Appendix B

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

Product Name: Smart lock

Trade Mark: N/A

Test Model: MS06

Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung

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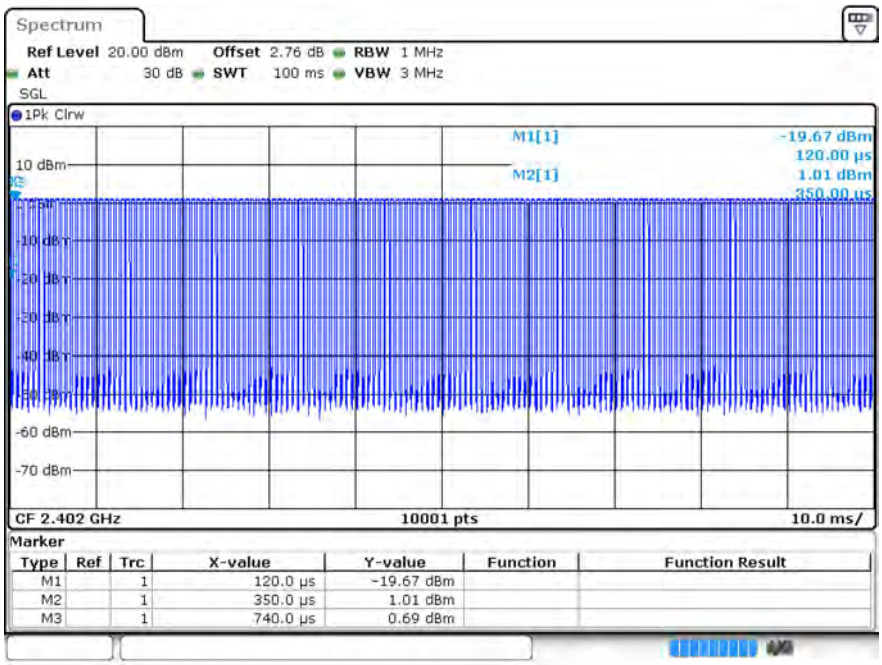
1 Duty Cycle

1.1 Test Result

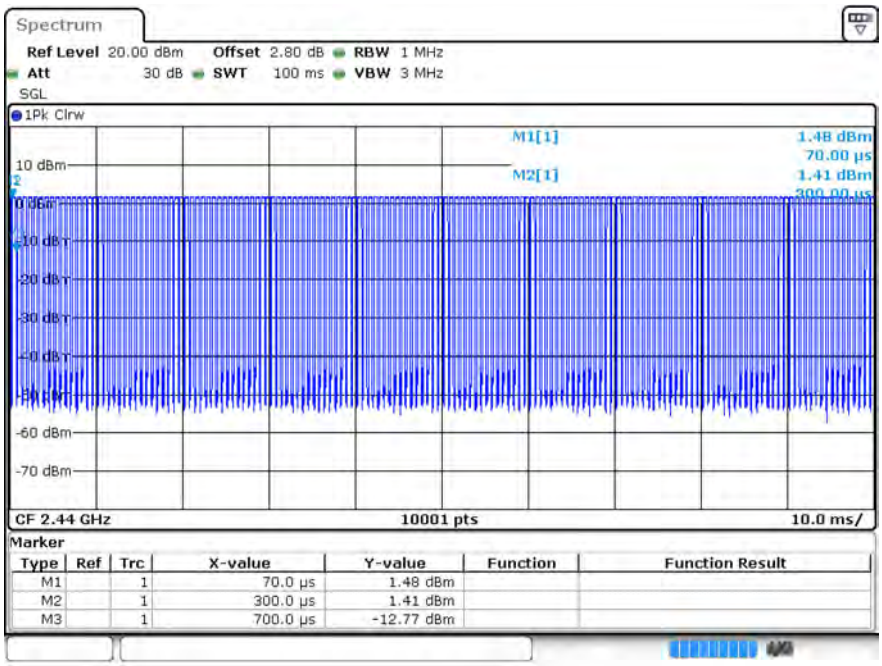
Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
BLE 1M	2402	64.8	1.88	2.56
BLE 1M	2440	64.8	1.88	2.5
BLE 1M	2480	64	1.94	2.56
BLE 2M	2402	35.2	4.54	4.76
BLE 2M	2440	34.66	4.6	4.76
BLE 2M	2480	35.21	4.53	4.76

