



Appendix A

RF Test Data for 2.4G BLE (Conducted Measurement)

Product Name: smart RGBIC Ambient Light

Test Model: FWWSA1-1302

Environmental Conditions

Temperature:	21.1 ° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Huan Li

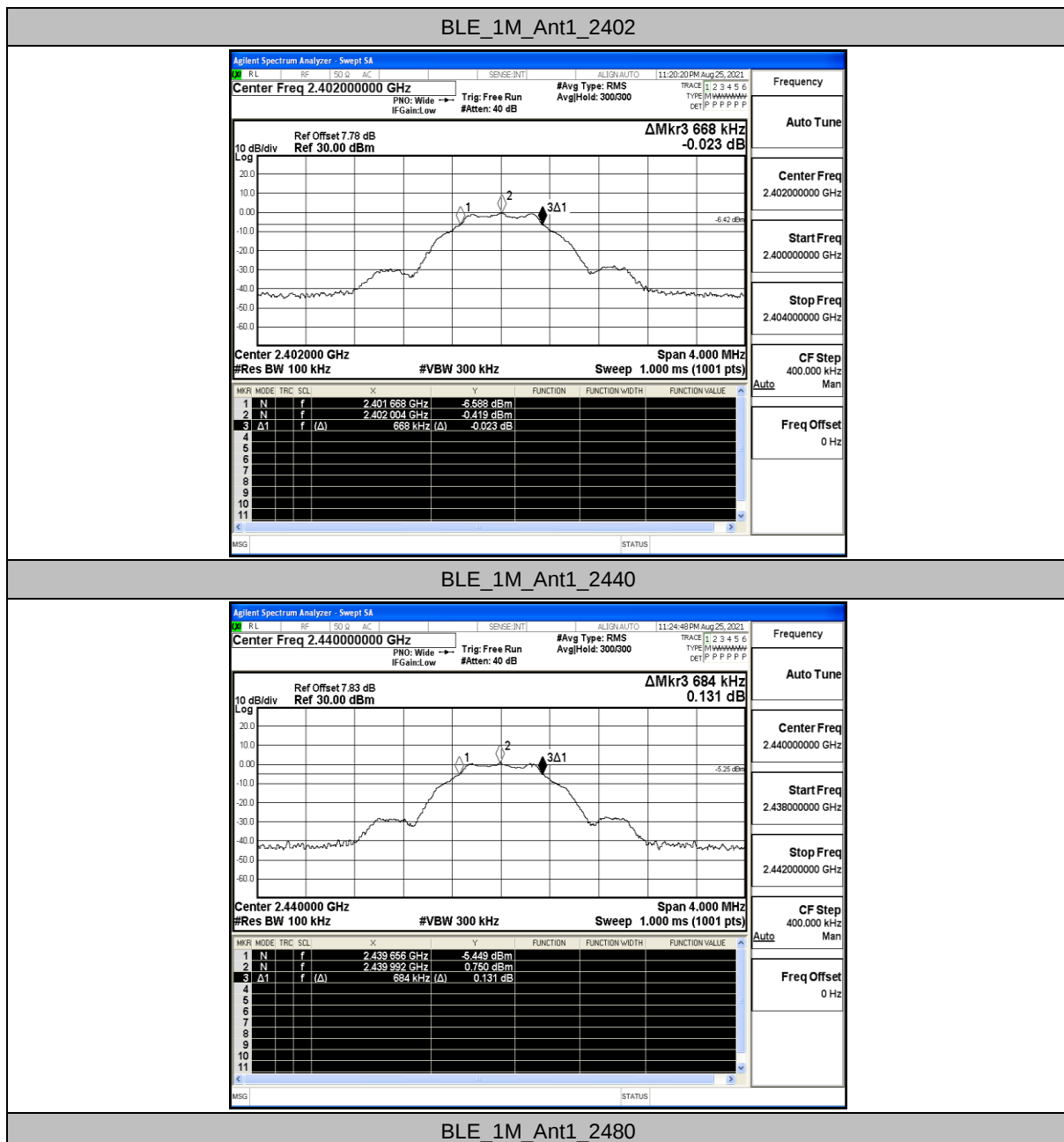


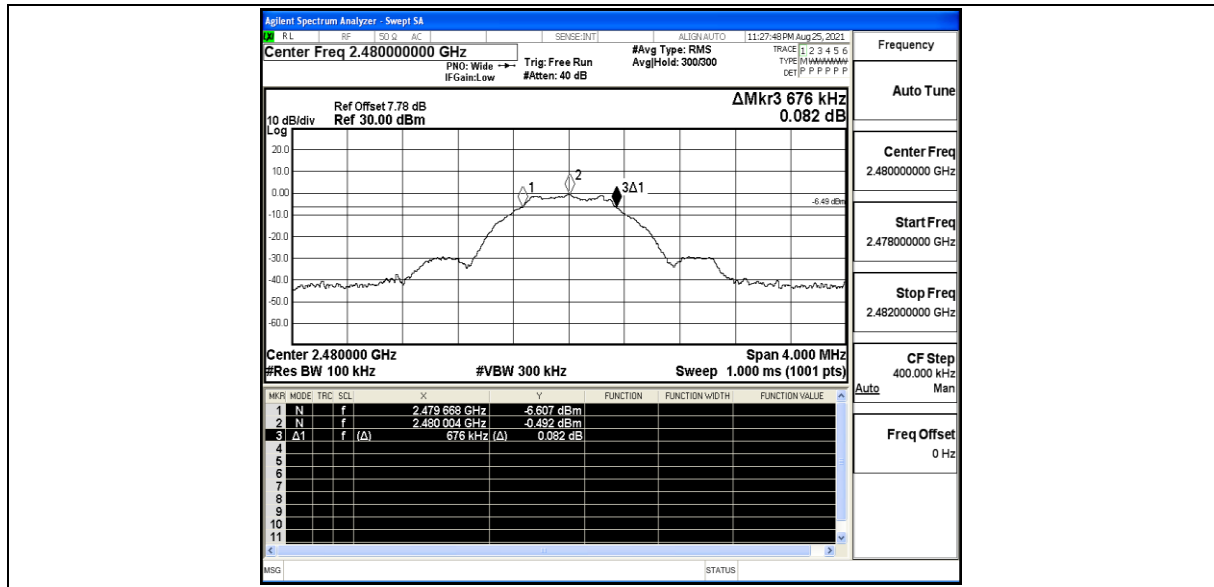
A.1 DTS Bandwidth

Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.668	2401.668	2402.336	≥0.5	PASS
		2440	0.684	2439.656	2440.340	≥0.5	PASS
		2480	0.676	2479.668	2480.344	≥0.5	PASS

