Appendix Test Data

Report No.:	18220WC20226001	Test Sample No.:	1-2-2
Start Test Date:	2022.9.20	Finish Test Date:	2022.9.23
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	27.3℃	Relative Humidity:	47 %
Pressure:	1012 hPa		

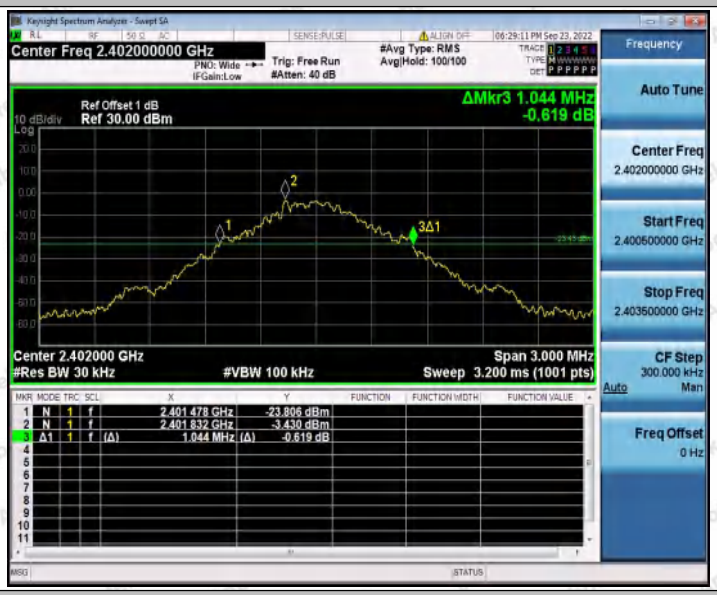
Appendix A: 20dB Emission Bandwidth

Test Result

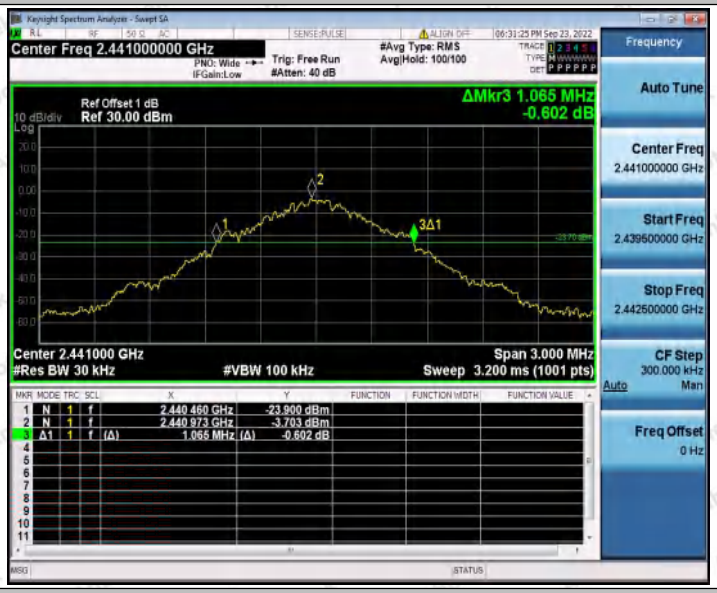
TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	1.044	2401.478	2402.522
		2441	1.065	2440.460	2441.525
		2480	1.062	2479.466	2480.528
2DH5	Ant1	2402	1.344	2401.331	2402.675
		2441	1.341	2440.331	2441.672
		2480	1.323	2479.343	2480.666
3DH5	Ant1	2402	1.305	2401.346	2402.651
		2441	1.287	2440.355	2441.642
		2480	1.326	2479.334	2480.660

Test Graphs

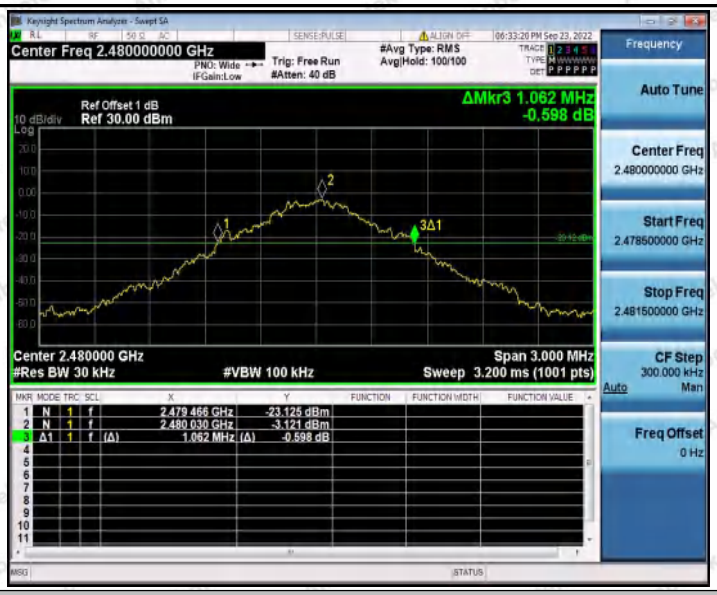
DH5_Ant1_2402



DH5_Ant1_2441

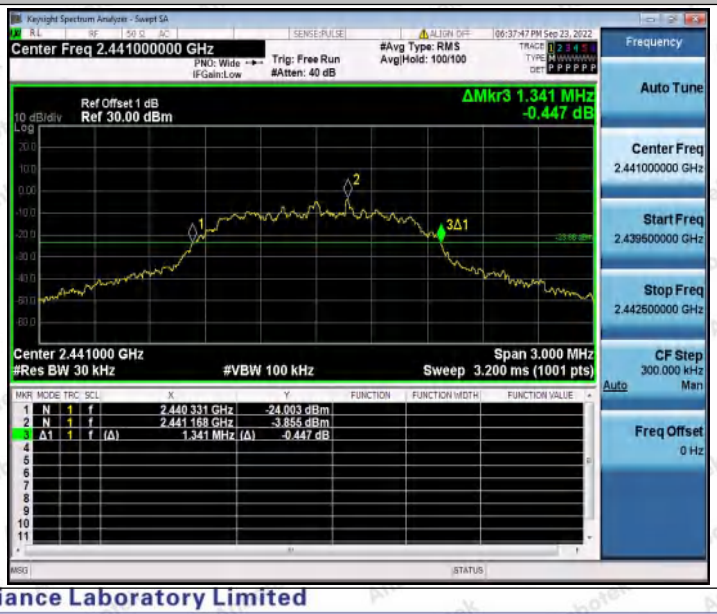


DH5_Ant1_2480



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]
DH5	Ant1	2402	0.94674	2401.5211	2402.4678
		2441	0.96749	2440.5107	2441.4781
		2480	0.97722	2479.5103	2480.4875
2DH5	Ant1	2402	1.2261	2401.3893	2402.6154
		2441	1.2427	2440.3847	2441.6274
		2480	1.2534	2479.3792	2480.6326
3DH5	Ant1	2402	1.2236	2401.3837	2402.6073
		2441	1.2238	2440.3862	2441.6100
		2480	1.2249	2479.3860	2480.6109

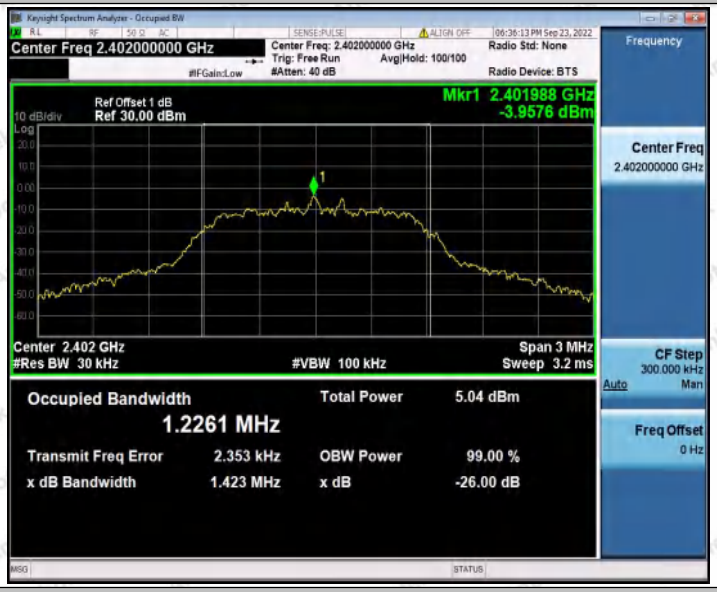
Test Graphs

DH5_Ant1_2402

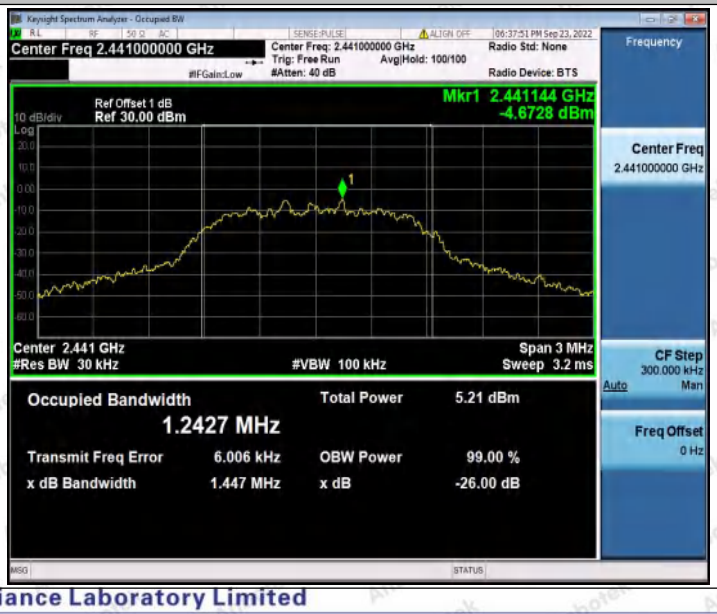
DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

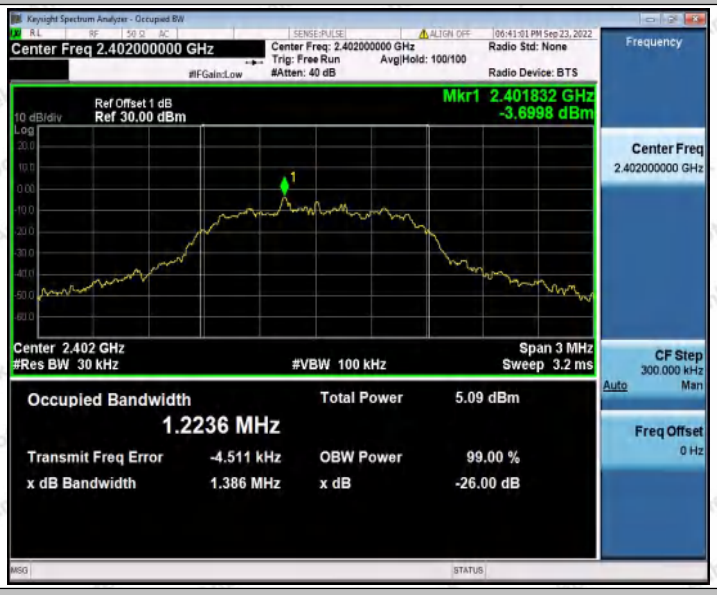


2DH5_Ant1_2441



2DH5_Ant1_2480

3DH5_Ant1_2402



3DH5_Ant1_2441

3DH5_Ant1_2480

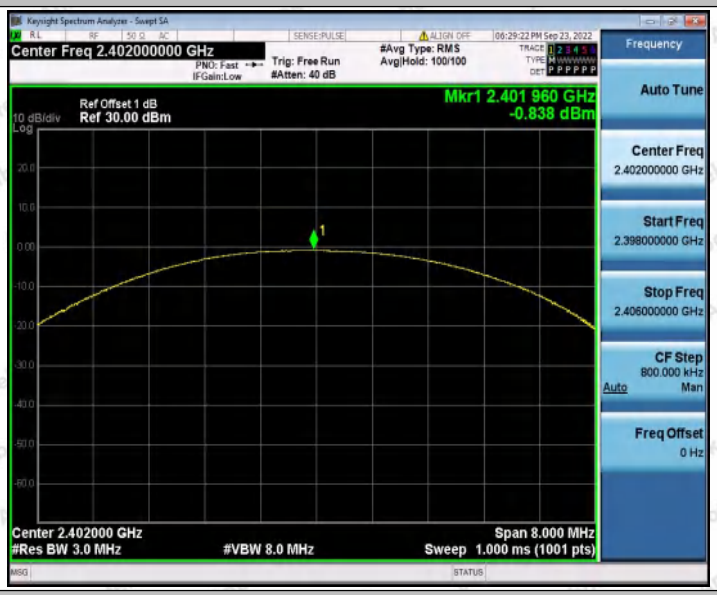
Appendix C: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	-0.84	≤20.97	PASS
		2441	-0.73	≤20.97	PASS
		2480	-0.37	≤20.97	PASS
2DH5	Ant1	2402	-0.05	≤20.97	PASS
		2441	0.16	≤20.97	PASS
		2480	0.47	≤20.97	PASS
3DH5	Ant1	2402	0.44	≤20.97	PASS
		2441	0.61	≤20.97	PASS
		2480	0.97	≤20.97	PASS

