Appendix Test Data

Report No.:	18220WC40014701	Test Sample No.:	1-2-2
Start Test Date:	2024.1.30	Finish Test Date:	2024.4.10
Test Engineer:	Hayman Chen	Auditor:	Rick Luo
Temperature:	25.6℃	Relative Humidity:	45%
Pressure:	101kPa		

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
2.4G	Ant1	2402	2.016	2400.941	2402.957	---	---
		2440	2.088	2438.902	2440.990	---	---
		2480	2.064	2478.932	2480.996	---	---

Test Graphs

2.4G_Ant1_2402

2.4G_Ant1_2440

2.4G_Ant1_2480

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
02:59:45 PM Jan 30, 2024
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr3 2.064 MHz
-0.344 dB
Center 2.480000 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3.000 MHz
Sweep 3.200 ms (1001 pts)
1 N 1 f 2.478 932 GHz -23.888 dBm
2 N 1 f 2.480 012 GHz -3.331 dBm
3 Δ1 1 f (Δ) 2.064 MHz (Δ) -0.344 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.481500000 GHz
CF Step
300.000 kHz
Auto Man
Freq Offset
0 Hz

Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
2.4G	Ant1	2402	1.8984	2401.0346	2402.9330	---	---
		2440	1.9234	2439.0104	2440.9338	---	---
		2480	1.9508	2479.0010	2480.9518	---	---

Test Graphs

2.4G_Ant1_2402

2.4G_Ant1_2440

2.4G_Ant1_2480

Keysight Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Mkr1 2.480015 GHz
-3.2593 dBm
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz
Occupied Bandwidth
1.9508 MHz
Total Power
7.56 dBm
Transmit Freq Error
-23.582 kHz
OBW Power
99.00 %
x dB Bandwidth
2.443 MHz
x dB
-26.00 dB

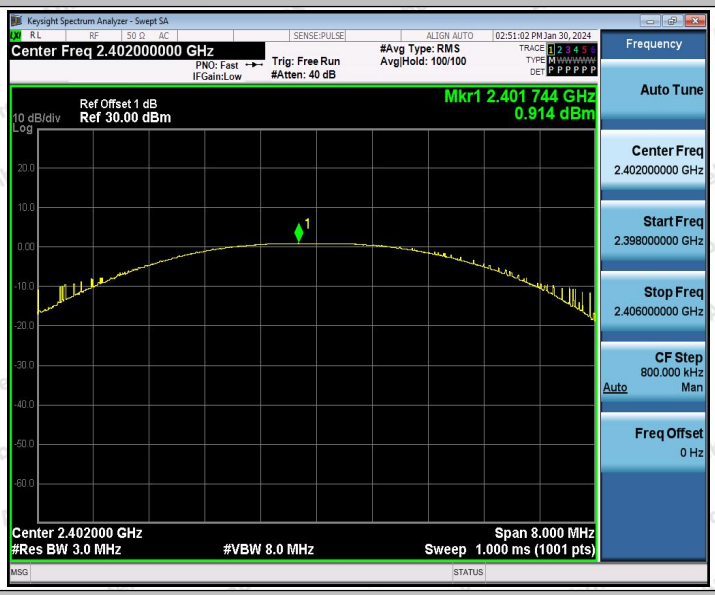
Appendix C: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
2.4G	Ant1	2402	0.91	≤20.97	PASS
		2440	1.77	≤20.97	PASS
		2480	2.57	≤20.97	PASS

