

Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Laptop

Test Model: H729AE

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Zhang hai
Supervised by:	Fengliu Tang

B.1 DTS Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.632	2401.676	2402.308	0.5	PASS
		2440	0.632	2439.672	2440.304	0.5	PASS
		2480	0.644	2479.668	2480.312	0.5	PASS
BLE_2M	Ant1	2402	1.120	2401.444	2402.564	0.5	PASS
		2440	1.128	2439.436	2440.564	0.5	PASS
		2480	1.132	2479.432	2480.564	0.5	PASS

Note: offset=System attenuation +cabal loss

Figure 10 shows two screenshots of a Keysight Spectrum Analyzer (Sweep SA) displaying the frequency spectrum for BLE 1M Ant1. The top screenshot is for Ant1_2402, showing a center frequency of 2.402000000 GHz and a peak power of 0.050 dBm. The bottom screenshot is for Ant1_2440, showing a center frequency of 2.440000000 GHz and a peak power of -0.285 dBm. Both plots show a signal with a peak at the center frequency, with a span of 4.000 MHz and a resolution bandwidth of 100 kHz. The plots also show the signal's power spectral density (PSD) and the signal's frequency offset from the center frequency.

BLE_1M_Ant1_2402

Center Freq 2.402000000 GHz

Ref Offset 12.18 dB

Ref 30.00 dBm

ΔMkr3 632 kHz

0.050 dB

Center 2.402000 GHz

#Res BW 100 kHz

#VBW 300 kHz

#Sweep 100.0 ms (1001 pts)

Span 4.000 MHz

Auto

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

MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.401 576 GHz	1.880 dBm			
2	N	f		2.401 598 GHz	7.703 dBm			
3	Δ1	f (Δ)		632 kHz (Δ)	0.050 dB			

BLE_1M_Ant1_2440

Center Freq 2.440000000 GHz

Ref Offset 12.27 dB

Ref 30.00 dBm

ΔMkr3 632 kHz

-0.285 dB

Center 2.440000 GHz

#Res BW 100 kHz

#VBW 300 kHz

#Sweep 100.0 ms (1001 pts)

Span 4.000 MHz

Auto

Frequency

Auto Tune

Center Freq 2.440000000 GHz

Start Freq 2.438000000 GHz

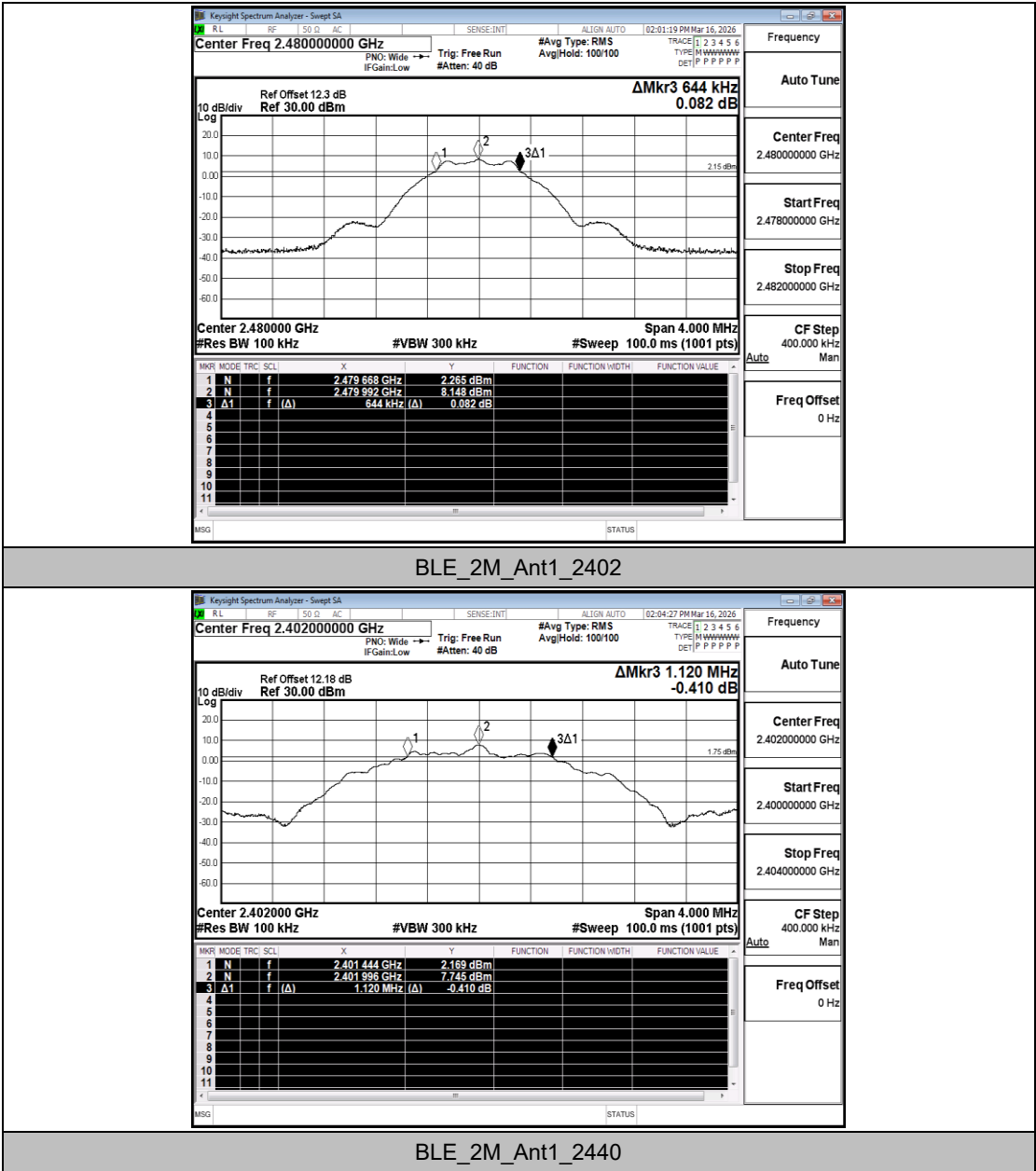
Stop Freq 2.442000000 GHz

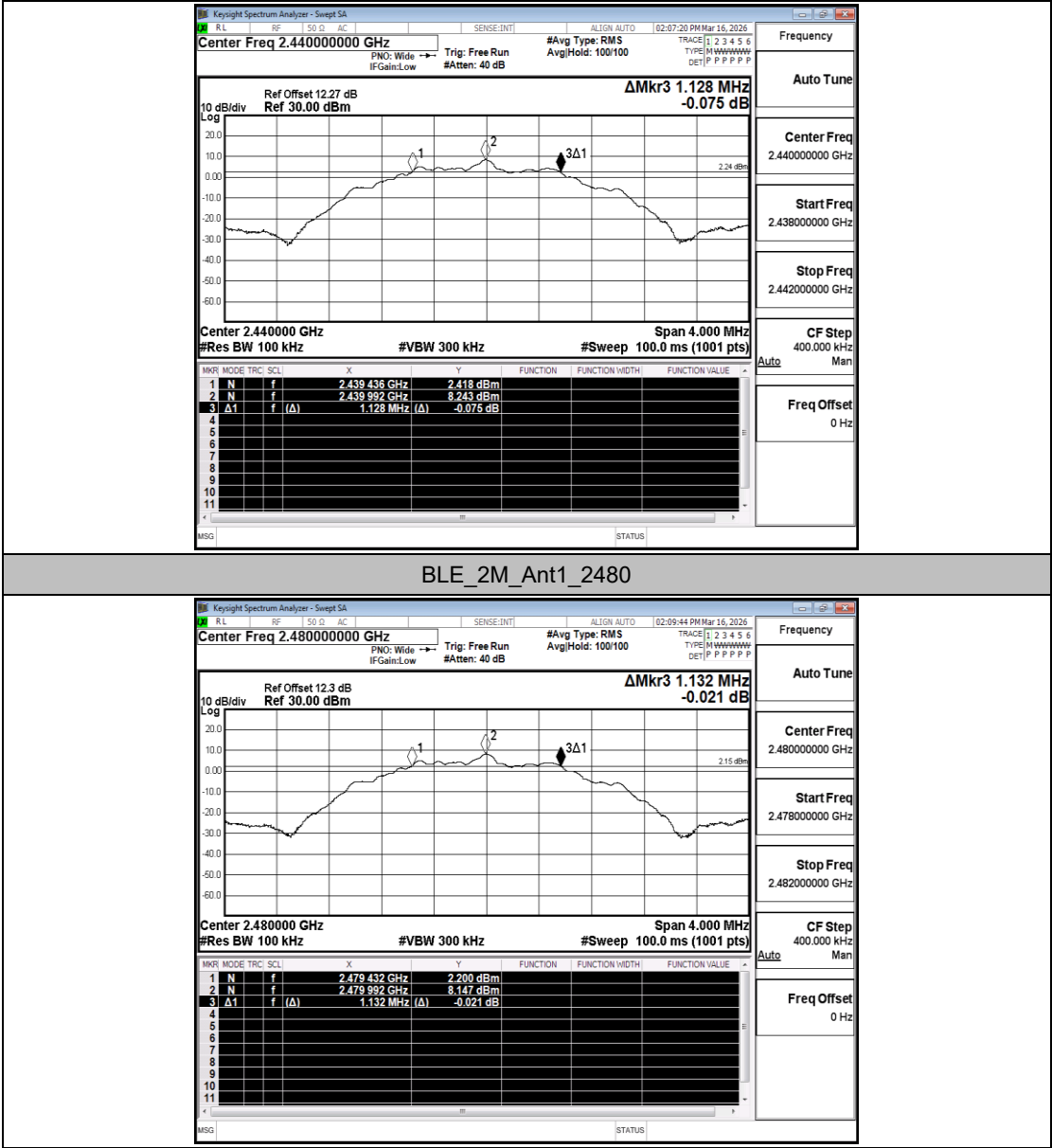
CF Step 400.000 kHz

Man

Freq Offset 0 Hz

MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.439 672 GHz	2.876 dBm			
2	N	f		2.439 992 GHz	8.135 dBm			
3	Δ1	f (Δ)		632 kHz (Δ)	-0.285 dB			





