



Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Smart switch

Test Model: Shelly PRO 3

Environmental Conditions

Temperature:	23.8 °C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	<i>monkey.Li</i> Monkey Li
Supervised by:	<i>Li</i> Li Huan





B.1 DTS Bandwidth

Test Result

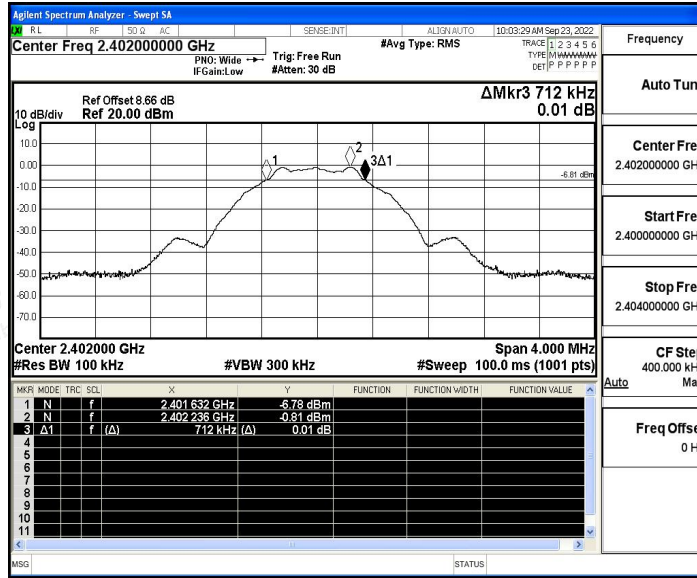
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.712	2401.632	2402.344	0.5	PASS
		2440	0.708	2439.632	2440.340	0.5	PASS
		2480	0.712	2479.632	2480.344	0.5	PASS



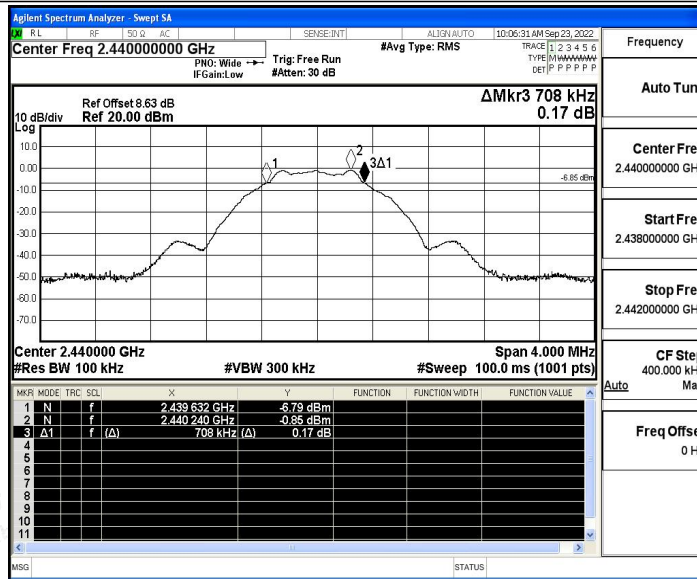


Test Graphs

BLE_1M_Ant1_2402

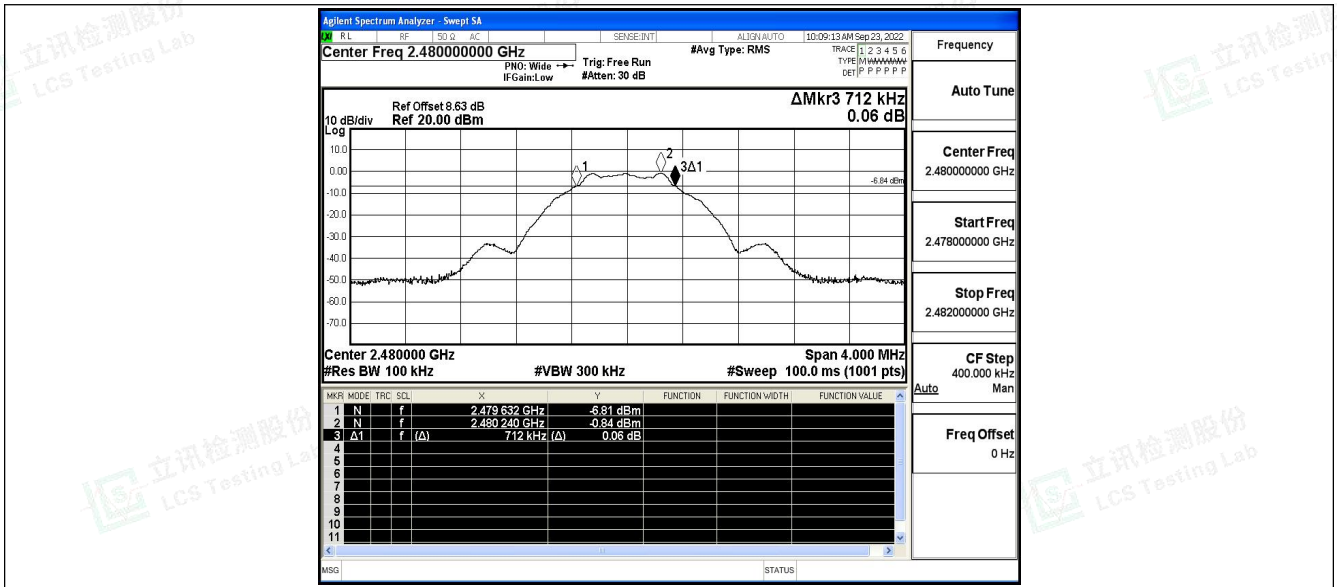


BLE_1M_Ant1_2440



BLE_1M_Ant1_2480







B.2 Maximum conducted output power

Test Result

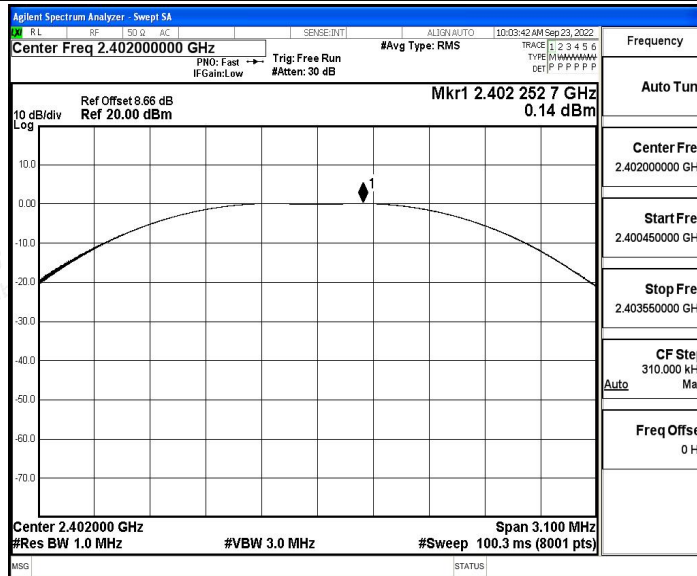
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.14	≤30	PASS
		2440	0.12	≤30	PASS
		2480	0.12	≤30	PASS