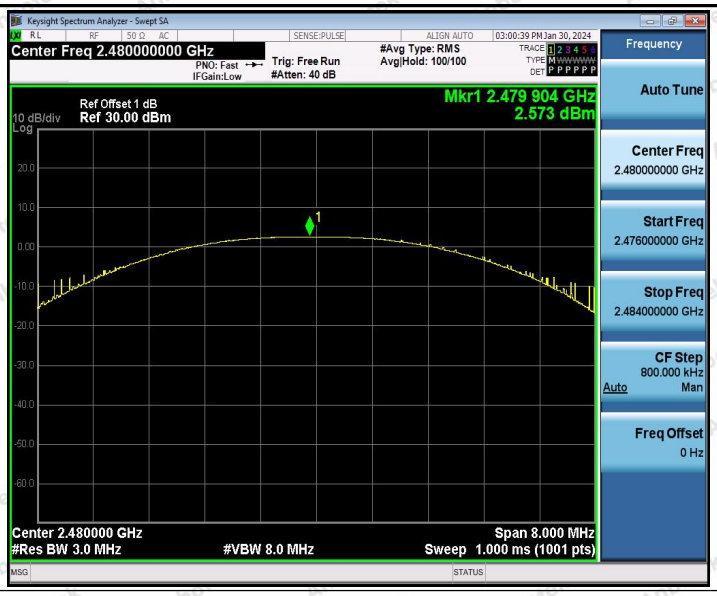
Test Graphs

2.4G_Ant1_2402



2.4G_Ant1_2440

2.4G_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
03:00:39 PM Jan 30, 2024
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.479 904 GHz
2.573 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 8.000 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.476000000 GHz
Stop Freq
2.484000000 GHz
CF Step
800.000 kHz
Auto
Man
Freq Offset
0 Hz

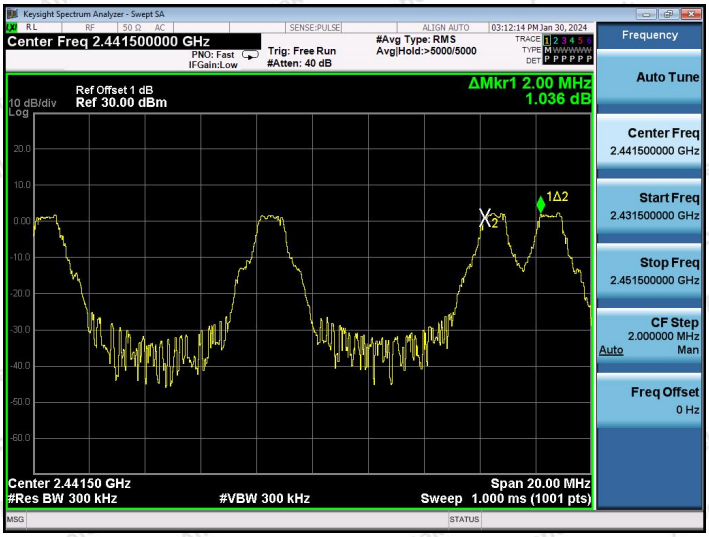
Appendix D: Carrier frequency separation

Test Result

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
2.4G	Ant1	Hop	2.00	≥1.392	PASS