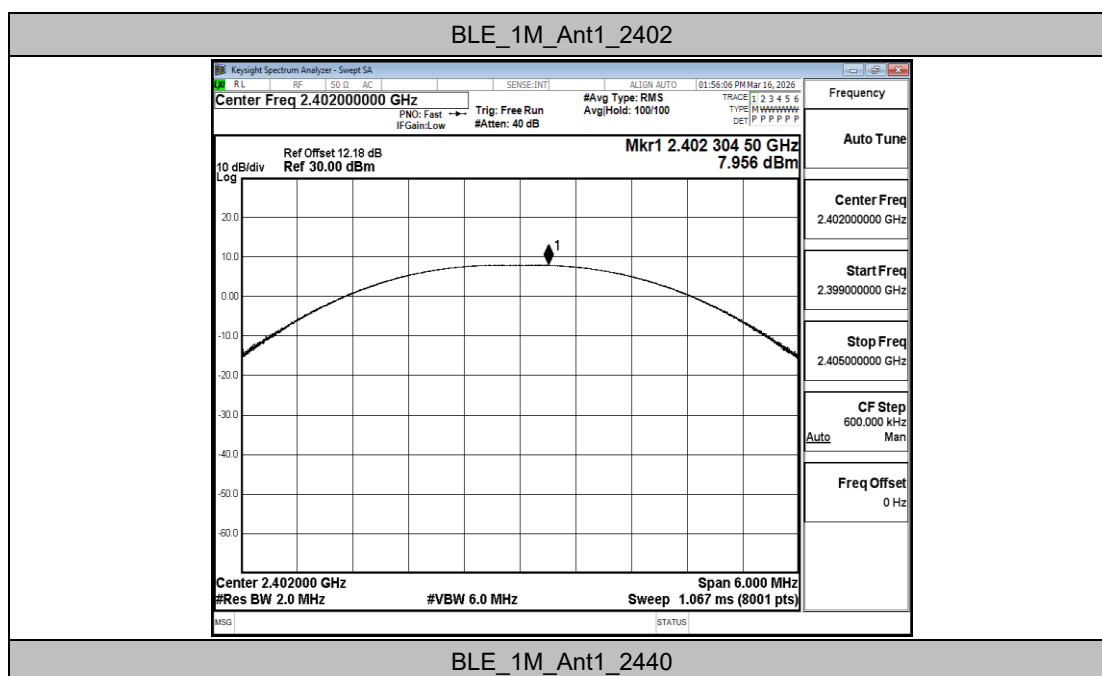
B.2 Maximum conducted output power

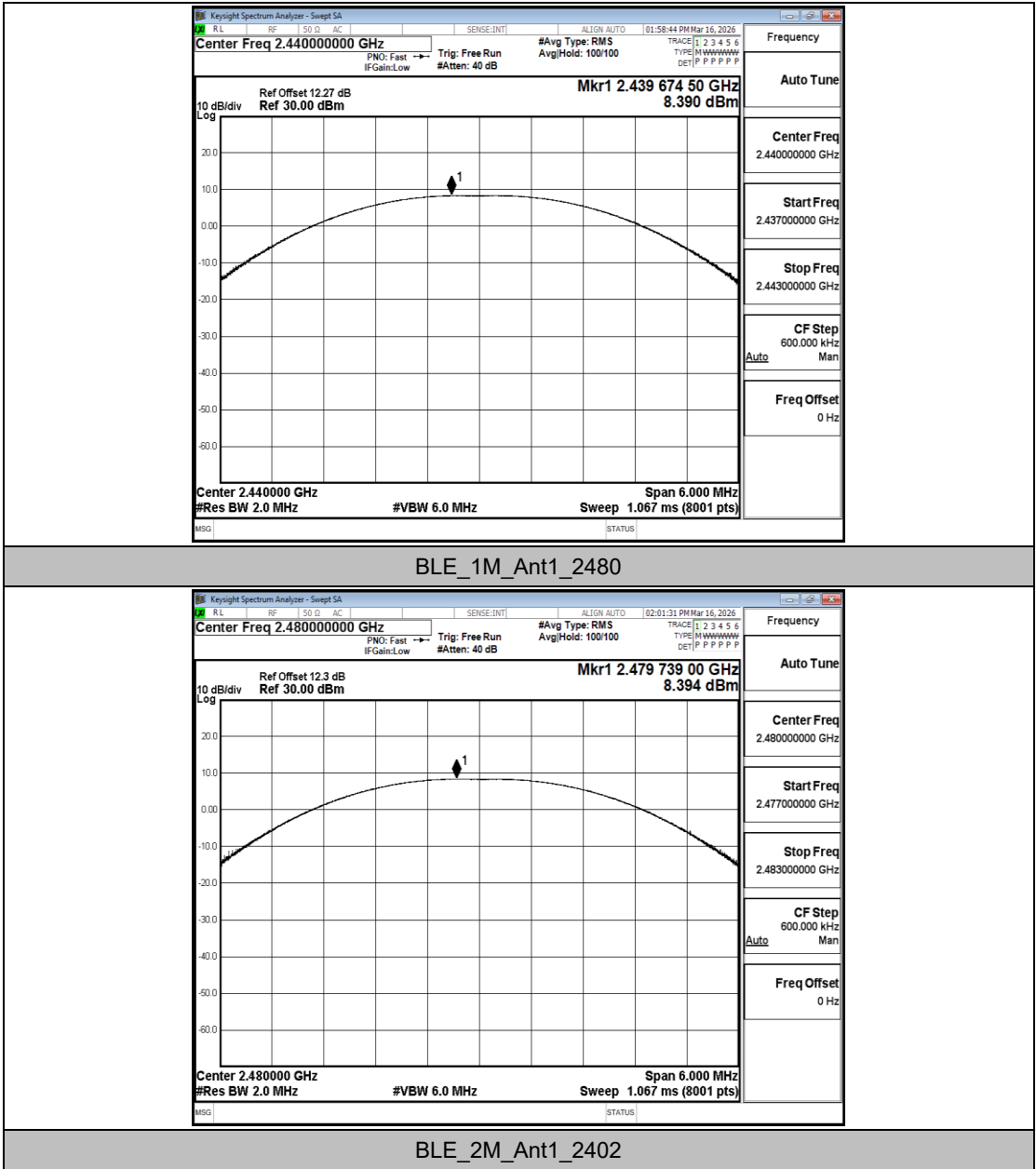
Test Result Peak

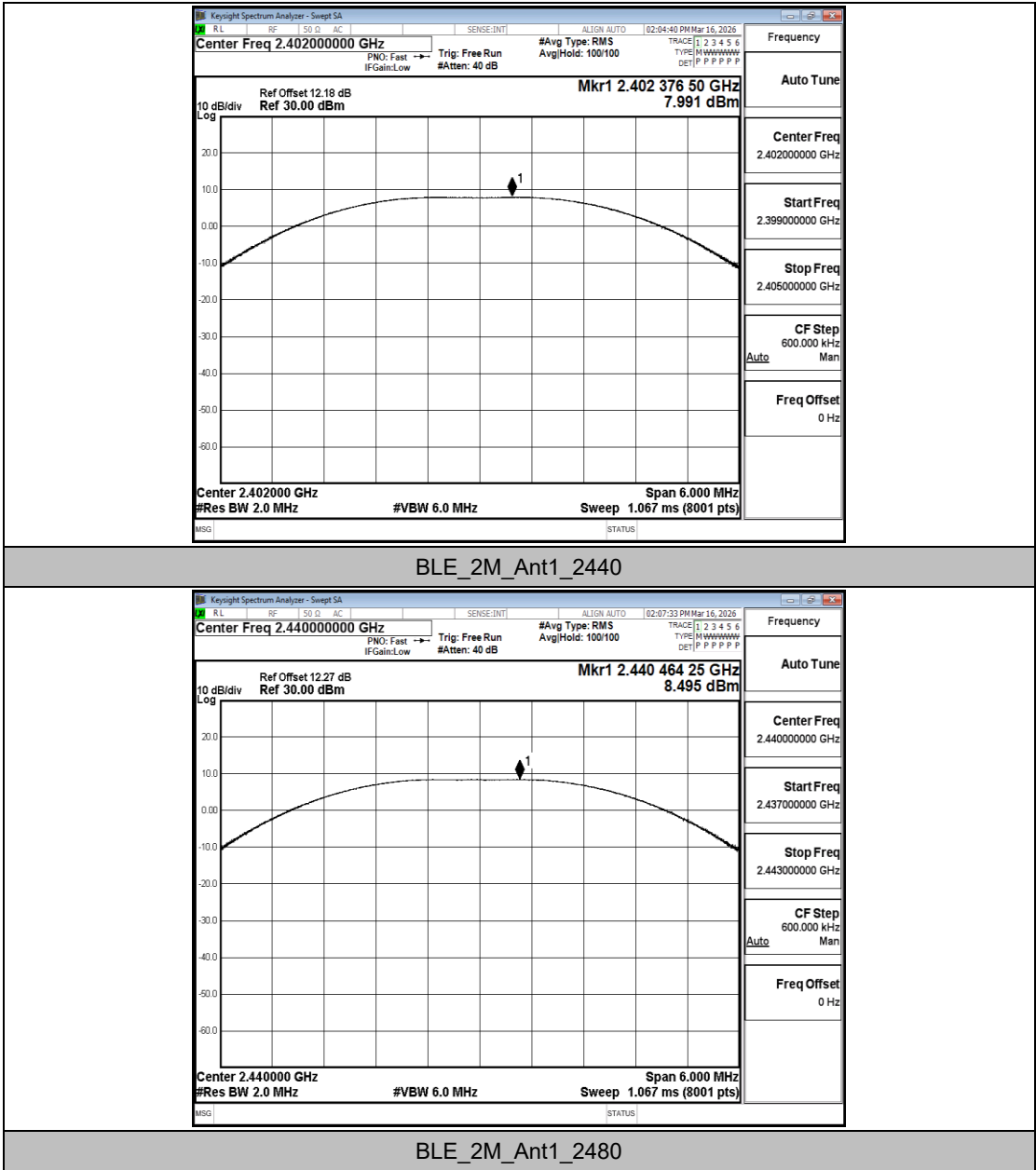
TestMode	Antenna	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	7.96	≤30	PASS
		2440	8.39	≤30	PASS
		2480	8.39	≤30	PASS
BLE_2M	Ant1	2402	7.99	≤30	PASS
		2440	8.50	≤30	PASS
		2480	8.42	≤30	PASS

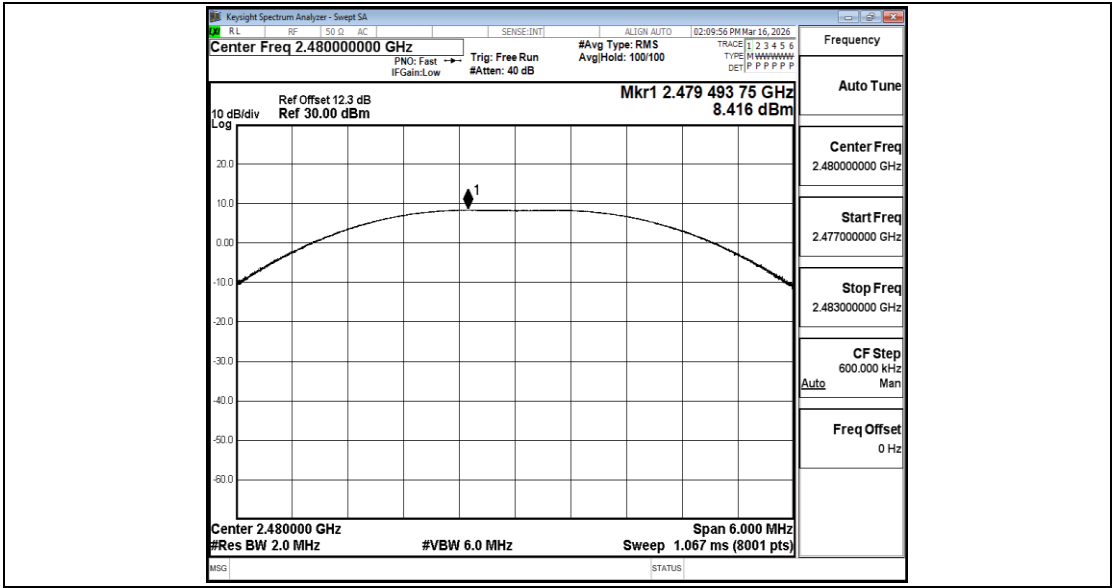
Note: offset=System attenuation +caba loss

