

FCC Appendix RF Test Data for BLE

FCC ID : 2BAQY-SVANAR2R

Company : HIFIMAN KUNSHAN TECHNOLOGY GROUP CO., LTD.

EUT : True Wireless Earbuds

Model Number : Svanar wireless 2-R

Report No. : CTA26072802101

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	2401.692	2402.332	0.5	PASS
		2440	0.652	2439.688	2440.340	0.5	PASS
		2480	0.636	2479.696	2480.332	0.5	PASS

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.402000000 GHz

Ref Offset 0.4 dB
Ref 30.00 dBm

Trig: Free Run
#Atten: 40 dB

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

Span 4.000 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.000 ms (1001 pts)

ΔMkr3 640 kHz
0.050 dB

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

MSG

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.440000000 GHz

Ref Offset 0.4 dB
Ref 30.00 dBm

Trig: Free Run
#Atten: 40 dB

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

Span 4.000 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.000 ms (1001 pts)

ΔMkr3 652 kHz
-0.264 dB

Frequency

Auto Tune

Center Freq
2.440000000 GHz

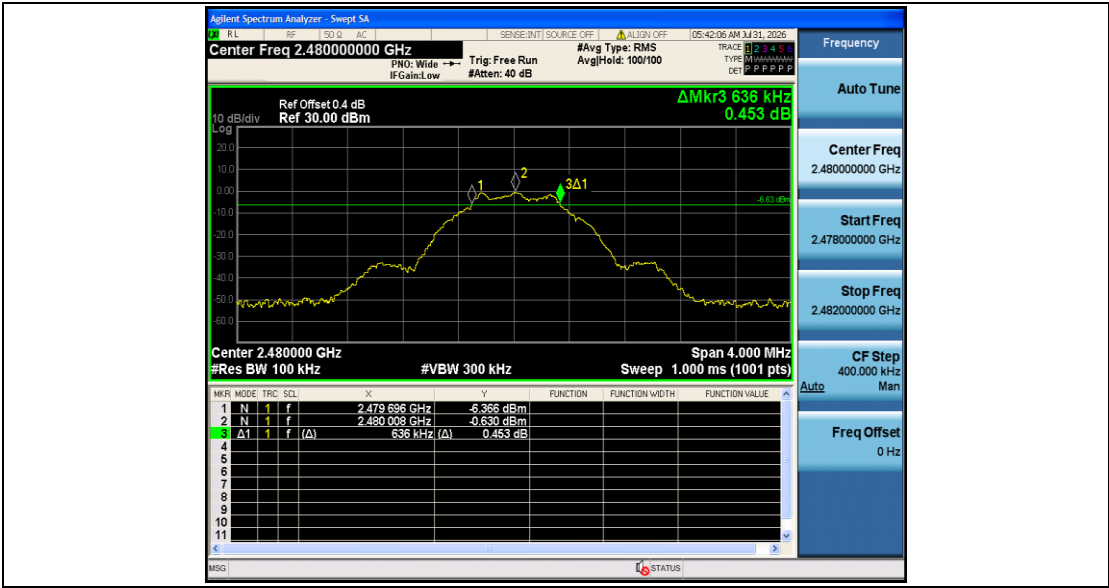
Start Freq
2.438000000 GHz

Stop Freq
2.442000000 GHz

CF Step
400.000 kHz
Man

Freq Offset
0 Hz

MSG

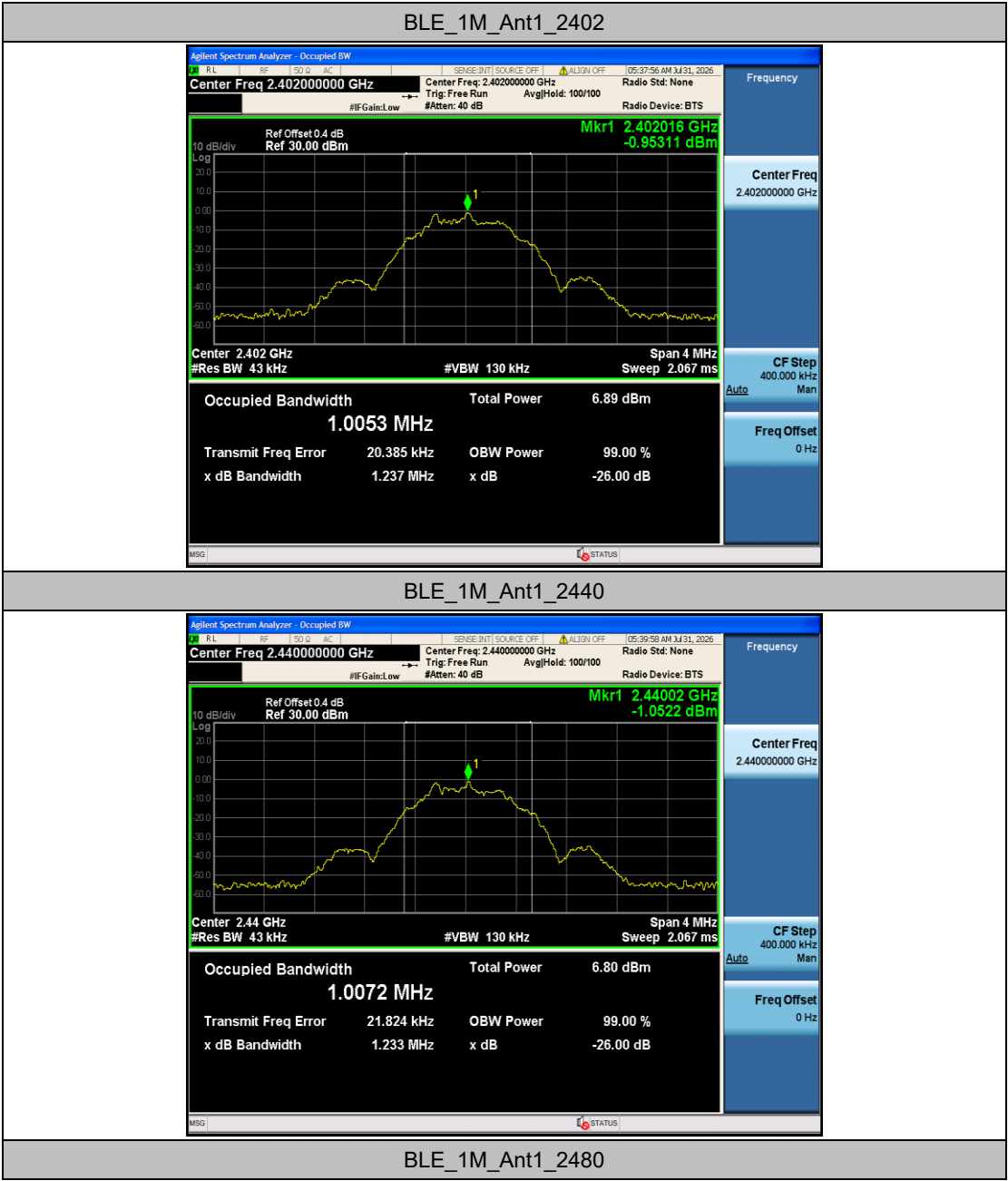


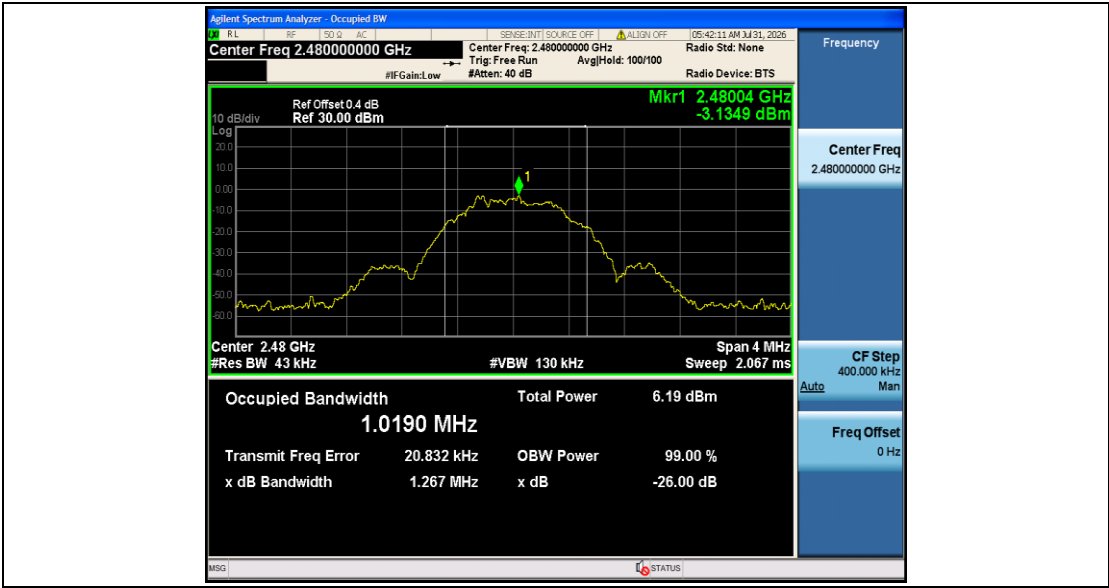
Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0053	2401.5177	2402.5230	---	---
		2440	1.0072	2439.5182	2440.5254	---	---
		2480	1.0190	2479.5113	2480.5303	---	---

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	0.10	≤30	PASS
		2440	-0.01	≤30	PASS
		2480	-0.31	≤30	PASS

