Appendix Test Data

Report No.:	18220WC20288102	Test Sample No.:	1-2-2
Start Test Date:	2022.12.19	Finish Test Date:	2022.12.24
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	23.3℃	Relative Humidity:	35 %
Pressure:	1012 hPa		

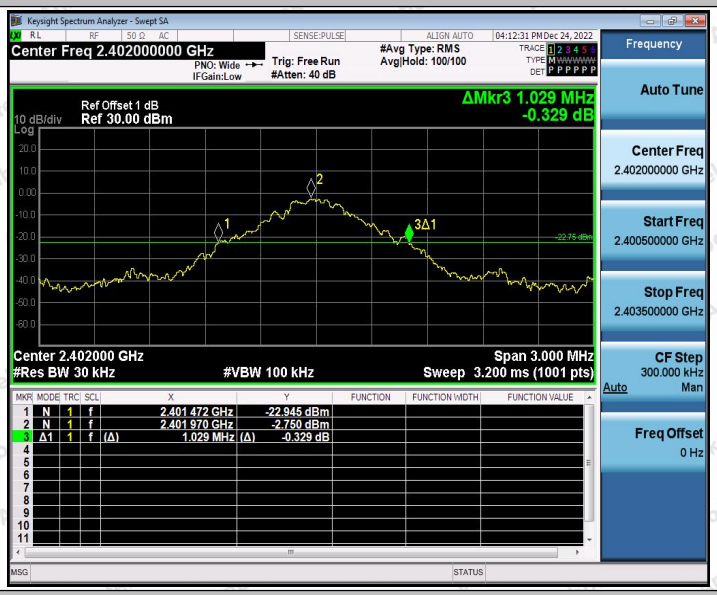
Appendix A: 20dB Emission Bandwidth

Test Result

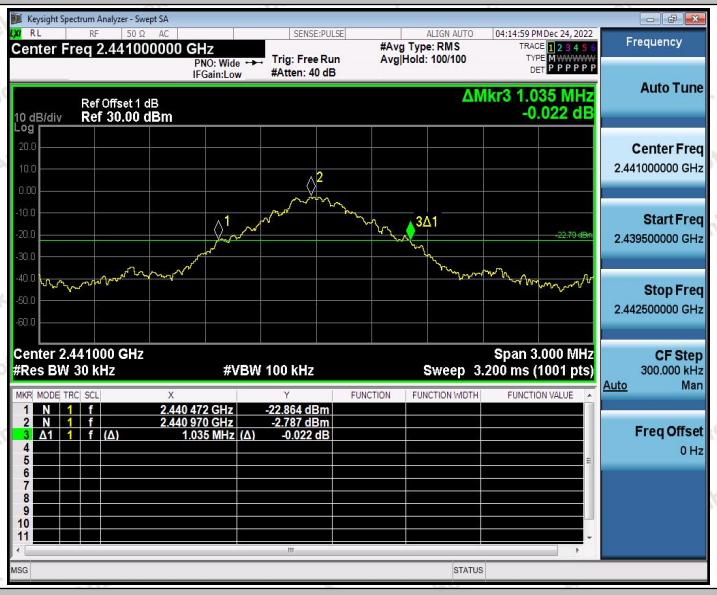
Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]
2.4G	Ant1	2402	1.029	2401.472	2402.501
		2441	1.035	2440.472	2441.507
		2480	1.032	2479.472	2480.504

Test Graphs

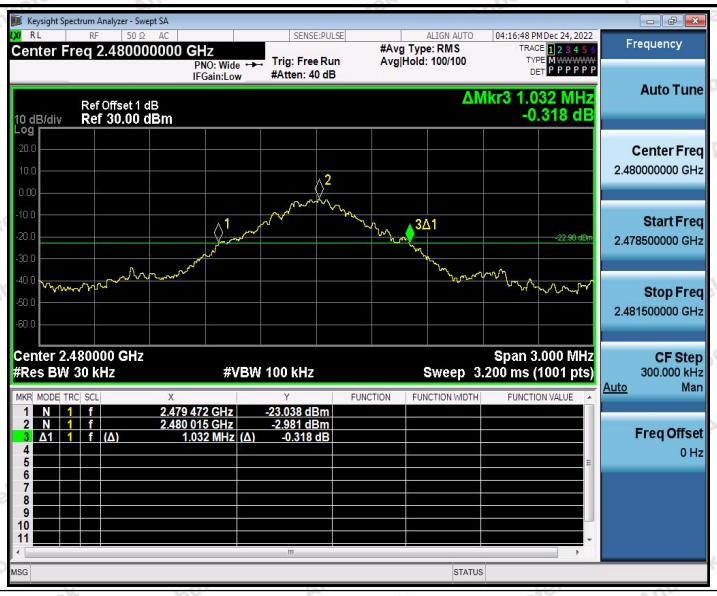
2.4G_Ant1_2402



2.4G_Ant1_2441



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
04:16:48 PM Dec 24, 2022
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr3 1.032 MHz
-0.318 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 2.479 472 GHz -23.038 dBm
2 N 1 f 2.480 015 GHz -2.981 dBm
3 Δ1 1 f (Δ) 1.032 MHz (Δ) -0.318 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