Test Graphs

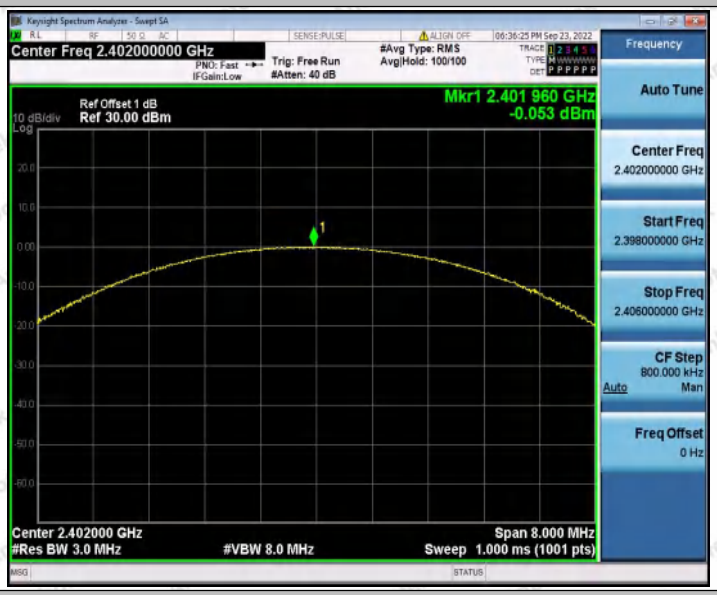
DH5_Ant1_2402



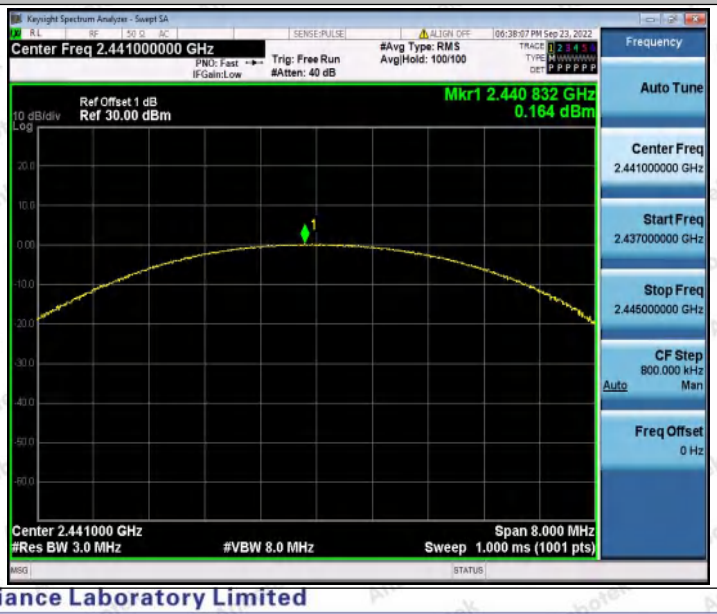
DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

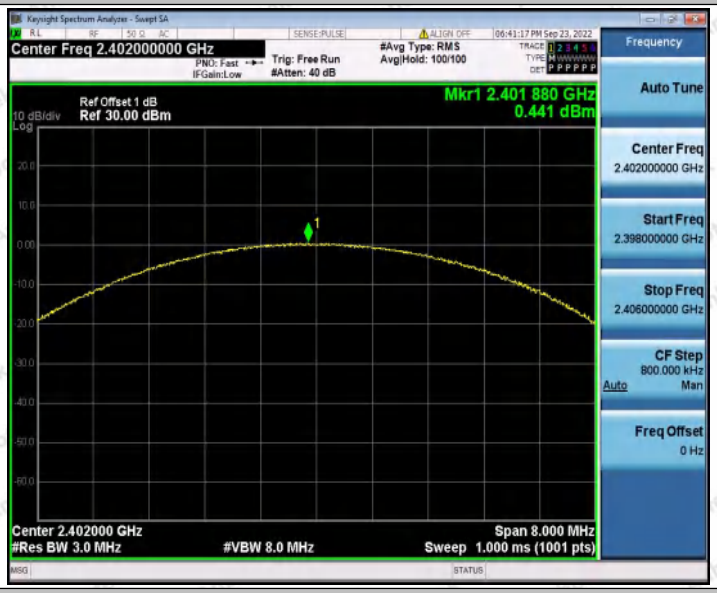


2DH5_Ant1_2441



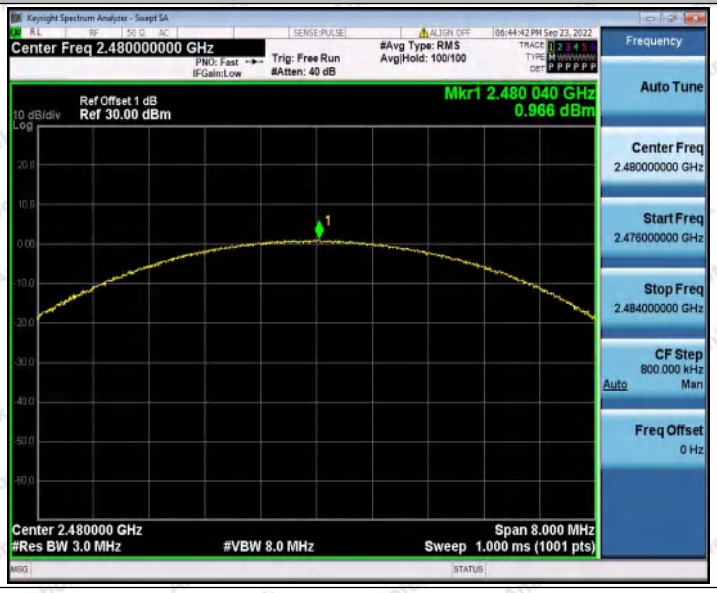
2DH5_Ant1_2480

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	0.87	≥0.710	PASS
2DH5	Ant1	Hop	0.966	≥0.896	PASS
3DH5	Ant1	Hop	0.998	≥0.884	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
07:00:35 PM Sep 23, 2022
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 998 kHz
0.023 dB
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
Start 2.440500 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.442500 GHz
Sweep 1.000 ms (1001 pts)

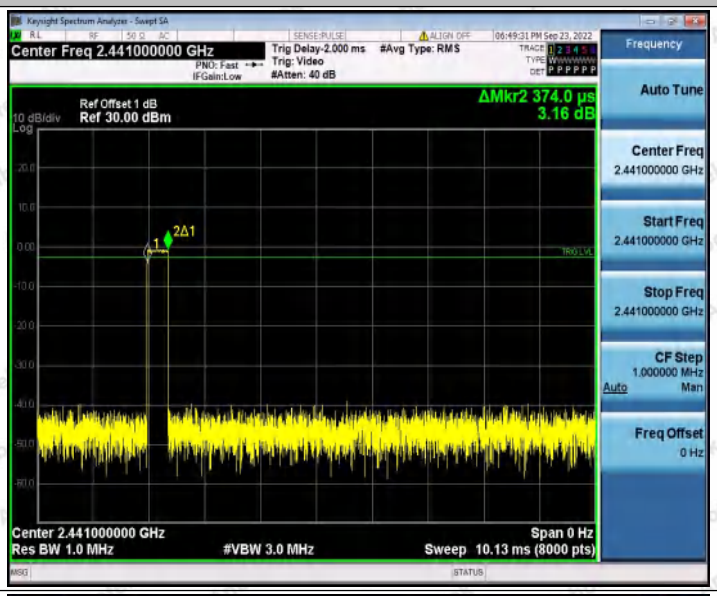
Appendix E: Time of occupancy

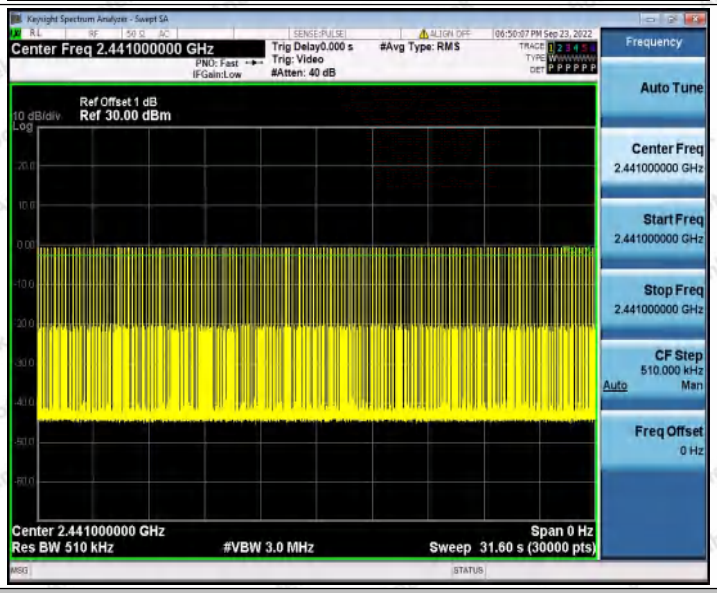
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.374	314	0.117	≤0.4	PASS
DH3	Ant1	Hop	1.631	165	0.269	≤0.4	PASS
DH5	Ant1	Hop	2.878	102	0.294	≤0.4	PASS
2DH1	Ant1	Hop	0.385	319	0.123	≤0.4	PASS
2DH3	Ant1	Hop	1.637	161	0.264	≤0.4	PASS
2DH5	Ant1	Hop	2.885	111	0.32	≤0.4	PASS
3DH1	Ant1	Hop	0.386	318	0.123	≤0.4	PASS
3DH3	Ant1	Hop	1.635	157	0.257	≤0.4	PASS
3DH5	Ant1	Hop	2.887	95	0.274	≤0.4	PASS

Test Graphs

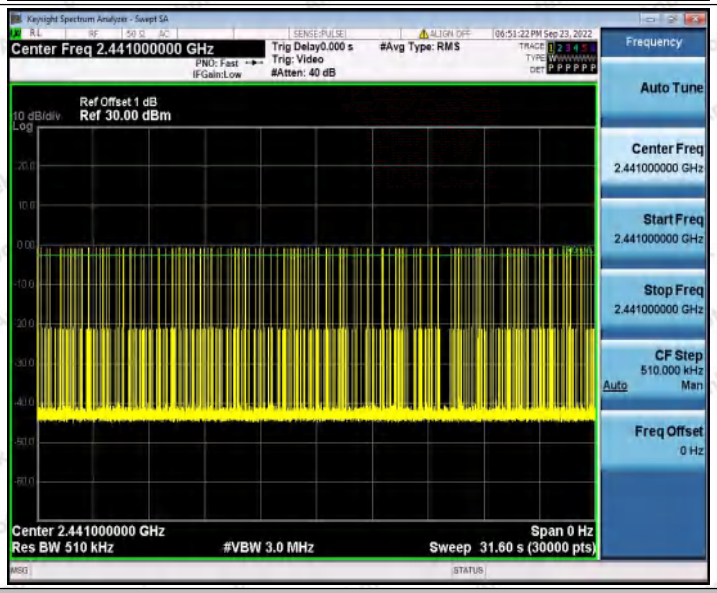
DH1_Ant1_Hop





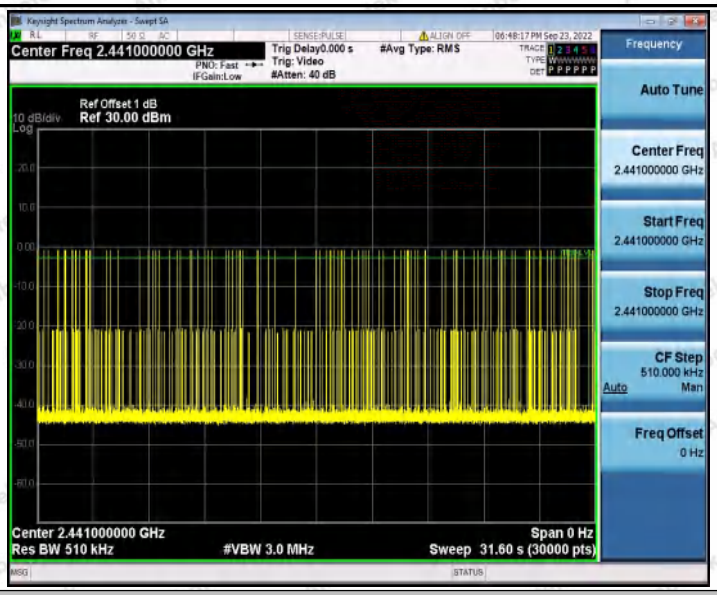
DH3_Ant1_Hop

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 1.631 ms
16.18 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

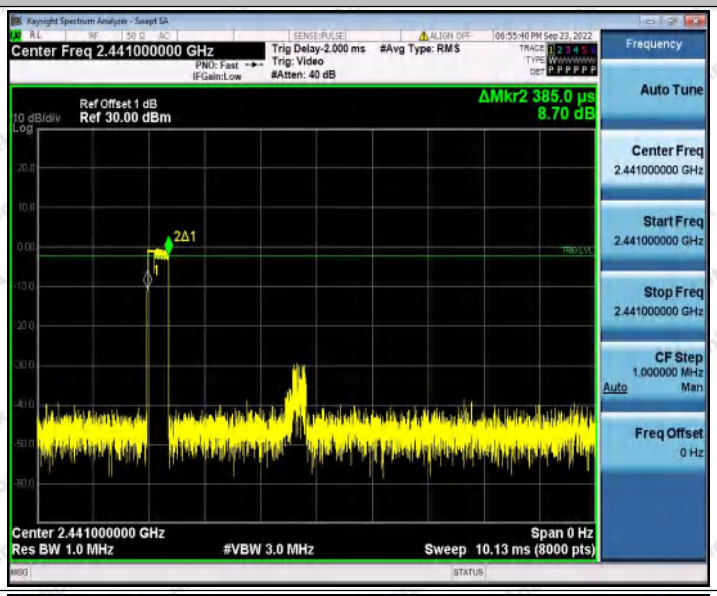

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq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

