Appendix Test Data

Report No.:	18220WC30131301	Test Sample No.:	1-2-2
Start Test Date:	2023.06.29	Finish Test Date:	2023.06.30
Test Engineer:	Rick Luo	Auditor:	Edward.Pan
Temperature:	26.0℃	Relative Humidity:	49%
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	0.951	2401.532	2402.483	---	---
		2441	0.951	2440.529	2441.480	---	---
		2480	0.933	2479.529	2480.462	---	---
2DH5	Ant1	2402	1.326	2401.328	2402.654	---	---
		2441	1.329	2440.325	2441.654	---	---
		2480	1.338	2479.325	2480.663	---	---
3DH5	Ant1	2402	1.311	2401.340	2402.651	---	---
		2441	1.332	2440.325	2441.657	---	---
		2480	1.302	2479.352	2480.654	---	---

Test Graphs

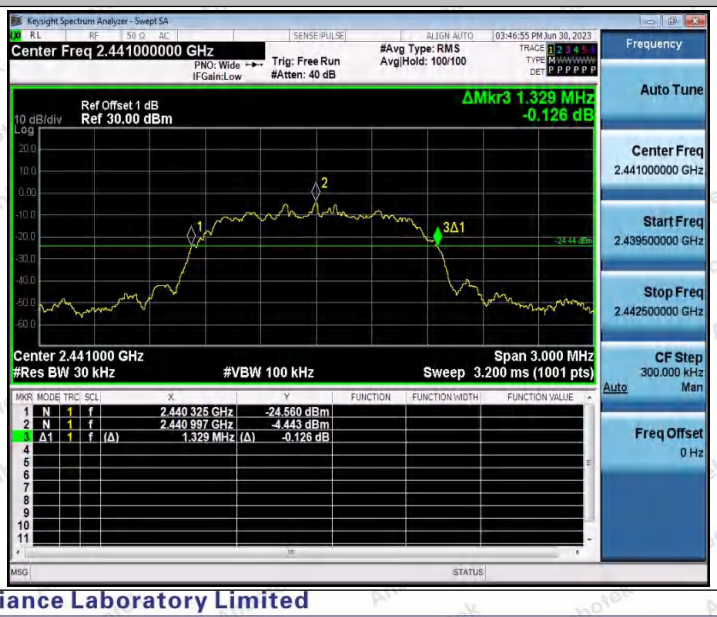
DH5_Ant1_2402

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	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.83768	2401.5744	2402.4120	---	---
		2441	0.85262	2440.5683	2441.4209	---	---
		2480	0.83149	2479.5792	2480.4107	---	---
2DH5	Ant1	2402	1.1818	2401.4025	2402.5843	---	---
		2441	1.1884	2440.4019	2441.5903	---	---
		2480	1.1836	2479.4018	2480.5854	---	---
3DH5	Ant1	2402	1.1844	2401.4026	2402.5870	---	---
		2441	1.1867	2440.4031	2441.5898	---	---
		2480	1.1819	2479.4102	2480.5921	---	---

Test Graphs

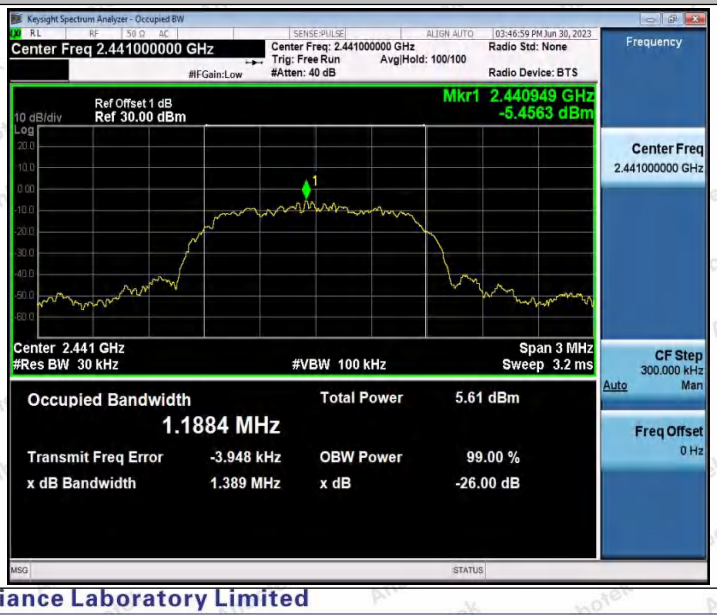
DH5_Ant1_2402

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	-1.06	≤20.97	PASS
		2441	-1.13	≤20.97	PASS
		2480	-1.74	≤20.97	PASS
2DH5	Ant1	2402	1.35	≤20.97	PASS
		2441	1.21	≤20.97	PASS
		2480	0.57	≤20.97	PASS
3DH5	Ant1	2402	2.02	≤20.97	PASS
		2441	1.85	≤20.97	PASS
		2480	1.12	≤20.97	PASS

Test Graphs

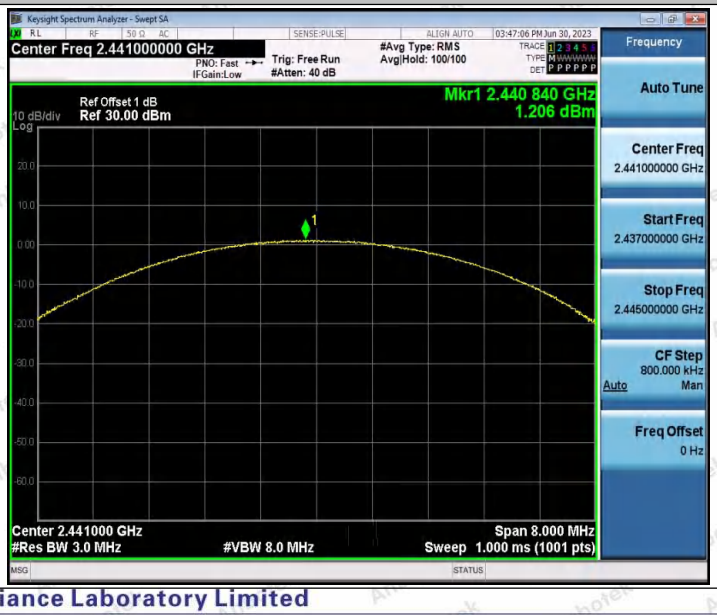
DH5_Ant1_2402

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	1.000	≥0.951	PASS
2DH5	Ant1	Hop	0.988	≥0.892	PASS
3DH5	Ant1	Hop	0.996	≥0.888	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop

Keysight 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
04:16:34 PM Jun 30, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
ΔMkr2 996 kHz
-0.017 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

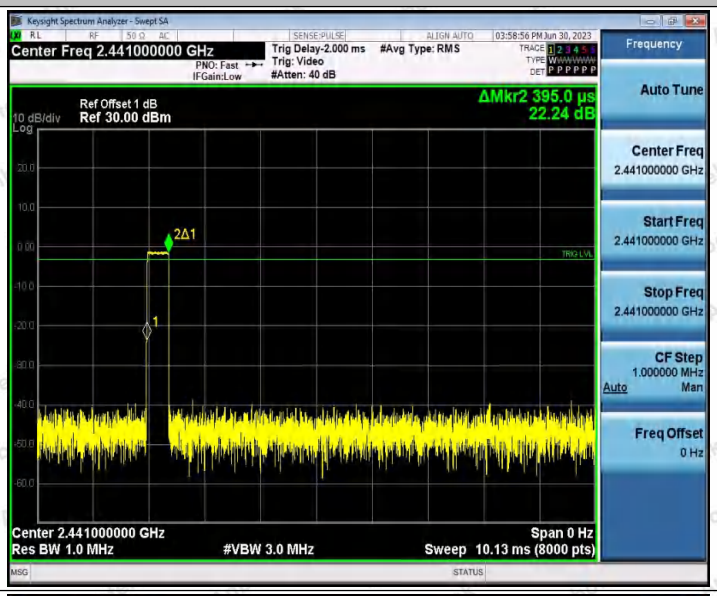
Appendix E: Time of occupancy

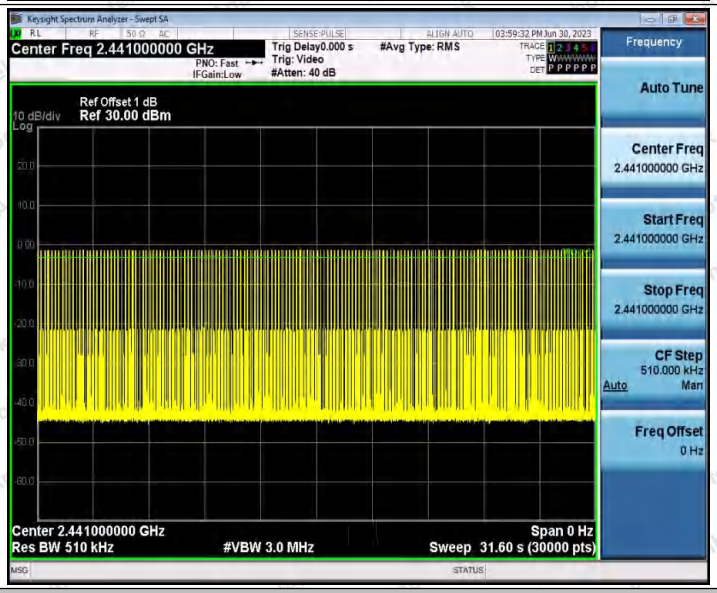
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.395	313	0.124	≤0.4	PASS
DH3	Ant1	Hop	1.650	146	0.241	≤0.4	PASS
DH5	Ant1	Hop	2.899	104	0.301	≤0.4	PASS
2DH1	Ant1	Hop	0.404	319	0.129	≤0.4	PASS
2DH3	Ant1	Hop	1.658	157	0.26	≤0.4	PASS
2DH5	Ant1	Hop	2.904	116	0.337	≤0.4	PASS
3DH1	Ant1	Hop	0.405	317	0.128	≤0.4	PASS
3DH3	Ant1	Hop	1.656	162	0.268	≤0.4	PASS
3DH5	Ant1	Hop	2.907	108	0.314	≤0.4	PASS

