FCC Appendix RF Test Data of Module 2

FCC ID	**:**	**2BO56-ZA001**
Company:	**:**	**Shenzhen Xingbiao Hang Technology Co., Ltd.**
EUT	**:**	**Dual WiFi three-in-one closed small system**
Model Number	**:**	**ZA001**
Report No.	**:**	**CTA25041800502**
Reviewed By	**:**	**Eric Wang**

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.957	2401.547	2402.504	---	---
		2441	0.948	2440.550	2441.498	---	---
		2480	0.951	2479.547	2480.498	---	---
2DH5	Ant1	2402	1.278	2401.382	2402.660	---	---
		2441	1.323	2440.349	2441.672	---	---
		2480	1.323	2479.352	2480.675	---	---
3DH5	Ant1	2402	1.296	2401.367	2402.663	---	---
		2441	1.305	2440.361	2441.666	---	---
		2480	1.287	2479.367	2480.654	---	---

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

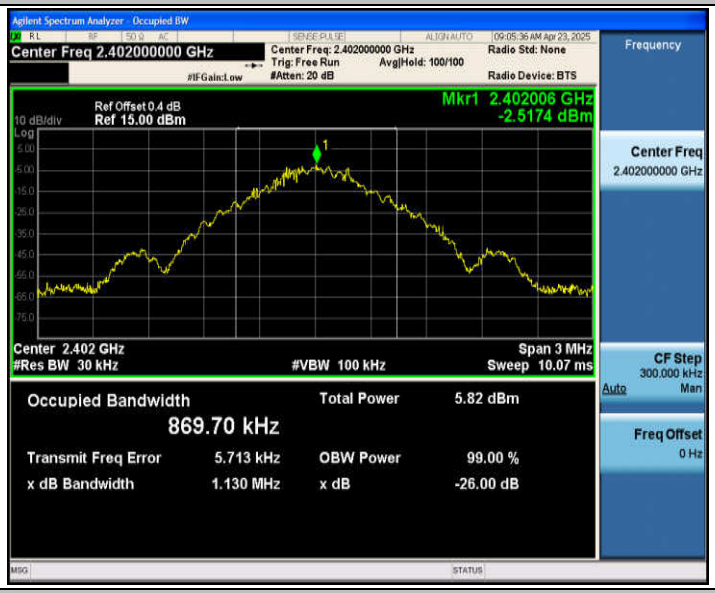
Appendix B: Occupied Channel Bandwidth

Test Result

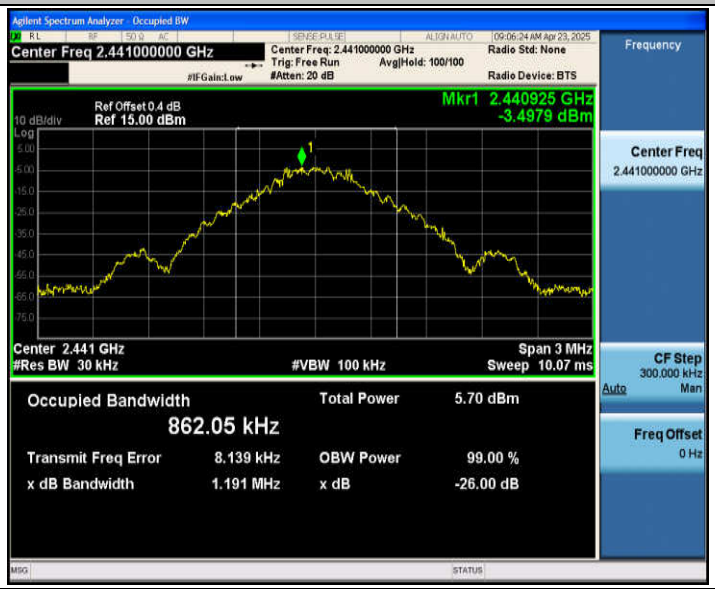
TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.86970	2401.5709	2402.4406	---	---
		2441	0.86205	2440.5771	2441.4392	---	---
		2480	0.86057	2479.5773	2480.4378	---	---
2DH5	Ant1	2402	1.1848	2401.4171	2402.6019	---	---
		2441	1.1853	2440.4174	2441.6027	---	---
		2480	1.1830	2479.4203	2480.6033	---	---
3DH5	Ant1	2402	1.1898	2401.4159	2402.6057	---	---
		2441	1.1851	2440.4190	2441.6041	---	---
		2480	1.1842	2479.4199	2480.6041	---	---

Test Graphs

DH5_Ant1_2402



DH5_Ant1_2441



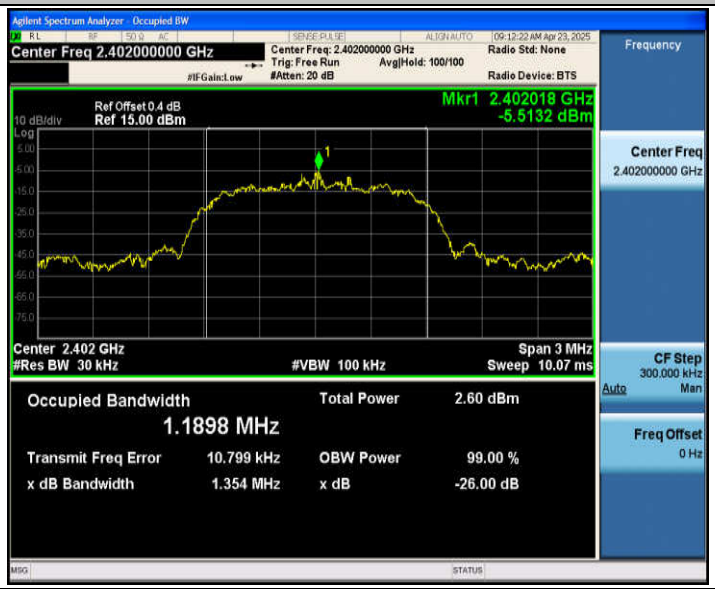
DH5_Ant1_2480

2DH5_Ant1_2402

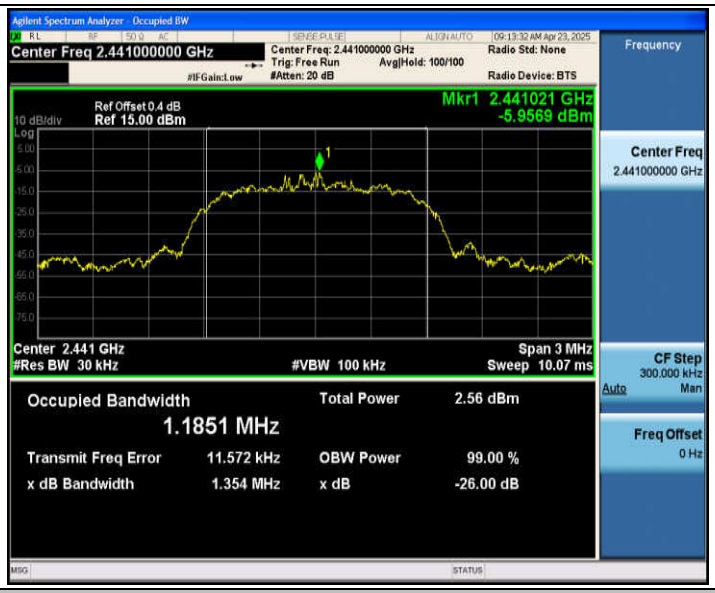
2DH5_Ant1_2441

2DH5_Ant1_2480

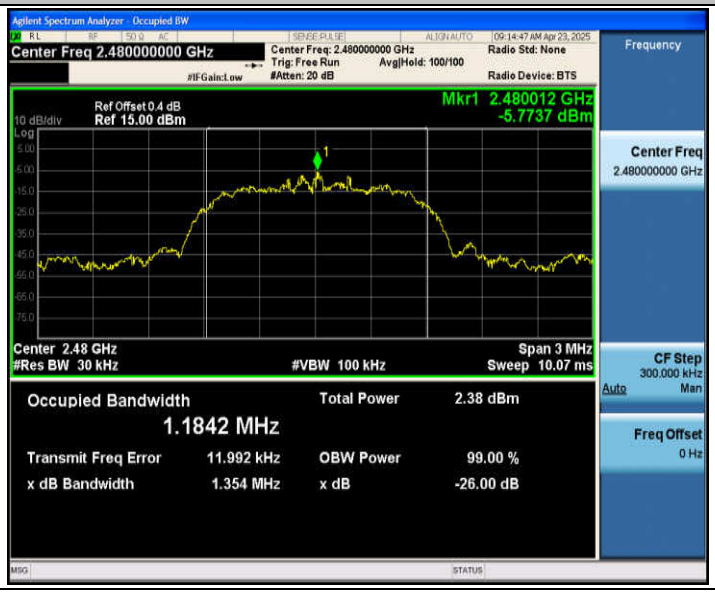
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



Appendix C: Maximum conducted output power

Test Result Peak

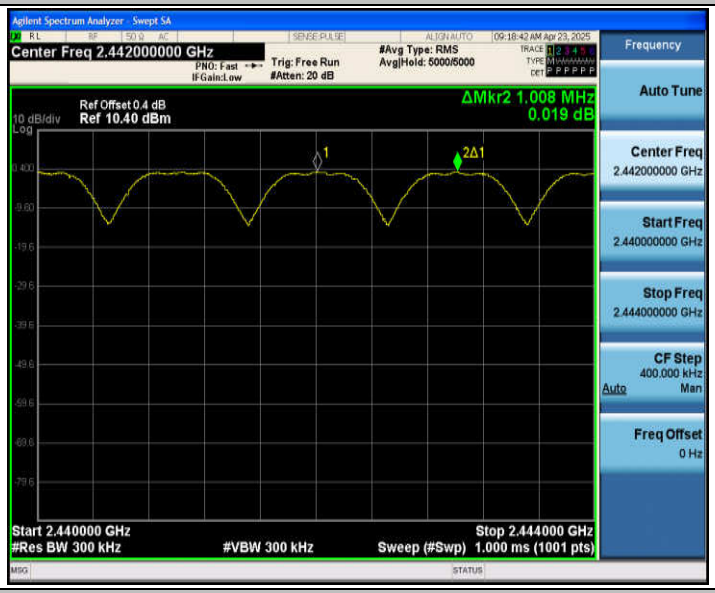
Test Mode	Antenna	Freq(MHz)	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	-0.05	≤20.97	PASS
		2441	-0.31	≤20.97	PASS
		2480	-0.38	≤20.97	PASS
2DH5	Ant1	2402	-0.89	≤20.97	PASS
		2441	-1.11	≤20.97	PASS
		2480	-1.16	≤20.97	PASS
3DH5	Ant1	2402	-0.44	≤20.97	PASS
		2441	-0.74	≤20.97	PASS
		2480	-0.77	≤20.97	PASS

Appendix D: Carrier frequency separation

Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.008	≥0.957	PASS
2DH5	Ant1	Hop	1.228	≥0.882	PASS
3DH5	Ant1	Hop	1.156	≥0.870	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop
3DH5_Ant1_Hop

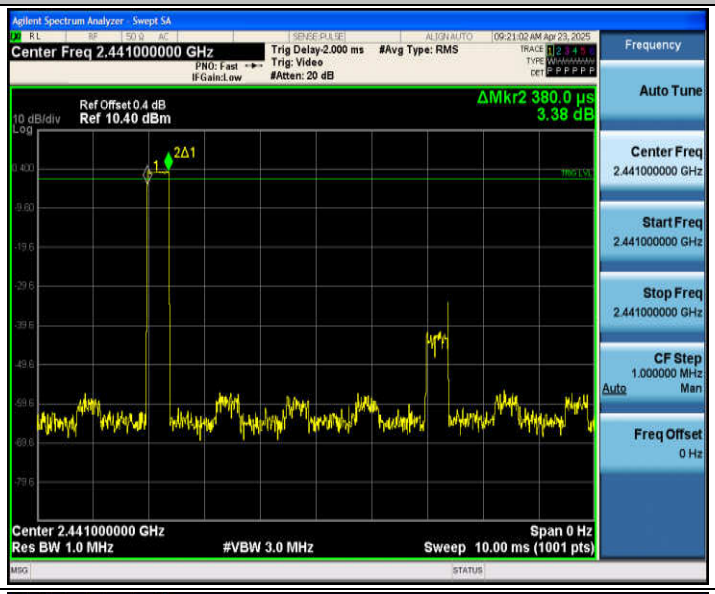
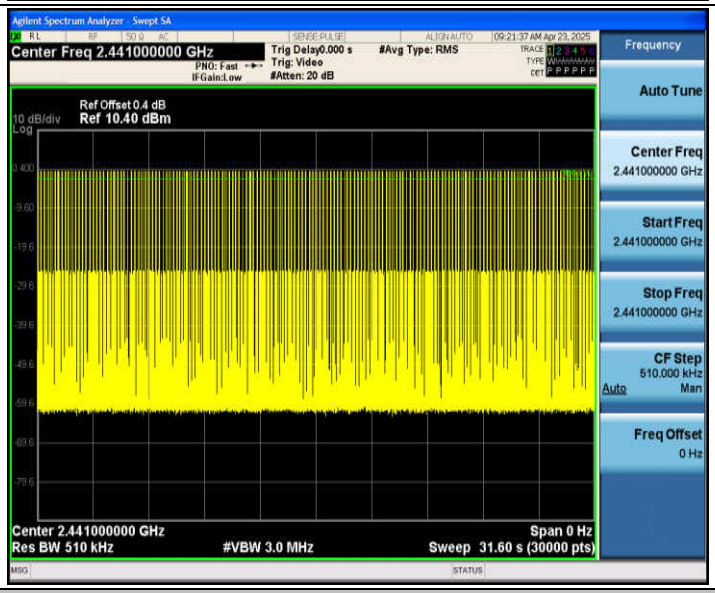
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.442000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 5000/5000
09:31:43 AM Apr 23, 2025
Frequency
Auto Tune
Center Freq
2.442000000 GHz
Start Freq
2.440000000 GHz
Stop Freq
2.444000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 0.4 dB
10 dB/div
Ref 10.40 dBm
Log
ΔMkr2 1.156 MHz
-0.514 dB
1
2Δ1
Start 2.440000 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.444000 GHz
Sweep (#Swp) 1.000 ms (1001 pts)

