



## Appendix B

### RF Test Data for BLE (Conducted Measurement)

**Product Name: Vivi Wireless Presentation**

**Trade Mark: Vivi**

**Test Model: VWP-210-16**

#### Environmental Conditions

Temperature:	22.5 ° C
Relative Humidity:	53%
ATM Pressure:	100.0 kPa
Test Engineer:	Wunder Wu
Supervised by:	Li Huan



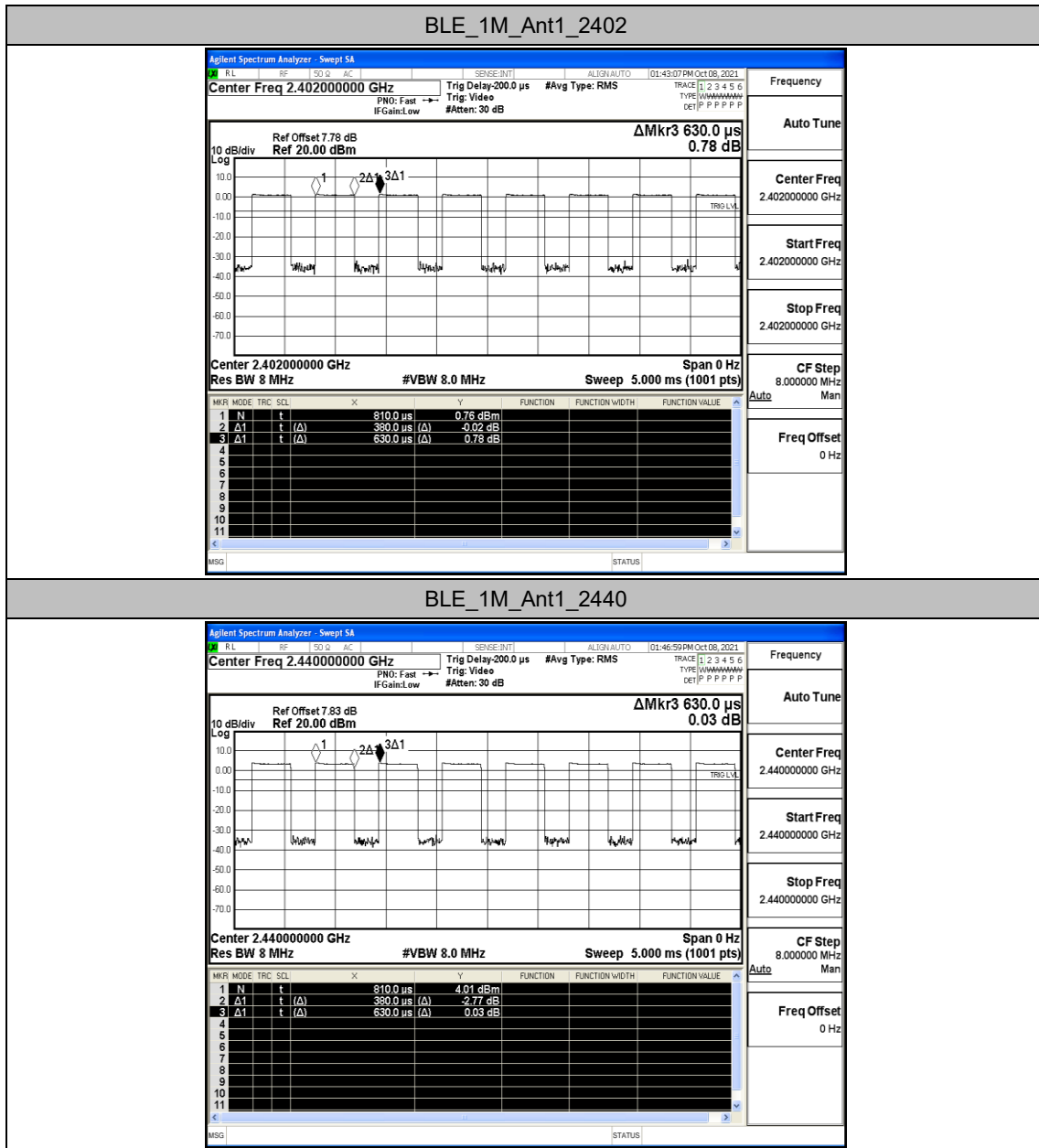
## Appendix B.1: Duty Cycle

### 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	0.38	0.63	0.6032	60.32	2.20	---	PASS
		2480	0.38	0.63	0.6032	60.32	2.20	---	PASS
BLE_2M	Ant1	2402	0.20	0.63	0.3175	31.75	4.98	---	PASS
		2440	0.19	0.62	0.3065	30.65	5.14	---	PASS
		2480	0.19	0.62	0.3065	30.65	5.14	---	PASS