1.2 Test Graphs

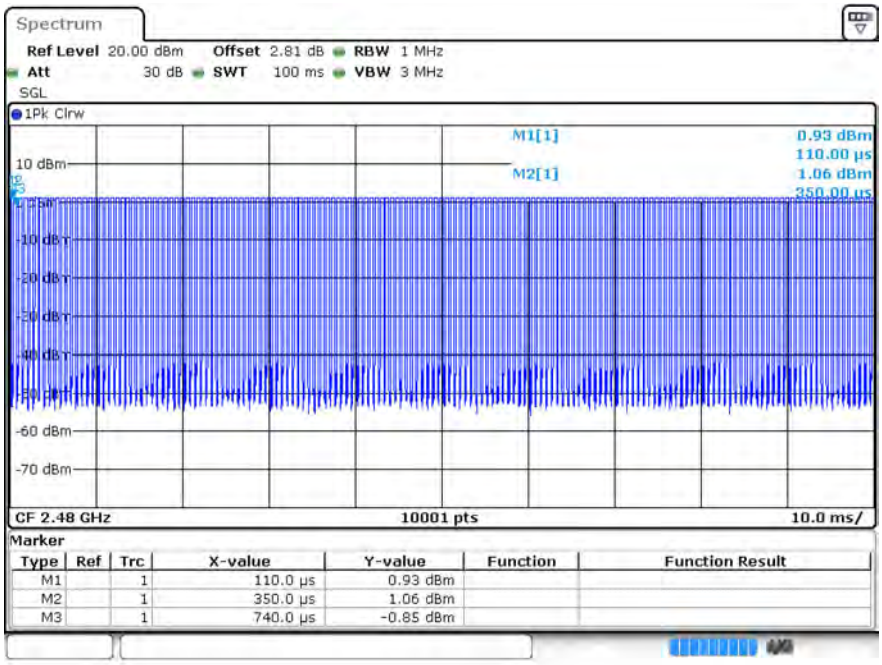
Test Graphs
BLE 1M 2402MHz



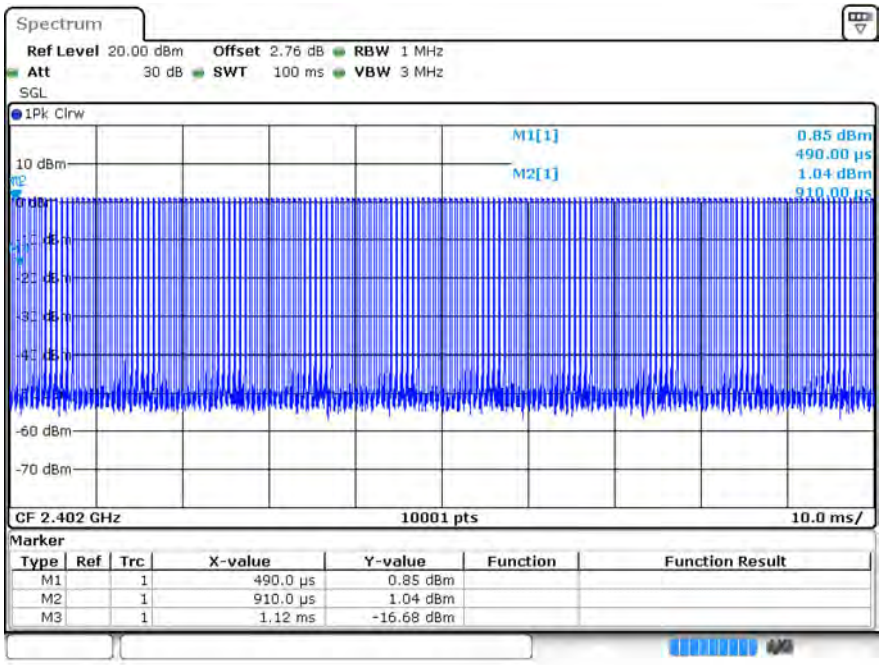
BLE 1M 2440MHz



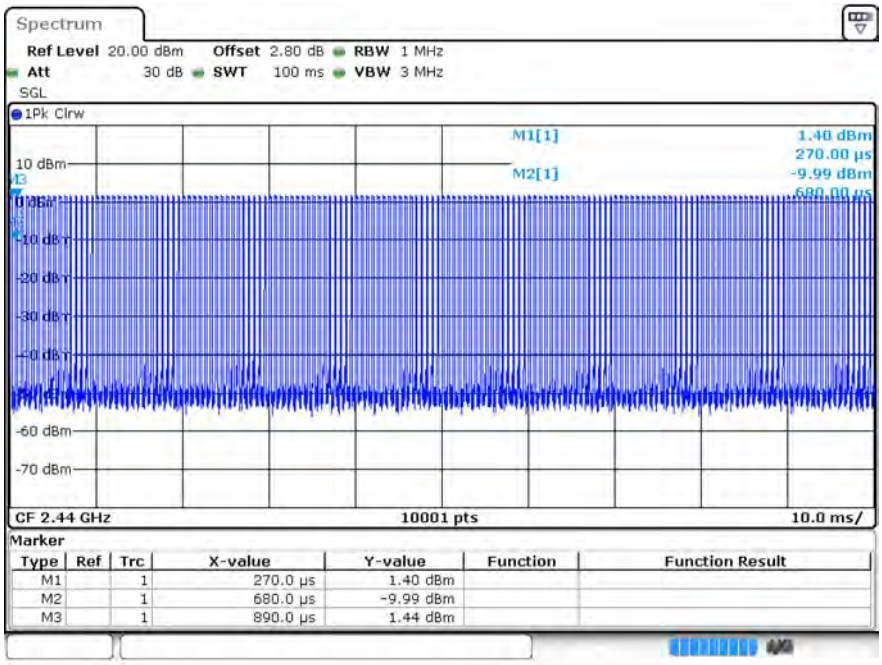
BLE 1M 2480MHz



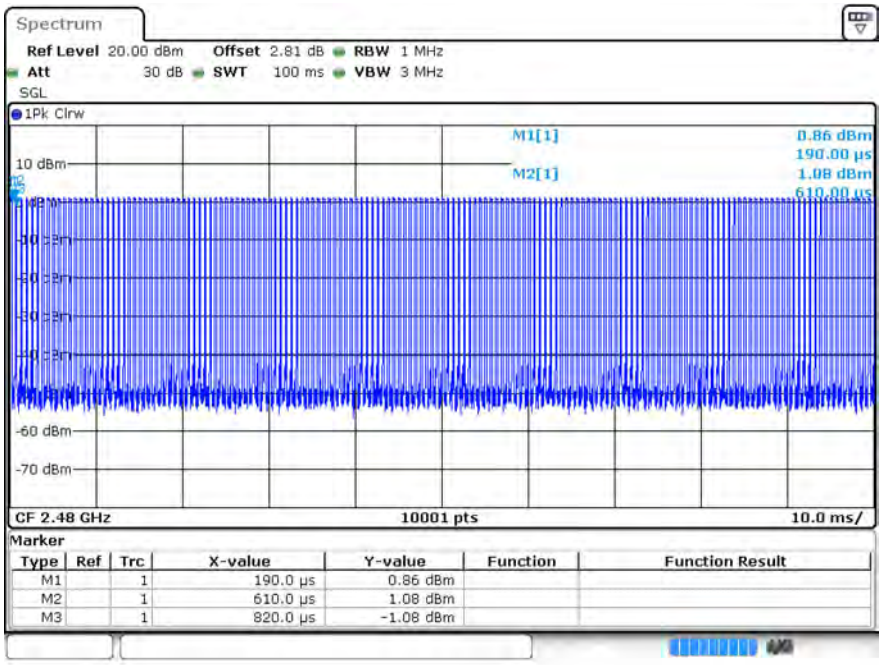
BLE 2M 2402MHz



BLE 2M 2440MHz



BLE 2M 2480MHz

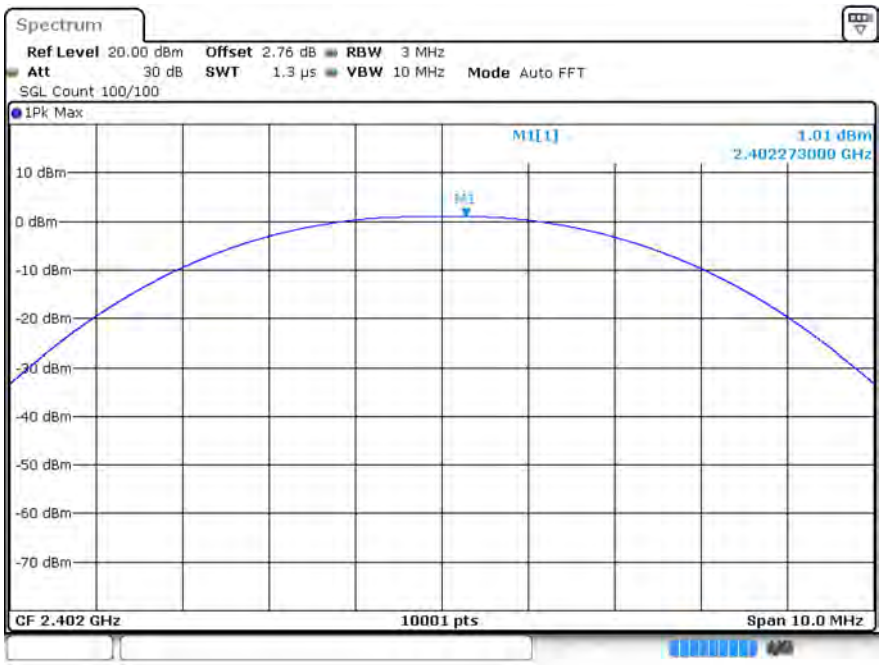
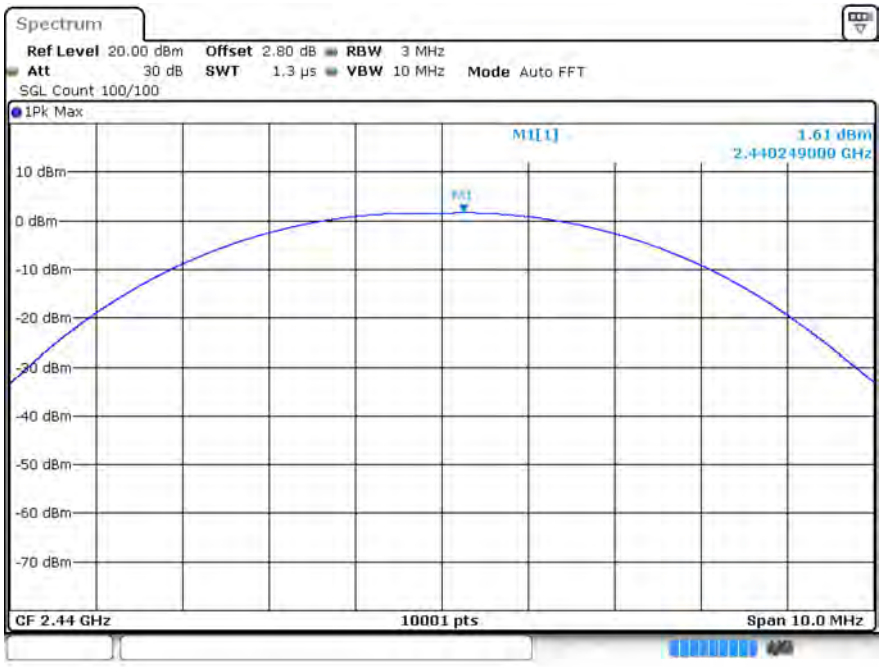


2 Maximum Conducted Output Power

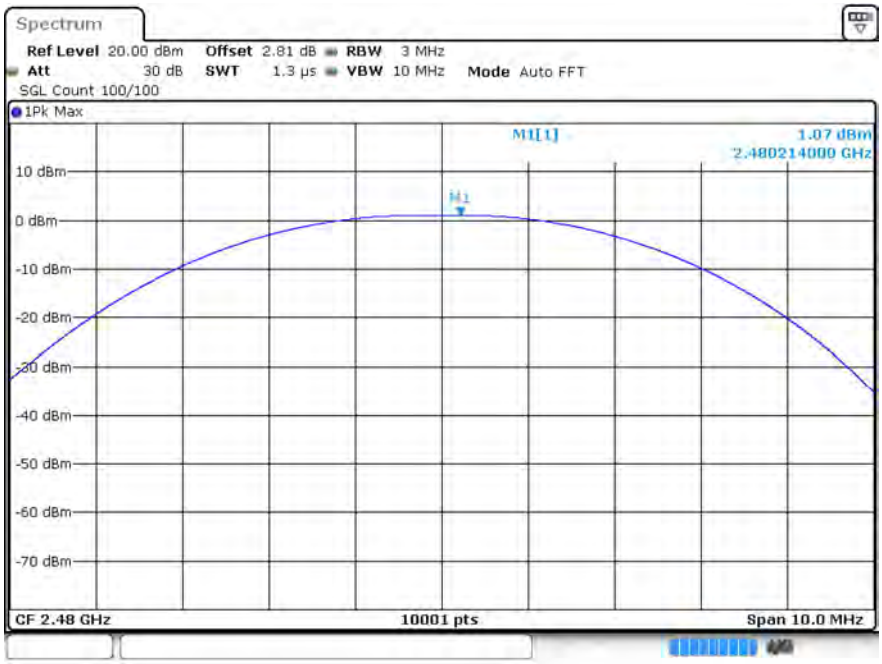
2.1 Test Result

Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
BLE 1M	2402	1.01	30	Pass
BLE 1M	2440	1.61	30	Pass
BLE 1M	2480	1.07	30	Pass
BLE 2M	2402	1.1	30	Pass
BLE 2M	2440	1.64	30	Pass
BLE 2M	2480	1.07	30	Pass

