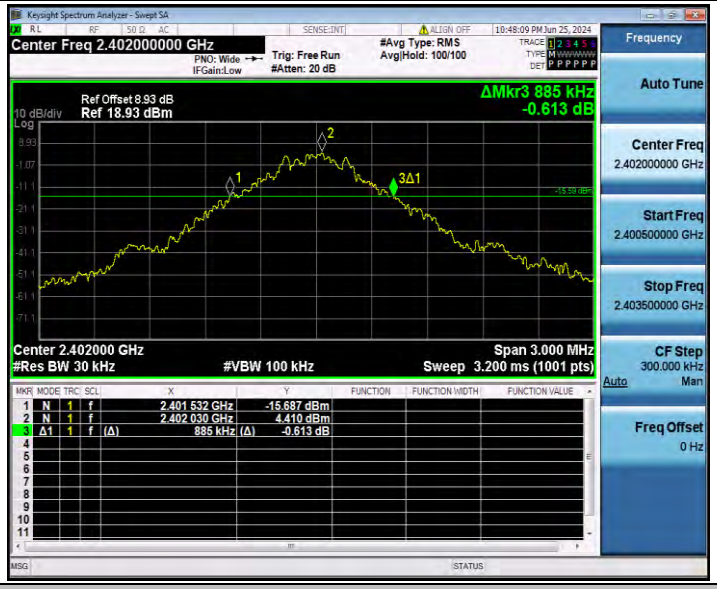
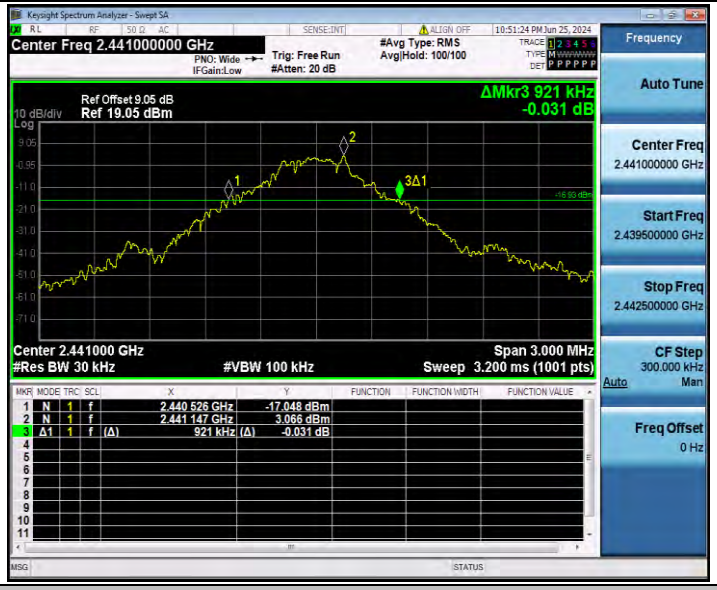
Case No. : CTA24061300701	
Ambient Condition: 24 ℃, 59 %RH	
According Standard: ■Part15C	
Test Date: 2024.6.20	**Test Engineer:** Evan ouyang

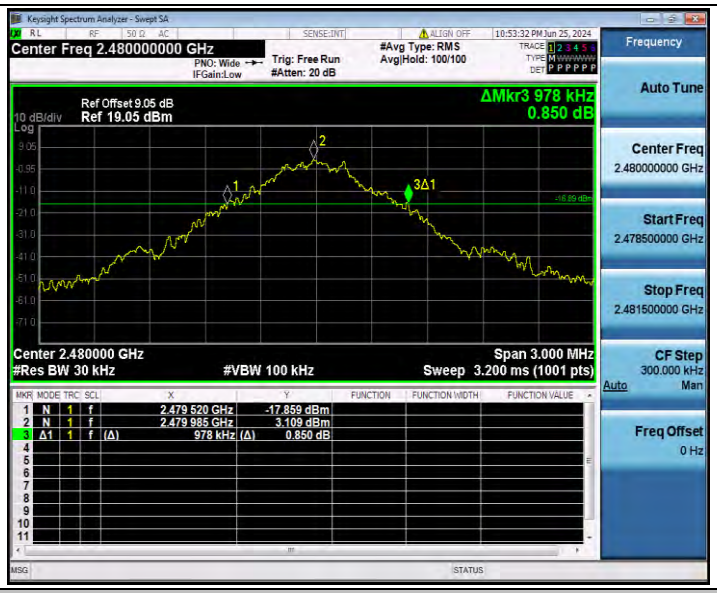
Appendix A.1: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]
DH1	Ant0	2402	0.885	2401.532	2402.417
		2441	0.921	2440.526	2441.447
		2480	0.978	2479.520	2480.498
2DH1	Ant0	2402	1.302	2401.337	2402.639
		2441	1.302	2440.334	2441.636
		2480	1.284	2479.331	2480.615
3DH1	Ant0	2402	1.248	2401.376	2402.624
		2441	1.278	2440.340	2441.618
		2480	1.281	2479.343	2480.624

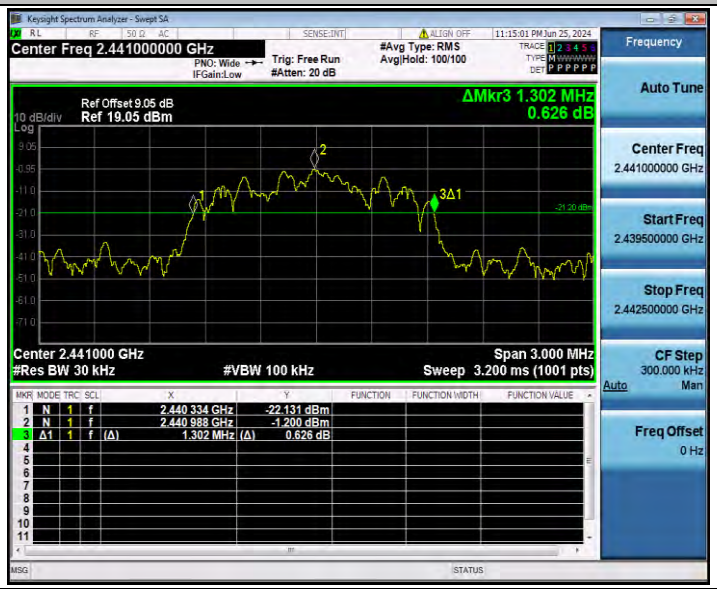
Test Graphs

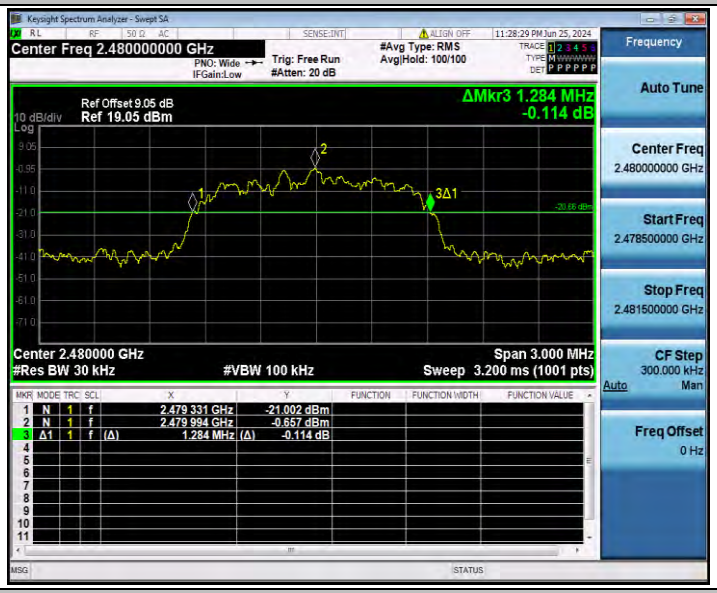
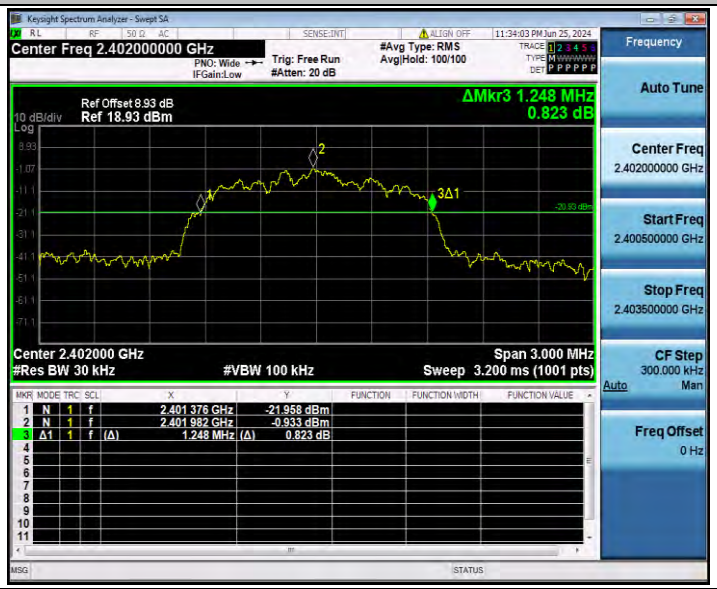
DH1_Ant0_2402

DH1_Ant0_2441

DH1_Ant0_2480

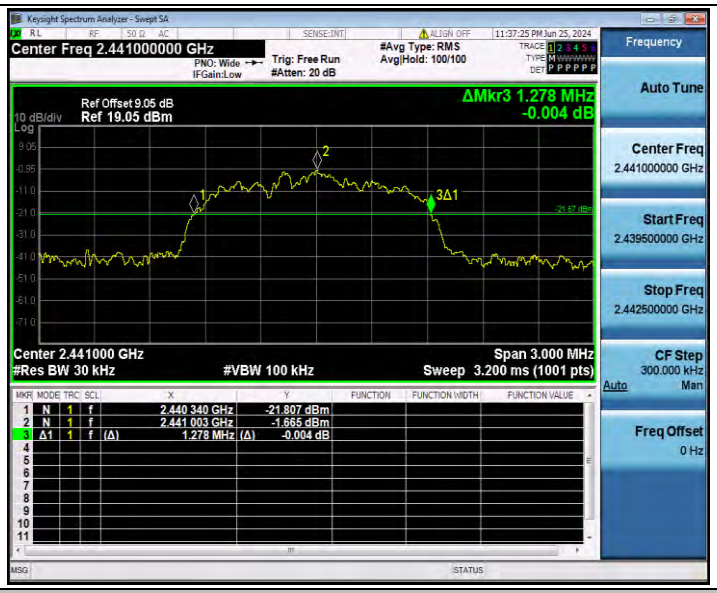


2DH1_Ant0_2402

2DH1_Ant0_2441



2DH1_Ant0_2480

3DH1_Ant0_2402

3DH1_Ant0_2441



3DH1_Ant0_2480

Appendix A.2: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
DH1	Ant0	2402	0.82865	2401.5790	2402.4077
		2441	0.89168	2440.5529	2441.4446
		2480	0.87036	2479.5562	2480.4265
2DH1	Ant0	2402	1.2388	2401.3665	2402.6053
		2441	1.2364	2440.3645	2441.6009
		2480	1.1762	2479.3911	2480.5673
3DH1	Ant0	2402	1.1648	2401.4135	2402.5783
		2441	1.1665	2440.4109	2441.5774
		2480	1.1669	2479.4111	2480.5780

