

Appendix A

RF Test Data for BT LE (Conducted Measurement)

Product Name: E-Paper Photo Frame

Test Model: EPF037

Environmental Conditions

Temperature:	23.2°C
Relative Humidity:	54.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Zhang hai
Supervised by:	Fengliu Tang

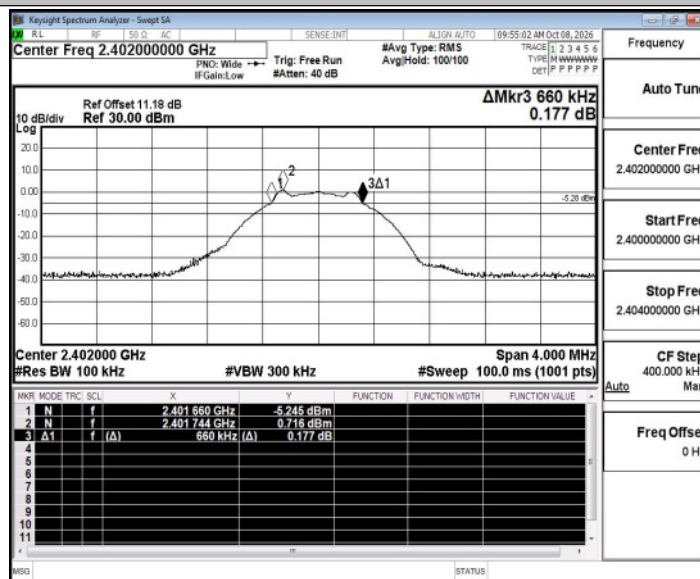
A.1 6dB Bandwidth

Test Result

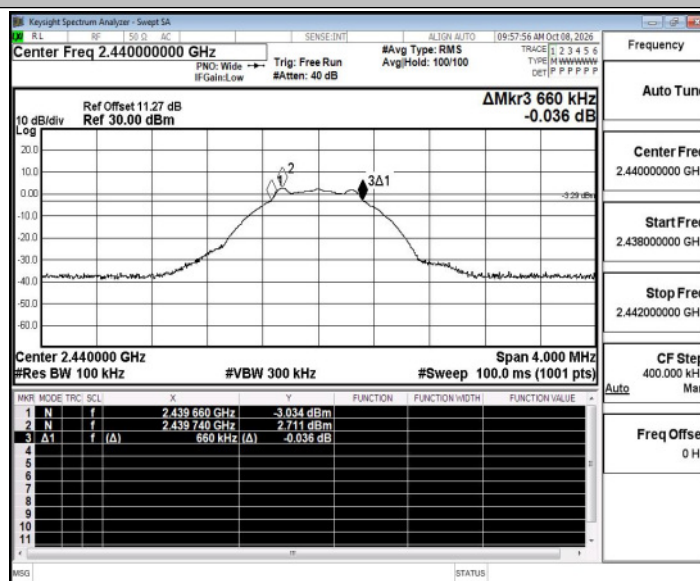
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.660	2401.660	2402.320	0.5	PASS
		2440	0.660	2439.660	2440.320	0.5	PASS
		2480	0.660	2479.660	2480.320	0.5	PASS
BLE_2M	Ant1	2402	1.152	2401.404	2402.556	0.5	PASS
		2440	1.148	2439.404	2440.552	0.5	PASS
		2480	1.152	2479.404	2480.556	0.5	PASS

Test Graphs

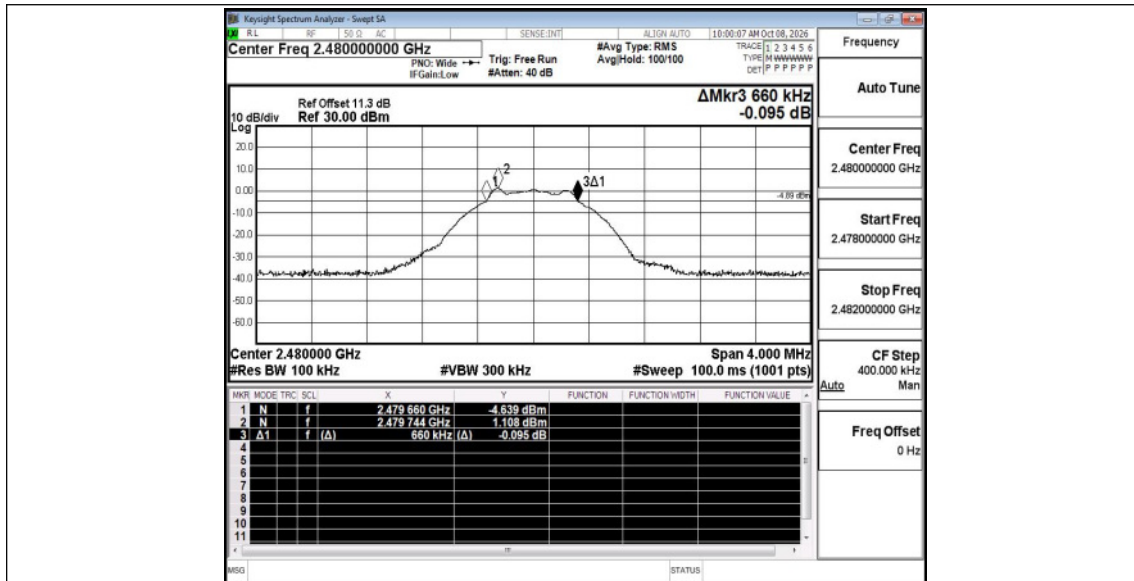
BLE_1M_Ant1_2402



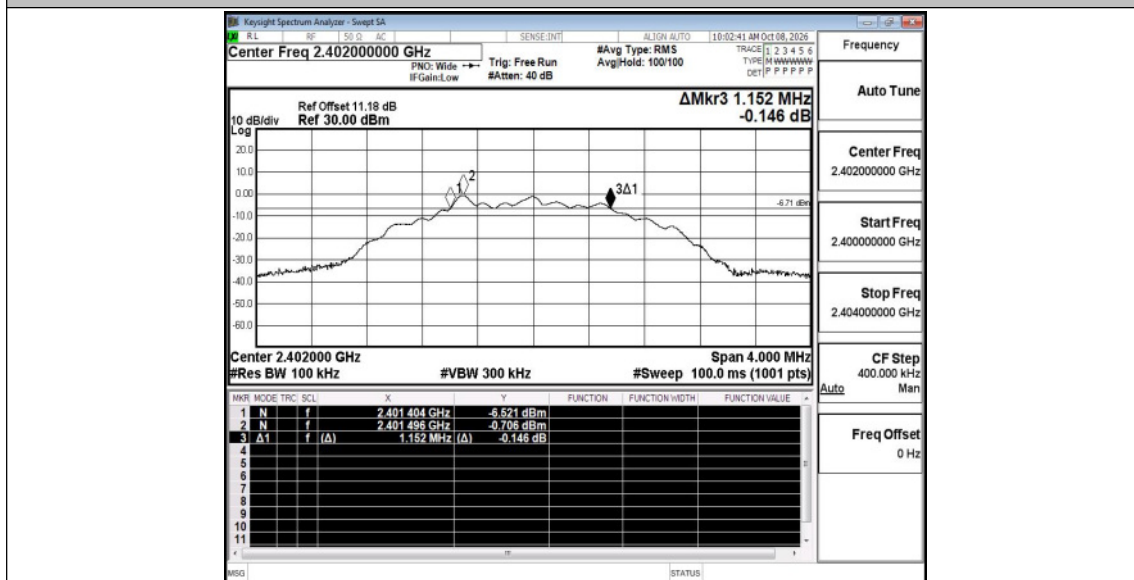
BLE_1M_Ant1_2440



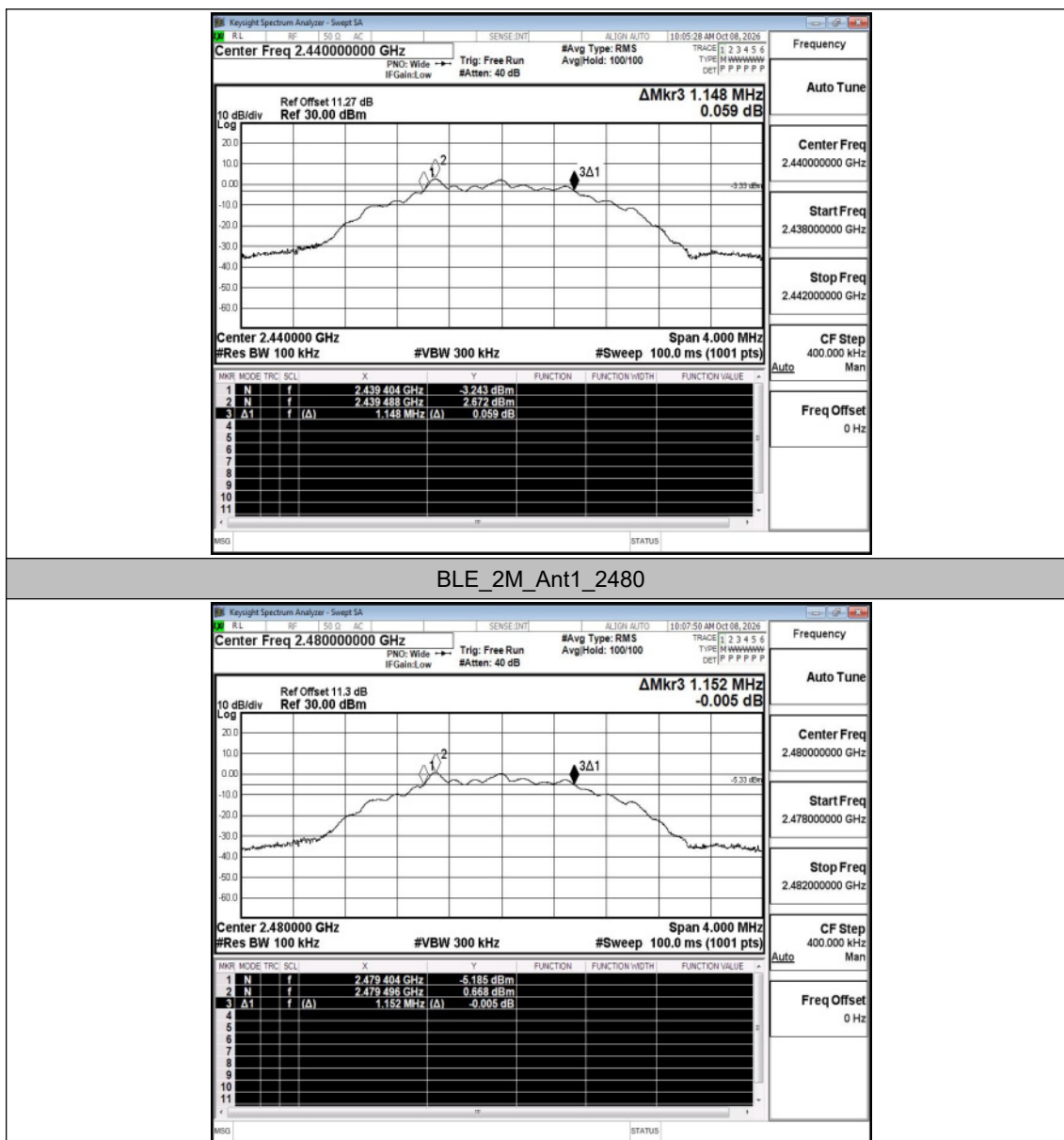
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



