Appendix A

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

Product Name: Bluetooth headset

Trade Mark: N/A

Test Model: HM-22(hi 85)

Environmental Conditions

Temperature:	25.6° 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

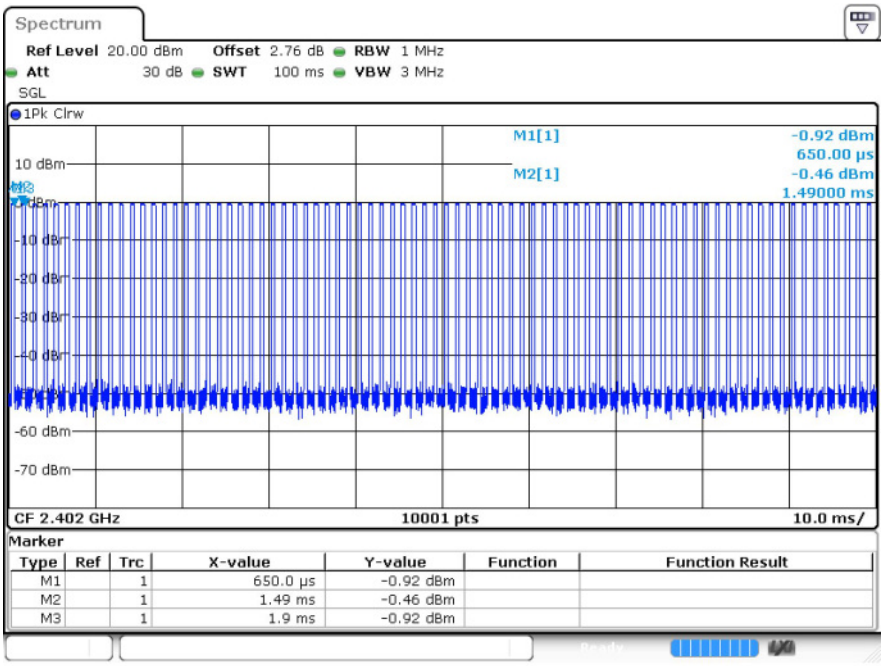
Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
1-DH1	2402	33.6	4.74	2.44
1-DH1	2441	32.81	4.84	2.5
1-DH1	2480	33.6	4.74	2.44
2-DH1	2402	34.34	4.64	2.44
2-DH1	2441	34.4	4.63	2.38
2-DH1	2480	33.6	4.74	2.44
3-DH1	2402	34.38	4.64	2.38
3-DH1	2441	34.4	4.63	2.38
3-DH1	2480	33.61	4.74	2.44

Note: Left and Right ears have been tested. The data from the Left ear is the worst, only showing the worst case mode.

