Case No. : GTS20230105011-1-44	
Ambient Condition: 23 ℃, 50 %RH, Atmos100.1Kpa,	
Test Date: 2023.3.1	**Test Engineer:** Jenny zeng

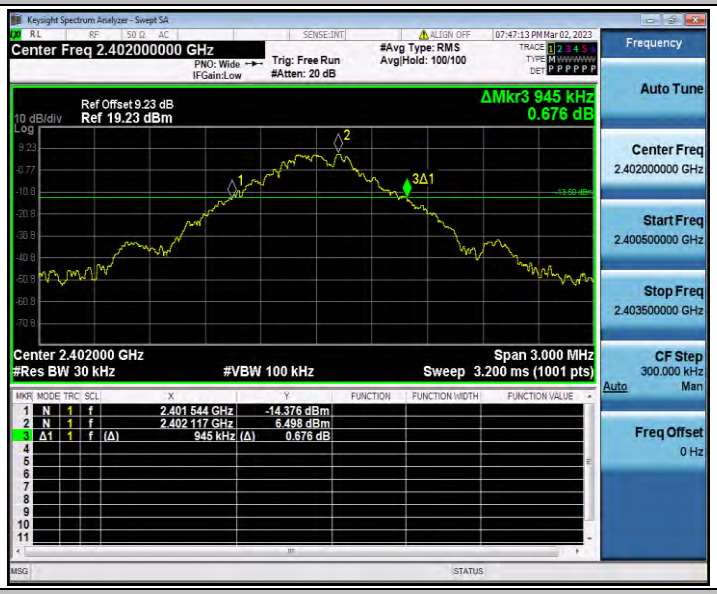
Appendix A.1: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.945	2401.544	2402.489	---	---
		2441	0.948	2440.547	2441.495	---	---
		2480	0.945	2479.544	2480.489	---	---
2DH1	Ant1	2402	1.473	2401.241	2402.714	---	---
		2441	1.467	2440.247	2441.714	---	---
		2480	1.500	2479.235	2480.735	---	---
3DH1	Ant1	2402	1.491	2401.271	2402.762	---	---
		2441	1.458	2440.280	2441.738	---	---
		2480	1.464	2479.271	2480.735	---	---

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	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.83994	2401.581	2402.421	---	---
		2441	0.82681	2440.590	2441.417	---	---
		2480	0.83845	2479.575	2480.413	---	---
2DH1	Ant1	2402	1.3337	2401.329	2402.663	---	---
		2441	1.3252	2440.336	2441.661	---	---
		2480	1.3359	2479.333	2480.669	---	---
3DH1	Ant1	2402	1.3446	2401.328	2402.672	---	---
		2441	1.3252	2440.335	2441.660	---	---
		2480	1.3423	2479.327	2480.669	---	---

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	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH1	Ant1	2402	9.58	≤30.00	PASS
		2441	10.65	≤30.00	PASS
		2480	10.48	≤30.00	PASS
2DH1	Ant1	2402	7.65	≤20.97	PASS
		2441	8.88	≤20.97	PASS
		2480	8.48	≤20.97	PASS
3DH1	Ant1	2402	7.76	≤20.97	PASS
		2441	8.94	≤20.97	PASS
		2480	8.64	≤20.97	PASS

Appendix A.4: Carrier frequency separation

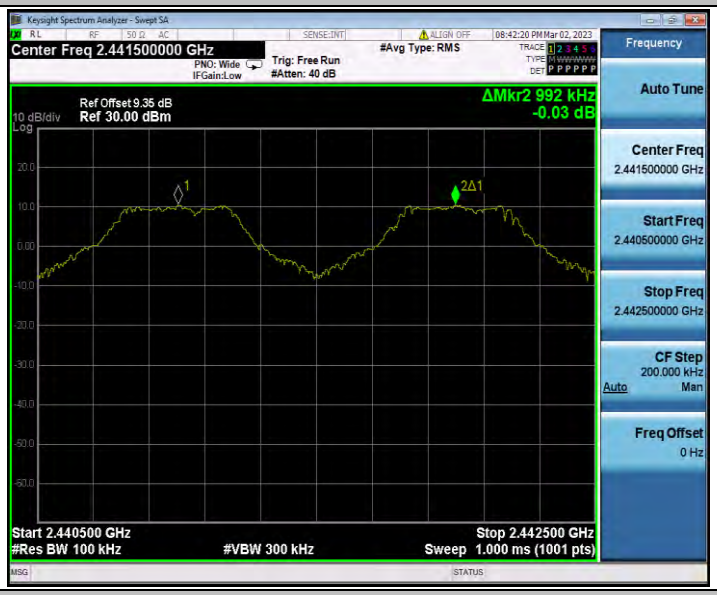
Test Result

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop_2402	1.004	≥0.948	PASS
		Hop_2441	0.992	≥0.948	PASS
		Hop_2480	0.998	≥0.948	PASS
2DH1	Ant1	Hop_2402	1.038	≥1.000	PASS
		Hop_2441	1.002	≥1.000	PASS
		Hop_2480	1.152	≥1.000	PASS
3DH1	Ant1	Hop_2402	0.998	≥0.994	PASS
		Hop_2441	1.16	≥0.994	PASS
		Hop_2480	1.018	≥0.994	PASS

Test Graphs

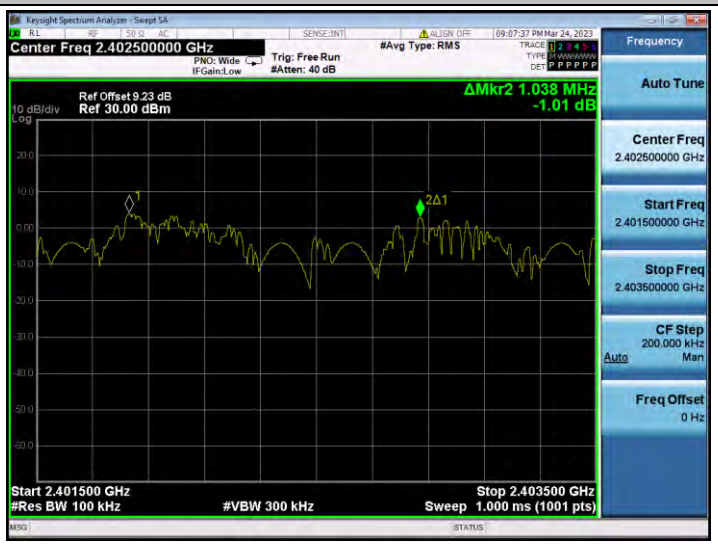
DH1_Ant1_Hop_2402

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

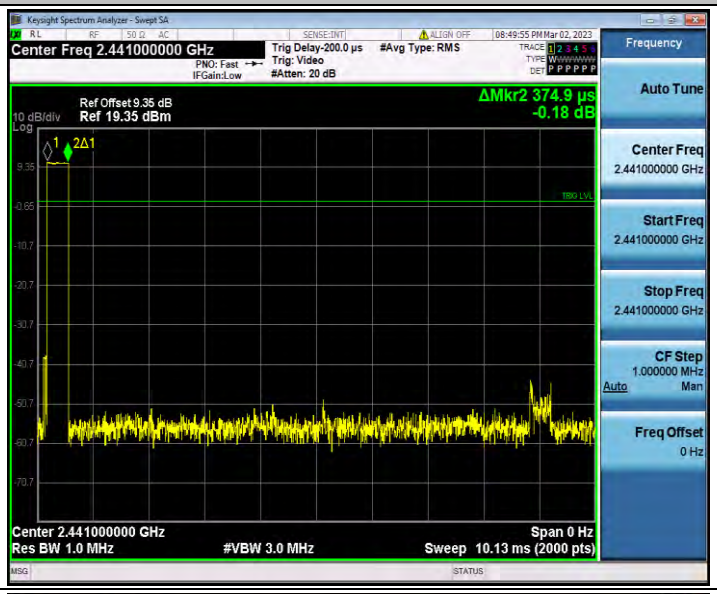
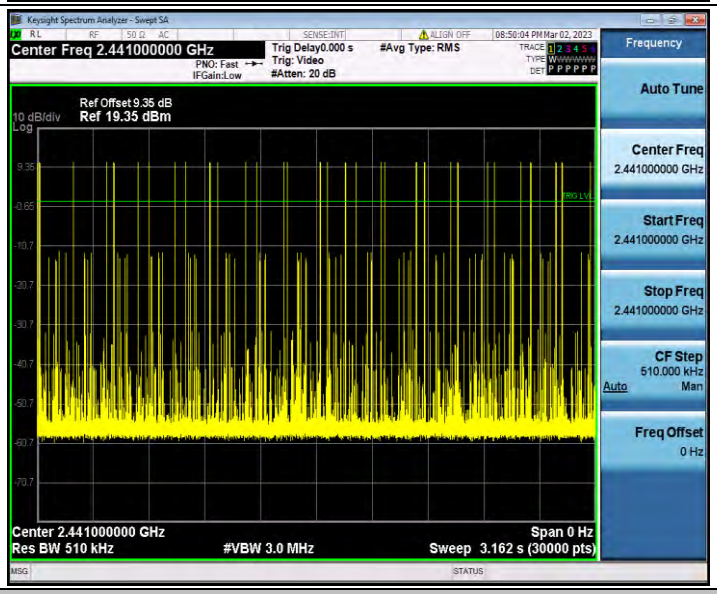
3DH1_Ant1_Hop_2480

