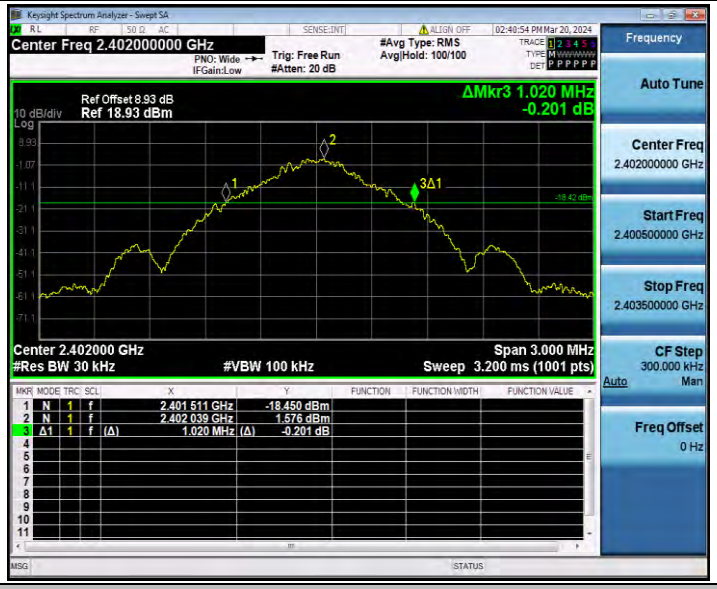
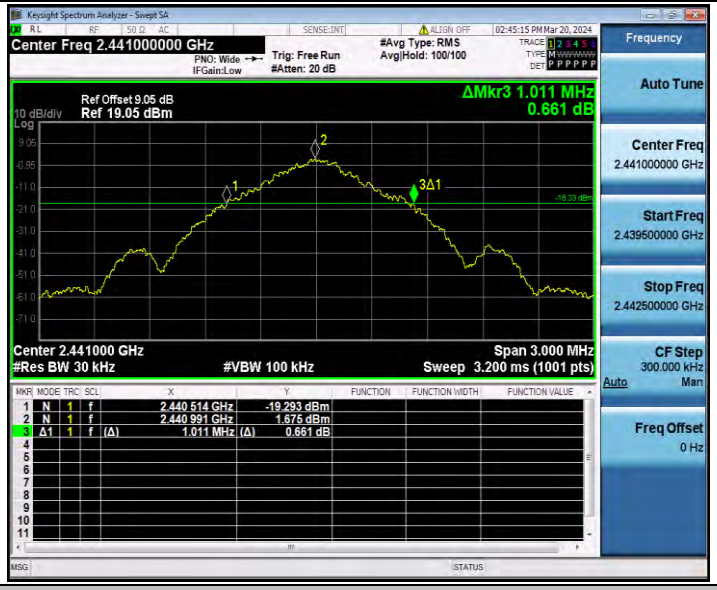
Case No. : CTA24050902501	
Ambient Condition: 23 ℃, 49 %RH	
According Standard: ■Part15C	
Test Date: 2024.3.19	**Test Engineer:** Evan ouyang

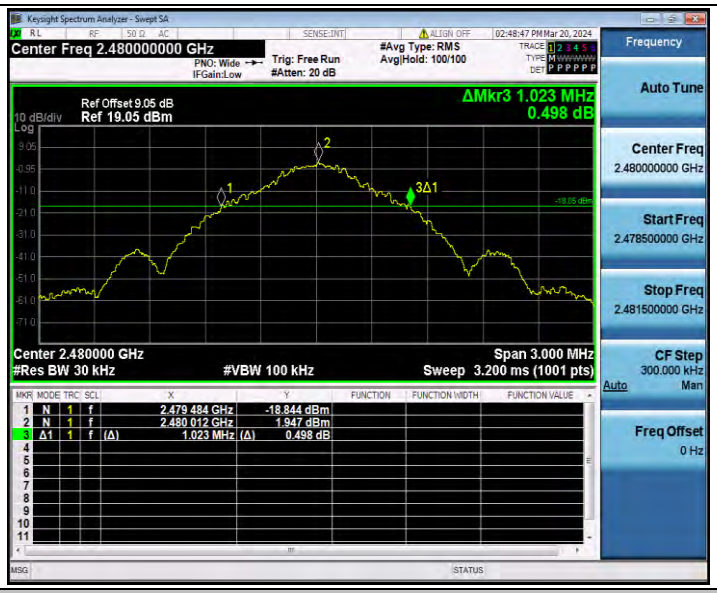
Appendix A.1: 20dB Emission Bandwidth

Test Result

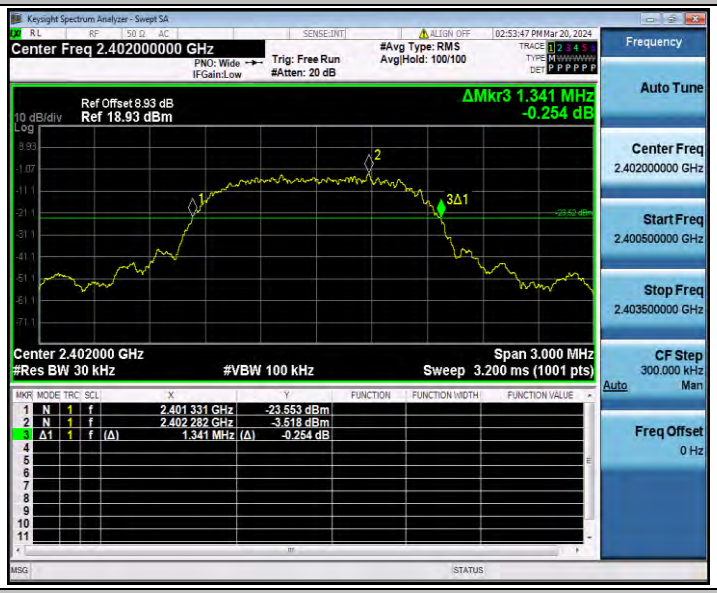
TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	1.020	2401.511	2402.531	---	---
		2441	1.011	2440.514	2441.525	---	---
		2480	1.023	2479.484	2480.507	---	---
2DH1	Ant1	2402	1.341	2401.331	2402.672	---	---
		2441	1.356	2440.322	2441.678	---	---
		2480	1.332	2479.325	2480.657	---	---
3DH1	Ant1	2402	1.359	2401.313	2402.672	---	---
		2441	1.356	2440.316	2441.672	---	---
		2480	1.347	2479.316	2480.663	---	---

Test Graphs

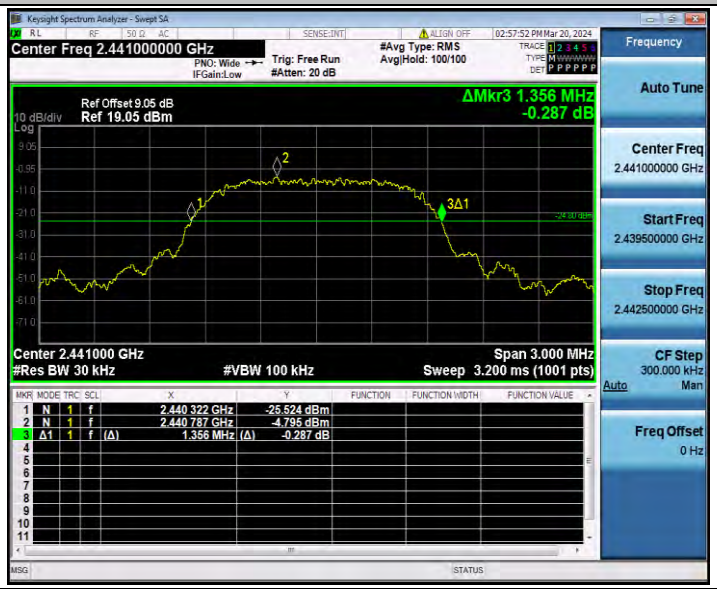
DH1_Ant1_2402

DH1_Ant1_2441

DH1_Ant1_2480

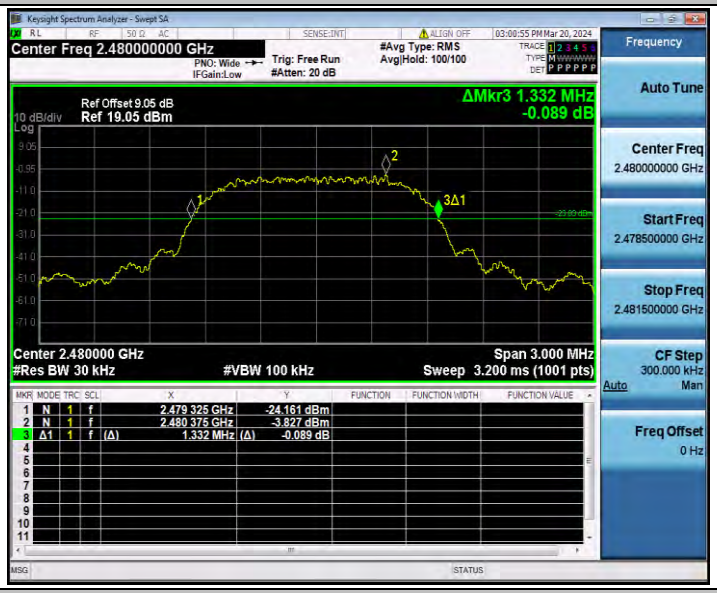
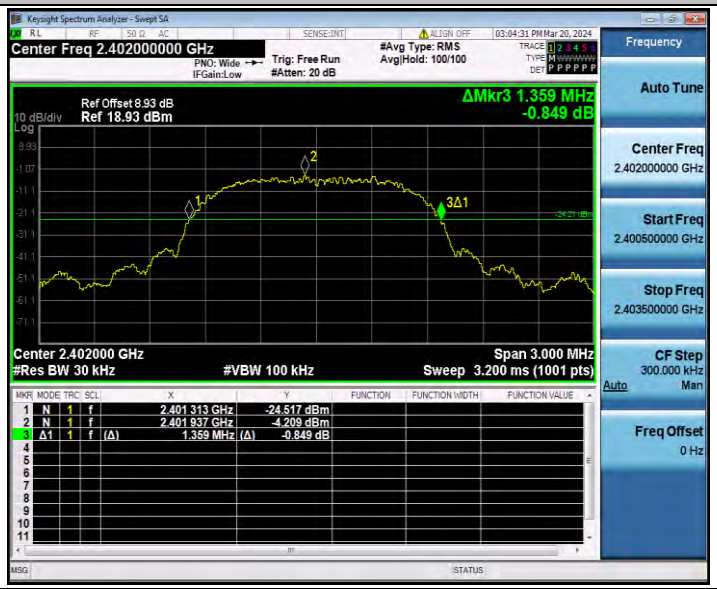


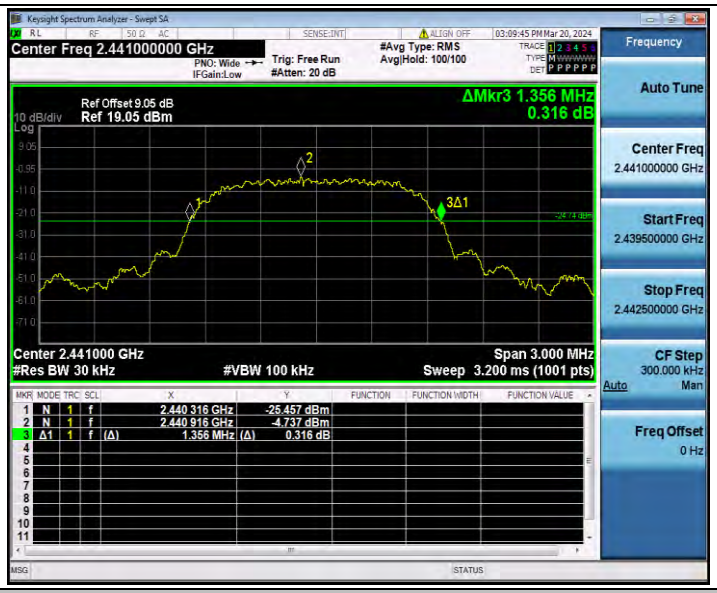
2DH1_Ant1_2402



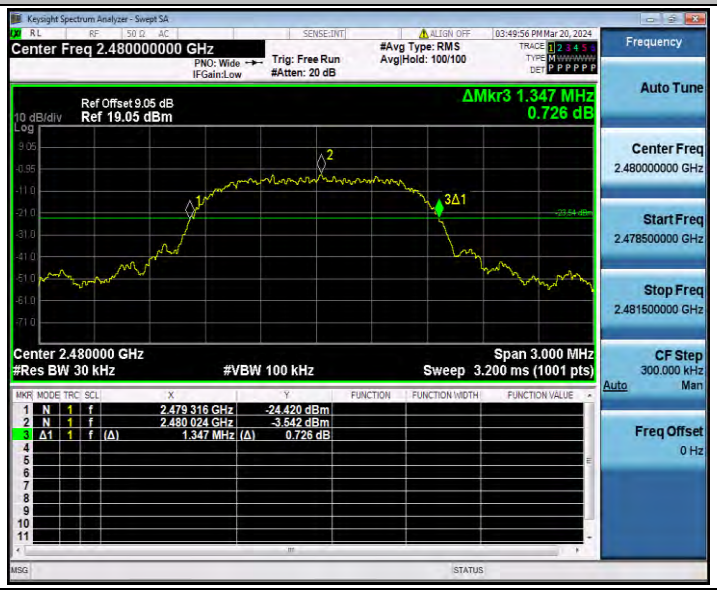
2DH1_Ant1_2441



2DH1_Ant1_2480

3DH1_Ant1_2402

3DH1_Ant1_2441



3DH1_Ant1_2480



Appendix A.2: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.88264	2401.5533	2402.4359	---	---
		2441	0.88945	2440.5506	2441.4400	---	---
		2480	0.87807	2479.5547	2480.4327	---	---
2DH1	Ant1	2402	1.1943	2401.3955	2402.5898	---	---
		2441	1.1916	2440.4028	2441.5944	---	---
		2480	1.1907	2479.4006	2480.5913	---	---
3DH1	Ant1	2402	1.1939	2401.3999	2402.5938	---	---
		2441	1.1847	2440.4058	2441.5905	---	---
		2480	1.1989	2479.3979	2480.5968	---	---

