

FCC Appendix RF Test Data for BLE

FCC ID : 2AHWR-SS14

Company : Shot Scope Technologies Ltd

EUT : Launch Monitor

Model Number : Shot Scope LM1

Report No. : CTA26012600301

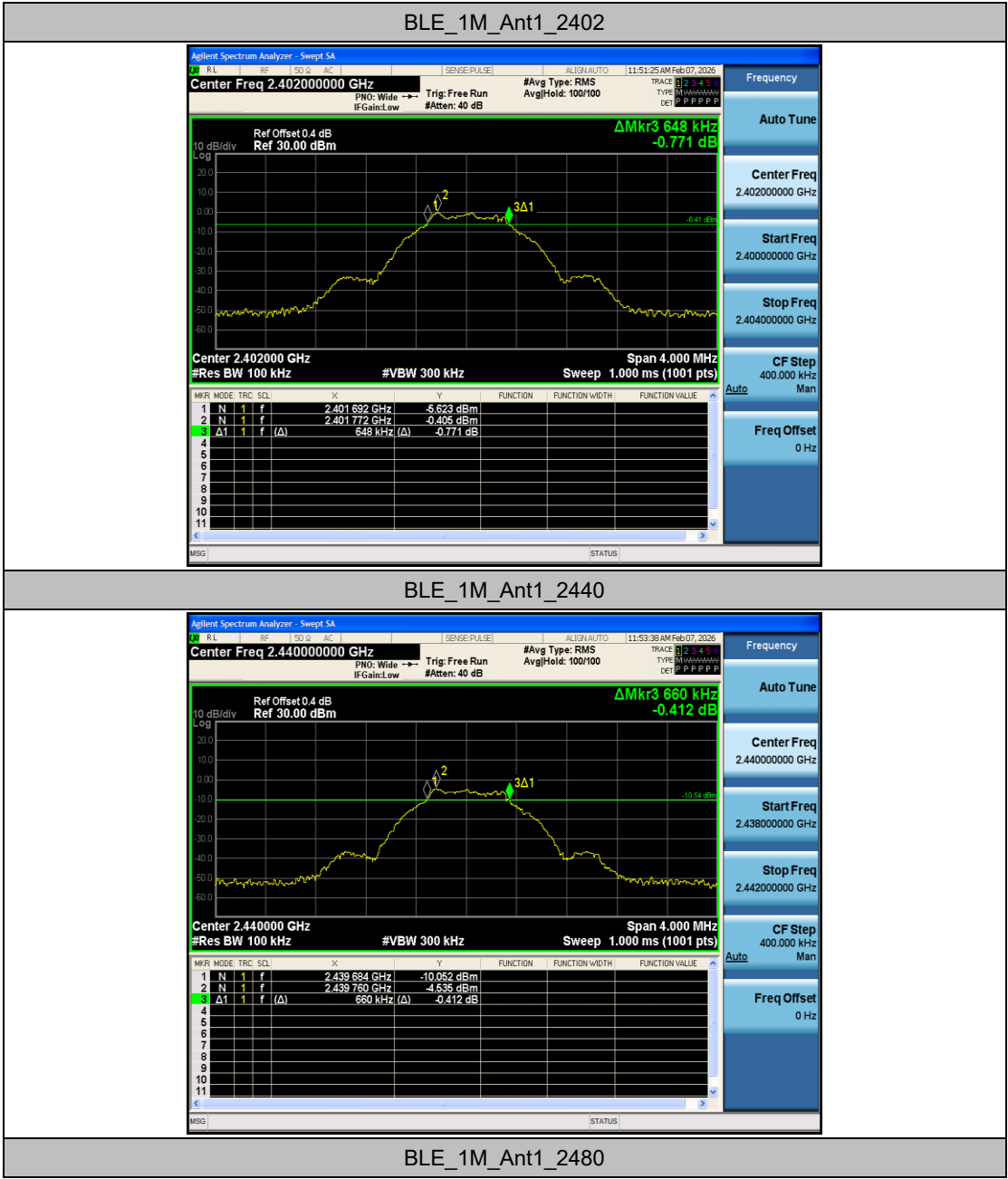
Reviewed By : Eric Wang

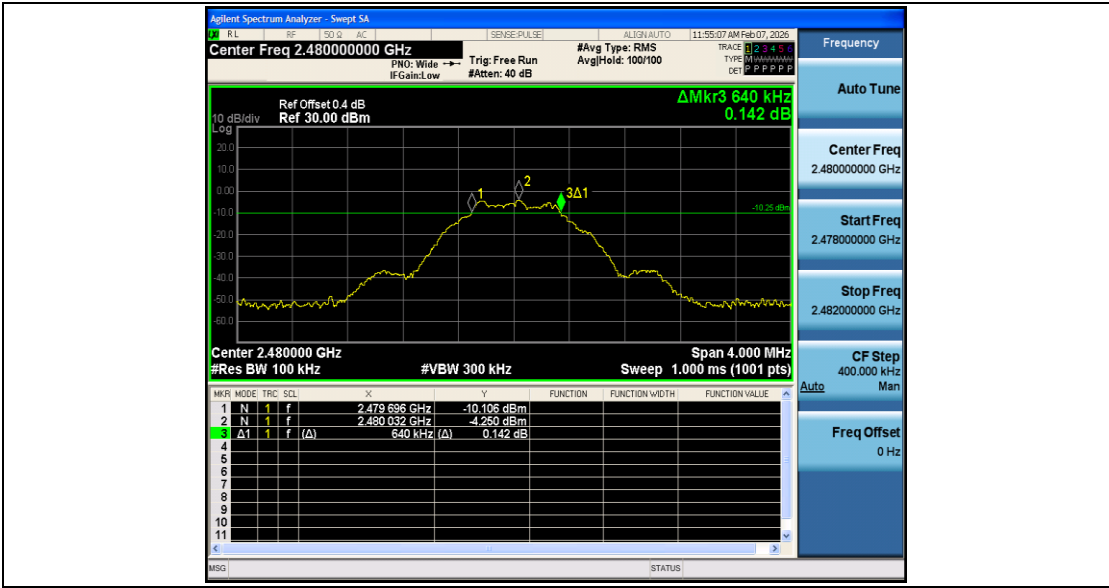
Appendix A: DTS Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.648	2401.692	2402.340	0.5	PASS
		2440	0.660	2439.684	2440.344	0.5	PASS
		2480	0.640	2479.696	2480.336	0.5	PASS