Test Graphs

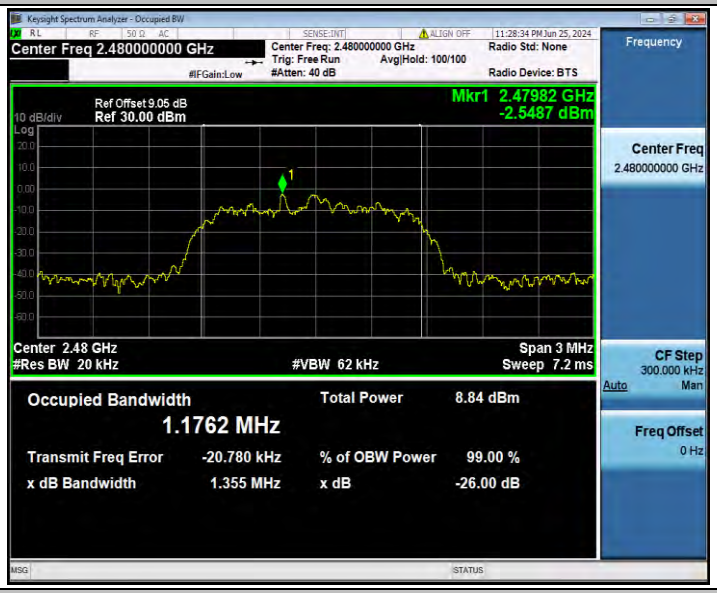
DH1_Ant0_2402

DH1_Ant0_2441

DH1_Ant0_2480

2DH1_Ant0_2402

2DH1_Ant0_2441

2DH1_Ant0_2480

3DH1_Ant0_2402

3DH1_Ant0_2441

3DH1_Ant0_2480

Appendix A.3: Maximum conducted output power

Test Result Peak

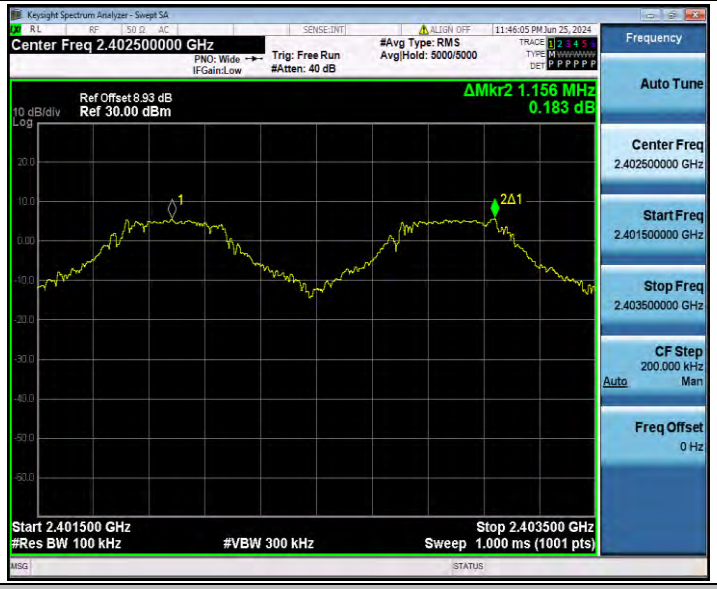
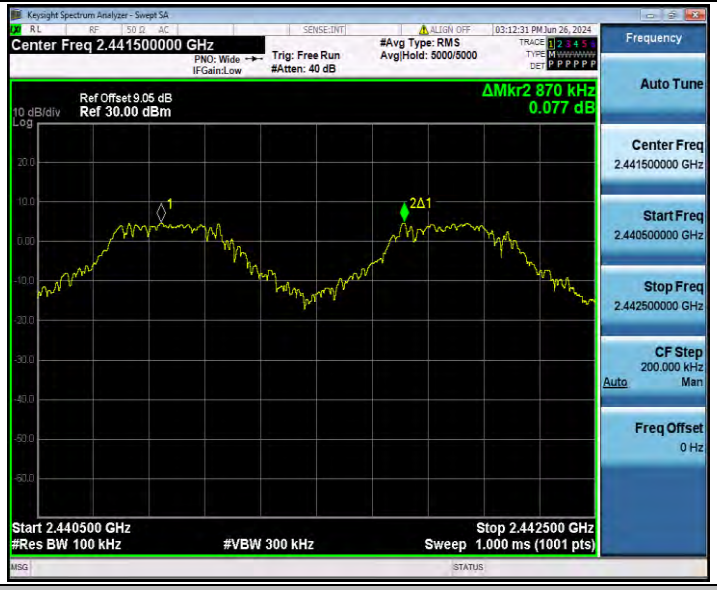
Test Mode	Antenna	Freq(MHz)	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH1	Ant0	2402	6.58	≤20.97	PASS
		2441	5.69	≤20.97	PASS
		2480	6.15	≤20.97	PASS
2DH1	Ant0	2402	5.23	≤20.97	PASS
		2441	4.54	≤20.97	PASS
		2480	5.04	≤20.97	PASS
3DH1	Ant0	2402	5.69	≤20.97	PASS
		2441	4.84	≤20.97	PASS
		2480	5.29	≤20.97	PASS

Appendix A.4: Carrier frequency separation

Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant0	Hop_2402	1.156	≥0.652	PASS
		Hop_2441	0.87	≥0.652	PASS
		Hop_2480	0.854	≥0.652	PASS
2DH1	Ant0	Hop_2402	1.004	≥0.868	PASS
		Hop_2441	1.006	≥0.868	PASS
		Hop_2480	1.026	≥0.868	PASS
3DH1	Ant0	Hop_2402	0.976	≥0.854	PASS
		Hop_2441	1.016	≥0.854	PASS
		Hop_2480	0.968	≥0.854	PASS

Test Graphs

DH1_Ant0_Hop_2402

DH1_Ant0_Hop_2441

DH1_Ant0_Hop_2480

2DH1_Ant0_Hop_2402

2DH1_Ant0_Hop_2441

2DH1_Ant0_Hop_2480

3DH1_Ant0_Hop_2402

3DH1_Ant0_Hop_2441

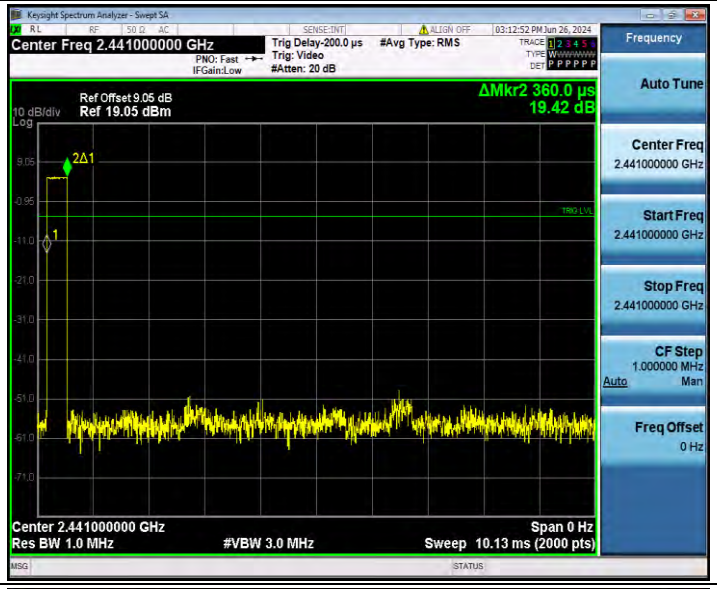
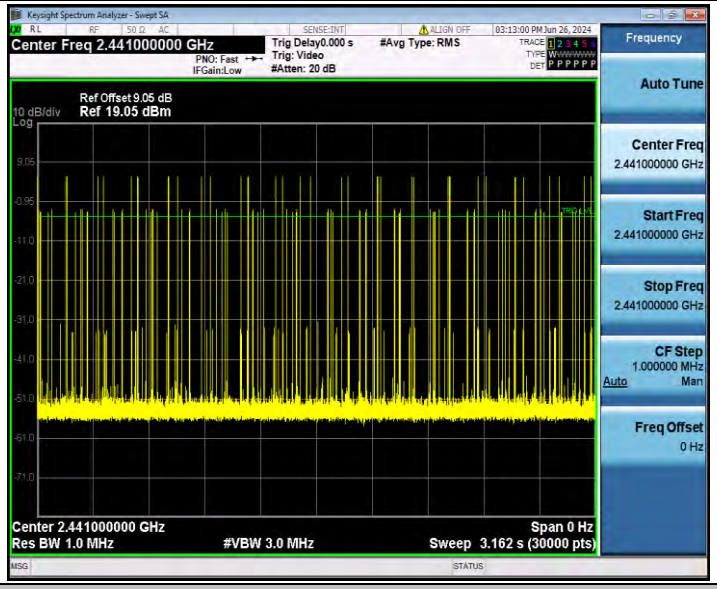
3DH1_Ant0_Hop_2480

Appendix A.5: Time of occupancy

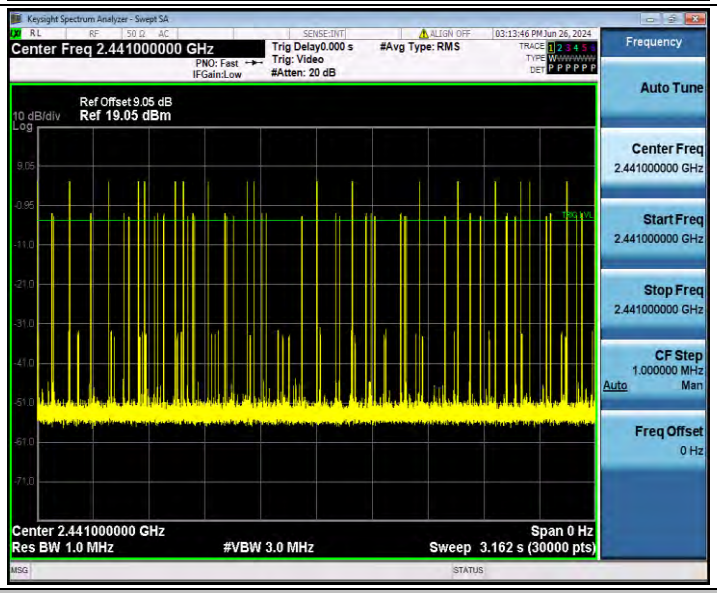
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant0	Hop	0.360	330	0.119	≤0.4	PASS
DH3	Ant0	Hop	1.616	190	0.307	≤0.4	PASS
DH5	Ant0	Hop	2.863	120	0.344	≤0.4	PASS
2DH1	Ant0	Hop	0.380	320	0.122	≤0.4	PASS
2DH3	Ant0	Hop	1.626	160	0.26	≤0.4	PASS
2DH5	Ant0	Hop	2.878	120	0.345	≤0.4	PASS
3DH1	Ant0	Hop	0.380	330	0.125	≤0.4	PASS
3DH3	Ant0	Hop	1.626	160	0.26	≤0.4	PASS
3DH5	Ant0	Hop	2.878	120	0.345	≤0.4	PASS

Test Graphs

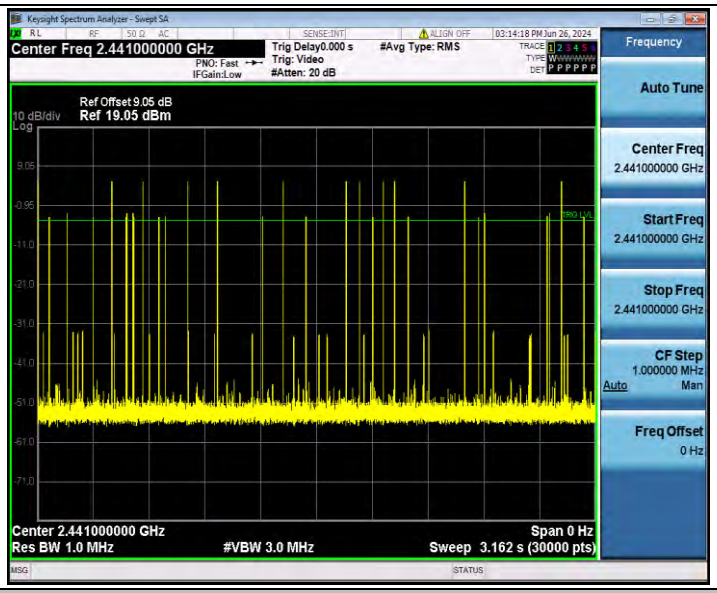
DH1_Ant0_Hop


DH3_Ant0_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-200.0 µs
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
03:13:39 PM Jun 26, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 1.616 ms
0.04 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (2000 pts)
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

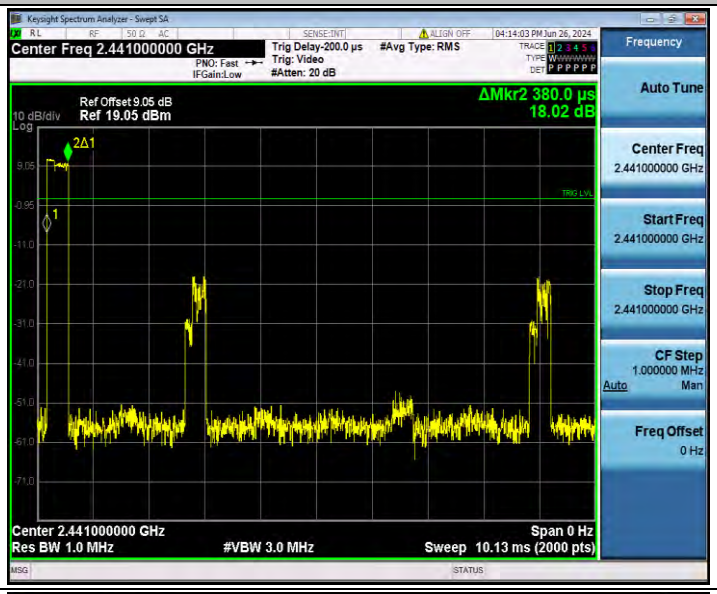

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
03:13:46 PM Jun 26, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
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

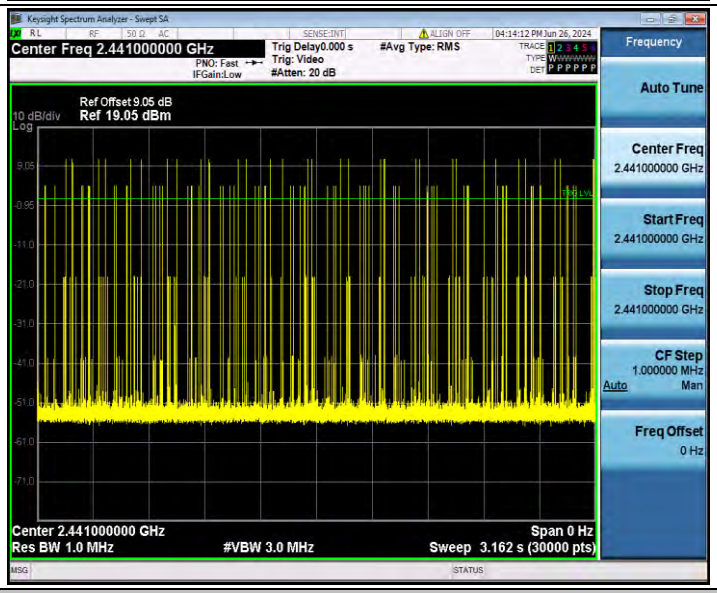
DH5_Ant0_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-200.0 µs
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
03:14:11 PM Jun 26, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 2.863 ms
0.53 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (2000 pts)
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

