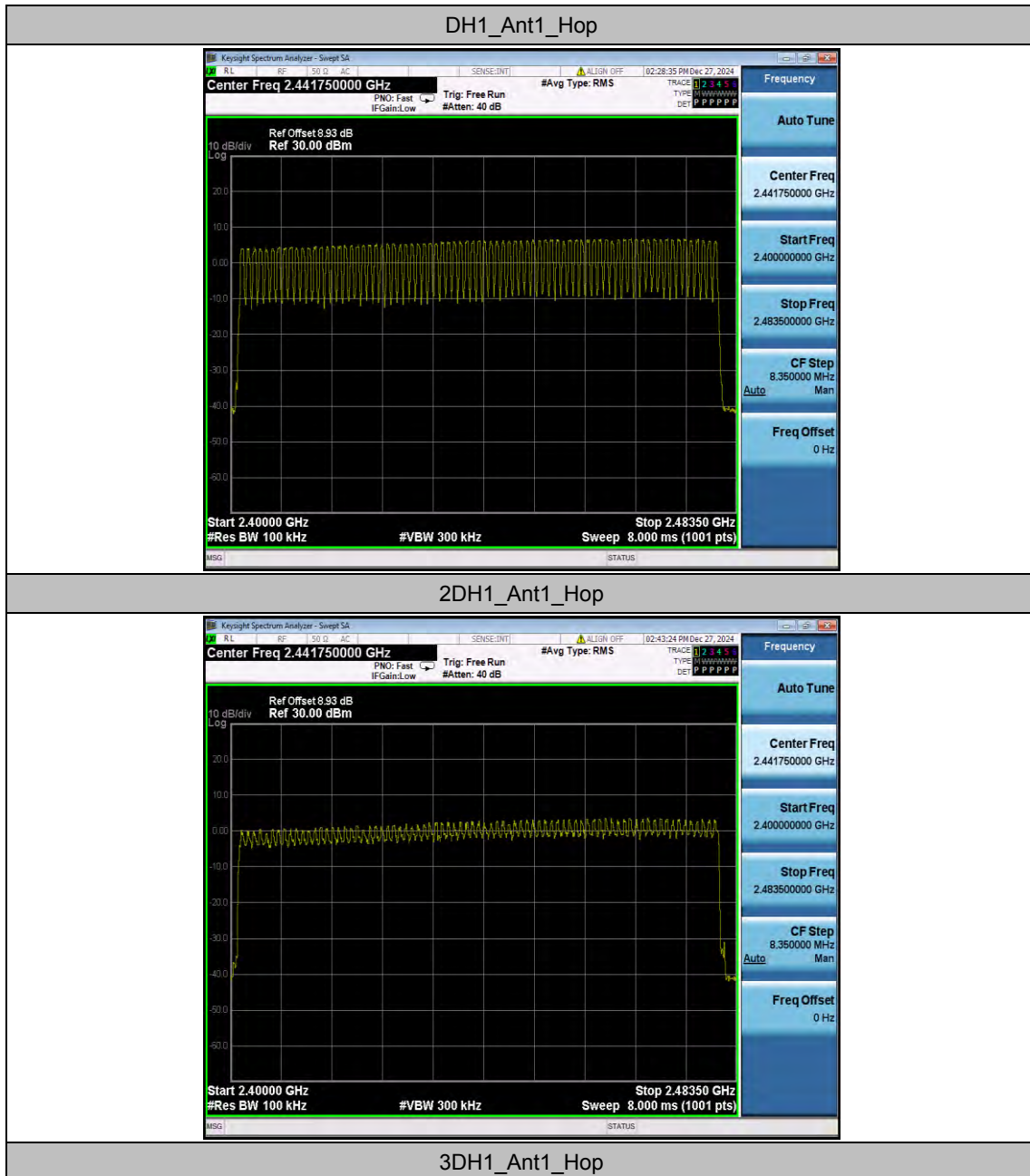


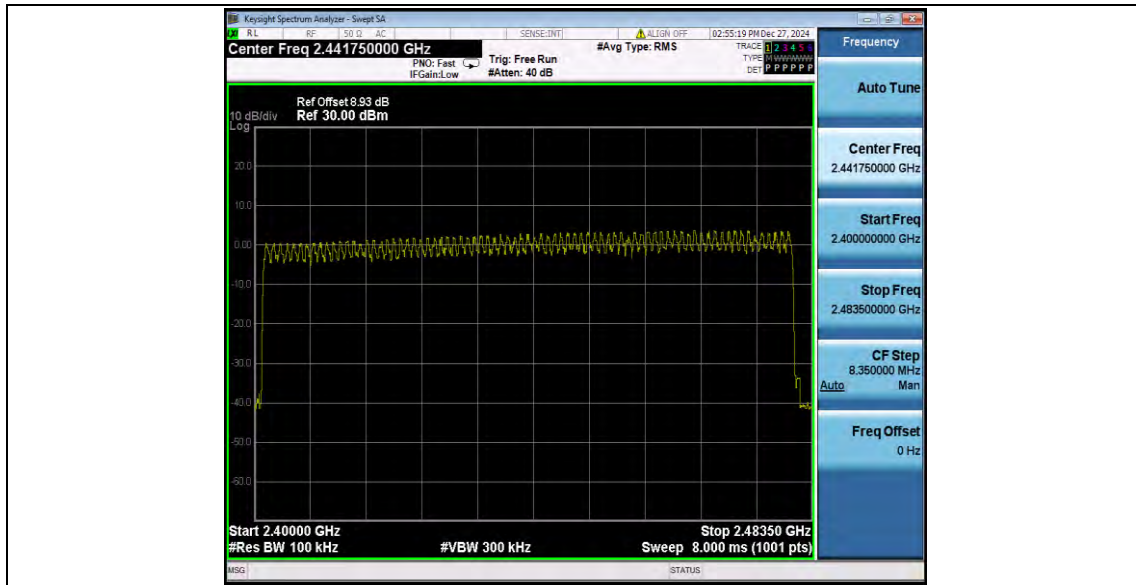
Appendix A.6: Number of hopping channels

