Appendix A

RF Test Data for BT(BDR/EDR) (Conducted Measurement)

Product Name: Wireless Earbuds

Trade Mark: N/A

Test Model: X16

Environmental Conditions

Temperature:	25.6° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung

Contents

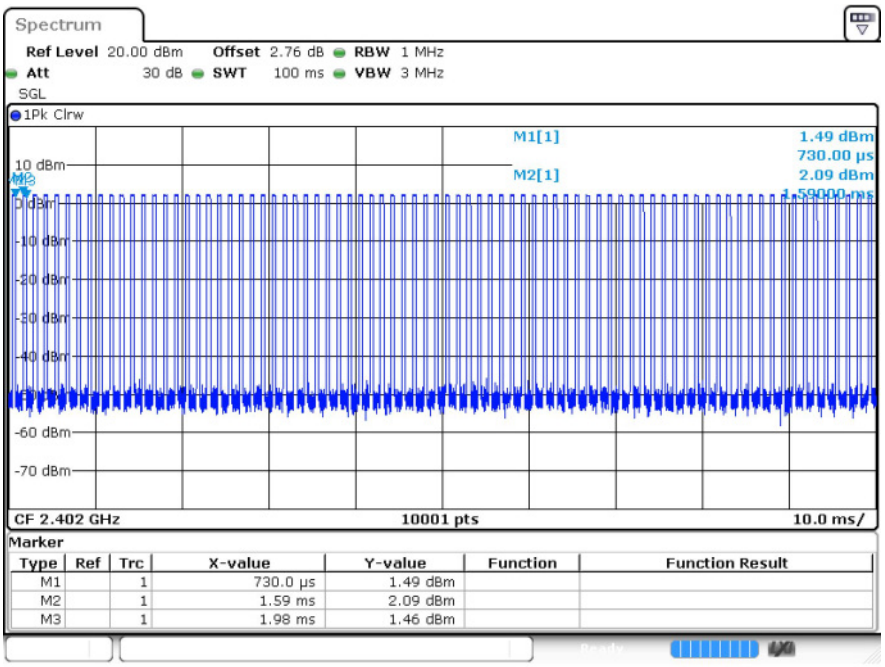
1 Duty Cycle

1.1 Test Result

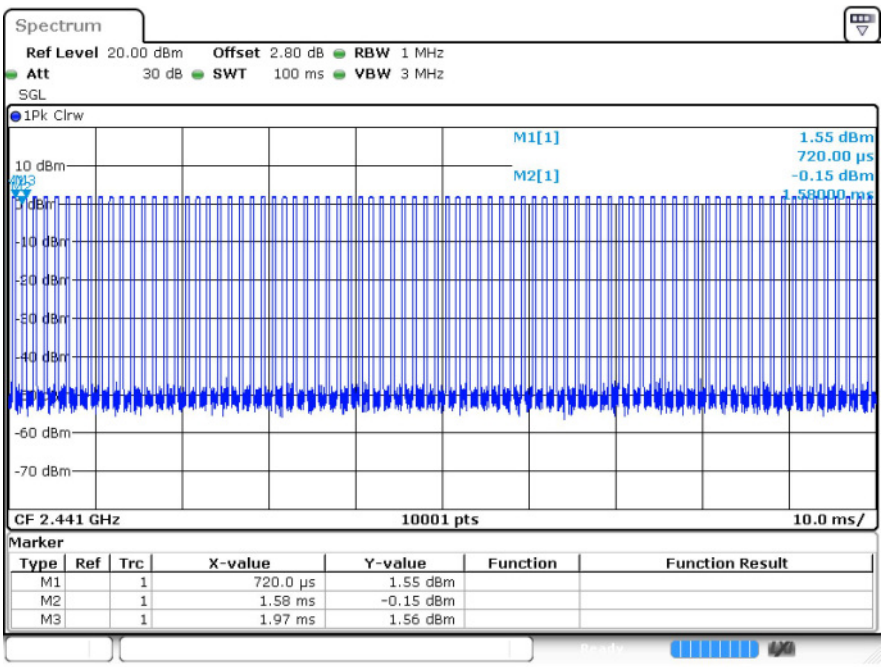
Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
1-DH1	2402	32	4.95	2.56
1-DH1	2441	32	4.95	2.56
1-DH1	2480	32	4.95	2.56
2-DH1	2402	32.22	4.92	2.5
2-DH1	2441	32.69	4.86	2.56
2-DH1	2480	32	4.95	2.56
3-DH1	2402	32	4.95	2.56
3-DH1	2441	32	4.95	2.56
3-DH1	2480	32	4.95	2.56