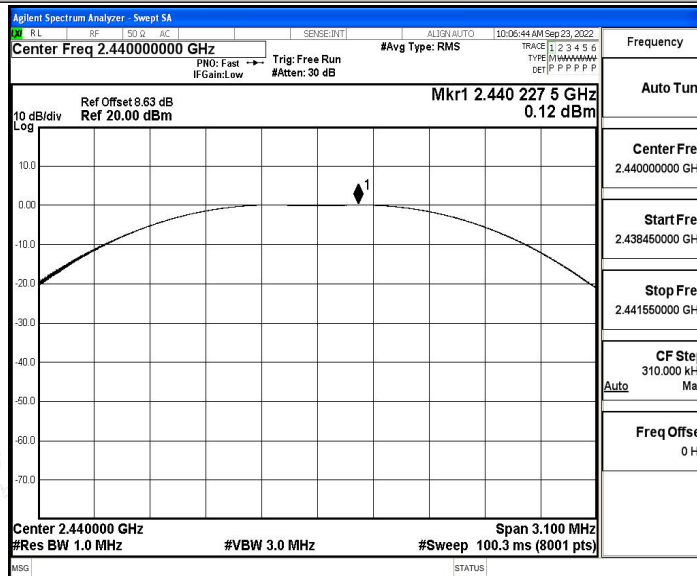


Test Graphs

BLE_1M_Ant1_2402

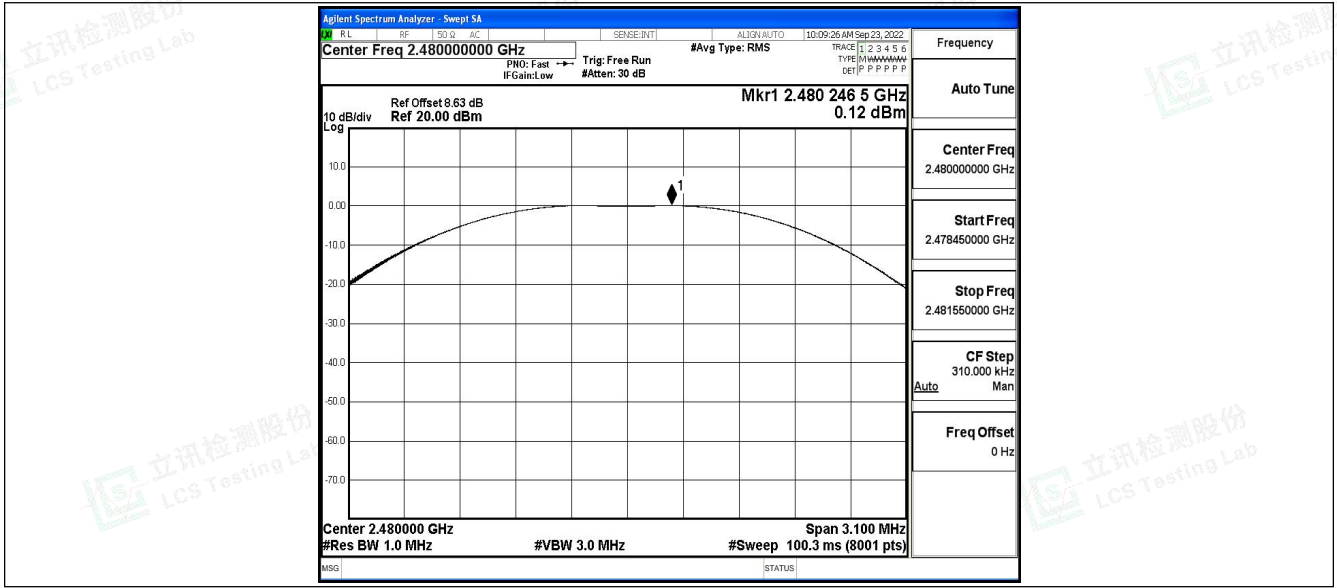


BLE_1M_Ant1_2440



BLE_1M_Ant1_2480







B.3 Maximum power spectral density

Test Result

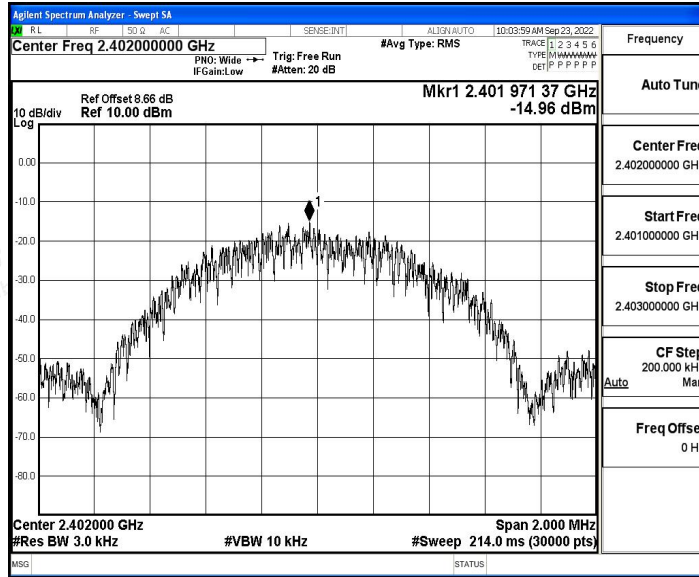
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-14.96	≤8.00	PASS
		2440	-15.01	≤8.00	PASS
		2480	-14.97	≤8.00	PASS



