



Appendix A

RF Test Data for BLE V5.0(DTS) (Conducted Measurement)

Product Name: Smart Switch

Trade Mark: N/A

Test Model: ESW-12TBNVB-US

Environmental Conditions

Temperature:	21.2 ° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Li Huan



A.1 DTS Bandwidth

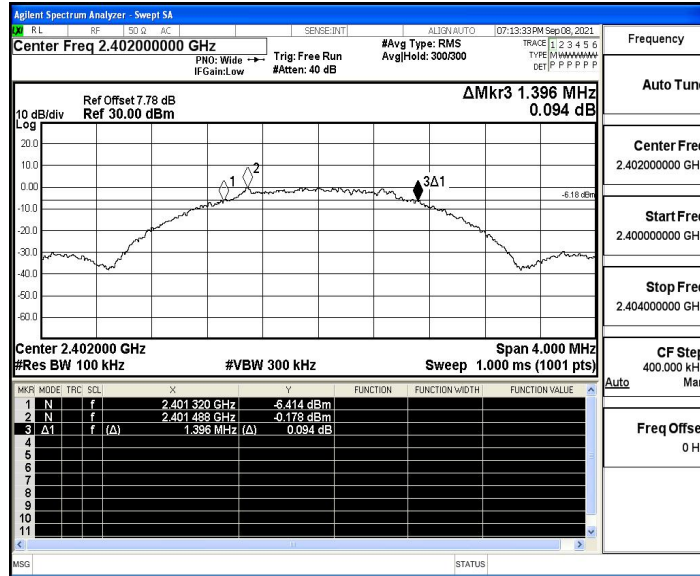
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_2M	Ant1	2402	1.396	2401.320	2402.716	≥0.5	PASS
		2440	1.304	2439.340	2440.644	≥0.5	PASS
		2480	1.396	2479.308	2480.704	≥0.5	PASS

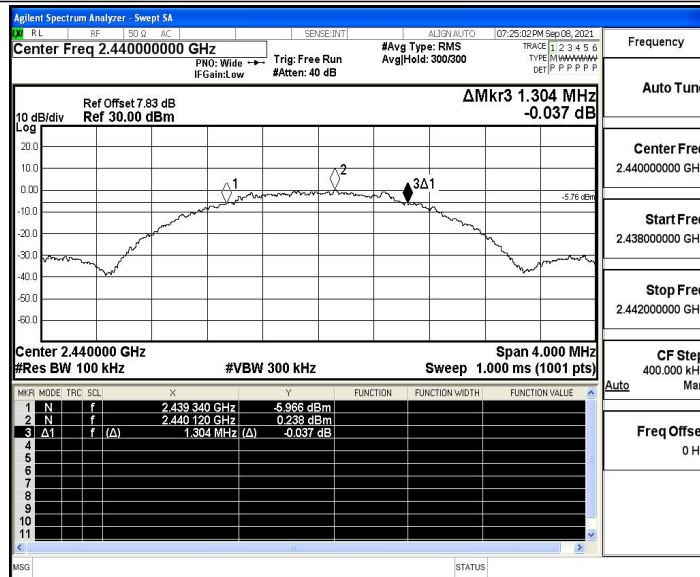


Test Graphs

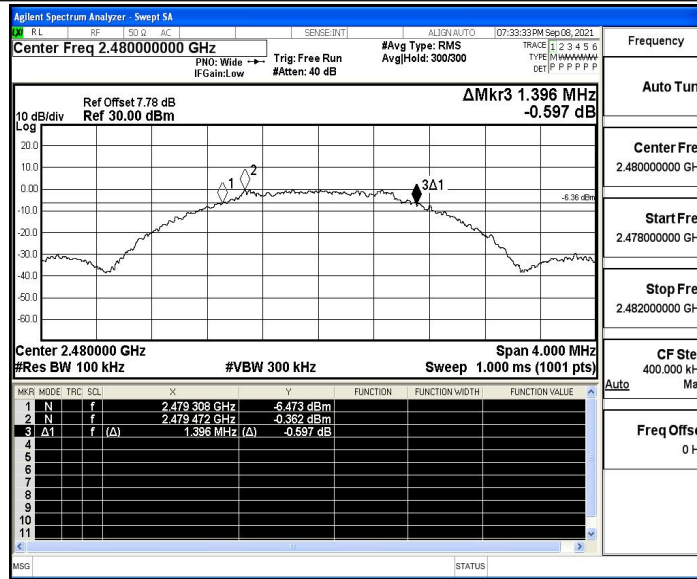
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.2 Maximum peak conducted output power