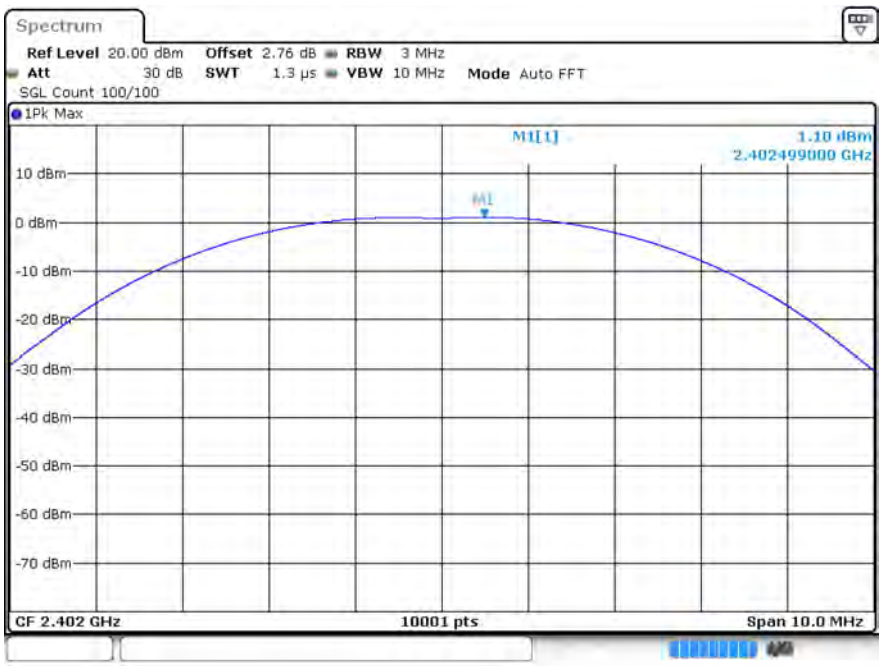
2.2 Test Graphs

Test Graphs
BLE 1M 2402MHz

BLE 1M 2440MHz


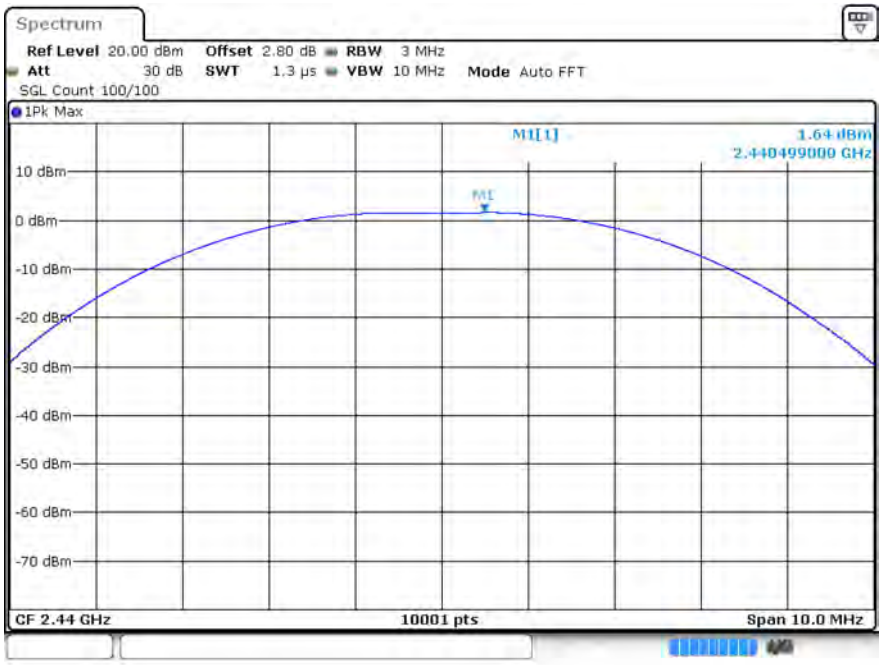
BLE 1M 2480MHz



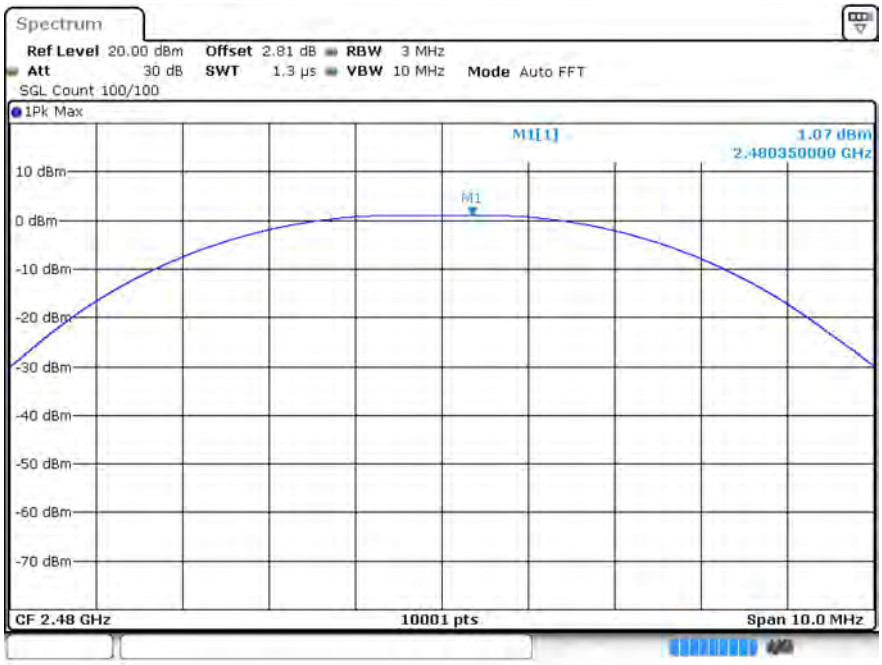
BLE 2M 2402MHz



BLE 2M 2440MHz



BLE 2M 2480MHz



3 -6dB Bandwidth

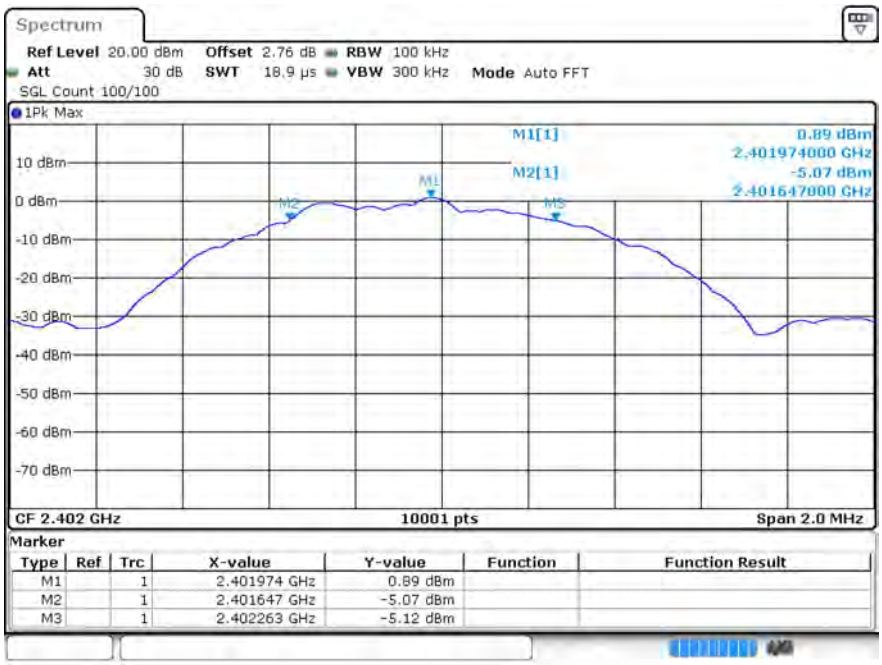
3.1 Test Result

Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
BLE 1M	2402	0.617	0.5	Pass
BLE 1M	2440	0.689	0.5	Pass
BLE 1M	2480	0.707	0.5	Pass
BLE 2M	2402	0.957	0.5	Pass
BLE 2M	2440	1.16	0.5	Pass
BLE 2M	2480	1.328	0.5	Pass

