Appendix B

RF Test Data for BLE (Conducted Measurement)

Product Name: All-in-One Live Streaming Device

Trade Mark: HNKJ LAB

Test Model: HN-V88-HD

Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

Contents

1 Duty Cycle

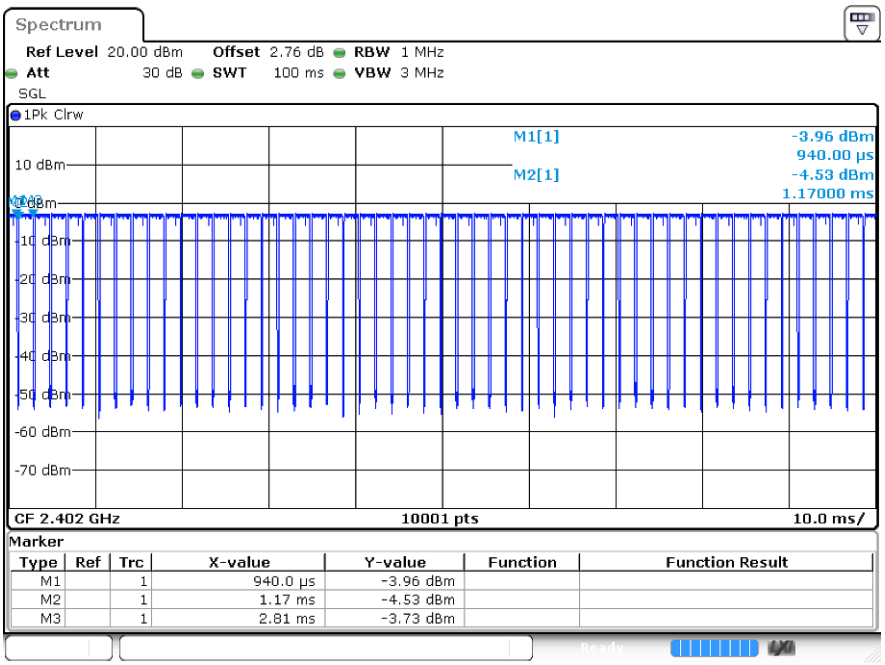
1.1 Test Result

Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	1/T (kHz)
GFSK 1M	2402	Ant1	88.08	0.61
GFSK 1M	2440	Ant1	88.08	0.61
GFSK 1M	2480	Ant1	87.73	0.61
GFSK 2M	2402	Ant1	66.39	1.22
GFSK 2M	2440	Ant1	67.2	1.2
GFSK 2M	2480	Ant1	67.2	1.2

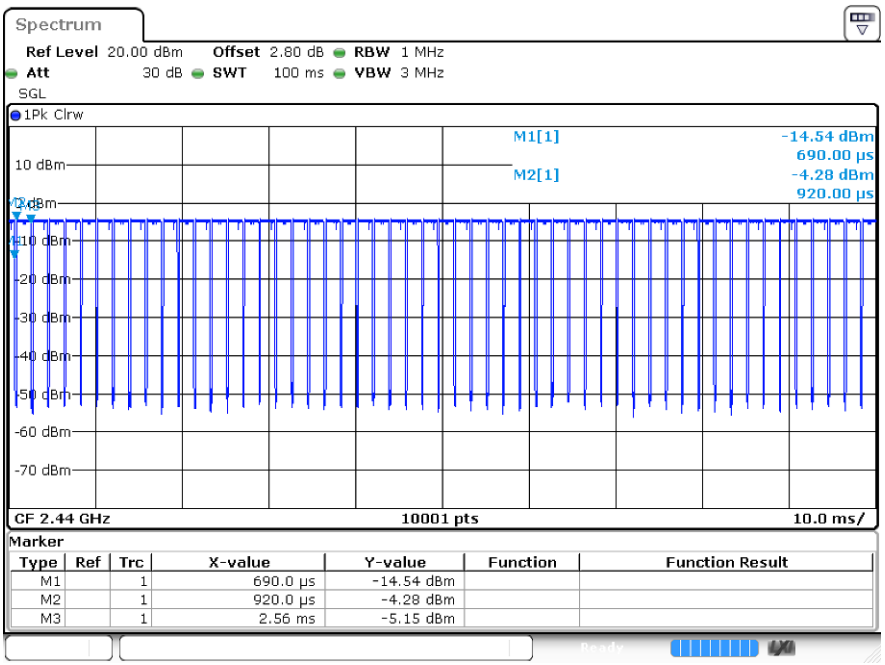
1.2 Test Graphs

Test Graphs of Duty Cycle

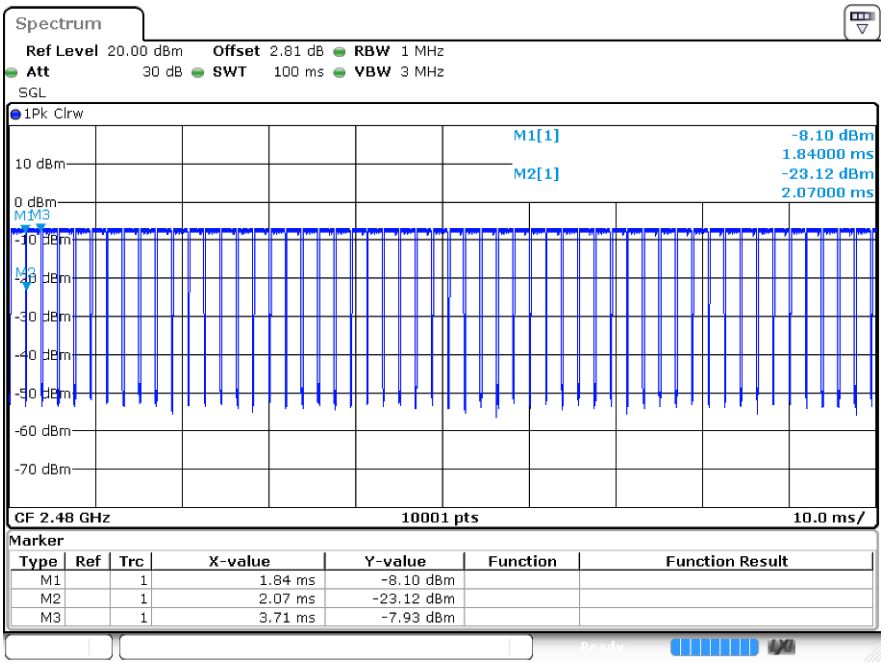
BLE 1M 2402MHz



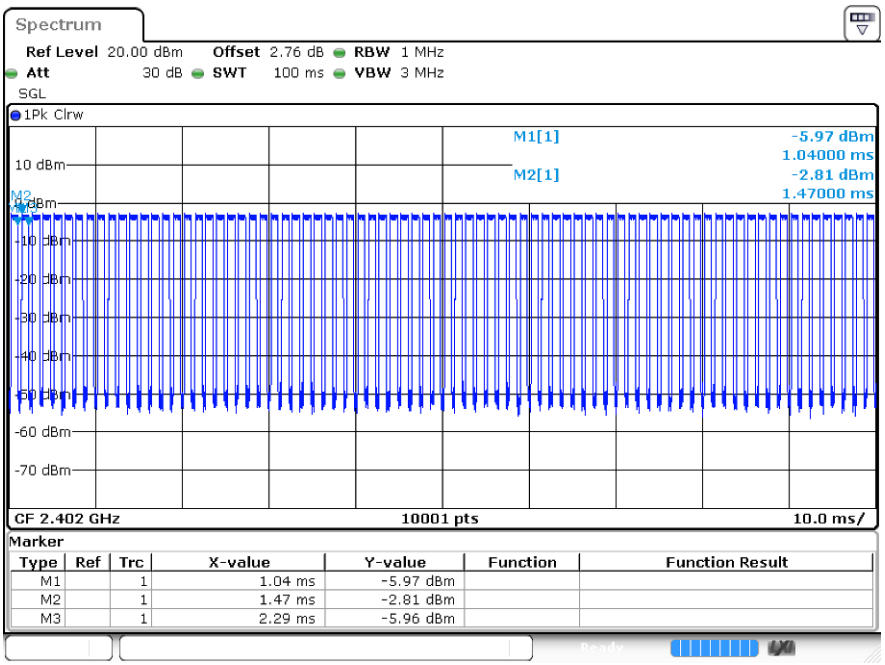
BLE 1M 2440MHz



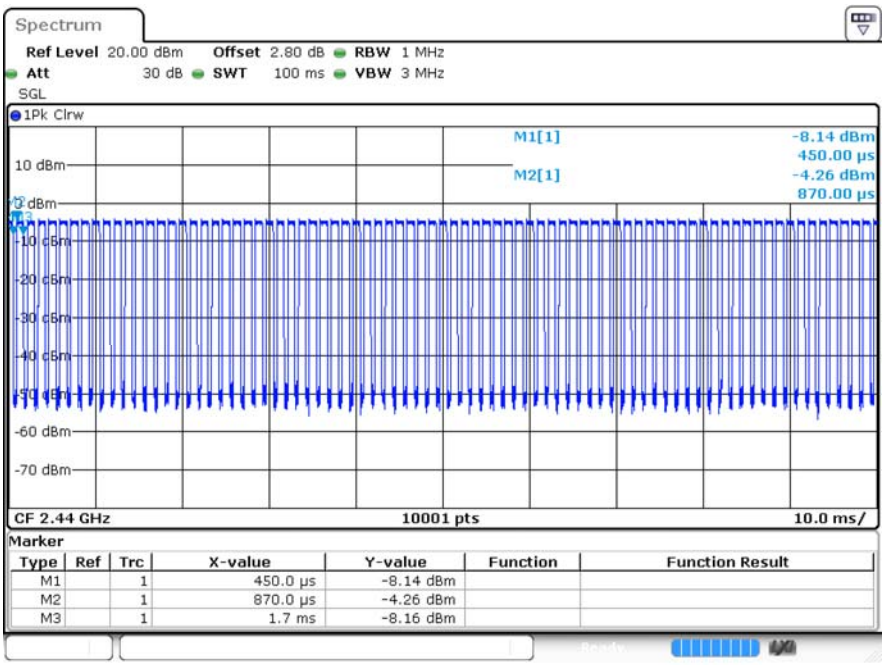
BLE 1M 2480MHz



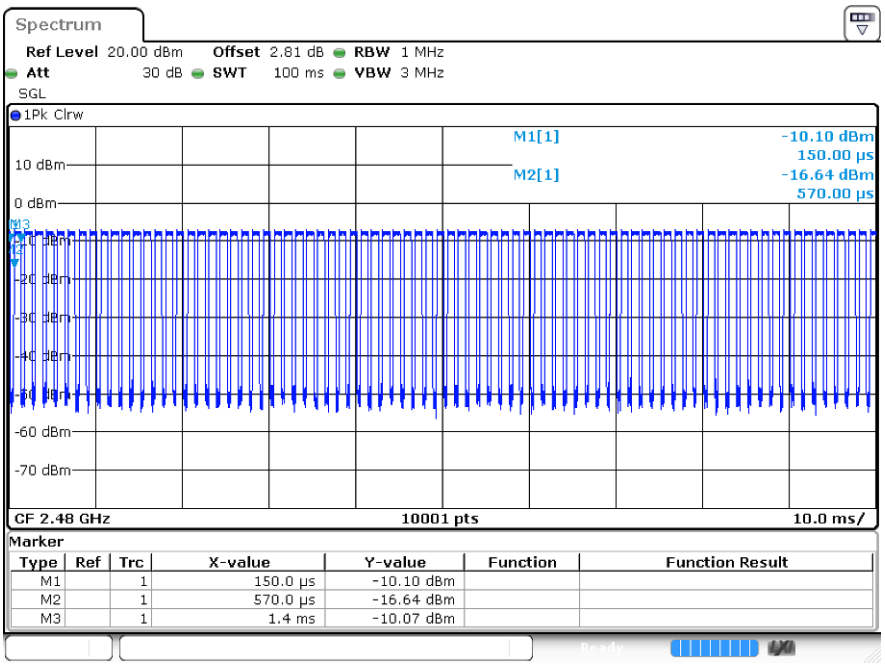
BLE 2M 2402MHz



BLE 2M 2440MHz



BLE 2M 2480MHz

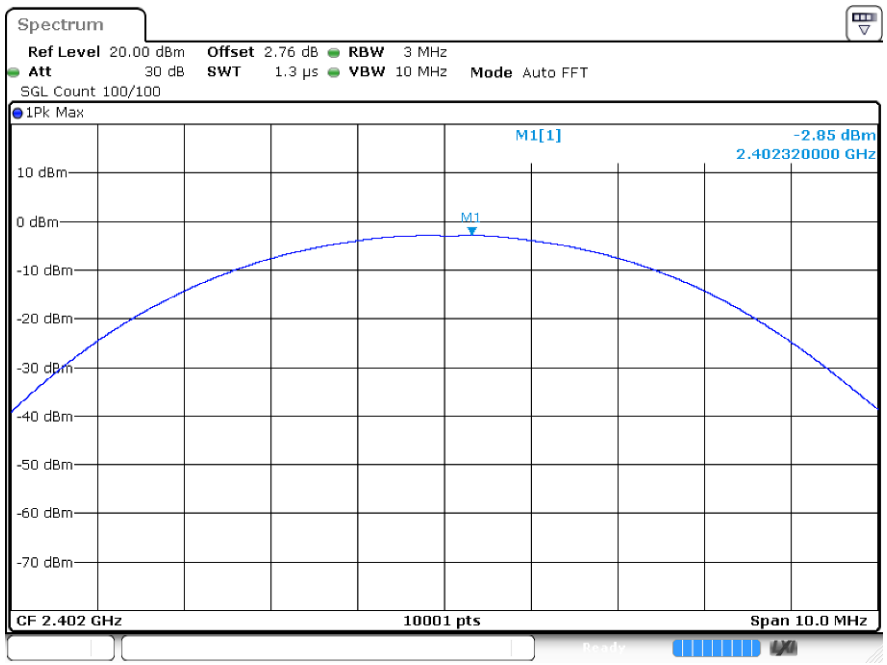
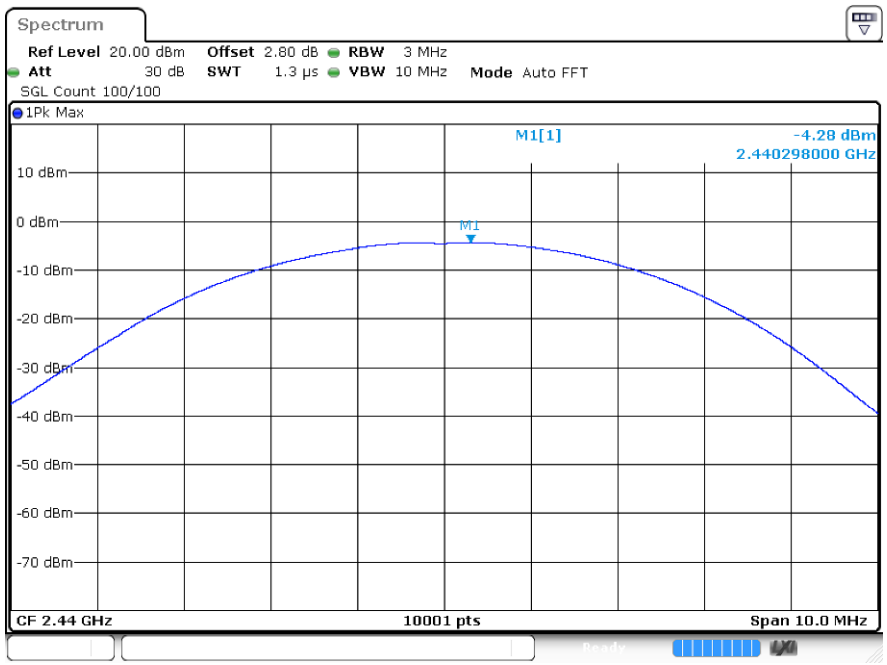


