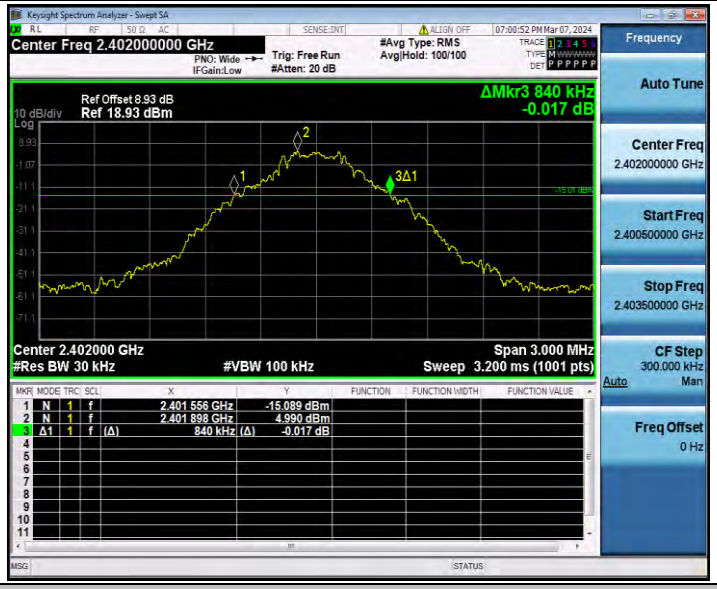
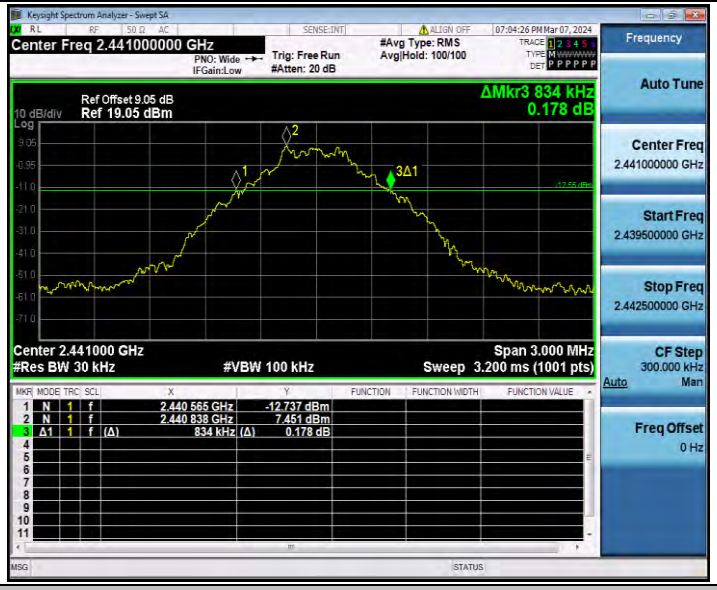
Case No. : CTA24052402901	
Ambient Condition: 24 ℃, 49 %RH	
According Standard: ■Part15C	
Test Date: 2024.2.21	**Test Engineer:** Evan ouyang

Appendix A.1: 20dB Emission Bandwidth

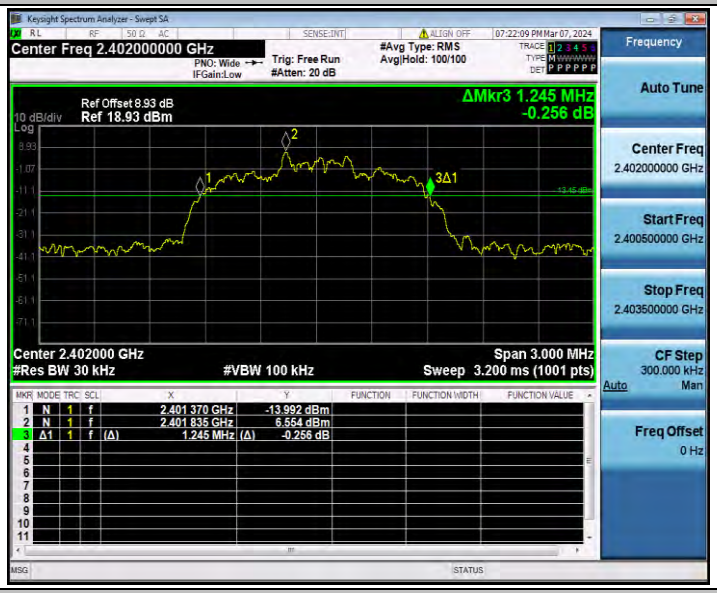
Test Result

TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant0	2402	0.840	2401.556	2402.396	---	---
		2441	0.834	2440.565	2441.399	---	---
		2480	0.852	2479.562	2480.414	---	---
2DH1	Ant0	2402	1.245	2401.370	2402.615	---	---
		2441	1.263	2440.367	2441.630	---	---
		2480	1.245	2479.373	2480.618	---	---
3DH1	Ant0	2402	1.257	2401.367	2402.624	---	---
		2441	1.224	2440.400	2441.624	---	---
		2480	1.227	2479.400	2480.627	---	---

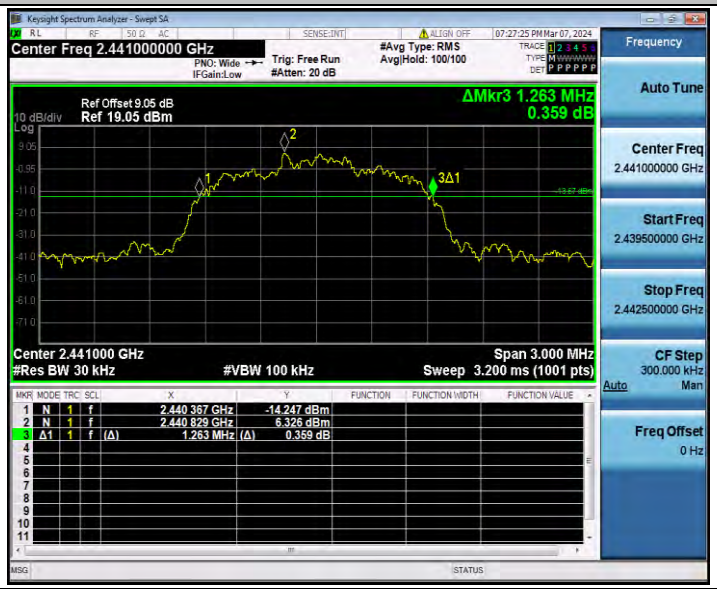
Test Graphs

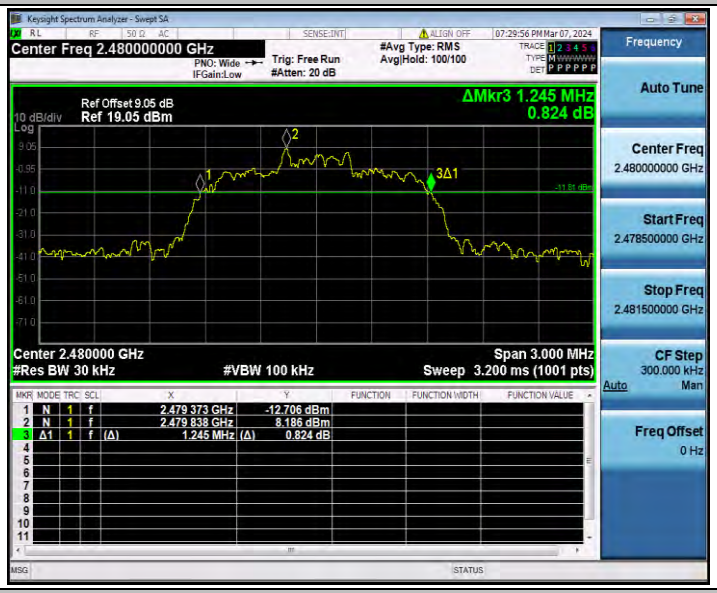
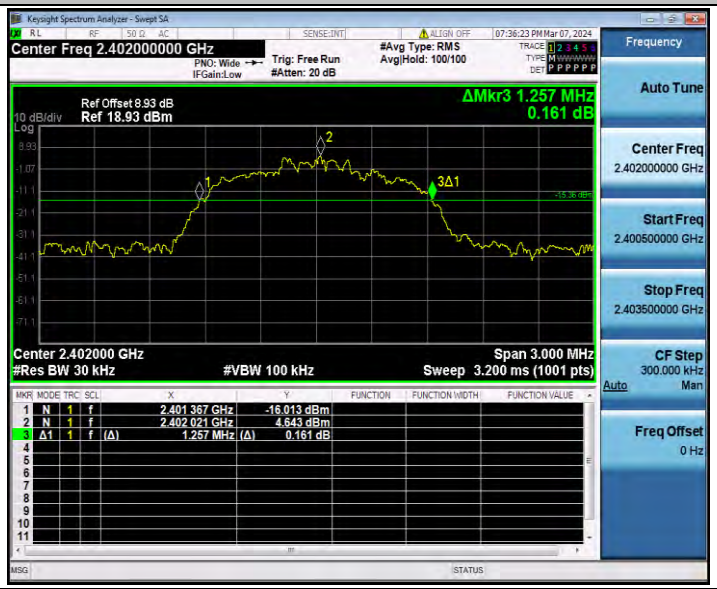
DH1_Ant0_2402

DH1_Ant0_2441

DH1_Ant0_2480

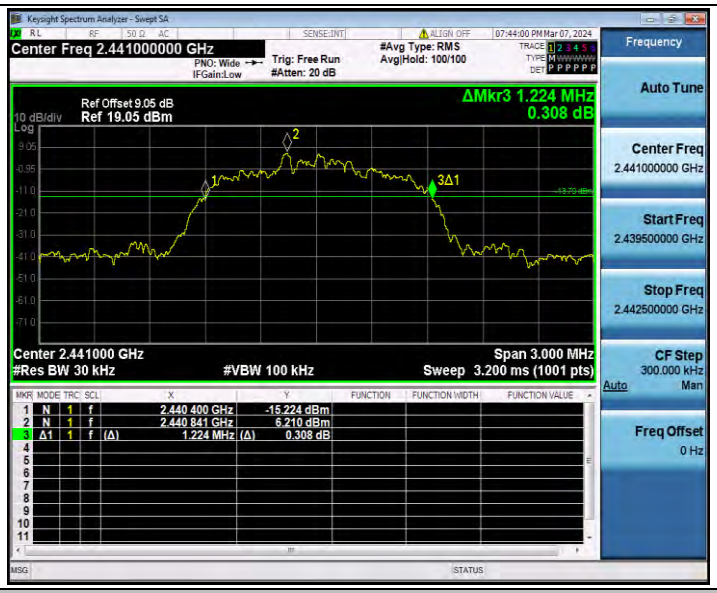
2DH1_Ant0_2402



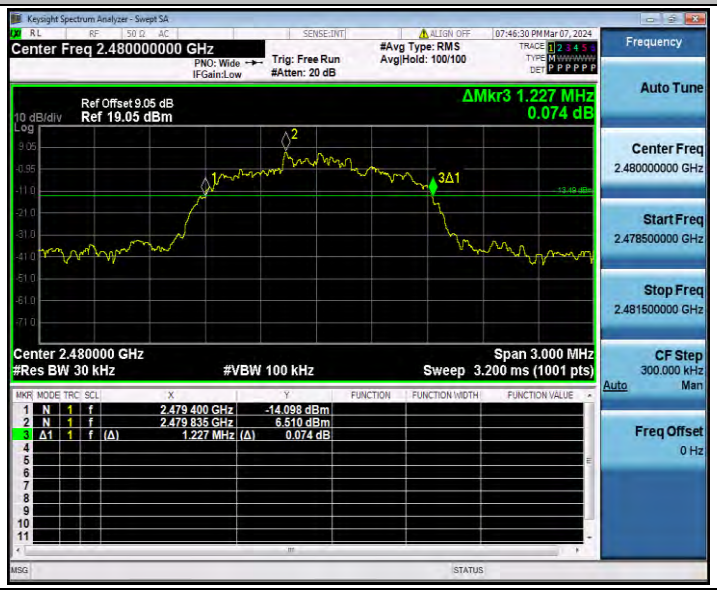
2DH1_Ant0_2441



2DH1_Ant0_2480

3DH1_Ant0_2402

3DH1_Ant0_2441



3DH1_Ant0_2480



Appendix A.2: Occupied Channel Bandwidth

Test Result

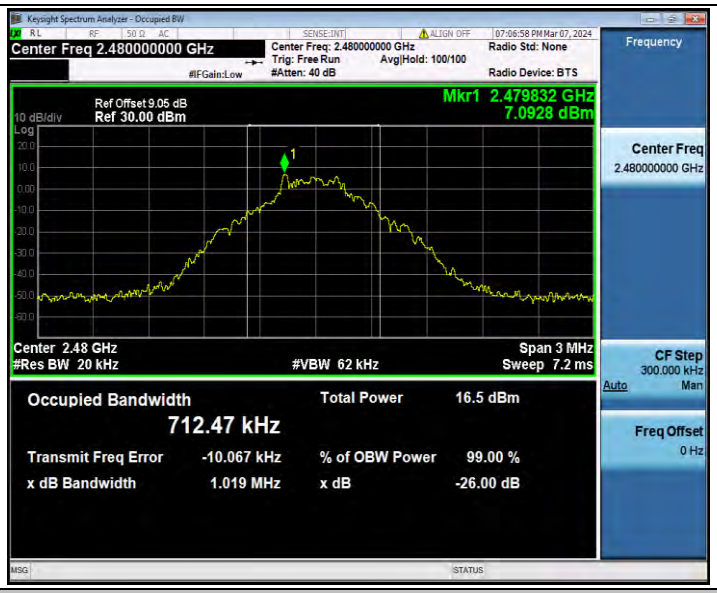
TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant0	2402	0.73087	2401.6300	2402.3608	---	---
		2441	0.71341	2440.6314	2441.3448	---	---
		2480	0.71247	2479.6337	2480.3462	---	---
2DH1	Ant0	2402	1.1433	2401.4251	2402.5684	---	---
		2441	1.1381	2440.4303	2441.5684	---	---
		2480	1.1436	2479.4214	2480.5650	---	---
3DH1	Ant0	2402	1.1454	2401.4367	2402.5821	---	---
		2441	1.1412	2440.4395	2441.5807	---	---
		2480	1.1320	2479.4396	2480.5716	---	---