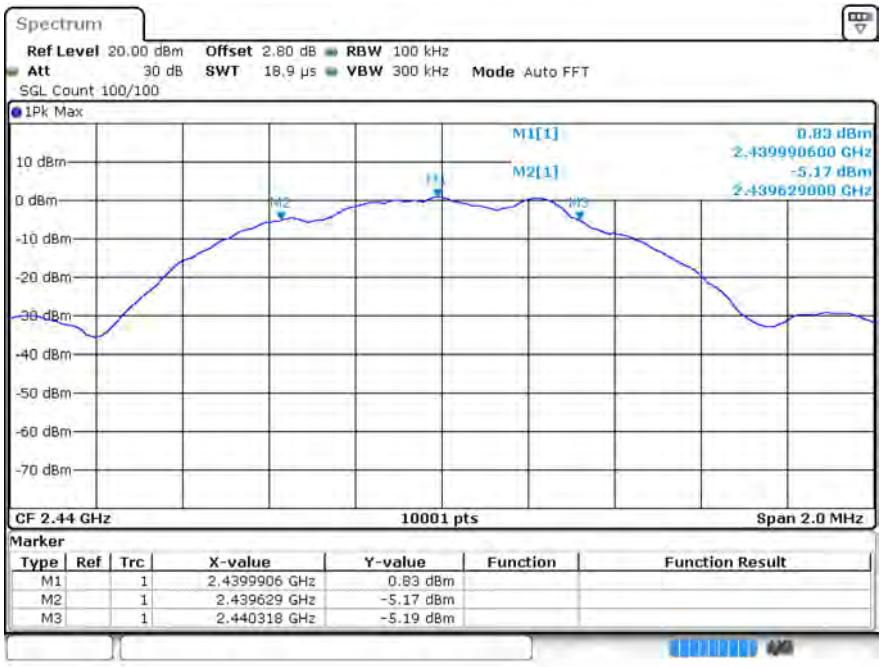
3.2 Test Graphs

Test Graphs

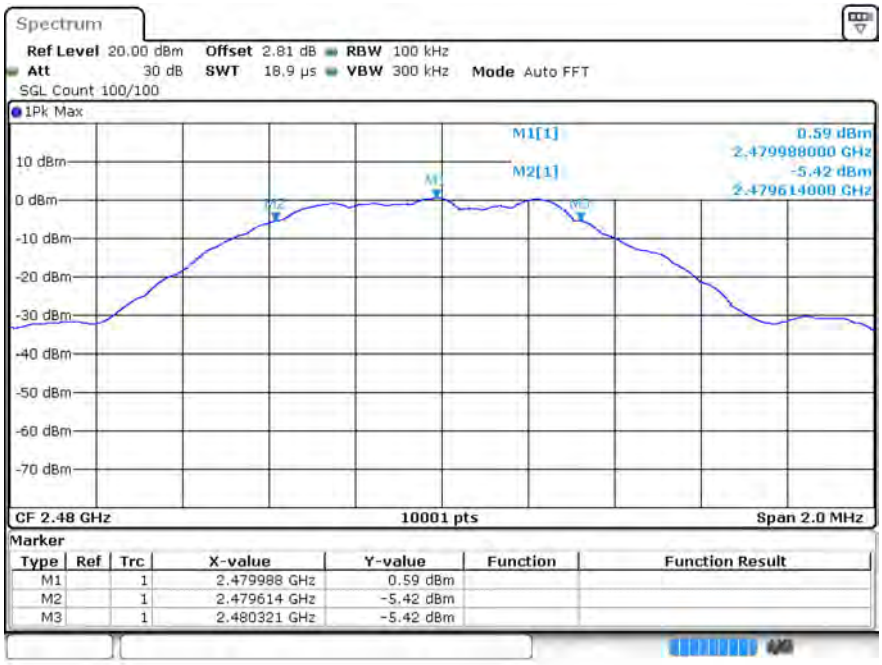
BLE 1M 2402MHz



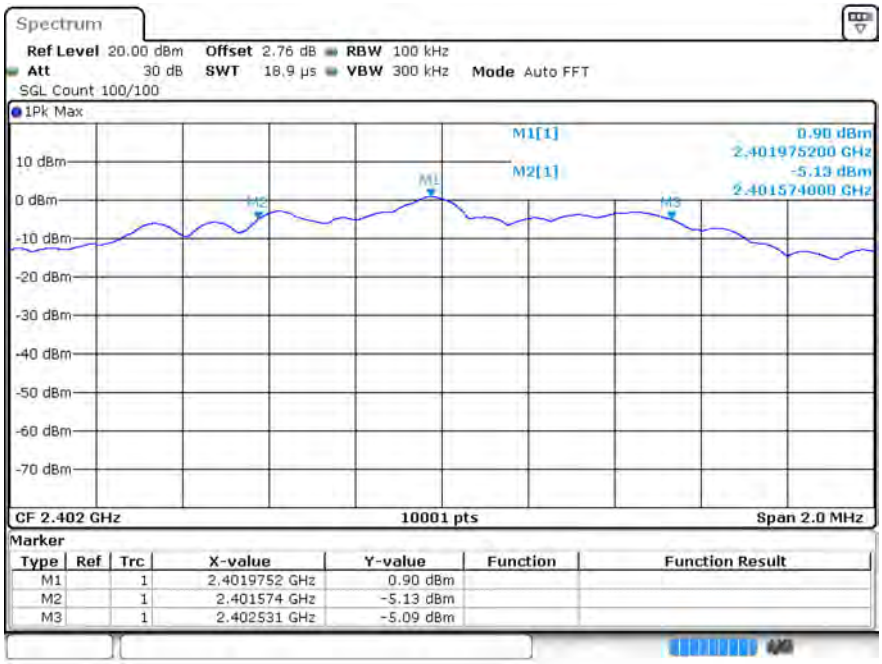
BLE 1M 2440MHz



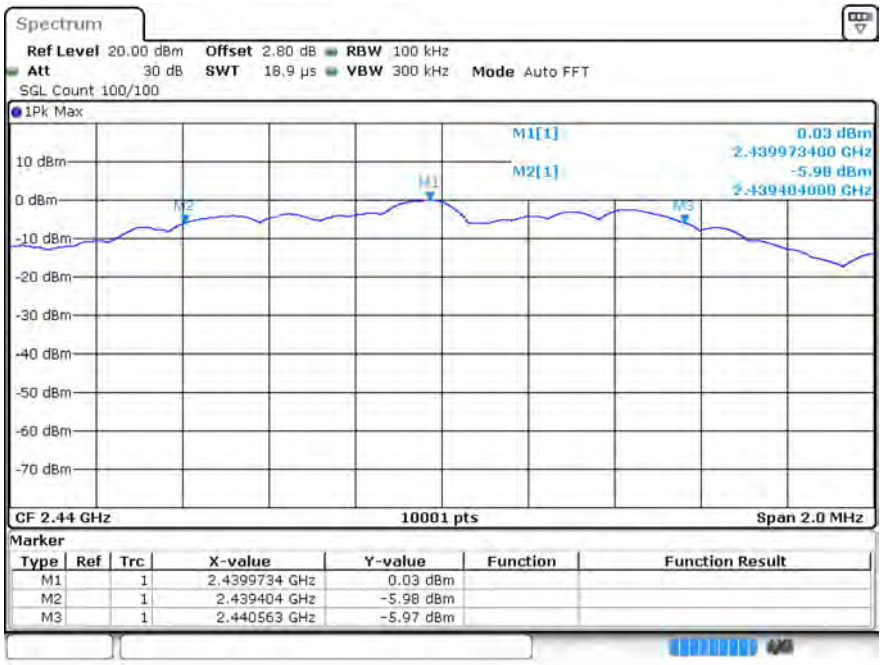
BLE 1M 2480MHz



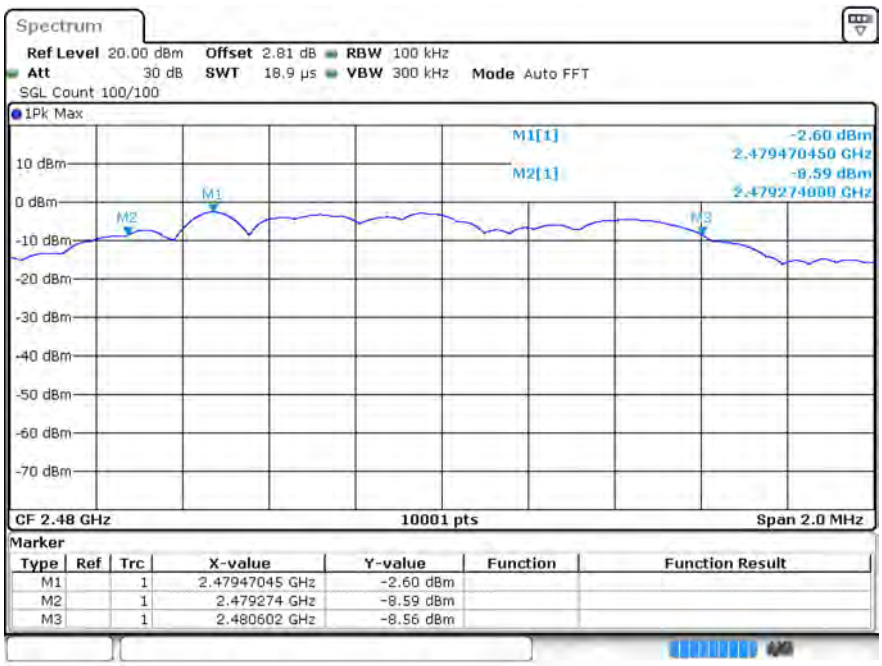
BLE 2M 2402MHz



BLE 2M 2440MHz



BLE 2M 2480MHz

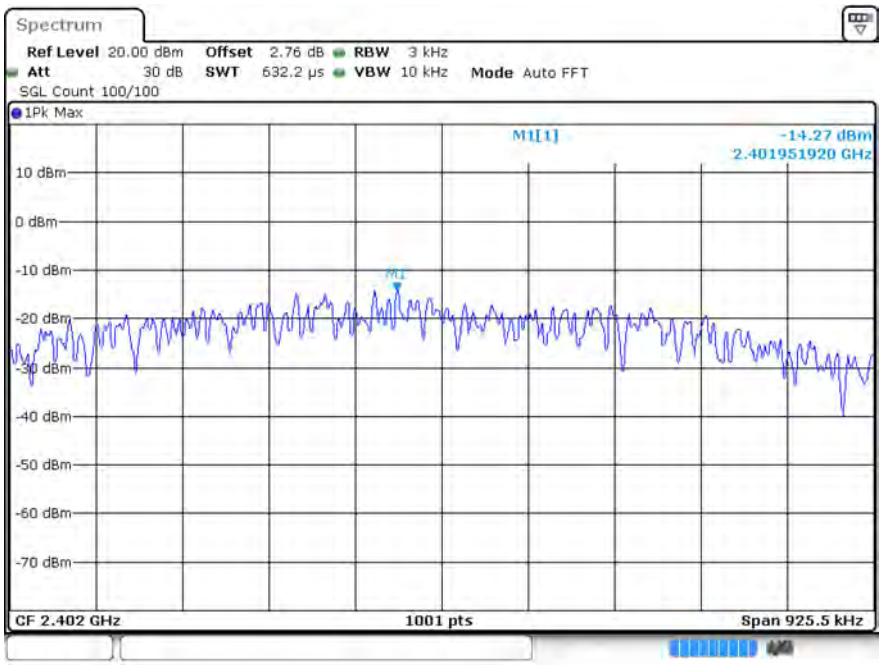
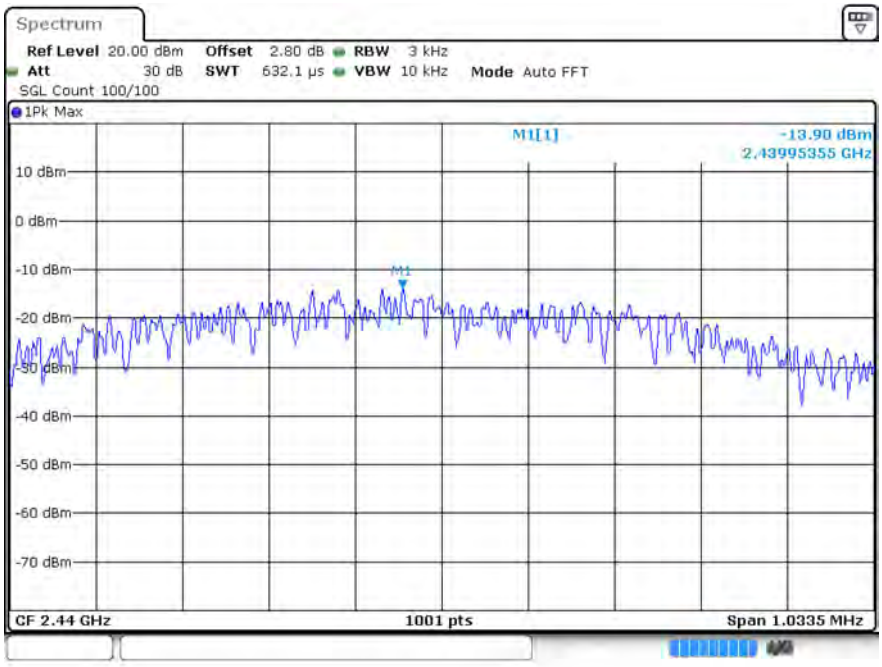


4 Maximum Power Spectral Density Level

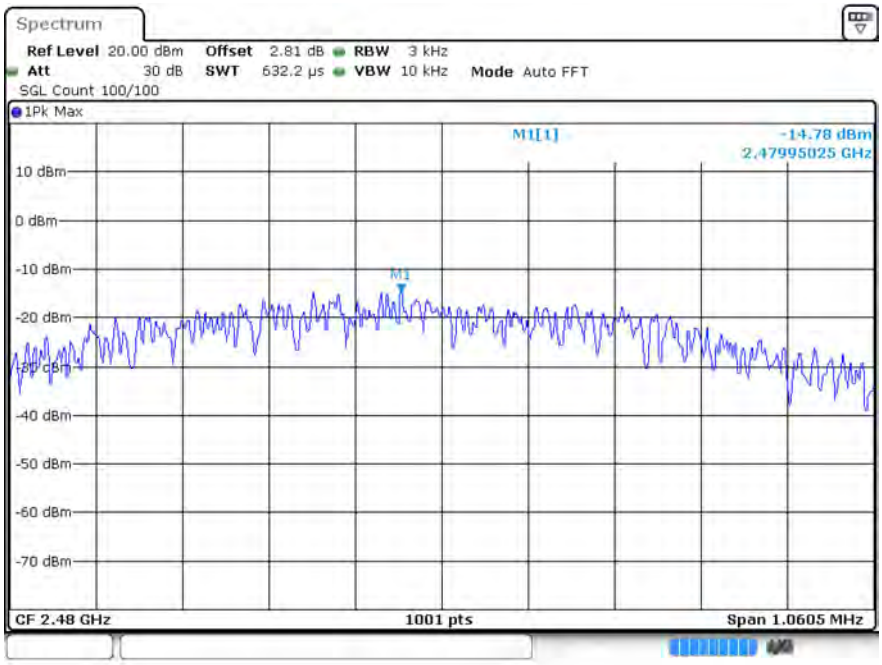
4.1 Test Result

Mode	Frequency (MHz)	Conducted PSD (dBm/3-100kHz)	Limit (dBm/3kHz)	Verdict
BLE 1M	2402	-14.27	≤8	Pass
BLE 1M	2440	-13.9	≤8	Pass
BLE 1M	2480	-14.78	≤8	Pass
BLE 2M	2402	-16.91	≤8	Pass
BLE 2M	2440	-16.31	≤8	Pass
BLE 2M	2480	-16.9	≤8	Pass