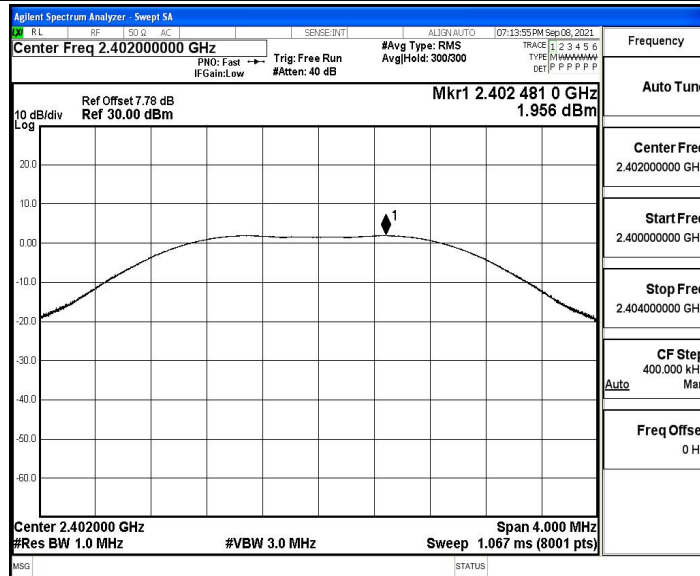
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant1	2402	1.96	≤ 30	PASS
		2440	2	≤ 30	PASS
		2480	1.93	≤ 30	PASS

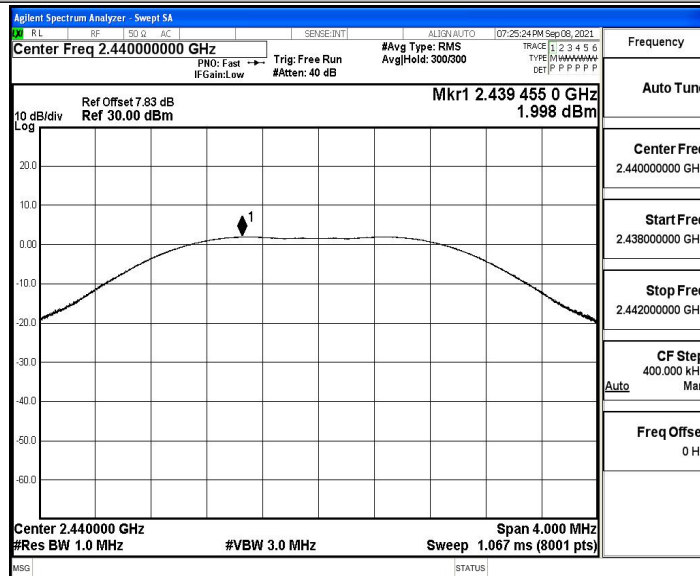


Test Graphs

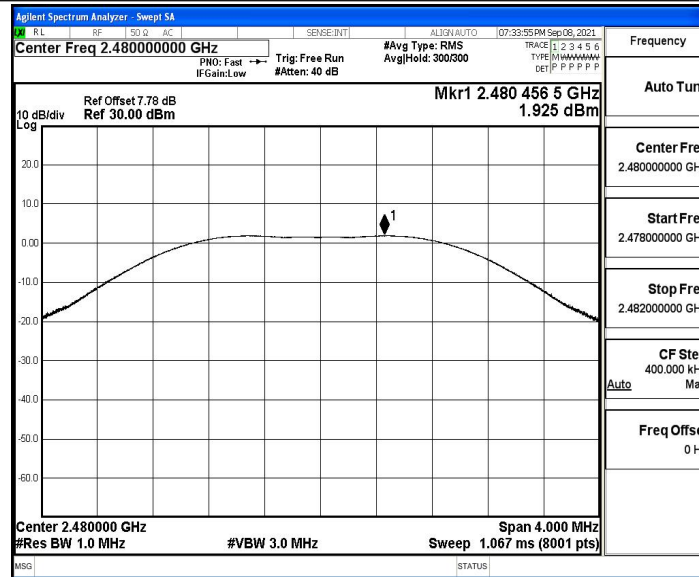
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.3 Maximum power spectral density

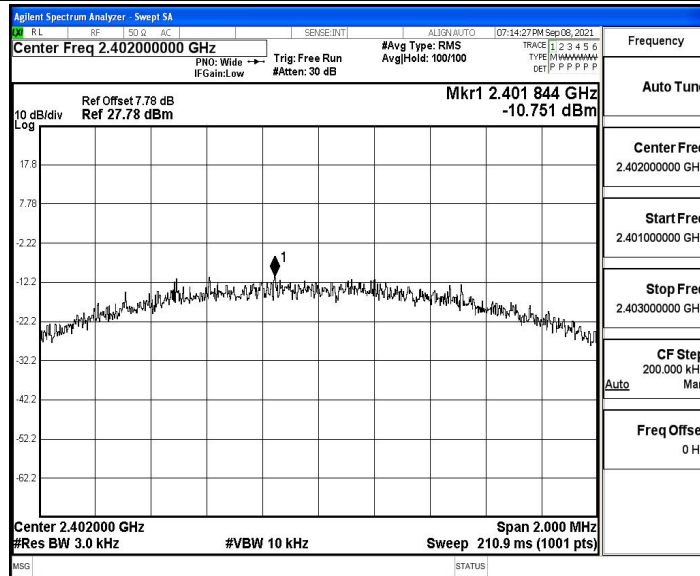
Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_2M	Ant1	2402	-10.75	≤8	PASS
		2440	-11.19	≤8	PASS
		2480	-9.36	≤8	PASS