Test Graphs

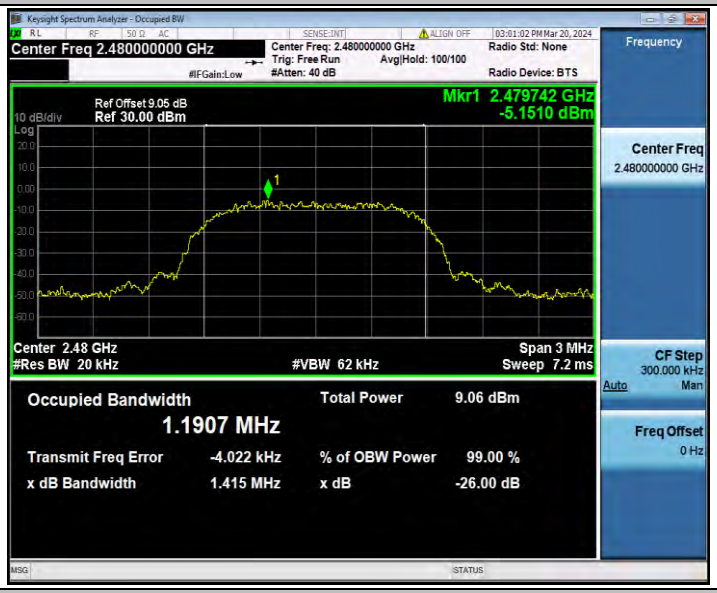
DH1_Ant1_2402

DH1_Ant1_2441

DH1_Ant1_2480

2DH1_Ant1_2402

2DH1_Ant1_2441

2DH1_Ant1_2480

3DH1_Ant1_2402

3DH1_Ant1_2441

3DH1_Ant1_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	Ant1	2402	3.83	≤20.97	PASS
		2441	3.49	≤20.97	PASS
		2480	3.08	≤20.97	PASS
2DH1	Ant1	2402	3.79	≤20.97	PASS
		2441	3.43	≤20.97	PASS
		2480	3.12	≤20.97	PASS
3DH1	Ant1	2402	3.31	≤20.97	PASS
		2441	3.87	≤20.97	PASS
		2480	3.66	≤20.97	PASS

Appendix A.4: Carrier frequency separation

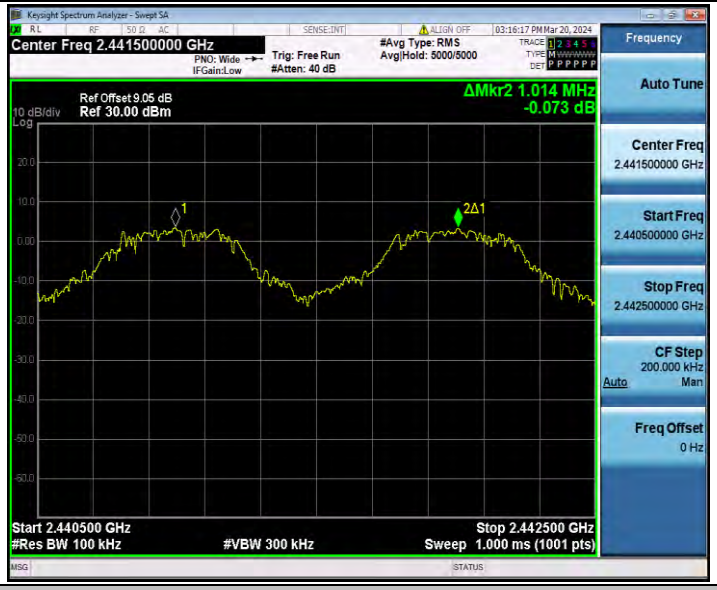
Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop_2402	0.998	≥0.682	PASS
		Hop_2441	1.014	≥0.682	PASS
		Hop_2480	0.998	≥0.682	PASS
2DH1	Ant1	Hop_2402	0.99	≥0.904	PASS
		Hop_2441	0.998	≥0.904	PASS
		Hop_2480	1	≥0.904	PASS
3DH1	Ant1	Hop_2402	1.004	≥0.906	PASS
		Hop_2441	1.01	≥0.906	PASS
		Hop_2480	1.012	≥0.906	PASS

Test Graphs

DH1_Ant1_Hop_2402

DH1_Ant1_Hop_2441



DH1_Ant1_Hop_2480

2DH1_Ant1_Hop_2402

2DH1_Ant1_Hop_2441

2DH1_Ant1_Hop_2480

3DH1_Ant1_Hop_2402

3DH1_Ant1_Hop_2441

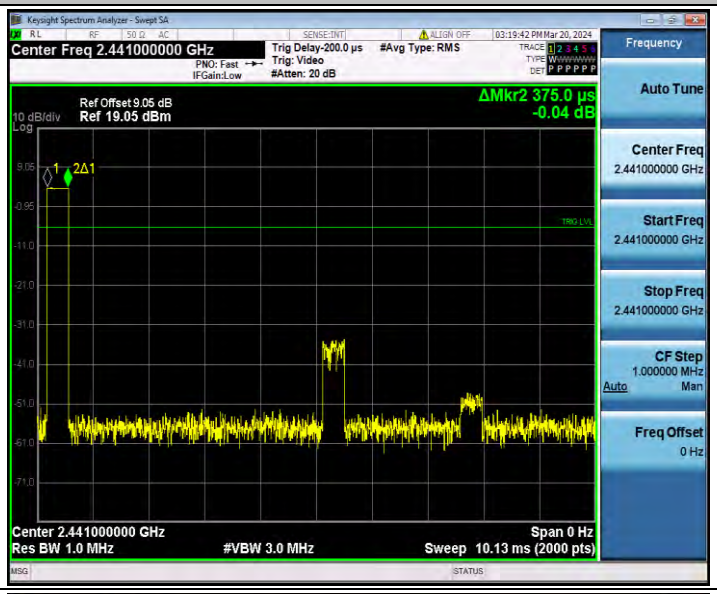
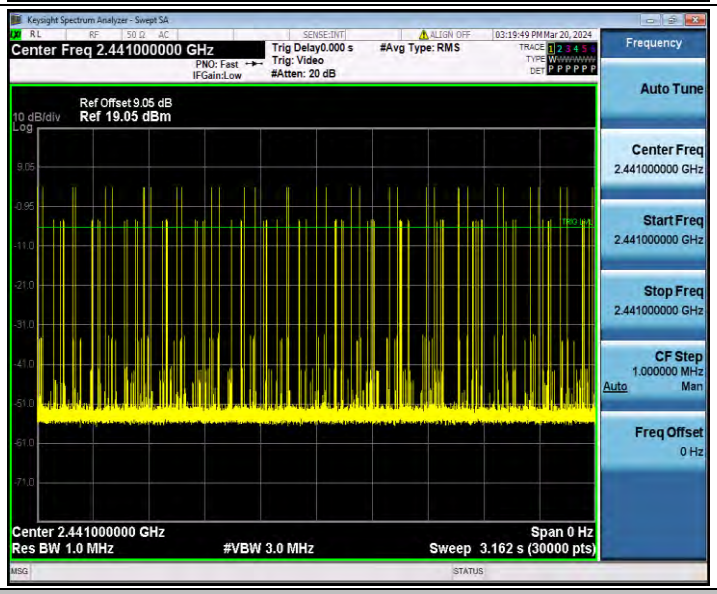
3DH1_Ant1_Hop_2480

Appendix A.5: Time of occupancy

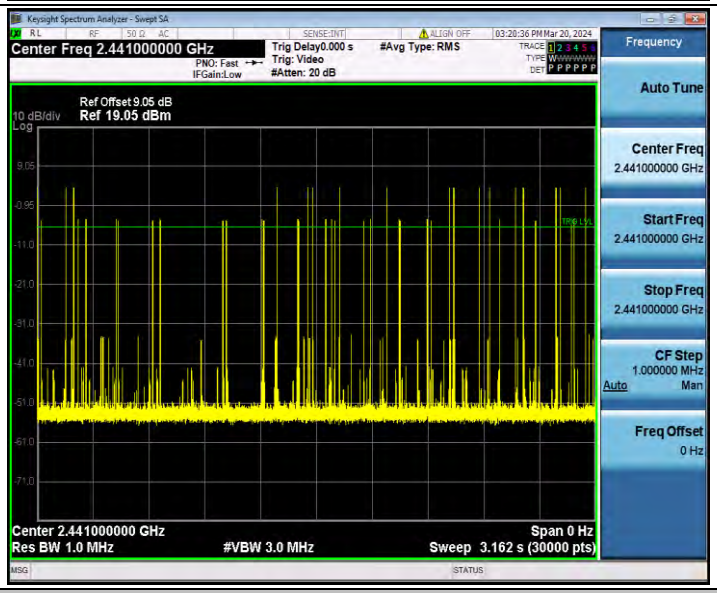
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.375	330	0.124	≤0.4	PASS
DH3	Ant1	Hop	1.631	170	0.277	≤0.4	PASS
DH5	Ant1	Hop	2.878	80	0.23	≤0.4	PASS
2DH1	Ant1	Hop	0.385	320	0.123	≤0.4	PASS
2DH3	Ant1	Hop	1.637	150	0.246	≤0.4	PASS
2DH5	Ant1	Hop	2.883	100	0.288	≤0.4	PASS
3DH1	Ant1	Hop	0.385	330	0.127	≤0.4	PASS
3DH3	Ant1	Hop	1.631	180	0.294	≤0.4	PASS
3DH5	Ant1	Hop	2.883	110	0.317	≤0.4	PASS

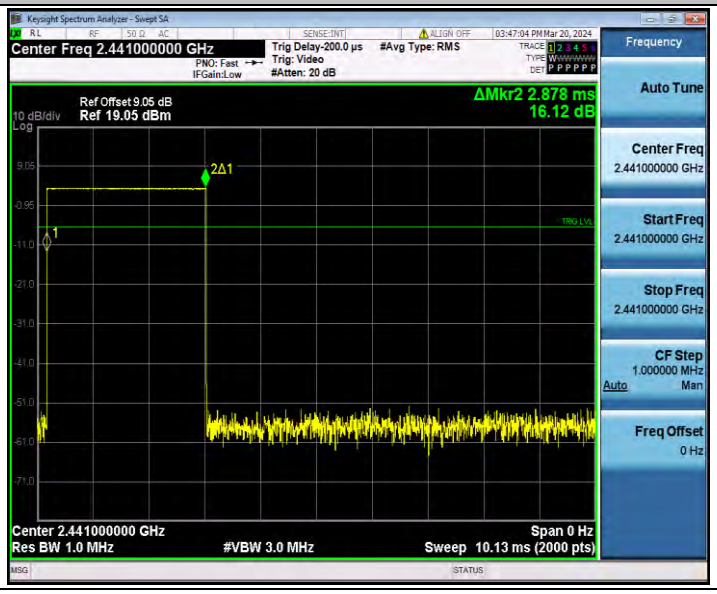
Test Graphs

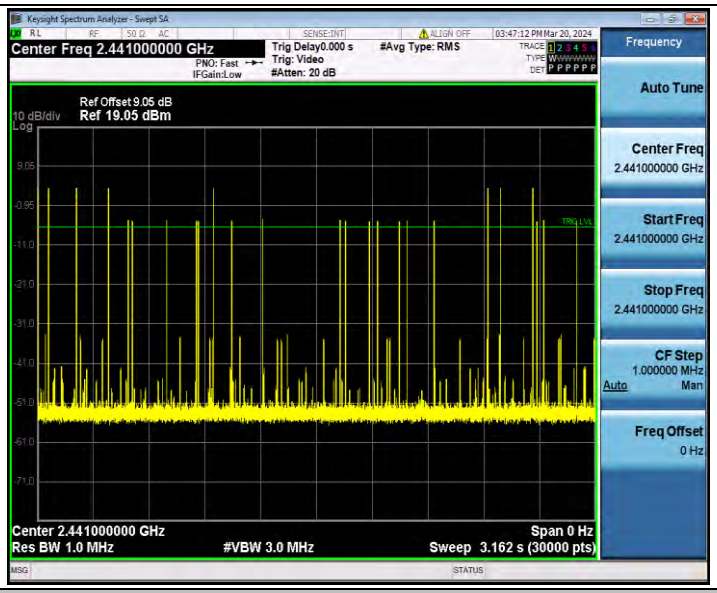
DH1_Ant1_Hop


DH3_Ant1_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
03:26:29 PM Mar 20, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 1.631 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

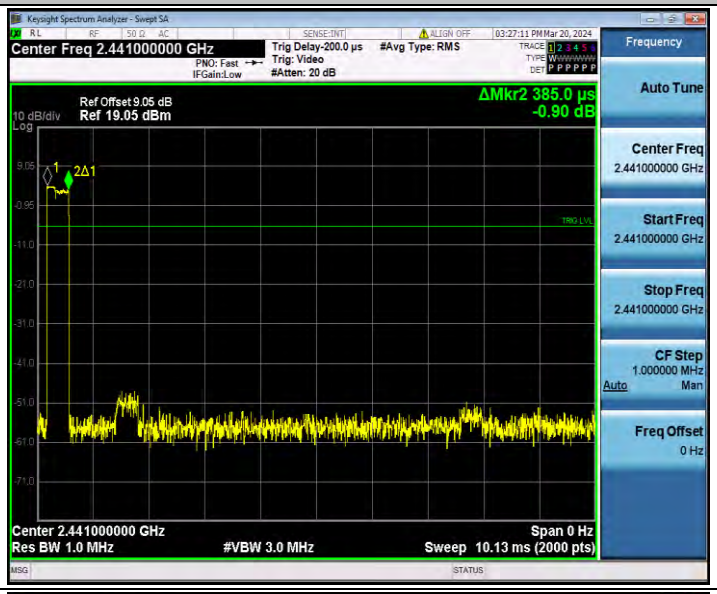

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
03:20:36 PM Mar 20, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
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