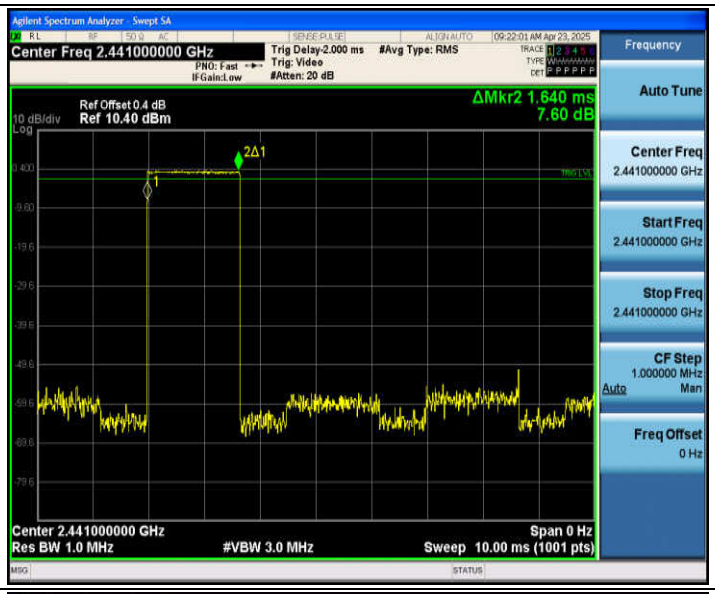
Appendix E: Time of occupancy

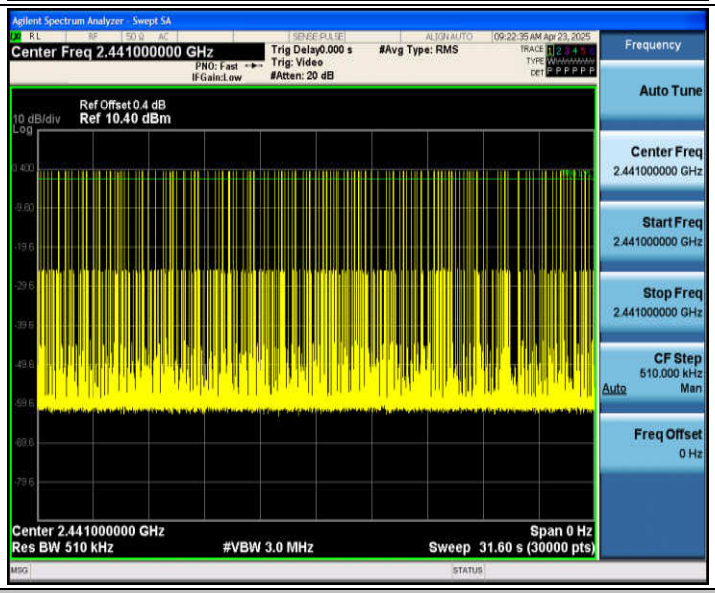
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.380	320	0.122	≤0.4	PASS
DH3	Ant1	Hop	1.640	157	0.257	≤0.4	PASS
DH5	Ant1	Hop	2.890	115	0.332	≤0.4	PASS
2DH1	Ant1	Hop	0.400	319	0.128	≤0.4	PASS
2DH3	Ant1	Hop	1.650	159	0.262	≤0.4	PASS
2DH5	Ant1	Hop	2.900	107	0.31	≤0.4	PASS
3DH1	Ant1	Hop	0.400	317	0.127	≤0.4	PASS
3DH3	Ant1	Hop	1.650	157	0.259	≤0.4	PASS
3DH5	Ant1	Hop	2.900	109	0.316	≤0.4	PASS

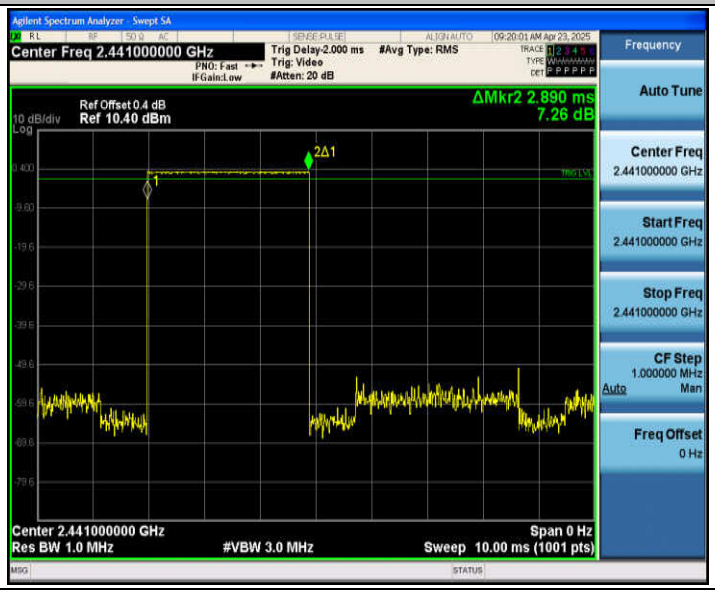
Test Graphs

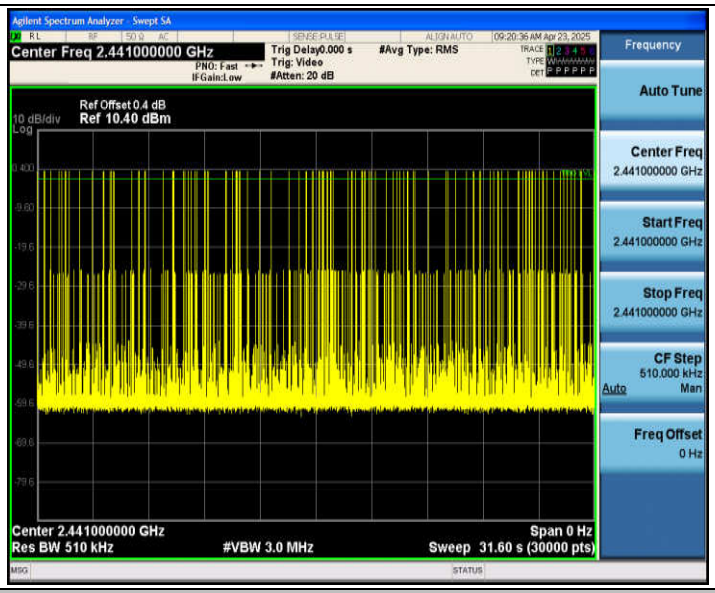
DH1_Ant1_Hop


DH3_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
Ref Offset 0.4 dB
10 dB/div
Ref 10.40 dBm
ΔMkr2 1.640 ms
7.60 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 10.00 ms (1001 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

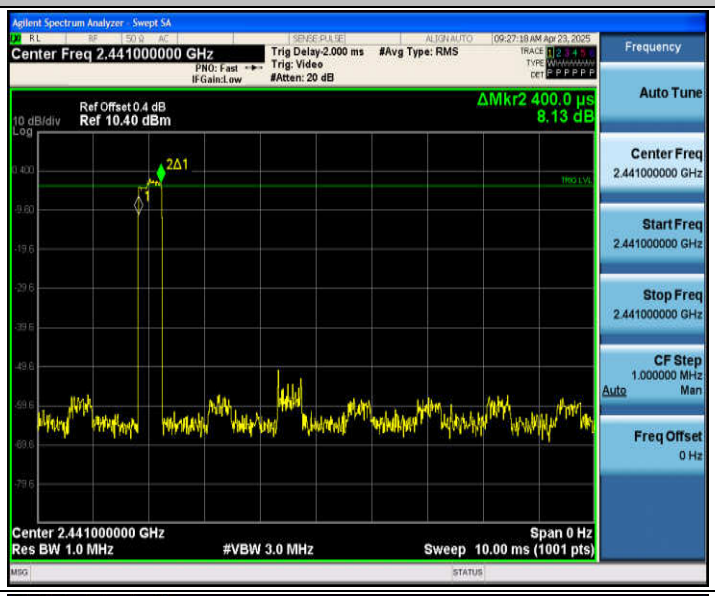

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
Ref Offset 0.4 dB
10 dB/div
Ref 10.40 dBm
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Freq Offset
0 Hz

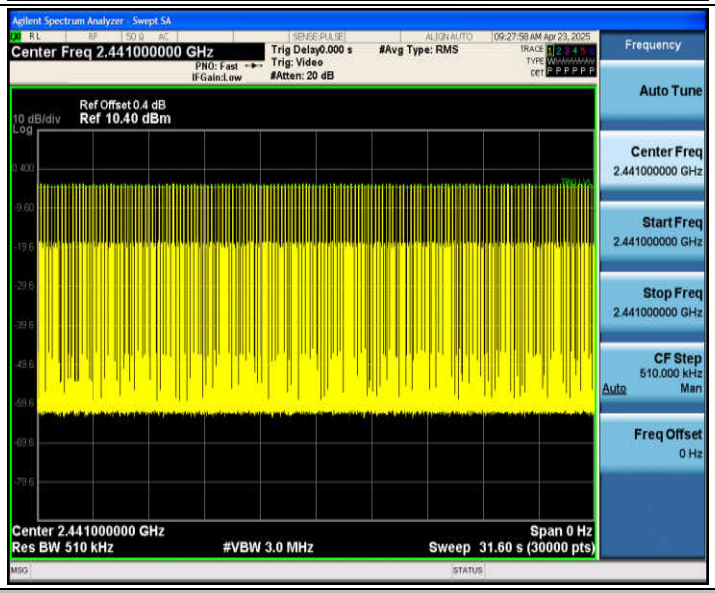
DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
Ref Offset 0.4 dB
10 dB/div
Ref 10.40 dBm
ΔMkr2 2.890 ms
7.26 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 10.00 ms (1001 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