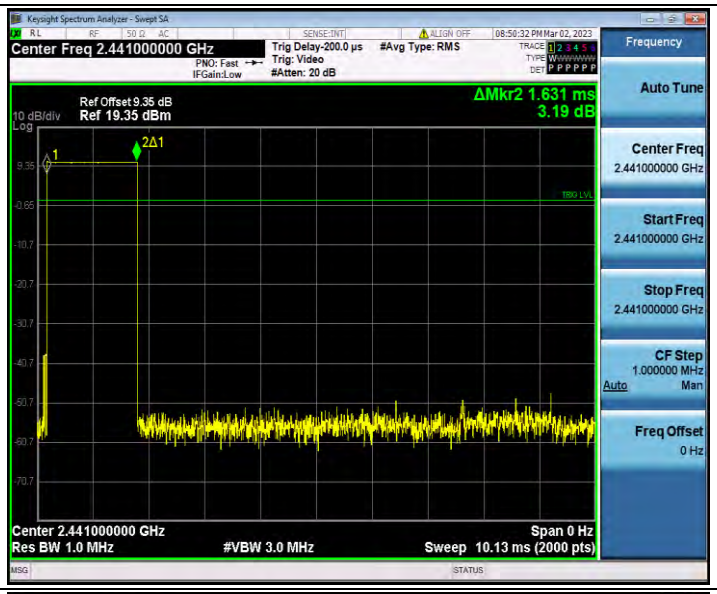
Appendix A.5: Time of occupancy

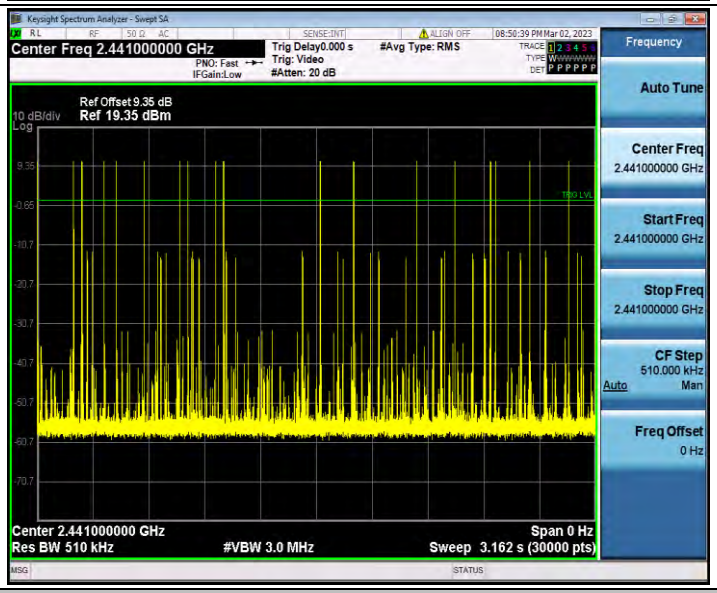
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.37	330	0.124	≤0.4	PASS
DH3	Ant1	Hop	1.63	190	0.31	≤0.4	PASS
DH5	Ant1	Hop	2.87	130	0.373	≤0.4	PASS
2DH1	Ant1	Hop	0.38	330	0.125	≤0.4	PASS
2DH3	Ant1	Hop	1.63	170	0.277	≤0.4	PASS
2DH5	Ant1	Hop	2.88	120	0.345	≤0.4	PASS
3DH1	Ant1	Hop	0.38	330	0.125	≤0.4	PASS
3DH3	Ant1	Hop	1.63	170	0.277	≤0.4	PASS
3DH5	Ant1	Hop	2.88	120	0.345	≤0.4	PASS

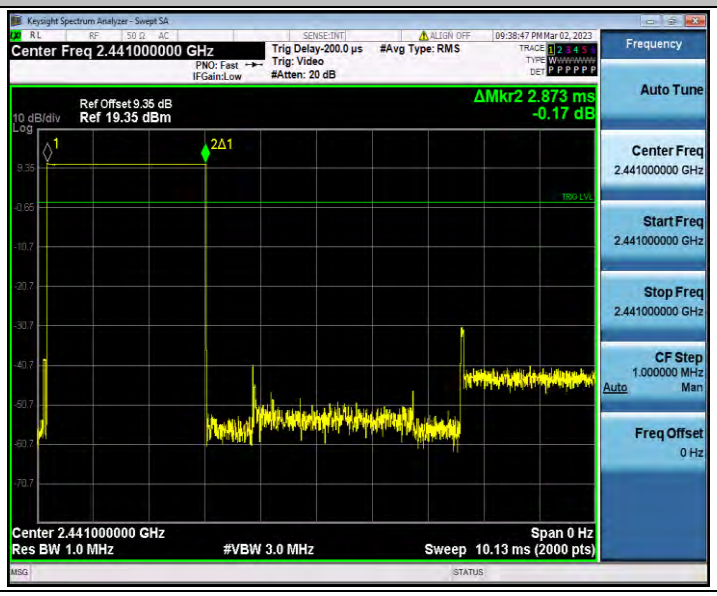
Test Graphs

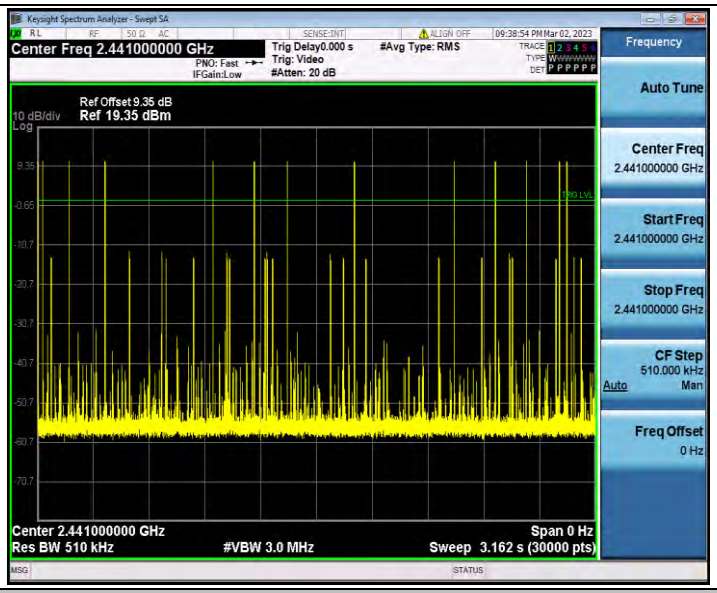
DH1_Ant1_Hop


DH3_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-200.0 µs
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
Ref Offset 9.35 dB
10 dB/div
Ref 19.35 dBm
ΔMkr2 1.631 ms
3.19 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
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
Freq Offset
0 Hz

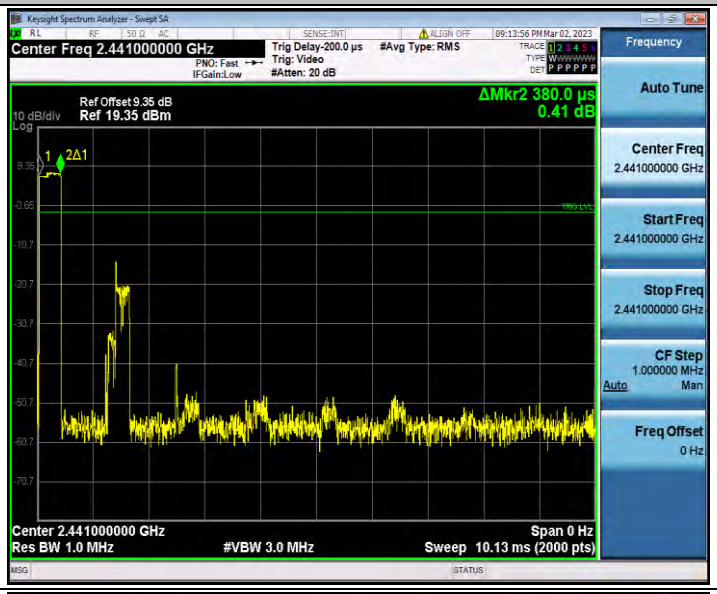

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
Ref Offset 9.35 dB
10 dB/div
Ref 19.35 dBm
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Freq Offset
0 Hz

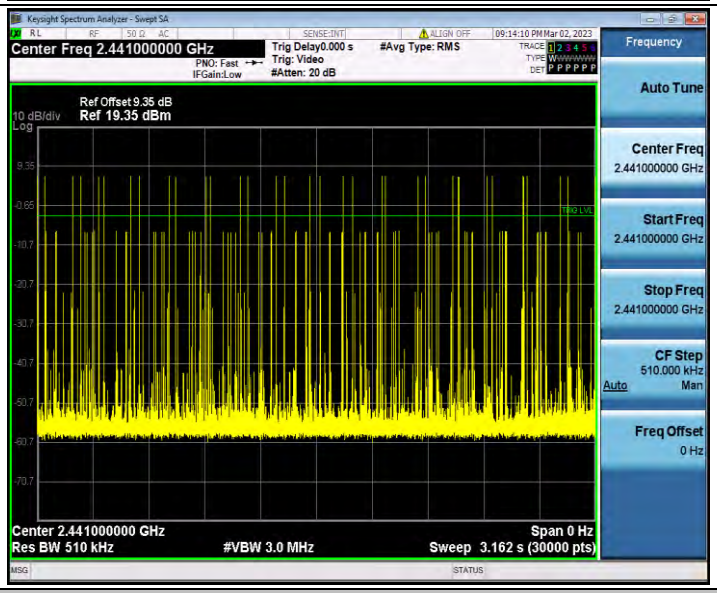
DH5_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-200.0 µs
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
Ref Offset 9.35 dB
10 dB/div
Ref 19.35 dBm
ΔMkr2 2.873 ms
-0.17 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
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
Freq Offset
0 Hz