1.2 Test Graphs

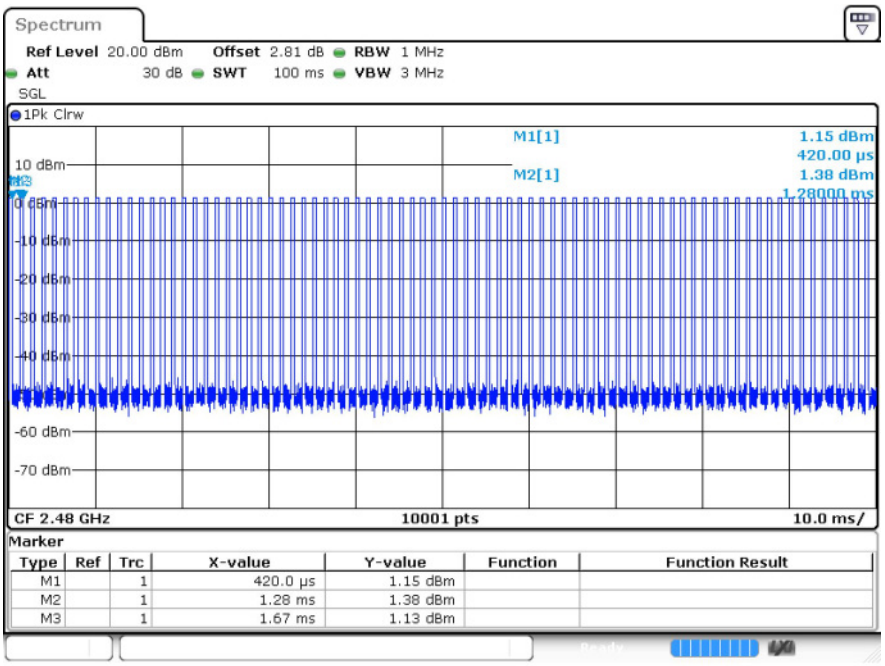
Test Graphs
1-DH1 2402MHz



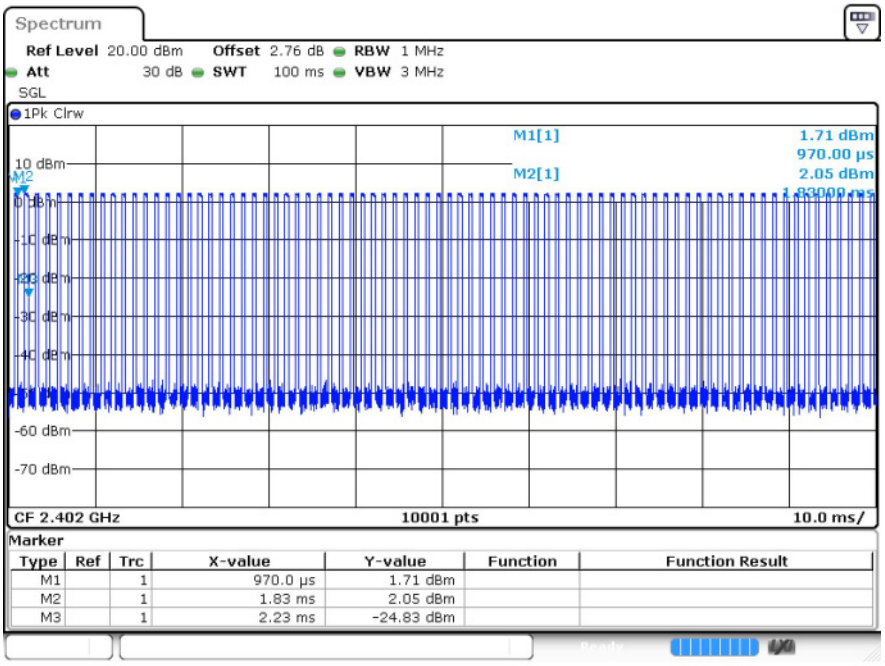
1-DH1 2441MHz



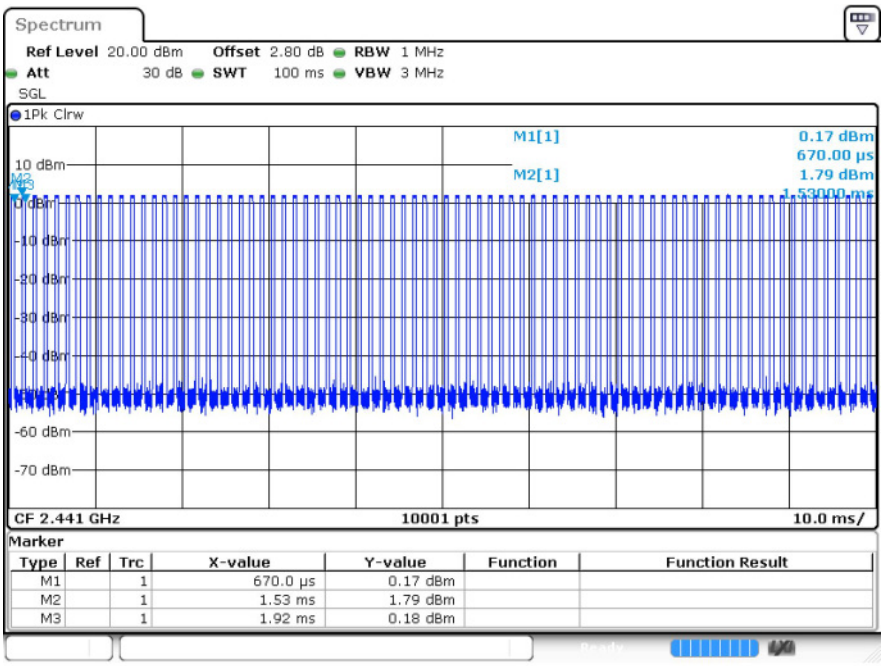
1-DH1 2480MHz



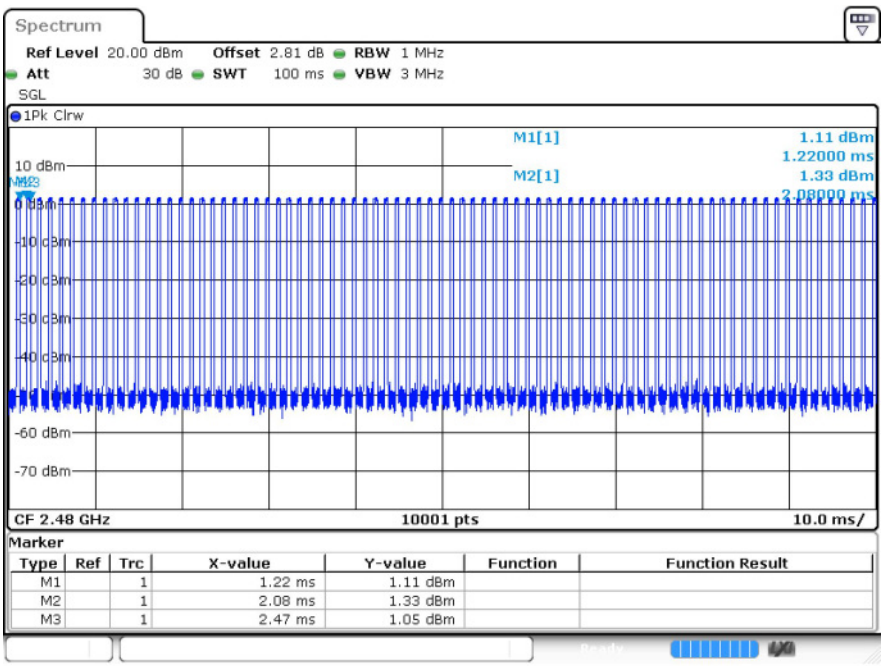
2-DH1 2402MHz



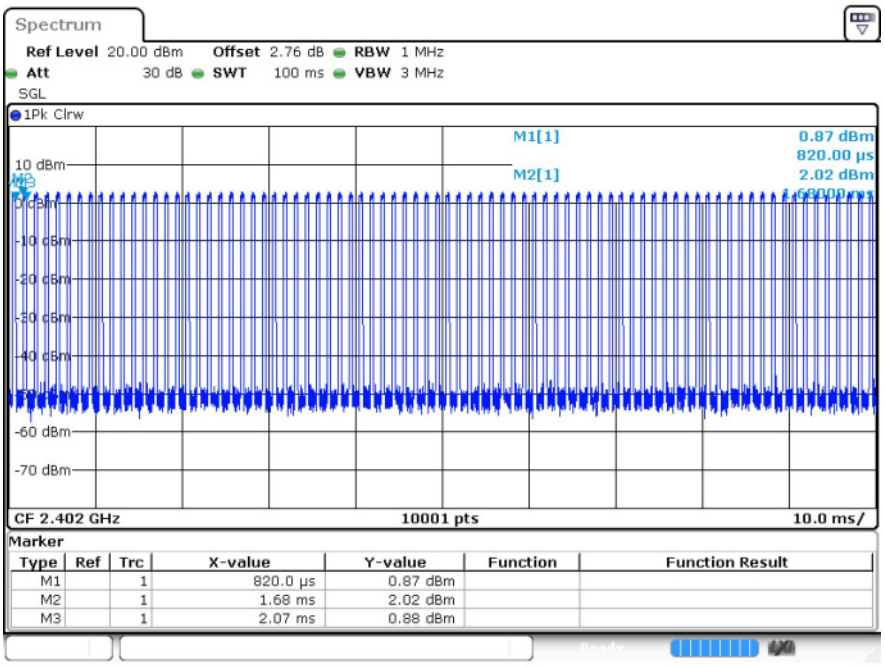
2-DH1 2441MHz



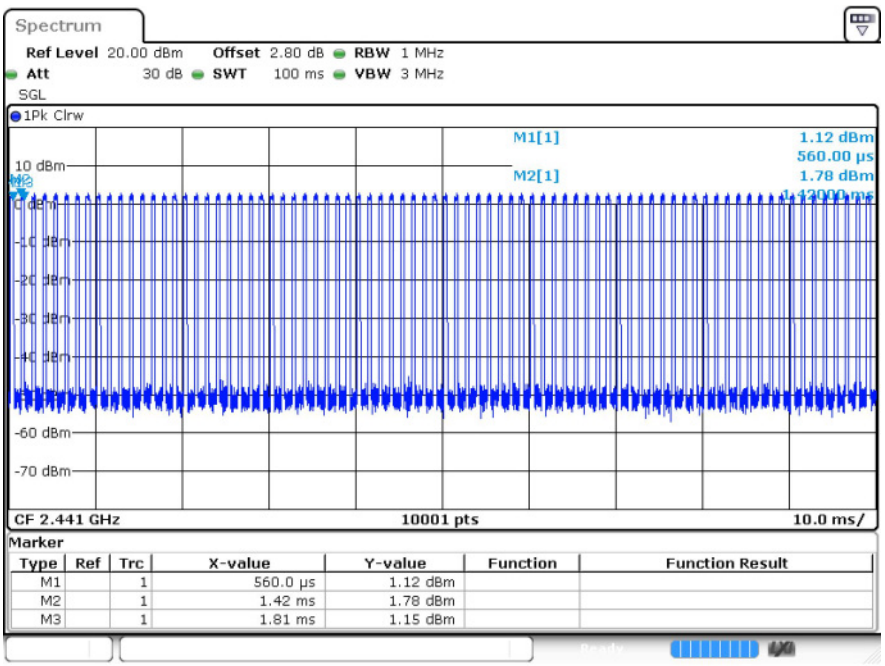
2-DH1 2480MHz



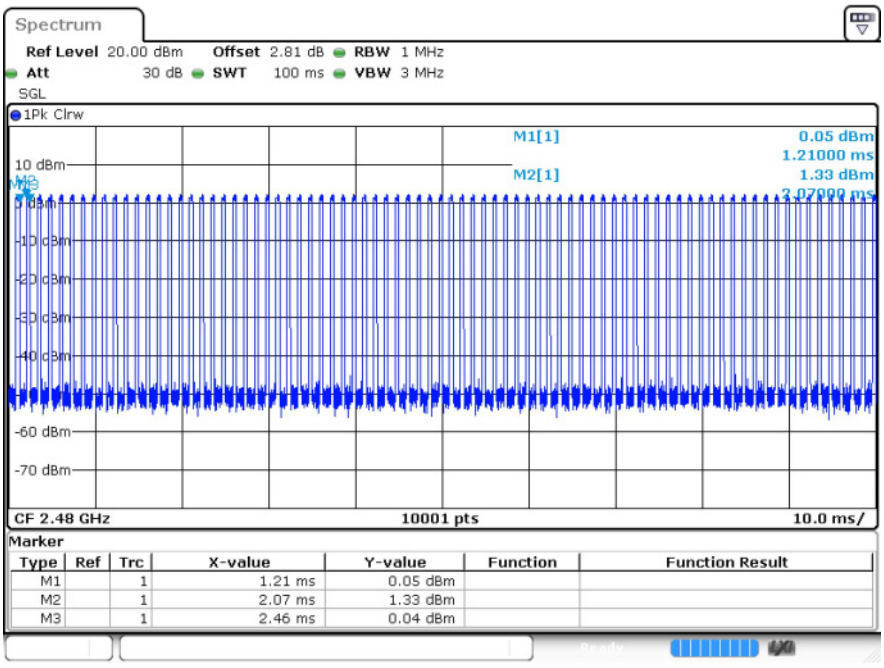
3-DH1 2402MHz



3-DH1 2441MHz



3-DH1 2480MHz

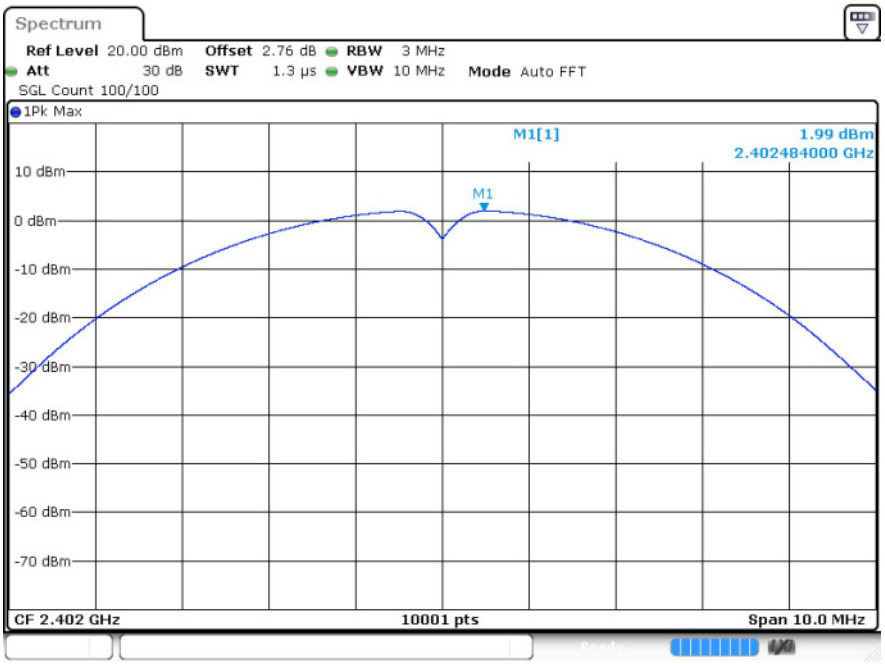
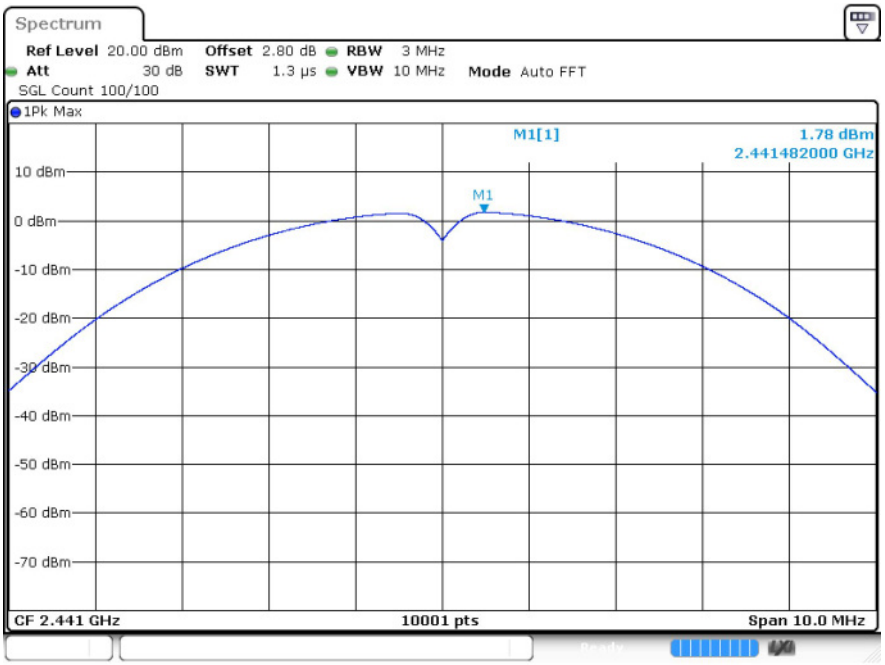


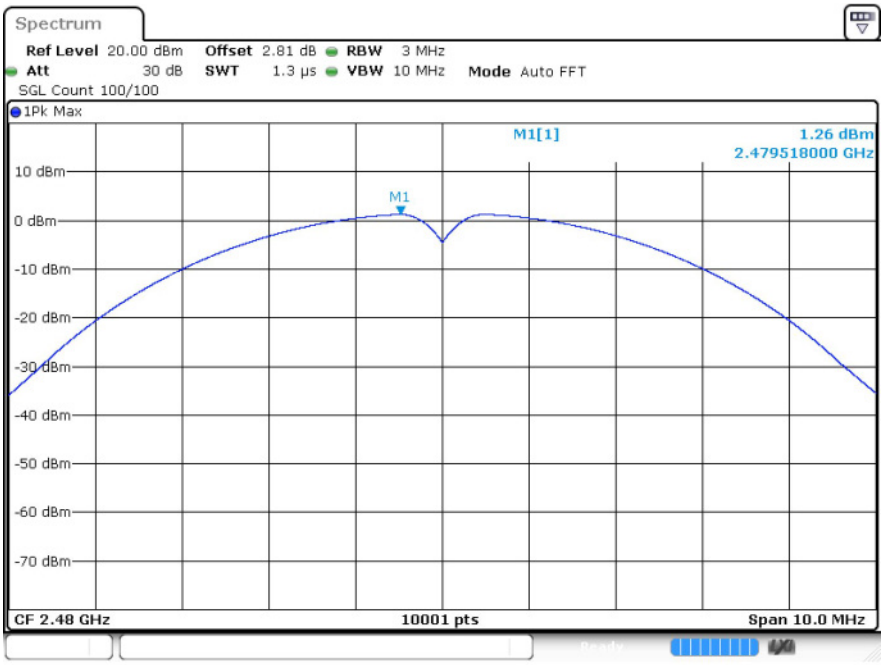
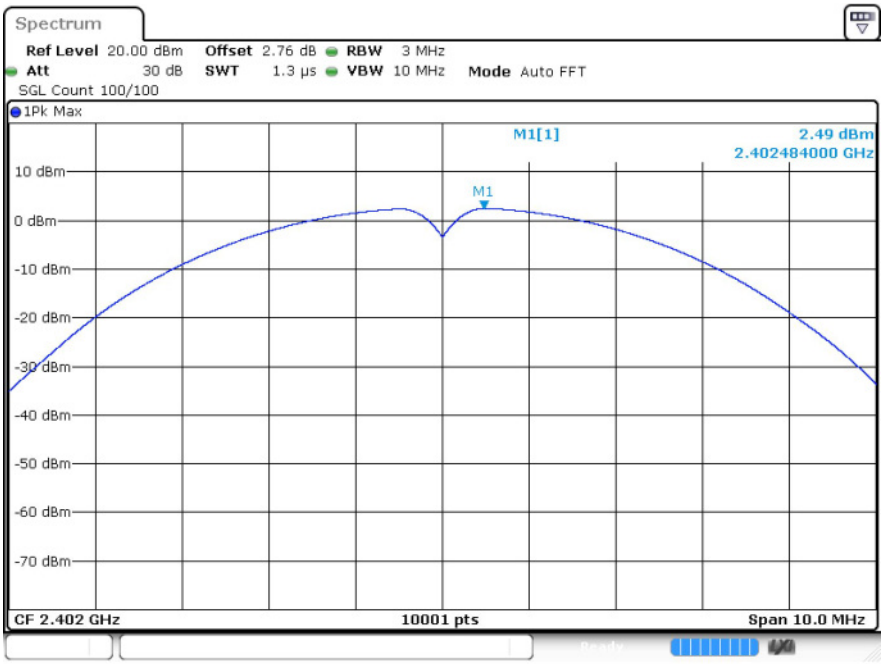
2 Maximum Conducted Peak Output Power