Test Graphs

2.4G_Ant1_Hop



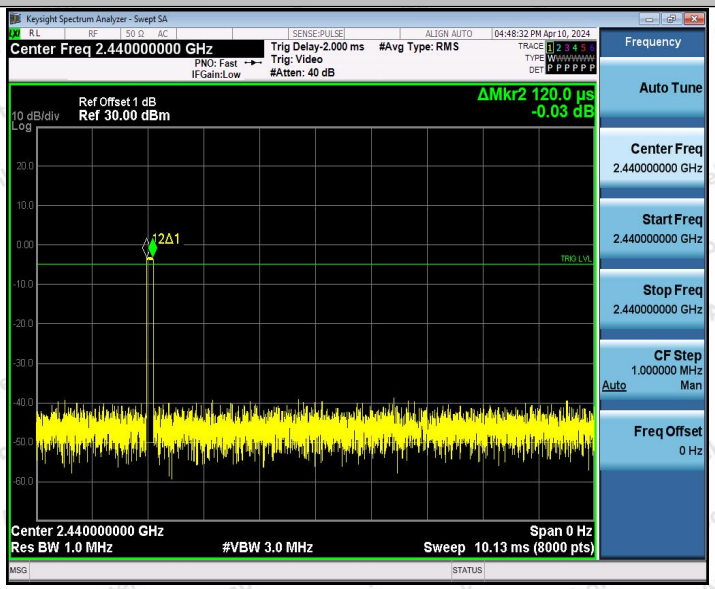
Appendix E: Dwell Time

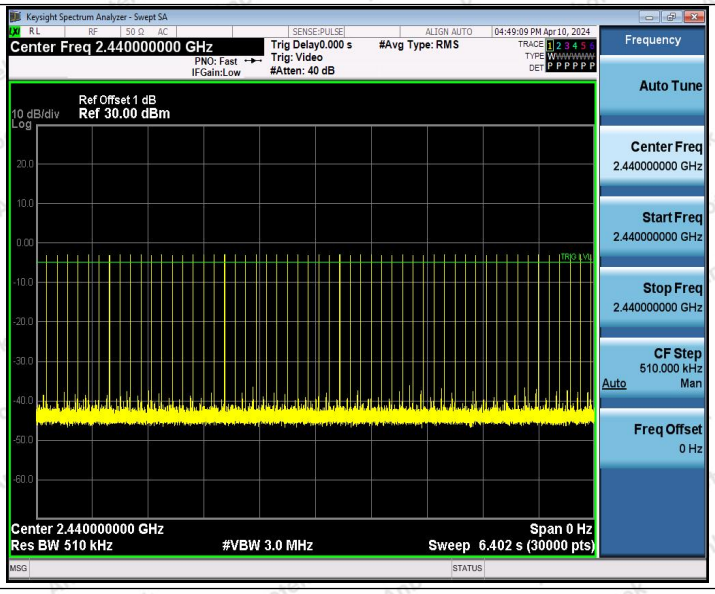
Test Result

Test Mode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
2.4G	Ant1	Hop	0.12	53	0.006	≤0.4	PASS

