Appendix A

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

Product Name: BLUETOOTH SPEAKER

Trade Mark: Heysound

Test Model: HY-5512

Environmental Conditions

Temperature:	25.6℃
Relative Humidity:	54.7%
ATM Pressure:	101Kpa
Test Engineer:	Emiya Lin
Supervised by:	Simba Huang

Contents

Page

COVER PAGE

1 Duty Cycle 3
1.1 Test Result 3
1.2 Test Graphs 4
2 Maximum Conducted Peak Output Power 9
2.1 Test Result 9
2.2 Test Graphs 10
3 20dB Bandwidth 15
3.1 Test Result 15
3.2 Test Graphs 16
4 Carrier Frequency Separation 21
4.1 Test Result 21
4.2 Test Graphs 22
5 Hopping Channel Number 24
5.1 Test Result 24
5.2 Test Graphs 25
6 Dwell Time 27
6.1 Test Result 27
6.2 Test Graphs 28
7 RF Conducted Spurious Emissions 31
7.1 Test Result 31
7.2 Test Graphs 32
8 Band-edge for RF Conducted Emissions 41
8.1 Test Result 41
8.2 Test Graphs 42
9 Restrict-band band-edge measurements 54
9.1 Test Result 54
9.2 Test Graphs 56

1 Duty Cycle

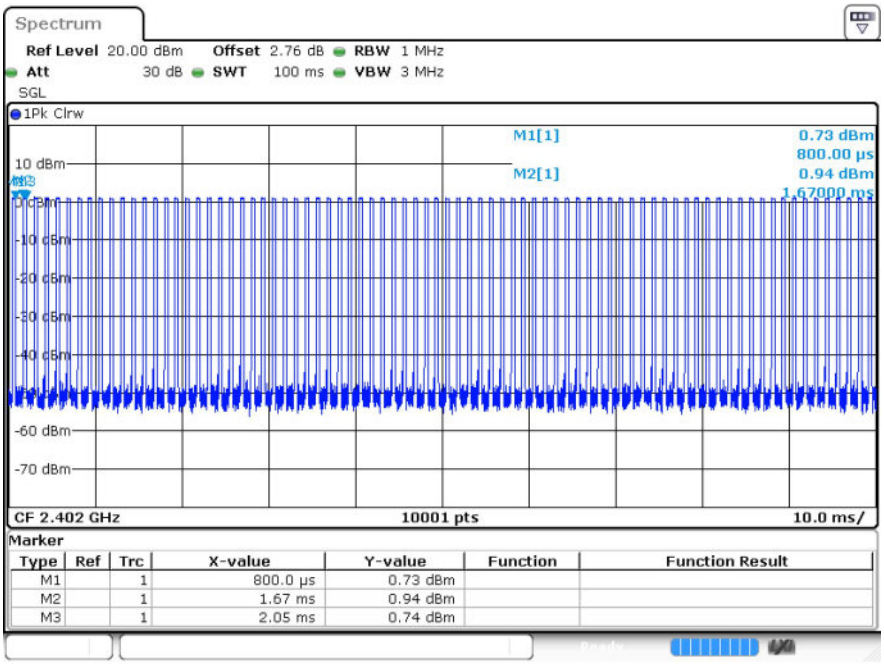
1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)	Duty Cycle Factor (dB)
1-DH1	2402	31.2	2.63	5.06
1-DH1	2441	31.2	2.63	5.06
1-DH1	2480	31.2	2.63	5.06
2-DH1	2402	32	2.56	4.95
2-DH1	2441	32	2.56	4.95
2-DH1	2480	32	2.56	4.95
3-DH1	2402	32.06	2.56	4.94
3-DH1	2441	32	2.56	4.95
3-DH1	2480	32	2.56	4.95

