Appendix A

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

Product Name: Bluetooth Speakers

Trade Mark: UEME

Test Model: JK-01

Environmental Conditions

Temperature:	22.8℃
Relative Humidity:	50.6%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

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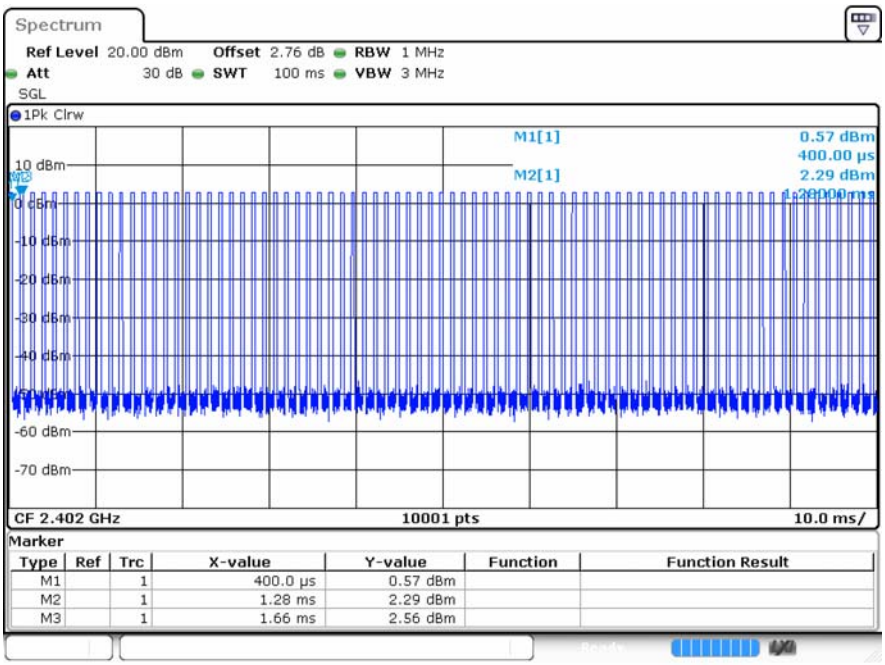
1 Duty Cycle

1.1 Test Result

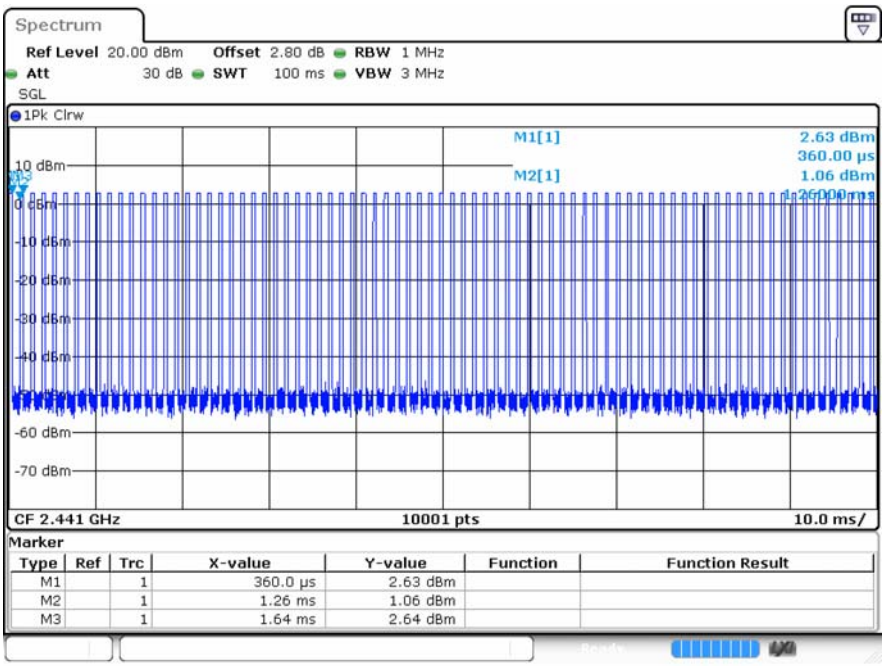
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.2	2.63
1-DH1	2441	31.14	2.63
1-DH1	2480	31.22	2.63
2-DH1	2402	31.03	2.63
2-DH1	2441	31.1	2.63
2-DH1	2480	31.01	2.63
3-DH1	2402	30.94	2.56
3-DH1	2441	31.11	2.56
3-DH1	2480	31.02	2.56

1.2 Test Graphs

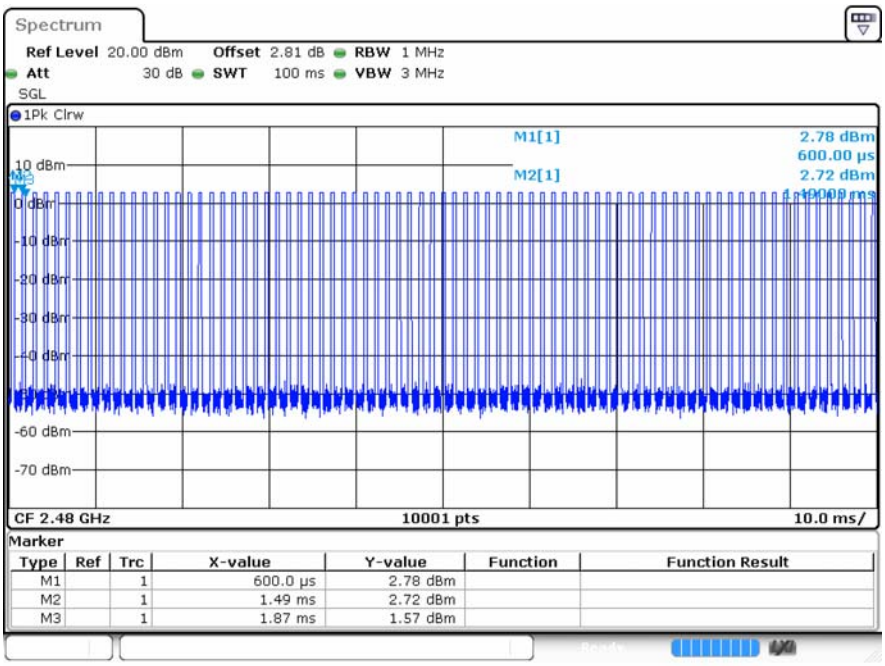
Test Graphs
1-DH1 2402MHz



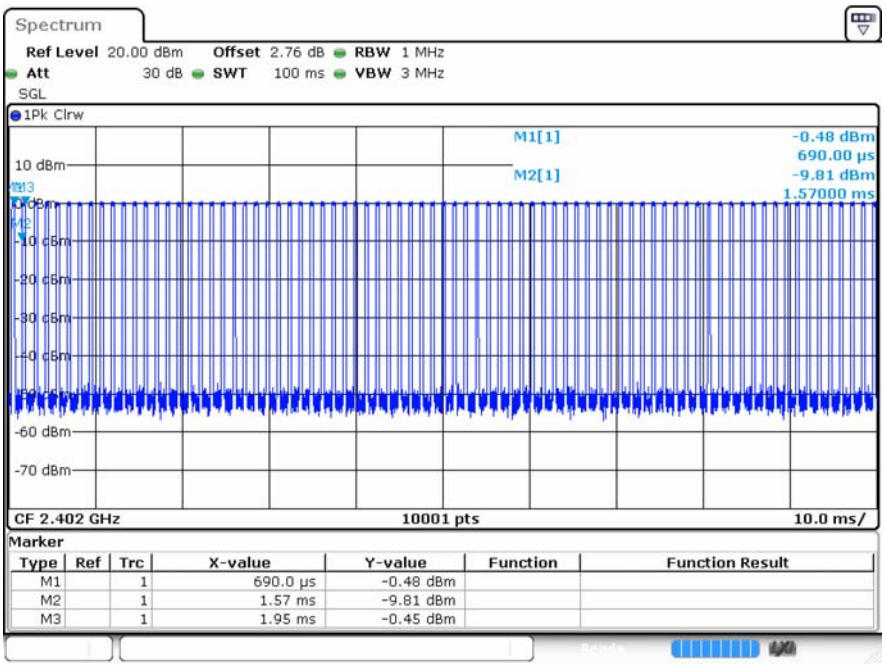
1-DH1 2441MHz



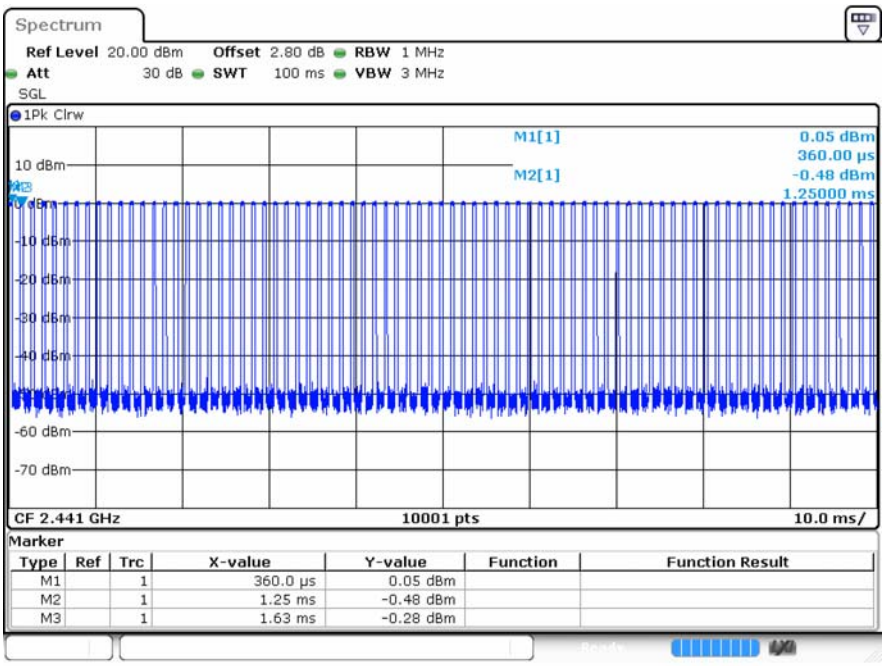
1-DH1 2480MHz



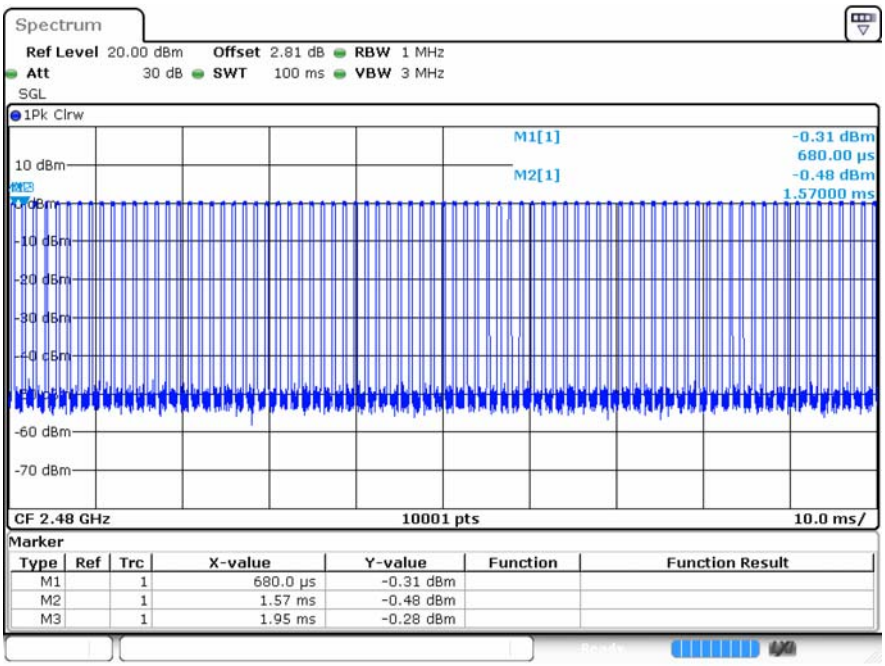
2-DH1 2402MHz



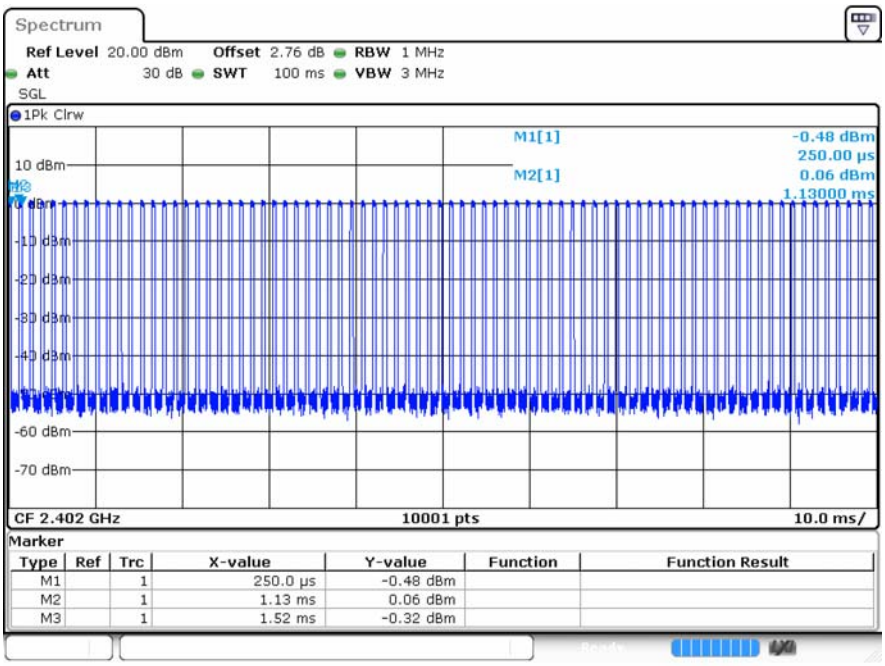
2-DH1 2441MHz



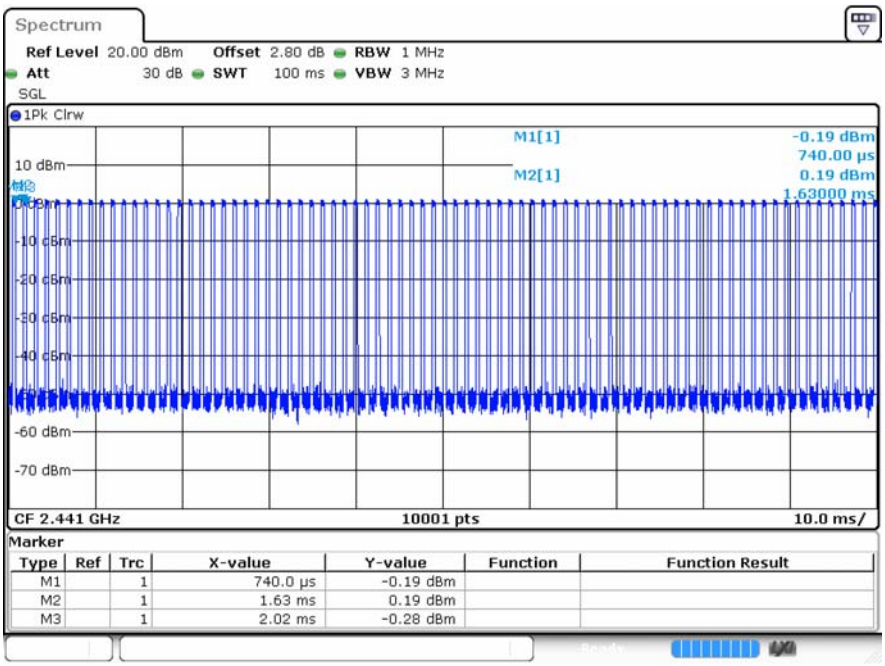
2-DH1 2480MHz



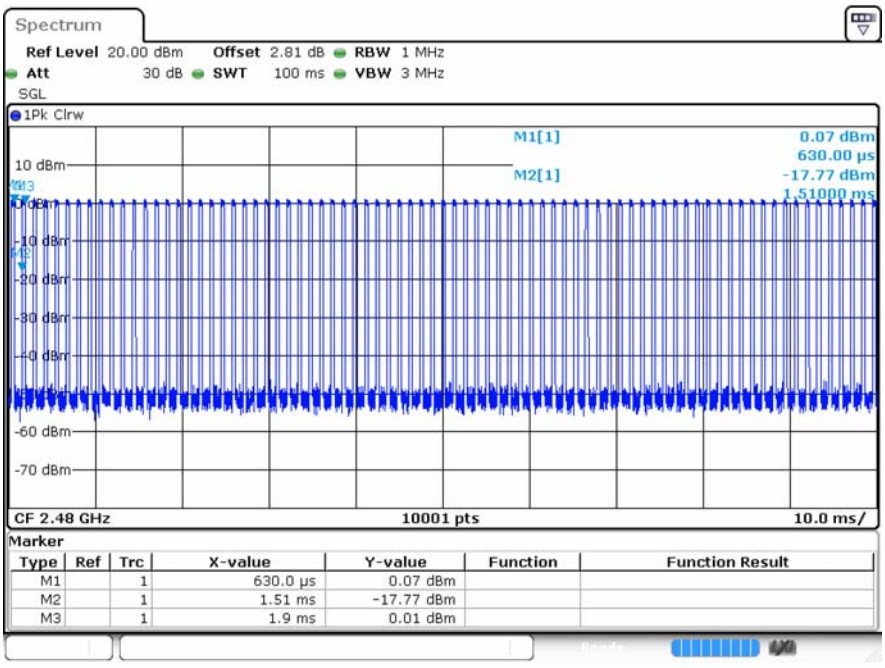
3-DH1 2402MHz



3-DH1 2441MHz



3-DH1 2480MHz

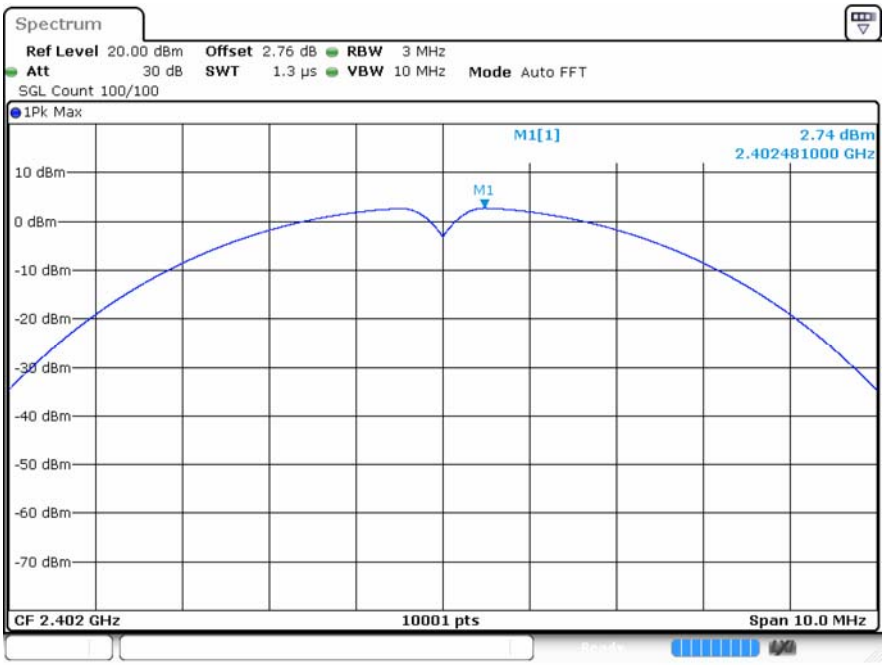
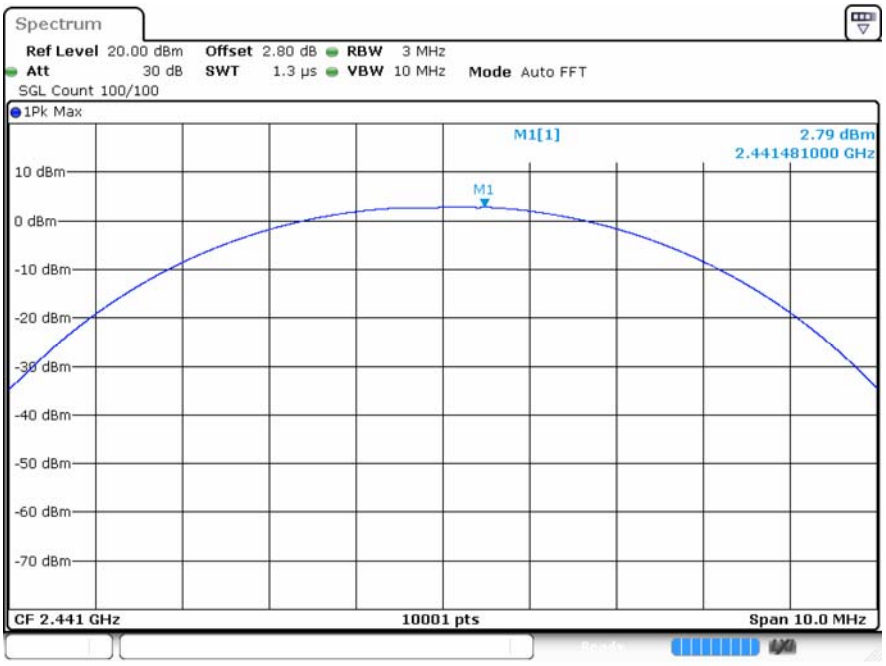


