Appendix A

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

Product Name: WIRELESS BONE CONDUCTION SPORT HEADPHONES

Trade Mark: N/A

Test Model: X11 PRO

Environmental Conditions

Temperature:	24.5℃
Relative Humidity:	52.1%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

Contents

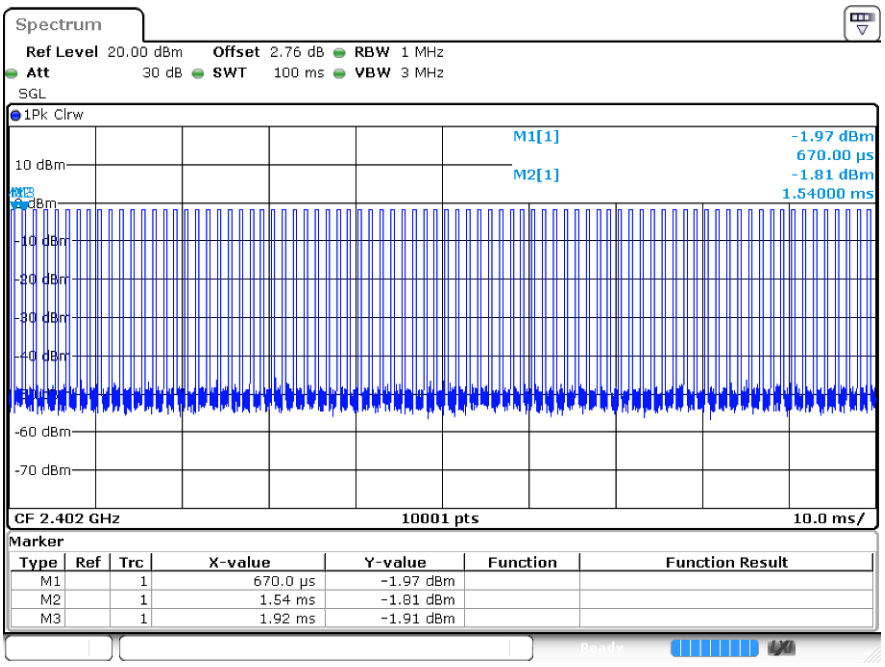
1 Duty Cycle

1.1 Test Result

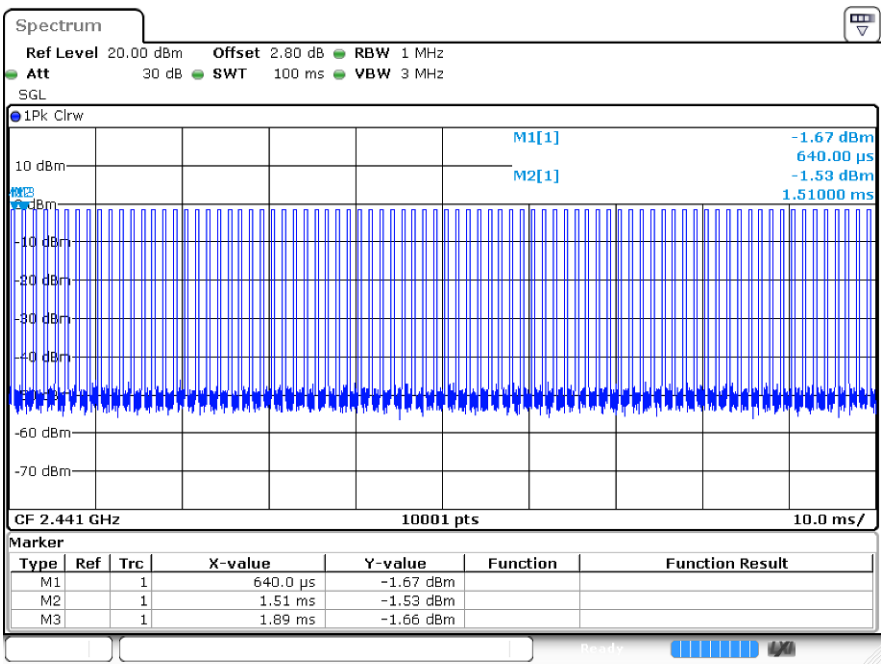
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.2	2.63
1-DH1	2441	31.2	2.63
1-DH1	2480	30.41	2.7
2-DH1	2402	31.2	2.63
2-DH1	2441	31.2	2.63
2-DH1	2480	31.2	2.63

1.2 Test Graphs

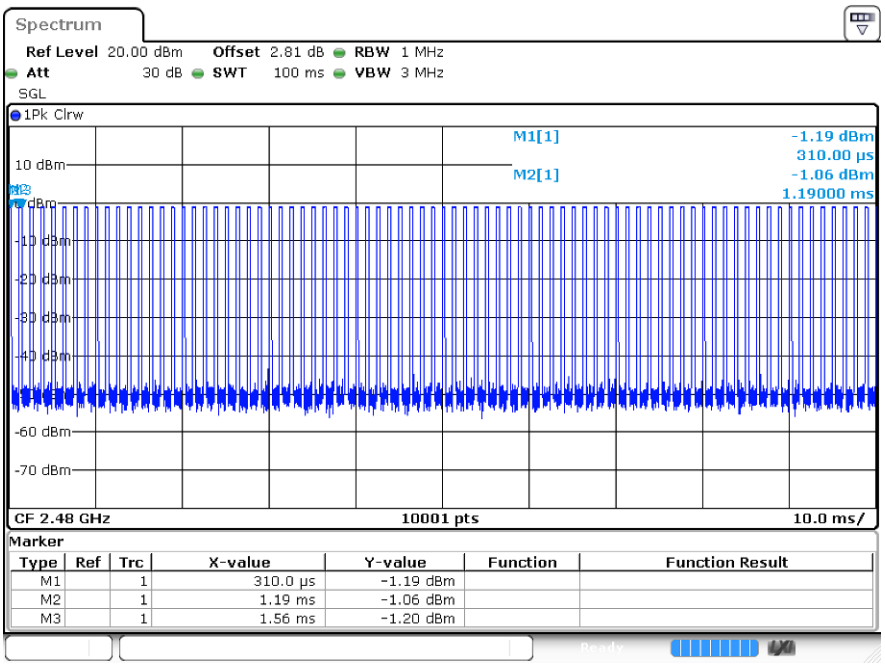
Test Graphs
1-DH1 2402MHz



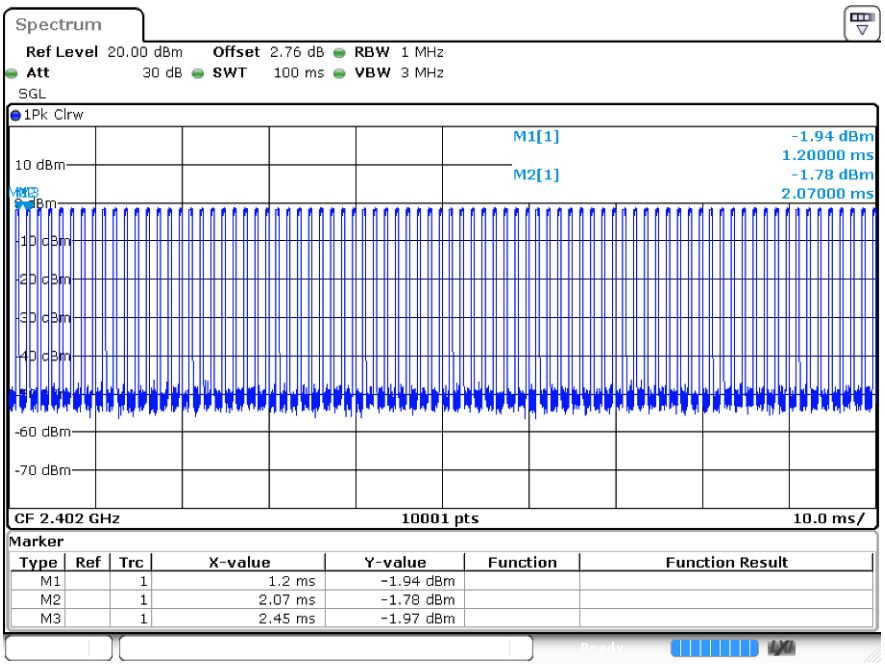
1-DH1 2441MHz



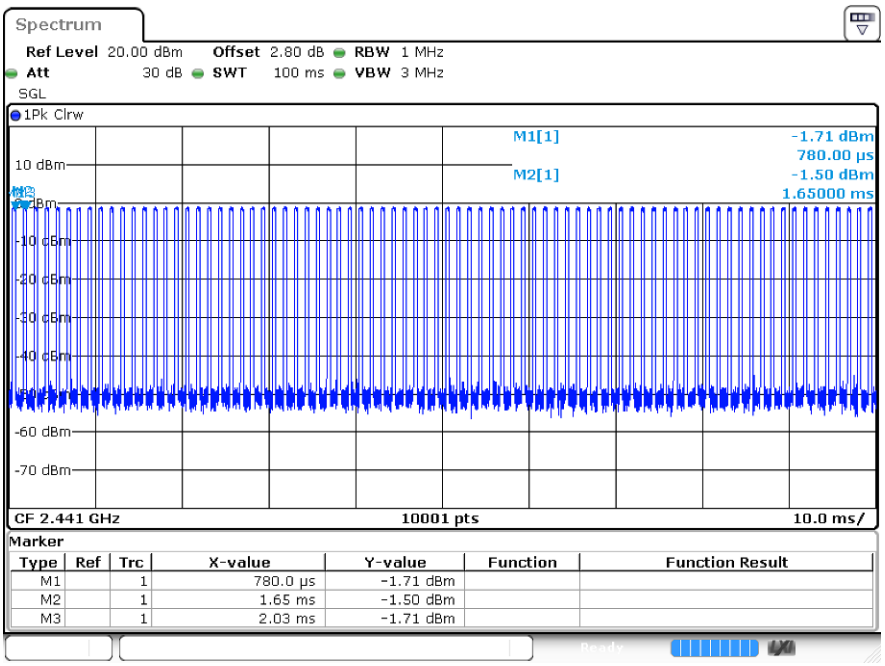
1-DH1 2480MHz



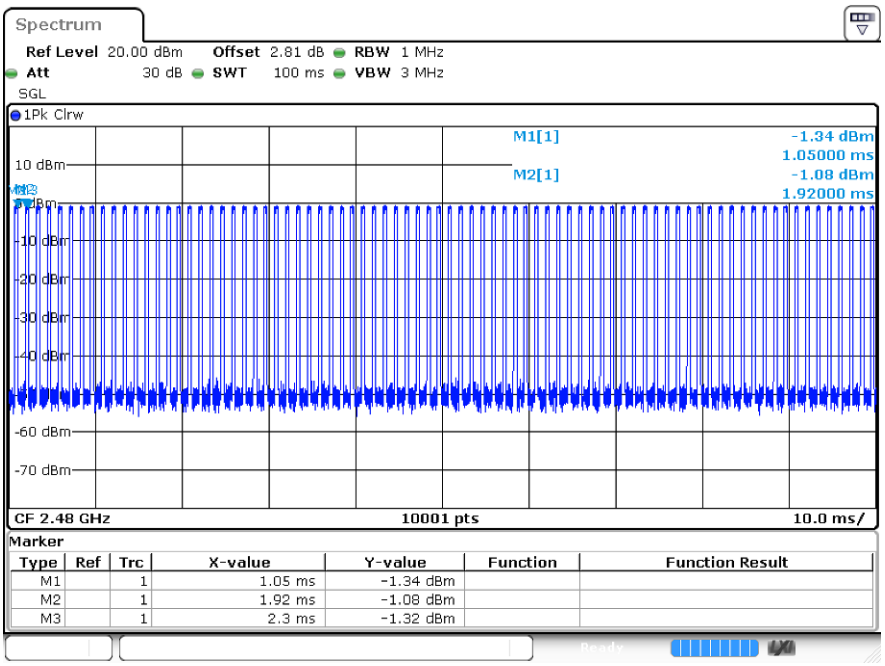
2-DH1 2402MHz



2-DH1 2441MHz



2-DH1 2480MHz

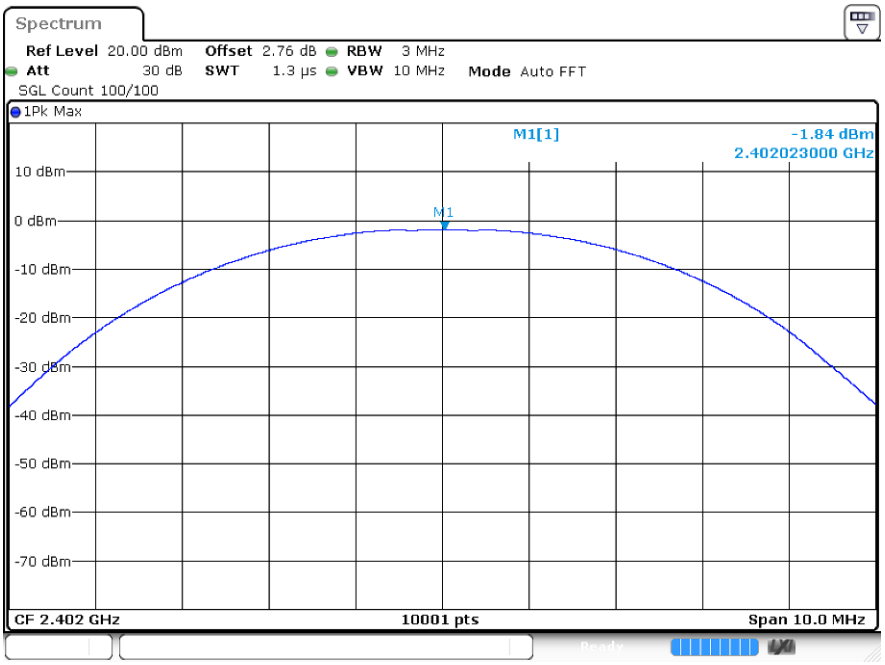
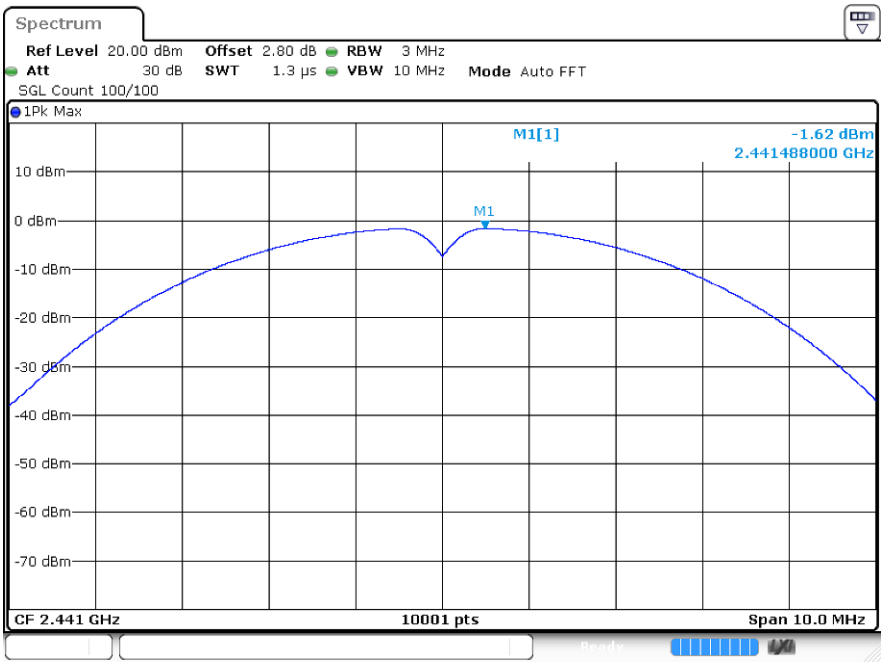