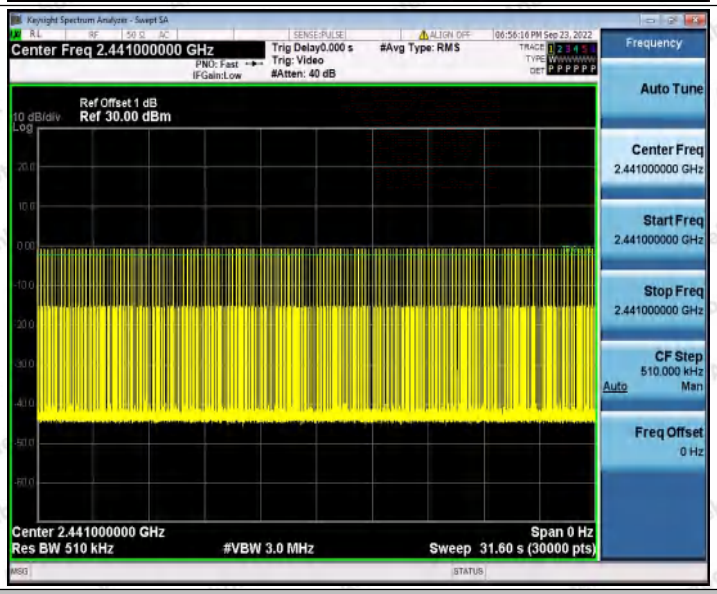
DH5_Ant1_Hop

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 2.878 ms
3.92 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

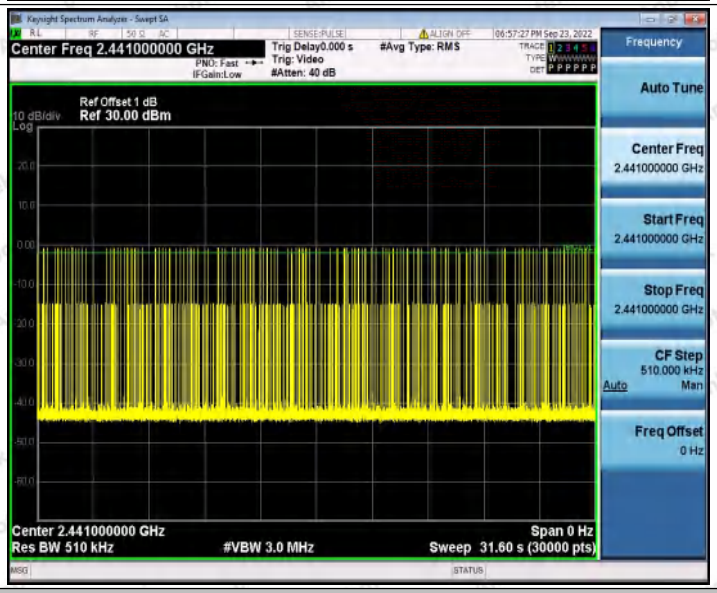


2DH1_Ant1_Hop

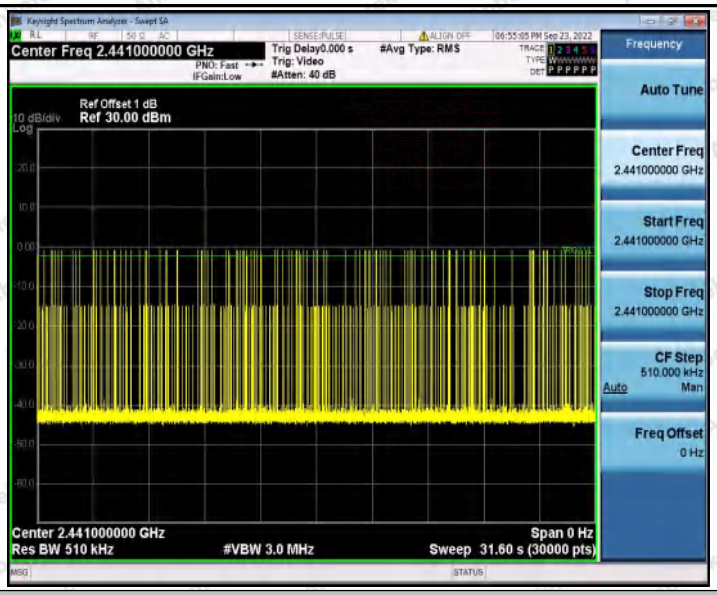




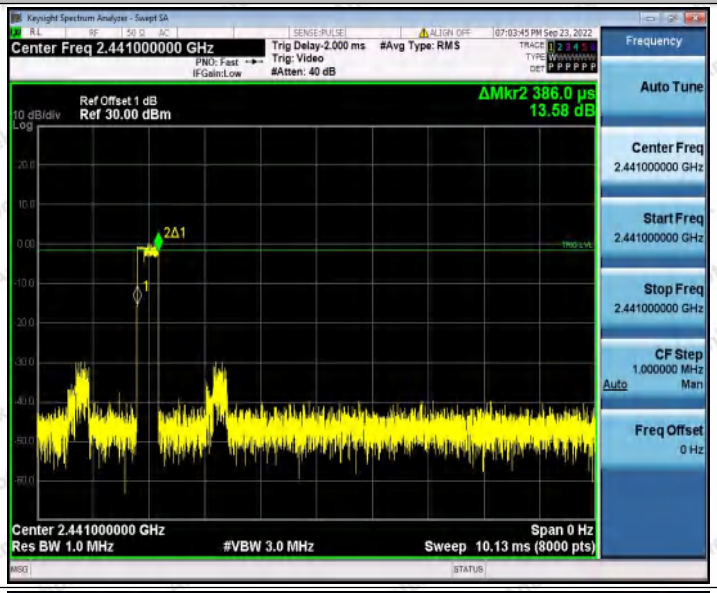
2DH3_Ant1_Hop

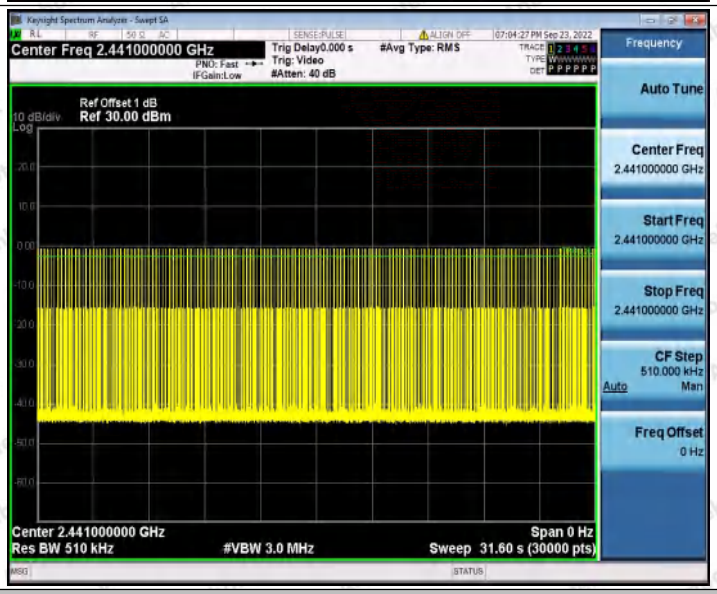


2DH5_Ant1_Hop

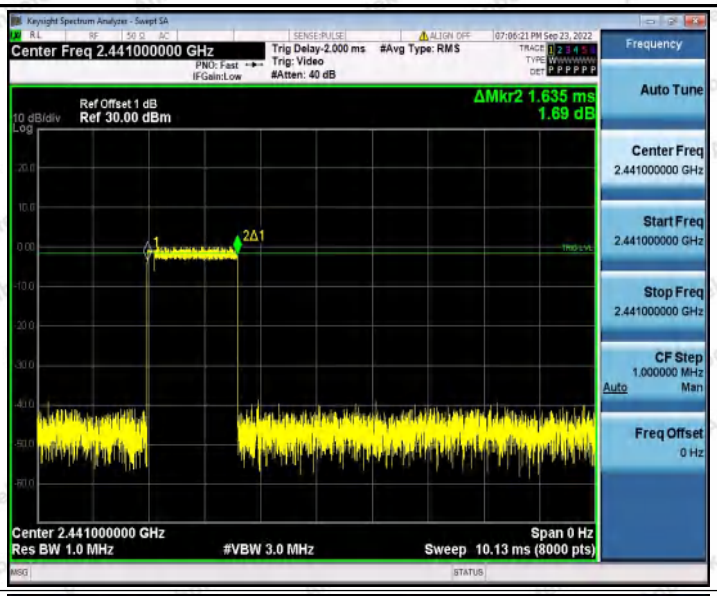


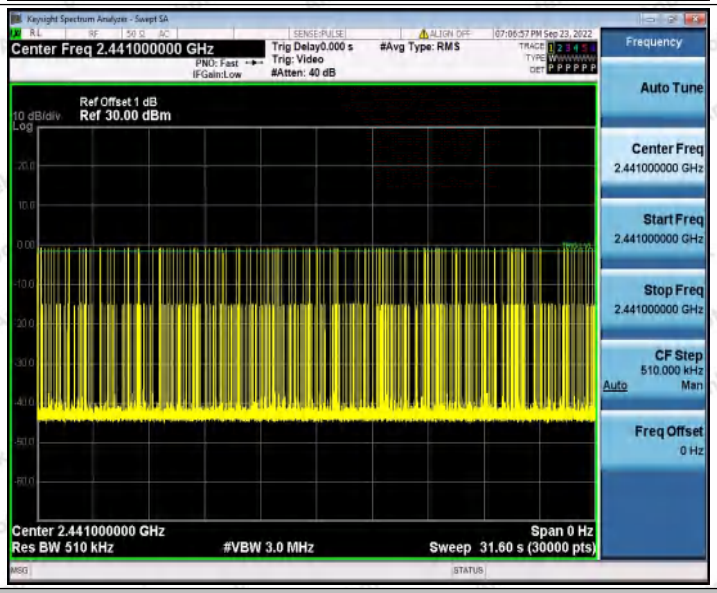
3DH1_Ant1_Hop



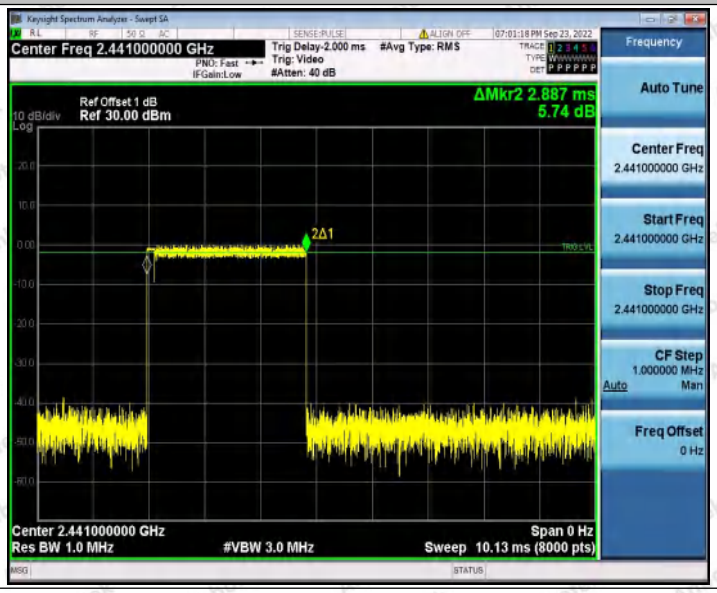


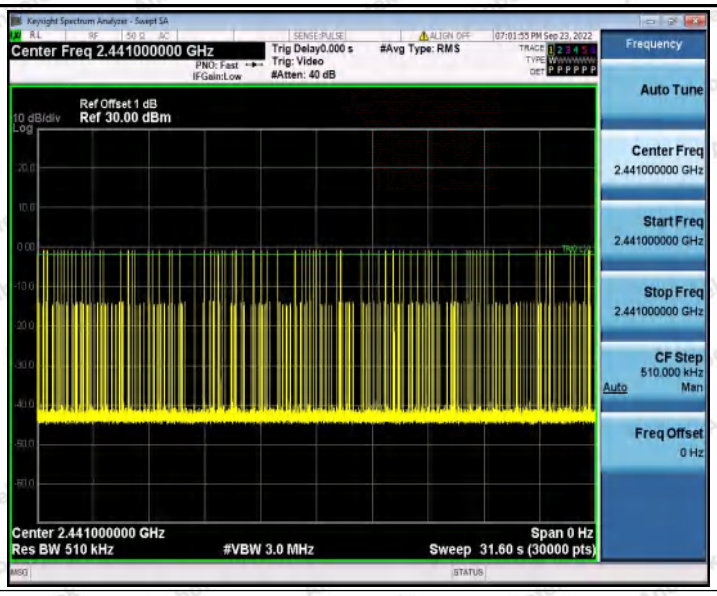
3DH3_Ant1_Hop





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

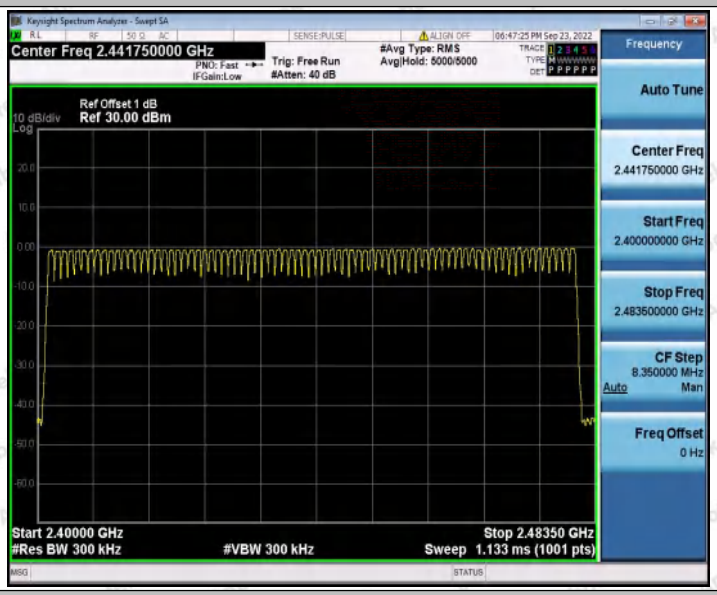
Appendix F: Number of hopping channels

Test Result

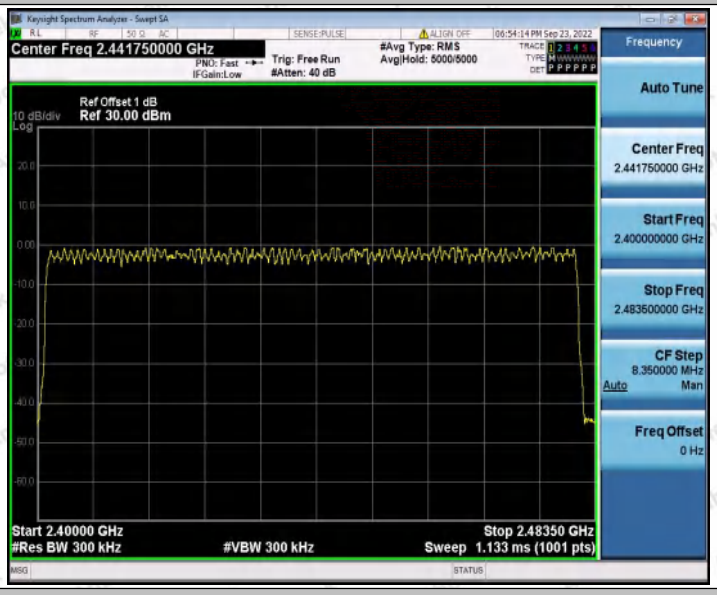
TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