Test Graphs

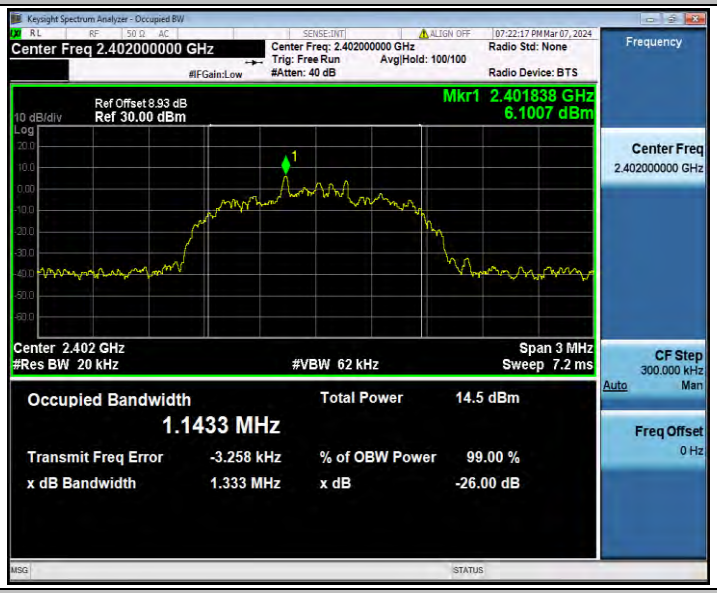
DH1_Ant0_2402

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

Test Mode	Antenna	Freq(MHz)	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH1	Ant0	2402	8.74	≤20.97	PASS
		2441	10.32	≤20.97	PASS
		2480	10.92	≤20.97	PASS
2DH1	Ant0	2402	8.92	≤20.97	PASS
		2441	9.81	≤20.97	PASS
		2480	10.51	≤20.97	PASS
3DH1	Ant0	2402	9.01	≤20.97	PASS
		2441	9.85	≤20.97	PASS
		2480	10.47	≤20.97	PASS

Note：

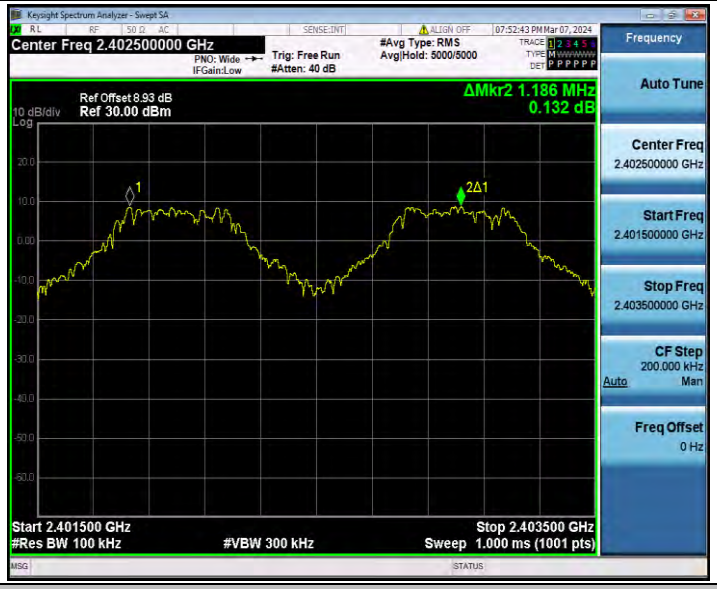
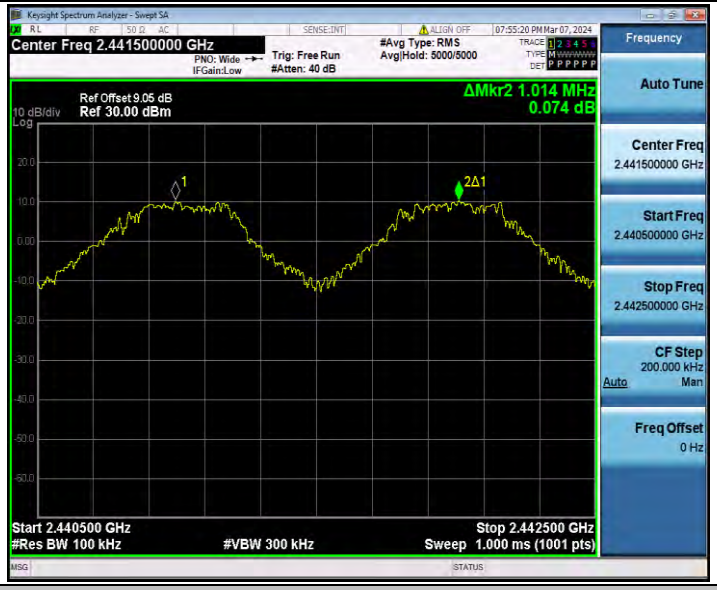
1.The Duty Cycle Factor and RBW Factor is compensated in the data.

Appendix A.4: Carrier frequency separation

Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant0	Hop_2402	1.186	≥0.852	PASS
		Hop_2441	1.014	≥0.852	PASS
		Hop_2480	0.988	≥0.852	PASS
2DH1	Ant0	Hop_2402	0.846	≥0.842	PASS
		Hop_2441	0.992	≥0.842	PASS
		Hop_2480	0.992	≥0.842	PASS
3DH1	Ant0	Hop_2402	1.176	≥0.838	PASS
		Hop_2441	0.852	≥0.838	PASS
		Hop_2480	1.172	≥0.838	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

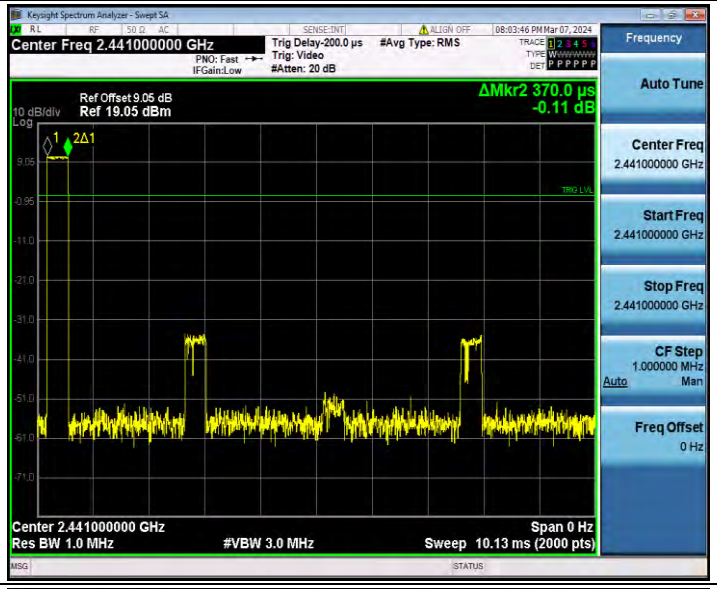
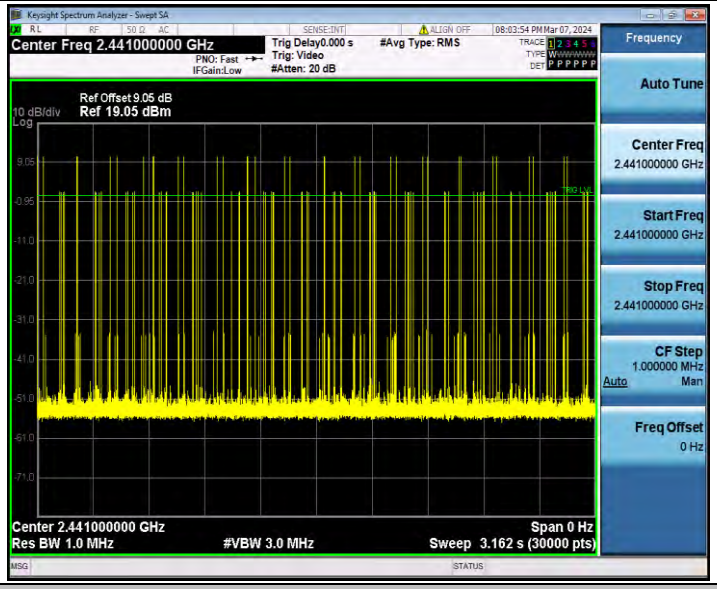
3DH1_Ant0_Hop_2480

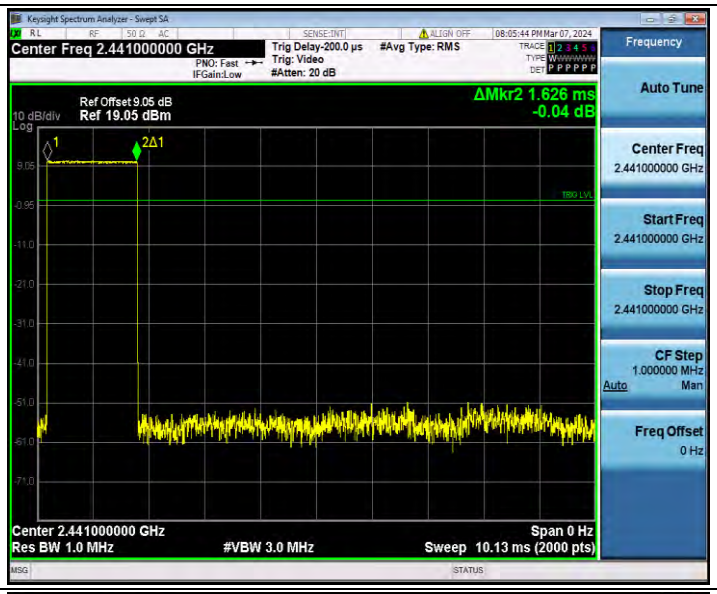
Appendix A.5: Time of occupancy

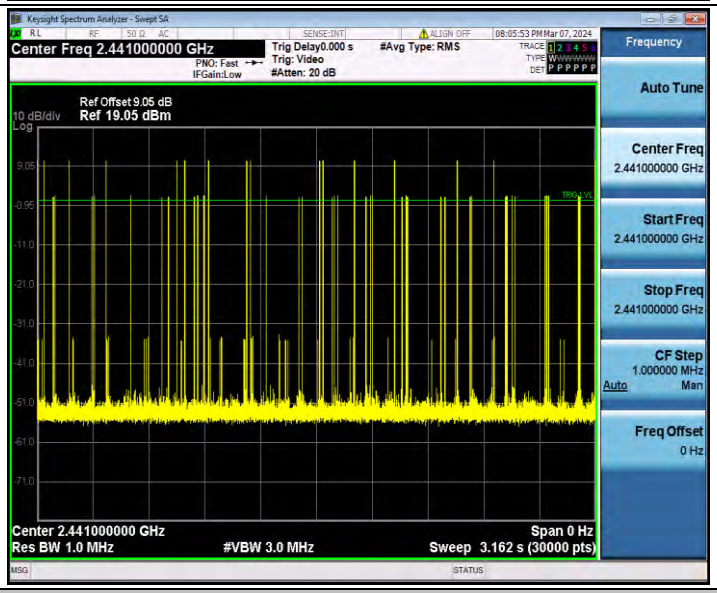
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant0	Hop	0.370	320	0.118	≤0.4	PASS
DH3	Ant0	Hop	1.626	160	0.26	≤0.4	PASS
DH5	Ant0	Hop	2.873	120	0.345	≤0.4	PASS
2DH1	Ant0	Hop	0.375	320	0.12	≤0.4	PASS
2DH3	Ant0	Hop	1.631	170	0.277	≤0.4	PASS
2DH5	Ant0	Hop	2.878	130	0.374	≤0.4	PASS
3DH1	Ant0	Hop	0.380	320	0.122	≤0.4	PASS
3DH3	Ant0	Hop	1.626	160	0.26	≤0.4	PASS
3DH5	Ant0	Hop	2.878	130	0.374	≤0.4	PASS

