Appendix Test Data

Report No.:	18220WC30010401	Test Sample No.:	1-2-2
Start Test Date:	2023.2.2	Finish Test Date:	2023.2.4
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	24.3℃	Relative Humidity:	52 %
Pressure:	1012 hPa		

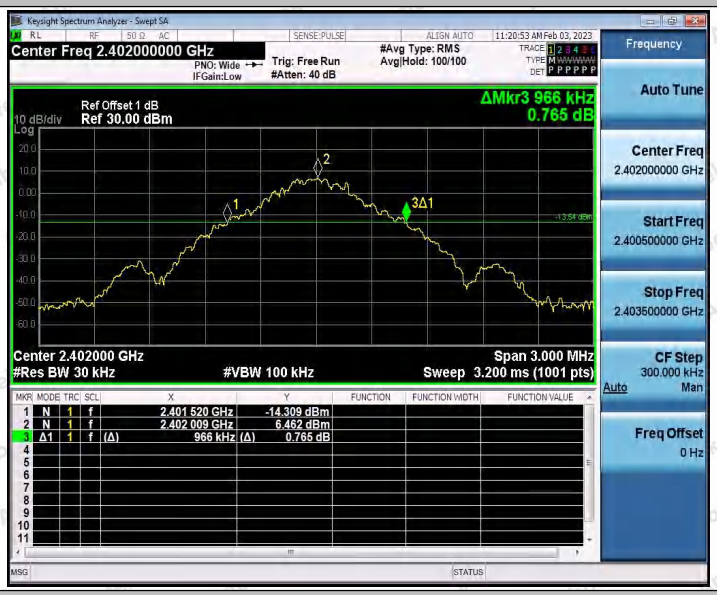
Appendix A: 20dB Emission Bandwidth

Test Result

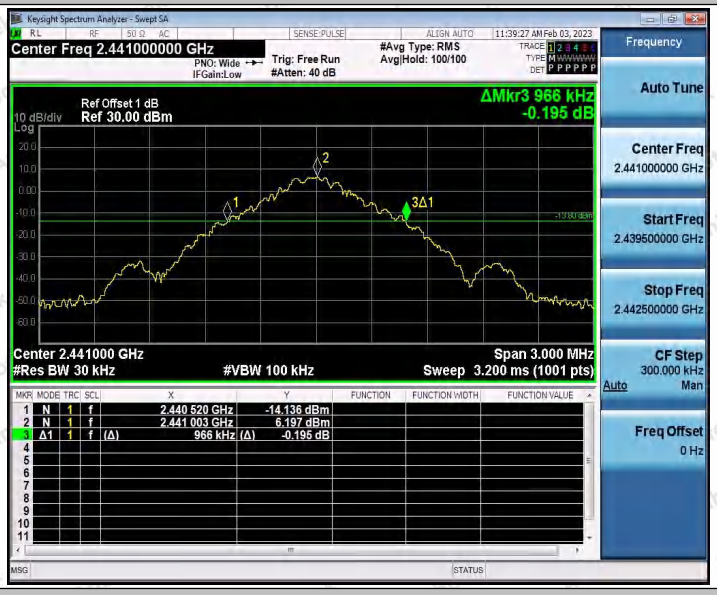
Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	0.966	2401.520	2402.486
		2441	0.966	2440.520	2441.486
		2480	1.026	2479.457	2480.483
2DH5	Ant1	2402	1.509	2401.241	2402.750
		2441	1.539	2440.220	2441.759
		2480	1.524	2479.223	2480.747
3DH5	Ant1	2402	1.506	2401.253	2402.759
		2441	1.548	2440.220	2441.768
		2480	1.488	2479.256	2480.744

Test Graphs

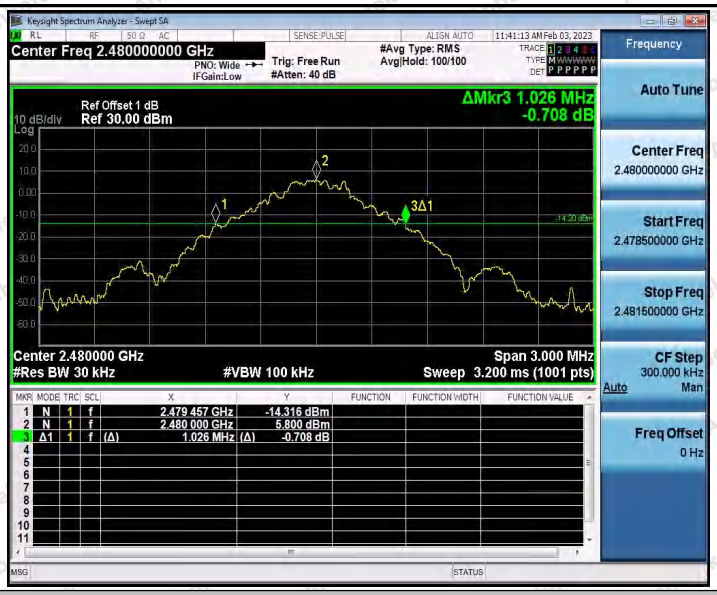
DH5_Ant1_2402



DH5_Ant1_2441

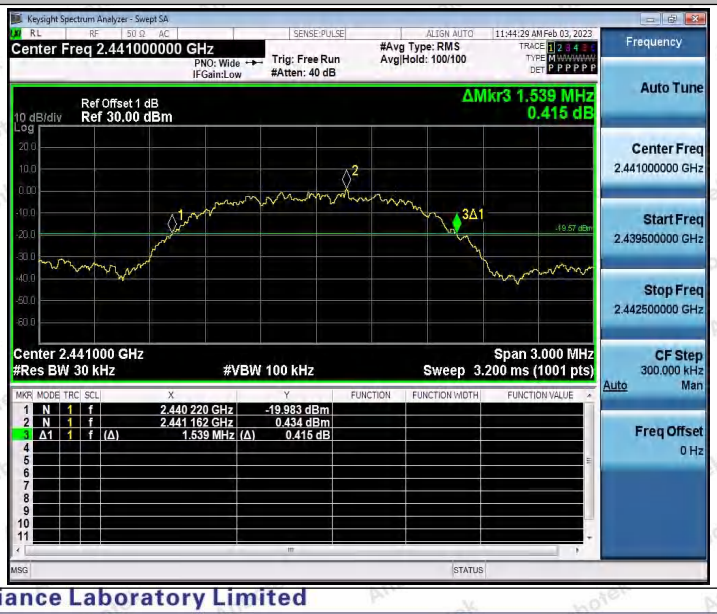


DH5_Ant1_2480

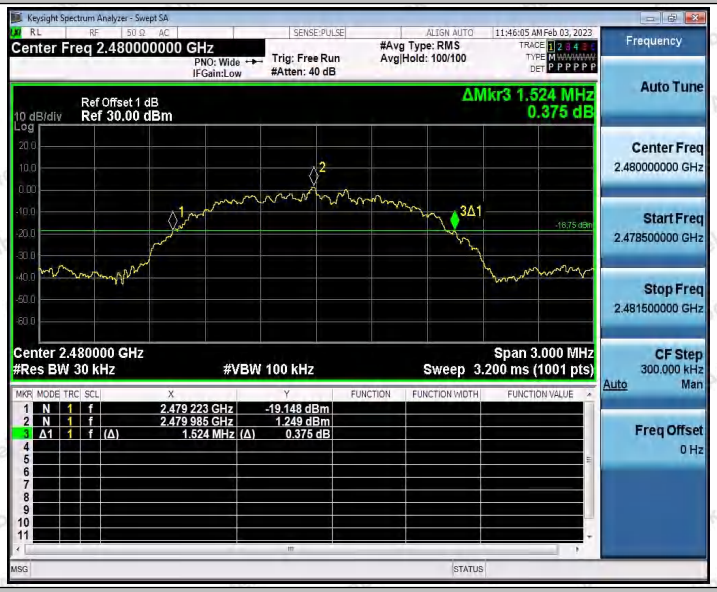


2DH5_Ant1_2402

2DH5_Ant1_2441

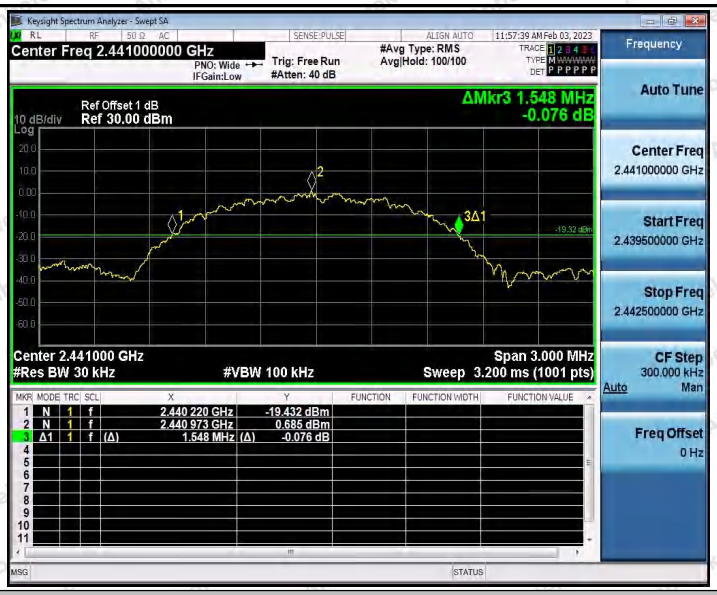


2DH5_Ant1_2480



3DH5_Ant1_2402

3DH5_Ant1_2441



3DH5_Ant1_2480

Appendix B: Occupied Channel Bandwidth

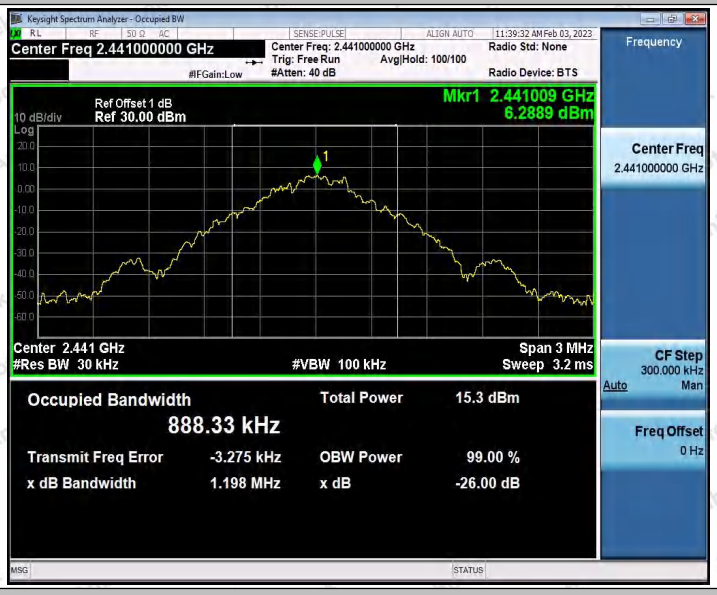
Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	0.88250	2401.5531	2402.4356
		2441	0.88833	2440.5526	2441.4409
		2480	0.86771	2479.5492	2480.4169
2DH5	Ant1	2402	1.3666	2401.3003	2402.6669
		2441	1.3648	2440.3055	2441.6703
		2480	1.3692	2479.2980	2480.6672
3DH5	Ant1	2402	1.3764	2401.2969	2402.6733
		2441	1.3639	2440.3043	2441.6682
		2480	1.3692	2479.2987	2480.6679

Test Graphs

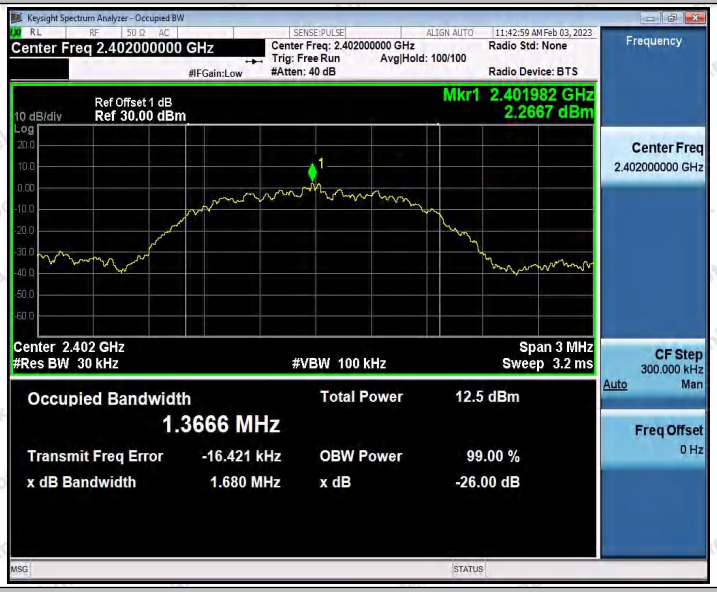
DH5_Ant1_2402

DH5_Ant1_2441

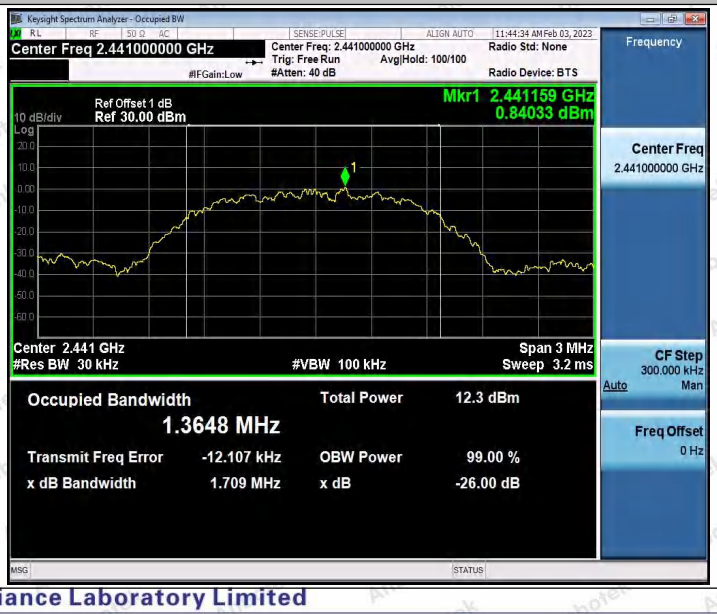


DH5_Ant1_2480

2DH5_Ant1_2402



2DH5_Ant1_2441



2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

Appendix C: Maximum conducted output power

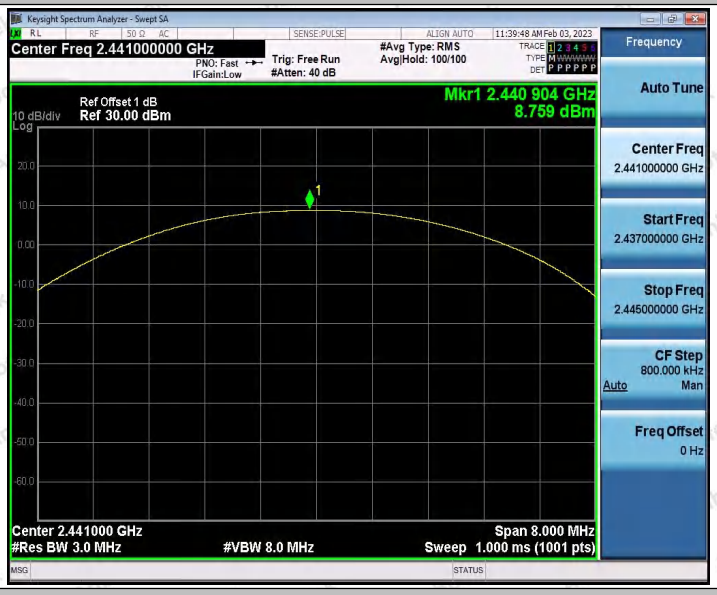
Test Result Peak

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	9.02	≤20.97	PASS
		2441	8.76	≤20.97	PASS
		2480	8.40	≤20.97	PASS
2DH5	Ant1	2402	7.49	≤20.97	PASS
		2441	7.26	≤20.97	PASS
		2480	6.81	≤20.97	PASS
3DH5	Ant1	2402	7.66	≤20.97	PASS
		2441	7.31	≤20.97	PASS
		2480	6.96	≤20.97	PASS