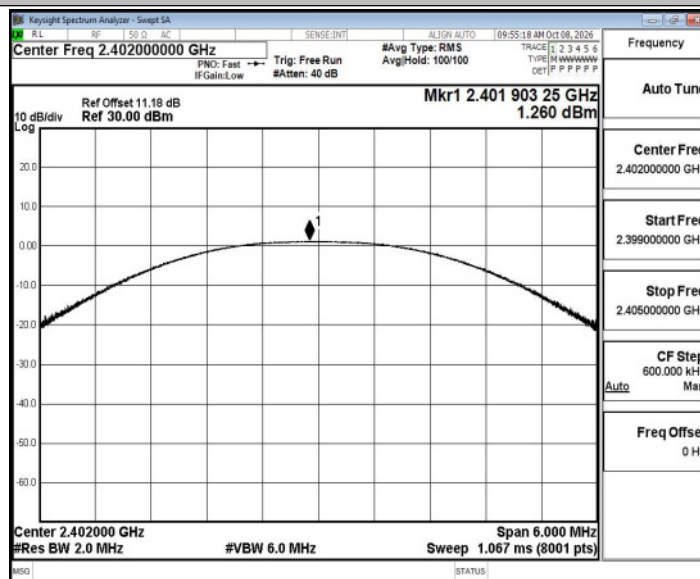
A.2 Maximum Peak conducted output power

Test Result

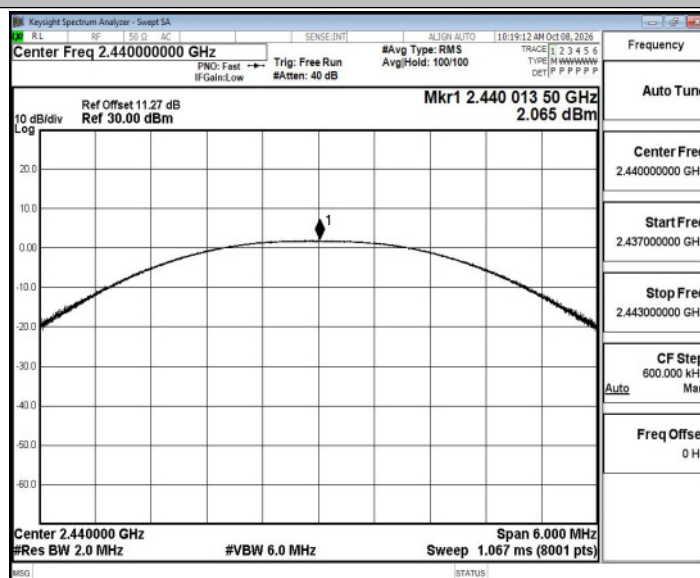
TestMode	Antenna	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	1.26	≤30	PASS
		2440	2.07	≤30	PASS
		2480	1.68	≤30	PASS
BLE_2M	Ant1	2402	-0.01	≤30	PASS
		2440	1.07	≤30	PASS
		2480	1.53	≤30	PASS

Test Graphs

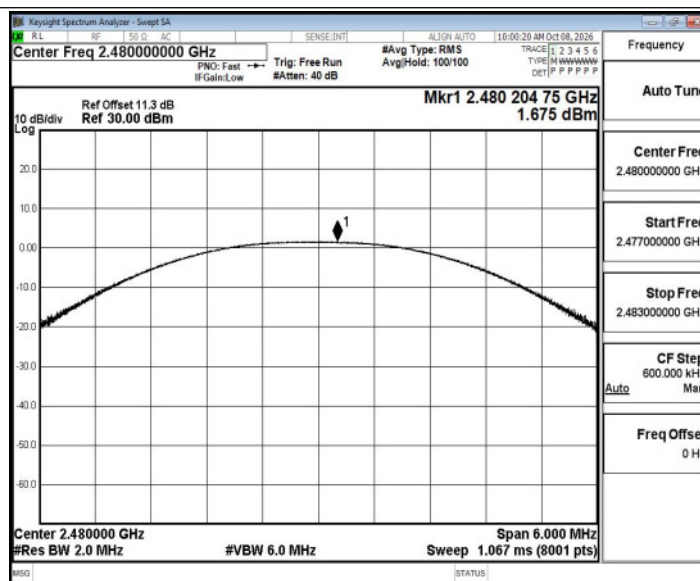
BLE_1M_Ant1_2402



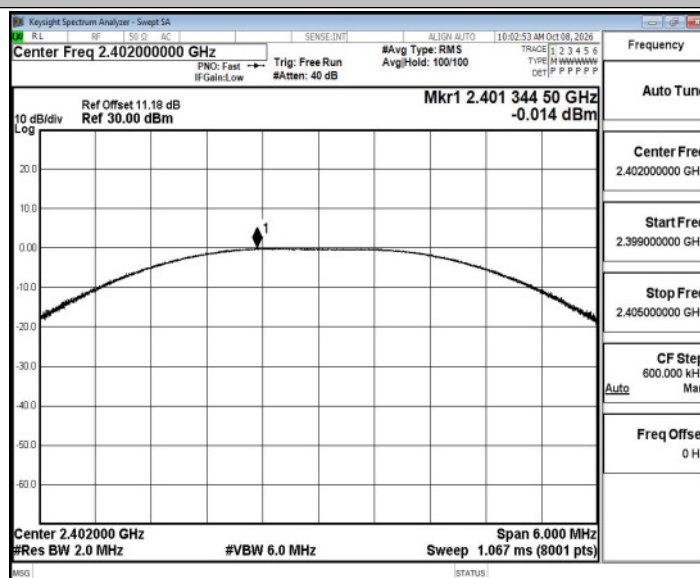
BLE_1M_Ant1_2440



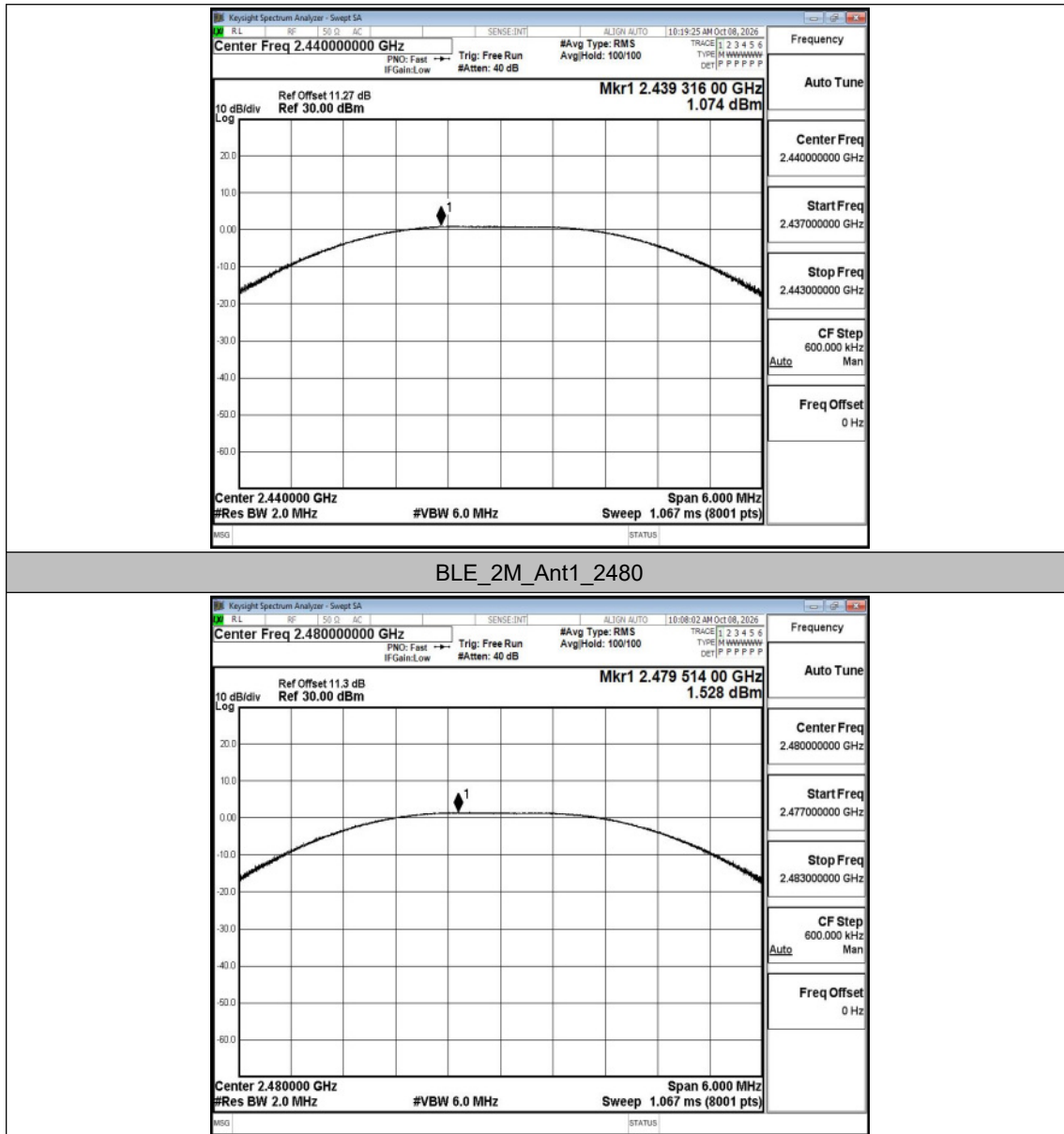
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



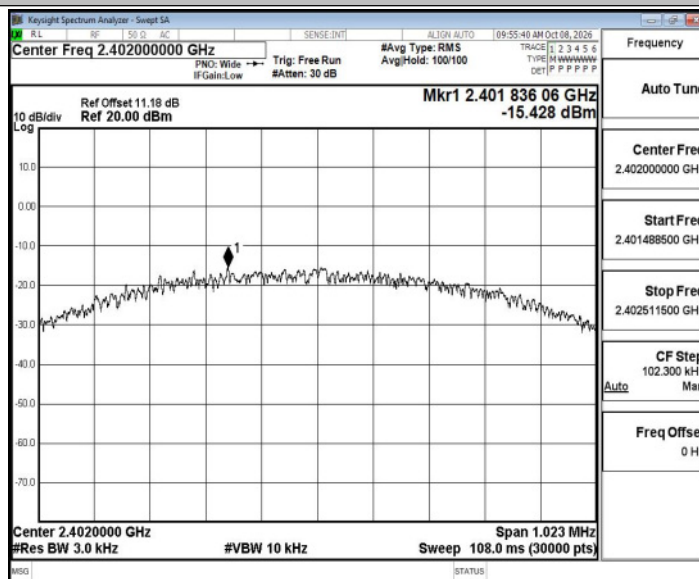
A.3 Maximum power spectral density

Test Result

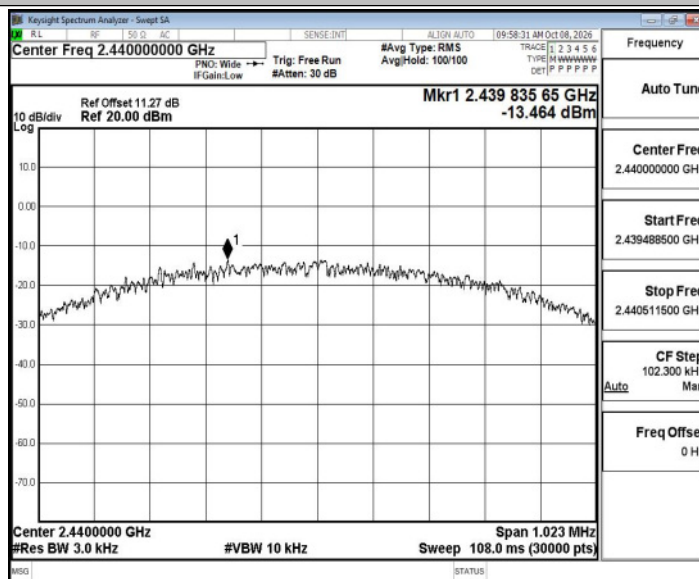
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.43	≤8.00	PASS
		2440	-13.46	≤8.00	PASS
		2480	-14.95	≤8.00	PASS
BLE_2M	Ant1	2402	-19.91	≤8.00	PASS
		2440	-16.32	≤8.00	PASS
		2480	-18.21	≤8.00	PASS