Test Graphs



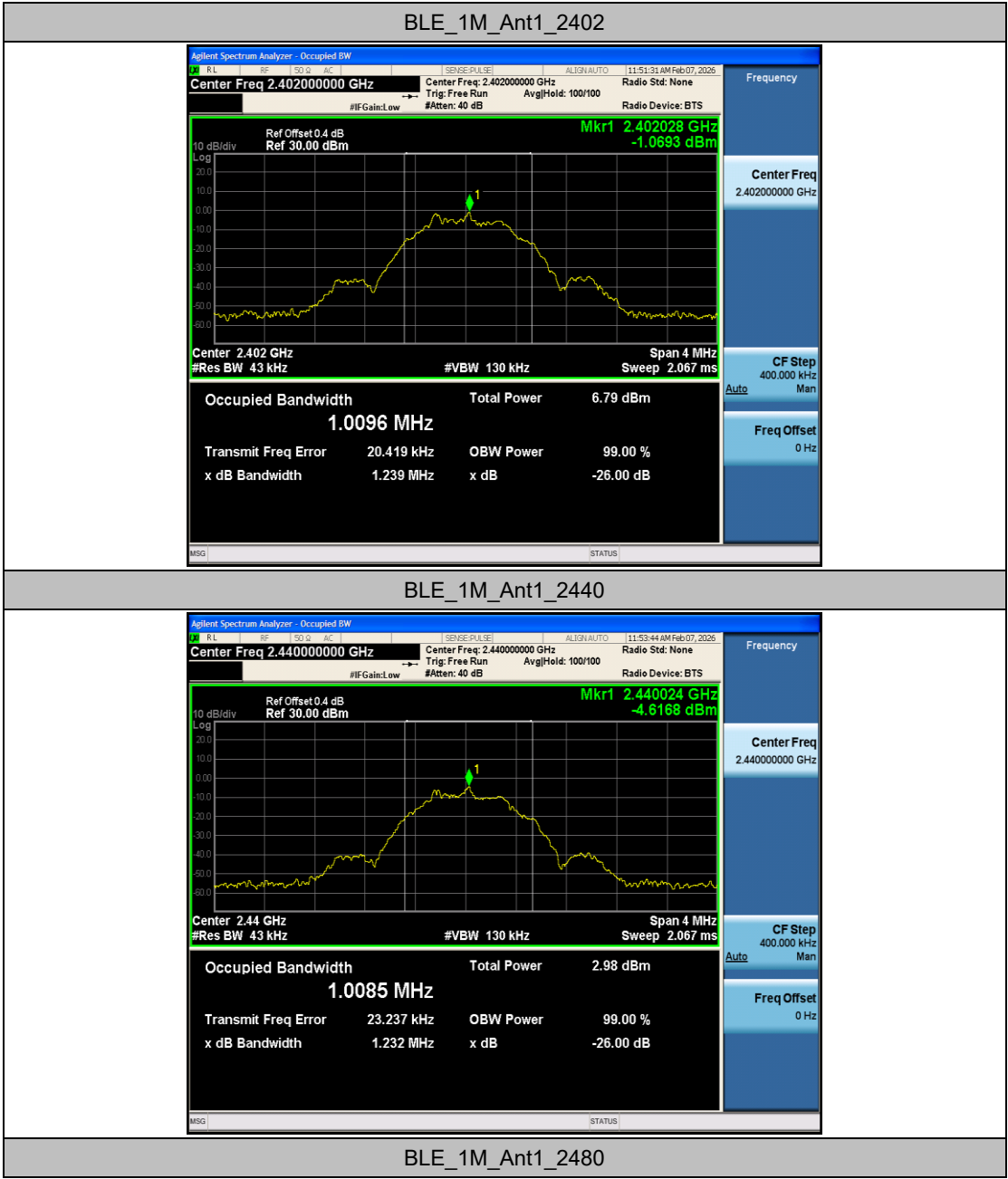


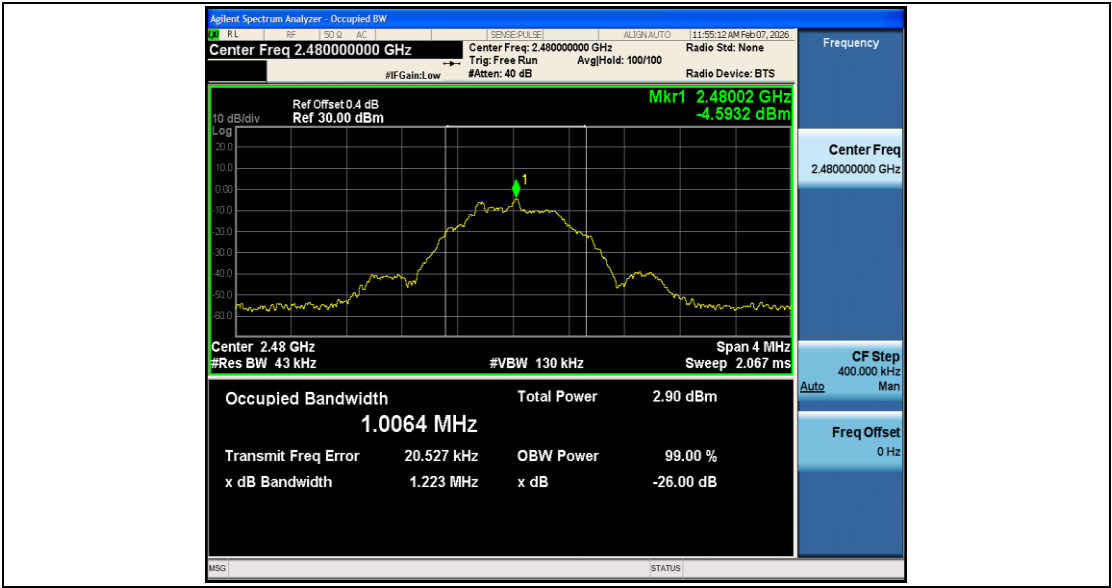
Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0096	2401.5156	2402.5252	---	---
		2440	1.0085	2439.5190	2440.5275	---	---
		2480	1.0064	2479.5173	2480.5237	---	---

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	0.11	≤30	PASS
