

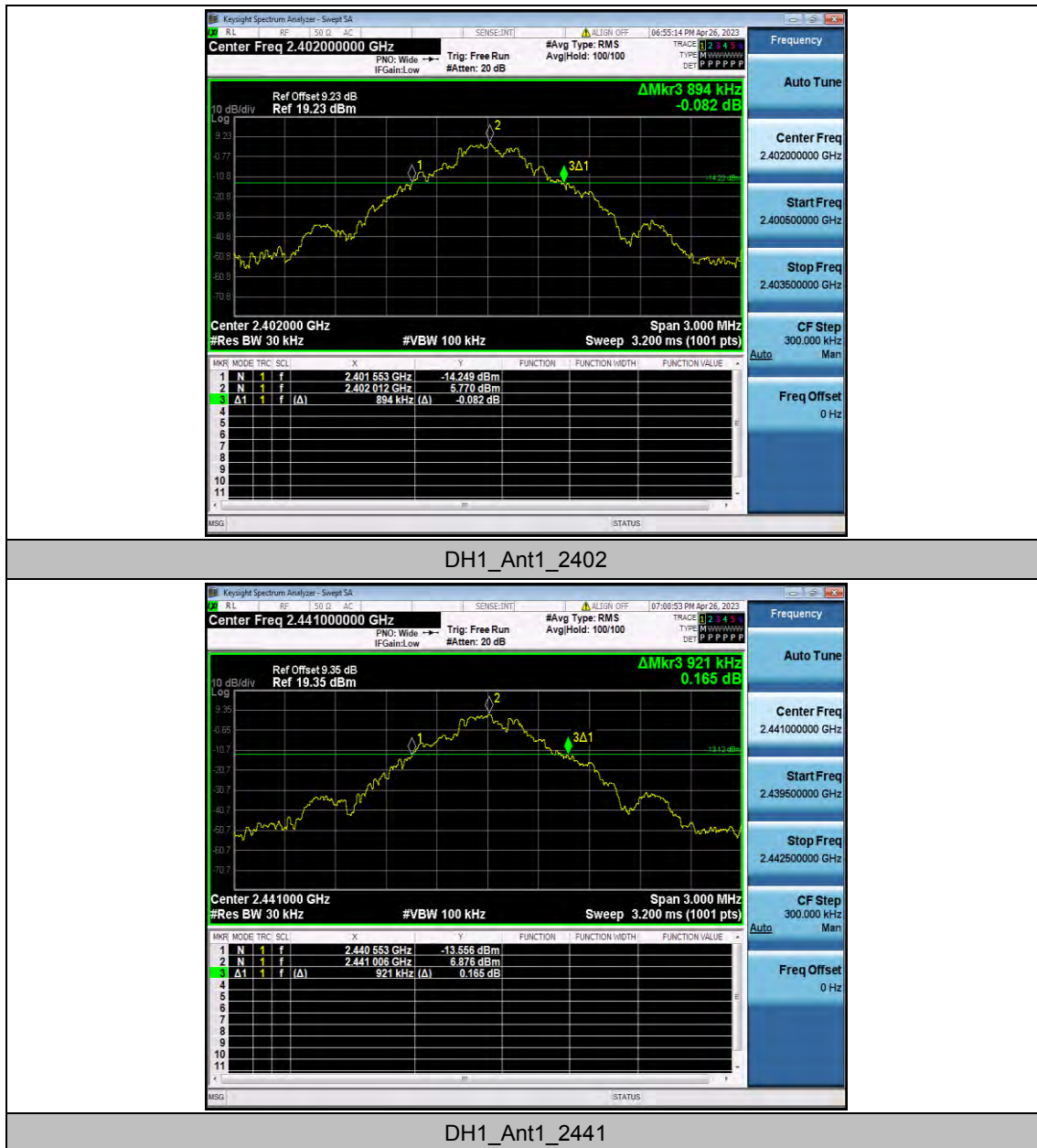
Case No. : <u>GTS20230420011-1-1</u>	
Ambient Condition: <u>23</u> °C, <u>49</u> %RH, Atmos100.1Kpa,	
Test Date: <u>2023.4.25</u>	Test Engineer: <u>Jenny zeng</u>

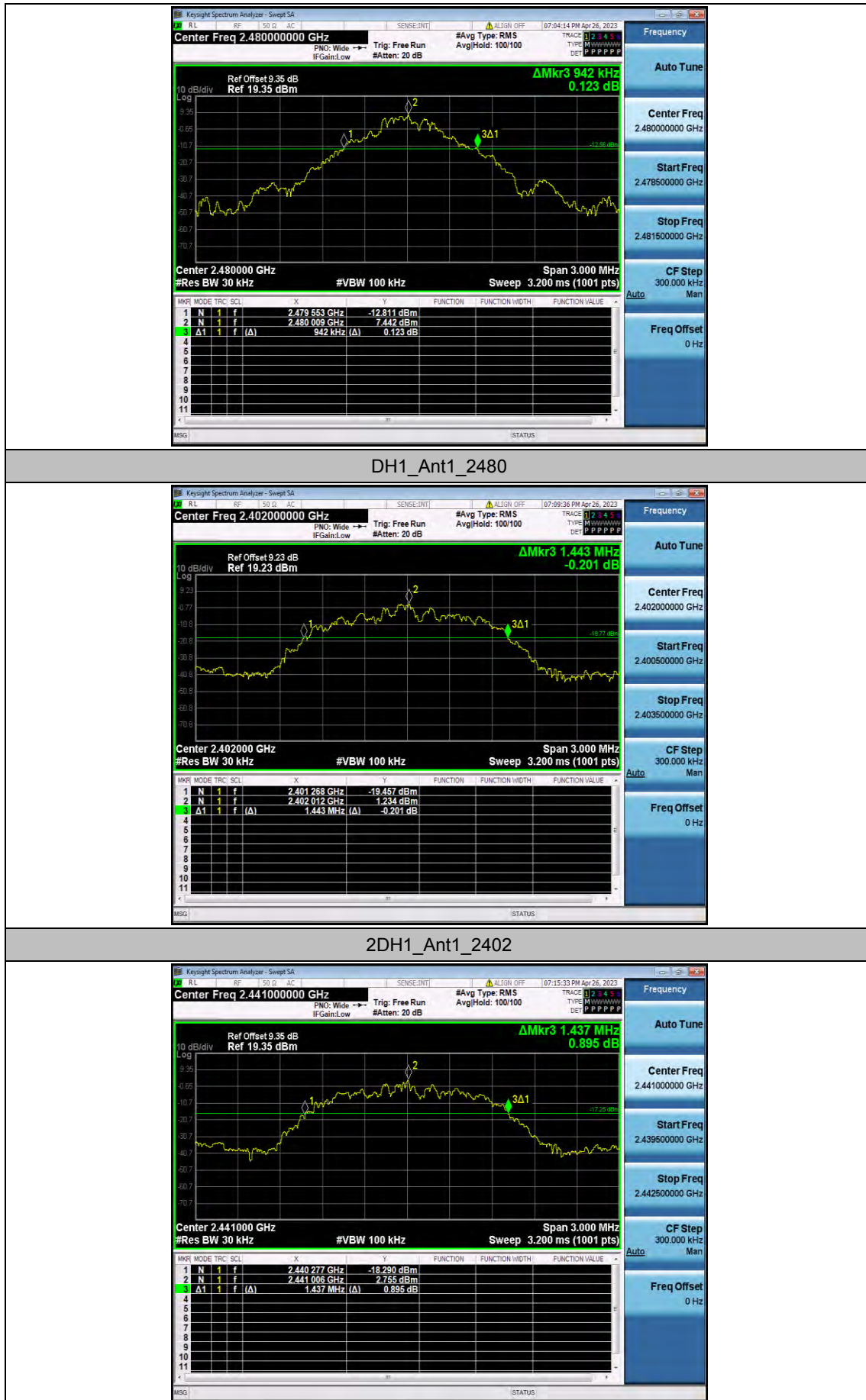
Appendix A.1: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.894	2401.553	2402.447	---	---
		2441	0.921	2440.553	2441.474	---	---
		2480	0.942	2479.553	2480.495	---	---
2DH1	Ant1	2402	1.443	2401.268	2402.711	---	---
		2441	1.437	2440.277	2441.714	---	---
		2480	1.443	2479.268	2480.711	---	---
3DH1	Ant1	2402	1.425	2401.277	2402.702	---	---
		2441	1.443	2440.286	2441.729	---	---
		2480	1.452	2479.283	2480.735	---	---

