



Appendix A

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

Product Name: Car multimedia navigation

Trade Mark: musictrip

Test Model: TKL-ZJ

Environmental Conditions

Temperature:	25.2℃
Relative Humidity:	52.4%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



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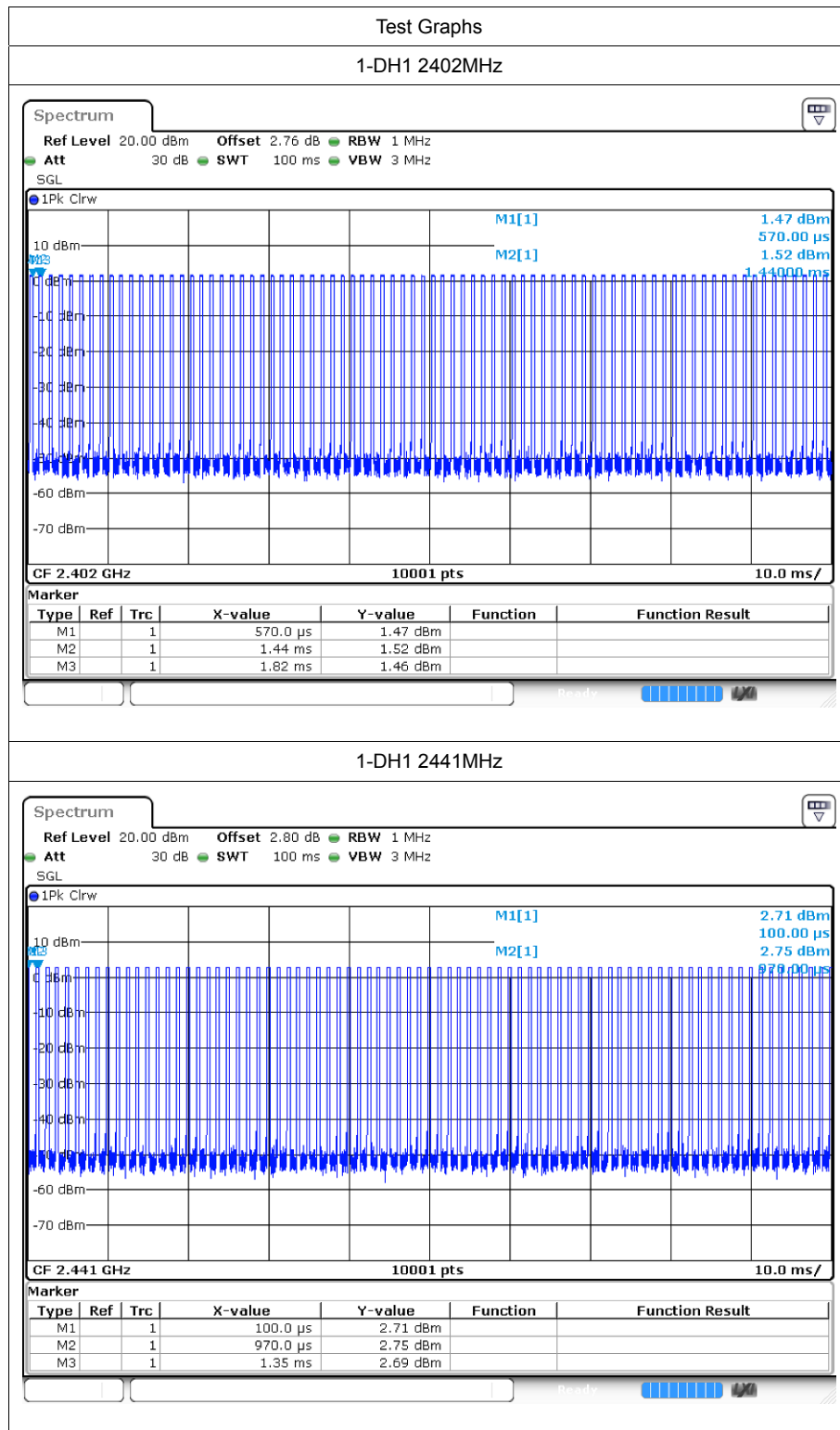
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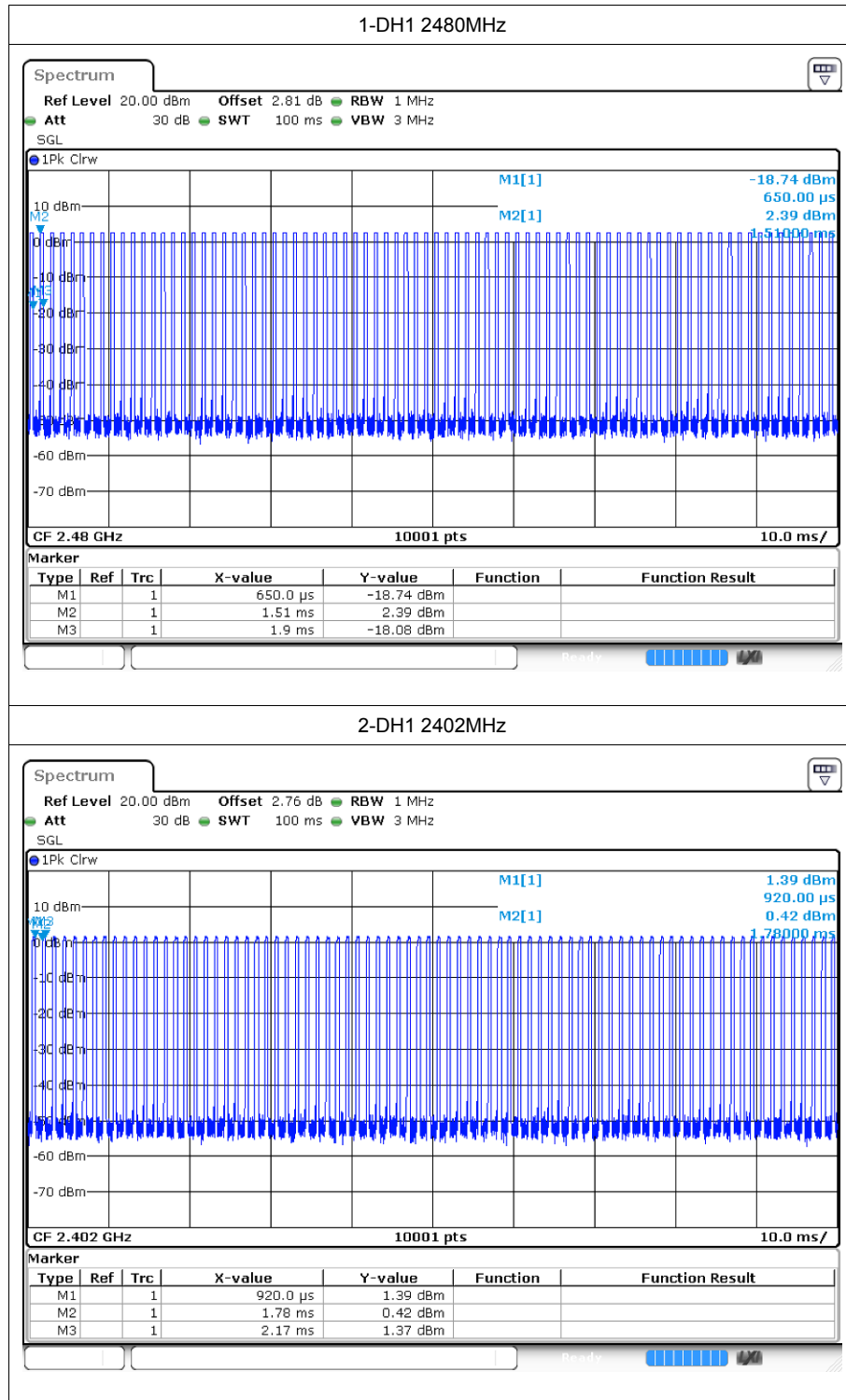
1 Duty Cycle

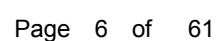
1.1 Test Result

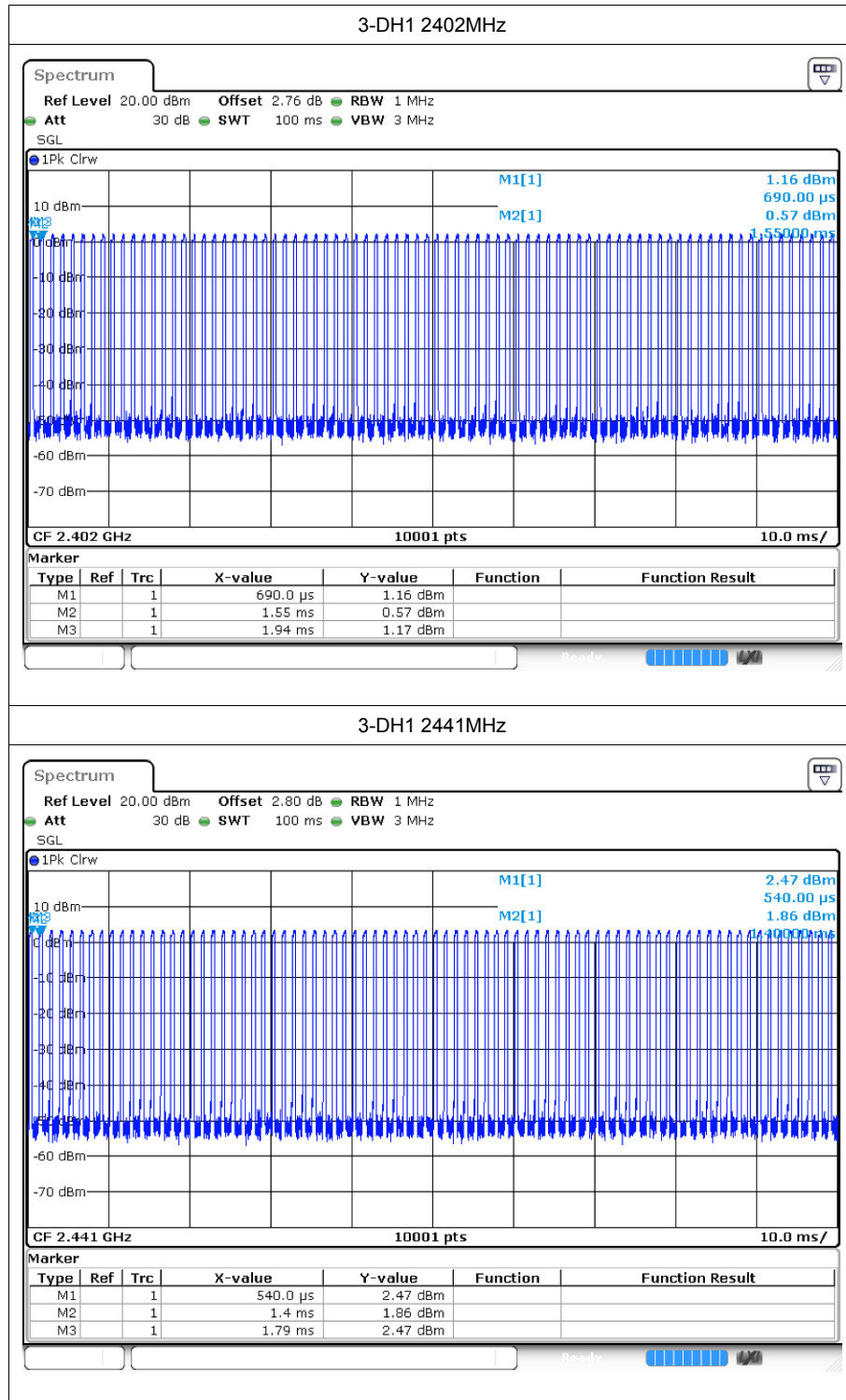
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.2	2.63
1-DH1	2441	31.25	2.63
1-DH1	2480	32	2.56
2-DH1	2402	32	2.56
2-DH1	2441	32.01	2.56
2-DH1	2480	32	2.56
3-DH1	2402	32	2.56
3-DH1	2441	32	2.56
3-DH1	2480	32	2.56