Test Graphs

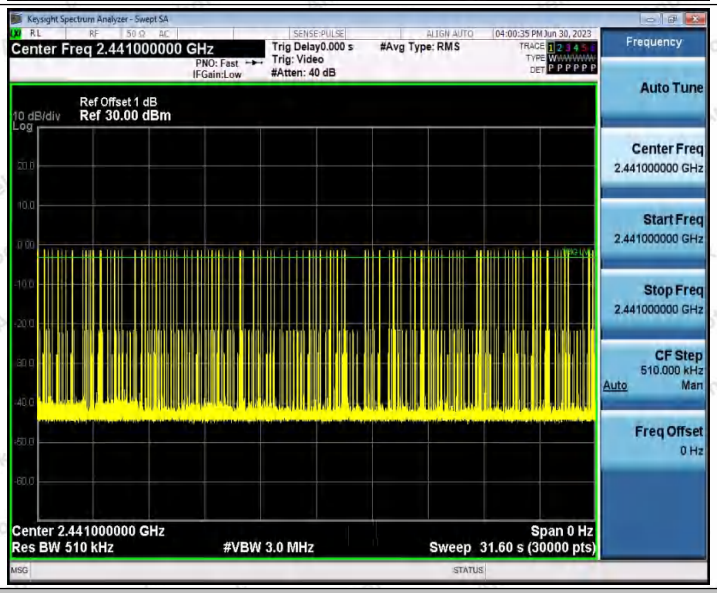
DH1_Ant1_Hop





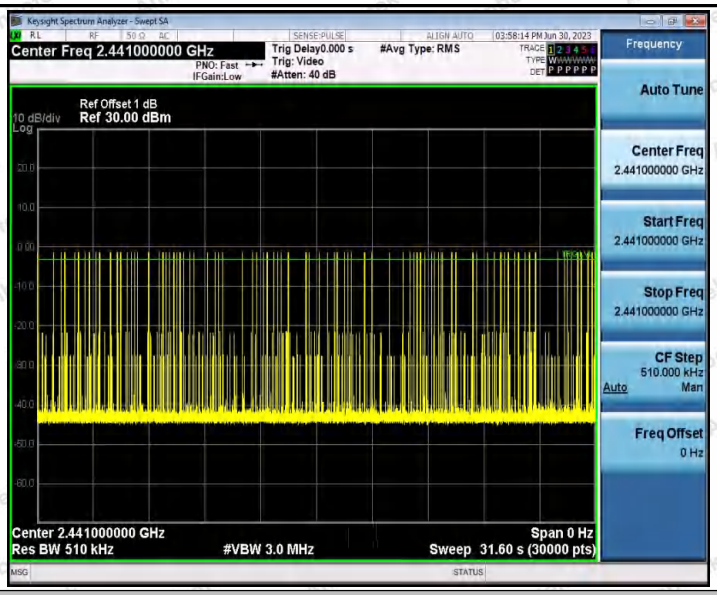
DH3_Ant1_Hop

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.650 ms
21.36 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 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

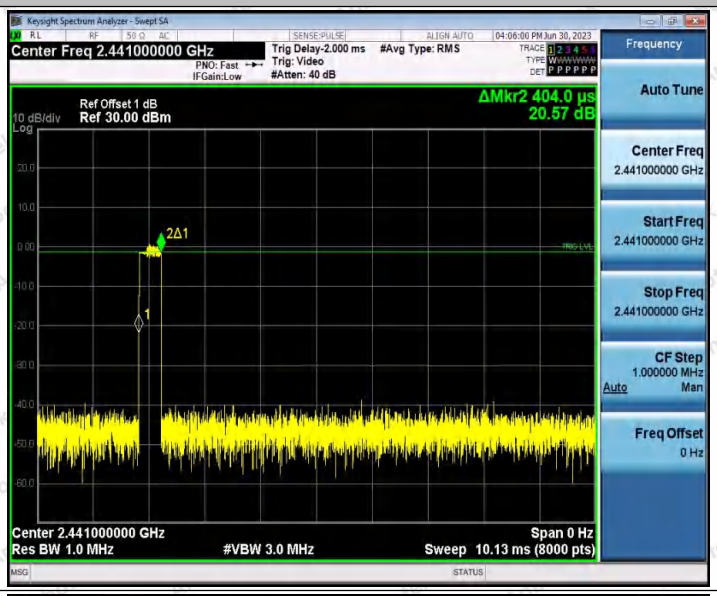

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq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

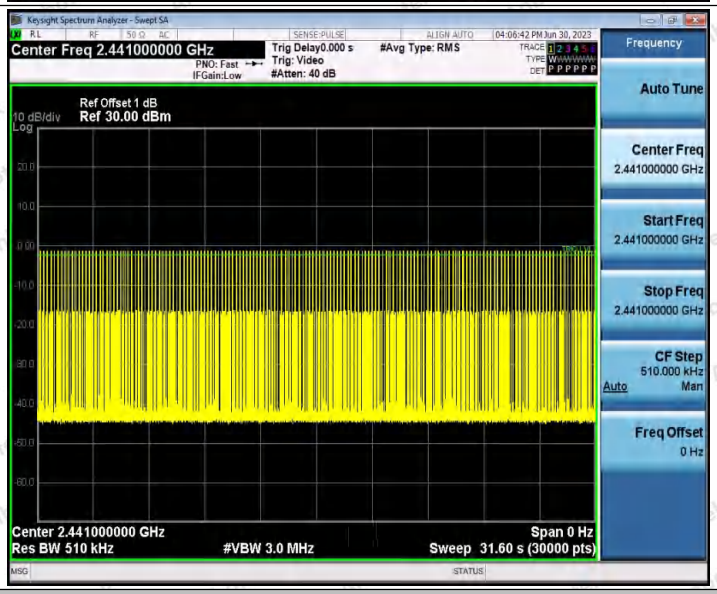
DH5_Ant1_Hop

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.899 ms
21.46 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 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