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





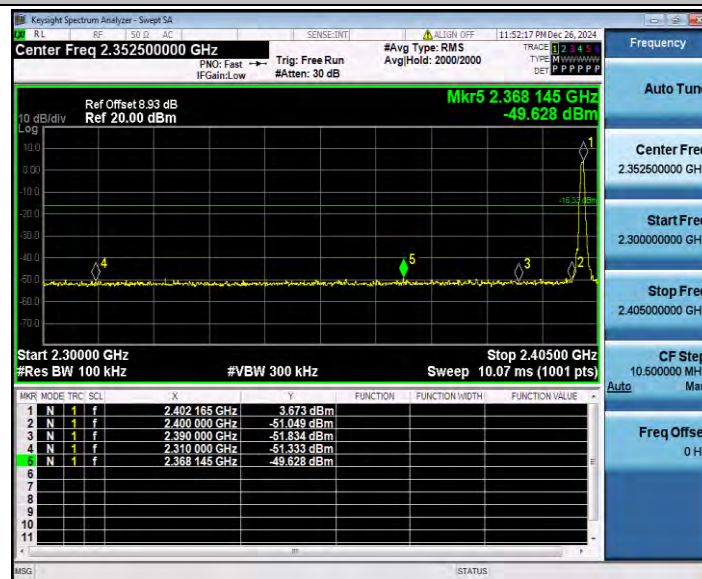
Appendix A.7: Band edge measurements

Test Result

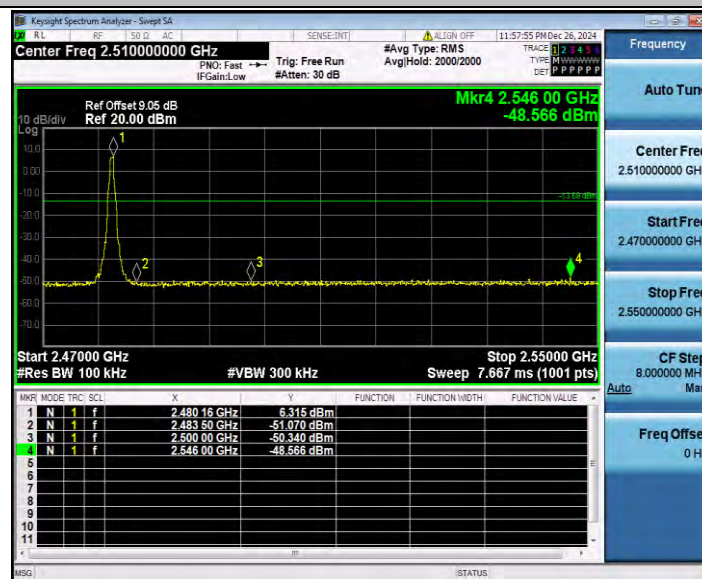
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	3.67	-49.63	≤ -16.33	PASS
		High	2480	6.32	-48.57	≤ -13.69	PASS
		Low	Hop_2402	4.36	-48.7	≤ -15.64	PASS
		High	Hop_2480	6.80	-49.07	≤ -13.2	PASS
2DH1	Ant1	Low	2402	-0.42	-49.08	≤ -20.42	PASS
		High	2480	2.75	-48.25	≤ -17.26	PASS
		Low	Hop_2402	0.08	-49.53	≤ -19.93	PASS
		High	Hop_2480	2.71	-49.11	≤ -17.29	PASS
3DH1	Ant1	Low	2402	-0.44	-49.66	≤ -20.44	PASS
		High	2480	2.78	-49	≤ -17.23	PASS
		Low	Hop_2402	-0.04	-48.9	≤ -20.04	PASS
		High	Hop_2480	3.52	-48.63	≤ -16.48	PASS

