Appendix Test Data

Report No.:	18220WC30277301	Test Sample No.:	1-2-2
Start Test Date:	2024.01.05	Finish Test Date:	2024.01.05
Test Engineer:	Hayman Chen	Auditor:	Rick Luo
Temperature:	23.1℃	Relative Humidity:	40%
Pressure:	101kPa		

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.975	2401.523	2402.498	---	---
		2441	1.017	2440.481	2441.498	---	---
		2480	0.966	2479.532	2480.498	---	---
2DH5	Ant1	2402	1.317	2401.340	2402.657	---	---
		2441	1.317	2440.340	2441.657	---	---
		2480	1.329	2479.334	2480.663	---	---
3DH5	Ant1	2402	1.308	2401.349	2402.657	---	---
		2441	1.305	2440.346	2441.651	---	---
		2480	1.299	2479.349	2480.648	---	---

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

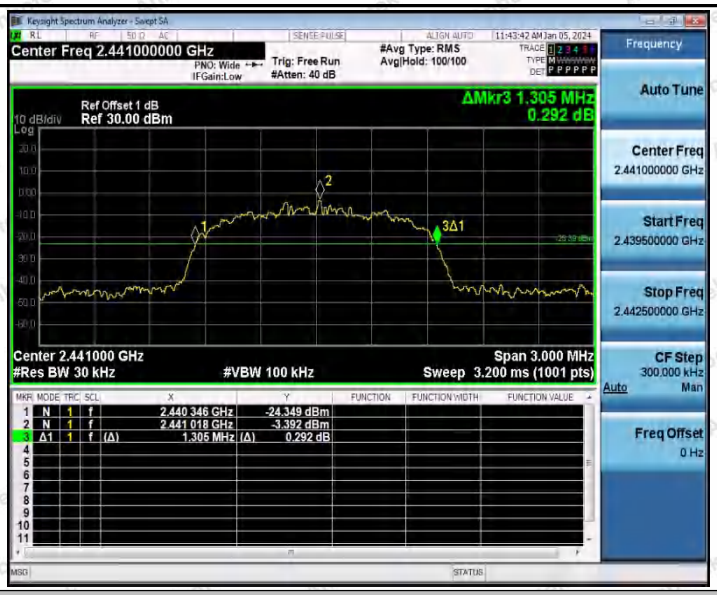
2DH5_Ant1_2402

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	0.89955	2401.5561	2402.4556	---	---
		2441	0.89884	2440.5502	2441.4490	---	---
		2480	0.90476	2479.5500	2480.4547	---	---
2DH5	Ant1	2402	1.1893	2401.4056	2402.5949	---	---
		2441	1.1790	2440.4089	2441.5879	---	---
		2480	1.1925	2479.4047	2480.5972	---	---
3DH5	Ant1	2402	1.2007	2401.3994	2402.6001	---	---
		2441	1.1920	2440.4055	2441.5975	---	---
		2480	1.1993	2479.3975	2480.5968	---	---

Test Graphs

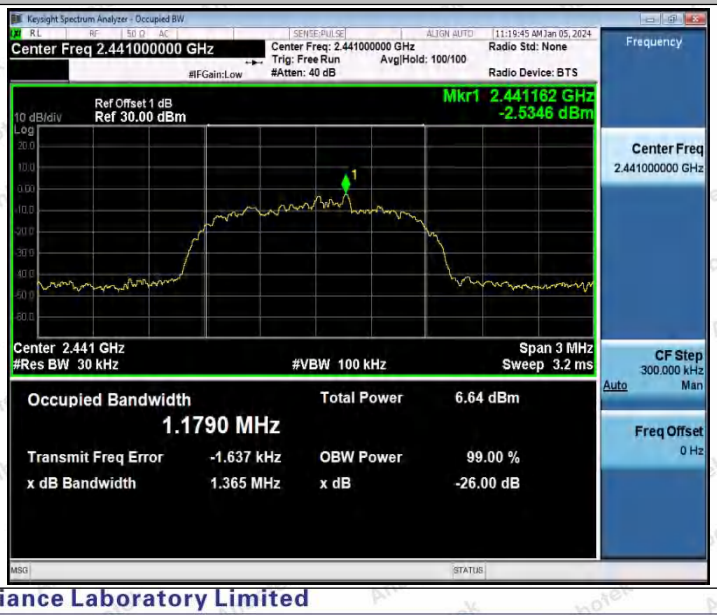
DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

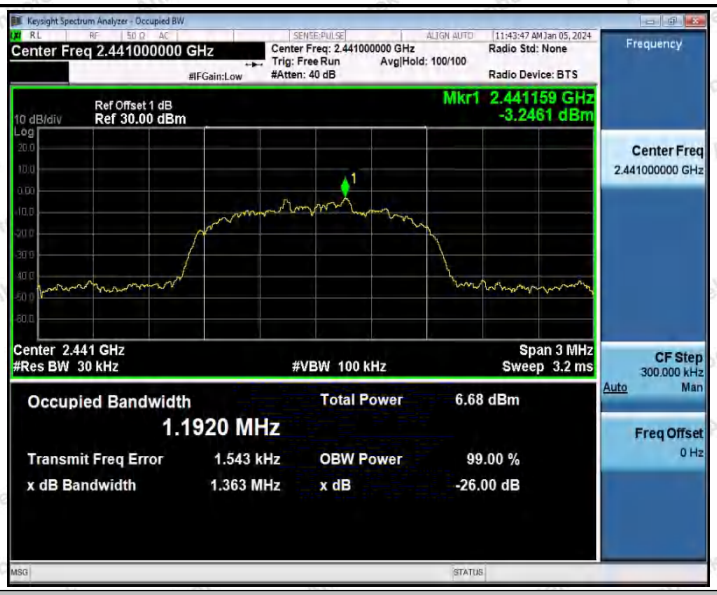
2DH5_Ant1_2441



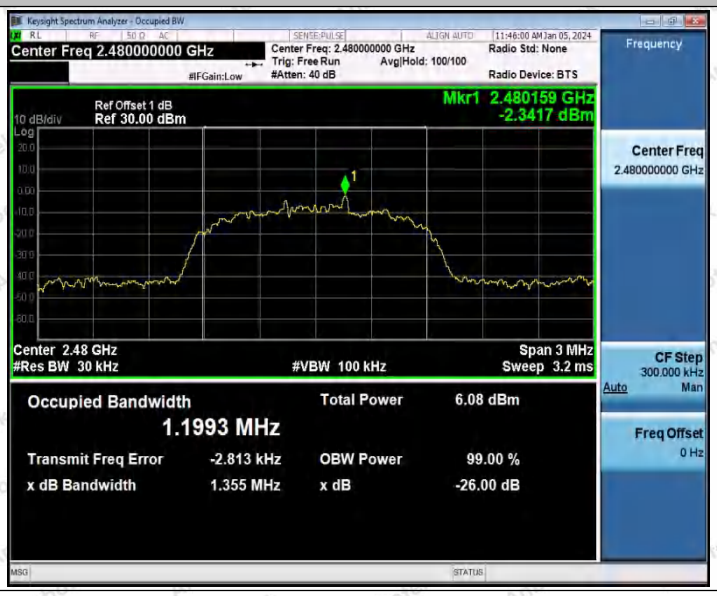
2DH5_Ant1_2480

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	1.63	≤20.97	PASS
		2441	2.12	≤20.97	PASS
		2480	1.42	≤20.97	PASS
2DH5	Ant1	2402	0.78	≤20.97	PASS
		2441	1.25	≤20.97	PASS
		2480	0.70	≤20.97	PASS
3DH5	Ant1	2402	0.94	≤20.97	PASS
		2441	1.40	≤20.97	PASS
		2480	0.85	≤20.97	PASS

Test Graphs

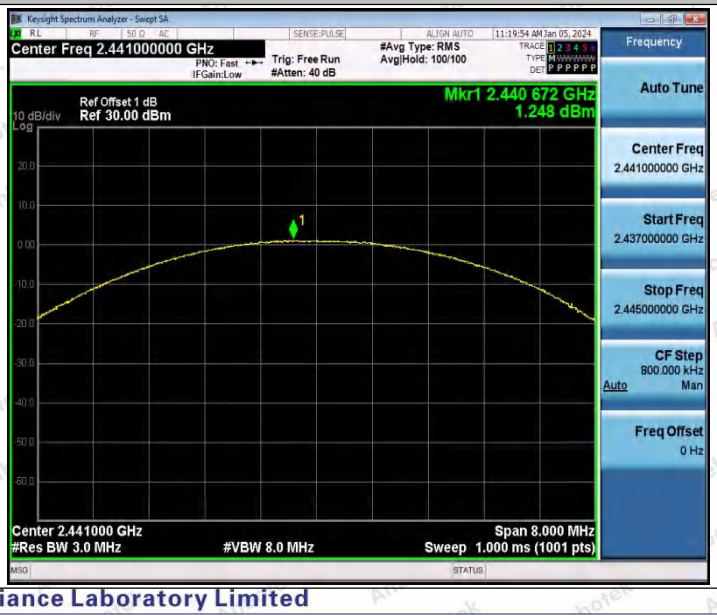
DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

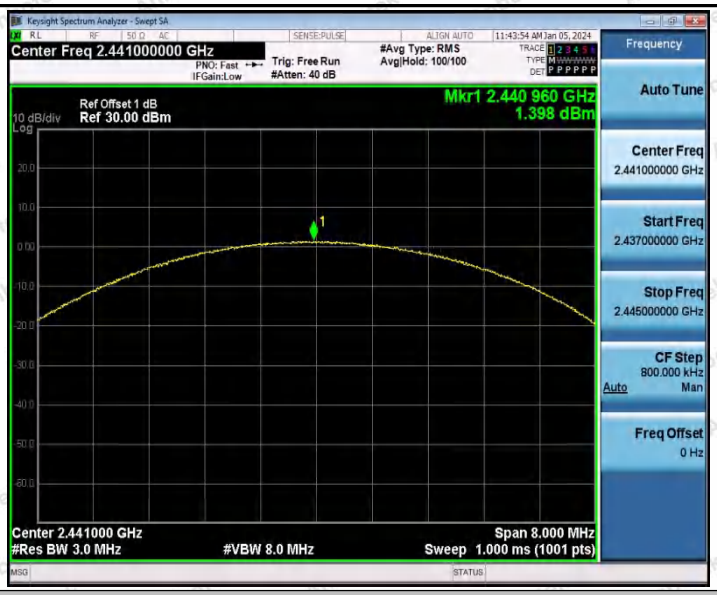
2DH5_Ant1_2441



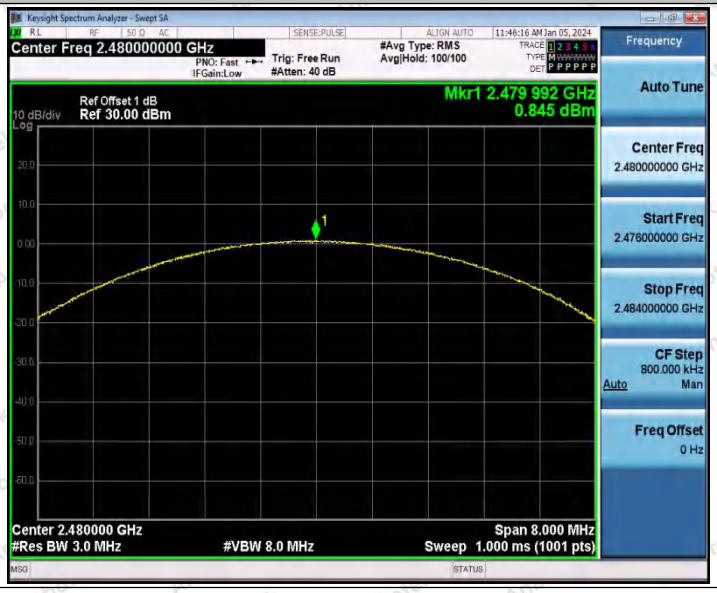
2DH5_Ant1_2480

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	0.998	≥0.678	PASS
2DH5	Ant1	Hop	1.044	≥0.886	PASS
3DH5	Ant1	Hop	1.014	≥0.872	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
12:00:47 PM Jan 05, 2024
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.014 MHz
-0.052 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