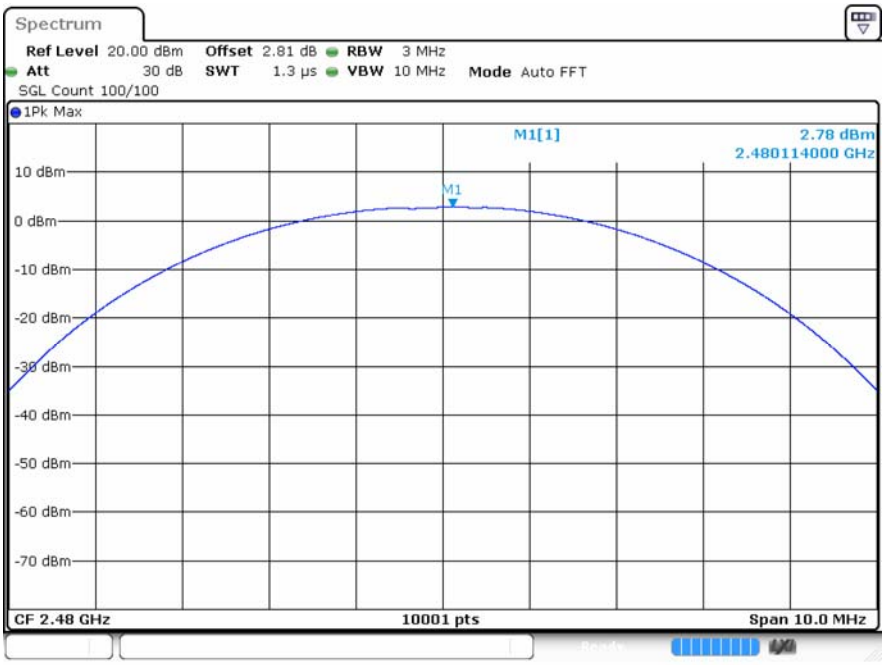
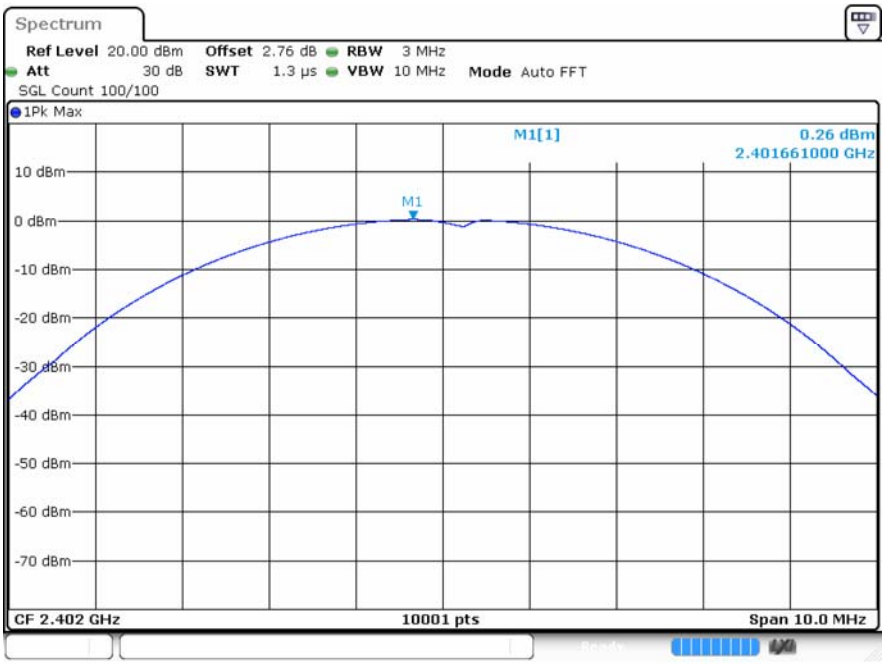
2 Maximum Conducted Peak Output Power

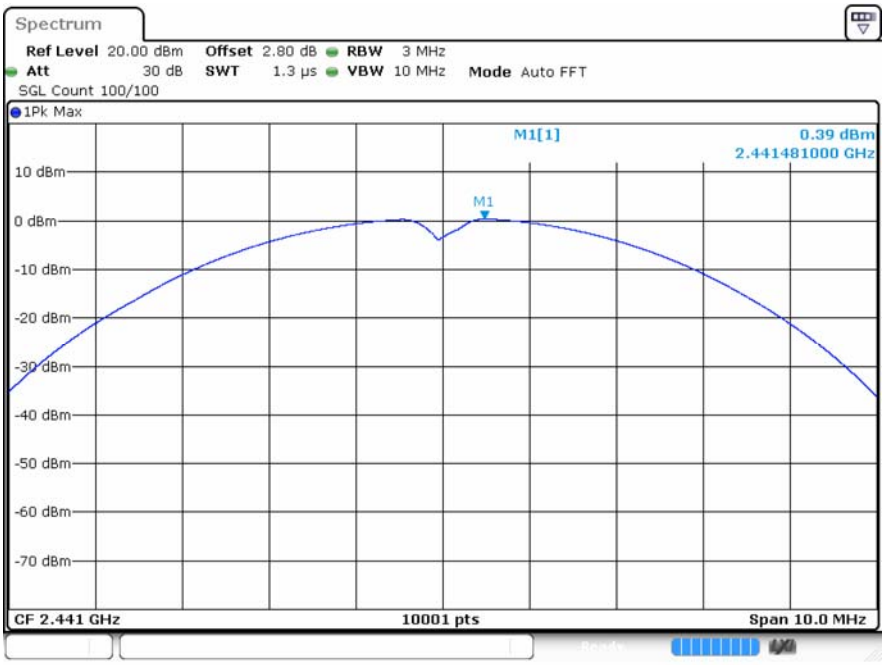
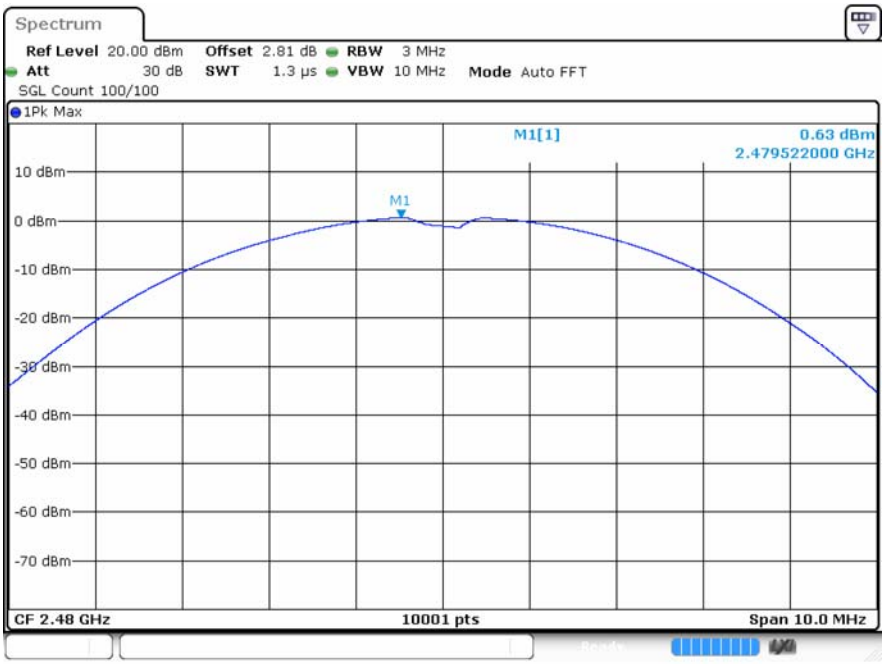
2.1 Test Result

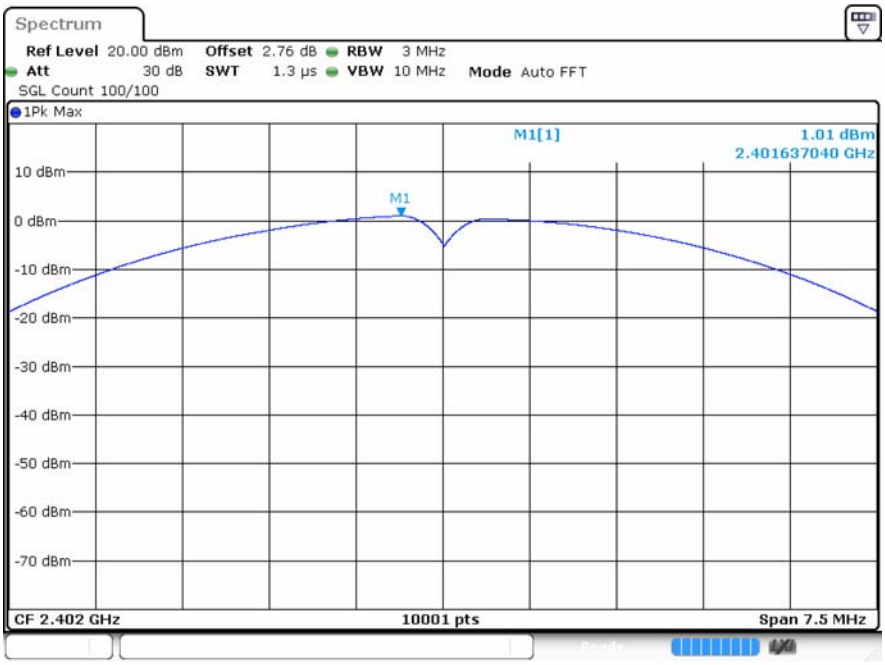
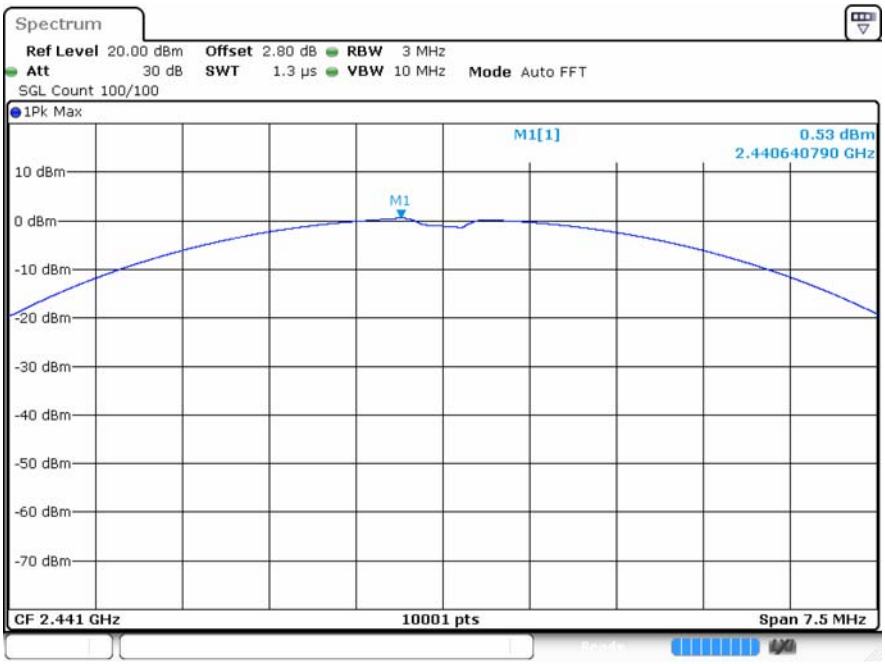
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.74	21	Pass
	MCH	2.79	21	Pass
	HCH	2.78	21	Pass
π/4DQPSK	LCH	0.26	21	Pass
	MCH	0.39	21	Pass
	HCH	0.63	21	Pass
8DPSK	LCH	1.01	21	Pass
	MCH	0.53	21	Pass
	HCH	0.83	21	Pass

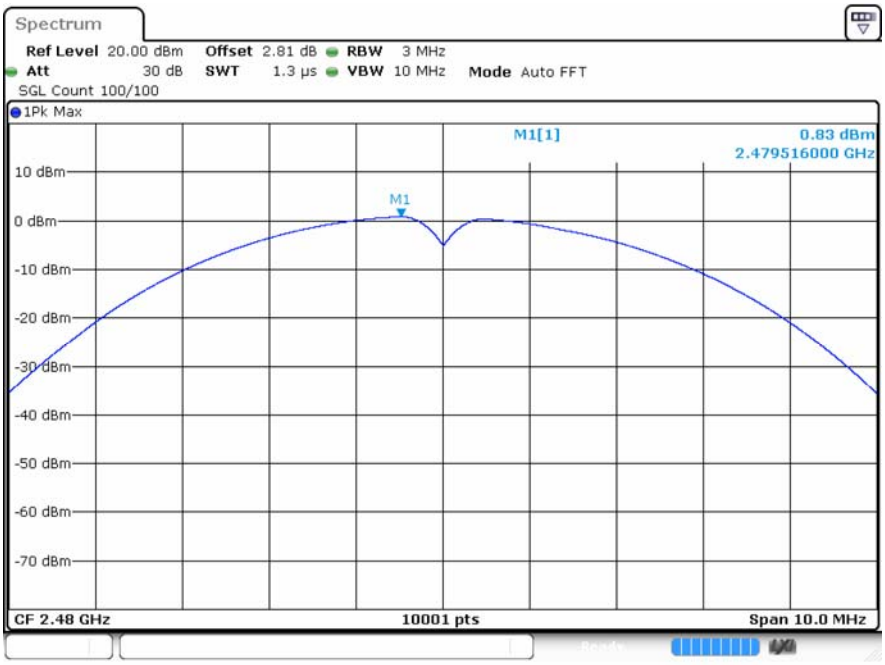
2.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

8DPSK/HCH	

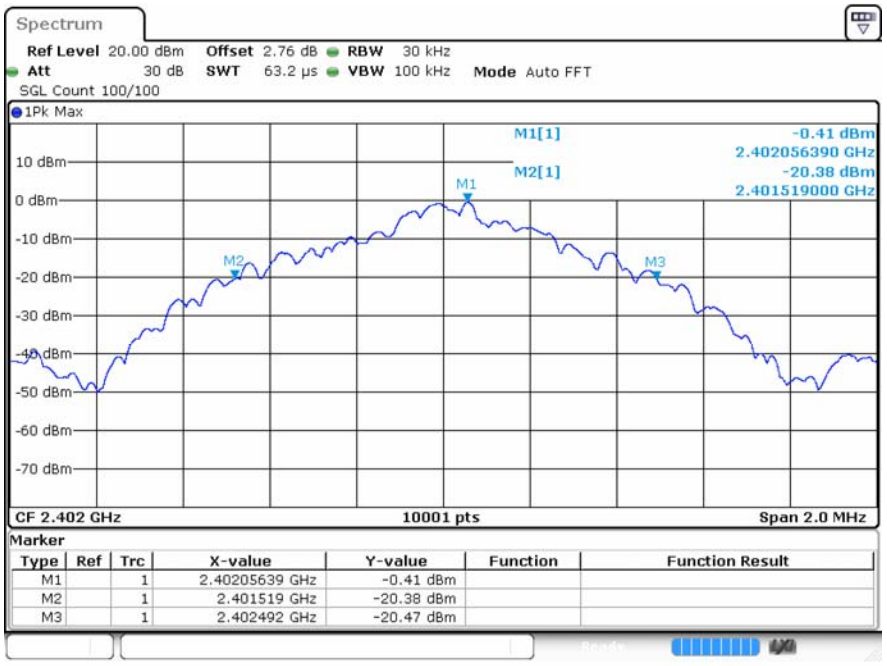
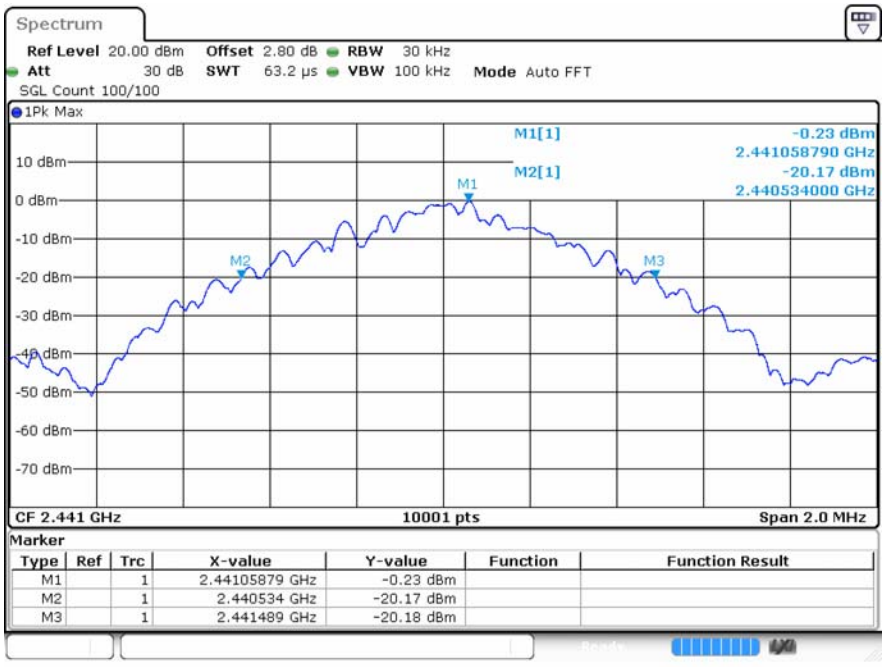
Spectrum
Ref Level 20.00 dBm Offset 2.81 dB RBW 3 MHz
Att 30 dB SWT 1.3 µs VBW 10 MHz Mode Auto FFT
SGL Count 100/100
1Pk Max
M1[1] 0.83 dBm
2.479516000 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.48 GHz
10001 pts
Span 10.0 MHz

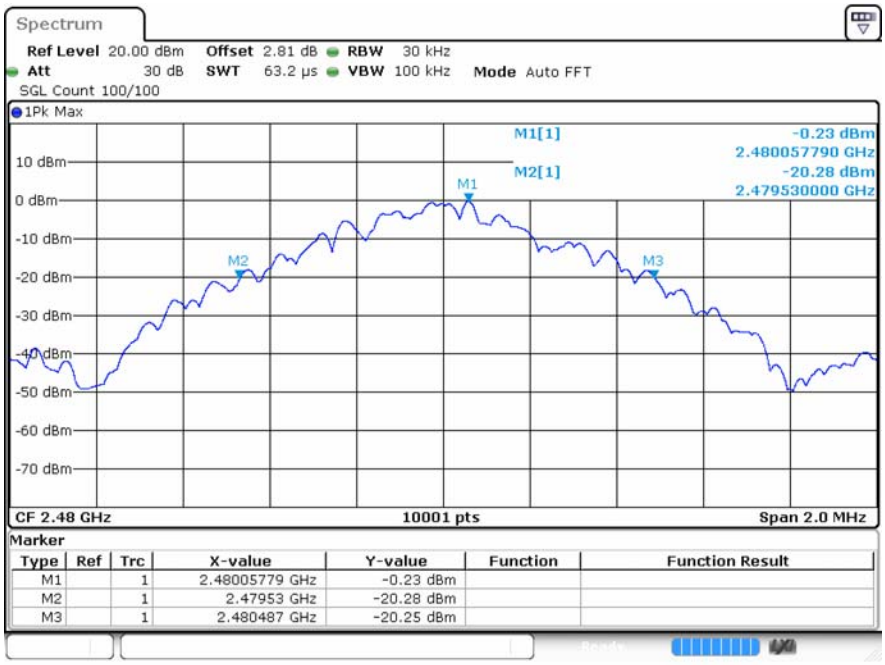
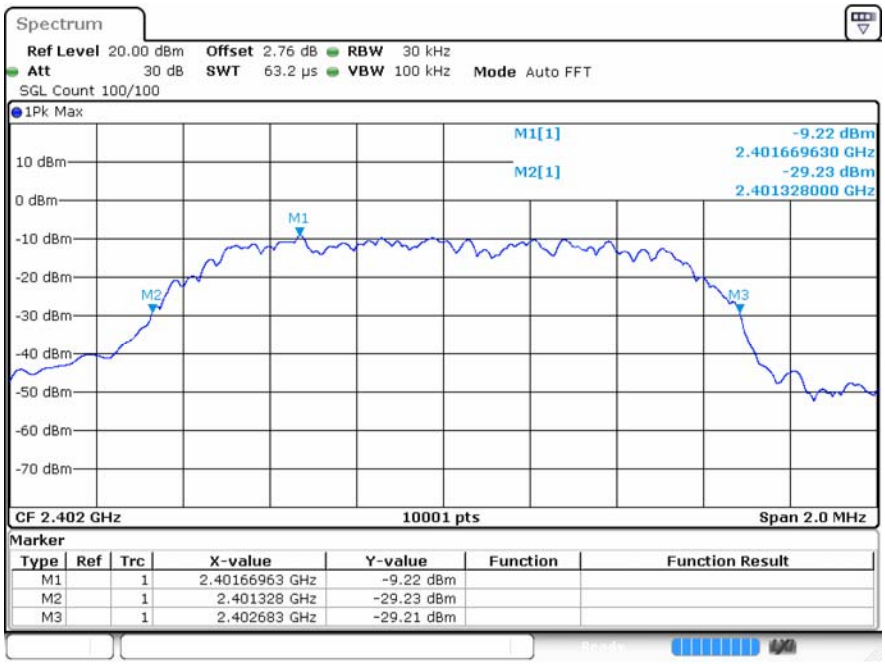
3 20dB Bandwidth

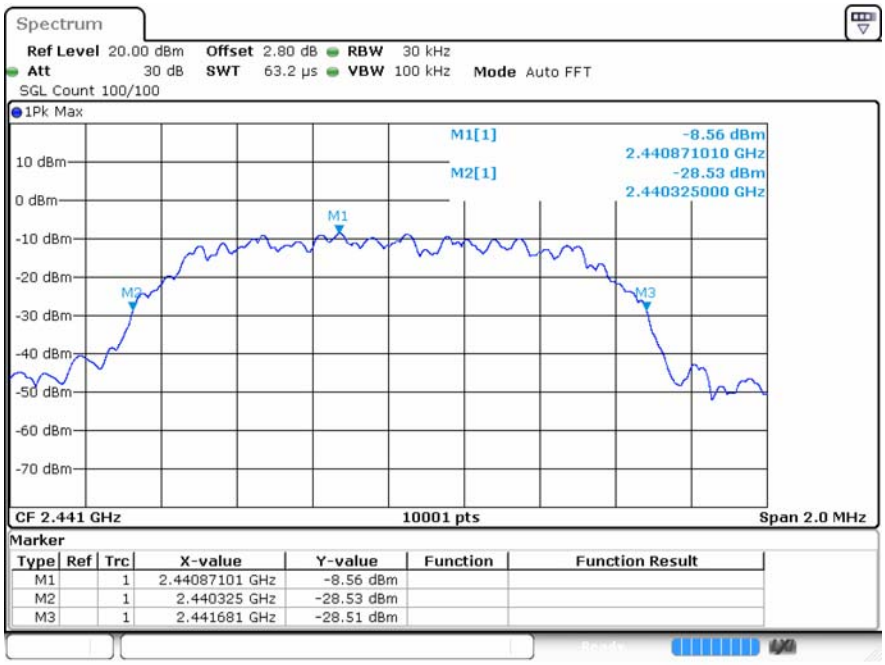
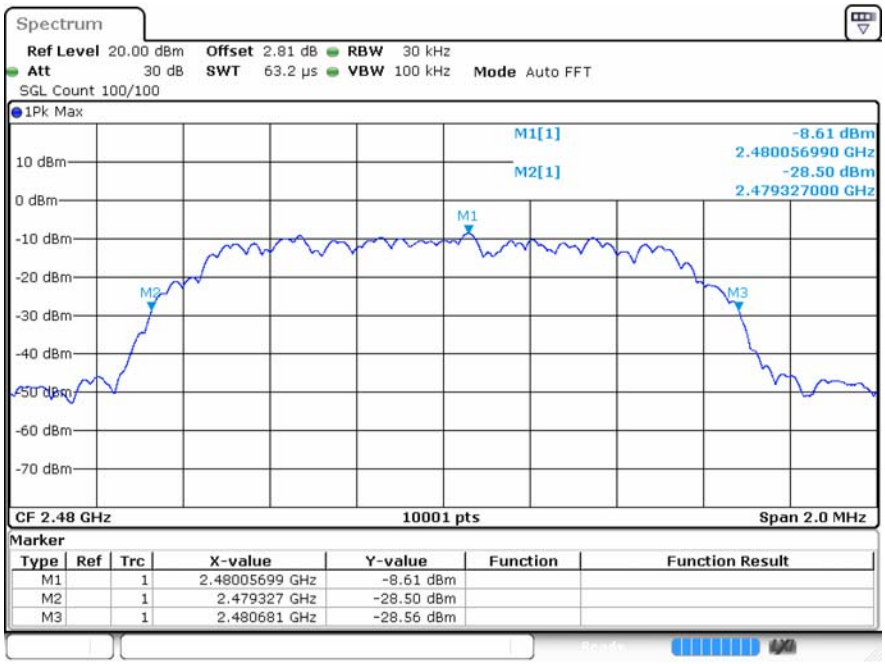
3.1 Test Result