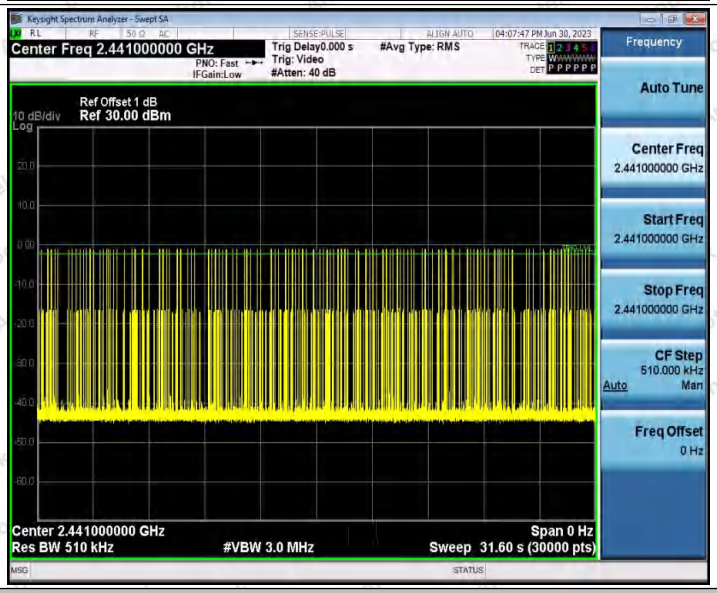


2DH1_Ant1_Hop

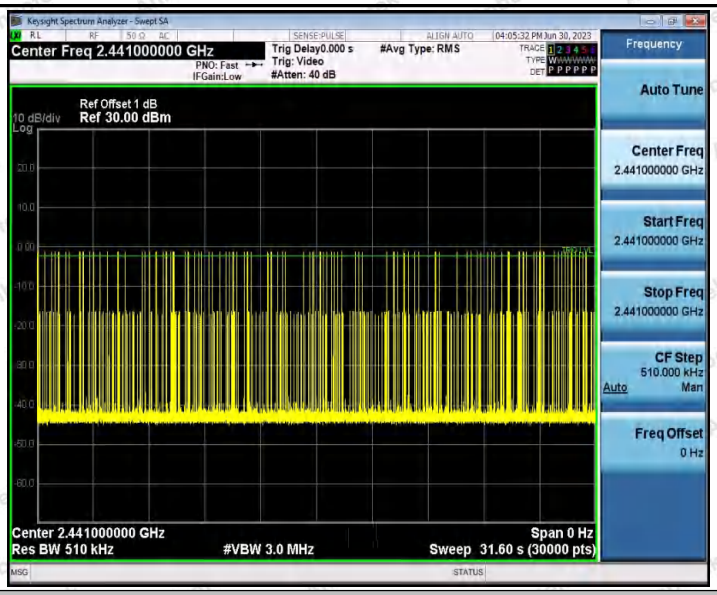




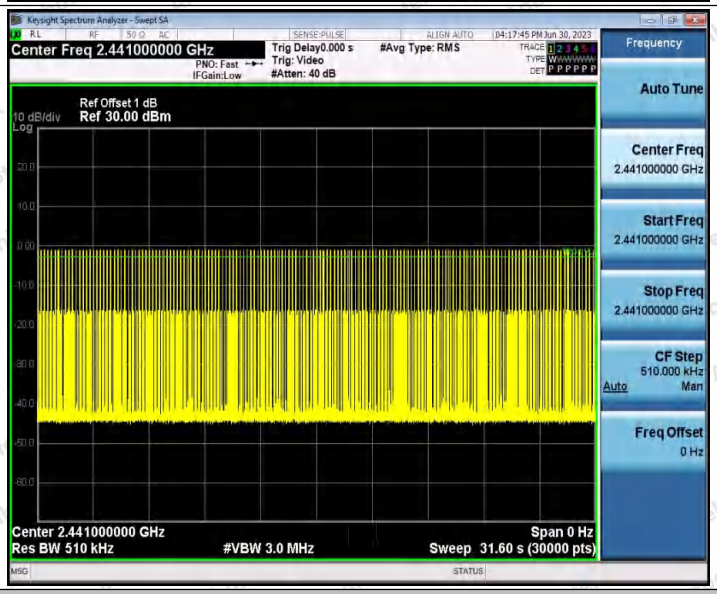
2DH3_Ant1_Hop



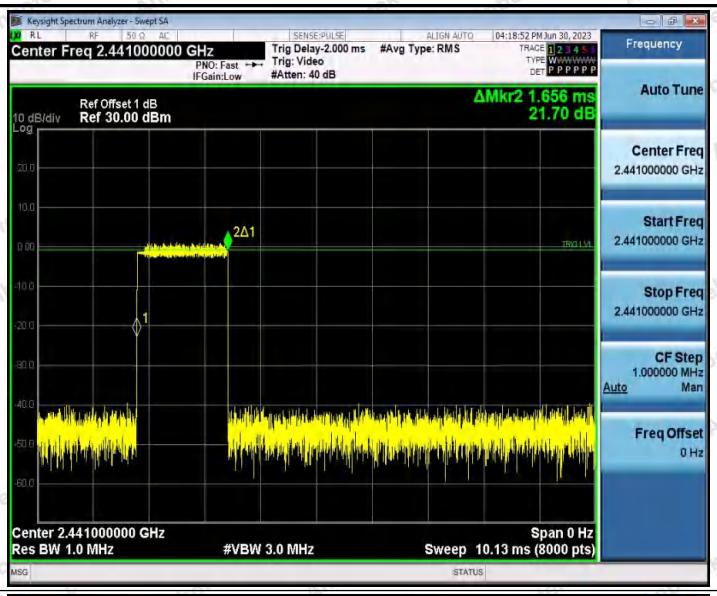
2DH5_Ant1_Hop

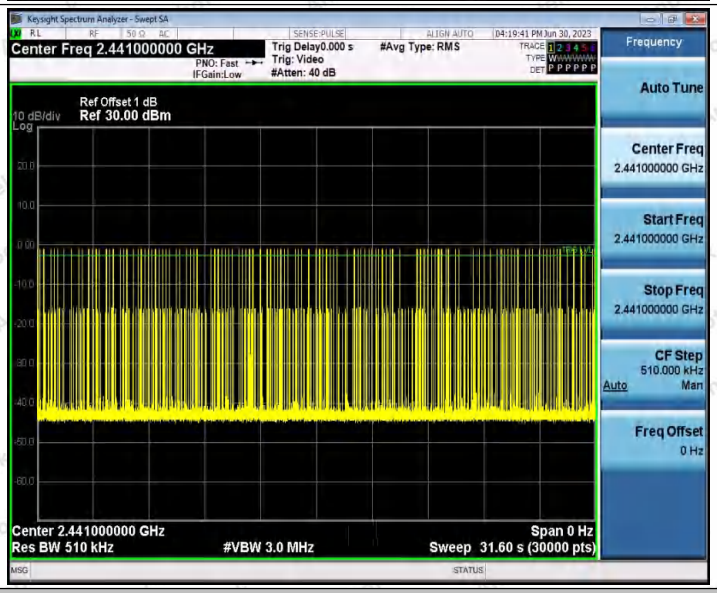


3DH1_Ant1_Hop

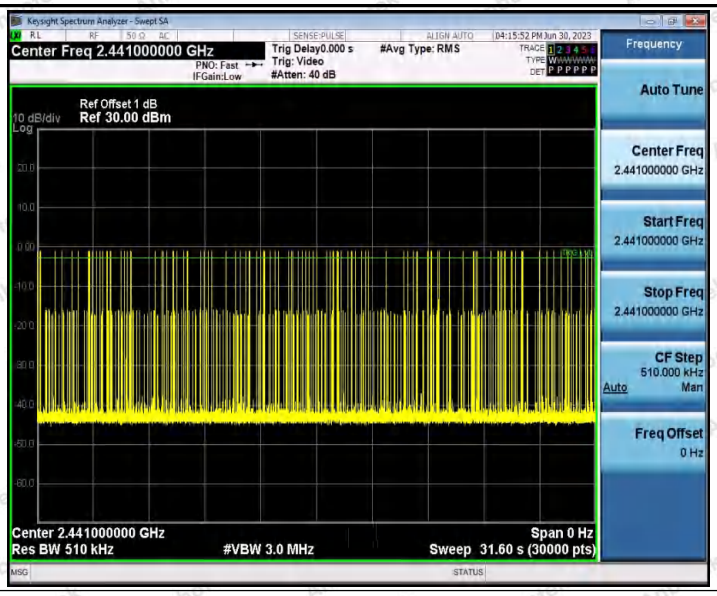


3DH3_Ant1_Hop





3DH5_Ant1_Hop


Keysight 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
04:15:52 PM Jun 30, 2023
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 1 dB
10 dB/div
Ref 30.00 dBm
Log
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
MSG
STATUS

Appendix F: Number of hopping channels

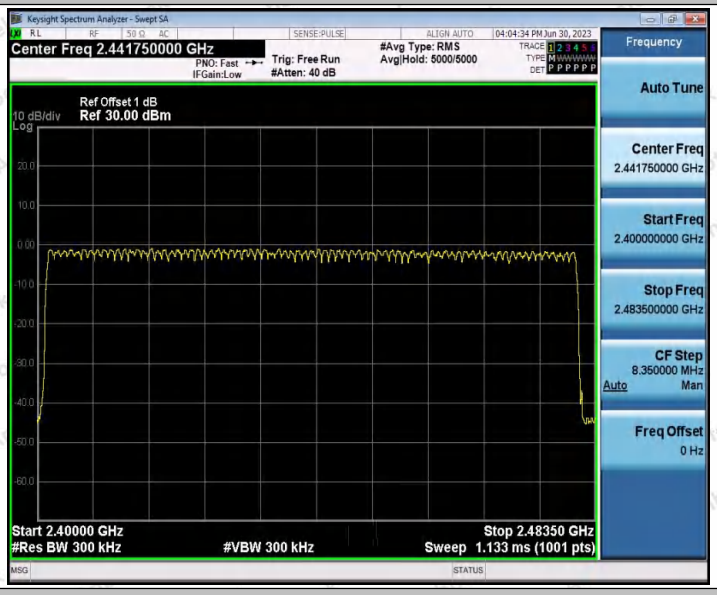
Test Result

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

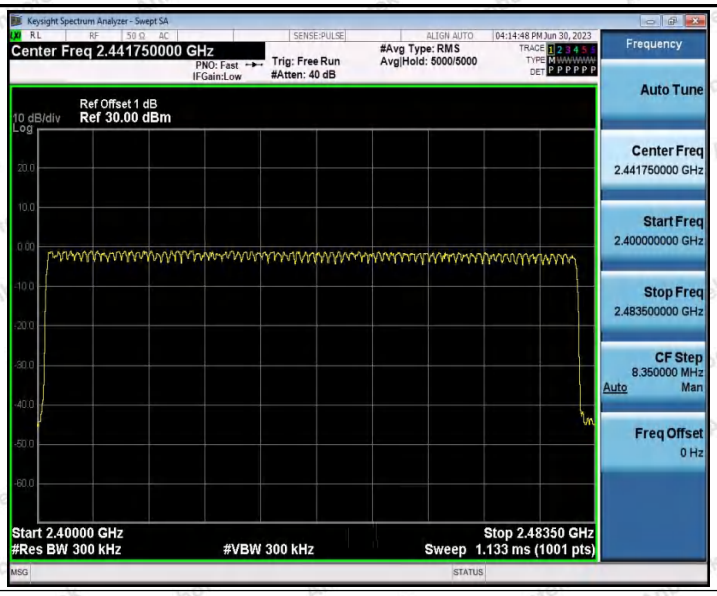
Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop



3DH5_Ant1_Hop


Keysight 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
04:14:48 PM Jun 30, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
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

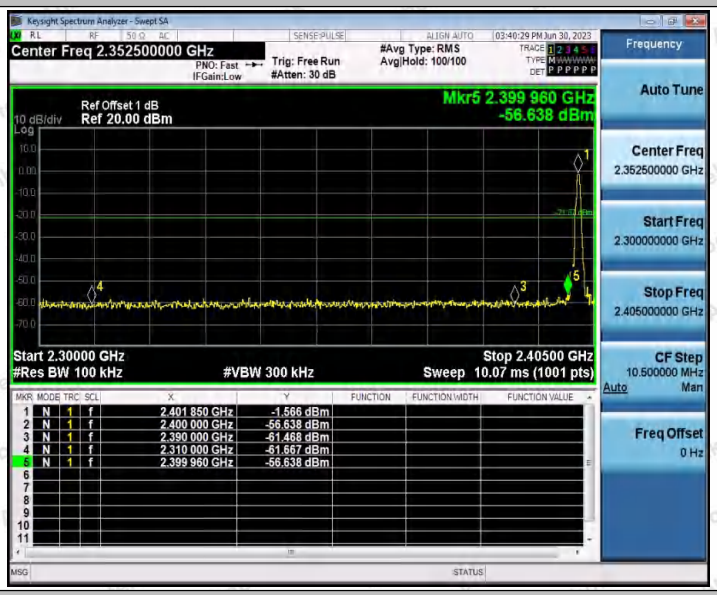
Appendix G: Band edge measurements

Test Result

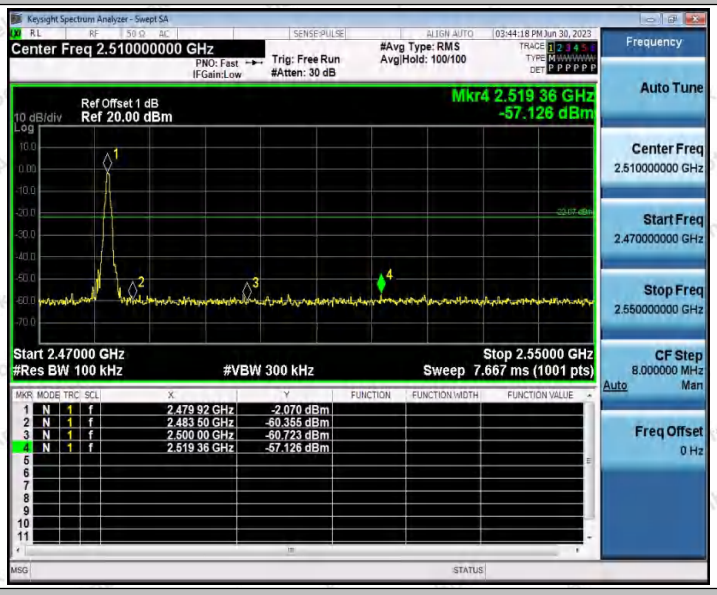
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-1.57	-56.64	≤-21.57	PASS
		High	2480	-2.07	-57.13	≤-22.07	PASS
		Low	Hop_2402	-1.55	-57.13	≤-21.55	PASS
		High	Hop_2480	-1.96	-57.03	≤-21.96	PASS
2DH5	Ant1	Low	2402	-1.80	-54.59	≤-21.8	PASS
		High	2480	-2.50	-57.85	≤-22.5	PASS
		Low	Hop_2402	-2.10	-56.67	≤-22.1	PASS
		High	Hop_2480	-3.18	-56.12	≤-23.18	PASS
3DH5	Ant1	Low	2402	-1.14	-55.39	≤-21.14	PASS
		High	2480	-3.40	-56.88	≤-23.4	PASS
		Low	Hop_2402	-2.94	-57.05	≤-22.94	PASS
		High	Hop_2480	-1.78	-56.8	≤-21.78	PASS

