Case No. : CTA24111500601	
Ambient Condition: 23 ℃, 52 %RH	
According Standard: ■Part15C	
Test Date: 2024.10.15	**Test Engineer:** Lushan Kong

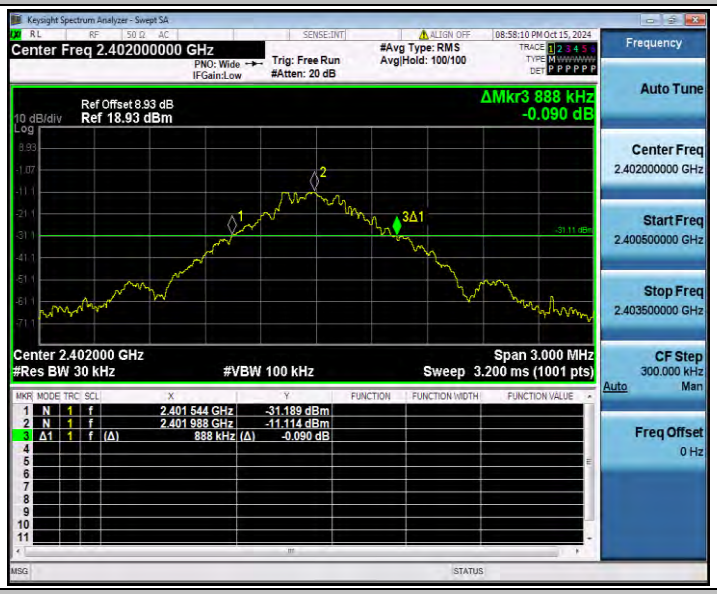
Appendix A.1: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.888	2401.544	2402.432	---	---
		2441	0.858	2440.550	2441.408	---	---
		2480	0.891	2479.541	2480.432	---	---
2DH1	Ant1	2402	1.290	2401.334	2402.624	---	---
		2441	1.254	2440.364	2441.618	---	---
		2480	1.233	2479.364	2480.597	---	---

Test Graphs

DH1_Ant1_2402



DH1_Ant1_2441

DH1_Ant1_2480

2DH1_Ant1_2402

2DH1_Ant1_2441

2DH1_Ant1_2480

Appendix A.2: Occupied Channel Bandwidth

Test Result

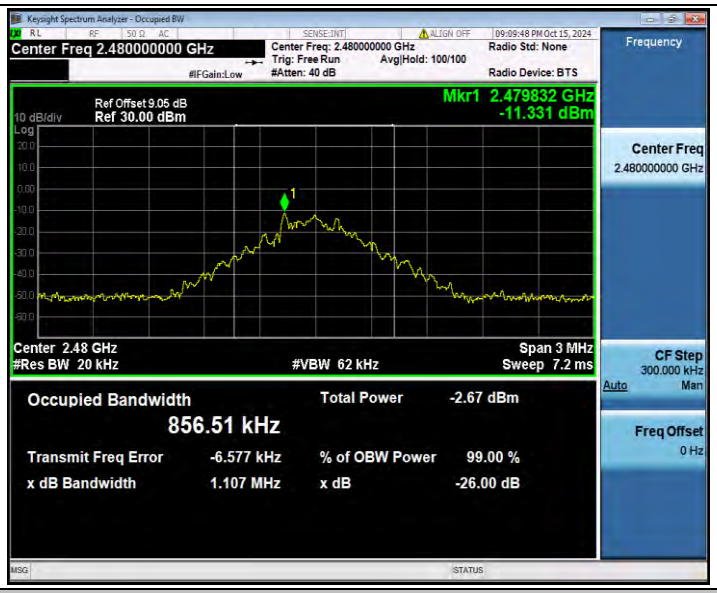
TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.84734	2401.5727	2402.4200	---	---
		2441	0.84390	2440.5772	2441.4211	---	---
		2480	0.85651	2479.5652	2480.4217	---	---
2DH1	Ant1	2402	1.1624	2401.4054	2402.5678	---	---
		2441	1.1592	2440.4070	2441.5662	---	---
		2480	1.1660	2479.4025	2480.5685	---	---

Test Graphs

DH1_Ant1_2402

DH1_Ant1_2441

DH1_Ant1_2480



2DH1_Ant1_2402

2DH1_Ant1_2441

2DH1_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	-7.70	≤20.97	PASS
		2441	-7.63	≤20.97	PASS
		2480	-8.08	≤20.97	PASS
2DH1	Ant1	2402	-6.43	≤20.97	PASS
		2441	-6.06	≤20.97	PASS
		2480	-6.91	≤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	≥0.594	PASS
		Hop_2441	1.132	≥0.594	PASS
		Hop_2480	0.686	≥0.594	PASS
2DH1	Ant1	Hop_2402	0.998	≥0.860	PASS
		Hop_2441	1.134	≥0.860	PASS
		Hop_2480	0.996	≥0.860	PASS

Test Graphs

DH1_Ant1_Hop_2402

DH1_Ant1_Hop_2441

DH1_Ant1_Hop_2480

2DH1_Ant1_Hop_2402

2DH1_Ant1_Hop_2441

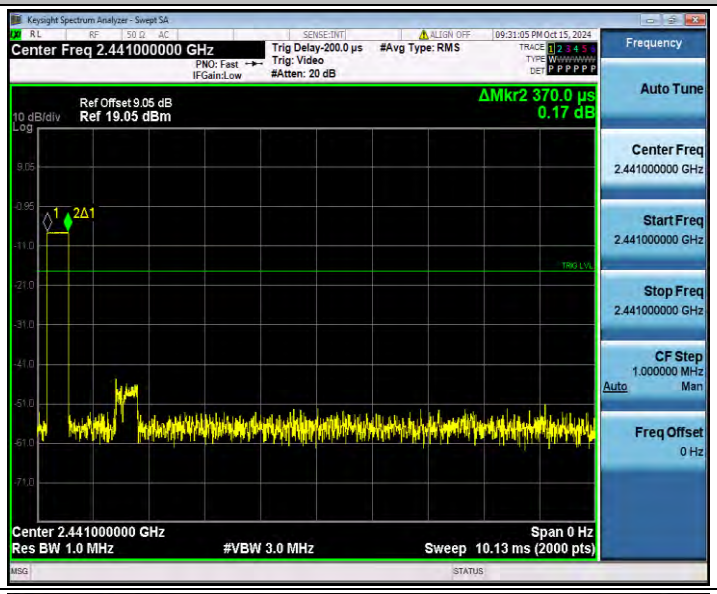
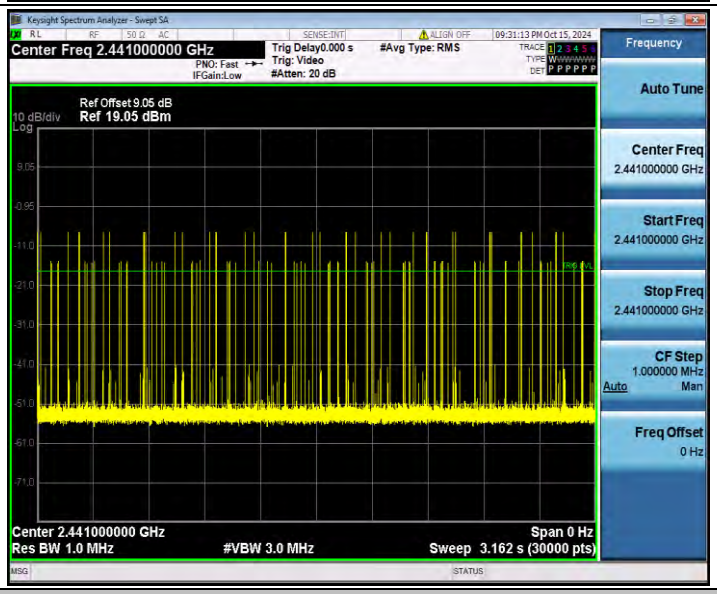
2DH1_Ant1_Hop_2480