Test Graphs

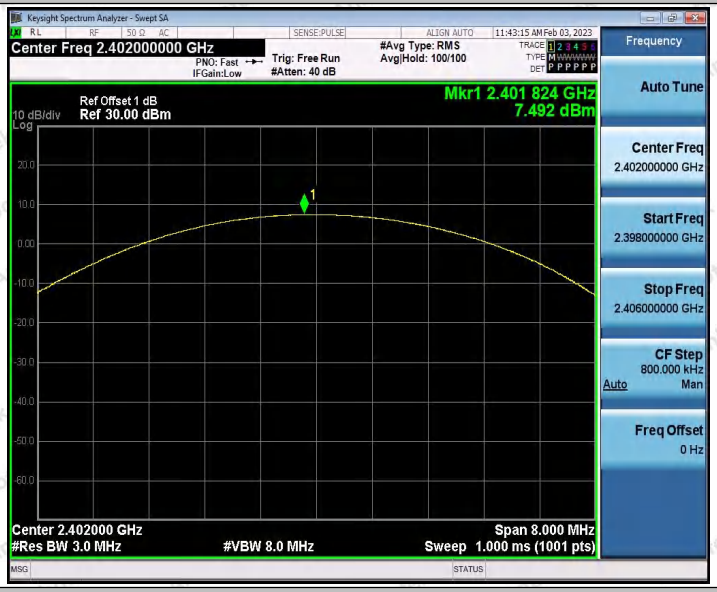
DH5_Ant1_2402

DH5_Ant1_2441

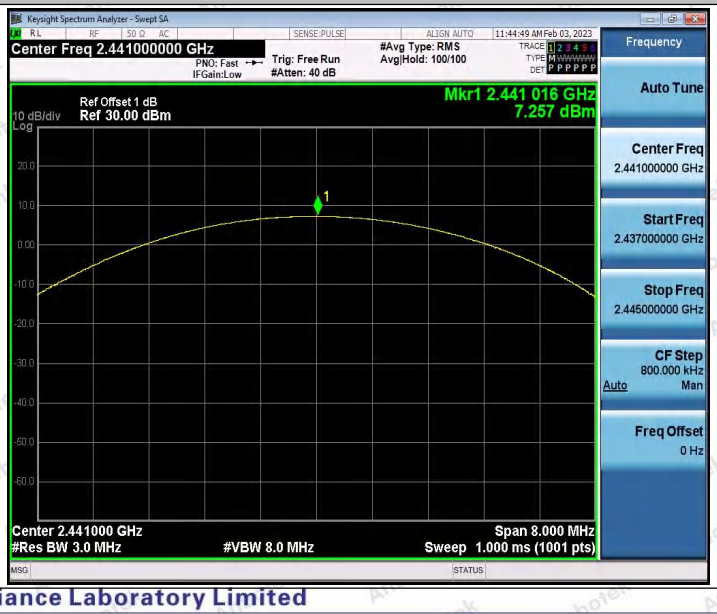


DH5_Ant1_2480

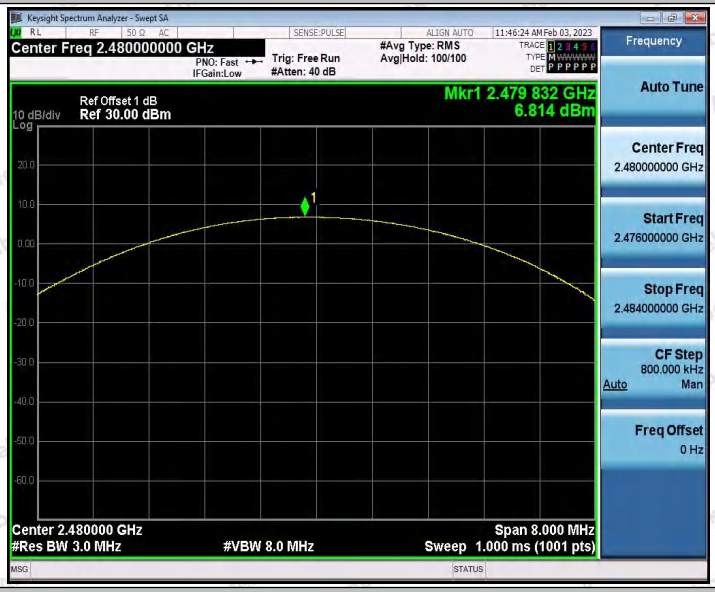
2DH5_Ant1_2402



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	0.868	≥0.684	PASS
2DH5	Ant1	Hop	1.24	≥1.026	PASS
3DH5	Ant1	Hop	1.038	≥1.032	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
12:22:25 PM Feb 03, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.038 MHz
0.003 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

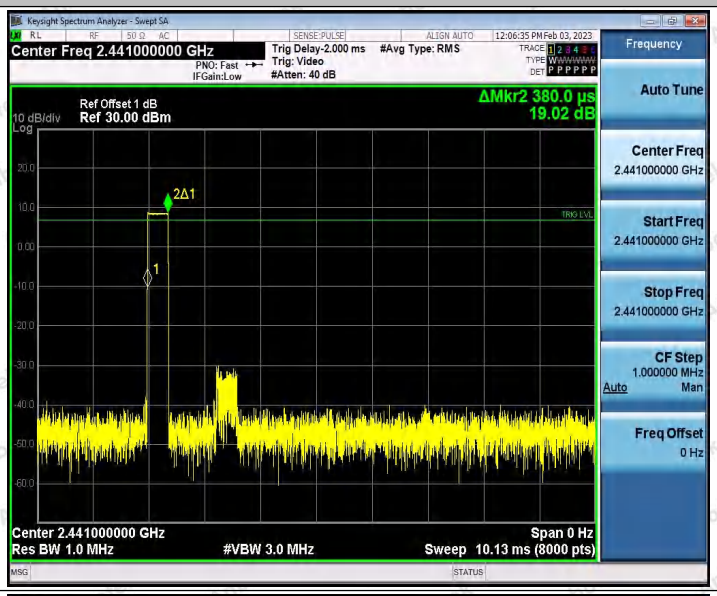
Appendix E: Time of occupancy

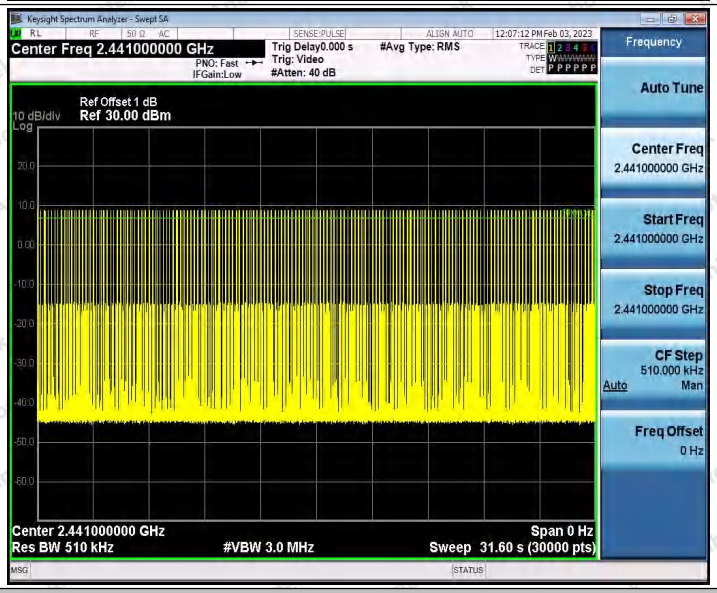
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.380	313	0.119	≤0.4	PASS
DH3	Ant1	Hop	1.635	168	0.275	≤0.4	PASS
DH5	Ant1	Hop	2.884	103	0.297	≤0.4	PASS
2DH1	Ant1	Hop	0.388	314	0.122	≤0.4	PASS
2DH3	Ant1	Hop	1.639	151	0.247	≤0.4	PASS
2DH5	Ant1	Hop	2.888	111	0.321	≤0.4	PASS
3DH1	Ant1	Hop	0.388	312	0.121	≤0.4	PASS
3DH3	Ant1	Hop	1.639	152	0.249	≤0.4	PASS
3DH5	Ant1	Hop	2.889	111	0.321	≤0.4	PASS

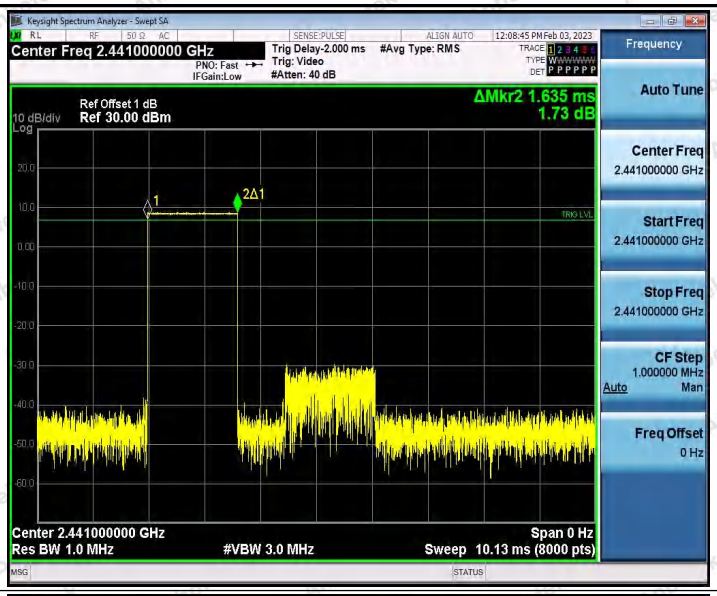
Test Graphs

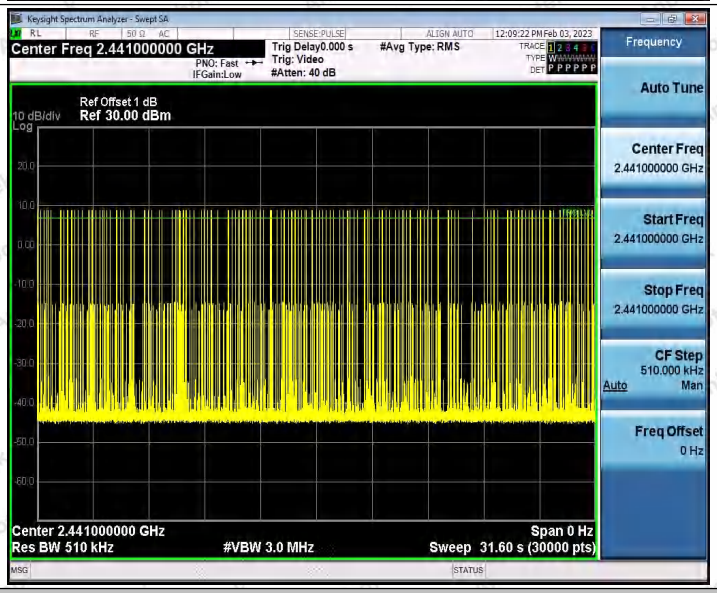
DH1_Ant1_Hop



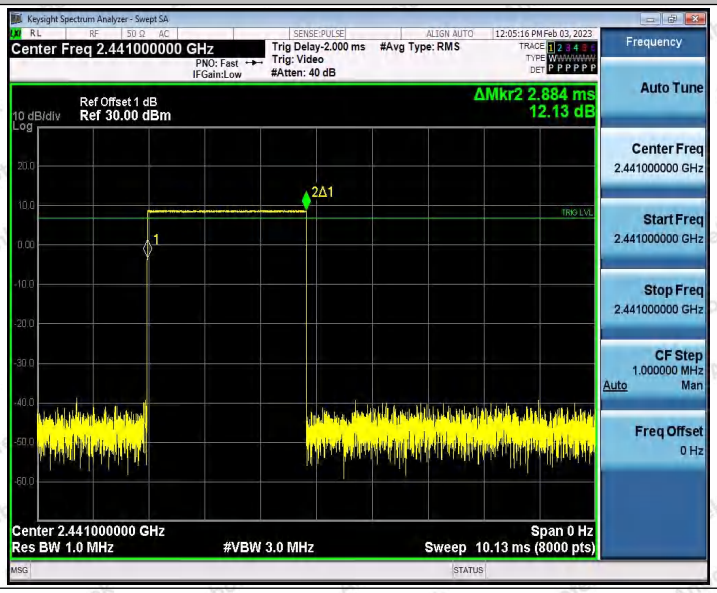


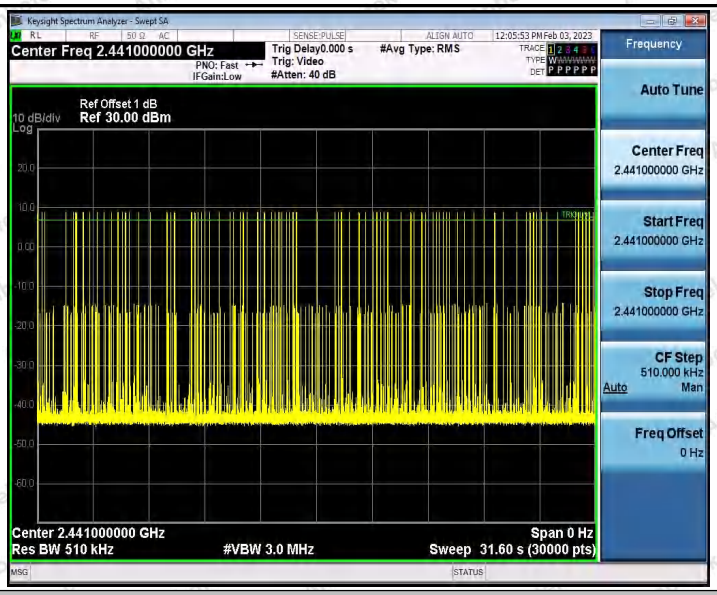
DH3_Ant1_Hop


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
12:08:45 PM Feb 03, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.635 ms
1.73 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
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