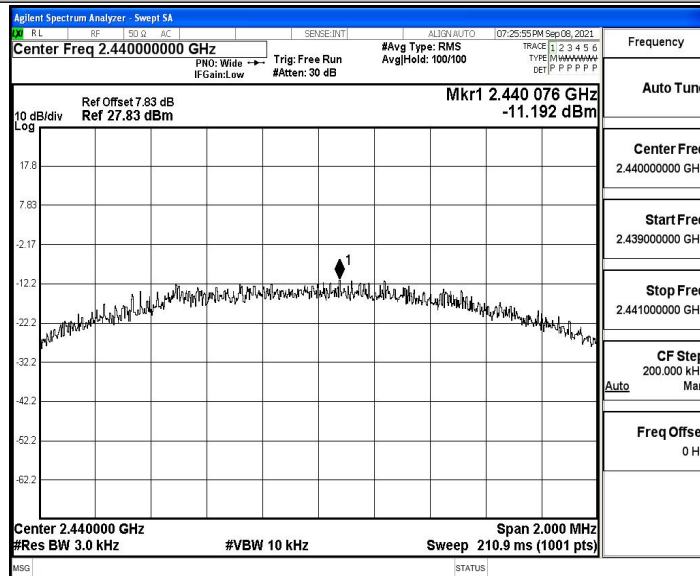


Test Graphs

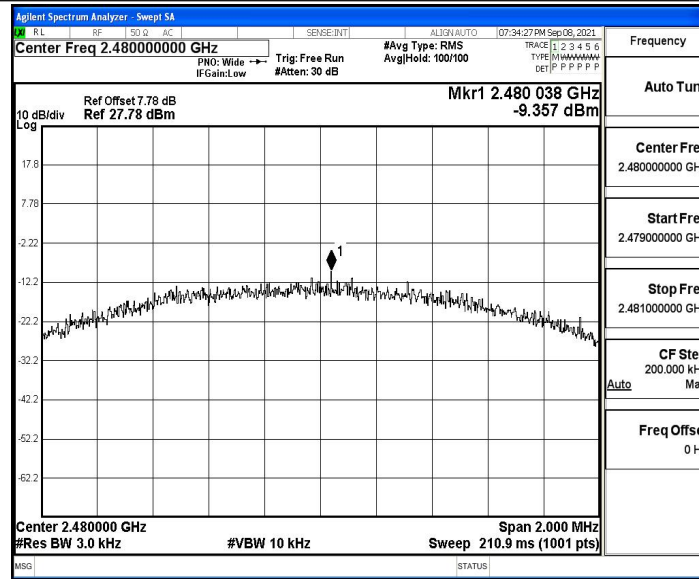
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480





A.4 Band edge measurements

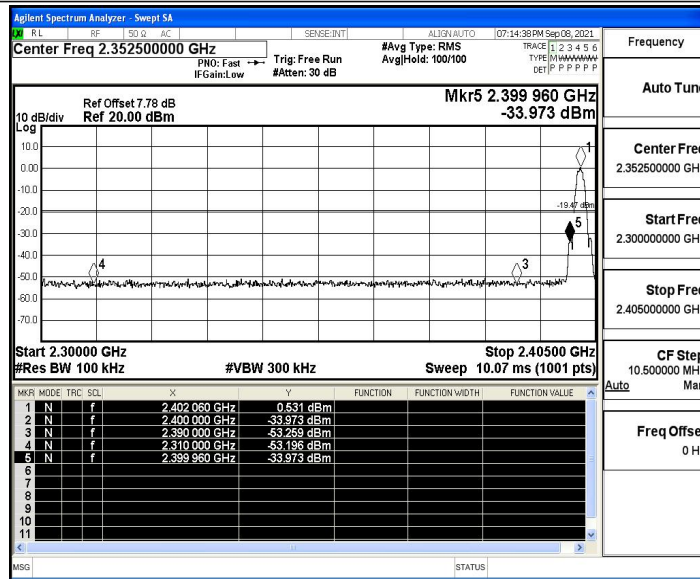
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant1	Low	2402	0.53	-33.97	≤ -19.47	PASS
		High	2480	-0.72	-48.89	≤ -20.72	PASS

