FCC Appendix RF Test Data for BLE

Company:	**:**	**Promaster Electronic LLC**
EUT	**:**	**Wireless CPAA adaptor**
FCC ID	**:**	**2A6P9-KPAIB01**
Model Number	**:**	**KPWCA-101**
Report No.	**:**	**CTA25052700602**
Reviewed By	**:**	**Eric Wang**

Appendix A: DTS Bandwidth

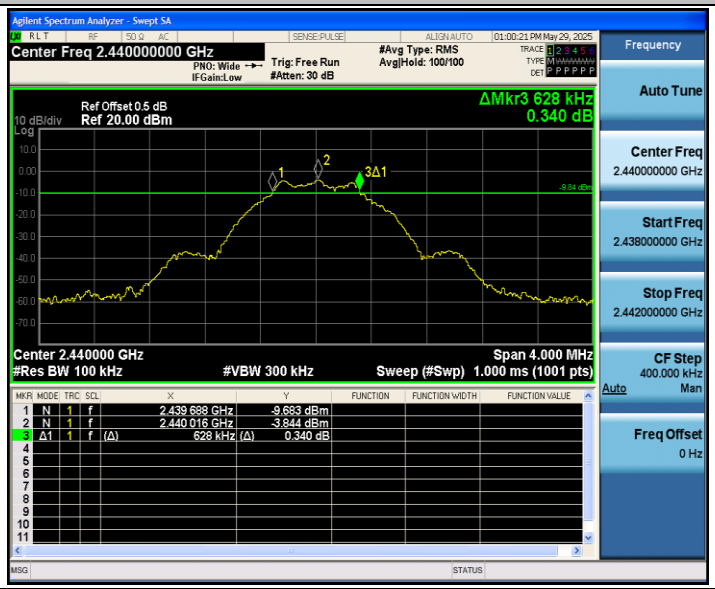
Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.628	2401.696	2402.324	0.5	PASS
		2440	0.628	2439.688	2440.316	0.5	PASS
		2480	0.656	2479.684	2480.340	0.5	PASS

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

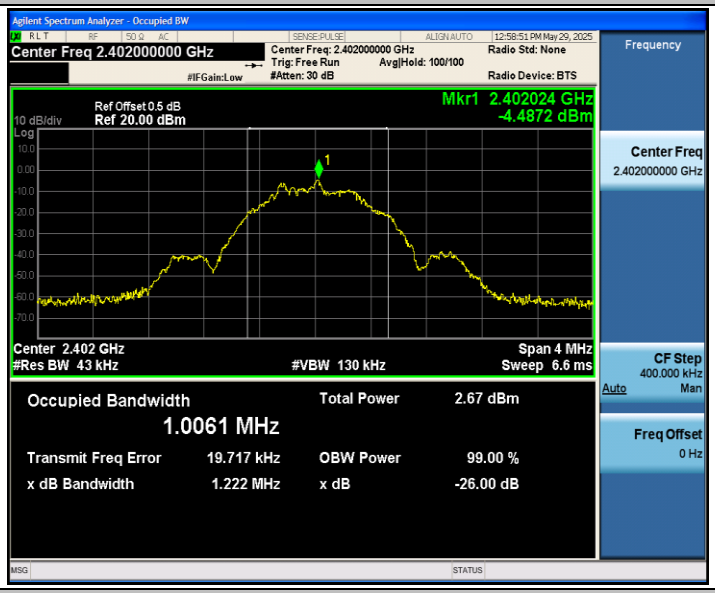

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
01:01:49 PM May 29, 2025
Frequency
Auto Tune
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
ΔMkr3 656 kHz
-0.083 dB
-10.24 dBm
Center Freq
2.480000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.482000000 GHz
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
Sweep (#Swp) 1.000 ms (1001 pts)
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.479 684 GHz -9.922 dBm
2 N 1 f 2.480 032 GHz -4.244 dBm
3 Δ1 1 f (Δ) 656 kHz (Δ) -0.083 dB
MSG
STATUS