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
2.4G	Ant1	2402	0.93135	2401.5350	2402.4663
		2441	0.94018	2440.5279	2441.4680
		2480	0.94719	2479.5265	2480.4736

Test Graphs

2.4G_Ant1_2402

2.4G_Ant1_2441

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
-3.2466 dBm
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
947.19 kHz
Total Power
5.80 dBm
Transmit Freq Error
49 Hz
OBW Power
99.00 %
x dB Bandwidth
1.211 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

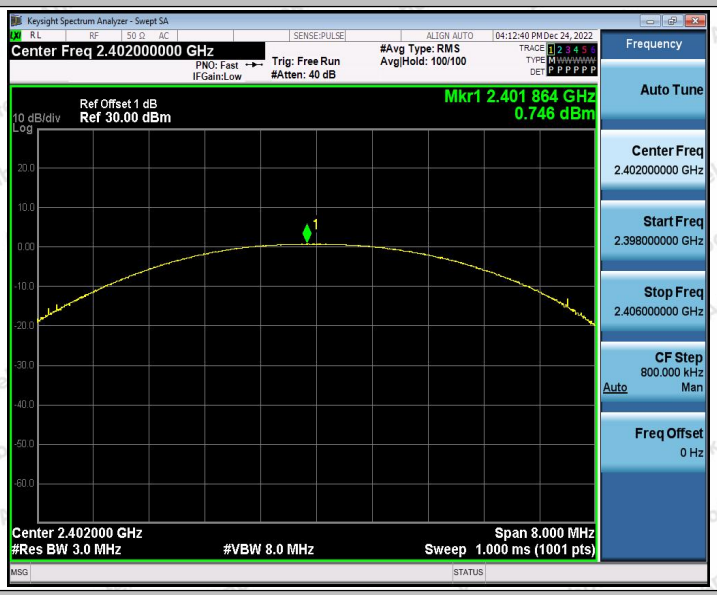
Appendix C: Maximum conducted output power

Test Result Peak

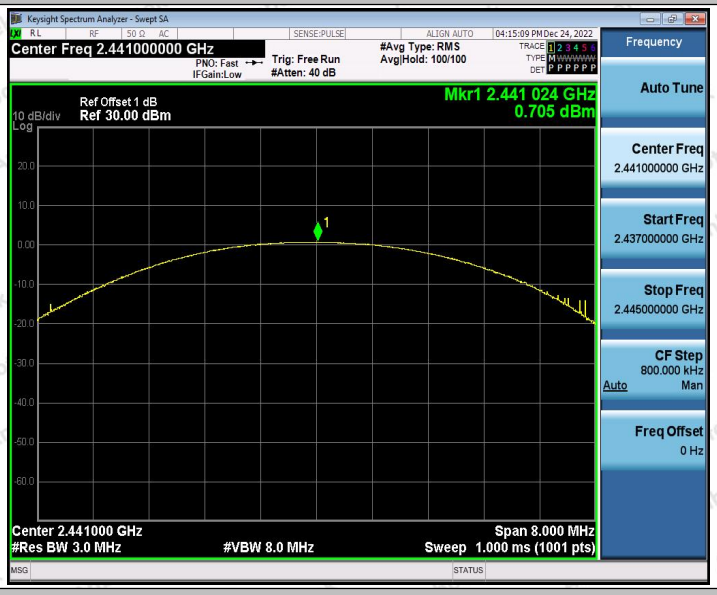
Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
2.4G	Ant1	2402	0.75	≤30	PASS
		2441	0.71	≤30	PASS
		2480	0.39	≤30	PASS

Test Graphs

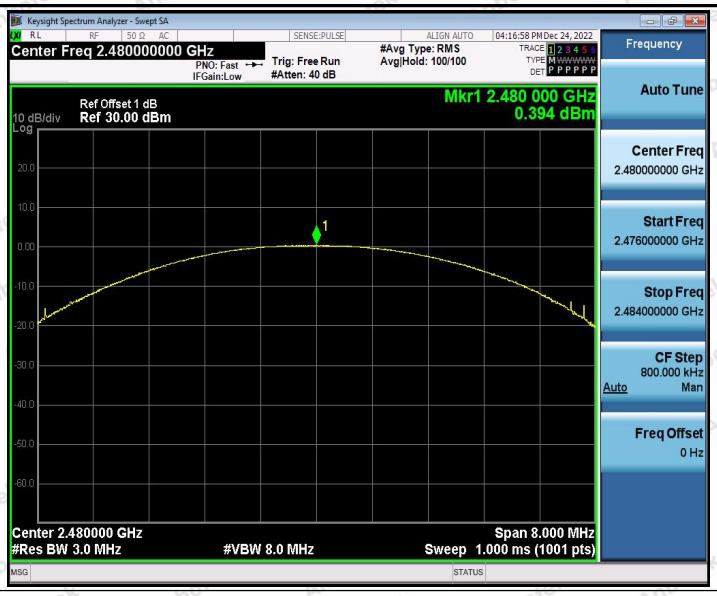
2.4G_Ant1_2402



2.4G_Ant1_2441



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
04:16:58 PM Dec 24, 2022
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.480 000 GHz
0.394 dBm
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
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 8.000 MHz
Sweep 1.000 ms (1001 pts)

