



Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: Mibro Watch A1

Test Model: XPAW007

Environmental Conditions

Temperature:	21.1° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Mark Chen
Supervised by:	Libin

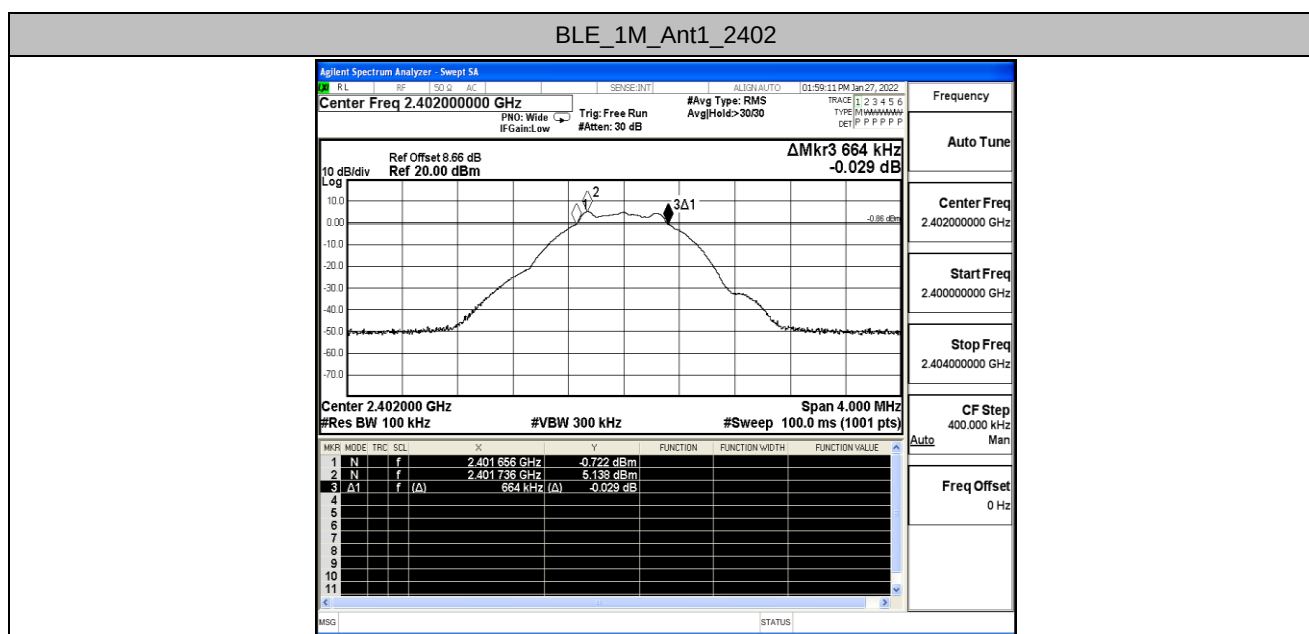


A.1 6dB Bandwidth

Test Result

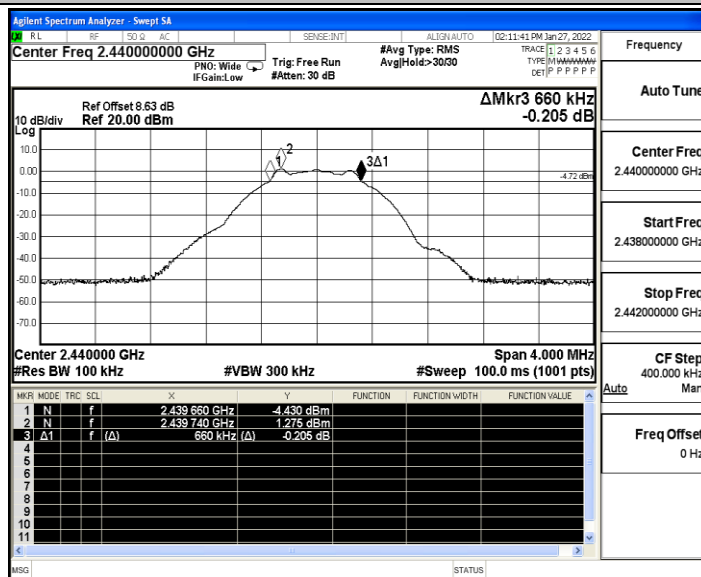
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.664	2401.656	2402.320	0.5	PASS
		2440	0.660	2439.660	2440.320	0.5	PASS
		2480	0.664	2479.656	2480.320	0.5	PASS
BLE_2M	Ant1	2402	1.160	2401.408	2402.568	0.5	PASS
		2440	1.160	2439.408	2440.568	0.5	PASS
		2480	1.160	2479.408	2480.568	0.5	PASS

Test Graphs

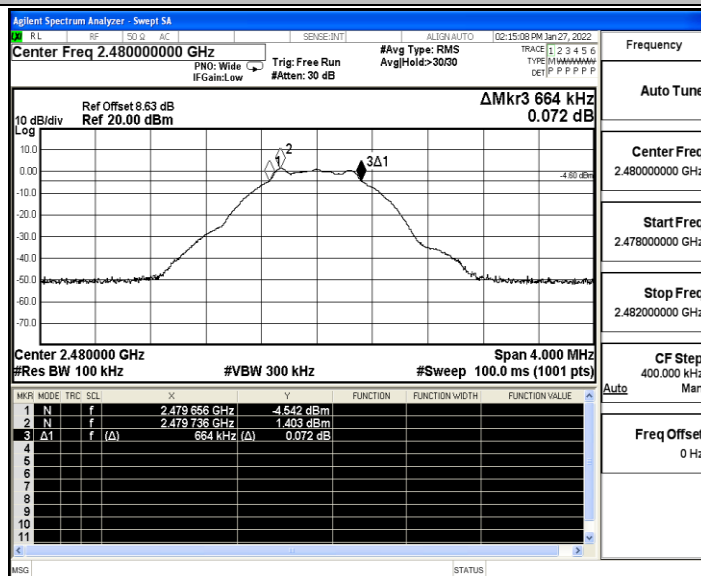




BLE_1M_Ant1_2440

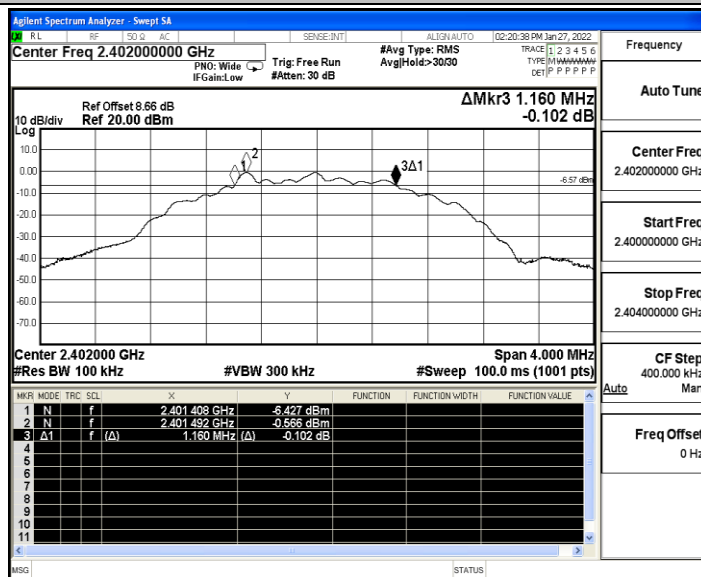


BLE_1M_Ant1_2480

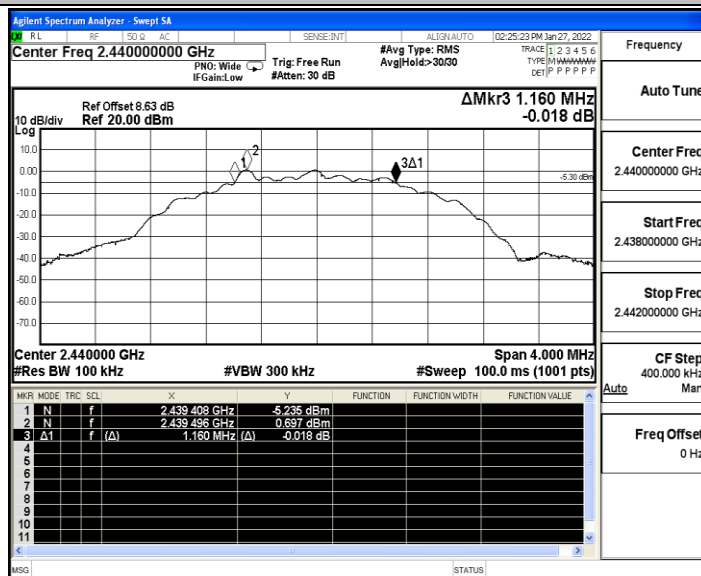




BLE_2M_Ant1_2402

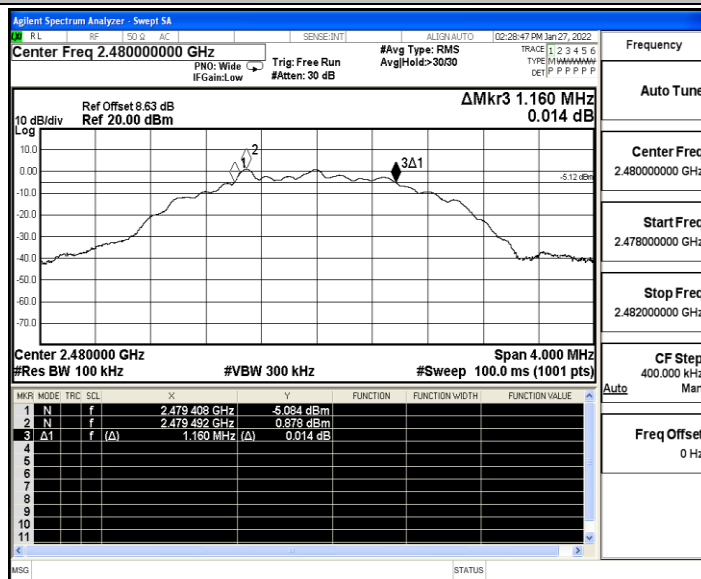


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





A.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.25	≤30	PASS
		2440	1.46	≤30	PASS
		2480	1.6	≤30	PASS
BLE_2M	Ant1	2402	0.29	≤30	PASS
		2440	1.52	≤30	PASS
		2480	1.72	≤30	PASS

