Appendix Test Data

Report No.:	18220WC30132201	Test Sample No.:	1-2-2
Start Test Date:	2023.06.29	Finish Test Date:	2023.07.04
Test Engineer:	Rick Luo	Auditor:	Edward. Pan
Temperature:	25.4℃	Relative Humidity:	48%
Pressure:	1012 hPa		

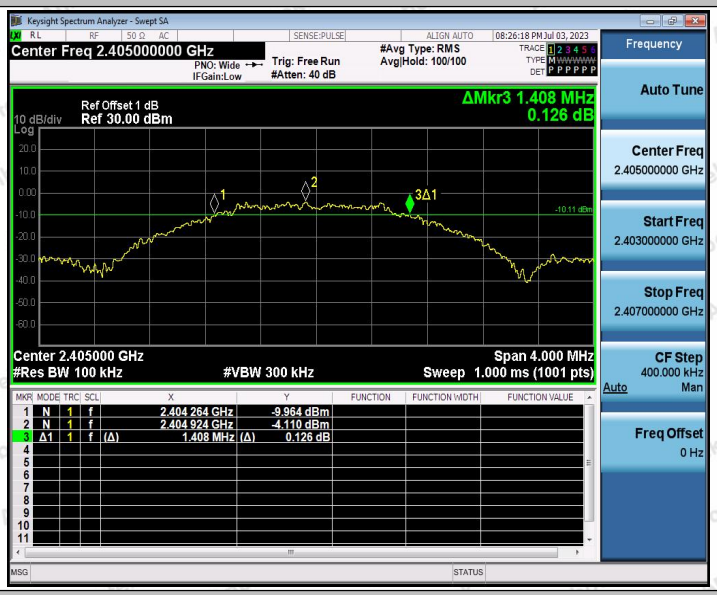
Appendix A: DTS Bandwidth

Test Result

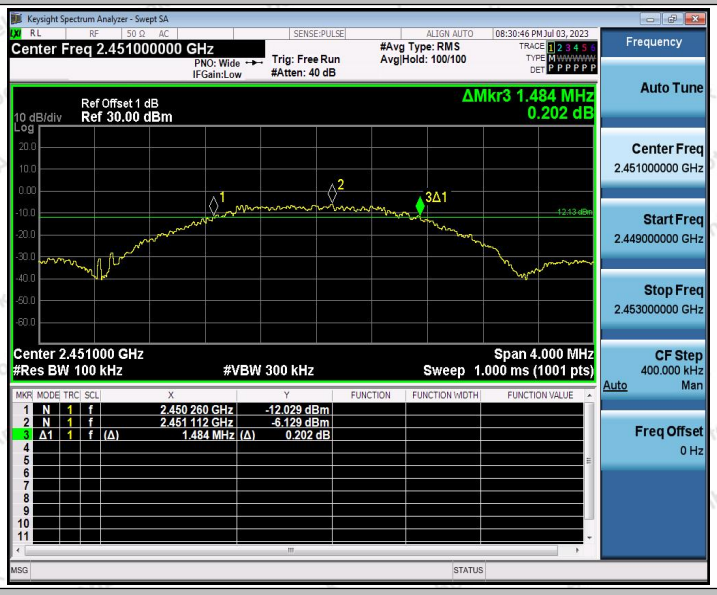
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
2.4G	Ant1	2405	1.408	2404.264	2405.672	0.5	PASS
		2451	1.484	2450.260	2451.744	0.5	PASS
		2475	1.520	2474.216	2475.736	0.5	PASS

