



Appendix A

RF Test Data for BT LE (Conducted Measurement)

Product Name: IP Access Control Device

Test Model: A1121 Rev. 1.0

Environmental Conditions

Temperature:	23.8 ° C
Relative Humidity:	52.0%
ATM Pressure:	100.0 kPa
Test Engineer:	Ling Zhu Ling Zhu
Supervised by:	Li Huan Li Huan





A.1 DTS Bandwidth

Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant	2402	0.680	2401.660	2402.340	0.5	PASS
		2440	0.680	2439.660	2440.340	0.5	PASS
		2480	0.676	2479.660	2480.336	0.5	PASS

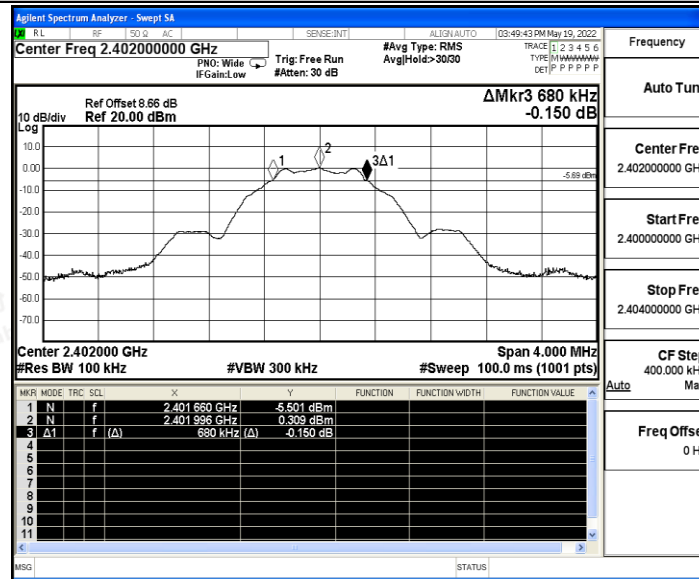
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_2M	Ant	2402	1.136	2401.404	2402.540	0.5	PASS
		2440	1.136	2439.404	2440.540	0.5	PASS
		2480	1.132	2479.404	2480.536	0.5	PASS



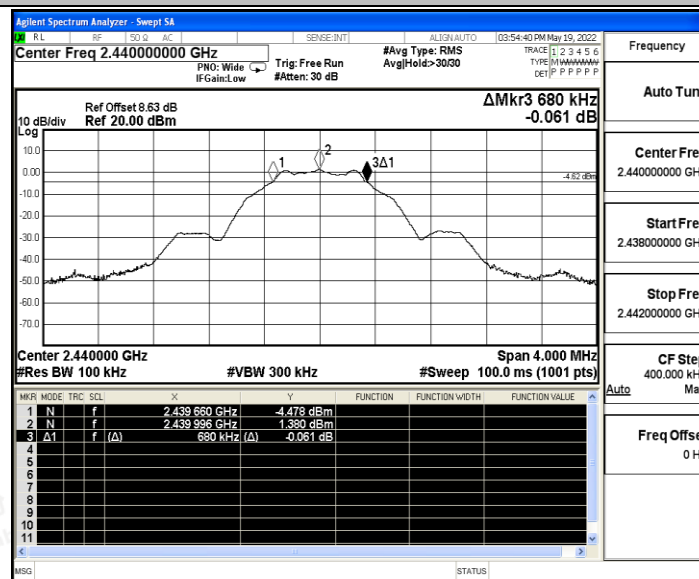


Test Graphs

BLE_1M_Ant_2402

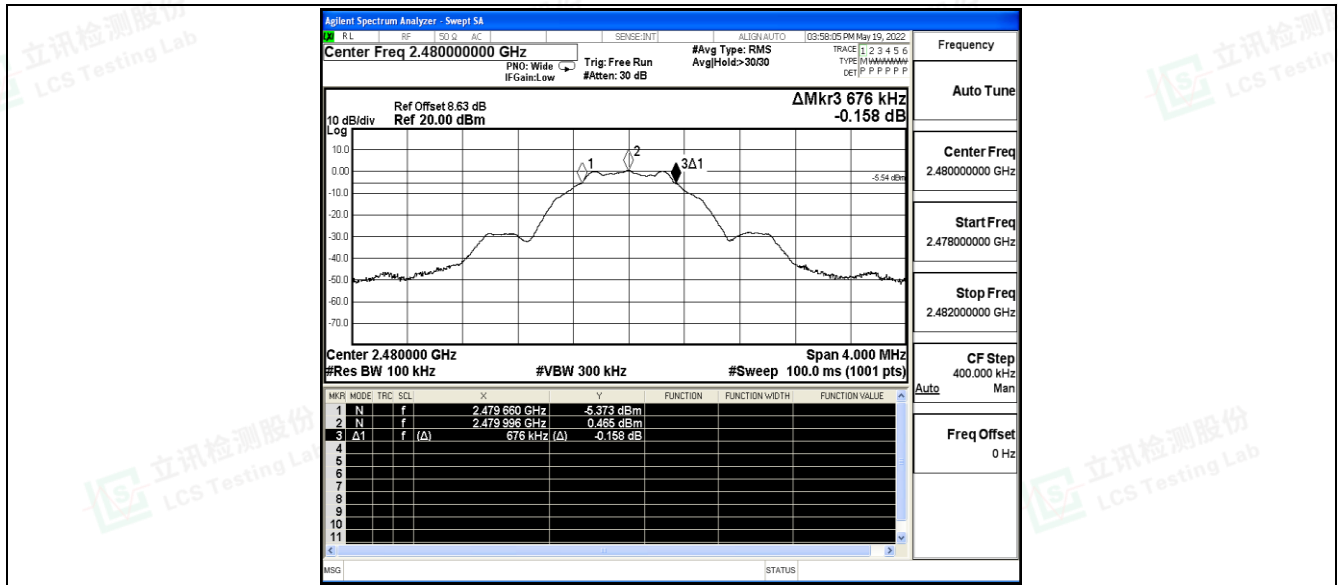


BLE_1M_Ant_2440

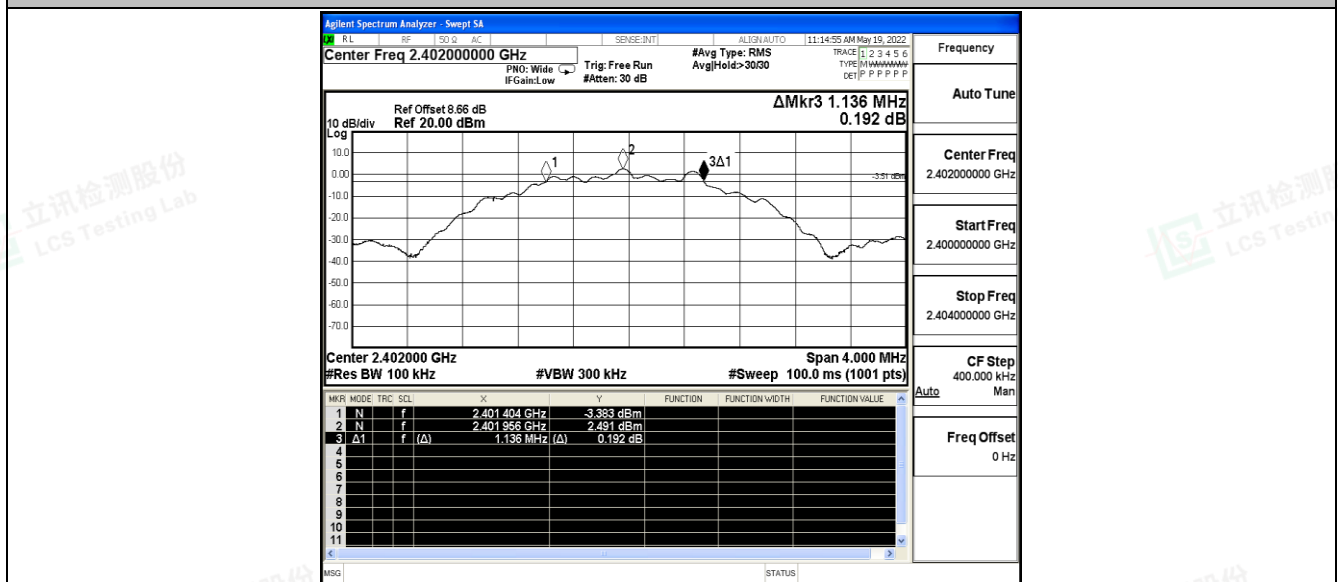


BLE_1M_Ant_2480



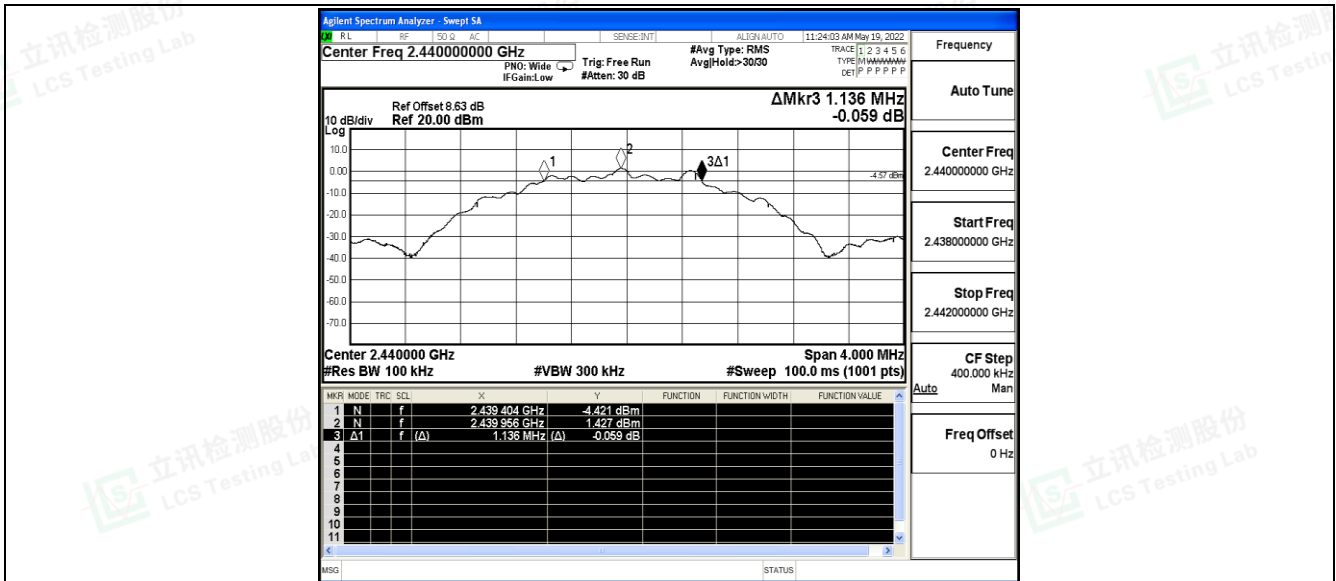


BLE_2M_Ant_2402

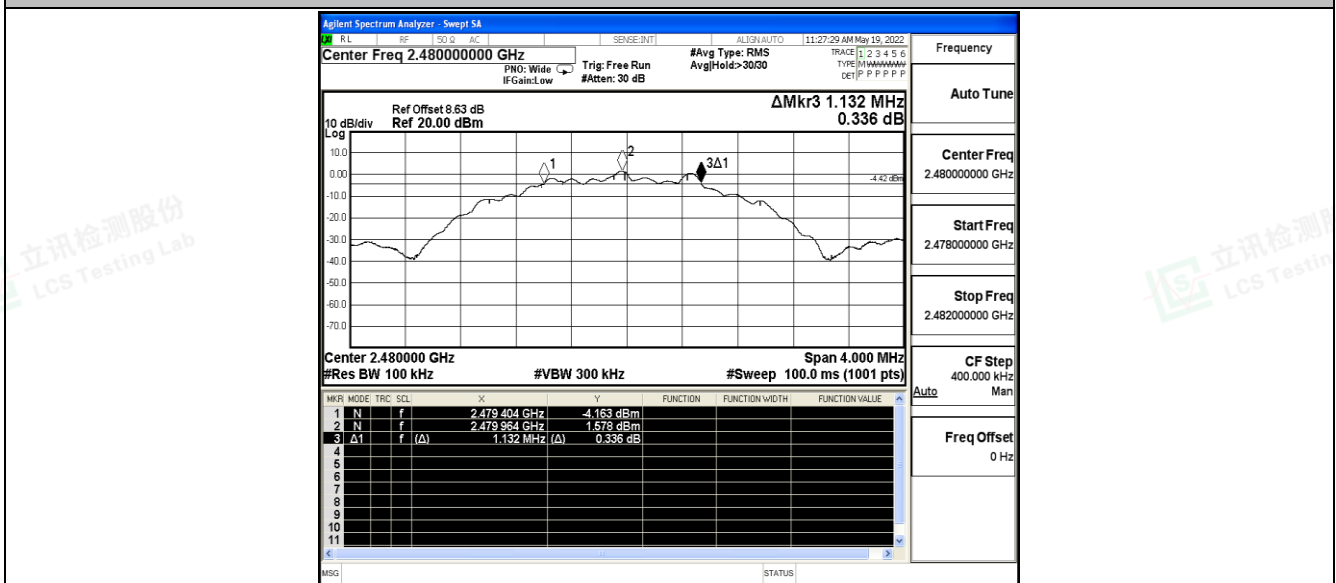


BLE_2M_Ant_2440





BLE_2M_Ant_2480





A.2 Maximum peak conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant	2402	0.88	≤30	PASS
		2440	1.96	≤30	PASS
		2480	1.03	≤30	PASS