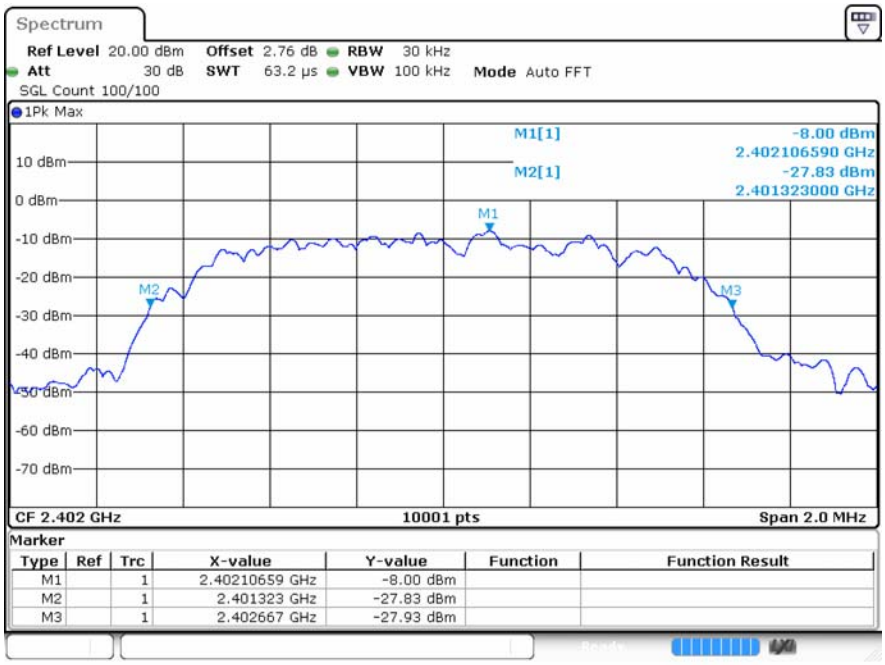
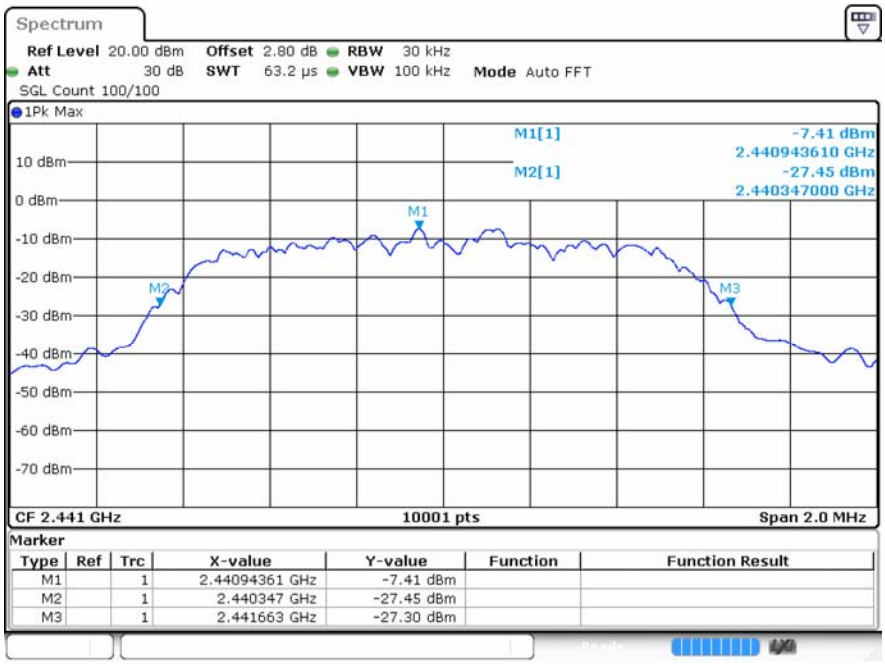
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.973	Not Specified	Pass
	MCH	0.955	Not Specified	Pass
	HCH	0.956	Not Specified	Pass
π/4DQPSK	LCH	1.355	Not Specified	Pass
	MCH	1.356	Not Specified	Pass
	HCH	1.354	Not Specified	Pass
8DPSK	LCH	1.345	Not Specified	Pass
	MCH	1.316	Not Specified	Pass
	HCH	1.324	Not Specified	Pass

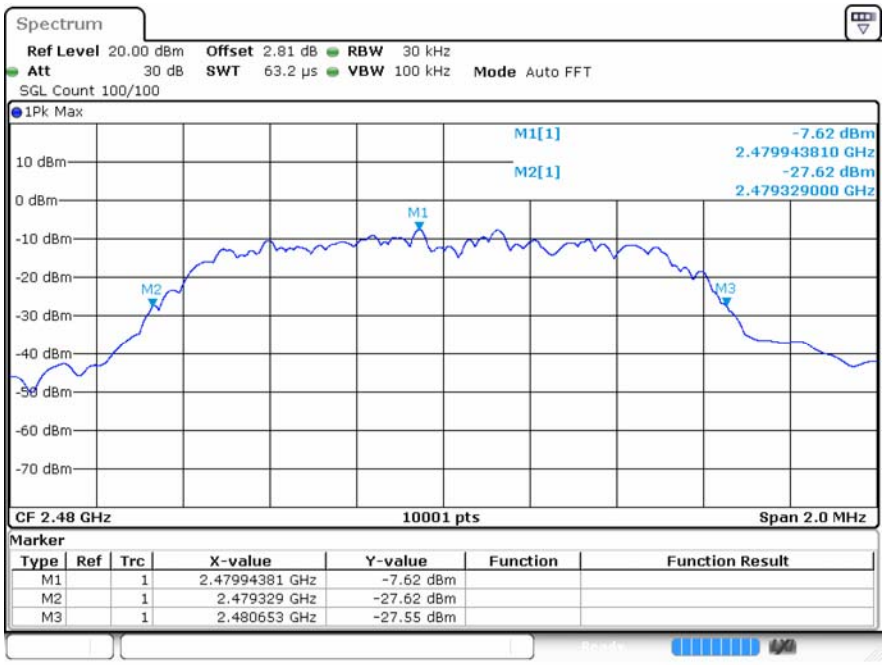
3.2 Test Graphs

Test Graphs	
GFSK/LCH	
GFSK/MCH	

GFSK/HCH	
π/4DQPSK/LCH	

π/4DQPSK/MCH	
π/4DQPSK/HCH	

8DPSK/LCH	
8DPSK/MCH	

8DPSK/HCH	

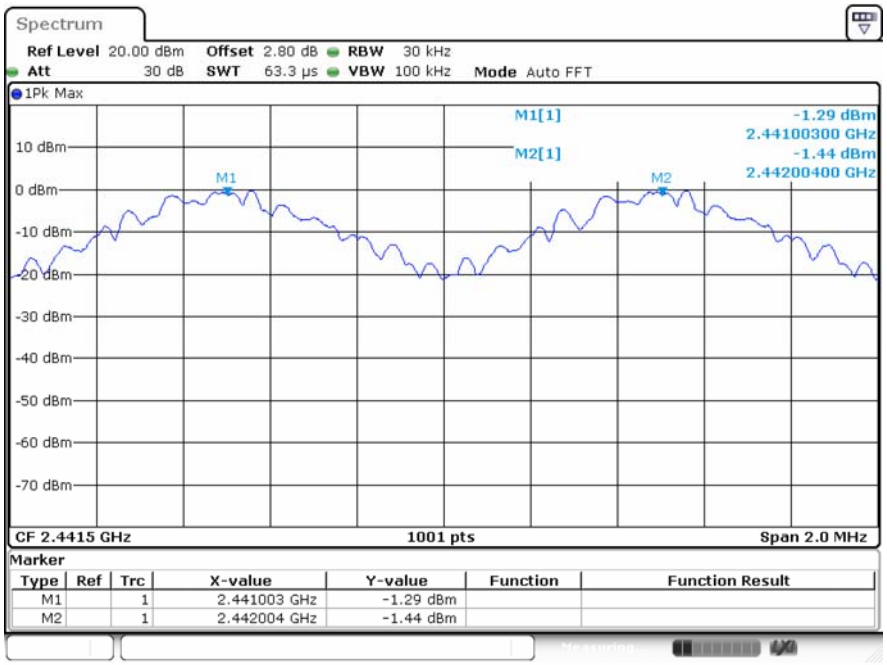
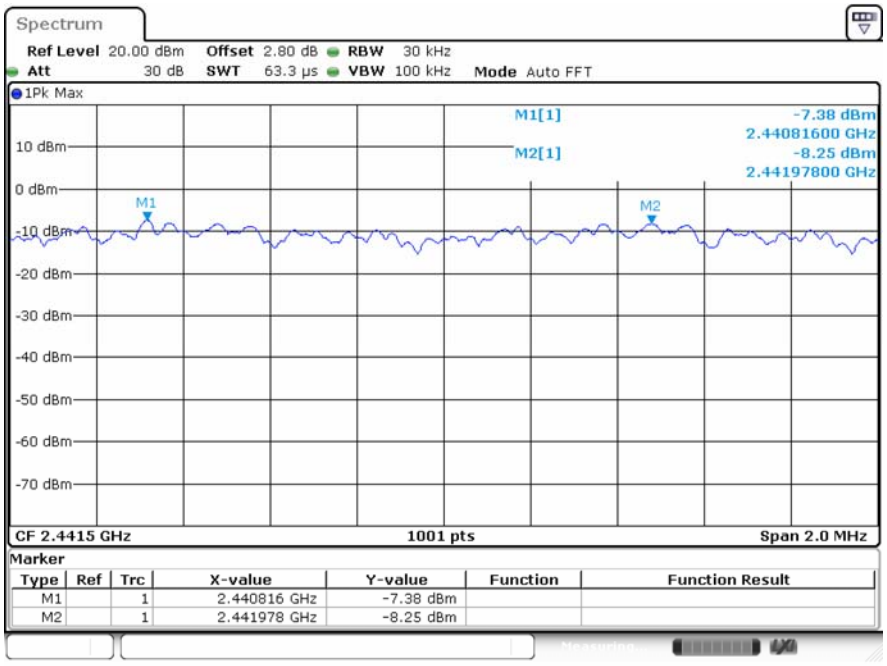
Spectrum
Ref Level 20.00 dBm Offset 2.81 dB RBW 30 kHz
Att 30 dB SWT 63.2 µs VBW 100 kHz Mode Auto FFT
SGL Count 100/100
1Pk Max
M1[1] -7.62 dBm
2.479943810 GHz
M2[1] -27.62 dBm
2.479329000 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
M3
CF 2.48 GHz
10001 pts
Span 2.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.47994381 GHz -7.62 dBm
M2 1 2.479329 GHz -27.62 dBm
M3 1 2.480653 GHz -27.55 dBm

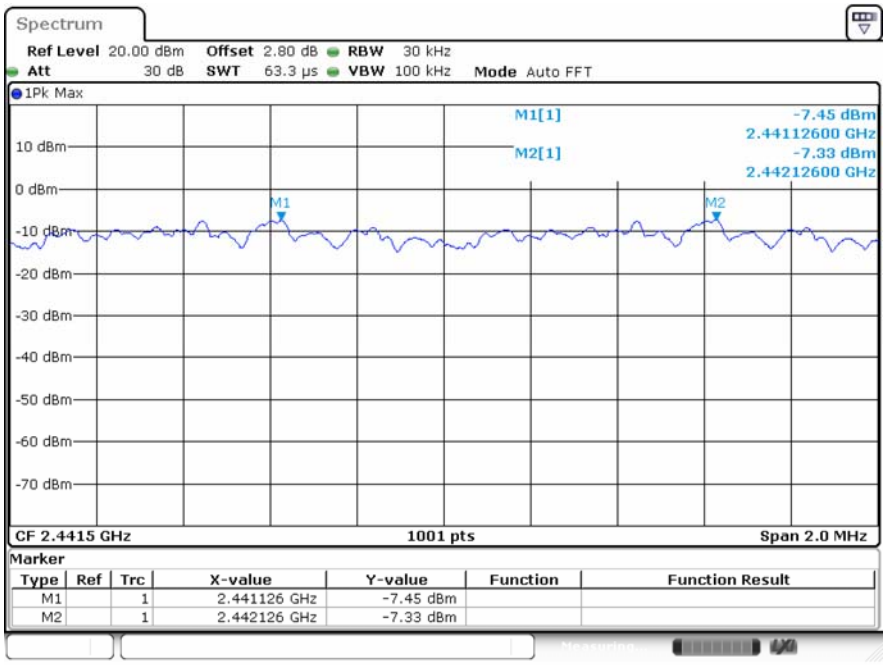
4 Carrier Frequency Separation

4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.637	Pass
π/4DQPSK	MCH	1.162	0.904	Pass
8DPSK	MCH	1	0.877	Pass

4.2 Test Graphs

Test Graphs	
GFSK/MCH	
π/4DQPSK/MCH	

8DPSK/MCH	

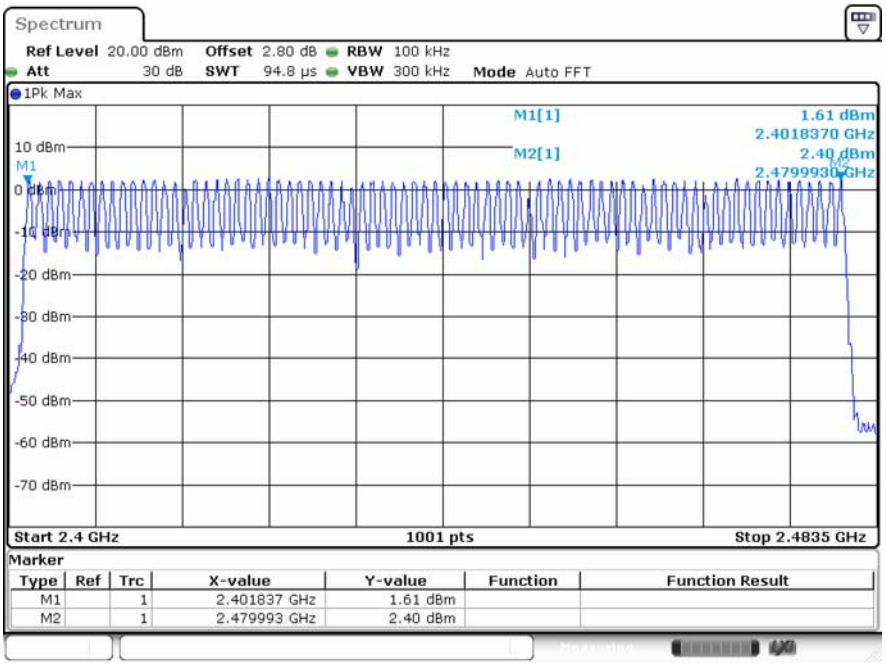
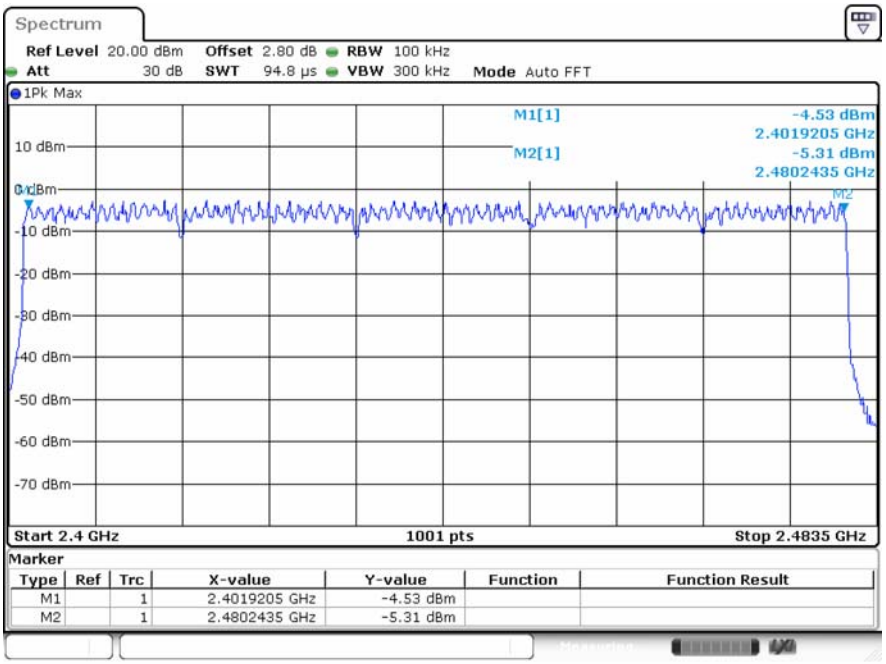
Spectrum
Ref Level 20.00 dBm Offset 2.80 dB RBW 30 kHz
Att 30 dB SWT 63.3 µs VBW 100 kHz Mode Auto FFT
1Pk Max
M1[1] -7.45 dBm
2.44112600 GHz
M2[1] -7.33 dBm
2.44212600 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
CF 2.4415 GHz
1001 pts
Span 2.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.441126 GHz -7.45 dBm
M2 1 2.442126 GHz -7.33 dBm

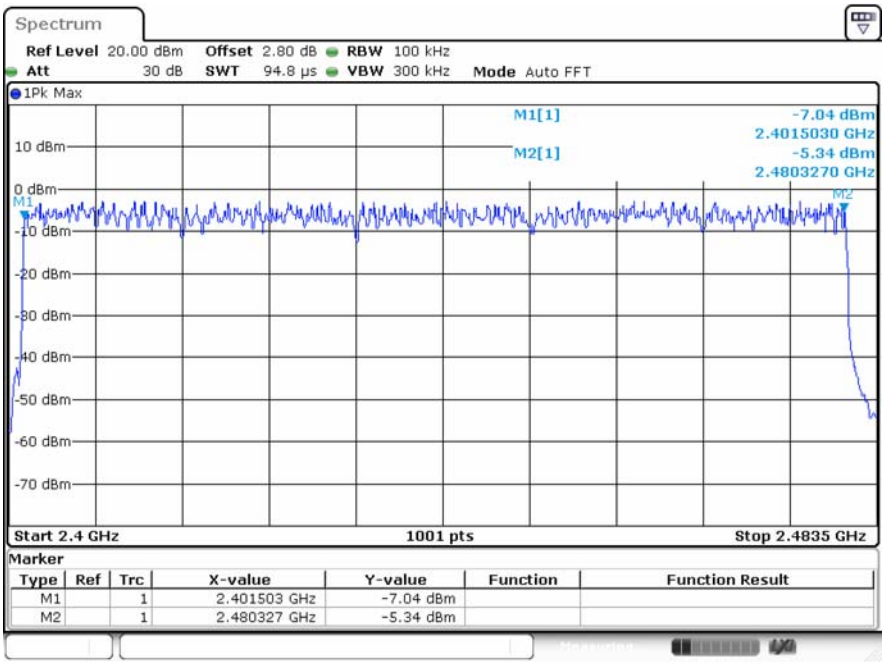
5 Hopping Channel Number

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	

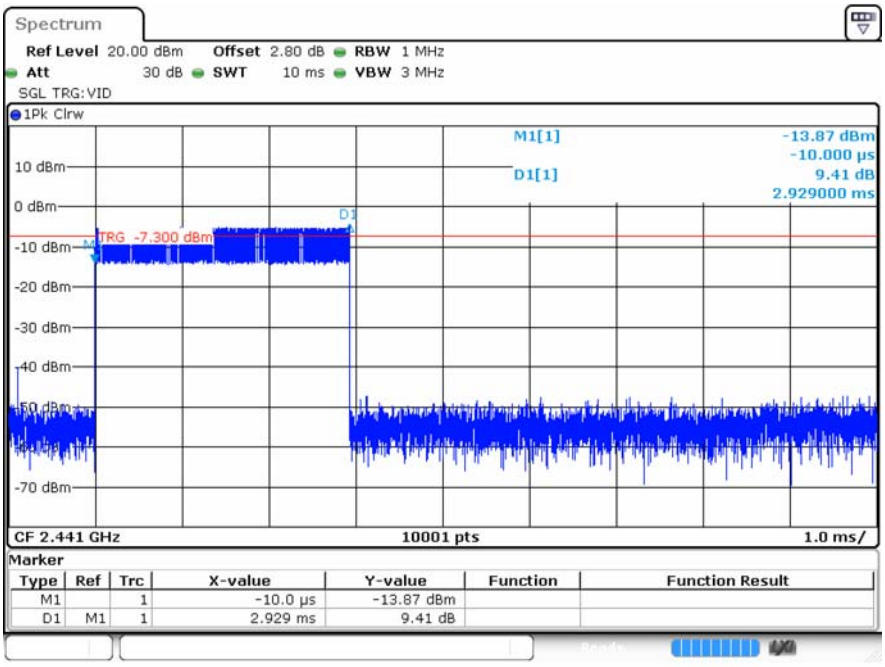
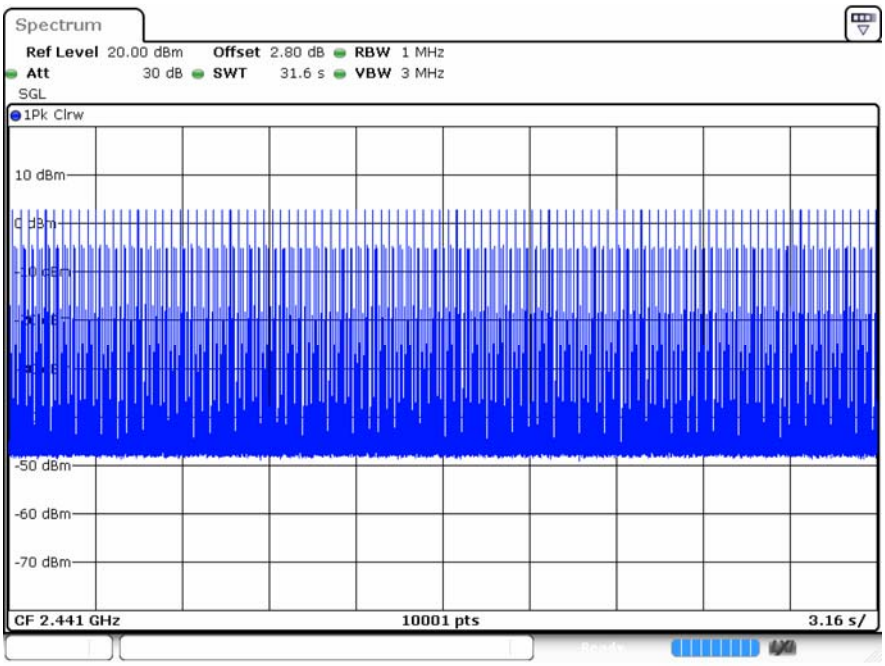
Spectrum
Ref Level 20.00 dBm Offset 2.80 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -7.04 dBm
2.4015030 GHz
M2[1] -5.34 dBm
2.4803270 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.4 GHz
1001 pts
Stop 2.4835 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.401503 GHz -7.04 dBm
M2 1 2.480327 GHz -5.34 dBm

