



Appendix B

RF Test Data for BLE (Conducted Measurement)

Product Name: LED PROJECTOR

Test Model: L005A

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Nick Peng
Supervised by:	Li Huan





B.1 DTS Bandwidth

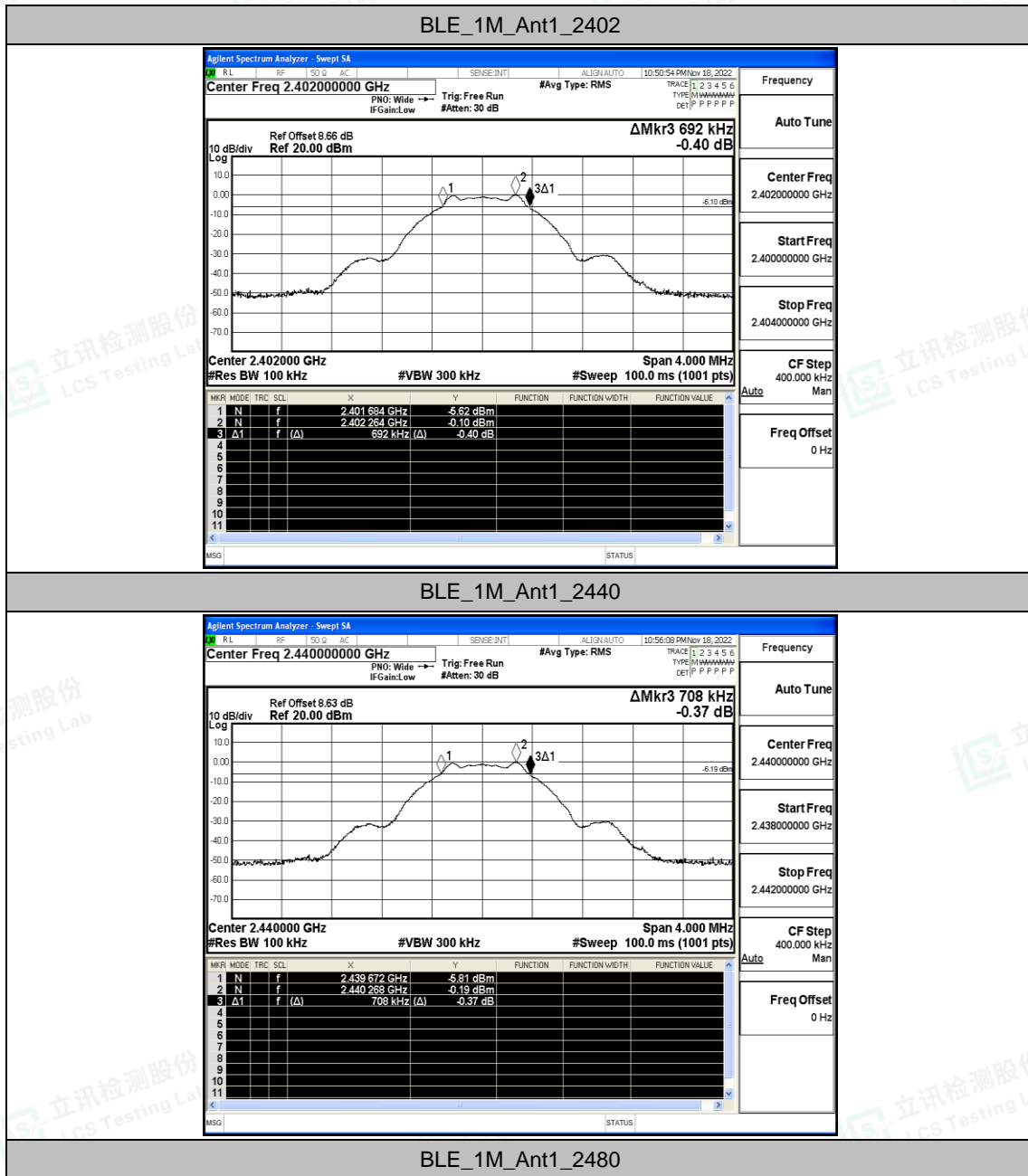
Test Result

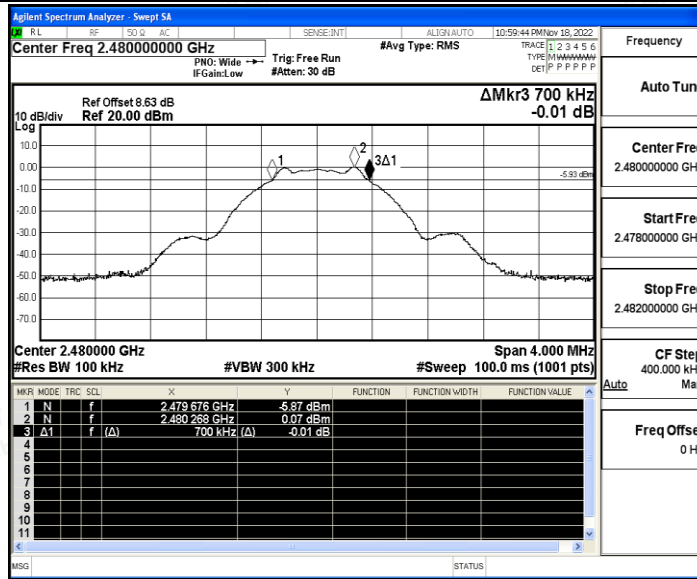
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.692	2401.684	2402.376	0.5	PASS
		2440	0.708	2439.672	2440.380	0.5	PASS
		2480	0.700	2479.676	2480.376	0.5	PASS
BLE_2M	Ant1	2402	1.280	2401.416	2402.696	0.5	PASS
		2440	1.292	2439.412	2440.704	0.5	PASS
		2480	1.300	2479.408	2480.708	0.5	PASS



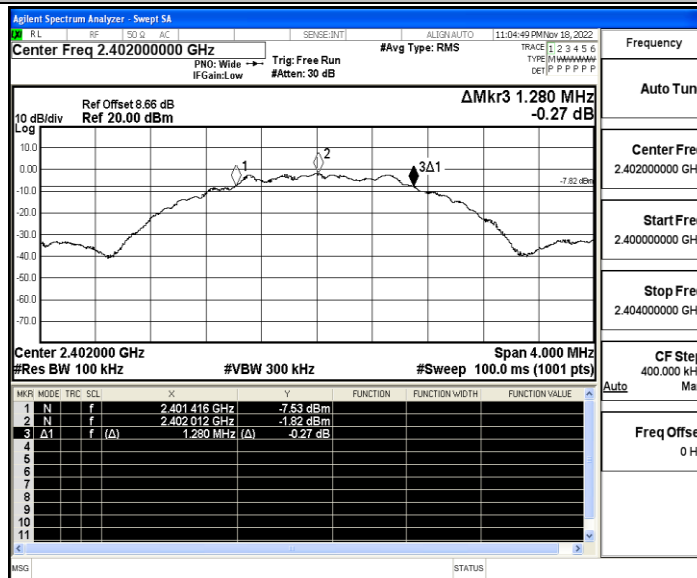


Test Graphs



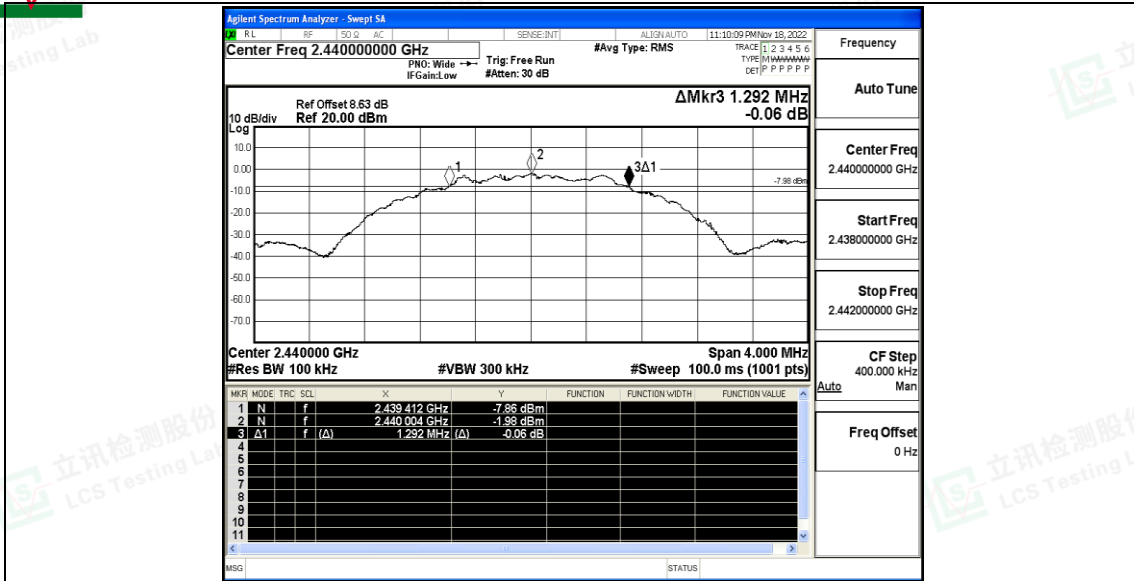


BLE_2M_Ant1_2402

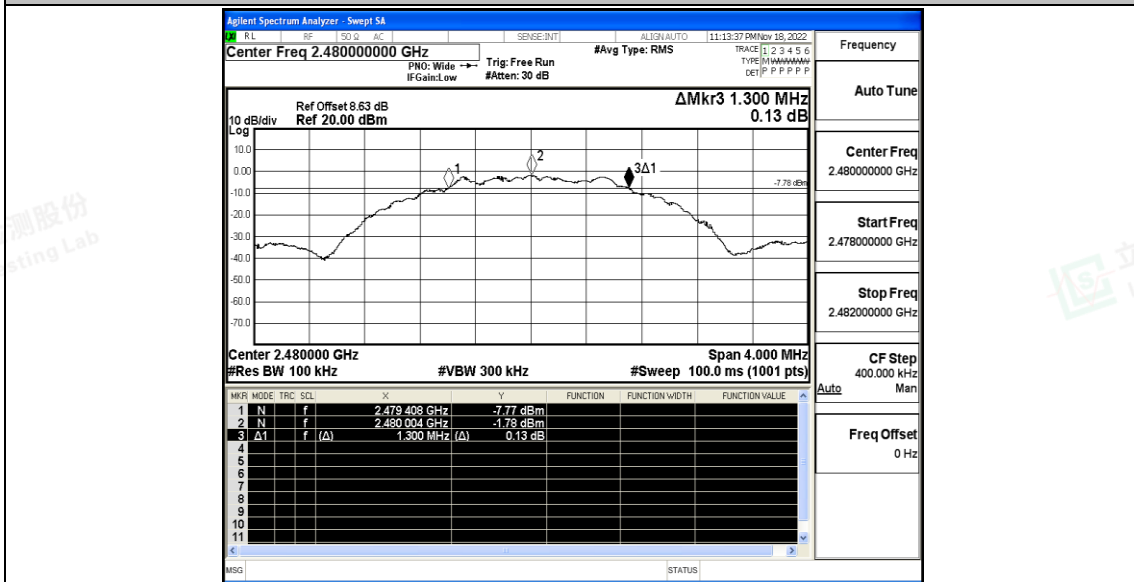


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.2 Maximum conducted output power