Test Graphs

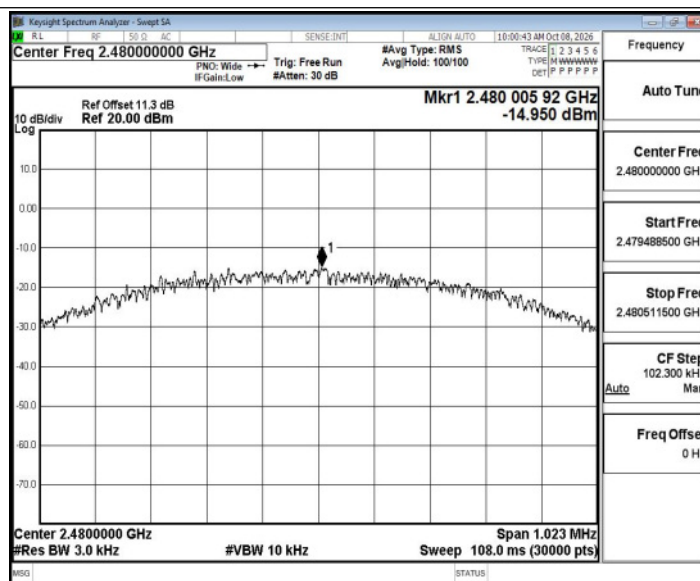
BLE_1M_Ant1_2402



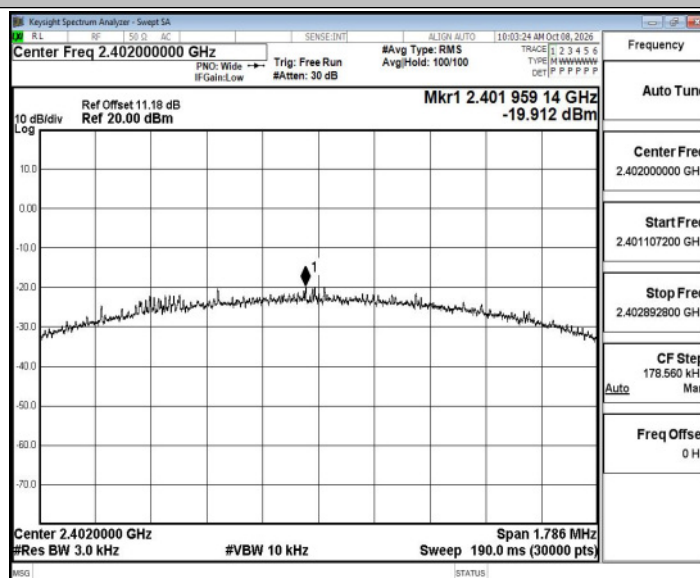
BLE_1M_Ant1_2440



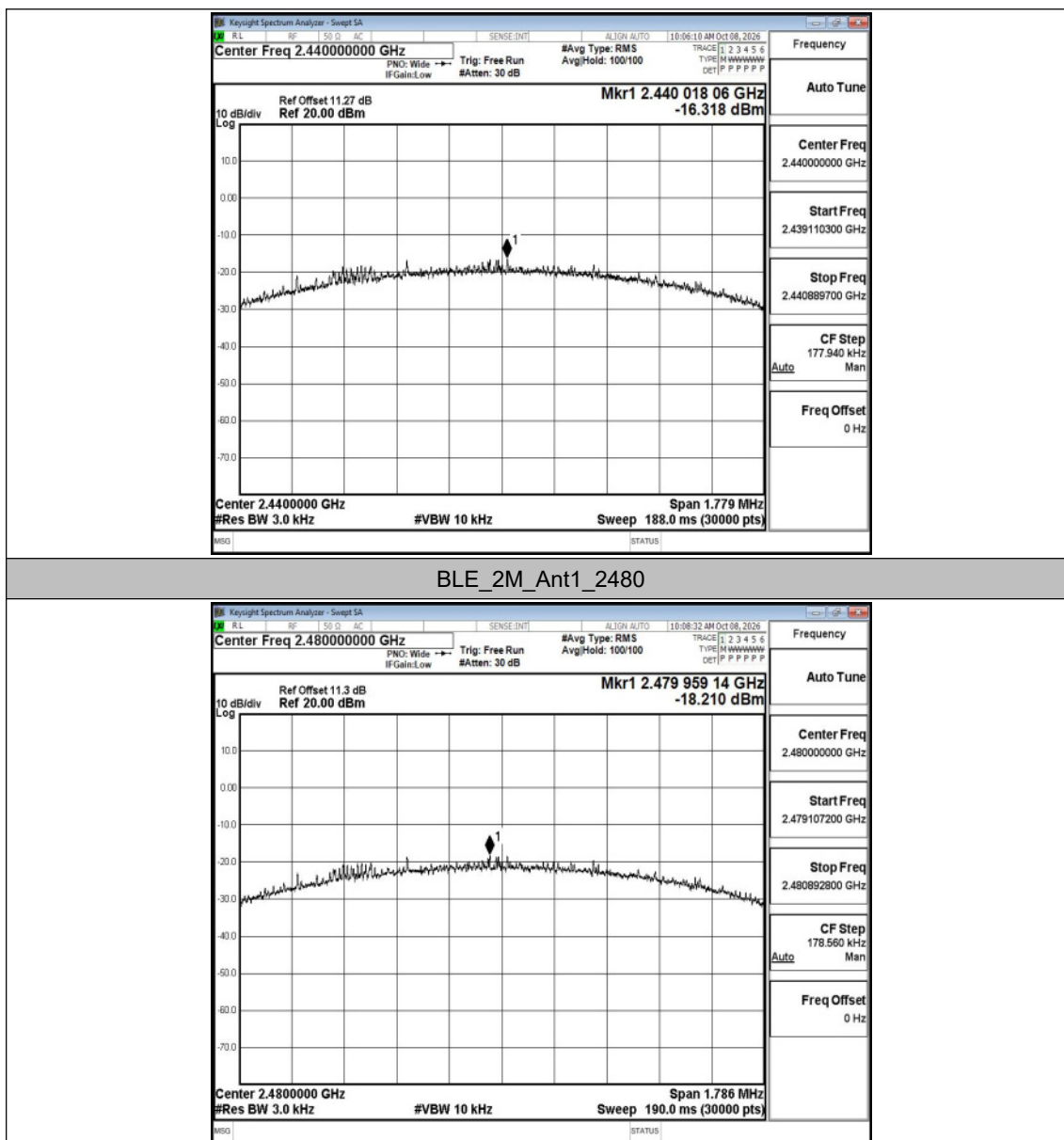
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



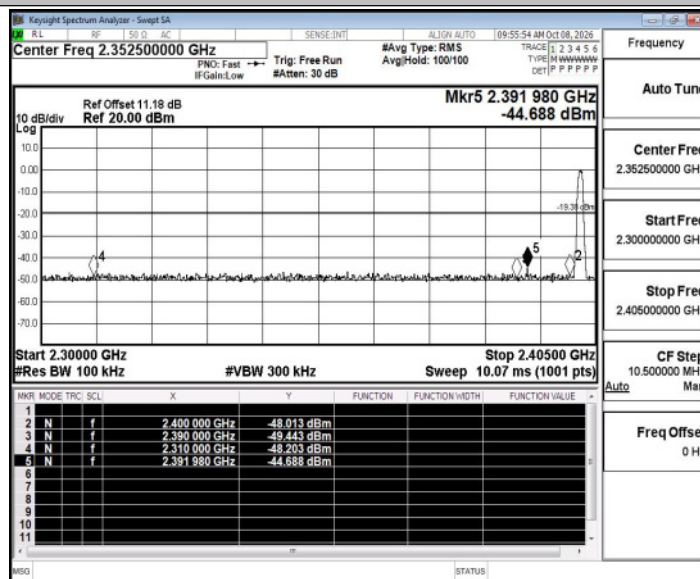
A.4 Band edge measurements

Test Result

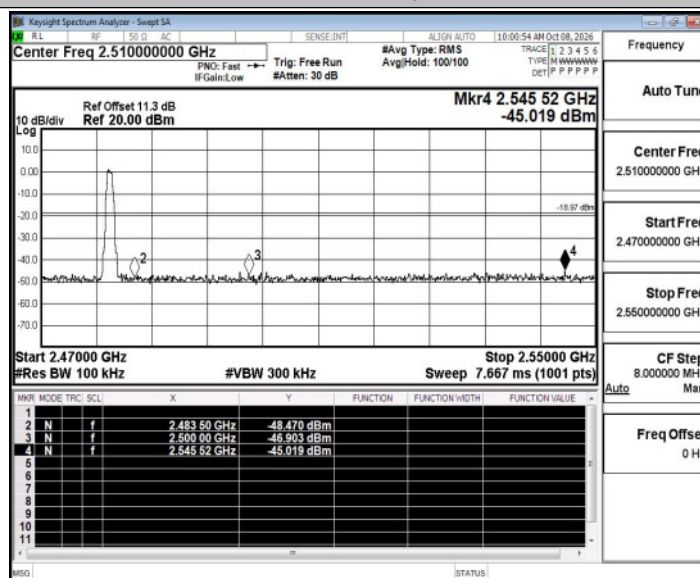
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.62	-44.69	≤-19.38	PASS
		High	2480	1.03	-45.02	≤-18.97	PASS
BLE_2M	Ant1	Low	2402	-0.81	-44.13	≤-20.81	PASS
		High	2480	0.88	-45.7	≤-19.12	PASS

Test Graphs

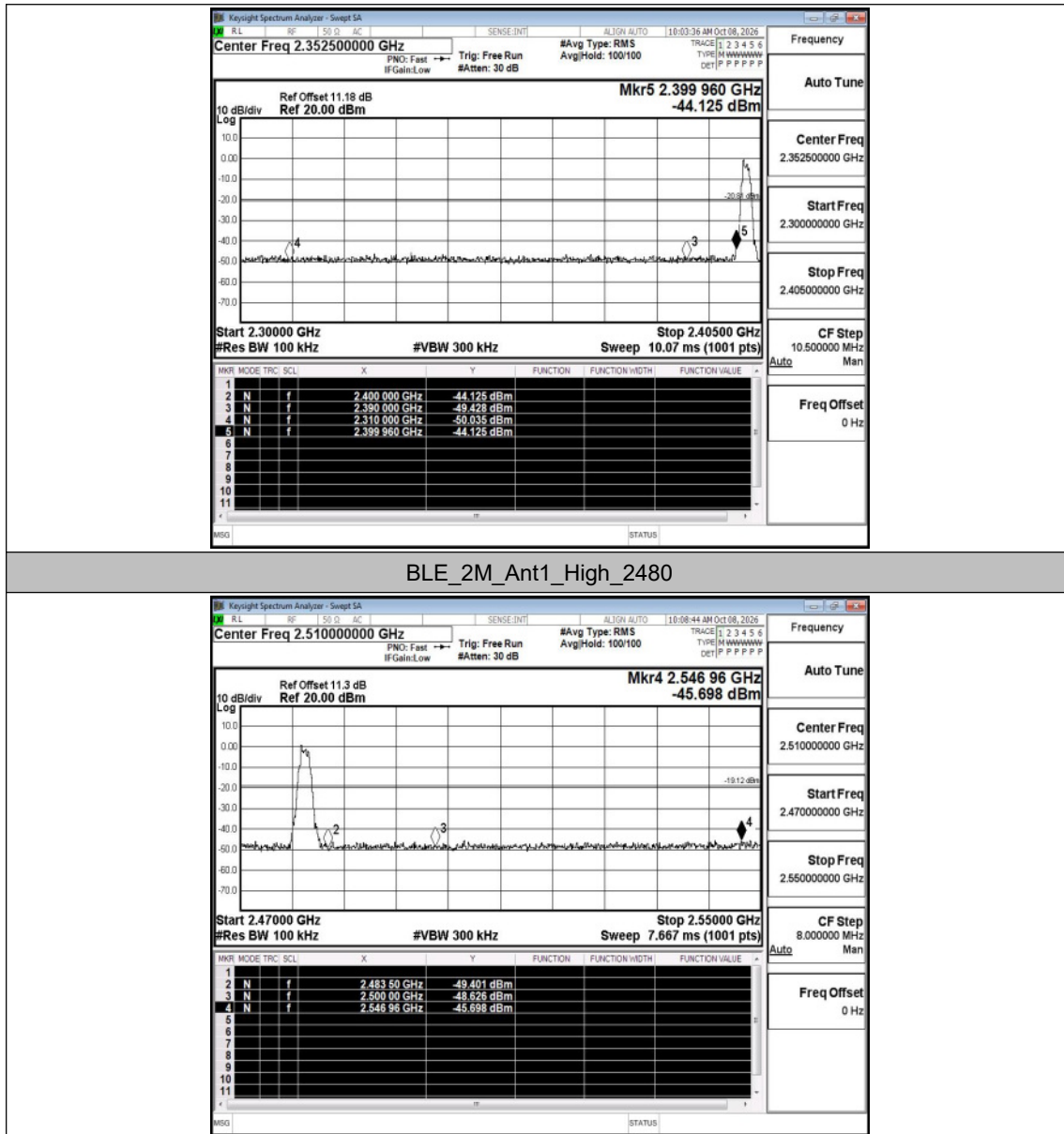
BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402



