Appendix Test Data

Report No.:	18220WC30076401	Test Sample No.:	1-2-2
Start Test Date:	2023.05.08	Finish Test Date:	2023.05.09
Test Engineer:	Rick Luo	Auditor:	Edward.Pan
Temperature:	26.7℃	Relative Humidity:	50%
Pressure:	1012 hPa		

Appendix A: 20dB Emission Bandwidth

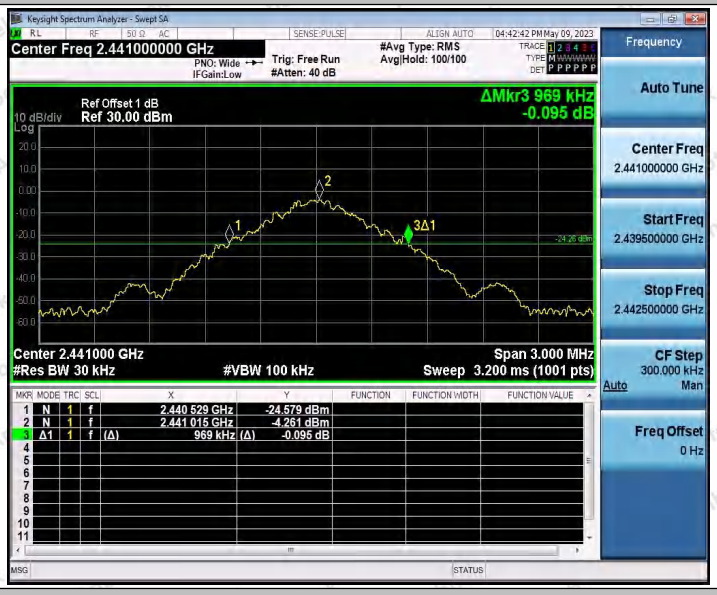
Test Result

Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	0.957	2401.535	2402.492
		2441	0.969	2440.529	2441.498
		2480	1.038	2479.466	2480.504
2DH5	Ant1	2402	1.335	2401.331	2402.666
		2441	1.293	2440.364	2441.657
		2480	1.305	2479.346	2480.651
3DH5	Ant1	2402	1.323	2401.340	2402.663
		2441	1.293	2440.346	2441.639
		2480	1.317	2479.346	2480.663

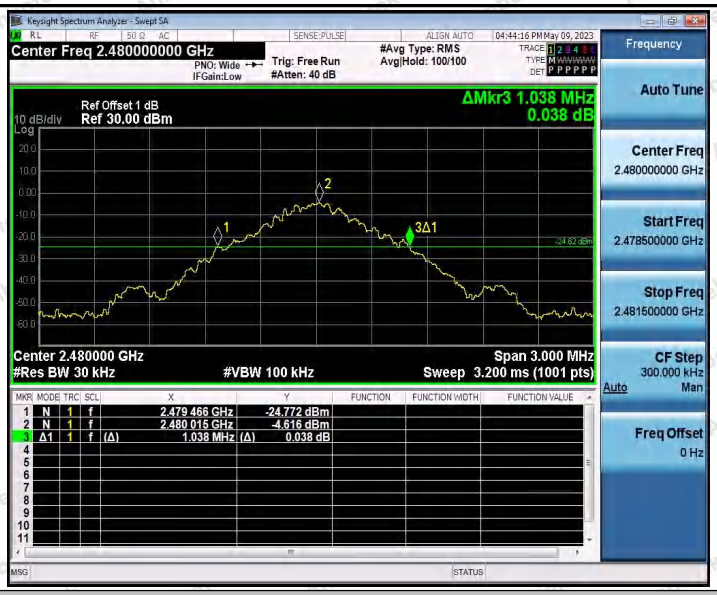
Test Graphs

DH5_Ant1_2402

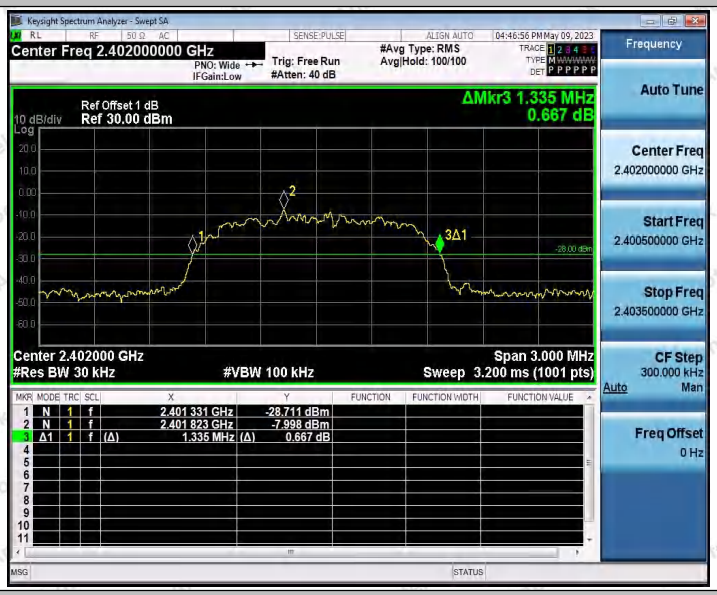
DH5_Ant1_2441



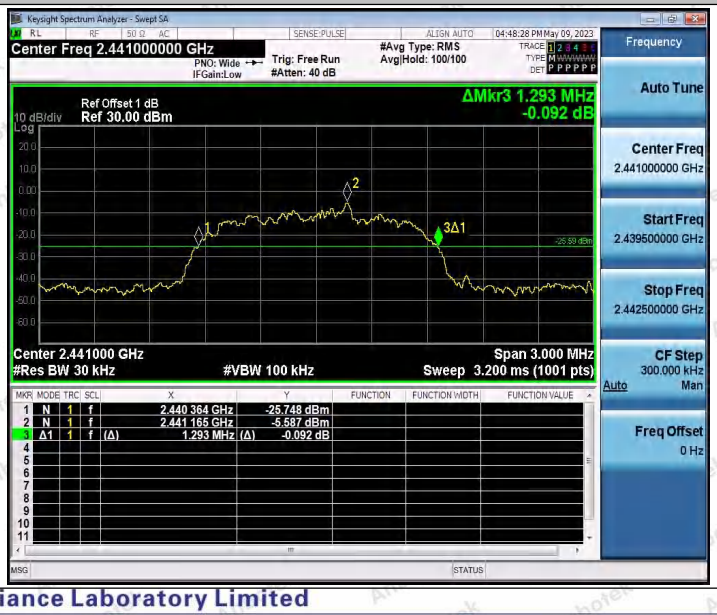
DH5_Ant1_2480



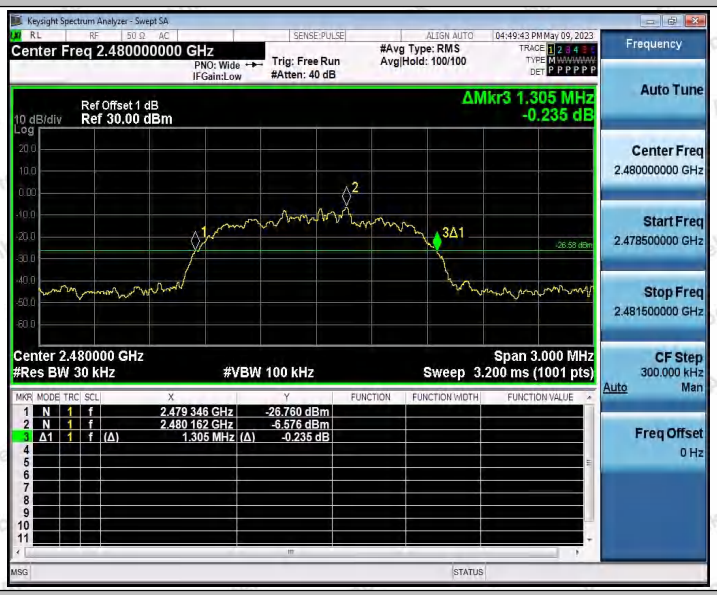
2DH5_Ant1_2402



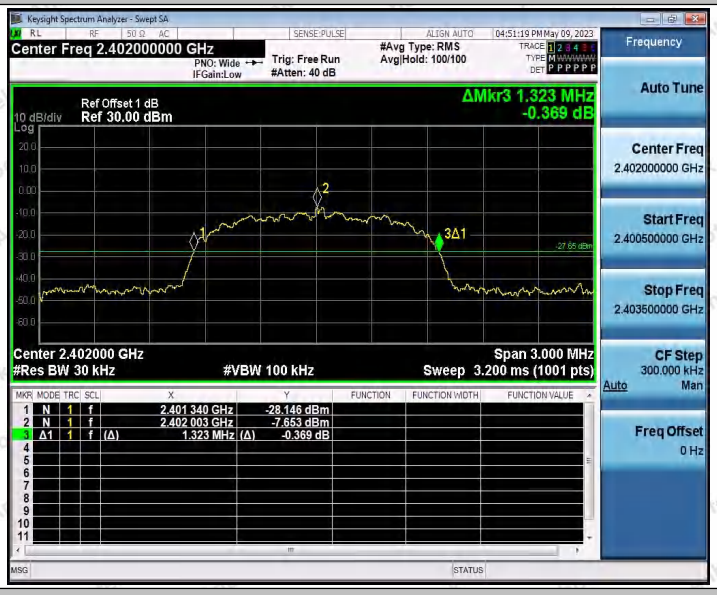
2DH5_Ant1_2441



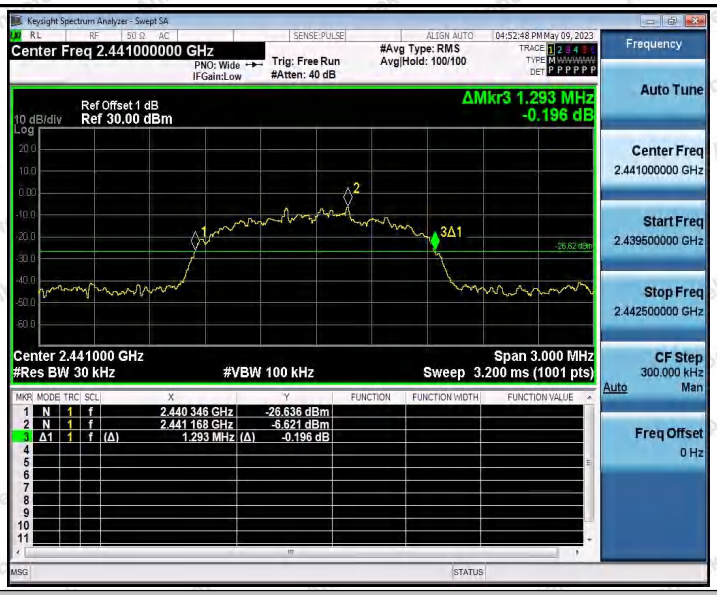
2DH5_Ant1_2480



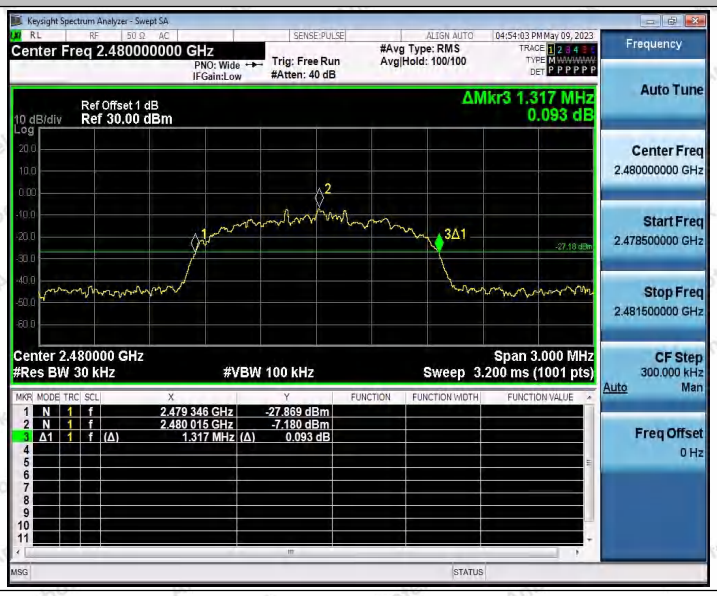
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



Appendix B: Occupied Channel Bandwidth

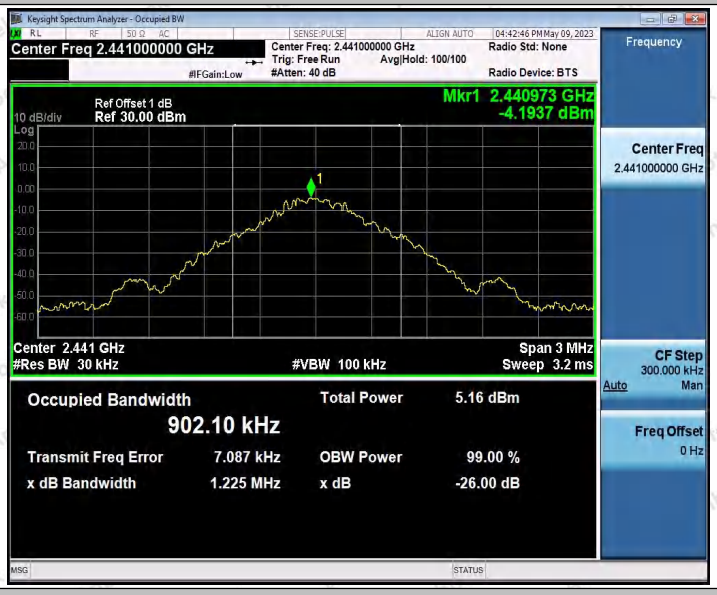
Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	0.91219	2401.5473	2402.4595
		2441	0.90210	2440.5560	2441.4581
		2480	0.90200	2479.5524	2480.4544
2DH5	Ant1	2402	1.1967	2401.4017	2402.5984
		2441	1.1976	2440.4027	2441.6003
		2480	1.1993	2479.4027	2480.6020
3DH5	Ant1	2402	1.2001	2401.3989	2402.5990
		2441	1.2054	2440.3933	2441.5987
		2480	1.2160	2479.3879	2480.6039