Test Graphs Peak









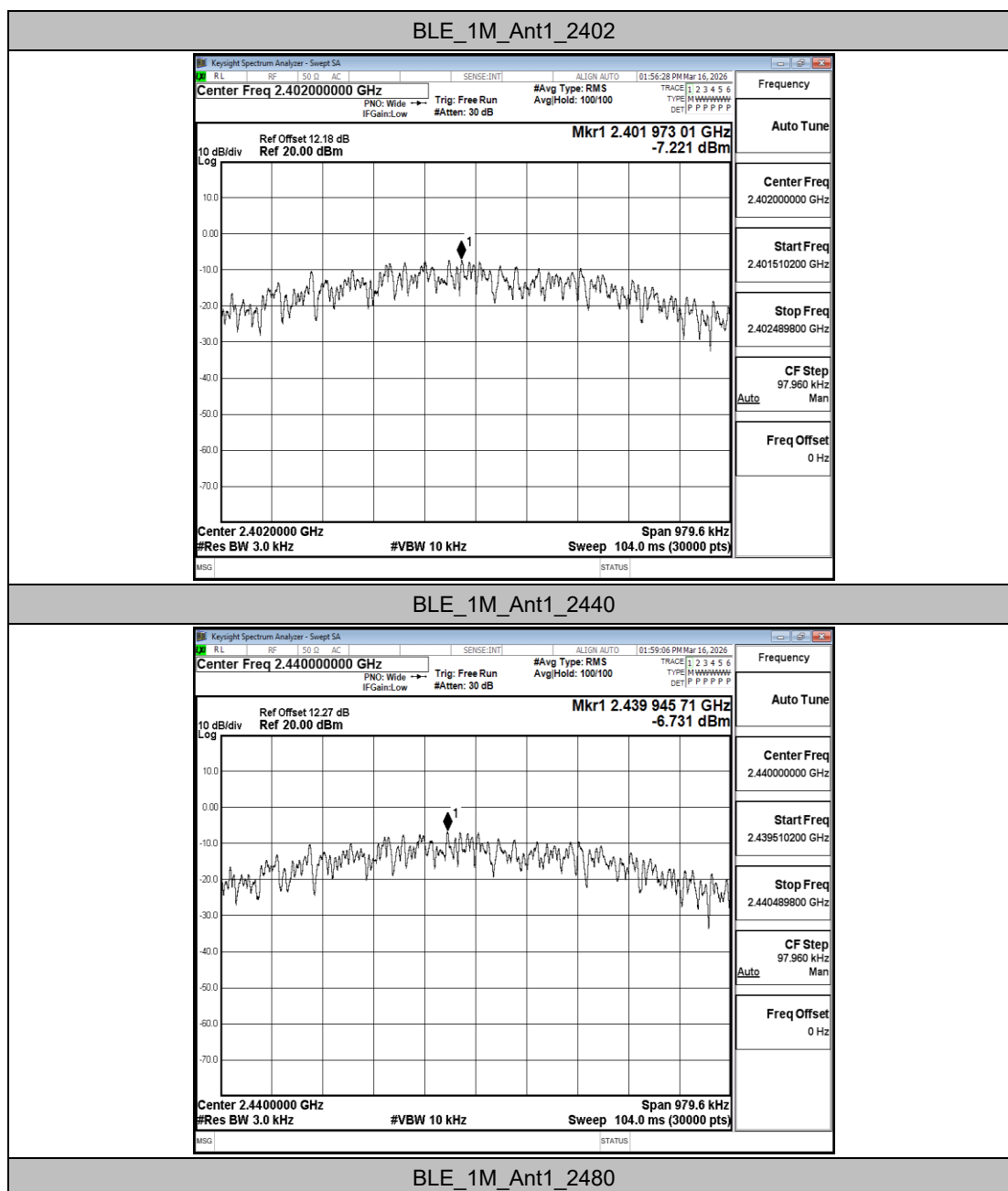
B.3 Maximum power spectral density

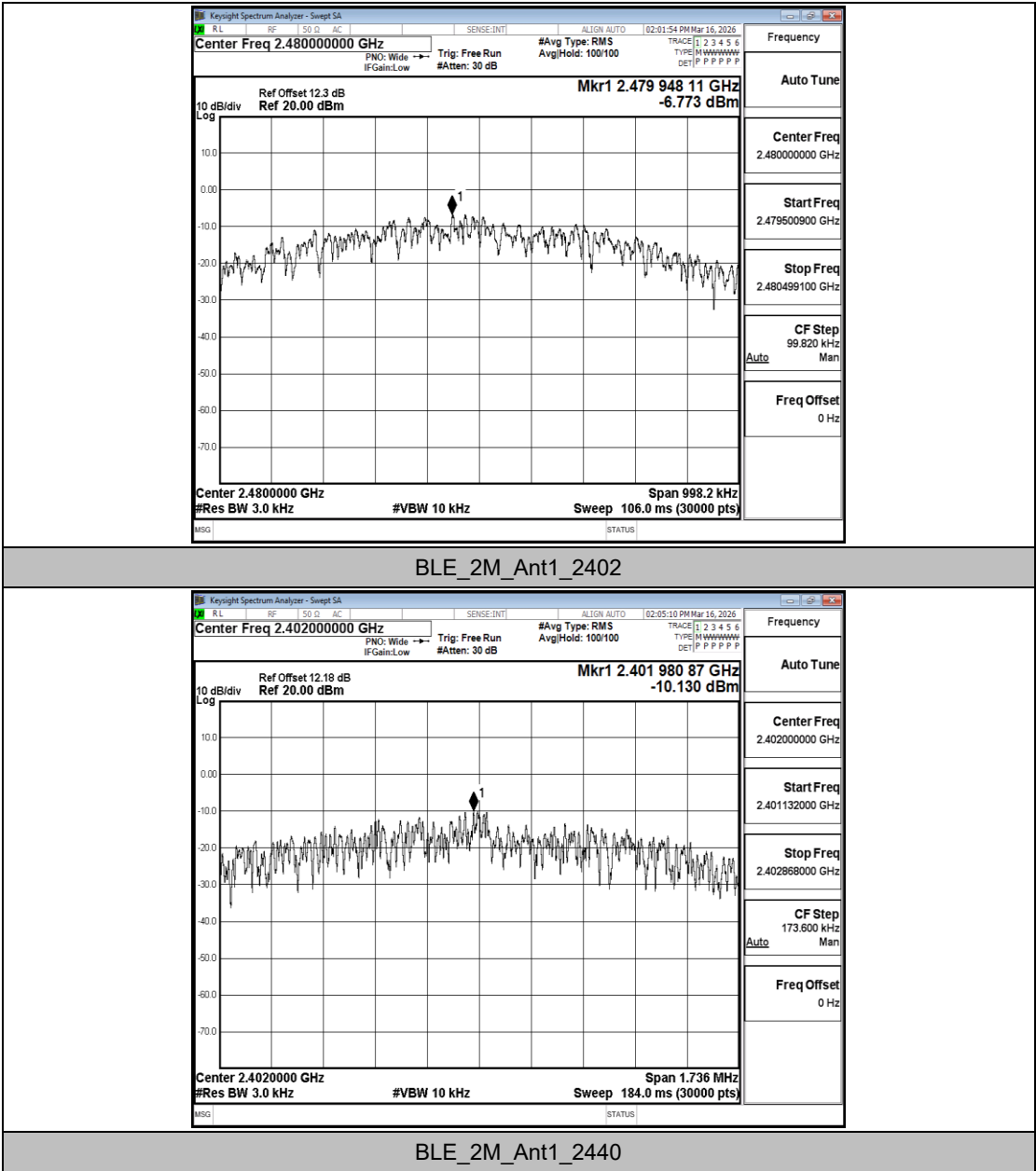
Test Result

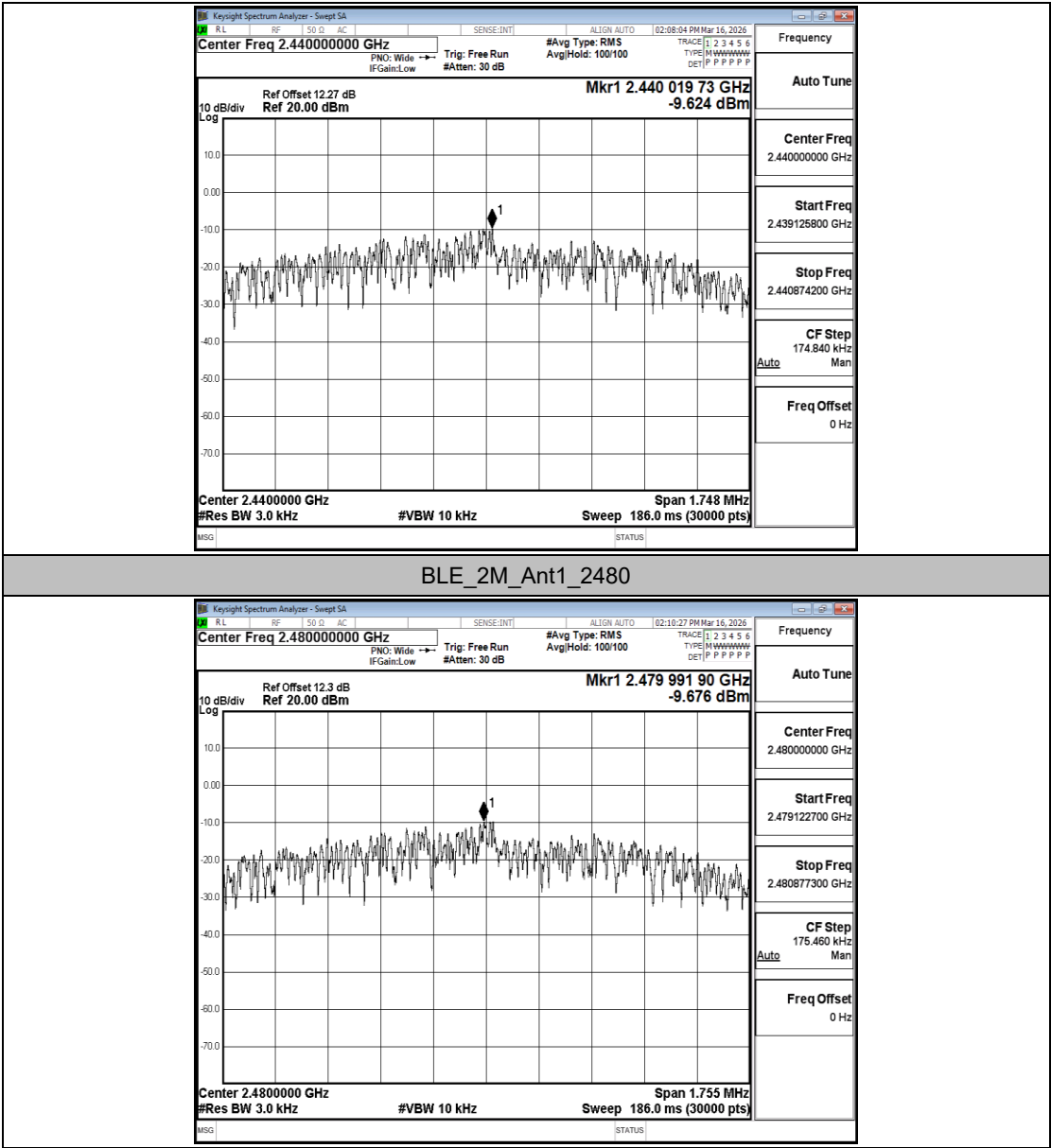
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-7.22	≤8.00	PASS
		2440	-6.73	≤8.00	PASS
		2480	-6.77	≤8.00	PASS
BLE_2M	Ant1	2402	-10.13	≤8.00	PASS
		2440	-9.62	≤8.00	PASS
		2480	-9.68	≤8.00	PASS