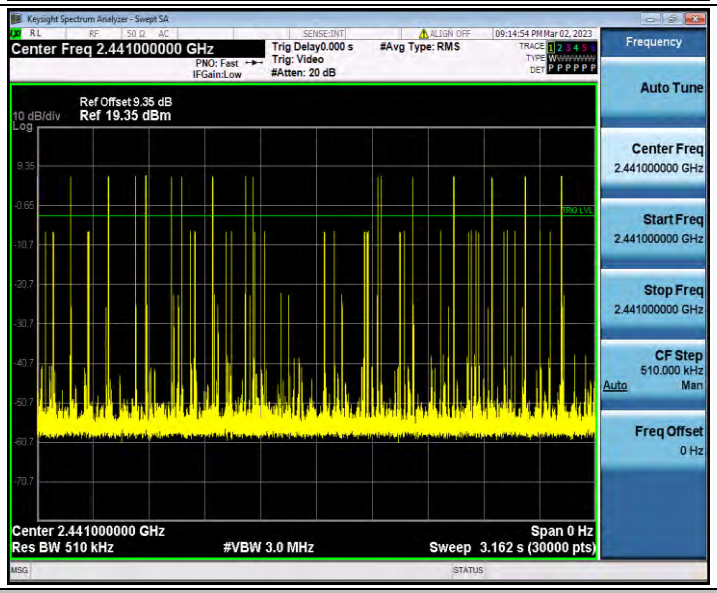


2DH1_Ant1_Hop

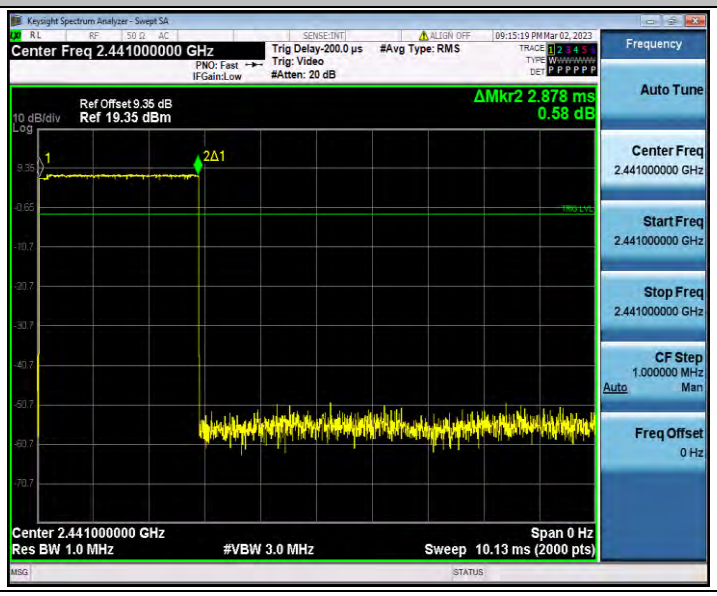


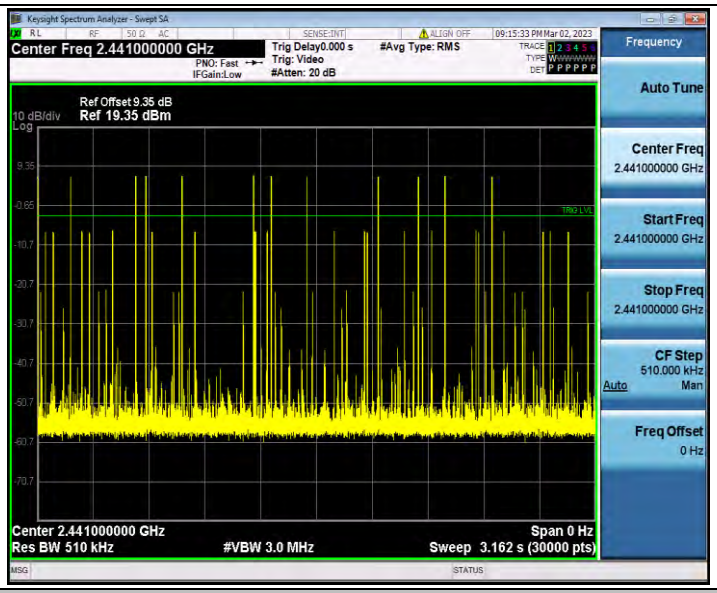


2DH3_Ant1_Hop

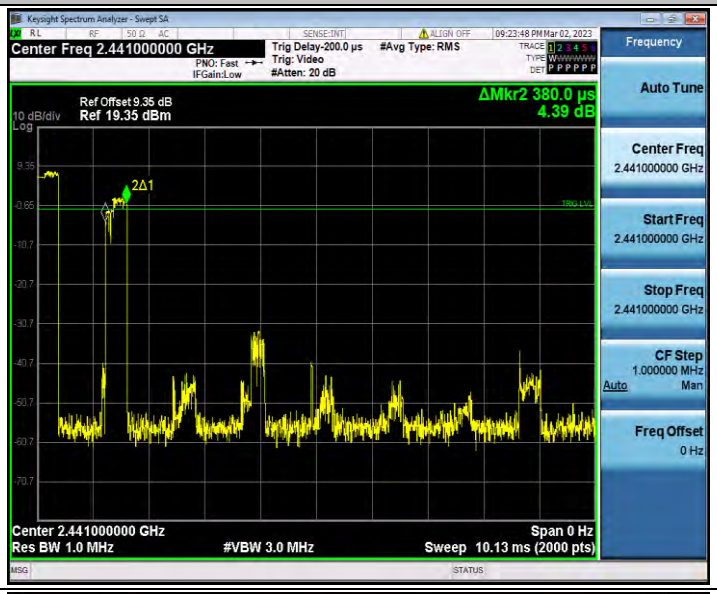


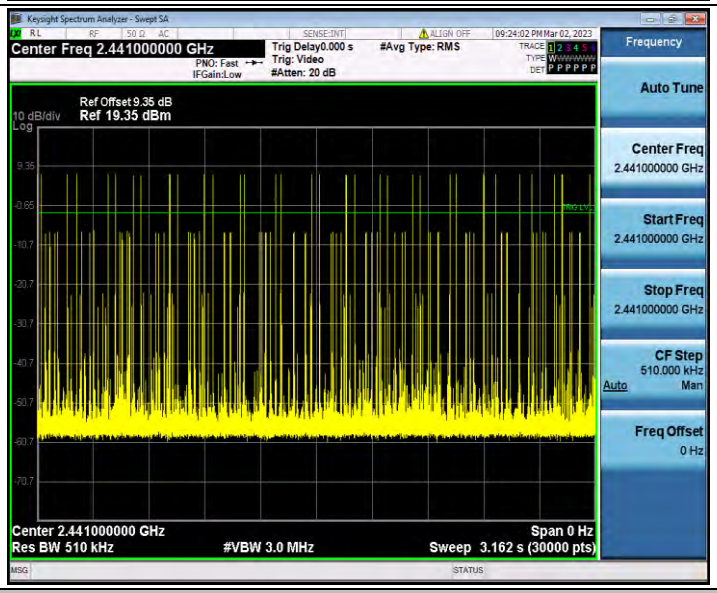
2DH5_Ant1_Hop



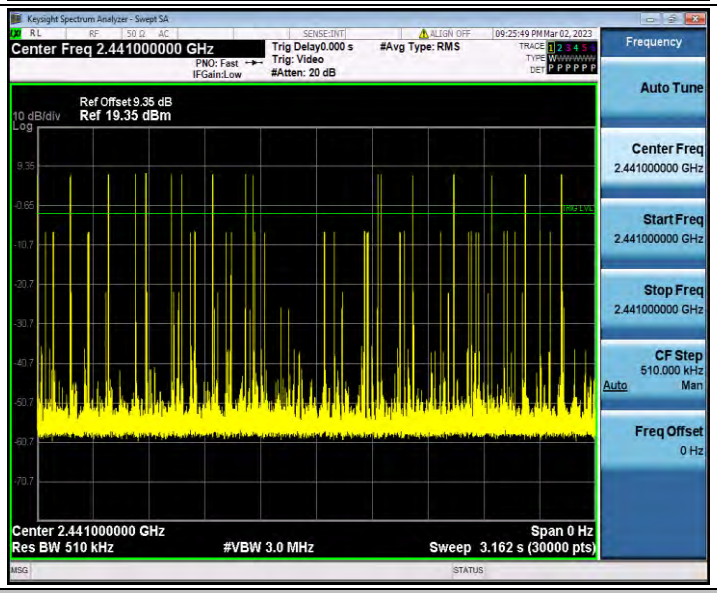


3DH1_Ant1_Hop

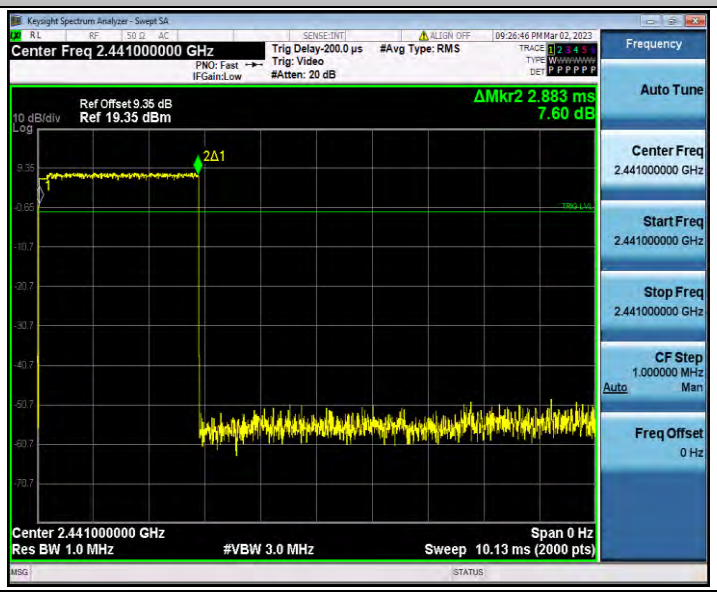


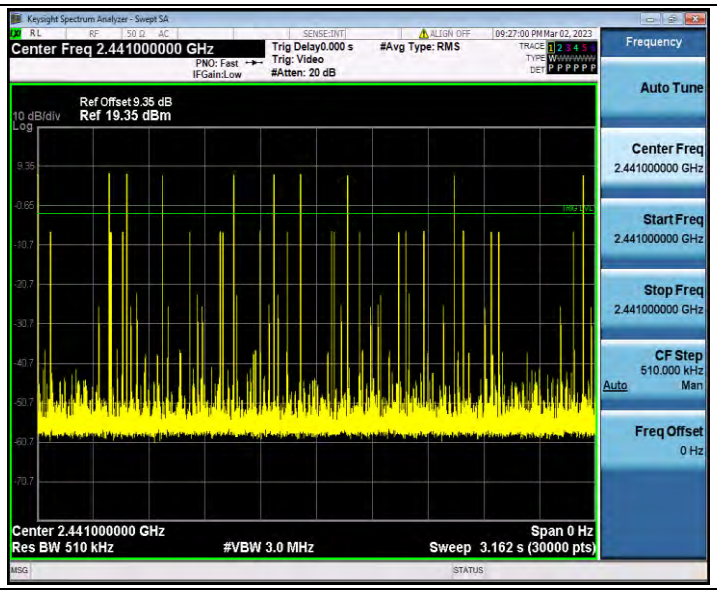


3DH3_Ant1_Hop



3DH5_Ant1_Hop




Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN OFF
09:27:00 PM Mar 02, 2023
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay 0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W W W W W W
DET P P P P P P
Frequency
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
Ref Offset 9.35 dB
10 dB/div
Ref 19.35 dBm
Log
9.35
-0.65
-10.7
-20.7
-30.7
-40.7
-50.7
-60.7
-70.7
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 3.162 s (30000 pts)
MSG
STATUS