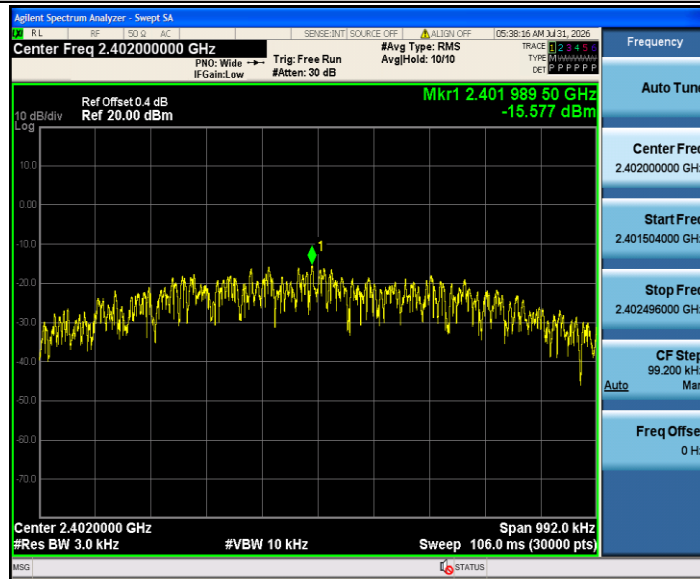
Appendix D: Maximum power spectral density

Test Result

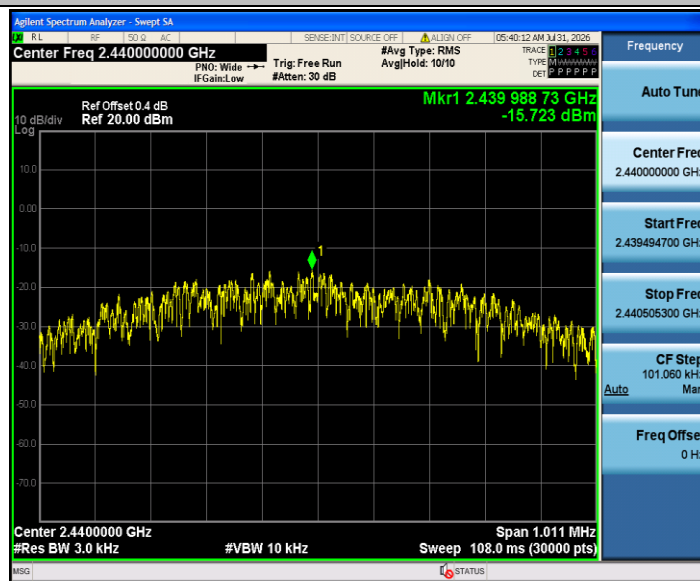
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.58	≤8.00	PASS
		2440	-15.72	≤8.00	PASS
		2480	-15.82	≤8.00	PASS

Test Graphs

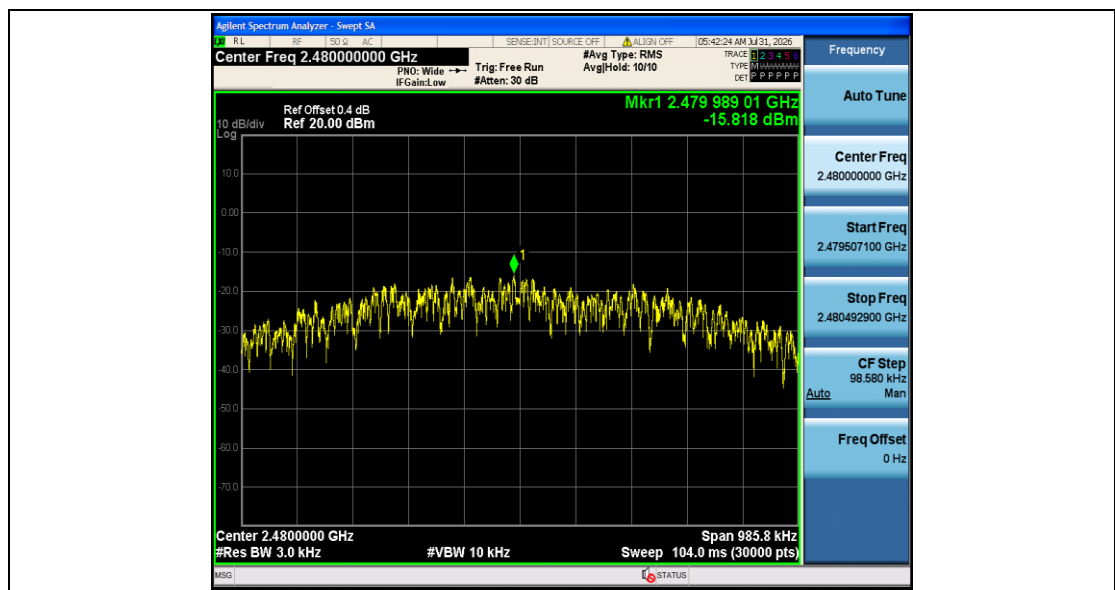
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



