

FCC Appendix RF Test Data for BLE

FCC ID : 2BUNC-YX011

Company : Dongguan Youxun Electronic Technology Co., Ltd.

EUT : Wireless Keyboard

Model Number : YX011

Report No. : CTA26011500101

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	0.644	2401.696	2402.340	0.5	PASS
		2440	0.652	2439.696	2440.348	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 0.5 dB
Ref 30.00 dBm

Trig: Free Run
#Atten: 40 dB

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

Trace 1 2 3 4 5 6
Type 1 2 3 4 5 6
Det 1 2 3 4 5 6

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 1.000 ms (1001 pts)

#Res BW 100 kHz
#VBW 300 kHz

Log

10 dB/div

20.0

10.0

0.00

-10.0

-20.0

-30.0

-40.0

-50.0

-60.0

ΔMkr3 644 kHz
-0.260 dB

1

2

3Δ1

Center 2.402000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 1.000 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.401696 GHz	-9.042 dBm			
2	N	1	f	2.402012 GHz	-9.430 dBm			
3	Δ1	1	f (Δ)	644 kHz (Δ)	-0.260 dB			

MSO

STATUS

BLE_1M_Ant1_2402

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.440000000 GHz

Ref Offset 0.5 dB
Ref 30.00 dBm

Trig: Free Run
#Atten: 40 dB

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

Trace 1 2 3 4 5 6
Type 1 2 3 4 5 6
Det 1 2 3 4 5 6

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 1.000 ms (1001 pts)

#Res BW 100 kHz
#VBW 300 kHz

Log

10 dB/div

20.0

10.0

0.00

-10.0

-20.0

-30.0

-40.0

-50.0

-60.0

ΔMkr3 652 kHz
-0.177 dB

1

2

3Δ1

Center 2.440000 GHz

#Res BW 100 kHz

#VBW 300 kHz

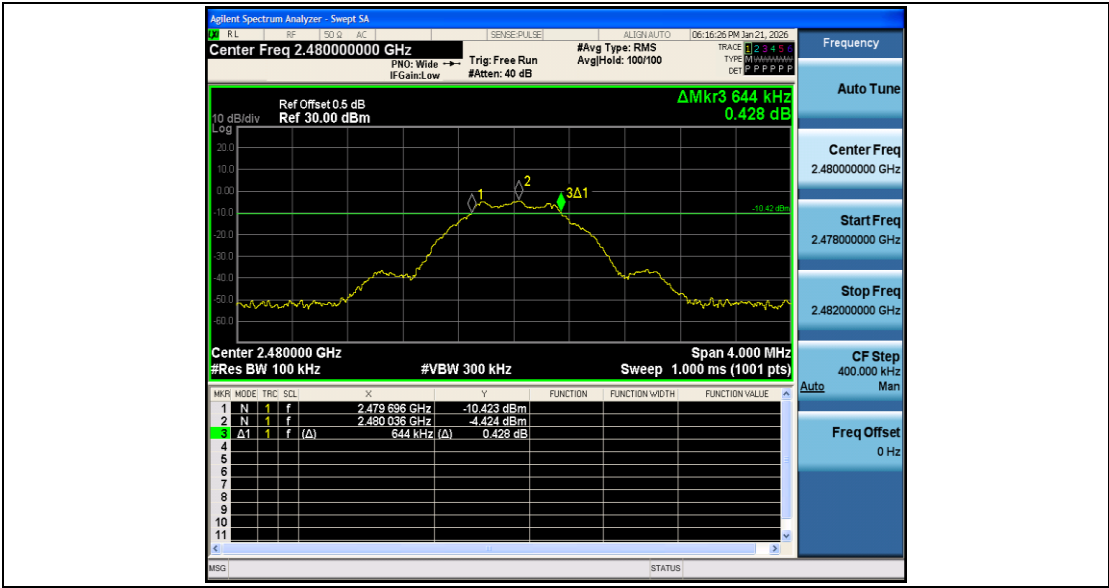
Sweep 1.000 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.439696 GHz	-9.856 dBm			
2	N	1	f	2.440032 GHz	-4.059 dBm			
3	Δ1	1	f (Δ)	652 kHz (Δ)	-0.177 dB			

