

FCC Appendix RF Test Data for BLE

FCC ID : 2A68F-LP1-PLUS

Company : Shenzhen Hingin Technology Co.,Ltd

EUT : LaserPecker LP1 Plus

Model Number : LP1-PLUS

Report No. : CTA25120901401

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	0.640	2401.696	2402.336	0.5	PASS
		2440	0.656	2439.688	2440.344	0.5	PASS
		2480	0.644	2479.696	2480.340	0.5	PASS

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.402000000 GHz

Ref Offset 0.2 dB
Ref 20.00 dBm

Trig: Free Run
#Atten: 30 dB

#Avg Type: RMS
Avg/Hold: 100/100

Trace 1: 2.402000000 GHz
Type: MWWWWWW
Det: P P P P P

Frequency

Auto Tune

Center Freq 2.402000000 GHz

Start Freq 2.400000000 GHz

Stop Freq 2.404000000 GHz

CF Step 400.000 kHz
Man

Freq Offset 0 Hz

Span 4.000 MHz
Sweep (#Swp) 1.000 ms (1001 pts)

#Res BW 100 kHz
#VBW 300 kHz

Log

10 dB/div

Ref 20.00 dBm

ΔMkr3 640 kHz
0.307 dB

1 2 3Δ1

Center 2.402000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep (#Swp) 1.000 ms (1001 pts)

MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.401696 GHz	-6.224 dBm			
2	N	1	f	2.402000 GHz	-0.233 dBm			
3	Δ1	1	f (Δ)	640 kHz (Δ)	0.307 dB			

MSO

STATUS

BLE_1M_Ant1_2402

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.440000000 GHz

Ref Offset 0.2 dB
Ref 20.00 dBm

Trig: Free Run
#Atten: 30 dB

#Avg Type: RMS
Avg/Hold: 100/100

Trace 1: 2.440000000 GHz
Type: MWWWWWW
Det: P P P P P

Frequency

Auto Tune

Center Freq 2.440000000 GHz

Start Freq 2.438000000 GHz

Stop Freq 2.442000000 GHz

CF Step 400.000 kHz
Man

Freq Offset 0 Hz

Span 4.000 MHz
Sweep (#Swp) 1.000 ms (1001 pts)

#Res BW 100 kHz
#VBW 300 kHz

Log

10 dB/div

Ref 20.00 dBm

ΔMkr3 656 kHz
-0.306 dB

1 2 3Δ1

Center 2.440000 GHz

#Res BW 100 kHz

#VBW 300 kHz

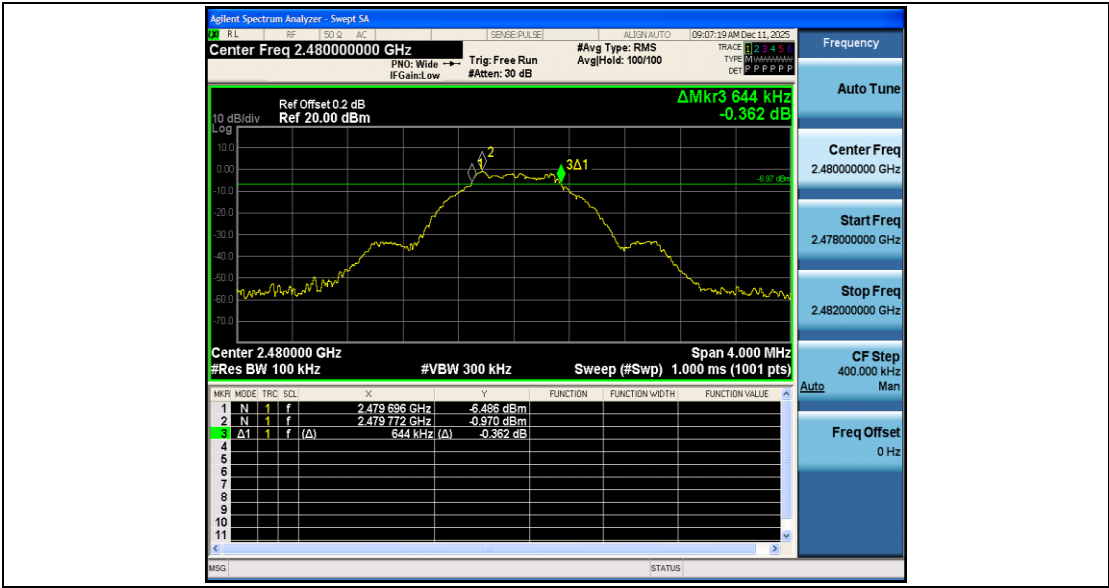
Sweep (#Swp) 1.000 ms (1001 pts)

MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.439688 GHz	-6.566 dBm			
2	N	1	f	2.440004 GHz	-0.918 dBm			
3	Δ1	1	f (Δ)	656 kHz (Δ)	-0.306 dB			

MSO

STATUS

BLE_1M_Ant1_2440

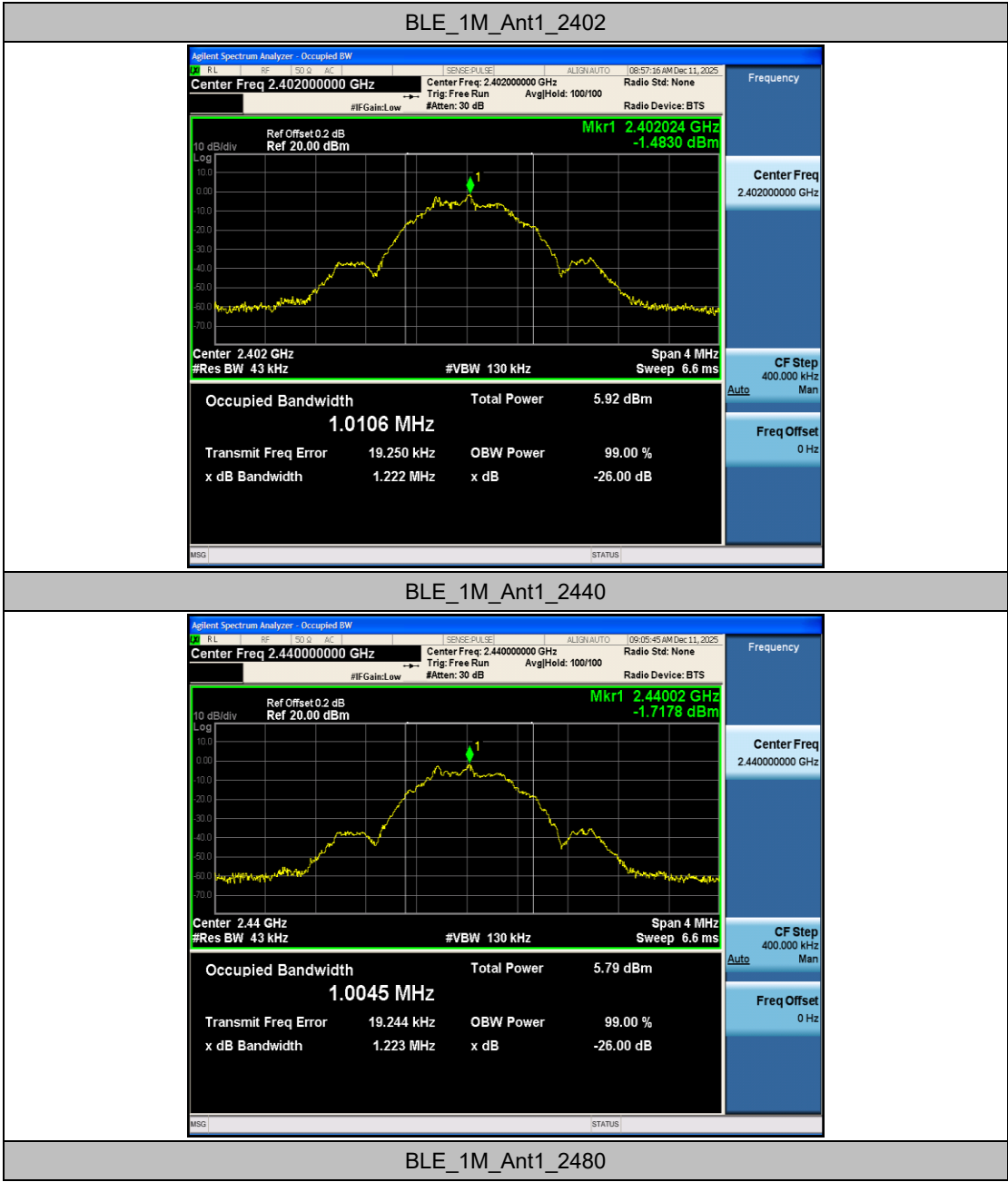


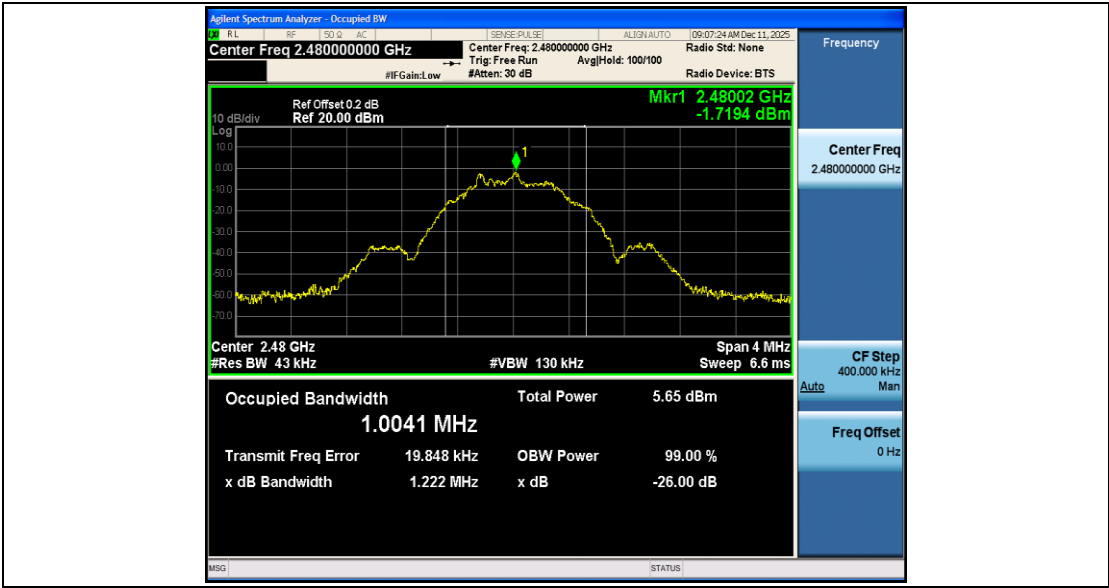
Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0106	2401.5140	2402.5246	---	---
		2440	1.0045	2439.5170	2440.5215	---	---
		2480	1.0041	2479.5178	2480.5219	---	---

Test Graphs





Appendix C: Maximum conducted output power

Test Result Peak

TestMode	Antenna	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-0.12	≤30	PASS
		2440	-0.47	≤30	PASS
		2480	-0.49	≤30	PASS

