Appendix A

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

Product Name: Colorful aromatherapy sleep speaker

Trade Mark: N/A

Test Model: SY810

Environmental Conditions

Temperature:	25.3℃
Relative Humidity:	52.4%
ATM Pressure:	101Kpa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung

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1 Duty Cycle

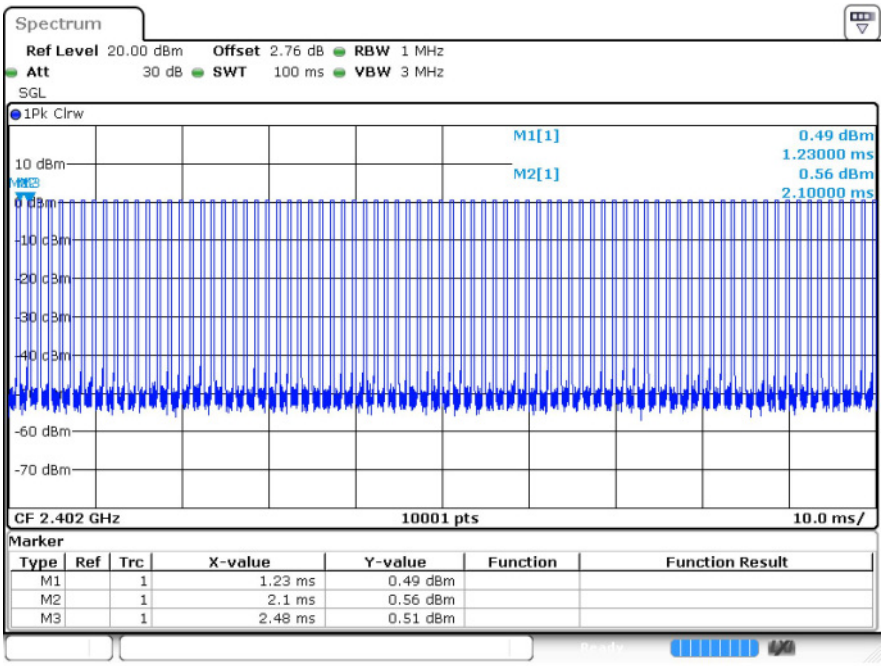
1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
1-DH1	2402	31.2	5.06	2.63
1-DH1	2441	31.97	4.95	2.56
1-DH1	2480	32.01	4.95	2.56
2-DH1	2402	32.01	4.95	2.56
2-DH1	2441	32.01	4.95	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	32.01	4.95	2.56