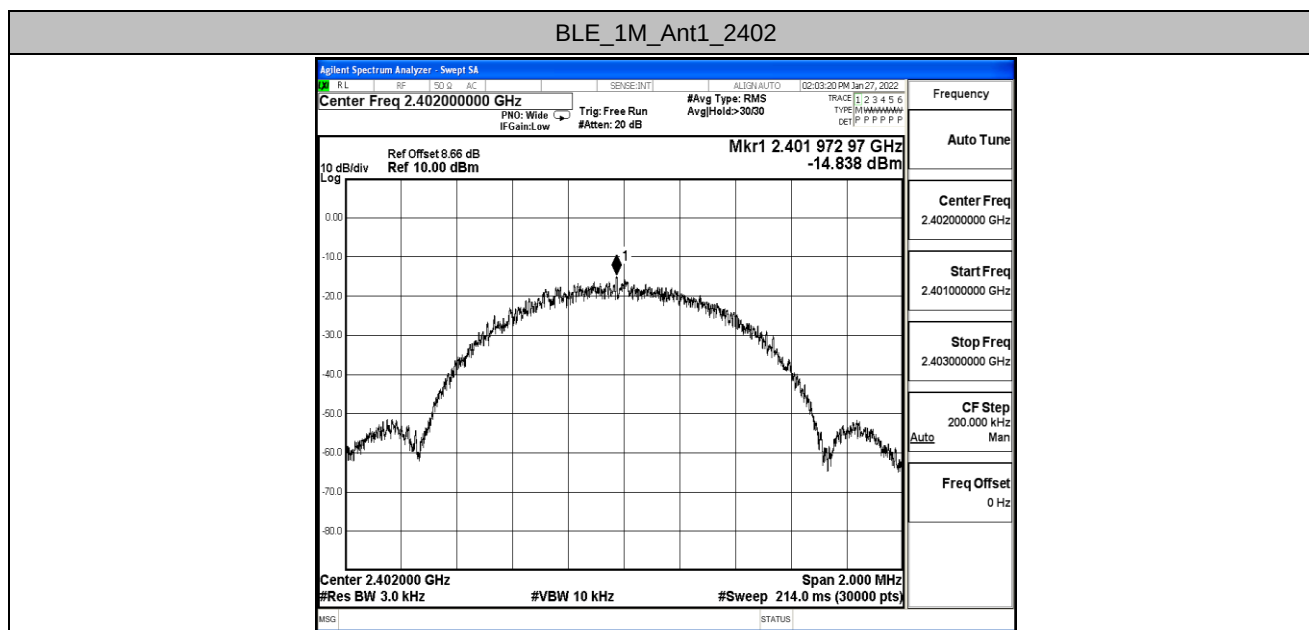


A.3 Maximum power spectral density

Test Result

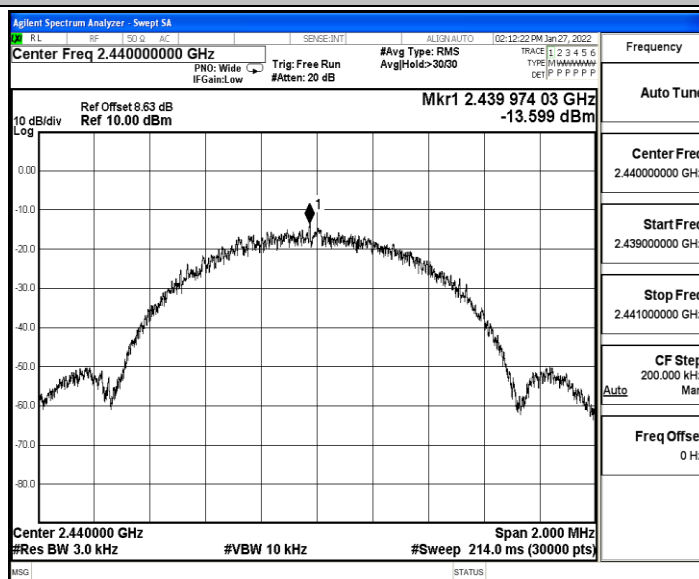
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-14.84	≤8.00	PASS
		2440	-13.62	≤8.00	PASS
		2480	-13.44	≤8.00	PASS
BLE_2M	Ant1	2402	-17.88	≤8.00	PASS
		2440	-16.66	≤8.00	PASS
		2480	-16.45	≤8.00	PASS