2 Maximum Conducted Output Power

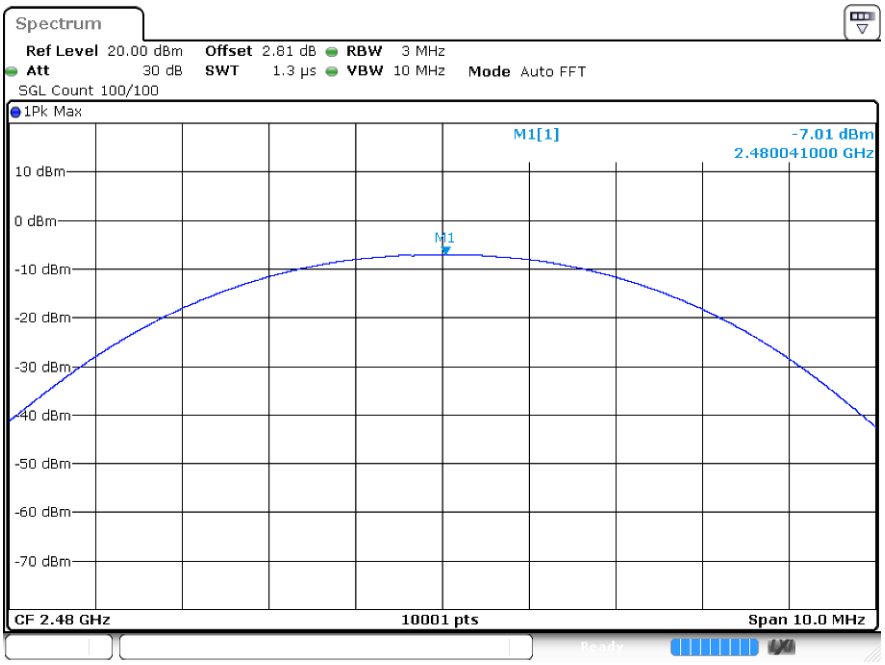
2.1 Test Result

Test Data of Conducted Output Power				
Test Mode	Test Channel (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail
GFSK 1M	2402	-2.85	≤30	Pass
	2440	-4.28	≤30	Pass
	2480	-7.01	≤30	Pass
GFSK 2M	2402	-2.94	≤30	Pass
	2440	-4.3	≤30	Pass
	2480	-7.17	≤30	Pass

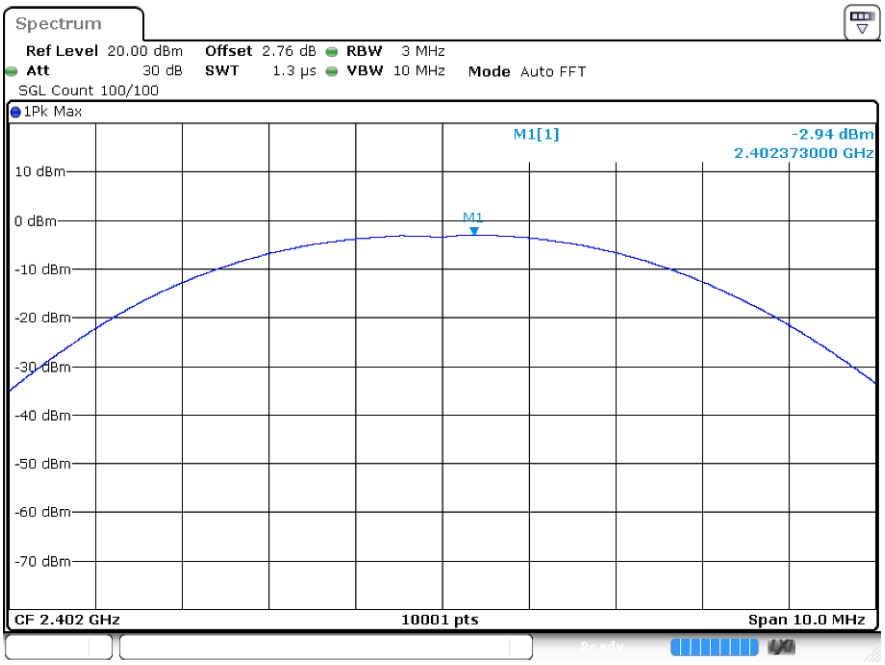
2.2 Test Graphs

Test Graphs for Peak Power
BLE 1M 2402MHz

BLE 1M 2440MHz


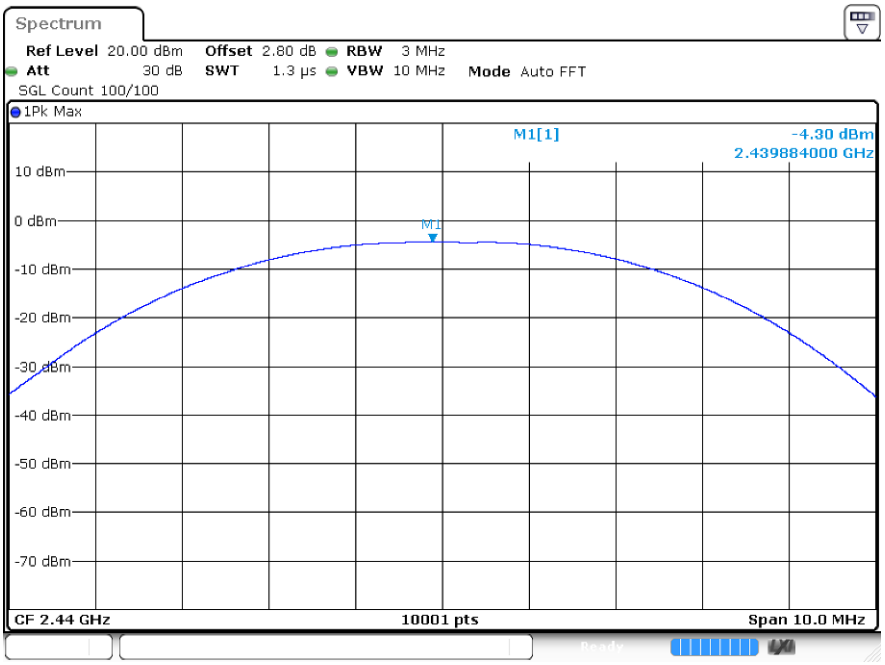
BLE 1M 2480MHz



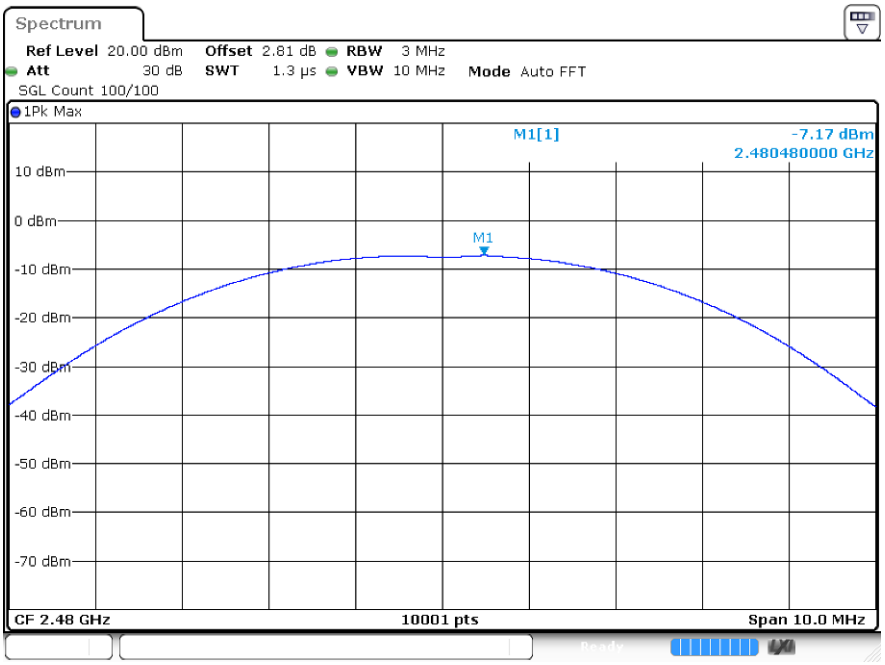
BLE 2M 2402MHz



BLE 2M 2440MHz



BLE 2M 2480MHz



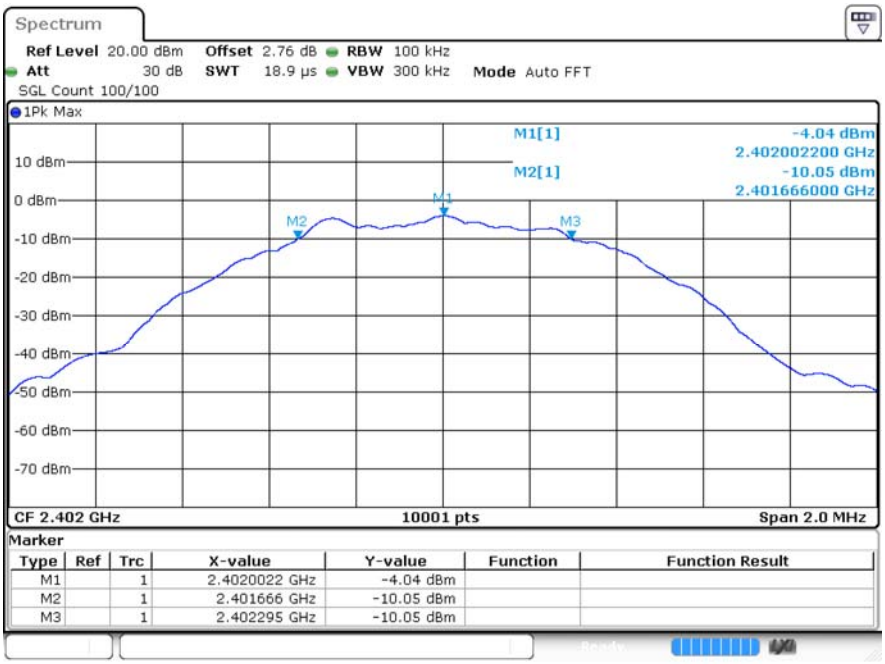
3 -6dB Bandwidth

3.1 Test Result

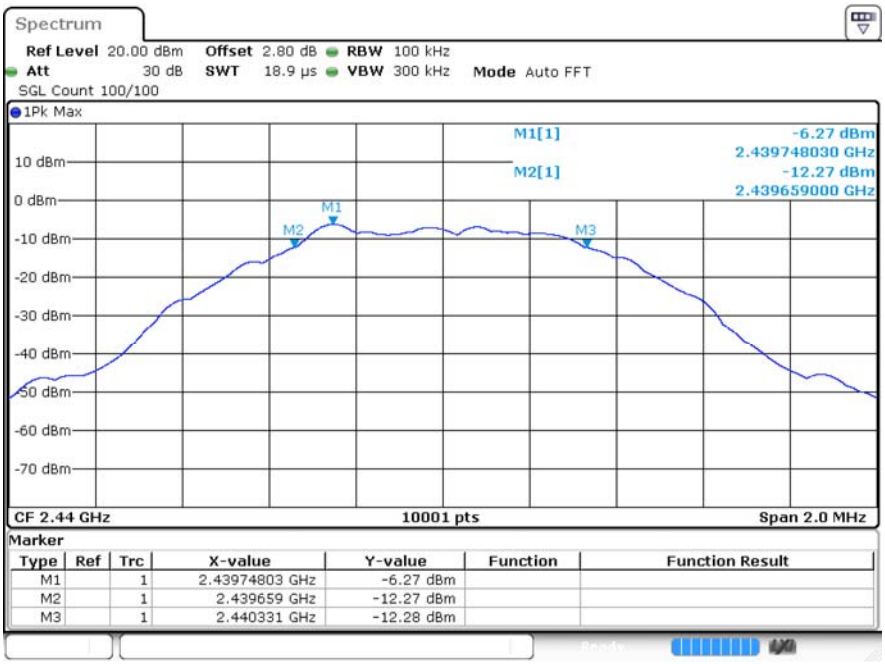
Test Data of Occupied Bandwidth and DTS Bandwidth					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-6dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
GFSK 1M	2402	1.006	0.629	≥0.5	Pass
	2440	1.003	0.672	≥0.5	Pass
	2480	1.012	0.632	≥0.5	Pass
GFSK 2M	2402	1.987	1.074	≥0.5	Pass
	2440	2.008	1.114	≥0.5	Pass
	2480	2.006	1.127	≥0.5	Pass