		2440	-3.68	≤30	PASS
		2480	-3.76	≤30	PASS

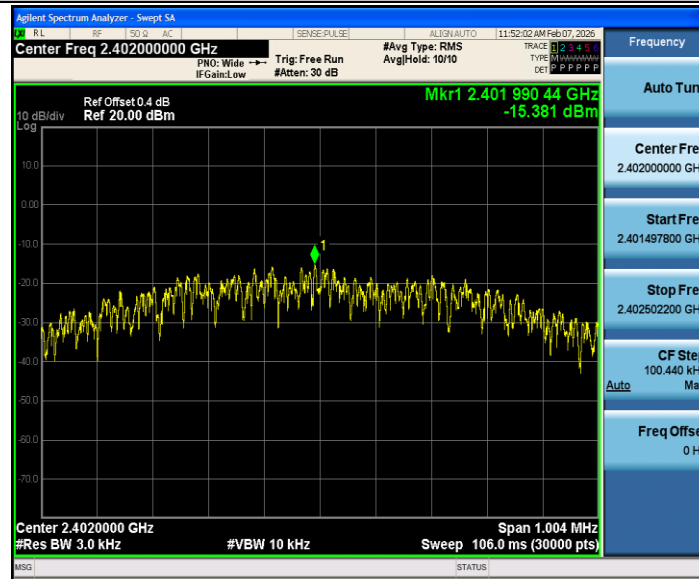
Appendix D: Maximum power spectral density

Test Result

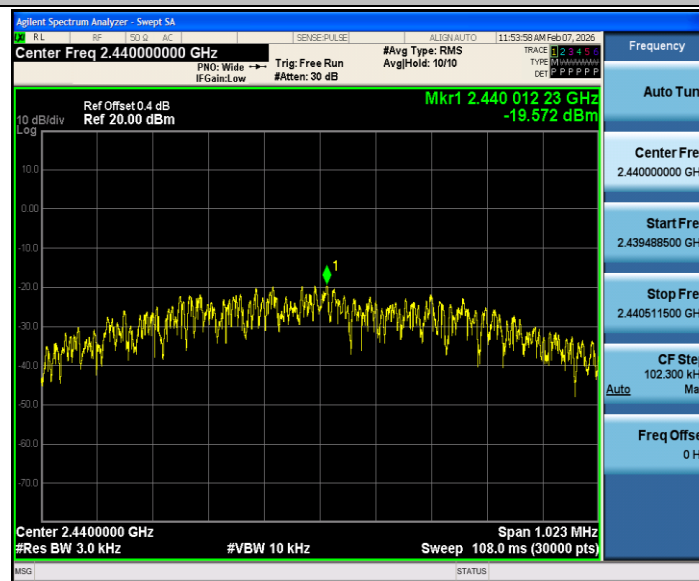
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.38	≤8.00	PASS
		2440	-19.57	≤8.00	PASS
		2480	-19.59	≤8.00	PASS