Test Graphs





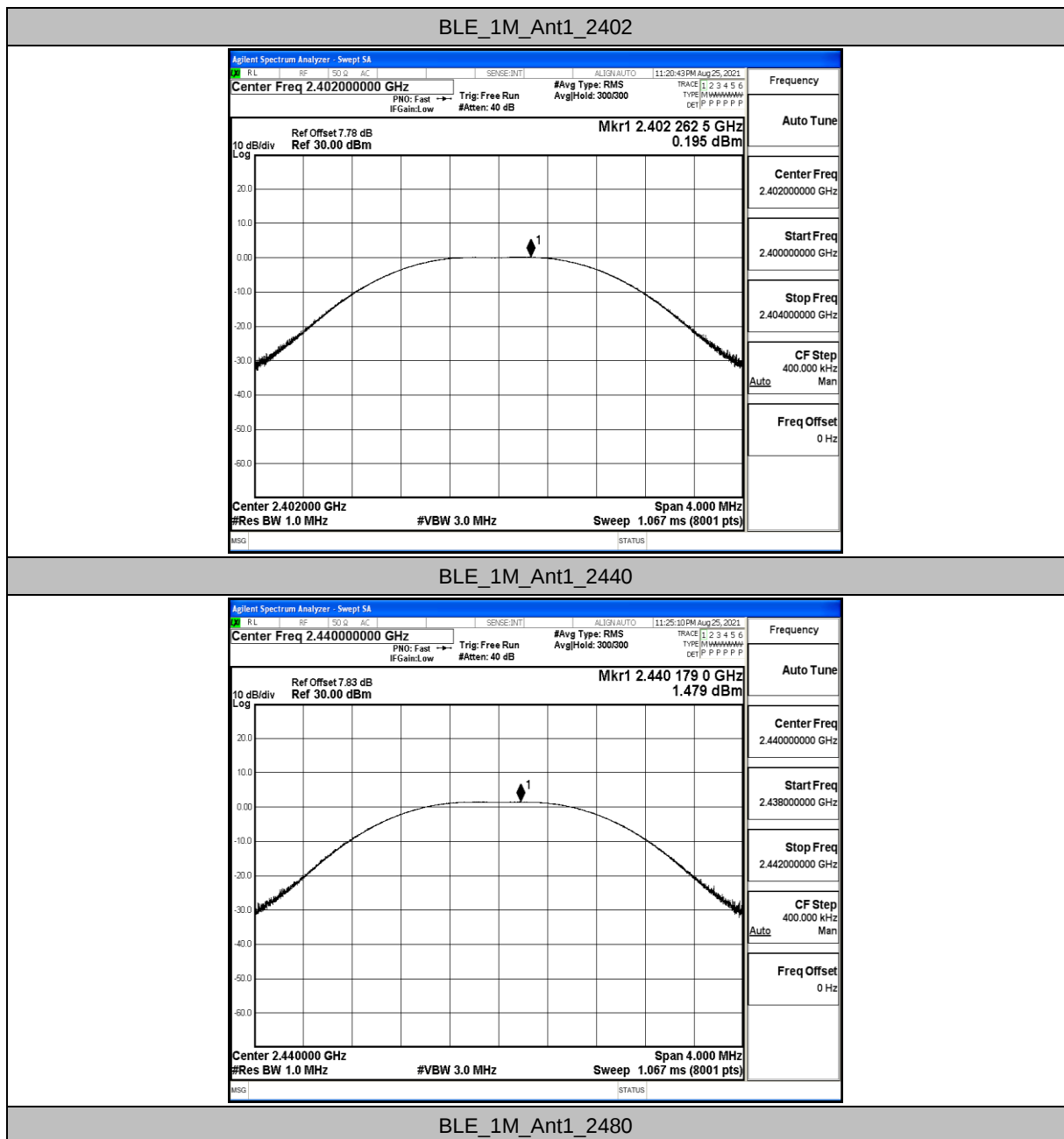


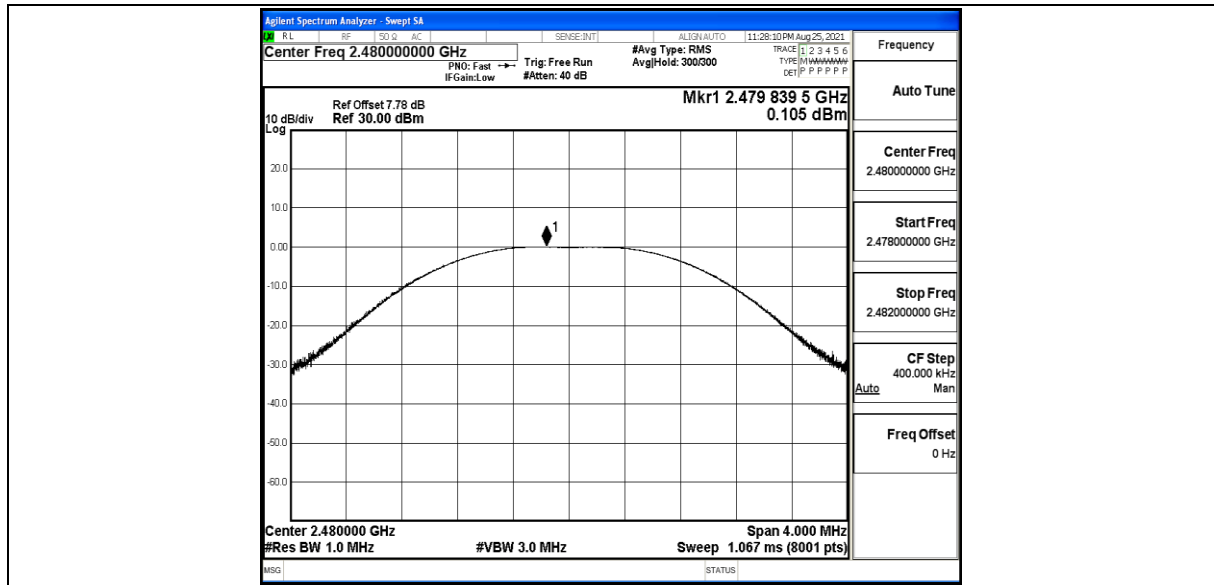
A.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.20	≤30	PASS
		2440	1.48	≤30	PASS
		2480	0.11	≤30	PASS