Appendix B: Occupied Channel Bandwidth

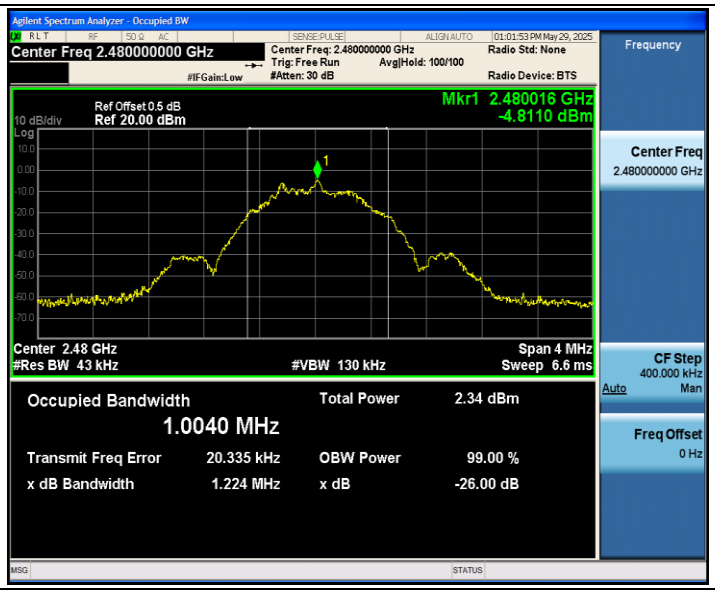
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0061	2401.5167	2402.5228	---	---
		2440	1.0058	2439.5172	2440.5230	---	---
		2480	1.0040	2479.5183	2480.5223	---	---

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
01:01:53 PM May 29, 2025
Frequency
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.480016 GHz
-4.8110 dBm
Center 2.48 GHz
#Res BW 43 kHz
#VBW 130 kHz
Span 4 MHz
Sweep 6.6 ms
Occupied Bandwidth
1.0040 MHz
Total Power 2.34 dBm
Transmit Freq Error 20.335 kHz
OBW Power 99.00 %
x dB Bandwidth 1.224 MHz
x dB -26.00 dB
Center Freq
2.480000000 GHz
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Appendix C: Maximum conducted output power

Test Result Peak

TestMode	Antenna	Freq(MHz)	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-3.34	≤30	-3.34	≤36	PASS
		2440	-3.70	≤30	-3.70	≤36	PASS
		2480	-3.74	≤30	-3.74	≤36	PASS

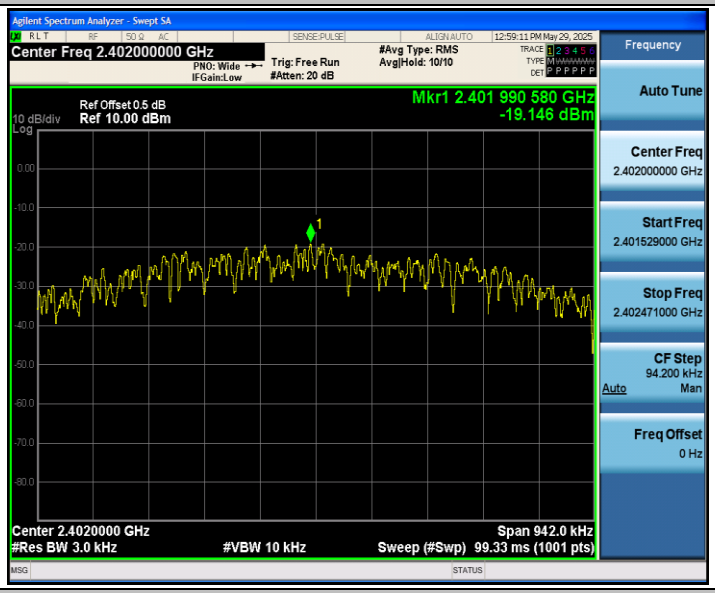
Appendix D: Maximum power spectral density