Test Graphs

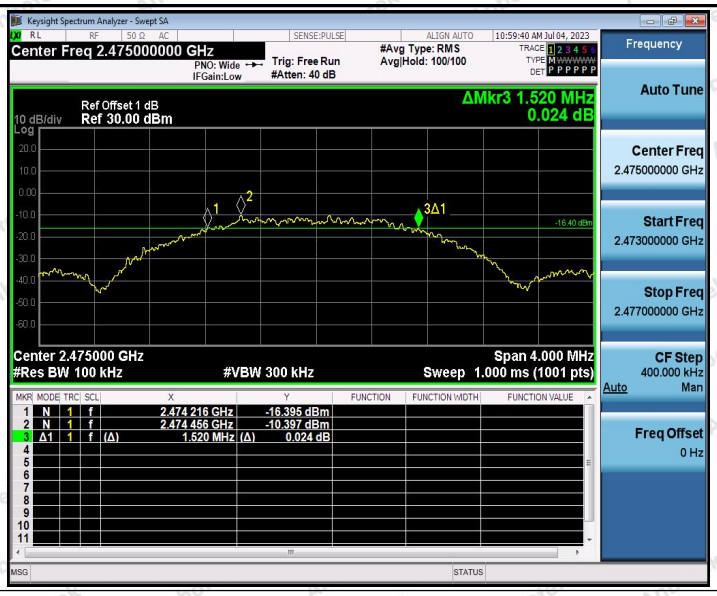
2.4G_Ant1_2405



2.4G_Ant1_2451



2.4G_Ant1_2475


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.475000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
10:59:40 AM Jul 04, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
ΔMkr3 1.520 MHz
0.024 dB
-16.40 dBm
Center 2.475000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.474 216 GHz -16.395 dBm
2 N 1 f 2.474 456 GHz -10.397 dBm
3 Δ1 1 f (Δ) 1.520 MHz (Δ) 0.024 dB
Frequency
Auto Tune
Center Freq
2.475000000 GHz
Start Freq
2.473000000 GHz
Stop Freq
2.477000000 GHz
CF Step
400.000 kHz
Auto Man
Freq Offset
0 Hz

Appendix B: Occupied Channel Bandwidth

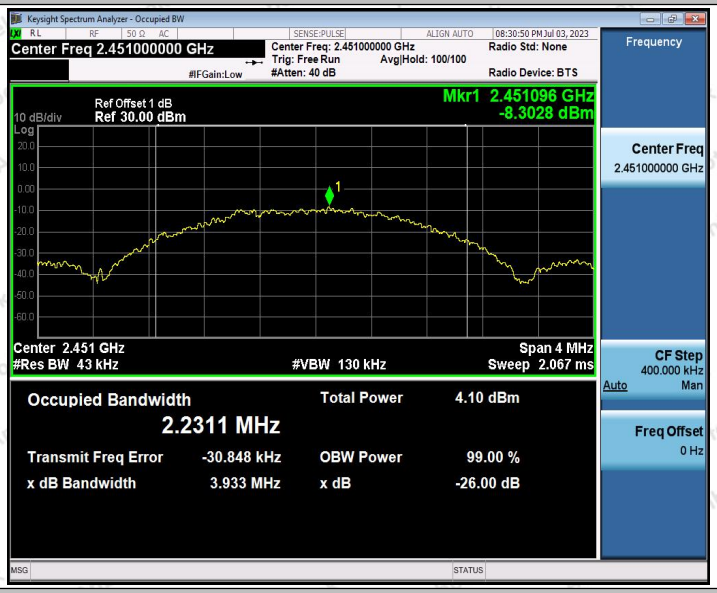
Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
2.4G	Ant1	2405	2.2122	2403.8576	2406.0698
		2451	2.2311	2449.8536	2452.0847
		2475	2.2494	2473.8387	2476.0881

Test Graphs

2.4G_Ant1_2405

2.4G_Ant1_2451



2.4G_Ant1_2475

Keysight Spectrum Analyzer - Occupied BW
Center Freq 2.475000000 GHz
Center Freq: 2.475000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
10:59:44 AM Jul 04, 2023
Frequency
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.47446 GHz
-12.532 dBm
Center Freq
2.475000000 GHz
Center 2.475 GHz
#Res BW 43 kHz
#VBW 130 kHz
Span 4 MHz
Sweep 2.067 ms
CF Step
400.000 kHz
Auto
Man
Occupied Bandwidth
2.2494 MHz
Total Power
-0.31 dBm
Transmit Freq Error
-36.609 kHz
OBW Power
99.00 %
x dB Bandwidth
3.920 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

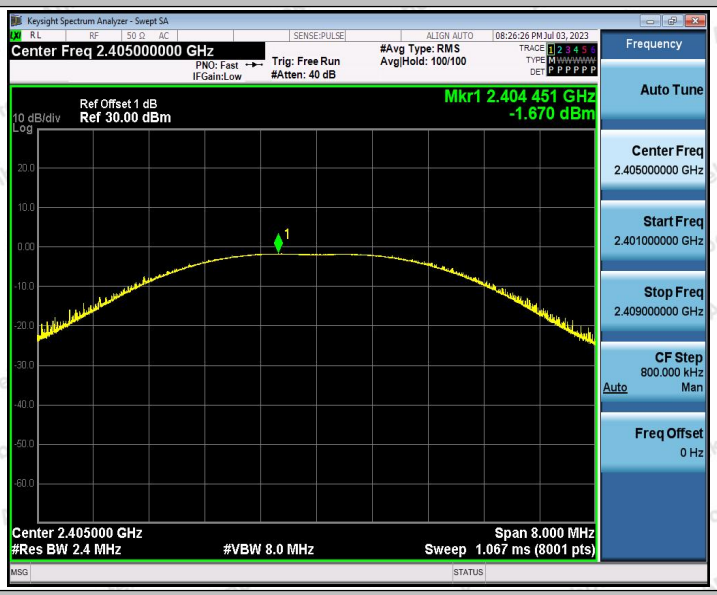
Appendix C: Maximum conducted output power