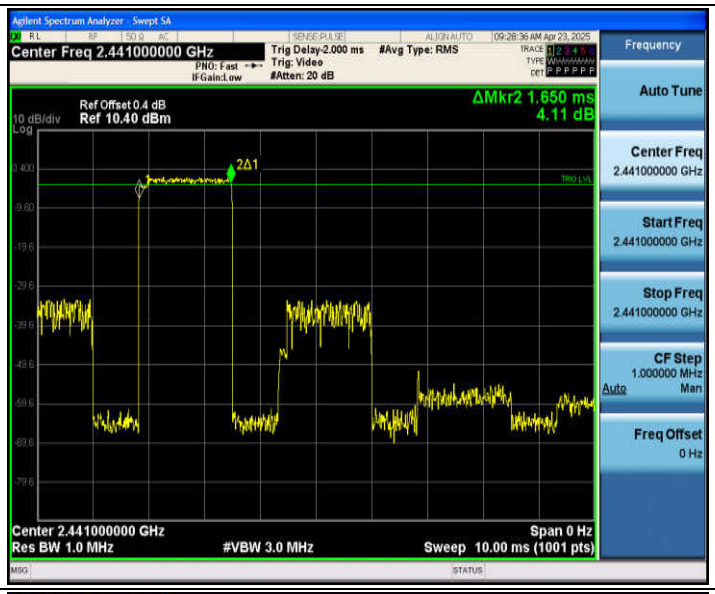


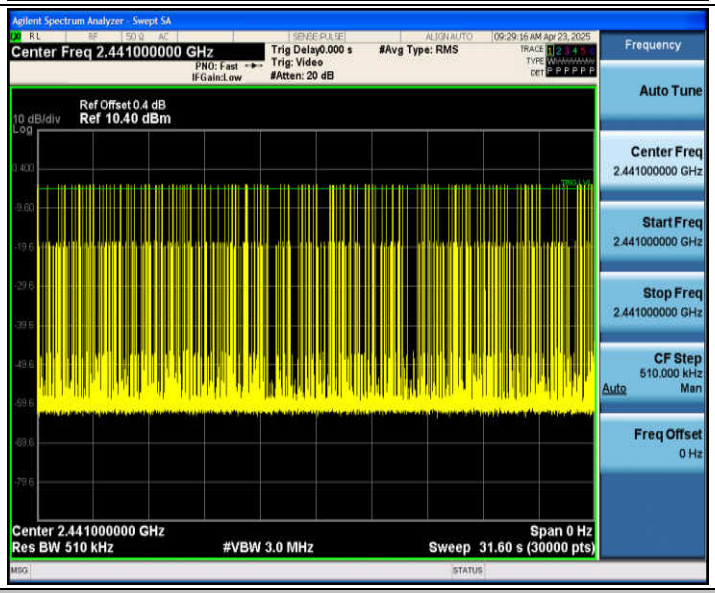
2DH1_Ant1_Hop



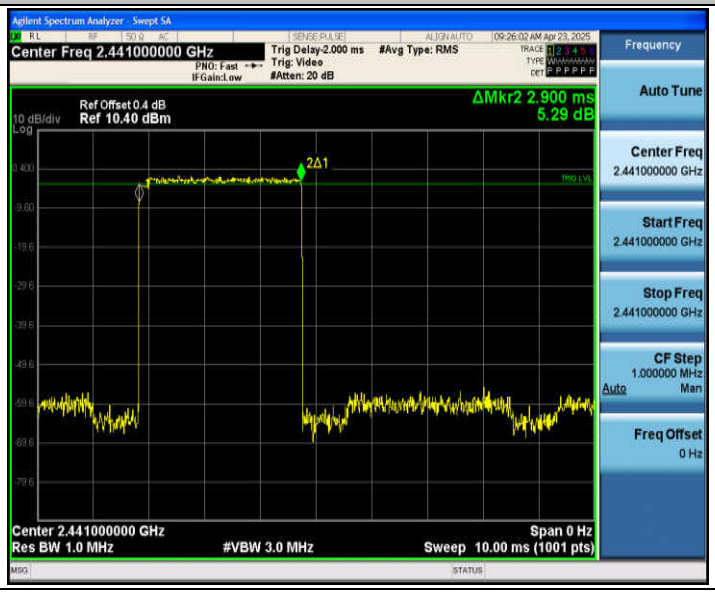


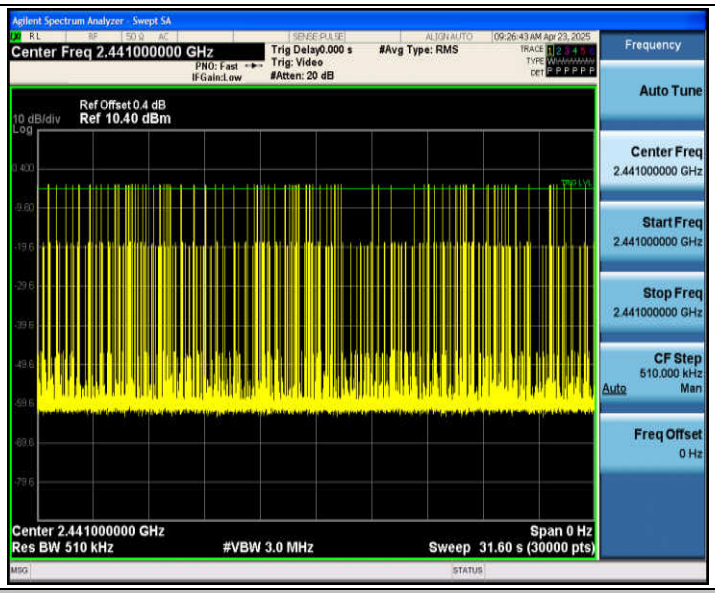
2DH3_Ant1_Hop



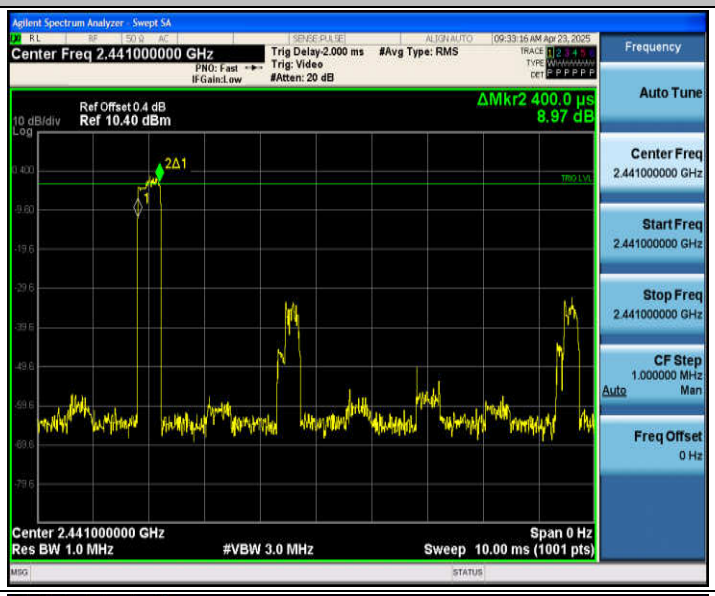


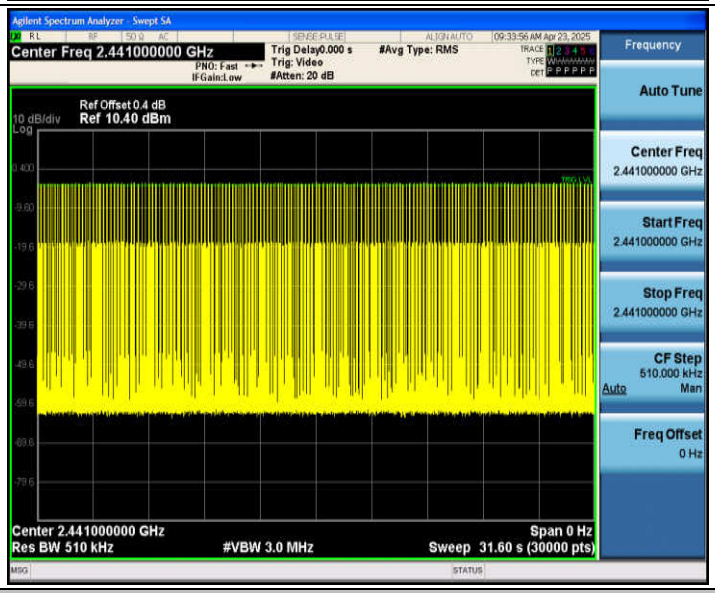
2DH5_Ant1_Hop



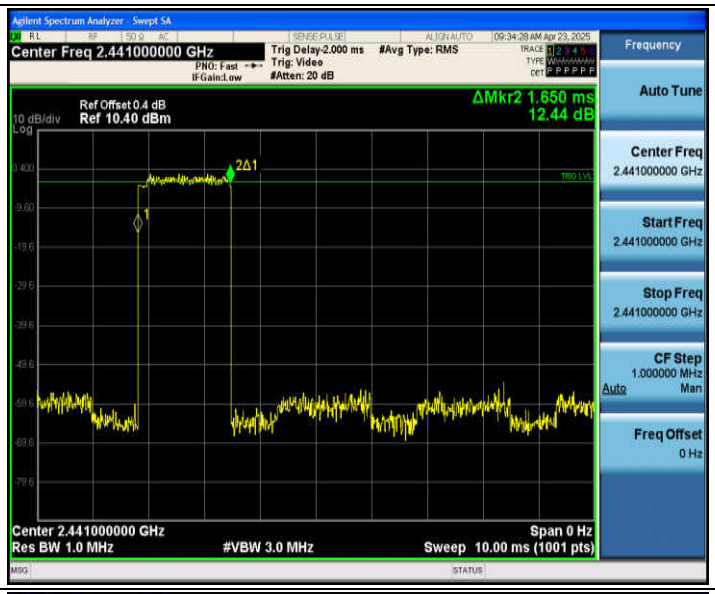


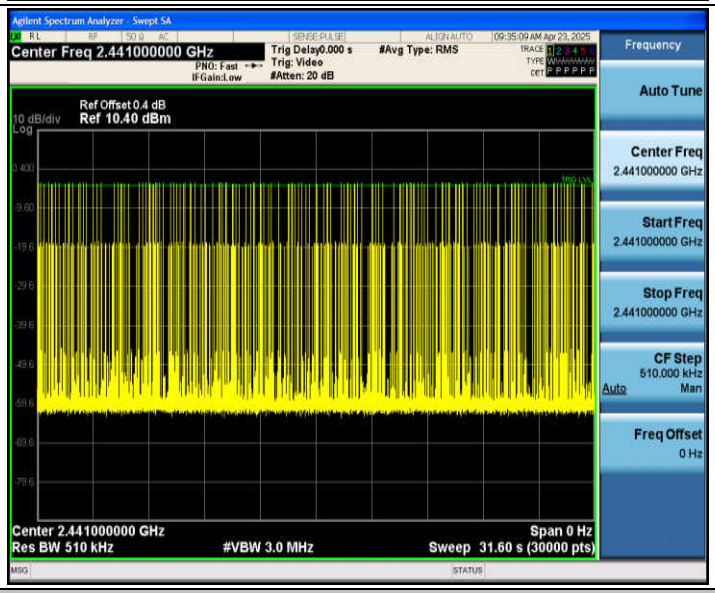
3DH1_Ant1_Hop



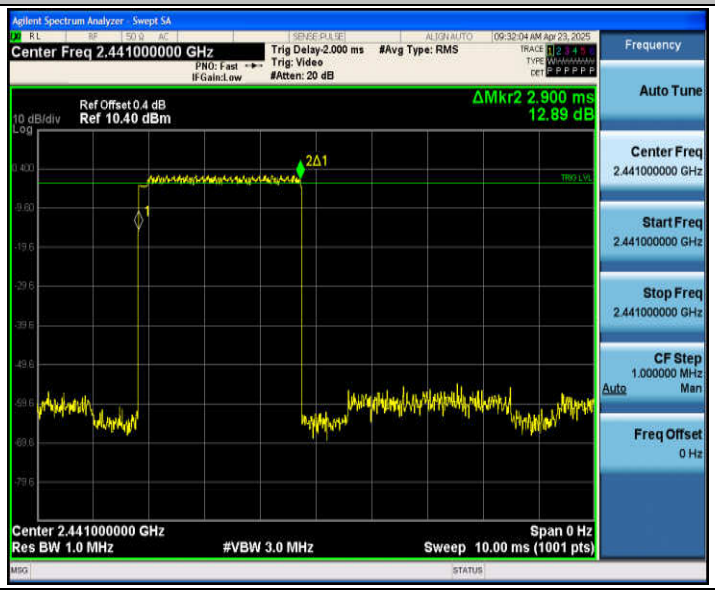


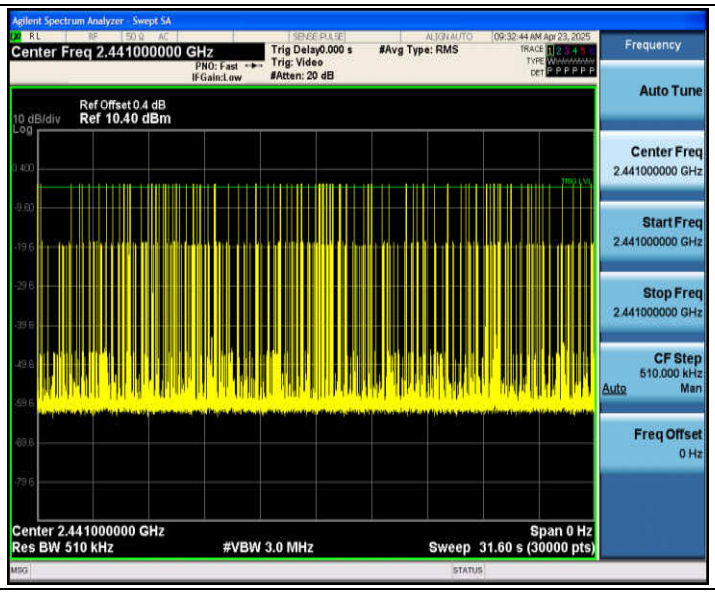
3DH3_Ant1_Hop





3DH5_Ant1_Hop



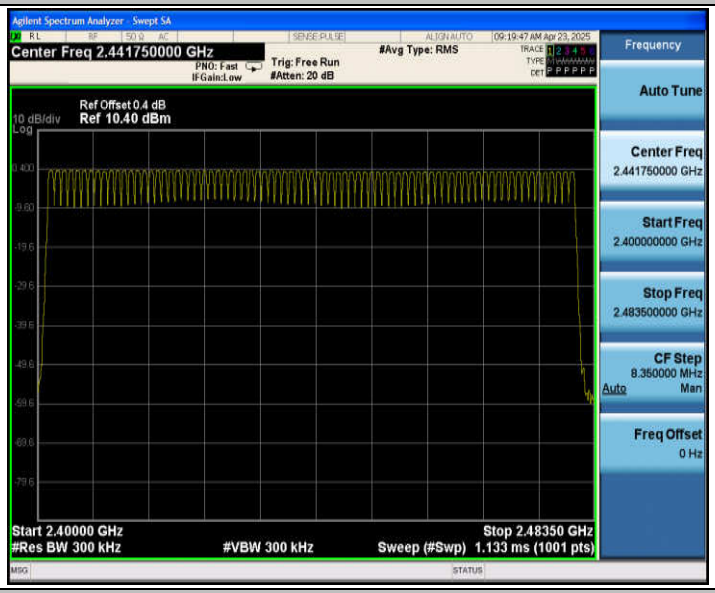
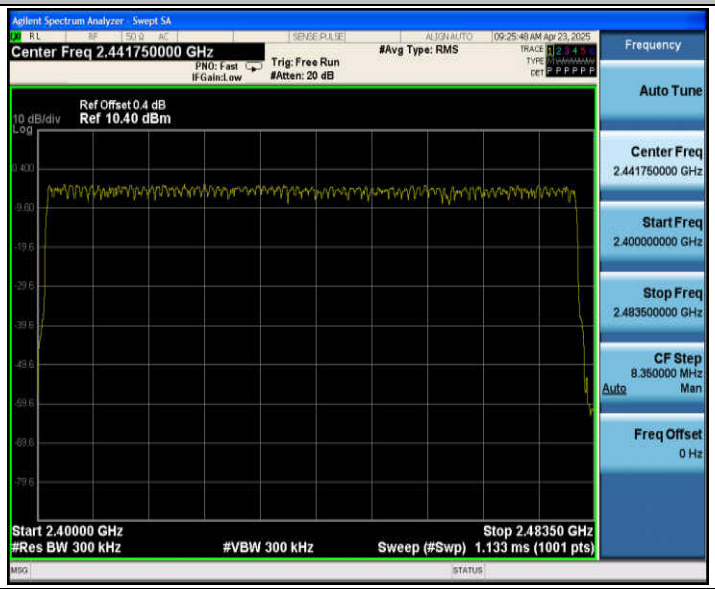

