



Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Smart Projector

Test Model: D061AQ

Environmental Conditions

Temperature:	23.1° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	<i>Nick Peng</i>
	Nick Peng
Supervised by:	<i>Taylor Hu</i>
	Taylor Hu





B.1 DTS Bandwidth

Test Result

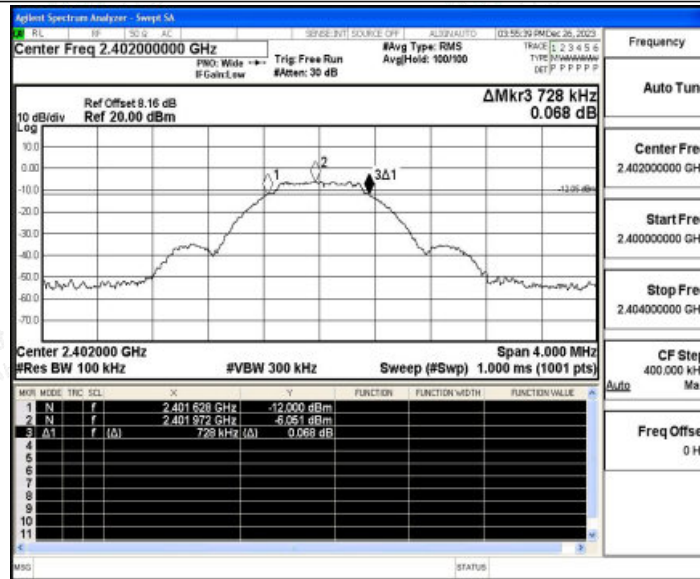
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.728	2401.628	2402.356	0.5	PASS
		2440	0.680	2439.648	2440.328	0.5	PASS
		2480	0.680	2479.660	2480.340	0.5	PASS
BLE_2M	Ant1	2402	1.236	2401.340	2402.576	0.5	PASS
		2440	1.372	2439.308	2440.680	0.5	PASS
		2480	1.108	2479.432	2480.540	0.5	PASS



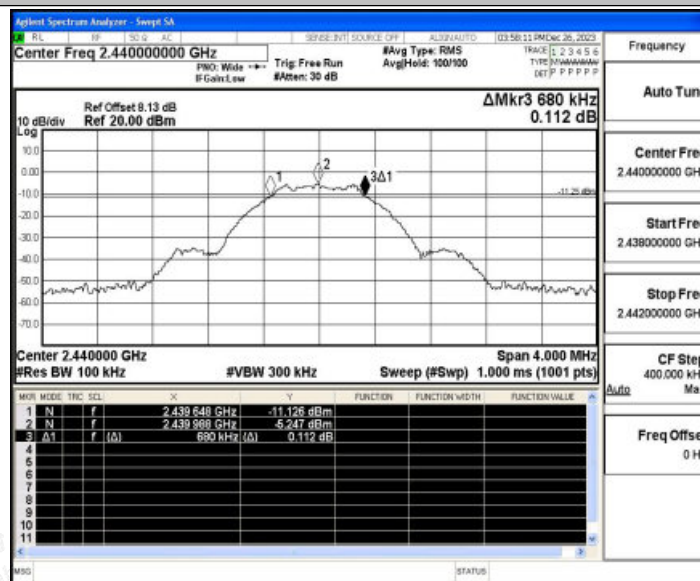


Test Graphs

BLE_1M_Ant1_2402

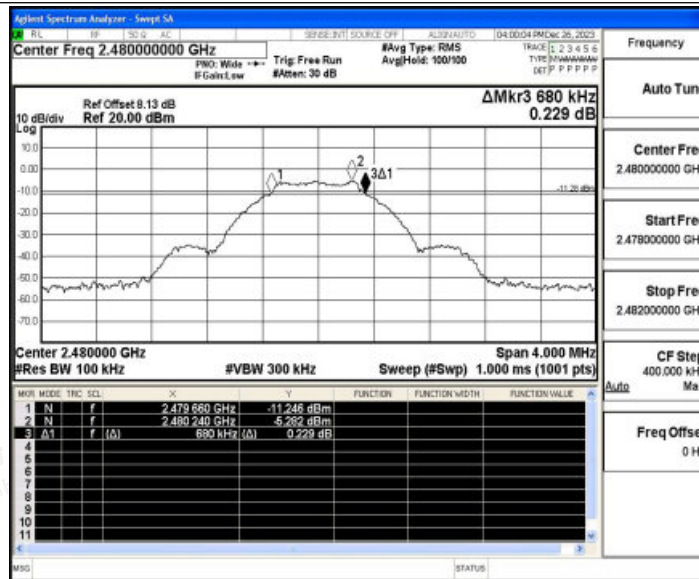


BLE_1M_Ant1_2440

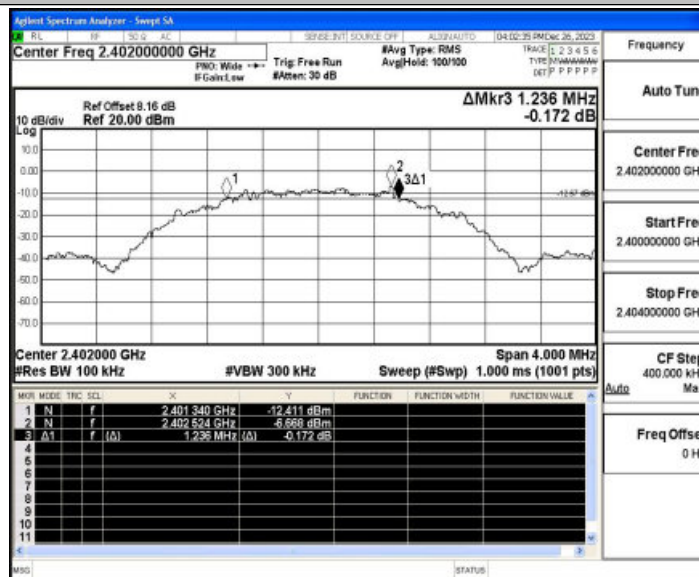


BLE_1M_Ant1_2480



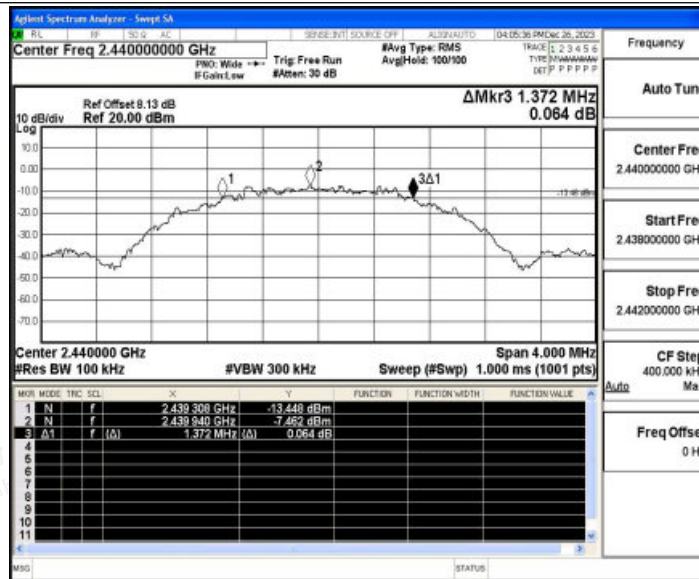


BLE_2M_Ant1_2402

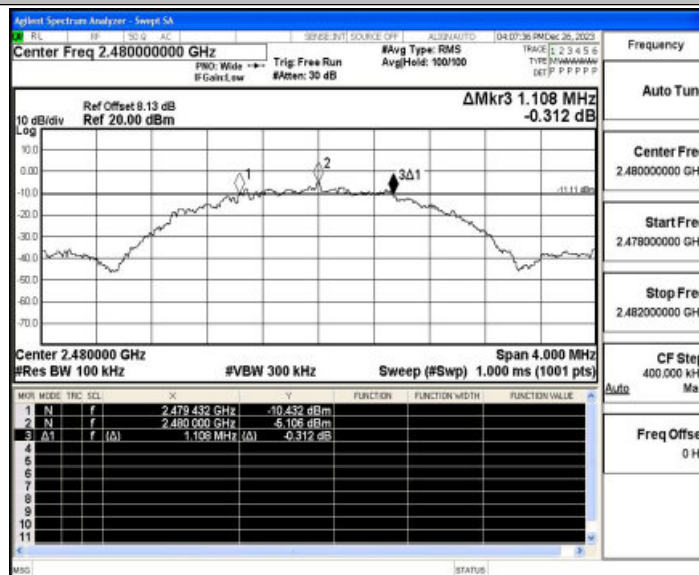


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.2 Maximum conducted output power

Test Result

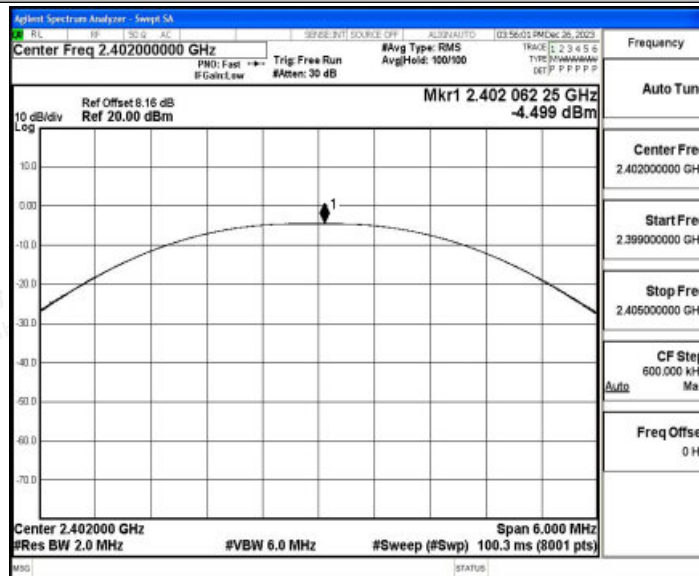
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-4.5	≤30	PASS
		2440	-4.38	≤30	PASS
		2480	-4.12	≤30	PASS
BLE_2M	Ant1	2402	-4.6	≤30	PASS
		2440	-4.44	≤30	PASS
		2480	-4.2	≤30	PASS



