



Appendix A

RF Test Data for BT LE (Conducted Measurement)

Product Name: Scorpion M Series Tracker Fob

Test Model: STMFOB

Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	 Mark Chen
Supervised by:	 Li Huan



A.1 DTS Bandwidth

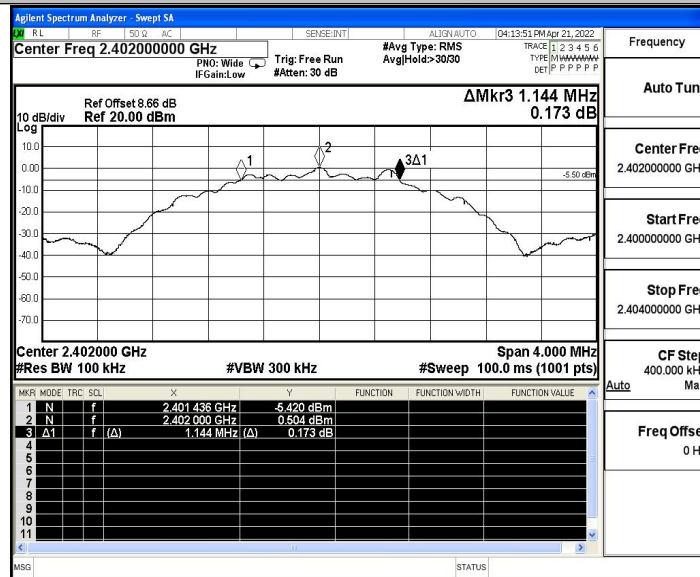
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_2M	Ant1	2402	1.144	2401.436	2402.580	0.5	PASS
		2440	1.136	2439.440	2440.576	0.5	PASS
		2480	1.136	2479.440	2480.576	0.5	PASS

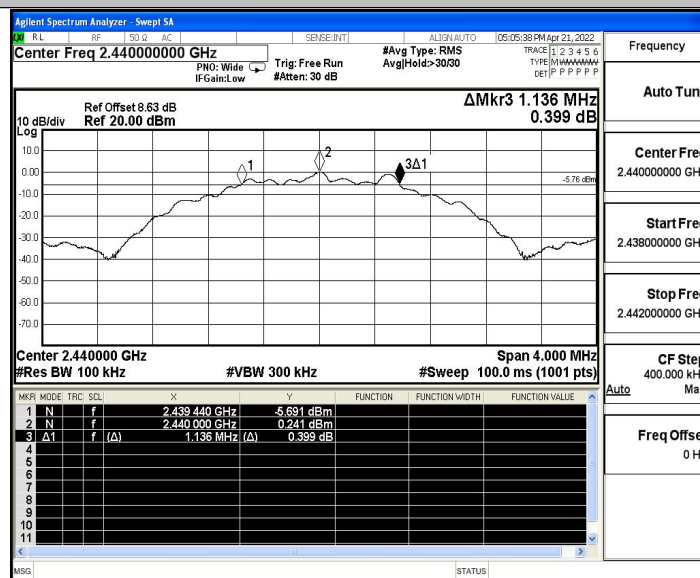


Test Graphs

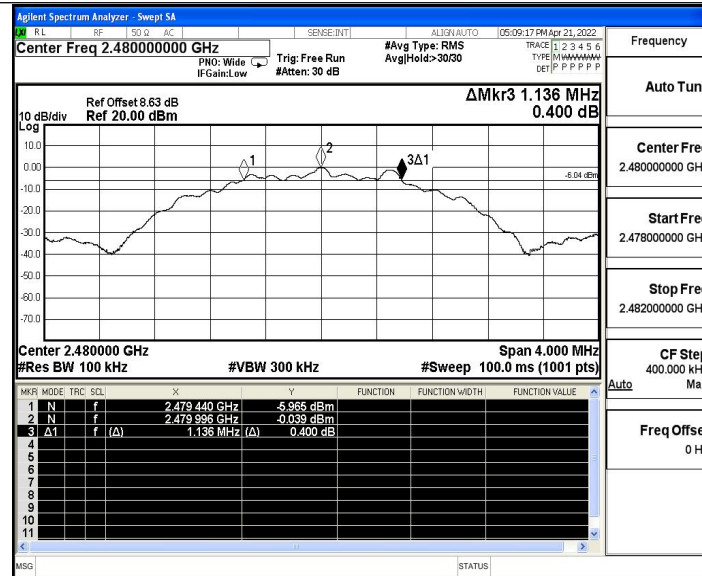
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.2 Occupied Channel Bandwidth

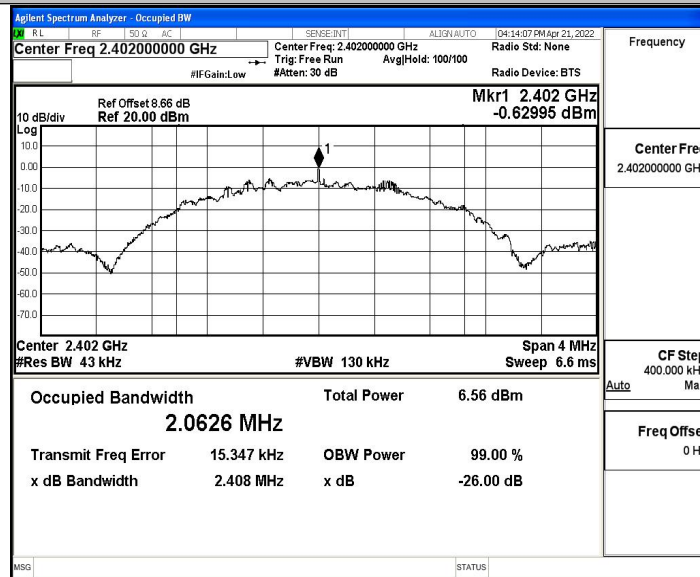
Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_2M	Ant1	2402	2.0626	2400.984	2403.047	---	---
		2440	2.0649	2438.981	2441.046	---	---
		2480	2.0807	2478.975	2481.055	---	---