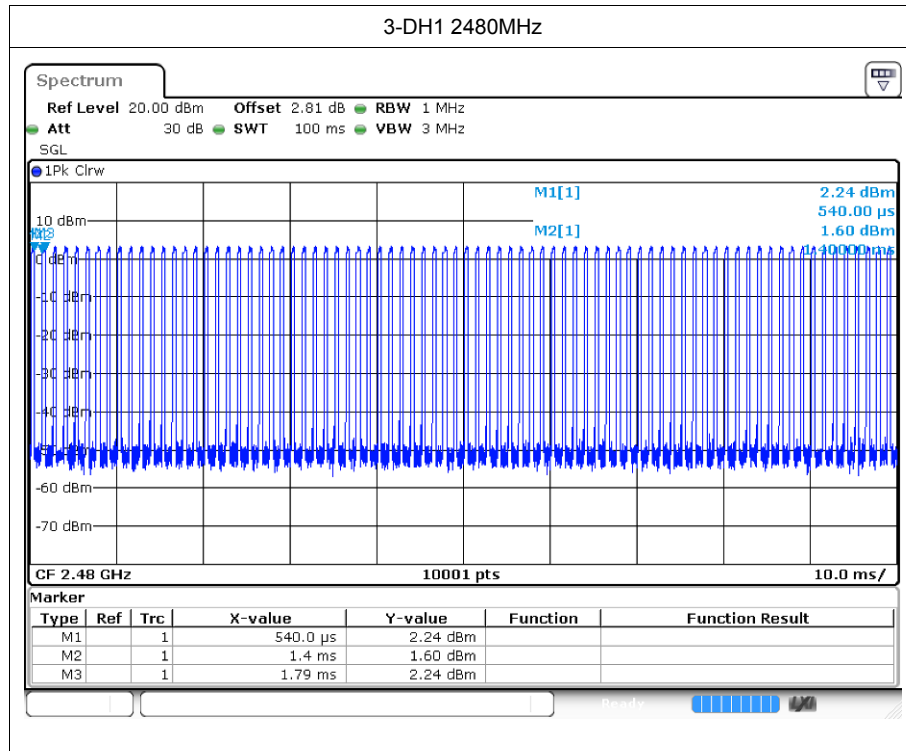
1.2 Test Graphs









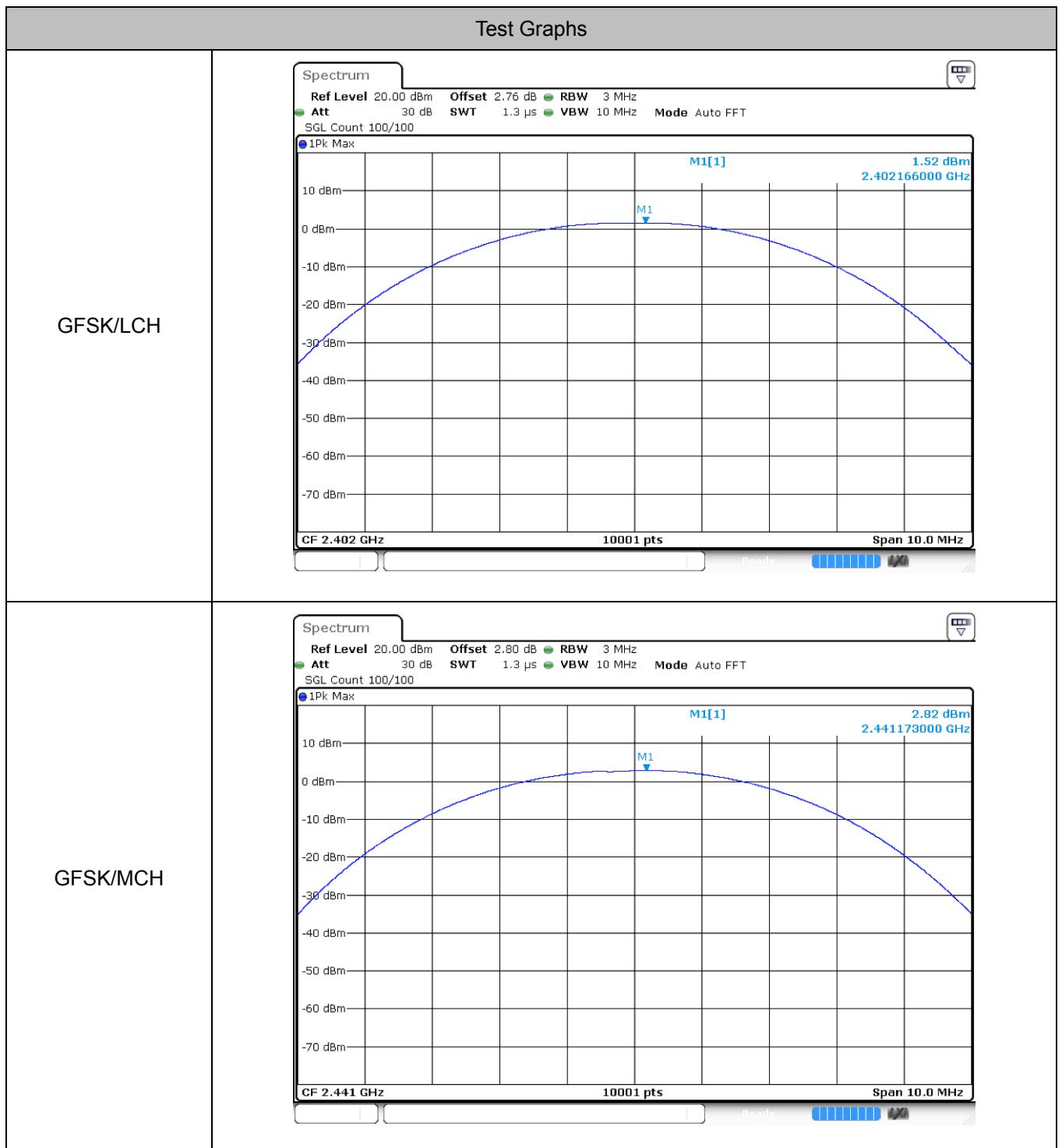


2 Maximum Conducted Peak Output Power

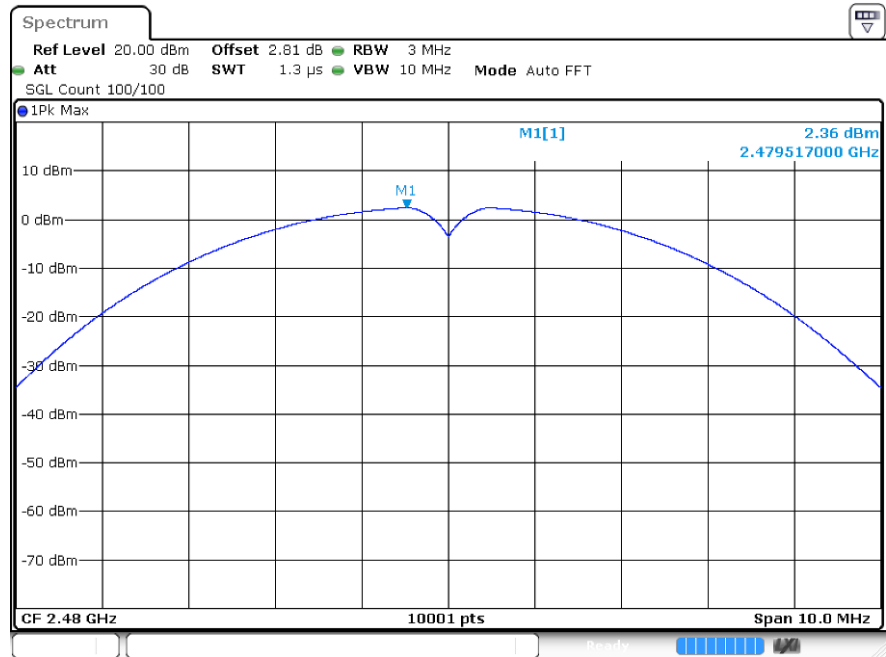
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.52	21	Pass
	MCH	2.82	21	Pass
	HCH	2.36	21	Pass
$\pi/4$ DQPSK	LCH	2.65	21	Pass
	MCH	3.62	21	Pass
	HCH	3.49	21	Pass
8DPSK	LCH	3.04	21	Pass
	MCH	3.95	21	Pass
	HCH	3.84	21	Pass

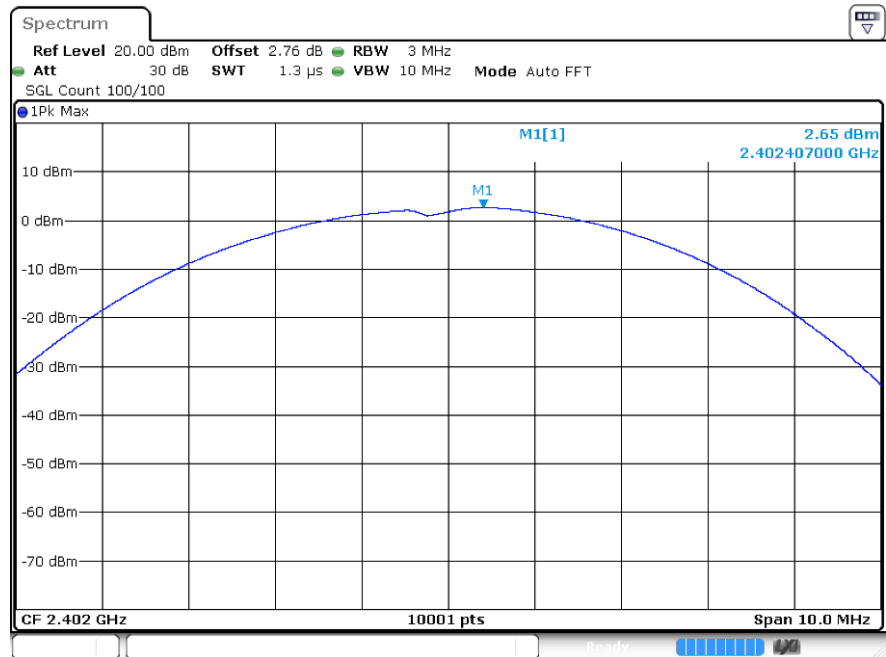
2.2 Test Graphs



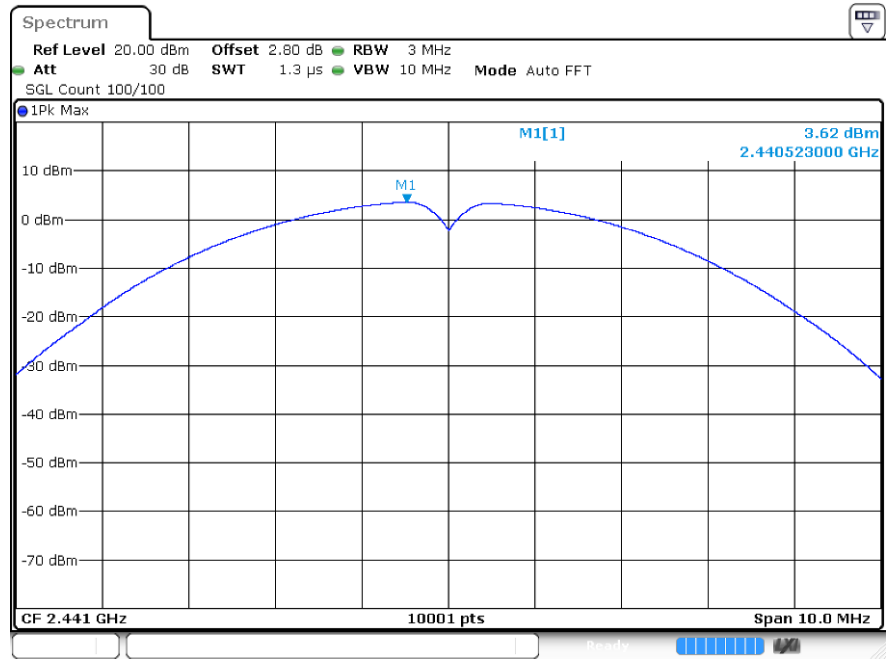
GFSK/HCH



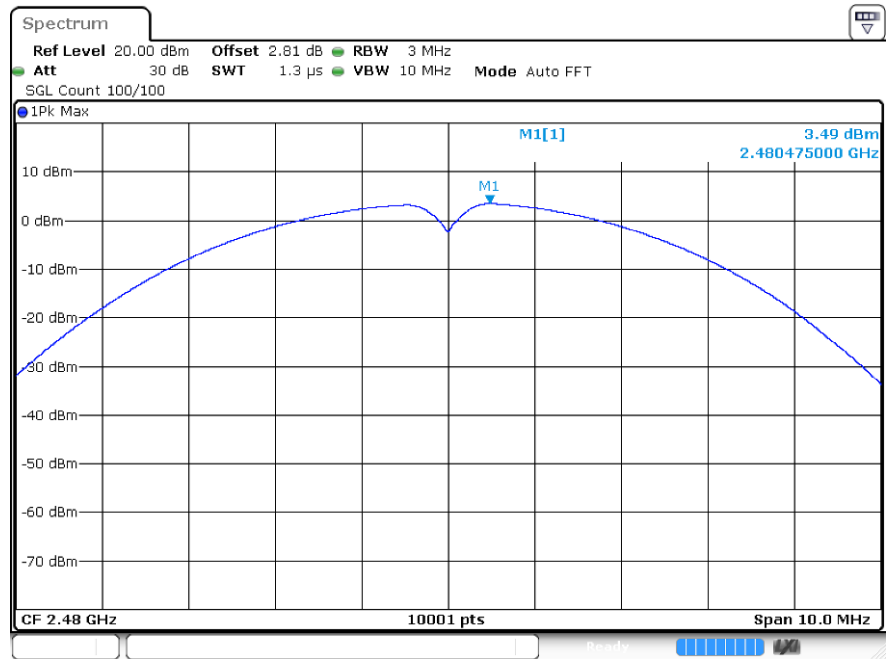
$\pi/4$ DQPSK/LCH



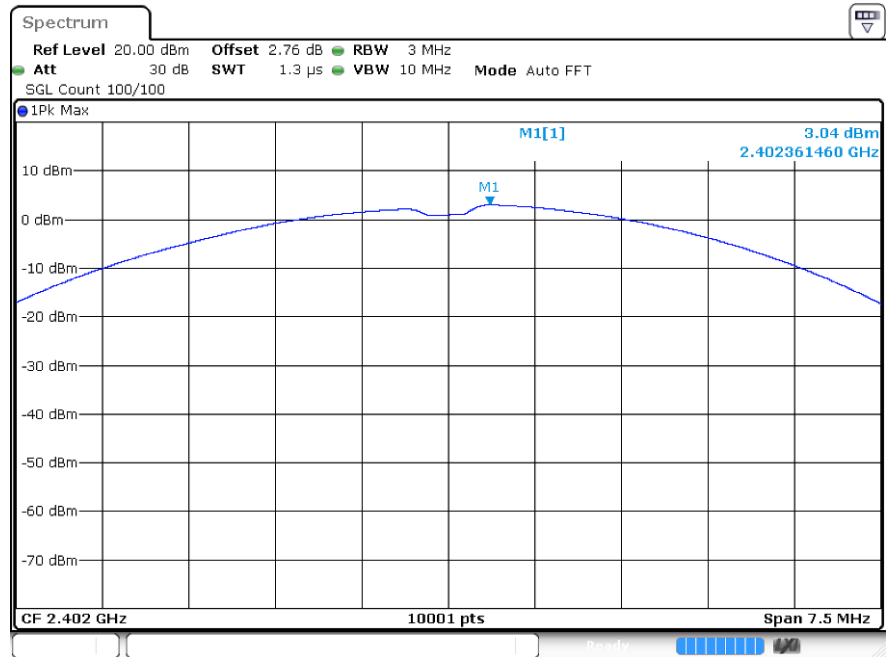
$\pi/4$ DQPSK/MCH



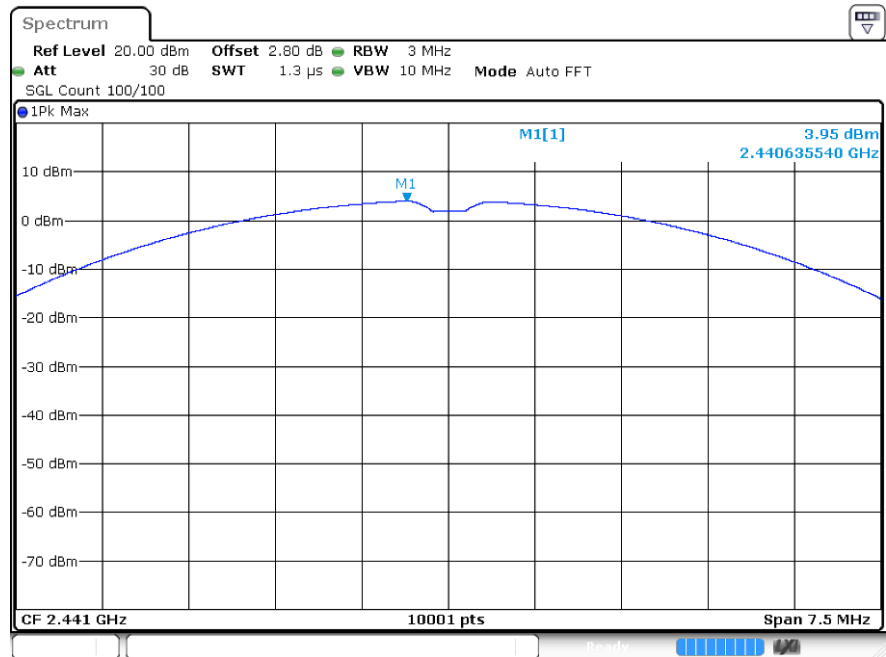
$\pi/4$ DQPSK/HCH



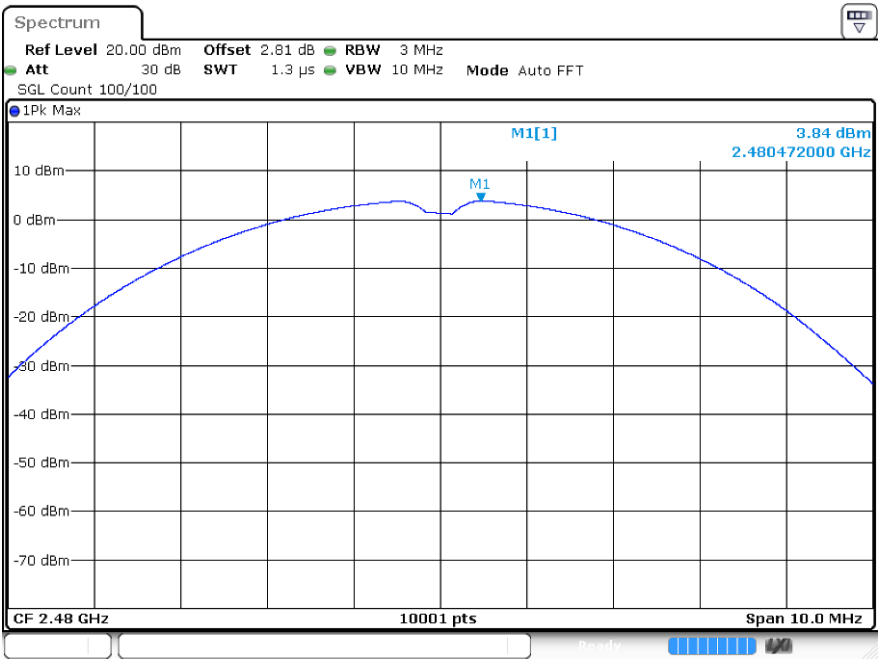
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