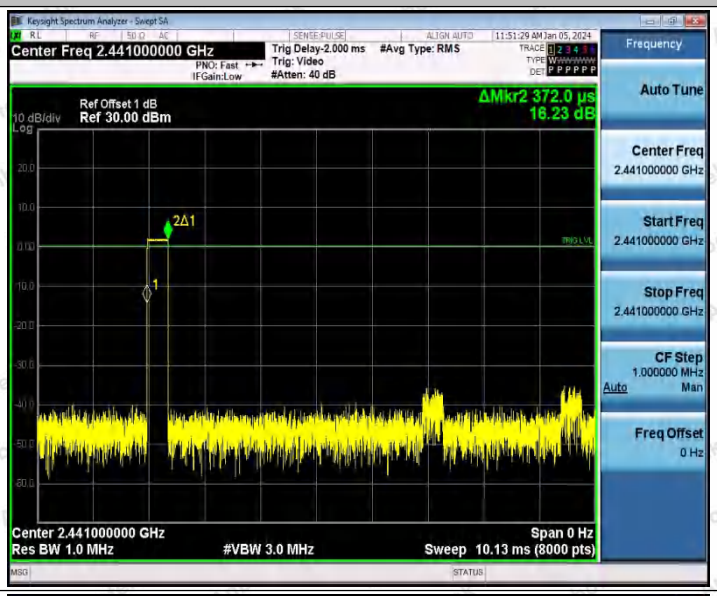
Appendix E: Time of occupancy

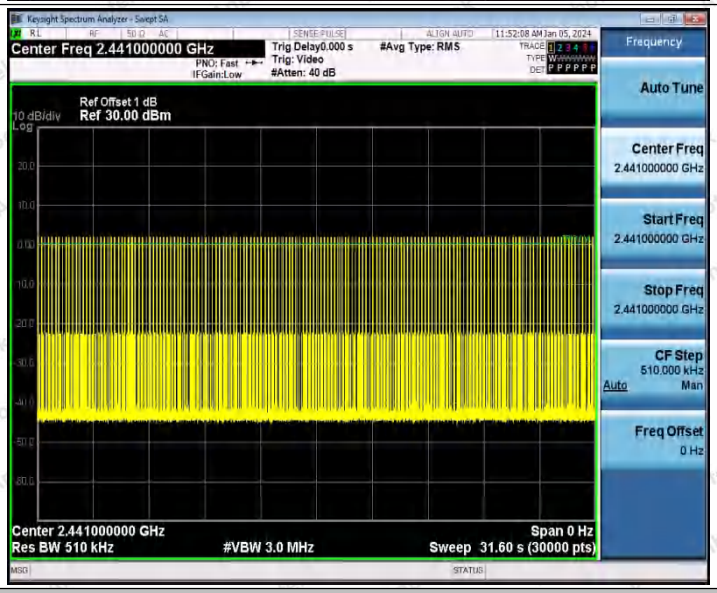
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.372	312	0.116	≤0.4	PASS
DH3	Ant1	Hop	1.628	159	0.259	≤0.4	PASS
DH5	Ant1	Hop	2.877	106	0.305	≤0.4	PASS
2DH1	Ant1	Hop	0.380	313	0.119	≤0.4	PASS
2DH3	Ant1	Hop	1.633	159	0.26	≤0.4	PASS
2DH5	Ant1	Hop	2.879	114	0.328	≤0.4	PASS
3DH1	Ant1	Hop	0.381	313	0.119	≤0.4	PASS
3DH3	Ant1	Hop	1.832	112	0.205	≤0.4	PASS
3DH5	Ant1	Hop	2.883	104	0.3	≤0.4	PASS

Test Graphs

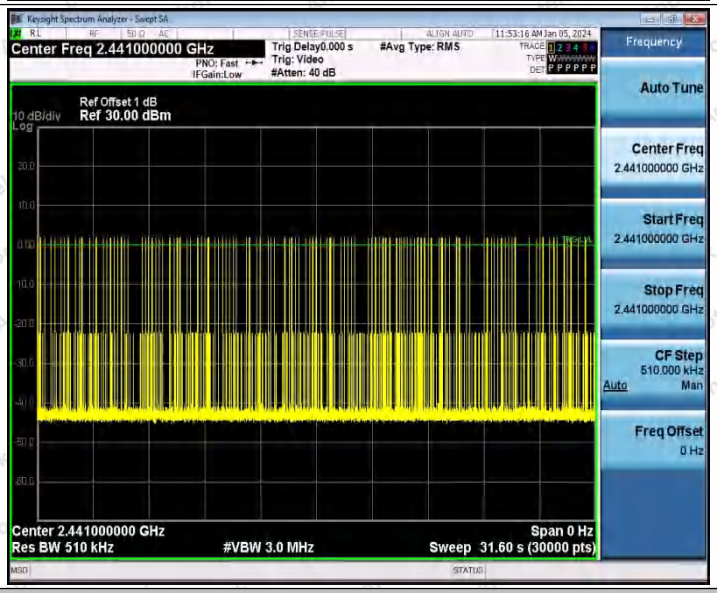
DH1_Ant1_Hop





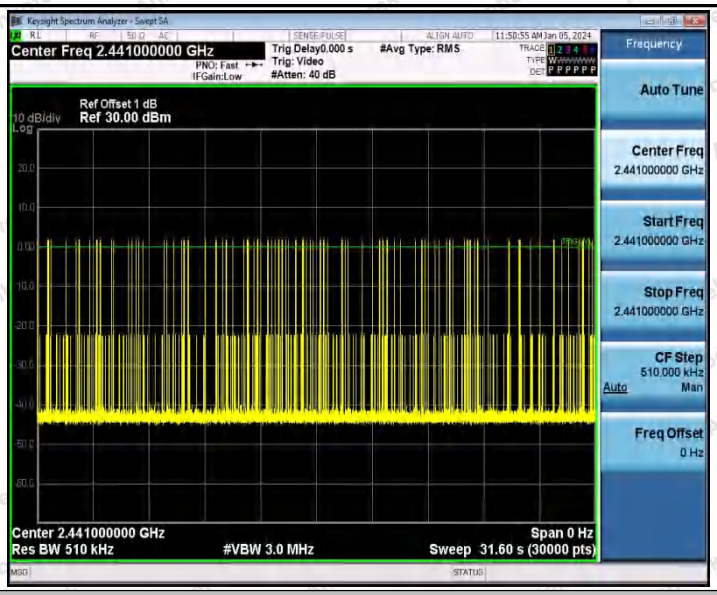
DH3_Ant1_Hop

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
11:52:38 AM Jan 05, 2024
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.628 ms
5.53 dB
2Δ1
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

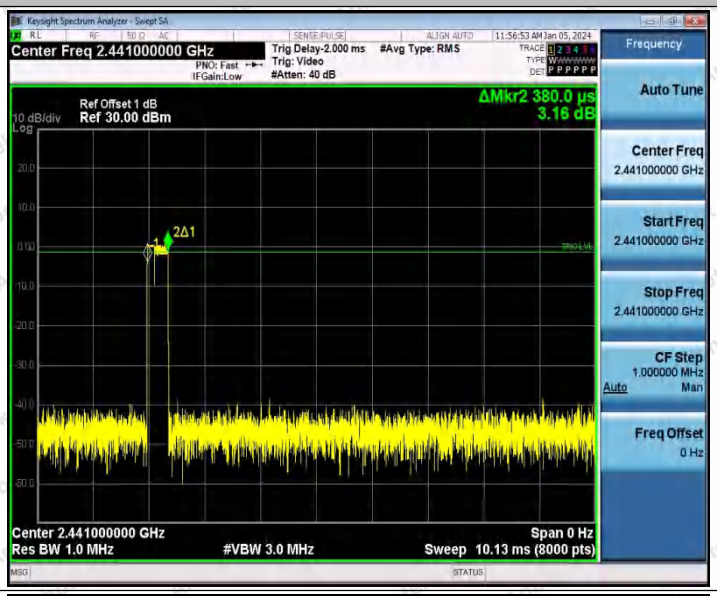

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
11:53:16 AM Jan 05, 2024
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)
Frequency
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

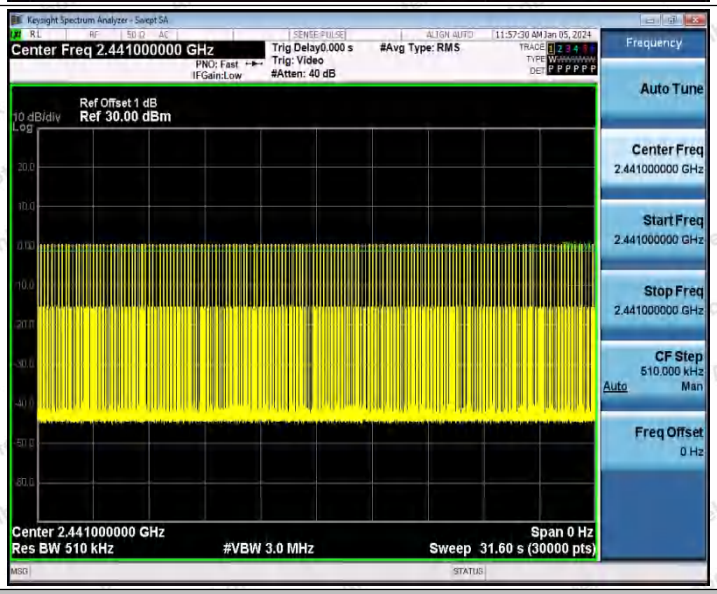
DH5_Ant1_Hop

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
11:50:17 AM Jan 05, 2024
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.877 ms
10.37 dB
2Δ1
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