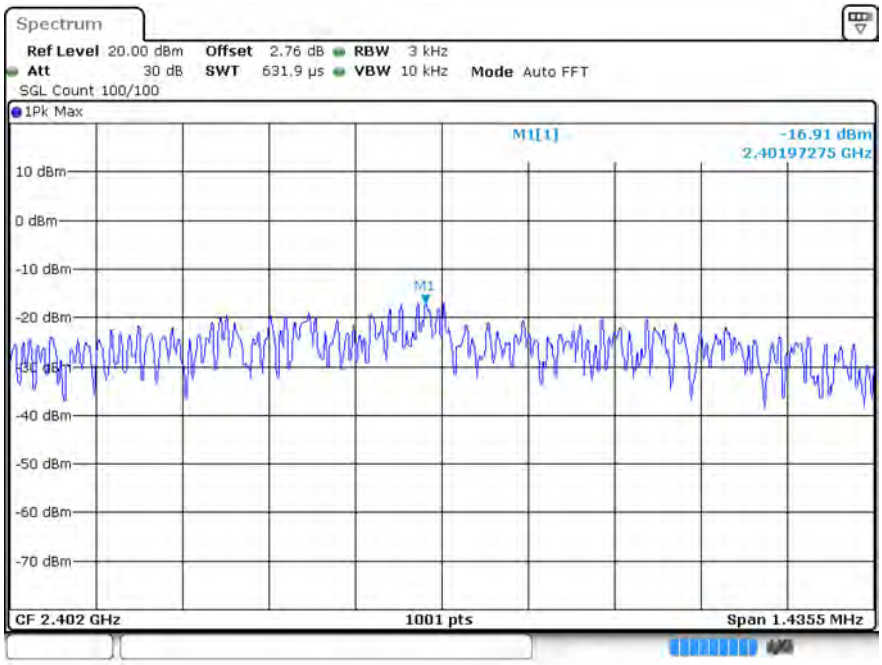
4.2 Test Graphs

Test Graphs
BLE 1M 2402MHz

BLE 1M 2440MHz


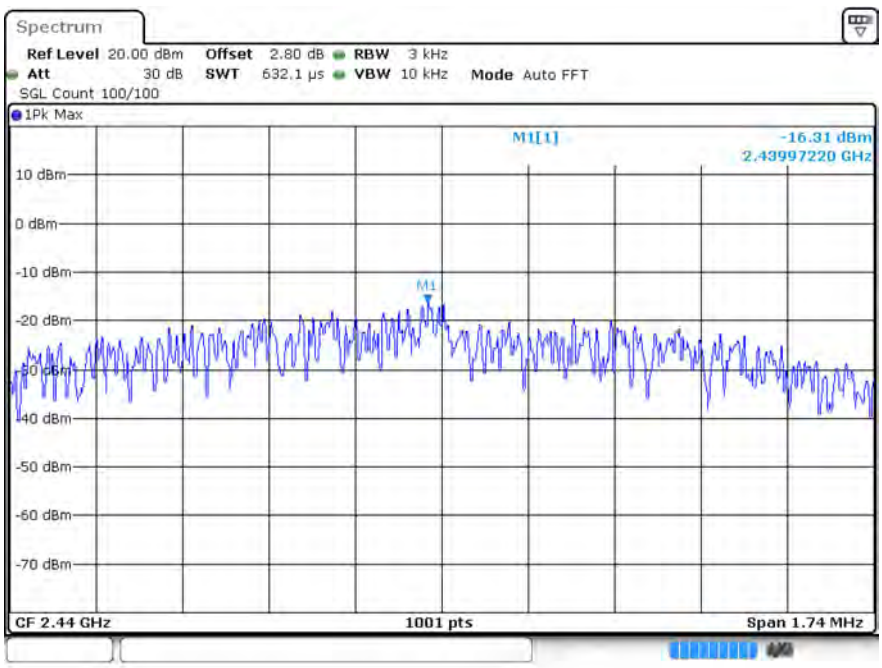
BLE 1M 2480MHz



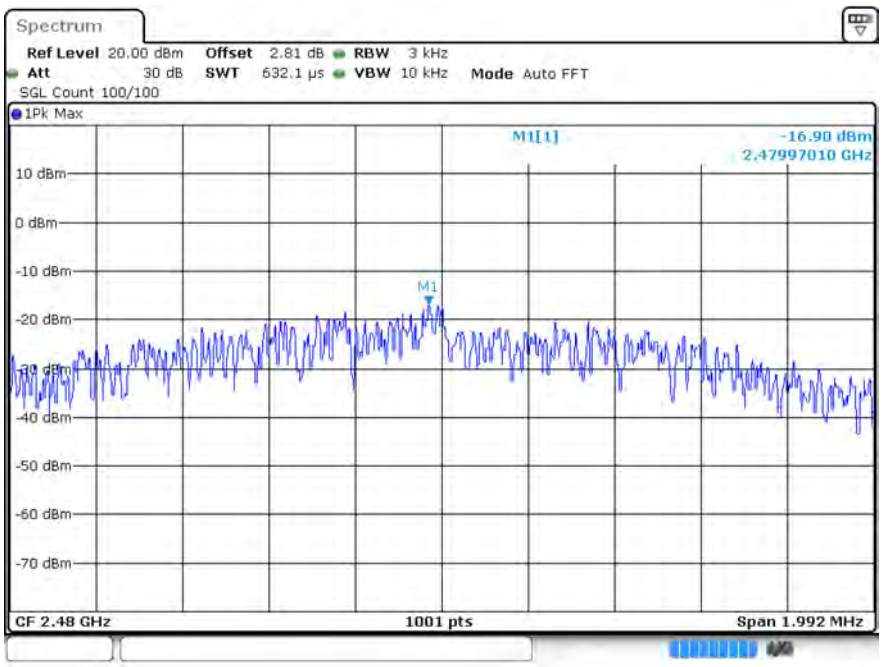
BLE 2M 2402MHz



BLE 2M 2440MHz



BLE 2M 2480MHz



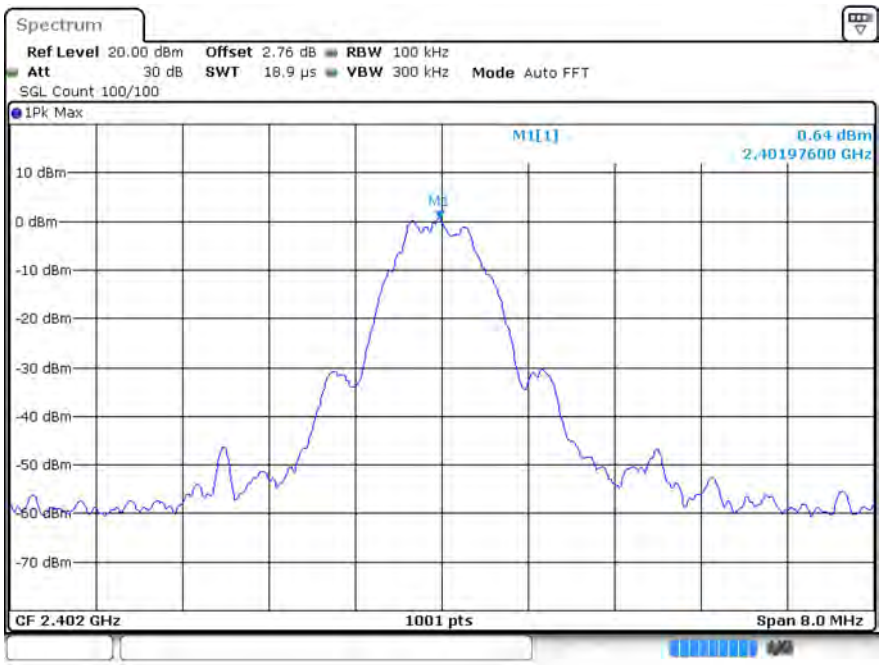
5 Band Edge

5.1 Test Result

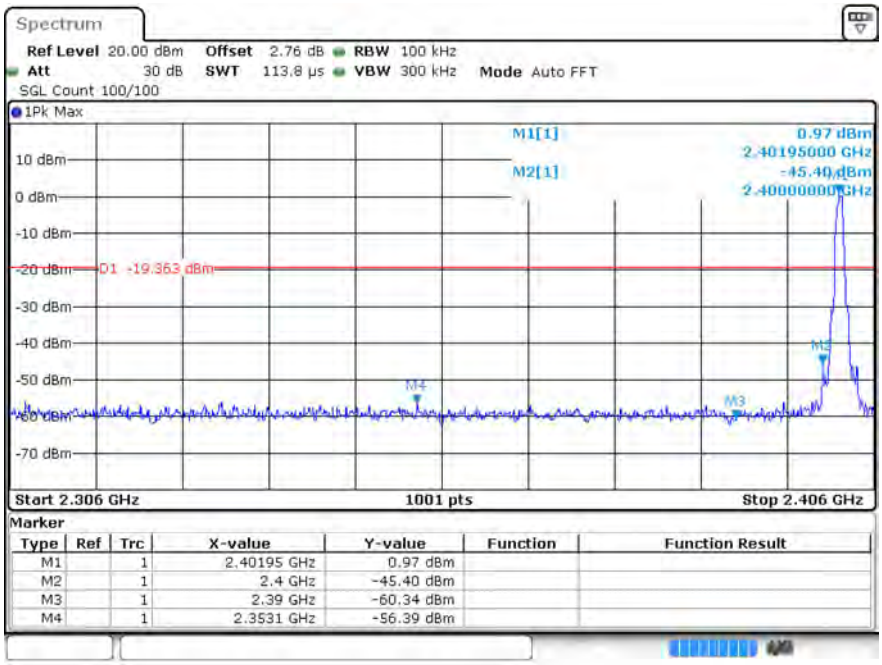
Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
BLE 1M	2402	-57.02	-20	Pass
BLE 1M	2480	-46.85	-20	Pass
BLE 2M	2402	-56.77	-20	Pass
BLE 2M	2480	-50.51	-20	Pass

5.2 Test Graphs

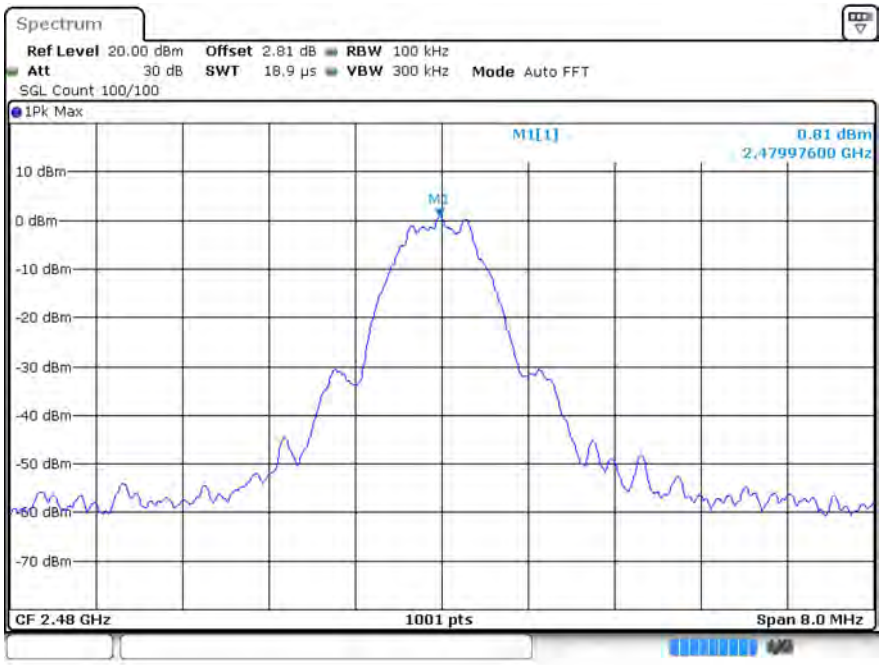
Test Graphs
BLE 1M 2402MHz Ref



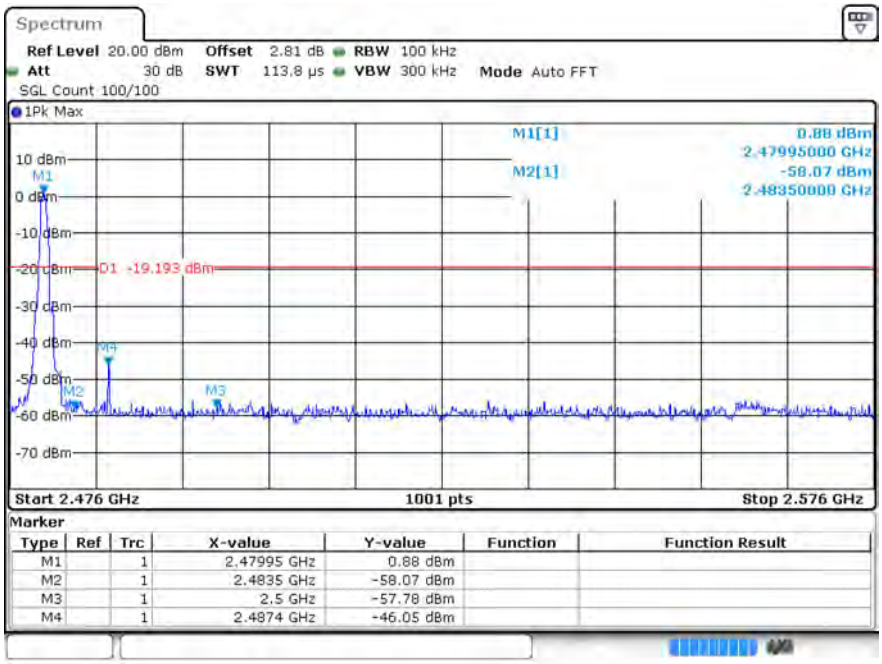
BLE 1M 2402MHz Emission



BLE 1M 2480MHz Ref



BLE 1M 2480MHz Emission

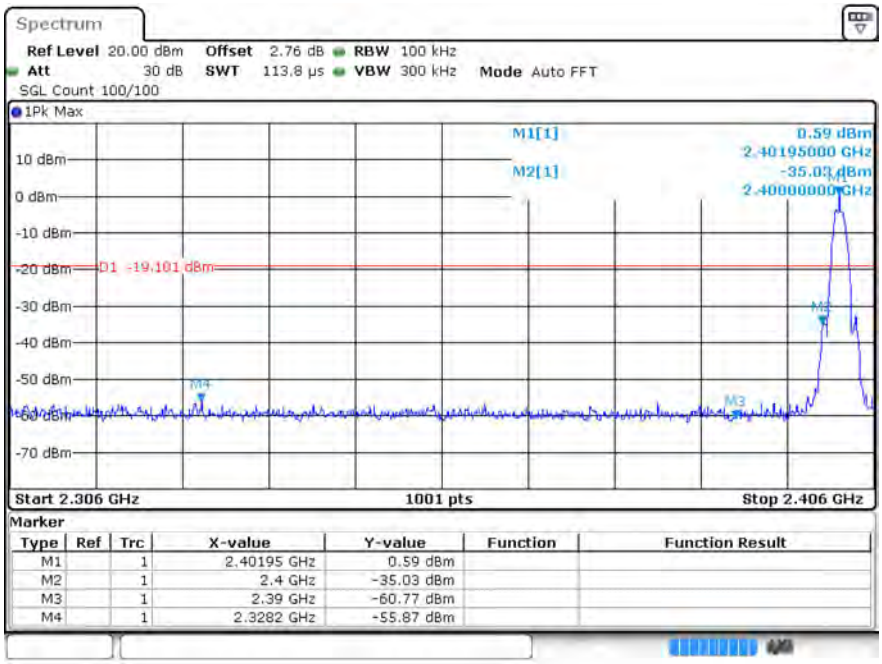


Marker

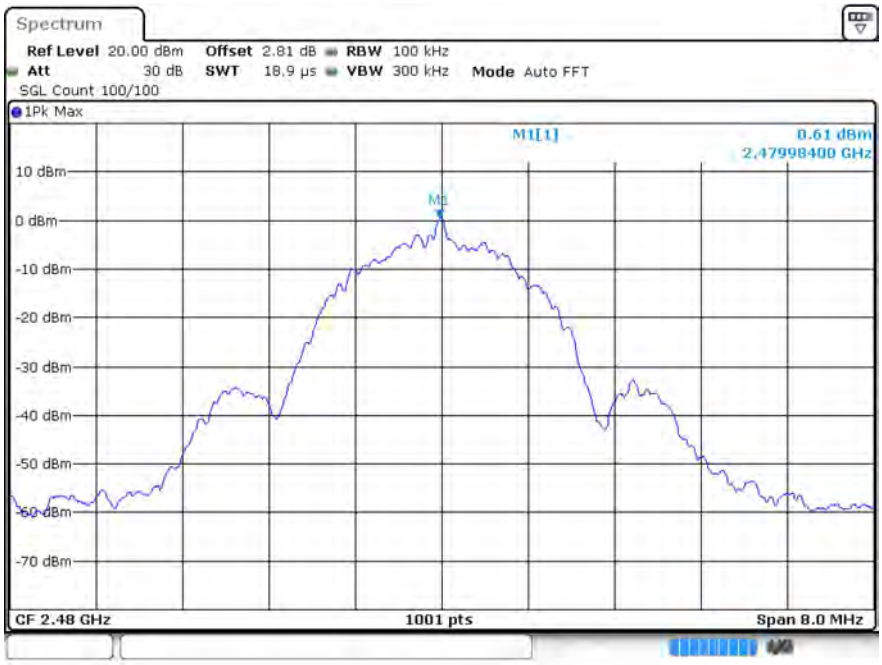
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47995 GHz	0.88 dBm		
M2		1	2.4835 GHz	-58.07 dBm		
M3		1	2.5 GHz	-57.78 dBm		
M4		1	2.4874 GHz	-46.05 dBm		

