



Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: control box

Test Model: CBU12-24VDD

Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li huan





A.1 6dB Bandwidth

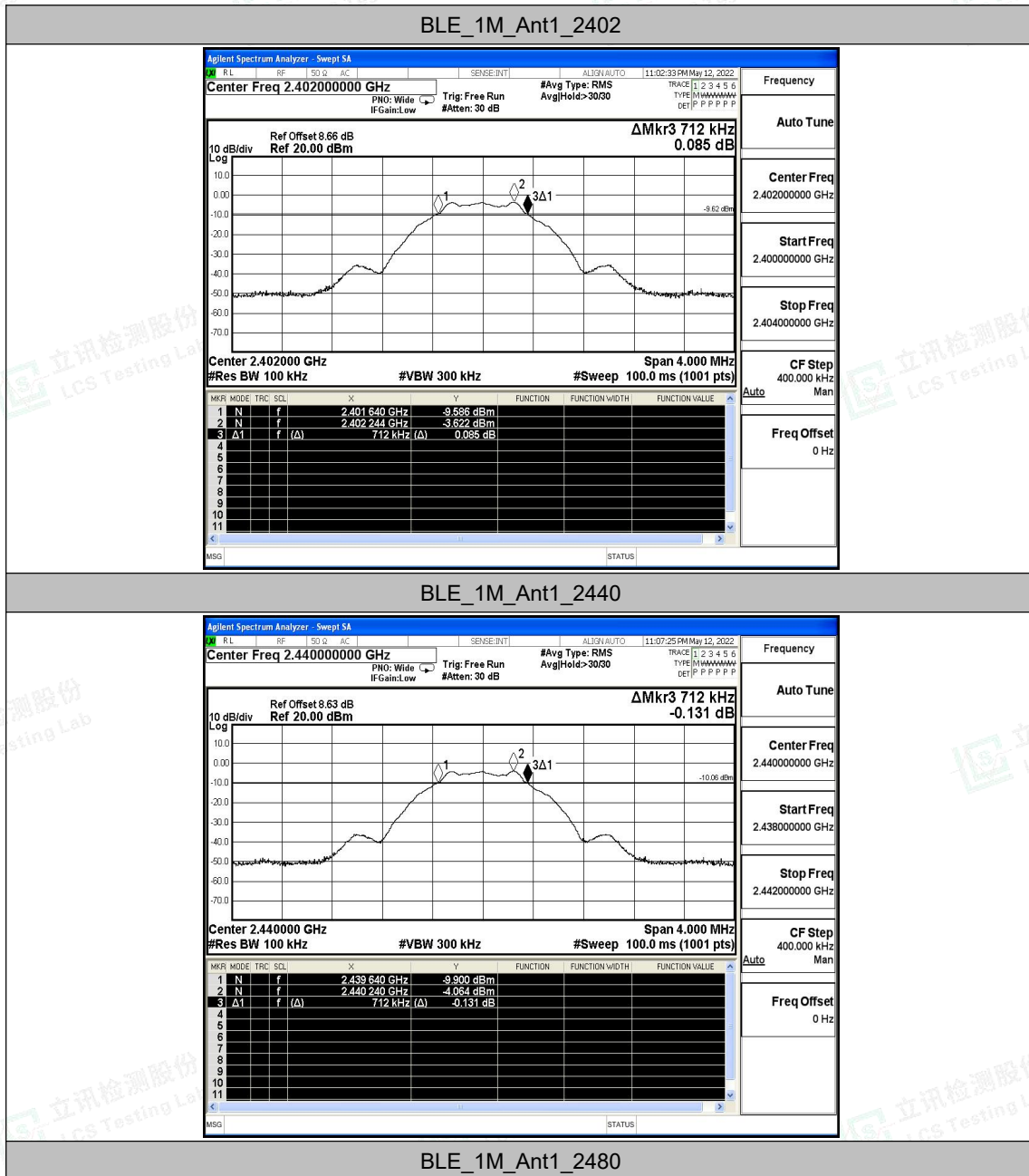
Test Result

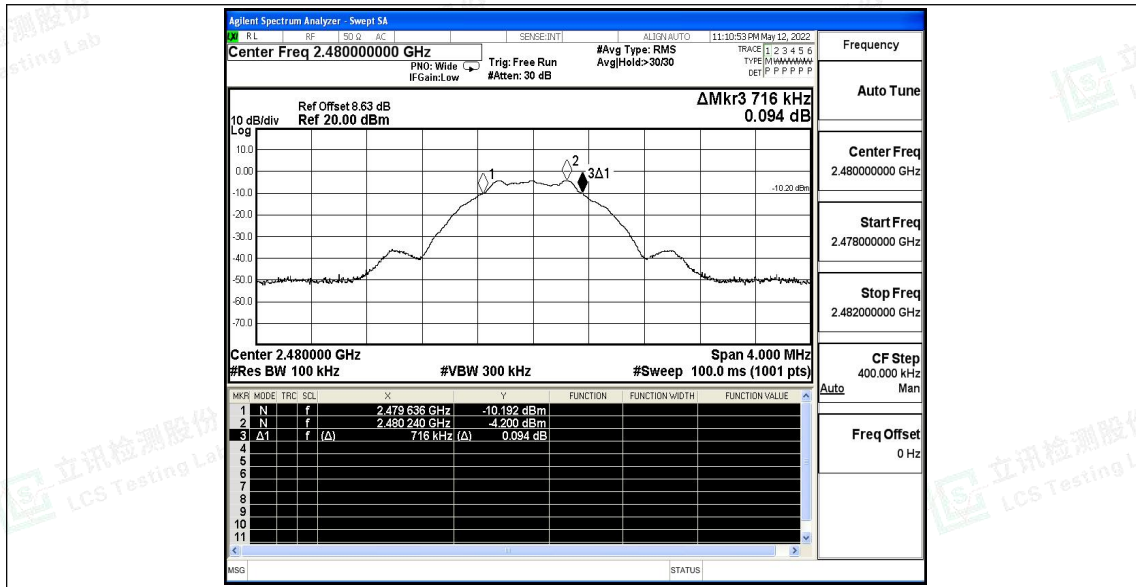
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.712	2401.640	2402.352	0.5	PASS
		2440	0.712	2439.640	2440.352	0.5	PASS
		2480	0.716	2479.636	2480.352	0.5	PASS