Test Graphs

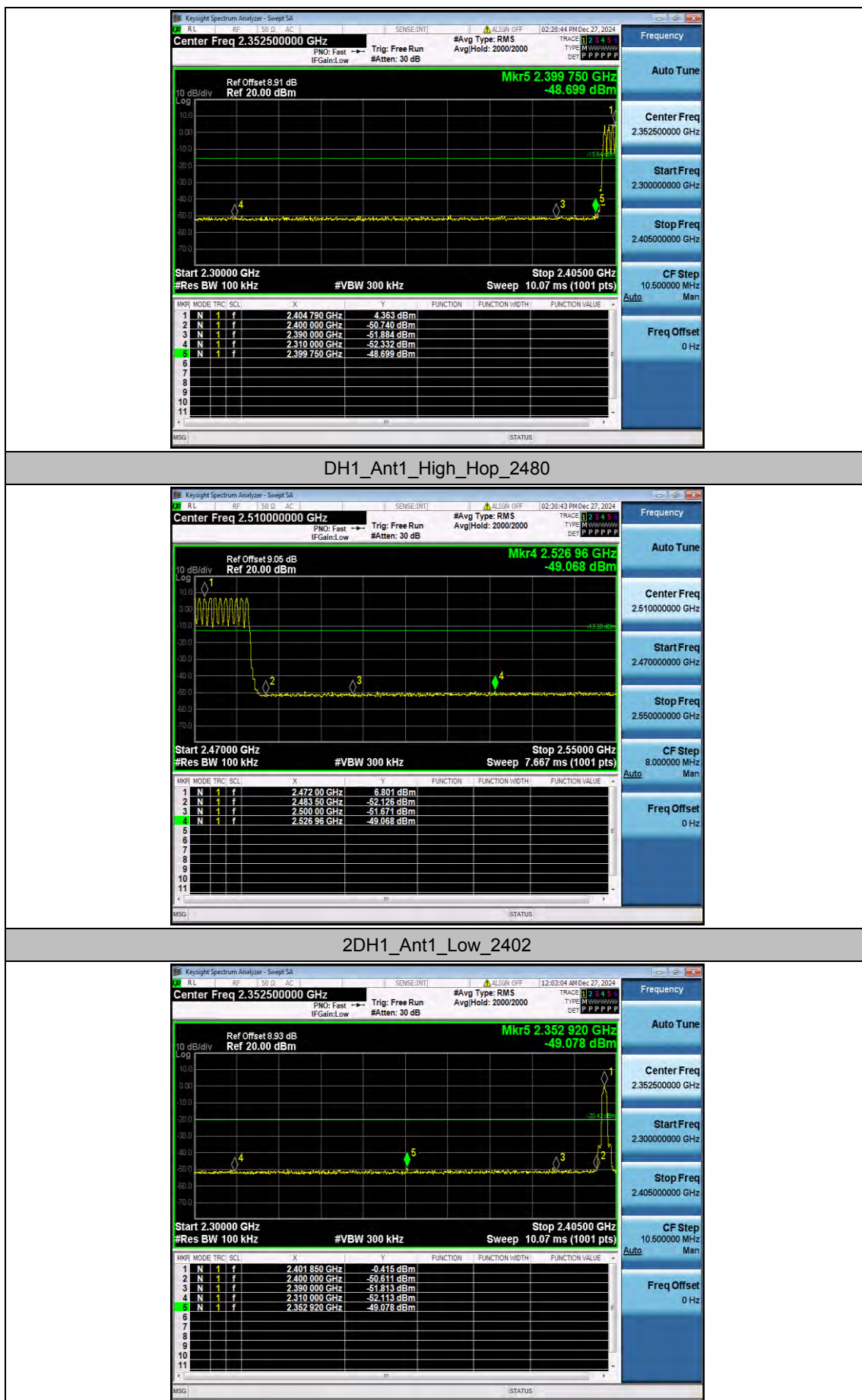
DH1_Ant1_Low_2402



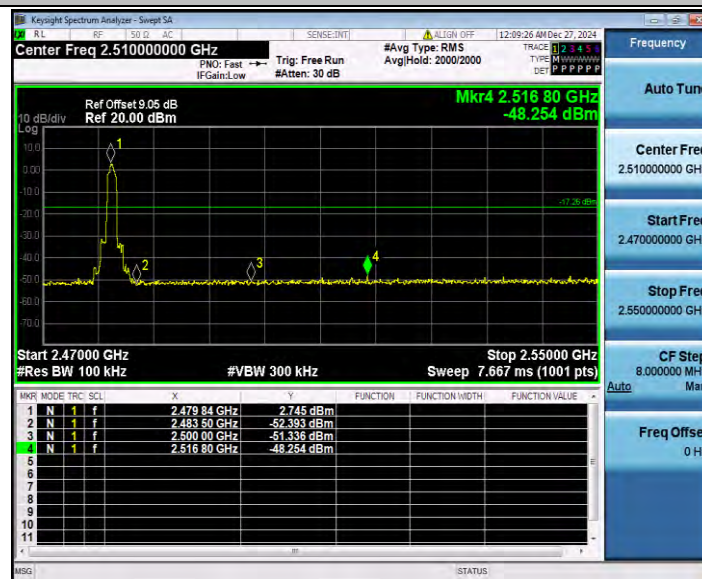
DH1_Ant1_High_2480



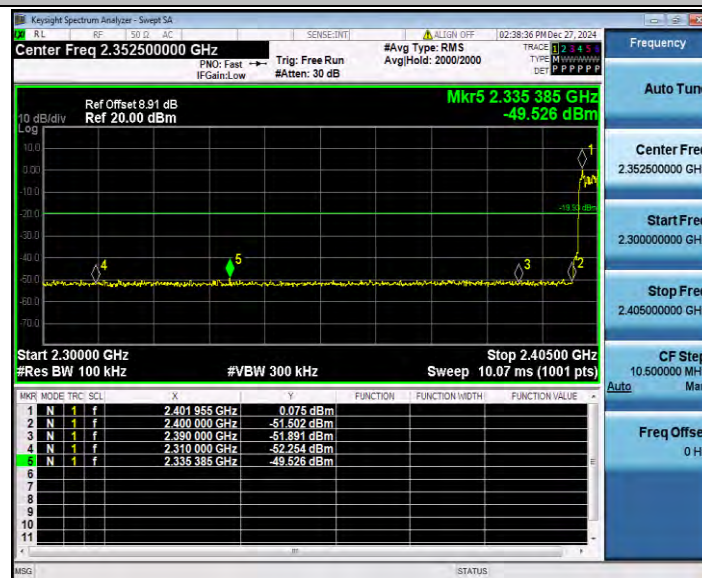
DH1_Ant1_Low_Hop_2402



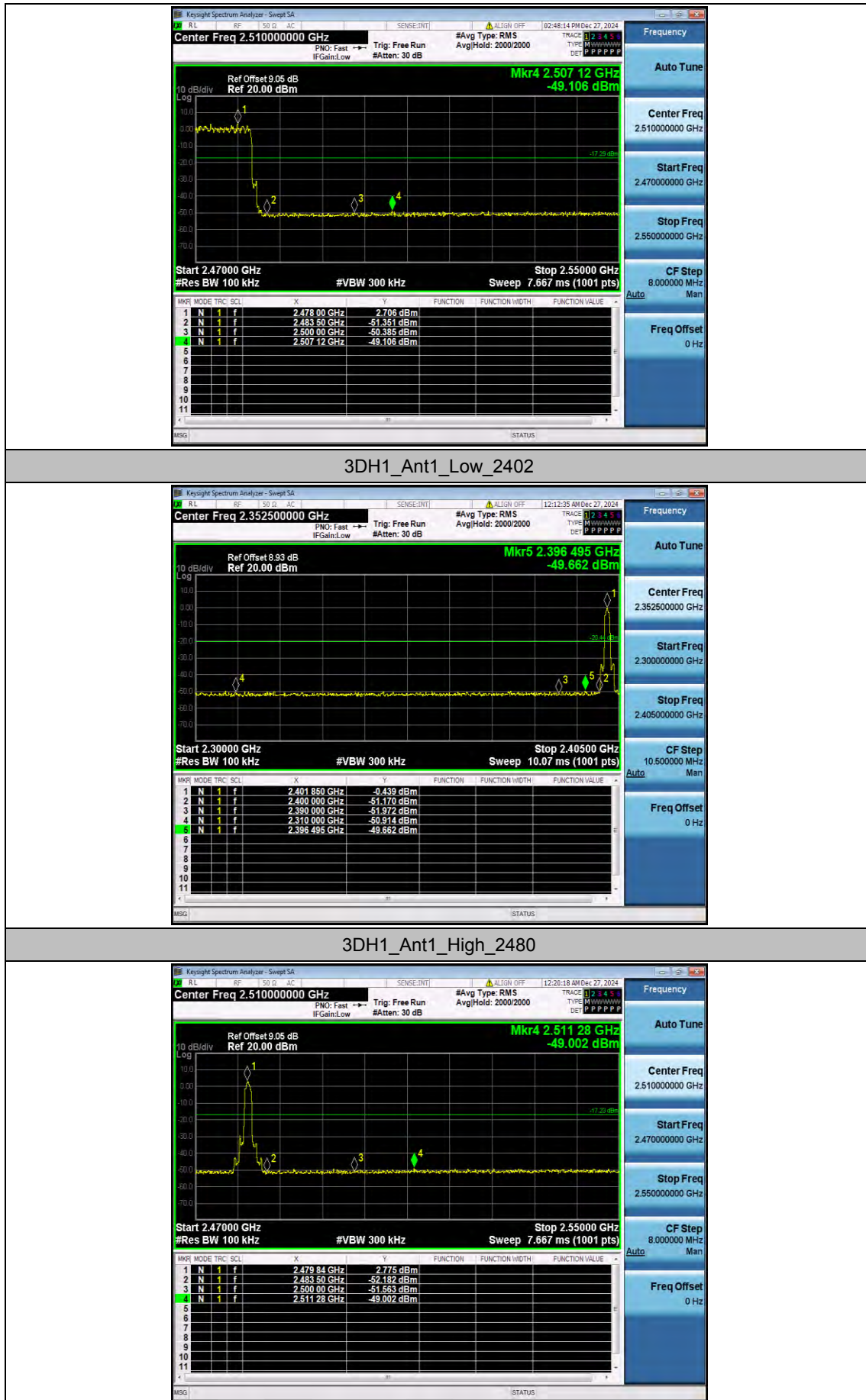
2DH1_Ant1_High_2480



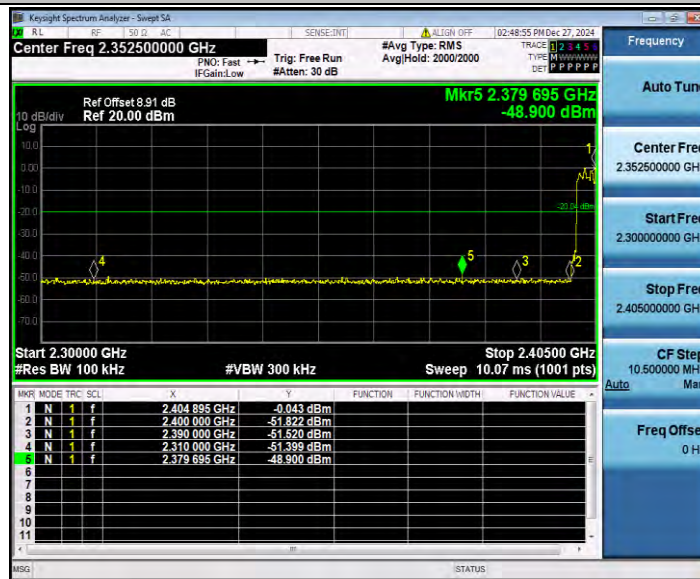
2DH1_Ant1_Low_Hop_2402



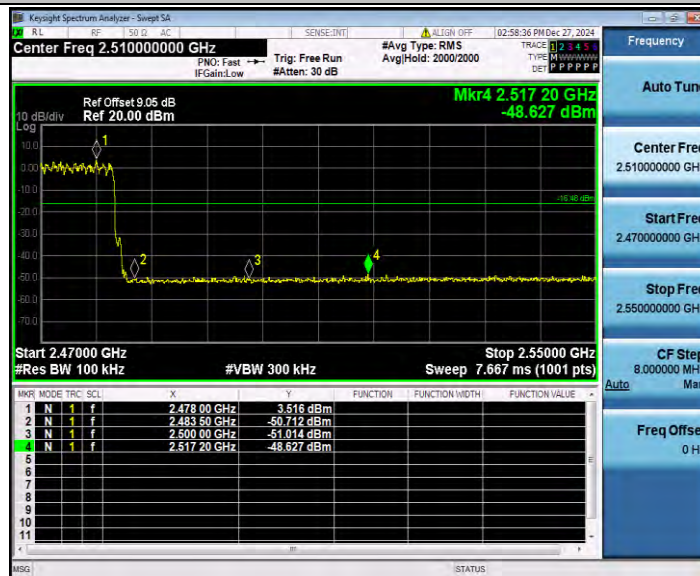
2DH1_Ant1_High_Hop_2480



3DH1_Ant1_Low_Hop_2402



3DH1_Ant1_High_Hop_2480

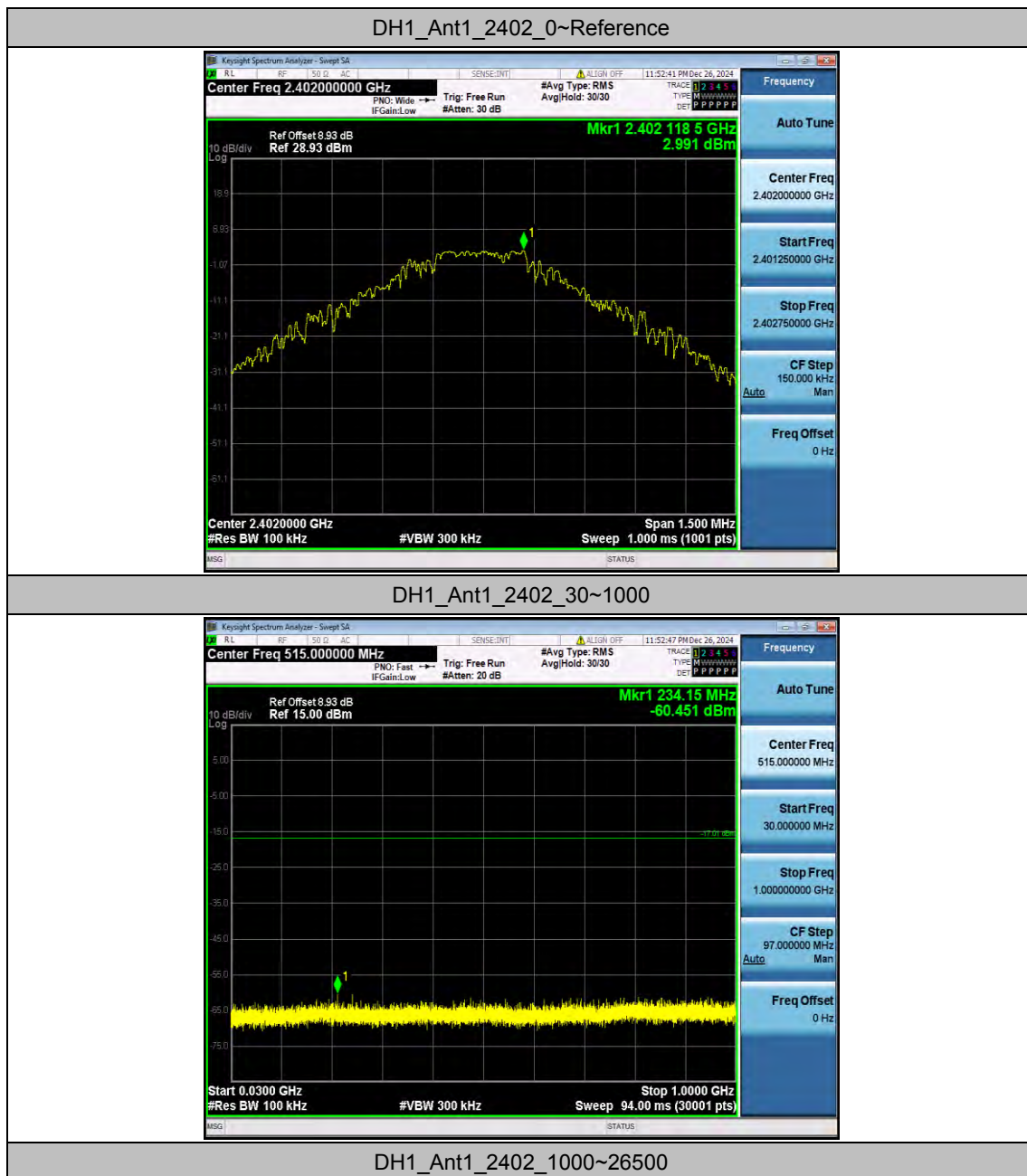


Appendix A.8: Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	2402	Reference	2.99	2.99	---	PASS
			30~1000	2.99	-60.45	≤ -17.01	PASS
			1000~26500	2.99	-43.8	≤ -17.01	PASS
		2441	Reference	5.48	5.48	---	PASS
			30~1000	5.48	-60.56	≤ -14.52	PASS
			1000~26500	5.48	-47.22	≤ -14.52	PASS