Test Graphs

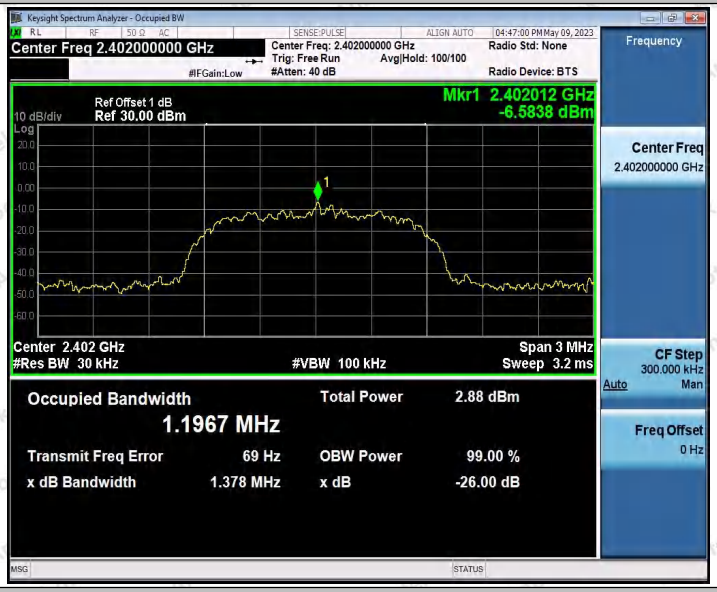
DH5_Ant1_2402

DH5_Ant1_2441

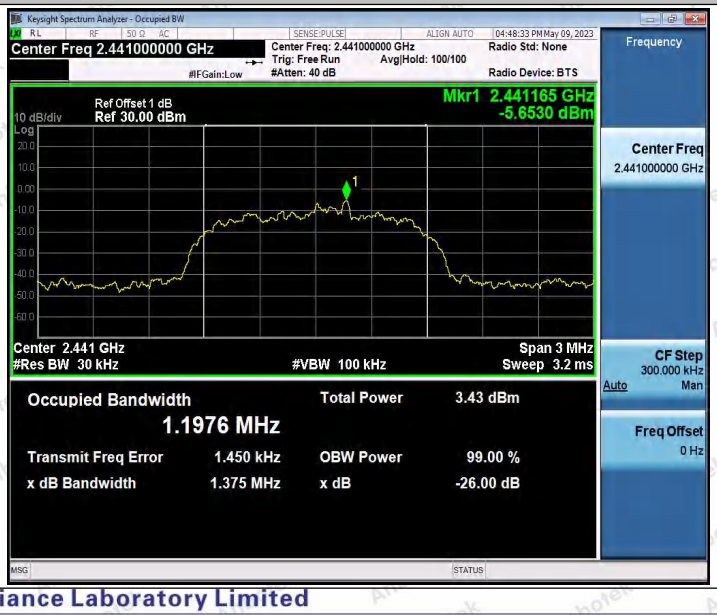


DH5_Ant1_2480

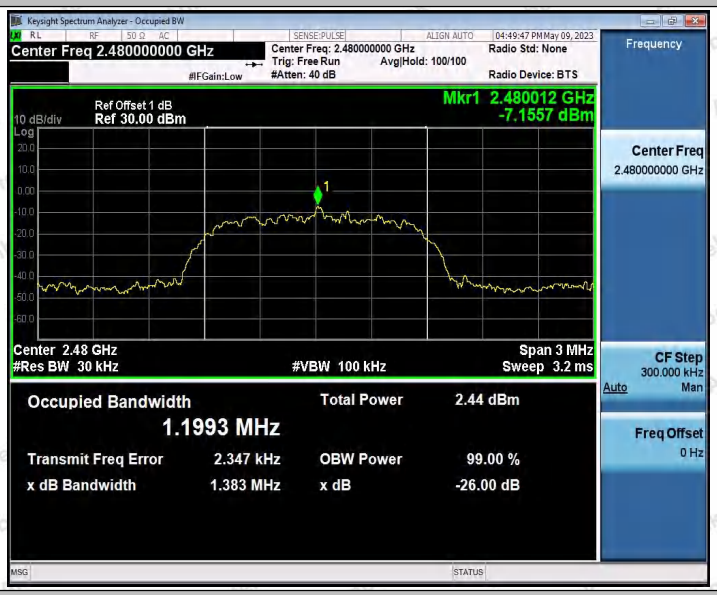
2DH5_Ant1_2402



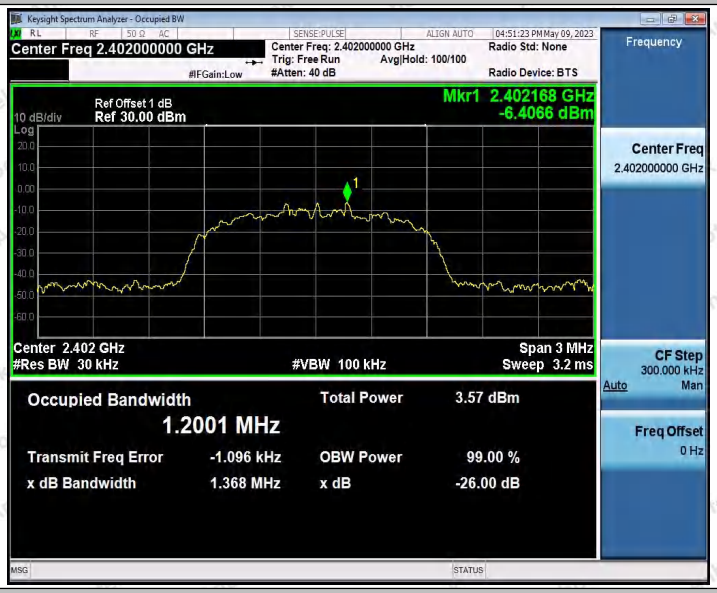
2DH5_Ant1_2441



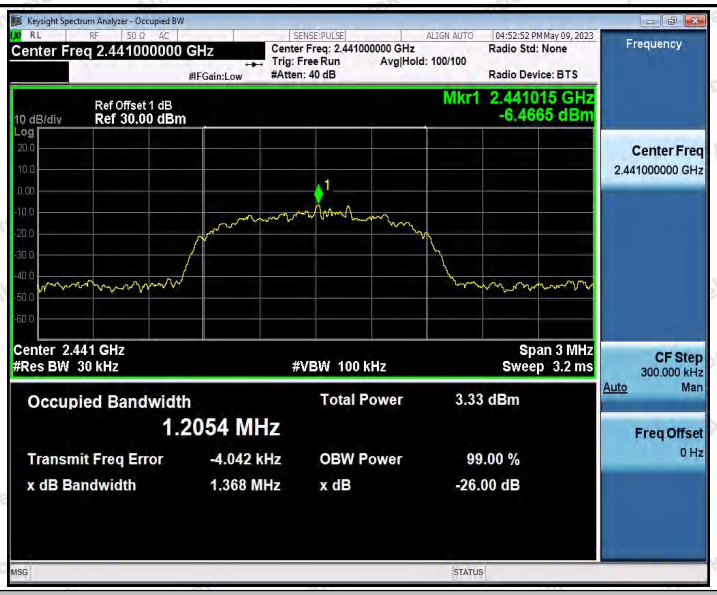
2DH5_Ant1_2480



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	**-1.02**	≤20.97	PASS
		2441	-1.41	≤20.97	PASS
		2480	-1.96	≤20.97	PASS
2DH5	Ant1	2402	-1.86	≤20.97	PASS
		2441	-1.82	≤20.97	PASS
		2480	-2.49	≤20.97	PASS
3DH5	Ant1	2402	-1.51	≤20.97	PASS
		2441	-1.72	≤20.97	PASS
		2480	-2.38	≤20.97	PASS

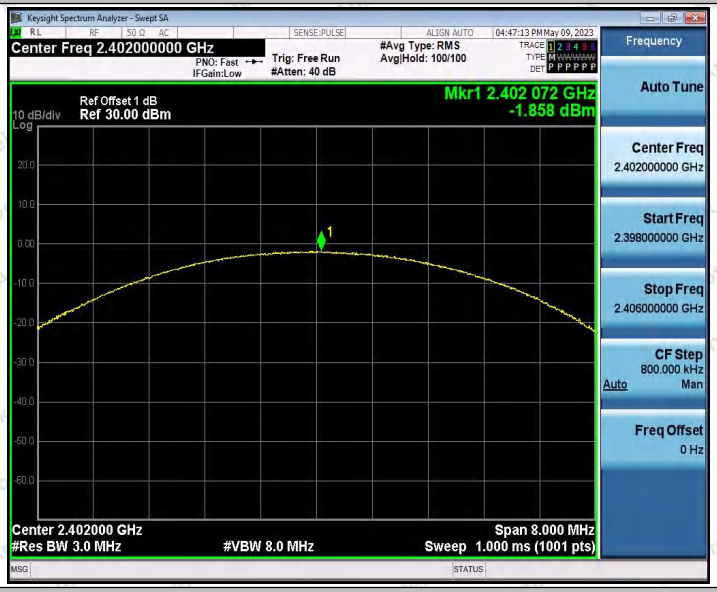
Test Graphs

DH5_Ant1_2402

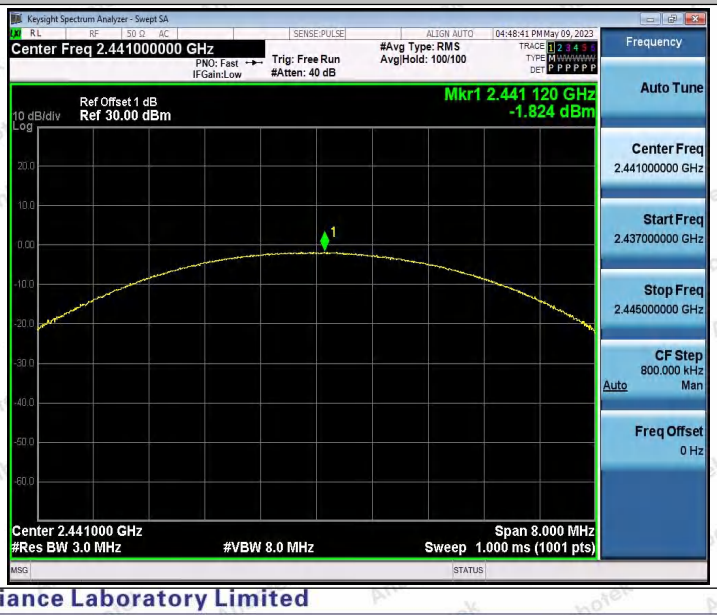
DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402



2DH5_Ant1_2441

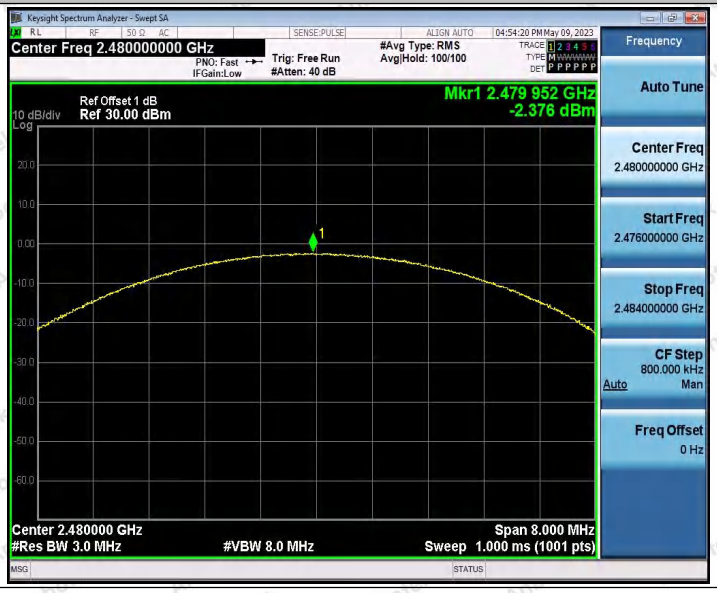


2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480



Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.010	≥0.692	PASS
2DH5	Ant1	Hop	0.968	≥0.890	PASS
3DH5	Ant1	Hop	0.984	≥0.882	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop

Keysight Spectrum Analyzer - Swept SA
Start Freq 2.440500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 8000/8000
05:17:52 PM May 09, 2023
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
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
ΔMkr2 984 kHz
0.015 dB
Start 2.440500 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.442500 GHz
Sweep 1.000 ms (1001 pts)

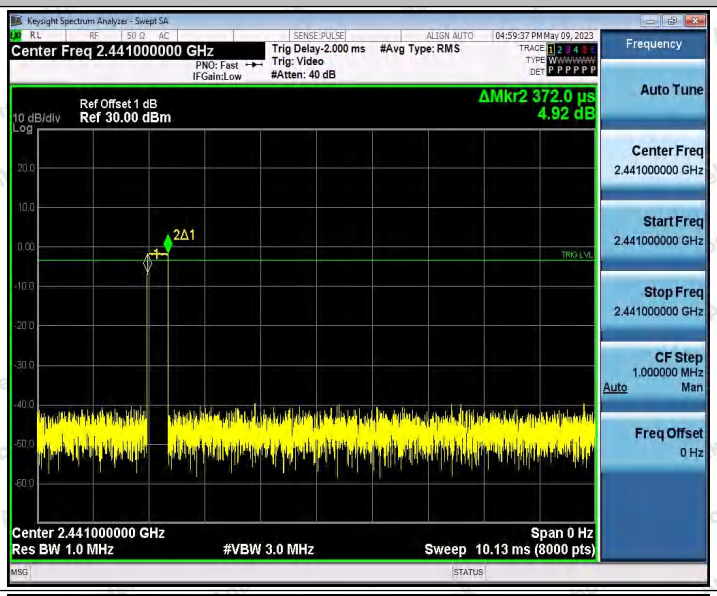
Appendix E: Time of occupancy

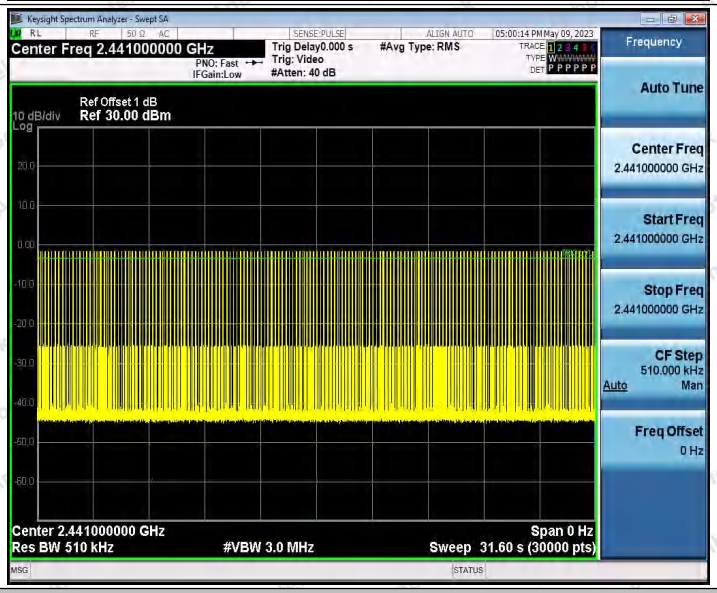
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.372	313	0.116	≤0.4	PASS
DH3	Ant1	Hop	1.629	157	0.256	≤0.4	PASS
DH5	Ant1	Hop	2.877	107	0.308	≤0.4	PASS
2DH1	Ant1	Hop	0.380	316	0.12	≤0.4	PASS
2DH3	Ant1	Hop	1.633	158	0.258	≤0.4	PASS
2DH5	Ant1	Hop	2.880	109	0.314	≤0.4	PASS
3DH1	Ant1	Hop	0.381	316	0.12	≤0.4	PASS
3DH3	Ant1	Hop	1.631	158	0.258	≤0.4	PASS
3DH5	Ant1	Hop	2.882	109	0.314	≤0.4	PASS