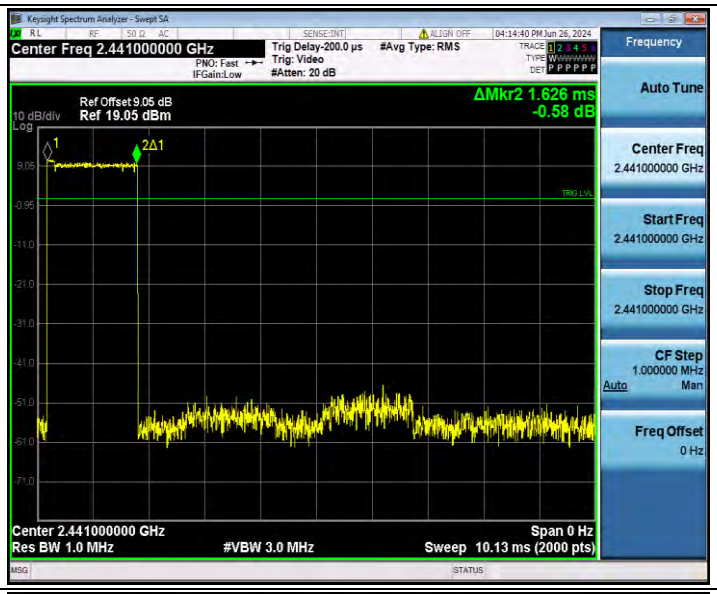


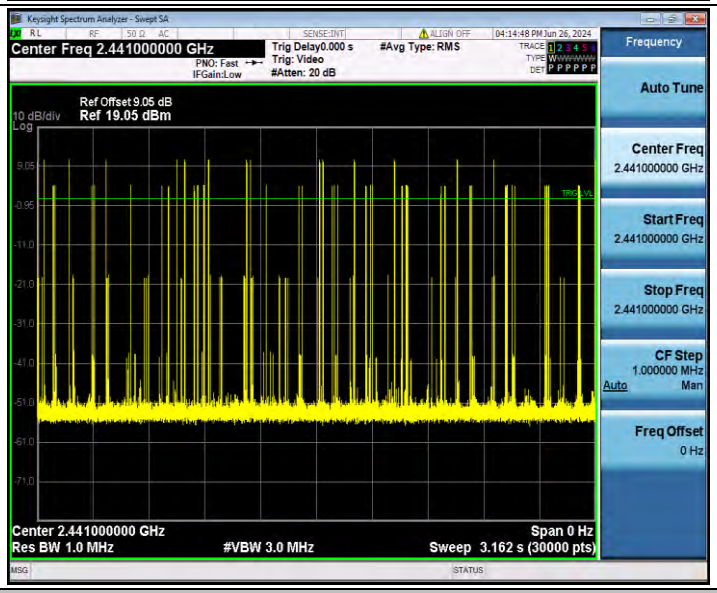
2DH1_Ant0_Hop



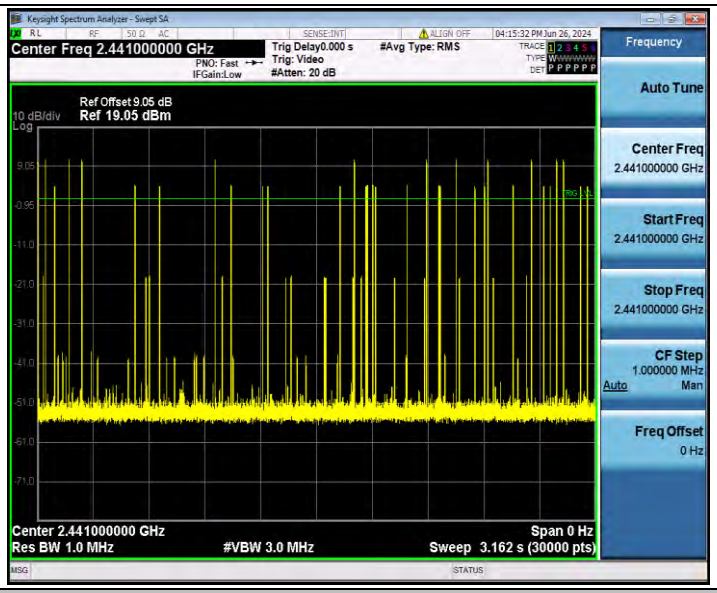


2DH3_Ant0_Hop

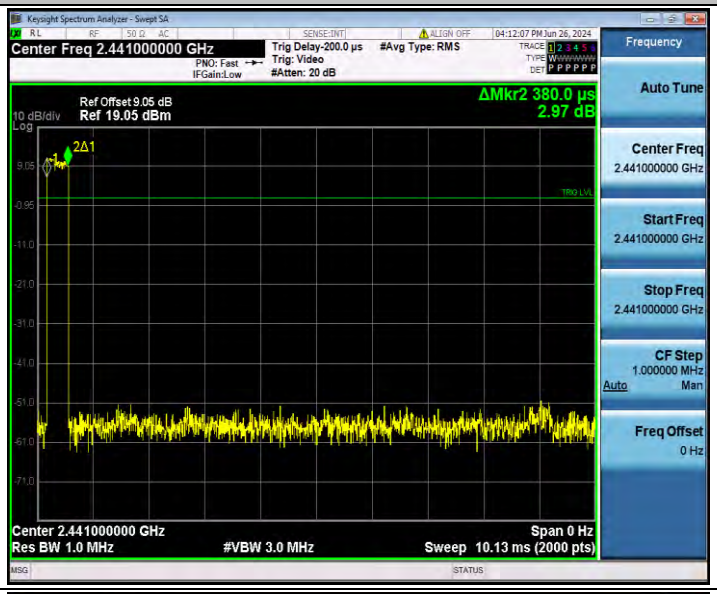


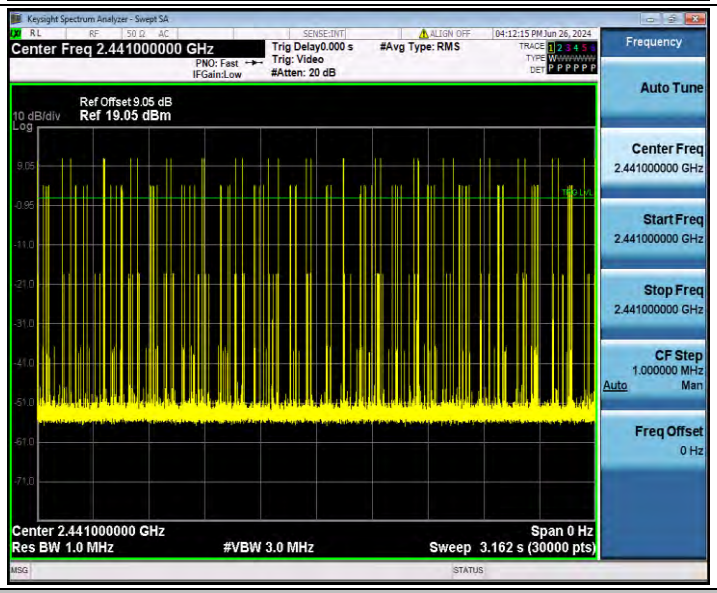


2DH5_Ant0_Hop

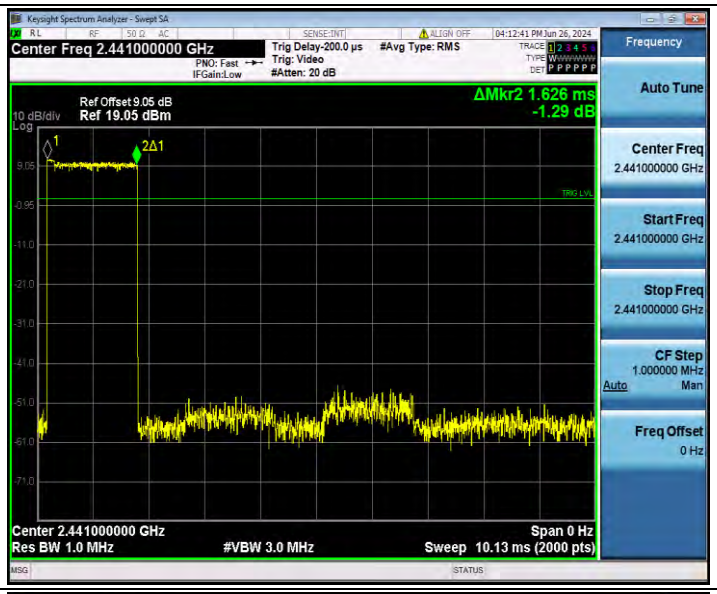


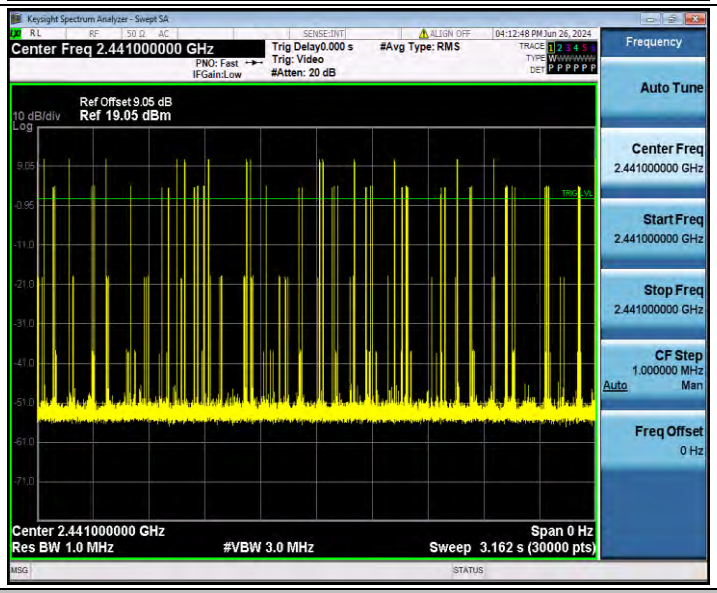
3DH1_Ant0_Hop



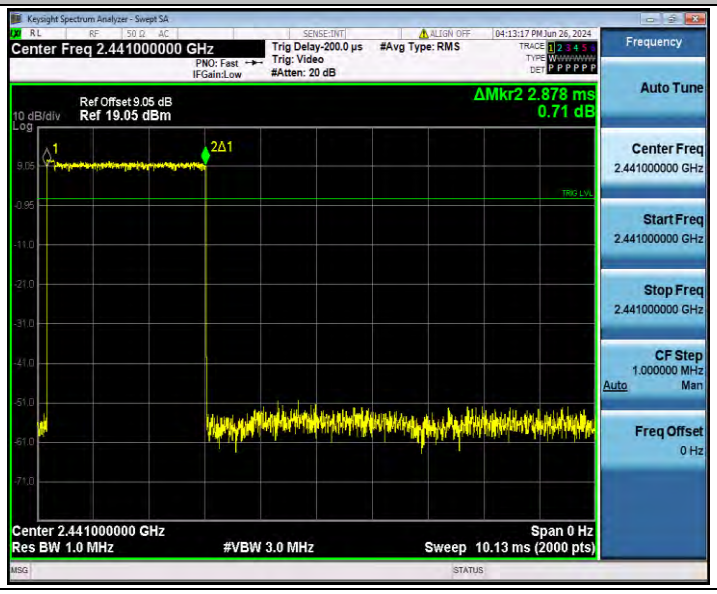


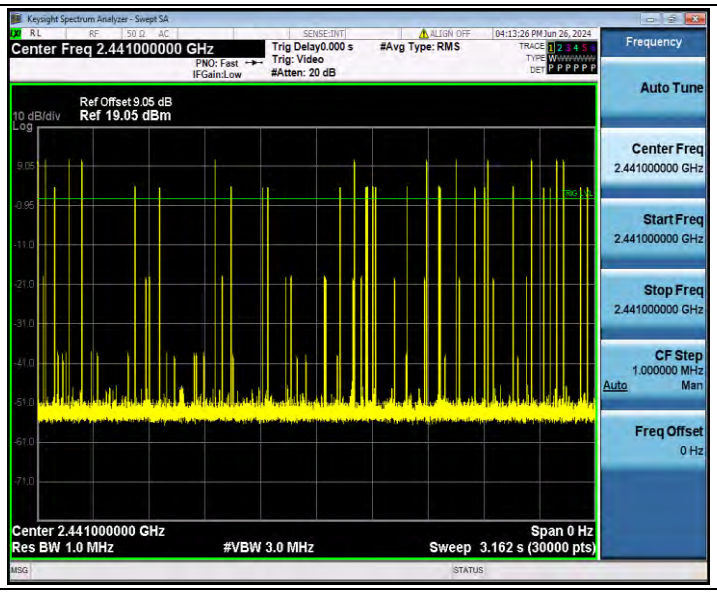
3DH3_Ant0_Hop





3DH5_Ant0_Hop




Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay 0.000 s
Trig: Video
#Avg Type: RMS
#Atten: 20 dB
04:13:26 PM Jun 26, 2024
Ref Offset 9.05 dB
10 dB/div
Log
Ref 19.05 dBm
9.05
-0.95
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
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

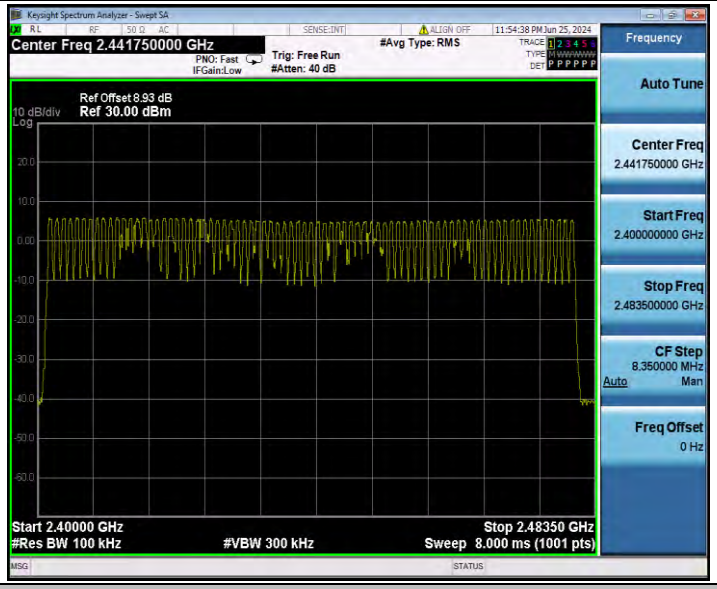
Appendix A.6: Number of hopping channels