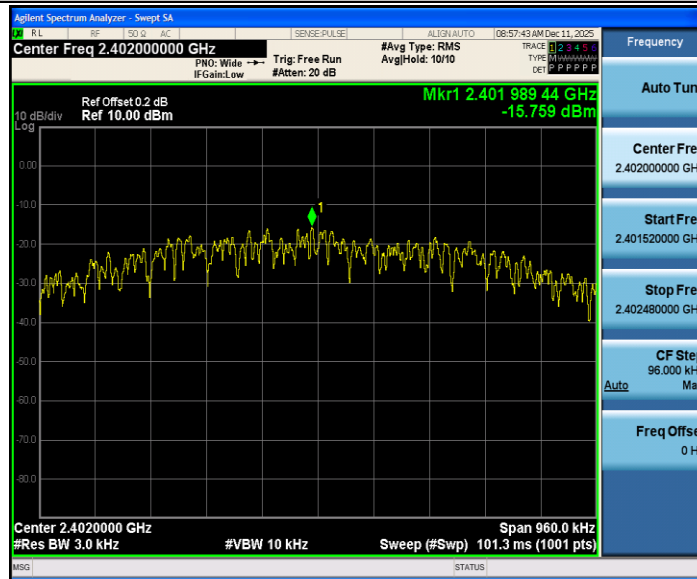
Appendix D: Maximum power spectral density

Test Result

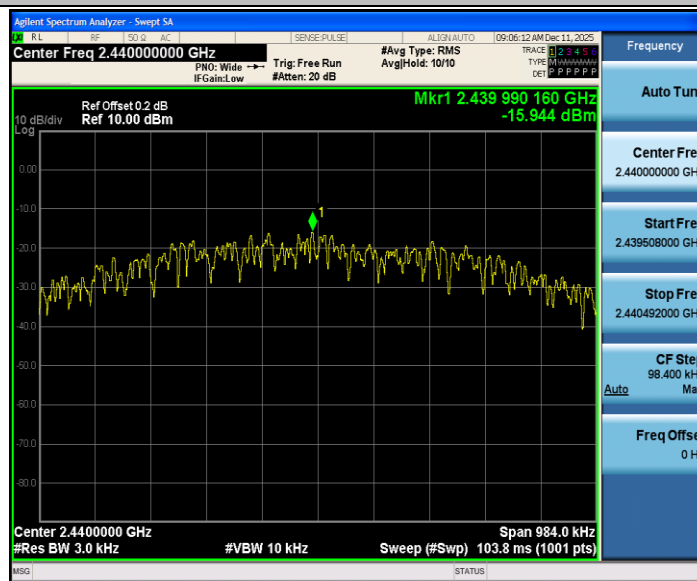
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.76	≤8.00	PASS
		2440	-15.94	≤8.00	PASS
		2480	-16.73	≤8.00	PASS

Test Graphs

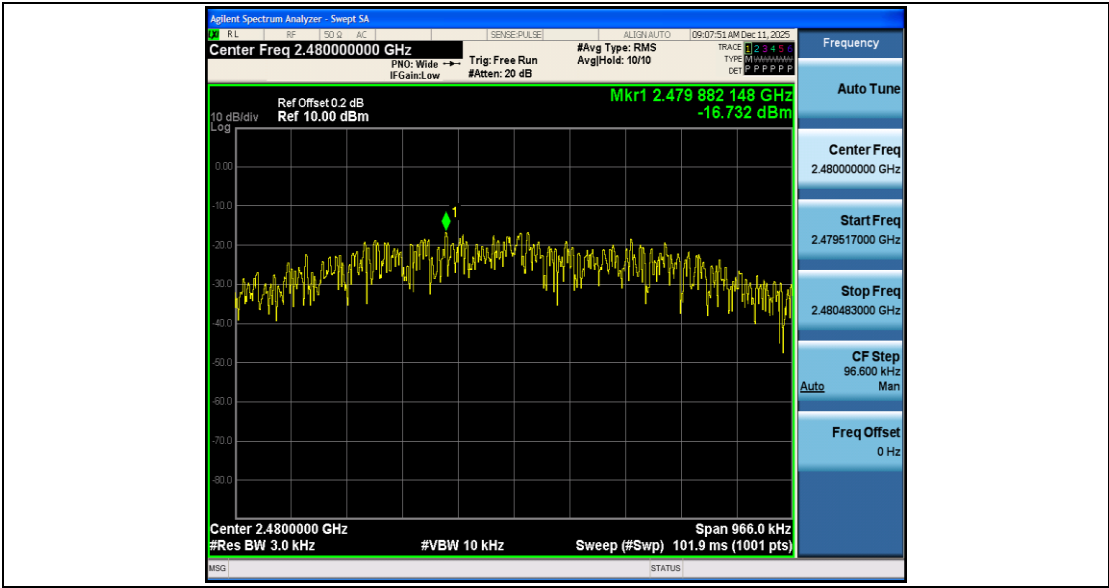
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