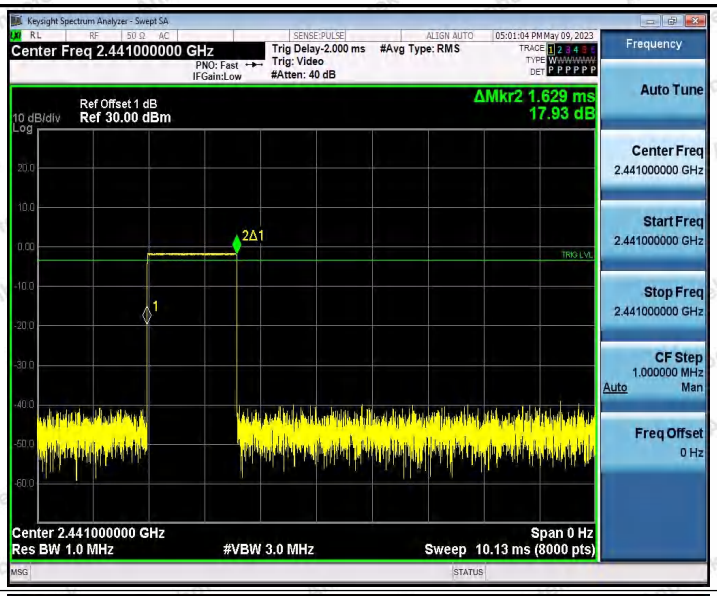
Test Graphs

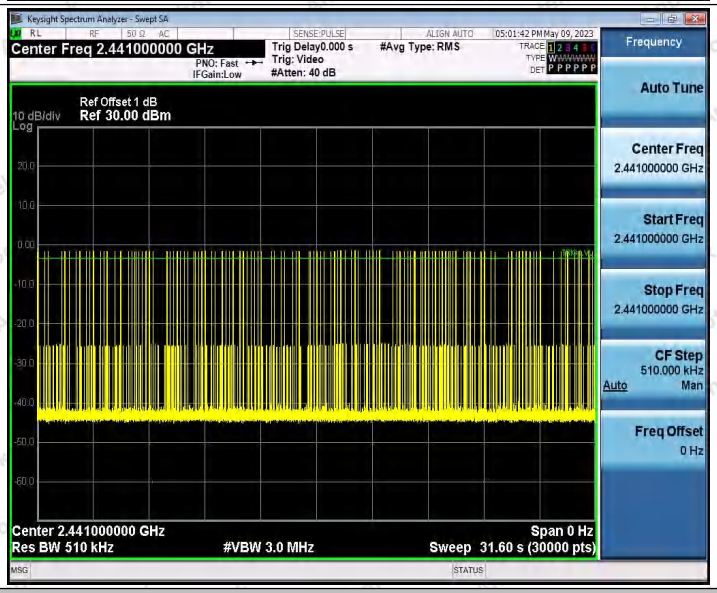
DH1_Ant1_Hop





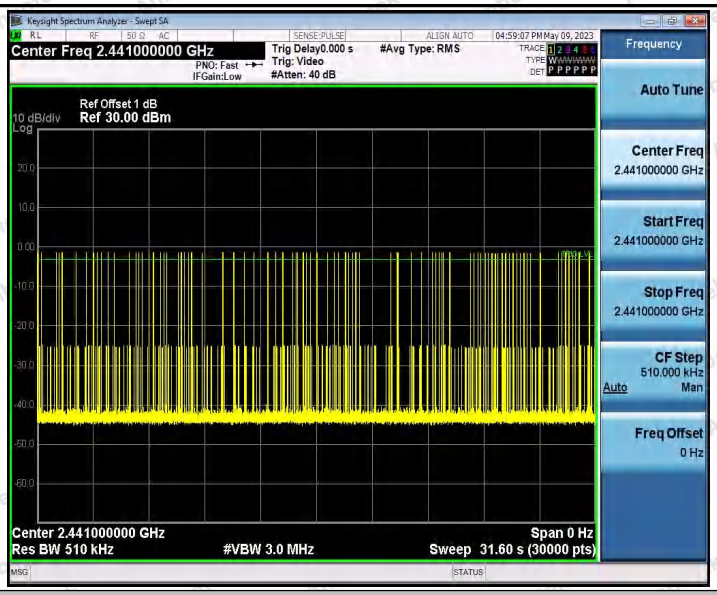
DH3_Ant1_Hop


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 1.629 ms
17.93 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

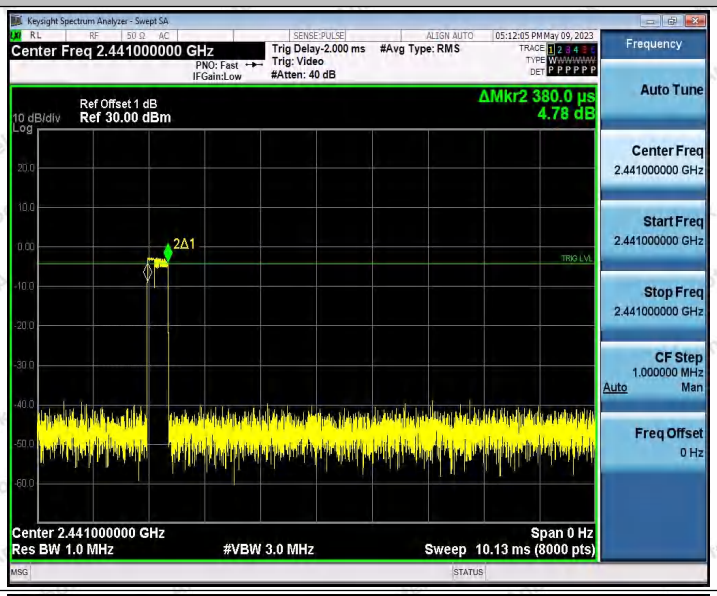

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq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

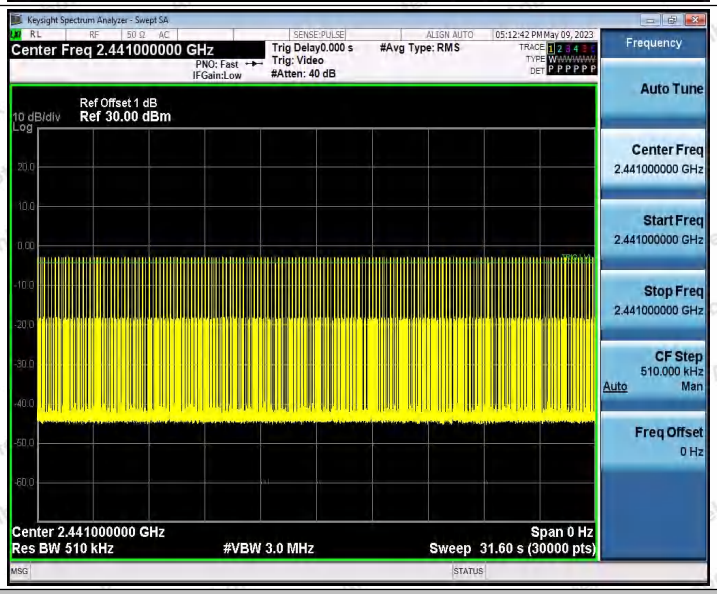
DH5_Ant1_Hop

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 2.877 ms
3.84 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