Test Graphs







A.2 Maximum conducted output power

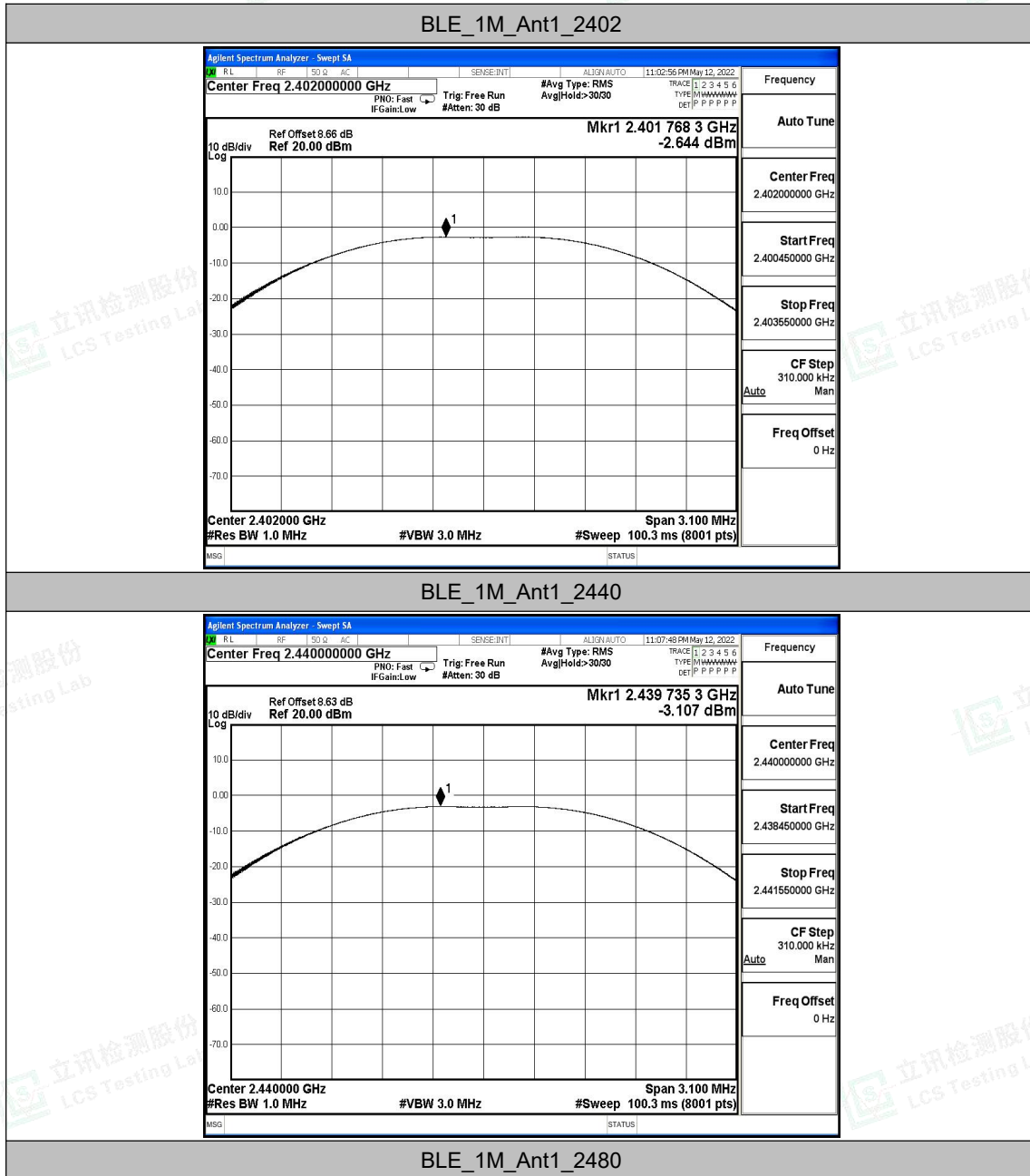
Test Result

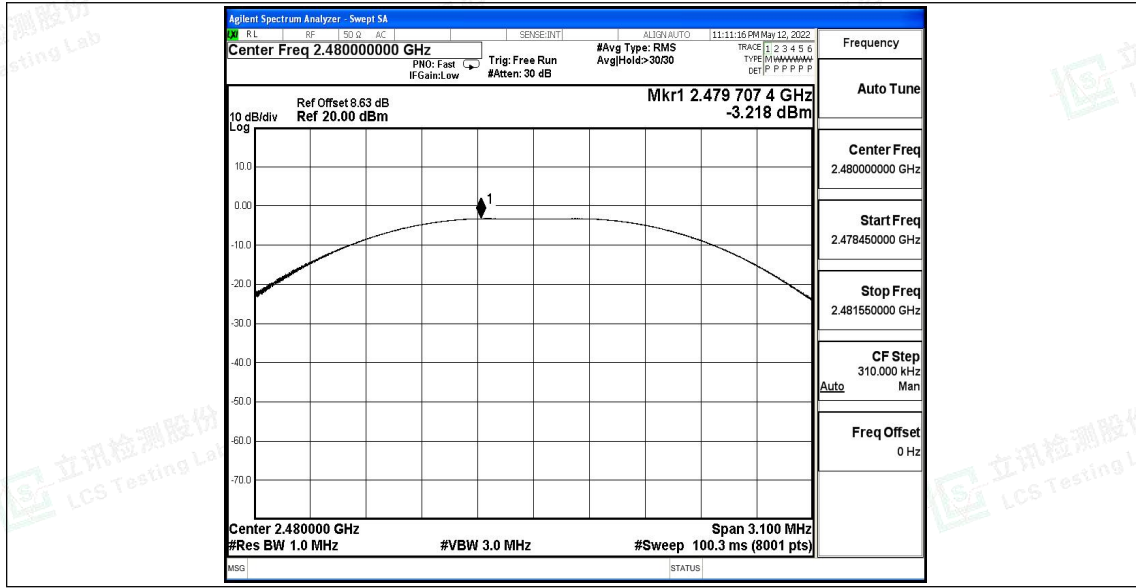
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-2.64	≤30	PASS
		2440	-3.11	≤30	PASS
		2480	-3.22	≤30	PASS