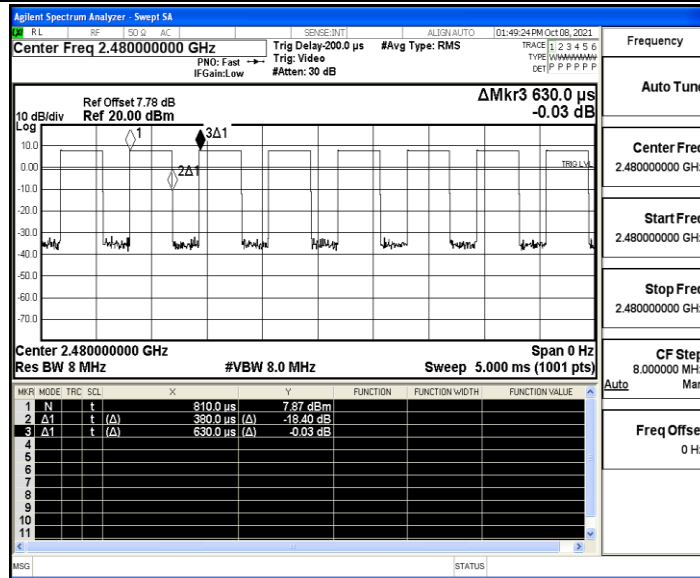


### Test Graphs

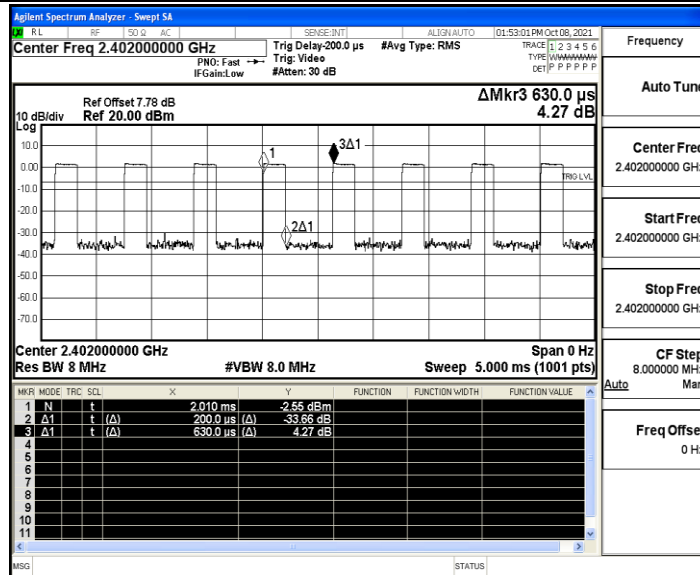




BLE\_1M\_Ant1\_2480

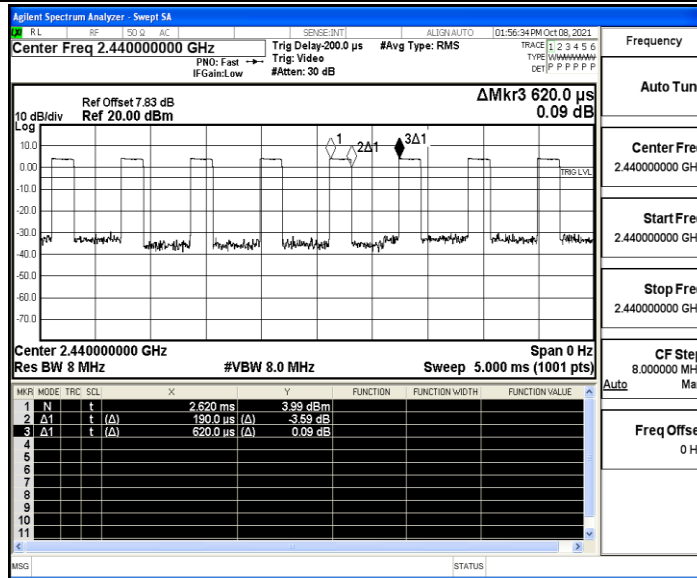


BLE\_2M\_Ant1\_2402

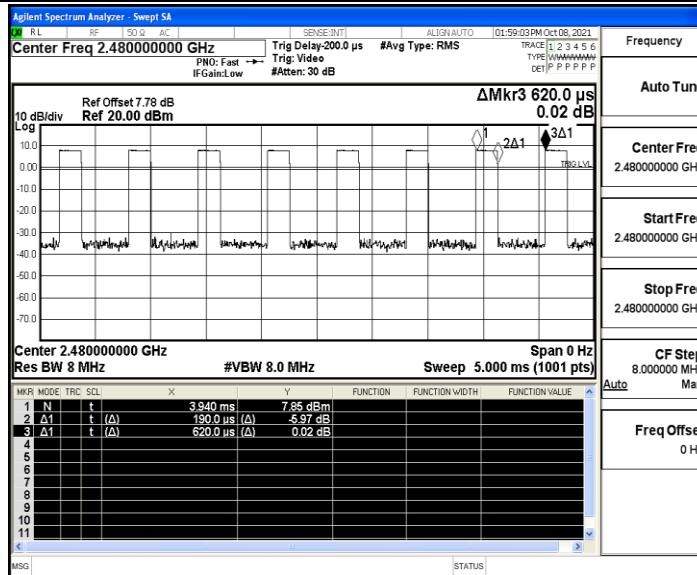




BLE\_2M\_Ant1\_2440



BLE\_2M\_Ant1\_2480





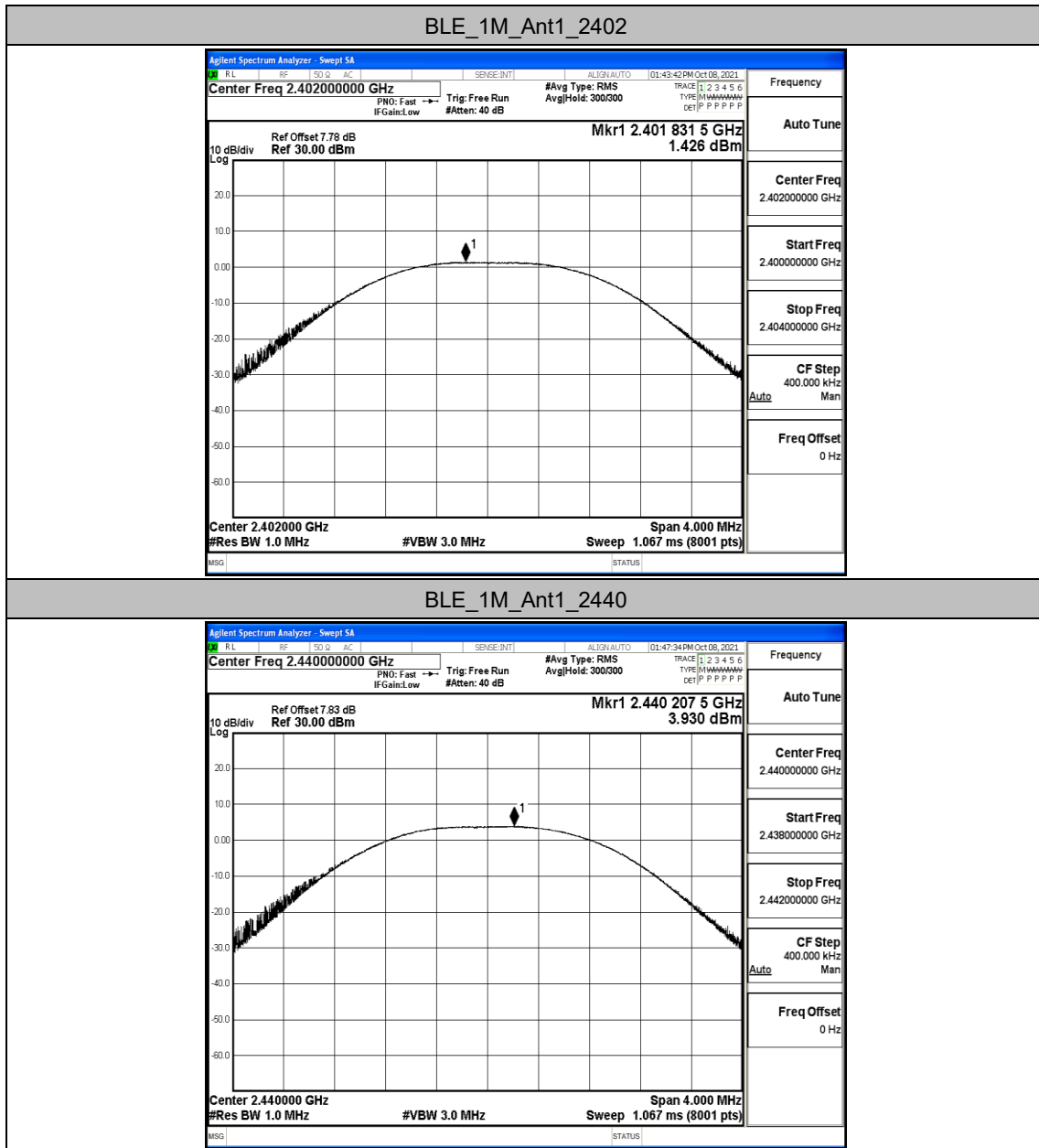
## Appendix B.2: Maximum conducted output power

### Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	1.43	≤30	PASS
		2440	3.93	≤30	PASS
		2480	7.77	≤30	PASS
BLE_2M	Ant1	2402	1.42	≤30	PASS
		2440	3.82	≤30	PASS
		2480	7.76	≤30	PASS

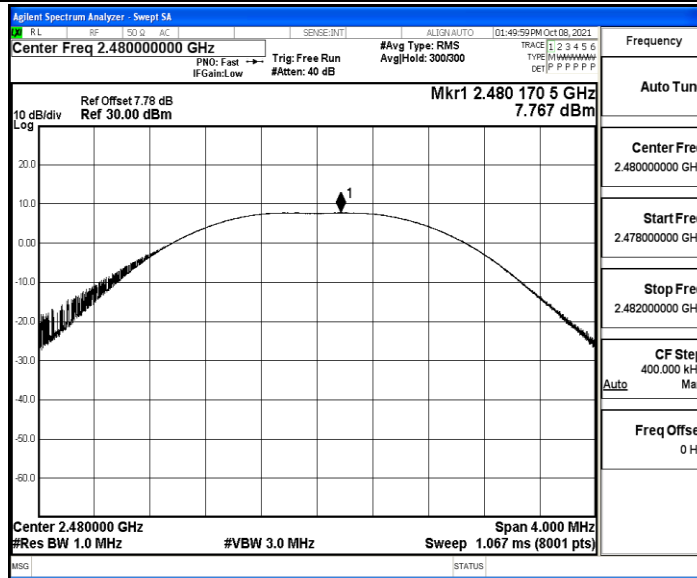


### Test Graphs

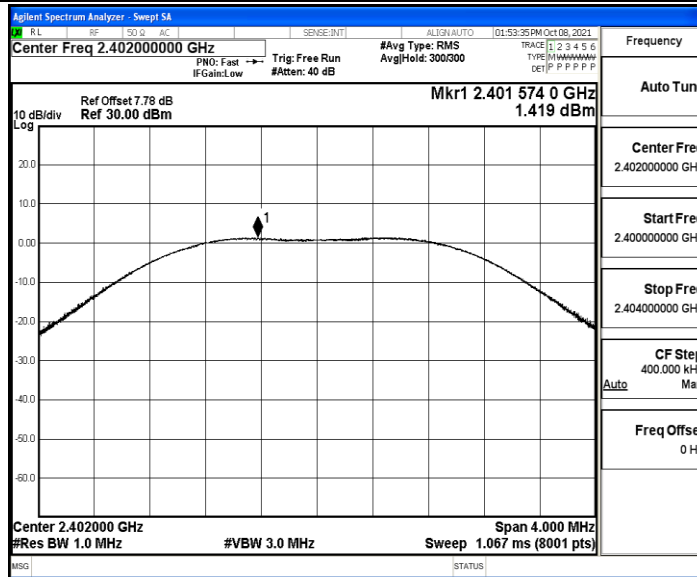




### BLE\_1M\_Ant1\_2480



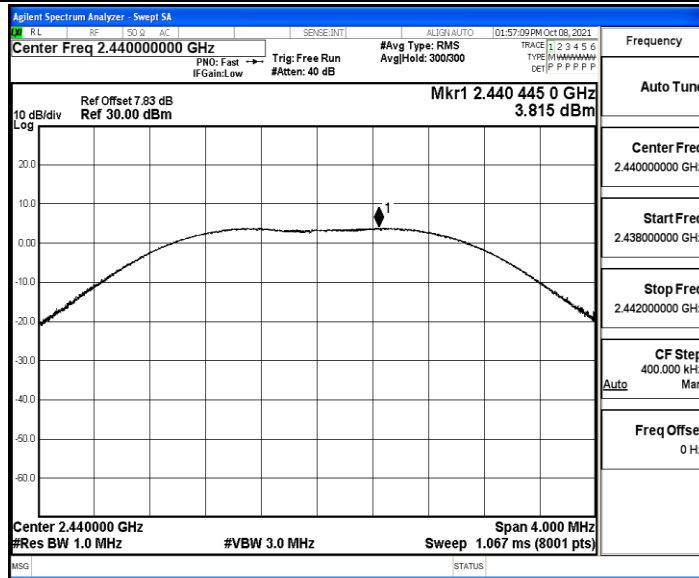
### BLE\_2M\_Ant1\_2402



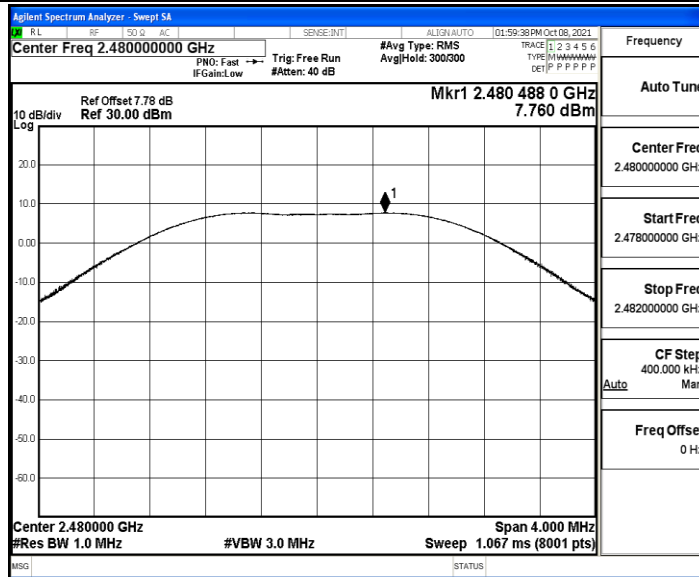




### BLE\_2M\_Ant1\_2440



### BLE\_2M\_Ant1\_2480





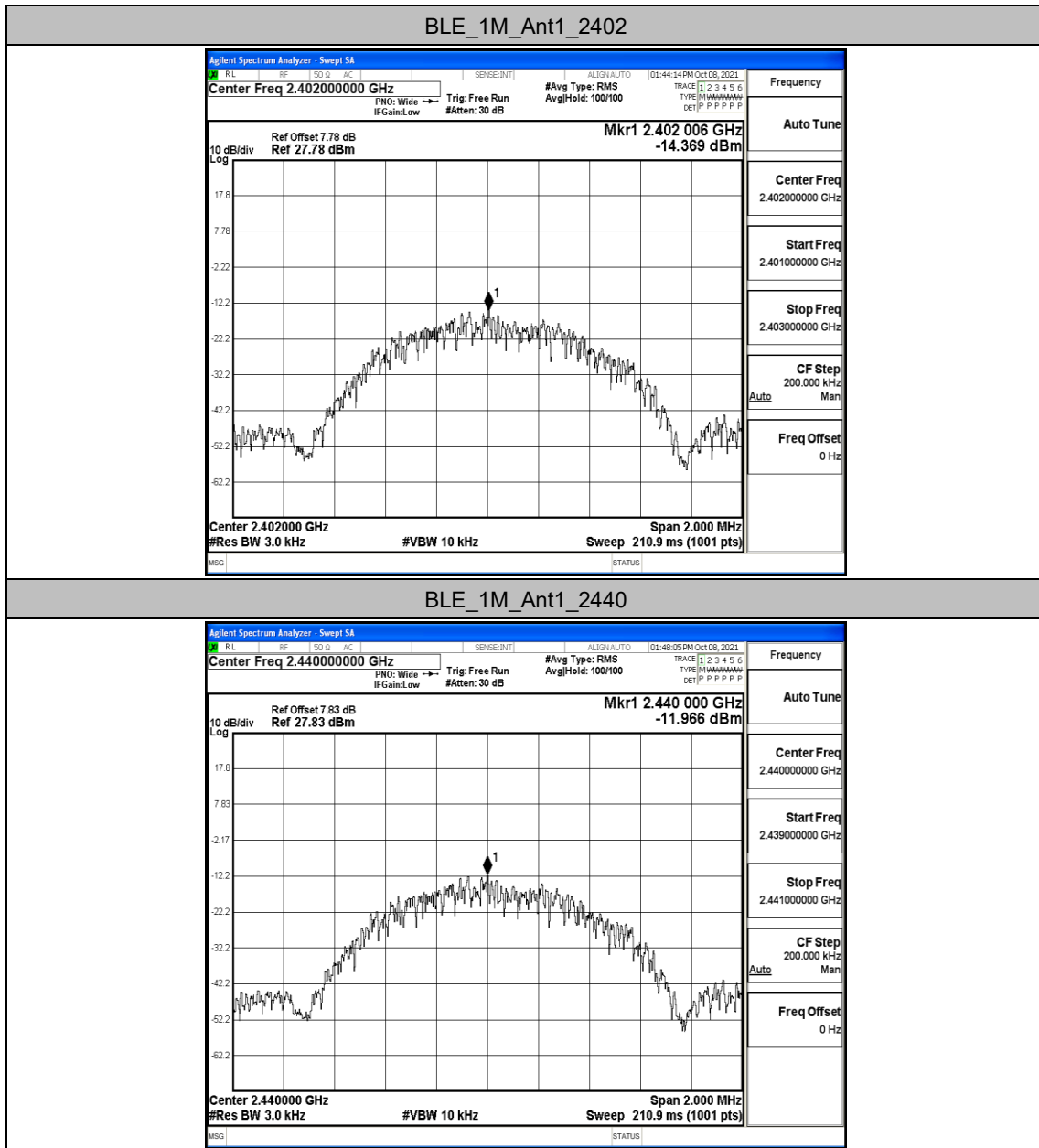
## Appendix B.3: Maximum power spectral density

### Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-14.37	≤8	PASS
		2440	-11.97	≤8	PASS
		2480	-7.62	≤8	PASS
BLE_2M	Ant1	2402	-16.65	≤8	PASS
		2440	-14.37	≤8	PASS
		2480	-9.89	≤8	PASS