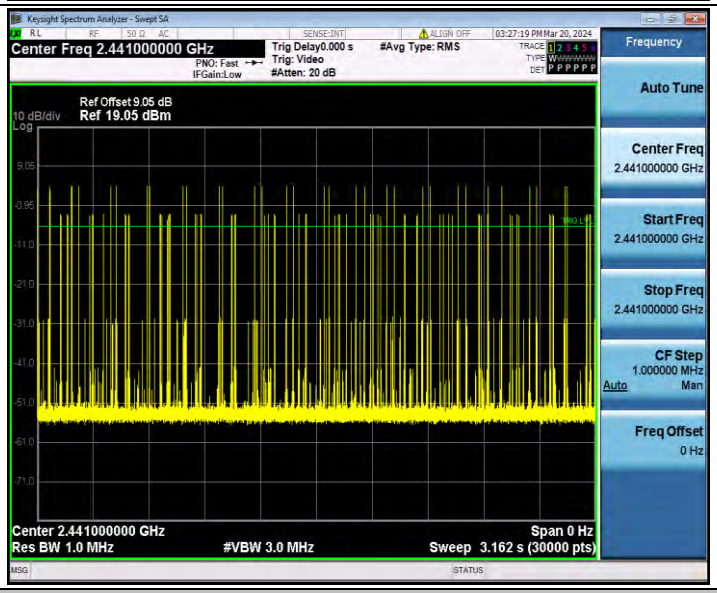
DH5_Ant1_Hop


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
03:47:04 PM Mar 20, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 2.878 ms
16.12 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

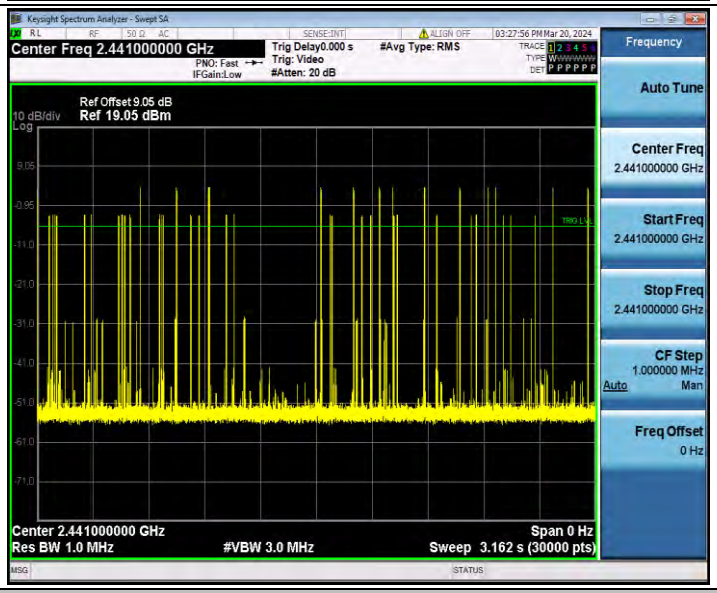


2DH1_Ant1_Hop

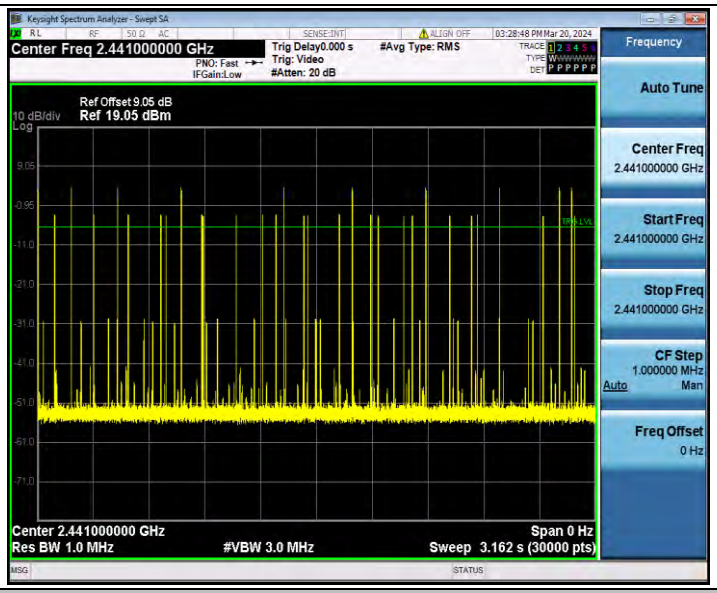




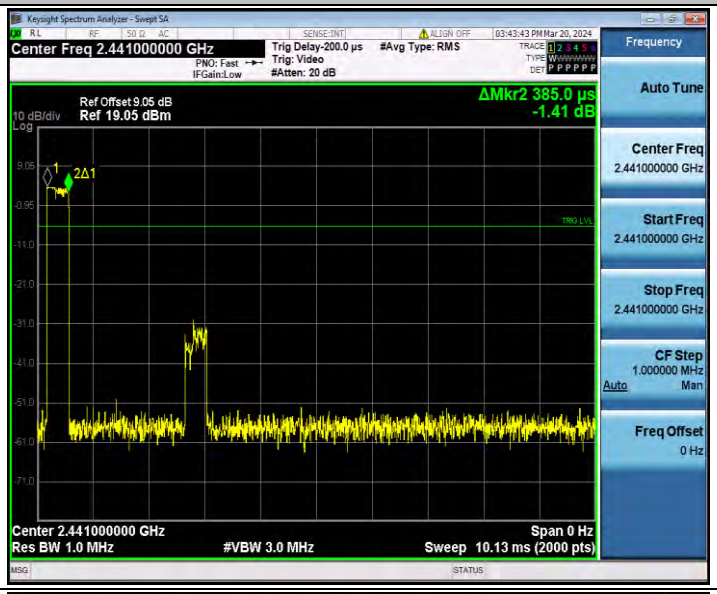
2DH3_Ant1_Hop

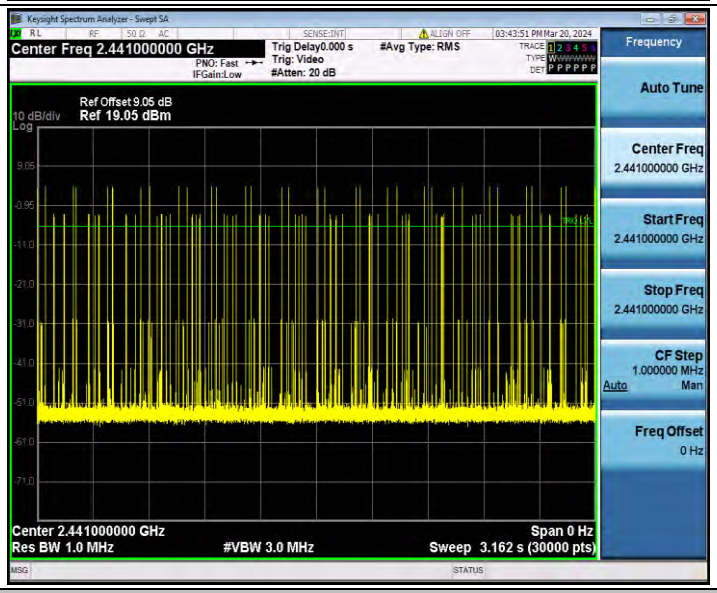


2DH5_Ant1_Hop

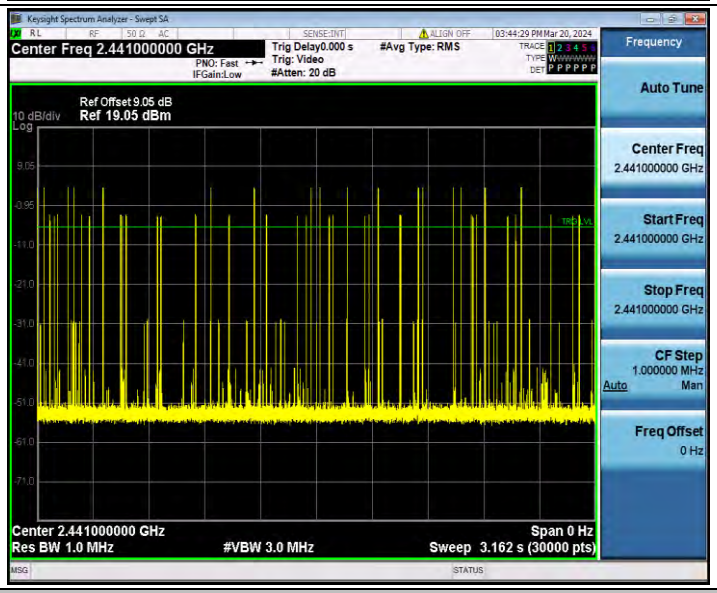


3DH1_Ant1_Hop

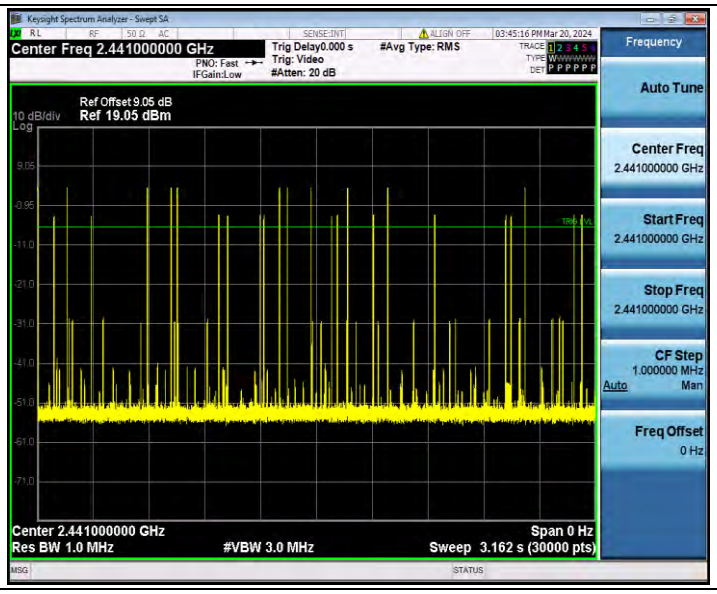




3DH3_Ant1_Hop



3DH5_Ant1_Hop

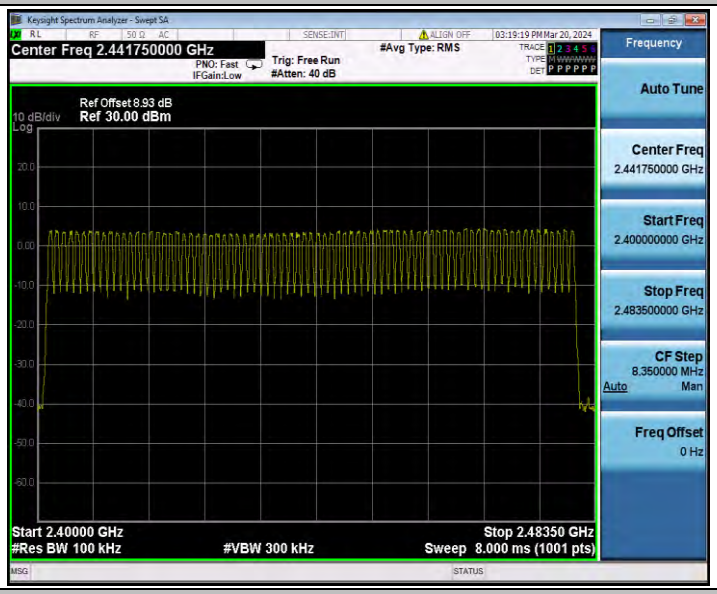
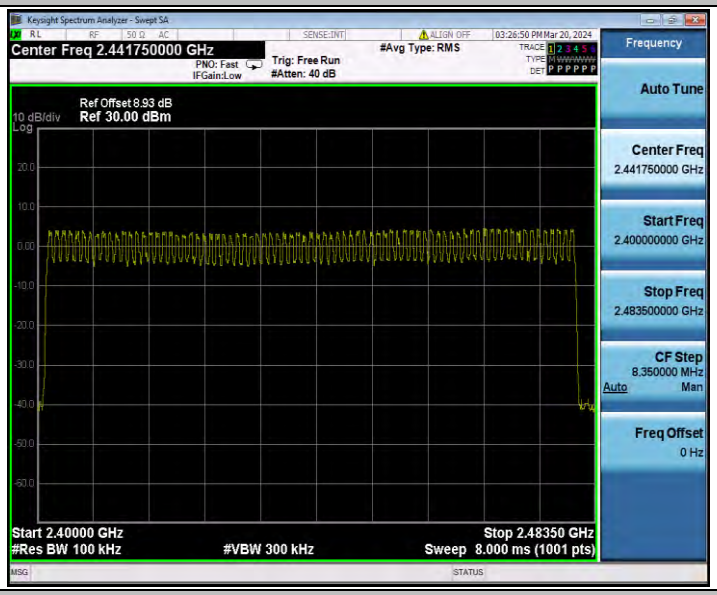

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
03:45:16 PM Mar 20, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Log
9.05
-0.95
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
Center 2.441000000 GHz
Res BW 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