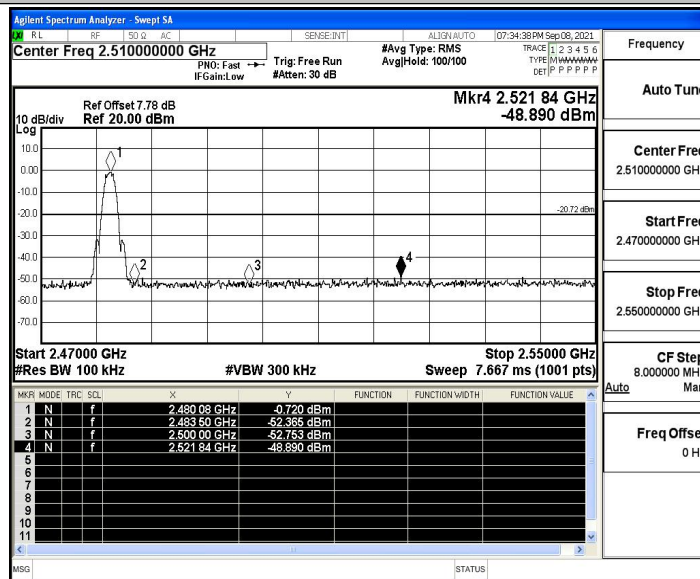


Test Graphs

BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480





A.5 Conducted Spurious Emission

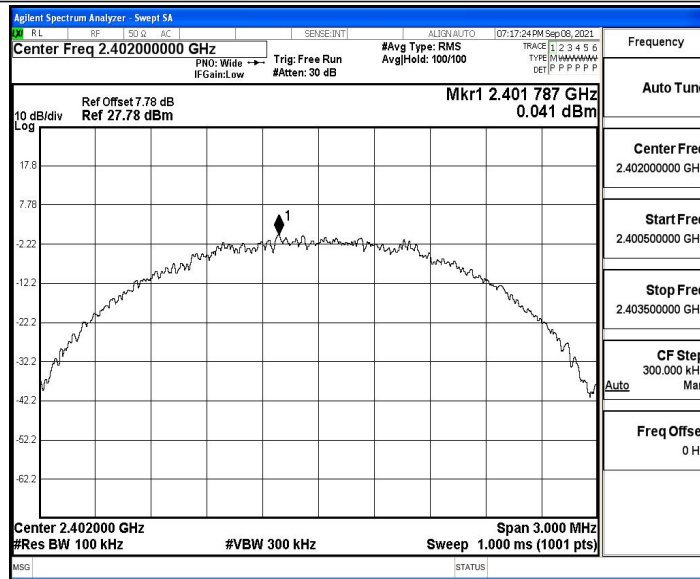
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant1	2402	Reference	0.04	0.04	---	PASS
			30~1000	0.04	-61.43	≤ -19.96	PASS
			1000~26500	0.04	-47.81	≤ -19.96	PASS
		2440	Reference	-0.34	-0.34	---	PASS
			30~1000	-0.34	-61.28	≤ -20.34	PASS
			1000~26500	-0.34	-47.27	≤ -20.34	PASS
		2480	Reference	-0.15	-0.15	---	PASS
			30~1000	-0.15	-60.38	≤ -20.15	PASS
			1000~26500	-0.15	-47.3	≤ -20.15	PASS