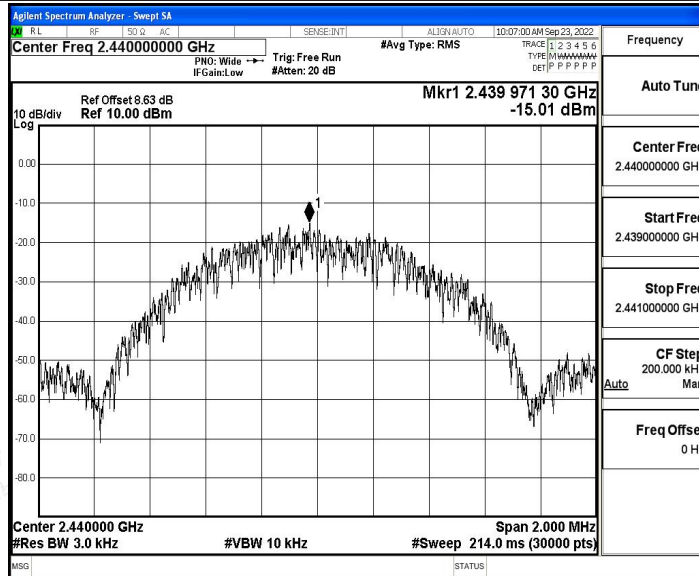


Test Graphs

BLE_1M_Ant1_2402

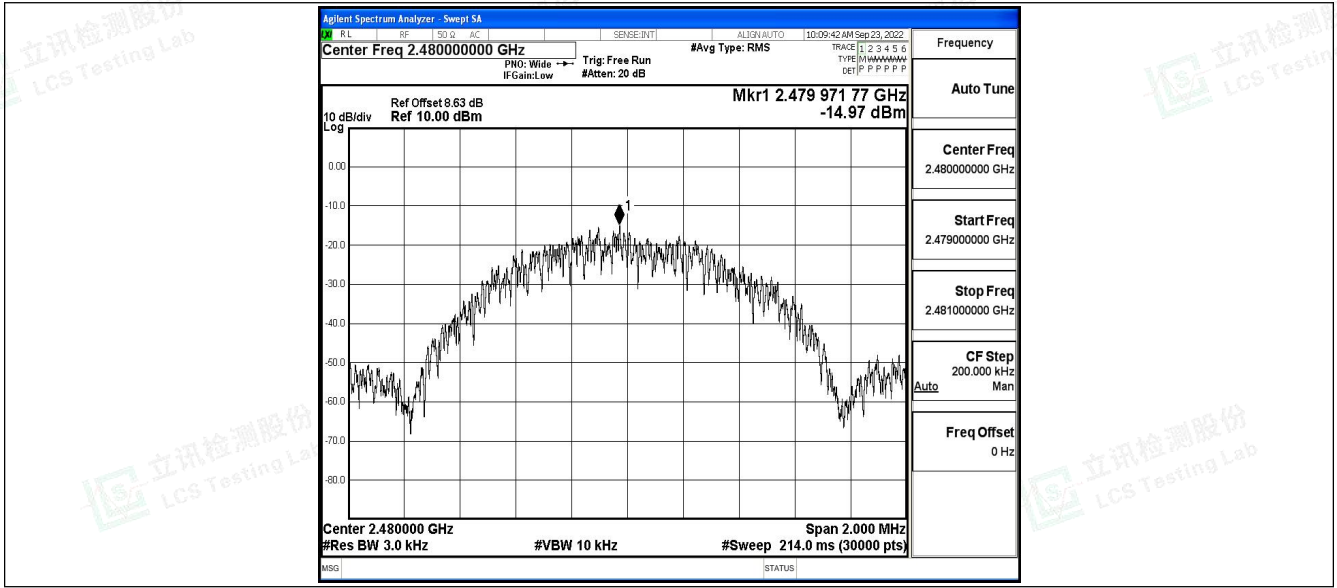


BLE_1M_Ant1_2440



BLE_1M_Ant1_2480







B.4 Band edge measurements

Test Result

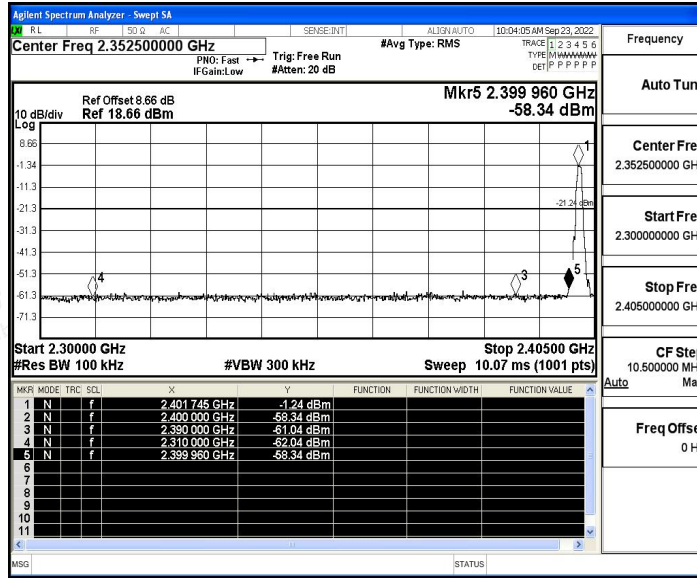
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-1.24	-58.34	≤-21.24	PASS
		High	2480	-0.72	-58.23	≤-20.72	PASS



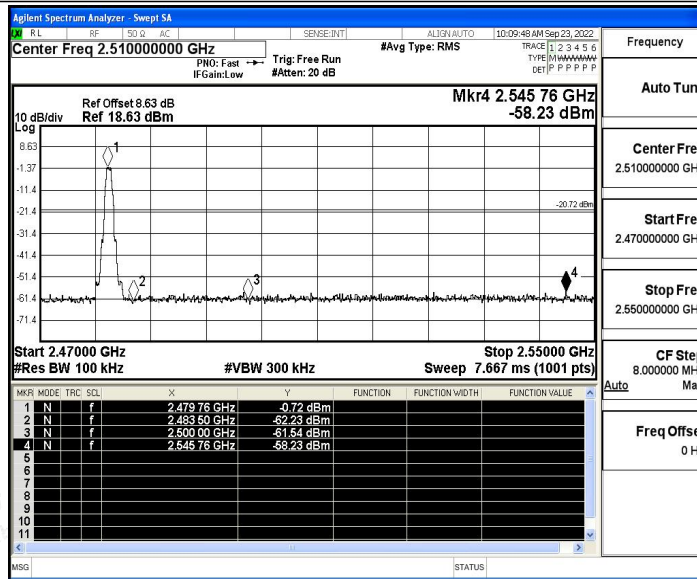


Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_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	-2.17	-2.17	---	PASS
			30~1000	-2.17	-60.72	≤-22.17	PASS
			1000~26500	-2.17	-45.49	≤-22.17	PASS
		2440	Reference	-0.90	-0.90	---	PASS
			30~1000	-0.90	-60.71	≤-20.9	PASS
			1000~26500	-0.90	-45.44	≤-20.9	PASS
		2480	Reference	-1.15	-1.15	---	PASS
			30~1000	-1.15	-60.87	≤-21.15	PASS
			1000~26500	-1.15	-46.2	≤-21.15	PASS