		2480	Reference	6.00	6.00	---	PASS
			30~1000	6.00	-60.48	≤ -14	PASS
			1000~26500	6.00	-47.79	≤ -14	PASS
2DH1	Ant1	2402	Reference	-1.25	-1.25	---	PASS
			30~1000	-1.25	-60.7	≤ -21.25	PASS
			1000~26500	-1.25	-47.98	≤ -21.25	PASS
		2441	Reference	1.11	1.11	---	PASS
			30~1000	1.11	-60.71	≤ -18.89	PASS
			1000~26500	1.11	-47.81	≤ -18.89	PASS
		2480	Reference	1.86	1.86	---	PASS
			30~1000	1.86	-60.48	≤ -18.14	PASS
			1000~26500	1.86	-47.77	≤ -18.14	PASS
3DH1	Ant1	2402	Reference	-0.54	-0.54	---	PASS
			30~1000	-0.54	-60.67	≤ -20.54	PASS
			1000~26500	-0.54	-48.01	≤ -20.54	PASS
		2441	Reference	1.40	1.40	---	PASS
			30~1000	1.40	-60.54	≤ -18.6	PASS
			1000~26500	1.40	-47.62	≤ -18.6	PASS
		2480	Reference	2.66	2.66	---	PASS
			30~1000	2.66	-60.54	≤ -17.34	PASS
			1000~26500	2.66	-47.77	≤ -17.34	PASS