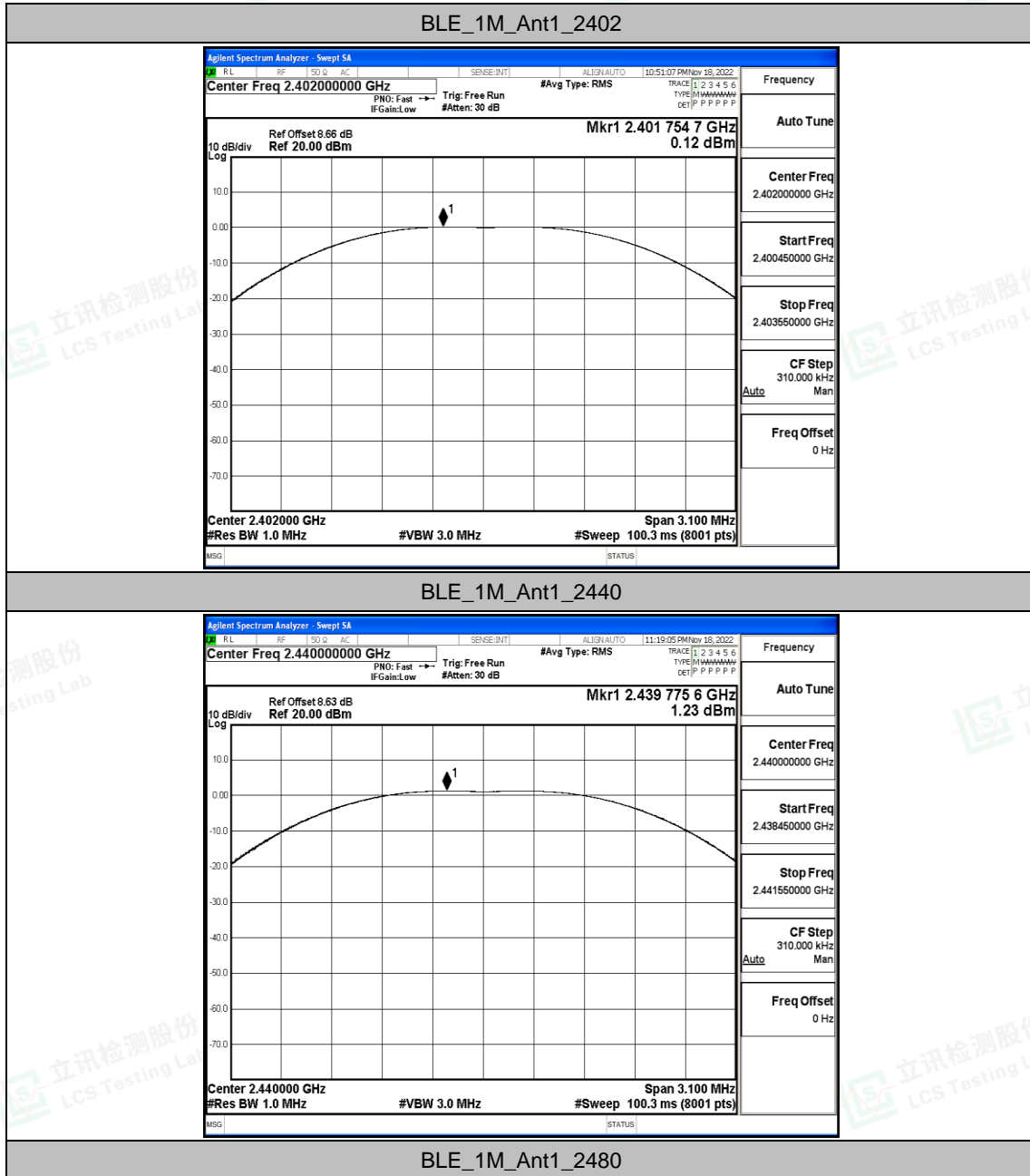
Test Result

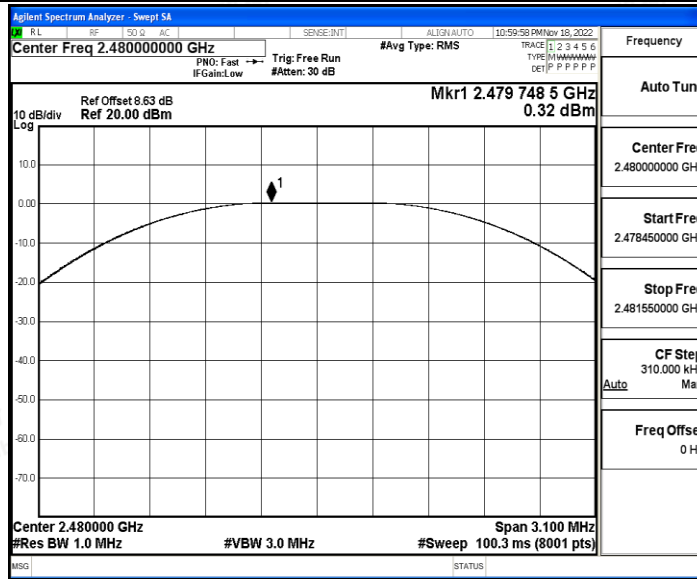
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.12	≤30	PASS
		2440	1.23	≤30	PASS
		2480	0.32	≤30	PASS
BLE_2M	Ant1	2402	0.21	≤30	PASS
		2440	1.27	≤30	PASS
		2480	0.32	≤30	PASS



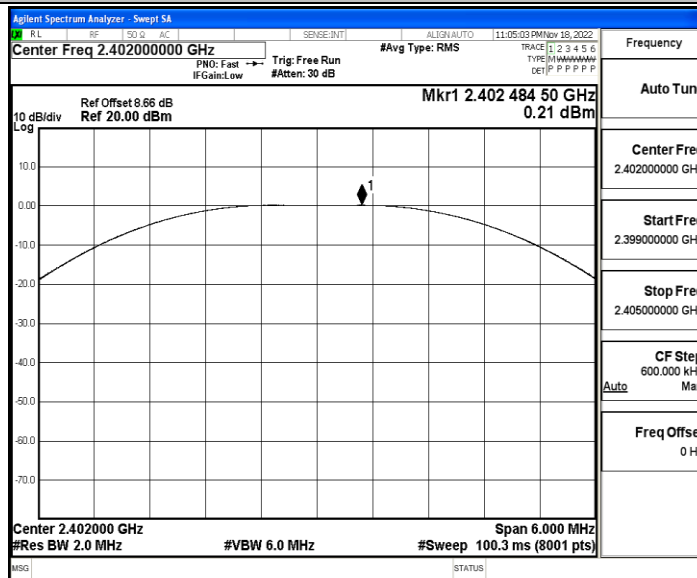


Test Graphs



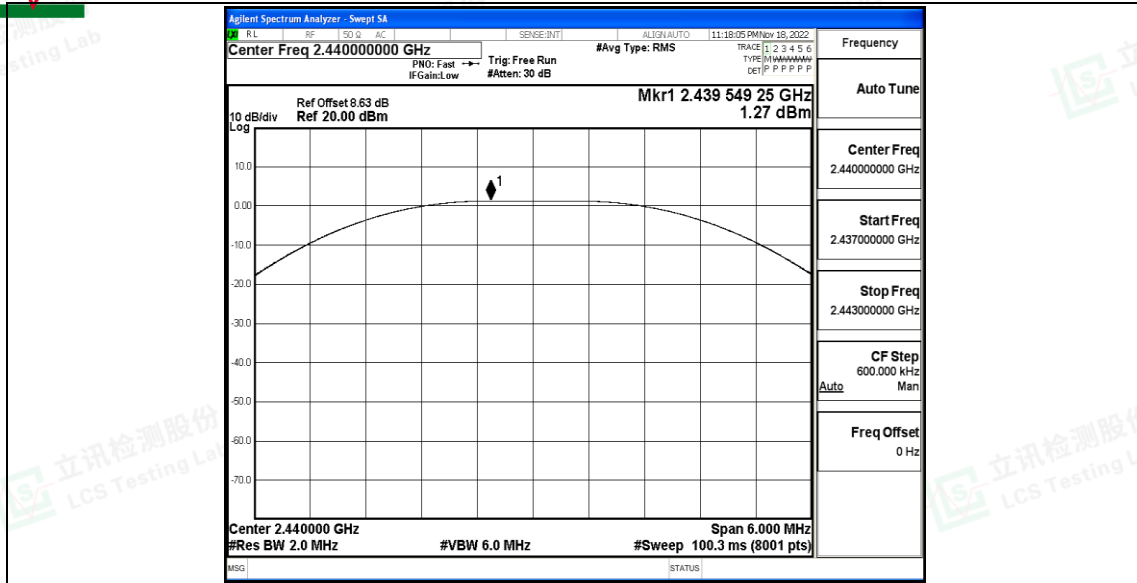


BLE_2M_Ant1_2402

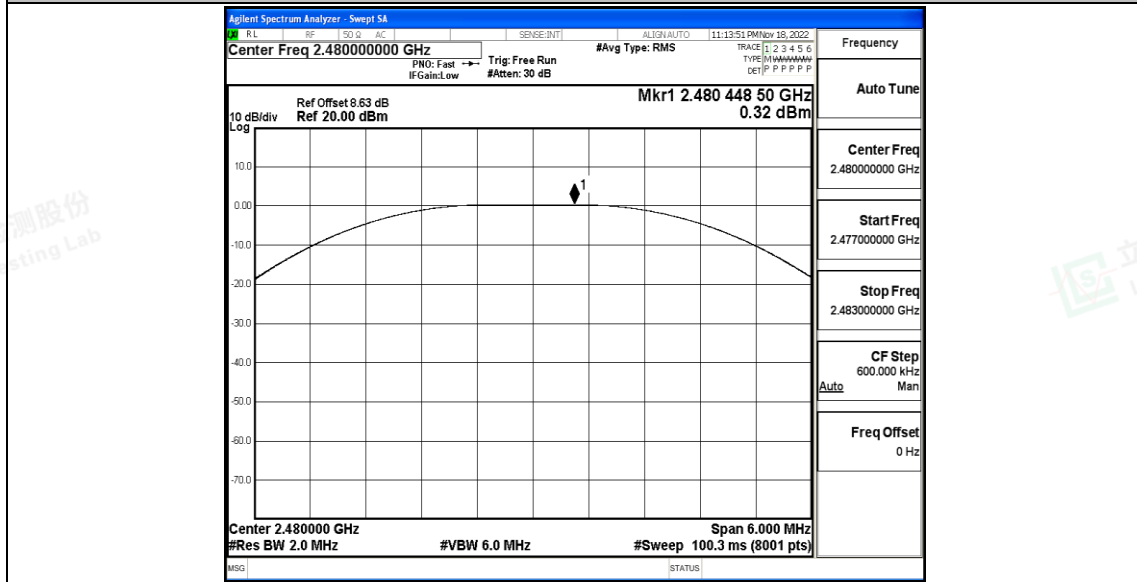


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.3 Maximum power spectral density