BLE 2M 2402MHz Ref

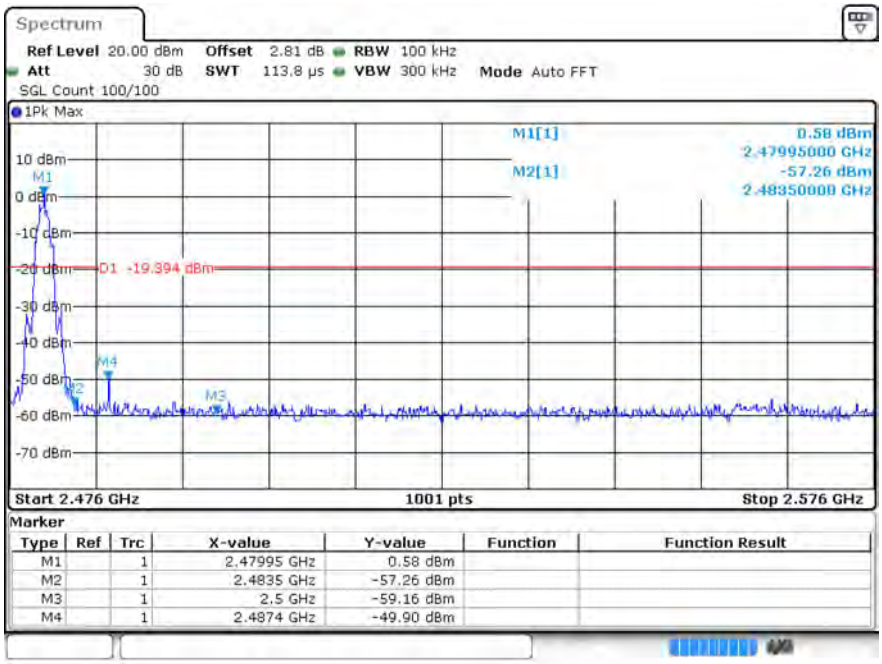
BLE 2M 2402MHz Emission



BLE 2M 2480MHz Ref



BLE 2M 2480MHz Emission



6 Conducted RF Spurious Emission

6.1 Test Result

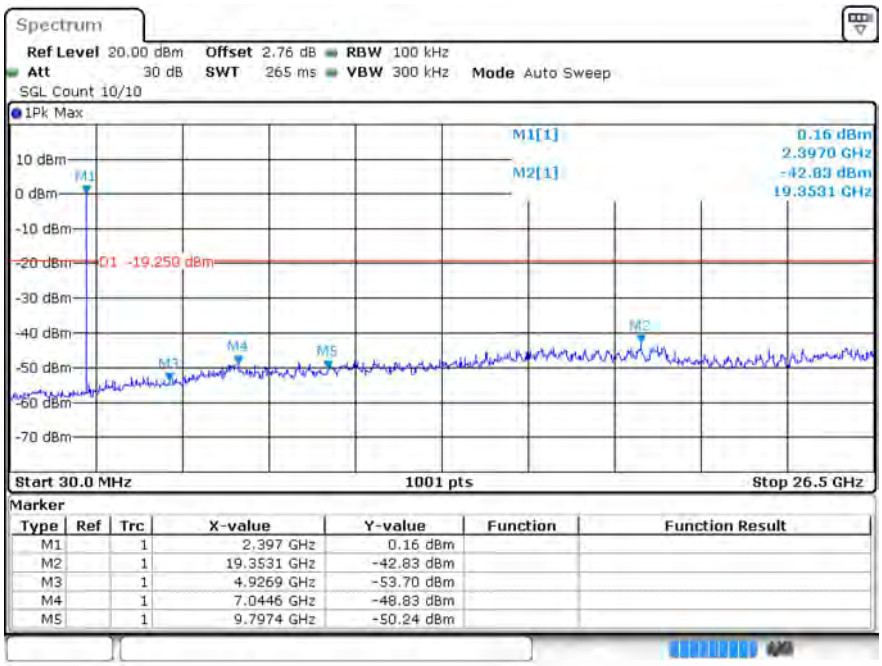
Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
BLE 1M	2402	-43.58	-20	Pass
BLE 1M	2440	-44.9	-20	Pass
BLE 1M	2480	-43.17	-20	Pass
BLE 2M	2402	-44.64	-20	Pass
BLE 2M	2440	-43.82	-20	Pass
BLE 2M	2480	-40.98	-20	Pass

6.2 Test Graphs

Test Graphs

BLE 1M 2402MHz Ref

BLE 1M 2402MHz Emission

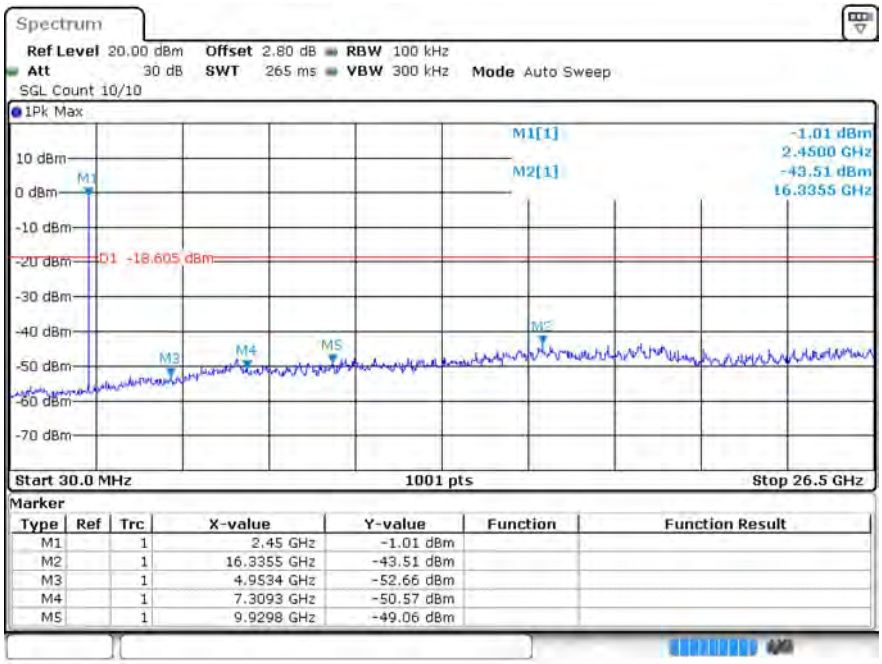


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.397 GHz	0.16 dBm		
M2		1	19.3531 GHz	-42.83 dBm		
M3		1	4.9269 GHz	-53.70 dBm		
M4		1	7.0446 GHz	-48.83 dBm		
M5		1	9.7974 GHz	-50.24 dBm		

BLE 1M 2440MHz Ref

BLE 1M 2440MHz Emission

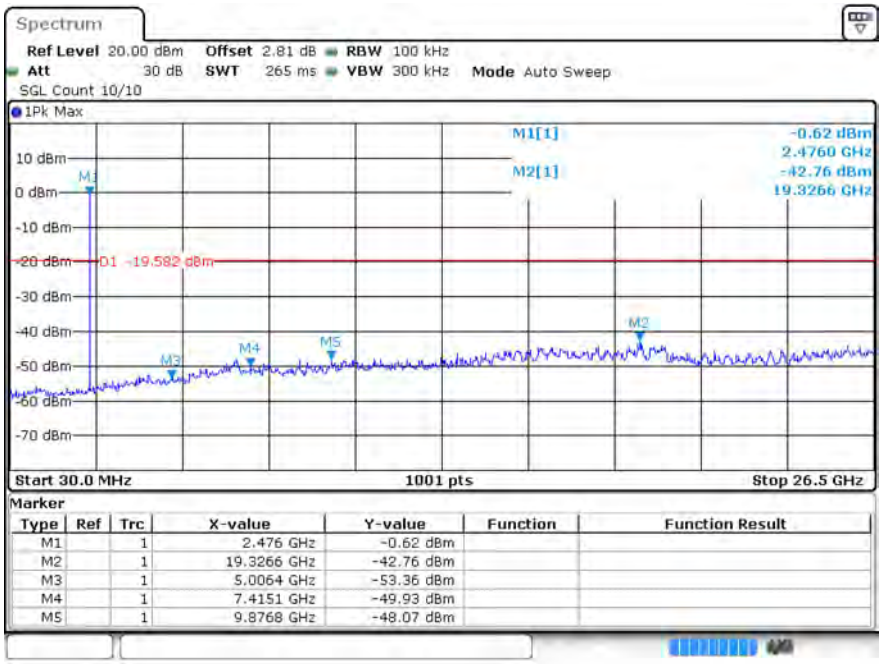


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-1.01 dBm		
M2		1	16.3355 GHz	-43.51 dBm		
M3		1	4.9534 GHz	-52.66 dBm		
M4		1	7.3093 GHz	-50.57 dBm		
M5		1	9.9298 GHz	-49.06 dBm		

BLE 1M 2480MHz Ref

BLE 1M 2480MHz Emission

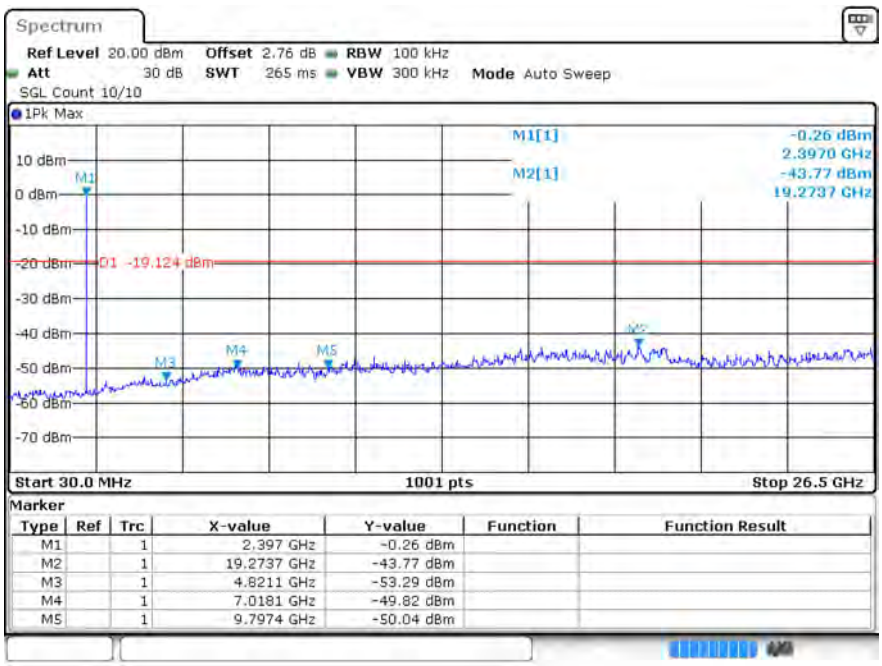


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.476 GHz	-0.62 dBm		
M2		1	19.3266 GHz	-42.76 dBm		
M3		1	5.0064 GHz	-53.36 dBm		
M4		1	7.4151 GHz	-49.93 dBm		
M5		1	9.8768 GHz	-48.07 dBm		