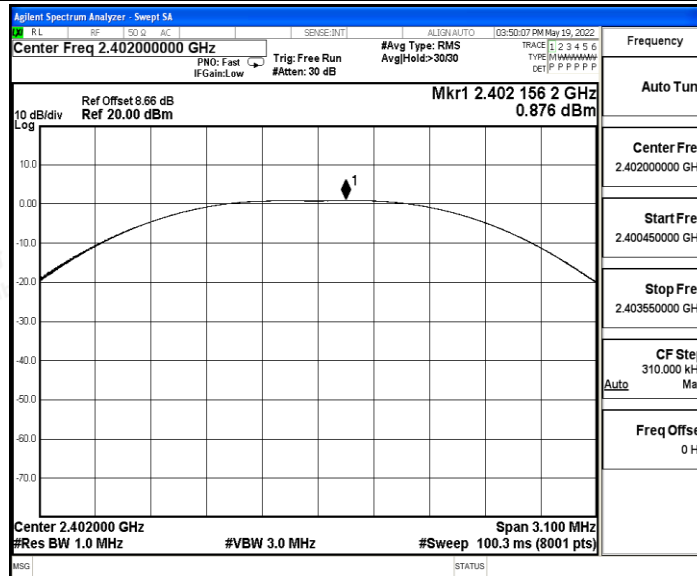
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant	2402	1.51	≤30	PASS
		2440	1.58	≤30	PASS
		2480	1.73	≤30	PASS



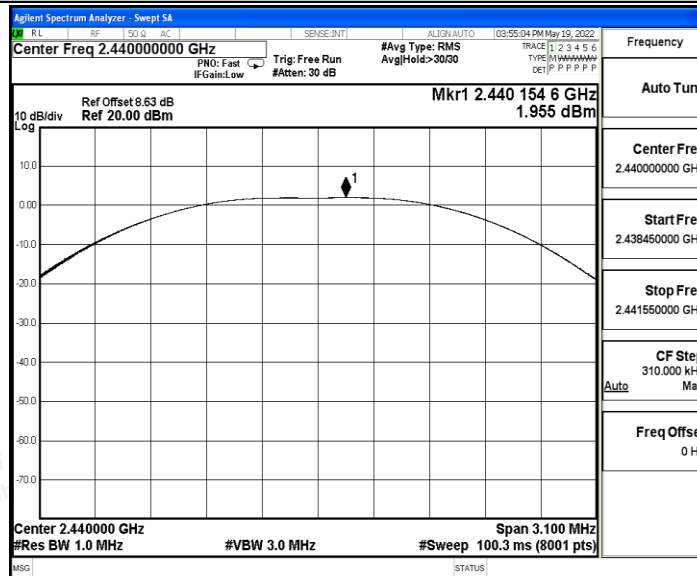


Test Graphs

BLE_1M_Ant_2402

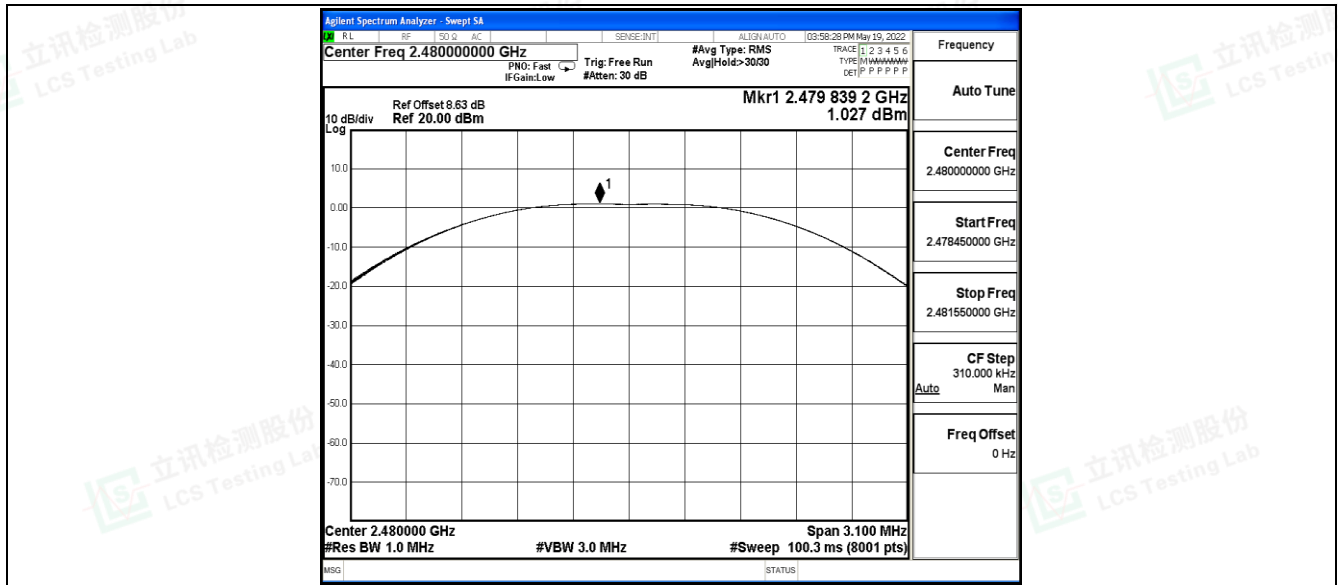


BLE_1M_Ant_2440

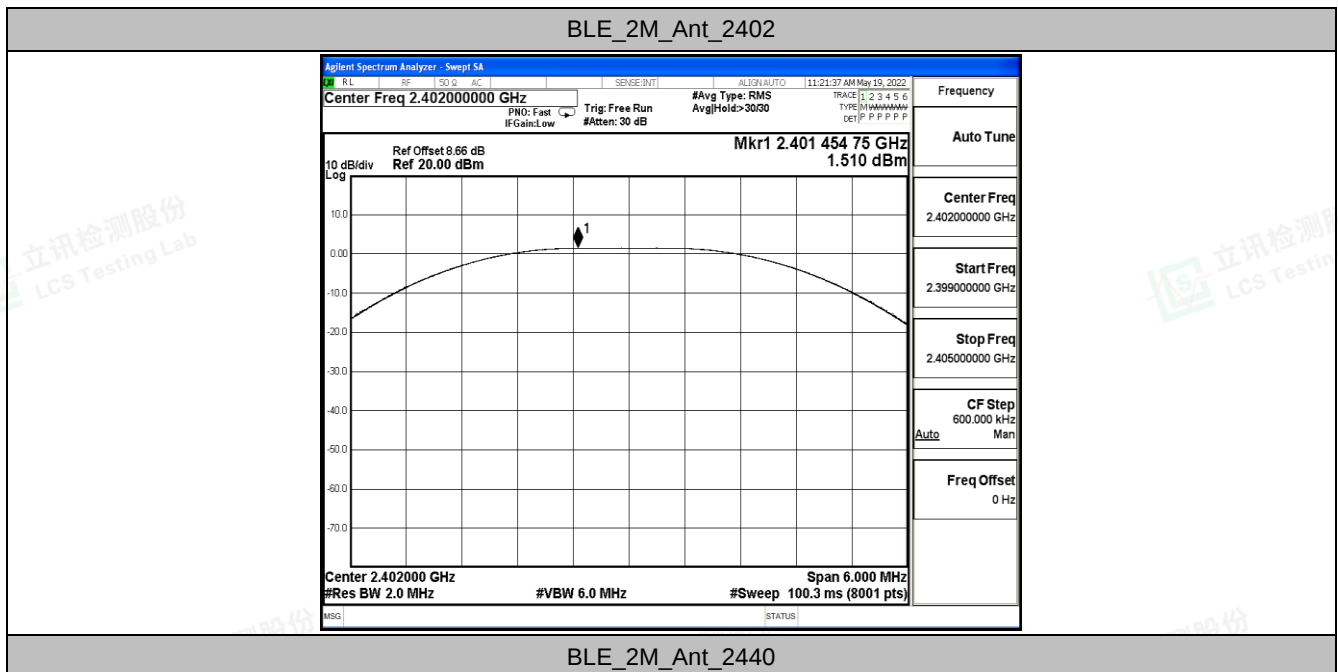


BLE_1M_Ant_2480



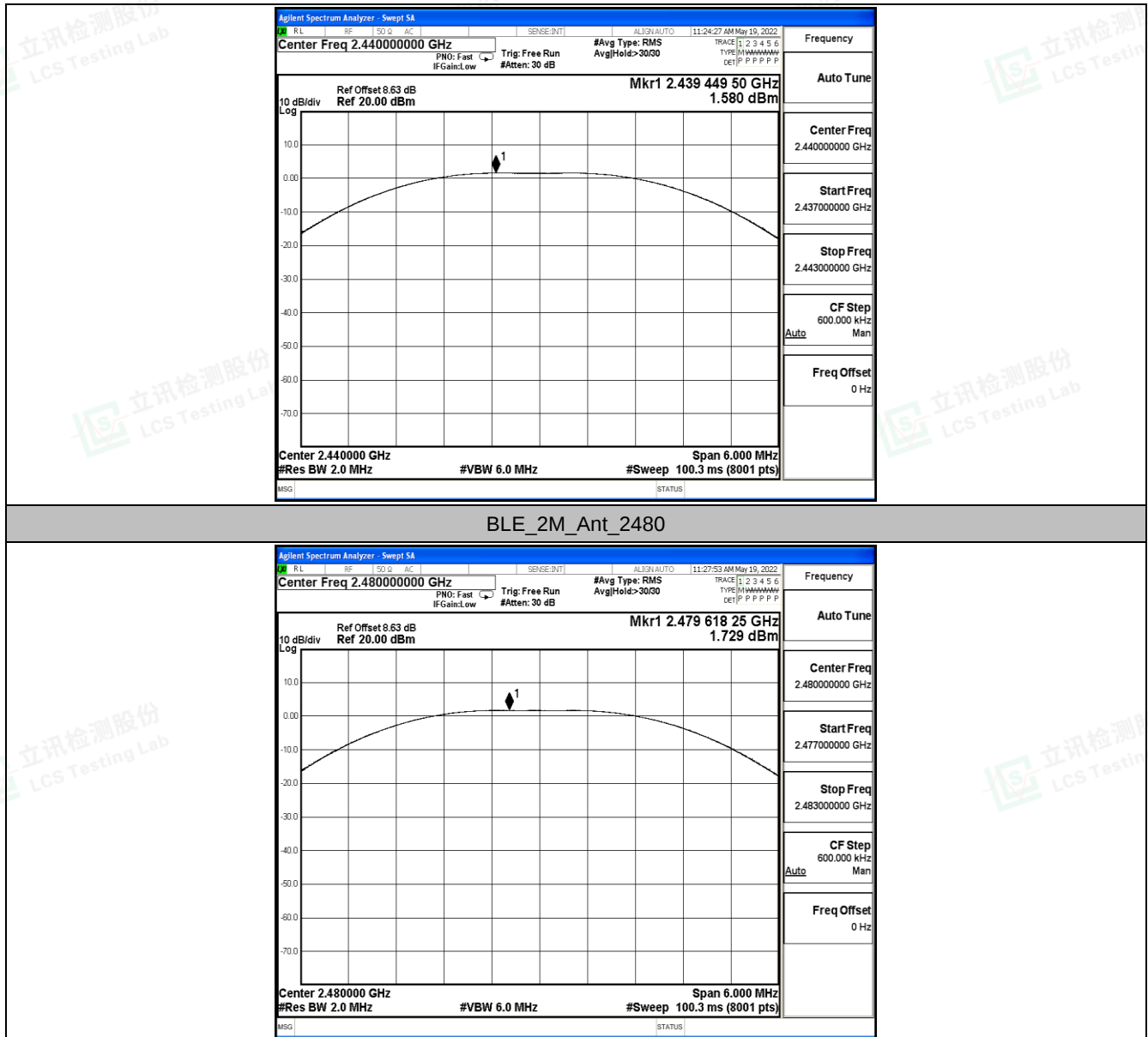


BLE_2M_Ant_2402



BLE_2M_Ant_2440







A.3 Maximum power spectral density

Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant	2402	-13.94	≤8.00	PASS
		2440	-12.88	≤8.00	PASS
		2480	-13.75	≤8.00	PASS

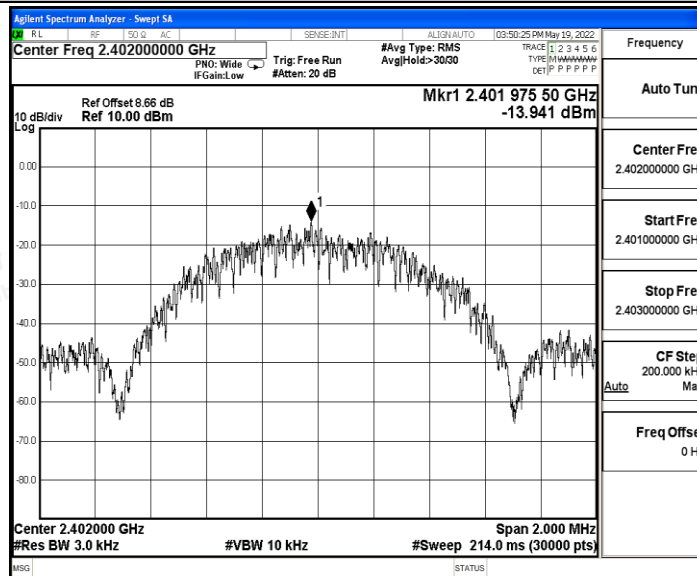
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_2M	Ant	2402	-15.72	≤8.00	PASS
		2440	-15.43	≤8.00	PASS
		2480	-15.37	≤8.00	PASS