Test Graphs

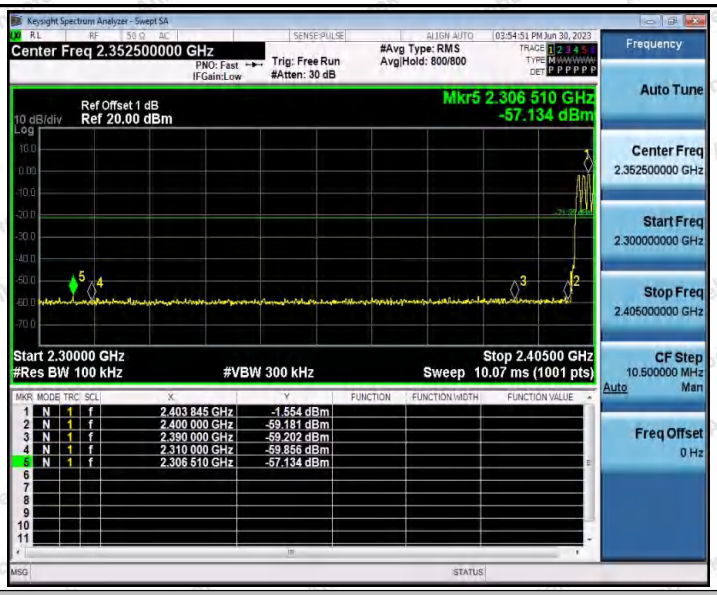
DH5_Ant1_Low_2402



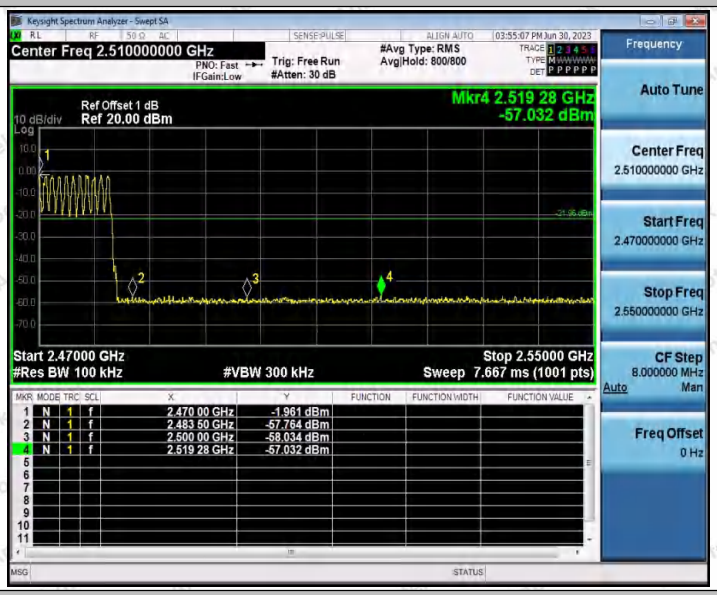
DH5_Ant1_High_2480



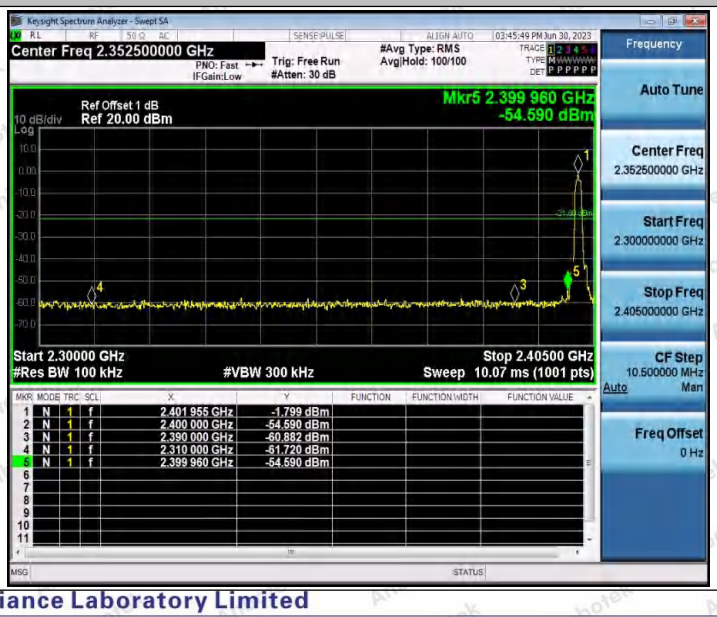
DH5_Ant1_Low_Hop_2402



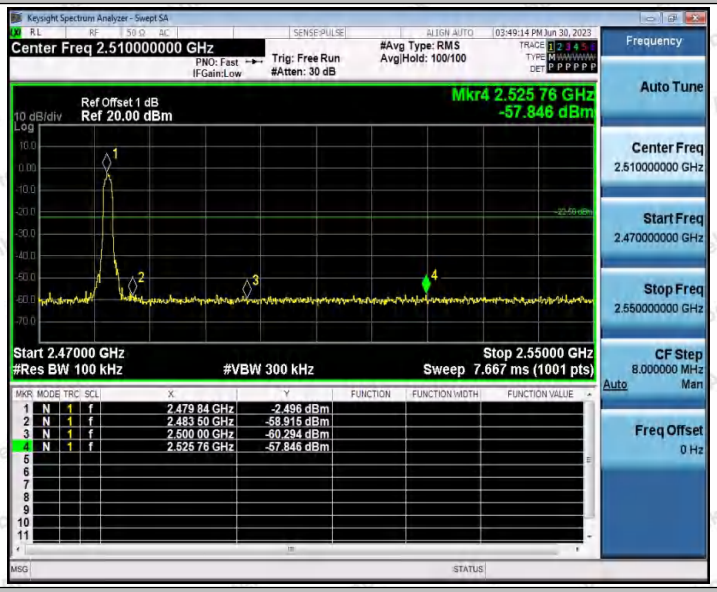
DH5_Ant1_High_Hop_2480



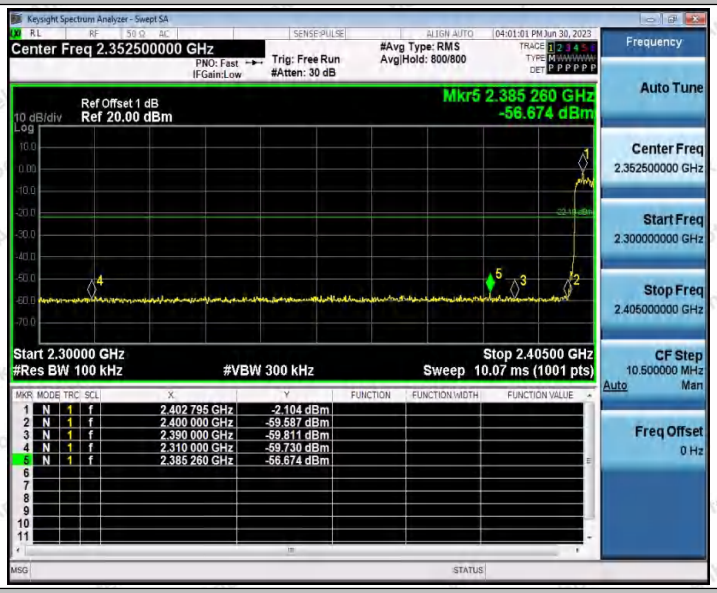
2DH5_Ant1_Low_2402



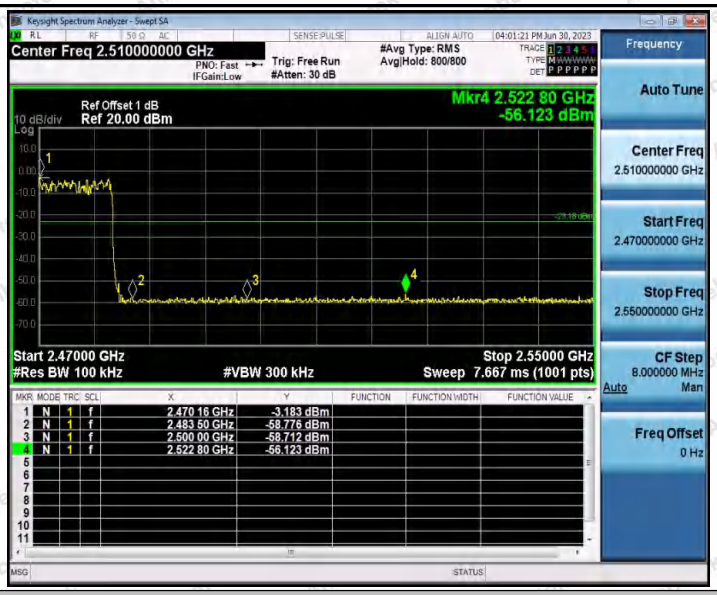
2DH5_Ant1_High_2480



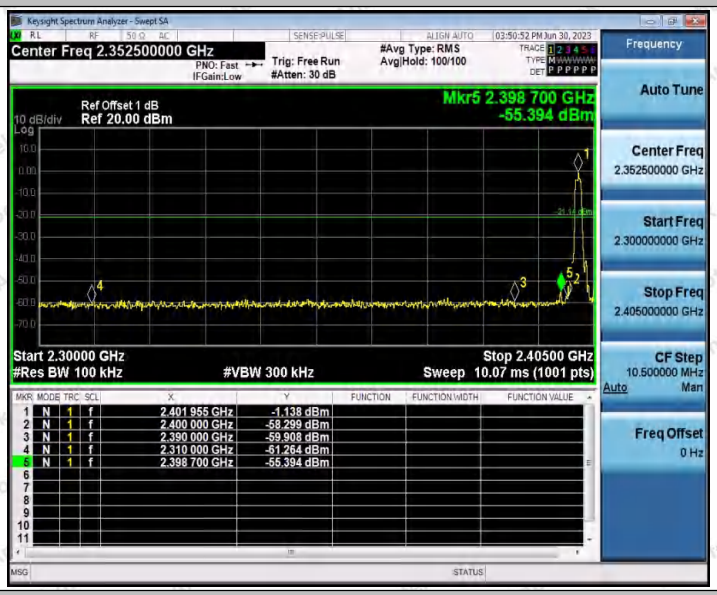
2DH5_Ant1_Low_Hop_2402



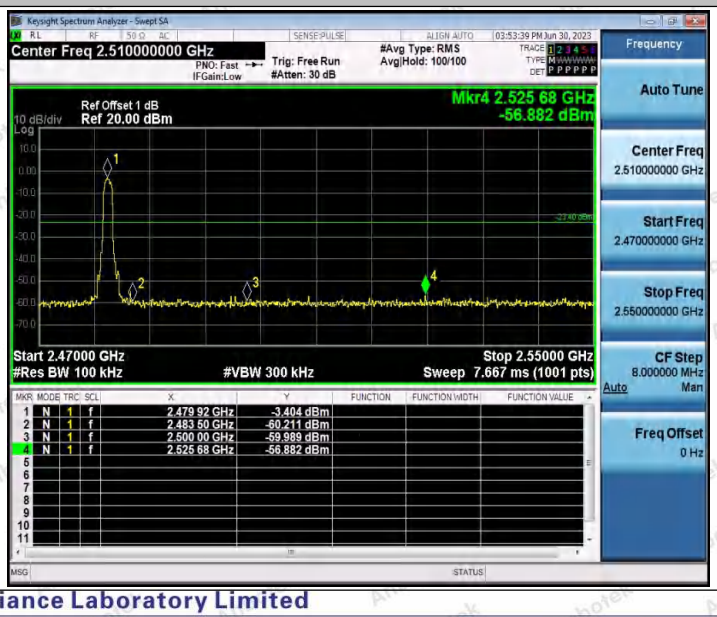
2DH5_Ant1_High_Hop_2480



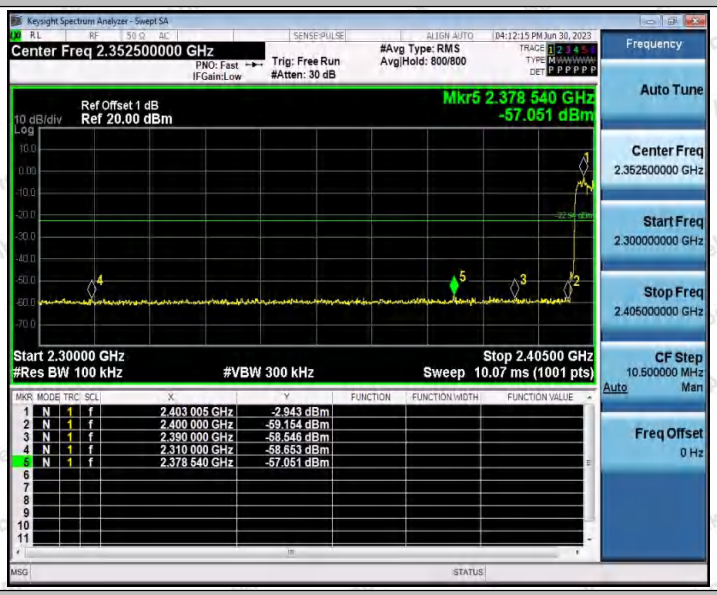
3DH5_Ant1_Low_2402



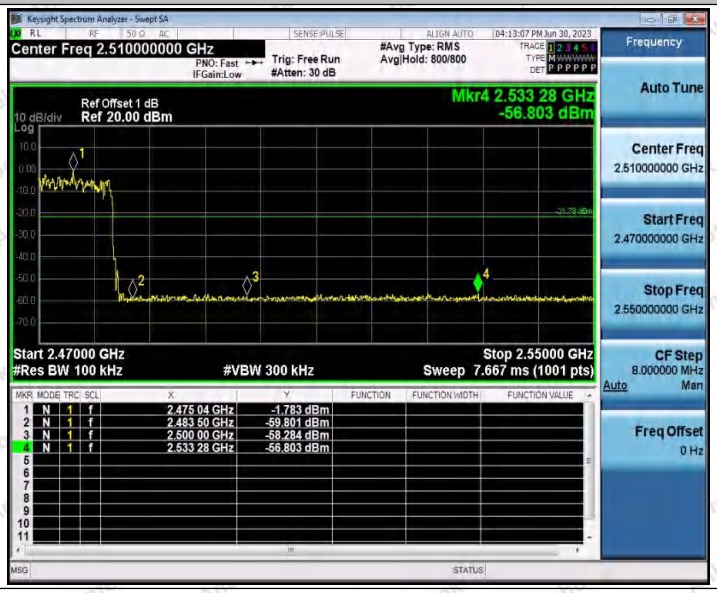
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