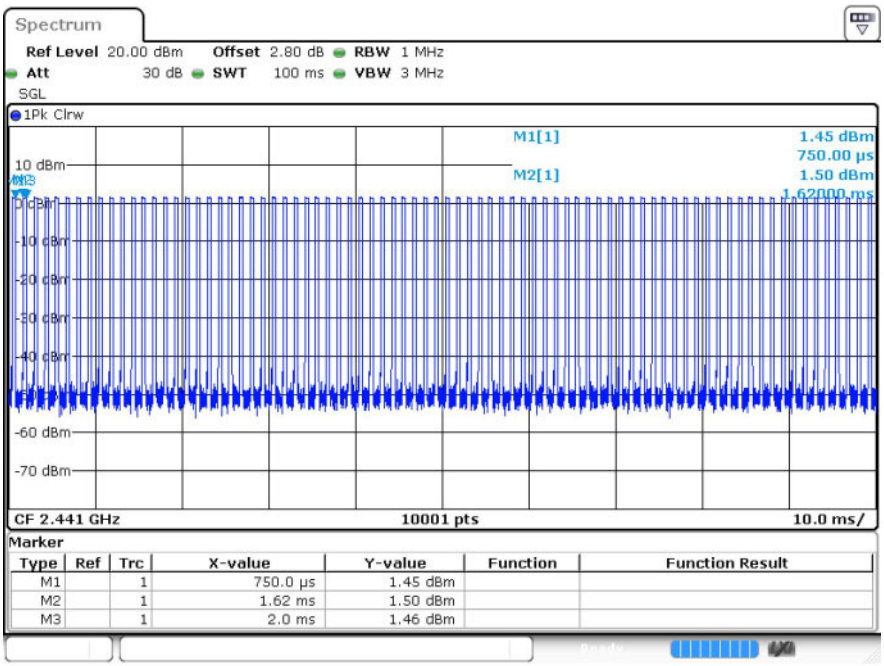
1.2 Test Graphs

Test Graphs

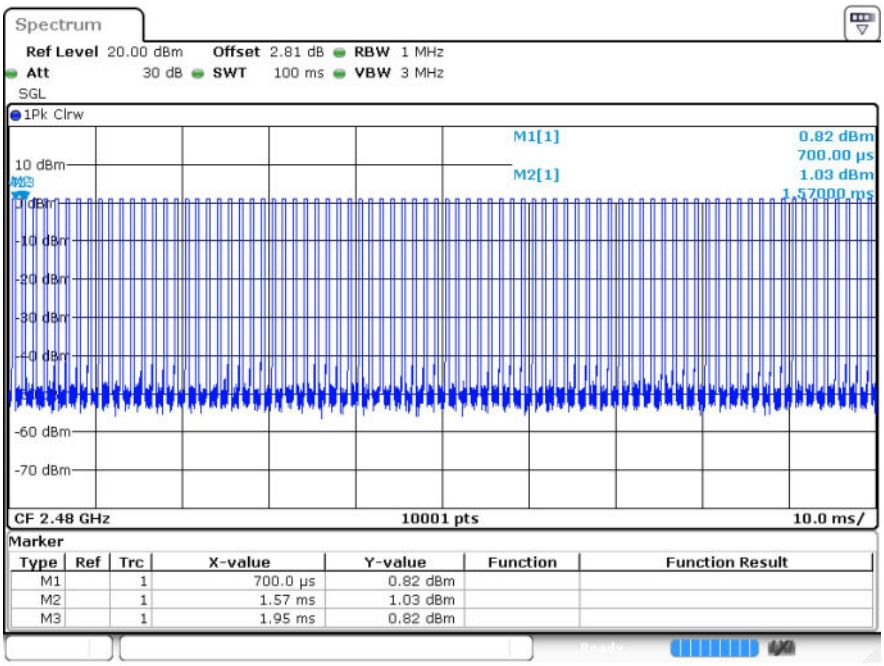
1-DH1 2402MHz



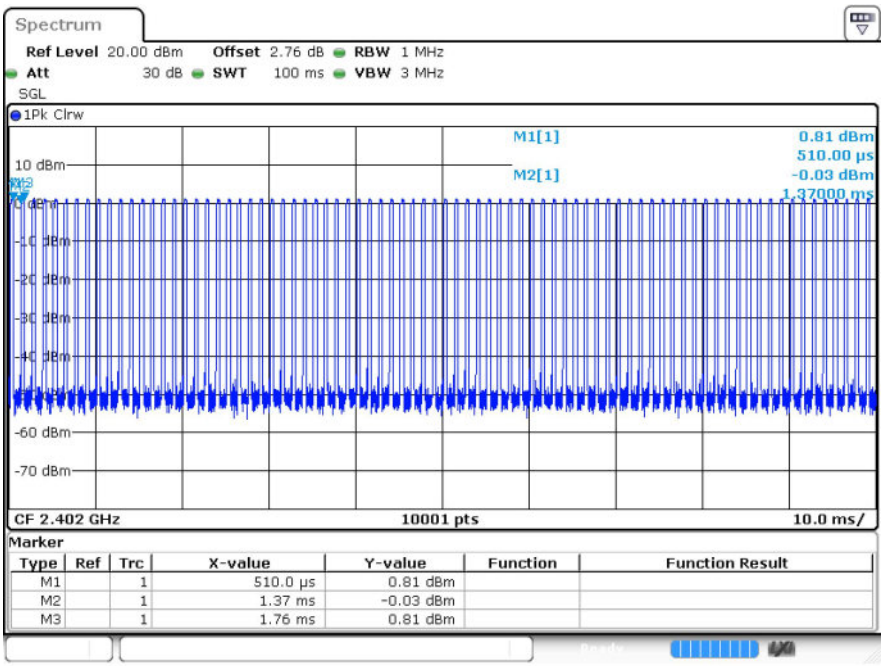
1-DH1 2441MHz



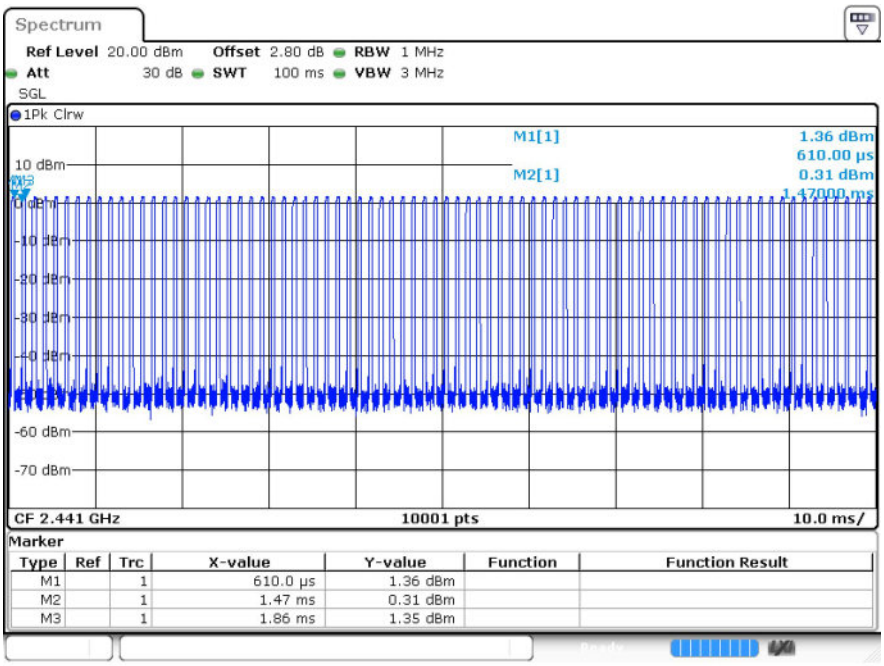
1-DH1 2480MHz



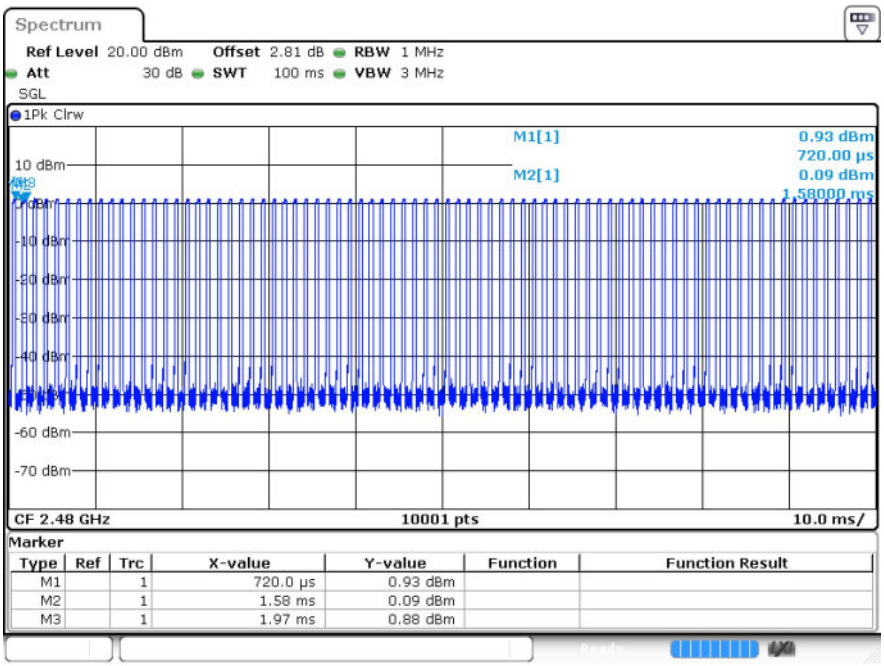
2-DH1 2402MHz



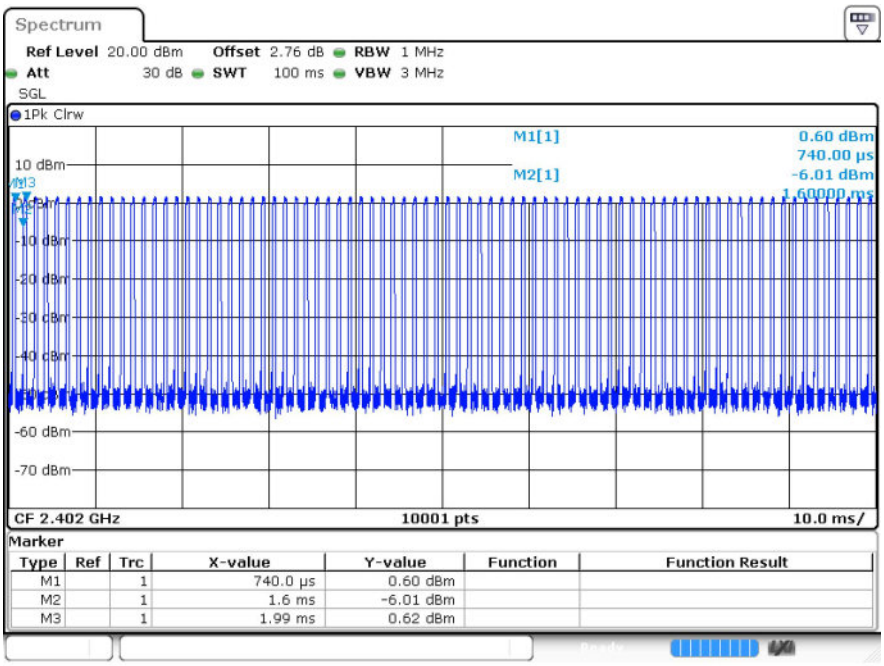
2-DH1 2441MHz



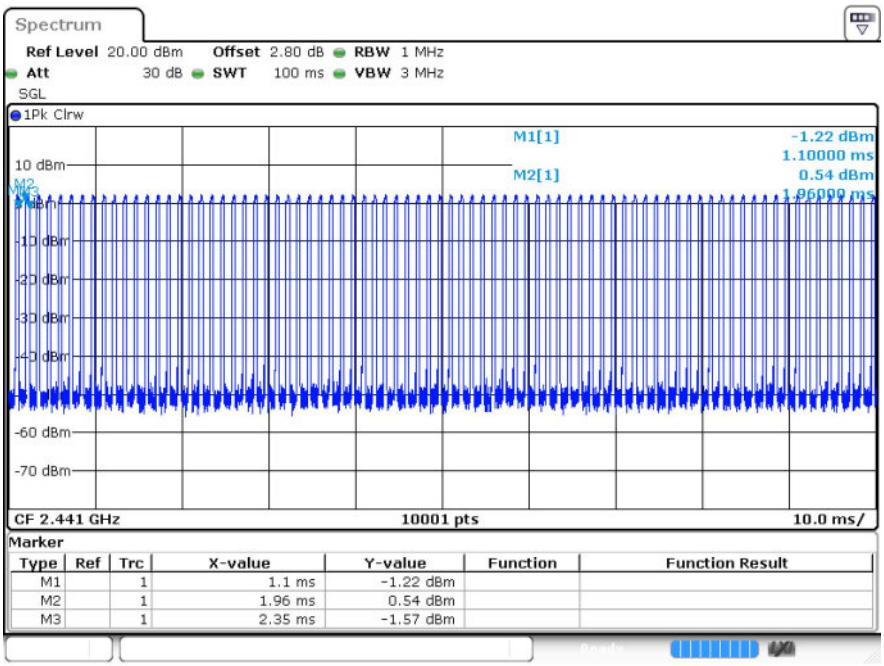
2-DH1 2480MHz



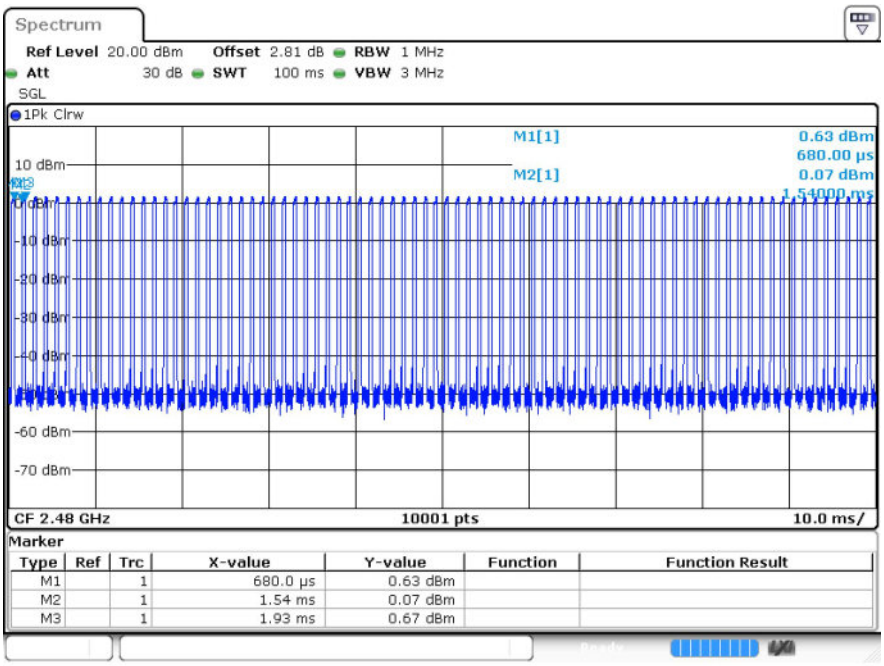
3-DH1 2402MHz



3-DH1 2441MHz



3-DH1 2480MHz

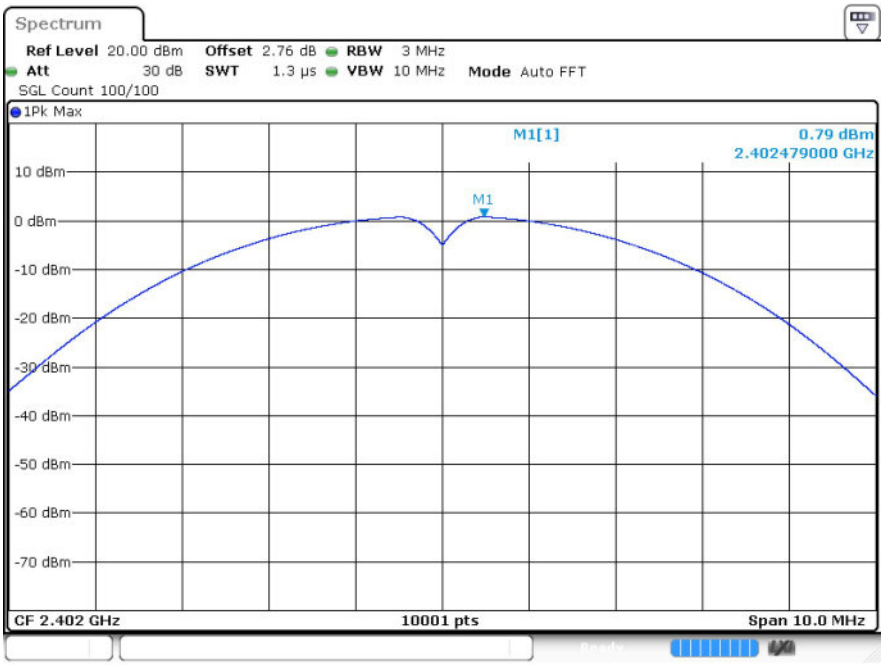
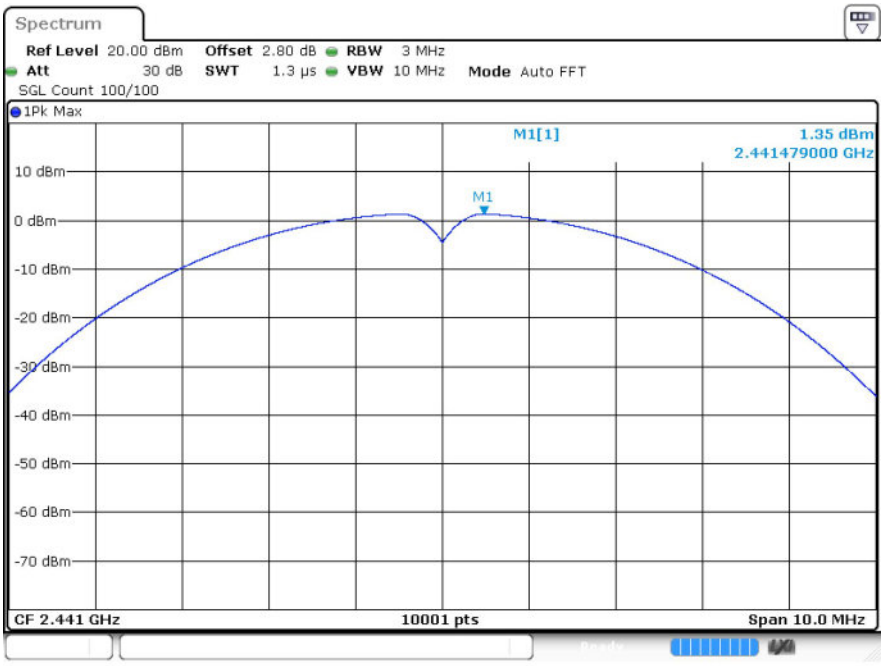