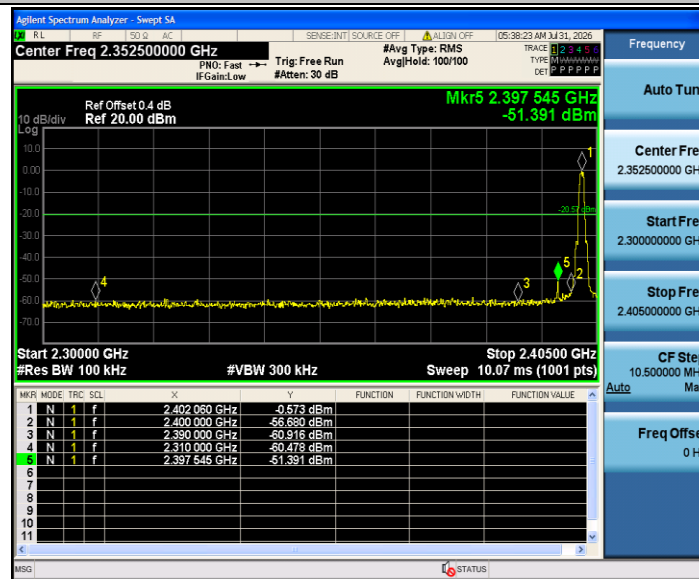
Appendix E: Band edge measurements

Test Result

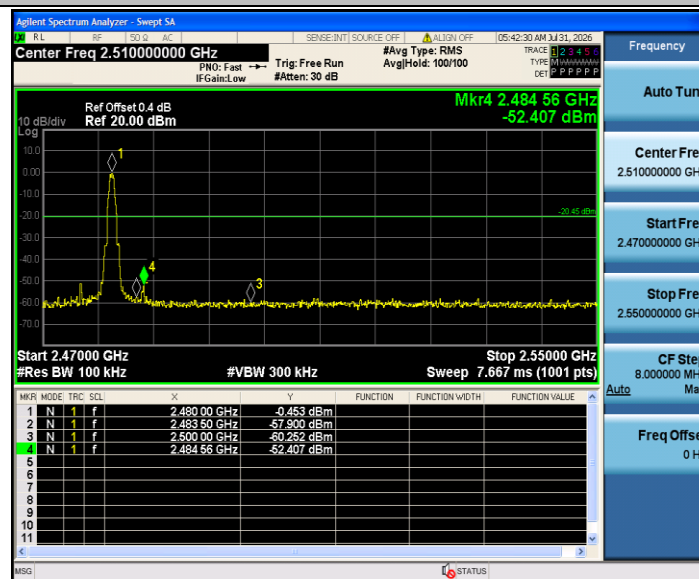
TestMode	Antenna	Channel	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-0.57	-51.39	≤-20.57	PASS
		High	2480	-0.45	-52.41	≤-20.45	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480