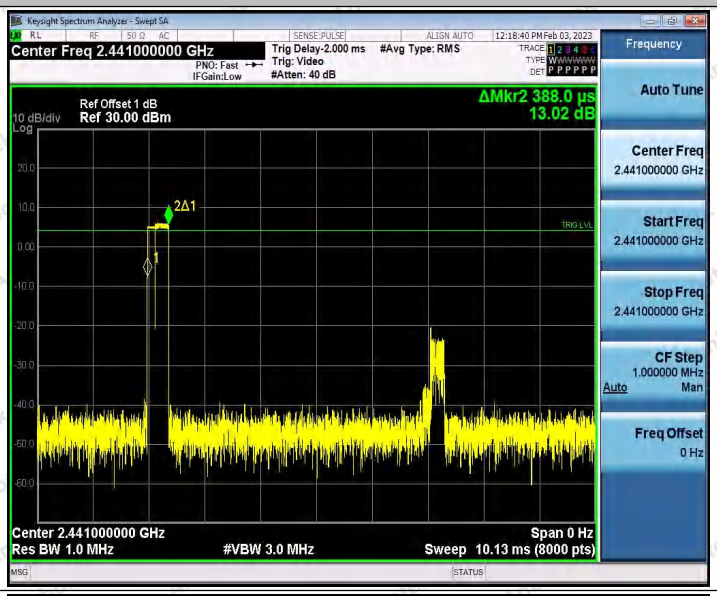

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
12:09:22 PM Feb 03, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz

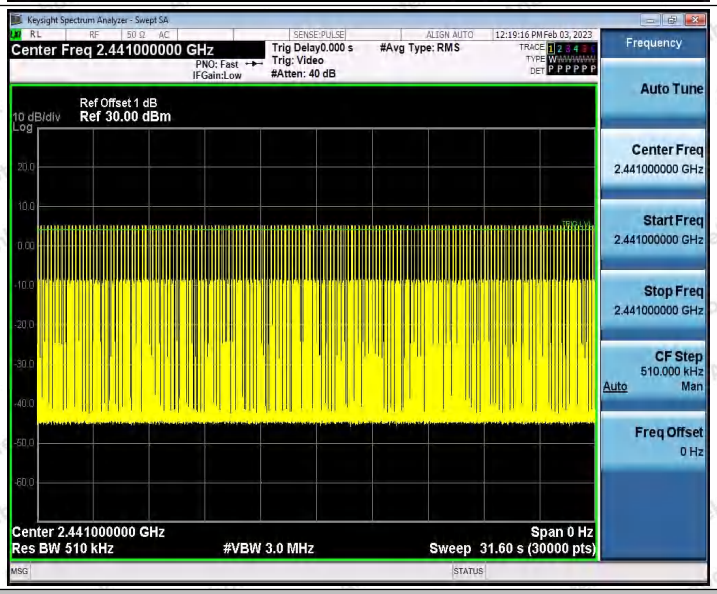
DH5_Ant1_Hop


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
12:05:16 PM Feb 03, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.884 ms
12.13 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
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

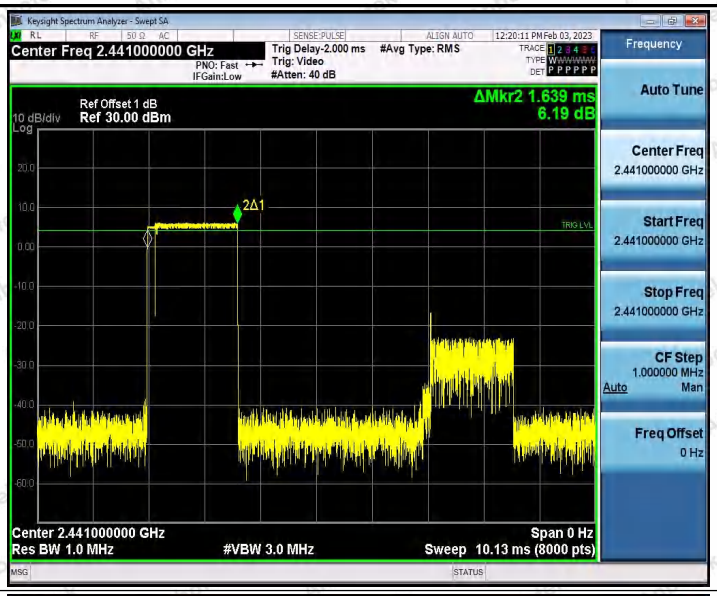


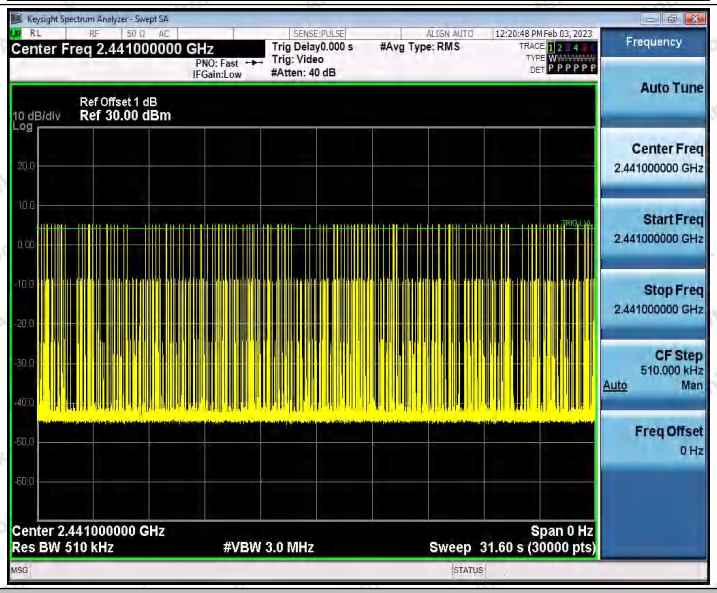
2DH1_Ant1_Hop



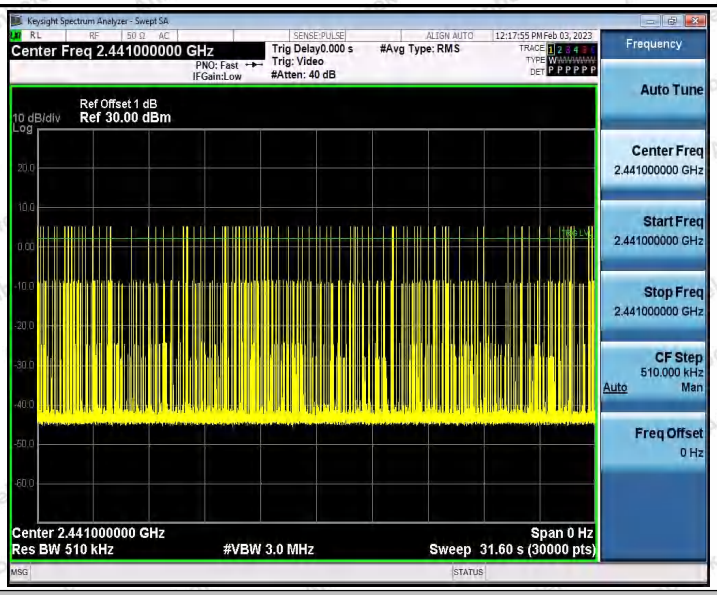


2DH3_Ant1_Hop

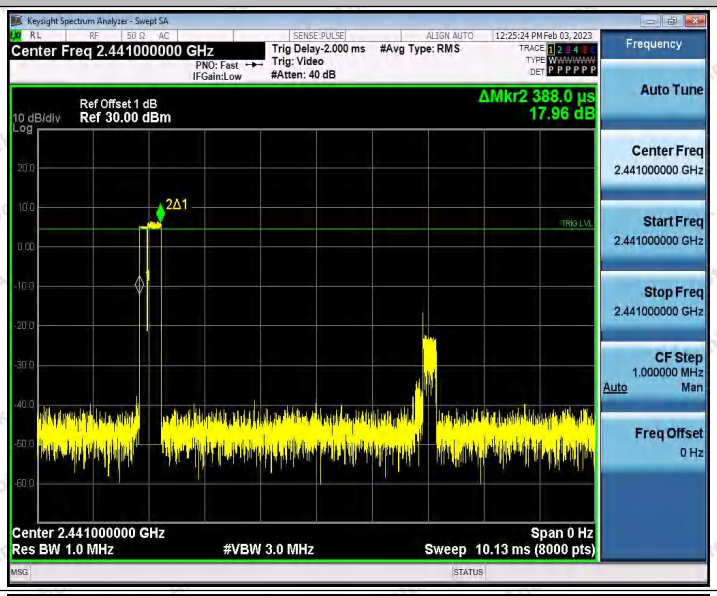


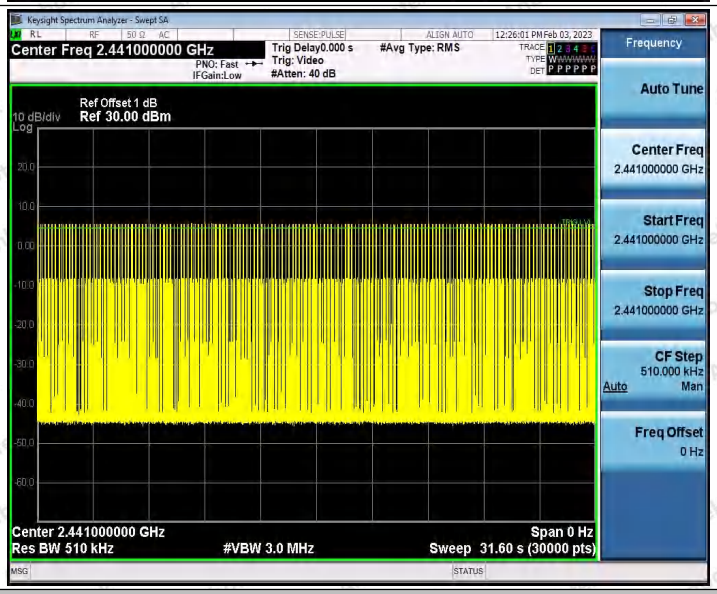


2DH5_Ant1_Hop

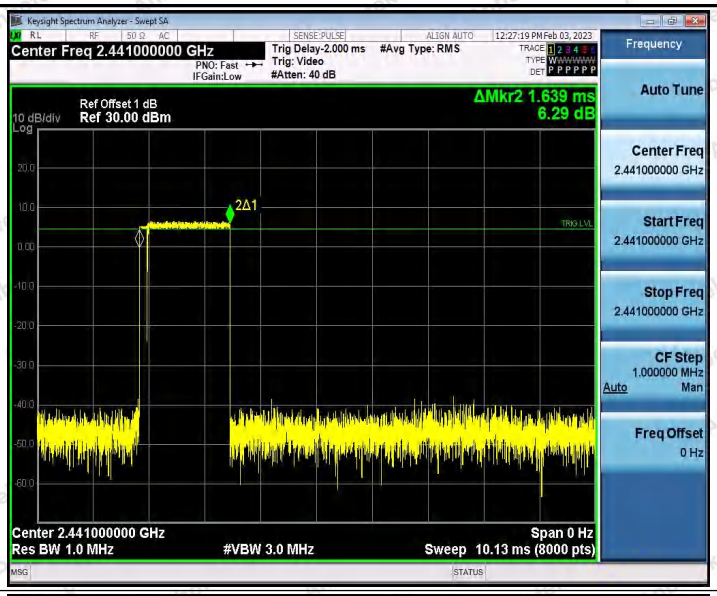


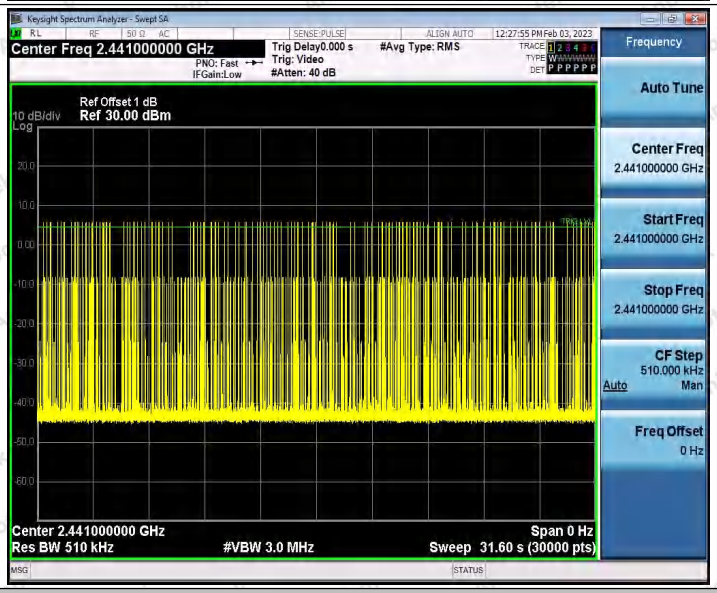
3DH1_Ant1_Hop



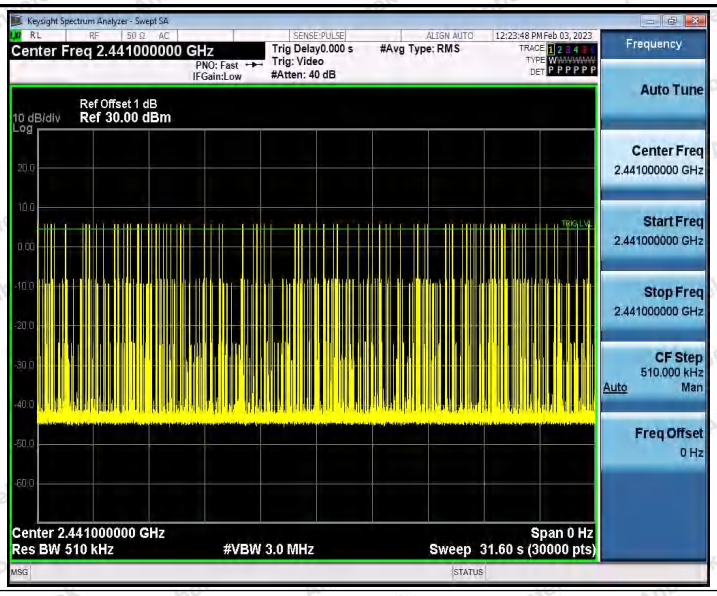


3DH3_Ant1_Hop





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
12:23:48 PM Feb 03, 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