Test Graphs





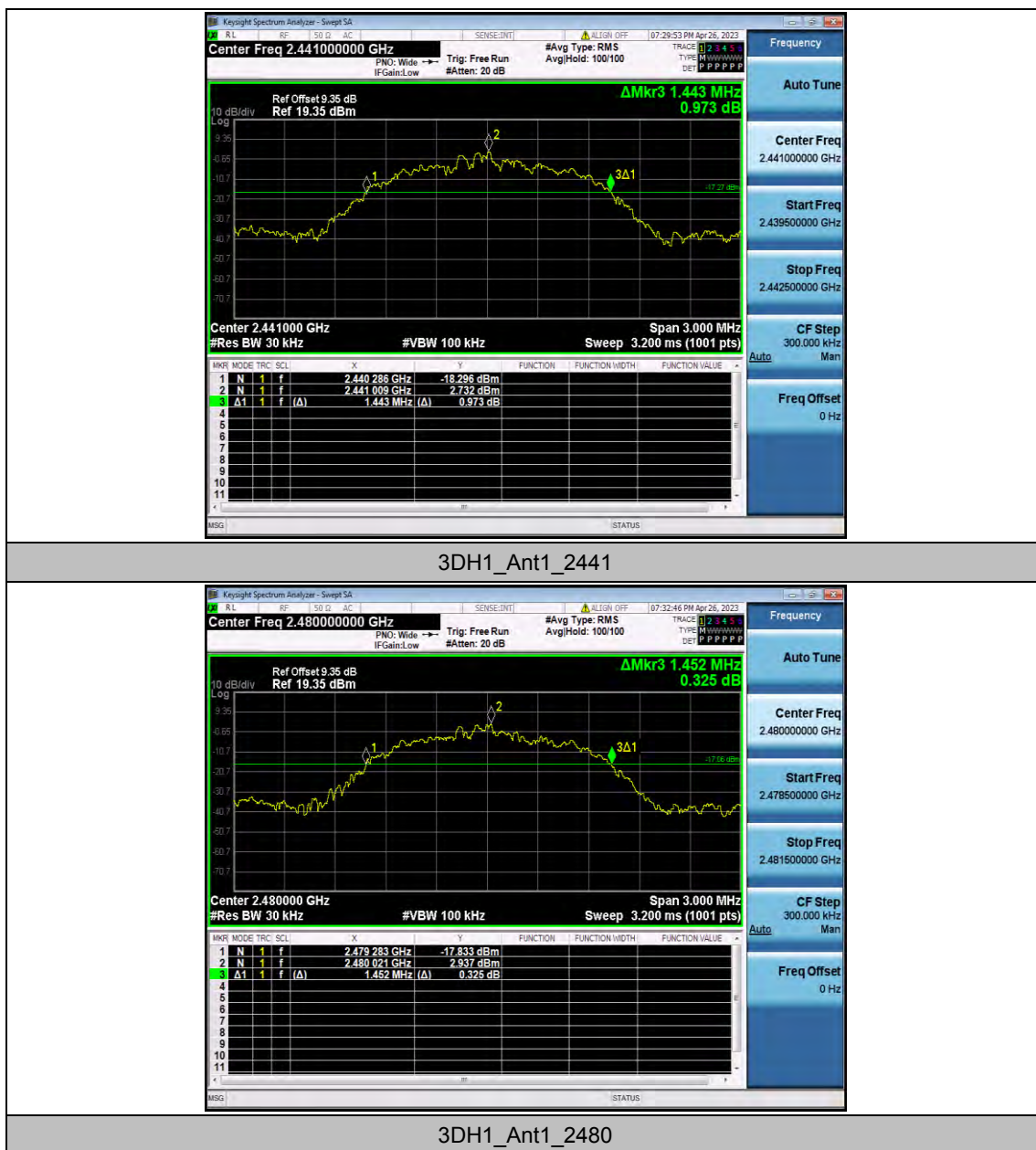
2DH1_Ant1_2441



2DH1_Ant1_2480



3DH1_Ant1_2402

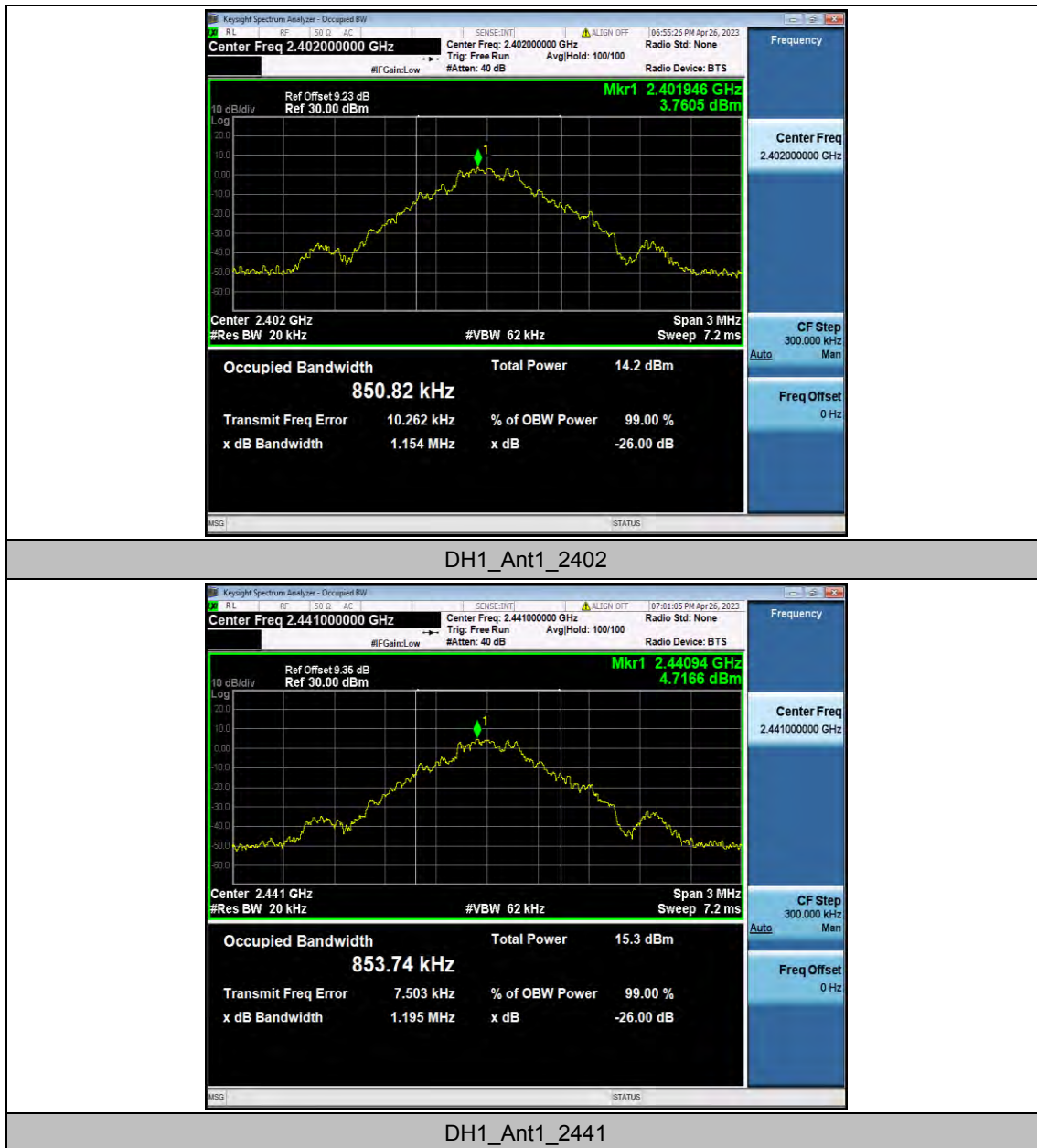


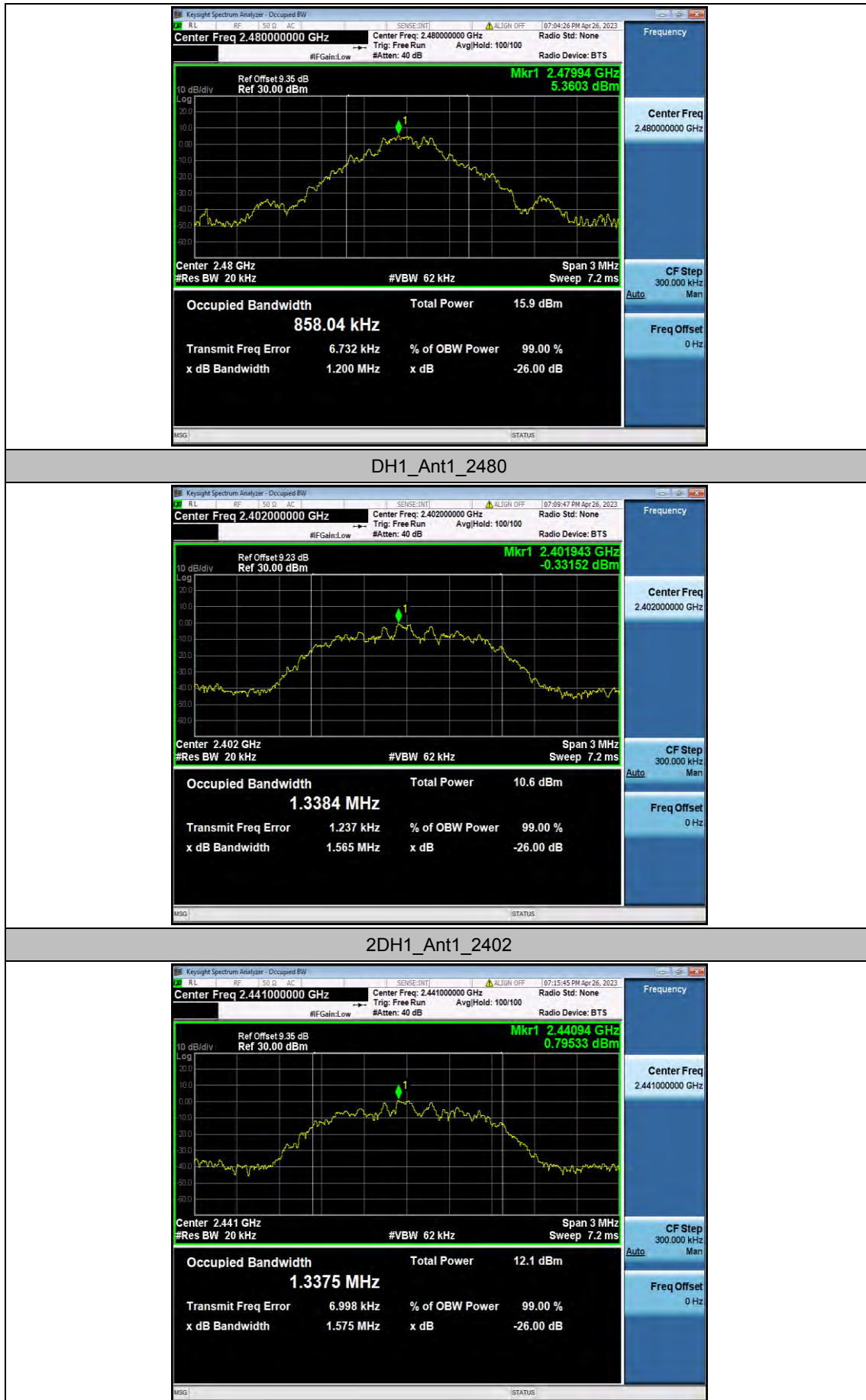
Appendix A.2: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.85082	2401.585	2402.436	---	---
		2441	0.85374	2440.581	2441.434	---	---
		2480	0.85804	2479.578	2480.436	---	---
2DH1	Ant1	2402	1.3384	2401.332	2402.670	---	---
		2441	1.3375	2440.338	2441.676	---	---
		2480	1.3300	2479.337	2480.667	---	---
3DH1	Ant1	2402	1.3462	2401.333	2402.679	---	---
		2441	1.3319	2440.343	2441.675	---	---
		2480	1.3365	2479.337	2480.673	---	---

Test Graphs





2DH1_Ant1_2441



2DH1_Ant1_2480



3DH1_Ant1_2402



Appendix A.3: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH1	Ant1	2402	7.96	≤ 20.97	PASS
		2441	9.04	≤ 20.97	PASS
		2480	9.67	≤ 20.97	PASS
2DH1	Ant1	2402	6.08	≤ 20.97	PASS
		2441	7.3	≤ 20.97	PASS
		2480	7.9	≤ 20.97	PASS
3DH1	Ant1	2402	6.2	≤ 20.97	PASS
		2441	7.45	≤ 20.97	PASS
		2480	8.05	≤ 20.97	PASS

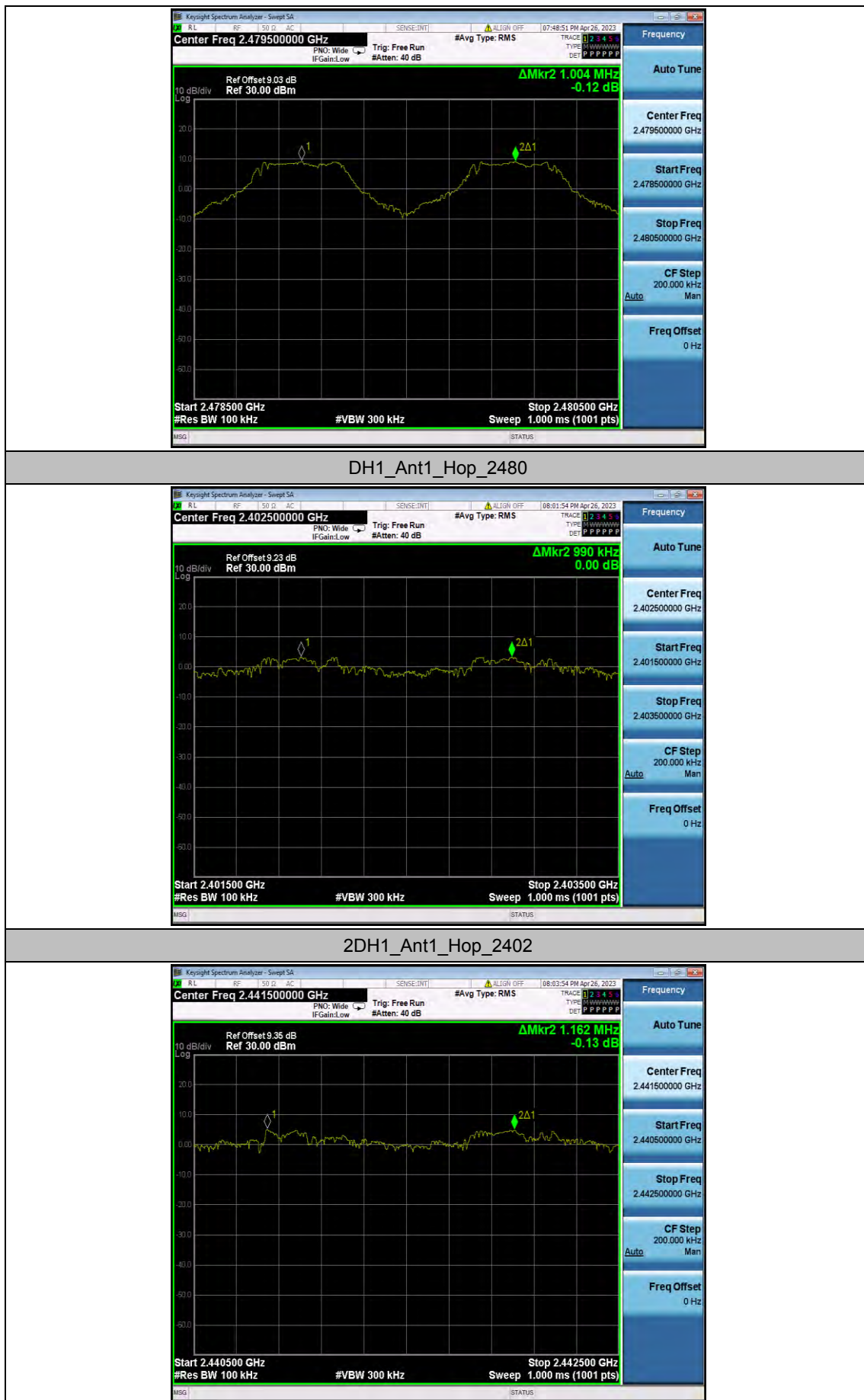
Appendix A.4: Carrier frequency separation

Test Result

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop_2402	1.154	≥ 0.942	PASS
		Hop_2441	0.996	≥ 0.942	PASS
		Hop_2480	1.004	≥ 0.942	PASS
2DH1	Ant1	Hop_2402	0.99	≥ 0.962	PASS
		Hop_2441	1.162	≥ 0.962	PASS
		Hop_2480	1.156	≥ 0.962	PASS
3DH1	Ant1	Hop_2402	1.334	≥ 0.968	PASS
		Hop_2441	1.02	≥ 0.968	PASS
		Hop_2480	1.008	≥ 0.968	PASS