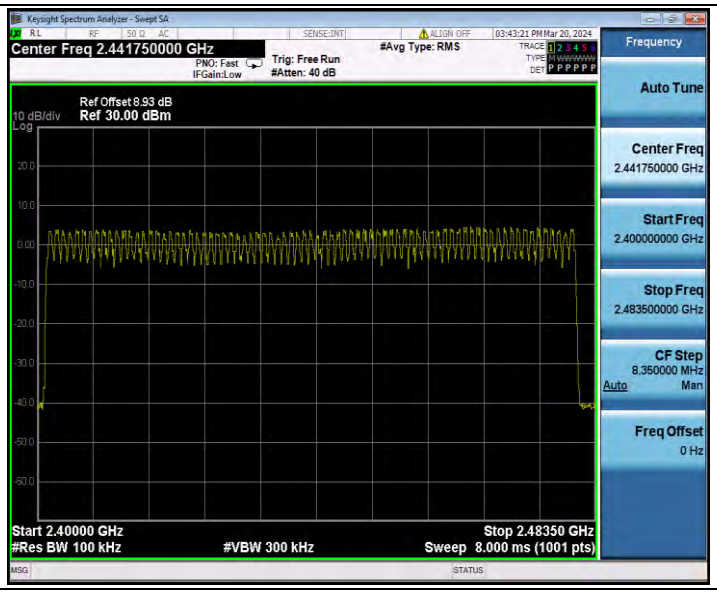
Appendix A.6: Number of hopping channels

Test Result

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

Test Graphs

DH1_Ant1_Hop

2DH1_Ant1_Hop

3DH1_Ant1_Hop

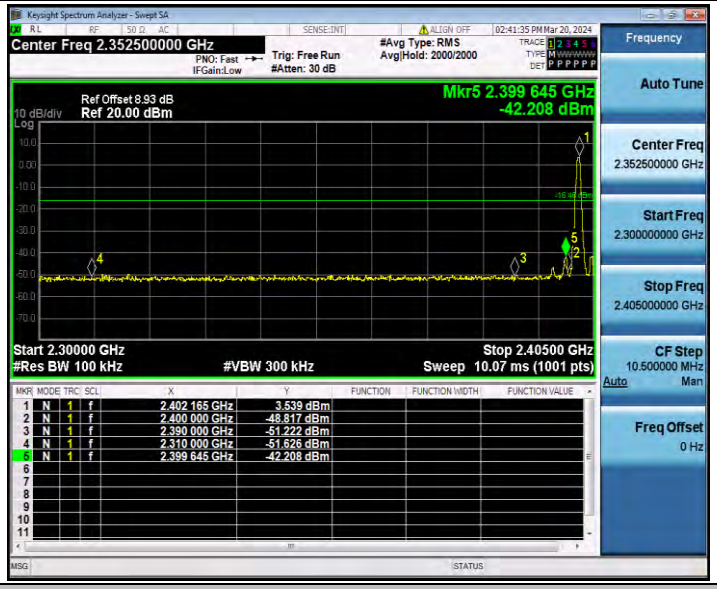
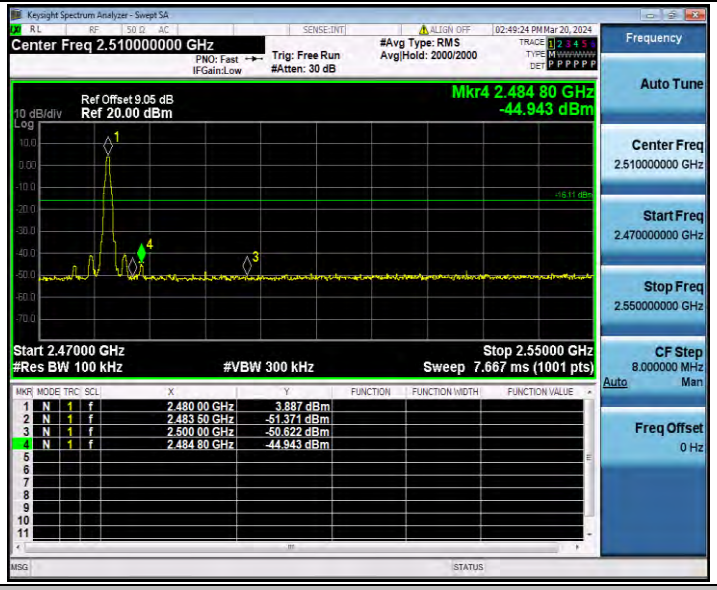

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
03:43:21 PM Mar 20, 2024
Ref Offset 8.93 dB
10 dB/div
Log
Ref 30.00 dBm
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (1001 pts)
Frequency
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

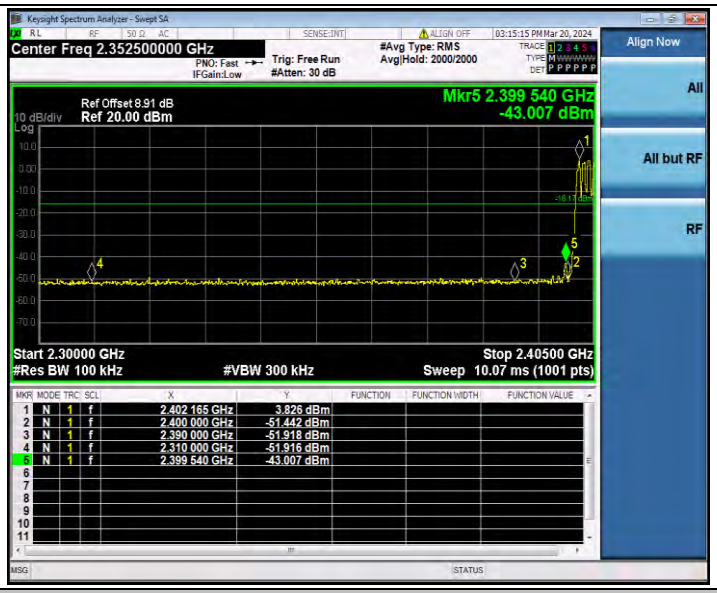
Appendix A.7: Band edge measurements

Test Result

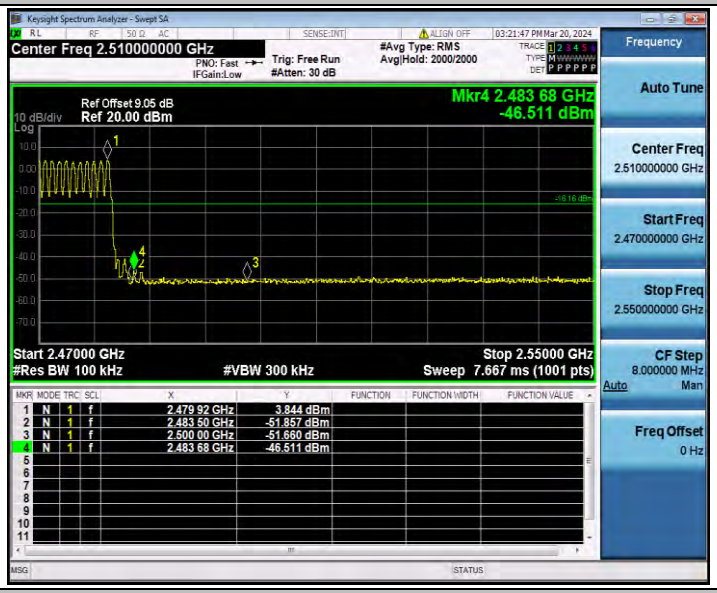
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	3.54	-42.21	≤-16.46	PASS
		High	2480	3.89	-44.94	≤-16.11	PASS
		Low	Hop_2402	3.83	-43.01	≤-16.17	PASS
		High	Hop_2480	3.84	-46.51	≤-16.16	PASS
2DH1	Ant1	Low	2402	0.28	-44.9	≤-19.72	PASS
		High	2480	0.91	-48.17	≤-19.1	PASS
		Low	Hop_2402	4.03	-45.62	≤-15.97	PASS
		High	Hop_2480	3.46	-48.52	≤-16.54	PASS
3DH1	Ant1	Low	2402	0.28	-45.4	≤-19.72	PASS
		High	2480	0.65	-47.83	≤-19.35	PASS
		Low	Hop_2402	3.92	-47	≤-16.08	PASS
		High	Hop_2480	4.28	-48.32	≤-15.72	PASS

Test Graphs

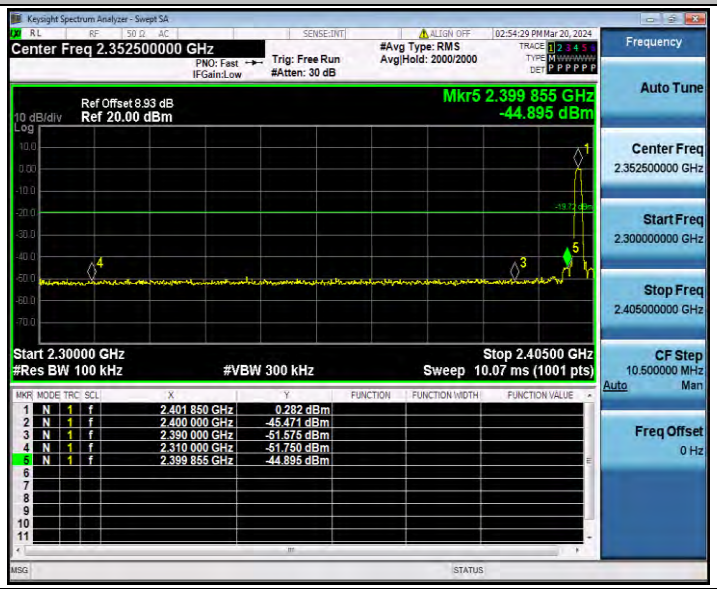
DH1_Ant1_Low_2402

DH1_Ant1_High_2480

DH1_Ant1_Low_Hop_2402

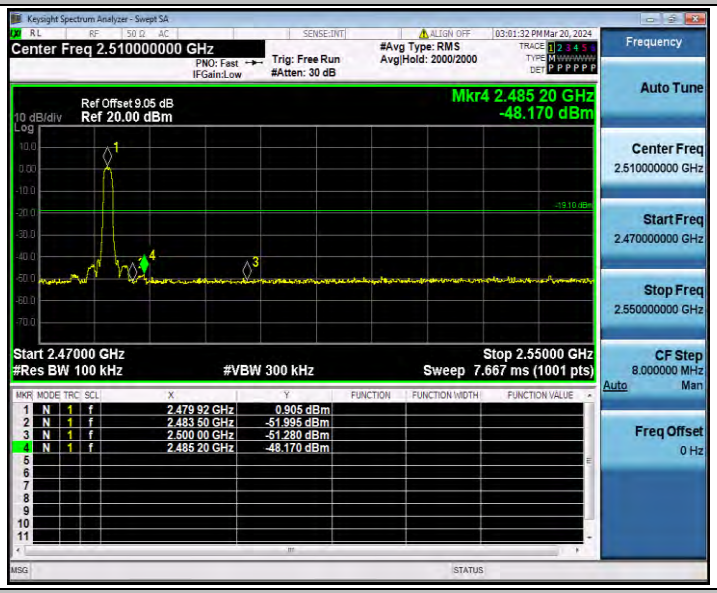
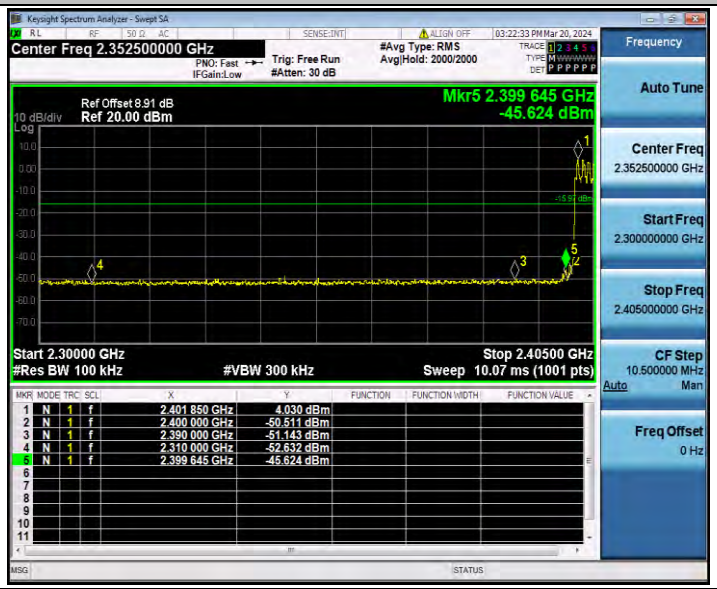