Test Graphs

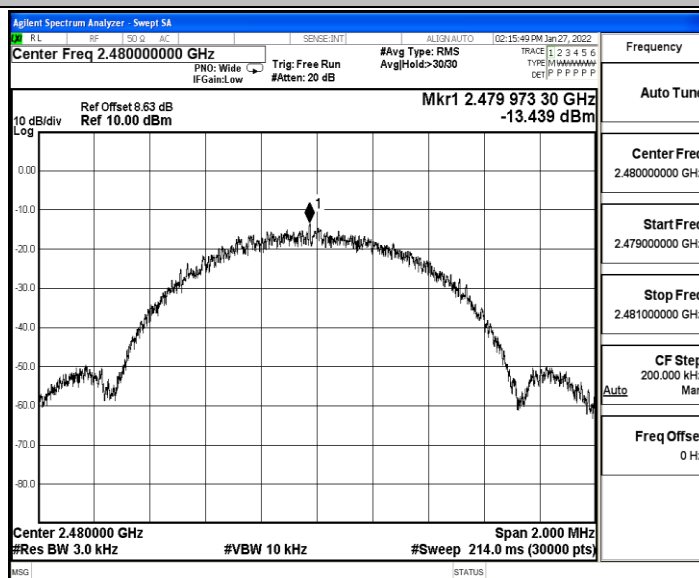




BLE_1M_Ant1_2440

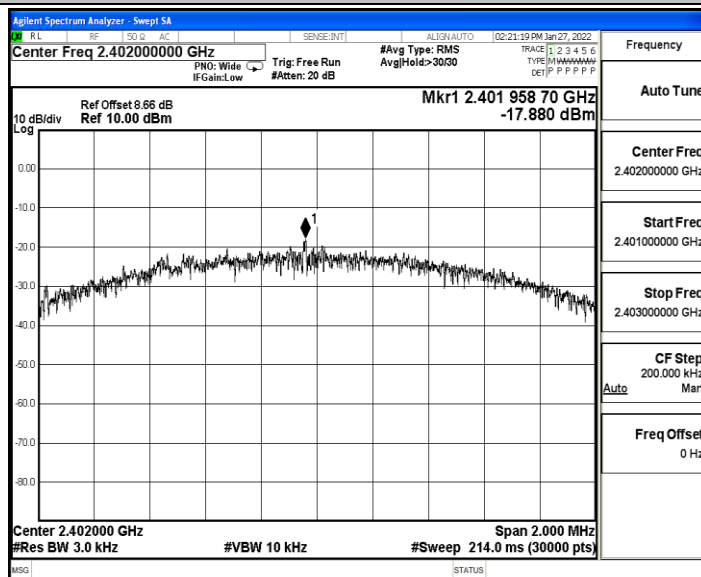


BLE_1M_Ant1_2480

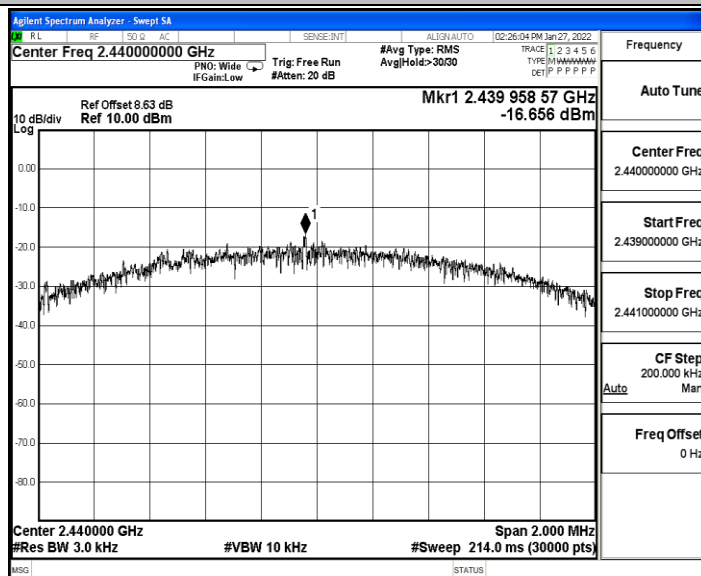




BLE_2M_Ant1_2402

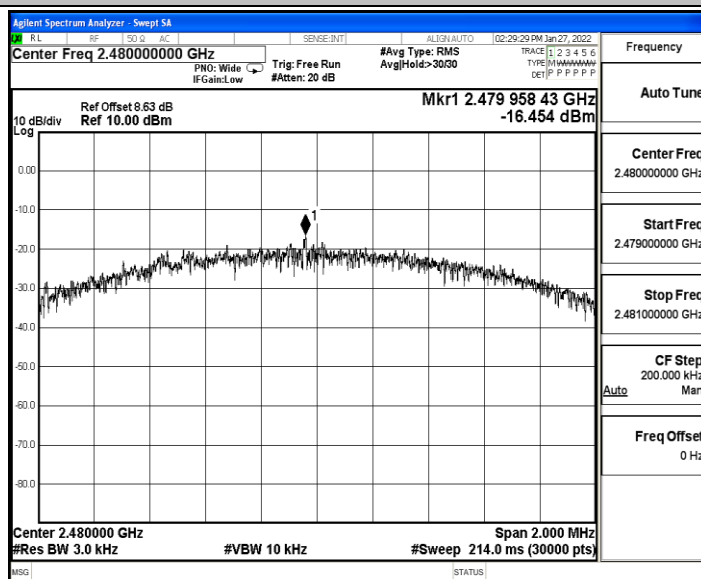


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480



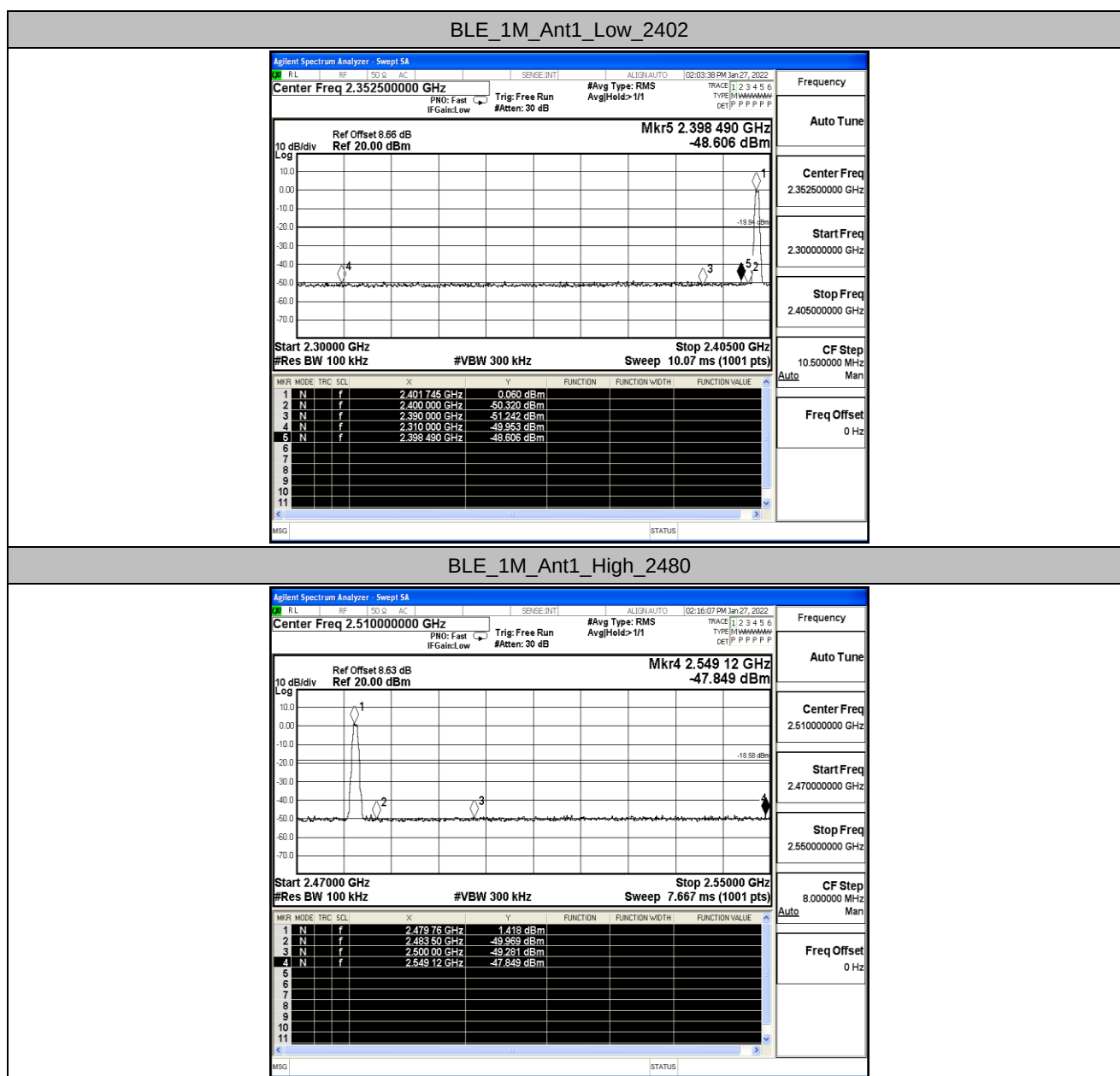


A.4 Band edge measurements

Test Result

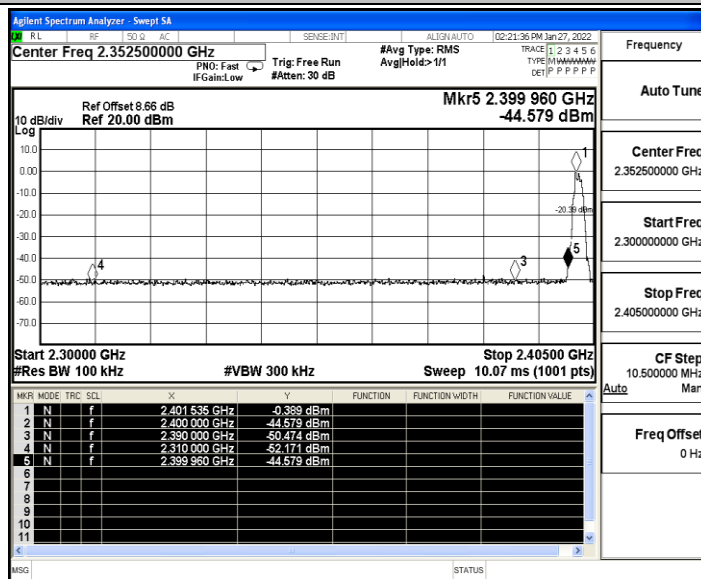
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.06	-48.61	≤-19.94	PASS
		High	2480	1.42	-47.85	≤-18.58	PASS
BLE_2M	Ant1	Low	2402	-0.39	-44.58	≤-20.39	PASS
		High	2480	1.05	-47.74	≤-18.95	PASS