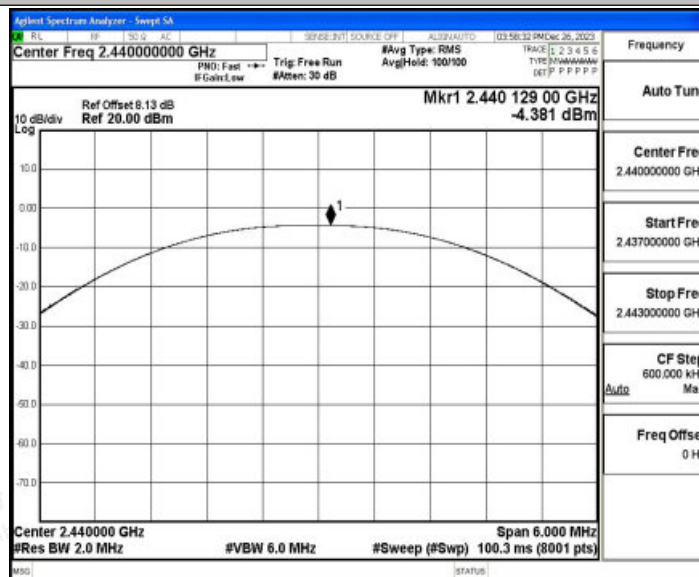


Test Graphs

BLE_1M_Ant1_2402

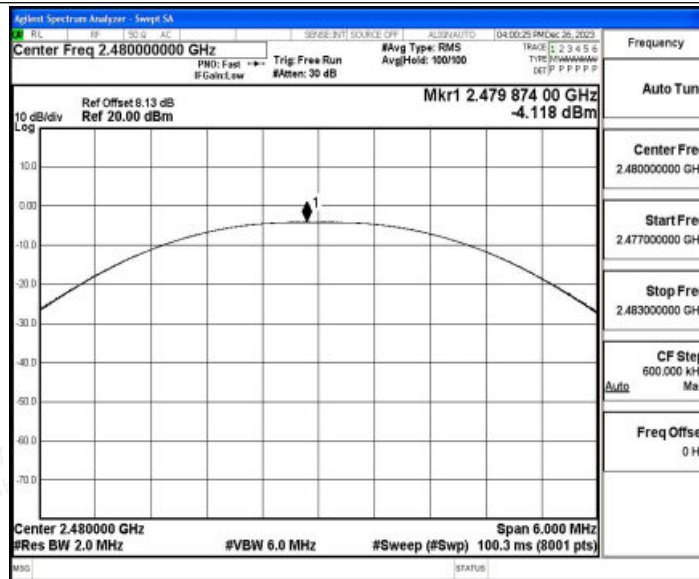


BLE_1M_Ant1_2440

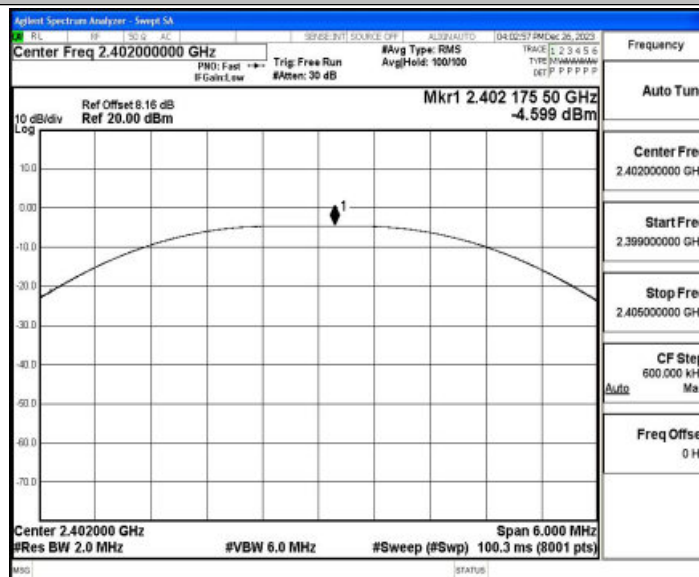


BLE_1M_Ant1_2480



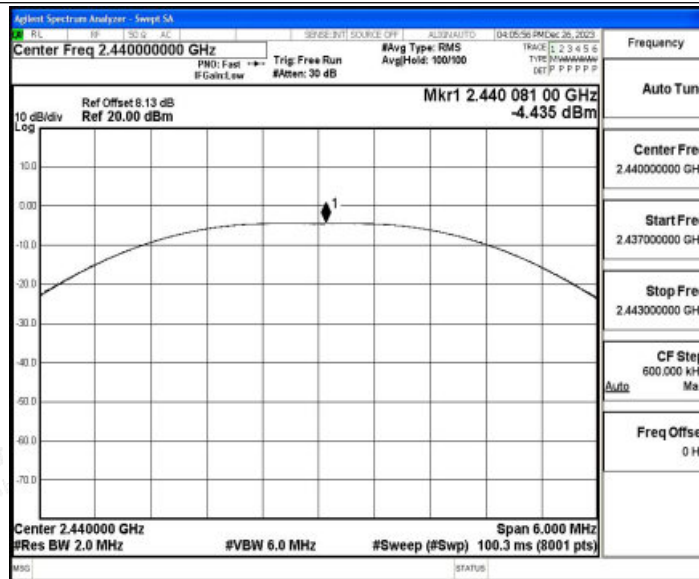


BLE_2M_Ant1_2402

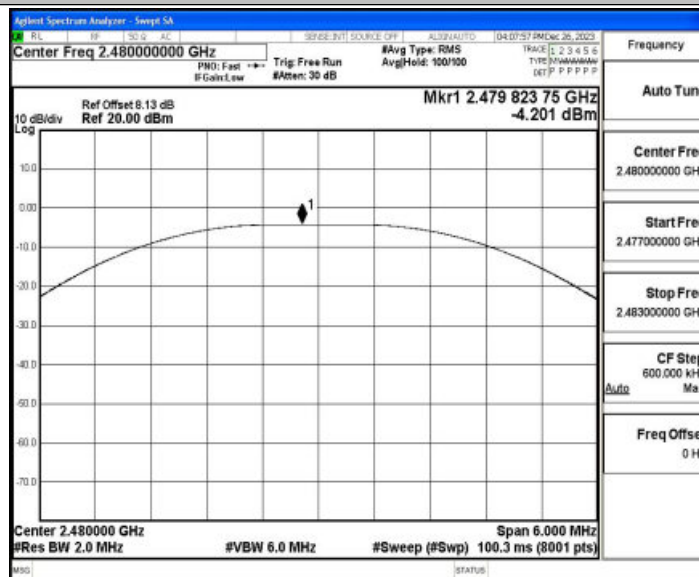


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.3 Maximum power spectral density

Test Result

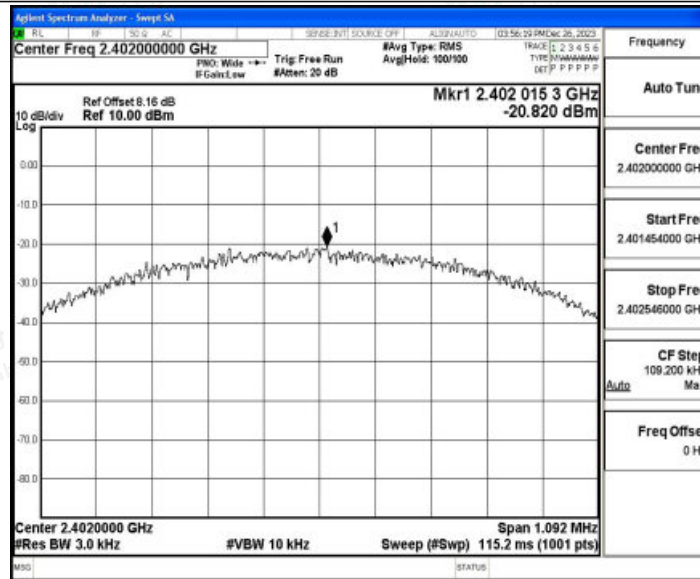
TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-20.82	≤8.00	PASS
		2440	-21.18	≤8.00	PASS
		2480	-20.87	≤8.00	PASS
BLE_2M	Ant1	2402	-23.37	≤8.00	PASS
		2440	-23.51	≤8.00	PASS
		2480	-23.05	≤8.00	PASS