3.2 Test Graphs

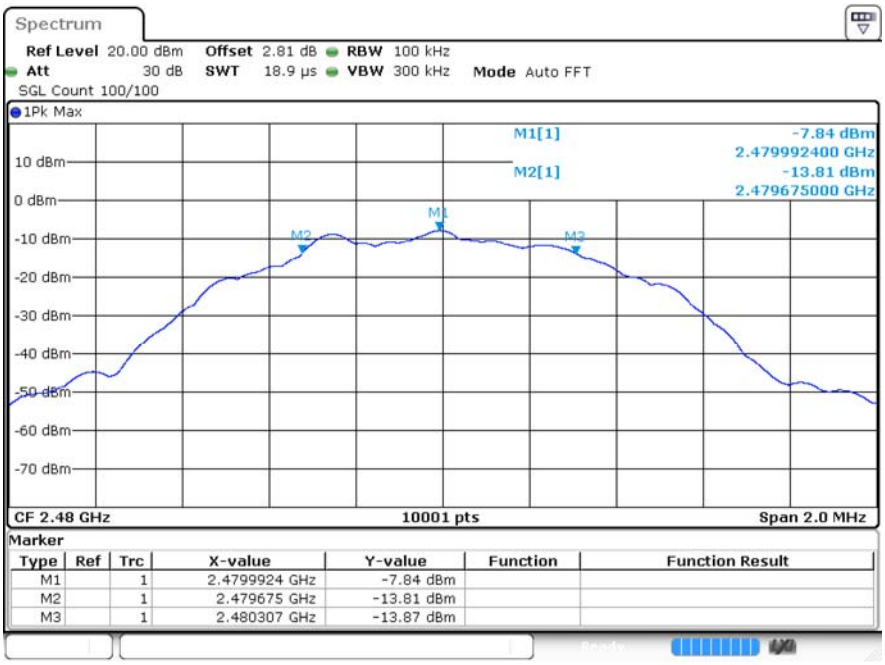
Test Graphs for Bandwidth
BLE 1M 2402MHz_DTSBW



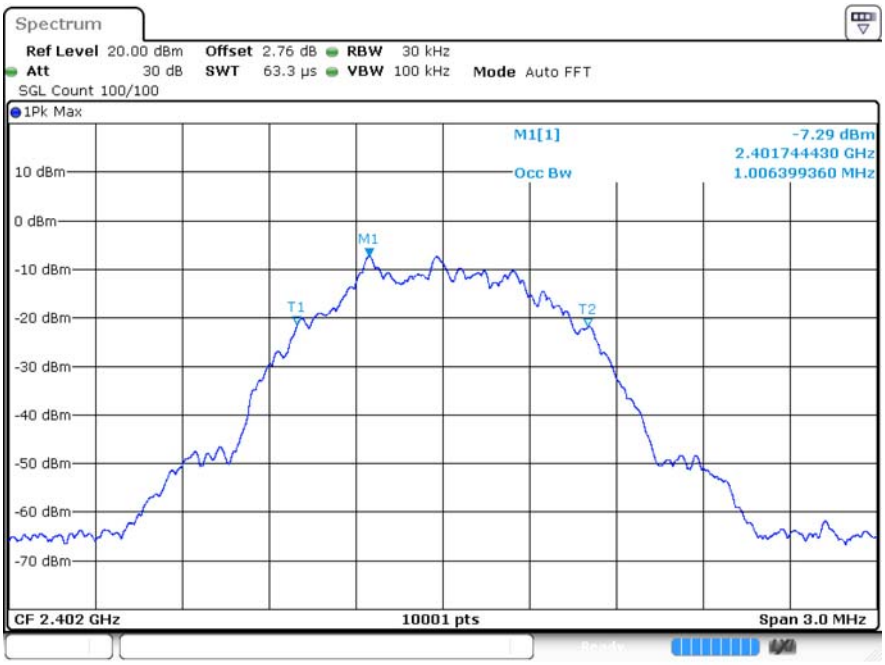
BLE 1M 2440MHz_DTSBW



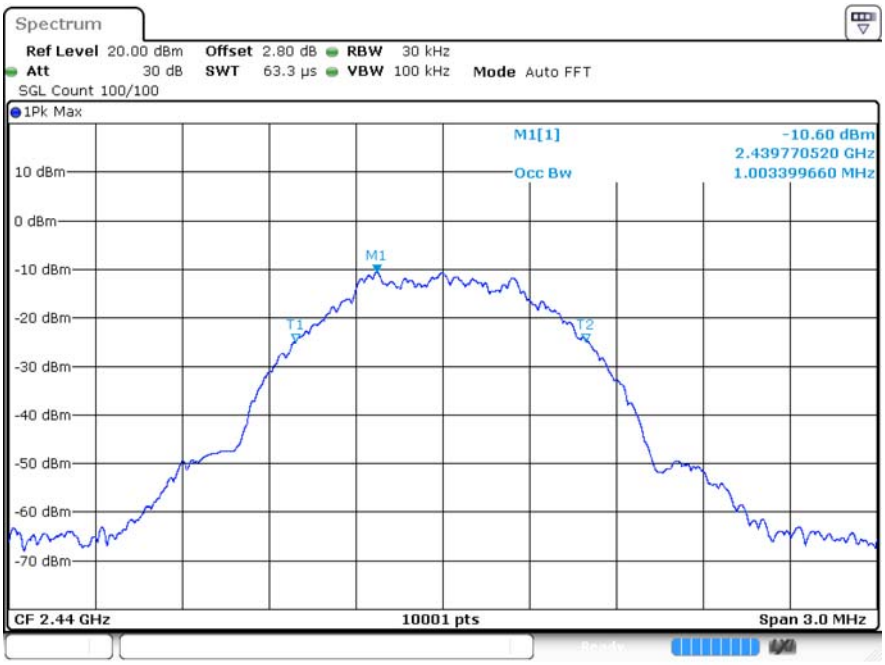
BLE 1M 2480MHz_DTSBW



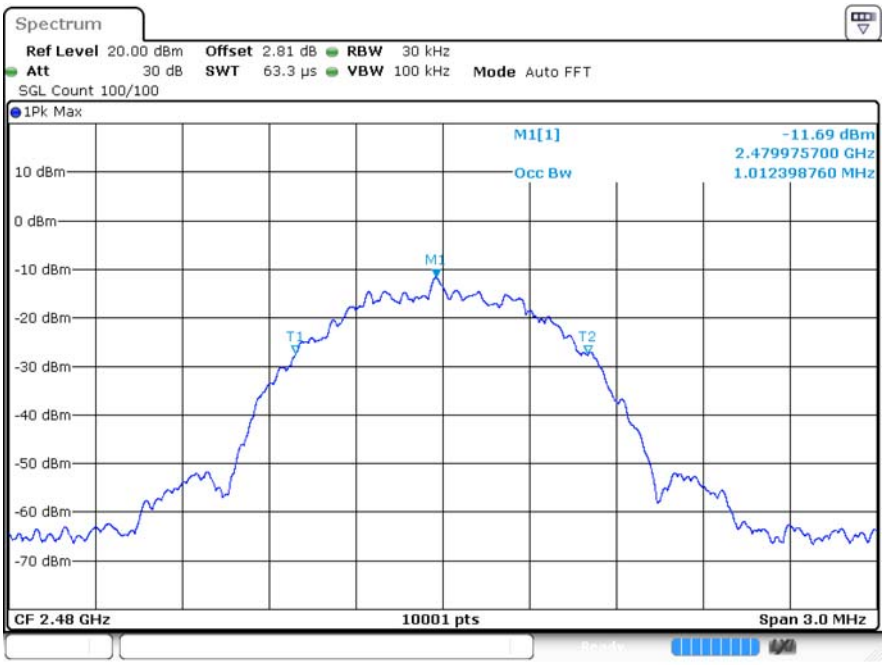
BLE 1M 2402MHz_OBW



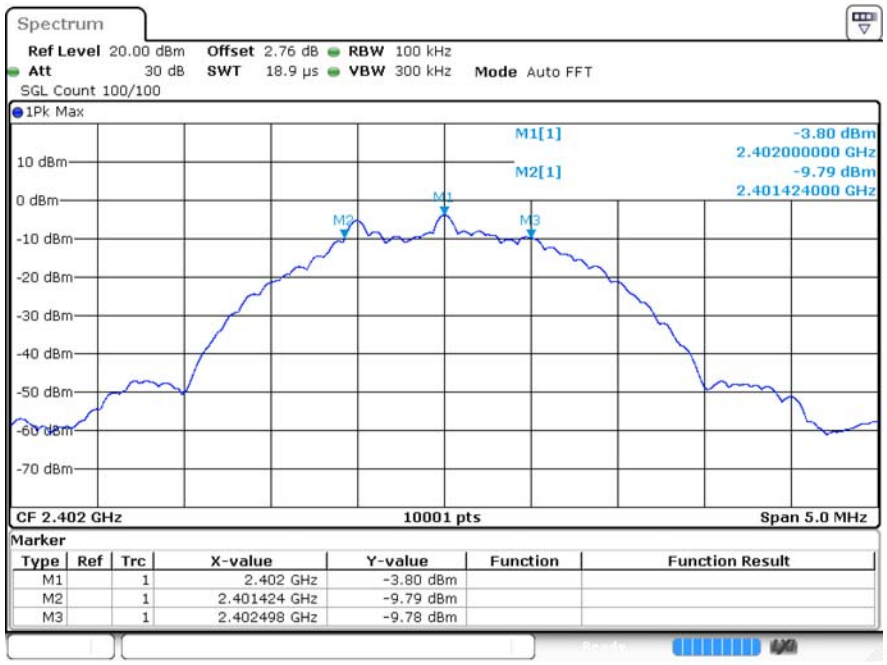
BLE 1M 2440MHz_OBW



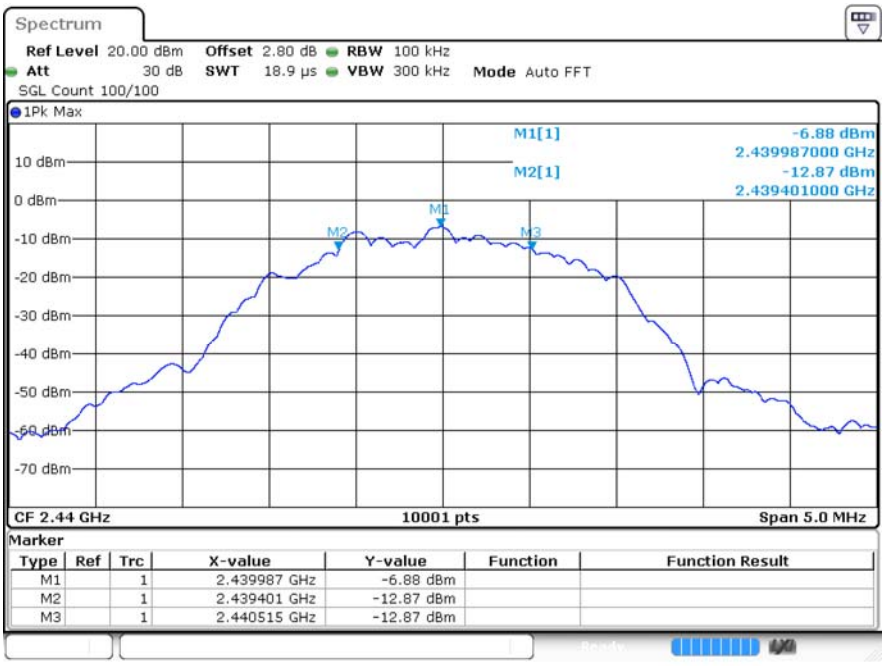
BLE 1M 2480MHz_OBW



BLE 2M 2402MHz_DTSBW



BLE 2M 2440MHz_DTSBW



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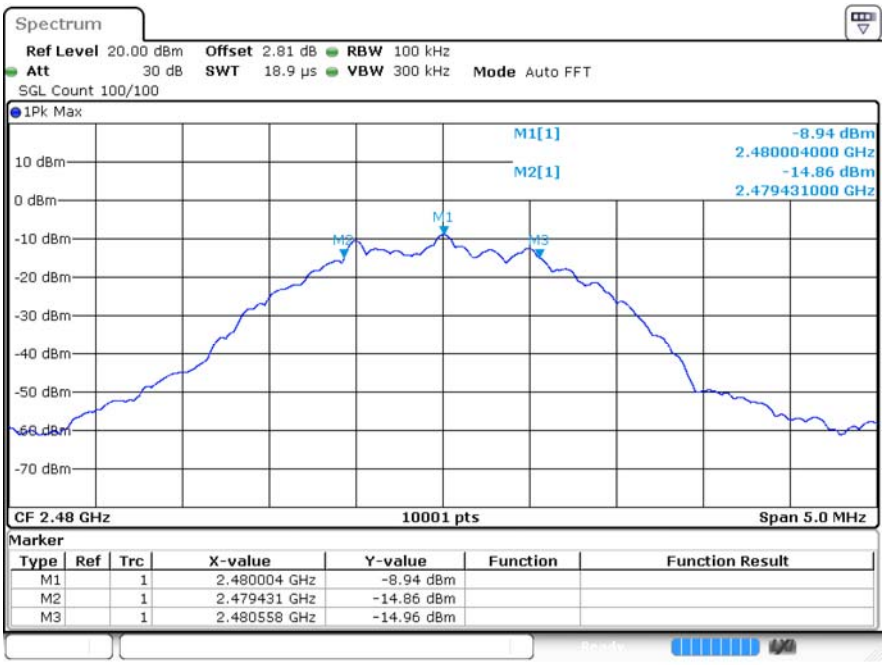
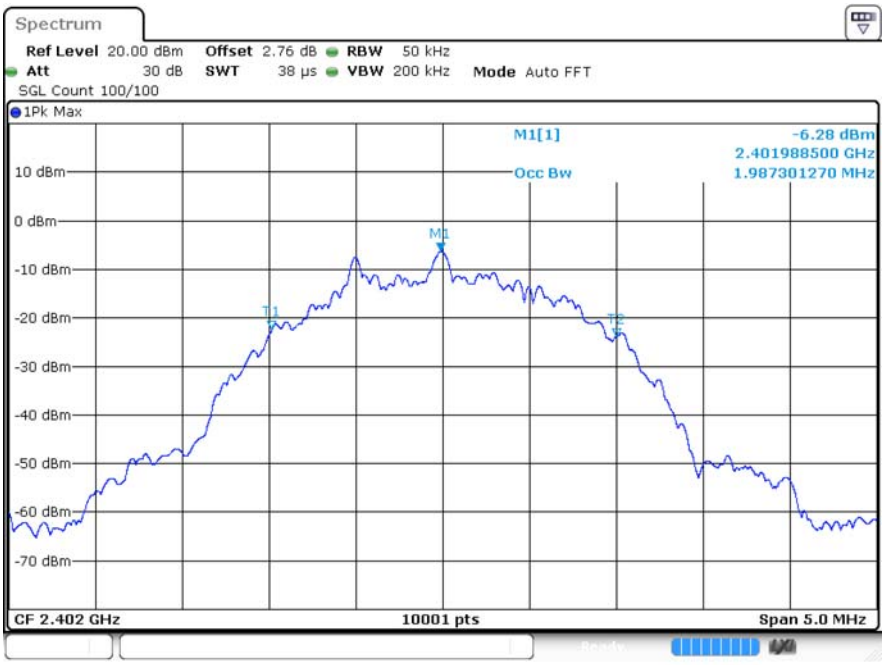
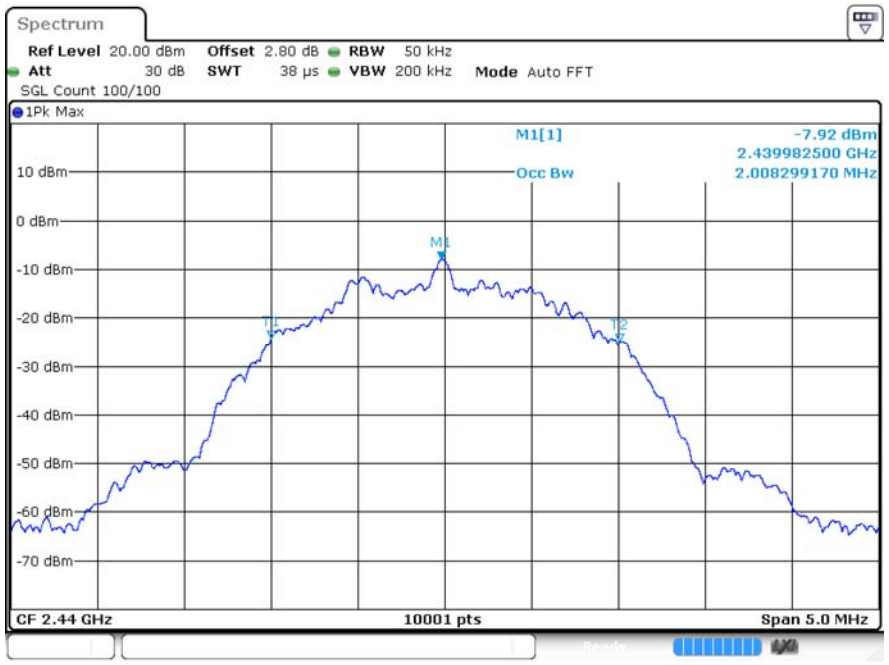
BLE 2M 2480MHz_DTSBW