Note: offset=System attenuation +cable loss

Test Graphs







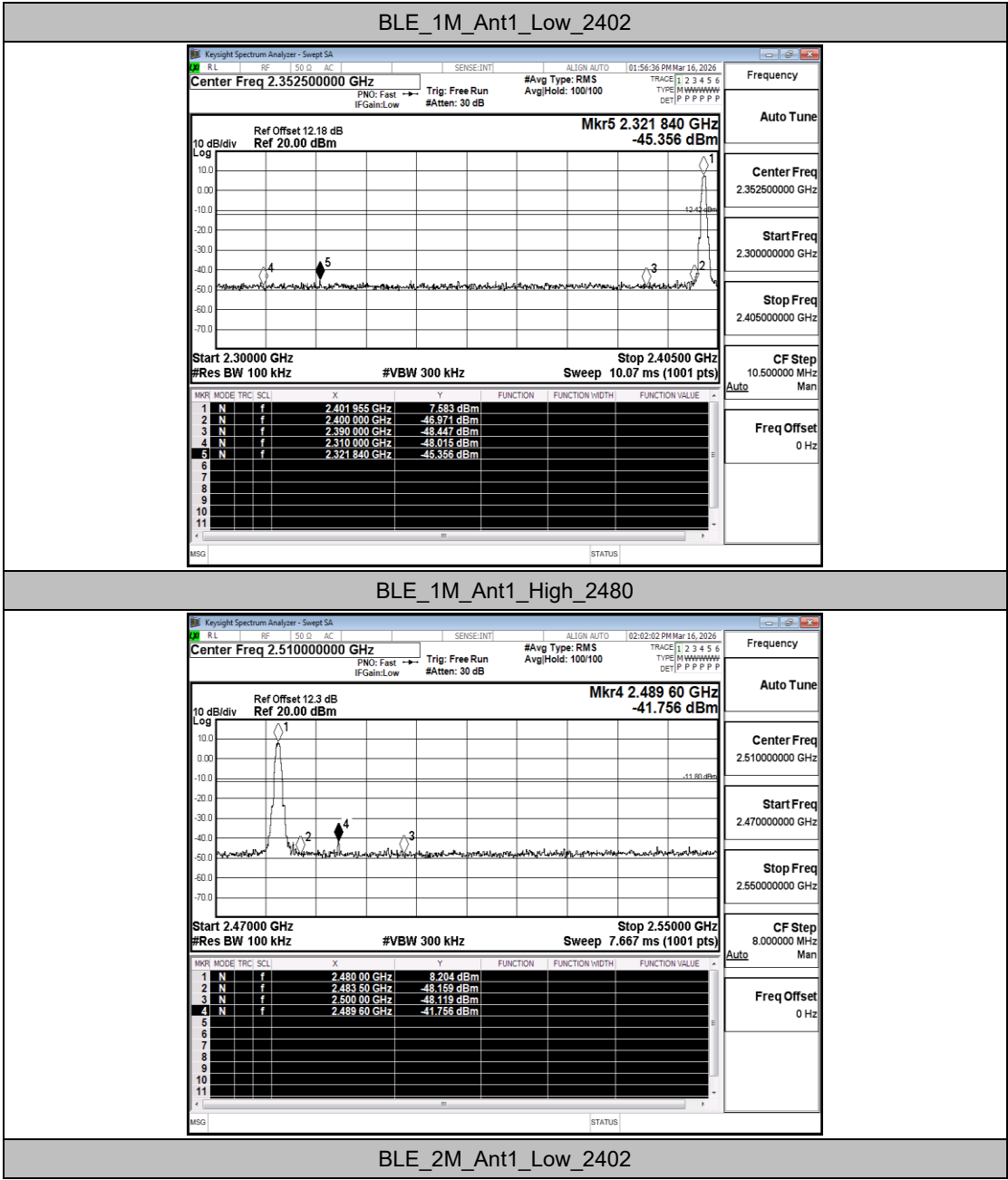
B.4 Band edge measurements

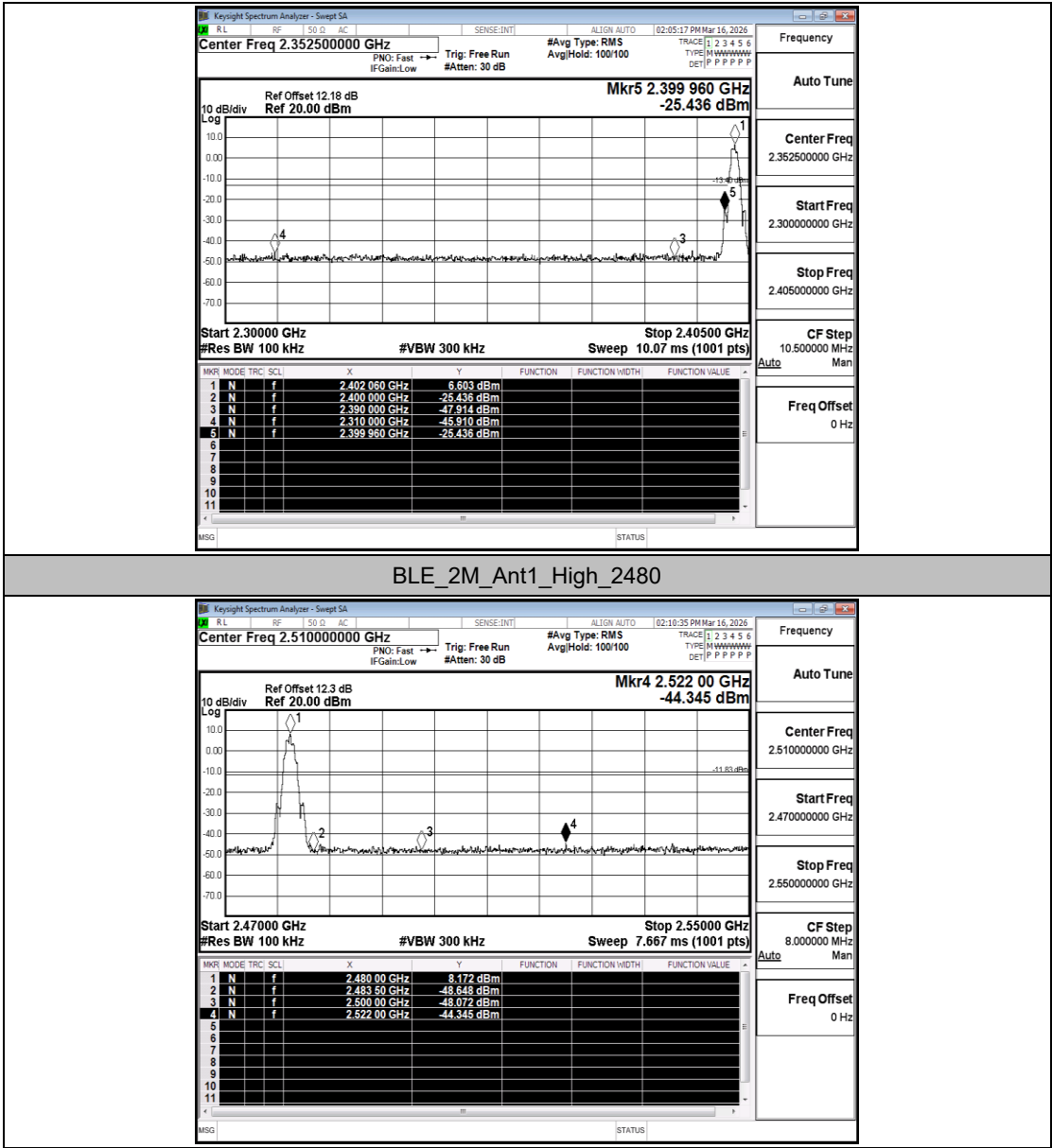
Test Result

TestMode	Antenna	Channel	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	7.58	-45.36	≤-12.42	PASS
		High	2480	8.20	-41.76	≤-11.8	PASS
BLE_2M	Ant1	Low	2402	6.60	-25.44	≤-13.4	PASS
		High	2480	8.17	-44.35	≤-11.83	PASS