Test Graphs

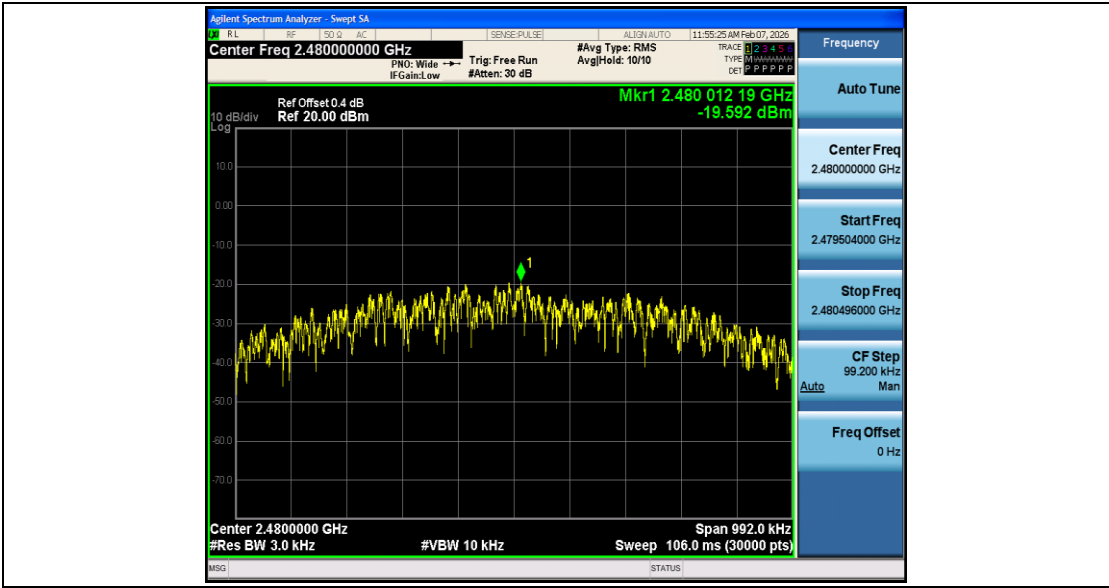
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



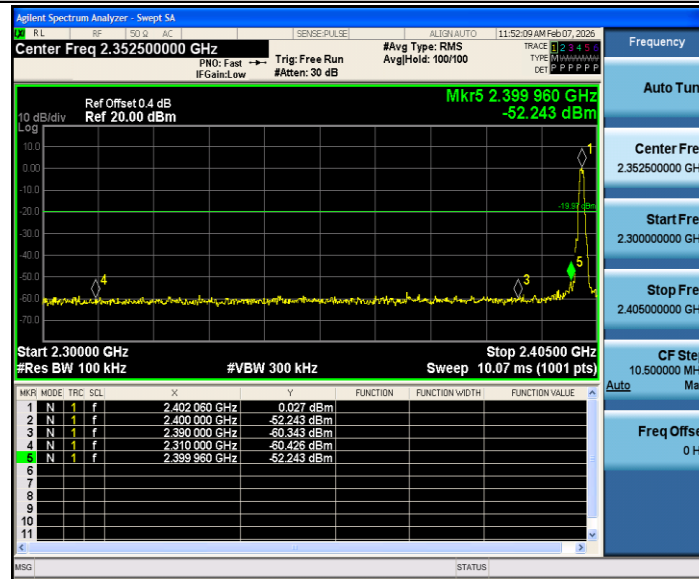
Appendix E: Band edge measurements

Test Result

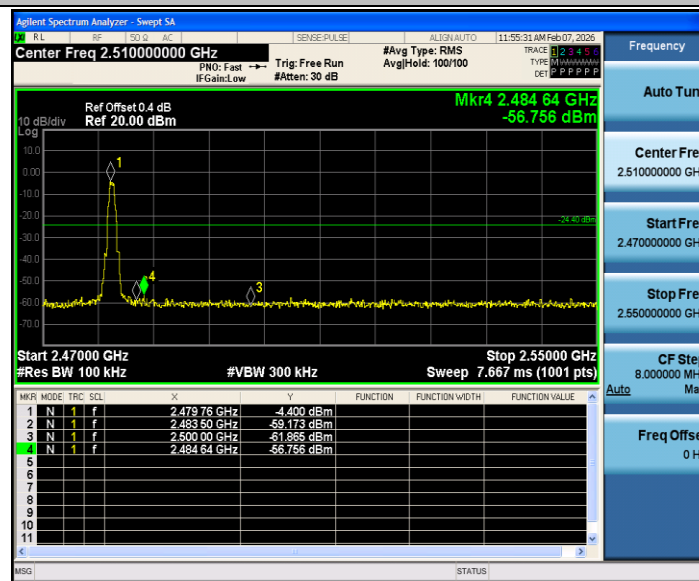
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.03	-52.24	≤-19.97	PASS
		High	2480	-4.40	-56.76	≤-24.4	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480