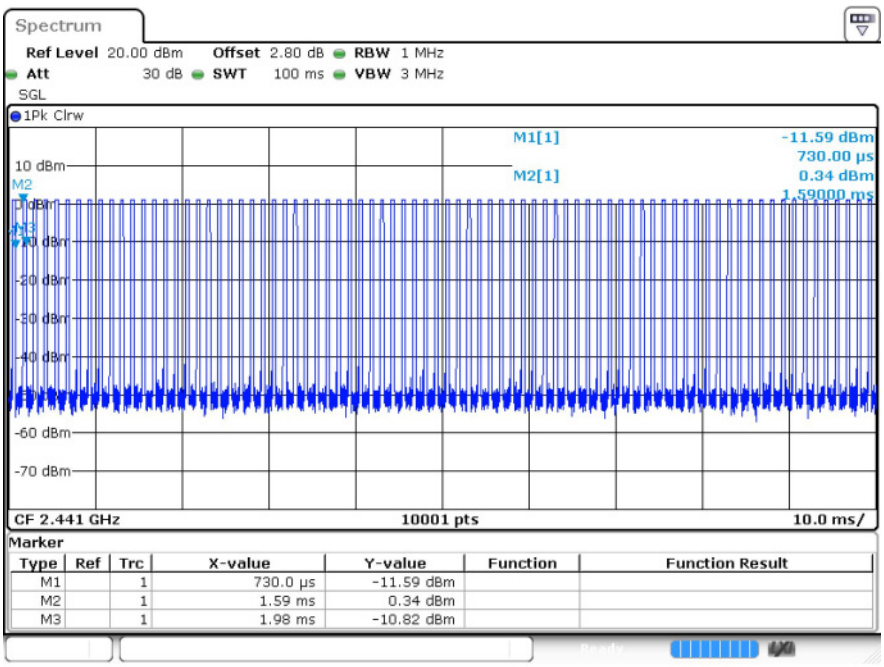
1.2 Test Graphs

Test Graphs

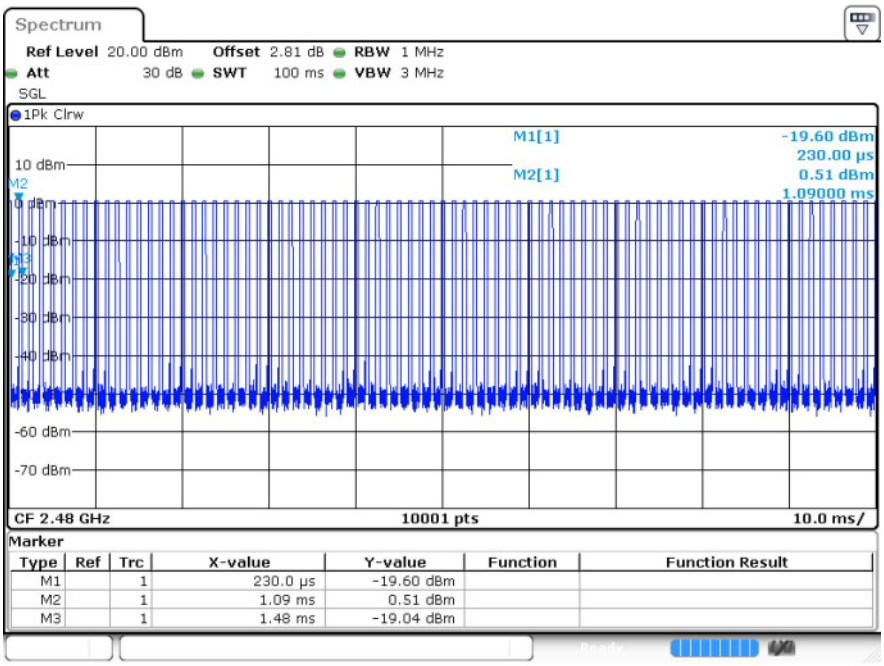
1-DH1 2402MHz



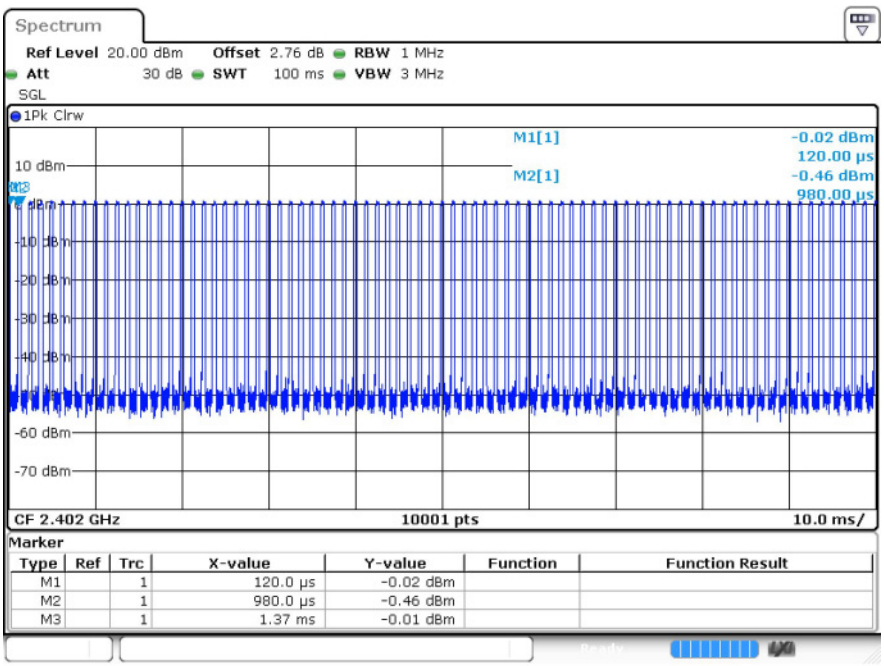
1-DH1 2441MHz



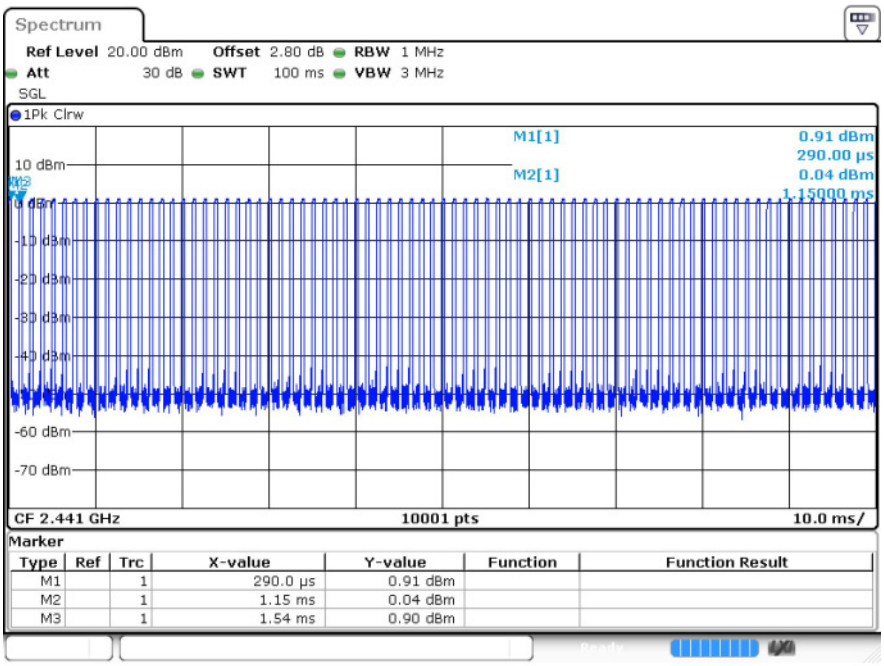
1-DH1 2480MHz



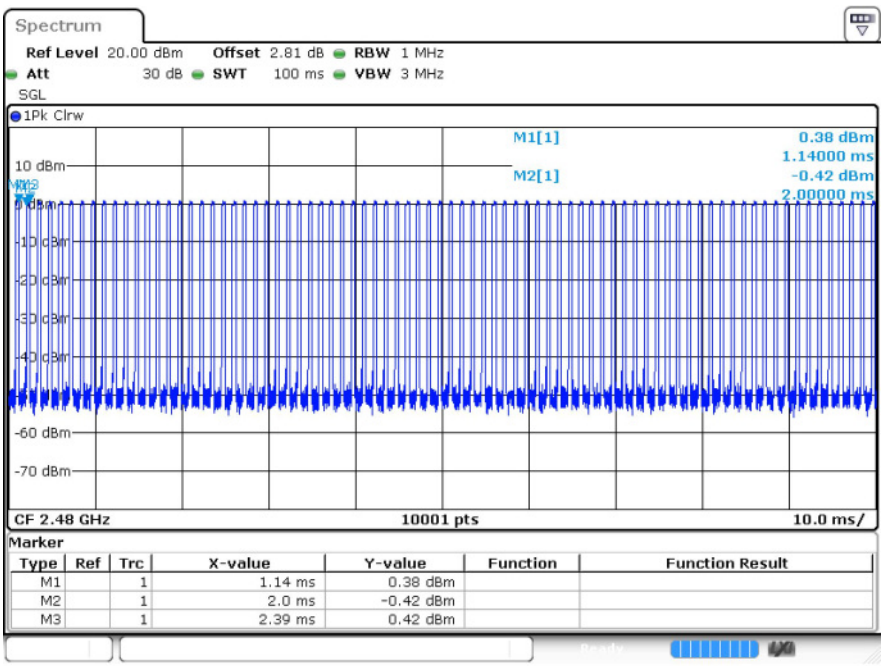
2-DH1 2402MHz



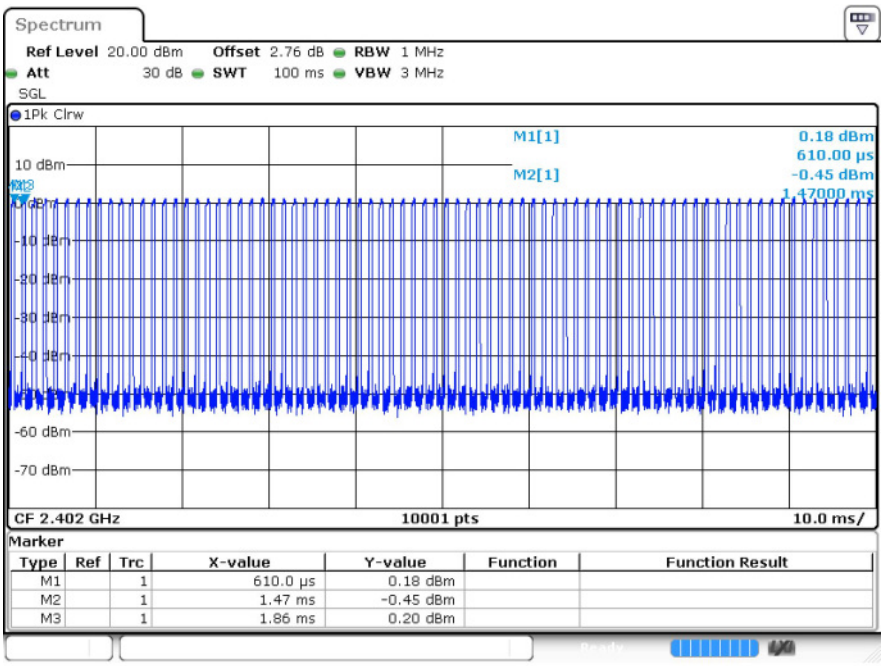
2-DH1 2441MHz



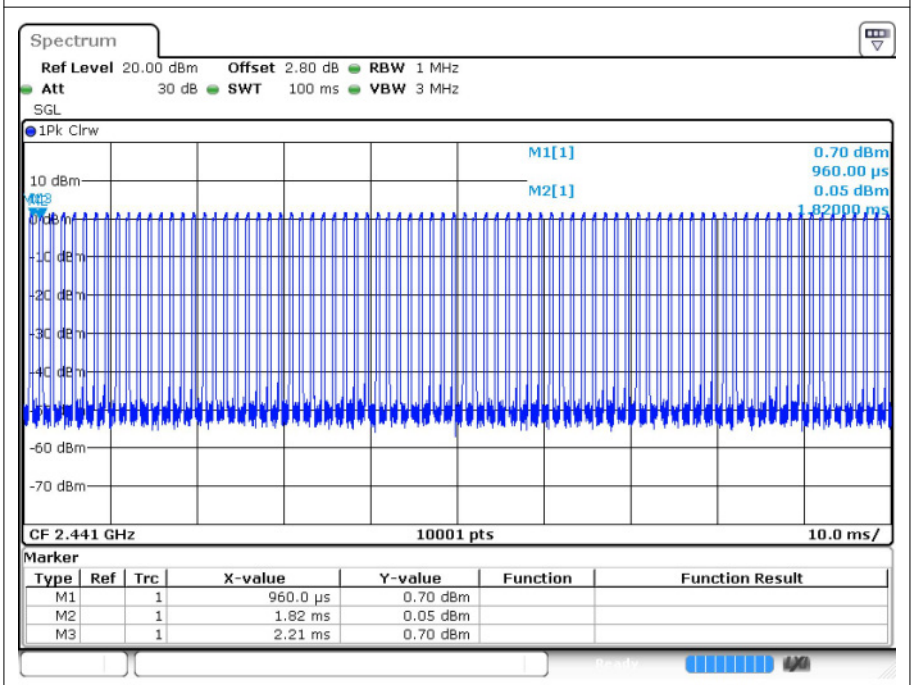
2-DH1 2480MHz



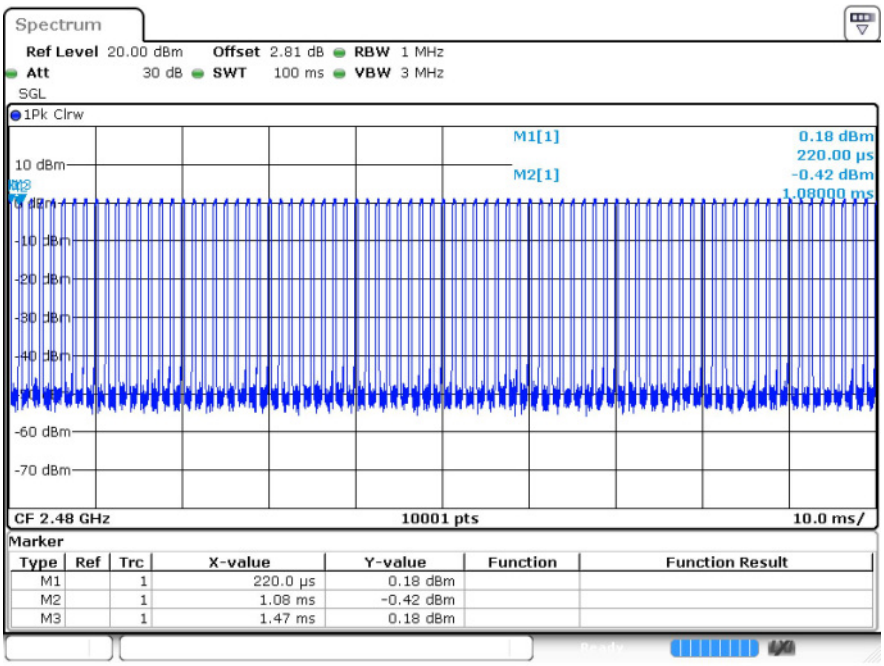
3-DH1 2402MHz



3-DH1 2441MHz



3-DH1 2480MHz

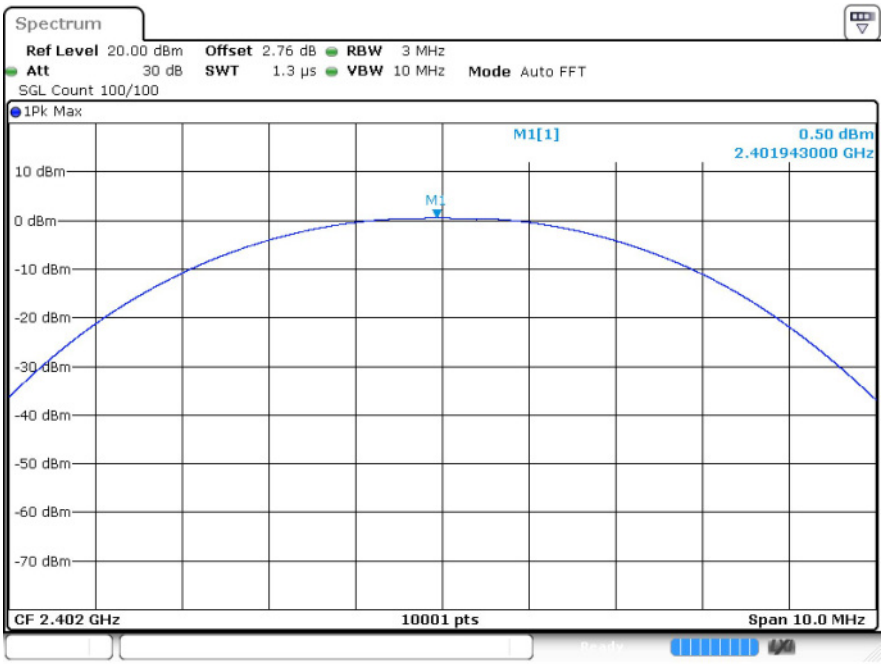
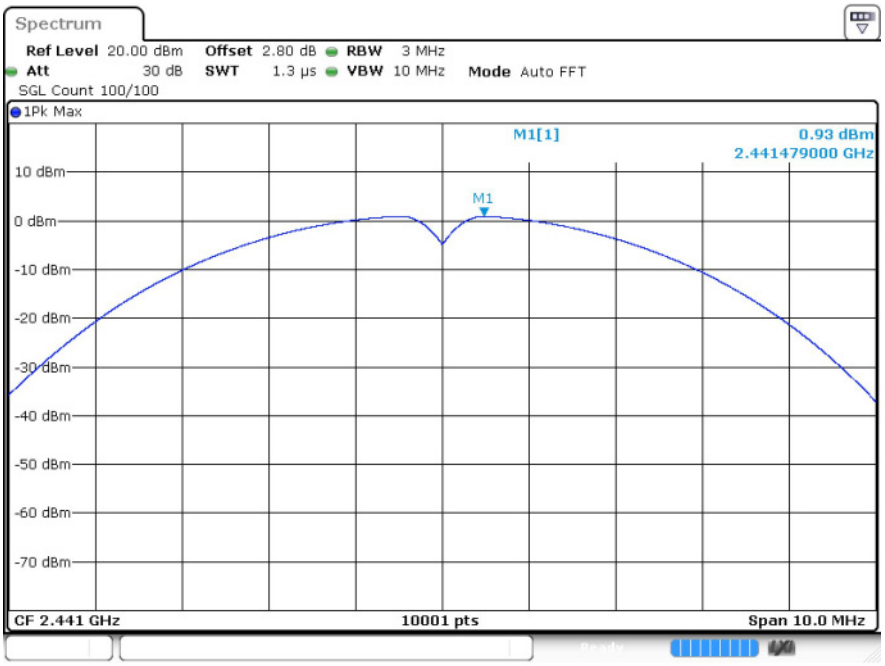


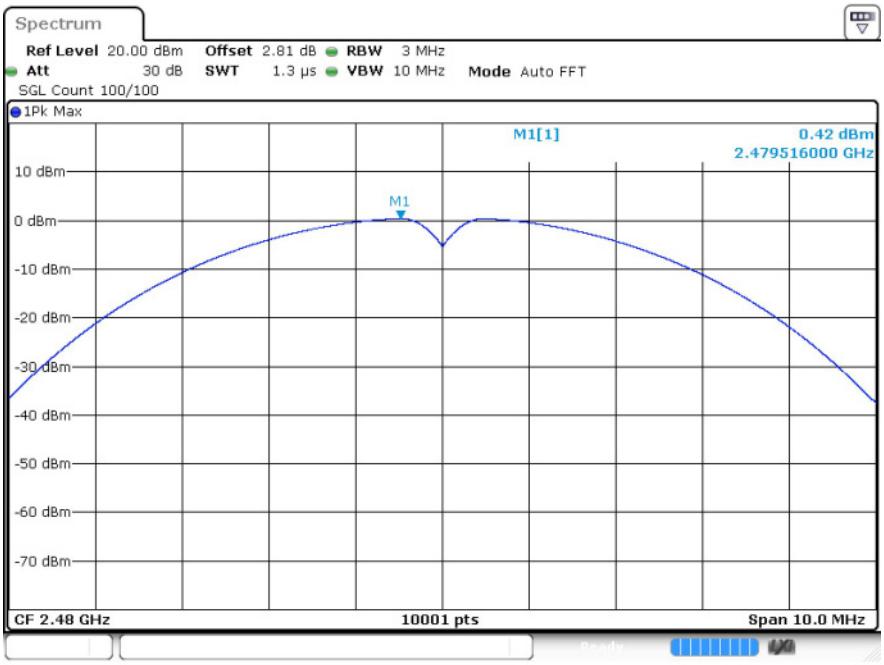
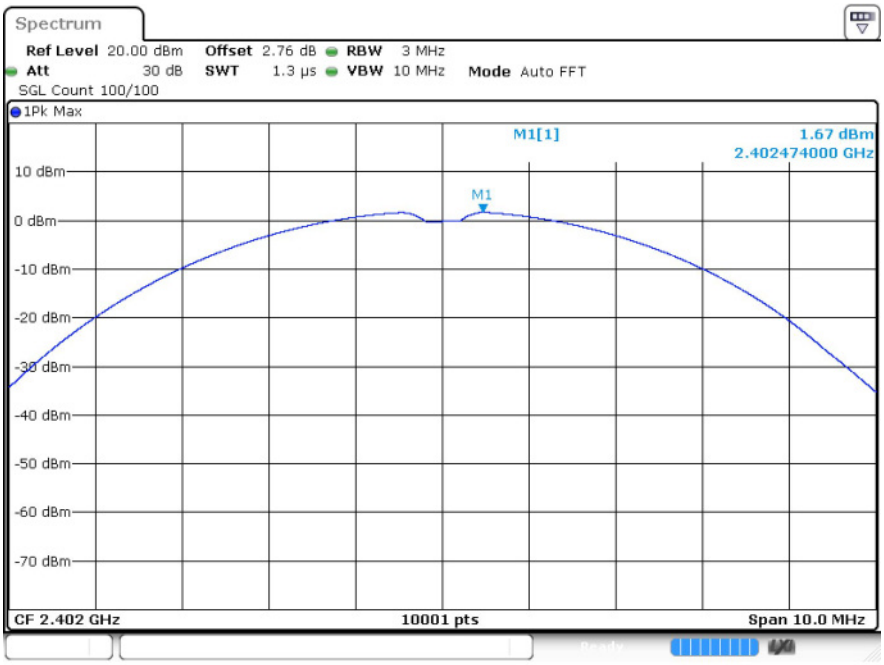
2 Maximum Conducted Peak Output Power