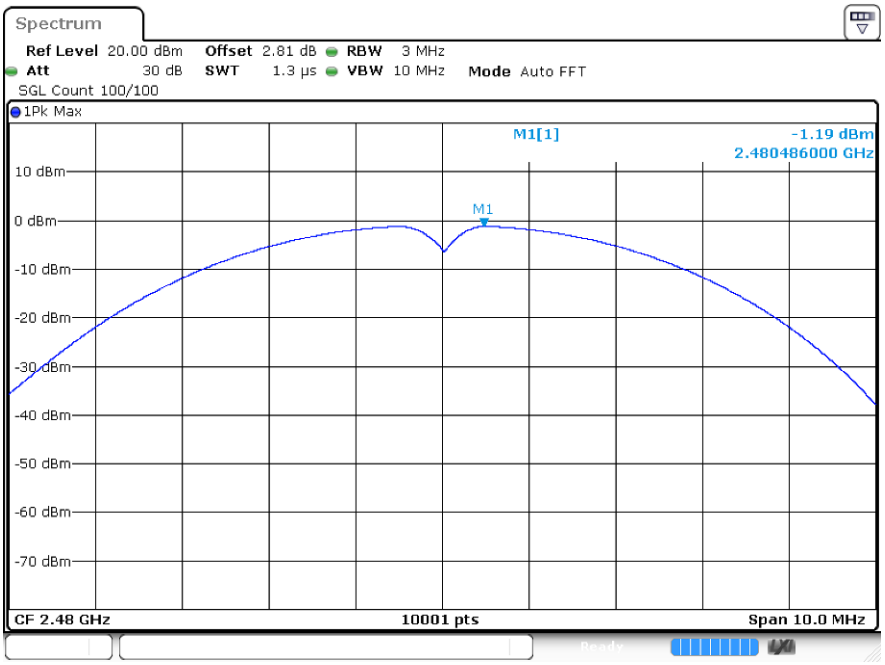
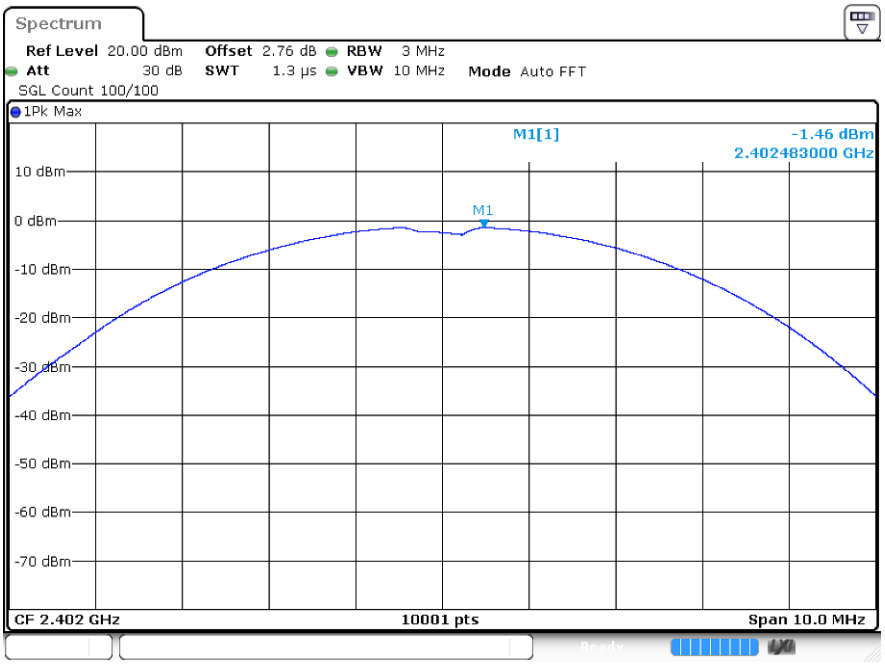
2 Maximum Conducted Peak Output Power

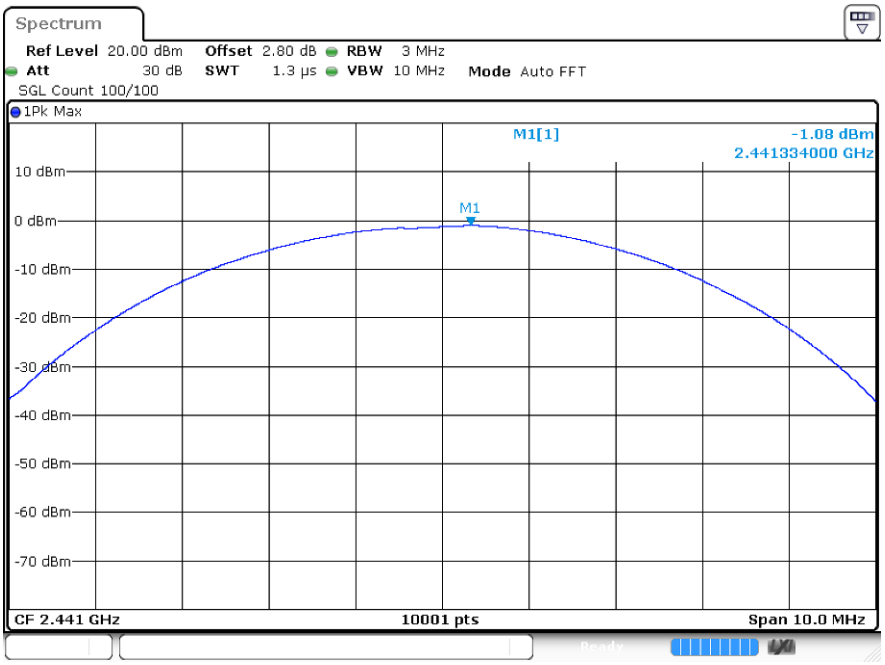
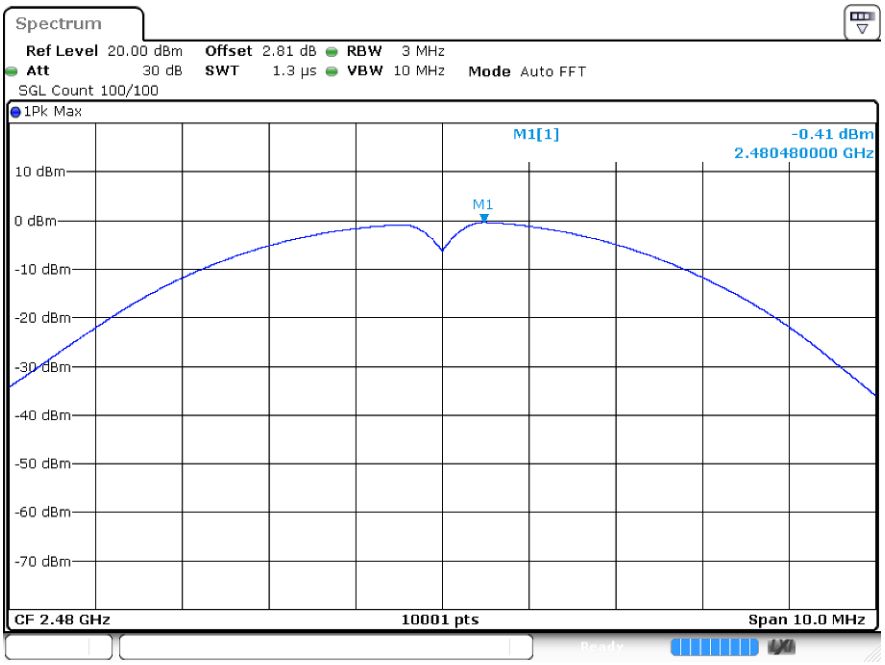
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.84	21	Pass
	MCH	-1.62	21	Pass
	HCH	-1.19	21	Pass
π/4DQPSK	LCH	-1.46	21	Pass
	MCH	-1.08	21	Pass
	HCH	-0.41	21	Pass

2.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

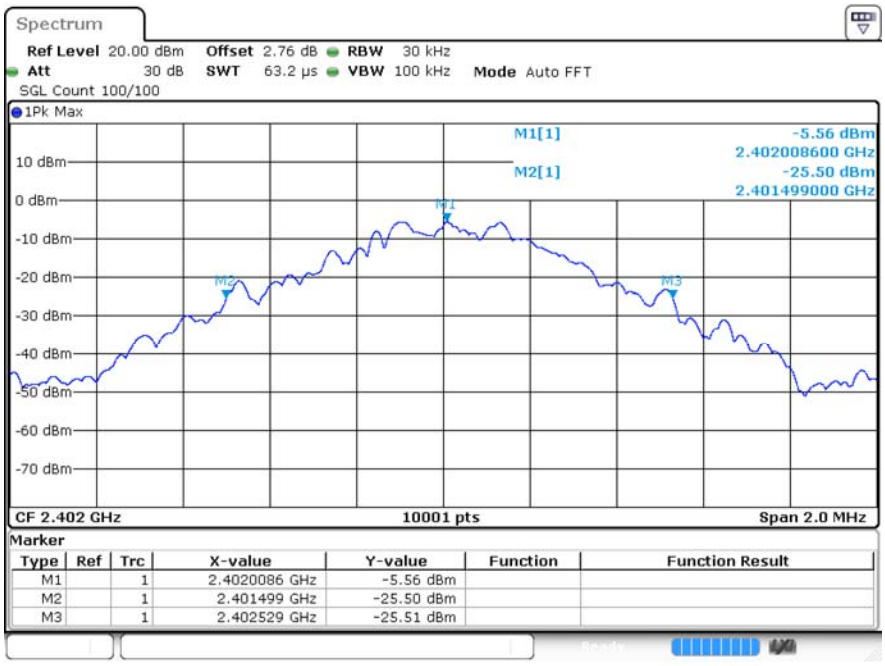
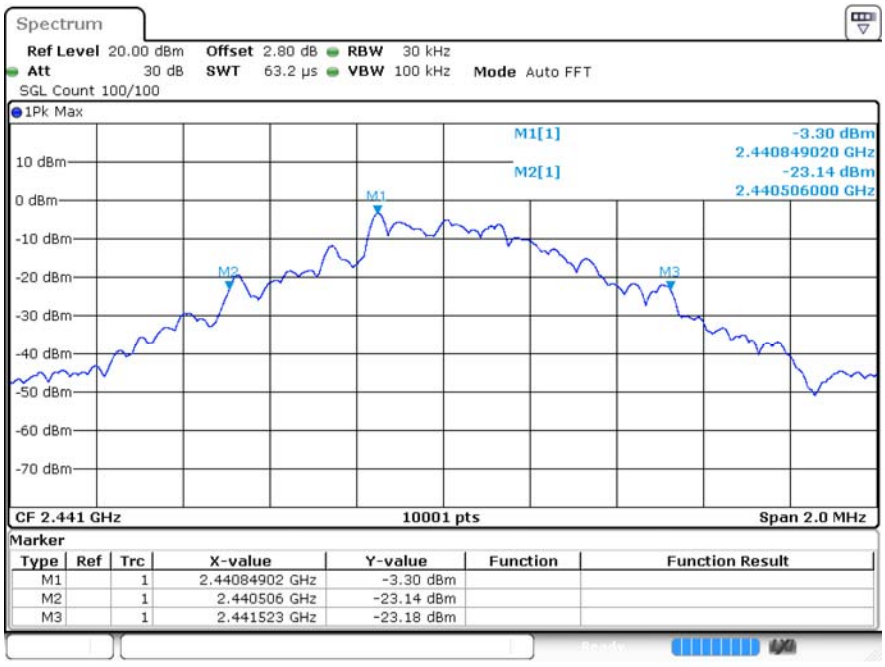
π/4DQPSK/MCH	
π/4DQPSK/HCH	