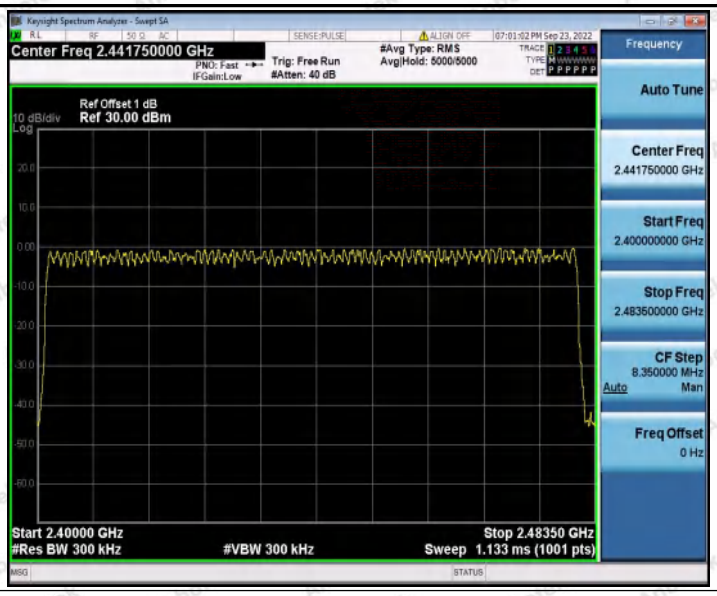
DH5_Ant1_Hop



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
07:01:02 PM Sep 23, 2022
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

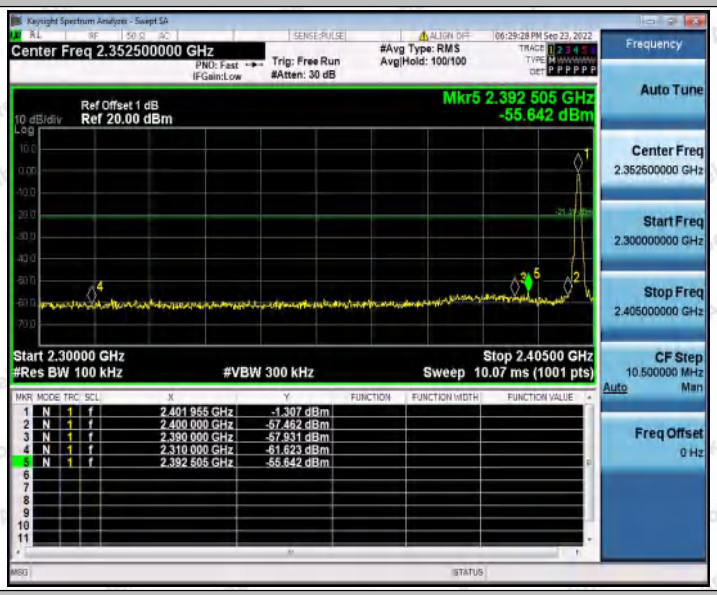
Appendix G: Band edge measurements

Test Result

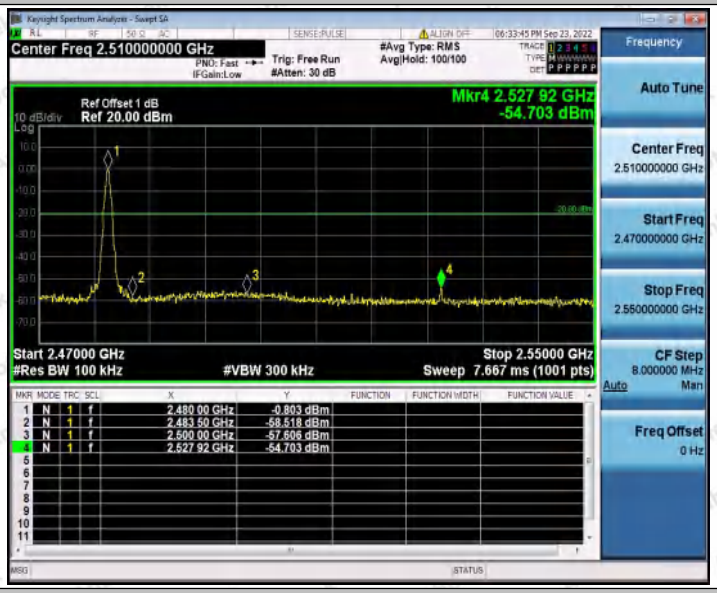
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-1.31	-55.64	≤-21.31	PASS
		High	2480	-0.80	-54.7	≤-20.8	PASS
		Low	Hop_2402	-1.53	-56.19	≤-21.53	PASS
		High	Hop_2480	-1.19	-56.54	≤-21.19	PASS
2DH5	Ant1	Low	2402	-1.32	-55.41	≤-21.32	PASS
		High	2480	-2.42	-55.02	≤-22.42	PASS
		Low	Hop_2402	-2.50	-56.77	≤-22.5	PASS
		High	Hop_2480	-4.96	-56.18	≤-24.96	PASS
3DH5	Ant1	Low	2402	-3.78	-55.36	≤-23.78	PASS
		High	2480	-1.20	-54.93	≤-21.2	PASS
		Low	Hop_2402	-4.97	-55.72	≤-24.97	PASS
		High	Hop_2480	-2.22	-56.41	≤-22.22	PASS