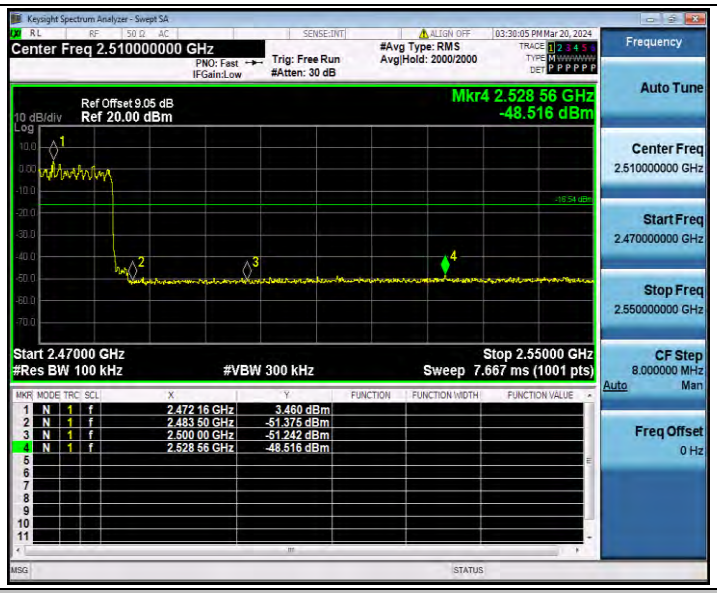
DH1_Ant1_High_Hop_2480



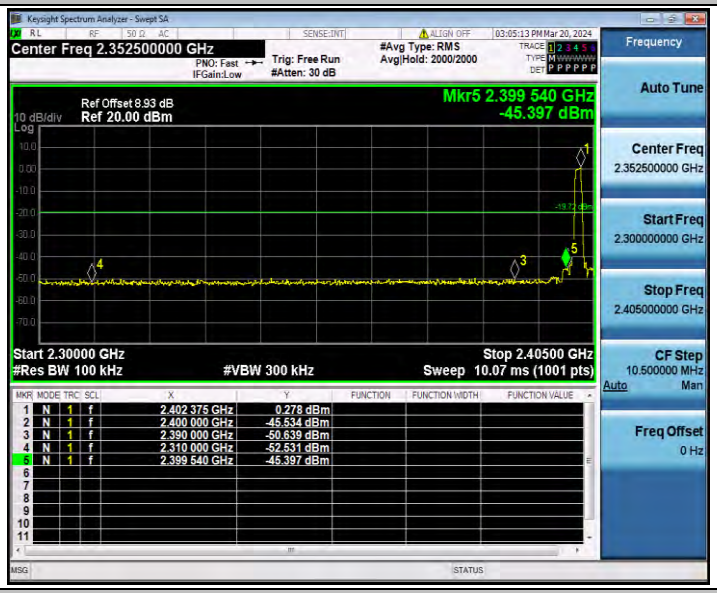
2DH1_Ant1_Low_2402



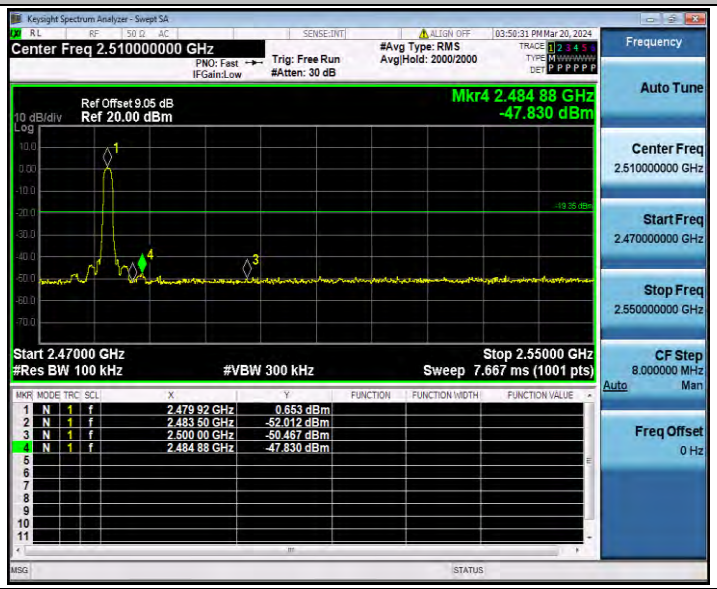
2DH1_Ant1_High_2480

2DH1_Ant1_Low_Hop_2402

2DH1_Ant1_High_Hop_2480

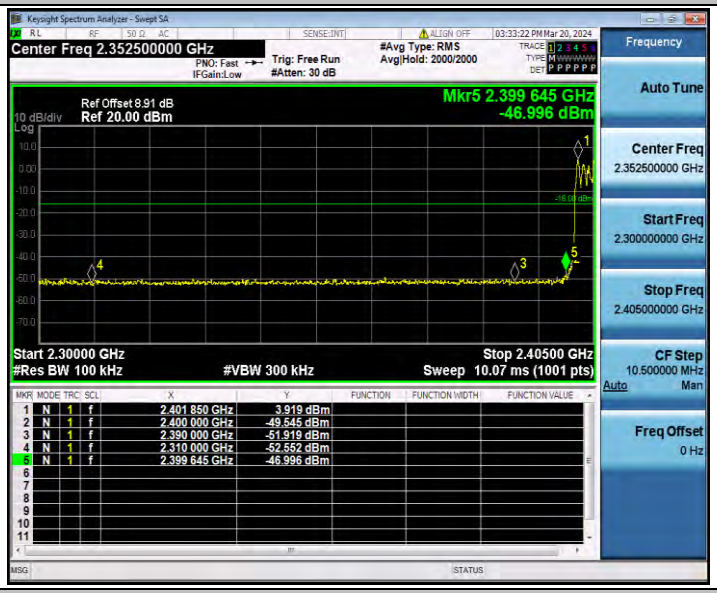
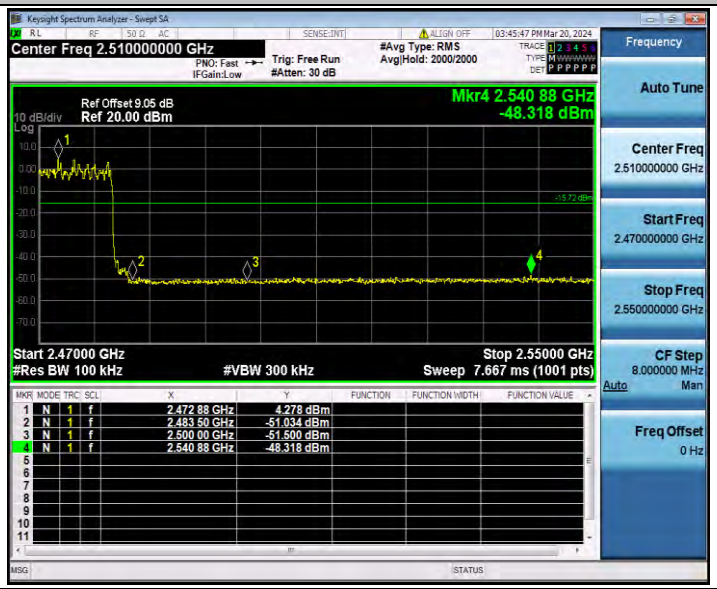


3DH1_Ant1_Low_2402



3DH1_Ant1_High_2480



3DH1_Ant1_Low_Hop_2402

3DH1_Ant1_High_Hop_2480


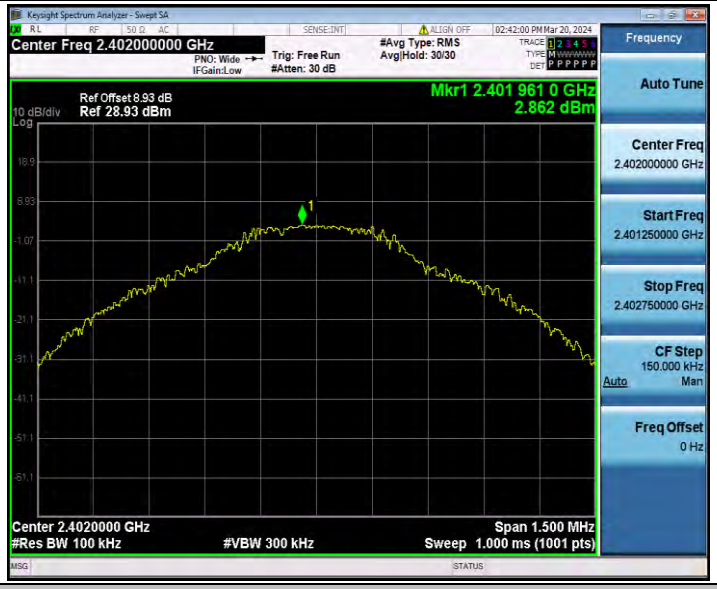
Appendix A.8: Conducted Spurious Emission

Test Result

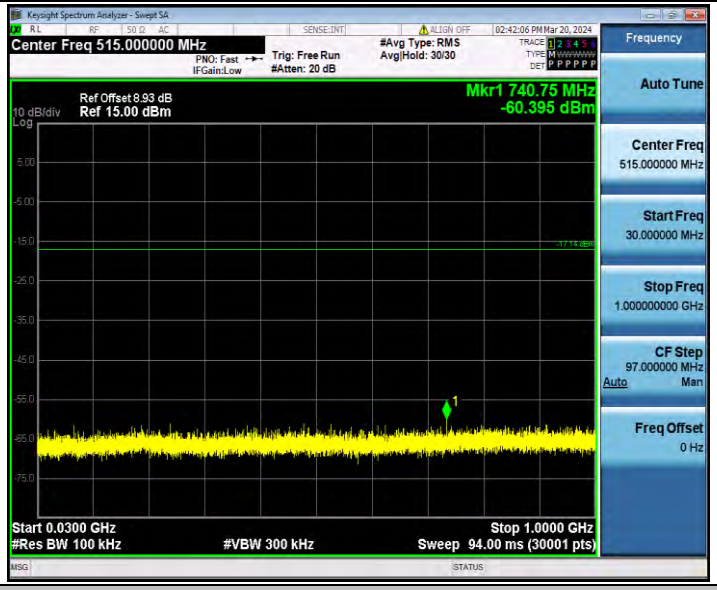
TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	2402	Reference	2.86	2.86	---	PASS
			30~1000	2.86	-60.4	≤-17.14	PASS
			1000~26500	2.86	-48.27	≤-17.14	PASS
		2441	Reference	2.47	2.47	---	PASS
			30~1000	2.47	-60.86	≤-17.53	PASS
			1000~26500	2.47	-47.2	≤-17.53	PASS
		2480	Reference	3.39	3.39	---	PASS
			30~1000	3.39	-61.15	≤-16.61	PASS
			1000~26500	3.39	-47.78	≤-16.61	PASS
2DH1	Ant1	2402	Reference	-0.09	-0.09	---	PASS
			30~1000	-0.09	-60.68	≤-20.09	PASS
			1000~26500	-0.09	-48.19	≤-20.09	PASS
		2441	Reference	-1.02	-1.02	---	PASS
			30~1000	-1.02	-60.75	≤-21.02	PASS
			1000~26500	-1.02	-47.59	≤-21.02	PASS
		2480	Reference	-0.37	-0.37	---	PASS
			30~1000	-0.37	-60.78	≤-20.37	PASS
			1000~26500	-0.37	-47.16	≤-20.37	PASS
3DH1	Ant1	2402	Reference	-0.99	-0.99	---	PASS
			30~1000	-0.99	-60.3	≤-20.99	PASS
			1000~26500	-0.99	-47.67	≤-20.99	PASS
		2441	Reference	-0.86	-0.86	---	PASS
			30~1000	-0.86	-60.63	≤-20.86	PASS
			1000~26500	-0.86	-47.88	≤-20.86	PASS
		2480	Reference	-0.26	-0.26	---	PASS
			30~1000	-0.26	-59.07	≤-20.26	PASS
			1000~26500	-0.26	-48.14	≤-20.26	PASS