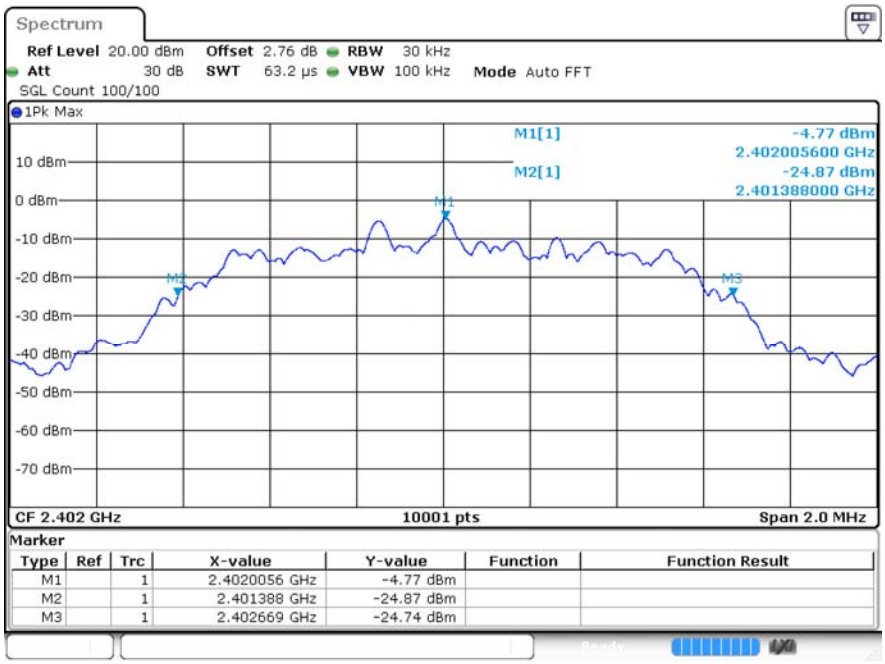
3 20dB Bandwidth

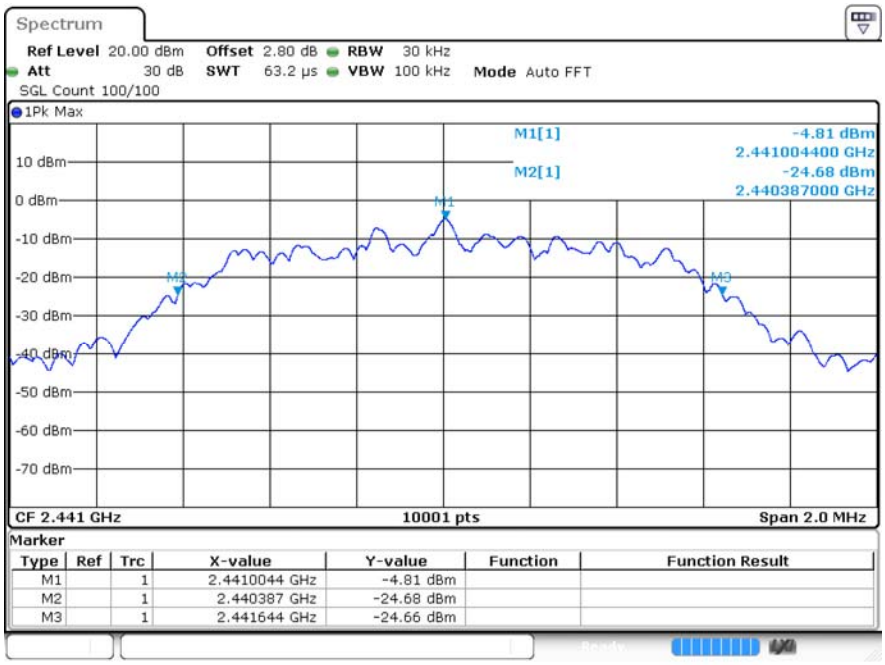
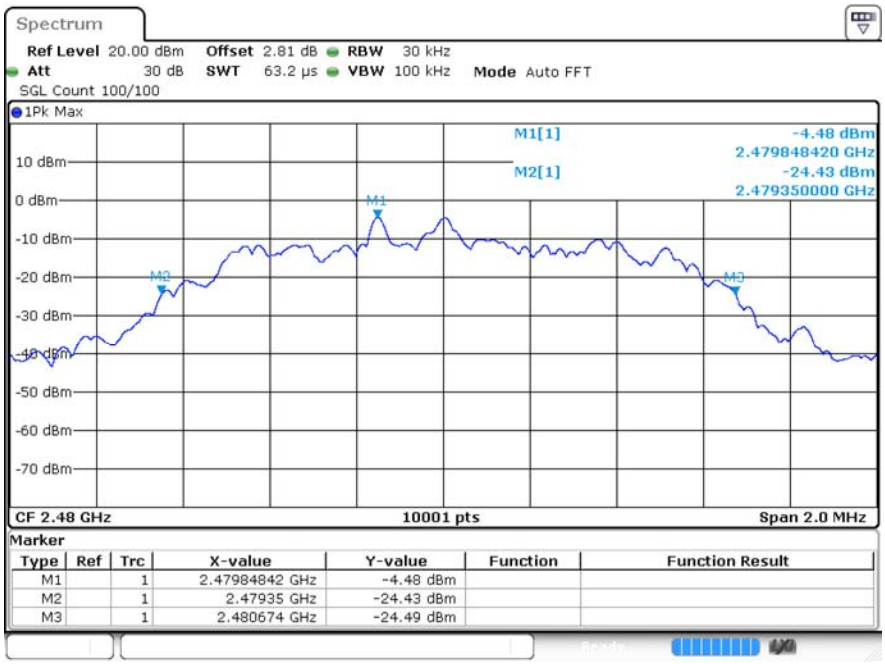
3.1 Test Result

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.03	Not Specified	Pass
	MCH	1.018	Not Specified	Pass
	HCH	1.028	Not Specified	Pass
π/4DQPSK	LCH	1.281	Not Specified	Pass
	MCH	1.258	Not Specified	Pass
	HCH	1.324	Not Specified	Pass

3.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

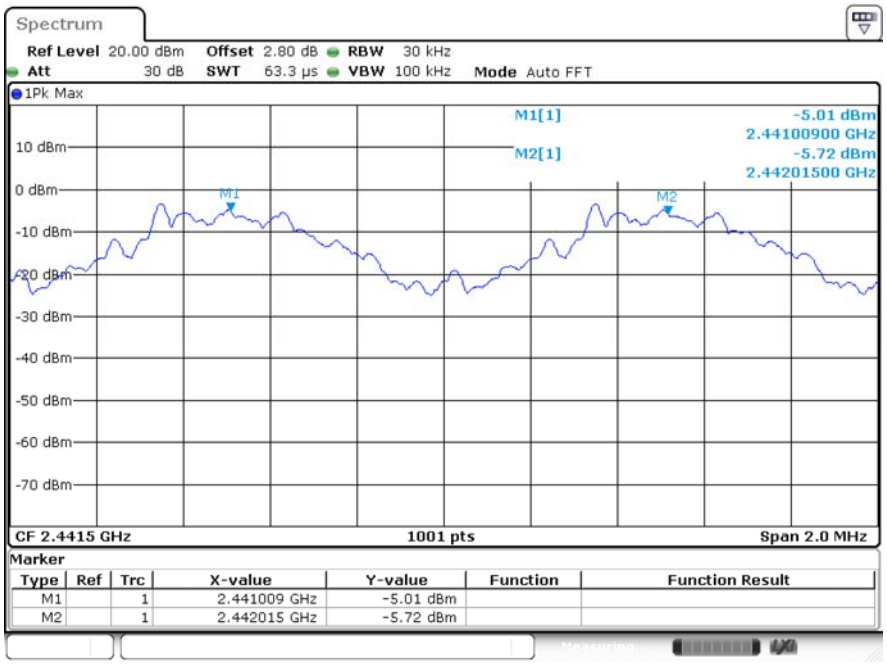
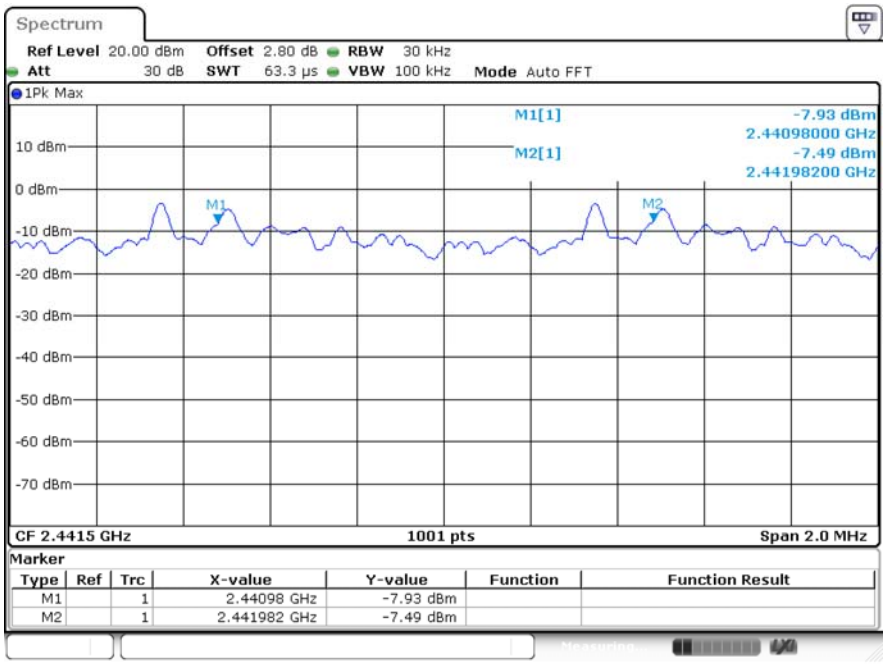
π/4DQPSK/MCH	
π/4DQPSK/HCH	

4 Carrier Frequency Separation

4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.006	0.679	Pass
π/4DQPSK	MCH	1.002	0.839	Pass

4.2 Test Graphs

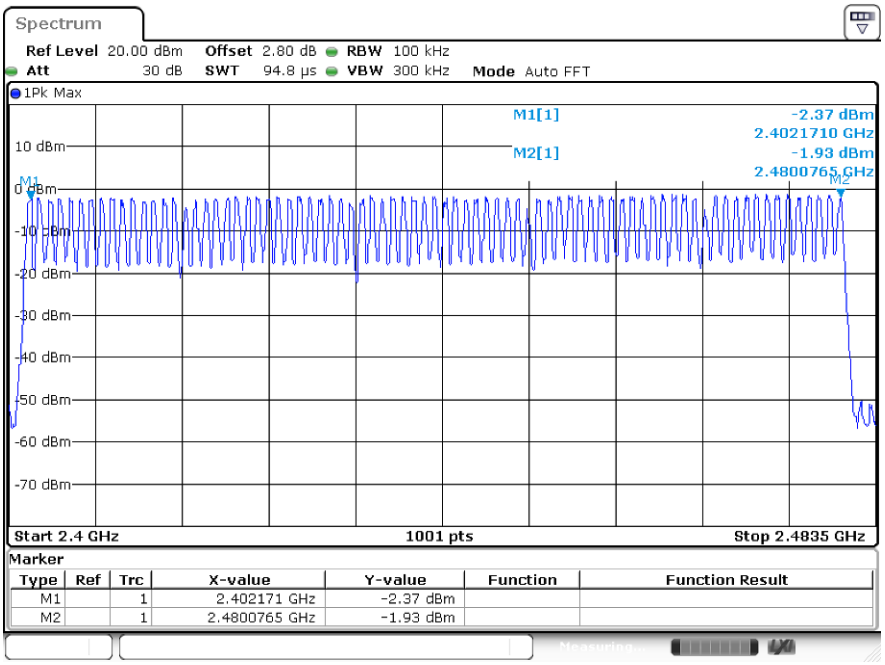
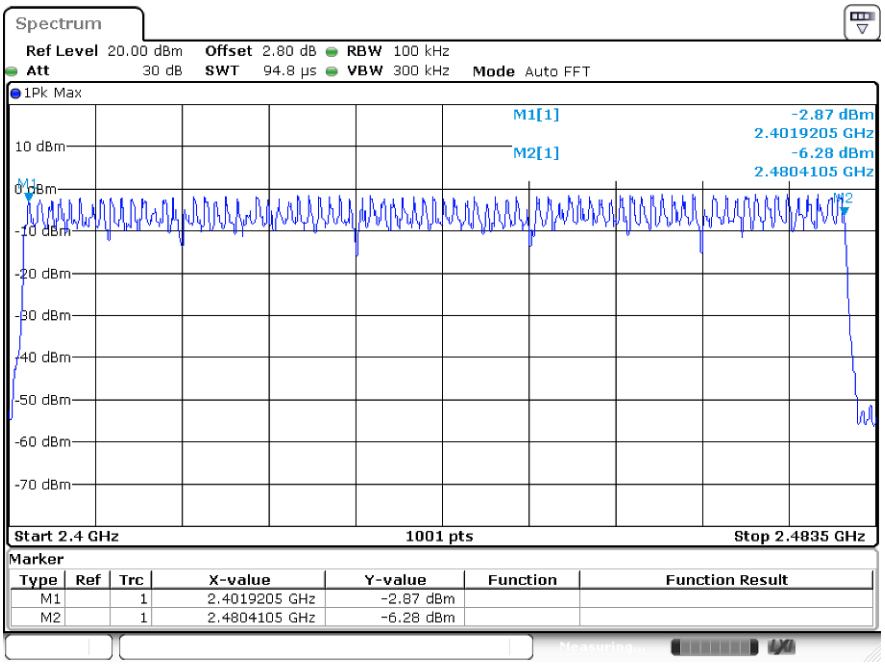
Test Graphs	
GFSK/MCH	
π/4DQPSK/MCH	

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

5.2 Test Graphs

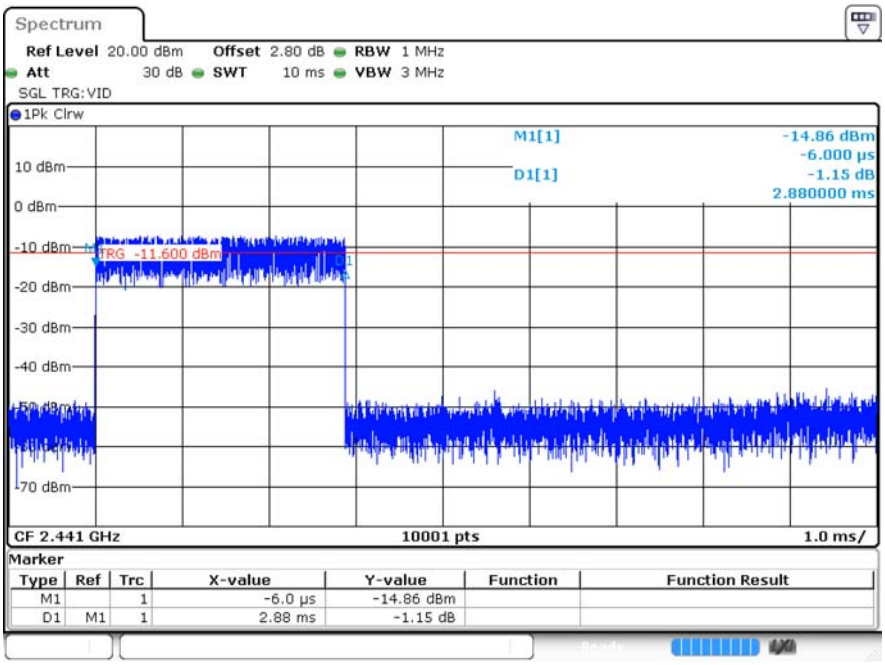
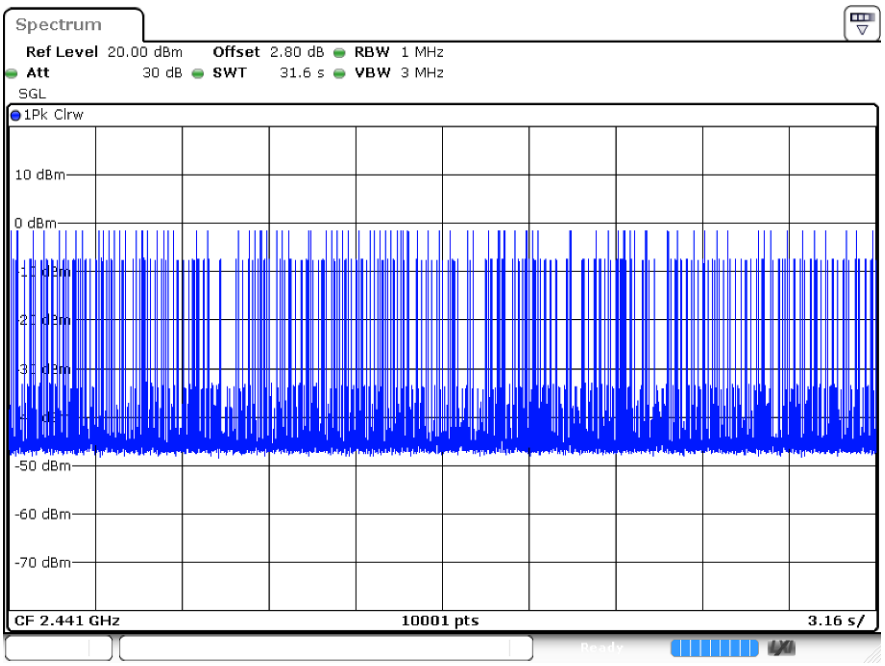
Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