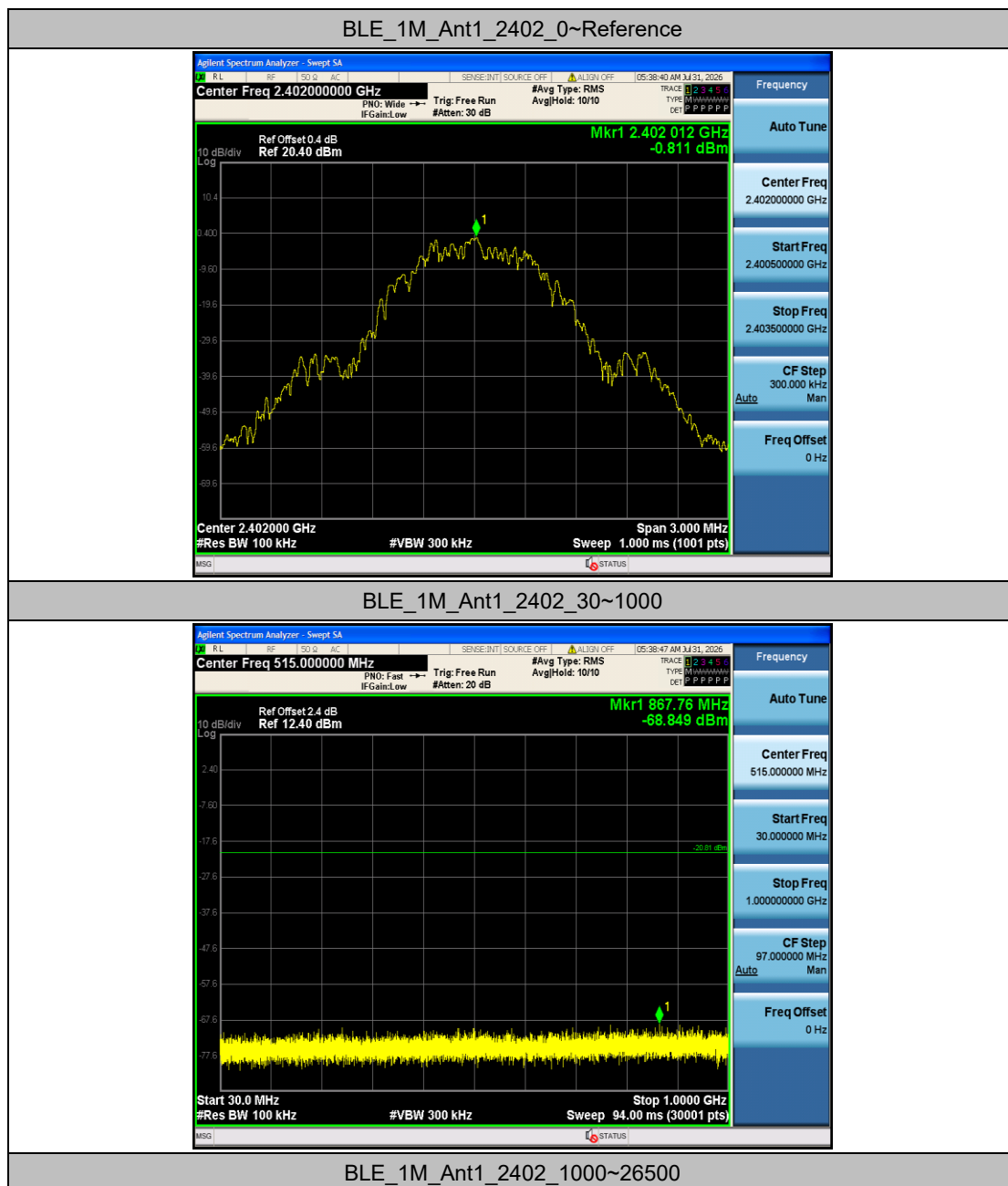


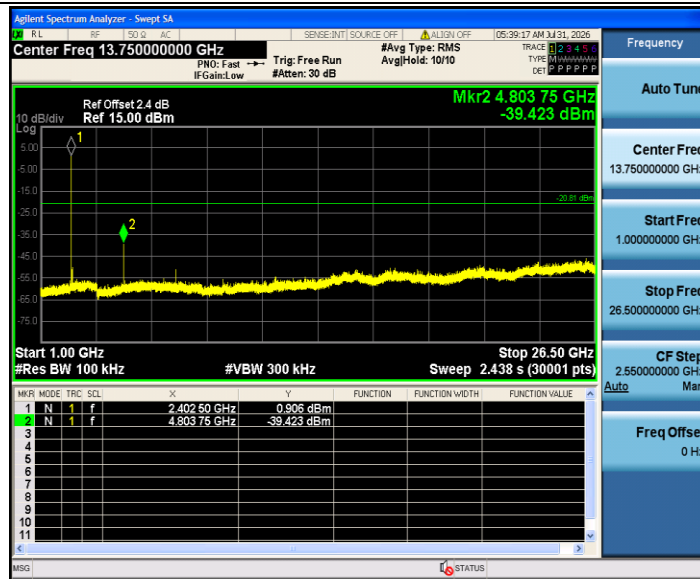
Appendix F: Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.81	-0.81	---	PASS
			30~1000	-0.81	-68.85	≤-20.81	PASS
			1000~26500	-0.81	-39.42	≤-20.81	PASS
		2440	Reference	-0.37	-0.37	---	PASS
			30~1000	-0.37	-68.55	≤-20.37	PASS
			1000~26500	-0.37	-43.88	≤-20.37	PASS
		2480	Reference	-2.03	-2.03	---	PASS
			30~1000	-2.03	-68.7	≤-22.03	PASS
			1000~26500	-2.03	-41.19	≤-22.03	PASS

Test Graphs

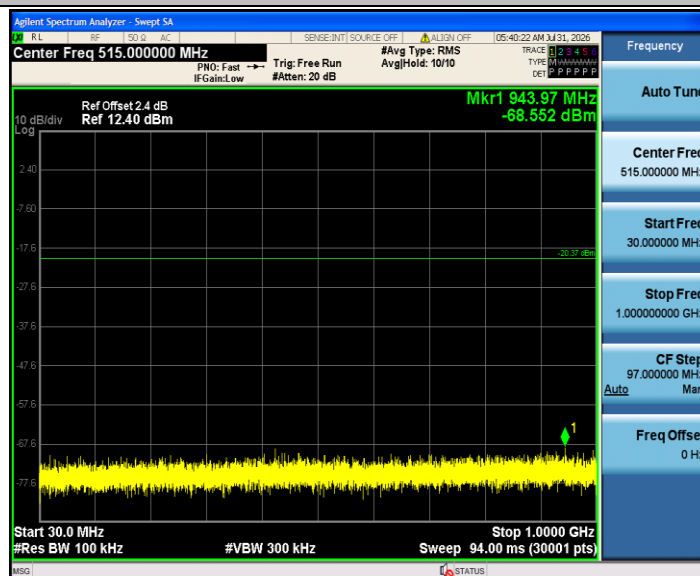




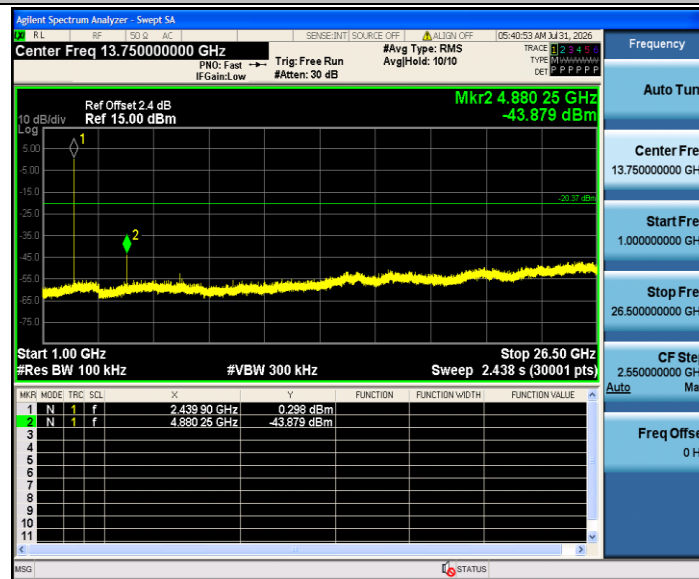
BLE_1M_Ant1_2440_0~Reference



BLE_1M_Ant1_2440_30~1000



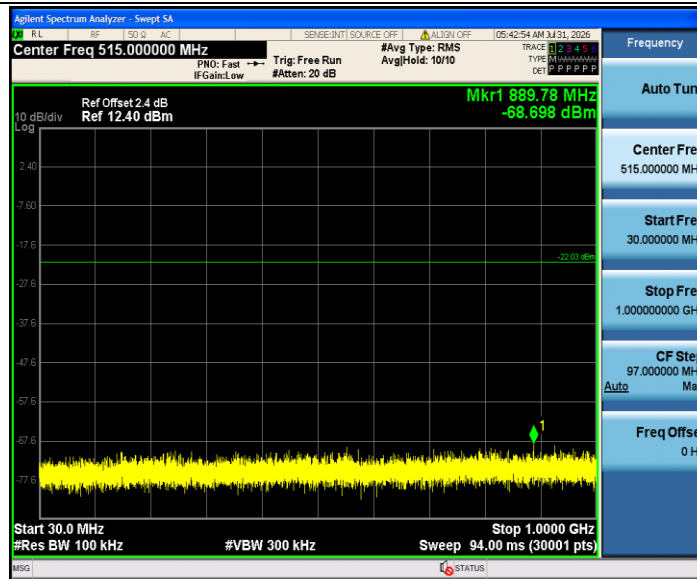
BLE_1M_Ant1_2440_1000~26500



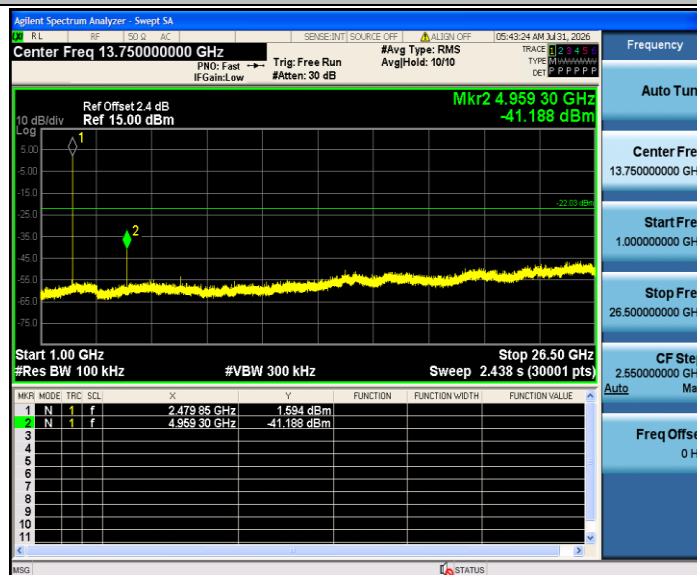
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500