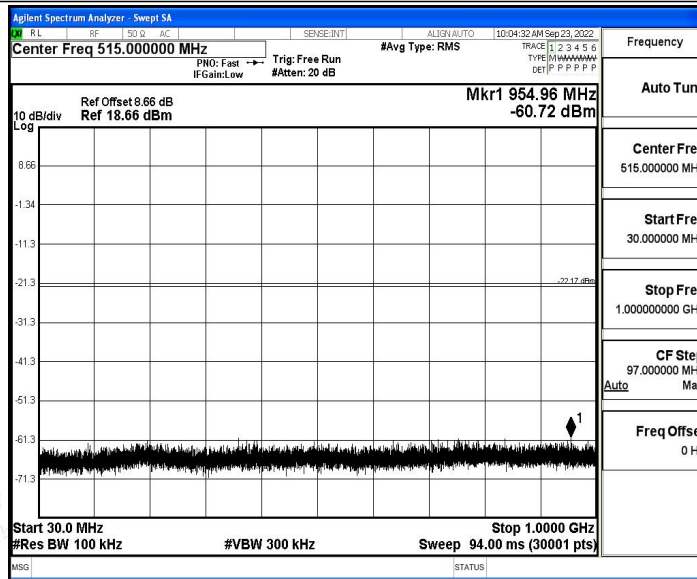


Test Graphs

BLE_1M_Ant1_2402_0~Reference

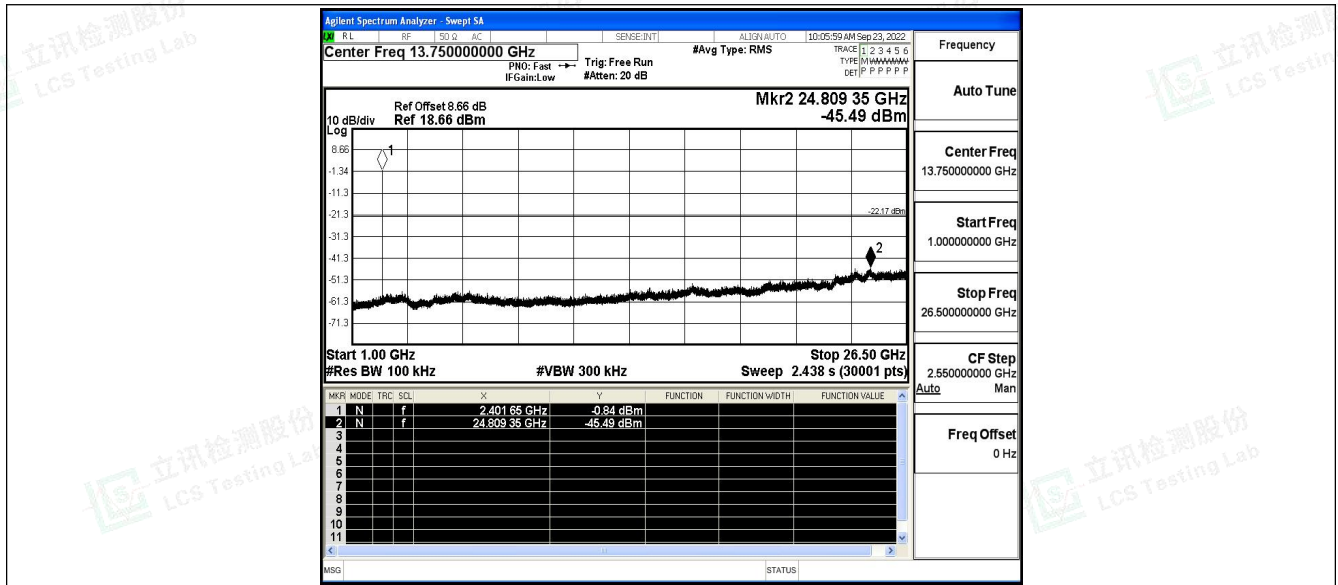


BLE_1M_Ant1_2402_30~1000

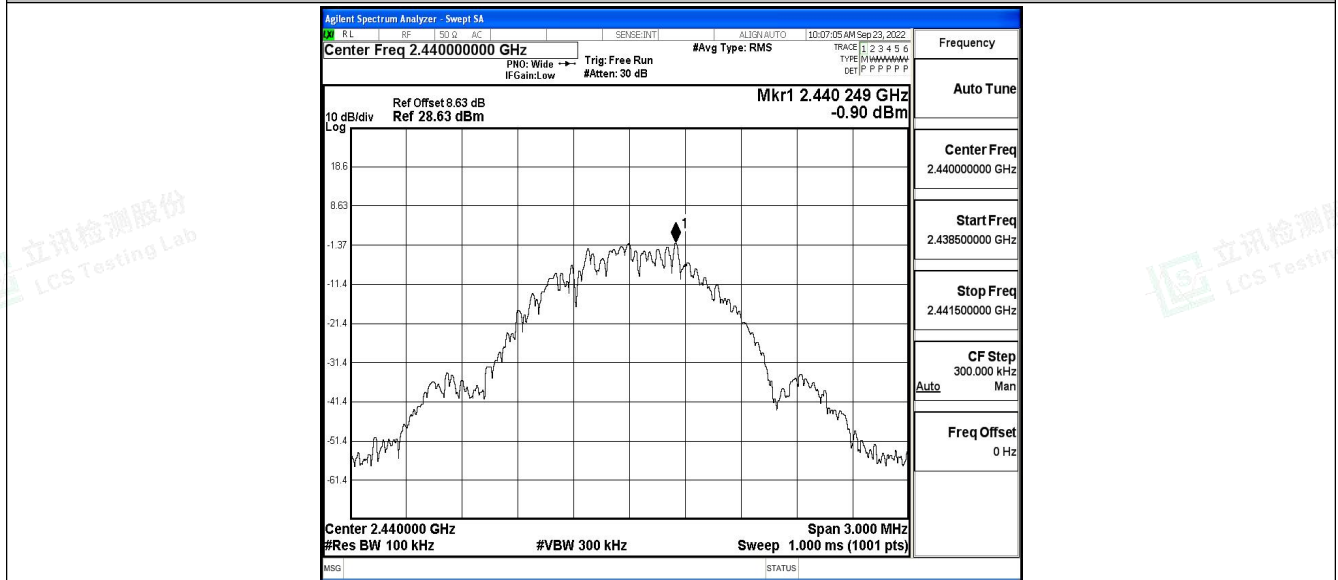


BLE_1M_Ant1_2402_1000~26500



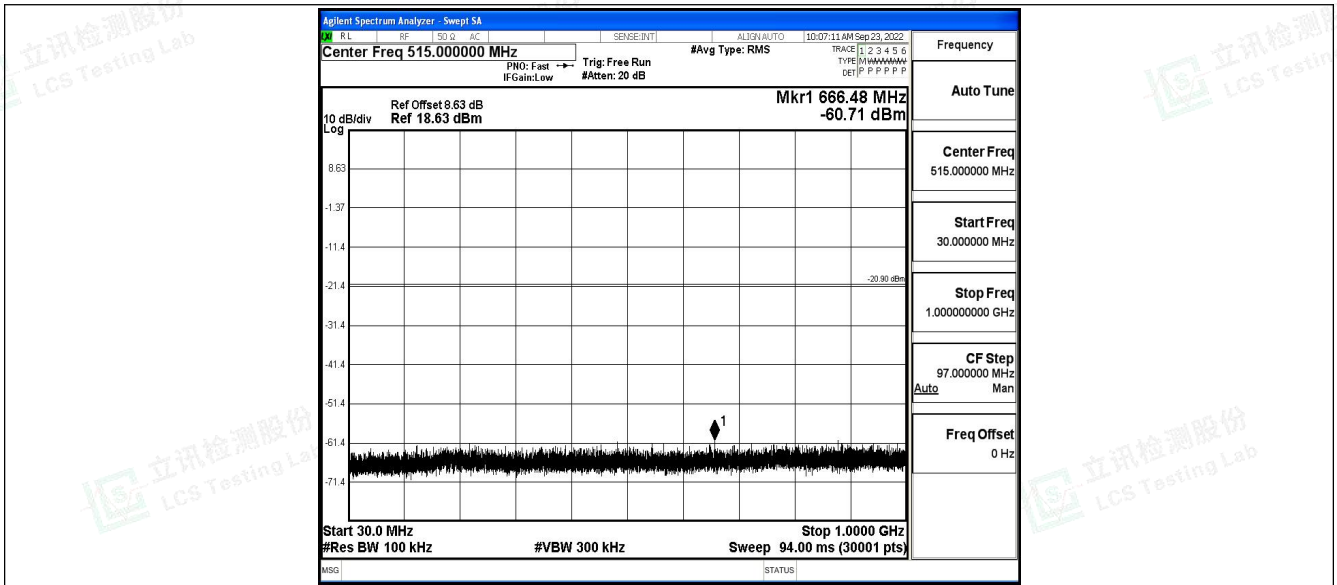


BLE_1M_Ant1_2440_0~Reference

