Appendix Test Data

Report No.:	18220WC30060201	Test Sample No.:	1-2-2
Start Test Date:	2023.04.11	Finish Test Date:	2023.04.14
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	25.5℃	Relative Humidity:	53%
Pressure:	1012 hPa		

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.954	2401.541	2402.495	---	---
		2441	0.945	2440.544	2441.489	---	---
		2480	0.945	2479.547	2480.492	---	---
2DH5	Ant1	2402	1.338	2401.337	2402.675	---	---
		2441	1.326	2440.340	2441.666	---	---
		2480	1.338	2479.337	2480.675	---	---
3DH5	Ant1	2402	1.299	2401.364	2402.663	---	---
		2441	1.317	2440.343	2441.660	---	---
		2480	1.323	2479.346	2480.669	---	---

Test Graphs

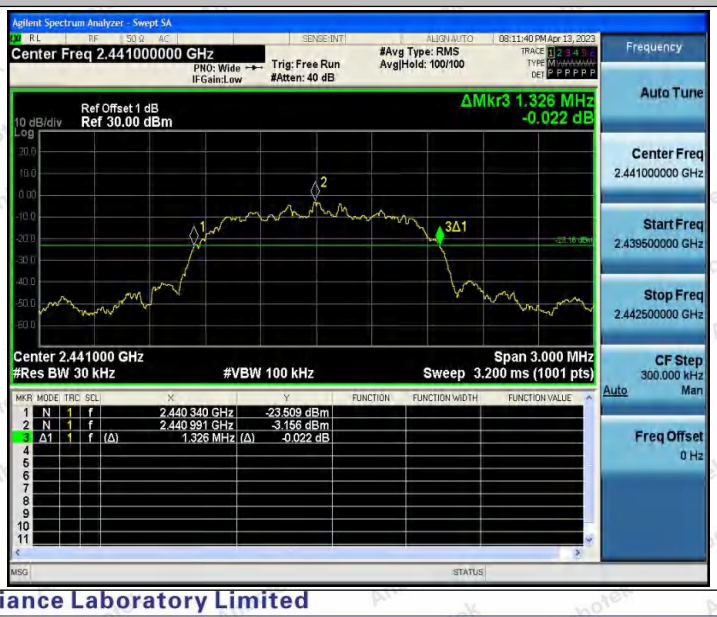
DH5_Ant1_2402

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	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.84614	2401.5816	2402.4277	---	---
		2441	0.85483	2440.5773	2441.4321	---	---
		2480	0.85666	2479.5786	2480.4353	---	---
2DH5	Ant1	2402	1.1765	2401.4217	2402.5982	---	---
		2441	1.1801	2440.4169	2441.5970	---	---
		2480	1.1771	2479.4178	2480.5949	---	---
3DH5	Ant1	2402	1.1930	2401.4132	2402.6062	---	---
		2441	1.1852	2440.4117	2441.5969	---	---
		2480	1.1968	2479.4097	2480.6065	---	---

Test Graphs

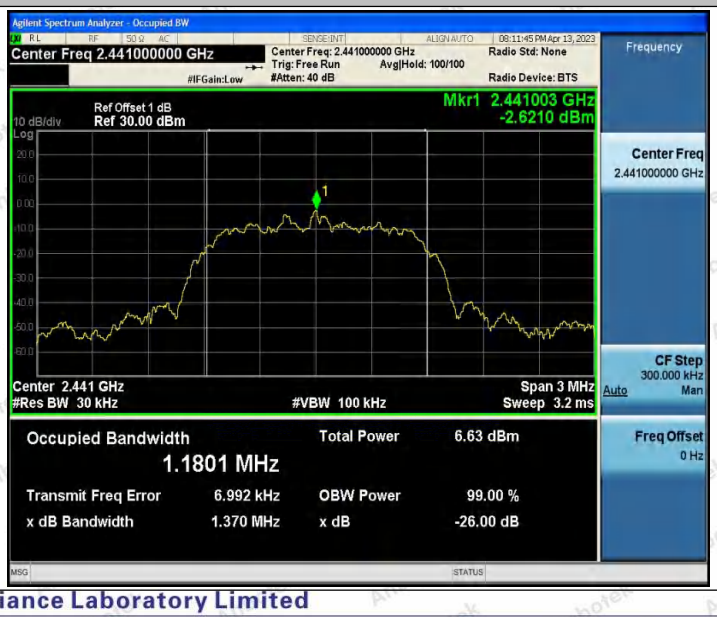
DH5_Ant1_2402

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

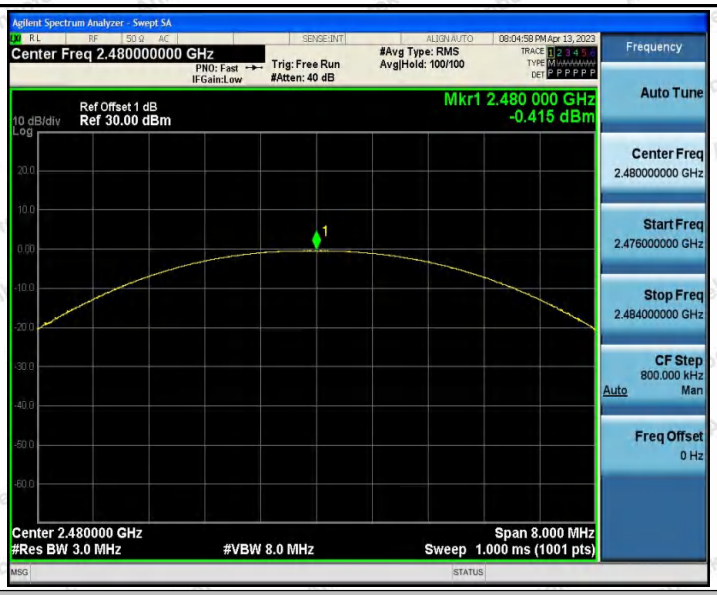
Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	0.29	≤20.97	PASS
		2441	-0.18	≤20.97	PASS
		2480	-0.42	≤20.97	PASS
2DH5	Ant1	2402	2.59	≤20.97	PASS
		2441	2.19	≤20.97	PASS
		2480	1.87	≤20.97	PASS
3DH5	Ant1	2402	2.9	≤20.97	PASS
		2441	2.55	≤20.97	PASS
		2480	2.25	≤20.97	PASS

Test Graphs

DH5_Ant1_2402

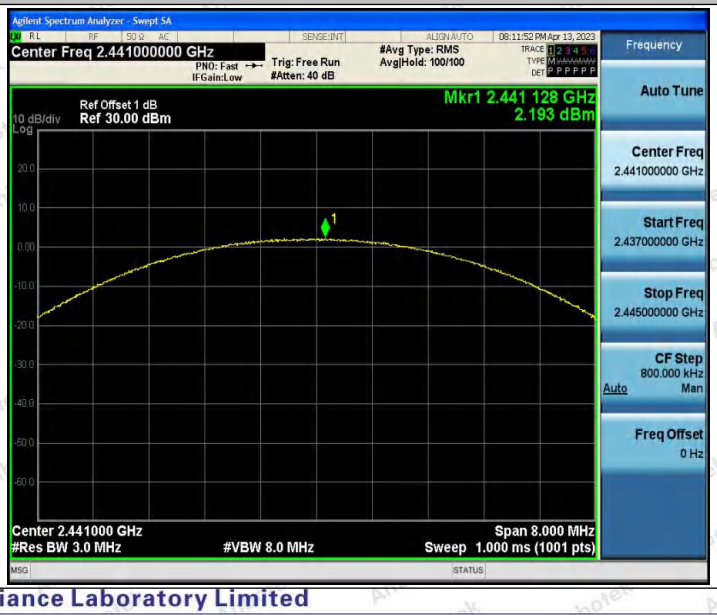
DH5_Ant1_2441

DH5_Ant1_2480



2DH5_Ant1_2402

2DH5_Ant1_2441



2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

Appendix D: Carrier frequency separation

Test Result

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.988	≥0.954	PASS
2DH5	Ant1	Hop	0.98	≥0.892	PASS
3DH5	Ant1	Hop	1.17	≥0.882	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 5000/5000
10:16:48 AM Apr 14, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
ΔMkr2 1.170 MHz
0.118 dB
Start 2.440500 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.442500 GHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

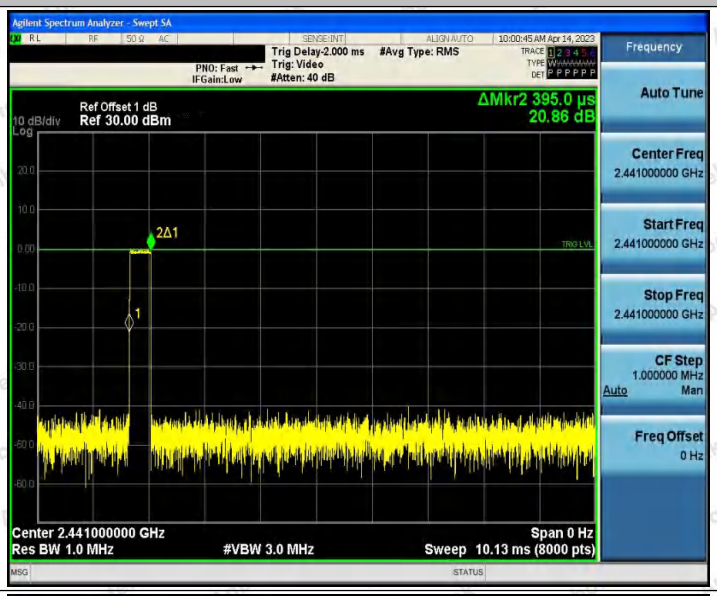
Appendix E: Time of occupancy

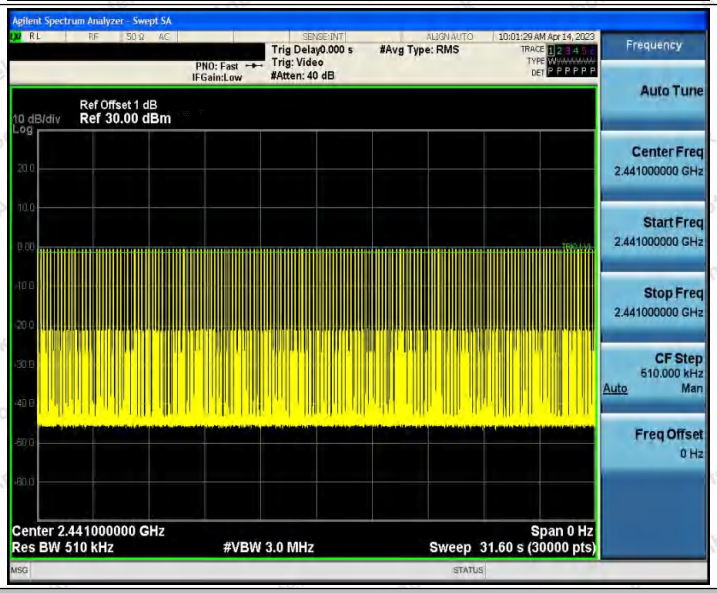
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.395	319	0.126	≤0.4	PASS
DH3	Ant1	Hop	1.652	166	0.274	≤0.4	PASS
DH5	Ant1	Hop	2.899	100	0.29	≤0.4	PASS
2DH1	Ant1	Hop	0.404	319	0.129	≤0.4	PASS
2DH3	Ant1	Hop	1.658	169	0.28	≤0.4	PASS
2DH5	Ant1	Hop	2.906	108	0.314	≤0.4	PASS
3DH1	Ant1	Hop	0.408	319	0.13	≤0.4	PASS
3DH3	Ant1	Hop	1.657	162	0.268	≤0.4	PASS
3DH5	Ant1	Hop	2.908	104	0.302	≤0.4	PASS