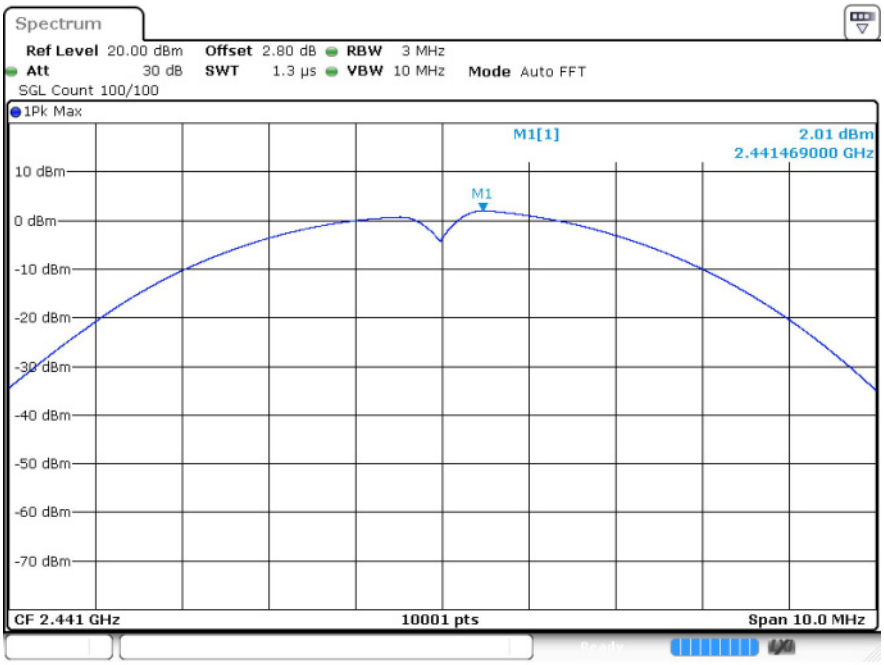
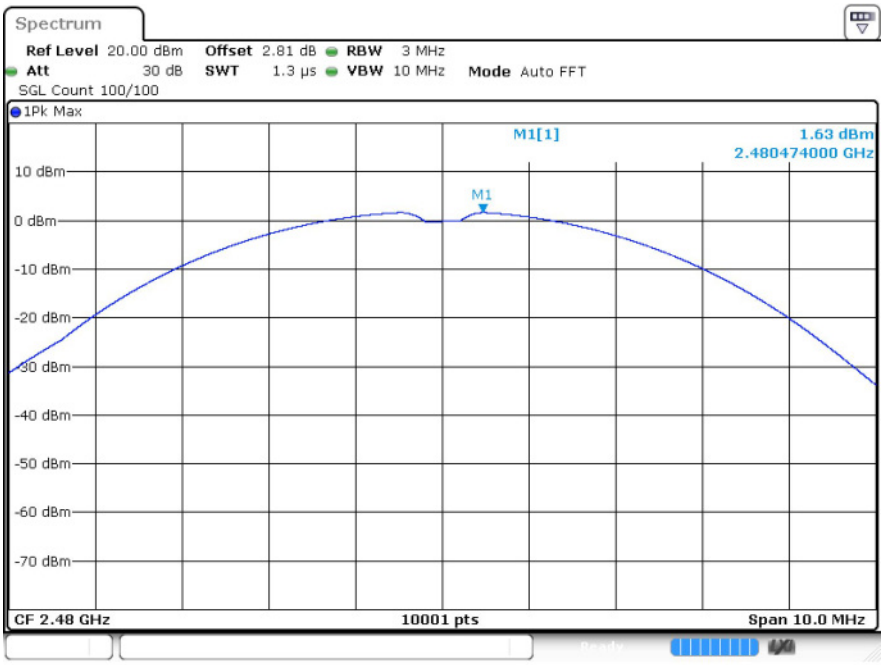
2.1 Test Result

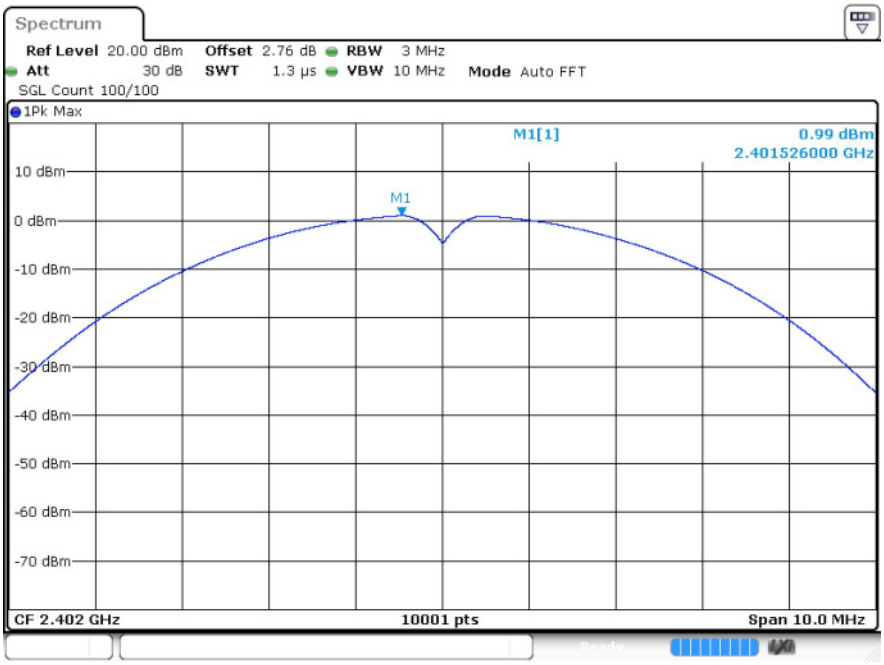
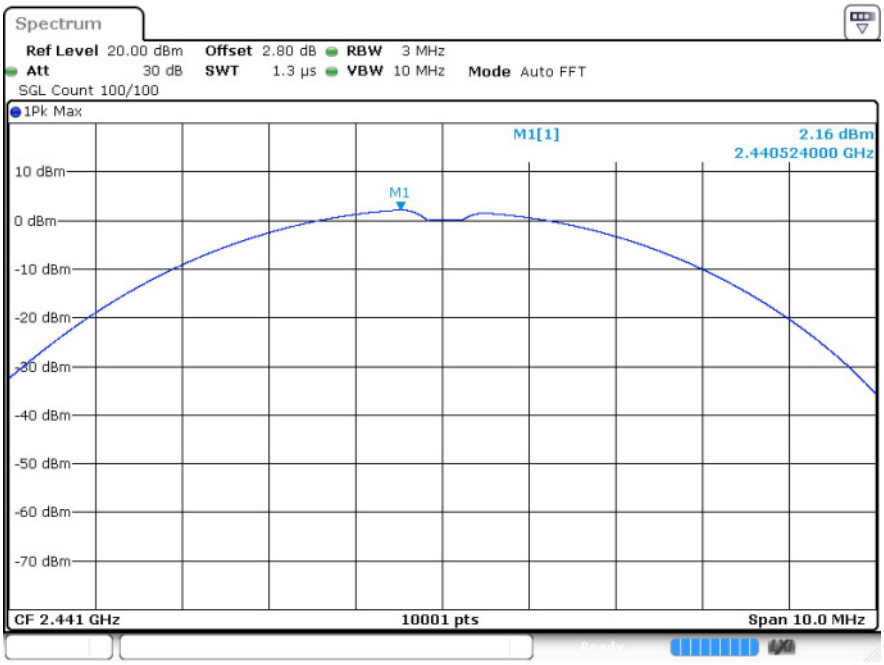
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.5	21	Pass
	MCH	0.93	21	Pass
	HCH	0.42	21	Pass
π/4DQPSK	LCH	1.67	21	Pass
	MCH	2.01	21	Pass
	HCH	1.63	21	Pass
8DPSK	LCH	0.99	21	Pass
	MCH	2.16	21	Pass
	HCH	1.21	21	Pass

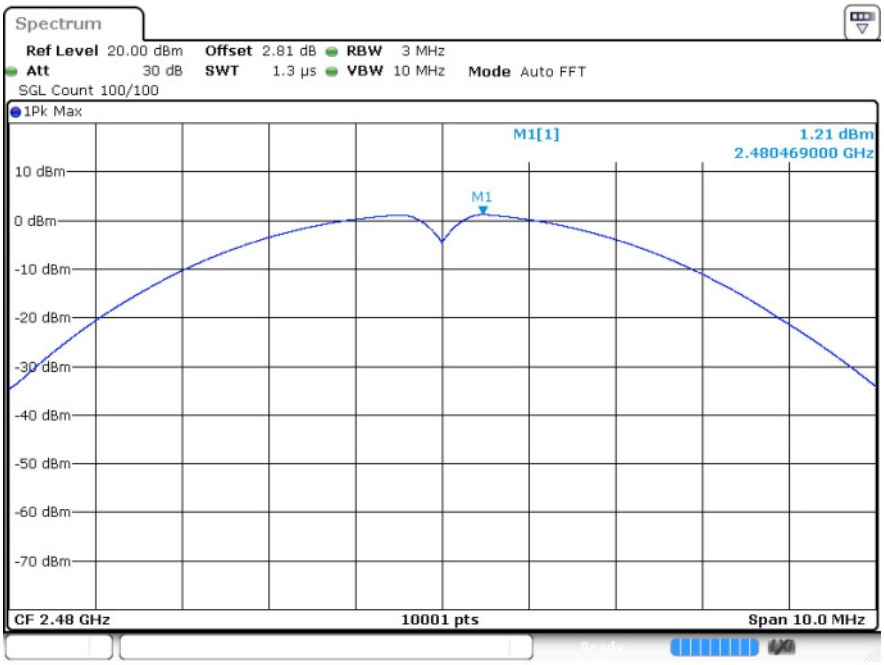
2.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

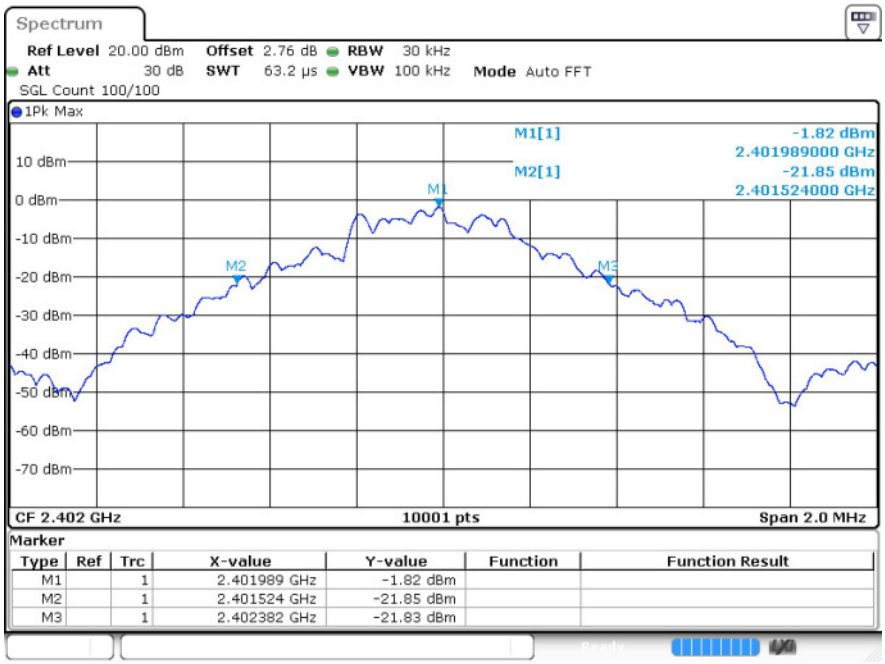
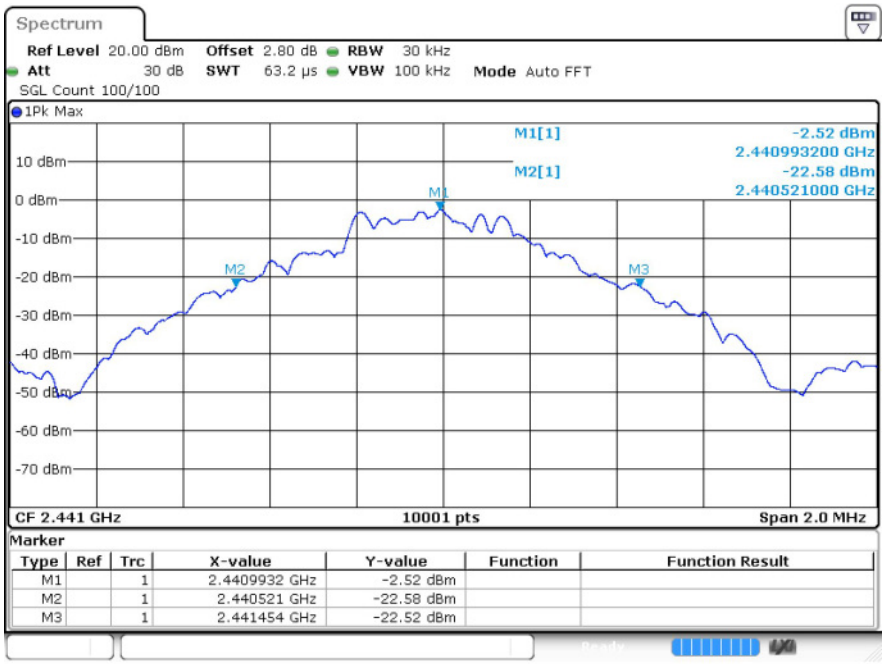
8DPSK/HCH	 Spectrum Ref Level 20.00 dBm Offset 2.81 dB RBW 3 MHz Att 30 dB SWT 1.3 µs VBW 10 MHz Mode Auto FFT SGL Count 100/100 1Pk Max M1[1] 1.21 dBm 2.480469000 GHz M1 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.48 GHz 10001 pts Span 10.0 MHz