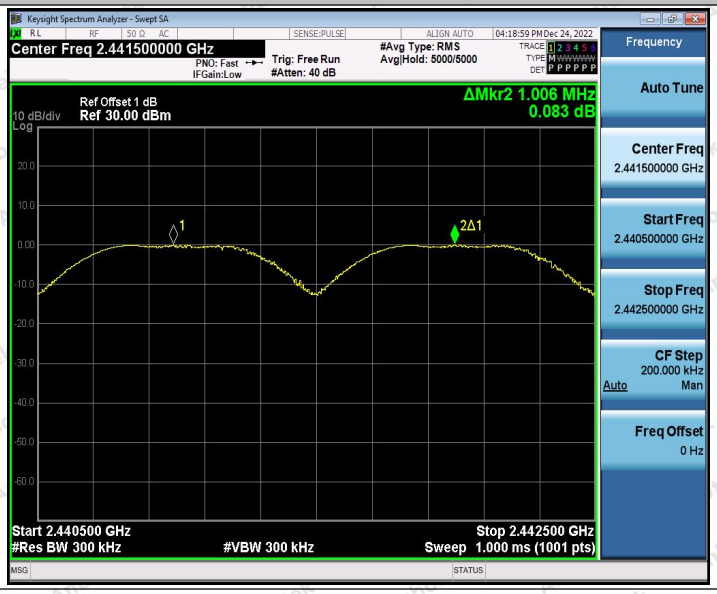
Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
2.4G	Ant1	Hop	1.006	≥0.690	PASS

Test Graphs

2.4G_Ant1_Hop



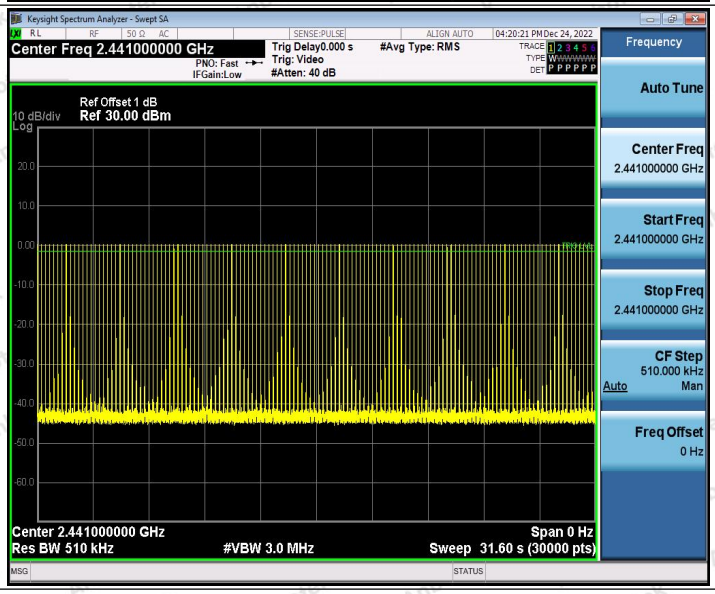
Appendix E: Time of occupancy

Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
2.4G	Ant1	Hop	2.830	135	0.382	≤0.4	PASS

Test Graphs

2.4G_Ant1_Hop



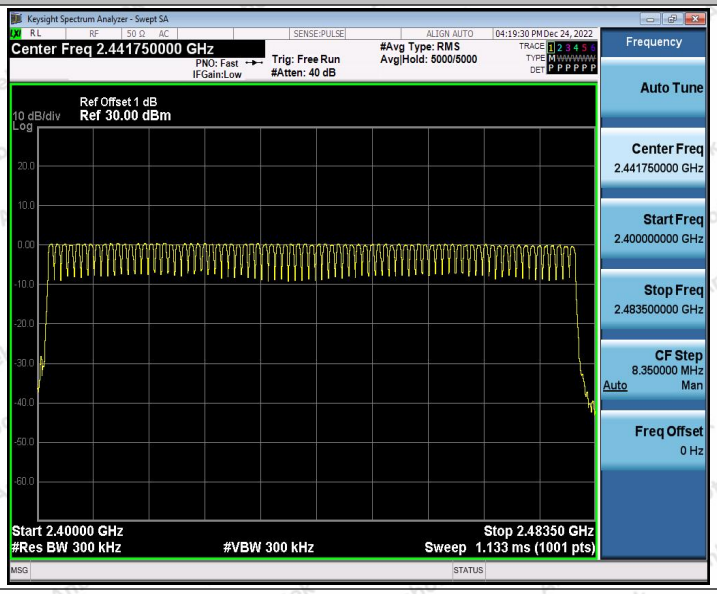
Appendix F: Number of hopping channels

Test Result

Test Mode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
2.4G	Ant1	Hop	79	≥15	PASS

