



Appendix B

RF Test Data for BLE (Conducted Measurement)

Product Name: M5AtomS3U

Trade Mark: M5STACK

Test Model: AtomS3U

Environmental Conditions

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



Contents

	Page
COVER PAGE	
1 Duty Cycle.....	3
1.1 Test Result.....	3
1.2 Test Graphs.....	4
2 Maximum Conducted Output Power.....	6
2.1 Test Result.....	6
2.2 Test Graphs.....	7
3 -6dB Bandwidth.....	9
3.1 Test Result.....	9
3.2 Test Graphs.....	10
4 Maximum Power Spectral Density Level.....	13
4.1 Test Result.....	13
4.2 Test Graphs.....	14
5 Band Edge.....	16
5.1 Test Result.....	16
5.2 Test Graphs.....	17
6 Conducted RF Spurious Emission.....	19
6.1 Test Result.....	19
6.2 Test Graphs.....	20
7 Restrict Band.....	23
7.1 Test Result.....	23
7.2 Test Graphs.....	24



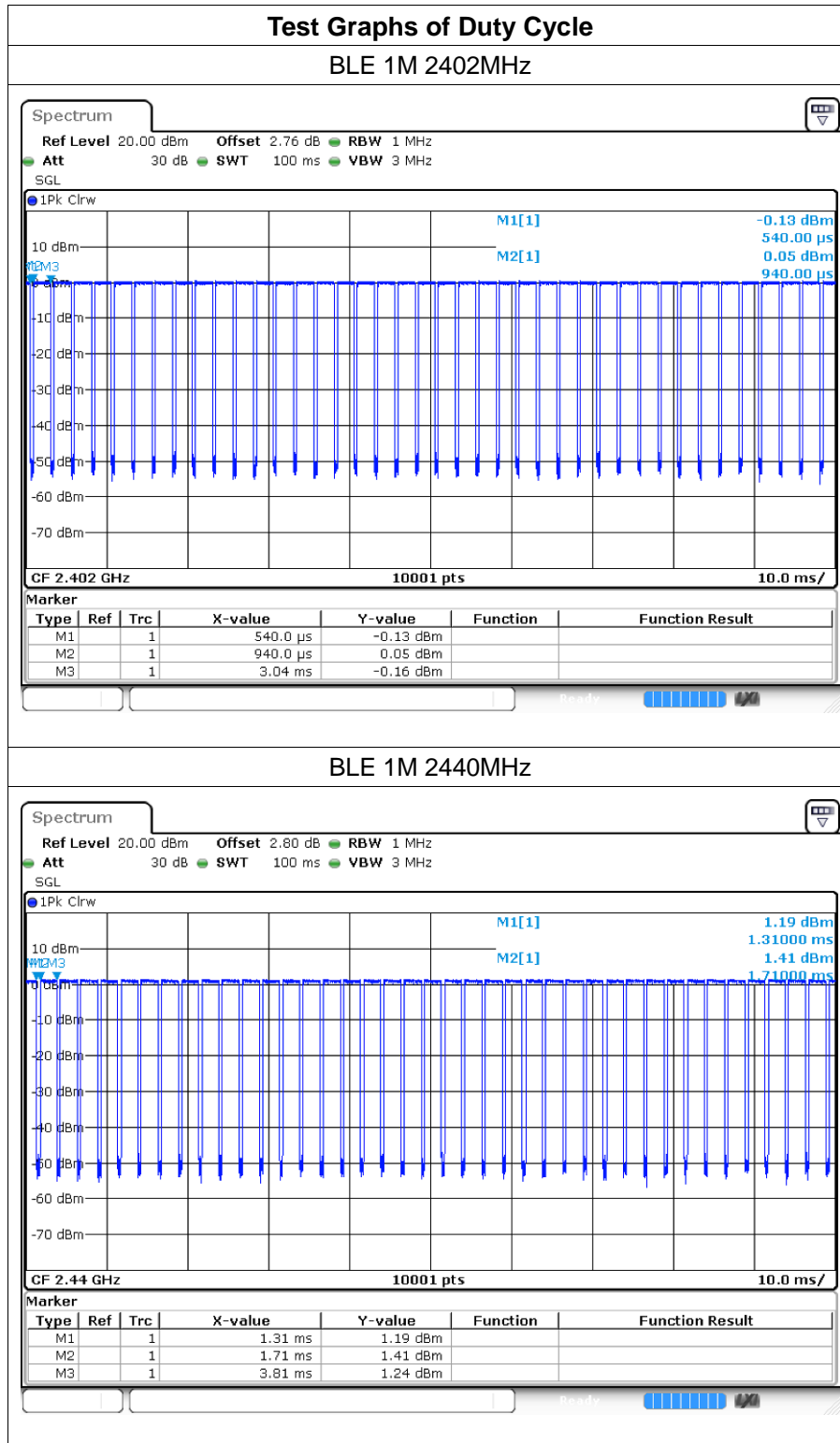
1 Duty Cycle

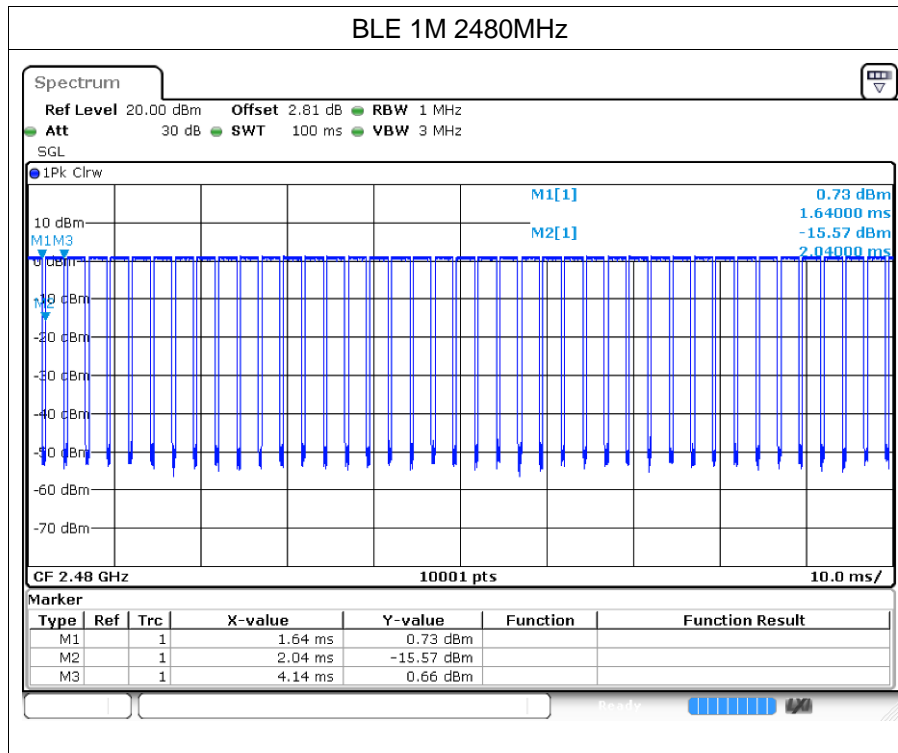
1.1 Test Result

Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	1/T (kHz)
GFSK 1M	2402	Ant1	84.4	0.48
GFSK 1M	2440	Ant1	84.4	0.48
GFSK 1M	2440	Ant1	84.4	0.48