MSO

STATUS

BLE_1M_Ant1_2440

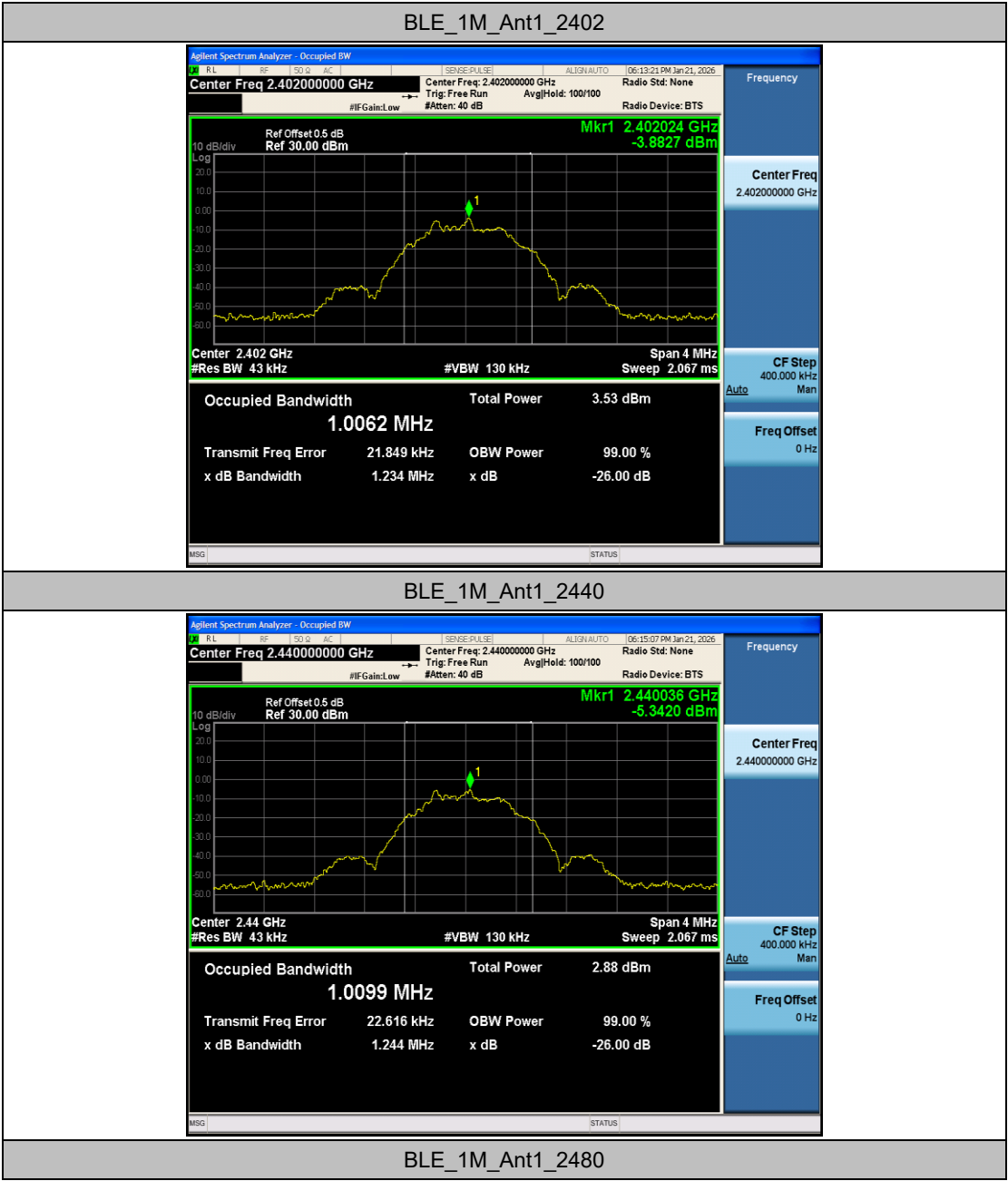


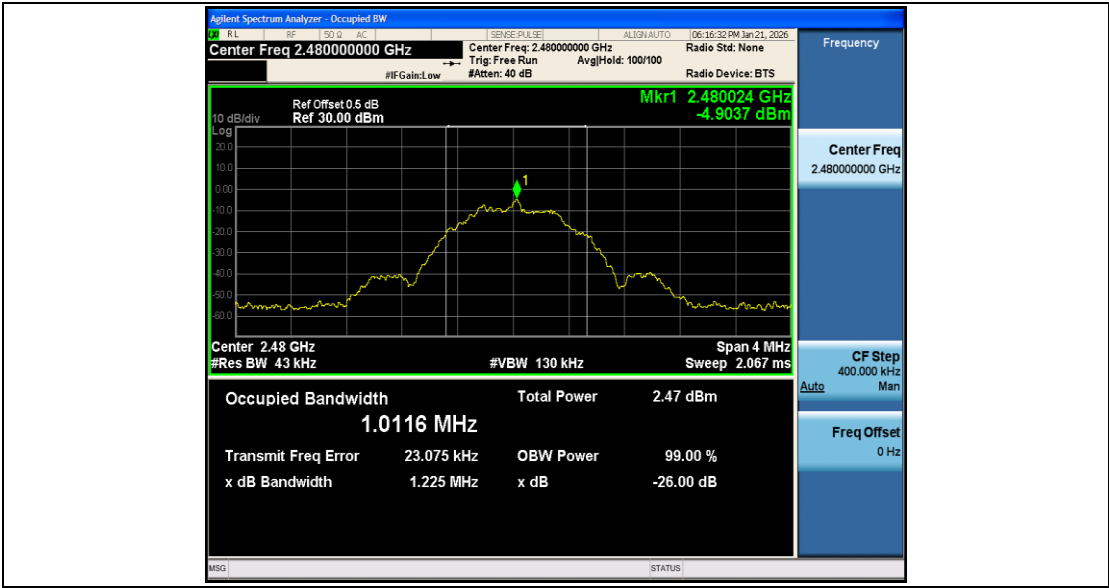
Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0062	2401.5188	2402.5250	---	---
		2440	1.0099	2439.5177	2440.5276	---	---
		2480	1.0116	2479.5173	2480.5289	---	---

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	-3.11	≤30	PASS
		2440	-3.71	≤30	PASS
		2480	-4.02	≤30	PASS