Test Result

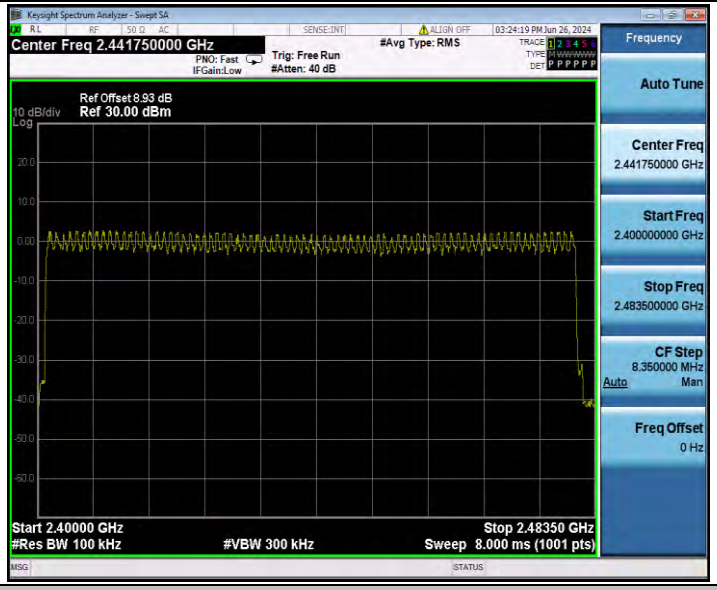
TestMode	Antenna	Freq(MHz)	Result[Num]	Limit[Num]	Verdict
DH1	Ant0	Hop	79	≥15	PASS
2DH1	Ant0	Hop	79	≥15	PASS
3DH1	Ant0	Hop	79	≥15	PASS

Test Graphs

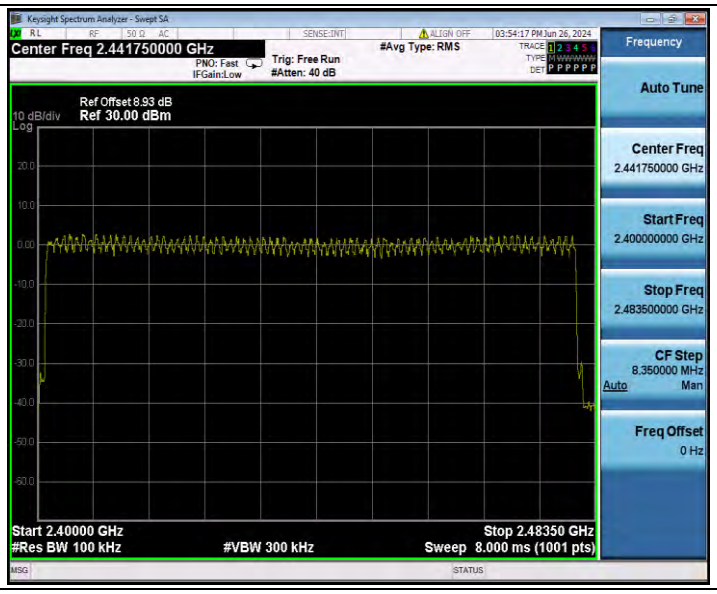
DH1_Ant0_Hop



2DH1_Ant0_Hop



3DH1_Ant0_Hop

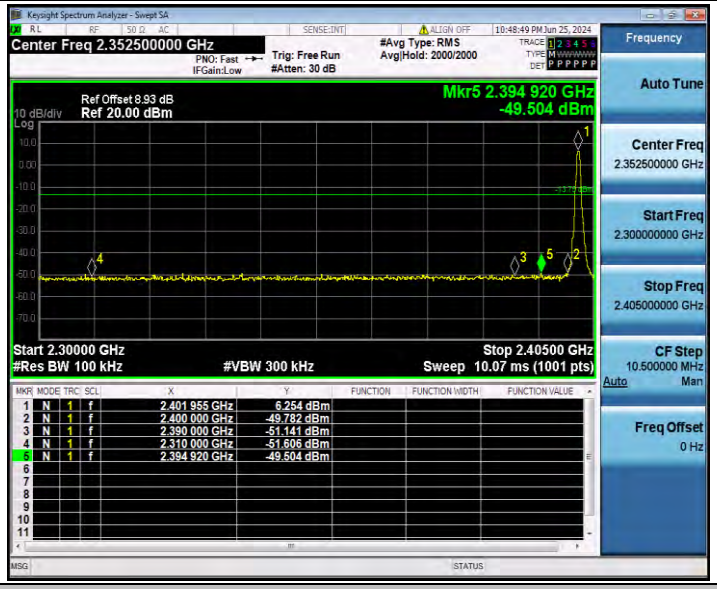
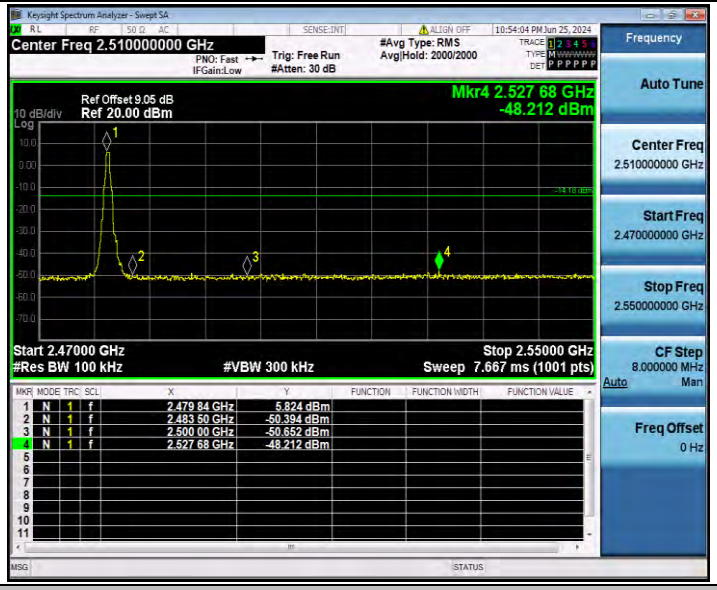

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
03:54:17 PM Jun 26, 2024
Ref Offset 8.93 dB
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.441750000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.483500000 GHz
CF Step
8.350000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

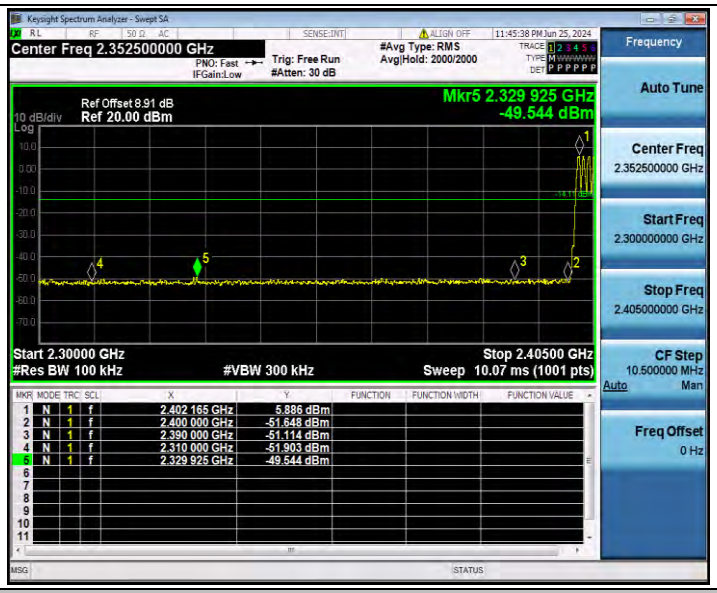
Appendix A.7: Band edge measurements

Test Result

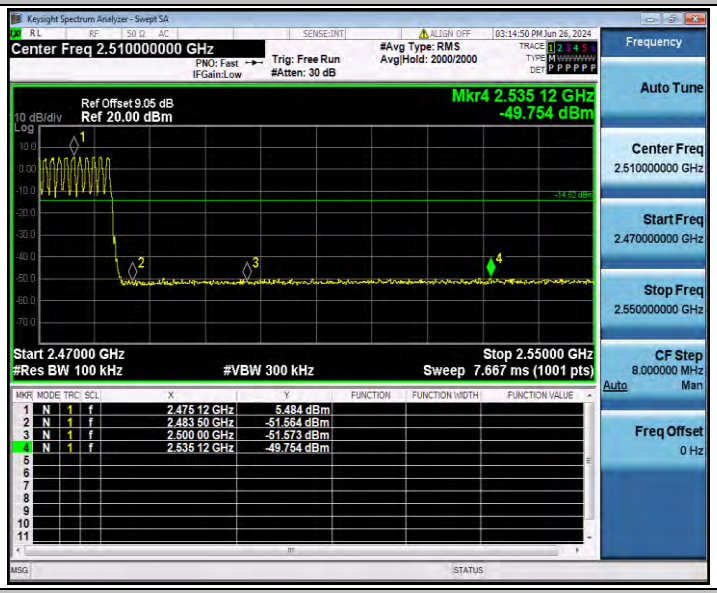
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant0	Low	2402	6.25	-49.5	≤-13.75	PASS
		High	2480	5.82	-48.21	≤-14.18	PASS
		Low	Hop_2402	5.89	-49.54	≤-14.11	PASS
		High	Hop_2480	5.48	-49.75	≤-14.52	PASS
2DH1	Ant0	Low	2402	2.45	-48.61	≤-17.55	PASS
		High	2480	2.17	-48.53	≤-17.83	PASS
		Low	Hop_2402	1.59	-49.71	≤-18.41	PASS
		High	Hop_2480	2.29	-48.78	≤-17.71	PASS
3DH1	Ant0	Low	2402	2.29	-49.49	≤-17.71	PASS
		High	2480	2.16	-49.66	≤-17.84	PASS
		Low	Hop_2402	2.21	-49.56	≤-17.79	PASS
		High	Hop_2480	2.25	-47.99	≤-17.75	PASS

Test Graphs

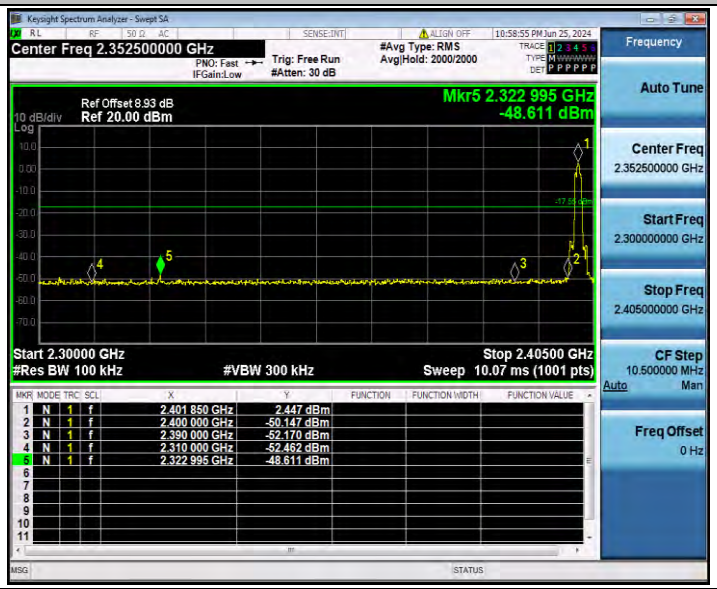
DH1_Ant0_Low_2402

DH1_Ant0_High_2480

DH1_Ant0_Low_Hop_2402

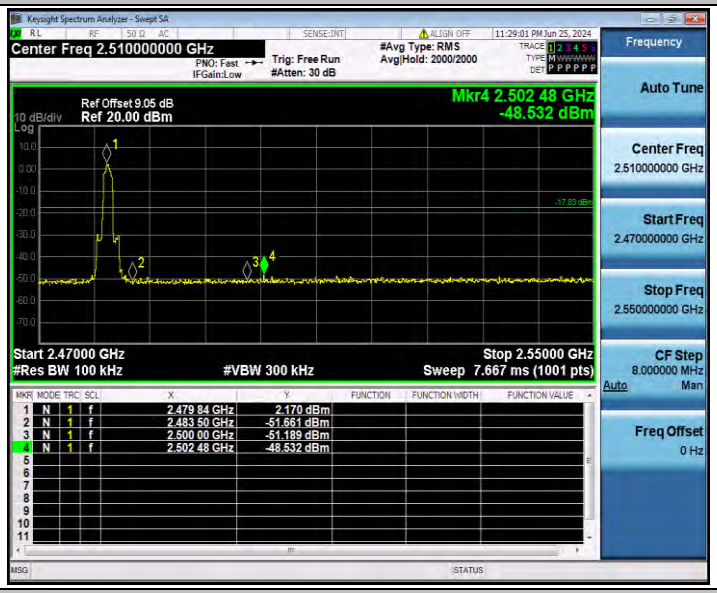
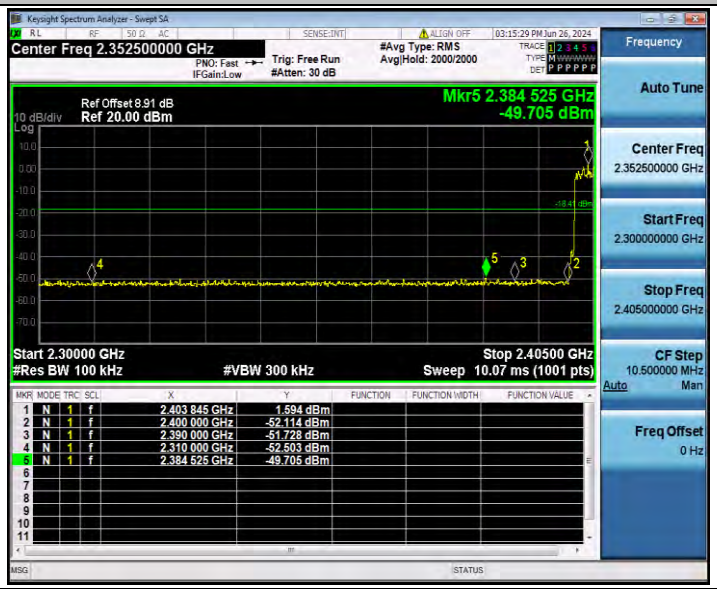