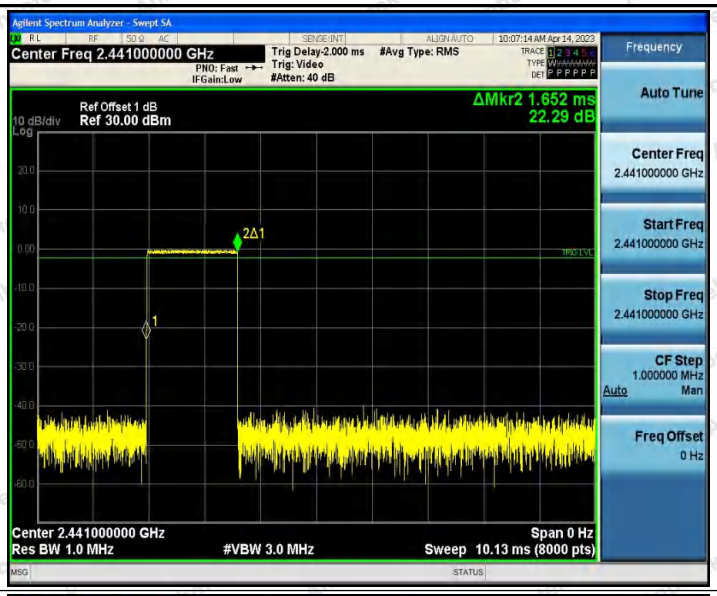
Test Graphs

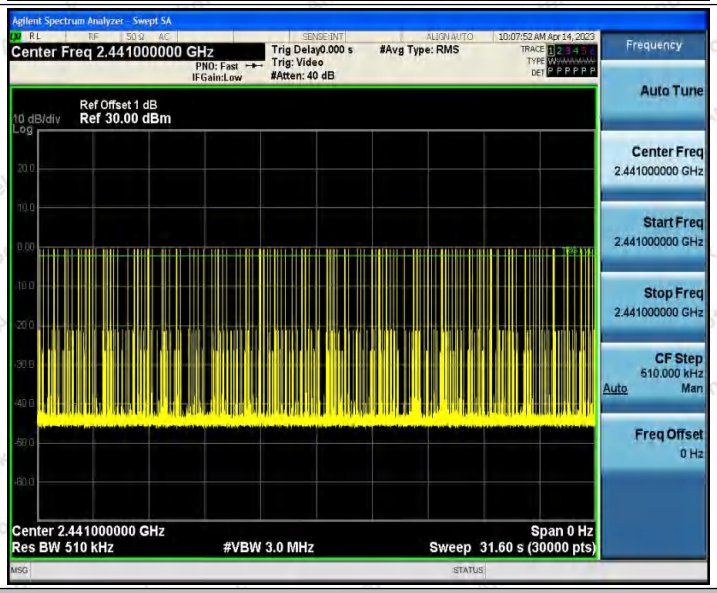
DH1_Ant1_Hop



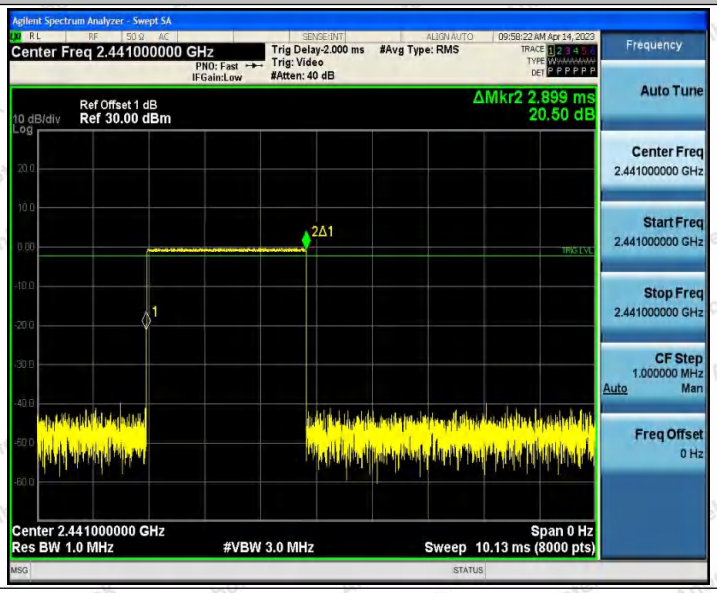


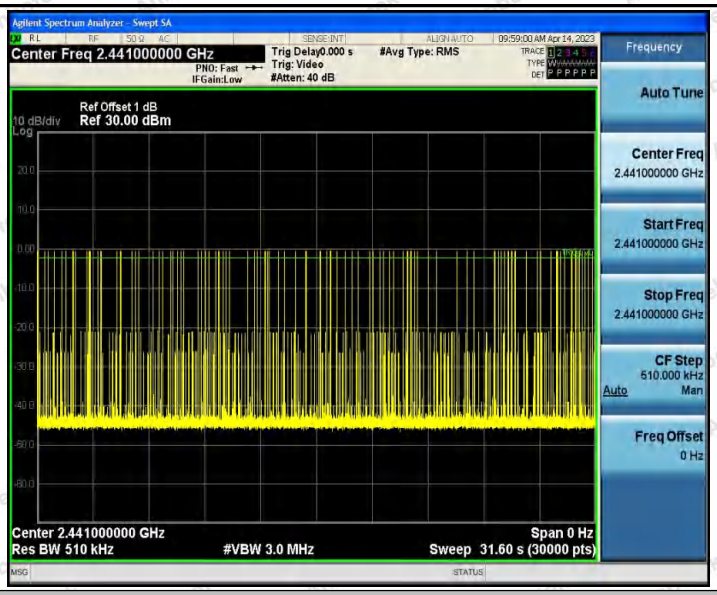
DH3_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
10:07:14 AM Apr 14, 2023
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.652 ms
22.29 dB
2Δ1
1
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
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 10.13 ms (8000 pts)

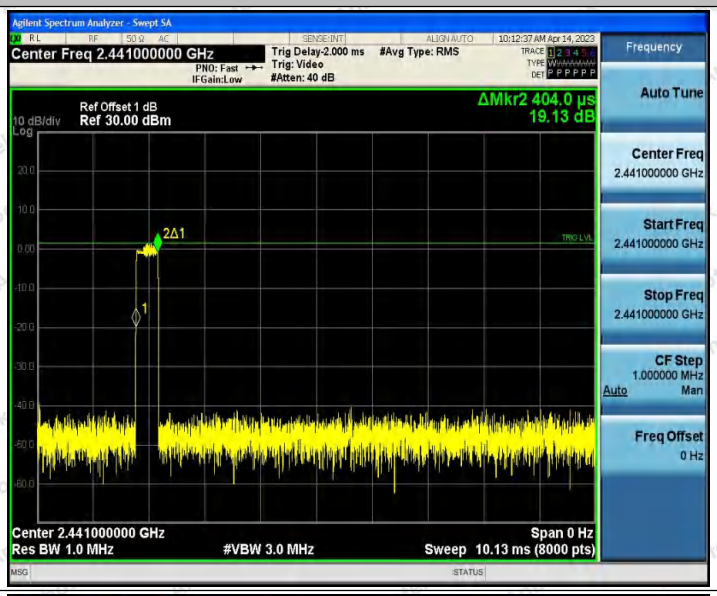

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
10:07:52 AM Apr 14, 2023
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)

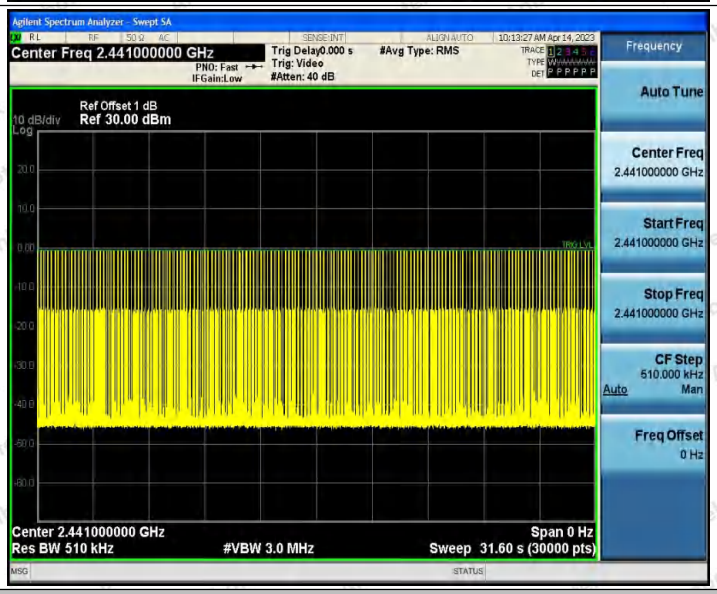
DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
09:58:22 AM Apr 14, 2023
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.899 ms
20.50 dB
2Δ1
1
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
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 10.13 ms (8000 pts)