Test Result

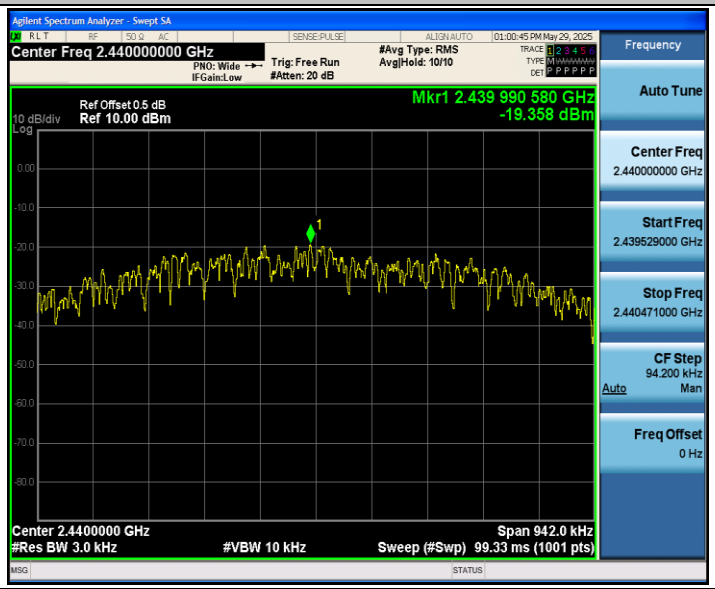
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-19.15	≤8.00	PASS
		2440	-19.36	≤8.00	PASS
		2480	-19.75	≤8.00	PASS

Test Graphs

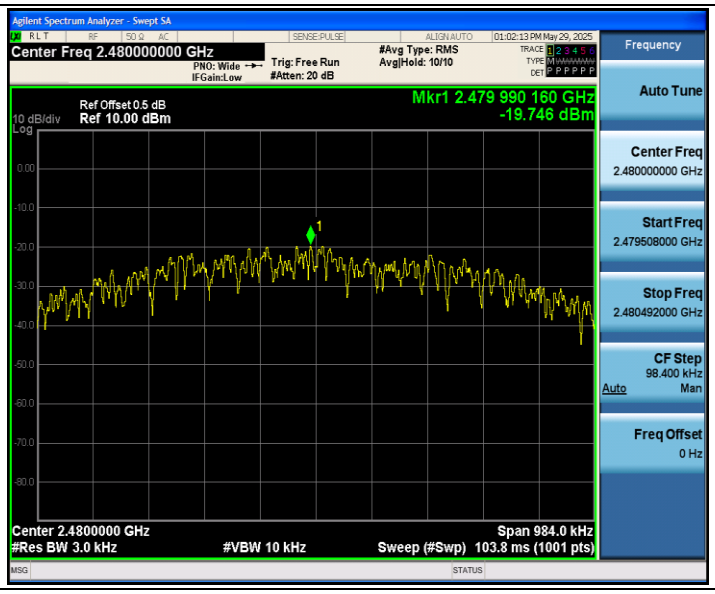
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

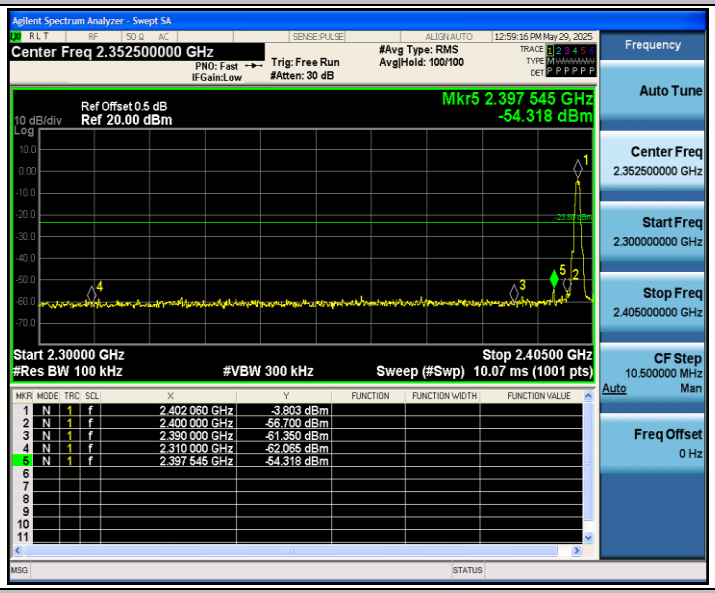
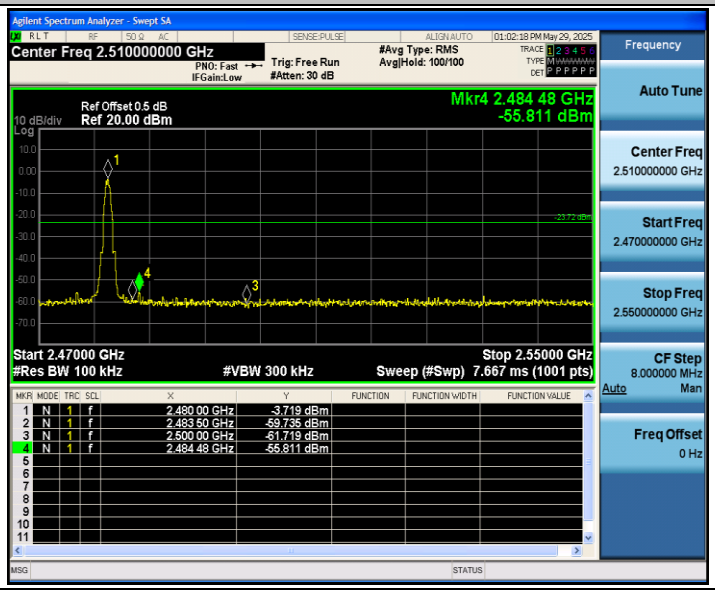