Test Graphs





2DH1_Ant1_Hop_2441



2DH1_Ant1_Hop_2480



3DH1_Ant1_Hop_2402

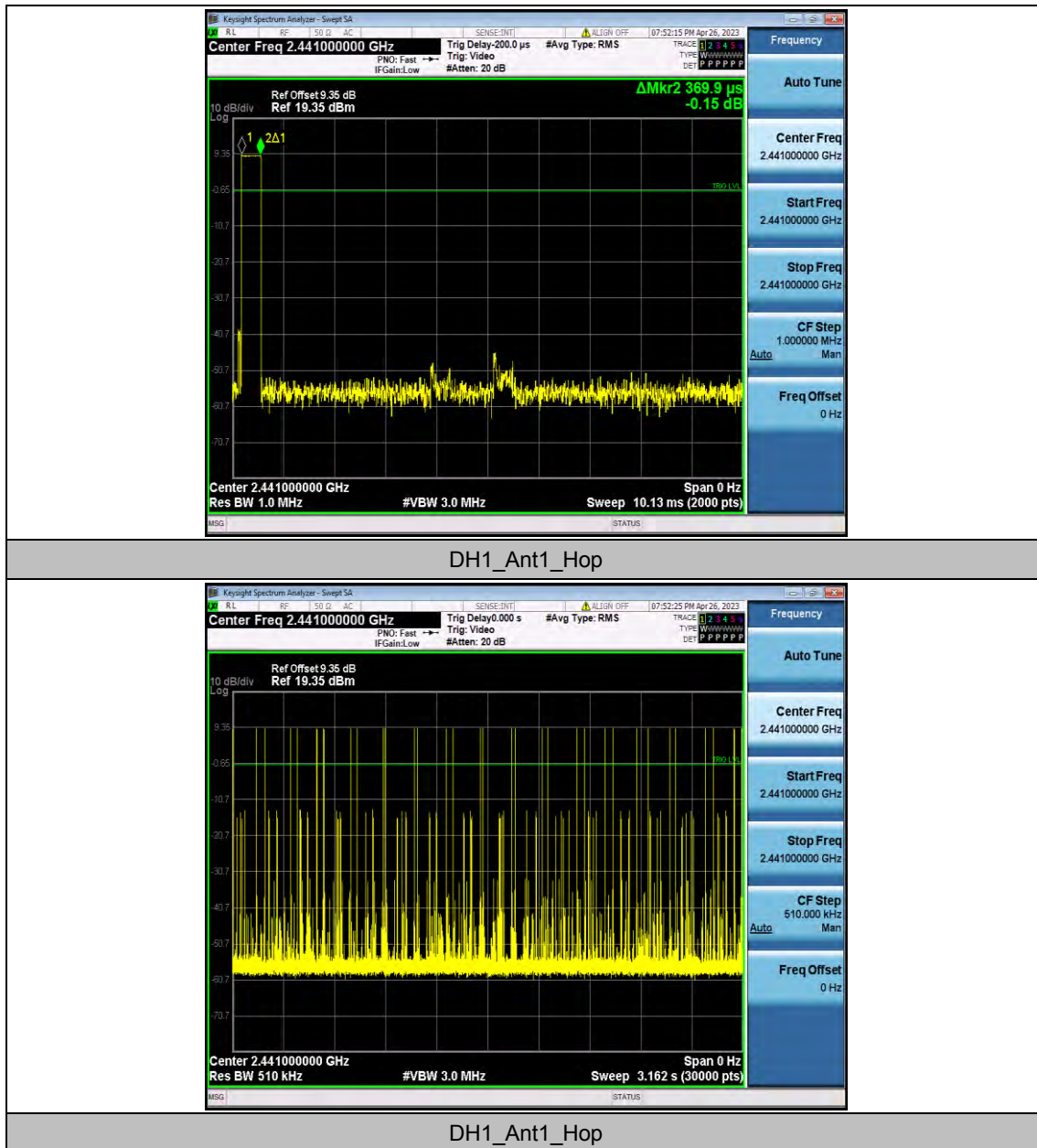


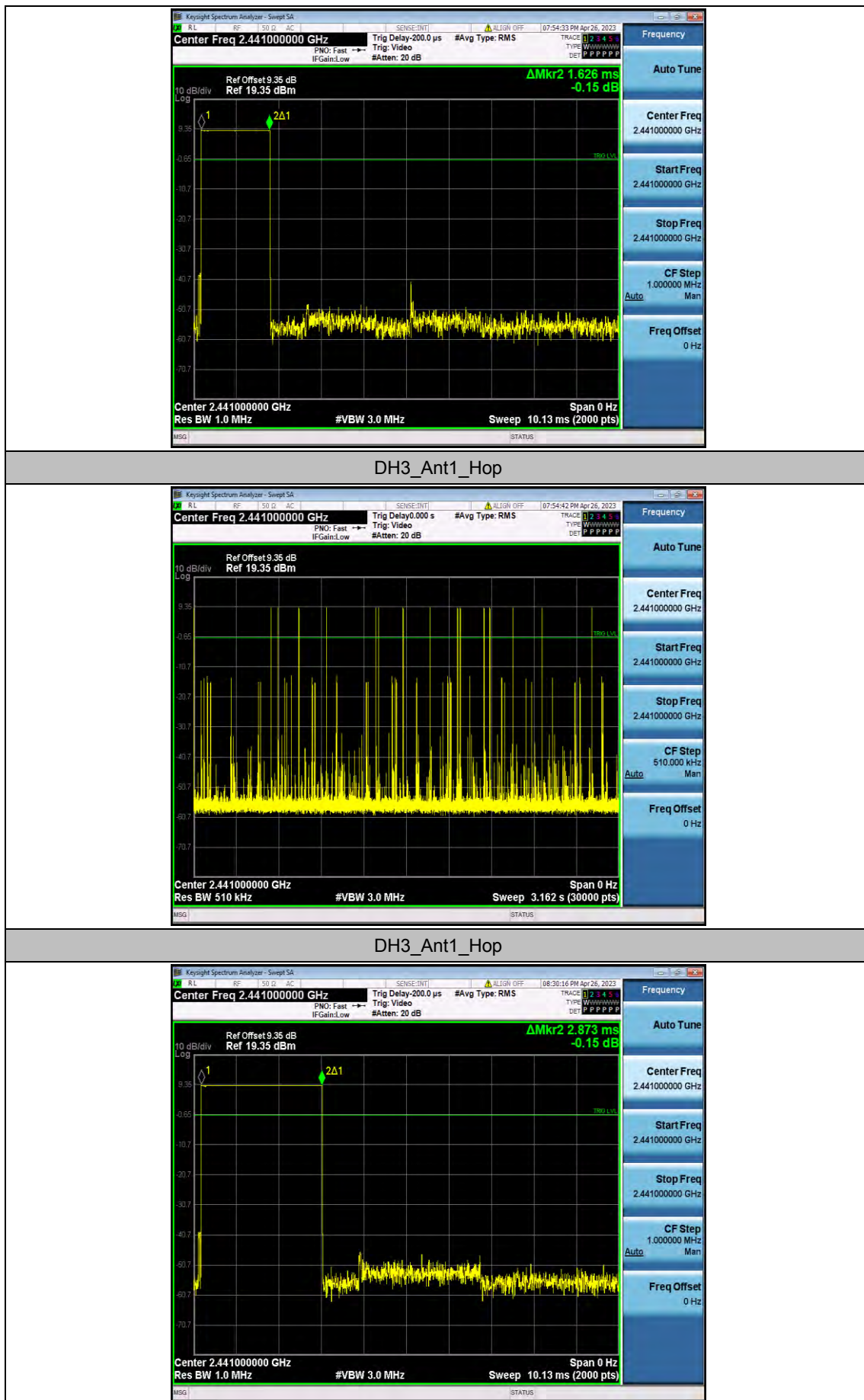
Appendix A.5: Time of occupancy

Test Result

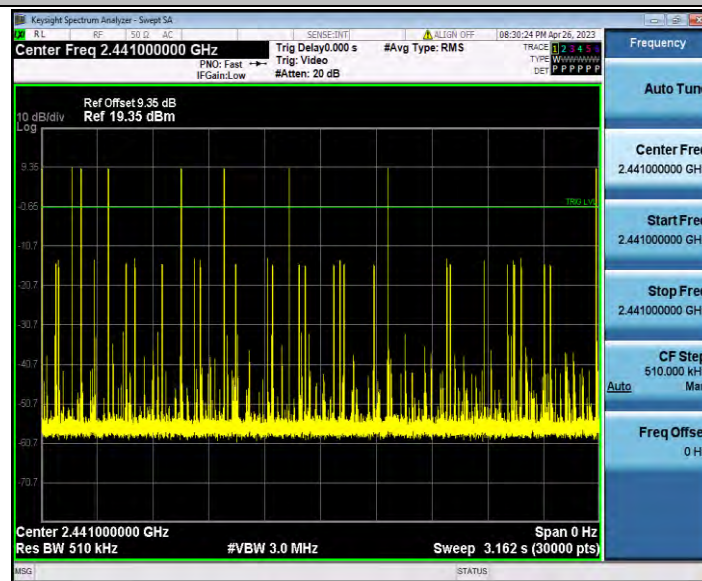
TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.37	330	0.122	≤0.4	PASS
DH3	Ant1	Hop	1.63	160	0.26	≤0.4	PASS
DH5	Ant1	Hop	2.87	90	0.259	≤0.4	PASS
2DH1	Ant1	Hop	0.38	330	0.125	≤0.4	PASS
2DH3	Ant1	Hop	1.63	190	0.31	≤0.4	PASS
2DH5	Ant1	Hop	2.88	50	0.144	≤0.4	PASS
3DH1	Ant1	Hop	0.38	330	0.124	≤0.4	PASS
3DH3	Ant1	Hop	1.60	180	0.289	≤0.4	PASS
3DH5	Ant1	Hop	2.88	110	0.317	≤0.4	PASS

Test Graphs

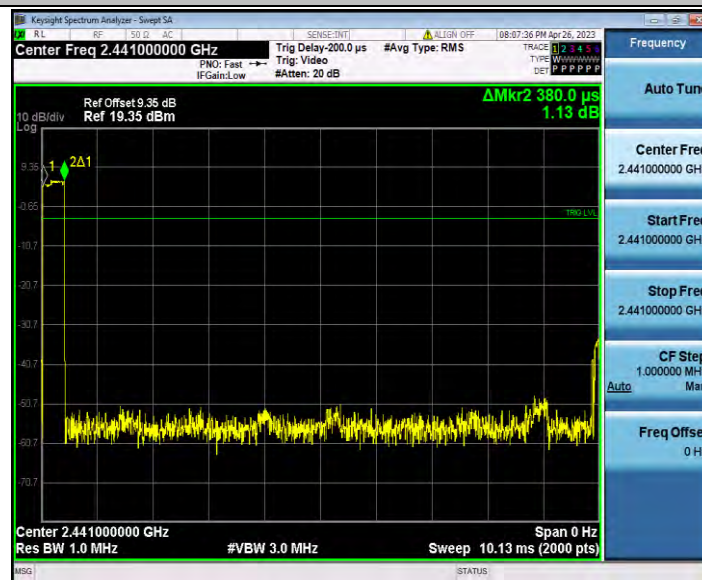




DH5_Ant1_Hop



DH5_Ant1_Hop



2DH1_Ant1_Hop

Keysight Spectrum Analyzer - Sweep SA

Center Freq 2.441000000 GHz

Trig Delay: 200.0 μ s

#Avg Type: RMS

08:13:32 PM Apr 26, 2023

Trace 1 2 x 1

Type: WWWWWWW

DET: P P P P P P

Ref Offset: 9.36 dB

Ref: 19.35 dBm

Δ Mkr2 1.631 ms

0.58 dB

10 dB/div

Log

9.36

0.65

10.7

20.7

30.7

40.7

50.7

60.7

70.7

1

2Δ1

TRIG LVL

Center 2.441000000 GHz

Res BW 1.0 MHz

#VBW 3.0 MHz

Sweep 10.13 ms (2000 pts)

Span 0 Hz

Frequency

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

Keysight Spectrum Analyzer - Swept SA

SENSE-TWT

ALIGN OFF

08:13:46 PM Apr 26, 2023

Trig Delay 0.000 s

Trig: Video

#Avg Type: RMS

TYPE W

DET P

P P P P P

PNO: Fast

IFGain: Low

#Atten: 20 dB

Center Freq 2.441000000 GHz

Ref Offset 9.35 dB

Ref 19.35 dBm

10 dB/div

Log

9.35

0.65

10.7

20.7

30.7

40.7

50.7

60.7

70.7

TRIG LVL

Center 2.441000000 GHz

Res BW 510 kHz

#VBW 3.0 MHz

Span 0 Hz

Sweep 3.162 s (30000 pts)