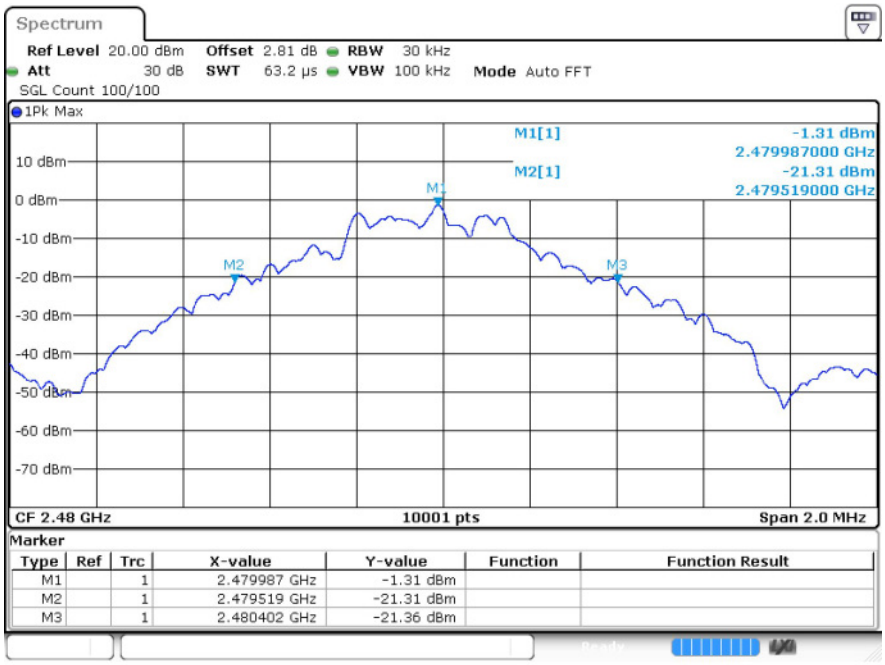
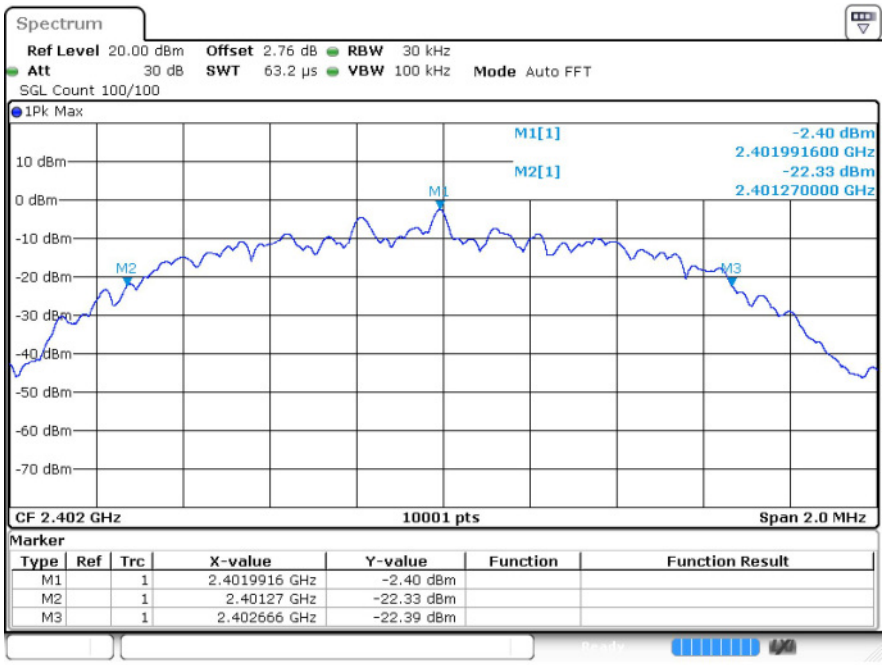
3 20dB Bandwidth

3.1 Test Result

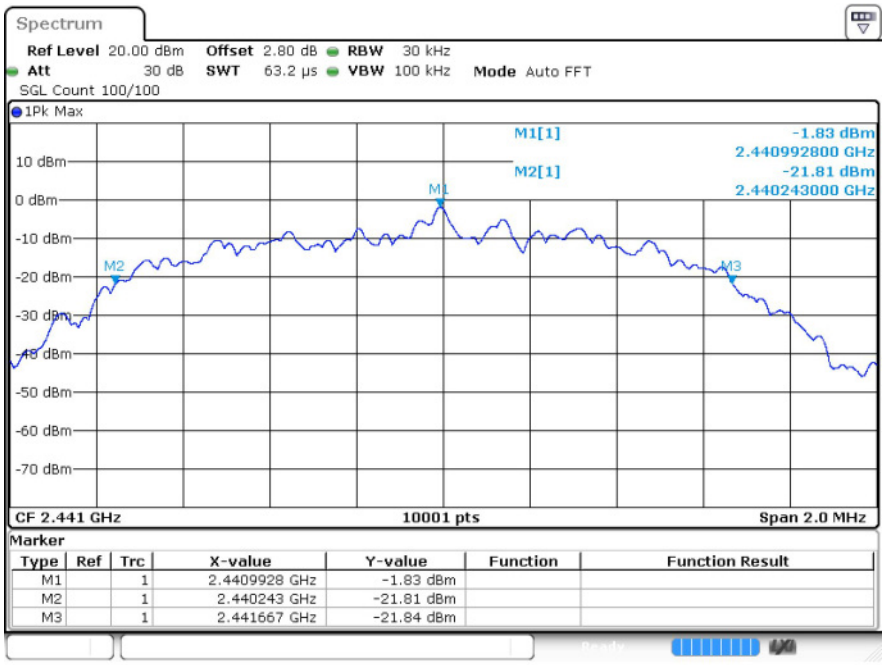
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.858	Not Specified	Pass
	MCH	0.933	Not Specified	Pass
	HCH	0.883	Not Specified	Pass
π/4DQPSK	LCH	1.396	Not Specified	Pass
	MCH	1.424	Not Specified	Pass
	HCH	1.426	Not Specified	Pass
8DPSK	LCH	1.432	Not Specified	Pass
	MCH	1.414	Not Specified	Pass
	HCH	1.468	Not Specified	Pass

3.2 Test Graphs

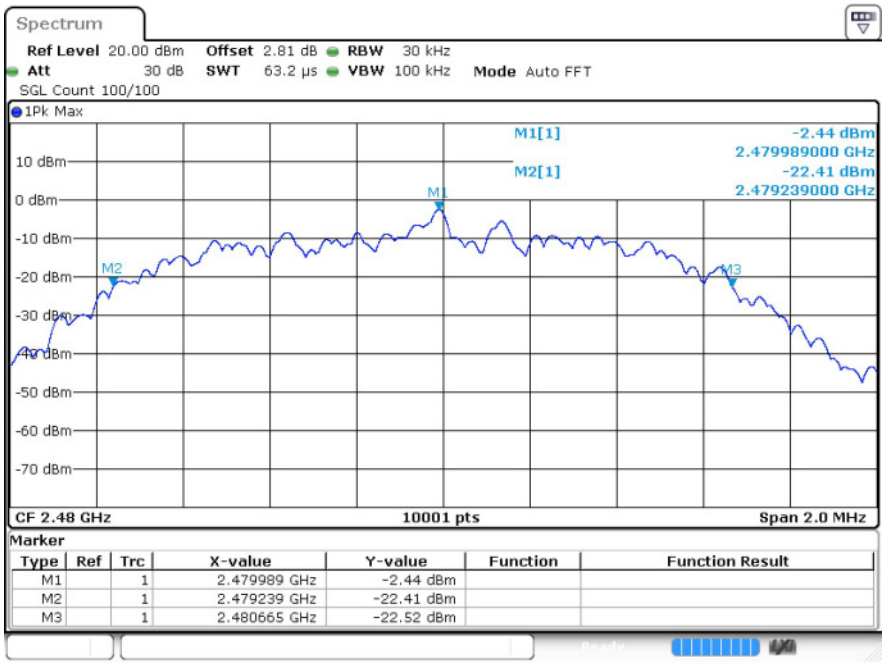
Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