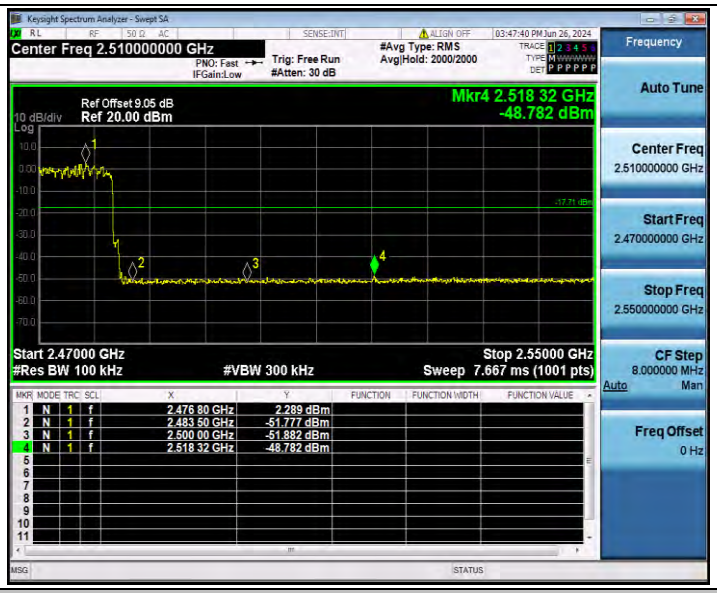
DH1_Ant0_High_Hop_2480



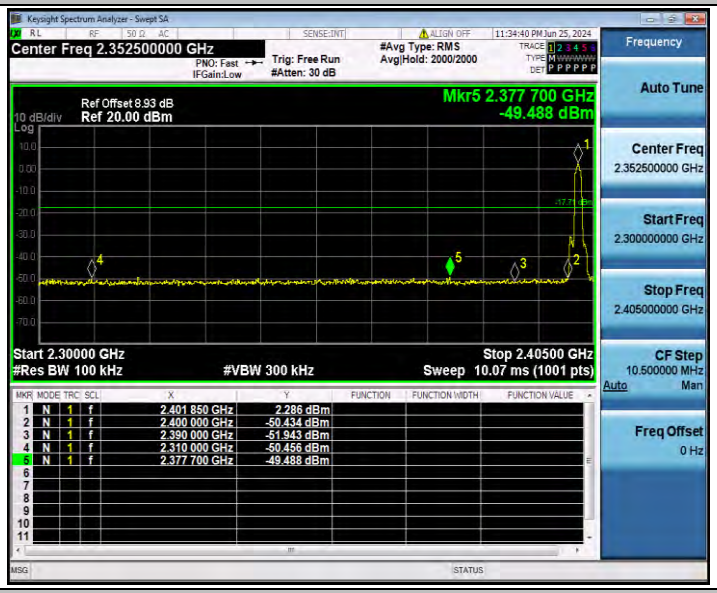
2DH1_Ant0_Low_2402



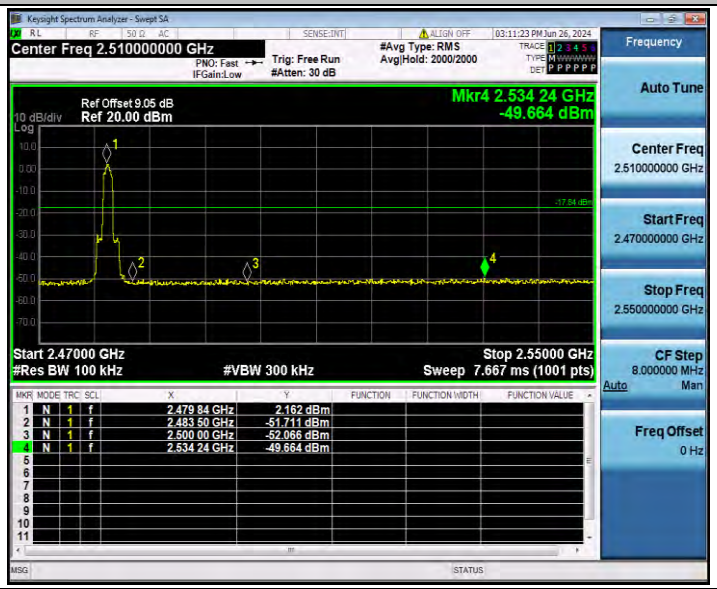
2DH1_Ant0_High_2480

2DH1_Ant0_Low_Hop_2402

2DH1_Ant0_High_Hop_2480

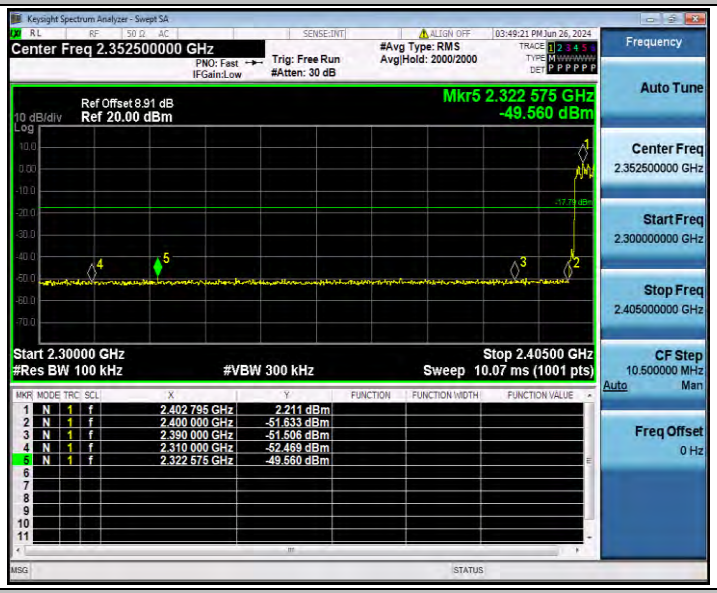
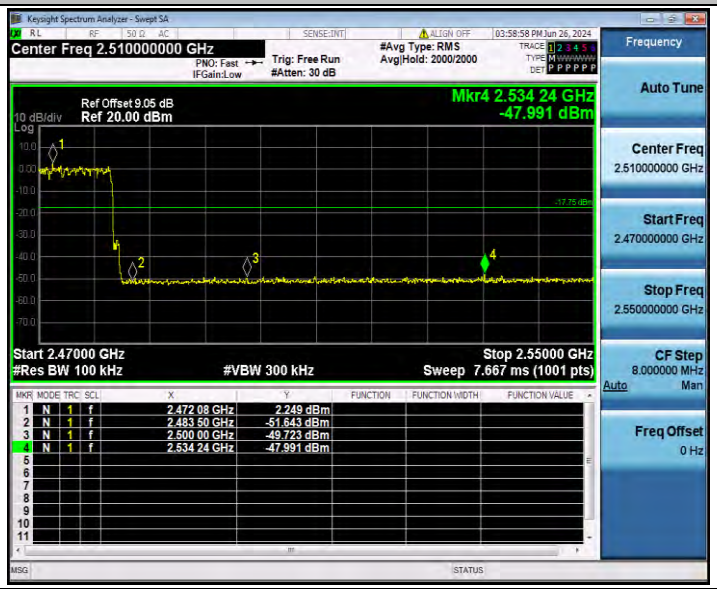


3DH1_Ant0_Low_2402



3DH1_Ant0_High_2480



3DH1_Ant0_Low_Hop_2402

3DH1_Ant0_High_Hop_2480


Appendix A.8: Conducted Spurious Emission

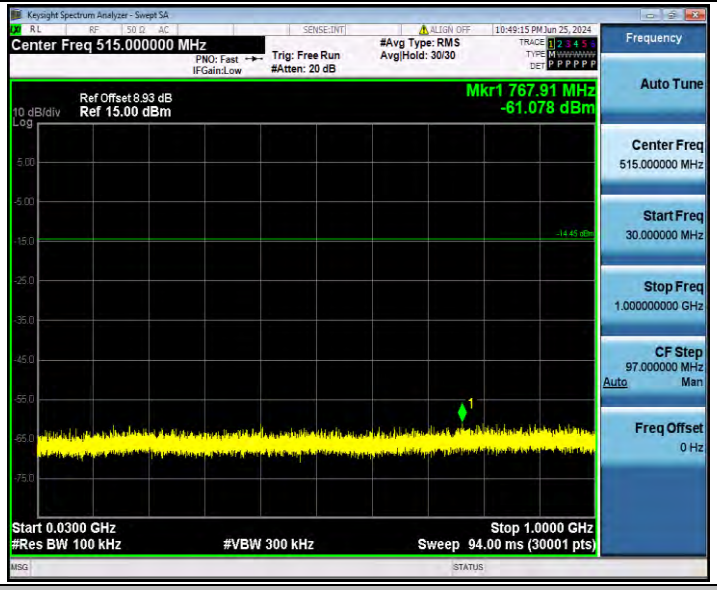
Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant0	2402	Reference	5.55	5.55	---	PASS
			30~1000	5.55	-61.08	≤-14.45	PASS
			1000~26500	5.55	-45.68	≤-14.45	PASS
		2441	Reference	5.21	5.21	---	PASS
			30~1000	5.21	-60.58	≤-14.79	PASS
			1000~26500	5.21	-45.9	≤-14.79	PASS
		2480	Reference	5.04	5.04	---	PASS
			30~1000	5.04	-60.56	≤-14.96	PASS
			1000~26500	5.04	-47.73	≤-14.96	PASS
2DH1	Ant0	2402	Reference	2.01	2.01	---	PASS
			30~1000	2.01	-39.5	≤-17.99	PASS
			1000~26500	2.01	-46.63	≤-17.99	PASS
		2441	Reference	0.83	0.83	---	PASS
			30~1000	0.83	-60.75	≤-19.17	PASS
			1000~26500	0.83	-47.89	≤-19.17	PASS
		2480	Reference	1.98	1.98	---	PASS
			30~1000	1.98	-60.22	≤-18.02	PASS
			1000~26500	1.98	-47.95	≤-18.02	PASS
3DH1	Ant0	2402	Reference	2.25	2.25	---	PASS
			30~1000	2.25	-60.99	≤-17.75	PASS
			1000~26500	2.25	-47.3	≤-17.75	PASS
		2441	Reference	1.43	1.43	---	PASS
			30~1000	1.43	-60.12	≤-18.57	PASS
			1000~26500	1.43	-47.79	≤-18.57	PASS
		2480	Reference	0.87	0.87	---	PASS
			30~1000	0.87	-60.79	≤-19.13	PASS
			1000~26500	0.87	-47.15	≤-19.13	PASS