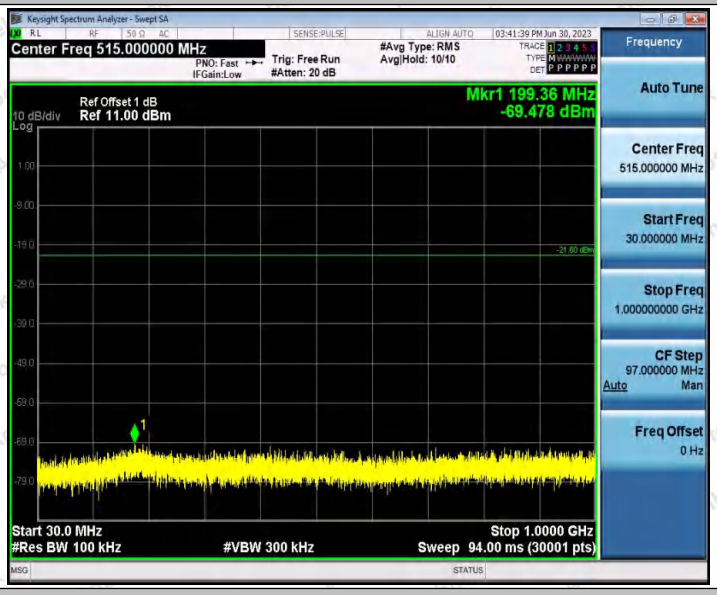
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-1.60	-1.60	---	PASS
			30~1000	-1.60	-69.48	≤-21.6	PASS
			1000~26500	-1.60	-46.3	≤-21.6	PASS
		2441	Reference	-2.16	-2.16	---	PASS
			30~1000	-2.16	-69.05	≤-22.16	PASS
			1000~26500	-2.16	-45.69	≤-22.16	PASS
		2480	Reference	-2.70	-2.70	---	PASS
			30~1000	-2.70	-69.69	≤-22.7	PASS
			1000~26500	-2.70	-48.01	≤-22.7	PASS
2DH5	Ant1	2402	Reference	-4.05	-4.05	---	PASS
			30~1000	-4.05	-68.86	≤-24.05	PASS
			1000~26500	-4.05	-46.54	≤-24.05	PASS
		2441	Reference	-2.17	-2.17	---	PASS
			30~1000	-2.17	-69.32	≤-22.17	PASS
			1000~26500	-2.17	-45.63	≤-22.17	PASS
		2480	Reference	-2.84	-2.84	---	PASS
			30~1000	-2.84	-68.88	≤-22.84	PASS
			1000~26500	-2.84	-49.15	≤-22.84	PASS
3DH5	Ant1	2402	Reference	-2.01	-2.01	---	PASS
			30~1000	-2.01	-69.1	≤-22.01	PASS
			1000~26500	-2.01	-46.35	≤-22.01	PASS
		2441	Reference	-1.56	-1.56	---	PASS
			30~1000	-1.56	-68.97	≤-21.56	PASS
			1000~26500	-1.56	-45.28	≤-21.56	PASS
		2480	Reference	-4.15	-4.15	---	PASS
			30~1000	-4.15	-69.93	≤-24.15	PASS
			1000~26500	-4.15	-48.95	≤-24.15	PASS

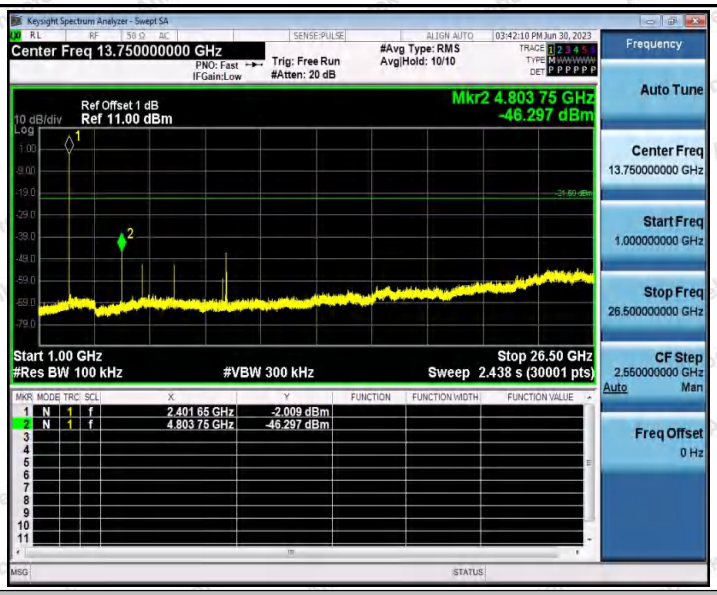
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