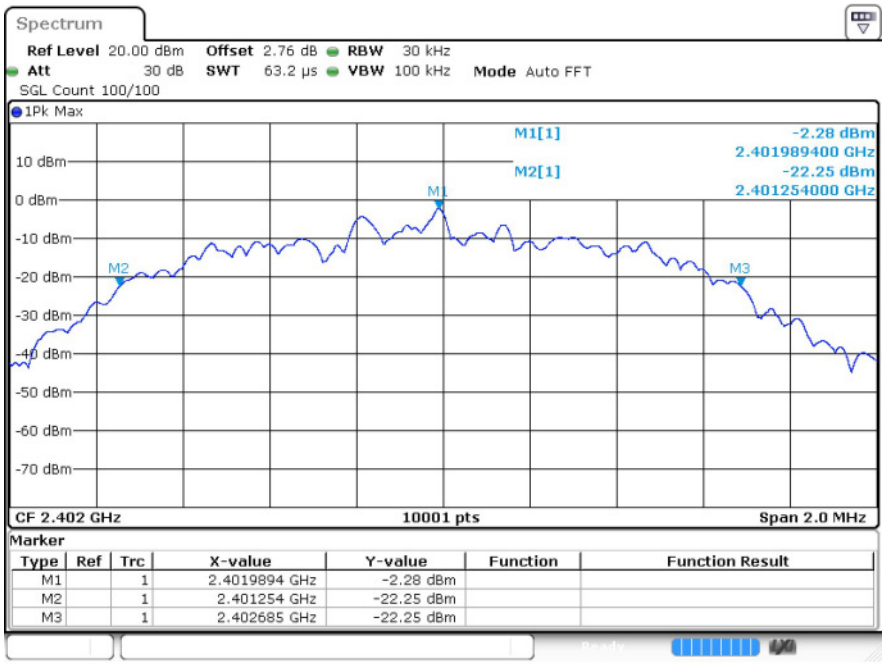
π/4DQPSK/MCH



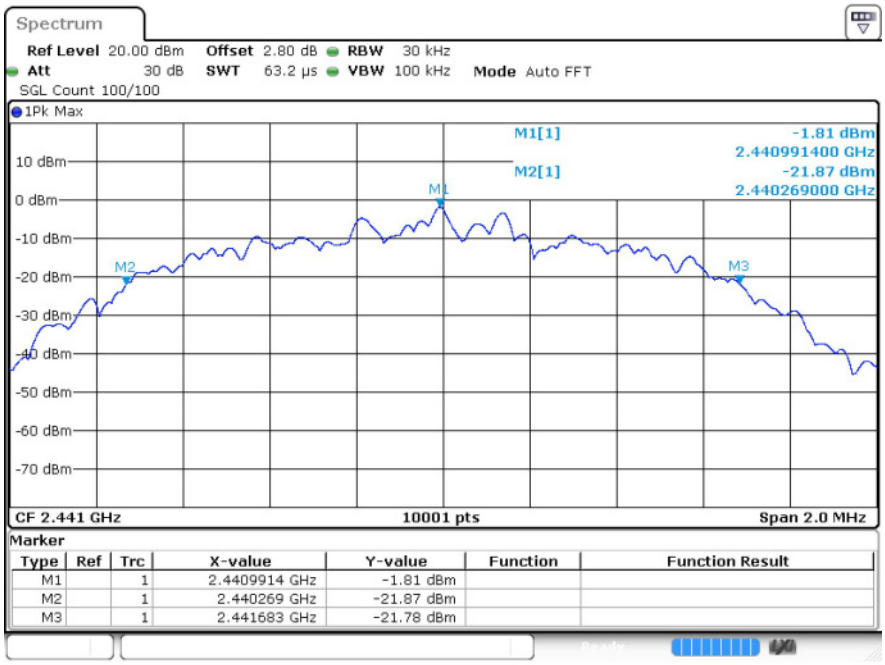
π/4DQPSK/HCH



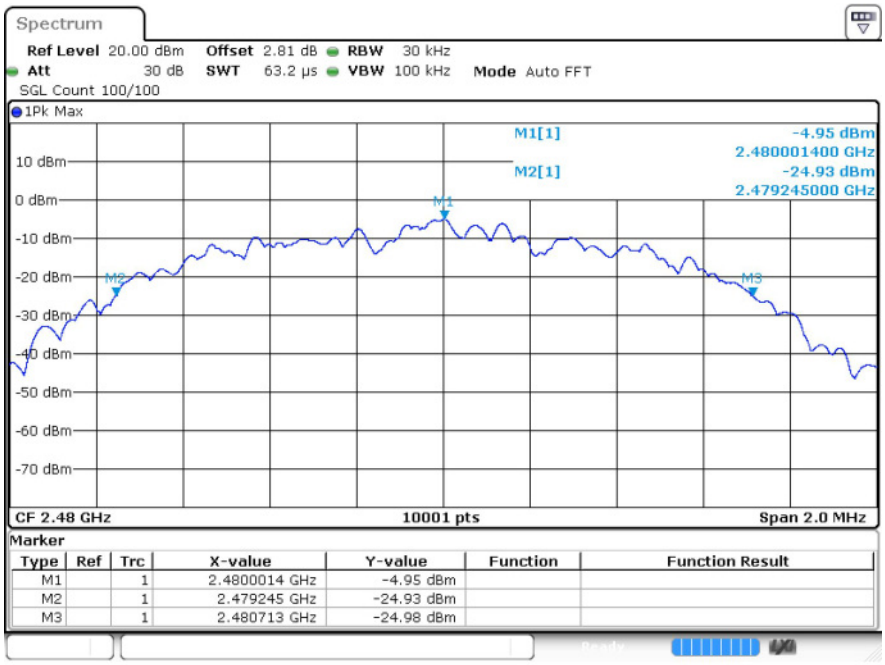
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

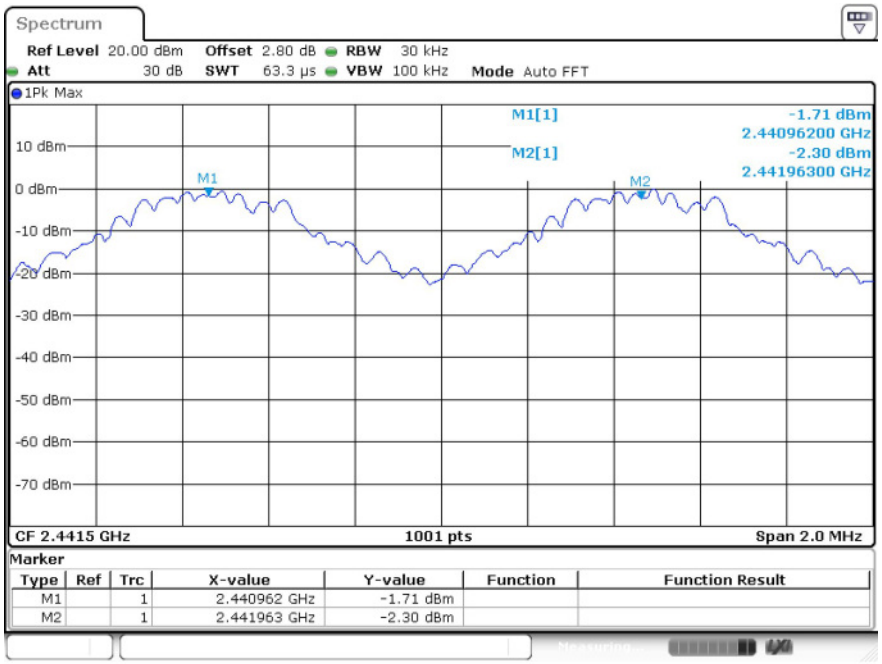
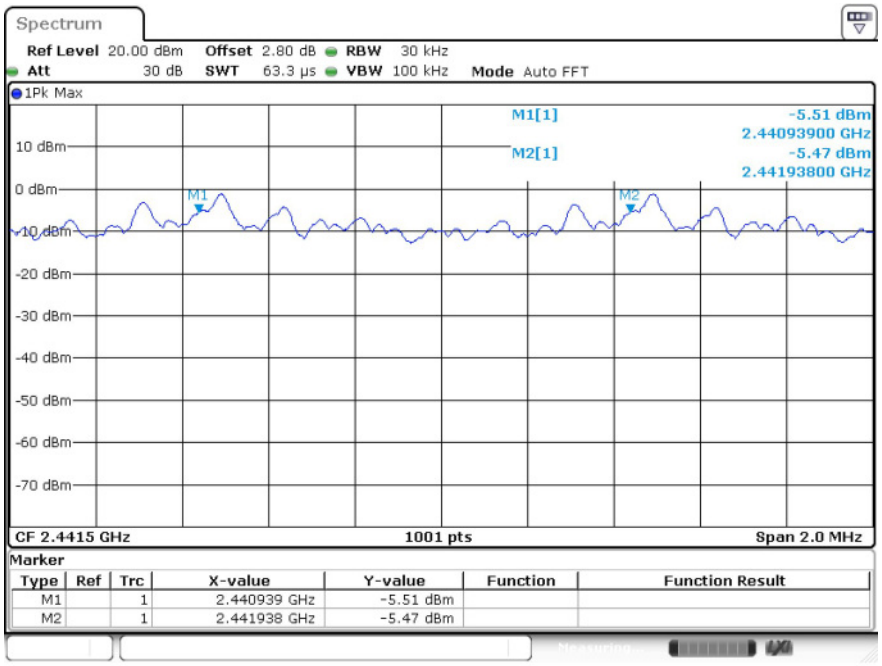

Spectrum
Ref Level 20.00 dBm Offset 2.81 dB RBW 30 kHz
Att 30 dB SWT 63.2 µs VBW 100 kHz Mode Auto FFT
SGL Count 100/100
1Pk Max
M1[1] -4.95 dBm 2.480001400 GHz
M2[1] -24.93 dBm 2.479245000 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.48 GHz
10001 pts
Span 2.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.4800014 GHz -4.95 dBm
M2 1 2.479245 GHz -24.93 dBm
M3 1 2.480713 GHz -24.98 dBm

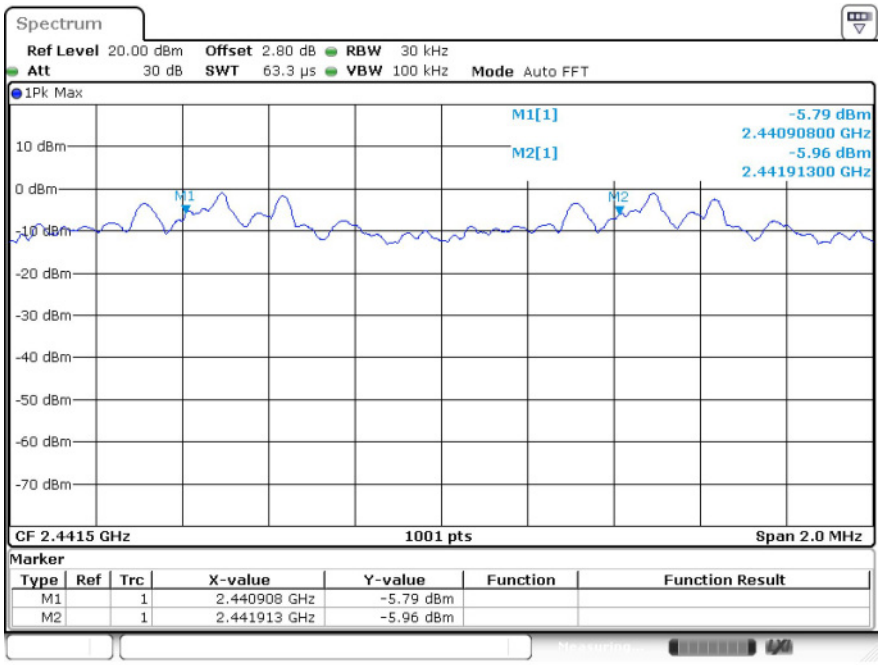
4 Carrier Frequency Separation

4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.622	Pass
π/4DQPSK	MCH	0.999	0.949	Pass
8DPSK	MCH	1.005	0.943	Pass

4.2 Test Graphs

Test Graphs	
GFSK/MCH	
π/4DQPSK/MCH	

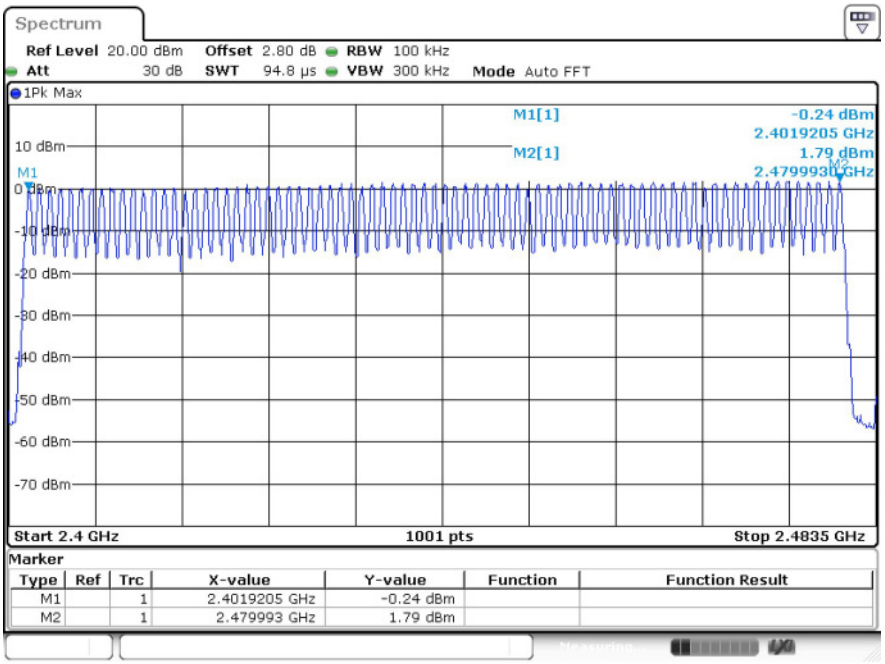
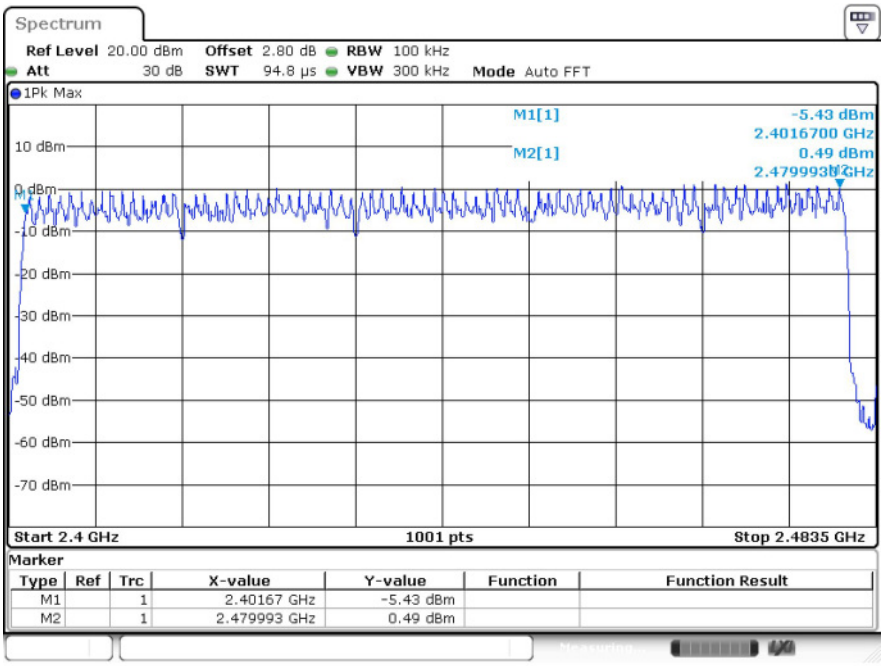
8DPSK/MCH	 Spectrum Ref Level 20.00 dBm Offset 2.80 dB RBW 30 kHz Att 30 dB SWT 63.3 µs VBW 100 kHz Mode Auto FFT 1Pk Max M1[1] -5.79 dBm 2.44090800 GHz M2[1] -5.96 dBm 2.44191300 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.4415 GHz 1001 pts Span 2.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.440908 GHz -5.79 dBm M2 1 2.441913 GHz -5.96 dBm