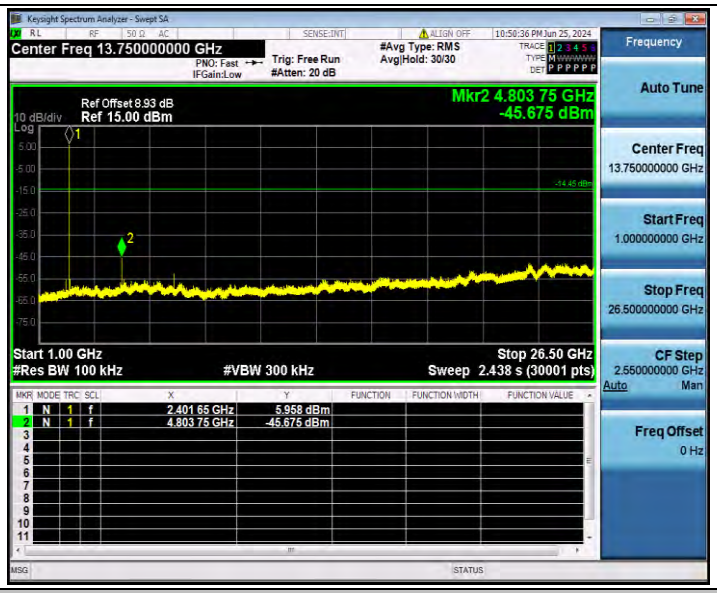
Test Graphs

DH1_Ant0_2402_0~Reference

DH1_Ant0_2402_30~1000

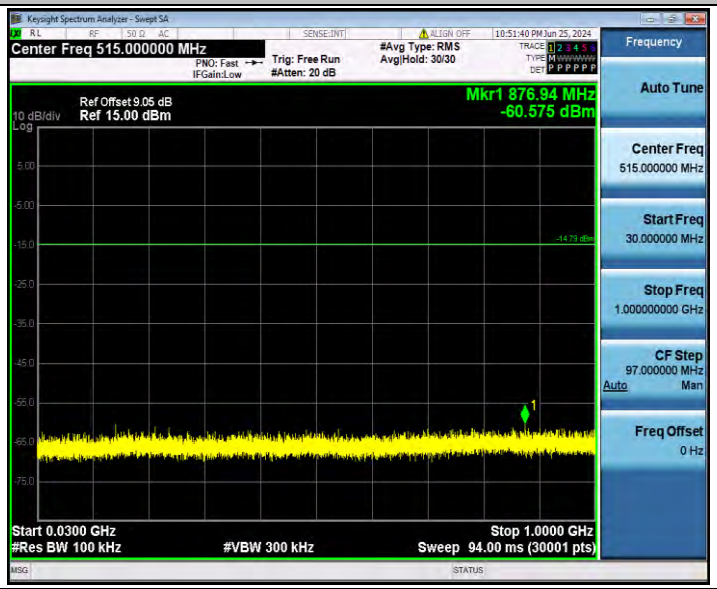


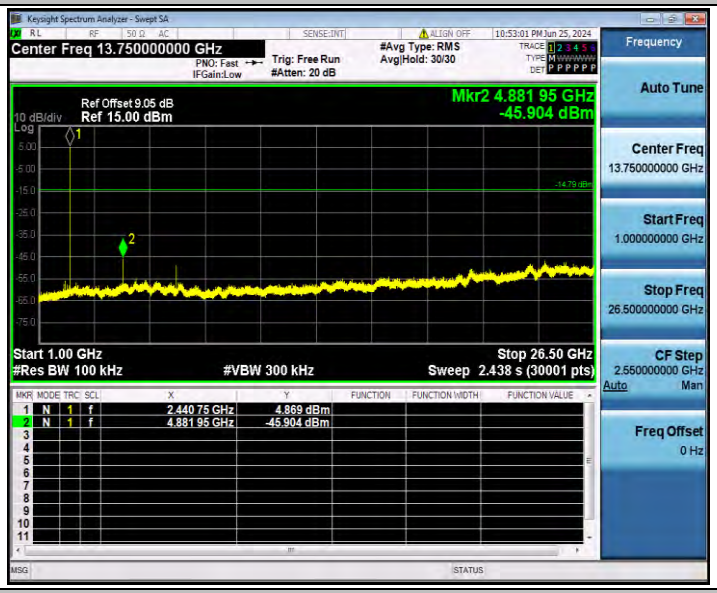
DH1_Ant0_2402_1000~26500



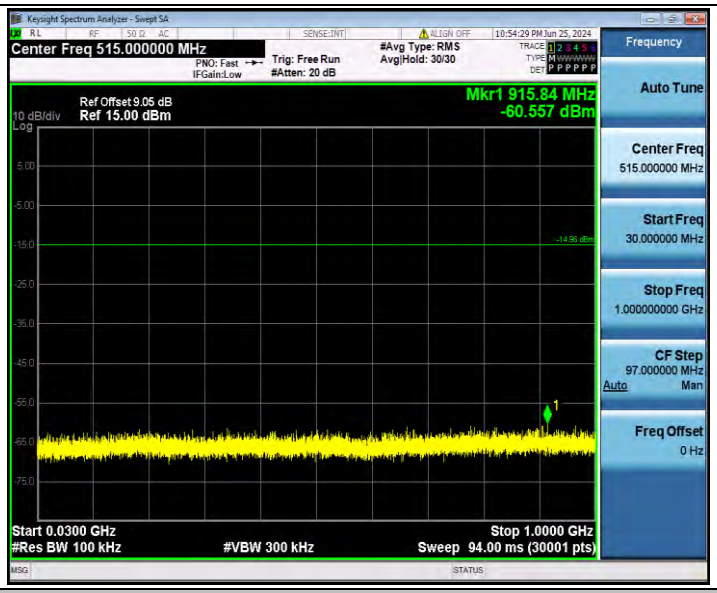
DH1_Ant0_2441_0~Reference

DH1_Ant0_2441_30~1000

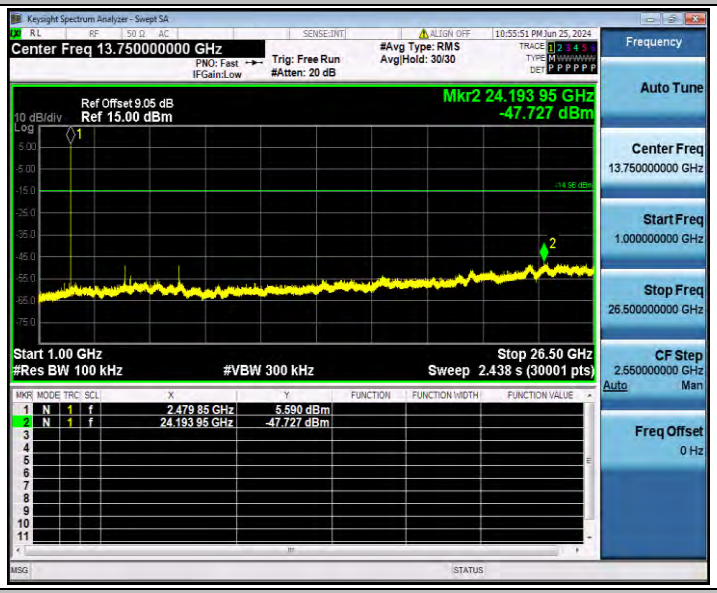


DH1_Ant0_2441_1000~26500

DH1_Ant0_2480_0~Reference

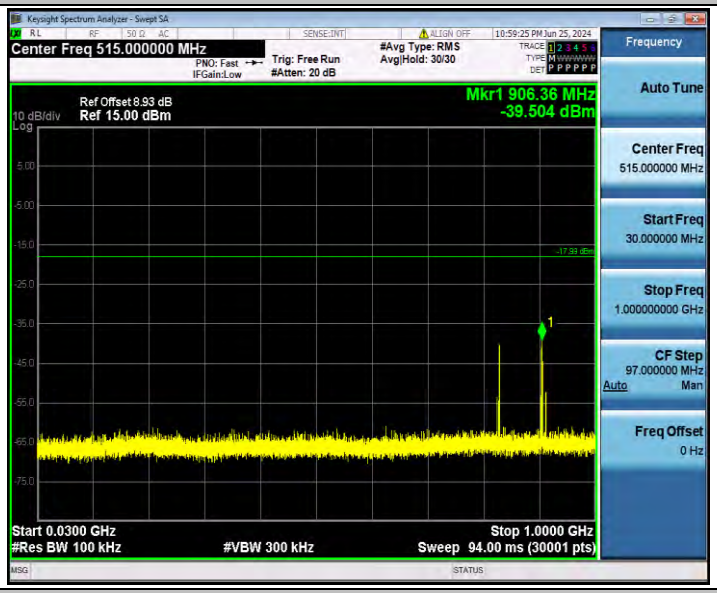
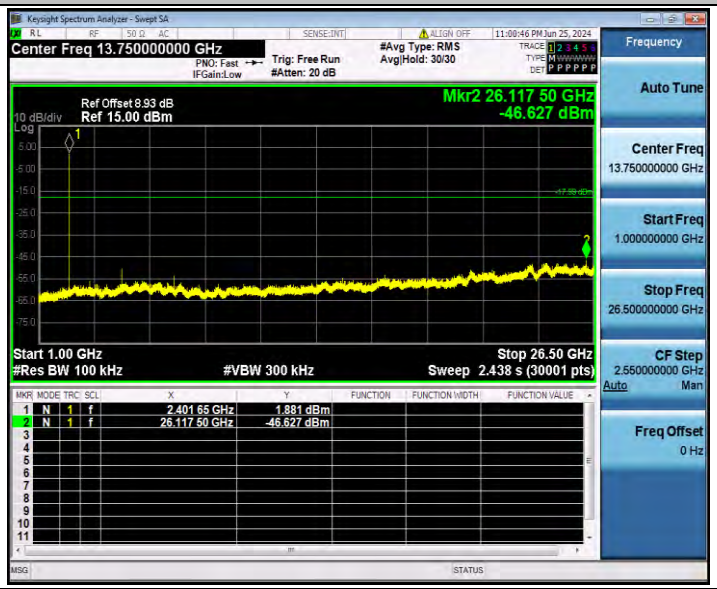
DH1_Ant0_2480_30~1000