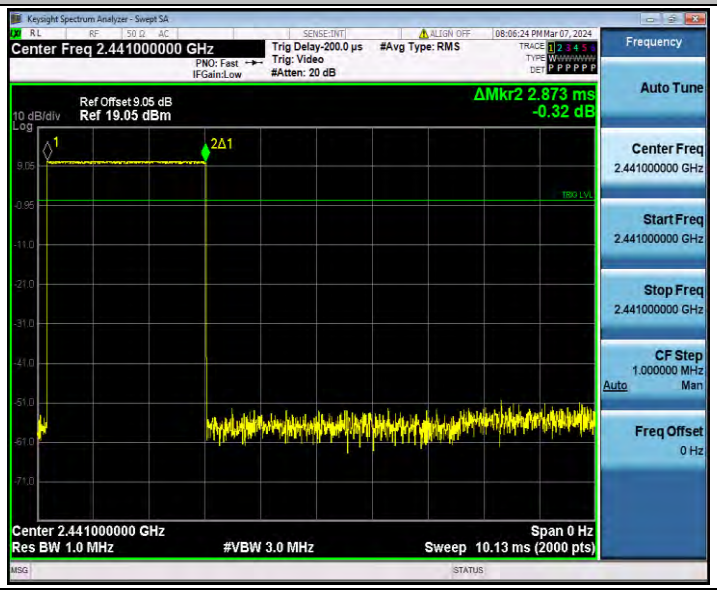
Test Graphs

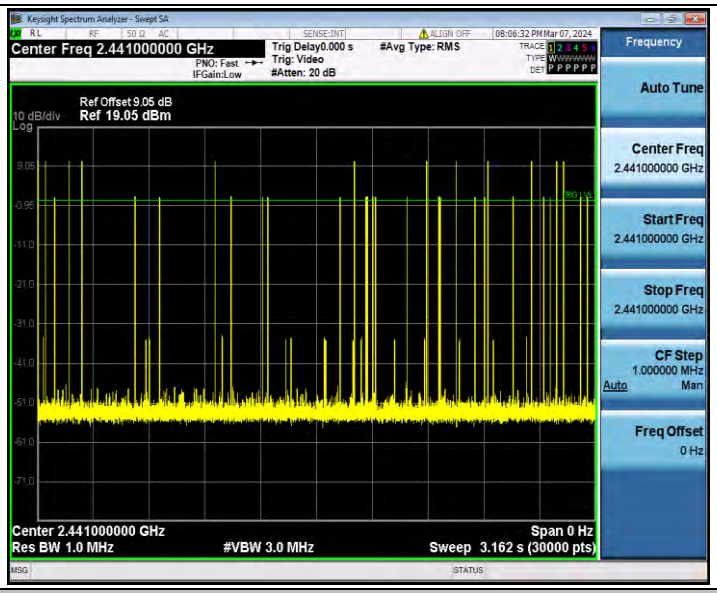
DH1_Ant0_Hop


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
08:05:44 PM Mar 07, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 1.626 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

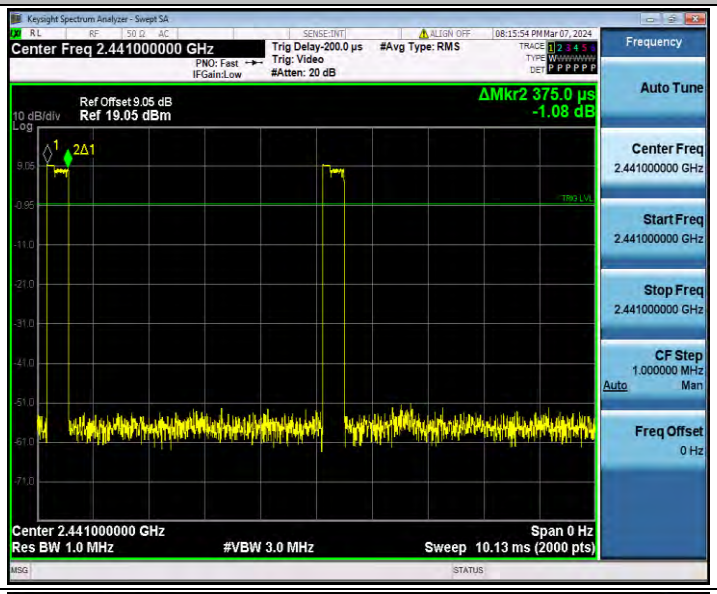

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
08:05:53 PM Mar 07, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
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

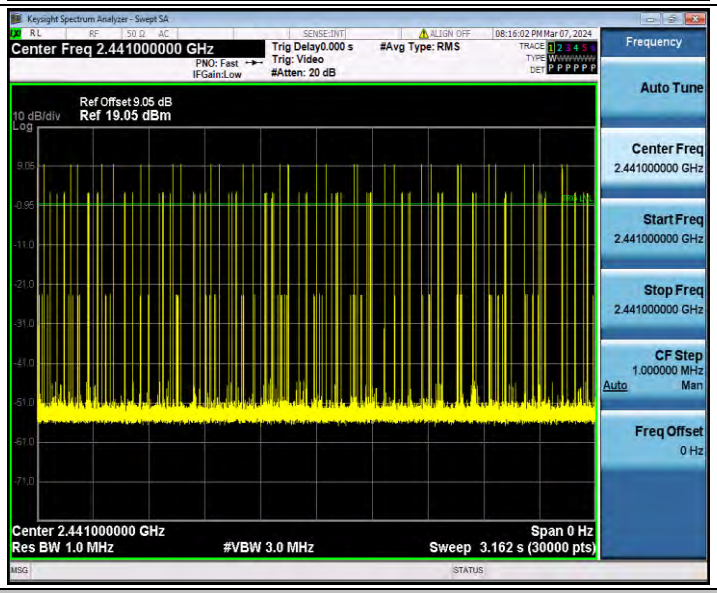
DH5_Ant0_Hop


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
08:06:24 PM Mar 07, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 2.873 ms
-0.32 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