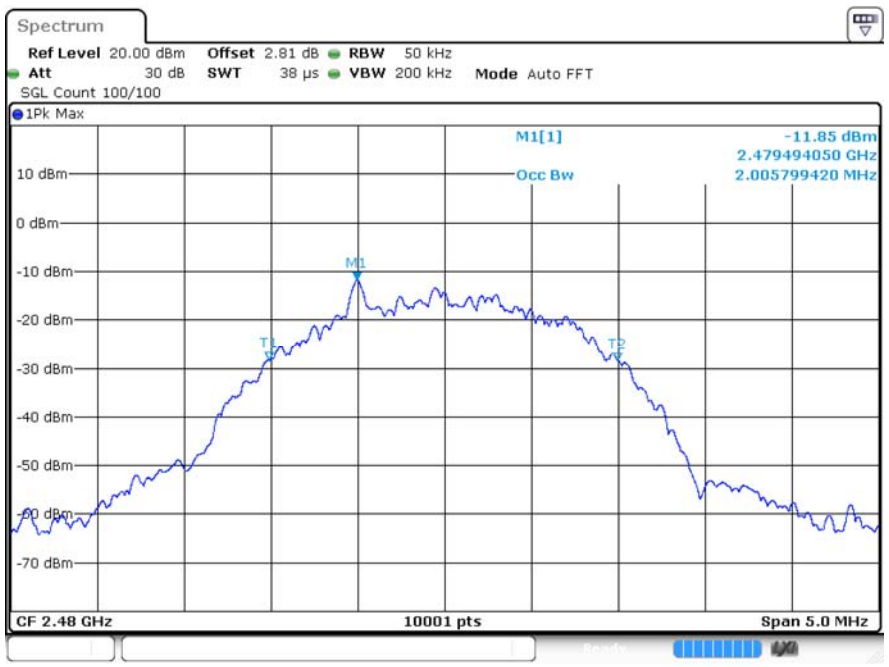
BLE 2M 2402MHz_OBW



BLE 2M 2440MHz_OBW



BLE 2M 2480MHz_OBW



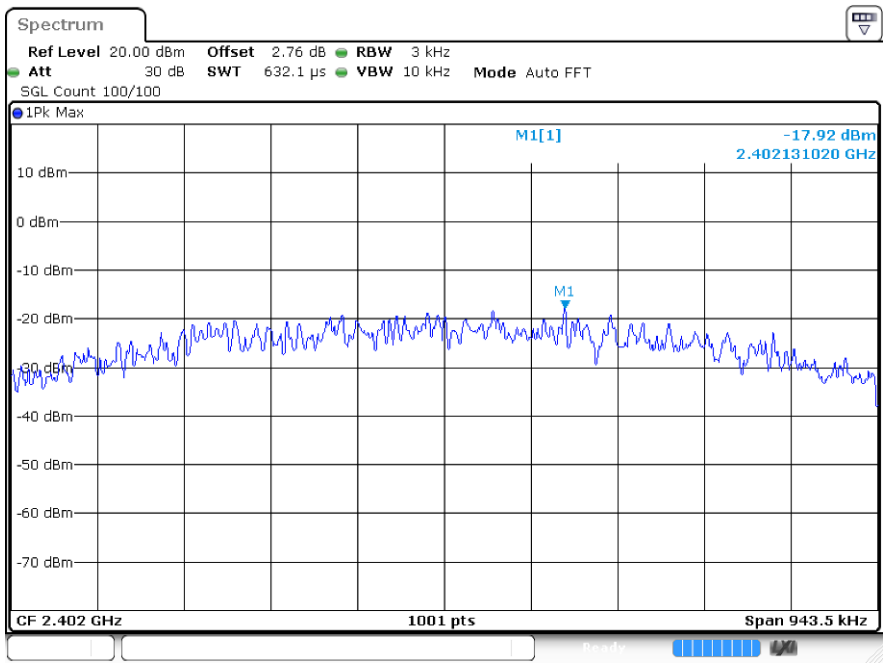
4 Maximum Power Spectral Density Level

4.1 Test Result

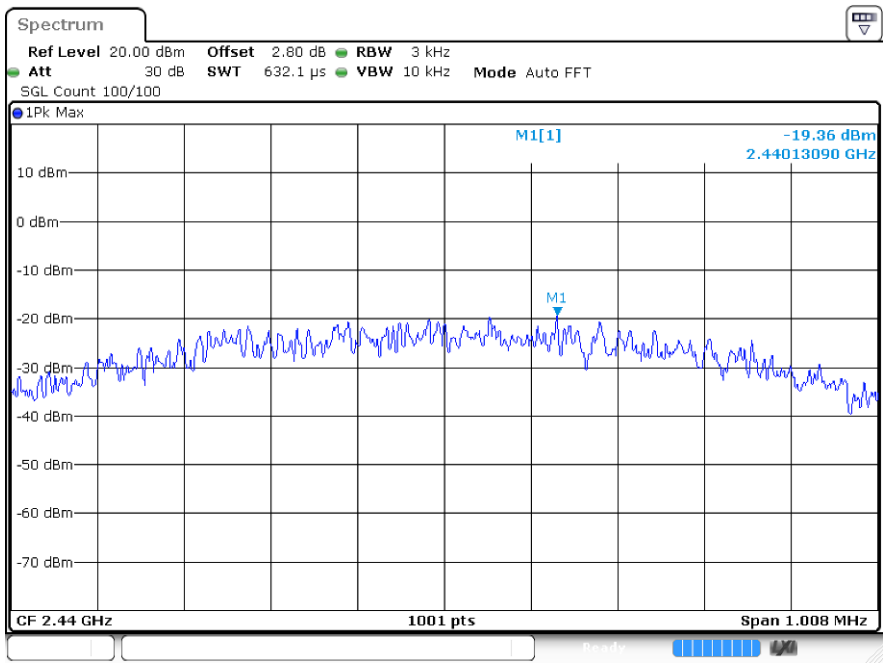
Test Data of Conducted Output Power Spectral Density				
Test Mode	Test Channel (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail
GFSK 1M	2402	-17.92	≤8	Pass
	2440	-19.36	≤8	Pass
	2480	-22.15	≤8	Pass
GFSK 2M	2402	-20.48	≤8	Pass
	2440	-21.85	≤8	Pass
	2480	-24.7	≤8	Pass

4.2 Test Graphs

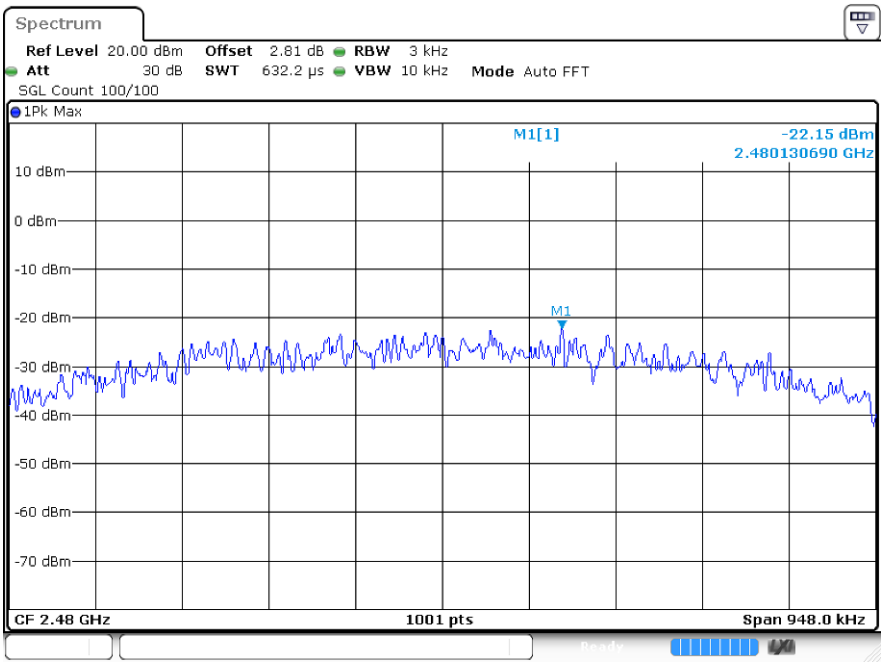
Test Graphs of Conducted Output Power Spectral Density
BLE 1M 2402MHz_PSD