Test Graphs

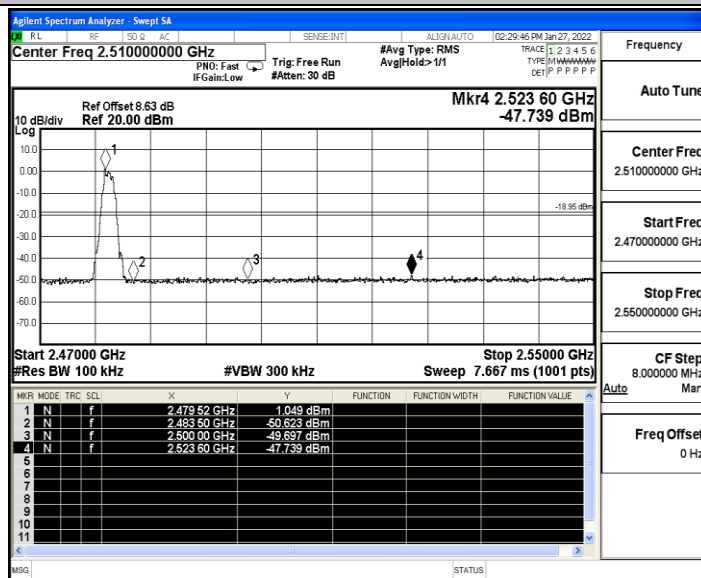




BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480





A.5 Conducted Spurious Emission

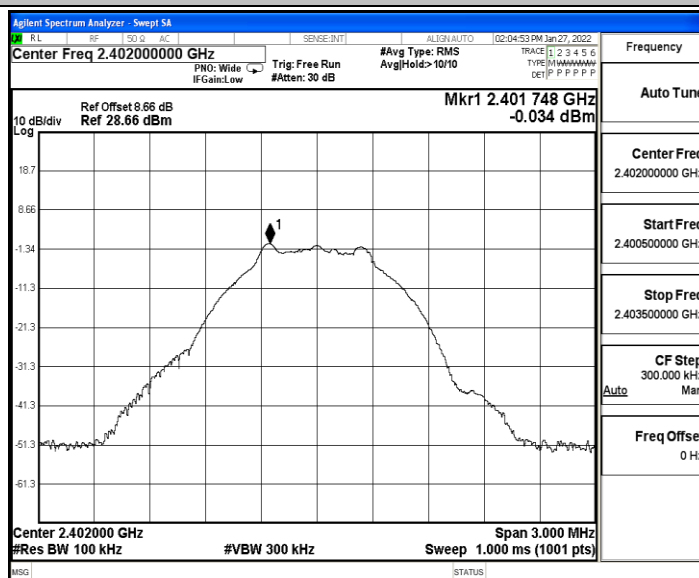
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.05	-0.05	---	PASS
			30~1000	-0.05	-61.08	≤-20.05	PASS
			1000~26500	-0.05	-45.92	≤-20.05	PASS
		2440	Reference	1.25	1.25	---	PASS
			30~1000	1.25	-60.38	≤-18.75	PASS
			1000~26500	1.25	-46.09	≤-18.75	PASS
		2480	Reference	1.39	1.39	---	PASS
			30~1000	1.39	-61.03	≤-18.61	PASS
			1000~26500	1.39	-46.66	≤-18.61	PASS
BLE_2M	Ant1	2402	Reference	-0.58	-0.58	---	PASS
			30~1000	-0.58	-60.86	≤-20.58	PASS
			1000~26500	-0.58	-46.8	≤-20.58	PASS
		2440	Reference	0.67	0.67	---	PASS
			30~1000	0.67	-60.73	≤-19.33	PASS
			1000~26500	0.67	-45.7	≤-19.33	PASS
		2480	Reference	0.83	0.83	---	PASS
			30~1000	0.83	-60.54	≤-19.17	PASS
			1000~26500	0.83	-45.81	≤-19.17	PASS