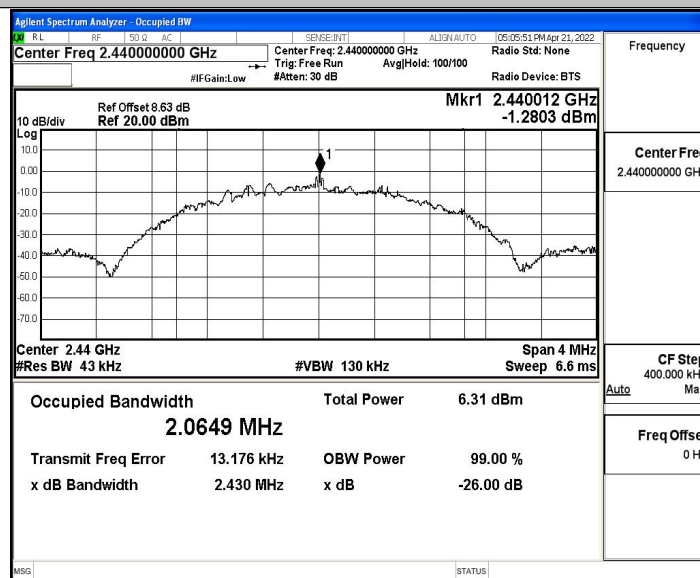


Test Graphs

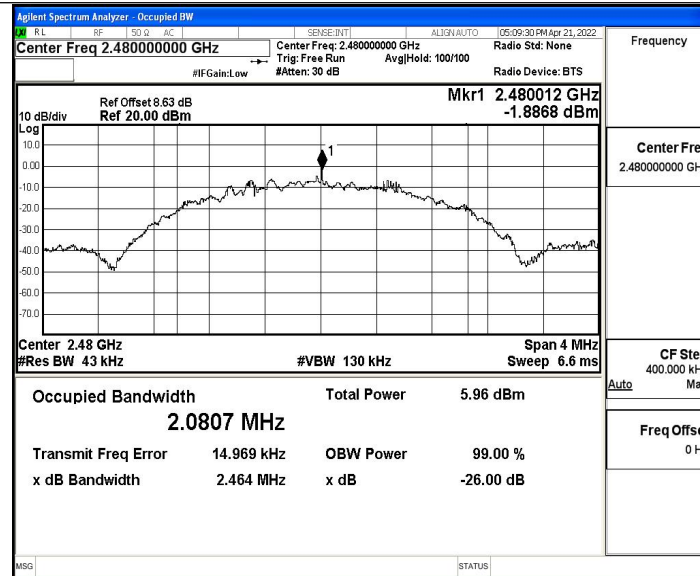
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.3 Maximum peak conducted output power

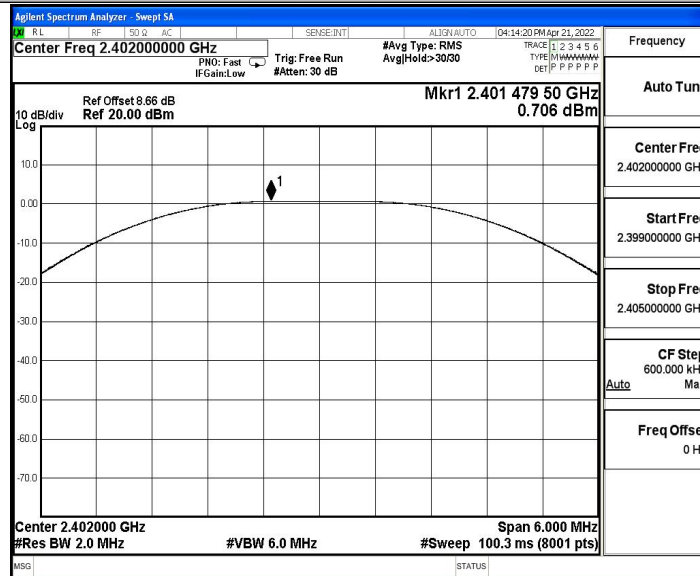
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant1	2402	0.71	≤30	PASS
		2440	0.43	≤30	PASS
		2480	0.16	≤30	PASS