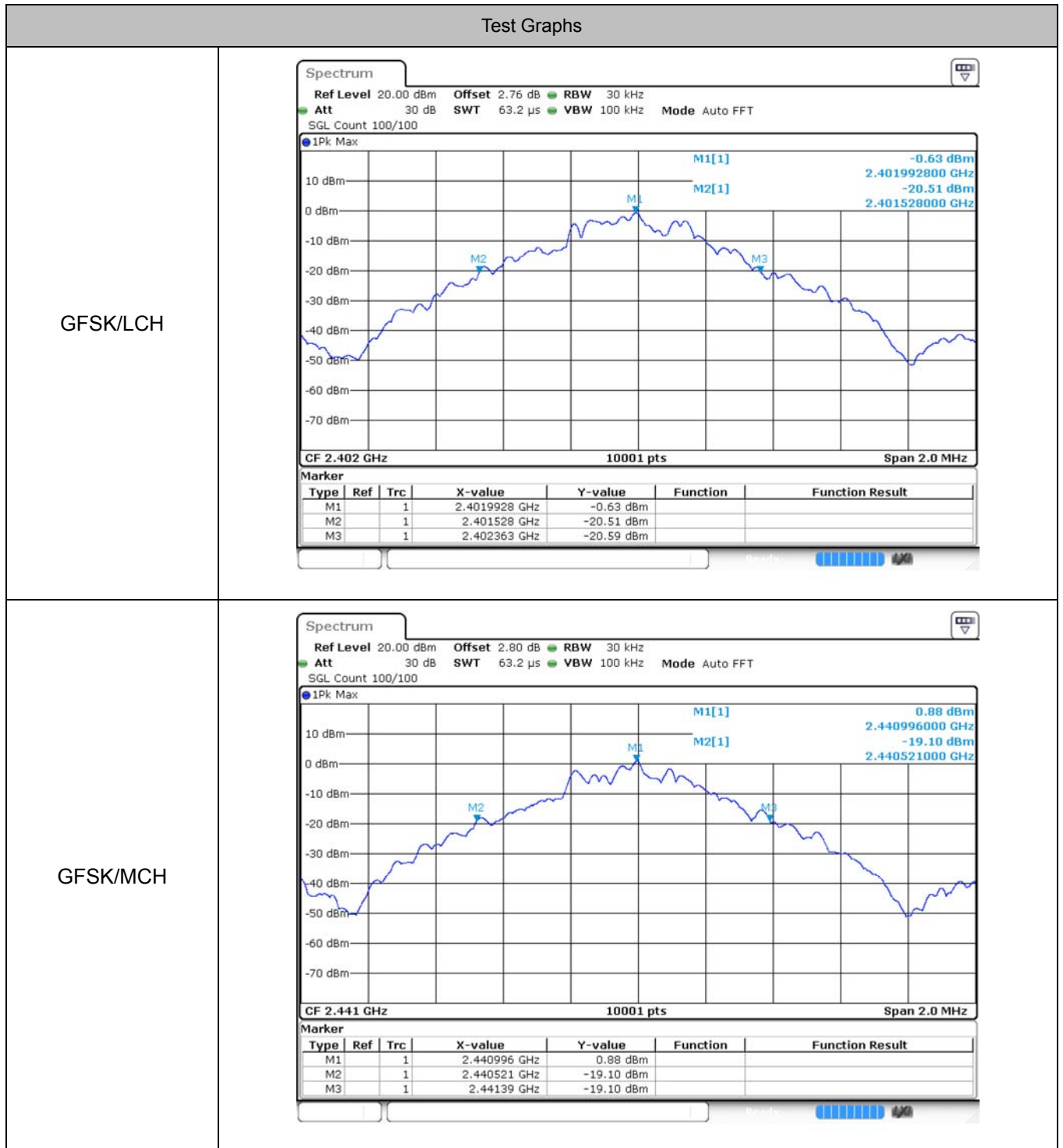


3 20dB Bandwidth

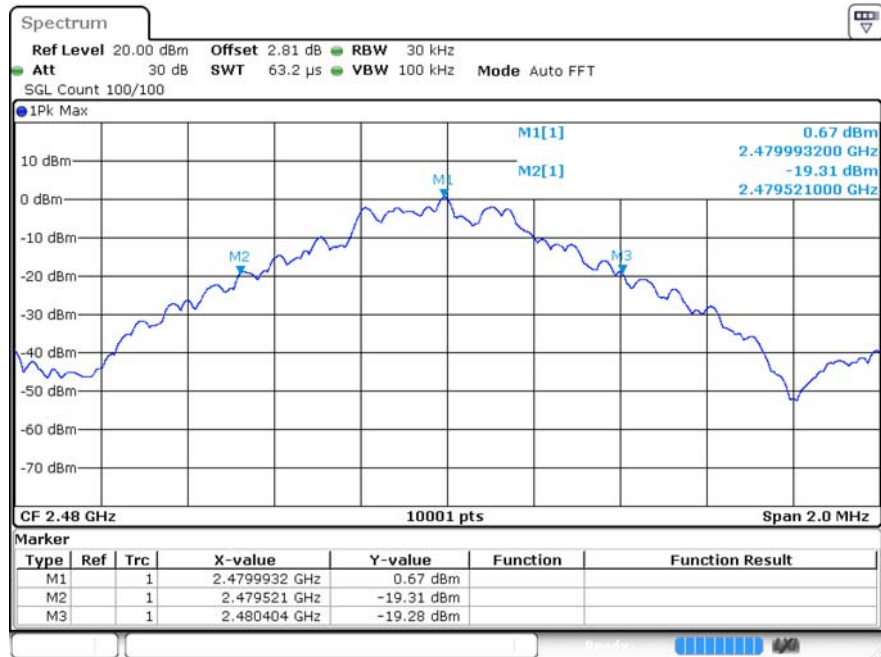
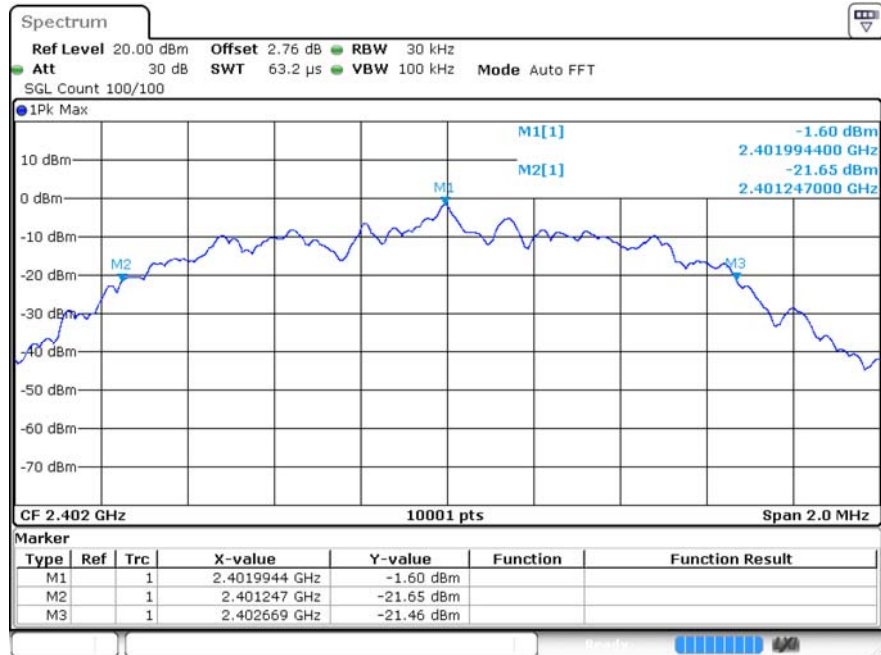
3.1 Test Result

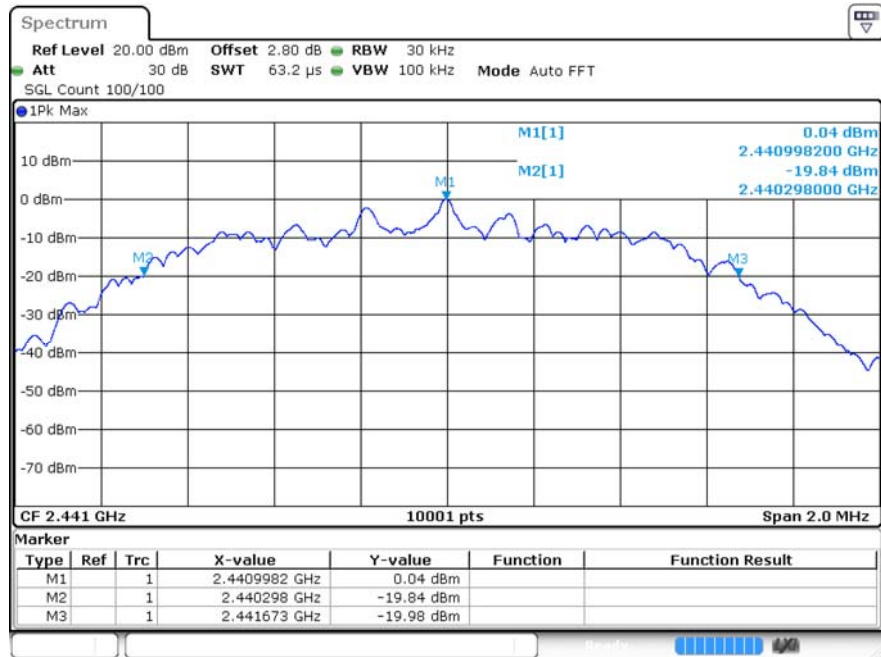
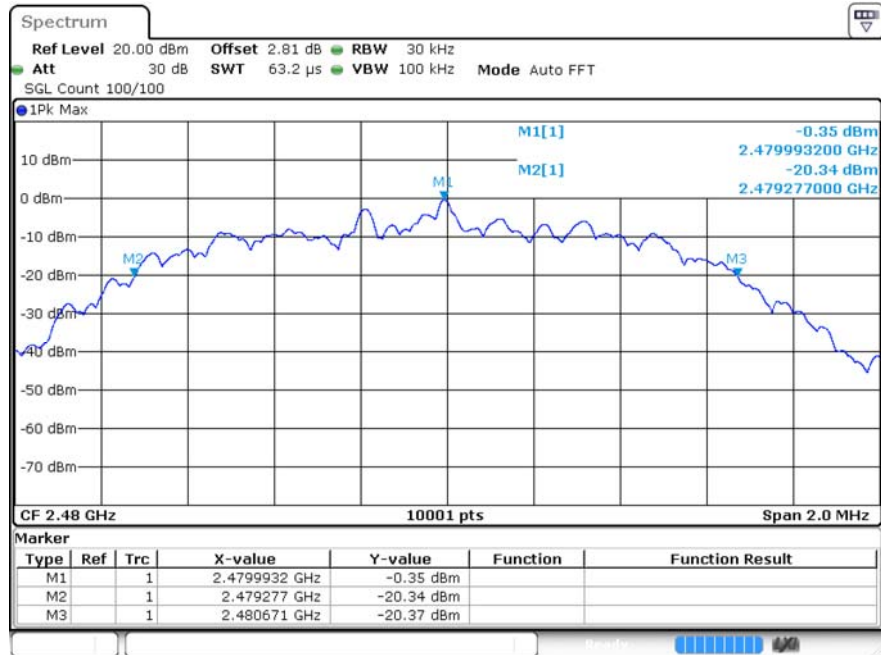
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.835	Not Specified	Pass
	MCH	0.869	Not Specified	Pass
	HCH	0.884	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.422	Not Specified	Pass
	MCH	1.375	Not Specified	Pass
	HCH	1.394	Not Specified	Pass
8DPSK	LCH	1.405	Not Specified	Pass
	MCH	1.417	Not Specified	Pass
	HCH	1.412	Not Specified	Pass

3.2 Test Graphs

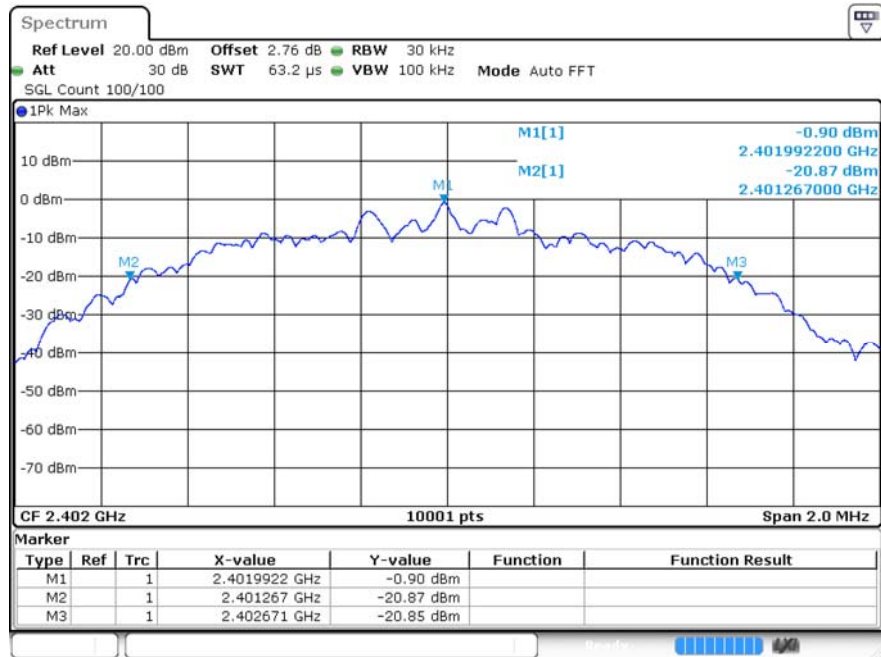


GFSK/HCH

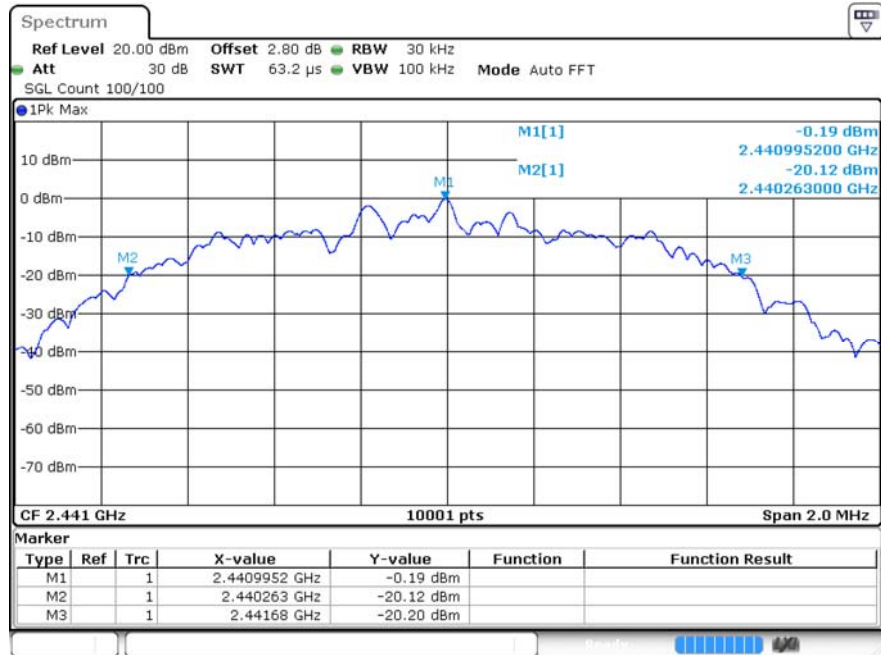

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


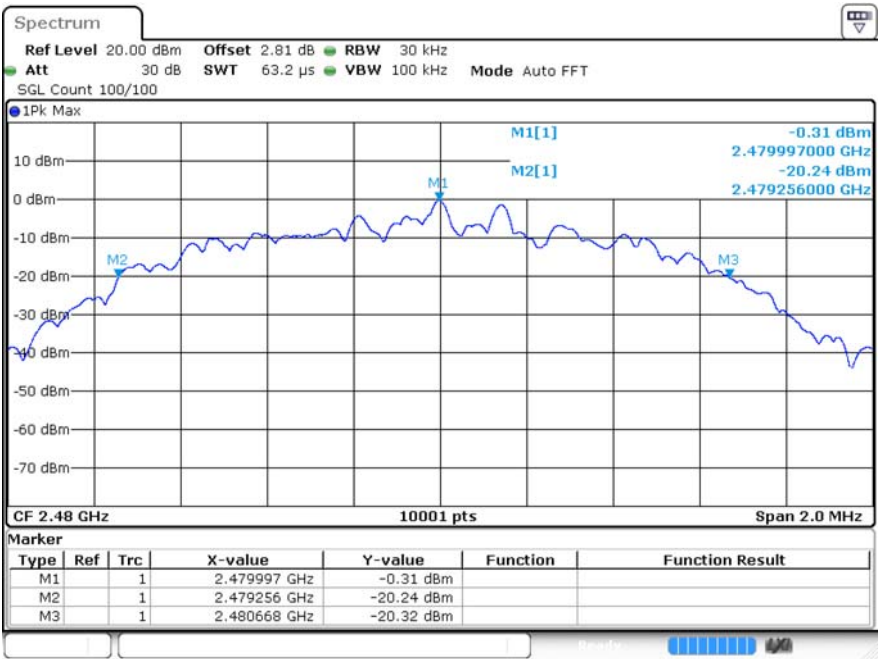
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