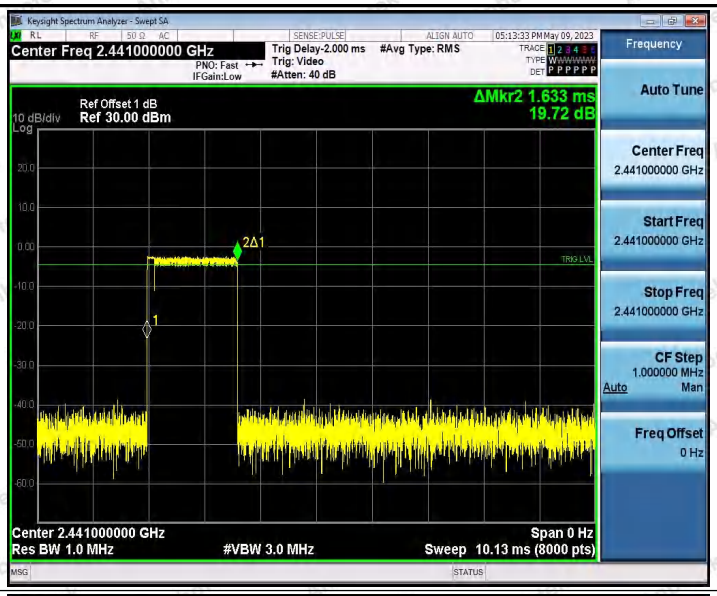


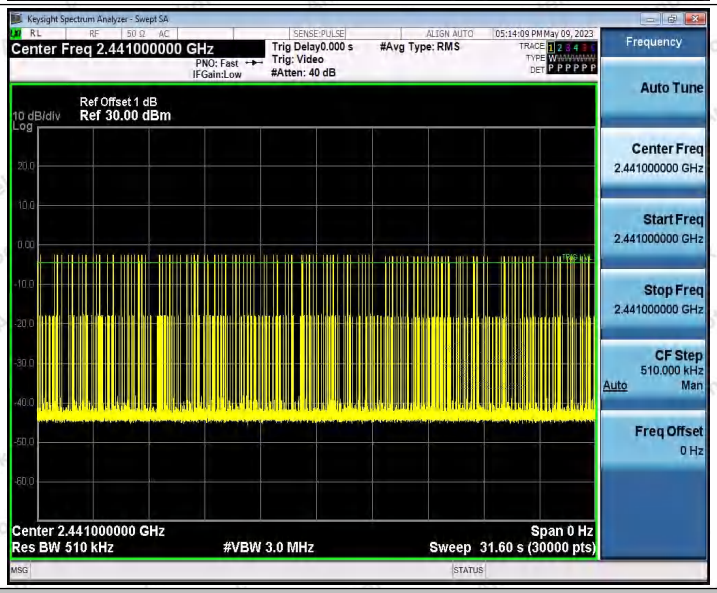
2DH1_Ant1_Hop



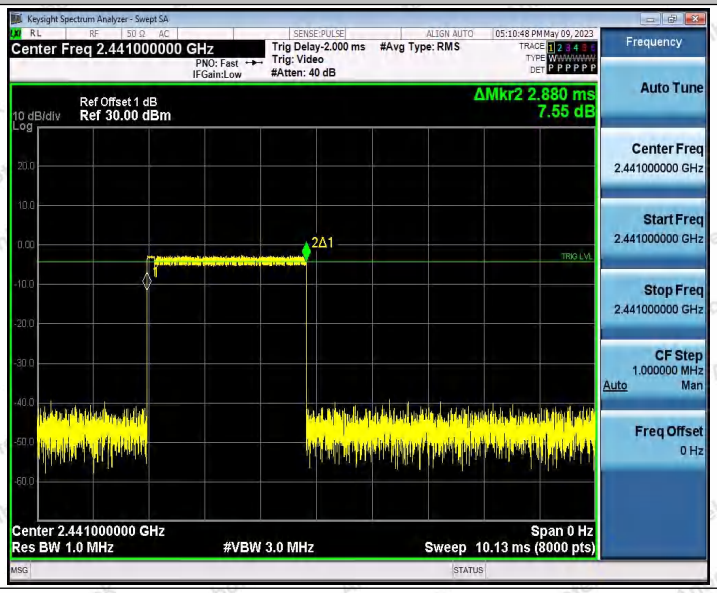


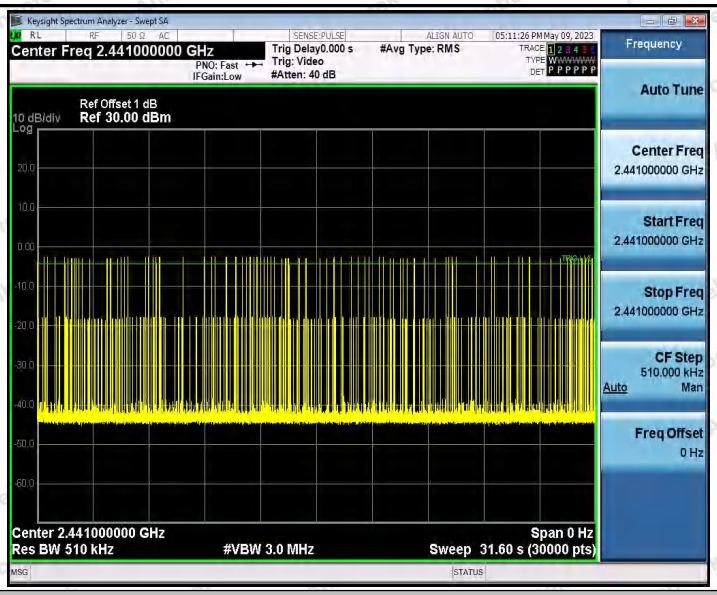
2DH3_Ant1_Hop



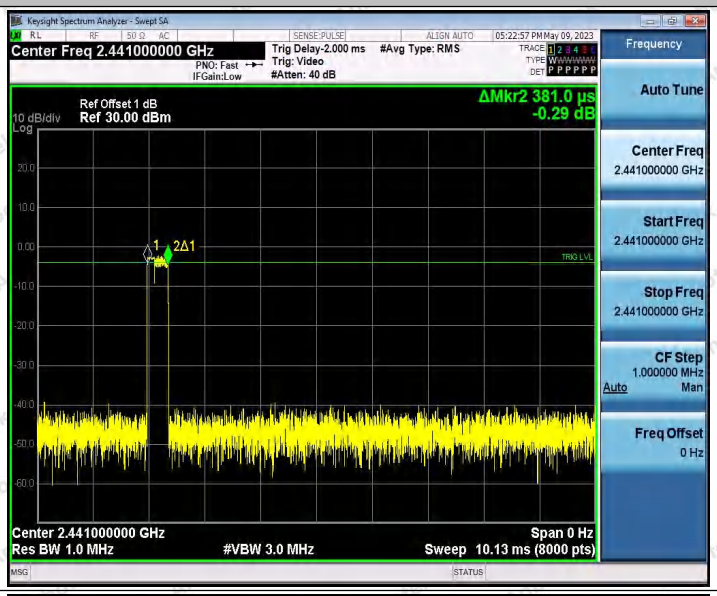


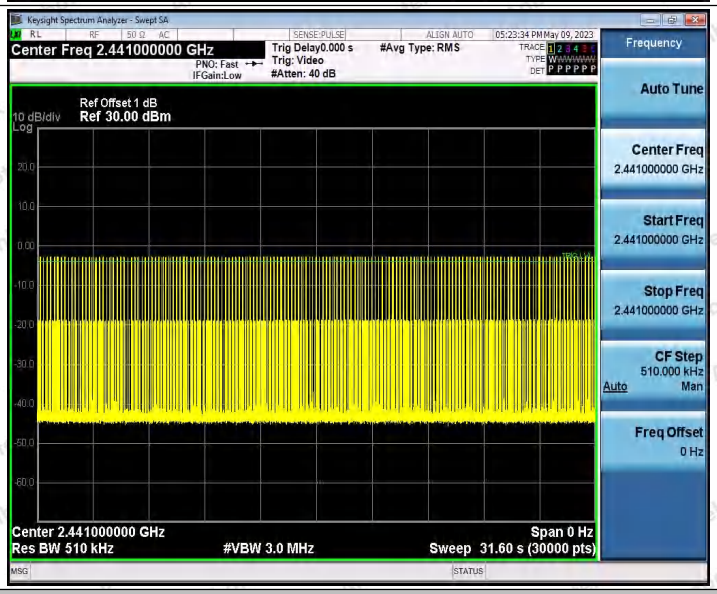
2DH5_Ant1_Hop



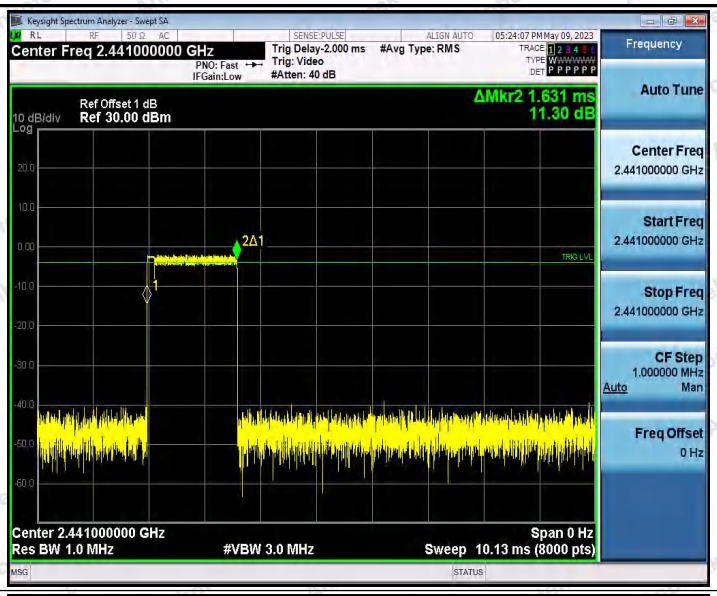


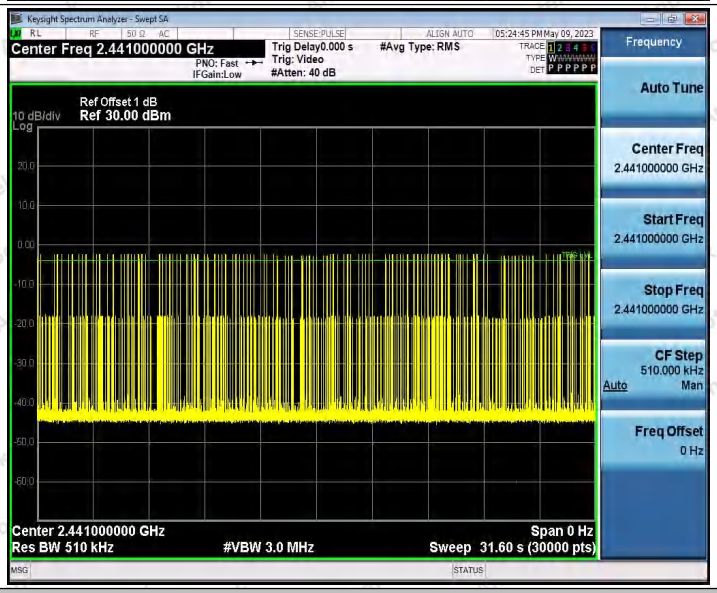
3DH1_Ant1_Hop



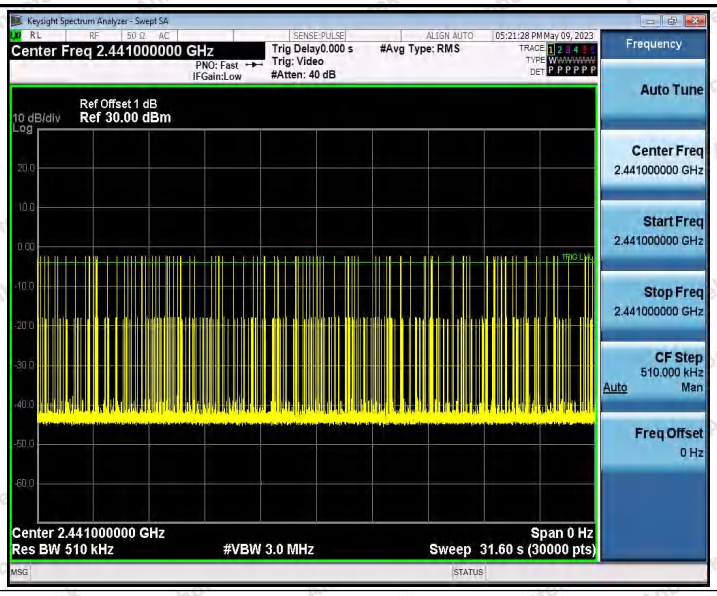


3DH3_Ant1_Hop





3DH5_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
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)
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

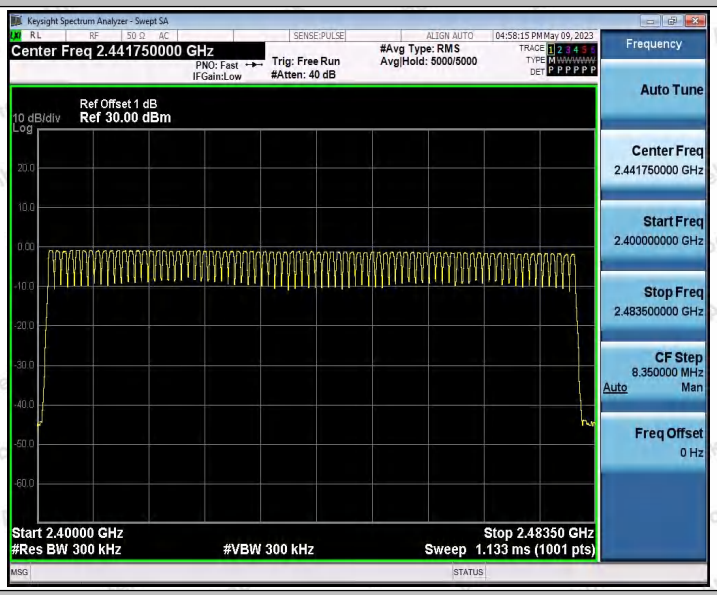
Appendix F: Number of hopping channels

Test Result

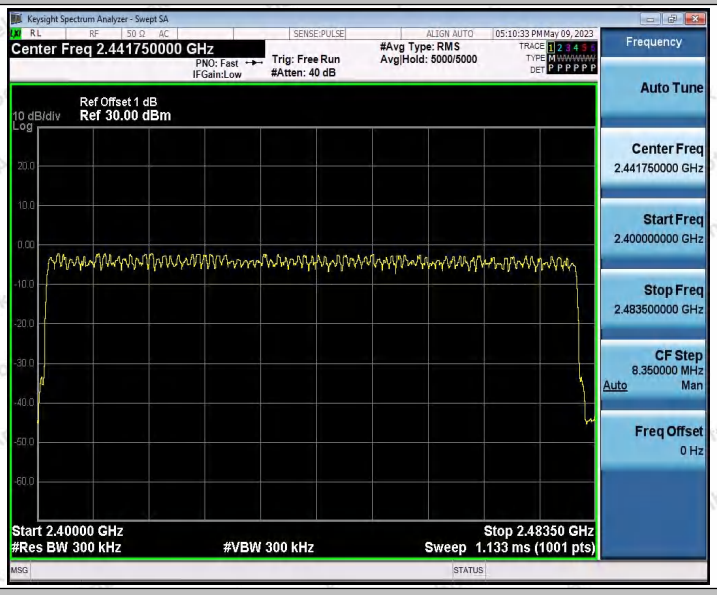
Test Mode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

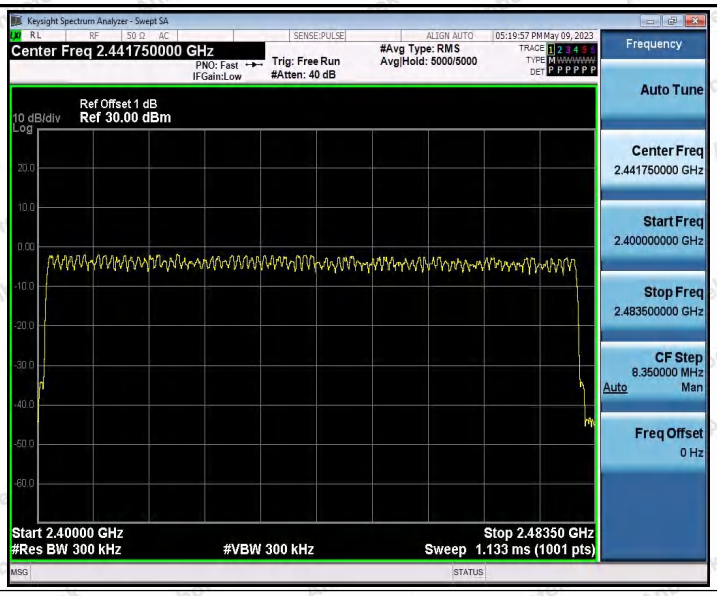
DH5_Ant1_Hop



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
05:19:57 PM May 09, 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

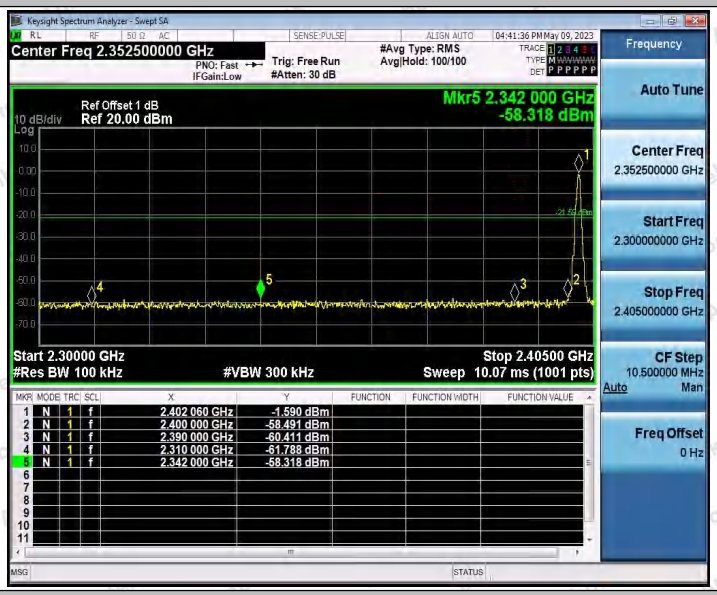
Appendix G: Band edge measurements

Test Result

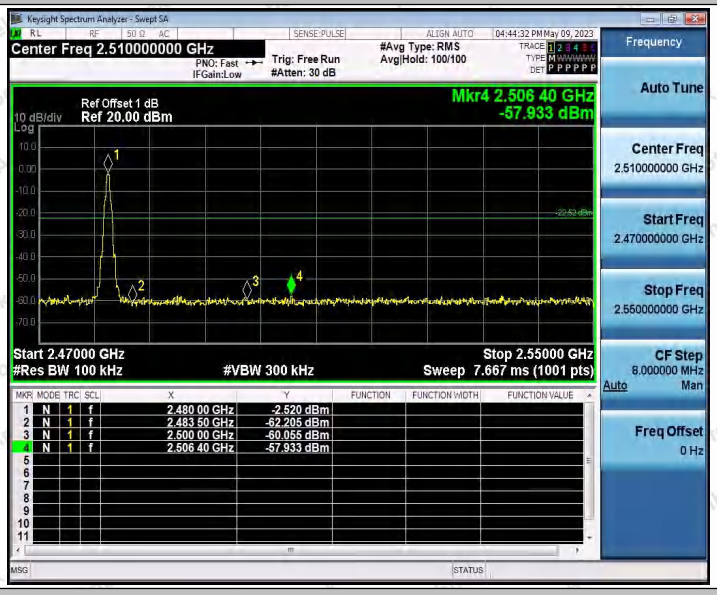
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-1.59	-58.32	≤-21.59	PASS
		High	2480	-2.52	-57.93	≤-22.52	PASS
		Low	Hop_2402	-1.36	-57.32	≤-21.36	PASS
		High	Hop_2480	-2.00	-56.81	≤-22	PASS
2DH5	Ant1	Low	2402	-3.41	-57.49	≤-23.41	PASS
		High	2480	-3.69	-57.39	≤-23.69	PASS
		Low	Hop_2402	-3.12	-56.61	≤-23.12	PASS
		High	Hop_2480	-4.73	-57.05	≤-24.73	PASS
3DH5	Ant1	Low	2402	-3.33	-57.02	≤-23.33	PASS
		High	2480	-4.47	-56.97	≤-24.47	PASS
		Low	Hop_2402	-5.91	-56.72	≤-25.91	PASS
		High	Hop_2480	-3.28	-56.75	≤-23.28	PASS