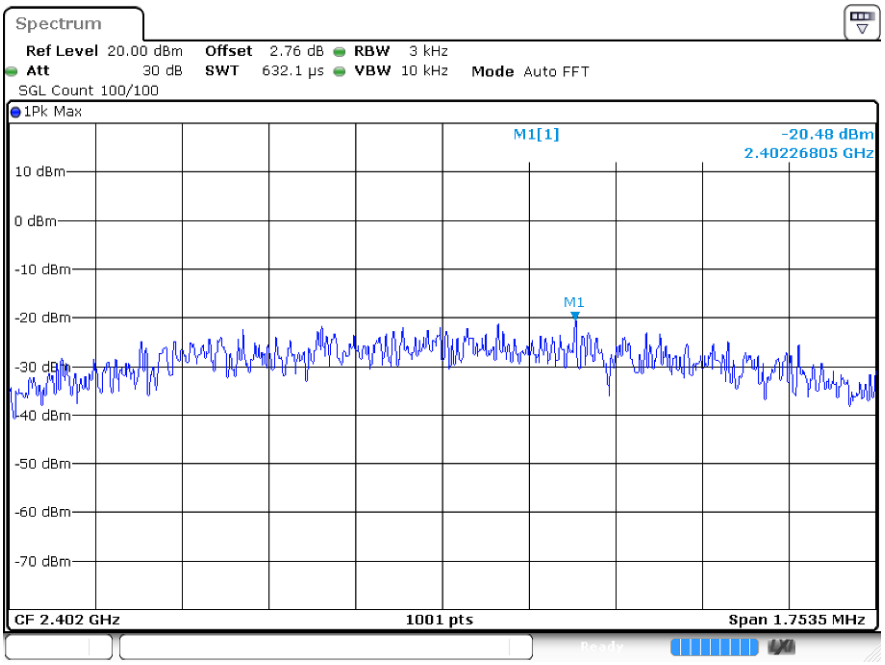
BLE 1M 2440MHz_PSD



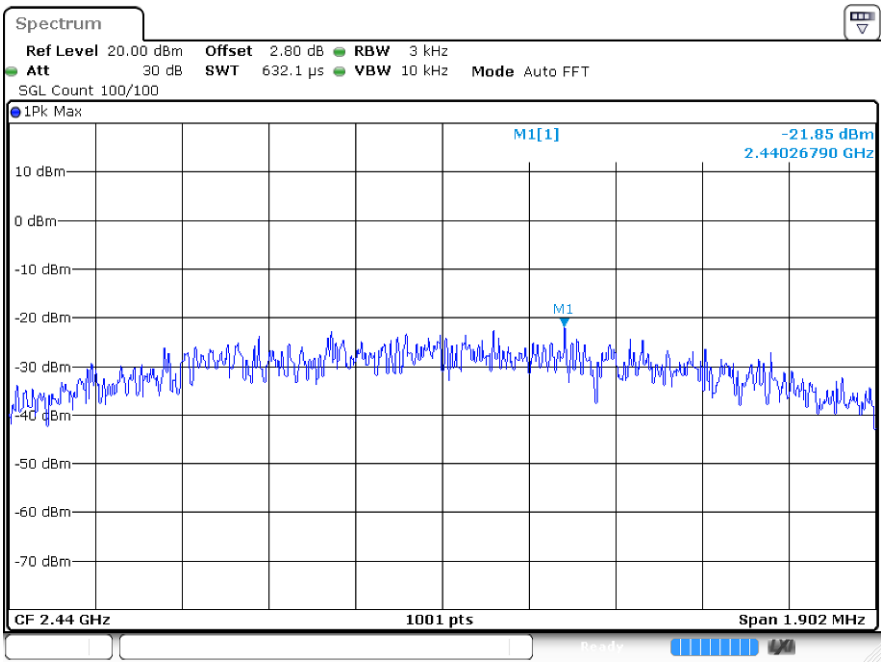
BLE 1M 2480MHz_PSD



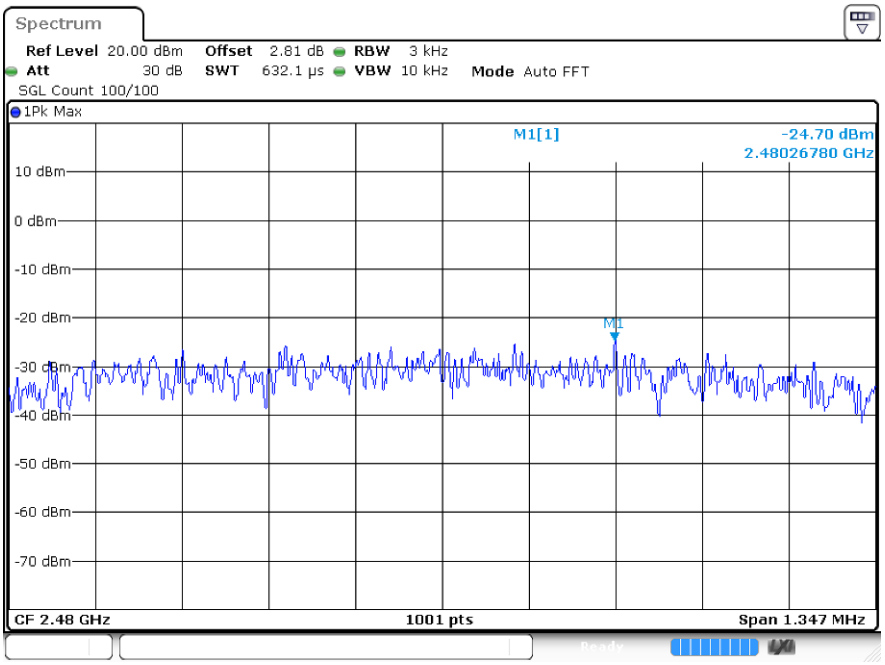
BLE 2M 2402MHz_PSD



BLE 2M 2440MHz_PSD



BLE 2M 2480MHz_PSD



5 Band Edge

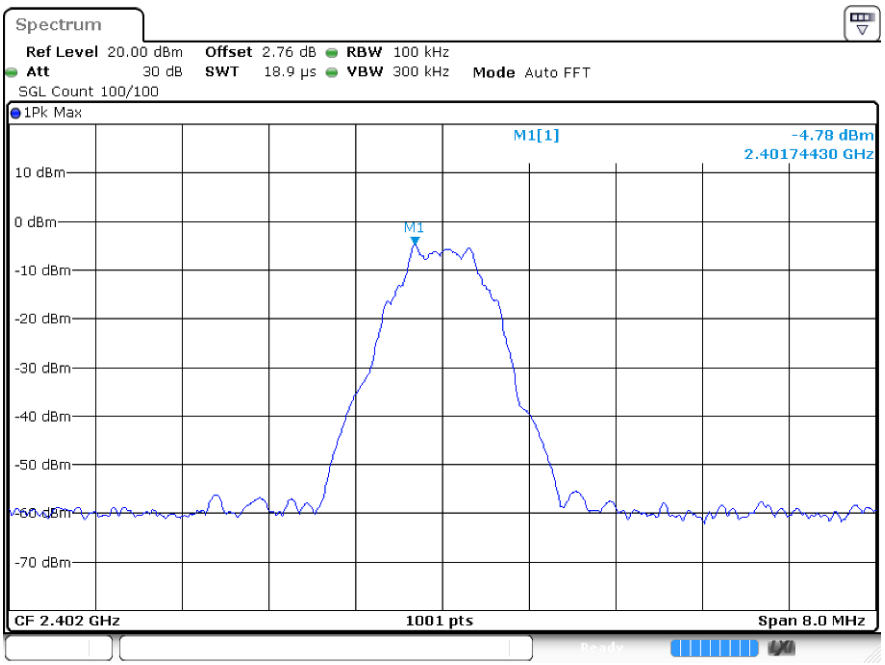
5.1 Test Result

Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
GFSK 1M	2402	-51.31	-20	Pass
GFSK 1M	2480	-48.16	-20	Pass
GFSK 2M	2402	-52.39	-20	Pass
GFSK 2M	2480	-48.74	-20	Pass