Appendix A.5: Time of occupancy

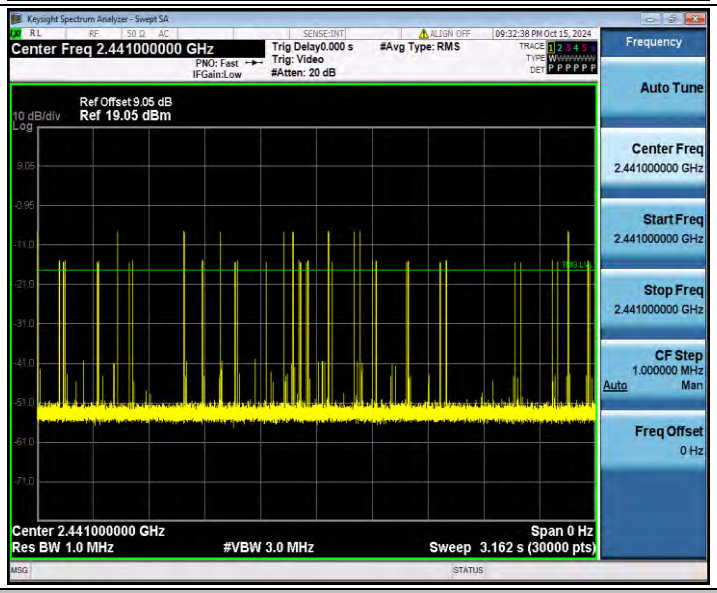
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.370	330	0.122	≤0.4	PASS
DH3	Ant1	Hop	1.626	100	0.163	≤0.4	PASS
DH5	Ant1	Hop	2.878	110	0.317	≤0.4	PASS
2DH1	Ant1	Hop	0.385	330	0.127	≤0.4	PASS
2DH3	Ant1	Hop	1.637	160	0.262	≤0.4	PASS
2DH5	Ant1	Hop	2.878	110	0.317	≤0.4	PASS

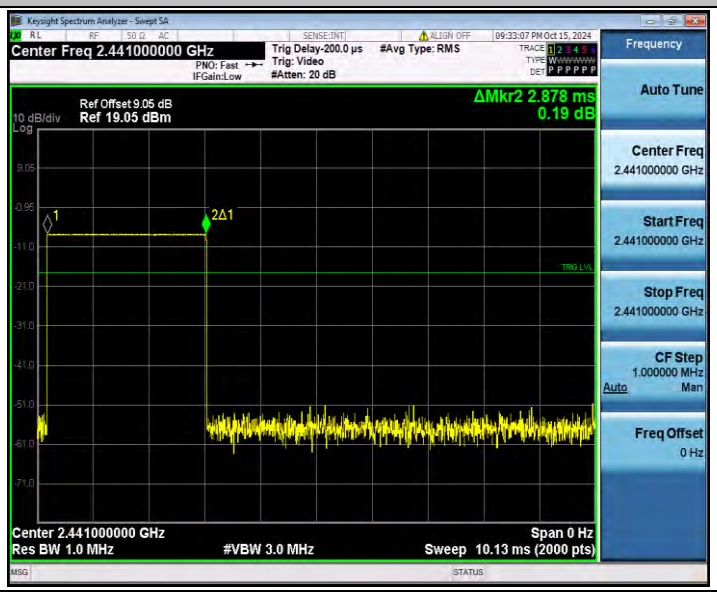
Test Graphs

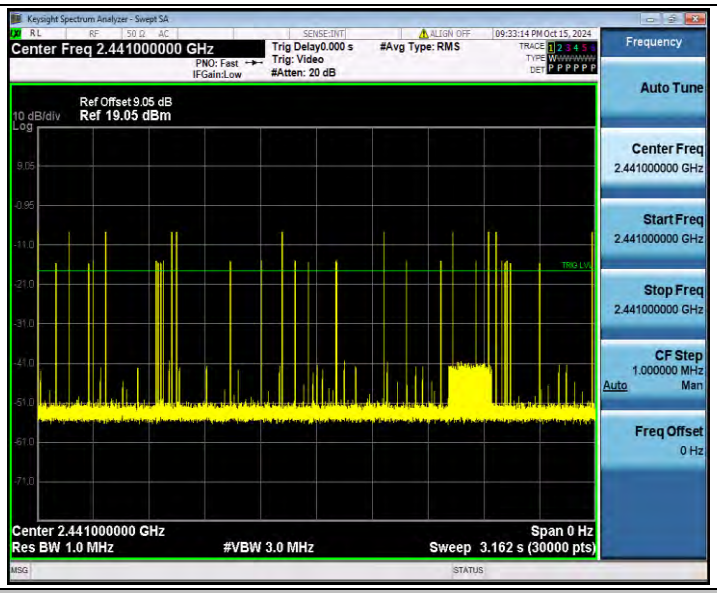
DH1_Ant1_Hop


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
09:32:30 PM Oct 15, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 1.626 ms
0.05 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

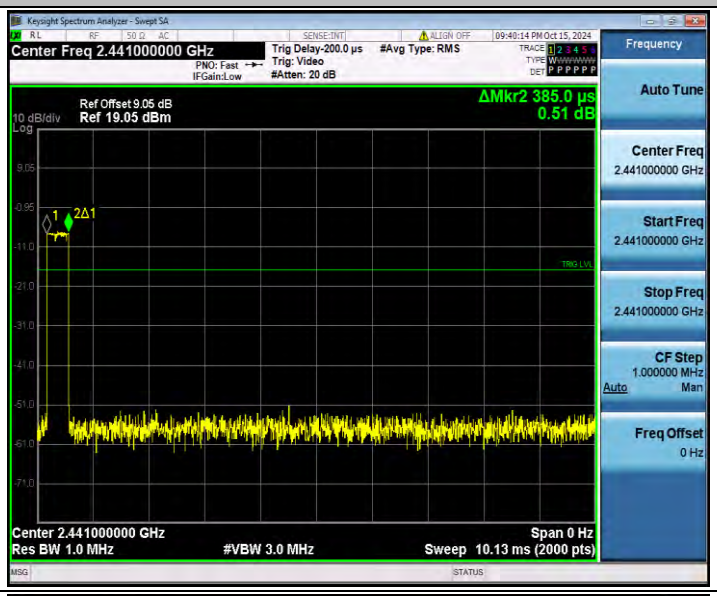

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
09:32:38 PM Oct 15, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
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

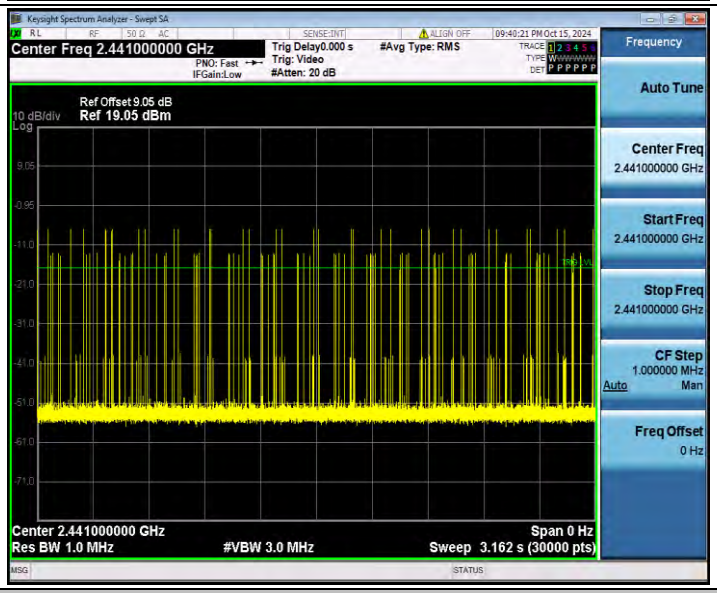
DH5_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-200.0 µs
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
09:33:07 PM Oct 15, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 2.878 ms
0.19 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