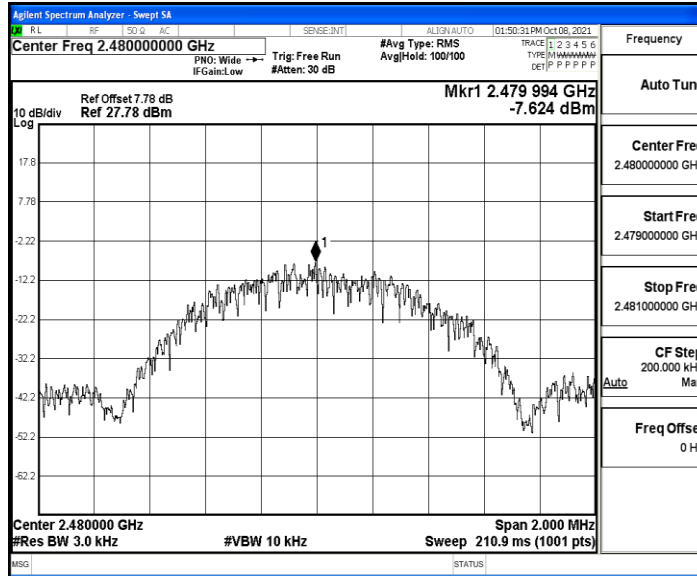


### Test Graphs

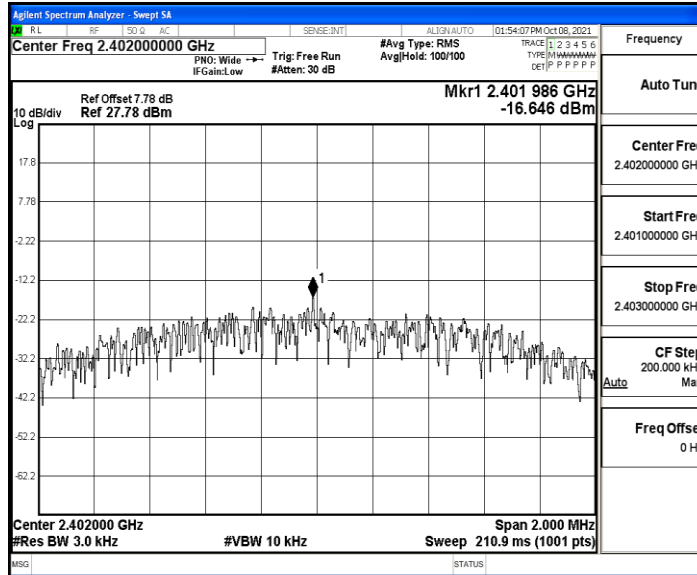




### BLE\_1M\_Ant1\_2480

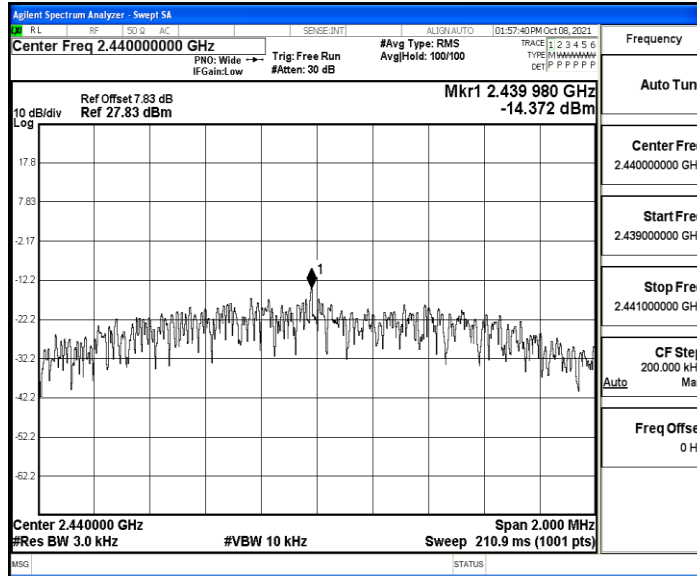


### BLE\_2M\_Ant1\_2402

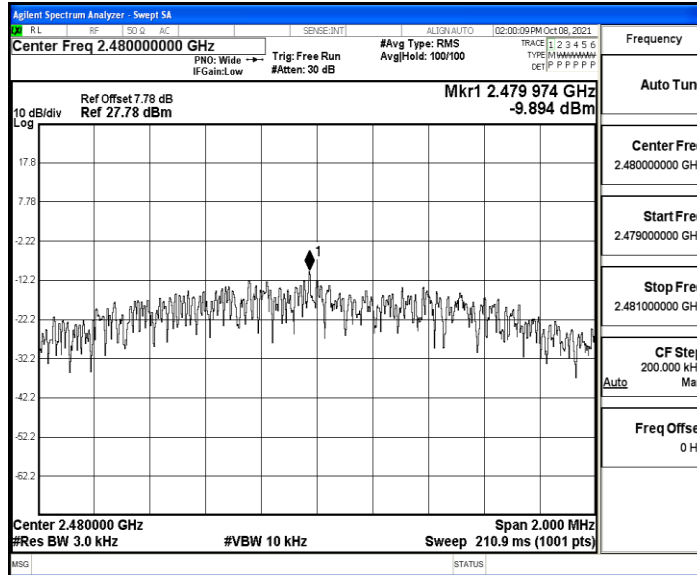




### BLE\_2M\_Ant1\_2440



### BLE\_2M\_Ant1\_2480





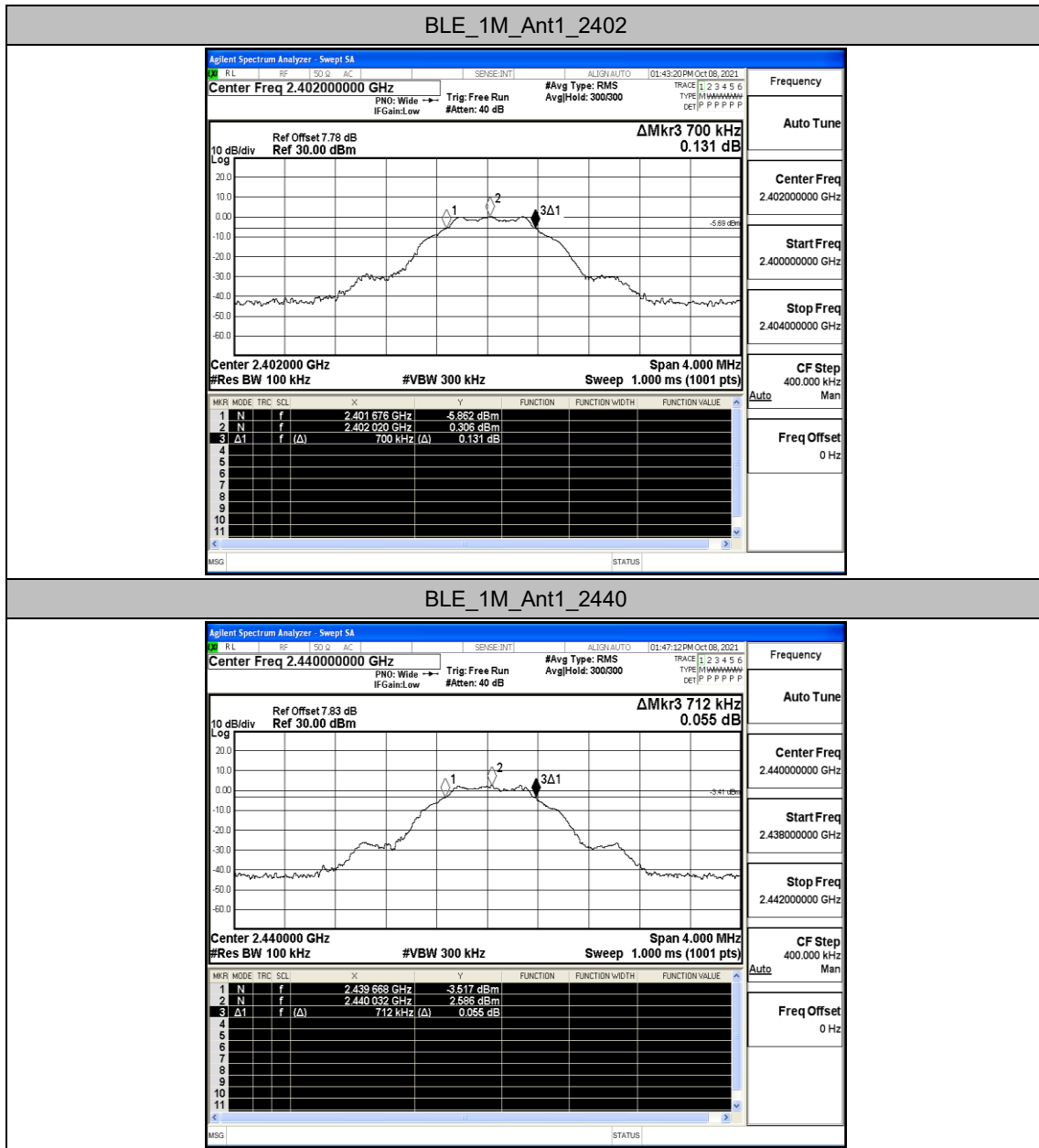
## Appendix B.4.1: DTS Bandwidth

### Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.700	2401.676	2402.376	$\geq 0.5$	PASS
		2440	0.712	2439.668	2440.380	$\geq 0.5$	PASS
		2480	0.708	2479.664	2480.372	$\geq 0.5$	PASS
BLE_2M	Ant1	2402	1.184	2401.424	2402.608	$\geq 0.5$	PASS
		2440	1.148	2439.420	2440.568	$\geq 0.5$	PASS
		2480	1.244	2479.364	2480.608	$\geq 0.5$	PASS