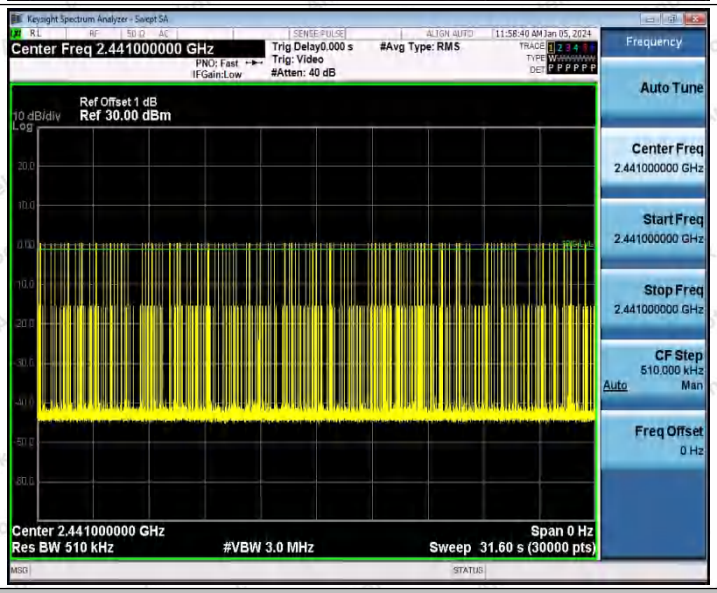


2DH1_Ant1_Hop

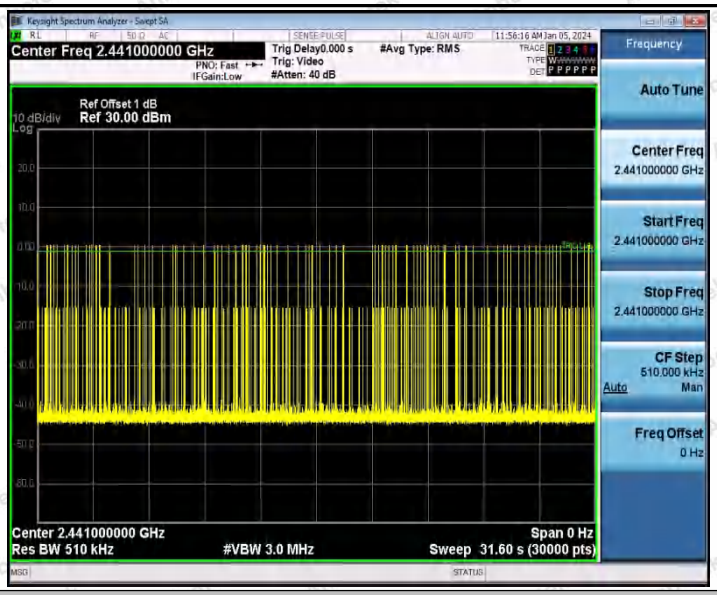




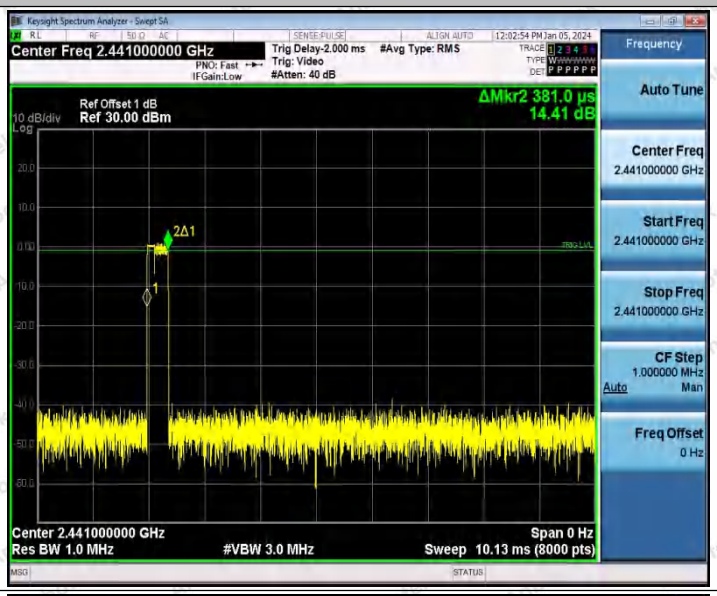
2DH3_Ant1_Hop

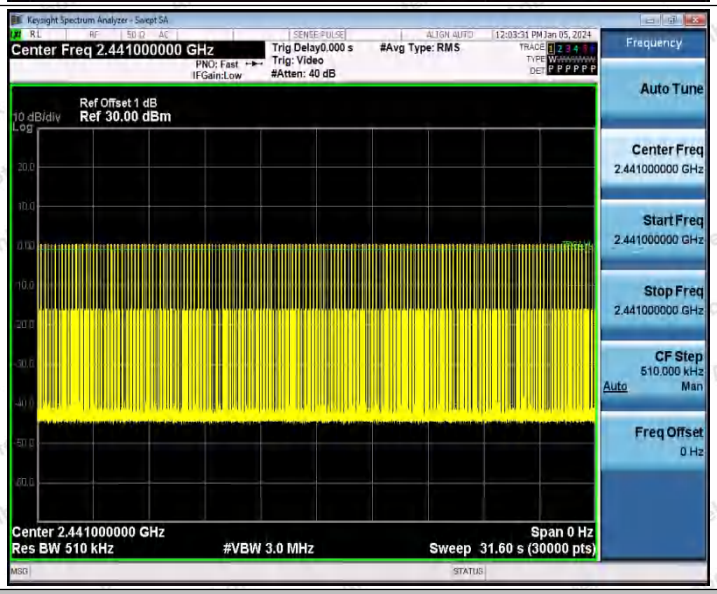


2DH5_Ant1_Hop

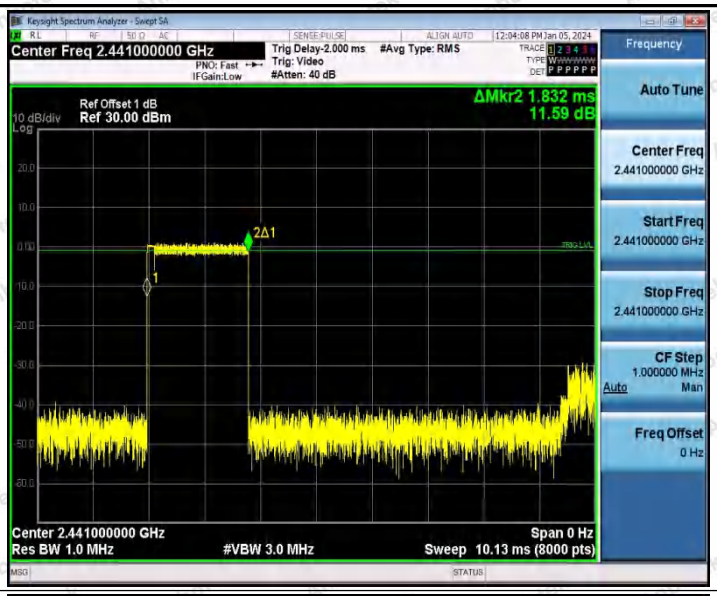


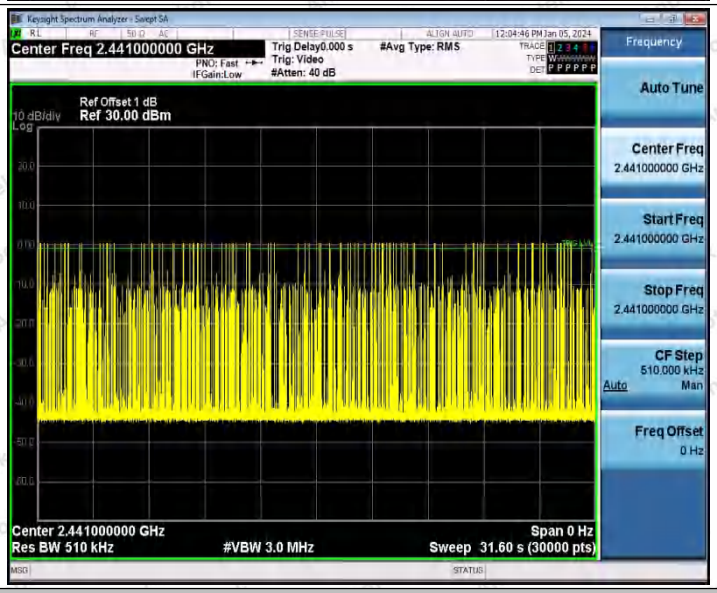
3DH1_Ant1_Hop



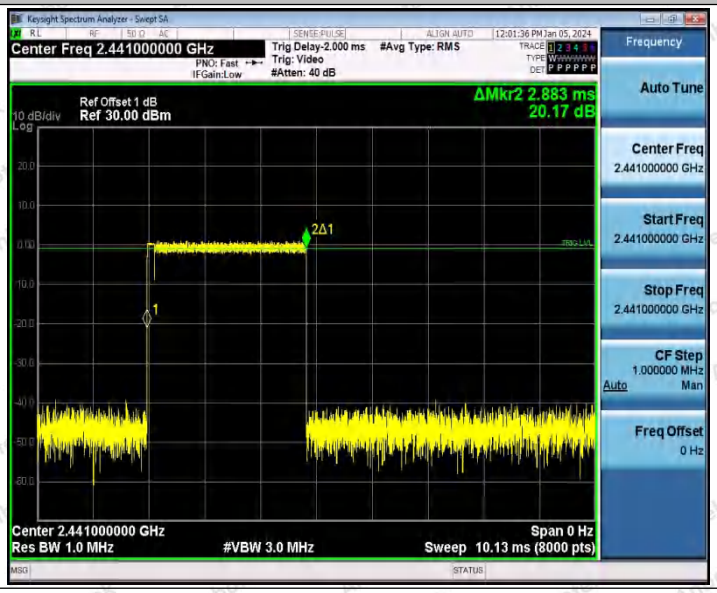


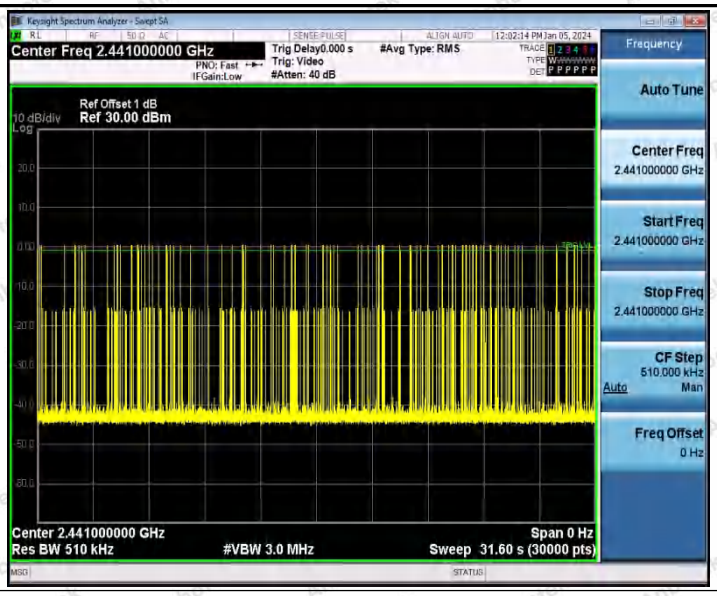
3DH3_Ant1_Hop





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
12:02:14 PM Jan 05, 2024
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
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)

Appendix F: Number of hopping channels

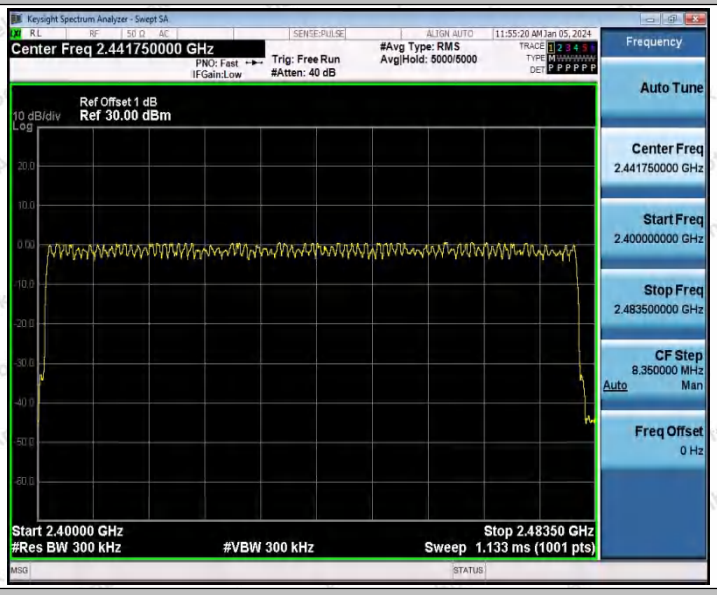
Test Result

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

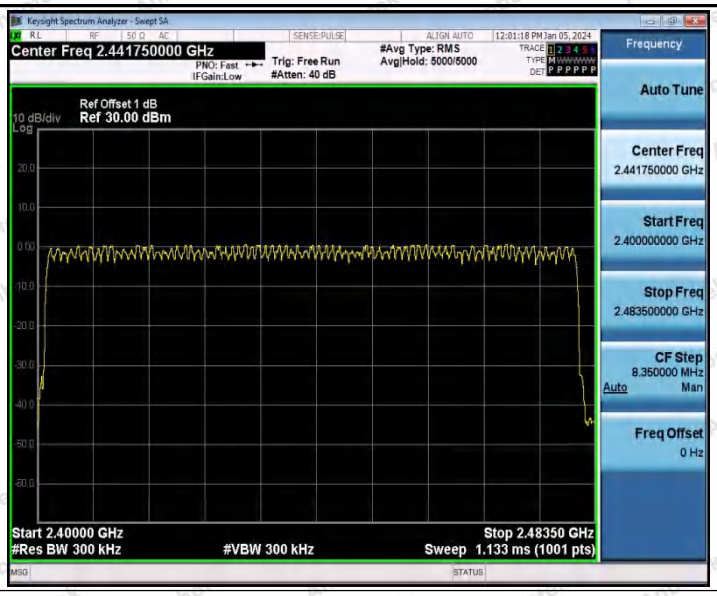
Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop



3DH5_Ant1_Hop


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
12:01:18 PM Jan 05, 2024
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