Test Graphs





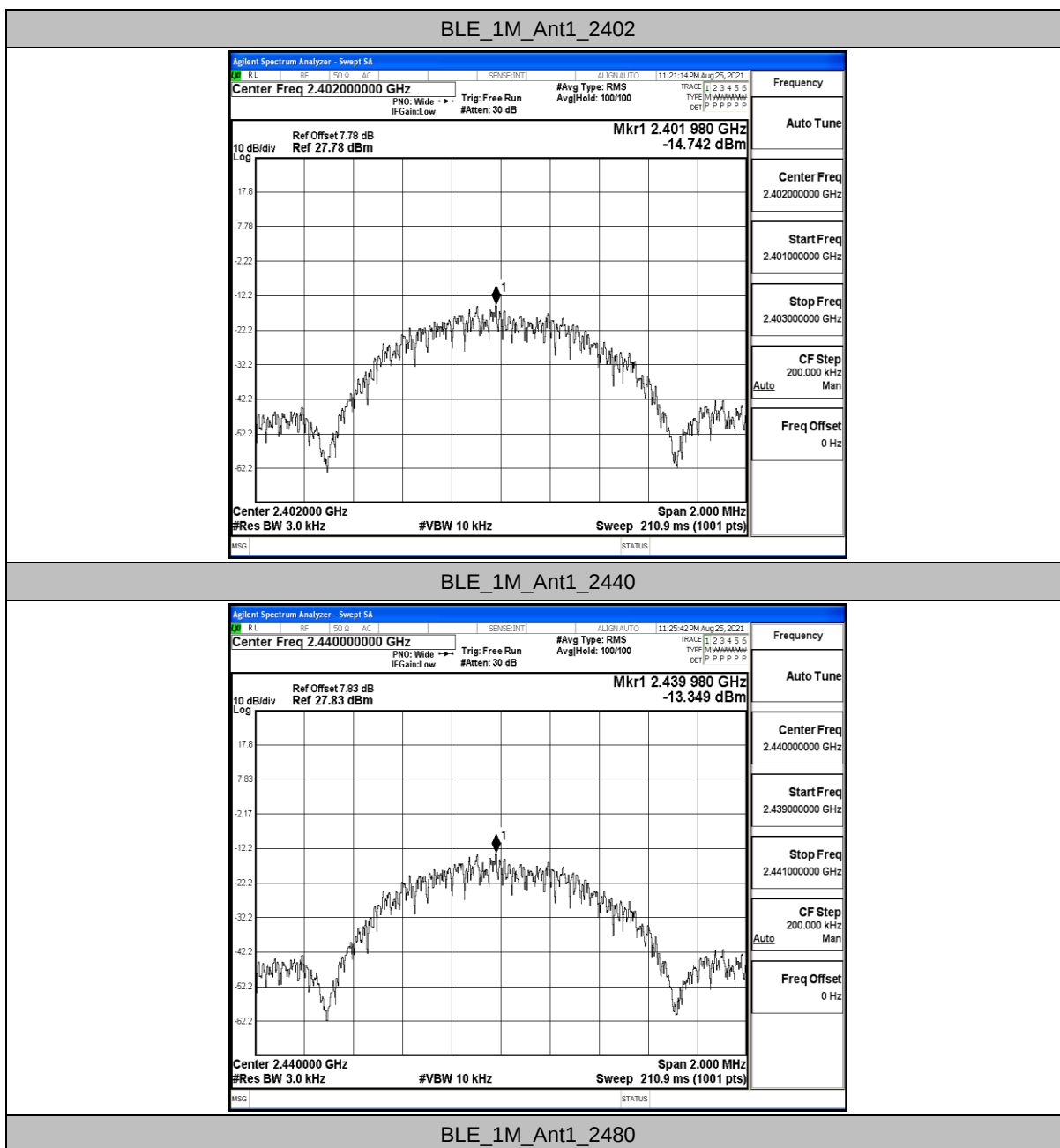


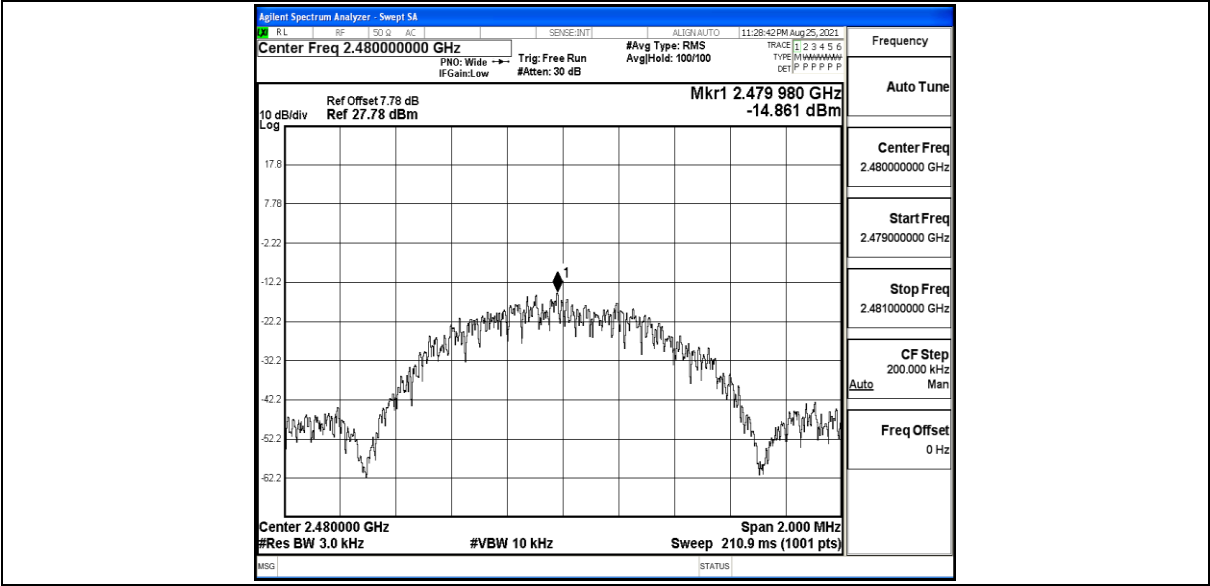
A.3 Maximum power spectral density

Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-14.74	≤8	PASS