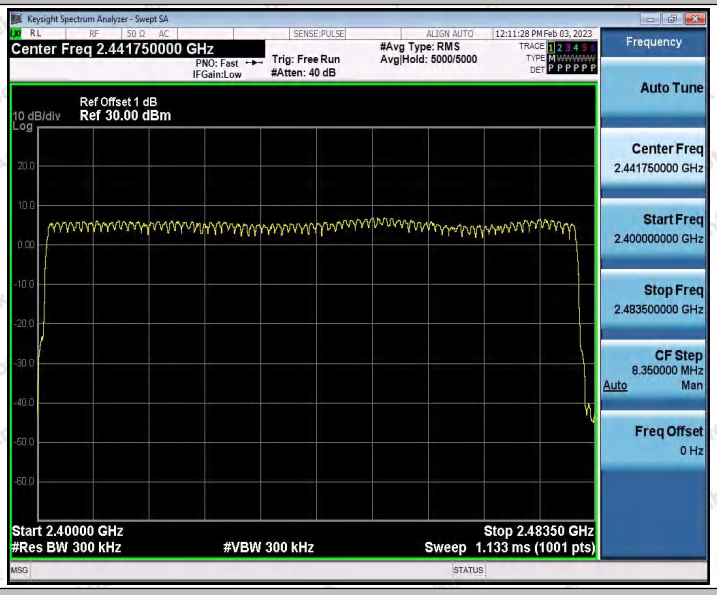
Test Result

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

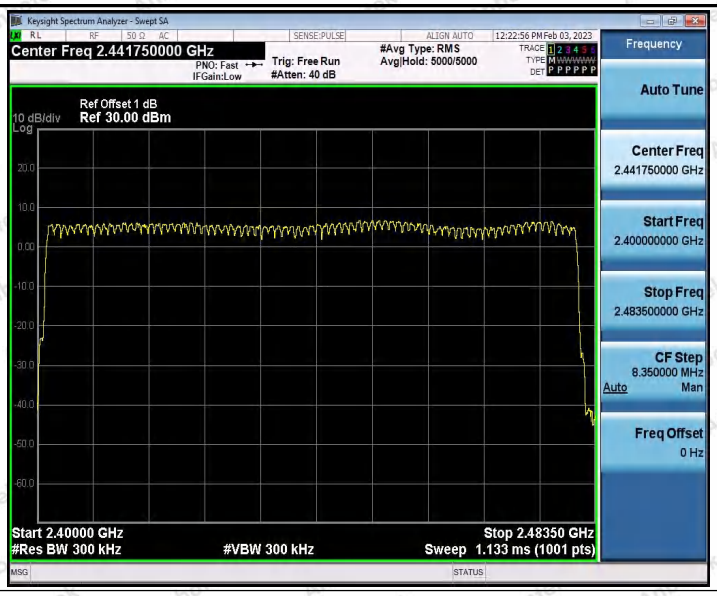
Test Graphs

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
12:22:56 PM Feb 03, 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

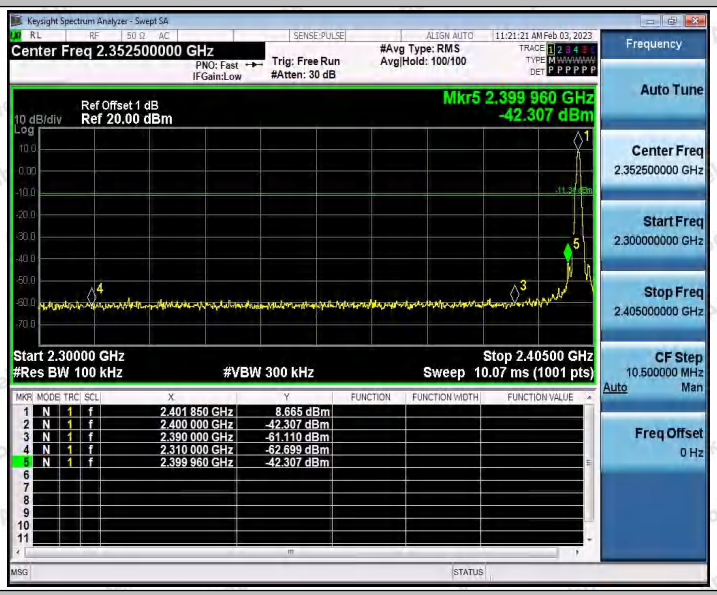
Appendix G: Band edge measurements

Test Result

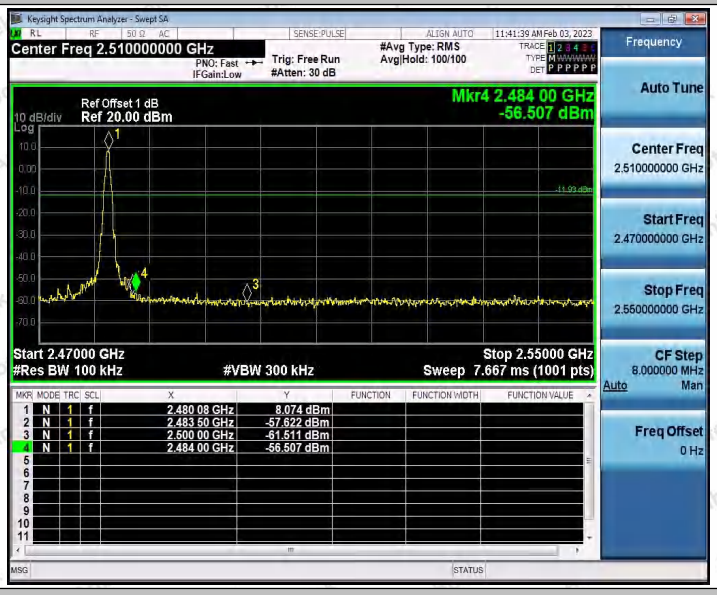
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	8.67	-42.31	≤-11.34	PASS
		High	2480	8.07	-56.51	≤-11.93	PASS
		Low	Hop_2402	8.80	-54.67	≤-11.21	PASS
		High	Hop_2480	8.95	-57.07	≤-11.05	PASS
2DH5	Ant1	Low	2402	3.43	-43.62	≤-16.57	PASS
		High	2480	4.02	-51.26	≤-15.98	PASS
		Low	Hop_2402	4.35	-55.74	≤-15.65	PASS
		High	Hop_2480	5.73	-57.61	≤-14.27	PASS
3DH5	Ant1	Low	2402	4.90	-43.99	≤-15.1	PASS
		High	2480	4.42	-56.17	≤-15.58	PASS
		Low	Hop_2402	5.08	-55.57	≤-14.93	PASS
		High	Hop_2480	6.15	-56.97	≤-13.85	PASS