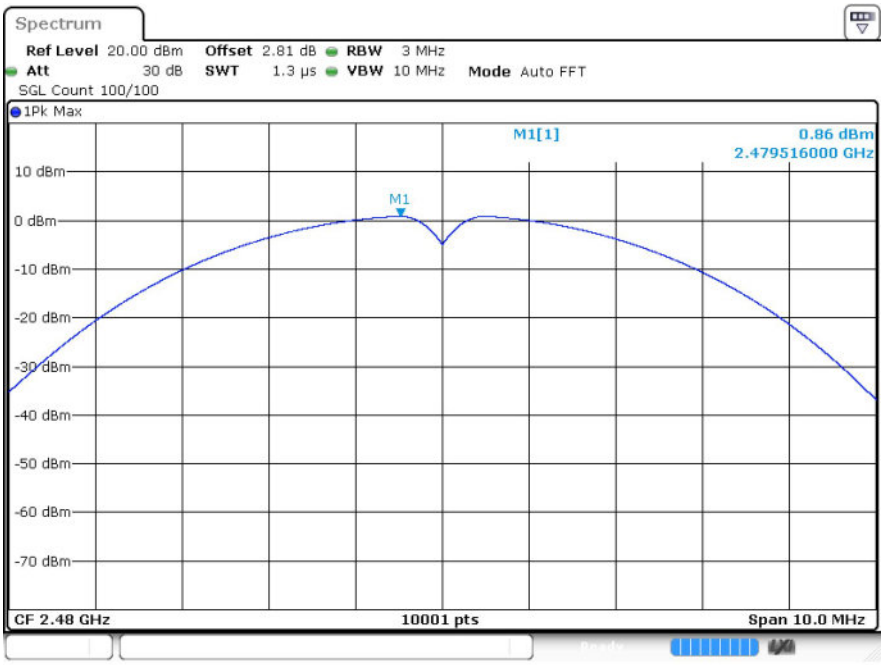
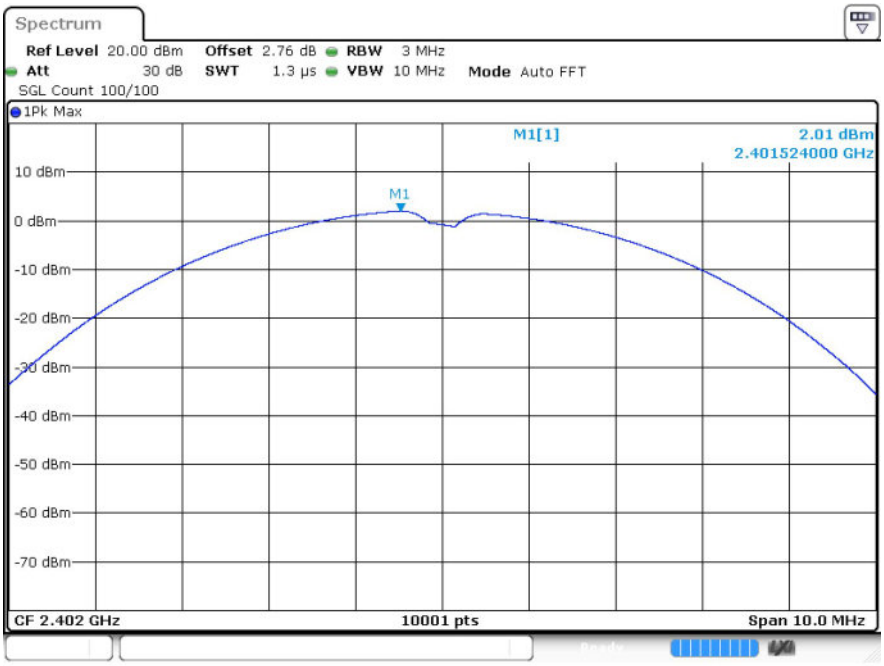
2 Maximum Conducted Peak Output Power

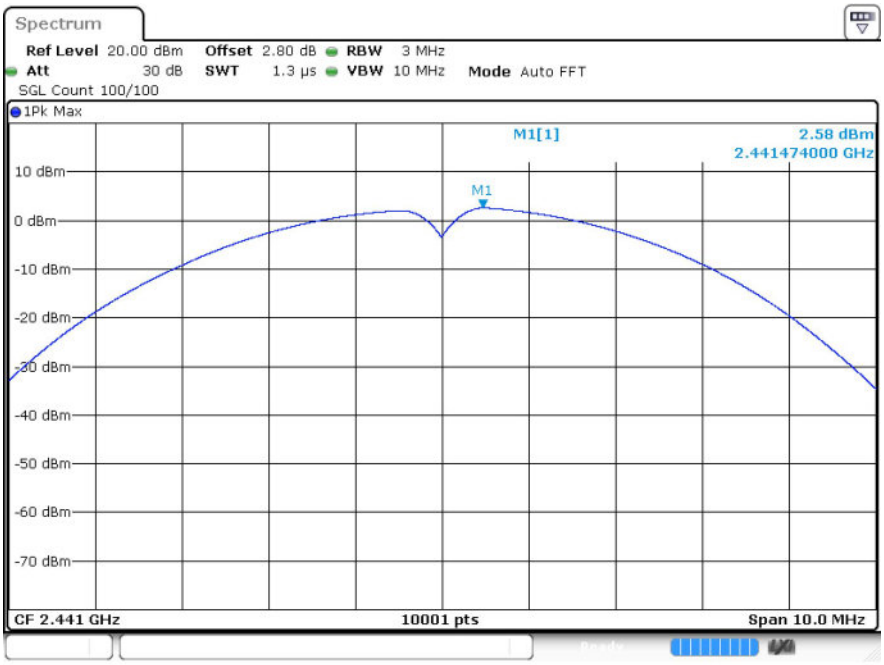
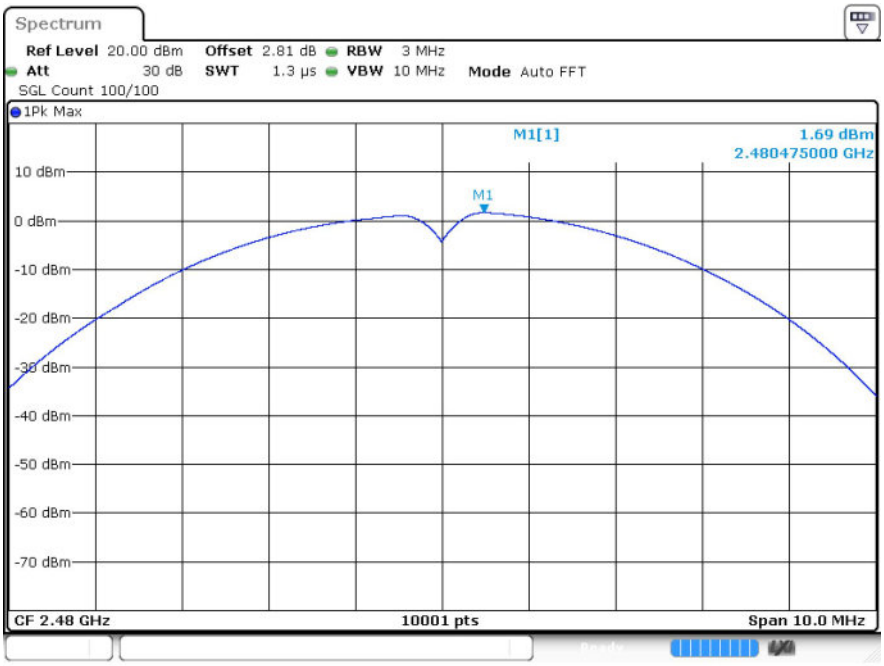
2.1 Test Result

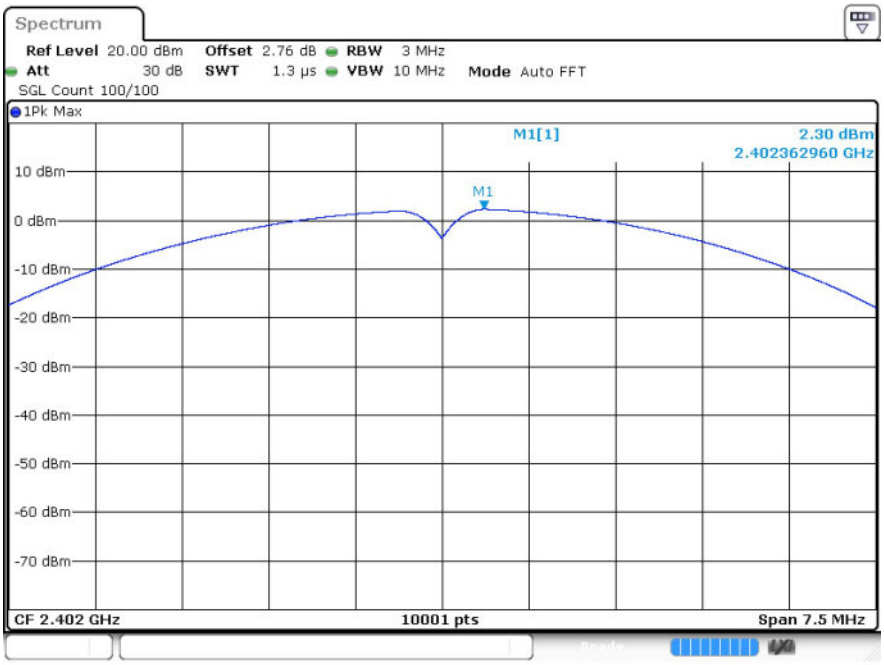
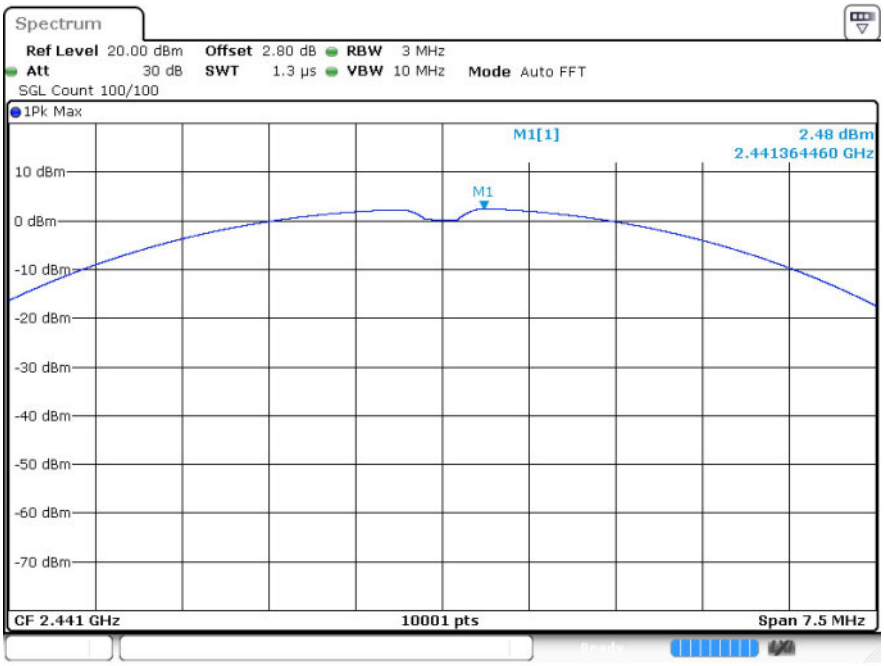
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.79	21	Pass
	MCH	1.35	21	Pass
	HCH	0.86	21	Pass
π/4DQPSK	LCH	2.01	21	Pass
	MCH	2.58	21	Pass
	HCH	1.69	21	Pass
8DPSK	LCH	2.3	21	Pass
	MCH	2.48	21	Pass
	HCH	2.2	21	Pass