BLE 2M 2402MHz Ref

BLE 2M 2402MHz Emission

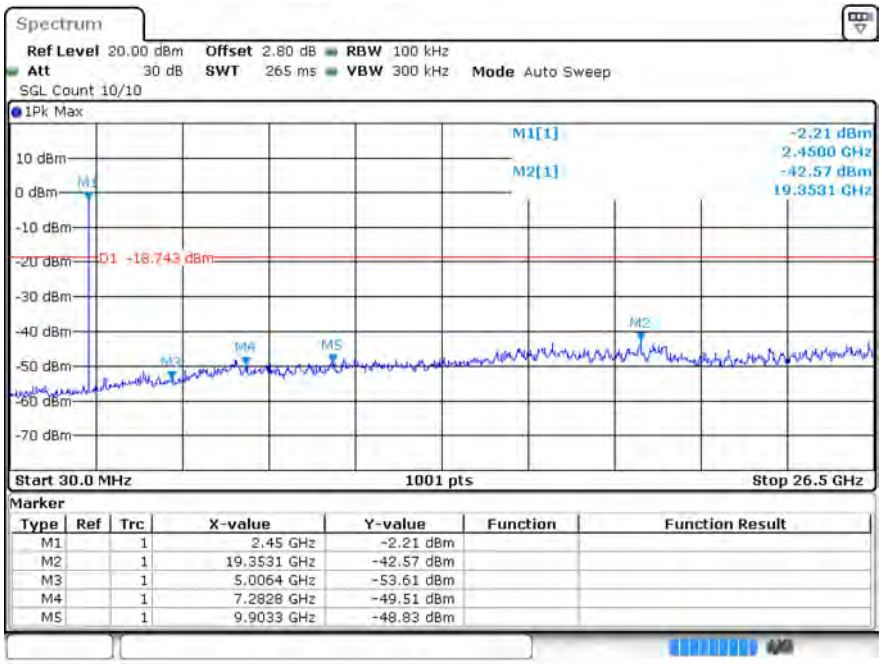


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.397 GHz	-0.26 dBm		
M2		1	19.2737 GHz	-43.77 dBm		
M3		1	4.8211 GHz	-53.29 dBm		
M4		1	7.0181 GHz	-49.82 dBm		
M5		1	9.7974 GHz	-50.04 dBm		

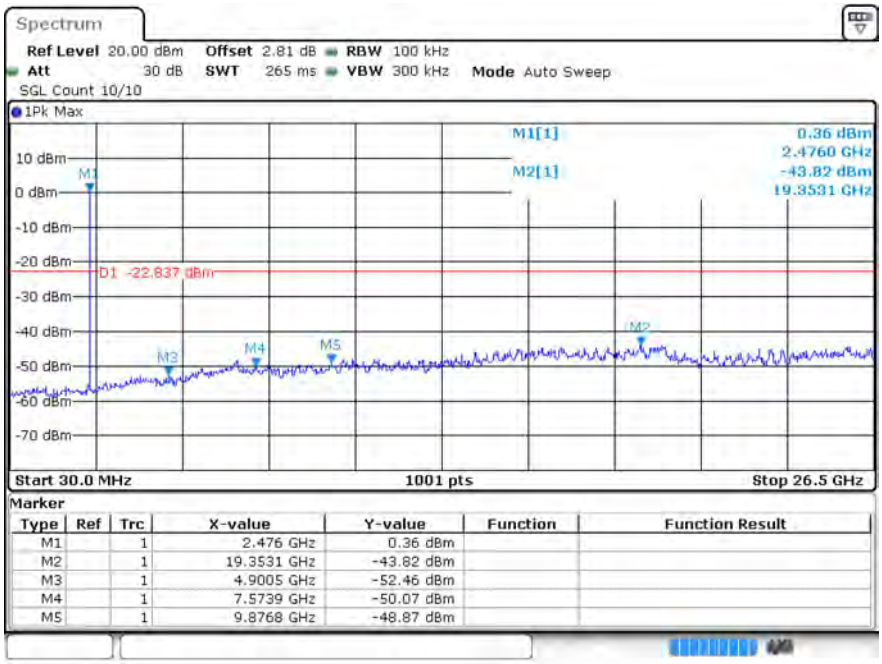
BLE 2M 2440MHz Ref

BLE 2M 2440MHz Emission



BLE 2M 2480MHz Ref

BLE 2M 2480MHz Emission



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.476 GHz	0.36 dBm		
M2		1	19.3531 GHz	-43.82 dBm		
M3		1	4.9005 GHz	-52.46 dBm		
M4		1	7.5739 GHz	-50.07 dBm		
M5		1	9.8768 GHz	-48.87 dBm		

7 Restrict Band

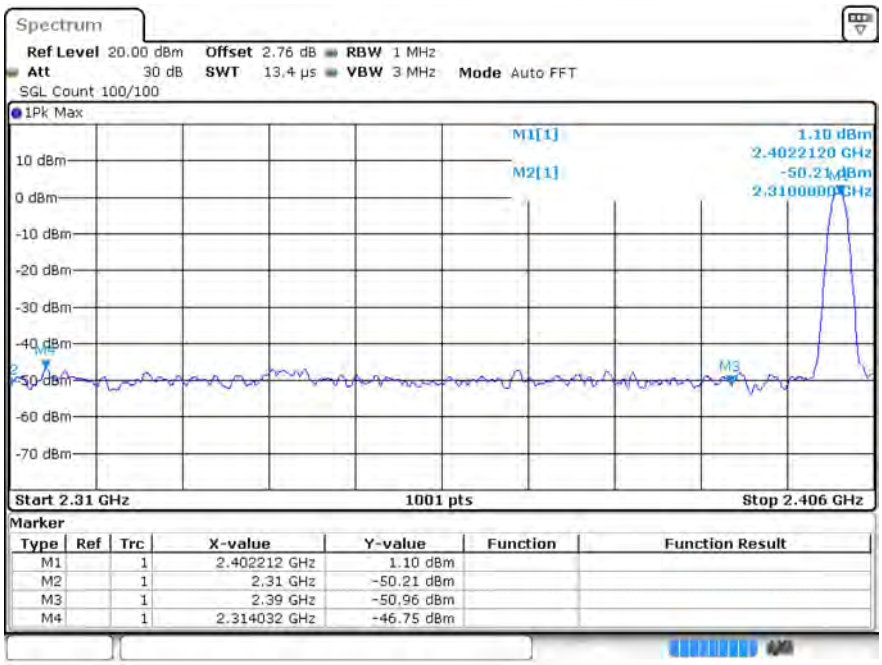
7.1 Test Result

Mode	Frequency (MHz)	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
BLE 1M	2402	2310	-50.21	2	-	47.05	Peak	74	Pass
BLE 1M	2402	2310	-56.74	2	1.88	42.4	Average	54	Pass
BLE 1M	2402	2314.032	-46.75	2	-	50.51	Peak	74	Pass
BLE 1M	2402	2341.872	-54.46	2	1.88	44.68	Average	54	Pass
BLE 1M	2402	2390	-50.96	2	-	46.3	Peak	74	Pass
BLE 1M	2402	2390	-57.6	2	1.88	41.54	Average	54	Pass
BLE 1M	2480	2483.5	-49.21	2	-	48.05	Peak	74	Pass
BLE 1M	2480	2483.5	-55.8	2	1.94	43.4	Average	54	Pass
BLE 1M	2480	2487.472	-46.15	2	-	51.11	Peak	74	Pass
BLE 1M	2480	2483.968	-55.66	2	1.94	43.54	Average	54	Pass
BLE 1M	2480	2500	-50.28	2	-	46.98	Peak	74	Pass
BLE 1M	2480	2500	-56.66	2	1.94	42.54	Average	54	Pass
BLE 2M	2402	2310	-50.43	2	-	46.83	Peak	74	Pass
BLE 2M	2402	2310	-56.58	2	4.54	45.22	Average	54	Pass
BLE 2M	2402	2332.848	-46.68	2	-	50.58	Peak	74	Pass
BLE 2M	2402	2339.952	-54.76	2	4.54	47.04	Average	54	Pass
BLE 2M	2402	2390	-49.74	2	-	47.52	Peak	74	Pass
BLE 2M	2402	2390	-57.81	2	4.54	43.99	Average	54	Pass
BLE 2M	2480	2483.5	-48.36	2	-	48.9	Peak	74	Pass
BLE 2M	2480	2483.5	-54.76	2	4.53	47.03	Average	54	Pass
BLE 2M	2480	2487.376	-42.98	2	-	54.28	Peak	74	Pass
BLE 2M	2480	2483.512	-54.88	2	4.53	46.91	Average	54	Pass
BLE 2M	2480	2500	-49.51	2	-	47.75	Peak	74	Pass
BLE 2M	2480	2500	-56.47	2	4.53	45.32	Average	54	Pass