6 Dwell Time

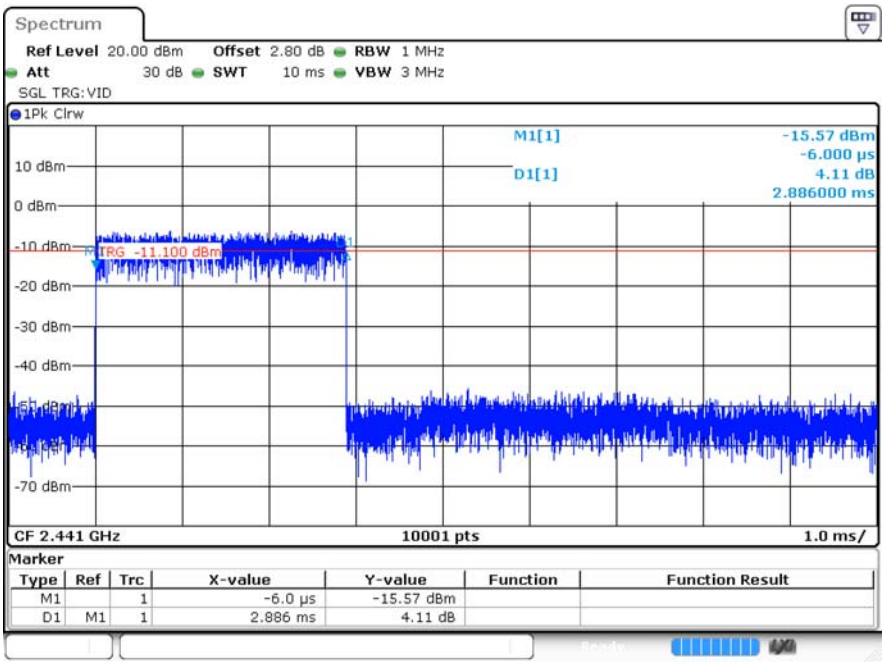
6.1 Test Result

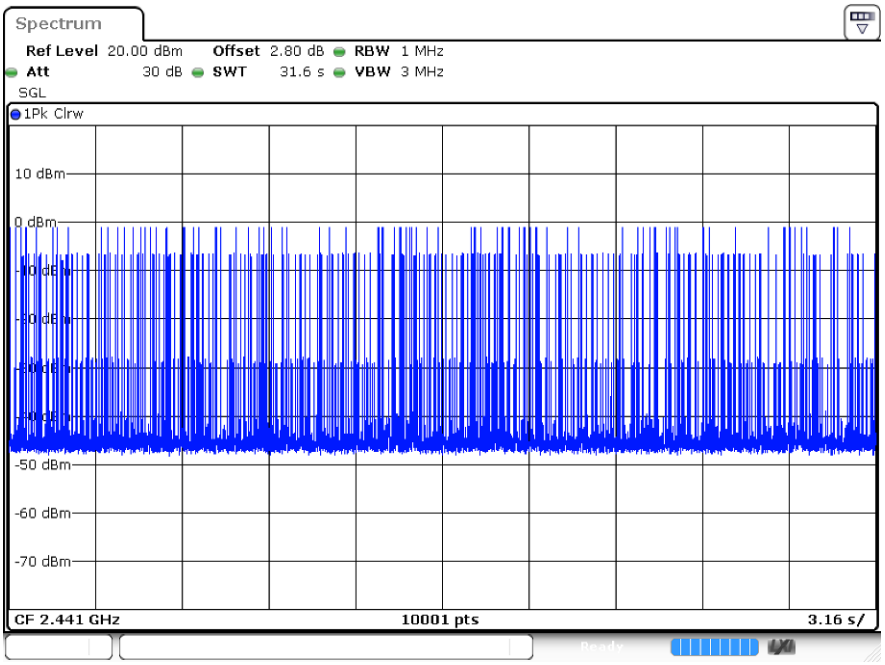
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.88	93	267.84	0.4	Pass
π/4DQPSK	2DH5	MCH	2.886	92	265.512	0.4	Pass

6.2 Test Graphs

Test Graphs	
GFSK_DH5/MCH	 

π/4DQPSK
_2DH5/MCH



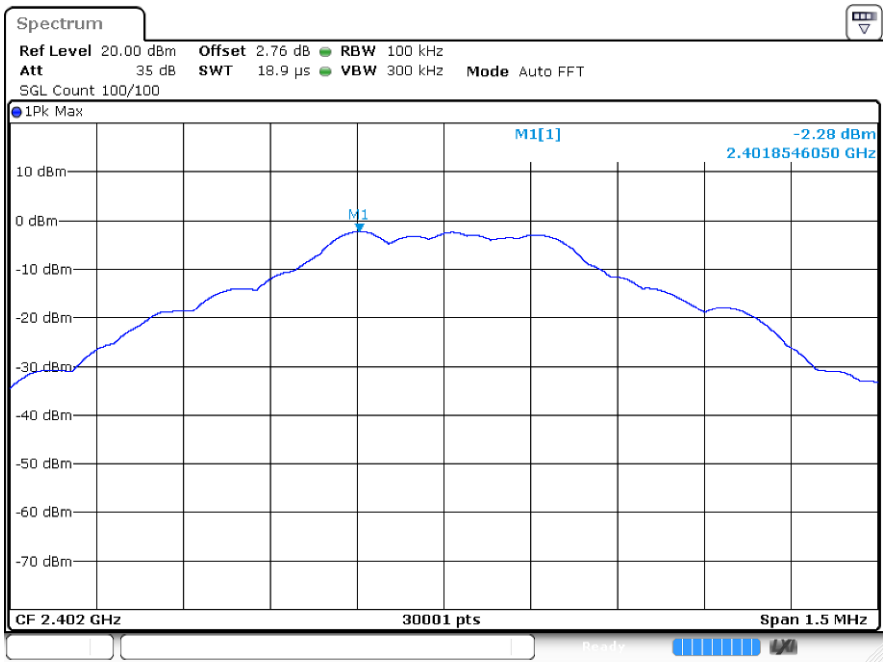
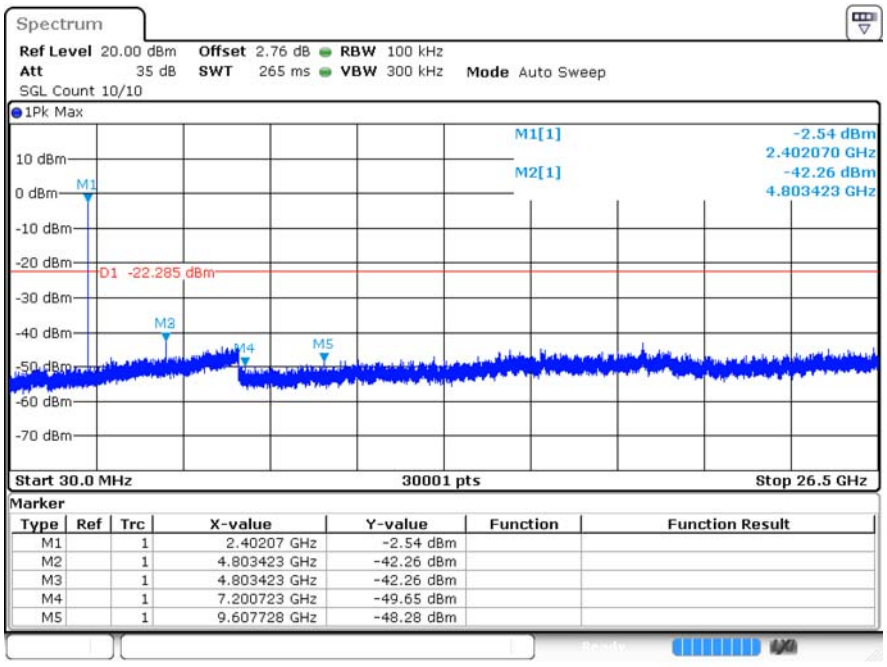


7 RF Conducted Spurious Emissions

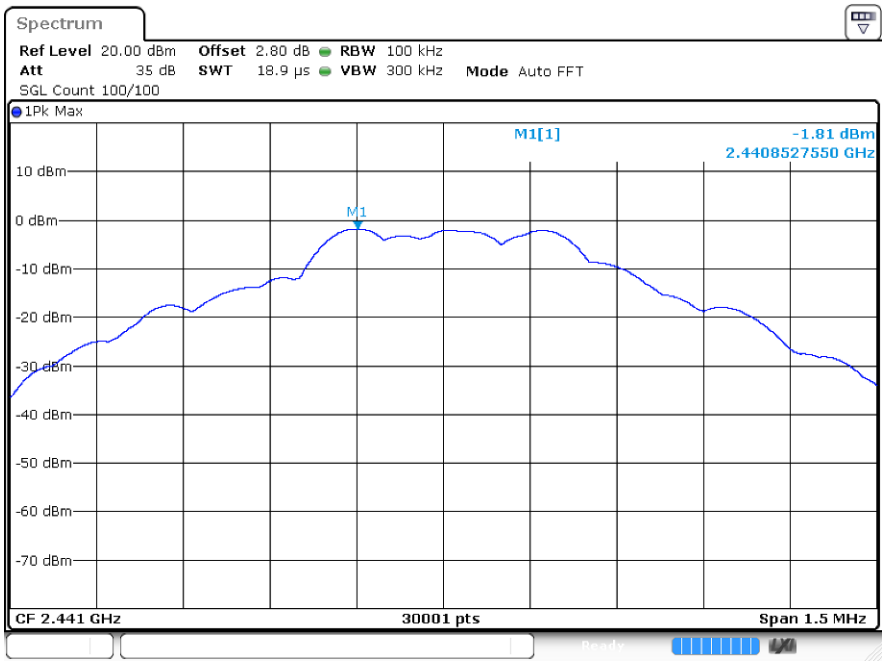
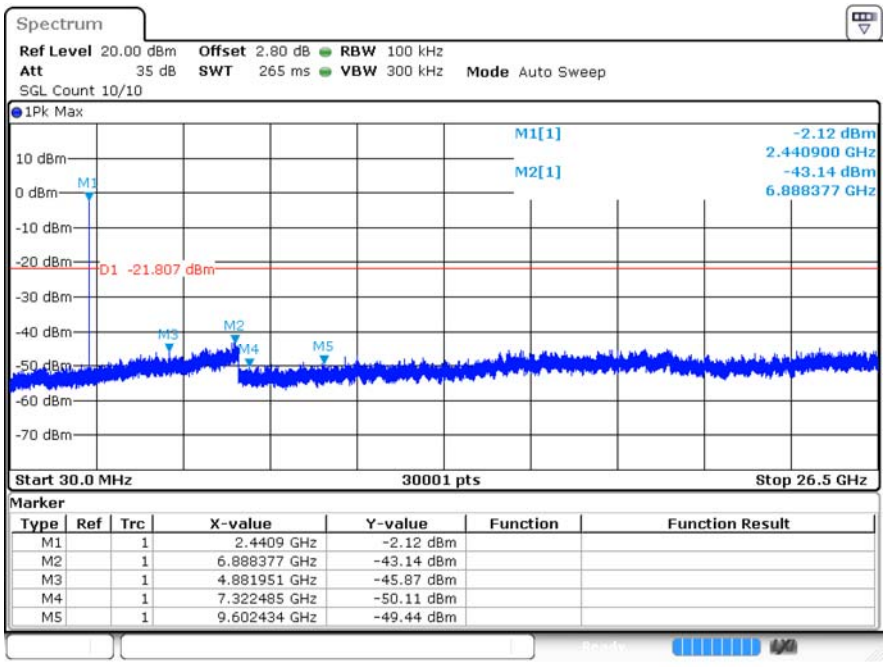
7.1 Test Result