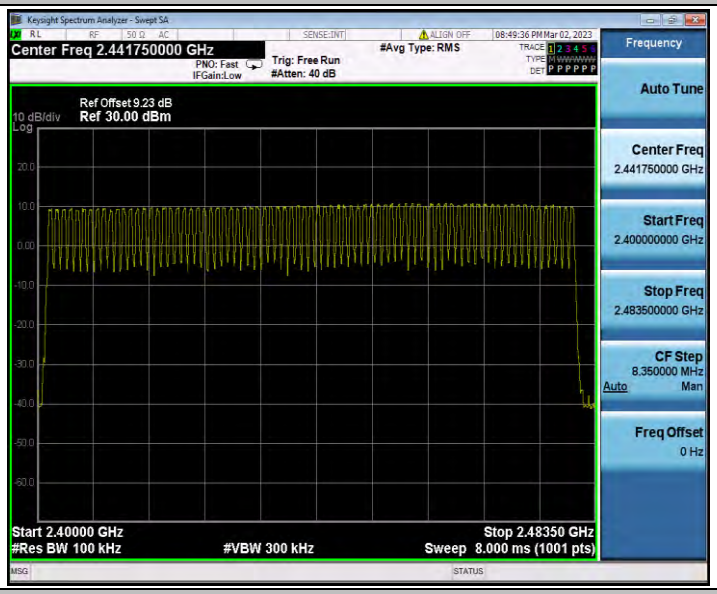
Appendix A.6: Number of hopping channels

Test Result

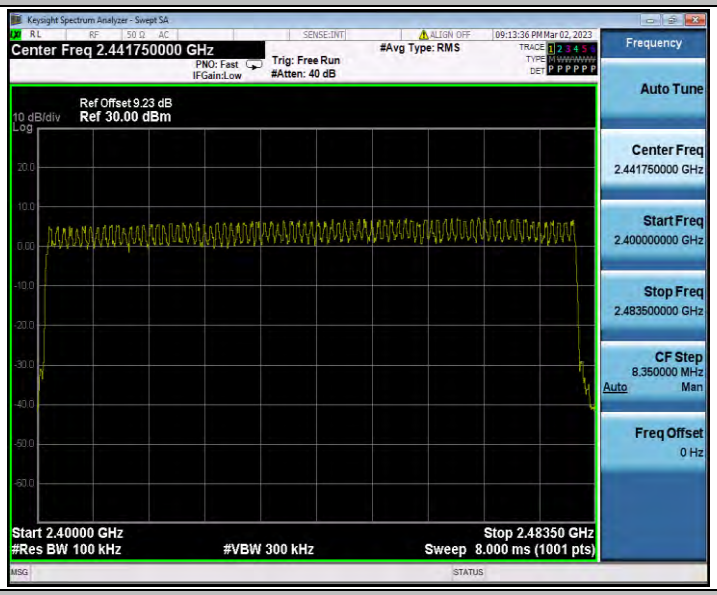
TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Hop	79	≥15	PASS
2DH1	Ant1	Hop	79	≥15	PASS
3DH1	Ant1	Hop	79	≥15	PASS

Test Graphs

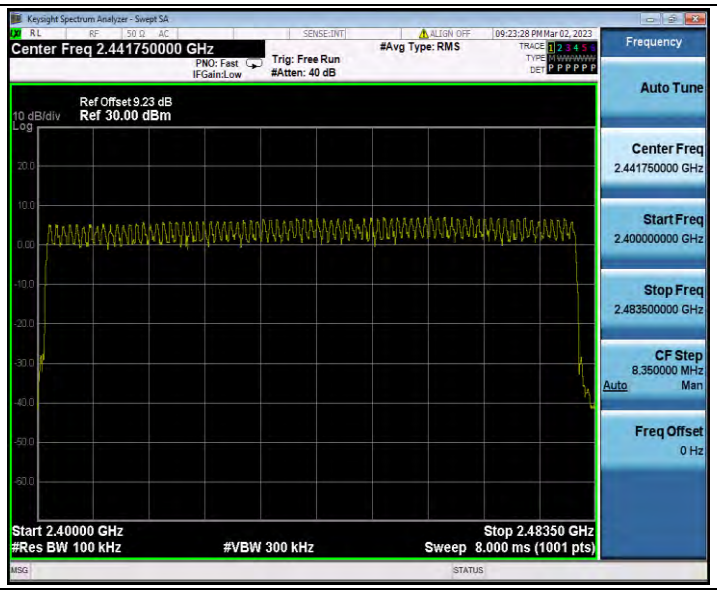
DH1_Ant1_Hop



2DH1_Ant1_Hop



3DH1_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN OFF
09:23:28 PM Mar 02, 2023
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE M WWWWWW
DET P P P P P P
Ref Offset 9.23 dB
10 dB/div
Ref 30.00 dBm
Log
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)
MSG
STATUS
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

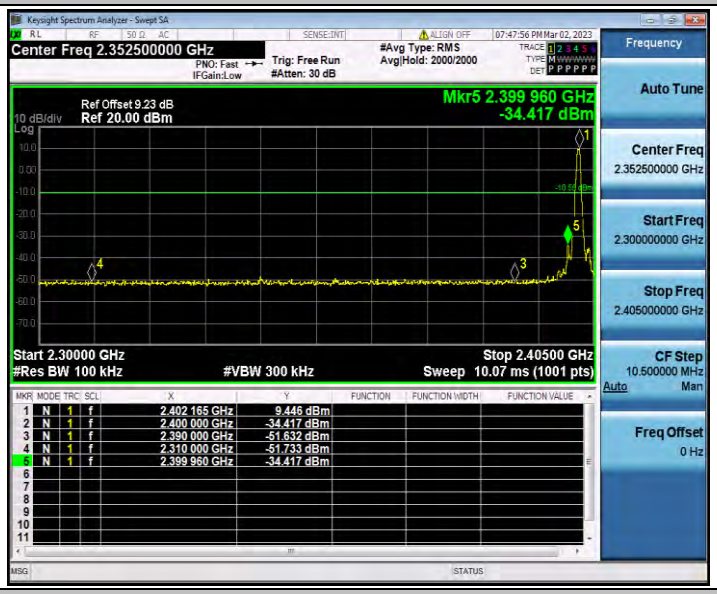
Appendix A.7: Band edge measurements

Test Result

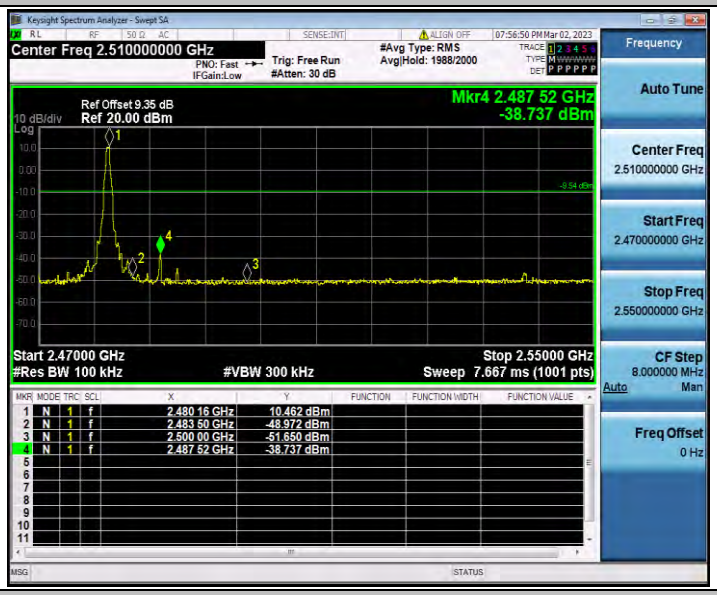
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	9.45	-34.42	≤-10.55	PASS
		High	2480	10.46	-38.74	≤-9.54	PASS
		Low	Hop_2402	9.34	-48.62	≤-10.66	PASS
		High	Hop_2480	10.43	-47.45	≤-9.57	PASS
2DH1	Ant1	Low	2402	5.40	-38.62	≤-14.6	PASS
		High	2480	6.41	-38.57	≤-13.59	PASS
		Low	Hop_2402	4.30	-48.39	≤-15.7	PASS
		High	Hop_2480	6.67	-48.79	≤-13.33	PASS
3DH1	Ant1	Low	2402	5.31	-38.27	≤-14.69	PASS
		High	2480	6.42	-38.67	≤-13.58	PASS
		Low	Hop_2402	4.72	-48.02	≤-15.28	PASS
		High	Hop_2480	6.44	-48.44	≤-13.56	PASS