Test Result Peak

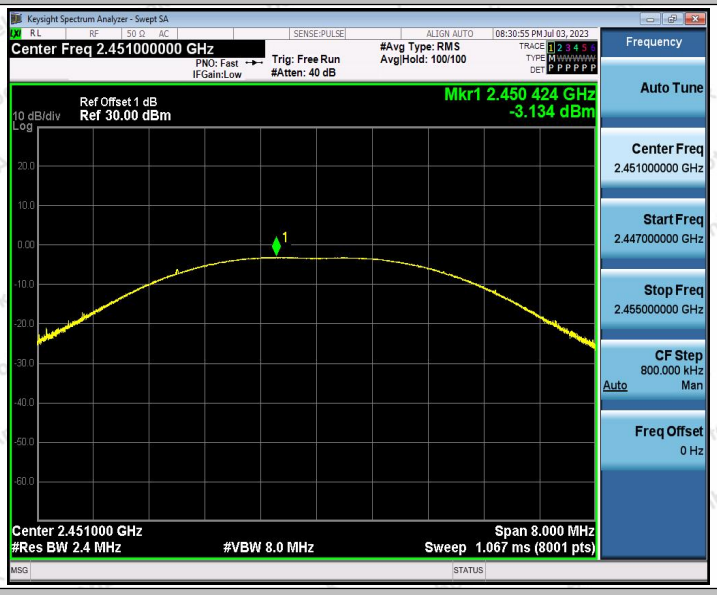
Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
2.4G	Ant1	2405	**-1.67**	≤30	PASS
		2451	-3.13	≤30	PASS
		2475	-7.80	≤30	PASS

Test Graphs Peak

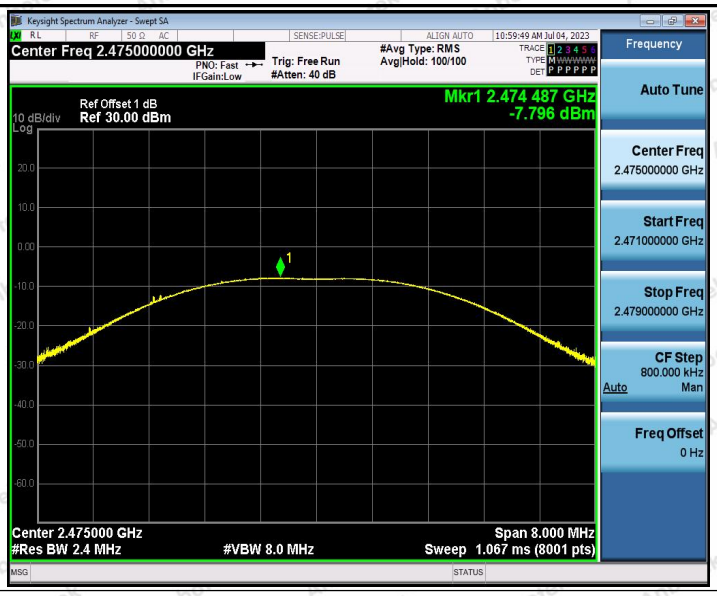
2.4G_Ant1_2405



2.4G_Ant1_2451



2.4G_Ant1_2475


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.475000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
10:59:49 AM Jul 04, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.474 487 GHz
-7.796 dBm
Center 2.475000 GHz
#Res BW 2.4 MHz
#VBW 8.0 MHz
Span 8.000 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.475000000 GHz
Start Freq
2.471000000 GHz
Stop Freq
2.479000000 GHz
CF Step
800.000 kHz
Auto
Man
Freq Offset
0 Hz

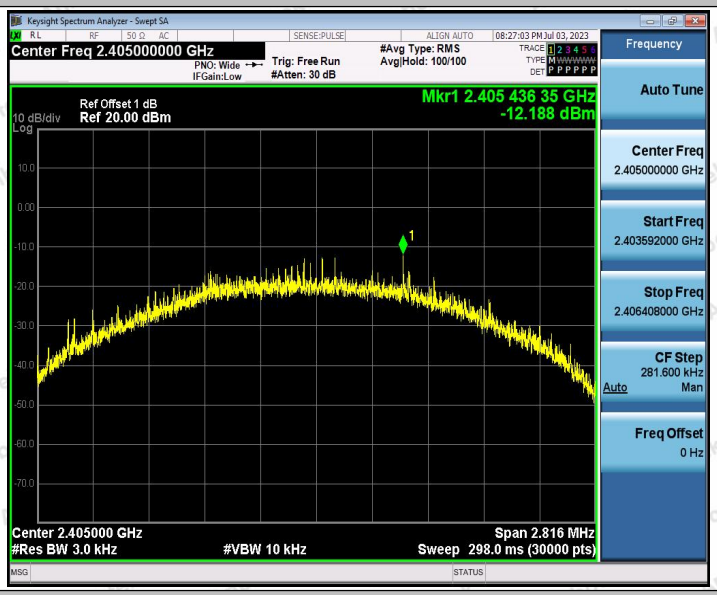
Appendix D: Maximum power spectral density