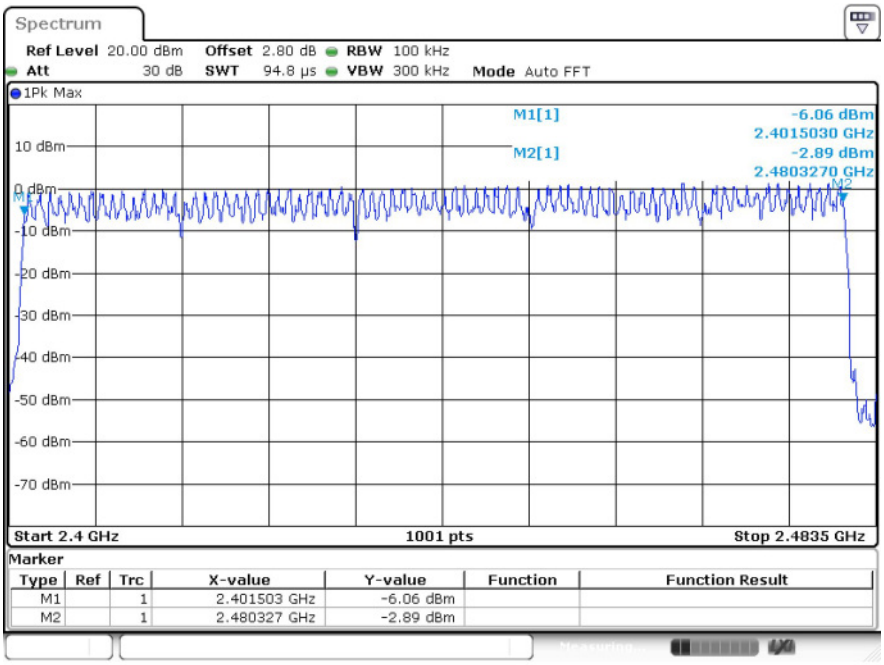
5 Hopping Channel Number

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	

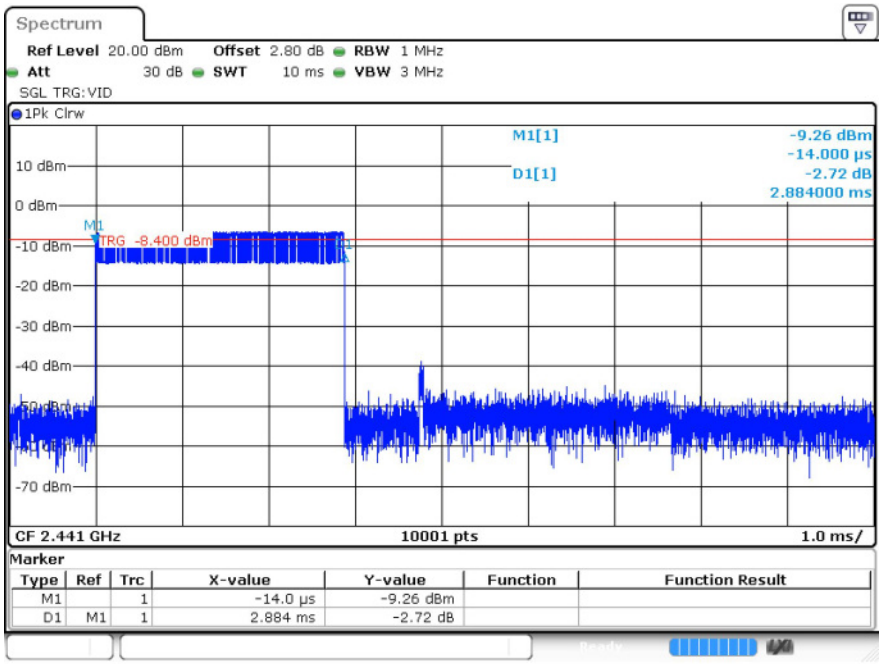
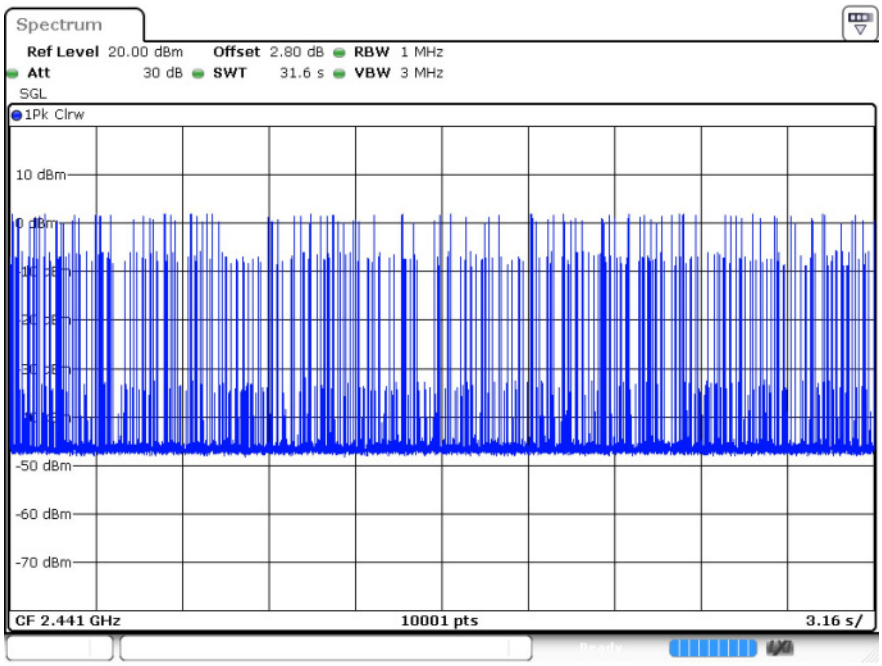
Spectrum
Ref Level 20.00 dBm Offset 2.80 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -6.06 dBm 2.4015030 GHz
M2[1] -2.89 dBm 2.4803270 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.4 GHz 1001 pts Stop 2.4835 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.401503 GHz -6.06 dBm
M2 1 2.480327 GHz -2.89 dBm

6 Dwell Time

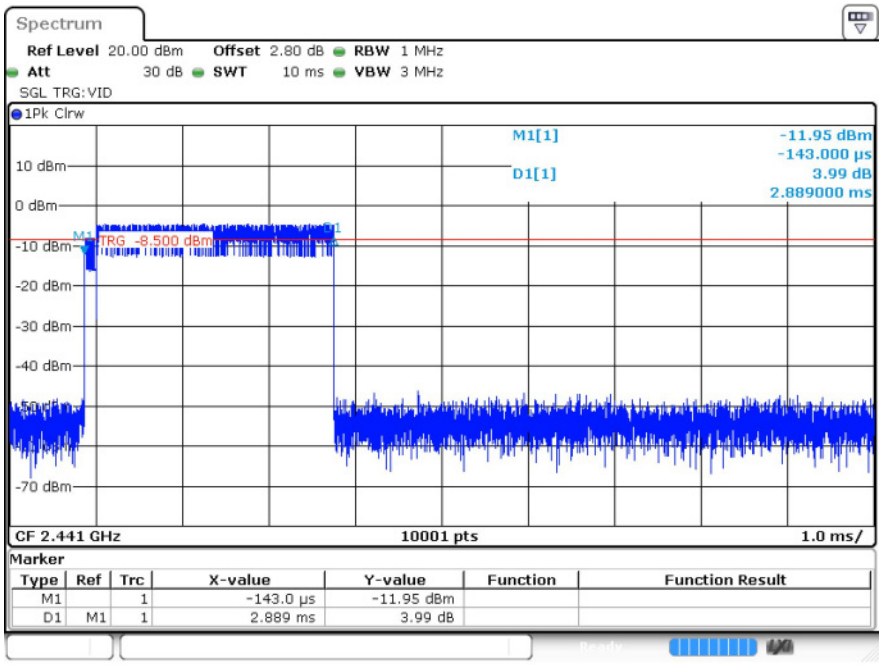
6.1 Test Result

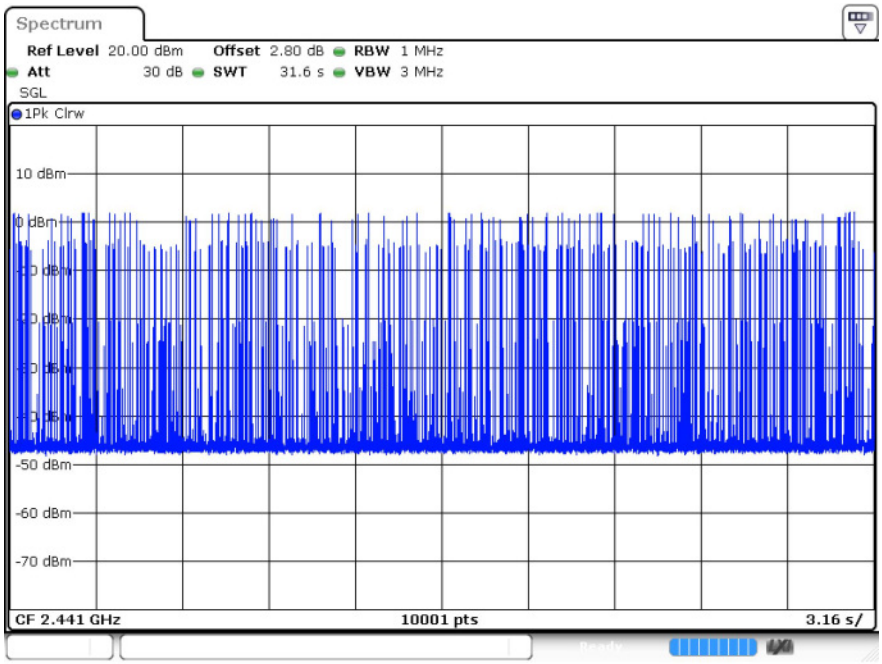
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.884	108	311.472	0.4	Pass
π/4DQPSK	2DH5	MCH	2.889	104	300.456	0.4	Pass
8DPSK	3DH5	MCH	2.891	103	297.773	0.4	Pass