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
09:32:44 AM Apr 23, 2025
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 0.4 dB
10 dB/div
Ref 10.40 dBm
Log
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)

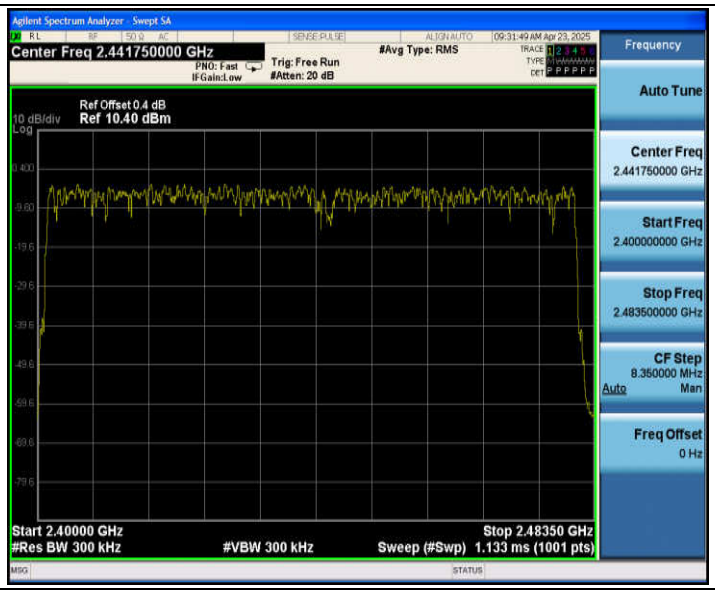
Appendix F: Number of hopping channels

Test Result

TestMode	Antenna	Freq(MHz)	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
09:31:49 AM Apr 23, 2025
Ref Offset 0.4 dB
10 dB/div
Ref 10.40 dBm
Log
Start 2.40000 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep (#Swp) 1.133 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

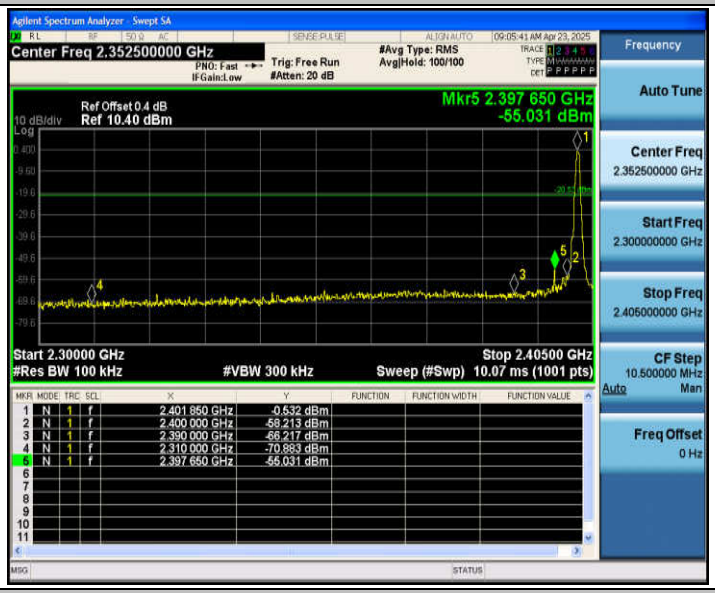
Appendix G: Band edge measurements

Test Result

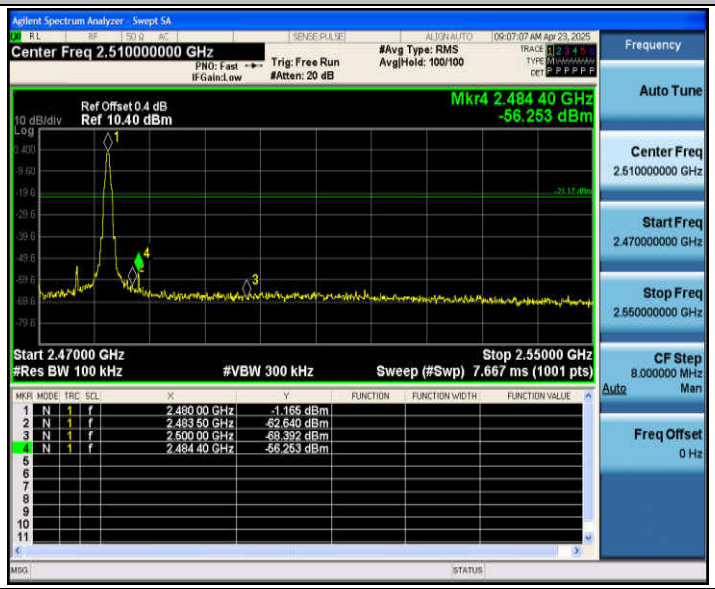
TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-0.53	-55.03	≤-20.53	PASS
		High	2480	-1.17	-56.25	≤-21.17	PASS
		Low	Hop_2402	-0.15	-60.02	≤-20.15	PASS
		High	Hop_2480	-0.84	-62.52	≤-20.84	PASS
2DH5	Ant1	Low	2402	-3.67	-59.68	≤-23.67	PASS
		High	2480	-3.92	-59.42	≤-23.92	PASS
		Low	Hop_2402	-4.02	-60.88	≤-24.02	PASS
		High	Hop_2480	-4.86	-63.92	≤-24.86	PASS
3DH5	Ant1	Low	2402	-5.48	-61.32	≤-25.48	PASS
		High	2480	-6.25	-64.53	≤-26.25	PASS
		Low	Hop_2402	-4.37	-63.23	≤-24.37	PASS
		High	Hop_2480	-4.05	-63.84	≤-24.05	PASS