Auto Tune

Center Freq
2.441000000 GHz

Start Freq
2.441000000 GHz

Stop Freq
2.441000000 GHz

CF Step
510.000 kHz

Auto

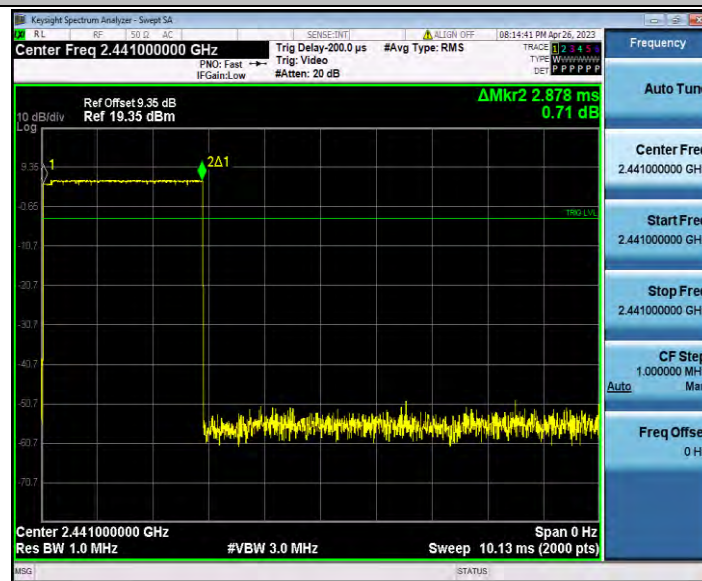
Man

Freq Offset
0 Hz

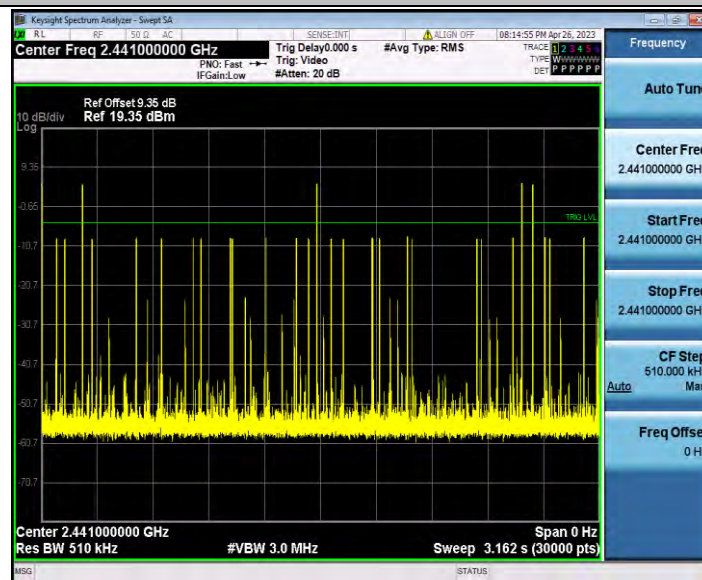
MSG

STATUS

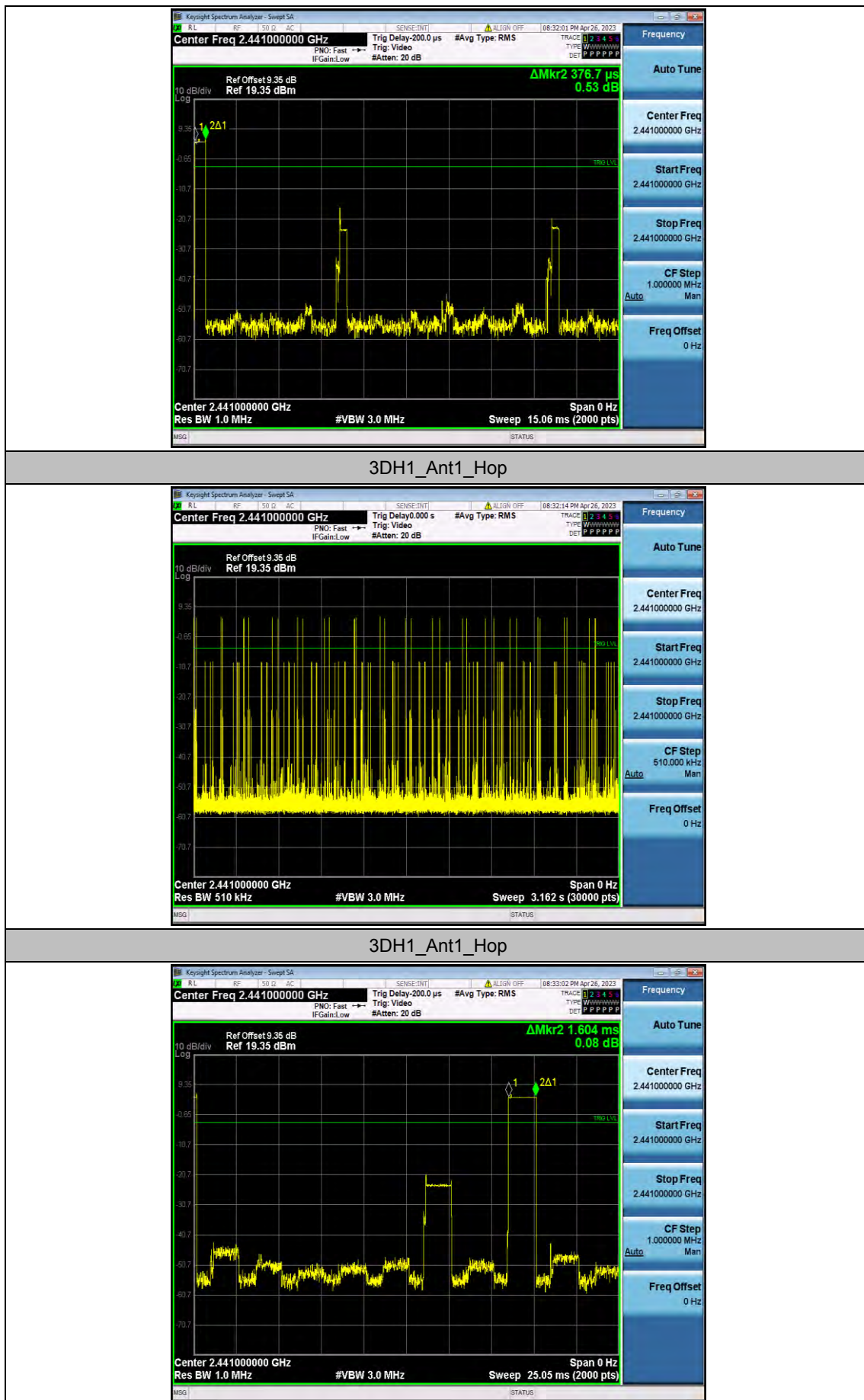
2DH3_Ant1_Hop



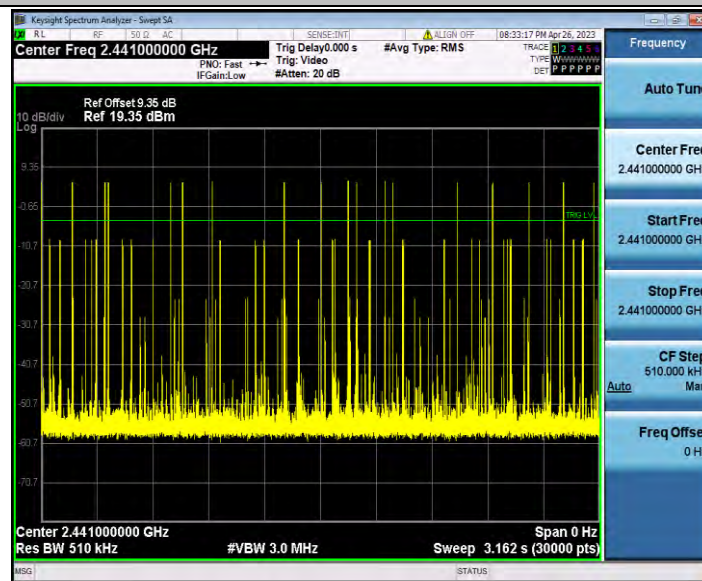
2DH5_Ant1_Hop



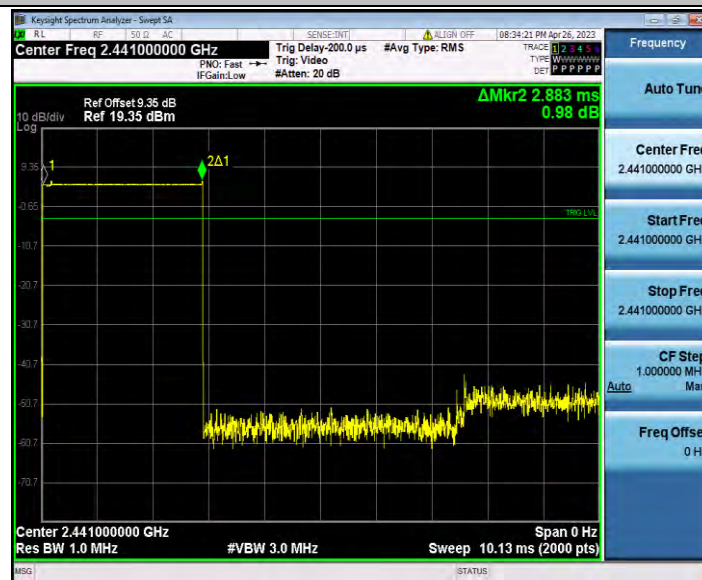
2DH5_Ant1_Hop



3DH3_Ant1_Hop



3DH3_Ant1_Hop



3DH5_Ant1_Hop

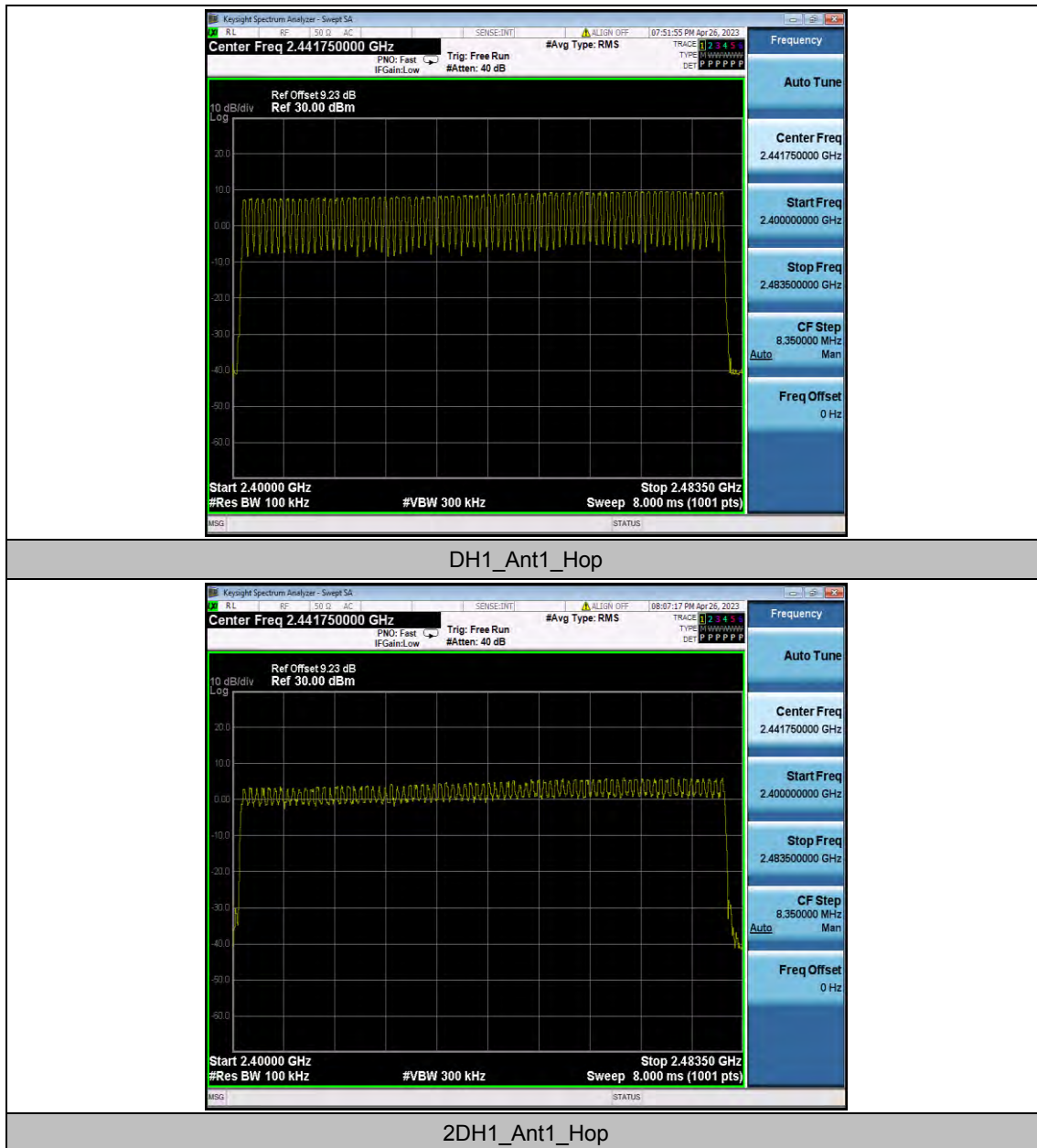


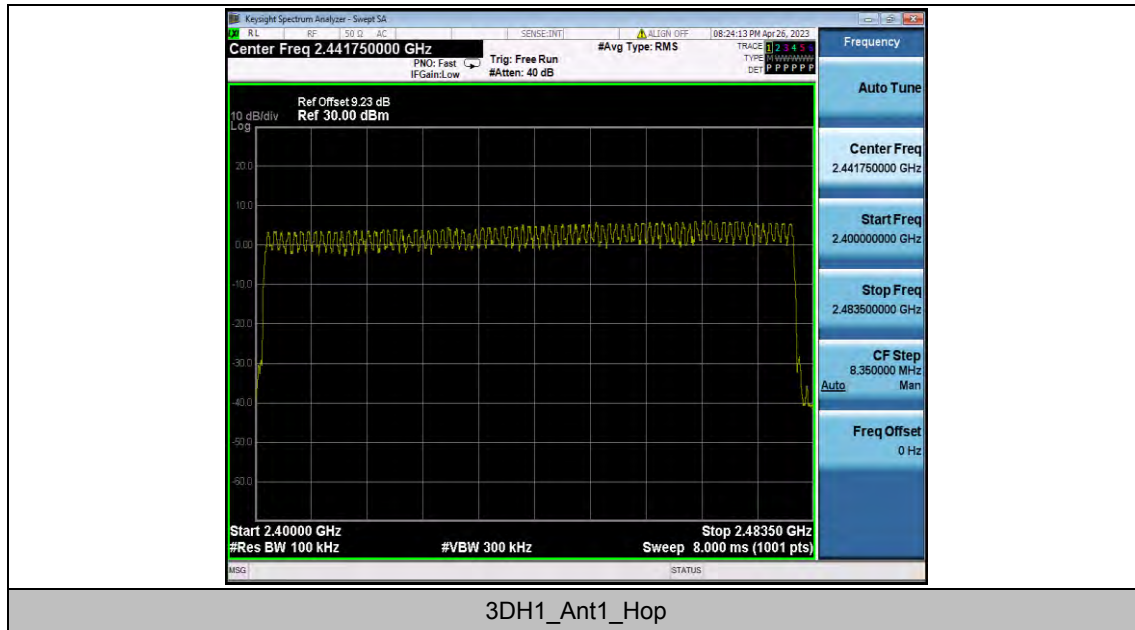
Appendix A.6: Number of hopping channels

Test Result

TestMode	Antenna	Frequency[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