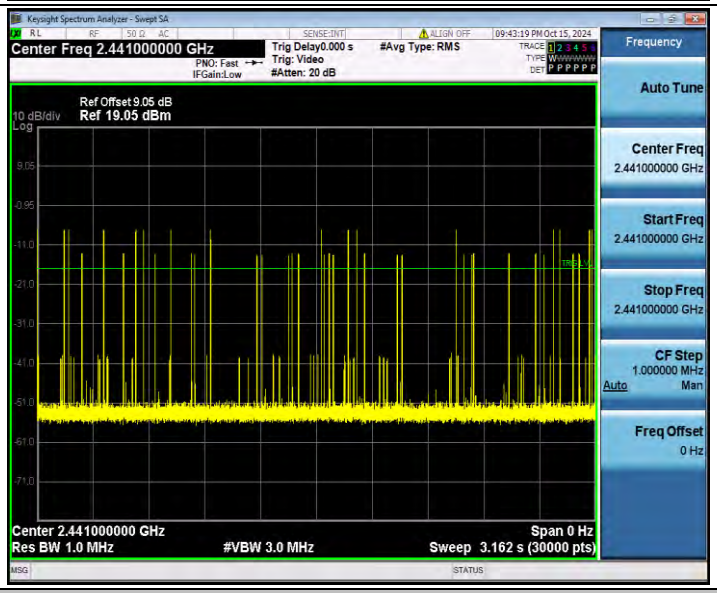


2DH1_Ant1_Hop

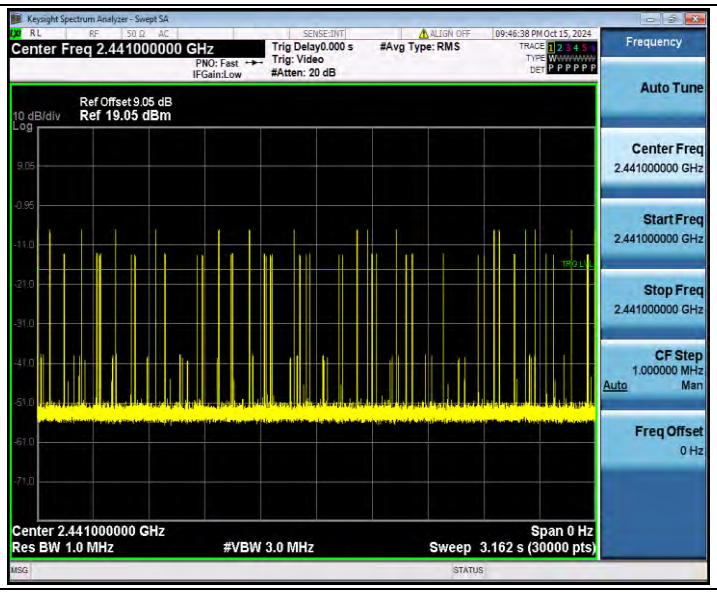




2DH3_Ant1_Hop



2DH5_Ant1_Hop

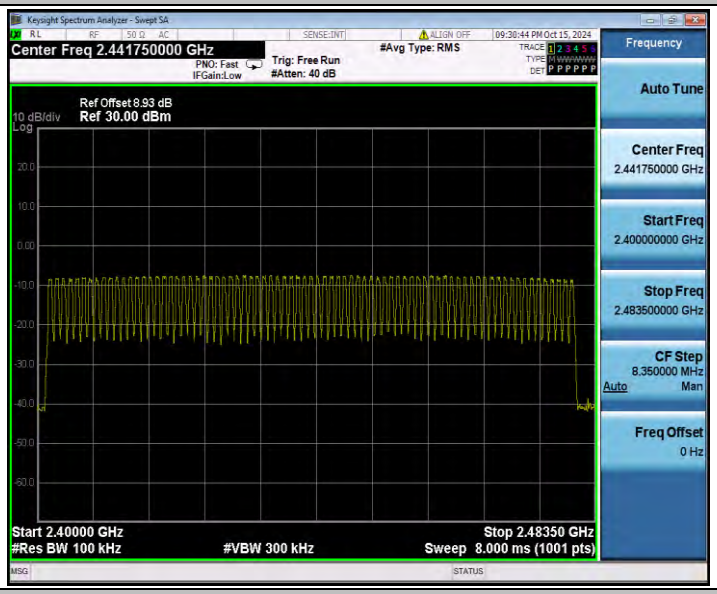

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
09:46:38 PM Oct 15, 2024
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Log
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 3.162 s (30000 pts)

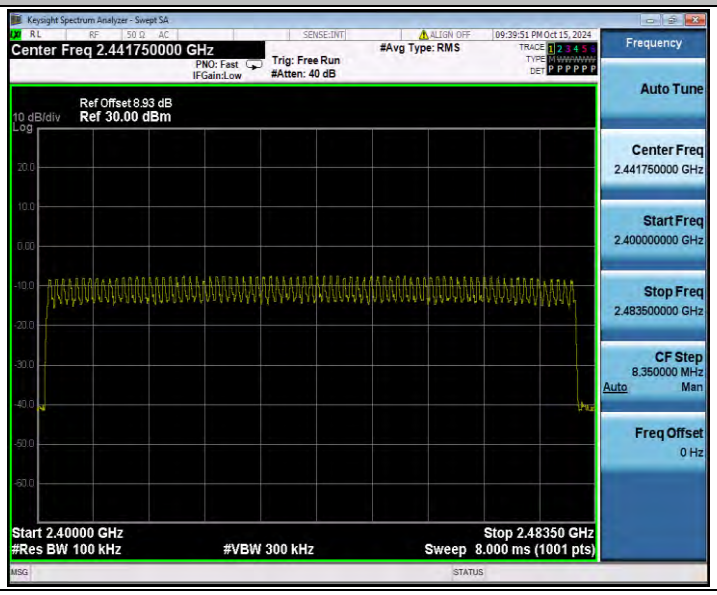
Appendix A.6: Number of hopping channels

Test Result

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

Test Graphs

DH1_Ant1_Hop


2DH1_Ant1_Hop


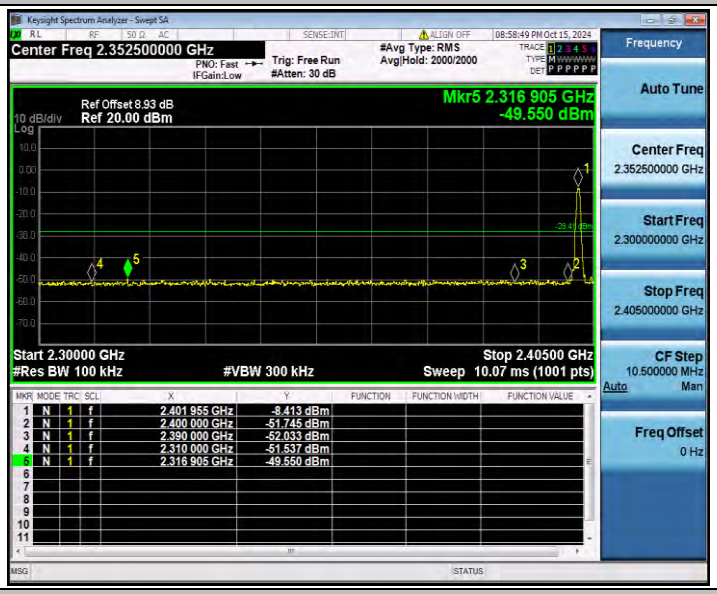
Appendix A.7: Band edge measurements

Test Result

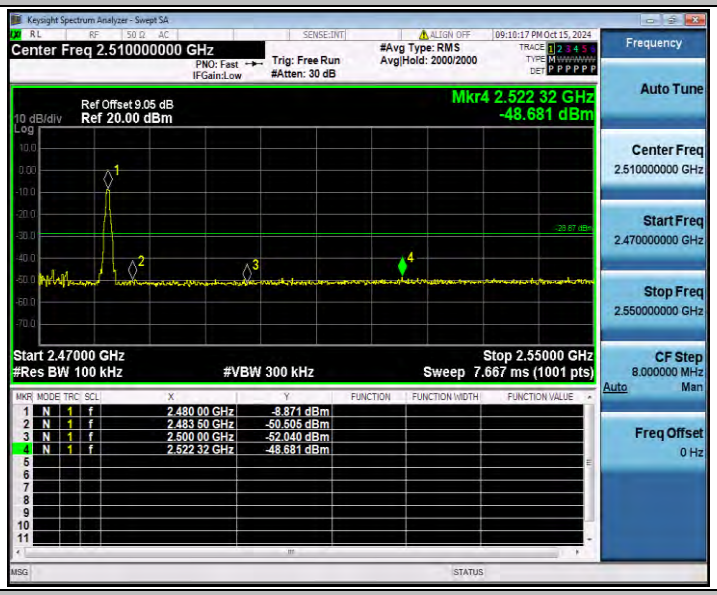
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	-8.41	-49.55	≤-28.41	PASS
		High	2480	-8.87	-48.68	≤-28.87	PASS
		Low	Hop_2402	-8.61	-42.1	≤-28.61	PASS
		High	Hop_2480	-8.35	-48.75	≤-28.35	PASS
2DH1	Ant1	Low	2402	-7.73	-49.97	≤-27.73	PASS
		High	2480	-8.19	-47.8	≤-28.19	PASS
		Low	Hop_2402	-8.48	-49.88	≤-28.48	PASS
		High	Hop_2480	-8.65	-49.4	≤-28.65	PASS