Test Graphs

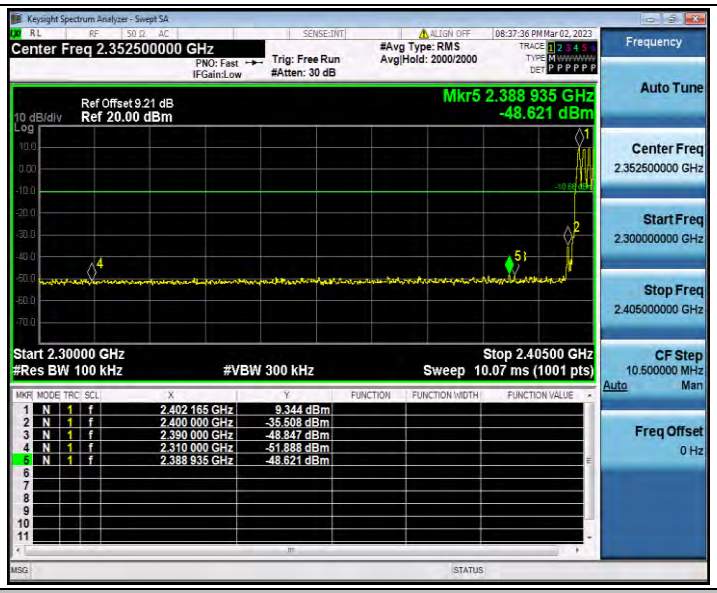
DH1_Ant1_Low_2402



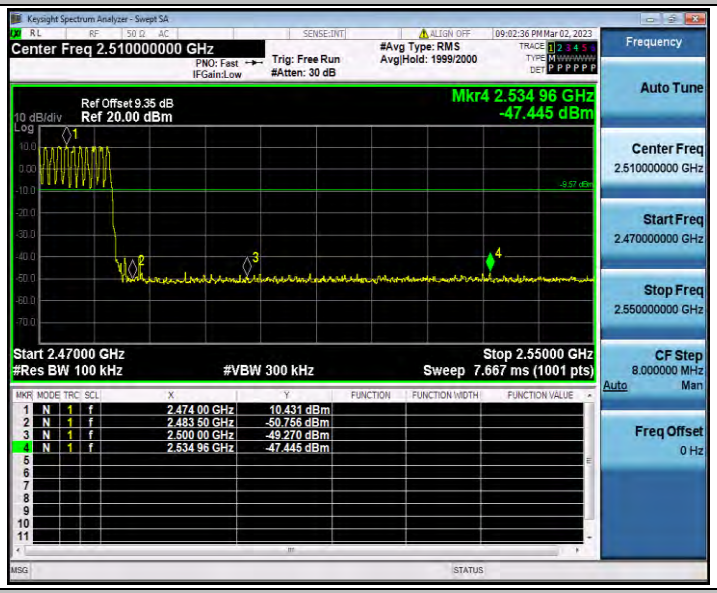
DH1_Ant1_High_2480



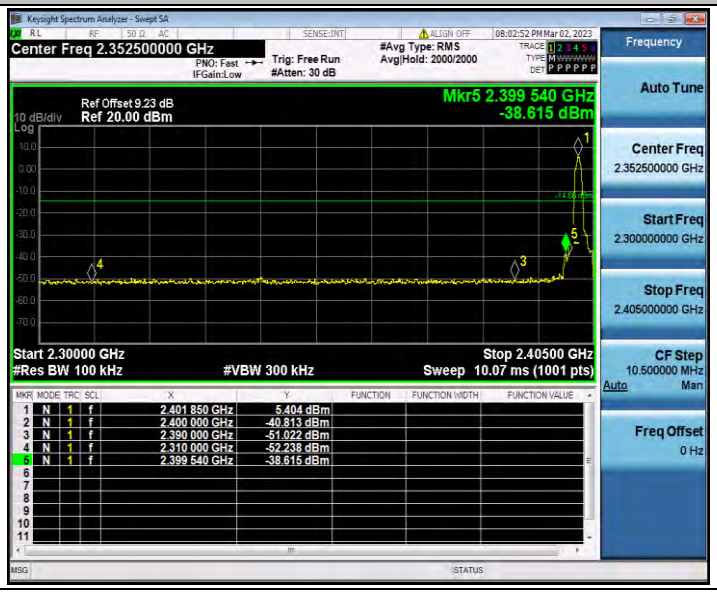
DH1_Ant1_Low_Hop_2402



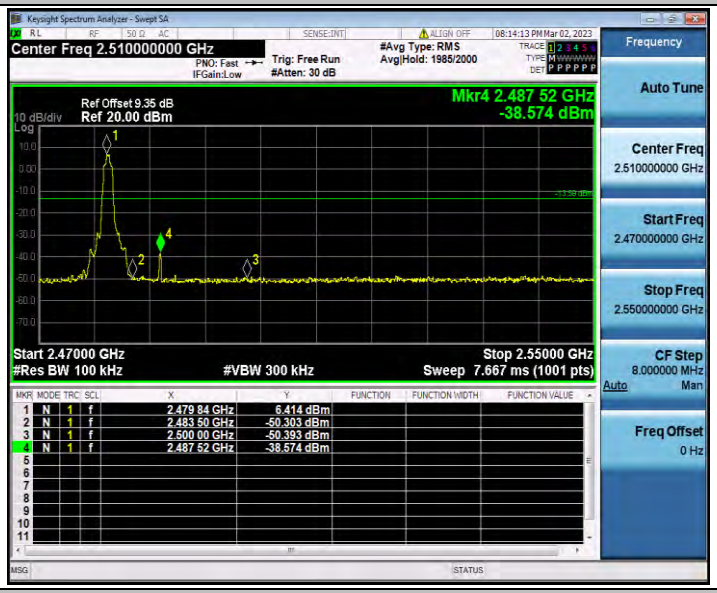
DH1_Ant1_High_Hop_2480



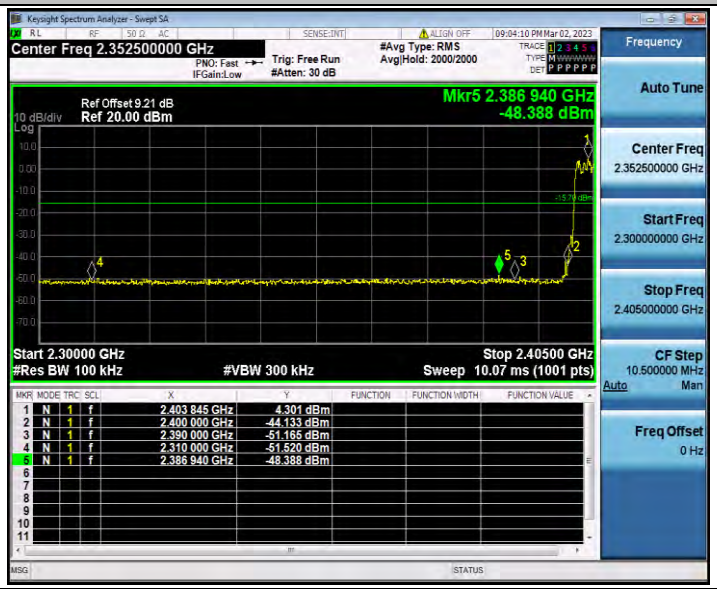
2DH1_Ant1_Low_2402



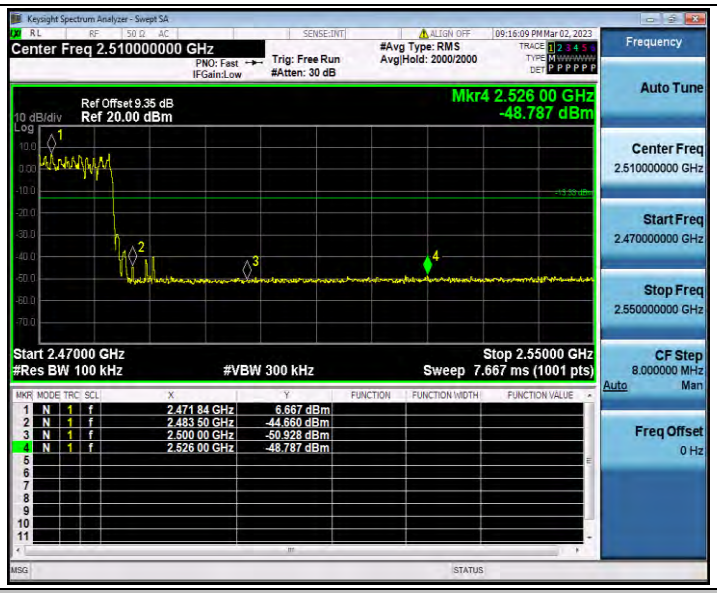
2DH1_Ant1_High_2480



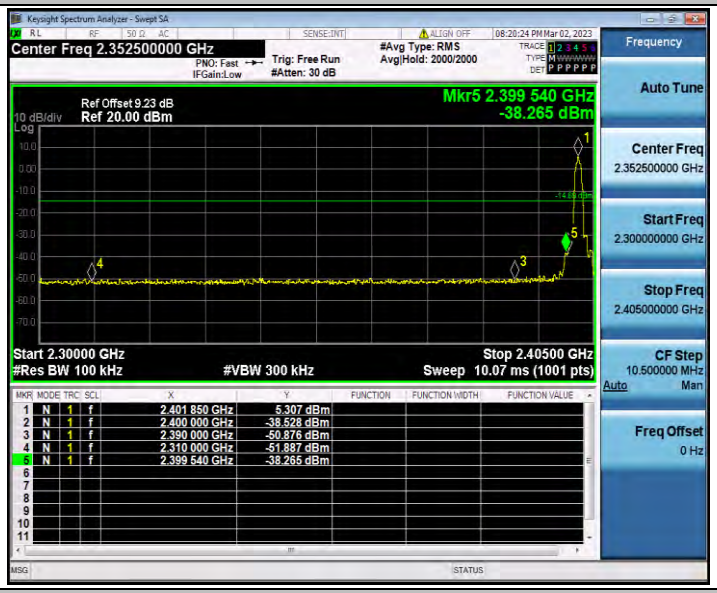
2DH1_Ant1_Low_Hop_2402



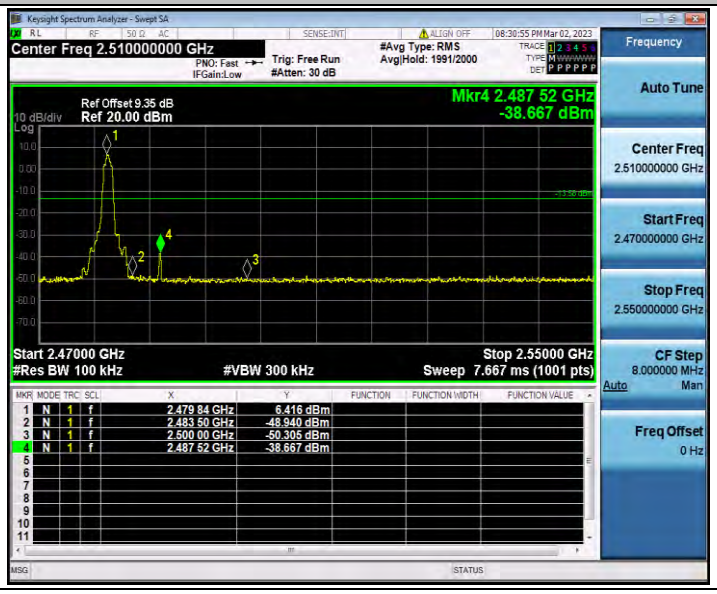
2DH1_Ant1_High_Hop_2480



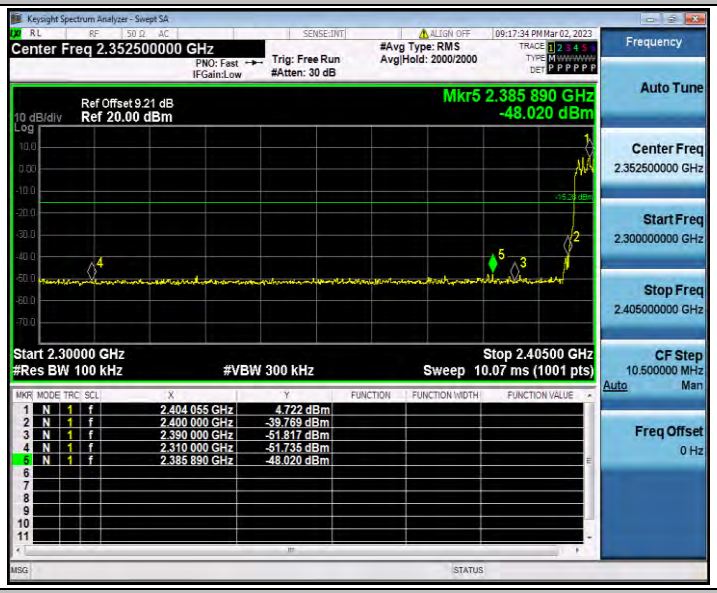
3DH1_Ant1_Low_2402



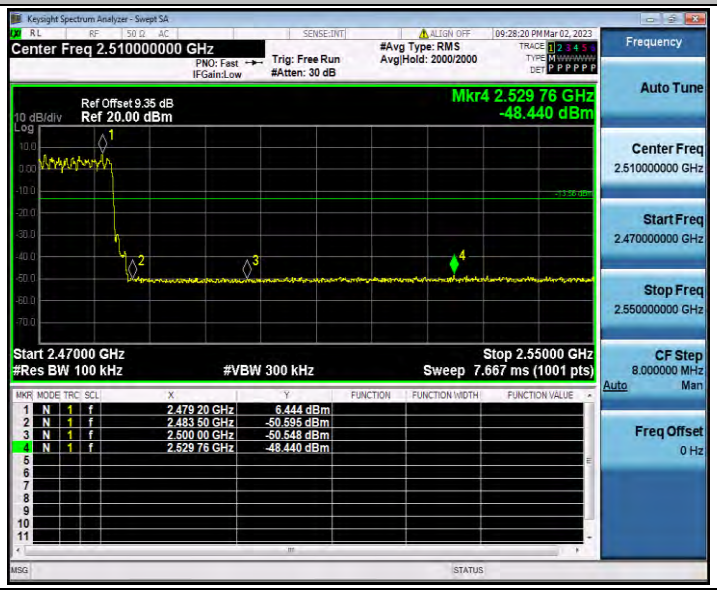
3DH1_Ant1_High_2480



3DH1_Ant1_Low_Hop_2402



3DH1_Ant1_High_Hop_2480



Appendix A.8: Conducted Spurious Emission

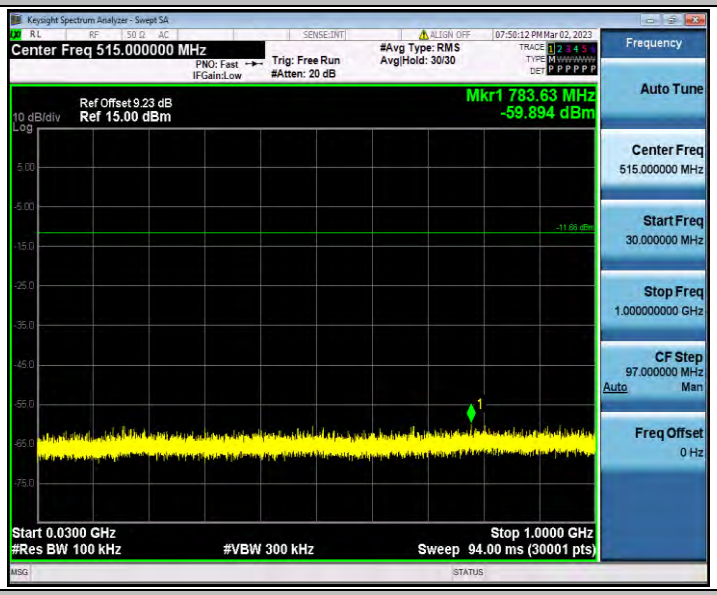
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	2402	Reference	8.34	8.34	---	PASS
			30~1000	8.34	-59.89	≤-11.66	PASS