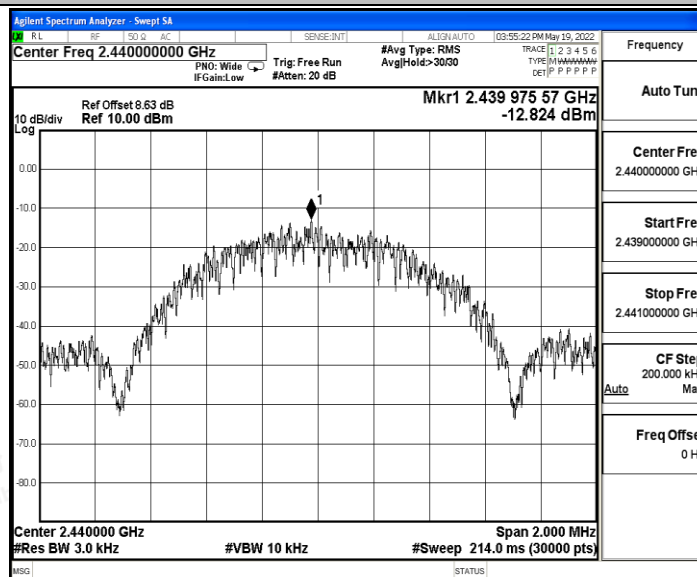


Test Graphs

BLE_1M_Ant_2402

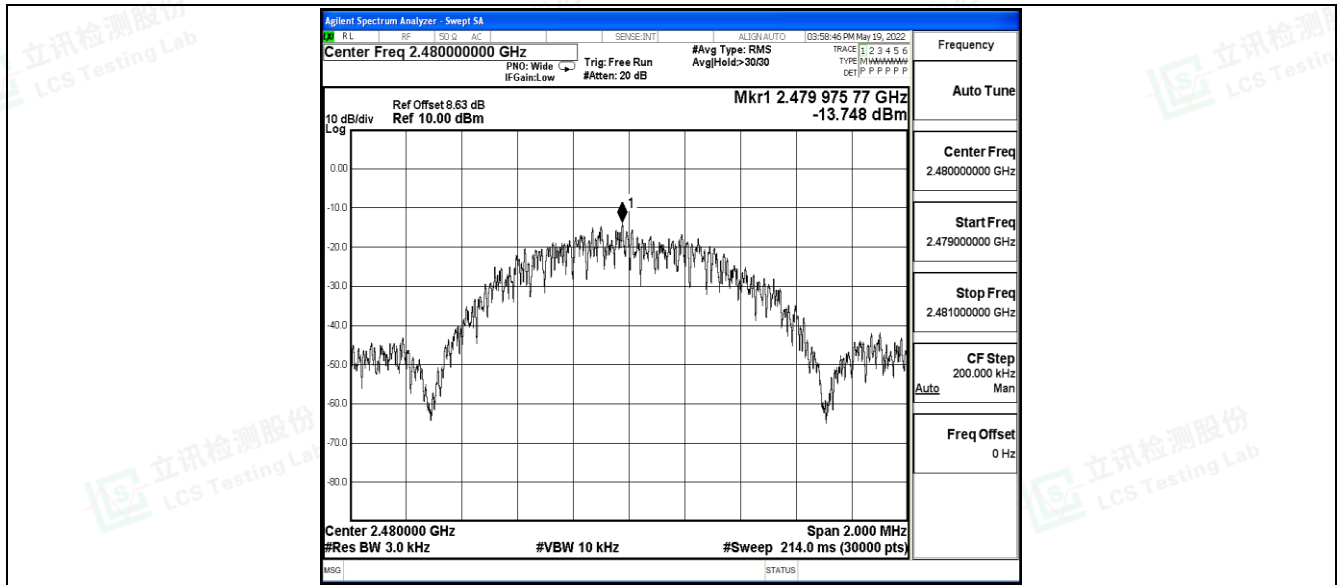


BLE_1M_Ant_2440

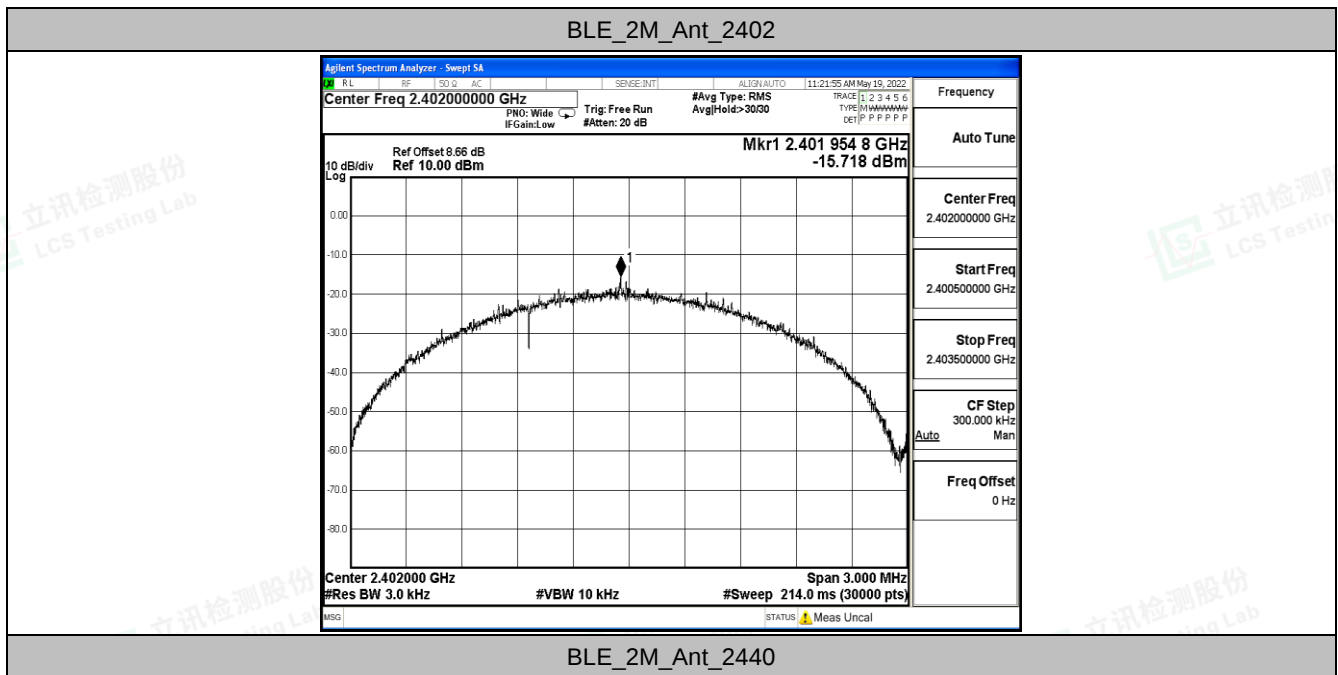


BLE_1M_Ant_2480



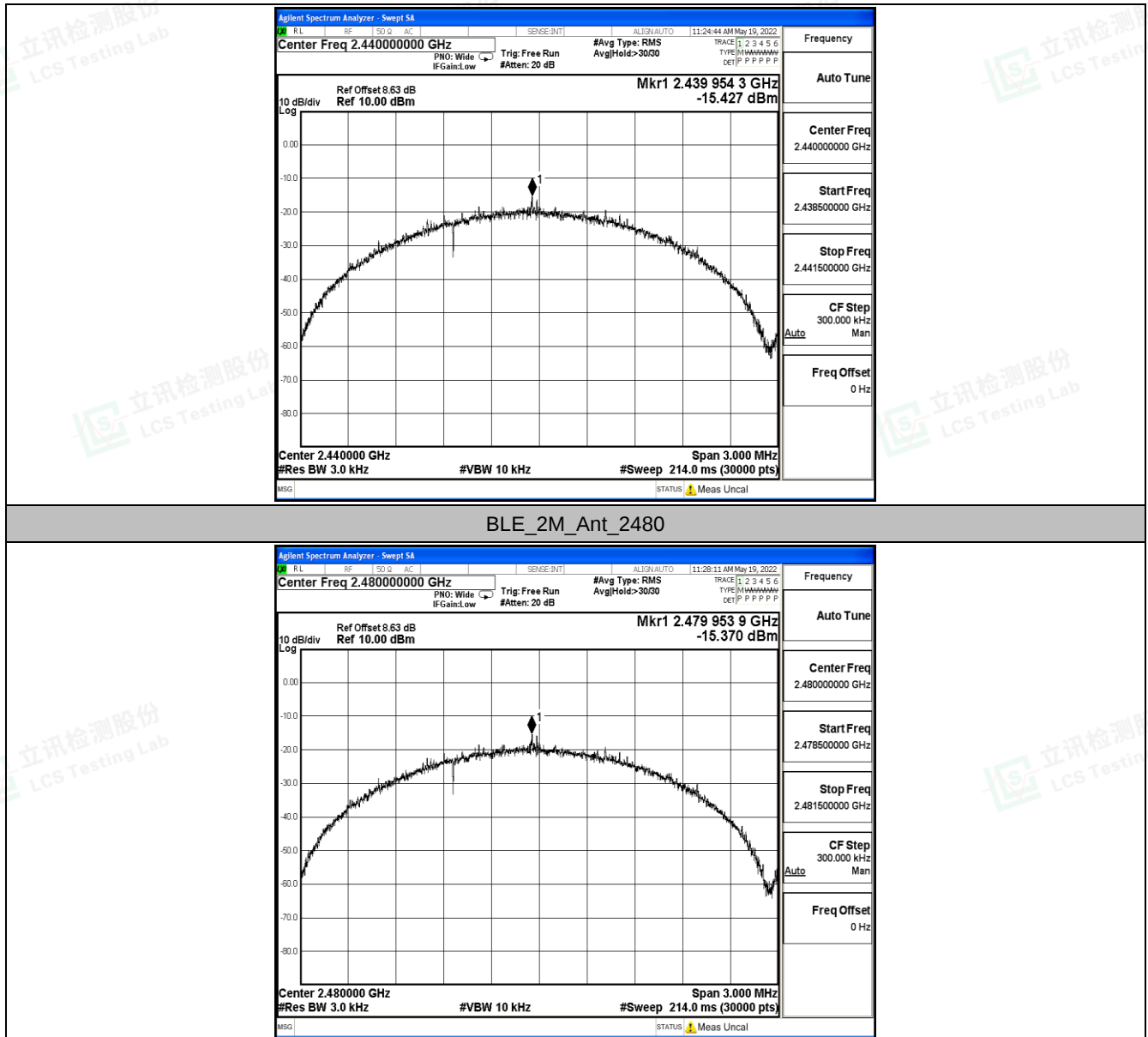


BLE_2M_Ant_2402



BLE_2M_Ant_2440







A.4 Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant	Low	2402	0.40	-48.52	≤-19.6	PASS
		High	2480	0.51	-47.61	≤-19.49	PASS

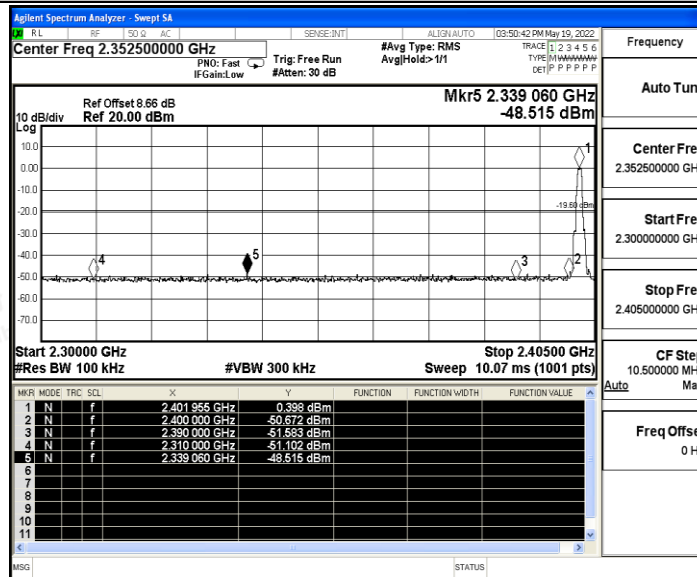
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant	Low	2402	0.52	-30.28	≤-19.48	PASS
		High	2480	1.58	-52.57	≤-18.42	PASS