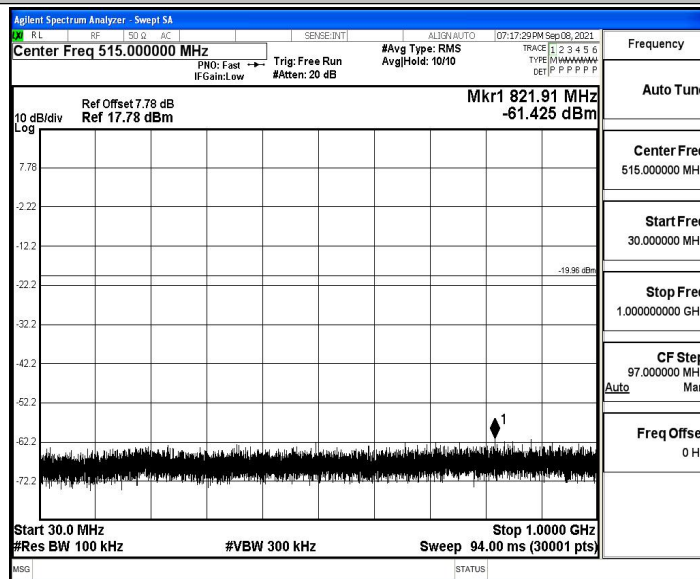


Test Graphs

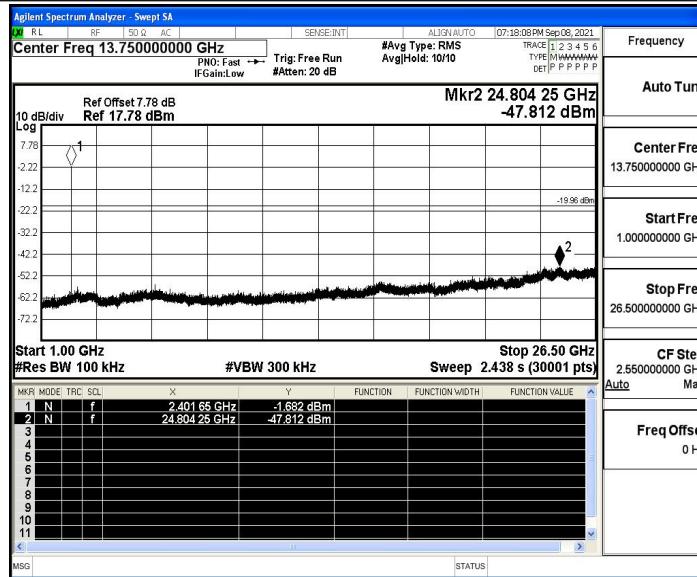
BLE_2M_Ant1_2402_0~Reference



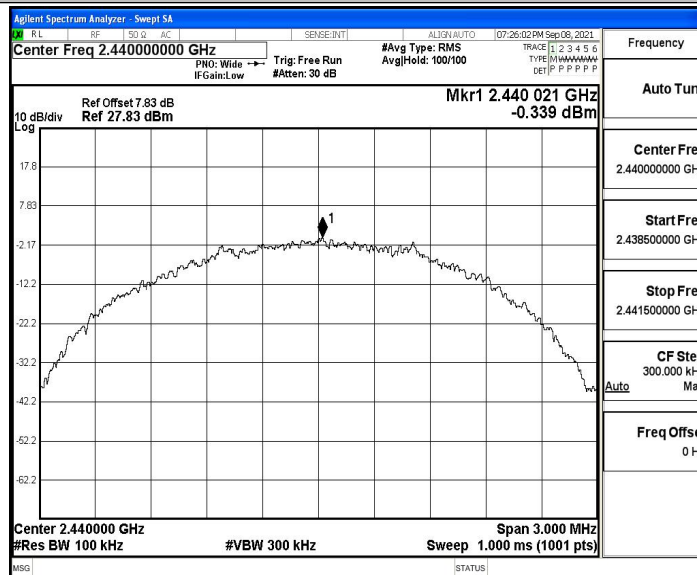
BLE_2M_Ant1_2402_30~1000



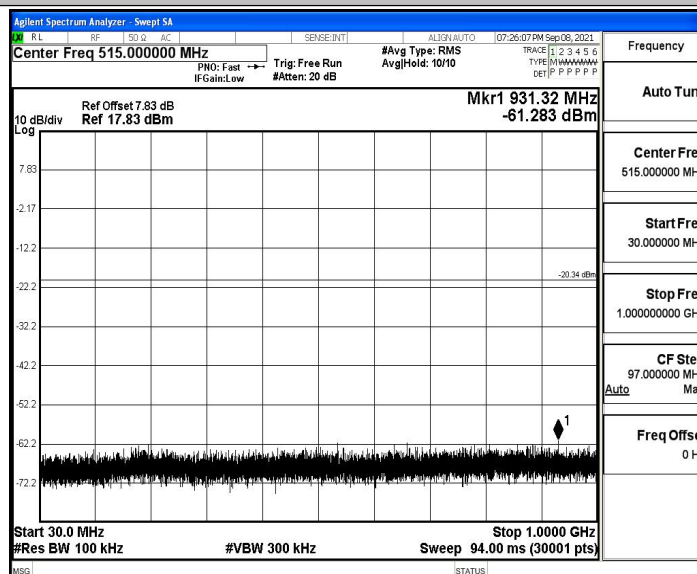
BLE_2M_Ant1_2402_1000~26500



BLE_2M_Ant1_2440_0~Reference