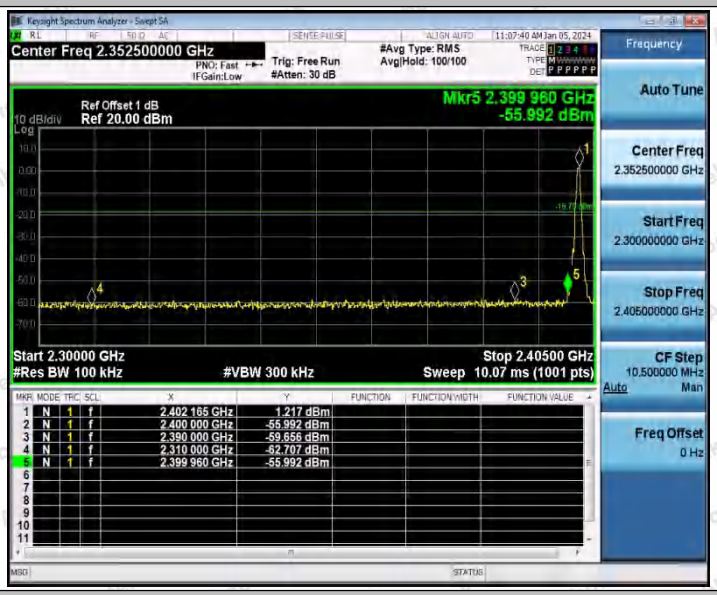
Appendix G: Band edge measurements

Test Result

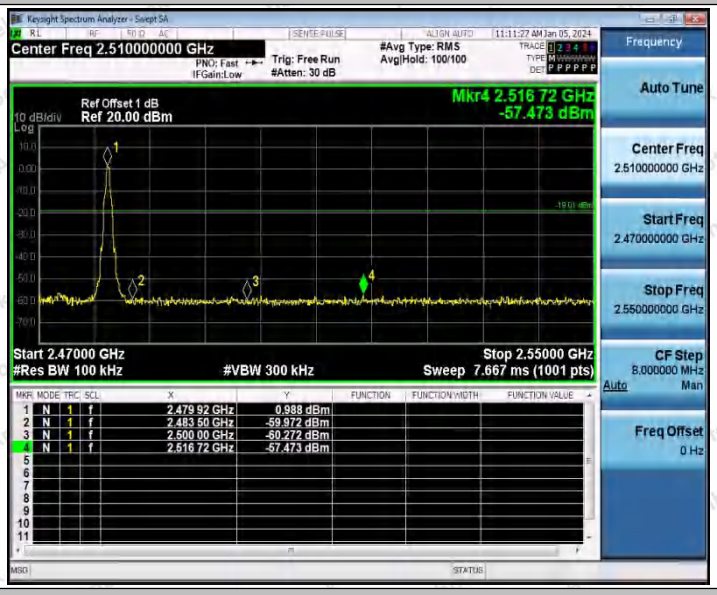
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	1.22	-55.99	≤-18.78	PASS
		High	2480	0.99	-57.47	≤-19.01	PASS
		Low	Hop_2402	1.01	-57.72	≤-18.99	PASS
		High	Hop_2480	1.24	-56.52	≤-18.76	PASS
2DH5	Ant1	Low	2402	-1.15	-56.64	≤-21.15	PASS
		High	2480	-0.43	-57.37	≤-20.43	PASS
		Low	Hop_2402	-0.40	-55.67	≤-20.4	PASS
		High	Hop_2480	-0.24	-57.04	≤-20.24	PASS
3DH5	Ant1	Low	2402	-0.42	-56.32	≤-20.42	PASS
		High	2480	-0.16	-56.9	≤-20.16	PASS
		Low	Hop_2402	-0.07	-57.67	≤-20.07	PASS
		High	Hop_2480	-0.09	-56.97	≤-20.09	PASS