Test Graphs

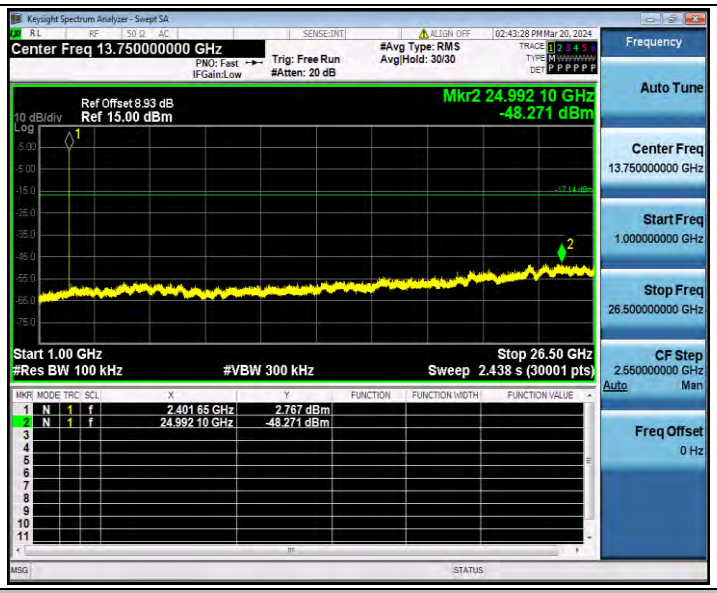
DH1_Ant1_2402_0~Reference



DH1_Ant1_2402_30~1000

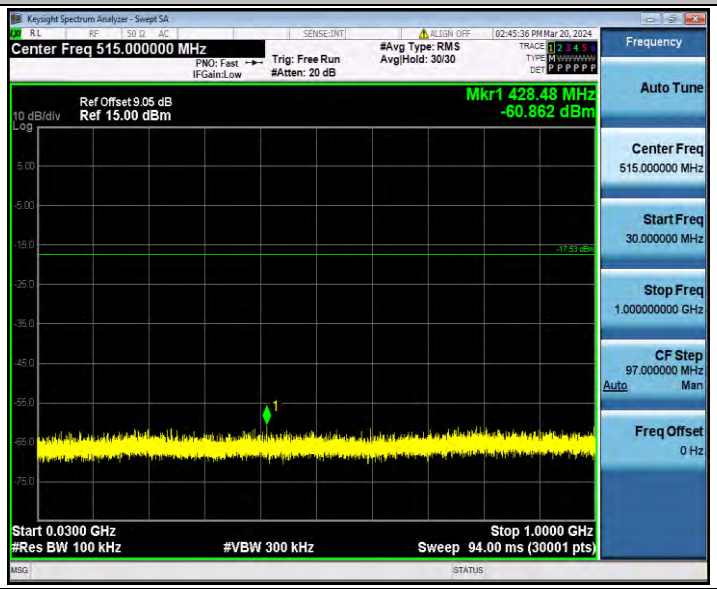


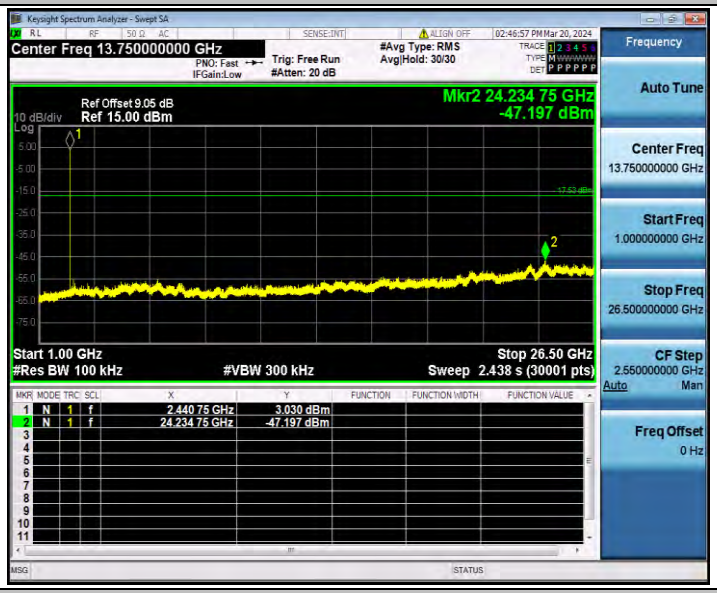
DH1_Ant1_2402_1000~26500



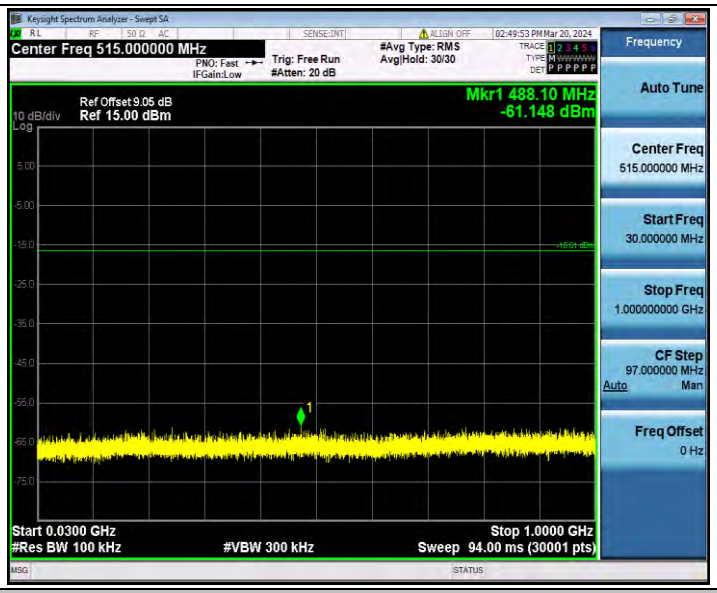
DH1_Ant1_2441_0~Reference

DH1_Ant1_2441_30~1000

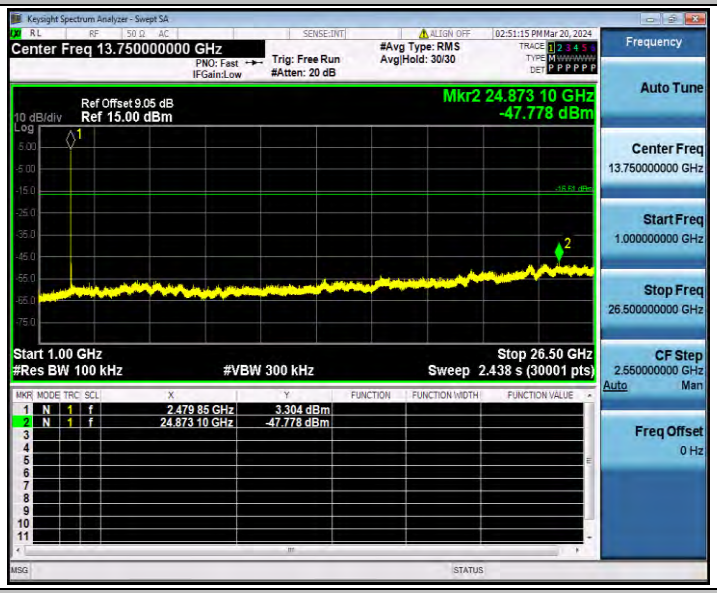


DH1_Ant1_2441_1000~26500

DH1_Ant1_2480_0~Reference

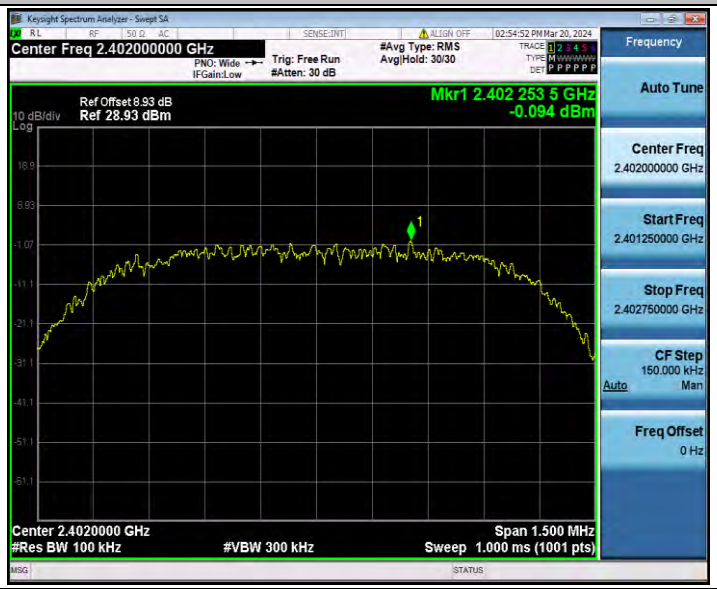
DH1_Ant1_2480_30~1000

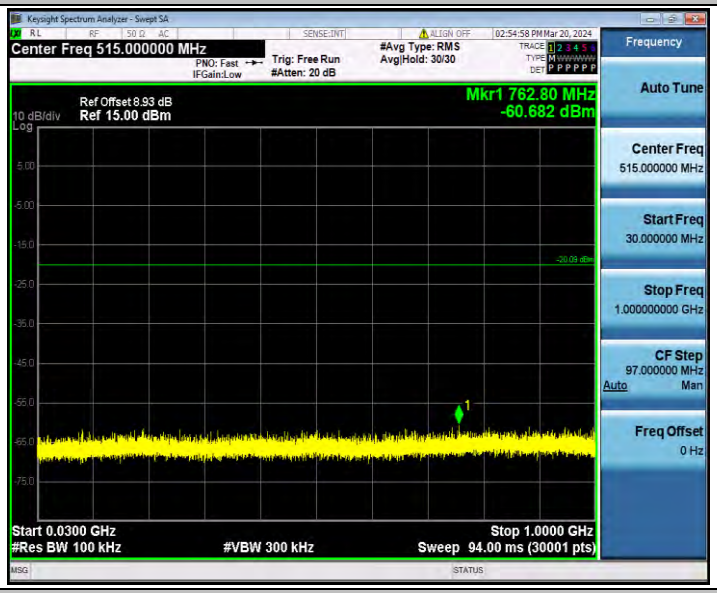
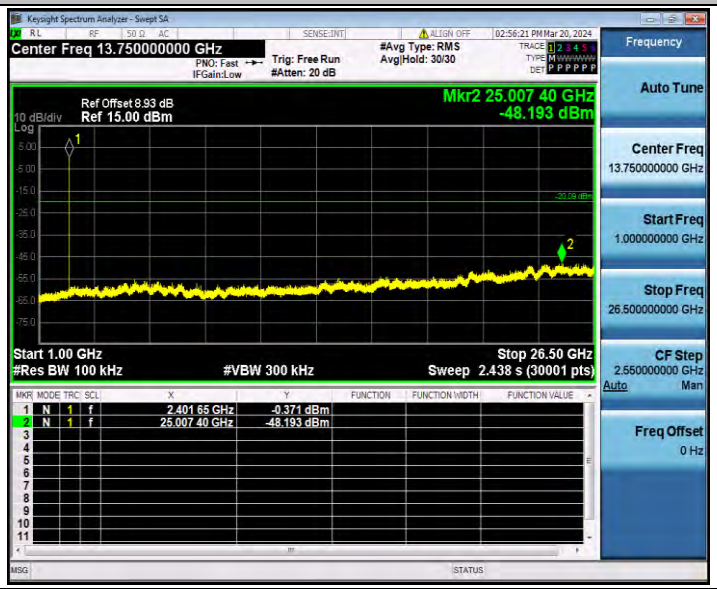