Test Graphs

2.4G_Ant1_Hop





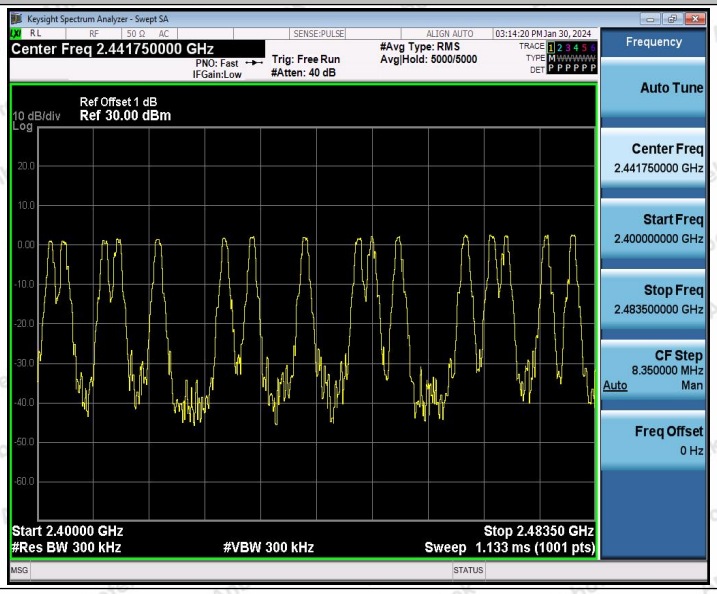
Appendix F: Number of hopping channels

Test Result

TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
2.4G	Ant1	Hop	16	≥15	PASS

Test Graphs

2.4G_Ant1_Hop



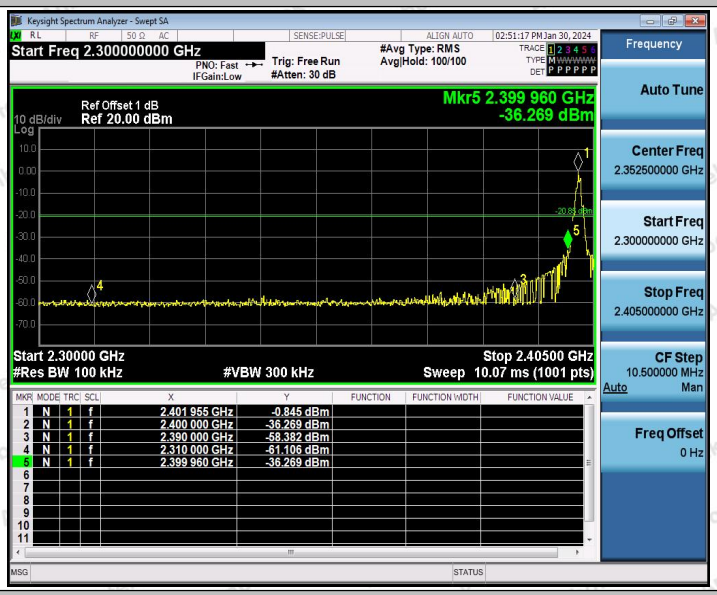
Appendix G: Band edge measurements

Test Result

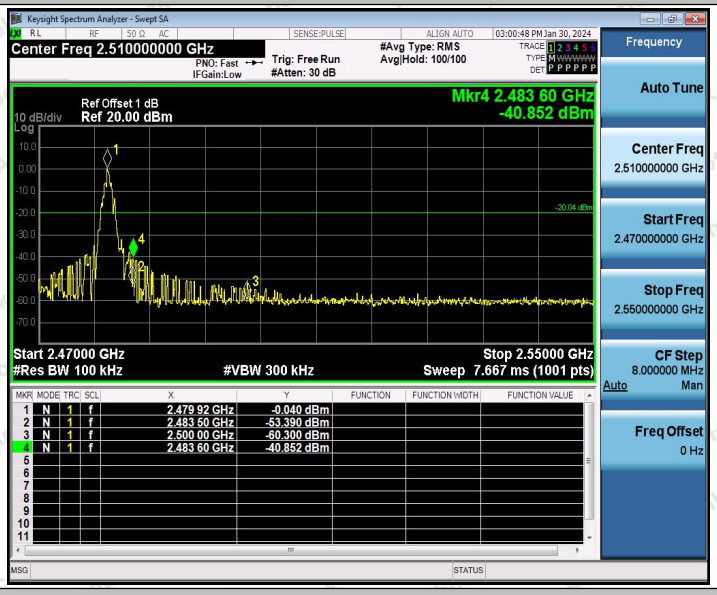
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
2.4G	Ant1	Low	2402	-0.85	-36.27	≤-20.85	PASS
		High	2480	-0.04	-40.85	≤-20.04	PASS
		Low	Hop_2402	-0.26	-43.57	≤-20.26	PASS
		High	Hop_2480	1.31	-37.78	≤-18.69	PASS