Test Graphs

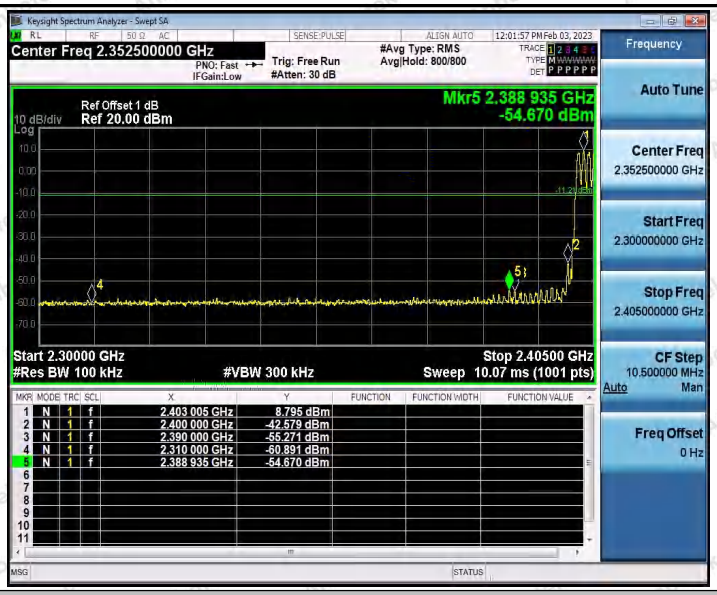
DH5_Ant1_Low_2402



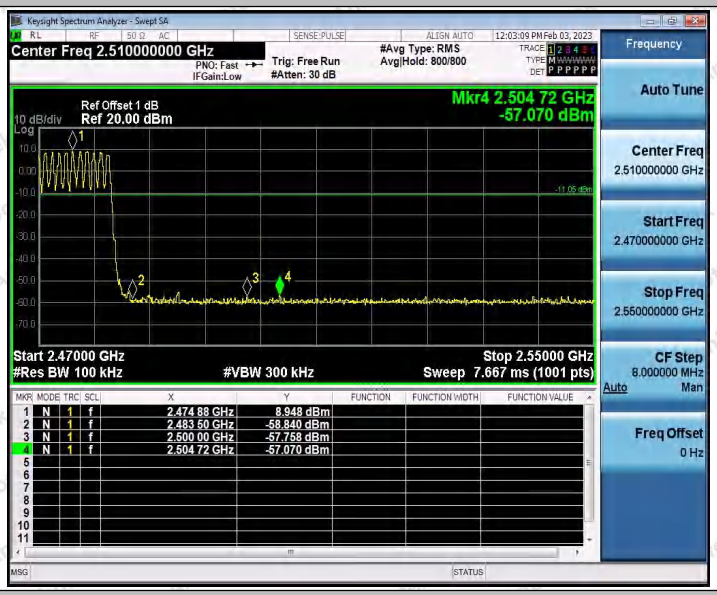
DH5_Ant1_High_2480



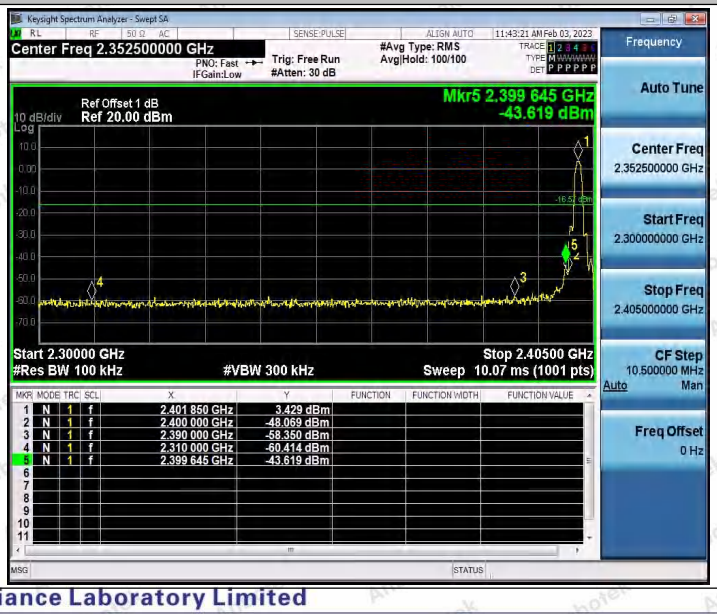
DH5_Ant1_Low_Hop_2402



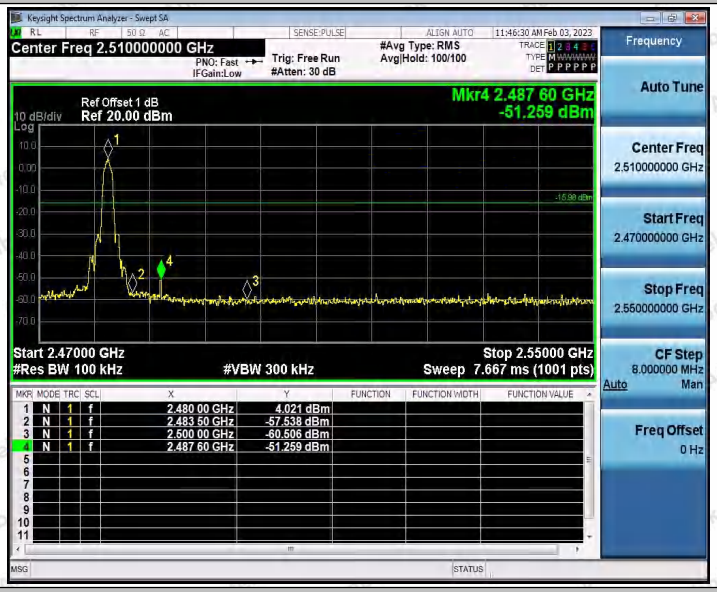
DH5_Ant1_High_Hop_2480



2DH5_Ant1_Low_2402



2DH5_Ant1_High_2480



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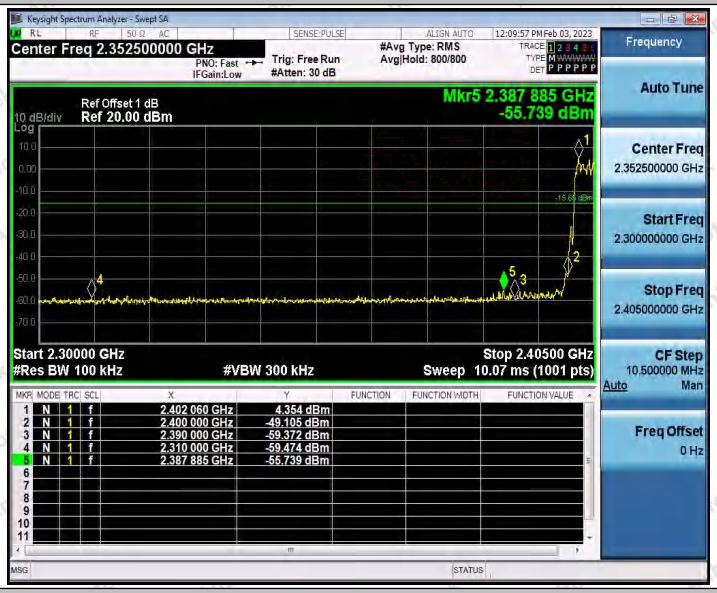
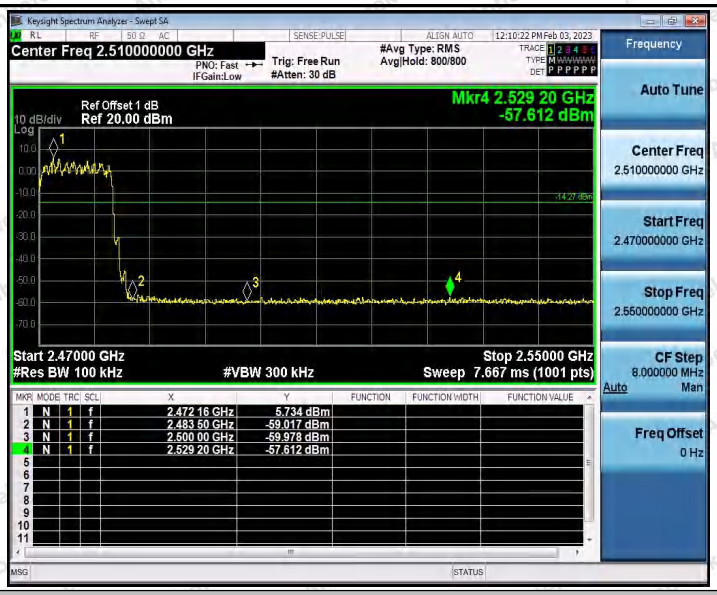
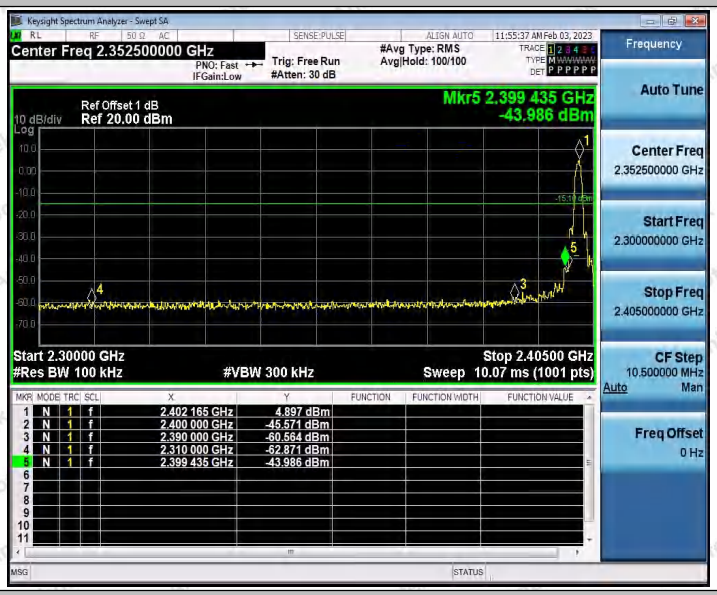


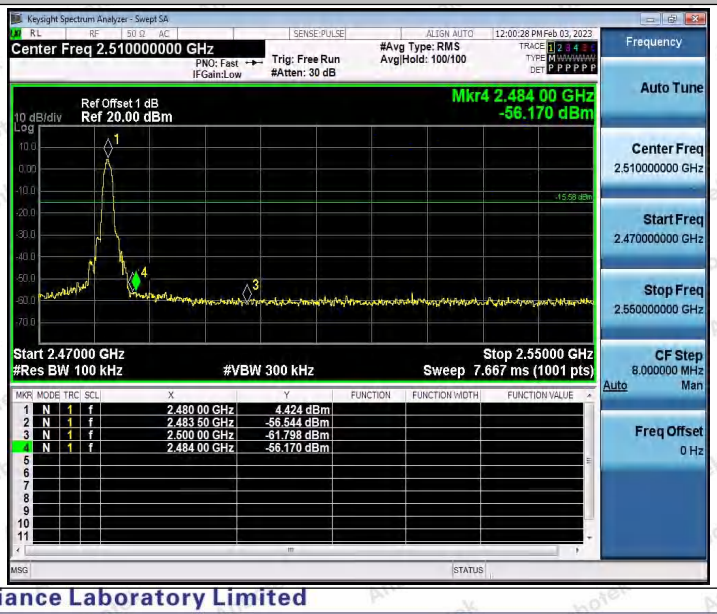
2DH5_Ant1_High_Hop_2480



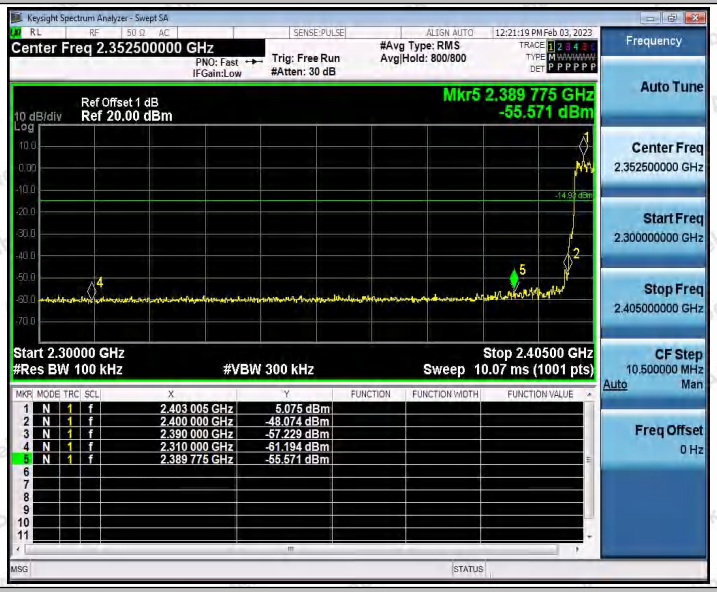
3DH5_Ant1_Low_2402



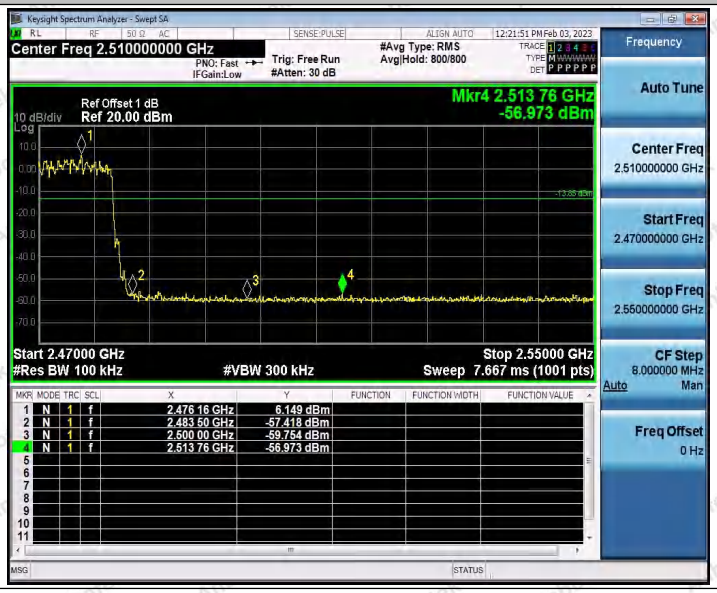
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

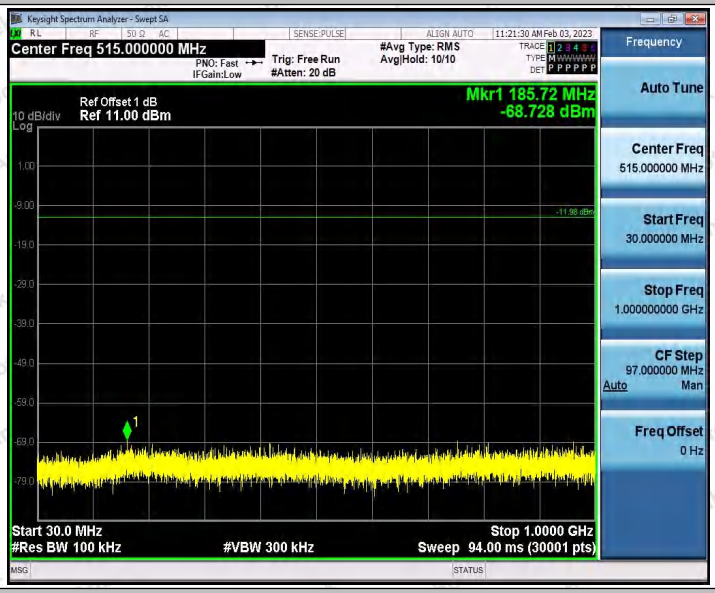
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	8.02	8.02	---	PASS
			30~1000	8.02	-68.73	≤-11.98	PASS
			1000~26500	8.02	-52.96	≤-11.98	PASS
		2441	Reference	8.05	8.05	---	PASS
			30~1000	8.05	-68.41	≤-11.95	PASS
			1000~26500	8.05	-53.37	≤-11.95	PASS
		2480	Reference	7.84	7.84	---	PASS
			30~1000	7.84	-68.55	≤-12.16	PASS
			1000~26500	7.84	-52.13	≤-12.16	PASS
2DH5	Ant1	2402	Reference	2.93	2.93	---	PASS
			30~1000	2.93	-69.04	≤-17.07	PASS
			1000~26500	2.93	-53.37	≤-17.07	PASS
		2441	Reference	3.61	3.61	---	PASS
			30~1000	3.61	-68.92	≤-16.39	PASS
			1000~26500	3.61	-52.85	≤-16.39	PASS
		2480	Reference	2.29	2.29	---	PASS
			30~1000	2.29	-68.77	≤-17.71	PASS
			1000~26500	2.29	-53.68	≤-17.71	PASS
3DH5	Ant1	2402	Reference	4.61	4.61	---	PASS
			30~1000	4.61	-68.82	≤-15.39	PASS
			1000~26500	4.61	-53.58	≤-15.39	PASS
		2441	Reference	3.10	3.10	---	PASS
			30~1000	3.10	-68.38	≤-16.9	PASS
			1000~26500	3.10	-53.3	≤-16.9	PASS
		2480	Reference	2.64	2.64	---	PASS
			30~1000	2.64	-69.08	≤-17.36	PASS
			1000~26500	2.64	-53.3	≤-17.36	PASS

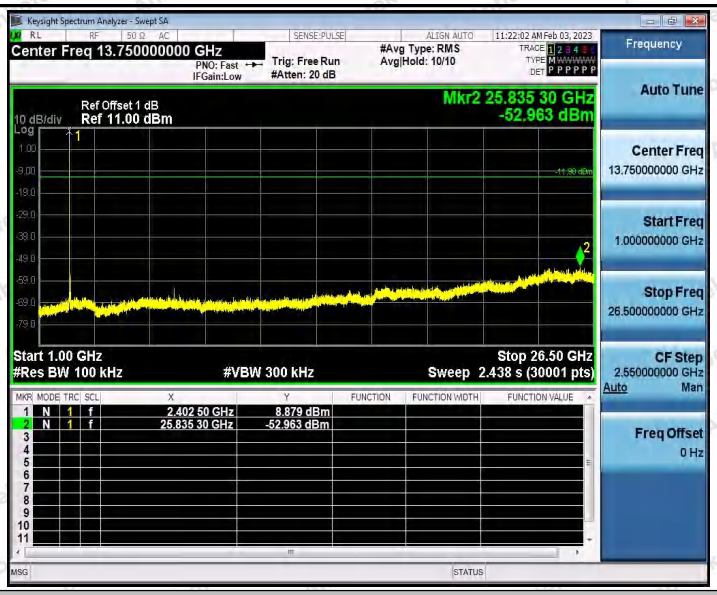
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