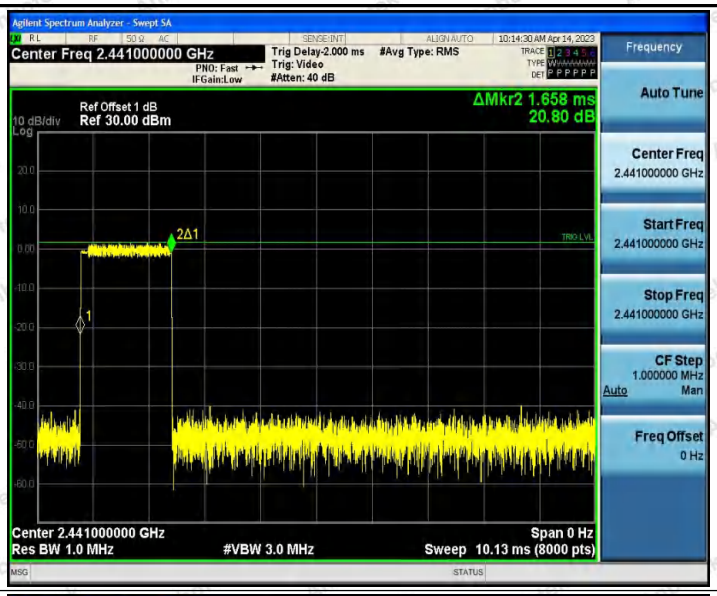


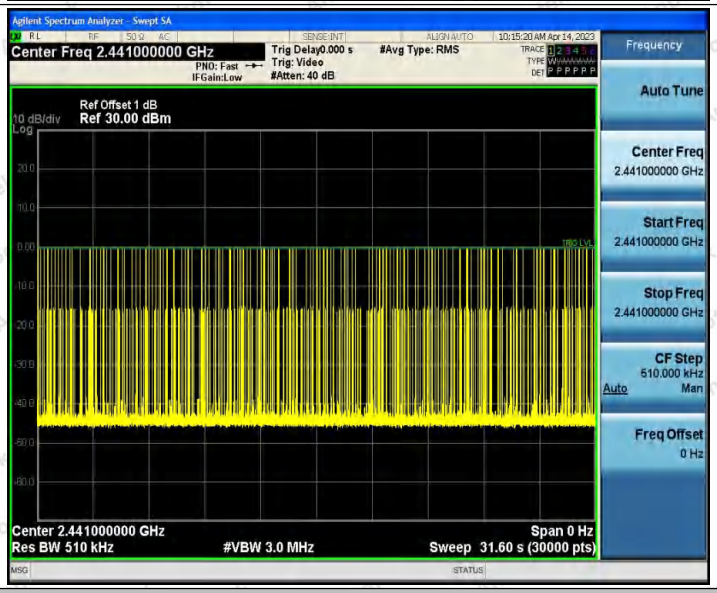
2DH1_Ant1_Hop



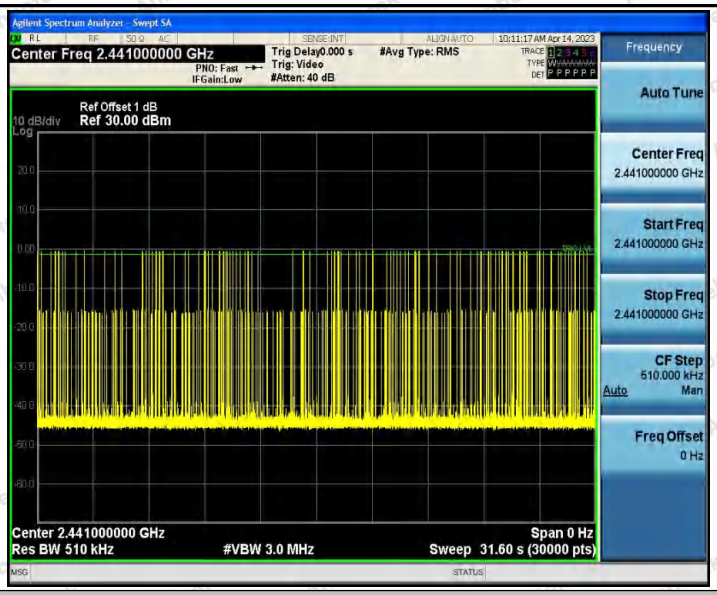


2DH3_Ant1_Hop

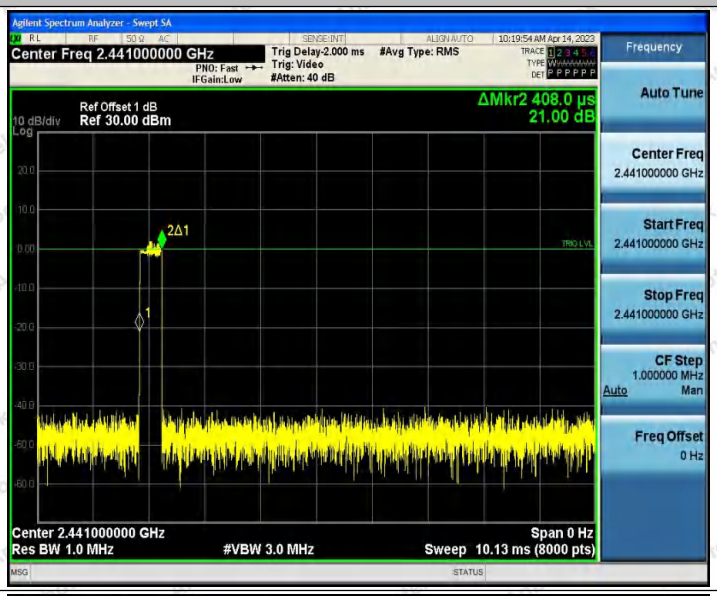


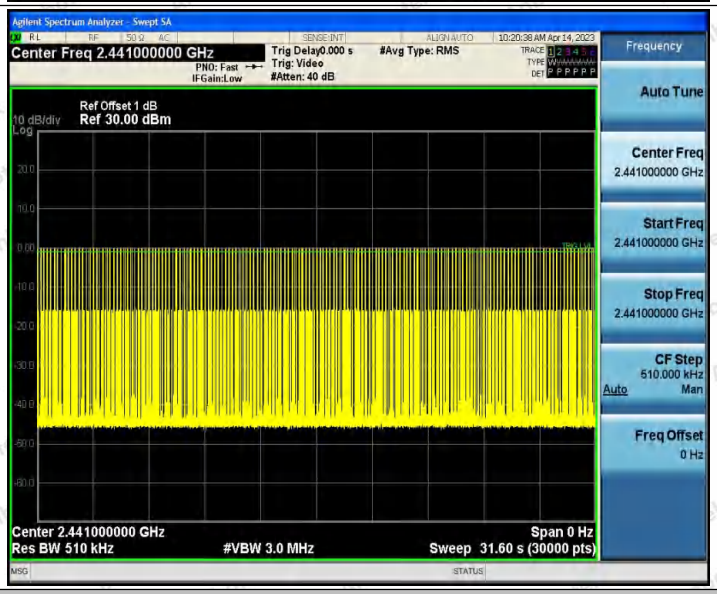


2DH5_Ant1_Hop

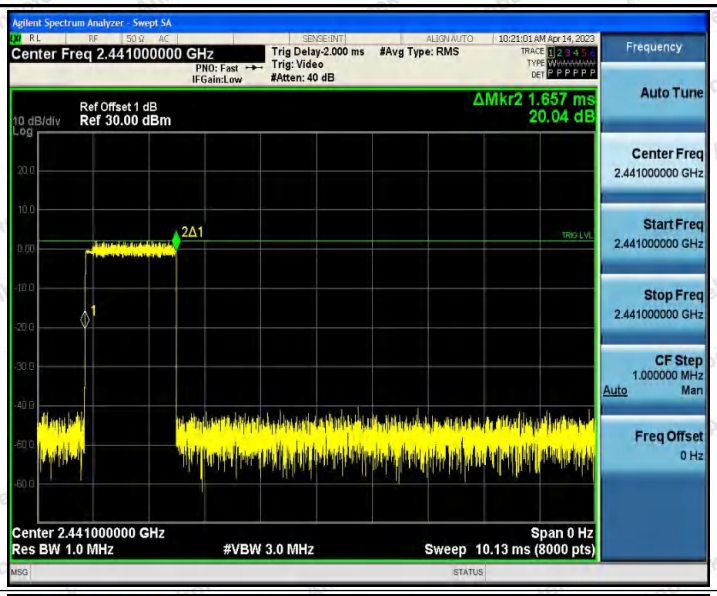


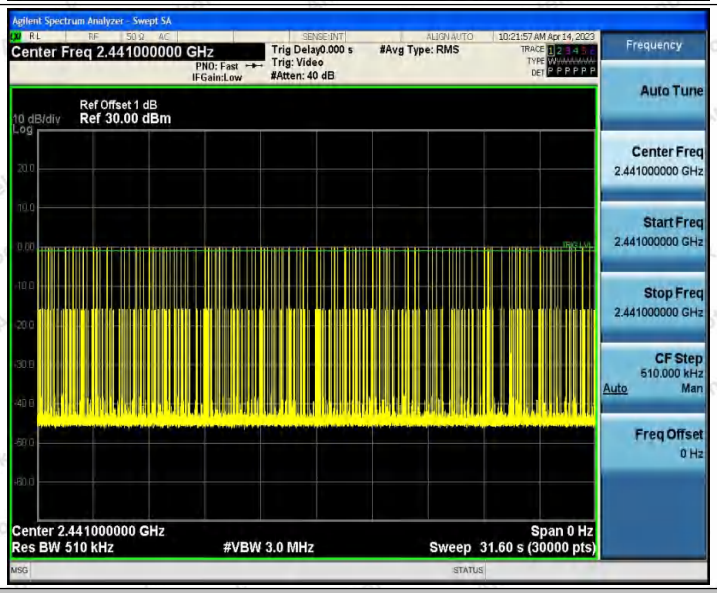
3DH1_Ant1_Hop



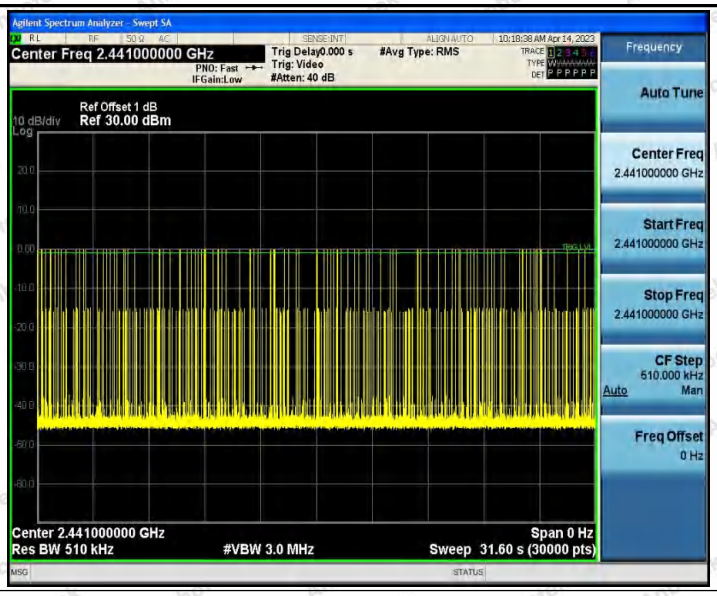


3DH3_Ant1_Hop





3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
10:18:38 AM Apr 14, 2023
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Log
Ref 30.00 dBm
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
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)

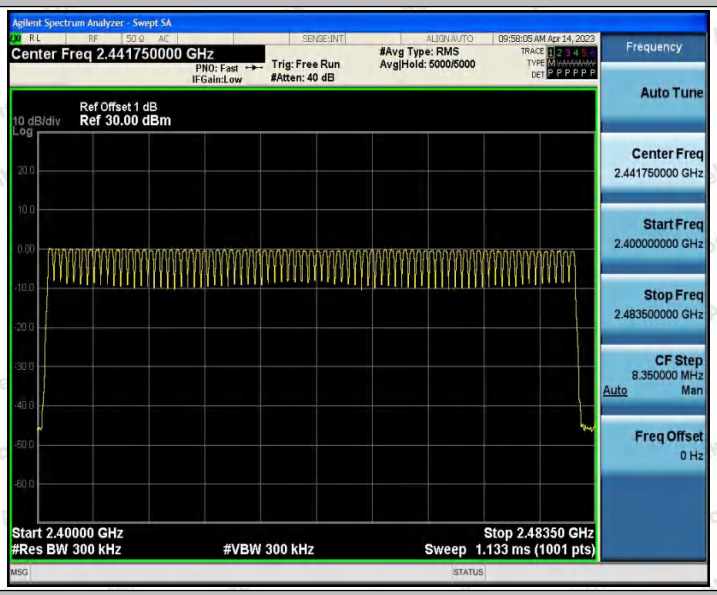
Appendix F: Number of hopping channels

Test Result

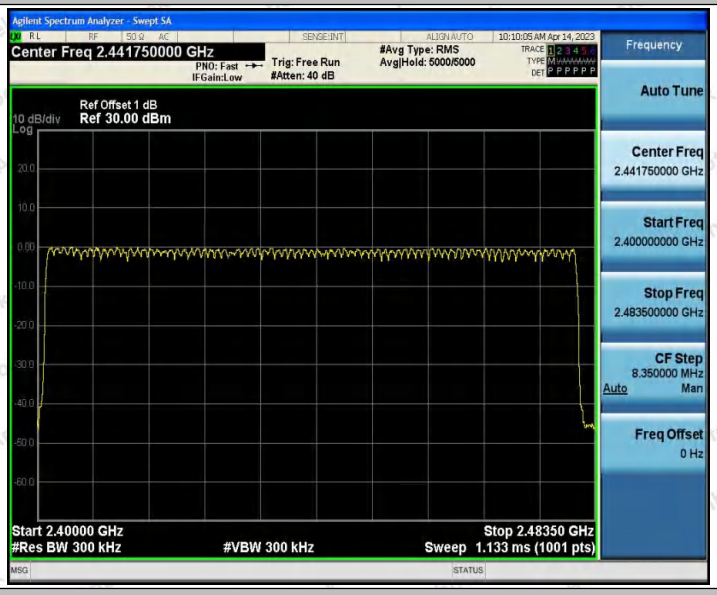
TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

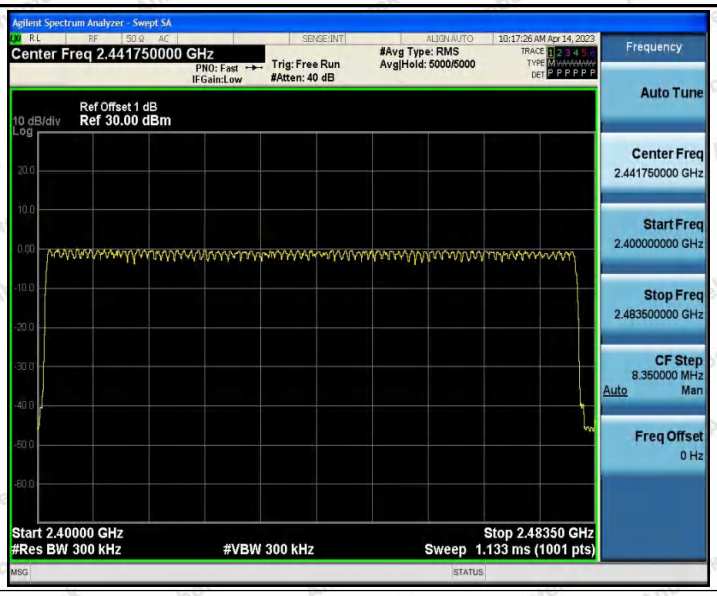
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 5000/5000
10:17:26 AM Apr 14, 2023
Ref Offset 1 dB
10 dB/div
Log
Ref 30.00 dBm
Start 2.40000 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 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