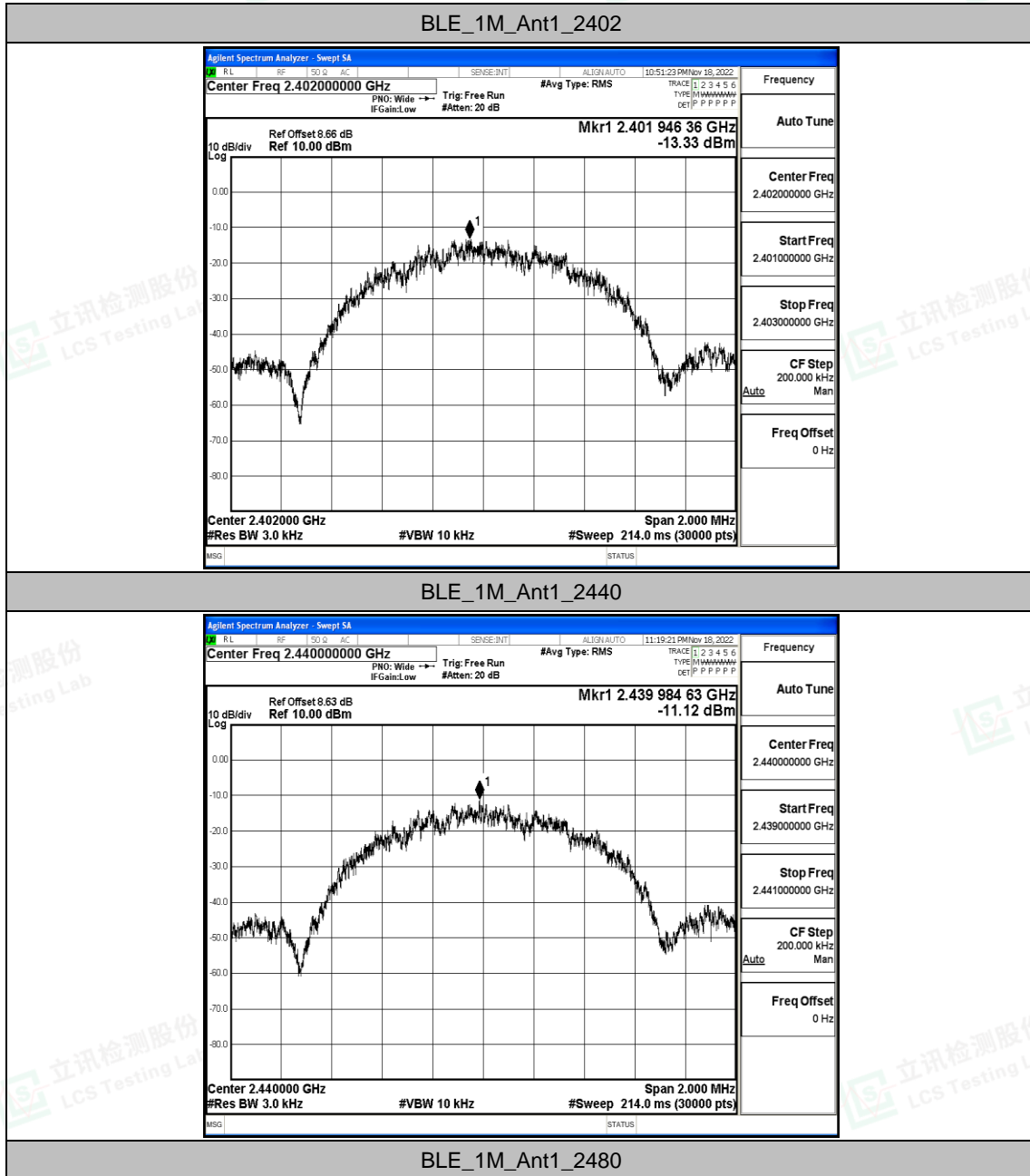
Test Result

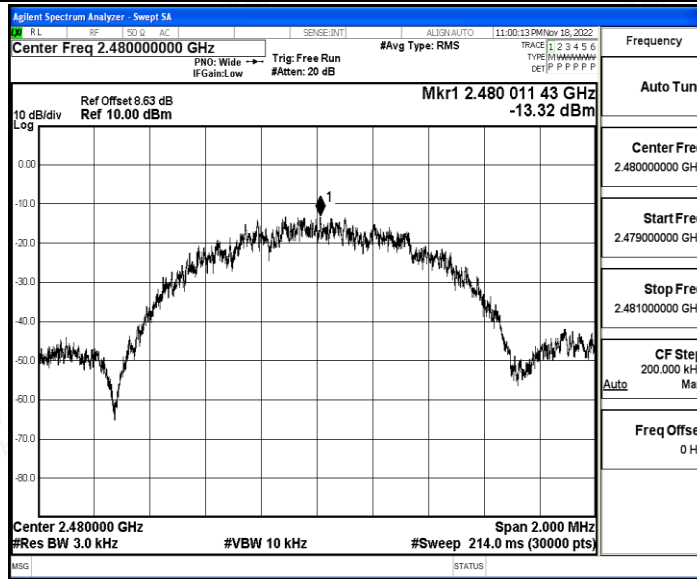
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.33	≤8.00	PASS
		2440	-11.12	≤8.00	PASS
		2480	-13.32	≤8.00	PASS
BLE_2M	Ant1	2402	-14.7	≤8.00	PASS
		2440	-13.61	≤8.00	PASS
		2480	-14.44	≤8.00	PASS



