Appendix Test Data

Report No.:	18220WC20183701	Test Sample No.:	1-2-2
Start Test Date:	2022.9.27	Finish Test Date:	2022.10.10
Test Engineer:	Rick Luo	Auditor:	Edward. Pan
Temperature:	27.3℃	Relative Humidity:	47 %
Pressure:	1012 hPa		

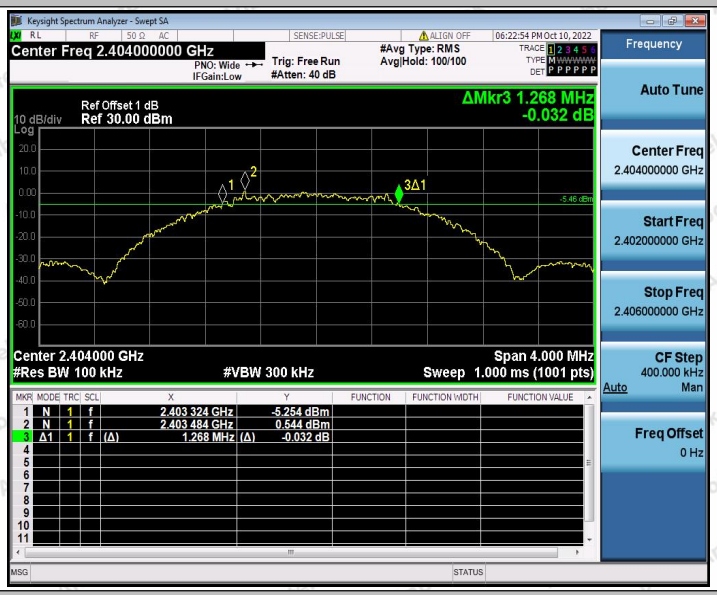
Appendix A: DTS Bandwidth

Test Result

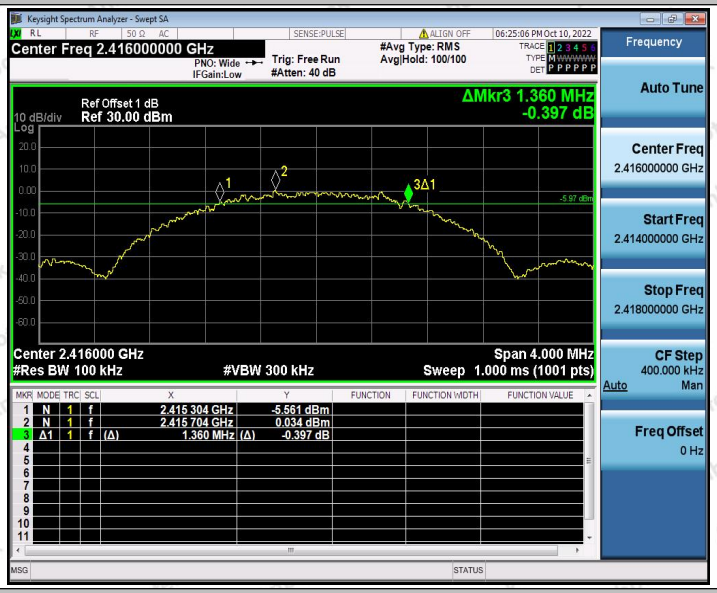
Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
2.4G	Ant1	2404	1.268	2403.324	2404.592	0.5	PASS
		2416	1.360	2415.304	2416.664	0.5	PASS
		2430	1.344	2429.268	2430.612	0.5	PASS