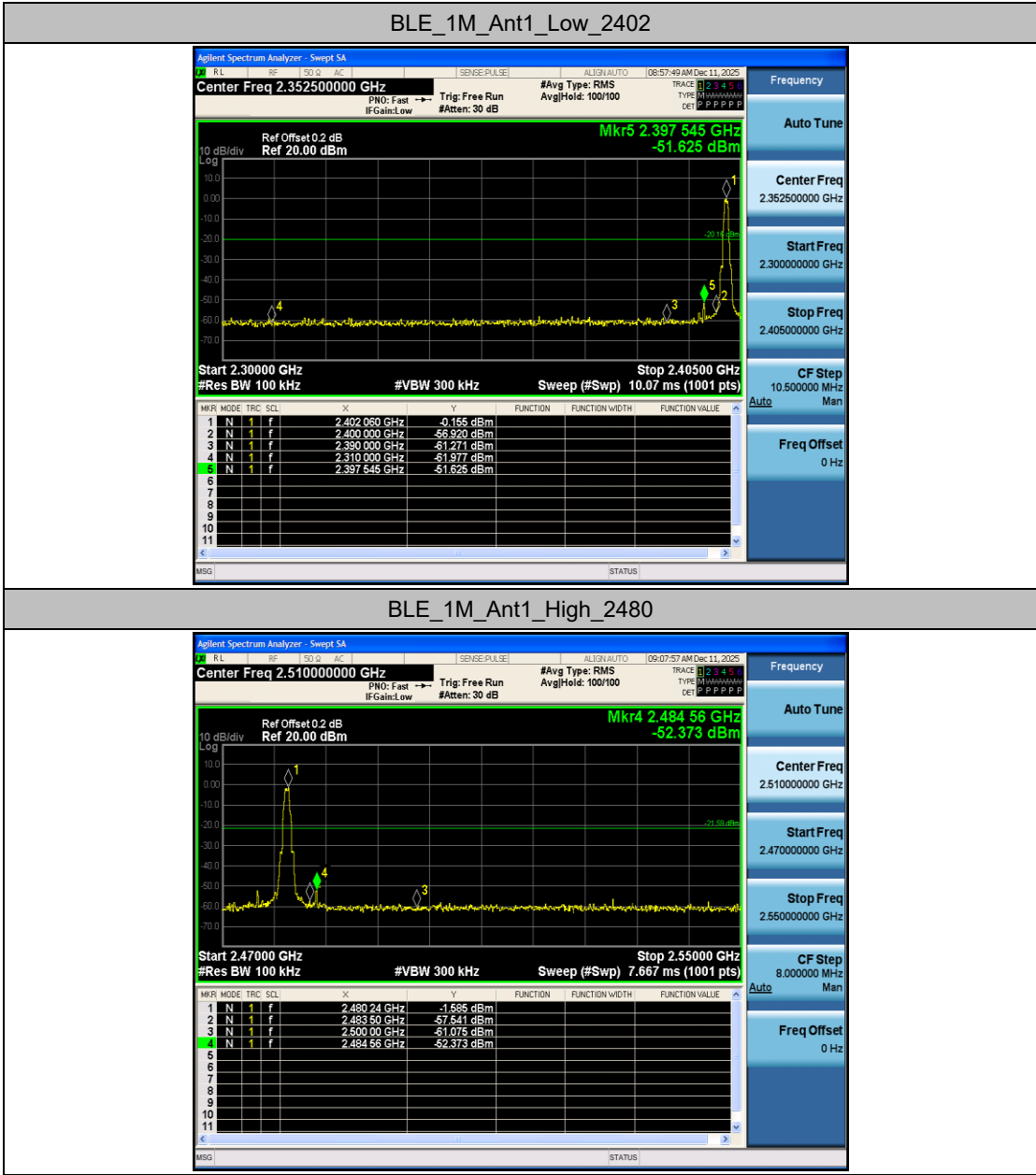


Appendix E: Band edge measurements

Test Result

TestMod e	Antenn a	ChNam e	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdic t
BLE_1M	Ant1	Low	2402	-0.16	-51.63	≤-20.16	PASS
		High	2480	-1.59	-52.37	≤-21.59	PASS