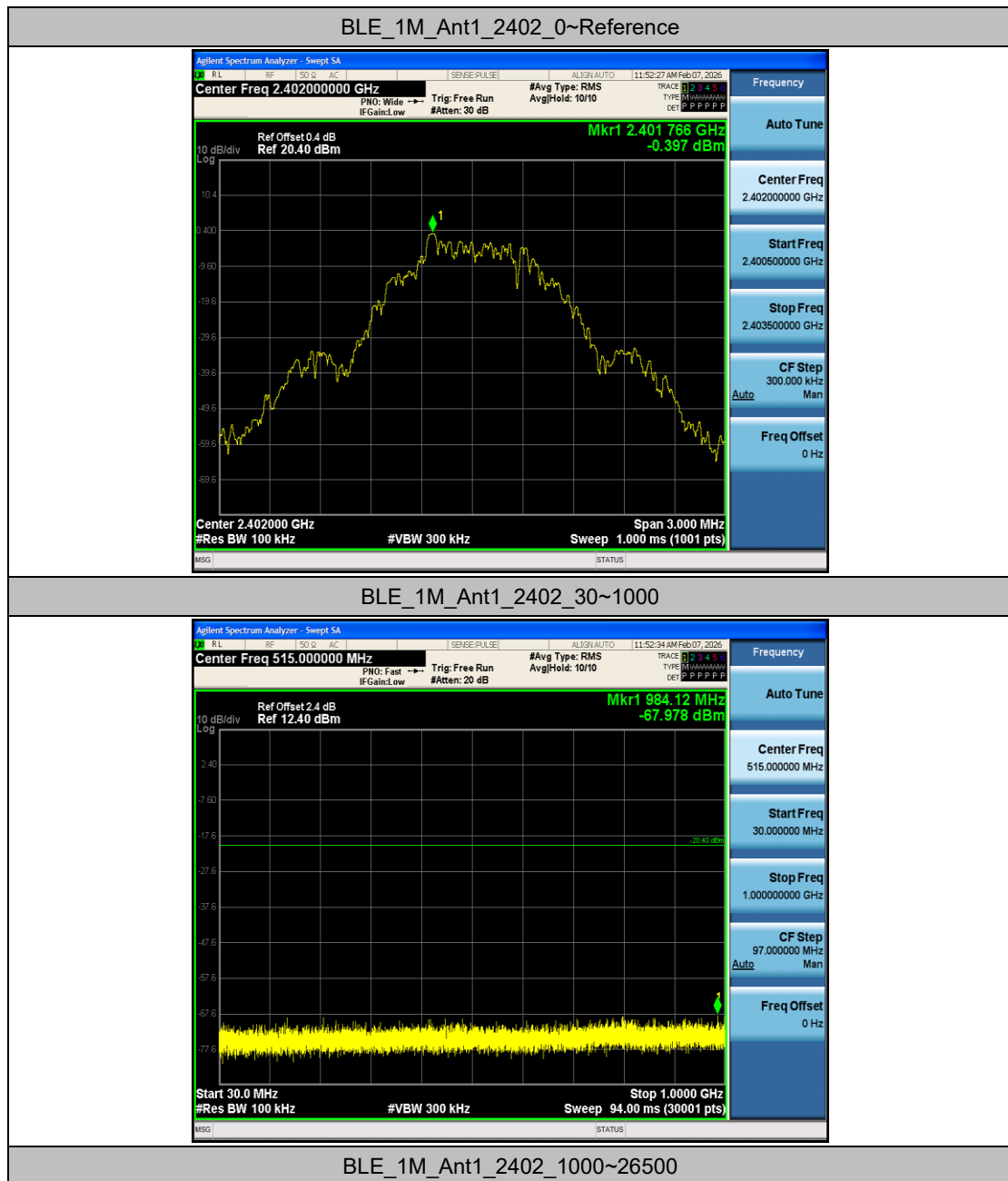


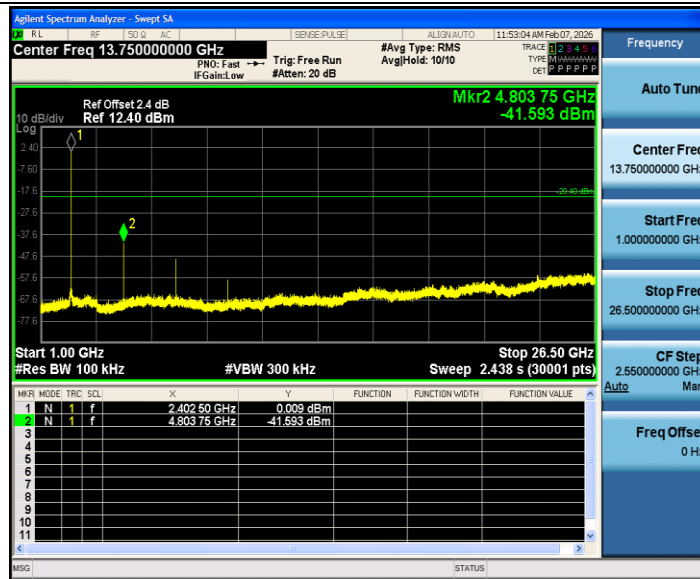
Appendix F: Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.40	-0.40	---	PASS
			30~1000	-0.40	-67.98	≤-20.4	PASS
			1000~26500	-0.40	-41.59	≤-20.4	PASS
		2440	Reference	-5.01	-5.01	---	PASS
			30~1000	-5.01	-68.86	≤-25.01	PASS
			1000~26500	-5.01	-46.66	≤-25.01	PASS
		2480	Reference	-4.48	-4.48	---	PASS
			30~1000	-4.48	-67.88	≤-24.48	PASS
			1000~26500	-4.48	-47.66	≤-24.48	PASS