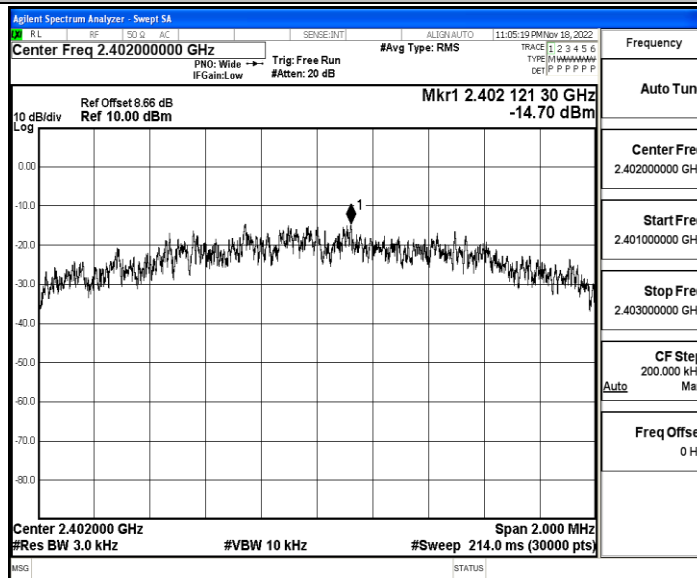


Test Graphs



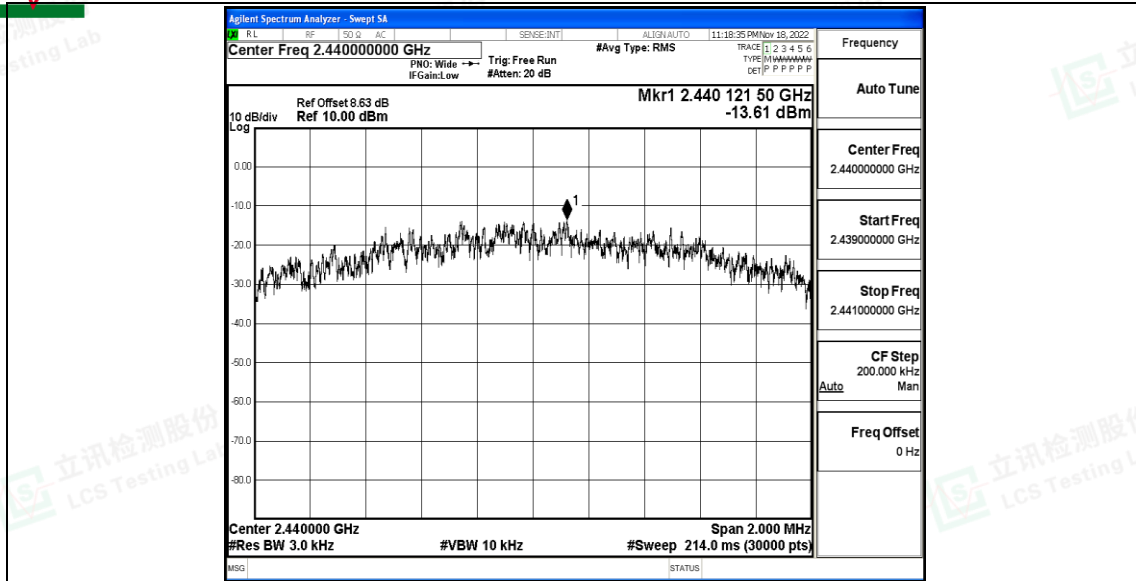


BLE_2M_Ant1_2402

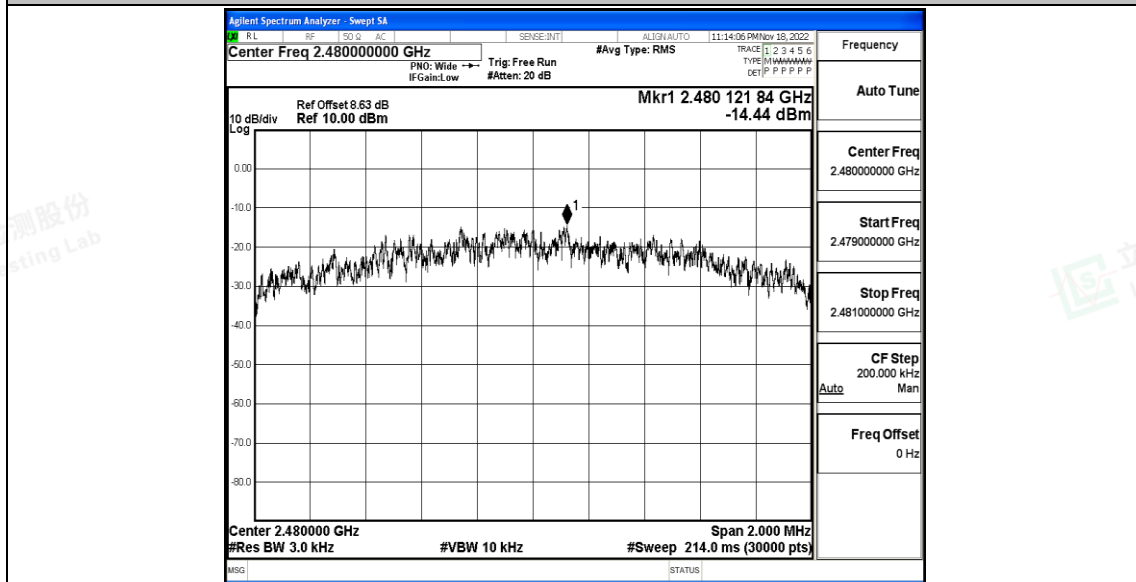


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.4 Band edge measurements

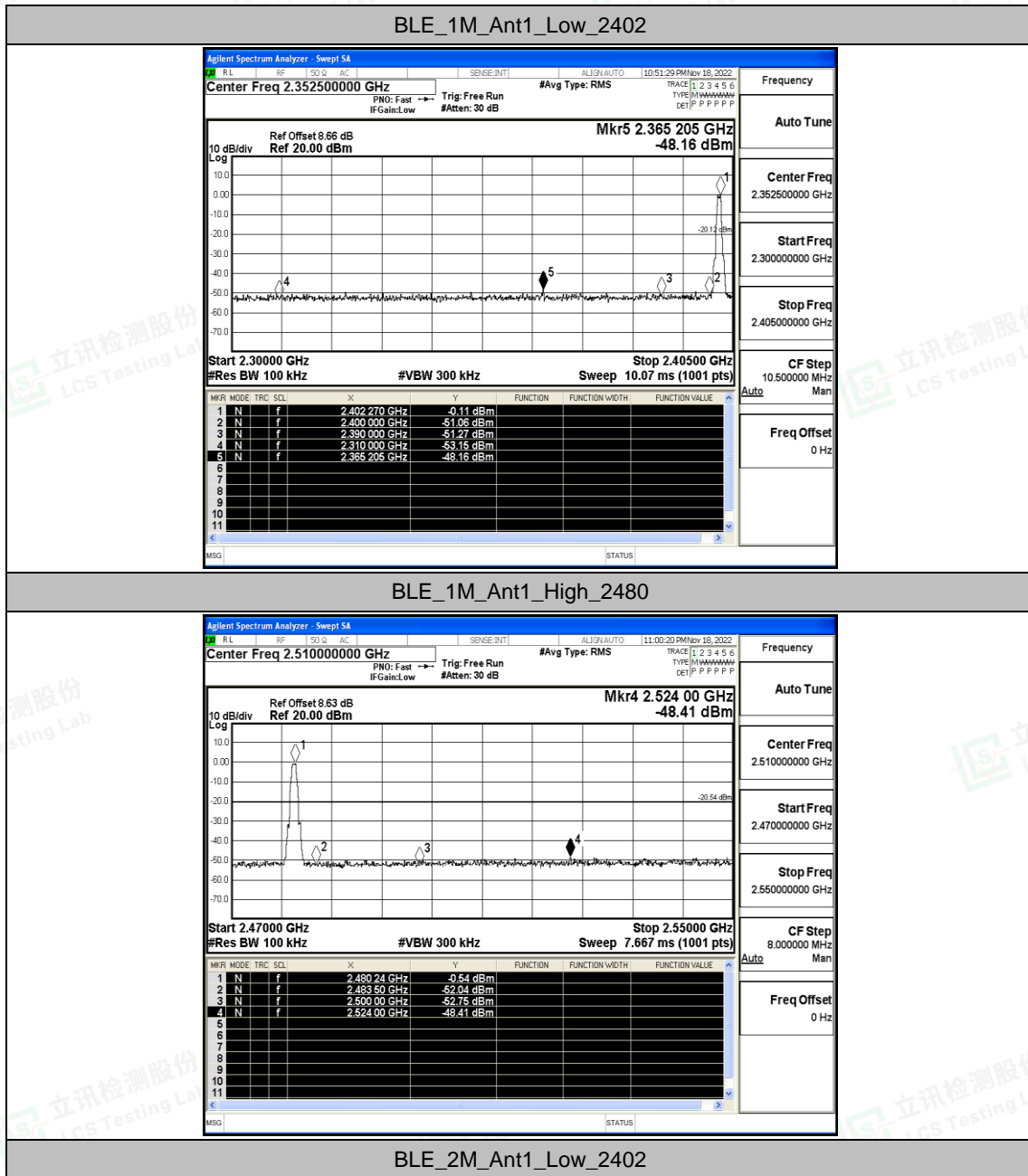
Test Result

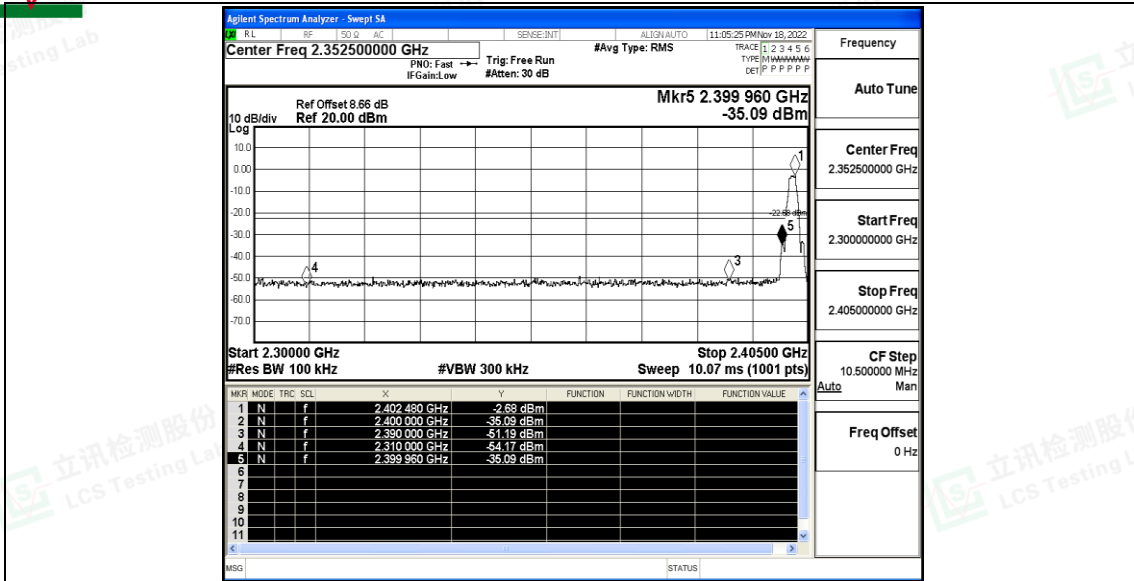
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-0.12	-48.16	≤-20.12	PASS
		High	2480	-0.54	-48.41	≤-20.54	PASS
BLE_2M	Ant1	Low	2402	-2.68	-35.09	≤-22.68	PASS
		High	2480	-1.85	-48.4	≤-21.85	PASS



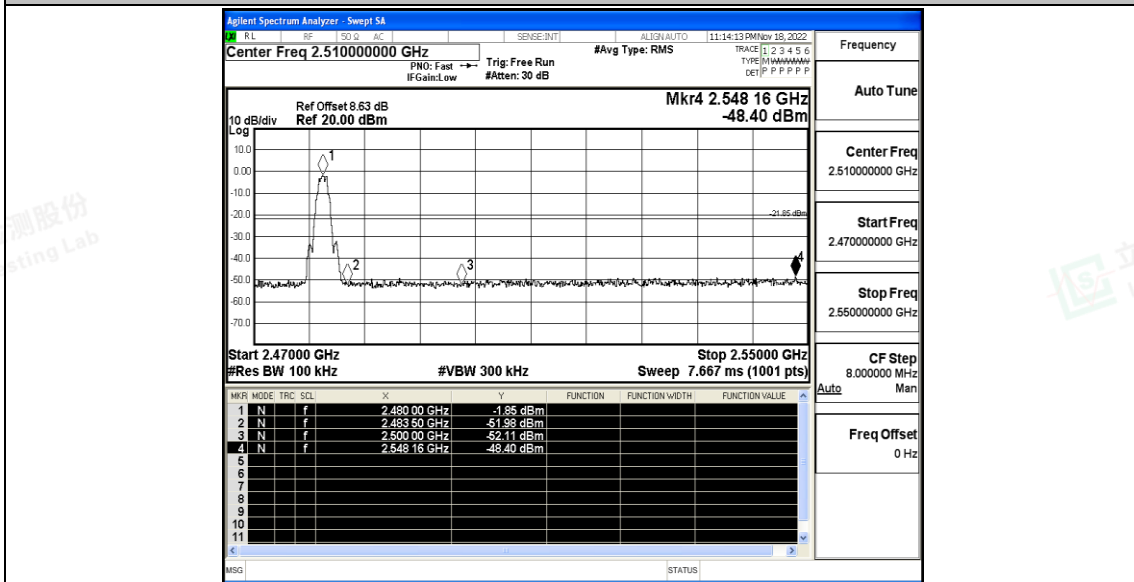


Test Graphs





BLE_2M_Ant1_High_2480





B.5 Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.76	-0.76	---	PASS
			30~1000	-0.76	-60.66	≤-20.76	PASS
			1000~26500	-0.76	-27.76	≤-20.76	PASS
		2440	Reference	-0.99	-0.99	---	PASS
			30~1000	-0.99	-60.67	≤-20.99	PASS
			1000~26500	-0.99	-31.3	≤-20.99	PASS
		2480	Reference	-0.40	-0.40	---	PASS
			30~1000	-0.40	-59.89	≤-20.4	PASS
			1000~26500	-0.40	-34.5	≤-20.4	PASS
BLE_2M	Ant1	2402	Reference	-2.68	-2.68	---	PASS
			30~1000	-2.68	-60.5	≤-22.68	PASS
			1000~26500	-2.68	-30.22	≤-22.68	PASS
		2440	Reference	-2.68	-2.68	---	PASS
			30~1000	-2.68	-60.95	≤-22.68	PASS
			1000~26500	-2.68	-32.42	≤-22.68	PASS
		2480	Reference	-2.53	-2.53	---	PASS
			30~1000	-2.53	-60.46	≤-22.53	PASS
			1000~26500	-2.53	-36.57	≤-22.53	PASS



Shenzhen LCS Compliance Testing Laboratory Ltd.

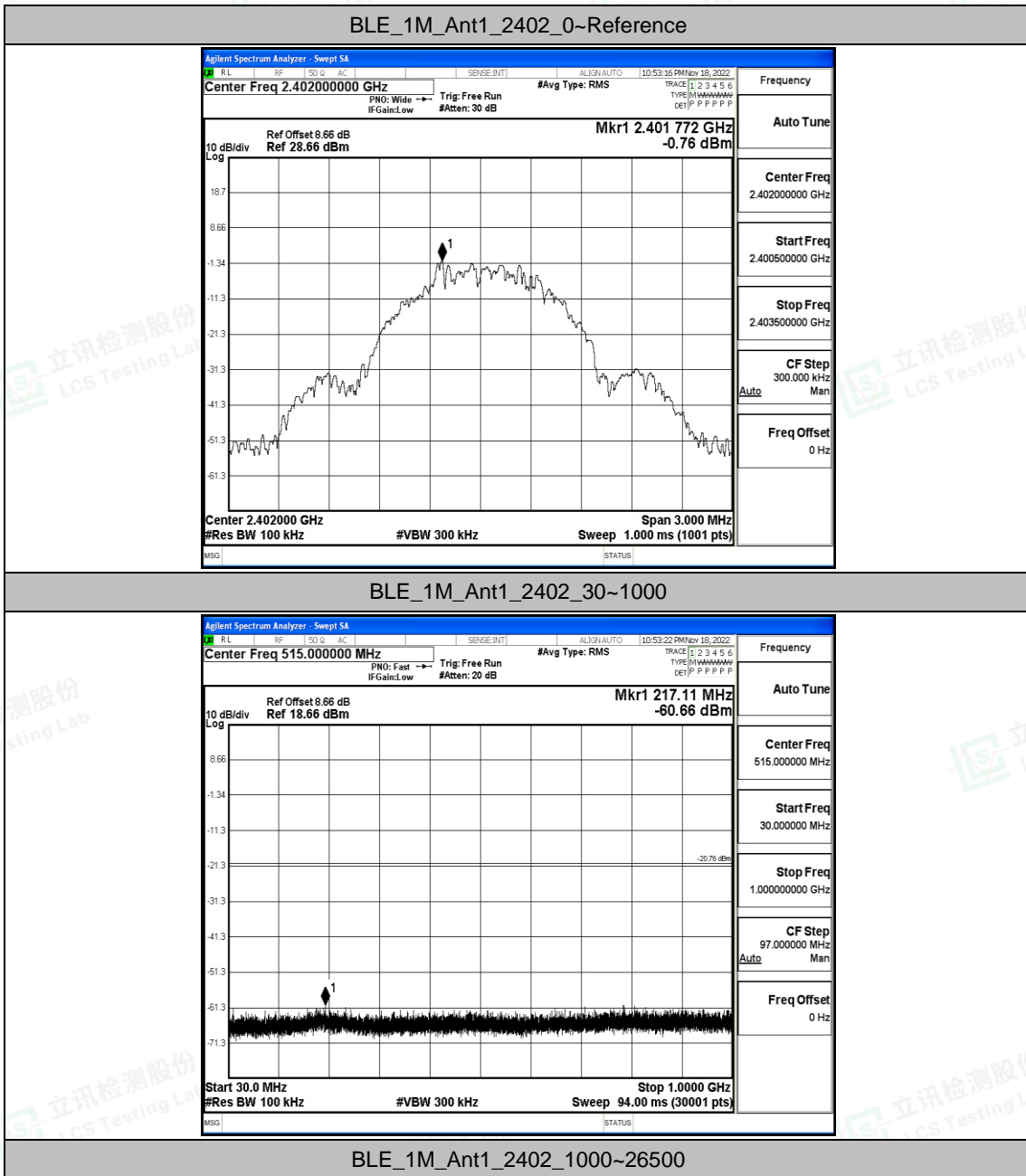
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