			1000~26500	8.34	-48.17	≤-11.66	PASS
		2441	Reference	10.36	10.36	---	PASS
			30~1000	10.36	-58.9	≤-9.64	PASS
			1000~26500	10.36	-46.82	≤-9.64	PASS
		2480	Reference	10.18	10.18	---	PASS
			30~1000	10.18	-59.92	≤-9.82	PASS
			1000~26500	10.18	-47.2	≤-9.82	PASS
2DH1	Ant1	2402	Reference	5.16	5.16	---	PASS
			30~1000	5.16	-59.66	≤-14.84	PASS
			1000~26500	5.16	-47.08	≤-14.84	PASS
		2441	Reference	6.59	6.59	---	PASS
			30~1000	6.59	-60.11	≤-13.41	PASS
			1000~26500	6.59	-47.23	≤-13.41	PASS
		2480	Reference	6.12	6.12	---	PASS
			30~1000	6.12	-60.17	≤-13.88	PASS
			1000~26500	6.12	-47.22	≤-13.88	PASS
3DH1	Ant1	2402	Reference	5.05	5.05	---	PASS
			30~1000	5.05	-60.01	≤-14.95	PASS
			1000~26500	5.05	-47.89	≤-14.95	PASS
		2441	Reference	6.30	6.30	---	PASS
			30~1000	6.30	-59.99	≤-13.7	PASS
			1000~26500	6.30	-47.13	≤-13.7	PASS
		2480	Reference	6.26	6.26	---	PASS
			30~1000	6.26	-57.65	≤-13.74	PASS
			1000~26500	6.26	-47.94	≤-13.74	PASS