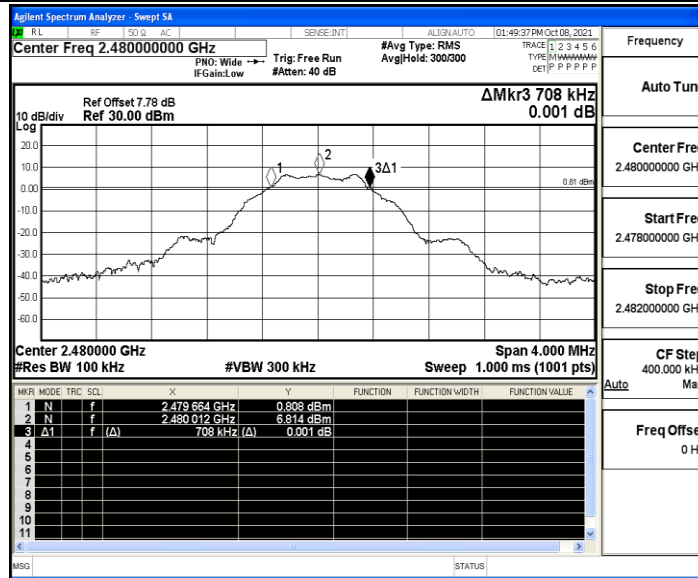


### Test Graphs

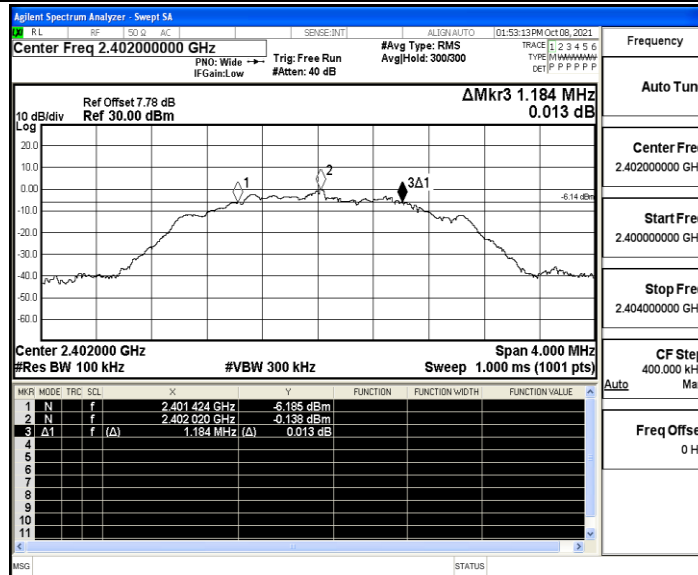




BLE\_1M\_Ant1\_2480



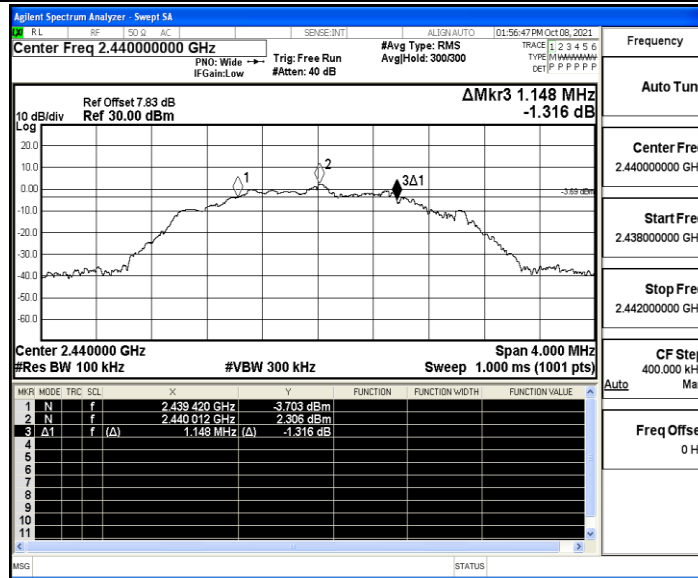
BLE\_2M\_Ant1\_2402



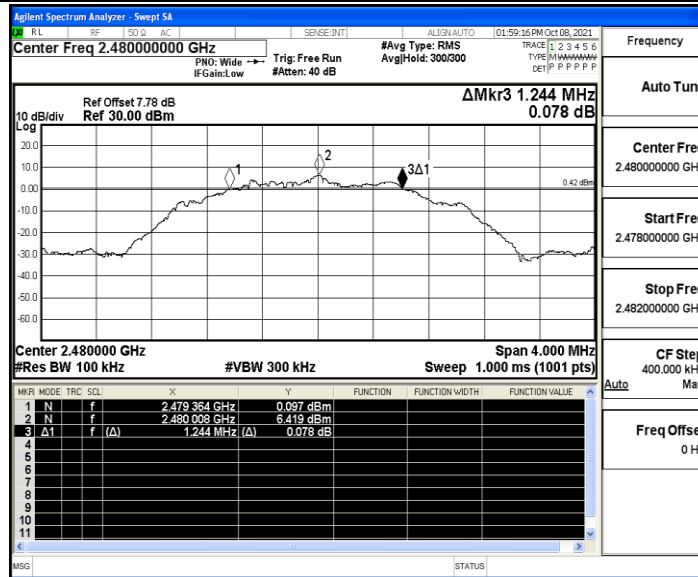




BLE\_2M\_Ant1\_2440



BLE\_2M\_Ant1\_2480





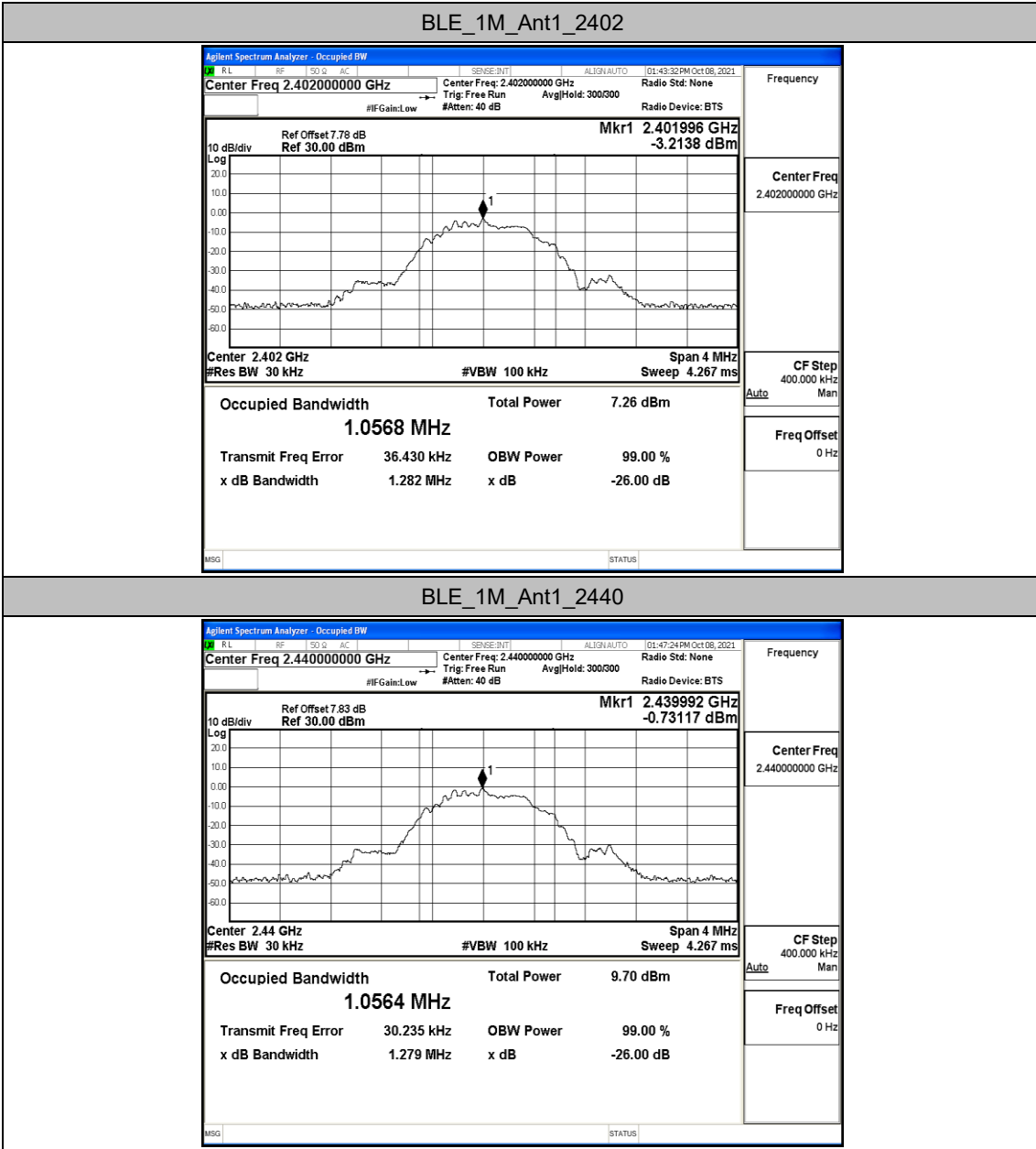
## Appendix B.4.2: Occupied Channel Bandwidth

### Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0568	2401.508	2402.565	---	PASS
		2440	1.0564	2439.502	2440.558	---	PASS
		2480	1.0541	2479.496	2480.550	---	PASS
BLE_2M	Ant1	2402	2.0486	2401.028	2403.076	---	PASS
		2440	2.0448	2439.023	2441.068	---	PASS
		2480	2.0575	2479.009	2481.067	---	PASS