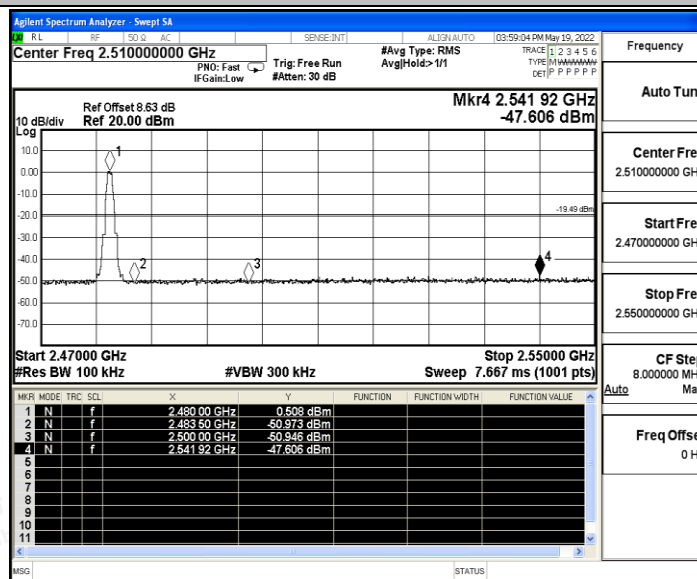


Test Graphs

BLE_1M_Ant_Low_2402

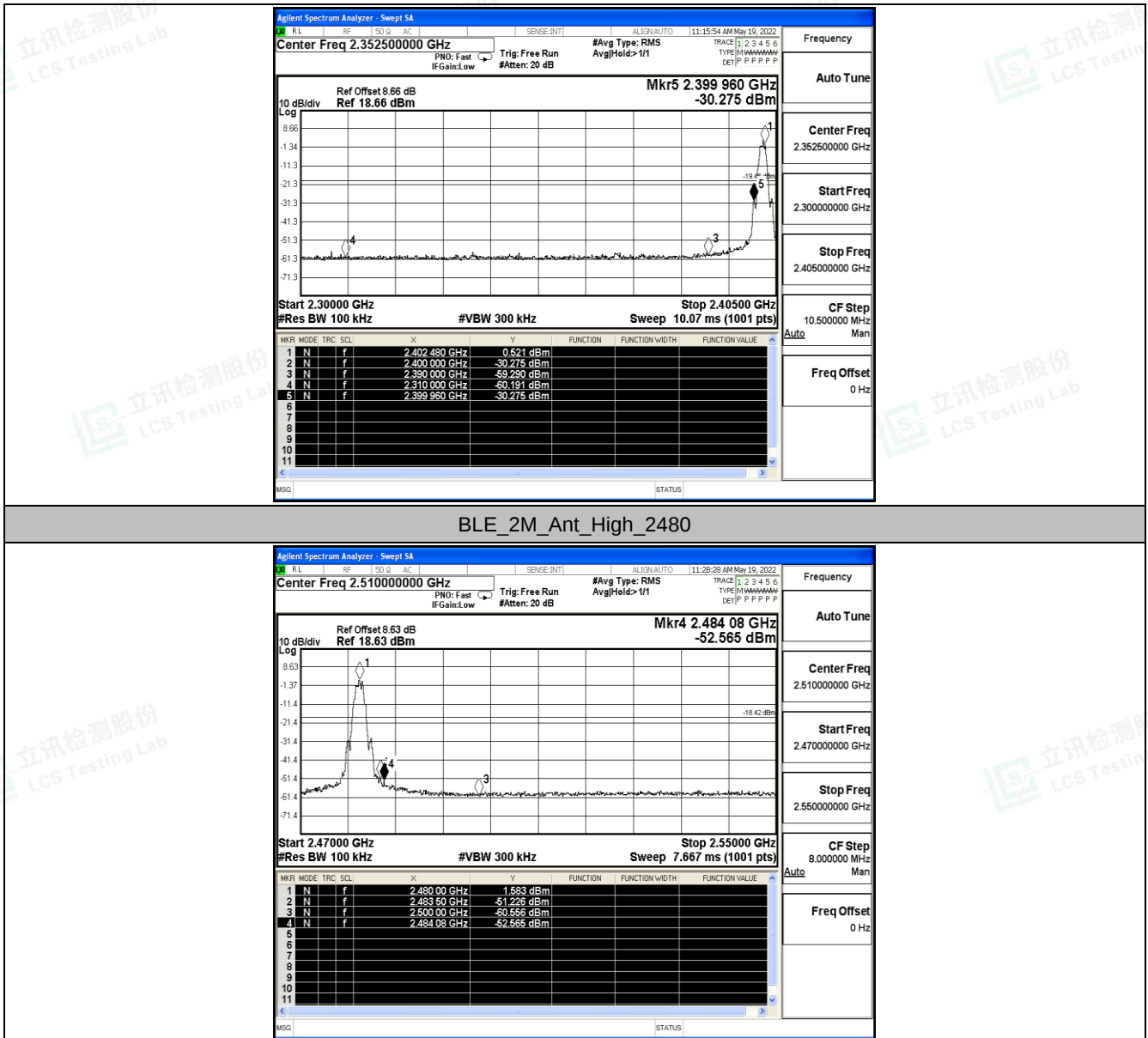


BLE_1M_Ant_High_2480



BLE_2M_Ant_Low_2402







A.5 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant	2402	Reference	0.35	0.35	---	PASS
			30~1000	0.35	-59.94	≤-19.65	PASS
			1000~26500	0.35	-45.95	≤-19.65	PASS
		2440	Reference	1.40	1.40	---	PASS
			30~1000	1.40	-60.6	≤-18.6	PASS
			1000~26500	1.40	-45.57	≤-18.6	PASS
		2480	Reference	0.46	0.46	---	PASS
			30~1000	0.46	-59.55	≤-19.54	PASS
			1000~26500	0.46	-45.86	≤-19.54	PASS

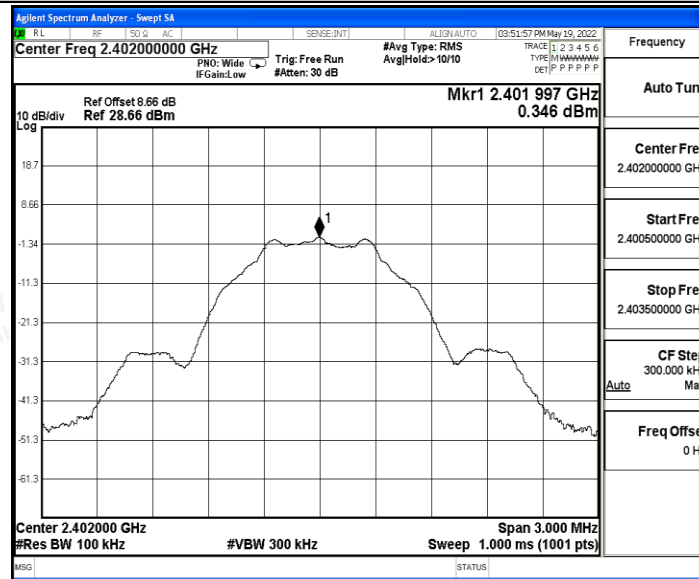
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant	2402	Reference	2.52	2.52	---	PASS
			30~1000	2.52	-60.34	≤-17.48	PASS
			1000~26500	2.52	-45.54	≤-17.48	PASS
		2440	Reference	1.48	1.48	---	PASS
			30~1000	1.48	-60.24	≤-18.52	PASS
			1000~26500	1.48	-45.68	≤-18.52	PASS
		2480	Reference	1.22	1.22	---	PASS
			30~1000	1.22	-60.4	≤-18.78	PASS
			1000~26500	1.22	-45.94	≤-18.78	PASS