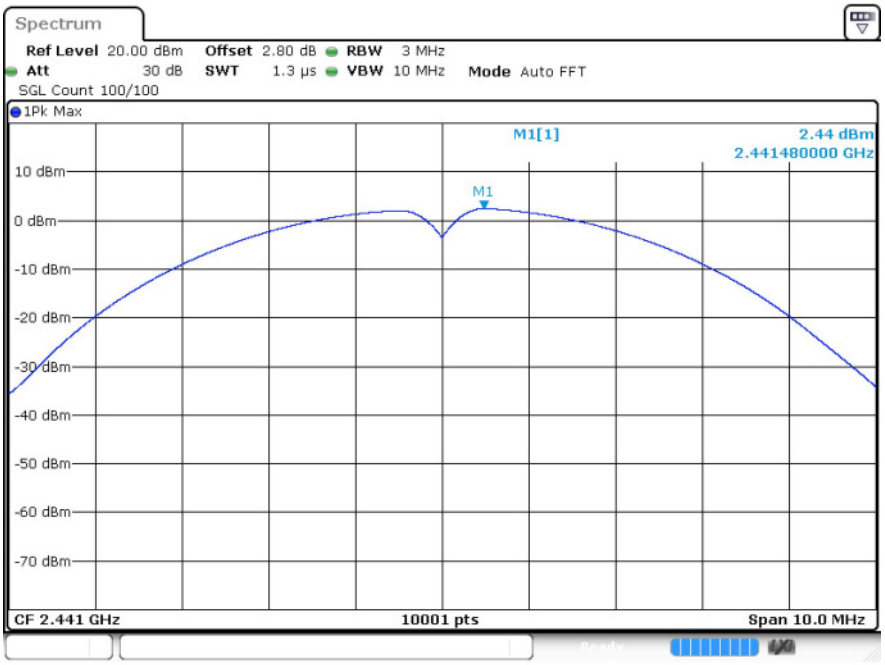
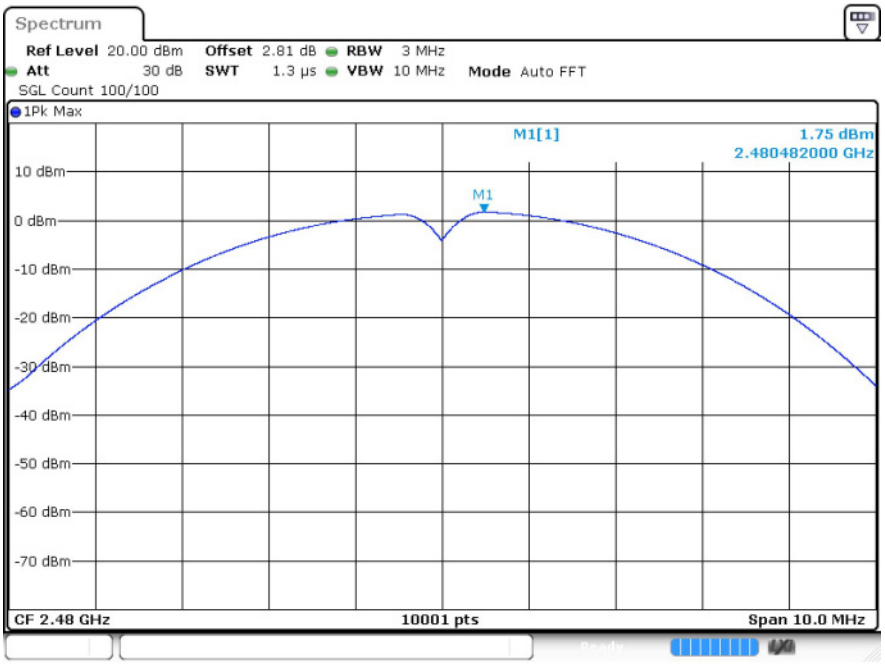
2.1 Test Result

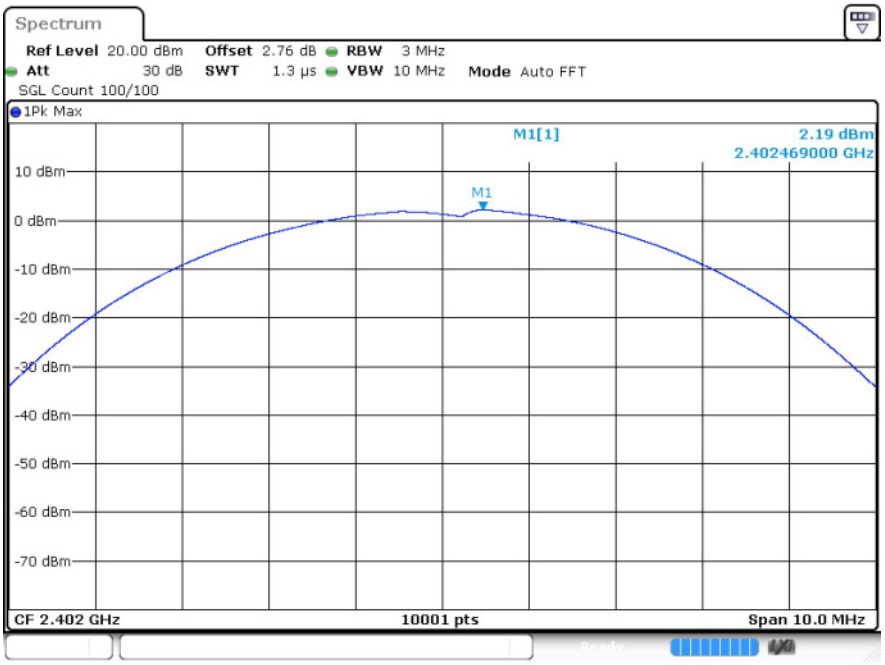
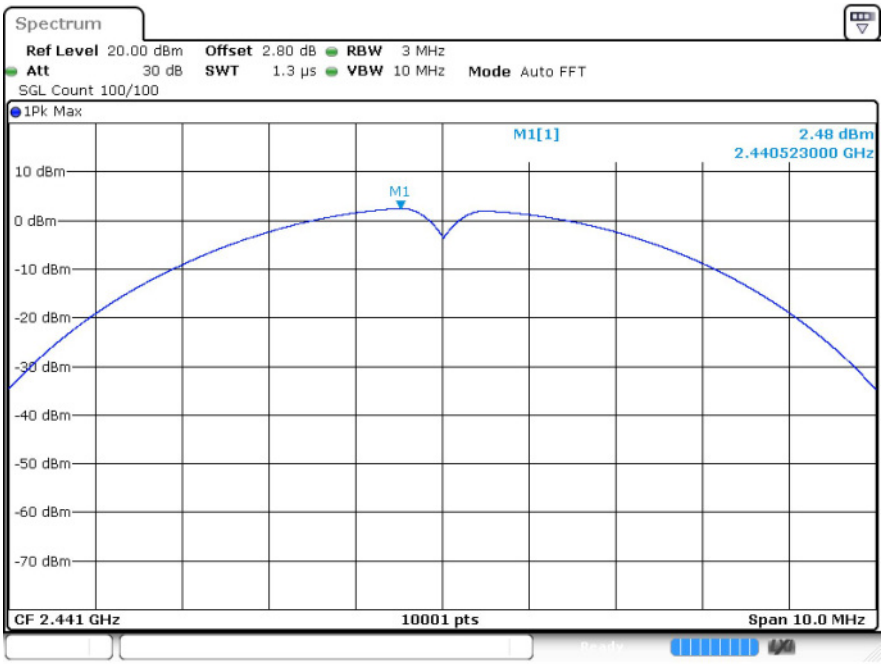
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.99	21	Pass
	MCH	1.78	21	Pass
	HCH	1.26	21	Pass
π/4DQPSK	LCH	2.49	21	Pass
	MCH	2.44	21	Pass
	HCH	1.75	21	Pass
8DPSK	LCH	2.19	21	Pass
	MCH	2.48	21	Pass
	HCH	2.03	21	Pass

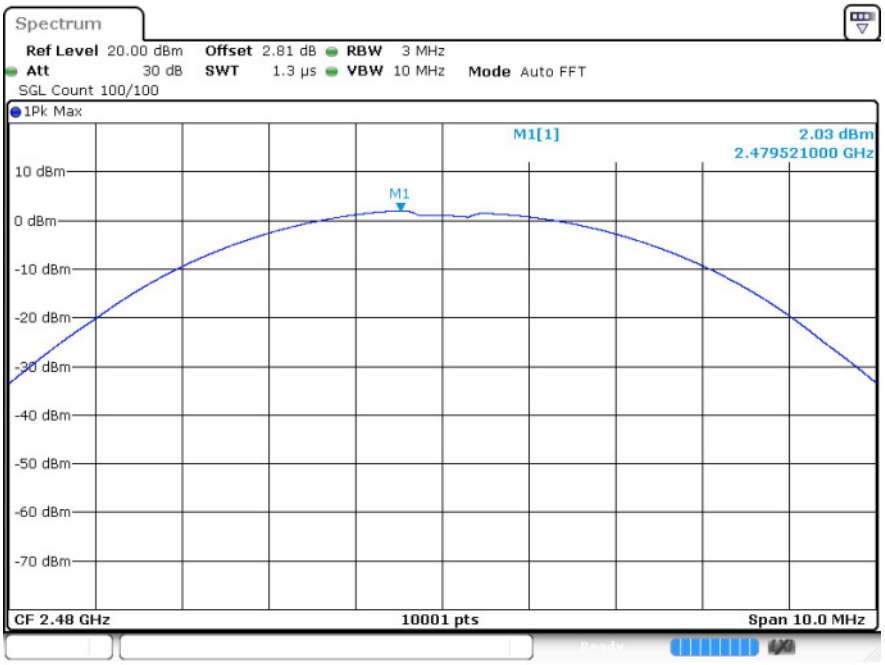
2.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

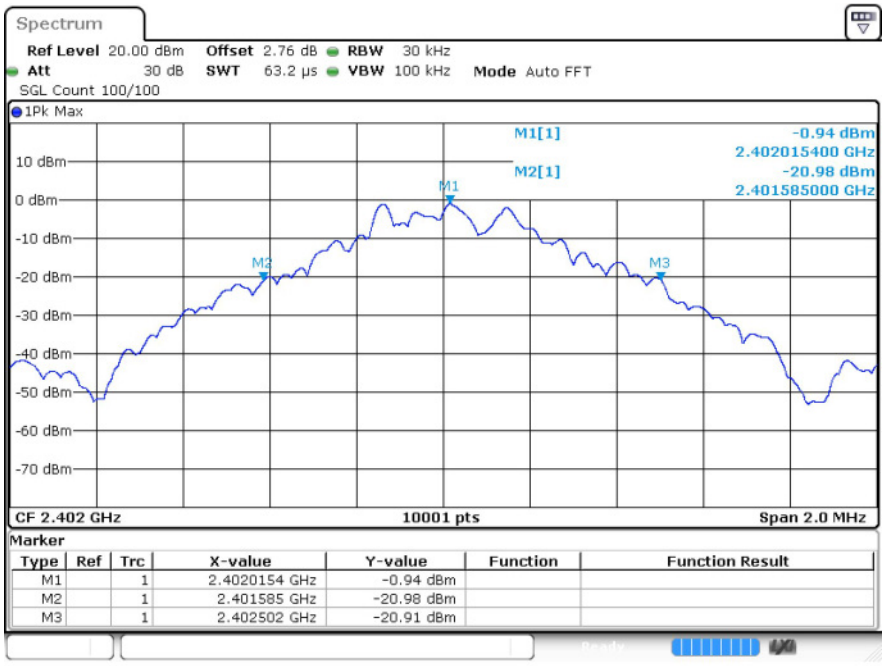
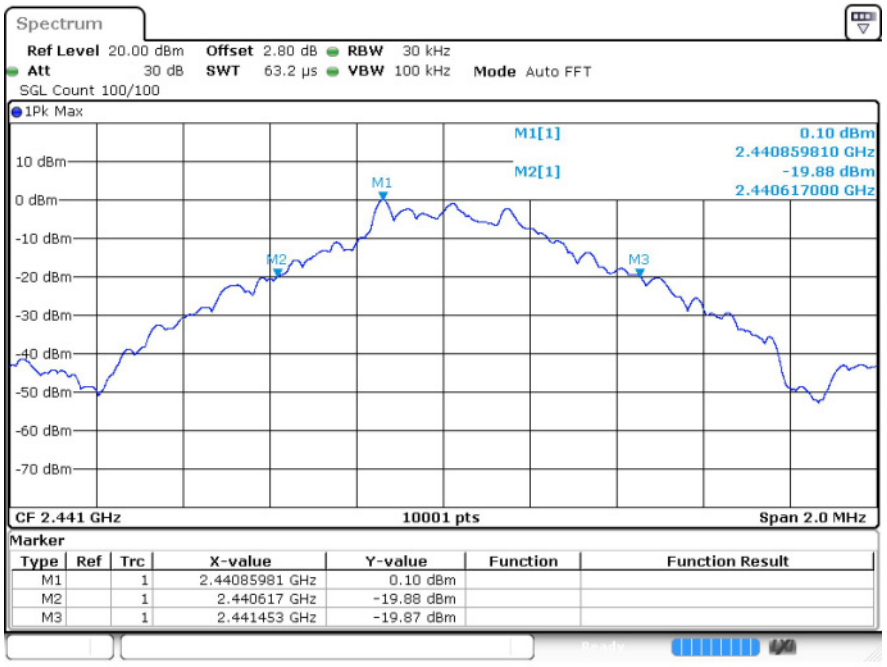
8DPSK/HCH	 Spectrum Ref Level 20.00 dBm Offset 2.81 dB RBW 3 MHz Att 30 dB SWT 1.3 µs VBW 10 MHz Mode Auto FFT SGL Count 100/100 1Pk Max M1[1] 2.03 dBm 2.479521000 GHz M1 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.48 GHz 10001 pts Span 10.0 MHz