Test Graphs

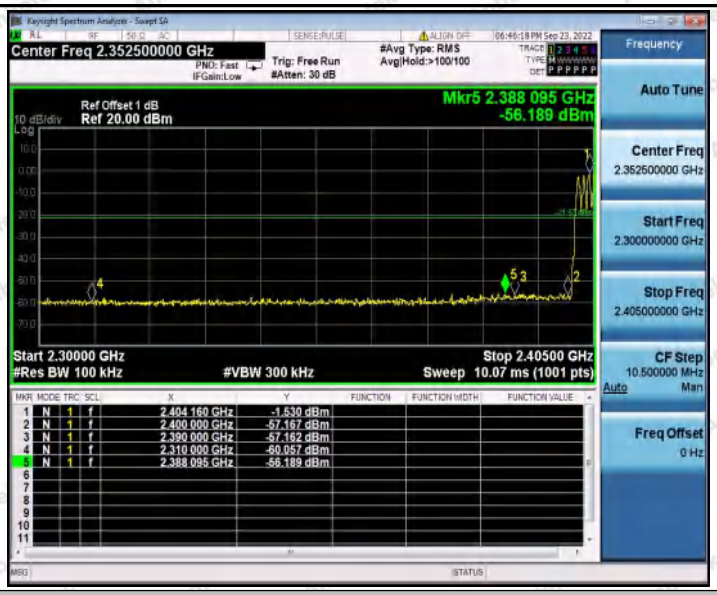
DH5_Ant1_Low_2402



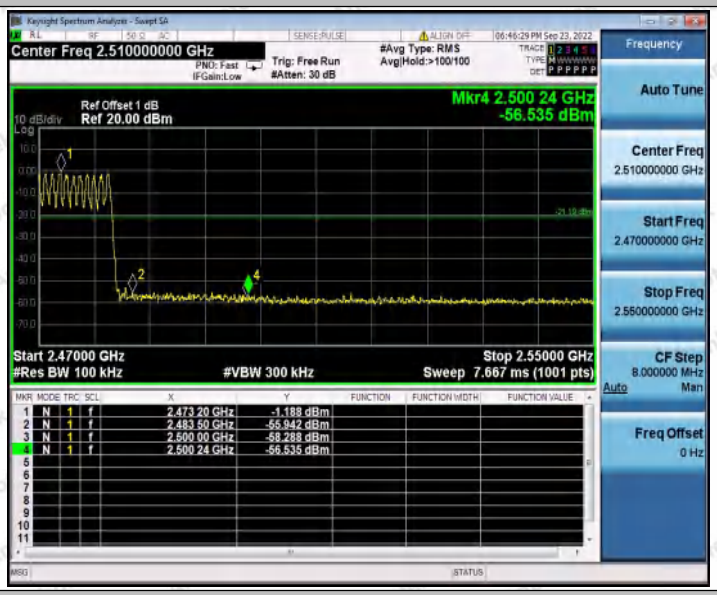
DH5_Ant1_High_2480



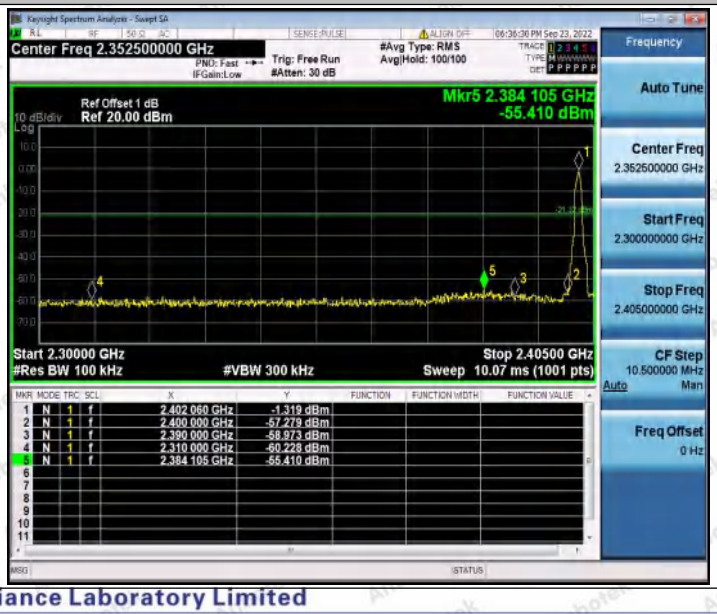
DH5_Ant1_Low_Hop_2402



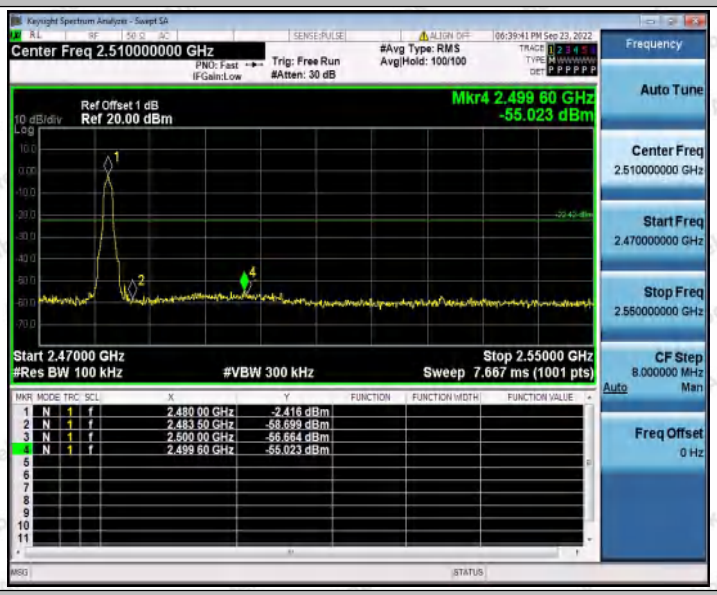
DH5_Ant1_High_Hop_2480



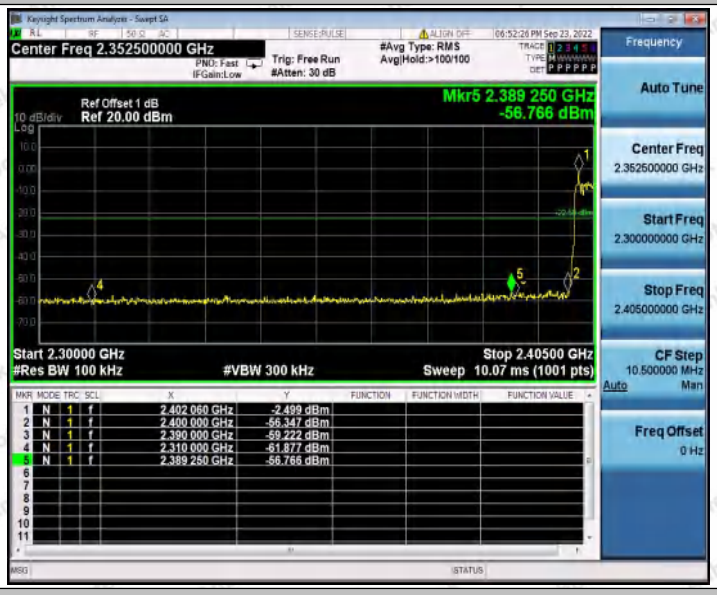
2DH5_Ant1_Low_2402



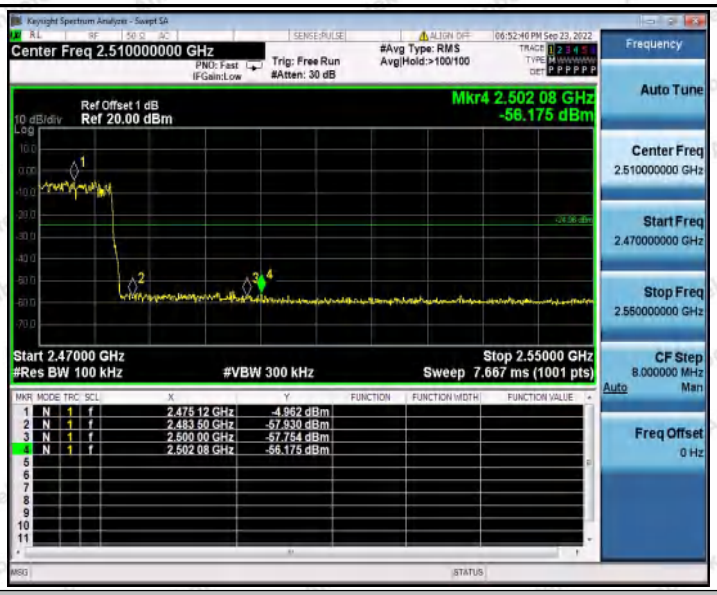
2DH5_Ant1_High_2480



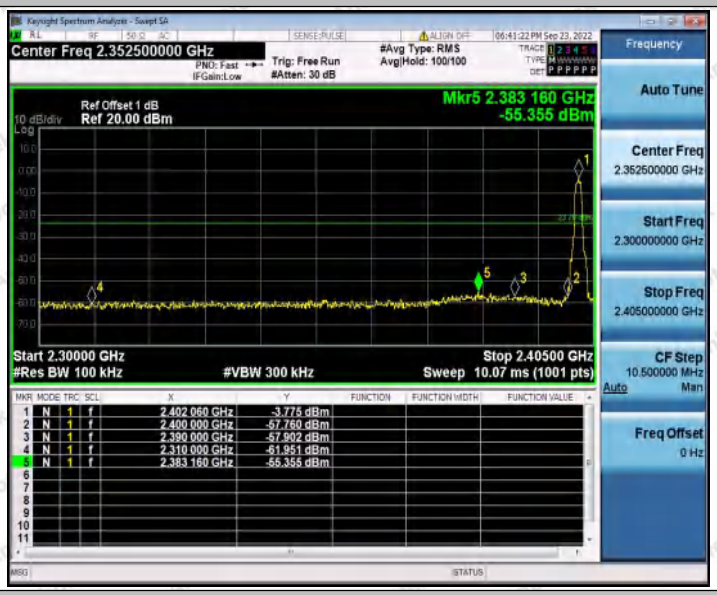
2DH5_Ant1_Low_Hop_2402



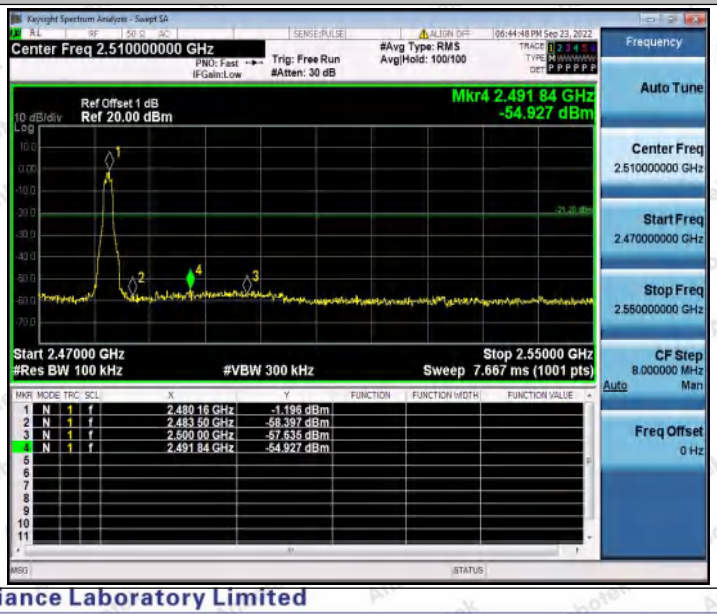
2DH5_Ant1_High_Hop_2480



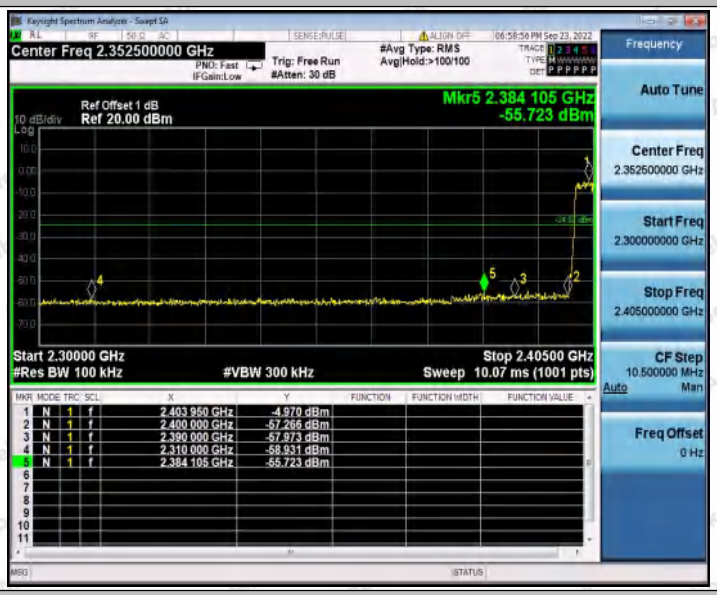
3DH5_Ant1_Low_2402



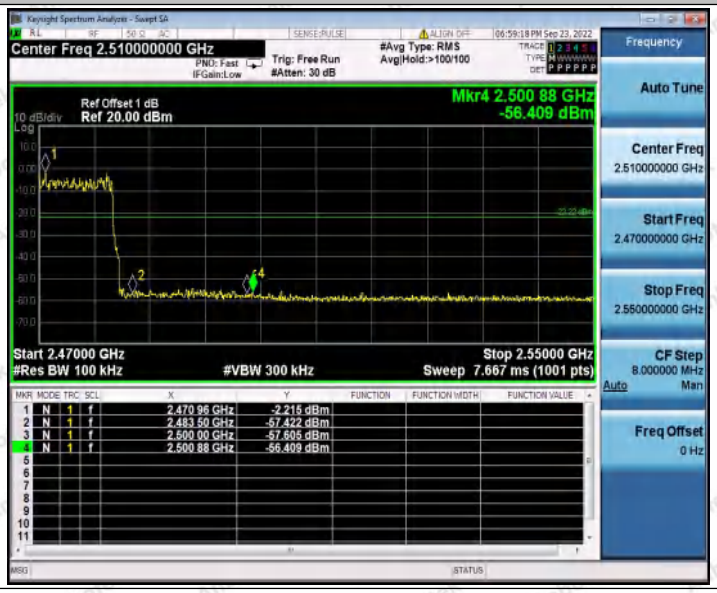
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

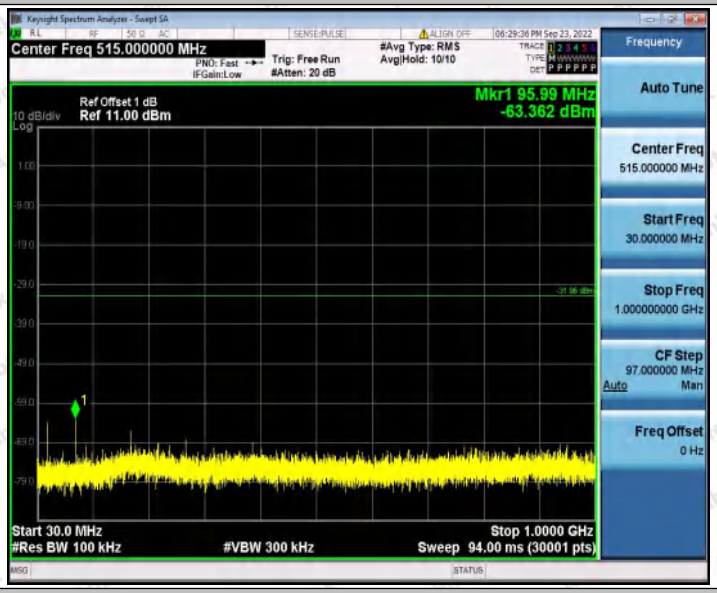
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-1.96	-1.96	---	PASS
			30~1000	-1.96	-63.36	≤-31.96	PASS
			1000~26500	-1.96	-51.64	≤-31.96	PASS
		2441	Reference	-1.58	-1.58	---	PASS
			30~1000	-1.58	-62.6	≤-31.58	PASS
			1000~26500	-1.58	-49.33	≤-31.58	PASS
		2480	Reference	-1.34	-1.34	---	PASS
			30~1000	-1.34	-62.64	≤-31.34	PASS
			1000~26500	-1.34	-52.48	≤-31.34	PASS
2DH5	Ant1	2402	Reference	-4.34	-4.34	---	PASS
			30~1000	-4.34	-63.15	≤-34.34	PASS
			1000~26500	-4.34	-51.05	≤-34.34	PASS
		2441	Reference	-2.40	-2.40	---	PASS
			30~1000	-2.40	-62.14	≤-32.4	PASS
			1000~26500	-2.40	-51.2	≤-32.4	PASS
		2480	Reference	-4.82	-4.82	---	PASS
			30~1000	-4.82	-63.4	≤-34.82	PASS
			1000~26500	-4.82	-52.19	≤-34.82	PASS
3DH5	Ant1	2402	Reference	-3.87	-3.87	---	PASS
			30~1000	-3.87	-61.68	≤-33.87	PASS
			1000~26500	-3.87	-51.19	≤-33.87	PASS
		2441	Reference	-4.60	-4.60	---	PASS
			30~1000	-4.60	-63.82	≤-34.6	PASS
			1000~26500	-4.60	-49.31	≤-34.6	PASS
		2480	Reference	-4.22	-4.22	---	PASS
			30~1000	-4.22	-64.68	≤-34.22	PASS
			1000~26500	-4.22	-50.61	≤-34.22	PASS

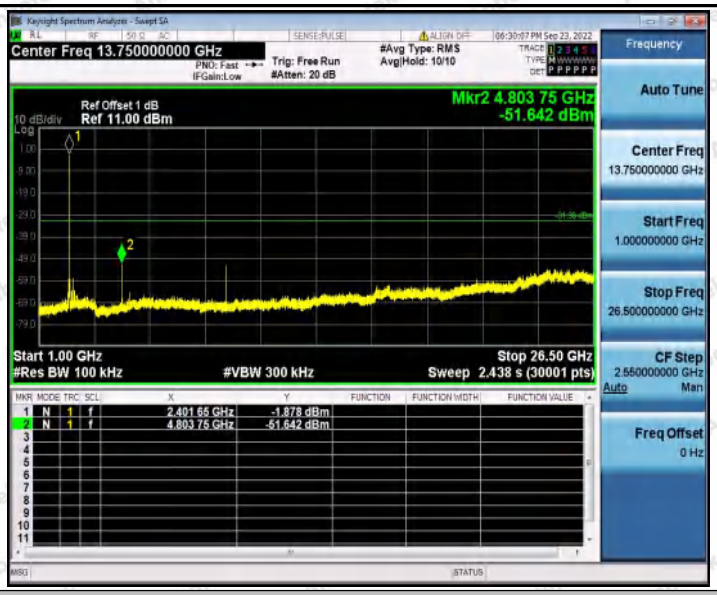
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