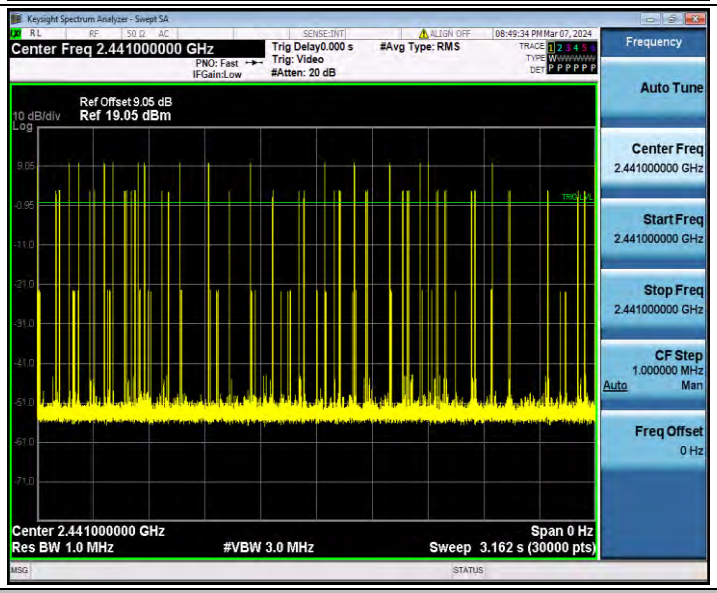


2DH1_Ant0_Hop

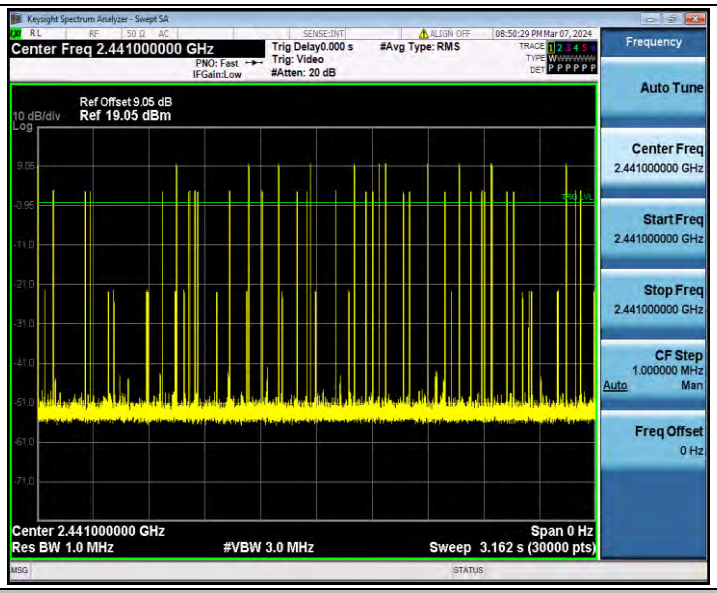




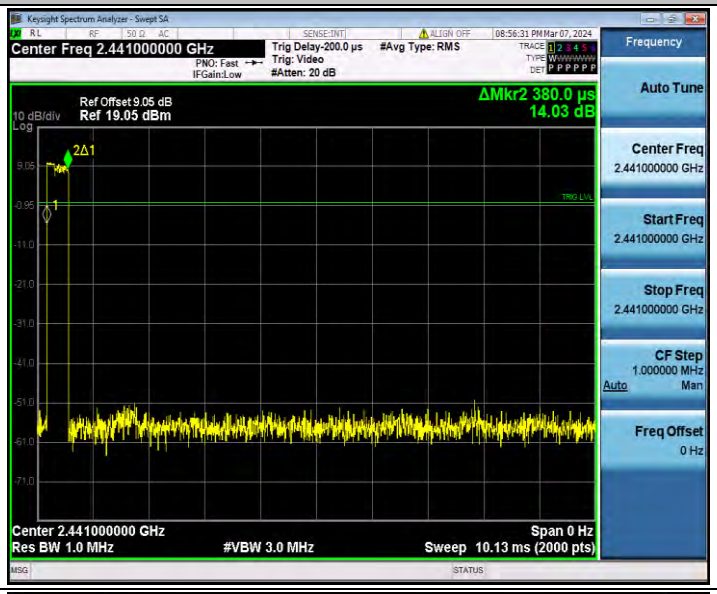
2DH3_Ant0_Hop

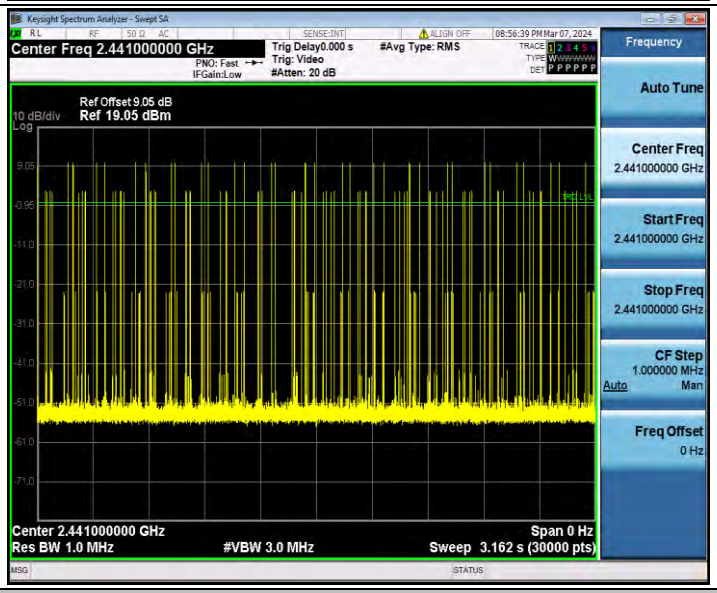


2DH5_Ant0_Hop

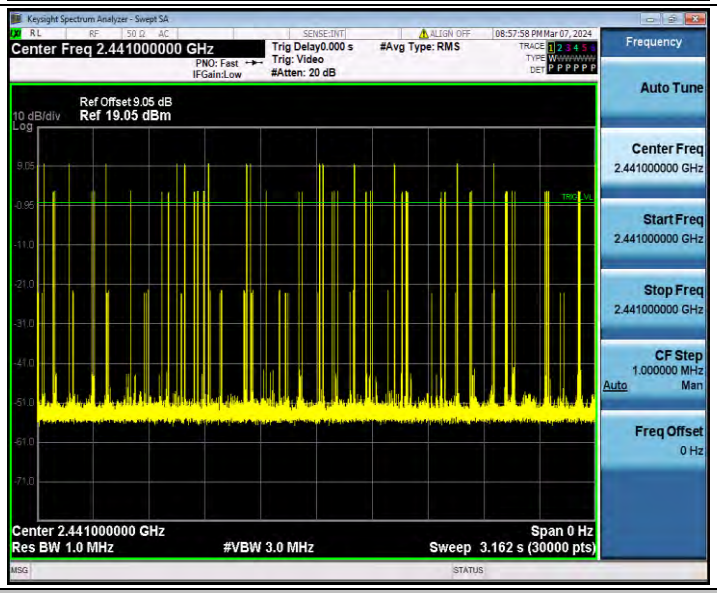


3DH1_Ant0_Hop

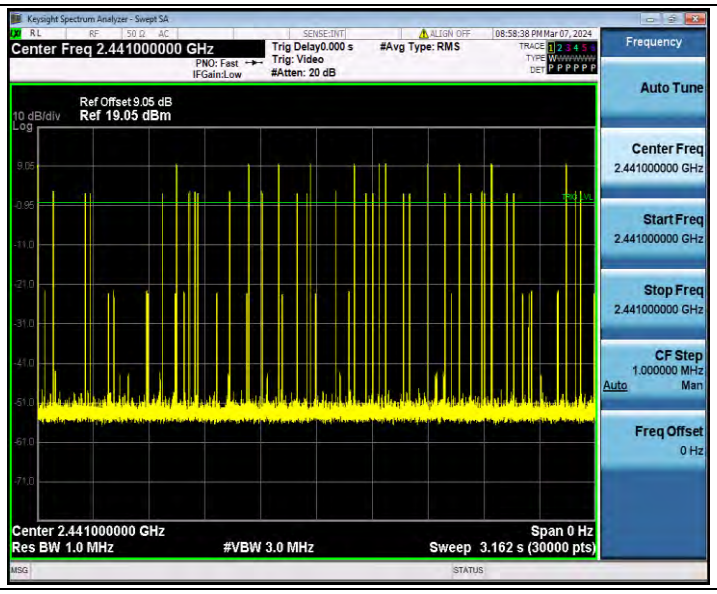




3DH3_Ant0_Hop



3DH5_Ant0_Hop

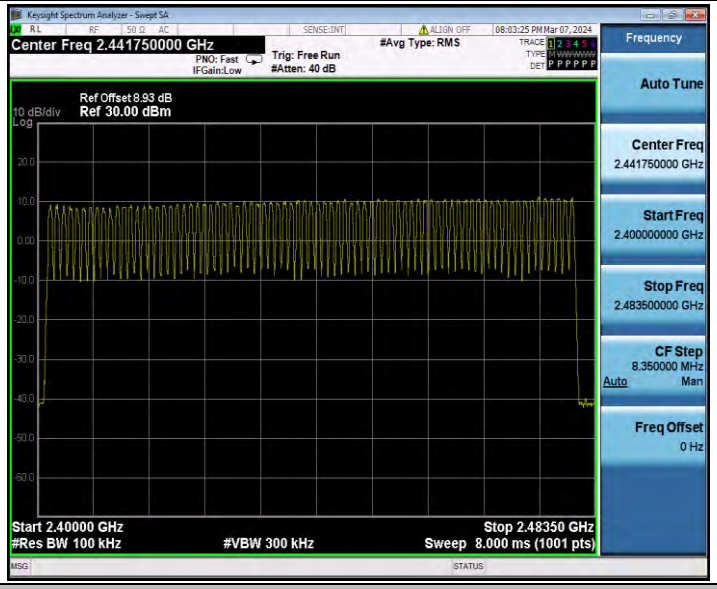
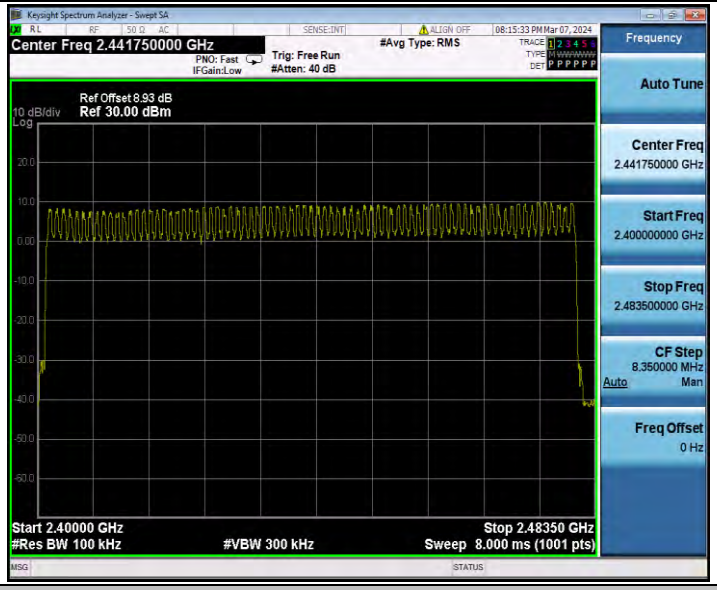

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
08:58:38 PM Mar 07, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Log
9.05
-0.95
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
Center 2.441000000 GHz
Res BW 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

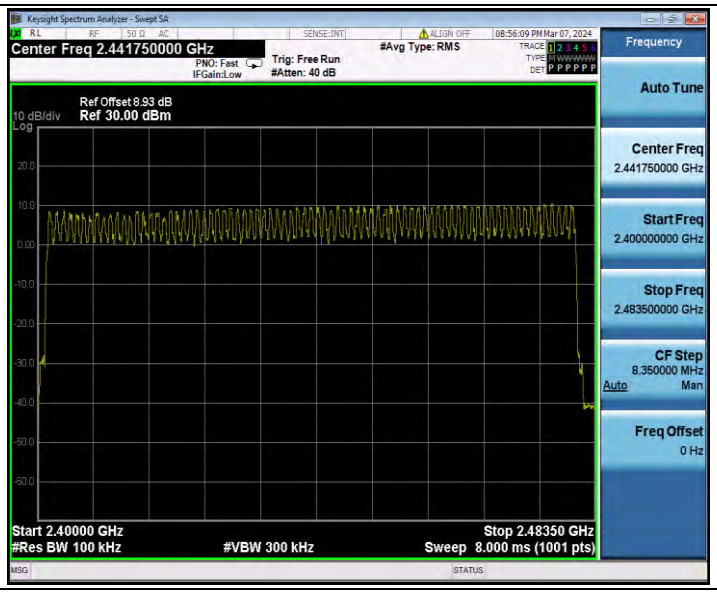
Appendix A.6: Number of hopping channels

Test Result

TestMode	Antenna	Freq(MHz)	Result[Num]	Limit[Num]	Verdict
DH1	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
08:56:09 PM Mar 07, 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

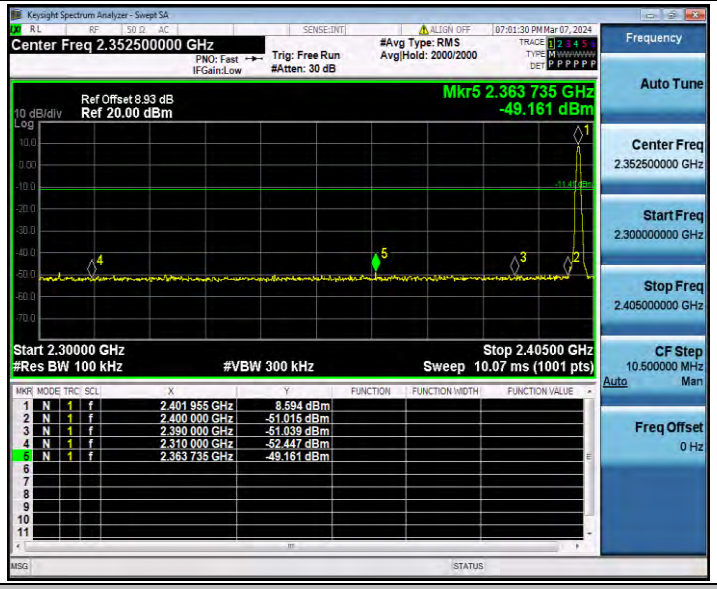
Appendix A.7: Band edge measurements

Test Result

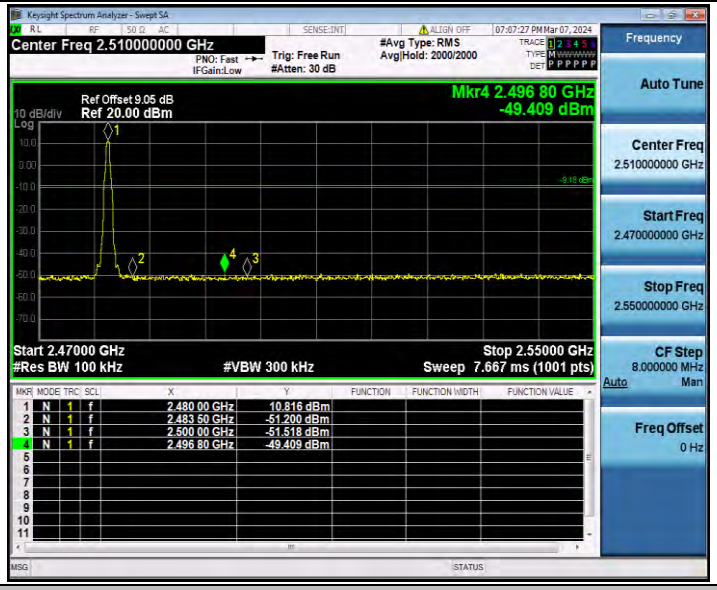
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant0	Low	2402	8.59	-49.16	≤-11.41	PASS
		High	2480	10.82	-49.41	≤-9.18	PASS
		Low	Hop_2402	8.85	-49.78	≤-11.15	PASS
		High	Hop_2480	10.59	-48.95	≤-9.41	PASS
2DH1	Ant0	Low	2402	8.68	-46.37	≤-11.32	PASS
		High	2480	10.34	-48.69	≤-9.67	PASS
		Low	Hop_2402	8.30	-49.6	≤-11.71	PASS
		High	Hop_2480	9.88	-48.41	≤-10.12	PASS
3DH1	Ant0	Low	2402	8.72	-44.06	≤-11.28	PASS
		High	2480	10.37	-48.75	≤-9.63	PASS
		Low	Hop_2402	8.28	-47.39	≤-11.72	PASS
		High	Hop_2480	9.77	-48.67	≤-10.23	PASS