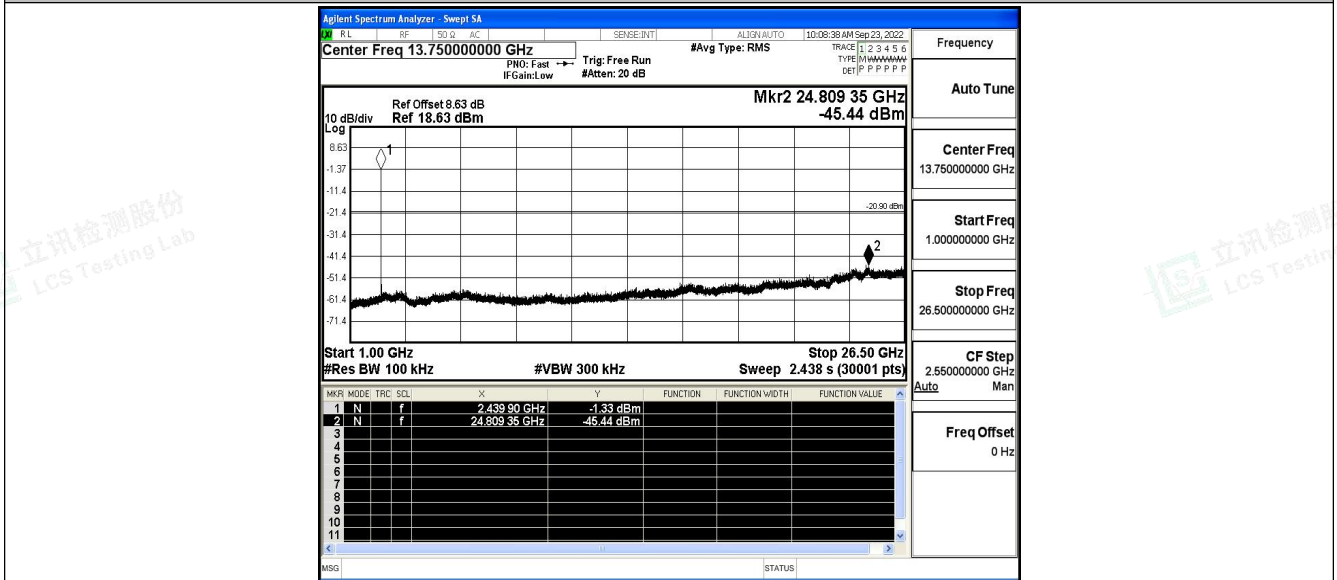


BLE_1M_Ant1_2440_30~1000



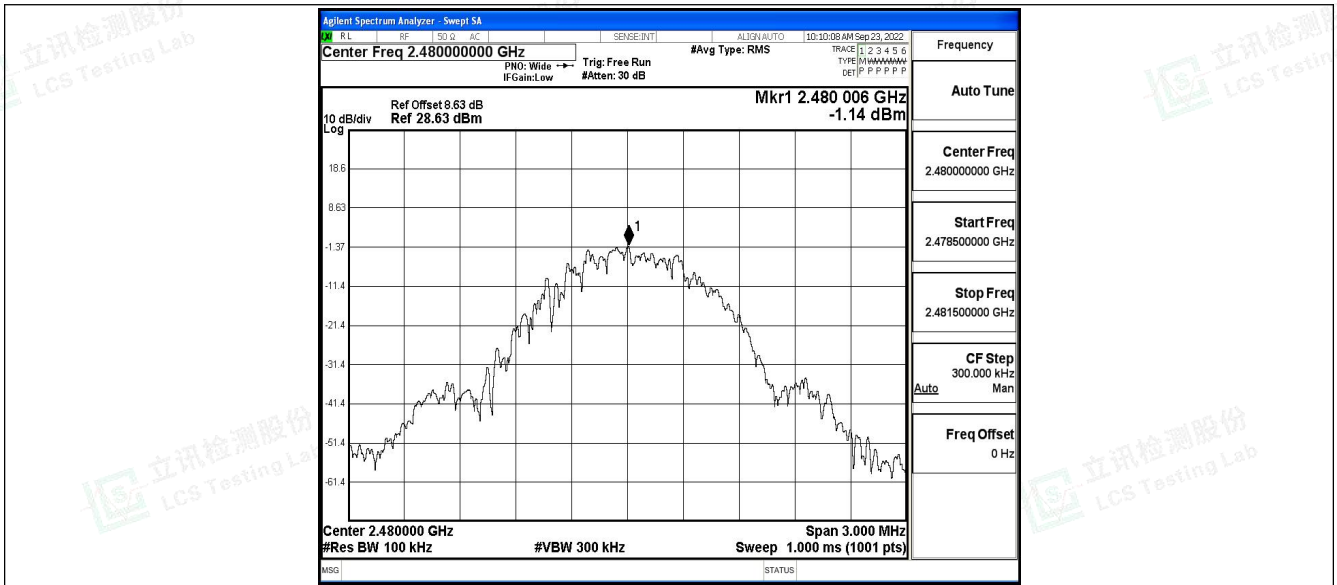


BLE_1M_Ant1_2440_1000~26500

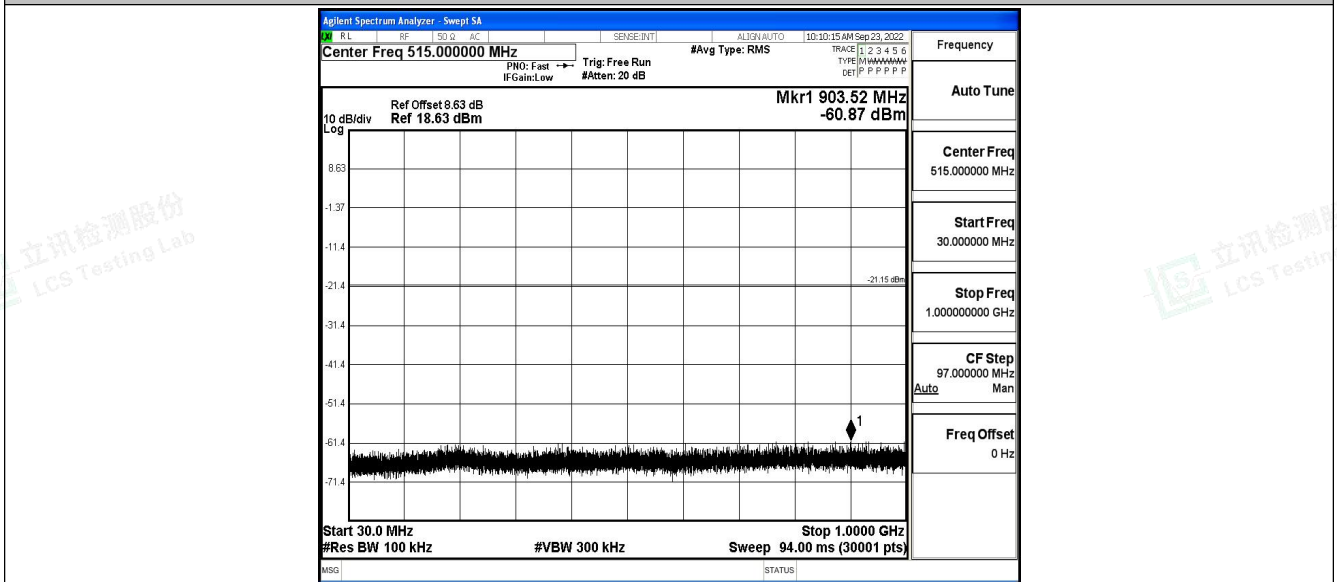


BLE_1M_Ant1_2480_0~Reference



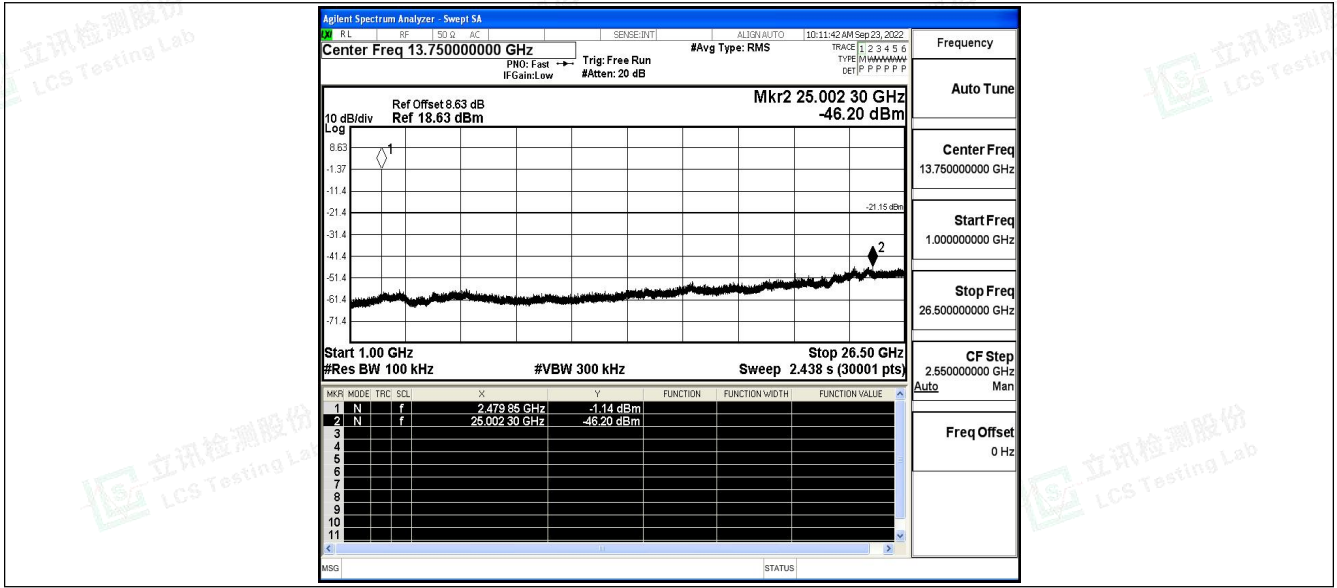


BLE_1M_Ant1_2480_30~100