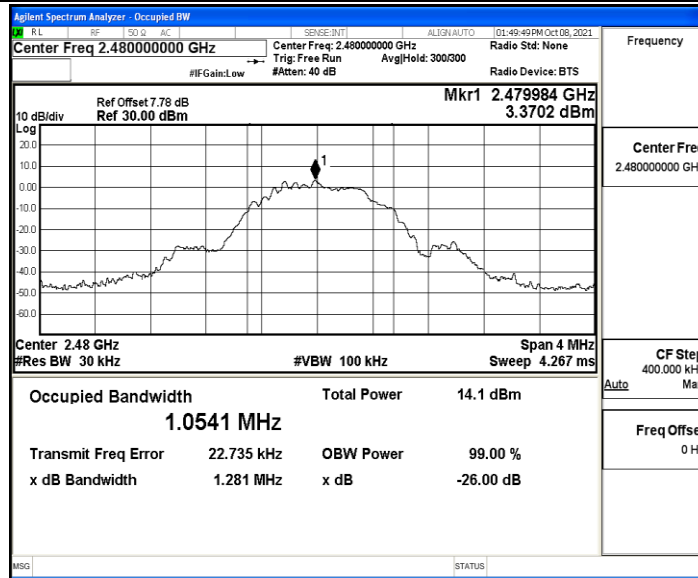


### Test Graphs

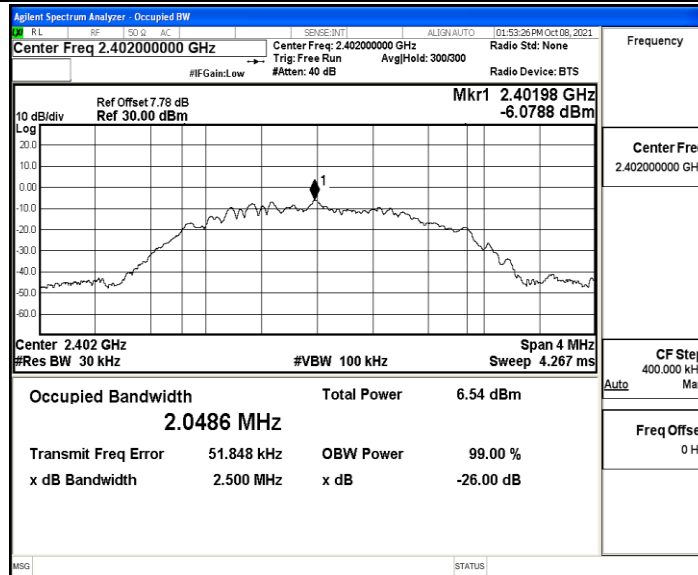




BLE\_1M\_Ant1\_2480

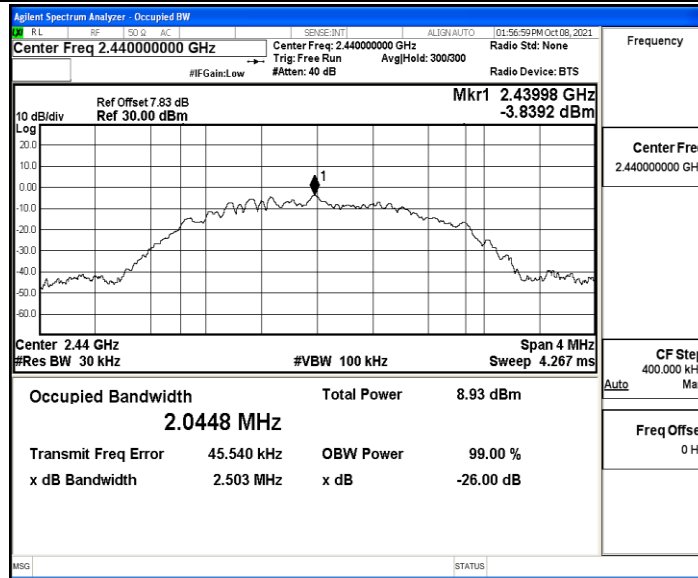


BLE\_2M\_Ant1\_2402

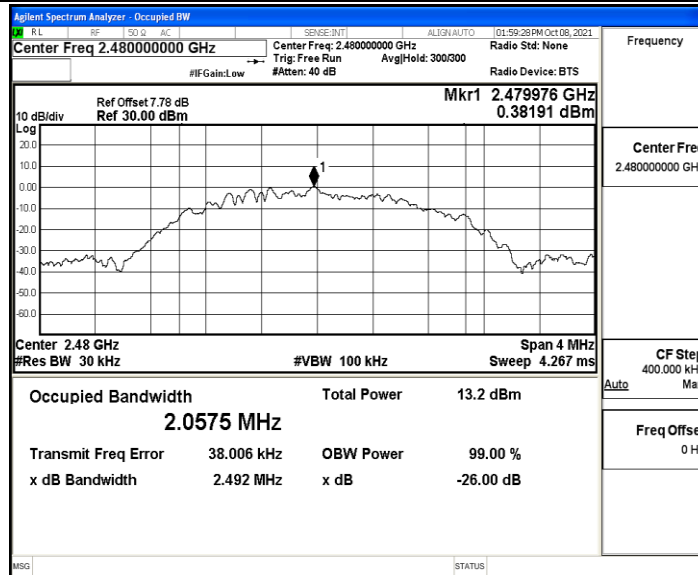




BLE\_2M\_Ant1\_2440



BLE\_2M\_Ant1\_2480





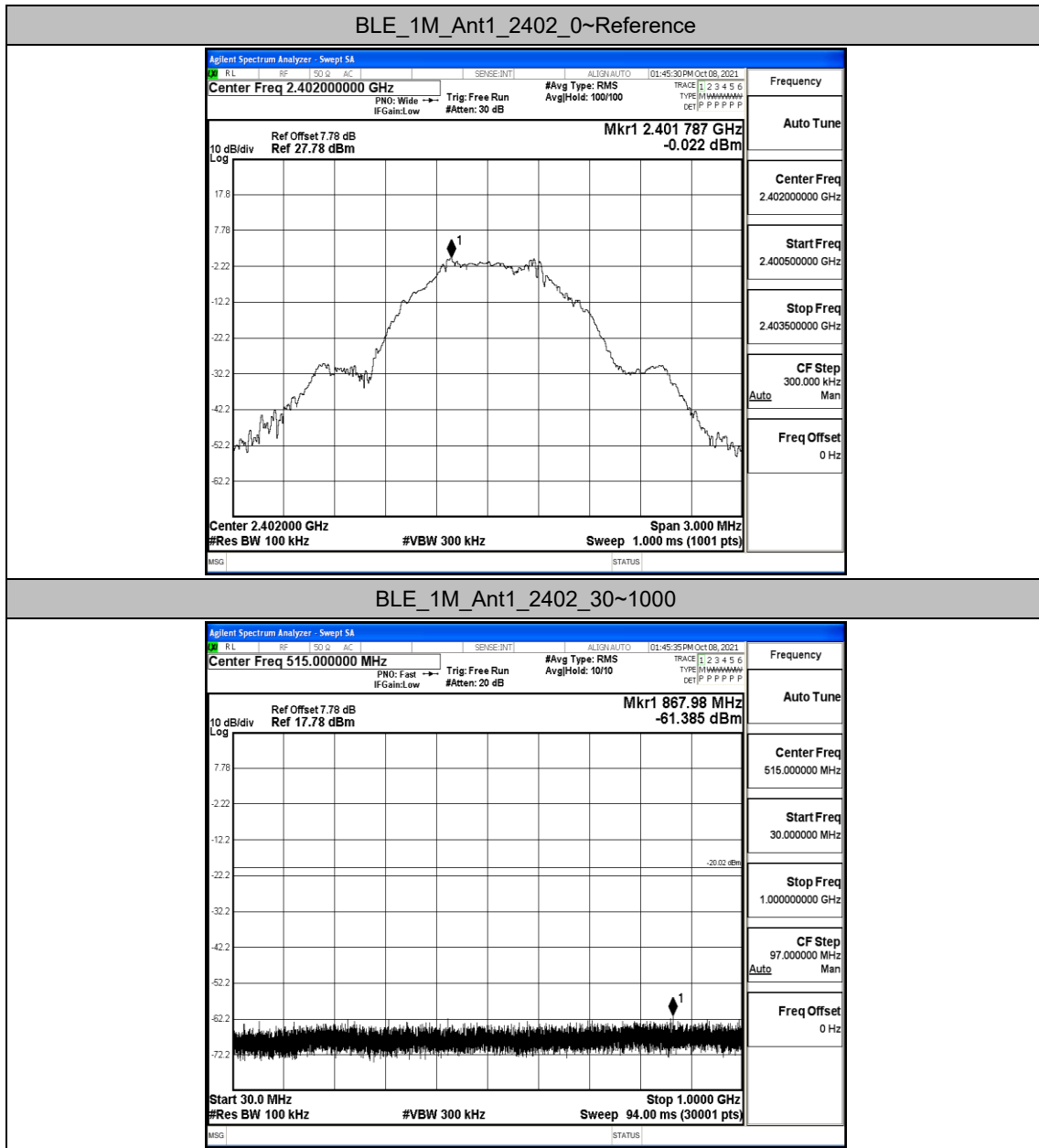
## Appendix B.5: Conducted Spurious Emission

### Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.02	-0.02	---	PASS
			30~1000	-0.02	-61.39	≤-20.02	PASS
			1000~26500	-0.02	-47.11	≤-20.02	PASS
		2440	Reference	2.77	2.77	---	PASS
			30~1000	2.77	-61.36	≤-17.23	PASS
			1000~26500	2.77	-47.82	≤-17.23	PASS
		2480	Reference	6.73	6.73	---	PASS
			30~1000	6.73	-61.2	≤-13.27	PASS
			1000~26500	6.73	-47.16	≤-13.27	PASS
BLE_2M	Ant1	2402	Reference	-0.42	-0.42	---	PASS
			30~1000	-0.42	-61.63	≤-20.42	PASS
			1000~26500	-0.42	-46.44	≤-20.42	PASS
		2440	Reference	2.23	2.23	---	PASS
			30~1000	2.23	-61.67	≤-17.77	PASS
			1000~26500	2.23	-47.35	≤-17.77	PASS
		2480	Reference	6.38	6.38	---	PASS
			30~1000	6.38	-61.51	≤-13.62	PASS
			1000~26500	6.38	-46.91	≤-13.62	PASS