Test Graphs

DH1_Ant1_2402_0~Reference

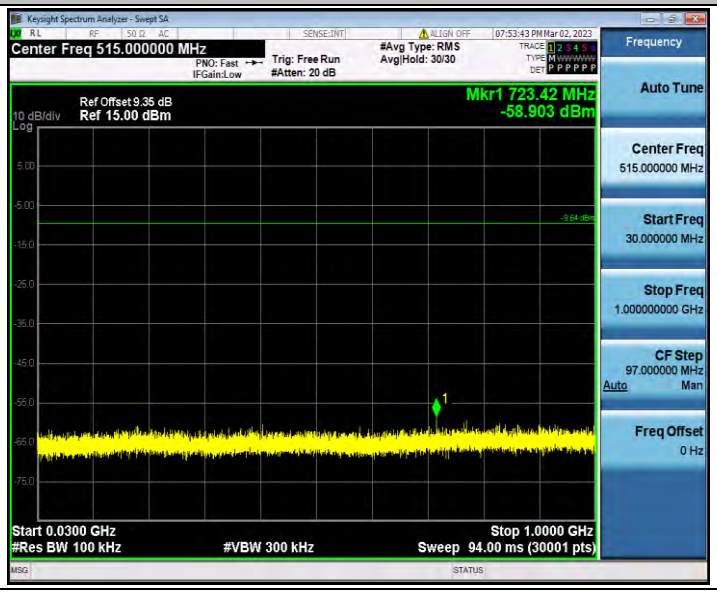
DH1_Ant1_2402_30~1000



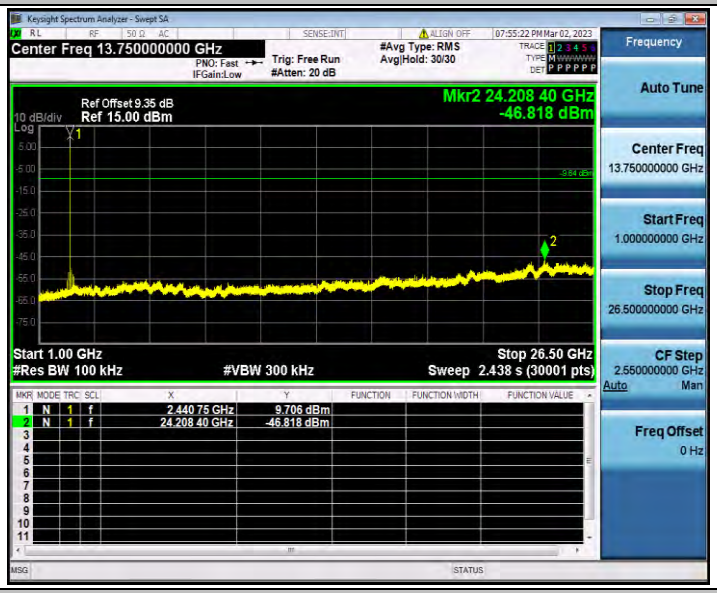
DH1_Ant1_2402_1000~26500

DH1_Ant1_2441_0~Reference

DH1_Ant1_2441_30~1000

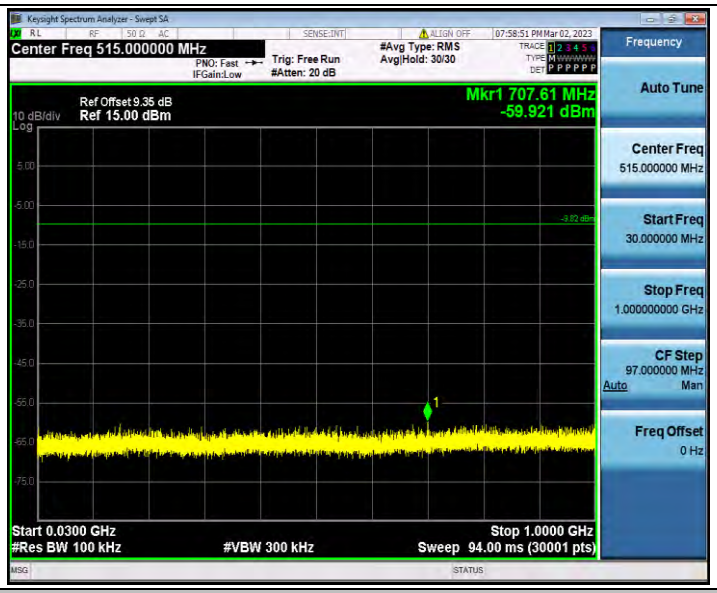


DH1_Ant1_2441_1000~26500

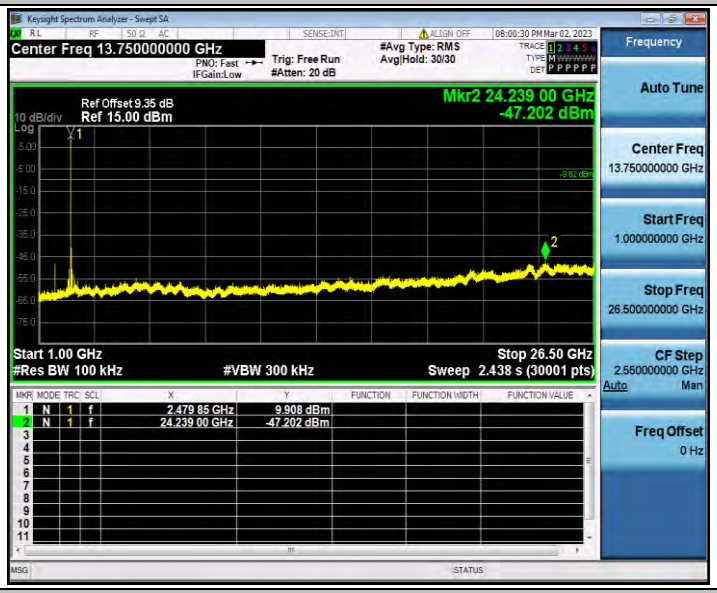


DH1_Ant1_2480_0~Reference

DH1_Ant1_2480_30~1000

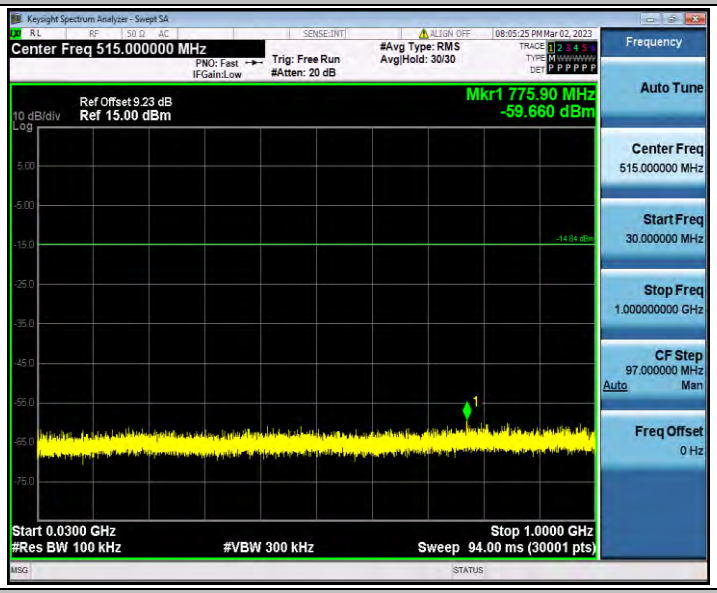


DH1_Ant1_2480_1000~26500

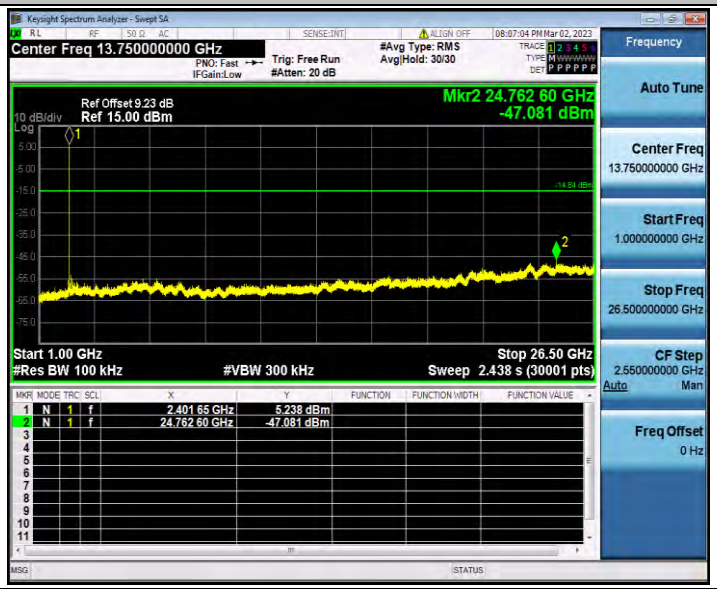


2DH1_Ant1_2402_0~Reference

2DH1_Ant1_2402_30~1000

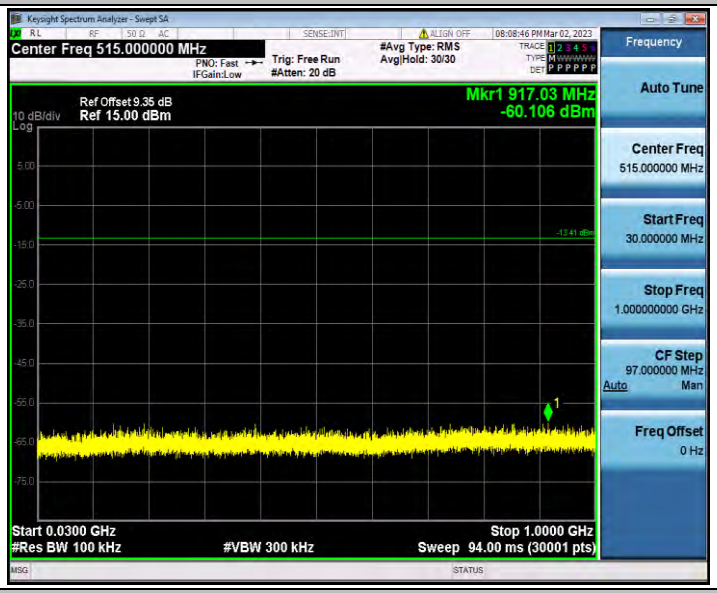


2DH1_Ant1_2402_1000~26500

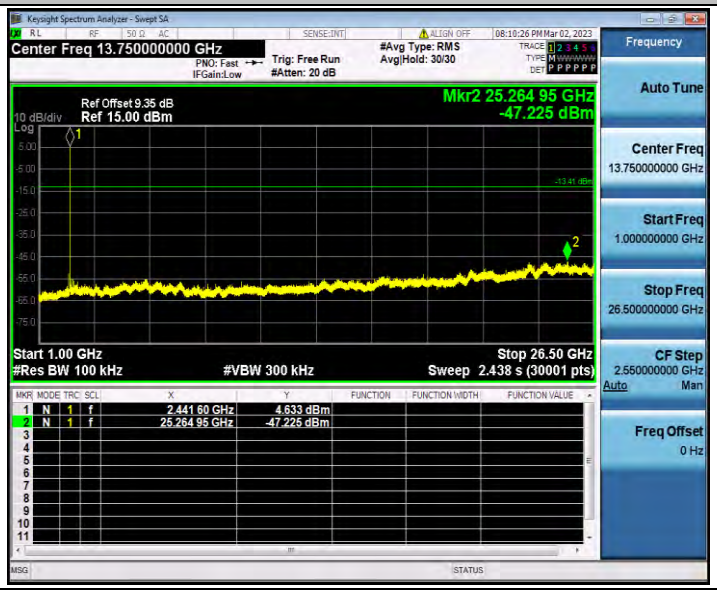


2DH1_Ant1_2441_0~Reference