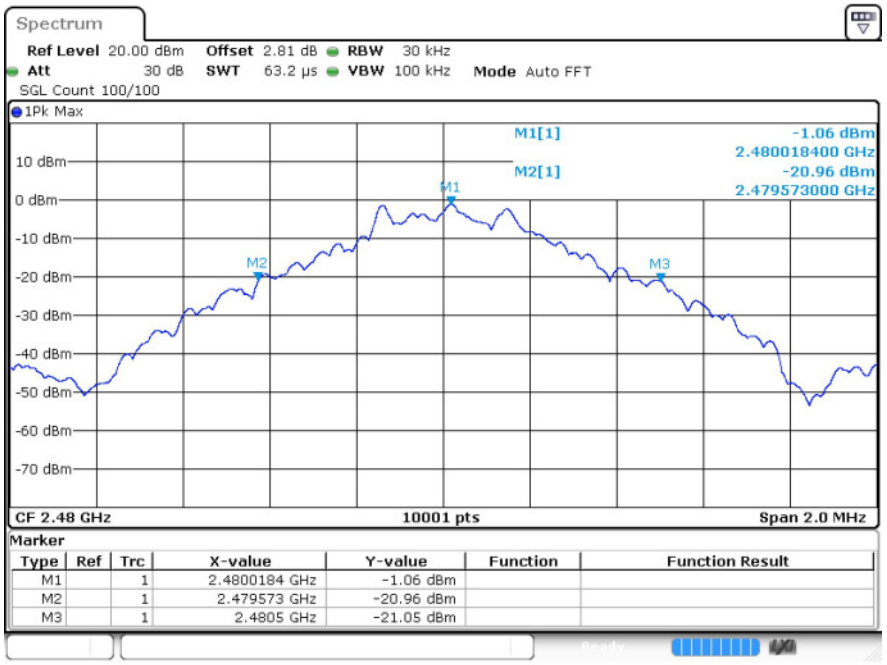
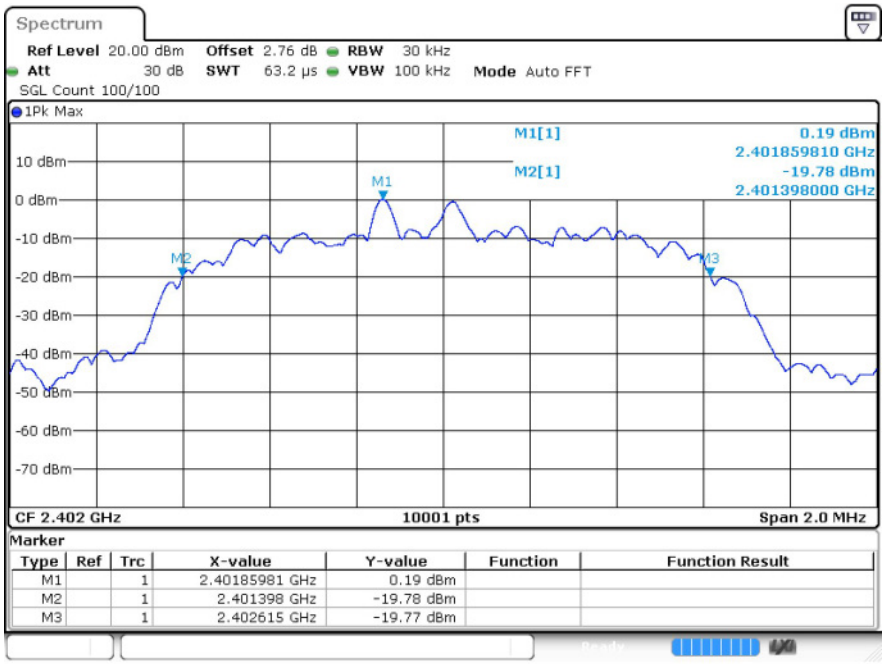
3 20dB Bandwidth

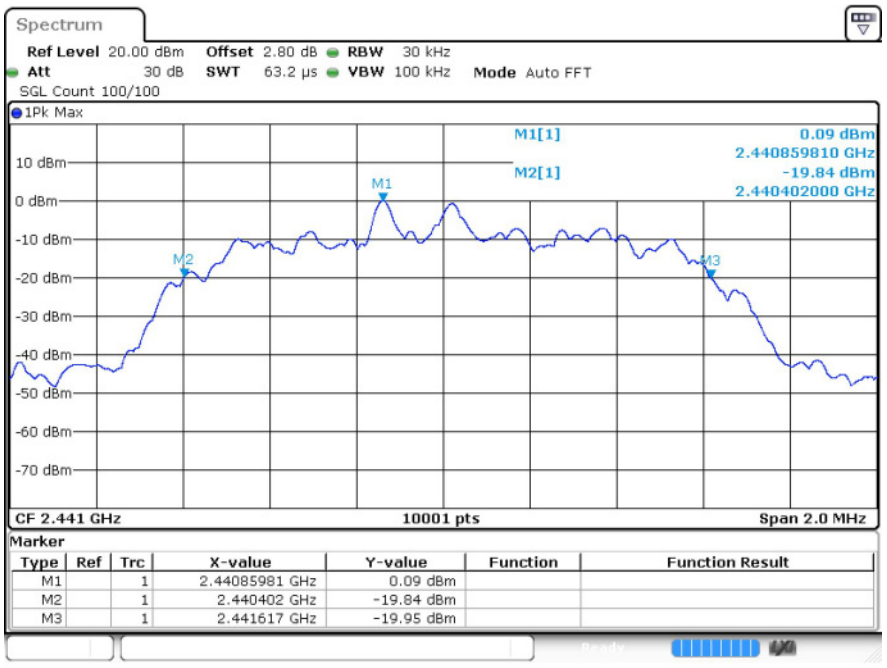
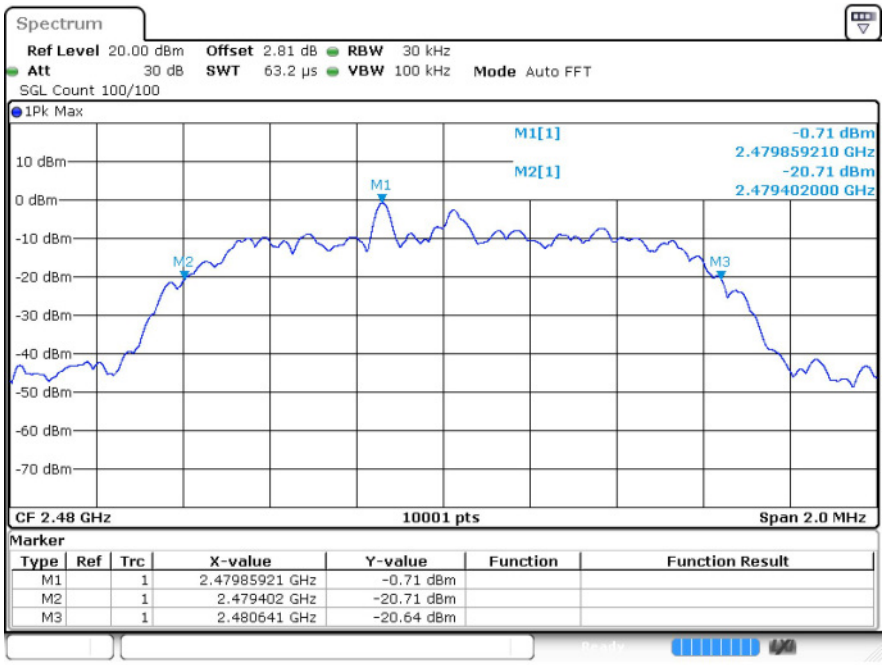
3.1 Test Result

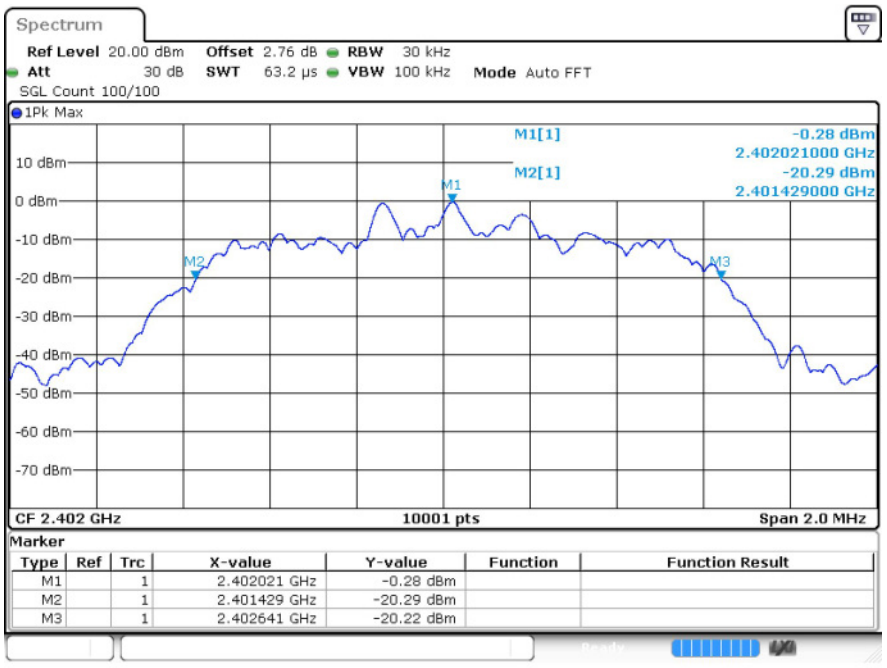
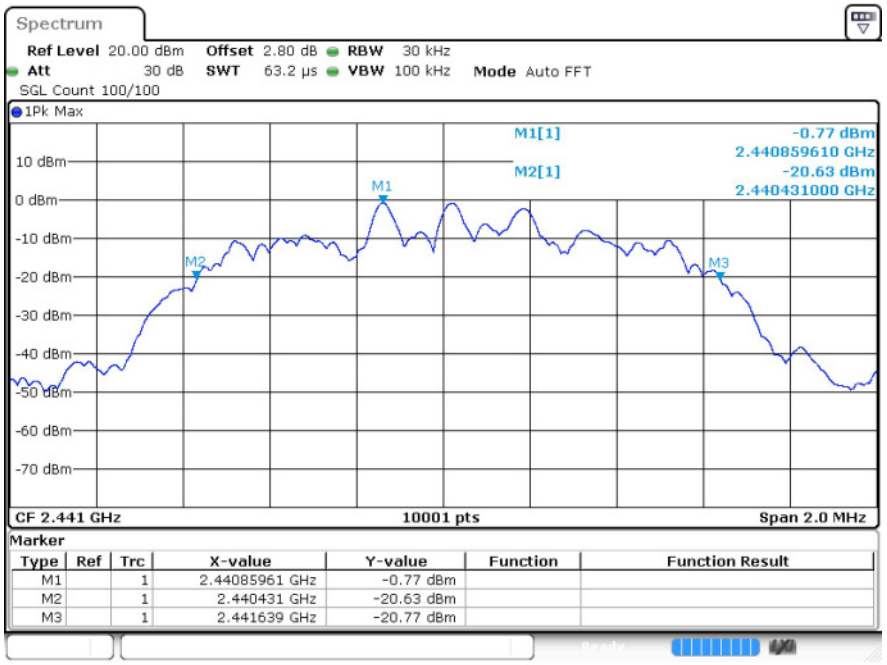
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.917	Not Specified	Pass
	MCH	0.837	Not Specified	Pass
	HCH	0.928	Not Specified	Pass
π/4DQPSK	LCH	1.217	Not Specified	Pass
	MCH	1.215	Not Specified	Pass
	HCH	1.239	Not Specified	Pass
8DPSK	LCH	1.212	Not Specified	Pass
	MCH	1.208	Not Specified	Pass
	HCH	1.248	Not Specified	Pass