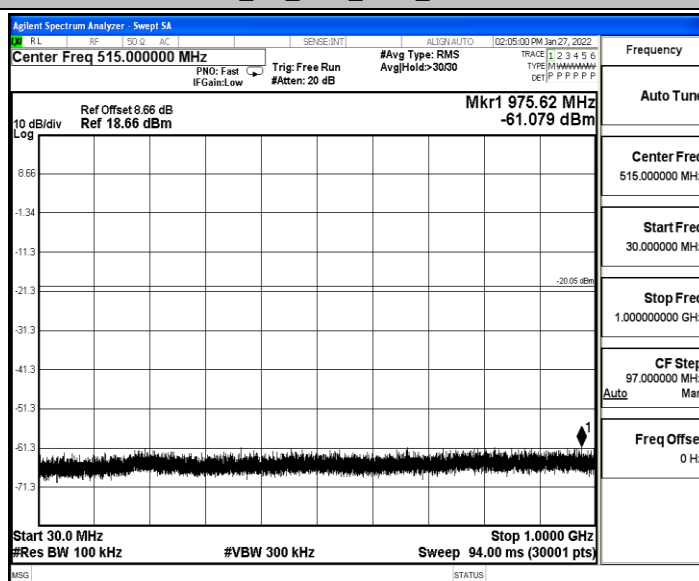


Test Graphs

BLE_1M_Ant1_2402_0~Reference

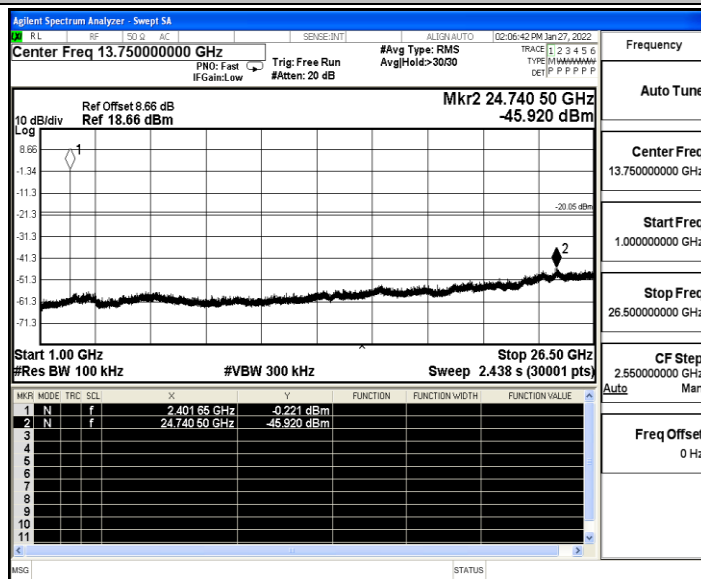


BLE_1M_Ant1_2402_30~1000

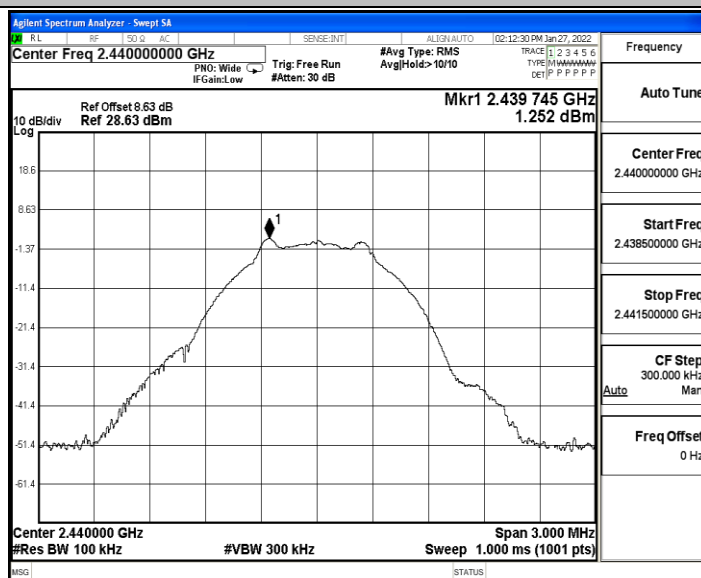




BLE_1M_Ant1_2402_1000~26500

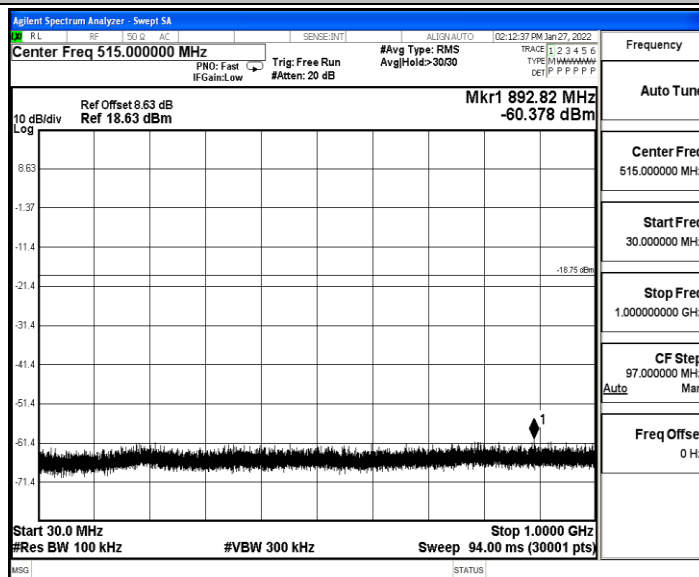


BLE_1M_Ant1_2440_0~Reference

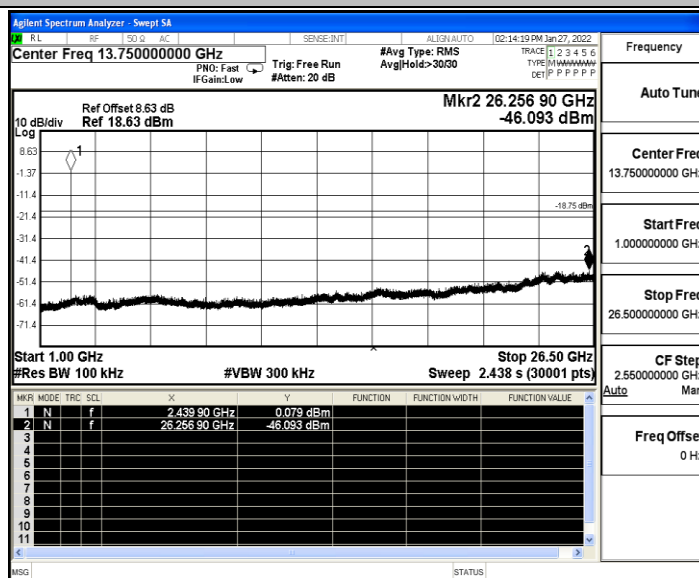




BLE_1M_Ant1_2440_30~1000

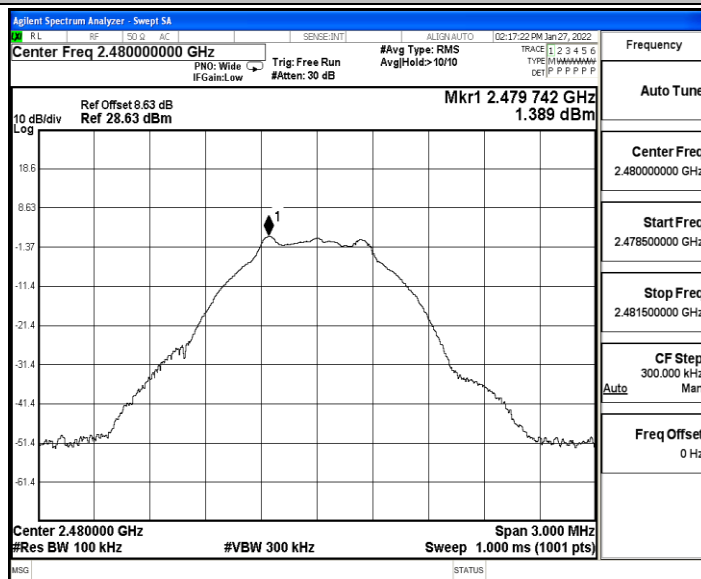


BLE_1M_Ant1_2440_1000~26500

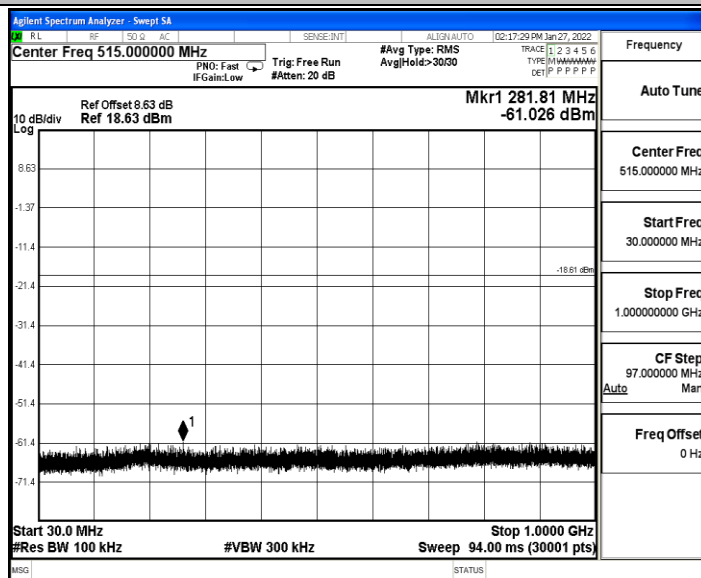




BLE_1M_Ant1_2480_0~Reference

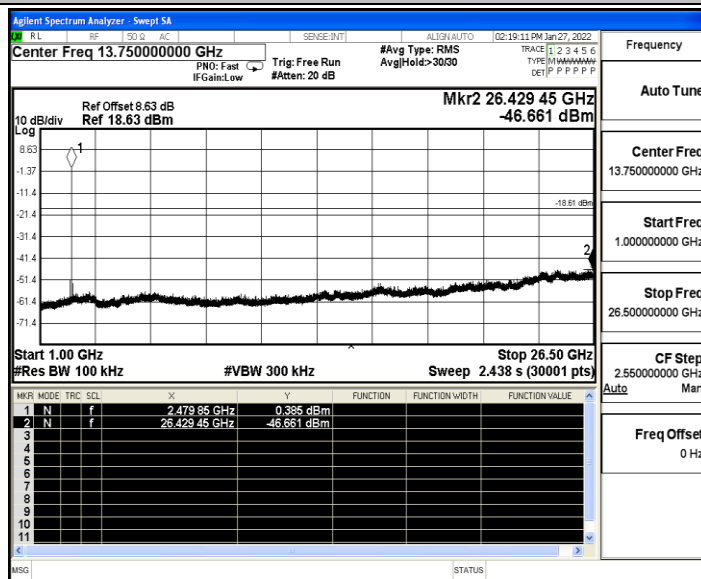


BLE_1M_Ant1_2480_30~1000

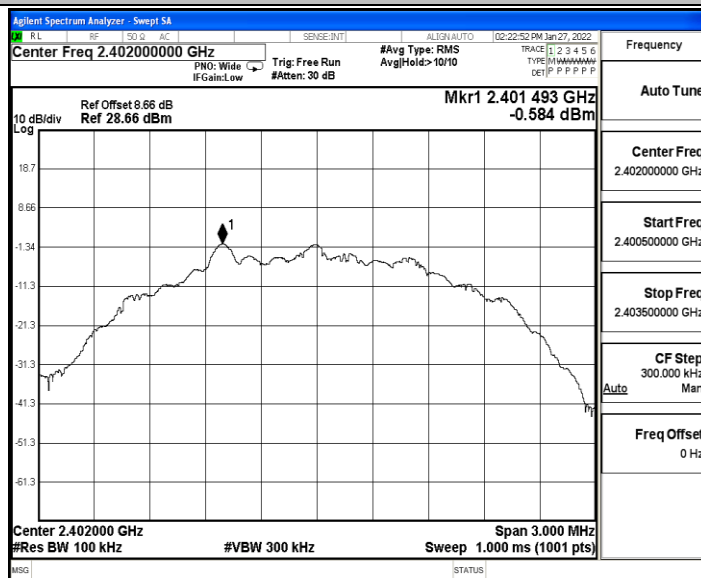




BLE_1M_Ant1_2480_1000~26500

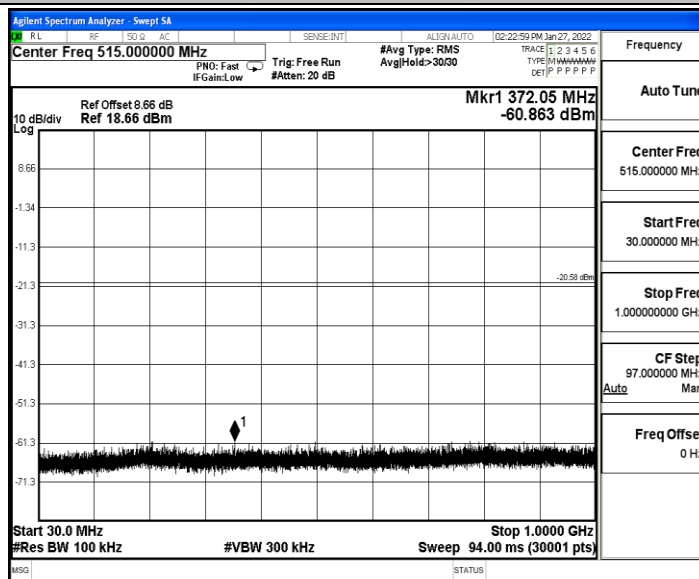


BLE_2M_Ant1_2402_0~Reference

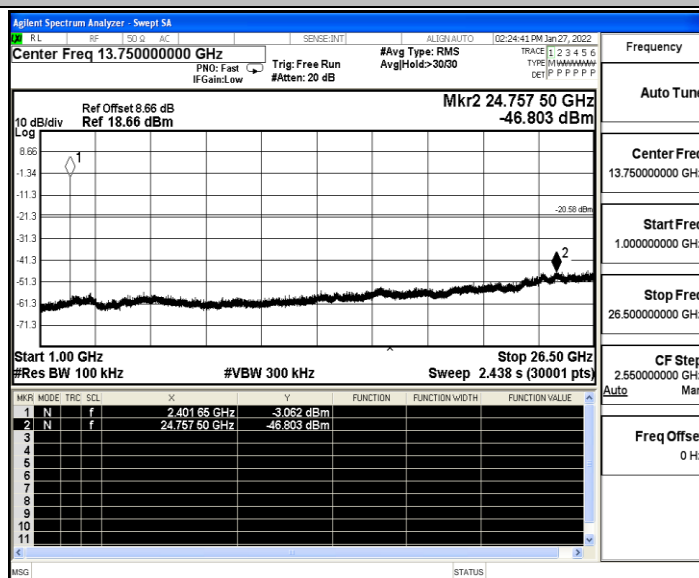




BLE_2M_Ant1_2402_30~1000

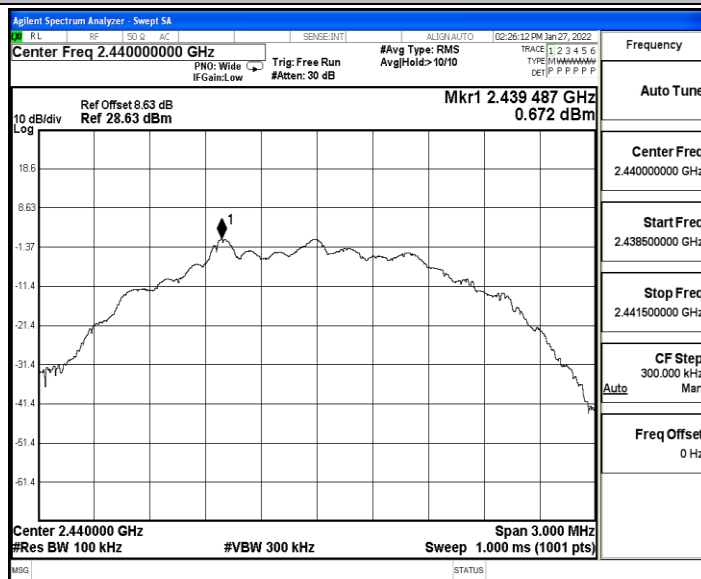


BLE_2M_Ant1_2402_1000~26500

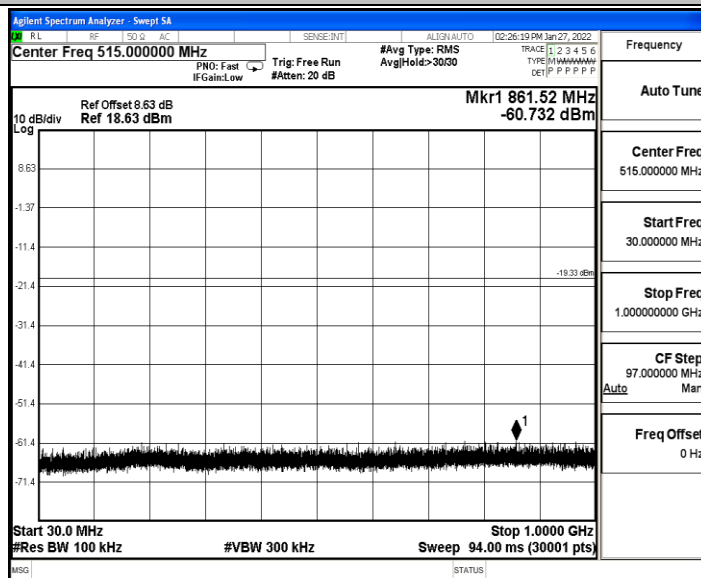




BLE_2M_Ant1_2440_0~Reference

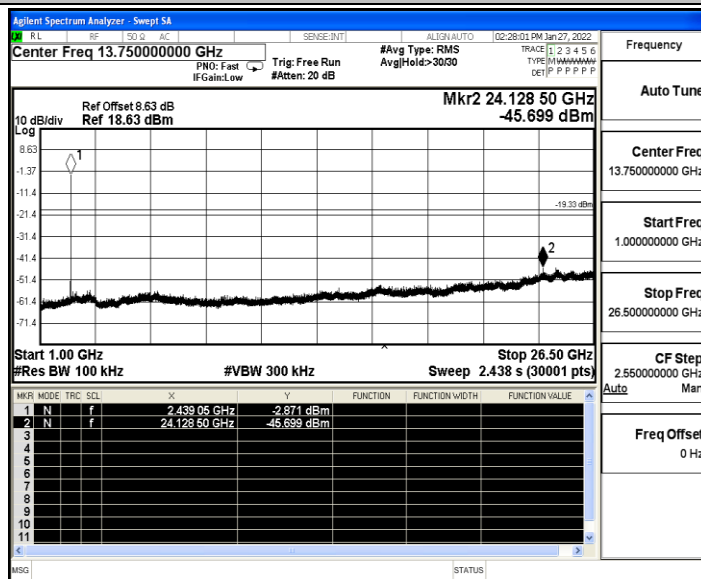


BLE_2M_Ant1_2440_30~1000

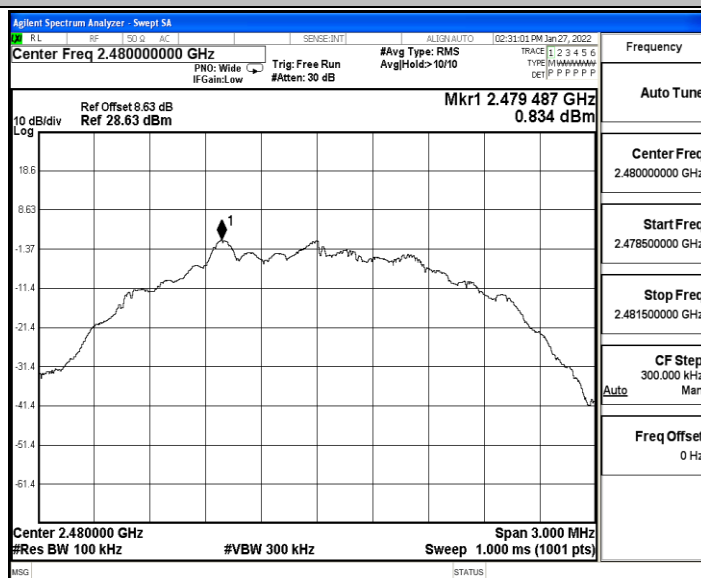