Test Graphs

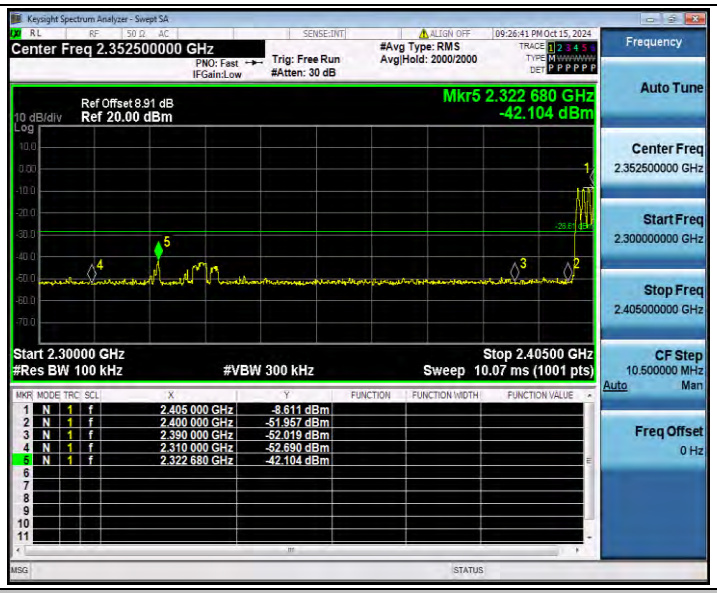
DH1_Ant1_Low_2402



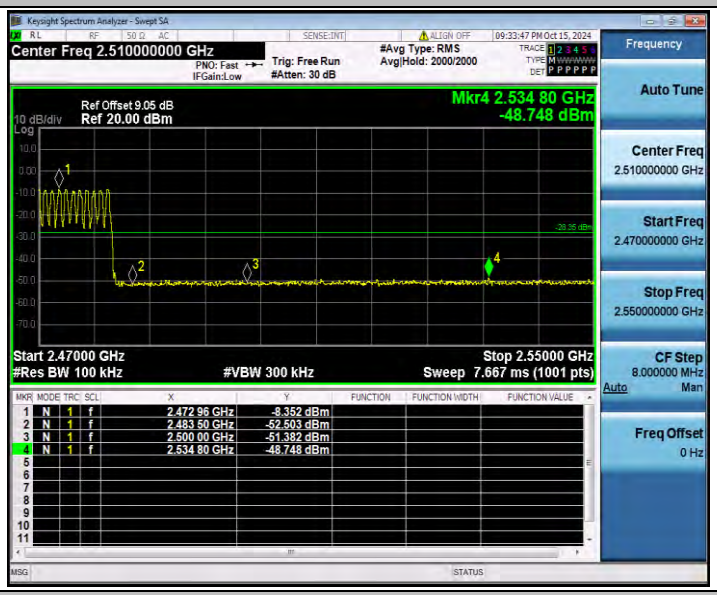
DH1_Ant1_High_2480



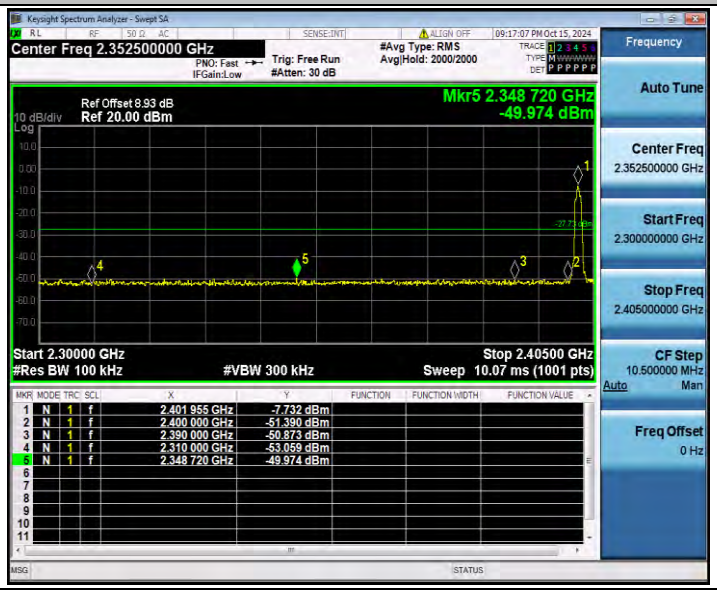
DH1_Ant1_Low_Hop_2402



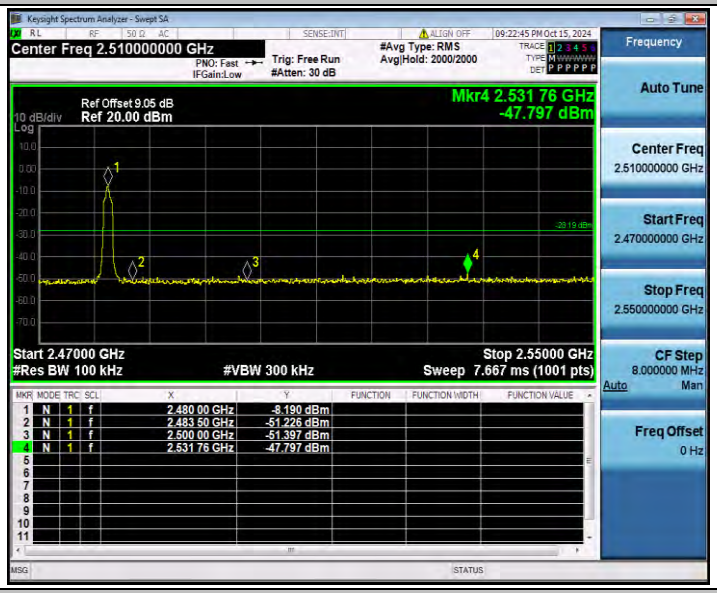
DH1_Ant1_High_Hop_2480



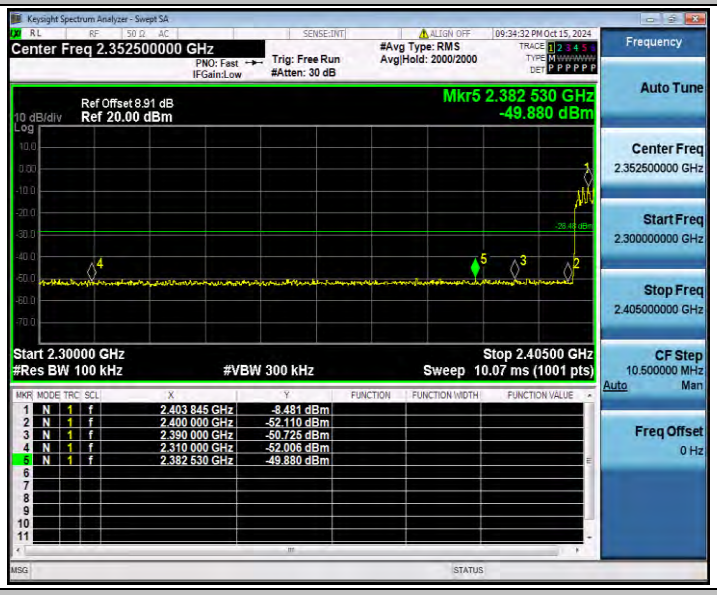
2DH1_Ant1_Low_2402



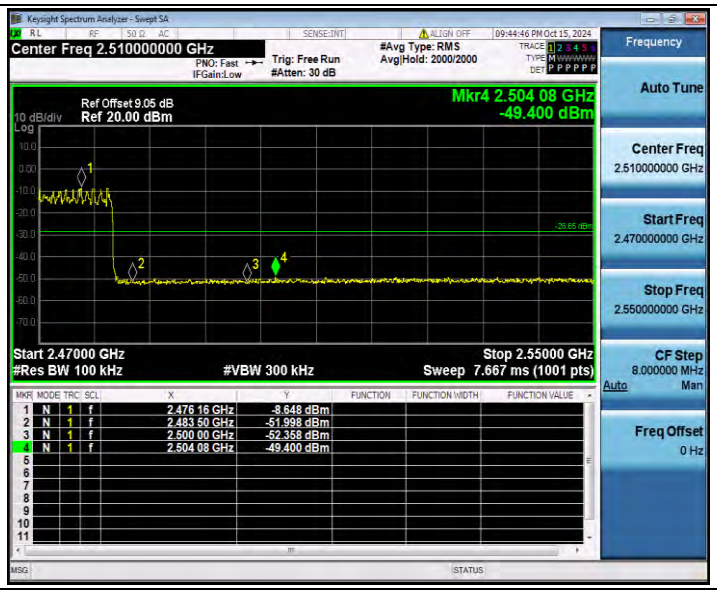
2DH1_Ant1_High_2480



2DH1_Ant1_Low_Hop_2402



2DH1_Ant1_High_Hop_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.510000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2000/2000
09:44:46 PM Oct 15, 2024
Frequency
Auto Tune
Center Freq
2.510000000 GHz
Start Freq
2.470000000 GHz
Stop Freq
2.550000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 9.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr4 2.504 08 GHz
-49.400 dBm
Start 2.47000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.55000 GHz
Sweep 7.667 ms (1001 pts)
1 N 1 f 2.476 16 GHz -8.648 dBm