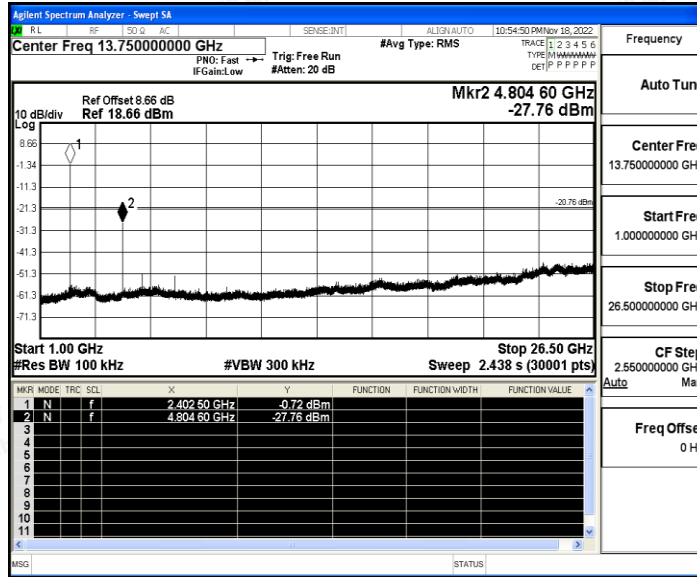
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