Test Graphs

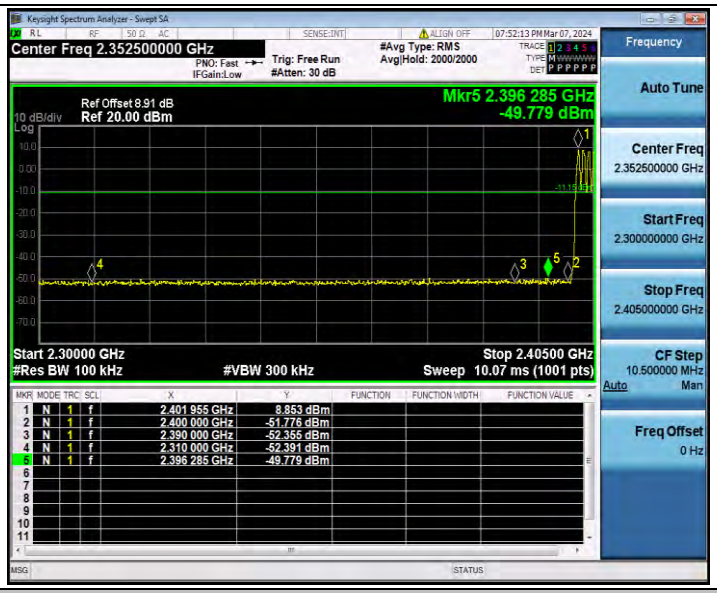
DH1_Ant0_Low_2402



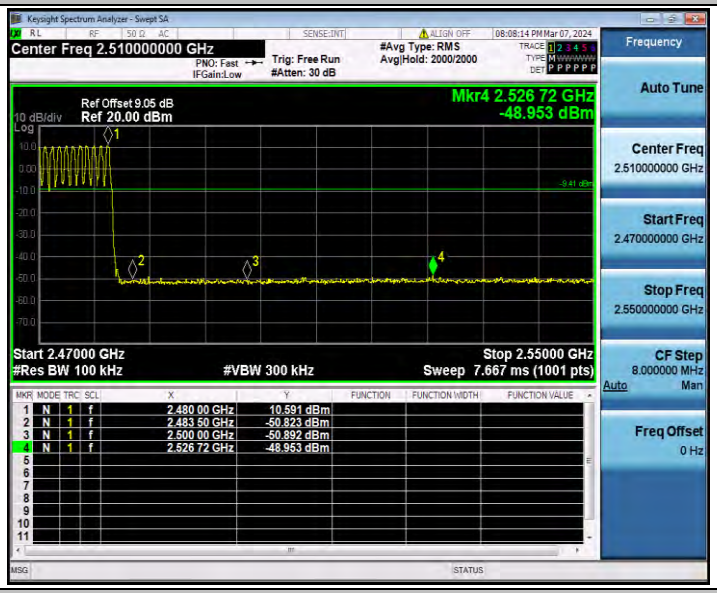
DH1_Ant0_High_2480



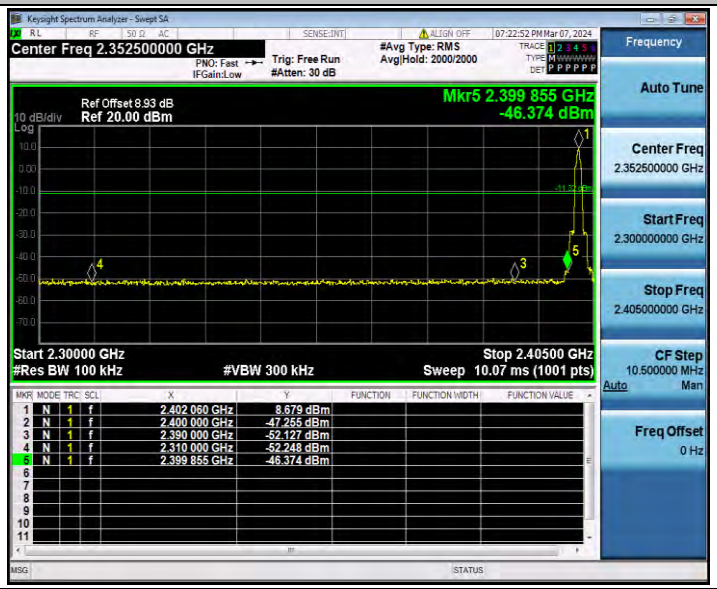
DH1_Ant0_Low_Hop_2402

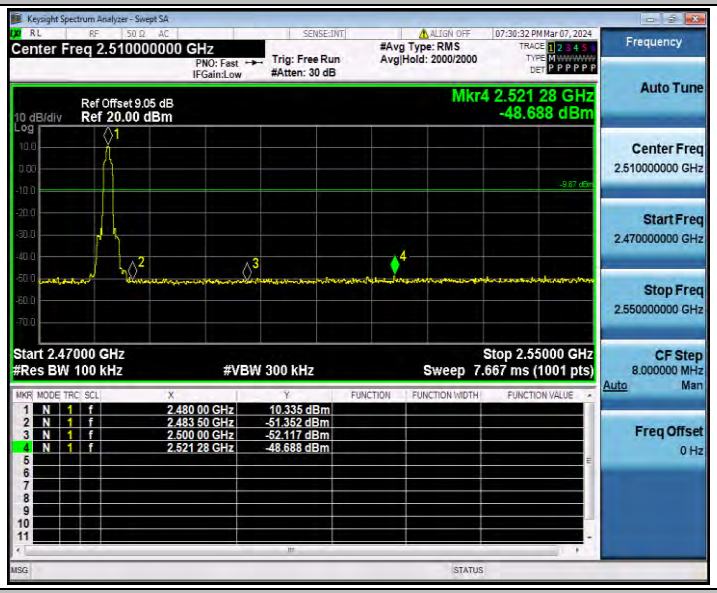
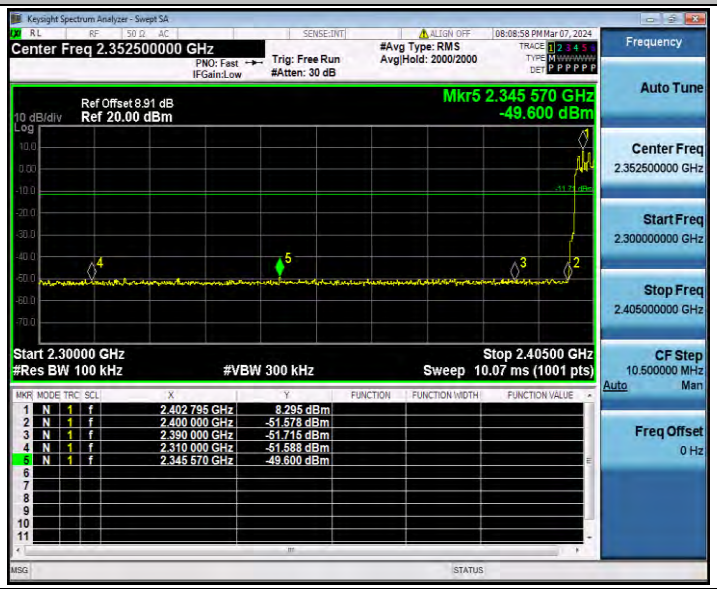


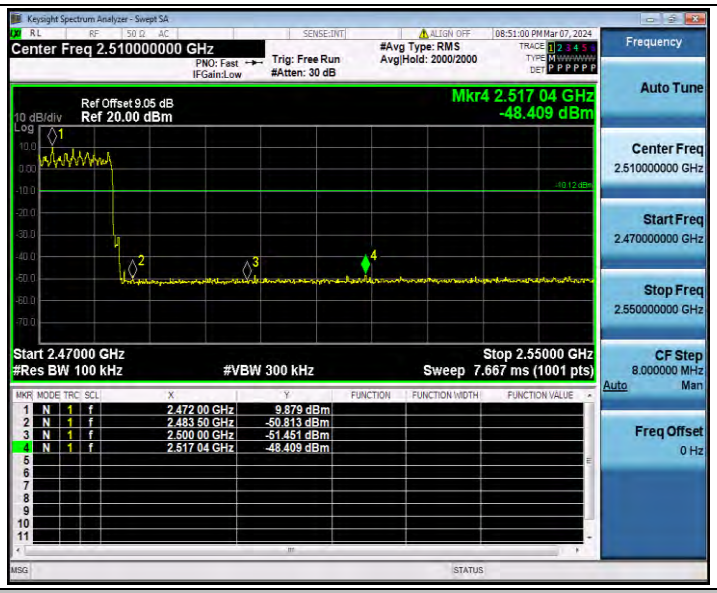
DH1_Ant0_High_Hop_2480



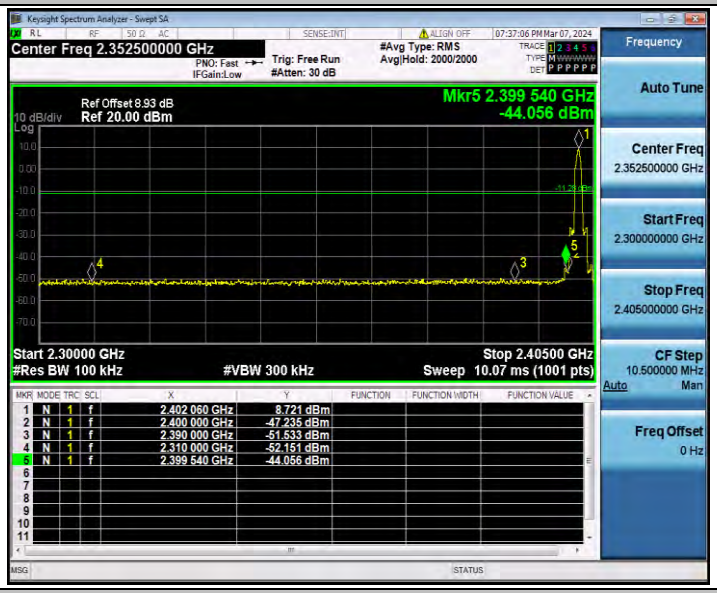
2DH1_Ant0_Low_2402



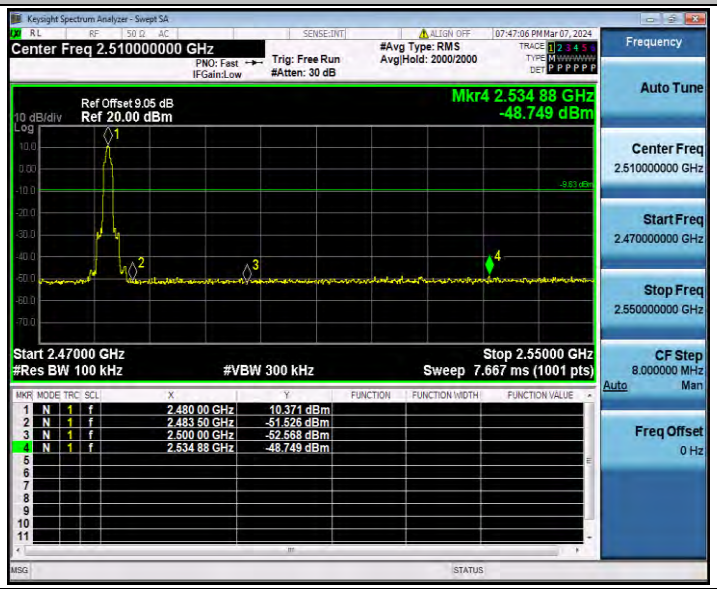
2DH1_Ant0_High_2480

2DH1_Ant0_Low_Hop_2402

2DH1_Ant0_High_Hop_2480

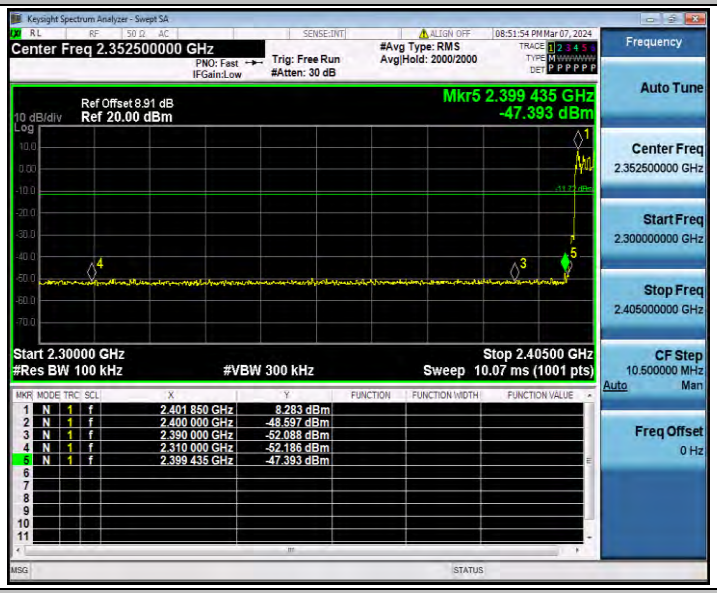
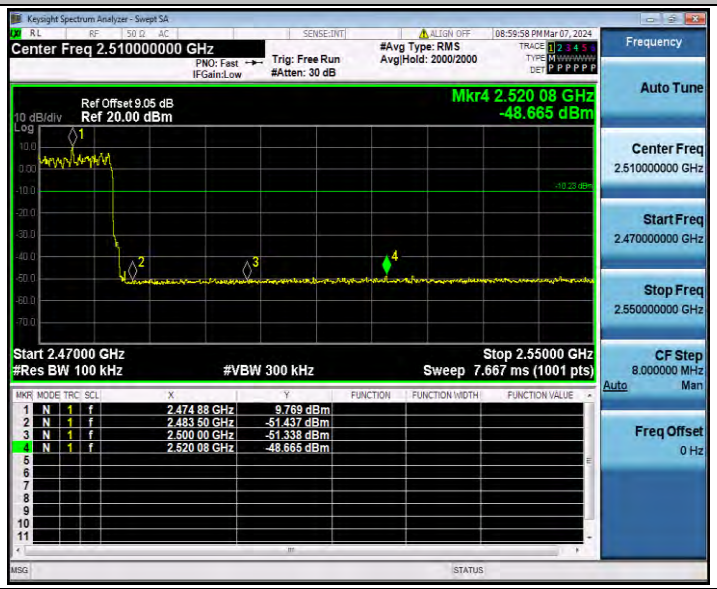


3DH1_Ant0_Low_2402



3DH1_Ant0_High_2480



3DH1_Ant0_Low_Hop_2402

3DH1_Ant0_High_Hop_2480


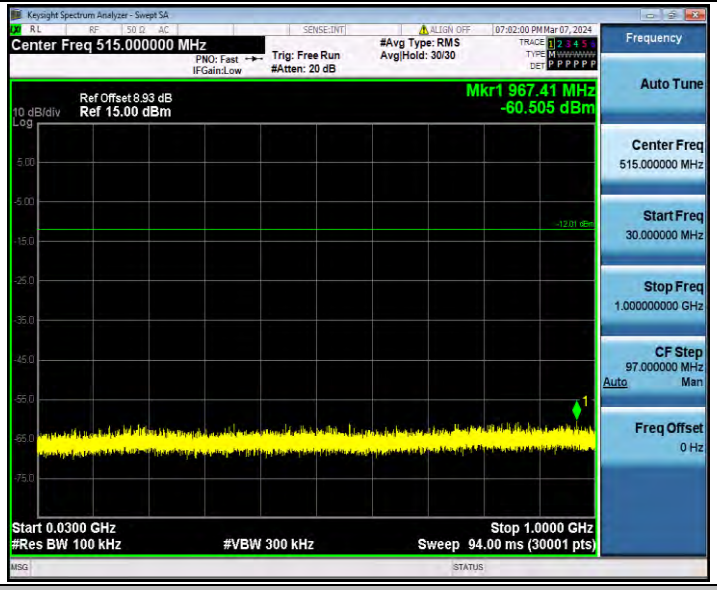
Appendix A.8: Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant0	2402	Reference	7.99	7.99	---	PASS
			30~1000	7.99	-60.51	≤-12.01	PASS
			1000~26500	7.99	-47.4	≤-12.01	PASS
		2441	Reference	9.70	9.70	---	PASS
			30~1000	9.70	-60.2	≤-10.3	PASS
			1000~26500	9.70	-47.16	≤-10.3	PASS
		2480	Reference	10.29	10.29	---	PASS
			30~1000	10.29	-60	≤-9.71	PASS
			1000~26500	10.29	-47.65	≤-9.71	PASS
2DH1	Ant0	2402	Reference	8.42	8.42	---	PASS
			30~1000	8.42	-60.23	≤-11.58	PASS
			1000~26500	8.42	-48.21	≤-11.58	PASS
		2441	Reference	9.48	9.48	---	PASS
			30~1000	9.48	-60.11	≤-10.52	PASS
			1000~26500	9.48	-47.84	≤-10.52	PASS
		2480	Reference	9.58	9.58	---	PASS
			30~1000	9.58	-60.11	≤-10.42	PASS
			1000~26500	9.58	-48.05	≤-10.42	PASS
3DH1	Ant0	2402	Reference	7.79	7.79	---	PASS
			30~1000	7.79	-59.75	≤-12.21	PASS
			1000~26500	7.79	-47.66	≤-12.21	PASS
		2441	Reference	9.31	9.31	---	PASS
			30~1000	9.31	-59.19	≤-10.69	PASS
			1000~26500	9.31	-47.67	≤-10.69	PASS
		2480	Reference	9.92	9.92	---	PASS
			30~1000	9.92	-60.17	≤-10.08	PASS
			1000~26500	9.92	-47.45	≤-10.08	PASS