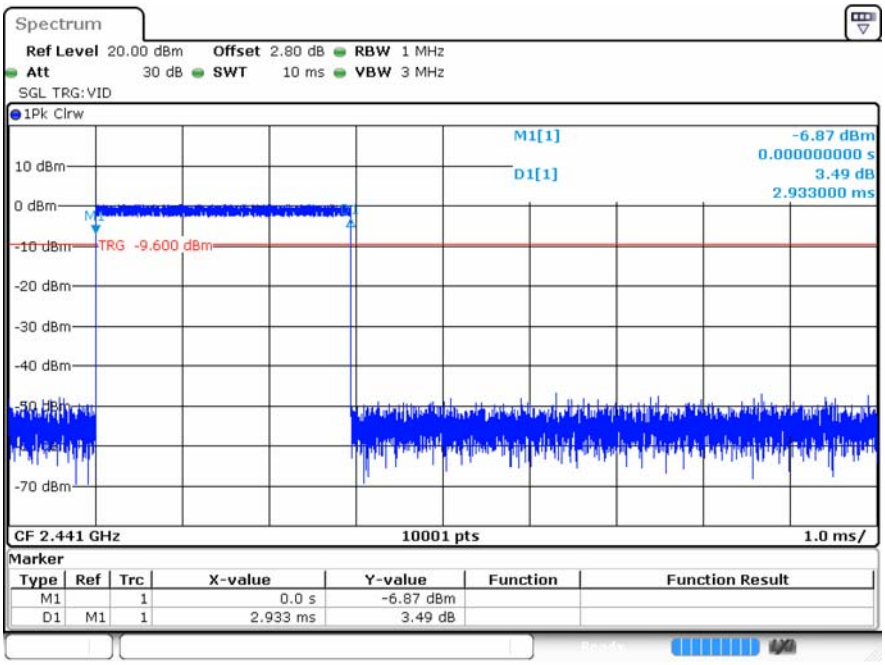
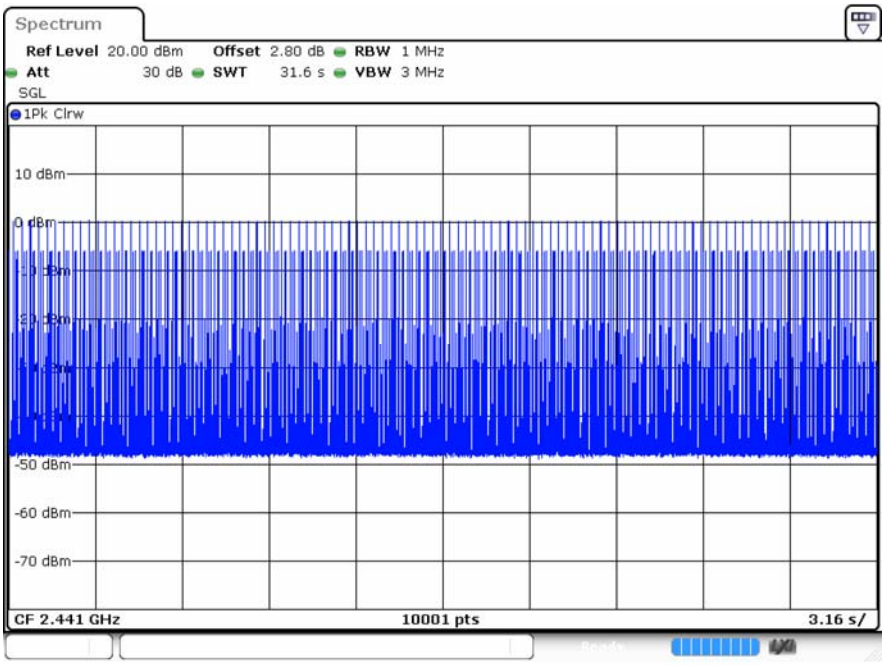
6 Dwell Time

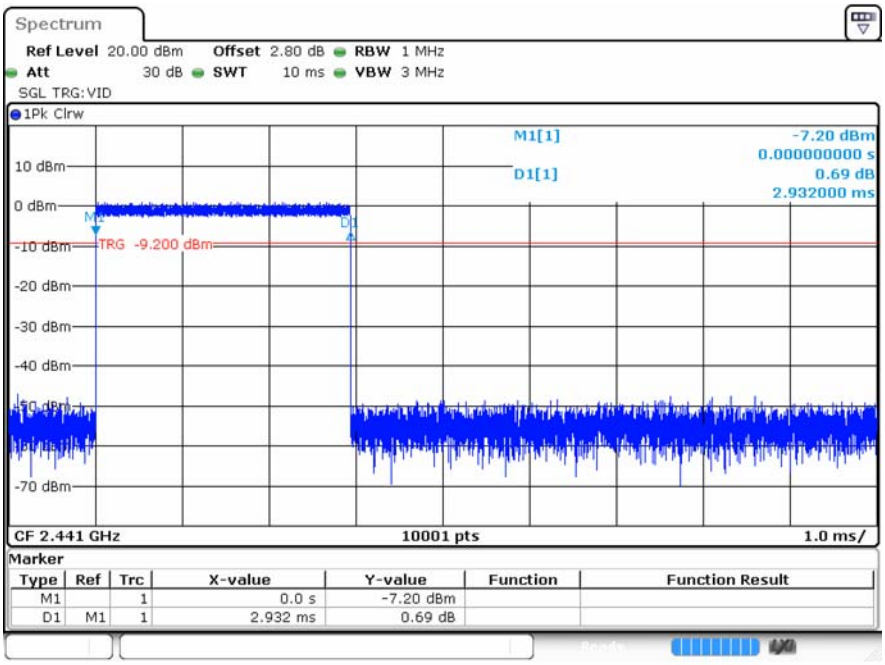
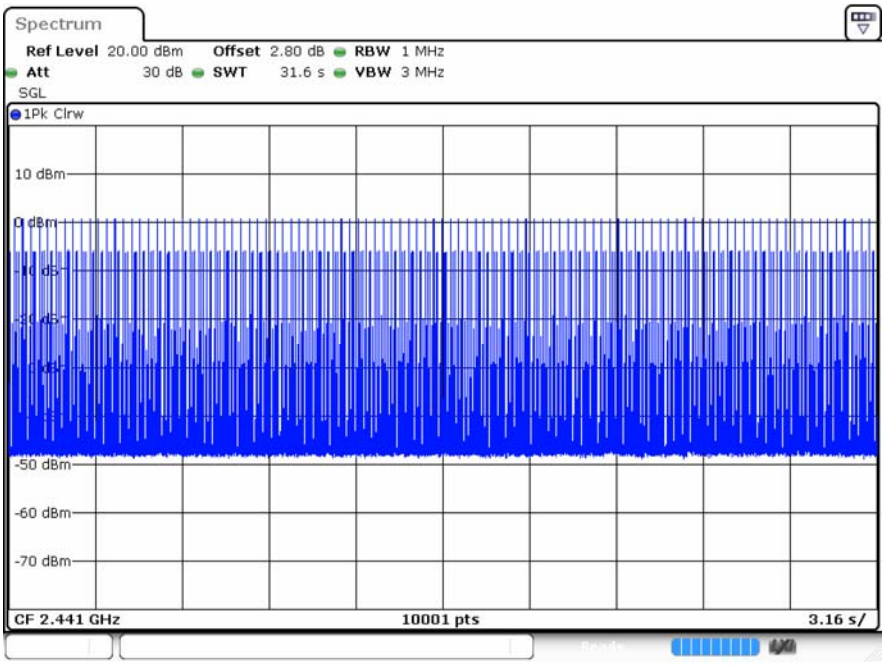
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.929	104	304.616	0.4	Pass
π/4DQPSK	2DH5	MCH	2.933	102	299.166	0.4	Pass
8DPSK	3DH5	MCH	2.932	103	301.996	0.4	Pass

6.2 Test Graphs

Test Graphs	
GFSK_DH5/MCH	 

π/4DQPSK _2DH5/MCH	 

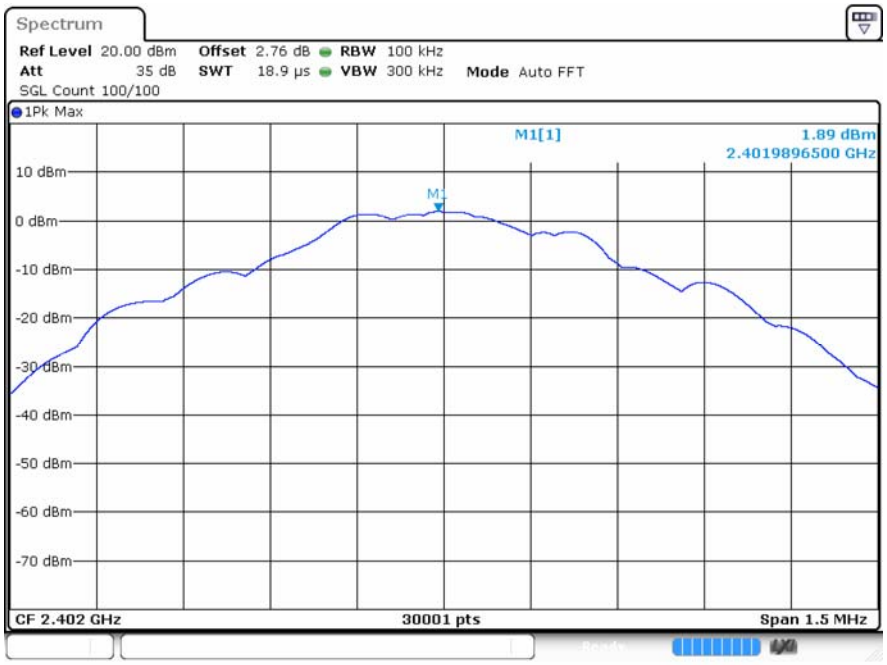
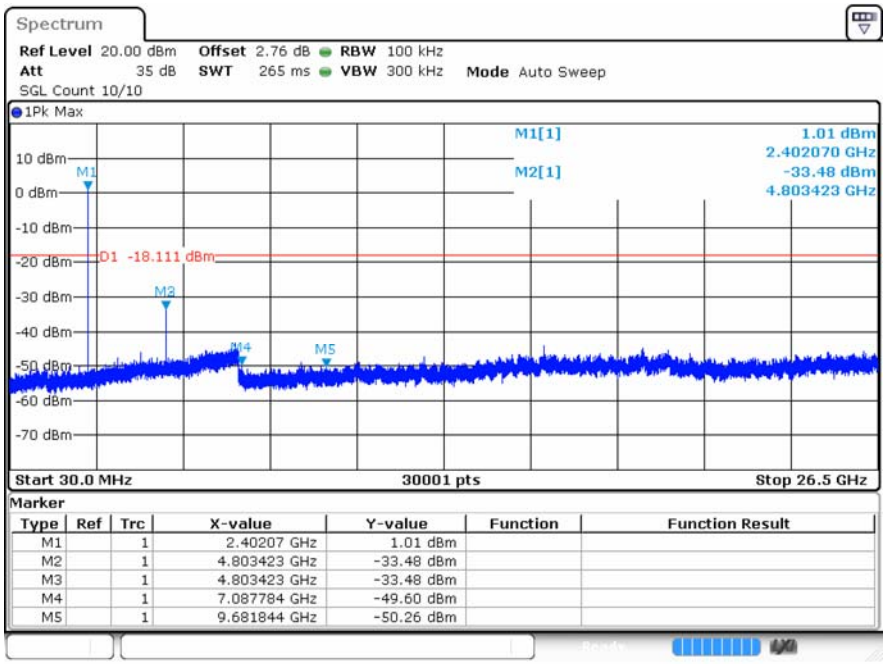
8DPSK _3DH5/MCH	 

7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-35.36	-20	Pass
	MCH	-37.82	-20	Pass
	HCH	-38.69	-20	Pass
π/4DQPSK	LCH	-35.61	-20	Pass
	MCH	-40.51	-20	Pass
	HCH	-38.27	-20	Pass
8DPSK	LCH	-35.02	-20	Pass
	MCH	-38.85	-20	Pass
	HCH	-39.32	-20	Pass

7.2 Test Graphs

GFSK_LCH_Graphs	
Pref	
Puw	

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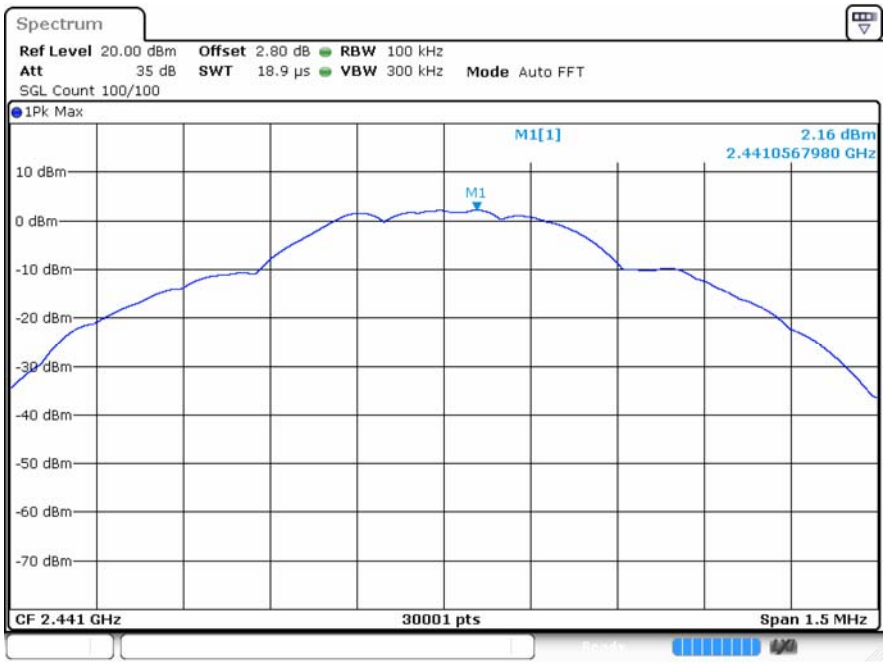
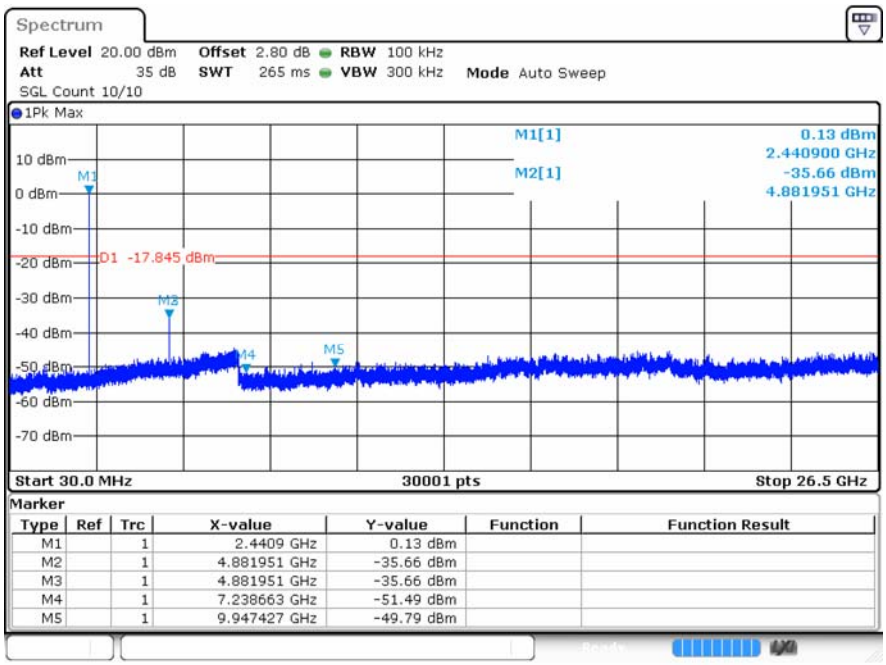
Pref	
Puw	

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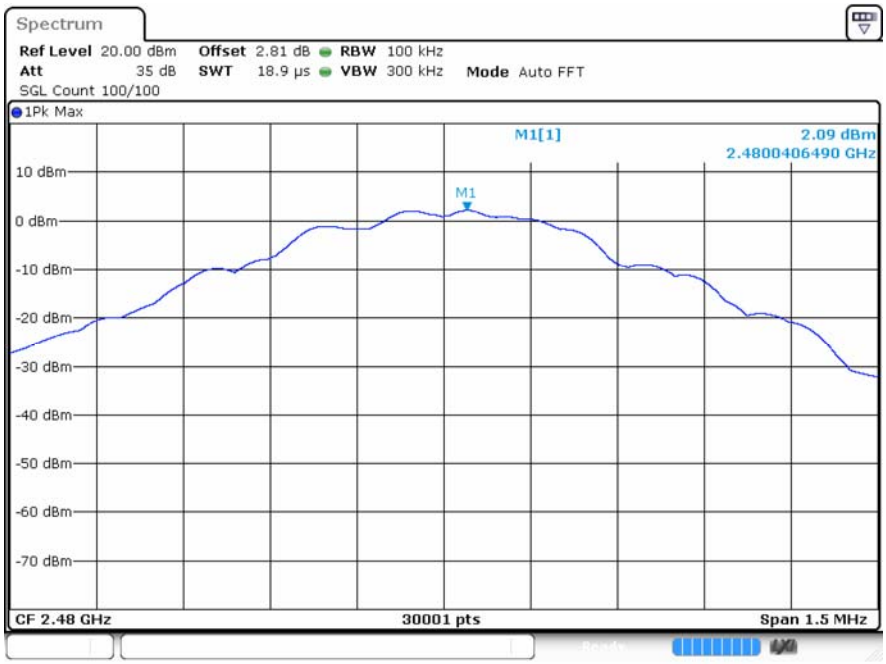
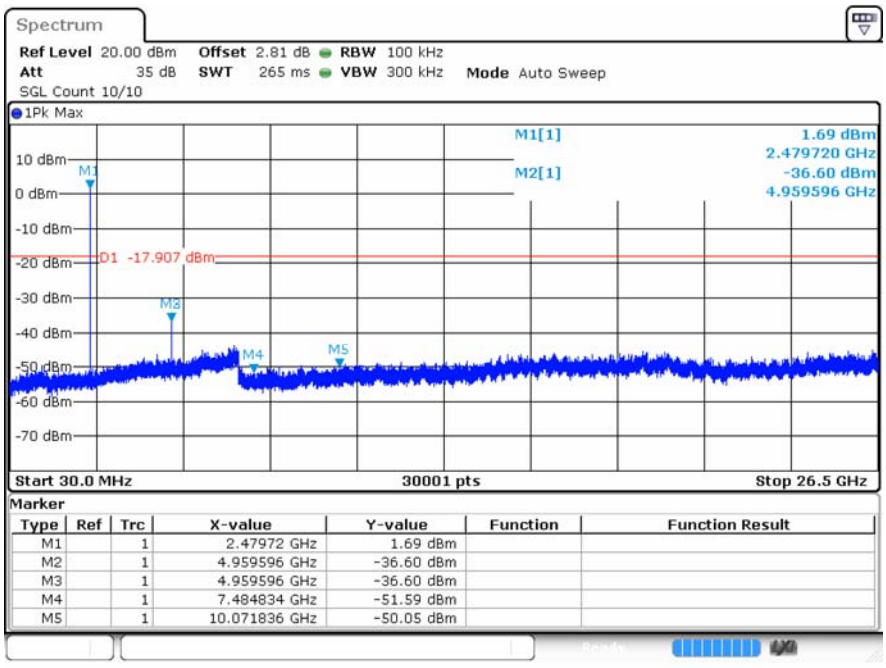
Pref	
Puw	

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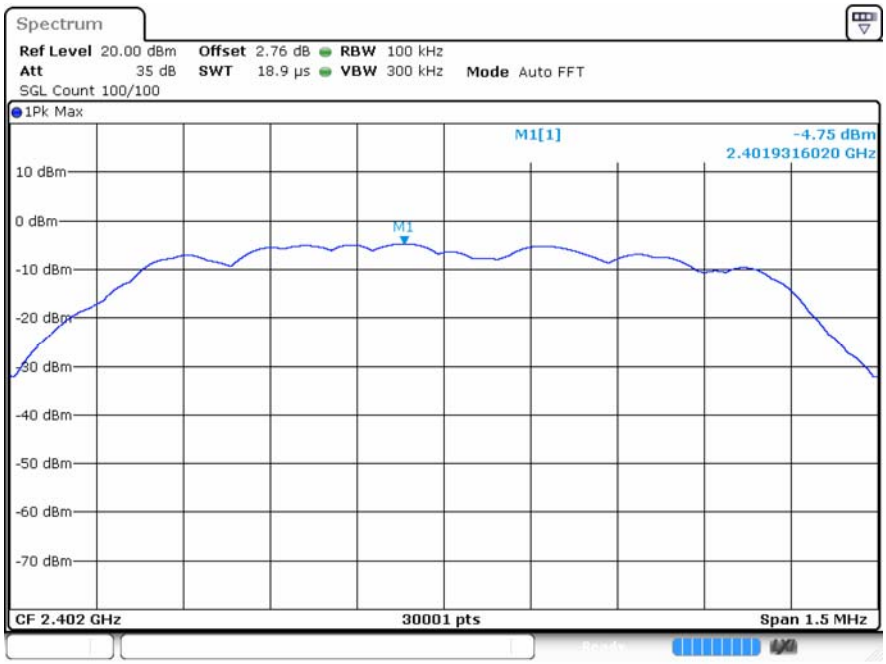
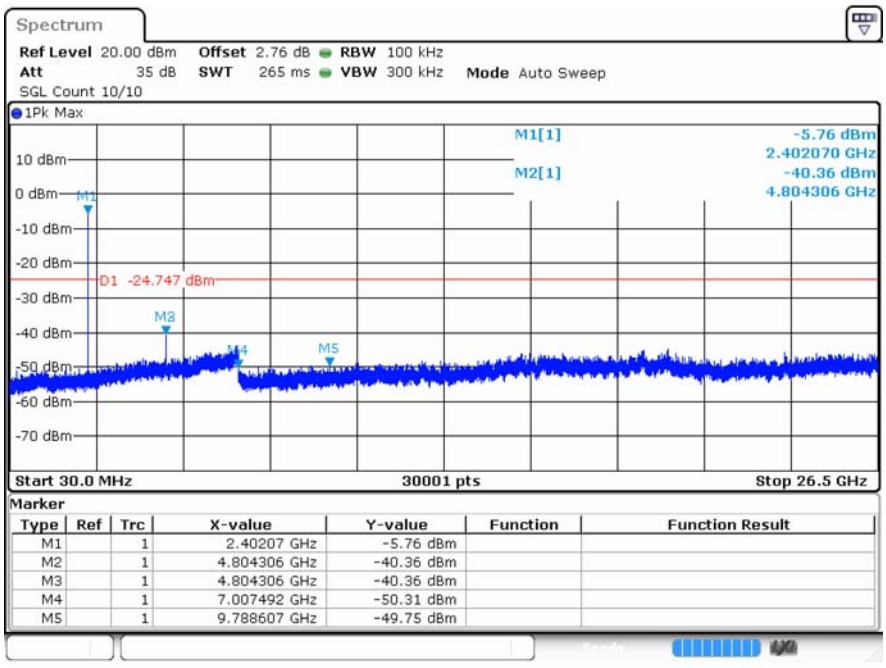
Pref	
Puw	