DH1_Ant1_2480_1000~26500



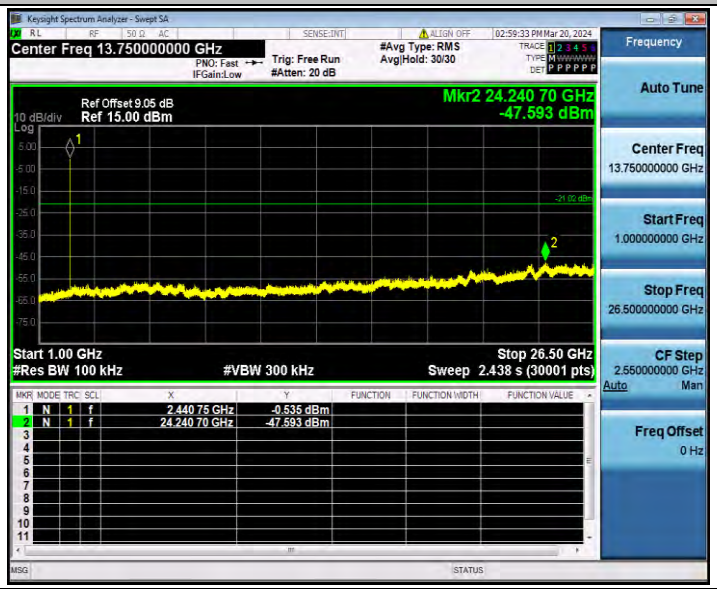
2DH1_Ant1_2402_0~Reference



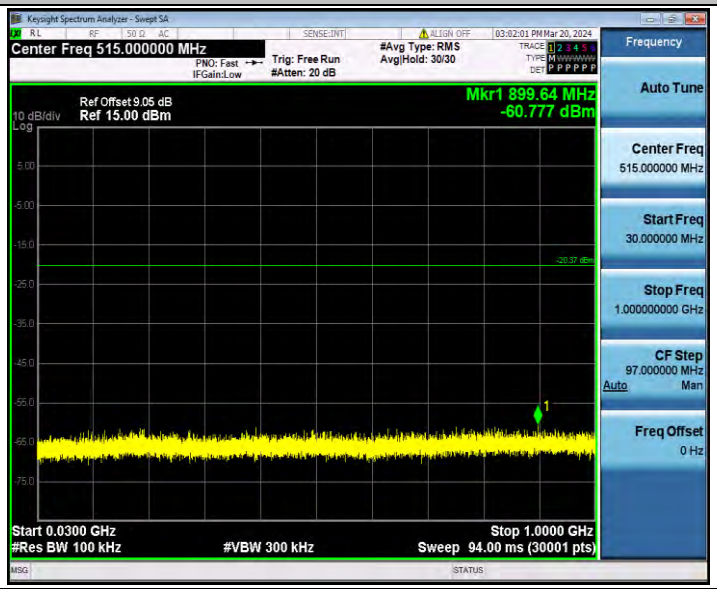
2DH1_Ant1_2402_30~1000

2DH1_Ant1_2402_1000~26500

2DH1_Ant1_2441_0~Reference

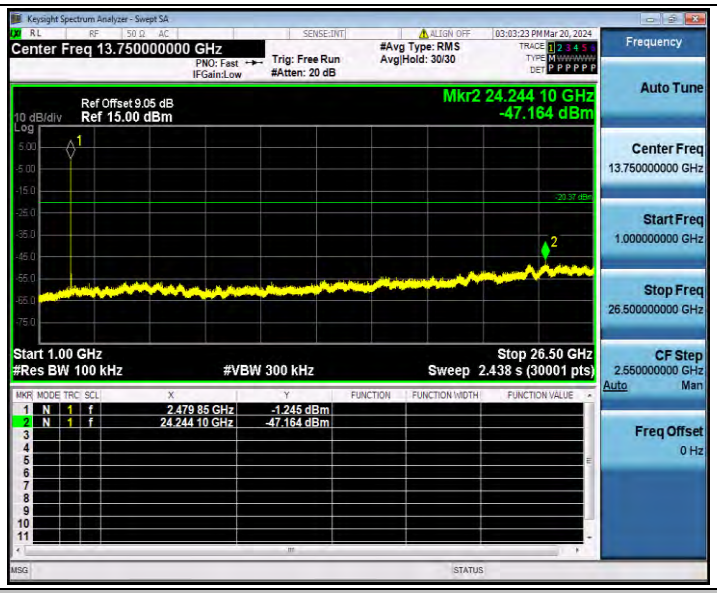
2DH1_Ant1_2441_30~1000

2DH1_Ant1_2441_1000~26500



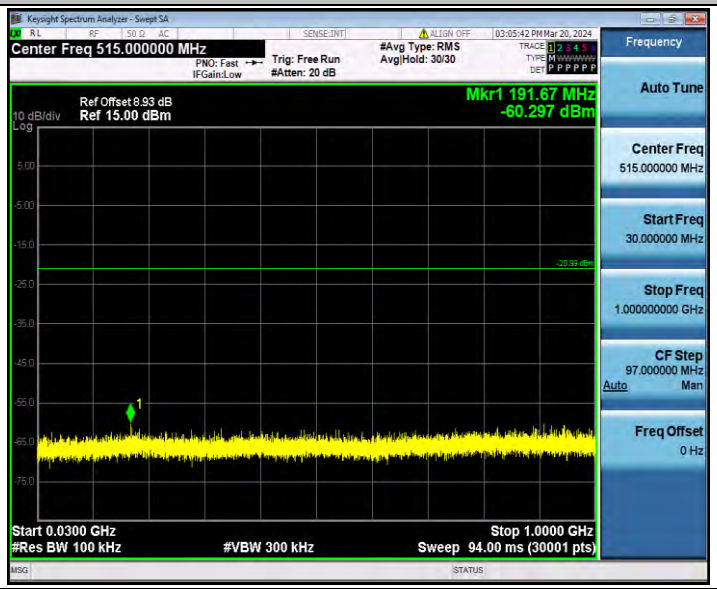
2DH1_Ant1_2480_0~Reference

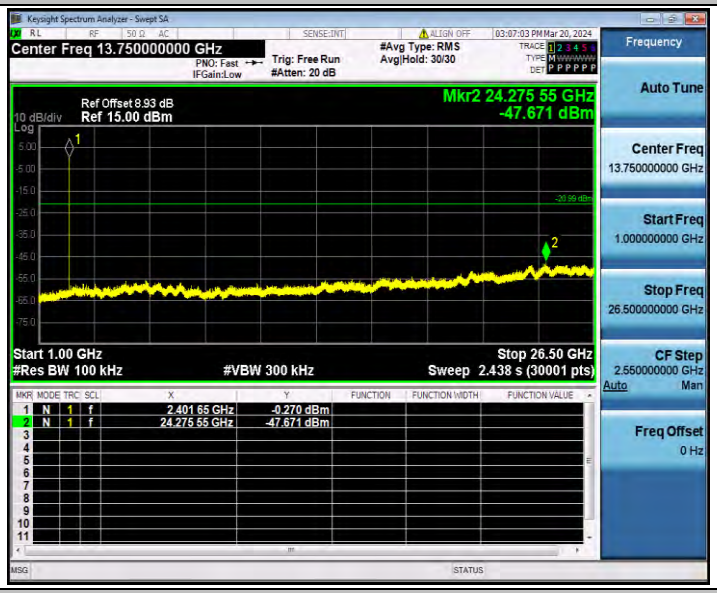
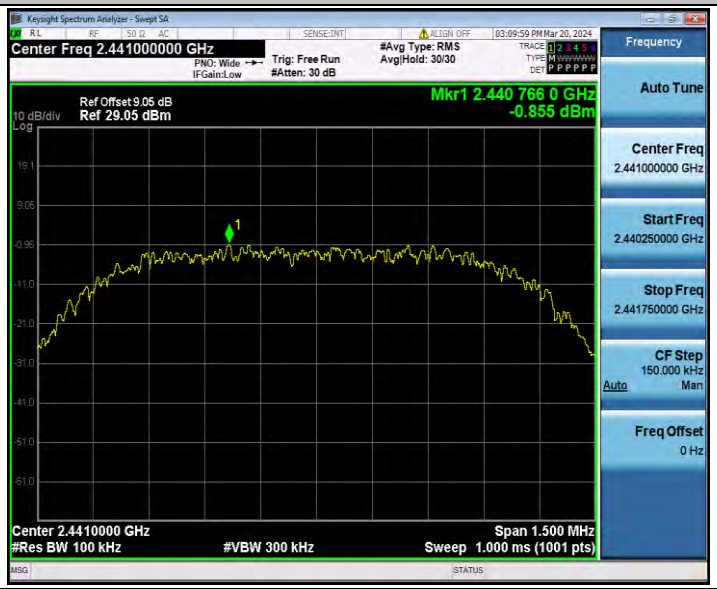
2DH1_Ant1_2480_30~1000

2DH1_Ant1_2480_1000~26500



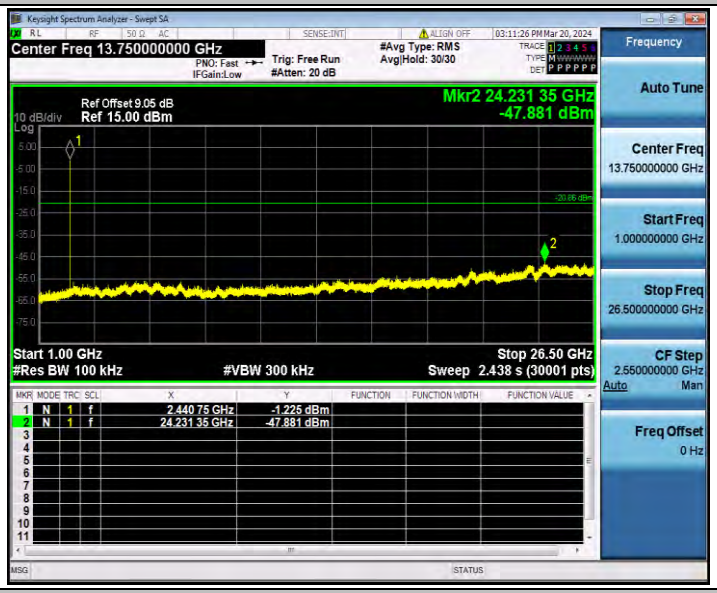
3DH1_Ant1_2402_0~Reference

3DH1_Ant1_2402_30~1000

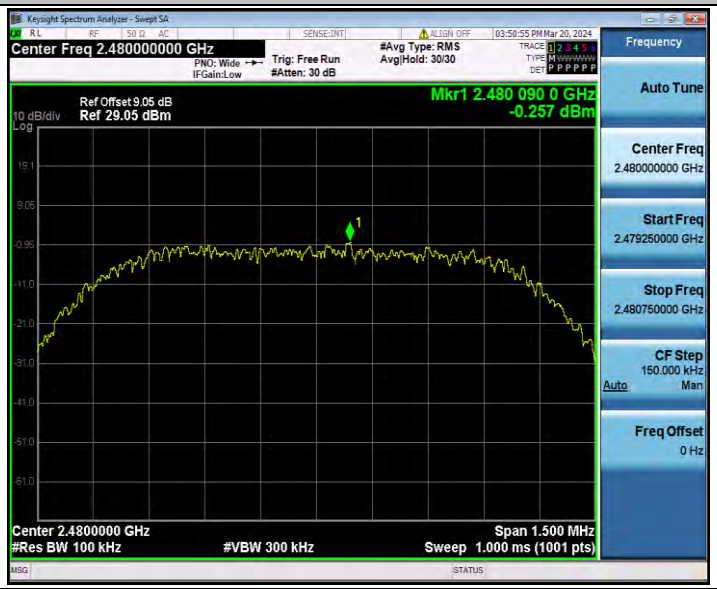


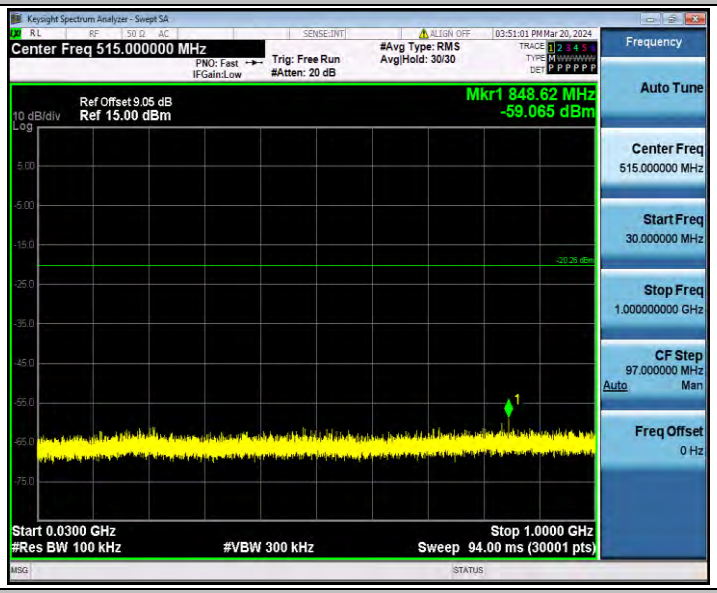
3DH1_Ant1_2402_1000~26500

3DH1_Ant1_2441_0~Reference

3DH1_Ant1_2441_30~1000

3DH1_Ant1_2441_1000~26500



3DH1_Ant1_2480_0~Reference



3DH1_Ant1_2480_30~1000

3DH1_Ant1_2480_1000~26500


Appendix A.9: Emissions in Restricted Bands

Test Result

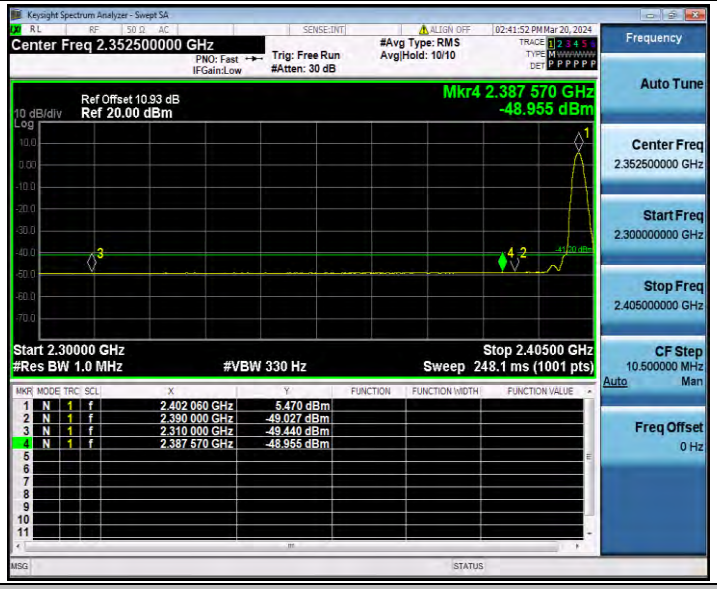
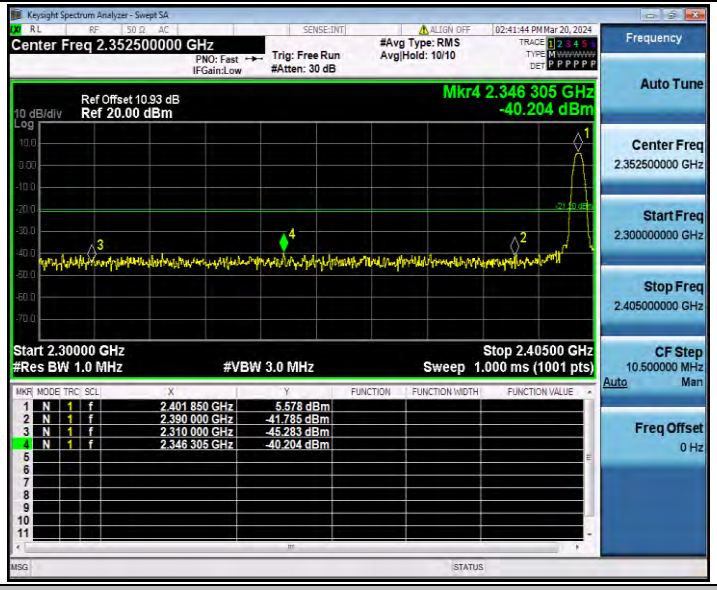
TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH1	Ant1	Low	2402	AV	2310.000	-49.44	≤-41.20	45.76	≤54	PASS
				AV	2387.570	-48.95	≤-41.20	46.25	≤54	PASS
				AV	2390.000	-49.03	≤-41.20	46.17	≤54	PASS
				Peak	2310.000	-45.28	≤-21.20	49.92	≤74	PASS
				Peak	2346.305	-40.2	≤-21.20	55.00	≤74	PASS
				Peak	2390.000	-41.79	≤-21.20	53.41	≤74	PASS
		High	2480	AV	2483.500	-45.84	≤-41.20	49.36	≤54	PASS
				AV	2484.640	-44.9	≤-41.20	50.30	≤54	PASS
				AV	2500.000	-48.87	≤-41.20	46.33	≤54	PASS
				Peak	2483.500	-42.06	≤-21.20	53.14	≤74	PASS
				Peak	2484.640	-37.54	≤-21.20	57.66	≤74	PASS
				Peak	2500.000	-44.79	≤-21.20	50.41	≤74	PASS
2DH1	Ant1	Low	2402	AV	2310.000	-49.53	≤-41.20	45.67	≤54	PASS
				AV	2389.145	-49	≤-41.20	46.20	≤54	PASS
				AV	2390.000	-49.04	≤-41.20	46.16	≤54	PASS
				Peak	2310.000	-44.44	≤-21.20	50.76	≤74	PASS
				Peak	2379.905	-39.48	≤-21.20	55.72	≤74	PASS
				Peak	2390.000	-40.77	≤-21.20	54.43	≤74	PASS
		High	2480	AV	2483.500	-46.03	≤-41.20	49.17	≤54	PASS
				AV	2483.520	-46.03	≤-41.20	49.17	≤54	PASS
				AV	2500.000	-48.81	≤-41.20	46.39	≤54	PASS
				Peak	2483.500	-42.18	≤-21.20	53.02	≤74	PASS
				Peak	2484.320	-40.03	≤-21.20	55.17	≤74	PASS
				Peak	2500.000	-42.97	≤-21.20	52.23	≤74	PASS
3DH1	Ant1	Low	2402	AV	2310.000	-49.31	≤-41.20	45.89	≤54	PASS
				AV	2381.585	-48.96	≤-41.20	46.24	≤54	PASS
				AV	2390.000	-49.24	≤-41.20	45.96	≤54	PASS
				Peak	2310.000	-44.14	≤-21.20	51.06	≤74	PASS
				Peak	2346.725	-39.31	≤-21.20	55.89	≤74	PASS
				Peak	2390.000	-44.23	≤-21.20	50.97	≤74	PASS
		High	2480	AV	2483.500	-45.88	≤-41.20	49.32	≤54	PASS
				AV	2483.520	-45.88	≤-41.20	49.32	≤54	PASS
				AV	2500.000	-48.77	≤-41.20	46.43	≤54	PASS
				Peak	2483.500	-42.68	≤-21.20	52.52	≤74	PASS
				Peak	2485.520	-39.71	≤-21.20	55.49	≤74	PASS