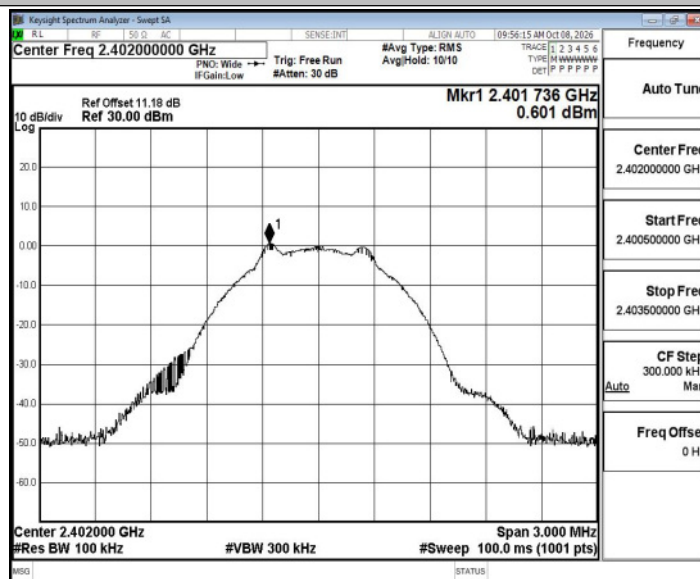
A.5 Conducted Spurious Emission

Test Result

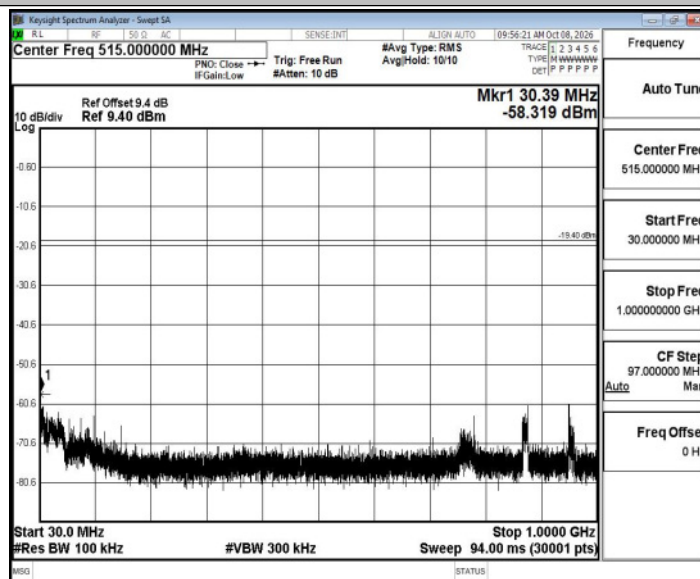
TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	0.60	0.60	---	PASS
			30~1000	0.60	-58.32	≤-19.4	PASS
			1000~26500	0.60	-41.79	≤-19.4	PASS
		2440	Reference	2.60	2.60	---	PASS
			30~1000	2.60	-50.94	≤-17.4	PASS
			1000~26500	2.60	-44.29	≤-17.4	PASS
		2480	Reference	1.07	1.07	---	PASS
			30~1000	1.07	-51.77	≤-18.93	PASS
			1000~26500	1.07	-44.17	≤-18.93	PASS
BLE_2M	Ant1	2402	Reference	-0.75	-0.75	---	PASS
			30~1000	-0.75	-55.16	≤-20.75	PASS
			1000~26500	-0.75	-44.13	≤-20.75	PASS
		2440	Reference	2.98	2.98	---	PASS
			30~1000	2.98	-53.46	≤-17.02	PASS
			1000~26500	2.98	-43.92	≤-17.02	PASS
		2480	Reference	0.68	0.68	---	PASS
			30~1000	0.68	-53.82	≤-19.32	PASS
			1000~26500	0.68	-43.8	≤-19.32	PASS