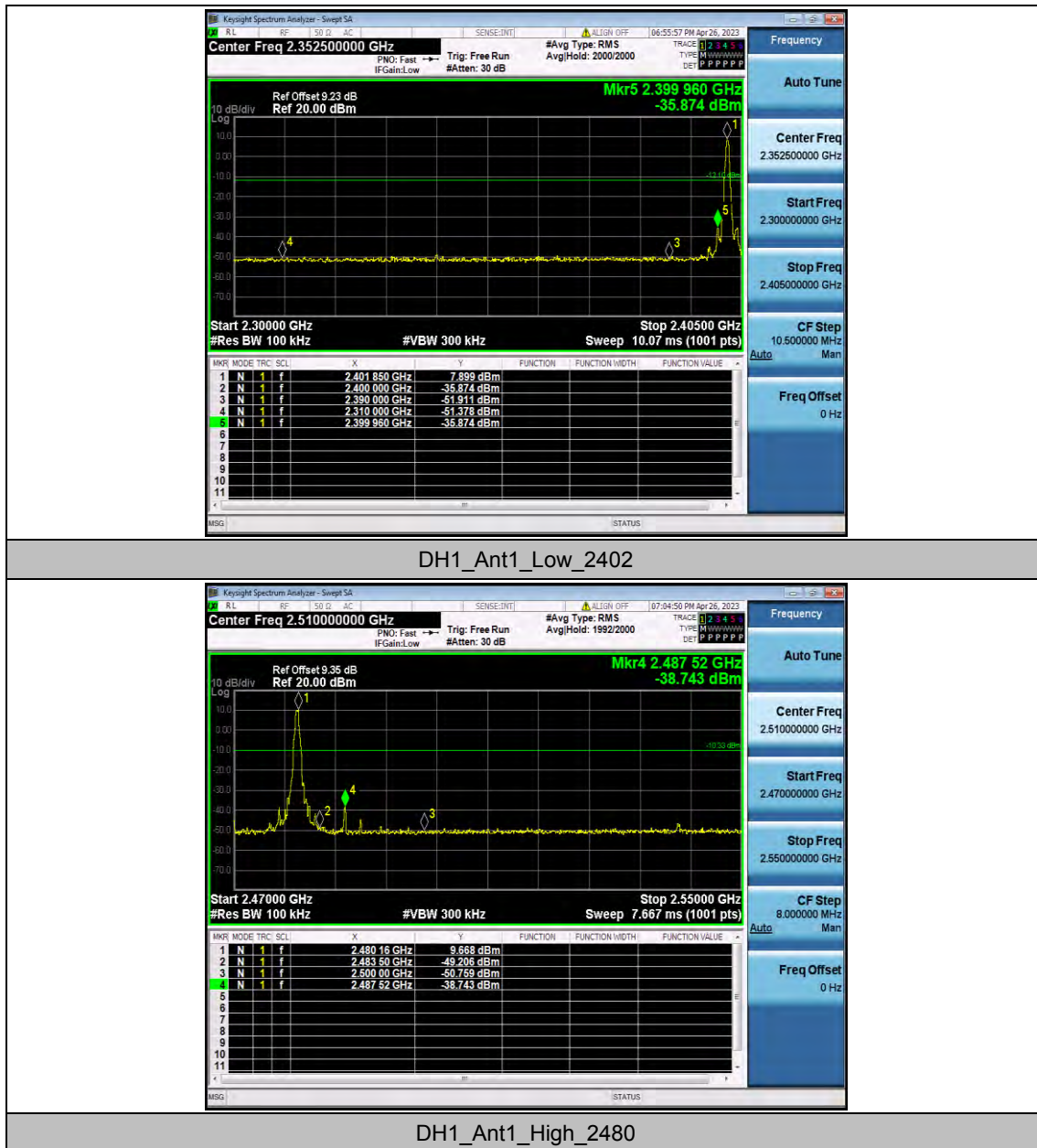


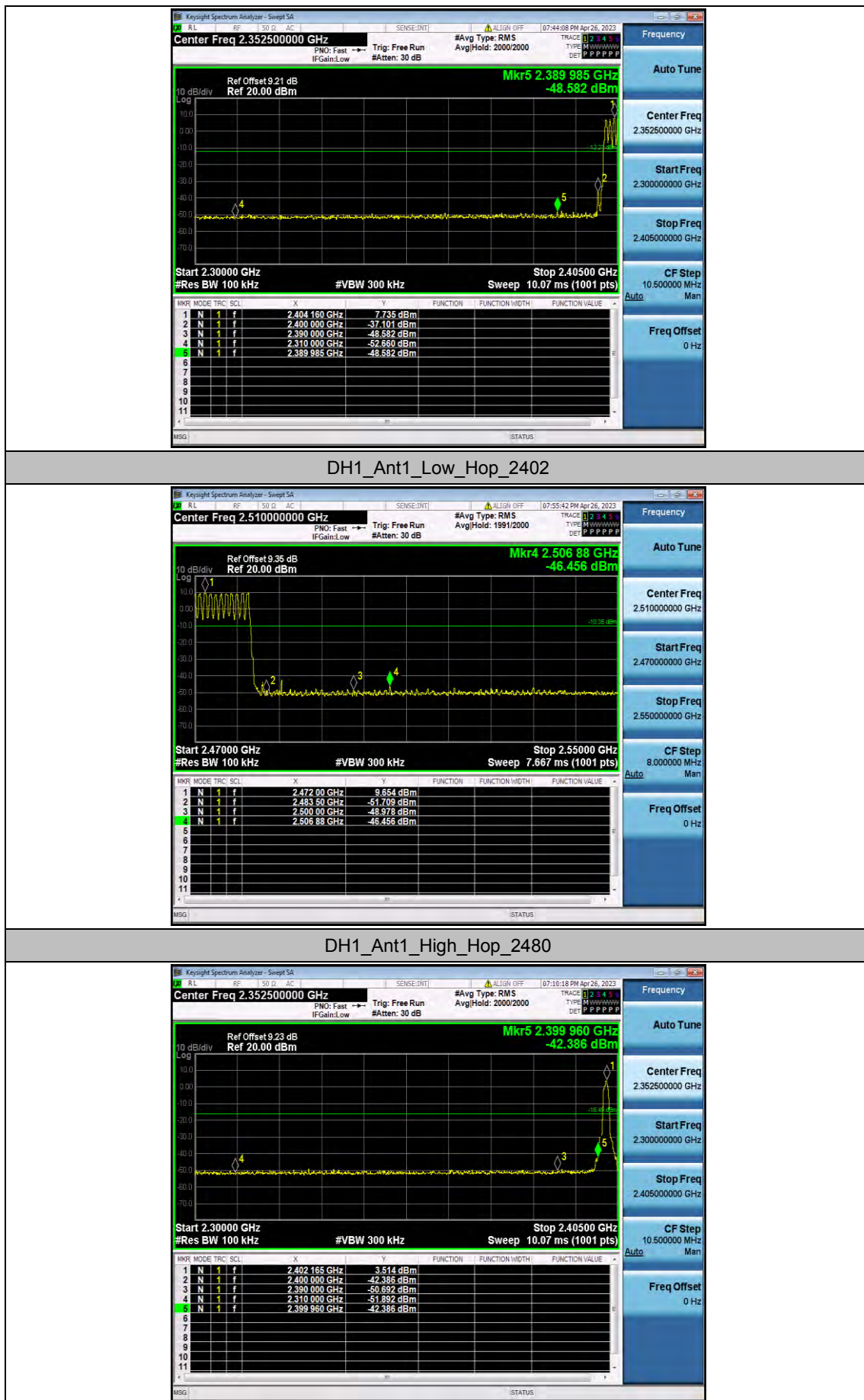
Appendix A.7: Band edge measurements

Test Result

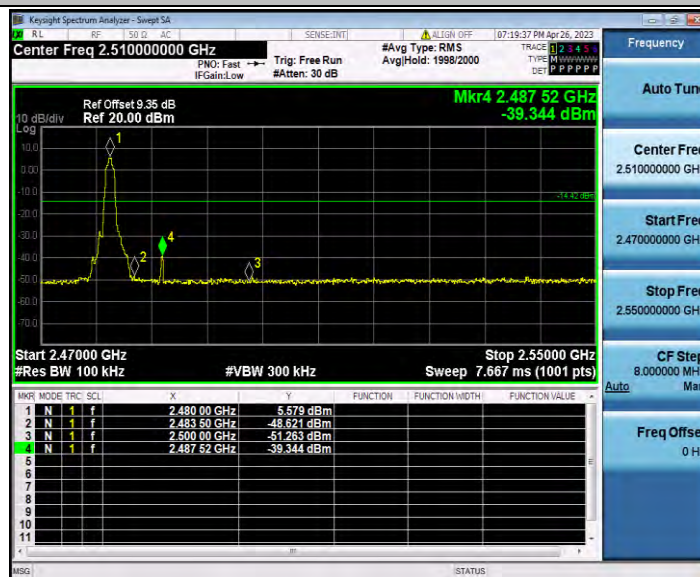
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	7.90	-35.87	≤-12.1	PASS
		High	2480	9.67	-38.74	≤-10.33	PASS
		Low	Hop_2402	7.74	-48.58	≤-12.27	PASS
		High	Hop_2480	9.65	-46.46	≤-10.35	PASS
2DH1	Ant1	Low	2402	3.51	-42.39	≤-16.49	PASS
		High	2480	5.58	-39.34	≤-14.42	PASS
		Low	Hop_2402	2.83	-49.09	≤-17.18	PASS
		High	Hop_2480	6.09	-47.95	≤-13.91	PASS
3DH1	Ant1	Low	2402	3.52	-40.29	≤-16.48	PASS
		High	2480	5.68	-38.76	≤-14.32	PASS
		Low	Hop_2402	2.57	-49.35	≤-17.43	PASS
		High	Hop_2480	5.57	-48.57	≤-14.43	PASS