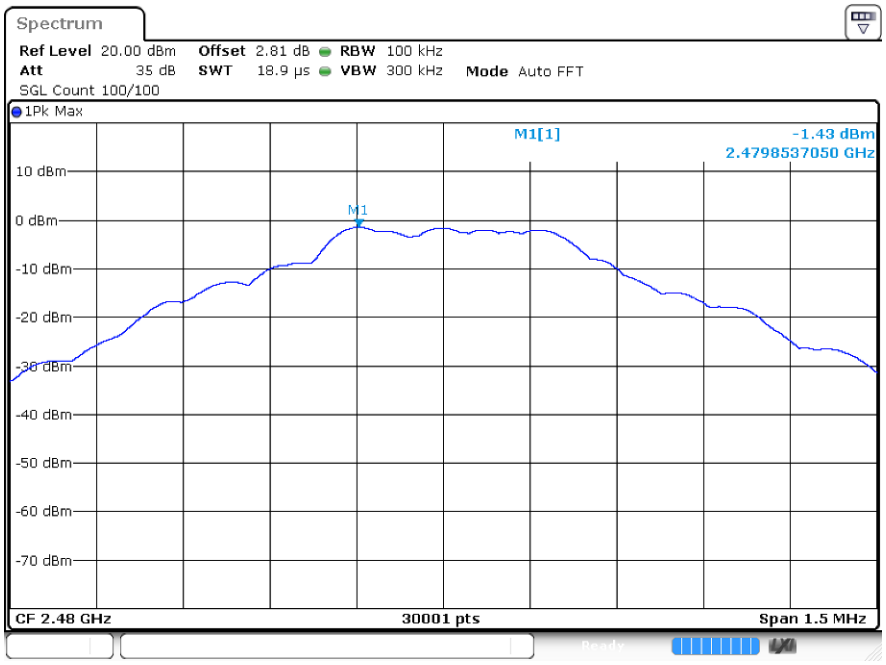
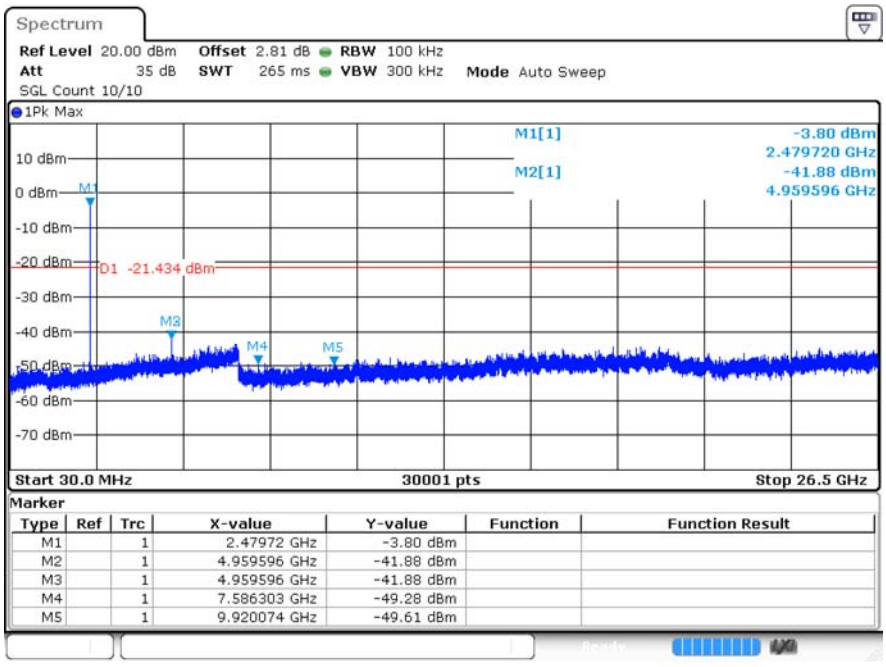
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-39.97	-20	Pass
	MCH	-41.32	-20	Pass
	HCH	-40.45	-20	Pass
π/4DQPSK	LCH	-41.27	-20	Pass
	MCH	-41.56	-20	Pass
	HCH	-42.2	-20	Pass

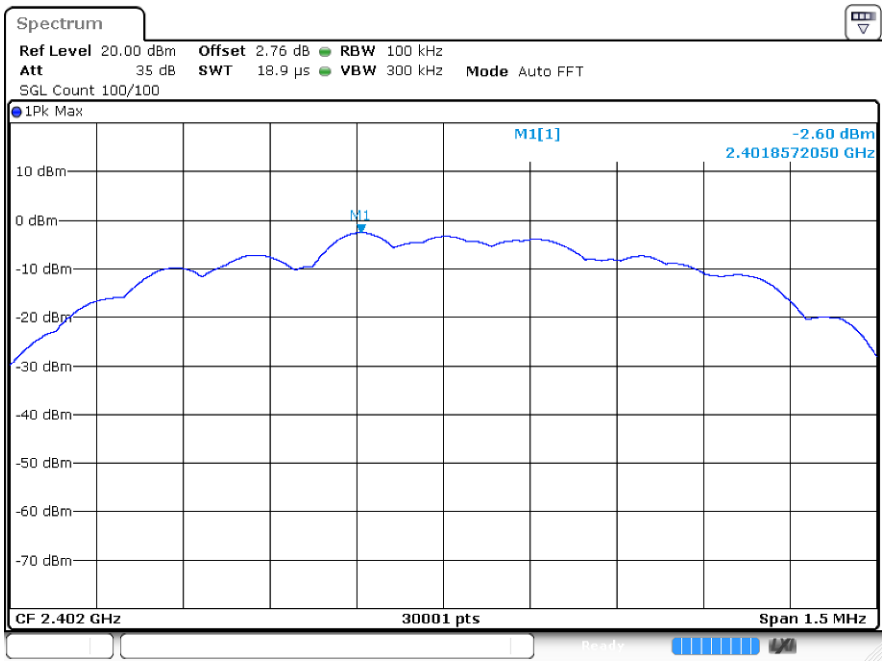
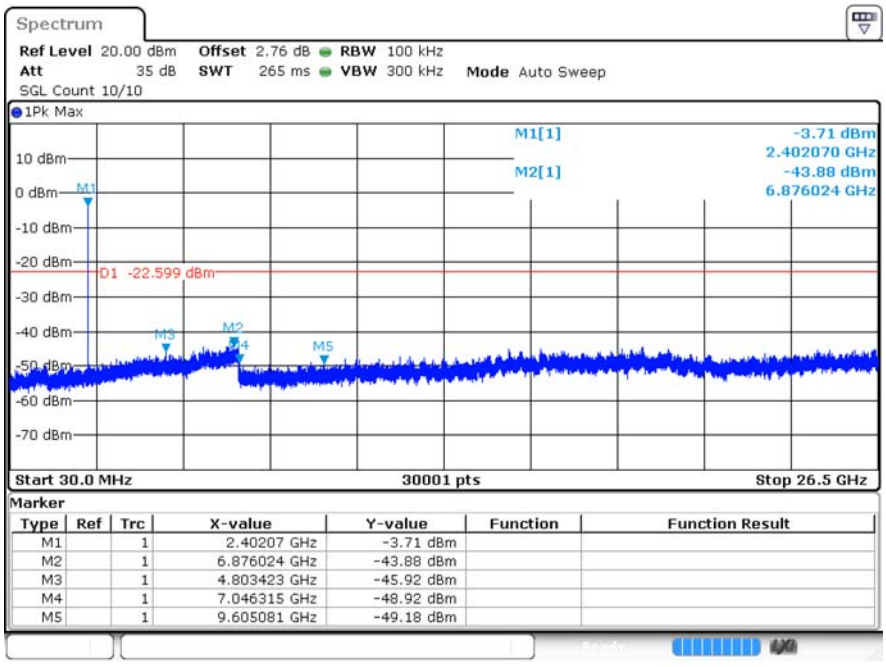
7.2 Test Graphs

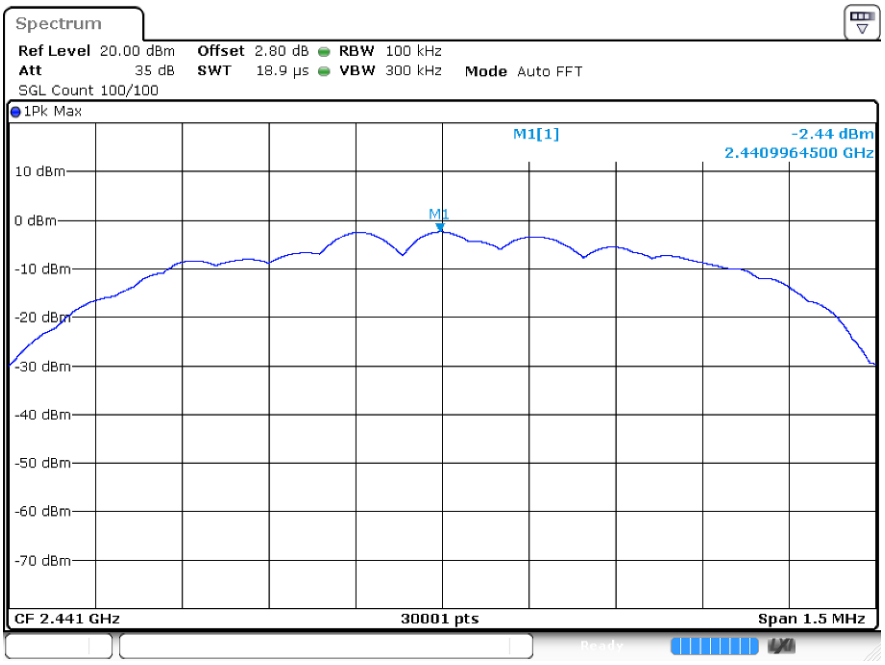
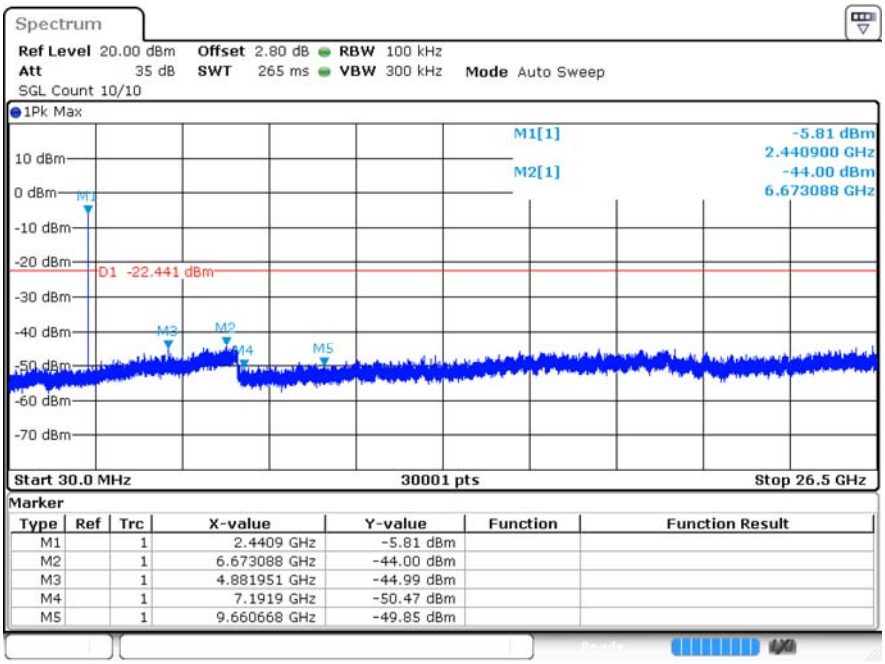
GFSK_LCH_Graphs	
Pref	
Puw	

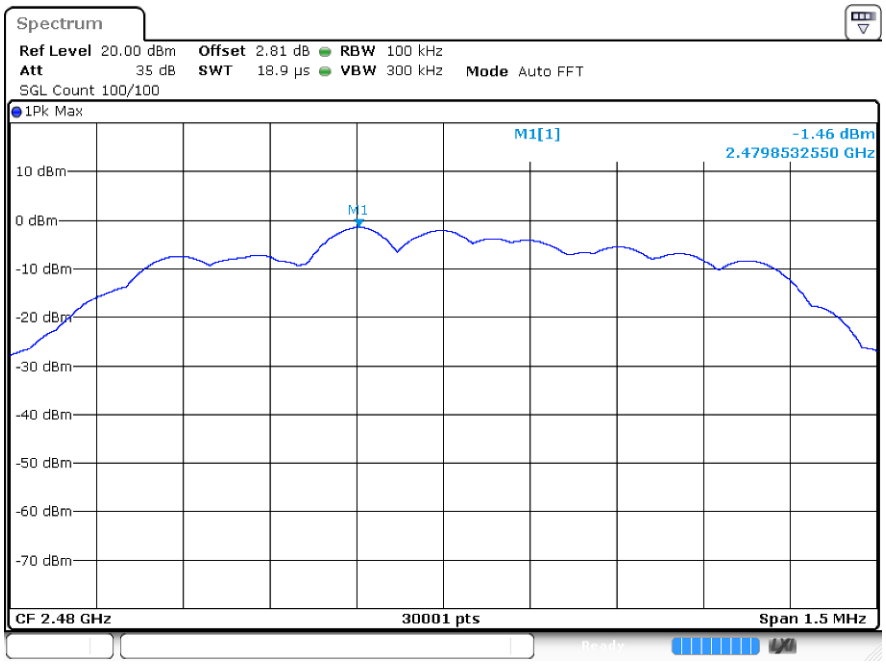
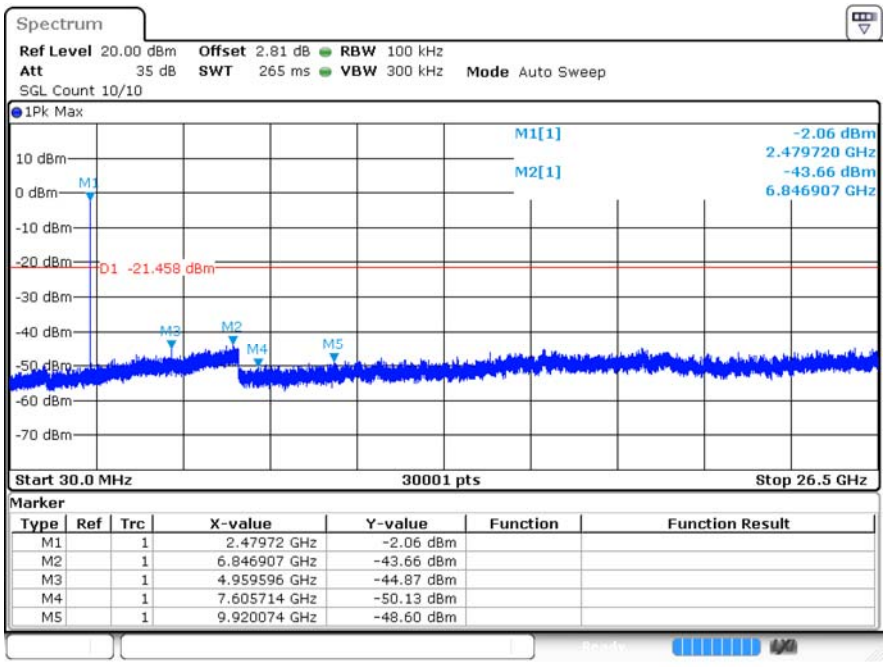
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40207 GHz	-2.54 dBm		
M2		1	4.803423 GHz	-42.26 dBm		
M3		1	4.803423 GHz	-42.26 dBm		
M4		1	7.200723 GHz	-49.65 dBm		
M5		1	9.607728 GHz	-48.28 dBm		