Note: offset=System attenuation +cable loss

Test Graphs





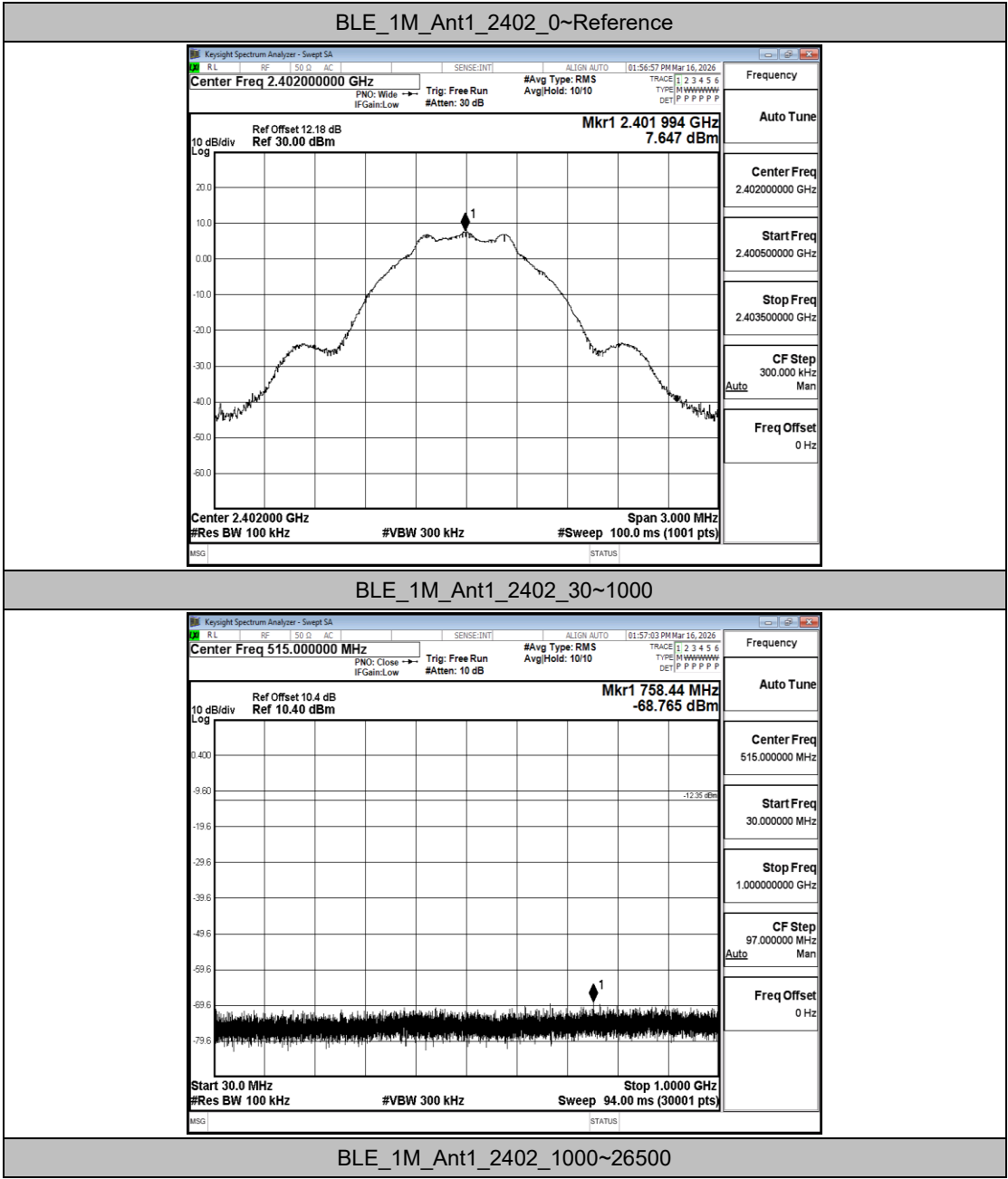
B.5 Conducted Spurious Emission

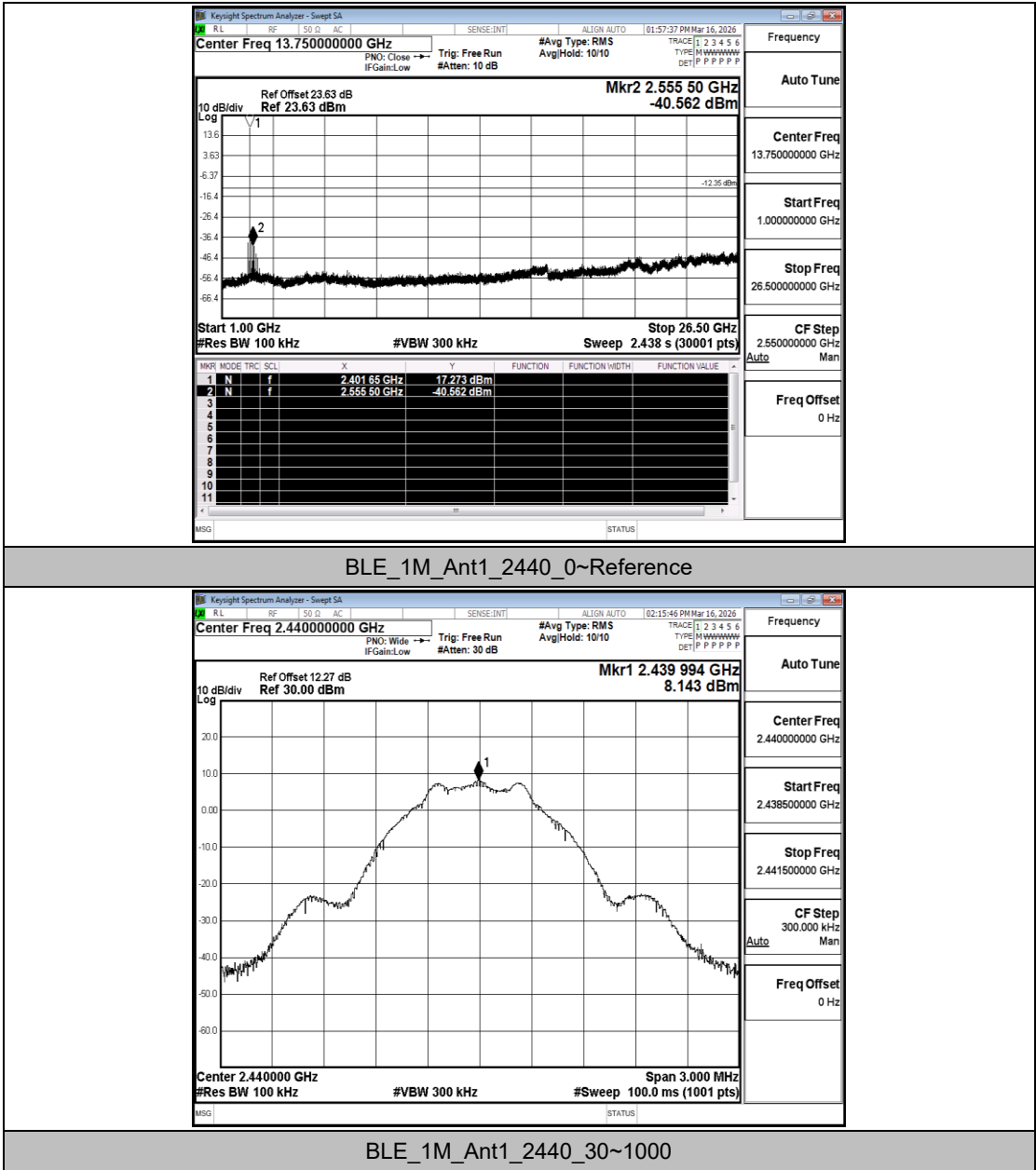
Test Result

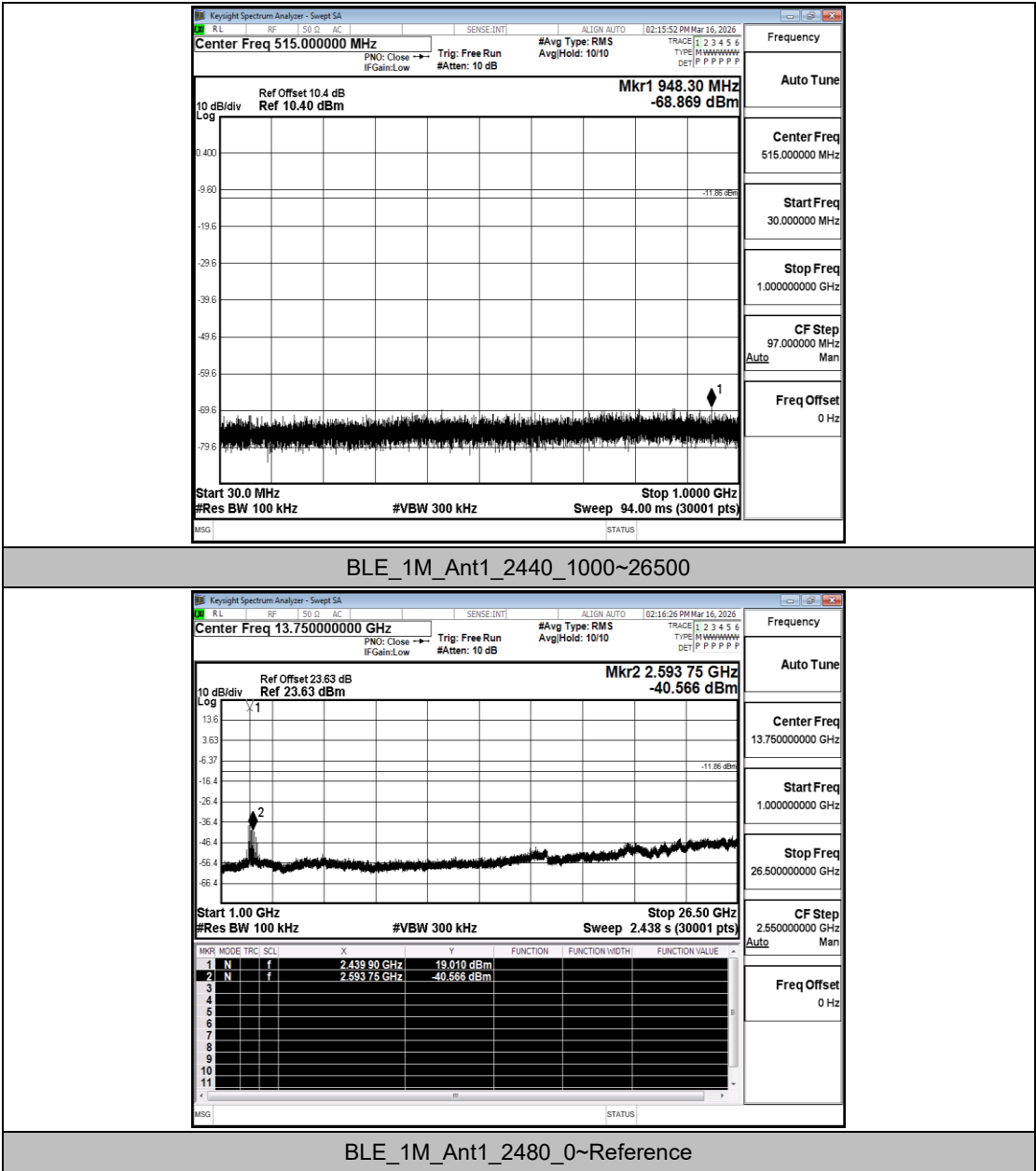
TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	7.65	7.65	---	PASS
			30~1000	7.65	-68.77	≤-12.35	PASS
			1000~26500	7.65	-40.56	≤-12.35	PASS
		2440	Reference	8.14	8.14	---	PASS
			30~1000	8.14	-68.87	≤-11.86	PASS
			1000~26500	8.14	-40.57	≤-11.86	PASS
		2480	Reference	8.08	8.08	---	PASS
			30~1000	8.08	-68.96	≤-11.92	PASS
			1000~26500	8.08	-39.72	≤-11.92	PASS
BLE_2M	Ant1	2402	Reference	7.70	7.70	---	PASS
			30~1000	7.70	-67.91	≤-12.3	PASS
			1000~26500	7.70	-39.93	≤-12.3	PASS
		2440	Reference	8.12	8.12	---	PASS
			30~1000	8.12	-68.93	≤-11.88	PASS
			1000~26500	8.12	-43.31	≤-11.88	PASS
		2480	Reference	8.08	8.08	---	PASS
			30~1000	8.08	-69.12	≤-11.92	PASS
			1000~26500	8.08	-39.3	≤-11.92	PASS

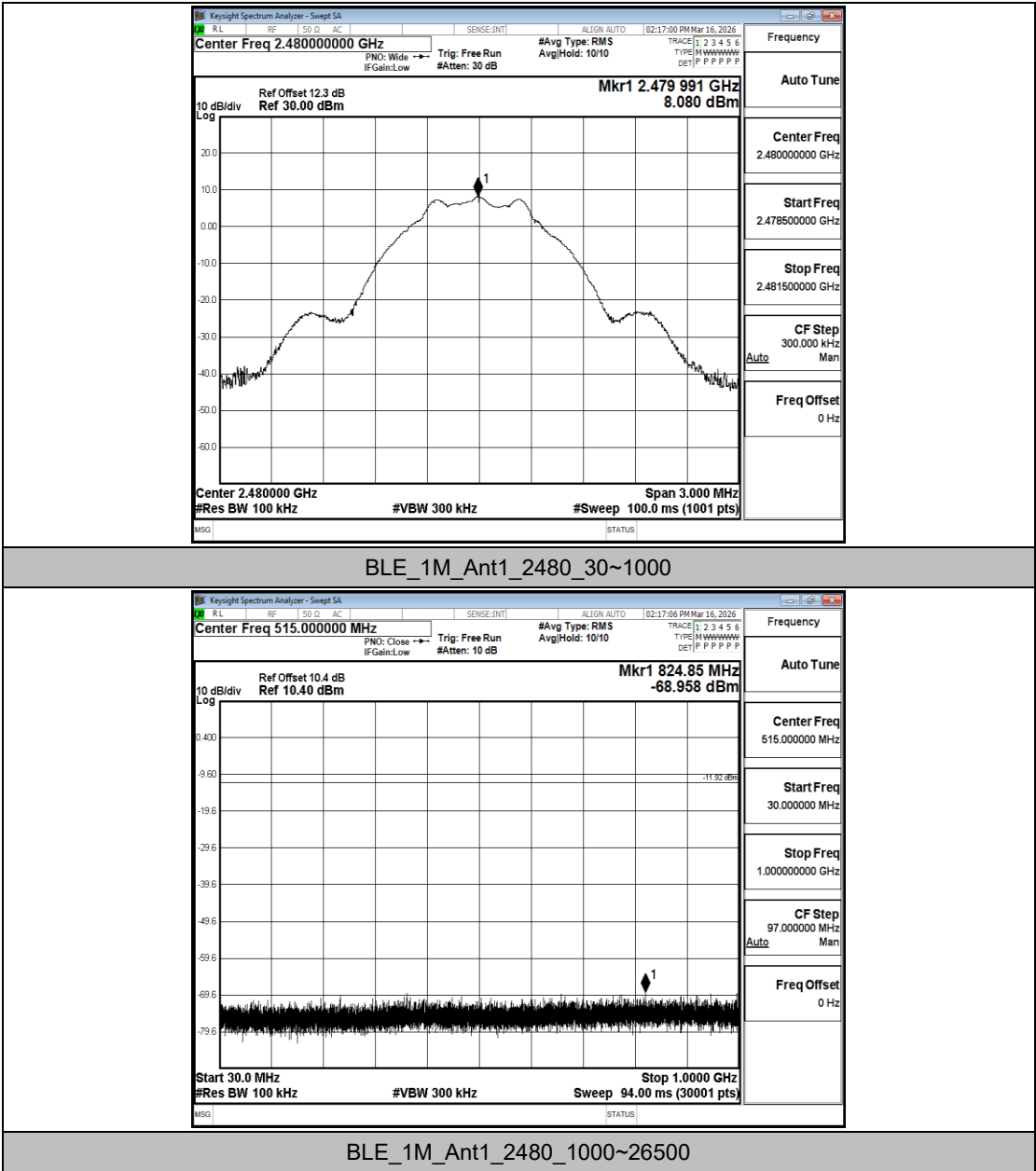
Note: offset=System attenuation +cabel loss