1.2 Test Graphs





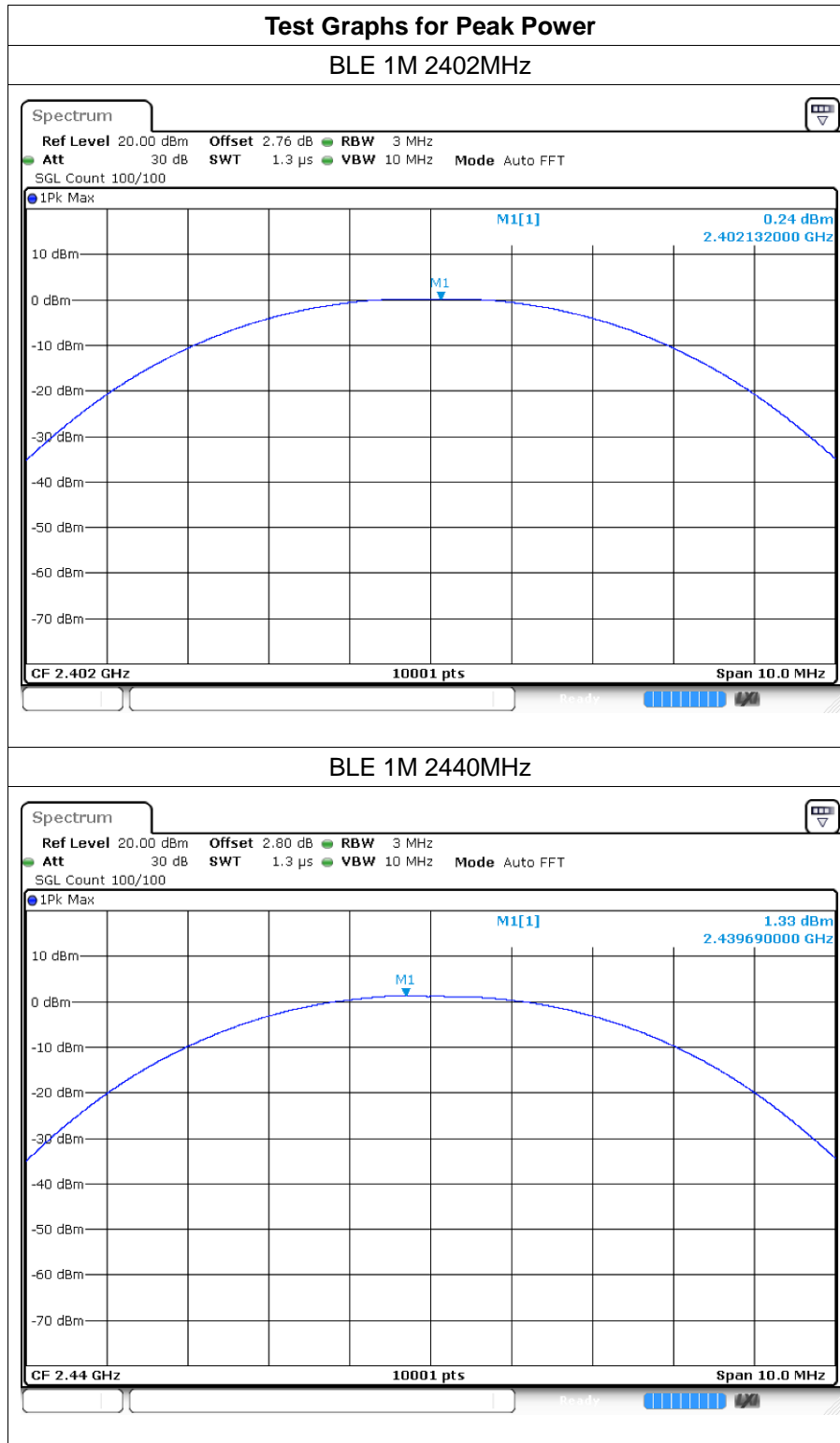


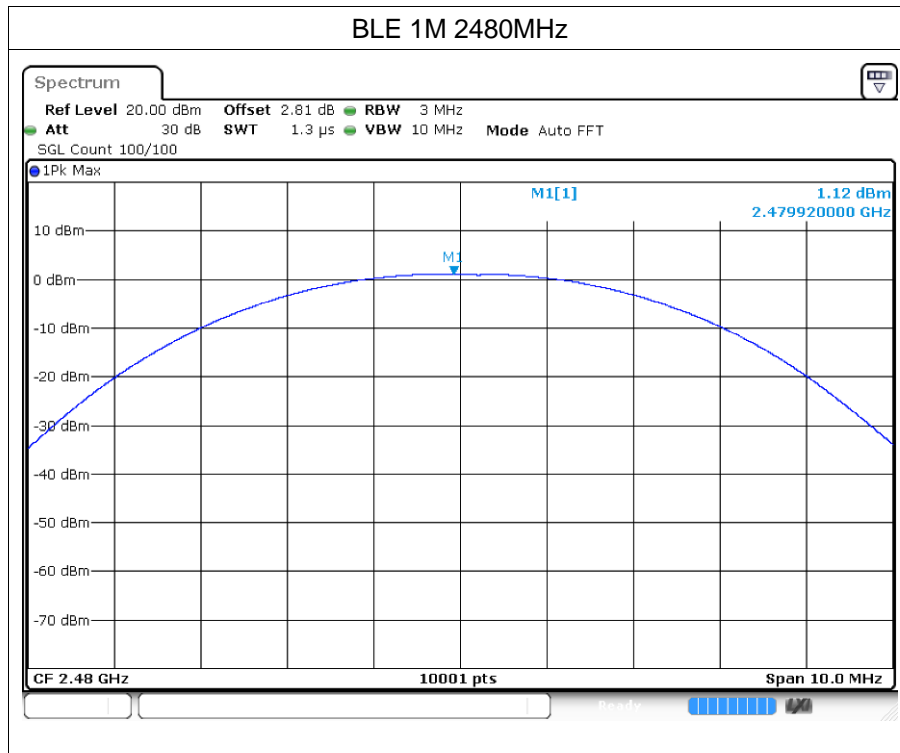
2 Maximum Conducted Output Power

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	0.24	≤30	Pass
	2440	1.33	≤30	Pass
	2480	1.12	≤30	Pass