GFSK_MCH_Graphs	
Pref	
Puw	

GFSK_HCH_Graphs	
Pref	
Puw	

π/4DQPSK_LCH_Graphs	
Pref	
Puw	

π/4DQPSK_MCH_Graphs	
Pref	
Puw	

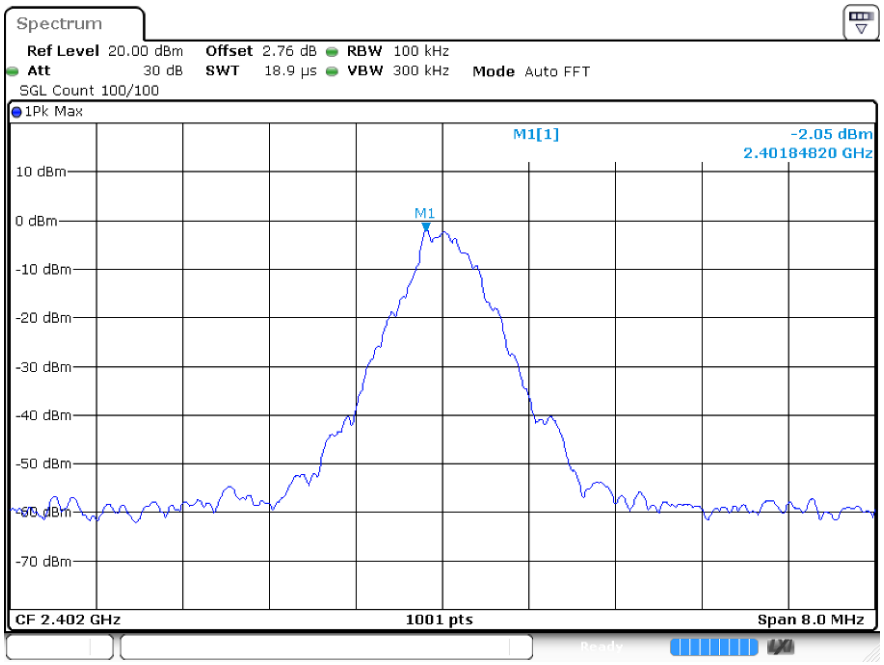
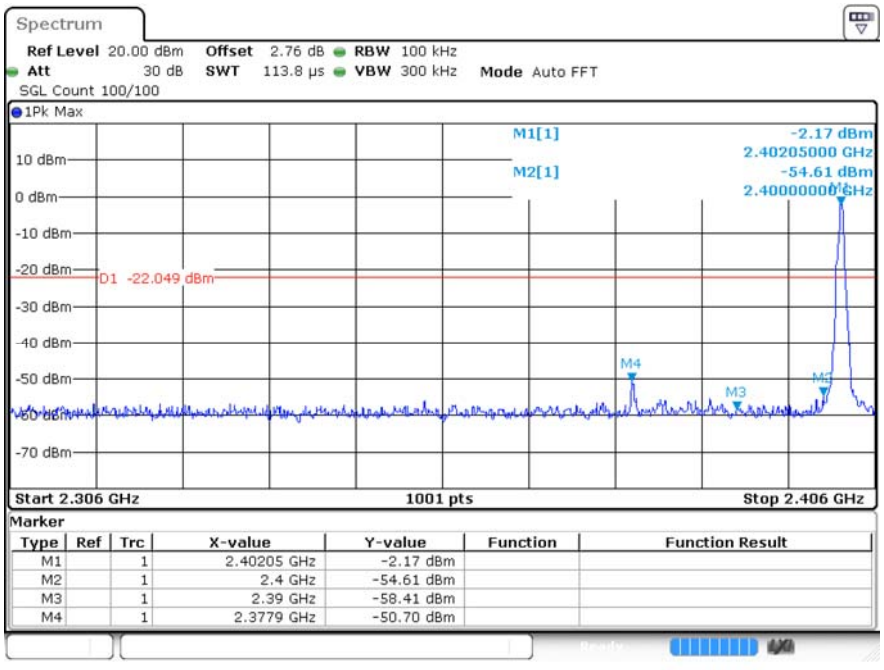
π/4DQPSK_HCH_Graphs	
Pref	
Puw	

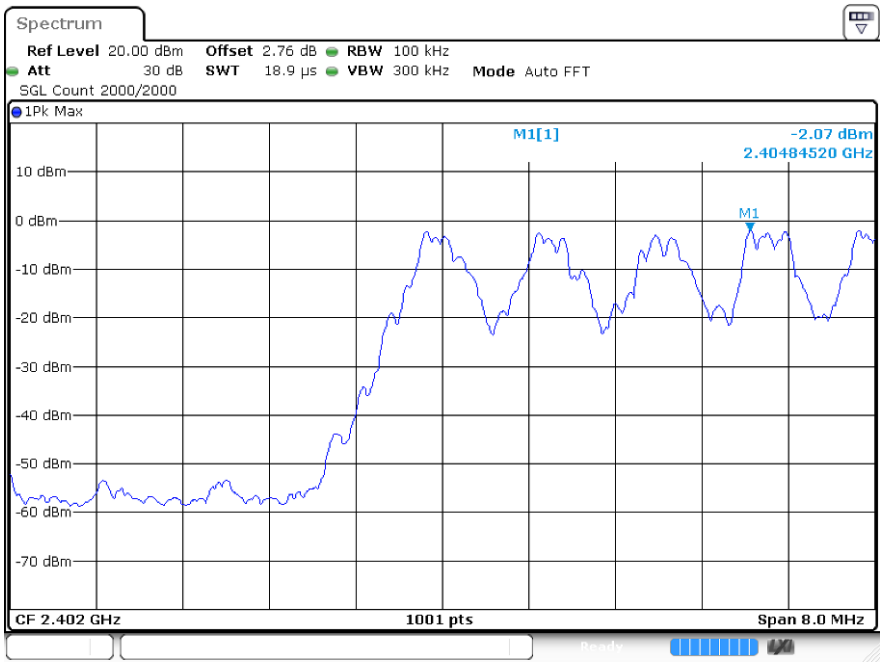
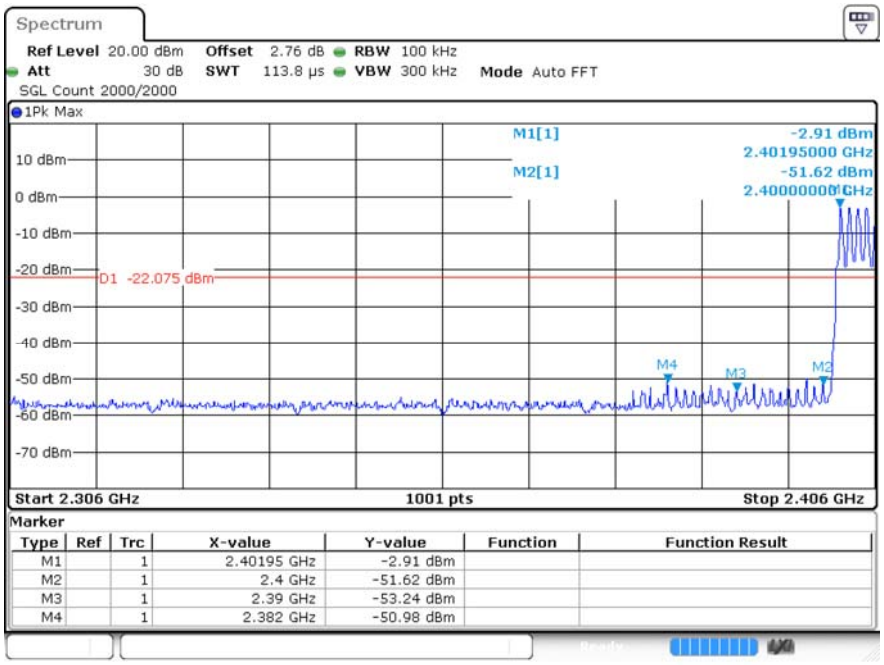
8 Band-edge for RF Conducted Emissions

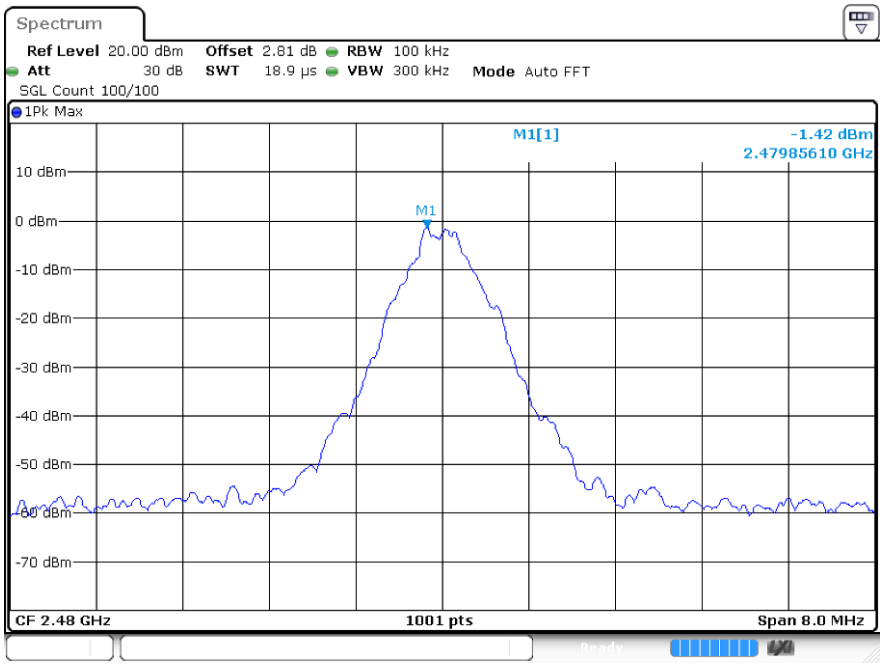
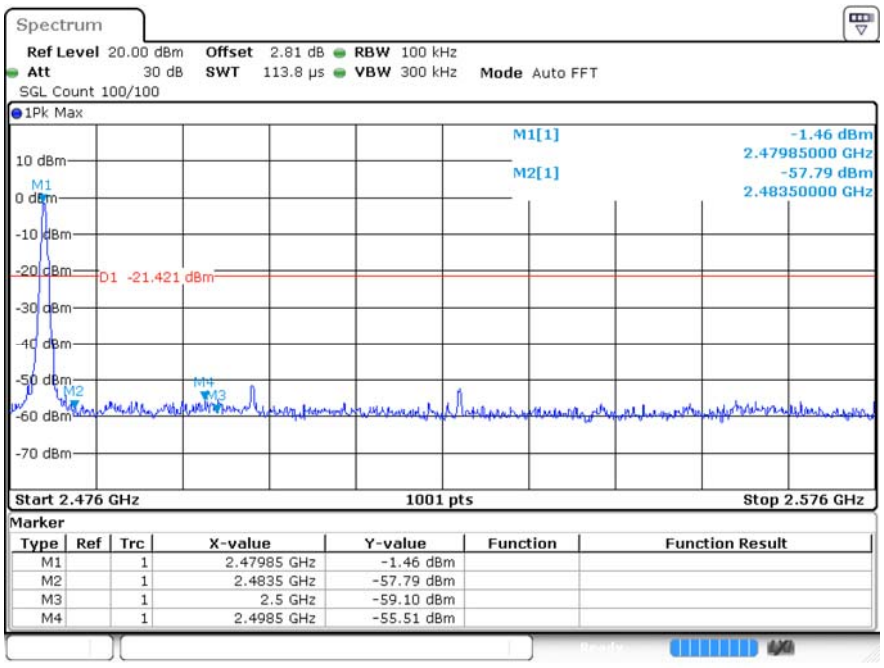
8.1 Test Result

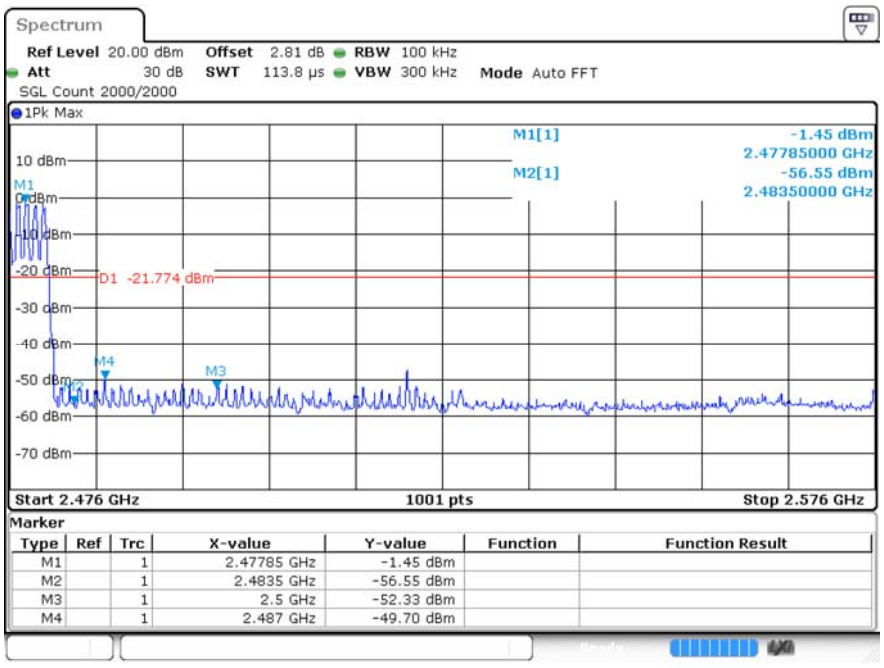
Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-48.65	-20	Pass
			On	-48.91	-20	Pass
	HCH	2480	Off	-54.09	-20	Pass
			On	-47.92	-20	Pass
π/4DQPSK	LCH	2402	Off	-52.04	-20	Pass
			On	-49.3	-20	Pass
	HCH	2480	Off	-53.48	-20	Pass
			On	-47.5	-20	Pass

