

Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Smart Phone

Test Model: ULTRA S25

Environmental Conditions

Temperature:	24.3°C
Relative Humidity:	53.1%
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	0.664	2401.660	2402.324	0.5	PASS
		2440	0.664	2439.660	2440.324	0.5	PASS
		2480	0.664	2479.660	2480.324	0.5	PASS
BLE_2M	Ant1	2402	1.164	2401.404	2402.568	0.5	PASS
		2440	1.160	2439.404	2440.564	0.5	PASS
		2480	1.164	2479.404	2480.568	0.5	PASS

Figure 10 shows two screenshots of a Keysight Spectrum Analyzer (Sweep SA) displaying the frequency spectrum for BLE_1M_Ant1_2402 and BLE_1M_Ant1_2440. Both plots show a peak at approximately 2.4 GHz, with a measured power level of -0.122 dBm for the 2402 MHz signal and -0.267 dBm for the 2440 MHz signal. The plots include a table of measured values (MNR MODE TRC SCL) and a table of function values (FUNCTION WIDTH, FUNCTION VALUE).

BLE_1M_Ant1_2402

Center Freq 2.402000000 GHz
Ref Offset 11.18 dB
Ref 30.00 dBm
ΔMkr3 664 kHz
-0.122 dBm

Center 2.402000 GHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 100.0 ms (1001 pts)

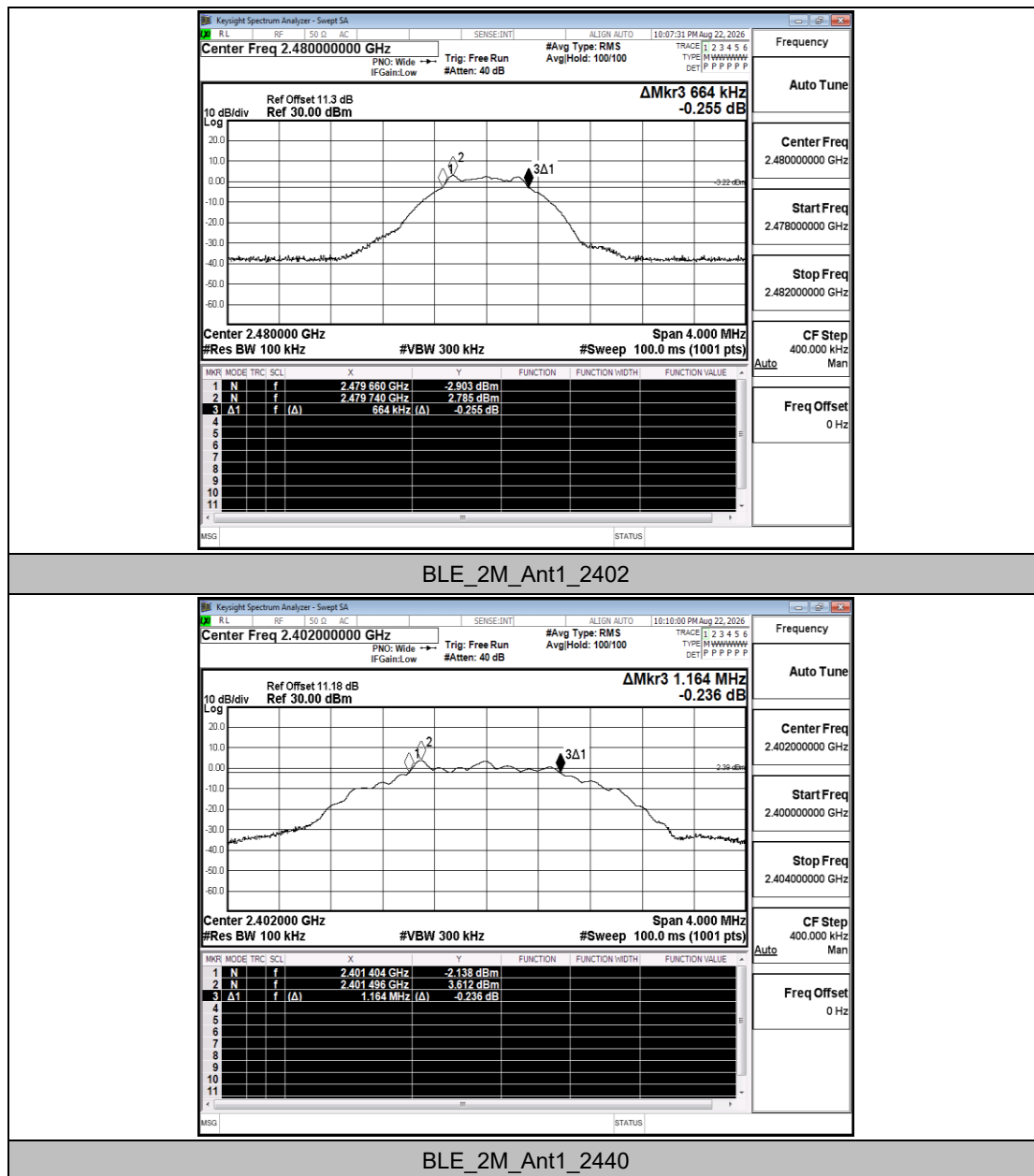
MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.401 660 GHz	-1.668 dBm			
2	N	f		2.401 744 GHz	3.938 dBm			
3	Δ1	f	(Δ)	664 kHz (Δ)	-0.122 dB			

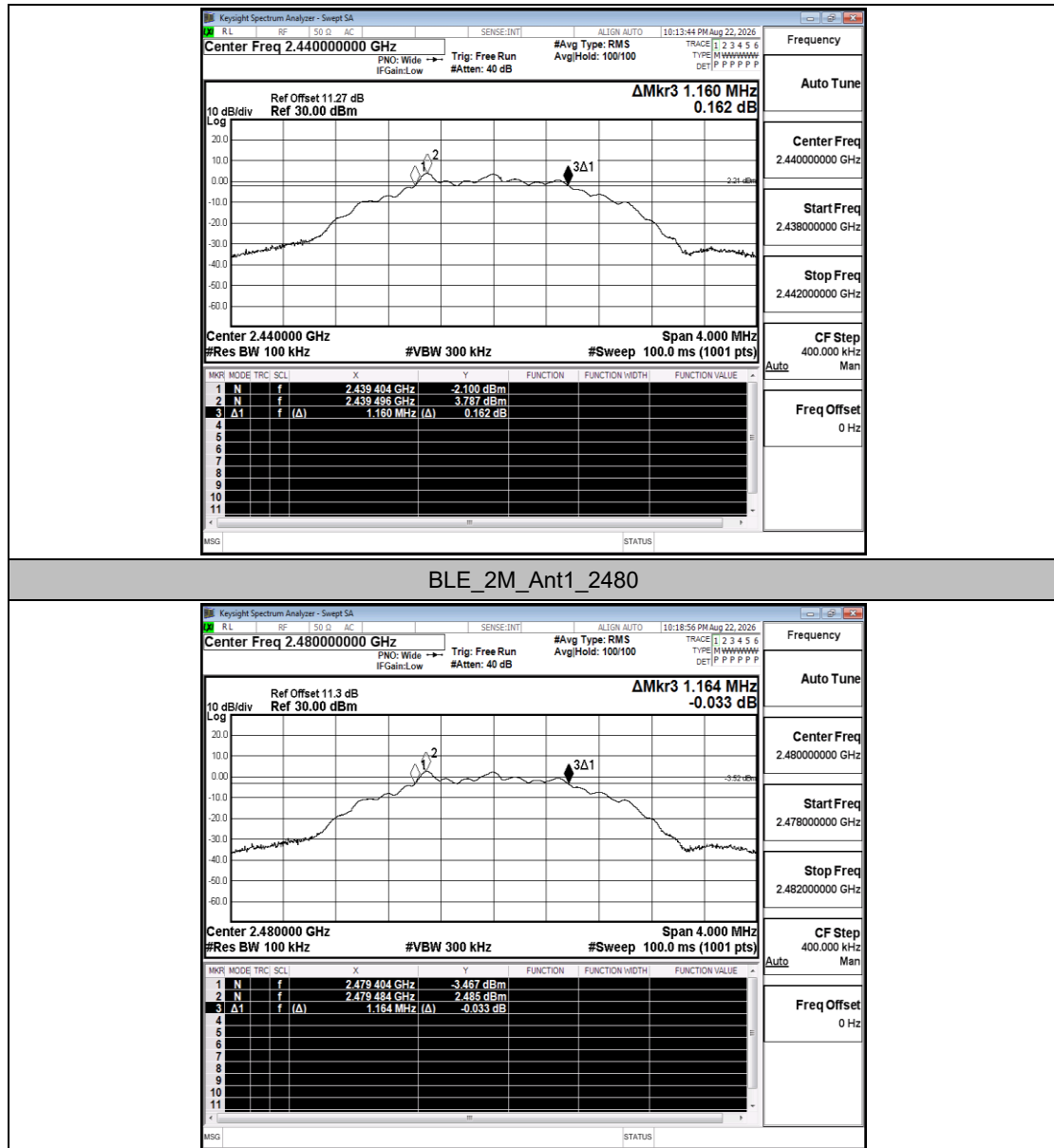
BLE_1M_Ant1_2440

Center Freq 2.440000000 GHz
Ref Offset 11.27 dB
Ref 30.00 dBm
ΔMkr3 664 kHz
-0.267 dBm

Center 2.440000 GHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 100.0 ms (1001 pts)

MNR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.439 660 GHz	-1.646 dBm			
2	N	f		2.439 744 GHz	4.036 dBm			
3	Δ1	f	(Δ)	664 kHz (Δ)	-0.267 dB			