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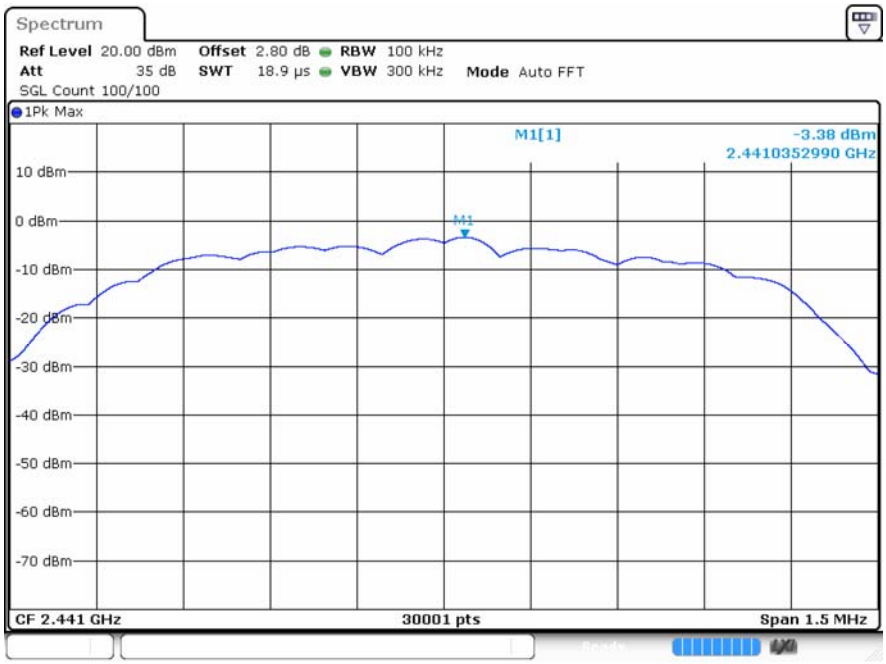
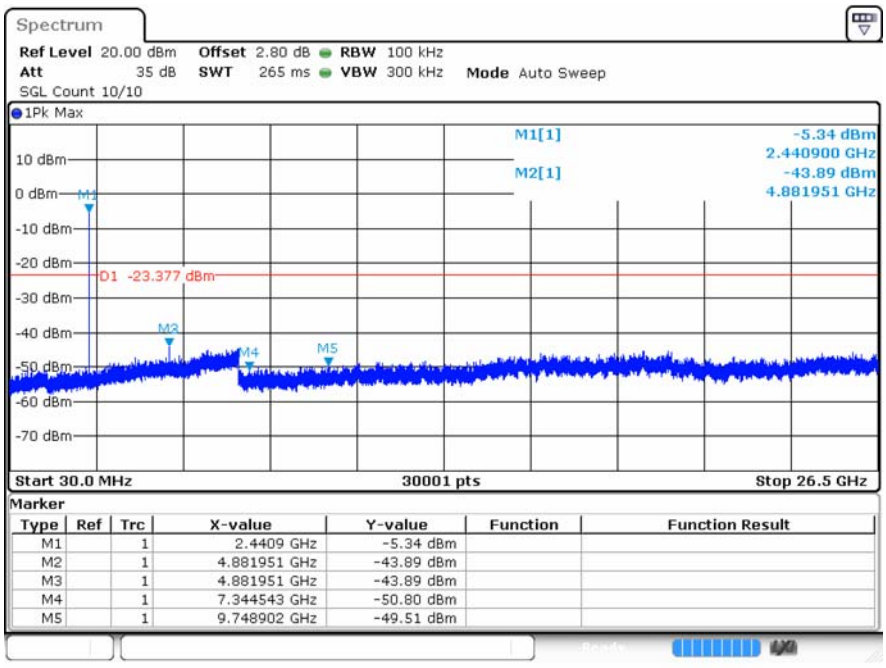
Pref	
Puw	

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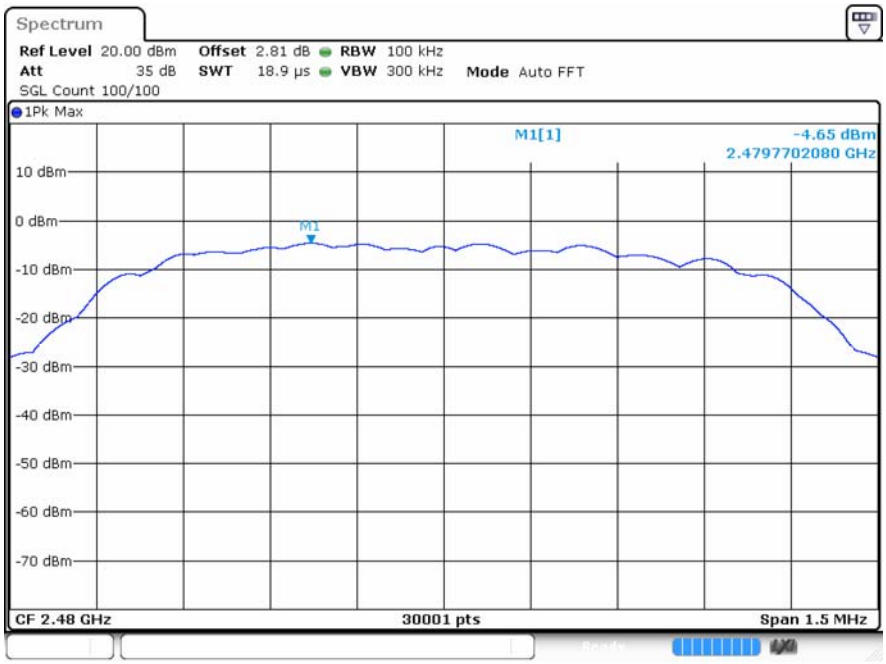
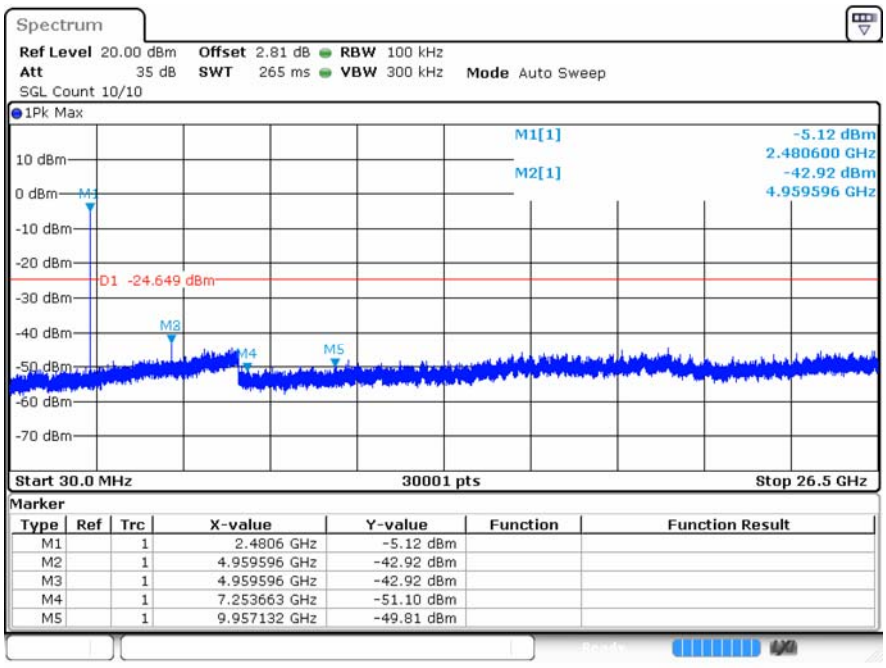
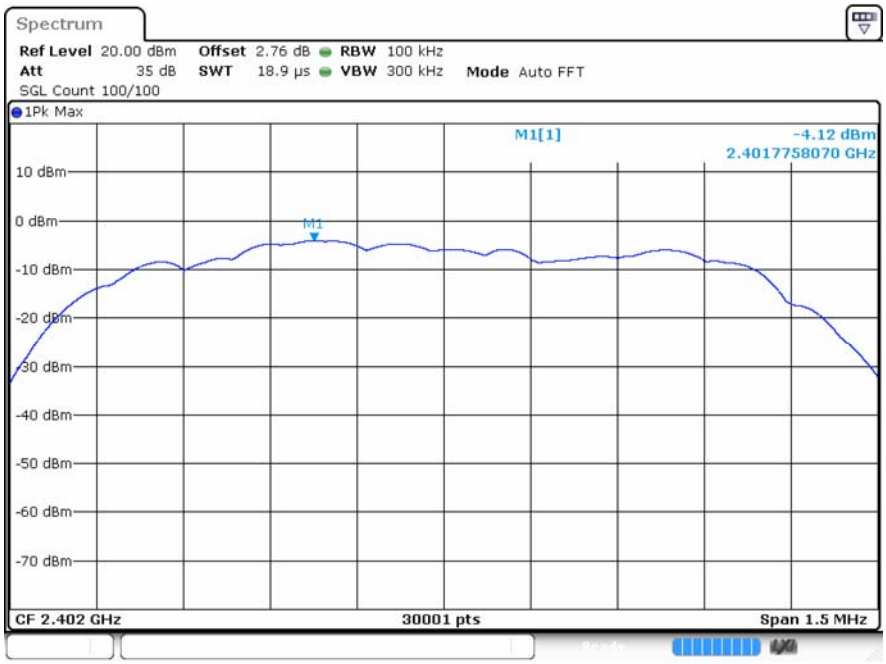
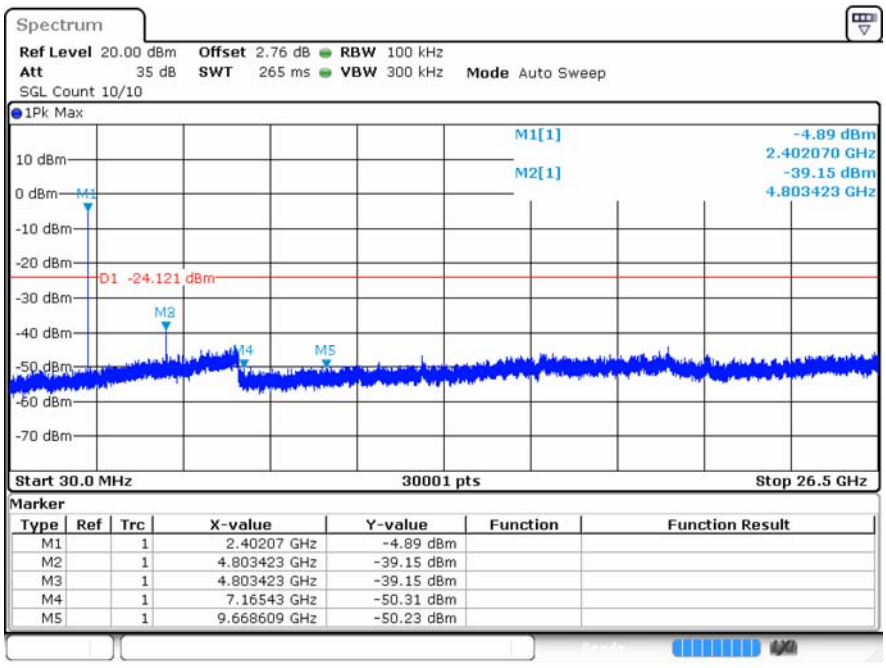
Pref	
Puw	

8DPSK_LCH_Graphs	
Pref	
Puw	

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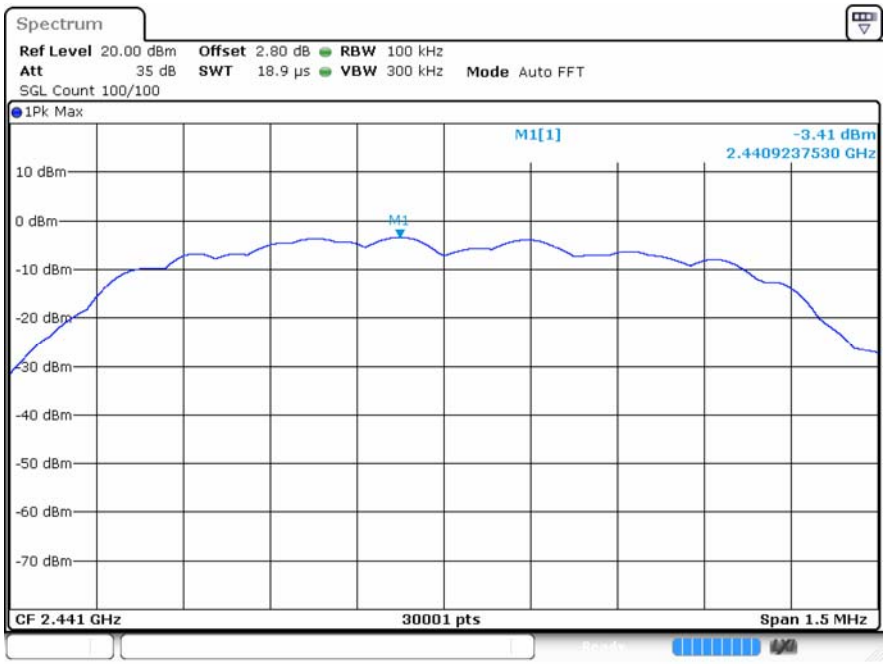
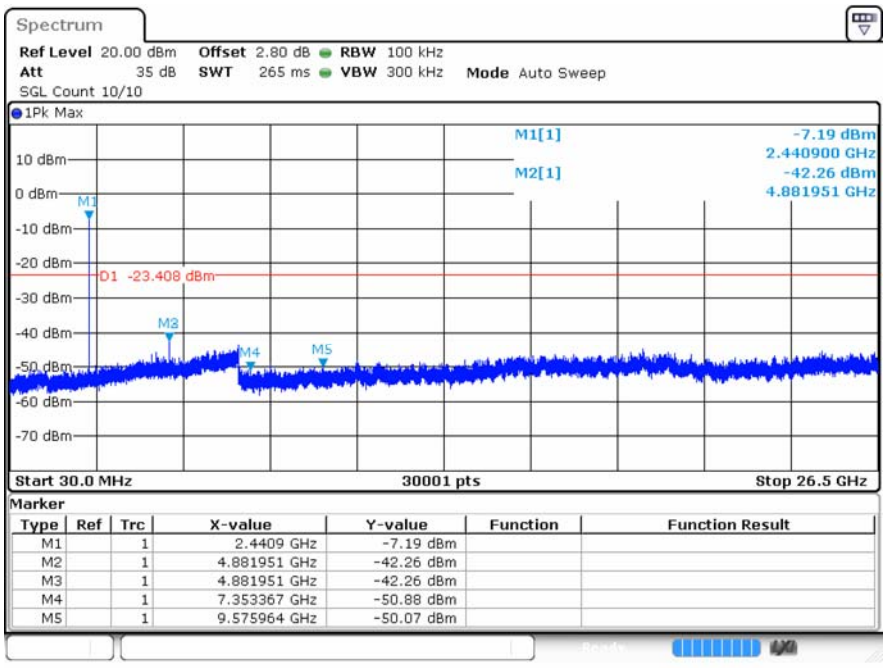
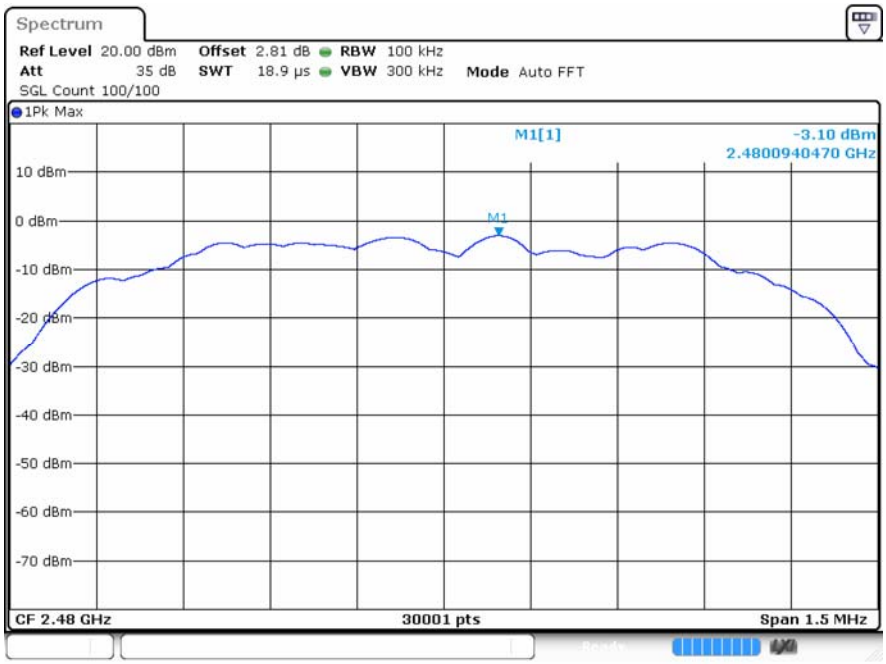
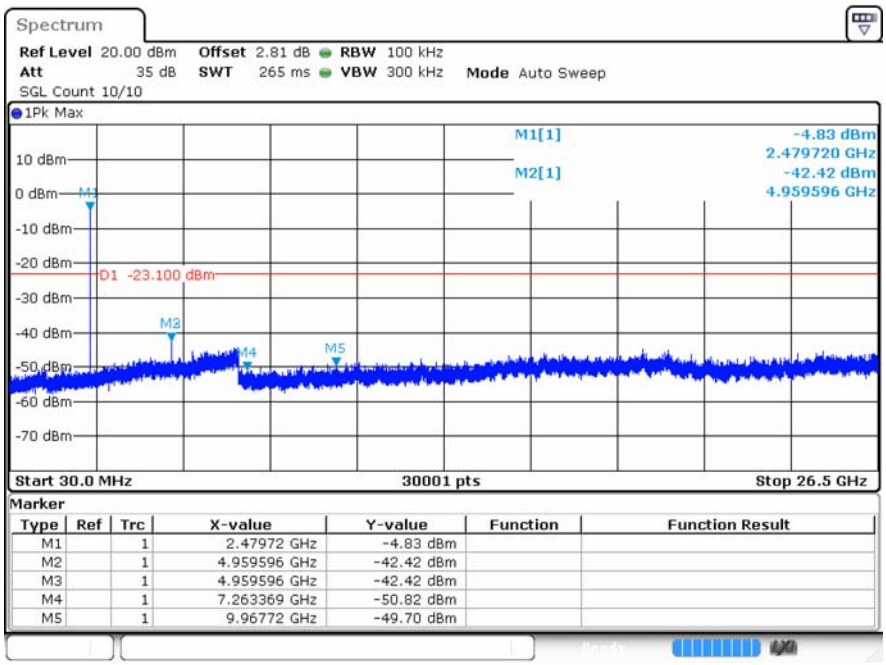
Pref	
Puw	 Marker Type | Ref | Trc | X-value | Y-value | Function | Function Result M1 | 1 | 2.4409 GHz | -7.19 dBm M2 | 1 | 4.881951 GHz | -42.26 dBm M3 | 1 | 4.881951 GHz | -42.26 dBm M4 | 1 | 7.353367 GHz | -50.88 dBm M5 | 1 | 9.575964 GHz | -50.07 dBm

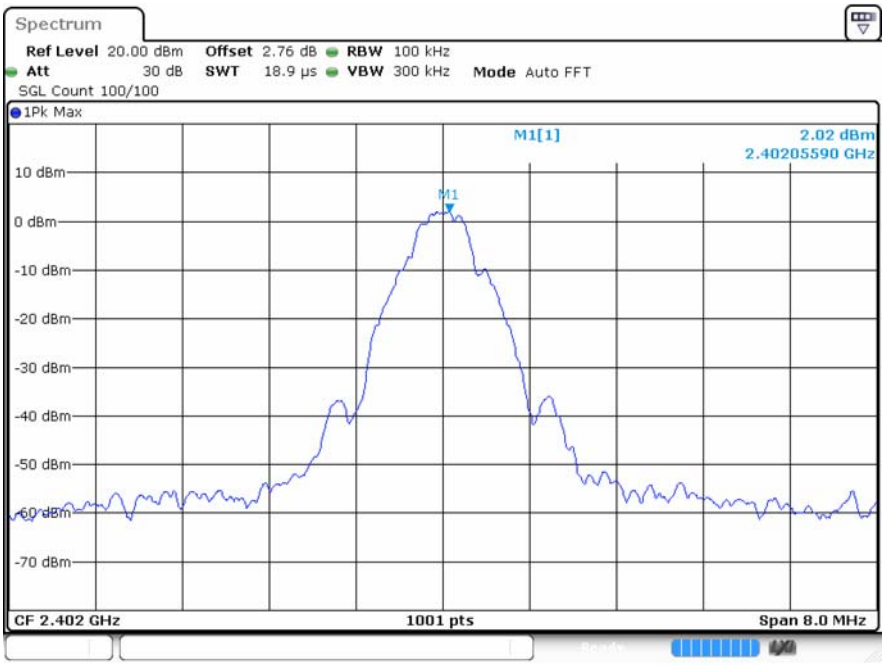
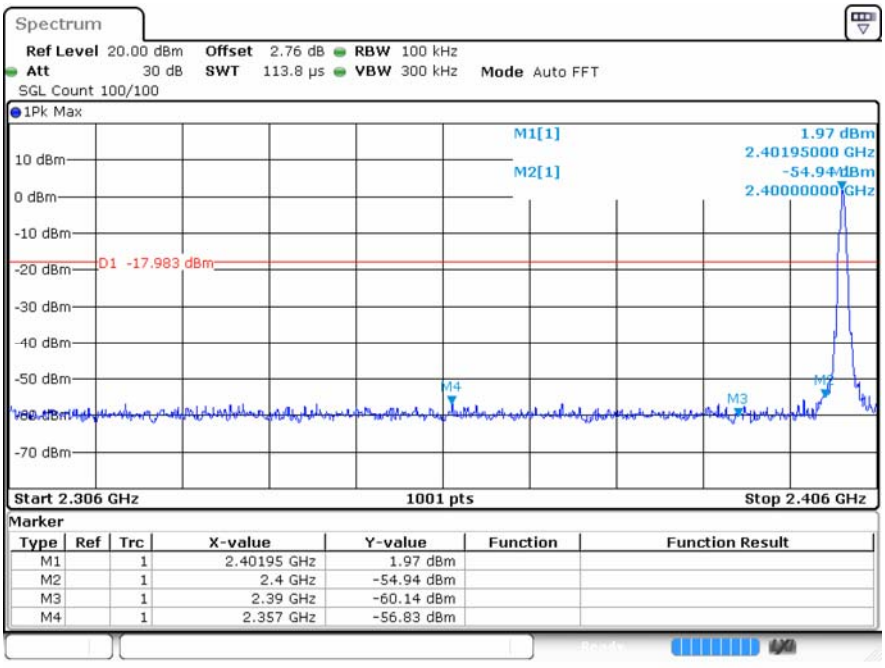
8DPSK_HCH_Graphs	
Pref	
Puw	 Marker Type | Ref | Trc | X-value | Y-value | Function | Function Result M1 | 1 | 2.47972 GHz | -4.83 dBm M2 | 1 | 4.959596 GHz | -42.42 dBm M3 | 1 | 4.959596 GHz | -42.42 dBm M4 | 1 | 7.263369 GHz | -50.82 dBm M5 | 1 | 9.96772 GHz | -49.70 dBm