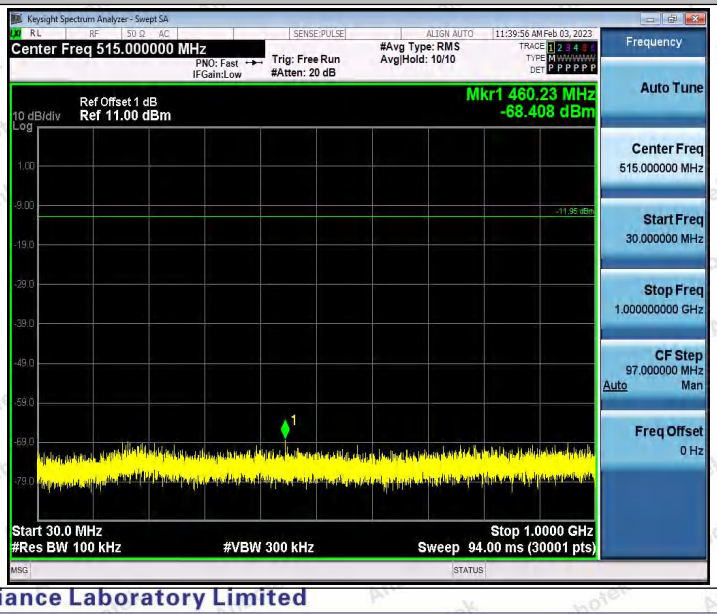


DH5_Ant1_2402_1000~26500

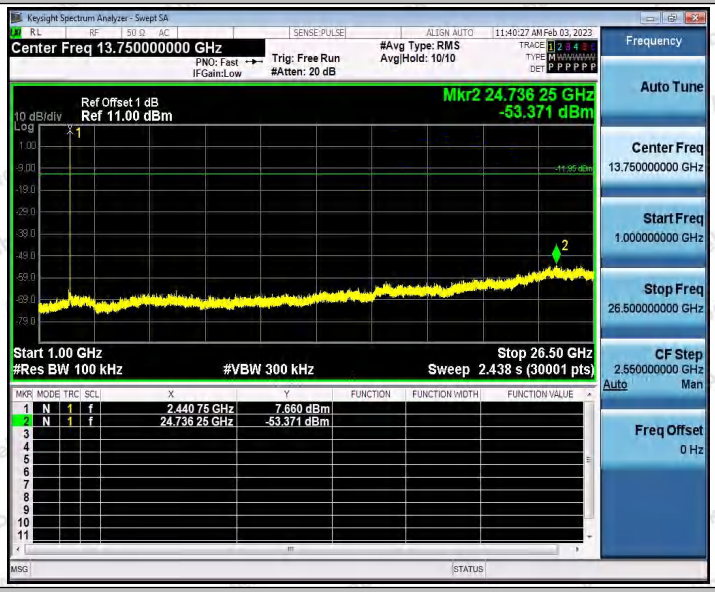


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

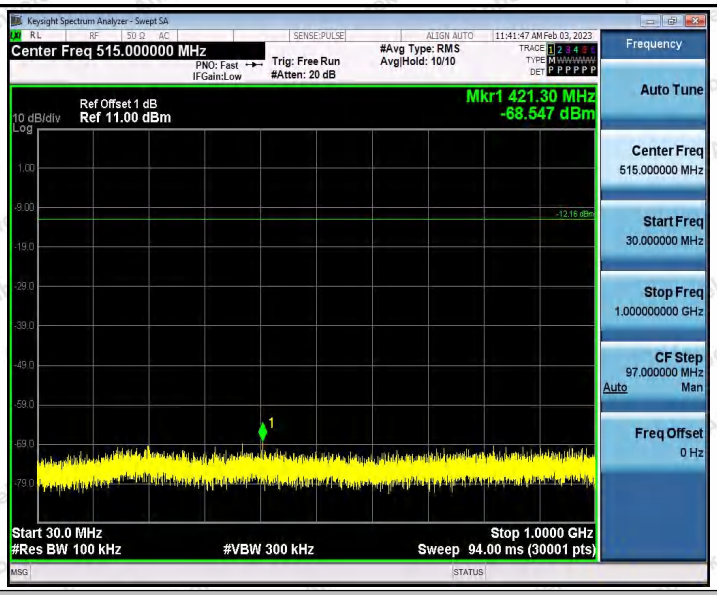


DH5_Ant1_2441_1000~26500

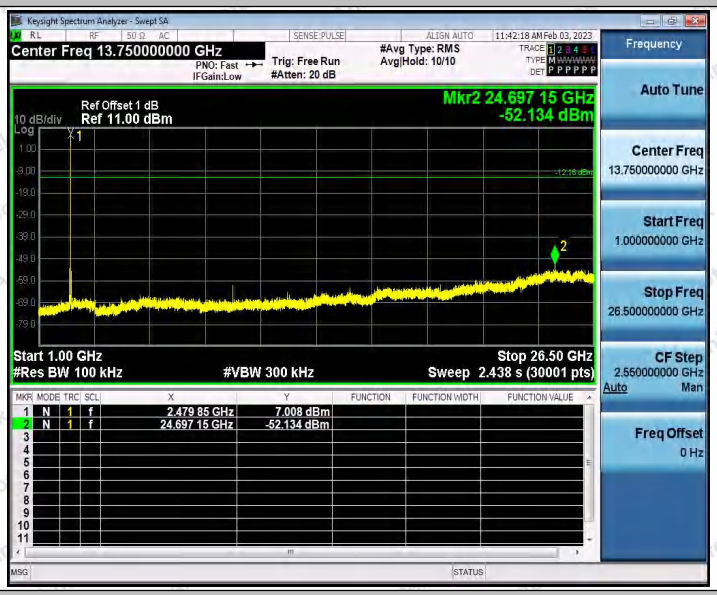


DH5_Ant1_2480_0~Reference

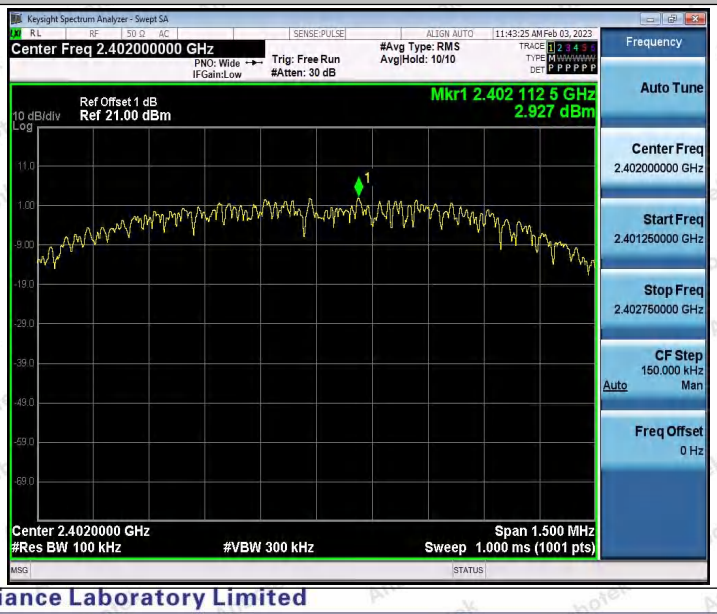
DH5_Ant1_2480_30~1000



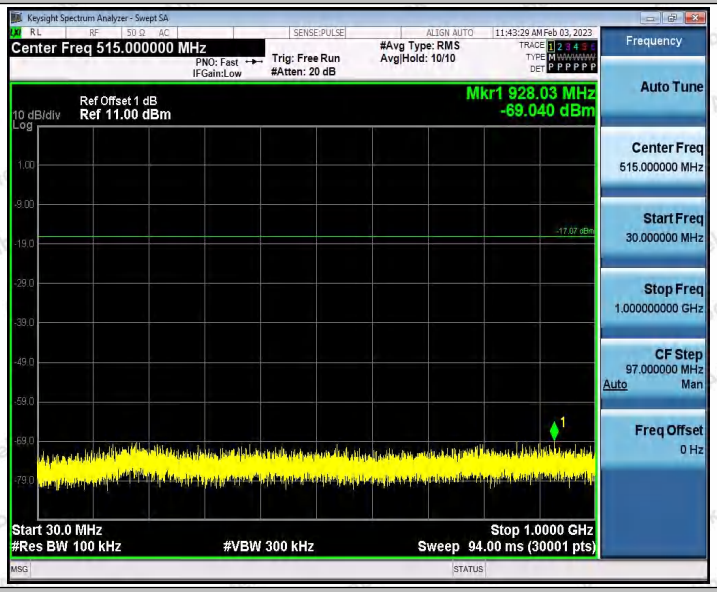
DH5_Ant1_2480_1000~26500



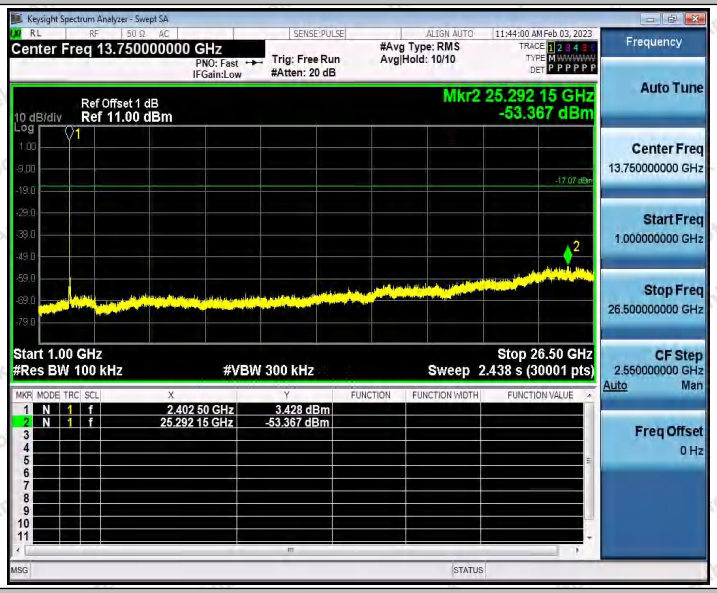
2DH5_Ant1_2402_0~Reference



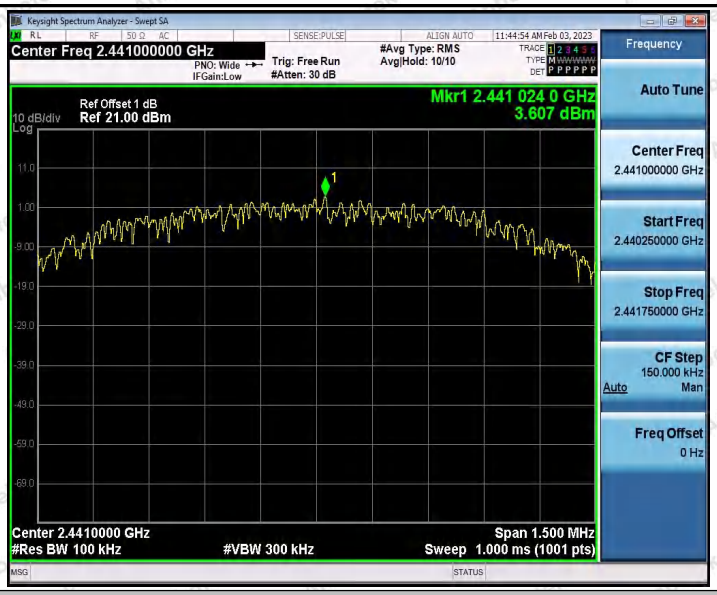
2DH5_Ant1_2402_30~1000



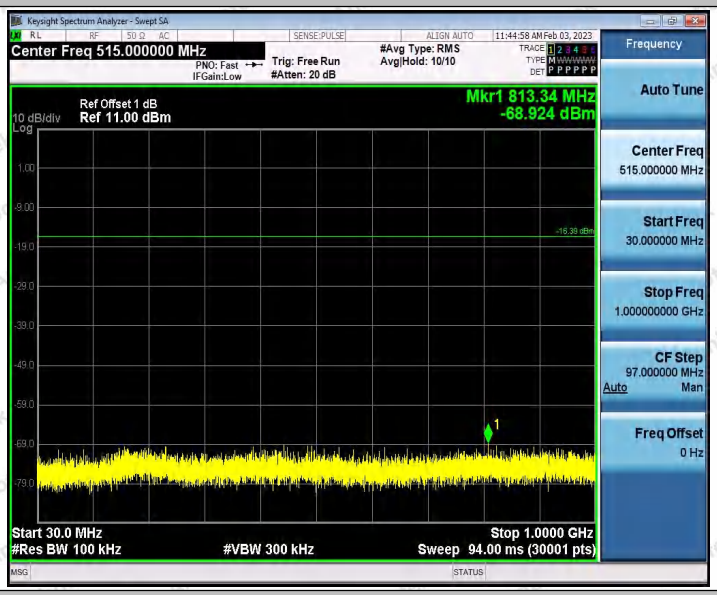
2DH5_Ant1_2402_1000~26500



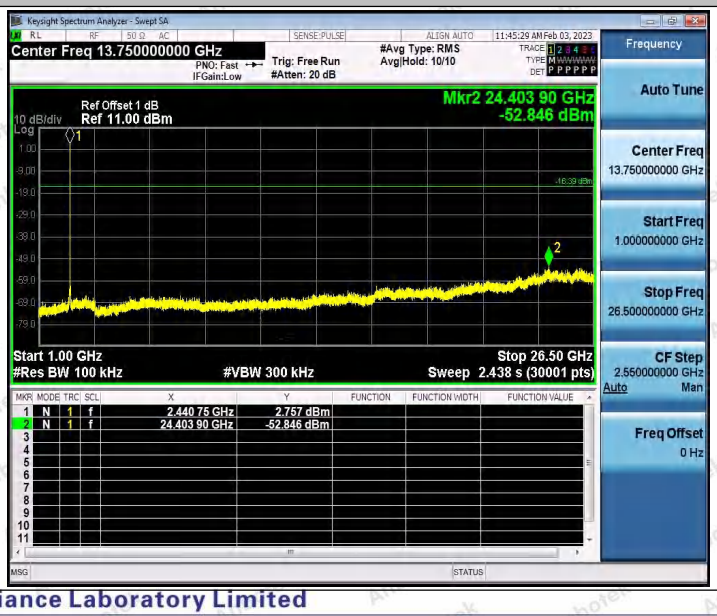
2DH5_Ant1_2441_0~Reference



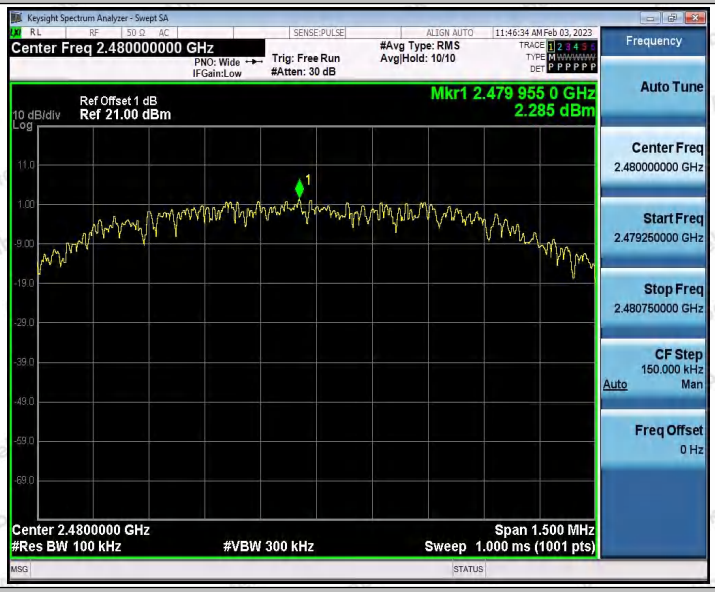