Test Graphs







A.3 Maximum power spectral density

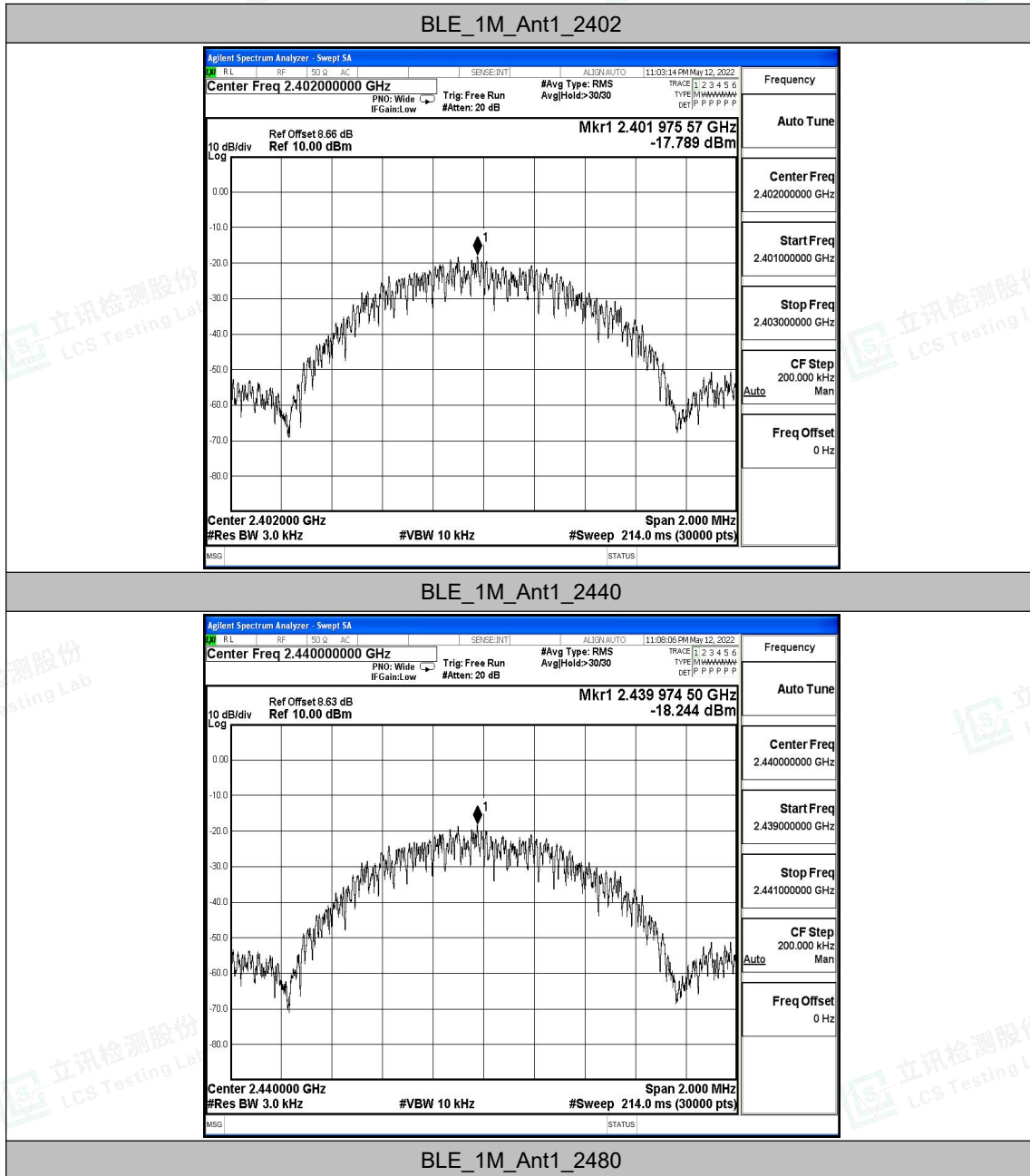
Test Result

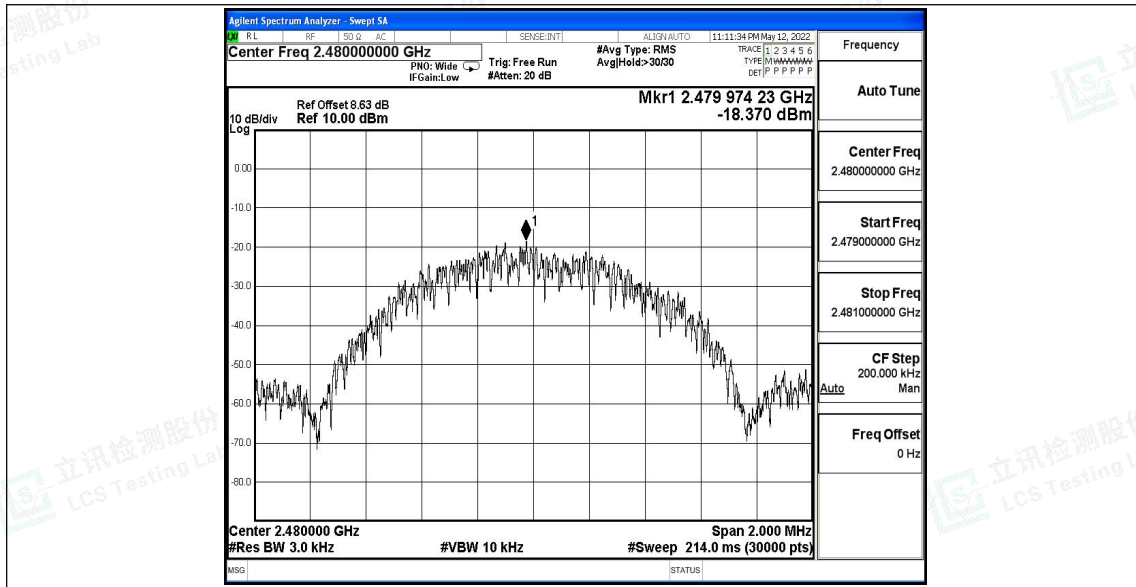
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-17.8	≤8.00	PASS
		2440	-18.3	≤8.00	PASS
		2480	-18.37	≤8.00	PASS





Test Graphs







A.4 Band edge measurements

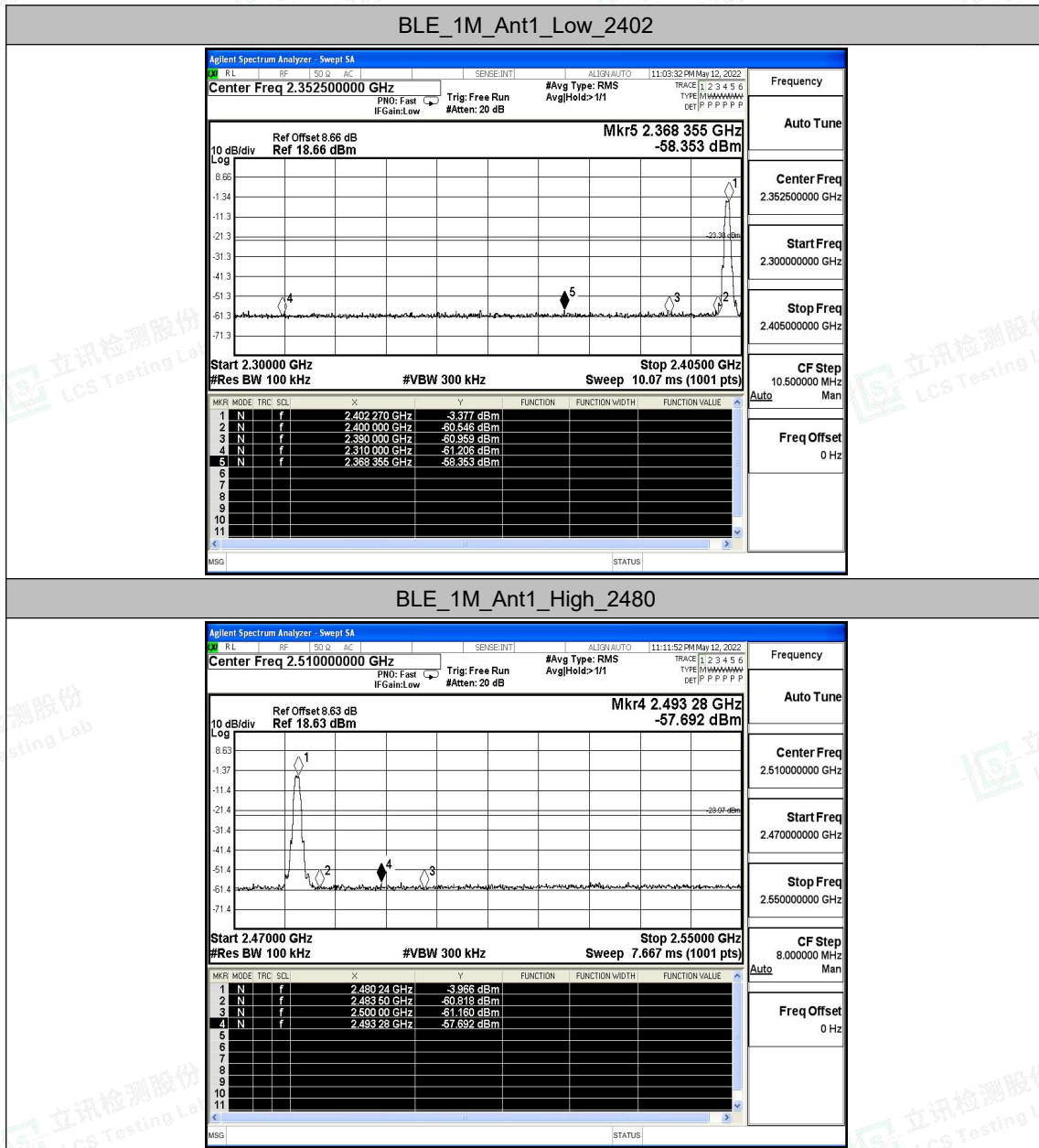
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-3.38	-58.35	≤-23.38	PASS
		High	2480	-3.97	-57.69	≤-23.97	PASS