Test Graphs

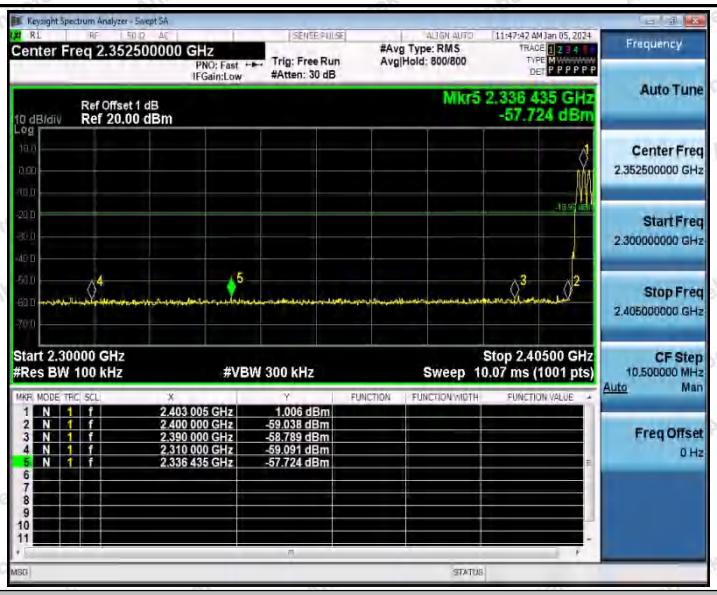
DH5_Ant1_Low_2402



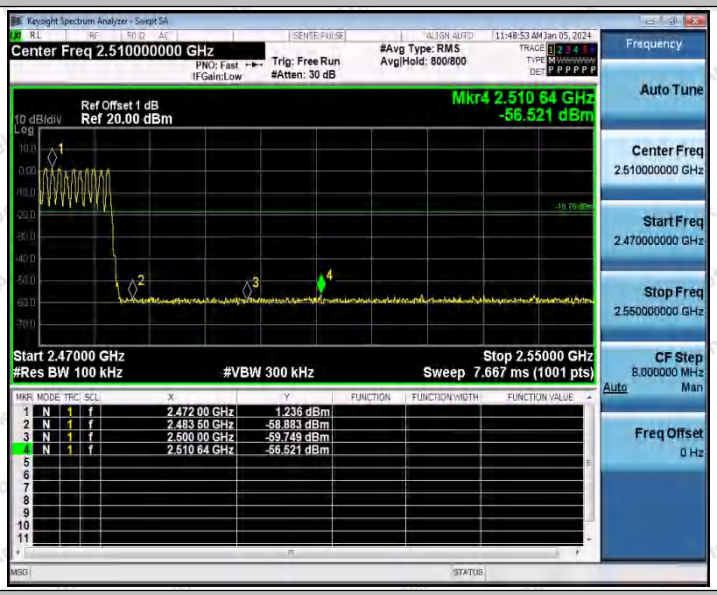
DH5_Ant1_High_2480



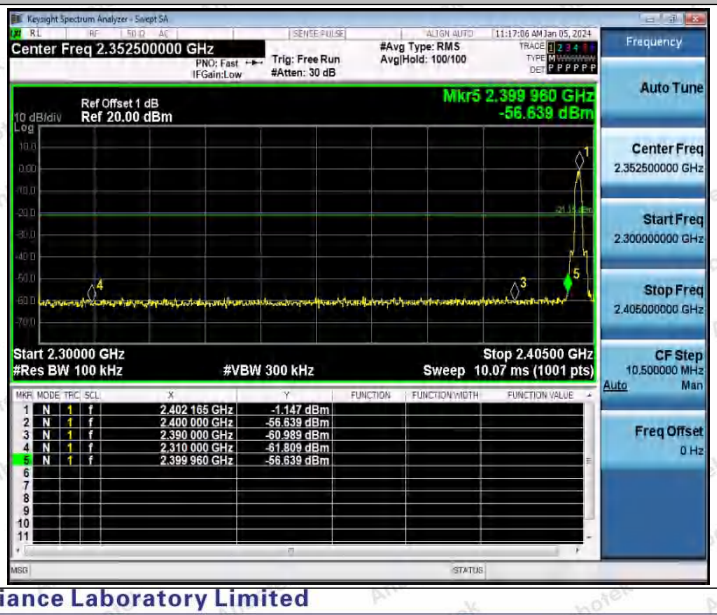
DH5_Ant1_Low_Hop_2402



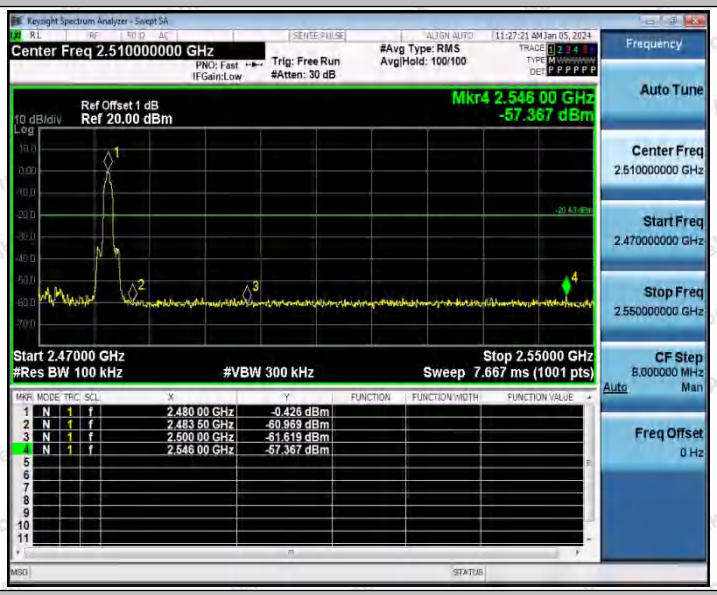
DH5_Ant1_High_Hop_2480



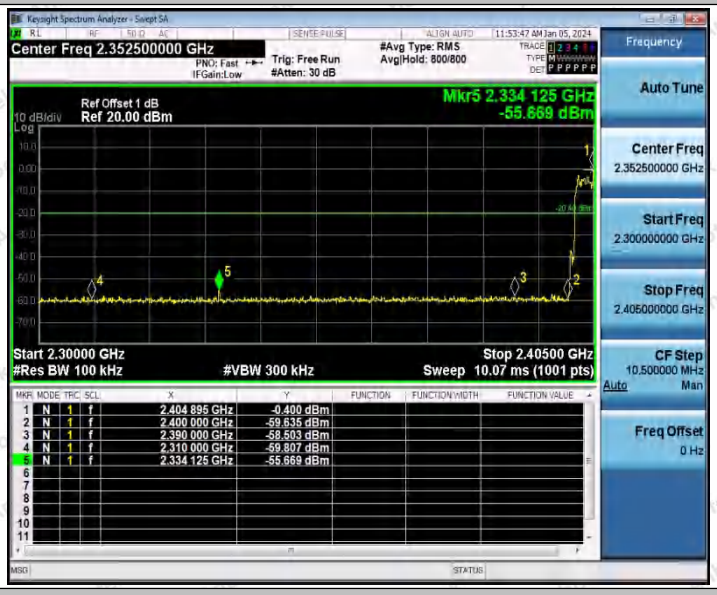
2DH5_Ant1_Low_2402



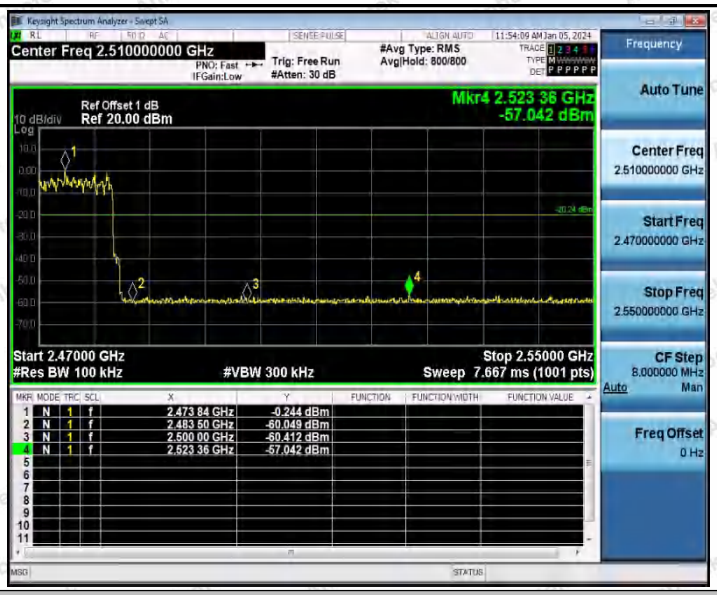
2DH5_Ant1_High_2480



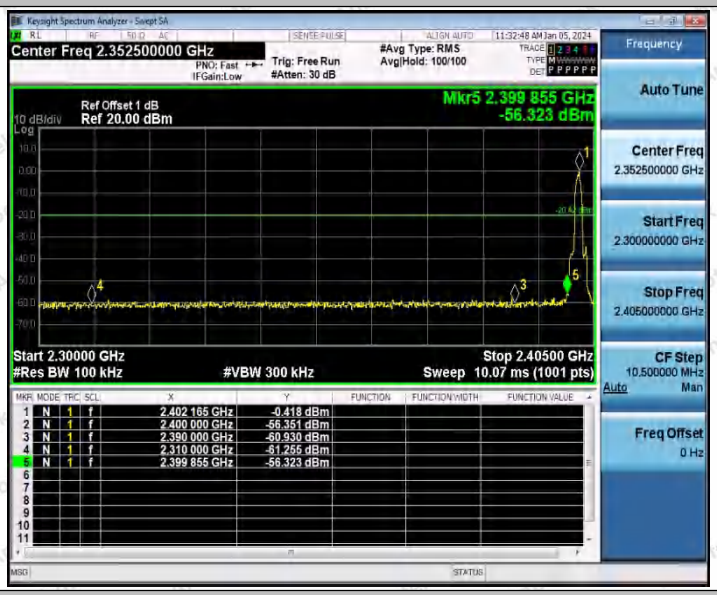
2DH5_Ant1_Low_Hop_2402



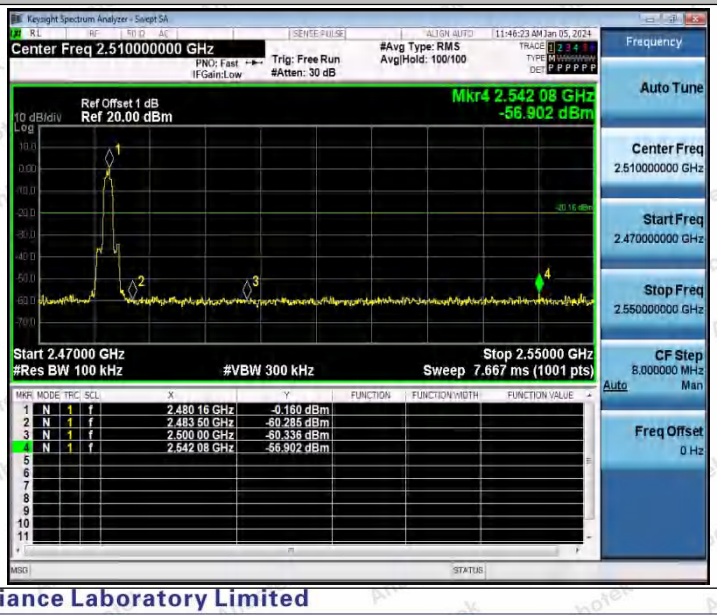
2DH5_Ant1_High_Hop_2480



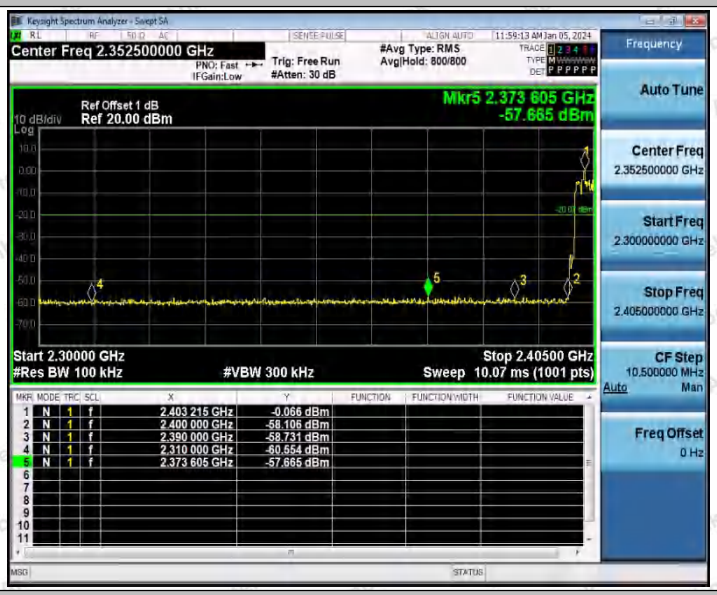
3DH5_Ant1_Low_2402



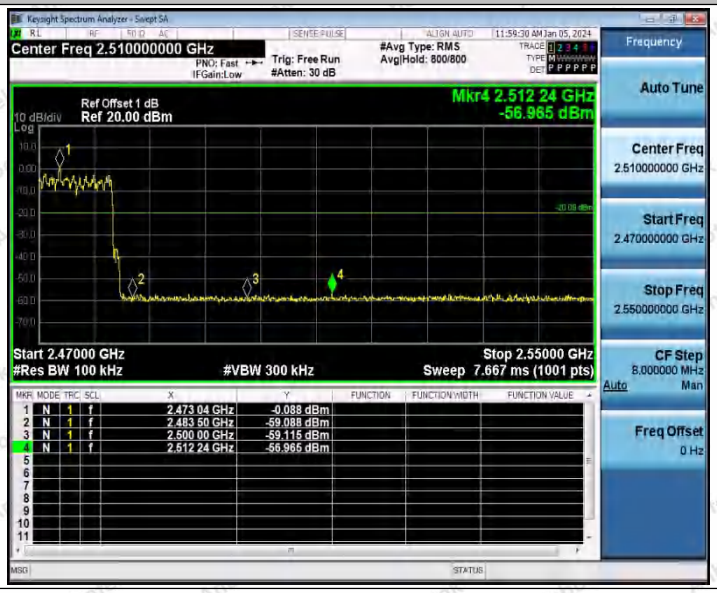
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

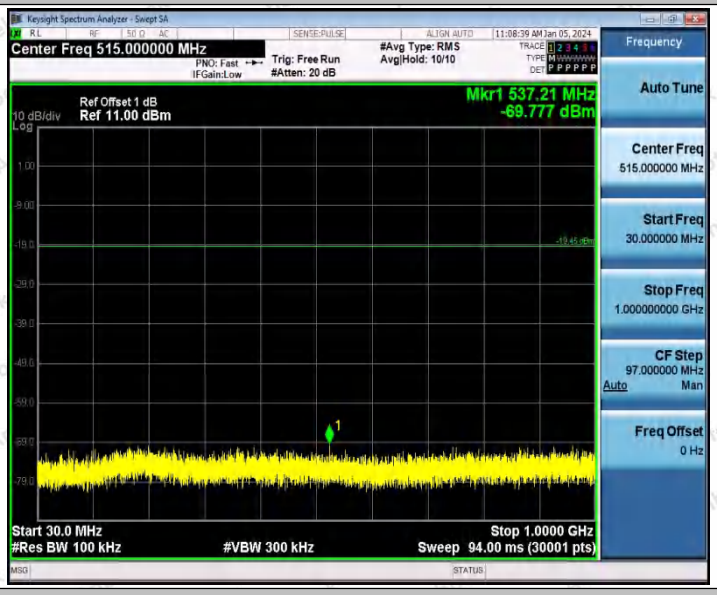
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	0.55	0.55	---	PASS
			30~1000	0.55	-69.78	≤-19.45	PASS
			1000~26500	0.55	-53.58	≤-19.45	PASS
		2441	Reference	1.01	1.01	---	PASS
			30~1000	1.01	-68.25	≤-18.99	PASS
			1000~26500	1.01	-53.37	≤-18.99	PASS
		2480	Reference	0.61	0.61	---	PASS
			30~1000	0.61	-68.82	≤-19.39	PASS
			1000~26500	0.61	-54.11	≤-19.39	PASS
2DH5	Ant1	2402	Reference	-1.44	-1.44	---	PASS
			30~1000	-1.44	-69.81	≤-21.44	PASS
			1000~26500	-1.44	-53.81	≤-21.44	PASS
		2441	Reference	-2.58	-2.58	---	PASS
			30~1000	-2.58	-69.64	≤-22.58	PASS
			1000~26500	-2.58	-53.38	≤-22.58	PASS
		2480	Reference	-0.99	-0.99	---	PASS
			30~1000	-0.99	-68.45	≤-20.99	PASS
			1000~26500	-0.99	-53	≤-20.99	PASS
3DH5	Ant1	2402	Reference	-2.03	-2.03	---	PASS
			30~1000	-2.03	-67.62	≤-22.03	PASS
			1000~26500	-2.03	-53.48	≤-22.03	PASS
		2441	Reference	-3.14	-3.14	---	PASS
			30~1000	-3.14	-69.33	≤-23.14	PASS
			1000~26500	-3.14	-52.4	≤-23.14	PASS
		2480	Reference	-3.17	-3.17	---	PASS
			30~1000	-3.17	-68.53	≤-23.17	PASS
			1000~26500	-3.17	-53.19	≤-23.17	PASS

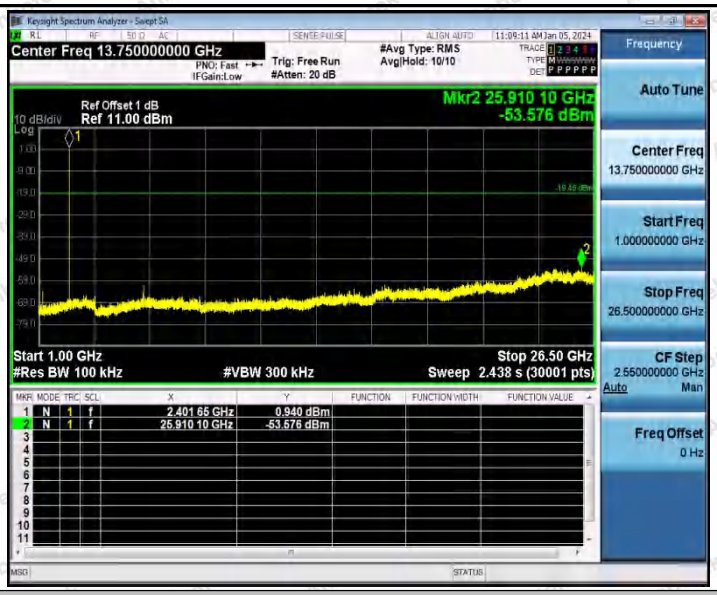
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