2DH5_Ant1_2441_30~1000



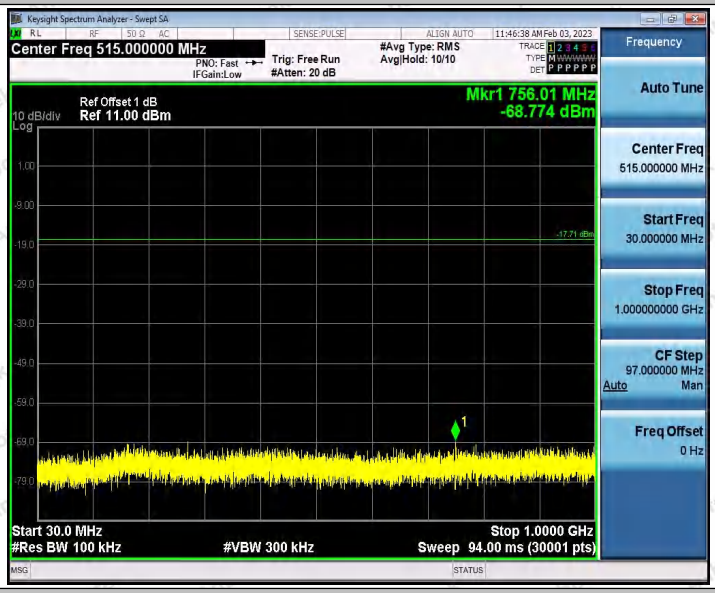
2DH5_Ant1_2441_1000~26500



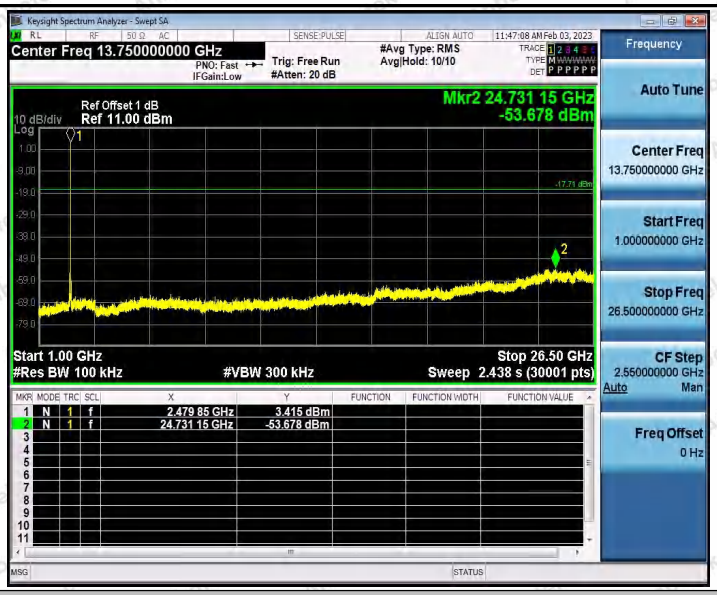
2DH5_Ant1_2480_0~Reference



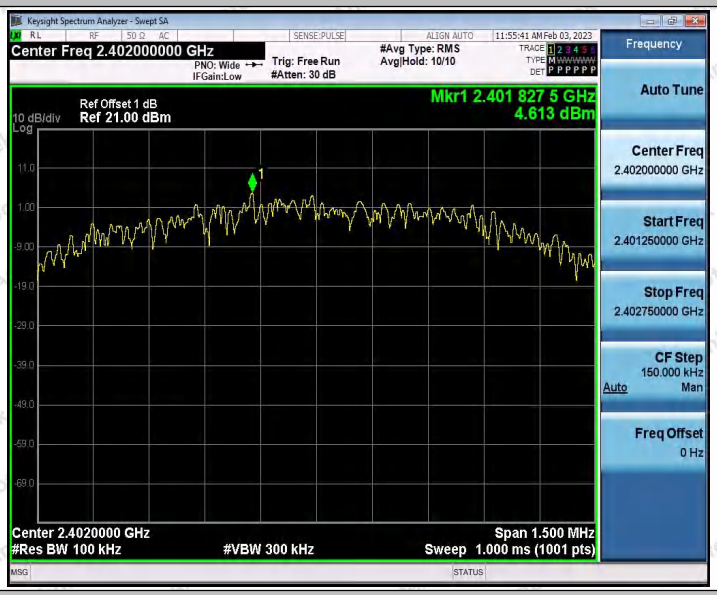
2DH5_Ant1_2480_30~1000



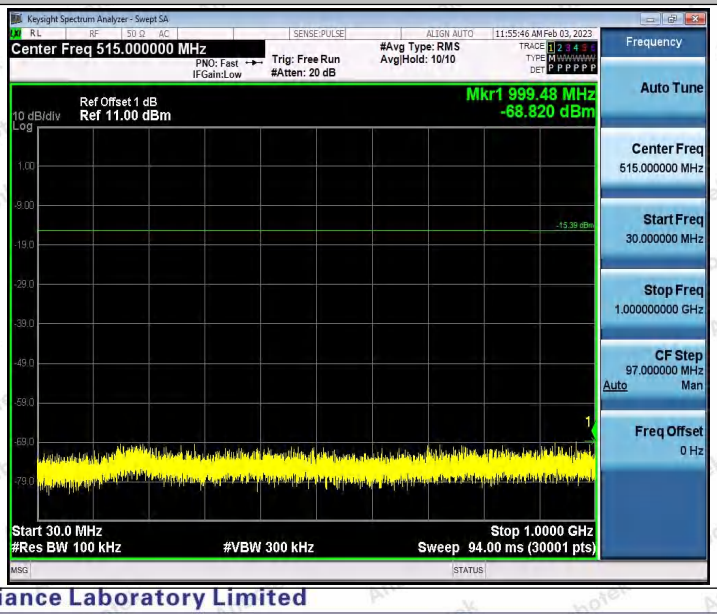
2DH5_Ant1_2480_1000~26500



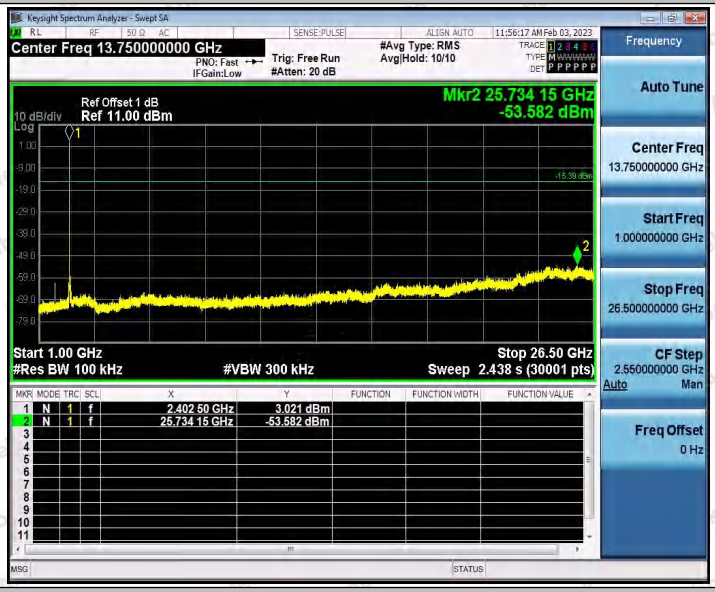
3DH5_Ant1_2402_0~Reference



3DH5_Ant1_2402_30~1000

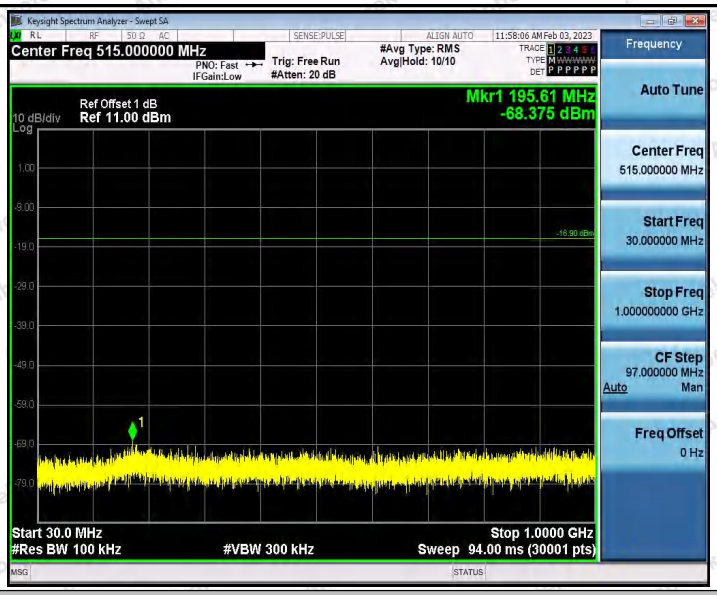


3DH5_Ant1_2402_1000~26500

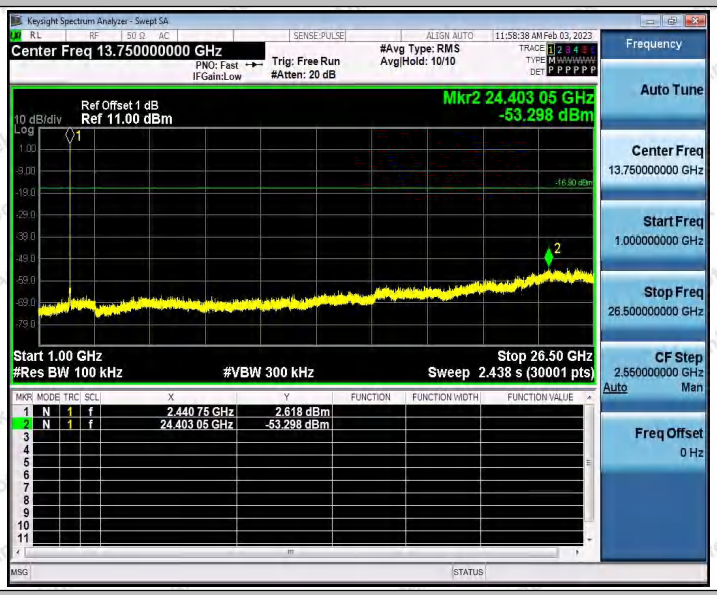


3DH5_Ant1_2441_0~Reference

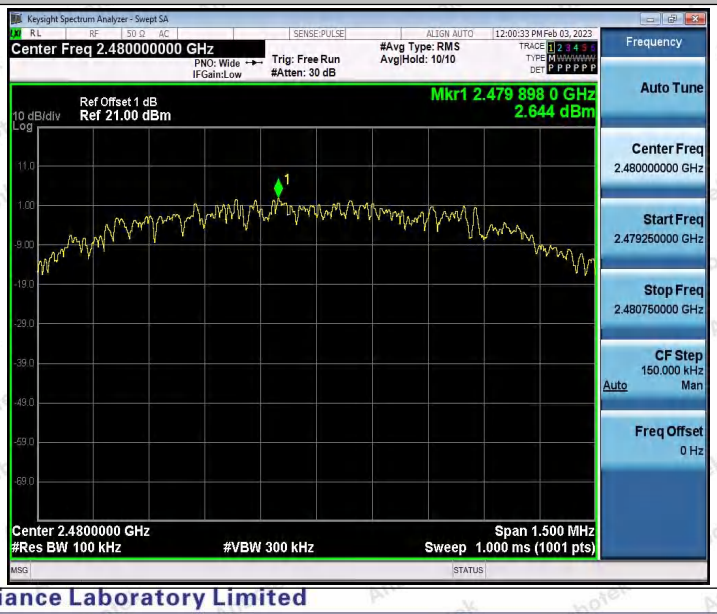
3DH5_Ant1_2441_30~1000



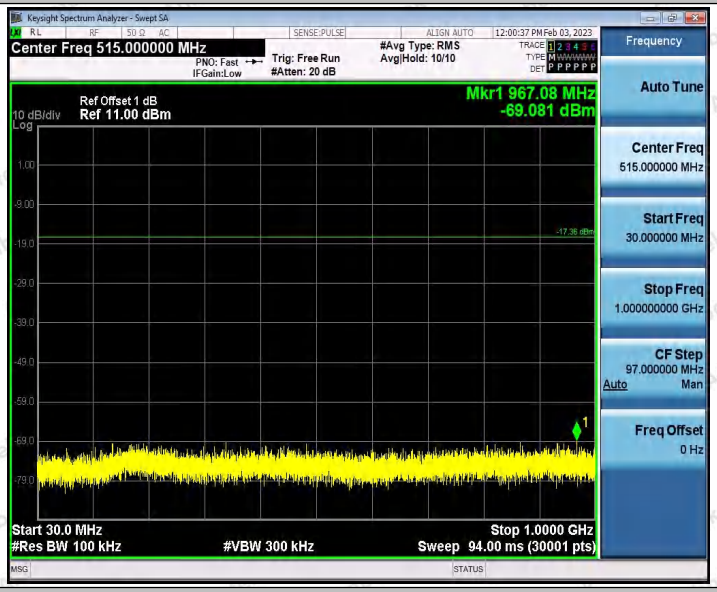
3DH5_Ant1_2441_1000~26500



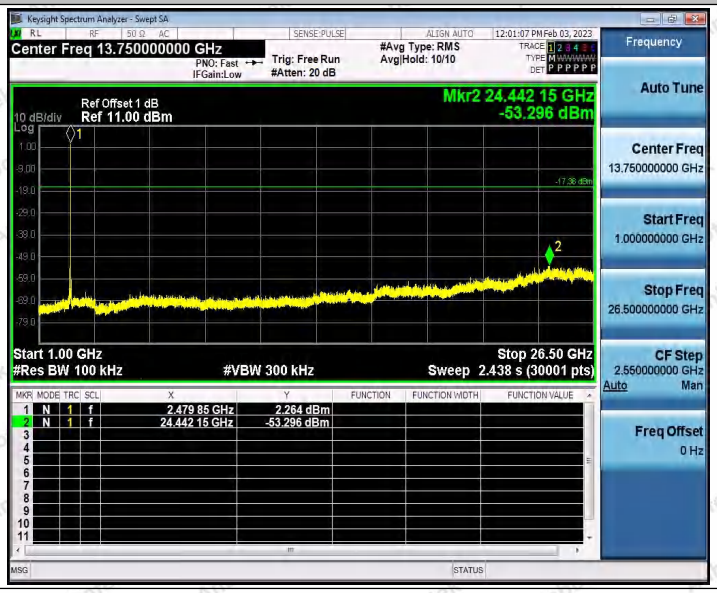
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