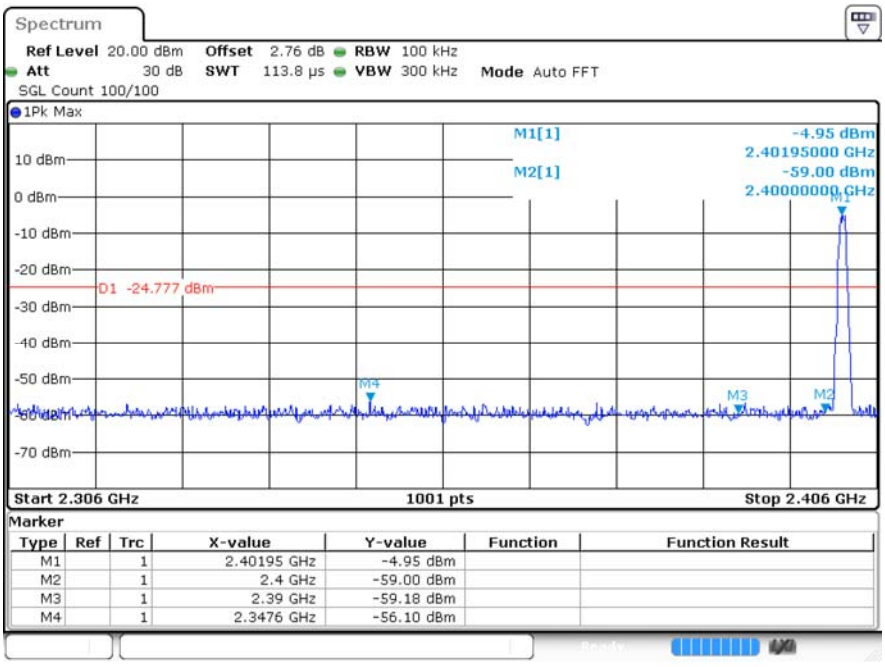
5.2 Test Graphs

Test Graphs for Band Edge

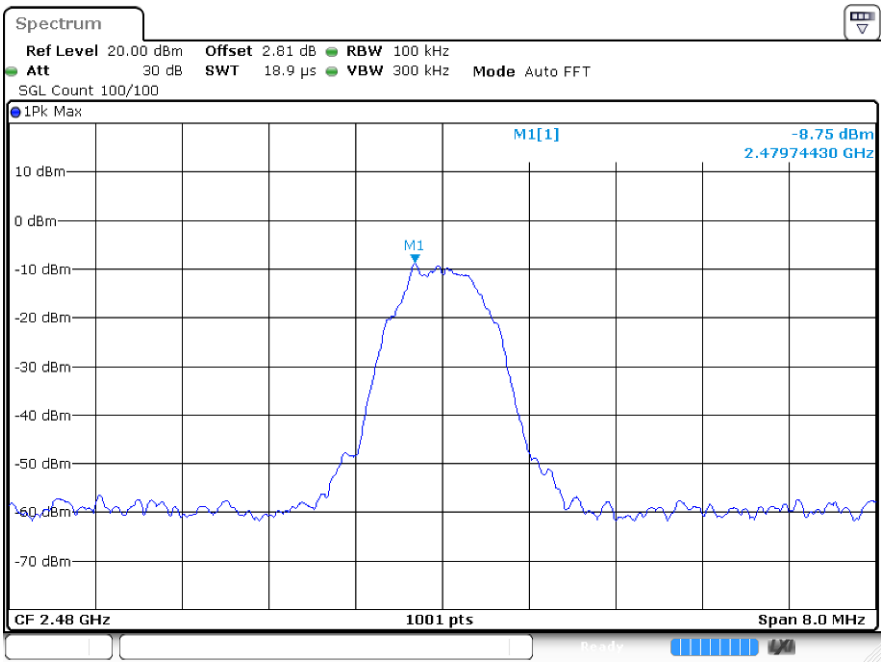
BLE 1M 2402MHz Ref



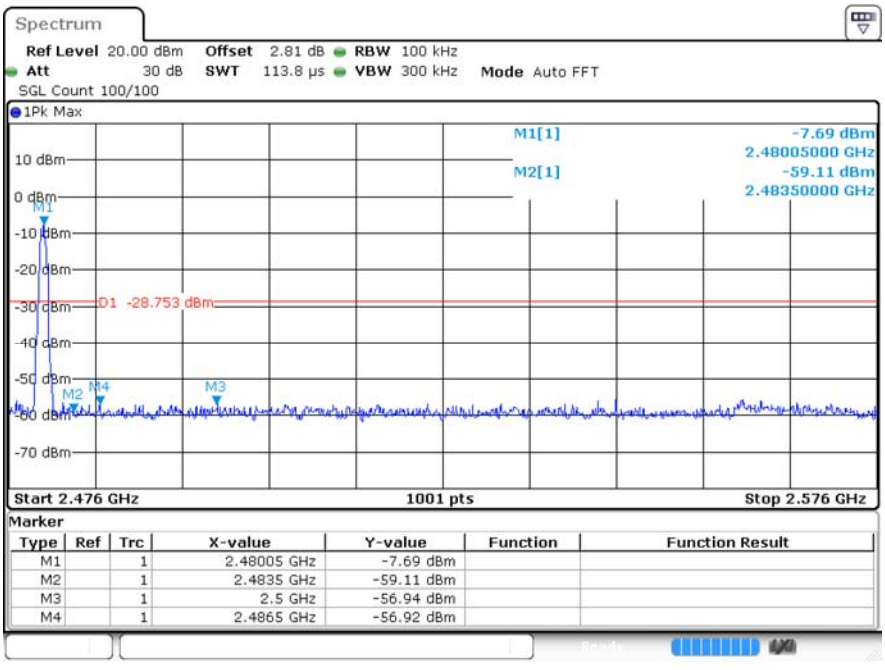
BLE 1M 2402MHz Emission



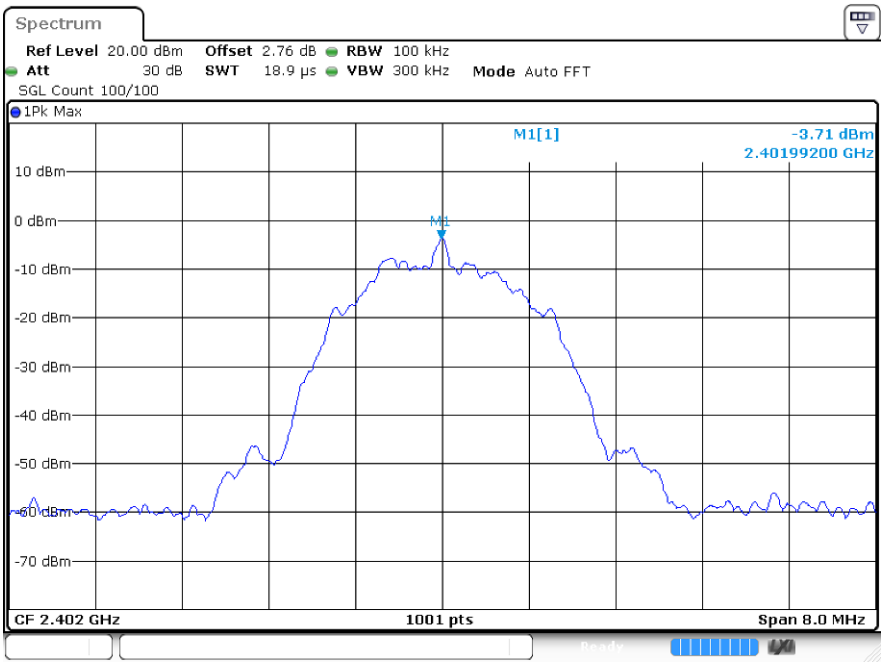
BLE 1M 2480MHz Ref



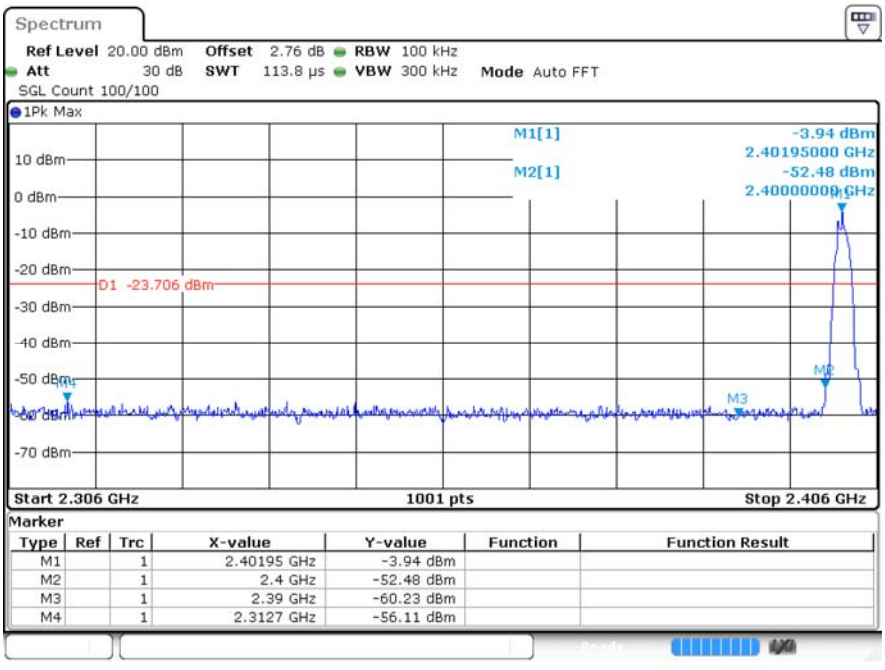
BLE 1M 2480MHz Emission



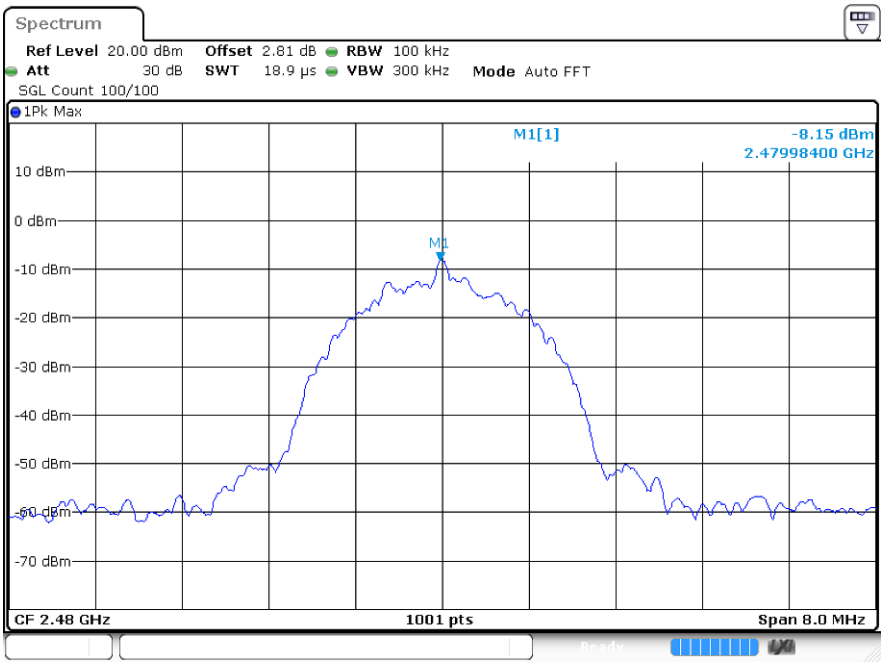
BLE 2M 2402MHz Ref



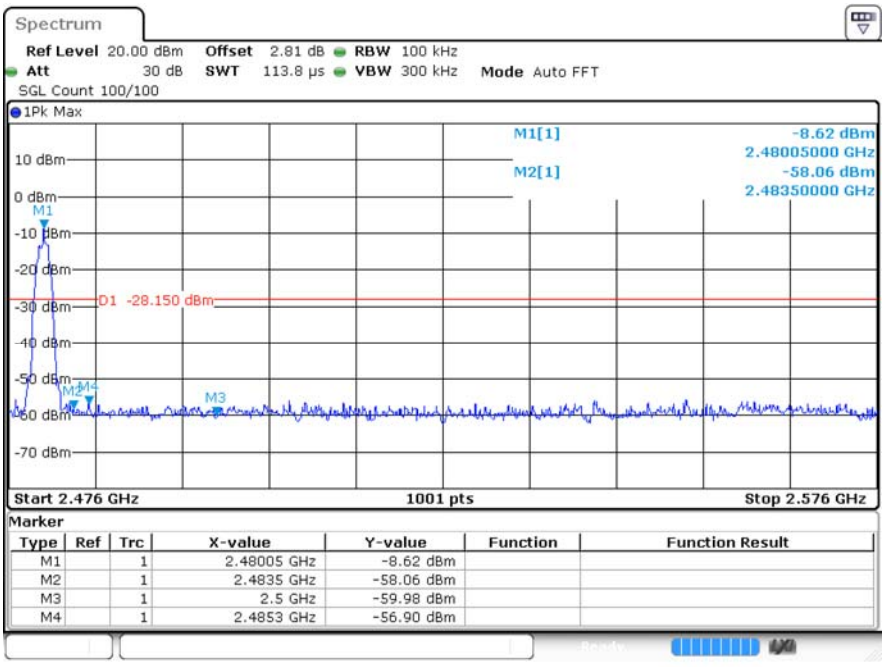
BLE 2M 2402MHz Emission



BLE 2M 2480MHz Ref



BLE 2M 2480MHz Emission



6 Conducted RF Spurious Emission

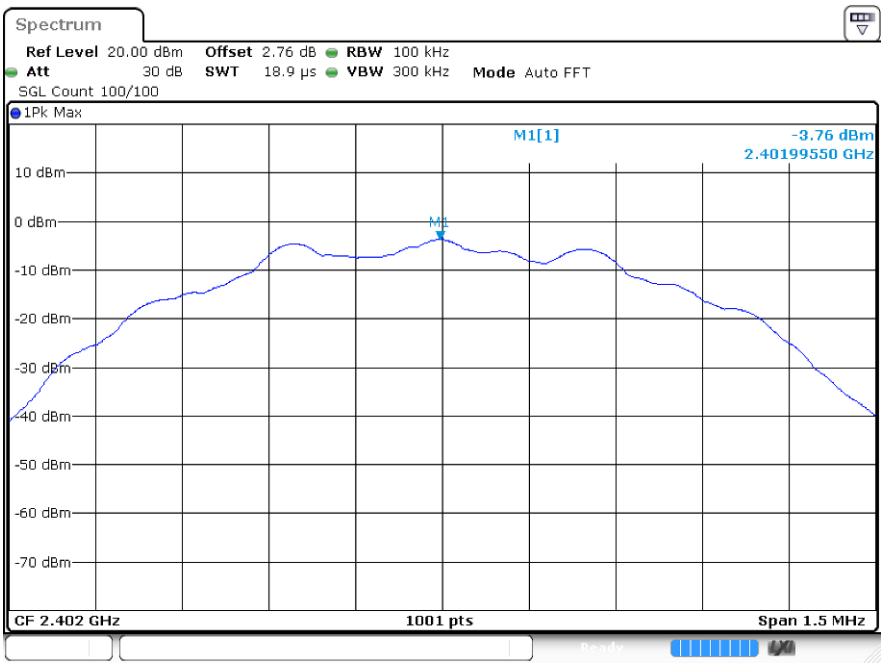
6.1 Test Result

Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
GFSK 1M	2402	-39.81	-20	Pass
GFSK 1M	2440	-38.14	-20	Pass
GFSK 1M	2480	-34.26	-20	Pass
GFSK 2M	2402	-38.33	-20	Pass
GFSK 2M	2440	-37.65	-20	Pass
GFSK 2M	2480	-33.09	-20	Pass