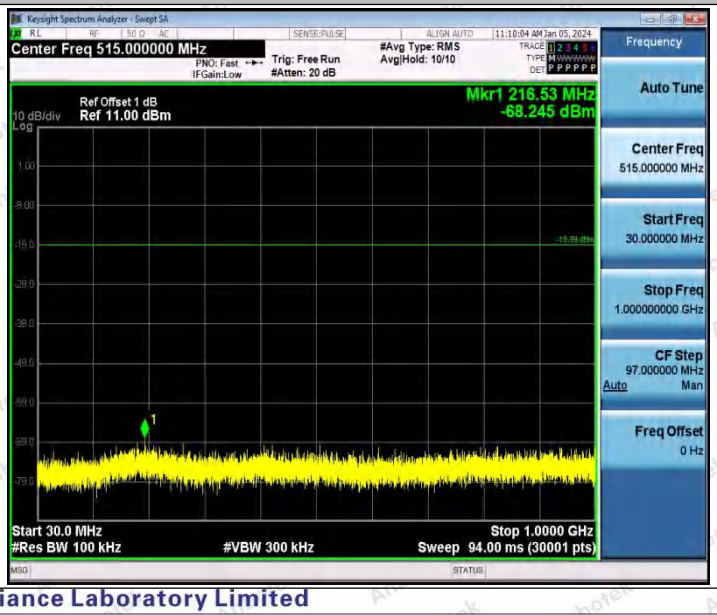


DH5_Ant1_2402_1000~26500

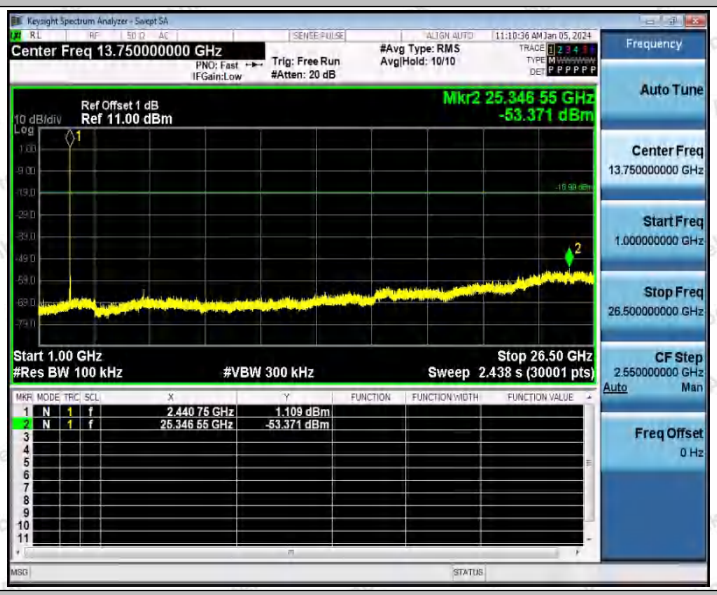


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

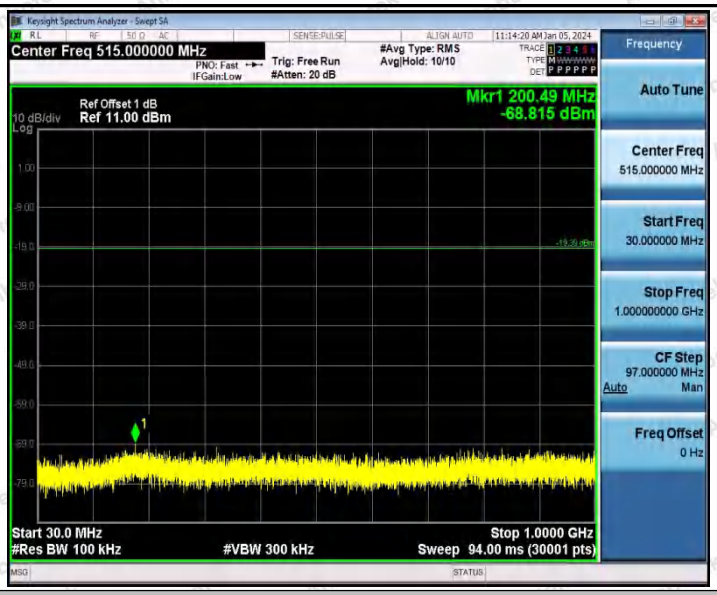


DH5_Ant1_2441_1000~26500

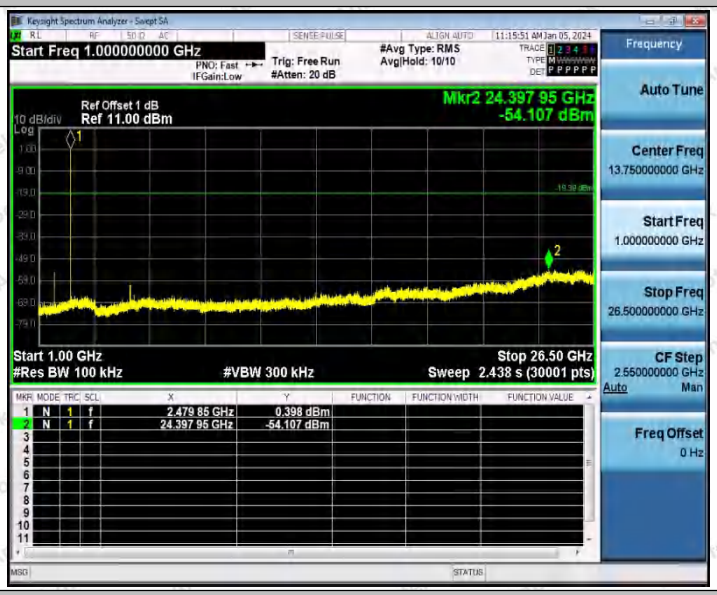


DH5_Ant1_2480_0~Reference

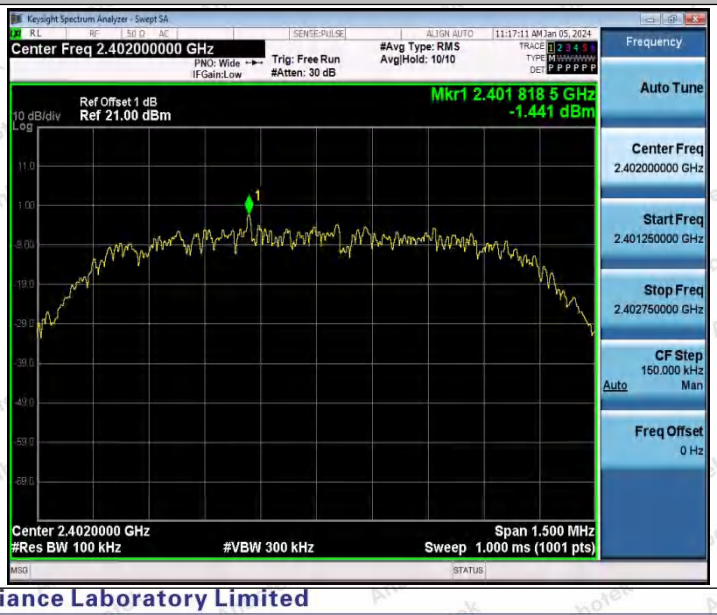
DH5_Ant1_2480_30~1000



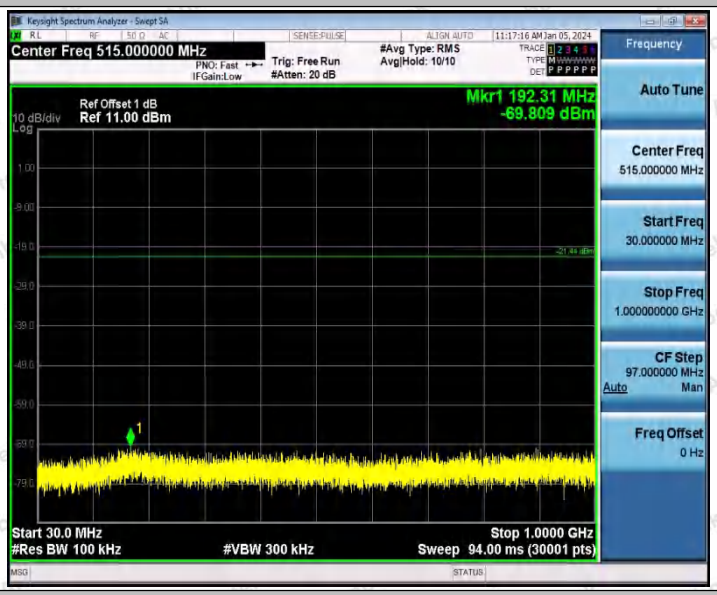
DH5_Ant1_2480_1000~26500



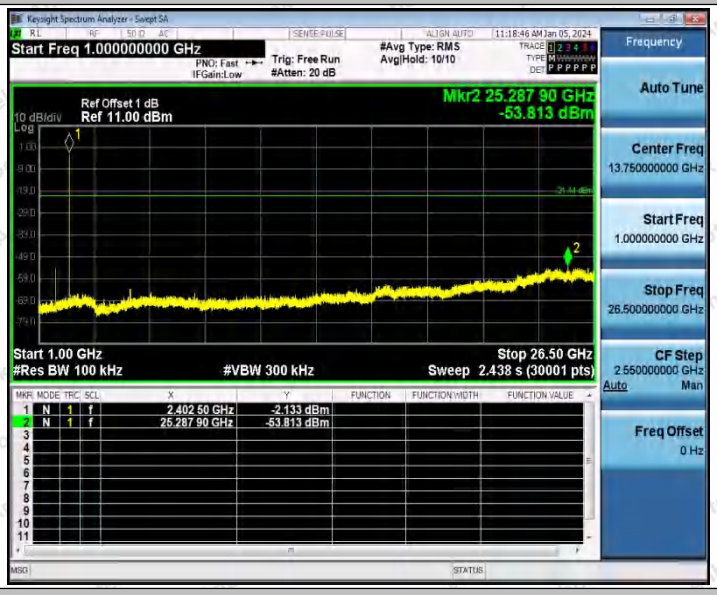
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