Test Graphs

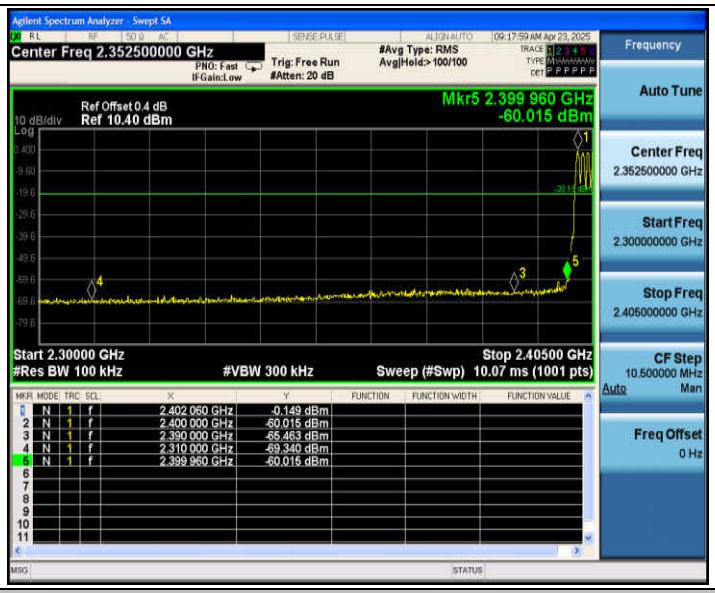
DH5_Ant1_Low_2402



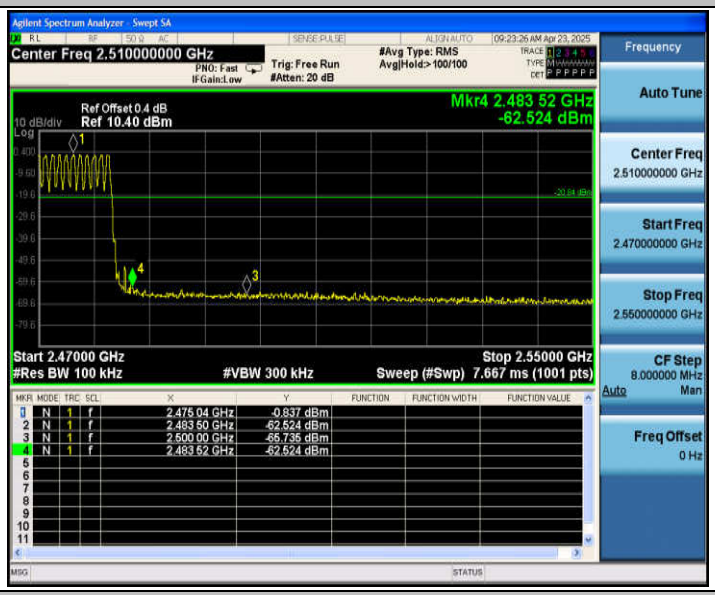
DH5_Ant1_High_2480



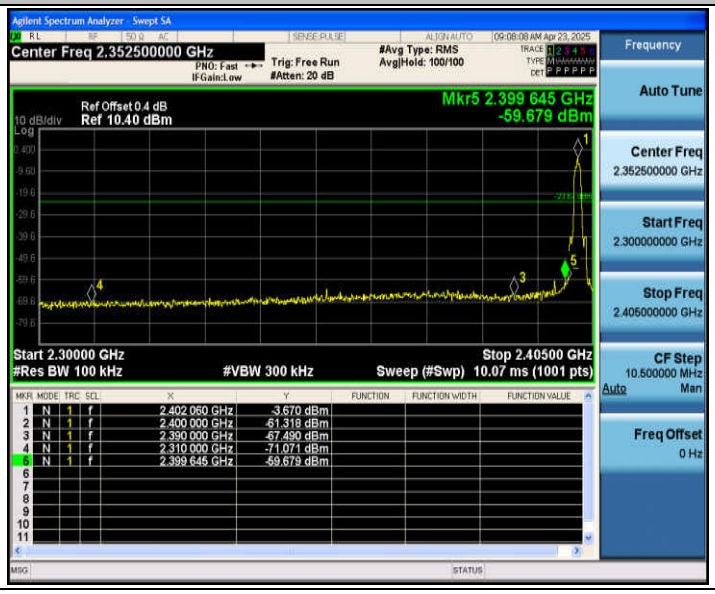
DH5_Ant1_Low_Hop_2402



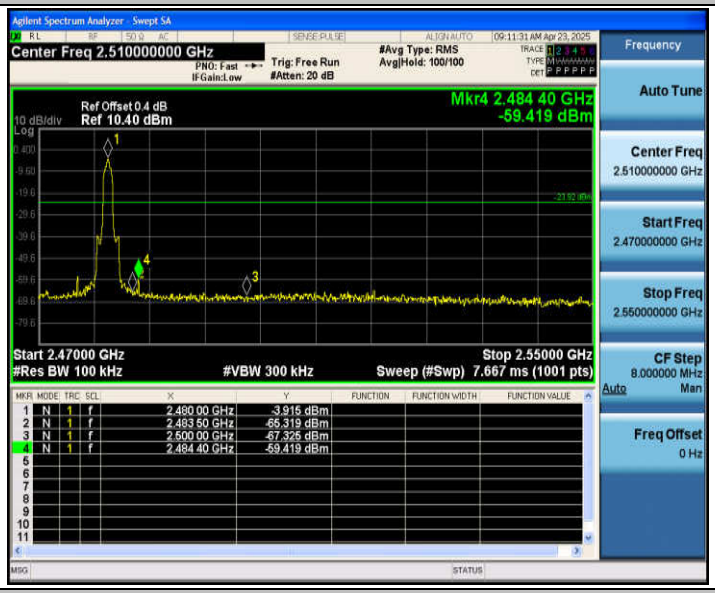
DH5_Ant1_High_Hop_2480



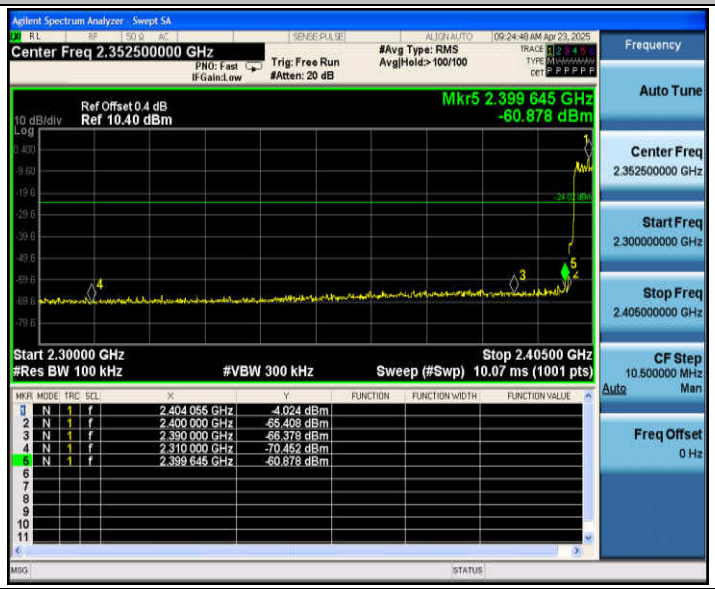
2DH5_Ant1_Low_2402



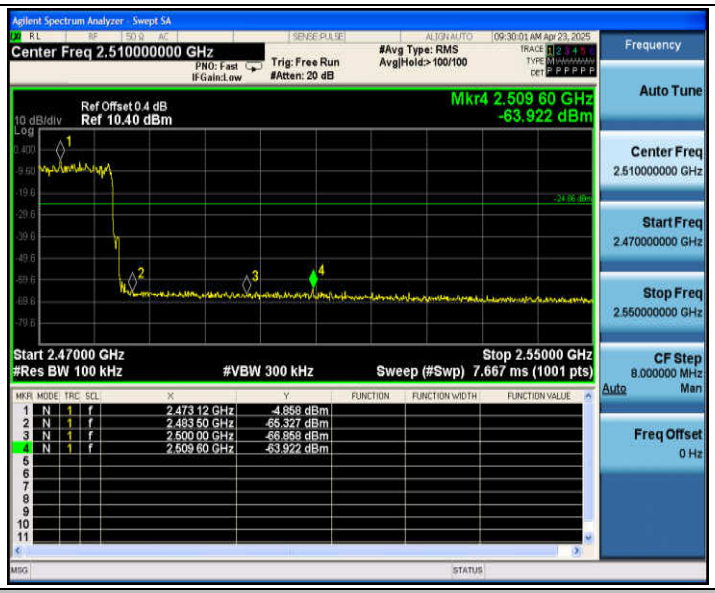
2DH5_Ant1_High_2480



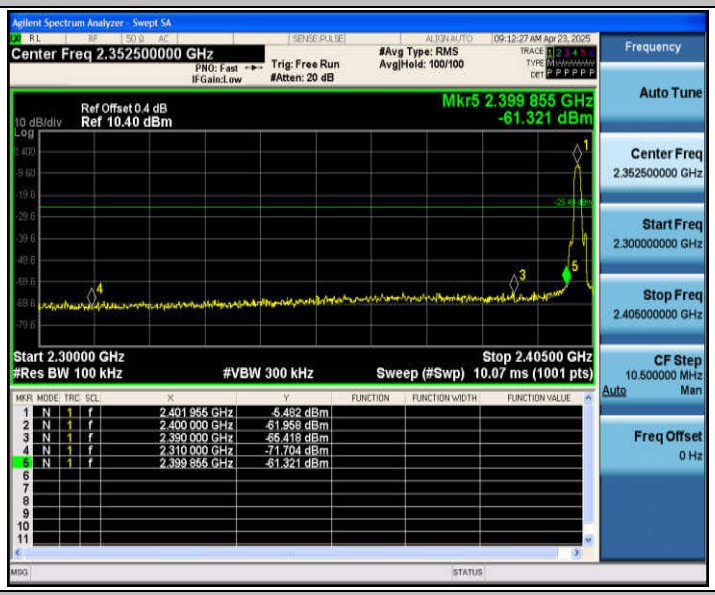
2DH5_Ant1_Low_Hop_2402



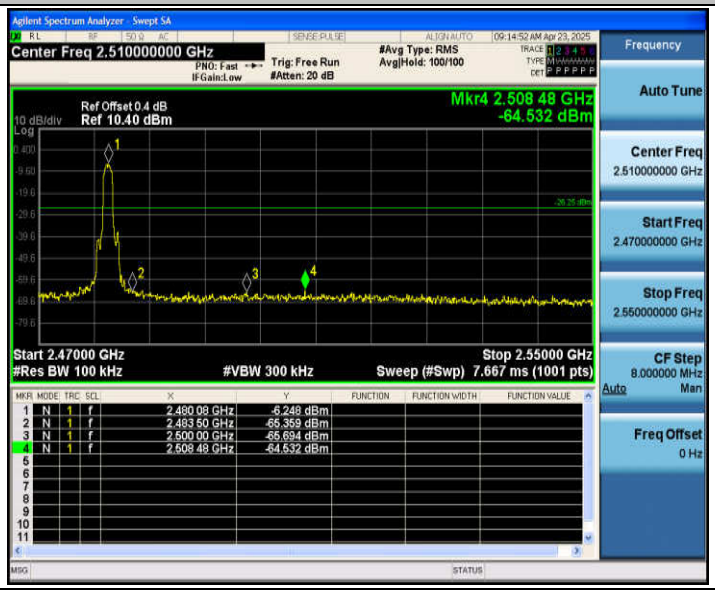
2DH5_Ant1_High_Hop_2480



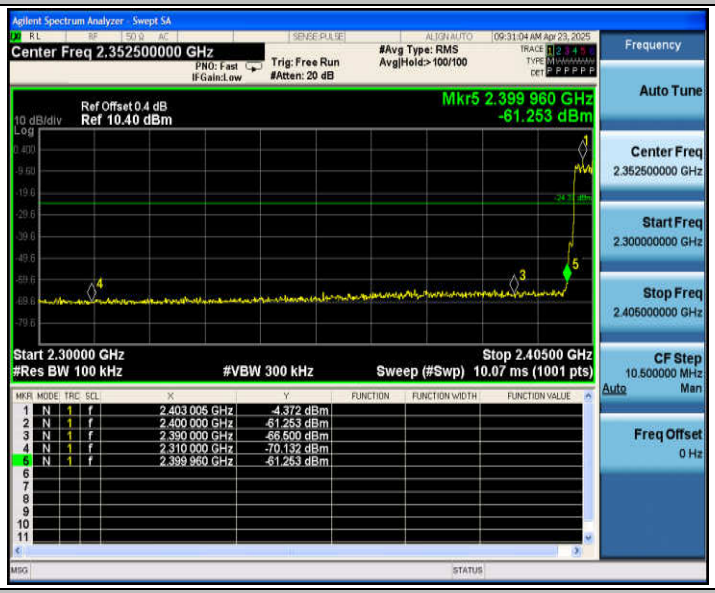
3DH5_Ant1_Low_2402



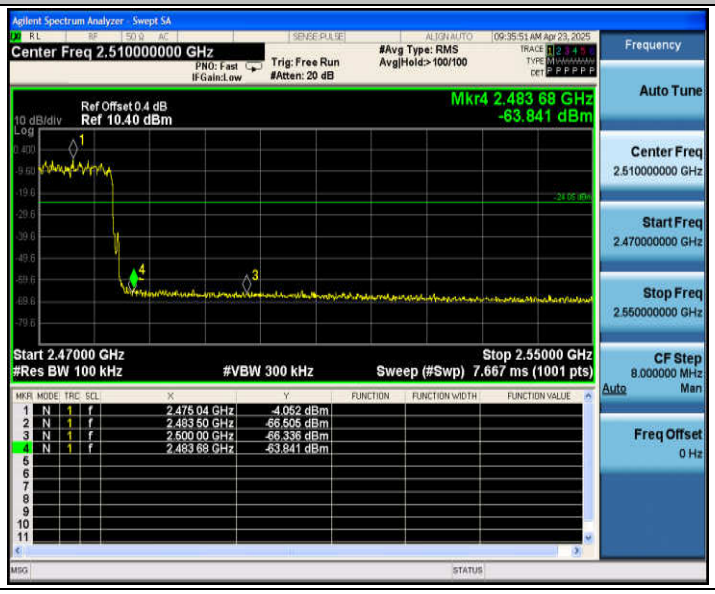
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

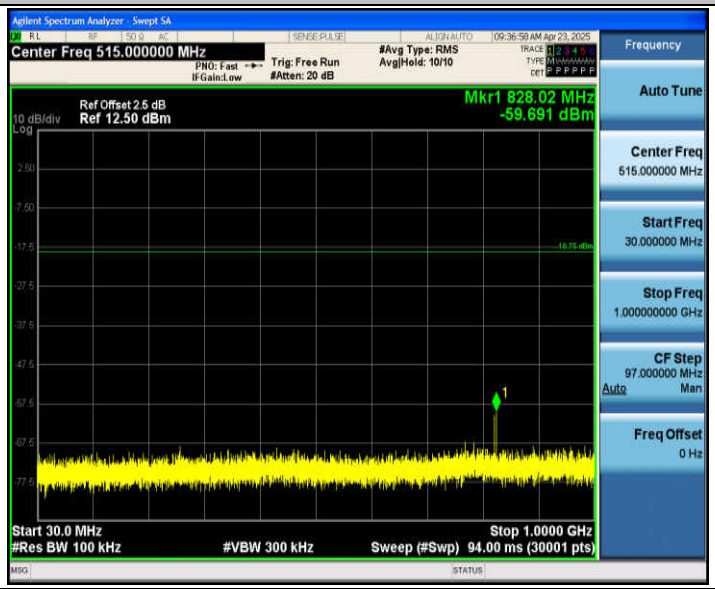
Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	1.25	1.25	---	PASS
			30~1000	1.25	-59.69	≤-18.75	PASS
			1000~26500	1.25	-41.9	≤-18.75	PASS
		2441	Reference	0.85	0.85	---	PASS
			30~1000	0.85	-68.25	≤-19.15	PASS
			1000~26500	0.85	-44.53	≤-19.15	PASS
		2480	Reference	0.50	0.50	---	PASS
			30~1000	0.50	-67.88	≤-19.5	PASS
			1000~26500	0.50	-44.03	≤-19.5	PASS
2DH5	Ant1	2402	Reference	-3.07	-3.07	---	PASS
			30~1000	-3.07	-68.03	≤-23.07	PASS
			1000~26500	-3.07	-48.09	≤-23.07	PASS
		2441	Reference	-3.69	-3.69	---	PASS
			30~1000	-3.69	-67.67	≤-23.69	PASS
			1000~26500	-3.69	-49.43	≤-23.69	PASS
		2480	Reference	-4.68	-4.68	---	PASS
			30~1000	-4.68	-67.89	≤-24.68	PASS
			1000~26500	-4.68	-51.94	≤-24.68	PASS
3DH5	Ant1	2402	Reference	-2.75	-2.75	---	PASS
			30~1000	-2.75	-68.03	≤-22.75	PASS
			1000~26500	-2.75	-50.14	≤-22.75	PASS
		2441	Reference	-3.68	-3.68	---	PASS
			30~1000	-3.68	-67.88	≤-23.68	PASS
			1000~26500	-3.68	-48.7	≤-23.68	PASS
		2480	Reference	-4.62	-4.62	---	PASS
			30~1000	-4.62	-67.5	≤-24.62	PASS
			1000~26500	-4.62	-51.65	≤-24.62	PASS

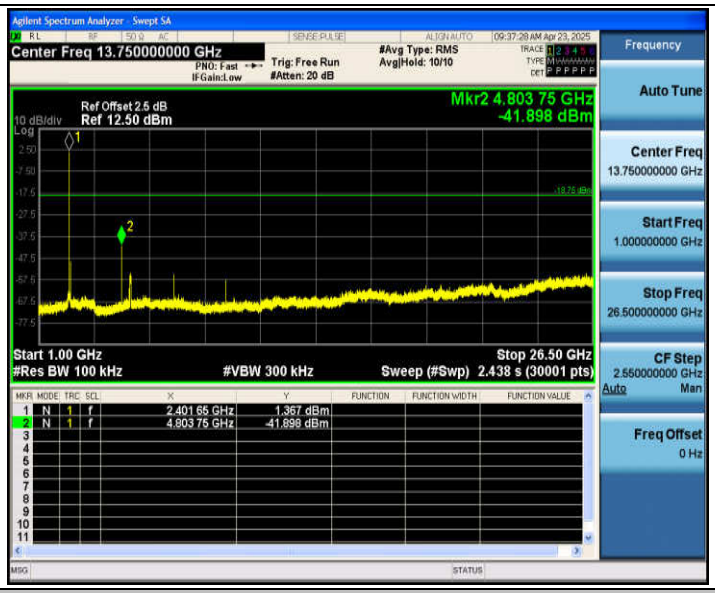
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