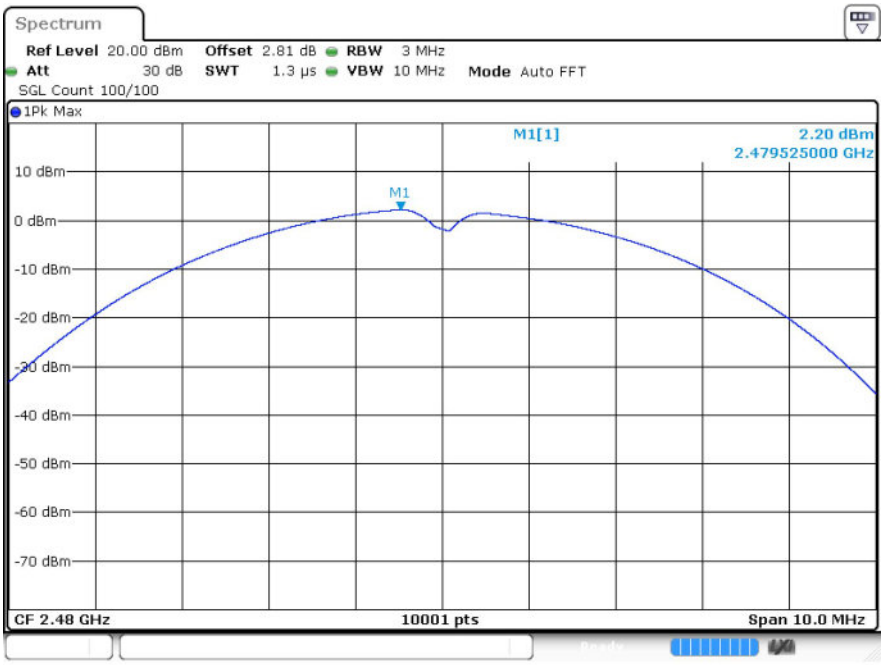
2.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

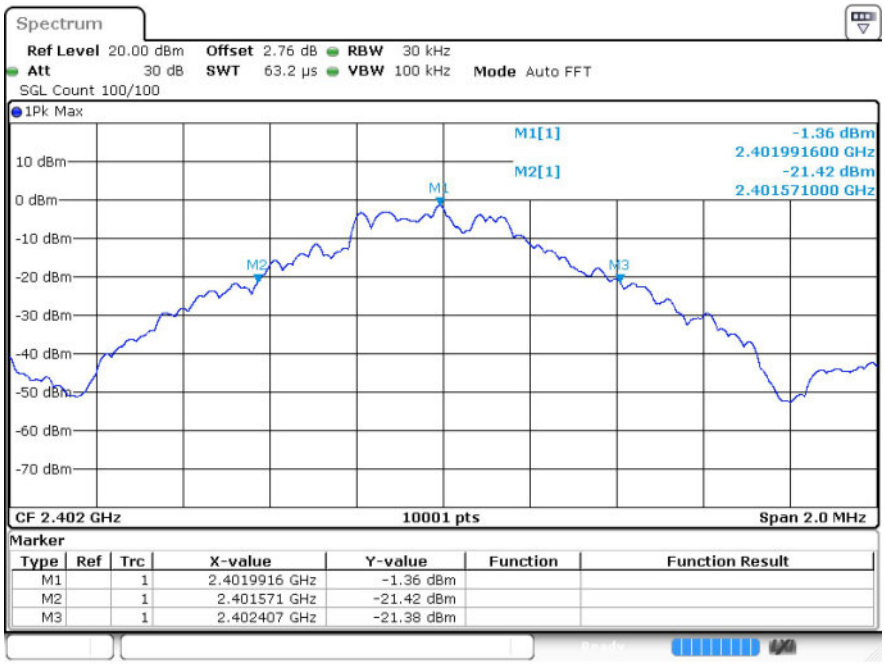
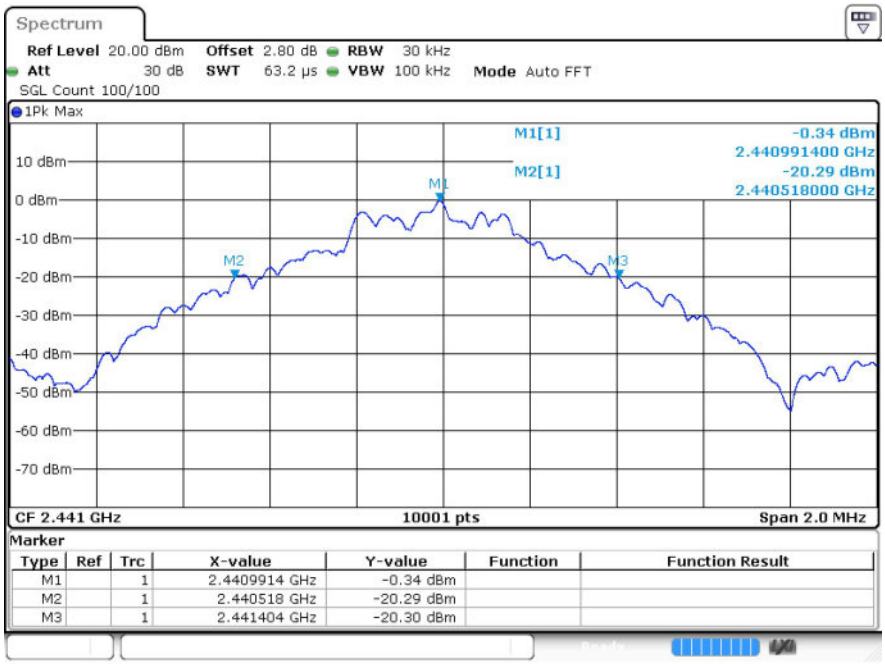
8DPSK/HCH	 Spectrum Ref Level 20.00 dBm Offset 2.81 dB RBW 3 MHz Att 30 dB SWT 1.3 µs VBW 10 MHz Mode Auto FFT SGL Count 100/100 1Pk Max M1[1] 2.20 dBm 2.479525000 GHz M1 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.48 GHz 10001 pts Span 10.0 MHz

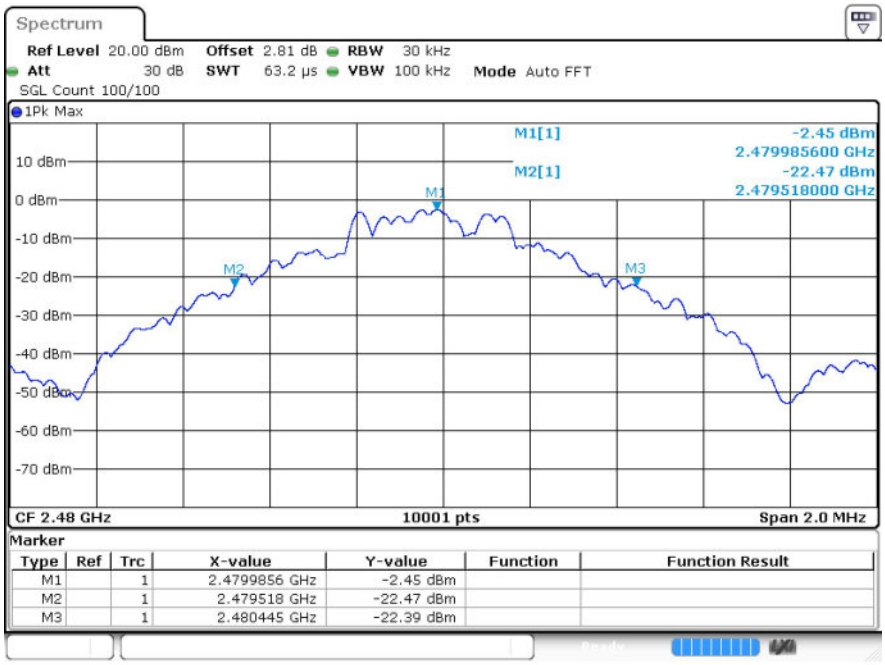
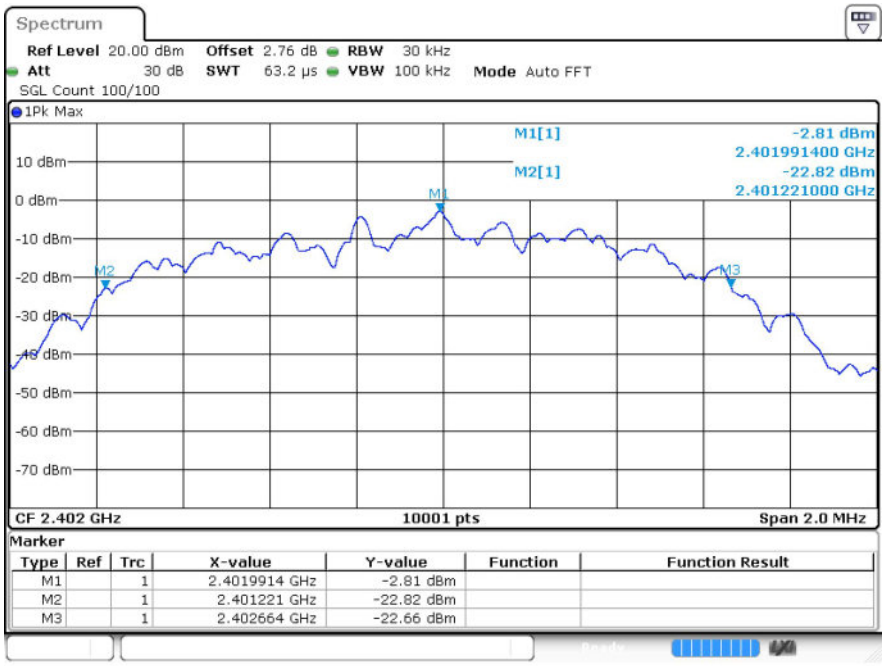
3 20dB Bandwidth

3.1 Test Result

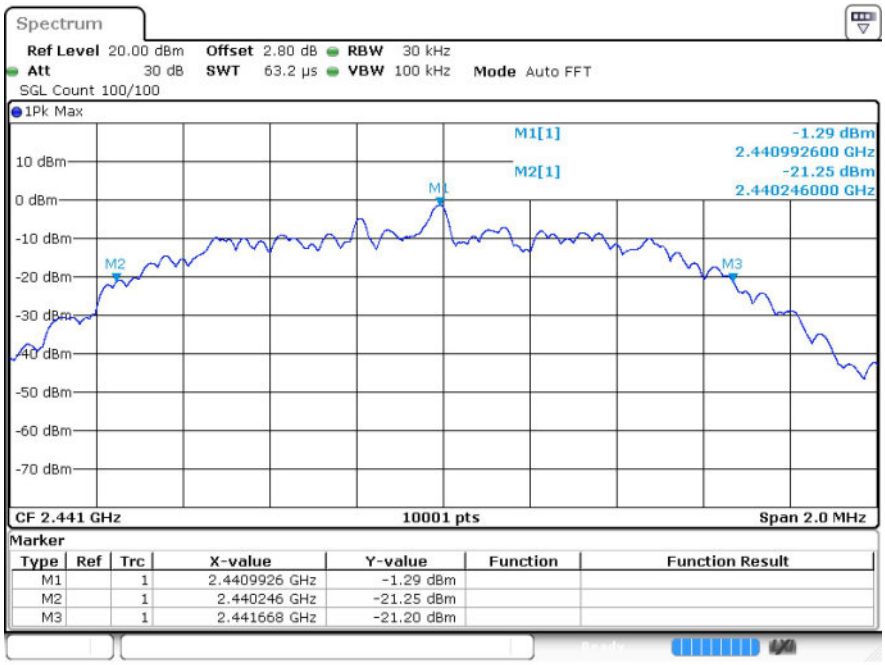
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.835	Not Specified	Pass
	MCH	0.886	Not Specified	Pass
	HCH	0.927	Not Specified	Pass
π/4DQPSK	LCH	1.443	Not Specified	Pass
	MCH	1.423	Not Specified	Pass
	HCH	1.395	Not Specified	Pass
8DPSK	LCH	1.439	Not Specified	Pass
	MCH	1.424	Not Specified	Pass
	HCH	1.446	Not Specified	Pass