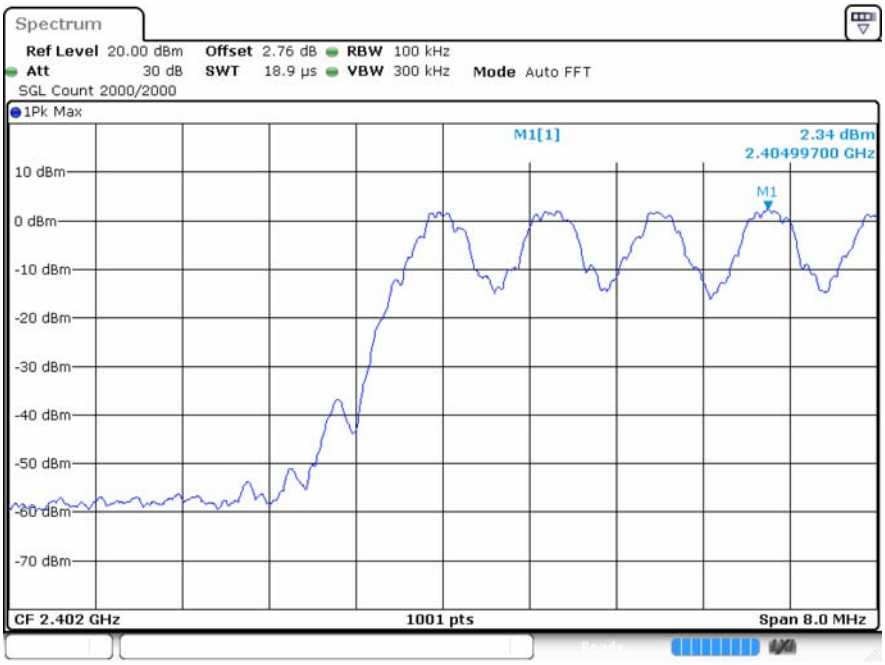
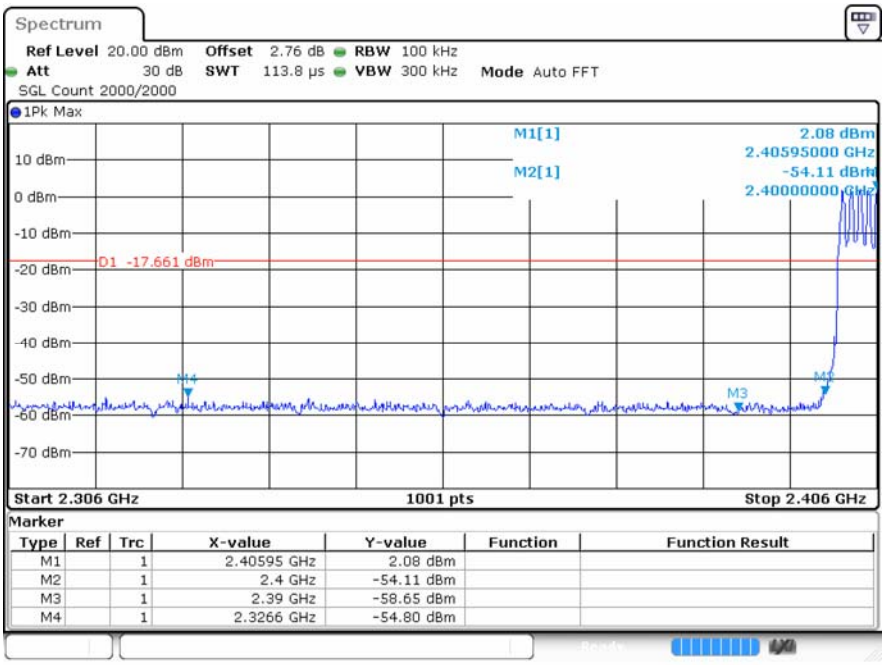
8 Band-edge for RF Conducted Emissions

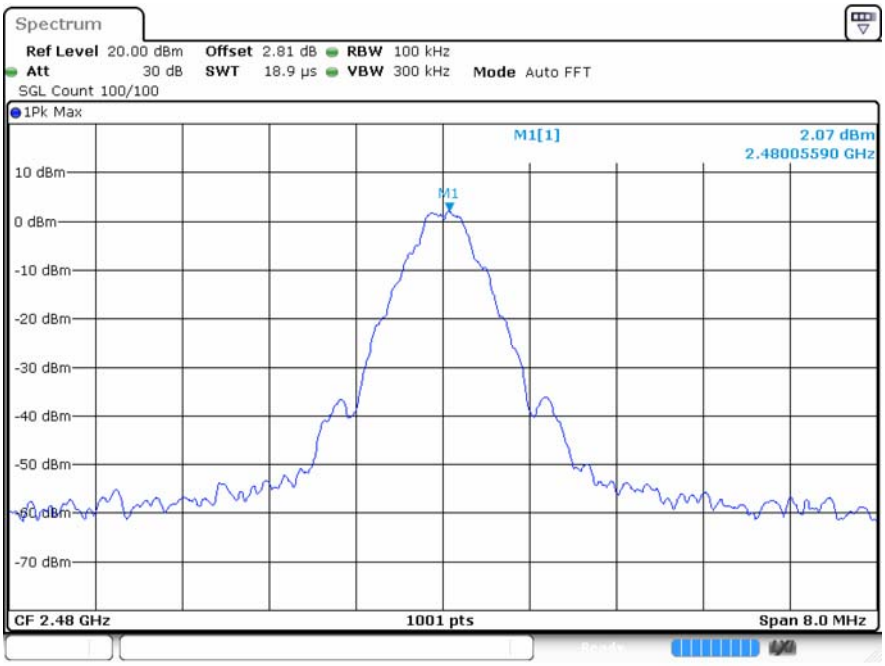
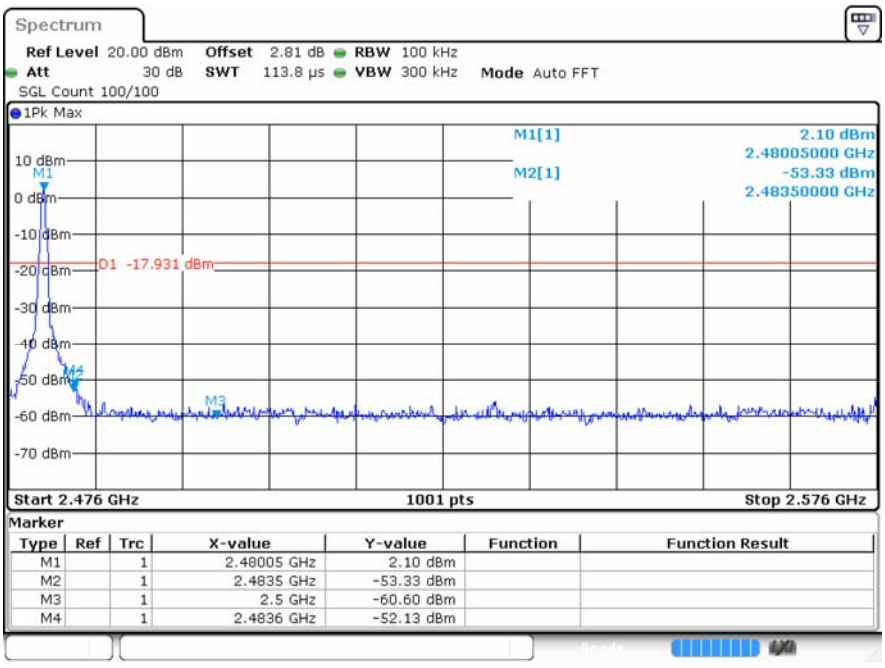
8.1 Test Result

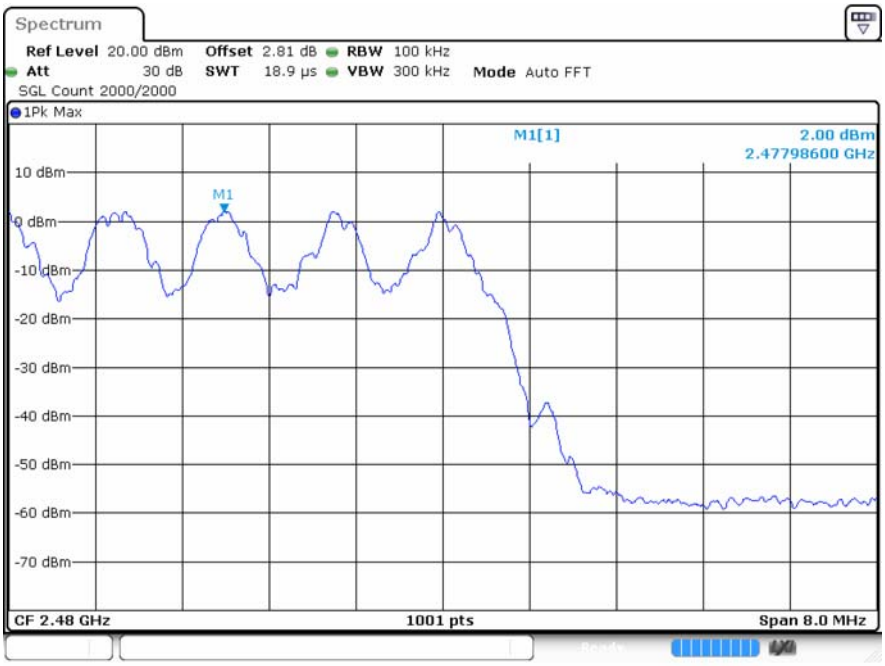
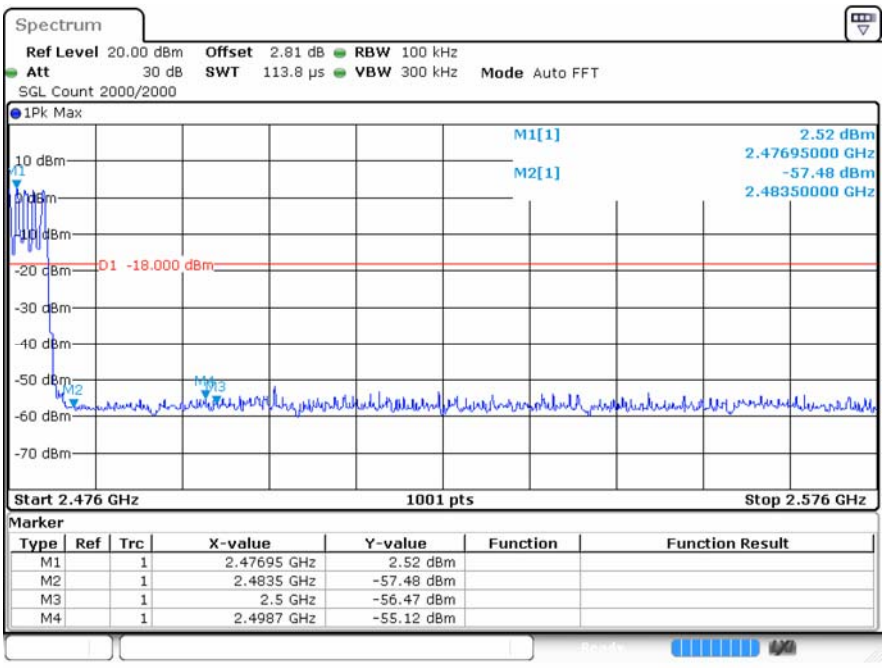
Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-58.84	-20	Pass
			On	-57.13	-20	Pass
	HCH	2480	Off	-54.2	-20	Pass
			On	-57.11	-20	Pass
π/4DQPSK	LCH	2402	Off	-52.28	-20	Pass
			On	-49.88	-20	Pass
	HCH	2480	Off	-52.38	-20	Pass
			On	-50.98	-20	Pass
8DPSK	LCH	2402	Off	-52.93	-20	Pass
			On	-51.87	-20	Pass
	HCH	2480	Off	-53.87	-20	Pass
			On	-52.36	-20	Pass

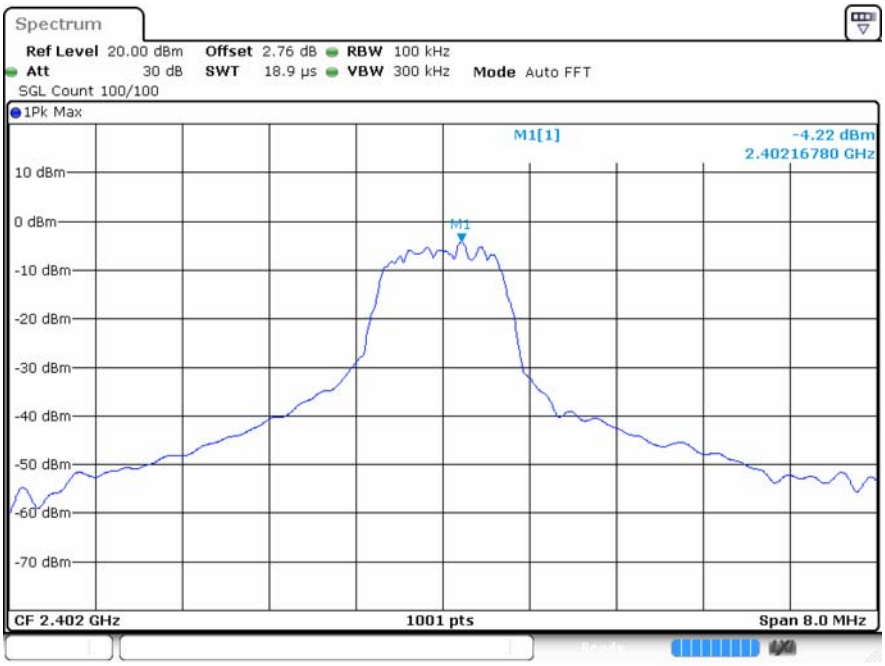
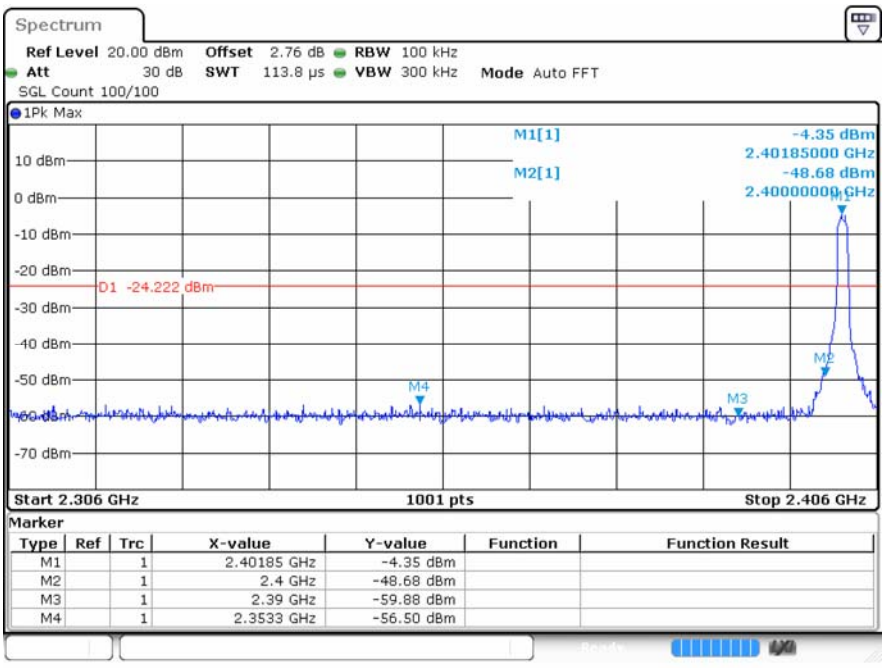
8.2 Test Graphs

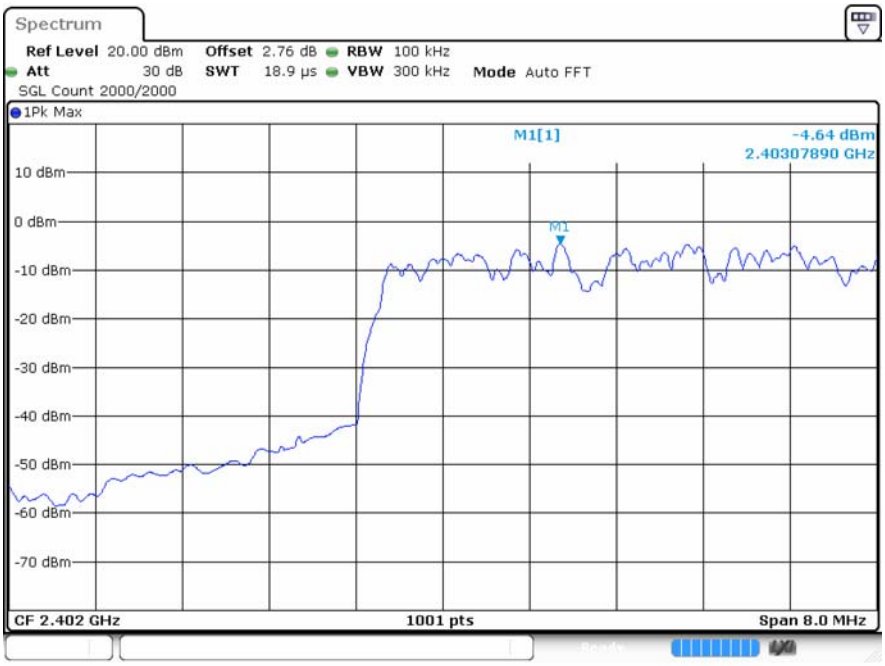
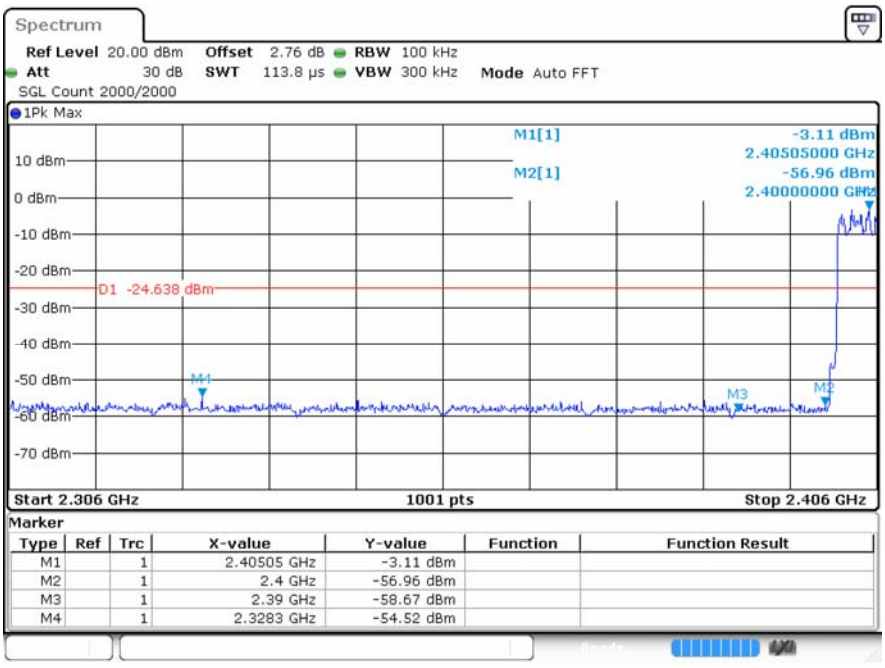
Test Graphs	
Pref	
GFSK/LCH/No Hop	

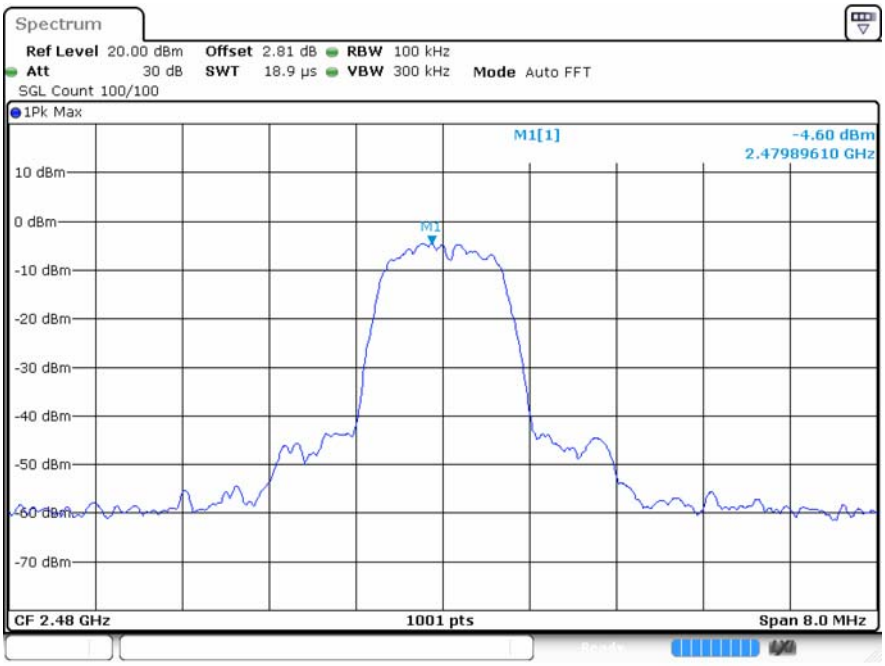
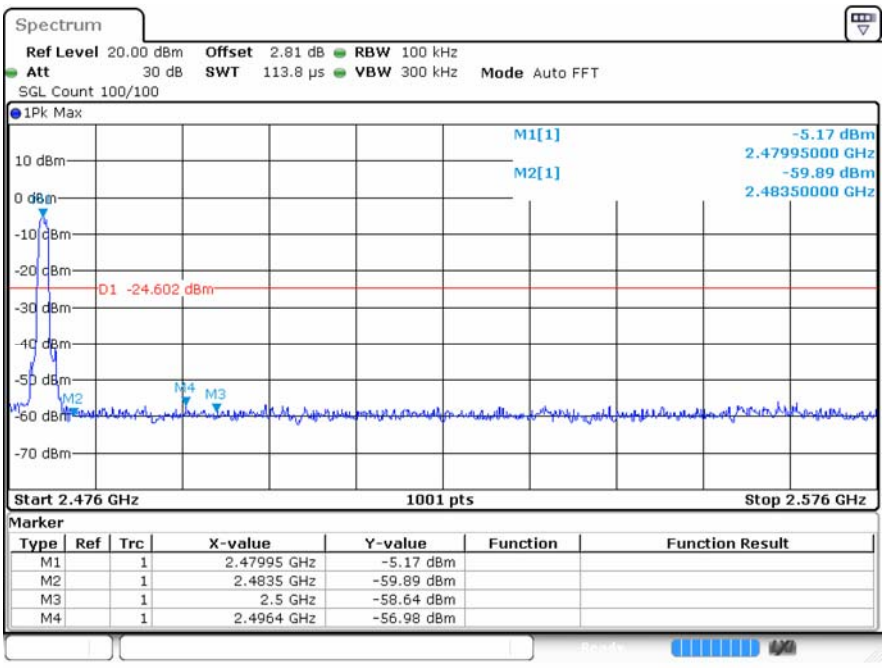
Ref	
GFSK/LCH/Hop	