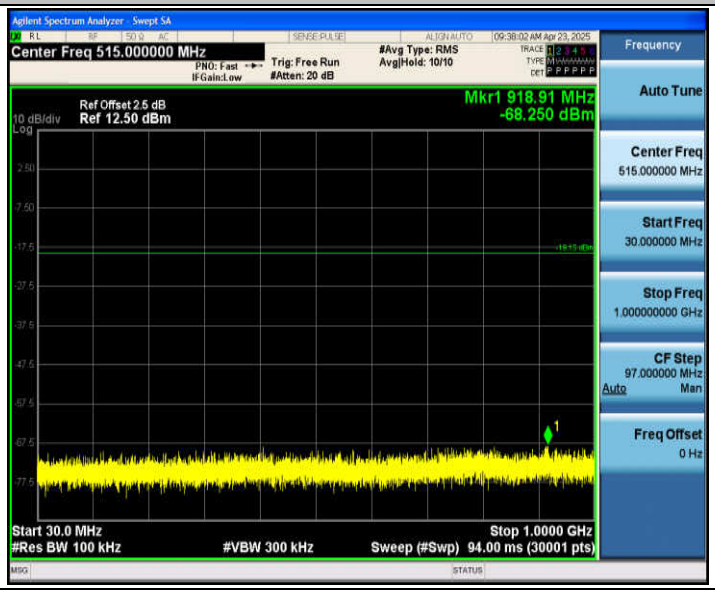


DH5_Ant1_2402_1000~26500

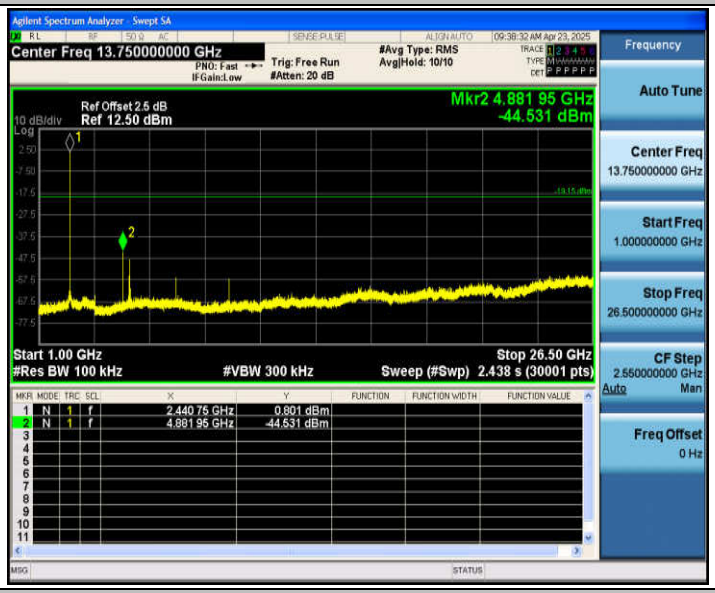


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

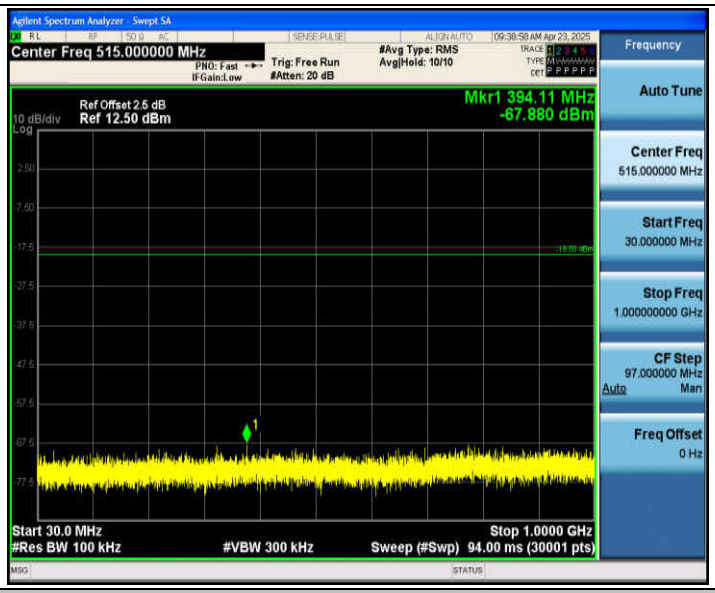


DH5_Ant1_2441_1000~26500

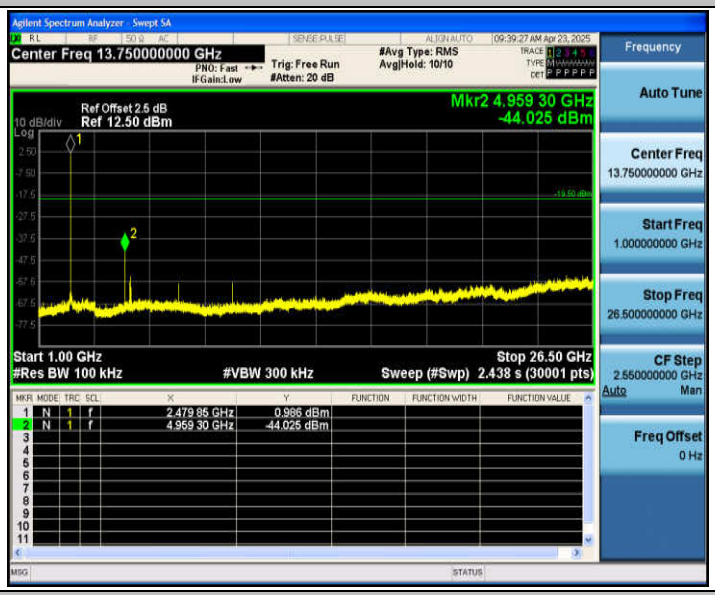


DH5_Ant1_2480_0~Reference

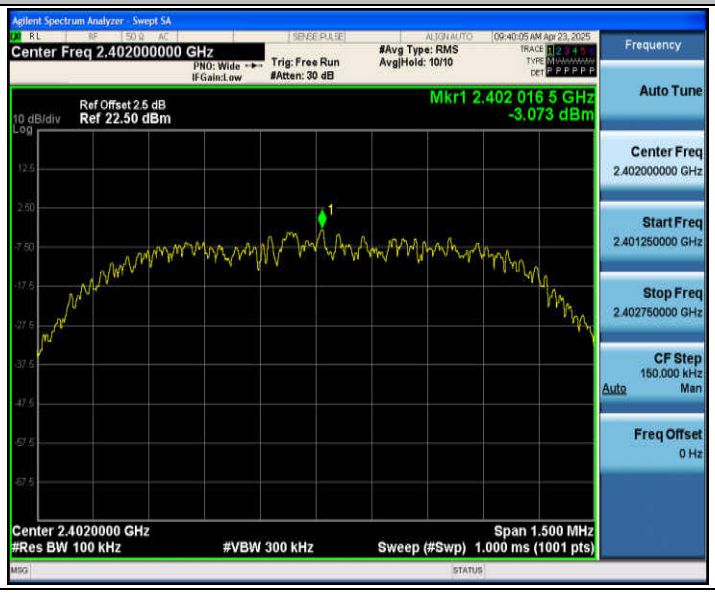
DH5_Ant1_2480_30~1000



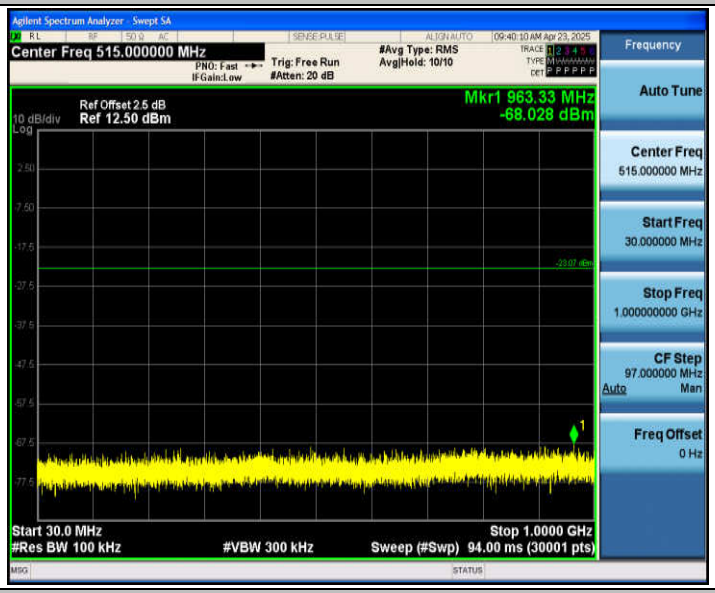
DH5_Ant1_2480_1000~26500



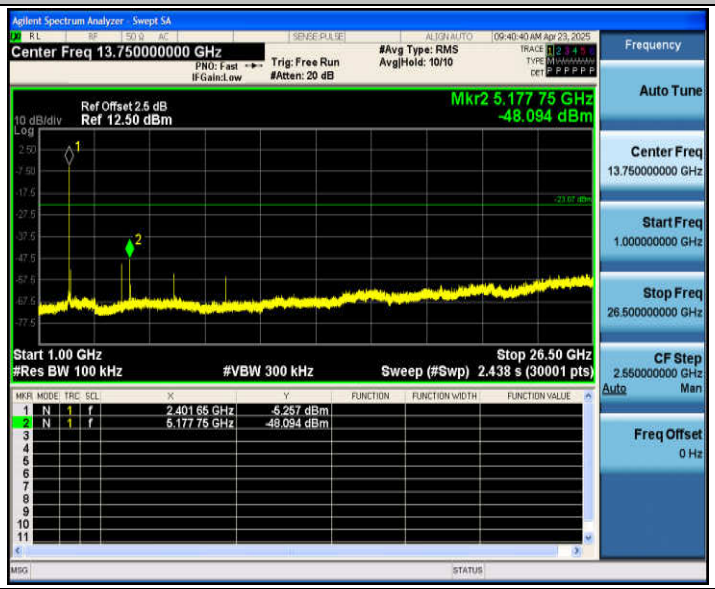
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