Test Graphs

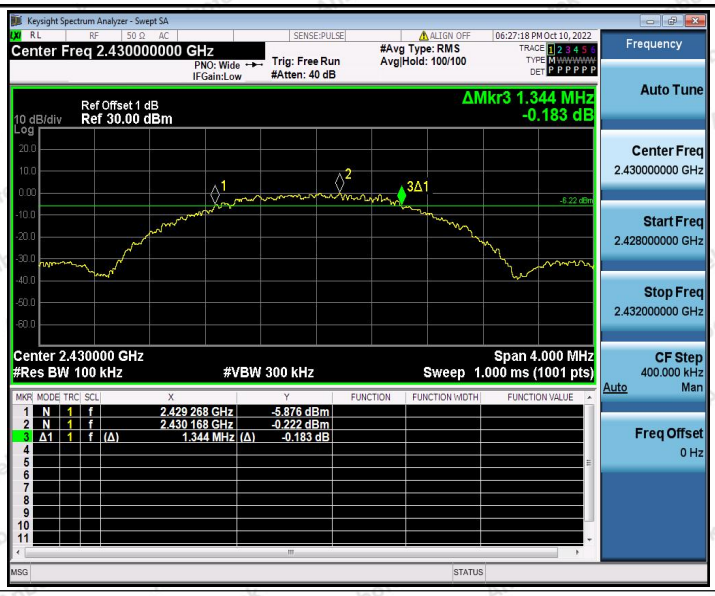
2.4G_Ant1_2404



2.4G_Ant1_2416



2.4G_Ant1_2430


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.430000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
06:27:18 PM Oct 10, 2022
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr3 1.344 MHz
-0.183 dB
Center 2.430000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.429 268 GHz -5.876 dBm
2 N 1 f 2.430 168 GHz -0.222 dBm
3 Δ1 1 f (Δ) 1.344 MHz (Δ) -0.183 dB
Frequency
Auto Tune
Center Freq
2.430000000 GHz
Start Freq
2.428000000 GHz
Stop Freq
2.432000000 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	2404	2.0550	2402.9470	2405.0020
		2416	2.0689	2414.9429	2417.0118
		2430	2.0272	2428.9536	2430.9808

Test Graphs

2.4G_Ant1_2404

2.4G_Ant1_2416

2.4G_Ant1_2430

Keysight Spectrum Analyzer - Occupied BW
Center Freq 2.430000000 GHz
Center Freq: 2.430000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
06:27:22 PM Oct 10, 2022
Frequency
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Mkr1 2.430036 GHz
-2.0592 dBm
Center Freq
2.430000000 GHz
Center 2.43 GHz
#Res BW 43 kHz
#VBW 130 kHz
Span 4 MHz
Sweep 2.067 ms
CF Step
400.000 kHz
Auto
Man
Occupied Bandwidth
2.0272 MHz
Total Power
10.3 dBm
Transmit Freq Error
-32.838 kHz
OBW Power
99.00 %
x dB Bandwidth
2.541 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

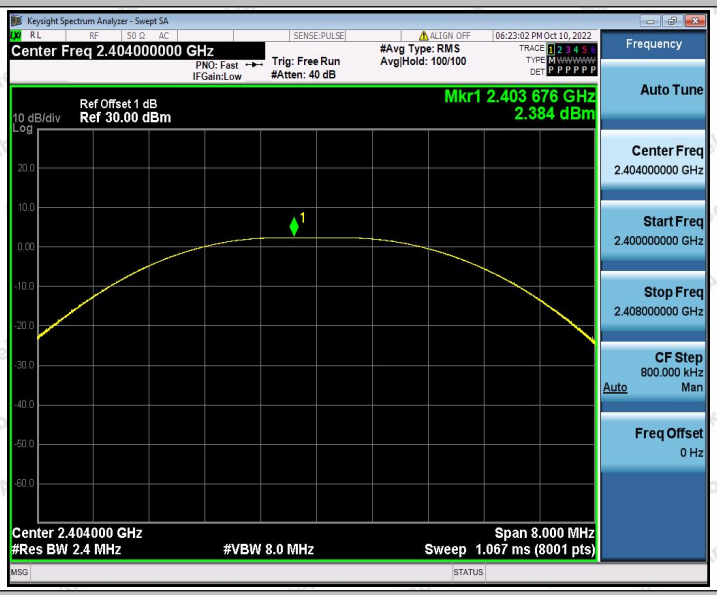
Appendix C: Maximum conducted output power

Test Result Peak

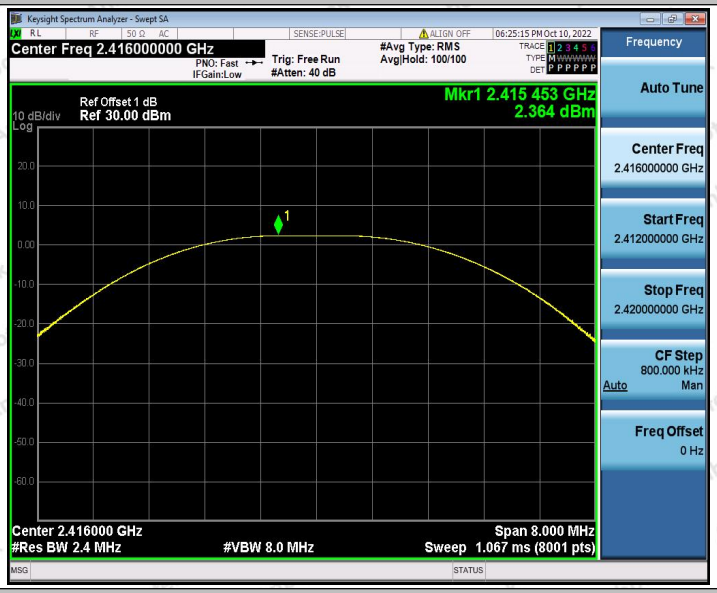
Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
2.4G	Ant1	2404	**2.38**	≤30	PASS
		2416	2.36	≤30	PASS
		2430	2.37	≤30	PASS