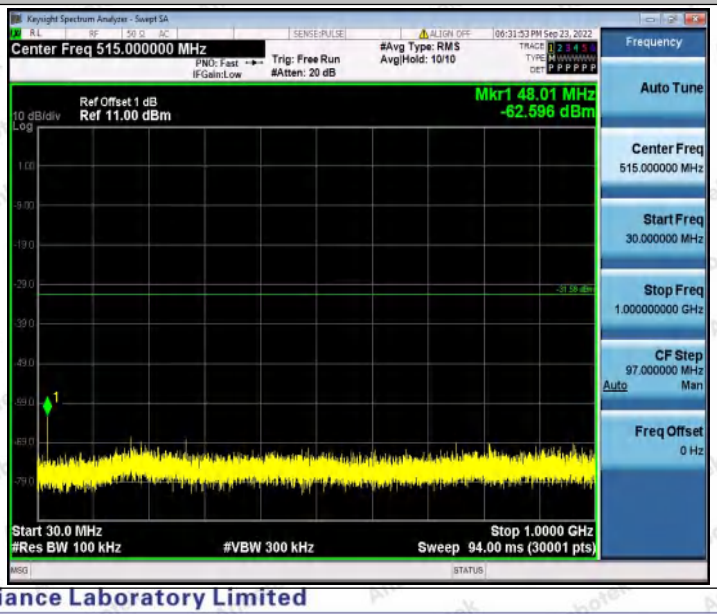


DH5_Ant1_2402_1000~26500

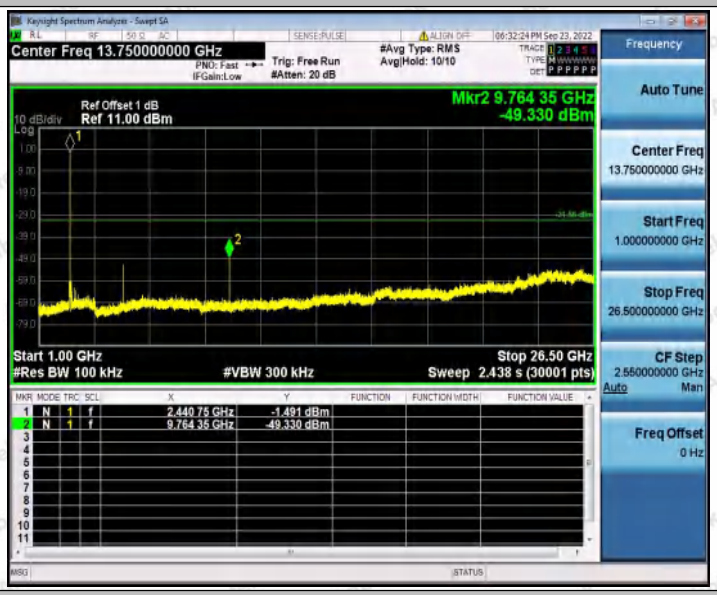


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

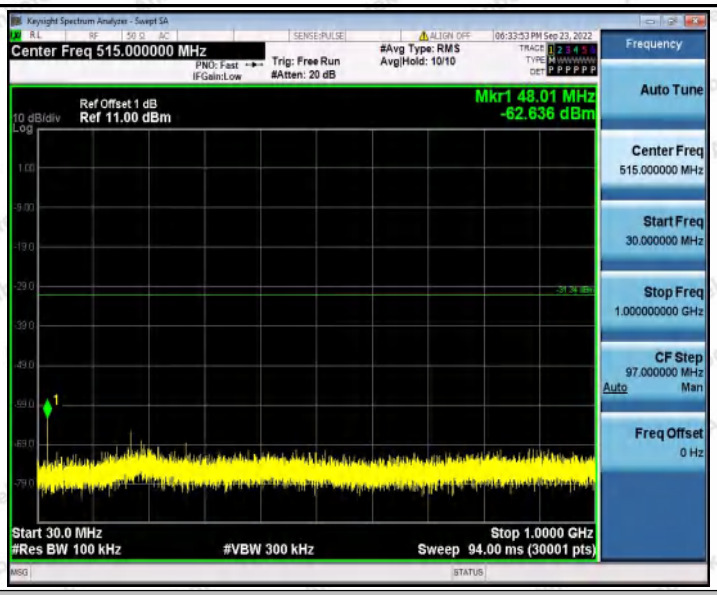


DH5_Ant1_2441_1000~26500

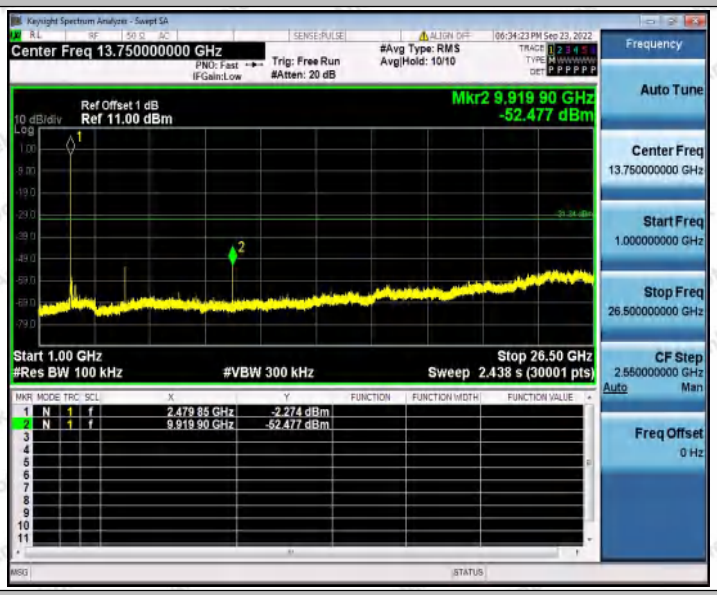


DH5_Ant1_2480_0~Reference

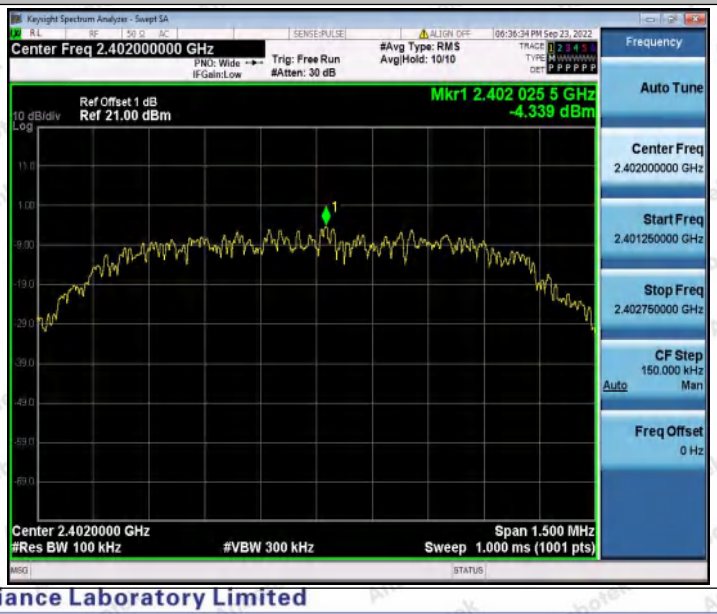
DH5_Ant1_2480_30~1000



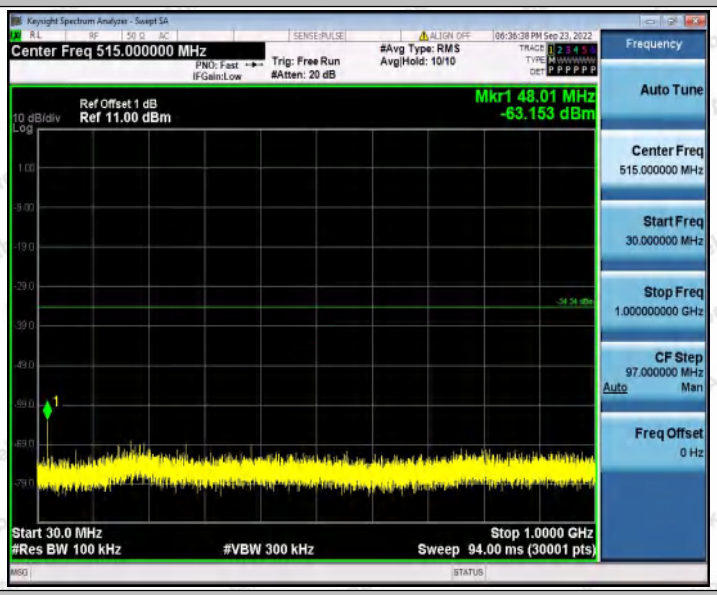
DH5_Ant1_2480_1000~26500



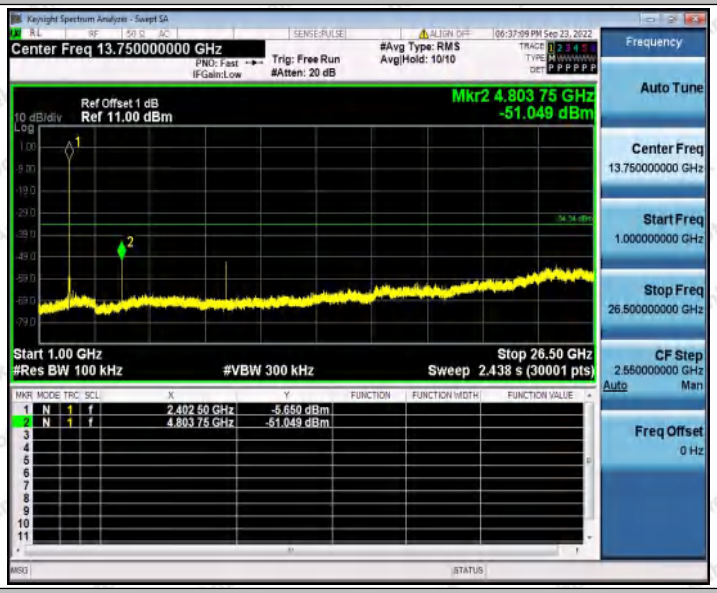
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