Test Result

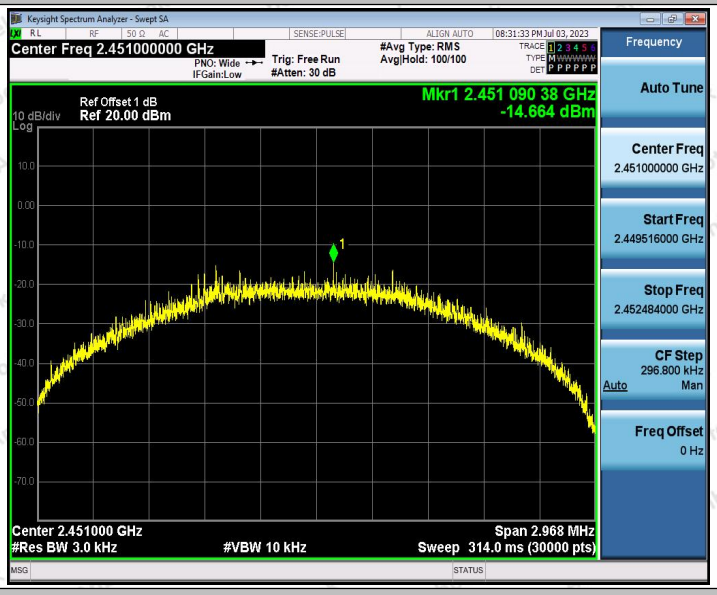
Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
2.4G	Ant1	2405	-12.19	≤8.00	PASS
		2451	-14.66	≤8.00	PASS
		2475	-16.92	≤8.00	PASS

Test Graphs

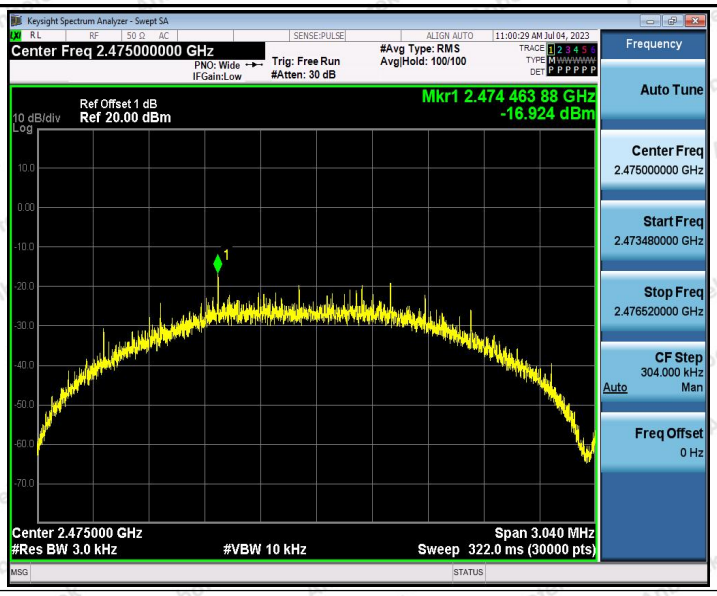
2.4G_Ant1_2405



2.4G_Ant1_2451



2.4G_Ant1_2475


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.475000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
11:00:29 AM Jul 04, 2023
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.474 463 88 GHz
-16.924 dBm
Center 2.475000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 3.040 MHz
Sweep 322.0 ms (30000 pts)
Frequency
Auto Tune
Center Freq
2.475000000 GHz
Start Freq
2.473480000 GHz
Stop Freq
2.476520000 GHz
CF Step
304.000 kHz
Auto
Man
Freq Offset
0 Hz