Test Graphs

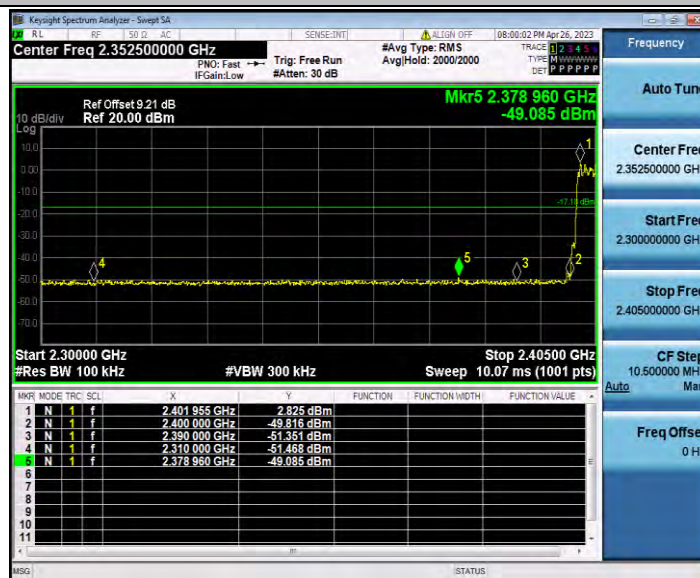




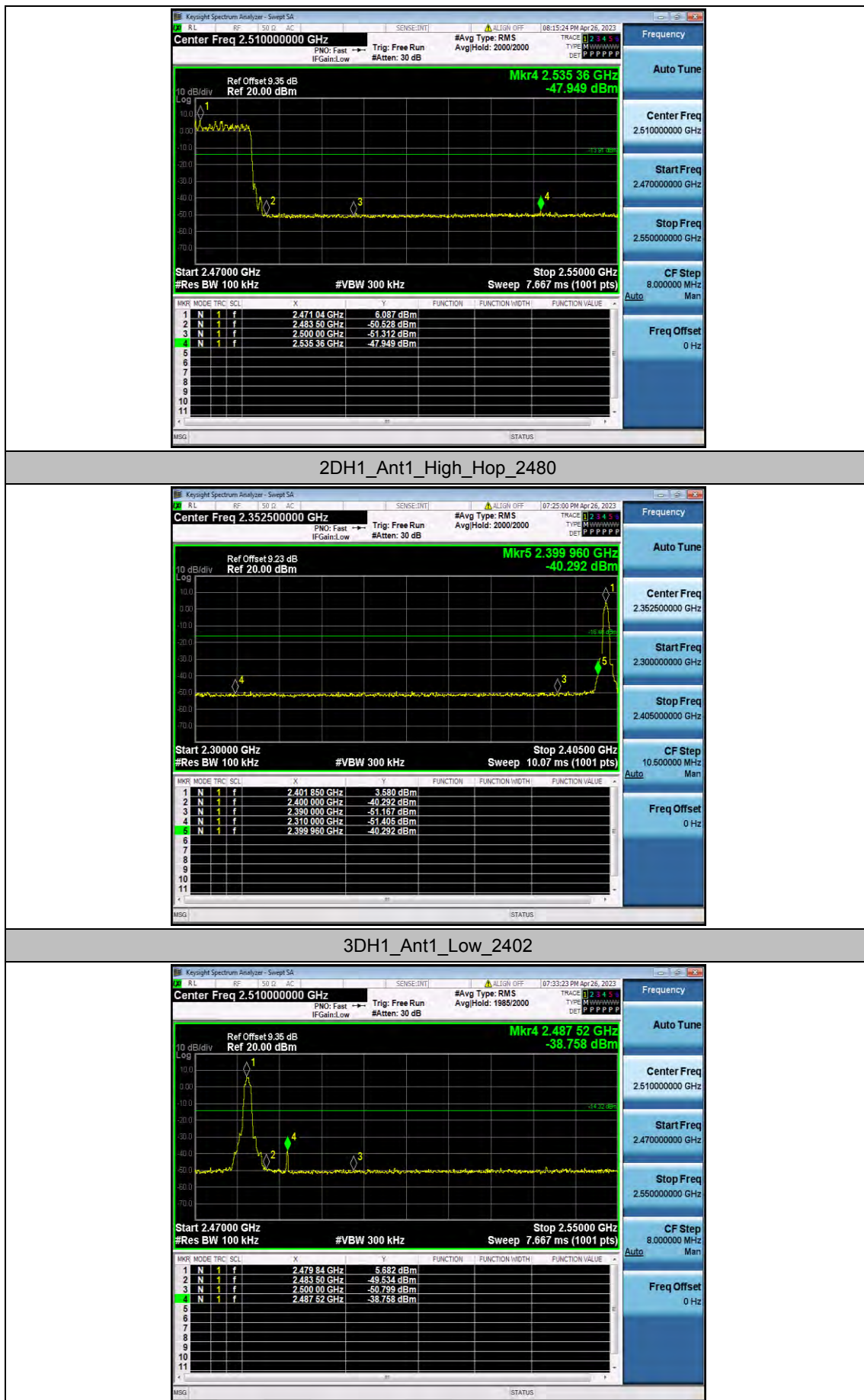
2DH1_Ant1_Low_2402



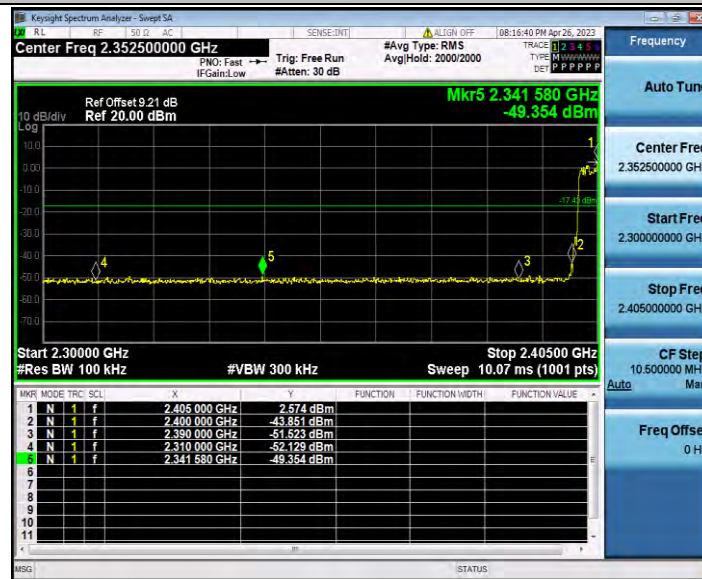
2DH1_Ant1_High_2480



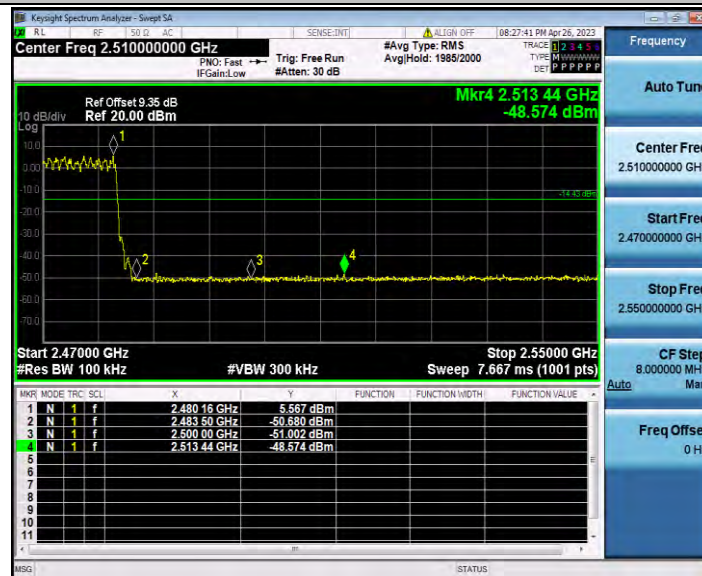
2DH1_Ant1_Low_Hop_2402



3DH1_Ant1_High_2480



3DH1_Ant1_Low_Hop_2402



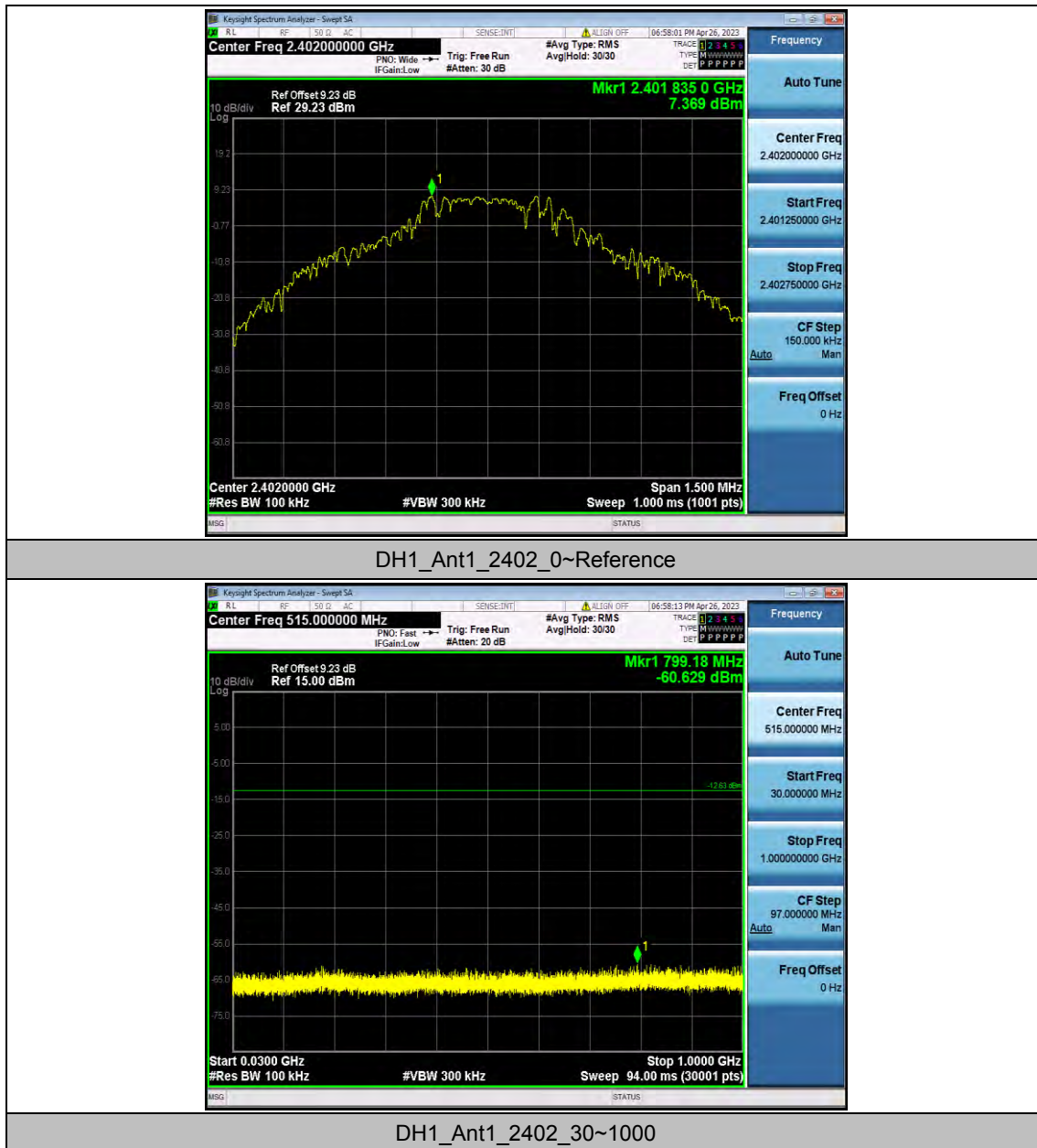
3DH1_Ant1_High_Hop_2480

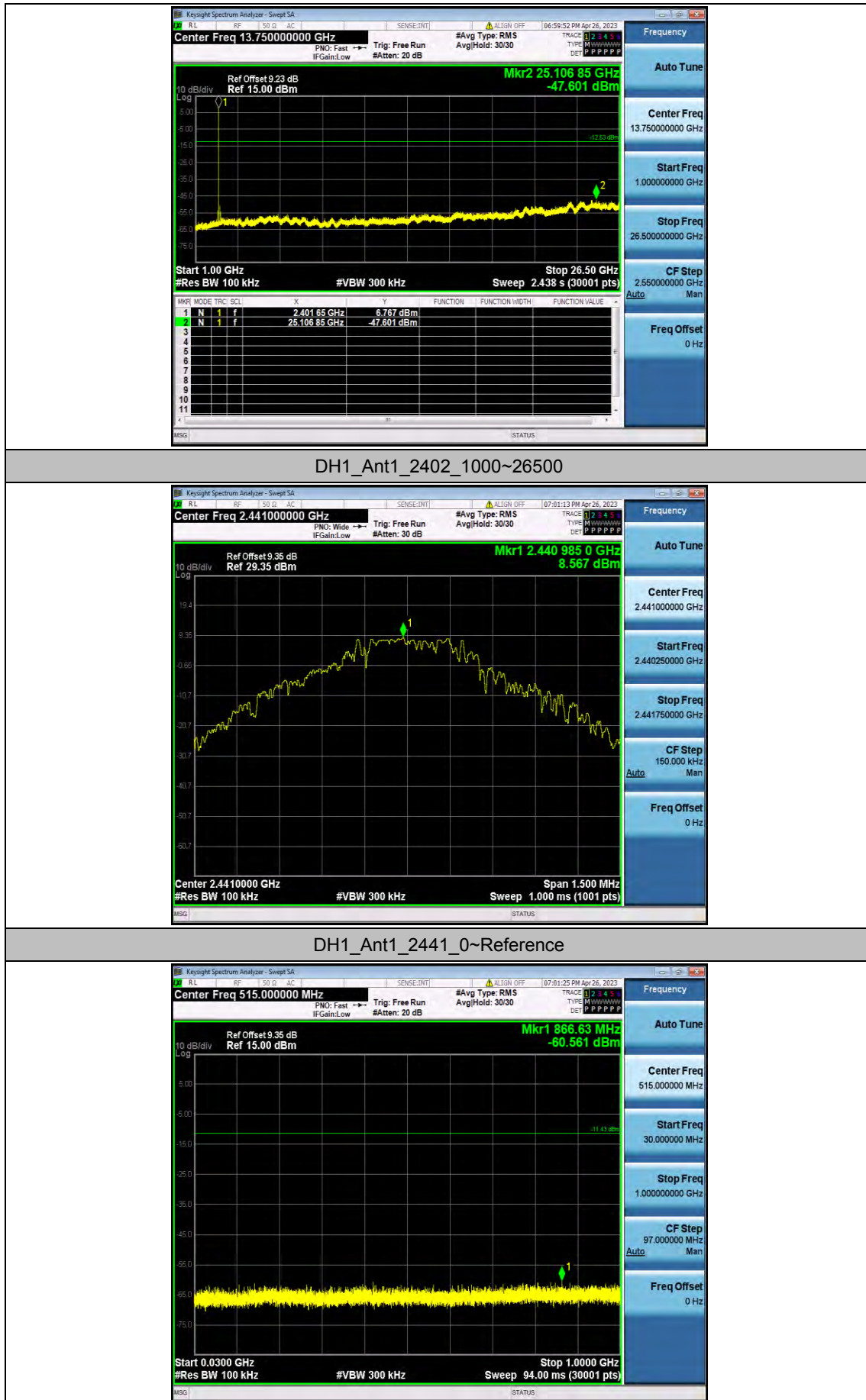
Appendix A.8: Conducted Spurious Emission

Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	2402	Reference	7.37	7.37	---	PASS
			30~1000	7.37	-60.63	≤ -12.63	PASS
			1000~26500	7.37	-47.6	≤ -12.63	PASS
		2441	Reference	8.57	8.57	---	PASS
			30~1000	8.57	-60.56	≤ -11.43	PASS
			1000~26500	8.57	-47.67	≤ -11.43	PASS
		2480	Reference	9.57	9.57	---	PASS
			30~1000	9.57	-50.37	≤ -10.43	PASS
			1000~26500	9.57	-47.55	≤ -10.43	PASS
2DH1	Ant1	2402	Reference	3.14	3.14	---	PASS
			30~1000	3.14	-60.63	≤ -16.86	PASS
			1000~26500	3.14	-47.81	≤ -16.86	PASS
		2441	Reference	4.65	4.65	---	PASS
			30~1000	4.65	-50.07	≤ -15.35	PASS
			1000~26500	4.65	-47.64	≤ -15.35	PASS
		2480	Reference	4.99	4.99	---	PASS
			30~1000	4.99	-60.86	≤ -15.01	PASS
			1000~26500	4.99	-47.82	≤ -15.01	PASS
3DH1	Ant1	2402	Reference	3.27	3.27	---	PASS
			30~1000	3.27	-60.89	≤ -16.73	PASS
			1000~26500	3.27	-47.56	≤ -16.73	PASS
		2441	Reference	4.77	4.77	---	PASS
			30~1000	4.77	-60.46	≤ -15.23	PASS
			1000~26500	4.77	-46.74	≤ -15.23	PASS
		2480	Reference	5.35	5.35	---	PASS
			30~1000	5.35	-60.15	≤ -14.65	PASS
			1000~26500	5.35	-47.29	≤ -14.65	PASS

Test Graphs





DH1_Ant1_2441_30~1000



DH1_Ant1_2441_1000~26500