Test Graphs

2.4G_Ant1_Hop



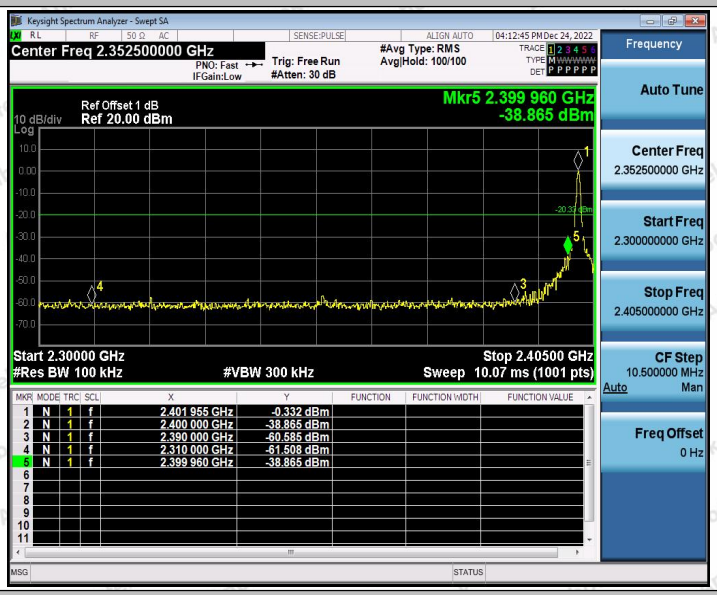
Appendix G: Band edge measurements

Test Result

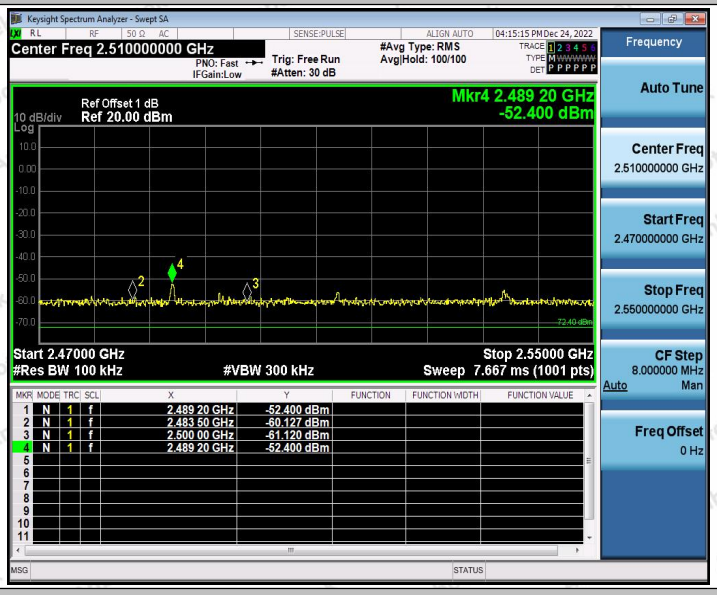
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
2.4G	Ant1	Low	2402	-0.33	-38.87	≤-20.33	PASS
		High	2441	-52.40	-52.4	≤-72.4	FAIL
			2480	-0.65	-44.1	≤-20.65	PASS
		Low	Hop_2402	-0.48	-55.42	≤-20.48	PASS
		High	Hop_2480	-0.44	-51.82	≤-20.44	PASS