		2440	-13.35	≤8	PASS
		2480	-14.86	≤8	PASS

Test Graphs





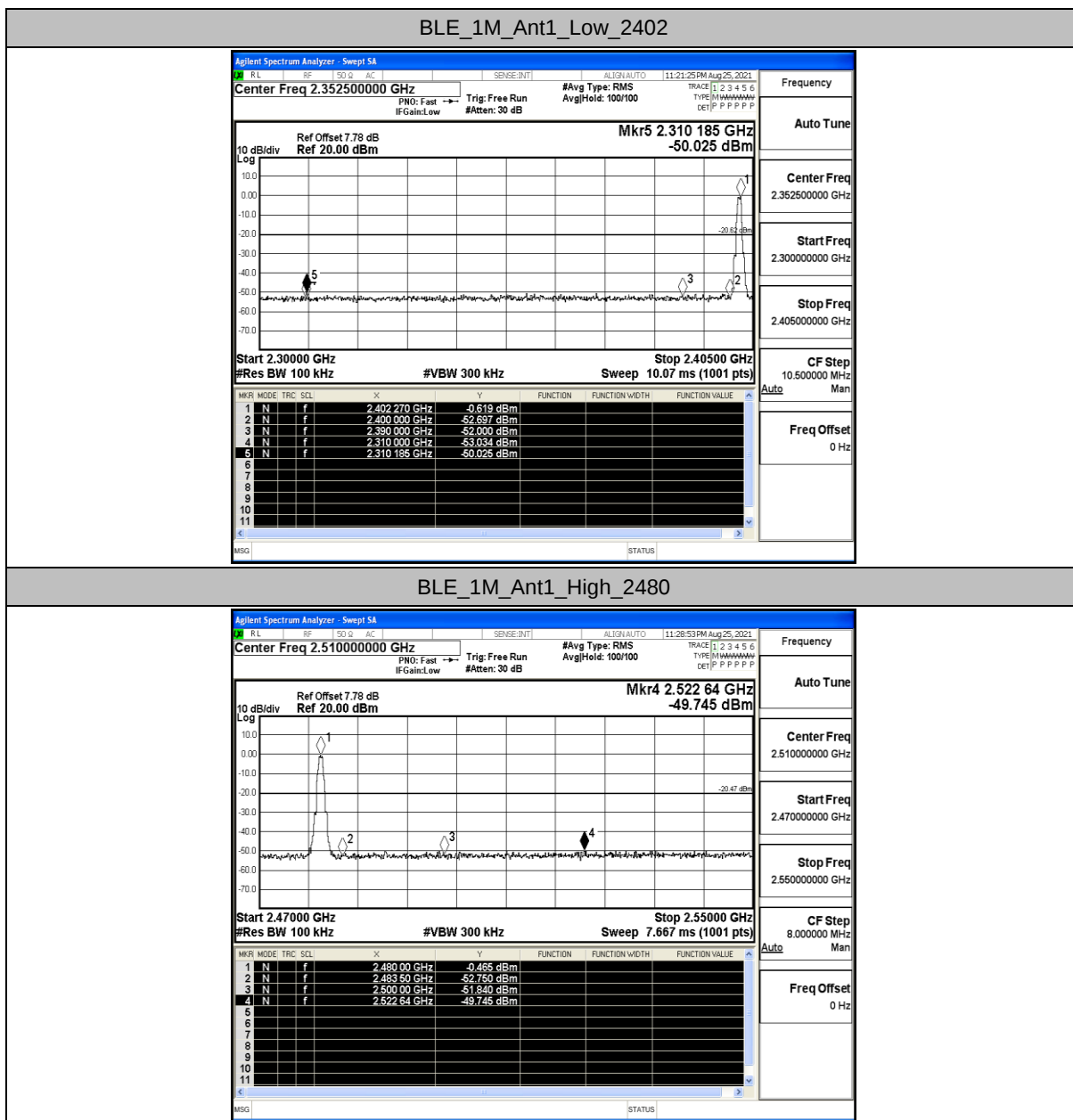


A.4 Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-0.62	-50.03	≤-20.62	PASS
		High	2480	-0.47	-49.75	≤-20.47	PASS