6.2 Test Graphs

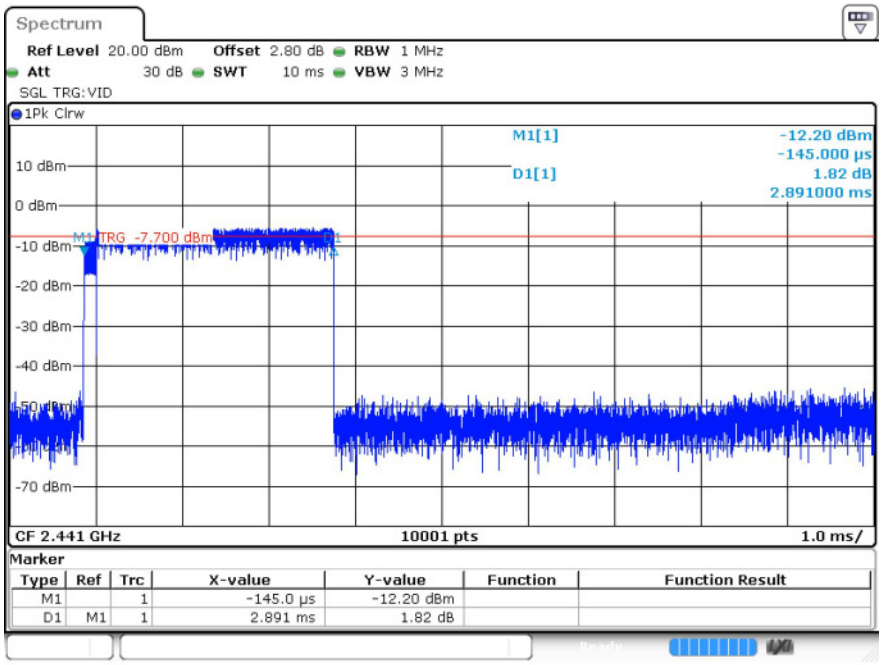
Test Graphs	
GFSK_DH5/MCH	 

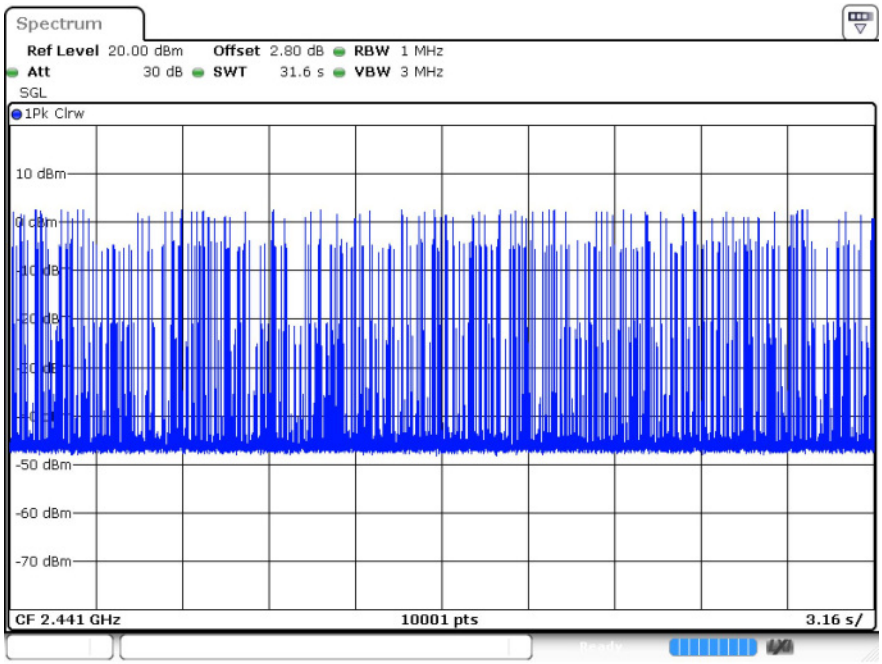
π/4DQPSK
_2DH5/MCH





8DPSK _3DH5/MCH



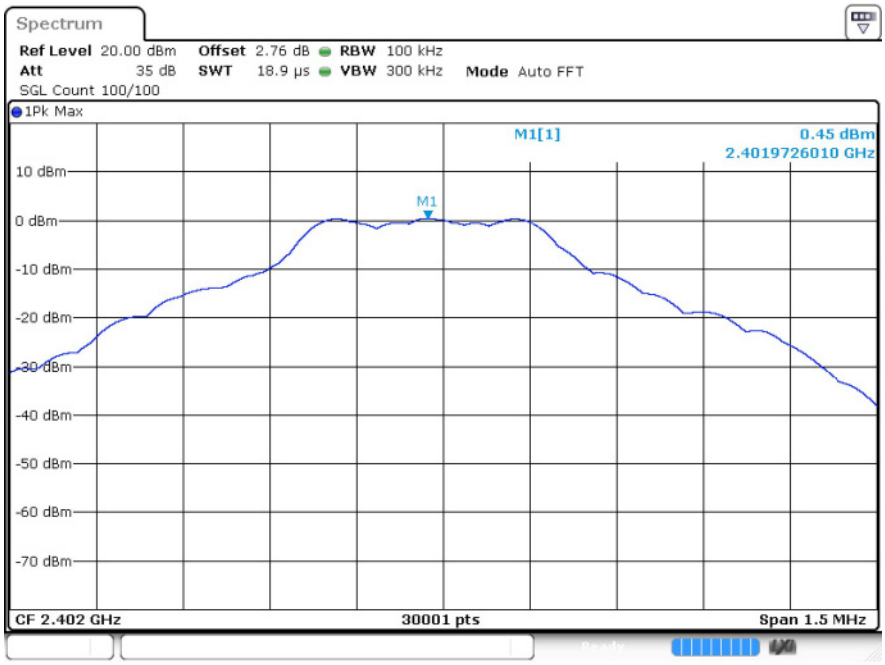
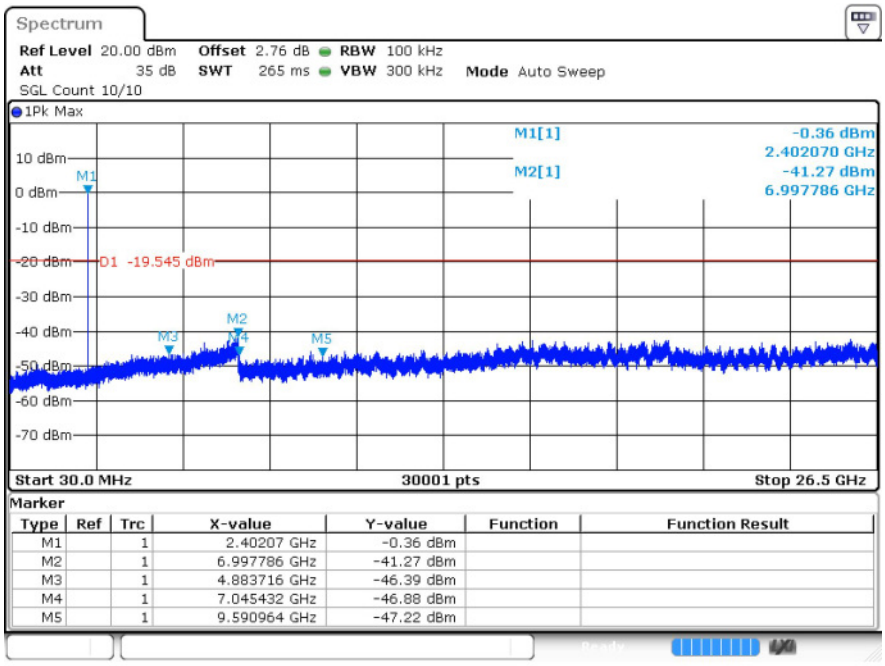


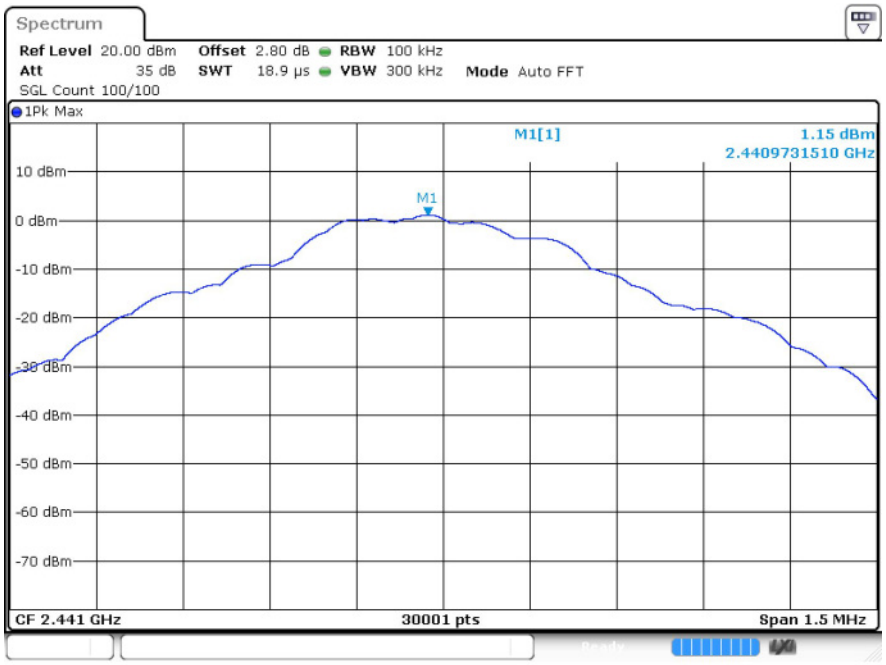
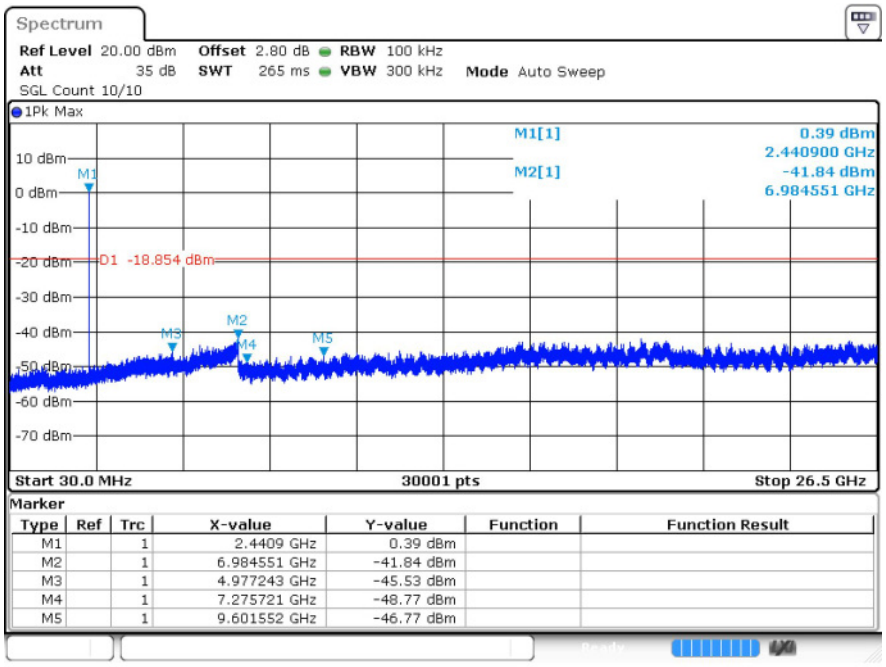
7 RF Conducted Spurious Emissions

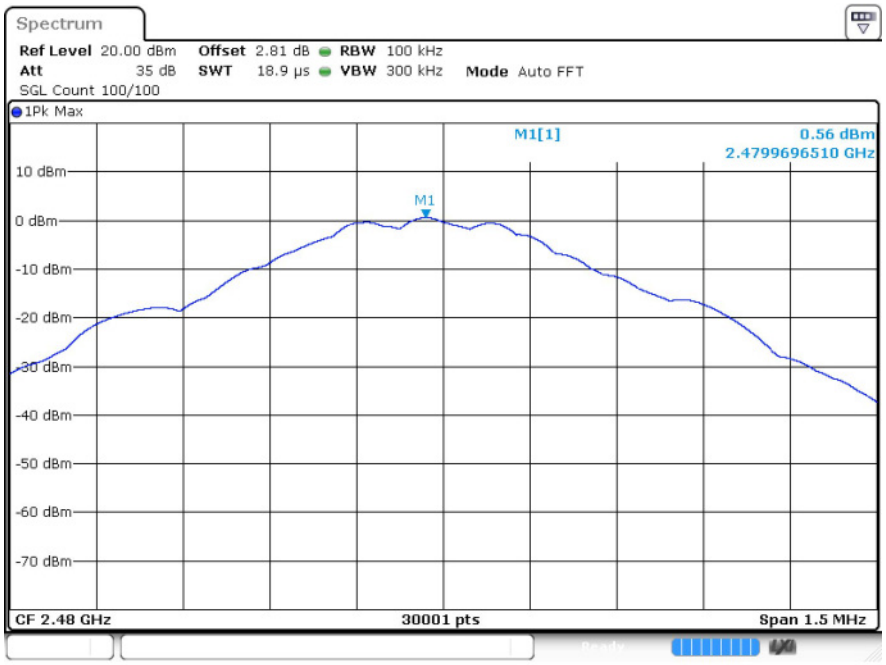
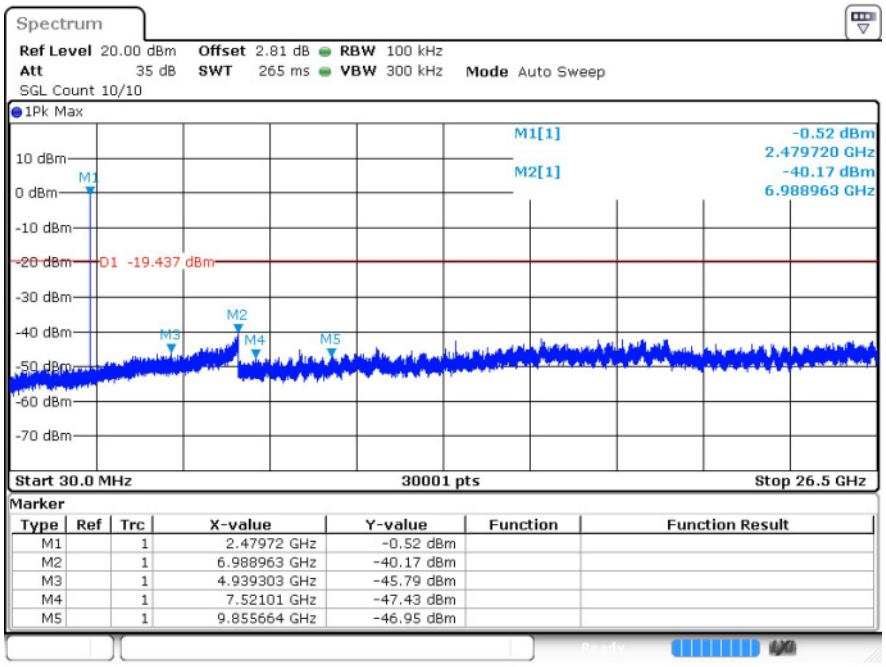
7.1 Test Result