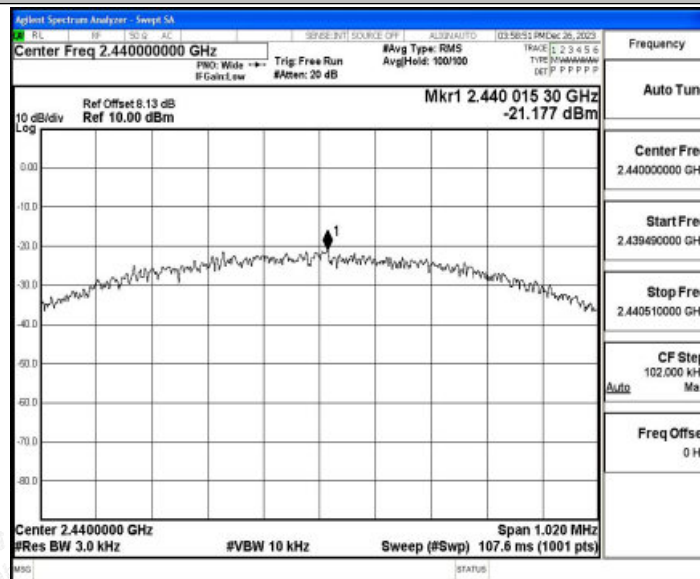


Test Graphs

BLE_1M_Ant1_2402

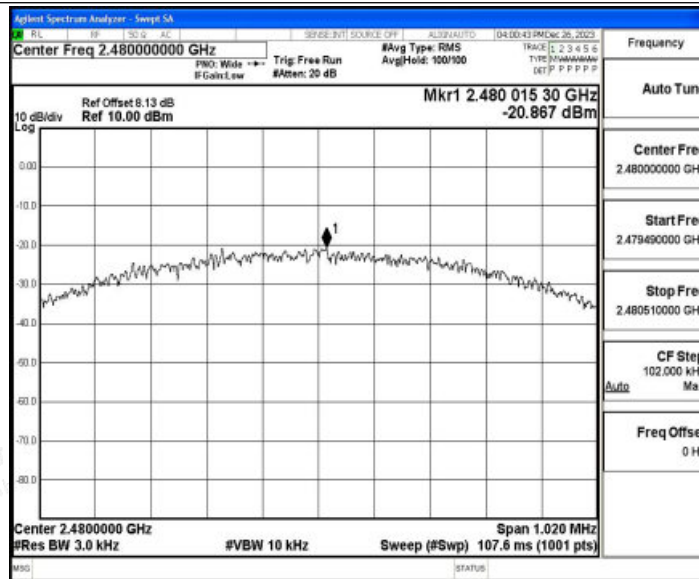


BLE_1M_Ant1_2440

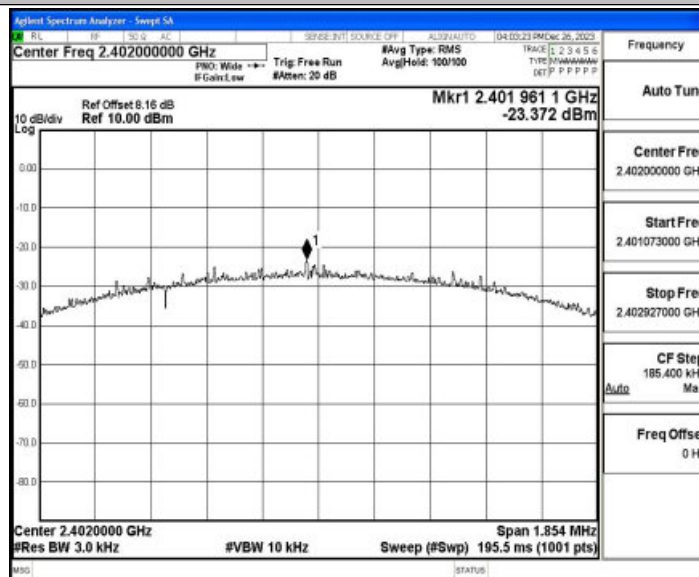


BLE_1M_Ant1_2480



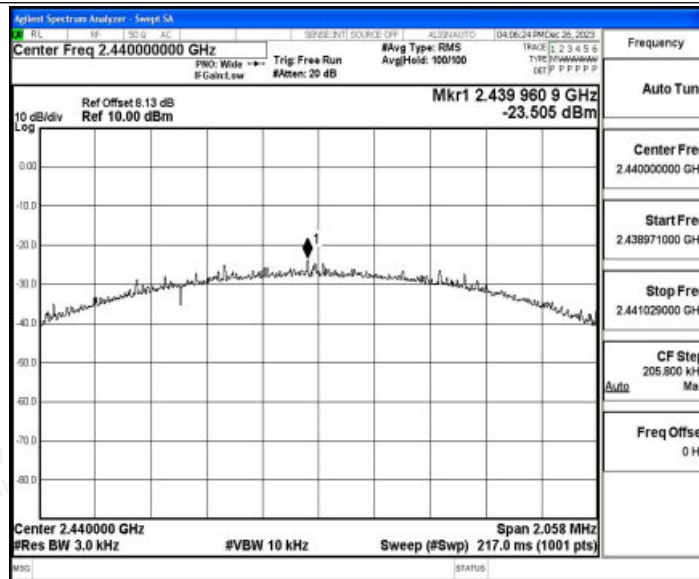


BLE_2M_Ant1_2402

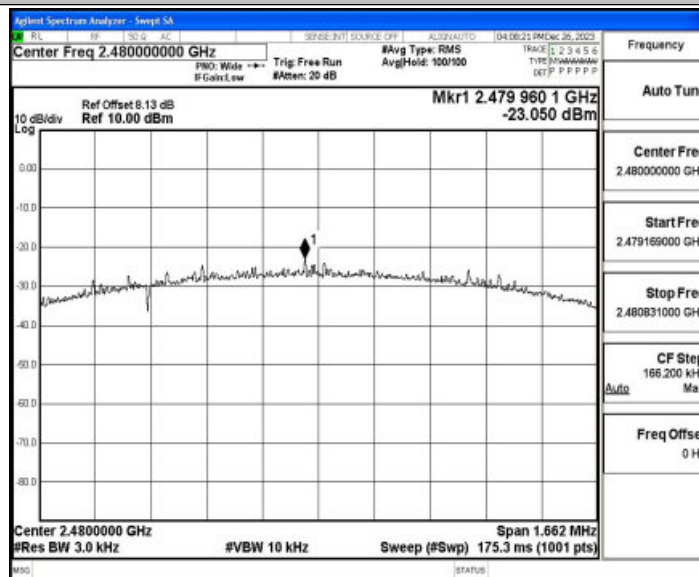


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.4 Band edge measurements

Test Result

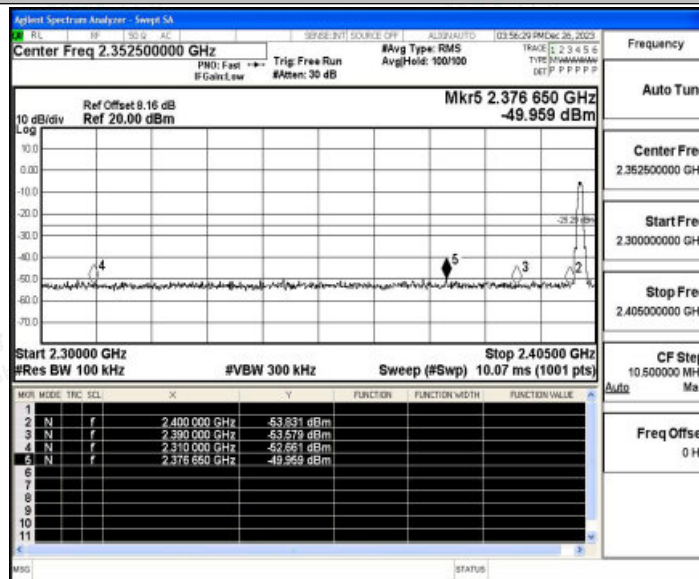
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-5.29	-49.96	≤ -25.29	PASS
		High	2480	-5.17	-50.01	≤ -25.17	PASS
BLE_2M	Ant1	Low	2402	-5.54	-39.22	≤ -25.54	PASS
		High	2480	-5.07	-49.91	≤ -25.07	PASS