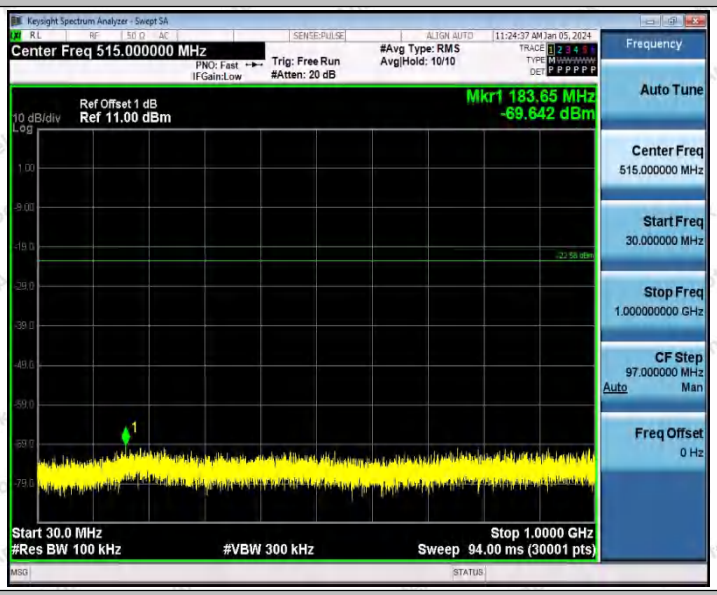


2DH5_Ant1_2402_1000~26500

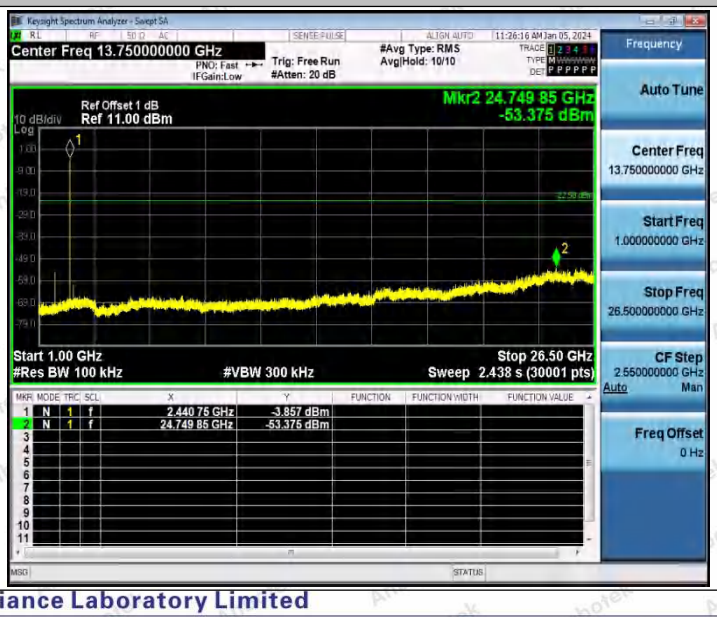


2DH5_Ant1_2441_0~Reference

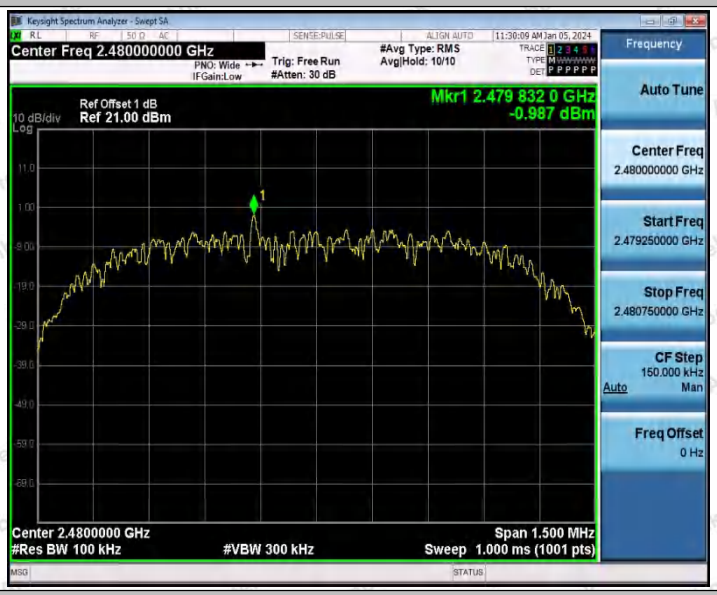
2DH5_Ant1_2441_30~1000



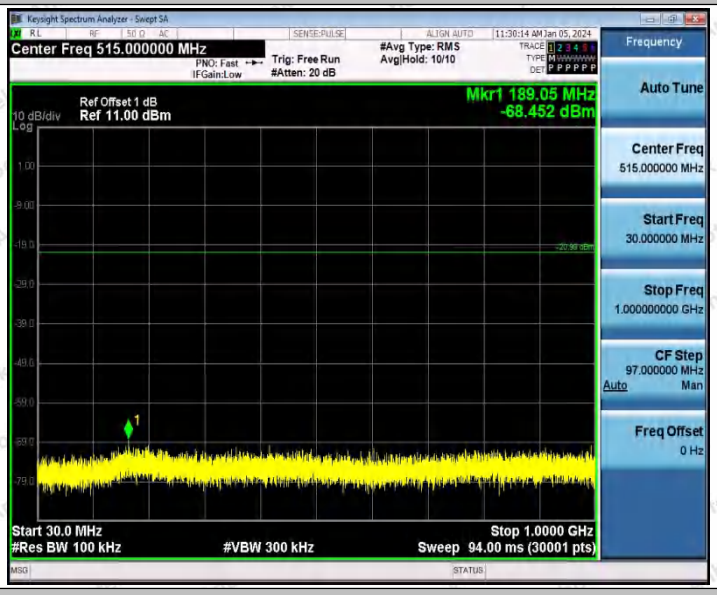
2DH5_Ant1_2441_1000~26500



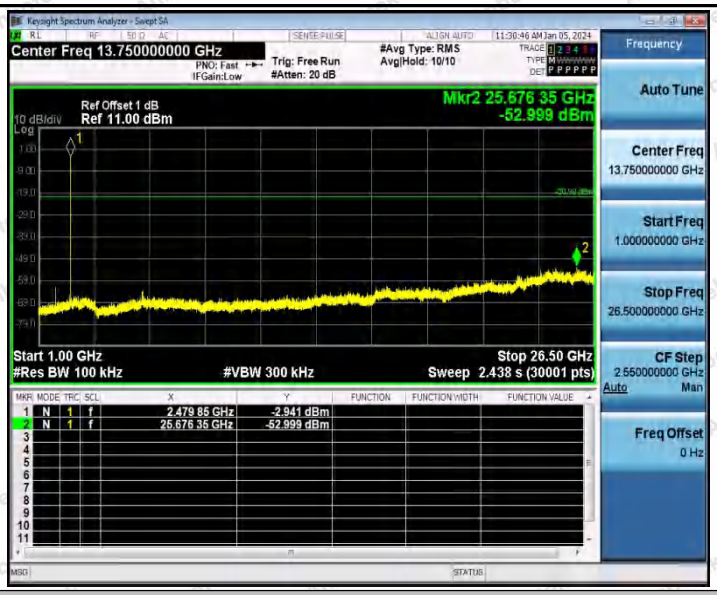
2DH5_Ant1_2480_0~Reference



2DH5_Ant1_2480_30~1000

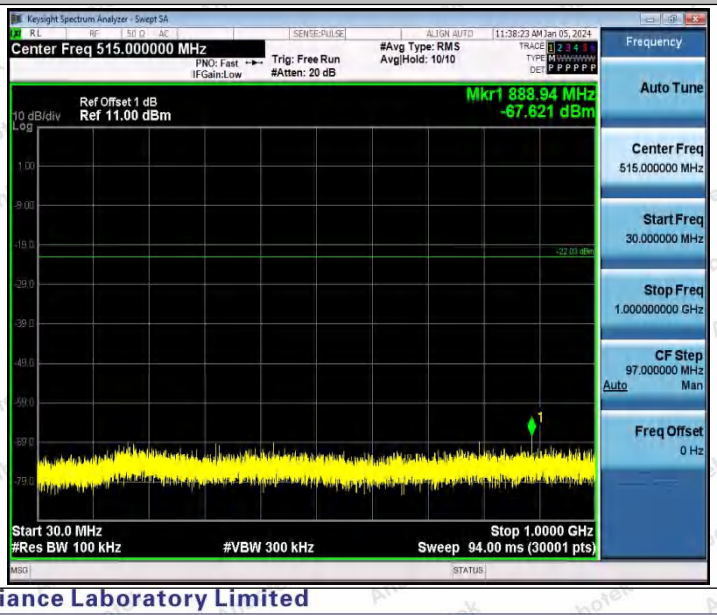


2DH5_Ant1_2480_1000~26500

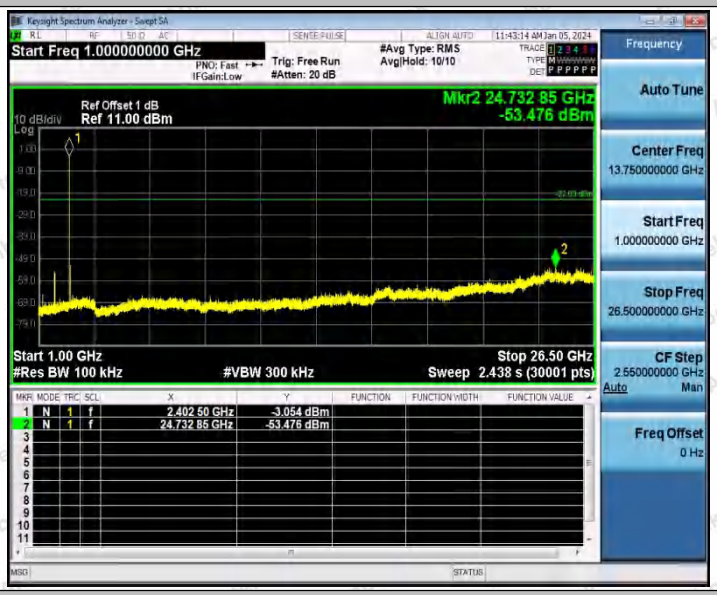


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

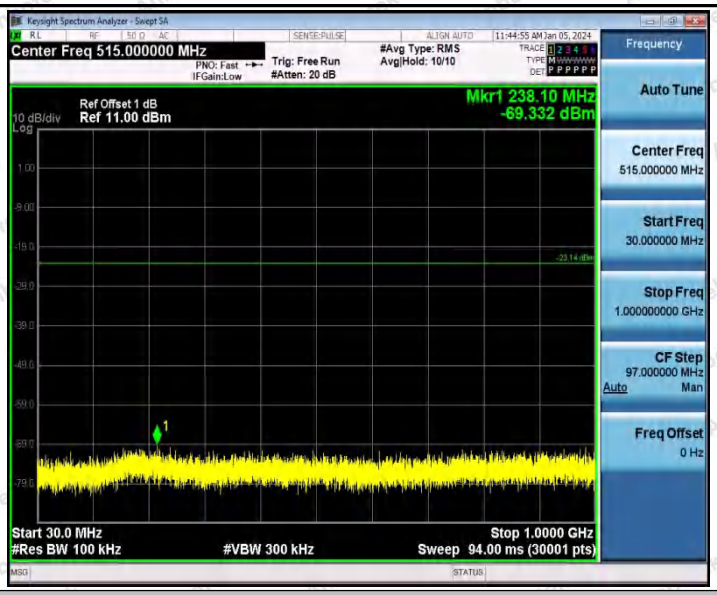


3DH5_Ant1_2402_1000~26500

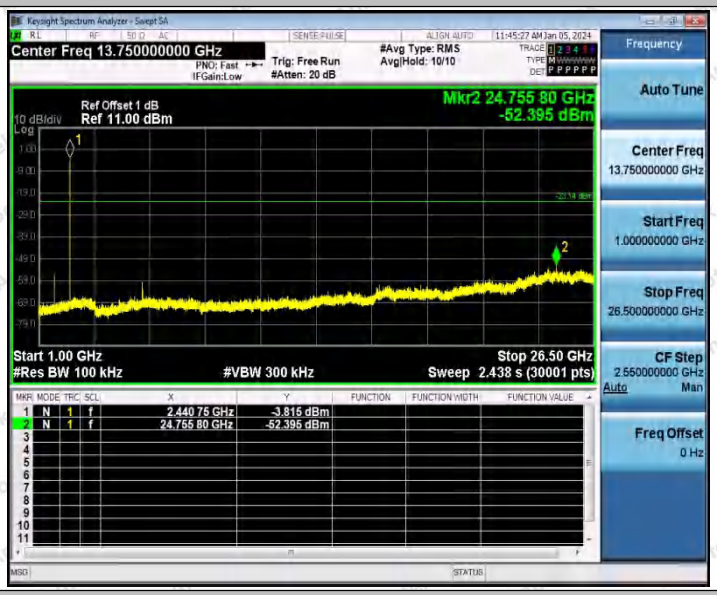


3DH5_Ant1_2441_0~Reference

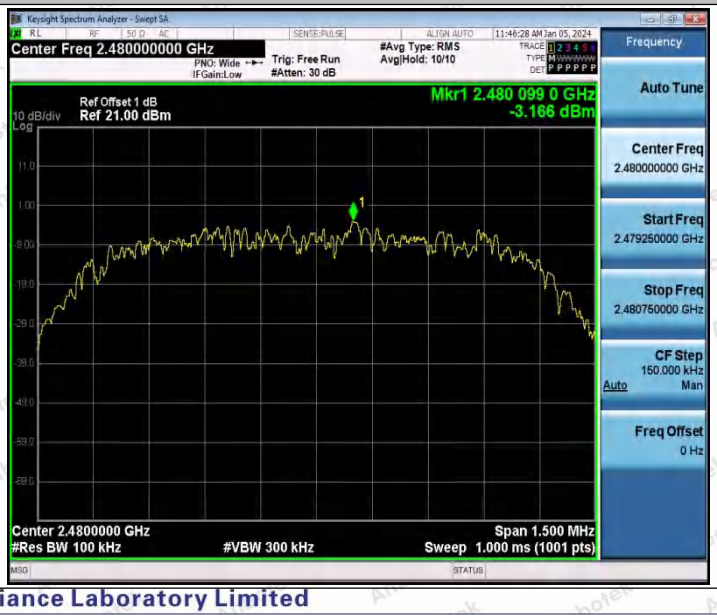
3DH5_Ant1_2441_30~1000



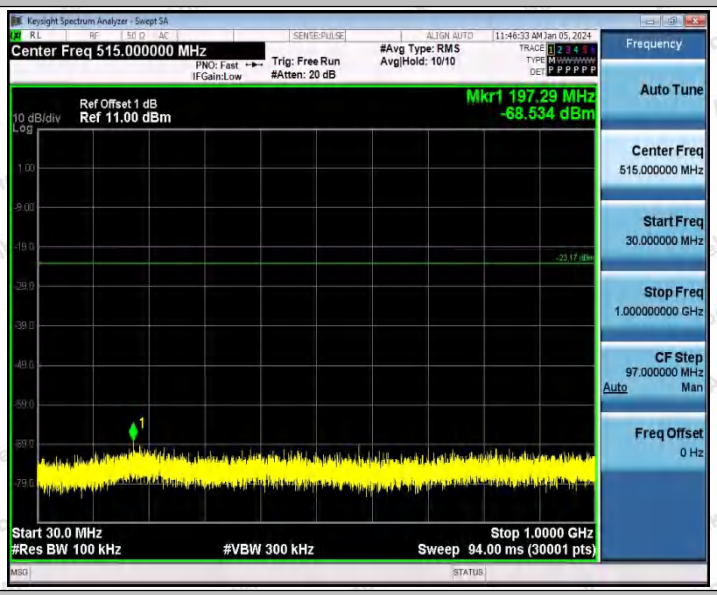
3DH5_Ant1_2441_1000~26500



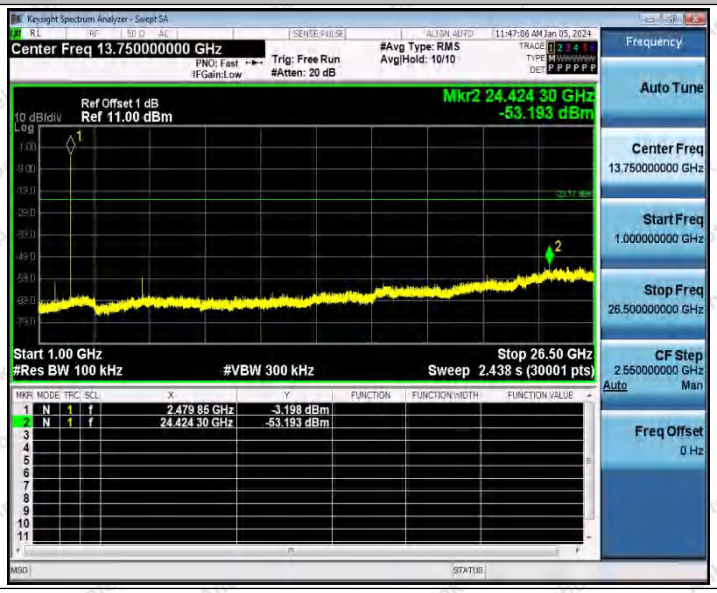
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