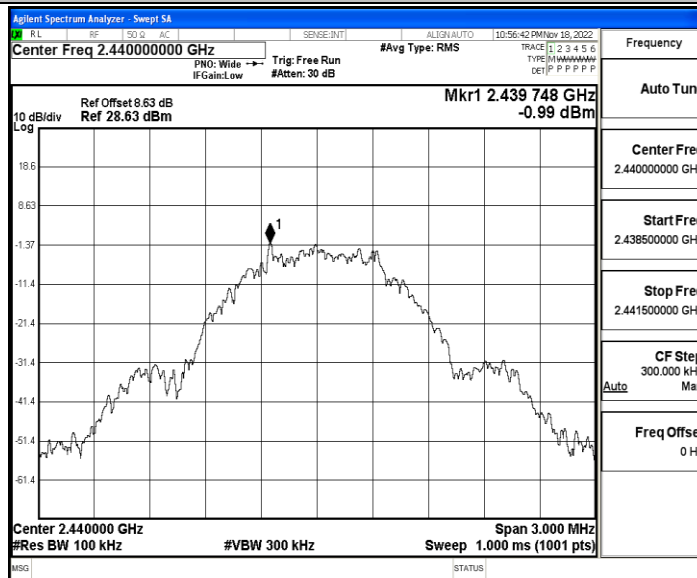


Test Graphs



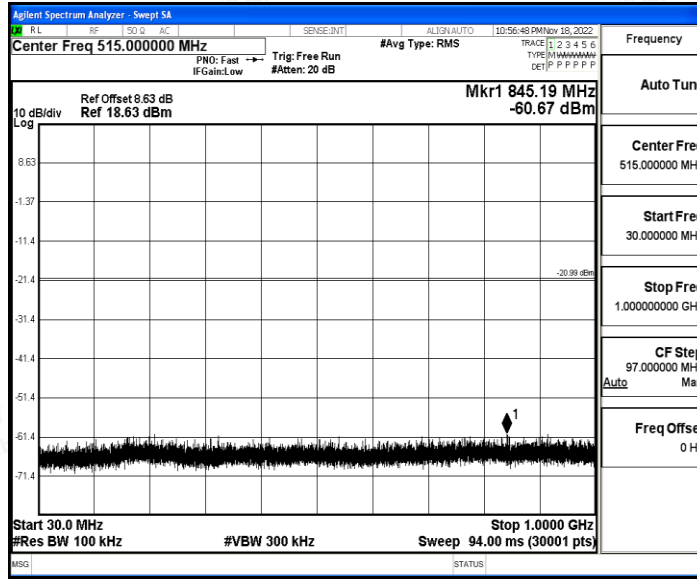


BLE_1M_Ant1_2440_0~Reference

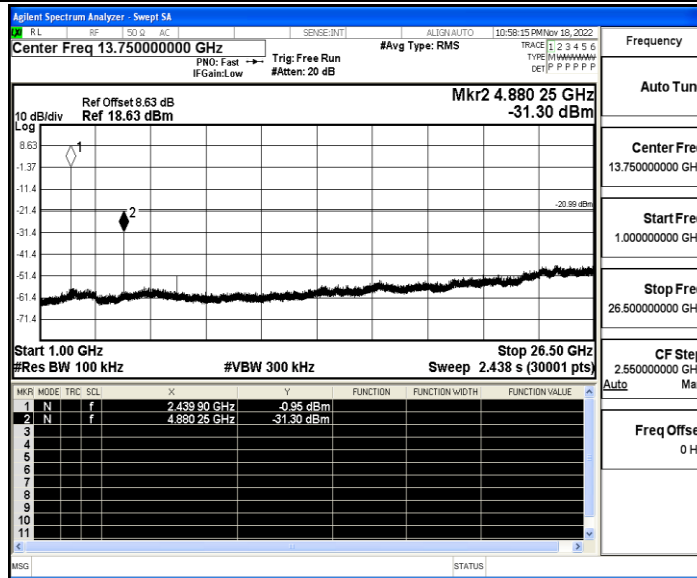


BLE_1M_Ant1_2440_30~1000



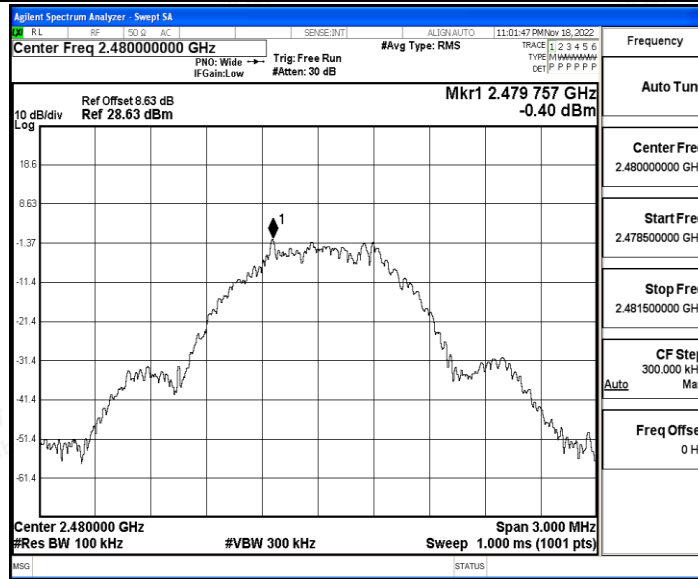


BLE_1M_Ant1_2440_1000~26500

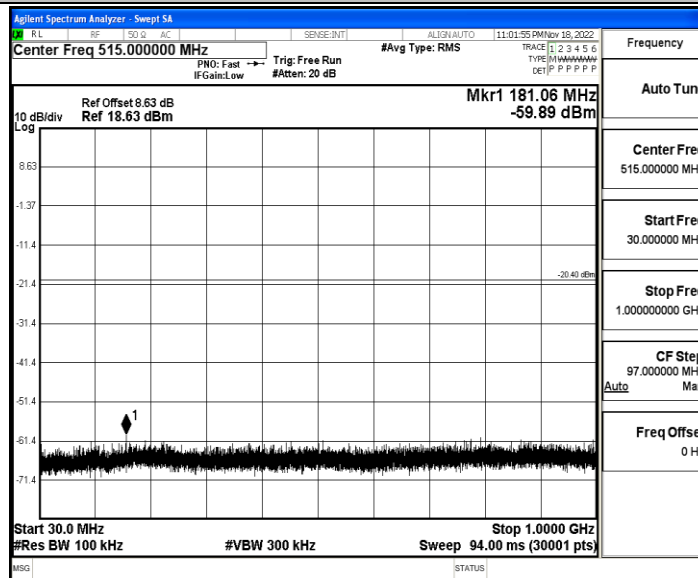


BLE_1M_Ant1_2480_0~Reference



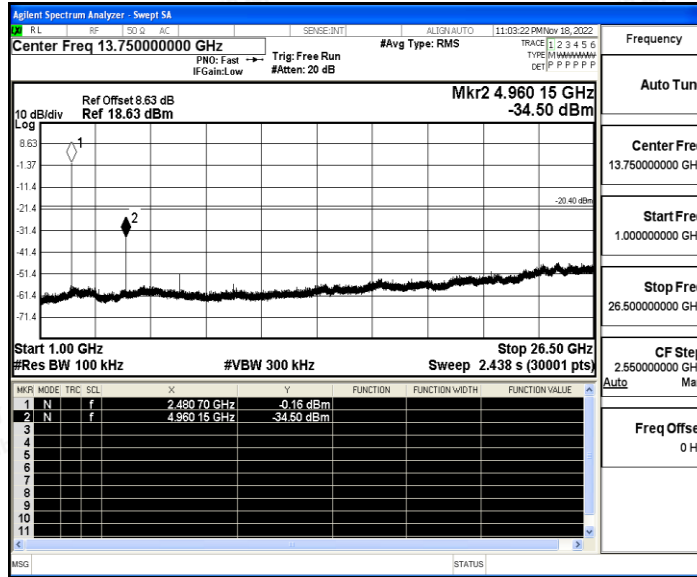


BLE_1M_Ant1_2480_30~1000

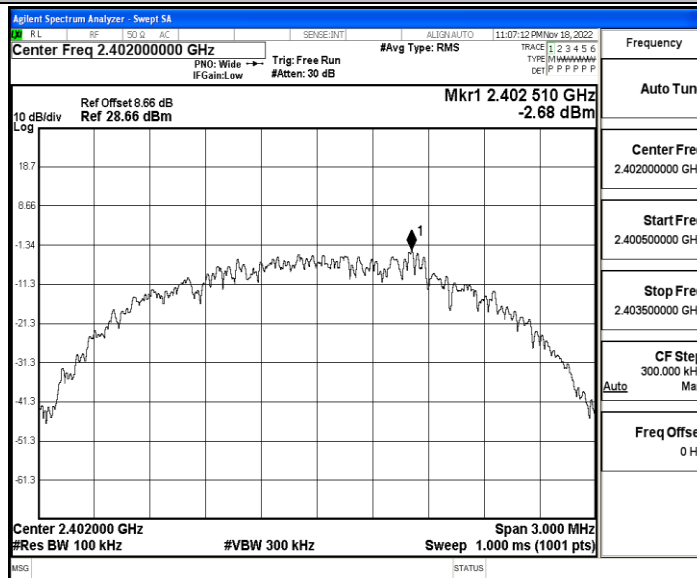


BLE_1M_Ant1_2480_1000~26500



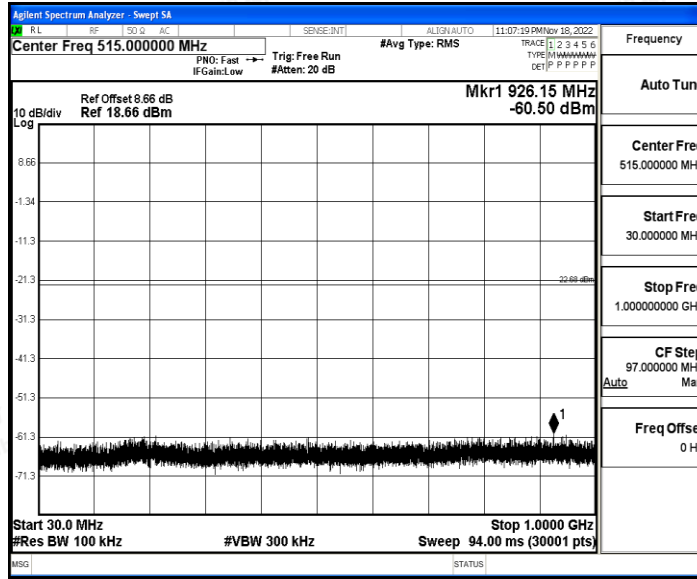


BLE_2M_Ant1_2402_0~Reference

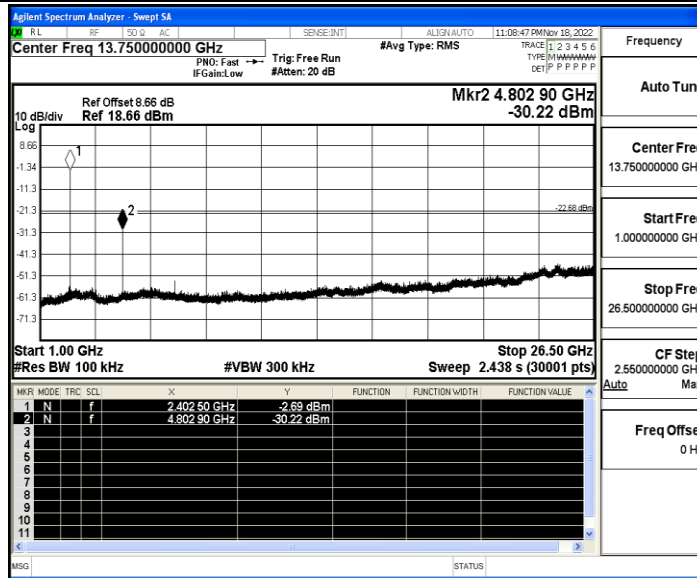


BLE_2M_Ant1_2402_30~1000



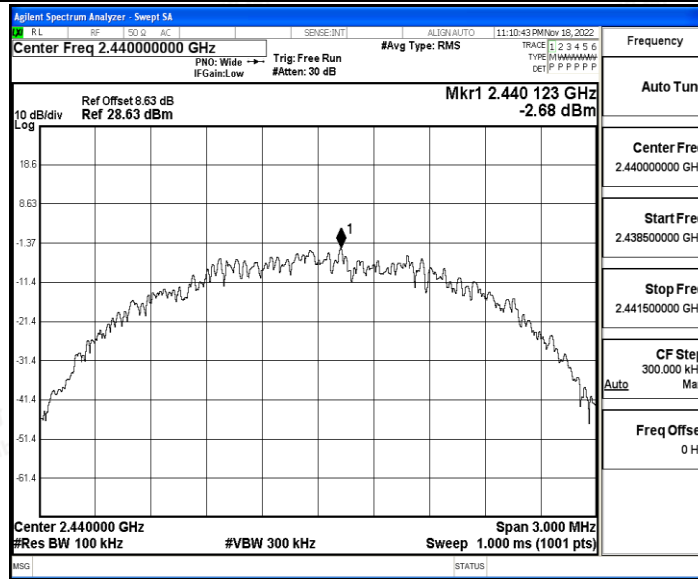


BLE_2M_Ant1_2402_1000~26500

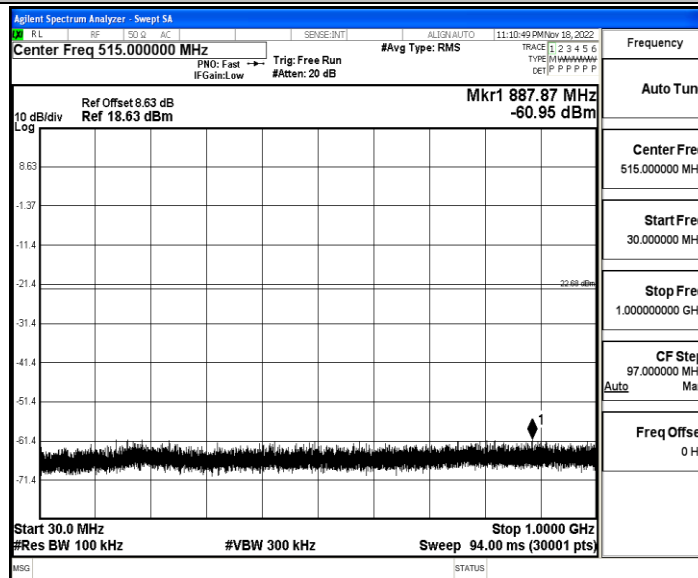


BLE_2M_Ant1_2440_0~Reference



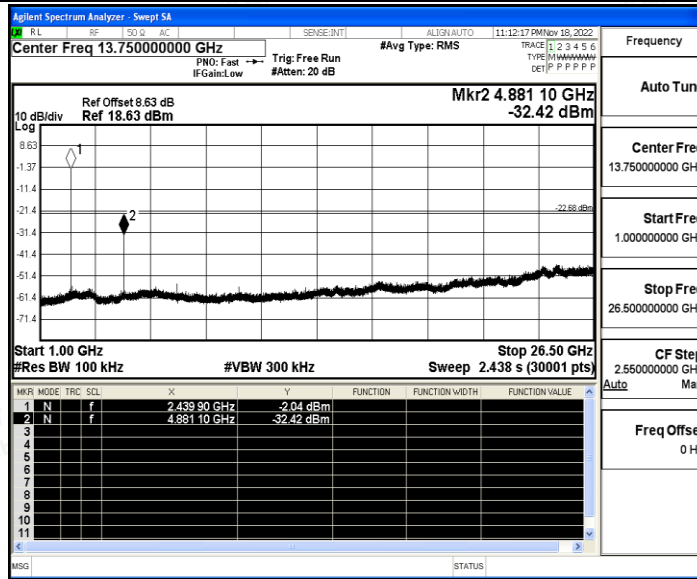


BLE_2M_Ant1_2440_30~1000

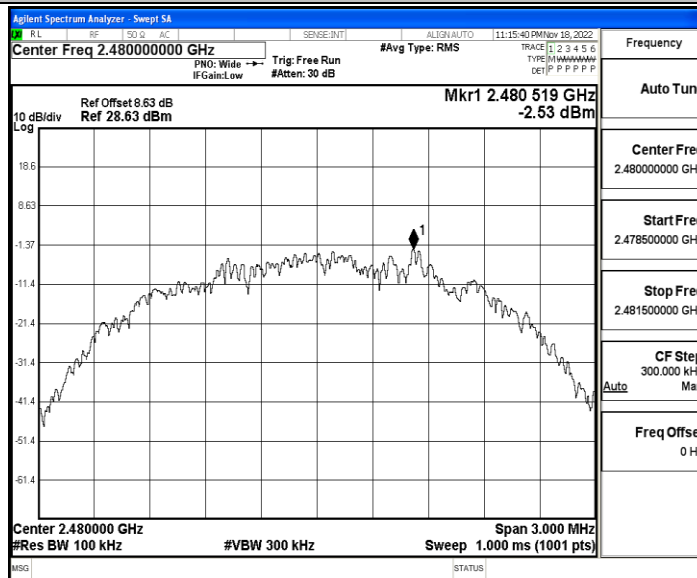


BLE_2M_Ant1_2440_1000~26500



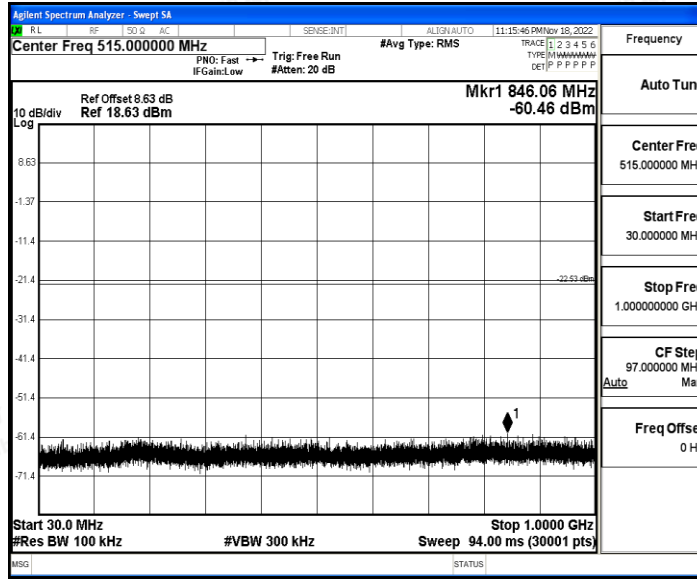


BLE_2M_Ant1_2480_0~Reference

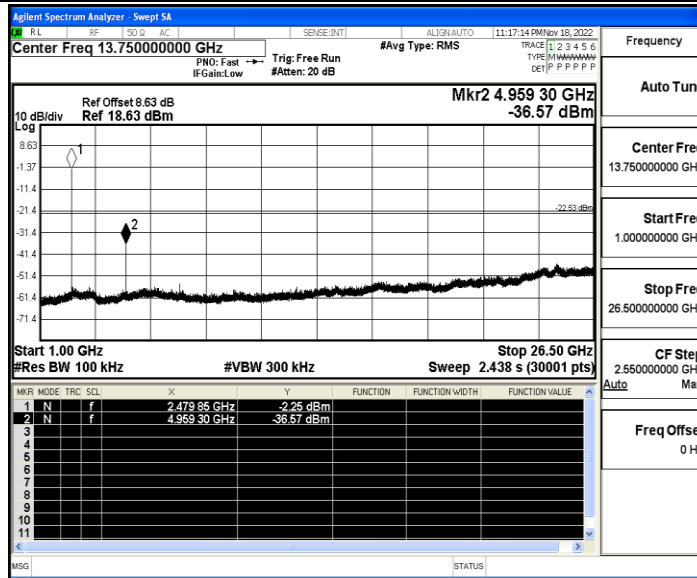


BLE_2M_Ant1_2480_30~1000





BLE_2M_Ant1_2480_1000~26500





B.6 Duty Cycle

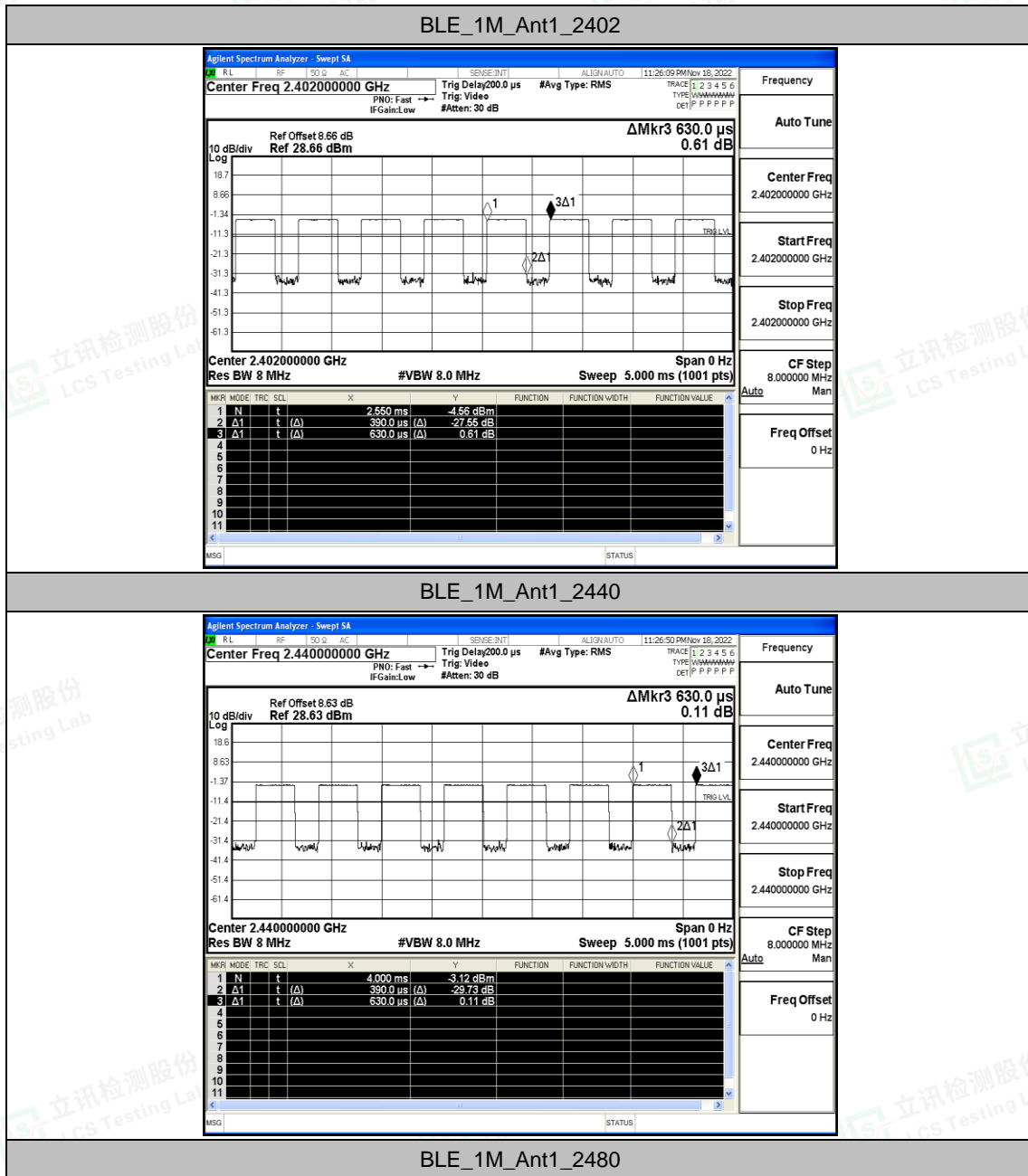
Test Result

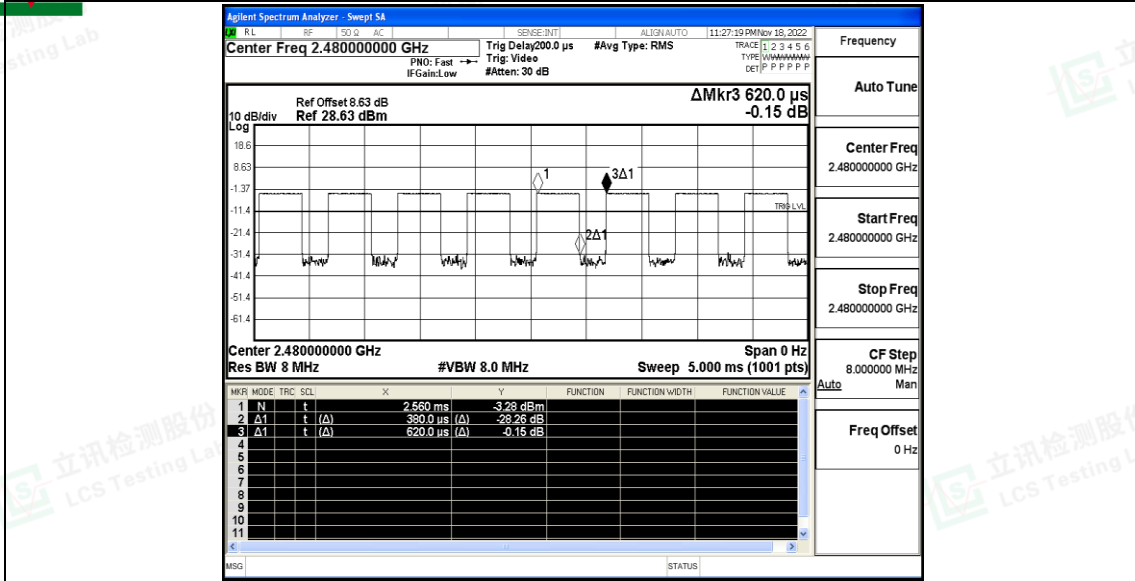
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	1/T	Limit	Verdict
BLE_1M	Ant1	2402	0.39	0.63	0.6190	61.90	2.08	2.56	---	---
		2440	0.39	0.63	0.6190	61.90	2.08	2.56	---	---
		2480	0.38	0.62	0.6129	61.29	2.13	2.63	---	---
BLE_2M	Ant1	2402	0.20	0.63	0.3175	31.75	4.98	5.00	---	---