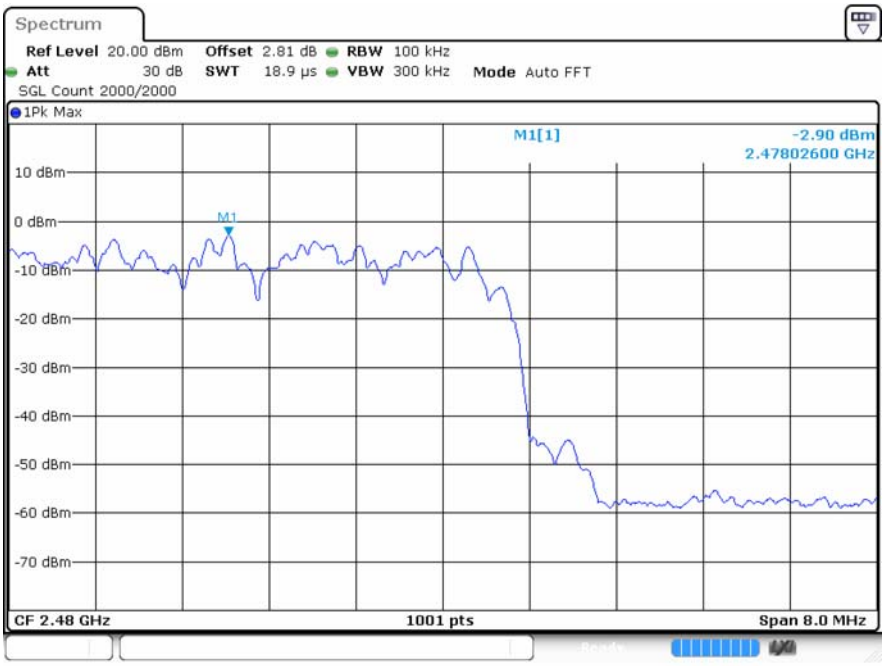
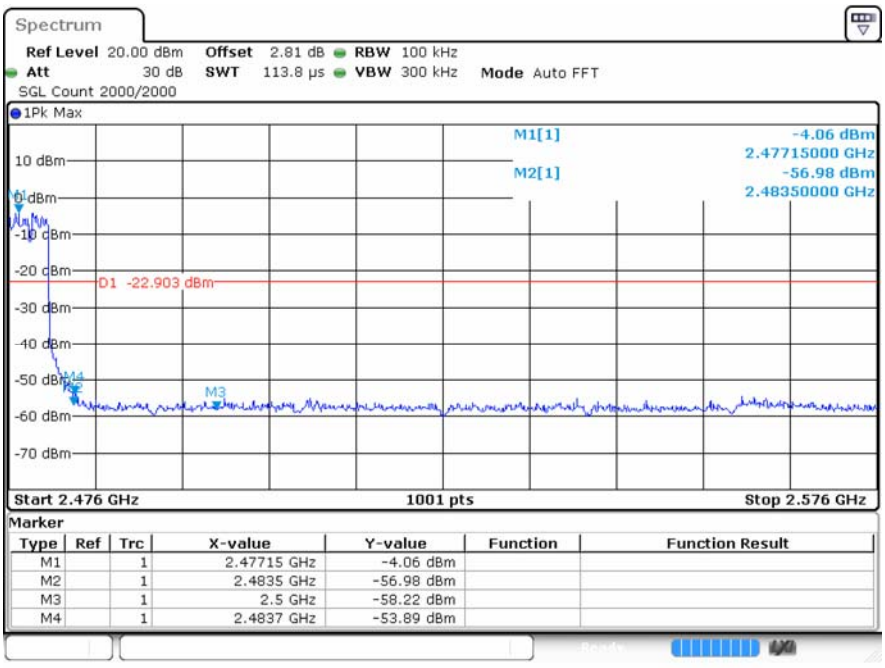
Ref	
GFSK/HCH/No Hop	

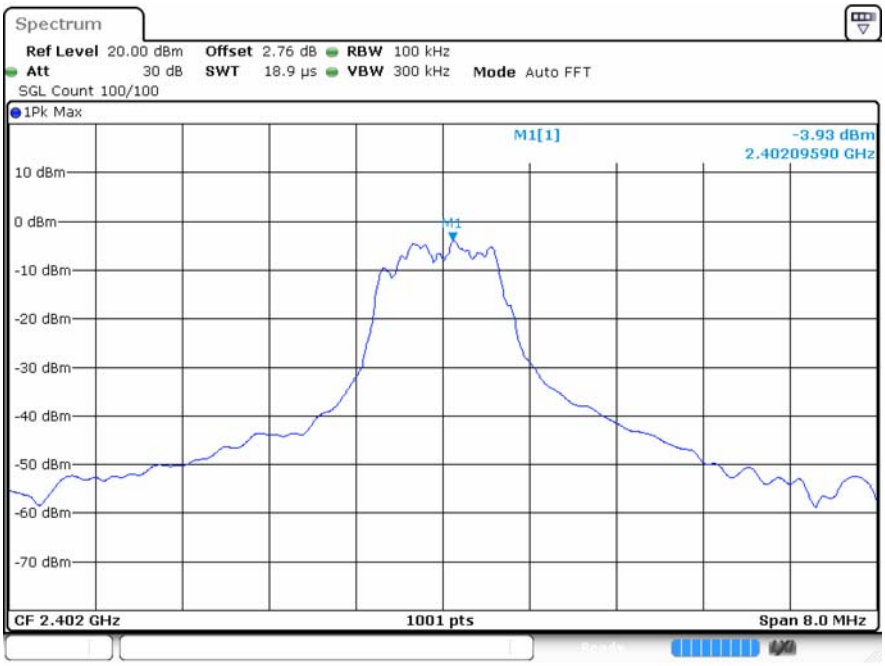
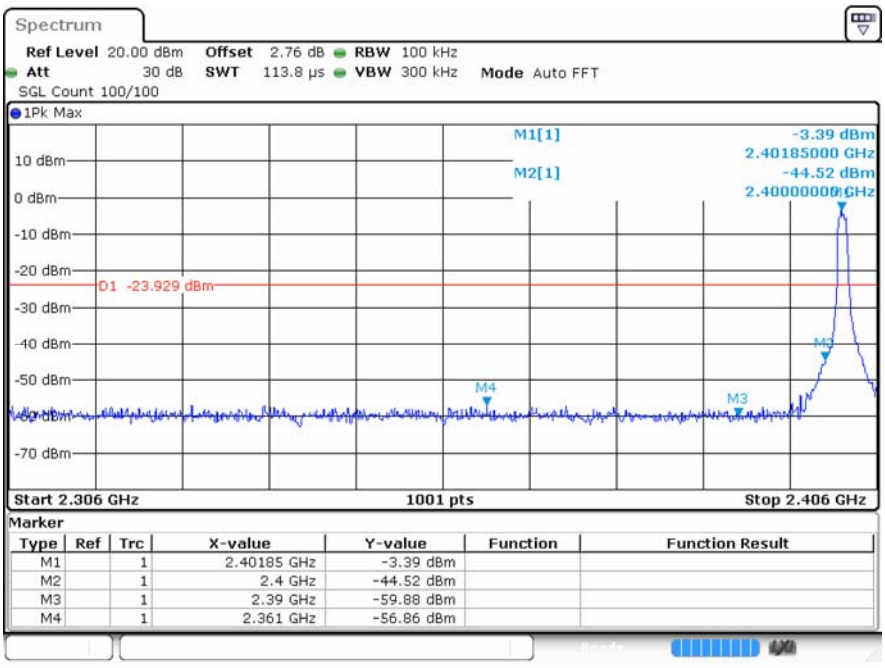
Ref.	
GFSK/HCH/Hop	

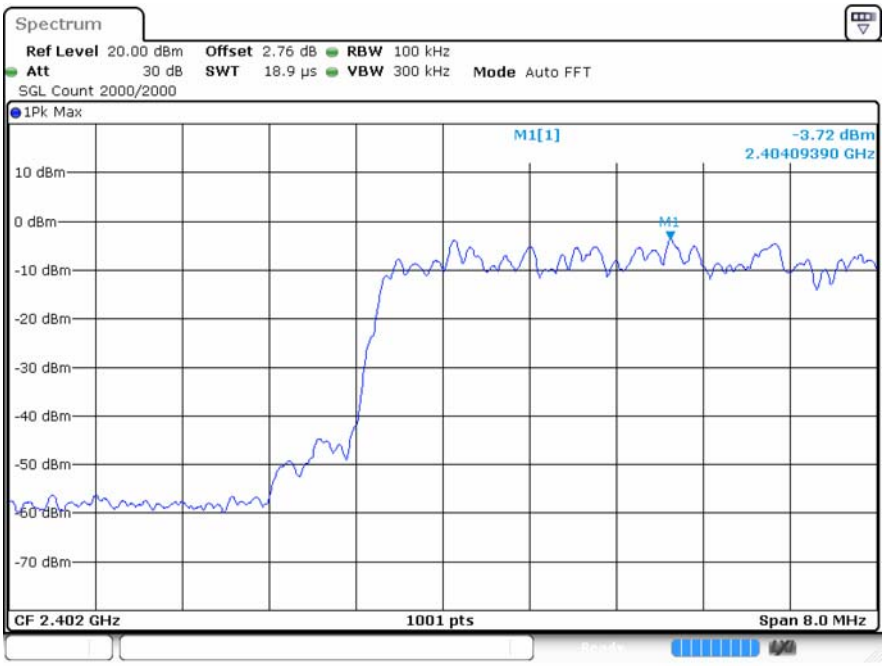
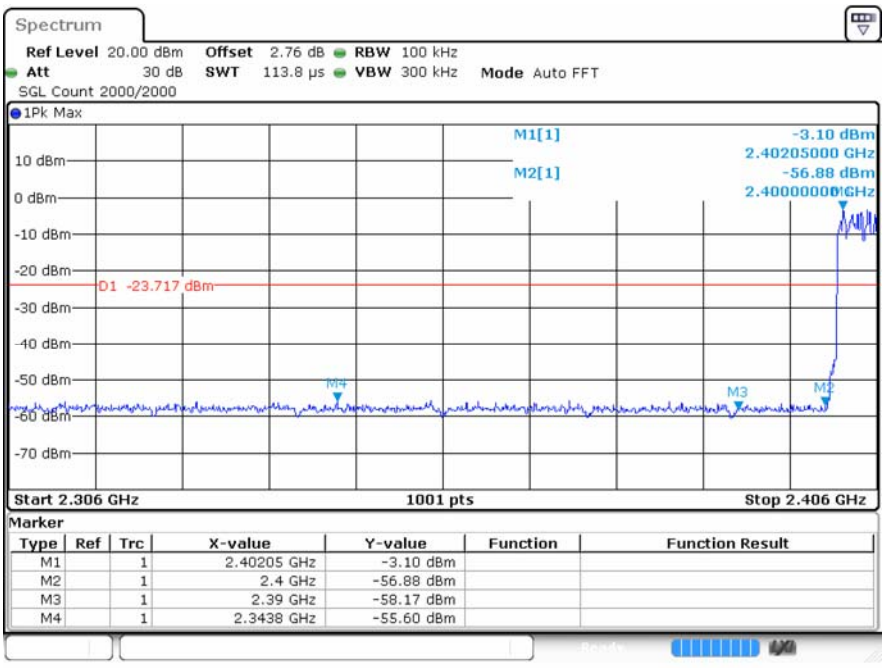
Ref	
π/4DQPSK/LCH/No Hop	

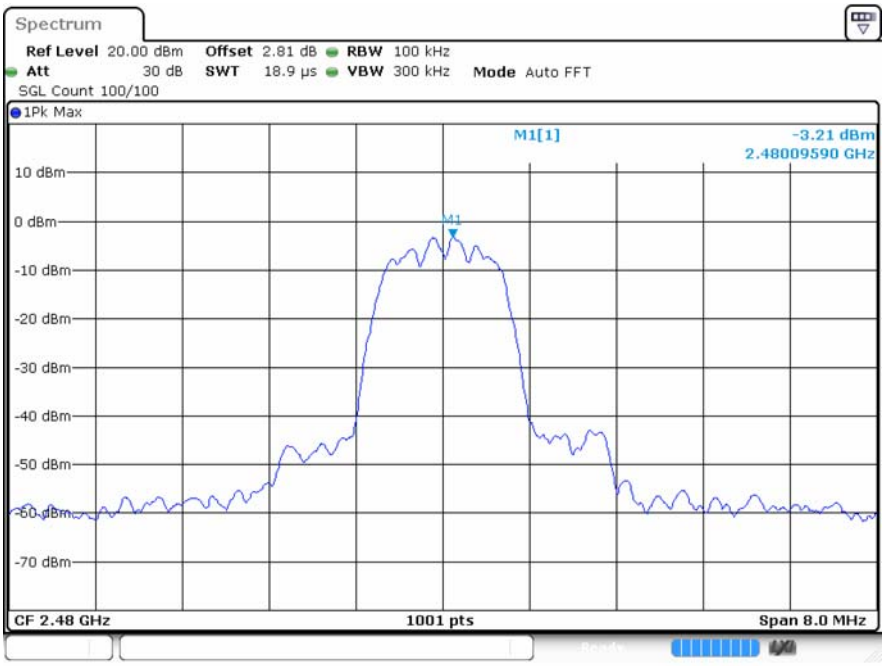
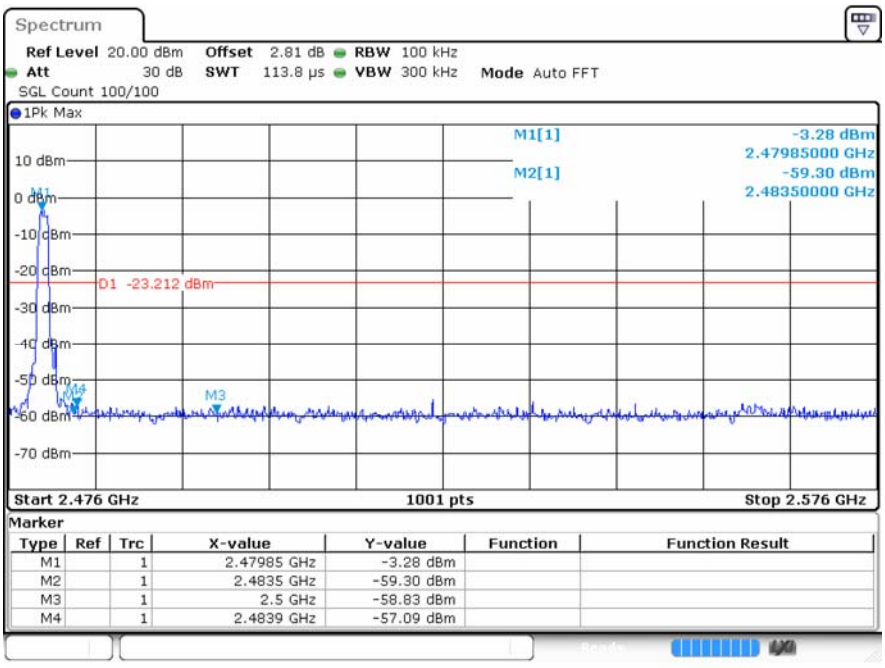
Ref	
π/4DQPSK/LCH/Hop	 Marker Type | Ref | Trc | X-value | Y-value | Function | Function Result M1 | | 1 | 2.40505 GHz | -3.11 dBm M2 | | 1 | 2.4 GHz | -56.96 dBm M3 | | 1 | 2.39 GHz | -58.67 dBm M4 | | 1 | 2.3283 GHz | -54.52 dBm

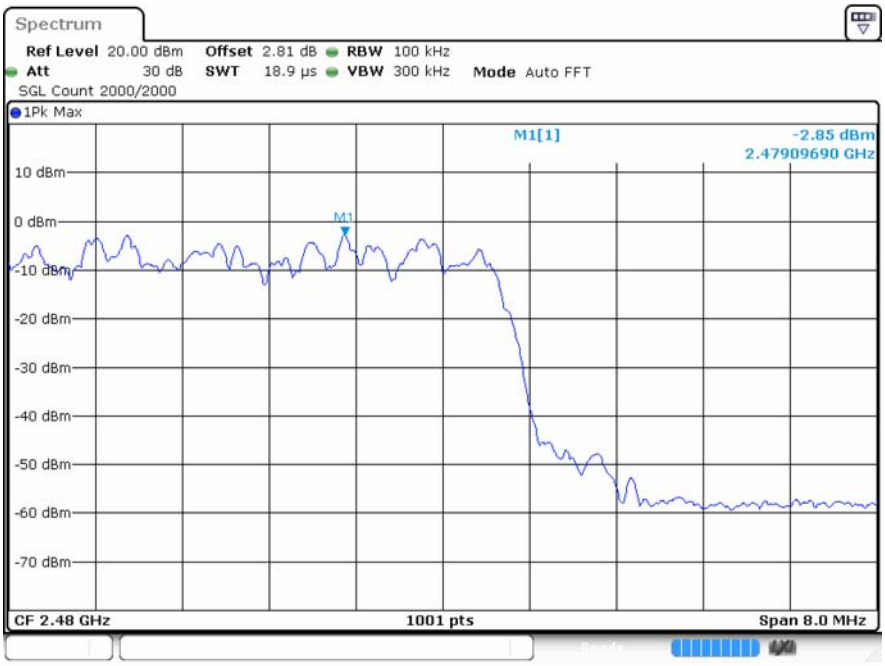
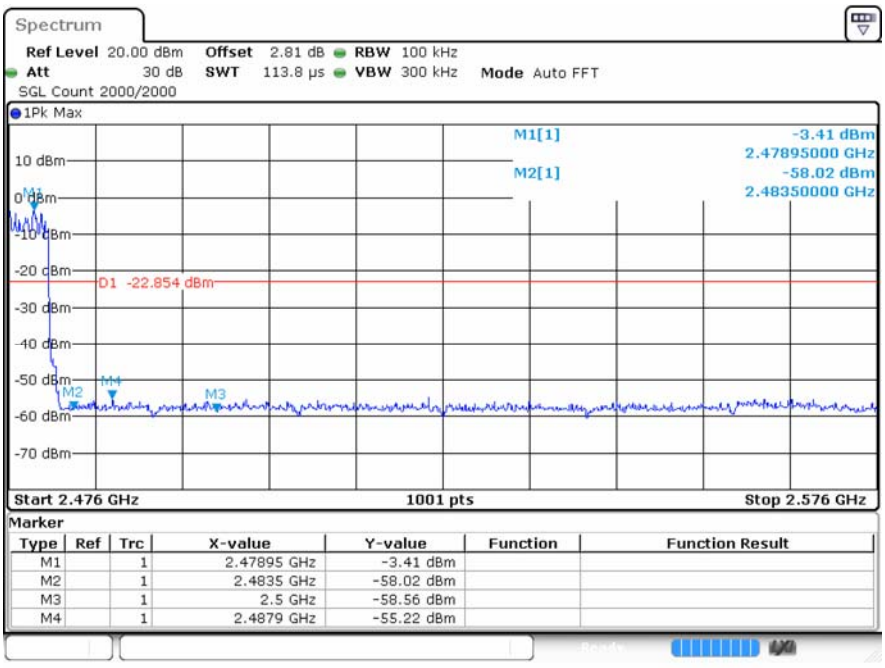
Ref	
π/4DQPSK/HCH/No Hop	

Ref	
π/4DQPSK/HCH/Hop	

Ref	
8DPSK/LCH/No Hop	

Ref	
8DPSK/LCH/Hop	

Ref	
8DPSK/HCH/No Hop	

Ref	
8DPSK/HCH/Hop	

9 Restrict-band band-edge measurements

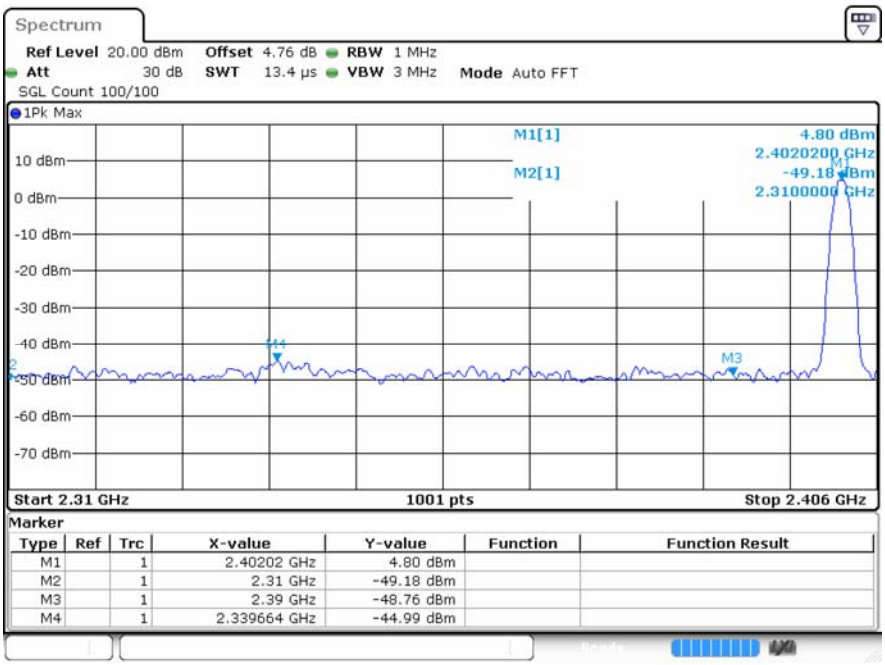
9.1 Test Result

Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-49.18	2	48.08	PEAK	74	Pass
	Off	2310.0	-56.89	2	40.37	AV	54	Pass
	Off	2339.664	-44.98	2	52.28	PEAK	74	Pass
	Off	2338.224	-54.05	2	43.21	AV	54	Pass
	Off	2390.0	-48.76	2	48.5	PEAK	74	Pass
	Off	2390.0	-56.71	2	40.55	AV	54	Pass
	Off	2483.5	-26.1	2	71.16	PEAK	74	Pass
	Off	2483.5	-54.67	2	42.59	AV	54	Pass
	Off	2483.512	-26.1	2	71.16	PEAK	74	Pass
	Off	2483.512	-54.67	2	42.59	AV	54	Pass
	Off	2500.0	-48.43	2	48.83	PEAK	74	Pass
	Off	2500.0	-56.46	2	40.8	AV	54	Pass
π/4DQPSK	Off	2310.0	-47.83	2	49.43	PEAK	74	Pass
	Off	2310.0	-56.45	2	40.81	AV	54	Pass
	Off	2340.816	-45.29	2	51.97	PEAK	74	Pass
	Off	2338.128	-54.48	2	42.78	AV	54	Pass
	Off	2390.0	-48.33	2	48.93	PEAK	74	Pass
	Off	2390.0	-56.92	2	40.34	AV	54	Pass
	Off	2483.5	-48.31	2	48.95	PEAK	74	Pass
	Off	2483.5	-55.44	2	41.82	AV	54	Pass
	Off	2484.136	-45.91	2	51.35	PEAK	74	Pass
	Off	2483.536	-55.43	2	41.83	AV	54	Pass
	Off	2500.0	-48.19	2	49.07	PEAK	74	Pass
	Off	2500.0	-56.1	2	41.16	AV	54	Pass
8DPSK	Off	2310.0	-48.93	2	48.33	PEAK	74	Pass
	Off	2310.0	-56.39	2	40.87	AV	54	Pass
	Off	2344.176	-44.77	2	52.49	PEAK	74	Pass
	Off	2338.32	-54.64	2	42.62	AV	54	Pass