Test Graphs





A.5 Conducted Spurious Emission

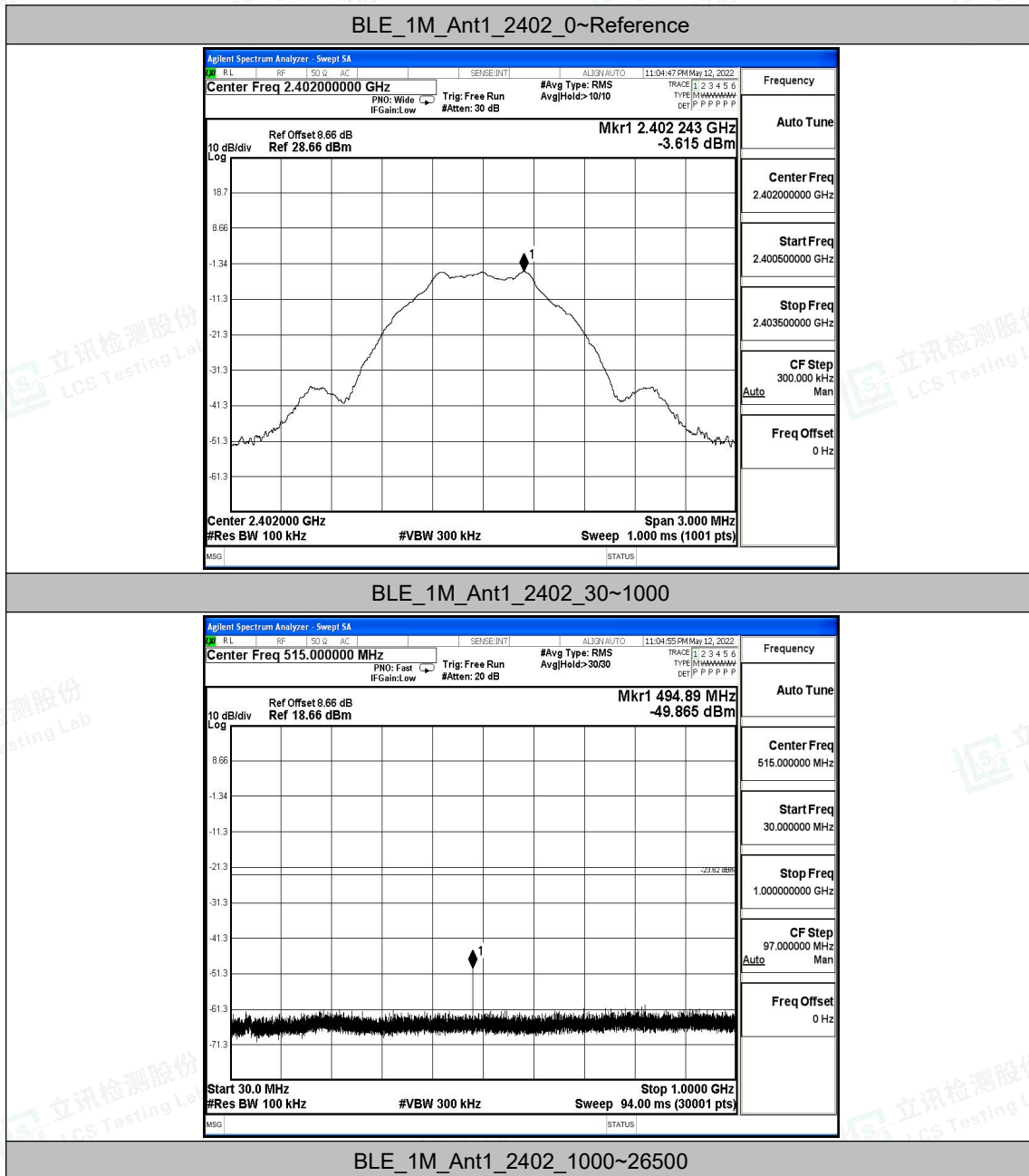
Test Result

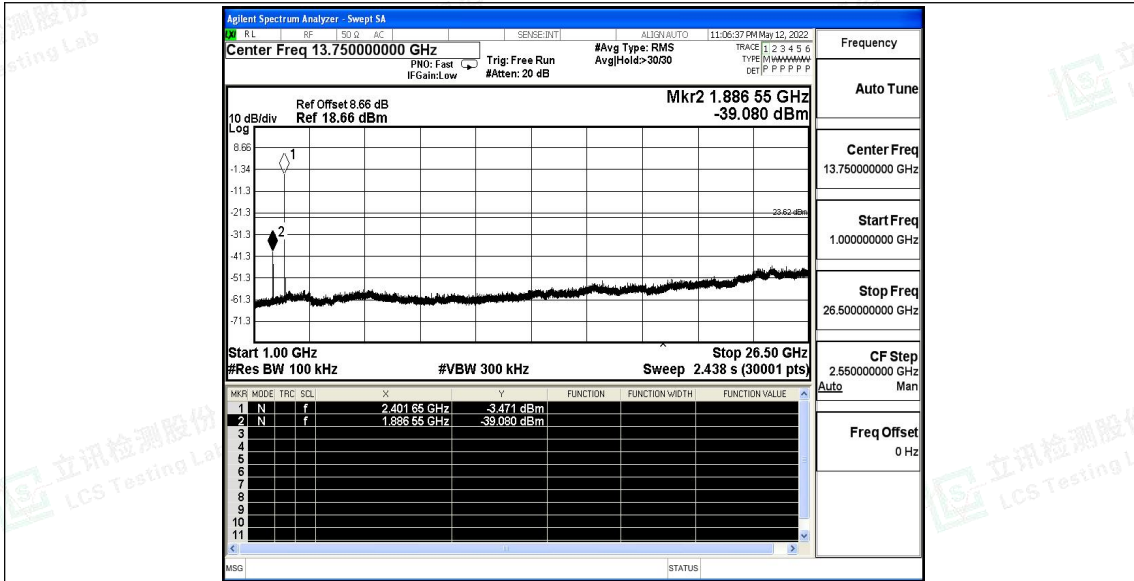
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-3.62	-3.62	---	PASS
			30~1000	-3.62	-49.87	≤-23.62	PASS
			1000~26500	-3.62	-39.08	≤-23.62	PASS
		2440	Reference	-4.06	-4.06	---	PASS
			30~1000	-4.06	-46.26	≤-24.06	PASS
			1000~26500	-4.06	-45.84	≤-24.06	PASS
		2480	Reference	-4.20	-4.20	---	PASS
			30~1000	-4.20	-59.83	≤-24.2	PASS
			1000~26500	-4.20	-45.48	≤-24.2	PASS