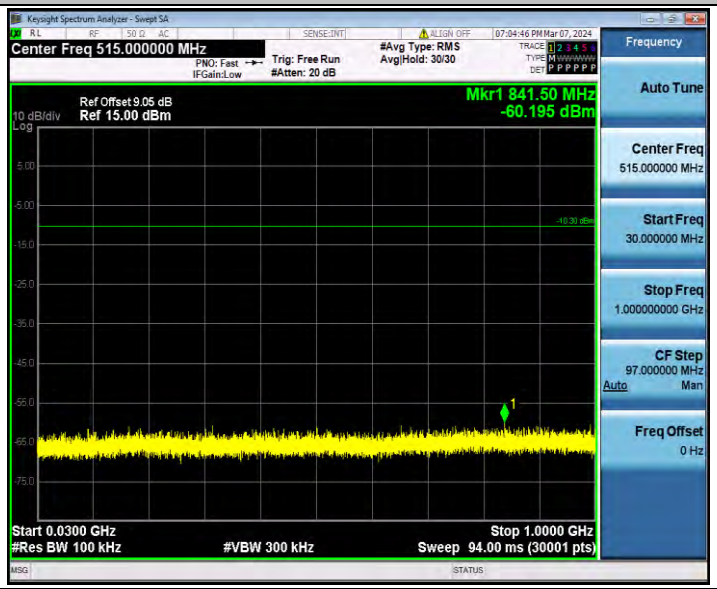
Test Graphs

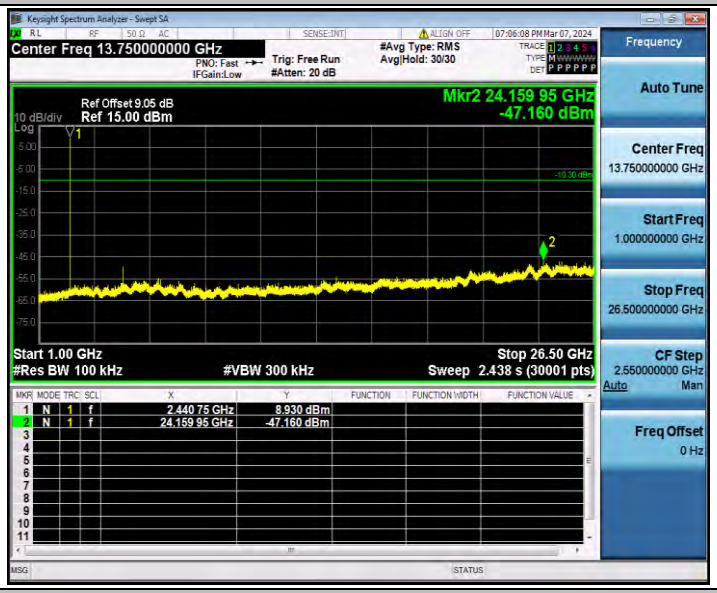
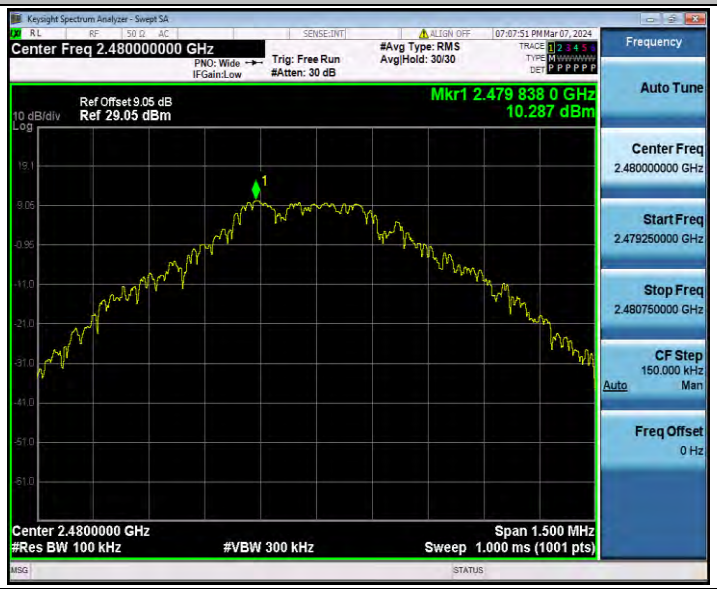
DH1_Ant0_2402_0~Reference

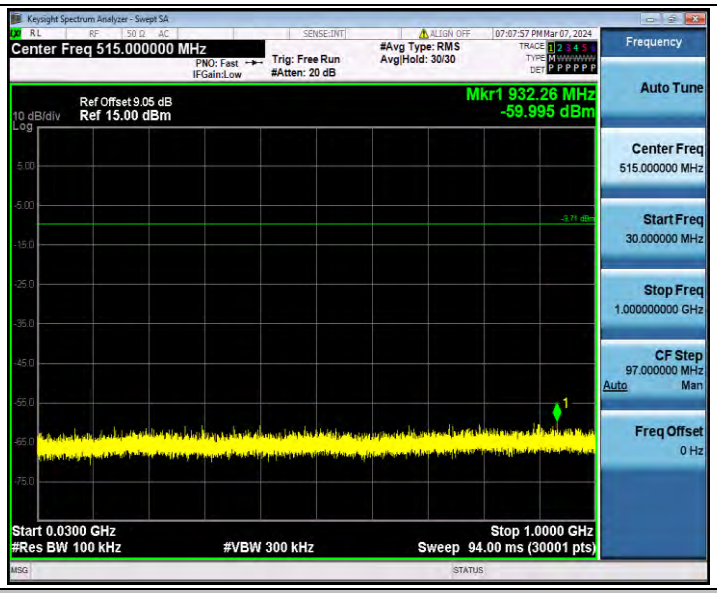
DH1_Ant0_2402_30~1000

DH1_Ant0_2402_1000~26500

DH1_Ant0_2441_0~Reference

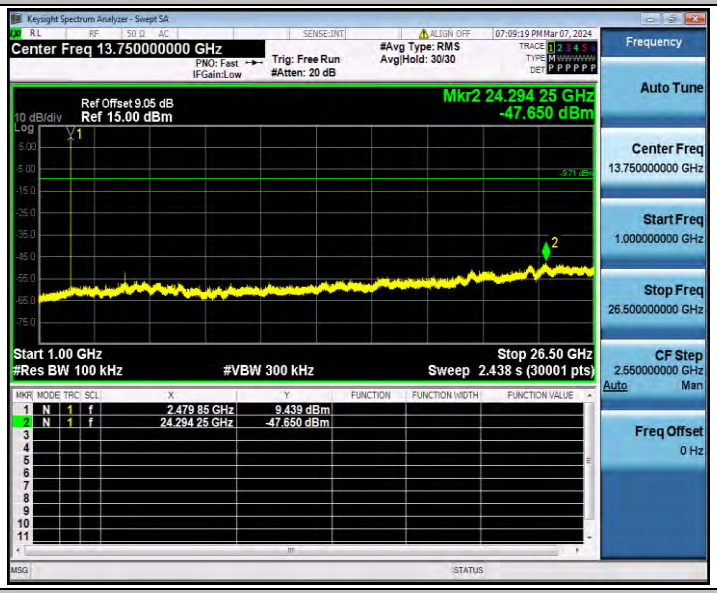
DH1_Ant0_2441_30~1000



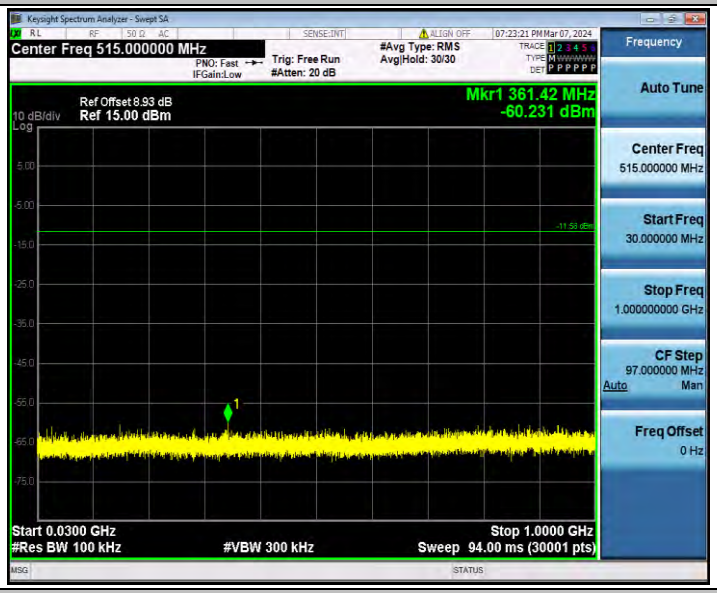
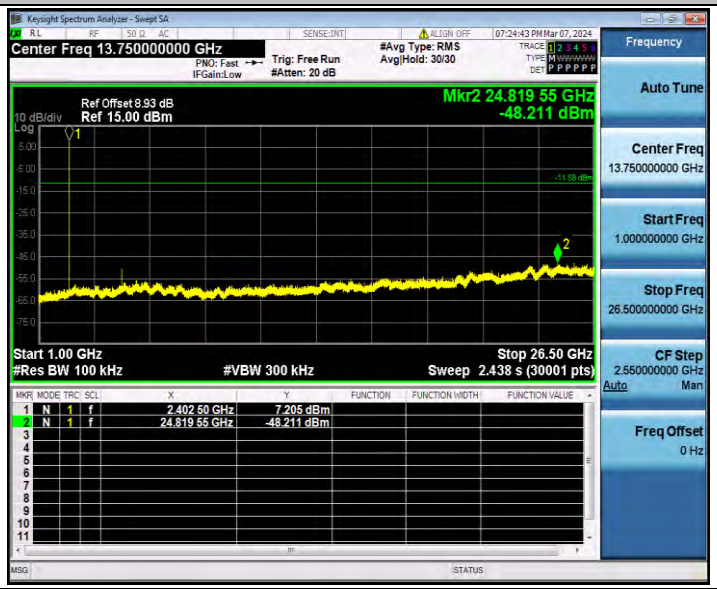
DH1_Ant0_2441_1000~26500