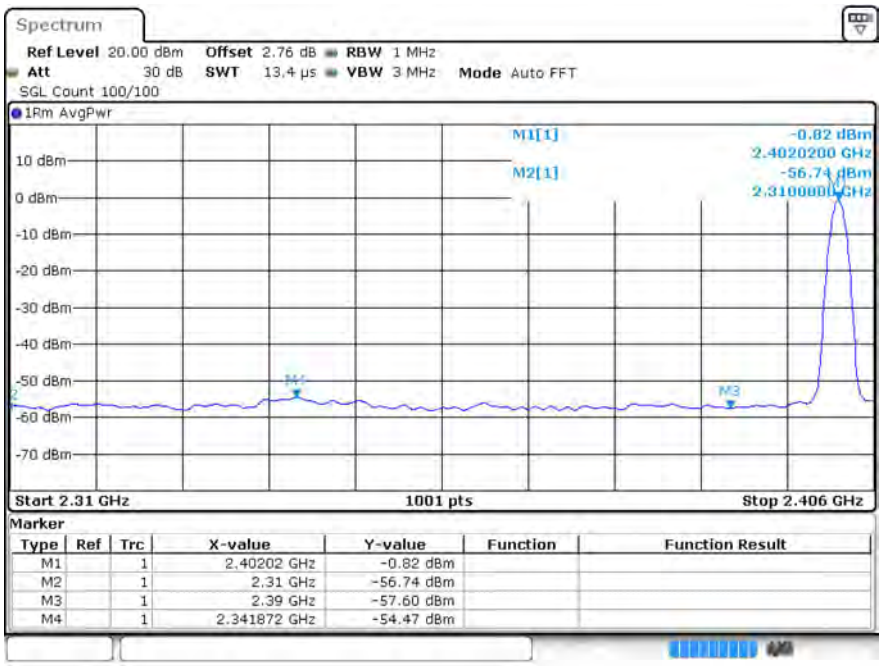
7.2 Test Graphs

Test Graphs

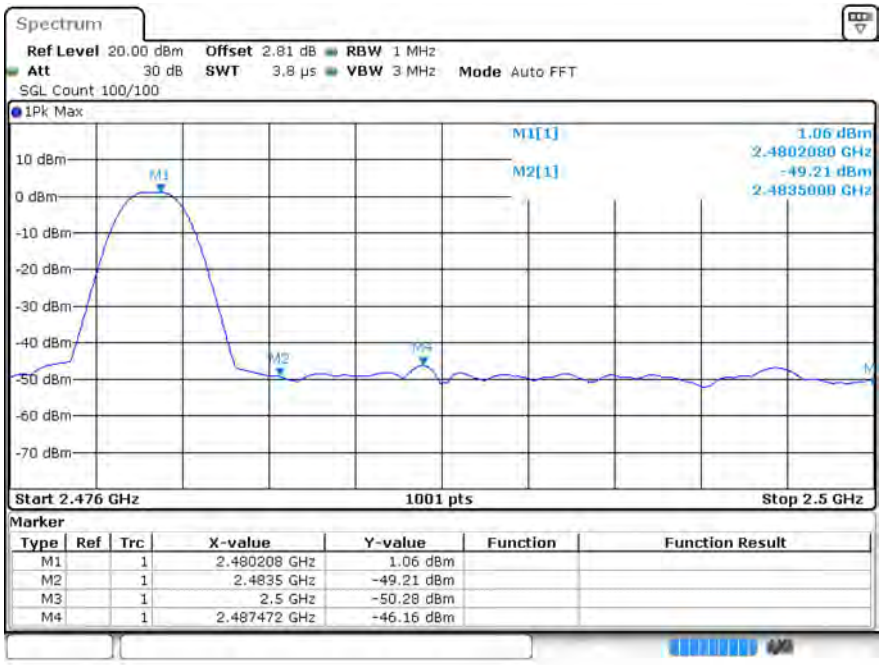
BLE 1M 2402MHz Peak



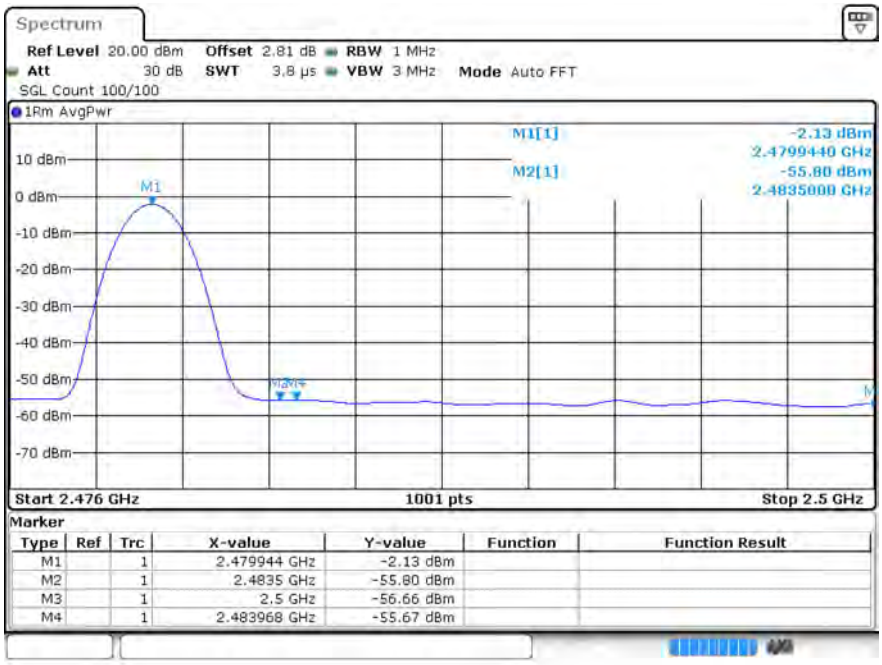
BLE 1M 2402MHz Average



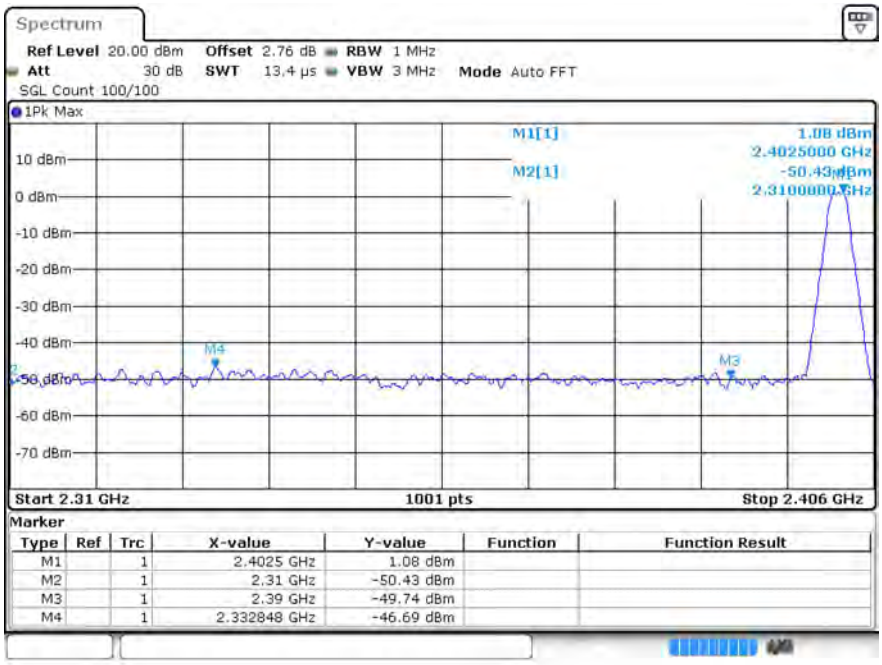
BLE 1M 2480MHz Peak



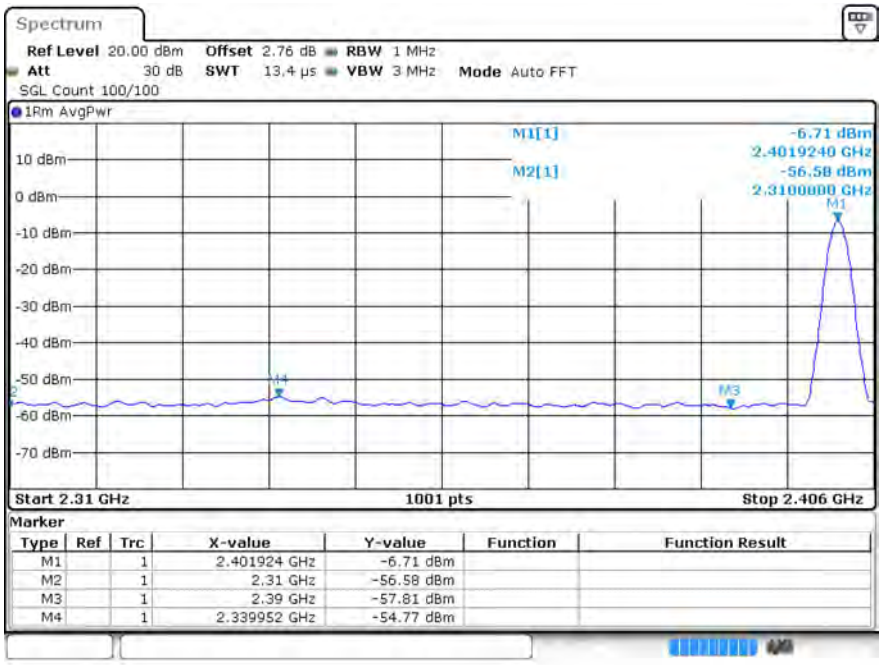
BLE 1M 2480MHz Average



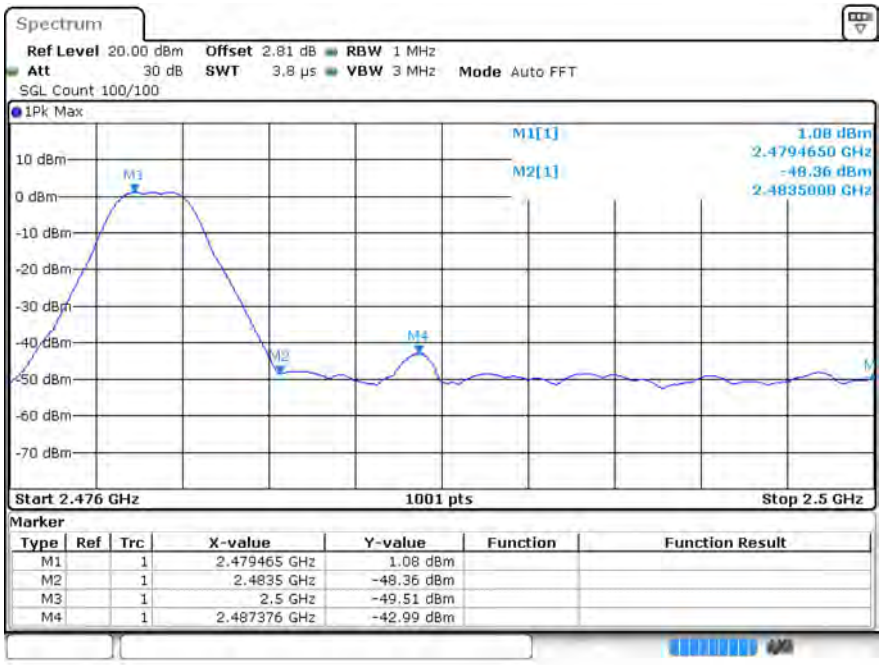
BLE 2M 2402MHz Peak



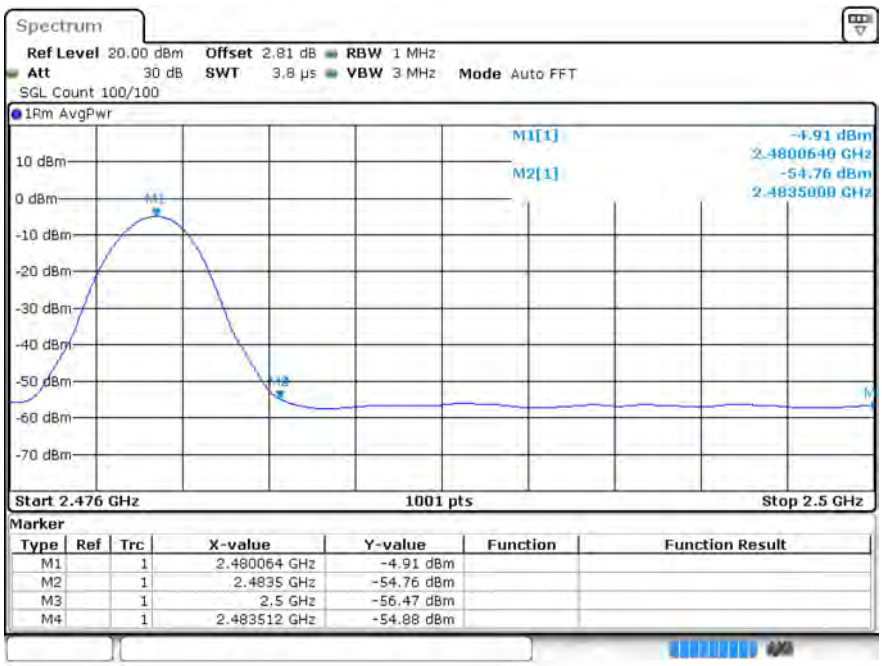
BLE 2M 2402MHz Average



BLE 2M 2480MHz Peak



BLE 2M 2480MHz Average



---The End---