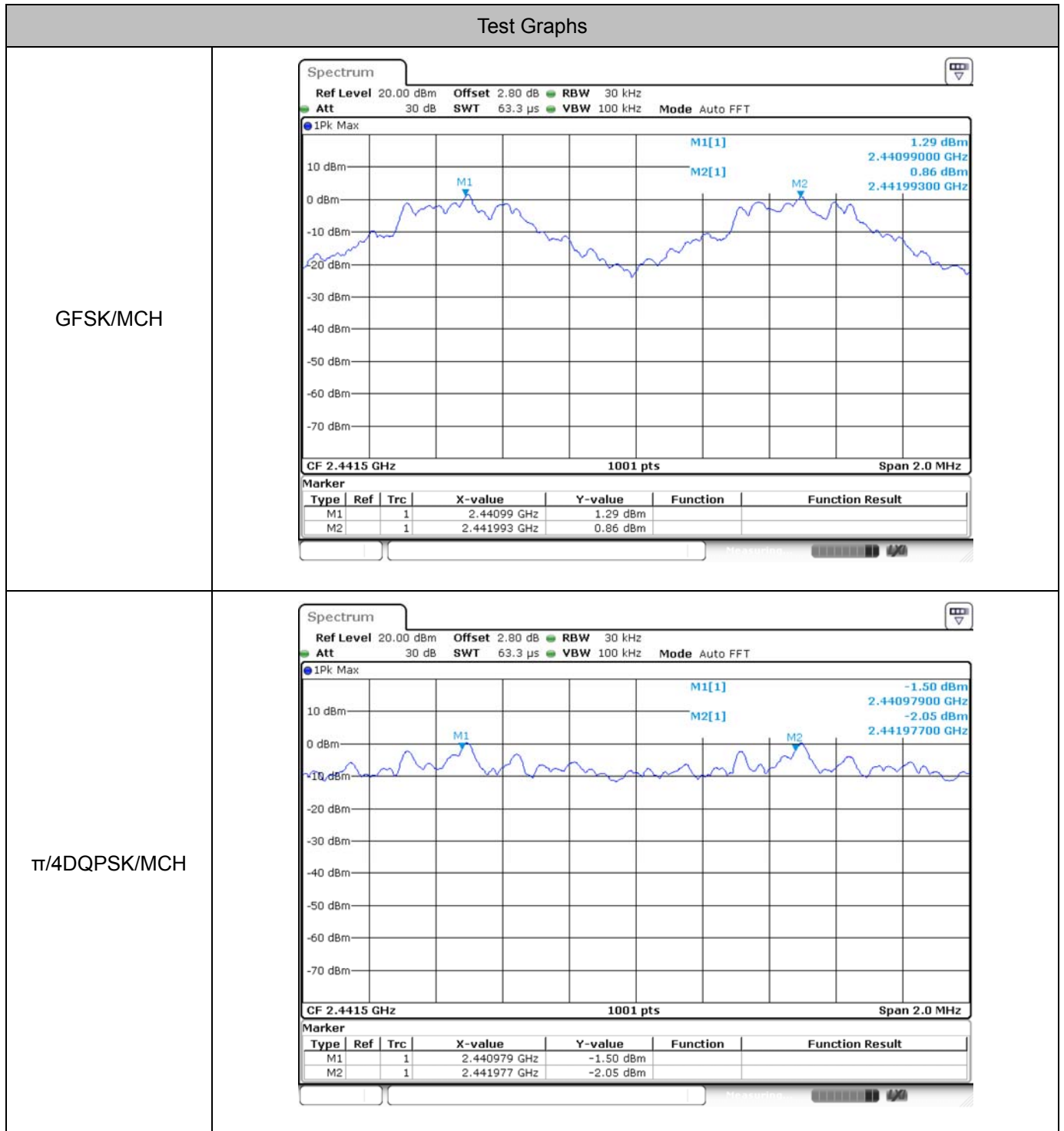


4 Carrier Frequency Separation

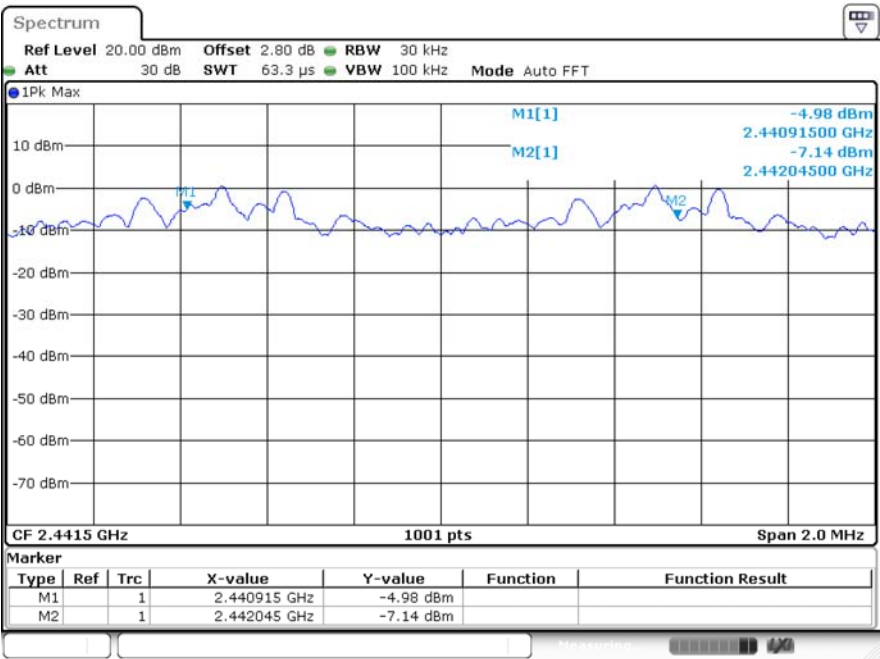
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.003	0.579	Pass
$\pi/4$ DQPSK	MCH	0.998	0.917	Pass
8DPSK	MCH	1.13	0.945	Pass

4.2 Test Graphs



8DPSK/MCH

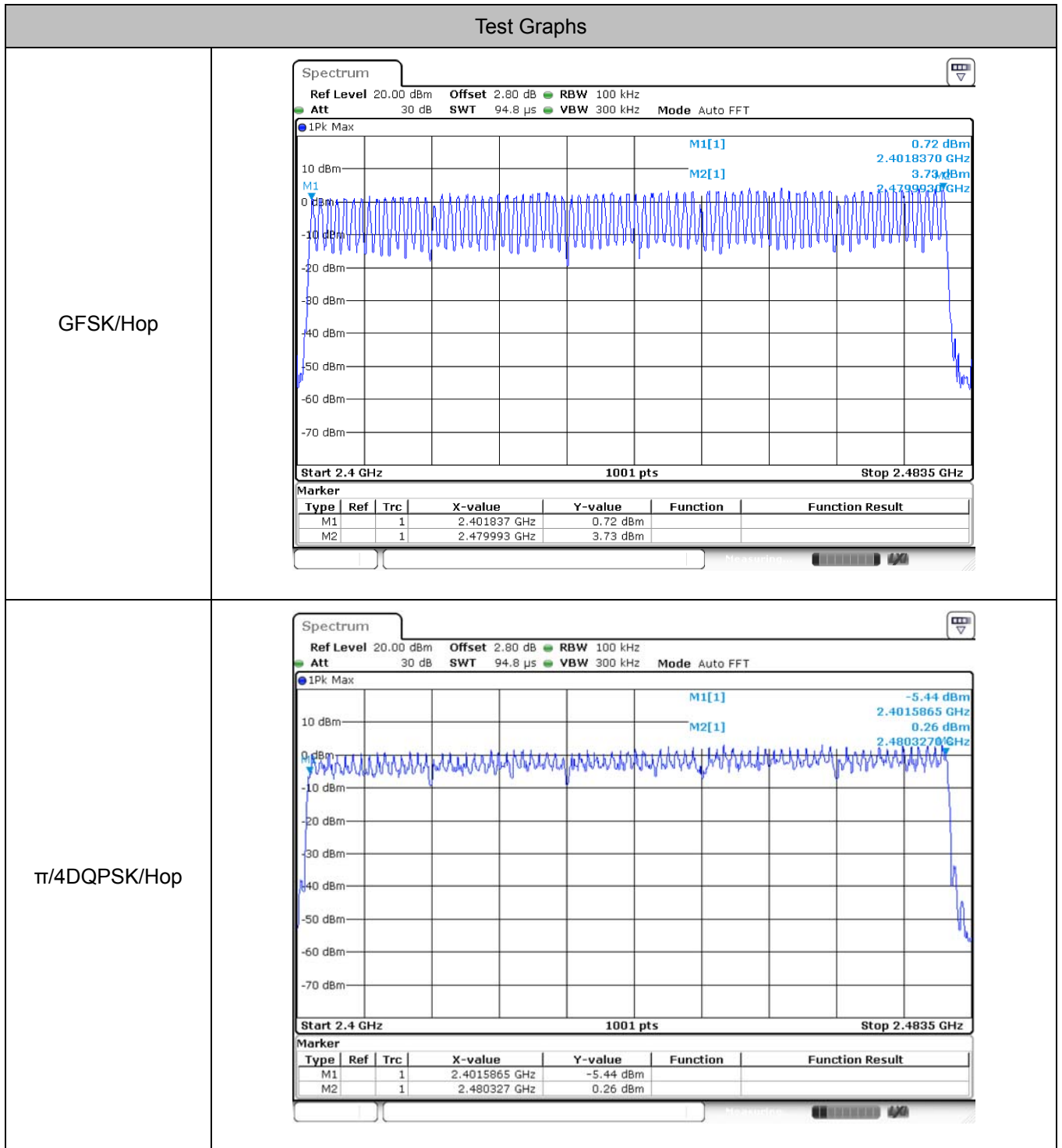


5 Hopping Channel Number

5.1 Test Result

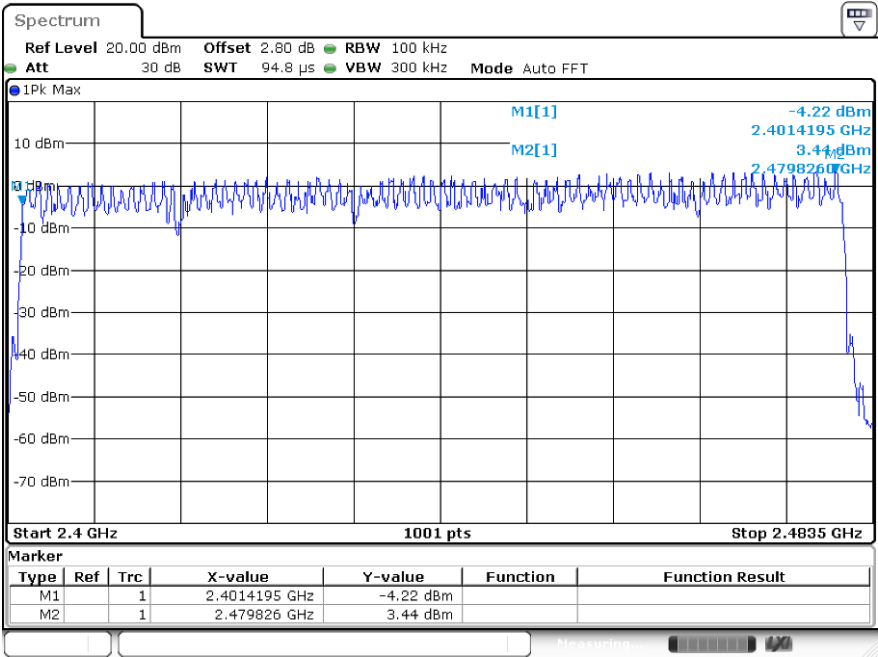
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