Test Graphs

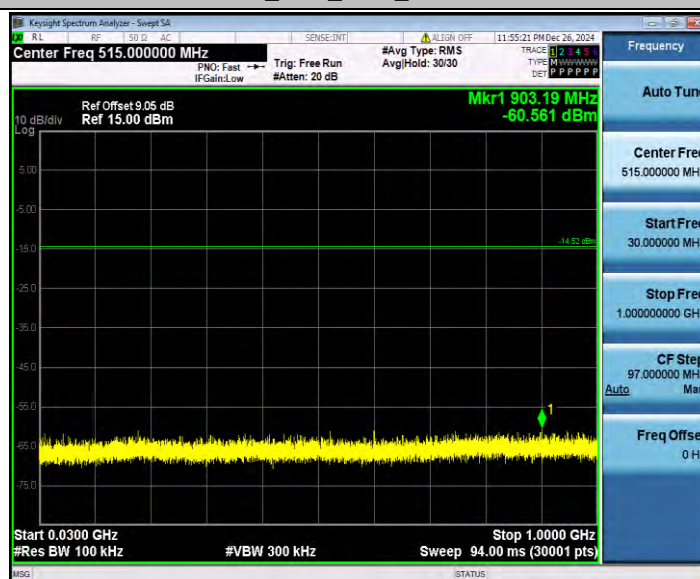




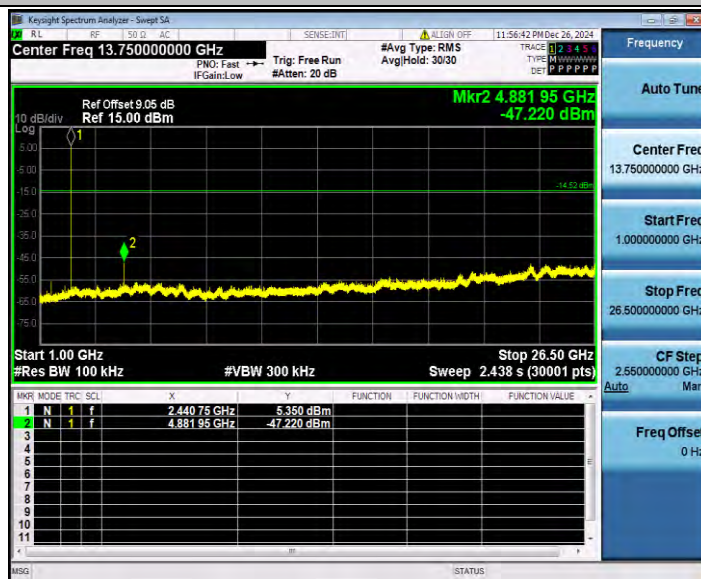
DH1_Ant1_2441_0~Reference



DH1_Ant1_2441_30~1000



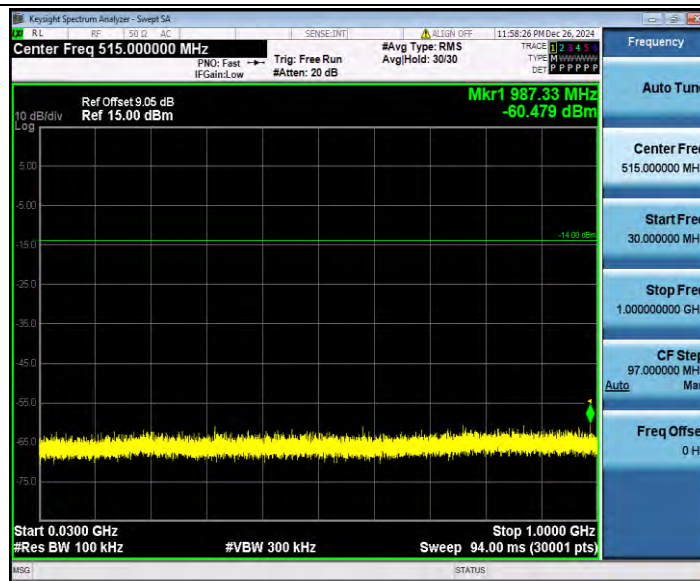
DH1_Ant1_2441_1000~26500



DH1_Ant1_2480_0~Reference



DH1_Ant1_2480_30~1000



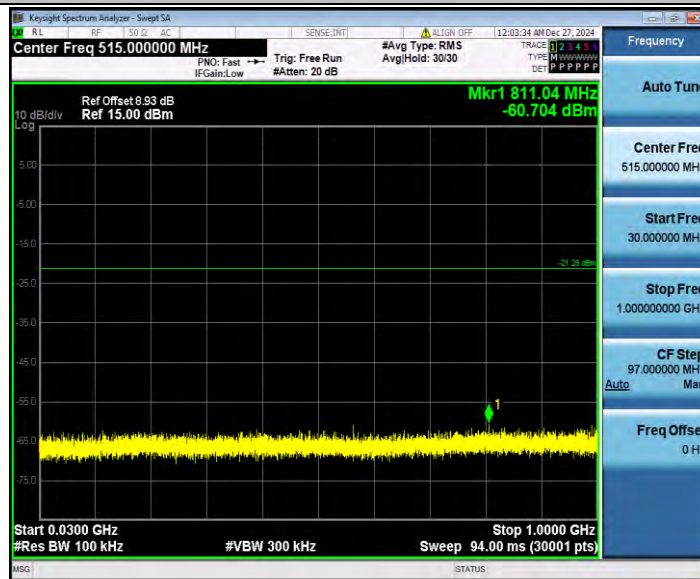
DH1_Ant1_2480_1000~26500



2DH1_Ant1_2402_0~Reference



2DH1_Ant1_2402_30~1000



2DH1_Ant1_2402_1000~26500



2DH1_Ant1_2441_0~Reference

Keysight Spectrum Analyzer - Swept SA

Center Freq 515.000000 MHz

Ref Offset 9.05 dB
Ref 15.00 dBm

10 dB/div
Log

Mkr1 852.27 MHz
-60.708 dBm

Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz

Stop 1.0000 GHz
Sweep 94.00 ms (30001 pts)

Frequency

Auto Tune

Center Freq
515.000000 MHz

Start Freq
30.000000 MHz

Stop Freq
1.000000000 GHz

CF Step
97.000000 MHz
Auto Man

Freq Offset
0 Hz

MSG STATUS

Keysight Spectrum Analyzer - Sweep SA

R/L RS S.I. O. AC SENSE[INT] ALIGN OFF 12-08-04 AM Dec 27, 2024

Center Freq 13.750000000 GHz Trg: Free Run #Avg Type: RMS TYPE M WAAAAH DET P P P P P
PMO: Fast IF Gain: Low AvgHold: 30/30 Att: 20 dB

Auto Tune

Frequency

Center Freq 13.750000000 GHz

Start Freq 1.000000000 GHz

Stop Freq 26.500000000 GHz

CF Step 2.550000000 GHz Man

Freq Offset 0 Hz

10 dB/div Ref Offset 9.05 dB Mkr2 26.046 95 GHz
Log Ref 15.00 dBm -47.812 dBm

Start 1.00 GHz Stop 26.50 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.438 s (30001 pts)

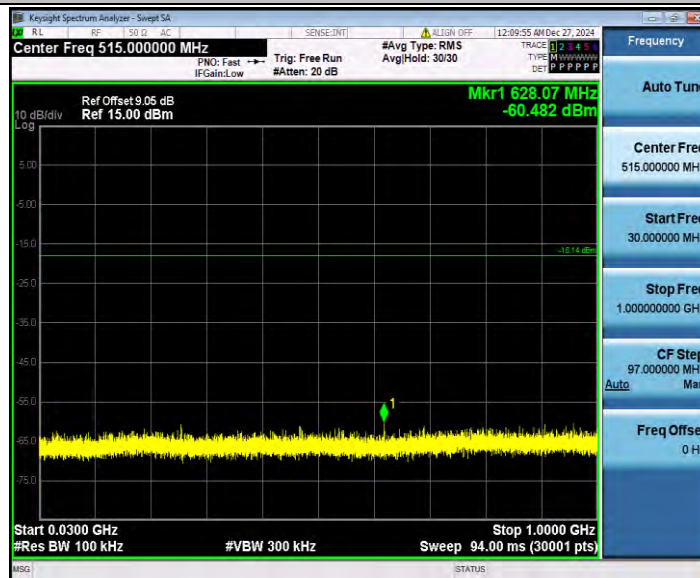
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.441 80 GHz	-6.955 dBm			
2	N	1	f	26.046 95 GHz	-47.812 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