BLE_1M_Ant1_2480_1000~26500







B.6 Duty Cycle

Test Result

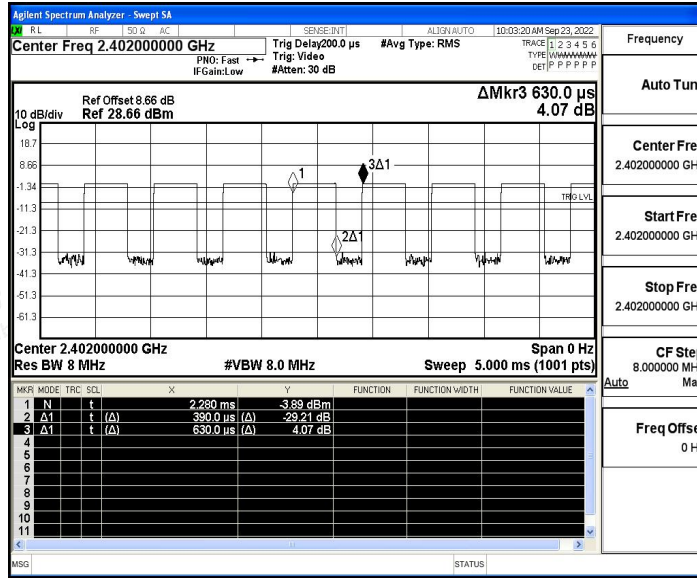
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	1/T
BLE_1M	Ant1	2402	0.39	0.63	0.6190	61.90	2.56
		2440	0.39	0.63	0.6190	61.90	2.56
		2480	0.38	0.62	0.6129	61.29	2.63