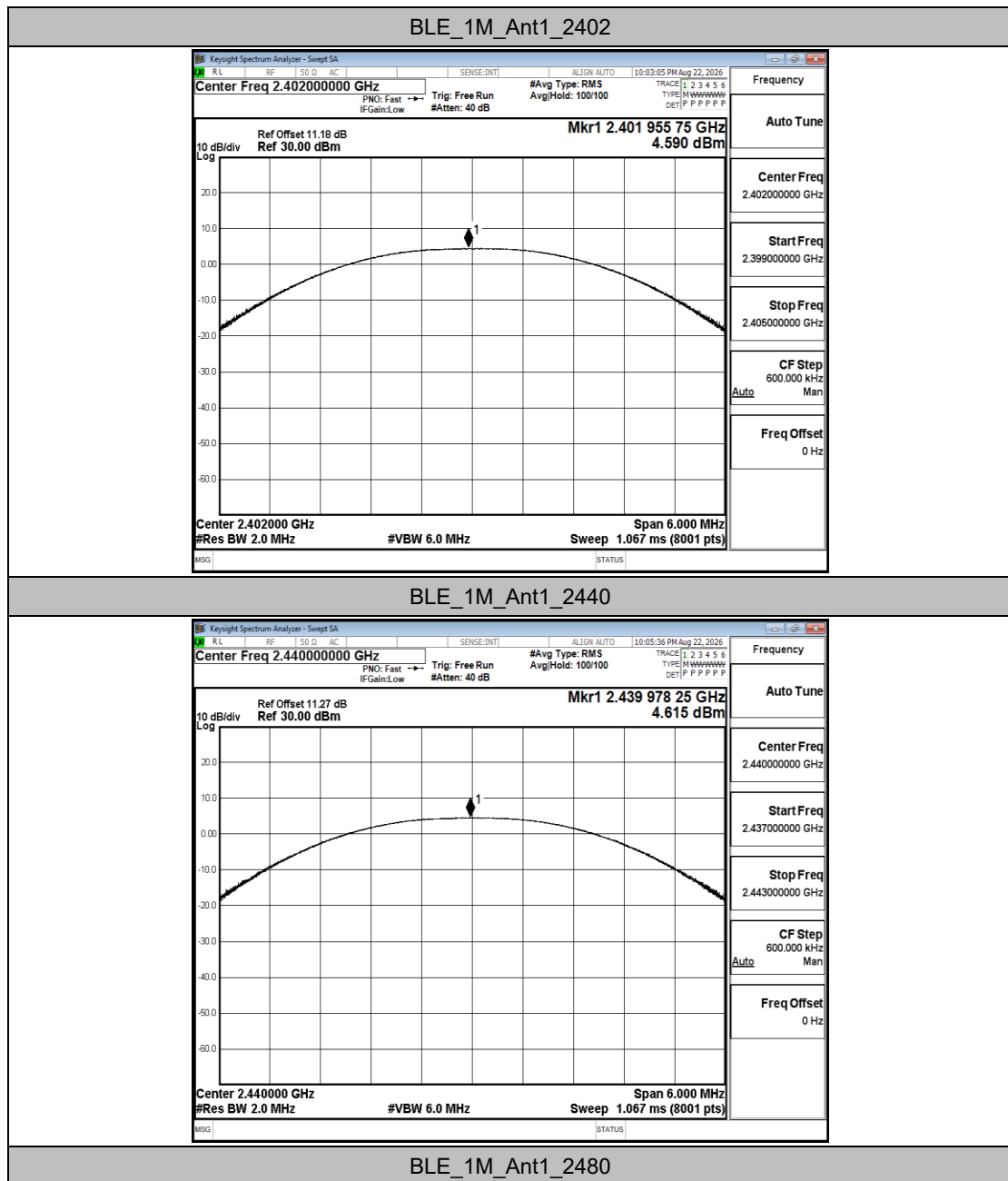


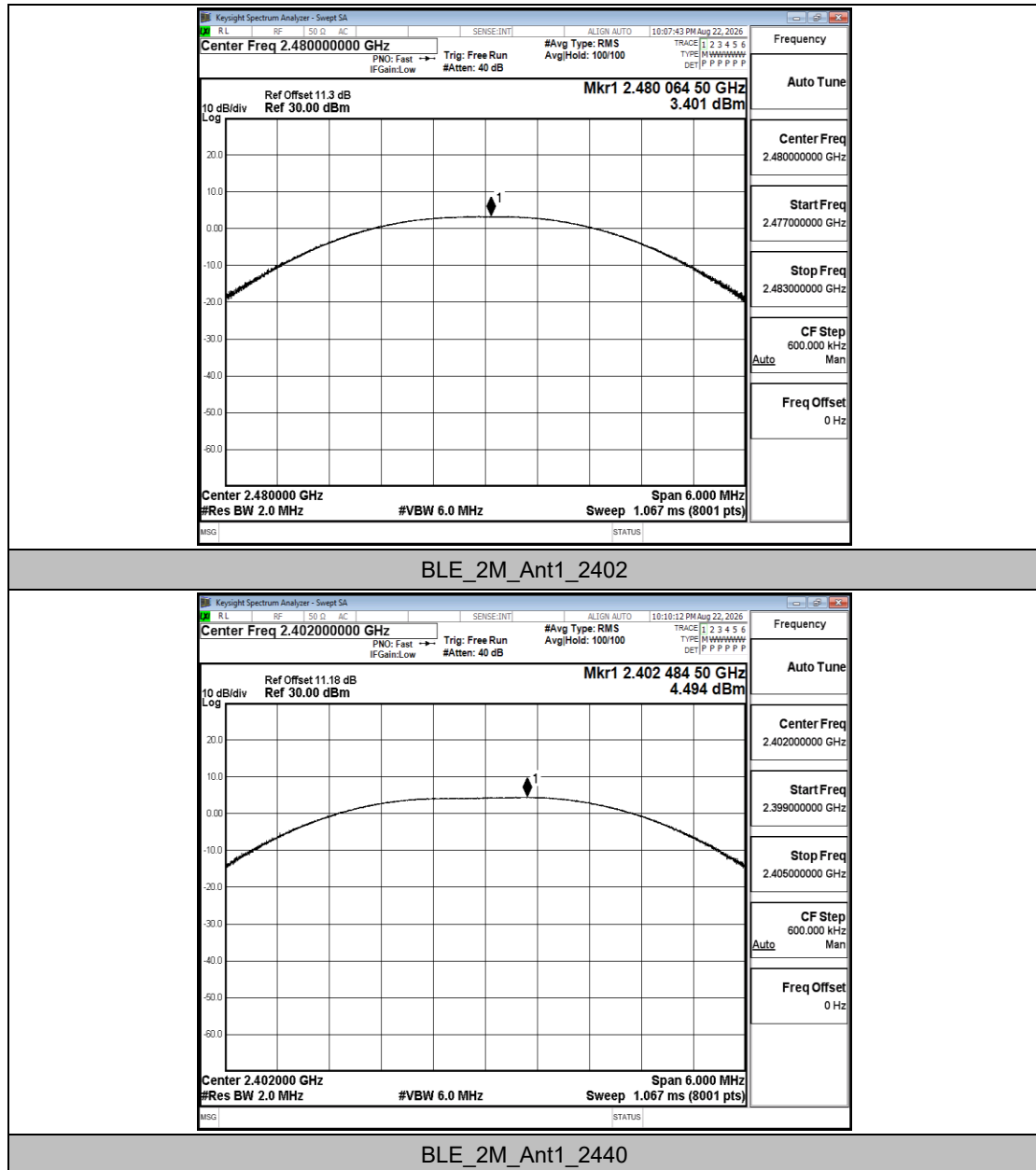
B.2 Maximum Peak conducted output power

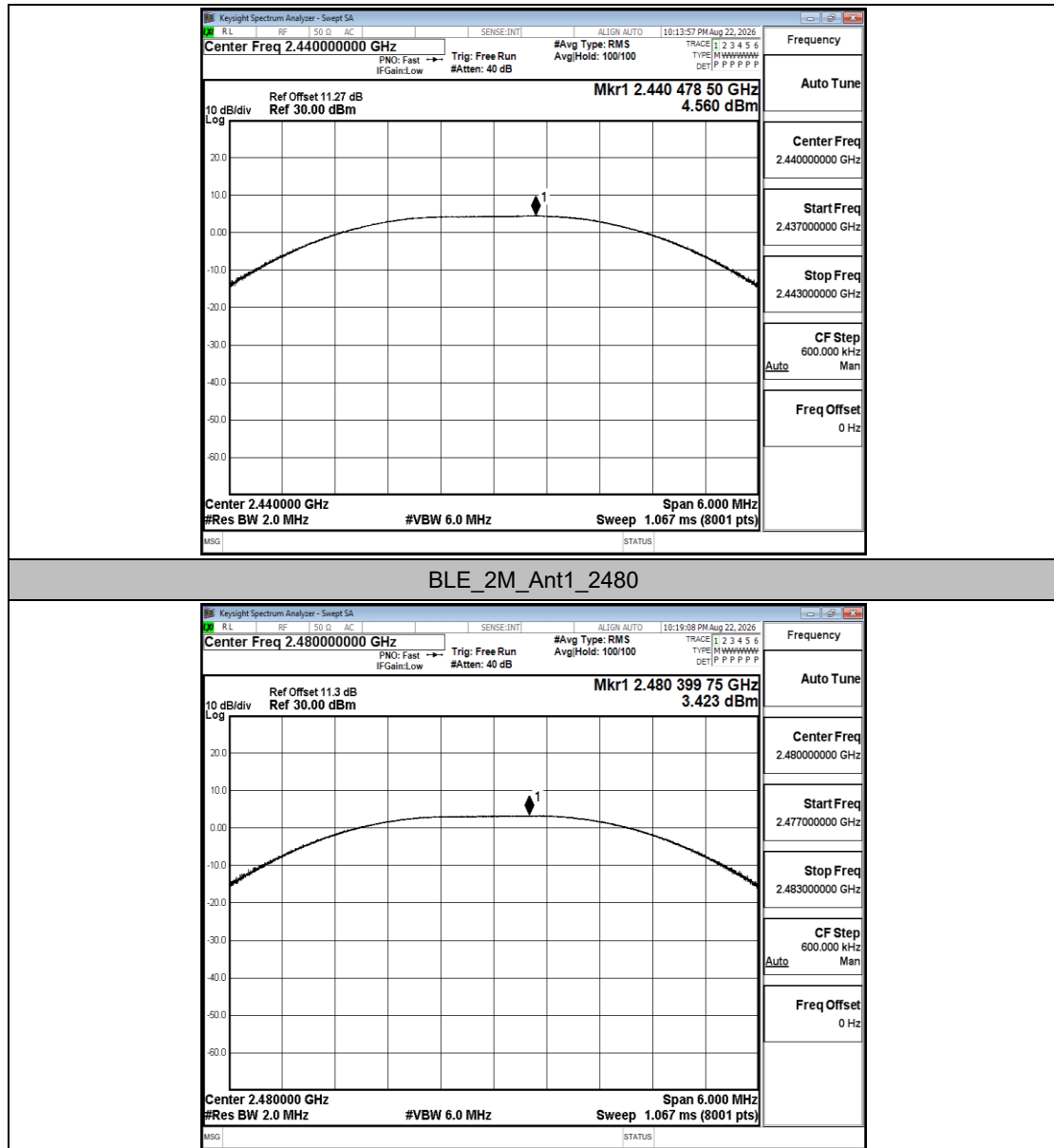
Test Result Peak

TestMode	Antenna	Freq (MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	4.59	≤30	PASS
		2440	4.62	≤30	PASS
		2480	3.40	≤30	PASS
BLE_2M	Ant1	2402	4.49	≤30	PASS
		2440	4.56	≤30	PASS
		2480	3.42	≤30	PASS

Test Graphs Peak





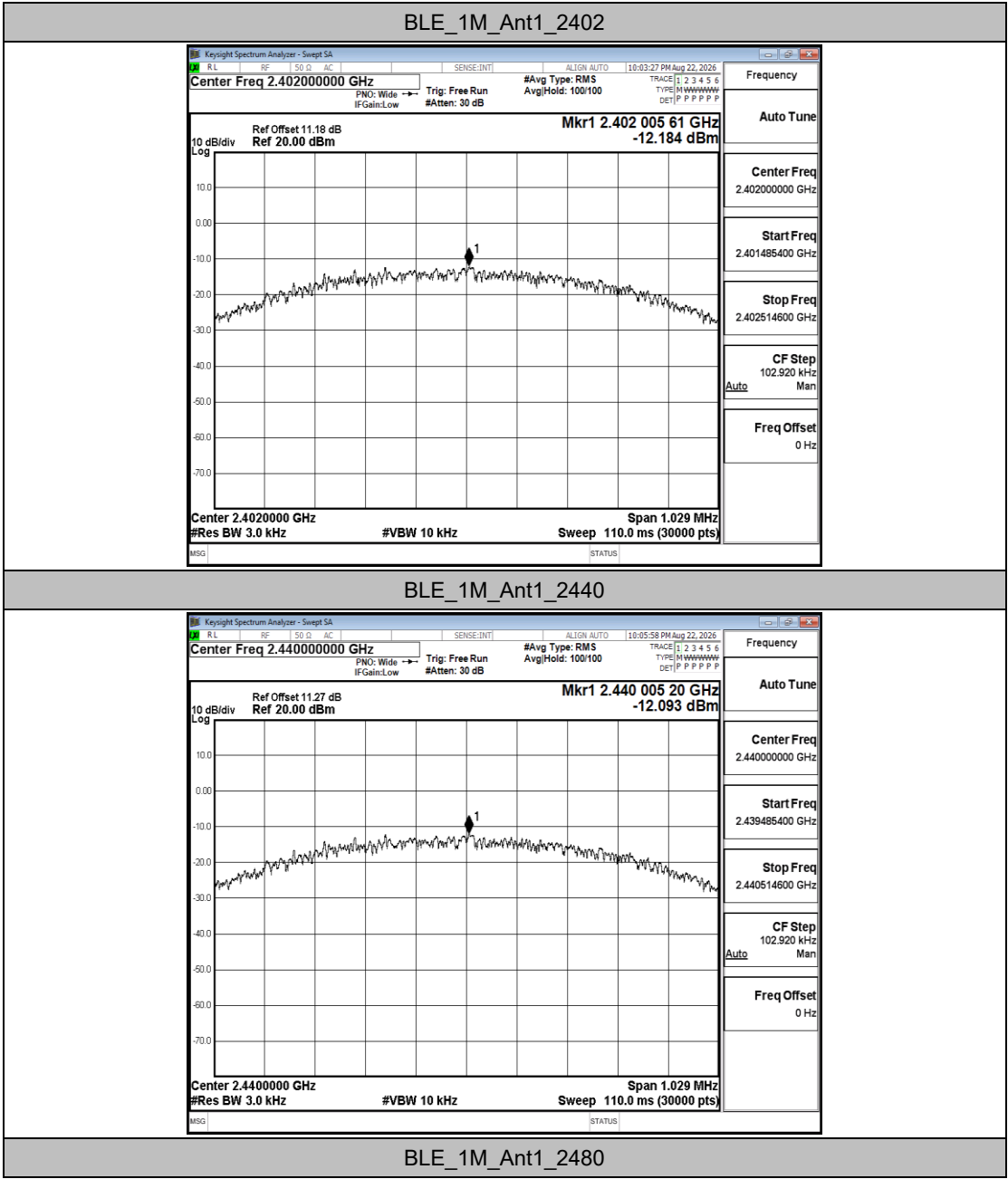


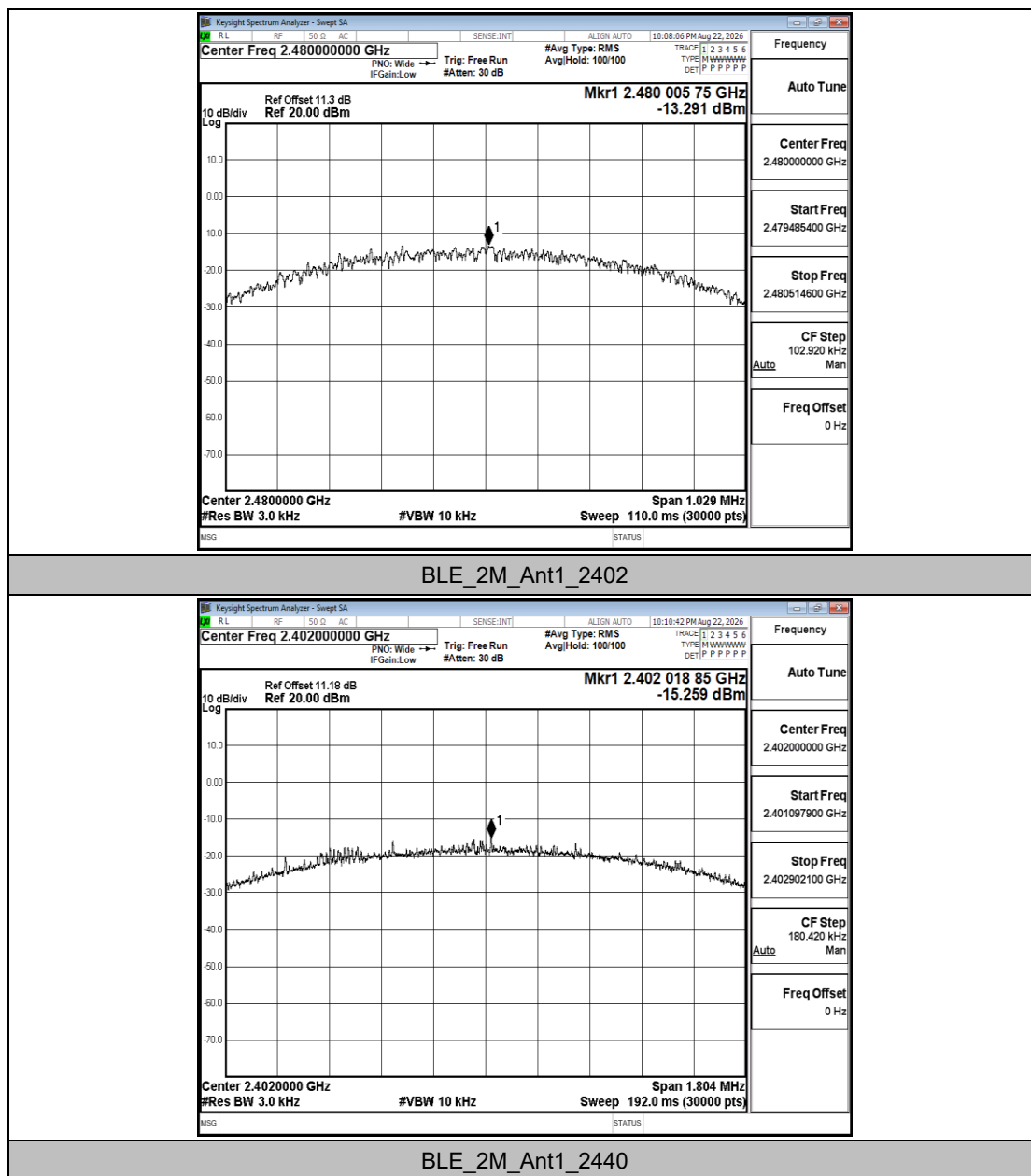
B.3 Maximum power spectral density

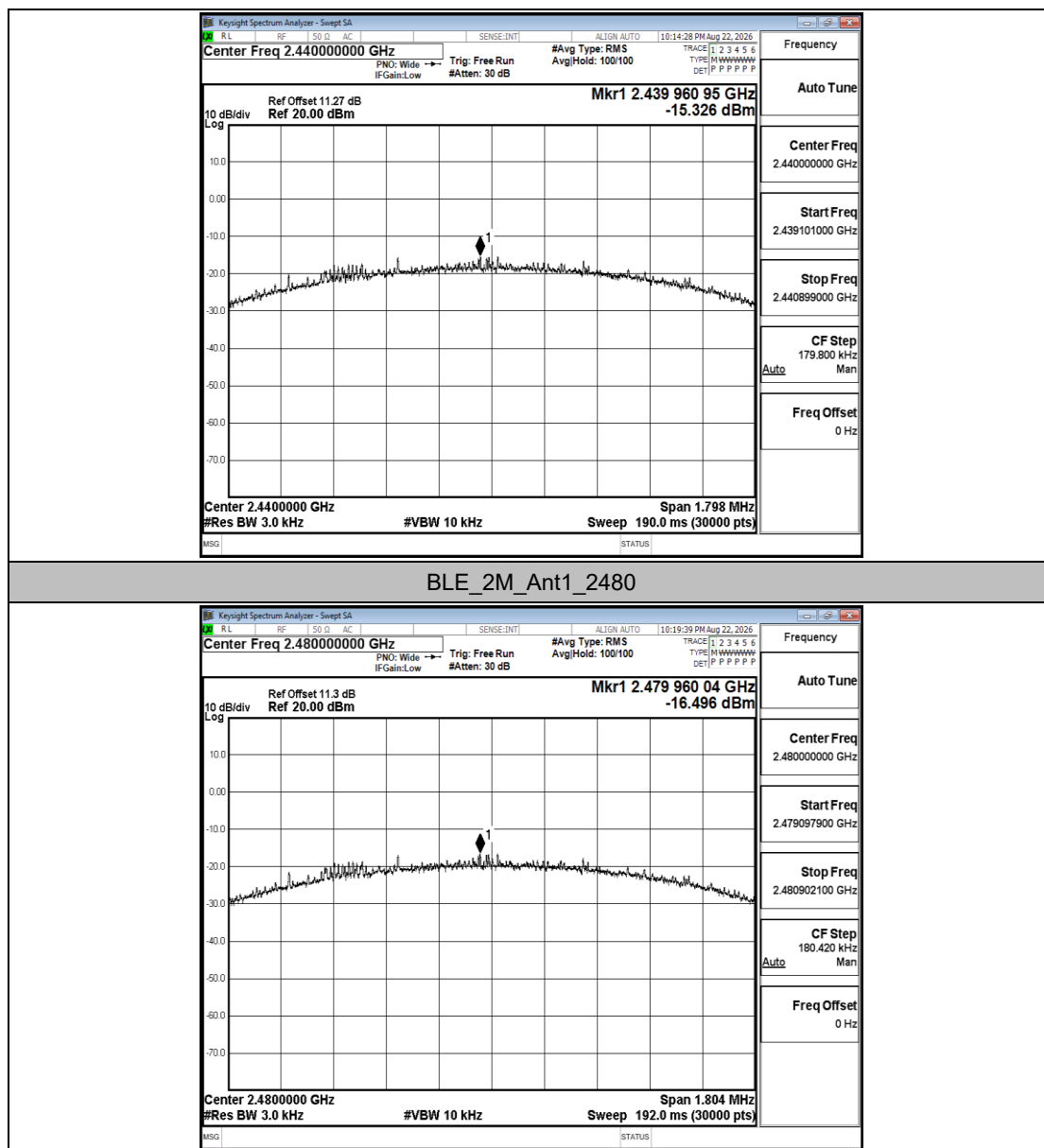
Test Result

TestMode	Antenna	Freq (MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-12.18	≤8.00	PASS
		2440	-12.09	≤8.00	PASS
		2480	-13.29	≤8.00	PASS
BLE_2M	Ant1	2402	-15.26	≤8.00	PASS
		2440	-15.33	≤8.00	PASS
		2480	-16.50	≤8.00	PASS

Test Graphs





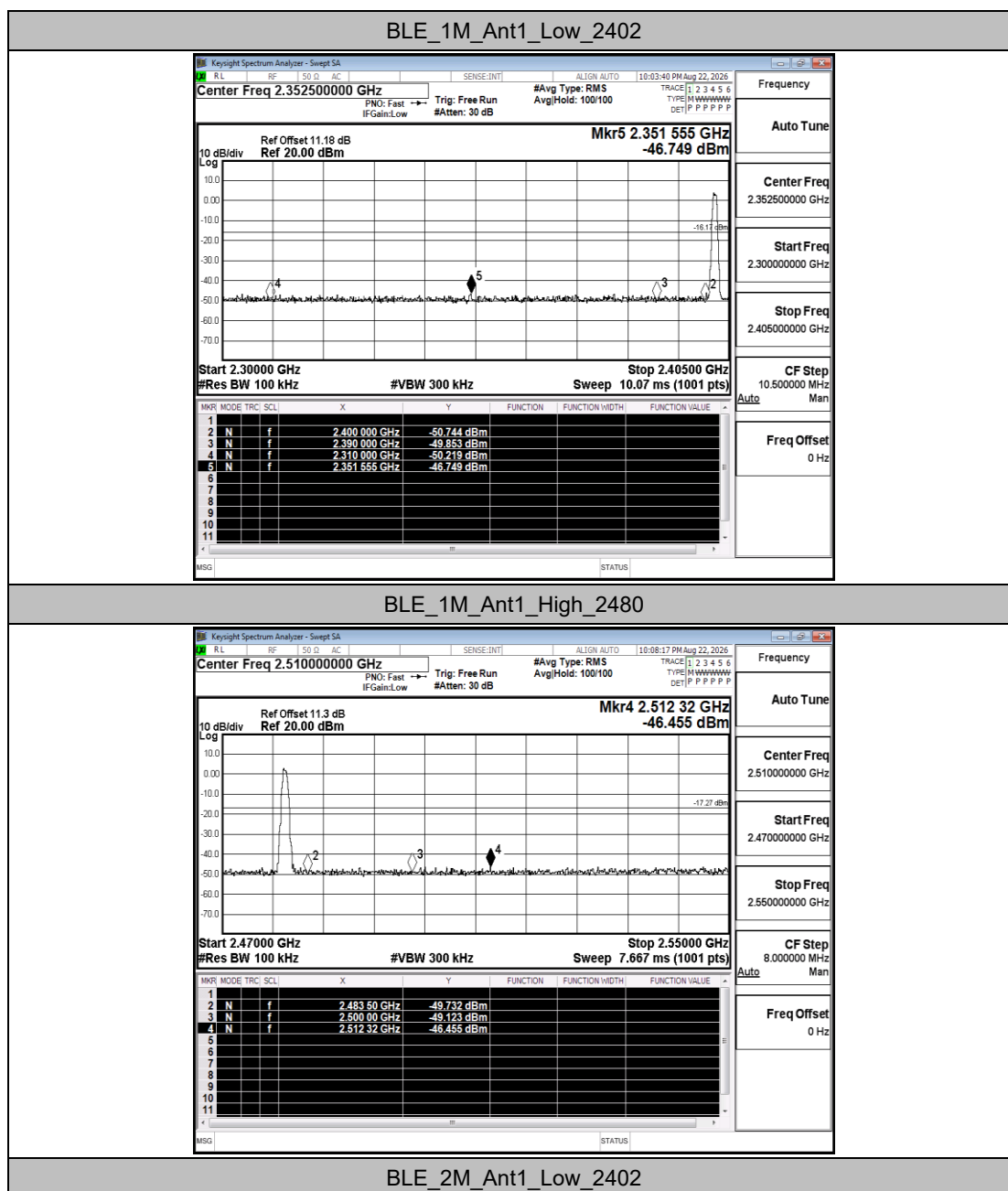


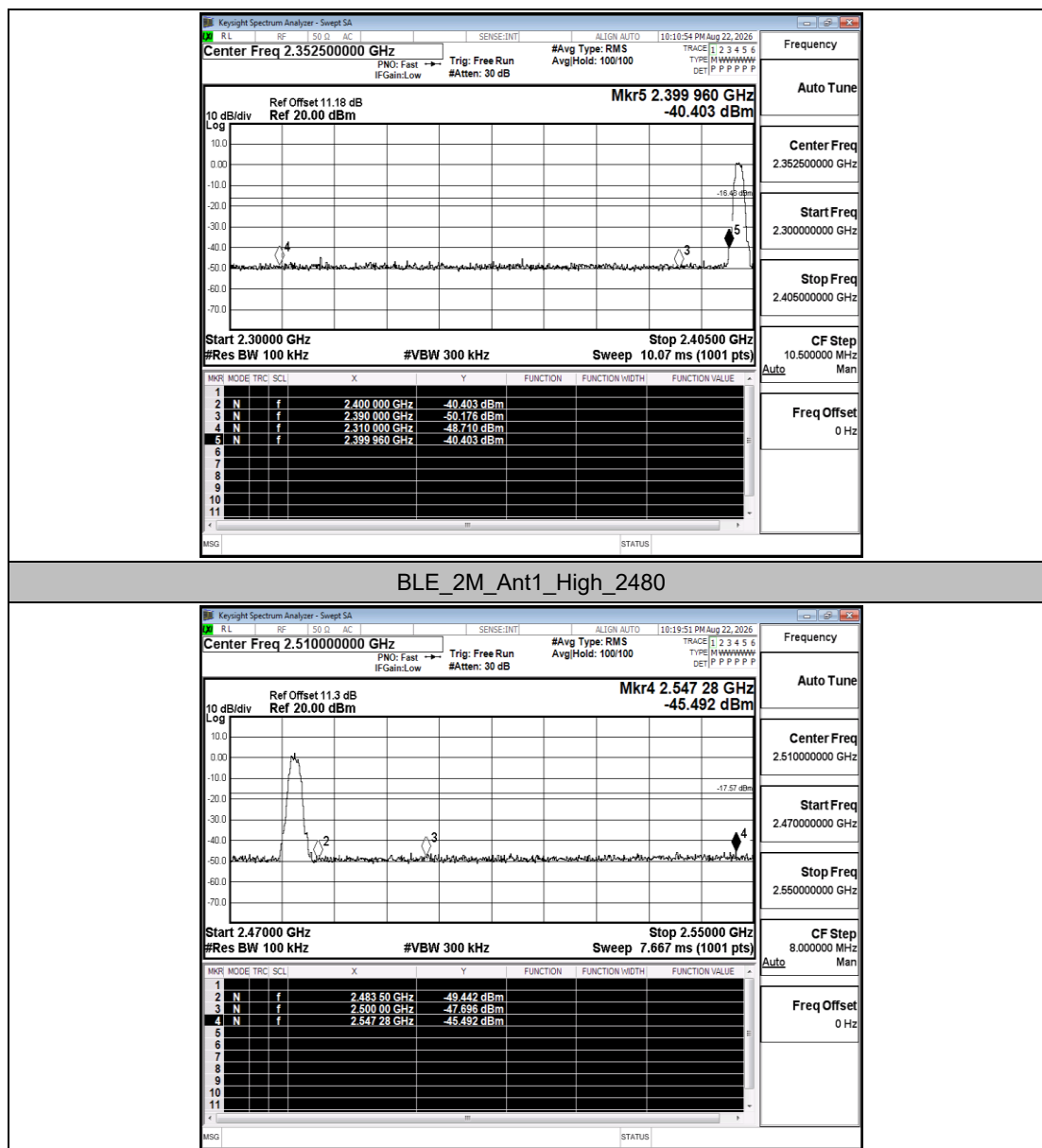
B.4 Band edge measurements

Test Result

TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	3.83	-46.75	≤-16.17	PASS
		High	2480	2.73	-46.46	≤-17.27	PASS
BLE_2M	Ant1	Low	2402	3.57	-40.4	≤-16.43	PASS
		High	2480	2.43	-45.49	≤-17.57	PASS

Test Graphs



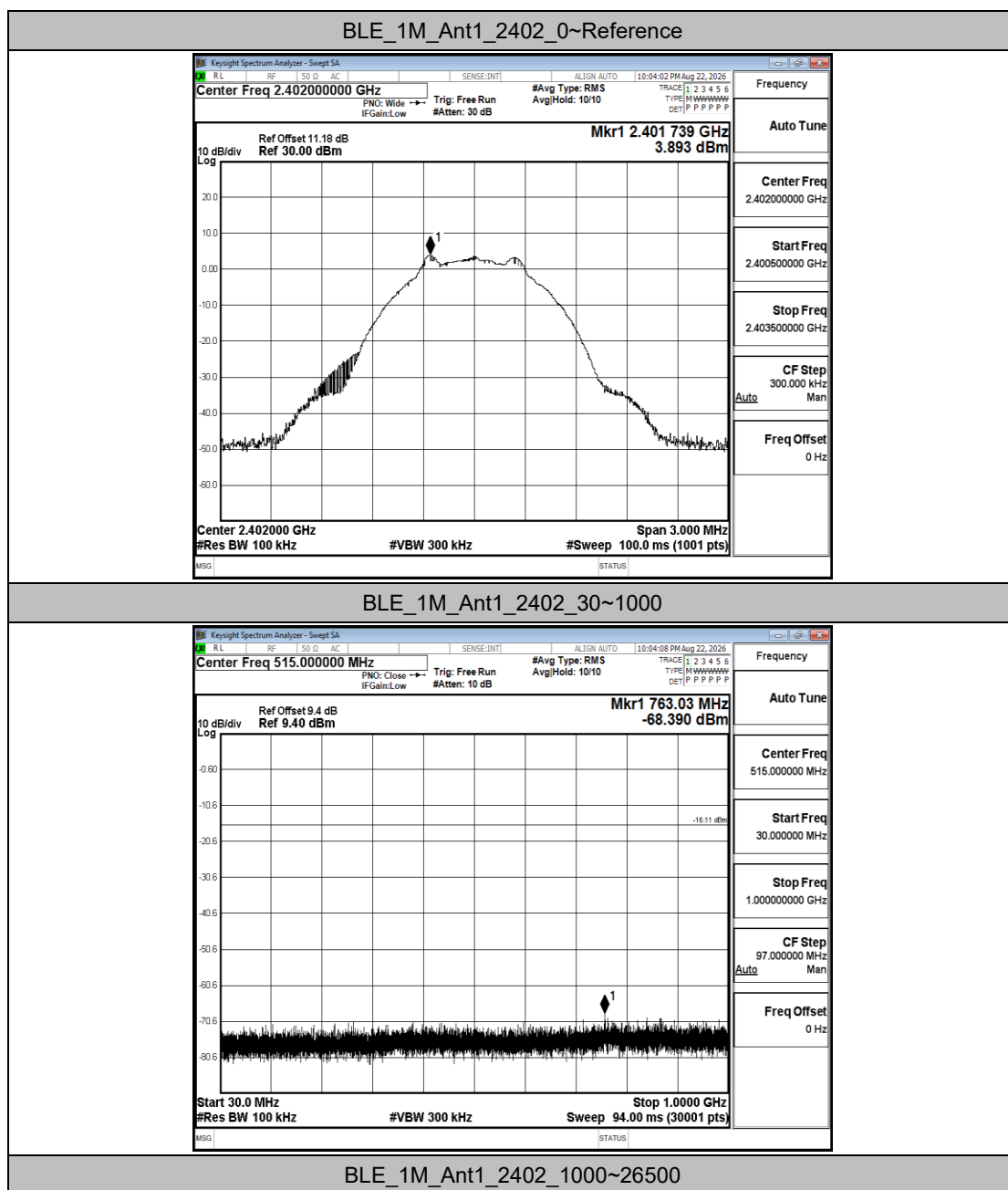


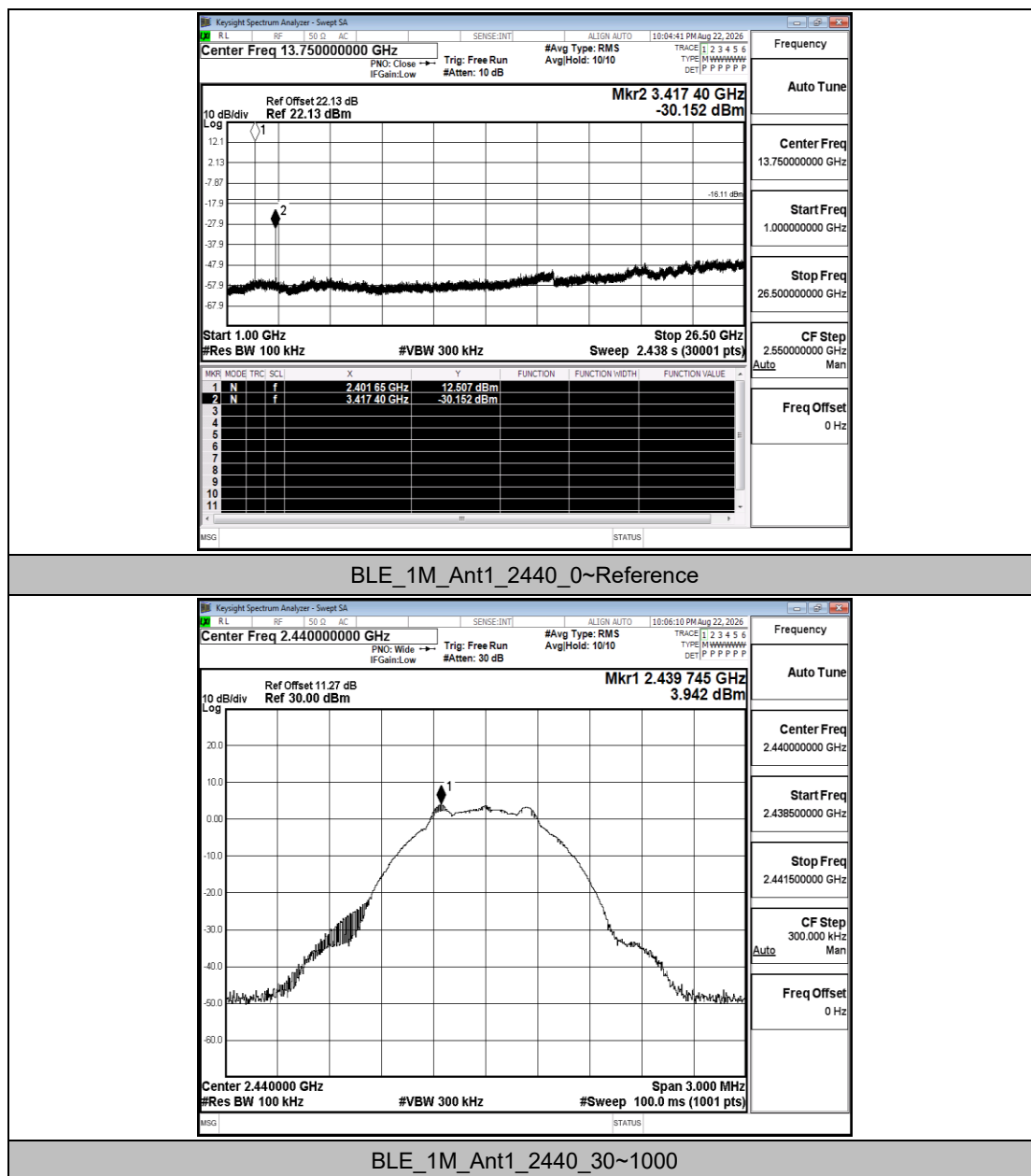
B.5 Conducted Spurious Emission

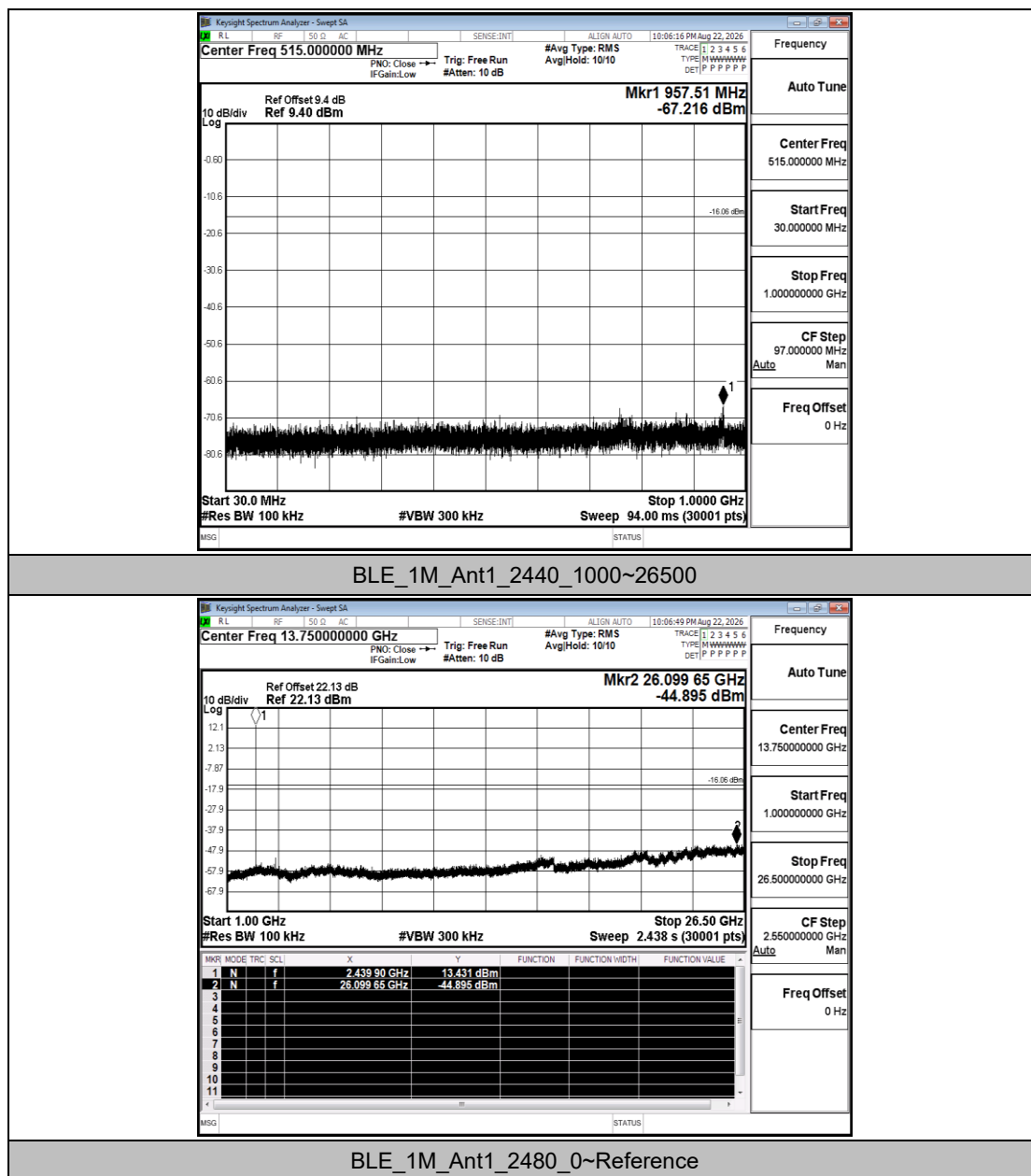
Test Result

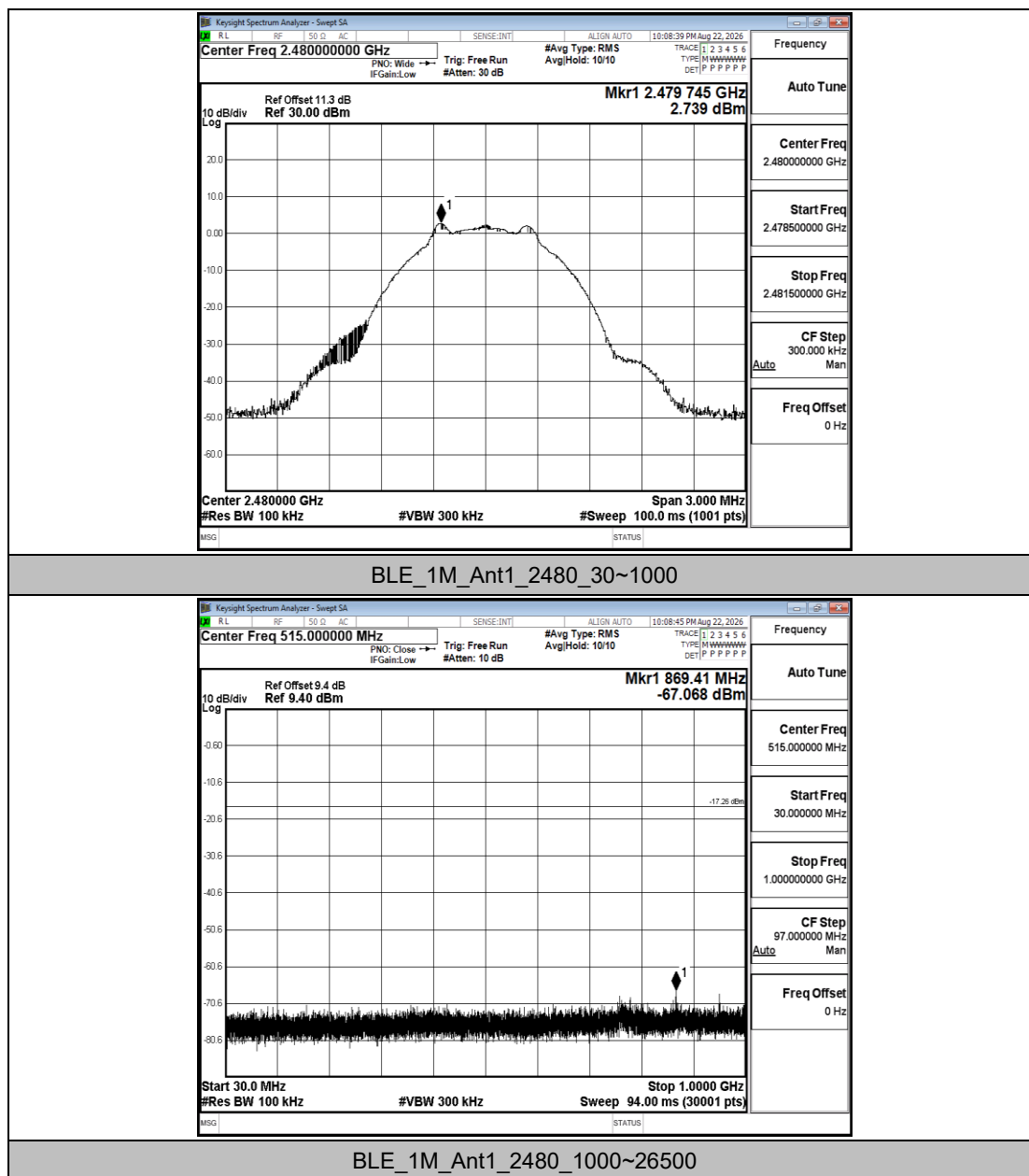
TestMode	Antenna	Freq (MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	3.89	3.89	---	PASS
			30~1000	3.89	-68.39	≤-16.11	PASS
			1000~26500	3.89	-30.15	≤-16.11	PASS
		2440	Reference	3.94	3.94	---	PASS
			30~1000	3.94	-67.22	≤-16.06	PASS
			1000~26500	3.94	-44.9	≤-16.06	PASS
		2480	Reference	2.74	2.74	---	PASS
			30~1000	2.74	-67.07	≤-17.26	PASS
			1000~26500	2.74	-44.73	≤-17.26	PASS
BLE_2M	Ant1	2402	Reference	3.57	3.57	---	PASS
			30~1000	3.57	-67.82	≤-16.43	PASS
			1000~26500	3.57	-44.46	≤-16.43	PASS
		2440	Reference	3.67	3.67	---	PASS
			30~1000	3.67	-69.15	≤-16.33	PASS
			1000~26500	3.67	-44.92	≤-16.33	PASS
		2480	Reference	2.42	2.42	---	PASS
			30~1000	2.42	-68.99	≤-17.58	PASS
			1000~26500	2.42	-44.51	≤-17.58	PASS