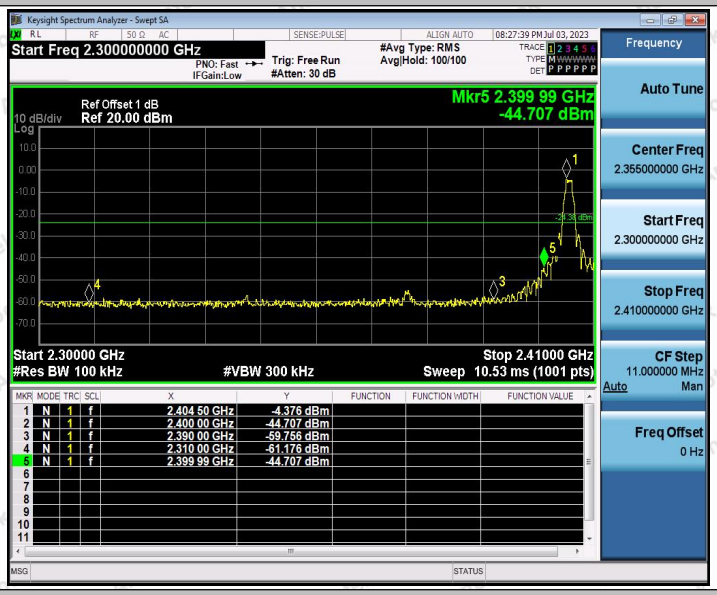
Appendix E: Band edge measurements

Test Result

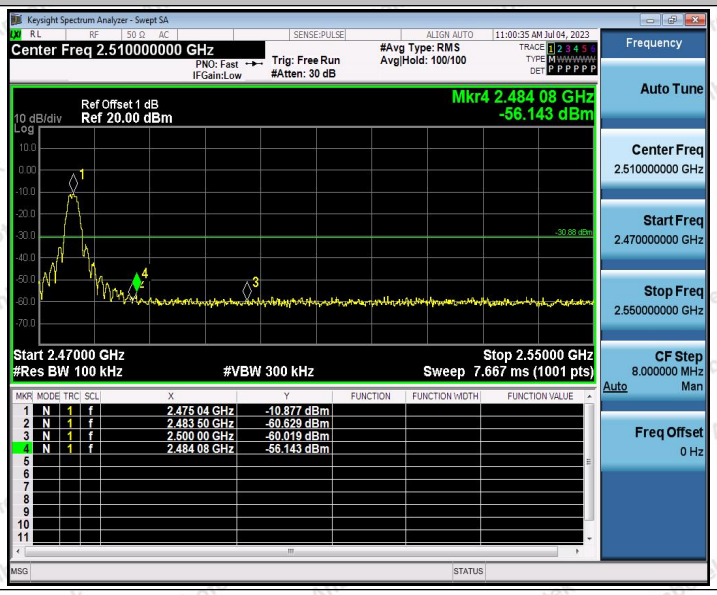
TestMode	Antenna	ChName	Frequency [MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
2.4G	Ant1	Low	2405	-4.38	-44.71	≤-24.38	PASS
		High	2475	-10.88	-56.14	≤-30.88	PASS

Test Graphs

2.4G_Ant1_Low_2405



2.4G_Ant1_High_2475



Appendix F: Conducted Spurious Emission

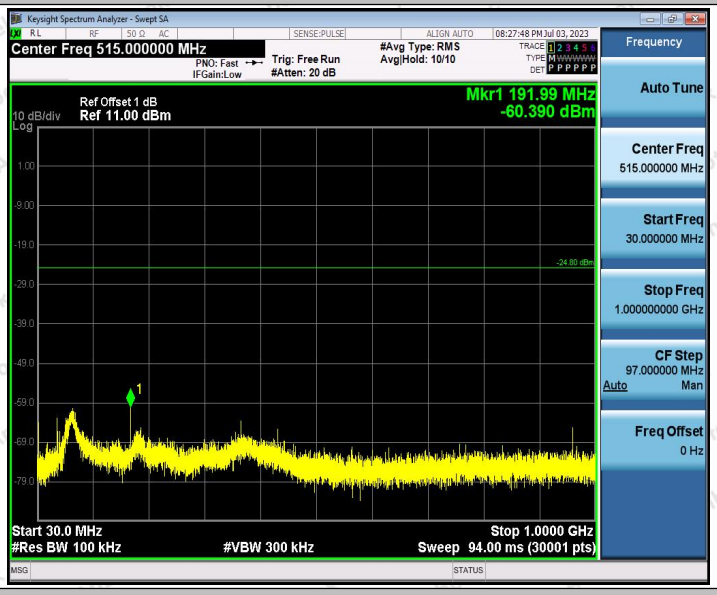
Test Result

TestMode	Antenna	Frequency [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
2.4G	Ant1	2405	Reference	-4.80	-4.80	---	PASS
			30~1000	-4.80	-60.39	≤-24.8	PASS
			1000~26500	-4.80	-33.23	≤-24.8	PASS
		2451	Reference	-6.73	-6.73	---	PASS
			30~1000	-6.73	-60.46	≤-26.73	PASS
			1000~26500	-6.73	-35.92	≤-26.73	PASS
		2475	Reference	-10.79	-10.79	---	PASS
			30~1000	-10.79	-60.08	≤-30.79	PASS
			1000~26500	-10.79	-33.93	≤-30.79	PASS