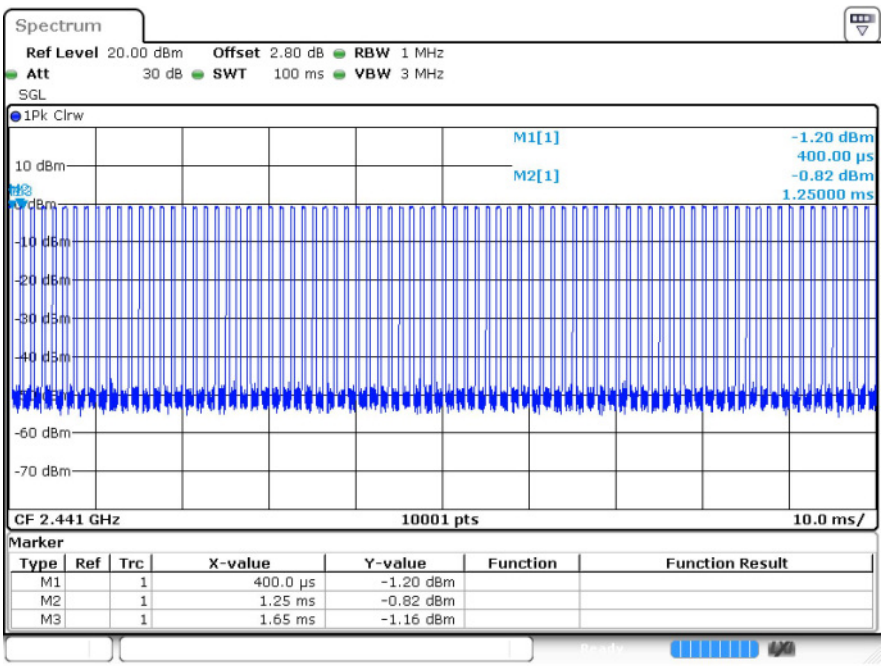
1.2 Test Graphs

Test Graphs

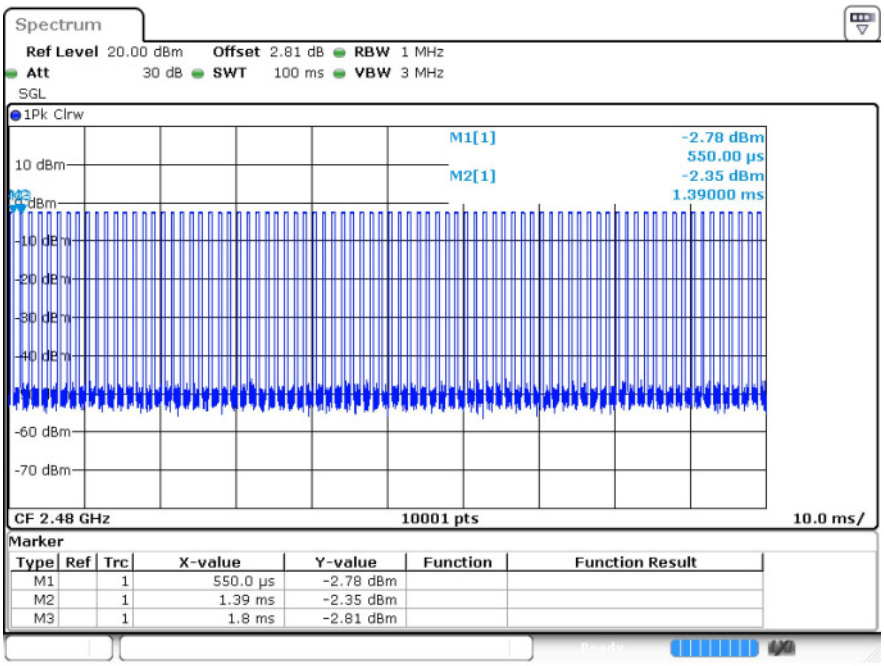
1-DH1 2402MHz



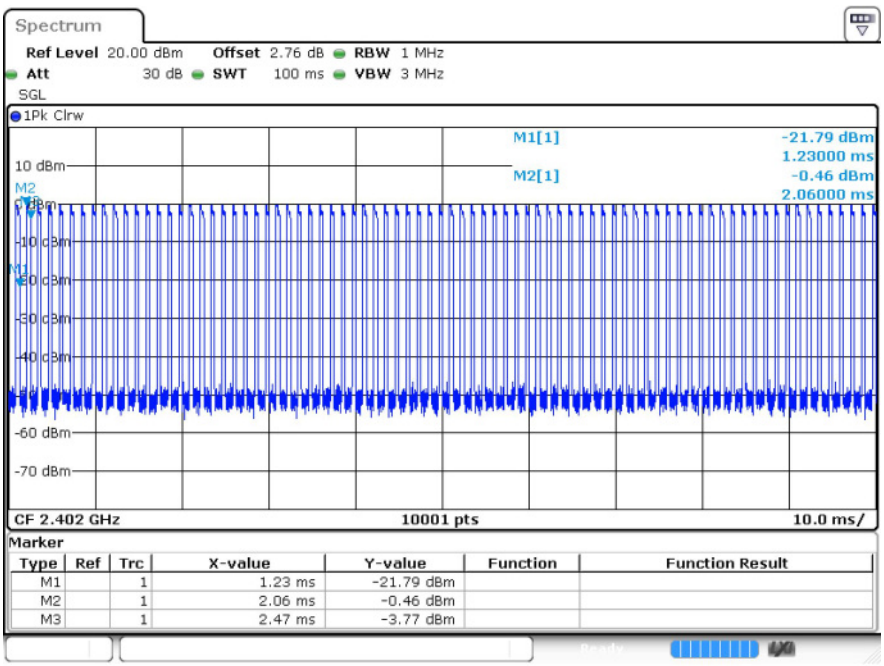
1-DH1 2441MHz



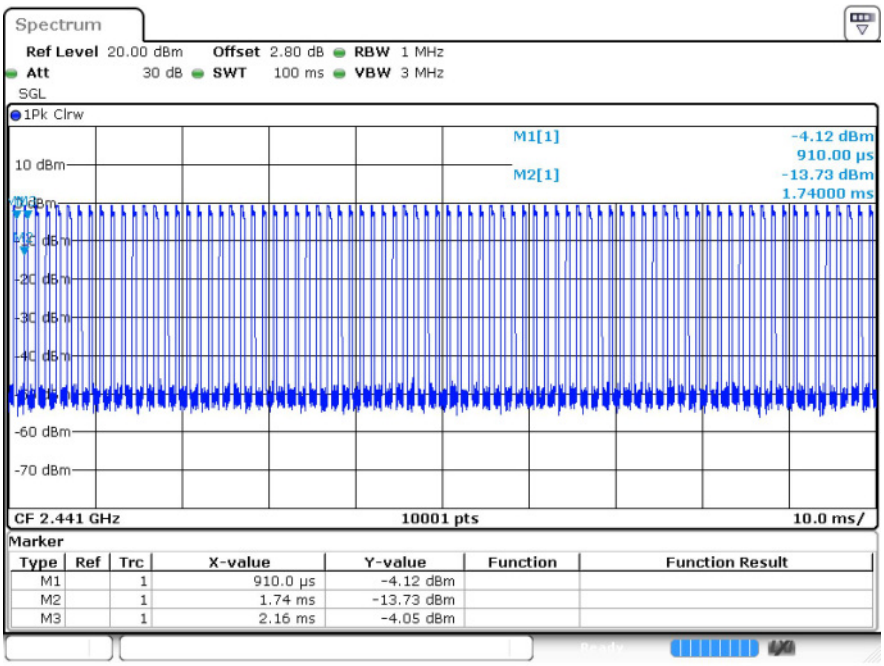
1-DH1 2480MHz



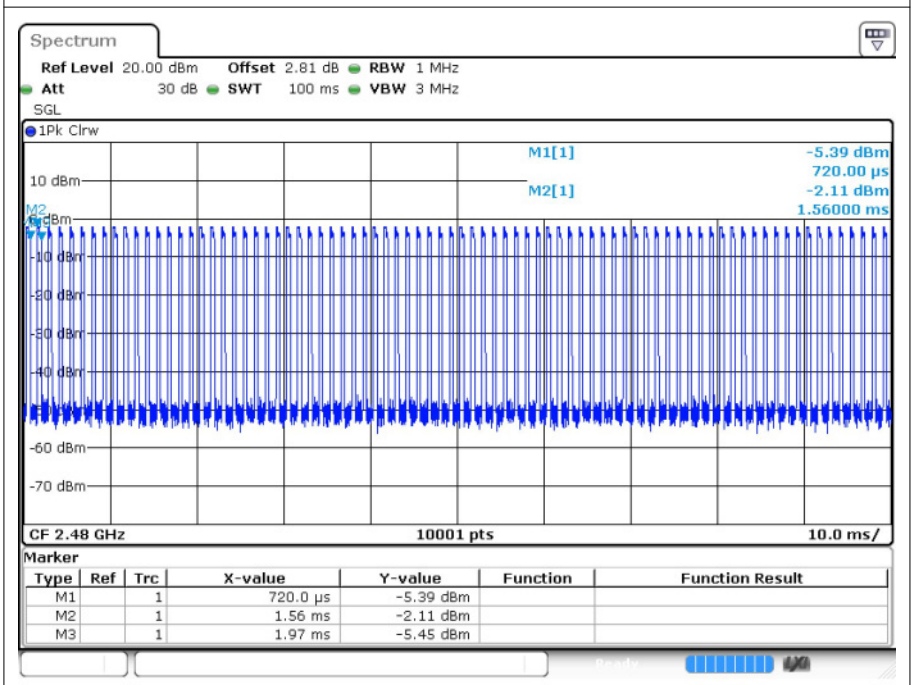
2-DH1 2402MHz



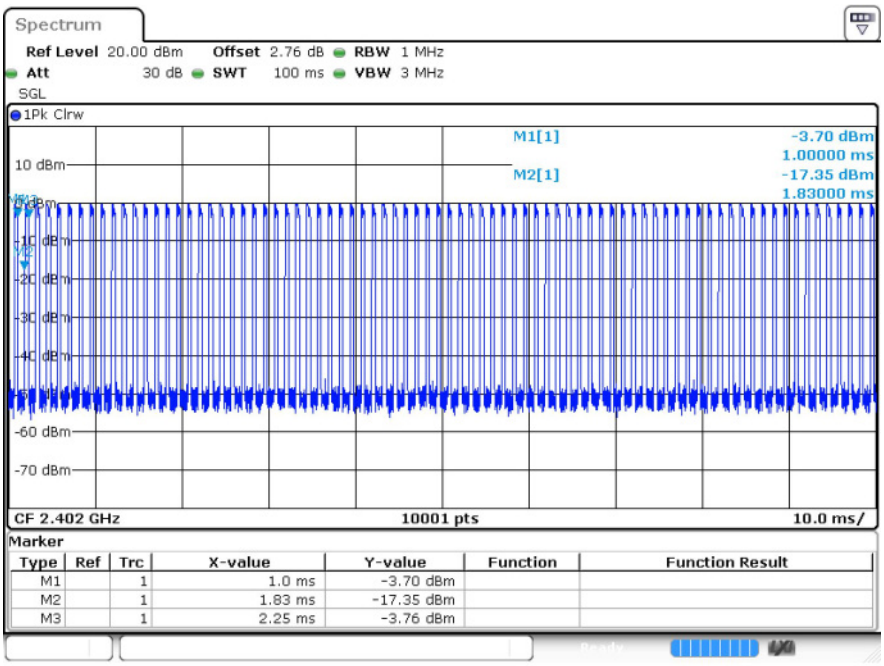
2-DH1 2441MHz



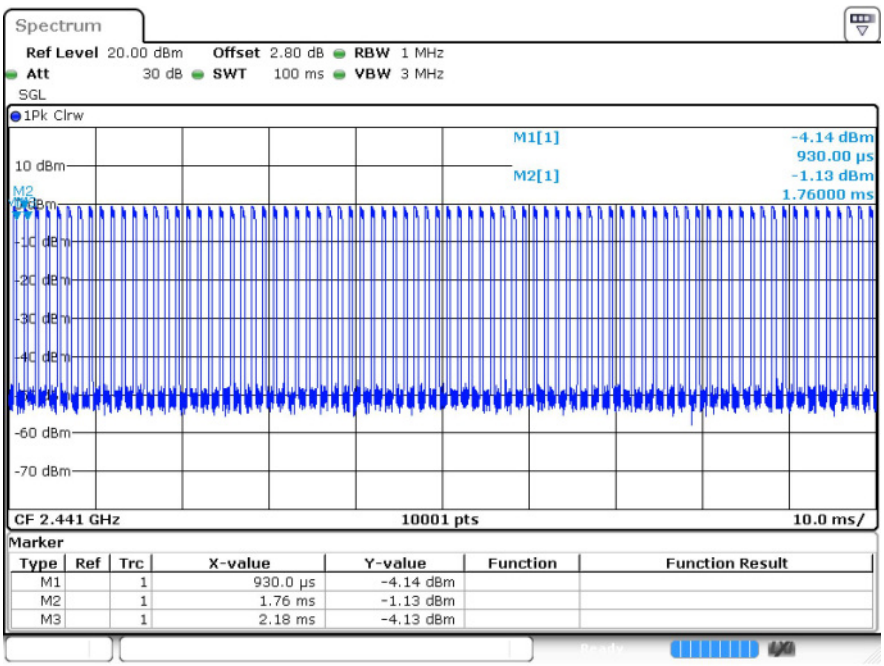
2-DH1 2480MHz



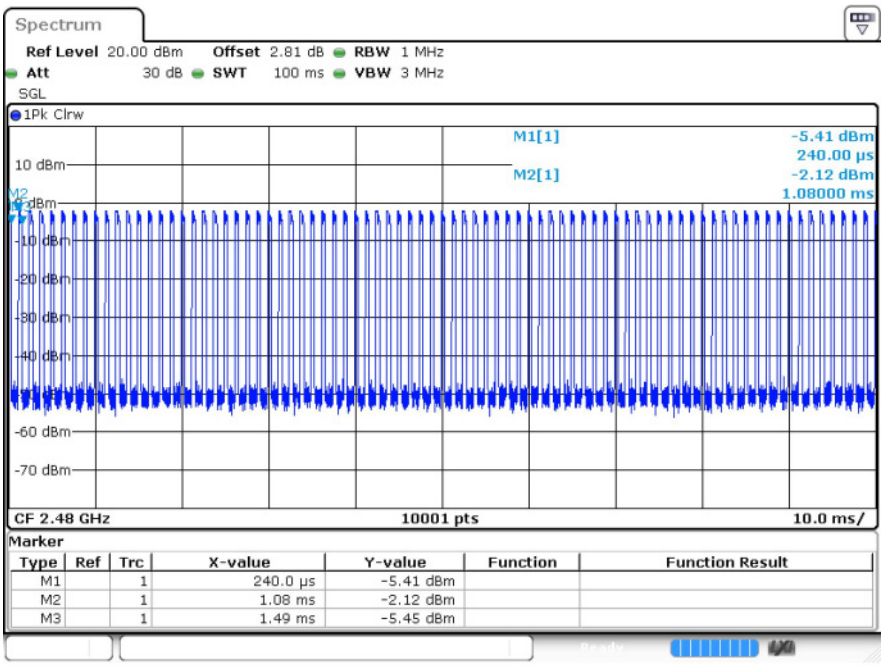
3-DH1 2402MHz



3-DH1 2441MHz



3-DH1 2480MHz



2 Maximum Conducted Peak Output Power

2.1 Test Result

Left:

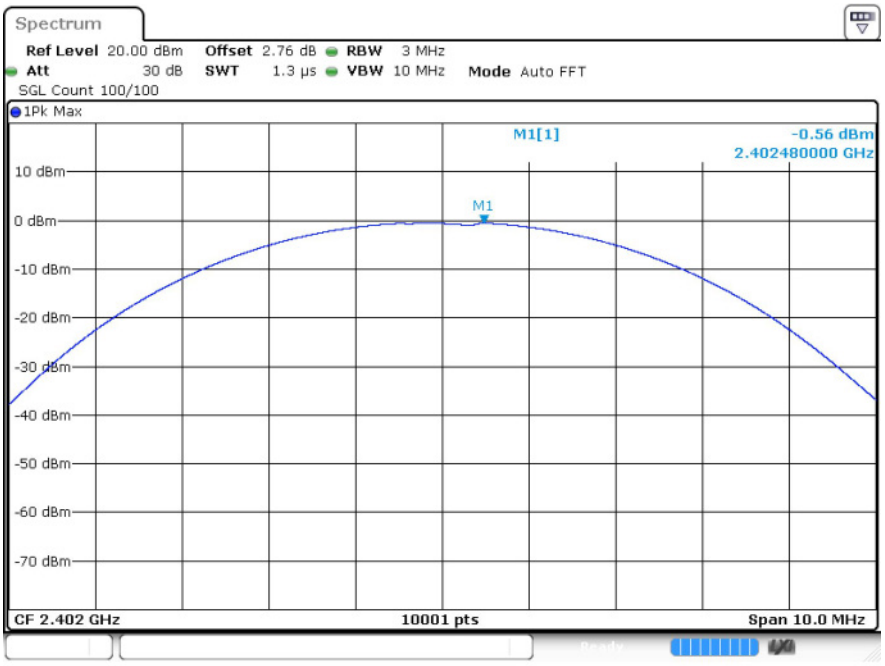
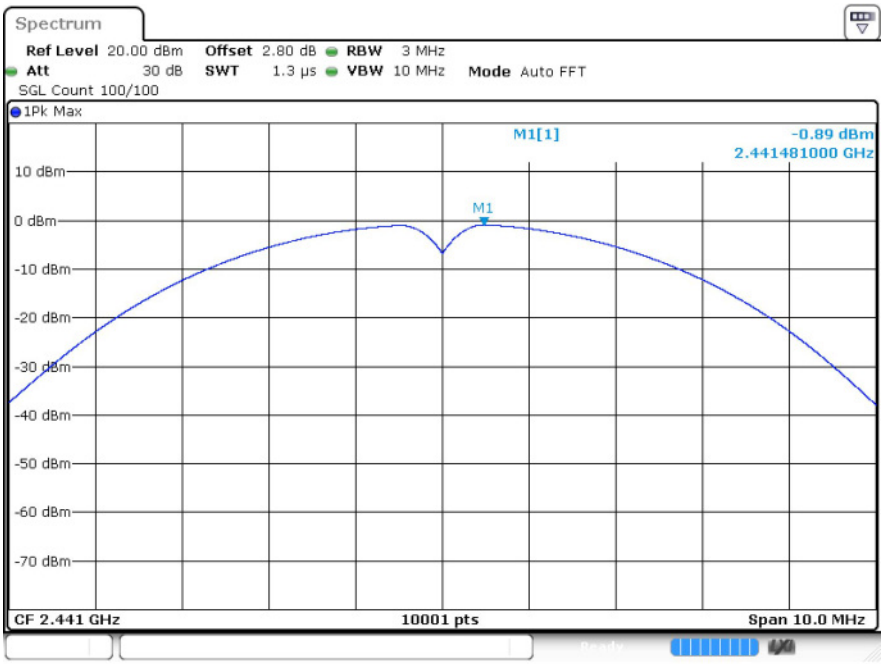
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.56	21	Pass
	MCH	-0.89	21	Pass
	HCH	-2.42	21	Pass
π/4DQPSK	LCH	-0.77	21	Pass
	MCH	-0.88	21	Pass
	HCH	-2.28	21	Pass
8DPSK	LCH	-0.52	21	Pass
	MCH	-1.01	21	Pass
	HCH	-2.32	21	Pass

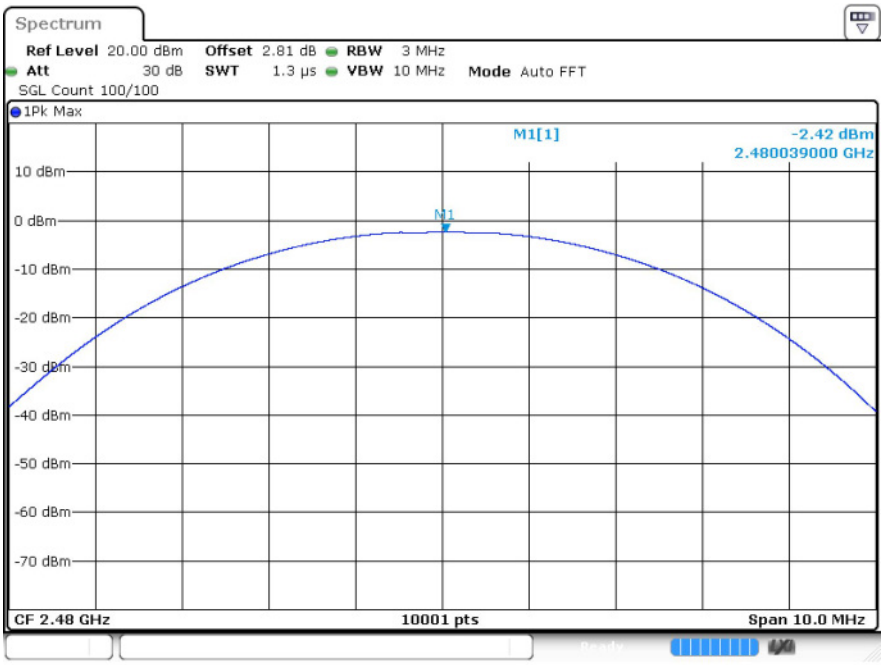
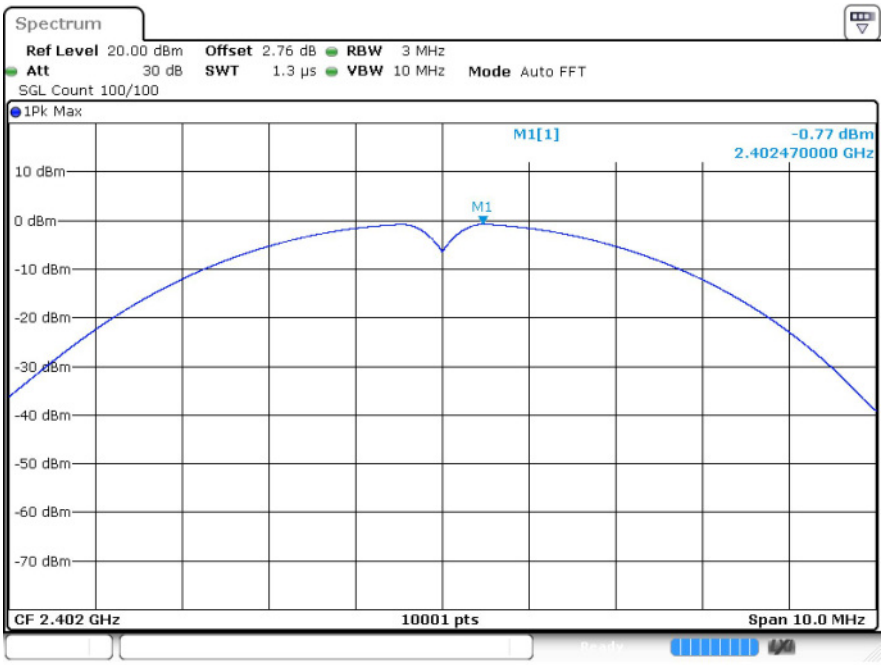
Right:

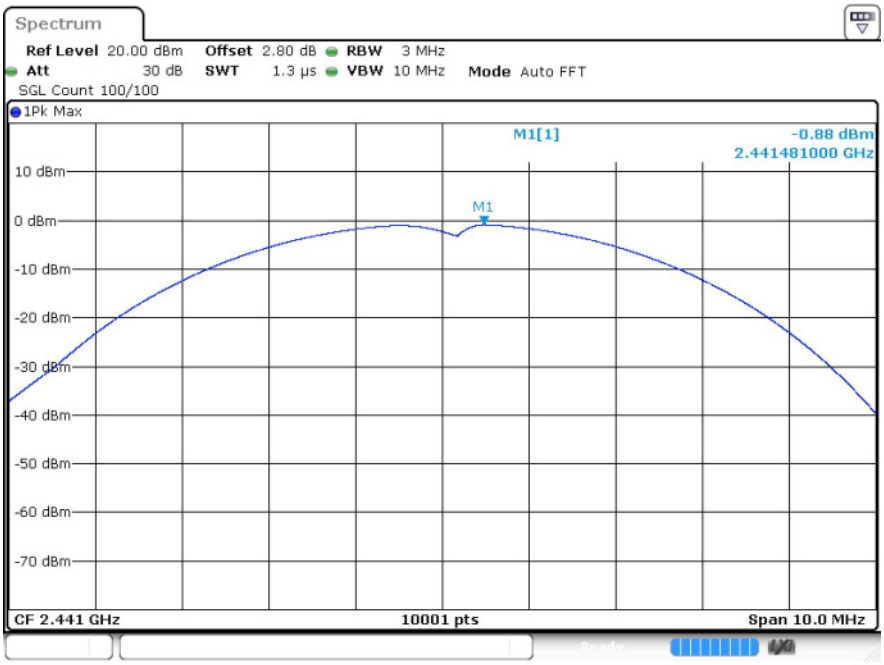
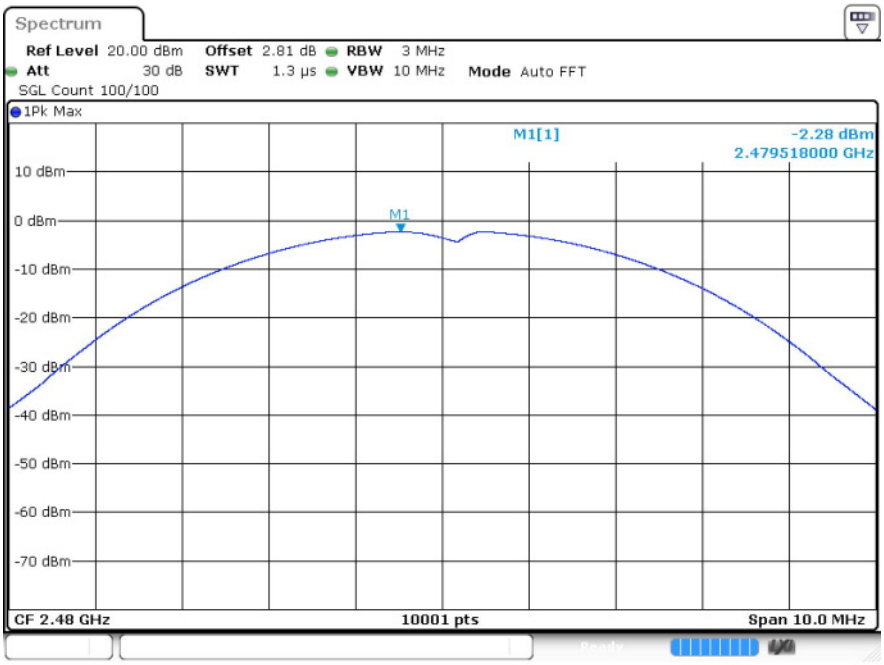
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.62	21	Pass
	MCH	-2.55	21	Pass
	HCH	-4.27	21	Pass
π/4DQPSK	LCH	-1.74	21	Pass
	MCH	-2.55	21	Pass
	HCH	-4.44	21	Pass
8DPSK	LCH	-1.9	21	Pass
	MCH	-2.65	21	Pass
	HCH	-4.25	21	Pass

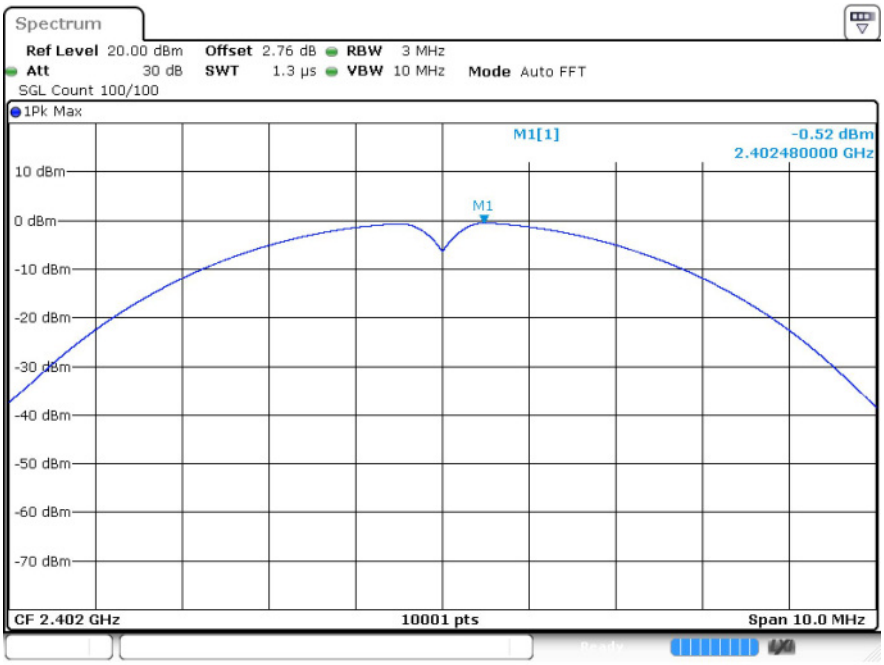
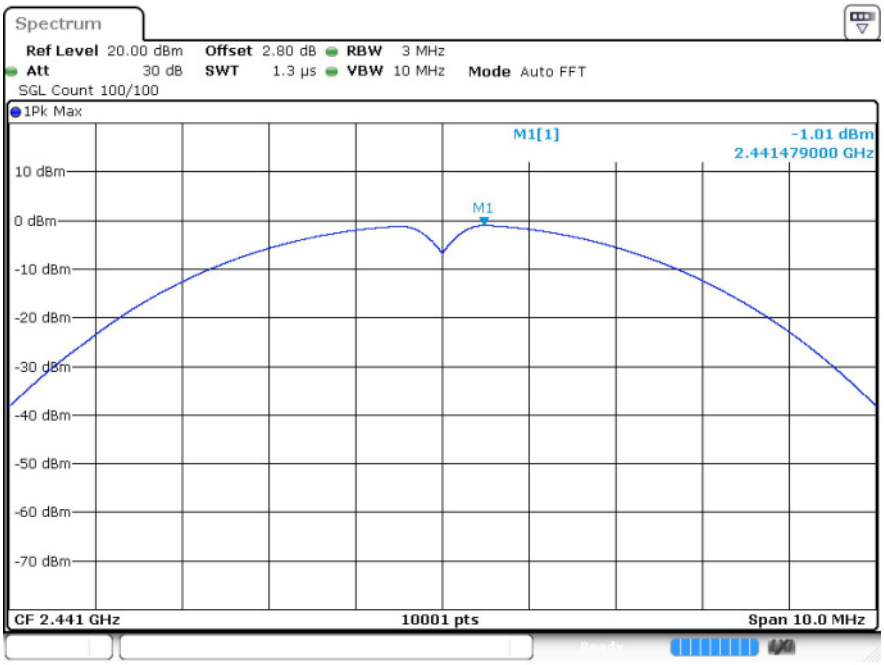
2.2 Test Graphs

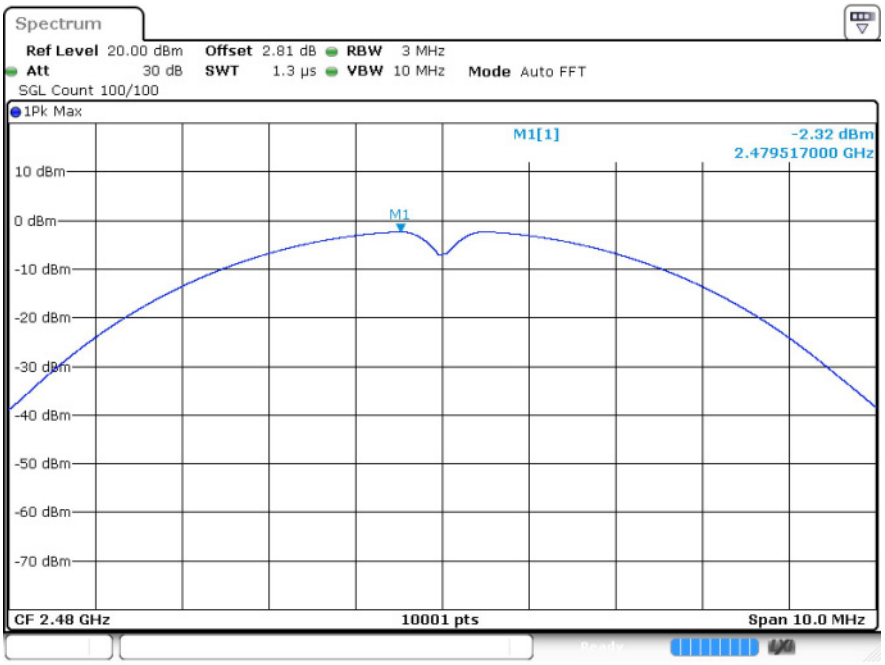
Left:

Test Graphs	
GFSK/LCH	
GFSK/MCH	

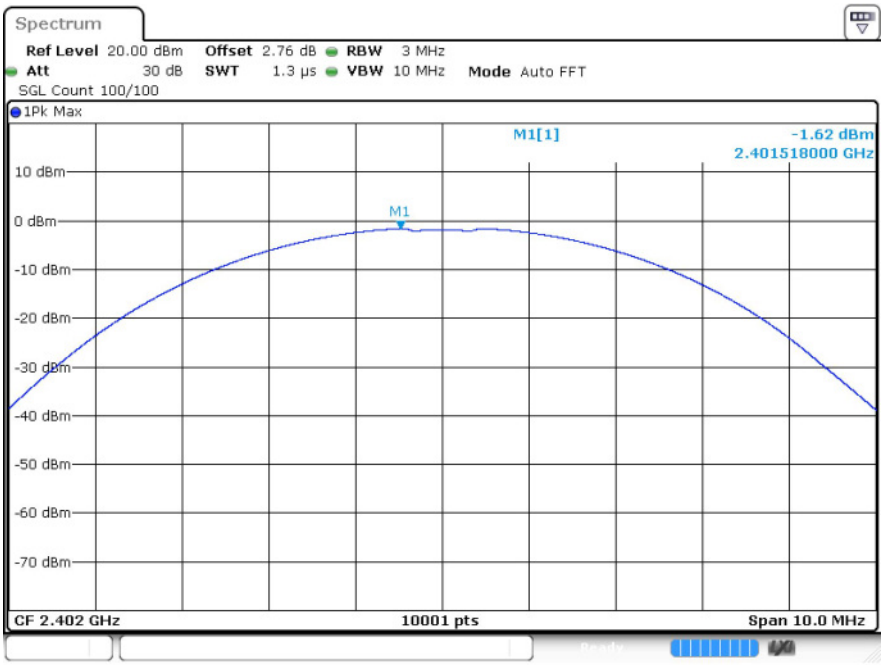
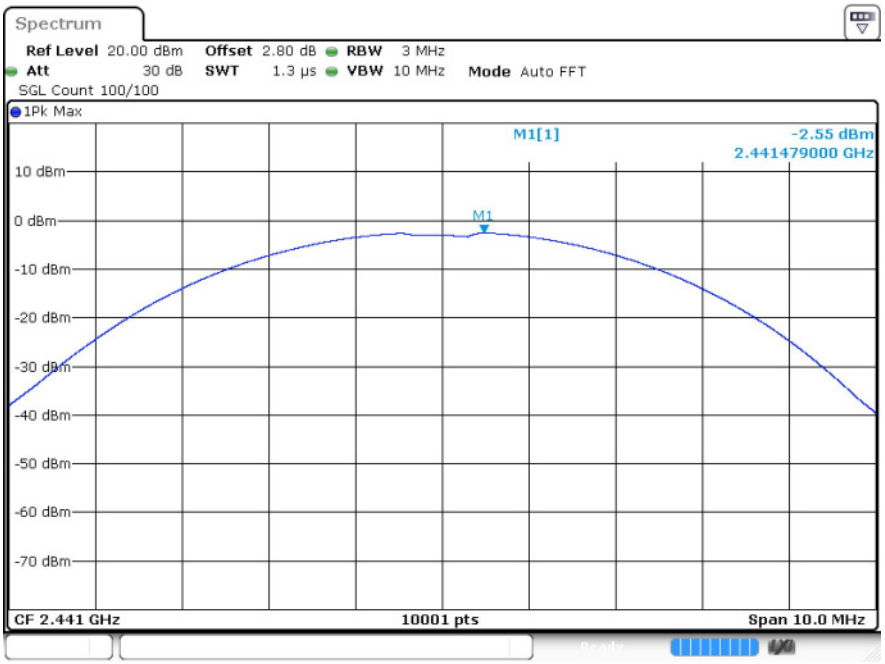
GFSK/HCH	
π/4DQPSK/LCH	