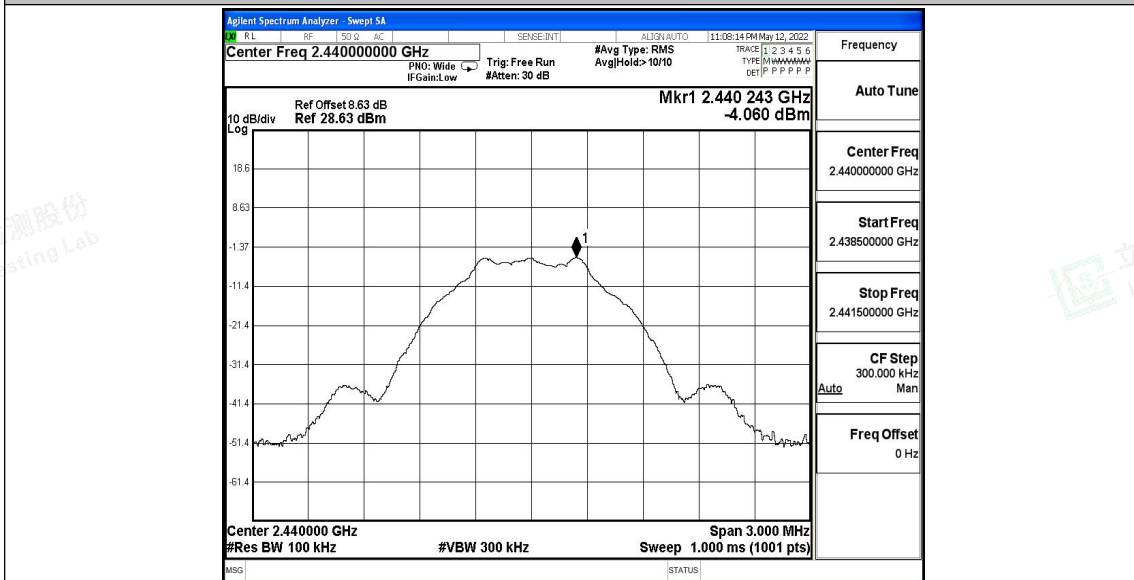


Test Graphs



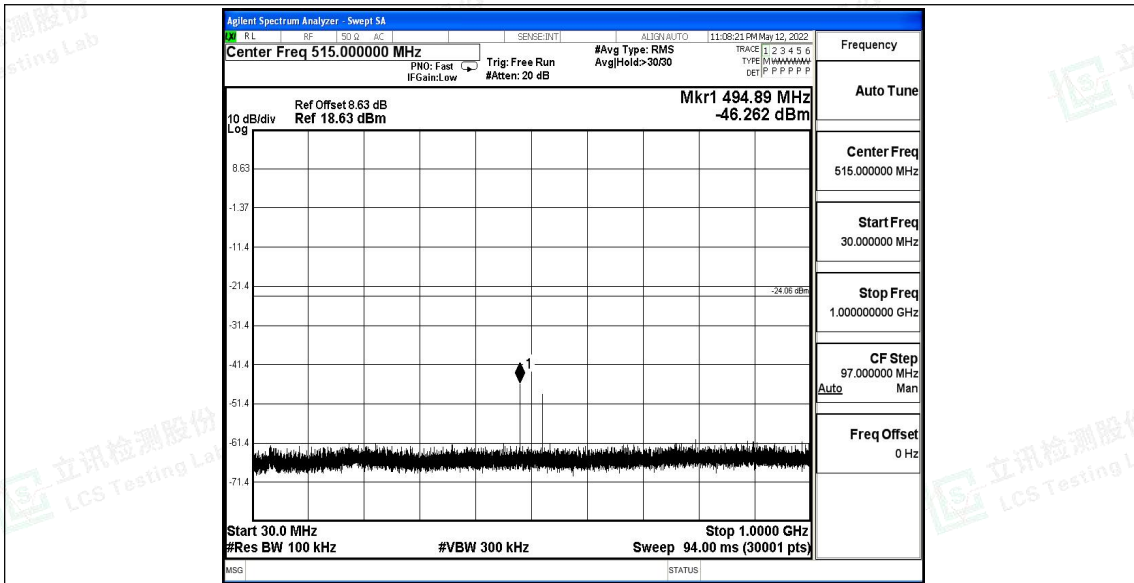


BLE_1M_Ant1_2440_0~Reference

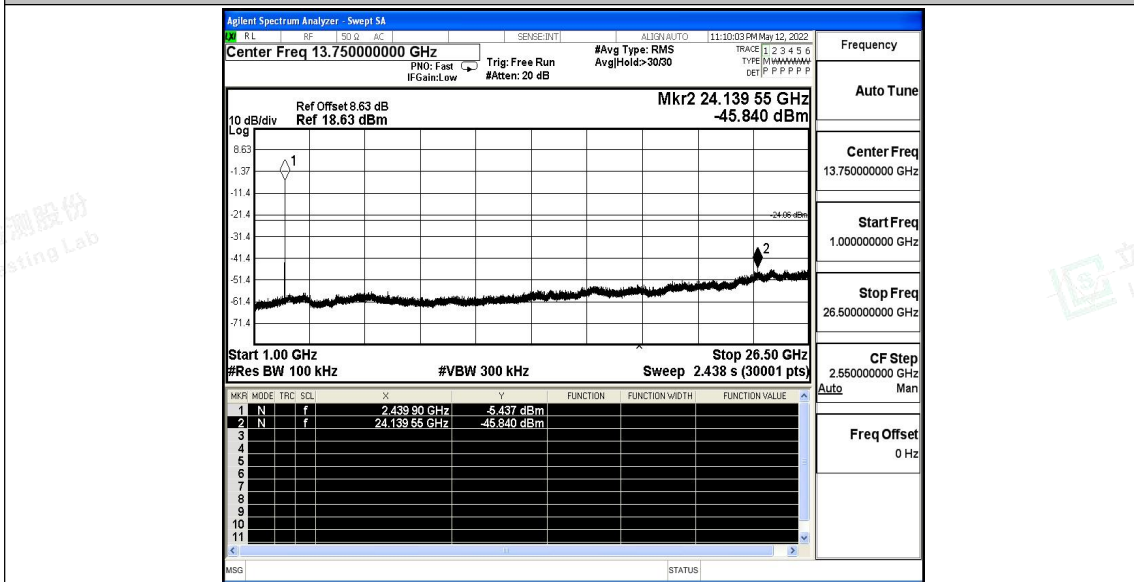


BLE_1M_Ant1_2440_30~1000



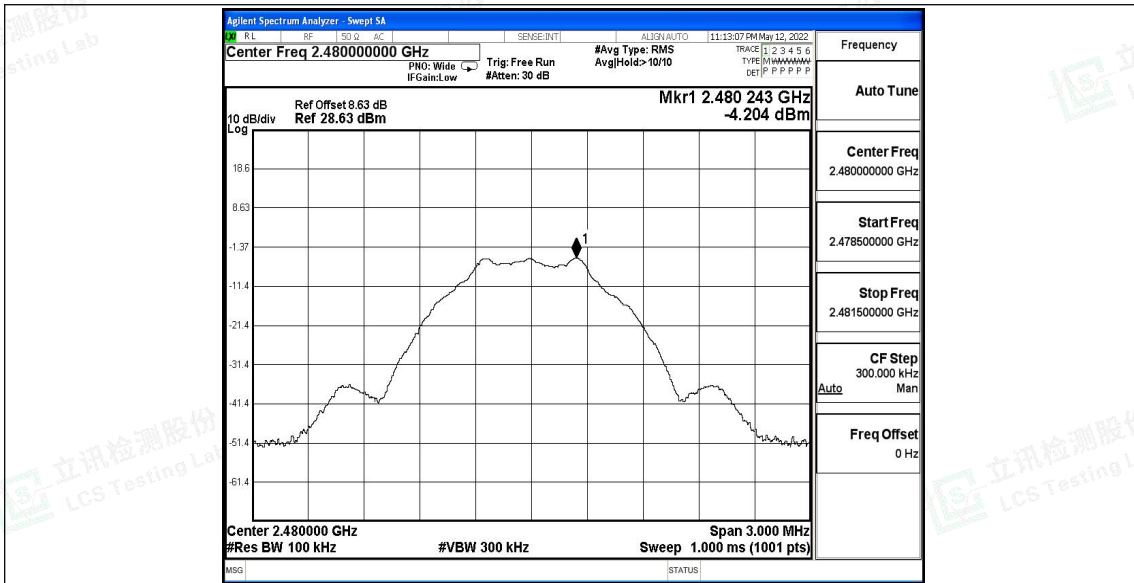


BLE_1M_Ant1_2440_1000~26500