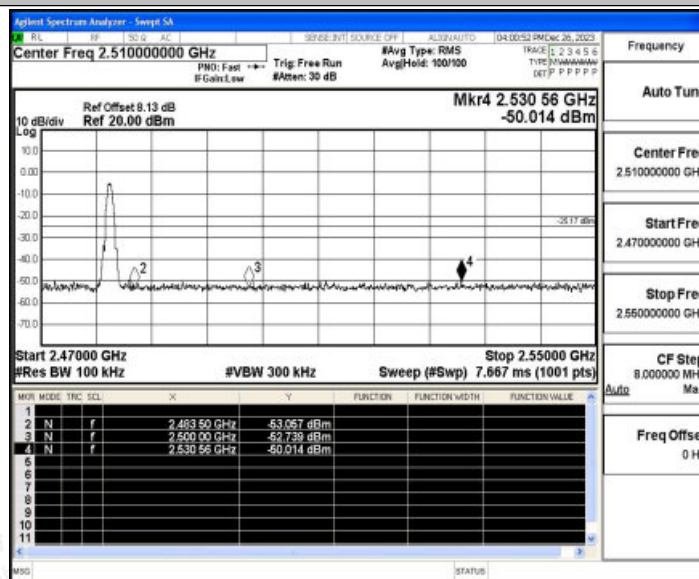


Test Graphs

BLE_1M_Ant1_Low_2402

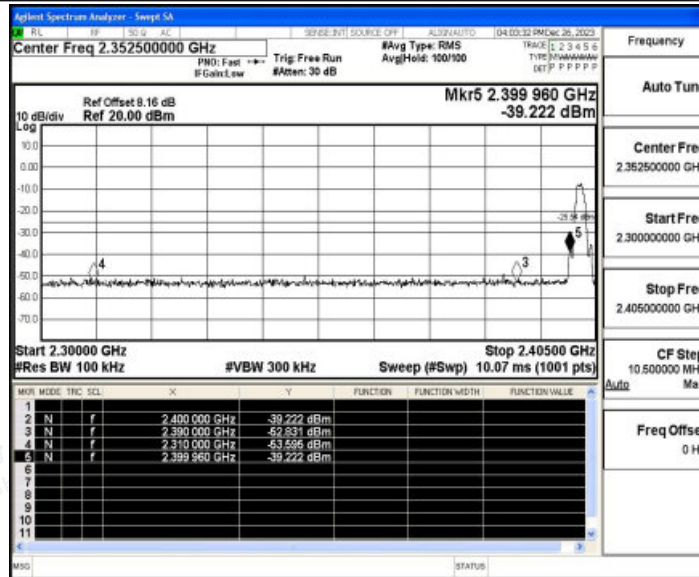


BLE_1M_Ant1_High_2480

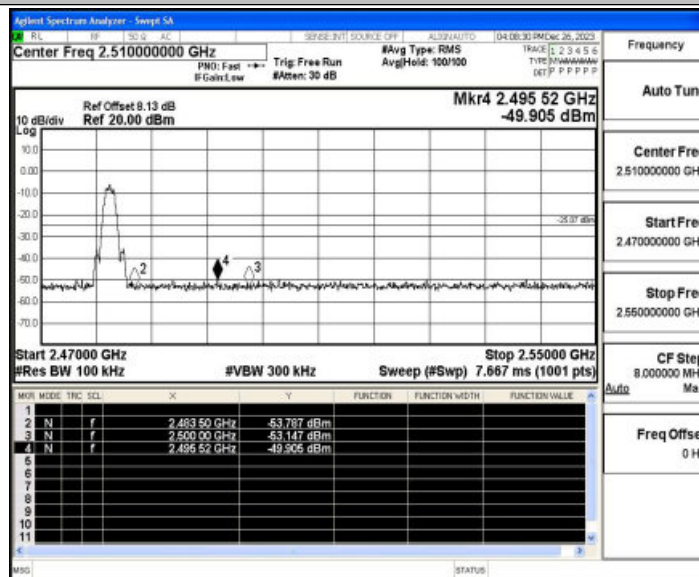


BLE_2M_Ant1_Low_2402





BLE_2M_Ant1_High_2480





B.5 Conducted Spurious Emission

Test Result

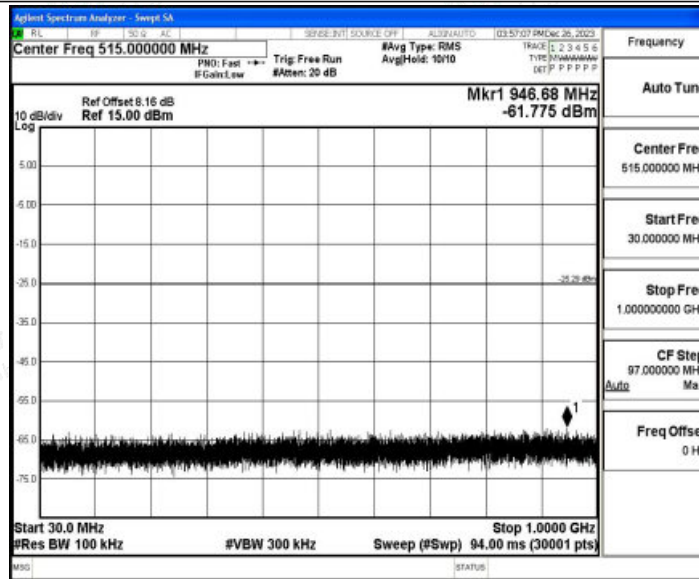
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	30~1000	-5.29	-61.78	≤-25.29	PASS
			1000~26500	-5.29	-48.52	≤-25.29	PASS
		2440	30~1000	-4.74	-61.84	≤-24.74	PASS
			1000~26500	-4.74	-48.84	≤-24.74	PASS
		2480	30~1000	-5.17	-61.31	≤-25.17	PASS
			1000~26500	-5.17	-49.07	≤-25.17	PASS
BLE_2M	Ant1	2402	30~1000	-5.54	-61.83	≤-25.54	PASS
			1000~26500	-5.54	-48.59	≤-25.54	PASS
		2440	30~1000	-5.33	-61.55	≤-25.33	PASS
			1000~26500	-5.33	-48.94	≤-25.33	PASS
		2480	30~1000	-5.07	-61.14	≤-25.07	PASS
			1000~26500	-5.07	-49.29	≤-25.07	PASS