Test Graphs



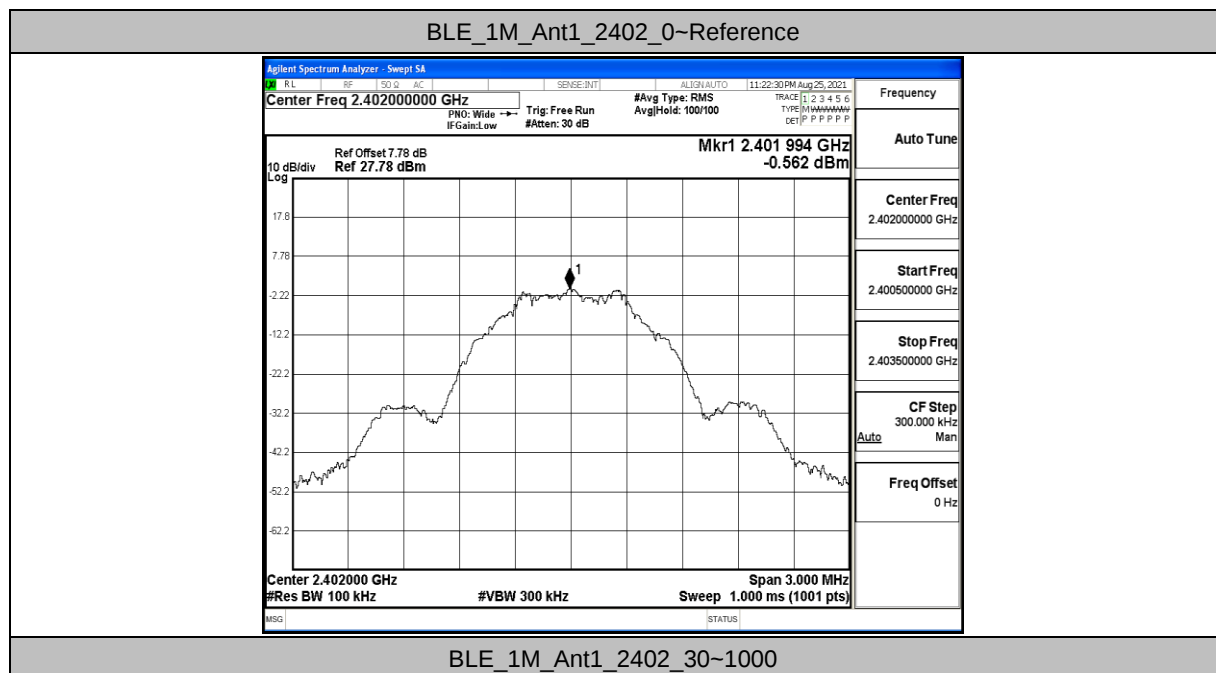


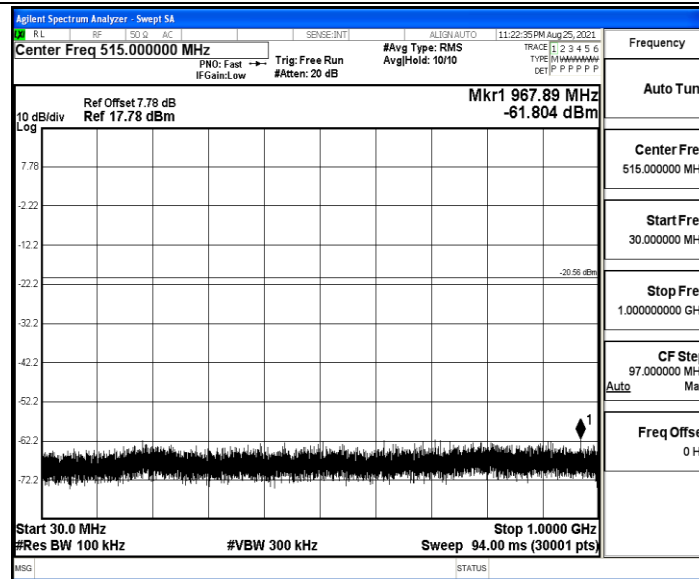
A.5 Conducted Spurious Emission

Test Result

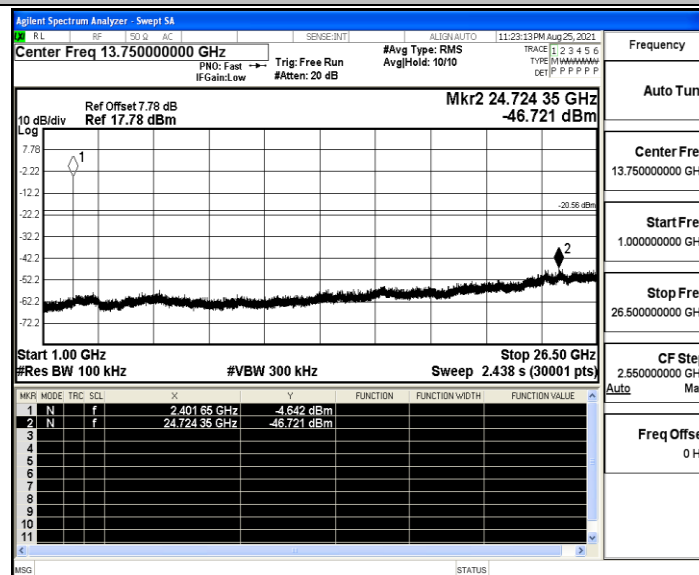
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.56	-0.56	---	PASS
			30~1000	-0.56	-61.8	≤-20.56	PASS
			1000~26500	-0.56	-46.72	≤-20.56	PASS
		2440	Reference	0.84	0.84	---	PASS
			30~1000	0.84	-61.6	≤-19.16	PASS
			1000~26500	0.84	-47.29	≤-19.16	PASS
		2480	Reference	-0.65	-0.65	---	PASS
			30~1000	-0.65	-62.01	≤-20.65	PASS
			1000~26500	-0.65	-47.64	≤-20.65	PASS