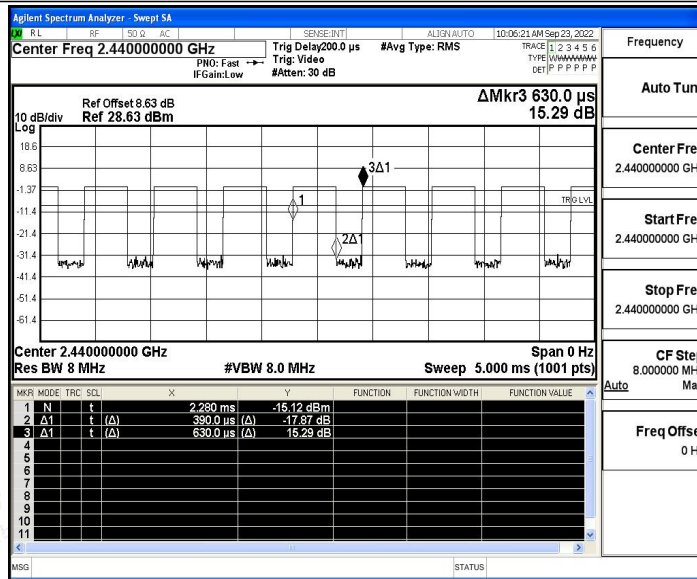


Test Graphs

BLE_1M_Ant1_2402

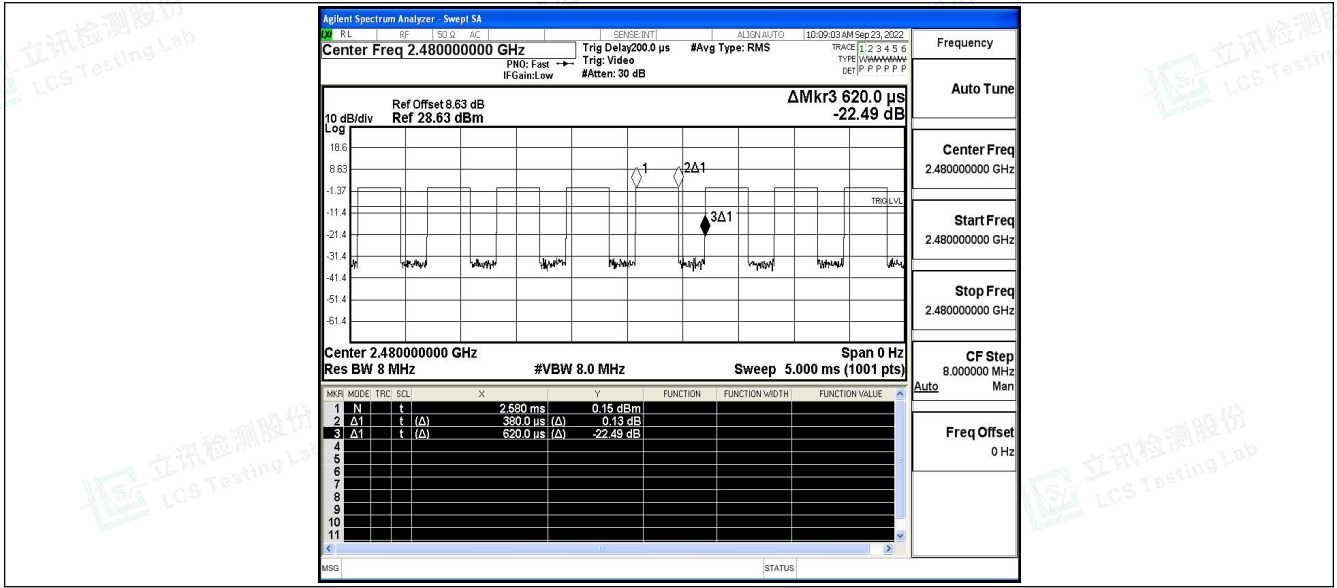


BLE_1M_Ant1_2440



BLE_1M_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	-57.58	≤-41.20	37.62	≤54	PASS
				AV	2382.950	-56.61	≤-41.20	38.59	≤54	PASS
				AV	2390.000	-57	≤-41.20	38.20	≤54	PASS
				Peak	2310.000	-51.23	≤-21.20	43.97	≤74	PASS
				Peak	2386.310	-47.74	≤-21.20	47.46	≤74	PASS
				Peak	2390.000	-50.33	≤-21.20	44.87	≤74	PASS
		High	2480	AV	2483.500	-53.57	≤-41.20	41.63	≤54	PASS
				AV	2483.520	-53.57	≤-41.20	41.63	≤54	PASS
				AV	2500.000	-56.48	≤-41.20	38.72	≤54	PASS
				Peak	2483.500	-51.46	≤-21.20	43.74	≤74	PASS
				Peak	2487.360	-47.78	≤-21.20	47.42	≤74	PASS
				Peak	2500.000	-50.38	≤-21.20	44.82	≤74	PASS

Note:

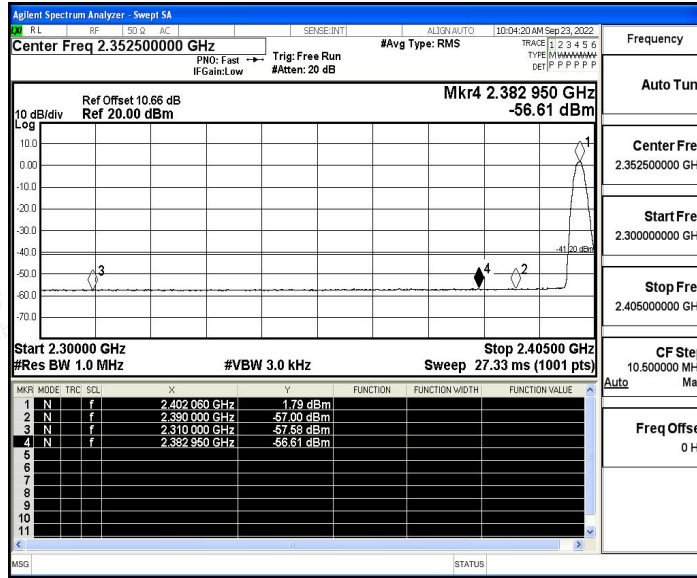
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



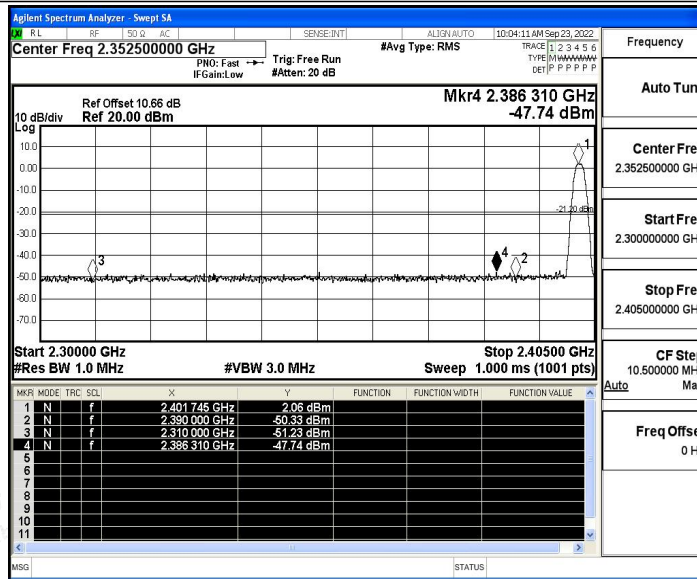


Test Graphs

BLE_1M_Ant1_Low_2402_AV

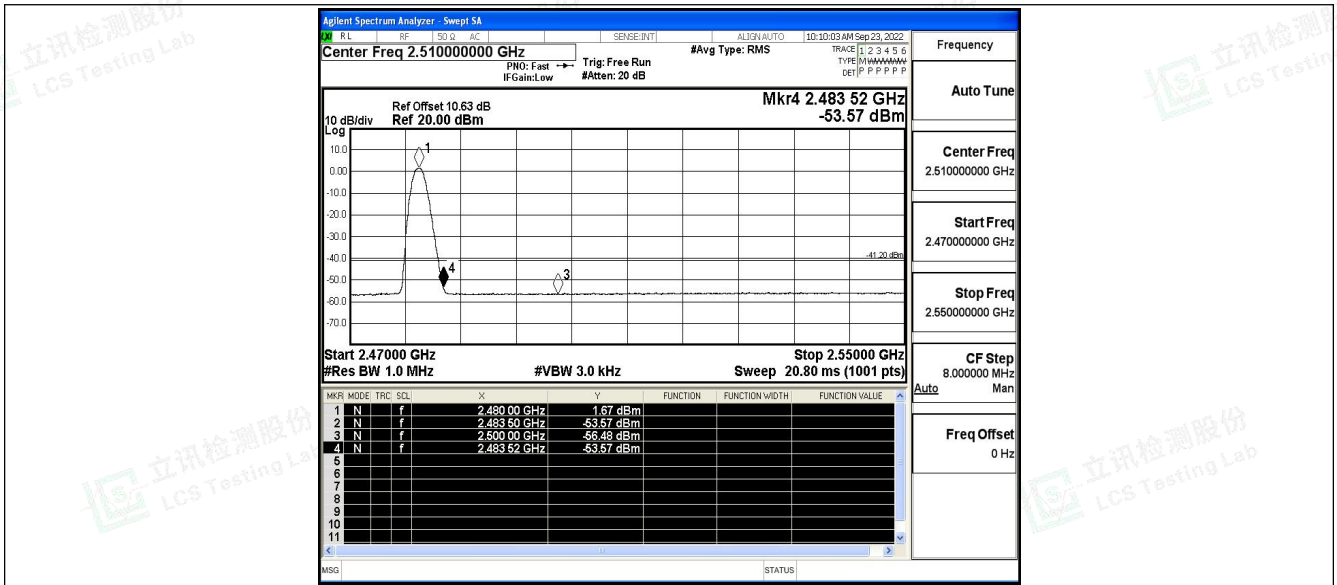


BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV





BLE_1M_Ant1_High_2480_Peak