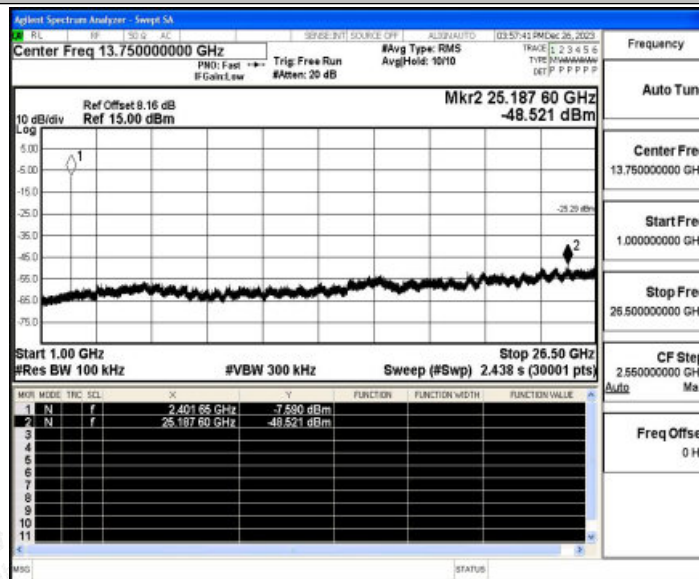


Test Graphs

BLE_1M_Ant1_2402_30~1000

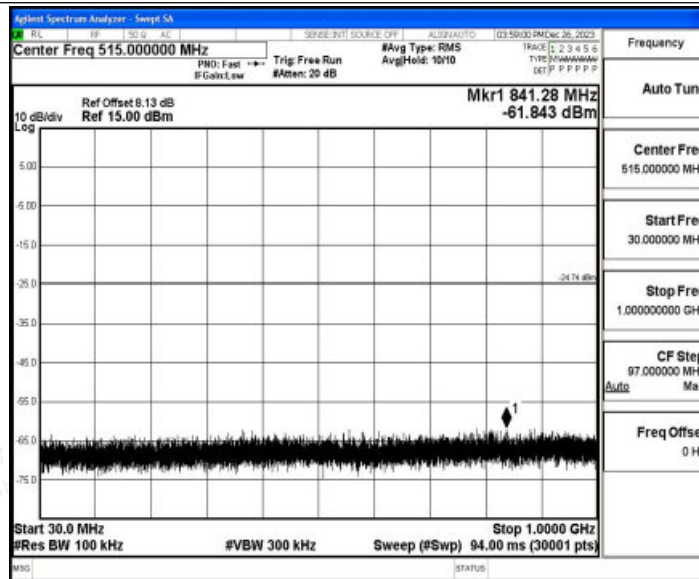


BLE_1M_Ant1_2402_1000~26500

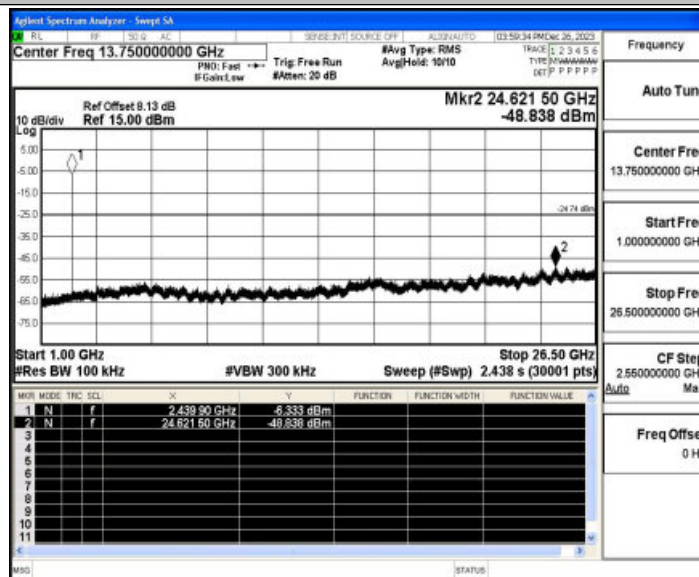


BLE_1M_Ant1_2440_30~1000



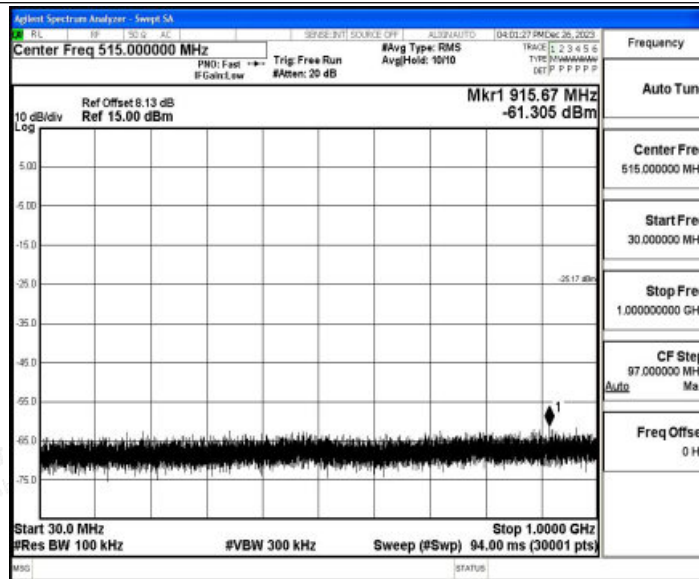


BLE_1M_Ant1_2440_1000~26500

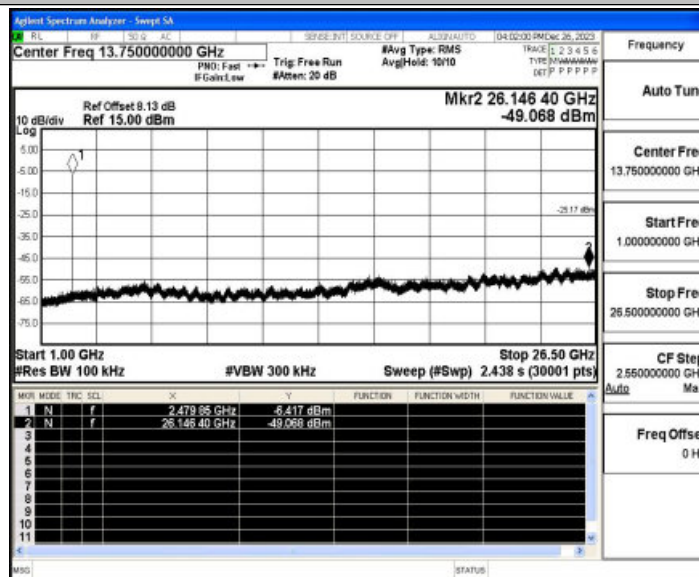


BLE_1M_Ant1_2480_30~1000



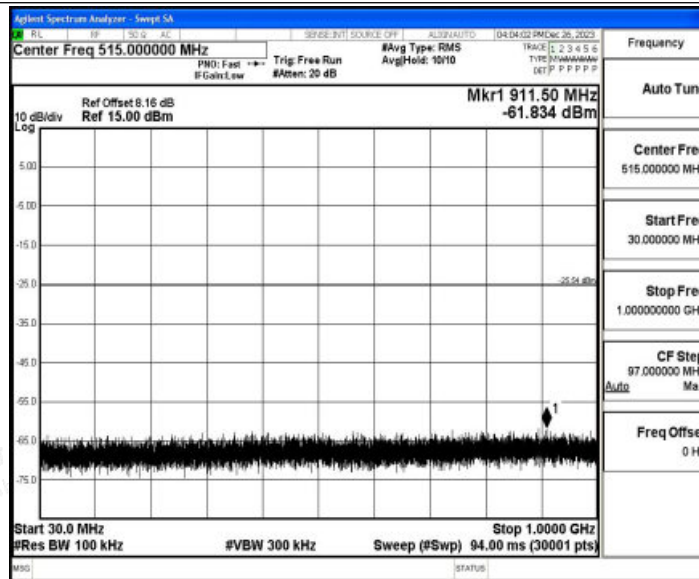


BLE_1M_Ant1_2480_1000~26500

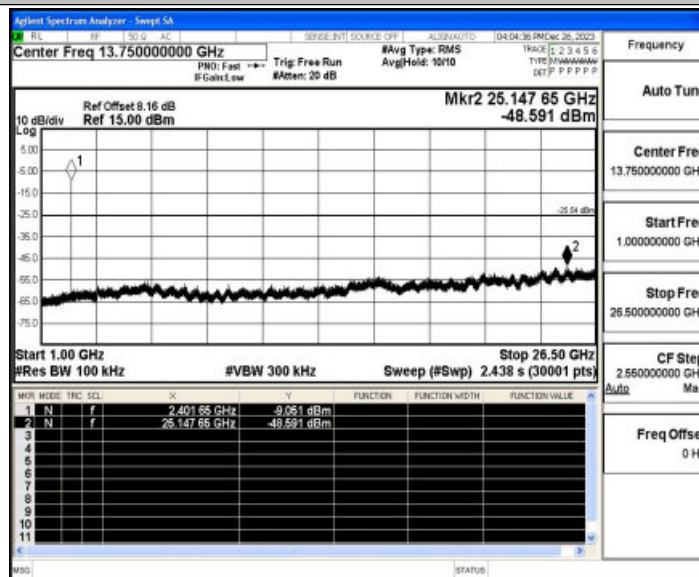


BLE_2M_Ant1_2402_30~1000



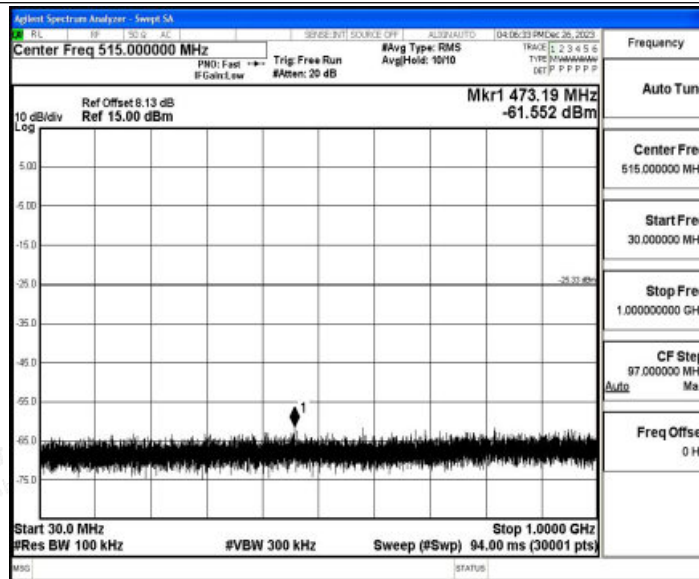


BLE_2M_Ant1_2402_1000~26500

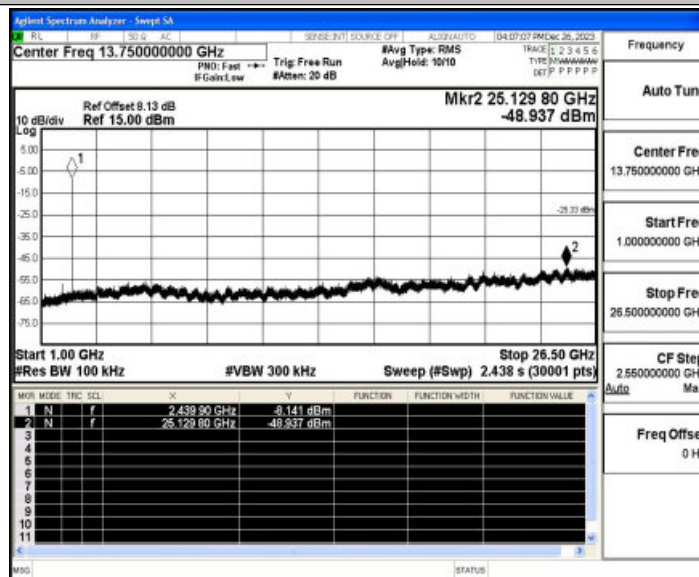


BLE_2M_Ant1_2440_30~1000



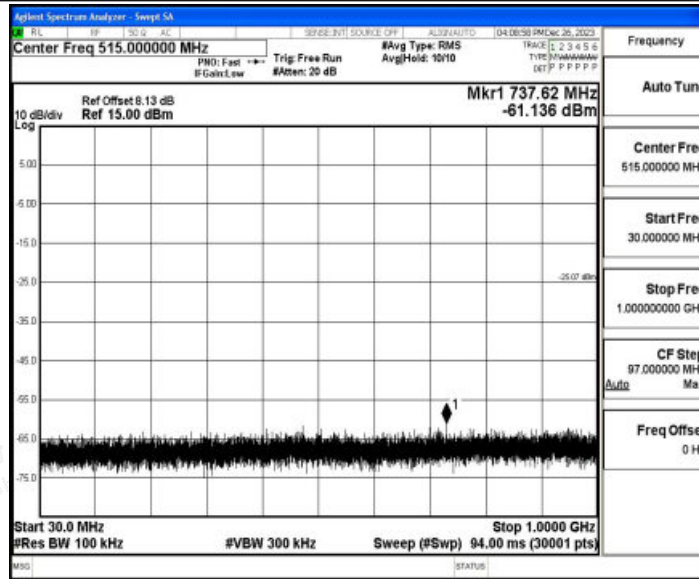


BLE_2M_Ant1_2440_1000~26500

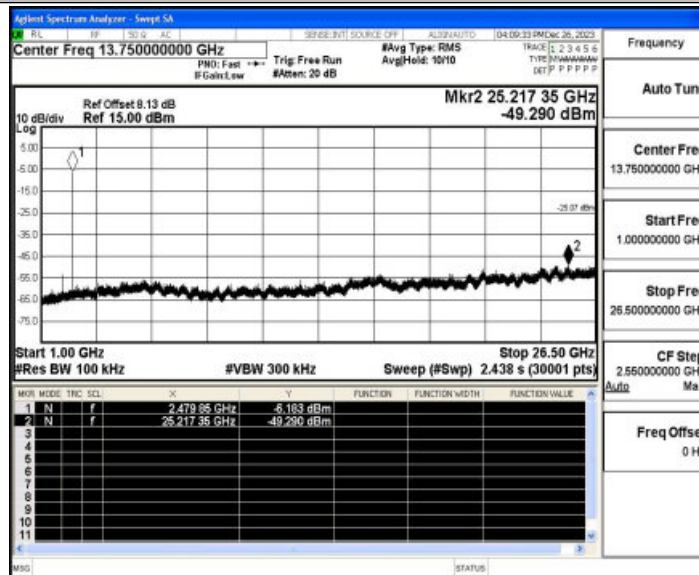


BLE_2M_Ant1_2480_30~1000





BLE_2M_Ant1_2480_1000~26500





Reference level measurement

Test Result

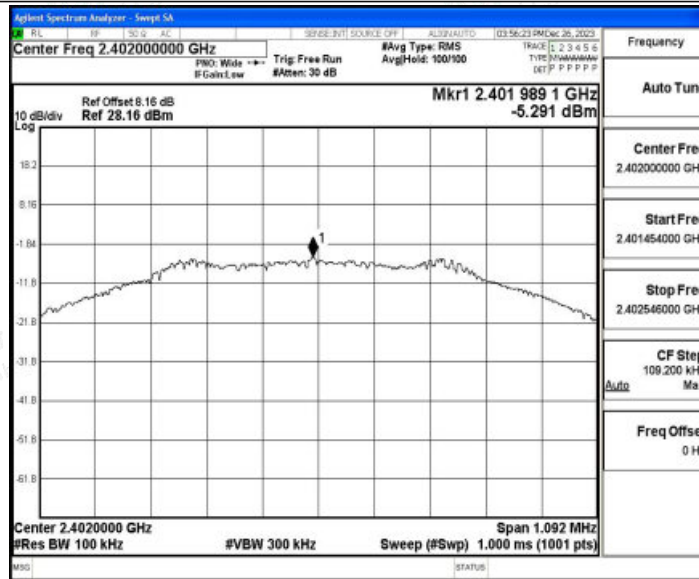