5.2 Test Graphs





8DPSK/Hop

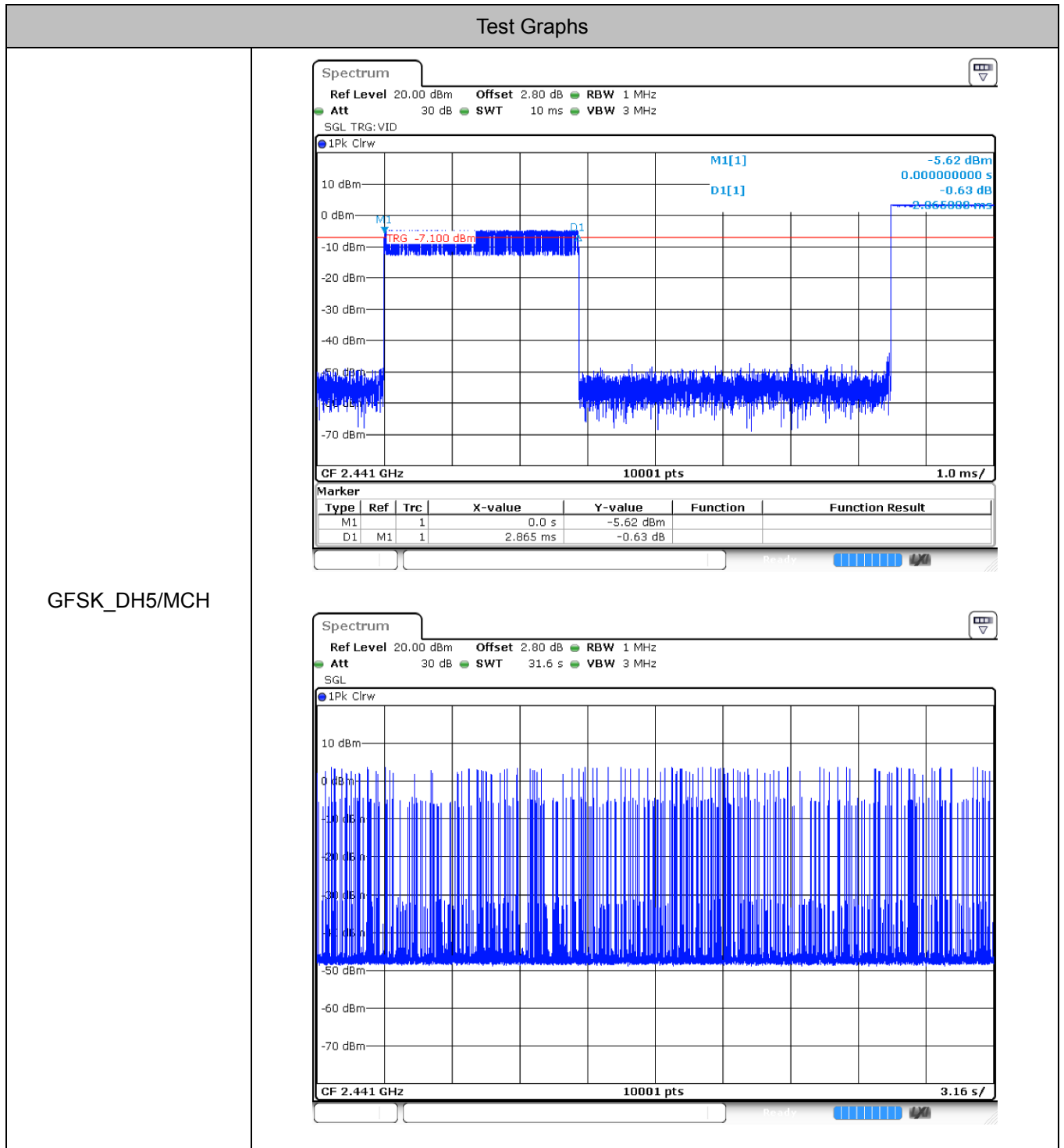


6 Dwell Time

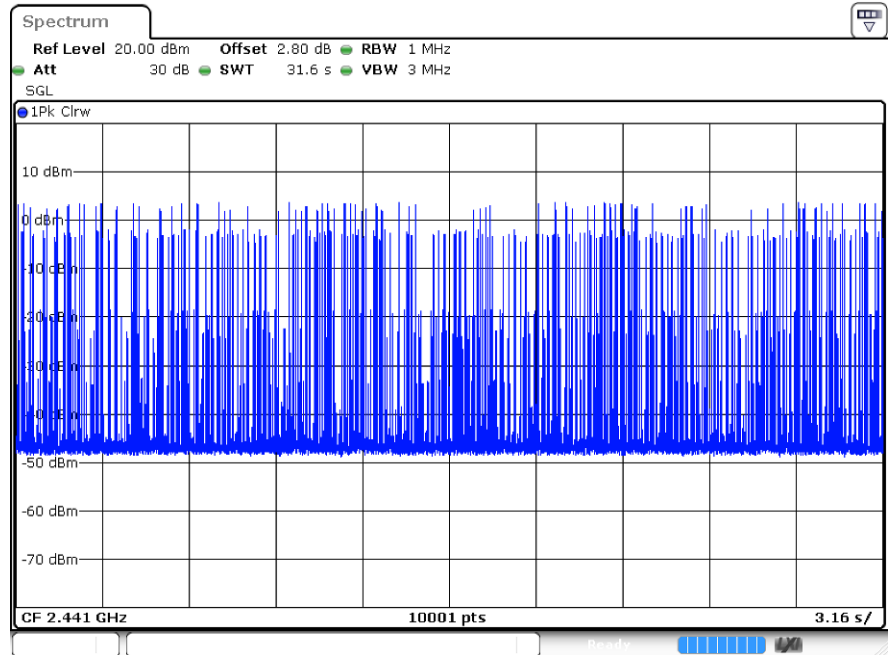
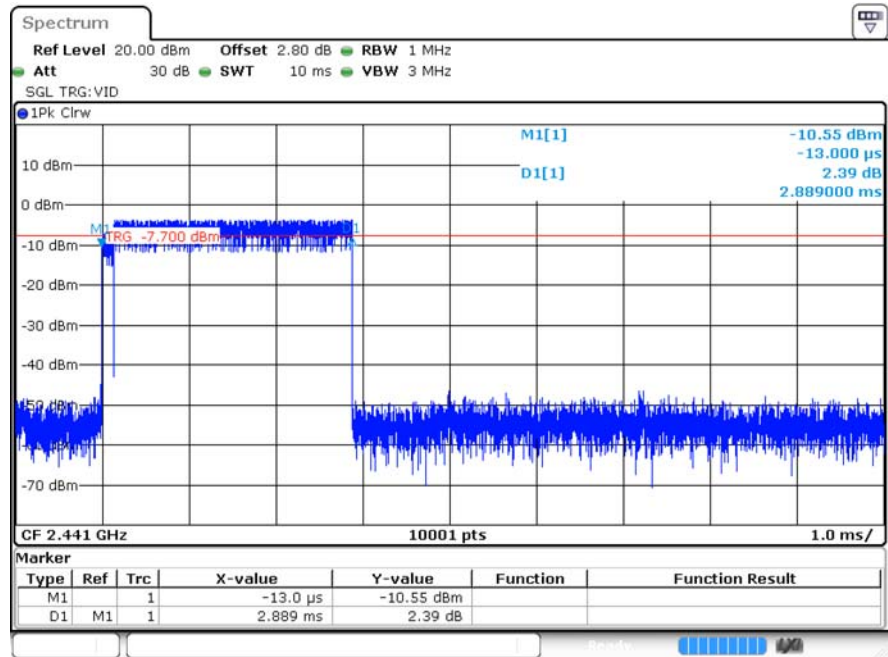
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.865	119	340.935	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.889	99	286.011	0.4	Pass
8DPSK	3DH5	MCH	2.892	103	297.876	0.4	Pass

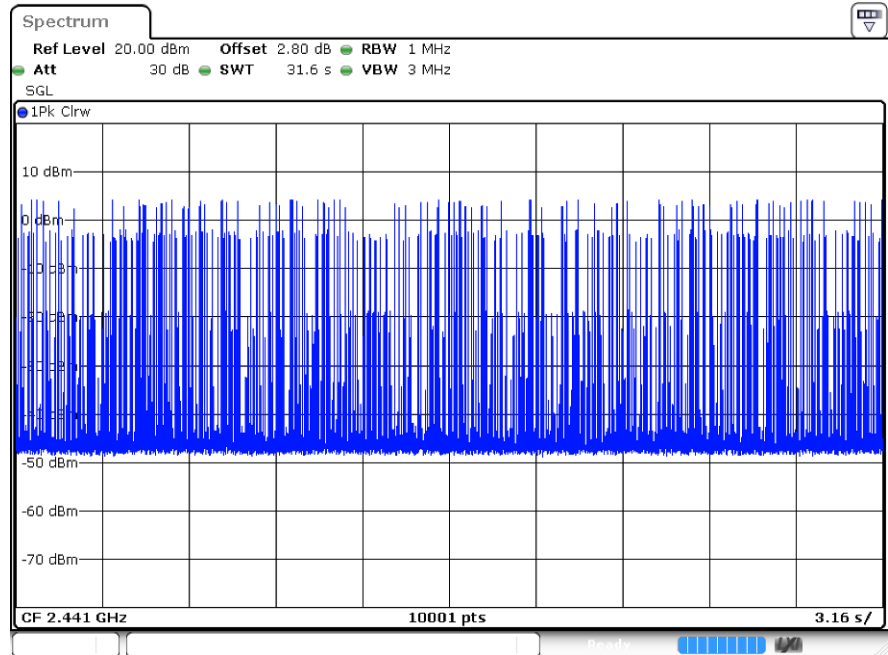
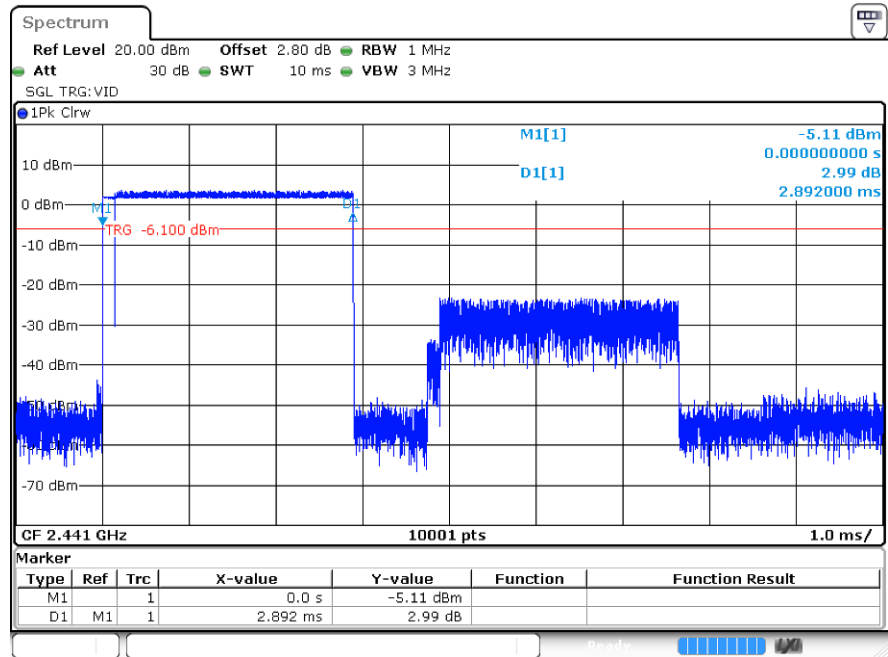
6.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH

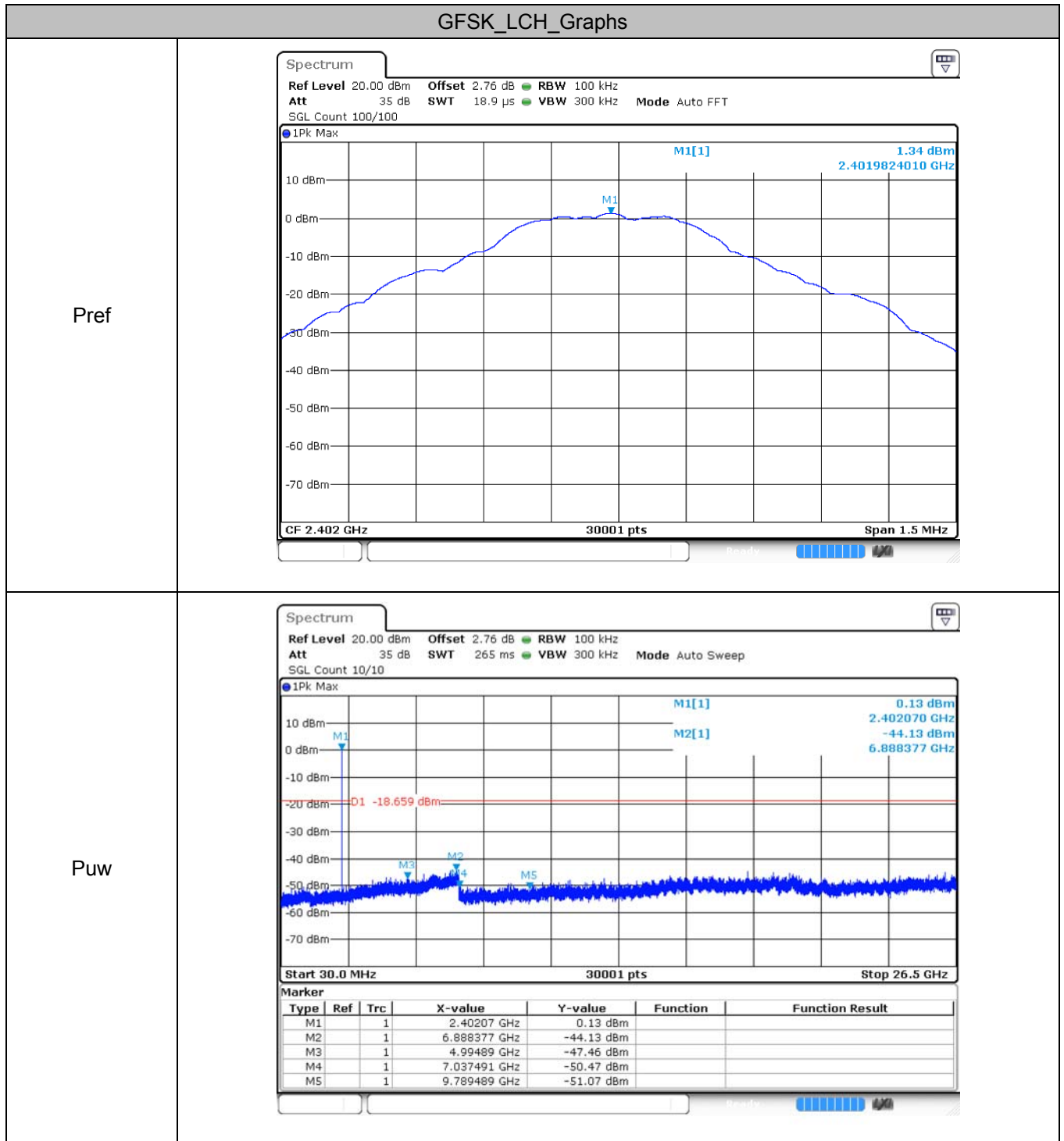


7 RF Conducted Spurious Emissions

7.1 Test Result

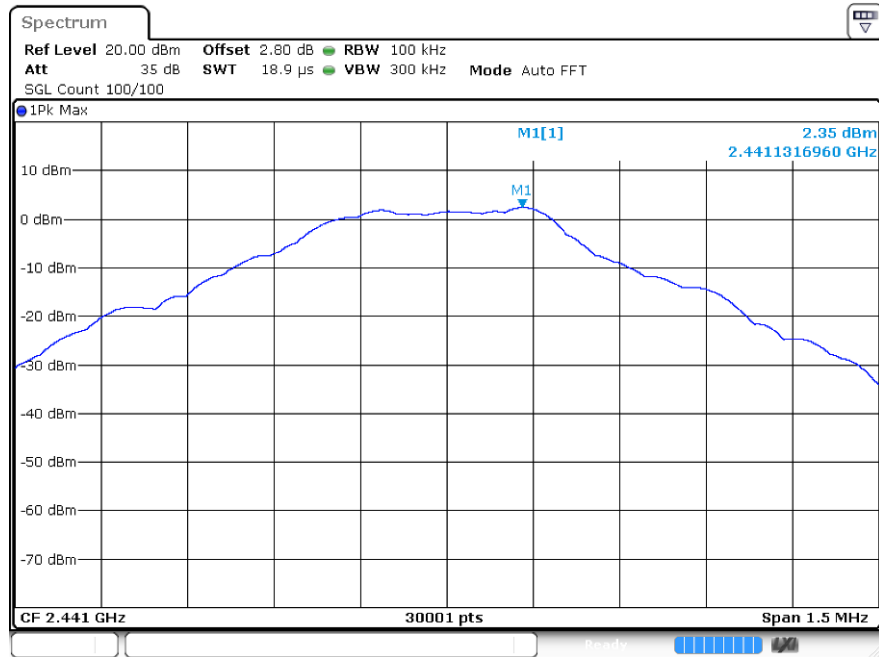
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-45.46	-20	Pass
	MCH	-46.22	-20	Pass
	HCH	-45.95	-20	Pass
$\pi/4$ DQPSK	LCH	-44.49	-20	Pass
	MCH	-45.21	-20	Pass
	HCH	-44.53	-20	Pass
8DPSK	LCH	-44.9	-20	Pass
	MCH	-44.69	-20	Pass
	HCH	-45.7	-20	Pass