BLE_2M_Ant1_2440_1000~26500

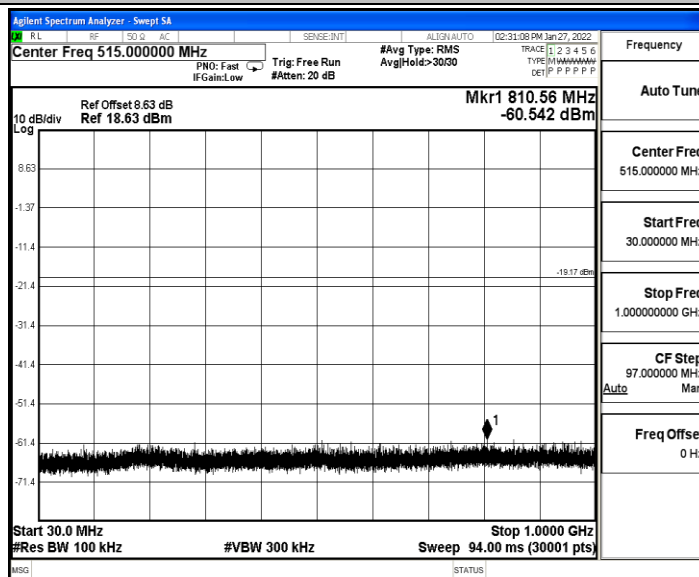


BLE_2M_Ant1_2480_0~Reference

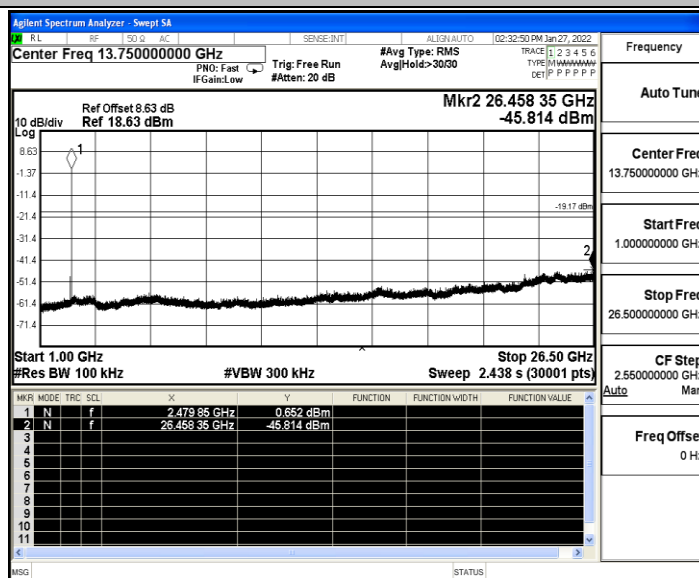




BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500



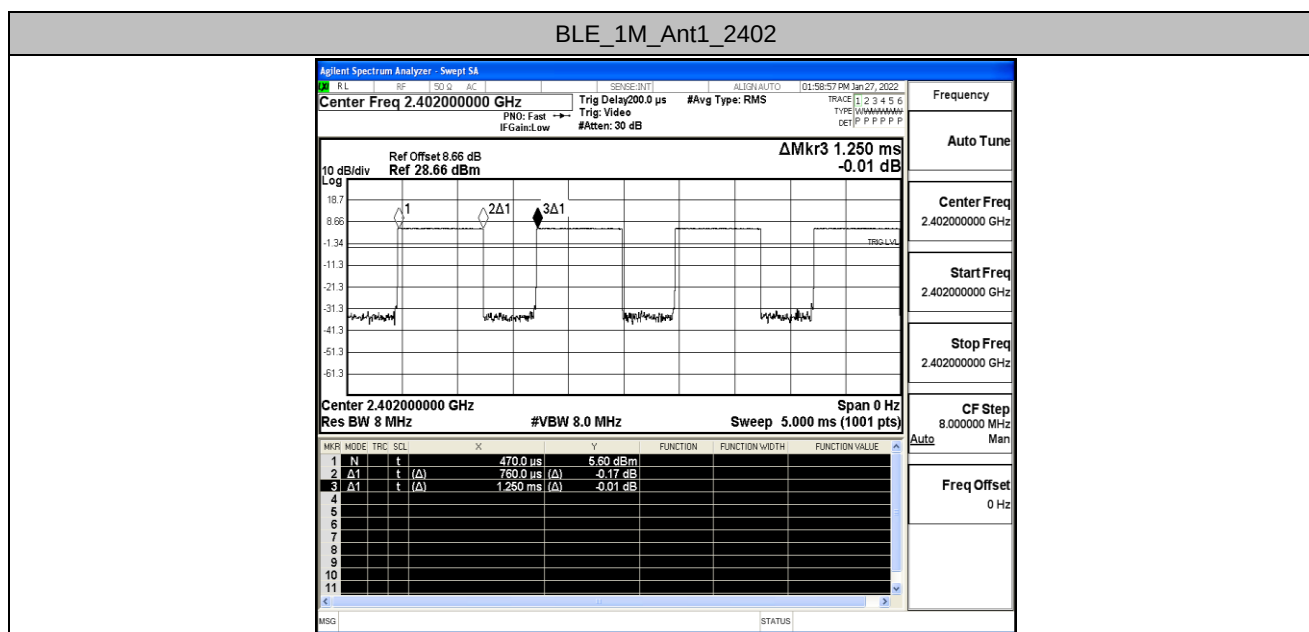


A.6 Duty Cycle

Test Result

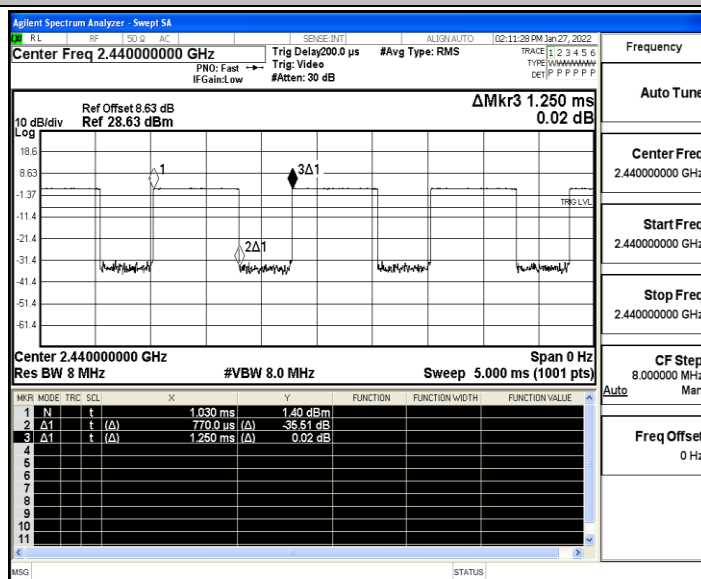
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.76	1.25	0.6080	60.80	2.16	---	---
		2440	0.77	1.25	0.6160	61.60	2.10	---	---
		2480	0.77	1.25	0.6160	61.60	2.10	---	---
BLE_2M	Ant1	2402	0.39	1.25	0.3120	31.20	5.06	---	---
		2440	0.39	1.25	0.3120	31.20	5.06	---	---
		2480	0.39	1.25	0.3120	31.20	5.06	---	---

Test Graphs

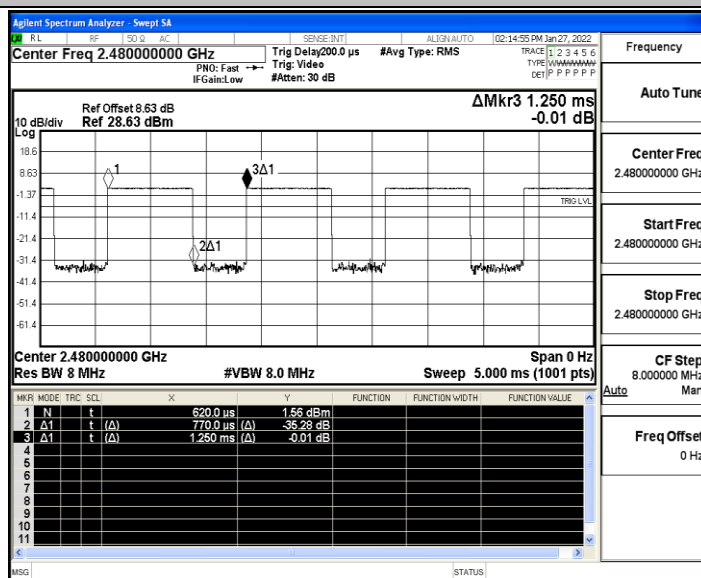




BLE_1M_Ant1_2440

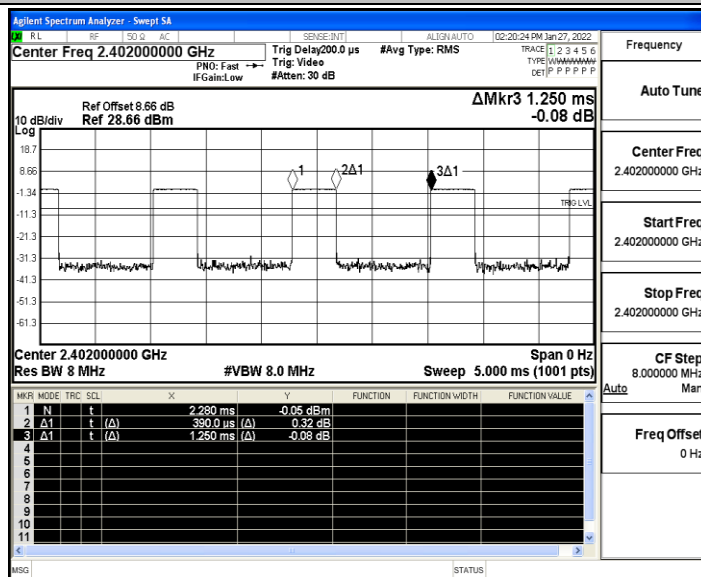


BLE_1M_Ant1_2480

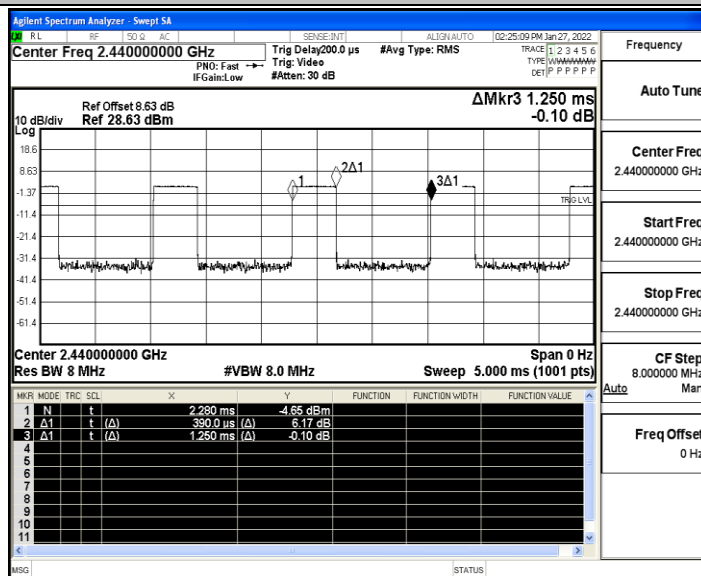




BLE_2M_Ant1_2402

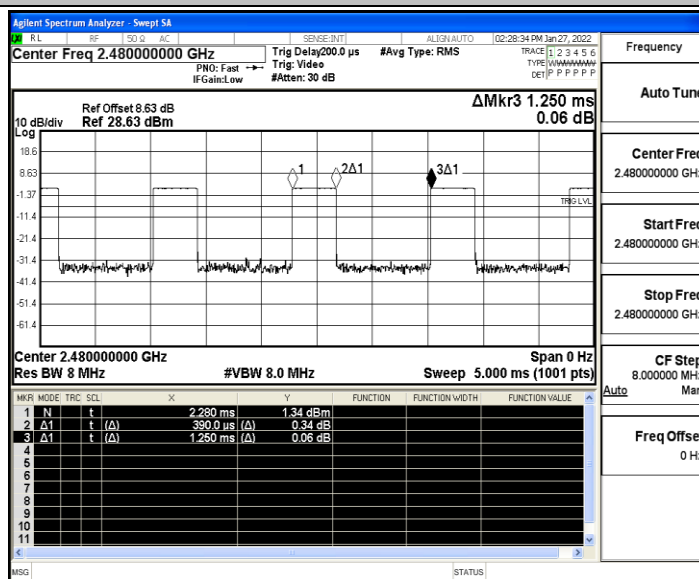


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





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	-48.04	≤-41.20	47.16	≤54	PASS
				AV	2386.835	-47.26	≤-41.20	47.94	≤54	PASS