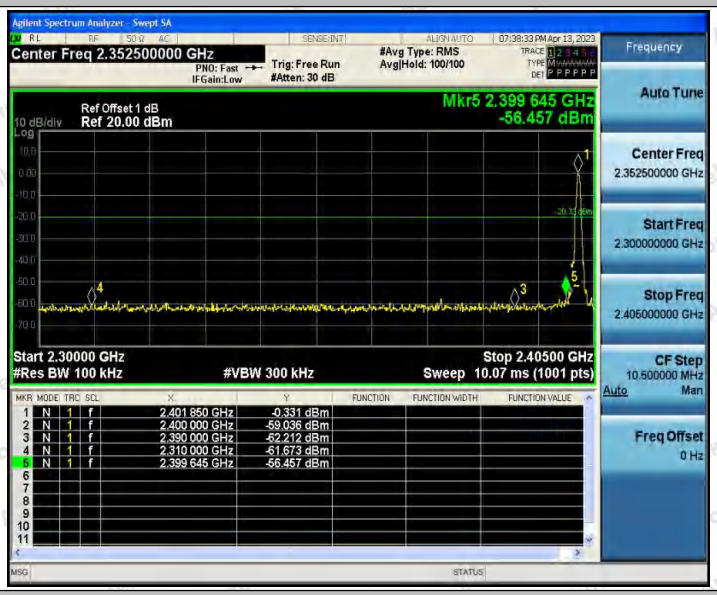
Appendix G: Band edge measurements

Test Result

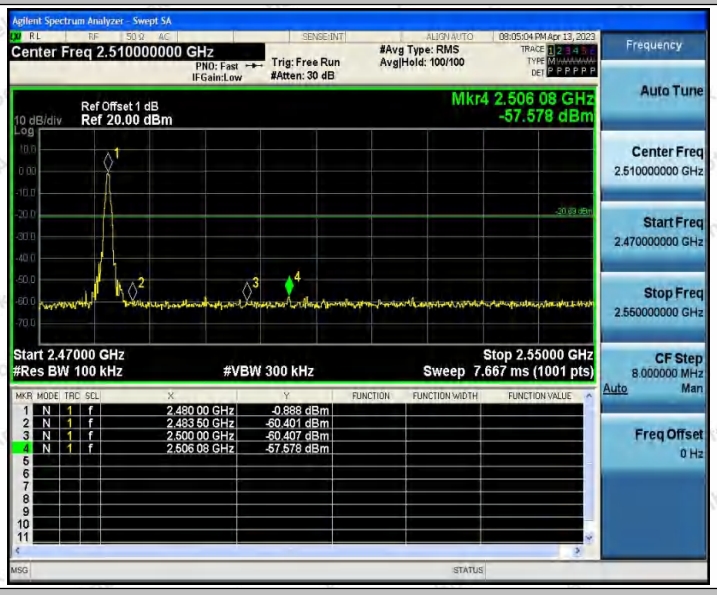
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-0.33	-56.46	≤-20.33	PASS
		High	2480	-0.89	-57.58	≤-20.89	PASS
		Low	Hop_2402	-0.38	-58.02	≤-20.38	PASS
		High	Hop_2480	-1.03	-57.38	≤-21.03	PASS
2DH5	Ant1	Low	2402	-2.43	-55.79	≤-22.43	PASS
		High	2480	-1.09	-57.93	≤-21.09	PASS
		Low	Hop_2402	-0.94	-58.33	≤-20.94	PASS
		High	Hop_2480	-3.33	-56.86	≤-23.33	PASS
3DH5	Ant1	Low	2402	-1.21	-51.29	≤-21.21	PASS
		High	2480	-2.40	-57.63	≤-22.4	PASS
		Low	Hop_2402	-1.19	-58.73	≤-21.19	PASS
		High	Hop_2480	-0.70	-56.93	≤-20.7	PASS