Test Graphs

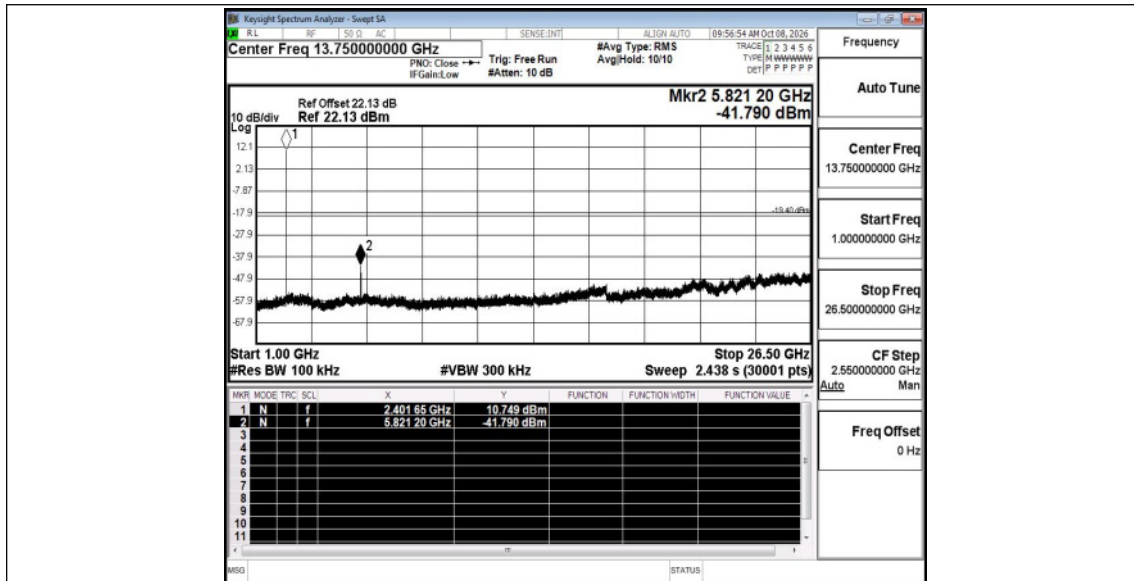
BLE_1M_Ant1_2402_0~Reference



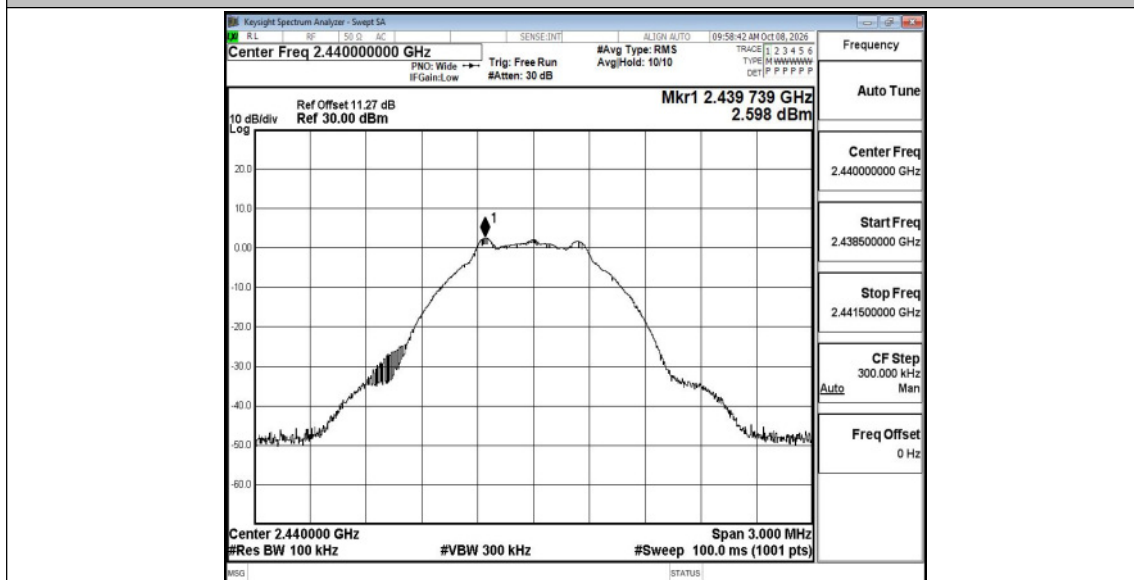
BLE_1M_Ant1_2402_30~1000



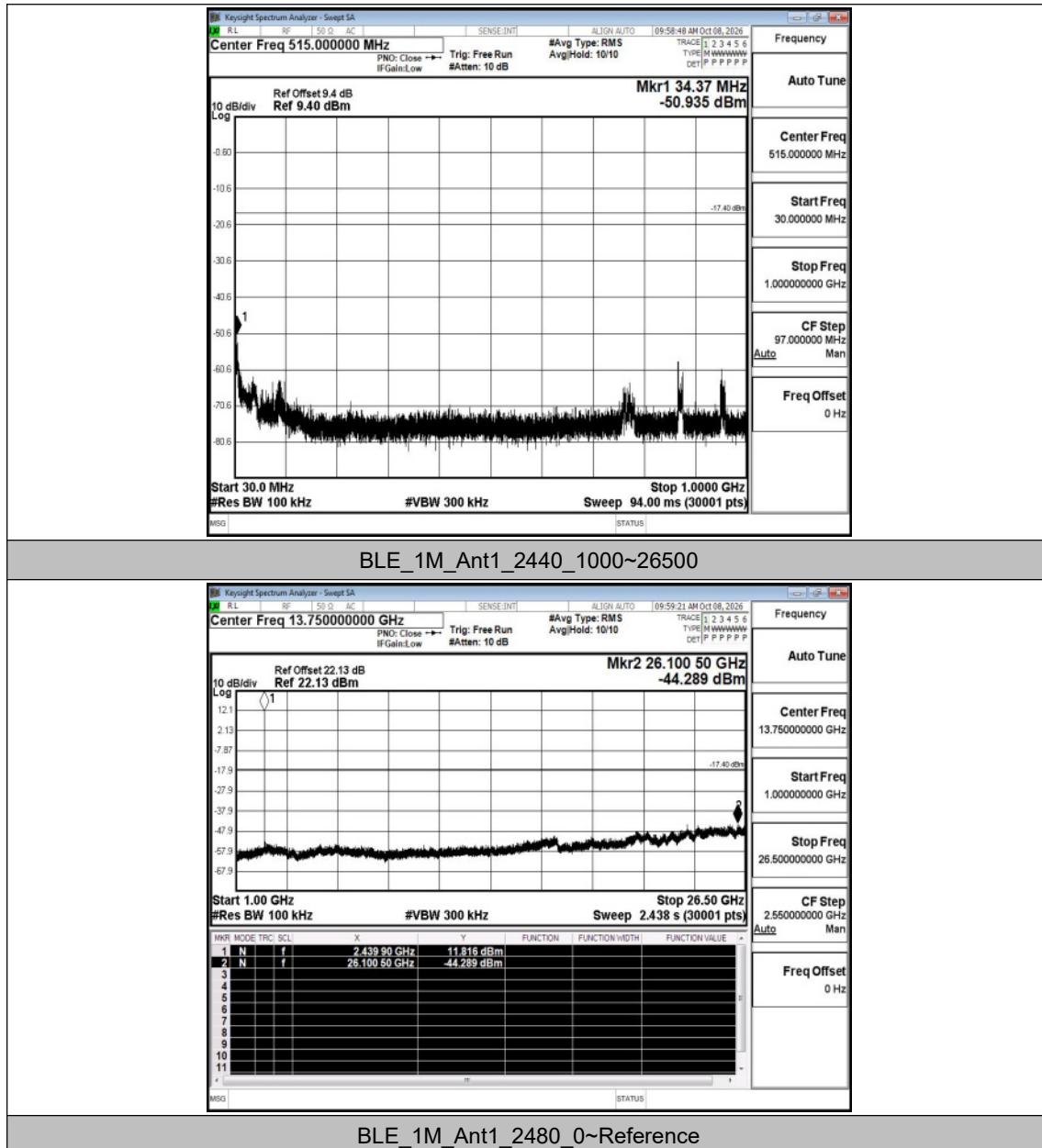
BLE_1M_Ant1_2402_1000~26500

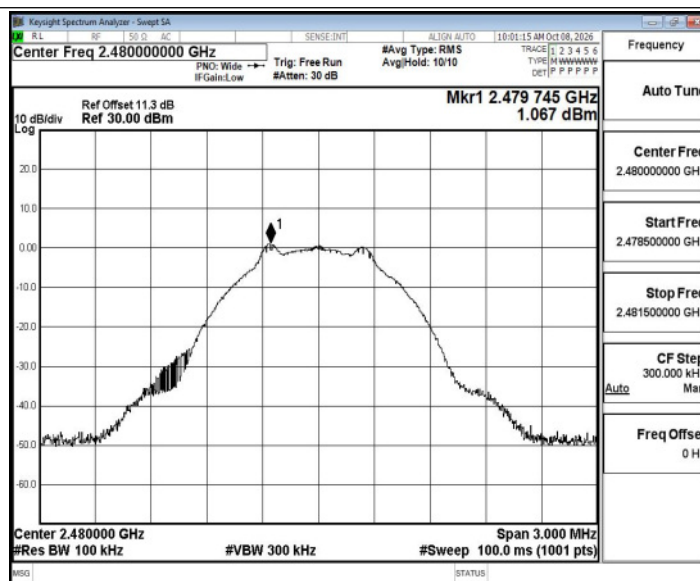


BLE_1M_Ant1_2440_0~Reference

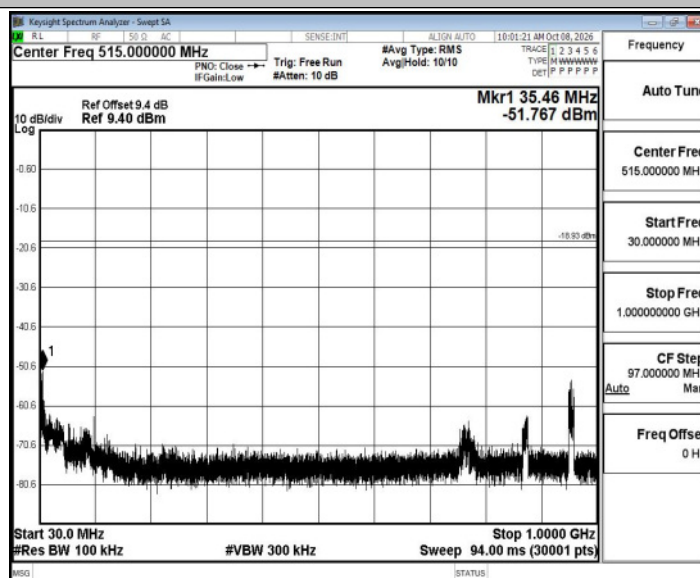


BLE_1M_Ant1_2440_30~1000

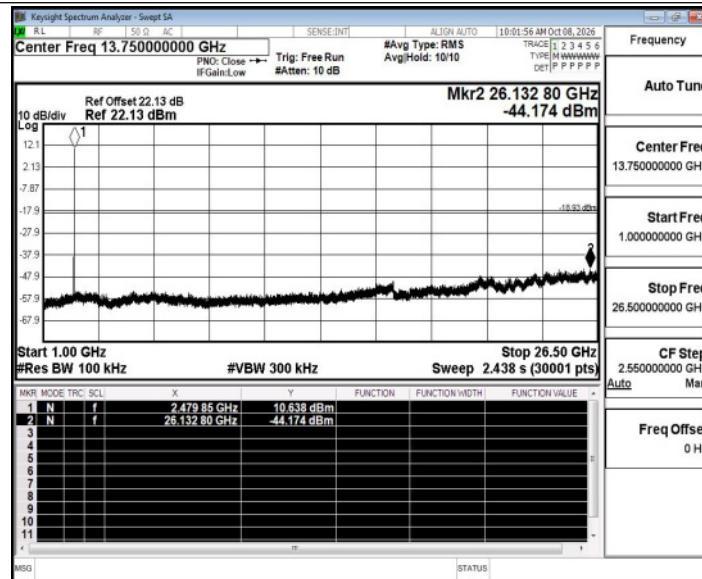




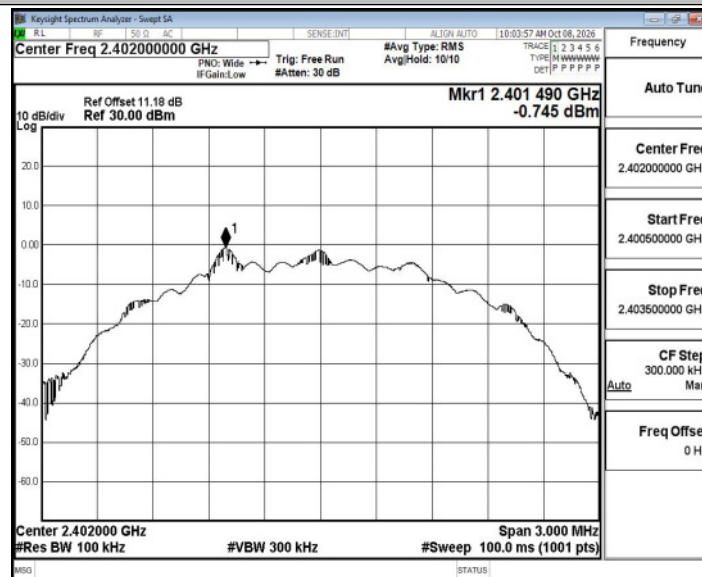
BLE_1M_Ant1_2480_30~1000



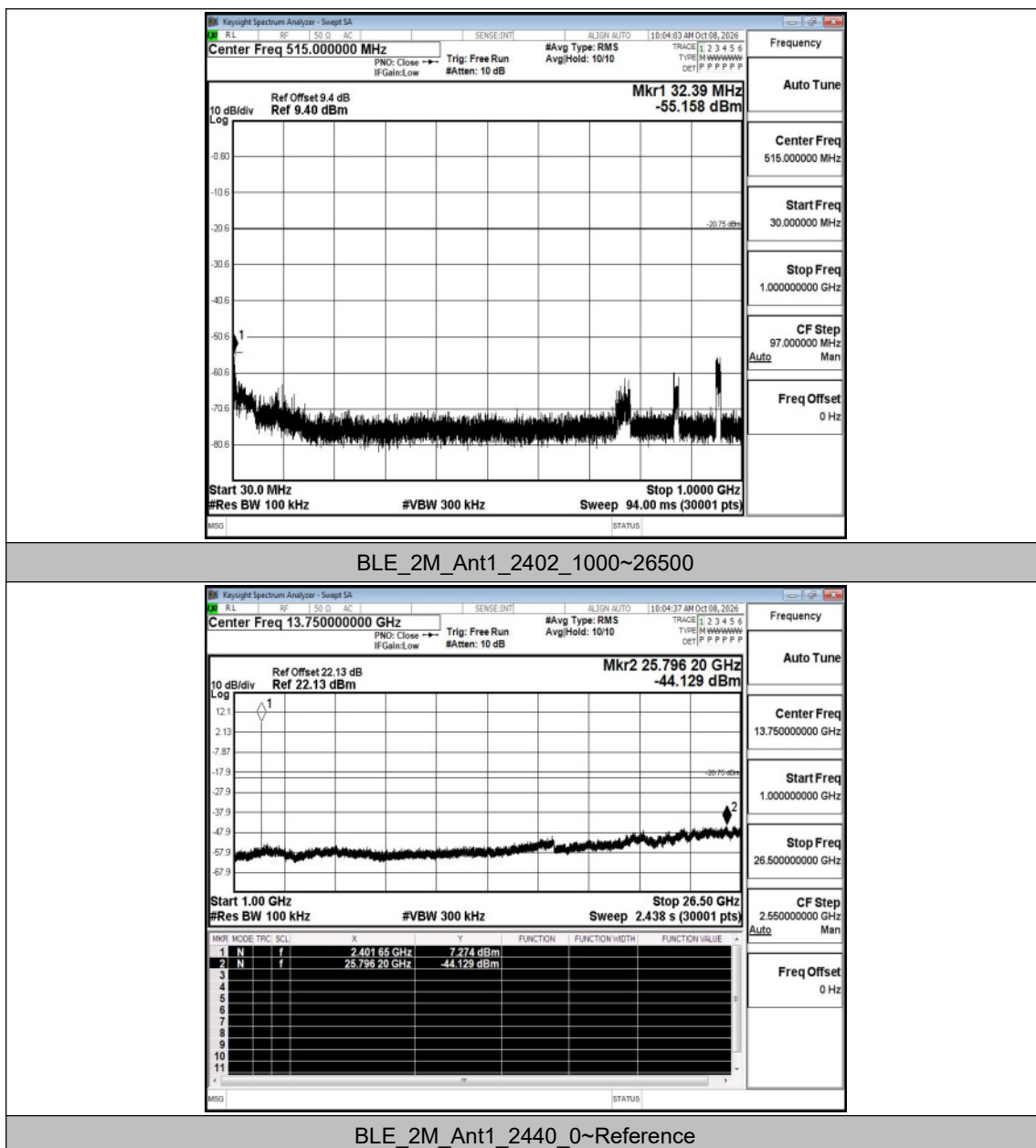