Test Graphs

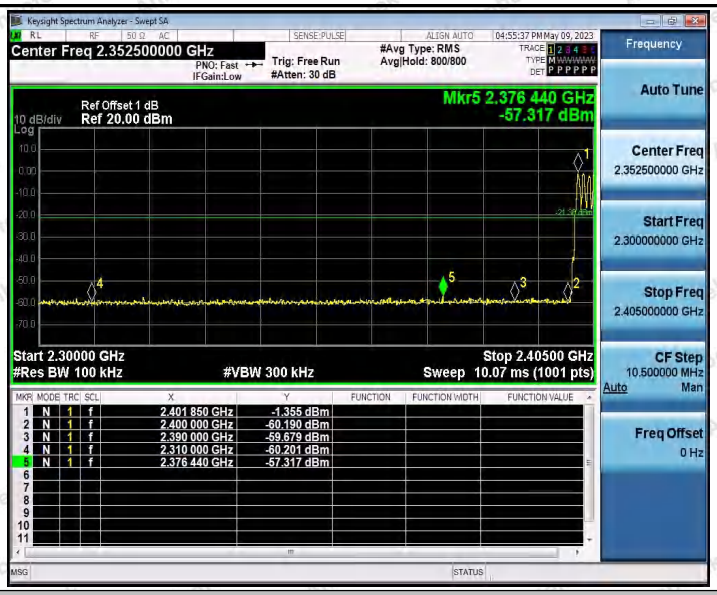
DH5_Ant1_Low_2402



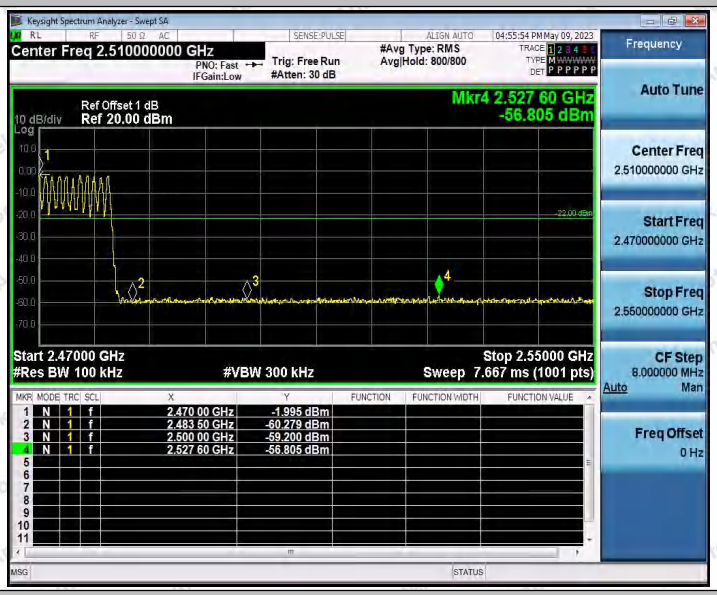
DH5_Ant1_High_2480



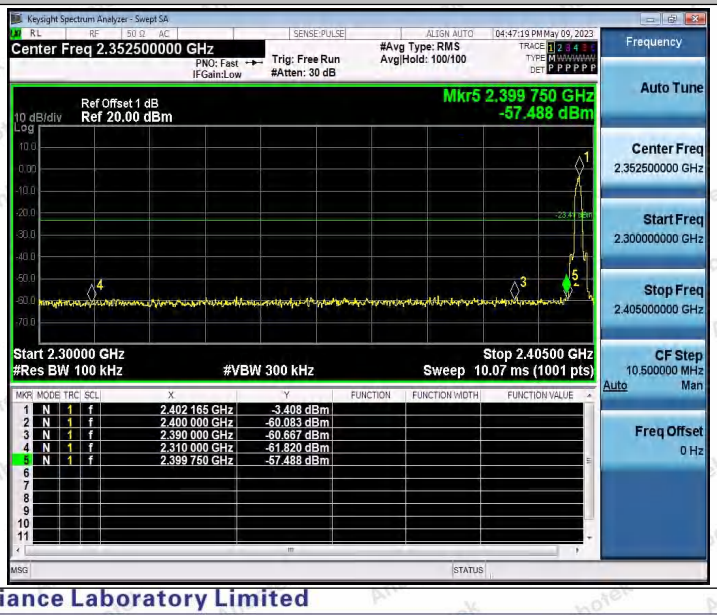
DH5_Ant1_Low_Hop_2402



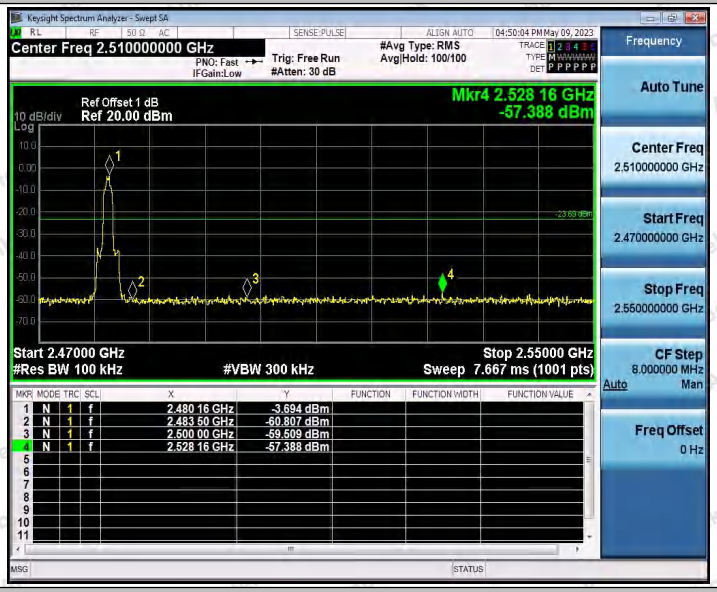
DH5_Ant1_High_Hop_2480



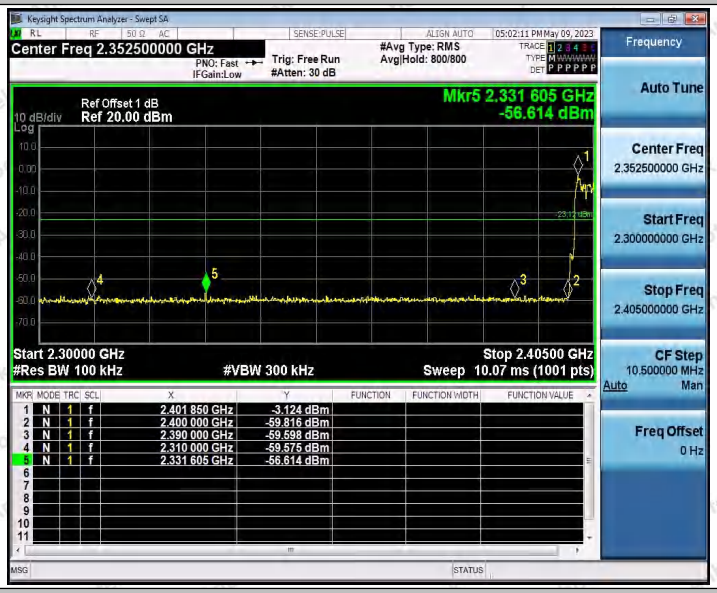
2DH5_Ant1_Low_2402



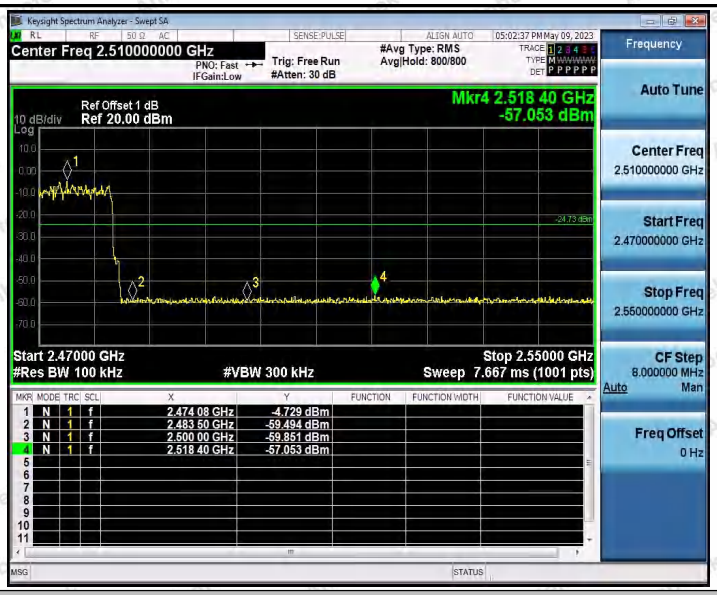
2DH5_Ant1_High_2480



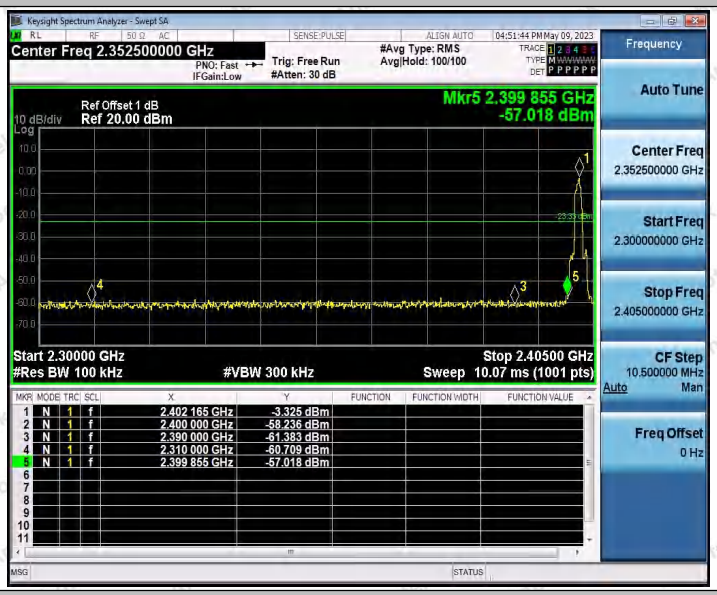
2DH5_Ant1_Low_Hop_2402



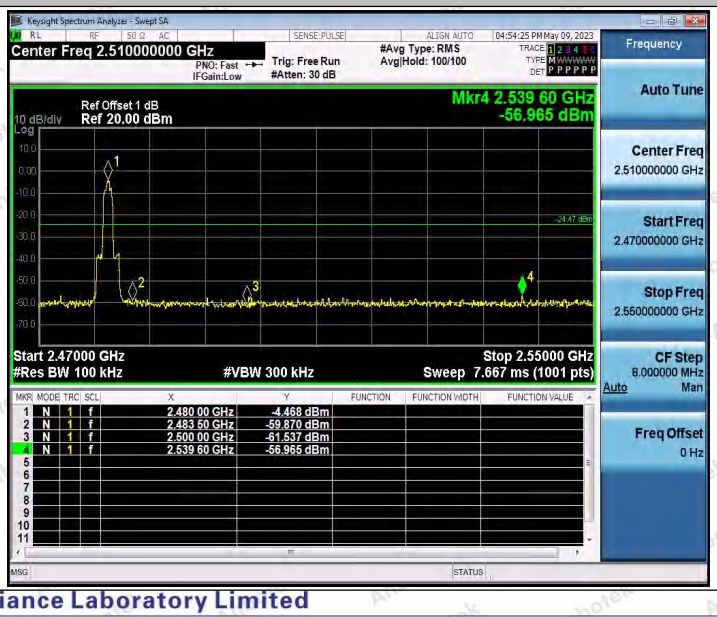
2DH5_Ant1_High_Hop_2480



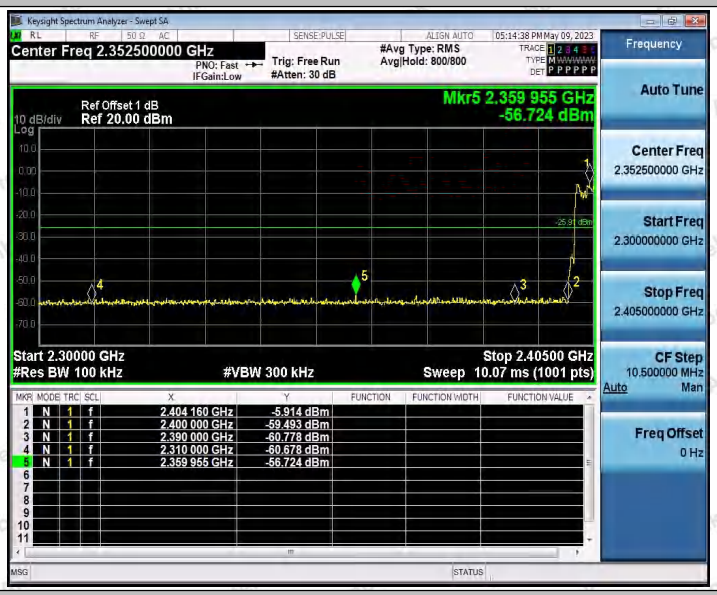
3DH5_Ant1_Low_2402



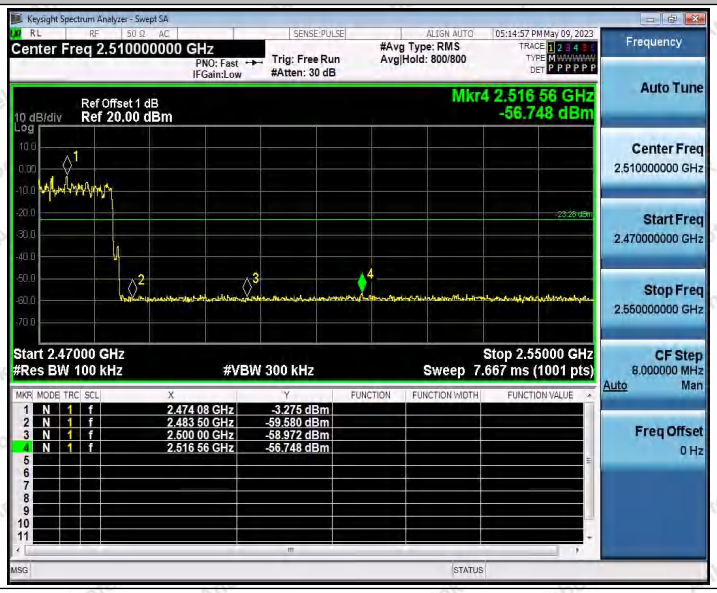
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