DH1_Ant1_2480_0~Reference

Keysight Spectrum Analyzer - Swept SA

Center Freq 13.750000000 GHz

PNO: Fast IFGain: Low Trig: Free Run #Atten: 20 dB

#Avg Type: RMS Avg Hold: 30/30

07:08:30 PM Apr 26, 2023

TRACE 1 2 3 4 5
TYPE M W W W W W W
DET P P P P P P P

Ref Offset 9.35 dB
Ref 15.00 dBm

Mkr2 23.526 70 GHz
-47.551 dBm

10 dB/div

Start 1.00 GHz
#Res BW 100 kHz

Stop 26.50 GHz
#VBW 300 kHz
Sweep 2.438 s (30001 pts)

Frequency

Auto Tune

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

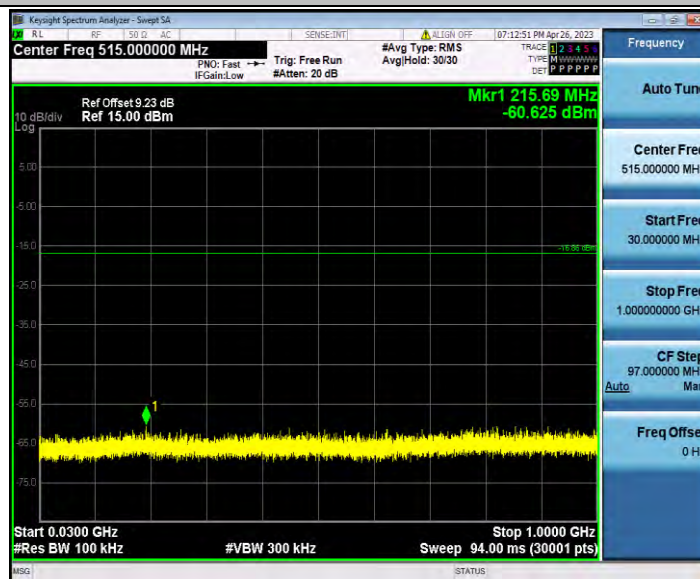
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.479 85 GHz	9.419 dBm			
2	N	1	f	23.526 70 GHz	-47.551 dBm			

The screenshot displays the Keysight Spectrum Analyzer - Sweep SA interface. The main plot shows a frequency spectrum with a peak at 2.4018665 GHz, labeled 'Mkr1 2.401 866 5 GHz' and '3.141 dBm'. The plot is set to a center frequency of 2.402000000 GHz, a span of 1.500 MHz, and a resolution bandwidth (RBW) of 300 kHz. The y-axis represents power in dBm, ranging from -50.0 to 10.0. The x-axis represents frequency in GHz, ranging from 2.401250000 to 2.402750000. The interface includes various control panels on the right for Frequency, Auto Tune, Center Freq, Start Freq, Stop Freq, CF Step, and Freq Offset. The bottom status bar shows the current center frequency, resolution bandwidth, and span.

Parameter	Value
Center Freq	2.402000000 GHz
Start Freq	2.401250000 GHz
Stop Freq	2.402750000 GHz
CF Step	150.000 kHz
Freq Offset	0 Hz

Center Freq 2.402000000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.000 ms (1001 pts)