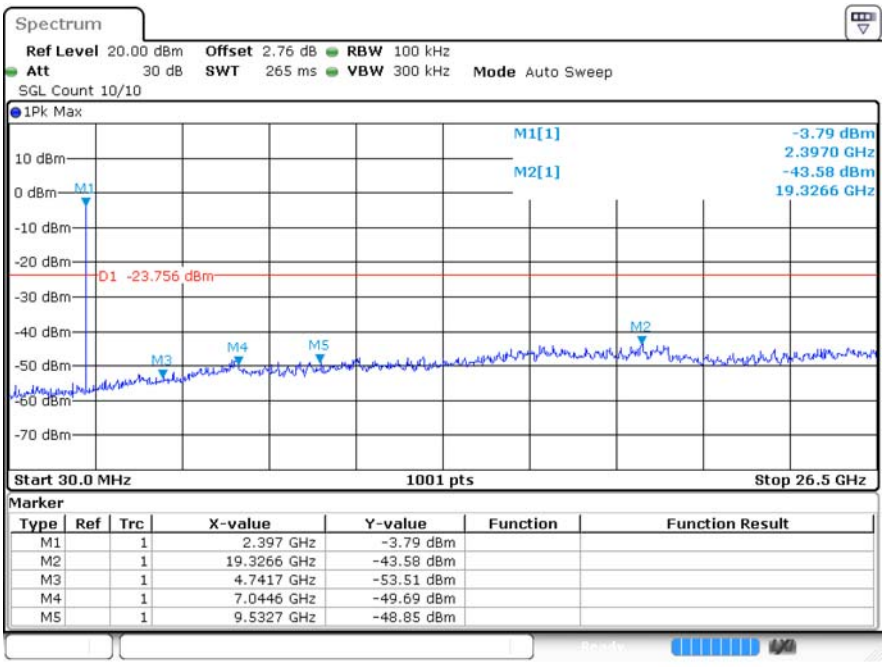
6.2 Test Graphs

Test Graphs for Conducted RF Spurious Emission

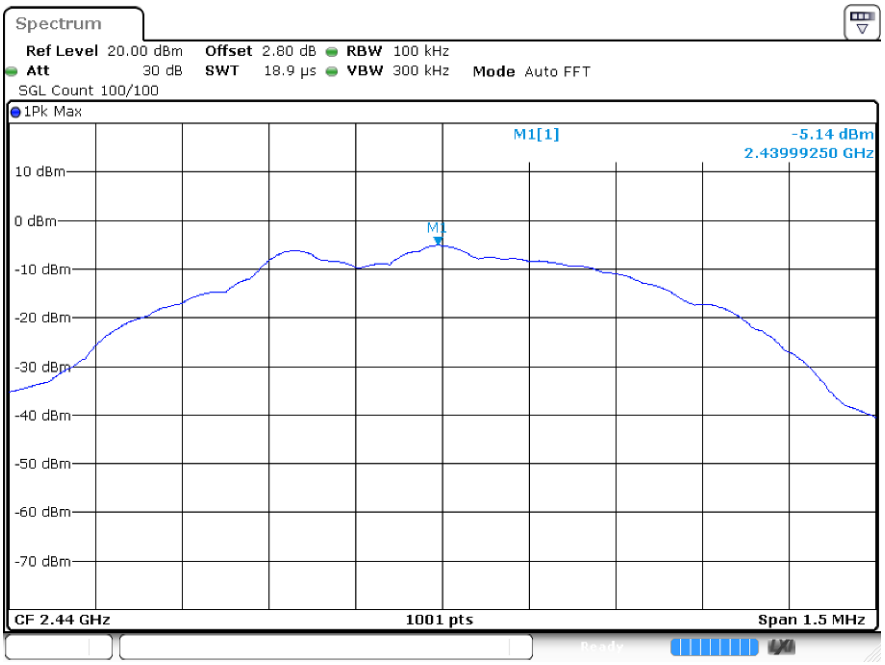
BLE 1M 2402MHz Ref



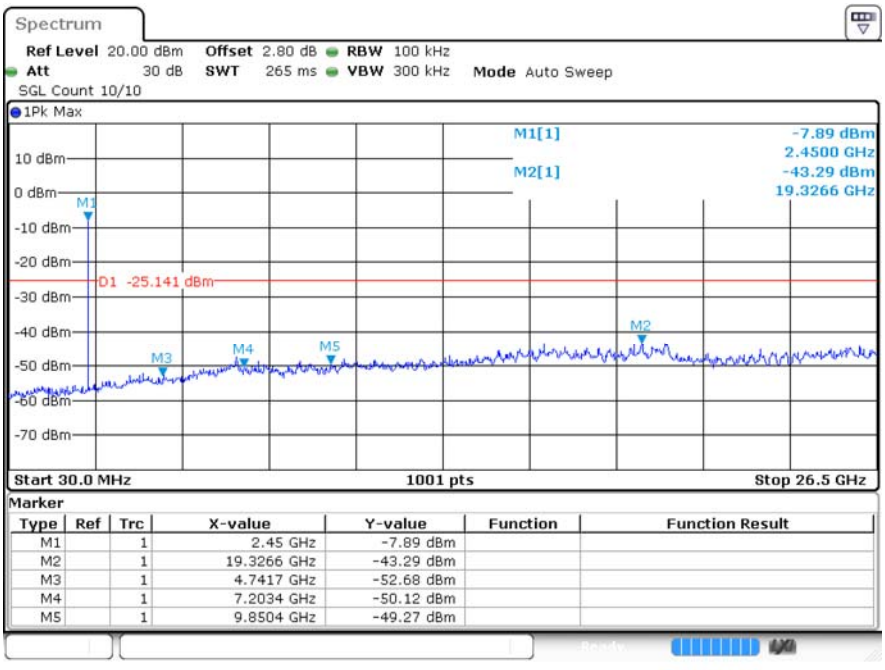
BLE 1M 2402MHz Emission



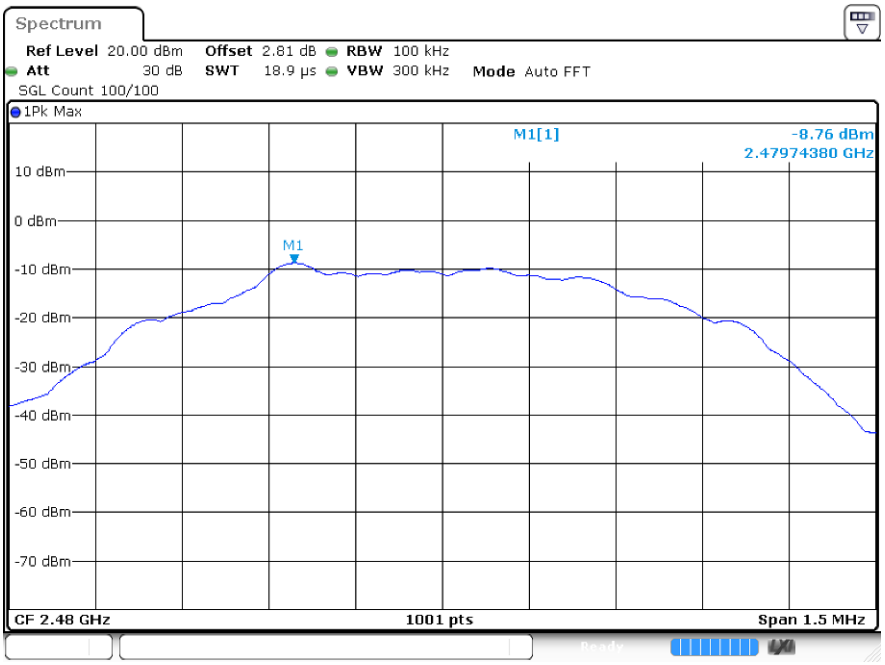
BLE 1M 2440MHz Ref



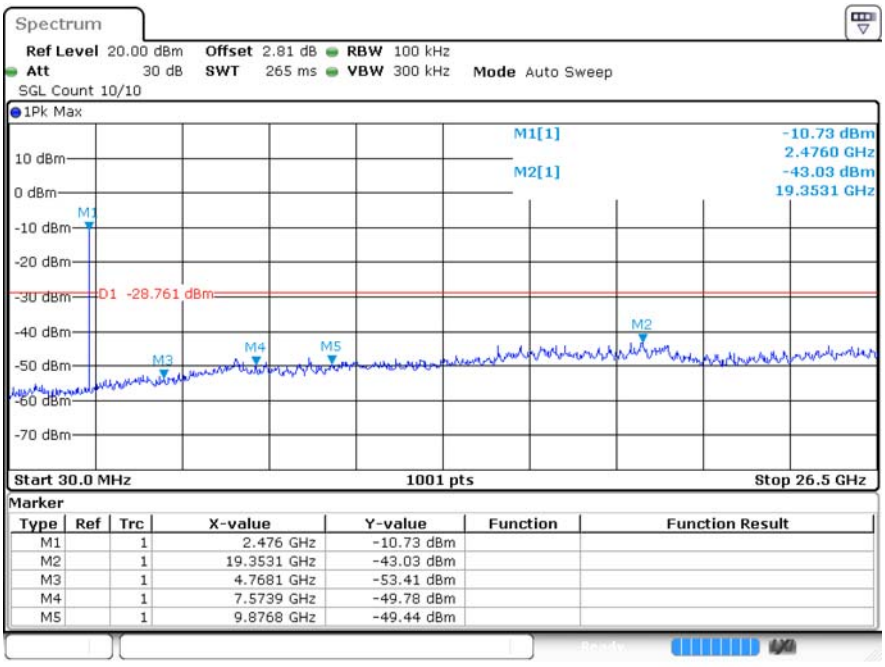
BLE 1M 2440MHz Emission



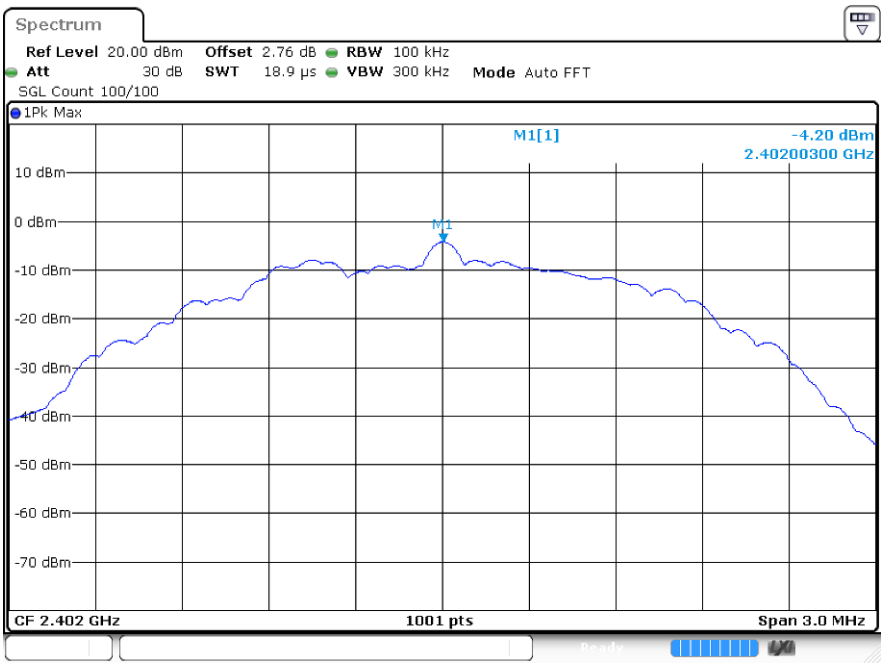
BLE 1M 2480MHz Ref



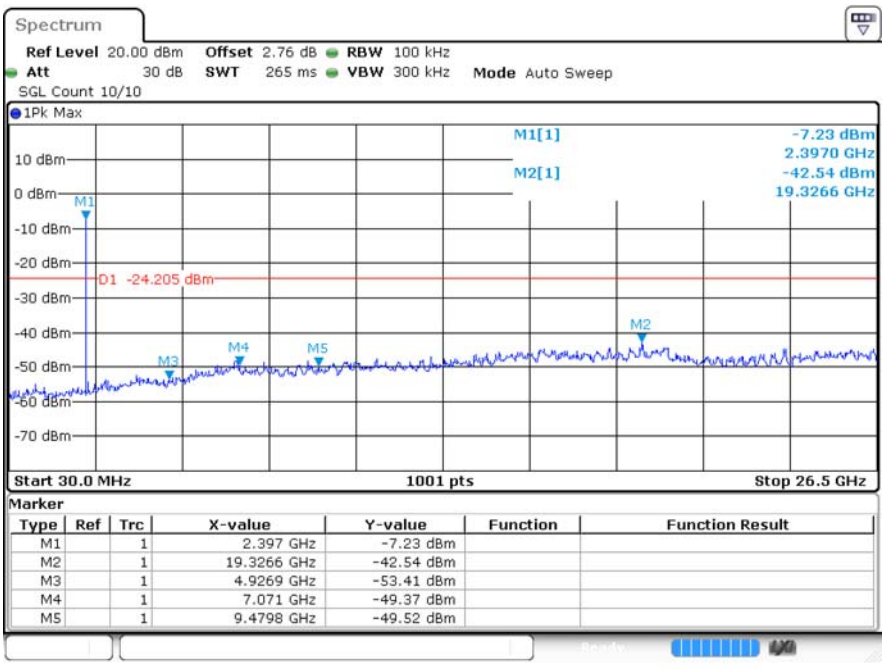
BLE 1M 2480MHz Emission



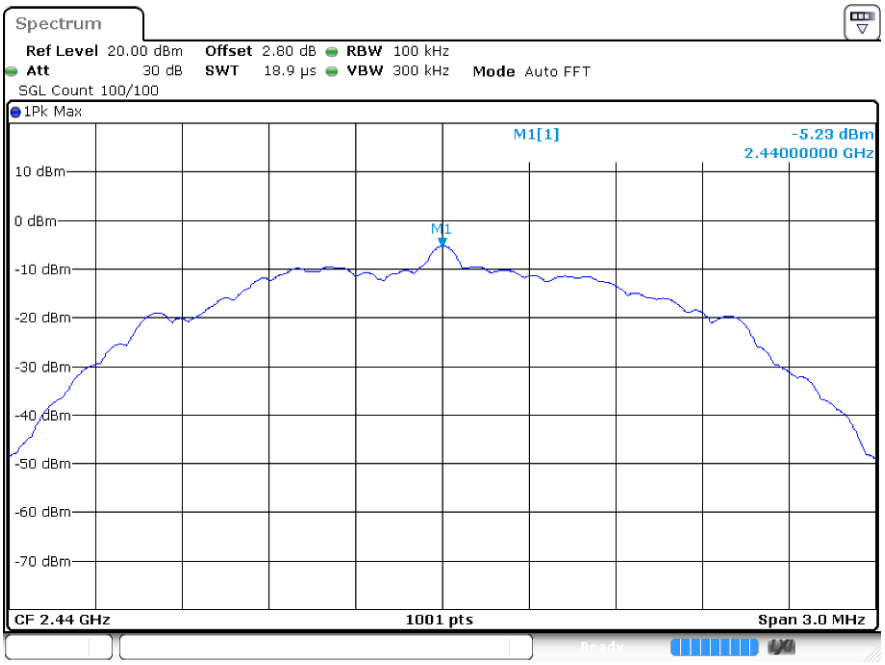
BLE 2M 2402MHz Ref



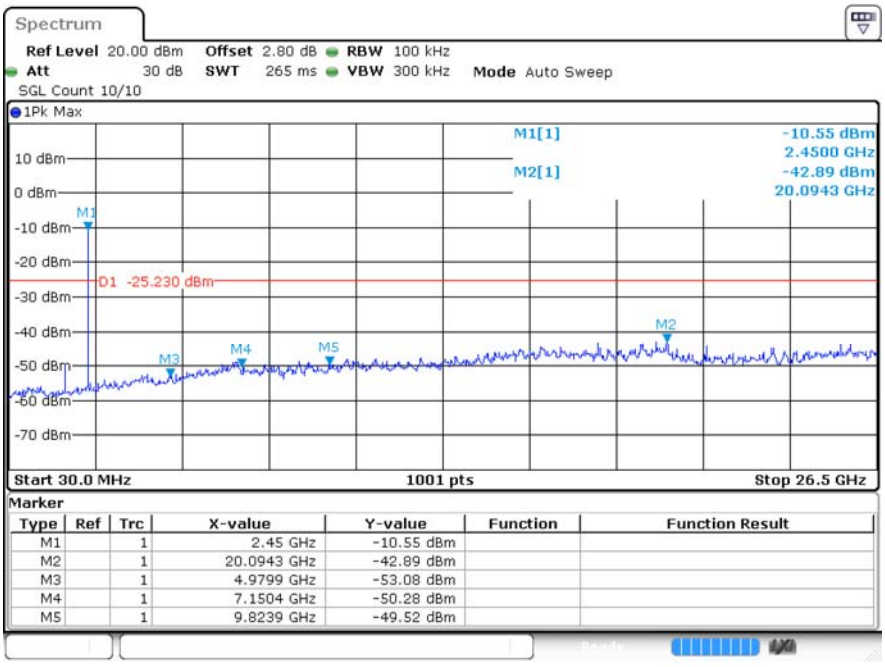
BLE 2M 2402MHz Emission



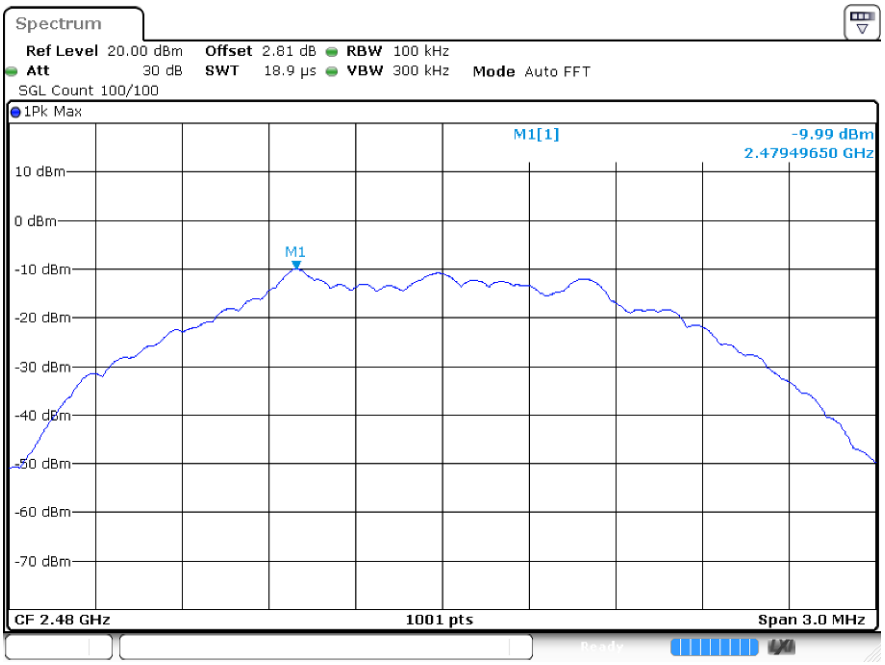
BLE 2M 2440MHz Ref



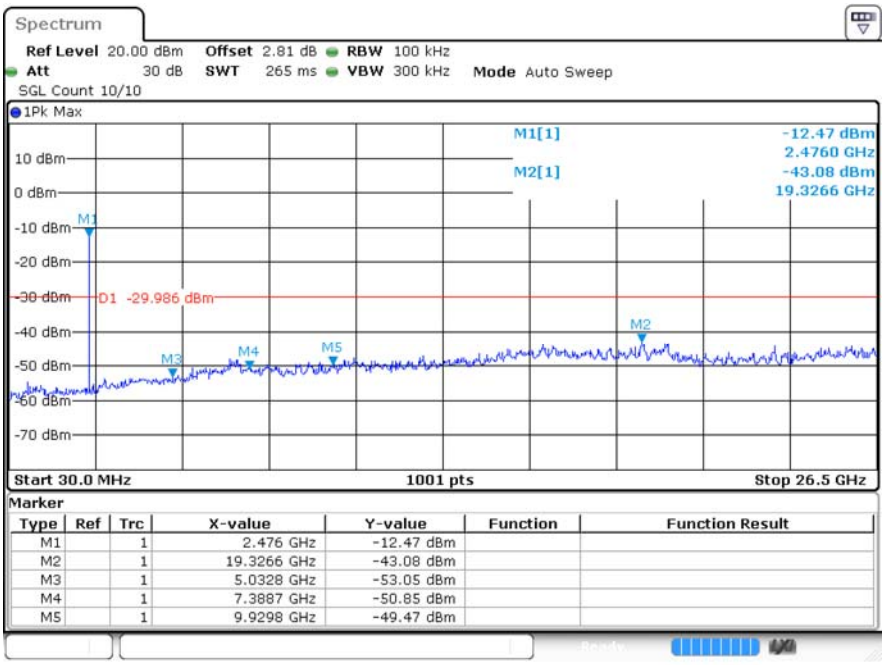
BLE 2M 2440MHz Emission



BLE 2M 2480MHz Ref



BLE 2M 2480MHz Emission



7 Restrict Band

7.1 Test Result

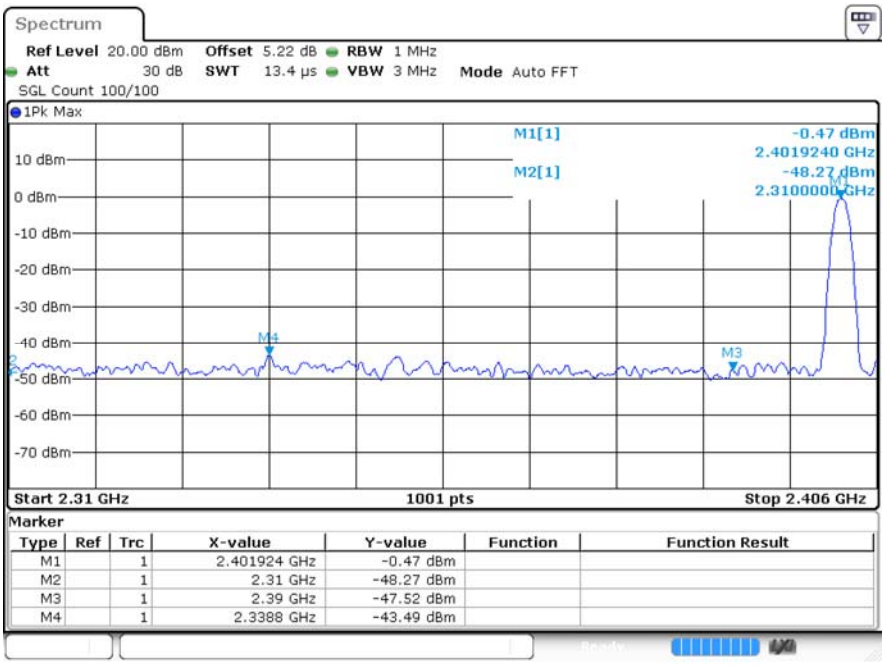
Mode	Frequency (MHz)	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
GFSK 1M	2402	2310	-48.27	2.46	49.45	Peak	74	Pass
GFSK 1M	2402	2310	-56.18	2.46	41.54	Average	54	Pass
GFSK 1M	2402	2338.8	-43.49	2.46	54.23	Peak	74	Pass
GFSK 1M	2402	2338.896	-54.38	2.46	43.34	Average	54	Pass
GFSK 1M	2402	2390	-47.51	2.46	50.21	Peak	74	Pass
GFSK 1M	2402	2390	-56.46	2.46	41.26	Average	54	Pass
GFSK 1M	2480	2483.5	-48.06	2.46	49.66	Peak	74	Pass
GFSK 1M	2480	2483.5	-55.96	2.46	41.76	Average	54	Pass
GFSK 1M	2480	2486.296	-45.71	2.46	52.01	Peak	74	Pass
GFSK 1M	2480	2486.368	-55.8	2.46	41.92	Average	54	Pass
GFSK 1M	2480	2500	-48.02	2.46	49.7	Peak	74	Pass
GFSK 1M	2480	2500	-56.12	2.46	41.6	Average	54	Pass

GFSK 2M	2402	2310	-49.06	2.46	48.66	Peak	74	Pass
GFSK 2M	2402	2310	-55.67	2.46	42.05	Average	54	Pass
GFSK 2M	2402	2314.608	-42.69	2.46	55.03	Peak	74	Pass
GFSK 2M	2402	2340.24	-54.01	2.46	43.71	Average	54	Pass
GFSK 2M	2402	2390	-45.77	2.46	51.95	Peak	74	Pass
GFSK 2M	2402	2390	-55.78	2.46	41.94	Average	54	Pass
GFSK 2M	2480	2483.5	-47.51	2.46	50.21	Peak	74	Pass
GFSK 2M	2480	2483.5	-55.88	2.46	41.84	Average	54	Pass
GFSK 2M	2480	2498.608	-45.48	2.46	52.24	Peak	74	Pass
GFSK 2M	2480	2484.688	-55.34	2.46	42.38	Average	54	Pass
GFSK 2M	2480	2500	-48.26	2.46	49.46	Peak	74	Pass
GFSK 2M	2480	2500	-55.74	2.46	41.98	Average	54	Pass

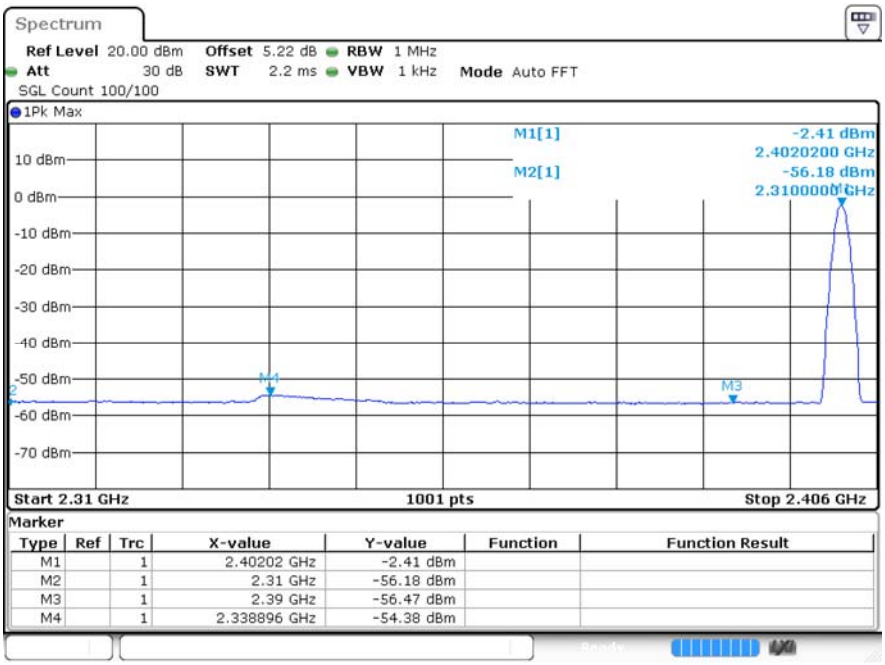
7.2 Test Graphs

Test Graphs for Restrict Band

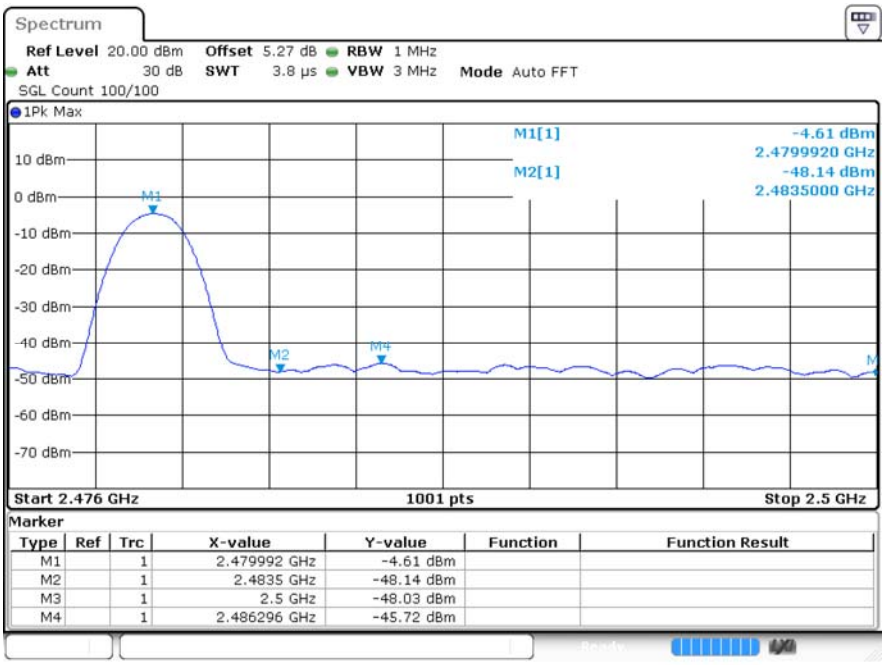
BLE 1M 2402MHz Peak



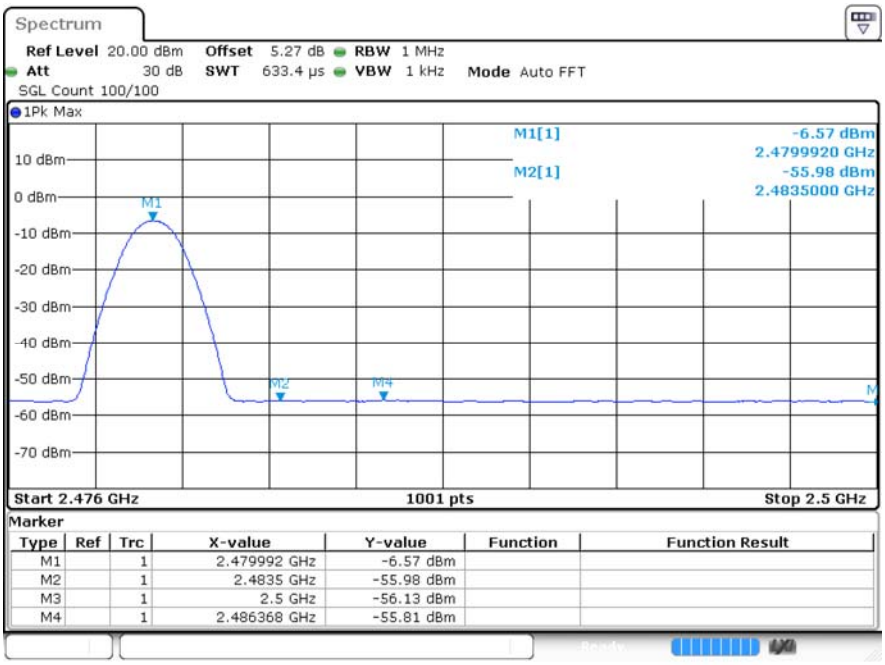
BLE 1M 2402MHz Average



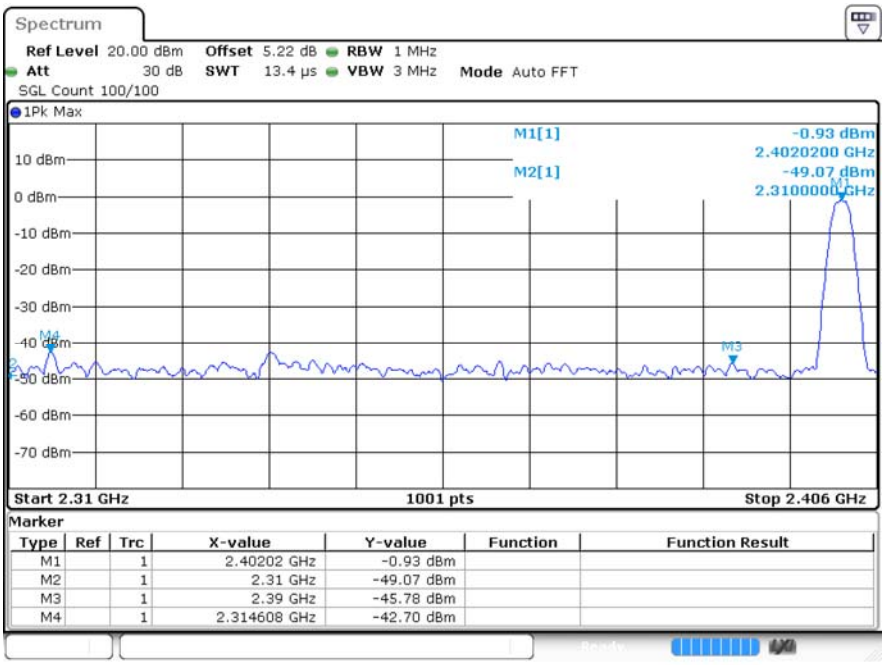
BLE 1M 2480MHz Peak



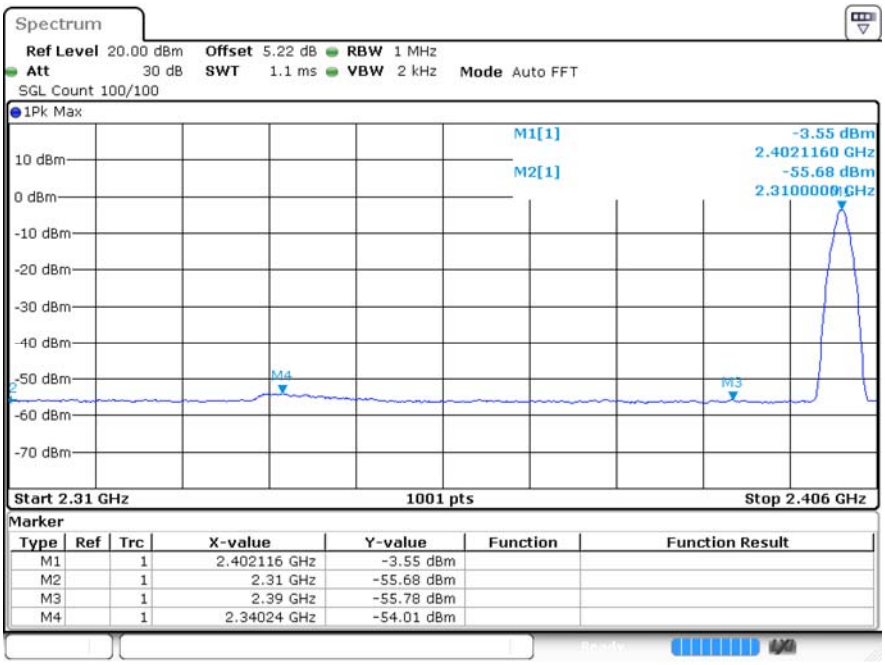
BLE 1M 2480MHz Average



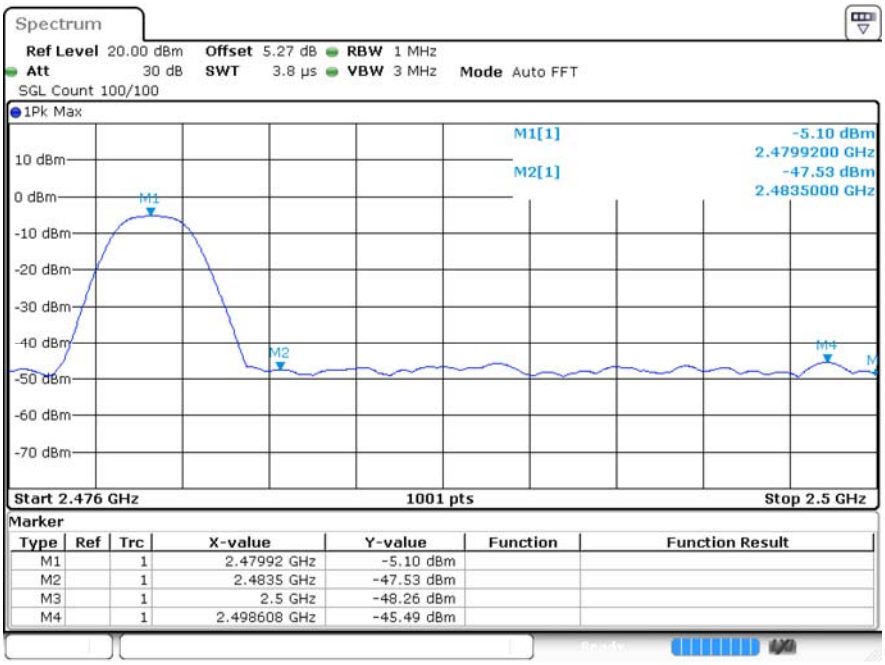
BLE 2M 2402MHz Peak



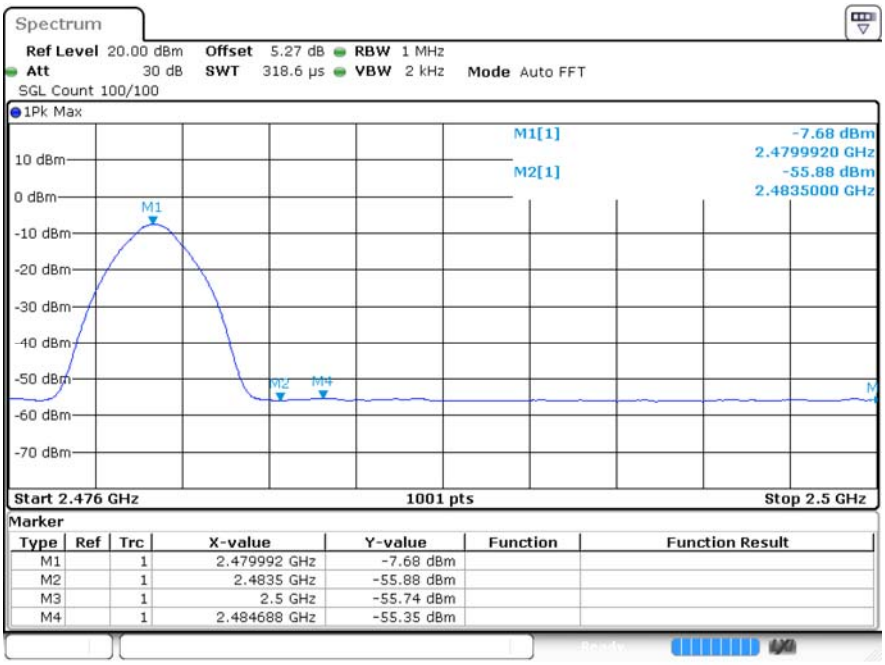
BLE 2M 2402MHz Average



BLE 2M 2480MHz Peak



BLE 2M 2480MHz Average



---The End---