2DH1_Ant1_2441_30~1000

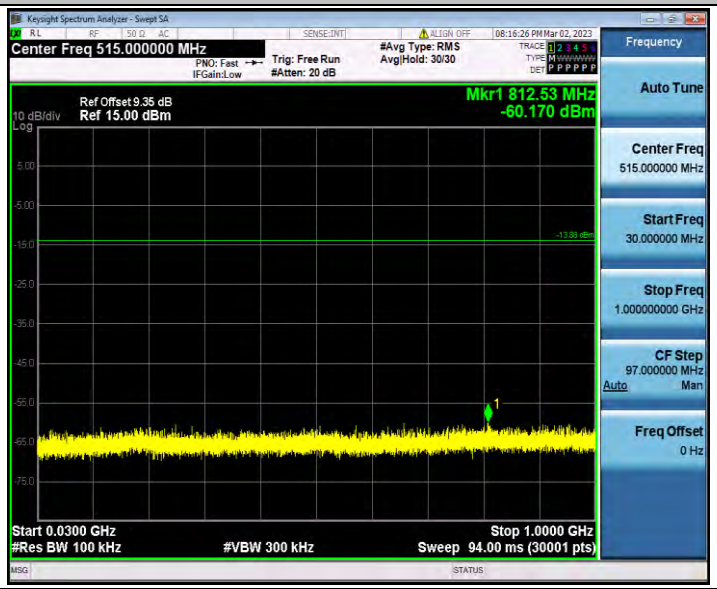


2DH1_Ant1_2441_1000~26500

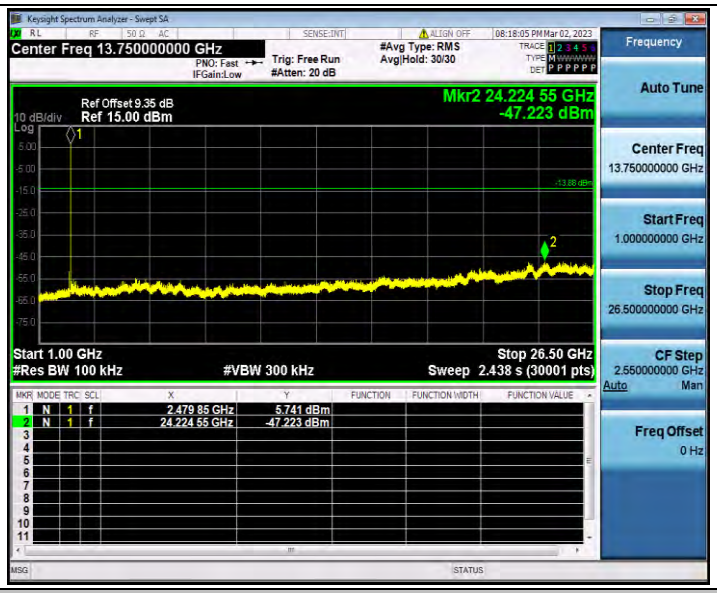


2DH1_Ant1_2480_0~Reference

2DH1_Ant1_2480_30~1000



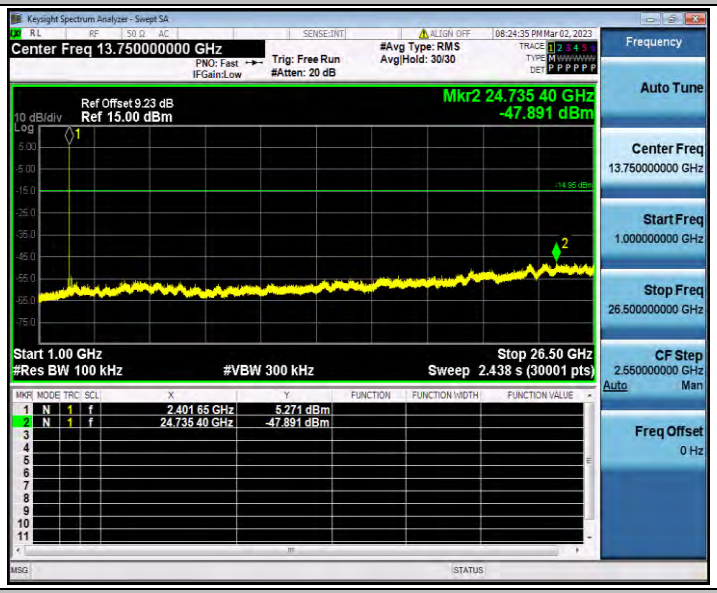
2DH1_Ant1_2480_1000~26500



3DH1_Ant1_2402_0~Reference

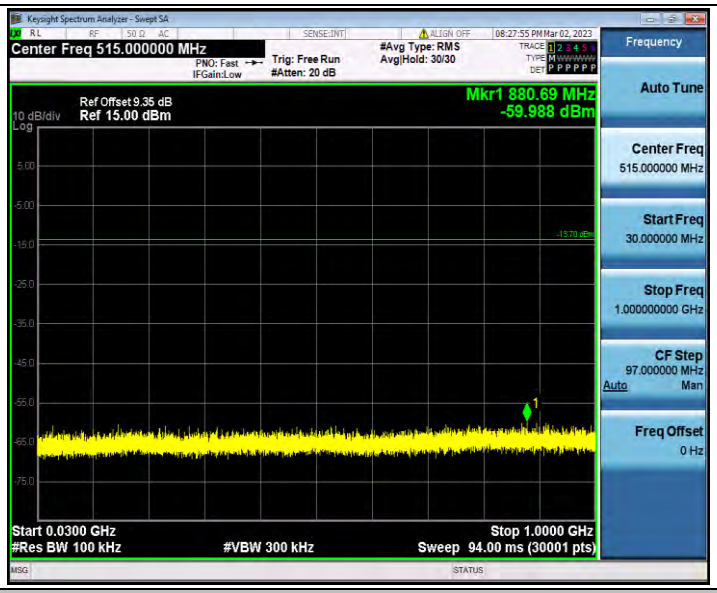
3DH1_Ant1_2402_30~1000

3DH1_Ant1_2402_1000~26500

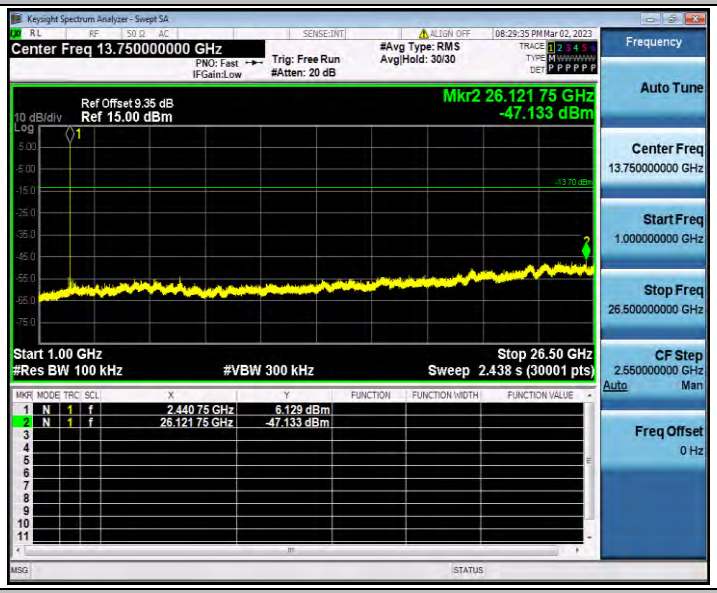


3DH1_Ant1_2441_0~Reference

3DH1_Ant1_2441_30~1000

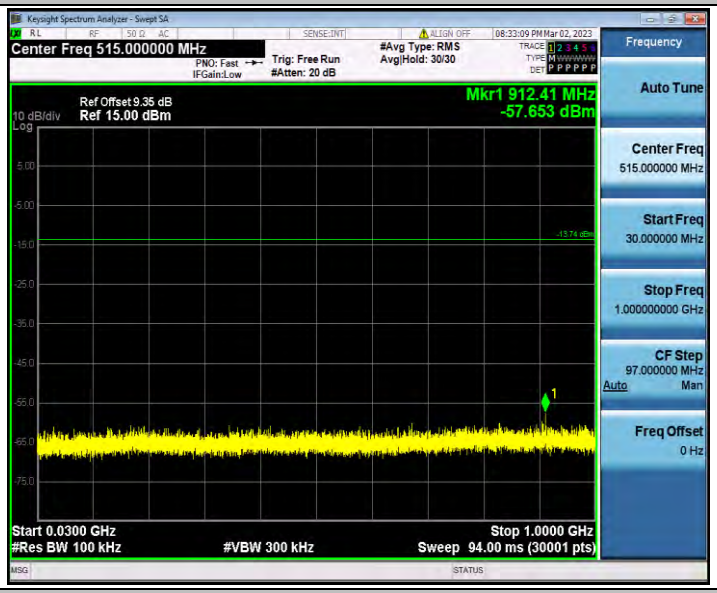
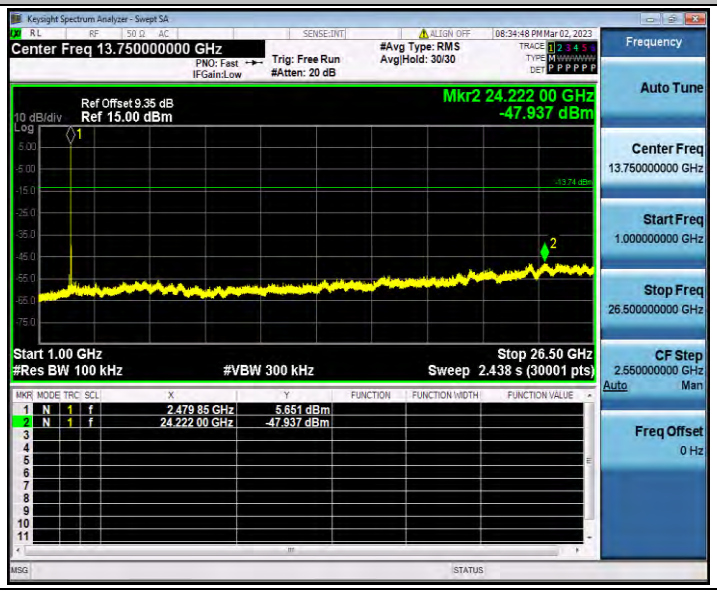


3DH1_Ant1_2441_1000~26500



3DH1_Ant1_2480_0~Reference

3DH1_Ant1_2480_30~1000



3DH1_Ant1_2480_1000~26500