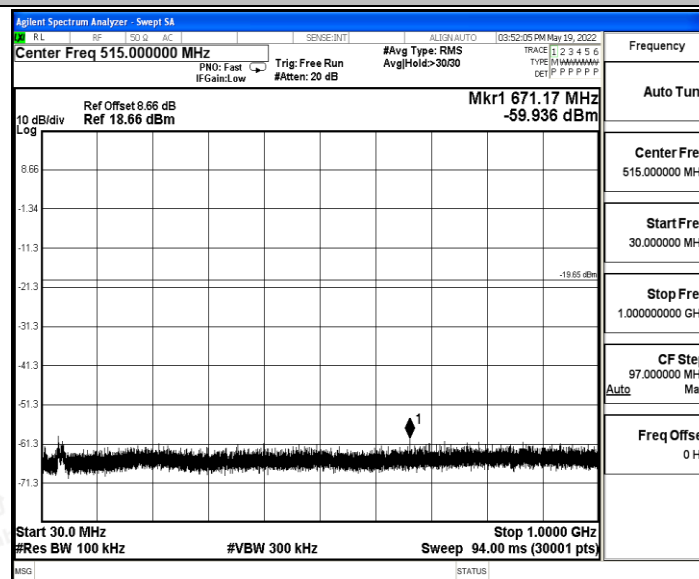


Test Graphs

BLE_1M_Ant_2402_0~Reference

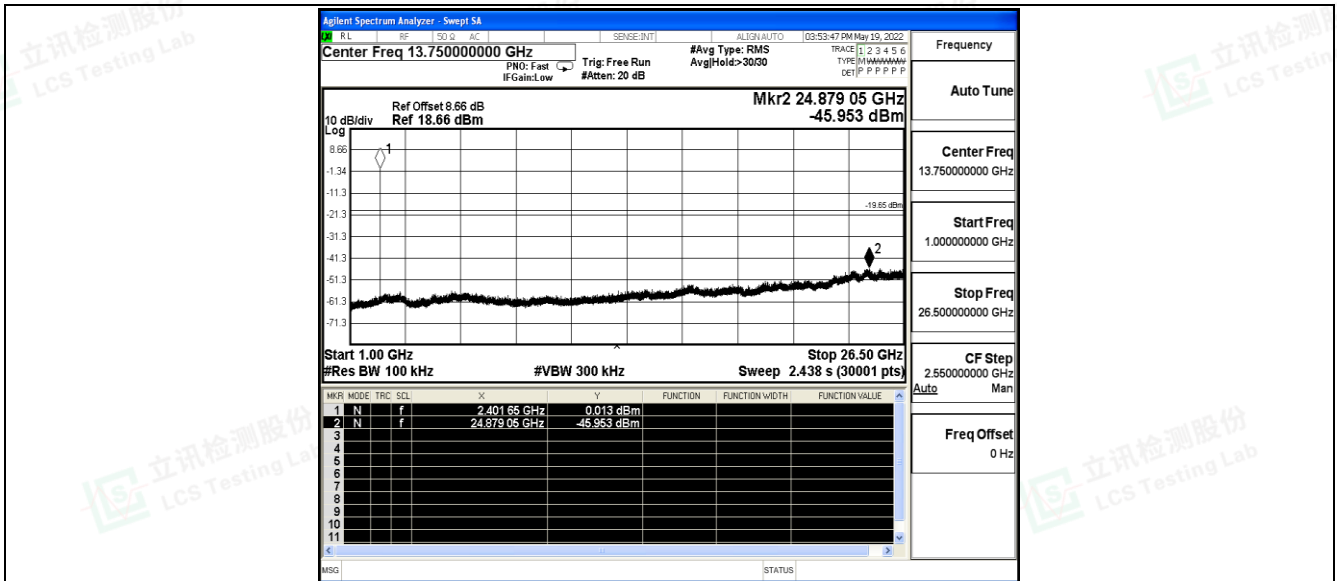


BLE_1M_Ant_2402_30~1000

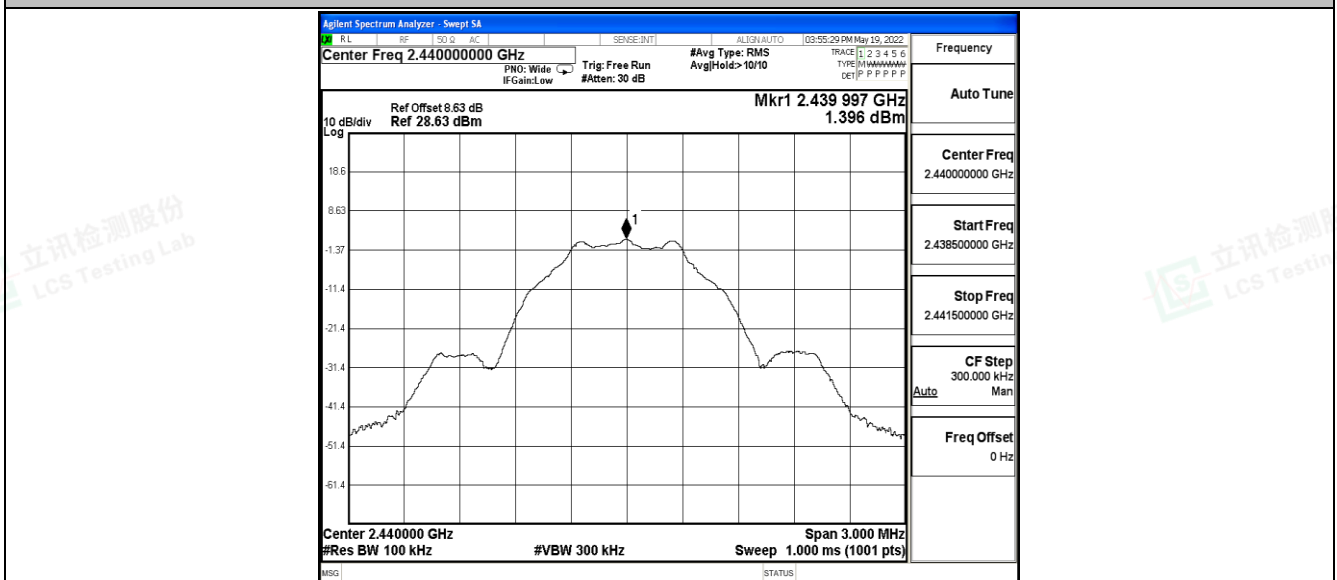


BLE_1M_Ant_2402_1000~26500



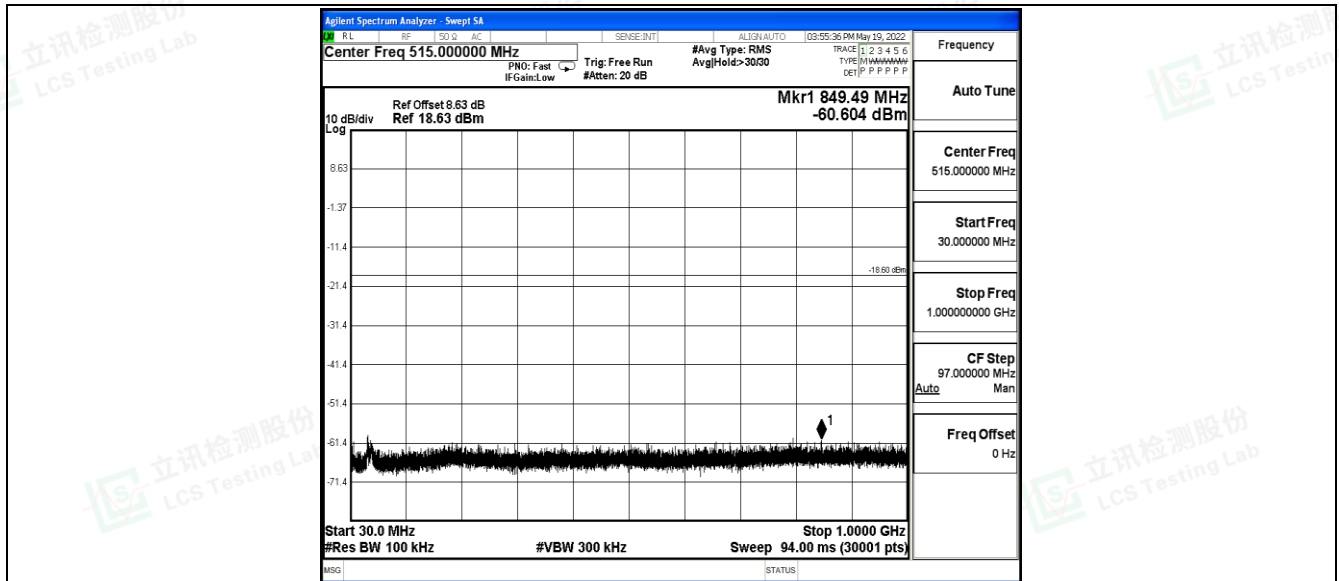


BLE_1M_Ant_2440_0-Reference

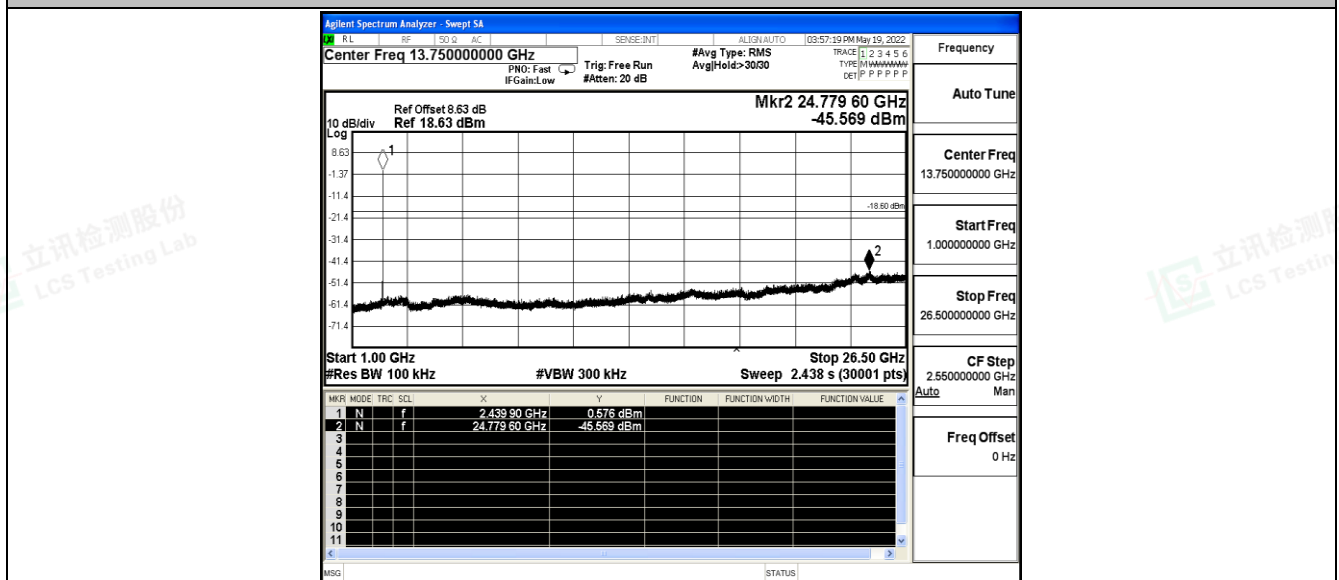


BLE_1M_Ant_2440_30~1000



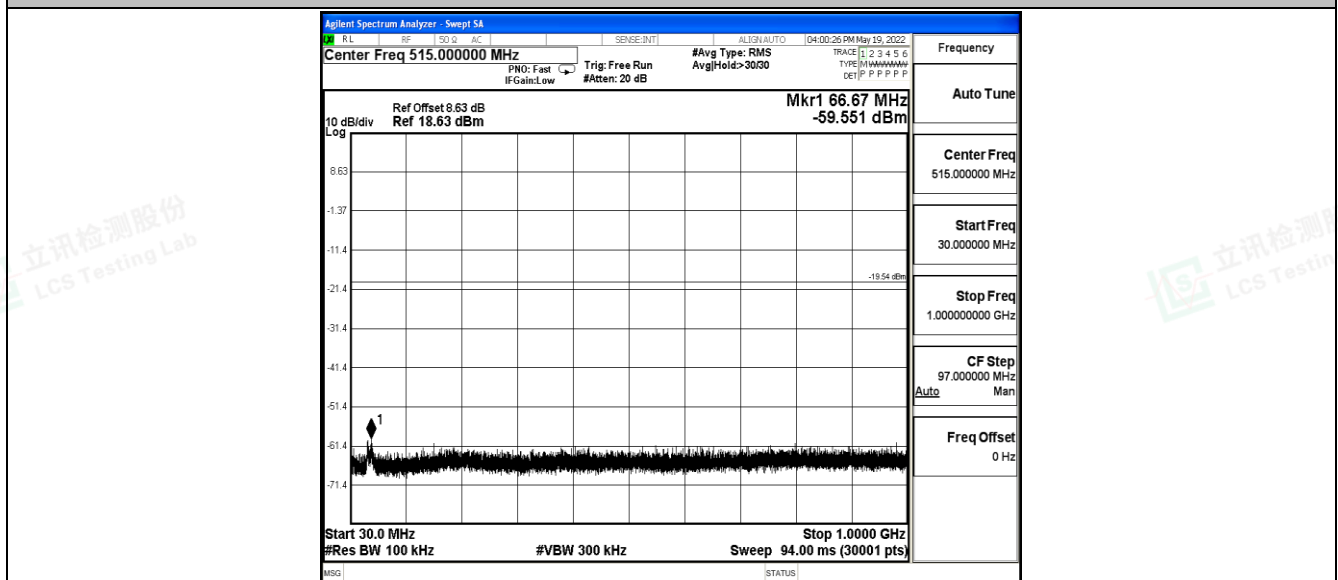
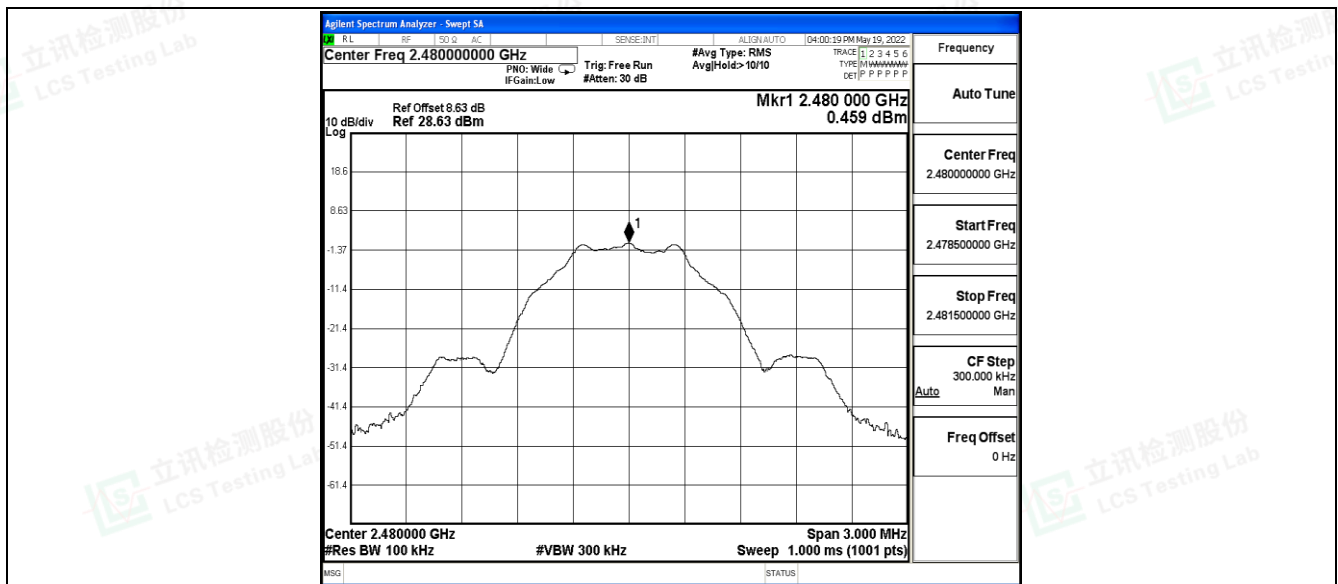


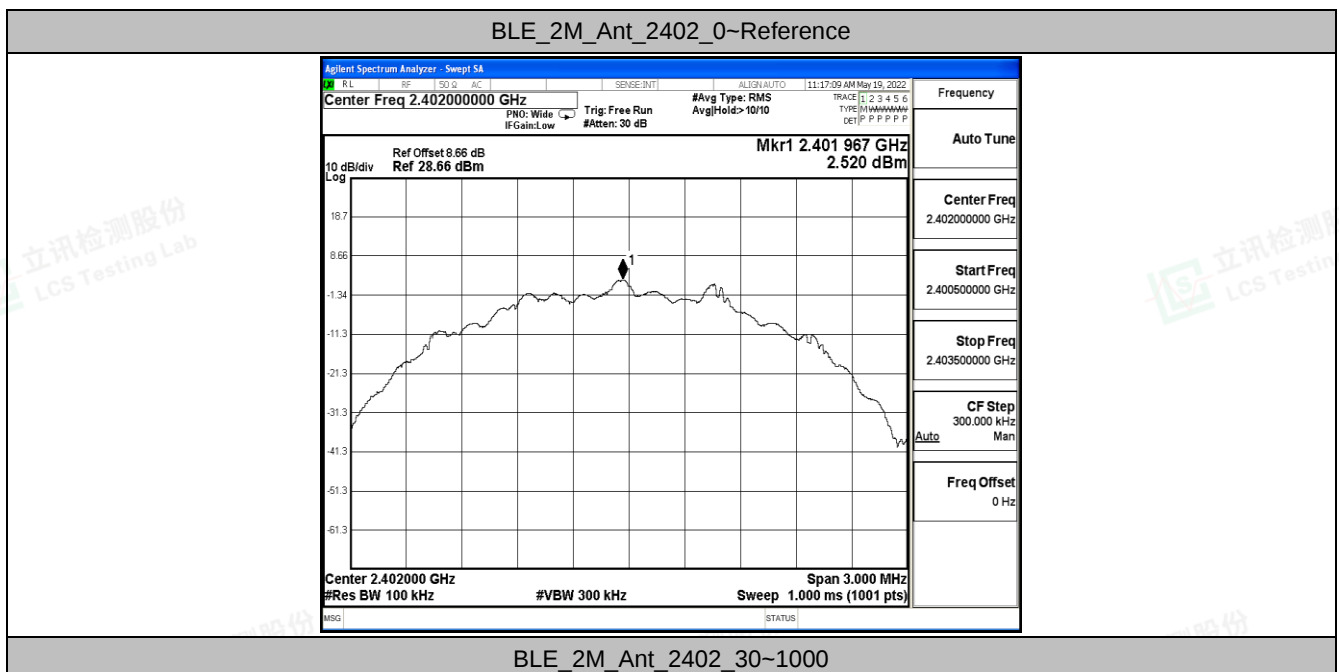
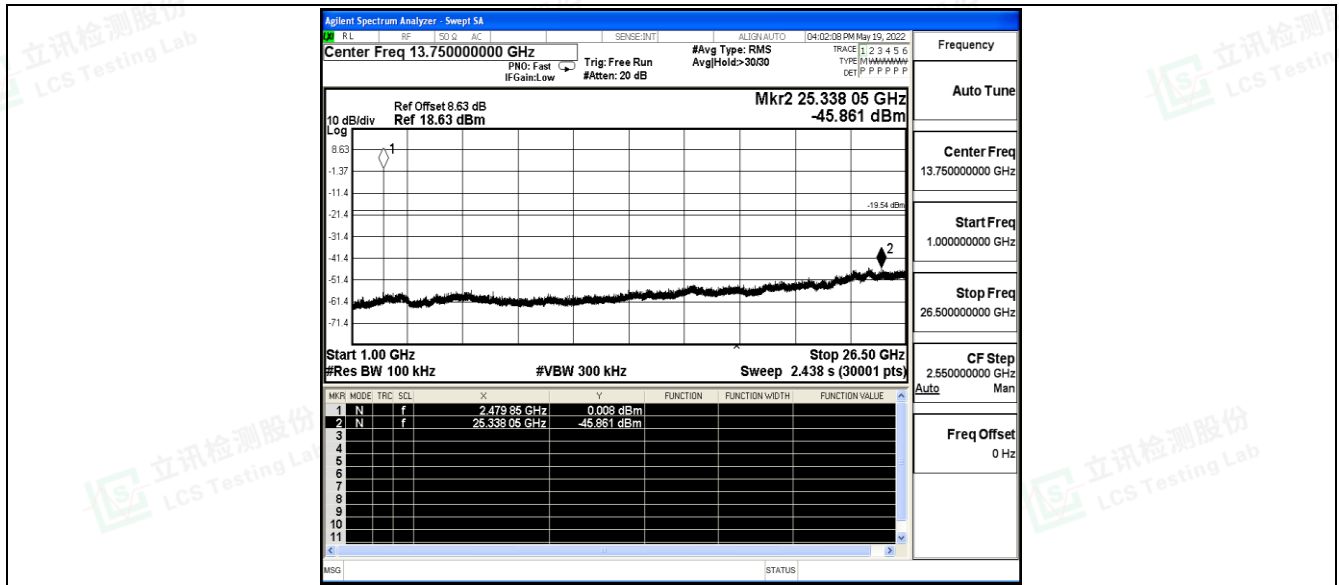
BLE_1M_Ant_2440_1000~26500