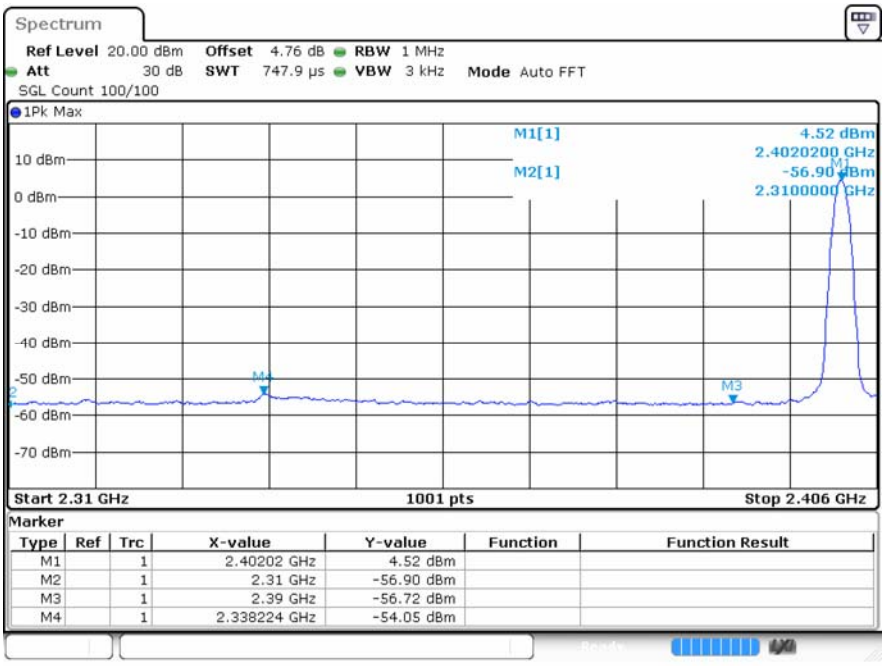
	Off	2390.0	-45.19	2	52.07	PEAK	74	Pass
	Off	2390.0	-56.59	2	40.67	AV	54	Pass
	Off	2483.5	-46.72	2	50.54	PEAK	74	Pass
	Off	2483.5	-55.09	2	42.17	AV	54	Pass
	Off	2498.296	-45.79	2	51.47	PEAK	74	Pass
	Off	2483.56	-55.05	2	42.21	AV	54	Pass
	Off	2500.0	-47.22	2	50.04	PEAK	74	Pass
	Off	2500.0	-56.19	2	41.07	AV	54	Pass

9.2 Test Graphs

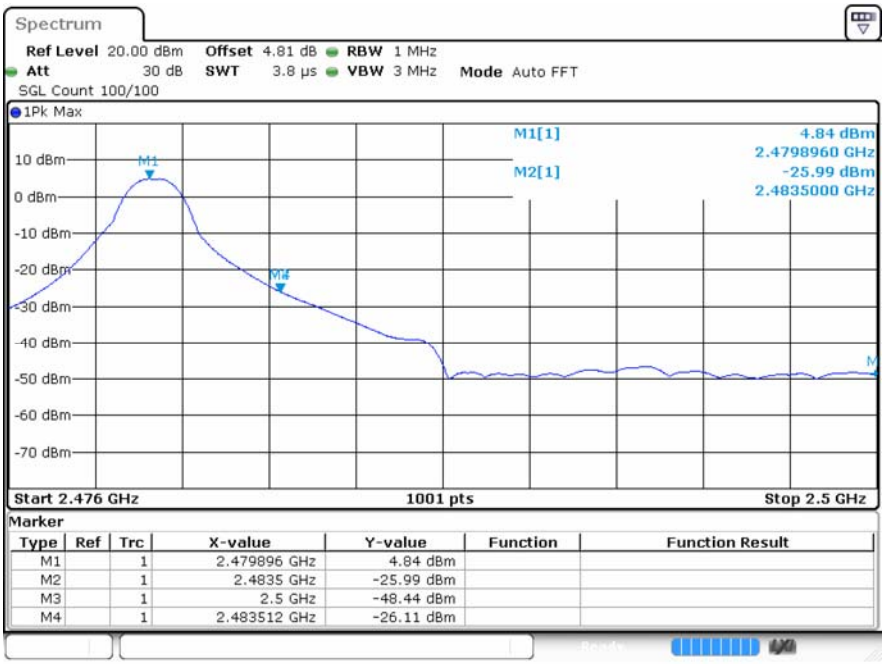
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



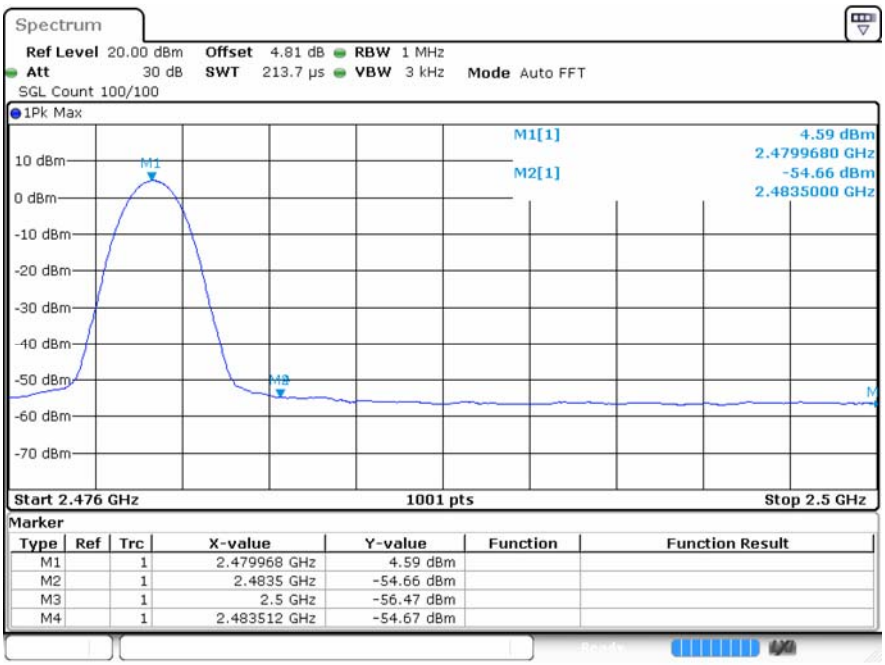
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



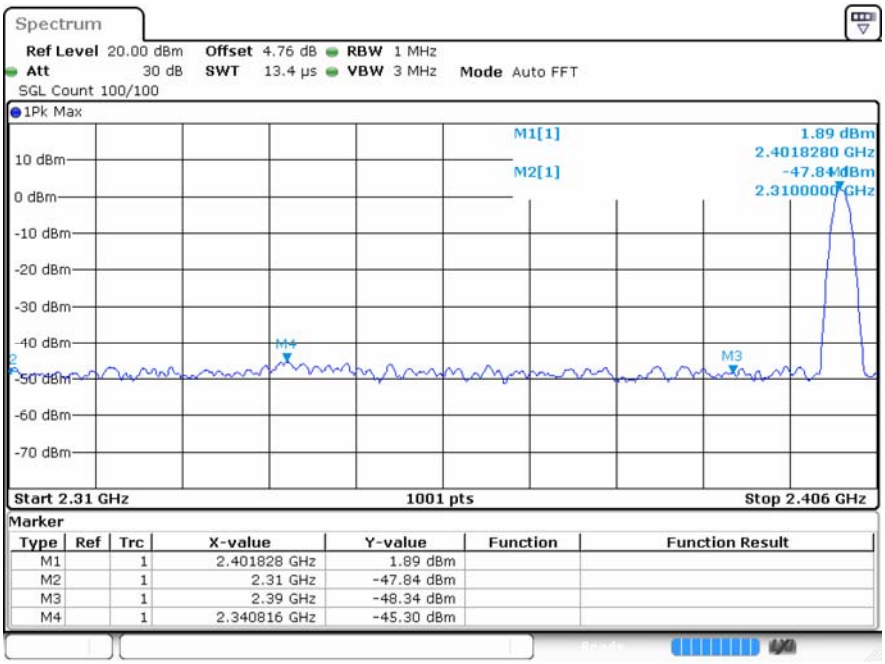
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



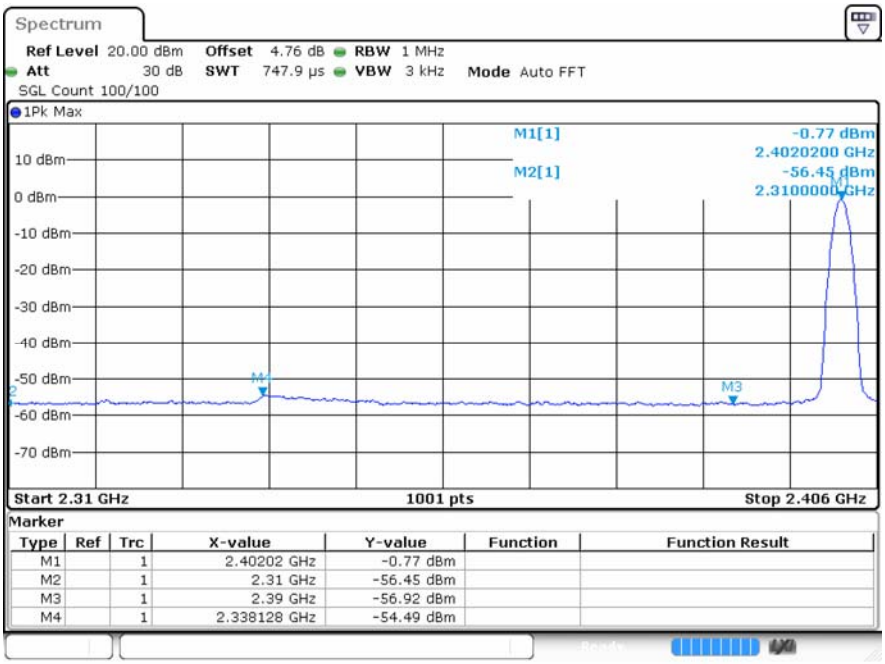
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



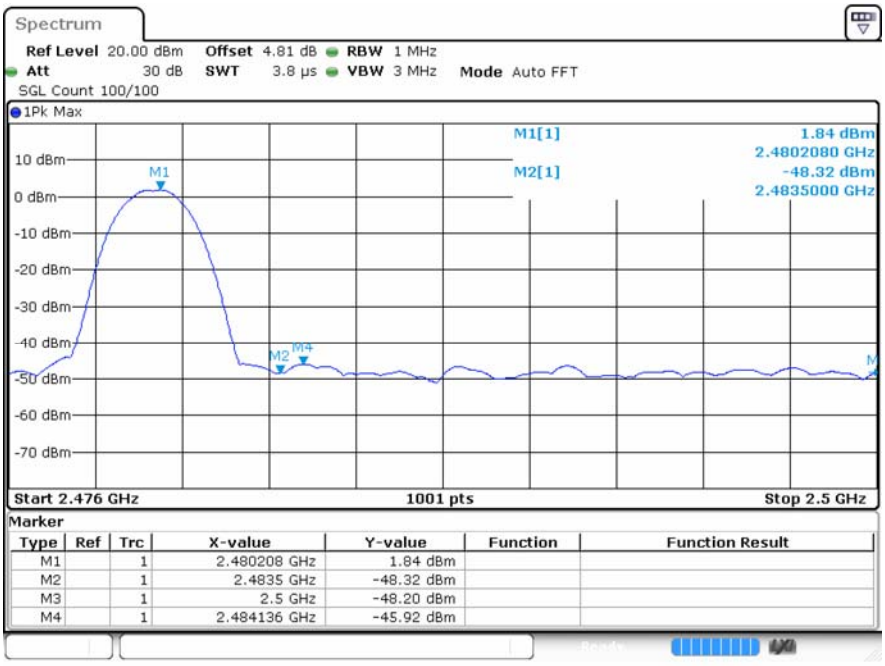
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



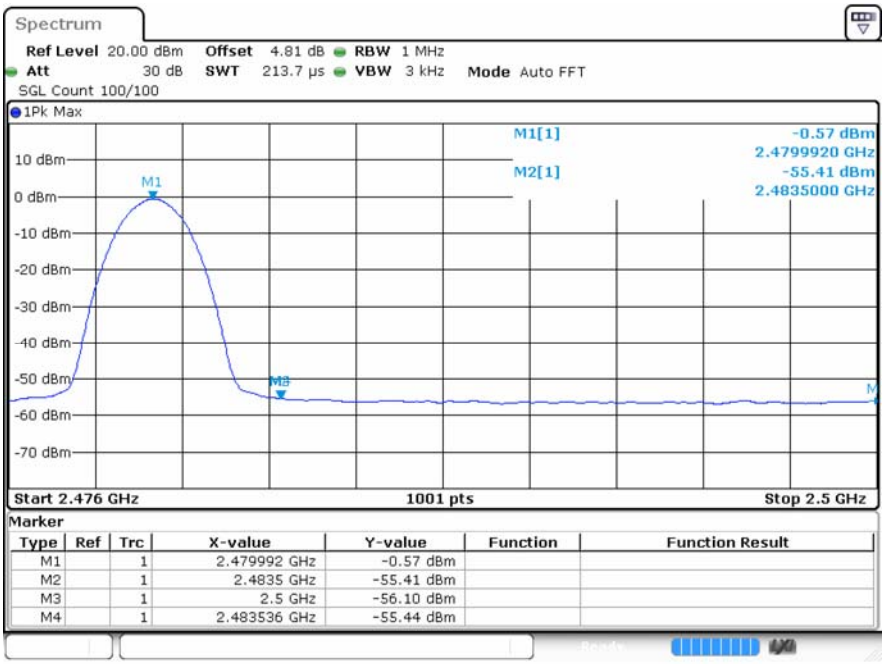
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



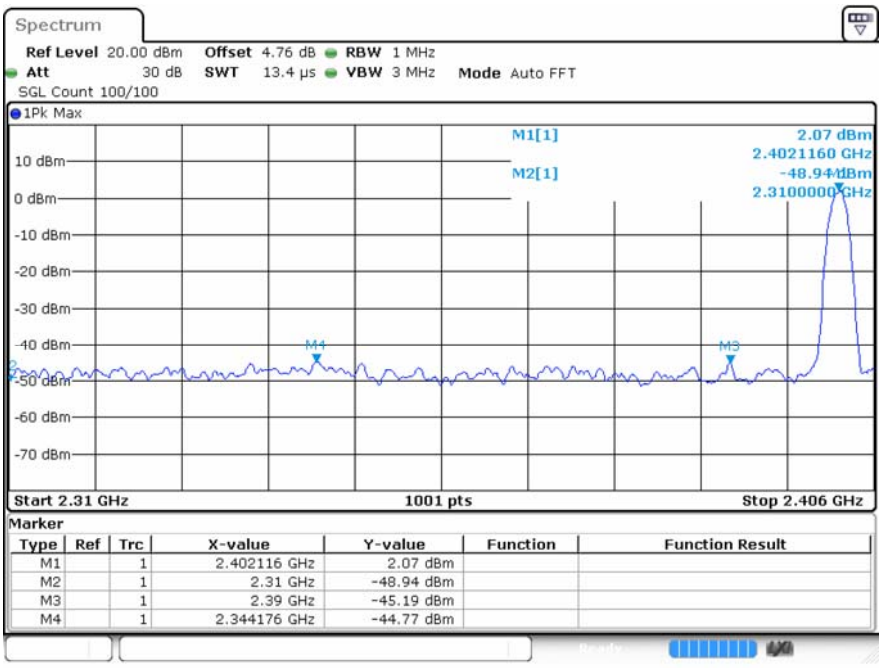
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



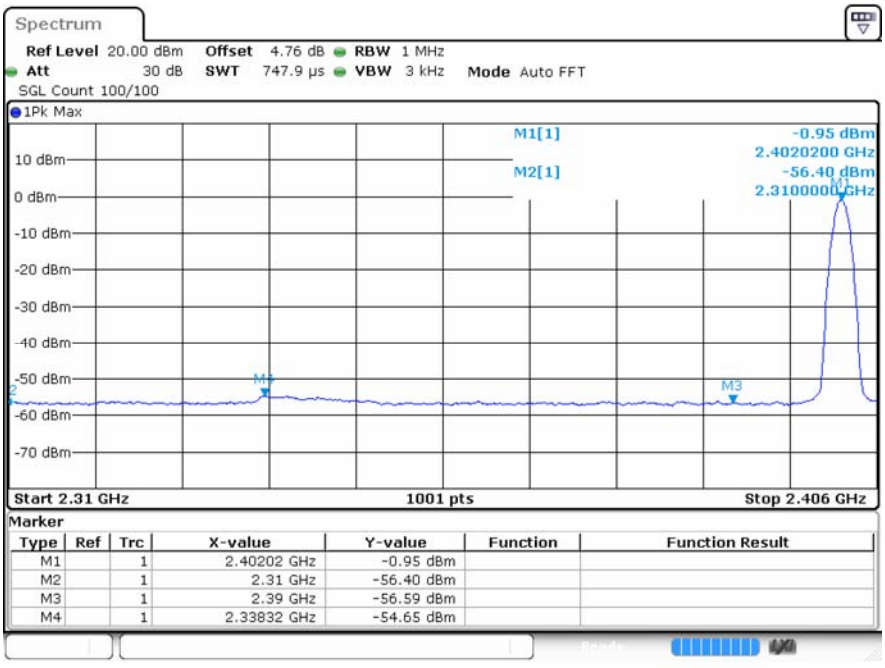
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



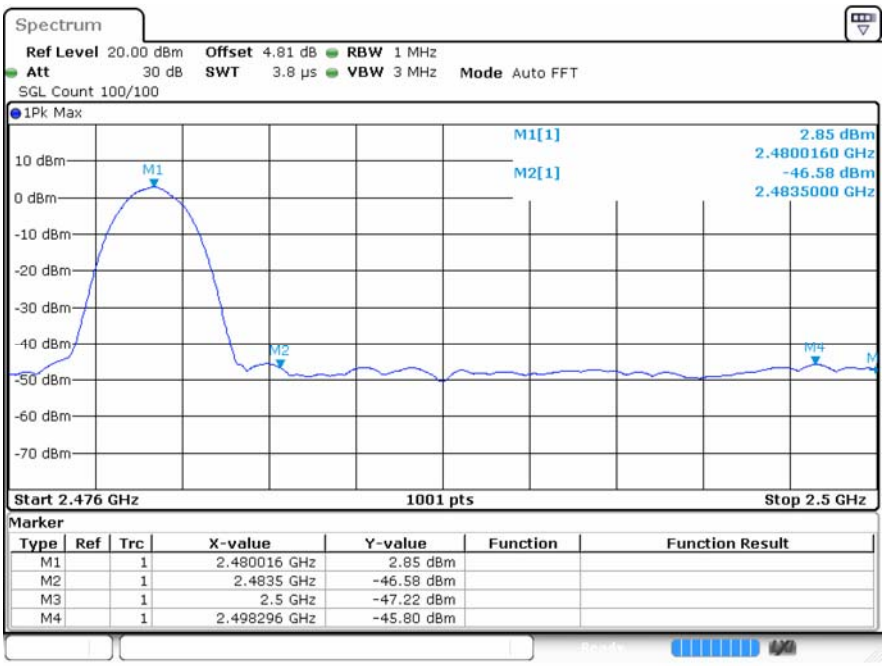
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



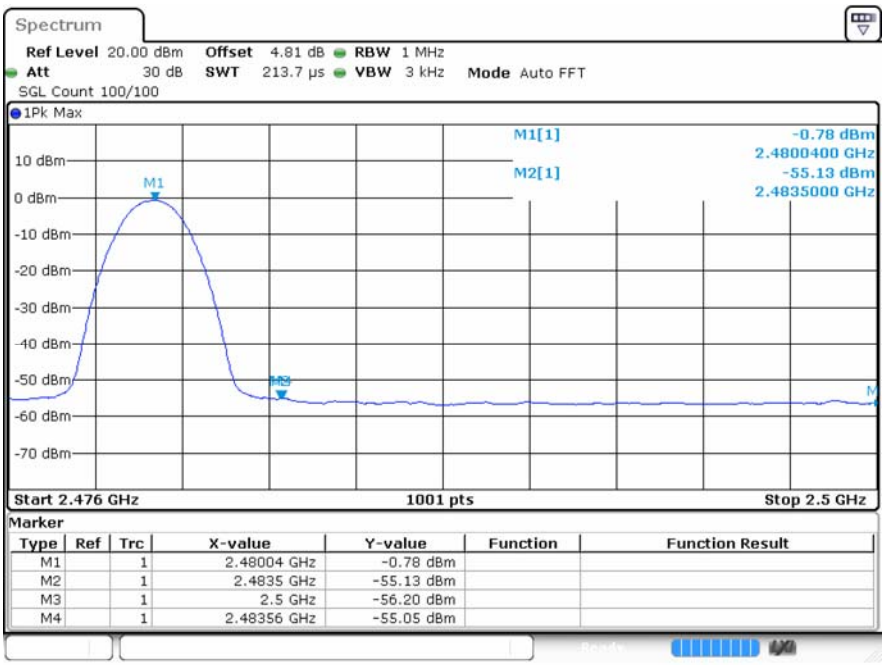
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)



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