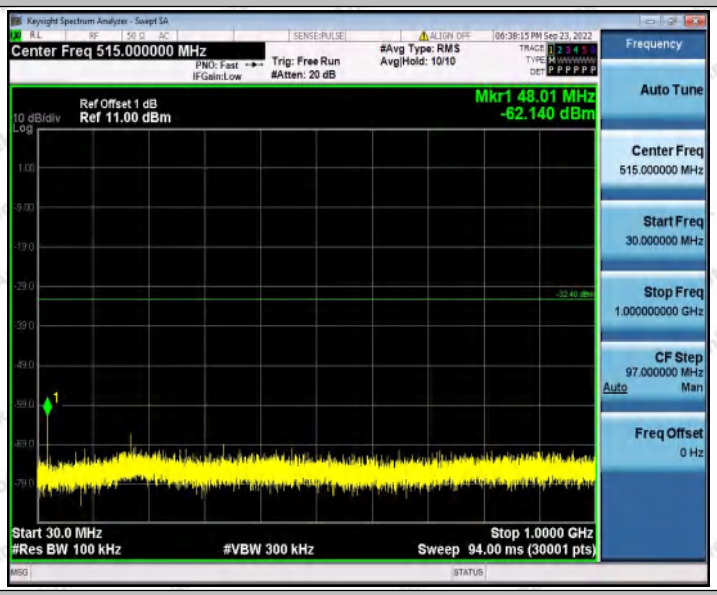


2DH5_Ant1_2402_1000~26500

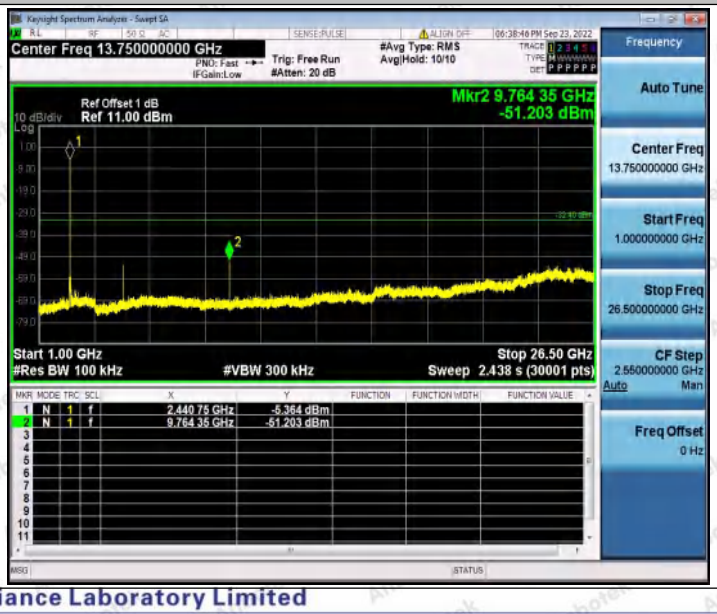


2DH5_Ant1_2441_0~Reference

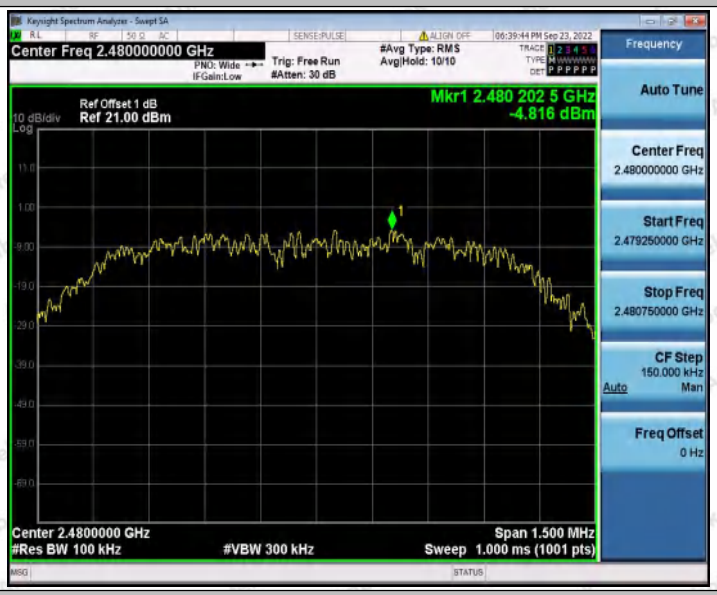
2DH5_Ant1_2441_30~1000



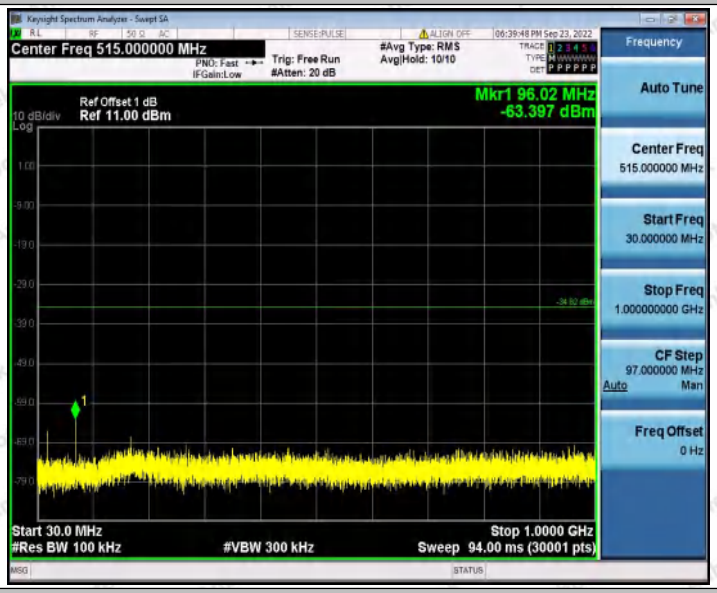
2DH5_Ant1_2441_1000~26500



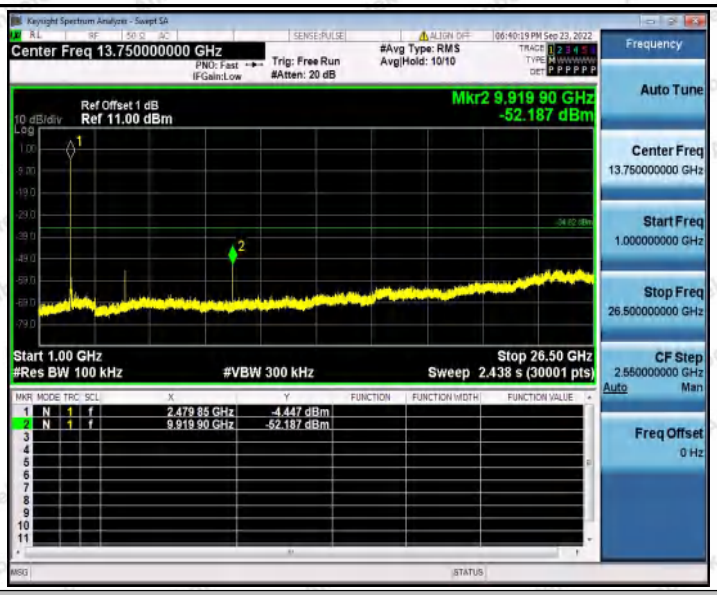
2DH5_Ant1_2480_0~Reference



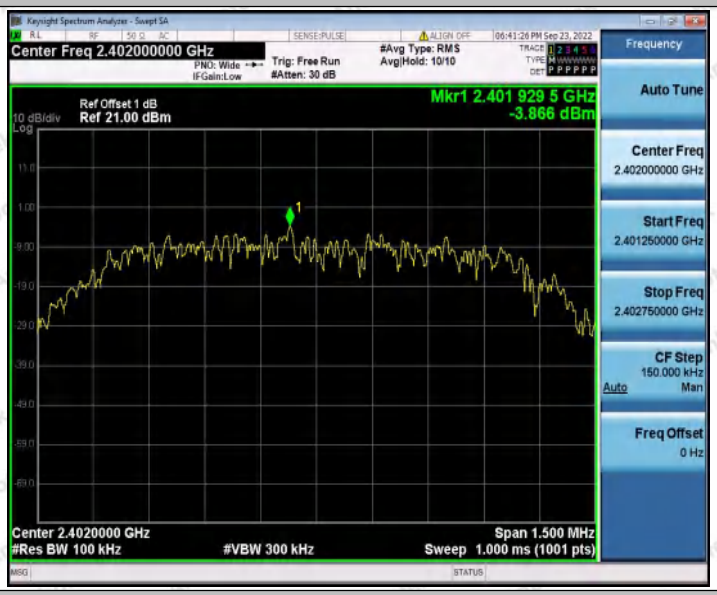
2DH5_Ant1_2480_30~1000



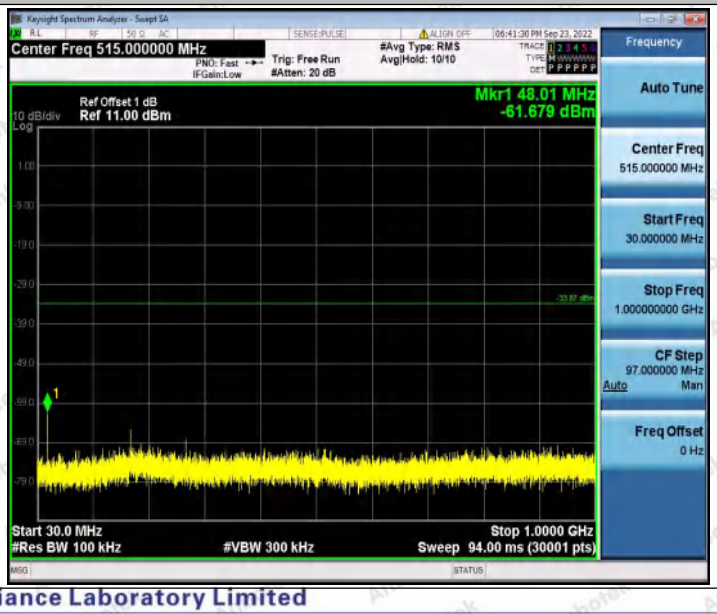
2DH5_Ant1_2480_1000~26500



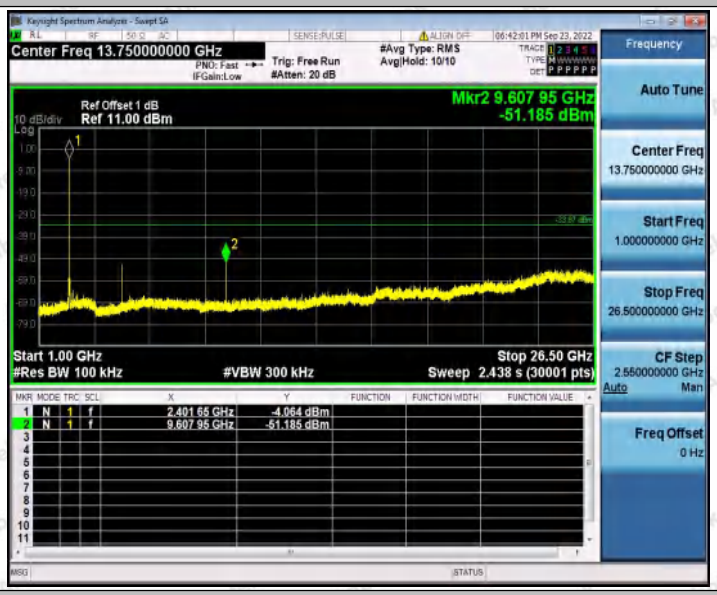
3DH5_Ant1_2402_0~Reference



3DH5_Ant1_2402_30~1000

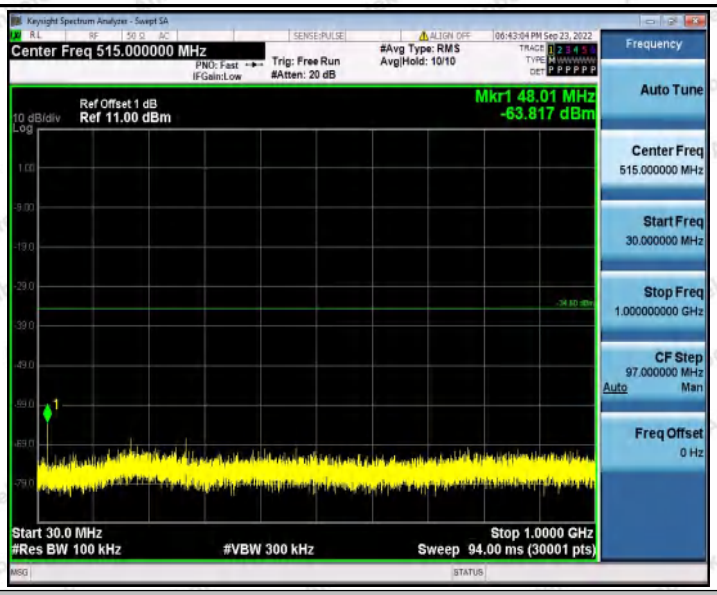


3DH5_Ant1_2402_1000~26500



3DH5_Ant1_2441_0~Reference

3DH5_Ant1_2441_30~1000



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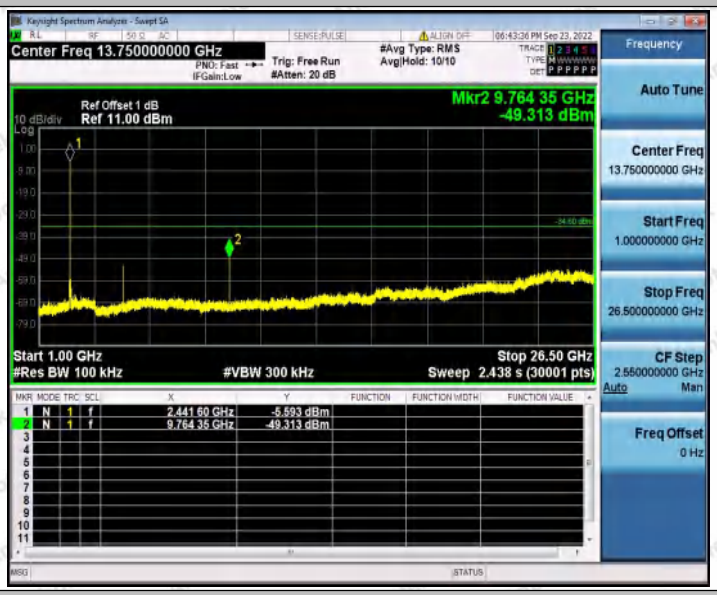
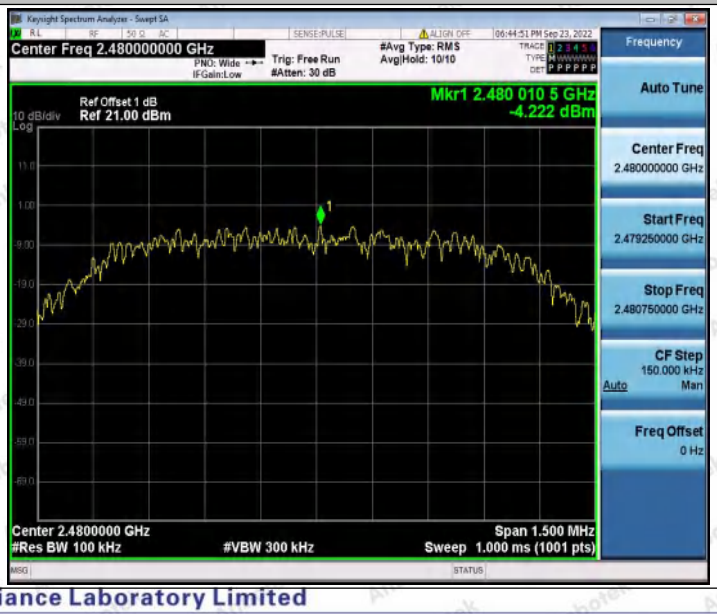
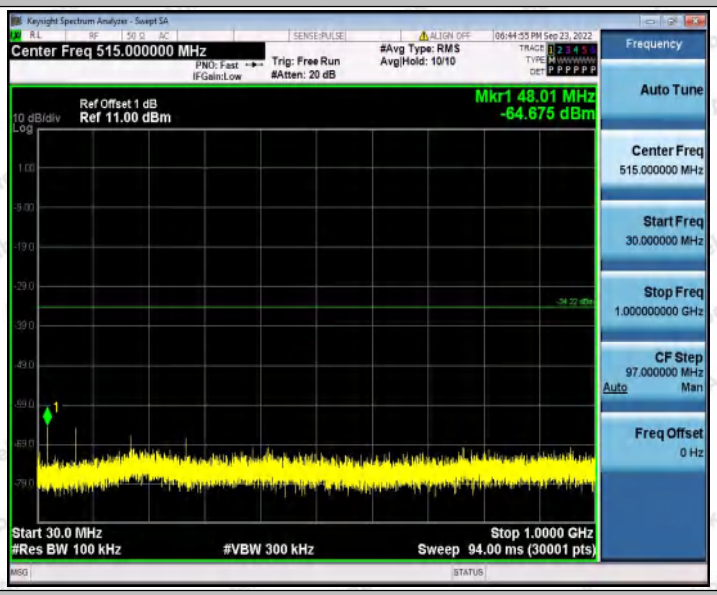


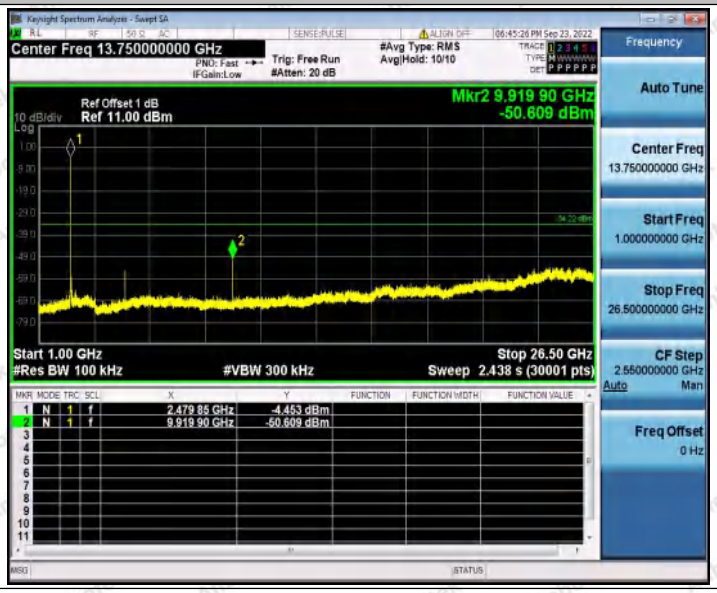
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