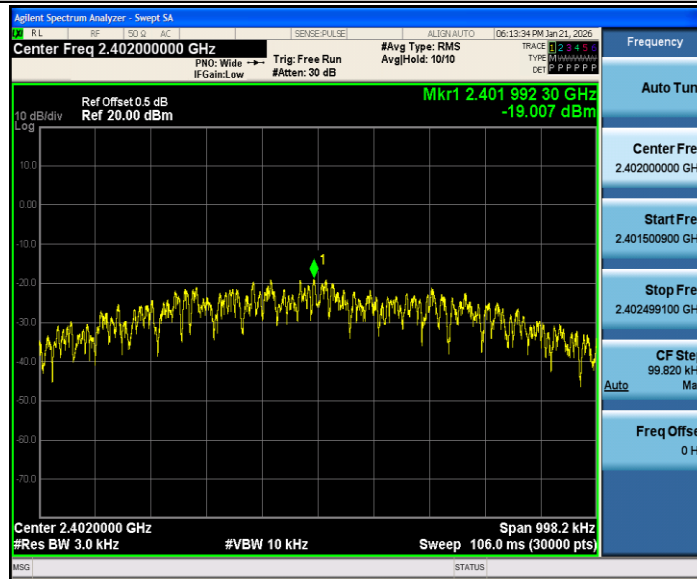
Appendix D: Maximum power spectral density

Test Result

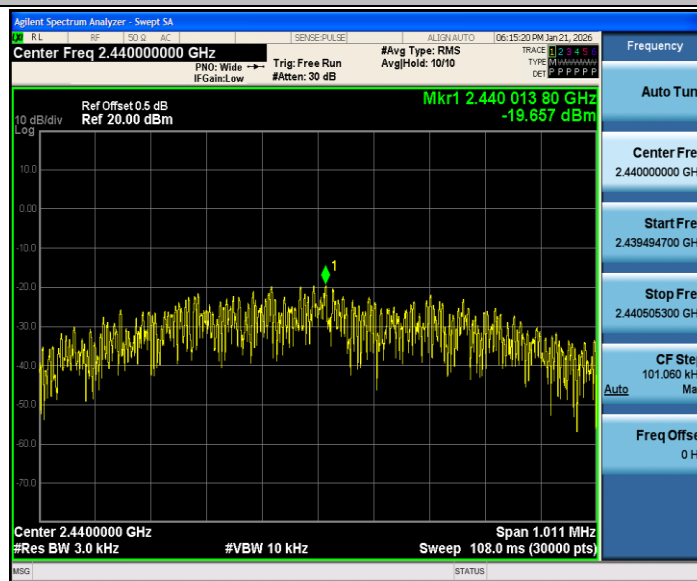
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-19.01	≤8.00	PASS
		2440	-19.66	≤8.00	PASS
		2480	-19.75	≤8.00	PASS

Test Graphs

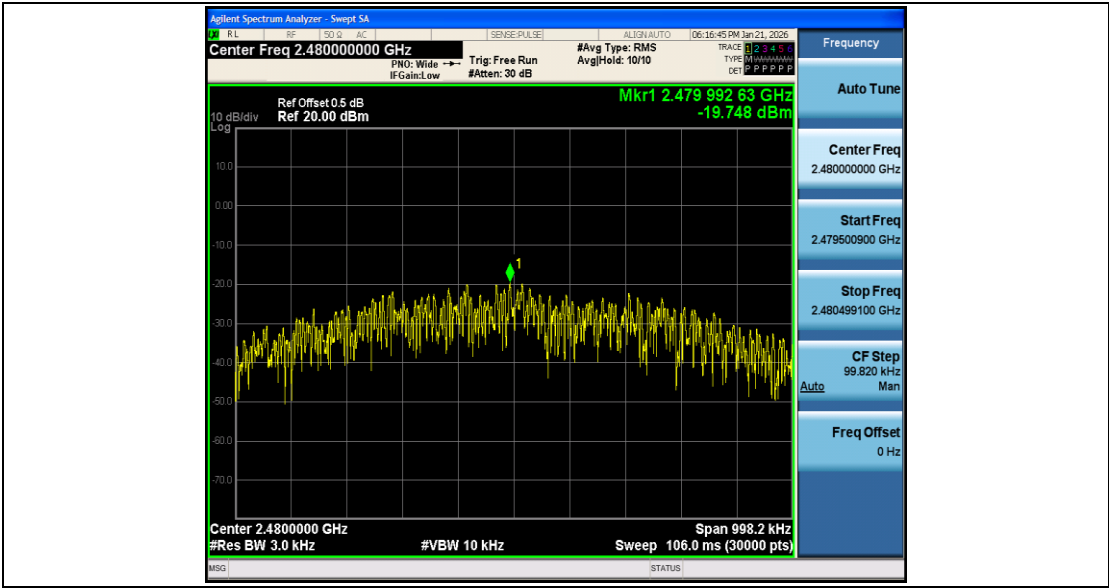
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