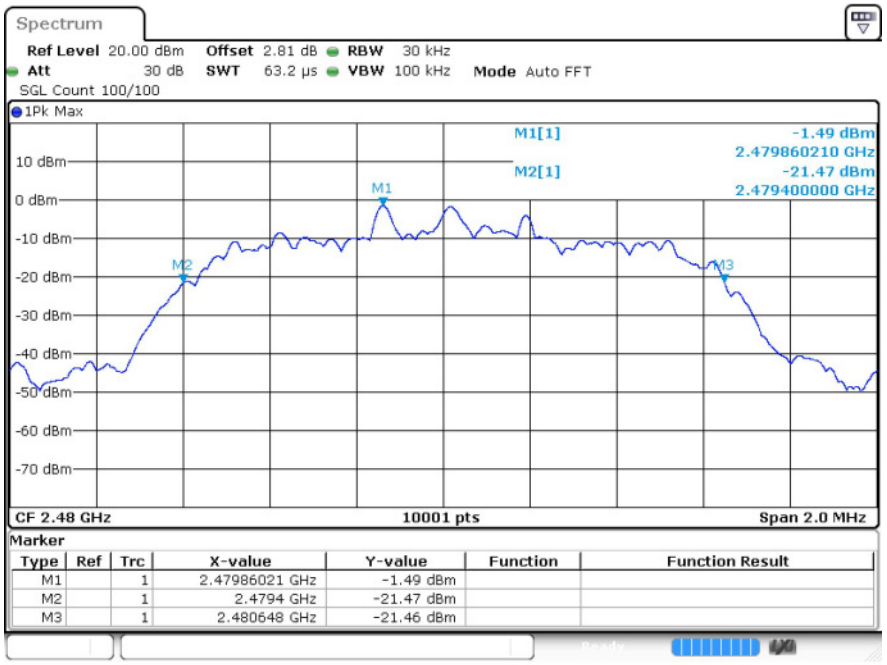
3.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

8DPSK/HCH	

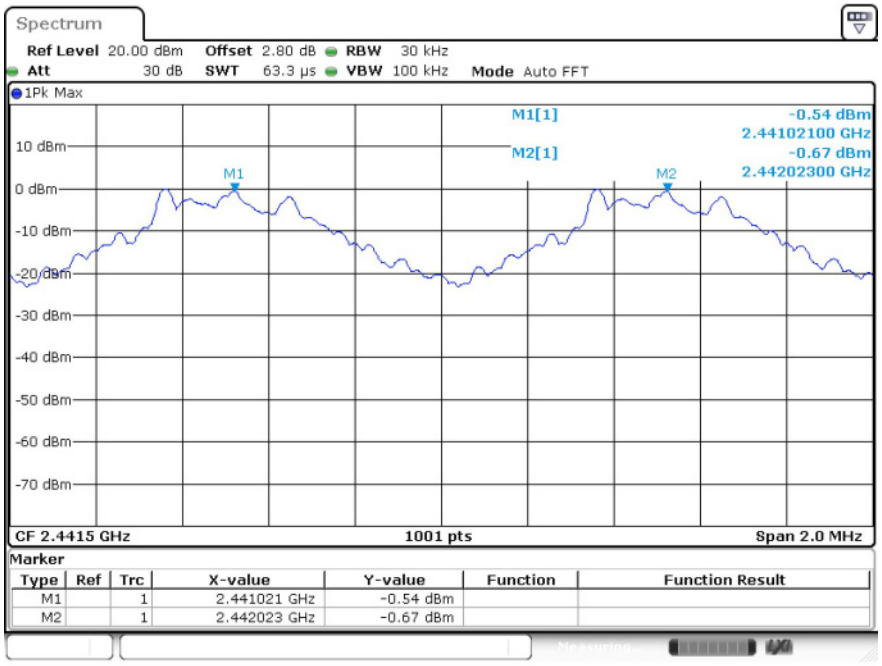
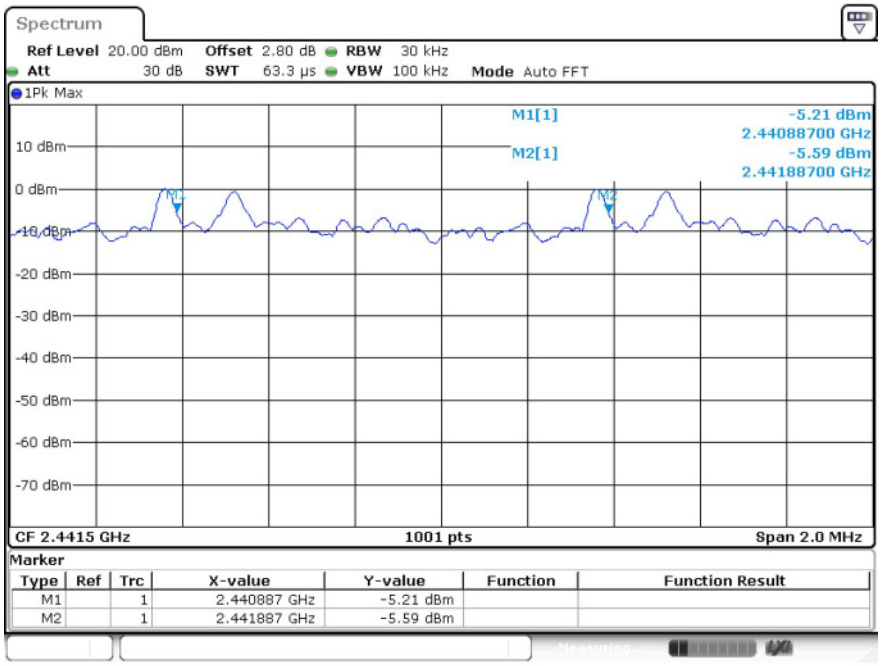
Spectrum
Ref Level 20.00 dBm Offset 2.81 dB RBW 30 kHz
Att 30 dB SWT 63.2 µs VBW 100 kHz Mode Auto FFT
SGL Count 100/100
1Pk Max
M1[1] -1.49 dBm
2.479860210 GHz
M2[1] -21.47 dBm
2.479400000 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
M3
CF 2.48 GHz
10001 pts
Span 2.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.47986021 GHz -1.49 dBm
M2 1 2.4794 GHz -21.47 dBm
M3 1 2.480648 GHz -21.46 dBm

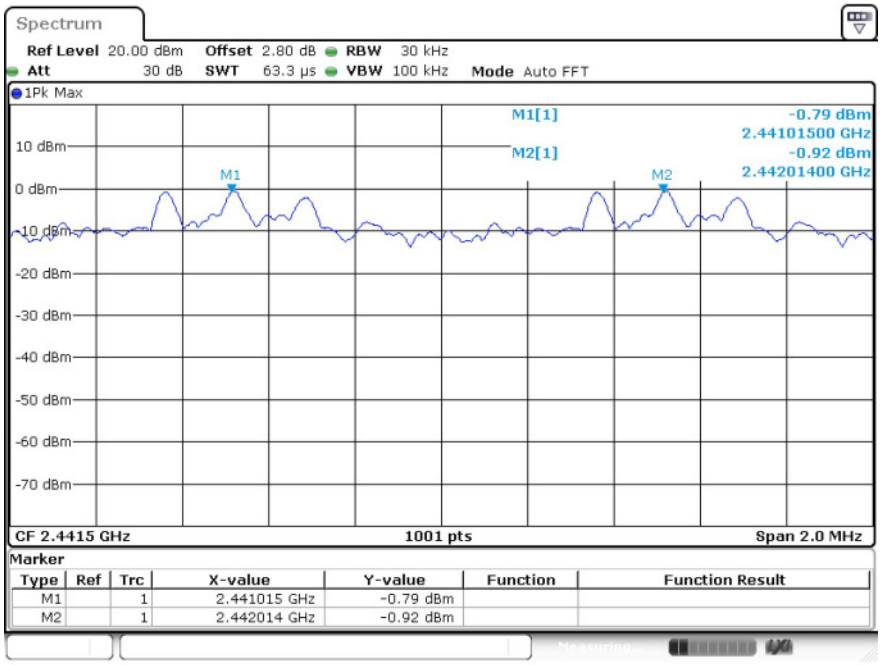
4 Carrier Frequency Separation

4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.002	0.558	Pass
π/4DQPSK	MCH	1	0.81	Pass
8DPSK	MCH	0.999	0.805	Pass

4.2 Test Graphs

Test Graphs	
GFSK/MCH	
π/4DQPSK/MCH	

8DPSK/MCH	

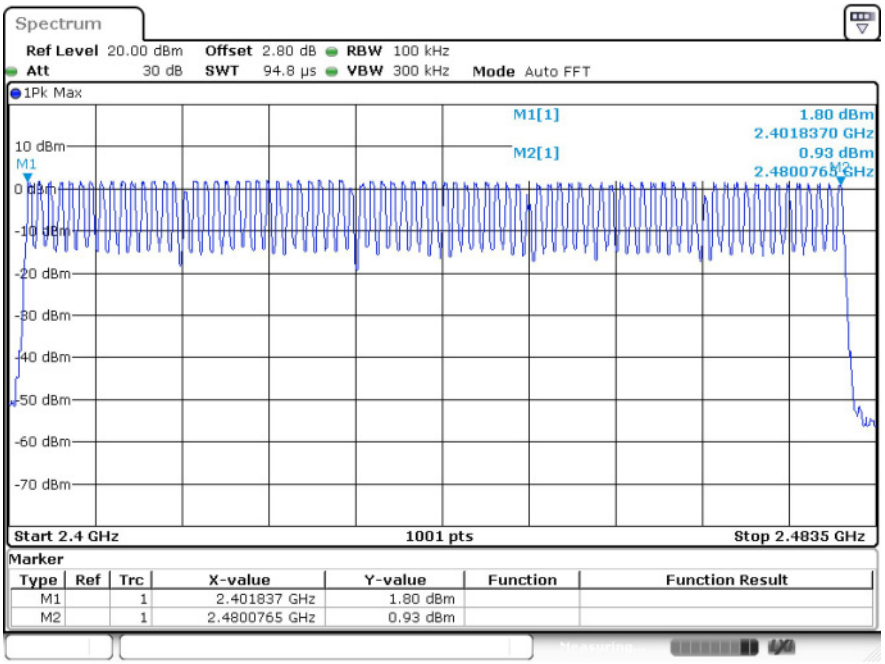
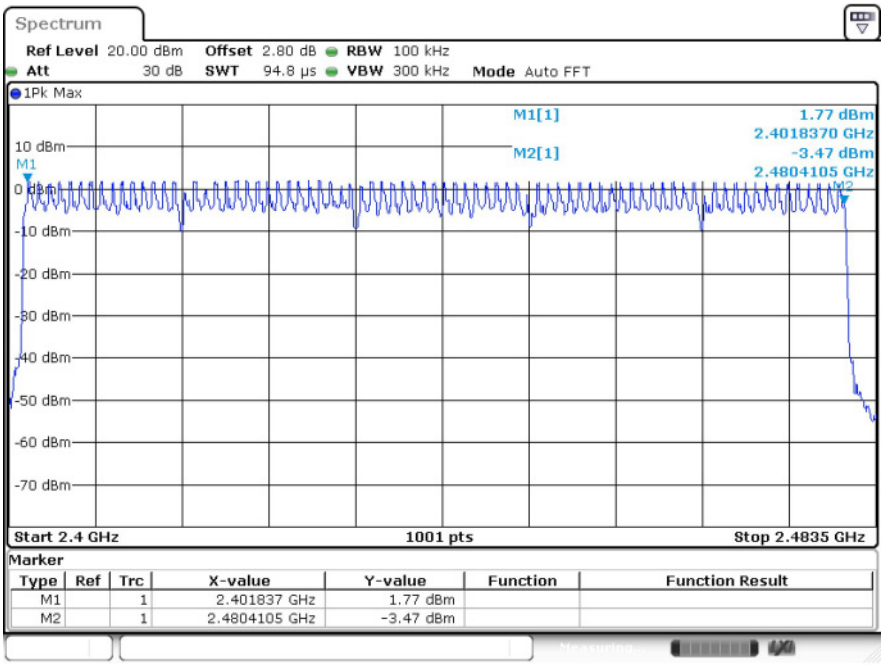
Spectrum
Ref Level 20.00 dBm Offset 2.80 dB RBW 30 kHz
Att 30 dB SWT 63.3 µs VBW 100 kHz Mode Auto FFT
1Pk Max
M1[1] -0.79 dBm
2.44101500 GHz
M2[1] -0.92 dBm
2.44201400 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
CF 2.4415 GHz
1001 pts
Span 2.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.441015 GHz -0.79 dBm
M2 1 2.442014 GHz -0.92 dBm