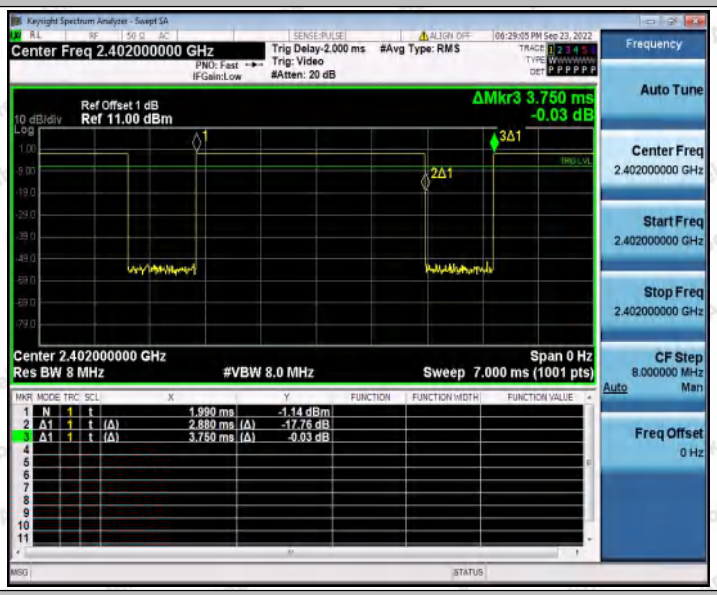
Appendix I: Duty Cycle

Test Result

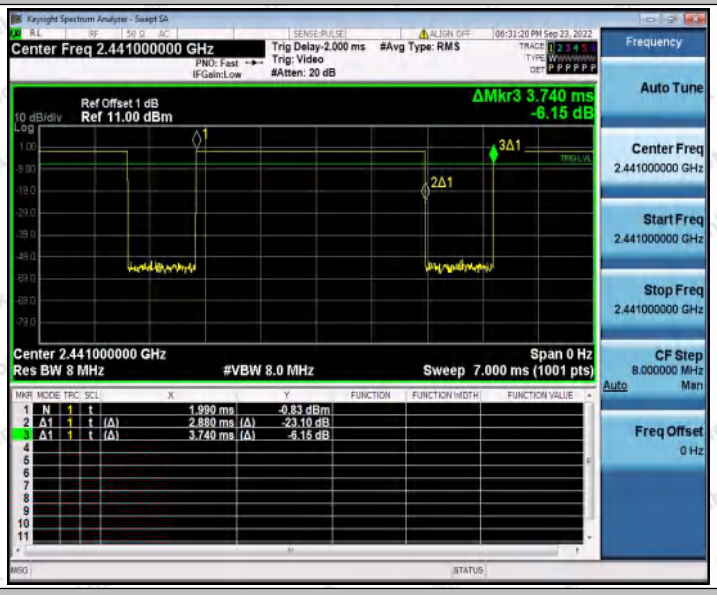
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.88	3.75	76.80	1.15
		2441	2.88	3.74	77.01	1.13
		2480	2.88	3.75	76.80	1.15
2DH5	Ant1	2402	2.89	3.75	77.07	1.13
		2441	2.88	3.75	76.80	1.15
		2480	2.90	3.76	77.13	1.13
3DH5	Ant1	2402	2.88	3.75	76.80	1.15
		2441	2.89	3.75	77.07	1.13
		2480	2.89	3.76	76.86	1.14

Test Graphs

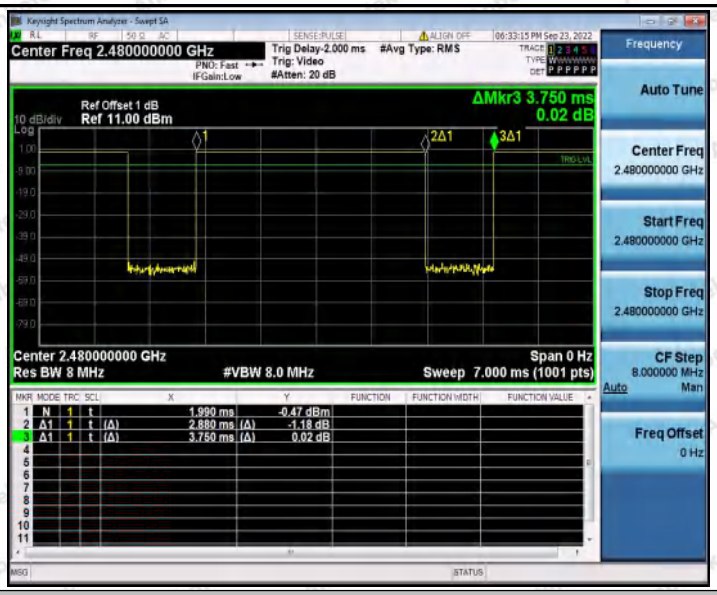
DH5_Ant1_2402



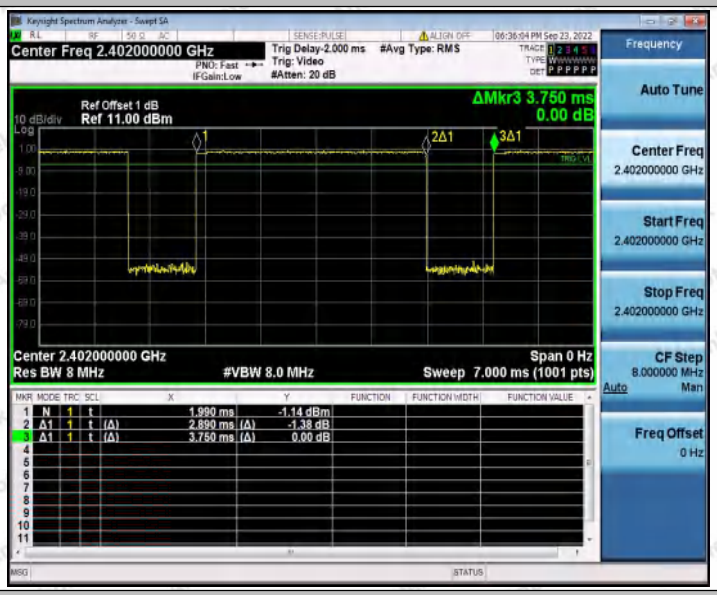
DH5_Ant1_2441



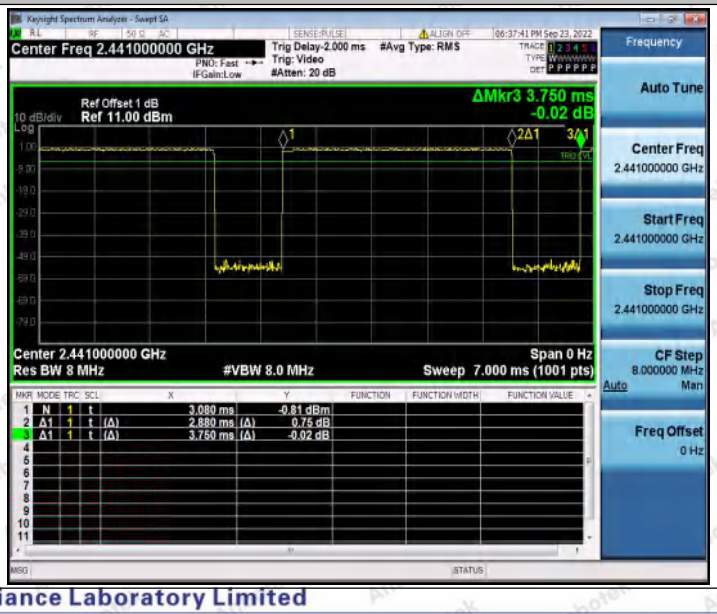
DH5_Ant1_2480



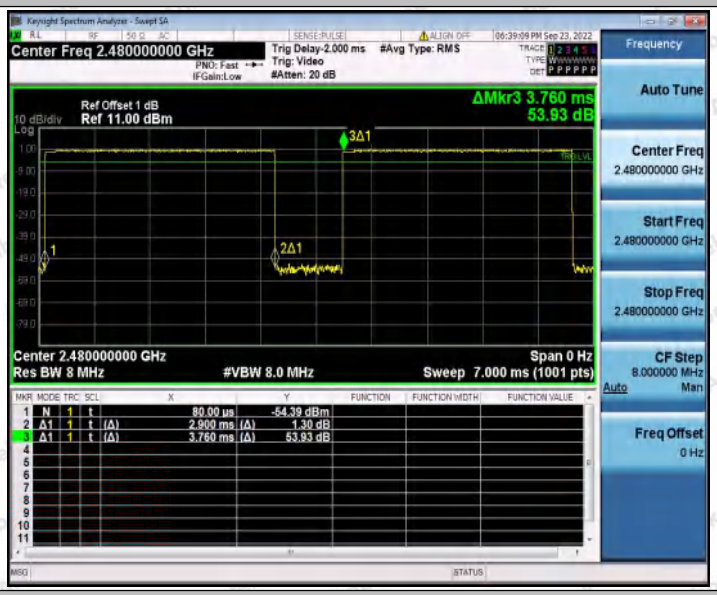
2DH5_Ant1_2402



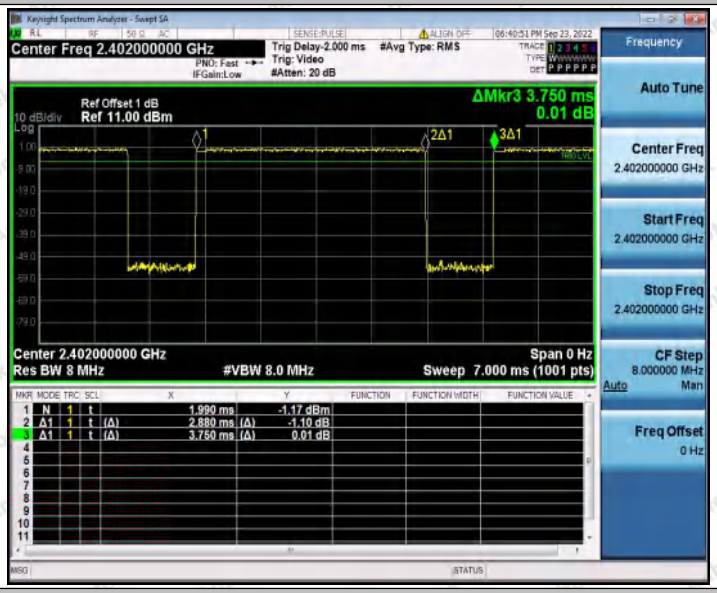
2DH5_Ant1_2441



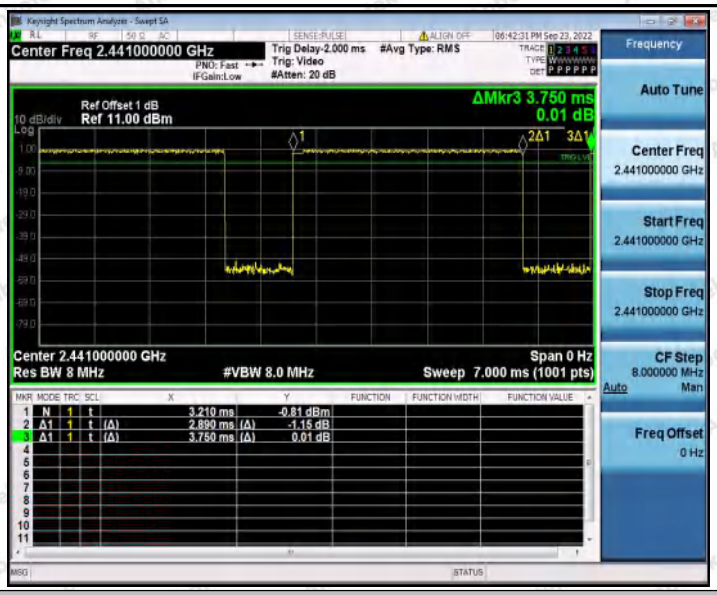
2DH5_Ant1_2480



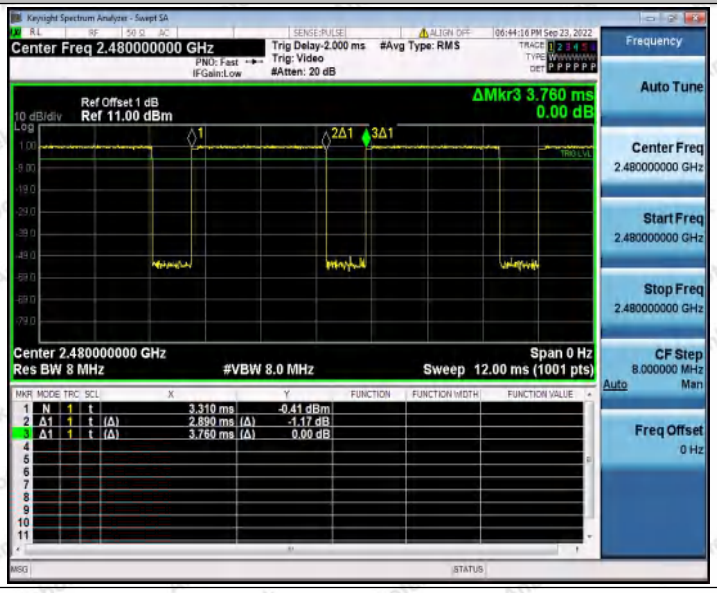
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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