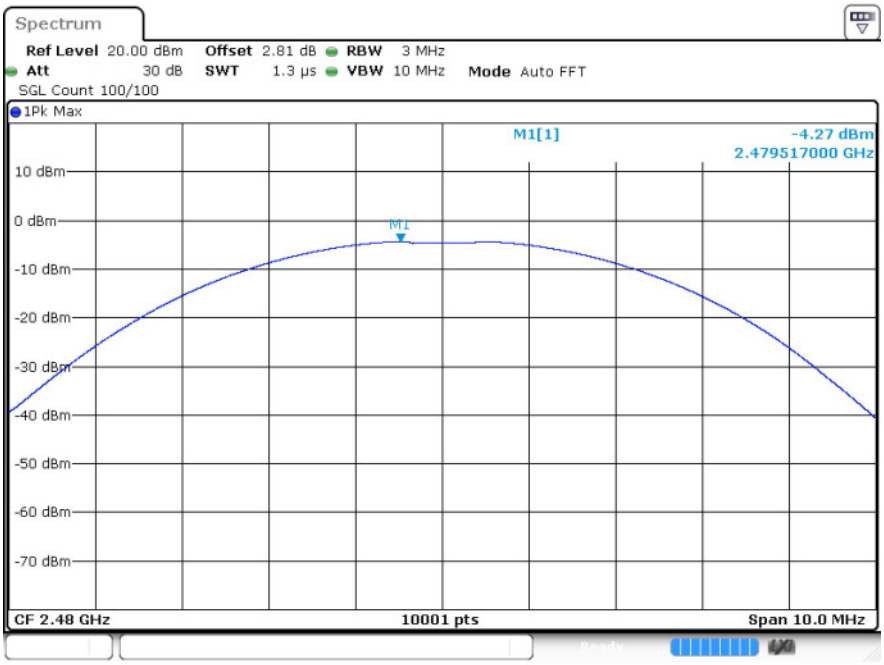
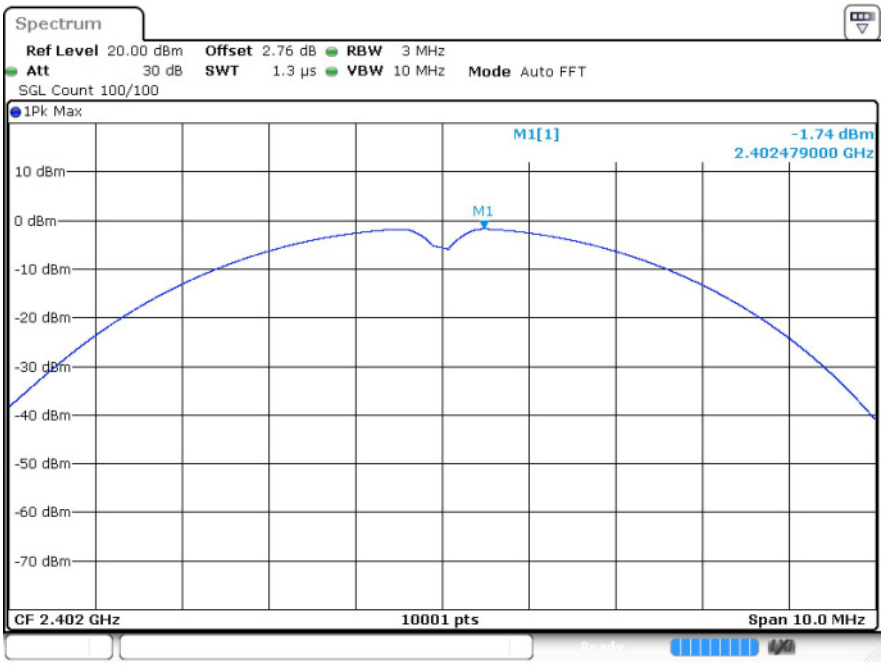
π/4DQPSK/MCH	
π/4DQPSK/HCH	

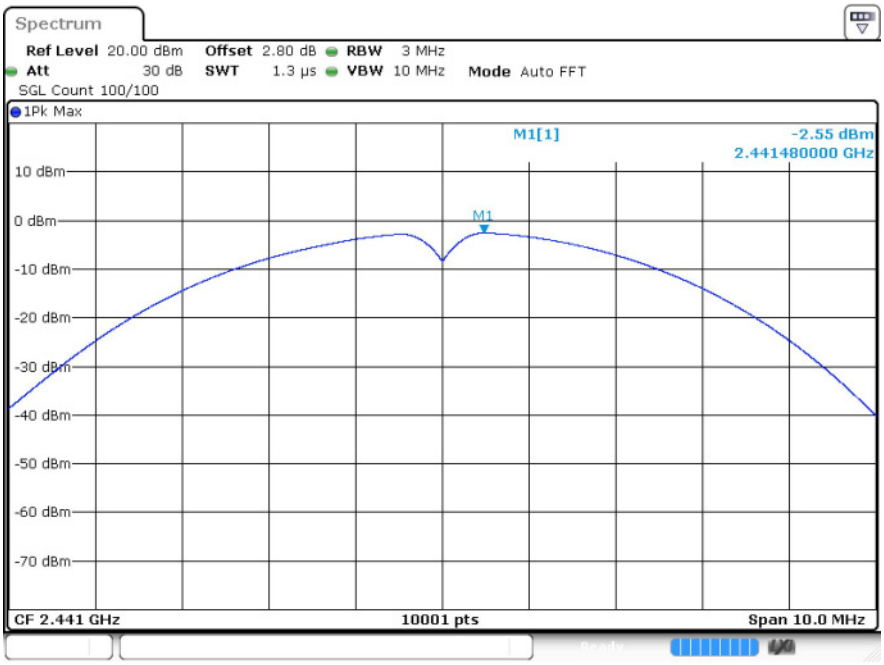
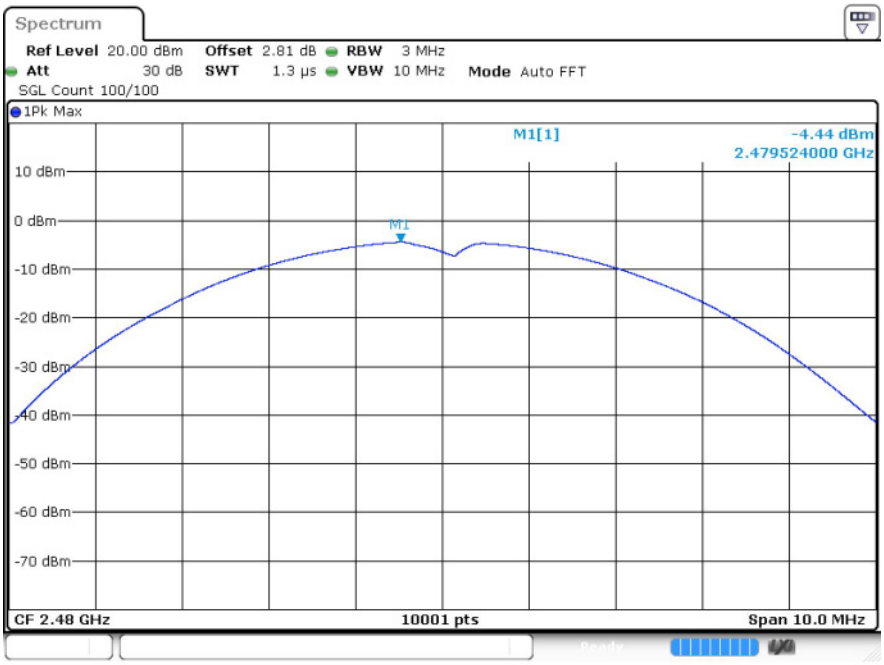
8DPSK/LCH	
8DPSK/MCH	

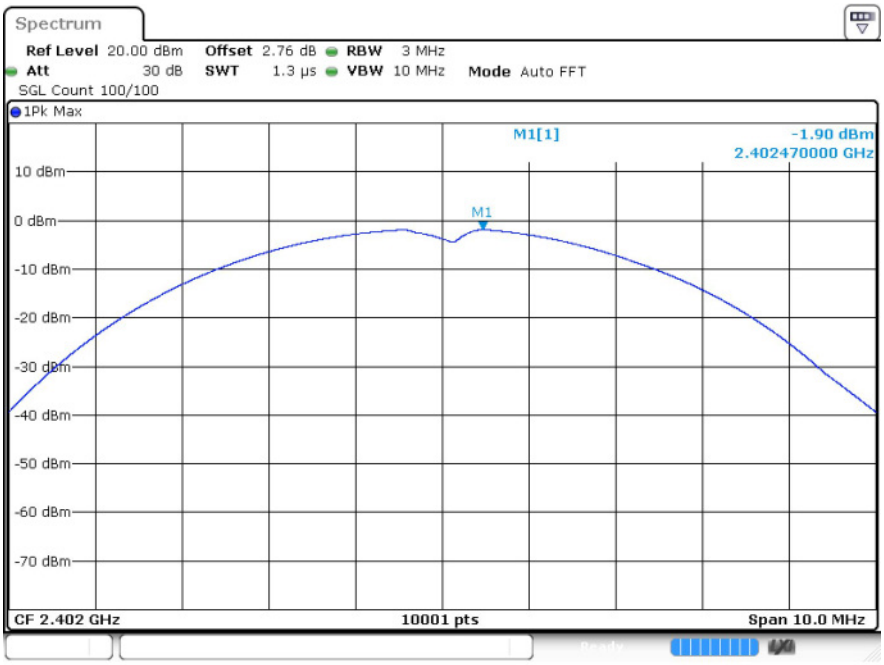
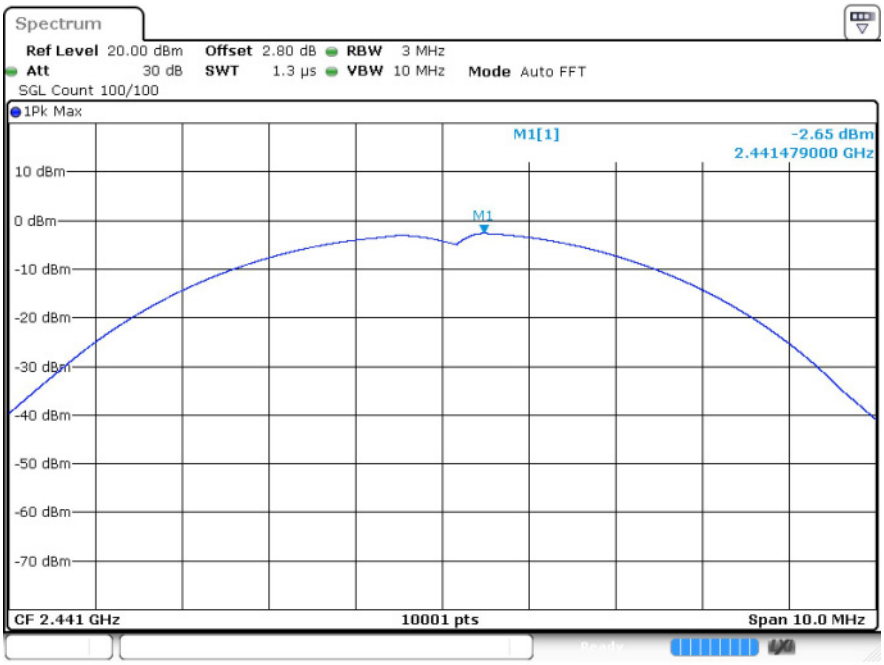
8DPSK/HCH	 Spectrum Ref Level 20.00 dBm Offset 2.81 dB RBW 3 MHz Att 30 dB SWT 1.3 µs VBW 10 MHz Mode Auto FFT SGL Count 100/100 1Pk Max M1[1] -2.32 dBm 2.479517000 GHz M1 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.48 GHz 10001 pts Span 10.0 MHz