Test Graphs Peak

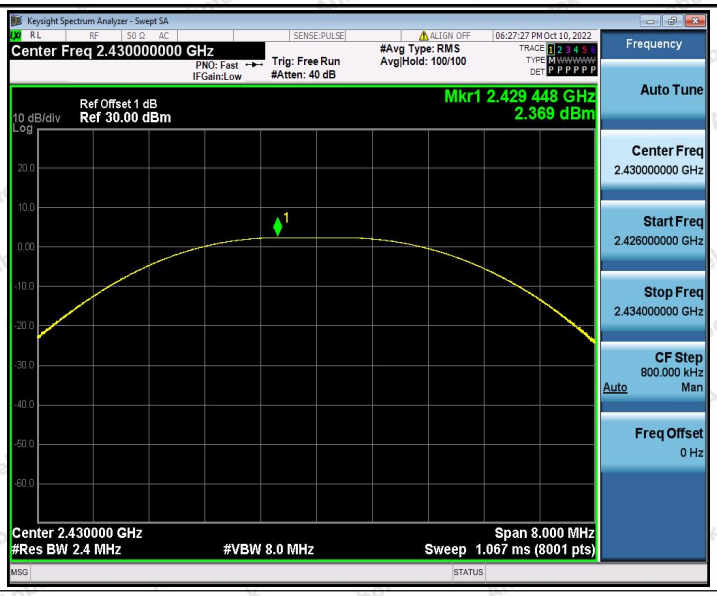
2.4G_Ant1_2404



2.4G_Ant1_2416



2.4G_Ant1_2430


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.430000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
06:27:27 PM Oct 10, 2022
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.429 448 GHz
2.369 dBm
Center Freq
2.430000000 GHz
Start Freq
2.426000000 GHz
Stop Freq
2.434000000 GHz
CF Step
800.000 kHz
Auto
Man
Freq Offset
0 Hz
Center 2.430000 GHz
#Res BW 2.4 MHz
#VBW 8.0 MHz
Span 8.000 MHz
Sweep 1.067 ms (8001 pts)

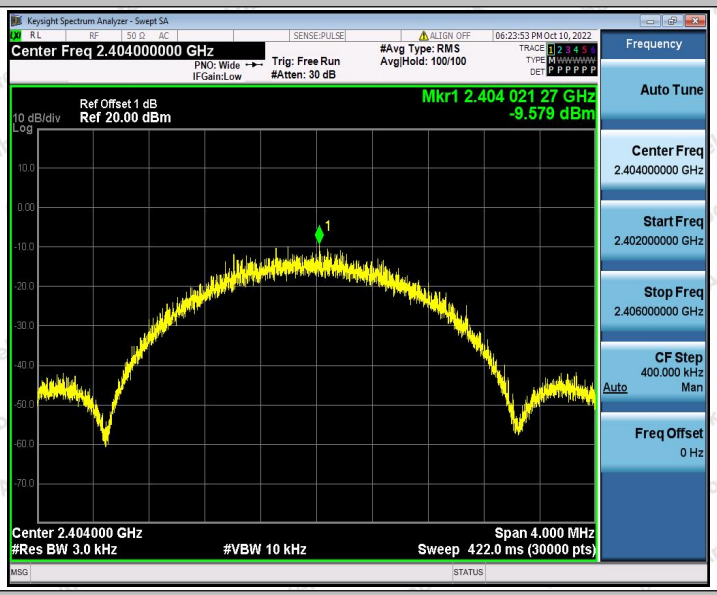
Appendix D: Maximum power spectral density

Test Result

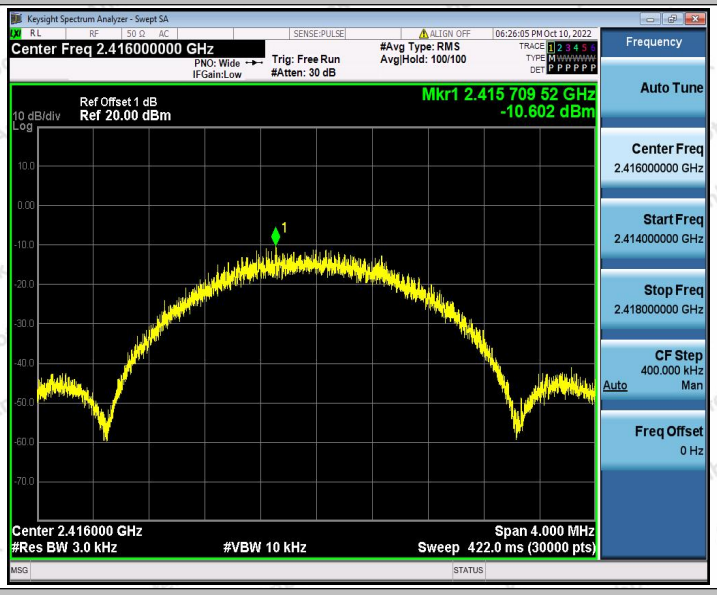
Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
2.4G	Ant1	2404	-9.58	≤8.00	PASS
		2416	-10.6	≤8.00	PASS
		2430	-10.04	≤8.00	PASS