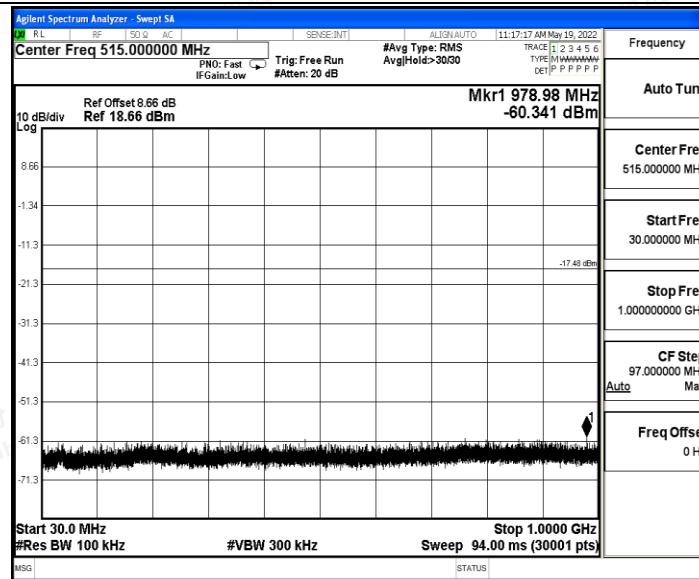


BLE_1M_Ant_2480_0-Reference

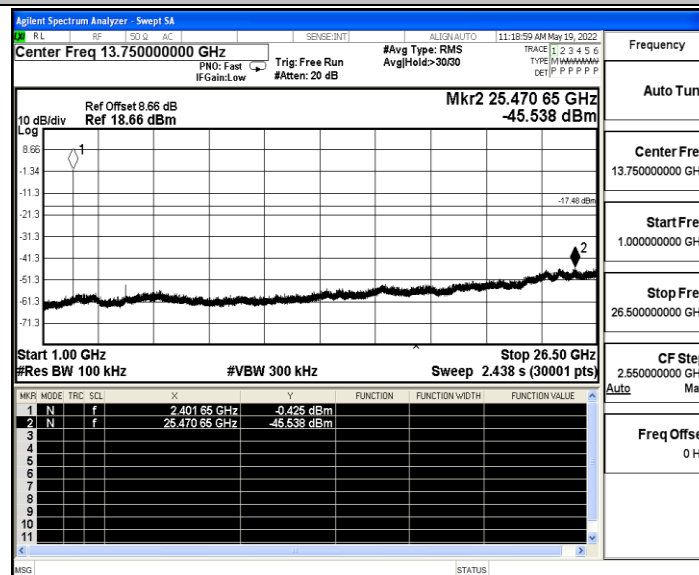






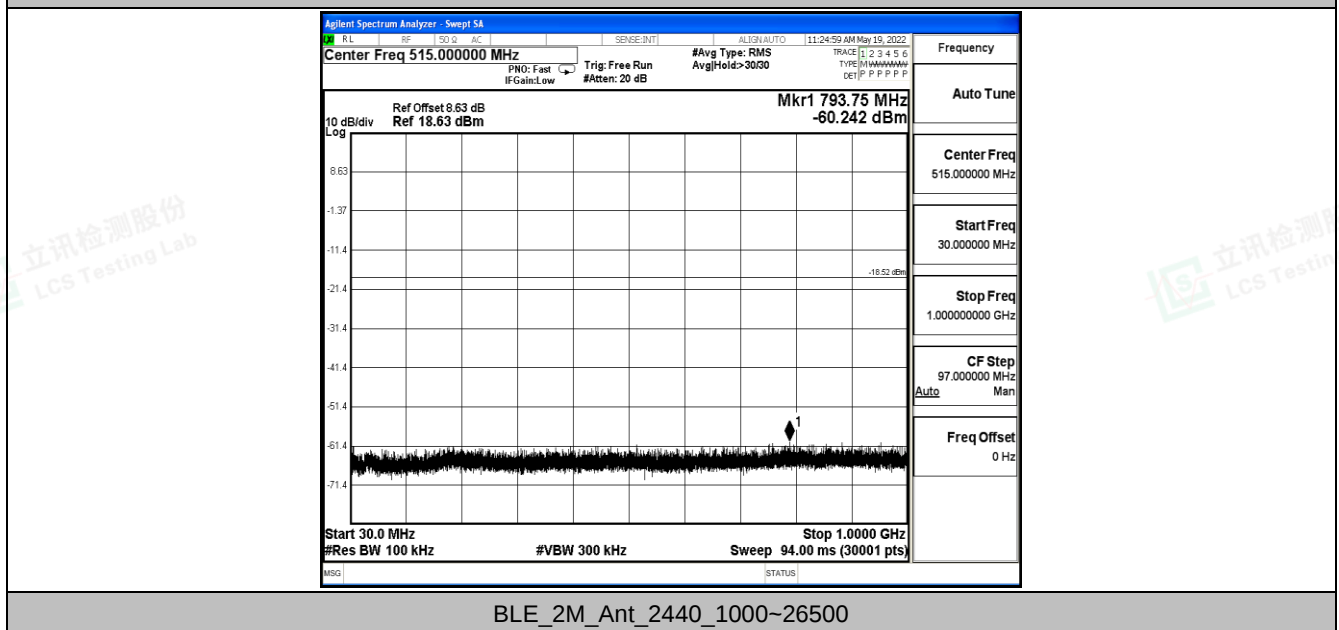
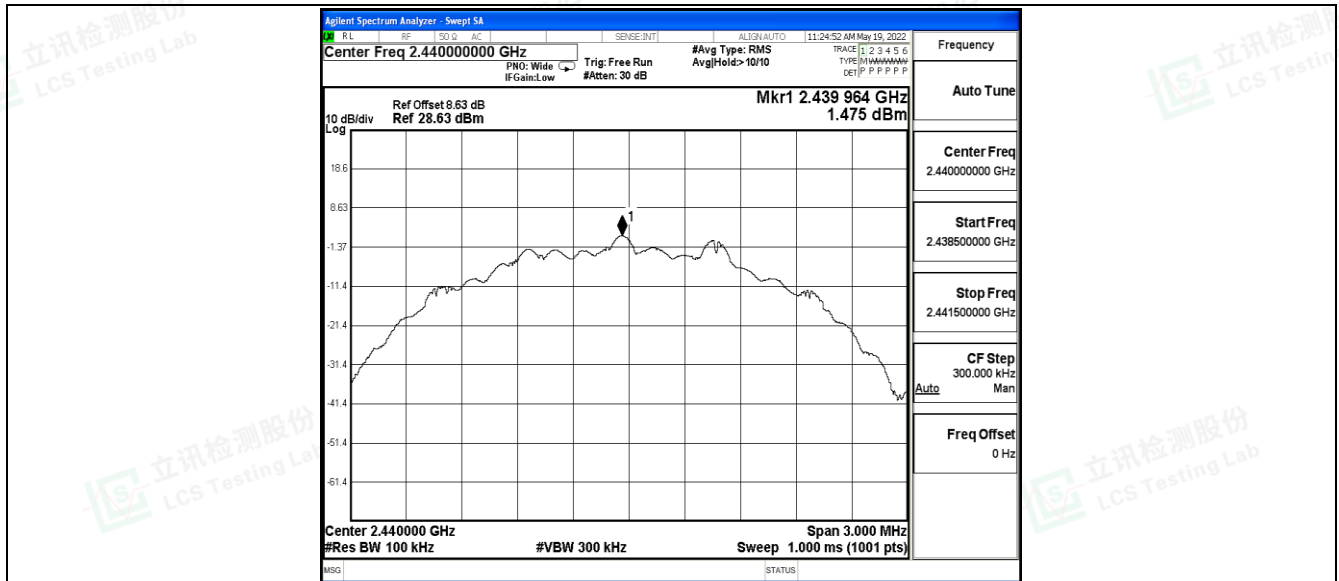