MISO STATUS

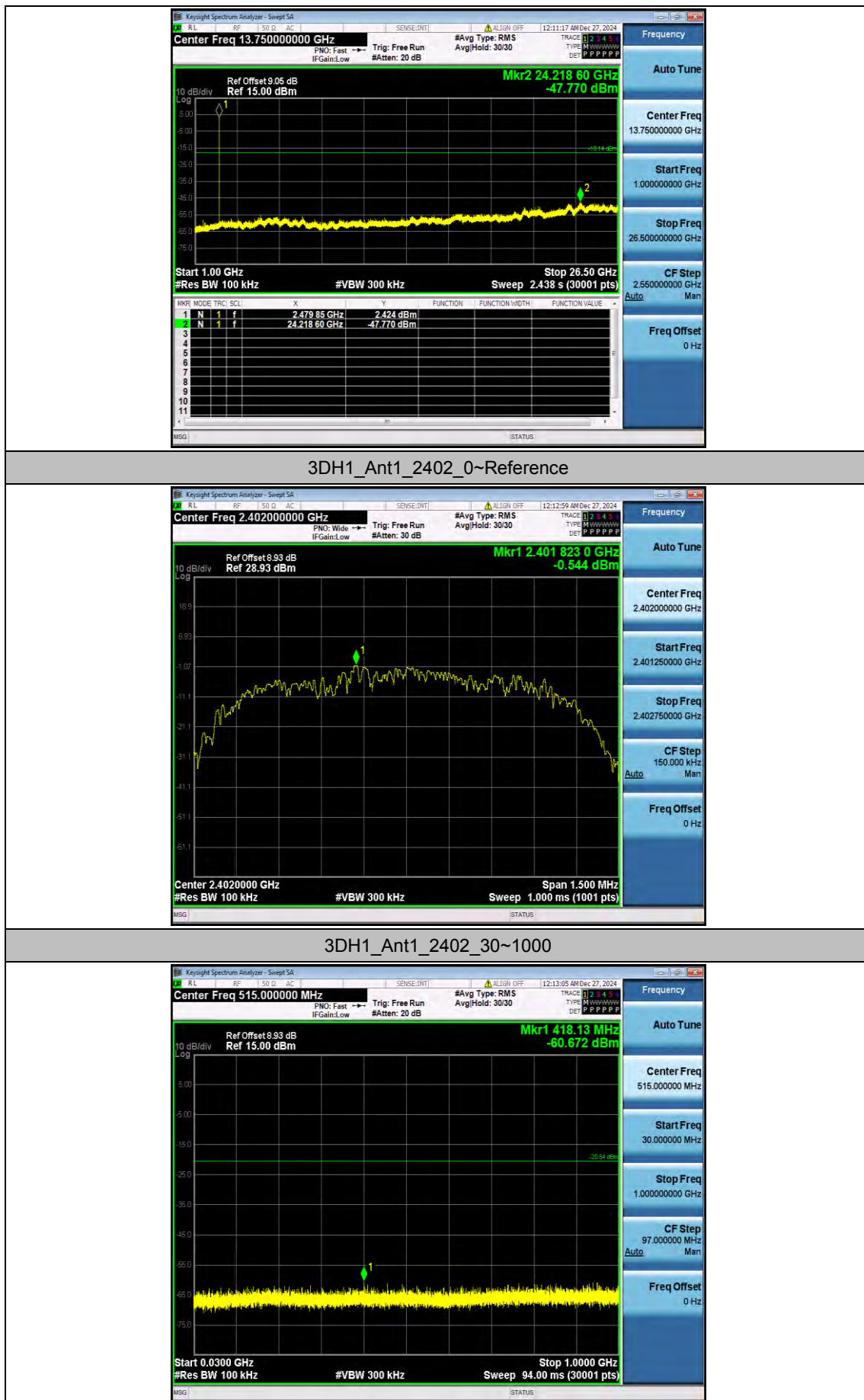
2DH1_Ant1_2480_0~Reference



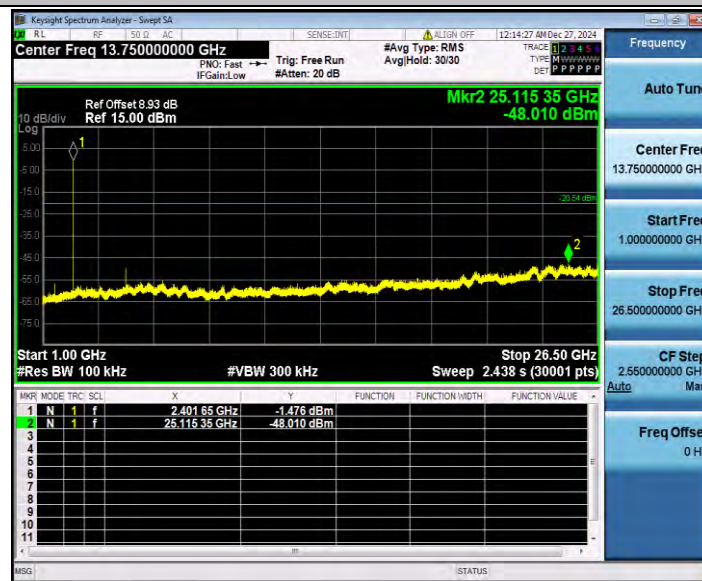
2DH1_Ant1_2480_30~1000



2DH1_Ant1_2480_1000~26500



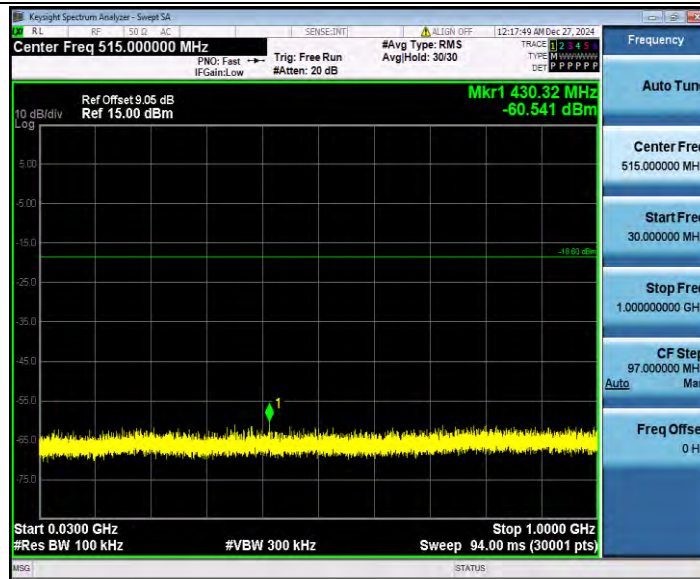
3DH1_Ant1_2402_1000~26500



3DH1_Ant1_2441_0~Reference



3DH1_Ant1_2441_30~1000

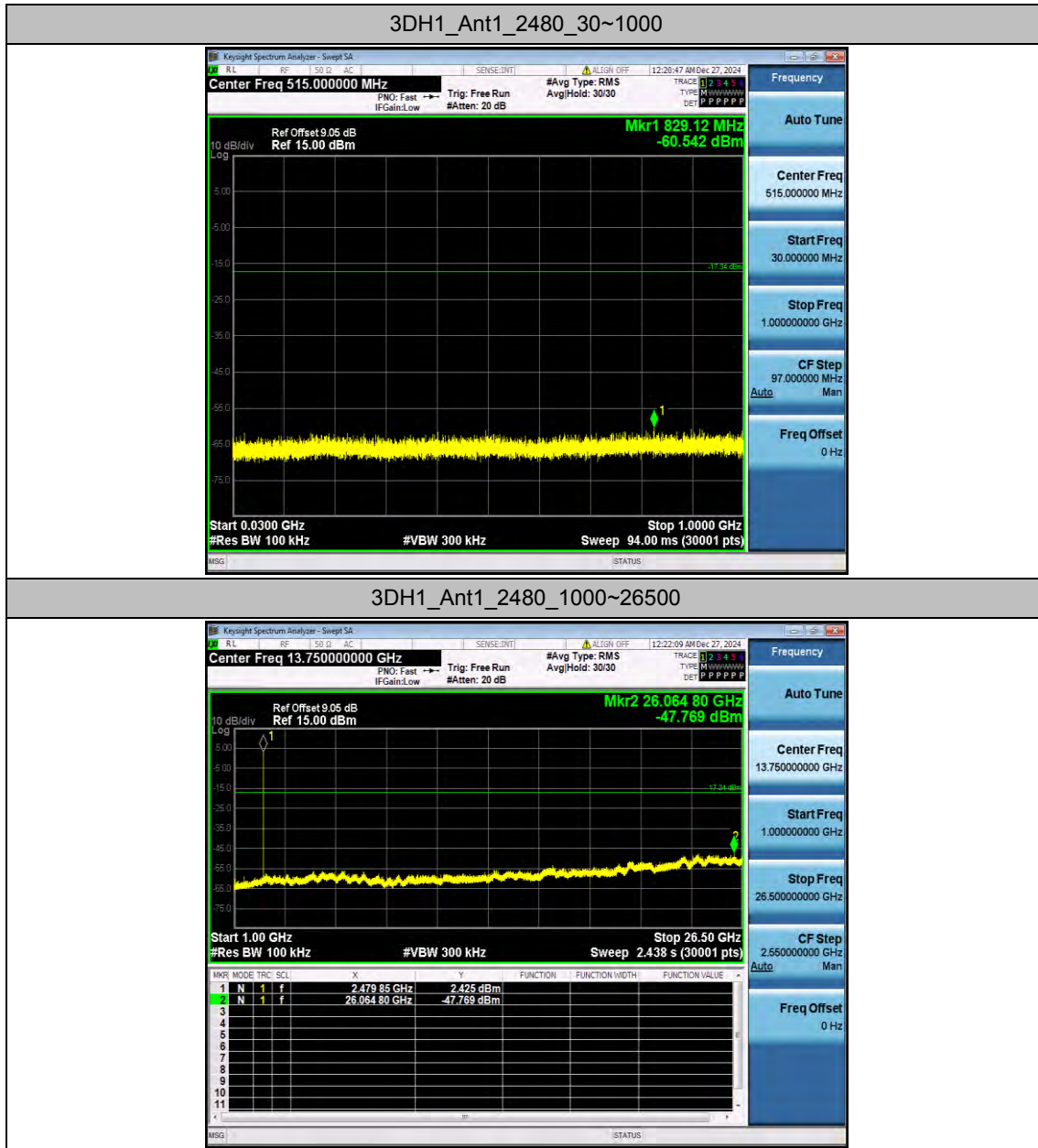


3DH1_Ant1_2441_1000~26500



3DH1_Ant1_2480_0~Reference





Appendix A.9: Emissions in Restricted Bands

Test Result

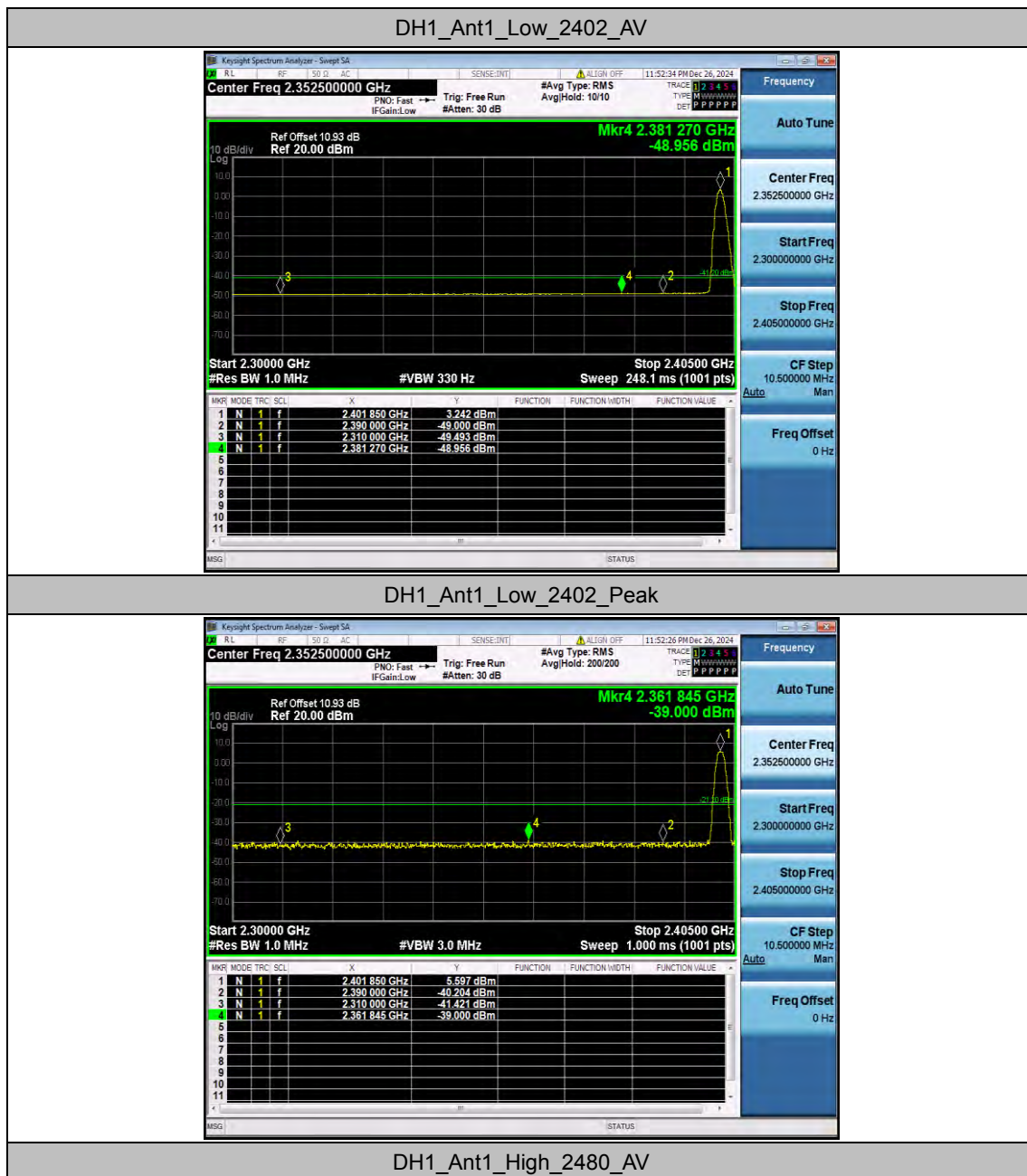
TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH1	Ant1	Low	2402	AV	2310.000	-49.49	≤-41.20	45.71	≤54	PASS
				AV	2381.270	-48.96	≤-41.20	46.24	≤54	PASS
				AV	2390.000	-49	≤-41.20	46.20	≤54	PASS
				Peak	2310.000	-41.42	≤-21.20	53.78	≤74	PASS
				Peak	2361.845	-39	≤-21.20	56.20	≤74	PASS
				Peak	2390.000	-40.2	≤-21.20	55.00	≤74	PASS
		High	2480	AV	2483.500	-48.1	≤-41.20	47.10	≤54	PASS
				AV	2483.520	-48.1	≤-41.20	47.10	≤54	PASS
				AV	2500.000	-48.83	≤-41.20	46.37	≤54	PASS
				Peak	2483.500	-40.89	≤-21.20	54.31	≤74	PASS
				Peak	2498.160	-38.33	≤-21.20	56.87	≤74	PASS
				Peak	2500.000	-41.05	≤-21.20	54.15	≤74	PASS
2DH1	Ant1	Low	2402	AV	2310.000	-49.54	≤-41.20	45.66	≤54	PASS