Test Graphs

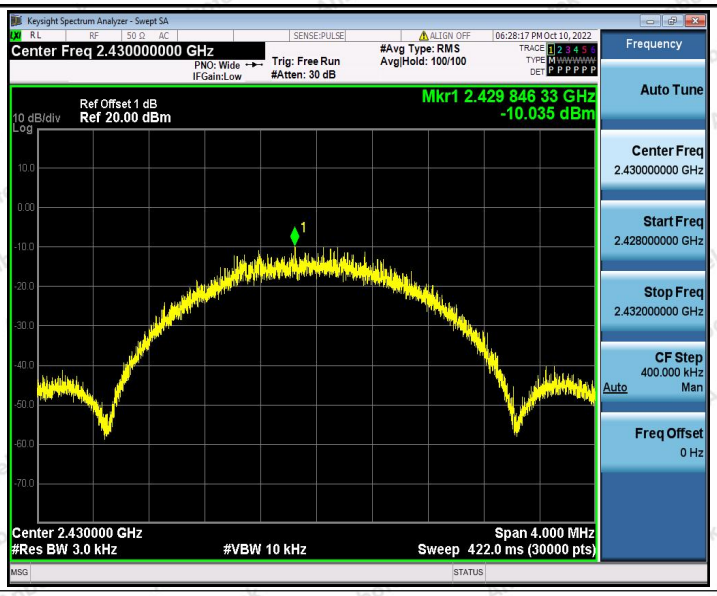
2.4G_Ant1_2404



2.4G_Ant1_2416



2.4G_Ant1_2430


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.430000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
06:28:17 PM Oct 10, 2022
Frequency
Auto Tune
Center Freq
2.430000000 GHz
Start Freq
2.428000000 GHz
Stop Freq
2.432000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.429 846 33 GHz
-10.035 dBm
Center 2.430000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 4.000 MHz
Sweep 422.0 ms (30000 pts)

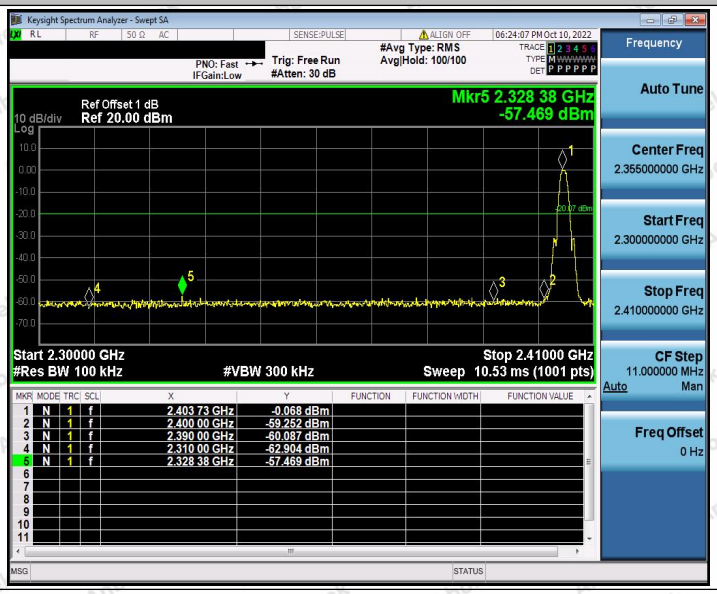
Appendix E: Band edge measurements

Test Result

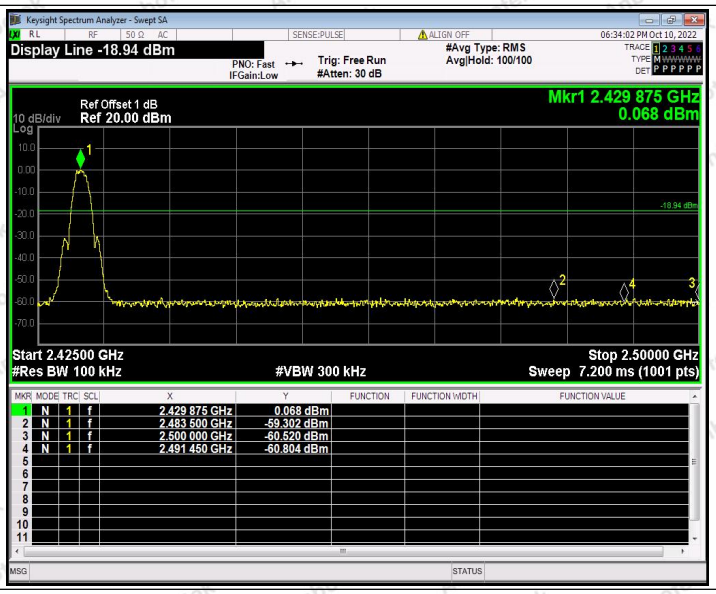
Test Mode	Antenna	Ch Name	Frequency [MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
2.4G	Ant1	Low	2404	-0.068	-60.087	≤-20.07	PASS
	Ant1	High	2430	0.068	-59.302	≤-18.94	PASS