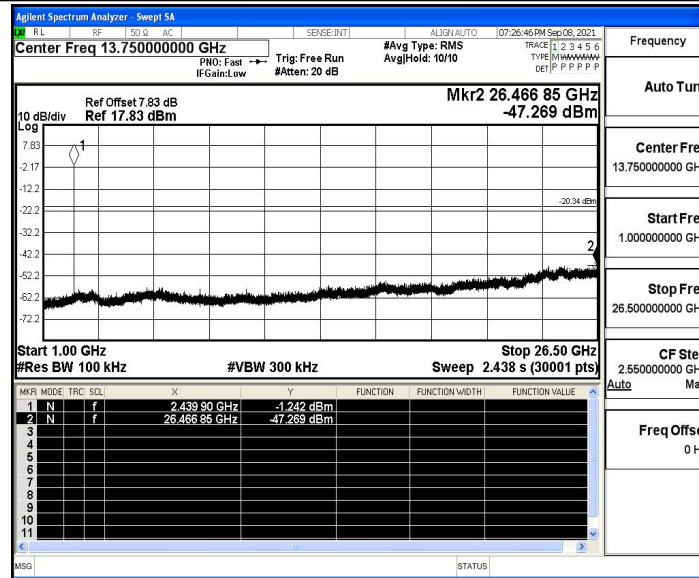


BLE_2M_Ant1_2440_30~1000

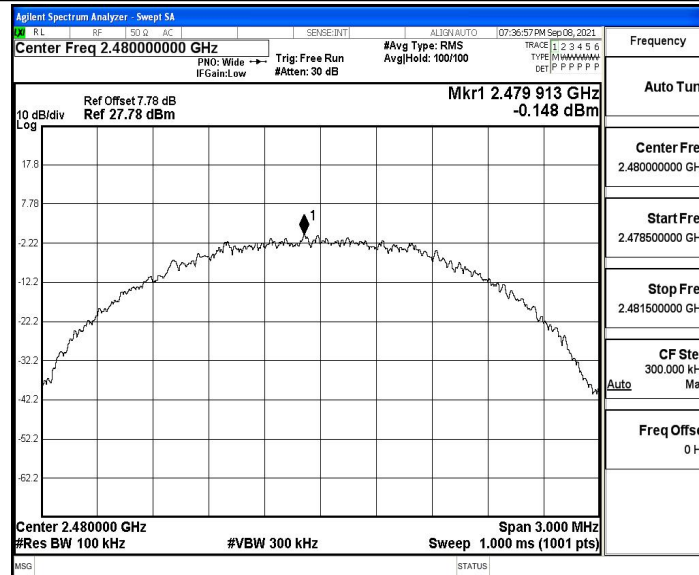




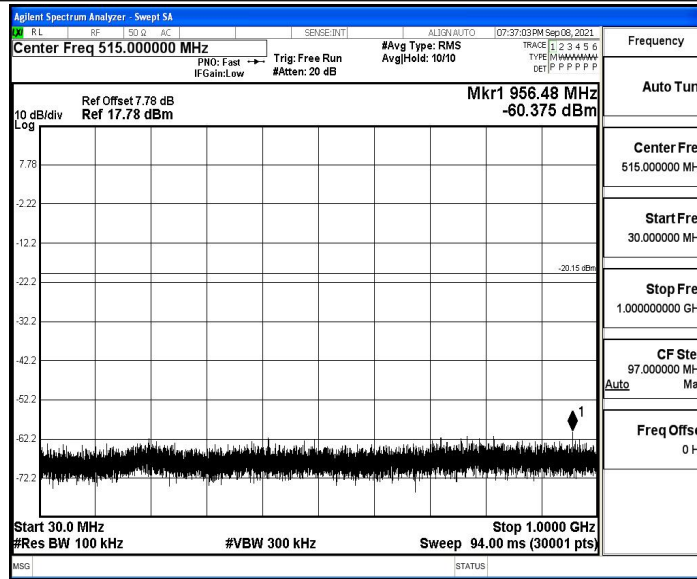
BLE_2M_Ant1_2440_1000~26500



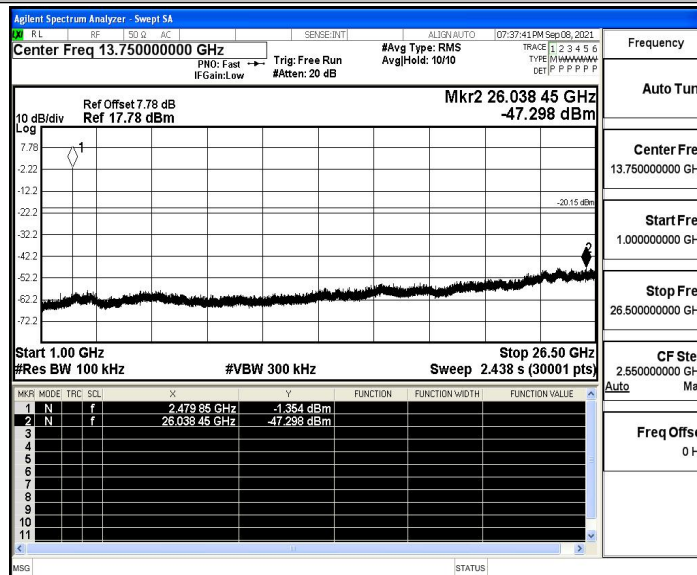
BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500