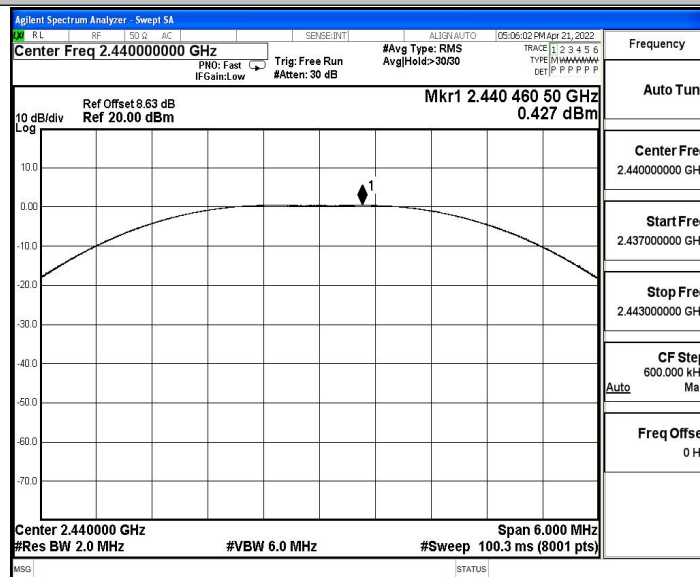


Test Graphs

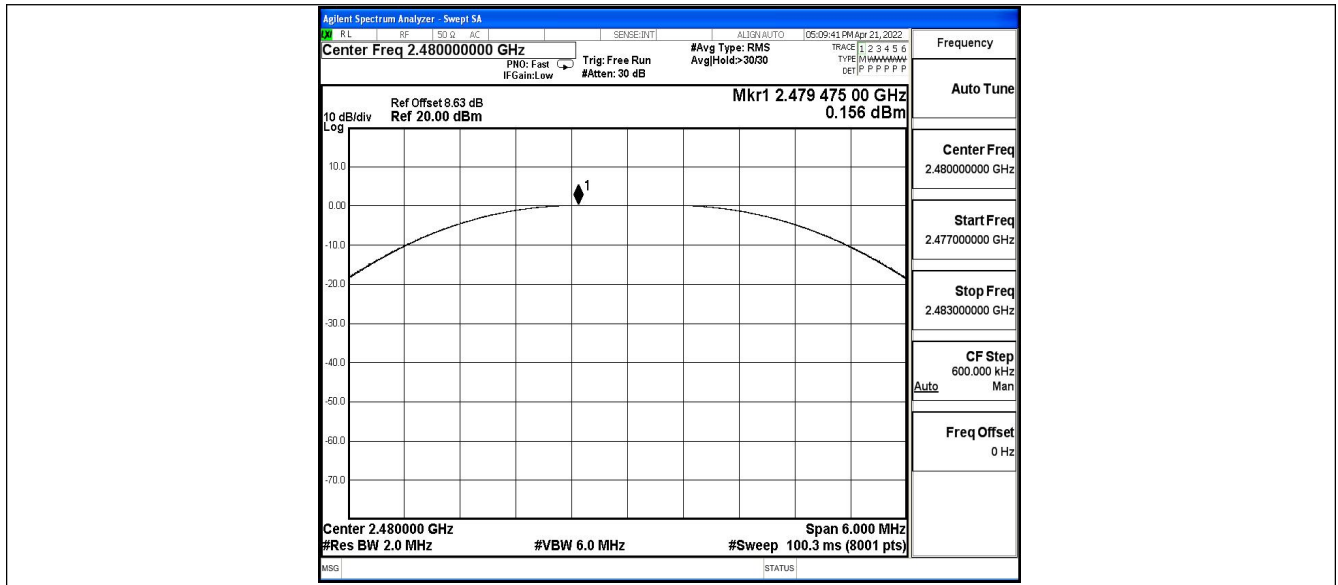
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.4 Maximum power spectral density

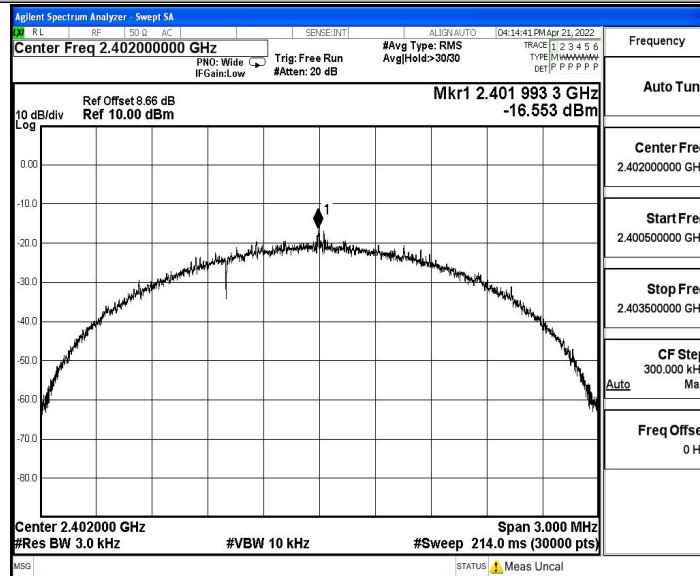
Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_2M	Ant1	2402	-16.55	≤8.00	PASS
		2440	-16.82	≤8.00	PASS
		2480	-17.71	≤8.00	PASS