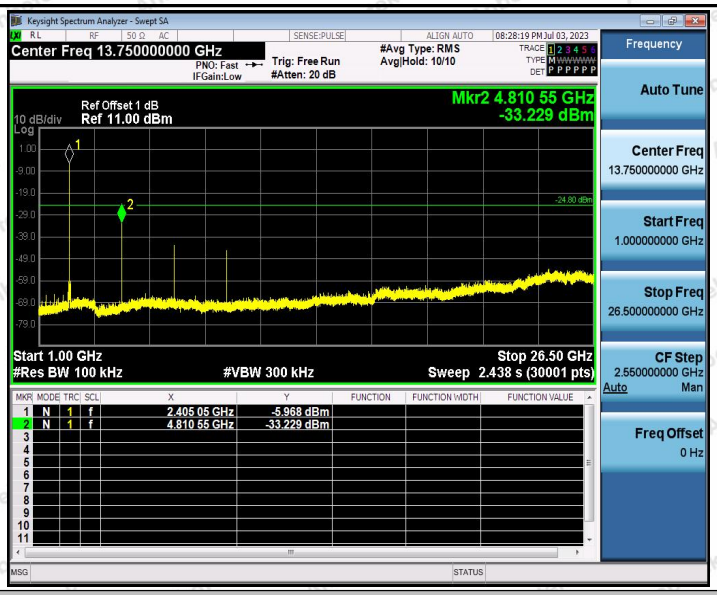
Test Graphs

2.4G_Ant1_2405_0~Reference

2.4G_Ant1_2405_30~1000

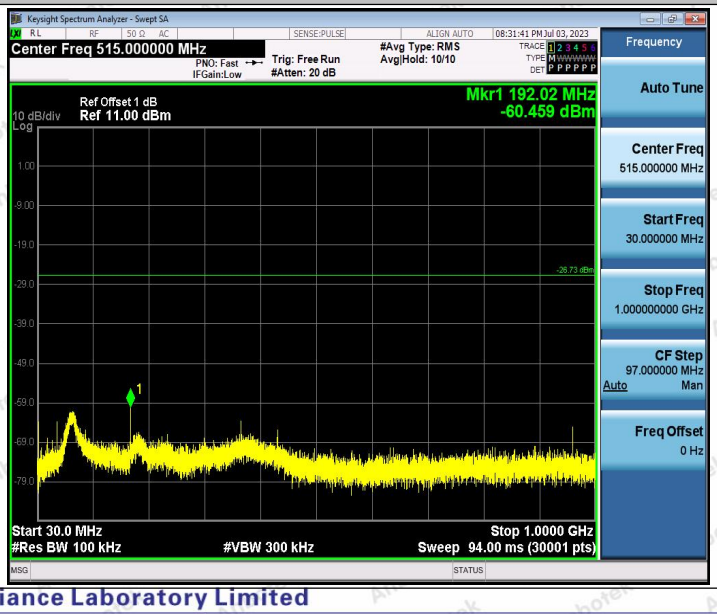


2.4G_Ant1_2405_1000~26500

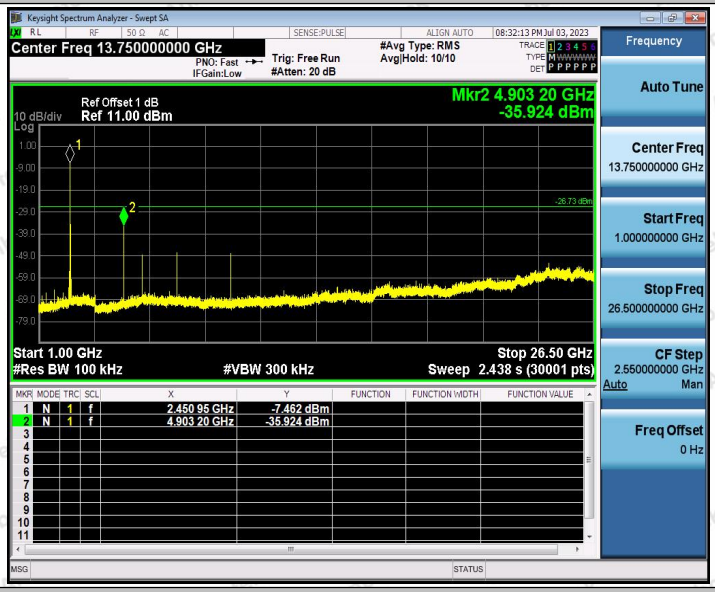


2.4G_Ant1_2451_0~Reference

2.4G_Ant1_2451_30~1000

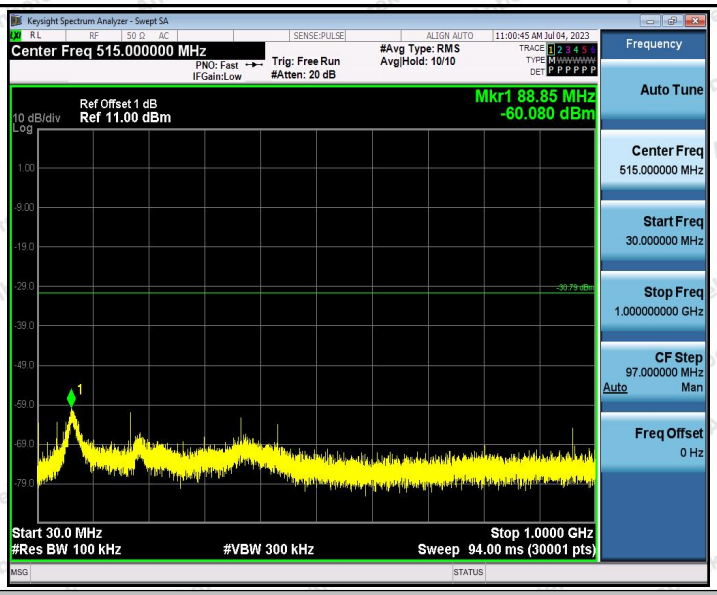


2.4G_Ant1_2451_1000~26500

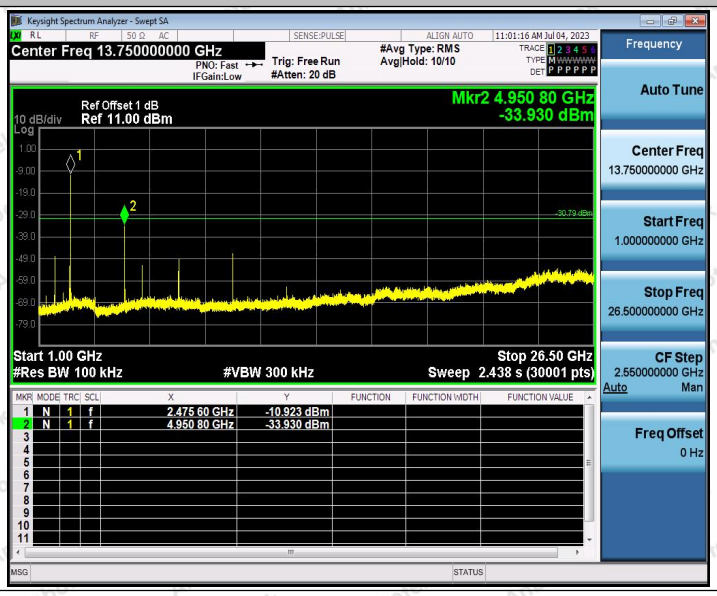


2.4G_Ant1_2475_0~Reference

2.4G_Ant1_2475_30~1000