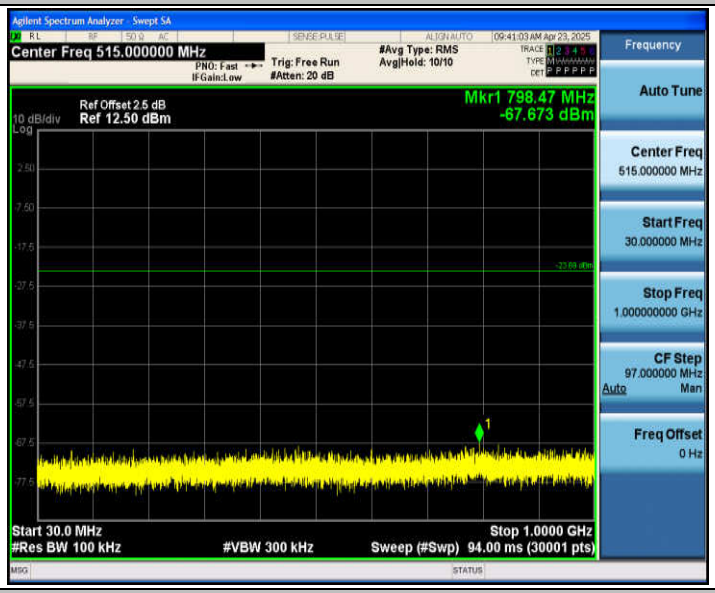


2DH5_Ant1_2402_1000~26500

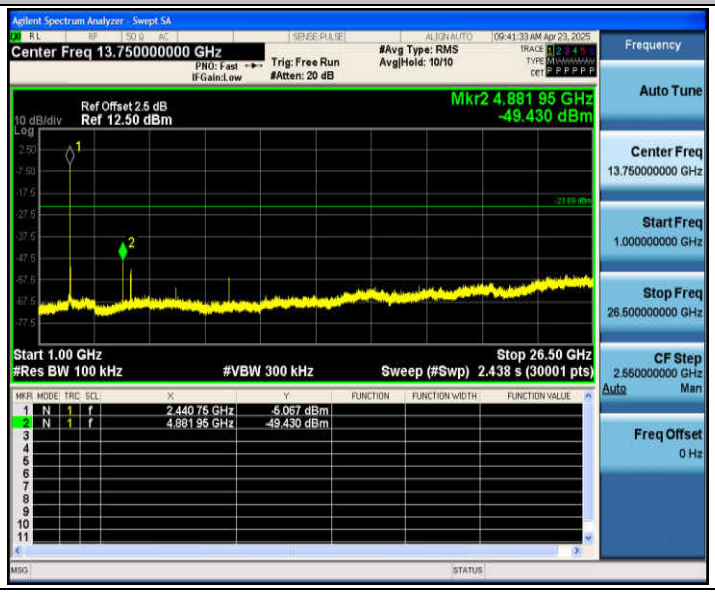


2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000

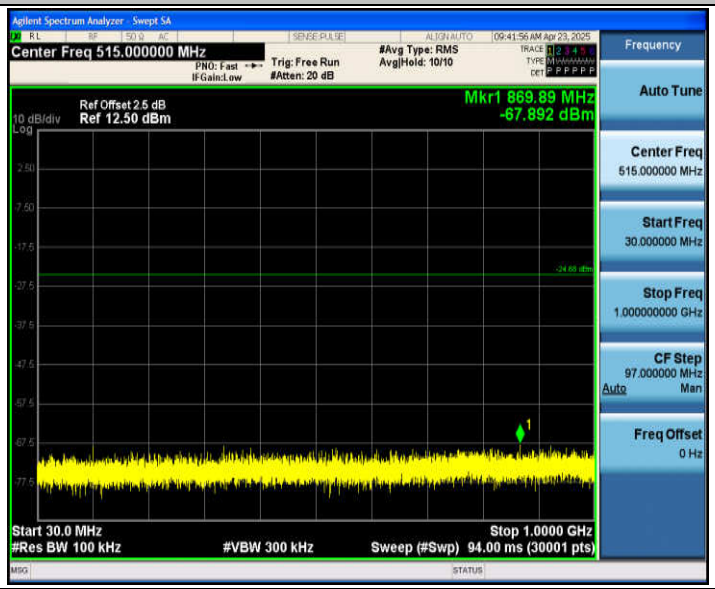


2DH5_Ant1_2441_1000~26500

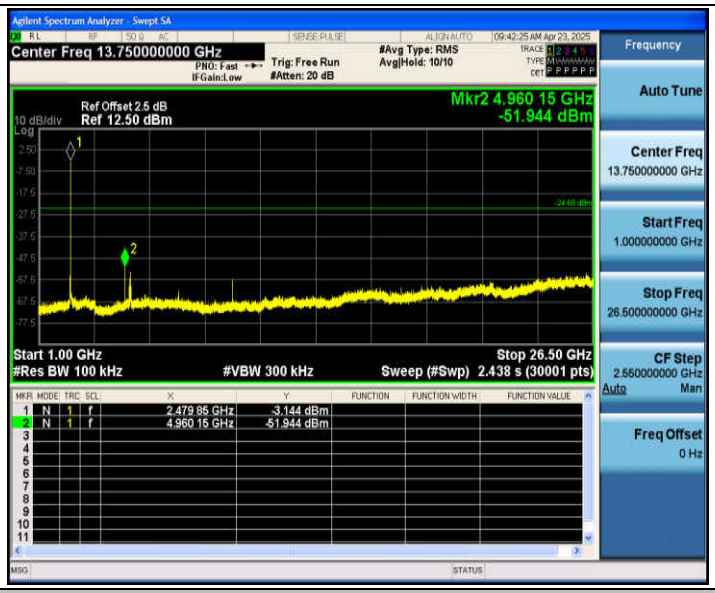


2DH5_Ant1_2480_0~Reference

2DH5_Ant1_2480_30~1000

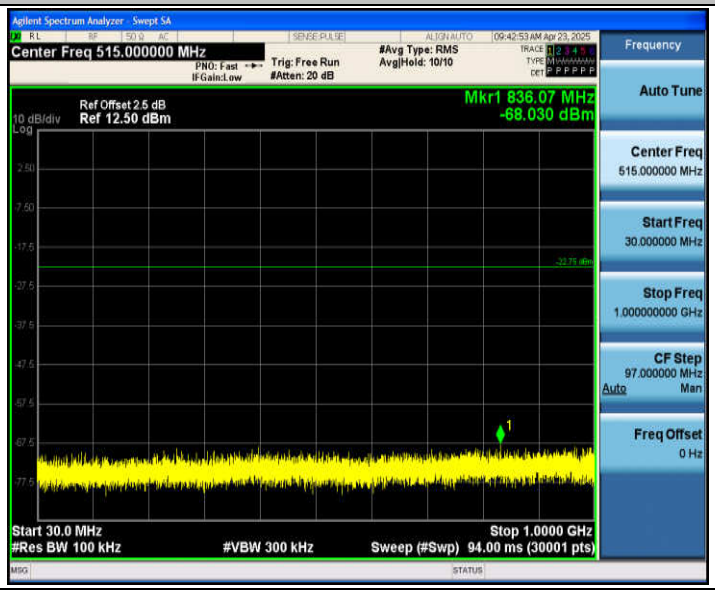


2DH5_Ant1_2480_1000~26500

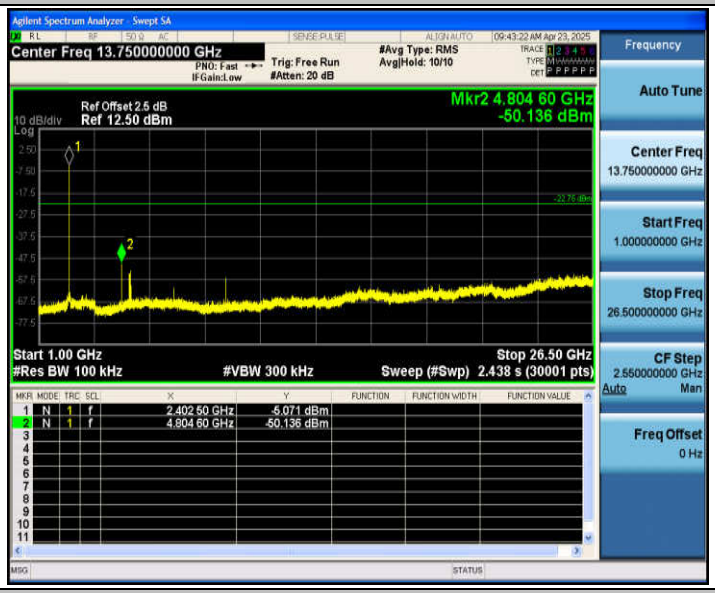


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

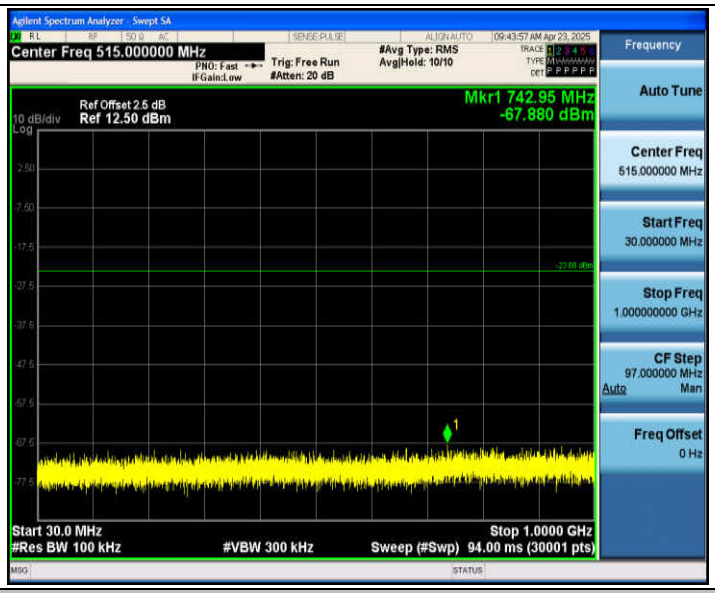


3DH5_Ant1_2402_1000~26500

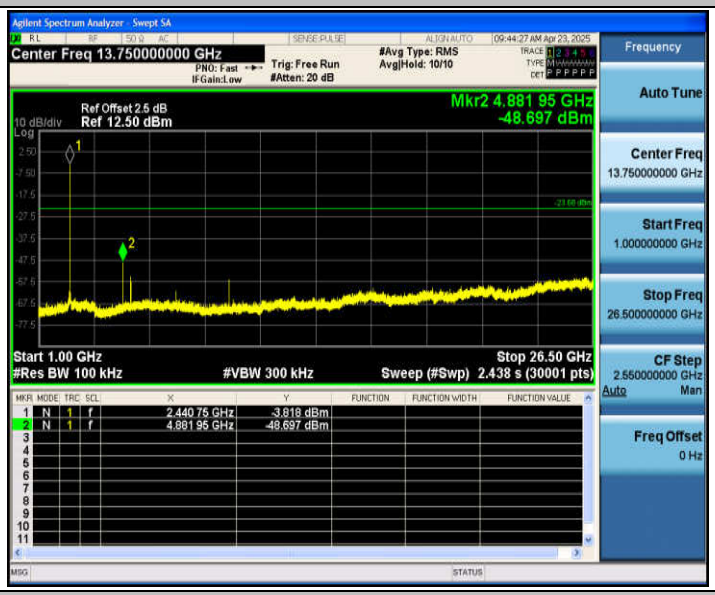


3DH5_Ant1_2441_0~Reference

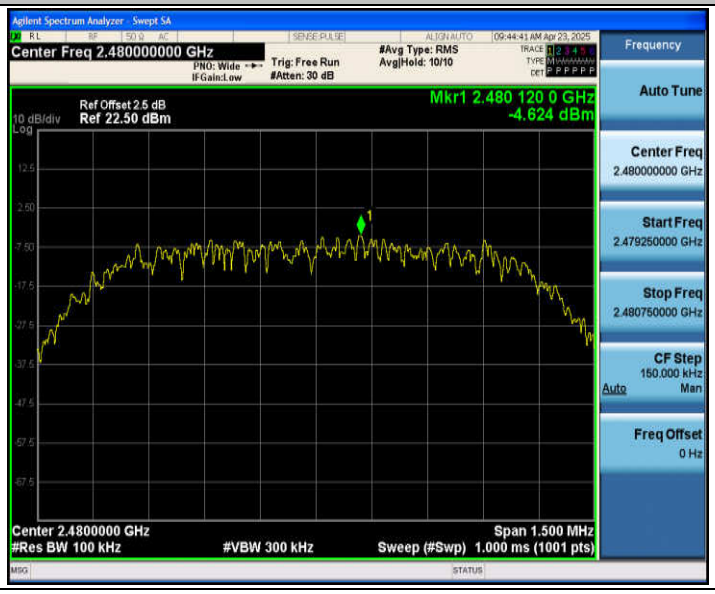
3DH5_Ant1_2441_30~1000



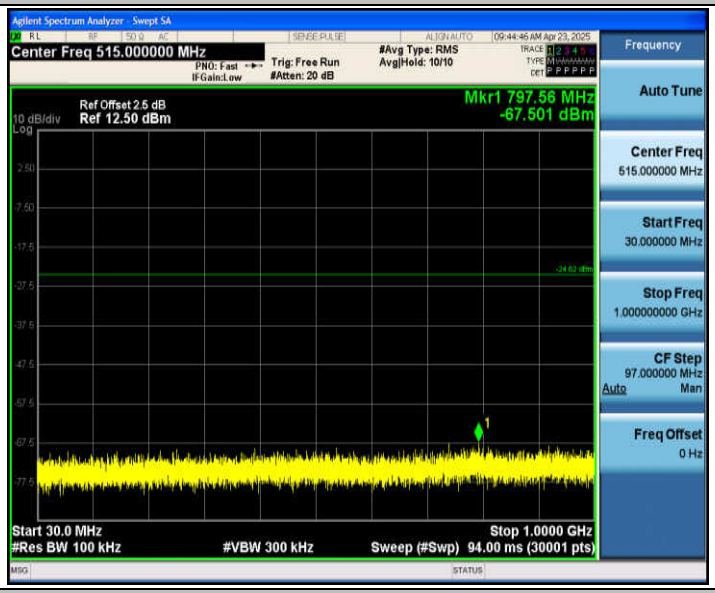
3DH5_Ant1_2441_1000~26500



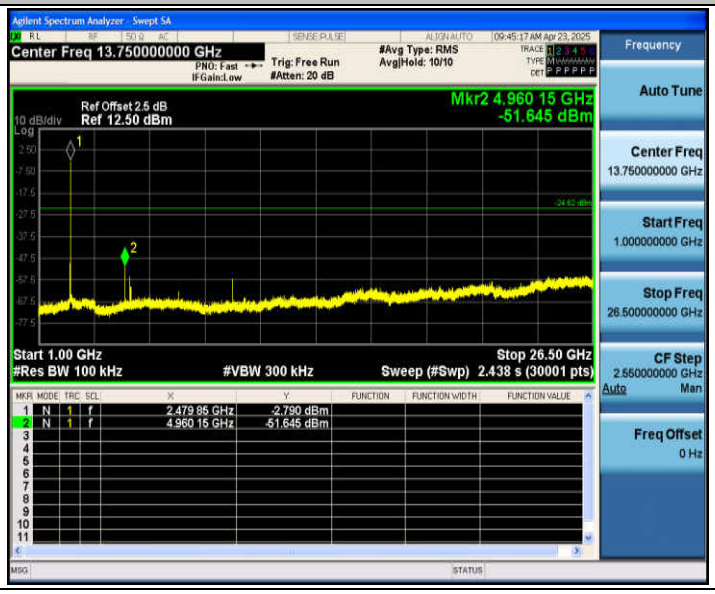
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