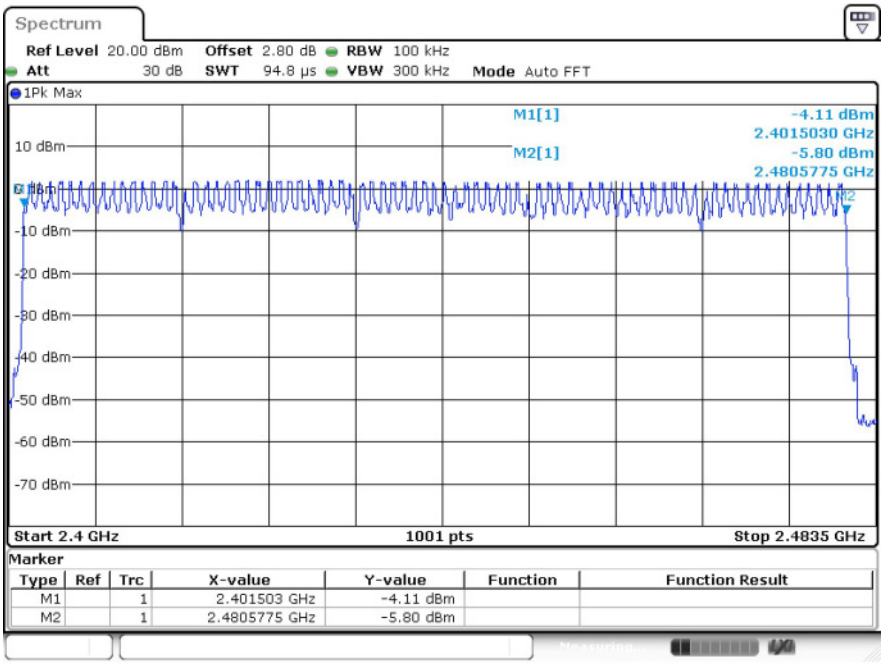
5 Hopping Channel Number

5.1 Test Result

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

5.2 Test Graphs

Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

8DPSK/Hop	

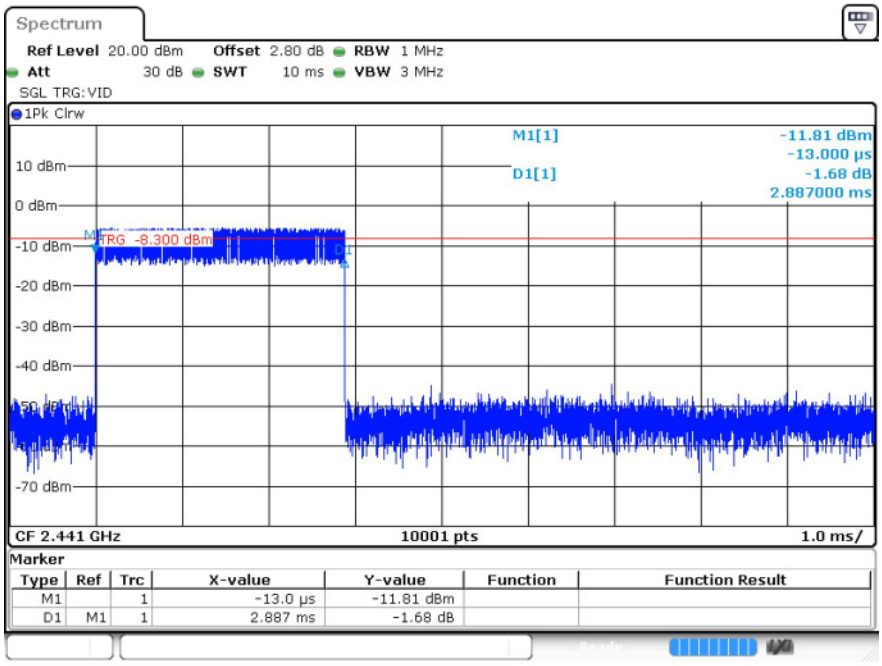
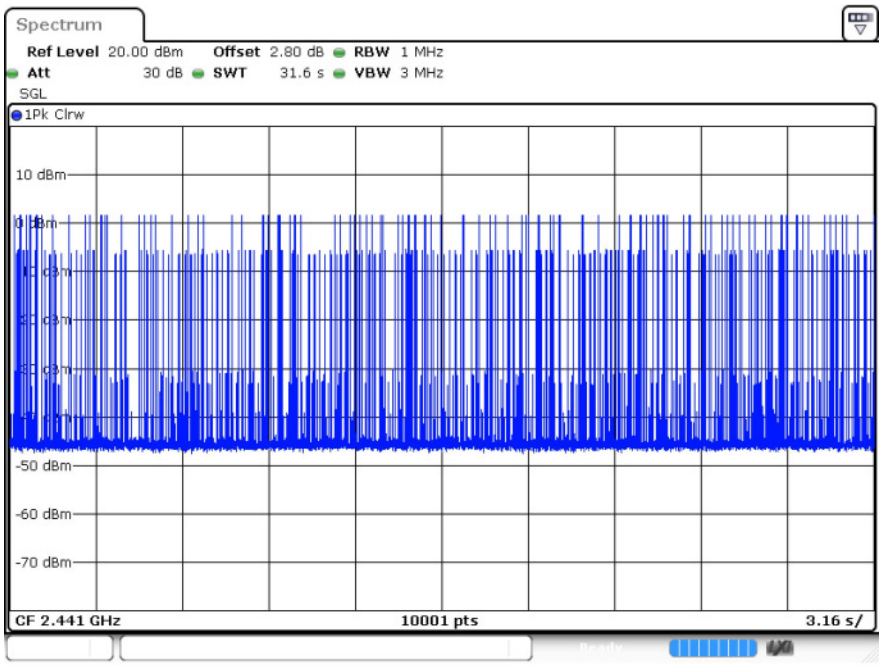
Spectrum
Ref Level 20.00 dBm Offset 2.80 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -4.11 dBm
2.4015030 GHz
M2[1] -5.80 dBm
2.4805775 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.4 GHz
1001 pts
Stop 2.4835 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.401503 GHz -4.11 dBm
M2 1 2.4805775 GHz -5.80 dBm

6 Dwell Time

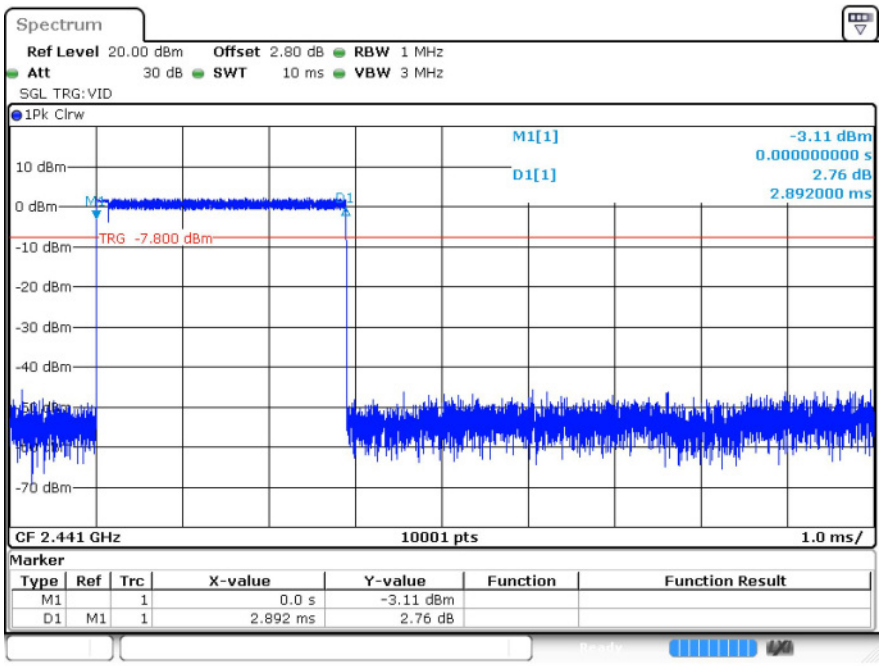
6.1 Test Result

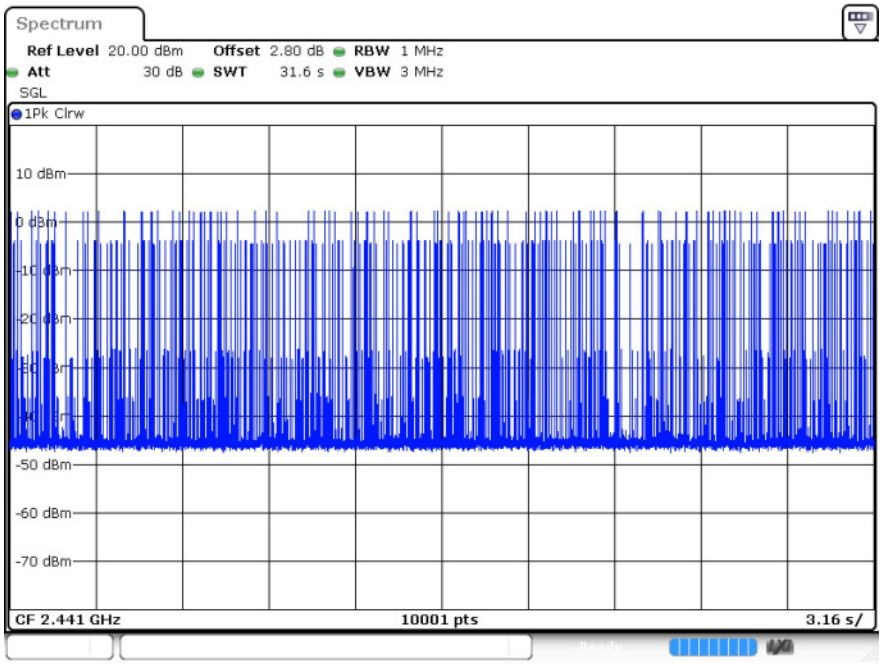
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.887	109	314.683	0.4	Pass
π/4DQPSK	2DH5	MCH	2.892	107	309.444	0.4	Pass
8DPSK	3DH5	MCH	2.894	116	335.704	0.4	Pass

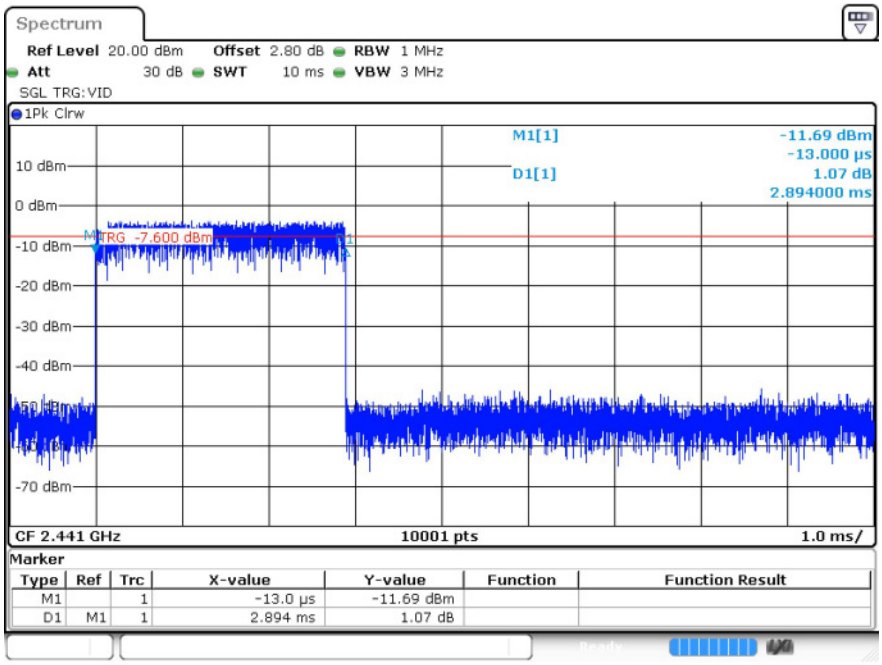
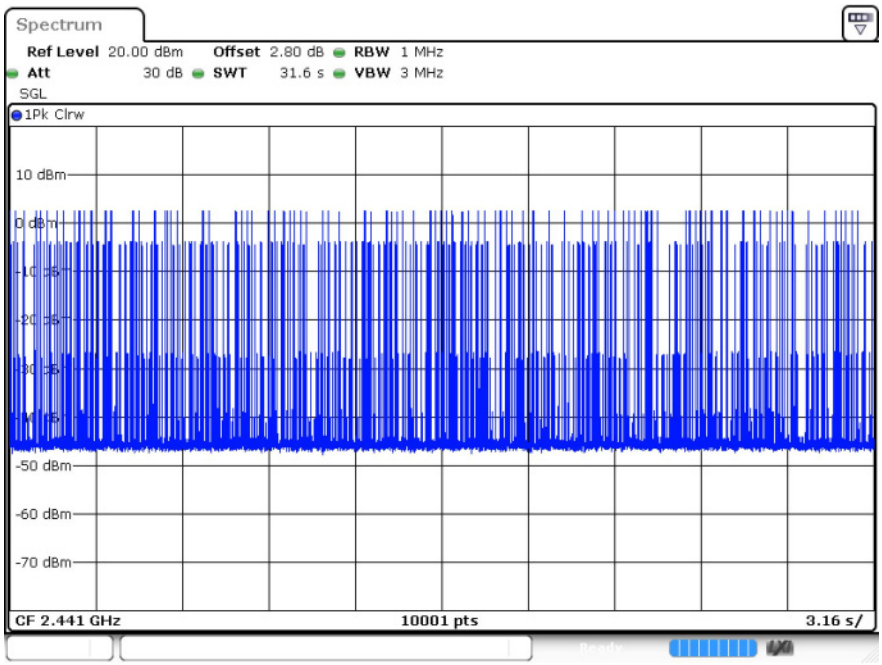
6.2 Test Graphs