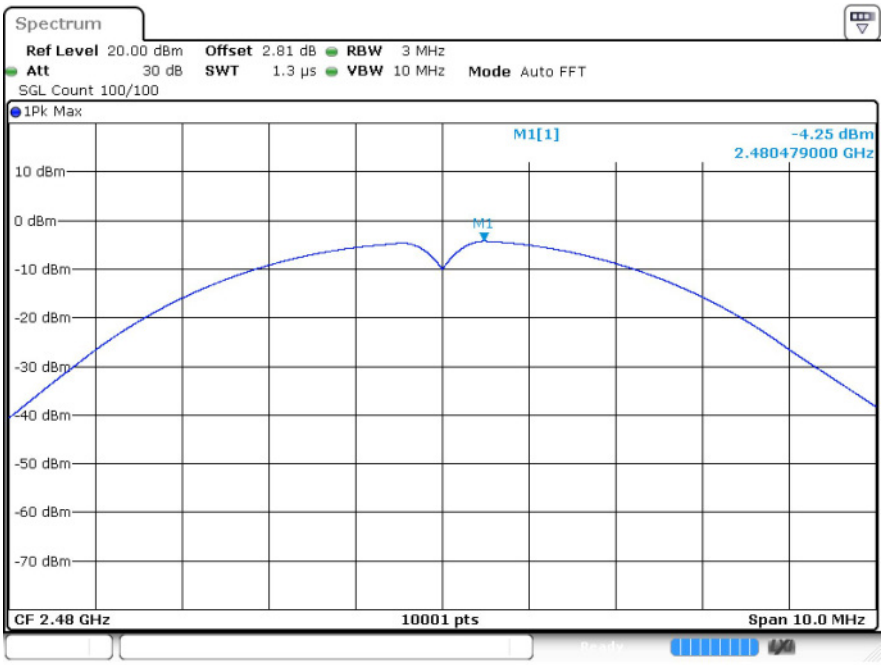
Right:

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] -4.25 dBm 2.480479000 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

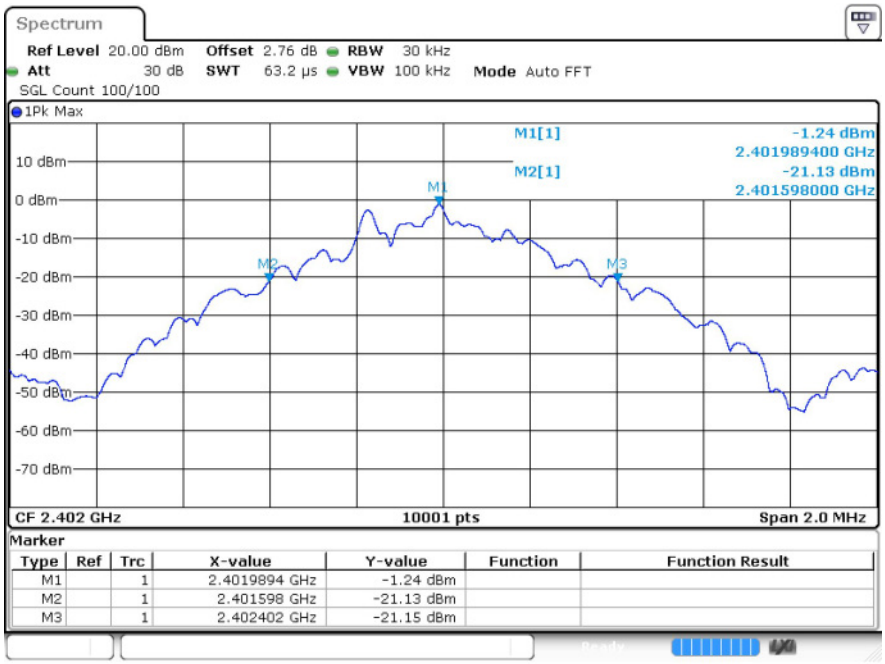
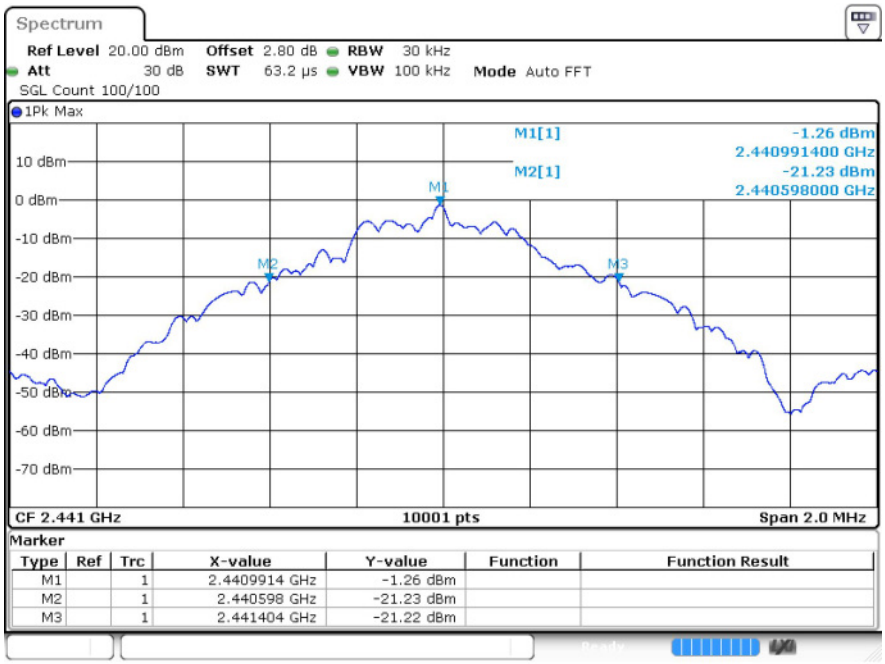
3 20dB Bandwidth

3.1 Test Result

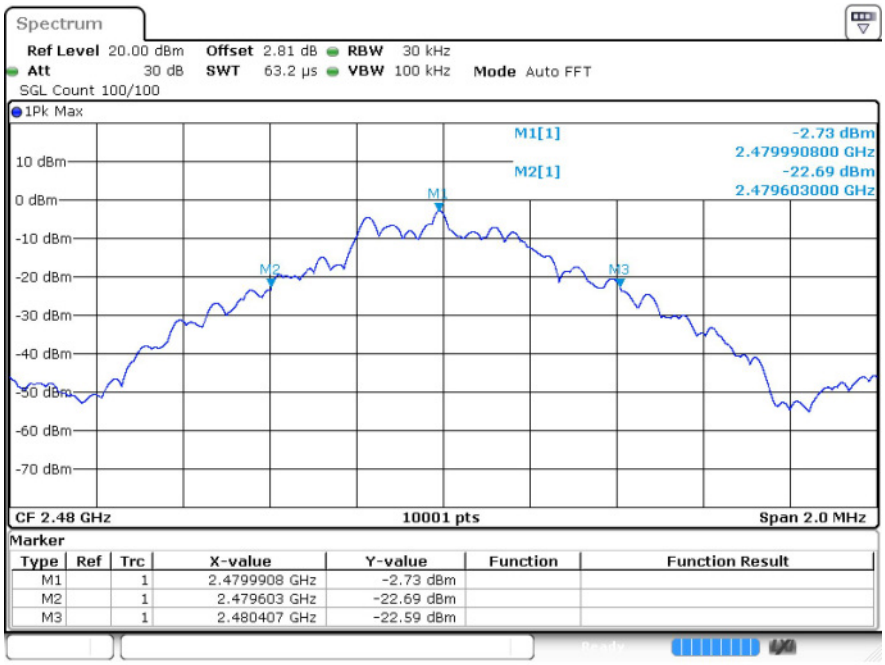
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.805	Not Specified	Pass
	MCH	0.806	Not Specified	Pass
	HCH	0.804	Not Specified	Pass
π/4DQPSK	LCH	1.166	Not Specified	Pass
	MCH	1.132	Not Specified	Pass
	HCH	1.161	Not Specified	Pass
8DPSK	LCH	1.114	Not Specified	Pass
	MCH	1.161	Not Specified	Pass
	HCH	1.156	Not Specified	Pass

Note: Left and Right ears have been tested. The data from the Left ear is the worst, only showing the worst case mode.

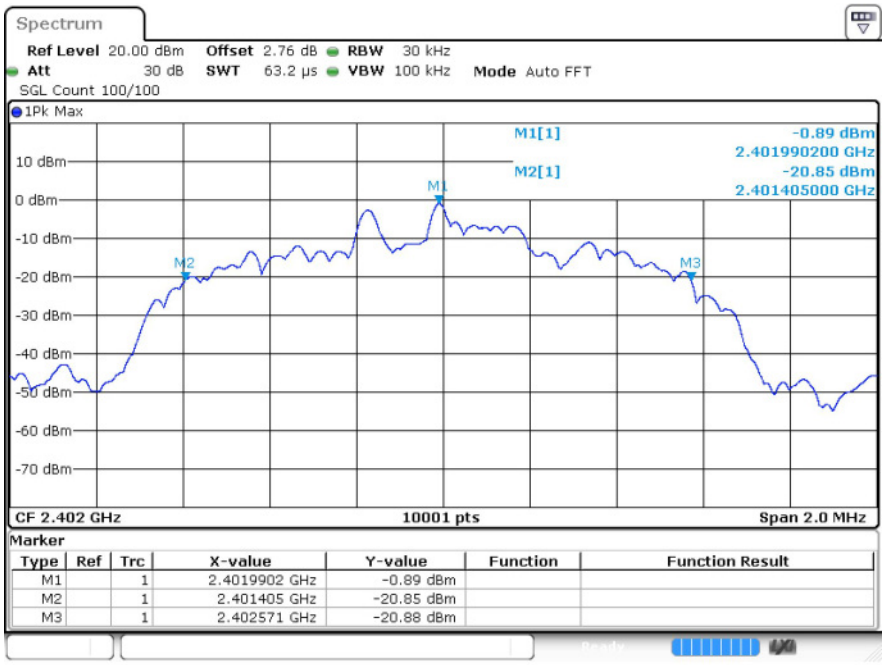
3.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