				AV	2390.000	-47.52	≤-41.20	47.68	≤54	PASS
				Peak	2310.000	-38	≤-21.20	57.20	≤74	PASS
				Peak	2369.090	-36.52	≤-21.20	58.68	≤74	PASS
				Peak	2390.000	-38.34	≤-21.20	56.86	≤74	PASS
		High	2480	AV	2483.500	-46.4	≤-41.20	48.80	≤54	PASS
				AV	2483.520	-46.41	≤-41.20	48.79	≤54	PASS
				AV	2500.000	-46.82	≤-41.20	48.38	≤54	PASS
				Peak	2483.500	-37.39	≤-21.20	57.81	≤74	PASS
				Peak	2498.320	-36.44	≤-21.20	58.76	≤74	PASS
				Peak	2500.000	-38.04	≤-21.20	57.16	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-47.49	≤-41.20	47.71	≤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	2325.725	-36.6	≤-21.20	58.60	≤74	PASS
				Peak	2390.000	-39.51	≤-21.20	55.69	≤74	PASS
		High	2480	AV	2483.500	-45.15	≤-41.20	50.05	≤54	PASS
				AV	2483.520	-45.15	≤-41.20	50.05	≤54	PASS
				AV	2500.000	-46.74	≤-41.20	48.46	≤54	PASS
				Peak	2483.500	-38.04	≤-21.20	57.16	≤74	PASS
				Peak	2497.680	-36.57	≤-21.20	58.63	≤74	PASS
				Peak	2500.000	-38.33	≤-21.20	56.87	≤74	PASS

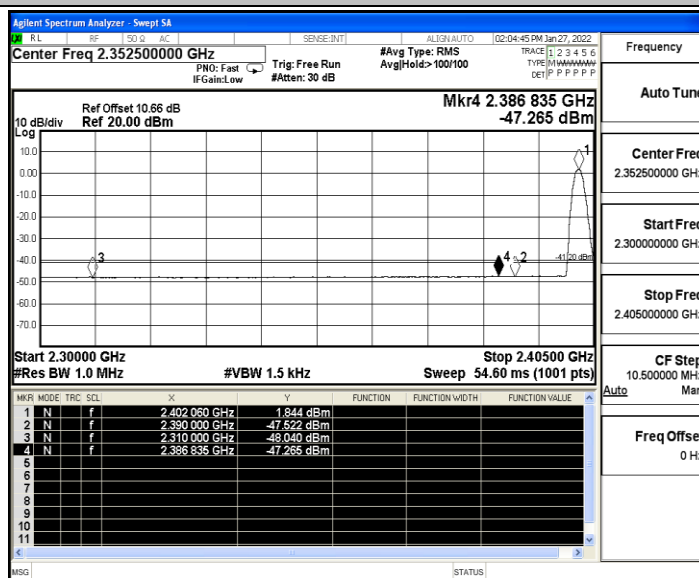
Note:

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.