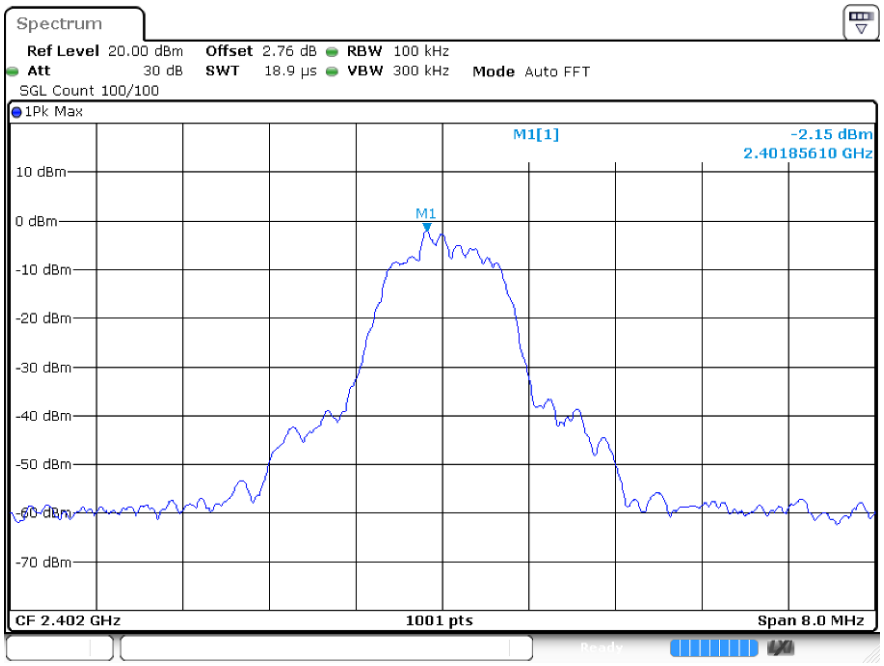
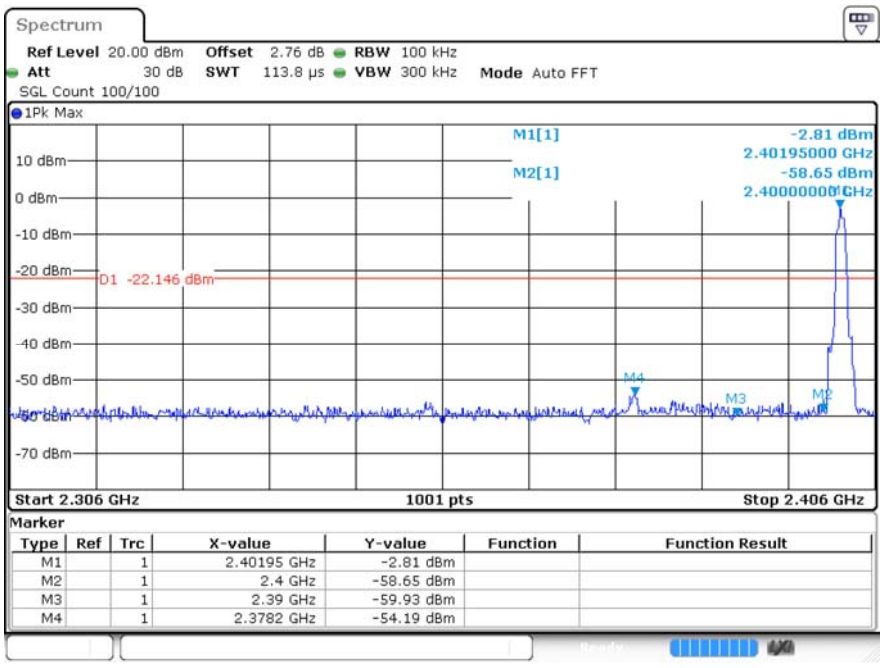
8.2 Test Graphs

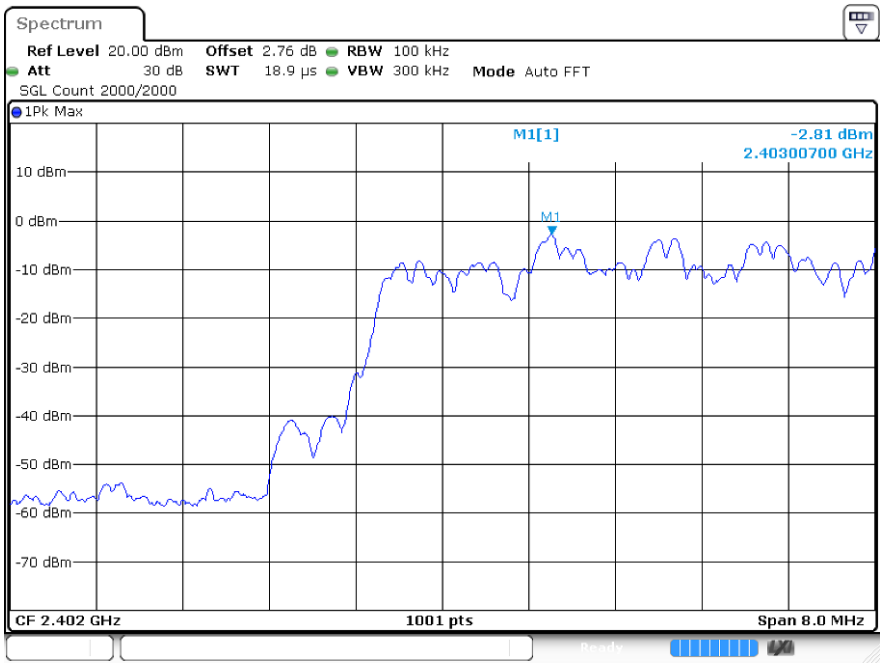
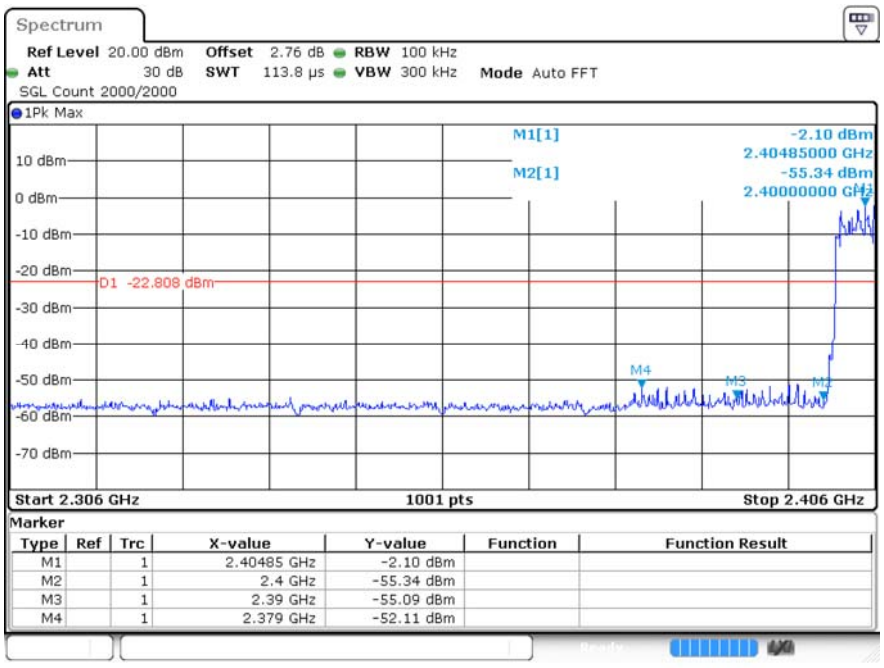
Test Graphs	
Pref	
GFSK/LCH/No Hop	

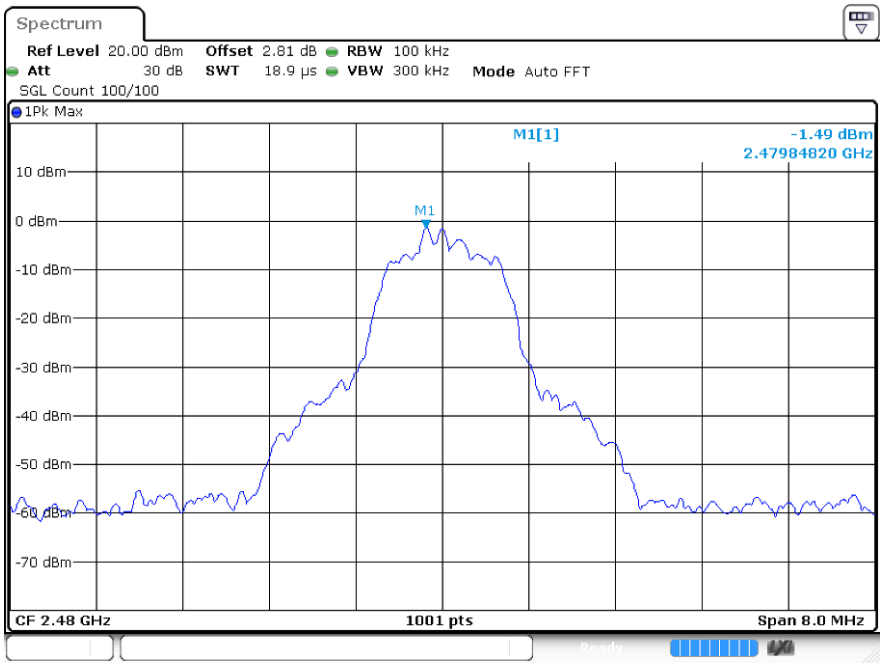
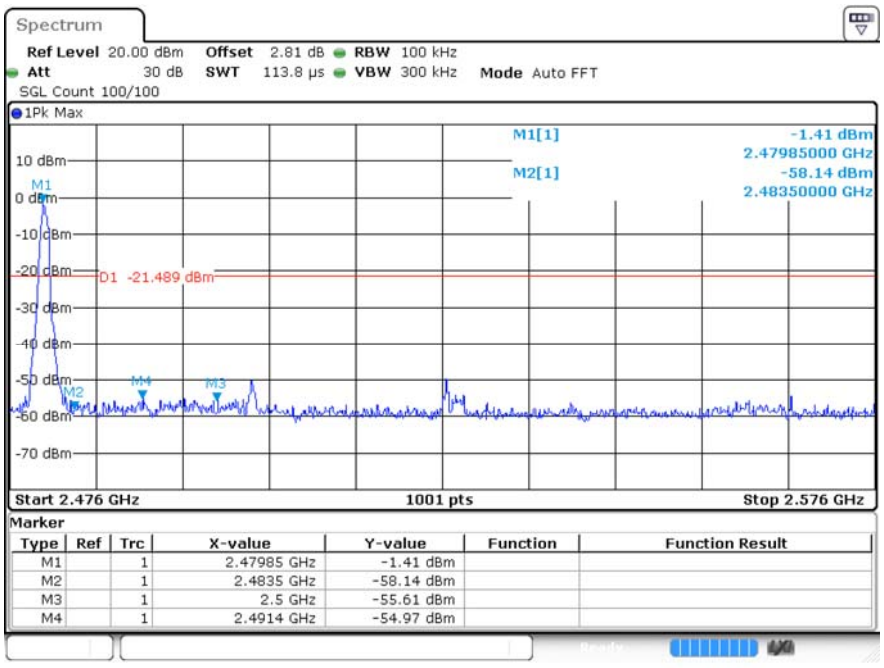
Ref	
GFSK/LCH/Hop	

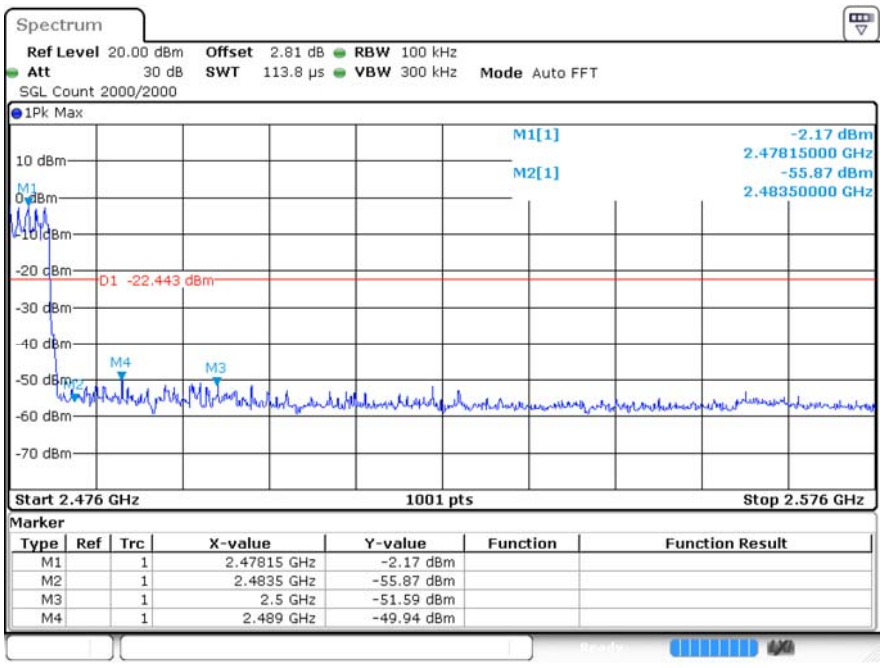
Ref	
GFSK/HCH/No Hop	

Ref.	
GFSK/HCH/Hop	 Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.47785 GHz -1.45 dBm M2 1 2.4835 GHz -56.55 dBm M3 1 2.5 GHz -52.33 dBm M4 1 2.487 GHz -49.70 dBm