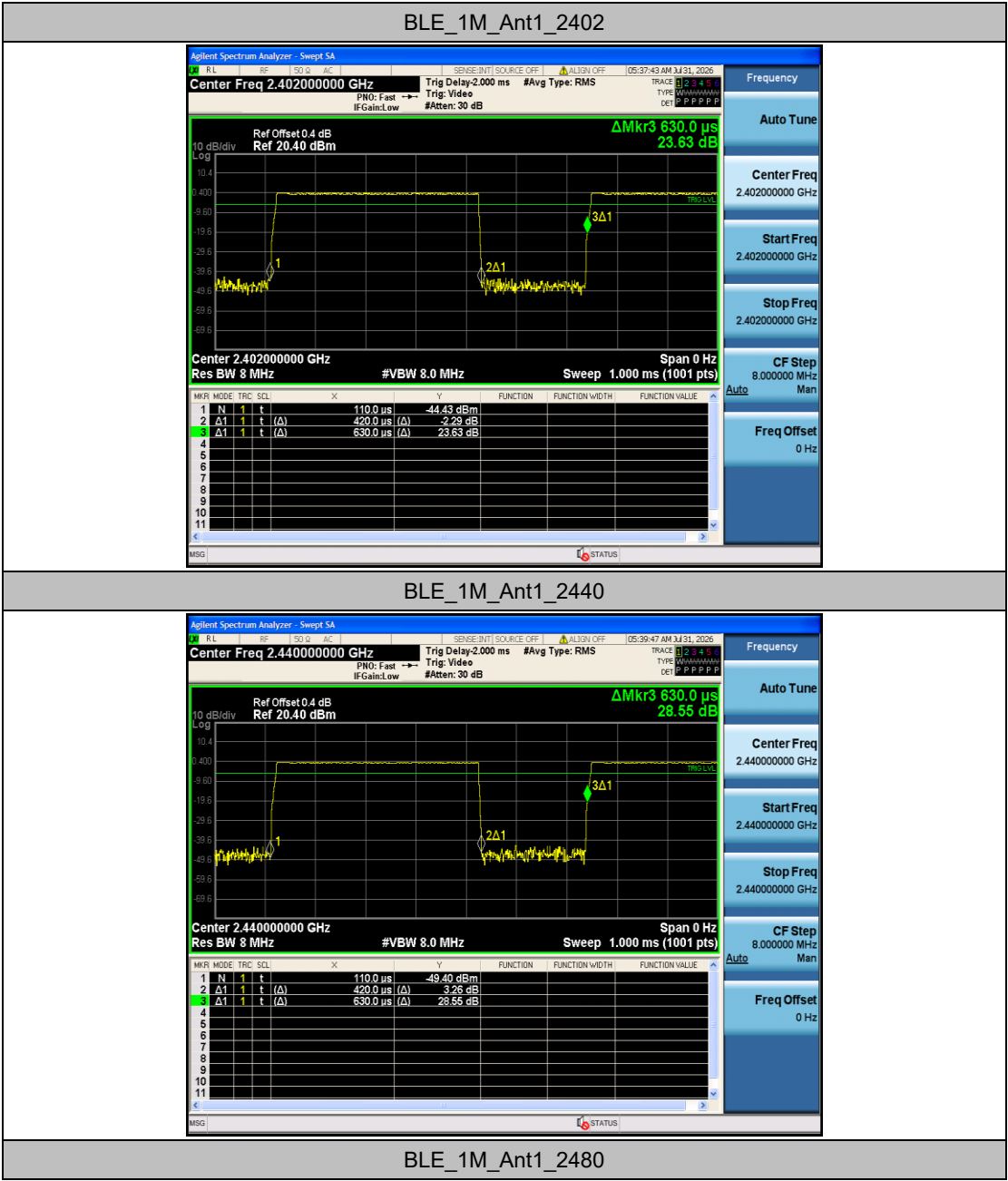


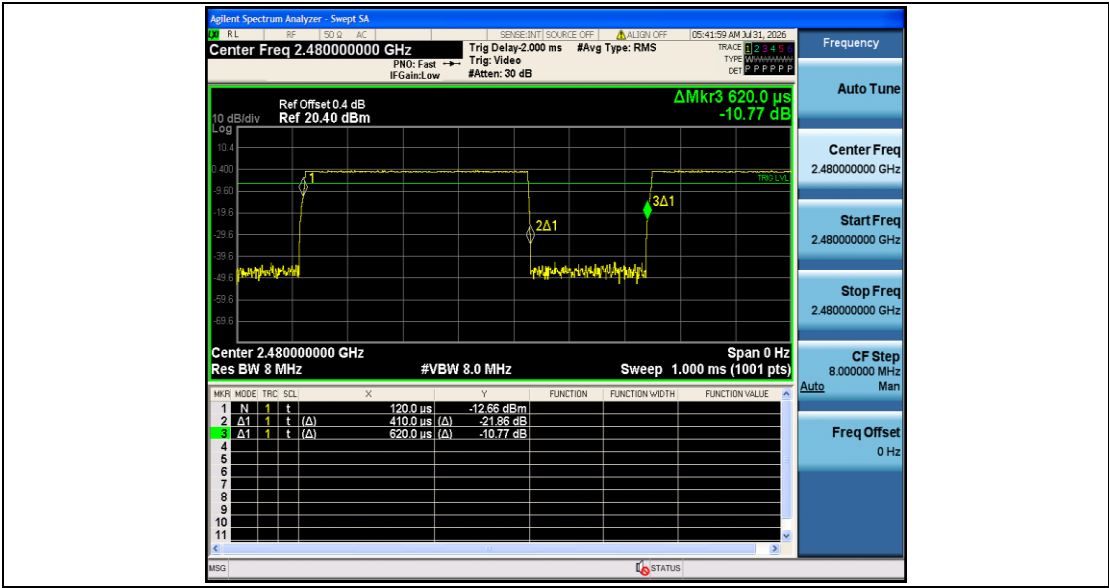
Appendix G: Duty Cycle

Test Result

TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.42	0.63	0.6667	66.67	1.76	---	---
		2440	0.42	0.63	0.6667	66.67	1.76	---	---
		2480	0.41	0.62	0.6613	66.13	1.80	---	---

Test Graphs





Appendix H: Emissions in Restricted Bands

Test Result

TestMode	Antenna	Channel	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	-60.31	2.69	1.76	39.34	≤54	PASS
				AV	2376.230	-58.8	2.69	1.76	40.85	≤54	PASS
				AV	2390.000	-59.54	2.69	1.76	40.11	≤54	PASS
				Peak	2310.000	-50.77	2.69	0.00	47.12	≤74	PASS