3.2 Test Graphs

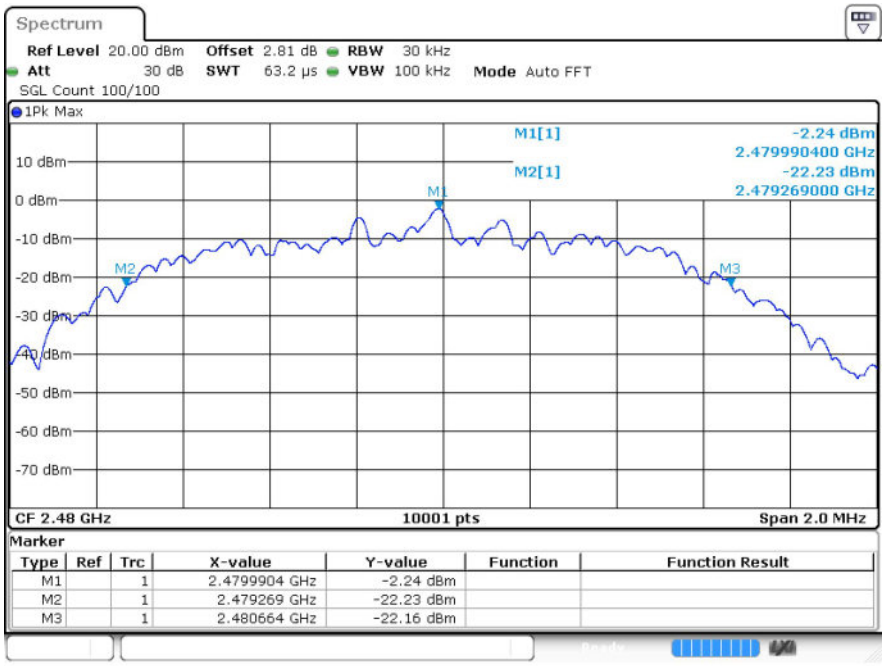
Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

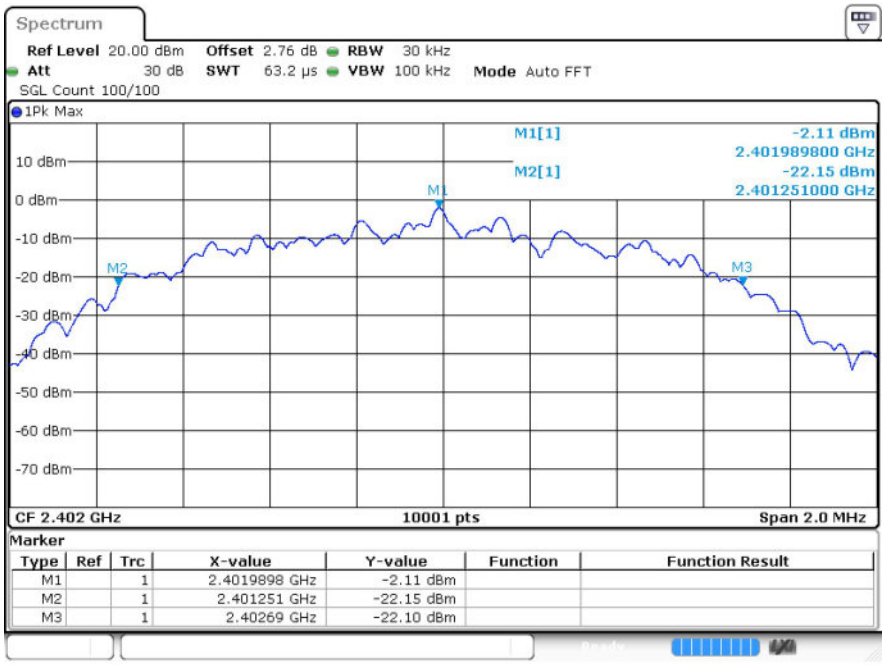
π/4DQPSK/MCH



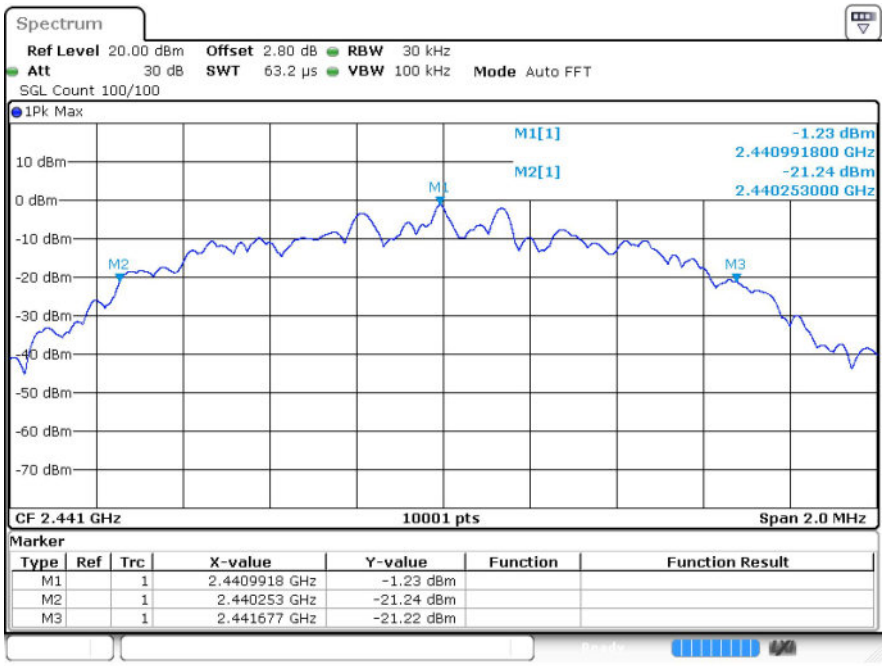
π/4DQPSK/HCH

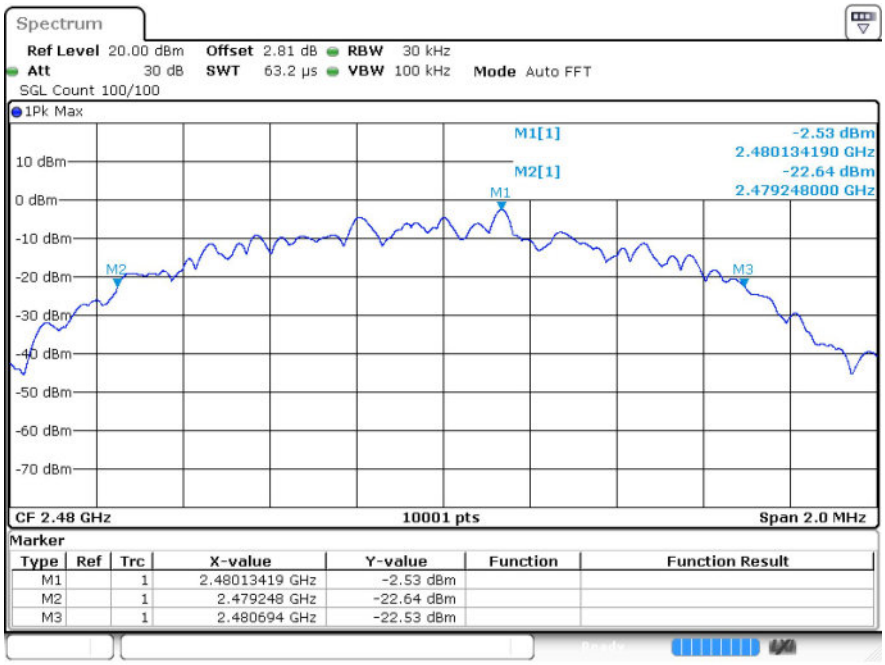


8DPSK/LCH



8DPSK/MCH



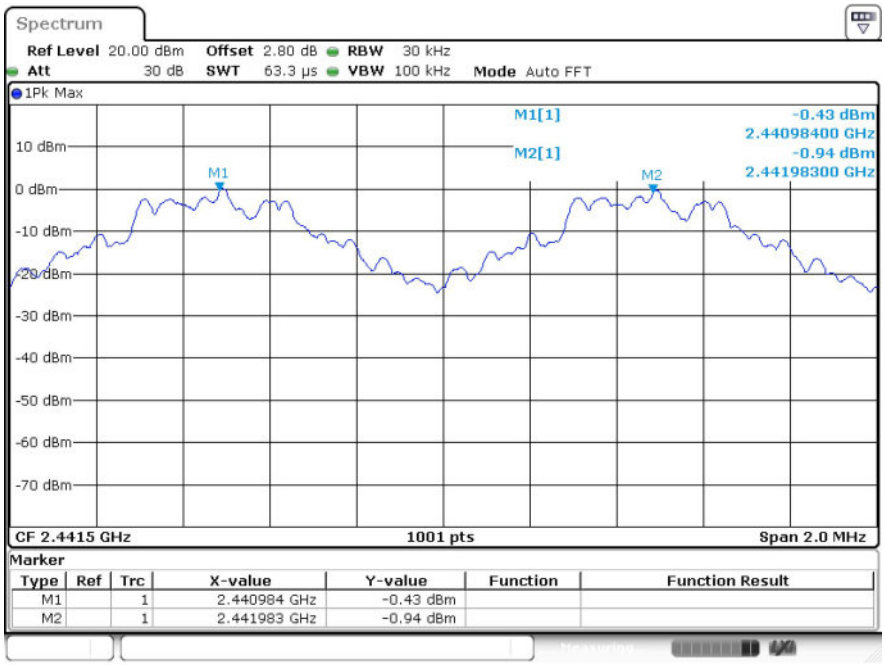
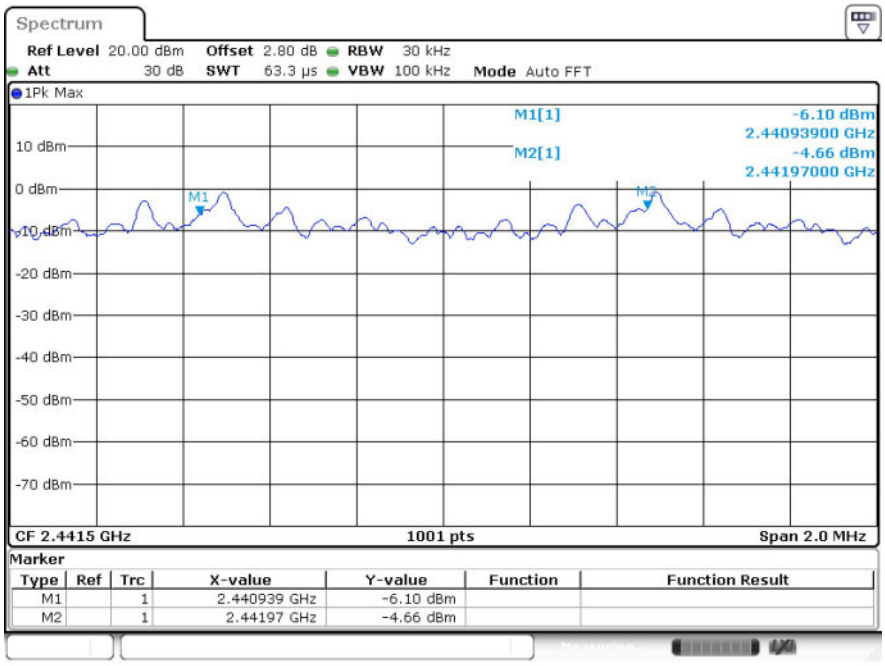
8DPSK/HCH	 Spectrum Ref Level 20.00 dBm Offset 2.81 dB RBW 30 kHz Att 30 dB SWT 63.2 µs VBW 100 kHz Mode Auto FFT SGL Count 100/100 1Pk Max M1[1] -2.53 dBm 2.480134190 GHz M2[1] -22.64 dBm 2.479248000 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm M1 M2 M3 CF 2.48 GHz 10001 pts Span 2.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.48013419 GHz -2.53 dBm M2 1 2.479248 GHz -22.64 dBm M3 1 2.480694 GHz -22.53 dBm