Test Graphs

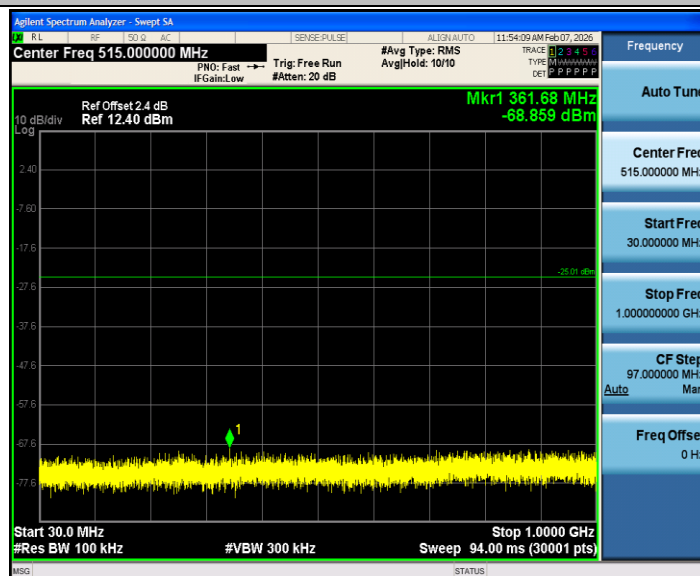




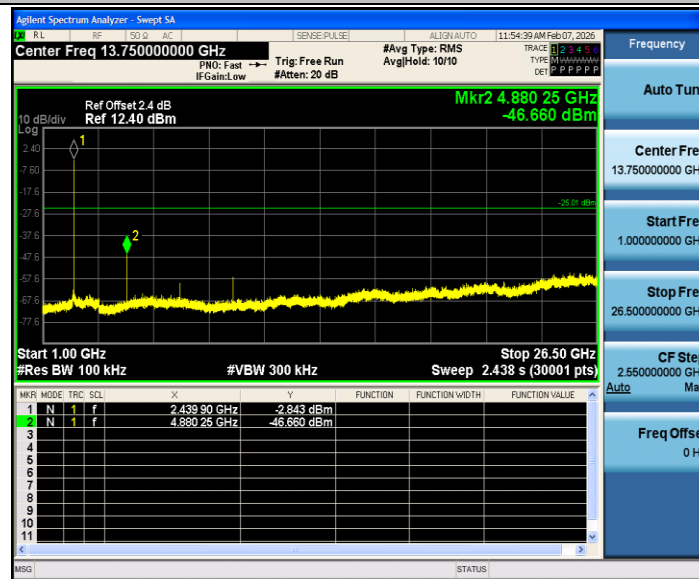
BLE_1M_Ant1_2440_0~Reference



BLE_1M_Ant1_2440_30~1000



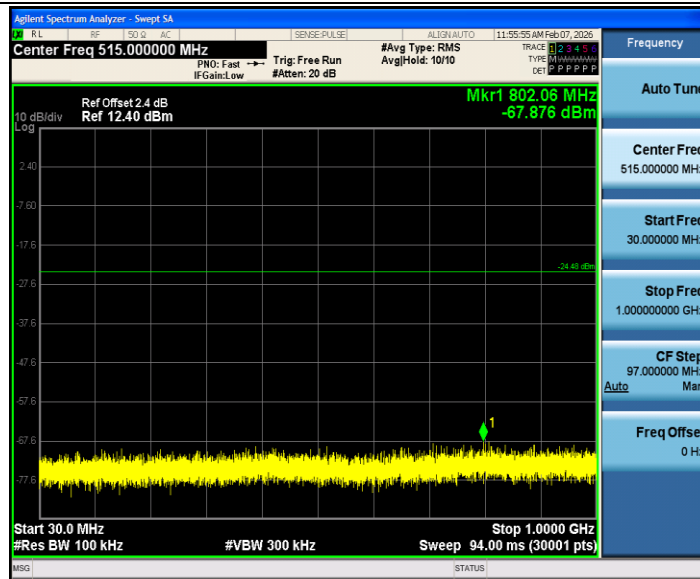
BLE_1M_Ant1_2440_1000~26500



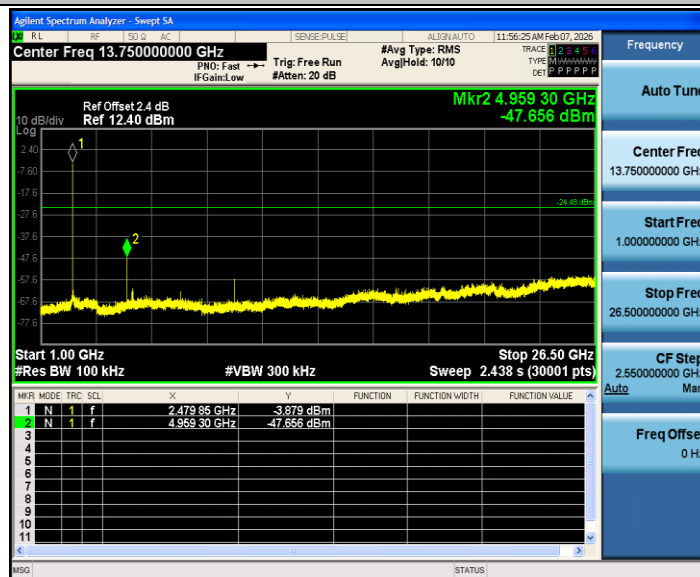
BLE_1M_Ant1_2480_0~Reference



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	---	---

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.402000000 GHz

Trig Delay: 2.000 ms #Avg Type: RMS

Ref Offset 0.4 dB Ref 20.40 dBm

PHO: Fast IF Gain: Low #Atten: 30 dB

Trig: Video

TYPE: WWWWWWWW DET: P P P P P

Frequency

Auto Tune

Center Freq 2.402000000 GHz

Start Freq 2.402000000 GHz

Stop Freq 2.402000000 GHz

CF Step 8.000000 MHz

Freq Offset 0 Hz

Span 0 Hz

Res BW 8 MHz #VBW 8.0 MHz Sweep 1.000 ms (1001 pts)