Test Graphs

2.4G_Ant1_Low



2.4G_Ant1_High



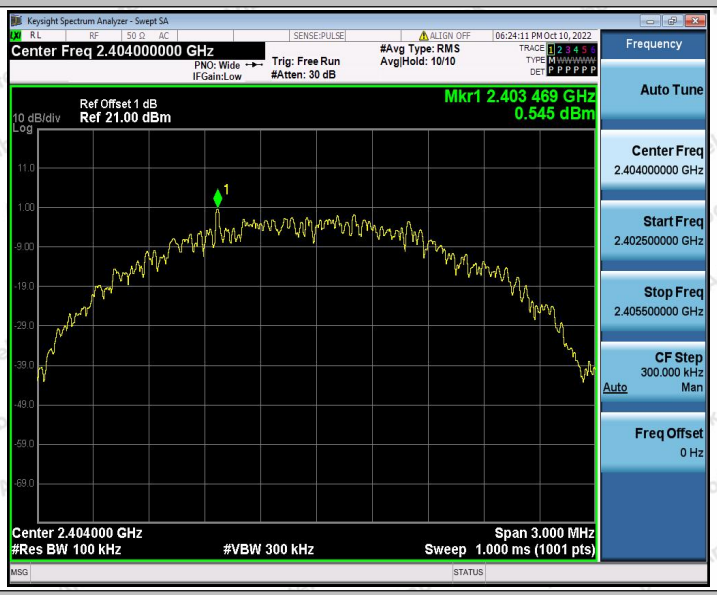
Appendix F: Conducted Spurious Emission

Test Result

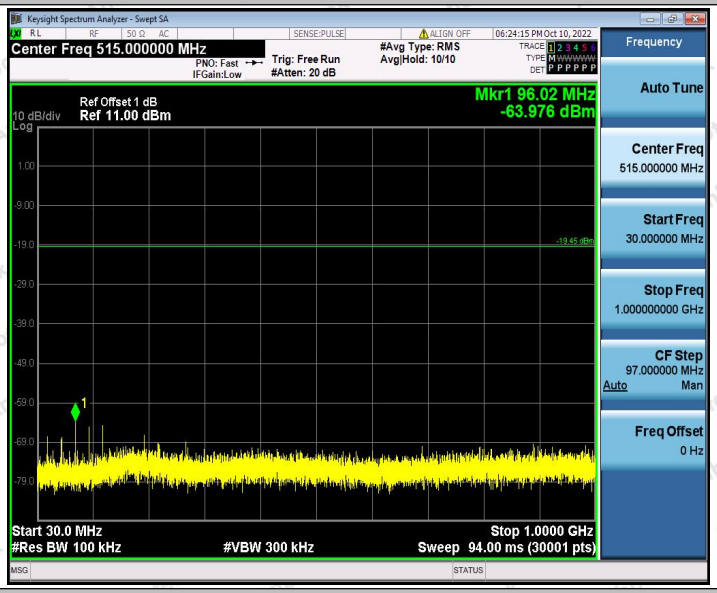
Test Mode	Antenna	Frequency[MHz]	Freq Range [MHz]	Ref Level [dBm]	Result[dBm]	Limit[dBm]	Verdict
2.4G	Ant1	2404	Reference	0.55	0.55	---	PASS
			30~1000	0.55	-63.98	≤-19.45	PASS
			1000~26500	0.55	-24.73	≤-19.45	PASS
		2416	Reference	-1.32	-1.32	---	PASS
			30~1000	-1.32	-64.15	≤-21.32	PASS
			1000~26500	-1.32	-23.79	≤-21.32	PASS
		2430	Reference	-0.35	-0.35	---	PASS
			30~1000	-0.35	-64.33	≤-20.35	PASS
			1000~26500	-0.35	-22.77	≤-20.35	PASS