Test Graphs

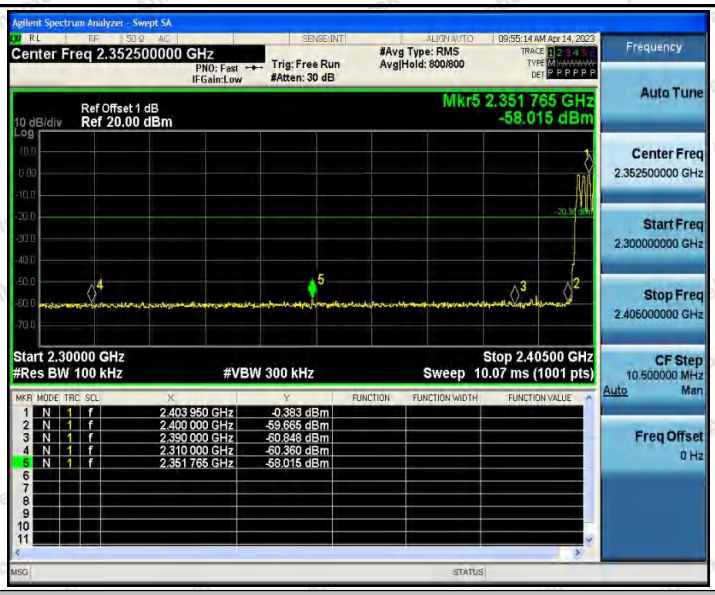
DH5_Ant1_Low_2402



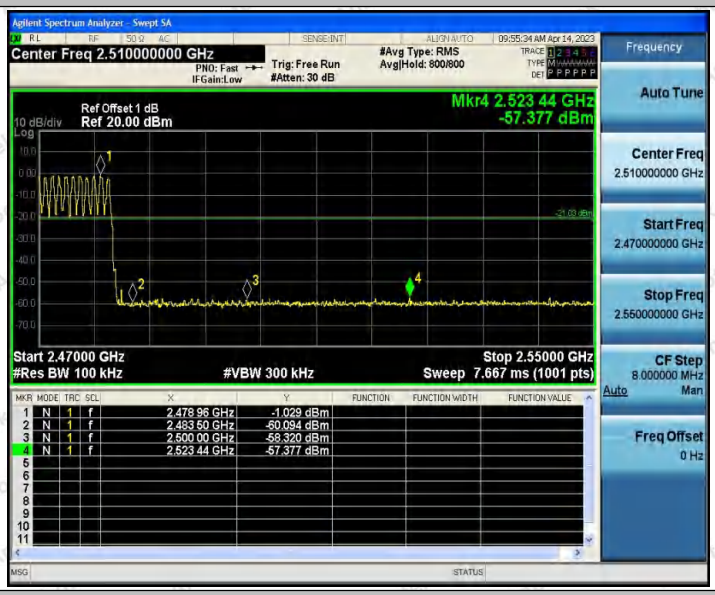
DH5_Ant1_High_2480



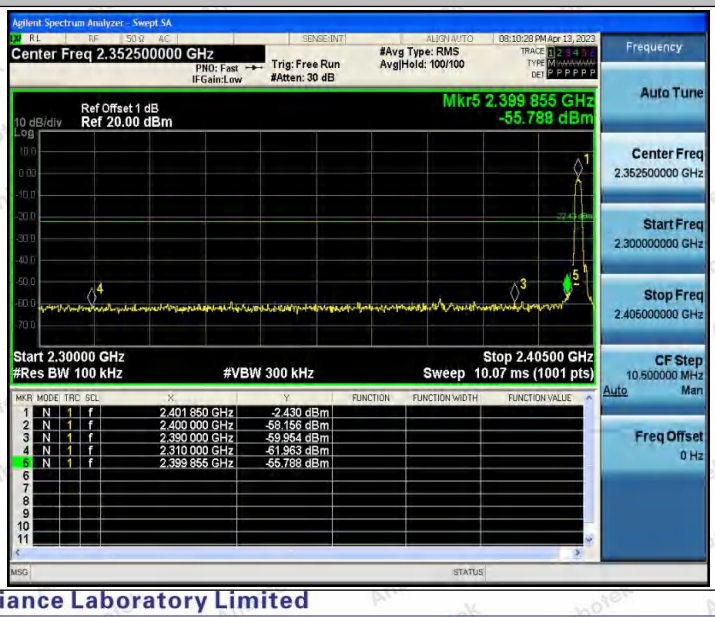
DH5_Ant1_Low_Hop_2402



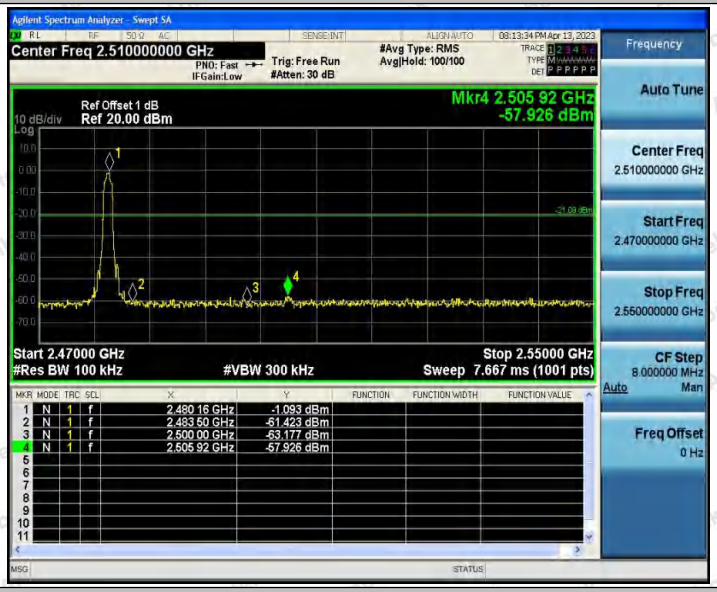
DH5_Ant1_High_Hop_2480



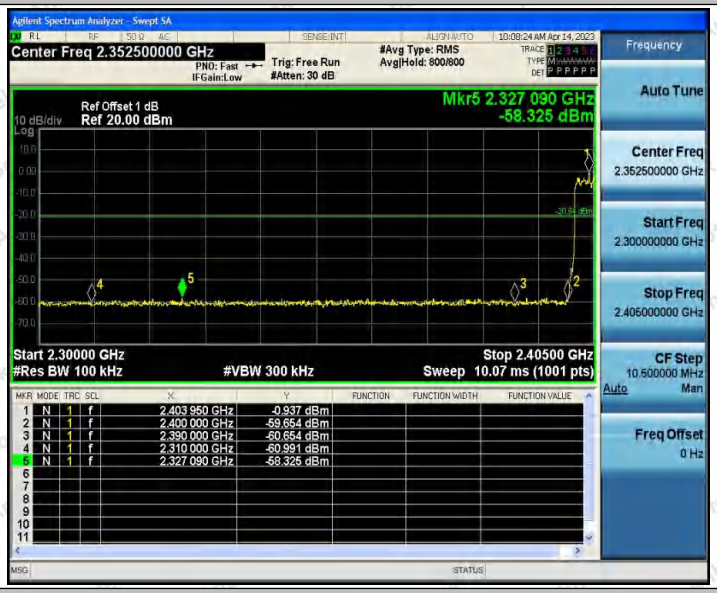
2DH5_Ant1_Low_2402



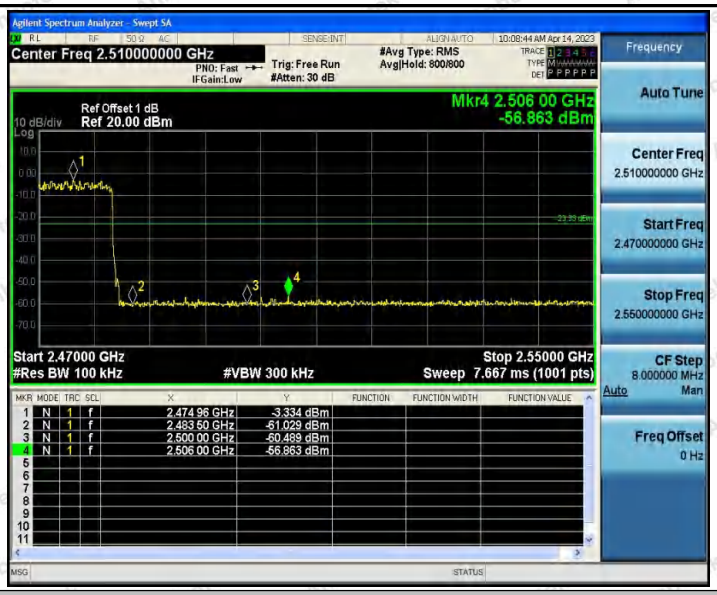
2DH5_Ant1_High_2480



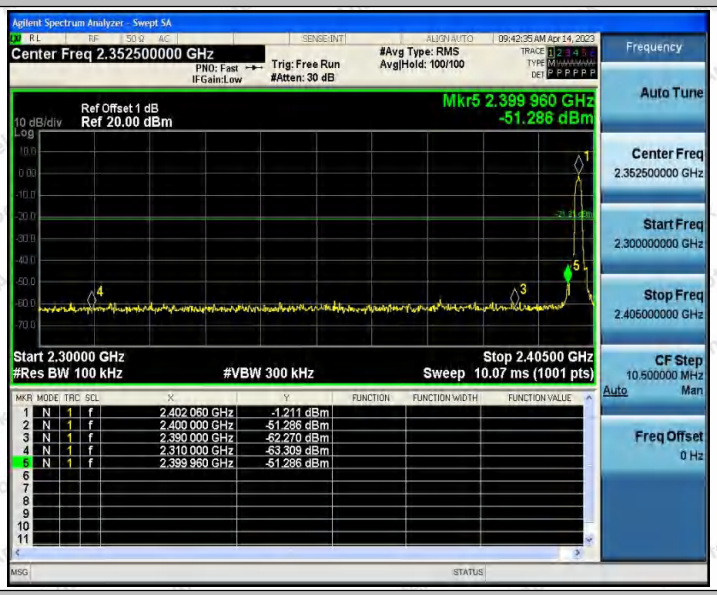
2DH5_Ant1_Low_Hop_2402



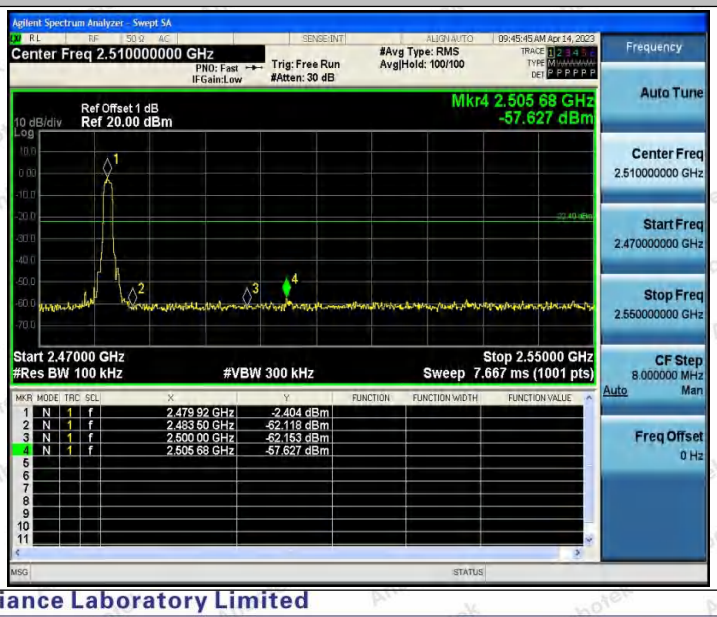
2DH5_Ant1_High_Hop_2480



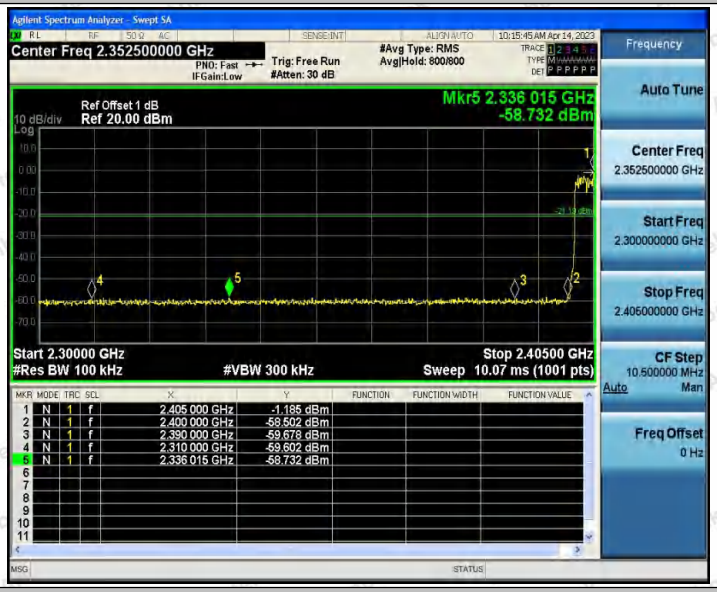
3DH5_Ant1_Low_2402



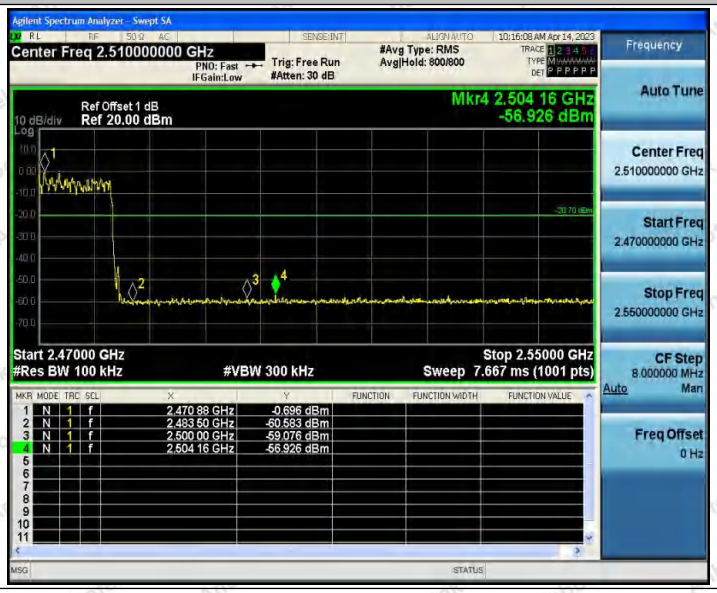
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

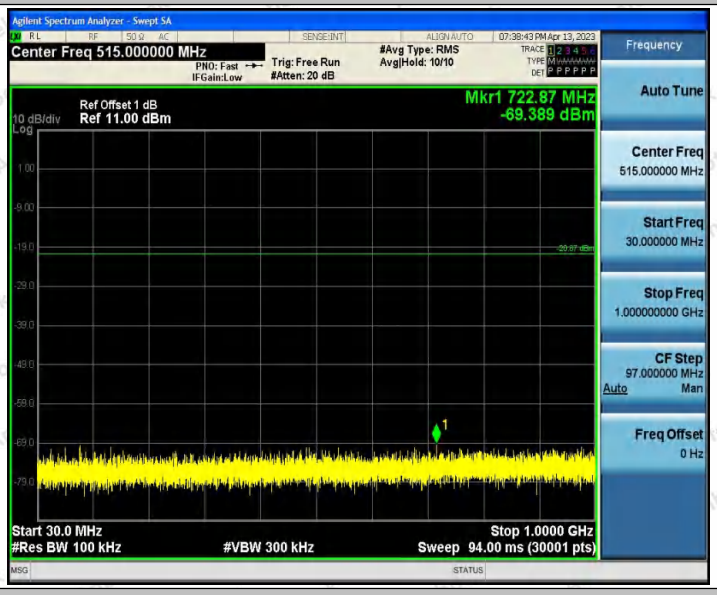
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-0.87	-0.87	---	PASS
			30~1000	-0.87	-69.39	≤-20.87	PASS
			1000~26500	-0.87	-43.01	≤-20.87	PASS
		2441	Reference	-1.36	-1.36	---	PASS
			30~1000	-1.36	-68.35	≤-21.36	PASS
			1000~26500	-1.36	-46.75	≤-21.36	PASS
		2480	Reference	-1.21	-1.21	---	PASS
			30~1000	-1.21	-68.96	≤-21.21	PASS
			1000~26500	-1.21	-48.42	≤-21.21	PASS
2DH5	Ant1	2402	Reference	-0.95	-0.95	---	PASS
			30~1000	-0.95	-67.41	≤-20.95	PASS
			1000~26500	-0.95	-46.63	≤-20.95	PASS
		2441	Reference	-1.28	-1.28	---	PASS
			30~1000	-1.28	-66.39	≤-21.28	PASS
			1000~26500	-1.28	-49.23	≤-21.28	PASS
		2480	Reference	-3.71	-3.71	---	PASS
			30~1000	-3.71	-68.83	≤-23.71	PASS
			1000~26500	-3.71	-48.15	≤-23.71	PASS
3DH5	Ant1	2402	Reference	-2.93	-2.93	---	PASS
			30~1000	-2.93	-67.55	≤-22.93	PASS
			1000~26500	-2.93	-46.95	≤-22.93	PASS
		2441	Reference	-3.35	-3.35	---	PASS
			30~1000	-3.35	-69.09	≤-23.35	PASS
			1000~26500	-3.35	-48.25	≤-23.35	PASS
		2480	Reference	-2.84	-2.84	---	PASS
			30~1000	-2.84	-69.49	≤-22.84	PASS
			1000~26500	-2.84	-48.19	≤-22.84	PASS

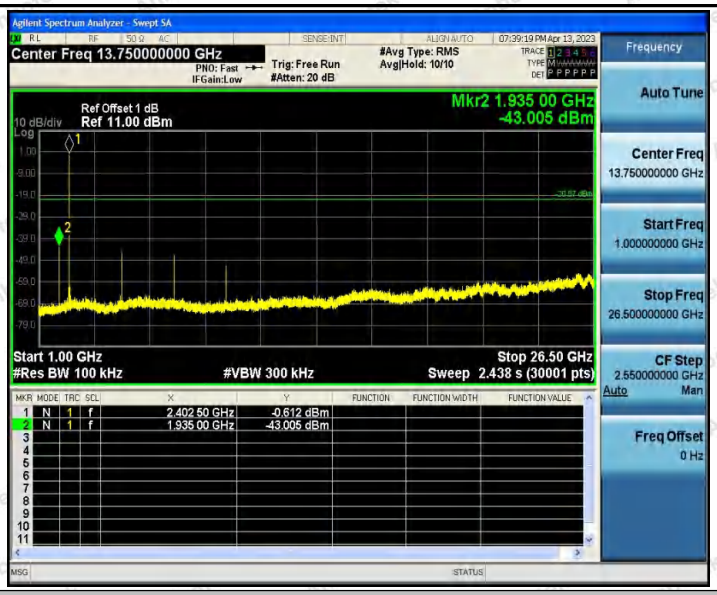
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