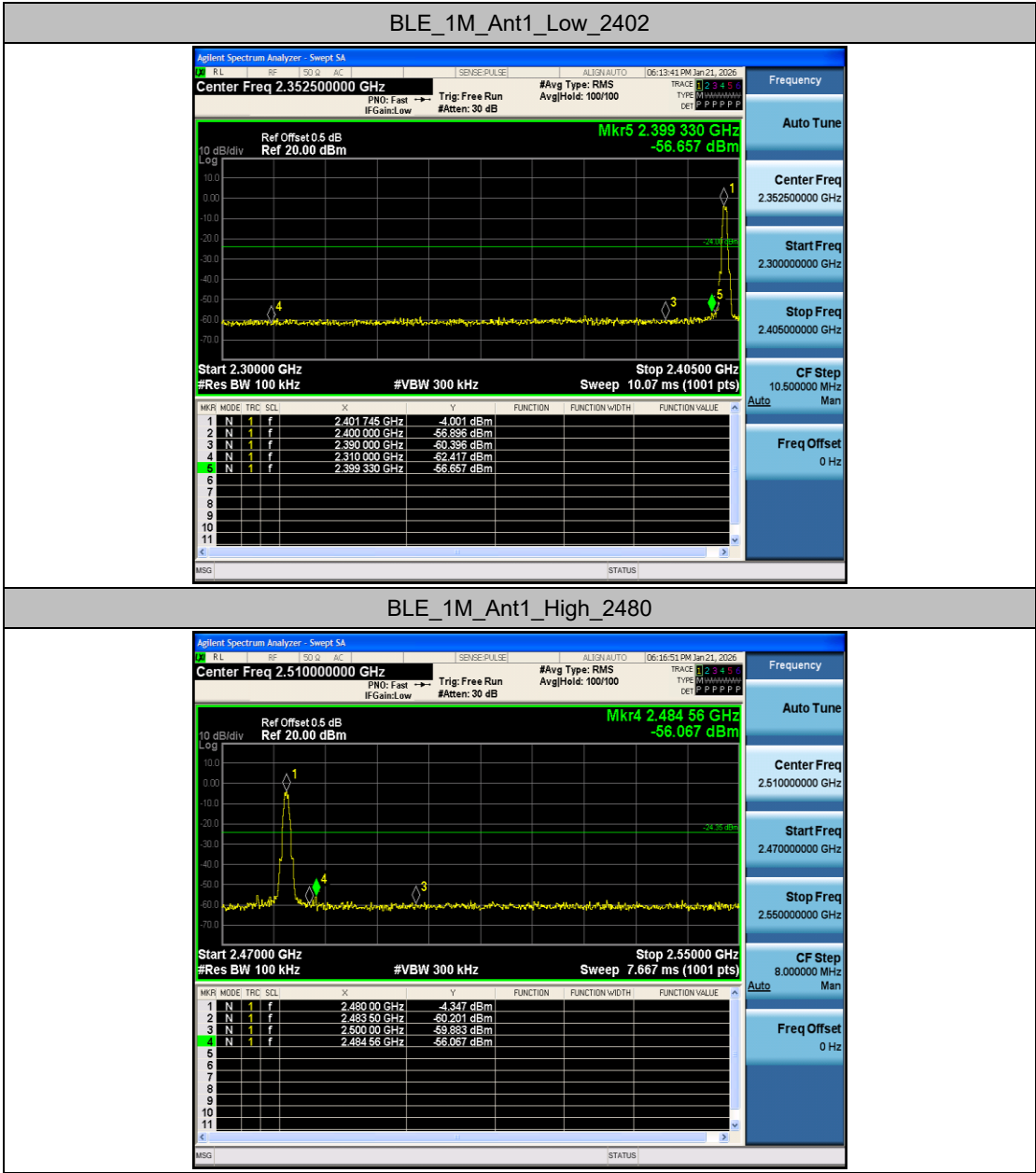


Appendix E: Band edge measurements

Test Result

TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-4.00	-56.66	≤-24	PASS
		High	2480	-4.35	-56.07	≤-24.35	PASS