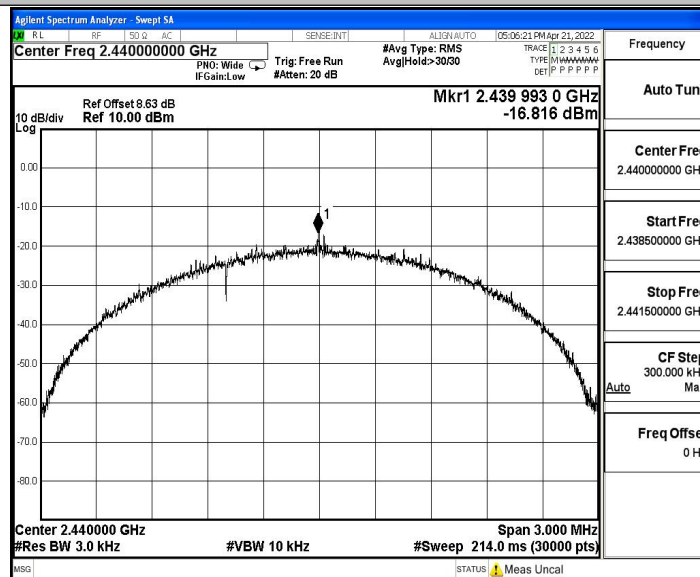


Test Graphs

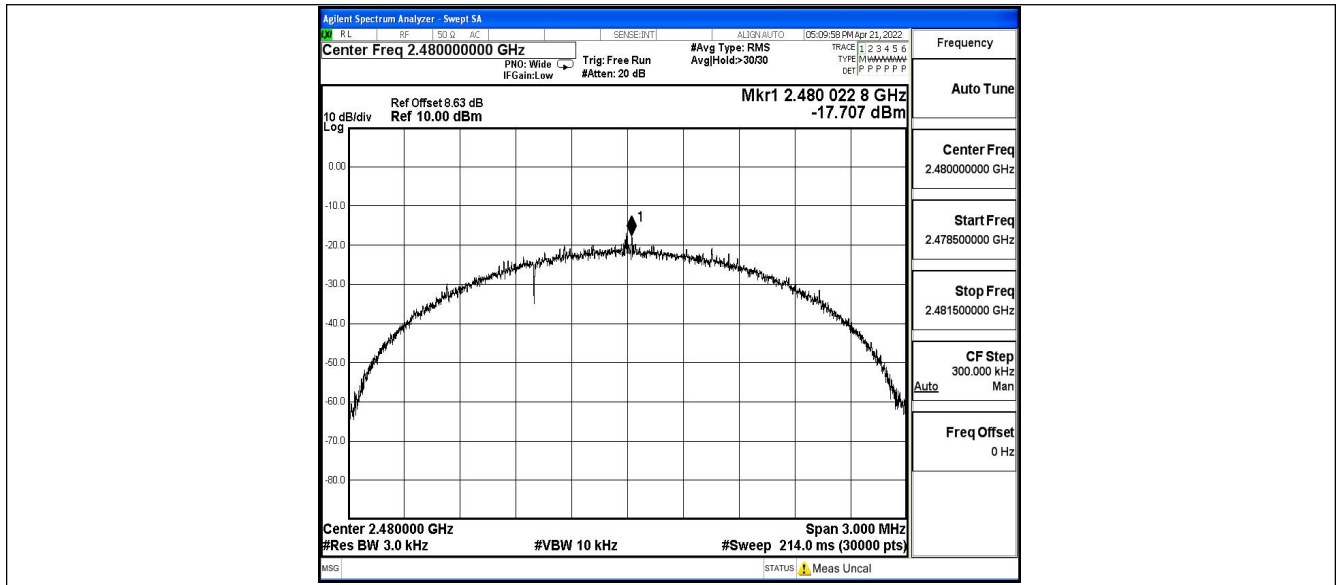
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.5 Band edge measurements

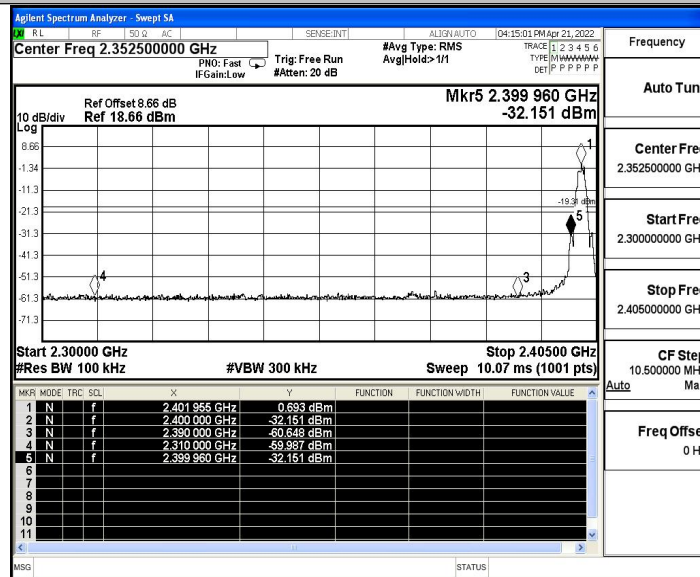
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant1	Low	2402	0.69	-32.15	≤ -19.31	PASS
		High	2480	-1.19	-54.65	≤ -21.19	PASS