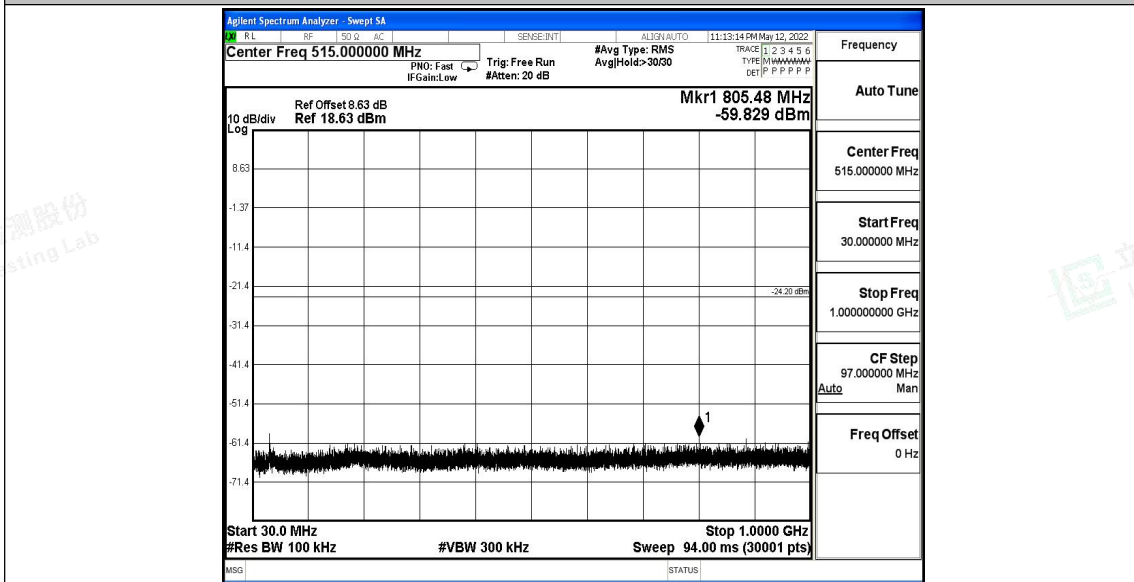


BLE_1M_Ant1_2480_0~Reference



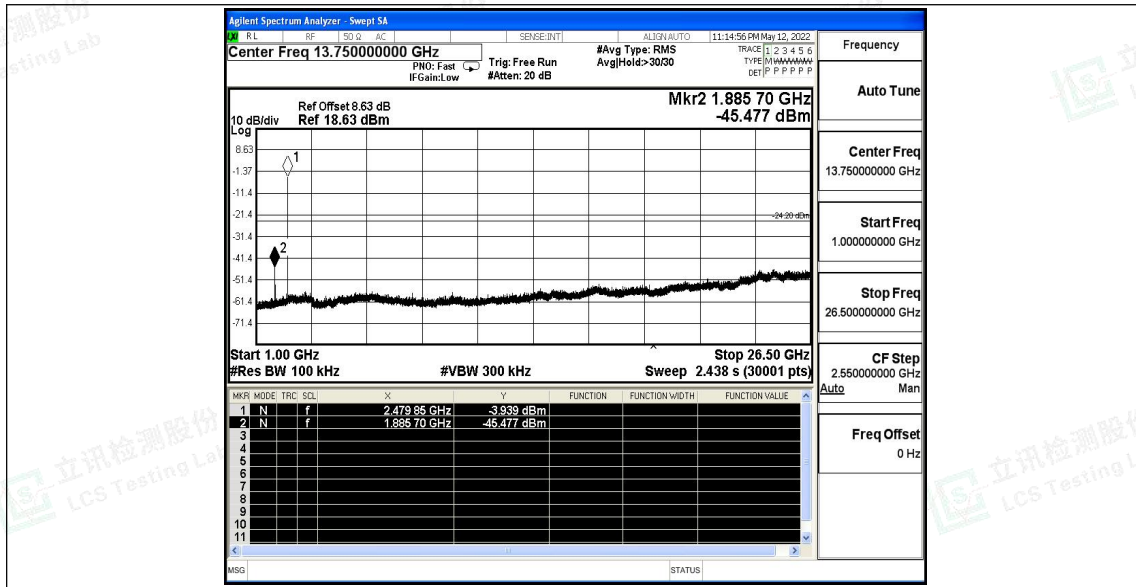


BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500







A.6 Duty Cycle

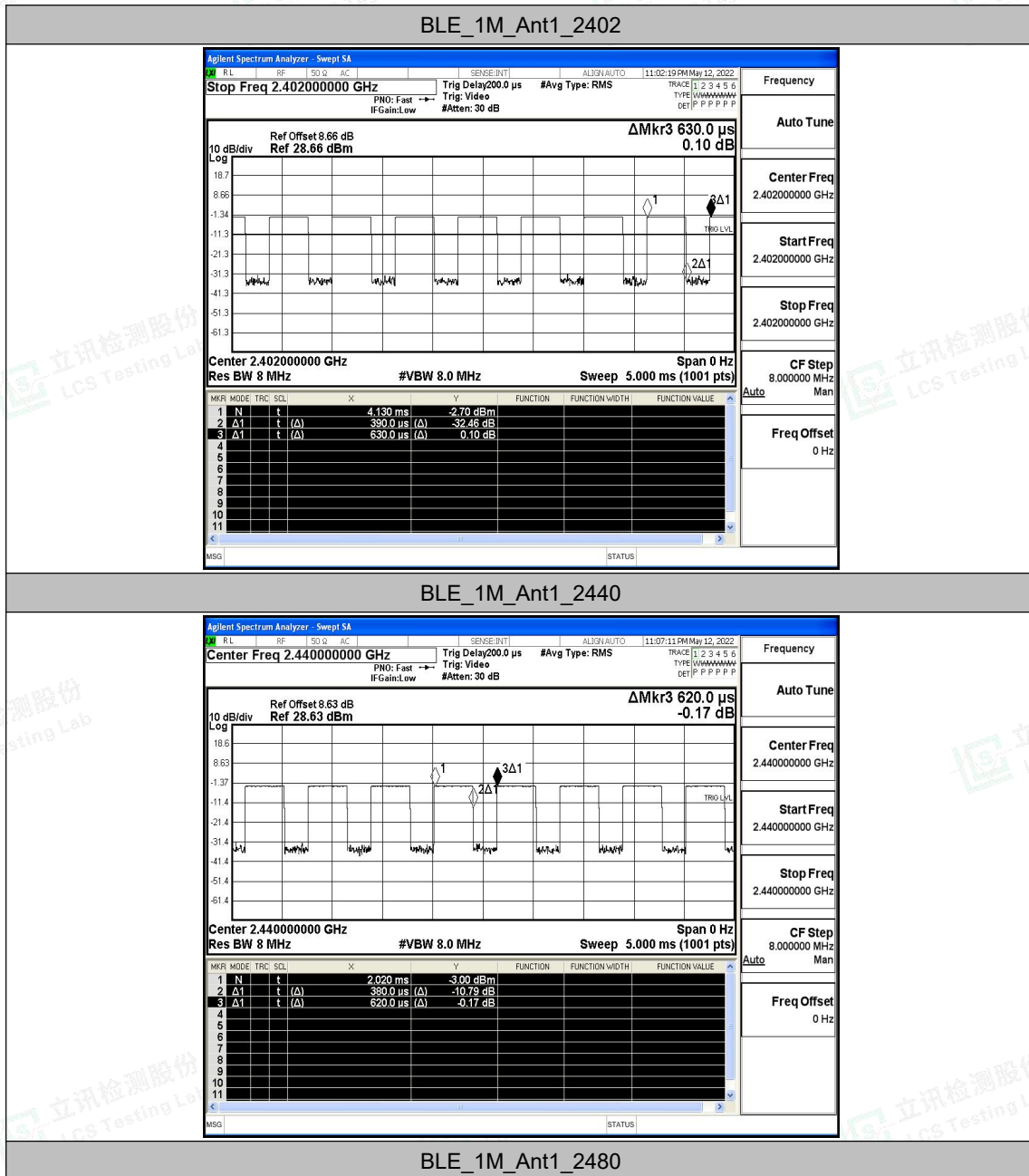
Test Result

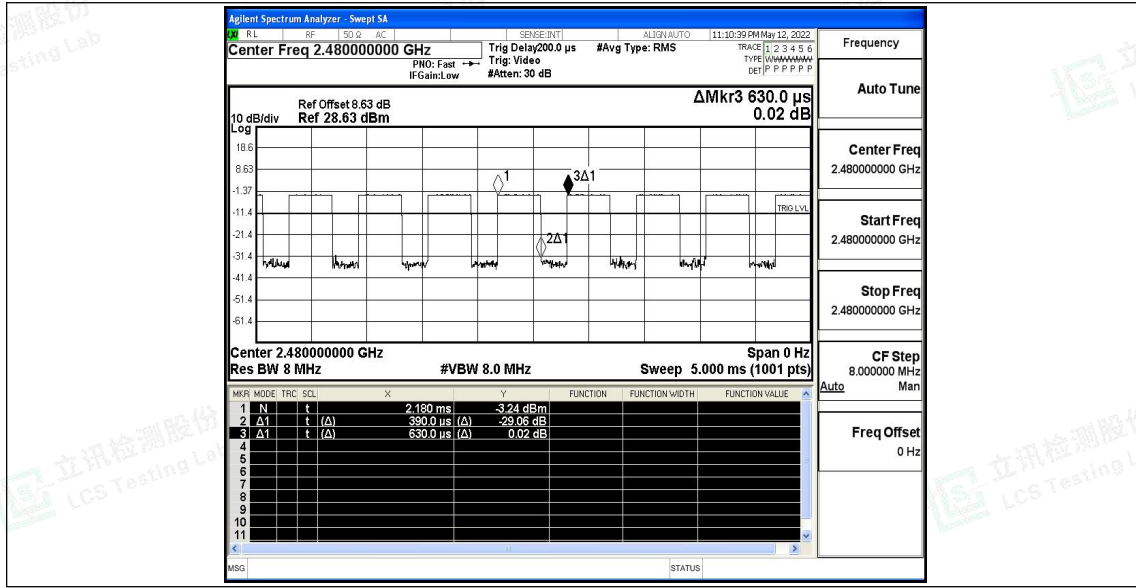
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	1/T	Limit
BLE_1M	Ant1	2402	0.39	0.63	0.6190	61.90	2.08	2.56	---
		2440	0.38	0.62	0.6129	61.29	2.13	2.63	---
		2480	0.39	0.63	0.6190	61.90	2.08	2.56	---