BLE_1M_Ant1_2480_1000~26500

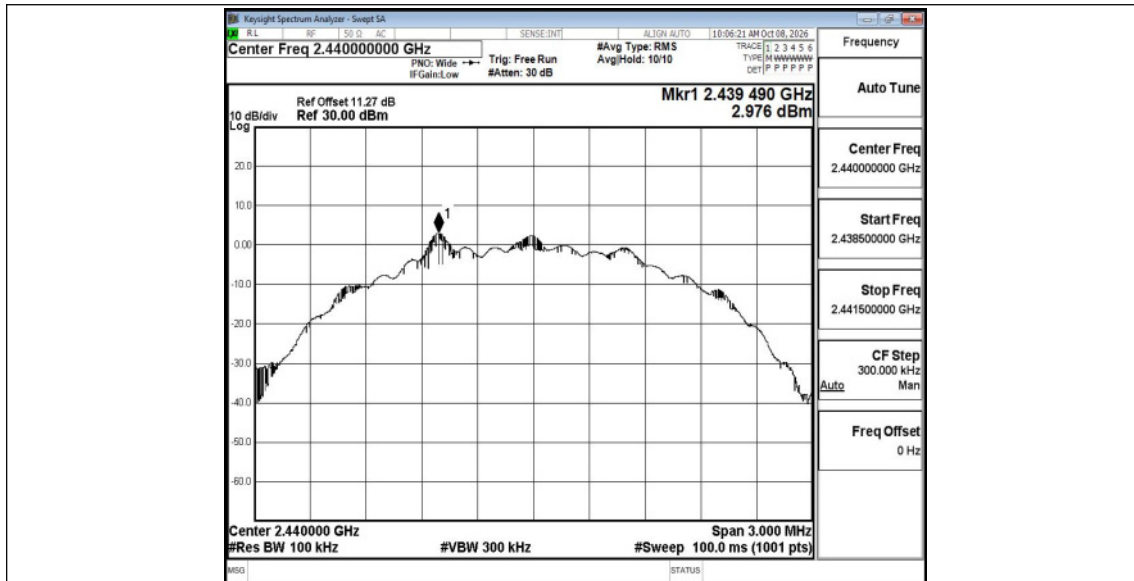


BLE_2M_Ant1_2402_0~Reference

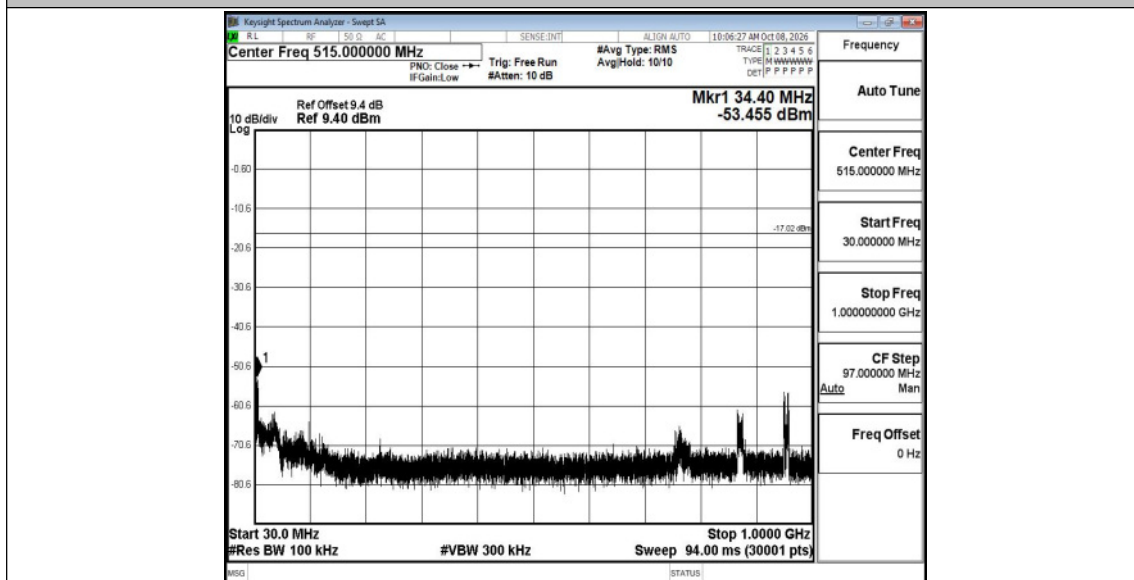


BLE_2M_Ant1_2402_30~1000

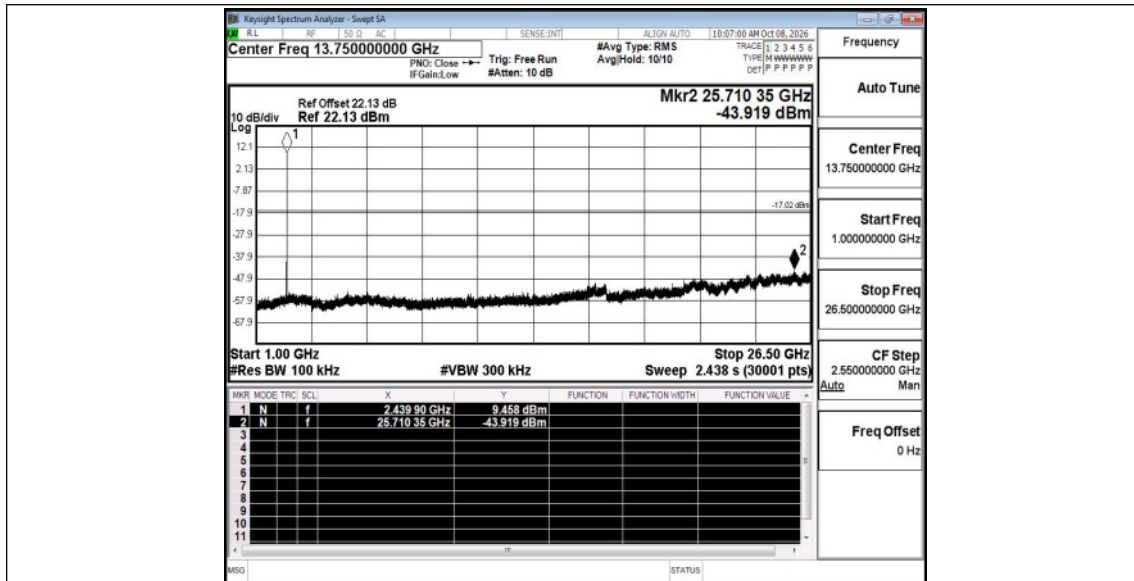




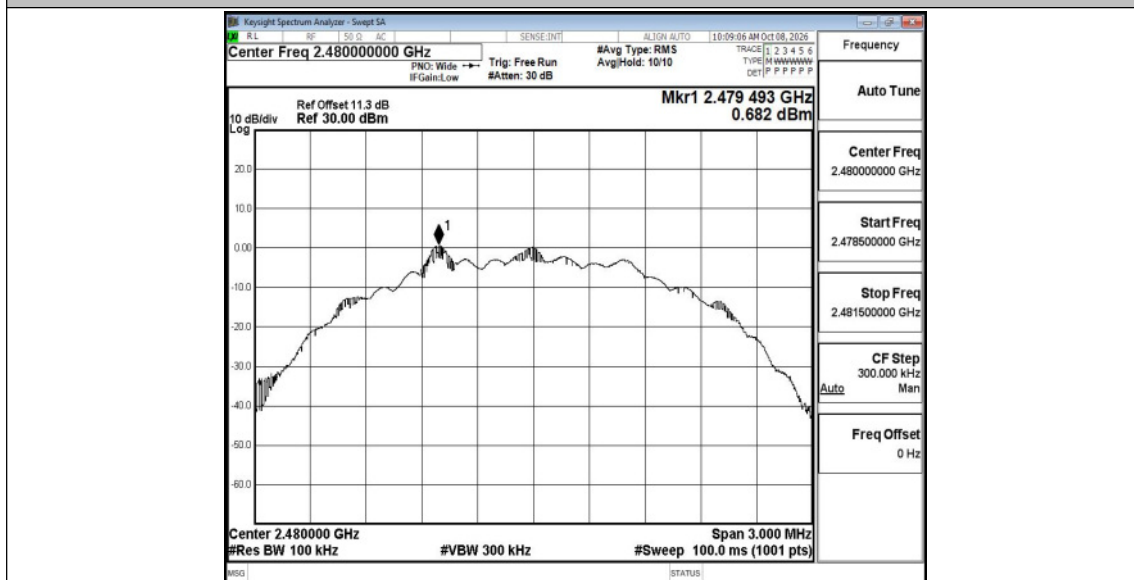
BLE_2M_Ant1_2440_30~1000



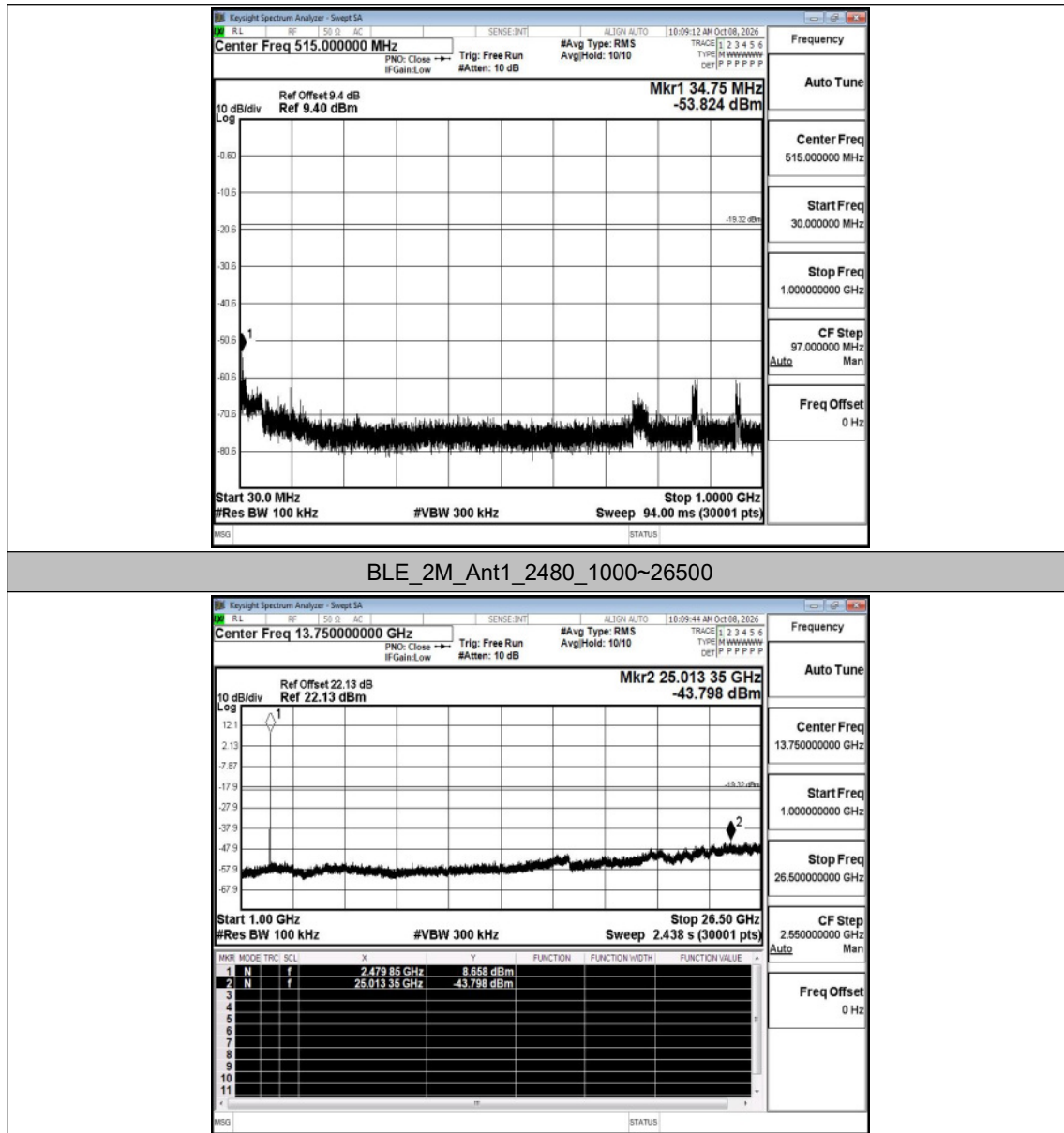
BLE_2M_Ant1_2440_1000~26500



BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



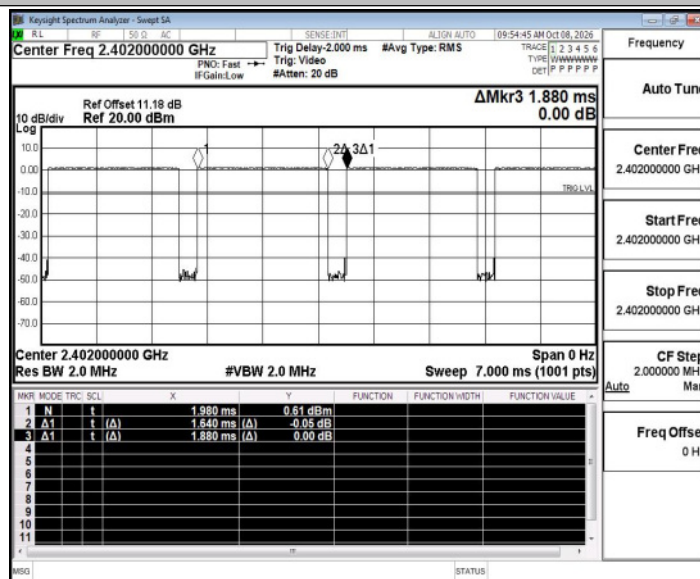
A.6 Duty Cycle

Test Result

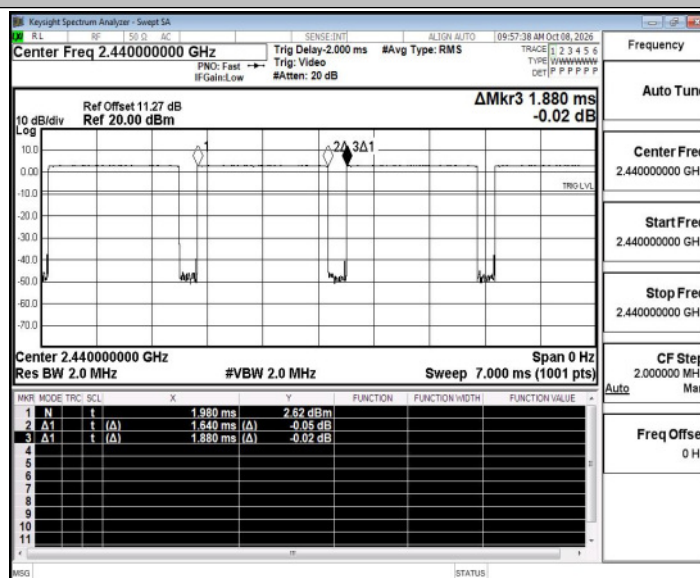
TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	1.64	1.88	0.8723	87.23	0.59	---	---
		2440	1.64	1.88	0.8723	87.23	0.59	---	---
		2480	1.64	1.88	0.8723	87.23	0.59	---	---
BLE_2M	Ant1	2402	0.81	1.24	0.6532	65.32	1.85	---	---
		2440	0.81	1.24	0.6532	65.32	1.85	---	---
		2480	0.82	1.25	0.6560	65.60	1.83	---	---

Test Graphs

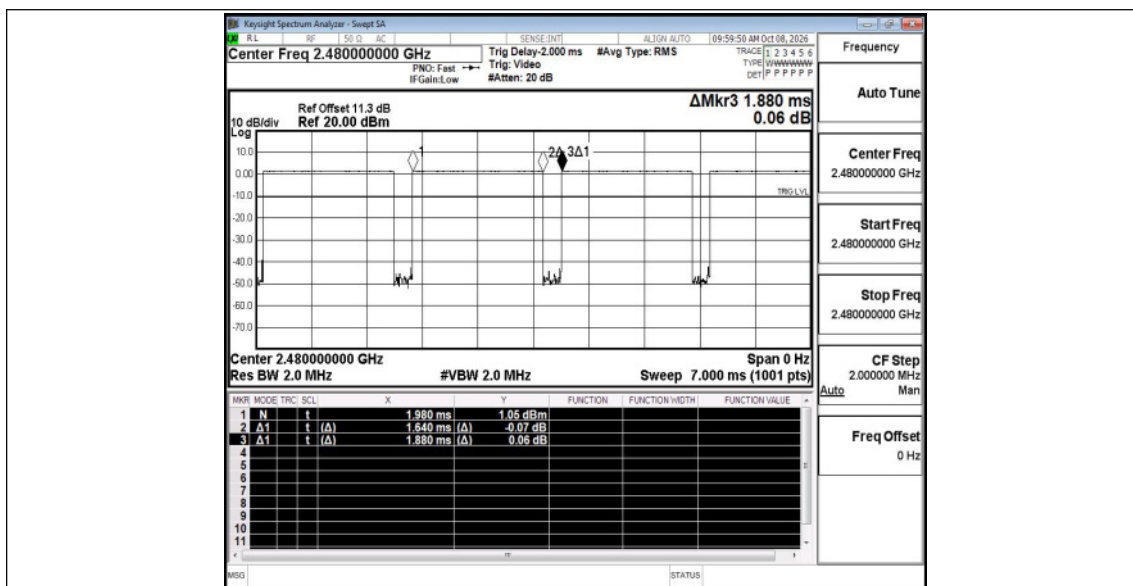
BLE_1M_Ant1_2402



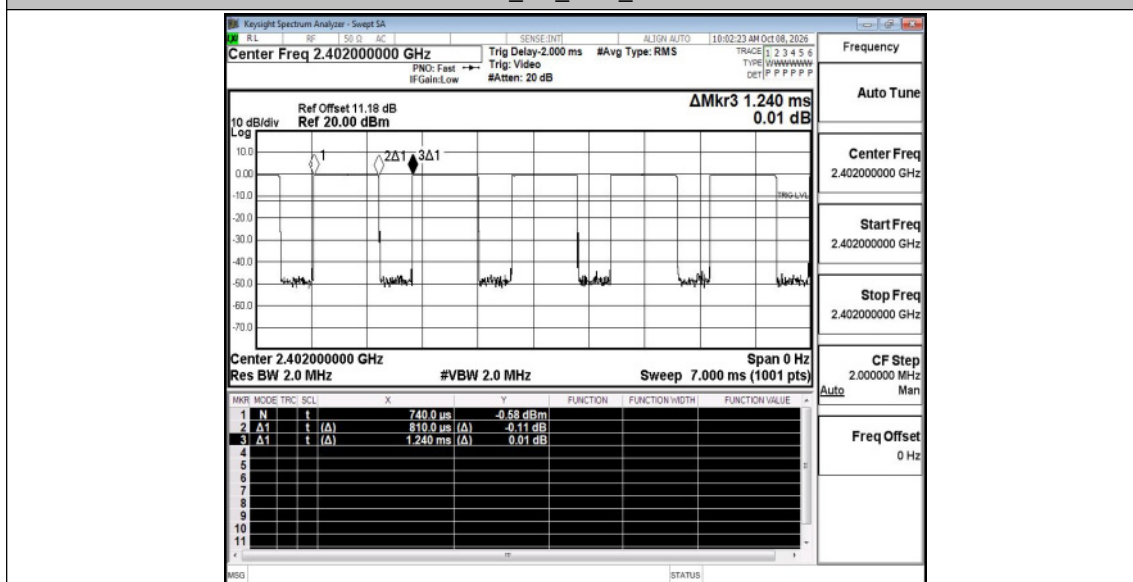
BLE_1M_Ant1_2440



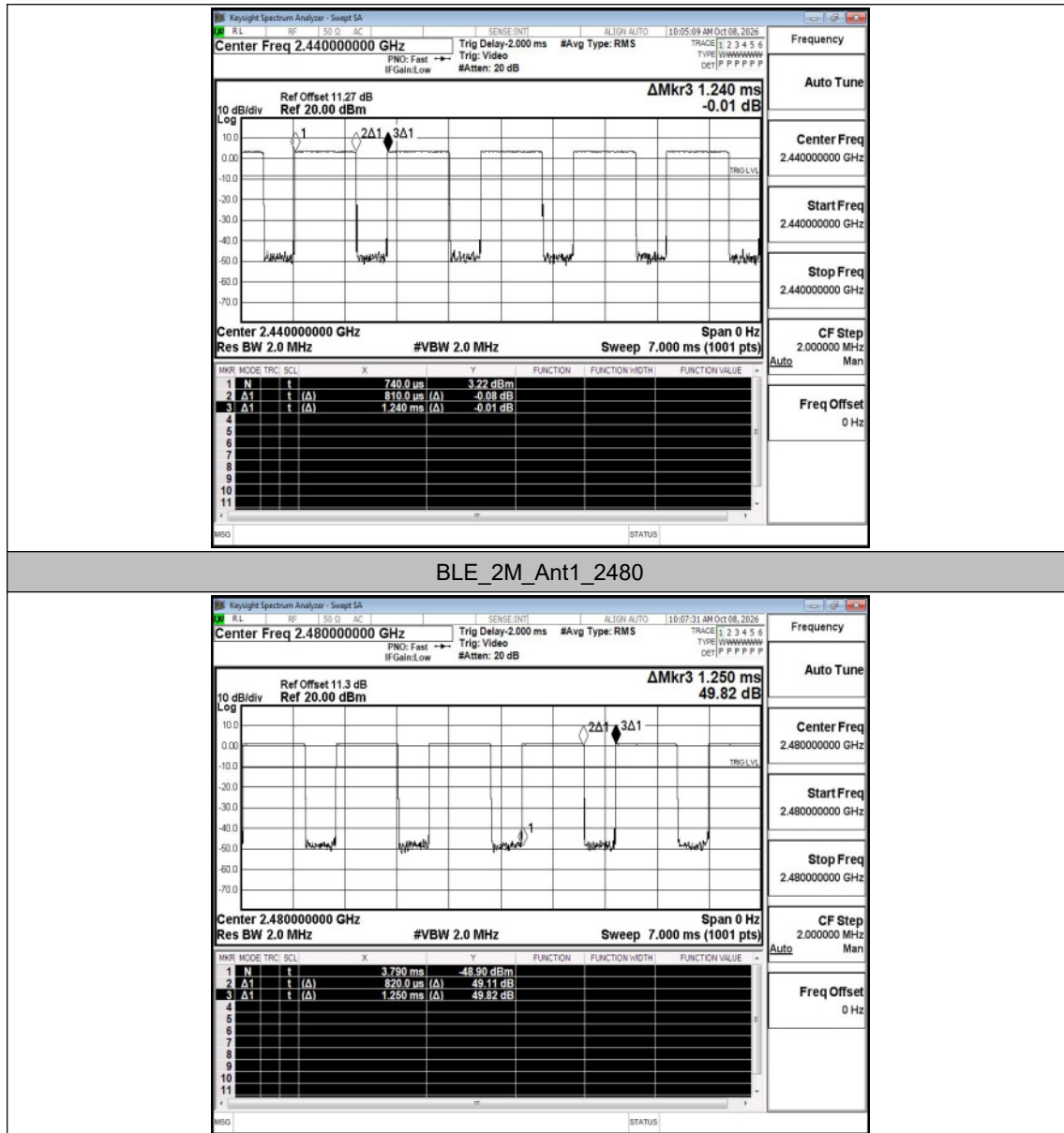
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