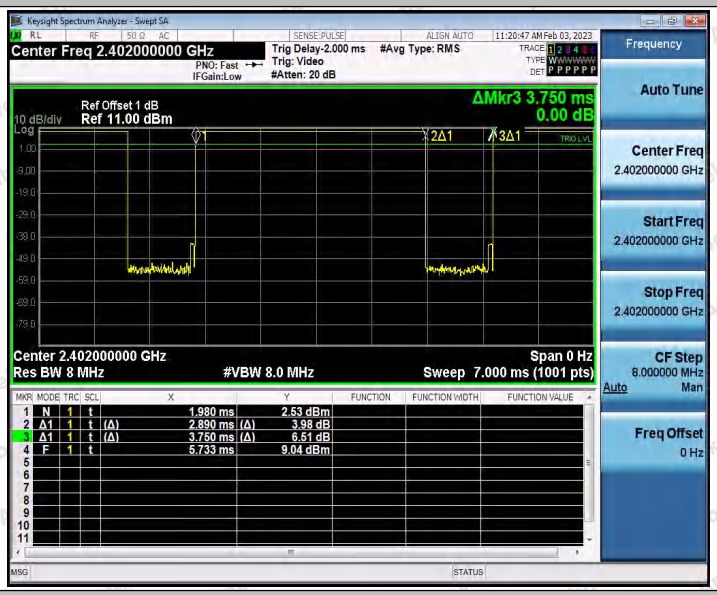
Appendix I: Duty Cycle

Test Result

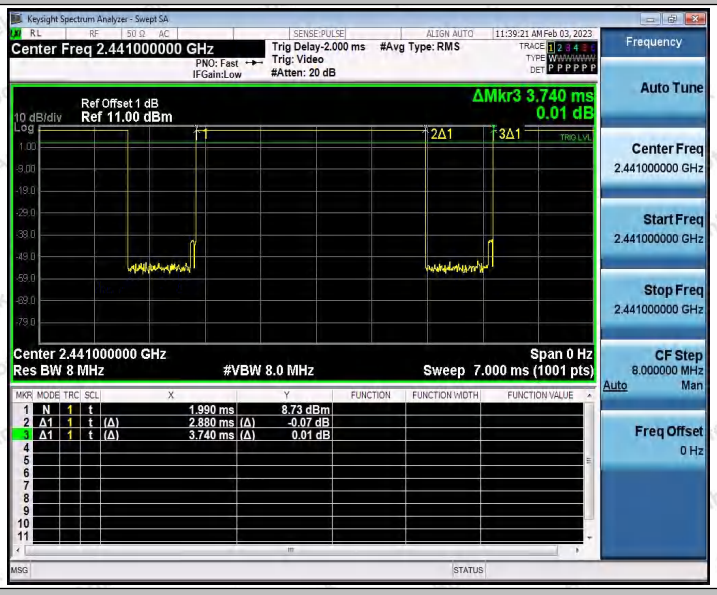
Test Mode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.89	3.75	77.07	1.13
		2441	2.88	3.74	77.01	1.13
		2480	2.88	3.75	76.80	1.15
2DH5	Ant1	2402	2.88	3.74	77.01	1.13
		2441	2.90	3.76	77.13	1.13
		2480	0.14	0.14	100.00	0.00
3DH5	Ant1	2402	0.14	0.15	93.33	0.30
		2441	0.14	0.14	100.00	0.00
		2480	2.89	3.76	76.86	1.14

Test Graphs

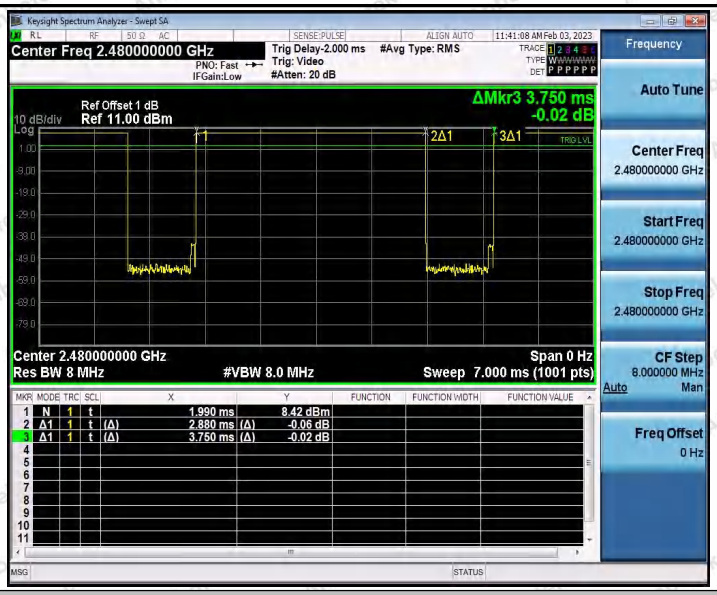
DH5_Ant1_2402



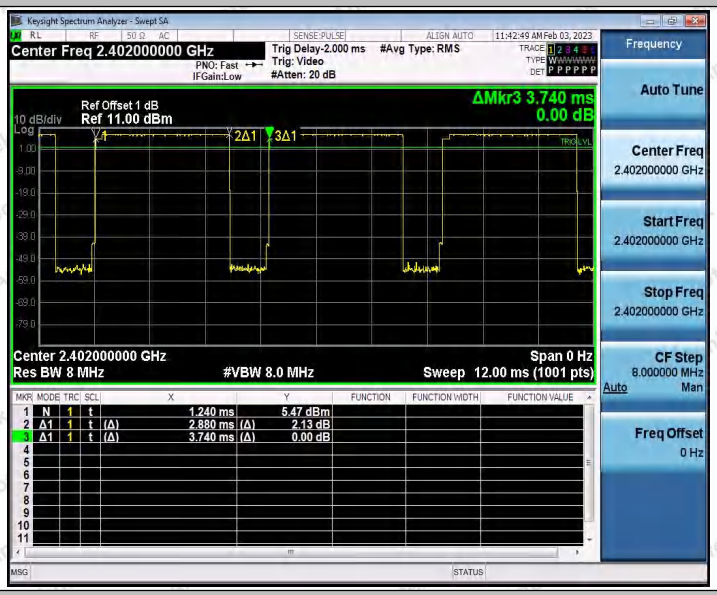
DH5_Ant1_2441



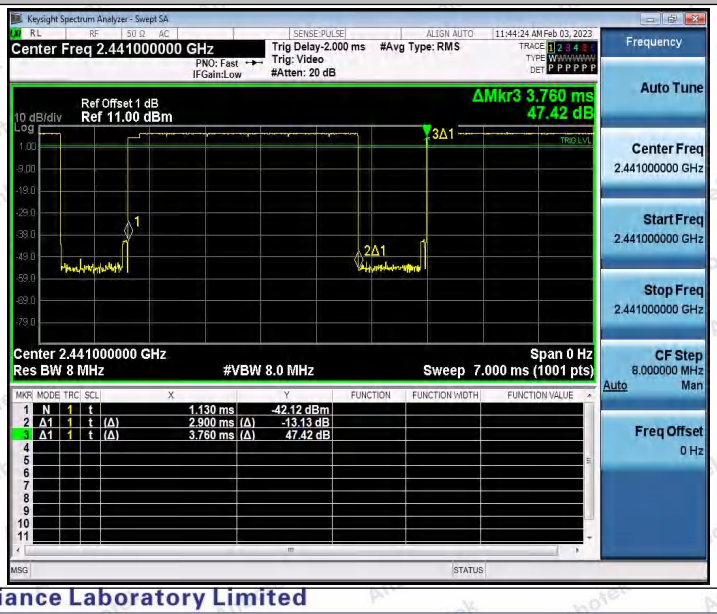
DH5_Ant1_2480



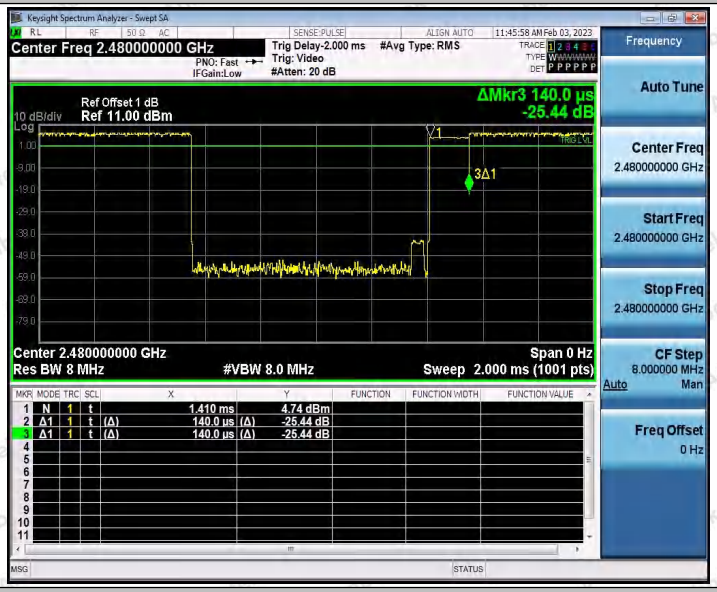
2DH5_Ant1_2402



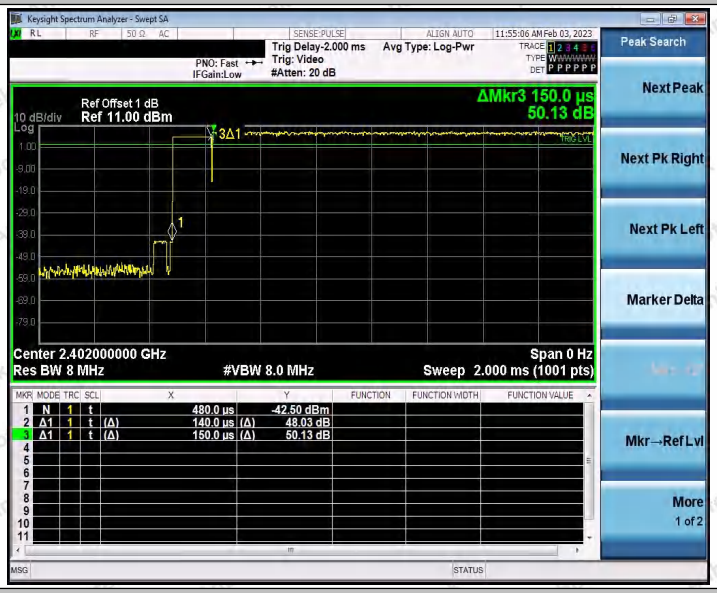
2DH5_Ant1_2441



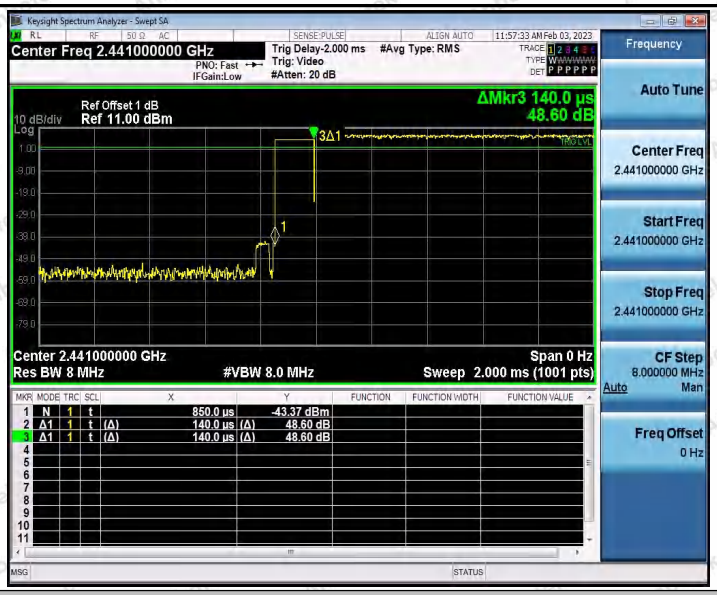
2DH5_Ant1_2480



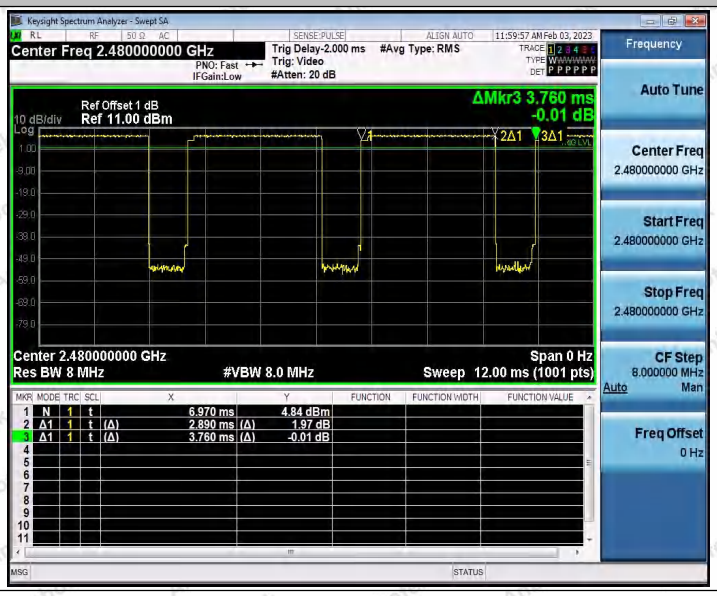
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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