Test Graphs

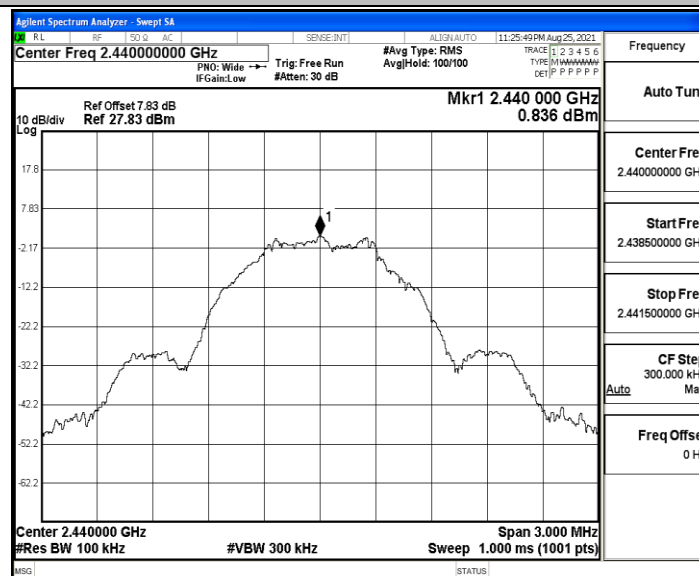




BLE_1M_Ant1_2402_1000~26500

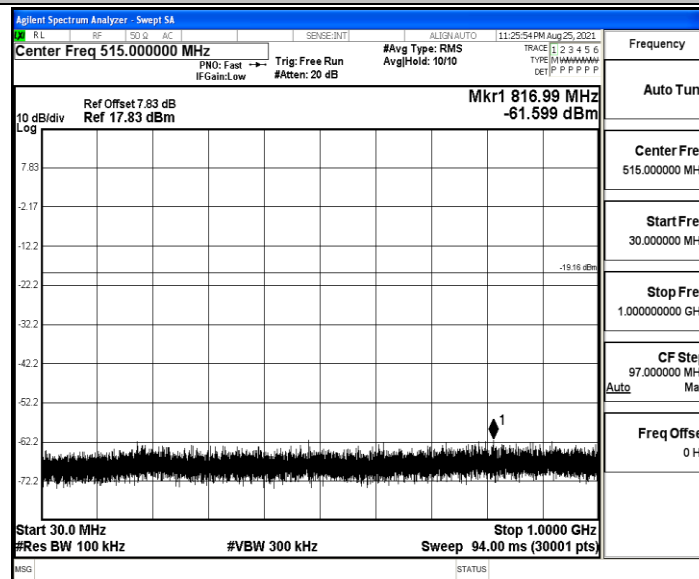


BLE_1M_Ant1_2440_0~Reference

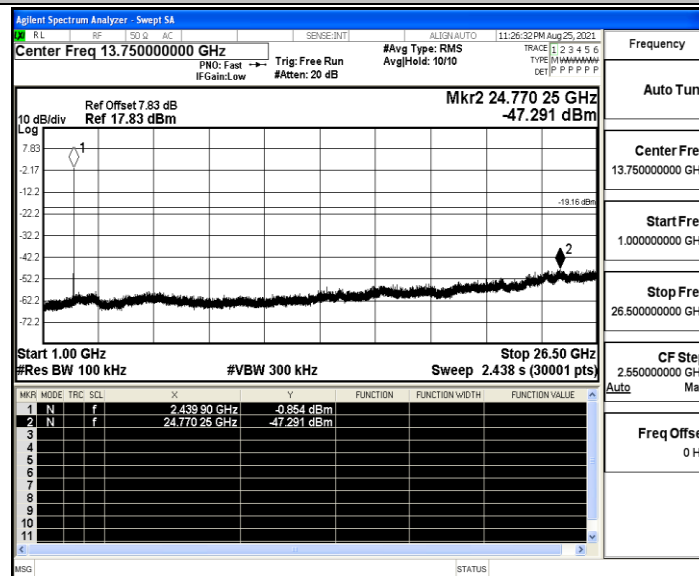




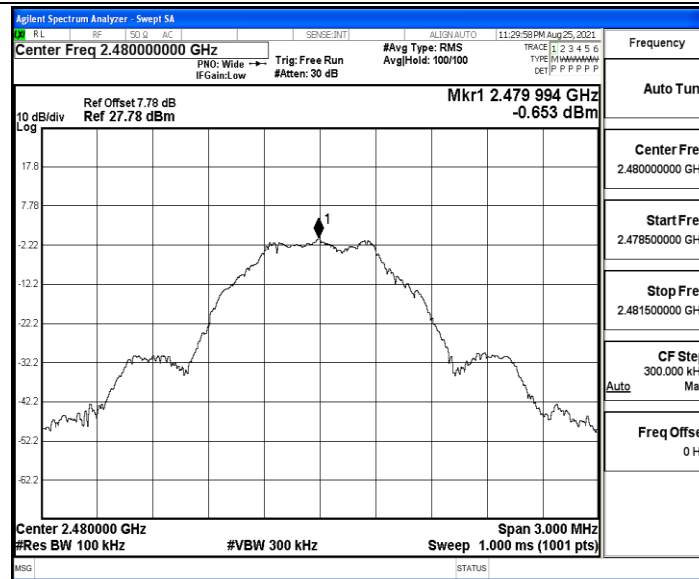
BLE_1M_Ant1_2440_30~1000



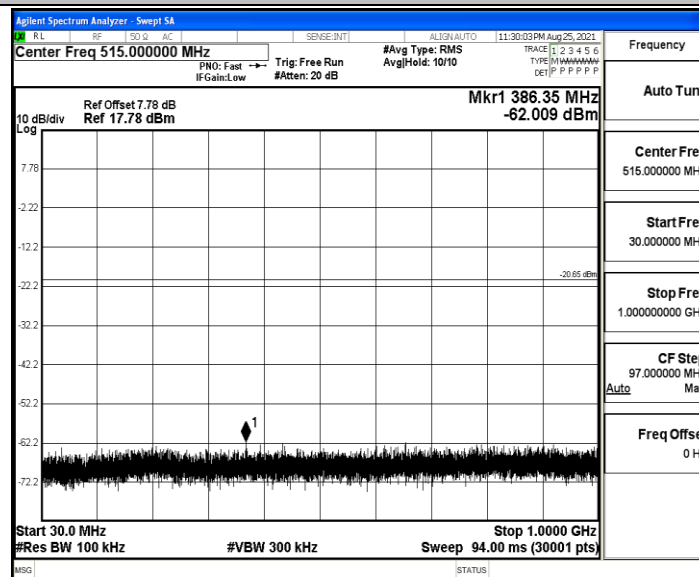
BLE_1M_Ant1_2440_1000~26500



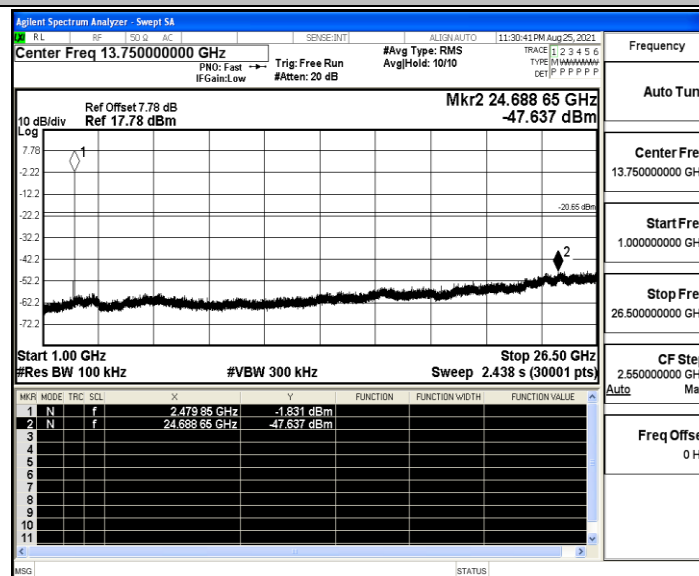
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500