				Peak	2389.775	-48.95	2.69	0.00	48.94	≤74	PASS
				Peak	2390.000	-52.25	2.69	0.00	45.64	≤74	PASS
		High	2480	AV	2483.500	-57.56	2.69	1.80	42.13	≤54	PASS
				AV	2484.000	-57.32	2.69	1.80	42.37	≤54	PASS
				AV	2500.000	-59.43	2.69	1.80	40.26	≤54	PASS
				Peak	2483.500	-50.47	2.69	0.00	47.42	≤74	PASS
				Peak	2484.720	-42.87	2.69	0.00	55.02	≤74	PASS
				Peak	2500.000	-51.38	2.69	0.00	46.51	≤74	PASS

Note:

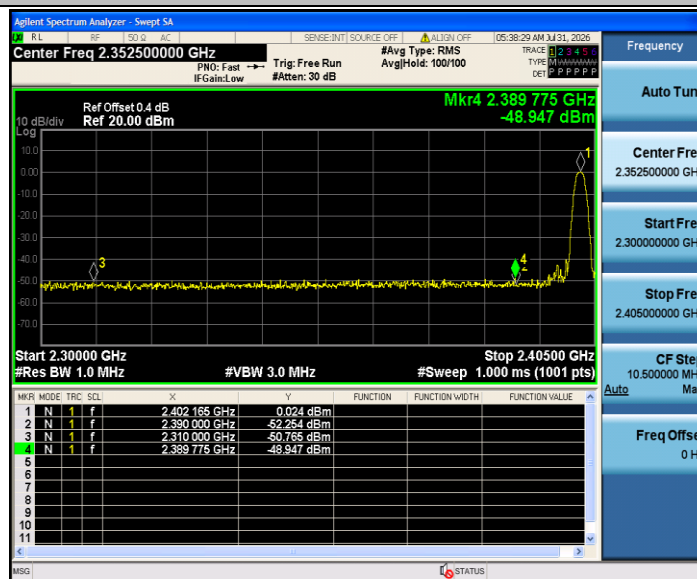
- The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

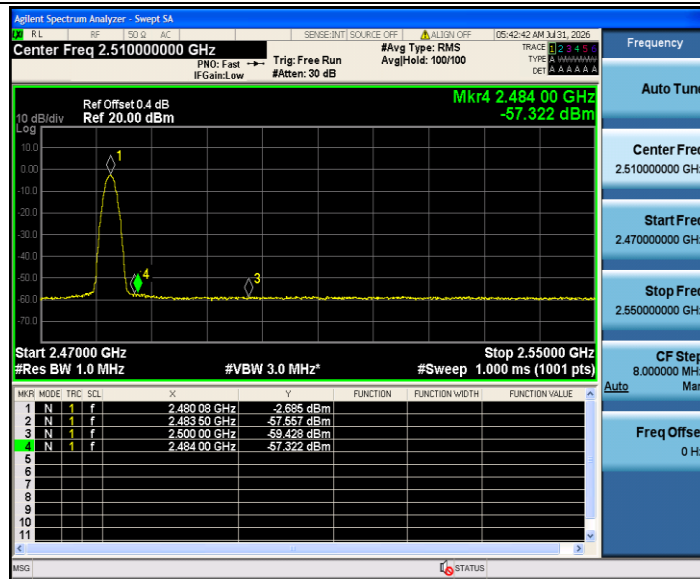
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak