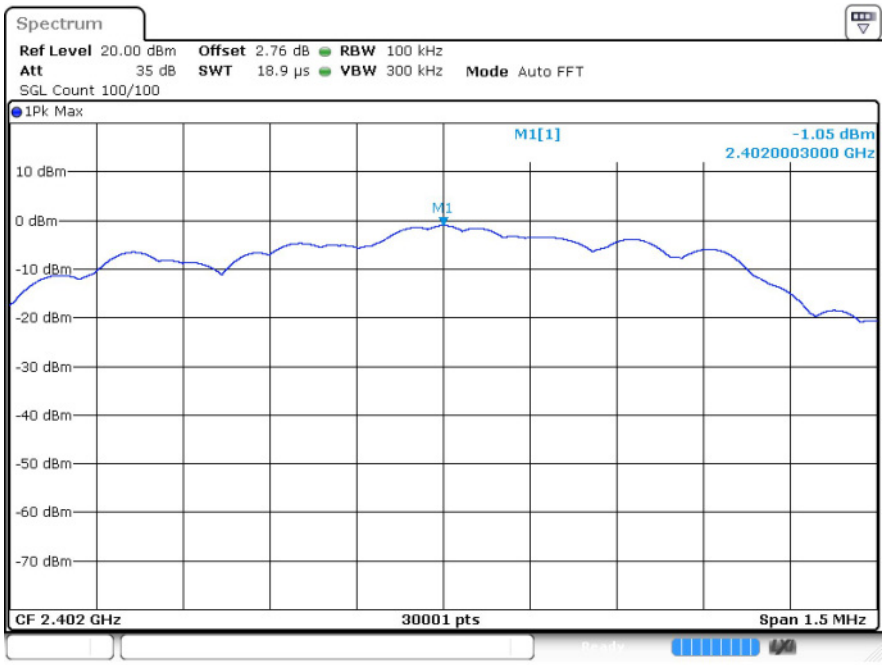
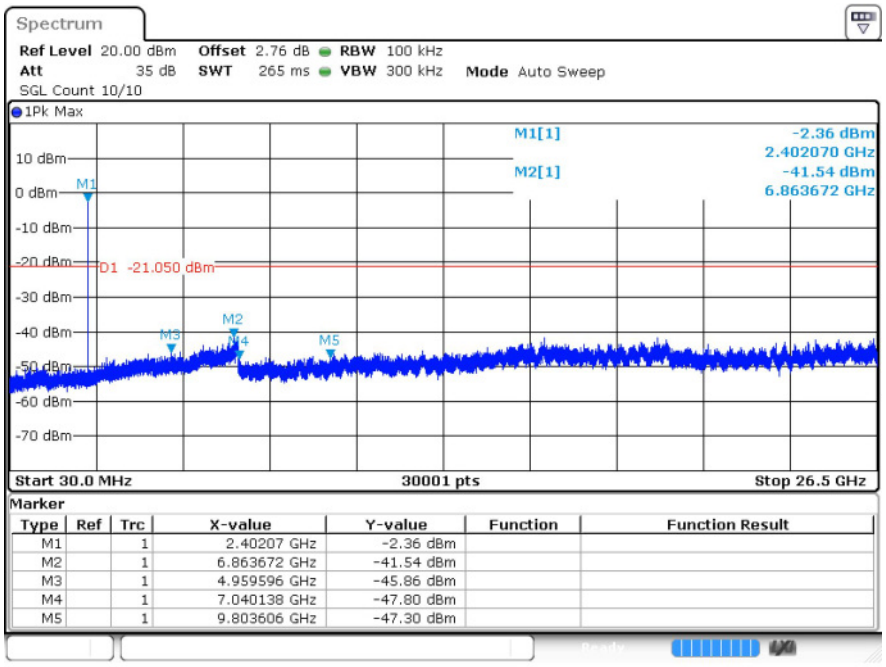
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-41.71	-20	Pass
	MCH	-42.99	-20	Pass
	HCH	-40.73	-20	Pass
π/4DQPSK	LCH	-40.48	-20	Pass
	MCH	-41.48	-20	Pass
	HCH	-40.72	-20	Pass
8DPSK	LCH	-39.46	-20	Pass
	MCH	-40.91	-20	Pass
	HCH	-40.11	-20	Pass

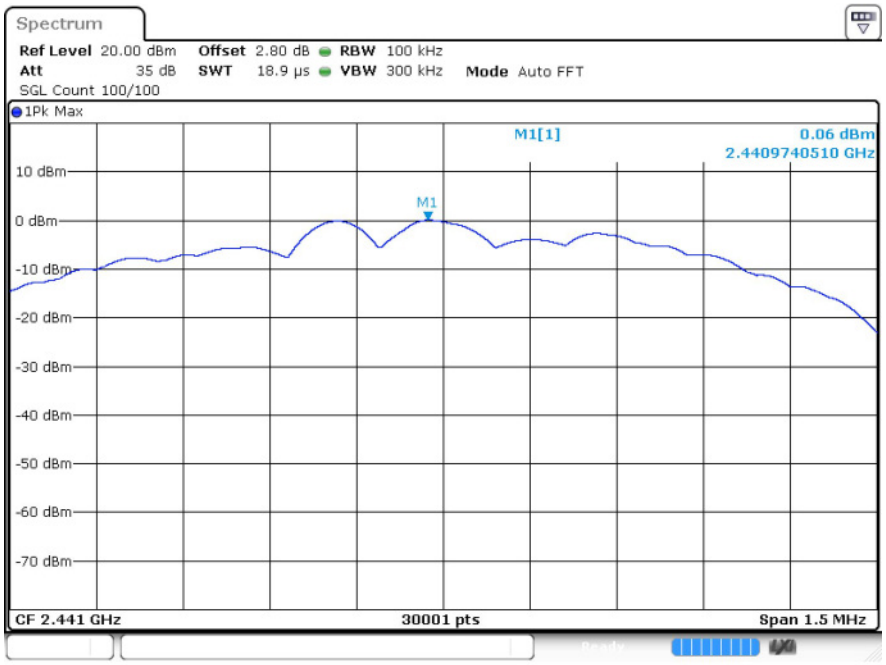
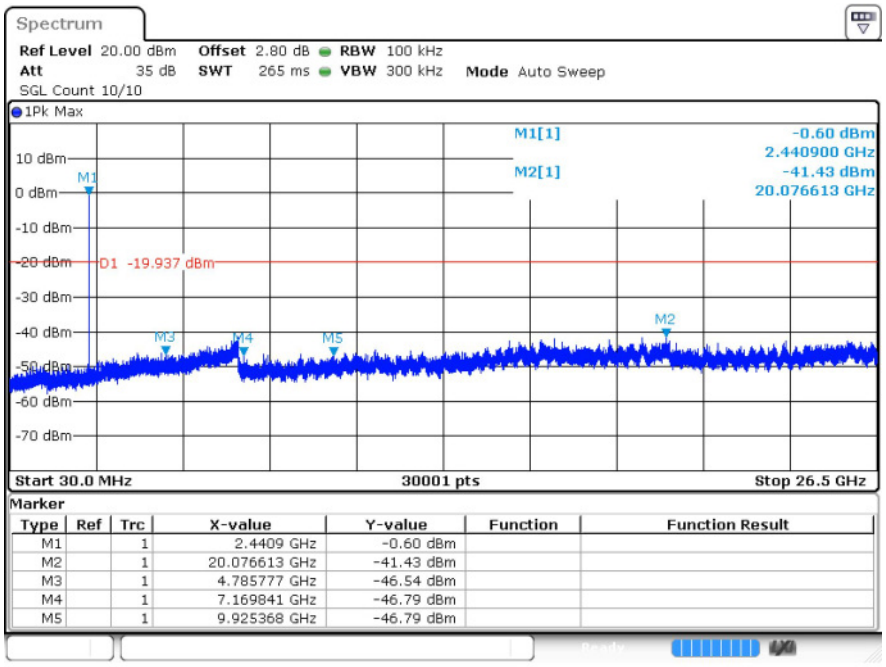
7.2 Test Graphs

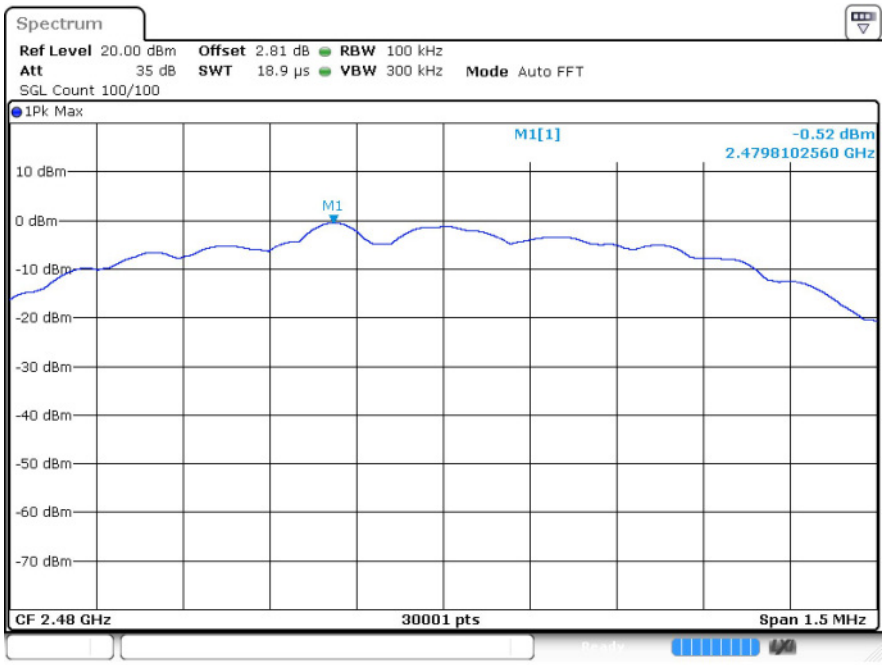
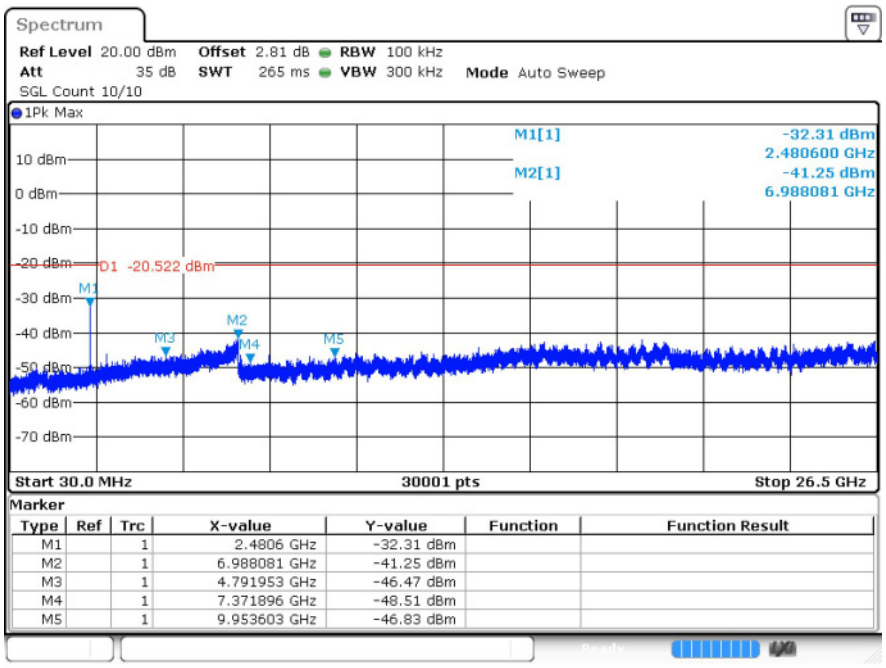
GFSK_LCH_Graphs	
Pref	
Puw	

GFSK_MCH_Graphs	
Pref	
Puw	 Marker Type | Ref | Trc | X-value | Y-value | Function | Function Result M1 | 1 | 2.4409 GHz | 0.39 dBm M2 | 1 | 6.984551 GHz | -41.84 dBm M3 | 1 | 4.977243 GHz | -45.53 dBm M4 | 1 | 7.275721 GHz | -48.77 dBm M5 | 1 | 9.601552 GHz | -46.77 dBm

GFSK_HCH_Graphs	
Pref	
Puw	

π/4DQPSK_LCH_Graphs	
Pref	
Puw	

π/4DQPSK_MCH_Graphs	
Pref	
Puw	

π/4DQPSK_HCH_Graphs	
Pref	
Puw