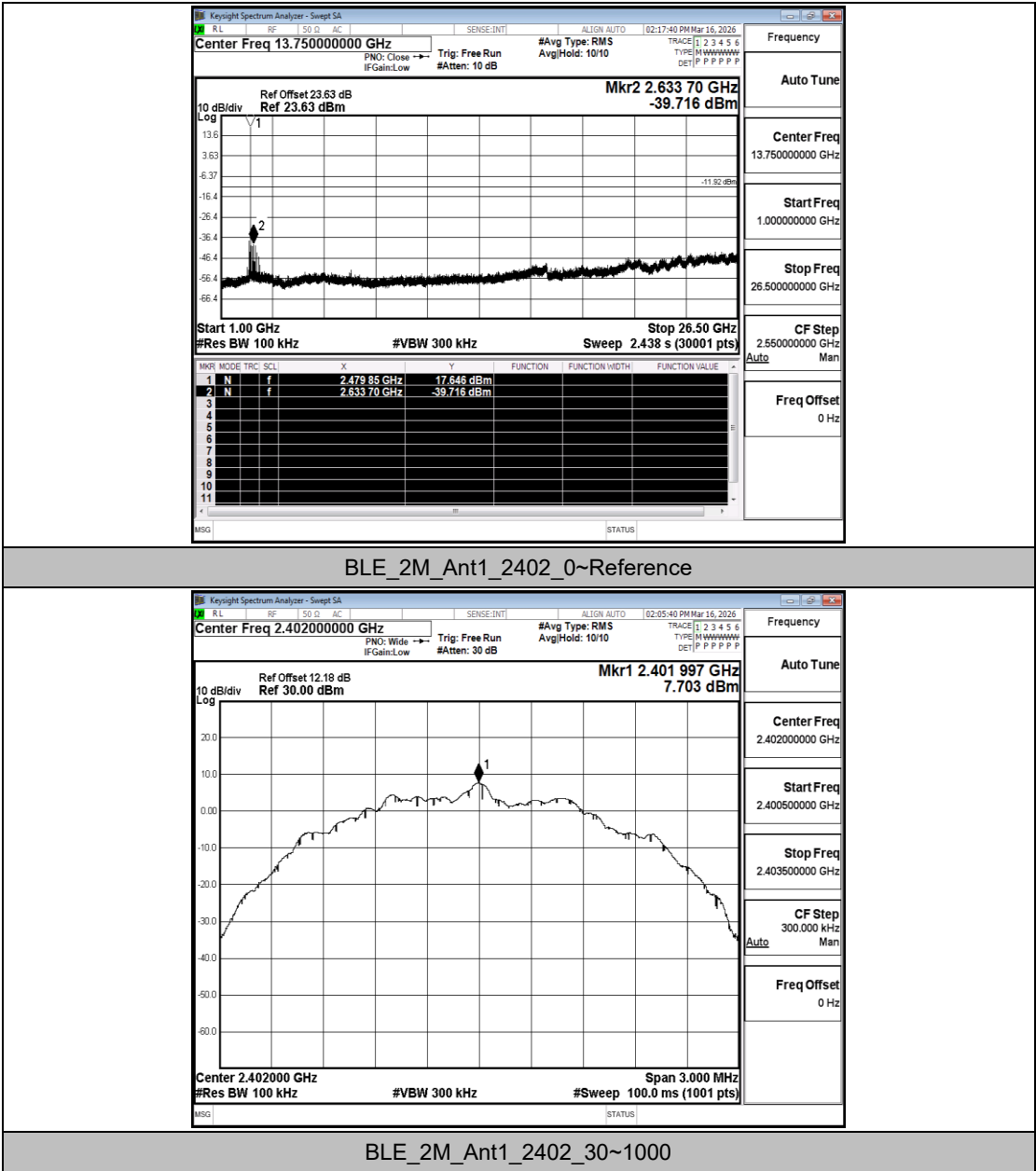
Test Graphs

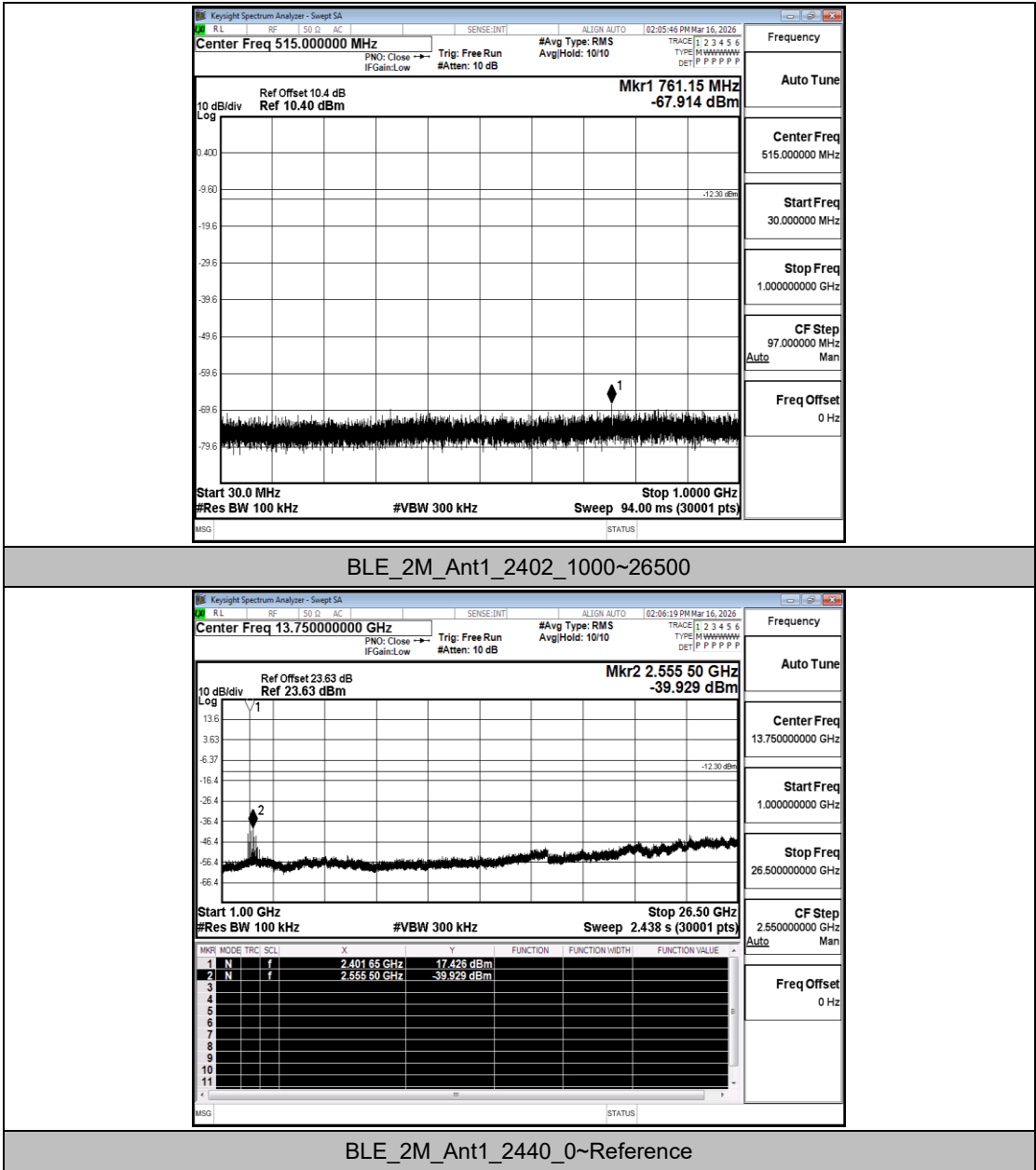


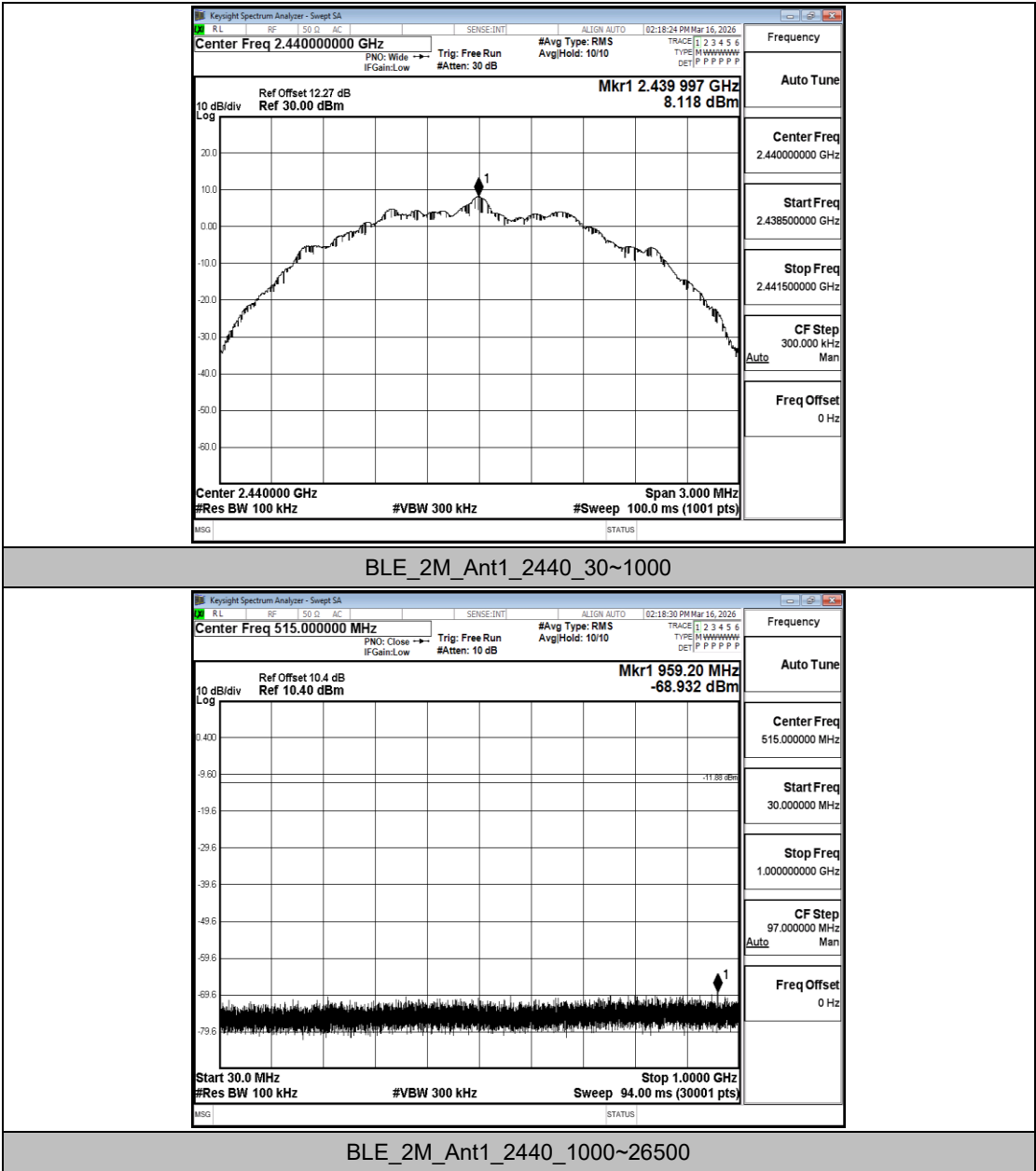


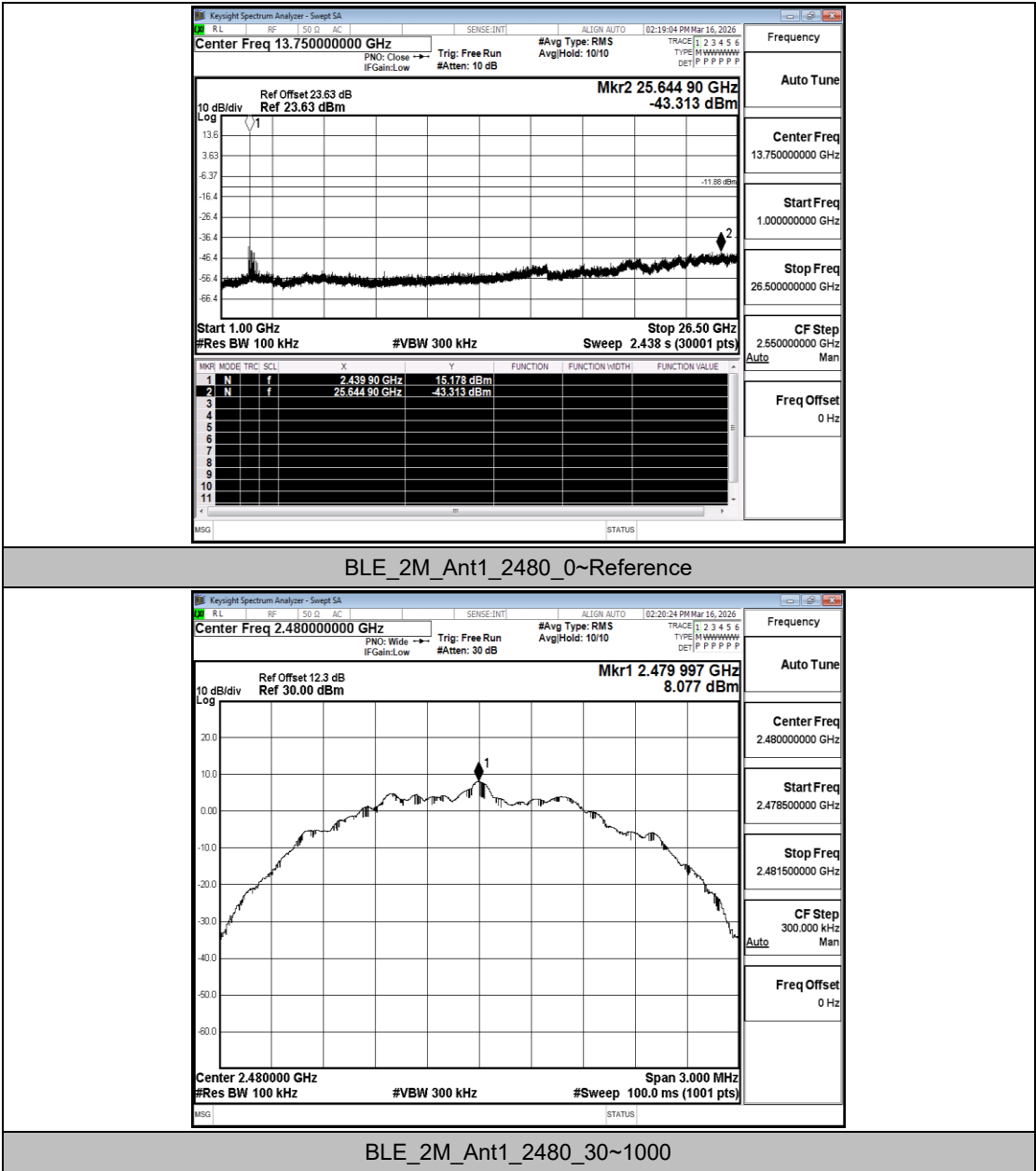


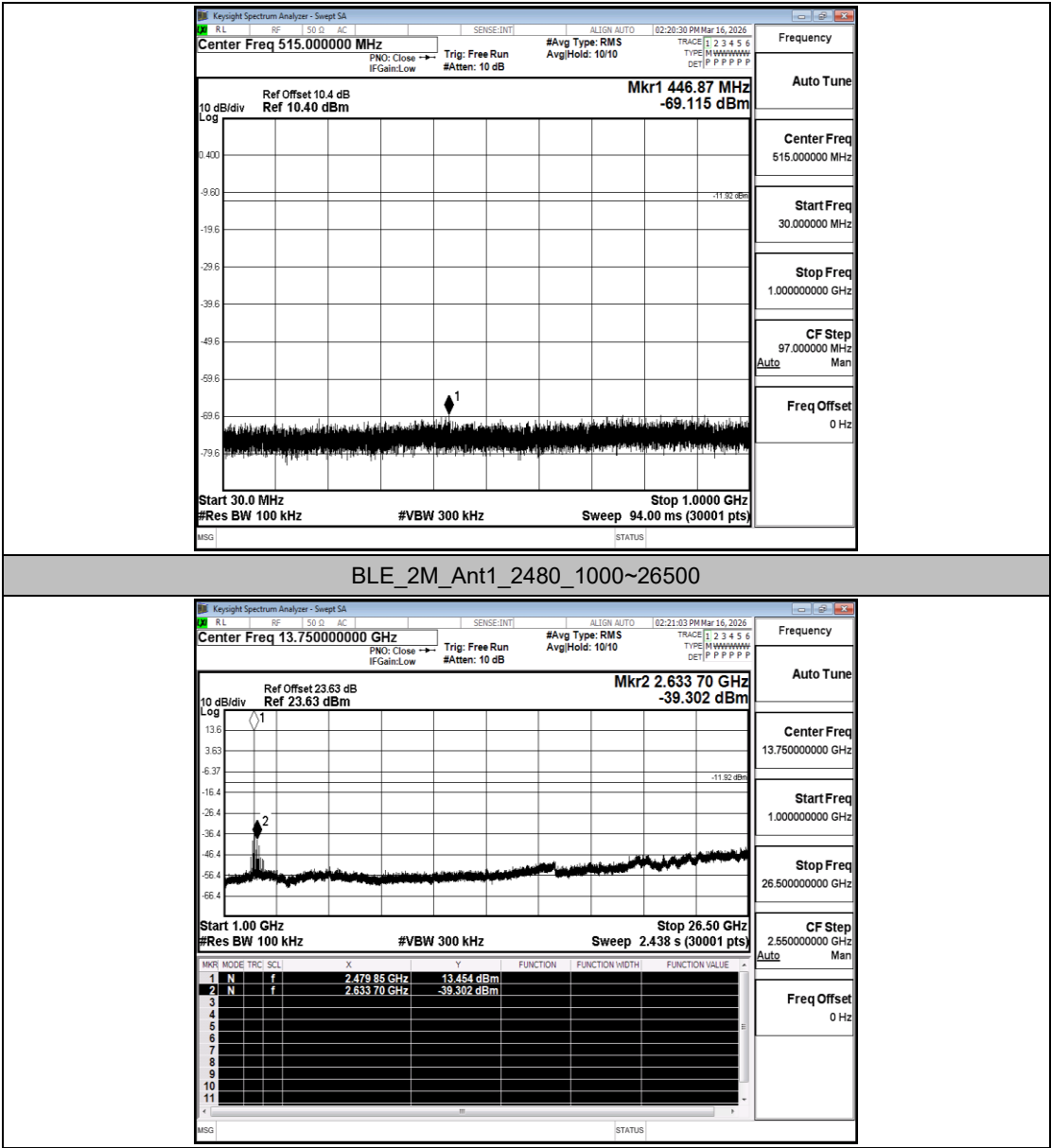










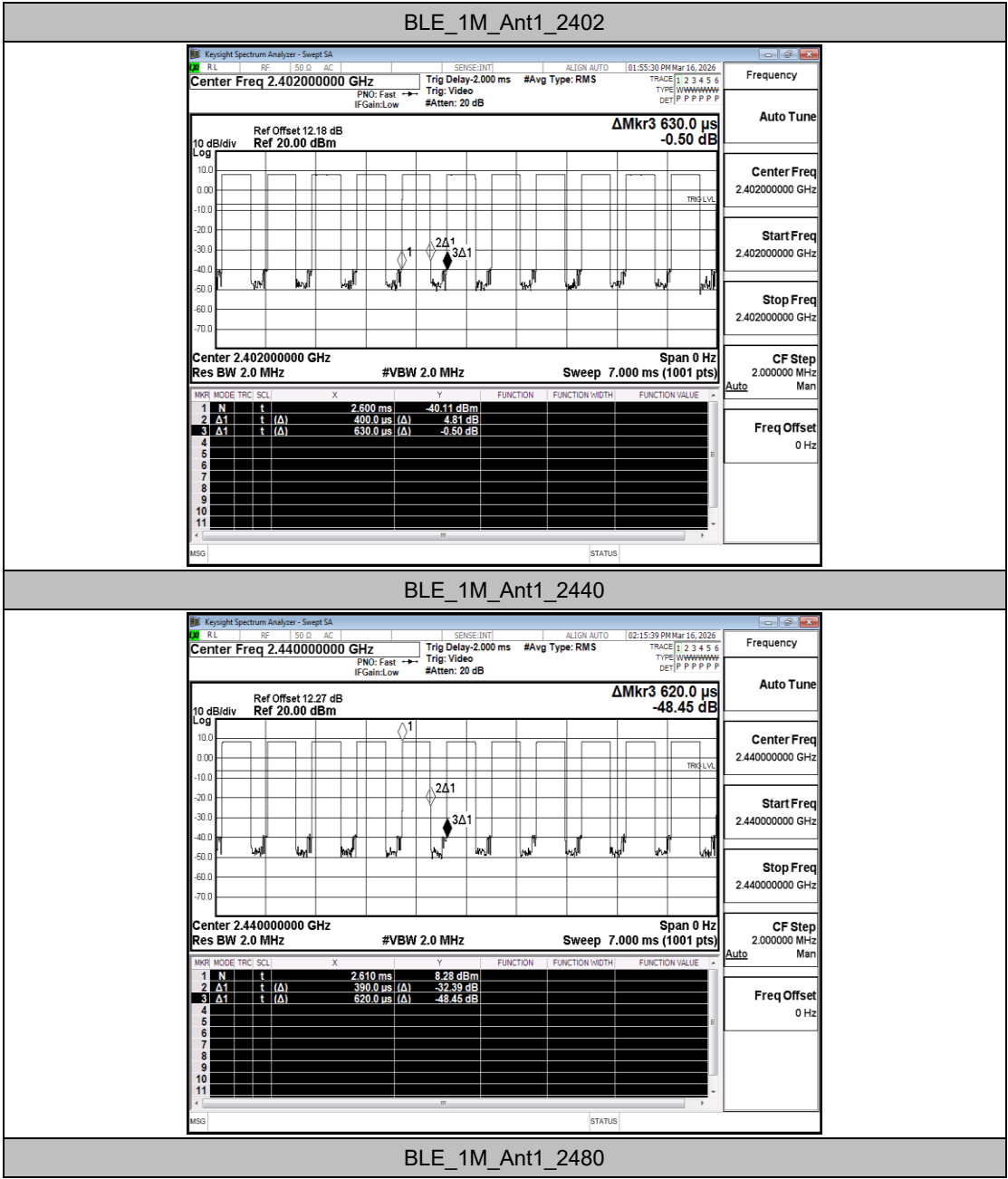


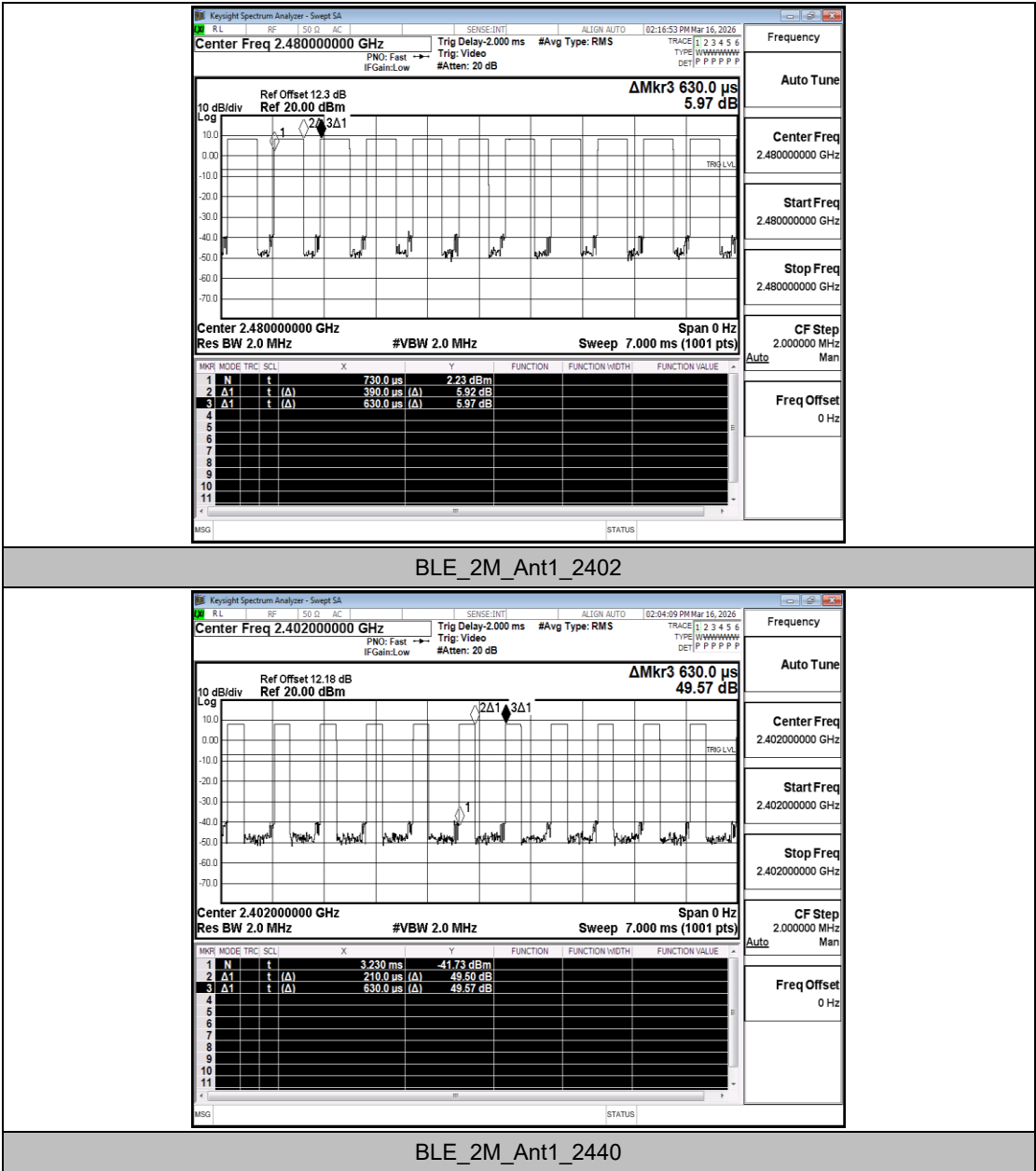
B.6 Duty Cycle

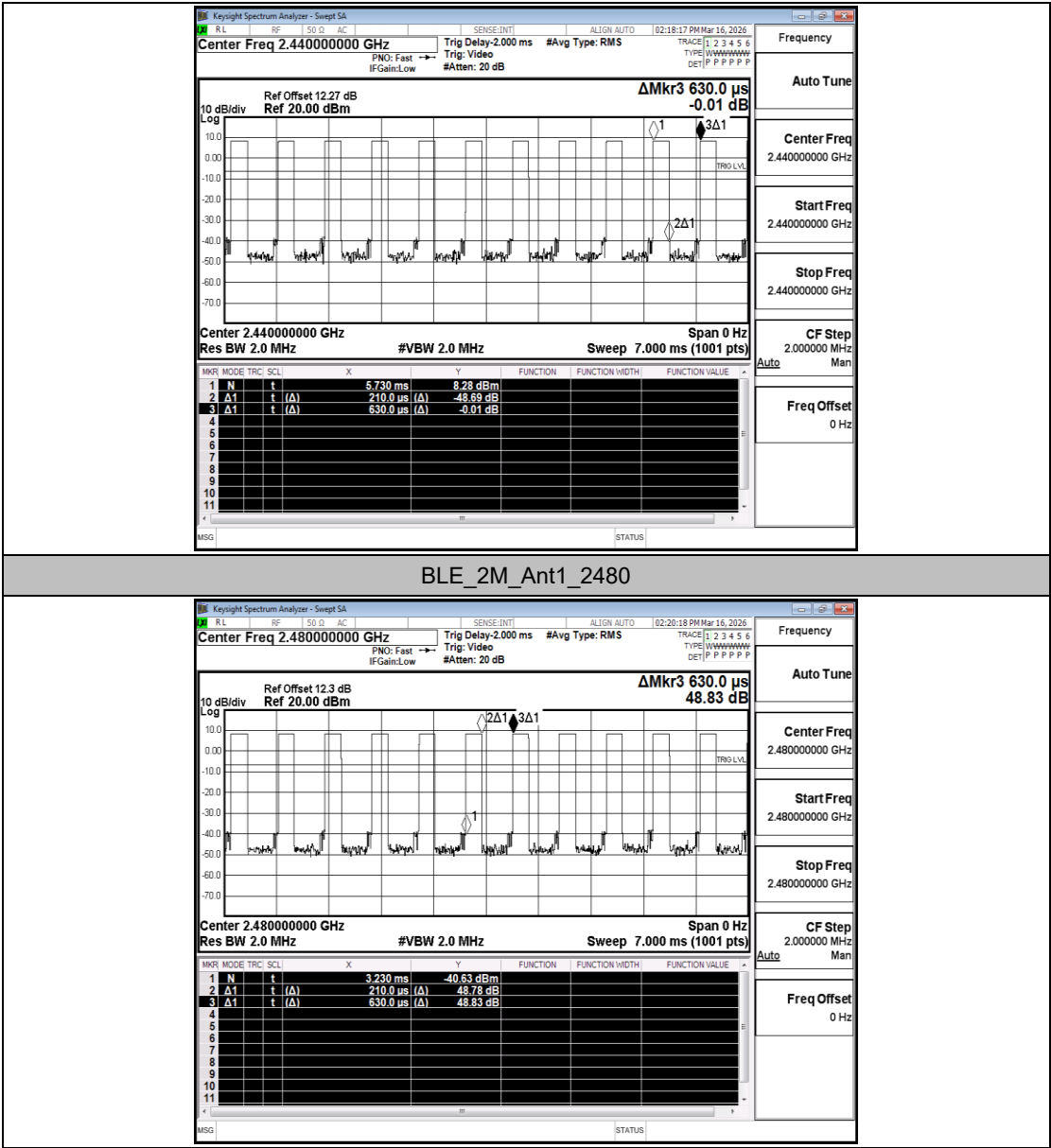
Test Result

TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.40	0.63	0.6349	63.49	1.97	---	---
		2440	0.39	0.62	0.6290	62.90	2.01	---	---
		2480	0.39	0.63	0.6190	61.90	2.08	---	---
BLE_2M	Ant1	2402	0.21	0.63	0.3333	33.33	4.77	---	---
		2440	0.21	0.63	0.3333	33.33	4.77	---	---
		2480	0.21	0.63	0.3333	33.33	4.77	---	---

Test Graphs