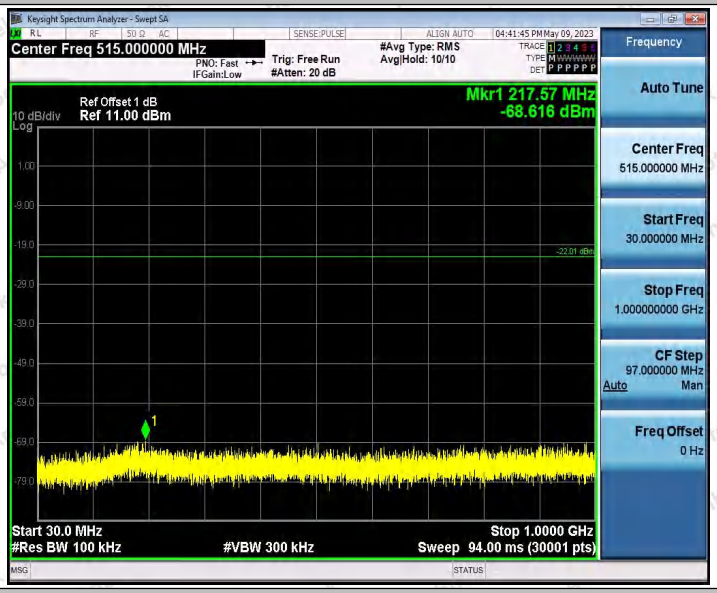
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-2.01	-2.01	---	PASS
			30~1000	-2.01	-68.62	≤-22.01	PASS
			1000~26500	-2.01	-53.31	≤-22.01	PASS
		2441	Reference	-2.38	-2.38	---	PASS
			30~1000	-2.38	-68.68	≤-22.38	PASS
			1000~26500	-2.38	-52.96	≤-22.38	PASS
		2480	Reference	-2.94	-2.94	---	PASS
			30~1000	-2.94	-68.6	≤-22.94	PASS
			1000~26500	-2.94	-53.5	≤-22.94	PASS
2DH5	Ant1	2402	Reference	-3.19	-3.19	---	PASS
			30~1000	-3.19	-68.67	≤-23.19	PASS
			1000~26500	-3.19	-52.72	≤-23.19	PASS
		2441	Reference	-6.53	-6.53	---	PASS
			30~1000	-6.53	-68.43	≤-26.53	PASS
			1000~26500	-6.53	-53.43	≤-26.53	PASS
		2480	Reference	-5.63	-5.63	---	PASS
			30~1000	-5.63	-68.38	≤-25.63	PASS
			1000~26500	-5.63	-52.85	≤-25.63	PASS
3DH5	Ant1	2402	Reference	-3.54	-3.54	---	PASS
			30~1000	-3.54	-67.95	≤-23.54	PASS
			1000~26500	-3.54	-53.65	≤-23.54	PASS
		2441	Reference	-6.83	-6.83	---	PASS
			30~1000	-6.83	-68.16	≤-26.83	PASS
			1000~26500	-6.83	-53.46	≤-26.83	PASS
		2480	Reference	-6.61	-6.61	---	PASS
			30~1000	-6.61	-68.28	≤-26.61	PASS
			1000~26500	-6.61	-53.39	≤-26.61	PASS

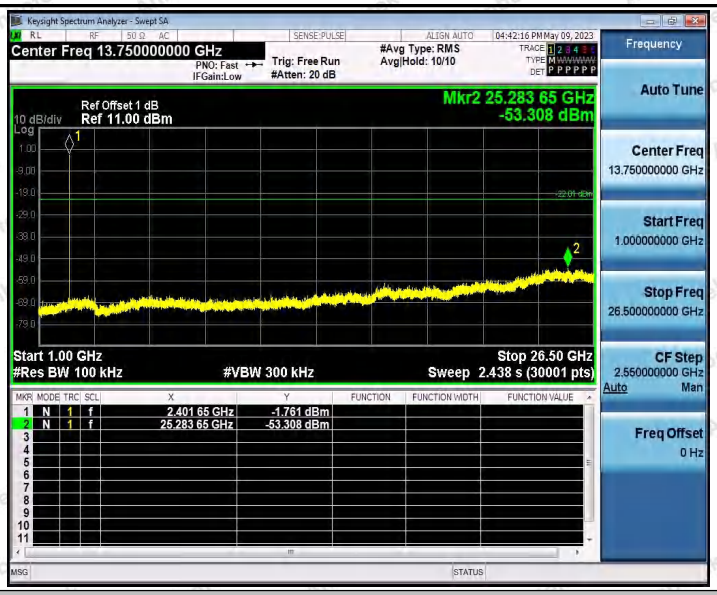
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

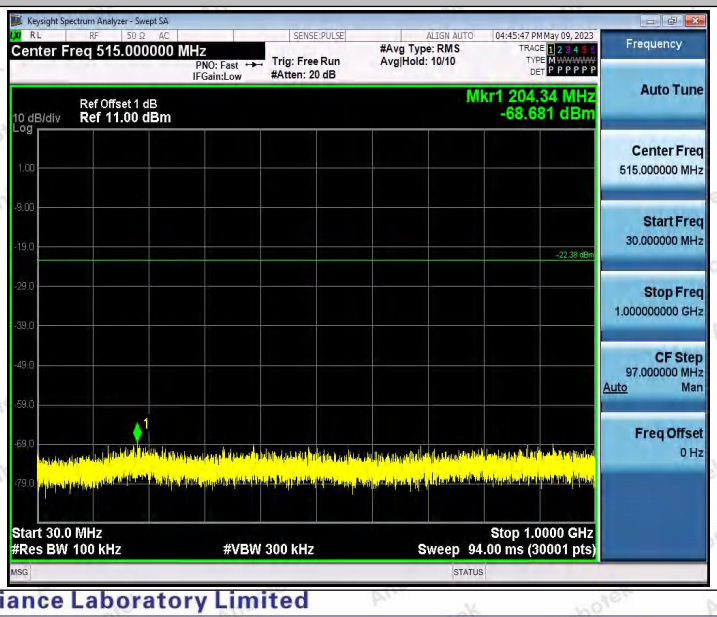


DH5_Ant1_2402_1000~26500

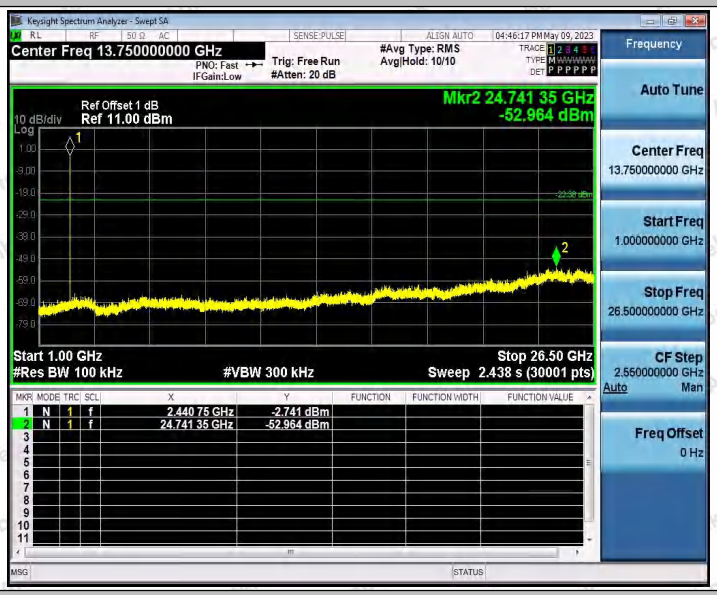


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

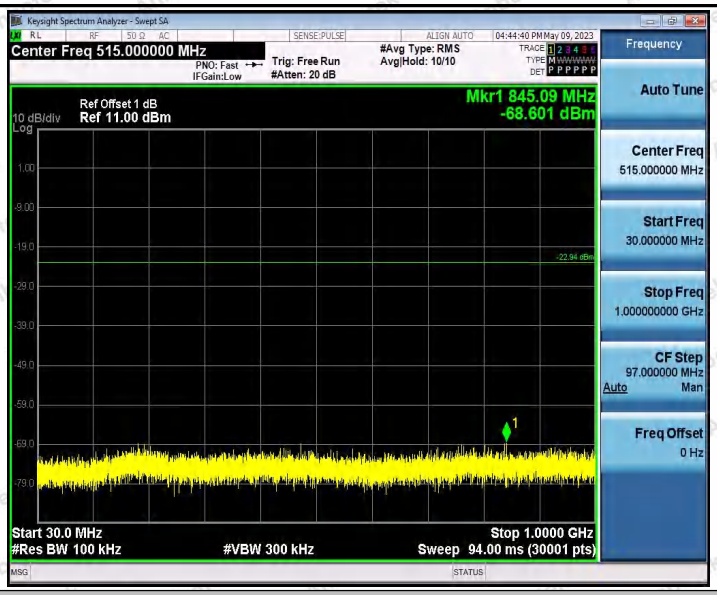


DH5_Ant1_2441_1000~26500

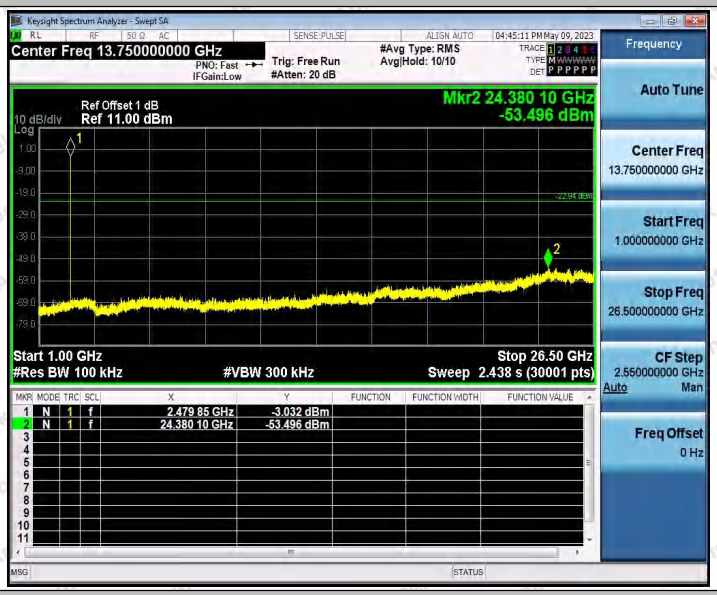


DH5_Ant1_2480_0~Reference

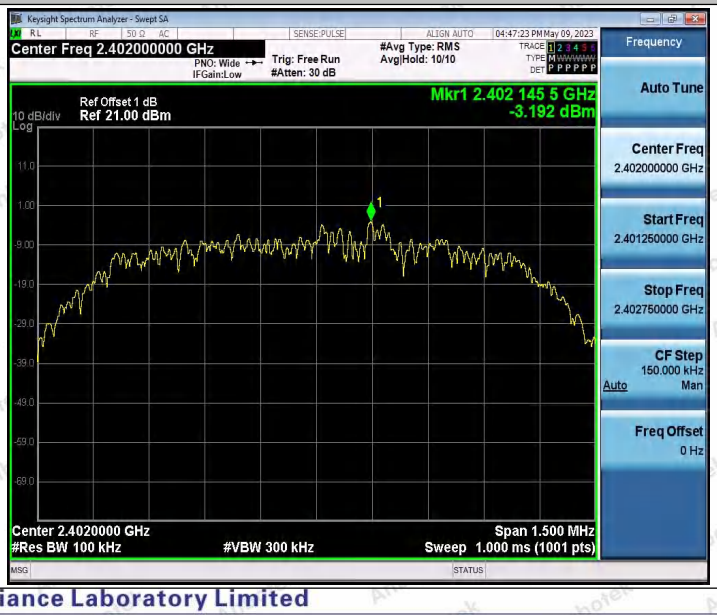
DH5_Ant1_2480_30~1000



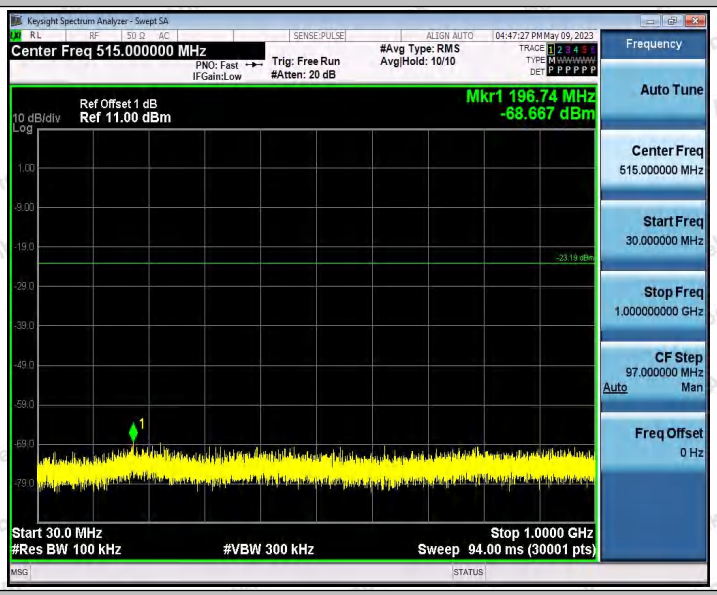
DH5_Ant1_2480_1000~26500



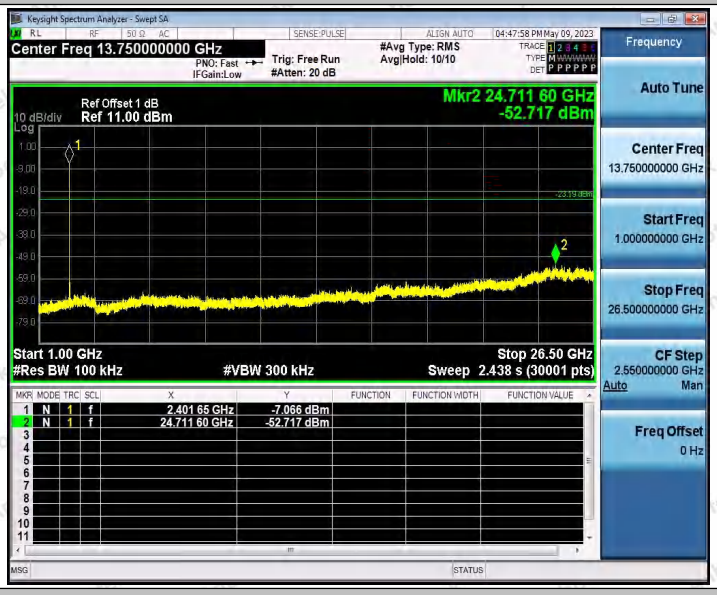
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