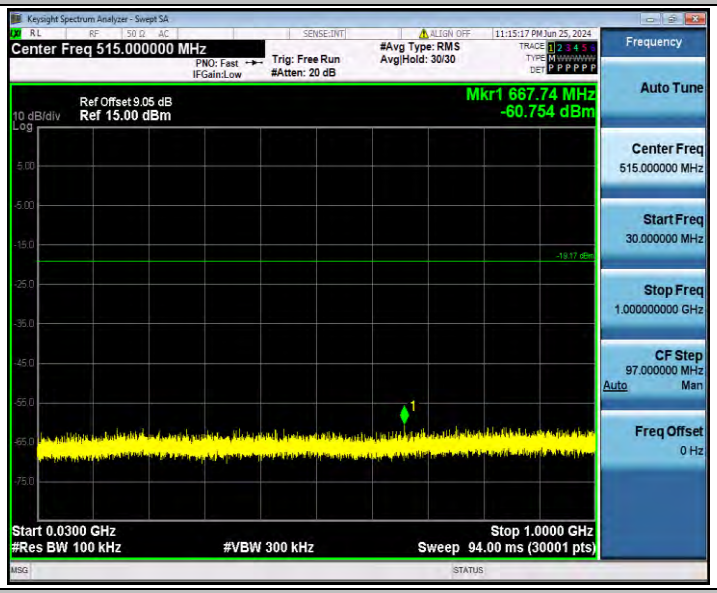
DH1_Ant0_2480_1000~26500



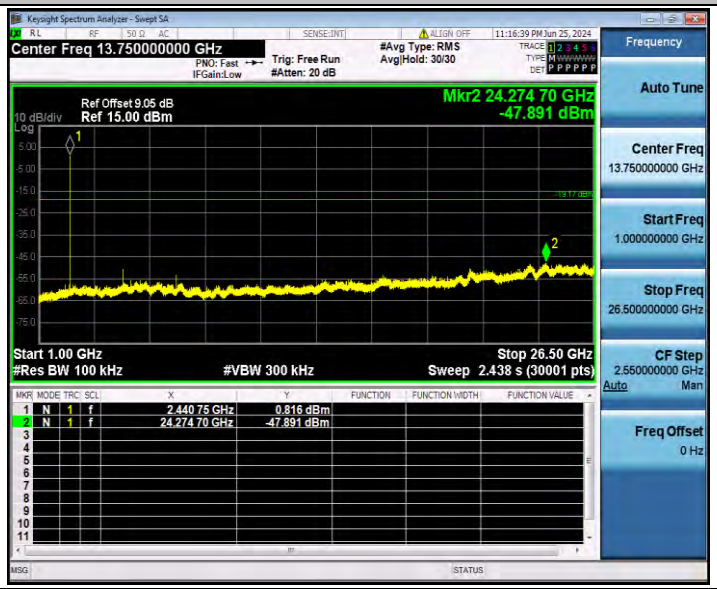
2DH1_Ant0_2402_0~Reference

2DH1_Ant0_2402_30~1000

2DH1_Ant0_2402_1000~26500

2DH1_Ant0_2441_0~Reference

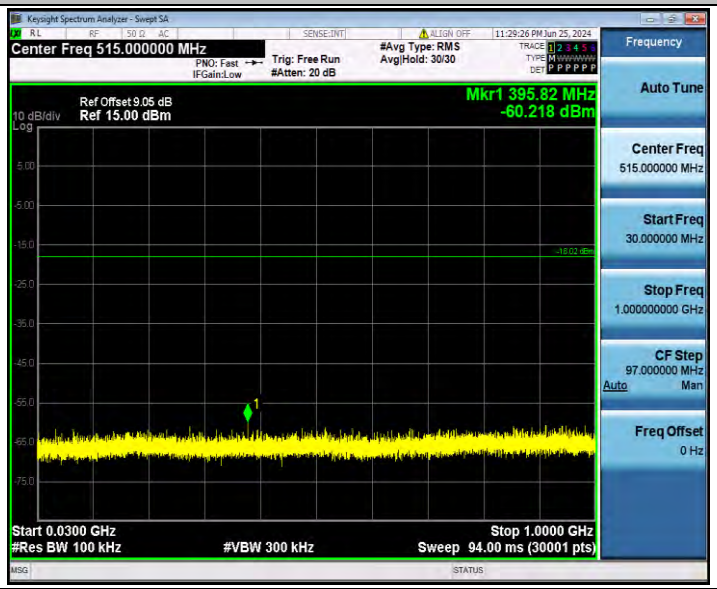
2DH1_Ant0_2441_30~1000

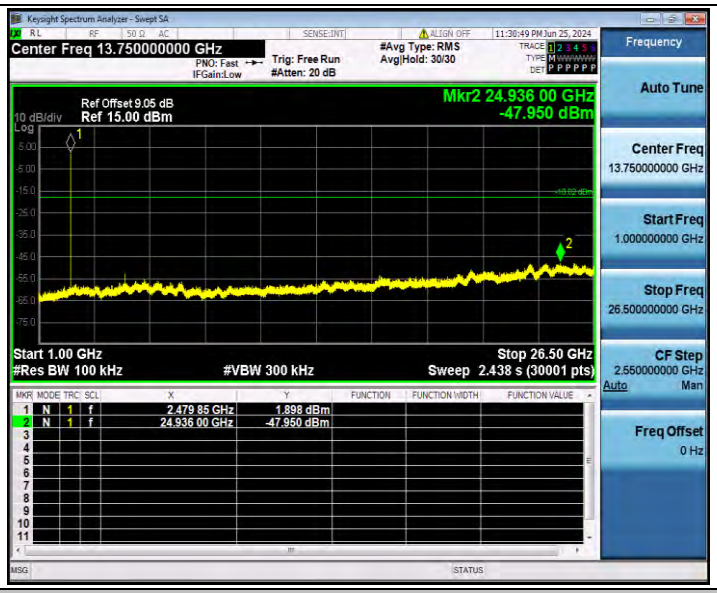


2DH1_Ant0_2441_1000~26500



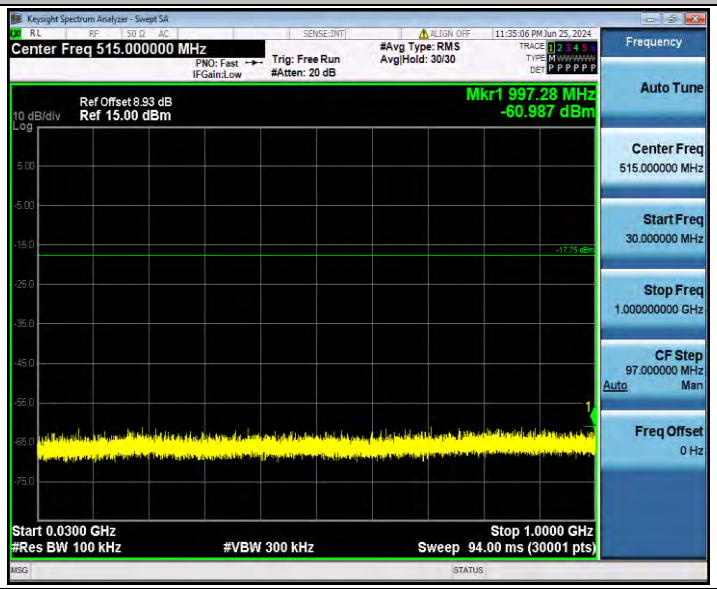
2DH1_Ant0_2480_0~Reference

2DH1_Ant0_2480_30~1000

2DH1_Ant0_2480_1000~26500



3DH1_Ant0_2402_0~Reference

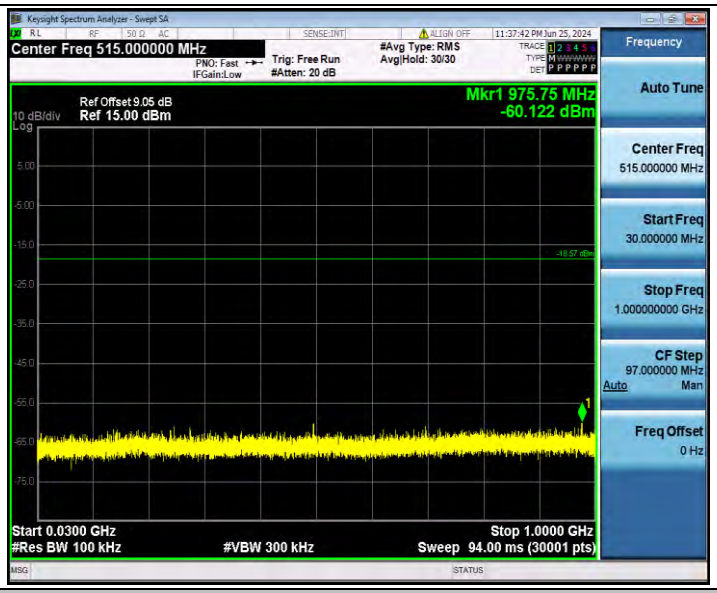
3DH1_Ant0_2402_30~1000



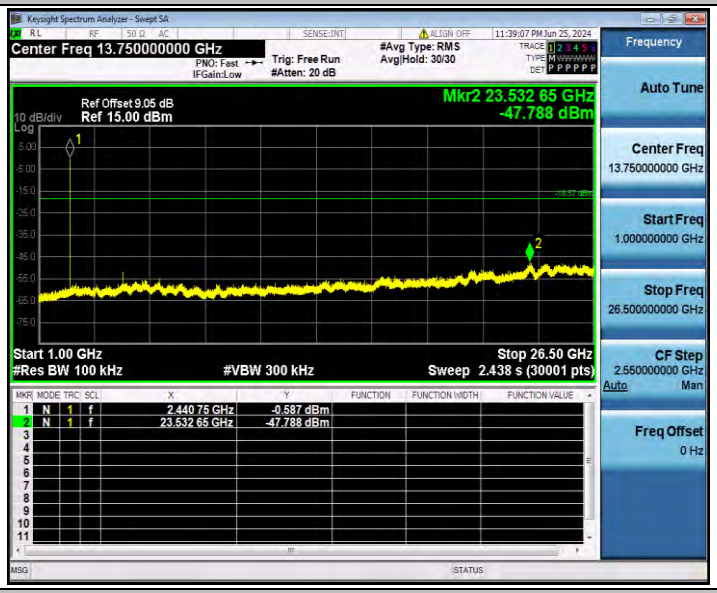
3DH1_Ant0_2402_1000~26500

3DH1_Ant0_2441_0~Reference

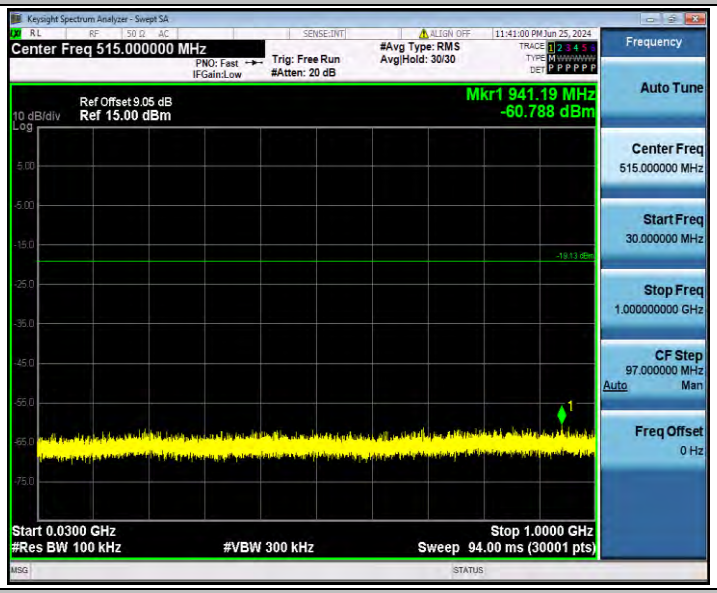
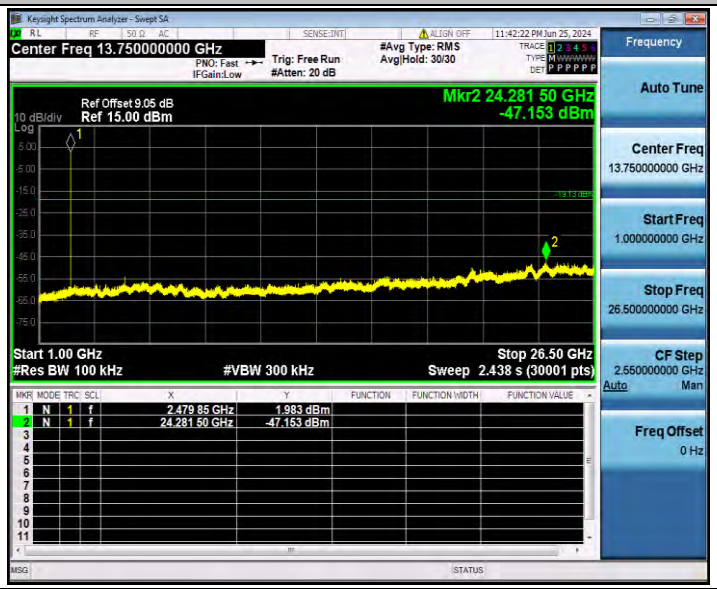
3DH1_Ant0_2441_30~1000



3DH1_Ant0_2441_1000~26500



3DH1_Ant0_2480_0~Reference

3DH1_Ant0_2480_30~1000

3DH1_Ant0_2480_1000~26500


Appendix A.9: Emissions in Restricted Bands

Test Result

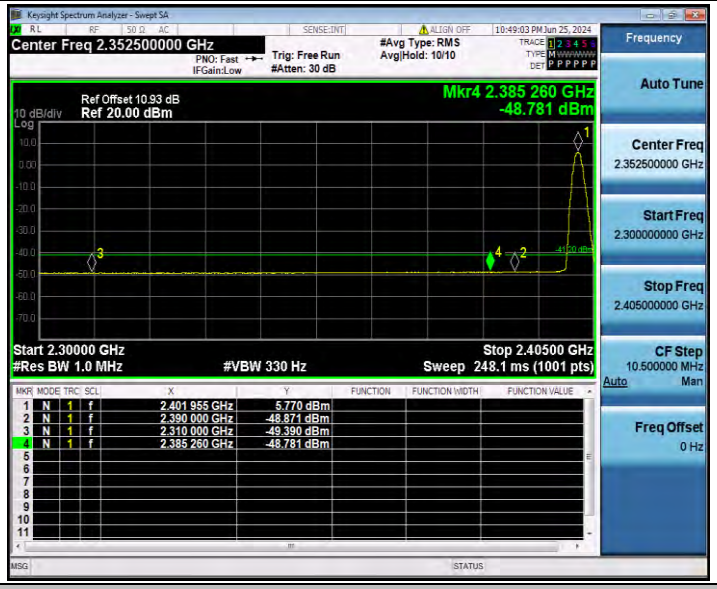
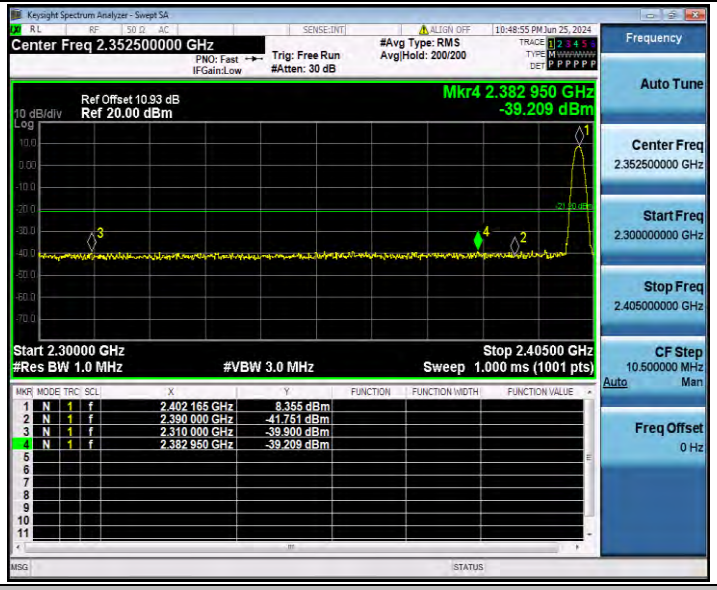
TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH1	Ant0	Low	2402	AV	2310.000	-49.39	≤-41.20	45.81	≤54	PASS
				AV	2385.260	-48.78	≤-41.20	46.42	≤54	PASS
				AV	2390.000	-48.87	≤-41.20	46.33	≤54	PASS
				Peak	2310.000	-39.9	≤-21.20	55.30	≤74	PASS
				Peak	2382.950	-39.21	≤-21.20	55.99	≤74	PASS
				Peak	2390.000	-41.75	≤-21.20	53.45	≤74	PASS
		High	2480	AV	2483.500	-48.17	≤-41.20	47.03	≤54	PASS
				AV	2483.520	-48.17	≤-41.20	47.03	≤54	PASS
				AV	2500.000	-48.68	≤-41.20	46.52	≤54	PASS
				Peak	2483.500	-40.12	≤-21.20	55.08	≤74	PASS
				Peak	2492.800	-38.21	≤-21.20	56.99	≤74	PASS
				Peak	2500.000	-41.22	≤-21.20	53.98	≤74	PASS
2DH1	Ant0	Low	2402	AV	2310.000	-49.35	≤-41.20	45.85	≤54	PASS
				AV	2386.625	-48.83	≤-41.20	46.37	≤54	PASS
				AV	2390.000	-48.89	≤-41.20	46.31	≤54	PASS
				Peak	2310.000	-42.96	≤-21.20	52.24	≤74	PASS
				Peak	2368.355	-38.71	≤-21.20	56.49	≤74	PASS
				Peak	2390.000	-40.15	≤-21.20	55.05	≤74	PASS
		High	2480	AV	2483.500	-48.18	≤-41.20	47.02	≤54	PASS
				AV	2483.520	-48.18	≤-41.20	47.02	≤54	PASS
				AV	2500.000	-48.72	≤-41.20	46.48	≤54	PASS
				Peak	2483.500	-41.65	≤-21.20	53.55	≤74	PASS
				Peak	2488.560	-38.6	≤-21.20	56.60	≤74	PASS
				Peak	2500.000	-41.22	≤-21.20	53.98	≤74	PASS
3DH1	Ant0	Low	2402	AV	2310.000	-49.21	≤-41.20	45.99	≤54	PASS
				AV	2382.845	-48.85	≤-41.20	46.35	≤54	PASS
				AV	2390.000	-49.06	≤-41.20	46.14	≤54	PASS
				Peak	2310.000	-41.95	≤-21.20	53.25	≤74	PASS
				Peak	2375.705	-38.37	≤-21.20	56.83	≤74	PASS
				Peak	2390.000	-41.75	≤-21.20	53.45	≤74	PASS
		High	2480	AV	2483.500	-48.29	≤-41.20	46.91	≤54	PASS
				AV	2483.520	-48.29	≤-41.20	46.91	≤54	PASS
				AV	2500.000	-48.64	≤-41.20	46.56	≤54	PASS
				Peak	2483.500	-42.16	≤-21.20	53.04	≤74	PASS
				Peak	2488.960	-38.81	≤-21.20	56.39	≤74	PASS