2.2 Test Graphs





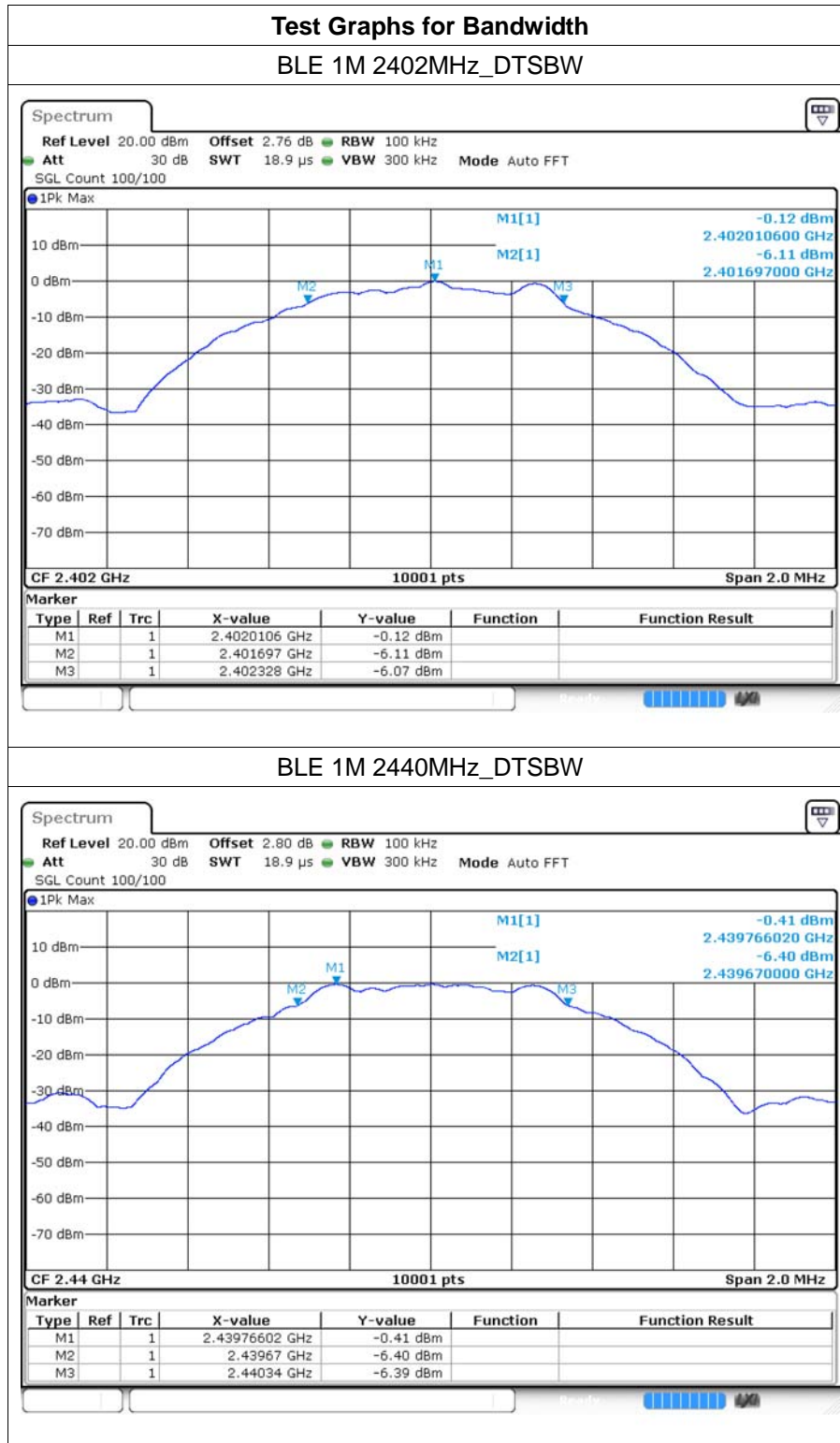


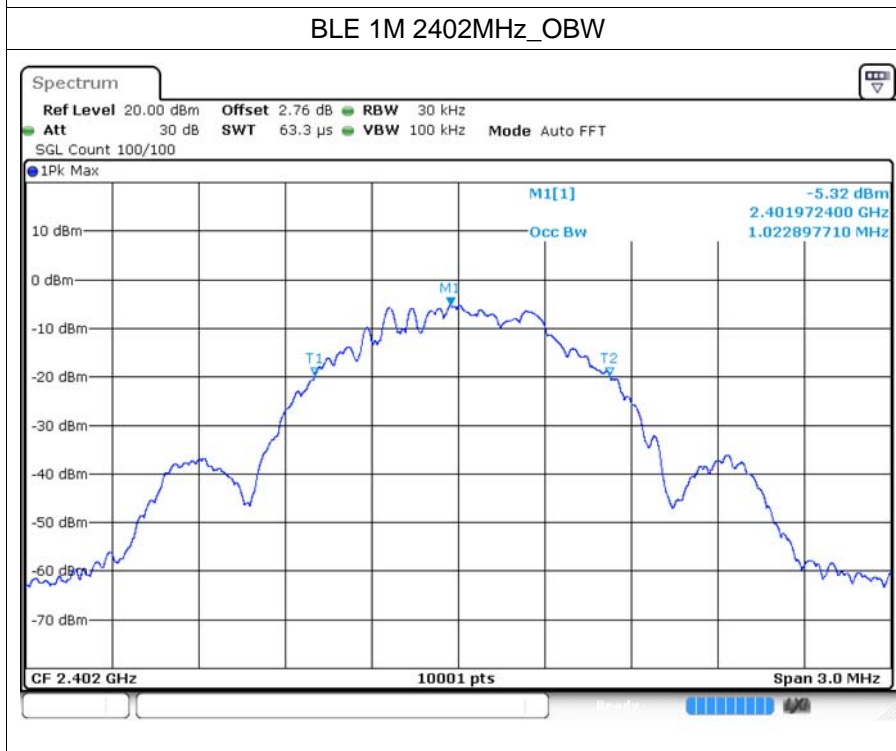
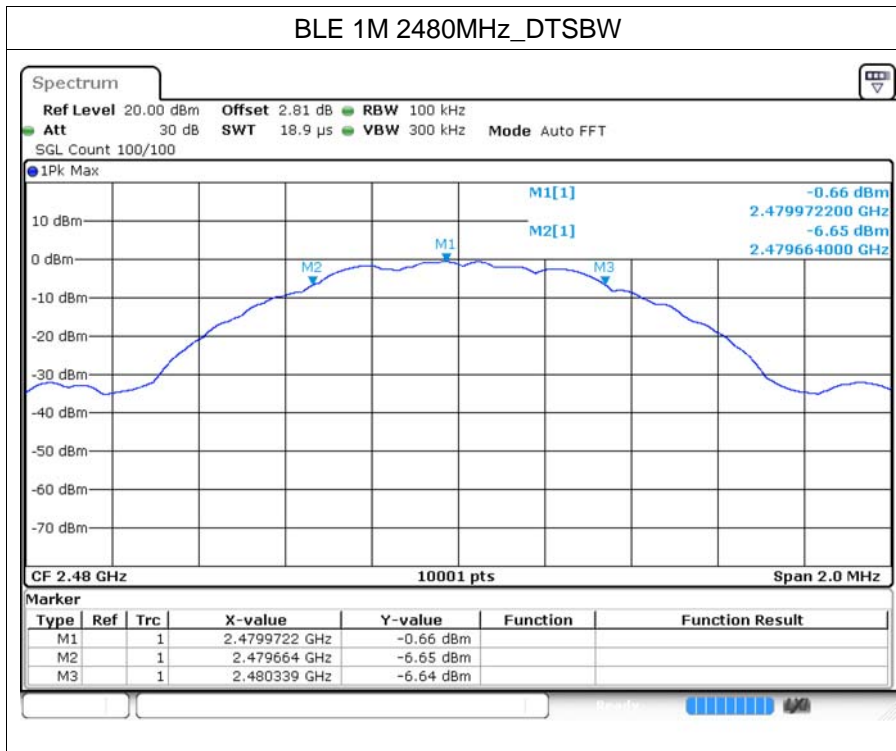
3 -6dB Bandwidth