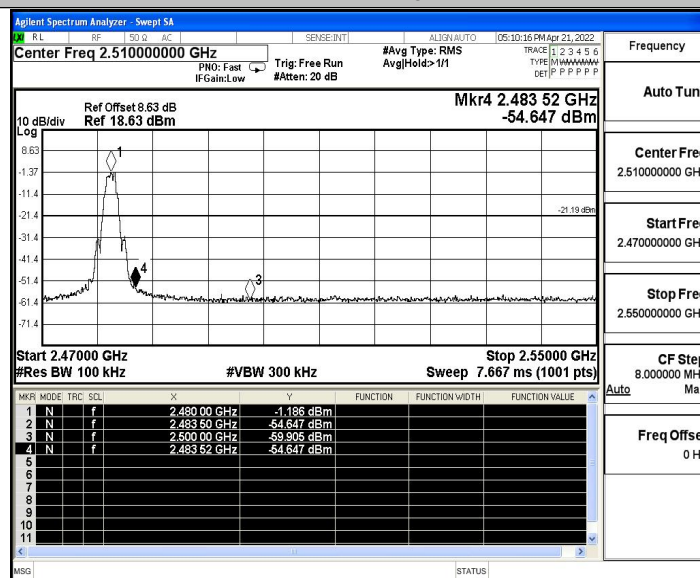


Test Graphs

BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480





A.6 Conducted Spurious Emission

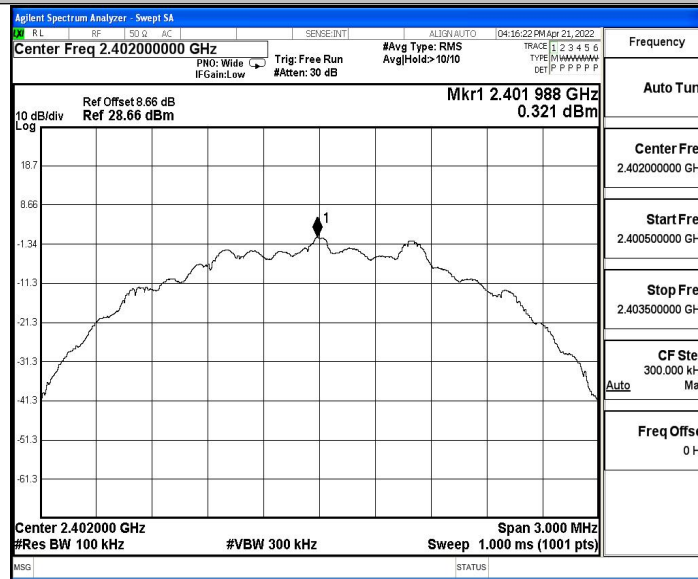
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant1	2402	Reference	0.32	0.32	---	PASS
			30~1000	0.32	-53.84	≤ -19.68	PASS
			1000~26500	0.32	-44.65	≤ -19.68	PASS
		2440	Reference	0.28	0.28	---	PASS
			30~1000	0.28	-53.22	≤ -19.72	PASS
			1000~26500	0.28	-45.91	≤ -19.72	PASS
		2480	Reference	-0.03	-0.03	---	PASS
			30~1000	-0.03	-53.26	≤ -20.03	PASS
			1000~26500	-0.03	-45.03	≤ -20.03	PASS