Test Graphs

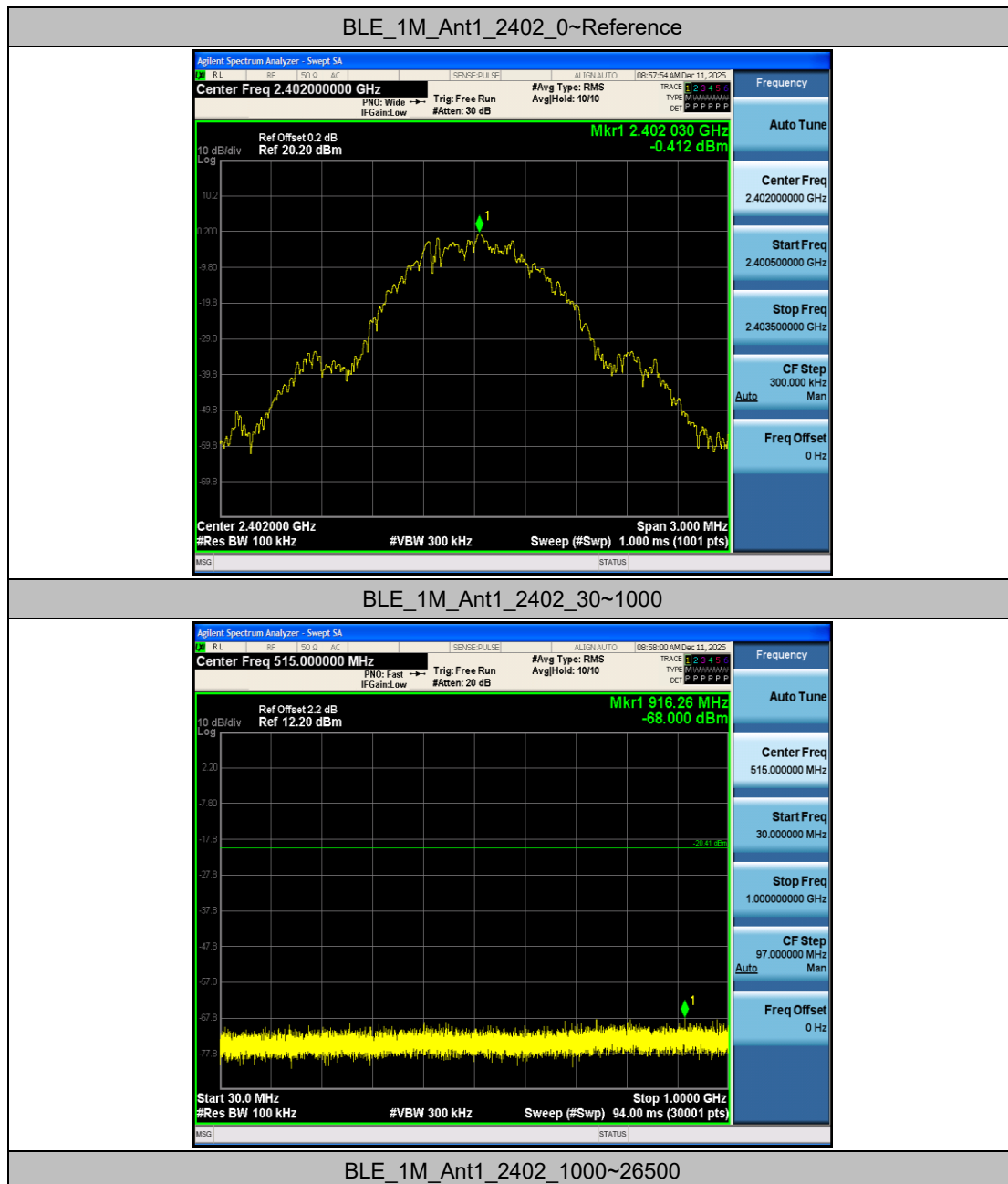


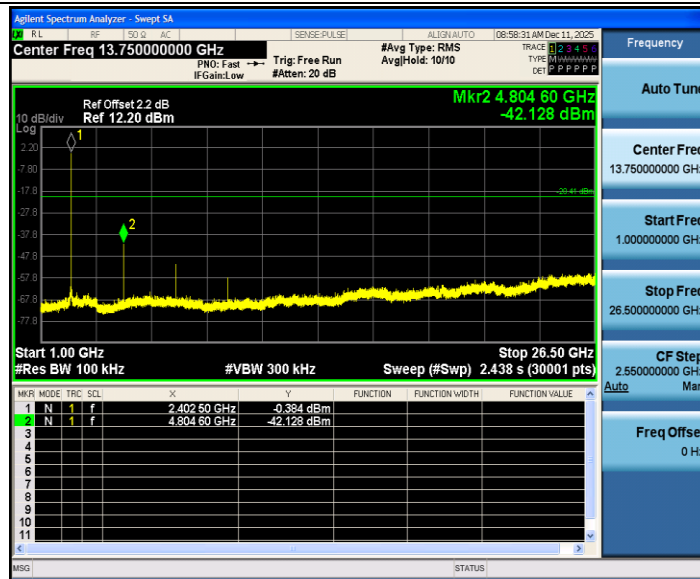
Appendix F: Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.41	-0.41	---	PASS
			30~1000	-0.41	-68	≤-20.41	PASS
			1000~26500	-0.41	-42.13	≤-20.41	PASS
		2440	Reference	-2.48	-2.48	---	PASS
			30~1000	-2.48	-68.3	≤-22.48	PASS
			1000~26500	-2.48	-42.39	≤-22.48	PASS
		2480	Reference	-2.03	-2.03	---	PASS
			30~1000	-2.03	-65.34	≤-22.03	PASS
			1000~26500	-2.03	-41.87	≤-22.03	PASS