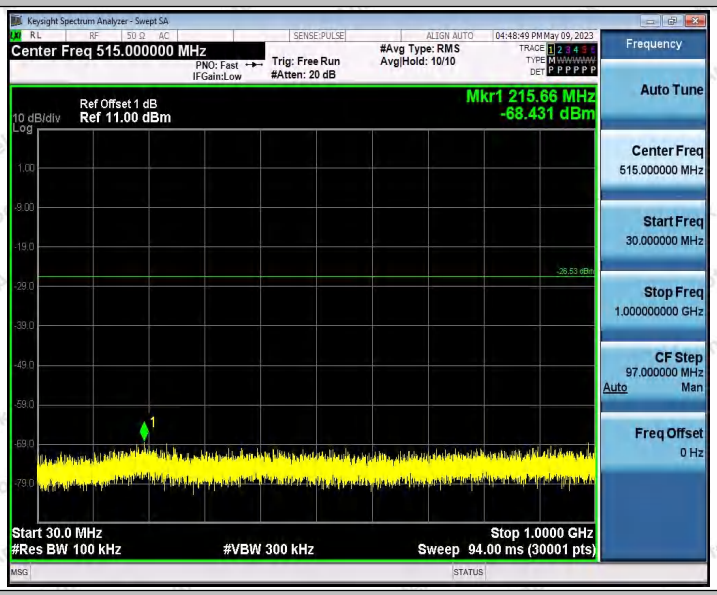


2DH5_Ant1_2402_1000~26500

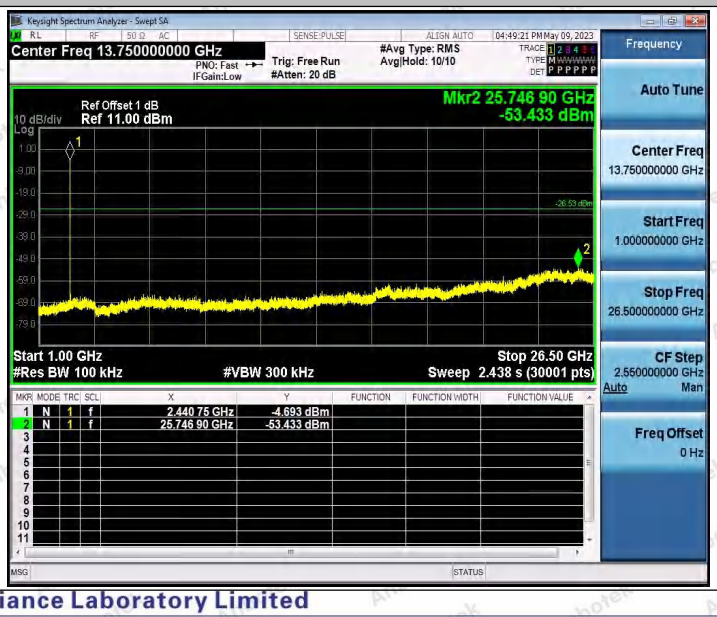


2DH5_Ant1_2441_0~Reference

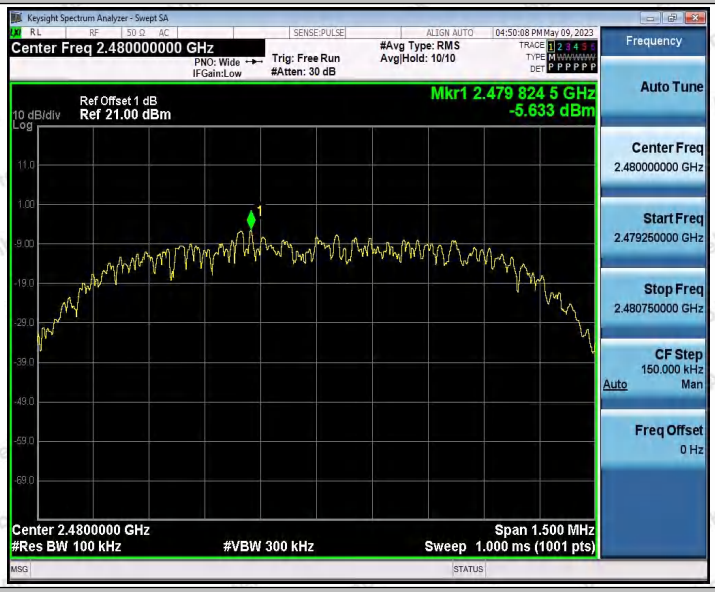
2DH5_Ant1_2441_30~1000



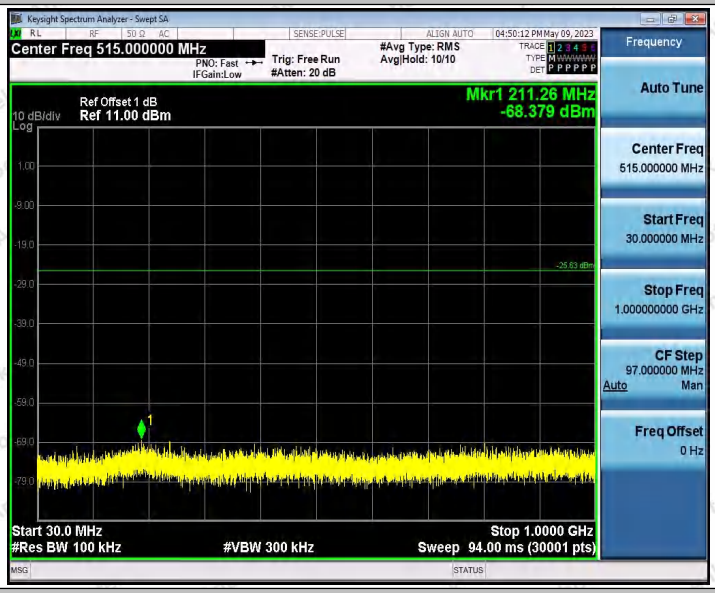
2DH5_Ant1_2441_1000~26500



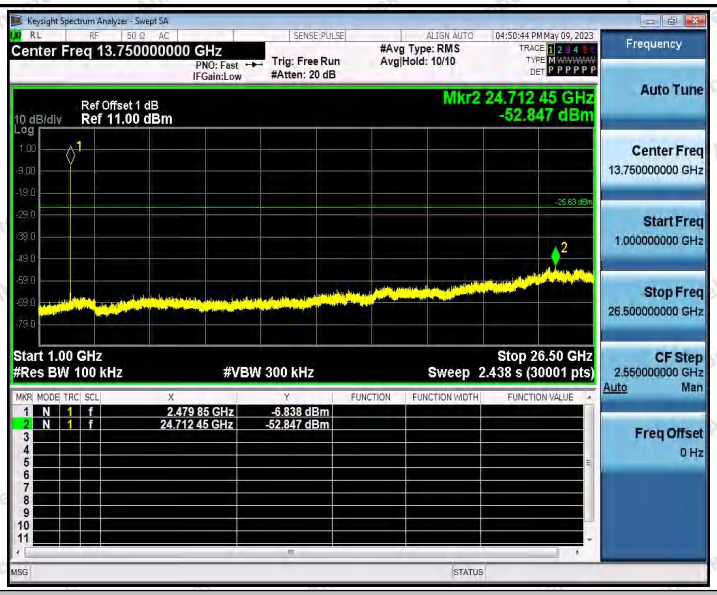
2DH5_Ant1_2480_0~Reference



2DH5_Ant1_2480_30~1000

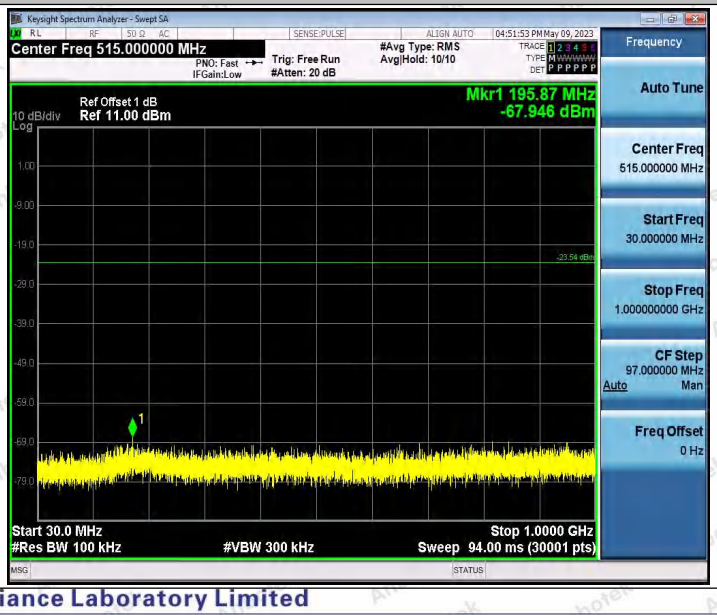


2DH5_Ant1_2480_1000~26500

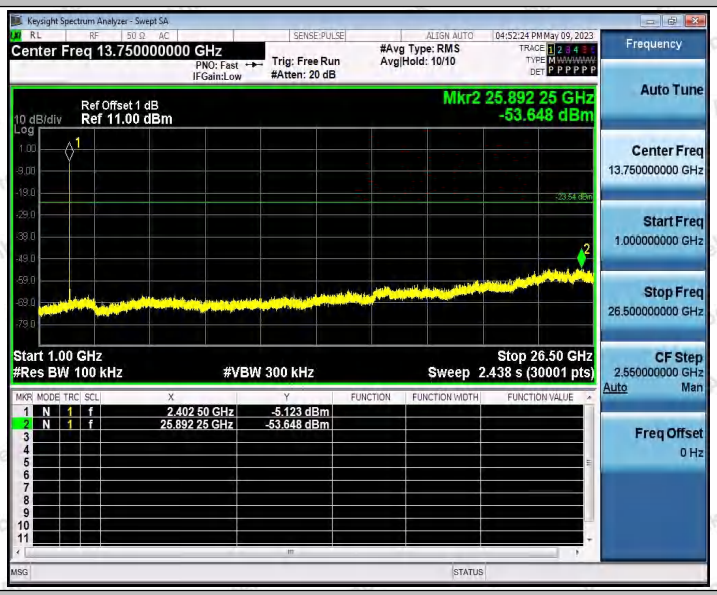


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

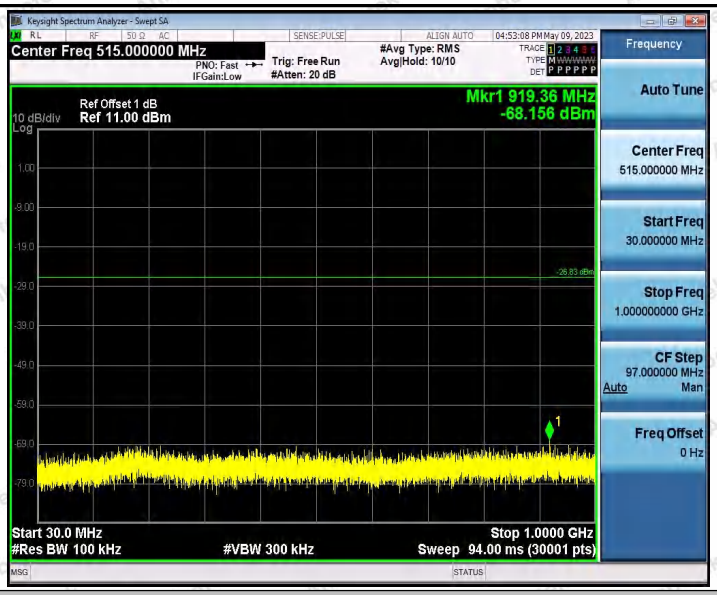


3DH5_Ant1_2402_1000~26500

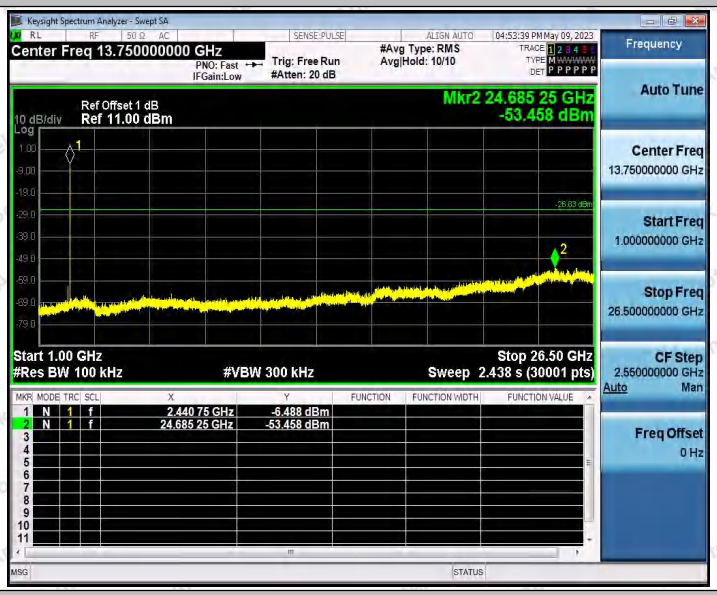


3DH5_Ant1_2441_0~Reference

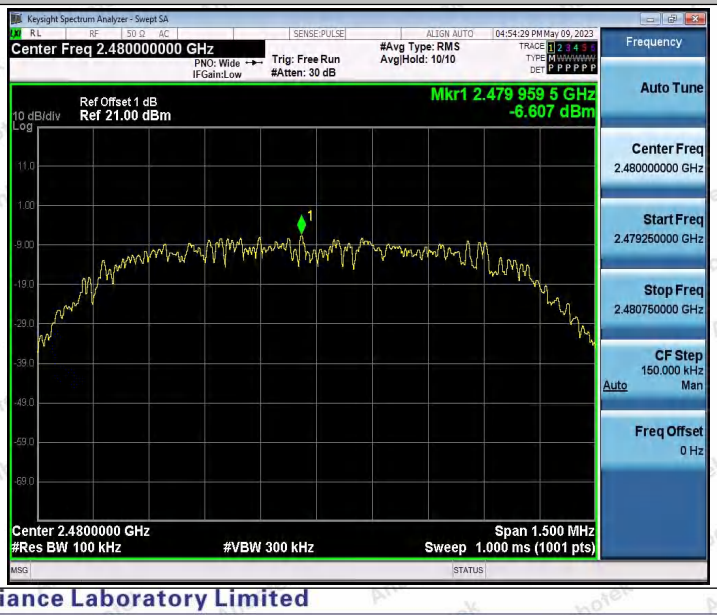
3DH5_Ant1_2441_30~1000



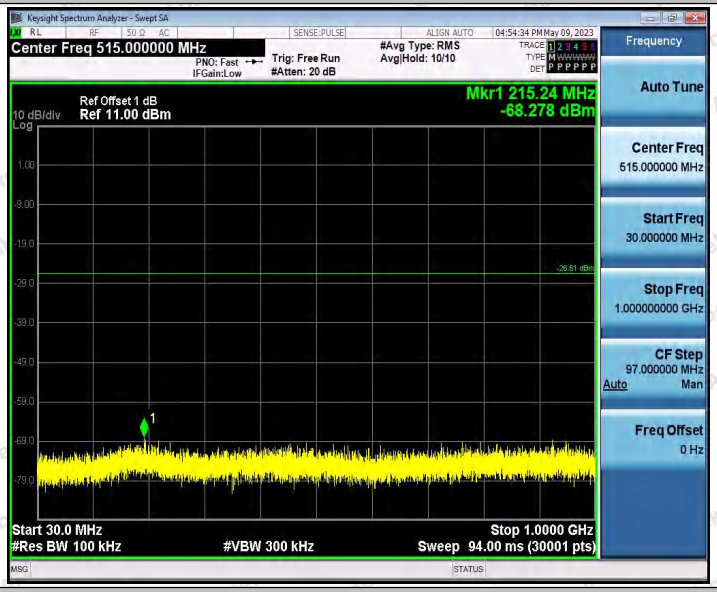
3DH5_Ant1_2441_1000~26500



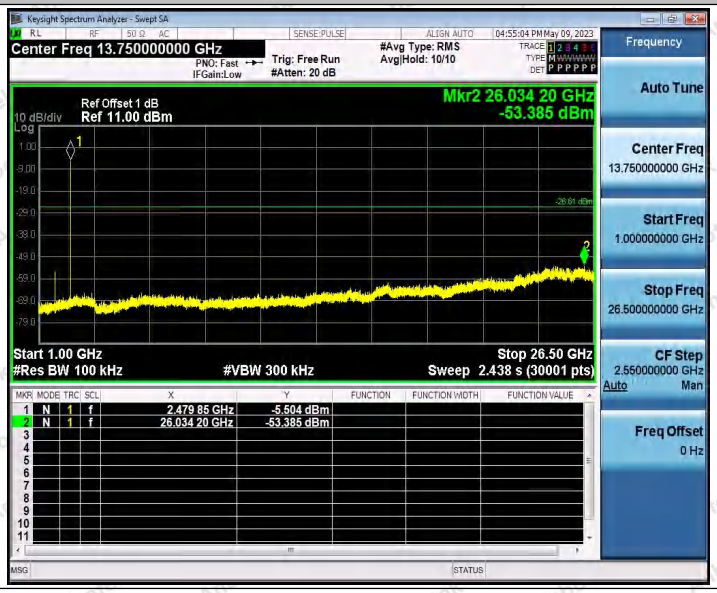
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