Test Graphs

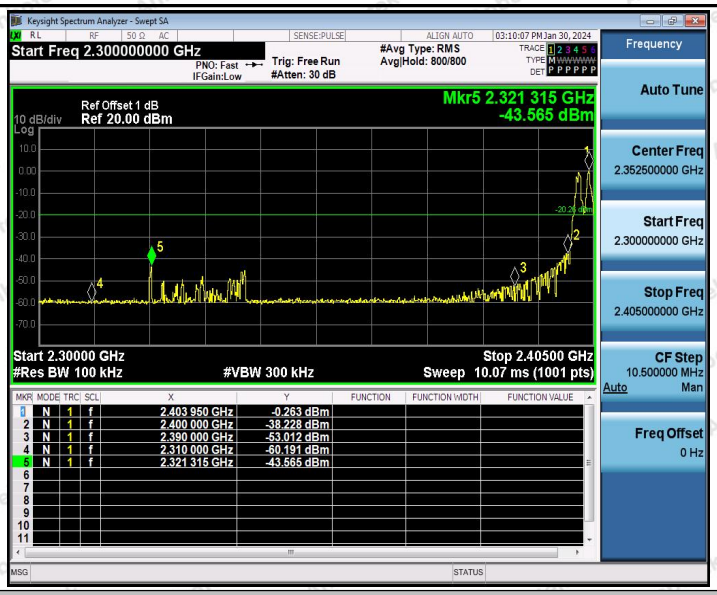
2.4G_Ant1_Low_2402



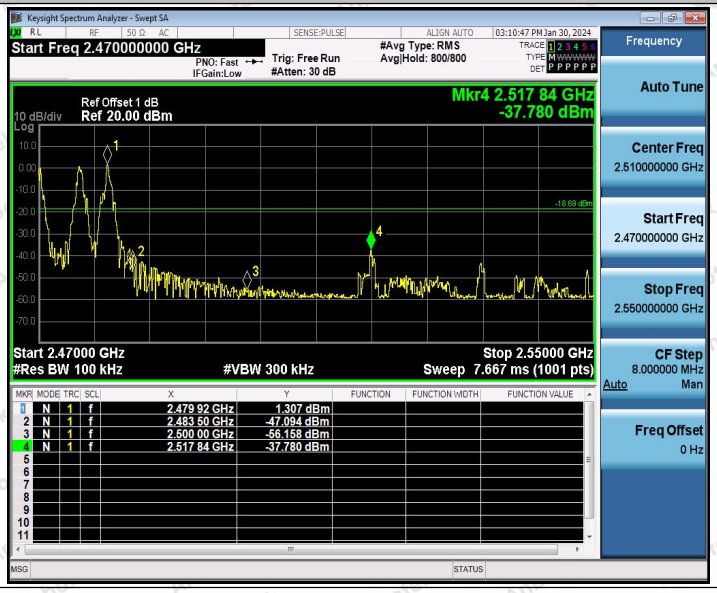
2.4G_Ant1_High_2480



2.4G_Ant1_Low_Hop_2402



2.4G_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

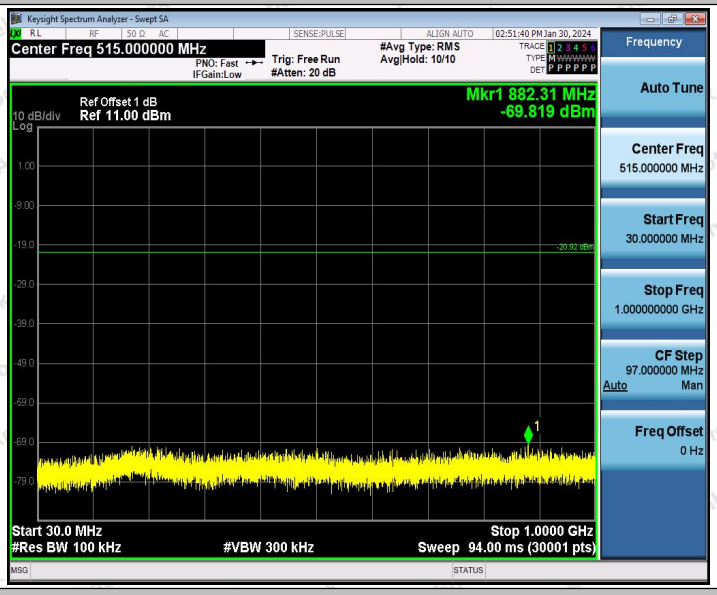
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
2.4G	Ant1	2402	Reference	-0.92	-0.92	---	PASS
			30~1000	-0.92	-69.82	≤-20.92	PASS
			1000~26500	-0.92	-52.17	≤-20.92	PASS
		2440	Reference	-0.39	-0.39	---	PASS
			30~1000	-0.39	-69.5	≤-20.39	PASS
			1000~26500	-0.39	-41	≤-20.39	PASS
		2480	Reference	0.55	0.55	---	PASS
			30~1000	0.55	-69.49	≤-19.45	PASS
			1000~26500	0.55	-37.81	≤-19.45	PASS