Test Graphs

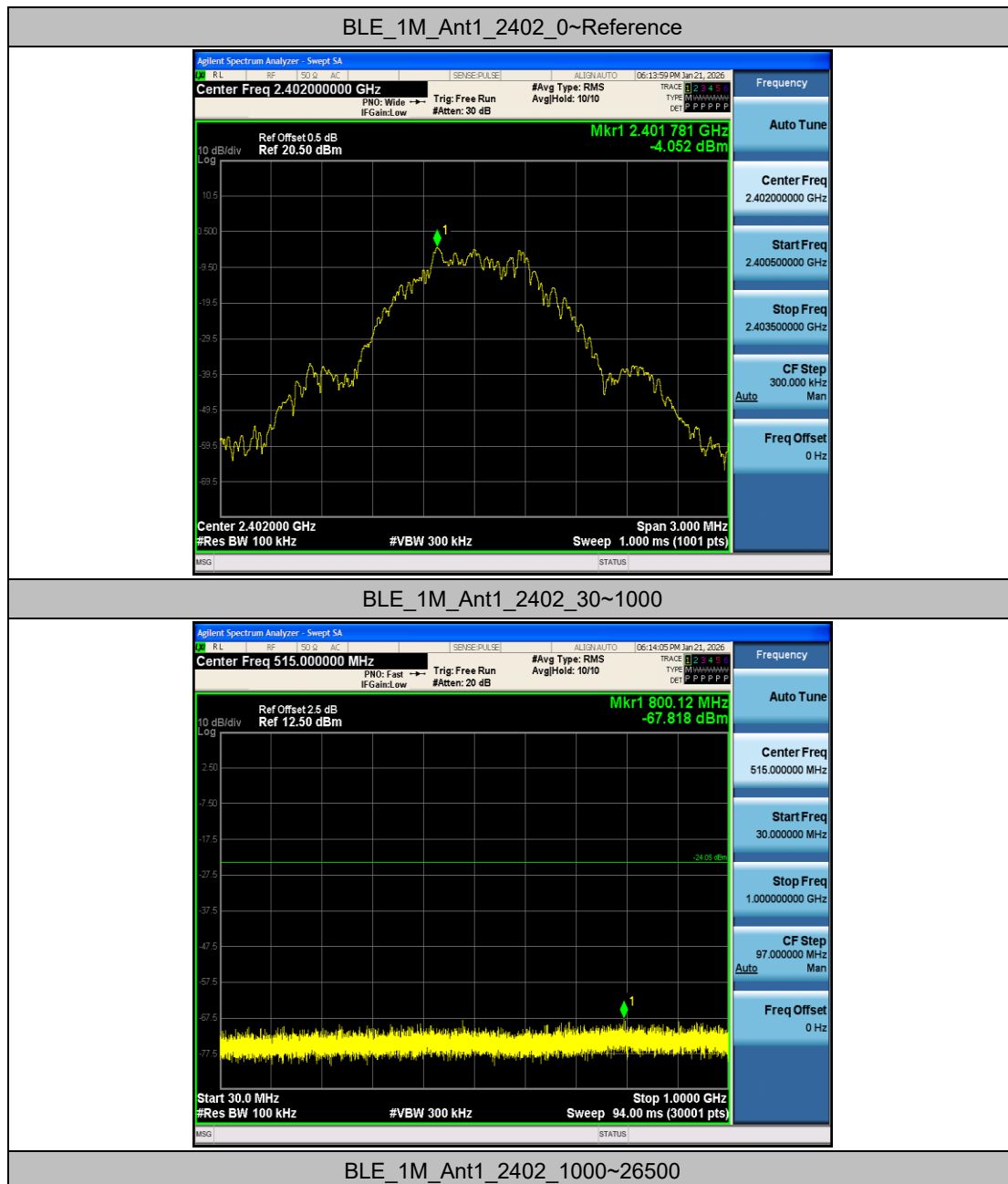


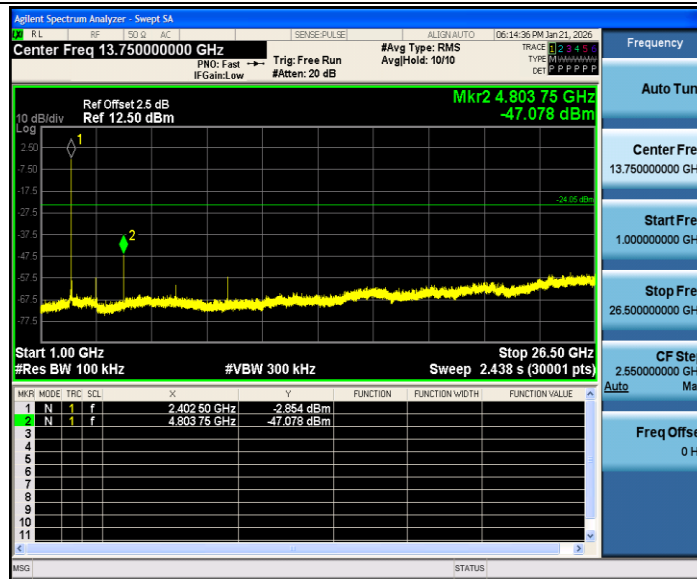
Appendix F: Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-4.05	-4.05	---	PASS
			30~1000	-4.05	-67.82	≤-24.05	PASS
			1000~26500	-4.05	-47.08	≤-24.05	PASS
		2440	Reference	-5.14	-5.14	---	PASS
			30~1000	-5.14	-67.78	≤-25.14	PASS
			1000~26500	-5.14	-47.08	≤-25.14	PASS
		2480	Reference	-5.17	-5.17	---	PASS
			30~1000	-5.17	-68.25	≤-25.17	PASS
			1000~26500	-5.17	-46.46	≤-25.17	PASS