Test Graphs

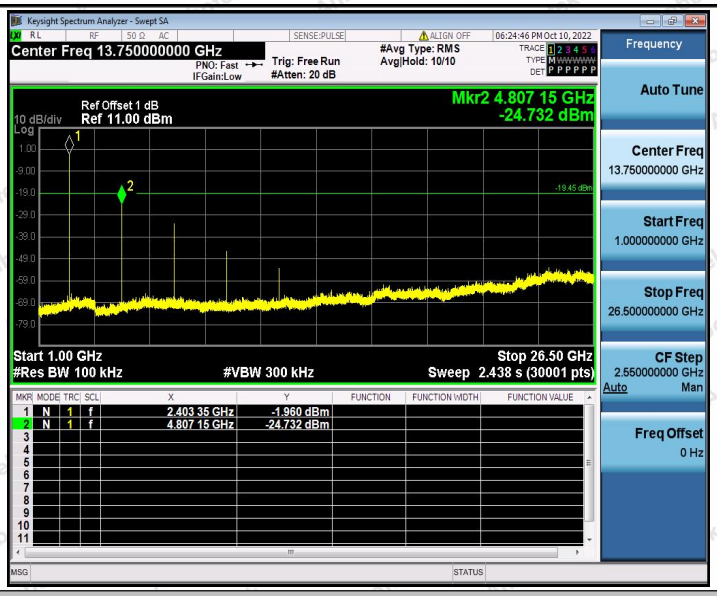
2.4G_Ant1_2404_0~Reference



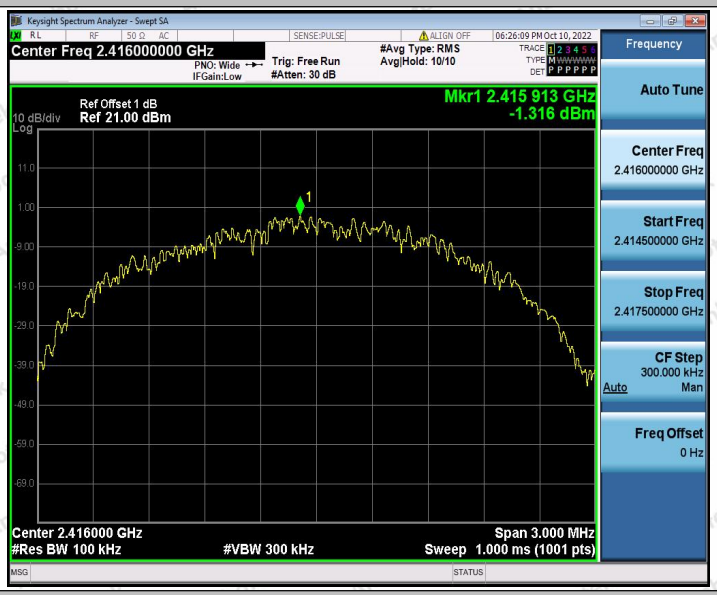
2.4G_Ant1_2404_30~1000



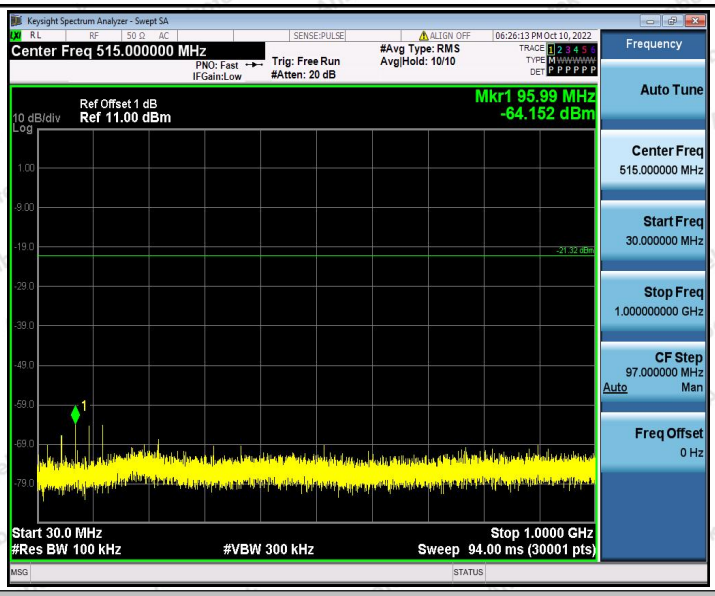
2.4G_Ant1_2404_1000~26500



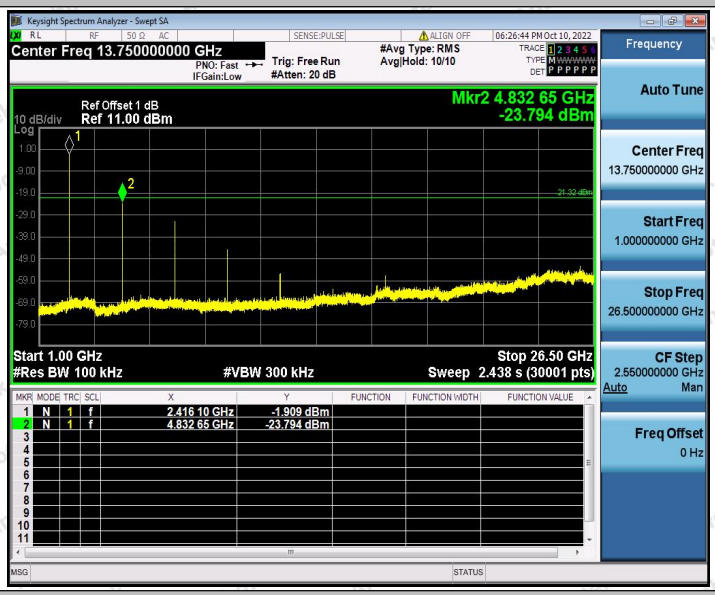
2.4G_Ant1_2416_0~Reference



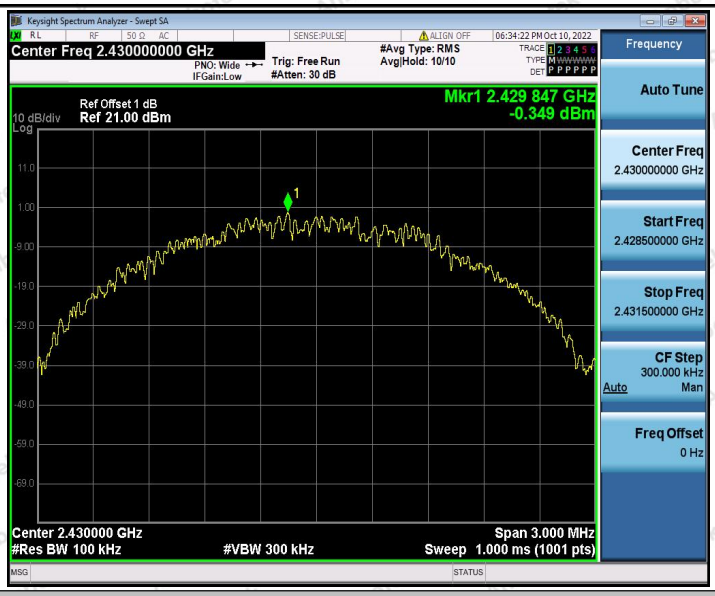
2.4G_Ant1_2416_30~1000



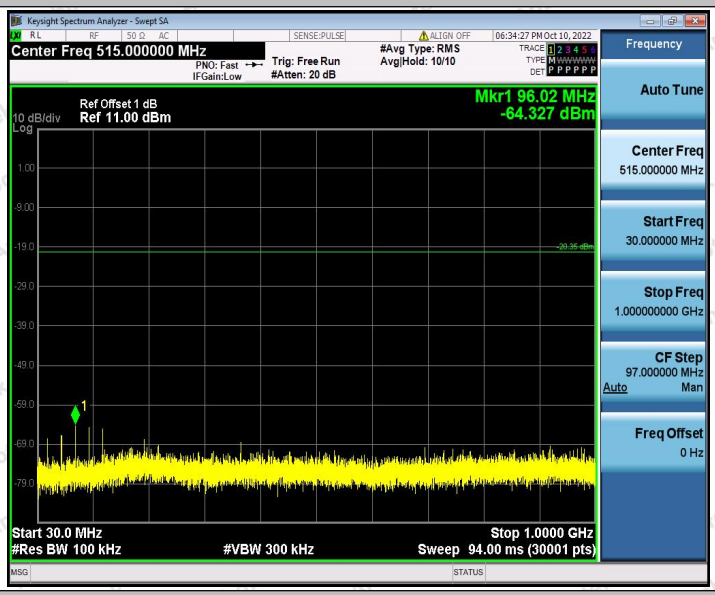
2.4G_Ant1_2416_1000~26500



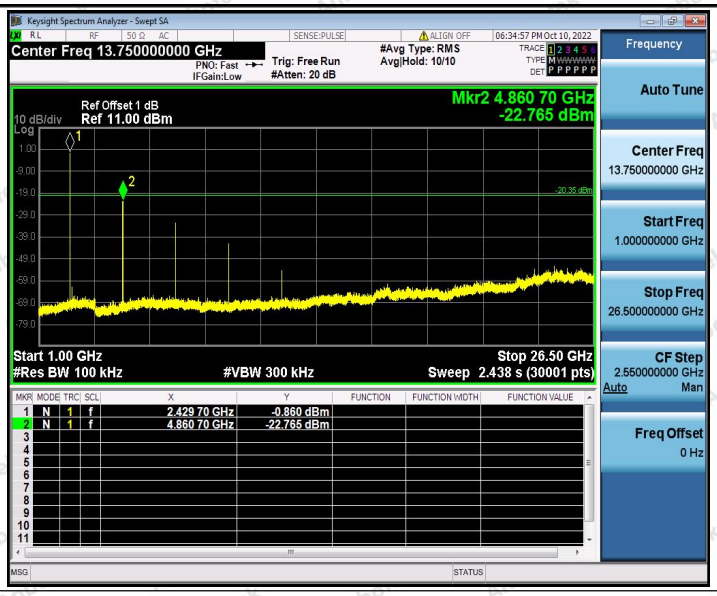
2.4G_Ant1_2430_0~Reference



2.4G_Ant1_2430_30~1000



2.4G_Ant1_2430_1000~26500


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
06:34:57 PM Oct 10, 2022
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr2 4.860 70 GHz
-22.765 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
1 N 1 f 2.429 70 GHz -0.860 dBm
2 N 1 f 4.860 70 GHz -22.765 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto Man
Freq Offset
0 Hz