2 N 1 f 2.483 50 GHz -51.998 dBm
3 N 1 f 2.500 00 GHz -52.358 dBm
4 N 1 f 2.504 08 GHz -49.400 dBm

Appendix A.8: Conducted Spurious Emission

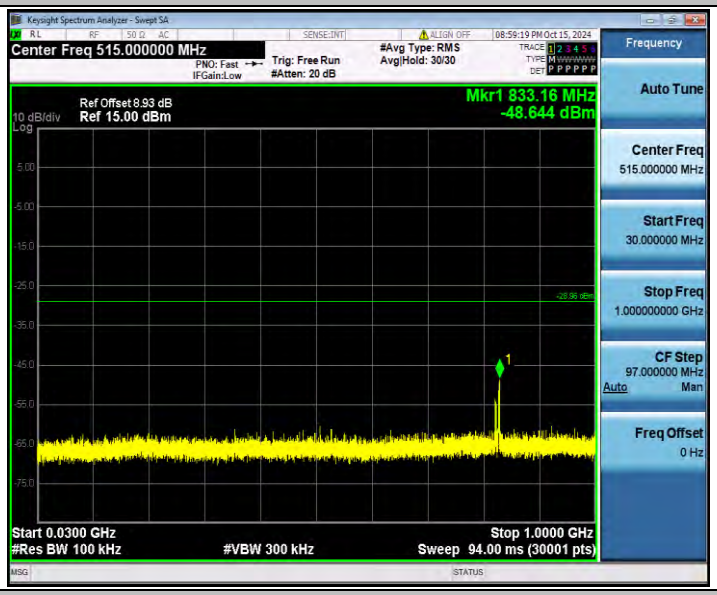
Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	2402	Reference	-8.96	-8.96	---	PASS
			30~1000	-8.96	-48.64	≤-28.96	PASS
			1000~26500	-8.96	-44.16	≤-28.96	PASS
		2441	Reference	-9.16	-9.16	---	PASS
			30~1000	-9.16	-59.9	≤-29.16	PASS
			1000~26500	-9.16	-47.11	≤-29.16	PASS
		2480	Reference	-9.57	-9.57	---	PASS
			30~1000	-9.57	-60.16	≤-29.57	PASS
			1000~26500	-9.57	-45.3	≤-29.57	PASS
2DH1	Ant1	2402	Reference	-8.46	-8.46	---	PASS
			30~1000	-8.46	-60.58	≤-28.46	PASS
			1000~26500	-8.46	-47.13	≤-28.46	PASS
		2441	Reference	-7.60	-7.60	---	PASS
			30~1000	-7.60	-60.85	≤-27.6	PASS
			1000~26500	-7.60	-45.54	≤-27.6	PASS
		2480	Reference	-8.42	-8.42	---	PASS
			30~1000	-8.42	-60.41	≤-28.42	PASS
			1000~26500	-8.42	-41.93	≤-28.42	PASS