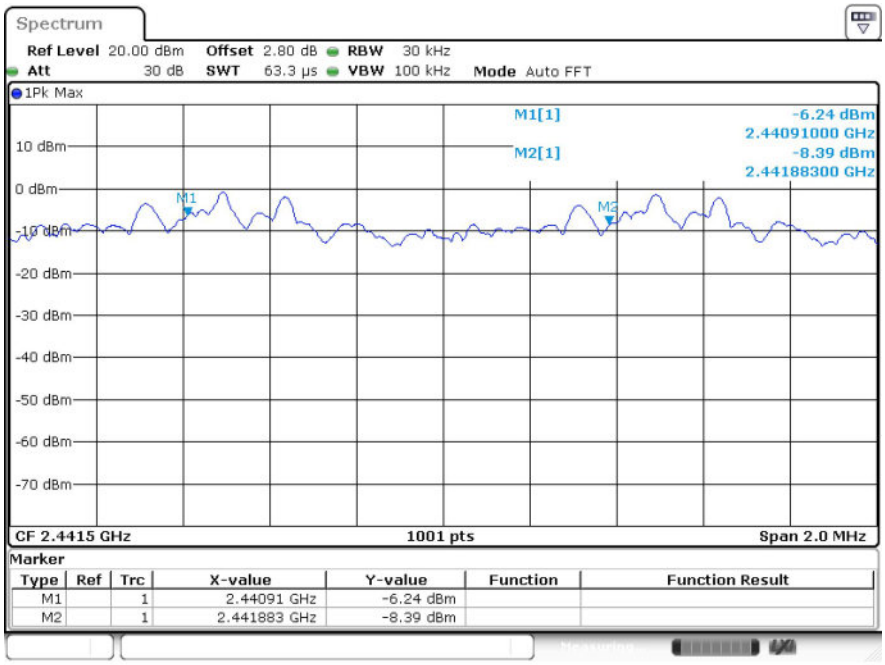
4 Carrier Frequency Separation

4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	0.999	0.591	Pass
π/4DQPSK	MCH	1.031	0.949	Pass
8DPSK	MCH	0.973	0.949	Pass

4.2 Test Graphs

Test Graphs	
GFSK/MCH	
π/4DQPSK/MCH	

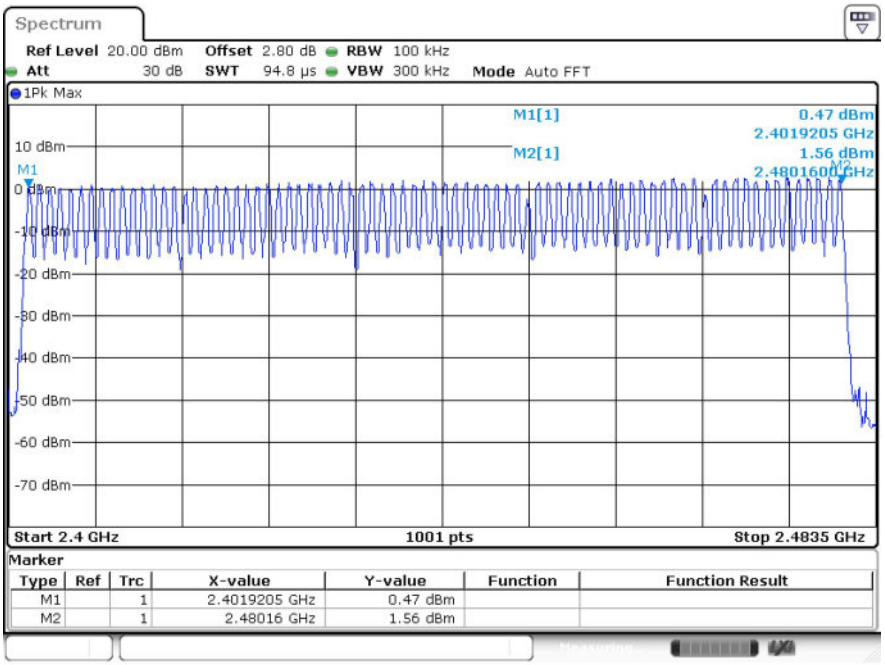
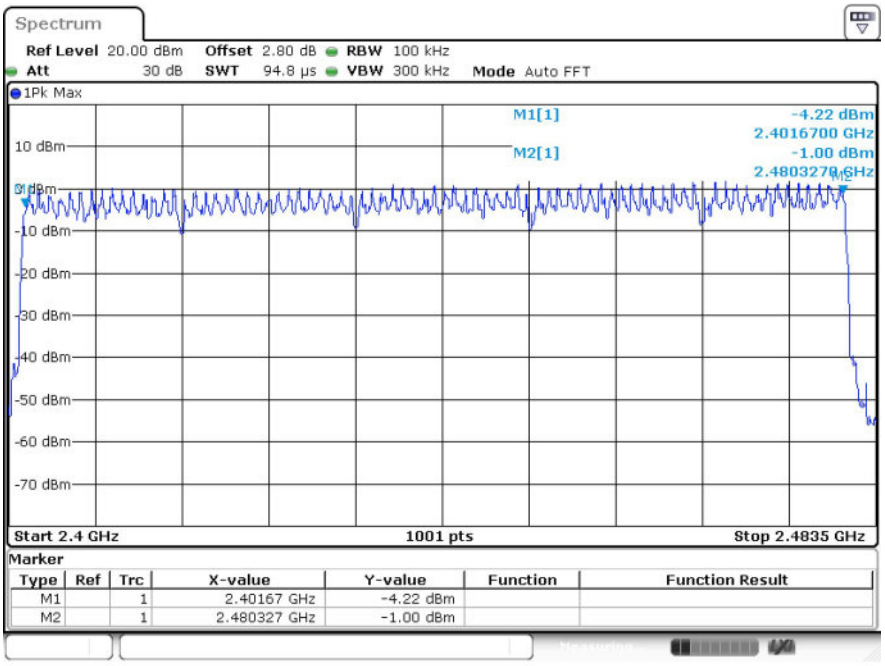
8DPSK/MCH	 Spectrum Ref Level 20.00 dBm Offset 2.80 dB RBW 30 kHz Att 30 dB SWT 63.3 µs VBW 100 kHz Mode Auto FFT 1Pk Max M1[1] -6.24 dBm 2.44091000 GHz M2[1] -8.39 dBm 2.44188300 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm CF 2.4415 GHz 1001 pts Span 2.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.44091 GHz -6.24 dBm M2 1 2.441883 GHz -8.39 dBm