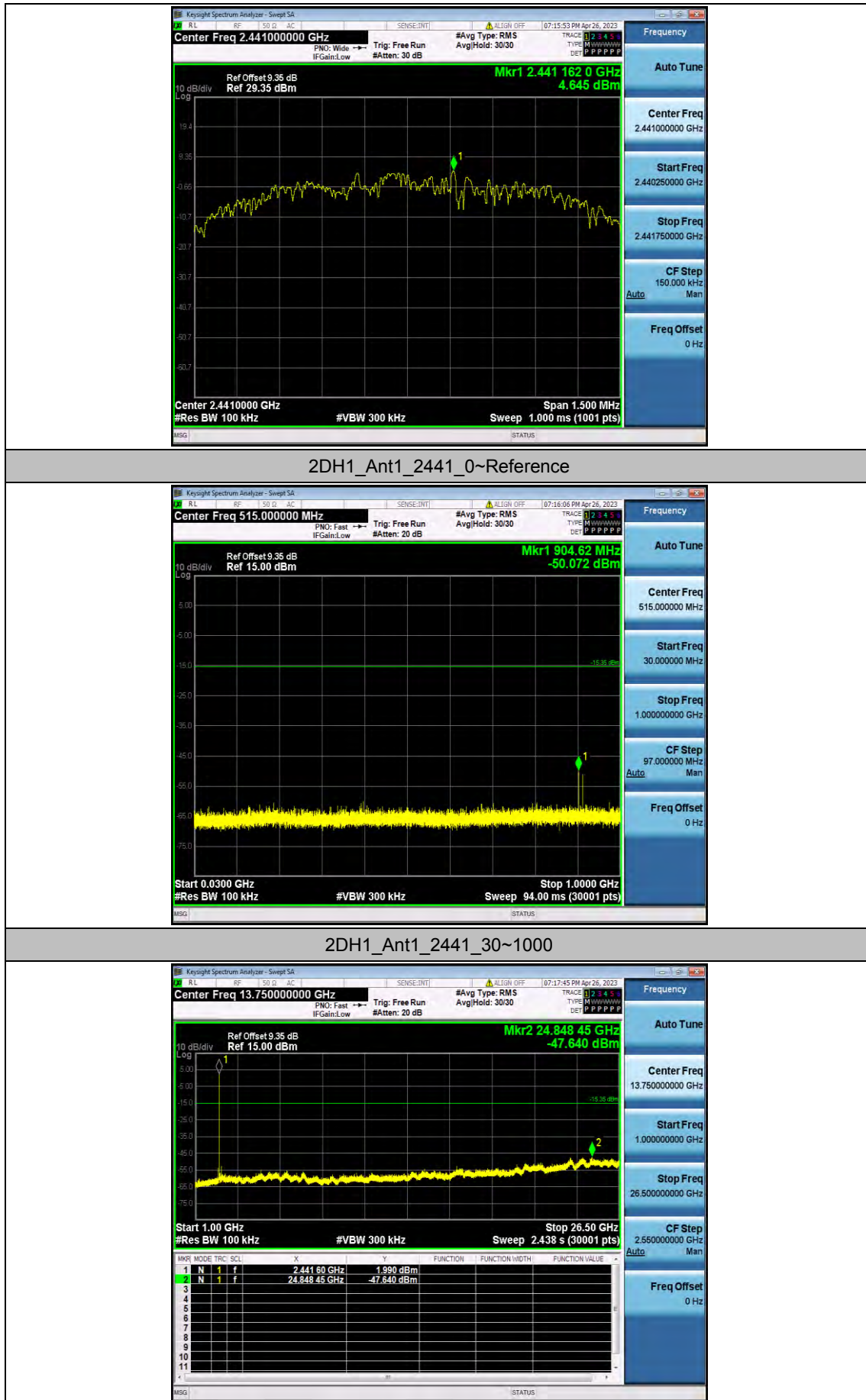
2DH1_Ant1_2402_0~Reference



2DH1_Ant1_2402_30~1000



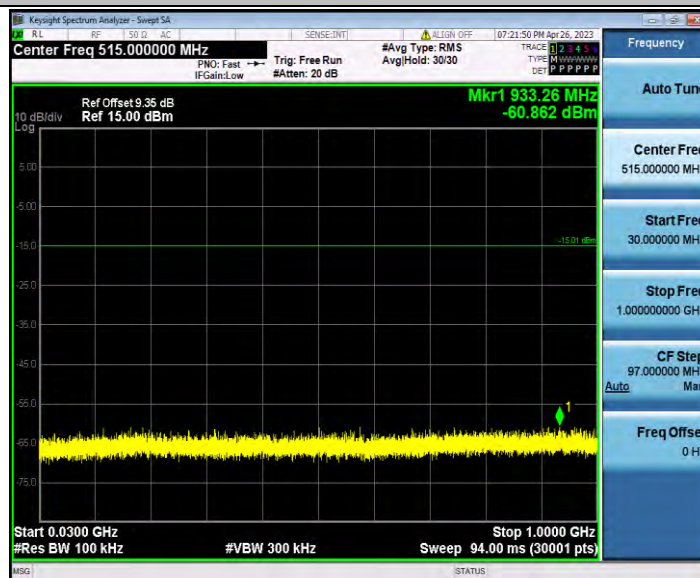
2DH1_Ant1_2402_1000~26500



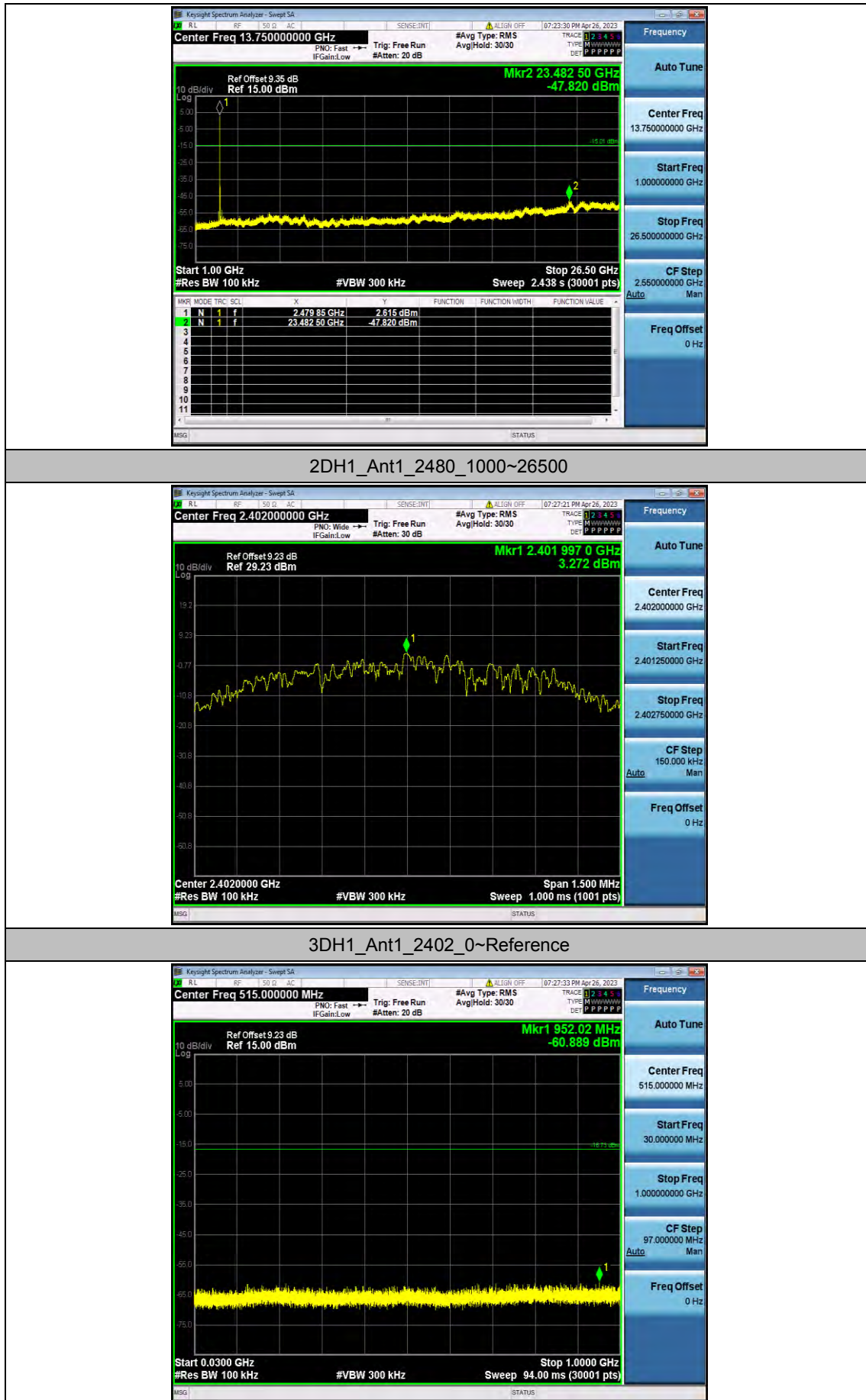
2DH1_Ant1_2441_1000~26500

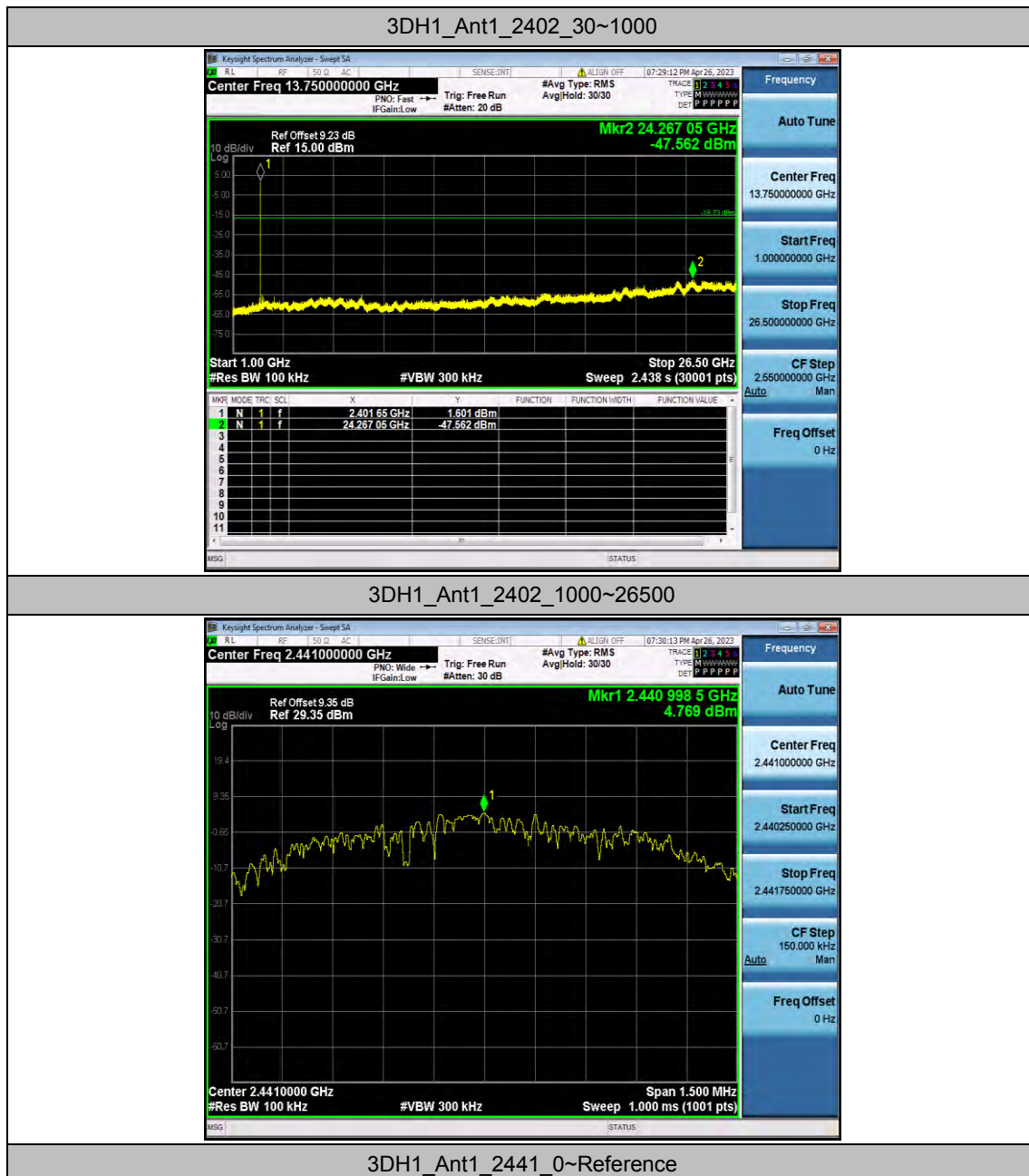


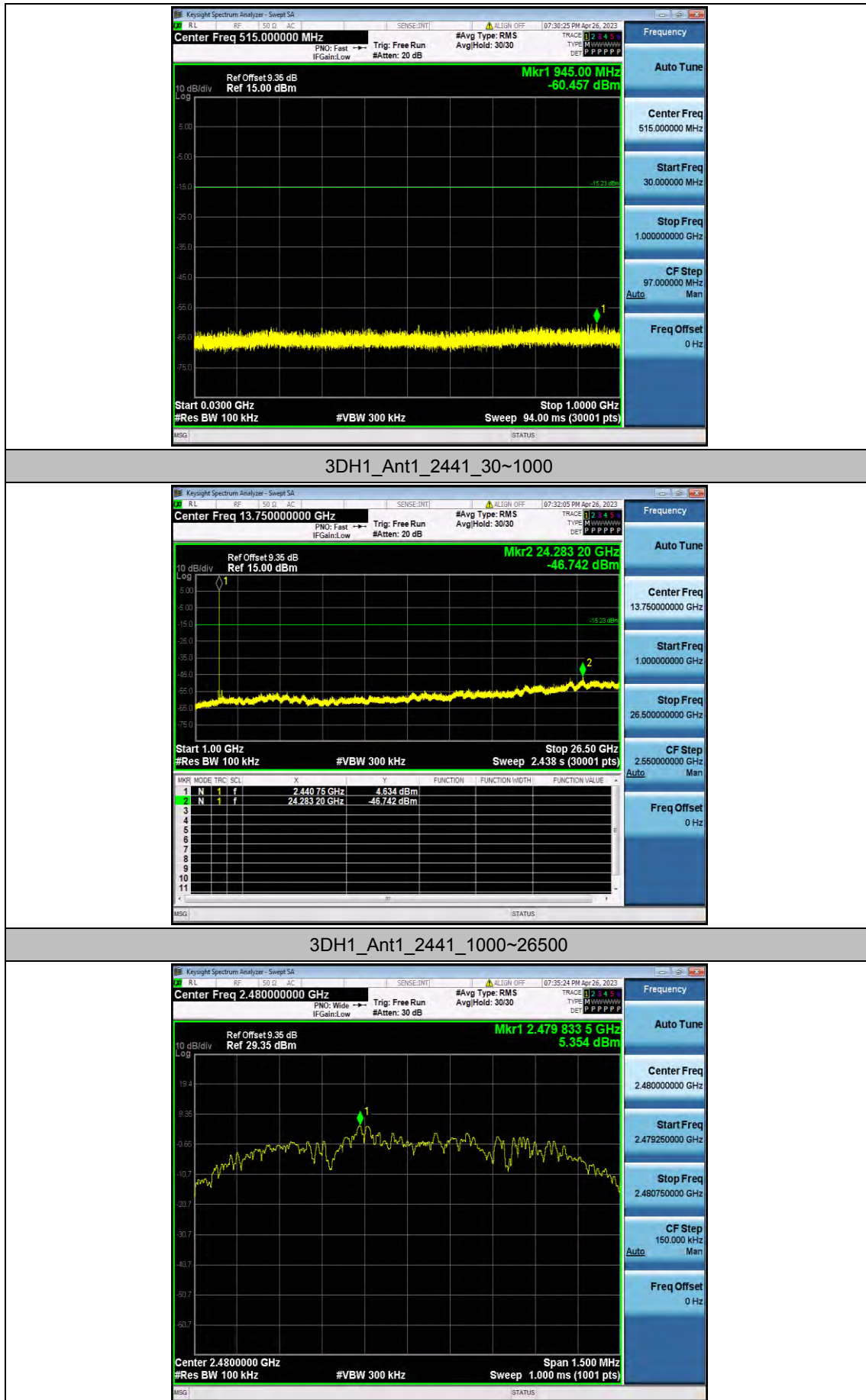
2DH1_Ant1_2480_0~Reference



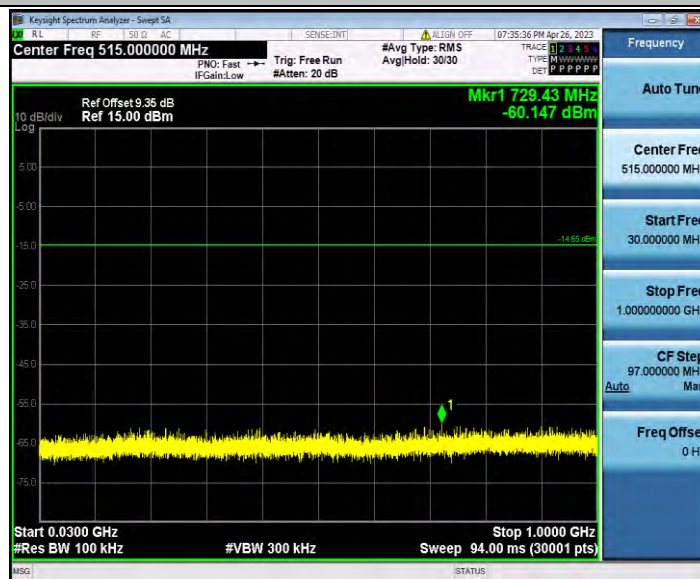
2DH1_Ant1_2480_30~1000







3DH1_Ant1_2480_0~Reference



3DH1_Ant1_2480_30~1000



3DH1_Ant1_2480_1000~26500