7.2 Test Graphs

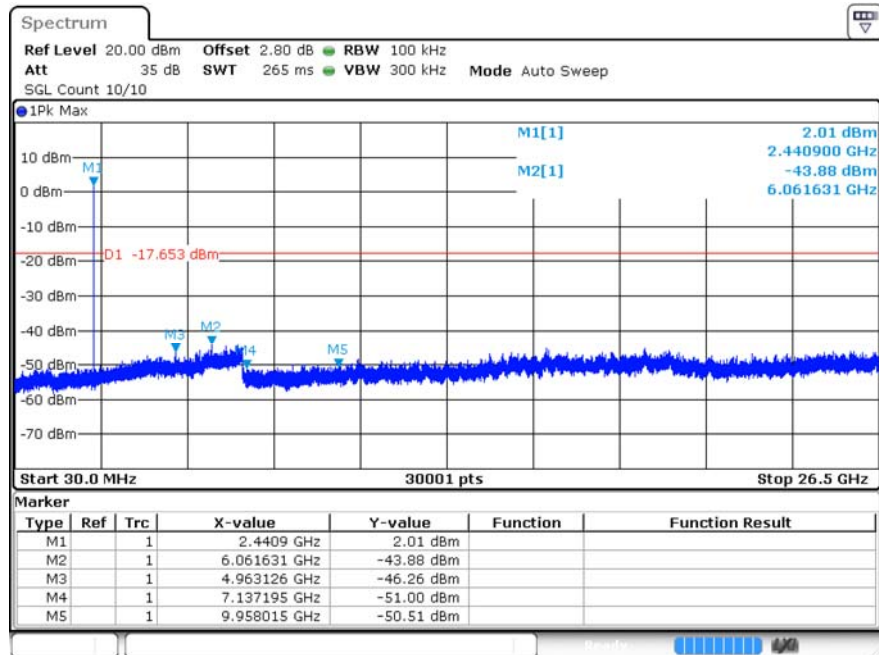


GFSK_MCH_Graphs

Pref

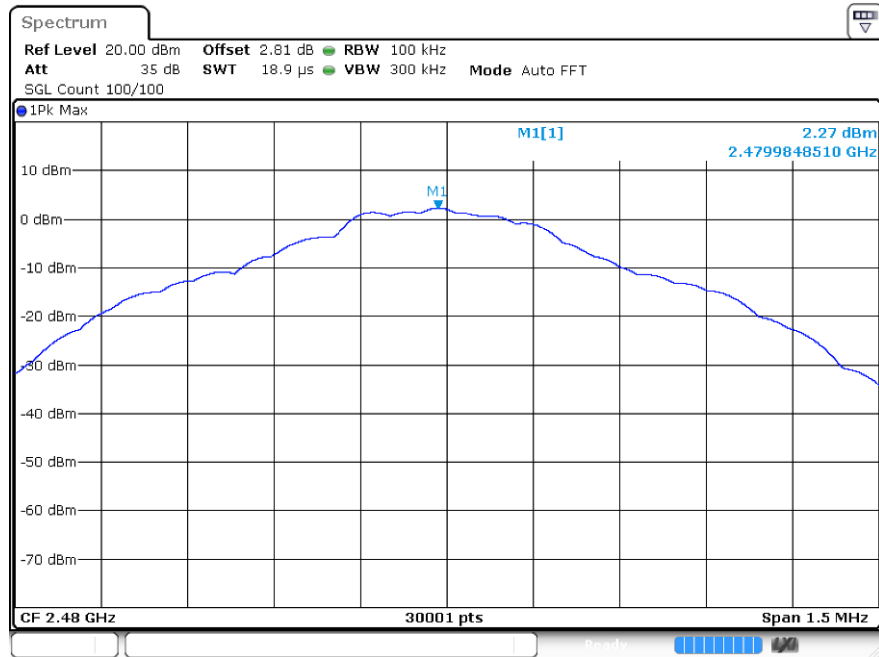


Puw

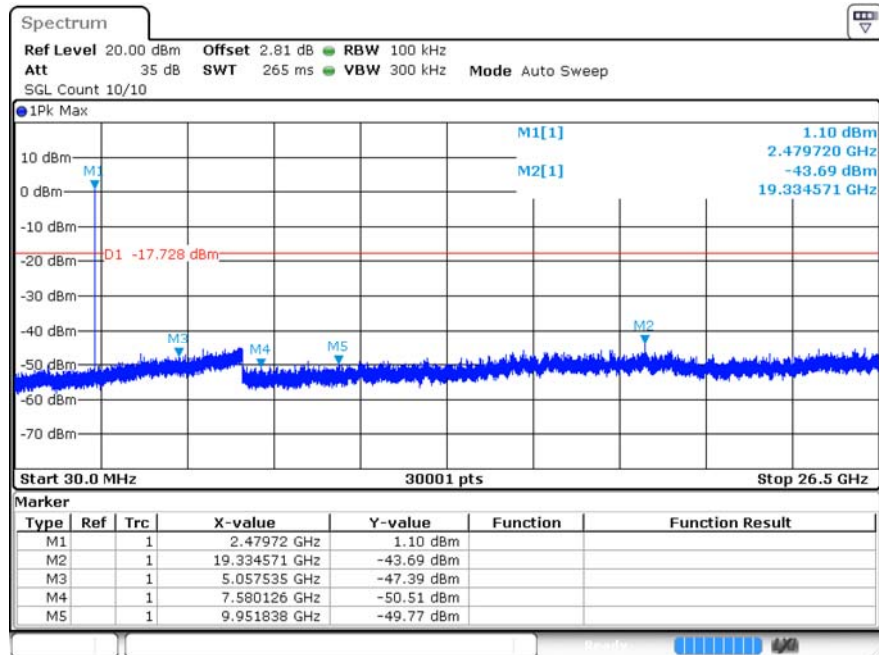


GFSK_HCH_Graphs

Pref

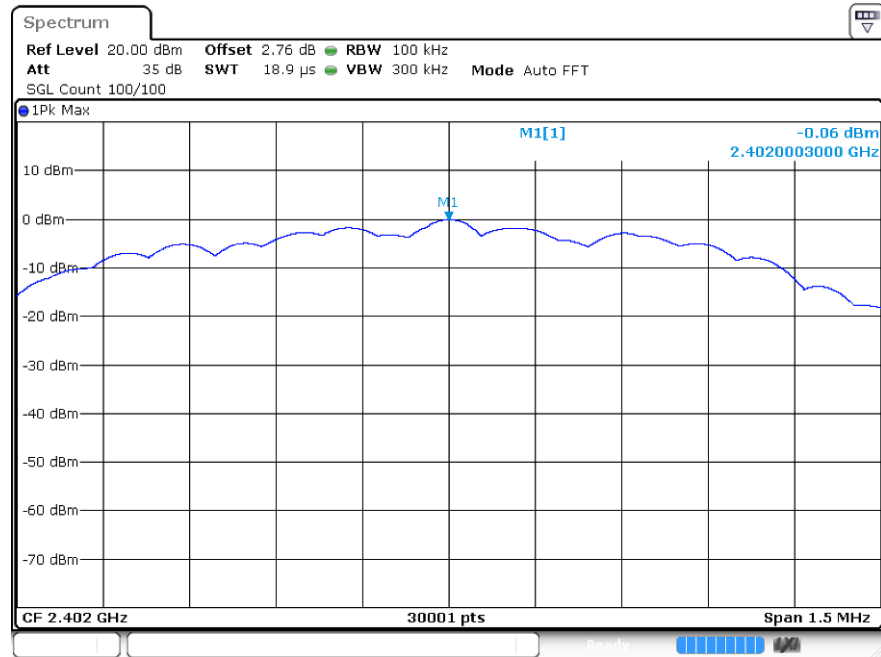


Puw

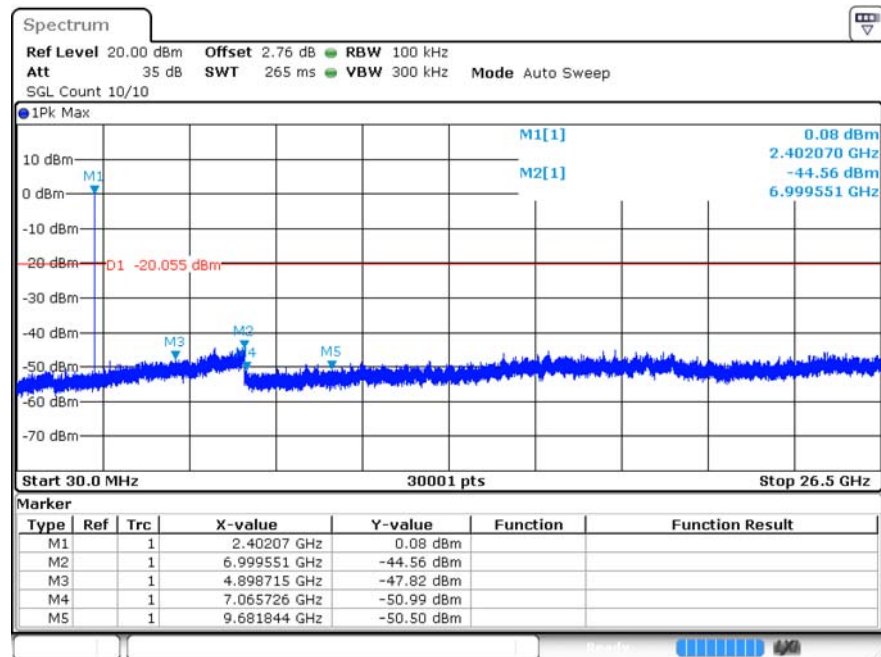


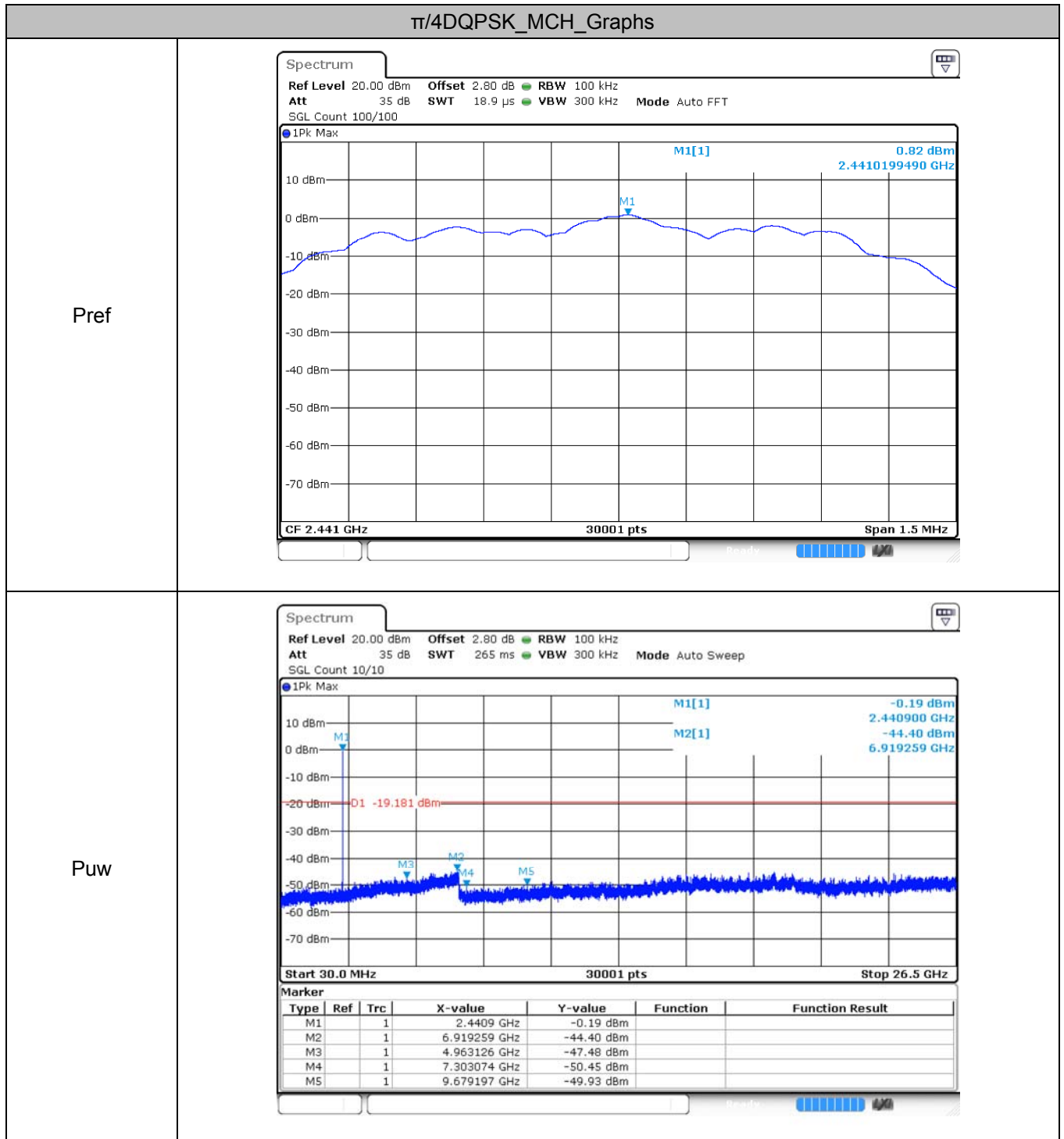
$\pi/4$ DQPSK_LCH_Graphs

Pref