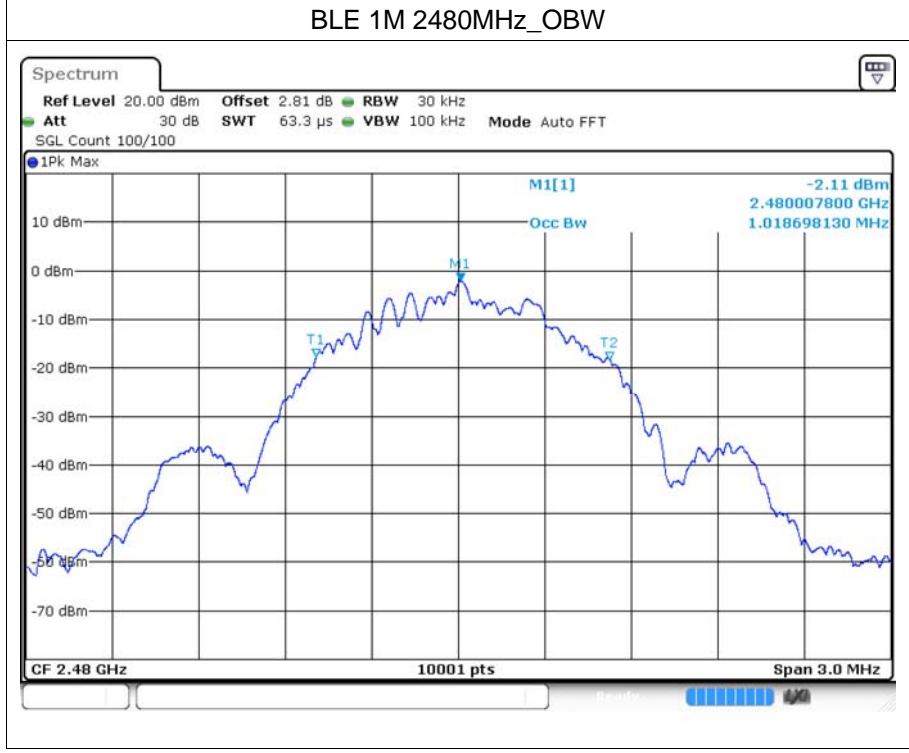
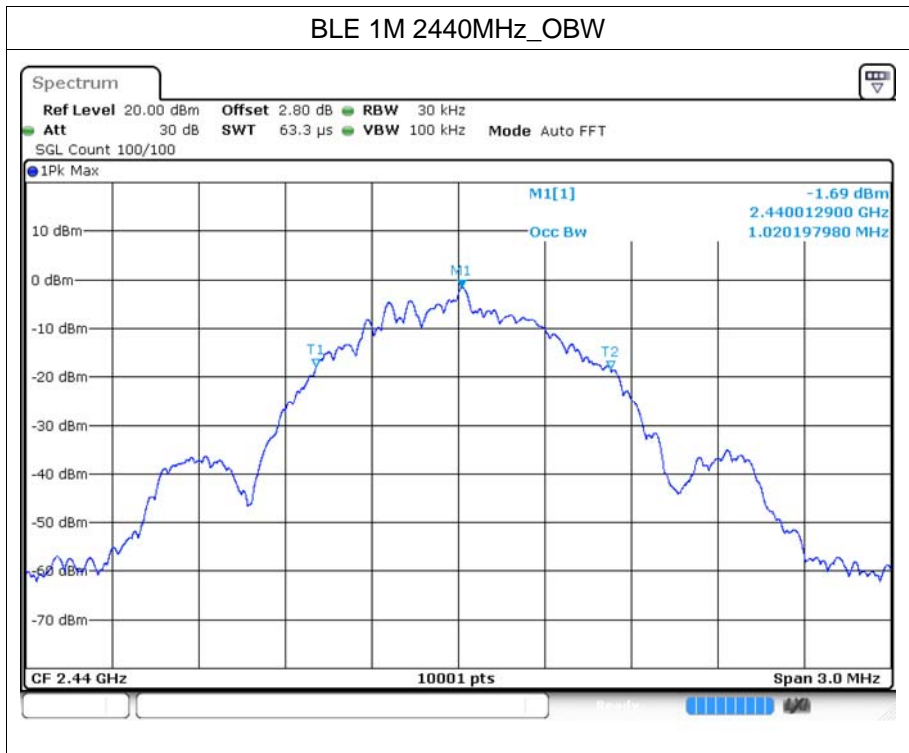
3.1 Test Result

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	1.023	0.632	≥ 0.5	Pass
	2440	1.02	0.671	≥ 0.5	Pass
	2480	1.019	0.675	≥ 0.5	Pass