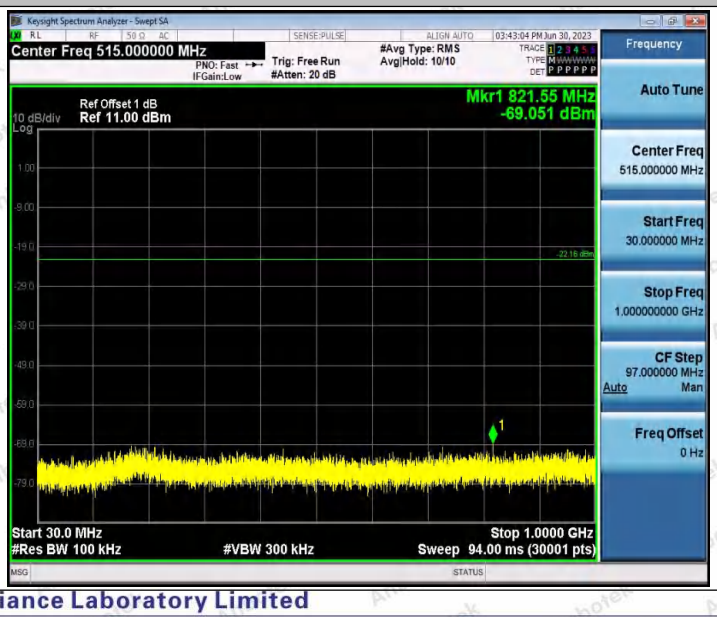


DH5_Ant1_2402_1000~26500

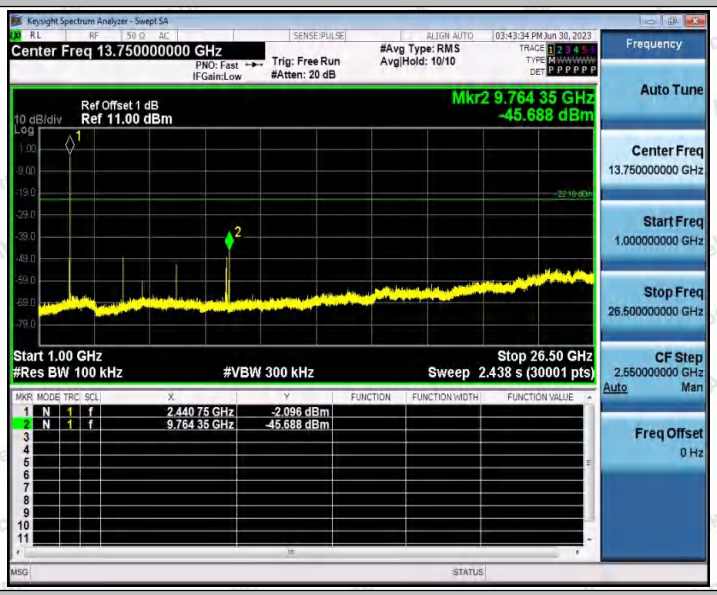


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

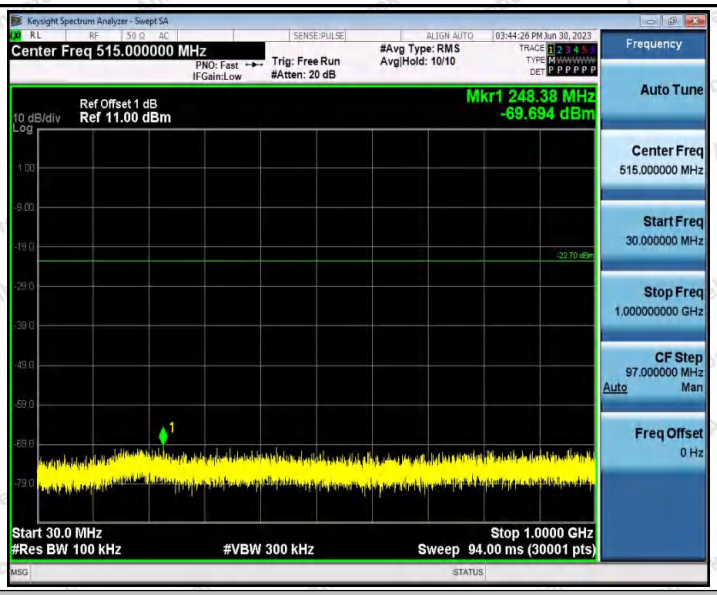


DH5_Ant1_2441_1000~26500

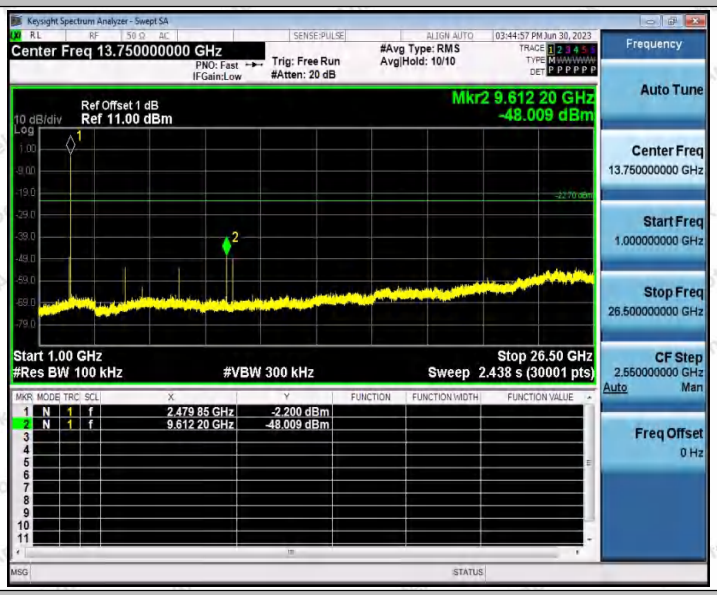


DH5_Ant1_2480_0~Reference

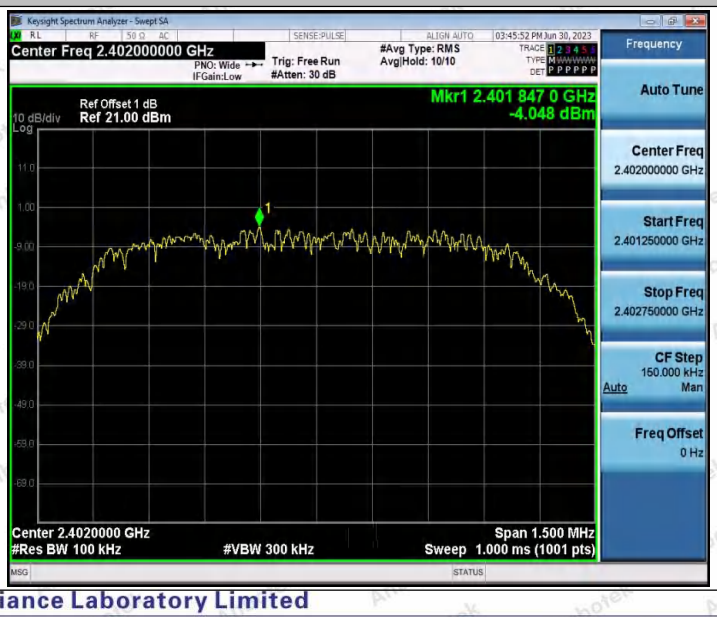
DH5_Ant1_2480_30~1000



DH5_Ant1_2480_1000~26500



2DH5_Ant1_2402_0~Reference



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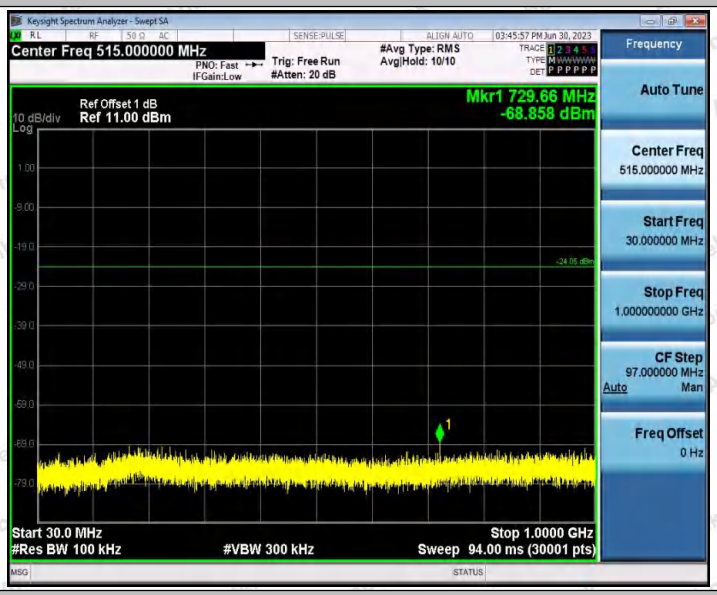
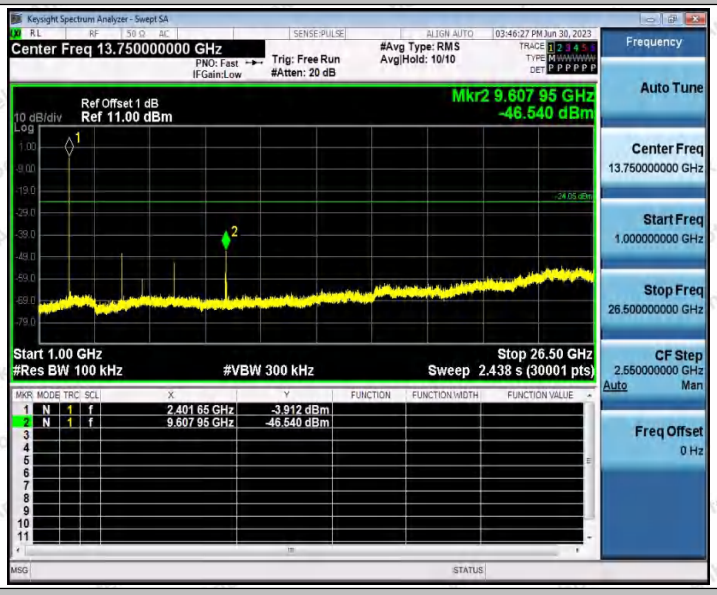
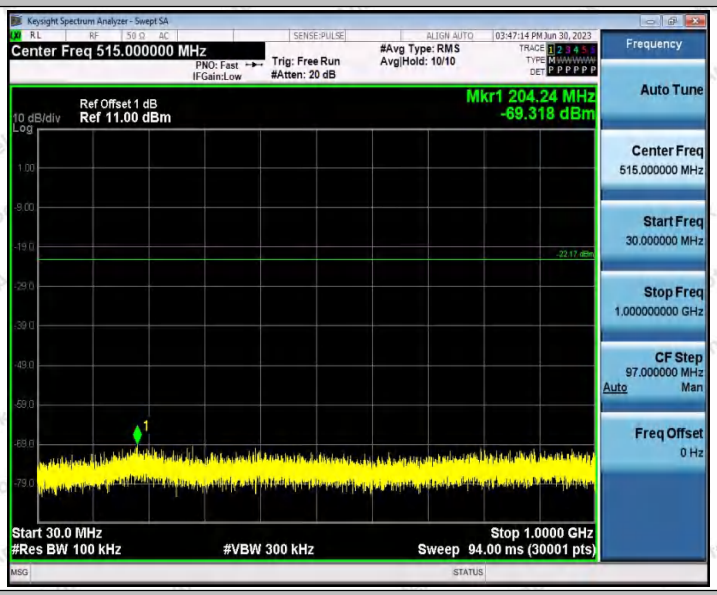


2DH5_Ant1_2402_1000~26500



2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000



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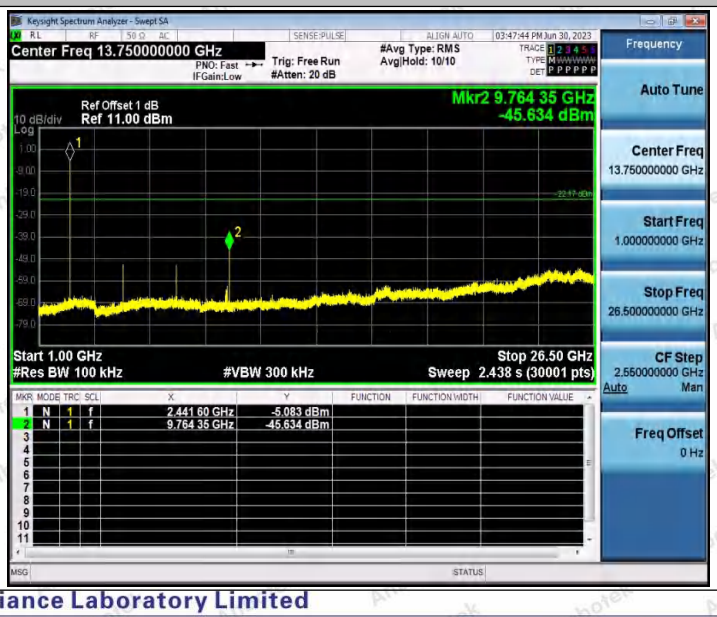

2DH5_Ant1_2480_0~Reference

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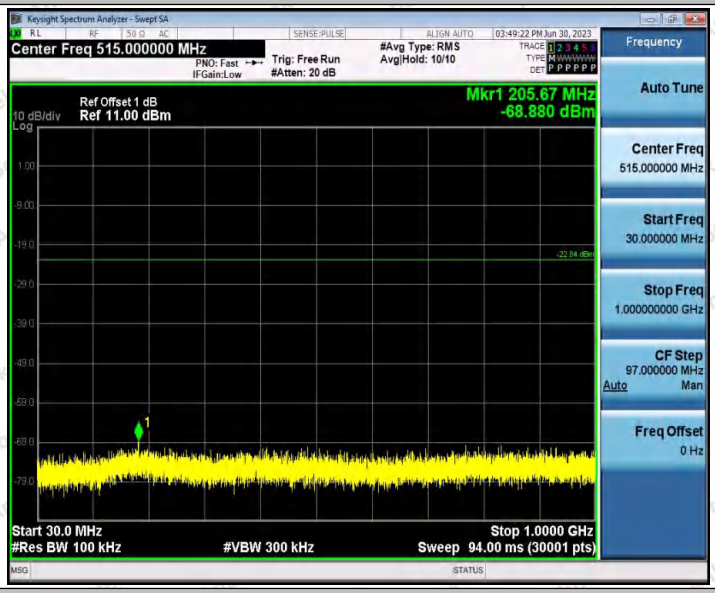
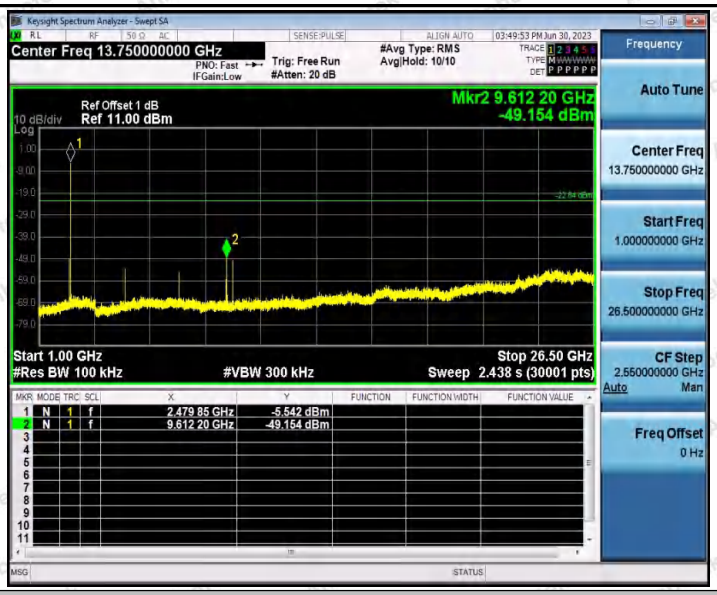
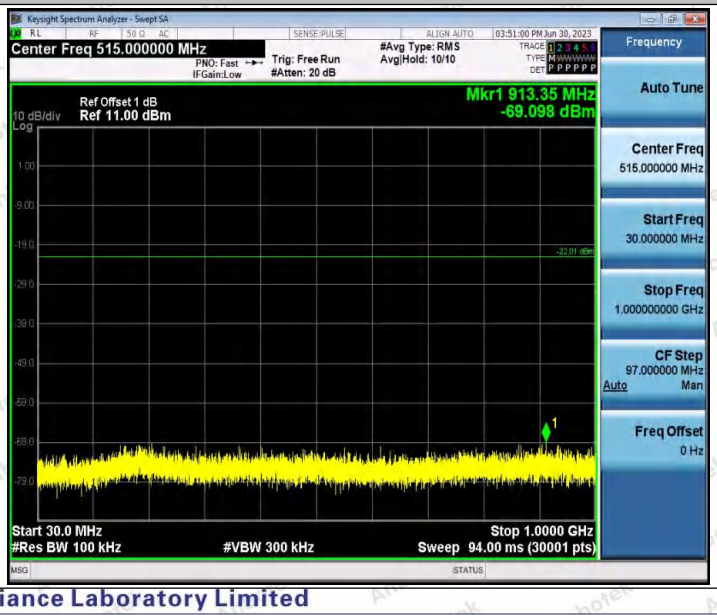


2DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000



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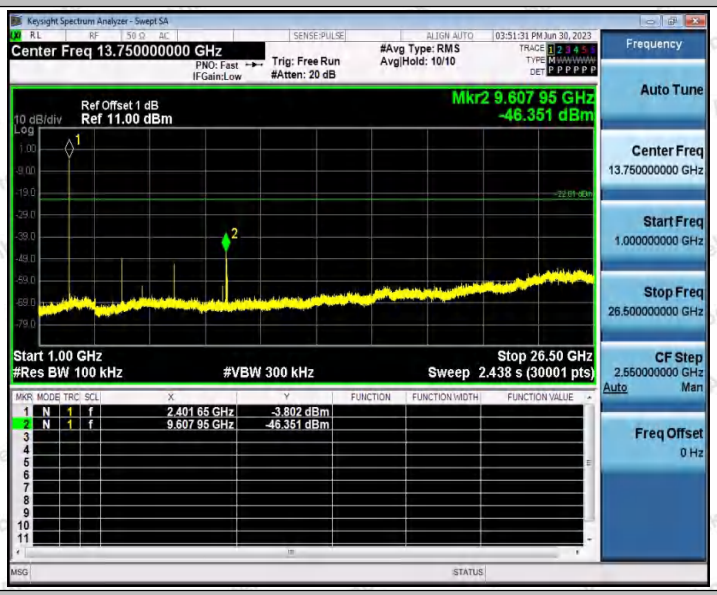
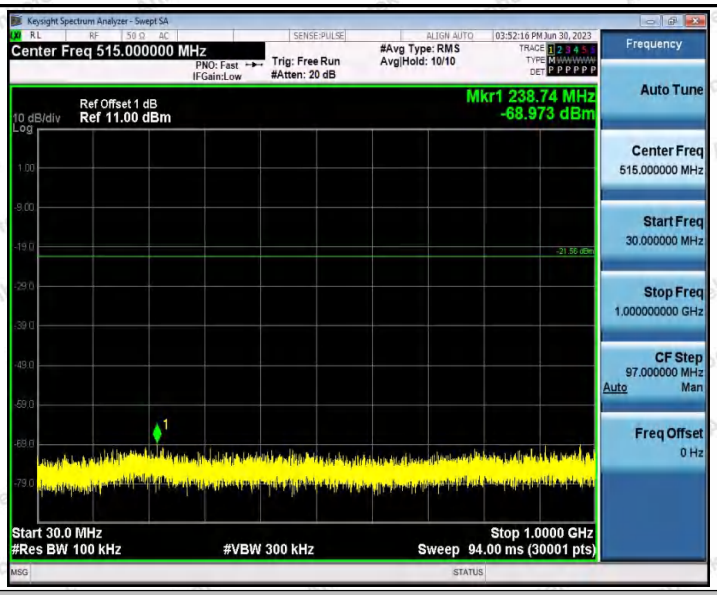
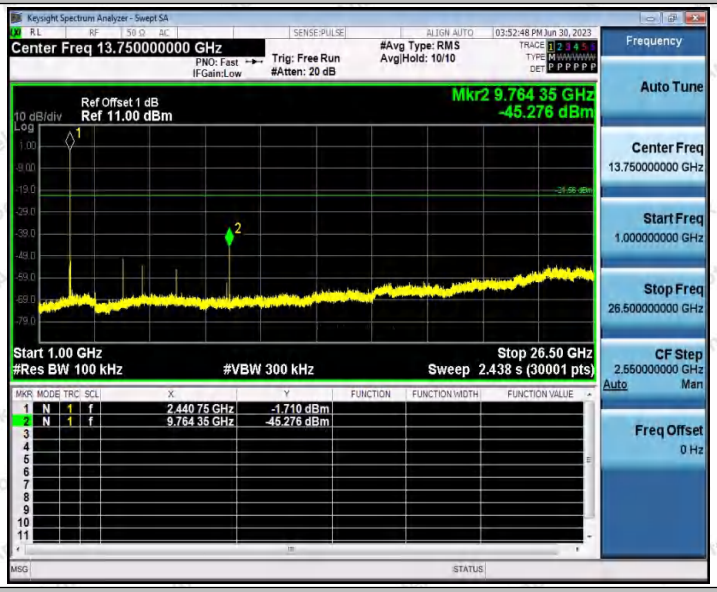


3DH5_Ant1_2441_0~Reference

3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500



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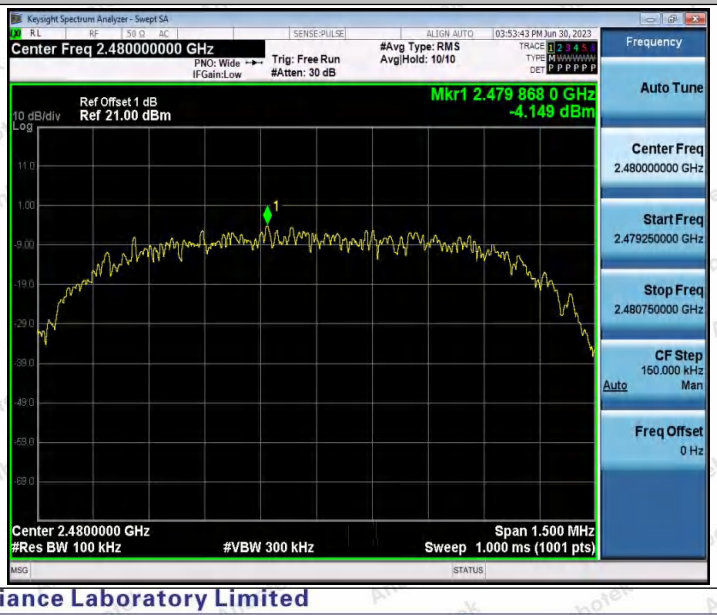
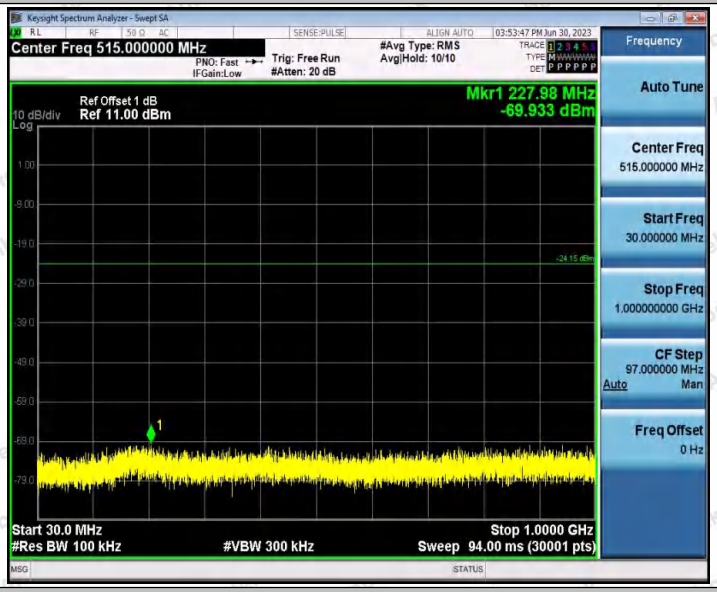
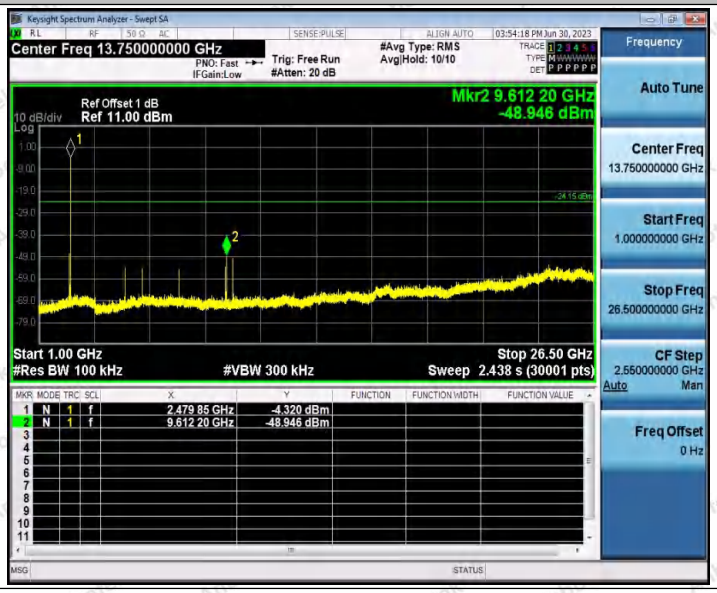


3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



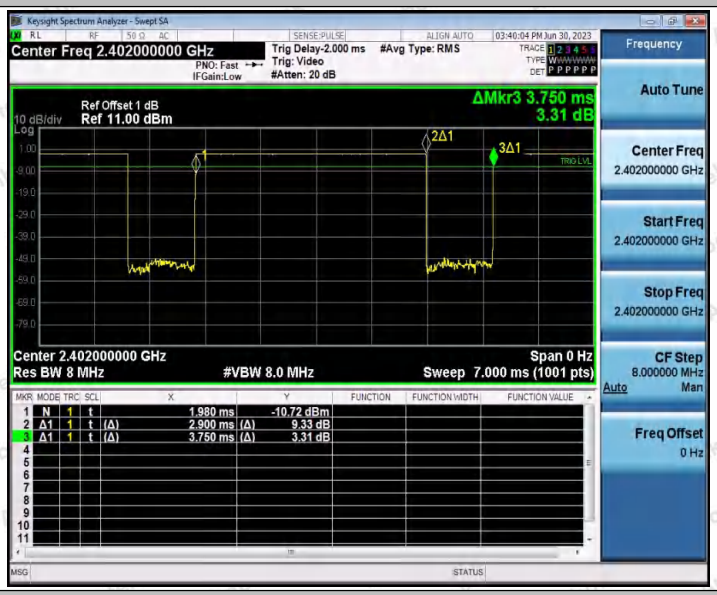
Appendix I: Duty Cycle

Test Result

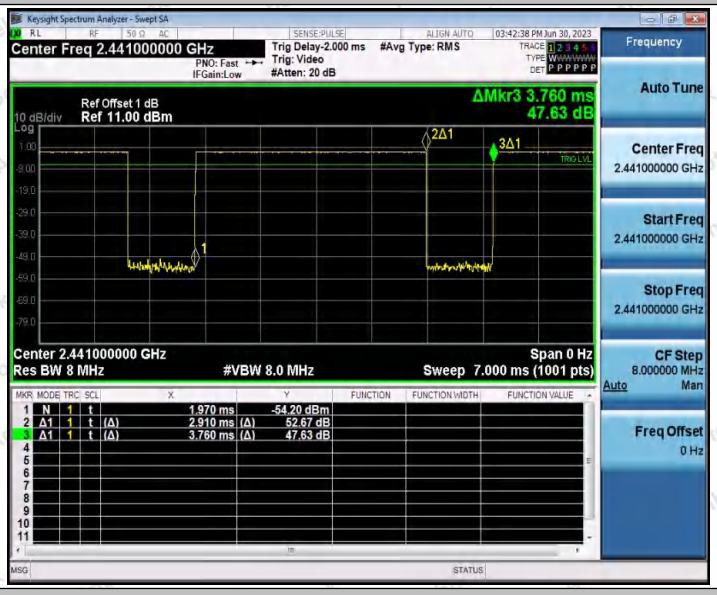
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.90	3.75	77.33	1.12
		2441	2.91	3.76	77.39	1.11
		2480	2.90	3.75	77.33	1.12
2DH5	Ant1	2402	2.90	3.75	77.33	1.12
		2441	2.91	3.75	77.60	1.10
		2480	2.91	3.76	77.39	1.11
3DH5	Ant1	2402	2.90	3.75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