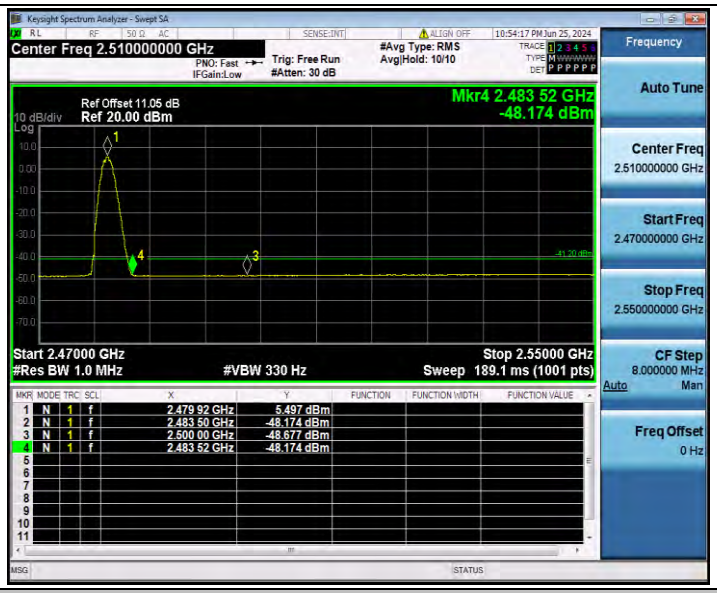
				Peak	2500.000	-41.03	≤-21.20	54.17	≤74	PASS

Note：

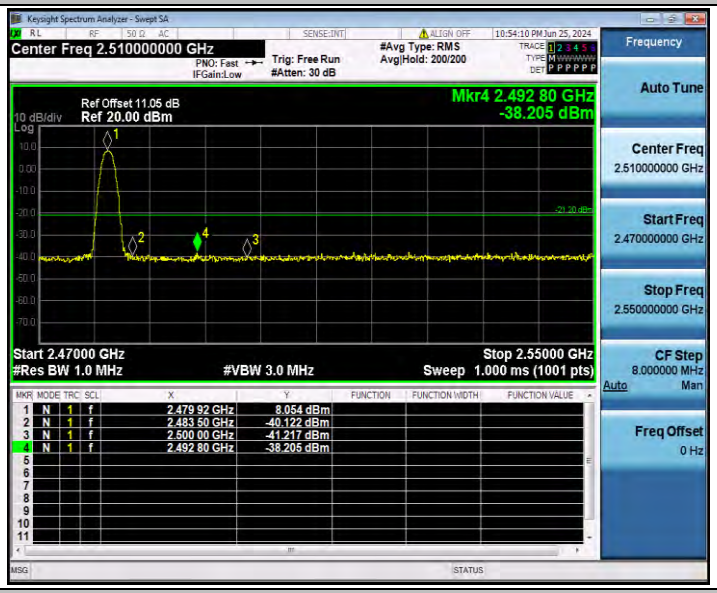
1. The Antenna Gain is compensated in the graph.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

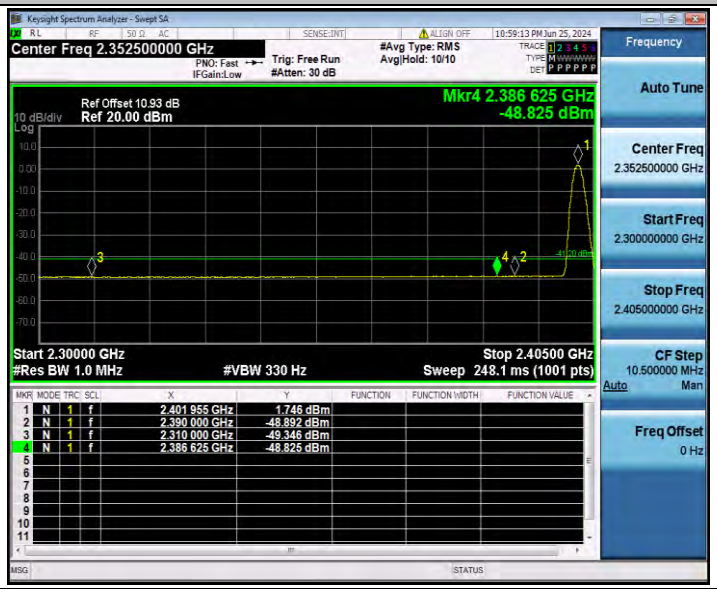
DH1_Ant0_Low_2402_AV

DH1_Ant0_Low_2402_Peak

DH1_Ant0_High_2480_AV

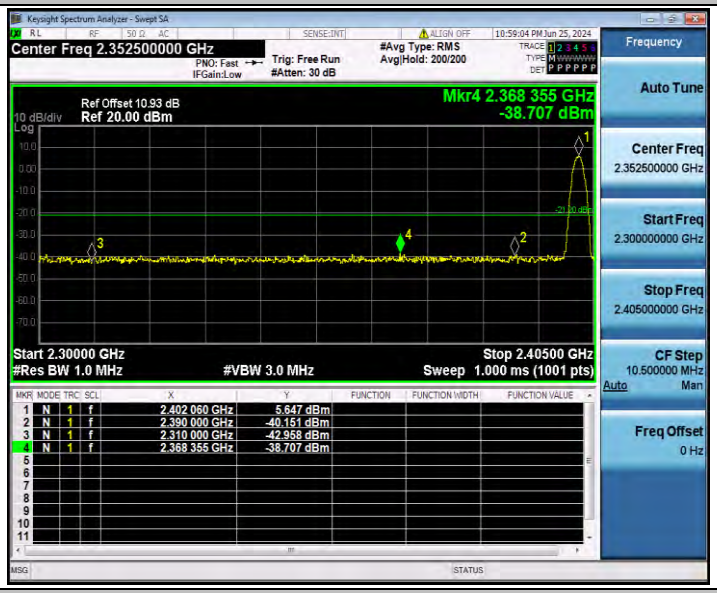
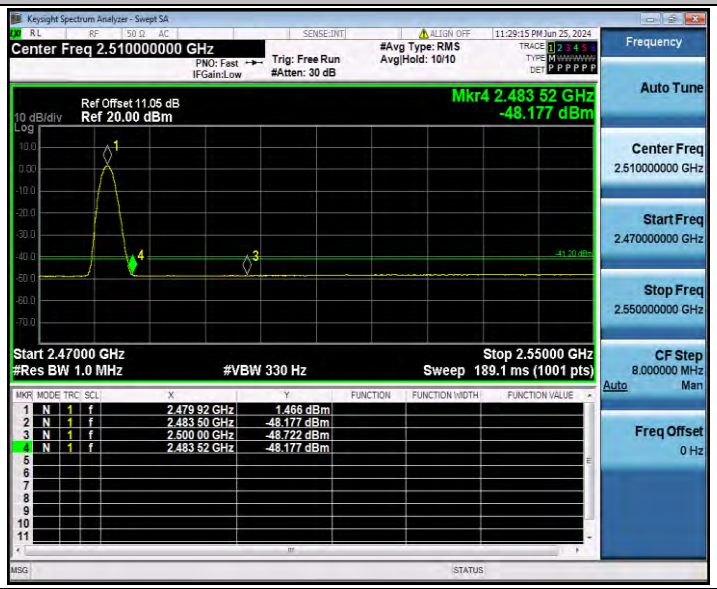


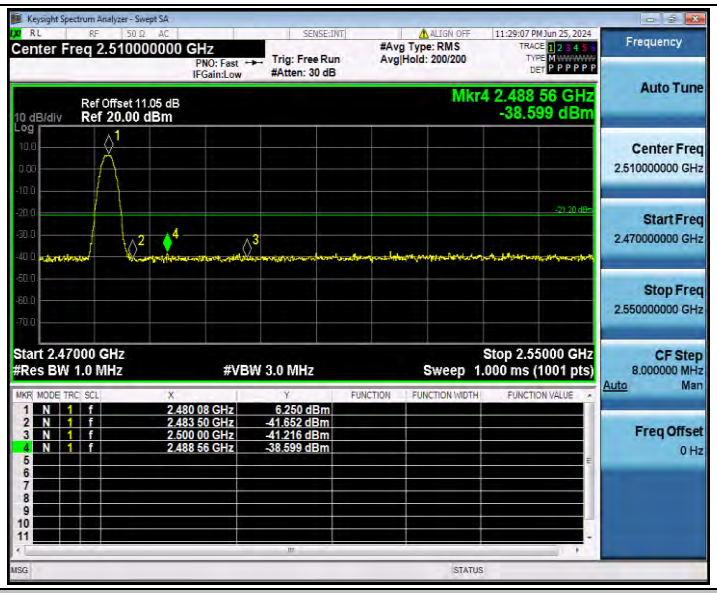
DH1_Ant0_High_2480_Peak



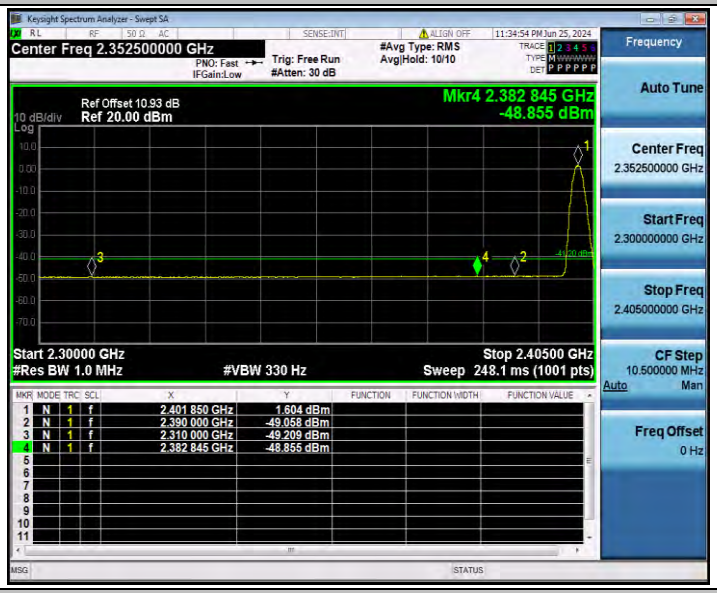
2DH1_Ant0_Low_2402_AV



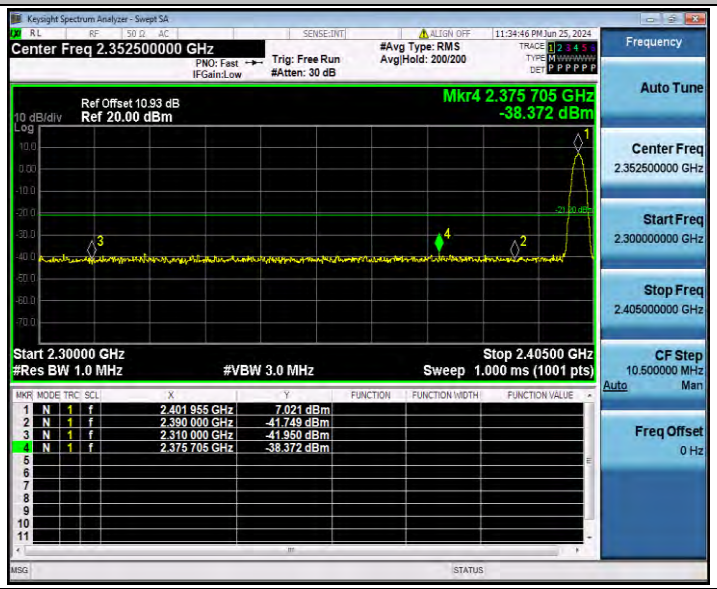
2DH1_Ant0_Low_2402_Peak

2DH1_Ant0_High_2480_AV

2DH1_Ant0_High_2480_Peak

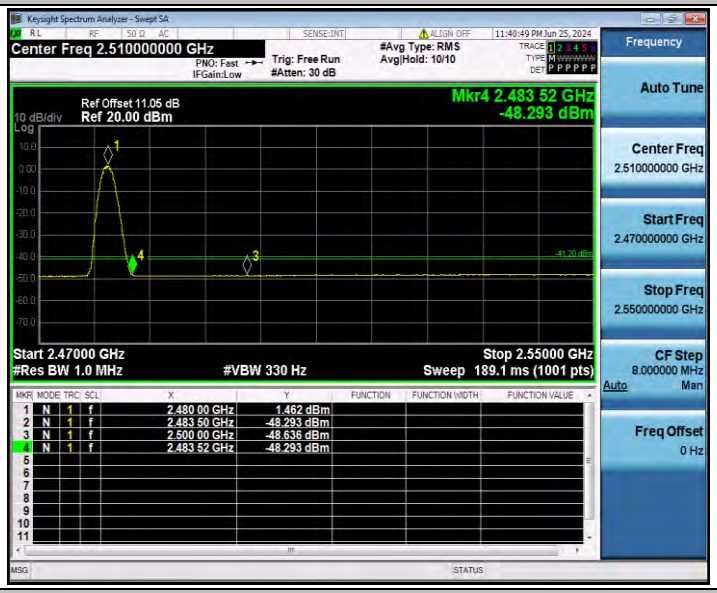


3DH1_Ant0_Low_2402_AV



3DH1_Ant0_Low_2402_Peak



3DH1_Ant0_High_2480_AV

3DH1_Ant0_High_2480_Peak