B.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBUV/m]	Limit [dBUV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-57.06	2.97	1.97	43.08	≤54	PASS
				AV	2325.410	-51.53	2.97	1.97	48.61	≤54	PASS
				AV	2390.000	-56.75	2.97	1.97	43.39	≤54	PASS
				Peak	2310.000	-48.87	2.97	0.00	49.30	≤74	PASS
				Peak	2325.410	-43.4	2.97	0.00	54.77	≤74	PASS
				Peak	2390.000	-47.87	2.97	0.00	50.30	≤74	PASS
		High	2480	AV	2483.500	-53.74	2.97	2.08	46.51	≤54	PASS
				AV	2483.680	-53.59	2.97	2.08	46.66	≤54	PASS
				AV	2500.000	-56.05	2.97	2.08	44.20	≤54	PASS
				Peak	2483.500	-41.68	2.97	0.00	56.49	≤74	PASS
				Peak	2489.840	-40.31	2.97	0.00	57.86	≤74	PASS
				Peak	2500.000	-48.1	2.97	0.00	50.07	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-57.33	2.97	4.77	45.61	≤54	PASS
				AV	2325.305	-53.76	2.97	4.77	49.18	≤54	PASS
				AV	2390.000	-56.61	2.97	4.77	46.33	≤54	PASS
				Peak	2310.000	-49.61	2.97	0.00	48.56	≤74	PASS
				Peak	2324.885	-44.26	2.97	0.00	53.91	≤74	PASS
				Peak	2390.000	-48.43	2.97	0.00	49.74	≤74	PASS
		High	2480	AV	2483.500	-51.46	2.97	4.91	51.62	≤54	PASS
				AV	2483.520	-51.46	2.97	4.91	51.62	≤54	PASS
				AV	2500.000	-56.49	2.97	4.91	46.59	≤54	PASS
				Peak	2483.500	-40.4	2.97	0.00	57.77	≤74	PASS
				Peak	2489.600	-40.2	2.97	0.00	57.97	≤74	PASS
				Peak	2500.000	-48.69	2.97	0.00	49.48	≤74	PASS

Note:

1. The Antenna Gain is compensated in the graph.
2. 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