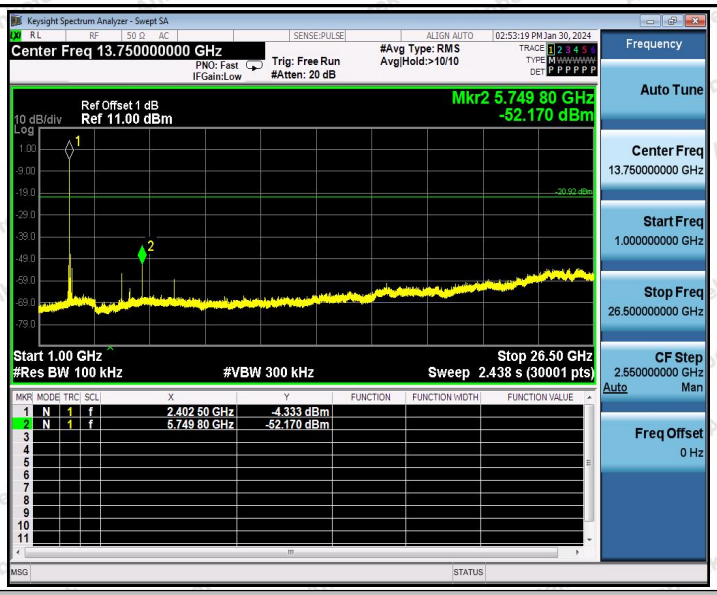
Test Graphs

2.4G_Ant1_2402_0~Reference

2.4G_Ant1_2402_30~1000

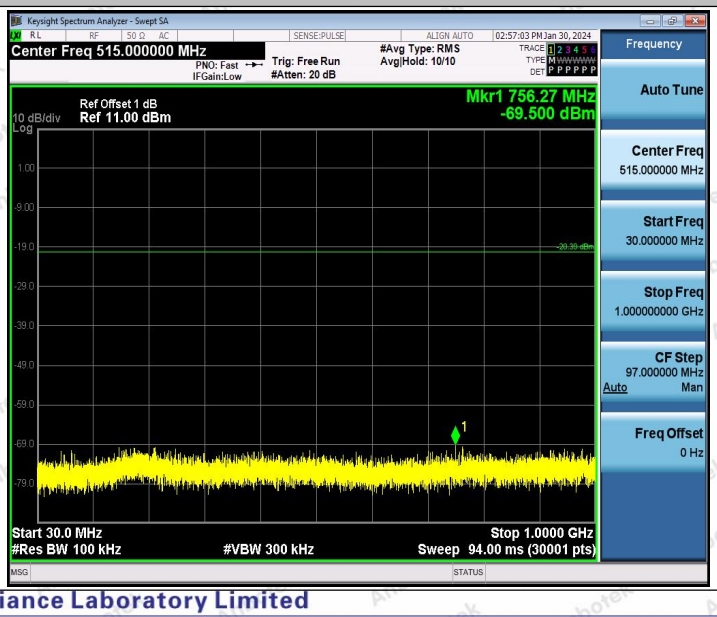


2.4G_Ant1_2402_1000~26500

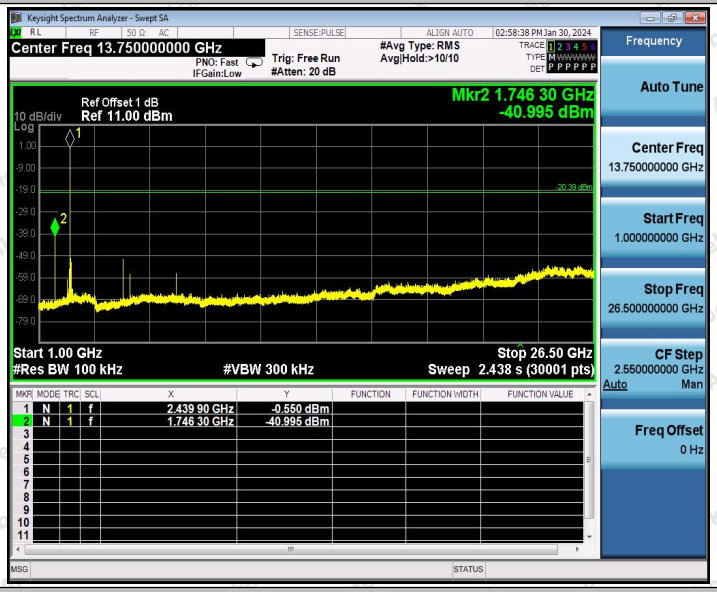


2.4G_Ant1_2440_0~Reference

2.4G_Ant1_2440_30~1000

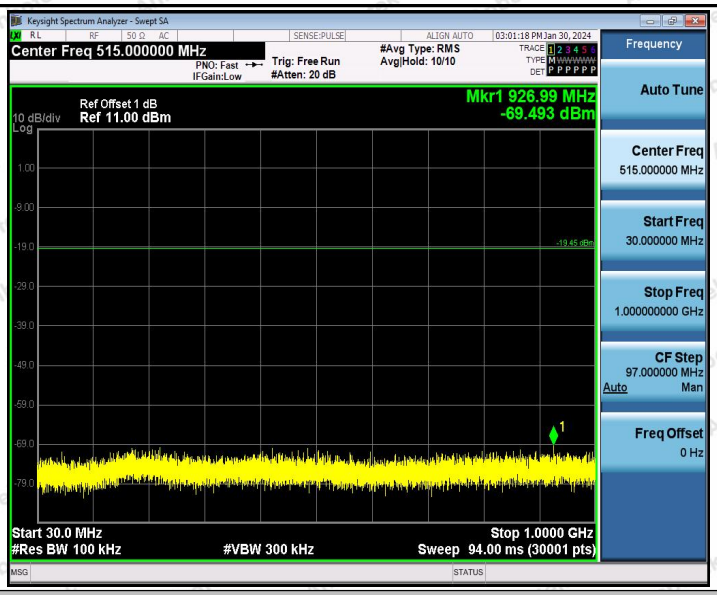