		2440	0.20	0.63	0.3175	31.75	4.98	5.00	---	---
		2480	0.20	0.62	0.3226	32.26	4.91	5.00	---	---



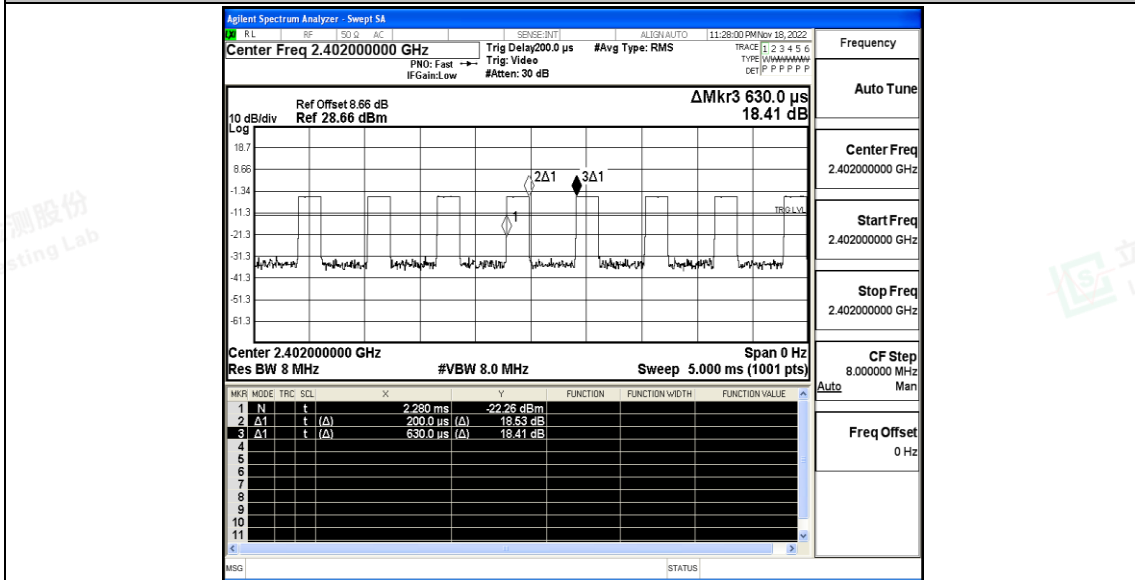


Test Graphs



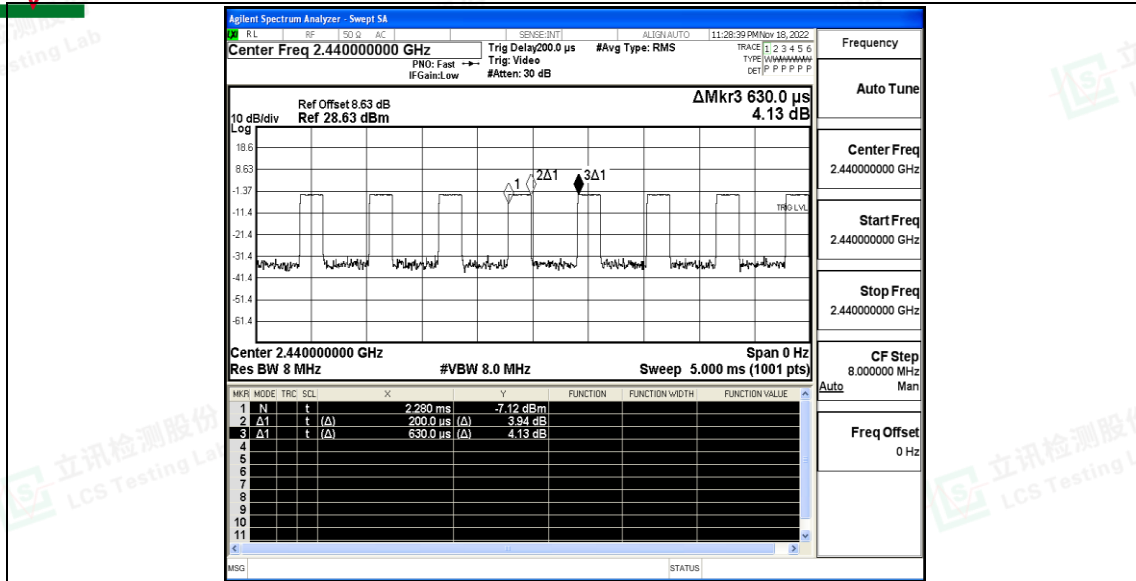


BLE_2M_Ant1_2402

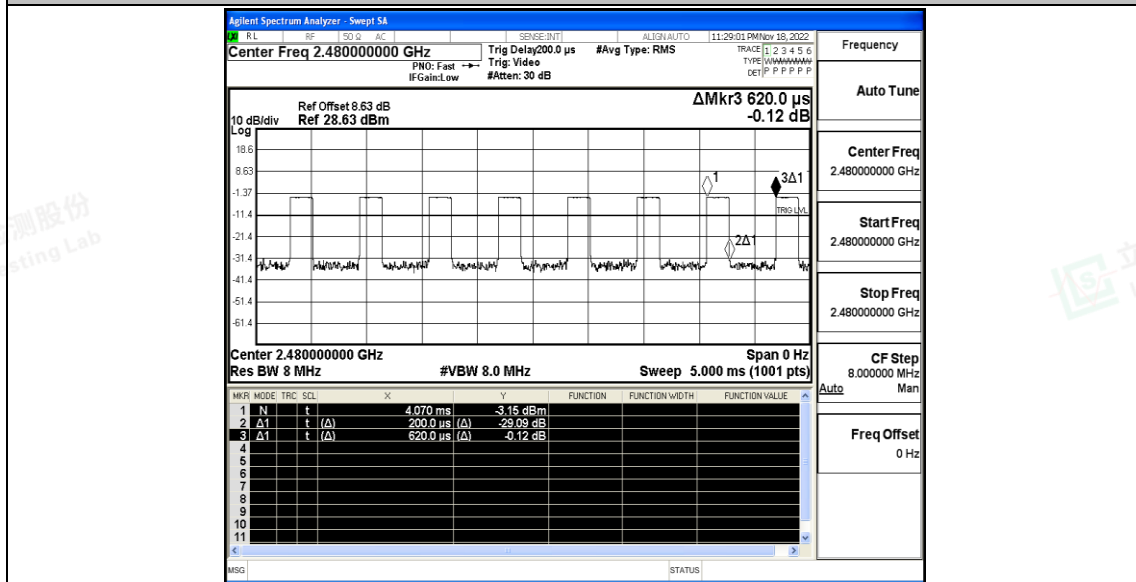


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.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	-47.62	≤-41.20	47.58	≤54	PASS
				AV	2371.925	-46.78	≤-41.20	48.42	≤54	PASS
				AV	2390.000	-47.43	≤-41.20	47.77	≤54	PASS
				Peak	2310.000	-39.66	≤-21.20	55.54	≤74	PASS
				Peak	2378.750	-37.22	≤-21.20	57.98	≤74	PASS
				Peak	2390.000	-39.59	≤-21.20	55.61	≤74	PASS
		High	2480	AV	2483.500	-47.06	≤-41.20	48.14	≤54	PASS
				AV	2496.800	-46.49	≤-41.20	48.71	≤54	PASS
				AV	2500.000	-46.51	≤-41.20	48.69	≤54	PASS
				Peak	2483.500	-40.67	≤-21.20	54.53	≤74	PASS
				Peak	2491.360	-37.76	≤-21.20	57.44	≤74	PASS
				Peak	2500.000	-39.13	≤-21.20	56.07	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-47.23	≤-41.20	47.97	≤54	PASS
				AV	2380.850	-46.01	≤-41.20	49.19	≤54	PASS
				AV	2390.000	-46.72	≤-41.20	48.48	≤54	PASS
				Peak	2310.000	-40.16	≤-21.20	55.04	≤74	PASS
				Peak	2331.185	-37.79	≤-21.20	57.41	≤74	PASS
				Peak	2390.000	-39.79	≤-21.20	55.41	≤74	PASS
		High	2480	AV	2483.500	-46.2	≤-41.20	49.00	≤54	PASS
				AV	2497.920	-45.59	≤-41.20	49.61	≤54	PASS
				AV	2500.000	-46.36	≤-41.20	48.84	≤54	PASS
				Peak	2483.500	-39.41	≤-21.20	55.79	≤74	PASS
				Peak	2486.240	-37.37	≤-21.20	57.83	≤74	PASS
				Peak	2500.000	-39.57	≤-21.20	55.63	≤74	PASS