DH1_Ant0_2480_0~Reference

DH1_Ant0_2480_30~1000



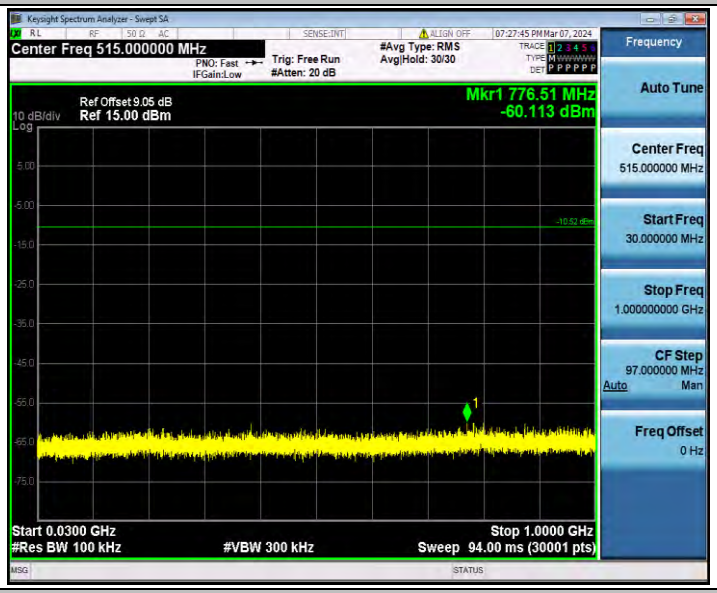
DH1_Ant0_2480_1000~26500



2DH1_Ant0_2402_0~Reference

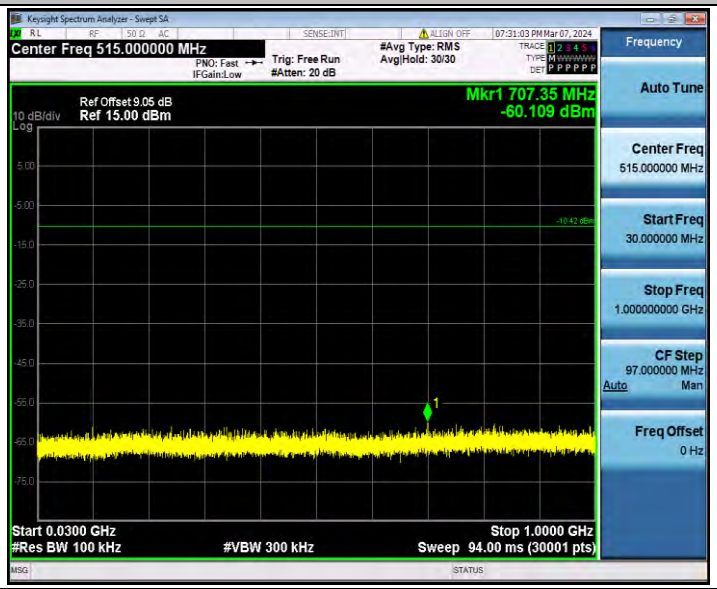
2DH1_Ant0_2402_30~1000

2DH1_Ant0_2402_1000~26500

2DH1_Ant0_2441_0~Reference

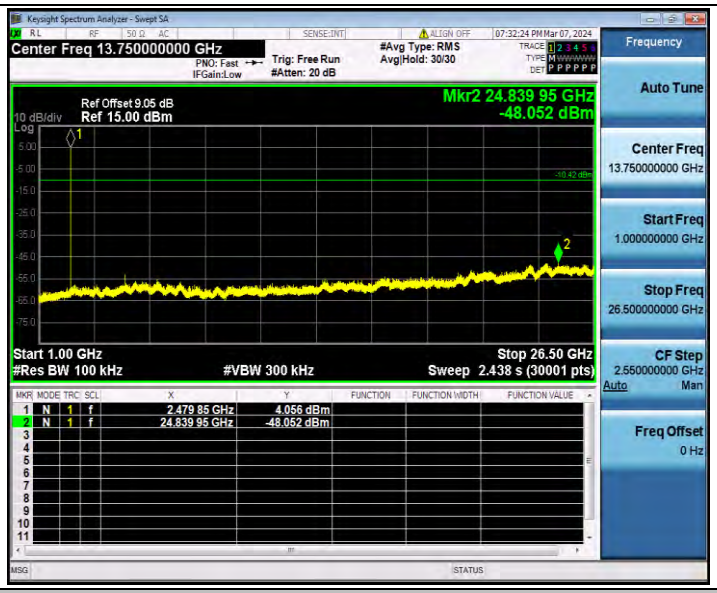
2DH1_Ant0_2441_30~1000



2DH1_Ant0_2441_1000~26500

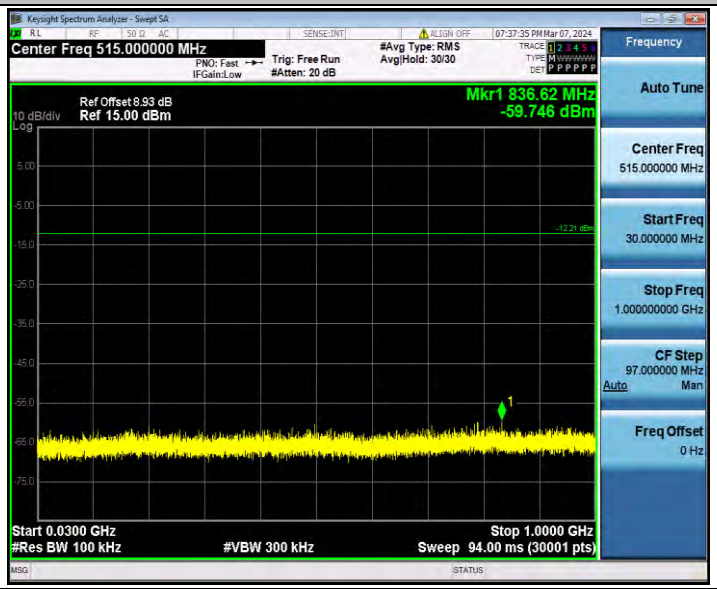
2DH1_Ant0_2480_0~Reference

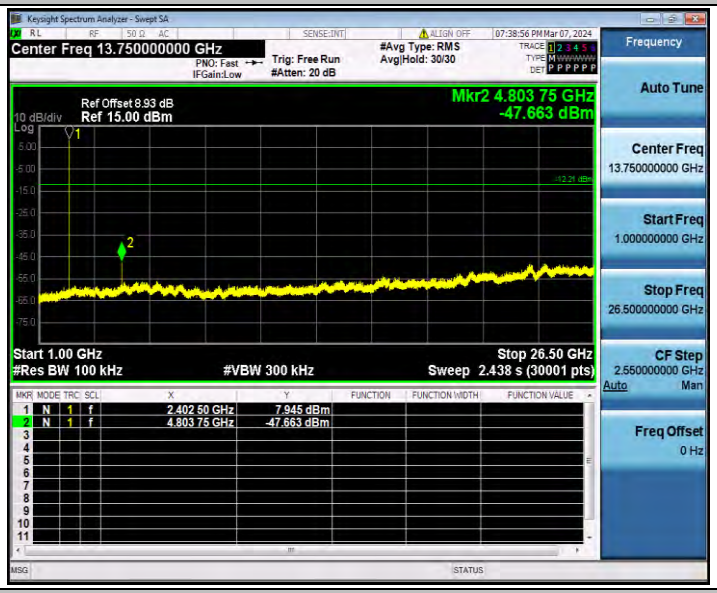
2DH1_Ant0_2480_30~1000

2DH1_Ant0_2480_1000~26500



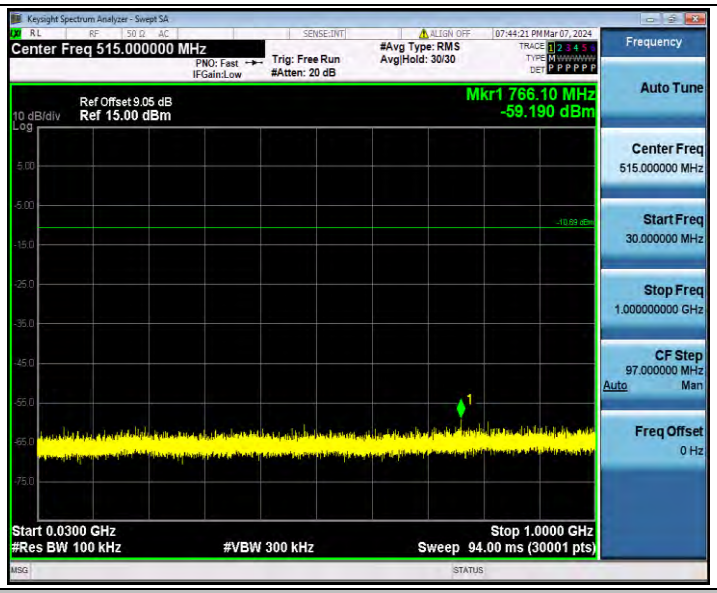
3DH1_Ant0_2402_0~Reference

3DH1_Ant0_2402_30~1000

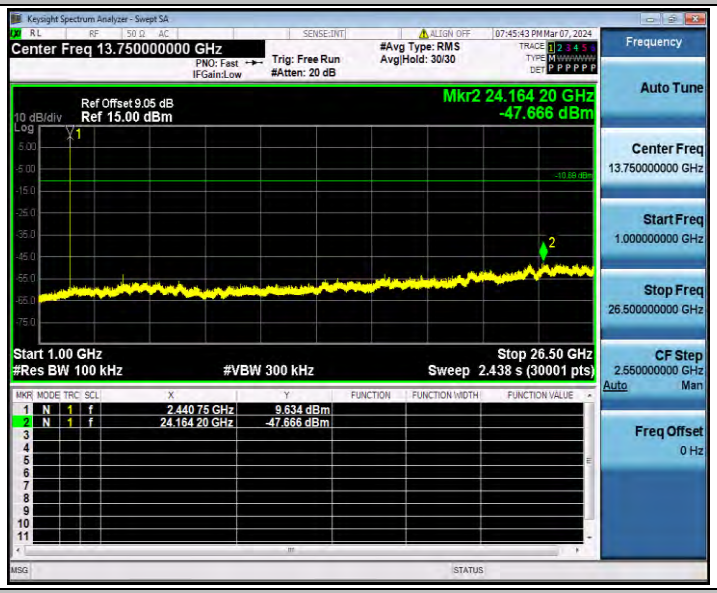


3DH1_Ant0_2402_1000~26500

3DH1_Ant0_2441_0~Reference

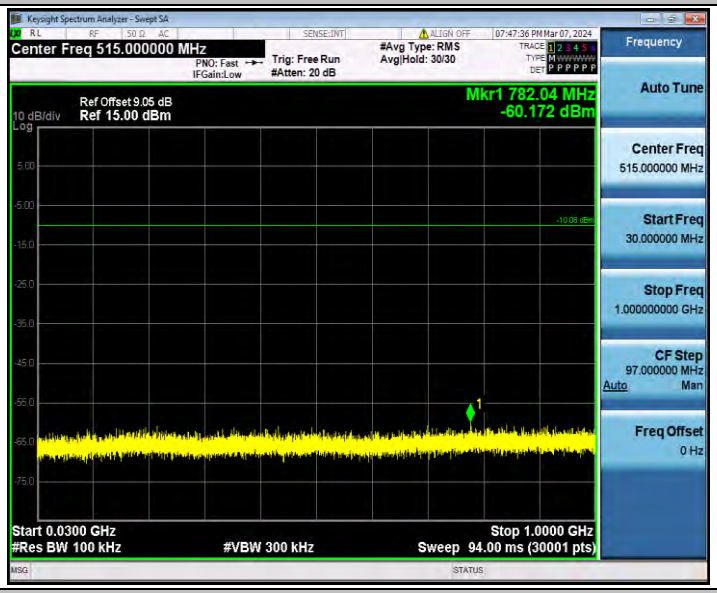
3DH1_Ant0_2441_30~1000



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

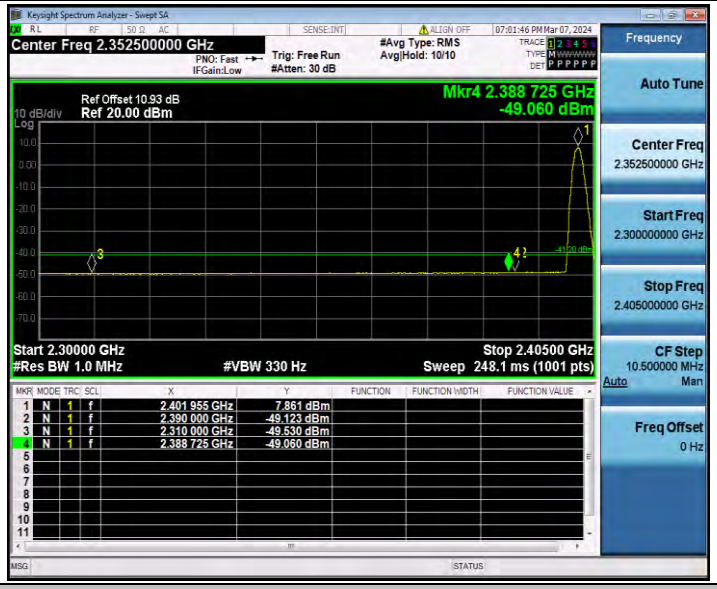
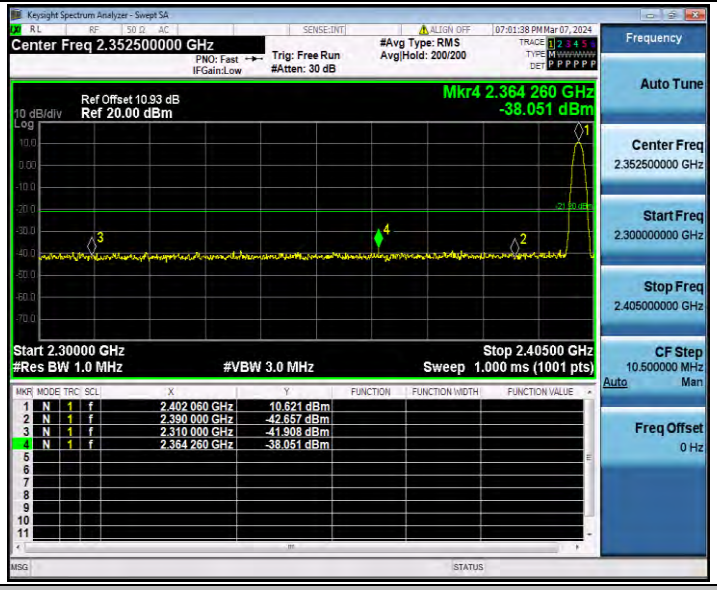
TestMode	Antenna	ChName	Freq (MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH1	Ant0	Low	2402	AV	2310.000	-49.53	≤-41.20	45.67	≤54	PASS
				AV	2388.725	-49.06	≤-41.20	46.14	≤54	PASS
				AV	2390.000	-49.12	≤-41.20	46.08	≤54	PASS
				Peak	2310.000	-41.91	≤-21.20	53.29	≤74	PASS
				Peak	2364.260	-38.05	≤-21.20	57.15	≤74	PASS
				Peak	2390.000	-42.66	≤-21.20	52.54	≤74	PASS
		High	2480	AV	2483.500	-47.46	≤-41.20	47.74	≤54	PASS
				AV	2483.520	-47.46	≤-41.20	47.74	≤54	PASS
				AV	2500.000	-48.95	≤-41.20	46.25	≤54	PASS
				Peak	2483.500	-42.23	≤-21.20	52.97	≤74	PASS
				Peak	2494.400	-38.82	≤-21.20	56.38	≤74	PASS
				Peak	2500.000	-39.78	≤-21.20	55.42	≤74	PASS
2DH1	Ant0	Low	2402	AV	2310.000	-49.53	≤-41.20	45.67	≤54	PASS
				AV	2389.040	-49.04	≤-41.20	46.16	≤54	PASS
				AV	2390.000	-49.15	≤-41.20	46.05	≤54	PASS
				Peak	2310.000	-42.6	≤-21.20	52.60	≤74	PASS
				Peak	2337.485	-38.89	≤-21.20	56.31	≤74	PASS
				Peak	2390.000	-41.22	≤-21.20	53.98	≤74	PASS
		High	2480	AV	2483.500	-47.2	≤-41.20	48.00	≤54	PASS
				AV	2483.520	-47.2	≤-41.20	48.00	≤54	PASS
				AV	2500.000	-48.9	≤-41.20	46.30	≤54	PASS
				Peak	2483.500	-39.34	≤-21.20	55.86	≤74	PASS
				Peak	2499.040	-38.5	≤-21.20	56.70	≤74	PASS
				Peak	2500.000	-41.28	≤-21.20	53.92	≤74	PASS
3DH1	Ant0	Low	2402	AV	2310.000	-49.58	≤-41.20	45.62	≤54	PASS
				AV	2389.460	-49.05	≤-41.20	46.15	≤54	PASS
				AV	2390.000	-49.1	≤-41.20	46.10	≤54	PASS
				Peak	2310.000	-41.54	≤-21.20	53.66	≤74	PASS
				Peak	2389.250	-38.23	≤-21.20	56.97	≤74	PASS
				Peak	2390.000	-41.25	≤-21.20	53.95	≤74	PASS
		High	2480	AV	2483.500	-47.33	≤-41.20	47.87	≤54	PASS
				AV	2483.520	-47.33	≤-41.20	47.87	≤54	PASS
				AV	2500.000	-48.89	≤-41.20	46.31	≤54	PASS
				Peak	2483.500	-41.15	≤-21.20	54.05	≤74	PASS
				Peak	2485.520	-38.67	≤-21.20	56.53	≤74	PASS