3.2 Test Graphs





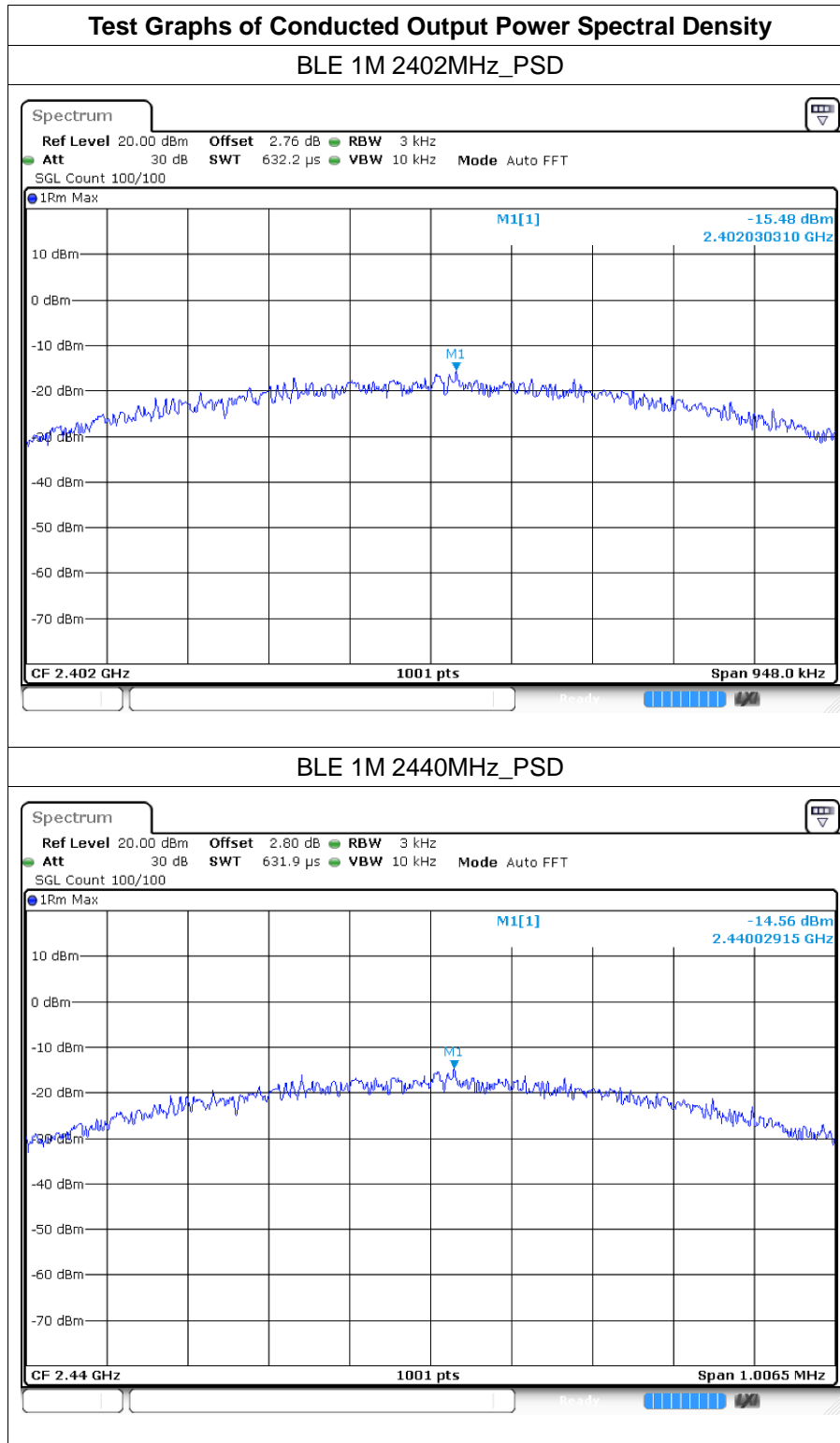


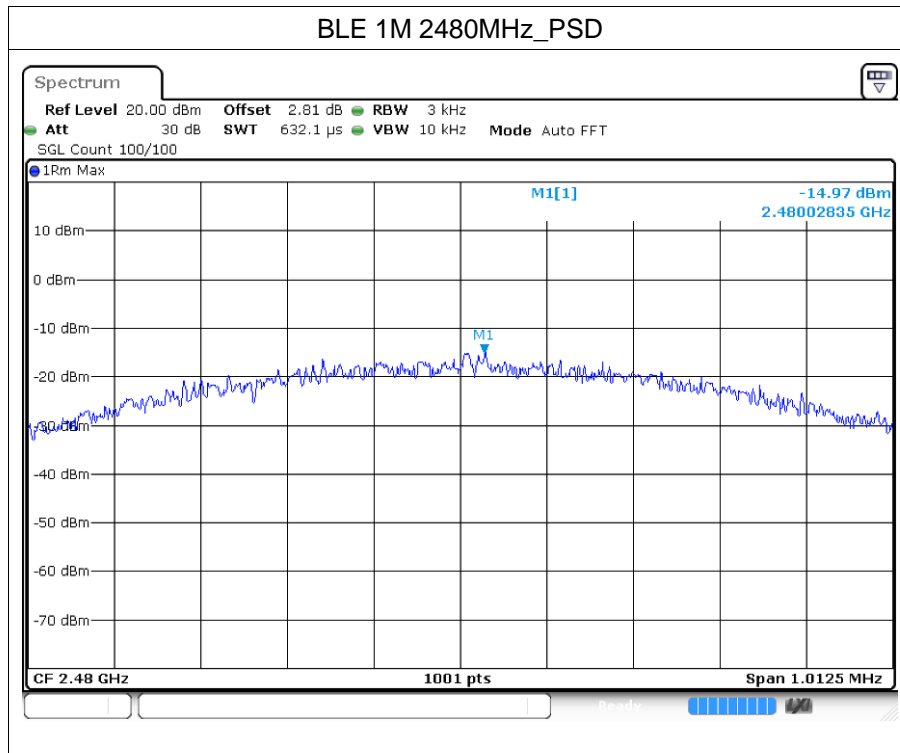
4 Maximum Power Spectral Density Level

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	-15.48	≤ 8	Pass
	2440	-14.56	≤ 8	Pass
	2480	-14.97	≤ 8	Pass