2.4G_Ant1_2440_1000~26500

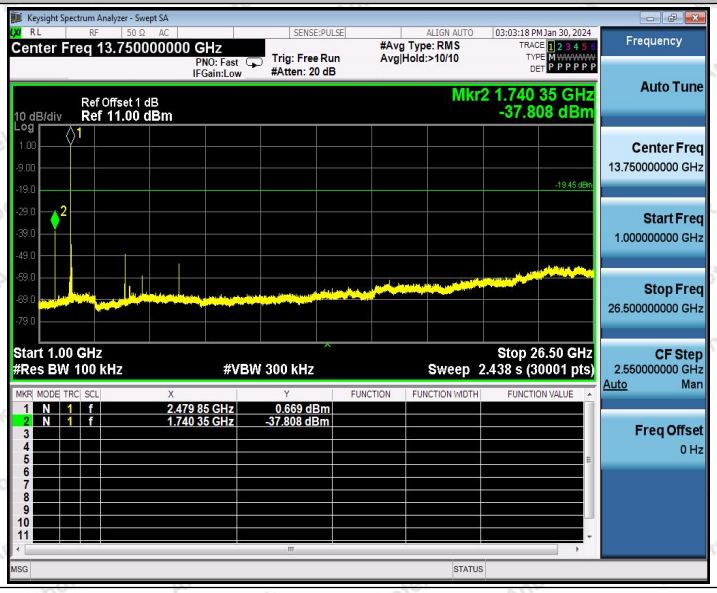


2.4G_Ant1_2480_0~Reference

2.4G_Ant1_2480_30~1000



2.4G_Ant1_2480_1000~26500



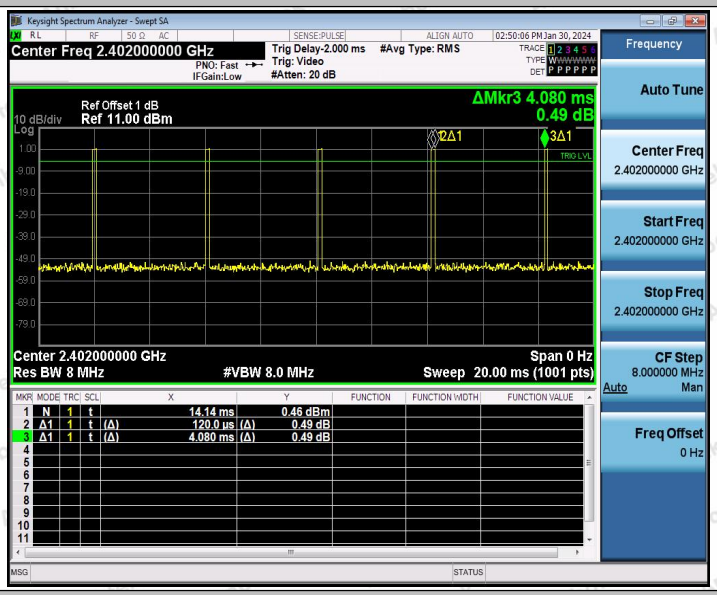
Appendix I: Duty Cycle

Test Result

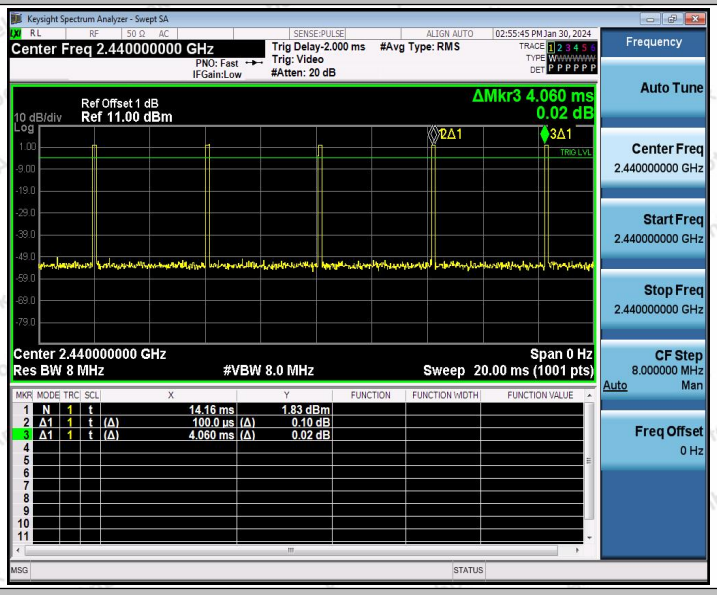
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