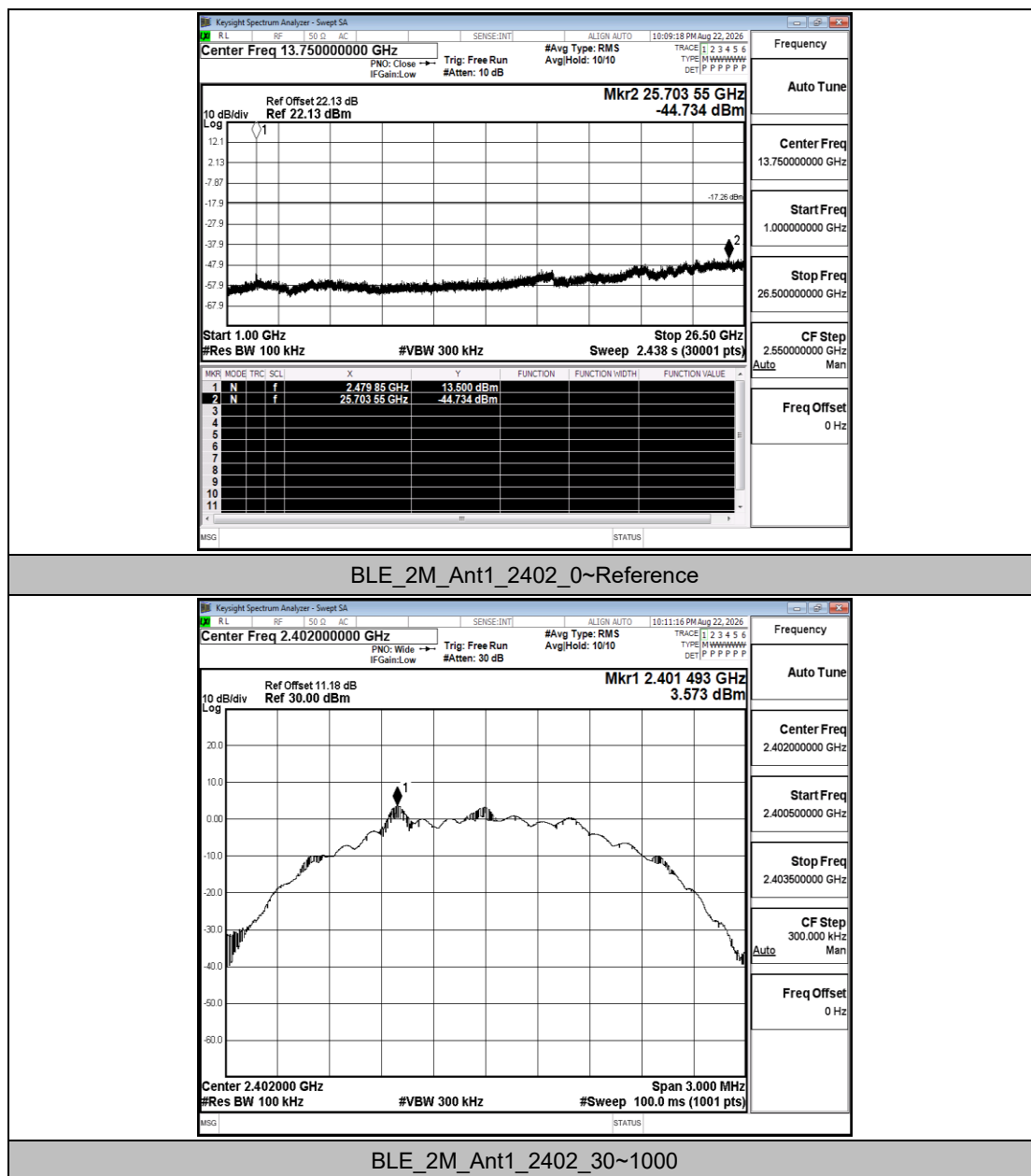
Test Graphs

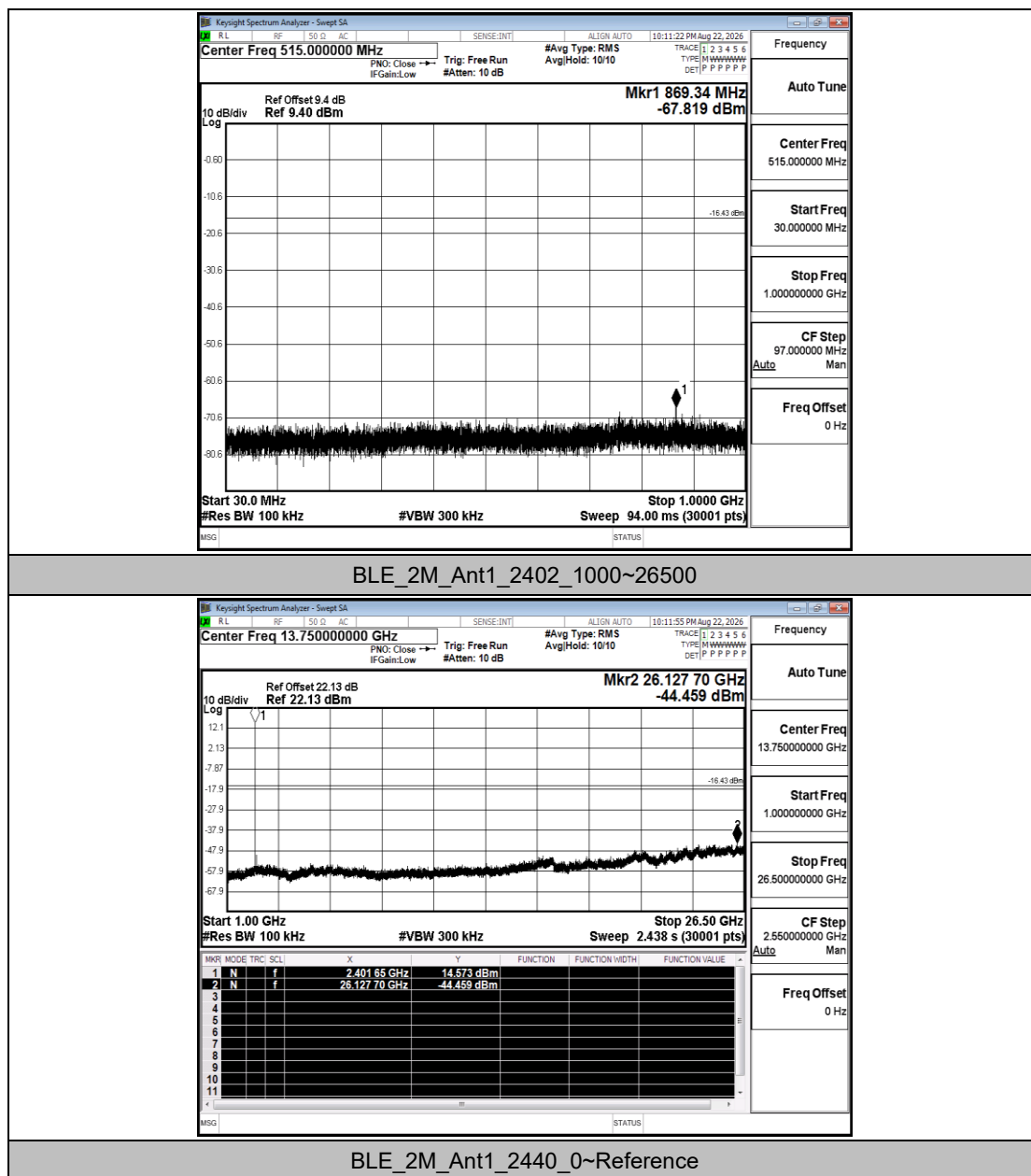


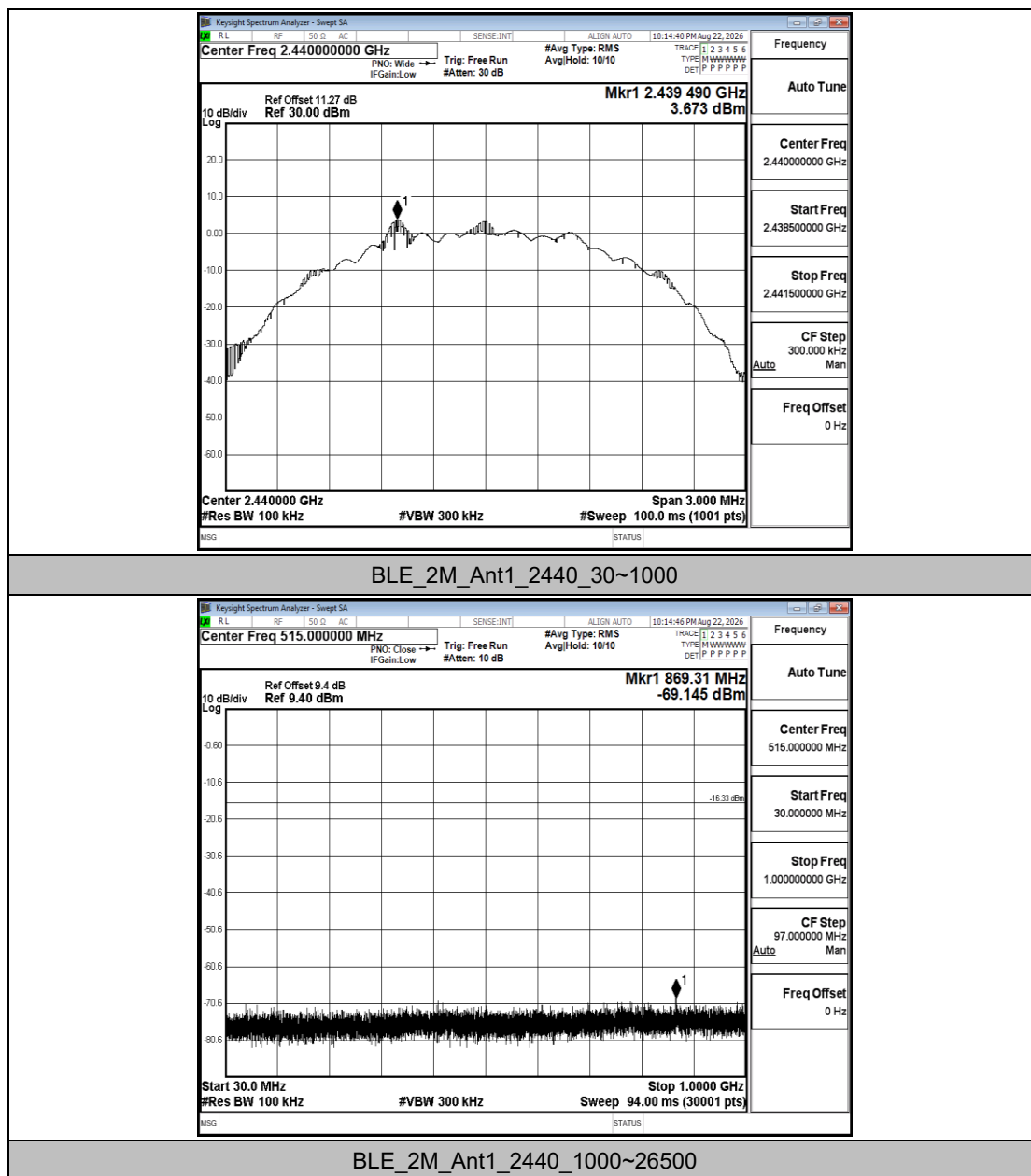


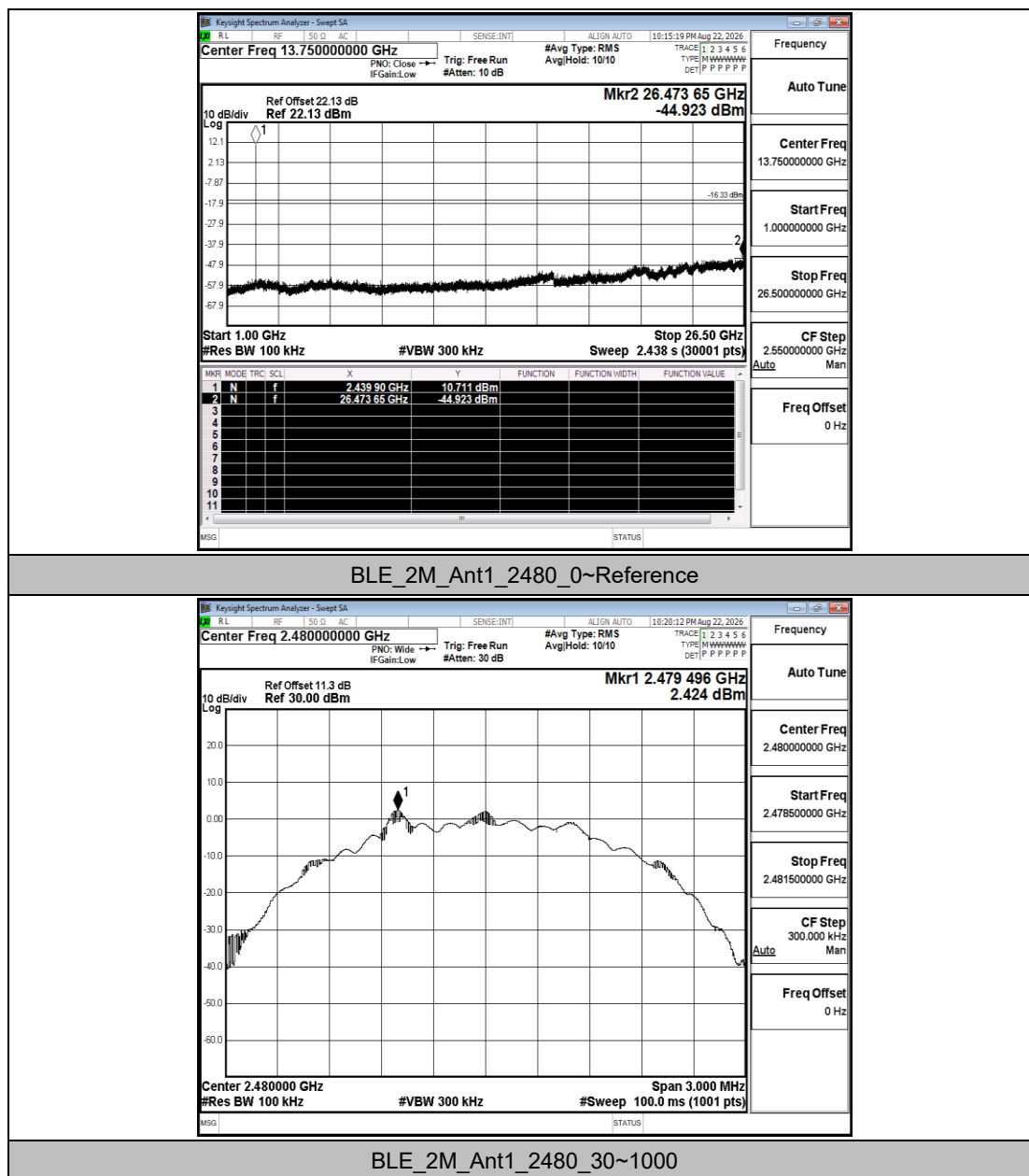


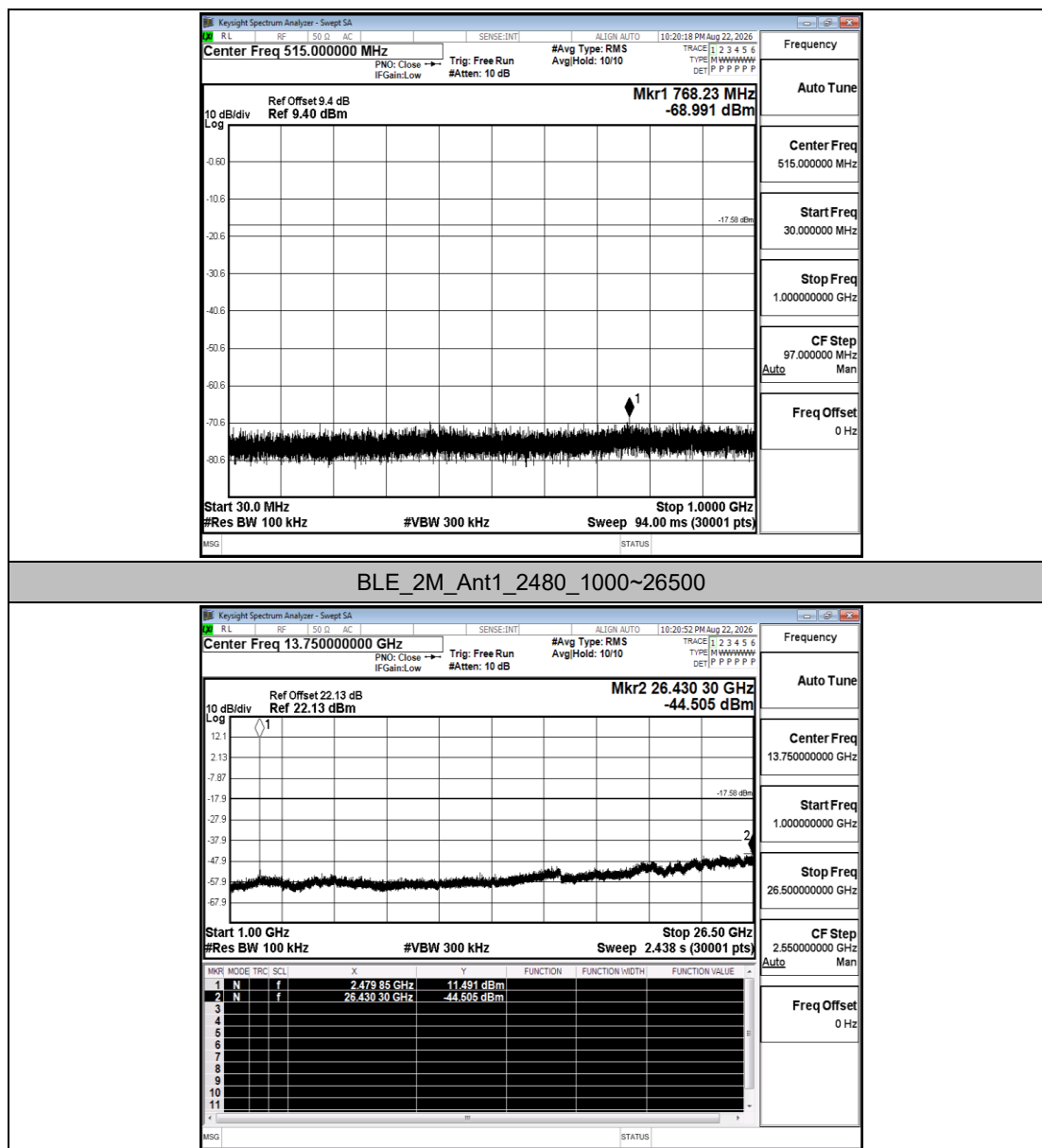










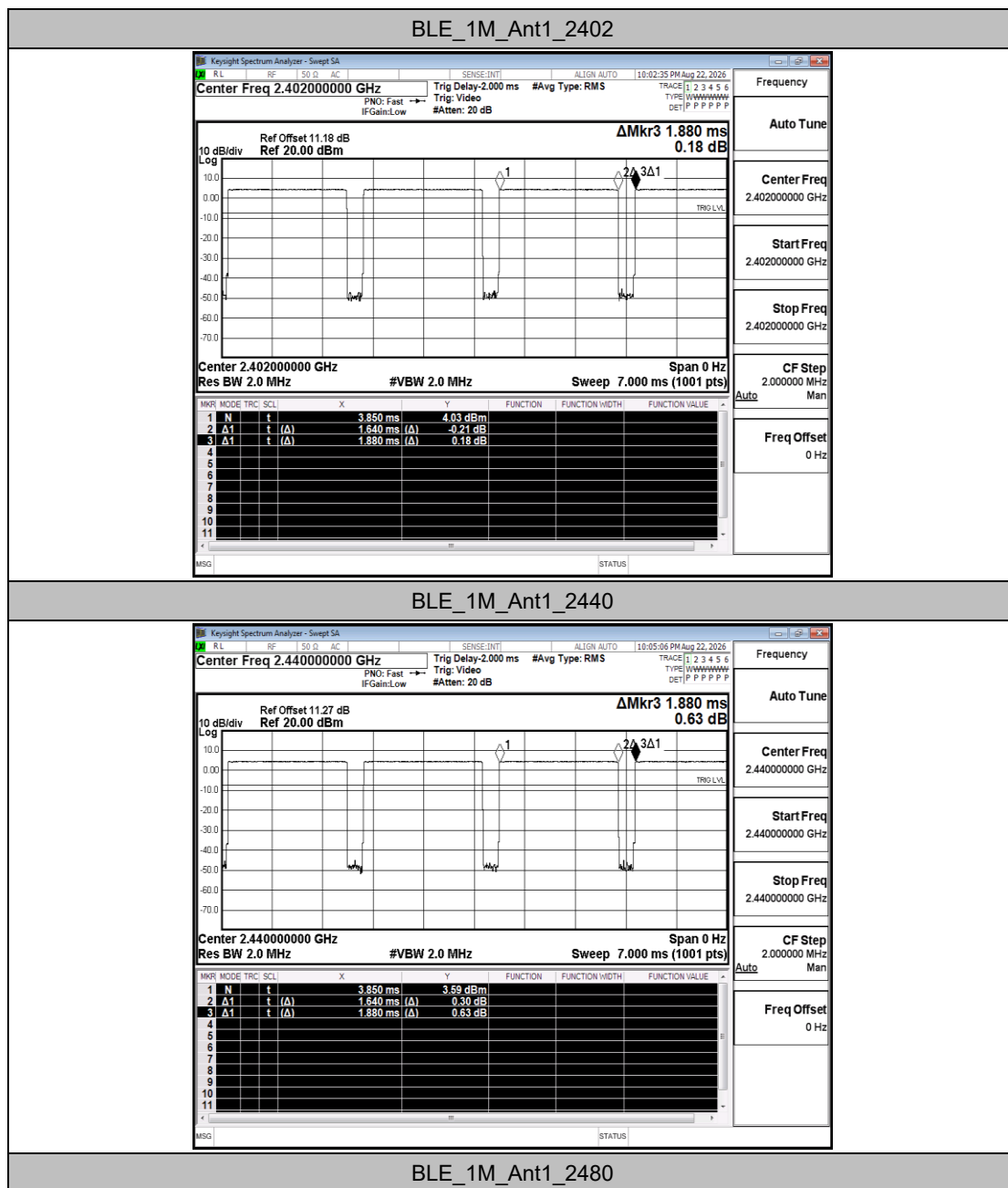


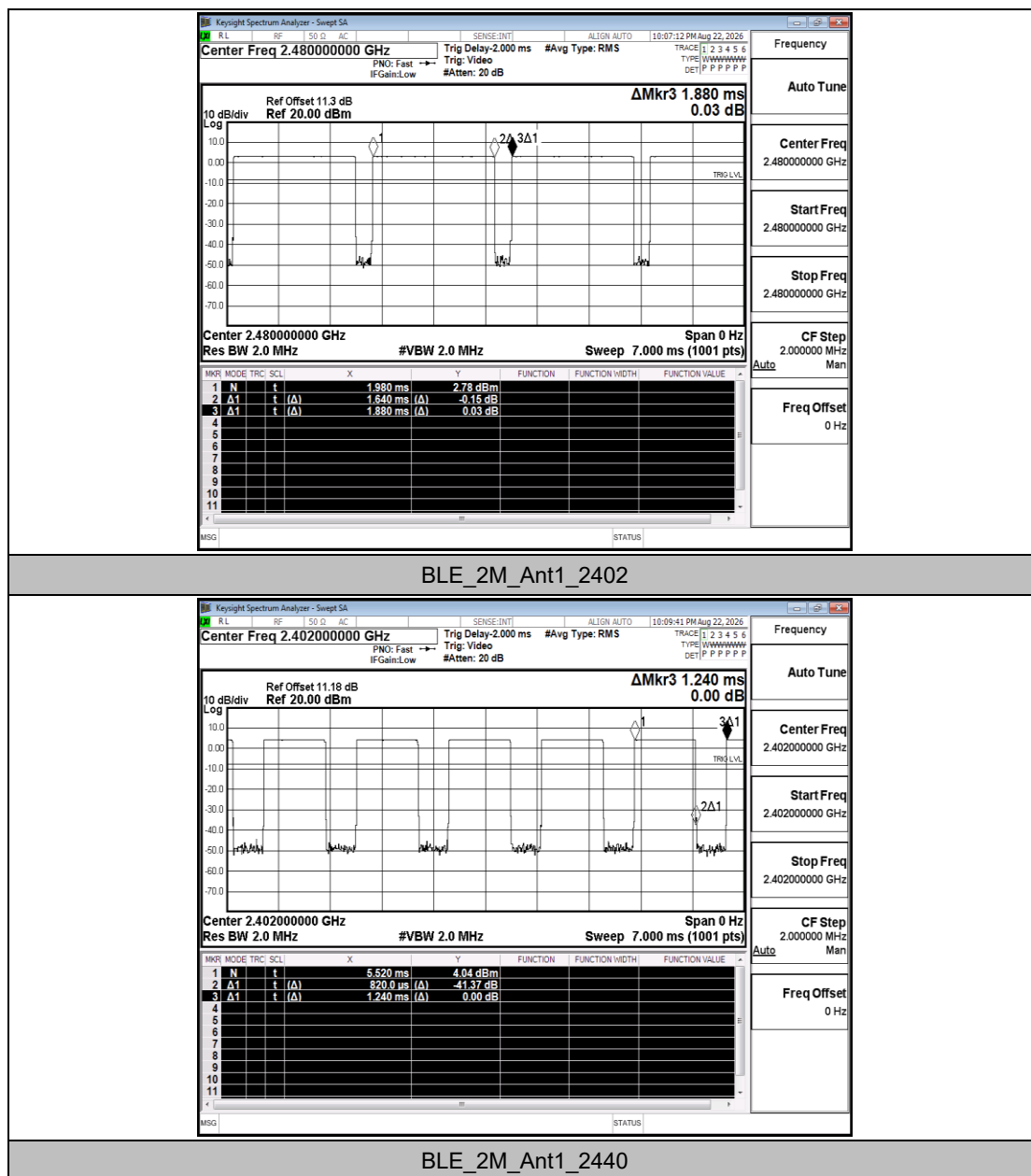
B.6 Duty Cycle

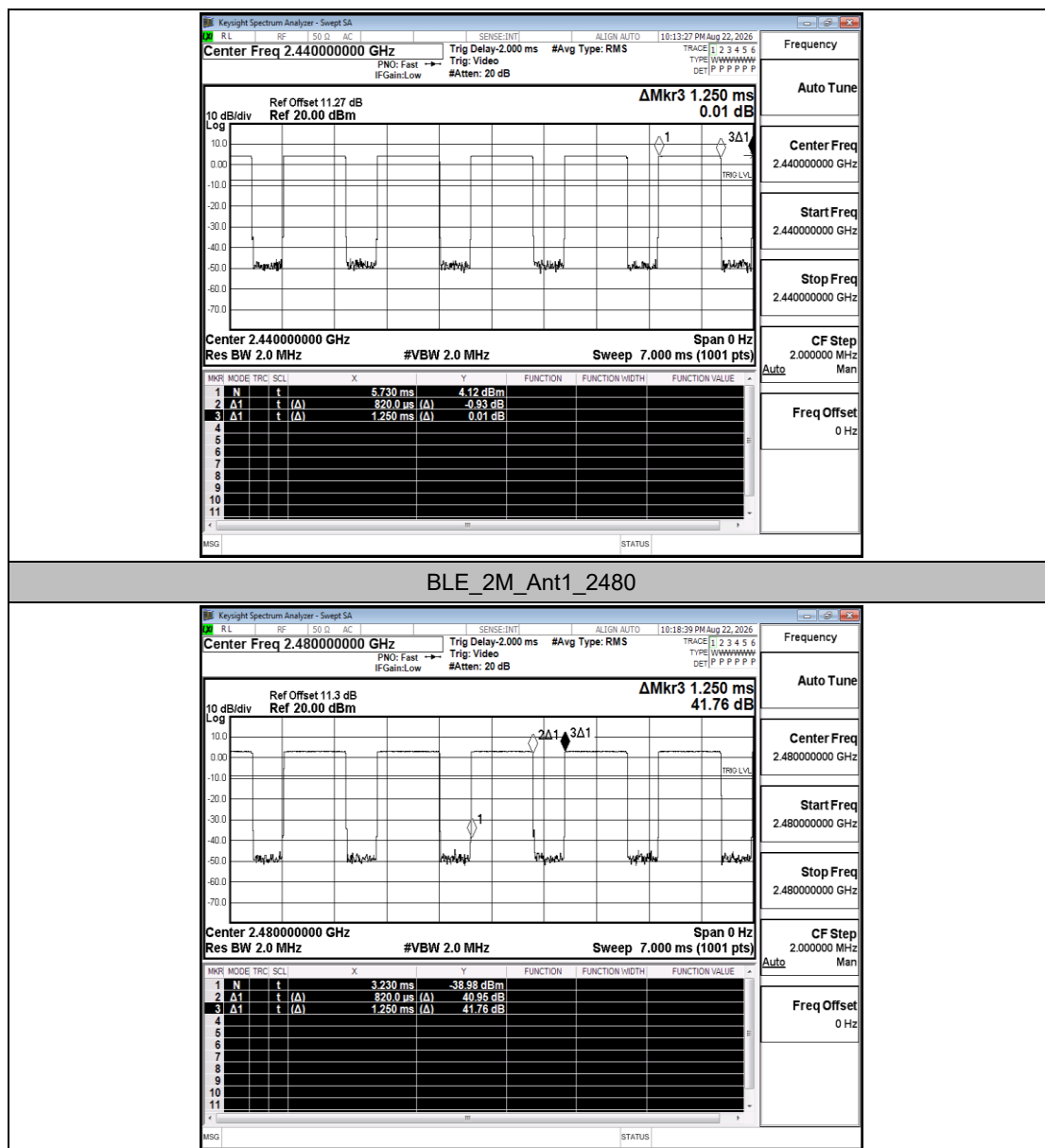
Test Result

TestMode	Antenna	Freq (MHz)	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	1.64	1.88	0.8723	87.23	0.59	---	---
		2440	1.64	1.88	0.8723	87.23	0.59	---	---
		2480	1.64	1.88	0.8723	87.23	0.59	---	---
BLE_2M	Ant1	2402	0.82	1.24	0.6613	66.13	1.80	---	---
		2440	0.82	1.25	0.6560	65.60	1.83	---	---
		2480	0.82	1.25	0.6560	65.60	1.83	---	---

Test Graphs