Test Graphs	
GFSK_DH5/MCH	 

π/4DQPSK
_2DH5/MCH





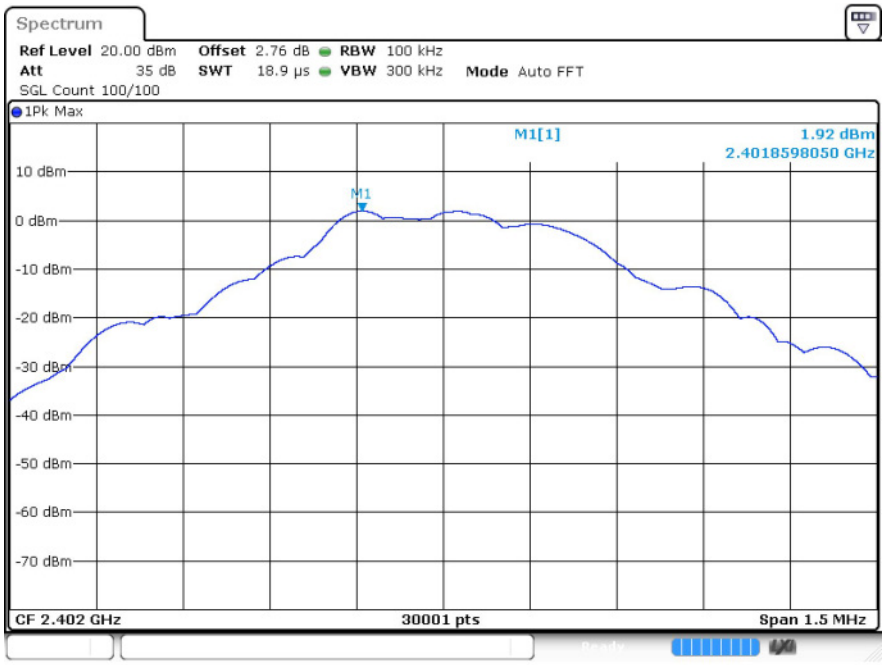
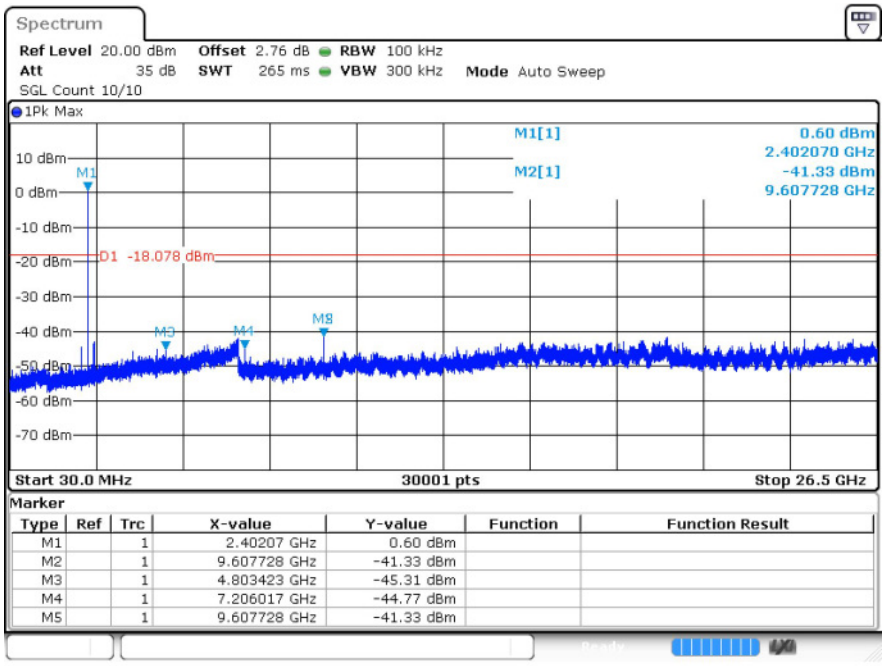
8DPSK _3DH5/MCH	 

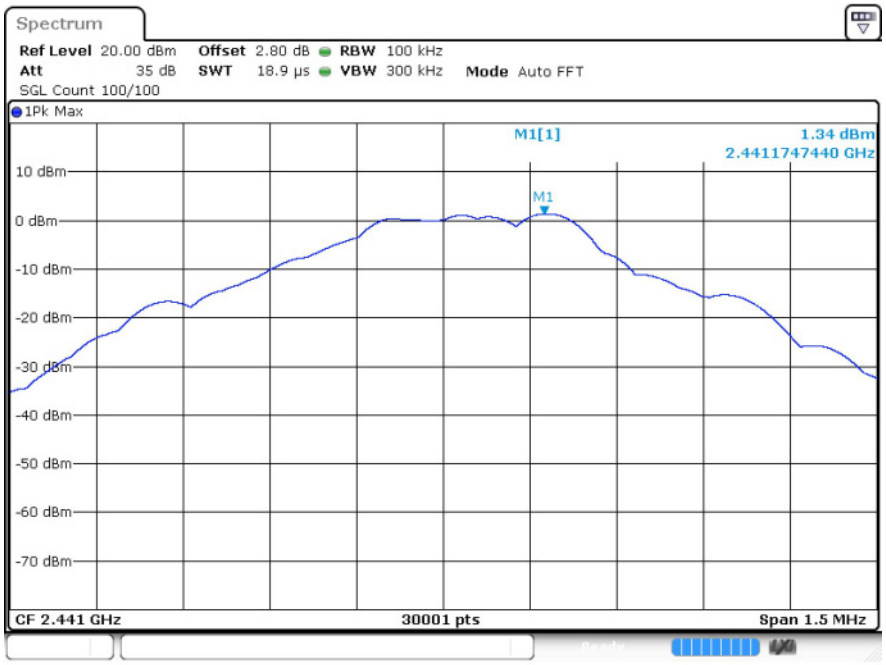
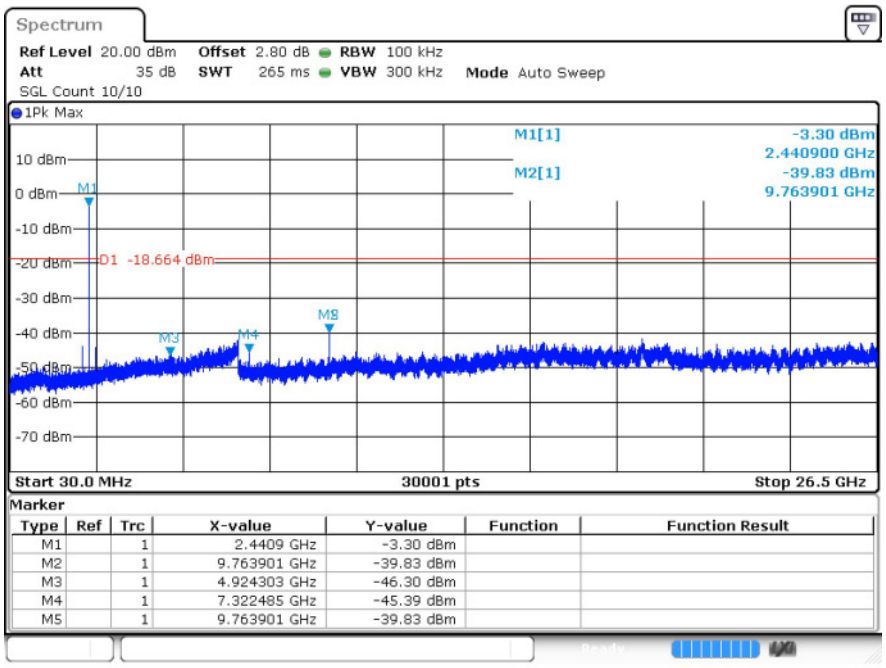
7 RF Conducted Spurious Emissions

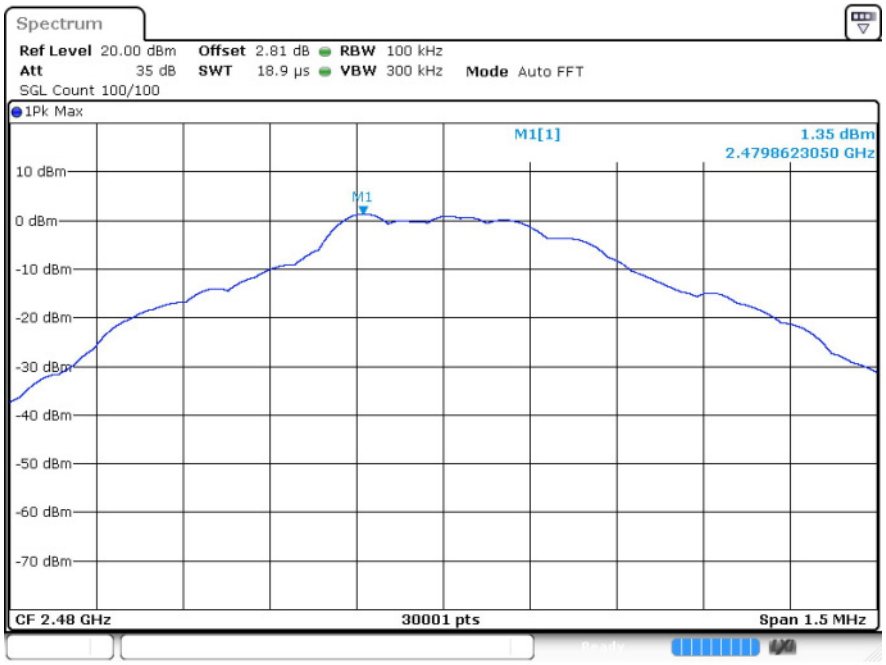
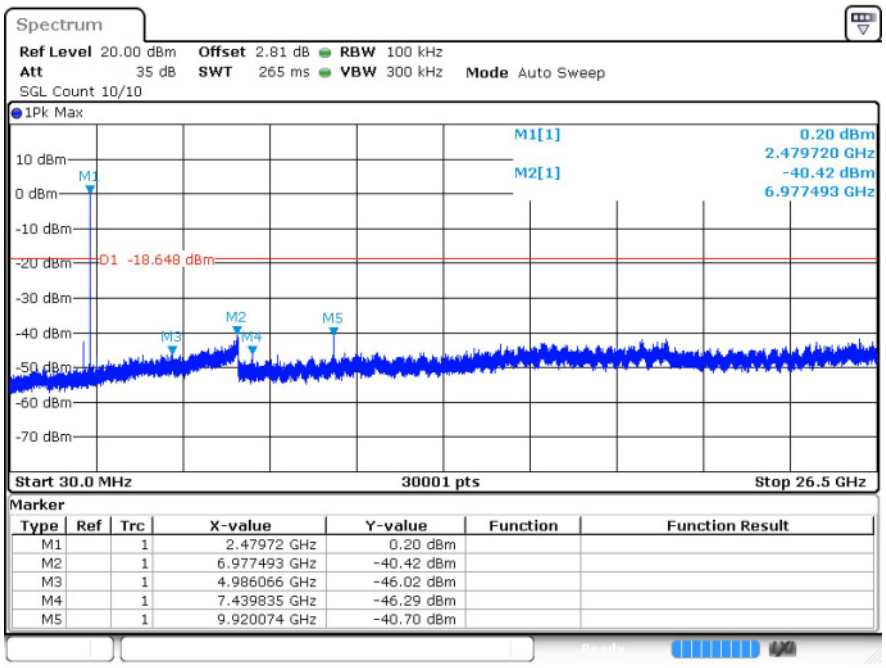
7.1 Test Result