				AV	2381.795	-48.98	≤-41.20	46.22	≤54	PASS
				AV	2390.000	-49.24	≤-41.20	45.96	≤54	PASS
				Peak	2310.000	-41.64	≤-21.20	53.56	≤74	PASS
				Peak	2343.365	-38.55	≤-21.20	56.65	≤74	PASS
				Peak	2390.000	-39.13	≤-21.20	56.07	≤74	PASS
		High	2480	AV	2483.500	-48.47	≤-41.20	46.73	≤54	PASS
				AV	2483.520	-48.47	≤-41.20	46.73	≤54	PASS
				AV	2500.000	-48.88	≤-41.20	46.32	≤54	PASS
				Peak	2483.500	-41.35	≤-21.20	53.85	≤74	PASS
				Peak	2490.800	-38.95	≤-21.20	56.25	≤74	PASS
				Peak	2500.000	-41.12	≤-21.20	54.08	≤74	PASS
3DH1	Ant1	Low	2402	AV	2310.000	-49.67	≤-41.20	45.53	≤54	PASS
				AV	2385.470	-49.01	≤-41.20	46.19	≤54	PASS
				AV	2390.000	-49.15	≤-41.20	46.05	≤54	PASS
				Peak	2310.000	-41.43	≤-21.20	53.77	≤74	PASS
				Peak	2363.525	-37.93	≤-21.20	57.27	≤74	PASS
				Peak	2390.000	-41.11	≤-21.20	54.09	≤74	PASS
		High	2480	AV	2483.500	-48.08	≤-41.20	47.12	≤54	PASS
				AV	2483.520	-48.08	≤-41.20	47.12	≤54	PASS
				AV	2500.000	-48.66	≤-41.20	46.54	≤54	PASS
				Peak	2483.500	-41.14	≤-21.20	54.06	≤74	PASS
				Peak	2484.320	-37.2	≤-21.20	58.00	≤74	PASS

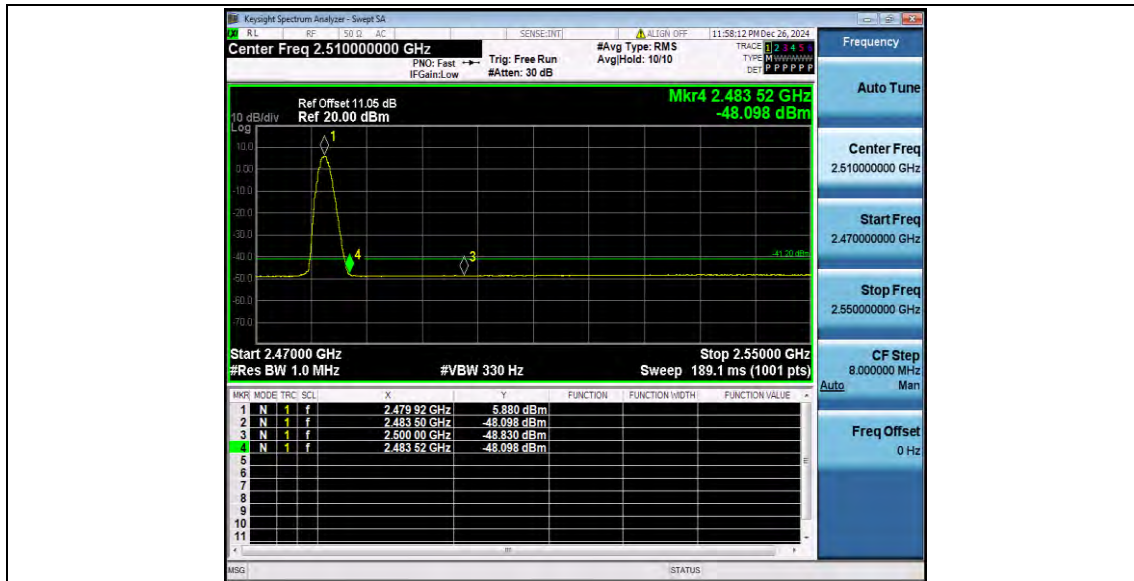
				Peak	2500.000	-41.57	≤-21.20	53.63	≤74	PASS
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Note:

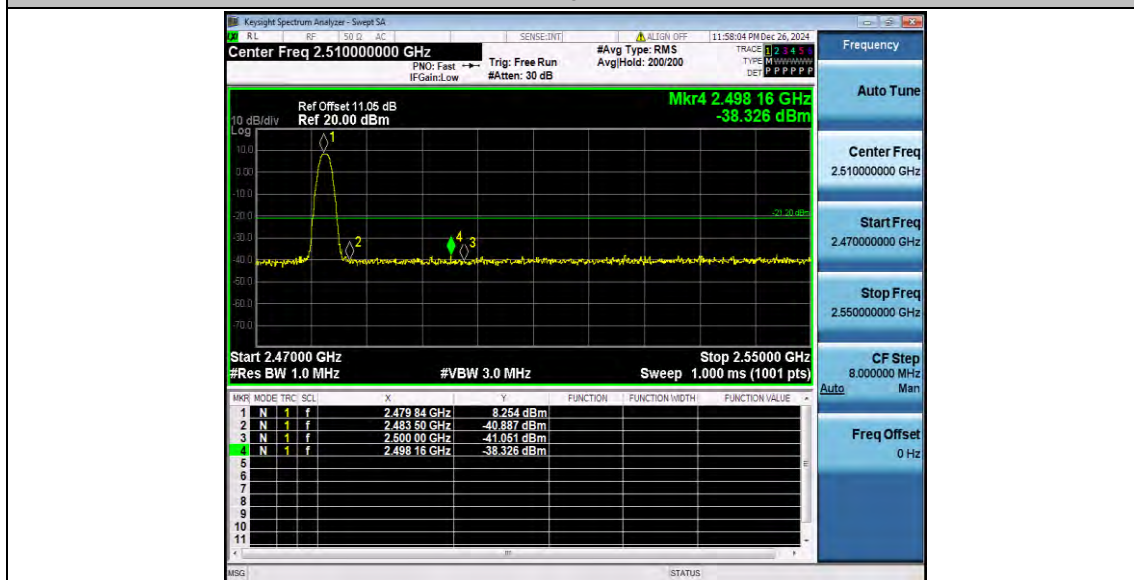
1. The Antenna Gain is compensated in the graph.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

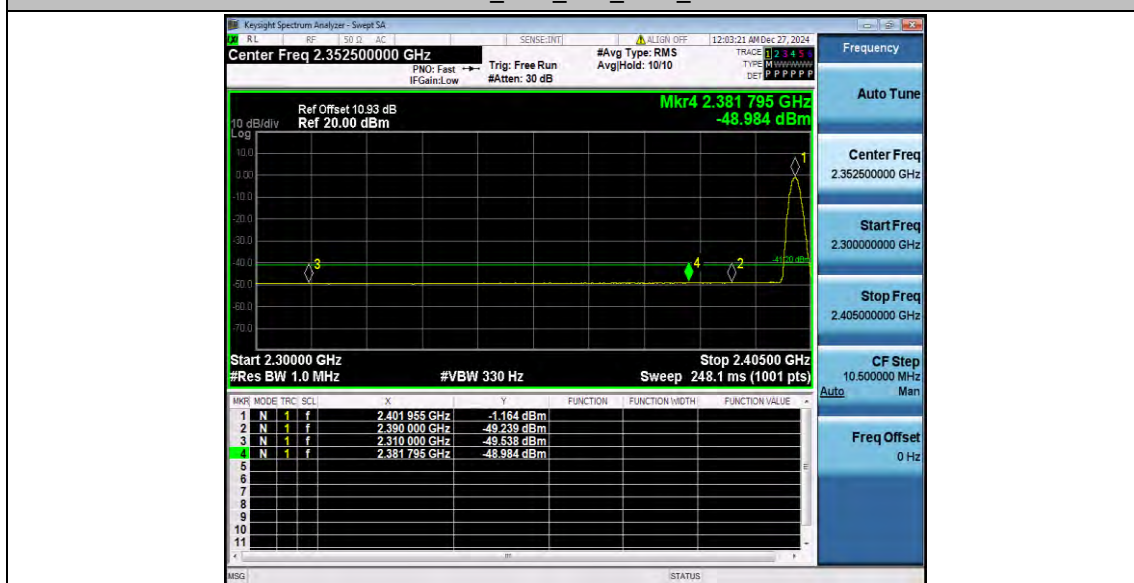




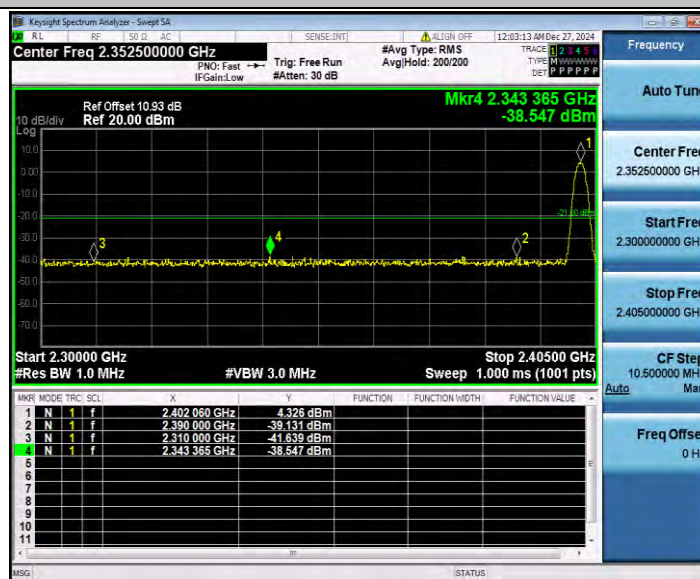
DH1_Ant1_High_2480_Peak



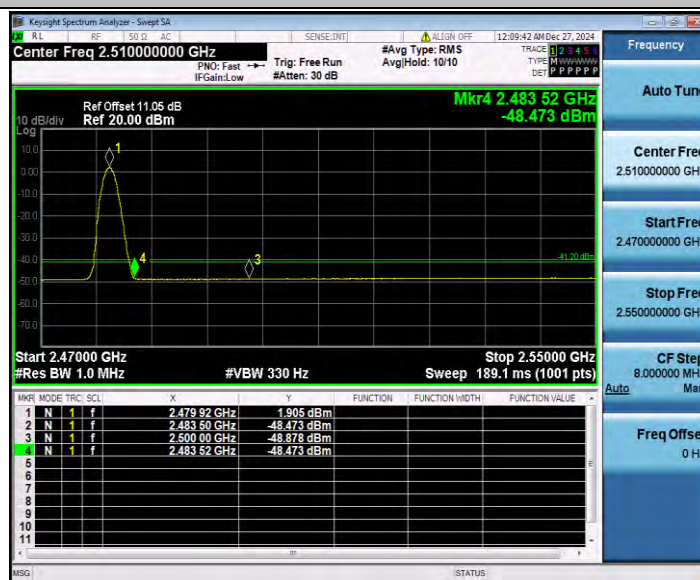
2DH1_Ant1_Low_2402_AV



2DH1_Ant1_Low_2402_Peak



2DH1_Ant1_High_2480_AV



2DH1_Ant1_High_2480_Peak