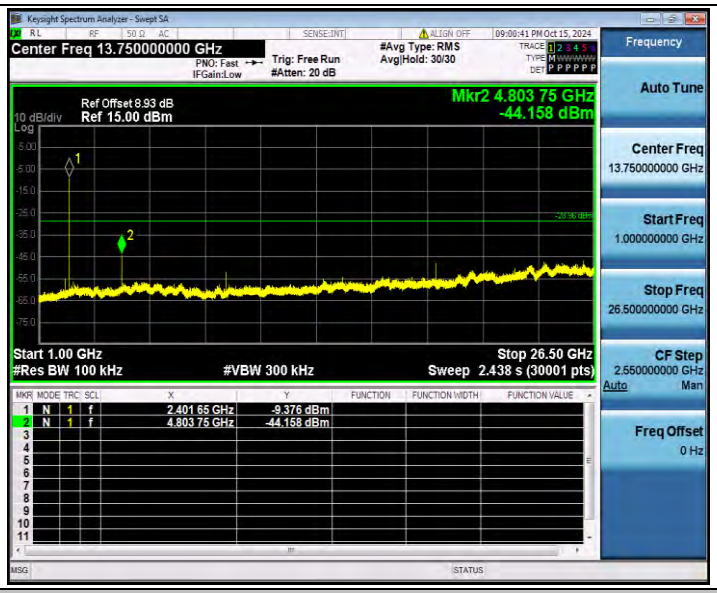
Test Graphs

DH1_Ant1_2402_0~Reference

DH1_Ant1_2402_30~1000



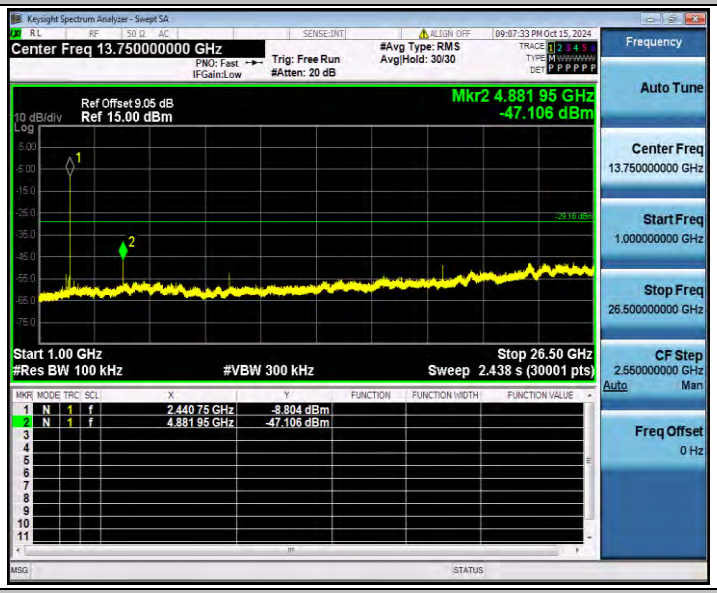
DH1_Ant1_2402_1000~26500



DH1_Ant1_2441_0~Reference

DH1_Ant1_2441_30~1000

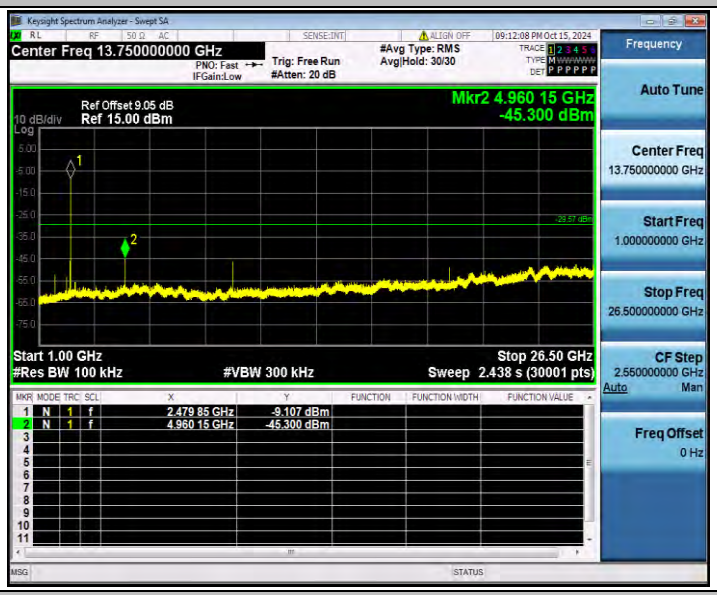
DH1_Ant1_2441_1000~26500



DH1_Ant1_2480_0~Reference

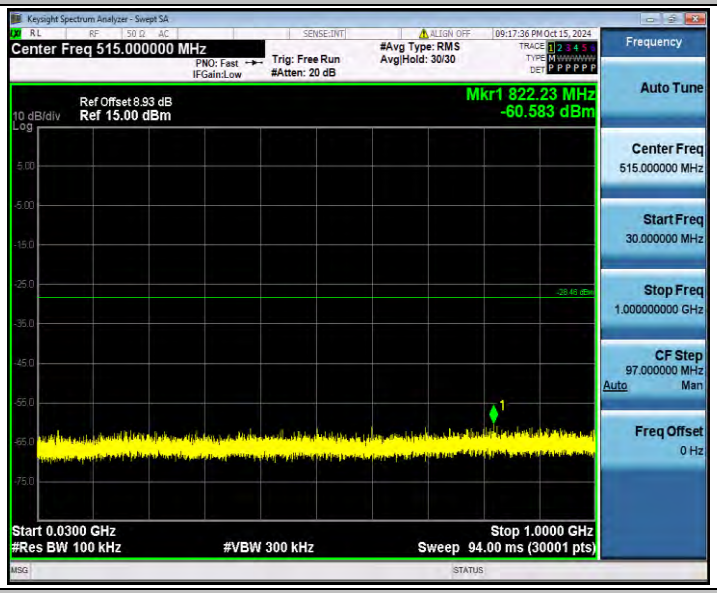
DH1_Ant1_2480_30~1000

DH1_Ant1_2480_1000~26500

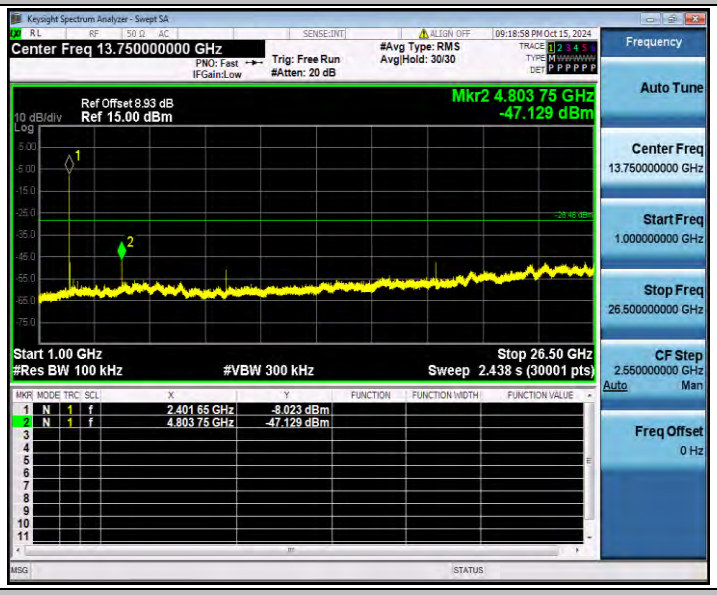


2DH1_Ant1_2402_0~Reference

2DH1_Ant1_2402_30~1000

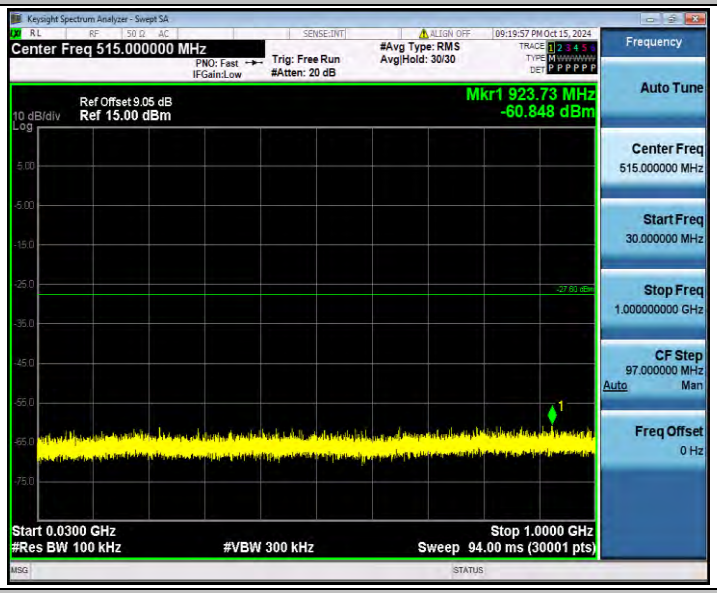


2DH1_Ant1_2402_1000~26500

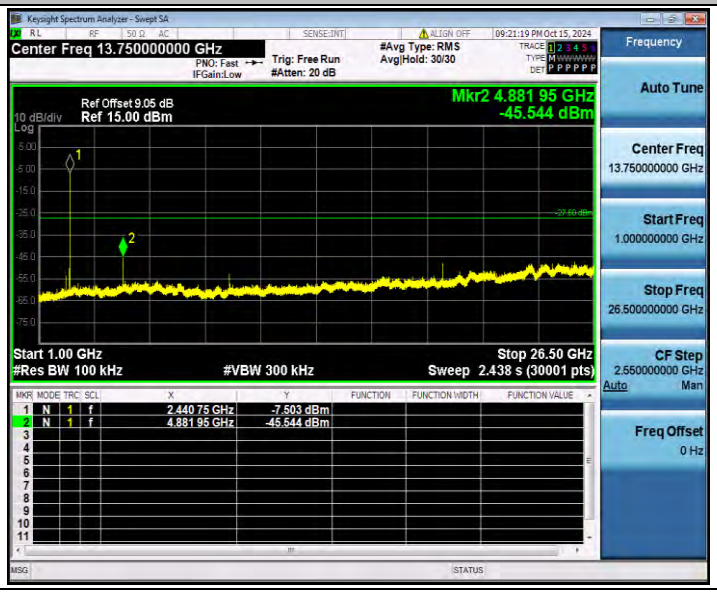


2DH1_Ant1_2441_0~Reference

2DH1_Ant1_2441_30~1000

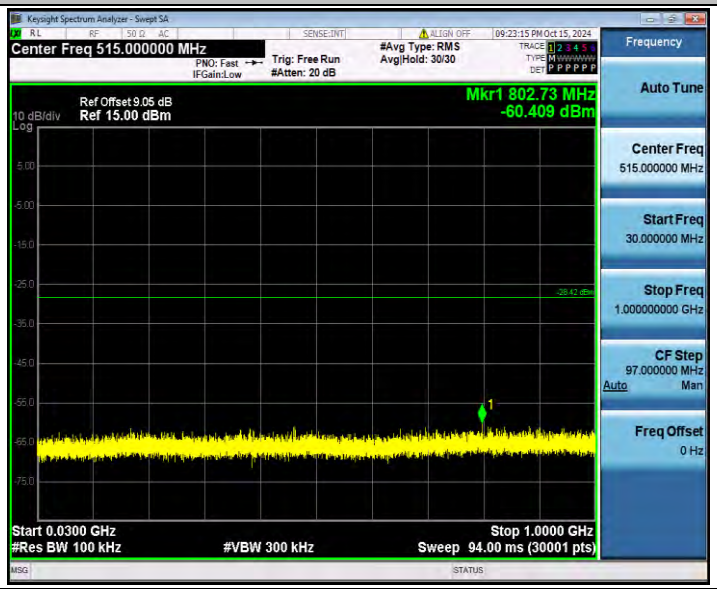


2DH1_Ant1_2441_1000~26500

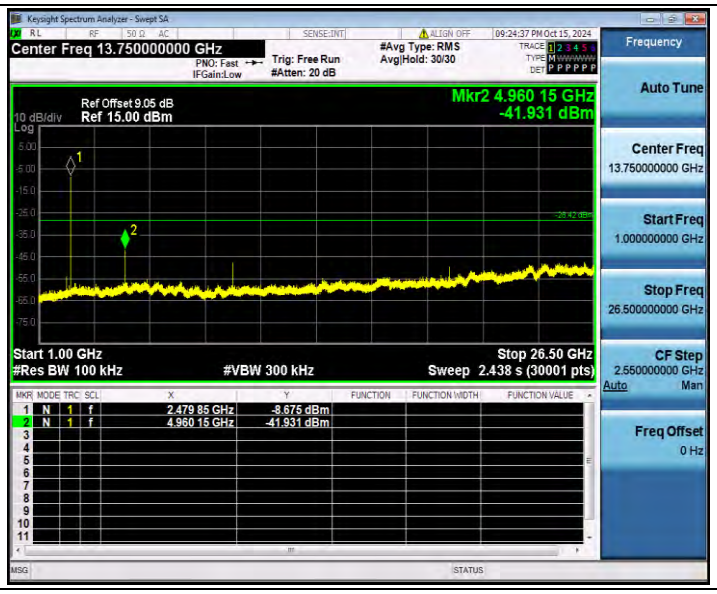


2DH1_Ant1_2480_0~Reference

2DH1_Ant1_2480_30~1000



2DH1_Ant1_2480_1000~26500


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 30/30
09:24:37 PM Oct 15, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 15.00 dBm
Log
Mkr2 4.960 15 GHz
-41.931 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
1 N 1 f 2.479 85 GHz -9.675 dBm
2 N 1 f 4.960 15 GHz -41.931 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz

Appendix A.9: Emissions in Restricted Bands

Test Result

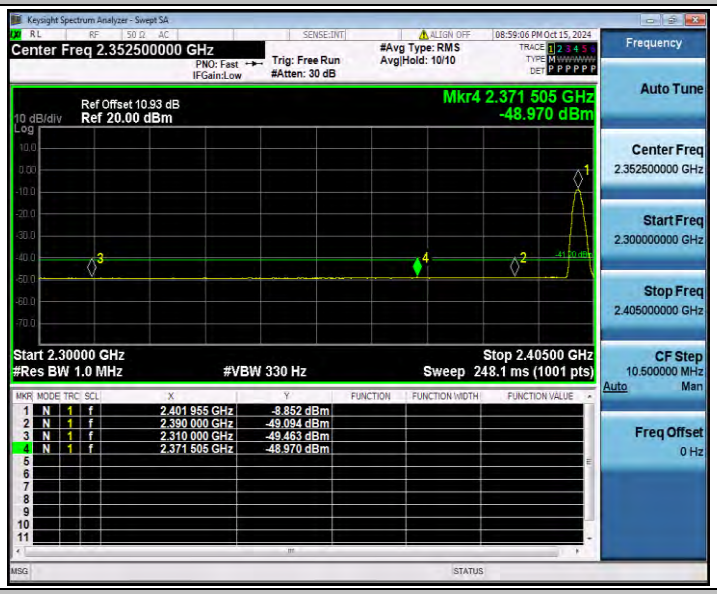
TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH1	Ant1	Low	2402	AV	2310.000	-49.46	≤-41.20	45.74	≤54	PASS
				AV	2371.505	-48.97	≤-41.20	46.23	≤54	PASS
				AV	2390.000	-49.09	≤-41.20	46.11	≤54	PASS
				Peak	2310.000	-44.51	≤-21.20	50.69	≤74	PASS
				Peak	2378.855	-40.1	≤-21.20	55.10	≤74	PASS
				Peak	2390.000	-42.73	≤-21.20	52.47	≤74	PASS
		High	2480	AV	2483.500	-49.01	≤-41.20	46.19	≤54	PASS
				AV	2498.960	-48.65	≤-41.20	46.55	≤54	PASS
				AV	2500.000	-48.74	≤-41.20	46.46	≤54	PASS
				Peak	2483.500	-41.44	≤-21.20	53.76	≤74	PASS
				Peak	2499.760	-38.25	≤-21.20	56.95	≤74	PASS
				Peak	2500.000	-41.44	≤-21.20	53.76	≤74	PASS
2DH1	Ant1	Low	2402	AV	2310.000	-49.72	≤-41.20	45.48	≤54	PASS
				AV	2376.650	-49.17	≤-41.20	46.03	≤54	PASS
				AV	2390.000	-49.3	≤-41.20	45.90	≤54	PASS
				Peak	2310.000	-42.07	≤-21.20	53.13	≤74	PASS
				Peak	2377.910	-39.26	≤-21.20	55.94	≤74	PASS
				Peak	2390.000	-41.82	≤-21.20	53.38	≤74	PASS
		High	2480	AV	2483.500	-48.93	≤-41.20	46.27	≤54	PASS
				AV	2493.120	-48.56	≤-41.20	46.64	≤54	PASS
				AV	2500.000	-48.84	≤-41.20	46.36	≤54	PASS
				Peak	2483.500	-40.81	≤-21.20	54.39	≤74	PASS
				Peak	2495.920	-38.39	≤-21.20	56.81	≤74	PASS
				Peak	2500.000	-41.72	≤-21.20	53.48	≤74	PASS

Note：

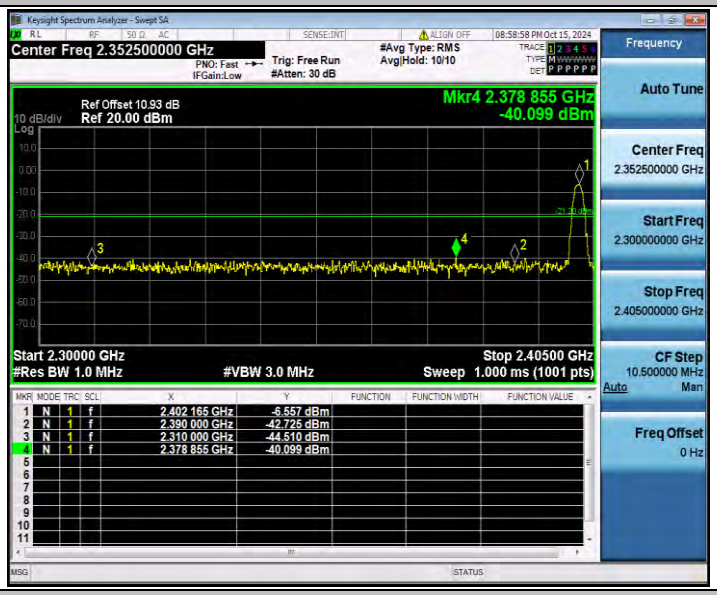
1. The Antenna Gain is compensated in the graph.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