4.2 Test Graphs





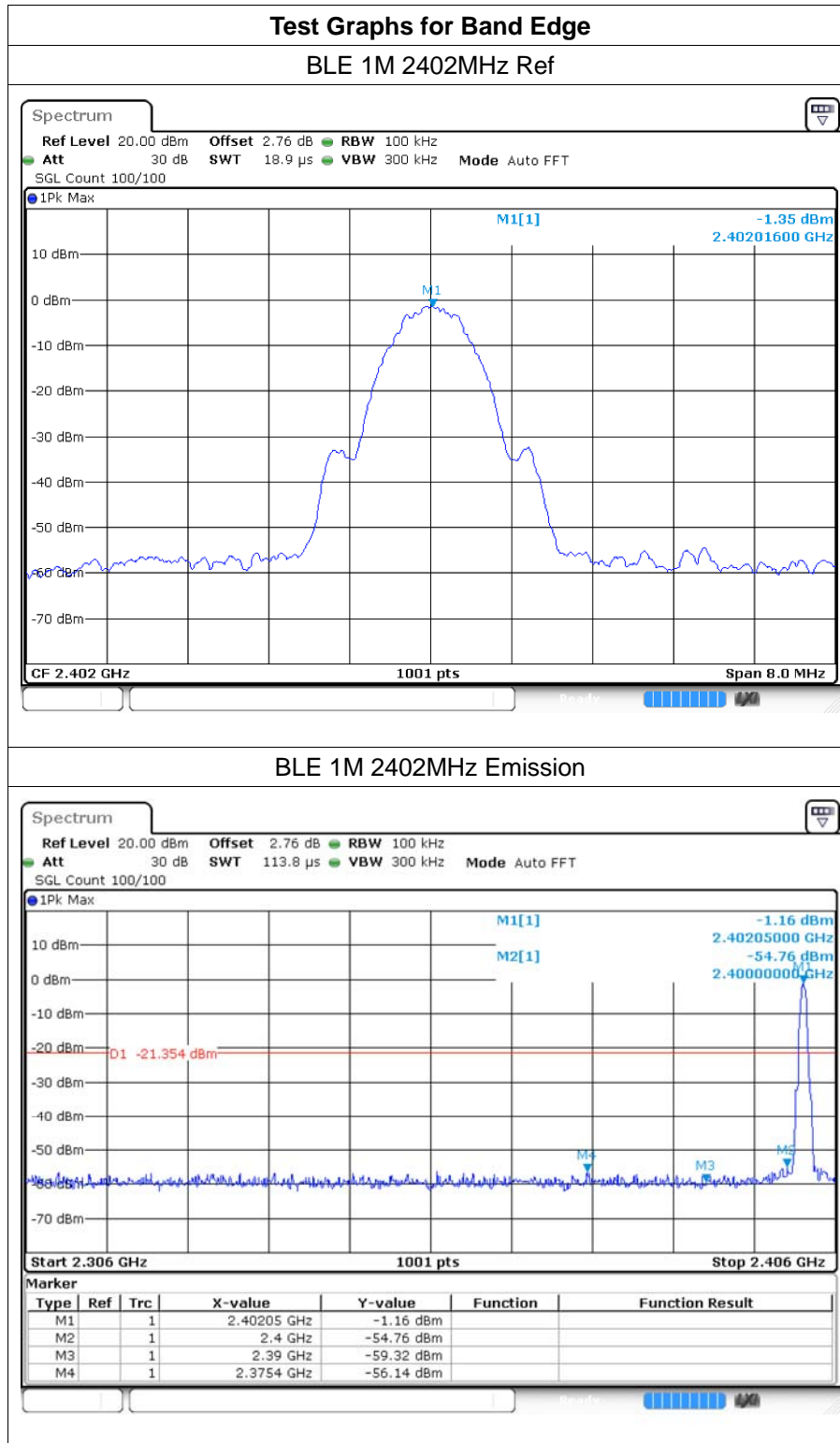


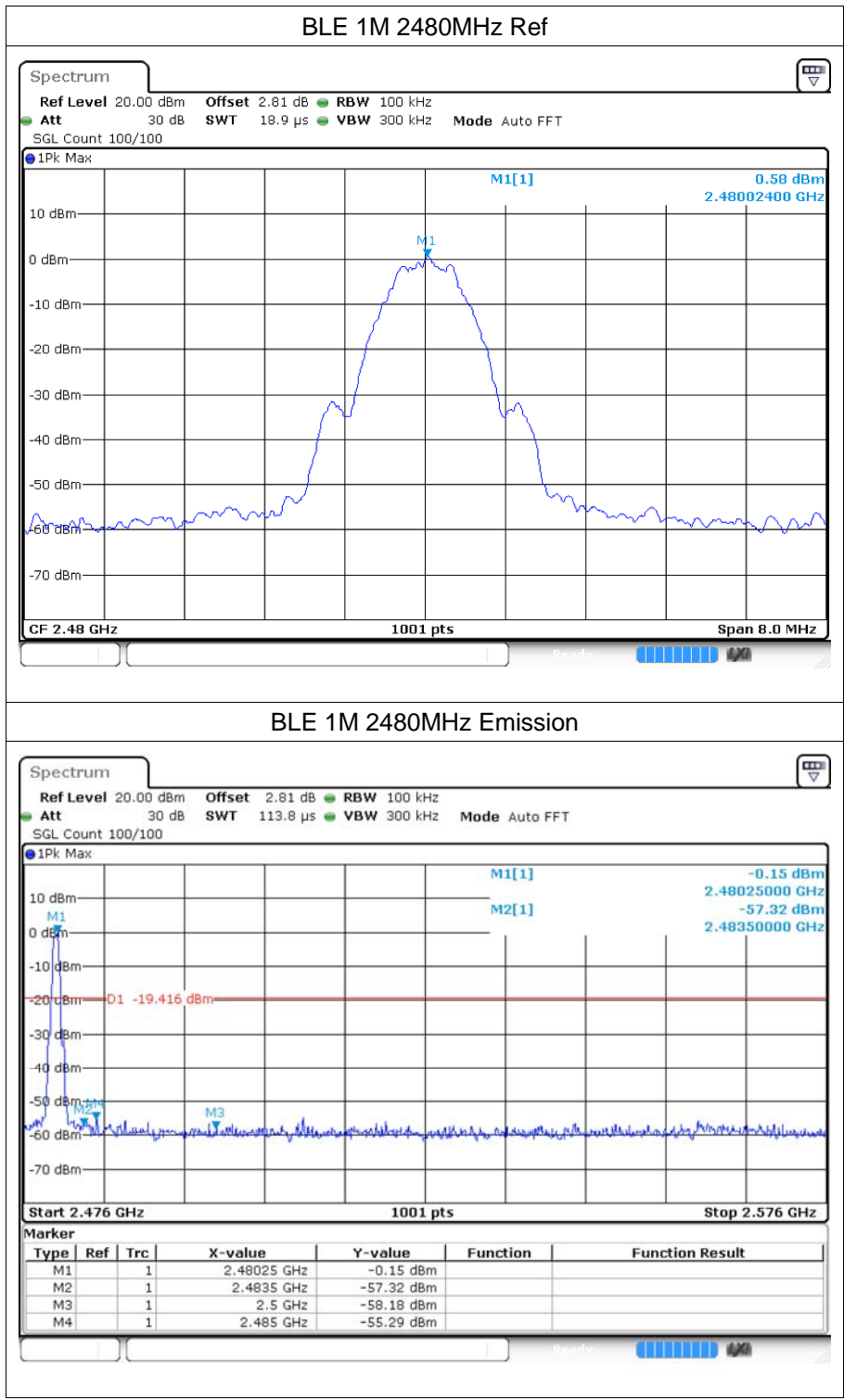
5 Band Edge

5.1 Test Result

Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
GFSK 1M	2402	-54.78	-20	Pass
GFSK 1M	2480	-55.87	-20	Pass

5.2 Test Graphs



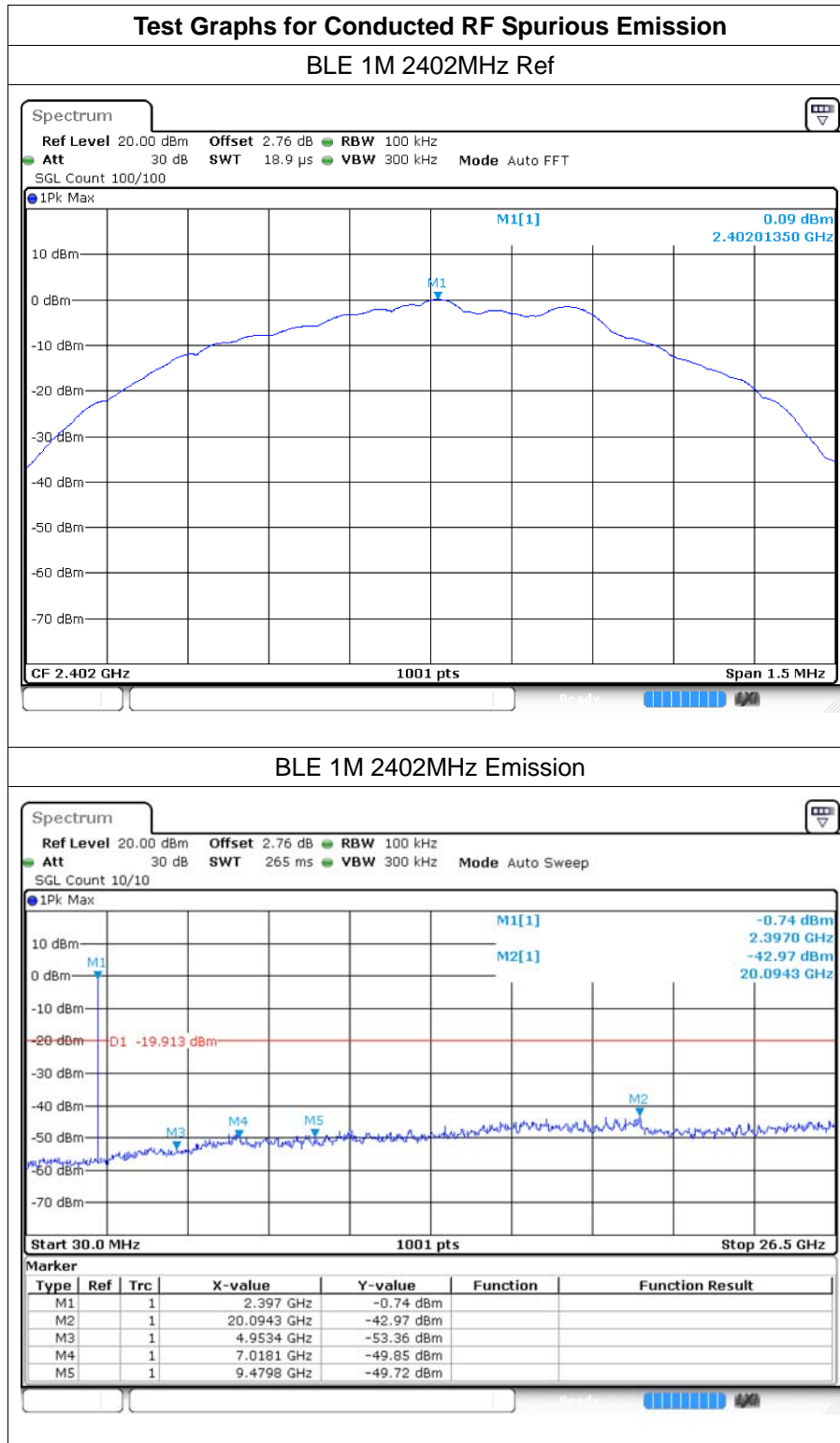


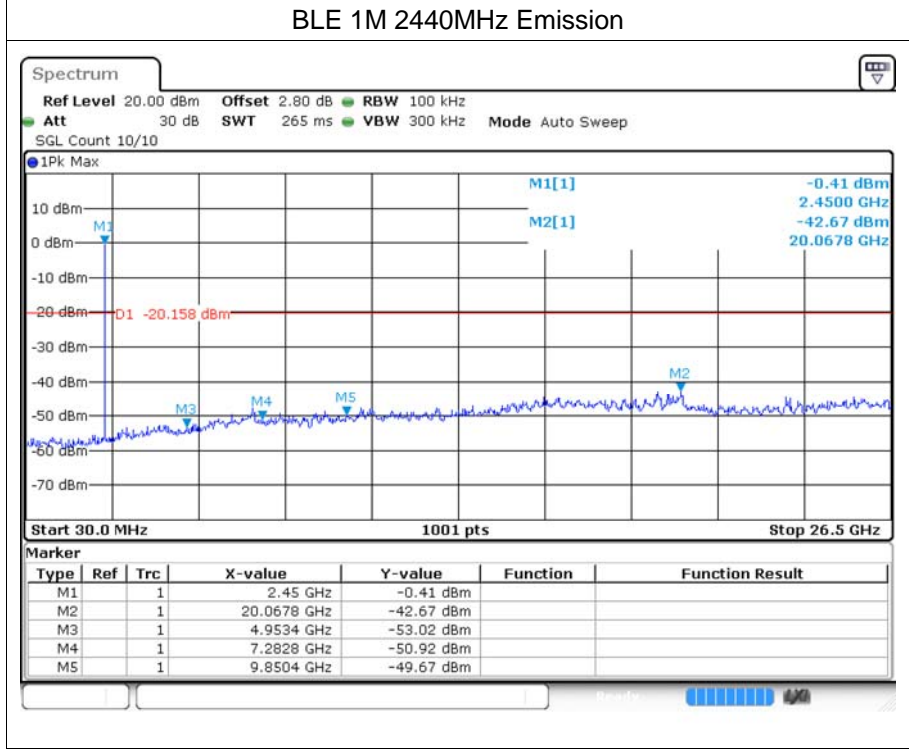
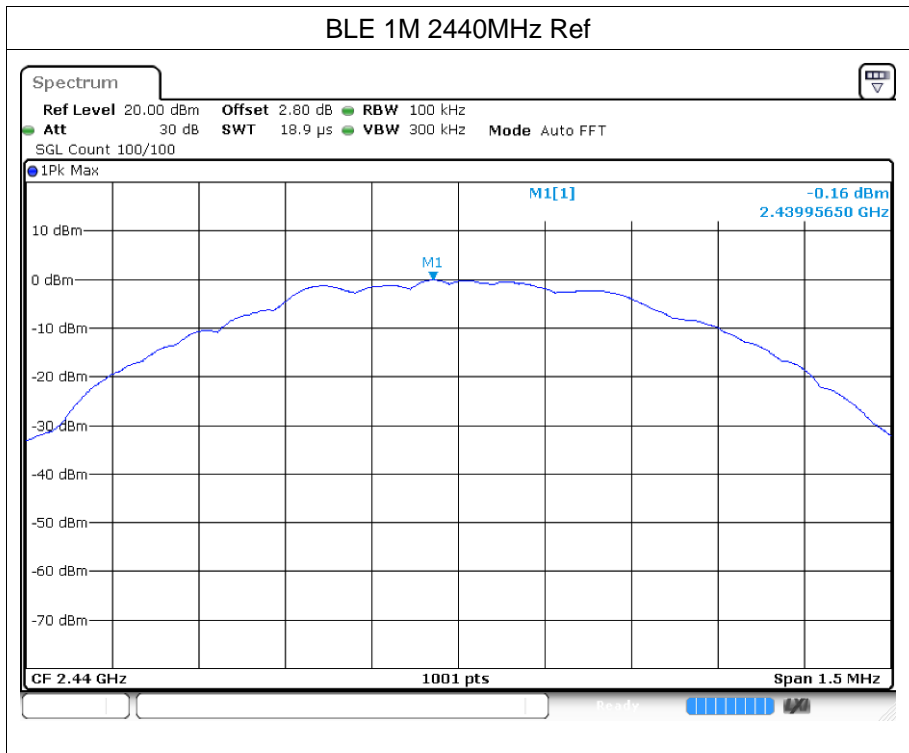
6 Conducted RF Spurious Emission