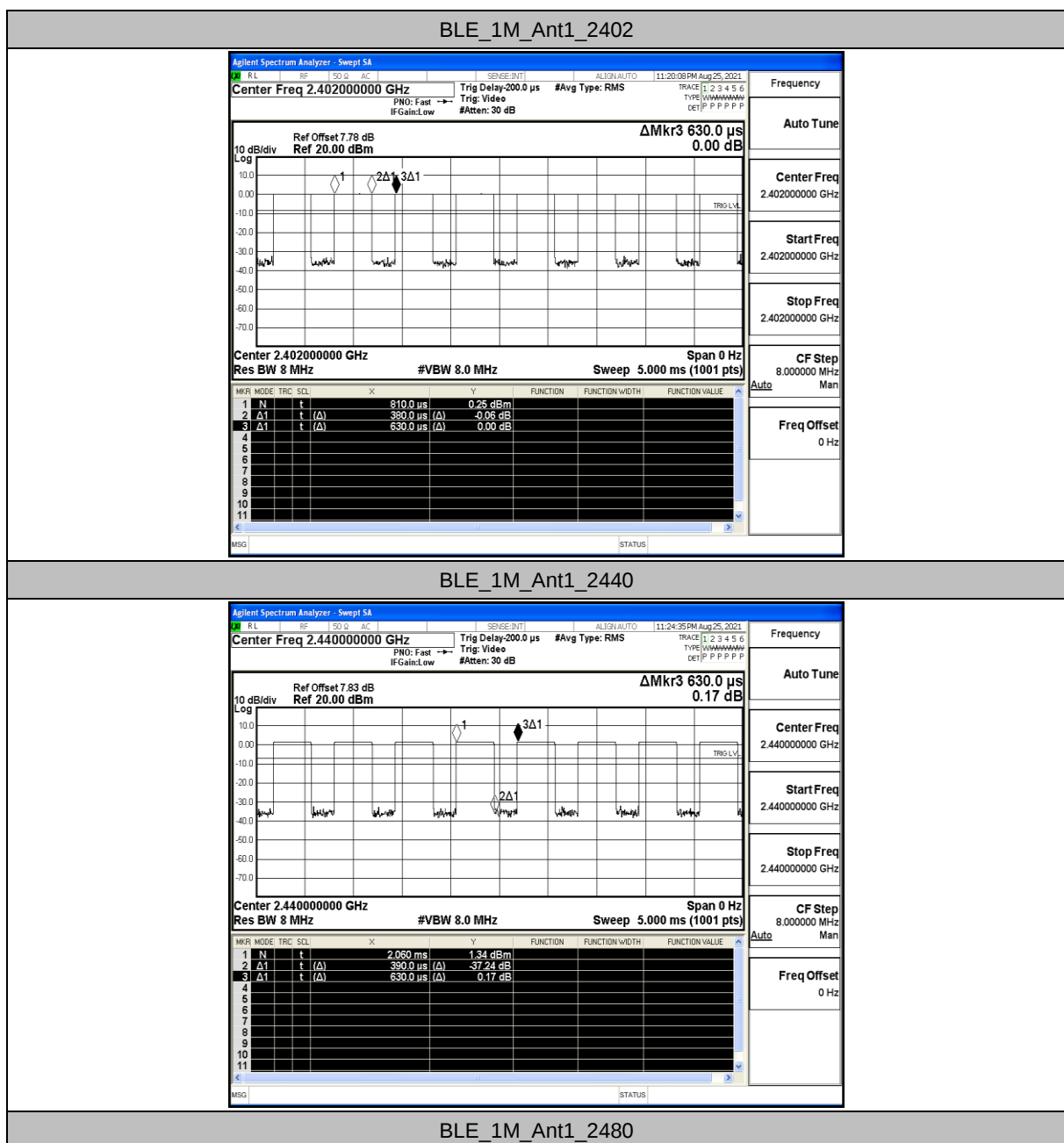


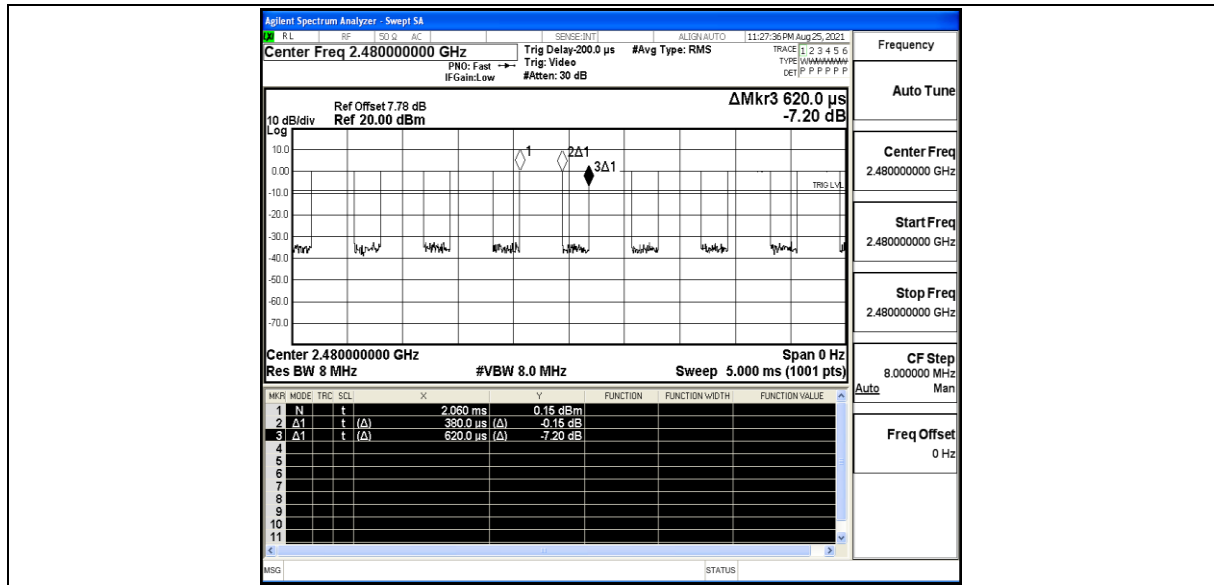
A.6 Duty Cycle

Test Result

TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.38	0.63	0.6032	60.32	2.20	---	PASS
		2440	0.39	0.63	0.6190	61.90	2.08	---	PASS
		2480	0.38	0.62	0.6129	61.29	2.13	---	PASS

Test Graphs







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	-48.29	≤-41.20	46.91	≤54	PASS
				AV	2358.485	-47.64	≤-41.20	47.56	≤54	PASS
				AV	2390.000	-47.91	≤-41.20	47.29	≤54	PASS
				Peak	2310.000	-42.61	≤-21.20	52.59	≤74	PASS
				Peak	2315.225	-38.14	≤-21.20	57.06	≤74	PASS