A.6 Duty Cycle

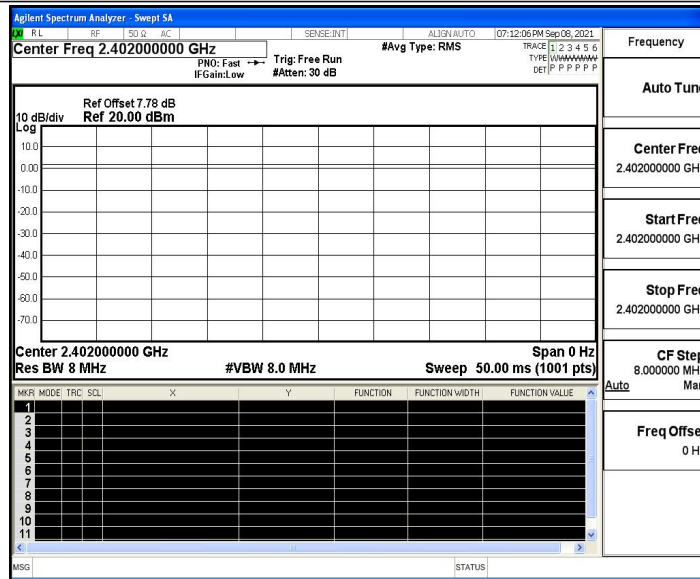
Test Result

TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_2M	Ant1	2402	50.00	50.00	1.0000	100.00	0.00	---	PASS
		2440	50.00	50.00	1.0000	100.00	0.00	---	PASS
		2480	50.00	50.00	1.0000	100.00	0.00	---	PASS

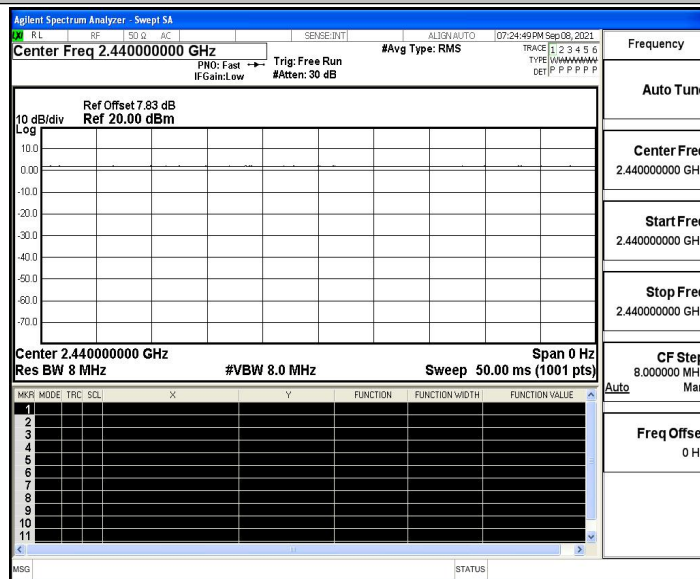


Test Graphs

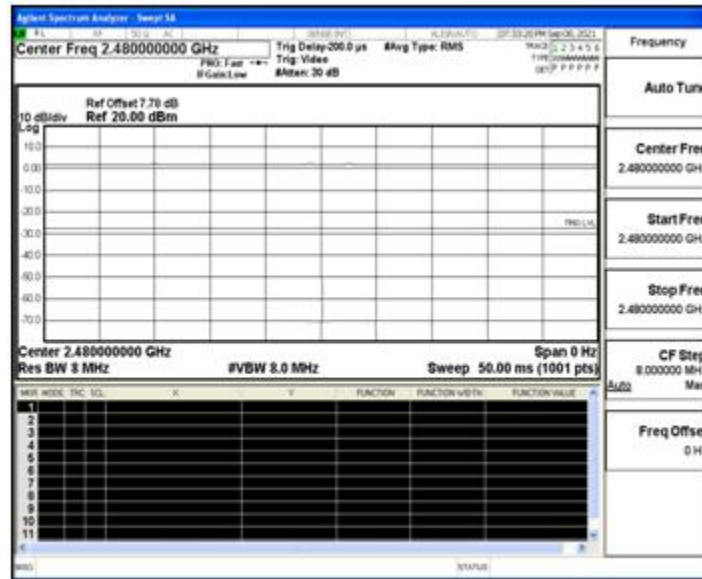
BLE_2M_Ant1_2402



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_2M	Ant1	Low	2402	AV	2310.000	-49.34	≤-41.20	45.86	≤54	PASS
				AV	2389.460	-48.95	≤-41.20	46.25	≤54	PASS
				AV	2390.000	-48.99	≤-41.20	46.21	≤54	PASS
				Peak	2310.000	-44.21	≤-21.20	50.99	≤74	PASS
				Peak	2328.770	-39.8	≤-21.20	55.40	≤74	PASS
				Peak	2390.000	-43.69	≤-21.20	51.51	≤74	PASS
		High	2480	AV	2483.500	-44.89	≤-41.20	50.31	≤54	PASS
				AV	2483.520	-44.89	≤-41.20	50.31	≤54	PASS
				AV	2500.000	-48.38	≤-41.20	46.82	≤54	PASS
				Peak	2483.500	-43.16	≤-21.20	52.04	≤74	PASS
				Peak	2490.160	-39.77	≤-21.20	55.43	≤74	PASS
				Peak	2500.000	-44.48	≤-21.20	50.72	≤74	PASS