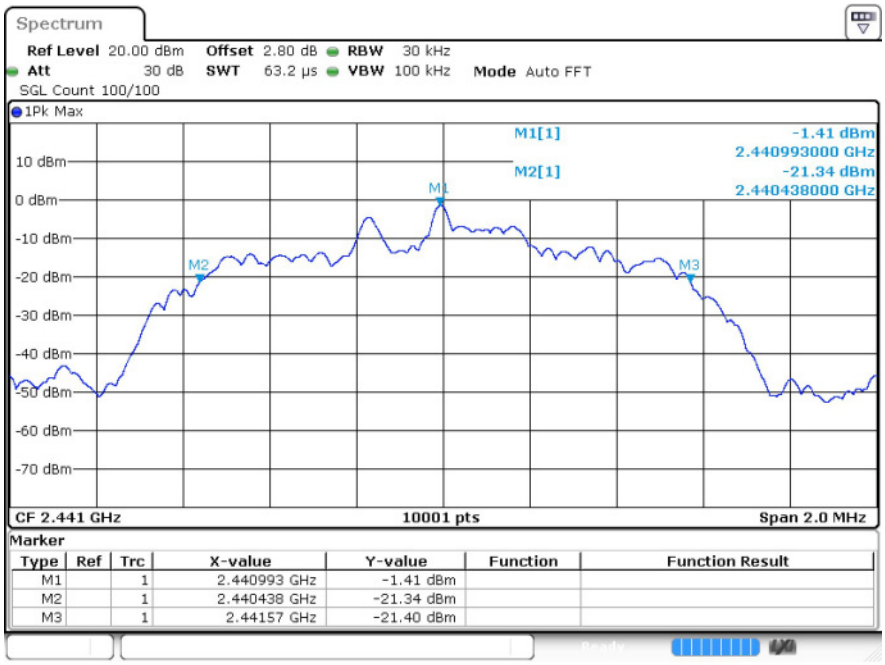
GFSK/HCH



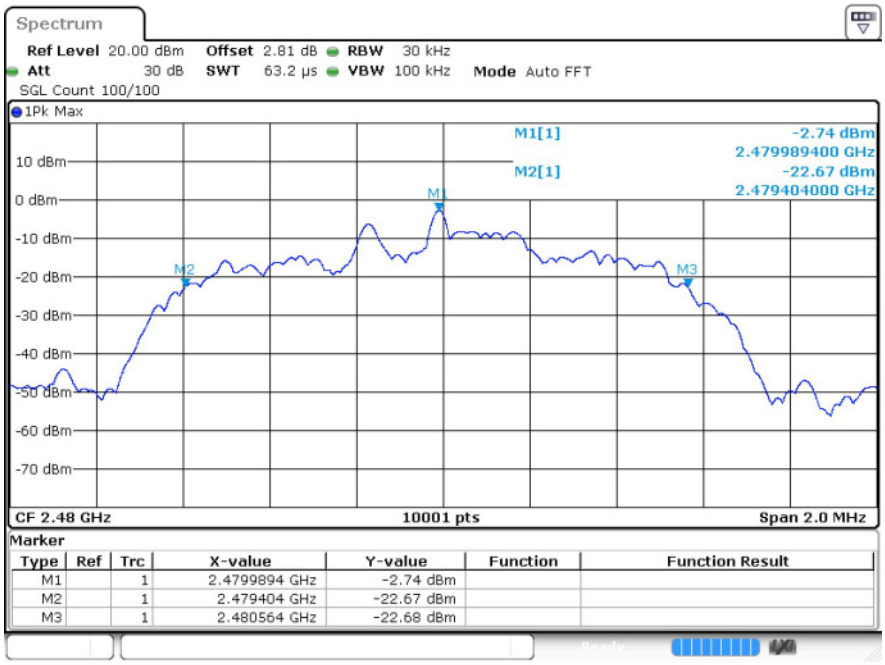
π/4DQPSK/LCH



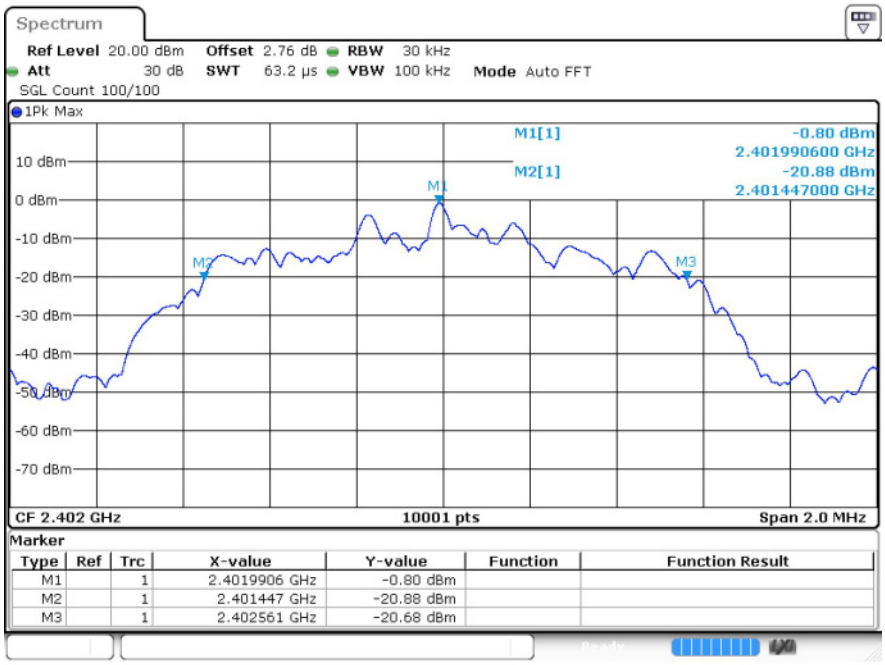
π/4DQPSK/MCH



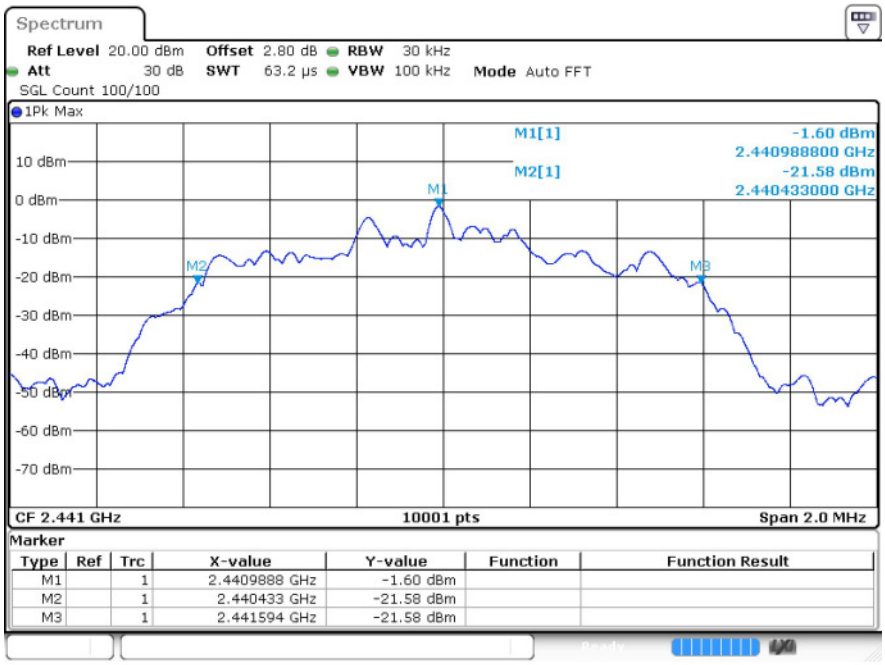
π/4DQPSK/HCH

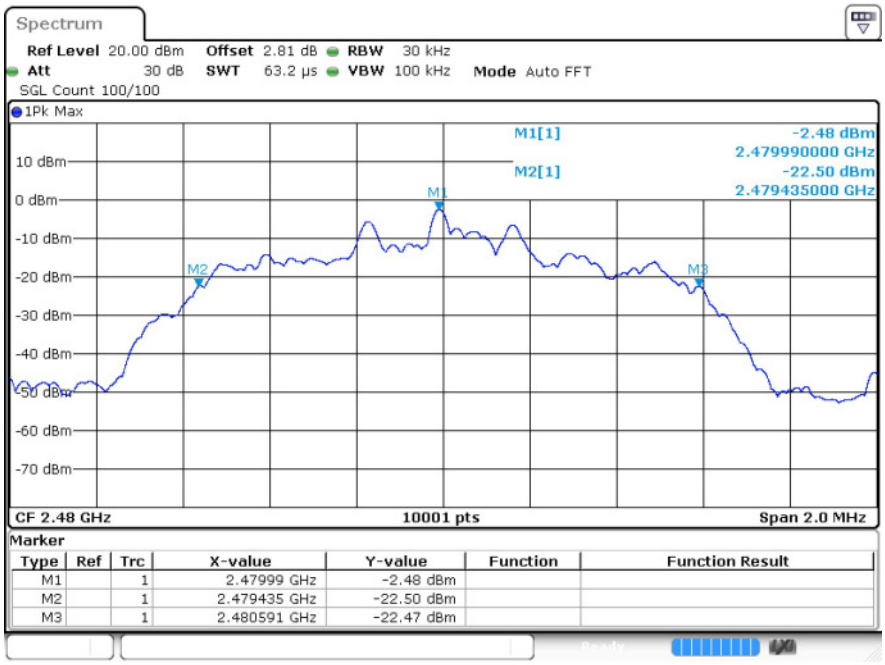


8DPSK/LCH



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] -2.48 dBm 2.479990000 GHz
M2[1] -22.50 dBm 2.479435000 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 2.47999 GHz -2.48 dBm
M2 1 2.479435 GHz -22.50 dBm
M3 1 2.480591 GHz -22.47 dBm

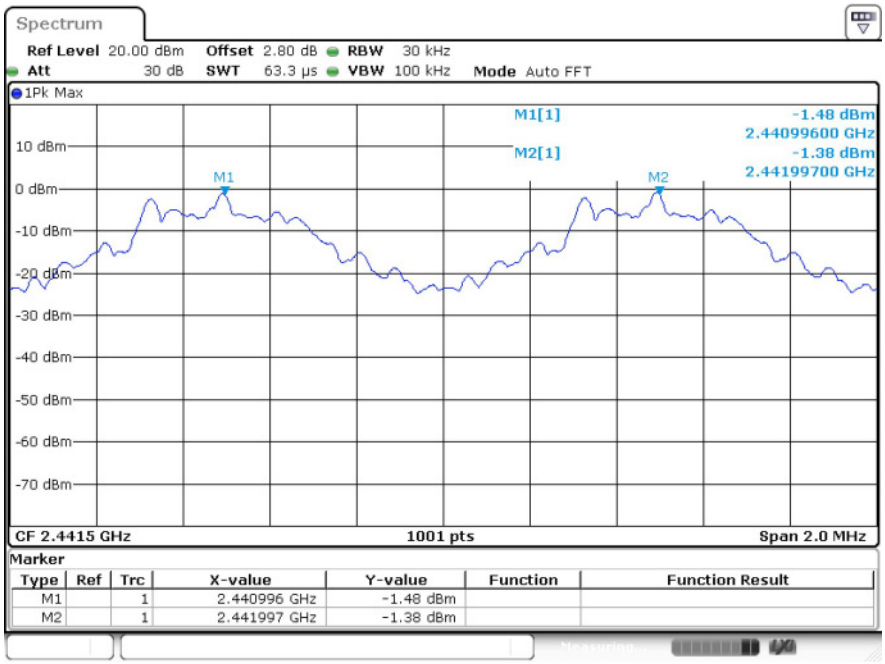
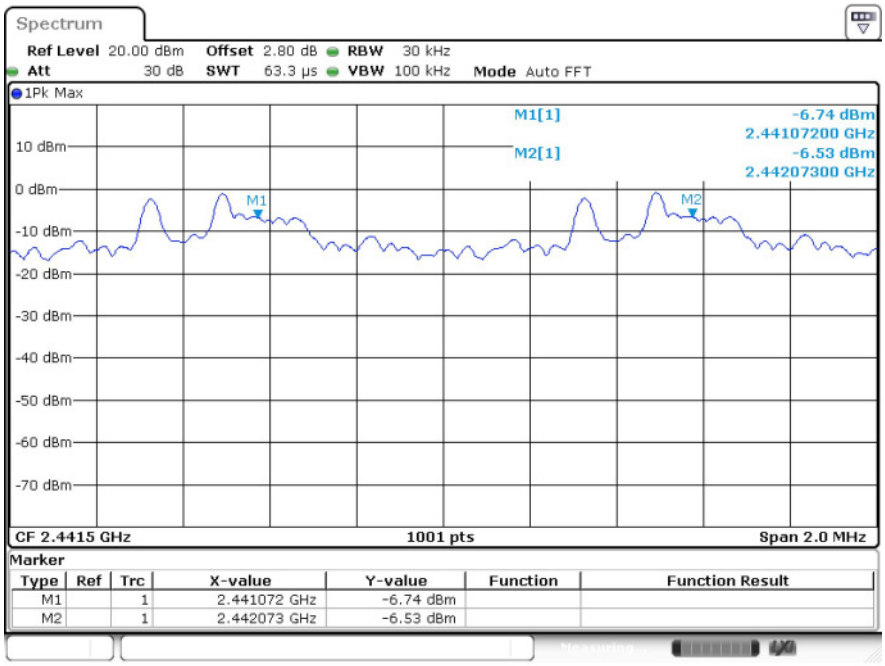
4 Carrier Frequency Separation

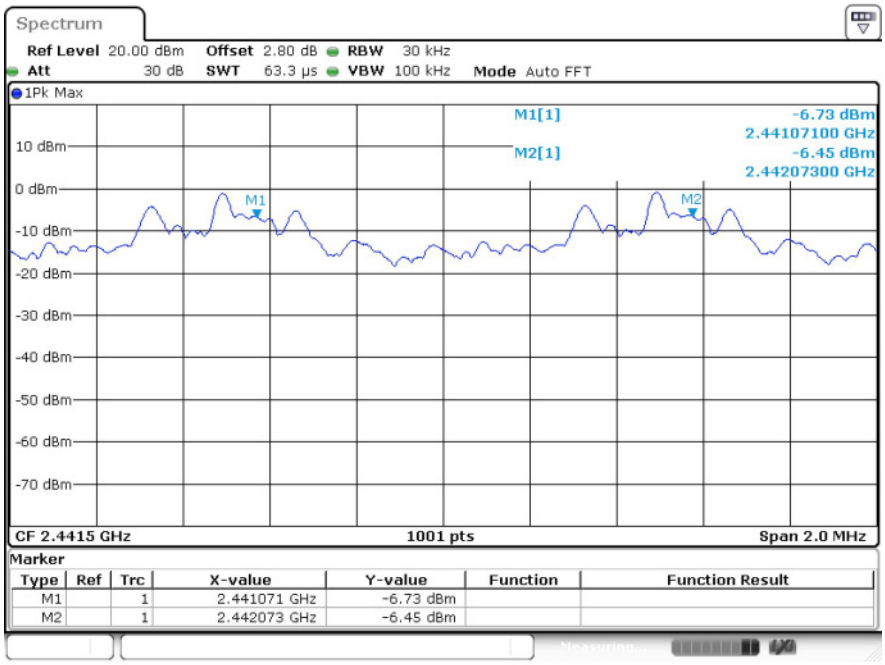
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.537	Pass
π/4DQPSK	MCH	1.001	0.755	Pass
8DPSK	MCH	1.002	0.774	Pass

Note: Left and Right ears have been tested. The data from the Left ear is the worst, only showing the worst case mode.