2.4G_Ant1_2475_1000~26500



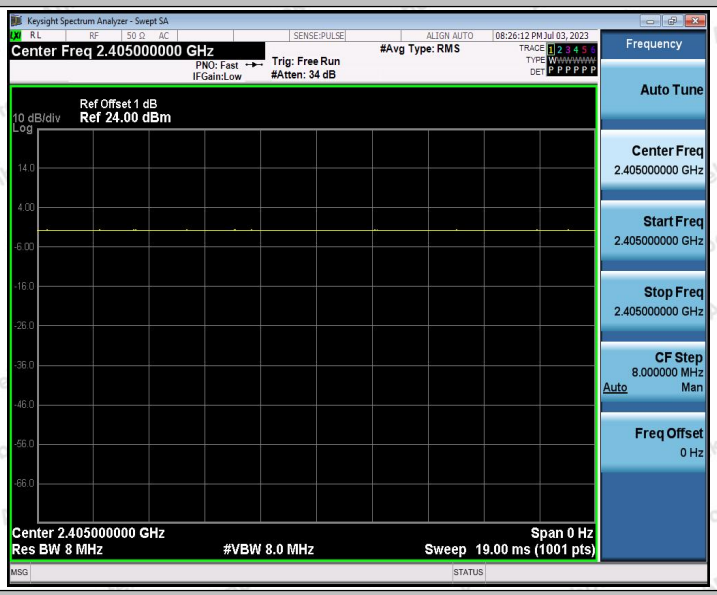
Appendix G: Duty Cycle

Test Result

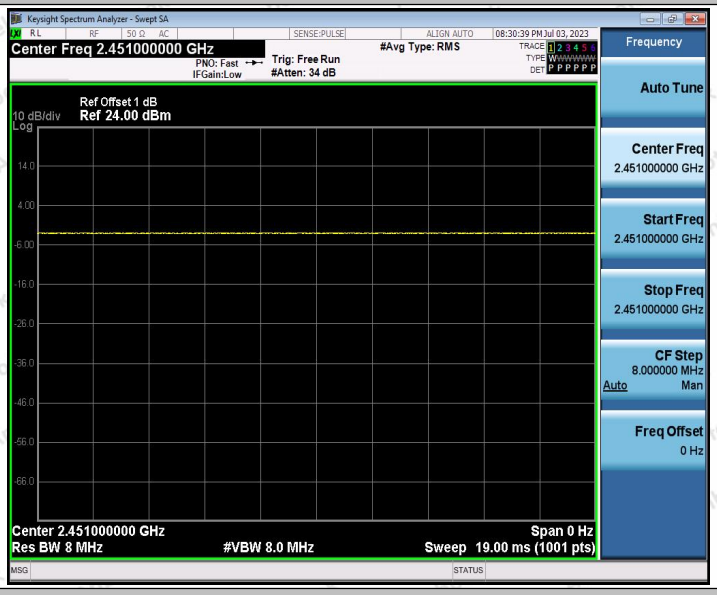
Test Mode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
2.4G	Ant1	2405	19.00	19.00	100	0.00
		2451	19.00	19.00	100	0.00
		2475	19.00	19.00	100	0.00

Test Graphs

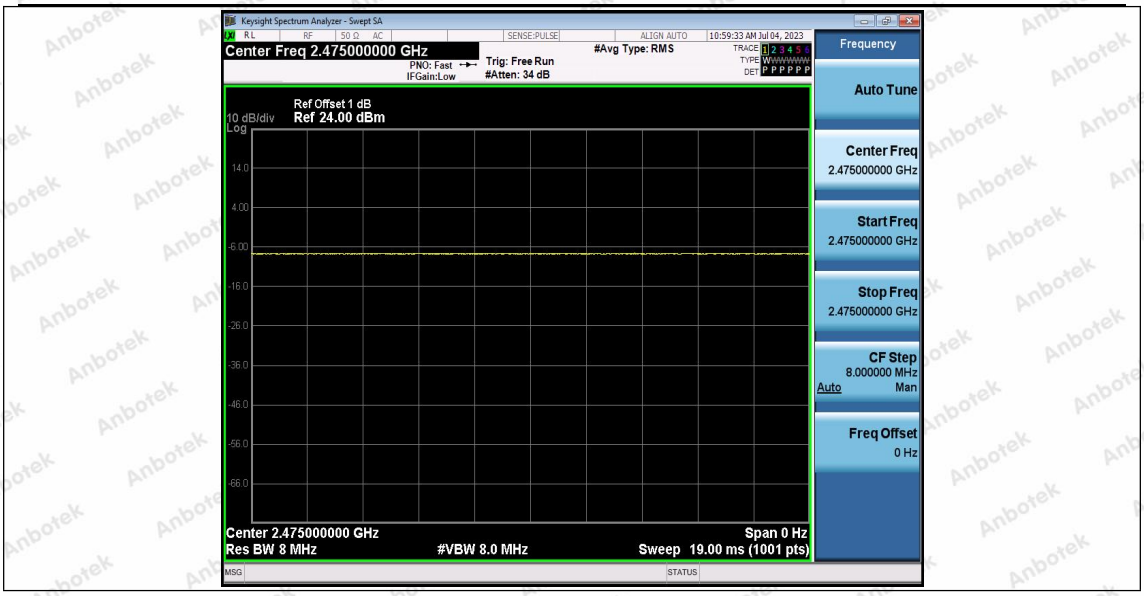
2.4G_Ant1_2405



2.4G_Ant1_2451



2.4G_Ant1_2475


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.475000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 34 dB
#Avg Type: RMS
10:59:33 AM Jul 04, 2023
Frequency
Auto Tune
Center Freq
2.475000000 GHz
Start Freq
2.475000000 GHz
Stop Freq
2.475000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 1 dB
10 dB/div
Ref 24.00 dBm
Log
Center 2.475000000 GHz
Span 0 Hz
Res BW 8 MHz
#VBW 8.0 MHz
Sweep 19.00 ms (1001 pts)

---End---