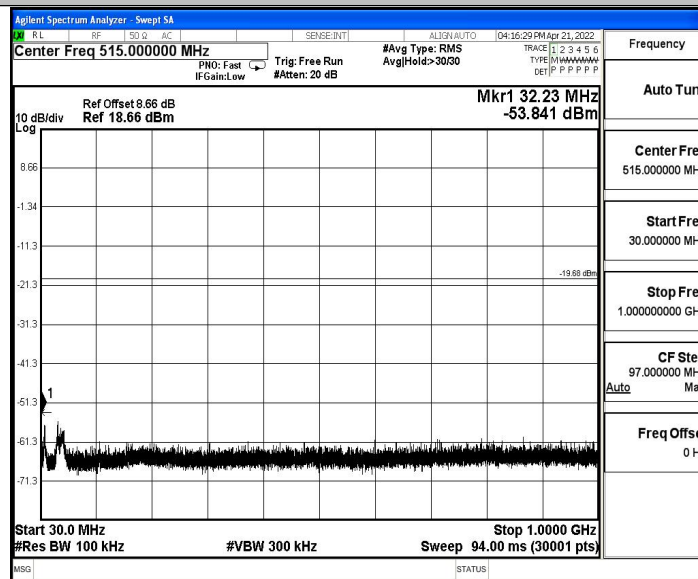


Test Graphs

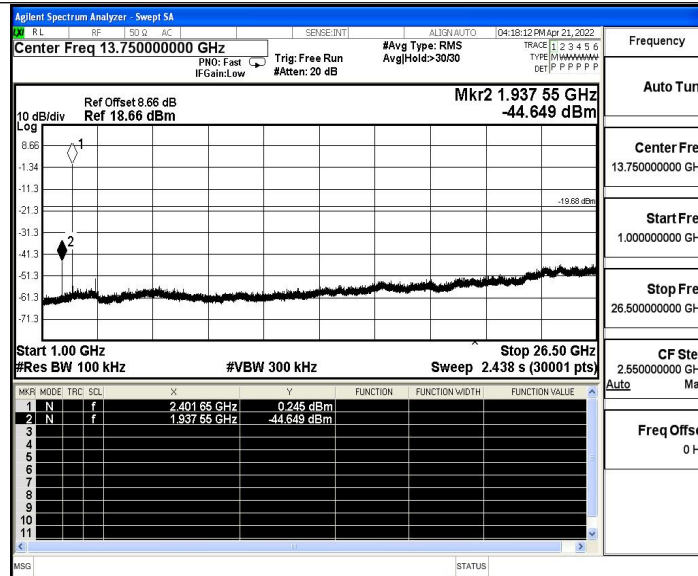
BLE_2M_Ant1_2402_0~Reference



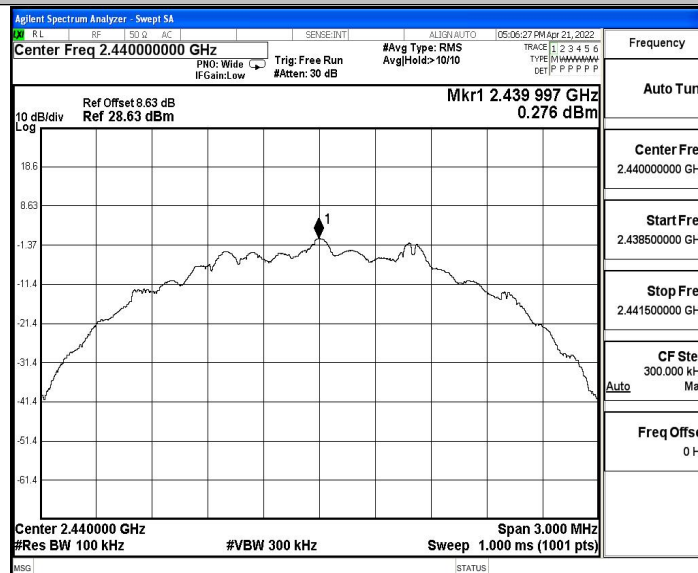
BLE_2M_Ant1_2402_30~1000



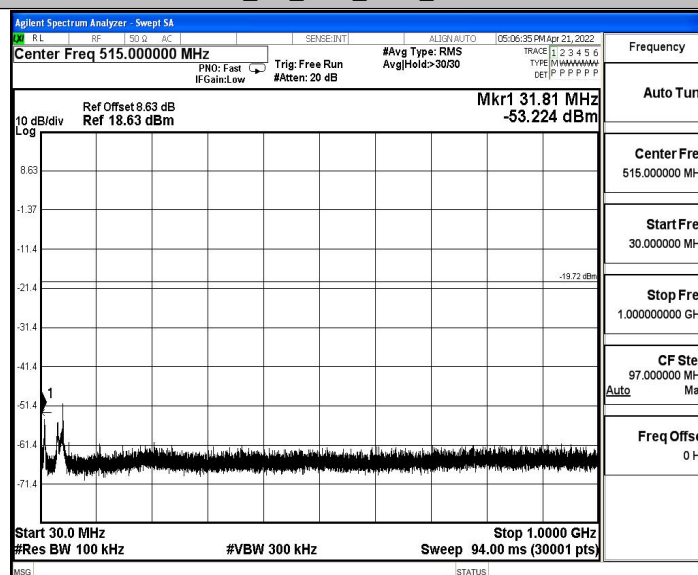
BLE_2M_Ant1_2402_1000~26500



BLE_2M_Ant1_2440_0~Reference

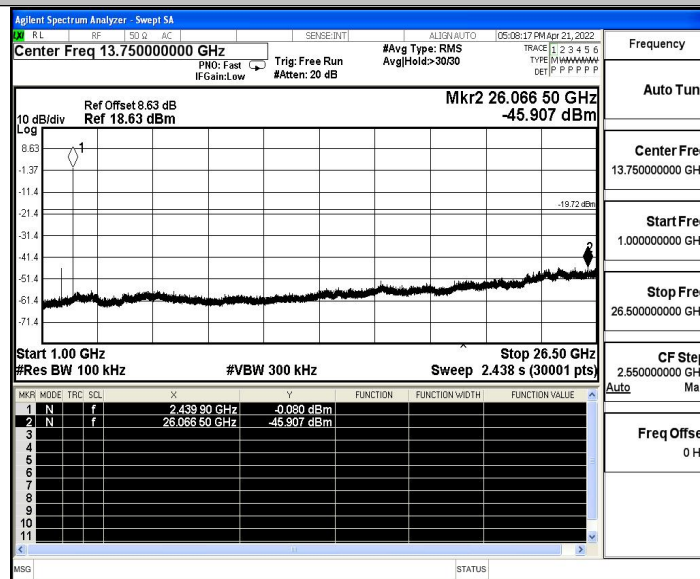


BLE_2M_Ant1_2440_30~1000

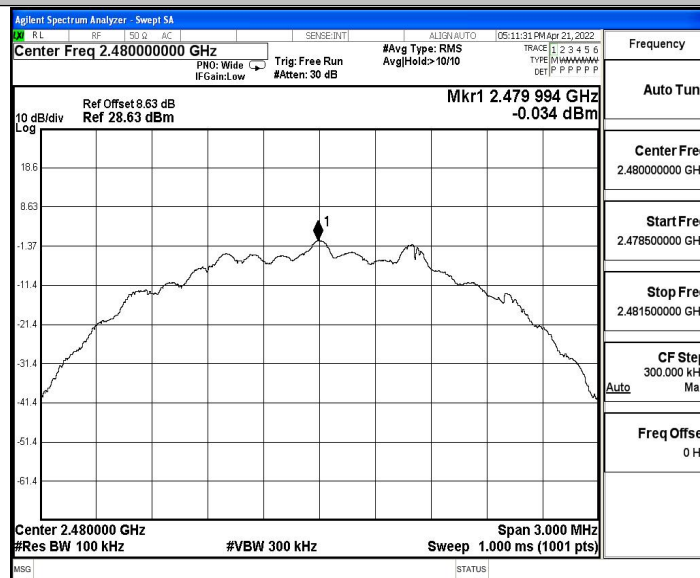




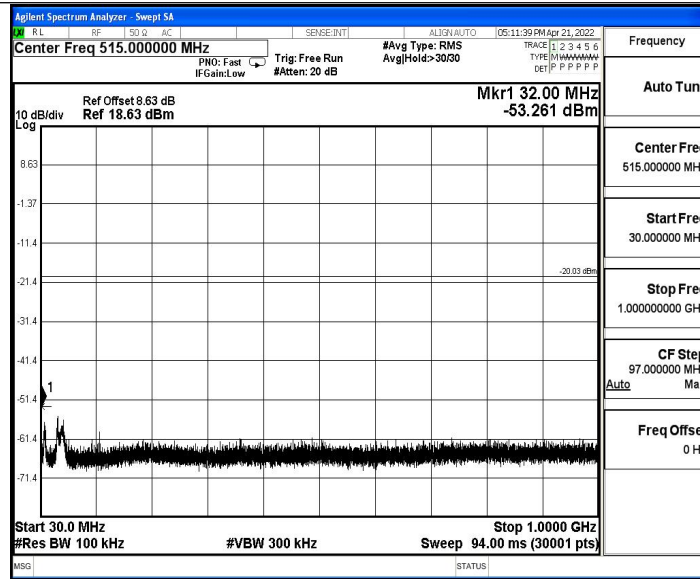
BLE_2M_Ant1_2440_1000~26500



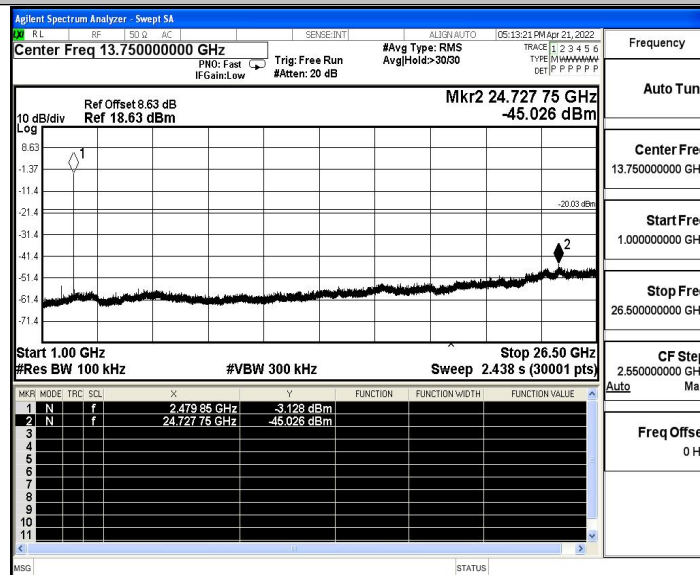
BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500





A.7 Duty Cycle

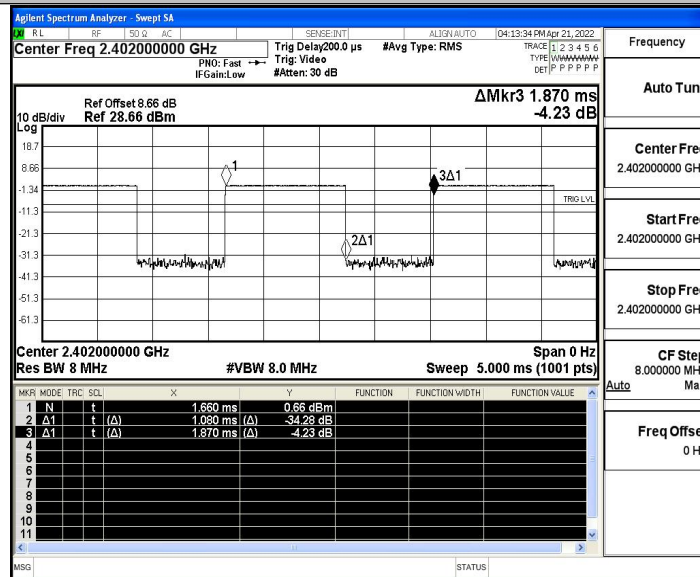
Test Result

TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	1/T[kHz]
BLE_2M	Ant1	2402	1.08	1.87	0.5775	57.75	2.38	0.93
		2440	1.08	1.87	0.5775	57.75	2.38	0.93
		2480	1.08	1.87	0.5775	57.75	2.38	0.93

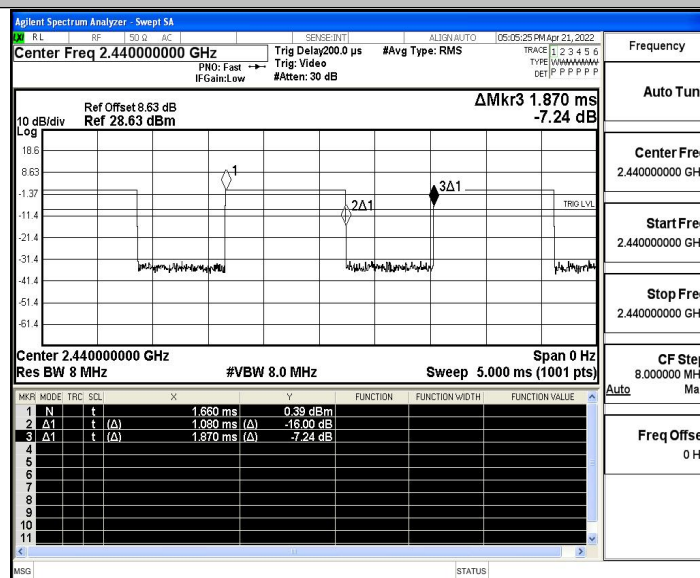


Test Graphs

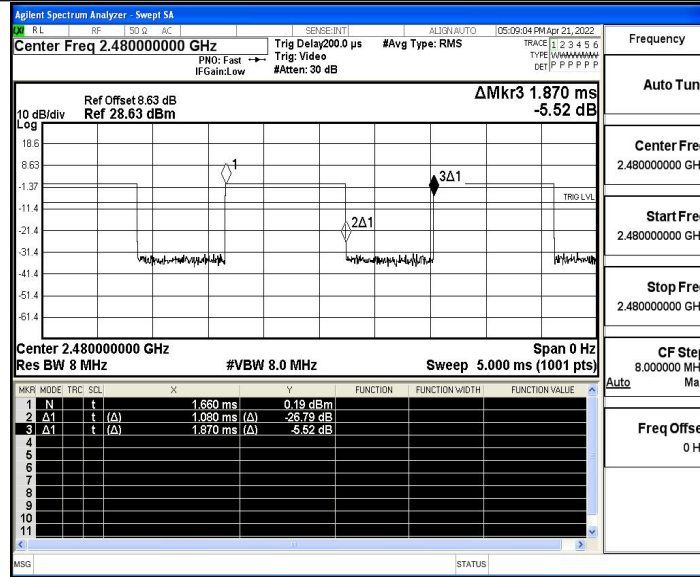
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.8 Emissions in Restricted Bands