B.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Freq (MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-57.86	≤-43.79	2.00	0.59	39.93	≤54	PASS
				AV	2311.025	-57.02	≤-43.79	2.00	0.59	40.77	≤54	PASS
				AV	2390.000	-57.14	≤-43.79	2.00	0.59	40.65	≤54	PASS
				Peak	2310.000	-48.12	≤-23.20	2.00	0.00	49.08	≤74	PASS
				Peak	2323.625	-46.53	≤-23.20	2.00	0.00	50.67	≤74	PASS
				Peak	2390.000	-50.3	≤-23.20	2.00	0.00	46.90	≤74	PASS
		High	2480	AV	2483.500	-56.9	≤-43.79	2.00	0.59	40.89	≤54	PASS
				AV	2484.000	-56.08	≤-43.79	2.00	0.59	41.71	≤54	PASS
				AV	2500.000	-57.55	≤-43.79	2.00	0.59	40.24	≤54	PASS
				Peak	2483.500	-48.76	≤-23.20	2.00	0.00	48.44	≤74	PASS
				Peak	2485.040	-42.29	≤-23.20	2.00	0.00	54.91	≤74	PASS
				Peak	2500.000	-49.11	≤-23.20	2.00	0.00	48.09	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-57.83	≤-45.00	2.00	1.80	41.17	≤54	PASS
				AV	2387.570	-57.02	≤-45.00	2.00	1.80	41.98	≤54	PASS
				AV	2390.000	-57.72	≤-45.00	2.00	1.80	41.28	≤54	PASS
				Peak	2310.000	-49.59	≤-23.20	2.00	0.00	47.61	≤74	PASS
				Peak	2378.645	-46.12	≤-23.20	2.00	0.00	51.08	≤74	PASS
				Peak	2390.000	-50.7	≤-23.20	2.00	0.00	46.50	≤74	PASS
		High	2480	AV	2483.500	-56.62	≤-45.03	2.00	1.83	42.41	≤54	PASS
				AV	2483.680	-55.9	≤-45.03	2.00	1.83	43.13	≤54	PASS
				AV	2500.000	-57.48	≤-45.03	2.00	1.83	41.55	≤54	PASS
				Peak	2483.500	-48.9	≤-23.20	2.00	0.00	48.30	≤74	PASS
				Peak	2485.200	-42.87	≤-23.20	2.00	0.00	54.33	≤74	PASS
				Peak	2500.000	-50.47	≤-23.20	2.00	0.00	46.73	≤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