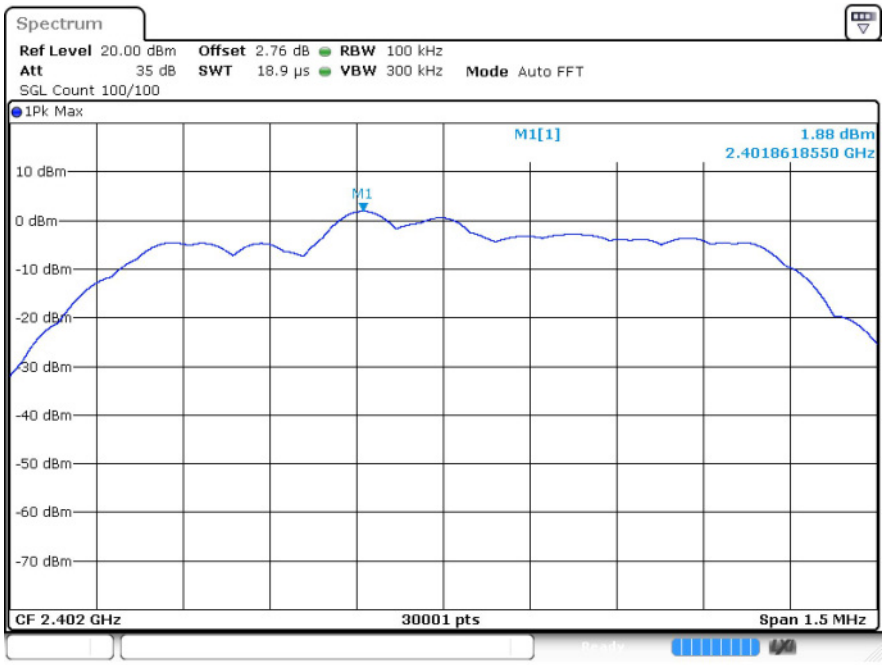
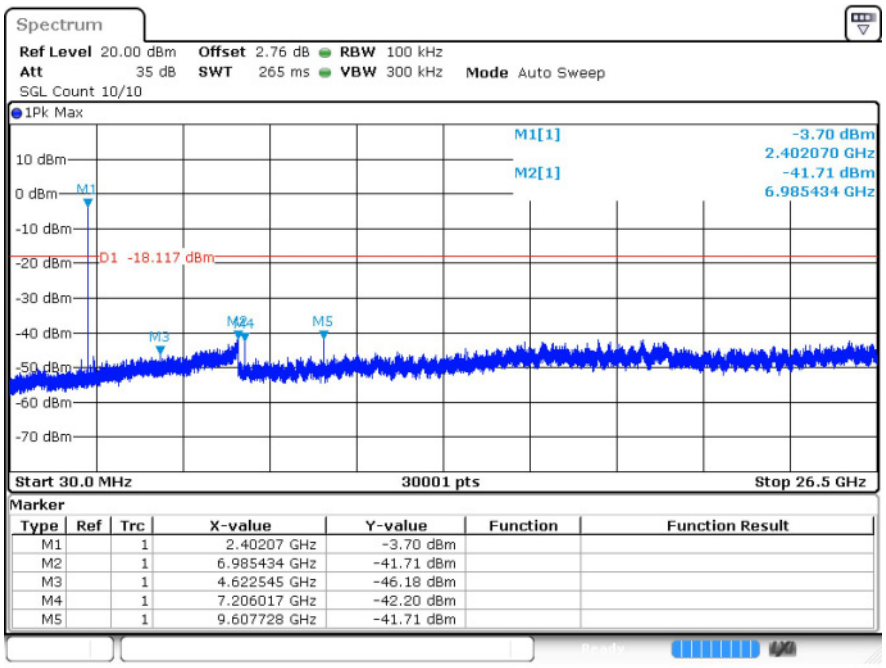
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-43.25	-20	Pass
	MCH	-41.17	-20	Pass
	HCH	-41.76	-20	Pass
π/4DQPSK	LCH	-43.58	-20	Pass
	MCH	-43.52	-20	Pass
	HCH	-42.13	-20	Pass
8DPSK	LCH	-44.2	-20	Pass
	MCH	-43.22	-20	Pass
	HCH	-41.87	-20	Pass

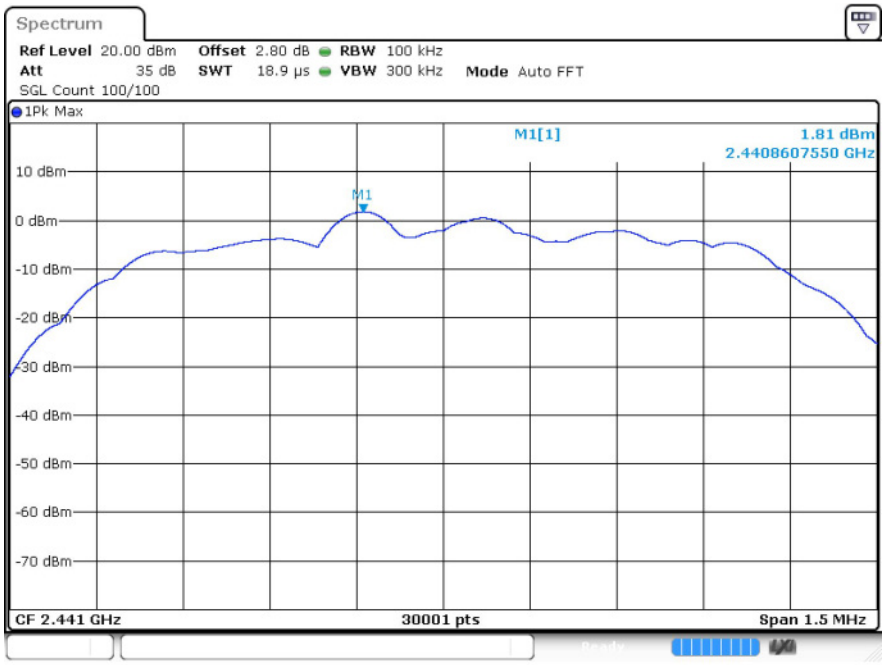
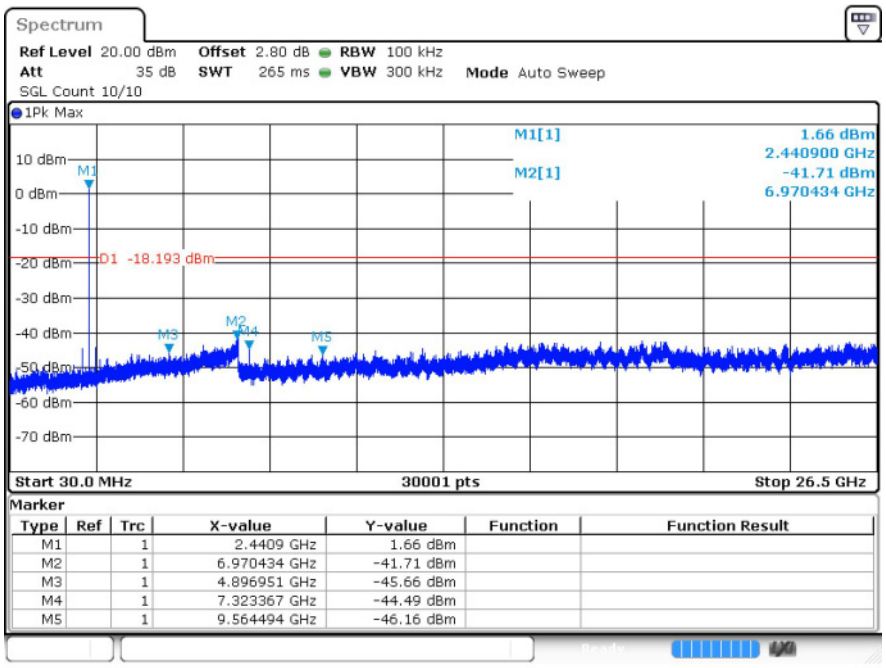
7.2 Test Graphs

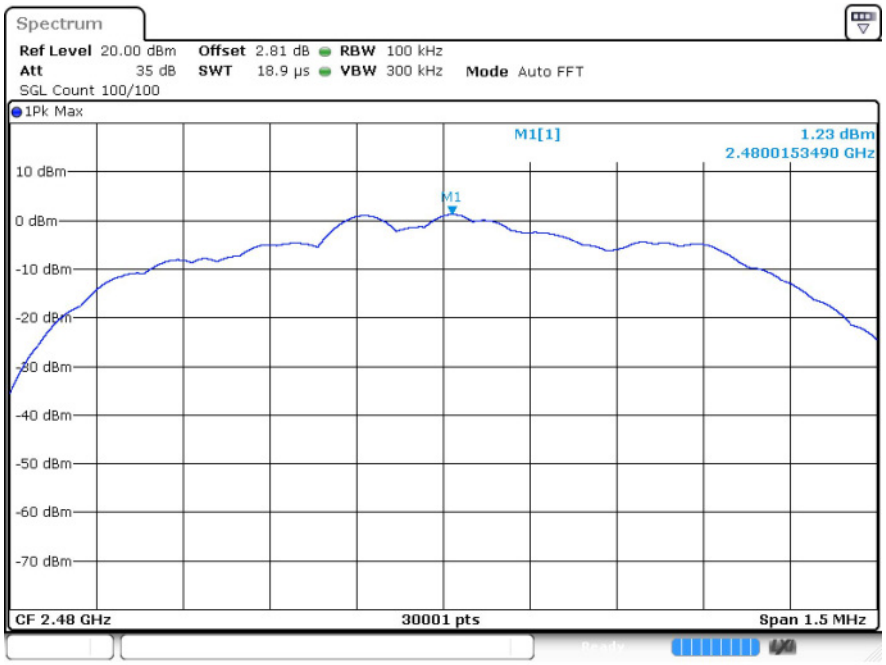
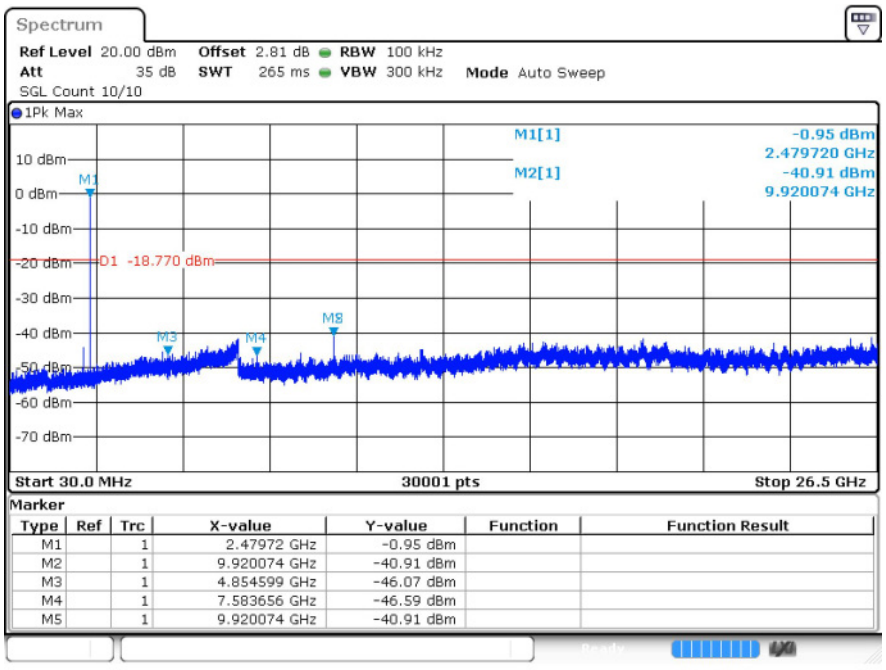
GFSK_LCH_Graphs	
Pref	
Puw	

GFSK_MCH_Graphs	
Pref	
Puw	 Marker Type | Ref | Trc | X-value | Y-value | Function | Function Result M1 | 1 | 2.4409 GHz | -3.30 dBm M2 | 1 | 9.763901 GHz | -39.83 dBm M3 | 1 | 4.924303 GHz | -46.30 dBm M4 | 1 | 7.322485 GHz | -45.39 dBm M5 | 1 | 9.763901 GHz | -39.83 dBm

GFSK_HCH_Graphs	
Pref	
Puw	 Marker Type | Ref | Trc | X-value | Y-value | Function | Function Result M1 | 1 | 2.47972 GHz | 0.20 dBm M2 | 1 | 6.977493 GHz | -40.42 dBm M3 | 1 | 4.986066 GHz | -46.02 dBm M4 | 1 | 7.439835 GHz | -46.29 dBm M5 | 1 | 9.920074 GHz | -40.70 dBm

π/4DQPSK_LCH_Graphs	
Pref	
Puw	

π/4DQPSK_MCH_Graphs	
Pref	
Puw	

π/4DQPSK_HCH_Graphs	
Pref	
Puw	 Marker Type | Ref | Trc | X-value | Y-value | Function | Function Result M1 | 1 | 2.47972 GHz | -0.95 dBm M2 | 1 | 9.920074 GHz | -40.91 dBm M3 | 1 | 4.854599 GHz | -46.07 dBm M4 | 1 | 7.583656 GHz | -46.59 dBm M5 | 1 | 9.920074 GHz | -40.91 dBm