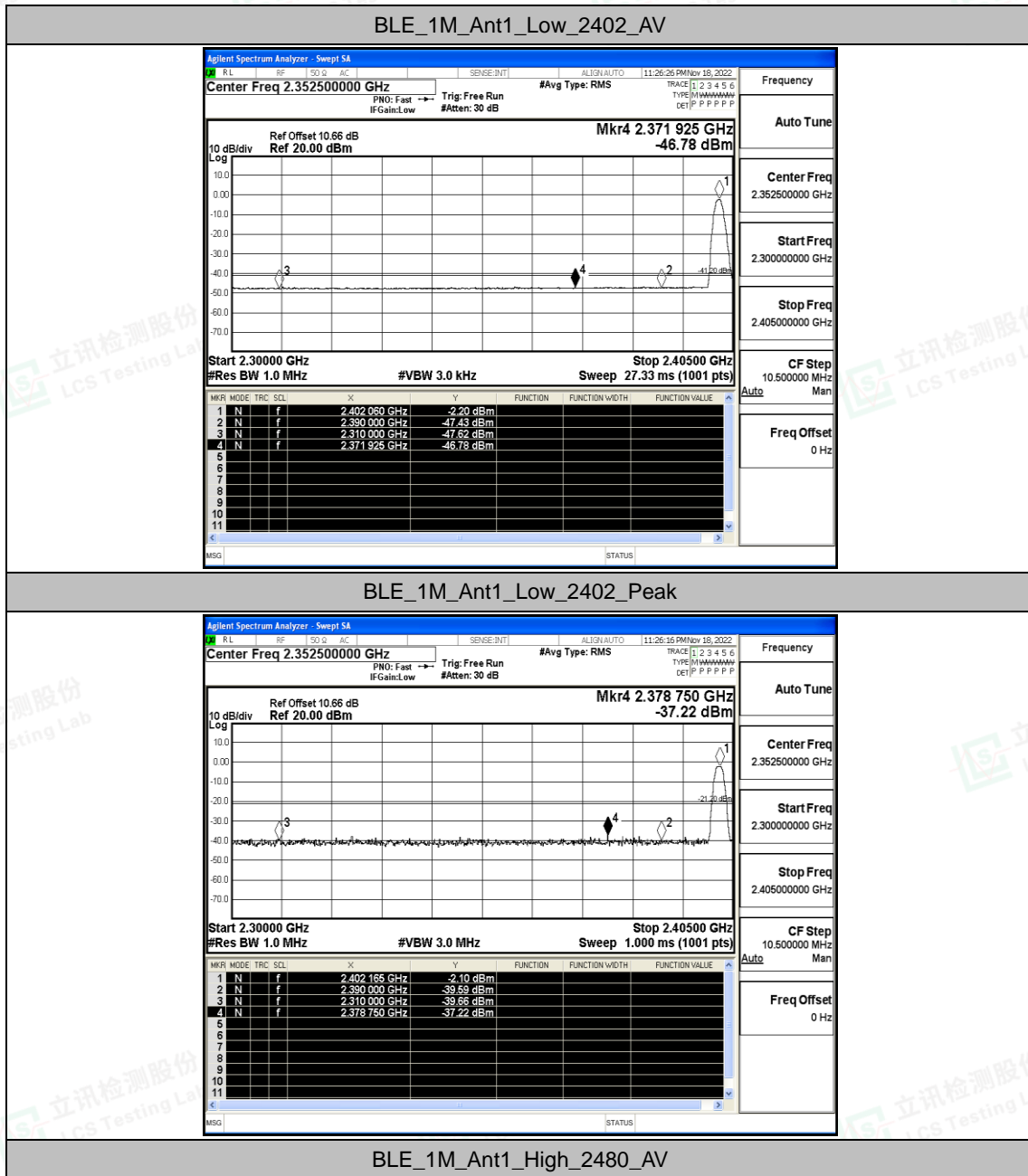
Note:

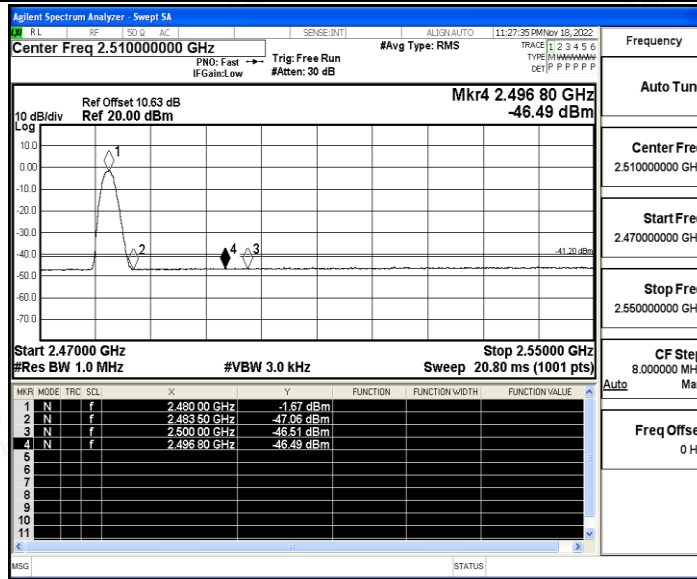
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



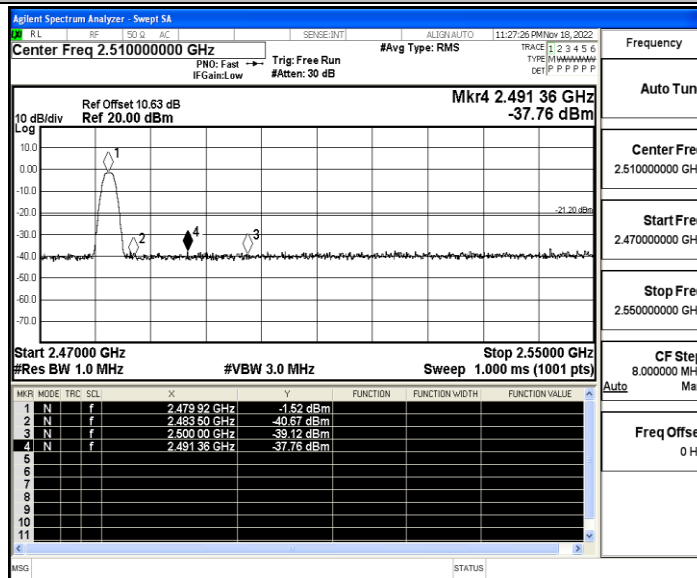


Test Graphs



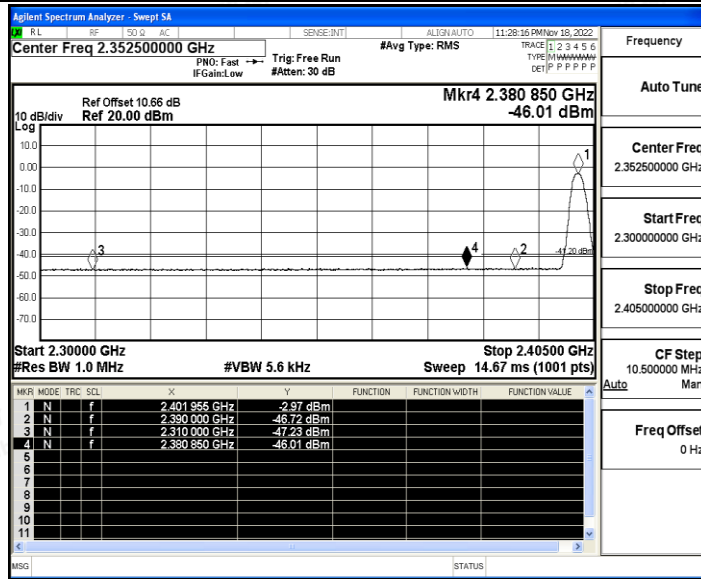


BLE_1M_Ant1_High_2480_Peak

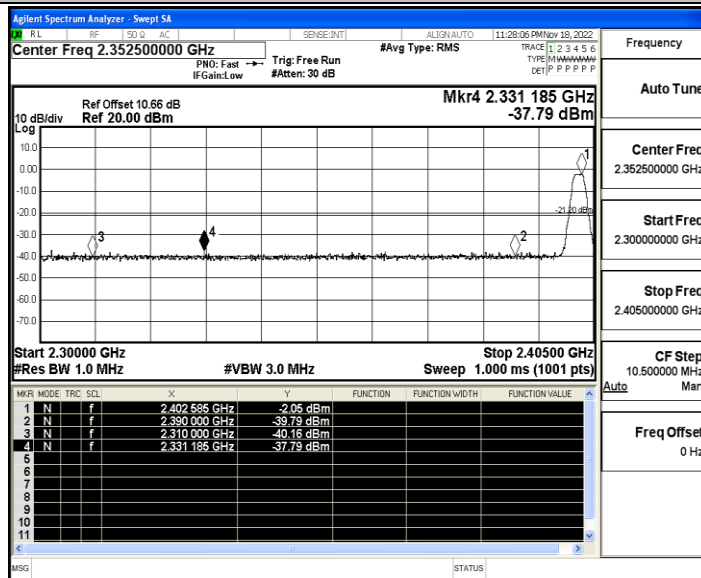


BLE_2M_Ant1_Low_2402_AV



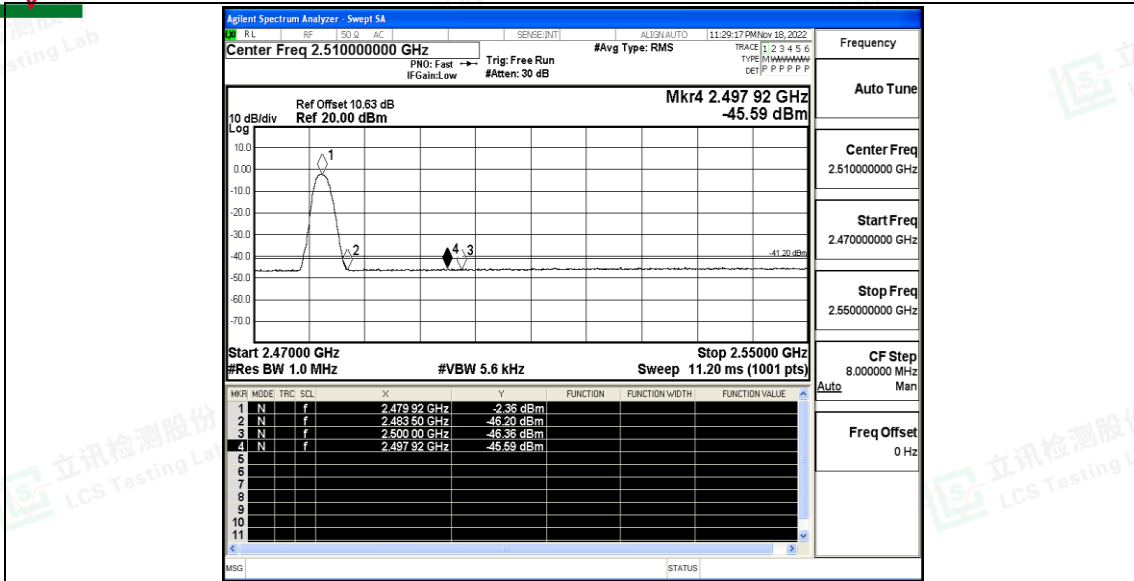


BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV





BLE_2M_Ant1_High_2480_Peak