Test Graphs

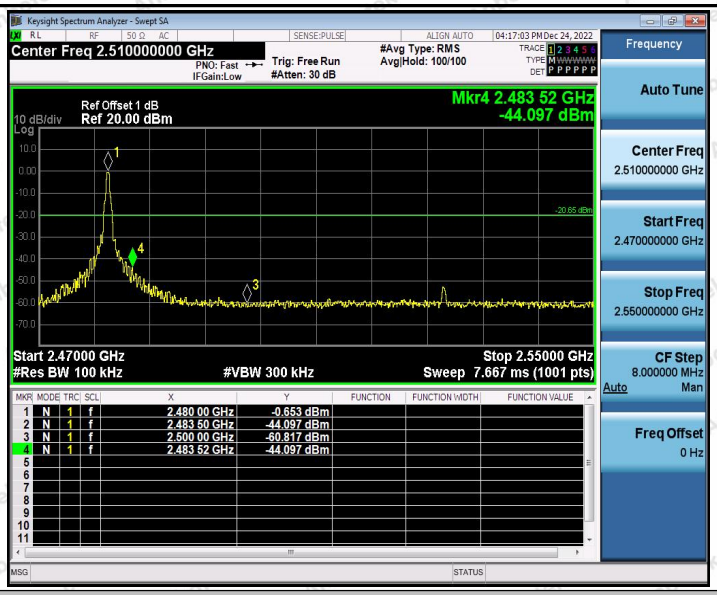
2.4G_Ant1_Low_2402



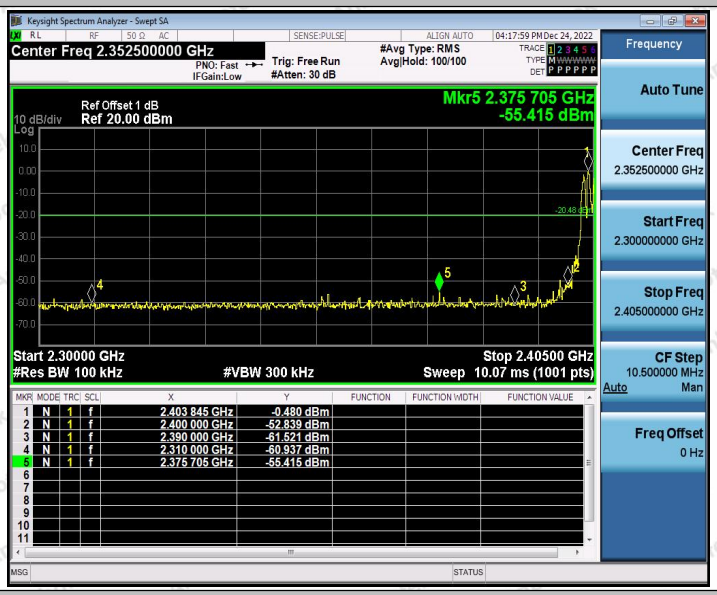
2.4G_Ant1_High_2441



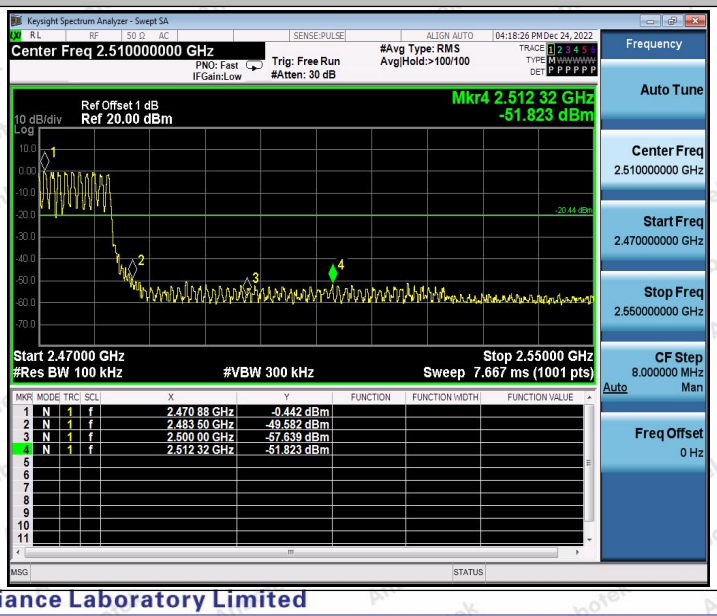
2.4G_Ant1_High_2480



2.4G_Ant1_Low_Hop_2402



2.4G_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

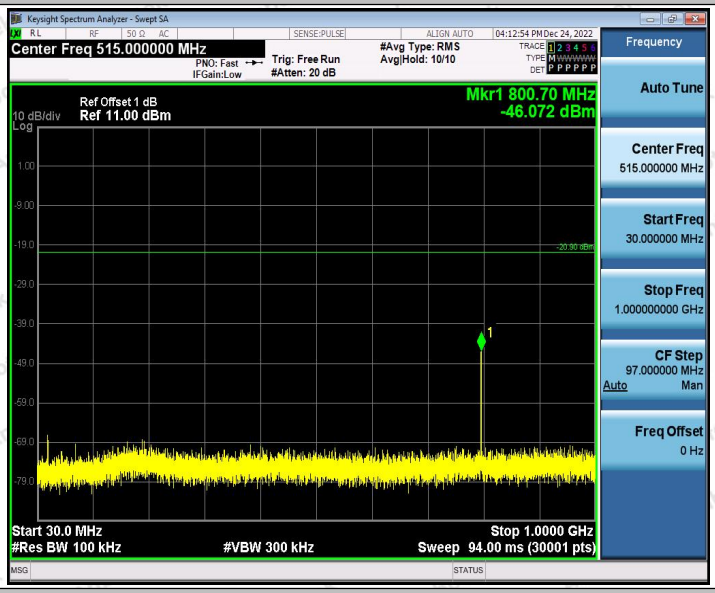
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
2.4G	Ant1	2402	Reference	-0.90	-0.90	---	PASS
			30~1000	-0.90	-46.07	≤-20.9	PASS
			1000~26500	-0.90	-36.5	≤-20.9	PASS
		2441	Reference	-0.89	-0.89	---	PASS
			30~1000	-0.89	-45.67	≤-20.89	PASS
			1000~26500	-0.81	-36.58	≤-20.81	PASS
		2480	Reference	-1.24	-1.24	---	PASS
			30~1000	-1.24	-45.87	≤-21.24	PASS
			1000~26500	-1.24	-37.46	≤-21.24	PASS