				Peak	2390.000	-42.26	≤-21.20	52.94	≤74	PASS
		High	2480	AV	2483.500	-47.32	≤-41.20	47.88	≤54	PASS
				AV	2499.440	-46.85	≤-41.20	48.35	≤54	PASS
				AV	2500.000	-47.23	≤-41.20	47.97	≤54	PASS
				Peak	2483.500	-40.73	≤-21.20	54.47	≤74	PASS
				Peak	2488.320	-38.36	≤-21.20	56.84	≤74	PASS
				Peak	2500.000	-38.45	≤-21.20	56.75	≤74	PASS

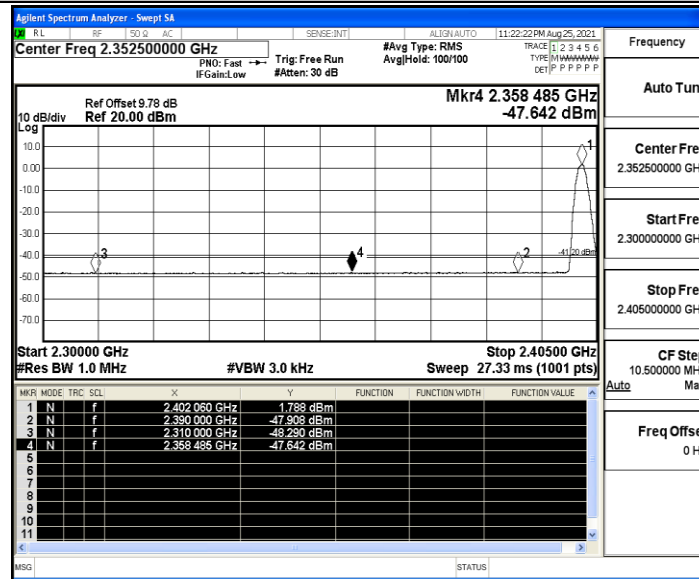
Note:

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.

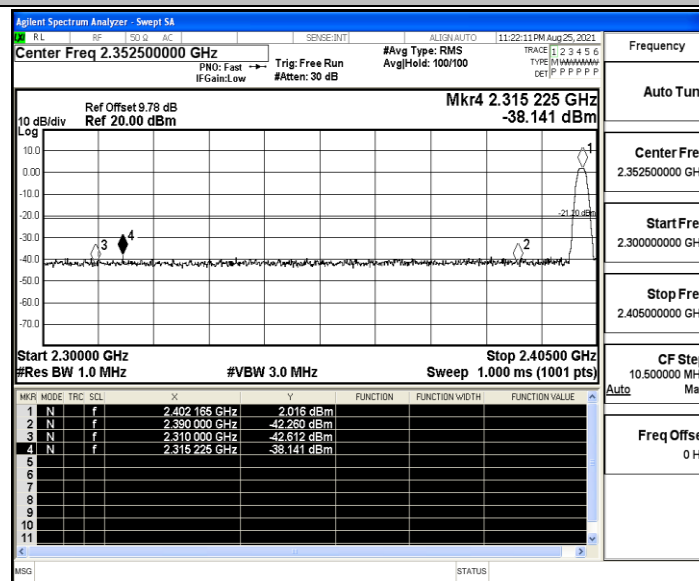


Test Graphs

BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV