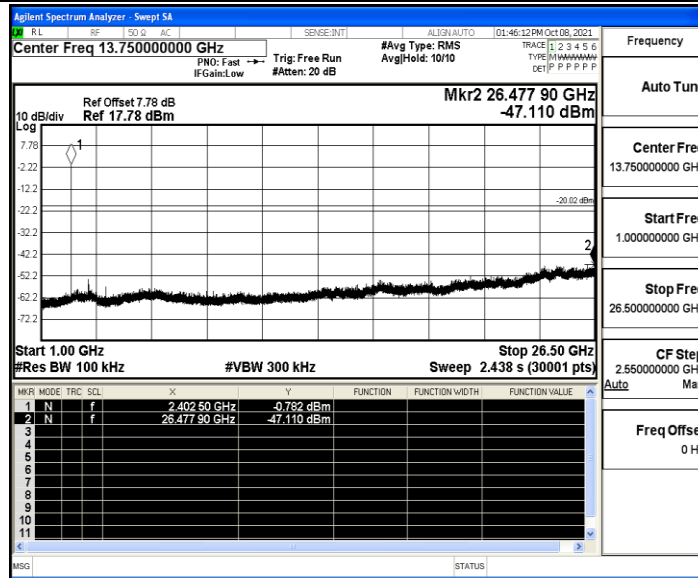


### Test Graphs

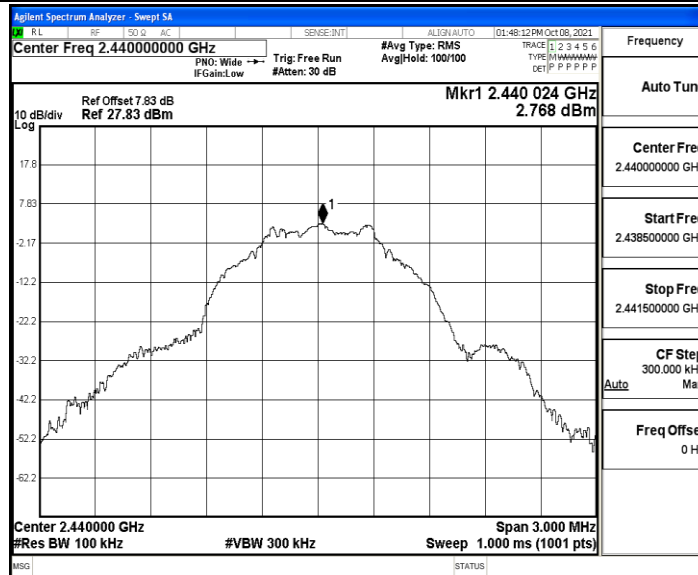




BLE\_1M\_Ant1\_2402\_1000~26500



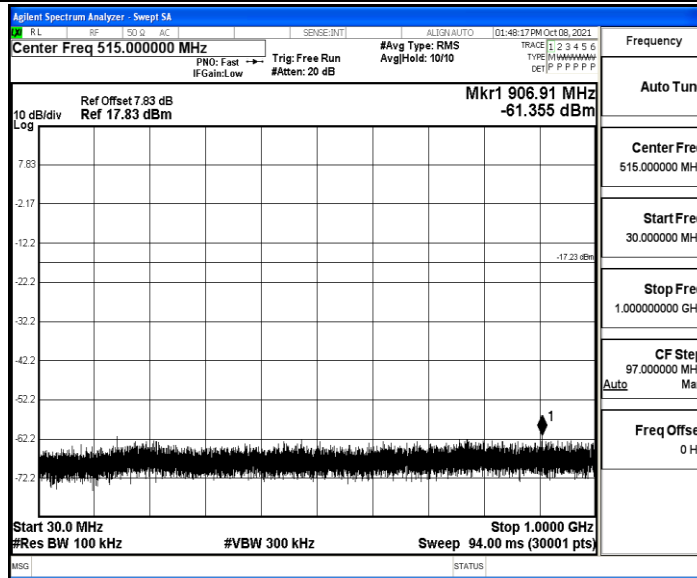
BLE\_1M\_Ant1\_2440\_0~Reference



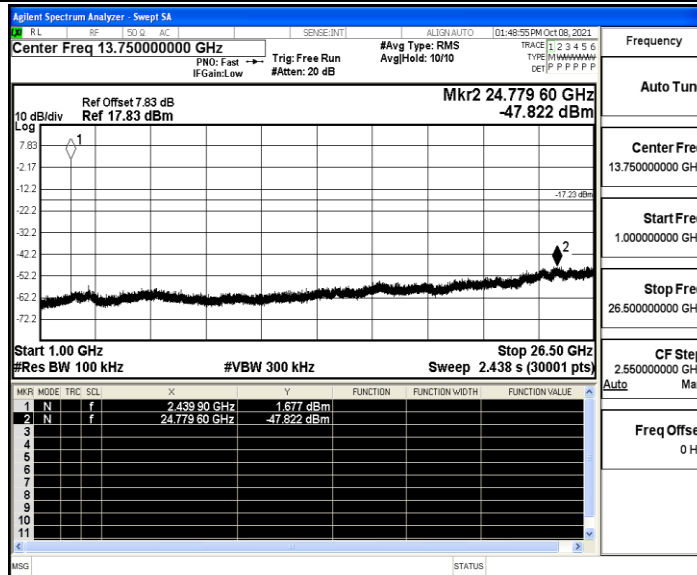




BLE\_1M\_Ant1\_2440\_30~1000

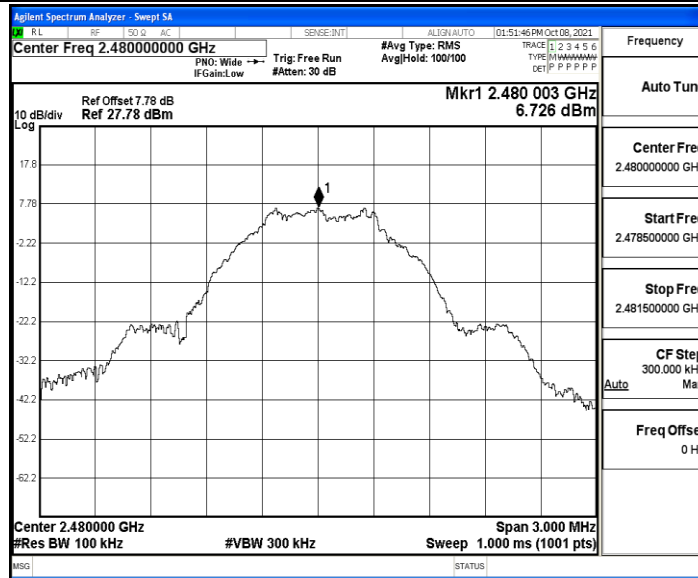


BLE\_1M\_Ant1\_2440\_1000~26500

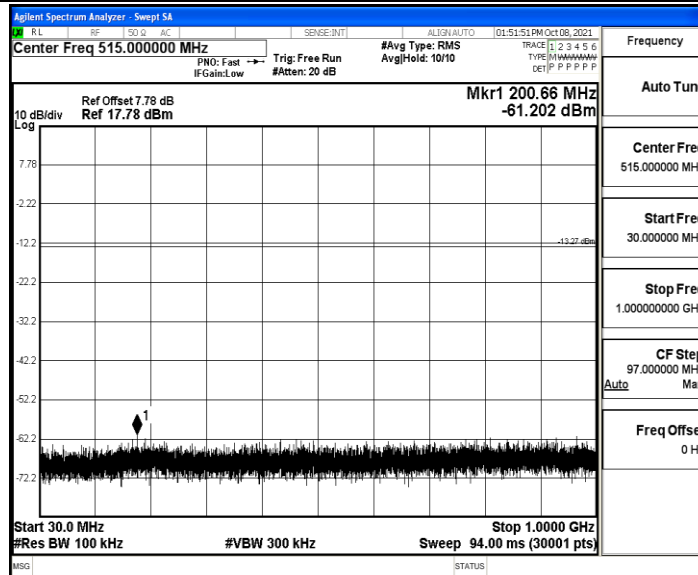




BLE\_1M\_Ant1\_2480\_0~Reference

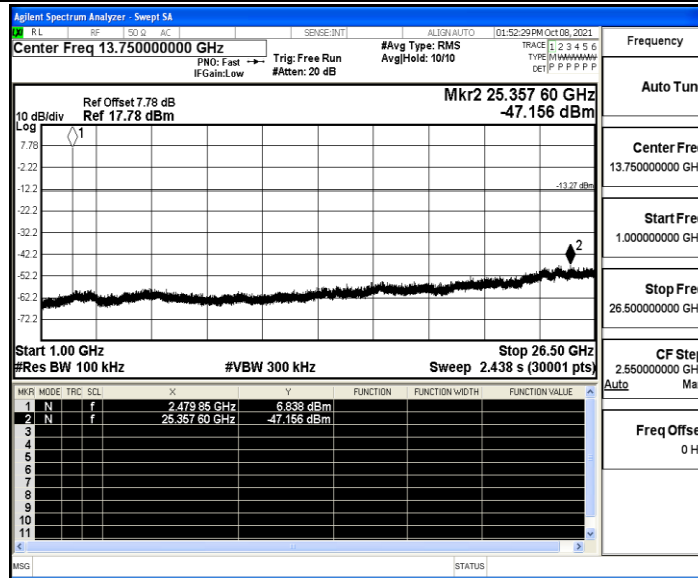


BLE\_1M\_Ant1\_2480\_30~1000

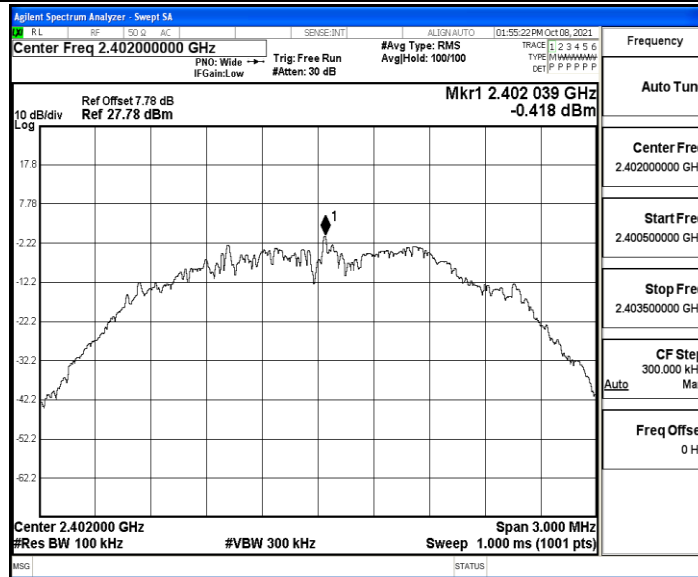




### BLE\_1M\_Ant1\_2480\_1000~26500

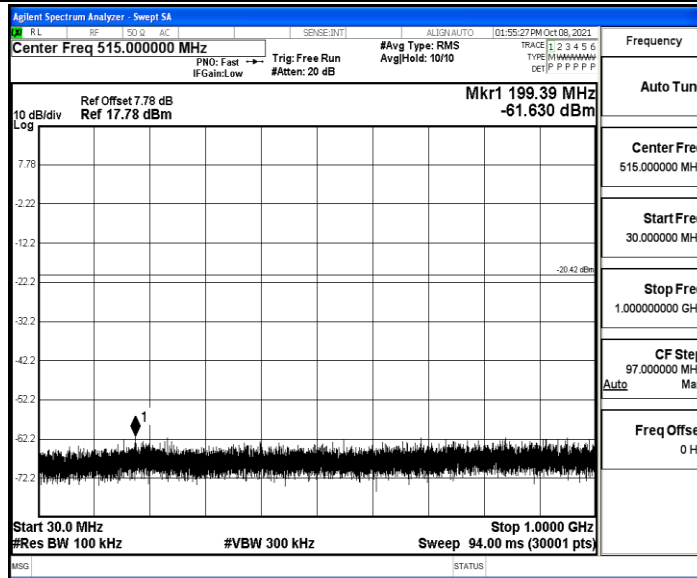


### BLE\_2M\_Ant1\_2402\_0~Reference

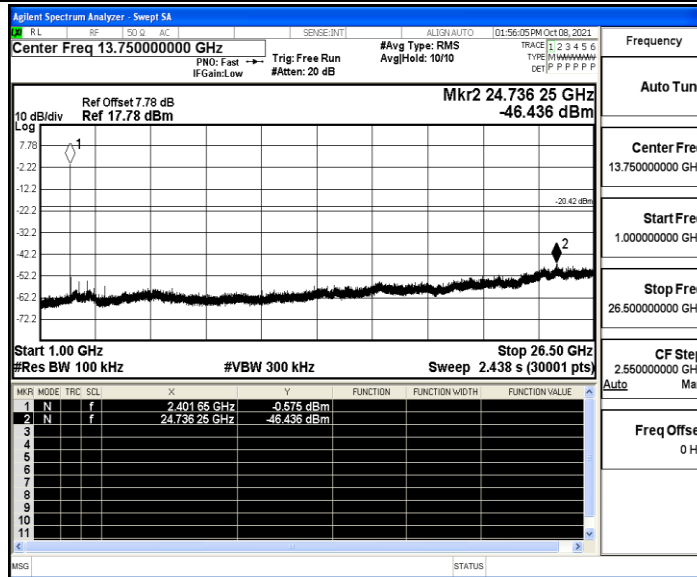




BLE\_2M\_Ant1\_2402\_30~1000

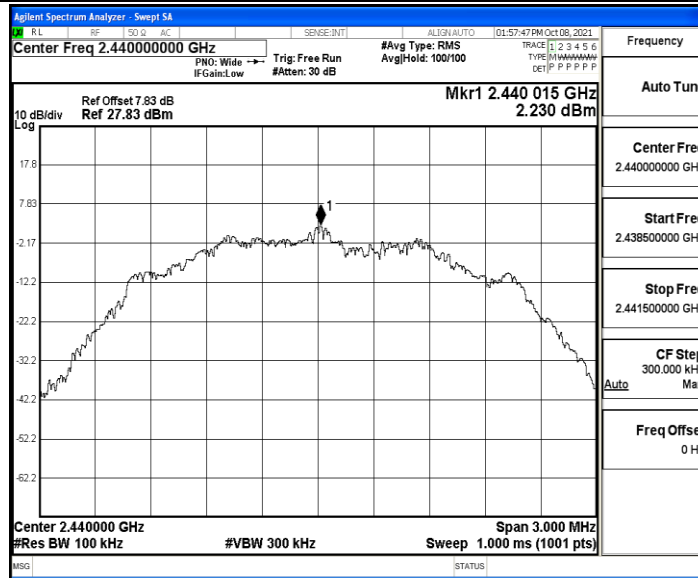