Test Graphs

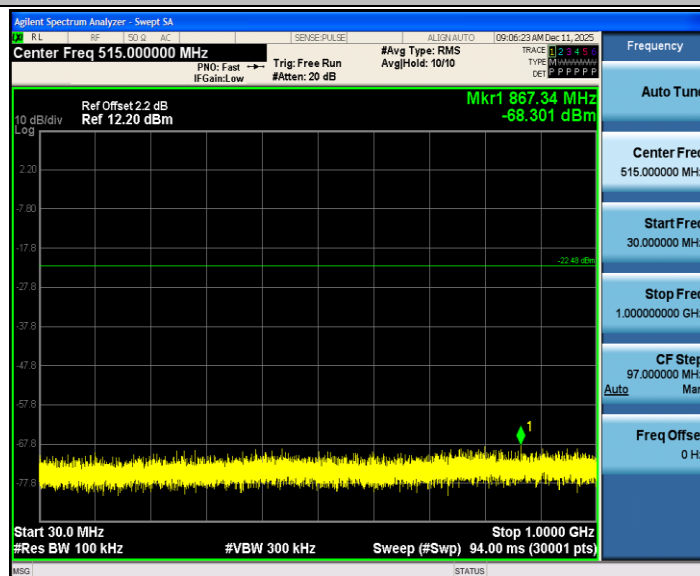




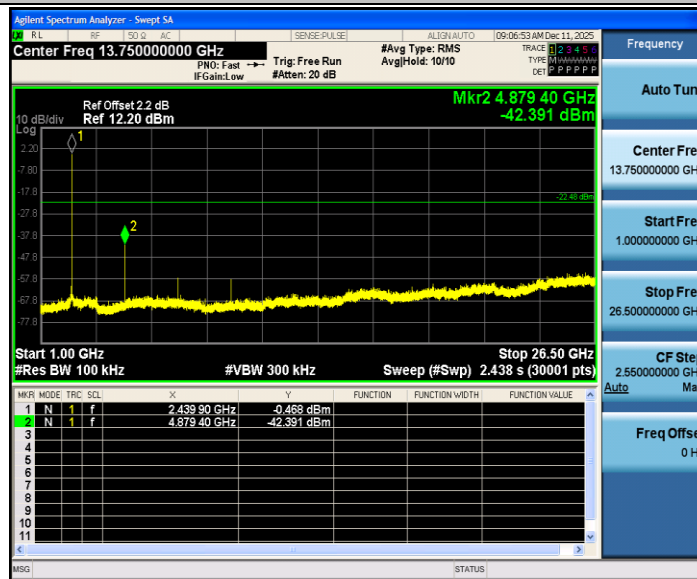
BLE_1M_Ant1_2440_0~Reference



BLE_1M_Ant1_2440_30~1000



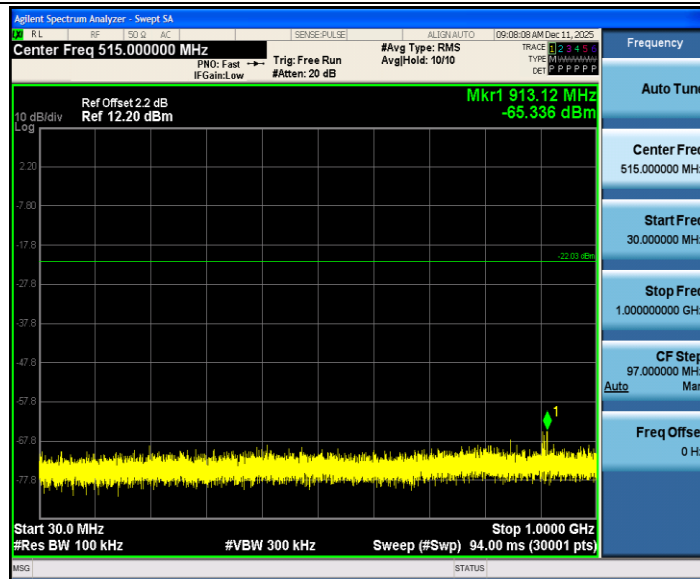
BLE_1M_Ant1_2440_1000~26500



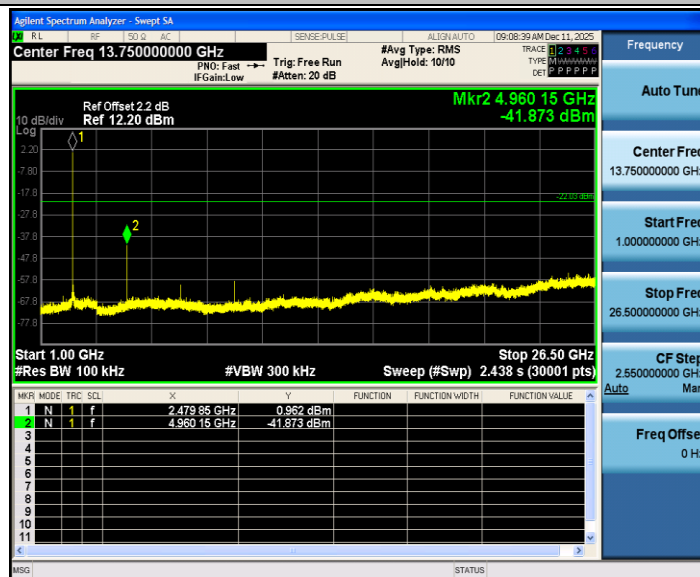
BLE_1M_Ant1_2480_0~Reference



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	0.62	0.6613	66.13	1.80	---	---
		2440	0.41	0.62	0.6613	66.13	1.80	---	---
		2480	0.41	0.62	0.6613	66.13	1.80	---	---

Test Graphs