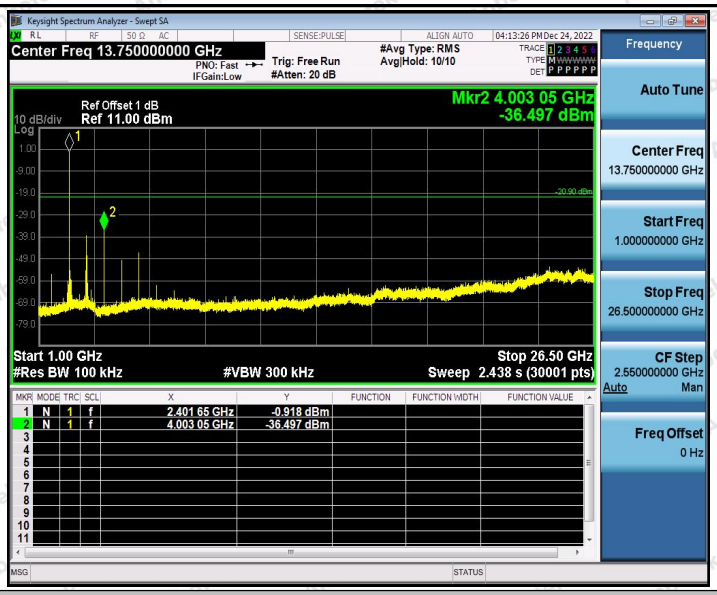
Test Graphs

2.4G_Ant1_2402_0~Reference

2.4G_Ant1_2402_30~1000

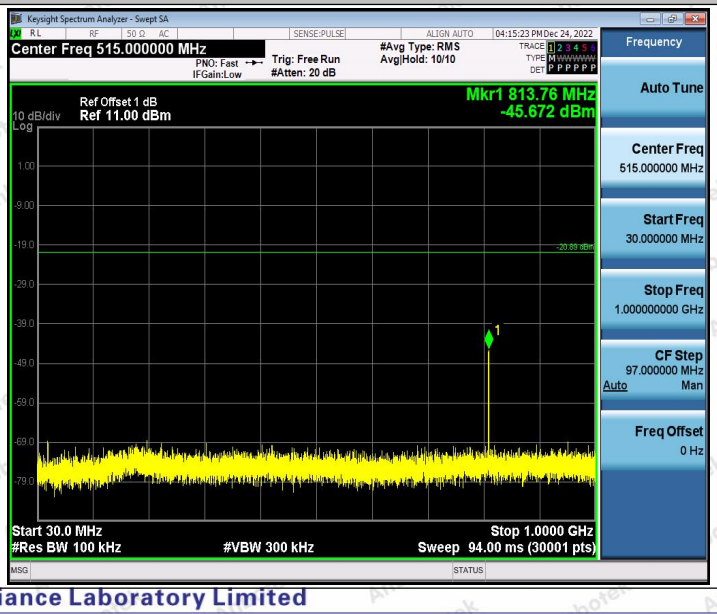


2.4G_Ant1_2402_1000~26500

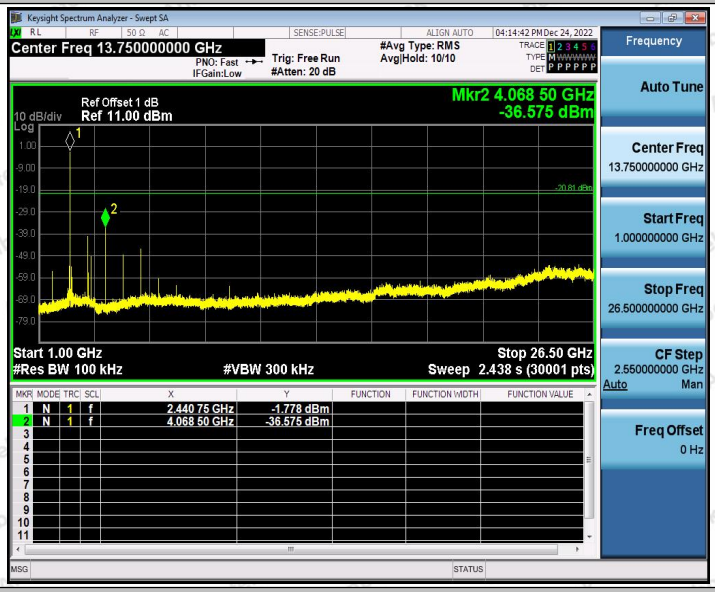


2.4G_Ant1_2441_0~Reference

2.4G_Ant1_2441_30~1000

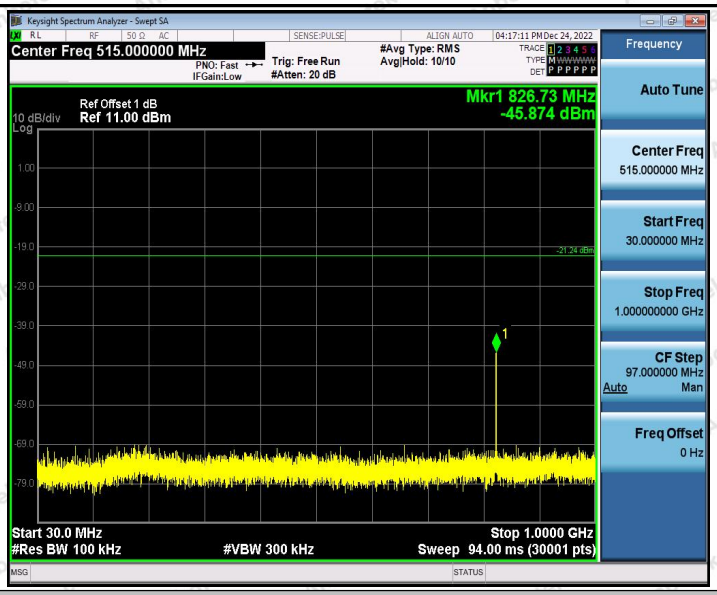


2.4G_Ant1_2441_1000~26500

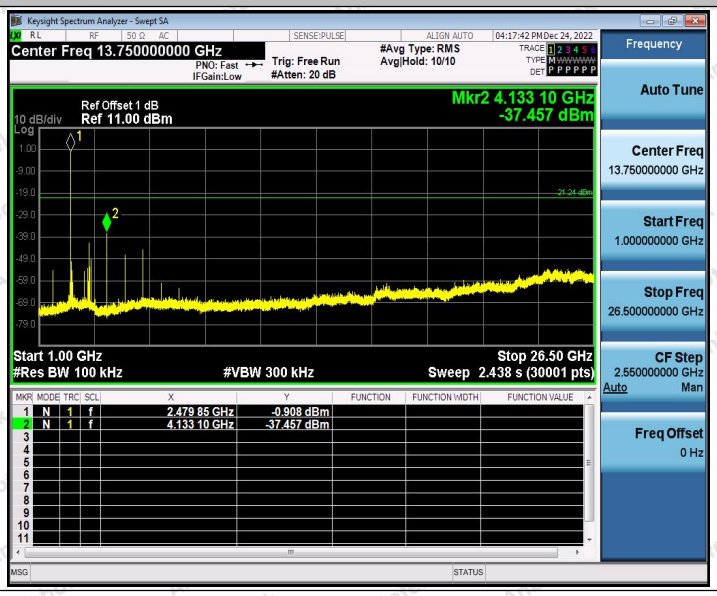


2.4G_Ant1_2480_0~Reference

2.4G_Ant1_2480_30~1000