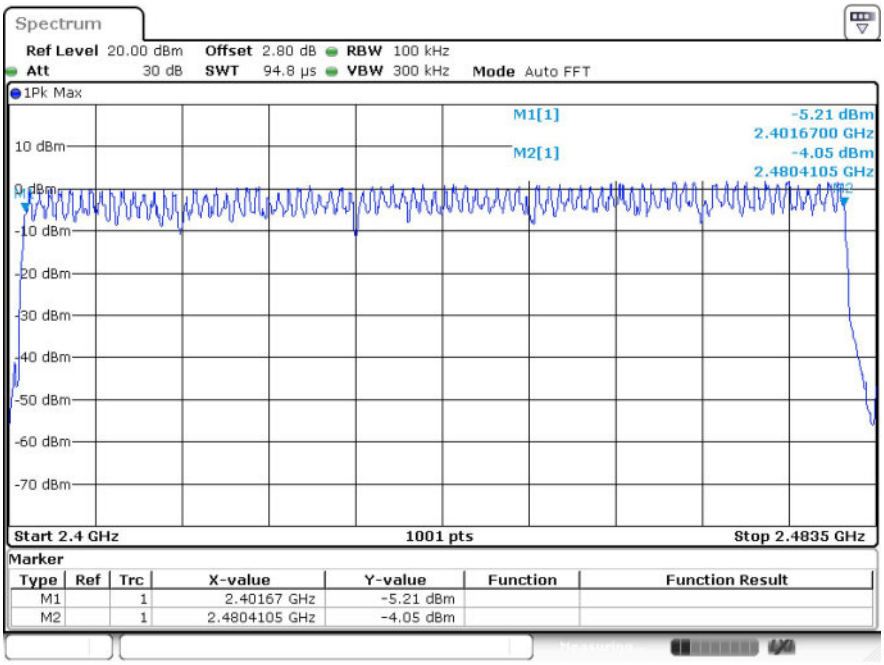
5 Hopping Channel Number

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	

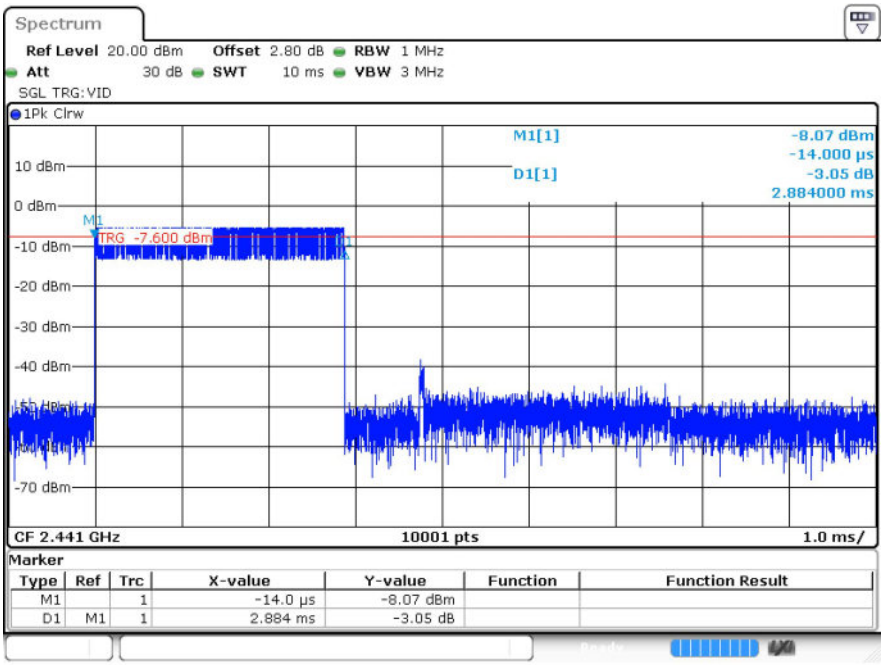
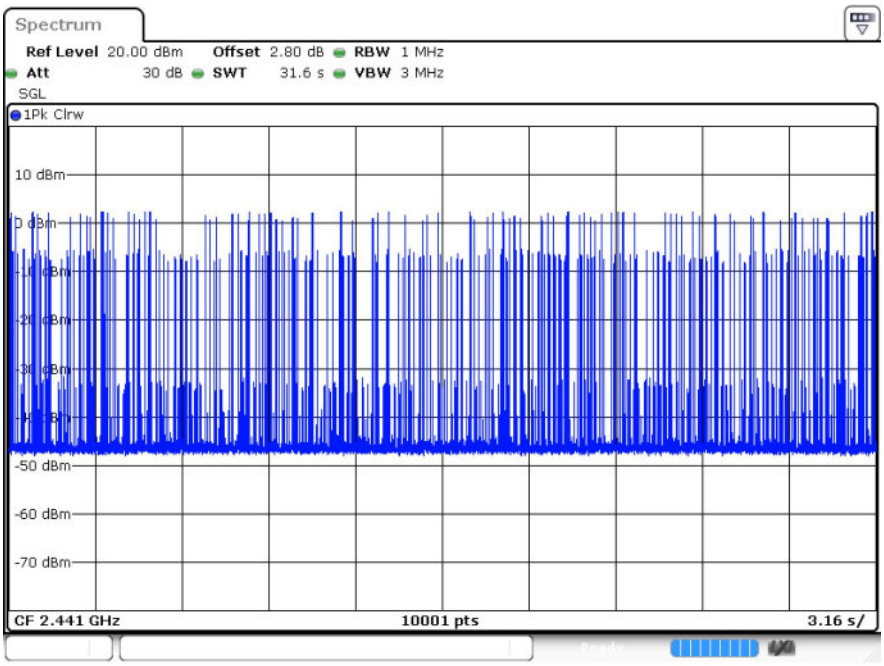
8DPSK/Hop	 Spectrum Ref Level 20.00 dBm Offset 2.80 dB RBW 100 kHz Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT 1Pk Max M1[1] -5.21 dBm 2.4016700 GHz M2[1] -4.05 dBm 2.4804105 GHz 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm Start 2.4 GHz 1001 pts Stop 2.4835 GHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.40167 GHz -5.21 dBm M2 1 2.4804105 GHz -4.05 dBm

6 Dwell Time

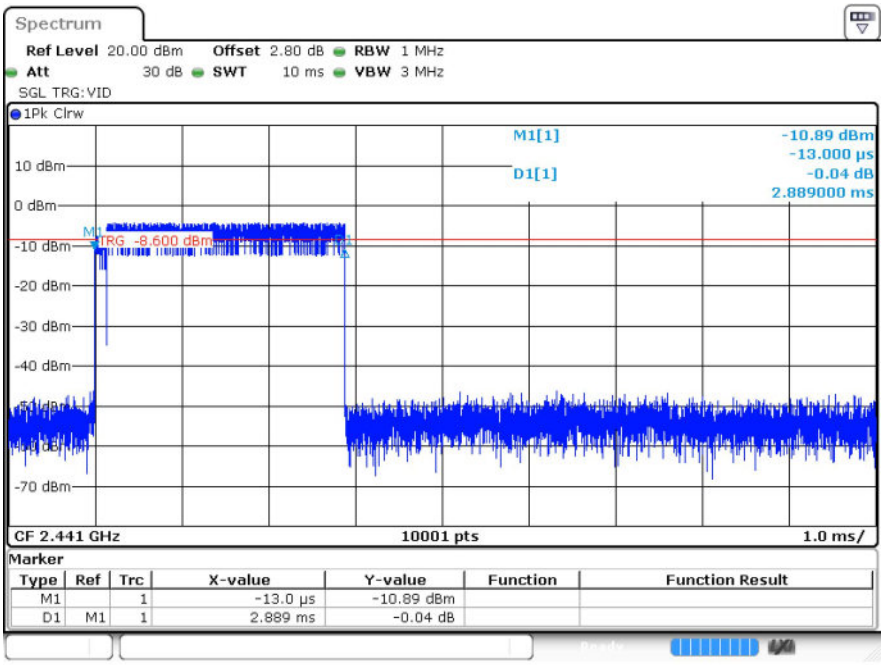
6.1 Test Result

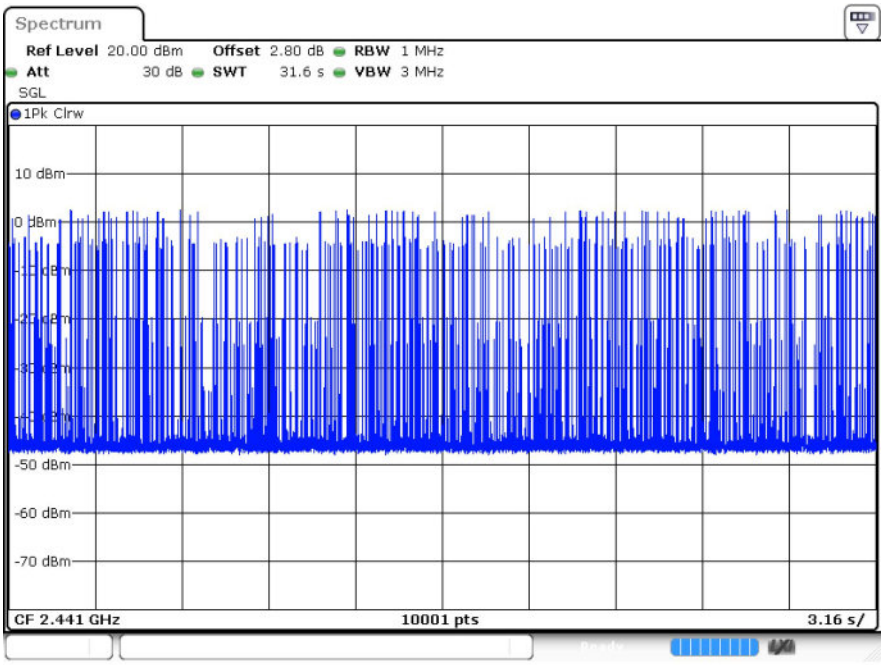
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.884	105	302.82	0.4	Pass
π/4DQPSK	2DH5	MCH	2.889	107	309.123	0.4	Pass
8DPSK	3DH5	MCH	2.891	110	318.01	0.4	Pass

6.2 Test Graphs

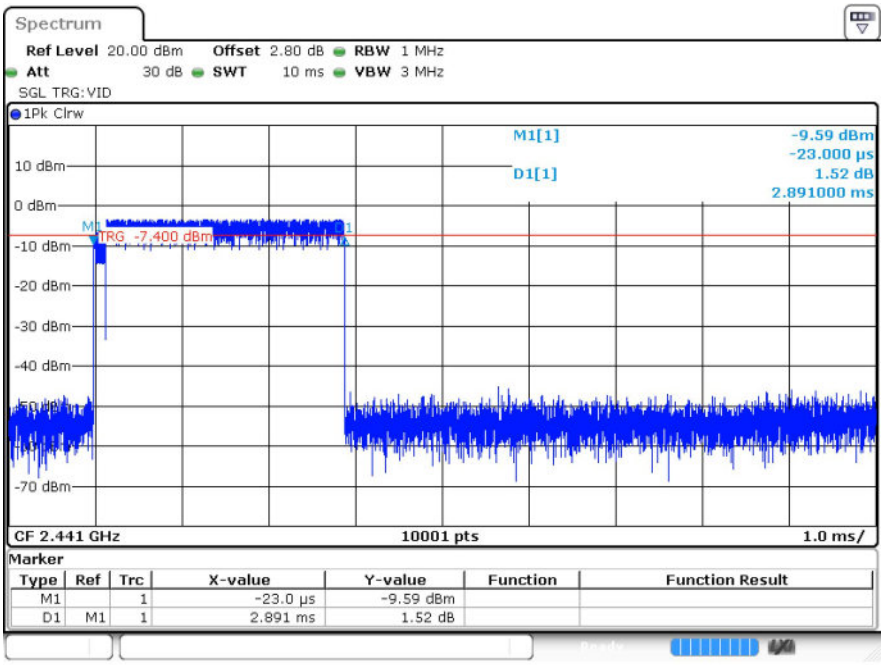
Test Graphs	
GFSK_DH5/MCH	 

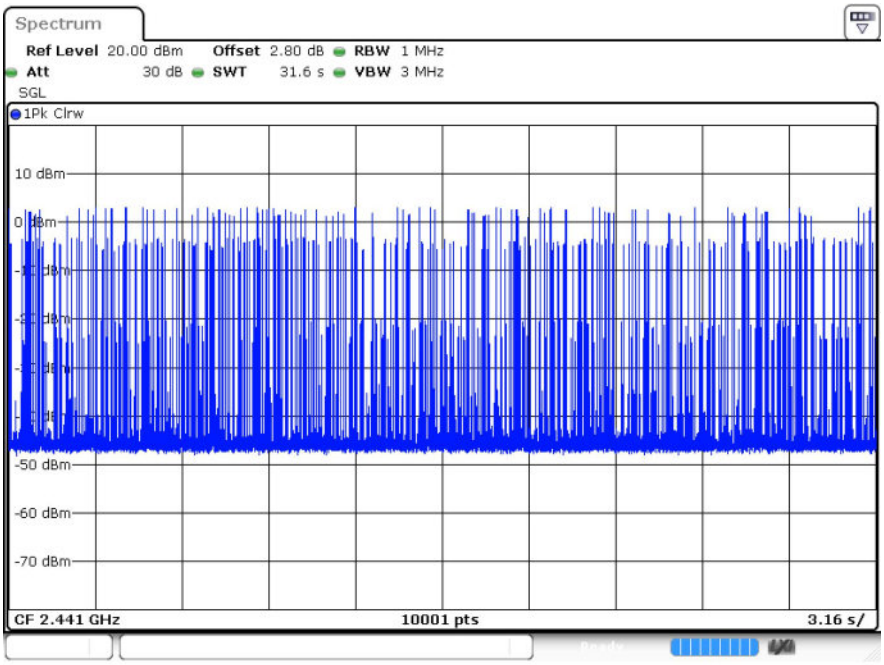
π/4DQPSK
_2DH5/MCH





8DPSK _3DH5/MCH



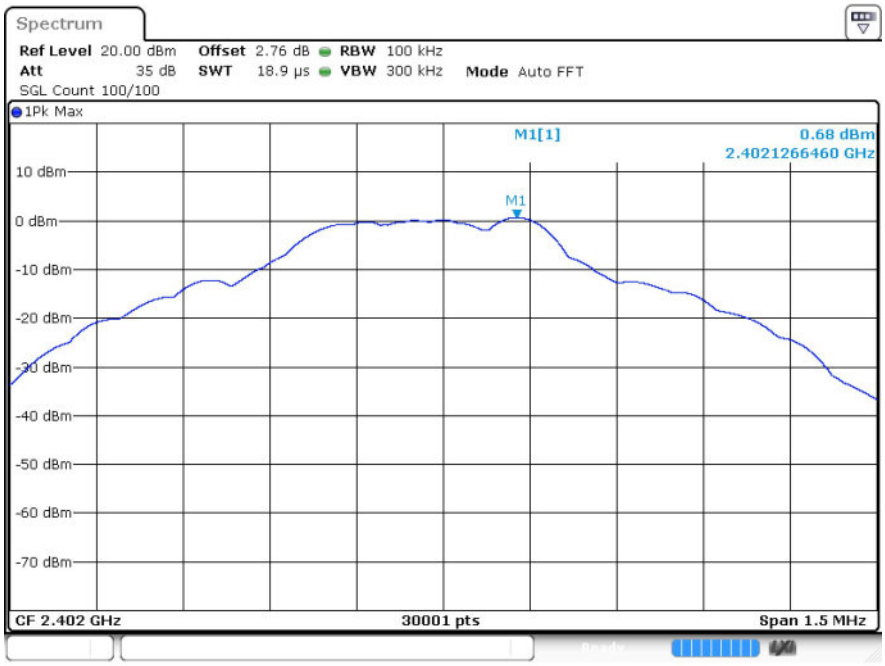
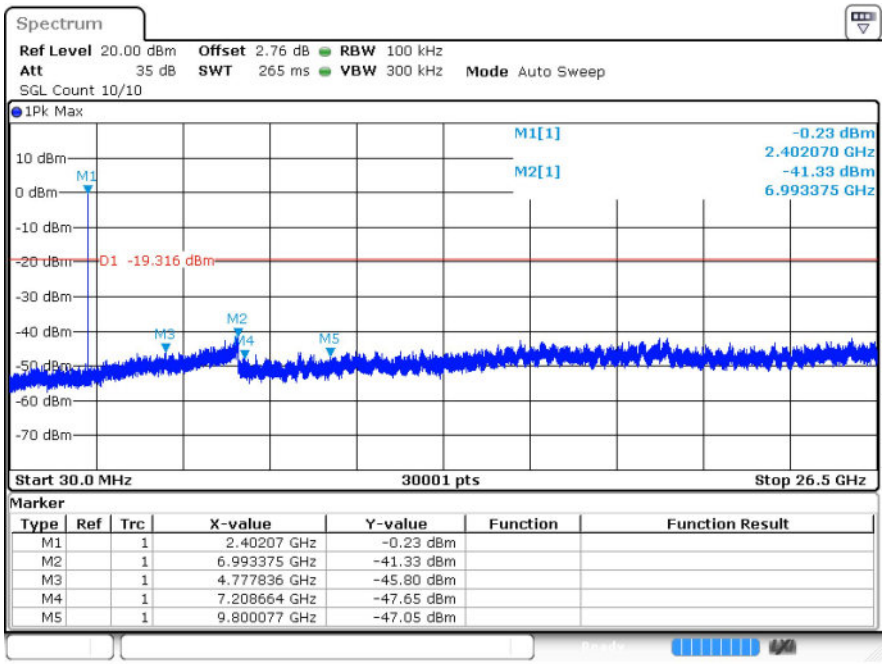


7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-42	-20	Pass
	MCH	-43.32	-20	Pass
	HCH	-42.47	-20	Pass
π/4DQPSK	LCH	-39.39	-20	Pass
	MCH	-40.92	-20	Pass
	HCH	-41.49	-20	Pass
8DPSK	LCH	-40.28	-20	Pass
	MCH	-41.95	-20	Pass
	HCH	-40.94	-20	Pass

7.2 Test Graphs

GFSK_LCH_Graphs	
Pref	
Puw	

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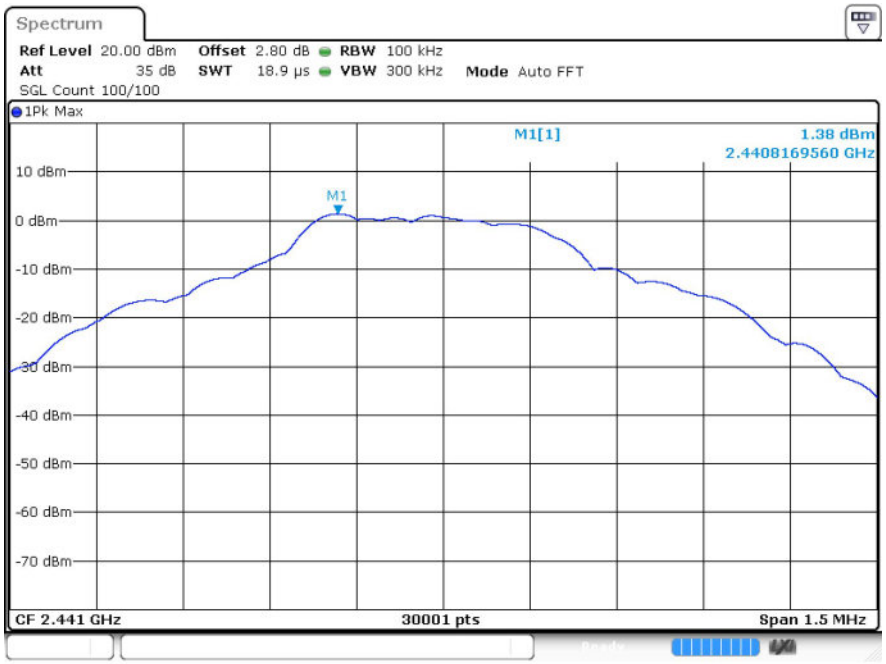
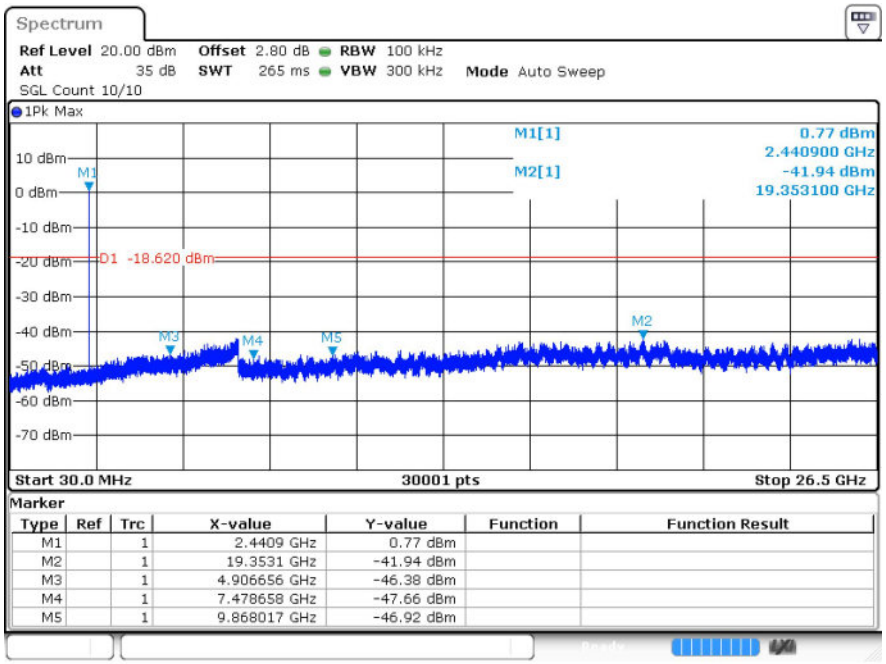
Pref	
Puw	

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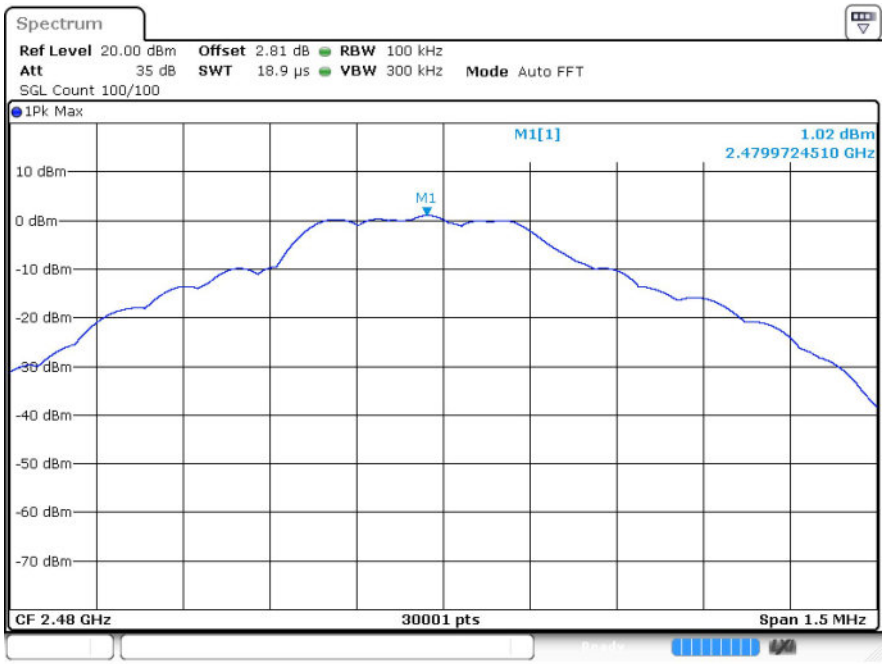
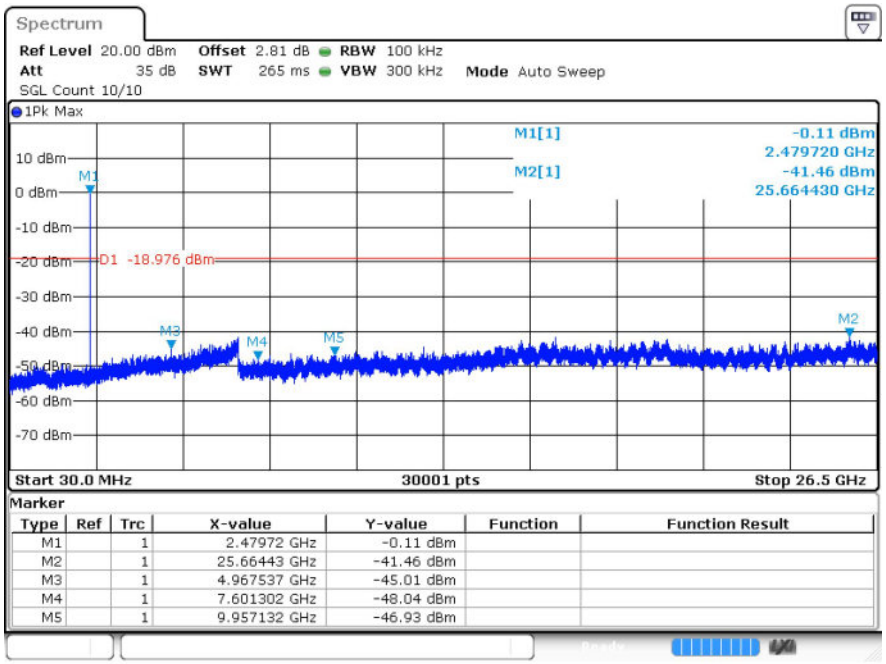
Pref	
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