2.4G	Ant1	2402	0.12	4.08	2.94	15.32
		2440	0.10	4.06	2.46	16.09
		2441	0.10	4.06	2.46	16.09
		2480	0.12	4.06	2.96	15.29

Test Graphs

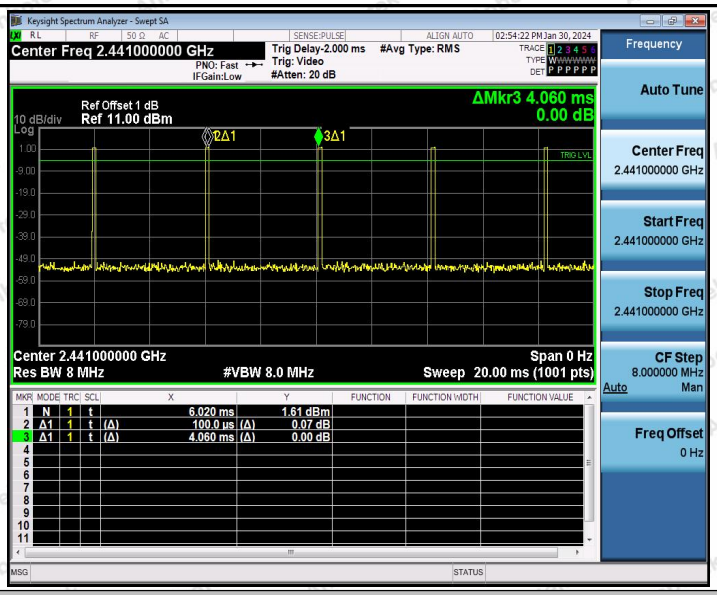
2.4G_Ant1_2402



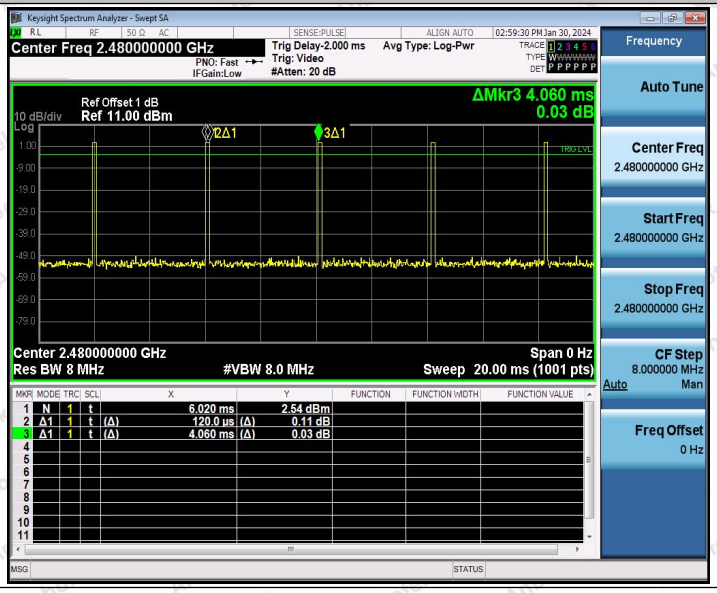
2.4G_Ant1_2440



2.4G_Ant1_2441



2.4G_Ant1_2480



---end---