Test Graphs

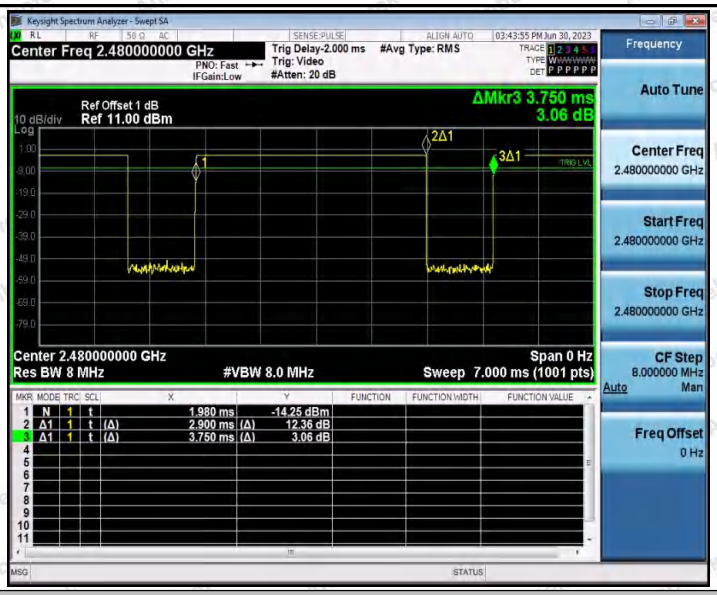
DH5_Ant1_2402



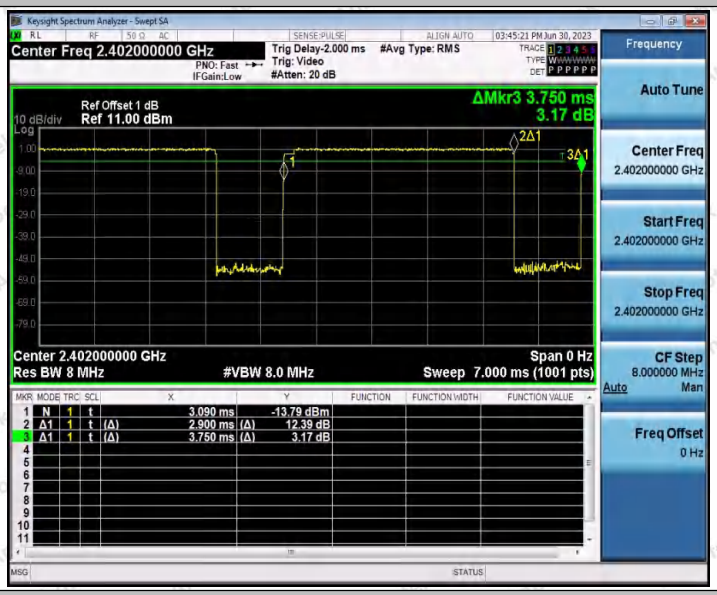
DH5_Ant1_2441



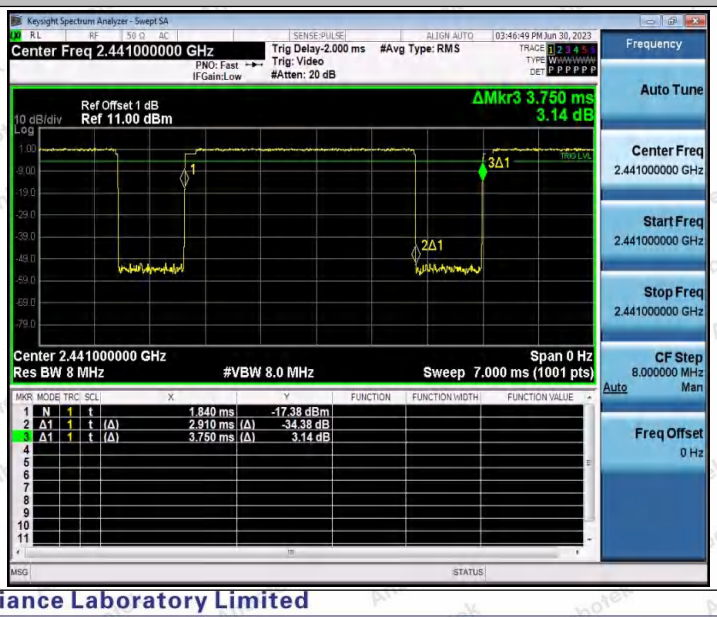
DH5_Ant1_2480



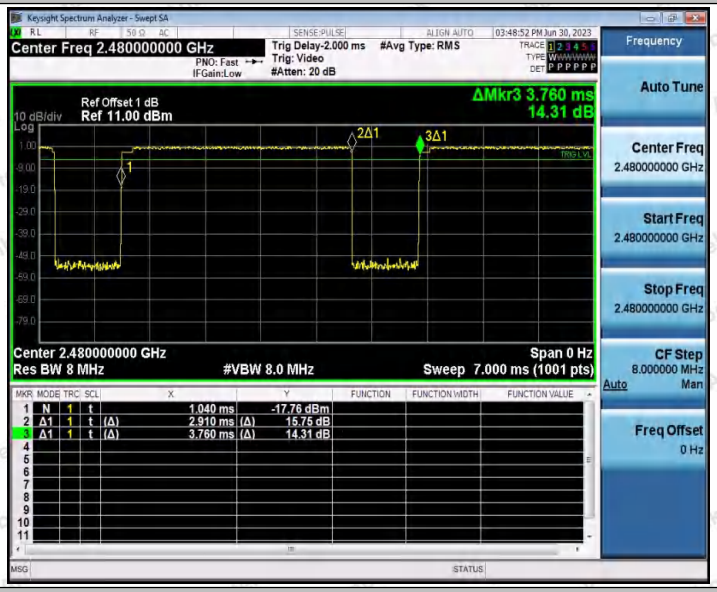
2DH5_Ant1_2402



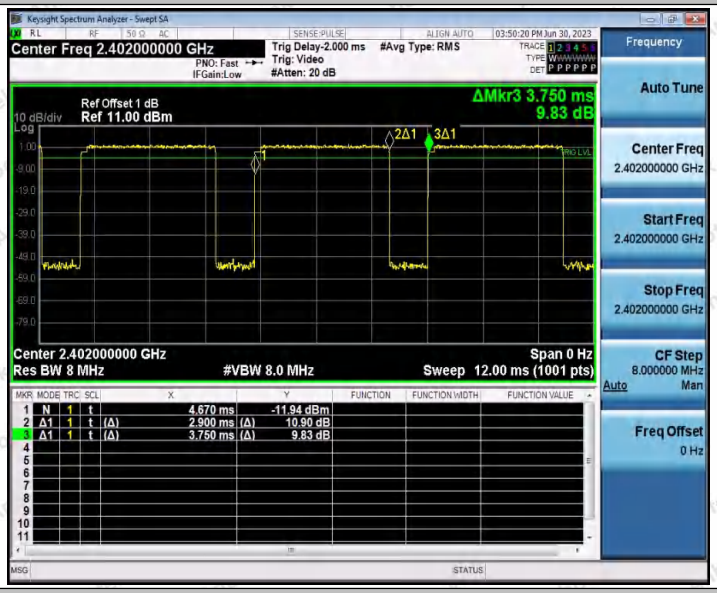
2DH5_Ant1_2441



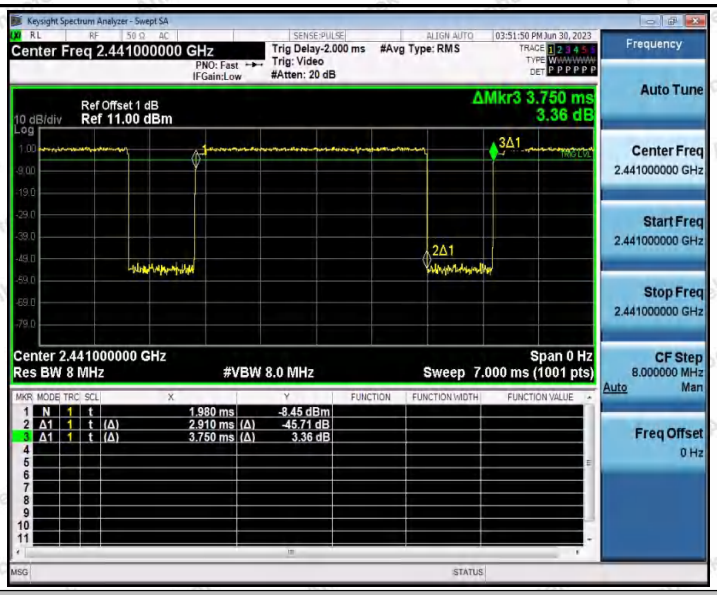
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



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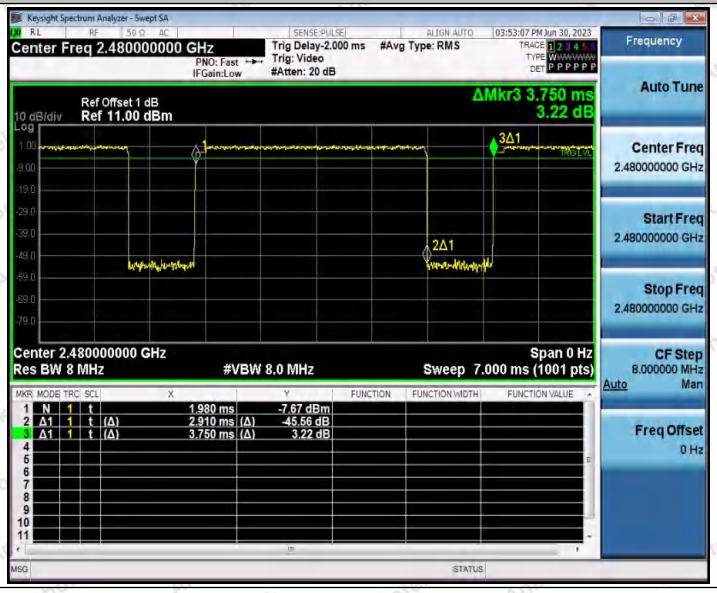

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