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
BLE_1M	Ant1	2402	2401.99	-5.29
		2440	2440.25	-4.74
		2480	2480.01	-5.17
BLE_2M	Ant1	2402	2402.00	-5.54
		2440	2439.99	-5.33
		2480	2479.99	-5.07



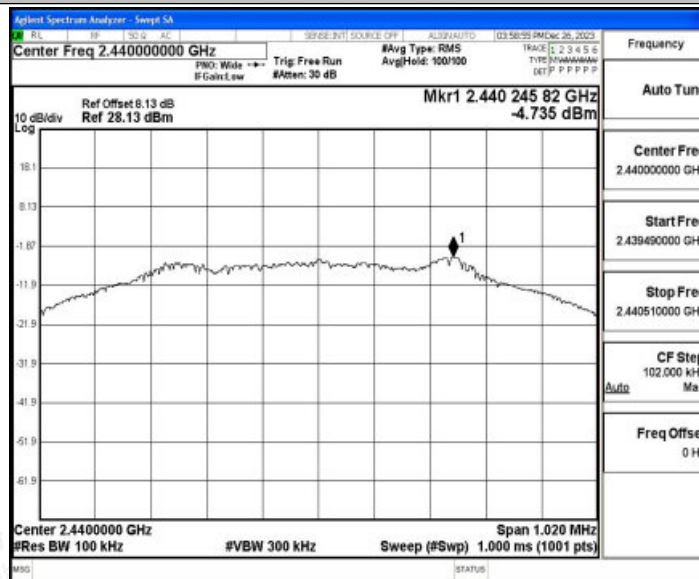


Test Graphs

BLE_1M_Ant1_2402

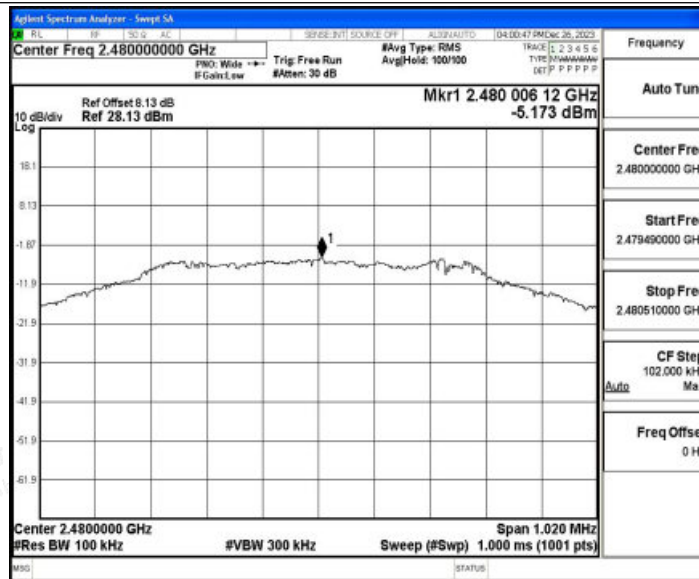


BLE_1M_Ant1_2440

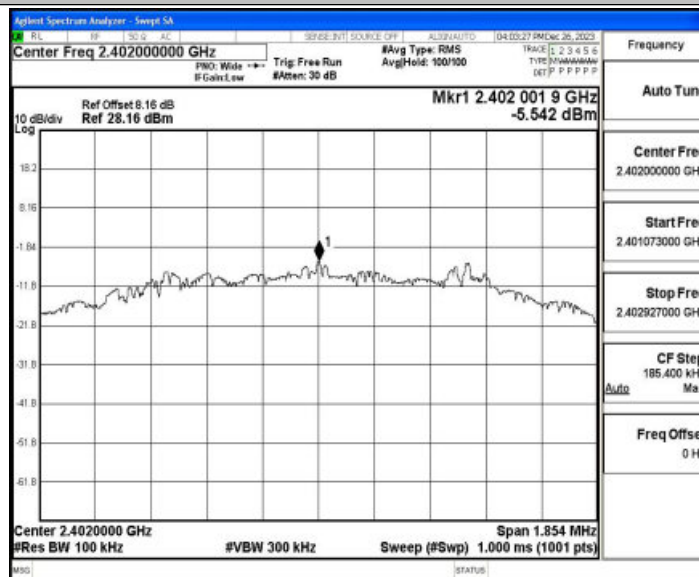


BLE_1M_Ant1_2480



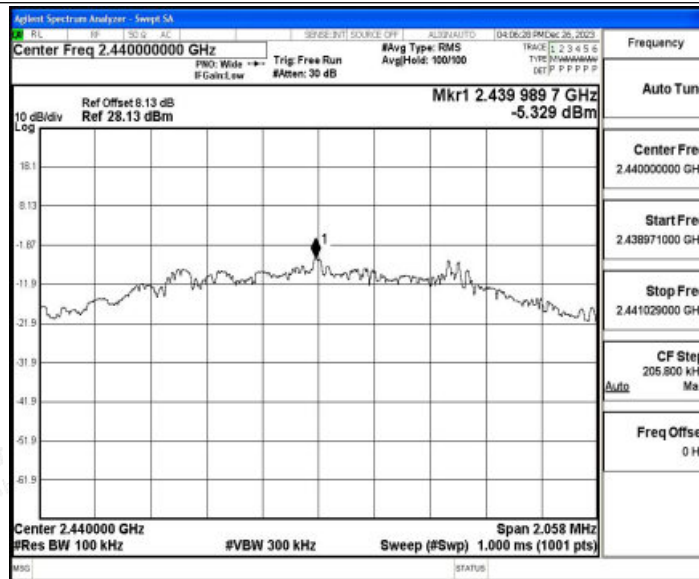


BLE_2M_Ant1_2402

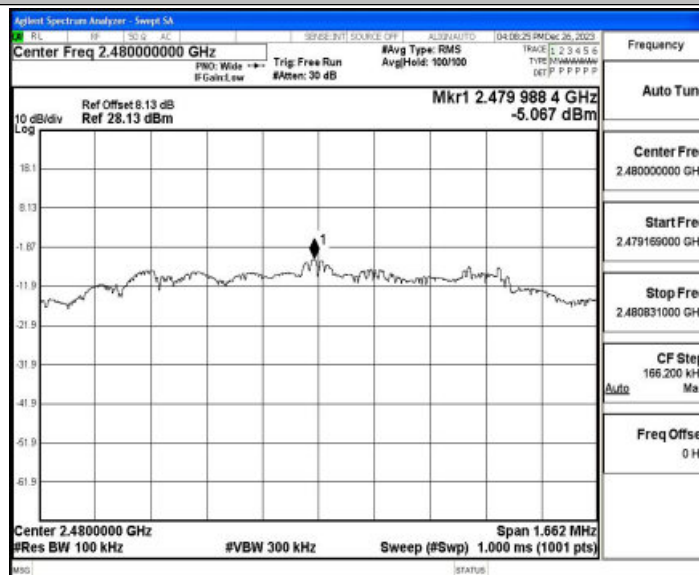


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.6 Duty Cycle

Test Result

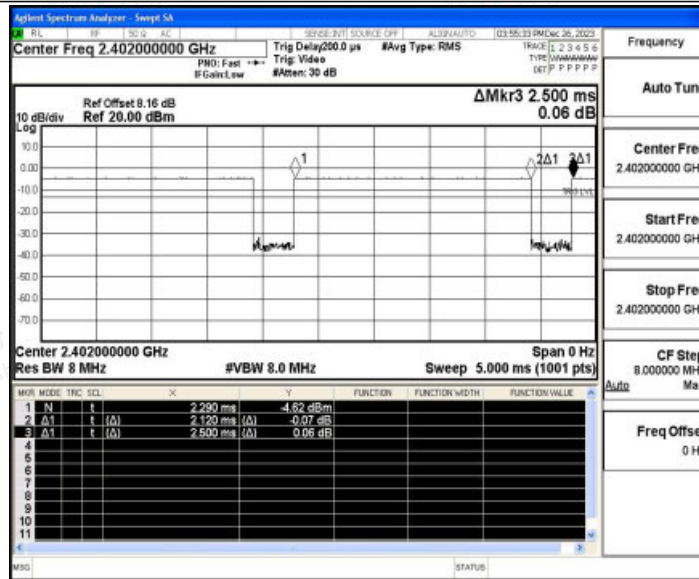
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]	1/T Factor[dB]
BLE_1M	Ant1	2402	2.12	2.50	84.80	0.72	0.47
		2440	2.12	2.50	84.80	0.72	0.47
		2480	2.12	2.50	84.80	0.72	0.47
BLE_2M	Ant1	2402	1.07	1.88	56.91	2.45	0.93
		2440	1.07	1.88	56.91	2.45	0.93
		2480	1.07	1.88	56.91	2.45	0.93