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
01:02:13 PM May 29, 2025
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.479 990 160 GHz
-19.746 dBm
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 984.0 kHz
Sweep (#Swp) 103.8 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479508000 GHz
Stop Freq
2.480492000 GHz
CF Step
98.400 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Appendix E: Band edge measurements

Test Result

TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-3.80	-54.32	≤-23.8	PASS
		High	2480	-3.72	-55.81	≤-23.72	PASS

Test Graphs

BLE_1M_Ant1_Low_2402

BLE_1M_Ant1_High_2480


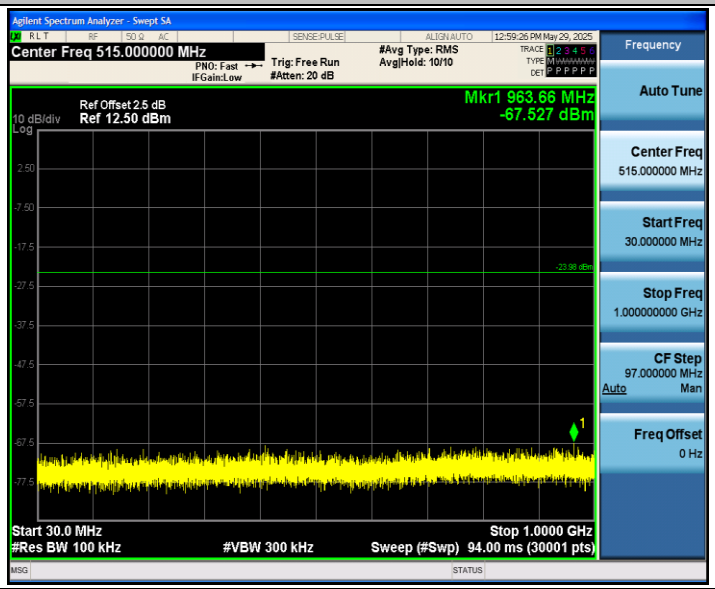
Appendix F: Conducted Spurious Emission

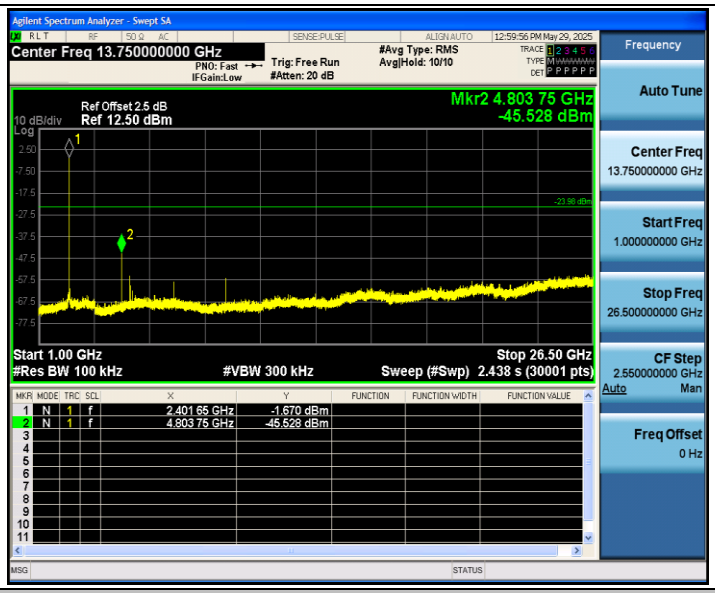
Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-3.98	-3.98	---	PASS
			30~1000	-3.98	-67.53	≤-23.98	PASS
			1000~26500	-3.98	-45.53	≤-23.98	PASS
		2440	Reference	-5.18	-5.18	---	PASS
			30~1000	-5.18	-68.28	≤-25.18	PASS
			1000~26500	-5.18	-48.57	≤-25.18	PASS
		2480	Reference	-4.38	-4.38	---	PASS
			30~1000	-4.38	-67.48	≤-24.38	PASS
			1000~26500	-4.38	-47.33	≤-24.38	PASS