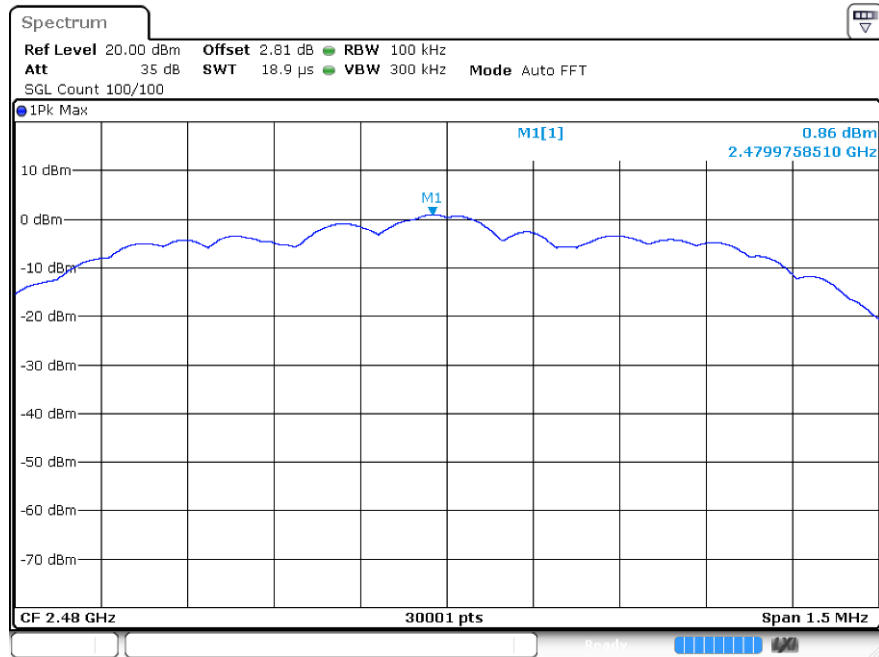
Puw



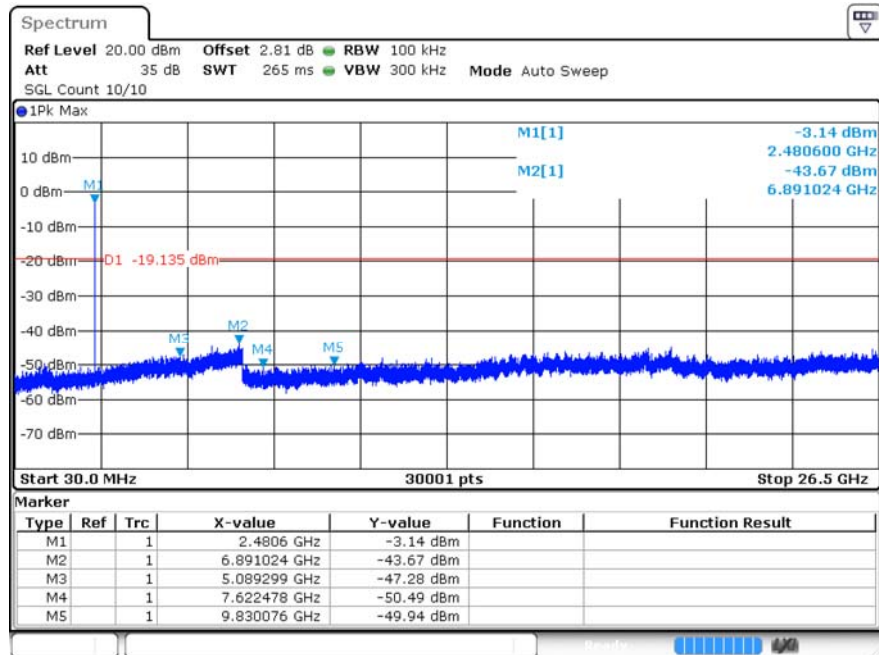


$\pi/4$ DQPSK_HCH_Graphs

Pref

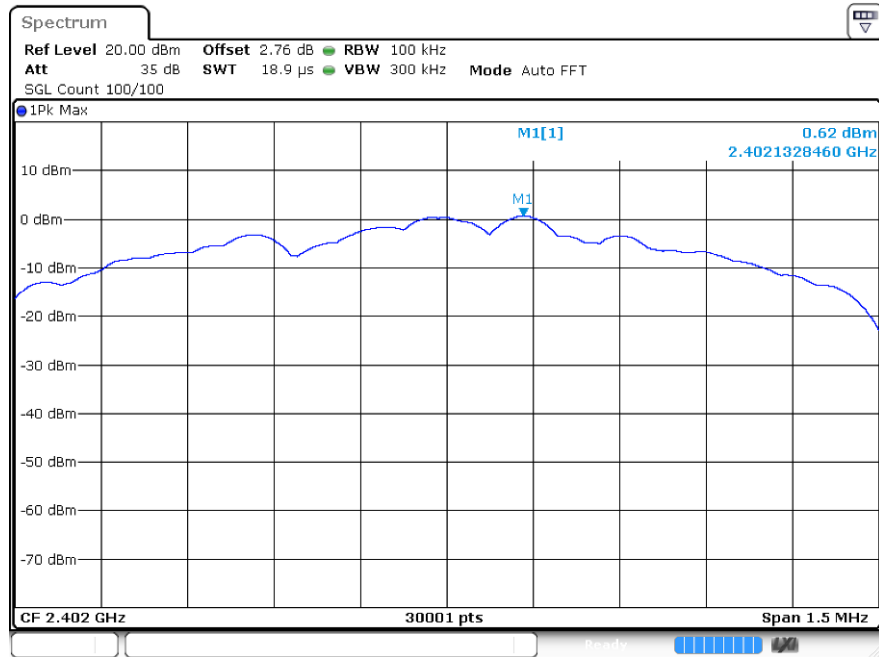


Puw

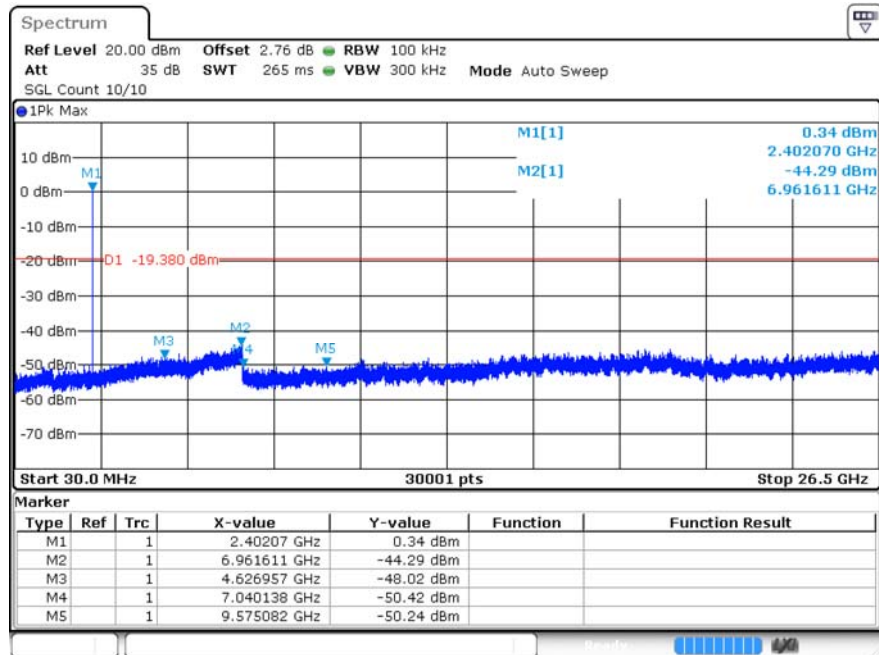


8DPSK_LCH_Graphs

Pref

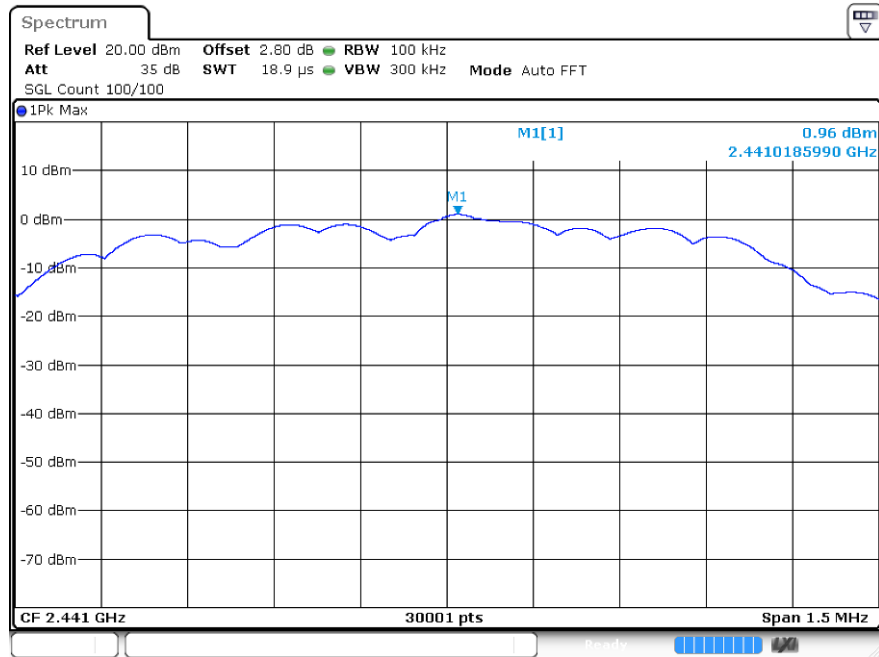


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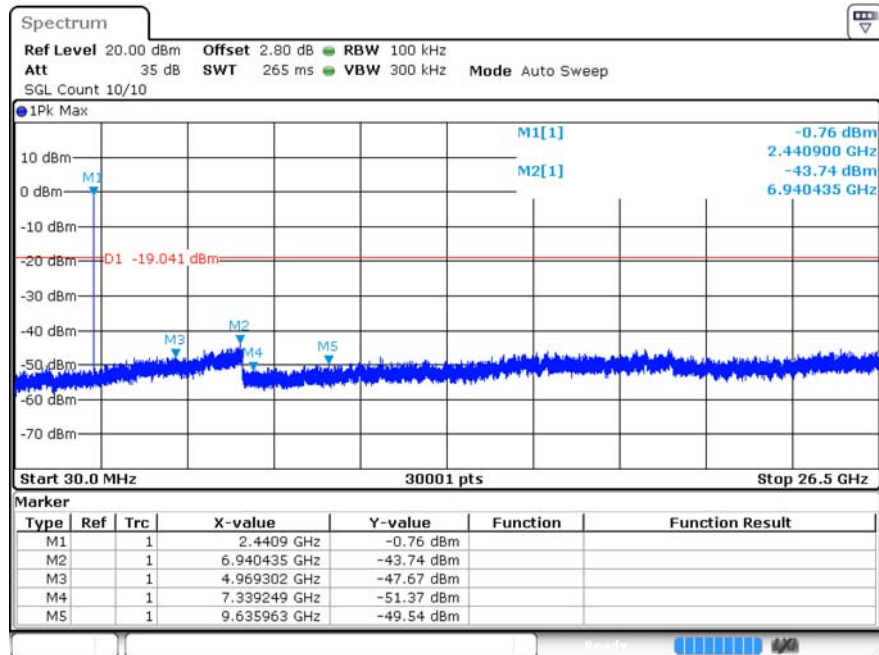