Test Result

TestMode	Antenna	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict	
BLE	Ant1	Low	2402	AV	2310.000	-57.71	≤-41.20	37.49	≤54	PASS
				AV	2369.615	-55.86	≤-41.20	39.34	≤54	PASS
				AV	2390.000	-56.74	≤-41.20	38.46	≤54	PASS
				Peak	2310.000	-47.54	≤-21.20	47.66	≤74	PASS
				Peak	2384.525	-46.03	≤-21.20	49.17	≤74	PASS
				Peak	2390.000	-47.84	≤-21.20	47.36	≤74	PASS
		High	2480	AV	2483.500	-47.58	≤-41.20	47.62	≤54	PASS
				AV	2483.520	-47.58	≤-41.20	47.62	≤54	PASS
				AV	2500.000	-56.68	≤-41.20	38.52	≤54	PASS
				Peak	2483.500	-37.36	≤-21.20	57.84	≤74	PASS
				Peak	2483.520	-37.36	≤-21.20	57.84	≤74	PASS
				Peak	2500.000	-48.13	≤-21.20	47.07	≤74	PASS

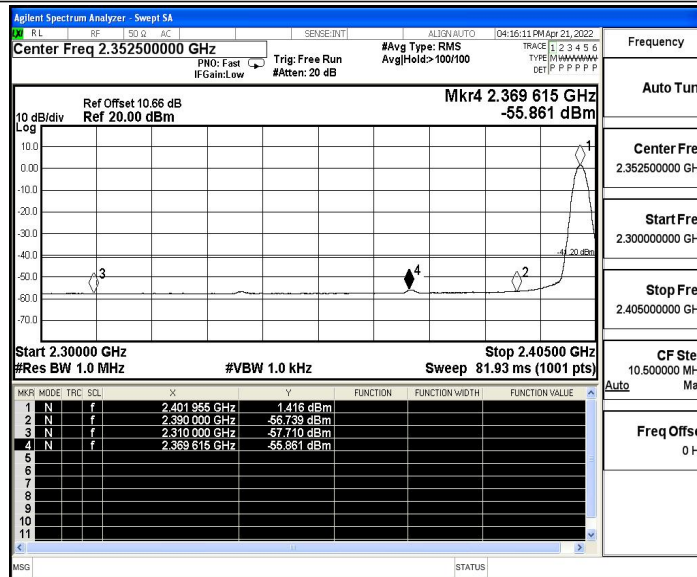
Note:

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.

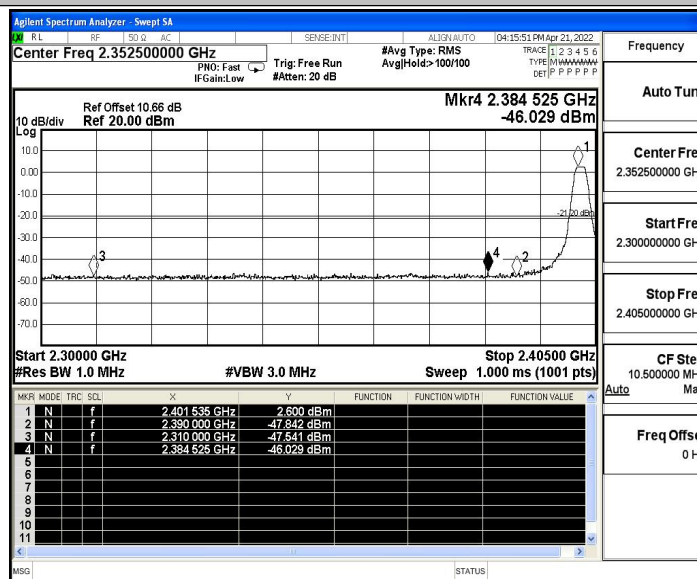


Test Graphs

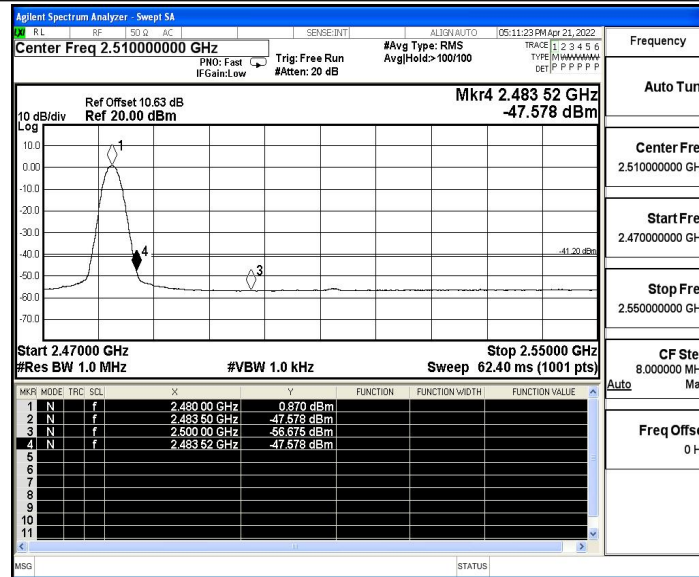
BLE_Ant1_Low_2402_AV



BLE_Ant1_Low_2402_Peak



BLE_Ant1_High_2480_AV



BLE_Ant1_High_2480_Peak