ΔMkr3 620.0 μs -10.64 dB

2Δ1

3Δ1

MKR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	t		120.0 μs	-11.62 dBm		
2	Δ1	1	t	(Δ)	410.0 μs (Δ)	-22.50 dB		
3	Δ1	1	t	(Δ)	620.0 μs (Δ)	-10.64 dB		

MSG (STATUS)

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.440000000 GHz

Trig Delay: 2.000 ms #Avg Type: RMS

Ref Offset 0.4 dB Ref 20.40 dBm

PHO: Fast IF Gain: Low #Atten: 30 dB

Trig: Video

TYPE: WWWWWWWW DET: P P P P P

Frequency

Auto Tune

Center Freq 2.440000000 GHz

Start Freq 2.440000000 GHz

Stop Freq 2.440000000 GHz

CF Step 8.000000 MHz

Freq Offset 0 Hz

Span 0 Hz

Res BW 8 MHz #VBW 8.0 MHz Sweep 1.000 ms (1001 pts)

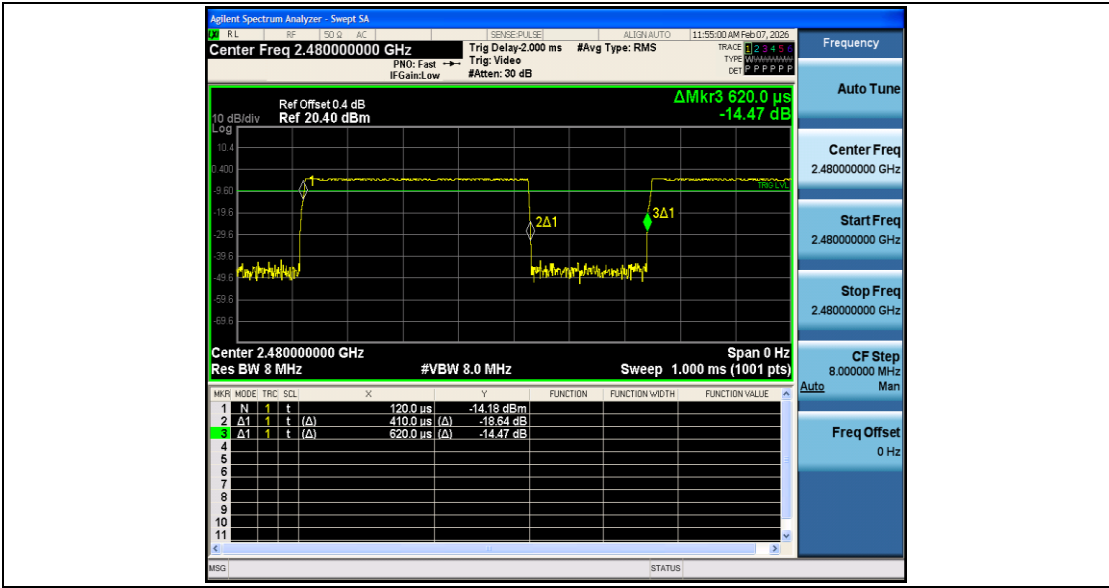
ΔMkr3 620.0 μs -32.58 dB

2Δ1

3Δ1

MKR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	t		120.0 μs	-16.75 dBm		
2	Δ1	1	t	(Δ)	410.0 μs (Δ)	-11.26 dB		
3	Δ1	1	t	(Δ)	620.0 μs (Δ)	-32.58 dB		

MSG (STATUS)