Test Graphs

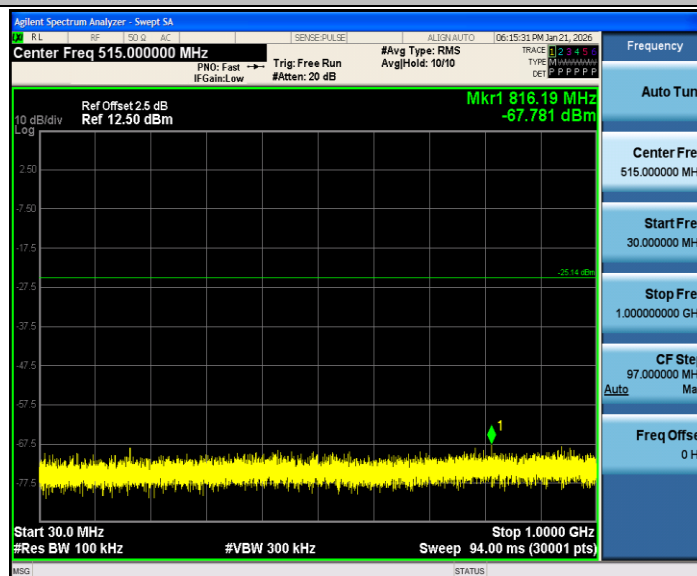




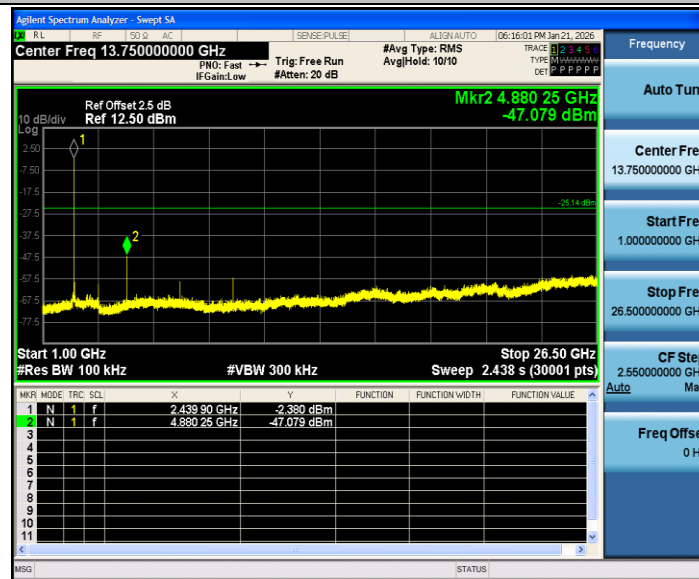
BLE_1M_Ant1_2440_0~Reference



BLE_1M_Ant1_2440_30~1000



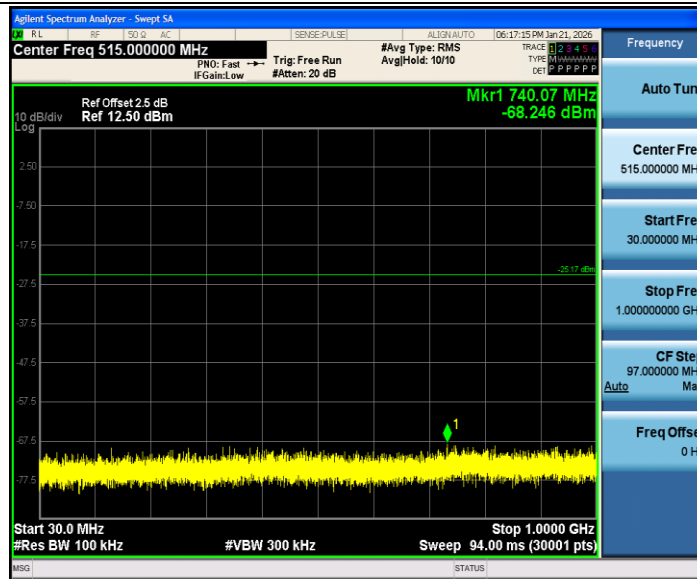
BLE_1M_Ant1_2440_1000~26500



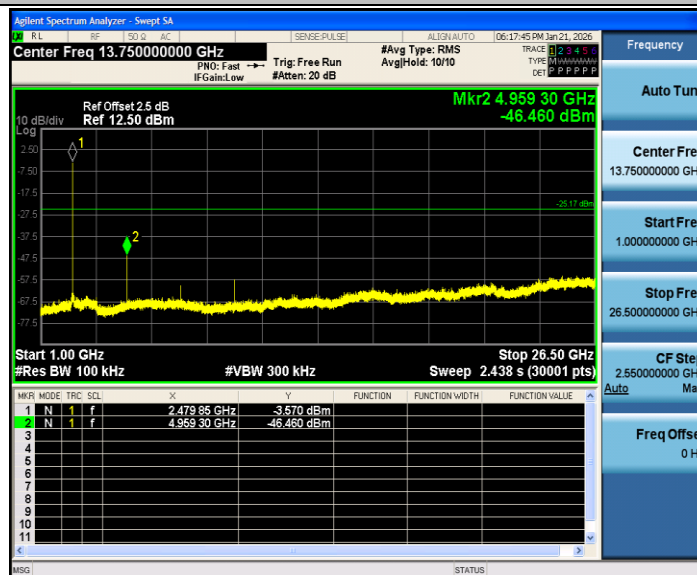
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500