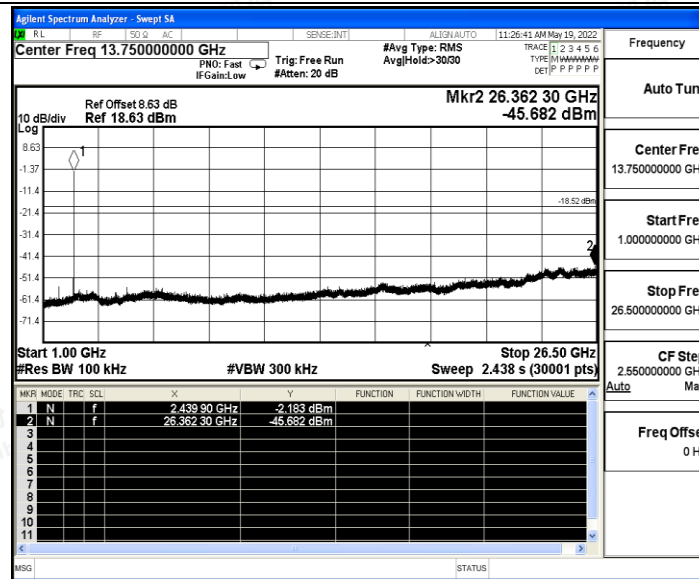
BLE_2M_Ant_2402_1000~26500



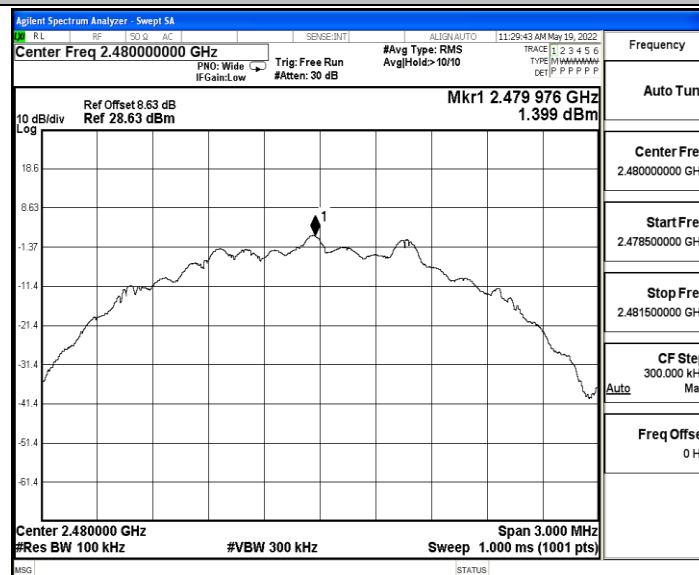
BLE_2M_Ant_2440_0-Reference





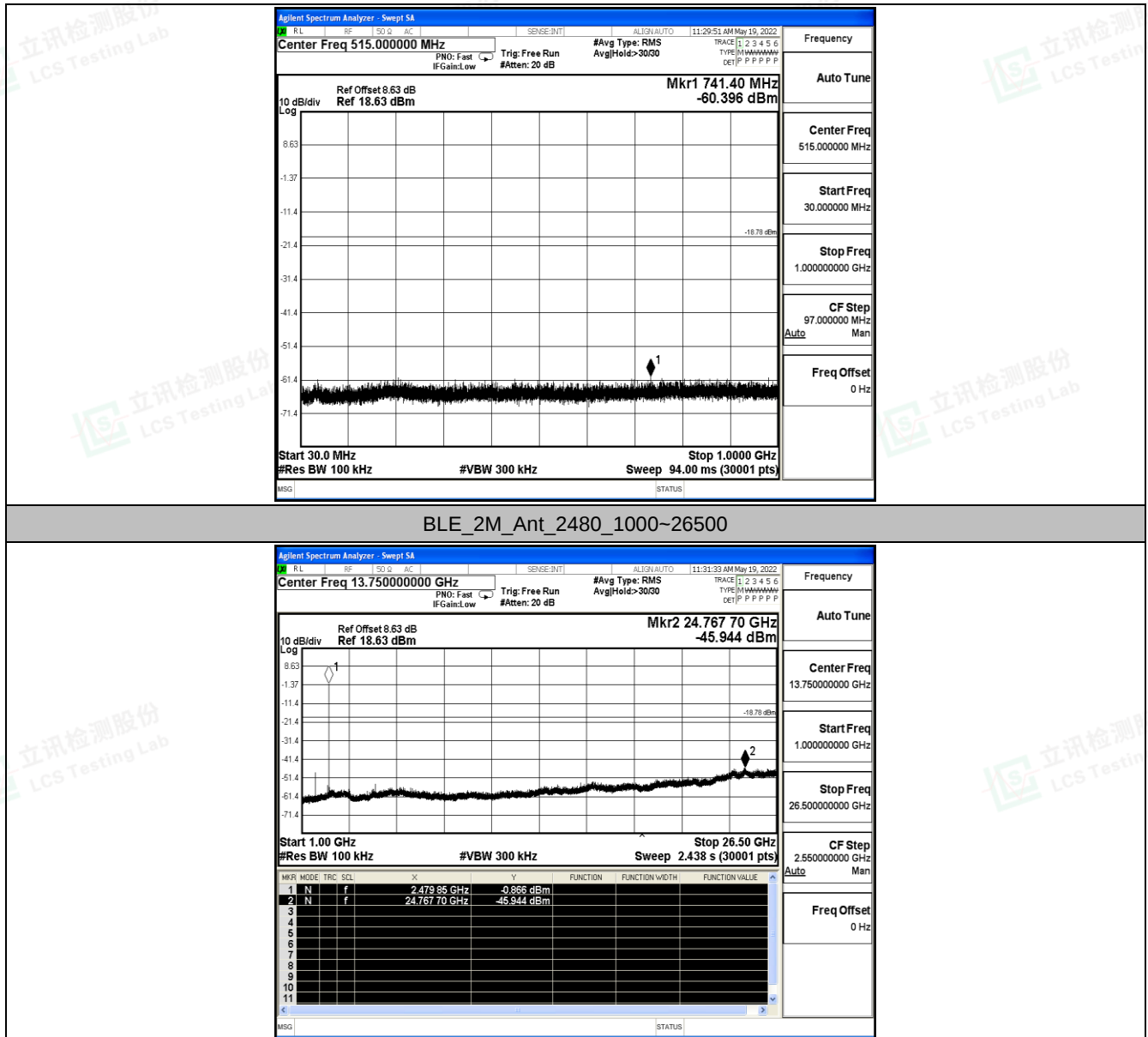


BLE_2M_Ant_2480_0-Reference



BLE_2M_Ant_2480_30~1000







A.6 Duty Cycle

Test Result

TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant	2402	0.39	0.63	0.6190	61.90	2.08	---	---
		2440	0.38	0.63	0.6032	60.32	2.20	---	---
		2480	0.38	0.63	0.6032	60.32	2.20	---	---

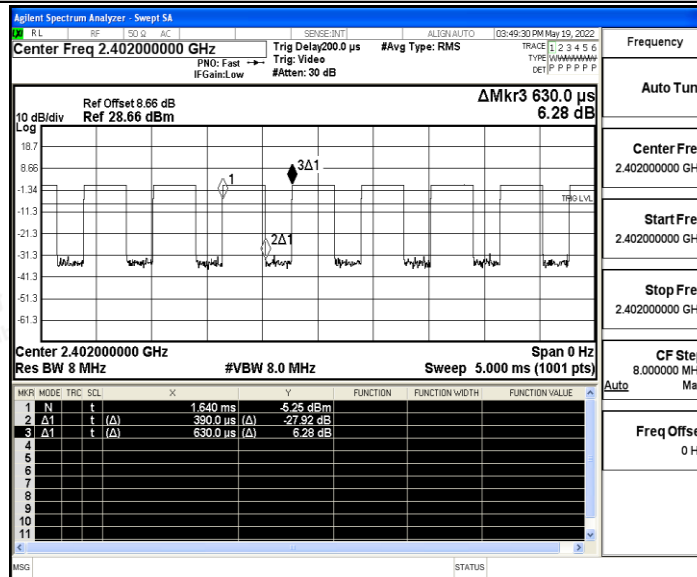
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_2M	Ant	2402	1.08	1.87	0.5775	57.75	2.38	---	---
		2440	1.08	1.88	0.5745	57.45	2.41	---	---
		2480	1.08	1.87	0.5775	57.75	2.38	---	---