2.4G_Ant1_2480_1000~26500



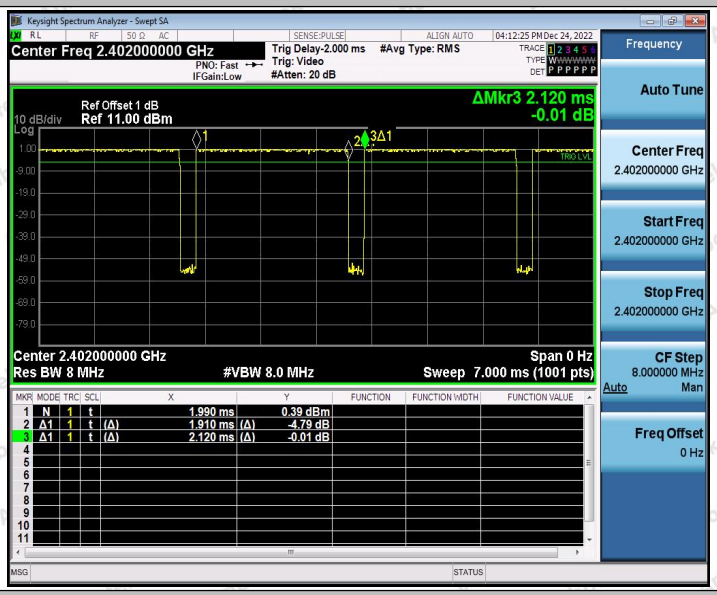
Appendix I: Duty Cycle

Test Result

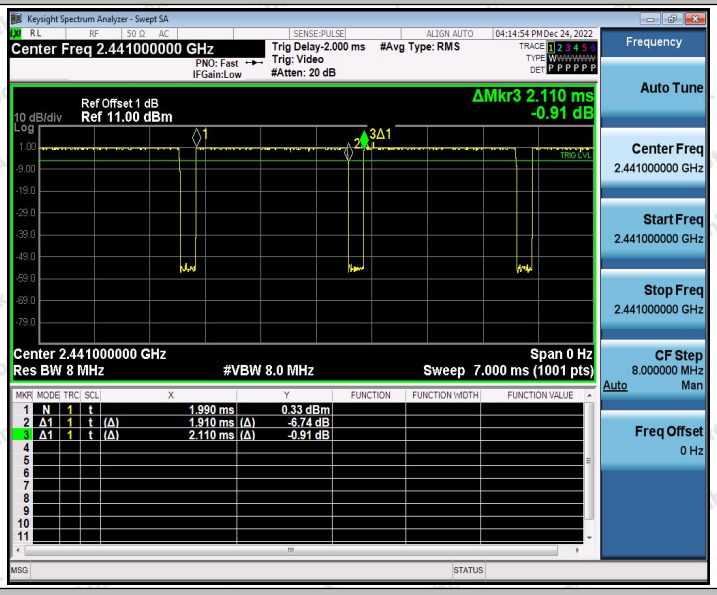
Test Mode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
2.4G	Ant1	2402	1.91	2.12	90.09	0.45
		2441	1.91	2.11	90.52	0.43
		2480	1.91	2.12	90.09	0.45

Test Graphs

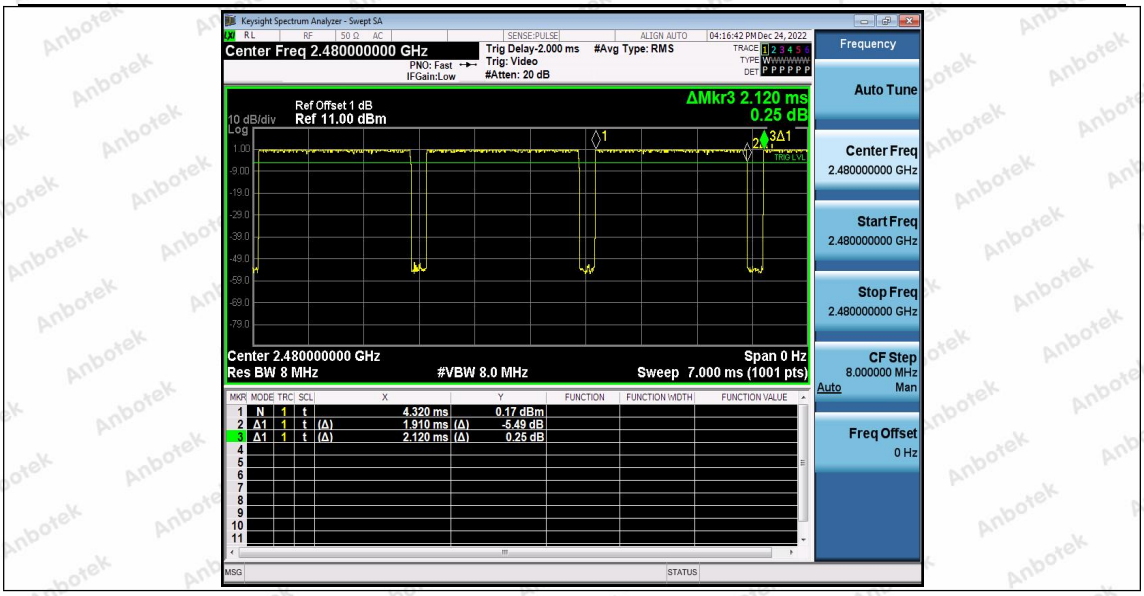
2.4G_Ant1_2402



2.4G_Ant1_2441



2.4G_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
Trig Delay-2.000 ms
Trig: Video
#Atten: 20 dB
#Avg Type: RMS
Ref Offset 1 dB
10 dB/div Ref 11.00 dBm
ΔMkr3 2.120 ms
0.25 dB
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 7.000 ms (1001 pts)
1 N 1 t 4.320 ms 0.17 dBm
2 Δ1 1 t (Δ) 1.910 ms (Δ) -5.49 dB
3 Δ1 1 t (Δ) 2.120 ms (Δ) 0.25 dB
Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.480000000 GHz
Stop Freq 2.480000000 GHz
CF Step 8.000000 MHz
Auto Man
Freq Offset 0 Hz

---End---