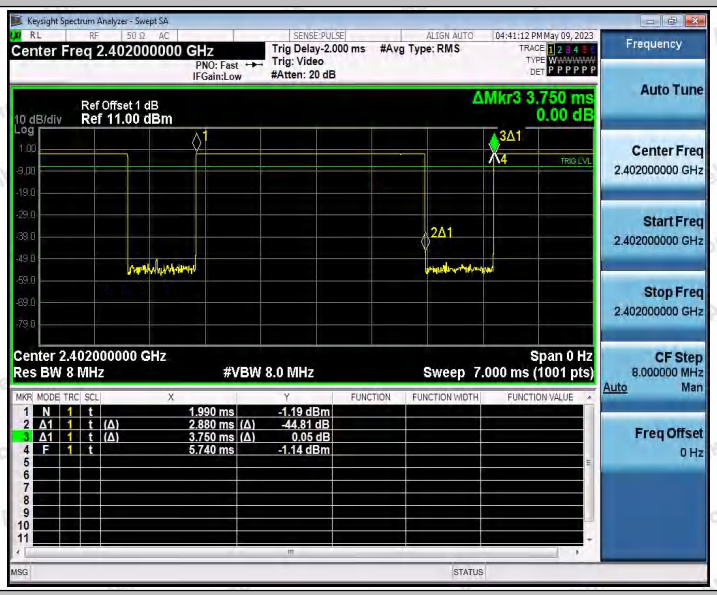
Appendix I: Duty Cycle

Test Result

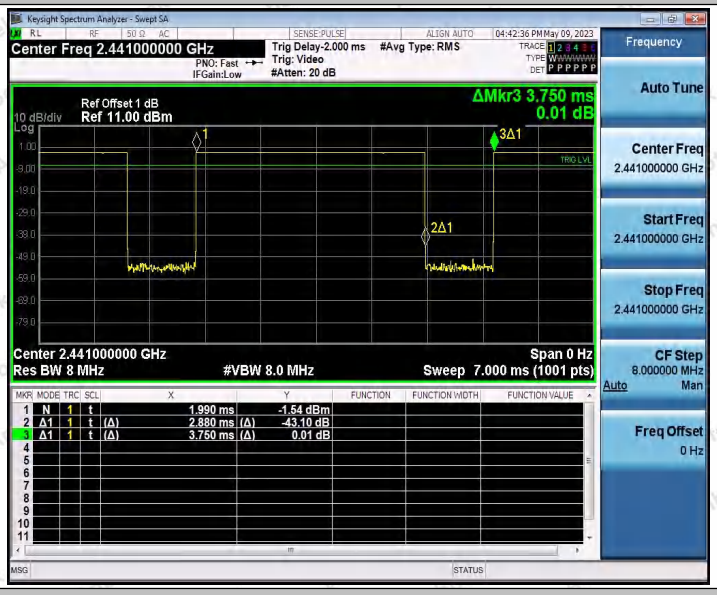
Test Mode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.88	3.75	76.80	1.15
		2441	2.88	3.75	76.80	1.15
		2480	2.88	3.75	76.80	1.15
2DH5	Ant1	2402	2.88	3.75	76.80	1.15
		2441	2.88	3.75	76.80	1.15
		2480	2.89	3.75	77.07	1.13
3DH5	Ant1	2402	2.88	3.75	76.80	1.15
		2441	2.88	3.75	76.80	1.15
		2480	2.88	3.74	77.01	1.13

Test Graphs

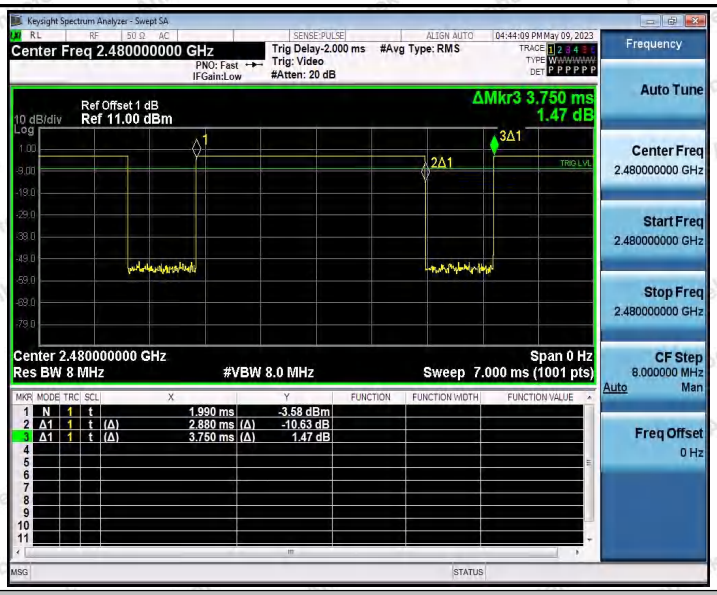
DH5_Ant1_2402



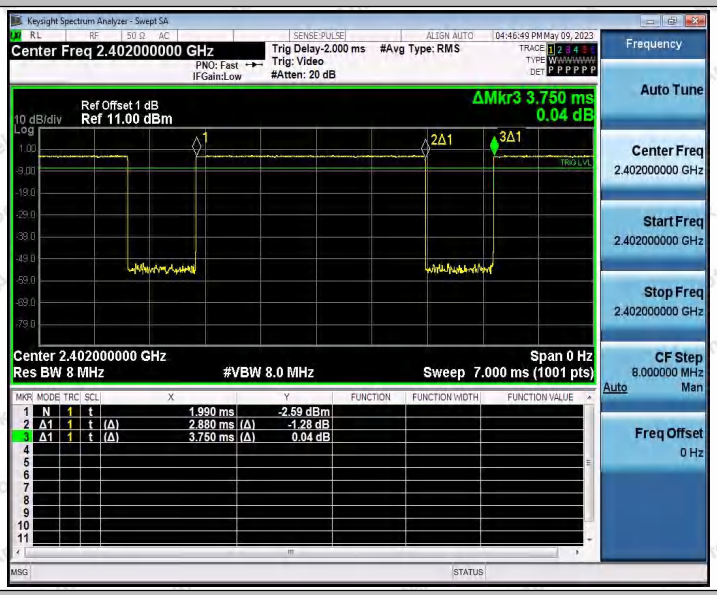
DH5_Ant1_2441



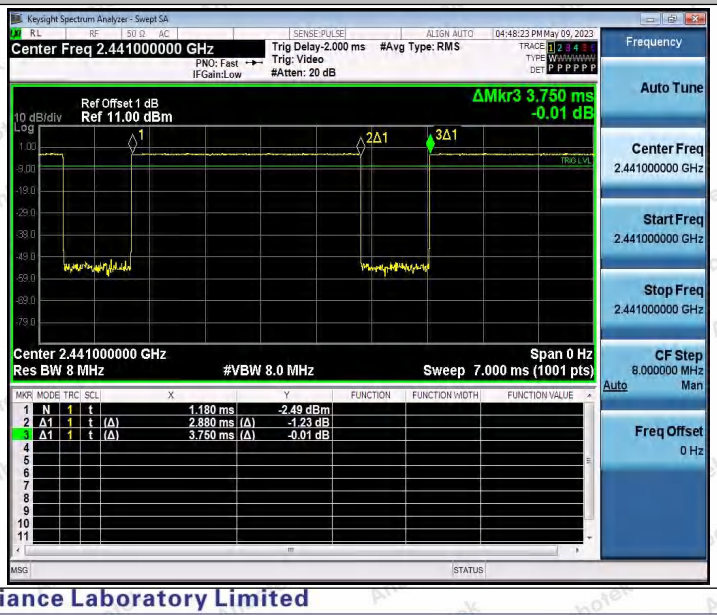
DH5_Ant1_2480



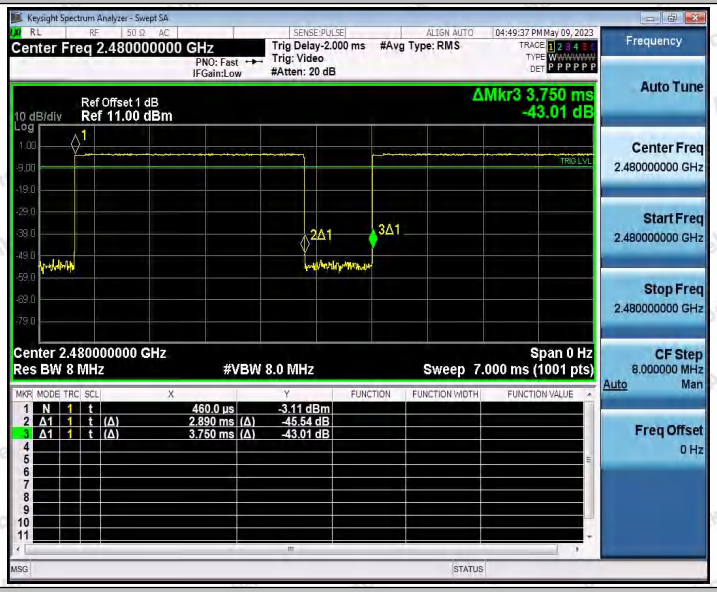
2DH5_Ant1_2402



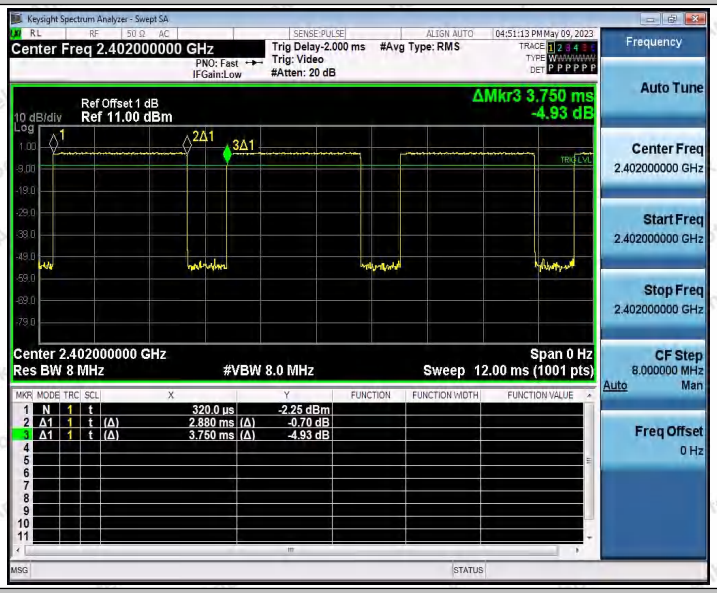
2DH5_Ant1_2441



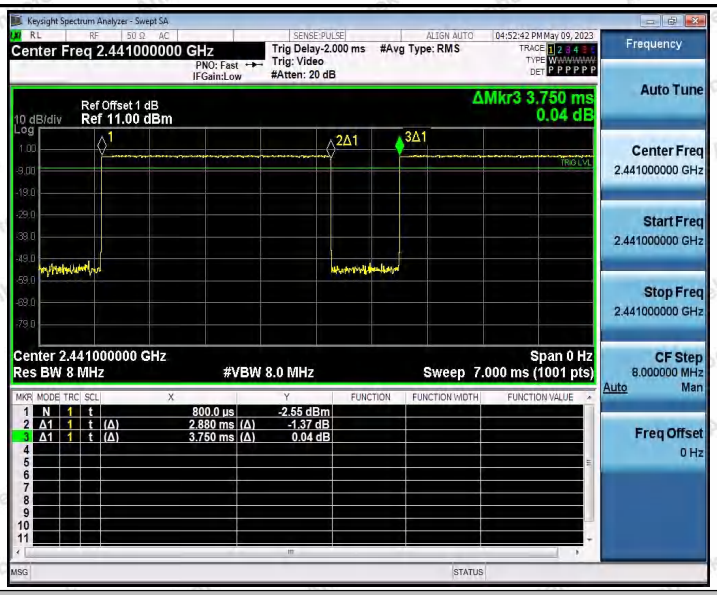
2DH5_Ant1_2480



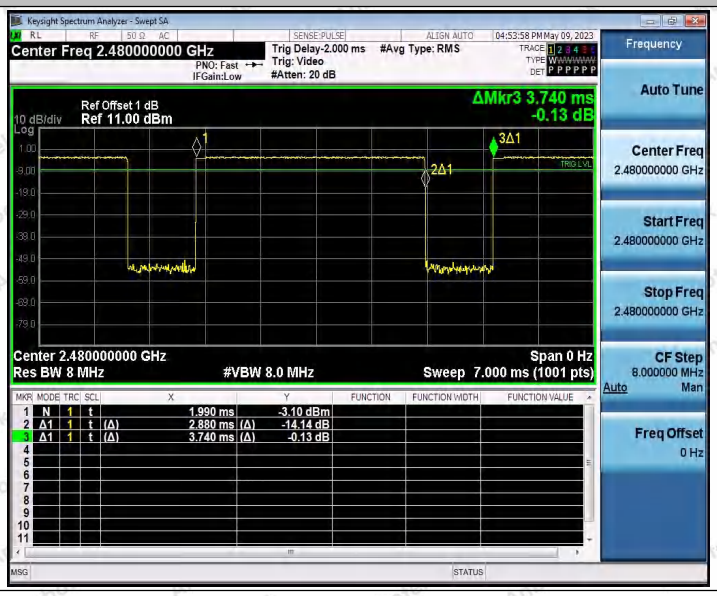
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



---End---