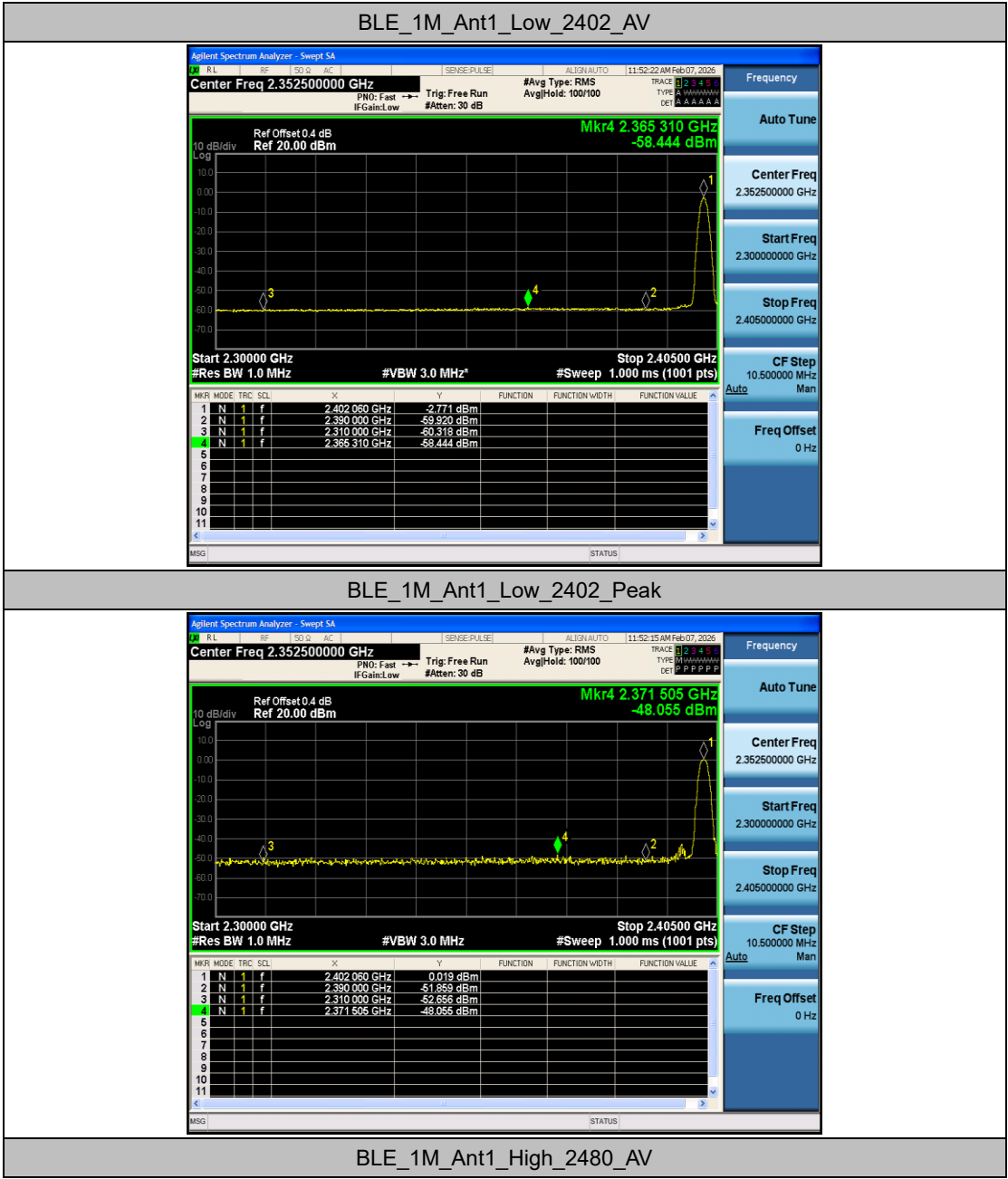
Appendix H: Emissions in Restricted Bands

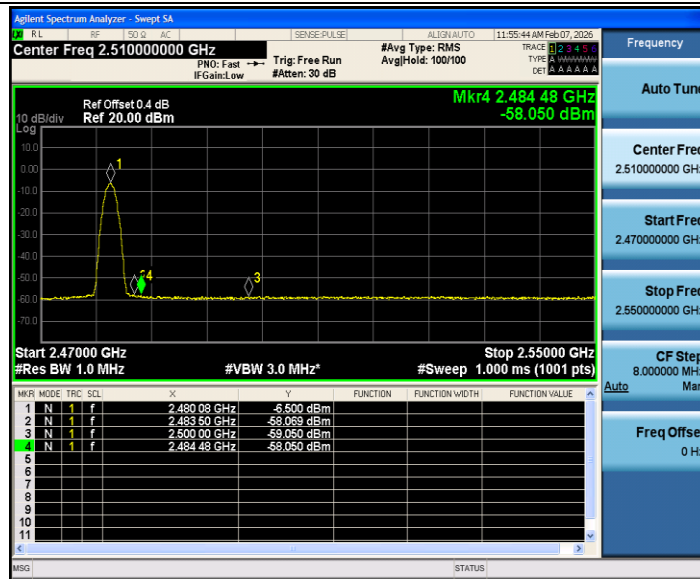
Test Result

TestMode	Antenna	Channel Name	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Gain [dB]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-60.32	2.00	1.80	38.68	≤54	PASS
				AV	2365.310	-58.44	2.00	1.80	40.56	≤54	PASS
				AV	2390.000	-59.92	2.00	1.80	39.08	≤54	PASS
				Peak	2310.000	-52.66	2.00	0.00	44.54	≤74	PASS
				Peak	2371.505	-48.05	2.00	0.00	49.15	≤74	PASS
				Peak	2390.000	-51.86	2.00	0.00	45.34	≤74	PASS
		High	2480	AV	2483.500	-58.07	2.00	1.80	40.93	≤54	PASS
				AV	2484.480	-58.05	2.00	1.80	40.95	≤54	PASS
				AV	2500.000	-59.05	2.00	1.80	39.95	≤54	PASS
				Peak	2483.500	-50.01	2.00	0.00	47.19	≤74	PASS
				Peak	2484.400	-46.83	2.00	0.00	50.37	≤74	PASS
				Peak	2500.000	-51.08	2.00	0.00	46.12	≤74	PASS

Note: The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs





BLE_1M_Ant1_High_2480_Peak