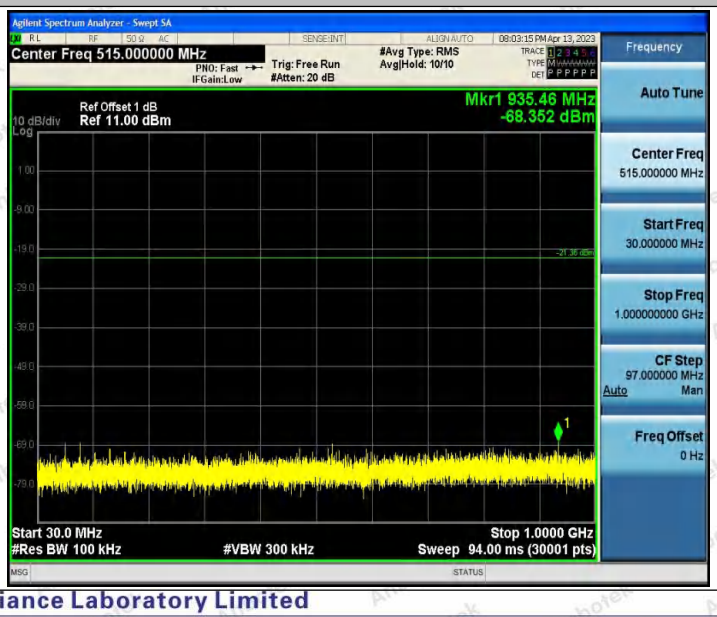


DH5_Ant1_2402_1000~26500

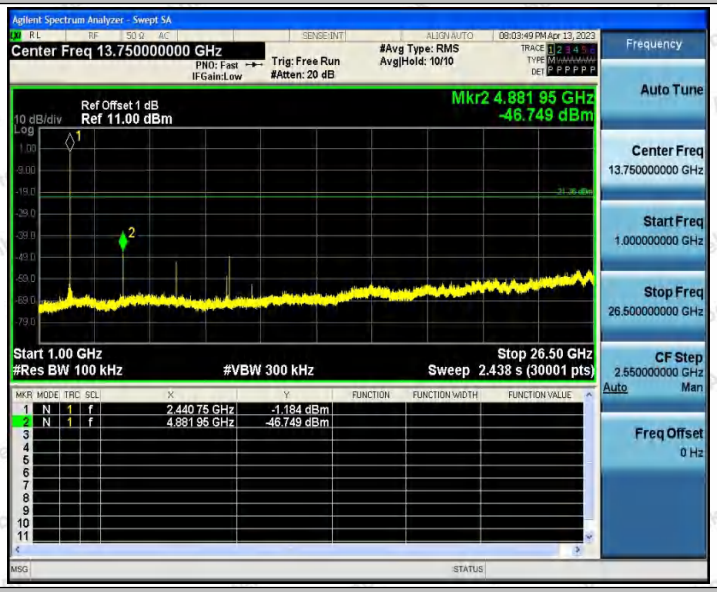


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

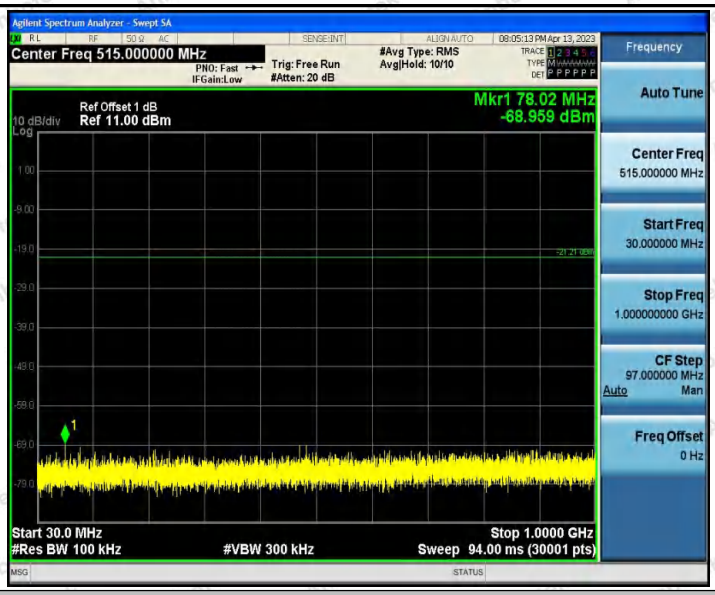


DH5_Ant1_2441_1000~26500

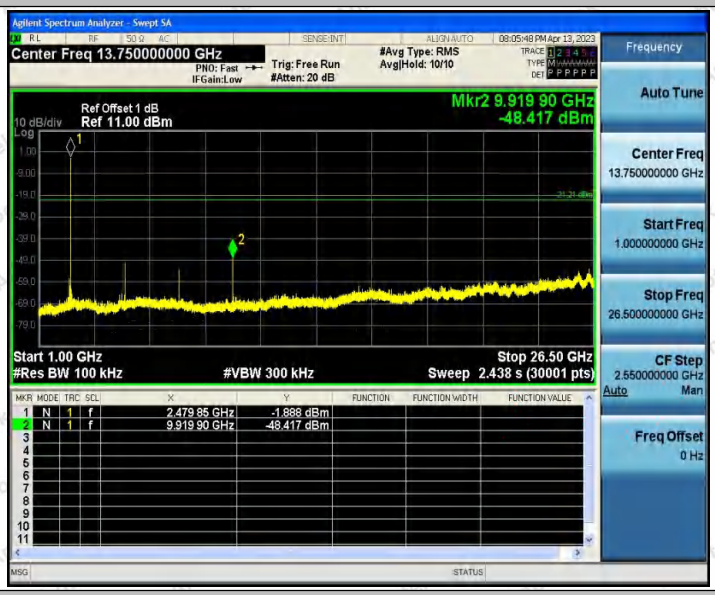


DH5_Ant1_2480_0~Reference

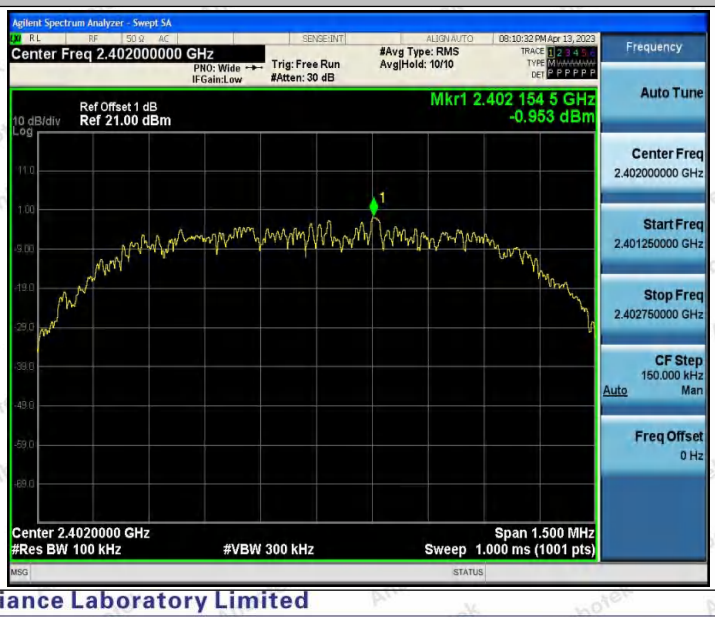
DH5_Ant1_2480_30~1000



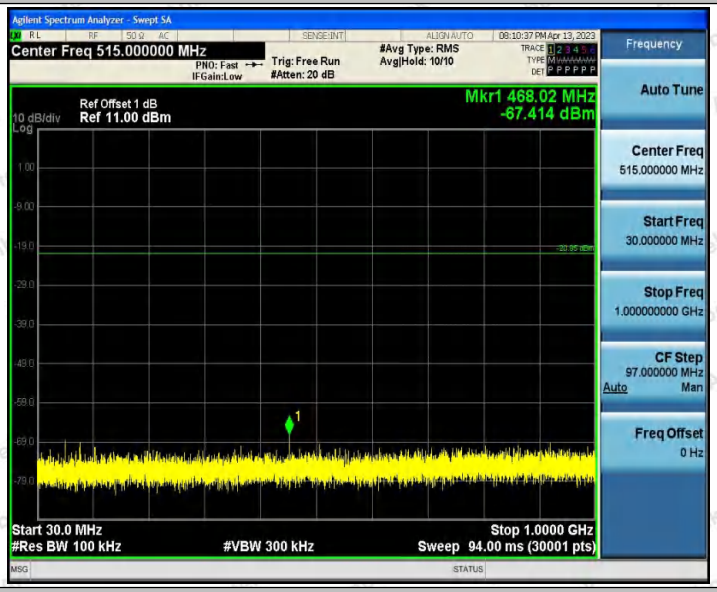
DH5_Ant1_2480_1000~26500



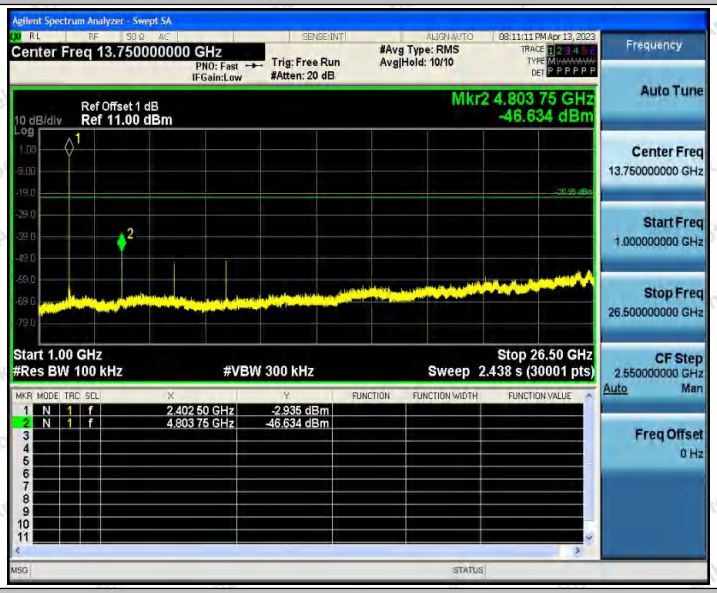
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