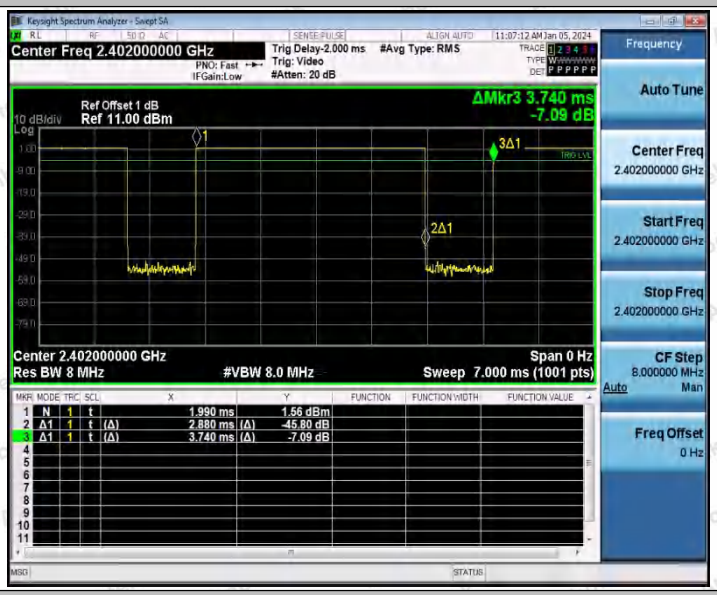
Appendix I: Duty Cycle

Test Result

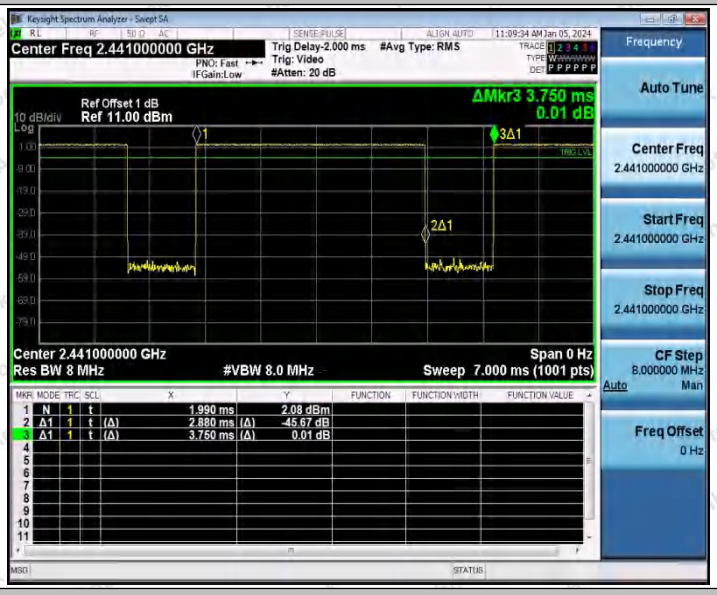
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.88	3.74	77.01	1.13
		2441	2.88	3.75	76.80	1.15
		2480	2.88	3.74	77.01	1.13
2DH5	Ant1	2402	2.88	3.75	76.80	1.15
		2441	2.88	3.75	76.80	1.15
		2480	2.88	3.74	77.01	1.13
3DH5	Ant1	2402	2.88	3.74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

Test Graphs

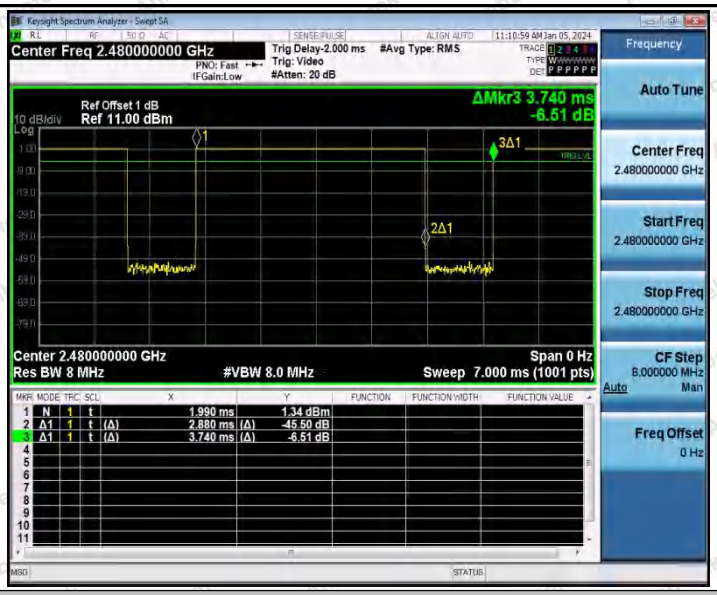
DH5_Ant1_2402



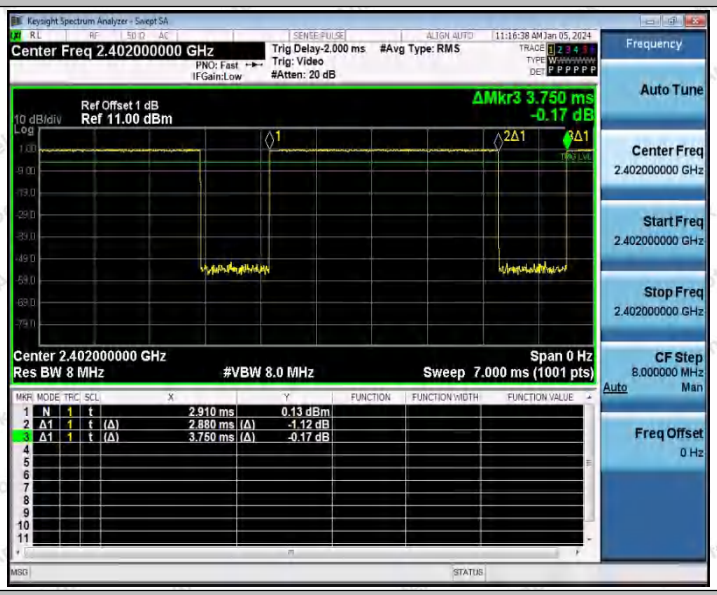
DH5_Ant1_2441



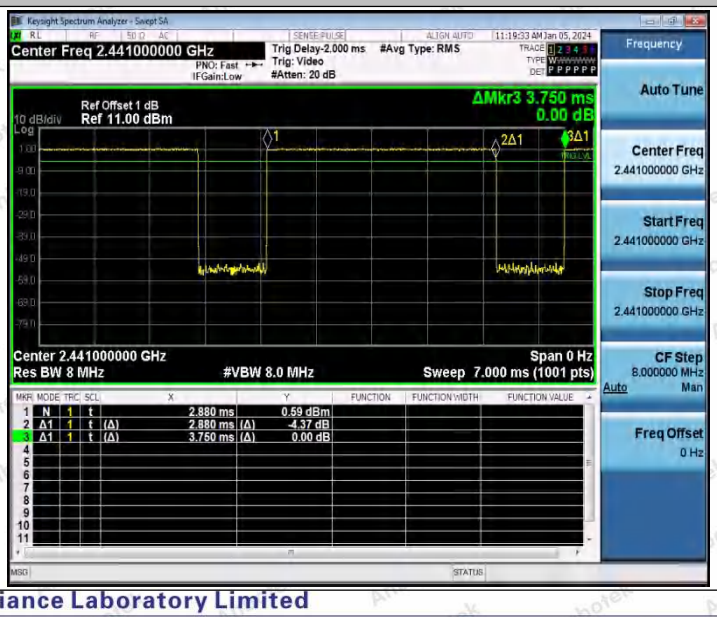
DH5_Ant1_2480



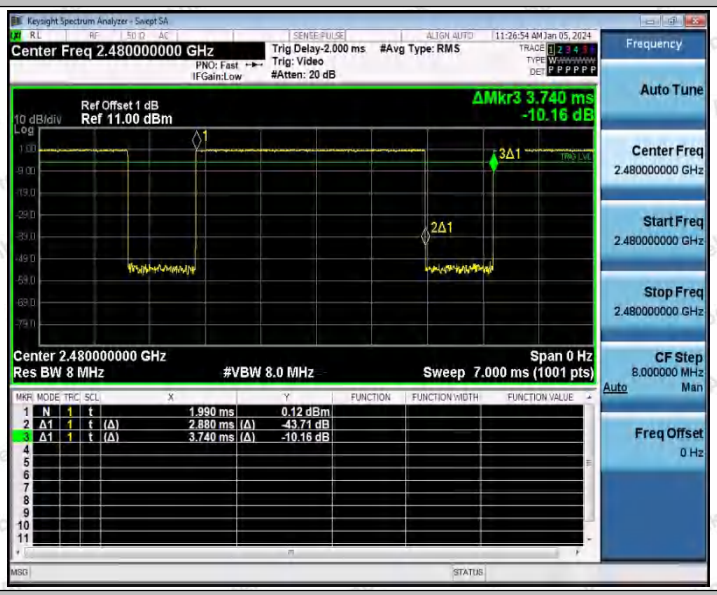
2DH5_Ant1_2402



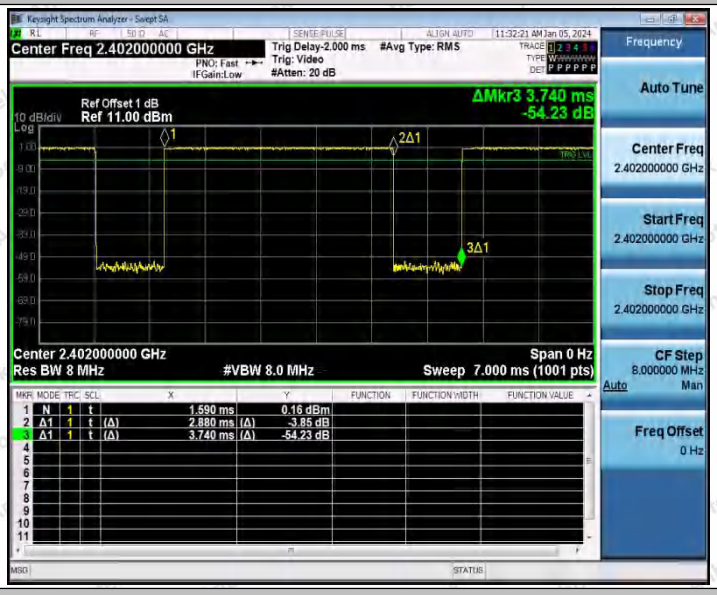
2DH5_Ant1_2441



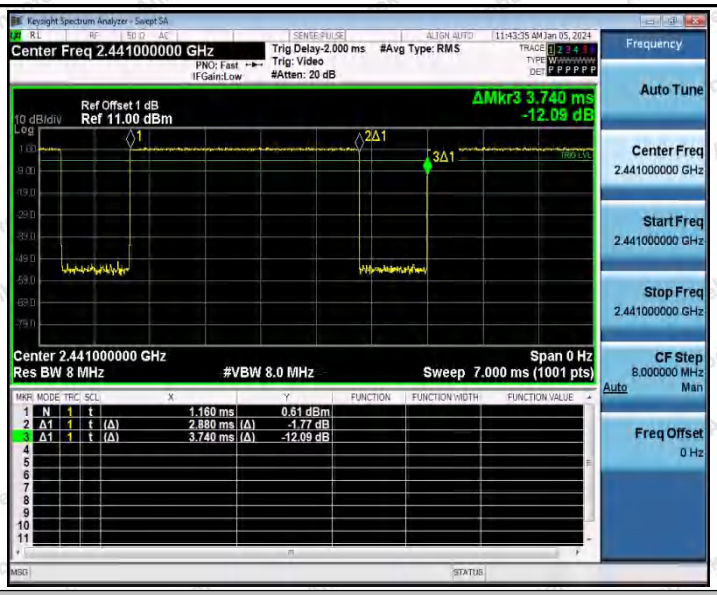
2DH5_Ant1_2480



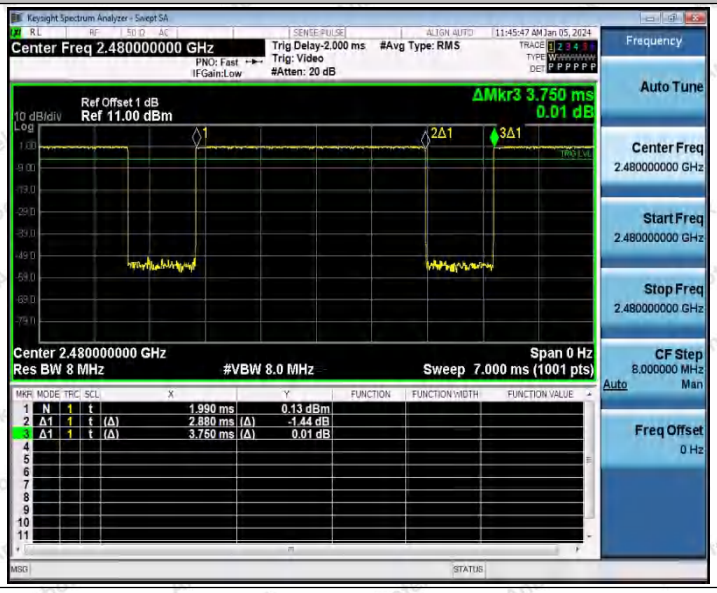
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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