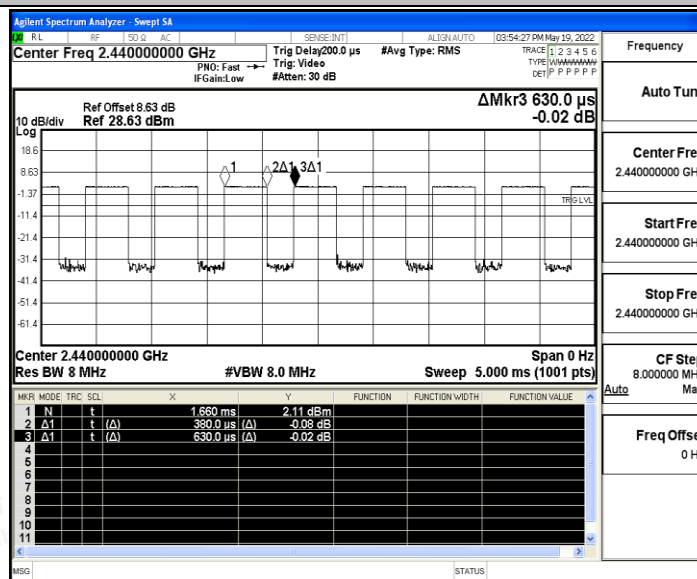


Test Graphs

BLE_1M_Ant_2402

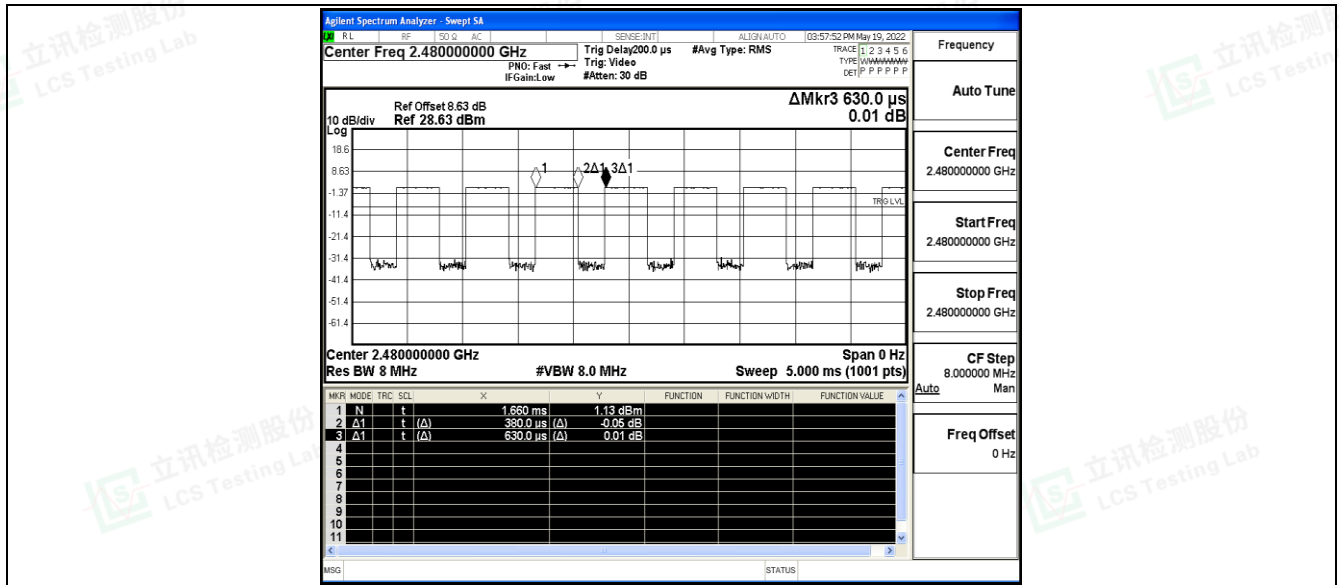


BLE_1M_Ant_2440

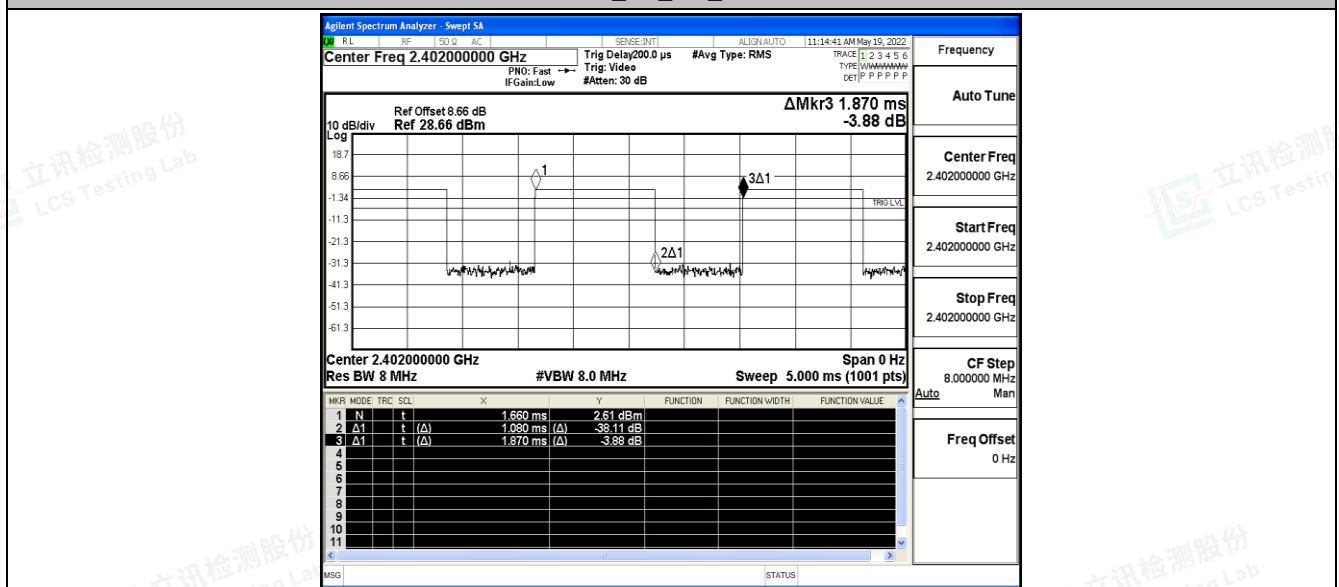


BLE_1M_Ant_2480



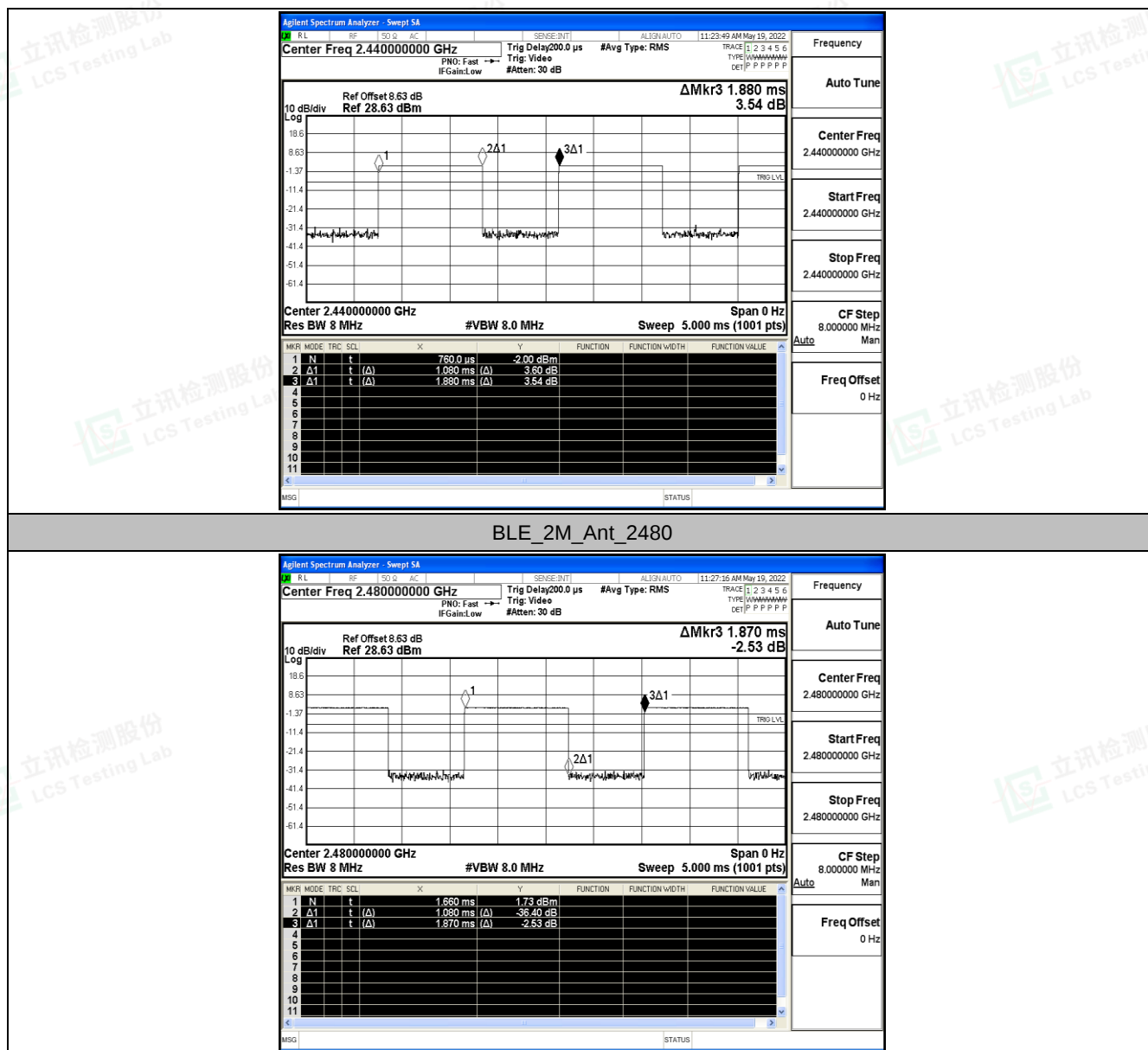


BLE_2M_Ant_2402



BLE_2M_Ant_2440







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	Ant	Low	2402	AV	2310.000	-47.47	≤-41.20	47.73	≤54	PASS
				AV	2388.935	-46.67	≤-41.20	48.53	≤54	PASS
				AV	2390.000	-47.17	≤-41.20	48.03	≤54	PASS
				Peak	2310.000	-37.83	≤-21.20	57.37	≤74	PASS
				Peak	2369.510	-36.56	≤-21.20	58.64	≤74	PASS
				Peak	2390.000	-38.64	≤-21.20	56.56	≤74	PASS
		High	2480	AV	2483.500	-46.31	≤-41.20	48.89	≤54	PASS
				AV	2498.960	-46.11	≤-41.20	49.09	≤54	PASS
				AV	2500.000	-46.34	≤-41.20	48.86	≤54	PASS
				Peak	2483.500	-38.34	≤-21.20	56.86	≤74	PASS
				Peak	2495.520	-36.08	≤-21.20	59.12	≤74	PASS
				Peak	2500.000	-37.37	≤-21.20	57.83	≤74	PASS

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Limit [dBuV/m]	Verdict
BLE_2M	Ant	Low	2402	AV	2310.000	-57.56	≤-41.20	≤54	PASS
				AV	2389.880	-55.86	≤-41.20	≤54	PASS
				AV	2390.000	-56.06	≤-41.20	≤54	PASS
				Peak	2310.000	-48.61	≤-21.20	≤74	PASS
				Peak	2387.255	-45.73	≤-21.20	≤74	PASS
				Peak	2390.000	-47.19	≤-21.20	≤74	PASS
		High	2480	AV	2483.500	-46.58	≤-41.20	≤54	PASS
				AV	2483.520	-46.58	≤-41.20	≤54	PASS
				AV	2500.000	-56.38	≤-41.20	≤54	PASS
				Peak	2483.500	-39.26	≤-21.20	≤74	PASS
				Peak	2483.680	-38.76	≤-21.20	≤74	PASS
				Peak	2500.000	-46.72	≤-21.20	≤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.

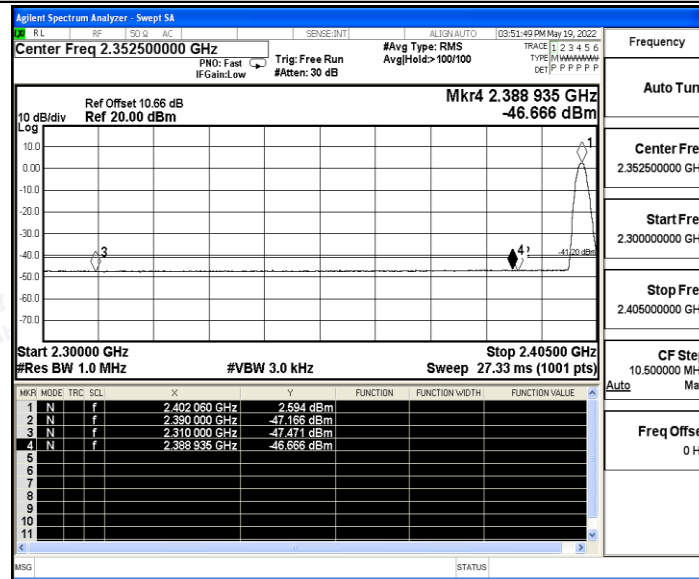


Shenzhen LCS Compliance Testing Laboratory Ltd.
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
Scan code to check authenticity

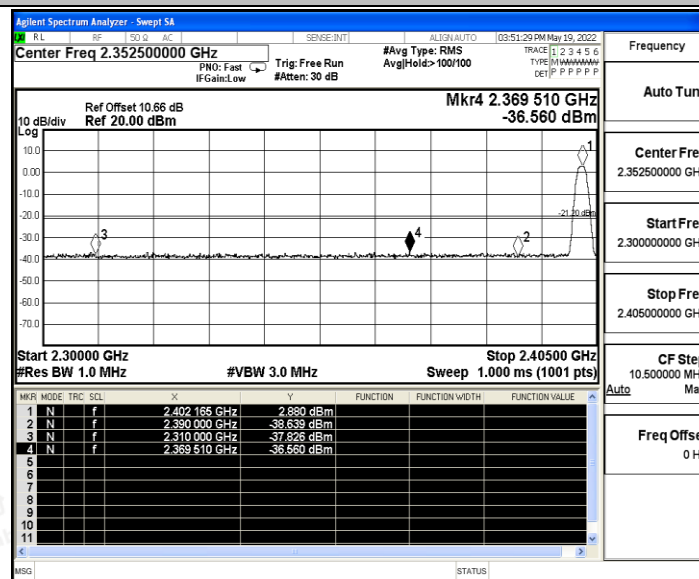


Test Graphs

BLE_1M_Ant_Low_2402_AV

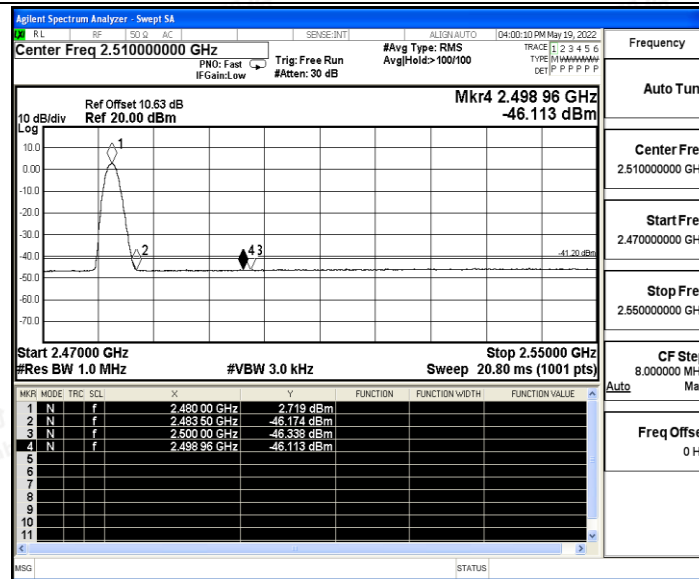


BLE_1M_Ant_Low_2402_Peak

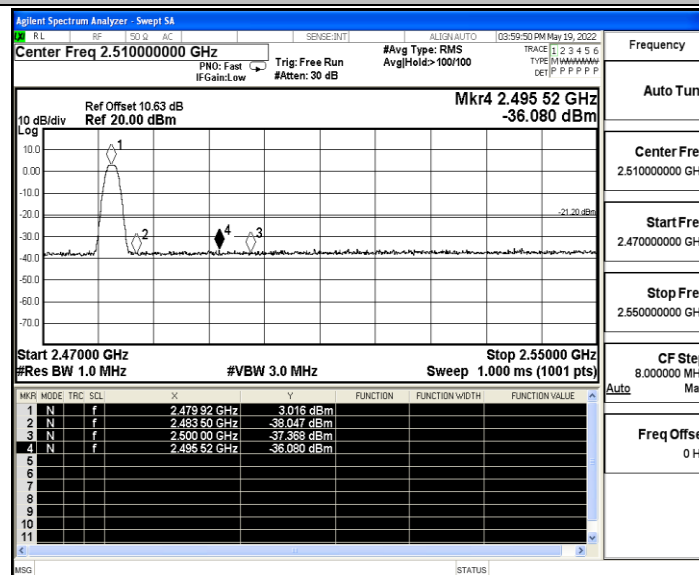


BLE_1M_Ant_High_2480_AV



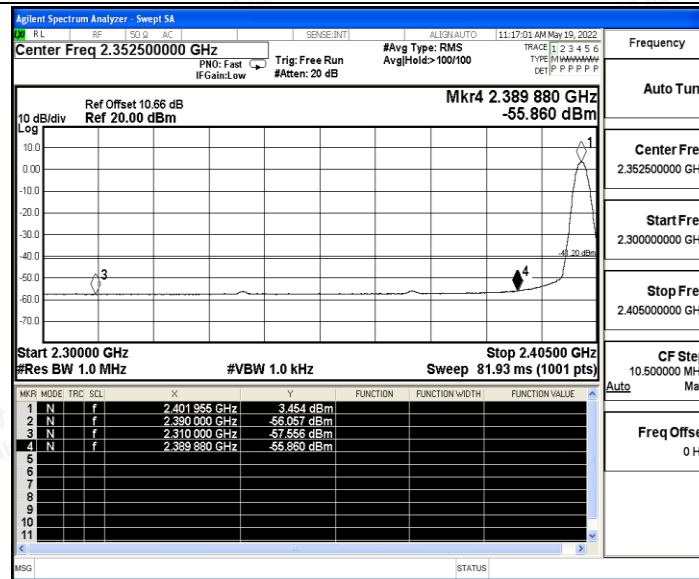


BLE_1M_Ant_High_2480_Peak

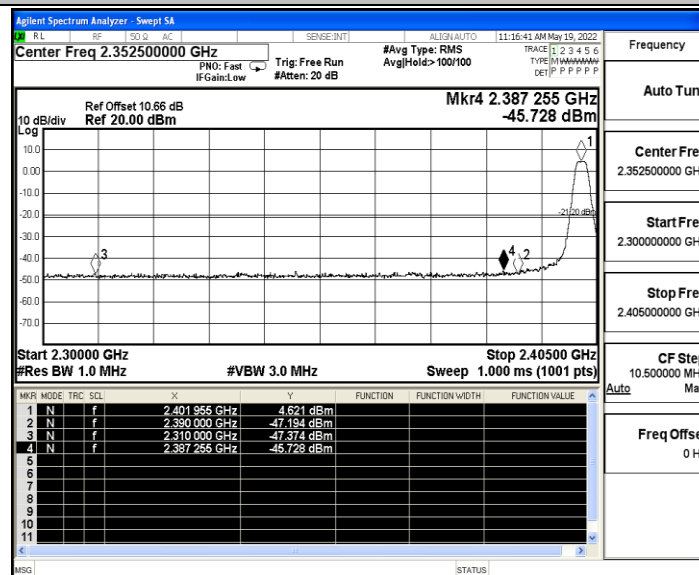


BLE_2M_Ant_Low_2402_AV



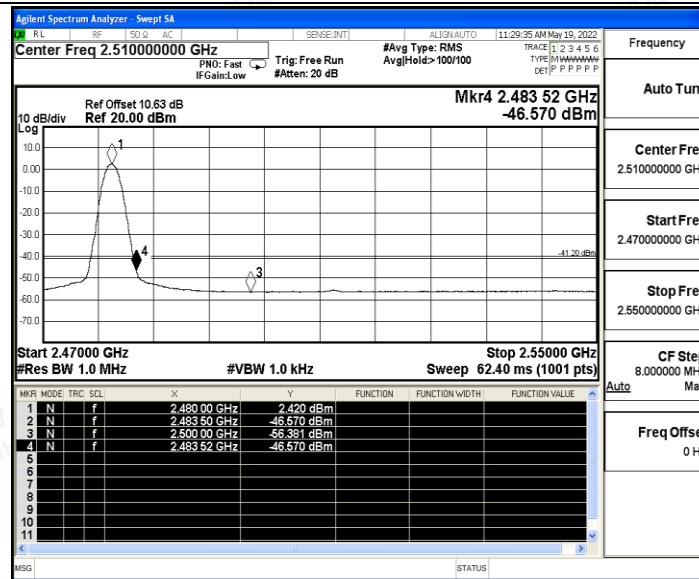


BLE_2M_Ant_Low_2402_Peak



BLE_2M_Ant_High_2480_AV





BLE_2M_Ant_High_2480_Peak