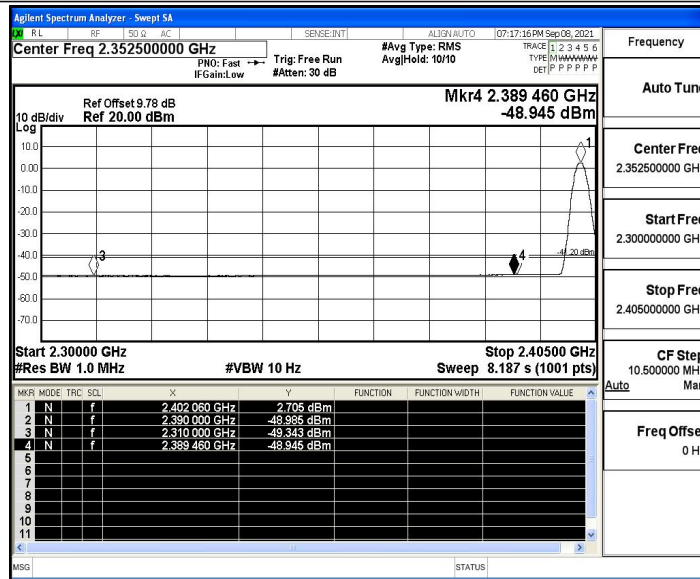
Note:

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.

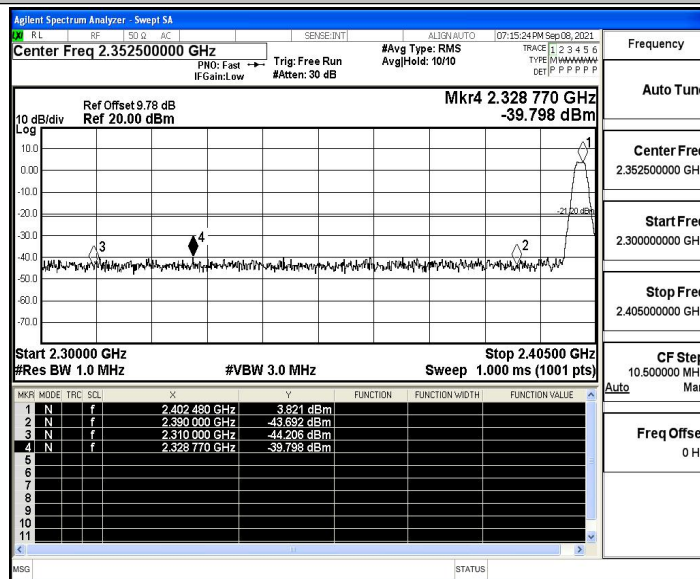


Test Graphs

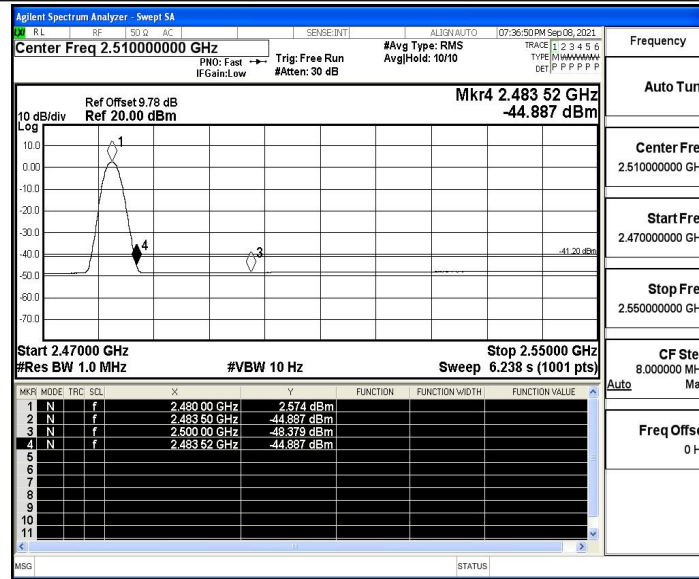
BLE_2M_Ant1_Low_2402_AV



BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak