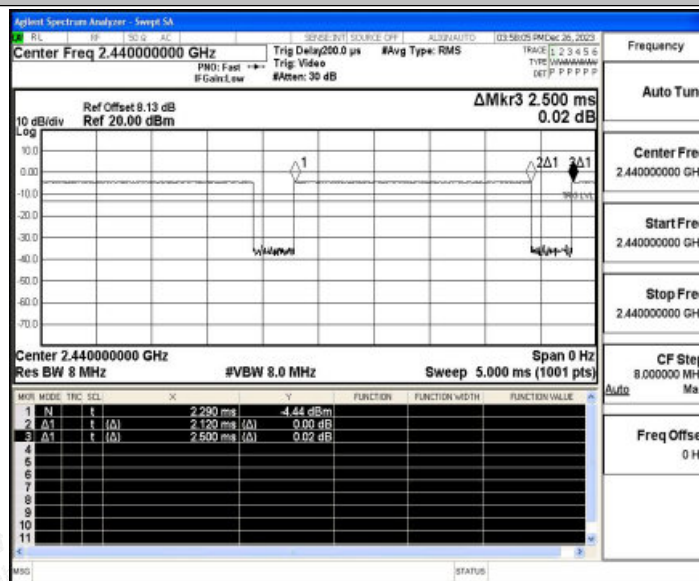


Test Graphs

BLE_1M_Ant1_2402

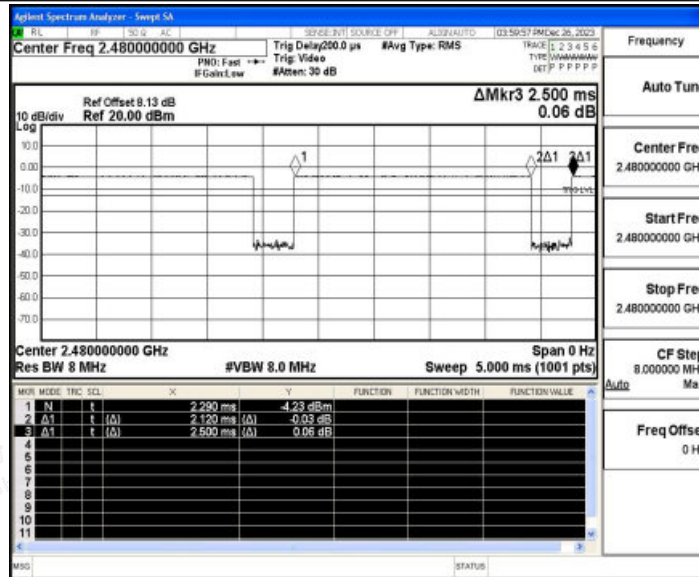


BLE_1M_Ant1_2440

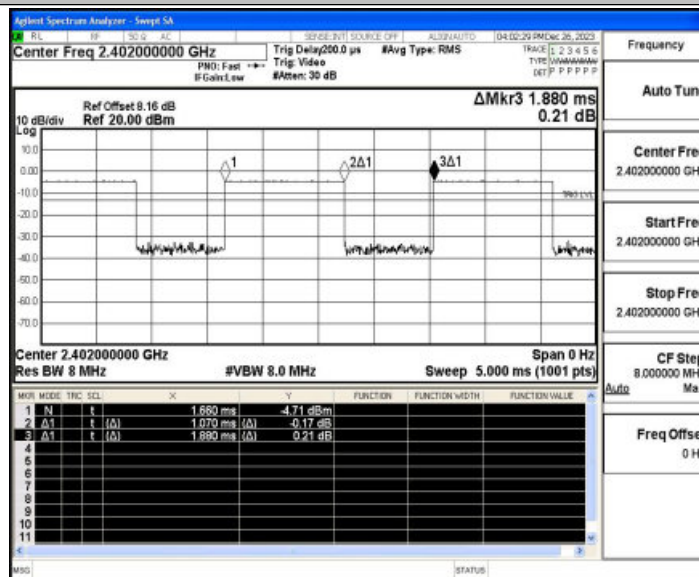


BLE_1M_Ant1_2480



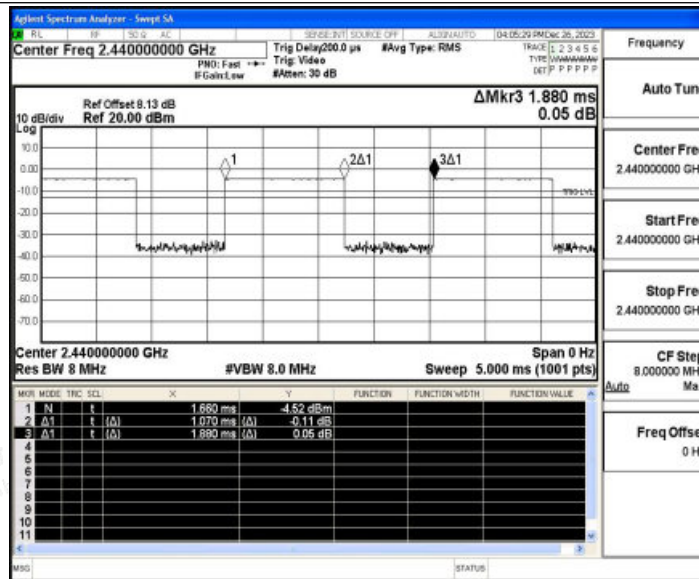


BLE_2M_Ant1_2402

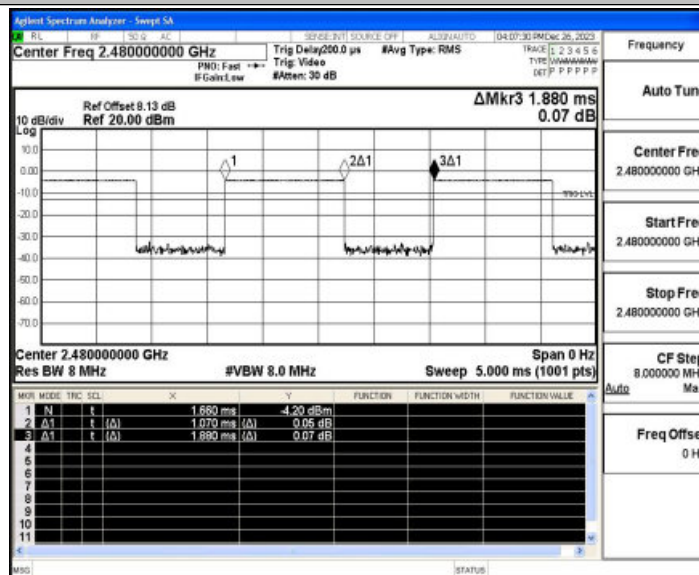


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





B.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	Channel	Frequency [MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-48.77	≤-41.20	46.43	≤54	PASS
				AV	2386.415	-47.95	≤-41.20	47.25	≤54	PASS
				AV	2390.000	-49.2	≤-41.20	46.00	≤54	PASS
				Peak	2310.000	-41.47	≤-21.20	53.73	≤74	PASS
				Peak	2385.365	-37.93	≤-21.20	57.27	≤74	PASS
				Peak	2390.000	-40.2	≤-21.20	55.00	≤74	PASS
		High	2480	AV	2483.500	-48.93	≤-41.20	46.27	≤54	PASS
				AV	2487.680	-48	≤-41.20	47.20	≤54	PASS
				AV	2500.000	-48.91	≤-41.20	46.29	≤54	PASS
				Peak	2483.500	-41.5	≤-21.20	53.70	≤74	PASS
				Peak	2499.760	-38.34	≤-21.20	56.86	≤74	PASS
				Peak	2500.000	-41.06	≤-21.20	54.14	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-47.52	≤-41.20	47.68	≤54	PASS
				AV	2385.995	-46.02	≤-41.20	49.18	≤54	PASS
				AV	2390.000	-46.59	≤-41.20	48.61	≤54	PASS
				Peak	2310.000	-41.13	≤-21.20	54.07	≤74	PASS
				Peak	2310.290	-38.04	≤-21.20	57.16	≤74	PASS
				Peak	2390.000	-42.28	≤-21.20	52.92	≤74	PASS
		High	2480	AV	2483.500	-46.27	≤-41.20	48.93	≤54	PASS
				AV	2493.680	-46.22	≤-41.20	48.98	≤54	PASS
				AV	2500.000	-46.95	≤-41.20	48.25	≤54	PASS
				Peak	2483.500	-41.14	≤-21.20	54.06	≤74	PASS
				Peak	2496.480	-37.67	≤-21.20	57.53	≤74	PASS
				Peak	2500.000	-40.06	≤-21.20	55.14	≤74	PASS