A.7 Emissions in Restricted Bands

Test Result

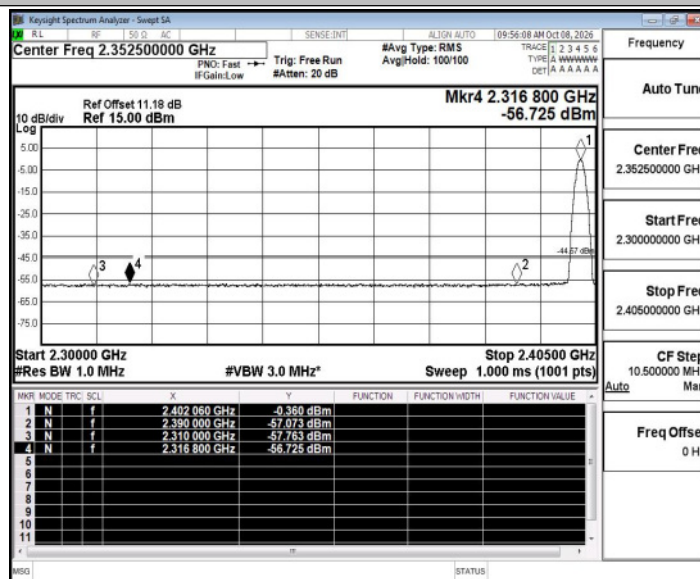
TestMode	Antenna	ChName	Freq(MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-57.76	≤-44.57	2.78	0.59	40.81	≤54	PASS
				AV	2316.800	-56.72	≤-44.57	2.78	0.59	41.85	≤54	PASS
				AV	2390.000	-57.07	≤-44.57	2.78	0.59	41.50	≤54	PASS
				Peak	2310.000	-50.57	≤-23.98	2.78	0.00	47.41	≤74	PASS
				Peak	2327.405	-46.18	≤-23.98	2.78	0.00	51.80	≤74	PASS
				Peak	2390.000	-48.63	≤-23.98	2.78	0.00	49.35	≤74	PASS
		High	2480	AV	2483.500	-56.61	≤-44.57	2.78	0.59	41.96	≤54	PASS
				AV	2483.680	-56.33	≤-44.57	2.78	0.59	42.24	≤54	PASS
				AV	2500.000	-57.21	≤-44.57	2.78	0.59	41.36	≤54	PASS
				Peak	2483.500	-47.64	≤-23.98	2.78	0.00	50.34	≤74	PASS
				Peak	2498.560	-45.79	≤-23.98	2.78	0.00	52.19	≤74	PASS
				Peak	2500.000	-49.52	≤-23.98	2.78	0.00	48.46	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-57.83	≤-45.83	2.78	1.85	42.00	≤54	PASS
				AV	2342.420	-56.67	≤-45.83	2.78	1.85	43.16	≤54	PASS
				AV	2390.000	-57.72	≤-45.83	2.78	1.85	42.11	≤54	PASS
				Peak	2310.000	-49.17	≤-23.98	2.78	0.00	48.81	≤74	PASS
				Peak	2326.040	-46.49	≤-23.98	2.78	0.00	51.49	≤74	PASS
				Peak	2390.000	-49.05	≤-23.98	2.78	0.00	48.93	≤74	PASS
		High	2480	AV	2483.500	-56.98	≤-45.81	2.78	1.83	42.83	≤54	PASS
				AV	2485.040	-56.25	≤-45.81	2.78	1.83	43.56	≤54	PASS
				AV	2500.000	-56.7	≤-45.81	2.78	1.83	43.11	≤54	PASS
				Peak	2483.500	-46.54	≤-23.98	2.78	0.00	51.44	≤74	PASS
				Peak	2484.160	-45.38	≤-23.98	2.78	0.00	52.60	≤74	PASS
				Peak	2500.000	-48.21	≤-23.98	2.78	0.00	49.77	≤74	PASS

Note:

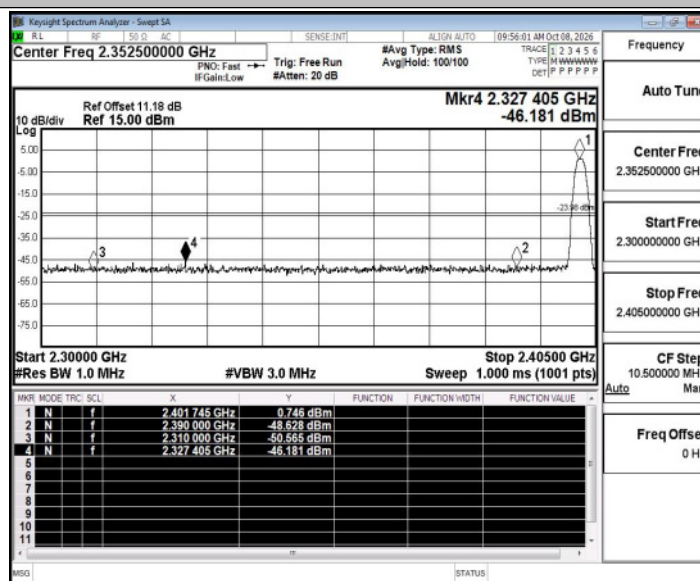
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

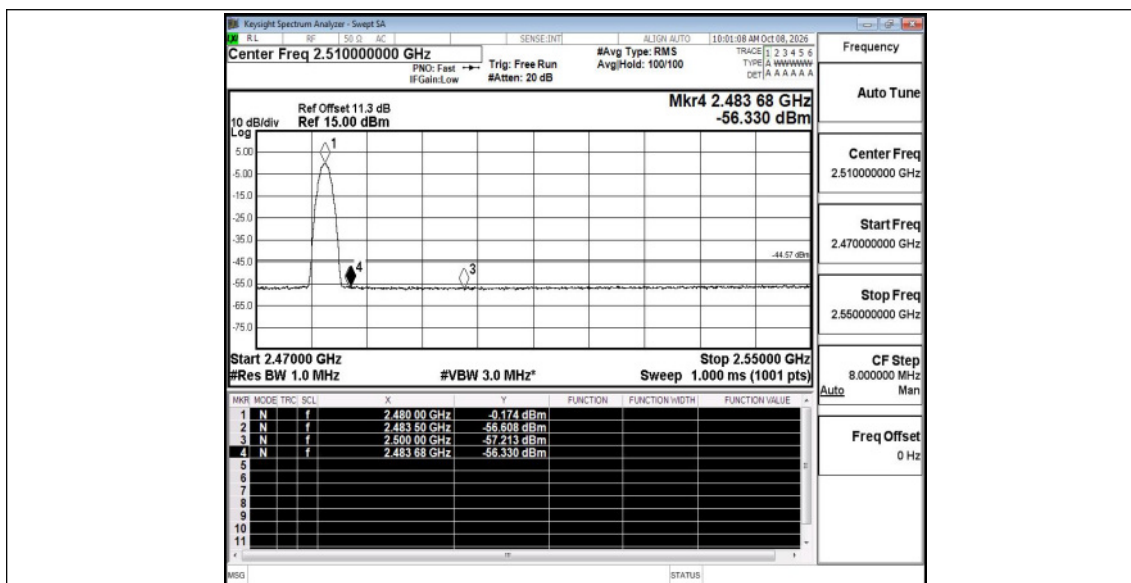
BLE_1M_Ant1_Low_2402_AV



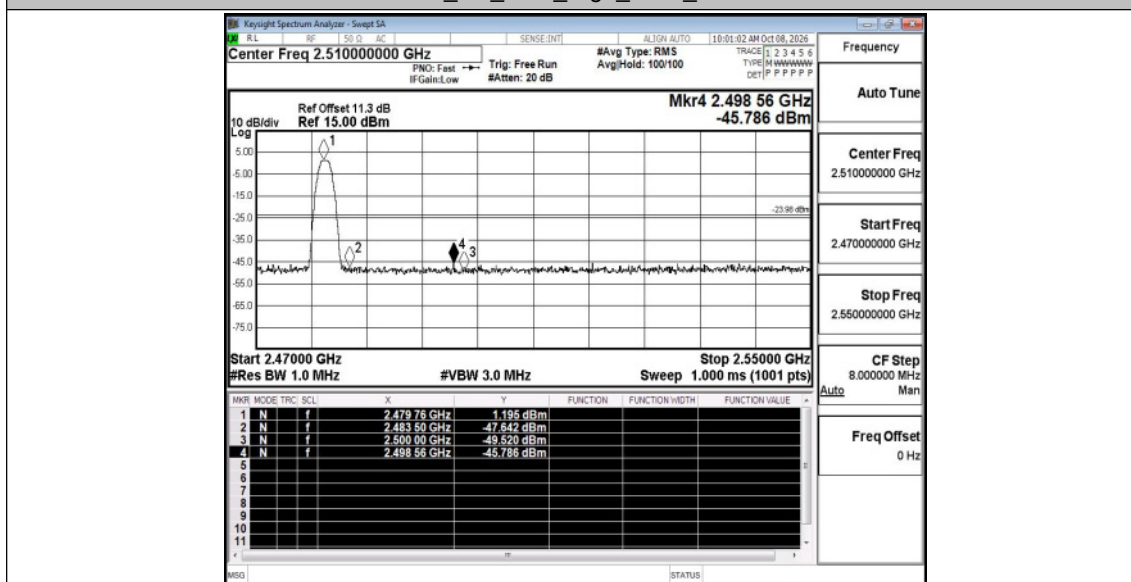
BLE_1M_Ant1_Low_2402_Peak



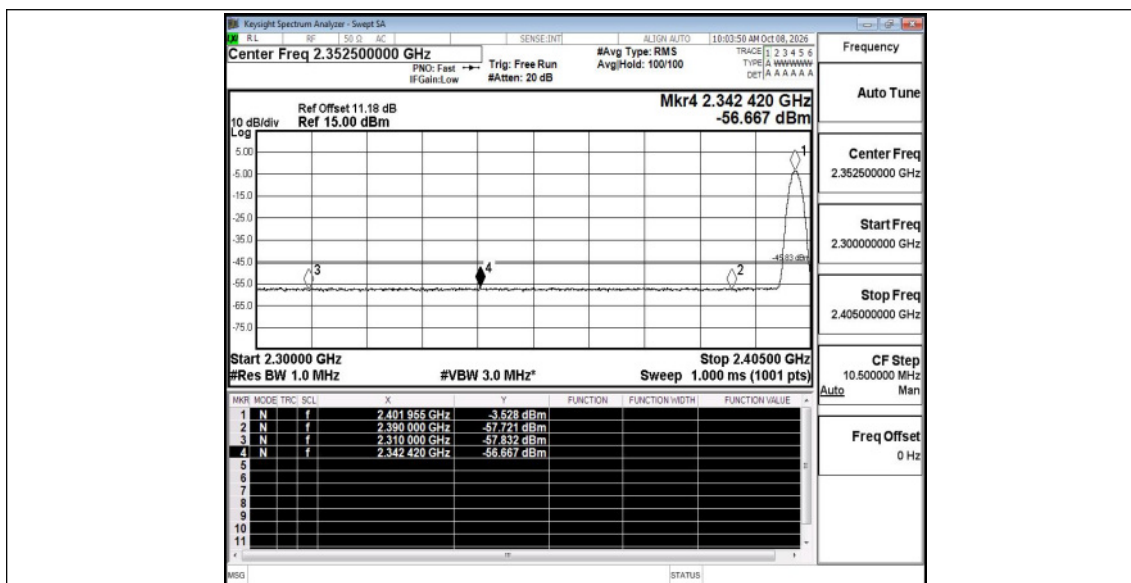
BLE_1M_Ant1_High_2480_AV



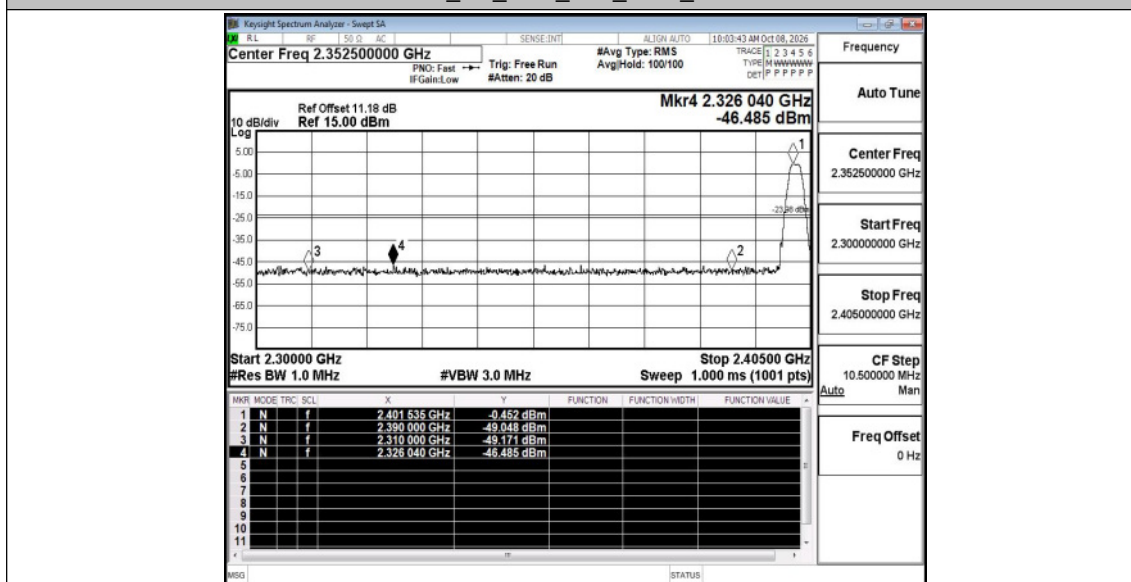
BLE_1M_Ant1_High_2480_Peak



BLE_2M_Ant1_Low_2402_AV



BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV