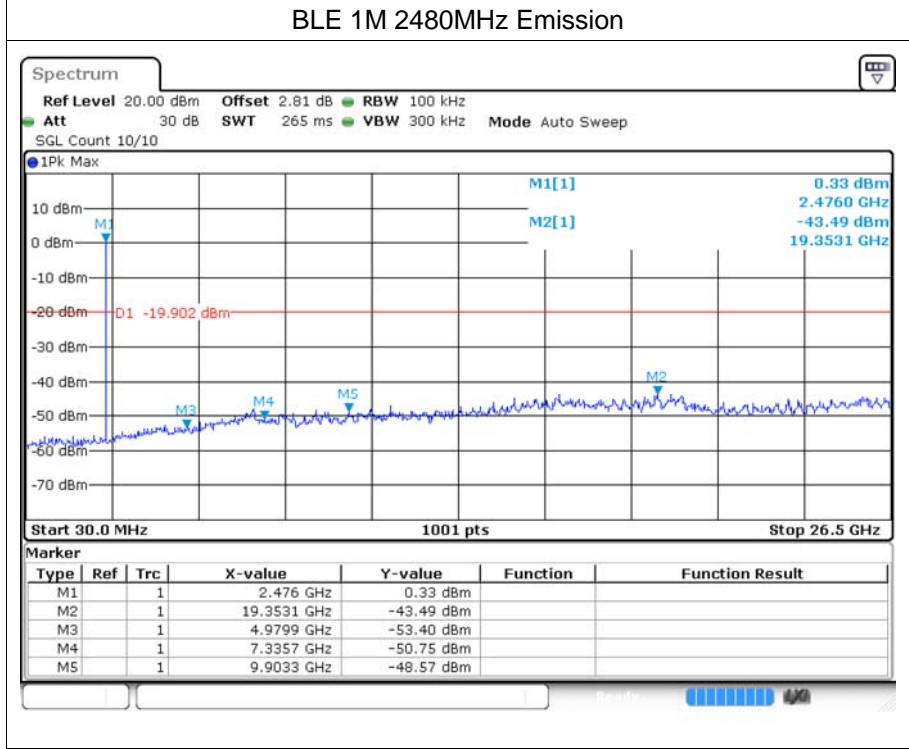
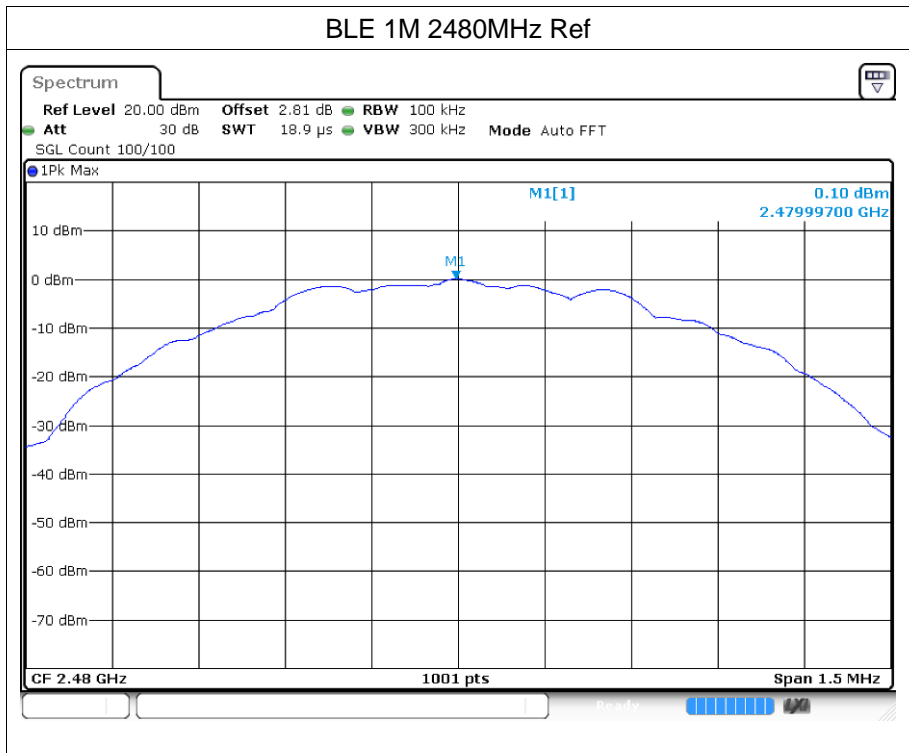
6.1 Test Result

Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
GFSK 1M	2402	-43.06	-20	Pass
GFSK 1M	2440	-42.5	-20	Pass
GFSK 1M	2480	-43.59	-20	Pass