BLE\_2M\_Ant1\_2402\_1000~26500

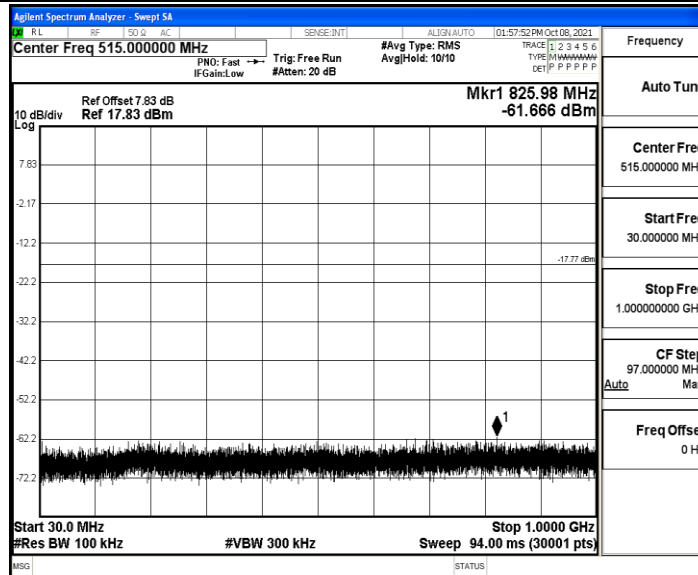




### BLE\_2M\_Ant1\_2440\_0~Reference

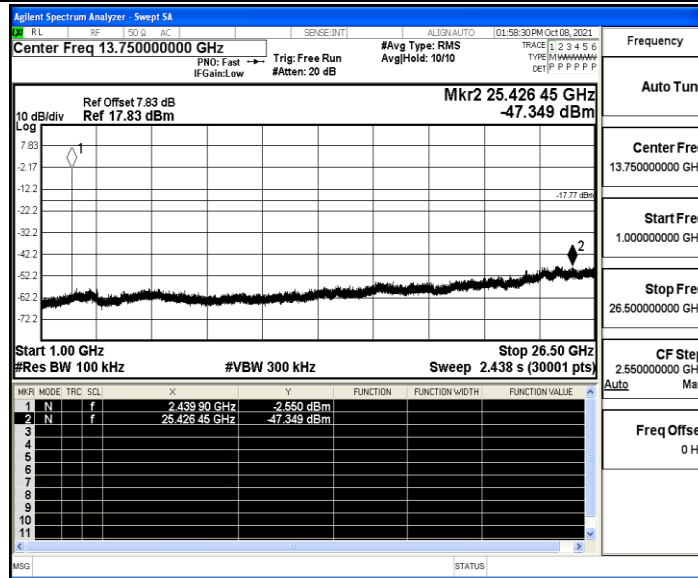


### BLE\_2M\_Ant1\_2440\_30~1000

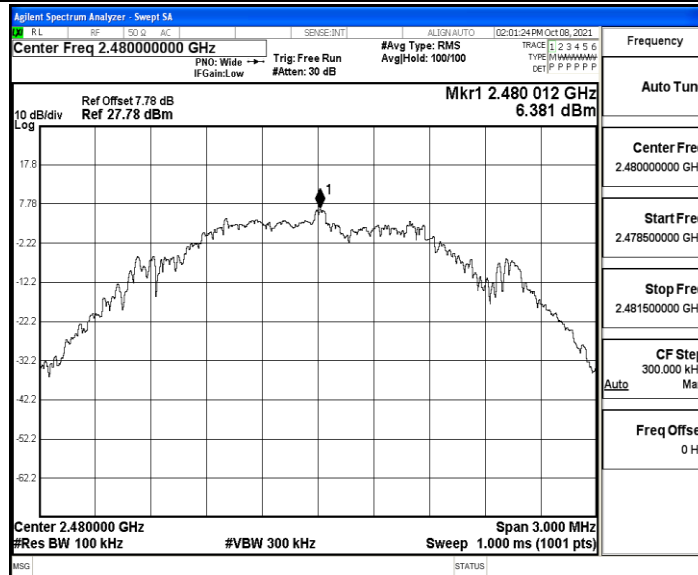




BLE\_2M\_Ant1\_2440\_1000~26500

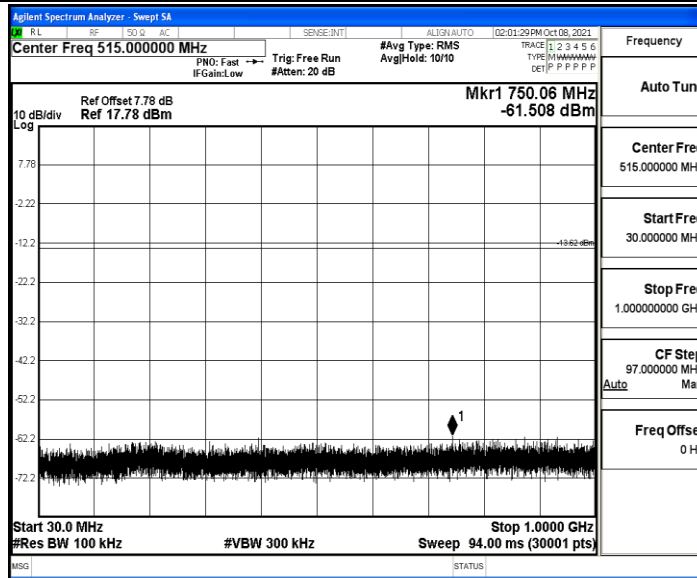


BLE\_2M\_Ant1\_2480\_0~Reference

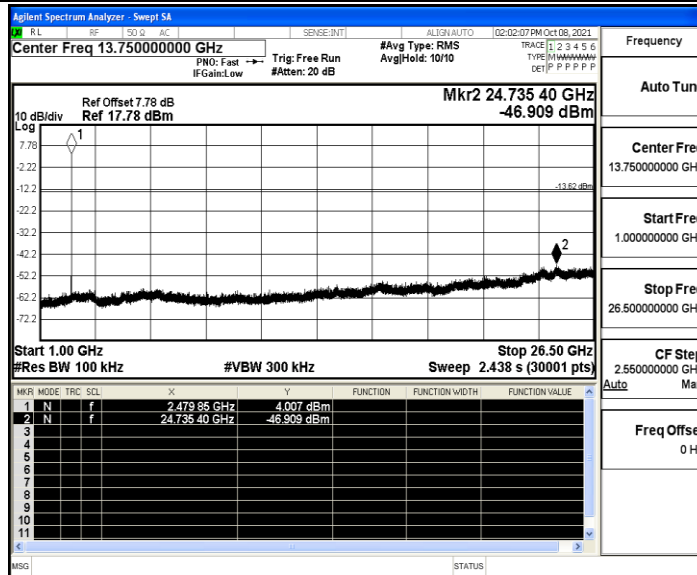




BLE\_2M\_Ant1\_2480\_30~1000



BLE\_2M\_Ant1\_2480\_1000~26500





## Appendix B.6: Band edge measurements

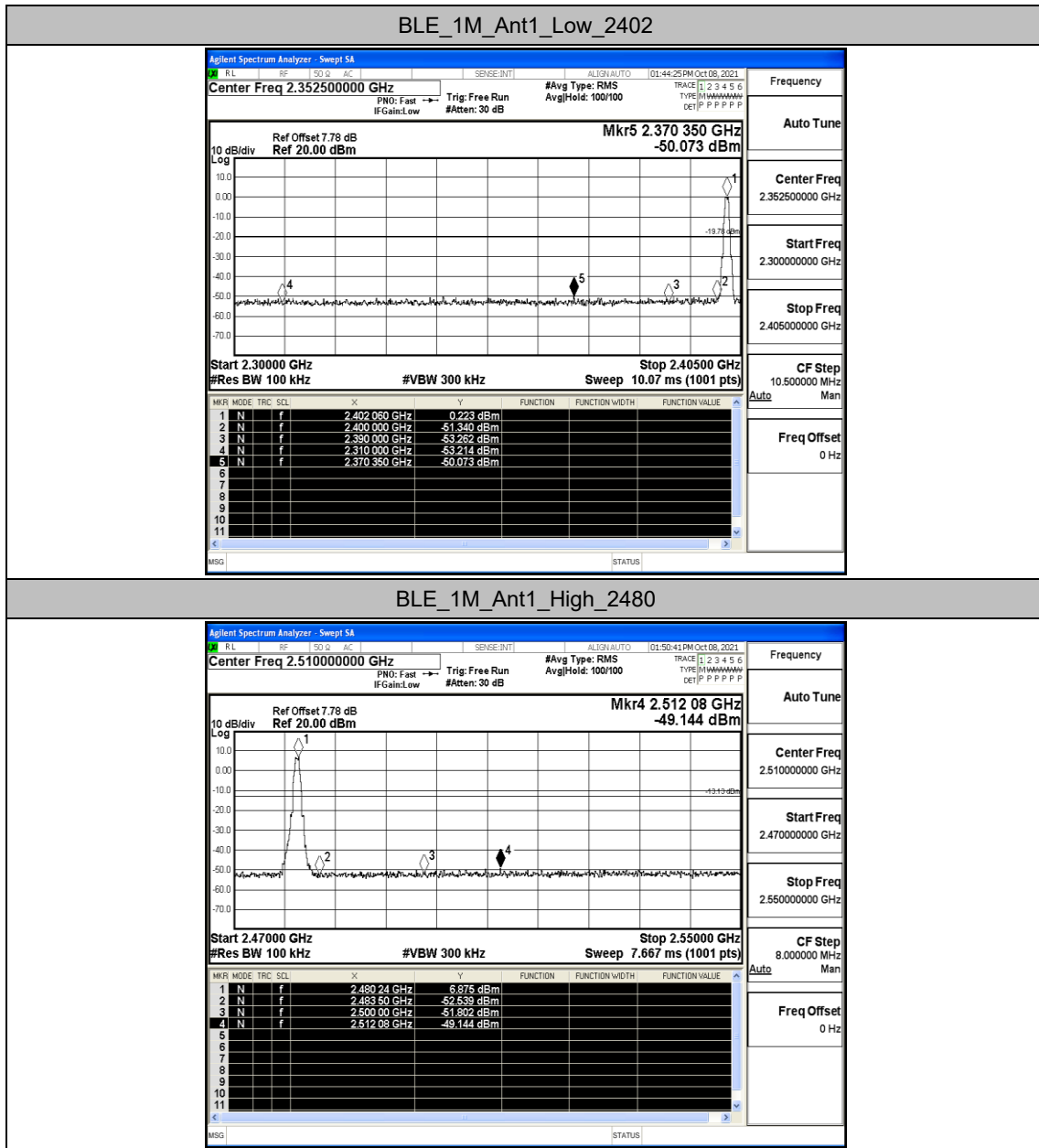
### Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.22	-50.07	$\leq -19.78$	PASS
		High	2480	6.88	-49.14	$\leq -13.13$	PASS
BLE_2M	Ant1	Low	2402	-0.29	-47.69	$\leq -20.29$	PASS
		High	2480	6.43	-48.97	$\leq -13.57$	PASS