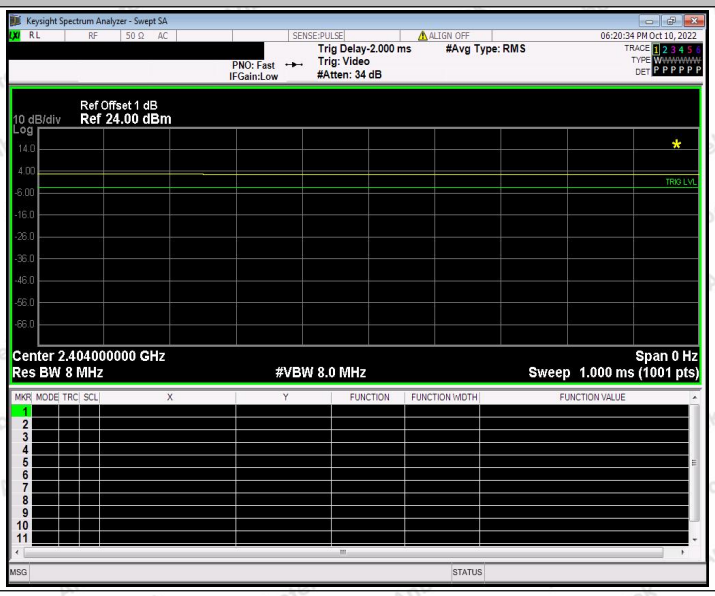
Appendix G: Duty Cycle

Test Result

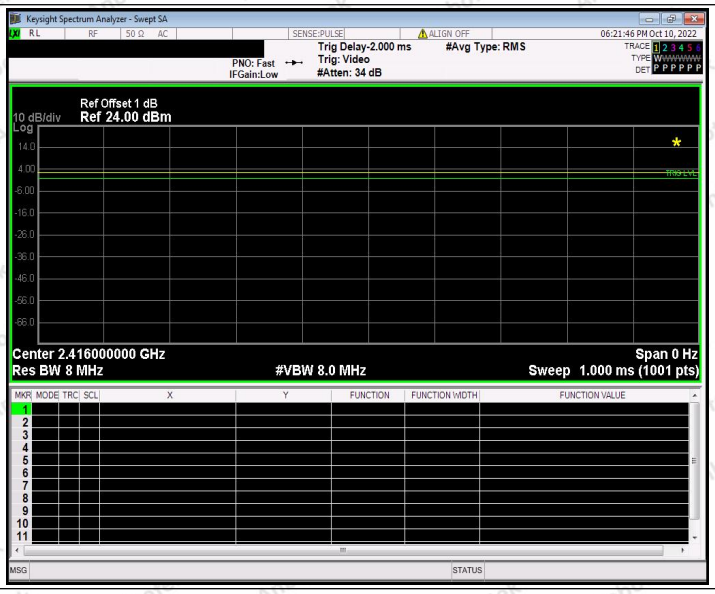
Test Mode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
2.4G	Ant1	2404	1.000	1.000	100	0
2.4G	Ant1	2416	1.000	1.000	100	0
2.4G	Ant1	2430	1.000	1.000	100	0

Test Graphs

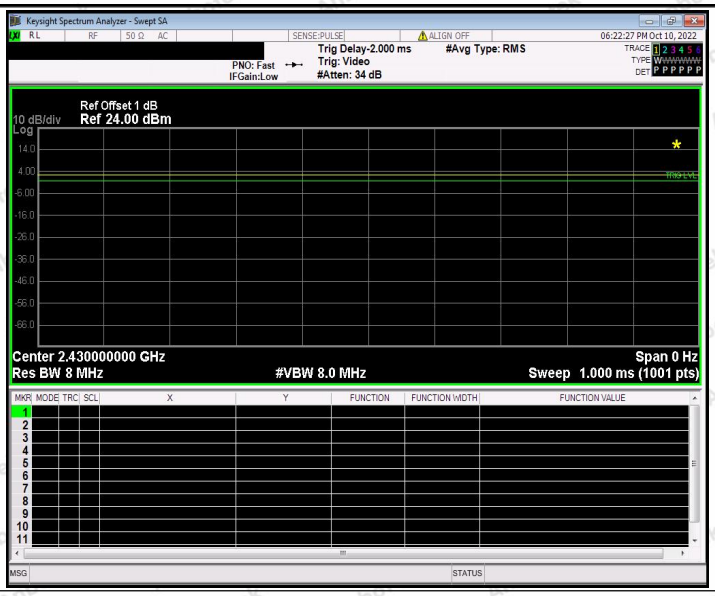
2.4G_Ant1_2404



2.4G_Ant1_2416



2.4G_Ant1_2430


Keysight Spectrum Analyzer - Swept SA
Trig Delay-2.000 ms
Trig: Video
#Atten: 34 dB
#Avg Type: RMS
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 24.00 dBm
Log
Center 2.430000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 1.000 ms (1001 pts)

---End---