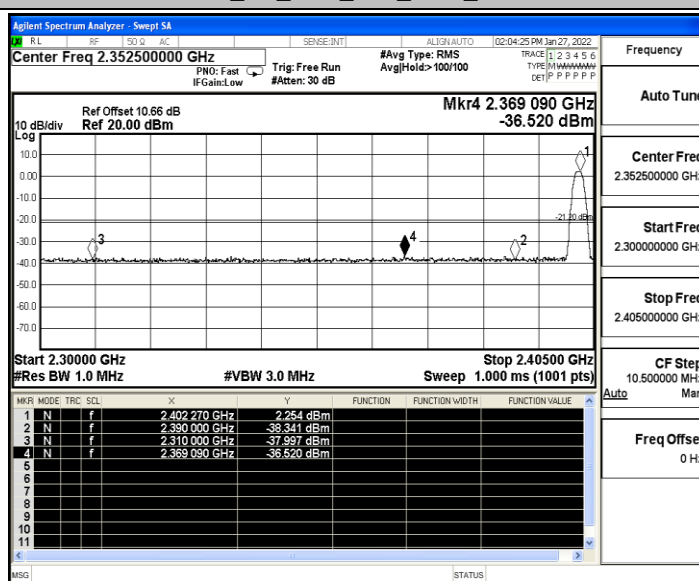


Test Graphs

BLE_1M_Ant1_Low_2402_AV

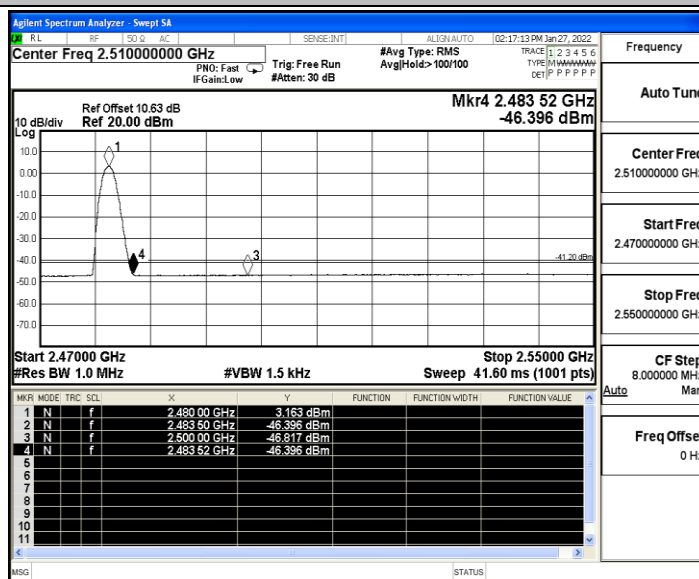


BLE_1M_Ant1_Low_2402_Peak

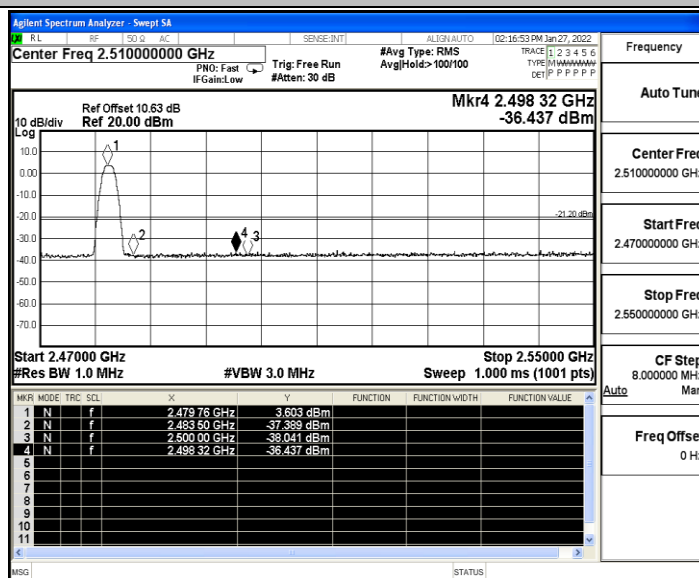




BLE_1M_Ant1_High_2480_AV

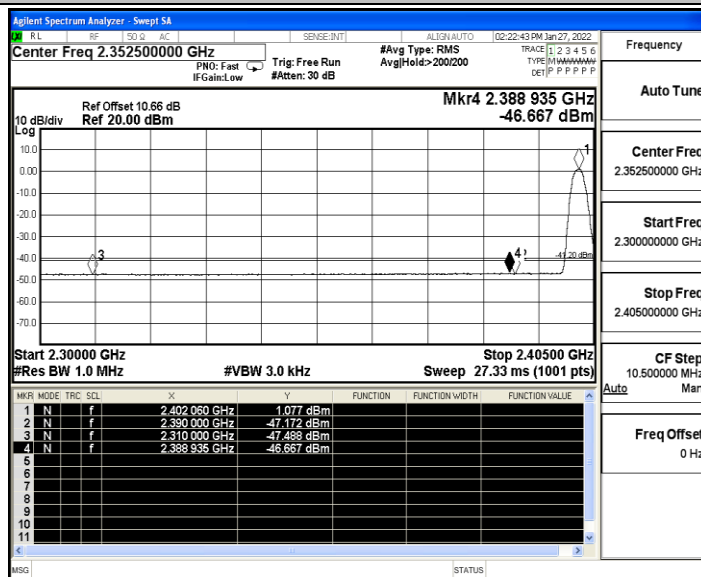


BLE_1M_Ant1_High_2480_Peak

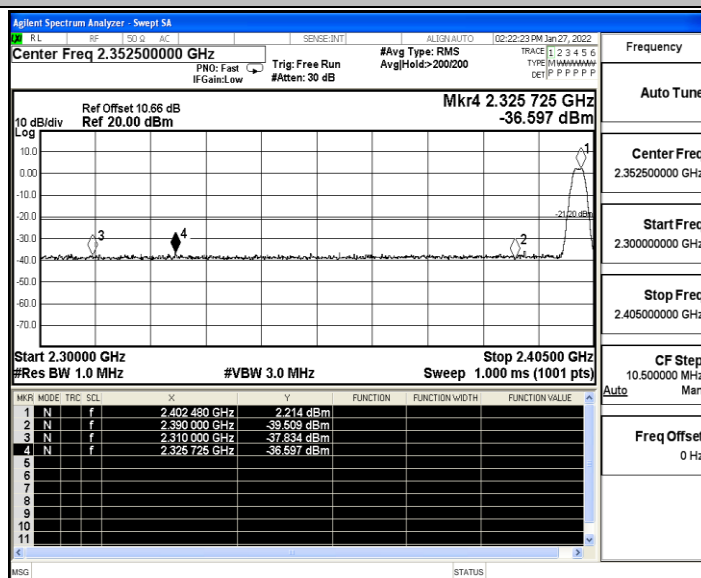




BLE_2M_Ant1_Low_2402_AV

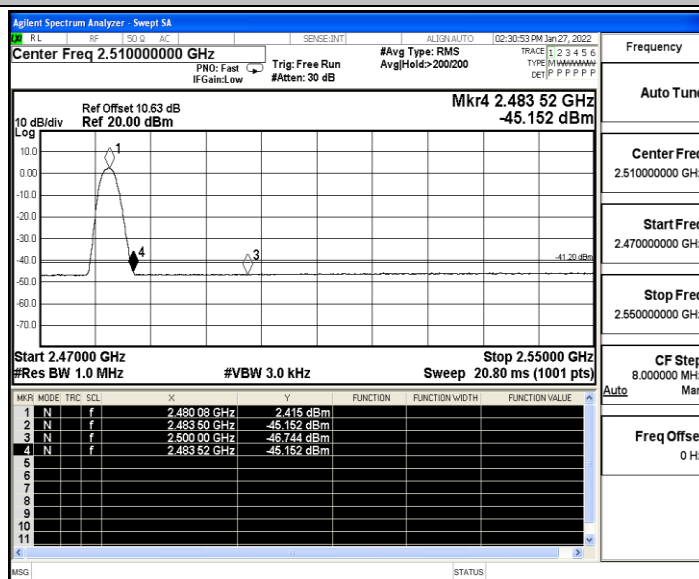


BLE_2M_Ant1_Low_2402_Peak





BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak