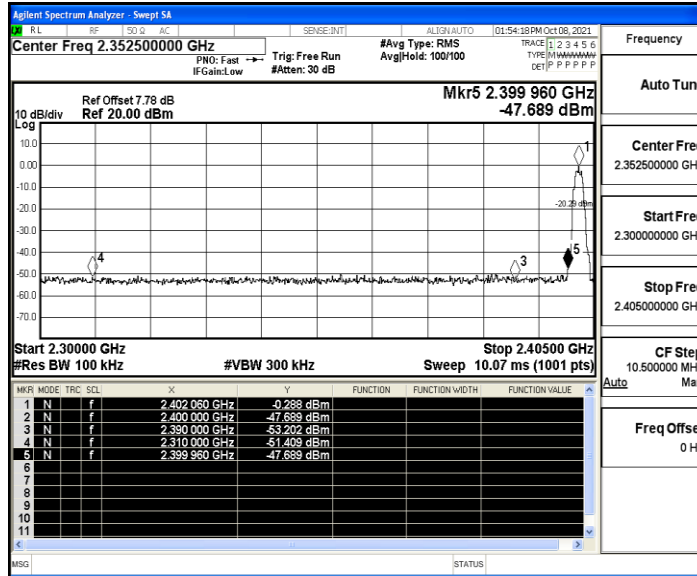


### Test Graphs

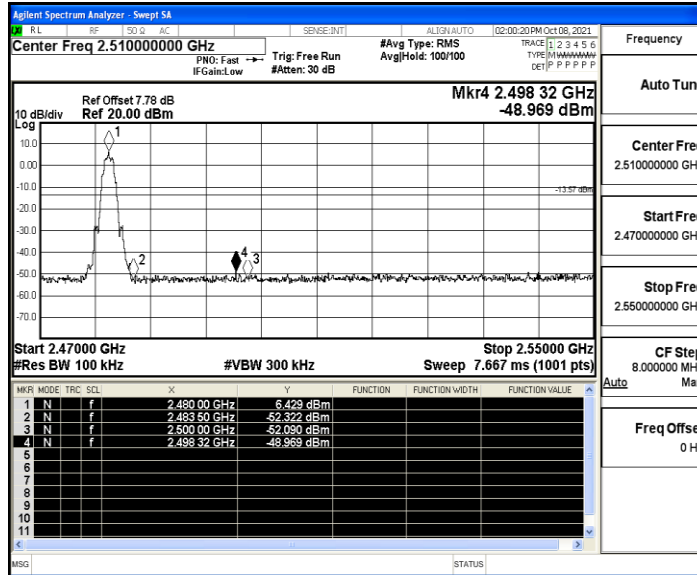




BLE\_2M\_Ant1\_Low\_2402



BLE\_2M\_Ant1\_High\_2480





## Appendix B.7: Emissions in Restricted Bands

### Test Result

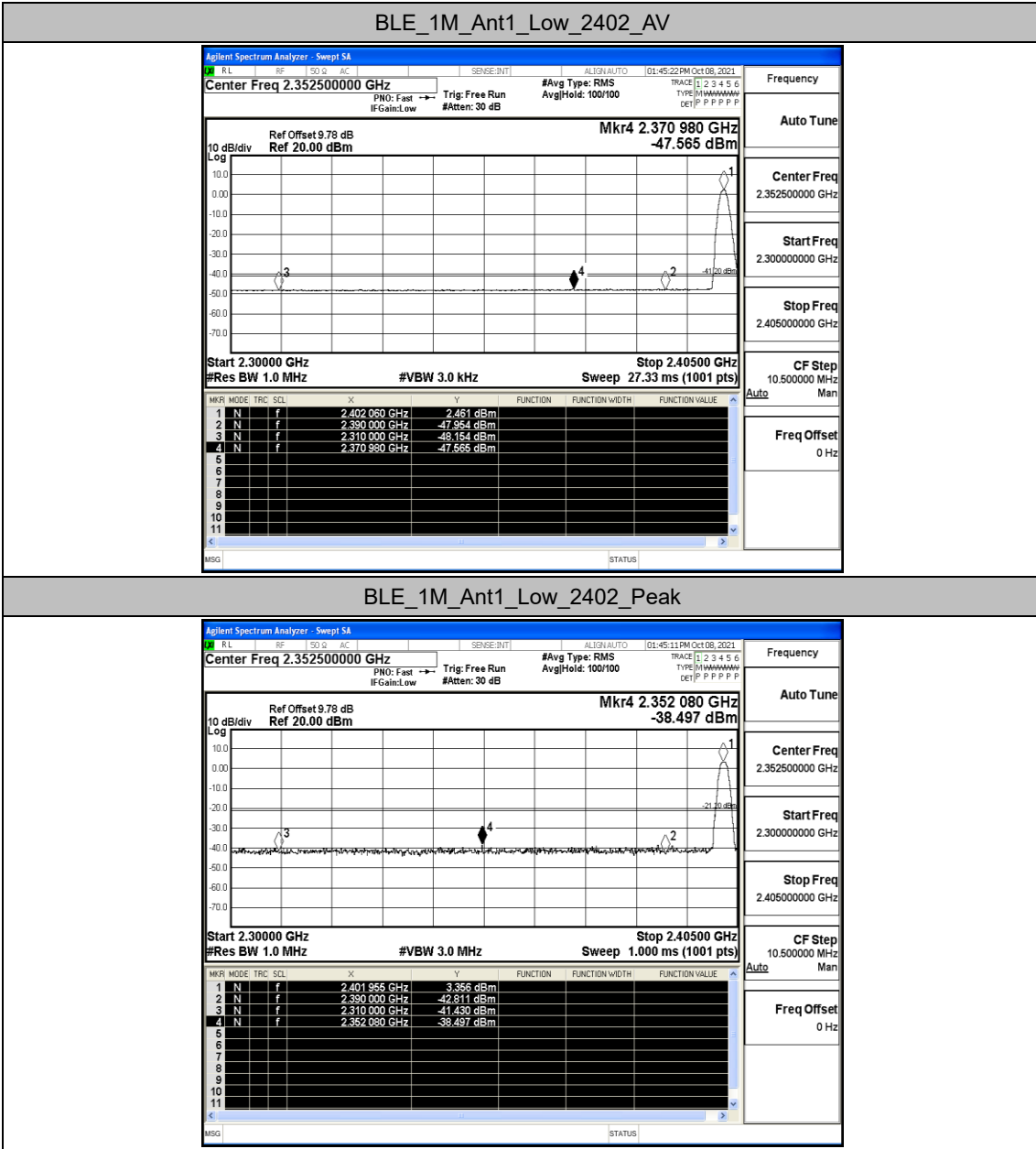
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-48.15	≤-41.20	47.05	≤54	PASS
				AV	2370.980	-47.57	≤-41.20	47.63	≤54	PASS
				AV	2390.000	-47.95	≤-41.20	47.25	≤54	PASS
				Peak	2310.000	-41.43	≤-21.20	53.77	≤74	PASS
				Peak	2352.080	-38.5	≤-21.20	56.70	≤74	PASS
				Peak	2390.000	-42.81	≤-21.20	52.39	≤74	PASS
		High	2480	AV	2483.500	-44.8	≤-41.20	50.40	≤54	PASS
				AV	2483.520	-44.8	≤-41.20	50.40	≤54	PASS
				AV	2500.000	-47.24	≤-41.20	47.96	≤54	PASS
				Peak	2483.500	-39.51	≤-21.20	55.69	≤74	PASS
				Peak	2487.280	-38.13	≤-21.20	57.07	≤74	PASS
				Peak	2500.000	-40.67	≤-21.20	54.53	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-47.77	≤-41.20	47.43	≤54	PASS
				AV	2339.165	-46.78	≤-41.20	48.42	≤54	PASS
				AV	2390.000	-47.03	≤-41.20	48.17	≤54	PASS
				Peak	2310.000	-41.02	≤-21.20	54.18	≤74	PASS
				Peak	2334.440	-38.42	≤-21.20	56.78	≤74	PASS
				Peak	2390.000	-41.01	≤-21.20	54.19	≤74	PASS
		High	2480	AV	2483.500	-43.21	≤-41.20	51.99	≤54	PASS
				AV	2483.520	-43.21	≤-41.20	51.99	≤54	PASS
				AV	2500.000	-46.52	≤-41.20	48.68	≤54	PASS
				Peak	2483.500	-39.04	≤-21.20	56.16	≤74	PASS
				Peak	2499.360	-38.07	≤-21.20	57.13	≤74	PASS
				Peak	2500.000	-40.63	≤-21.20	54.57	≤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.

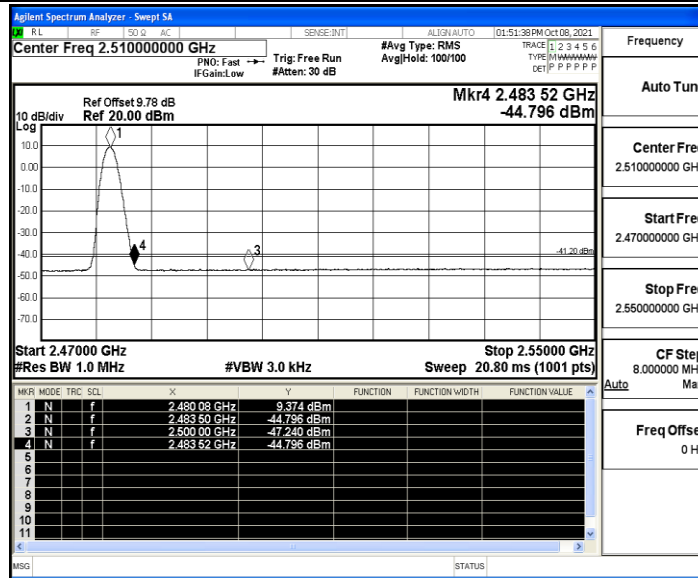


### Test Graphs

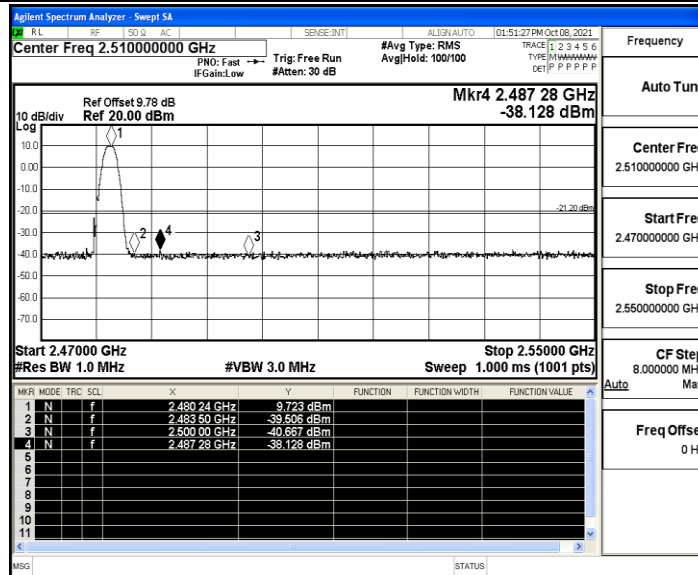




BLE\_1M\_Ant1\_High\_2480\_AV

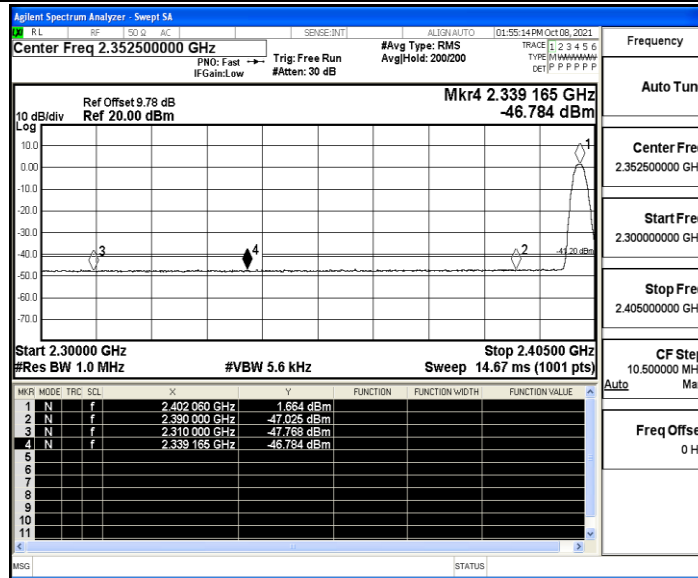


BLE\_1M\_Ant1\_High\_2480\_Peak

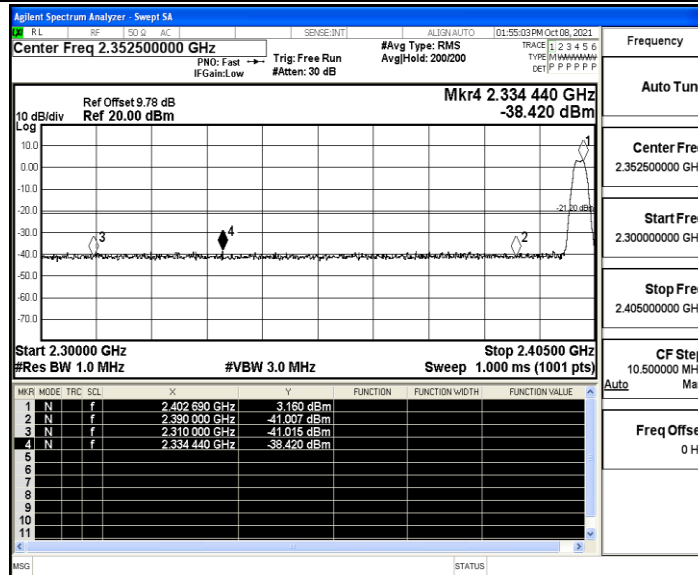




BLE\_2M\_Ant1\_Low\_2402\_AV

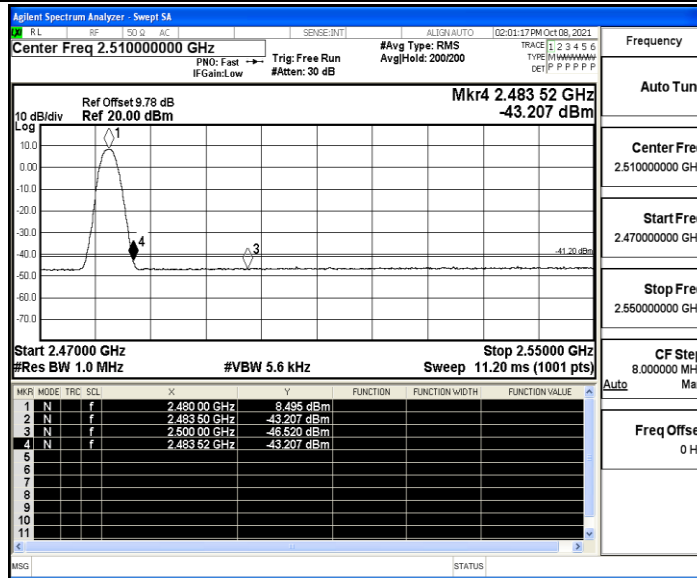


BLE\_2M\_Ant1\_Low\_2402\_Peak





BLE\_2M\_Ant1\_High\_2480\_AV



BLE\_2M\_Ant1\_High\_2480\_Peak