Ref	
π/4DQPSK/LCH/No Hop	

Ref	
π/4DQPSK/LCH/Hop	

Ref	
π/4DQPSK/HCH/No Hop	

Ref	
π/4DQPSK/HCH/Hop	

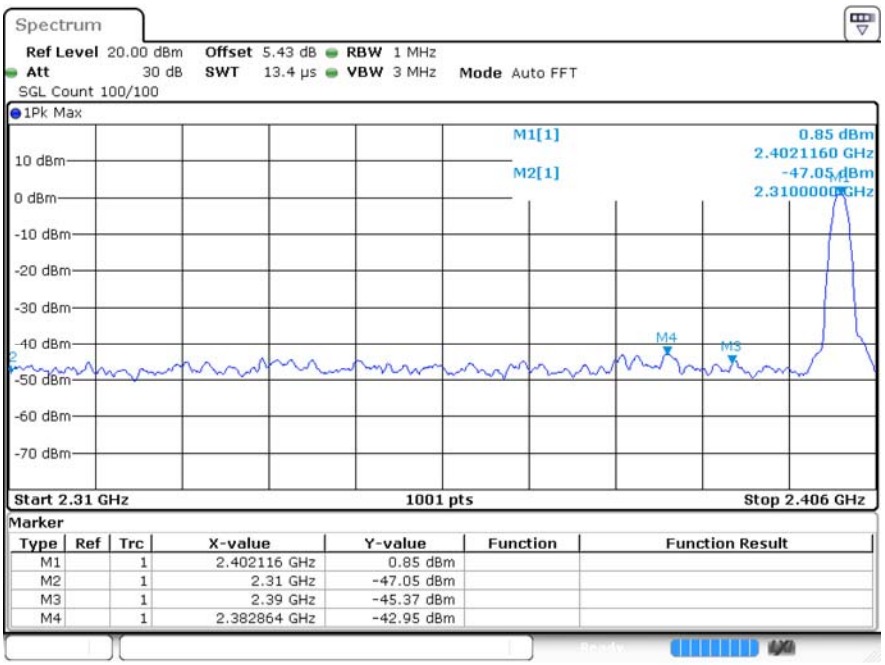
9 Restrict-band band-edge measurements

9.1 Test Result

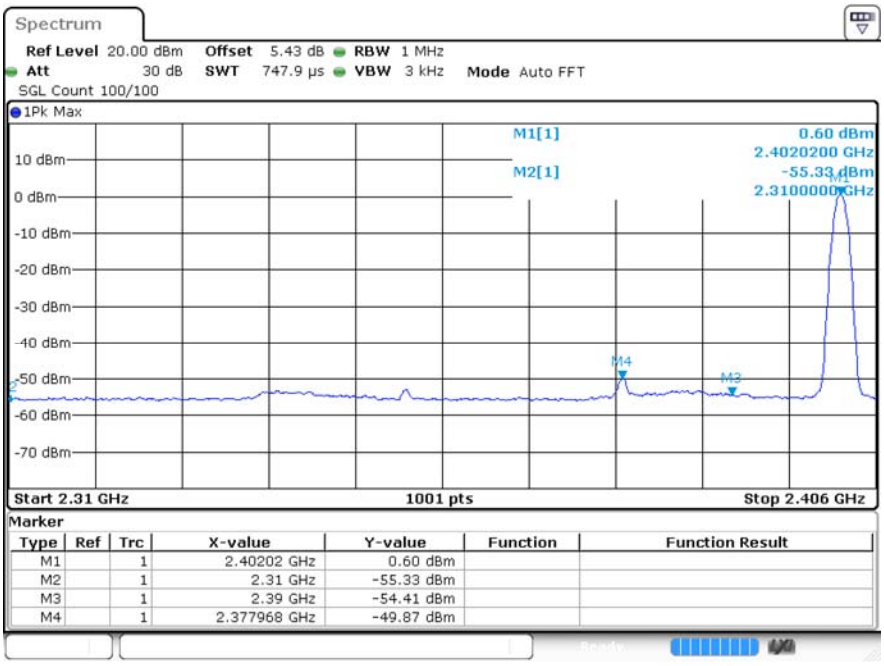
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-47.04	2.67	50.89	PEAK	74	Pass
	Off	2310.0	-55.32	2.67	42.61	AV	54	Pass
	Off	2382.864	-42.95	2.67	54.98	PEAK	74	Pass
	Off	2377.968	-49.87	2.67	48.06	AV	54	Pass
	Off	2390.0	-45.36	2.67	52.57	PEAK	74	Pass
	Off	2390.0	-54.41	2.67	43.52	AV	54	Pass
	Off	2483.5	-46.14	2.67	51.79	PEAK	74	Pass
	Off	2483.5	-54.13	2.67	43.8	AV	54	Pass
	Off	2499.328	-43.57	2.67	54.36	PEAK	74	Pass
	Off	2497.576	-52.73	2.67	45.2	AV	54	Pass
	Off	2500.0	-46.54	2.67	51.39	PEAK	74	Pass
	Off	2500.0	-53.11	2.67	44.82	AV	54	Pass
π/4DQPSK	Off	2310.0	-46.43	2.67	51.5	PEAK	74	Pass
	Off	2310.0	-55.26	2.67	42.67	AV	54	Pass
	Off	2378.064	-43.21	2.67	54.72	PEAK	74	Pass
	Off	2377.968	-50.26	2.67	47.67	AV	54	Pass
	Off	2390.0	-45.55	2.67	52.38	PEAK	74	Pass
	Off	2390.0	-54.2	2.67	43.73	AV	54	Pass
	Off	2483.5	-46.19	2.67	51.74	PEAK	74	Pass
	Off	2483.5	-54.01	2.67	43.92	AV	54	Pass
	Off	2490.28	-43.05	2.67	54.88	PEAK	74	Pass
	Off	2499.976	-52.44	2.67	45.49	AV	54	Pass
	Off	2500.0	-43.23	2.67	54.7	PEAK	74	Pass
	Off	2500.0	-52.44	2.67	45.49	AV	54	Pass

9.2 Test Graphs

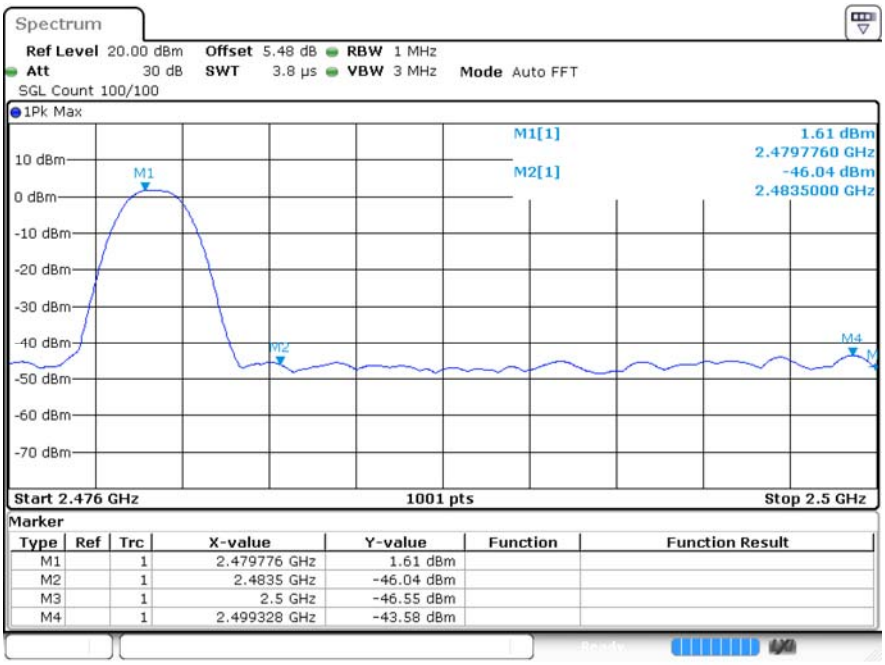
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



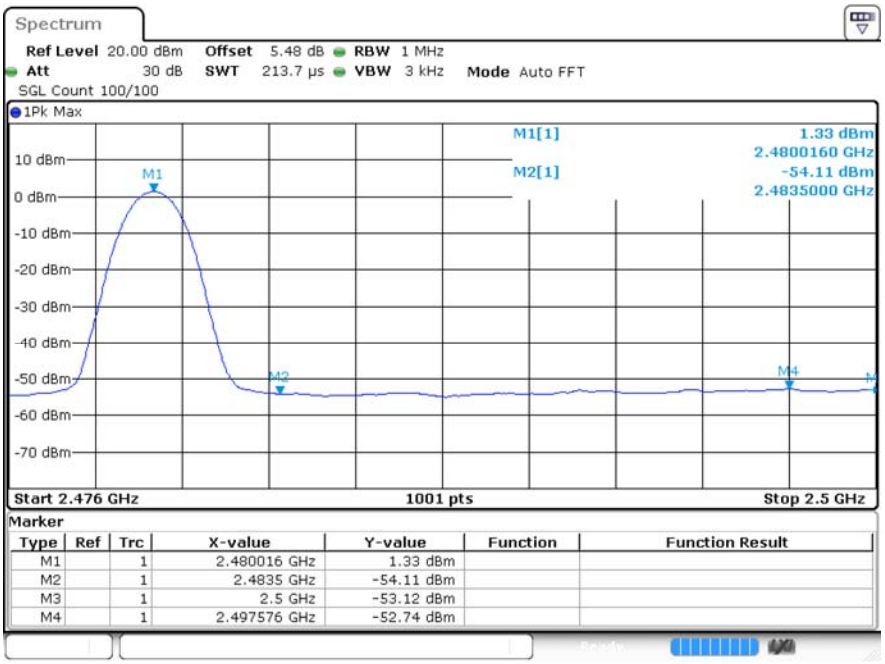
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



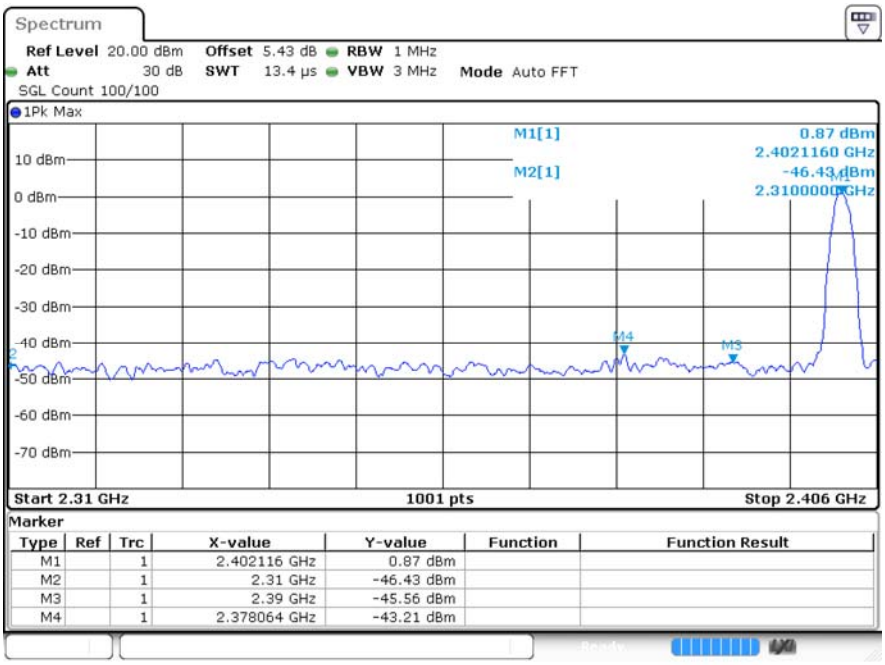
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



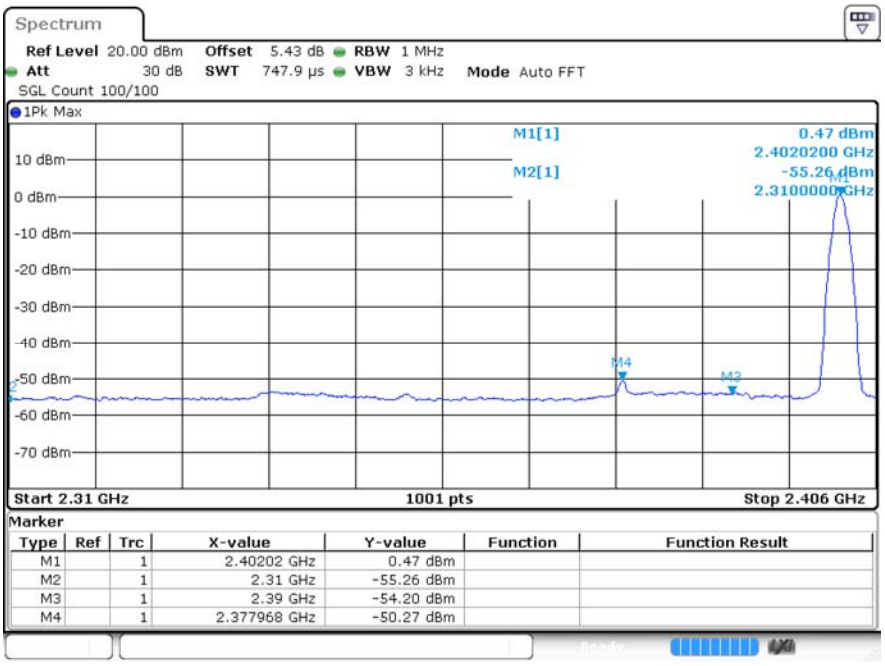
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



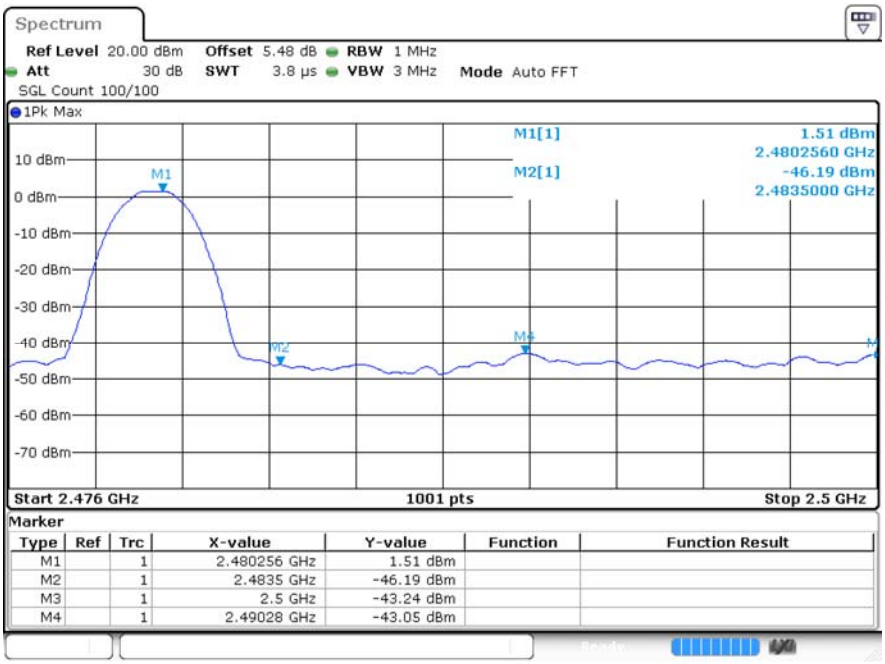
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



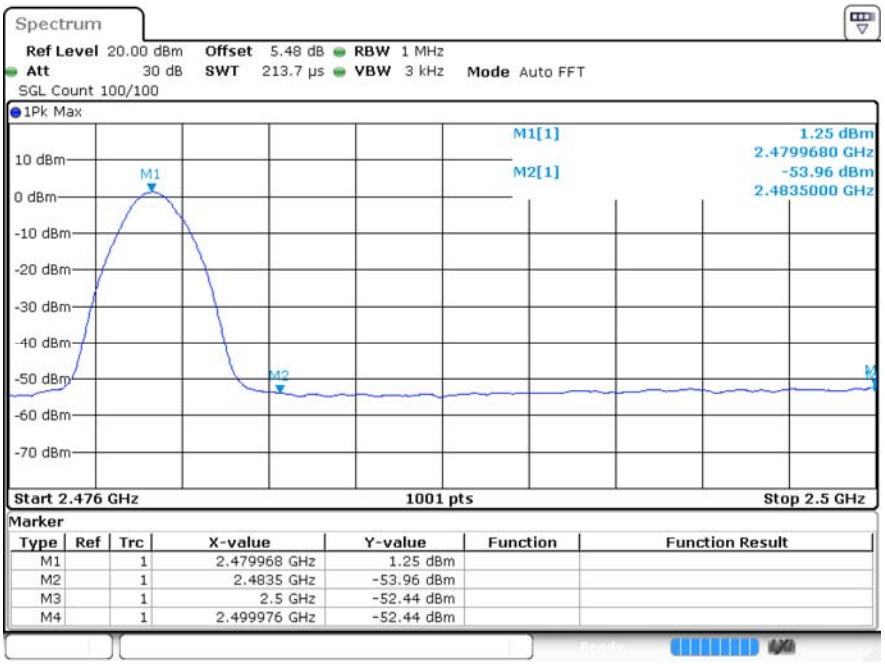
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



---The End---