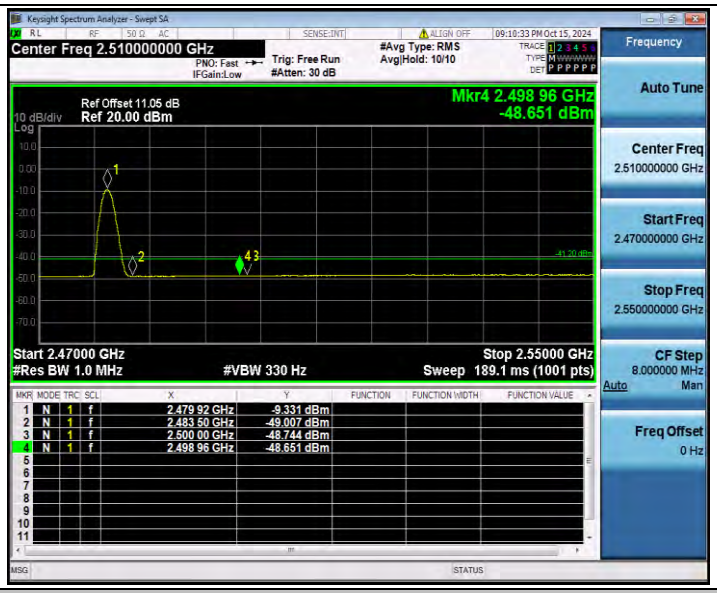
DH1_Ant1_Low_2402_AV



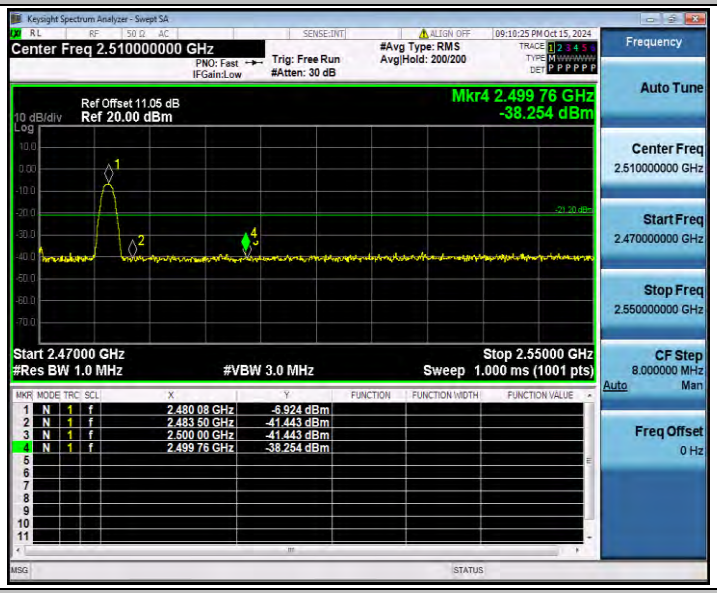
DH1_Ant1_Low_2402_Peak



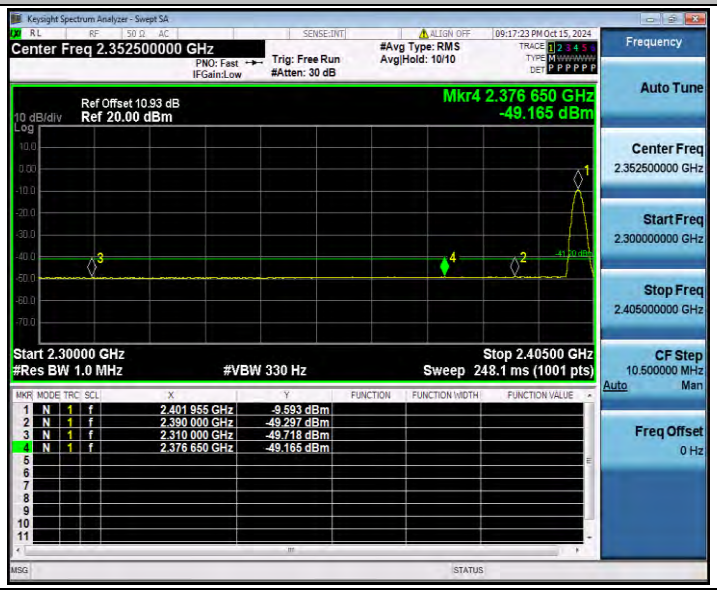
DH1_Ant1_High_2480_AV



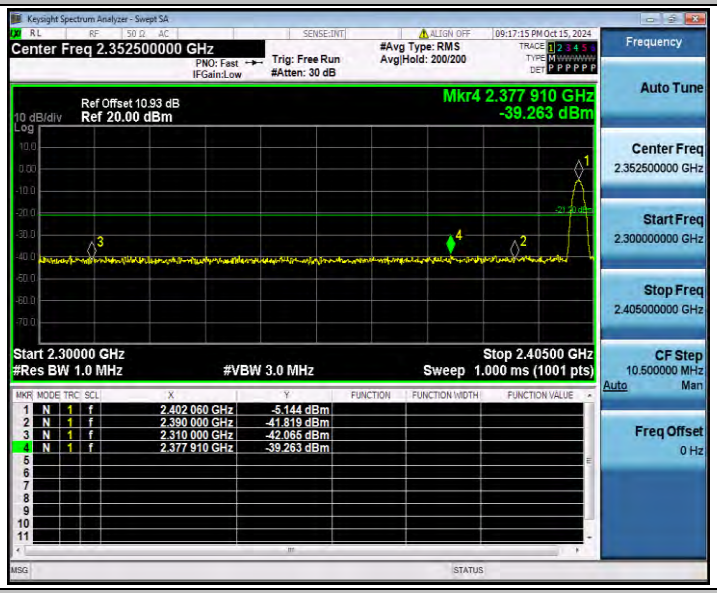
DH1_Ant1_High_2480_Peak



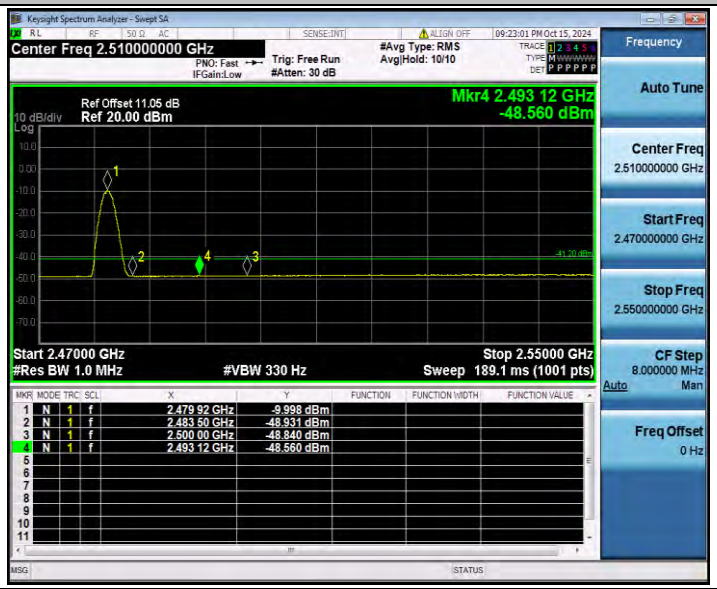
2DH1_Ant1_Low_2402_AV



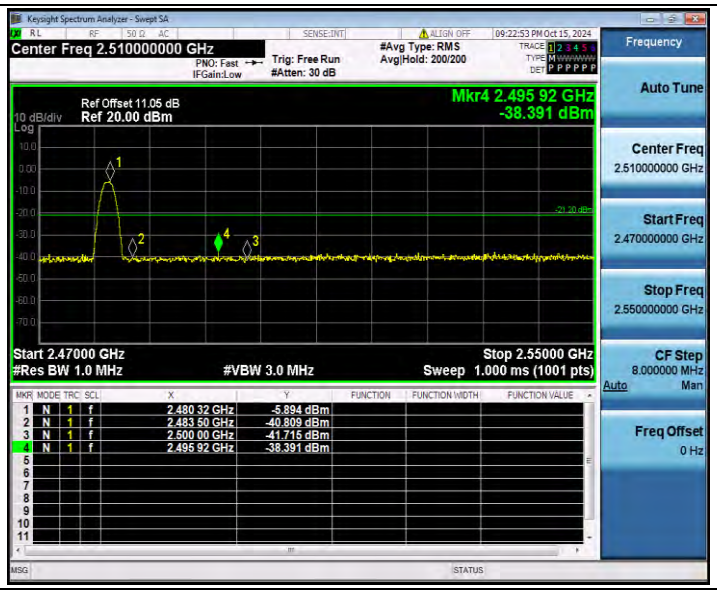
2DH1_Ant1_Low_2402_Peak



2DH1_Ant1_High_2480_AV



2DH1_Ant1_High_2480_Peak


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.510000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 200/200
09:22:53 PM Oct 15, 2024
Frequency
Auto Tune
Center Freq
2.510000000 GHz
Start Freq
2.470000000 GHz
Stop Freq
2.550000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 11.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr4 2.495 92 GHz
-38.391 dBm
Start 2.47000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.55000 GHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.480 32 GHz -5.894 dBm
2 N 1 f 2.483 50 GHz -40.809 dBm
3 N 1 f 2.500 00 GHz -41.715 dBm
4 N 1 f 2.495 92 GHz -38.391 dBm