Test Graphs

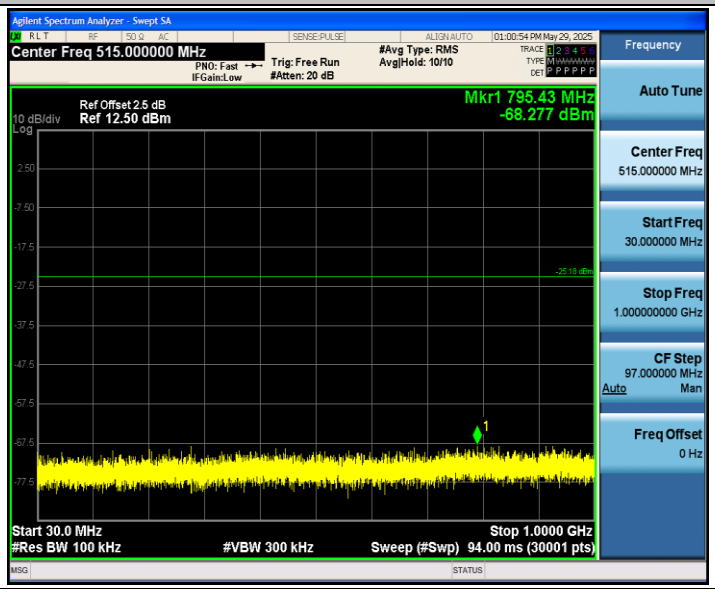
BLE_1M_Ant1_2402_0~Reference

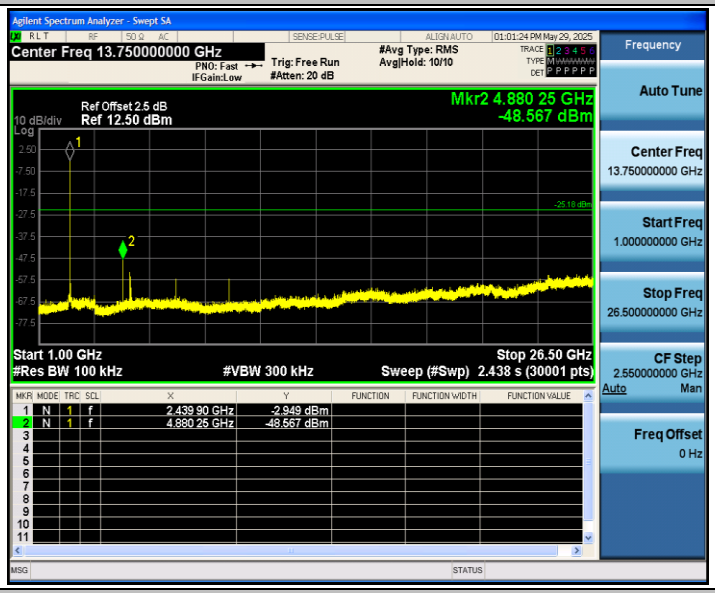
BLE_1M_Ant1_2402_30~1000

BLE_1M_Ant1_2402_1000~26500



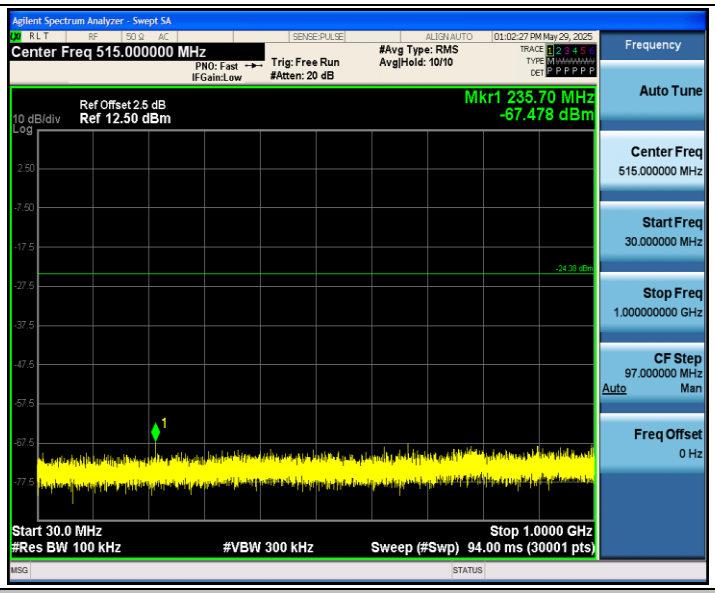
BLE_1M_Ant1_2440_0~Reference

BLE_1M_Ant1_2440_30~1000

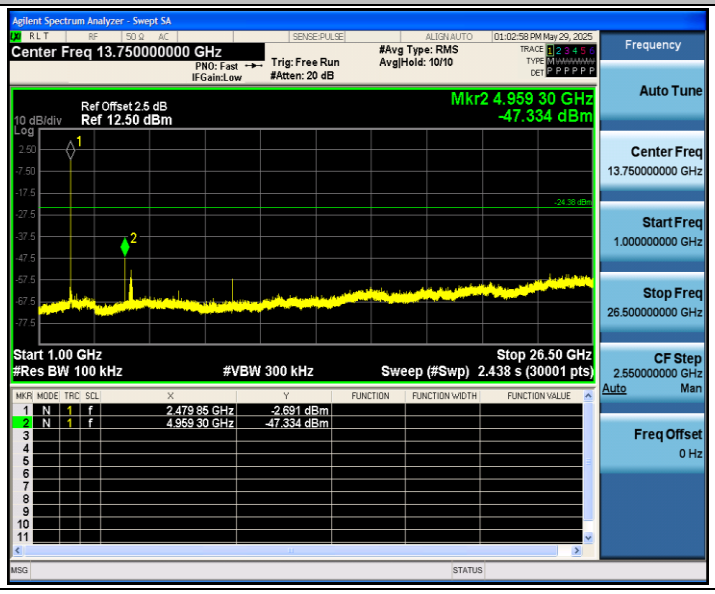


BLE_1M_Ant1_2440_1000~26500

BLE_1M_Ant1_2480_0~Reference

BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500

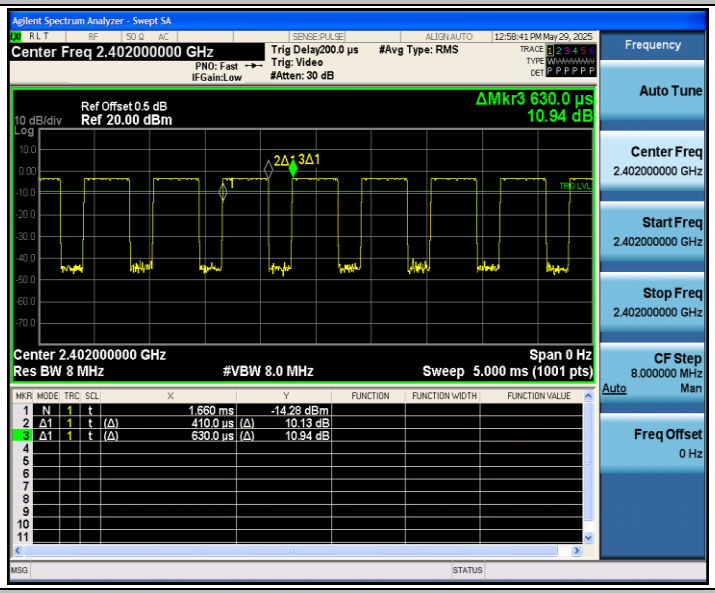
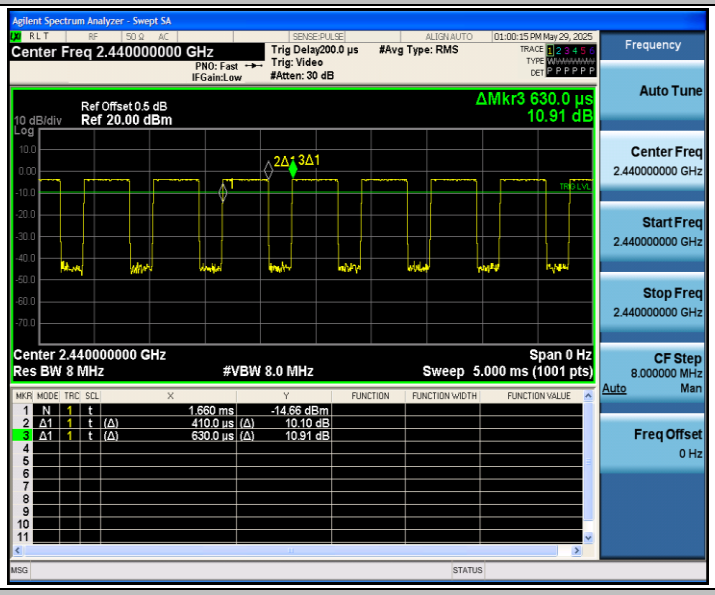


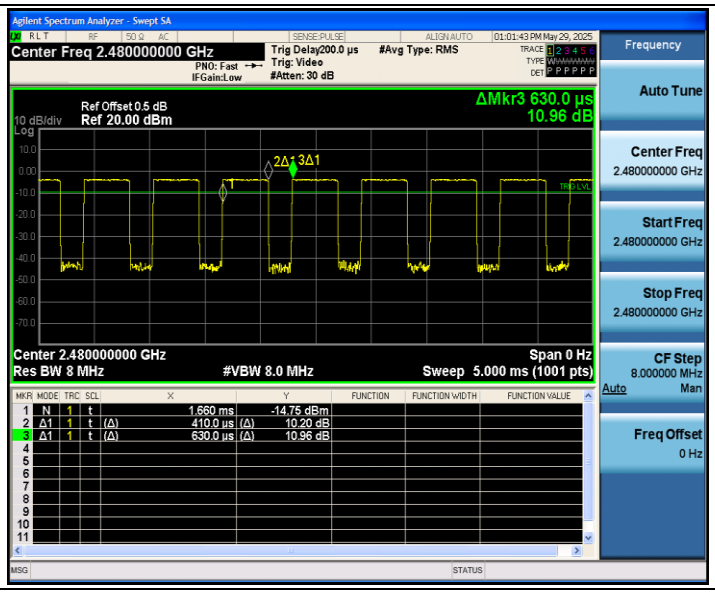
Appendix G: Duty Cycle

Test Result

TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.41	0.63	0.6508	65.08	1.87	---	---
		2440	0.41	0.63	0.6508	65.08	1.87	---	---
		2480	0.41	0.63	0.6508	65.08	1.87	---	---

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig Delay 200.0 µs
Trig: Video
#Atten: 30 dB
#Avg Type: RMS
01:01:43 PM May 29, 2025
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
ΔMkr3 630.0 µs
10.96 dB
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
1 N 1 t 1.660 ms -14.75 dBm
2 Δ1 1 t (Δ) 410.0 µs (Δ) 10.20 dB
3 Δ1 1 t (Δ) 630.0 µs (Δ) 10.96 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