Test Graphs







A.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-57.36	≤-41.20	37.84	≤54	PASS
				AV	2384.945	-56.7	≤-41.20	38.50	≤54	PASS
				AV	2390.000	-57.03	≤-41.20	38.17	≤54	PASS
				Peak	2310.000	-48.2	≤-21.20	47.00	≤74	PASS
				Peak	2310.815	-46.58	≤-21.20	48.62	≤74	PASS
				Peak	2390.000	-47.96	≤-21.20	47.24	≤74	PASS
		High	2480	AV	2483.500	-54.88	≤-41.20	40.32	≤54	PASS
				AV	2483.520	-54.88	≤-41.20	40.32	≤54	PASS
				AV	2500.000	-56.44	≤-41.20	38.76	≤54	PASS
				Peak	2483.500	-47.84	≤-21.20	47.36	≤74	PASS
				Peak	2486.320	-46.45	≤-21.20	48.75	≤74	PASS
				Peak	2500.000	-47.58	≤-21.20	47.62	≤74	PASS

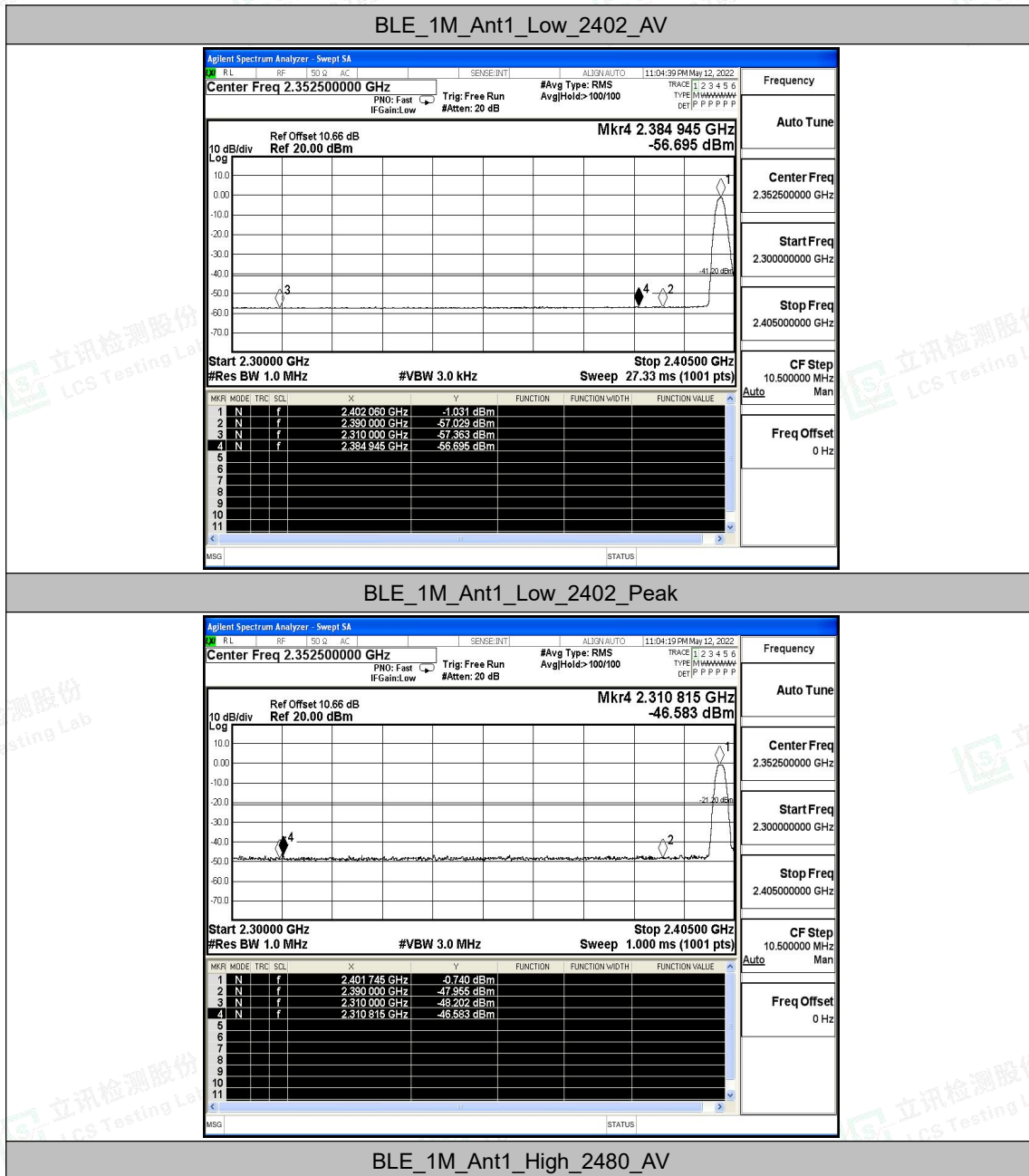
Note:

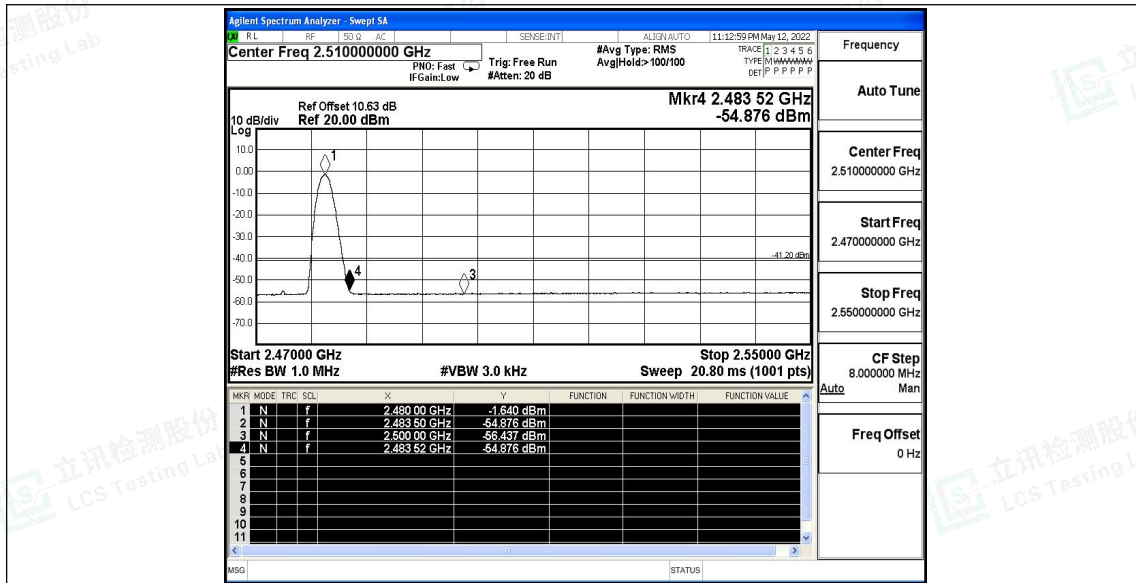
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.





Test Graphs





BLE_1M_Ant1_High_2480_Peak