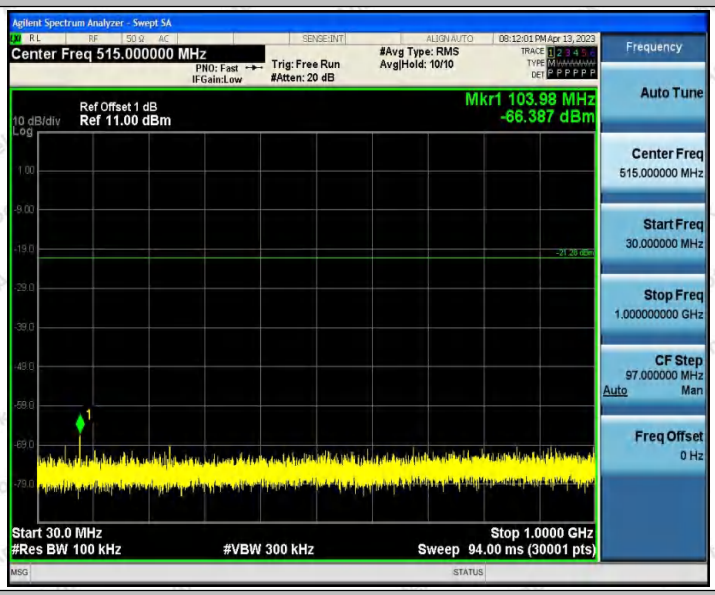


2DH5_Ant1_2402_1000~26500

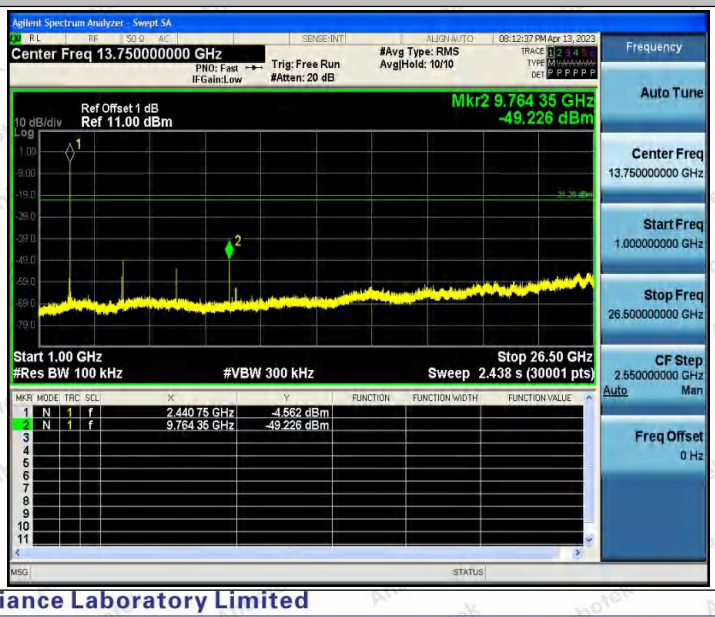


2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000

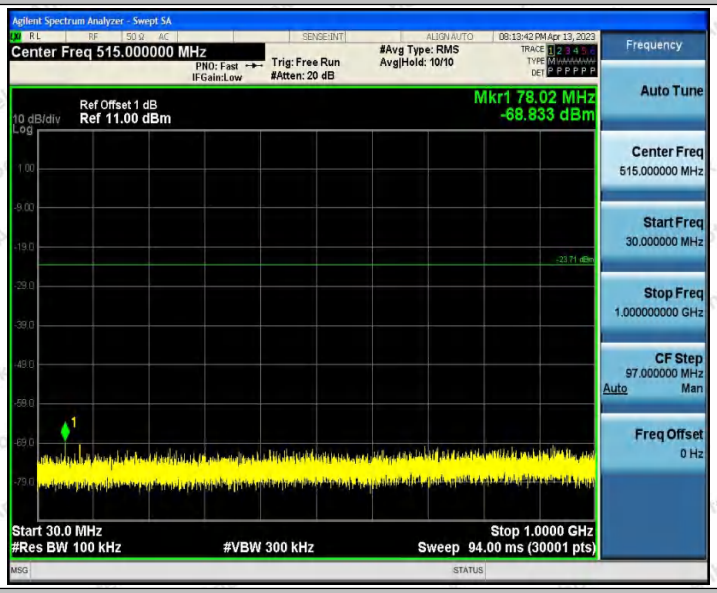


2DH5_Ant1_2441_1000~26500

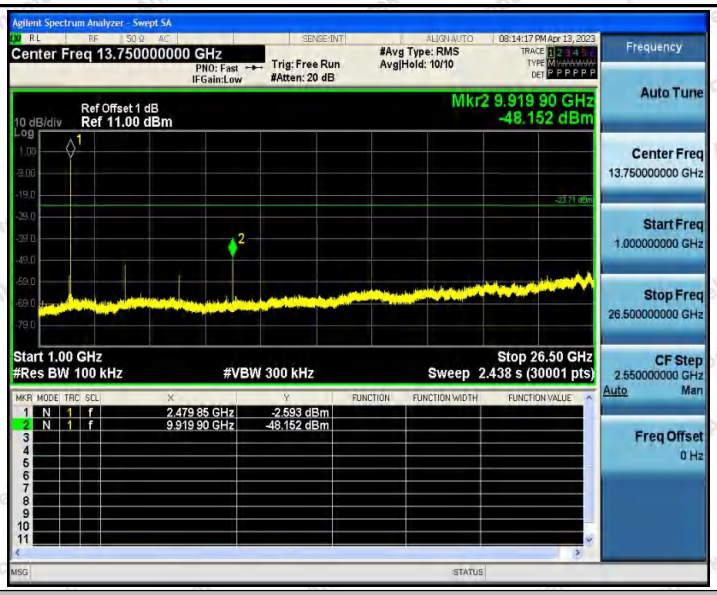


2DH5_Ant1_2480_0~Reference

2DH5_Ant1_2480_30~1000

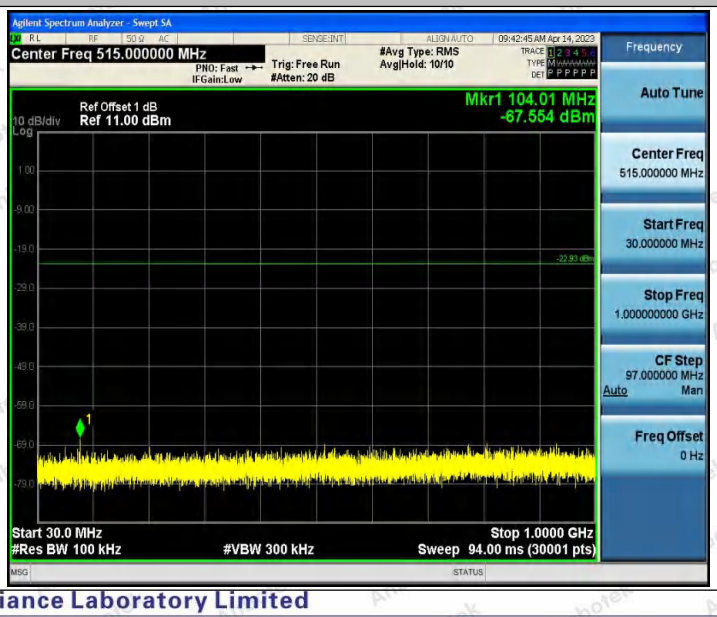


2DH5_Ant1_2480_1000~26500

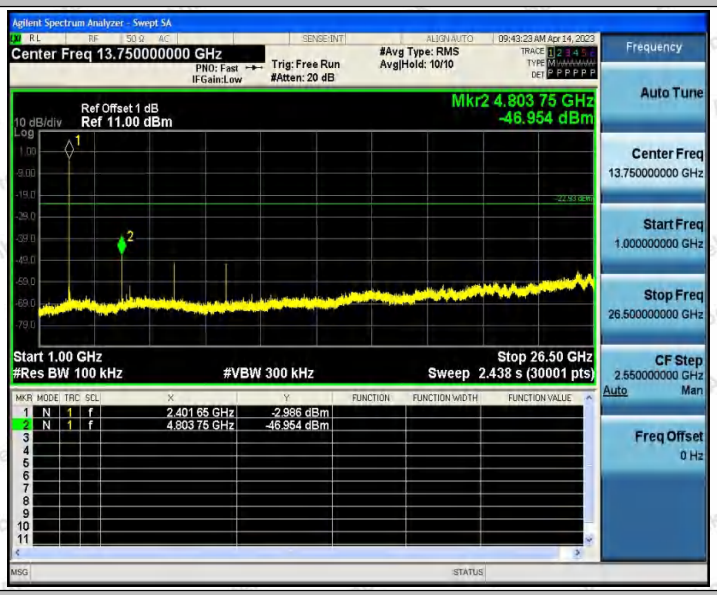


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

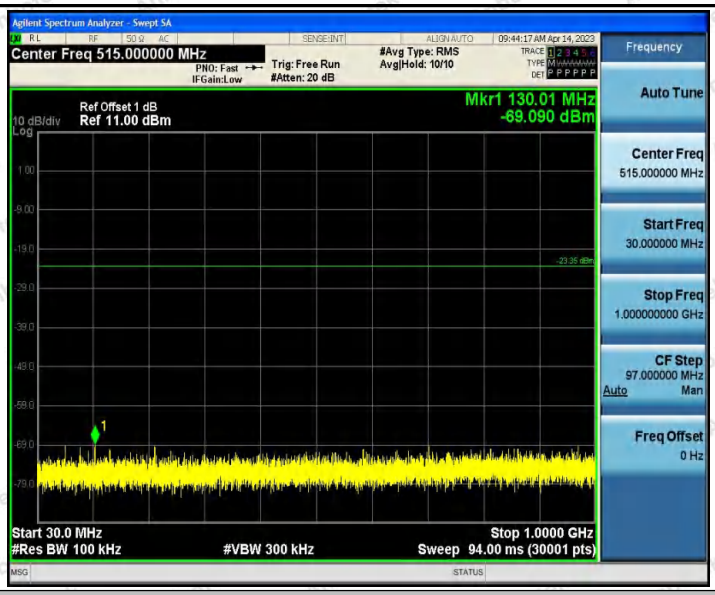


3DH5_Ant1_2402_1000~26500

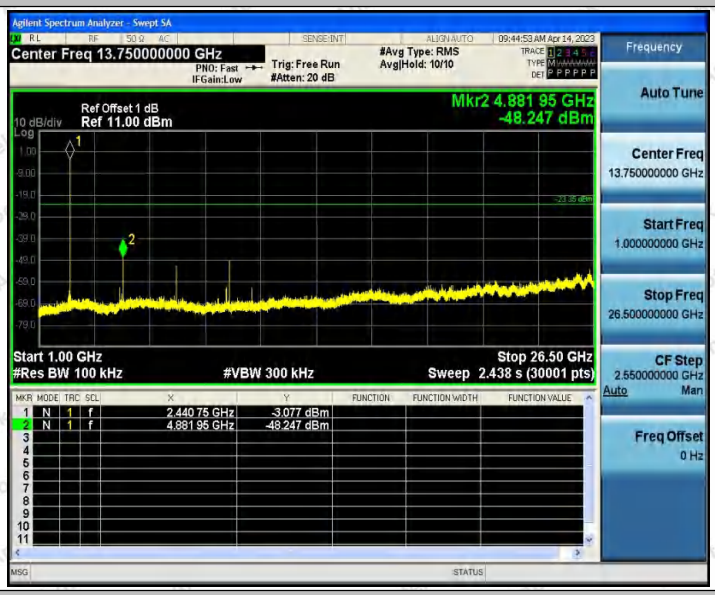


3DH5_Ant1_2441_0~Reference

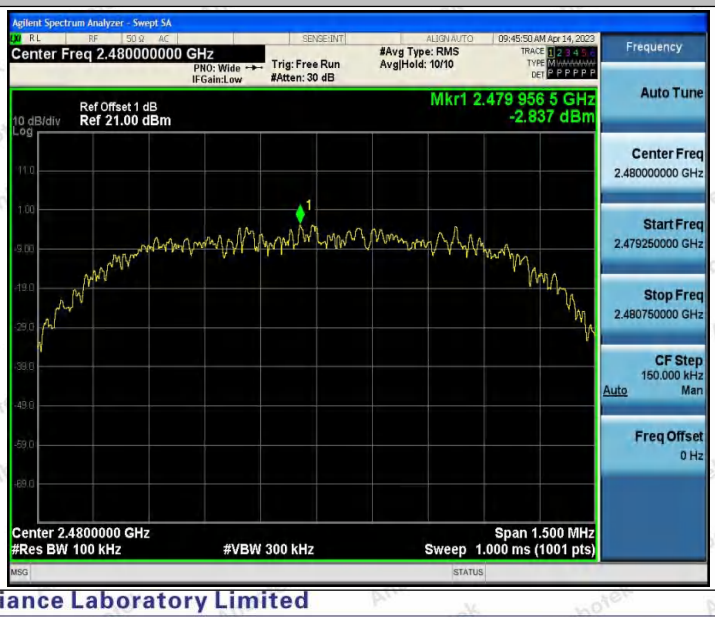
3DH5_Ant1_2441_30~1000



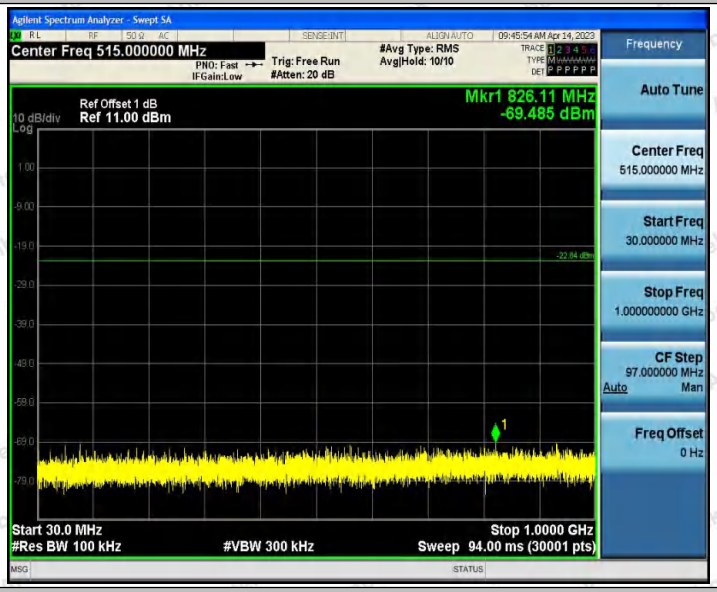
3DH5_Ant1_2441_1000~26500



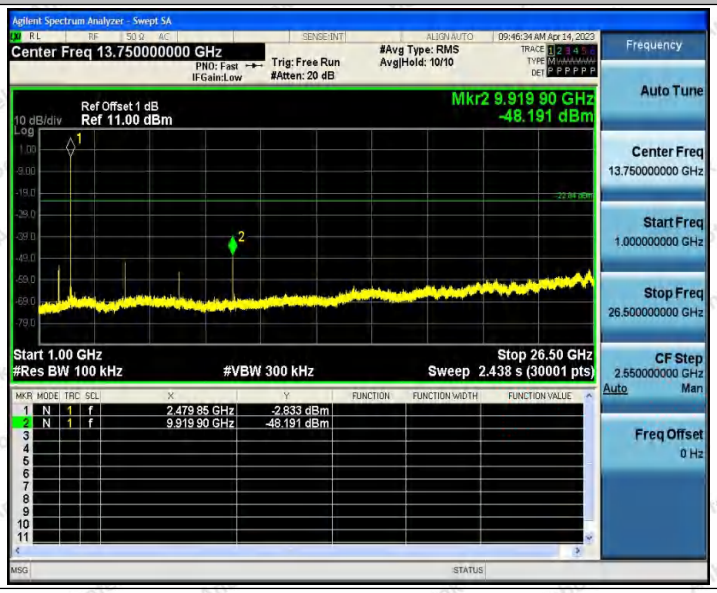
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