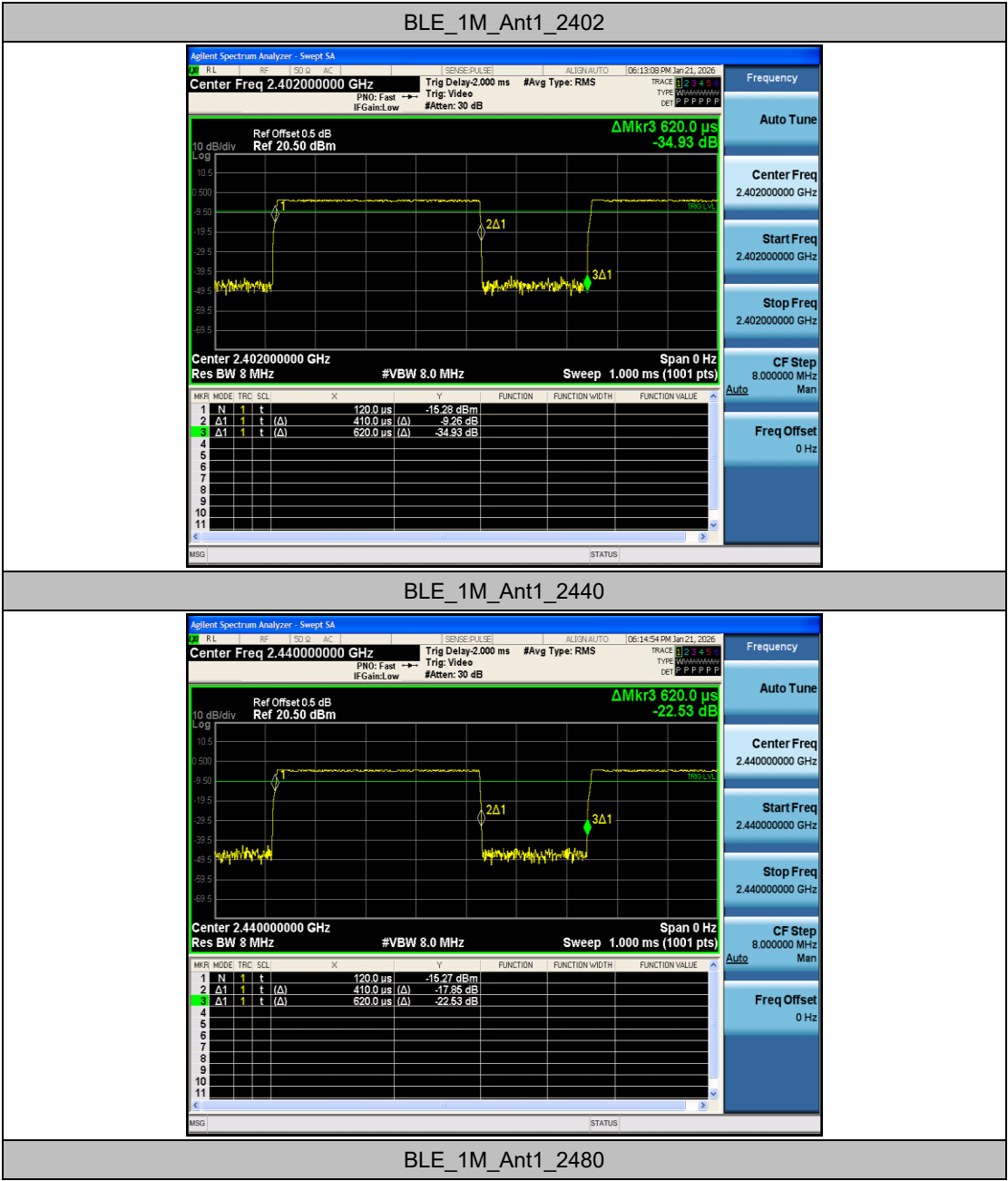


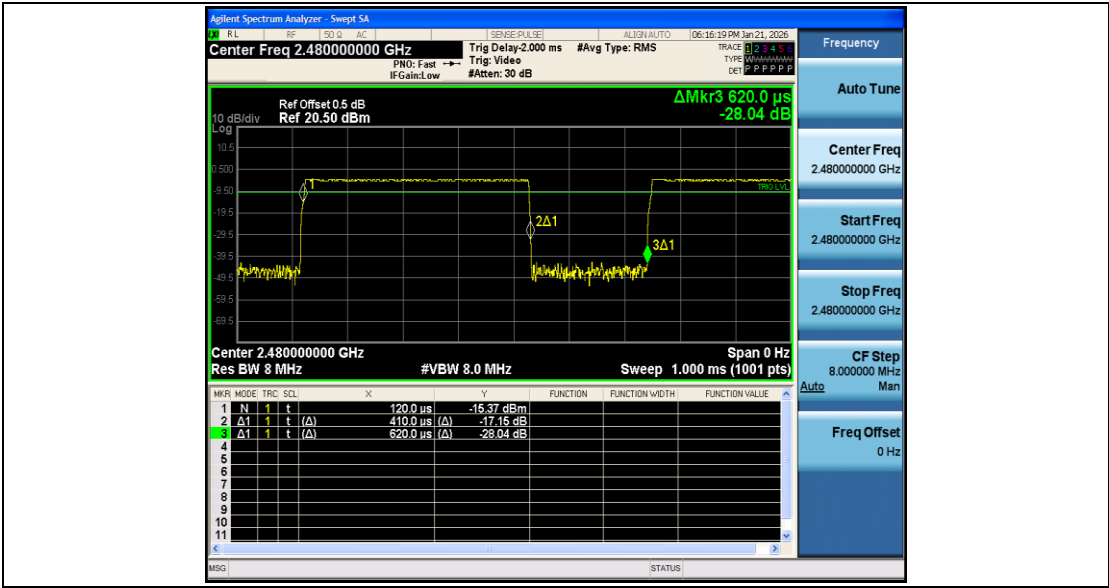
Appendix G: Duty Cycle

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





Appendix H: Emissions in Restricted Bands

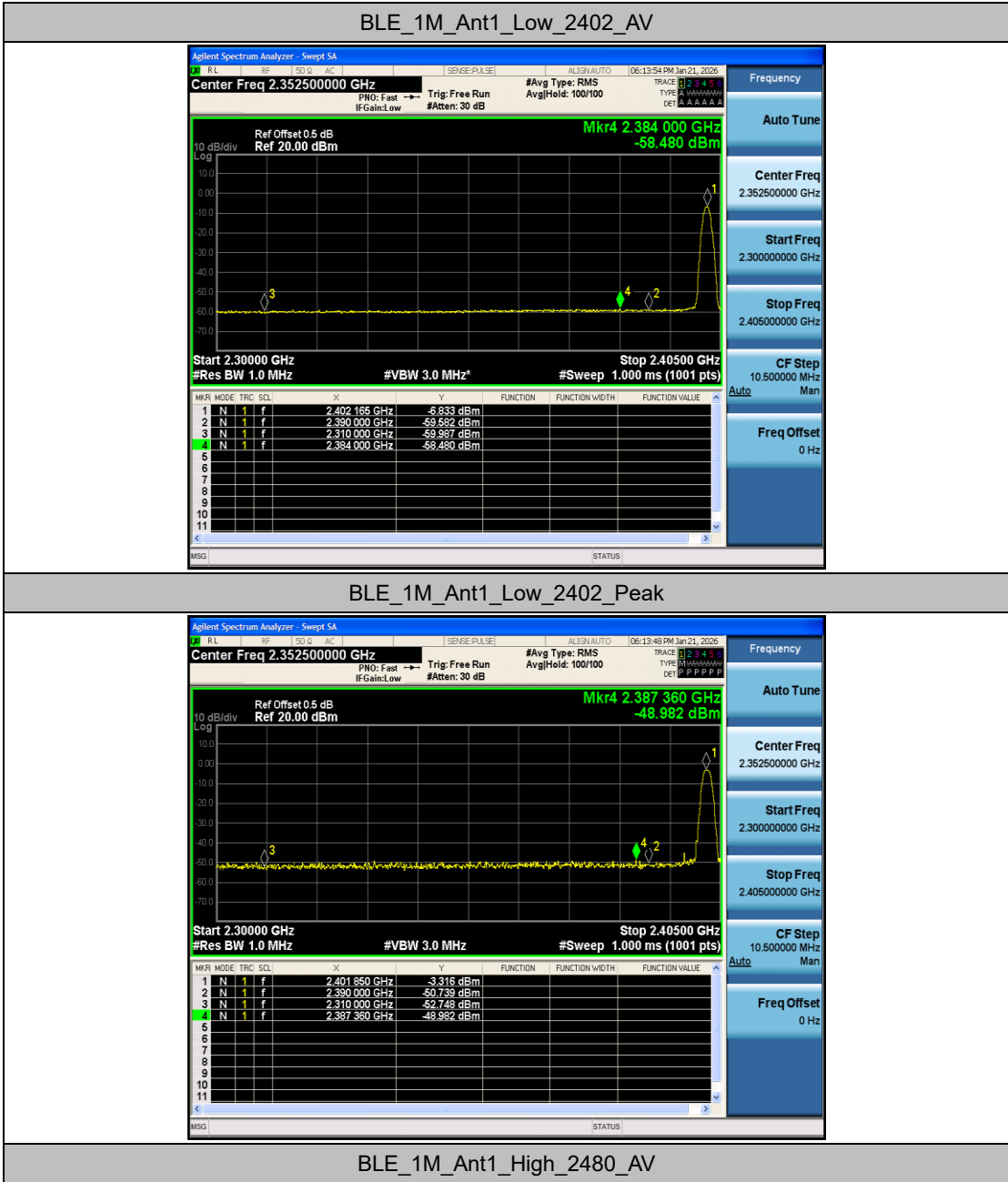
Test Result

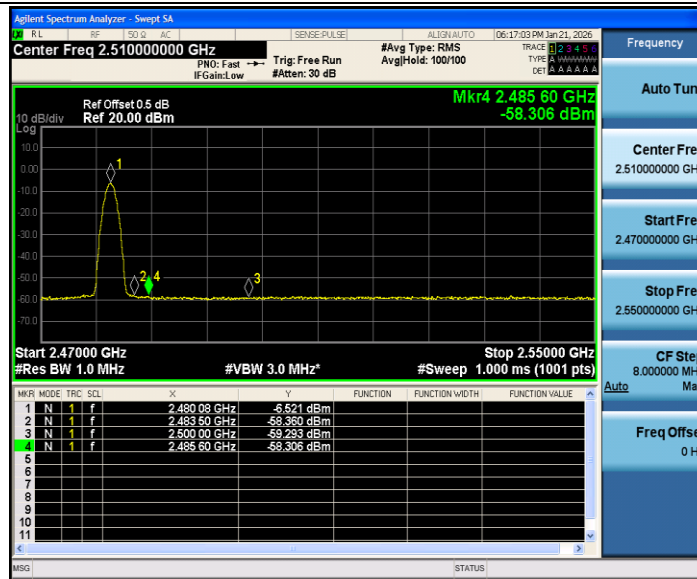
TestMode	Antenna	Channel	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Gain [dB]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-59.99	2.00	1.80	39.01	≤54	PASS
				AV	2384.000	-58.48	2.00	1.80	40.52	≤54	PASS
				AV	2390.000	-59.58	2.00	1.80	39.42	≤54	PASS
				Peak	2310.000	-52.75	2.00	0.00	44.45	≤74	PASS
				Peak	2387.360	-48.98	2.00	0.00	48.22	≤74	PASS
				Peak	2390.000	-50.74	2.00	0.00	46.46	≤74	PASS
		High	2480	AV	2483.500	-58.36	2.00	1.80	40.64	≤54	PASS
				AV	2485.600	-58.31	2.00	1.80	40.69	≤54	PASS
				AV	2500.000	-59.29	2.00	1.80	39.71	≤54	PASS
				Peak	2483.500	-48.41	2.00	0.00	48.79	≤74	PASS
				Peak	2485.360	-48.07	2.00	0.00	49.13	≤74	PASS
				Peak	2500.000	-51.1	2.00	0.00	46.10	≤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