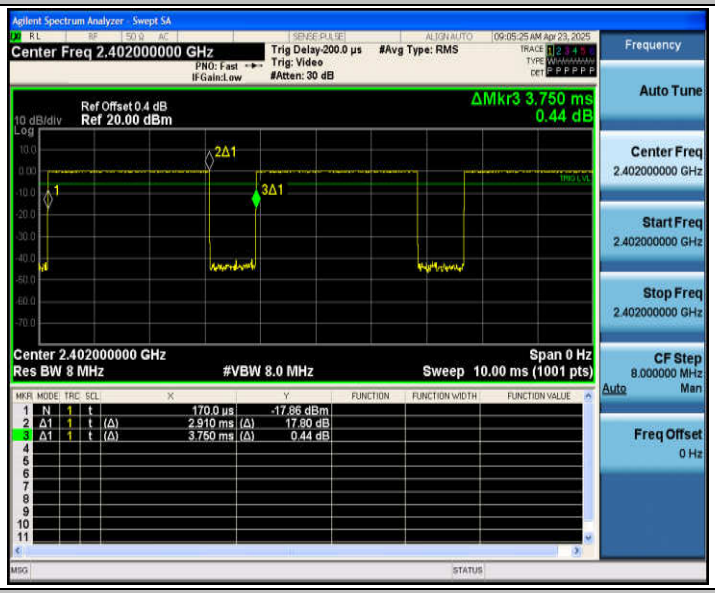
Appendix I: Duty Cycle

Test Result

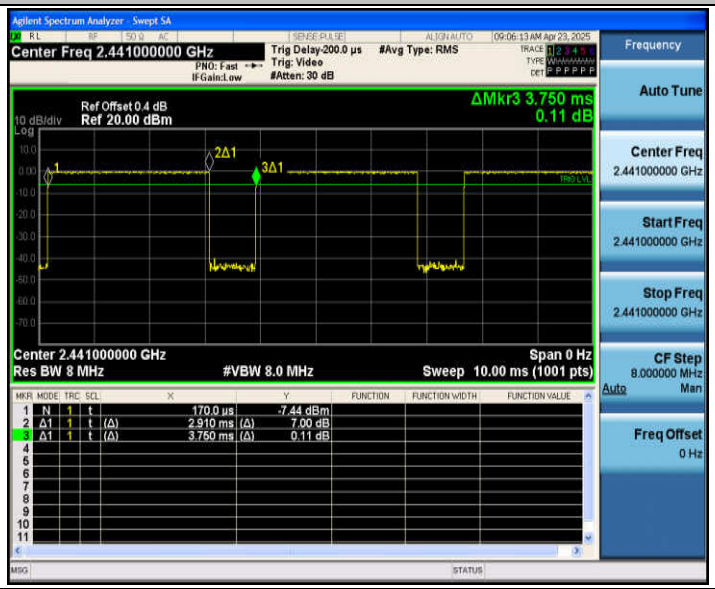
TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	DC [%]	xFactor	Limit	Verdict
DH5	Ant1	2402	2.91	3.75	77.60	1.10	---	---
		2441	2.91	3.75	77.60	1.10	---	---
		2480	2.92	3.75	77.87	1.09	---	---
2DH5	Ant1	2402	2.92	3.75	77.87	1.09	---	---
		2441	2.91	3.75	77.60	1.10	---	---
		2480	2.91	3.75	77.60	1.10	---	---
3DH5	Ant1	2402	2.92	3.75	77.87	1.09	---	---
		2441	2.92	3.75	77.87	1.09	---	---
		2480	2.92	3.75	77.87	1.09	---	---

Test Graphs

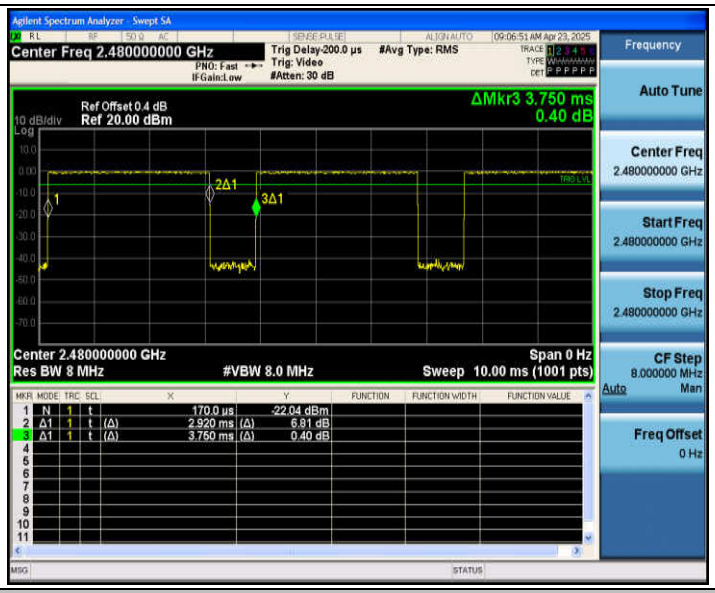
DH5_Ant1_2402



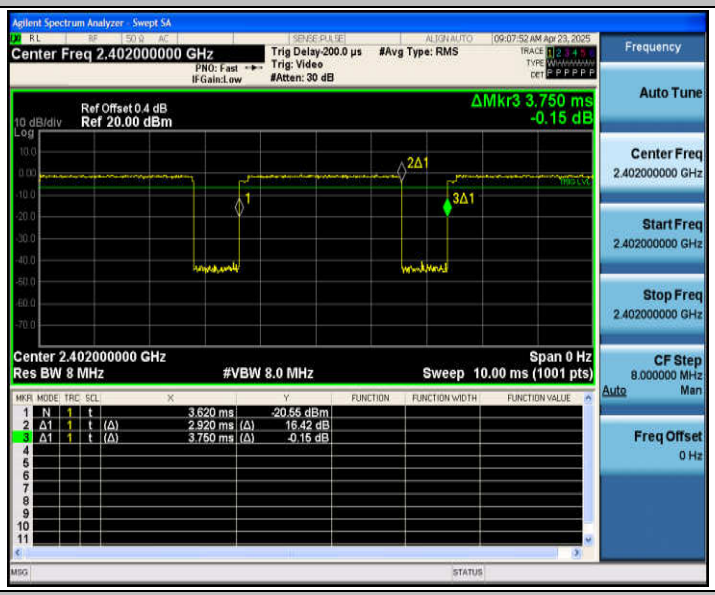
DH5_Ant1_2441



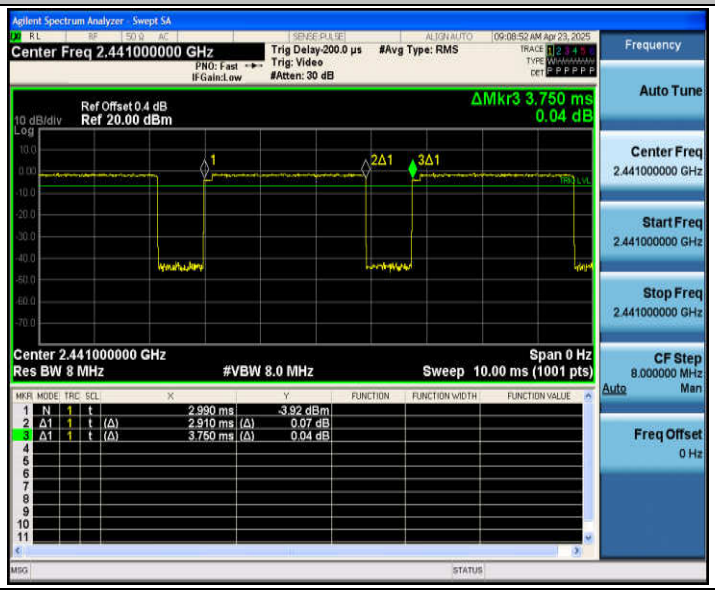
DH5_Ant1_2480



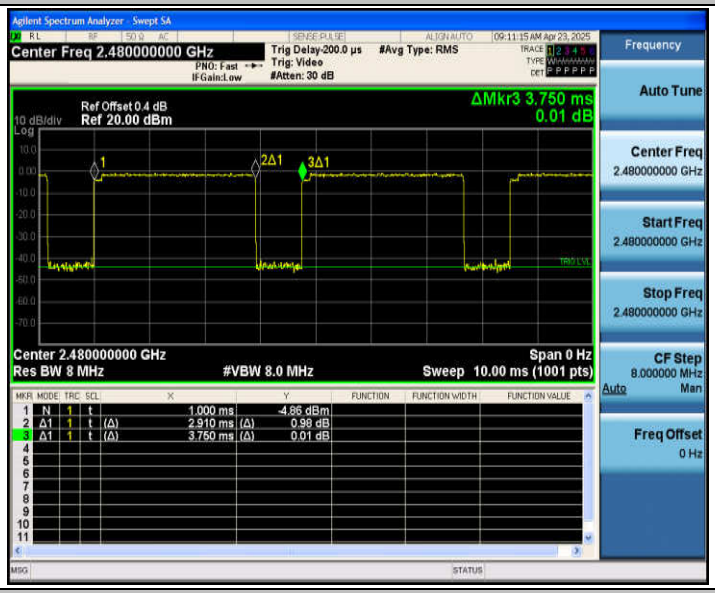
2DH5_Ant1_2402



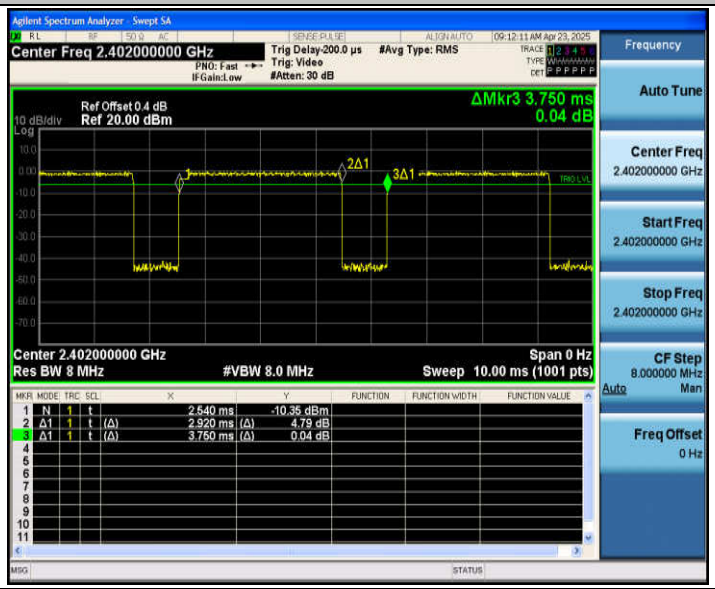
2DH5_Ant1_2441



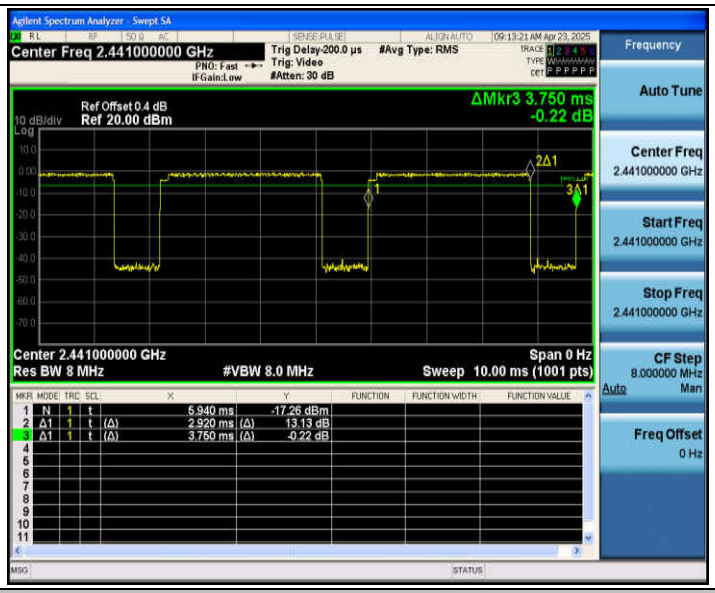
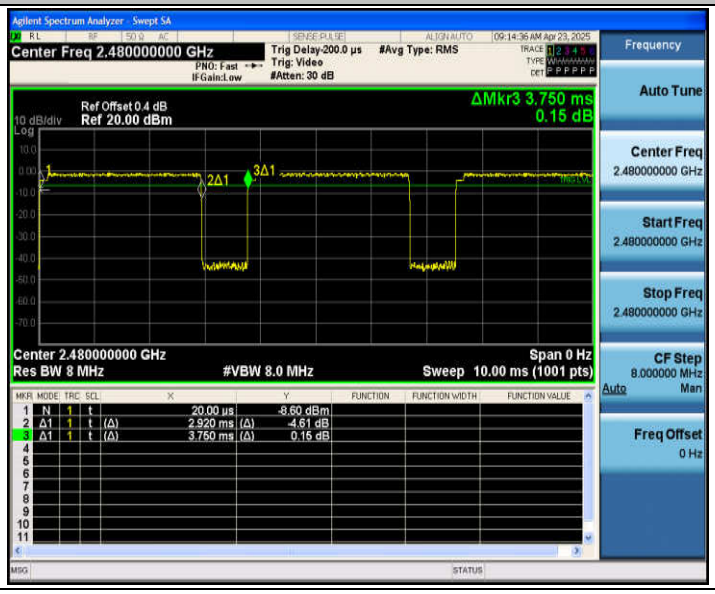
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480