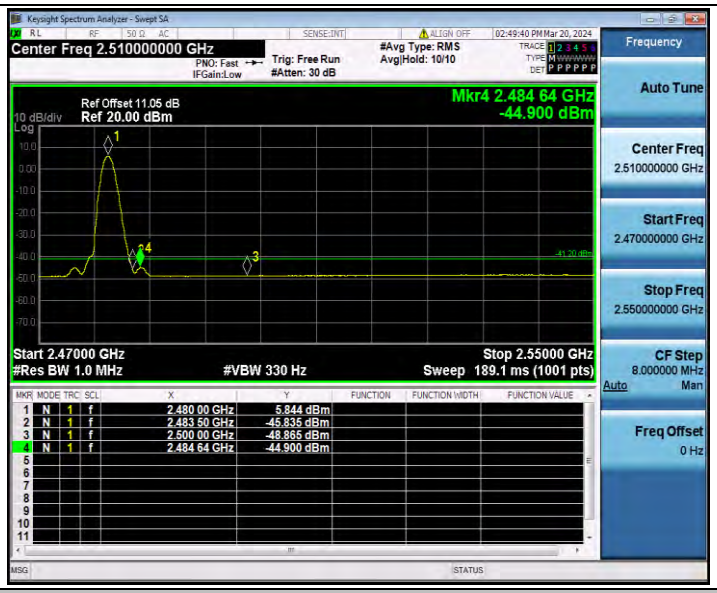
				Peak	2500.000	-45.17	≤-21.20	50.03	≤74	PASS

Note：

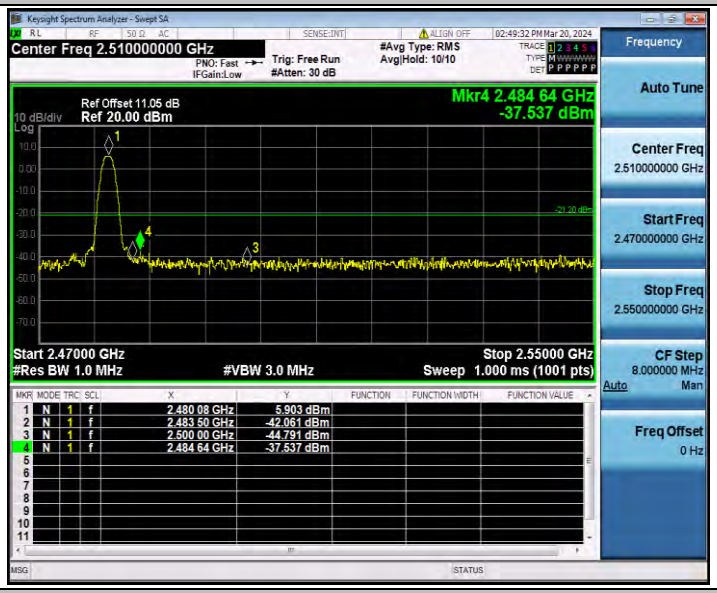
1. The Antenna Gain is compensated in the graph.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

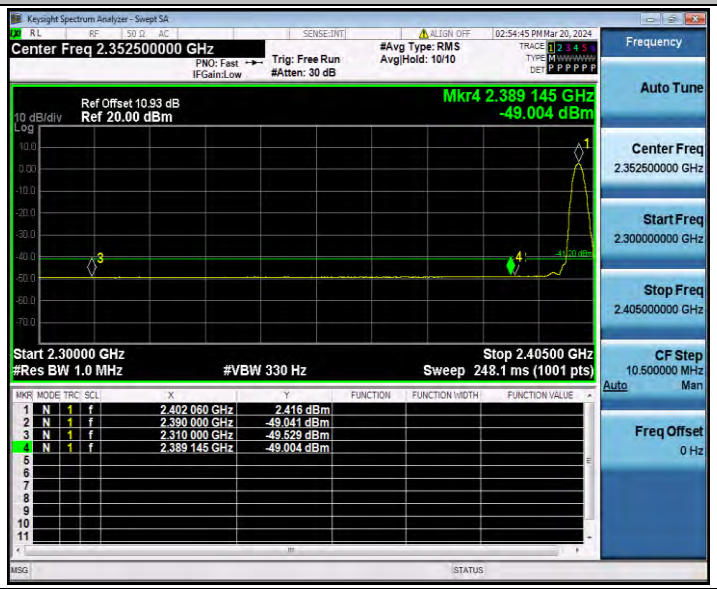
DH1_Ant1_Low_2402_AV

DH1_Ant1_Low_2402_Peak

DH1_Ant1_High_2480_AV

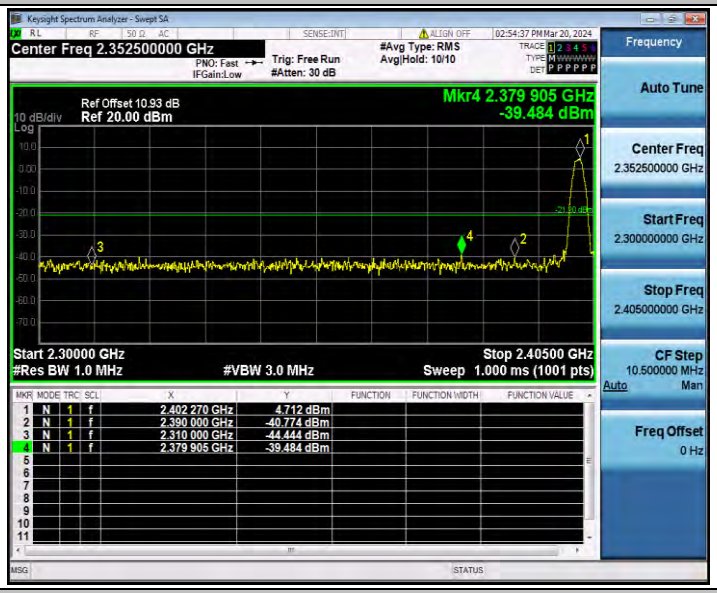
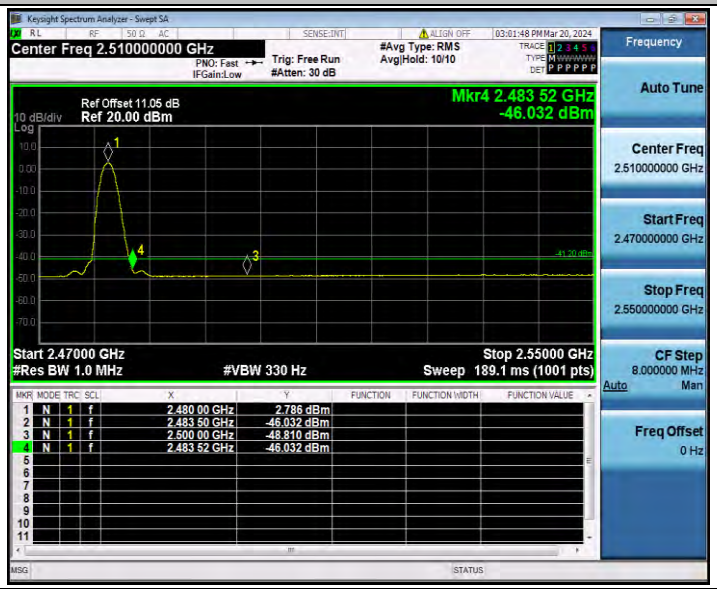


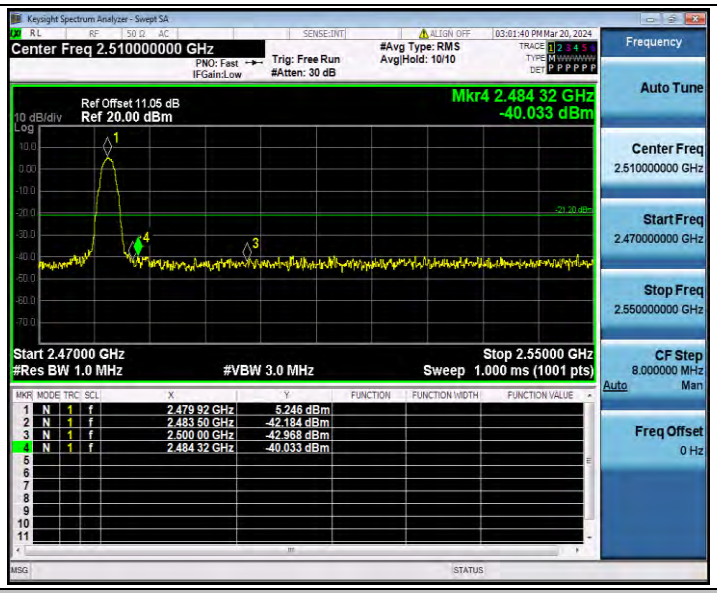
DH1_Ant1_High_2480_Peak



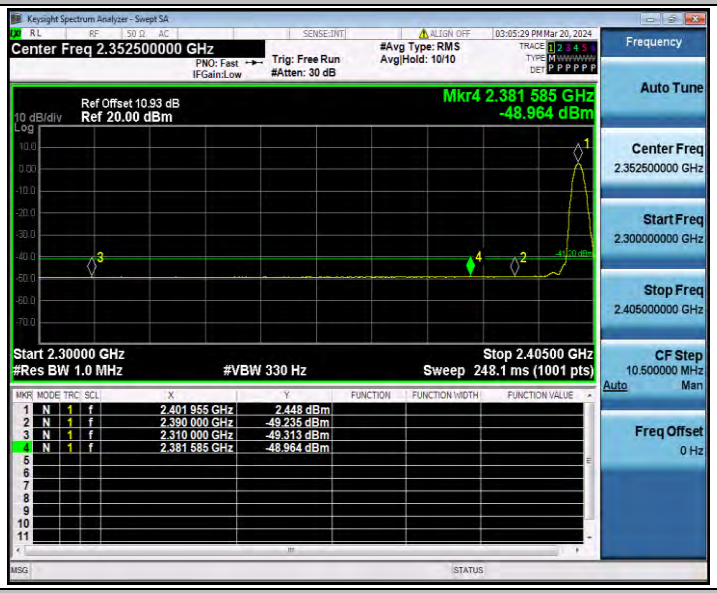
2DH1_Ant1_Low_2402_AV



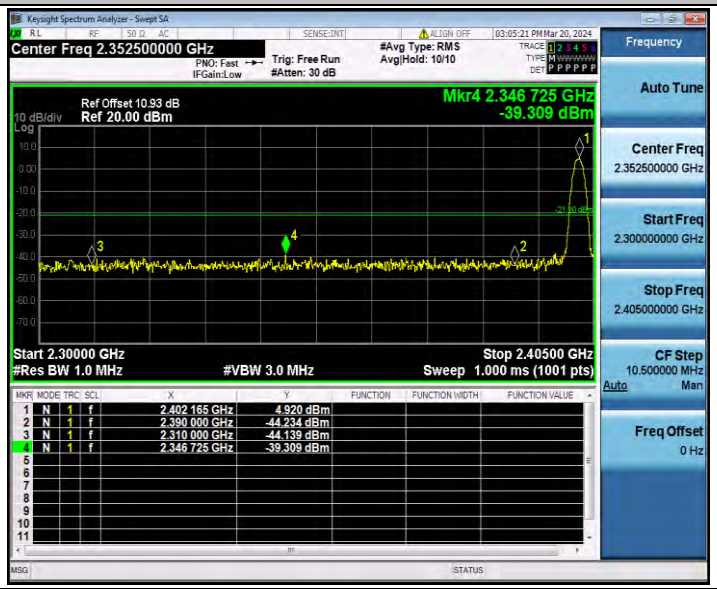
2DH1_Ant1_Low_2402_Peak

2DH1_Ant1_High_2480_AV

2DH1_Ant1_High_2480_Peak

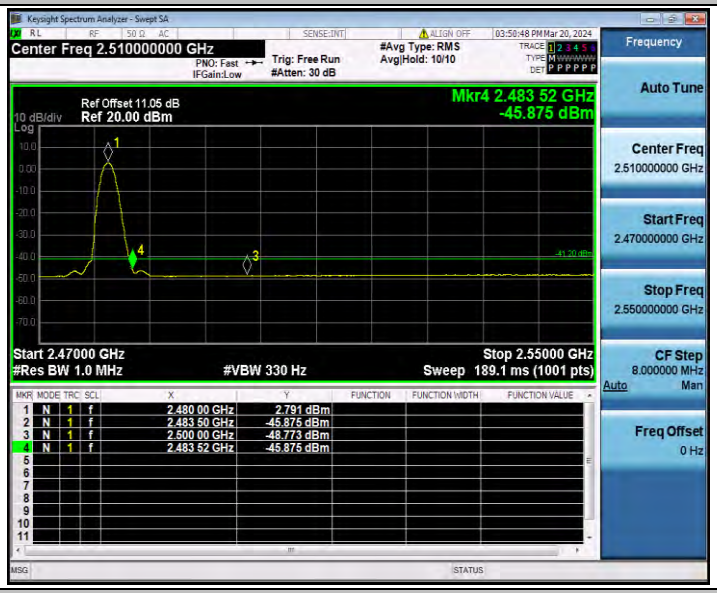


3DH1_Ant1_Low_2402_AV



3DH1_Ant1_Low_2402_Peak



3DH1_Ant1_High_2480_AV

3DH1_Ant1_High_2480_Peak