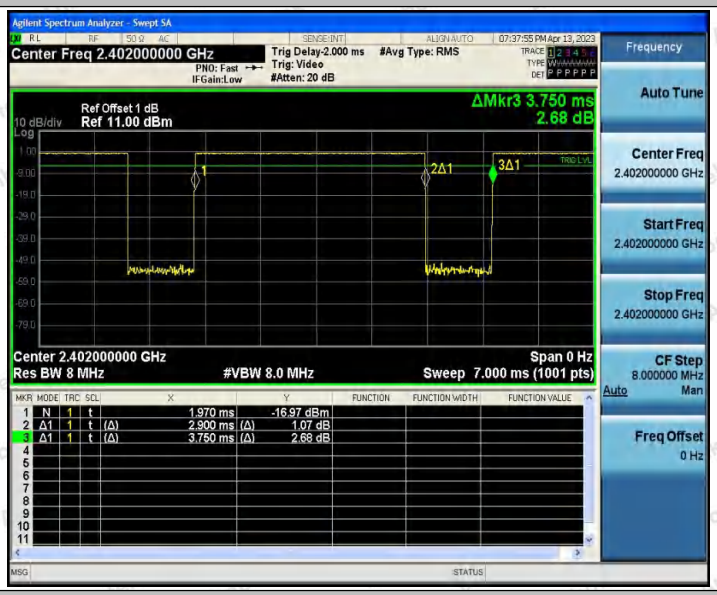
Appendix I: Duty Cycle

Test Result

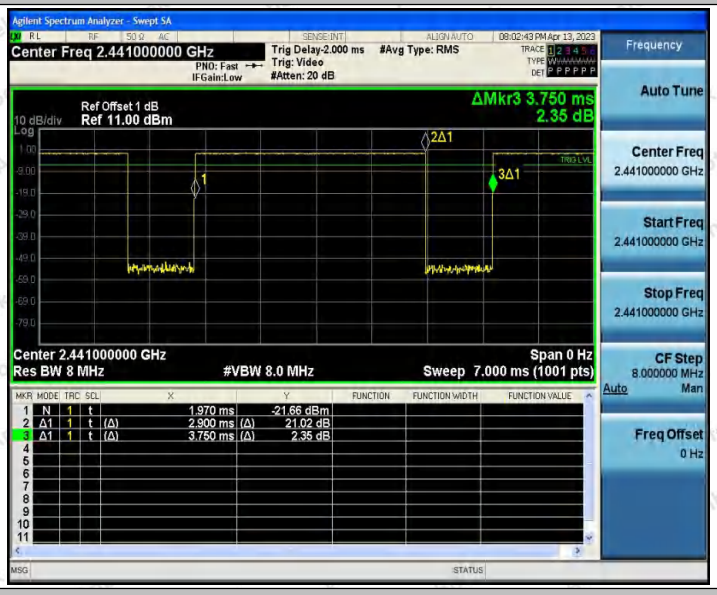
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.90	3.75	77.33	1.12
		2441	2.90	3.75	77.33	1.12
		2480	2.90	3.76	77.13	1.13
2DH5	Ant1	2402	2.90	3.75	77.33	1.12
		2441	2.90	3.75	77.33	1.12
		2480	2.90	3.75	77.33	1.12
3DH5	Ant1	2402	2.91	3.75	77.60	1.10
		2441	2.91	3.75	77.60	1.10
		2480	2.91	3.76	77.39	1.11

Test Graphs

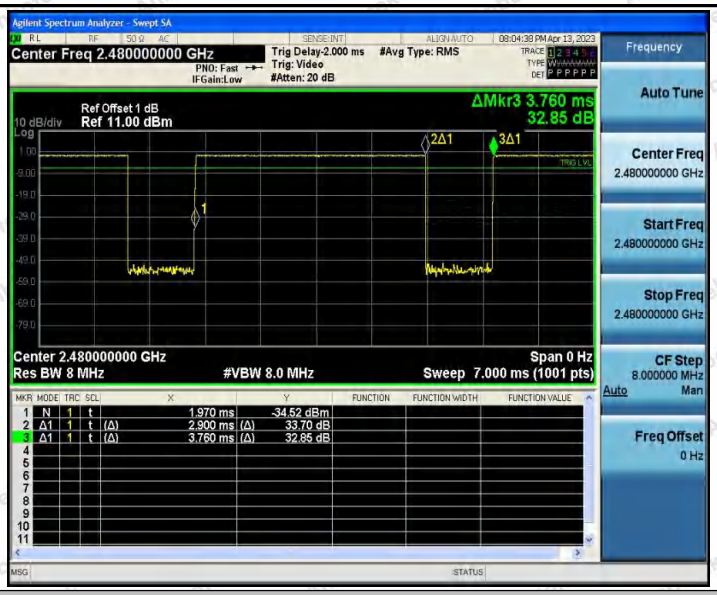
DH5_Ant1_2402



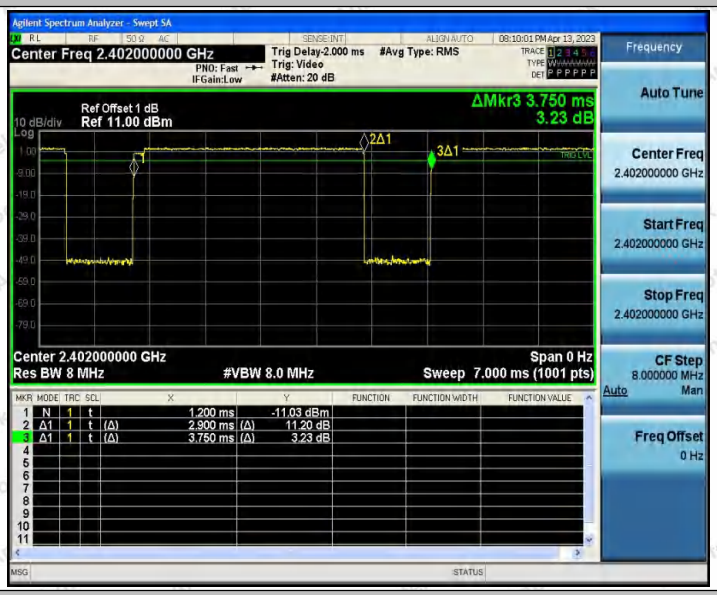
DH5_Ant1_2441



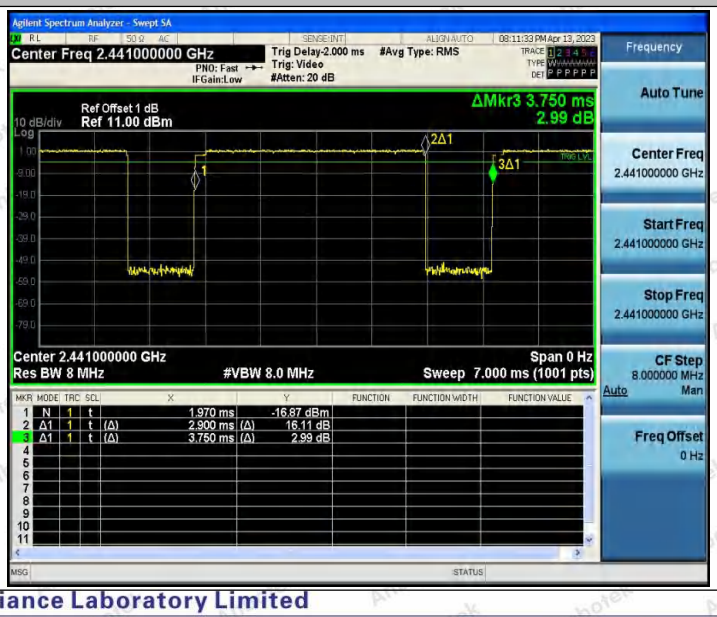
DH5_Ant1_2480



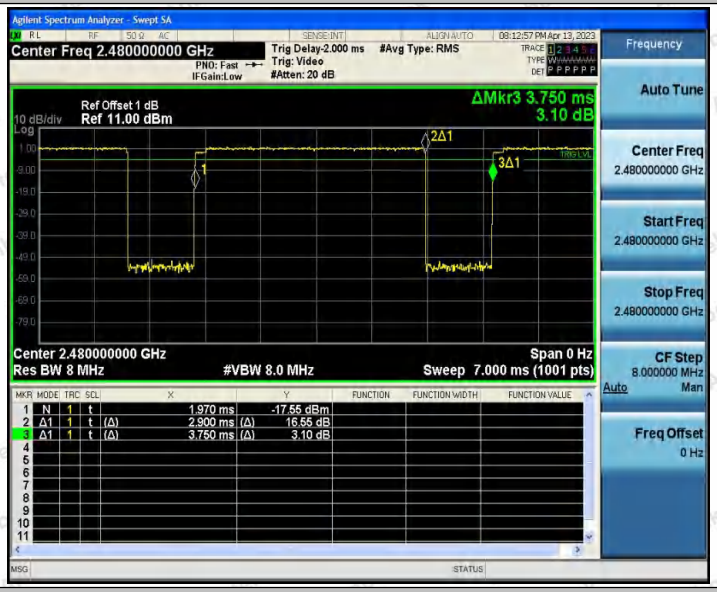
2DH5_Ant1_2402



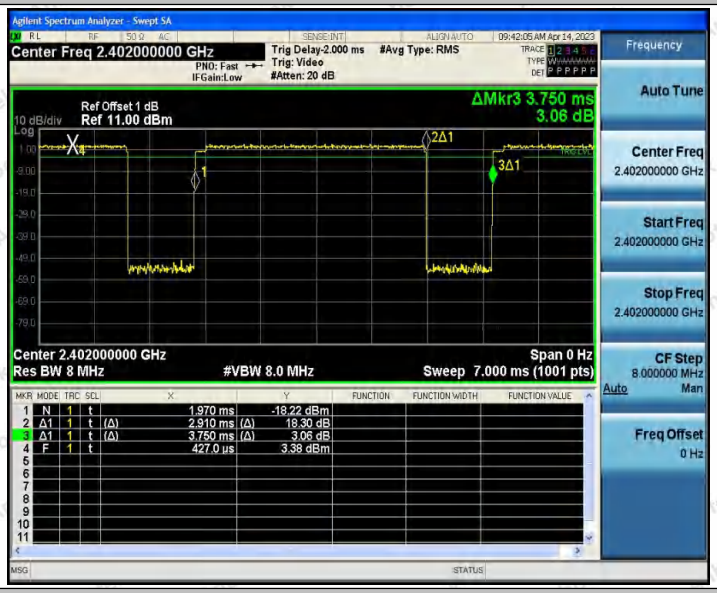
2DH5_Ant1_2441



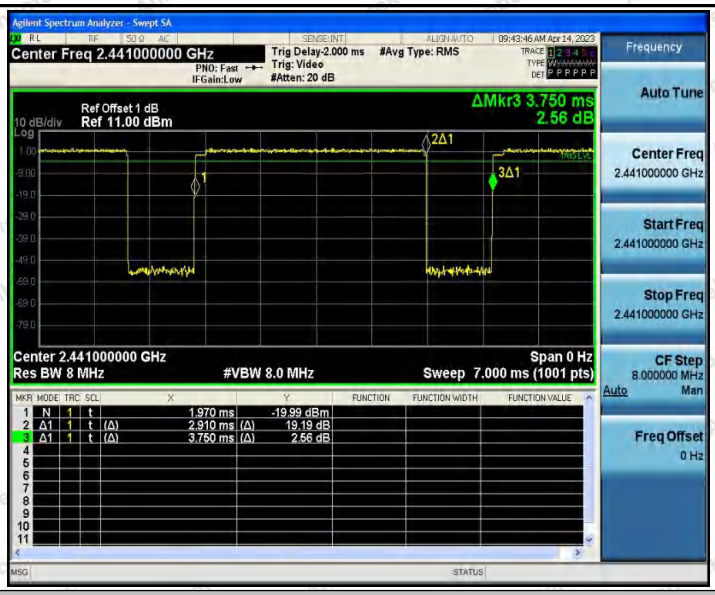
2DH5_Ant1_2480



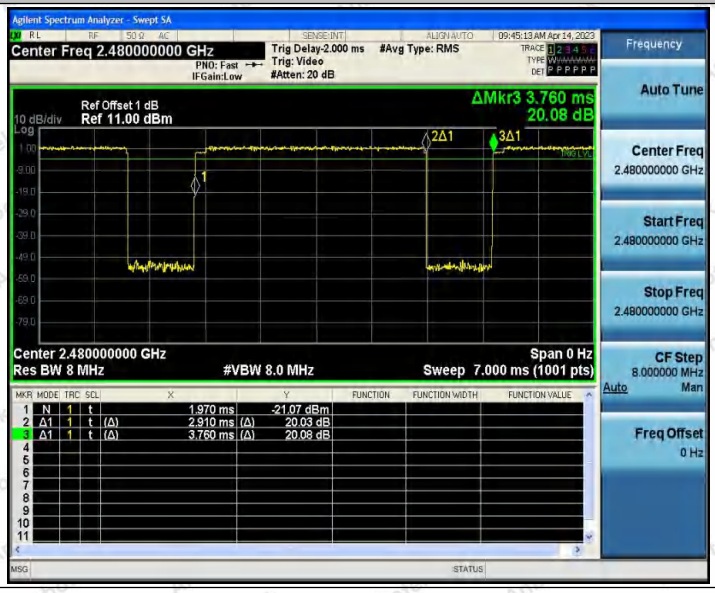
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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