Note:

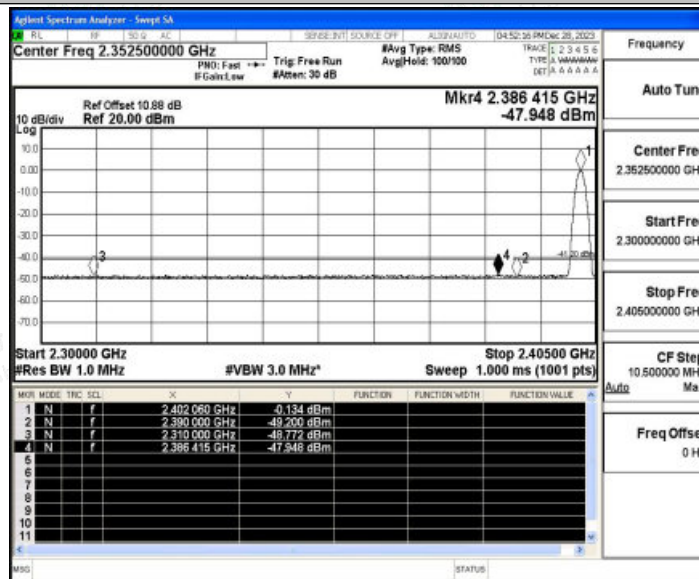
1. The Antenna Gain is compensated in the graph. The Correction Factor is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



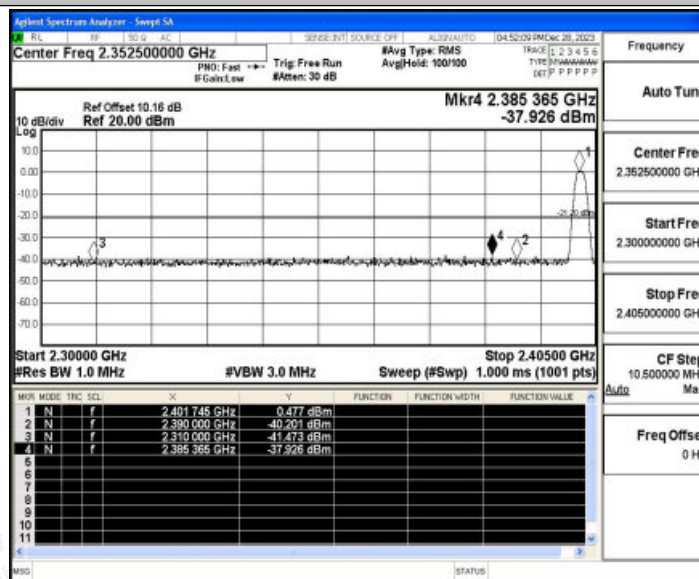


Test Graphs

BLE_1M_Ant1_Low_2402_AV

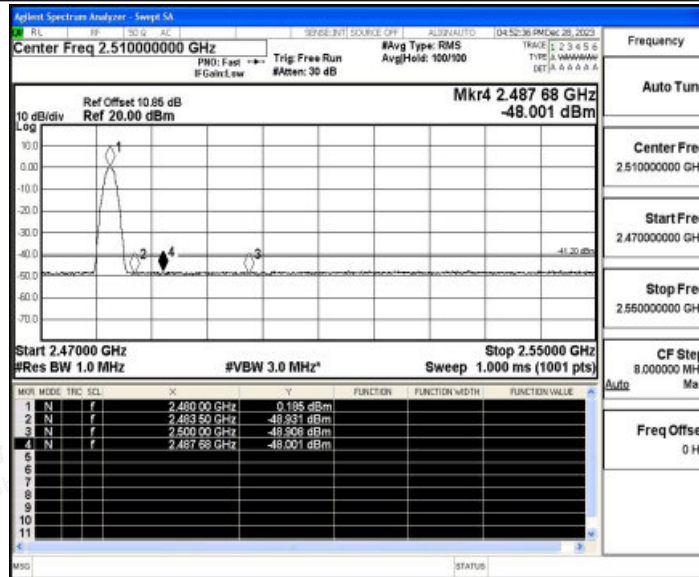


BLE_1M_Ant1_Low_2402_Peak

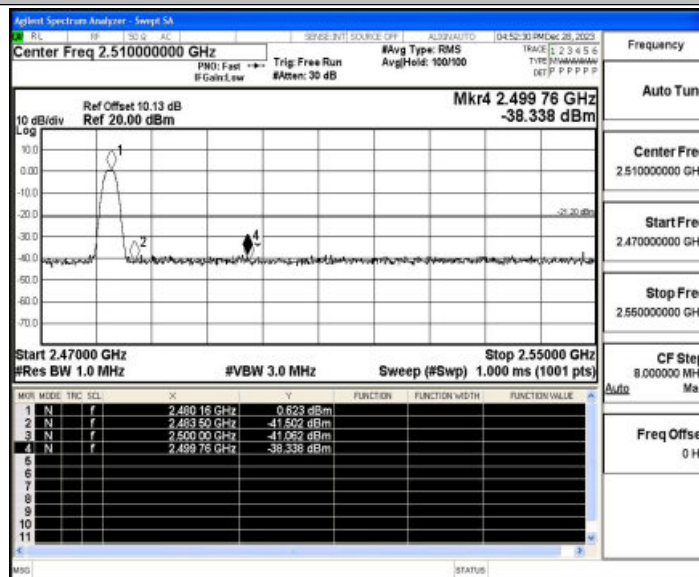


BLE_1M_Ant1_High_2480_AV



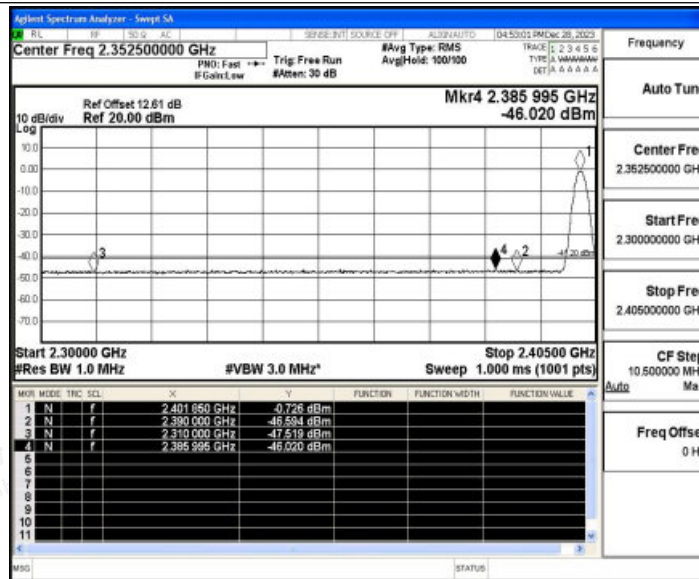


BLE_1M_Ant1_High_2480_Peak

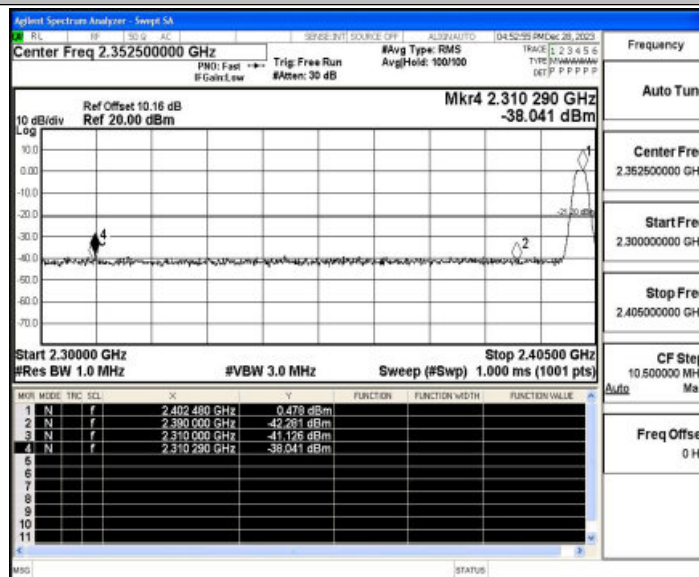


BLE_2M_Ant1_Low_2402_AV



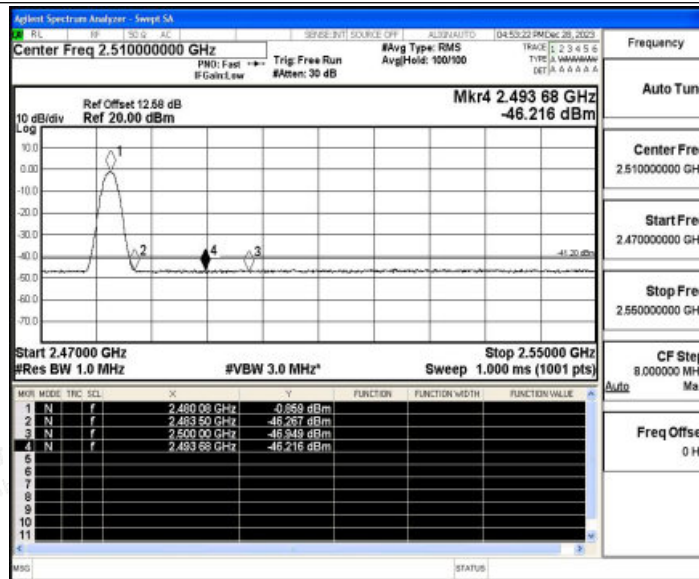


BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV





BLE_2M_Ant1_High_2480_Peak