6.2 Test Graphs







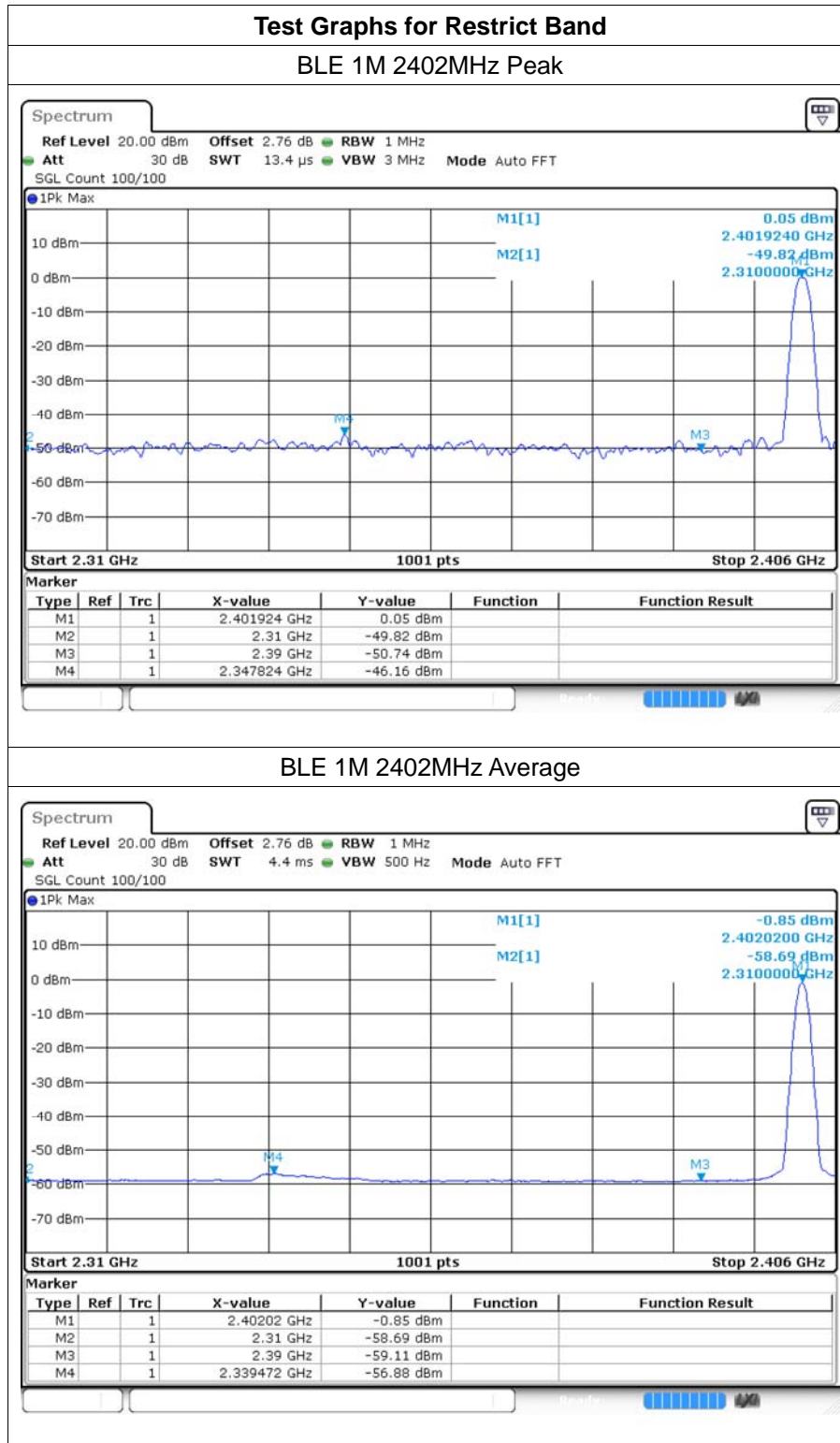


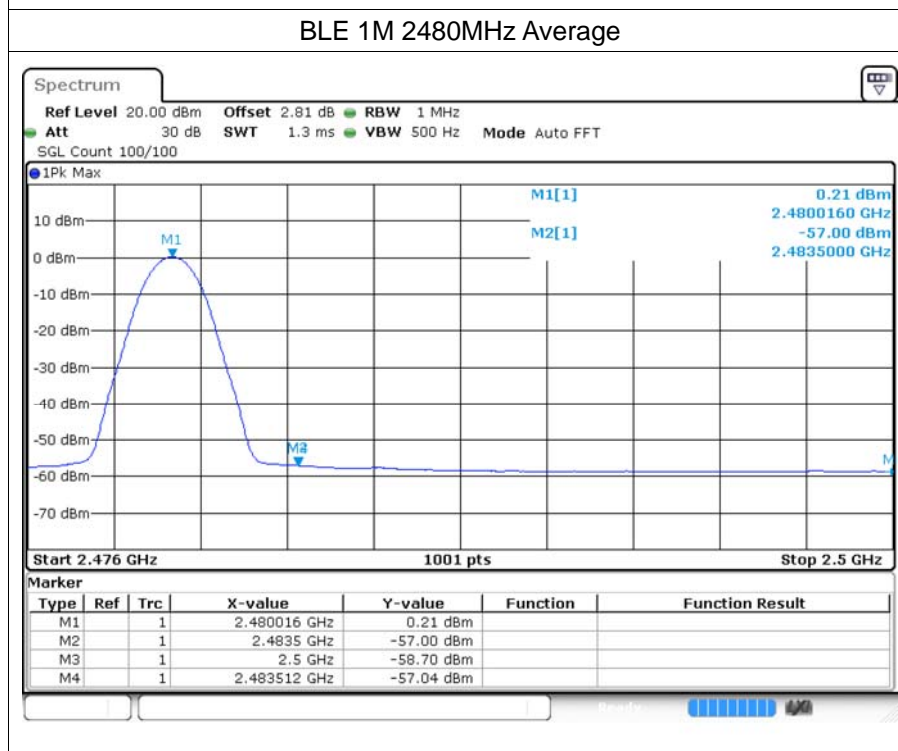
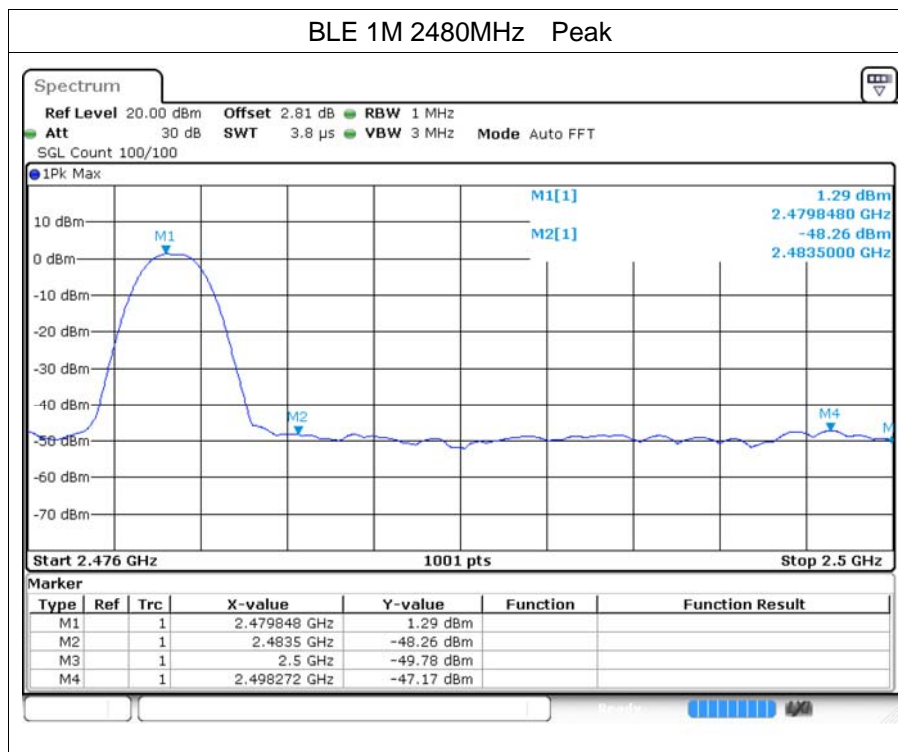
7 Restrict Band

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	-49.820	2.46	47.90	Peak	74	Pass
GFSK 1M	2402	2310	-58.690	2.46	39.03	Average	54	Pass
GFSK 1M	2402	2347.824	-46.160	2.46	51.56	Peak	74	Pass
GFSK 1M	2402	2339.472	-56.870	2.46	40.85	Average	54	Pass
GFSK 1M	2402	2390	-50.730	2.46	46.99	Peak	74	Pass
GFSK 1M	2402	2390	-59.100	2.46	38.62	Average	54	Pass
GFSK 1M	2480	2483.5	-48.300	2.46	49.42	Peak	74	Pass
GFSK 1M	2480	2483.5	-57.040	2.46	40.68	Average	54	Pass
GFSK 1M	2480	2498.272	-47.170	2.46	50.55	Peak	74	Pass
GFSK 1M	2480	2483.512	-57.040	2.46	40.68	Average	54	Pass
GFSK 1M	2480	2500	-49.770	2.46	47.95	Peak	74	Pass
GFSK 1M	2480	2500	-58.690	2.46	39.03	Average	54	Pass

7.2 Test Graphs





---The End---