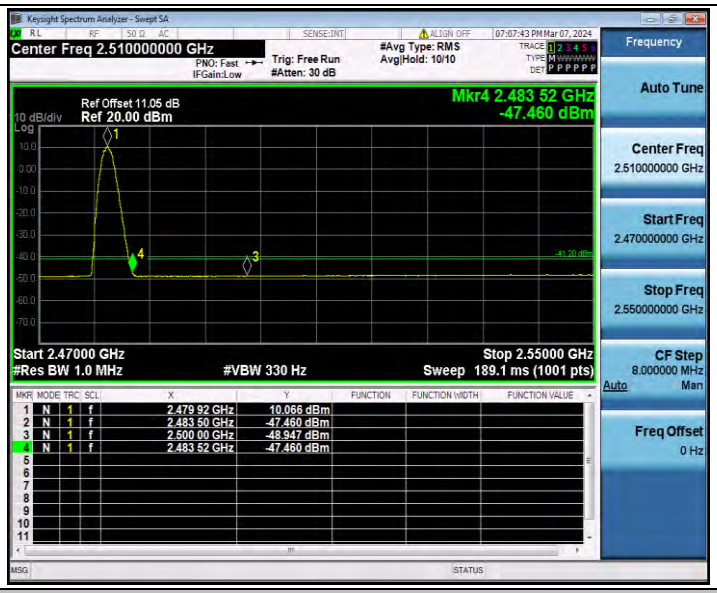
				Peak	2500.000	-39.53	≤-21.20	55.67	≤74	PASS

Note：

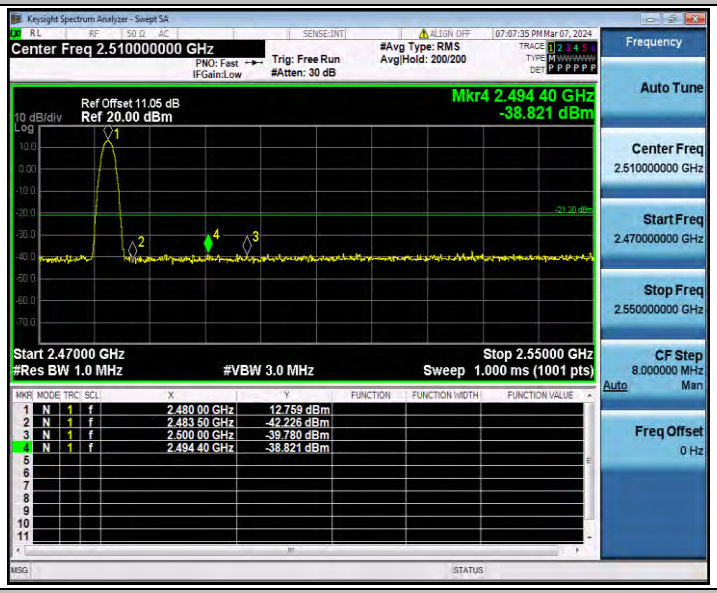
1. The Antenna Gain is compensated in the graph.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

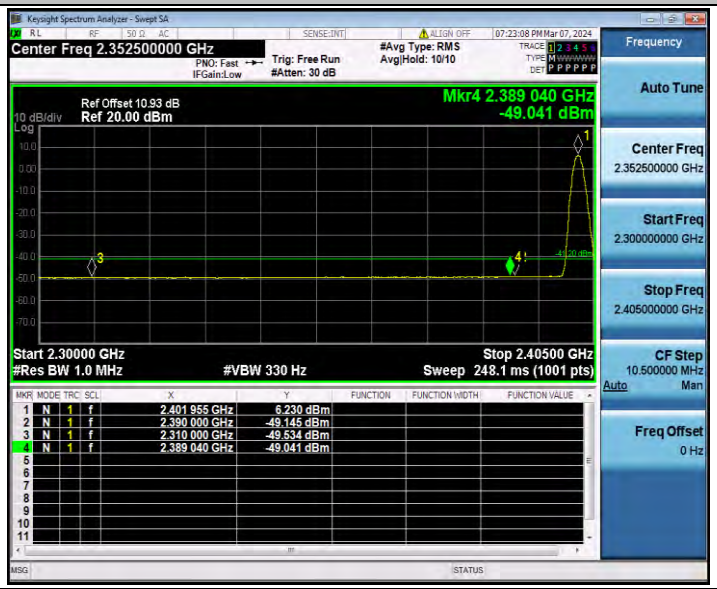
DH1_Ant0_Low_2402_AV

DH1_Ant0_Low_2402_Peak

DH1_Ant0_High_2480_AV

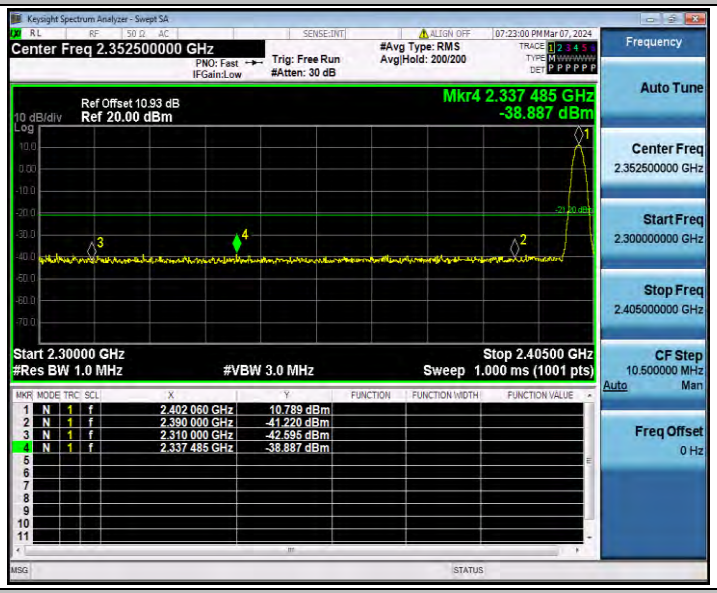
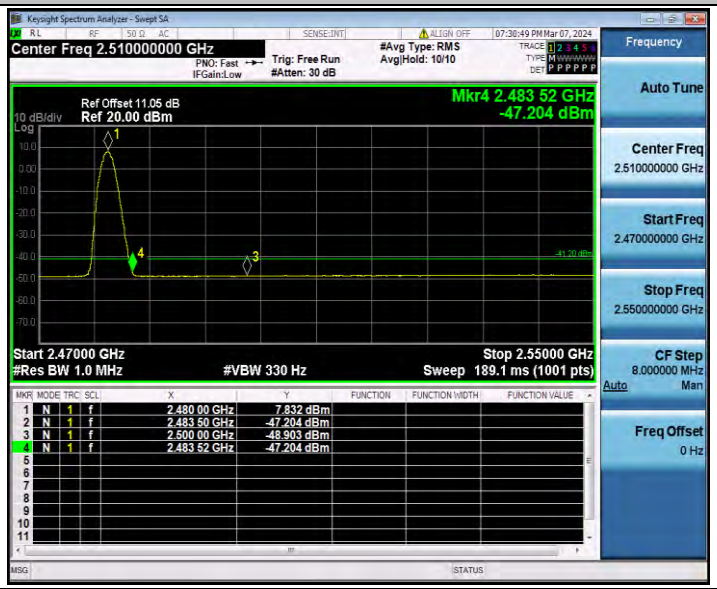


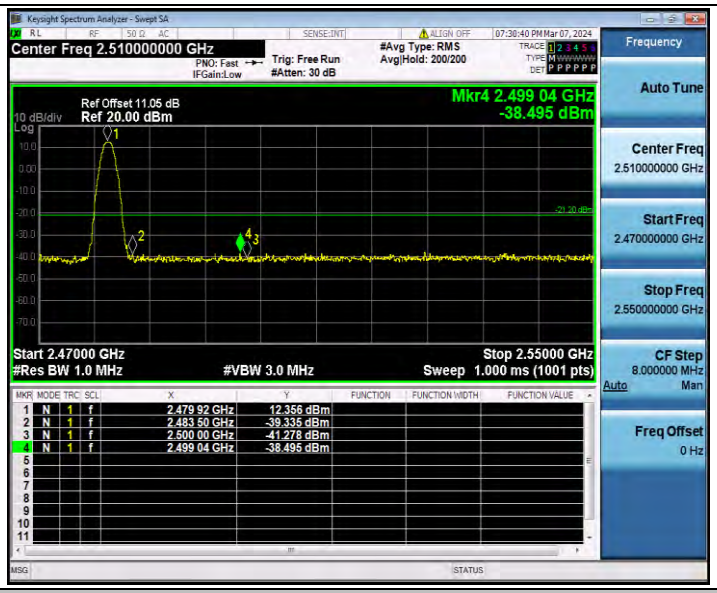
DH1_Ant0_High_2480_Peak



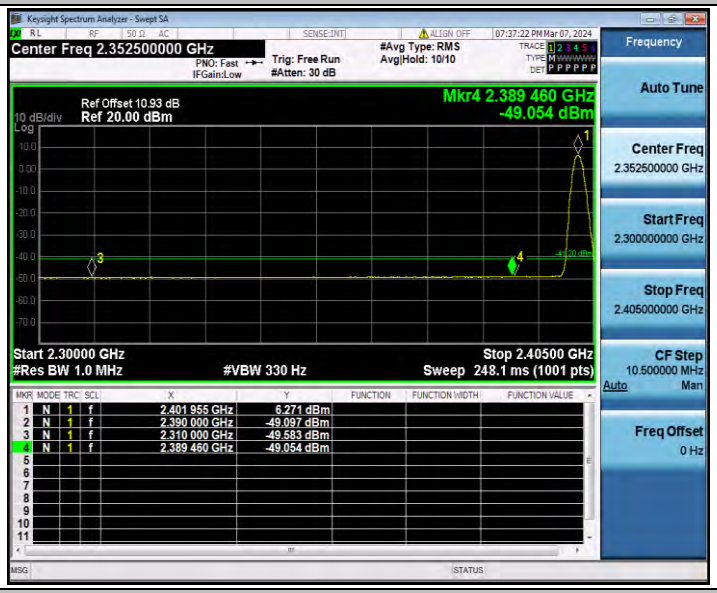
2DH1_Ant0_Low_2402_AV



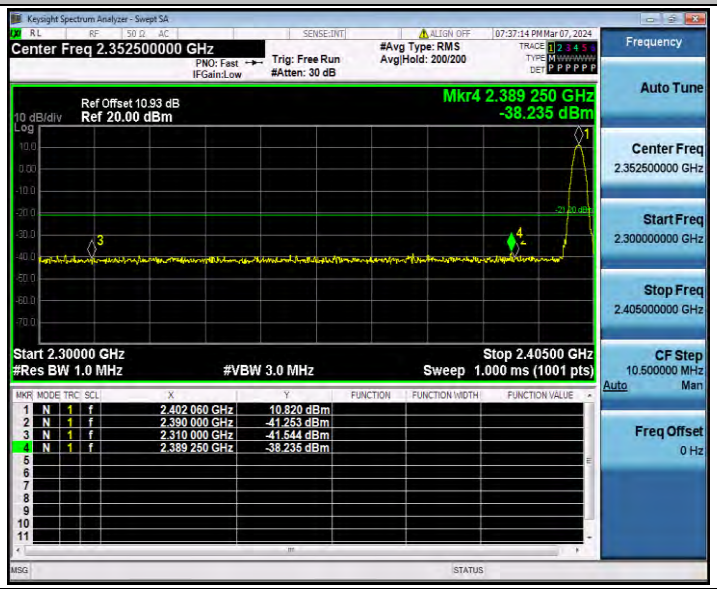
2DH1_Ant0_Low_2402_Peak

2DH1_Ant0_High_2480_AV

2DH1_Ant0_High_2480_Peak

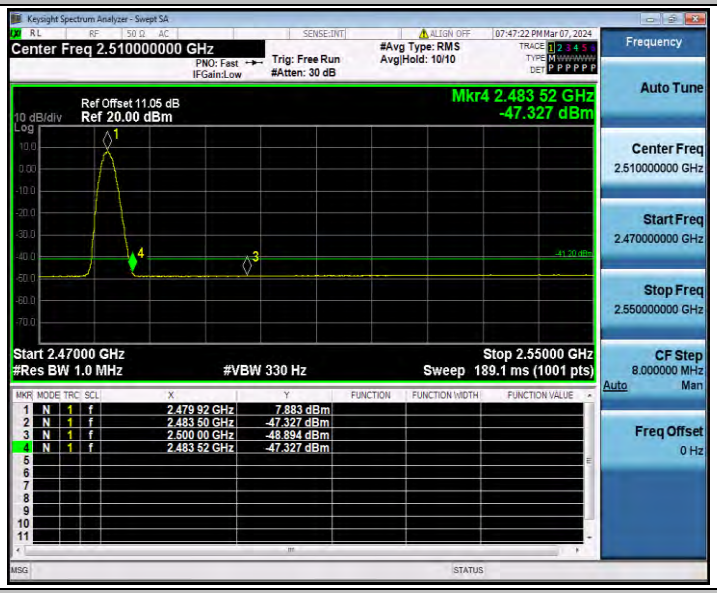


3DH1_Ant0_Low_2402_AV



3DH1_Ant0_Low_2402_Peak



3DH1_Ant0_High_2480_AV

3DH1_Ant0_High_2480_Peak