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] -6.73 dBm 2.44107100 GHz M2[1] -6.45 dBm 2.44207300 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 2.441071 GHz -6.73 dBm M2 1 2.442073 GHz -6.45 dBm

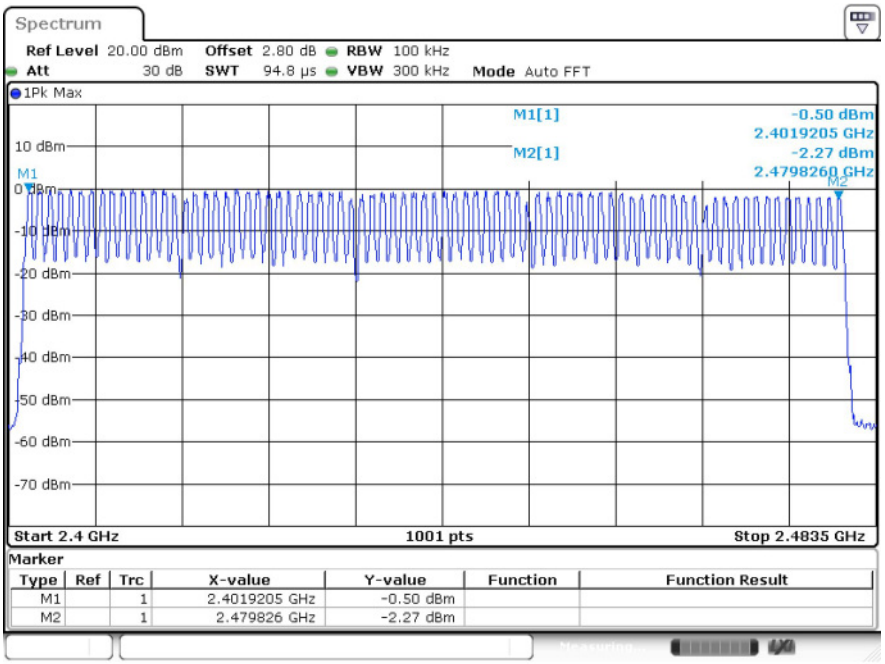
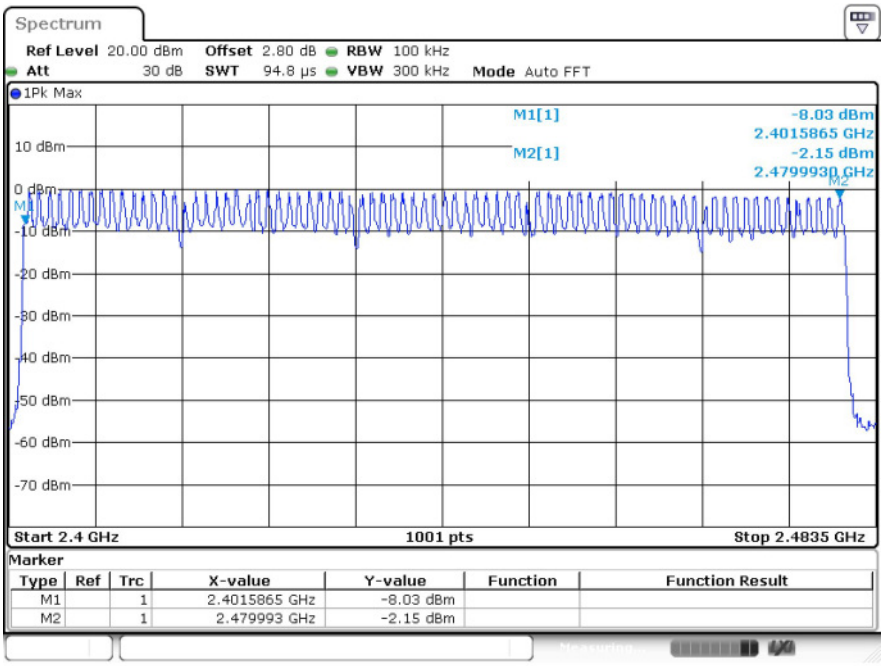
5 Hopping Channel Number

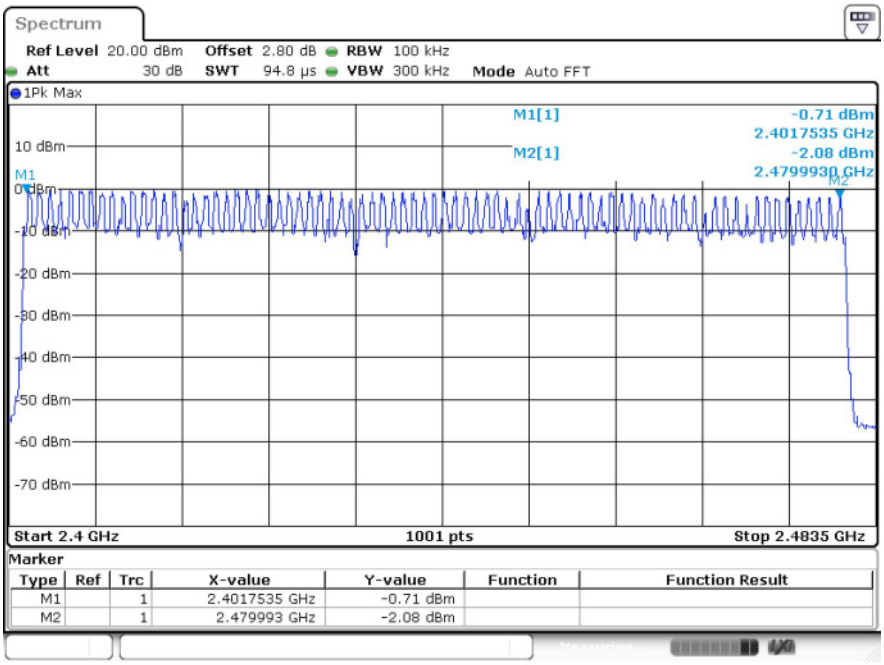
5.1 Test Result

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

Note: Left and Right ears have been tested. The data from the Left ear is the worst, only showing the worst case mode.

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] -0.71 dBm 2.4017535 GHz M2[1] -2.08 dBm 2.479993 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 2.4017535 GHz -0.71 dBm M2 1 2.479993 GHz -2.08 dBm

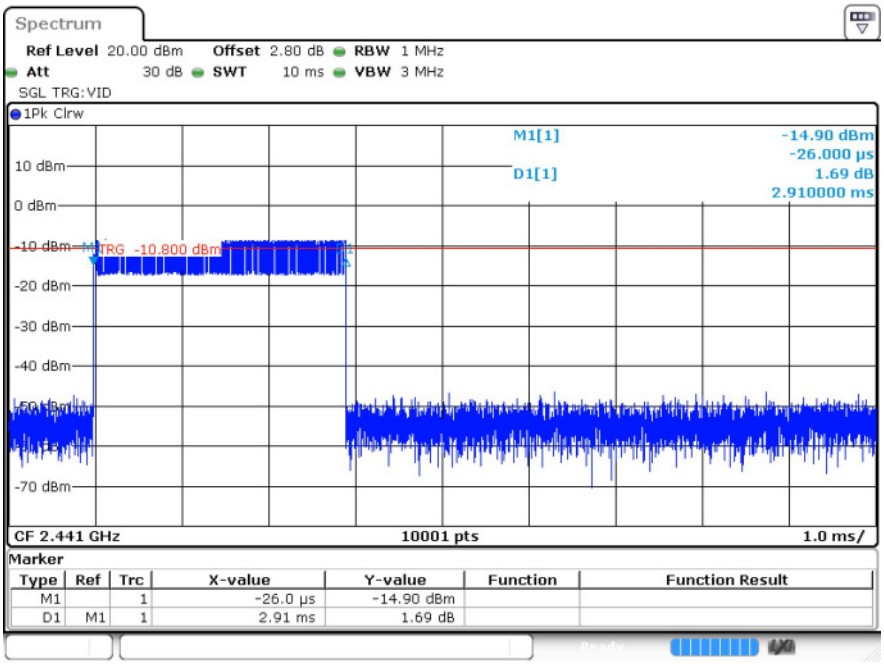
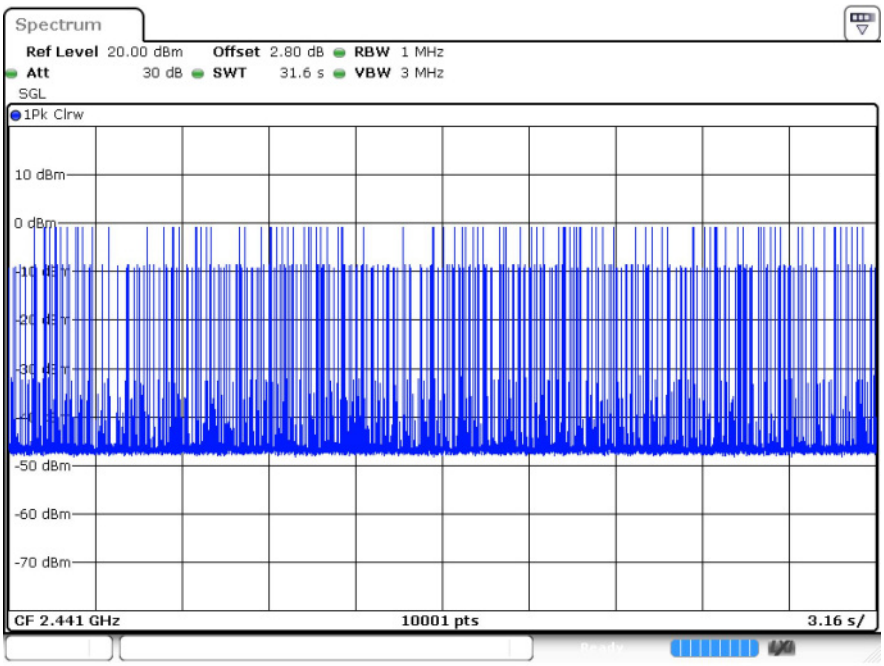
6 Dwell Time

6.1 Test Result

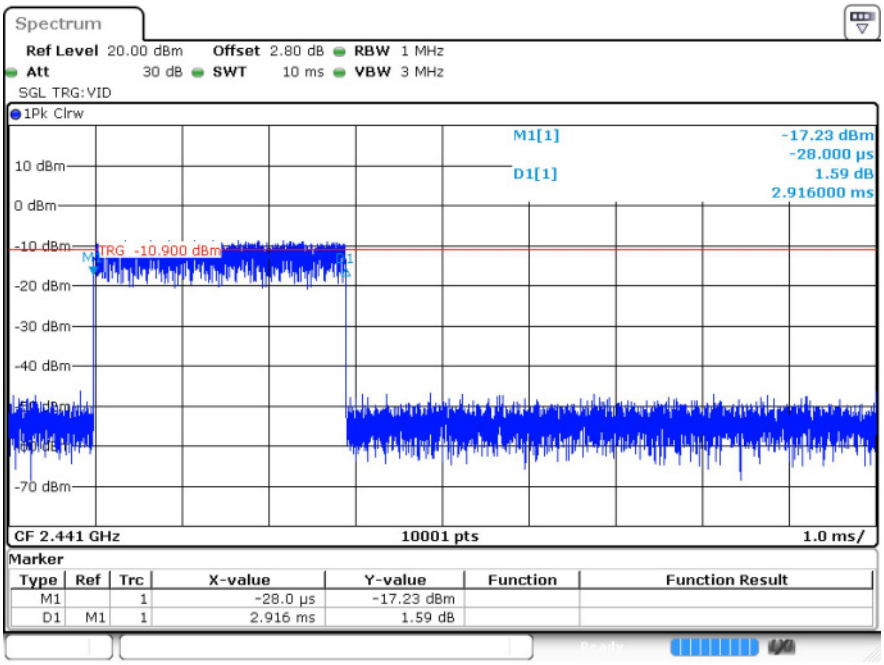
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.91	102	296.82	0.4	Pass
π/4DQPSK	2DH5	MCH	2.916	100	291.6	0.4	Pass
8DPSK	3DH5	MCH	2.918	107	312.226	0.4	Pass

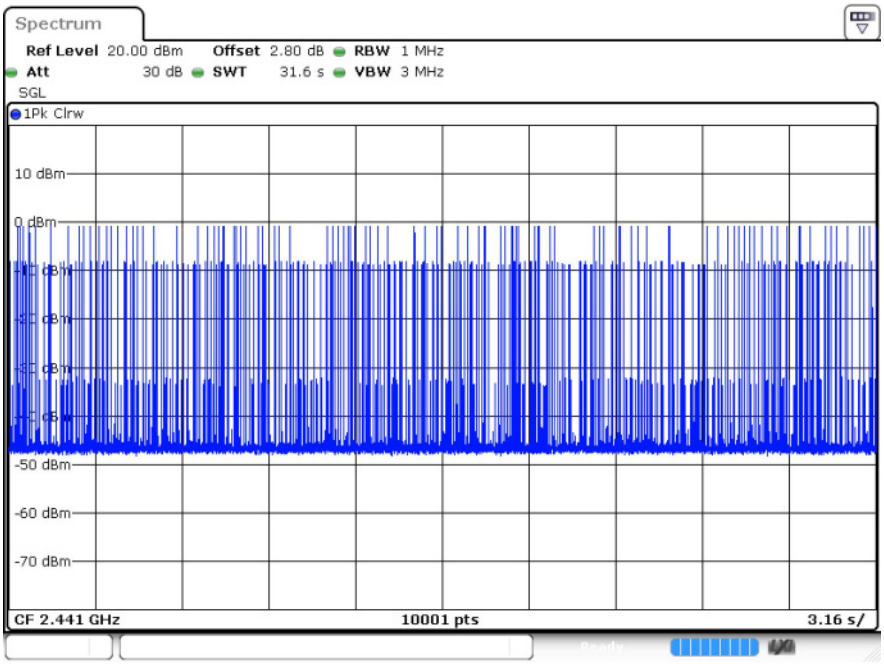
Note: Left and Right ears have been tested. The data from the Left ear is the worst, only showing the worst case mode.

6.2 Test Graphs

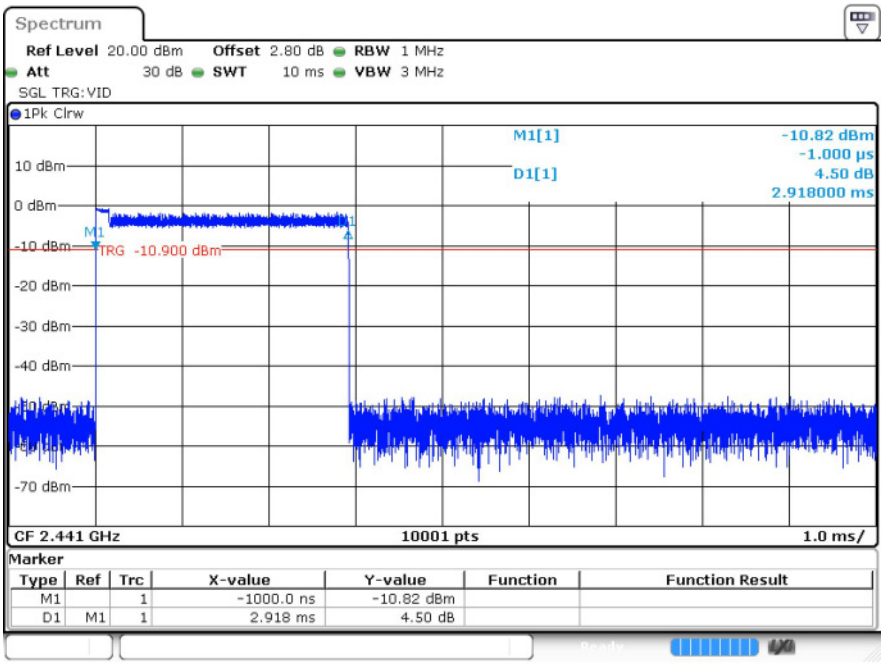
Test Graphs	
GFSK_DH5/MCH	 

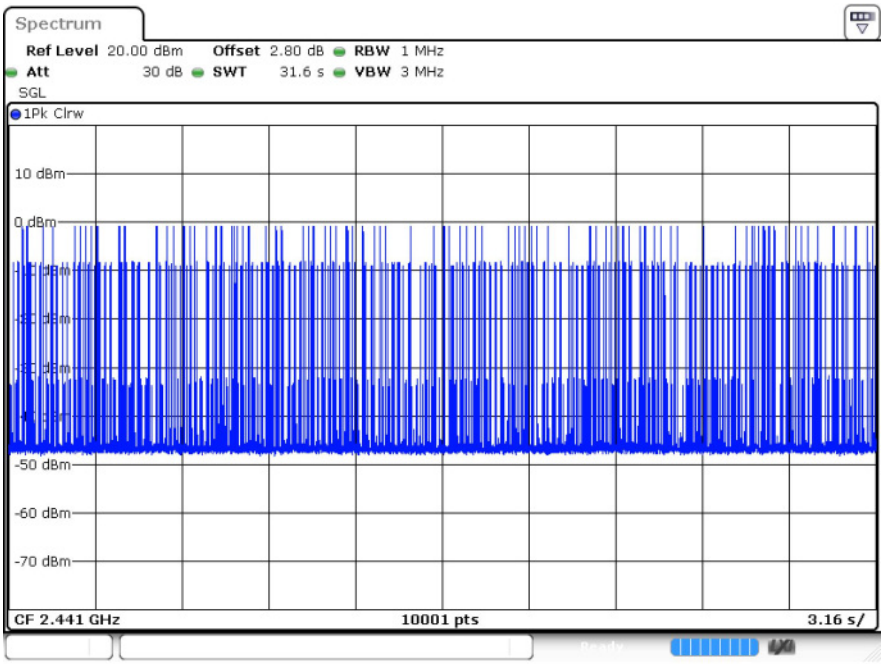
π/4DQPSK
_2DH5/MCH





8DPSK _3DH5/MCH





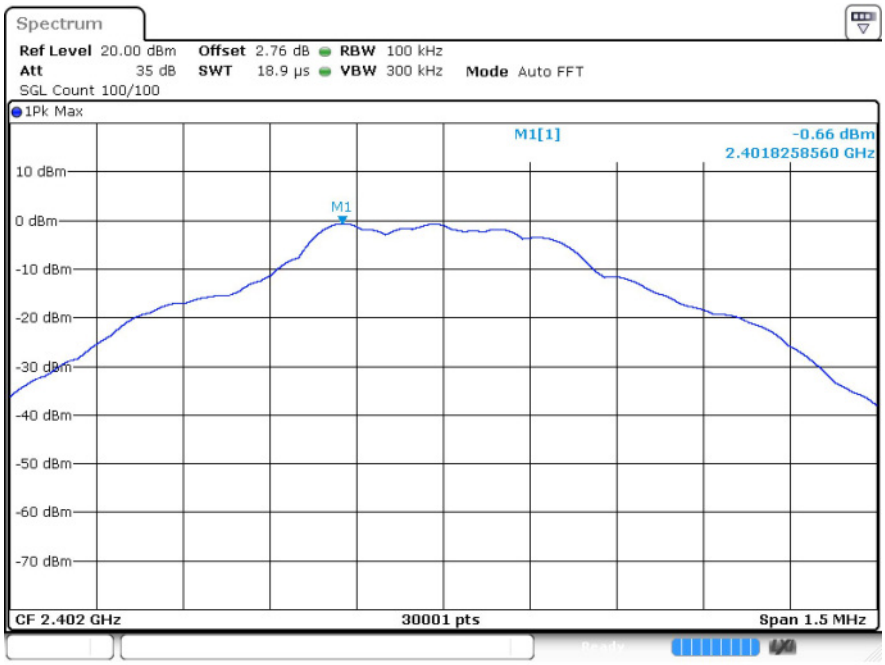
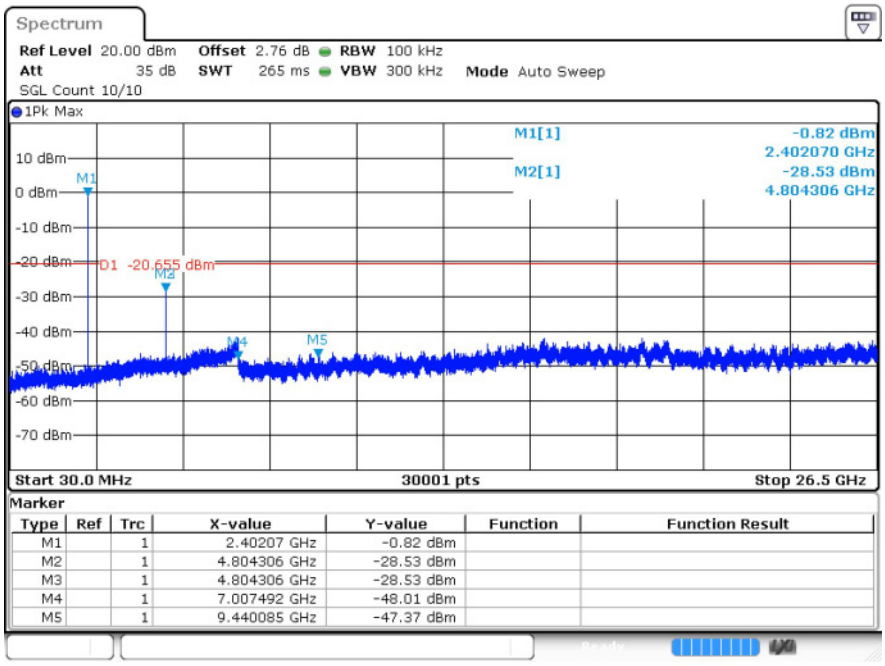
7 RF Conducted Spurious Emissions

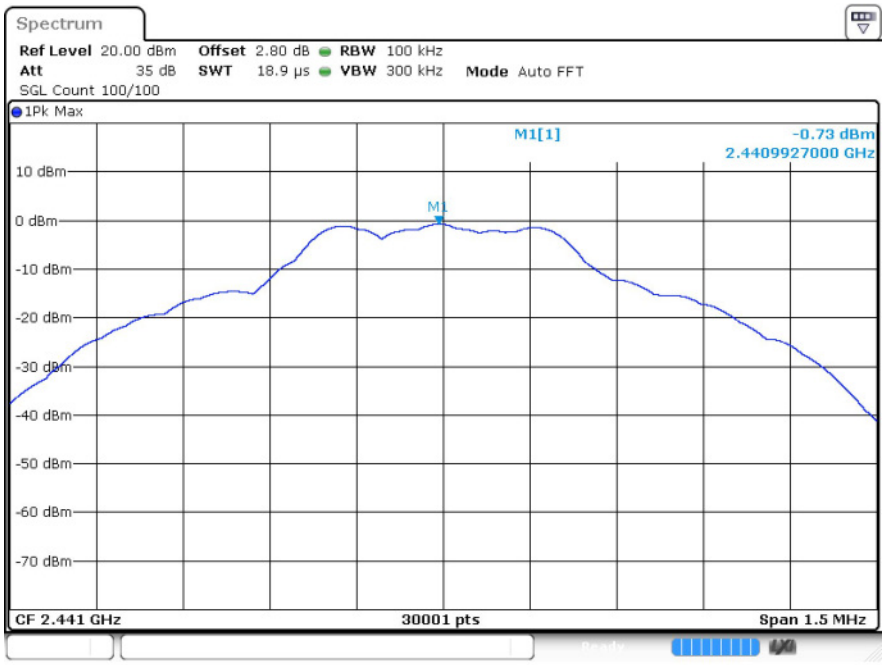
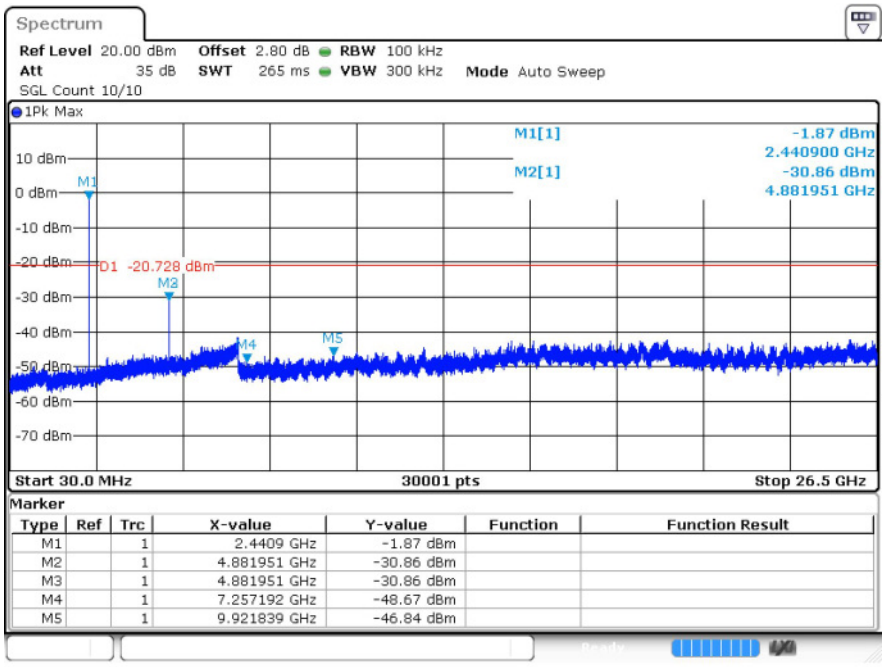
7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-27.87	-20	Pass
	MCH	-30.13	-20	Pass
	HCH	-26.26	-20	Pass
π/4DQPSK	LCH	-26.79	-20	Pass
	MCH	-24.95	-20	Pass
	HCH	-35.27	-20	Pass
8DPSK	LCH	-25.03	-20	Pass
	MCH	-27.21	-20	Pass
	HCH	-26.21	-20	Pass

Note: Left and Right ears have been tested. The data from the Left ear is the worst, only showing the worst case mode.

7.2 Test Graphs

GFSK_LCH_Graphs	
Pref	
Puw	

GFSK_MCH_Graphs	
Pref	
Puw