8DPSK_MCH_Graphs

Pref

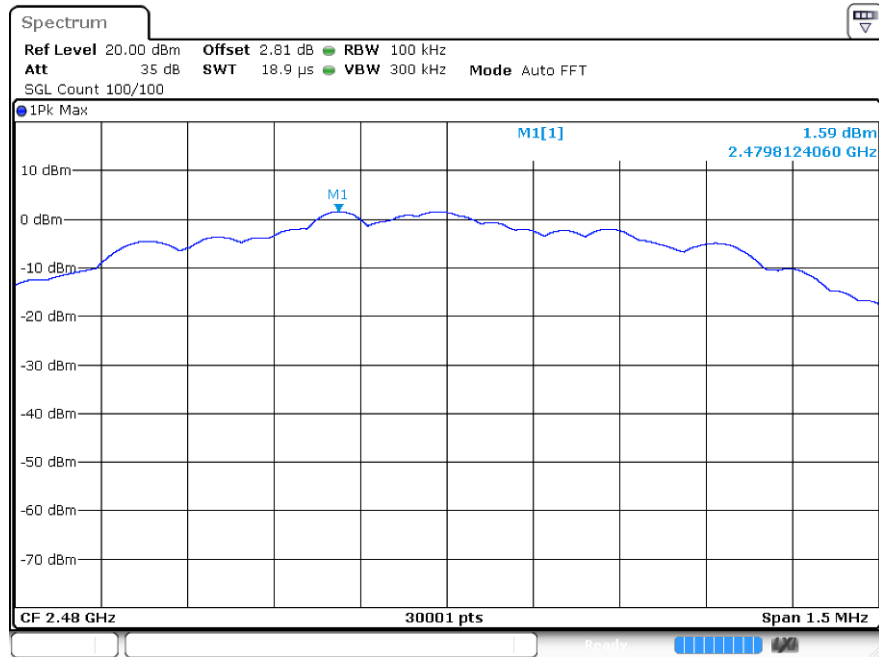


Puw

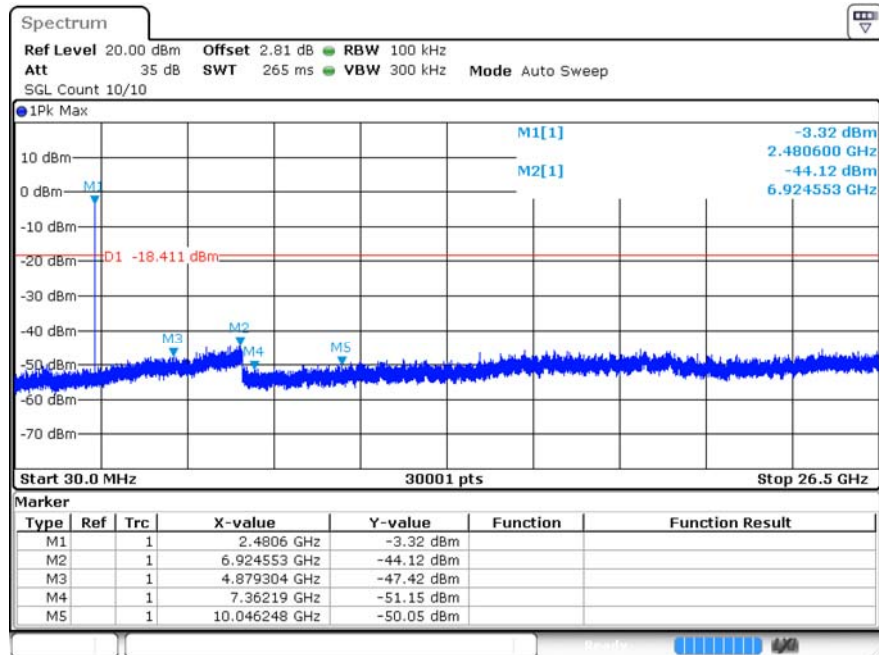


8DPSK_HCH_Graphs

Pref



Puw

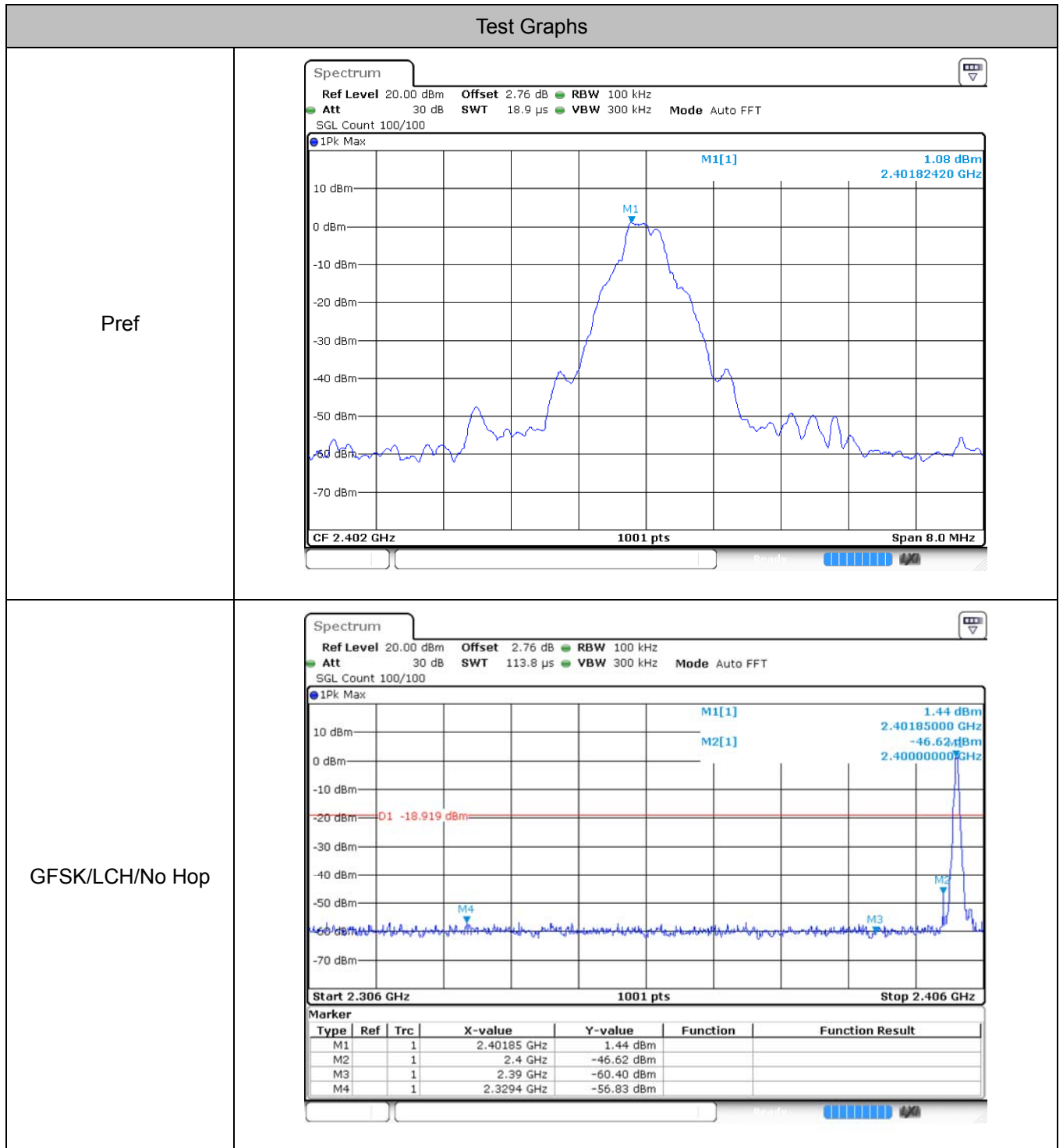


8 Band-edge for RF Conducted Emissions

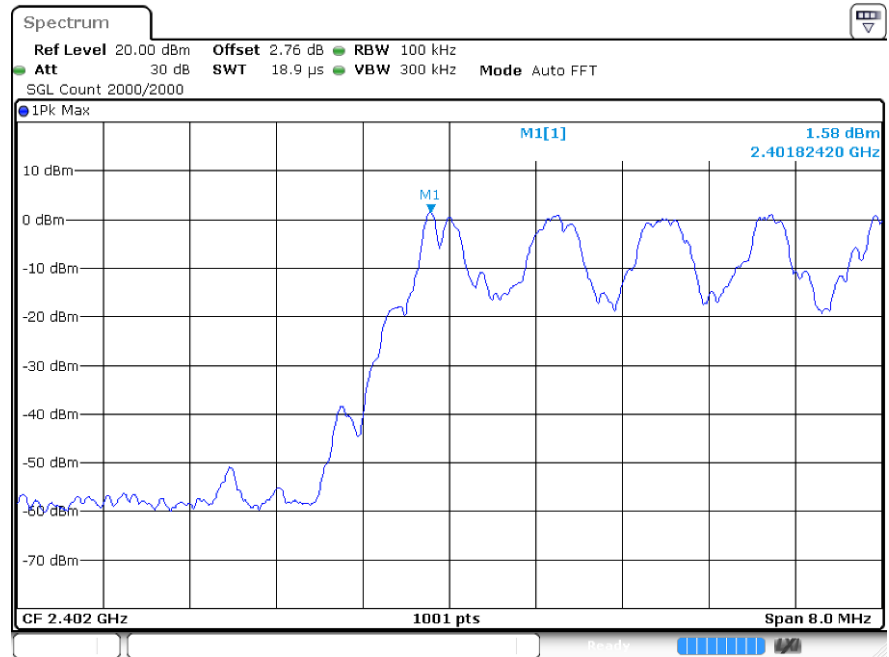
8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-57.91	-20	Pass
			On	-55.96	-20	Pass
	HCH	2480	Off	-50.76	-20	Pass
			On	-51.56	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-55.19	-20	Pass
			On	-55.8	-20	Pass
	HCH	2480	Off	-56.53	-20	Pass
			On	-50.47	-20	Pass
8DPSK	LCH	2402	Off	-57.07	-20	Pass
			On	-56.01	-20	Pass
	HCH	2480	Off	-49.32	-20	Pass
			On	-51.21	-20	Pass

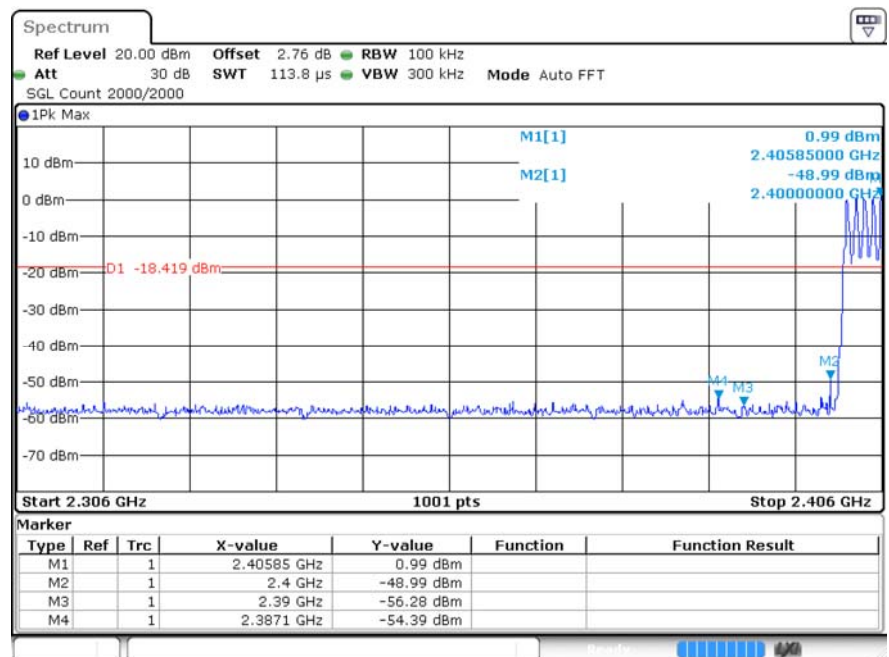
8.2 Test Graphs



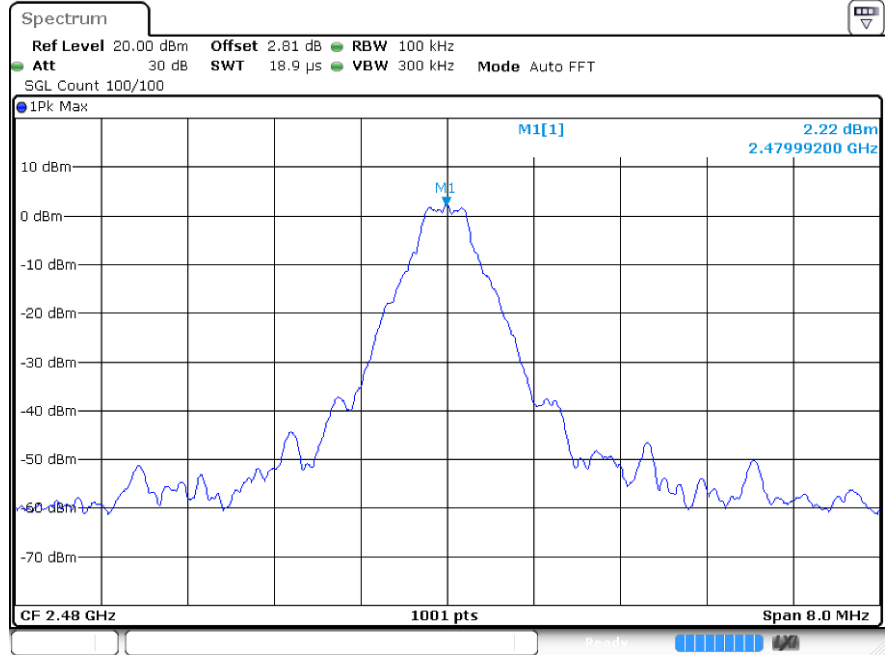
Ref



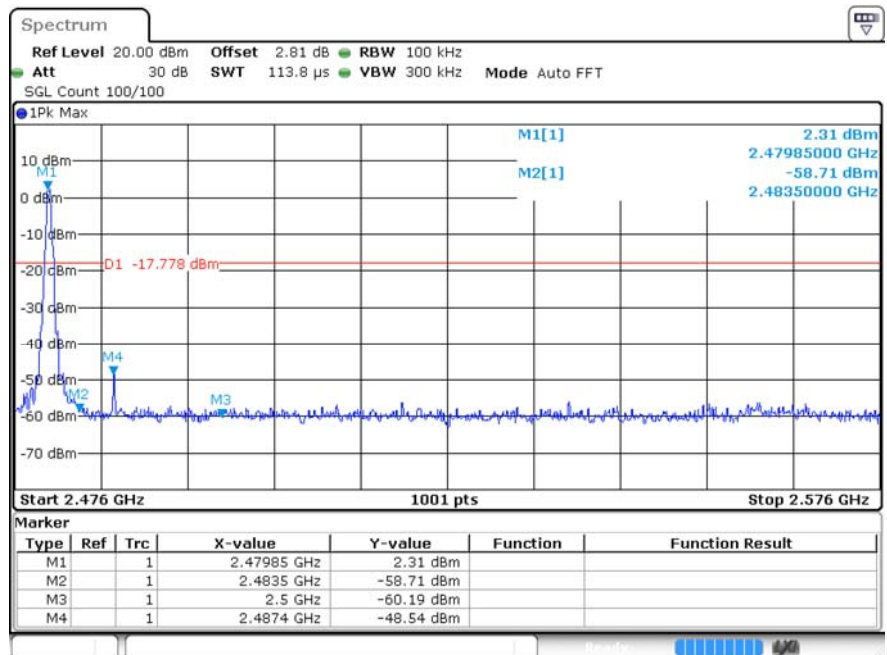
GFSK/LCH/Hop

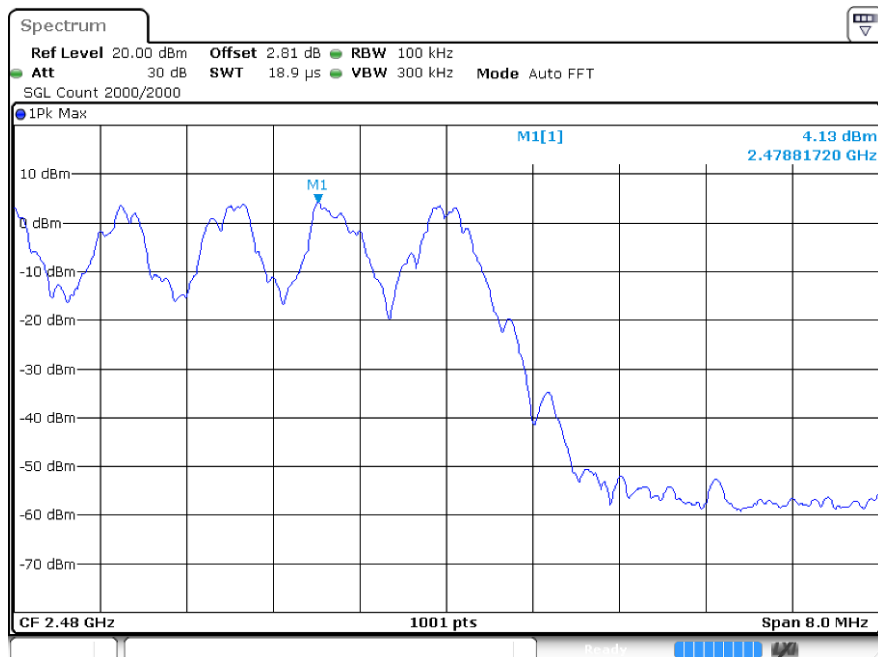


Ref



GFSK/HCH/No Hop





Spectrum

Ref Level 20.00 dBm Offset 2.81 dB RBW 100 kHz
Att 30 dB SWT 113.8 μ s VBW 300 kHz Mode Auto FFT
SGL Count 2000/2000

1Pk Max

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

M1[1] 3.60 dBm 2.47905000 GHz
M2[1] -47.47 dBm 2.48350000 GHz

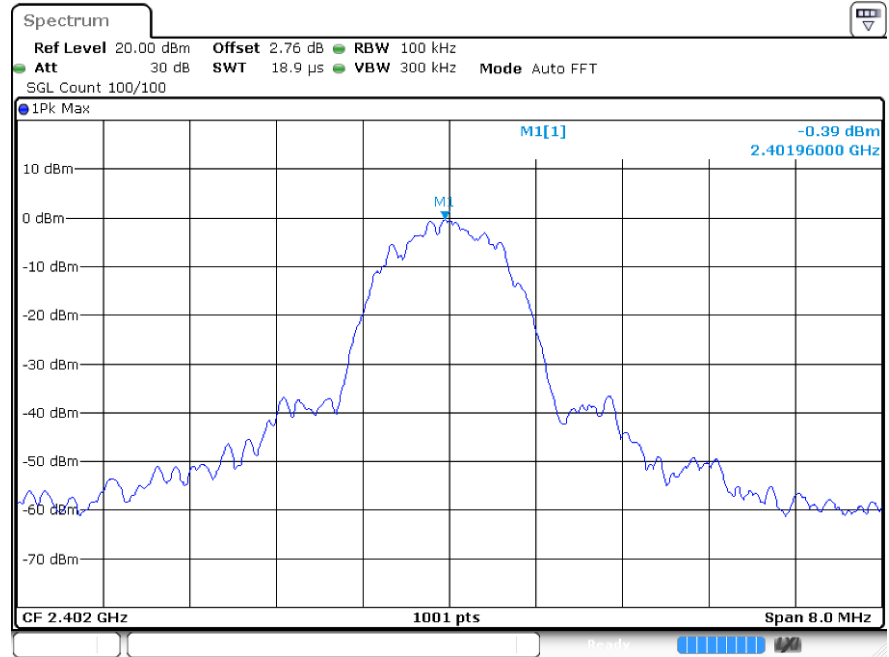
D1 -15.869 dBm

M2 M4 M3

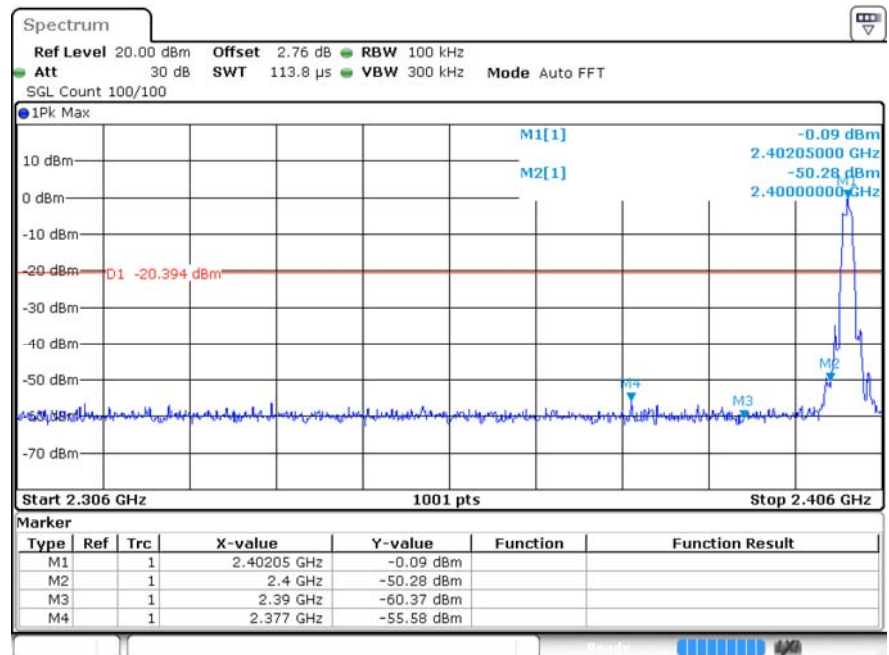
Start 2.475 GHz 1001 pts Stop 2.575 GHz

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47905 GHz	3.60 dBm		
M2		1	2.4835 GHz	-47.47 dBm		
M3		1	2.5 GHz	-56.57 dBm		
M4		1	2.4874 GHz	-47.44 dBm		

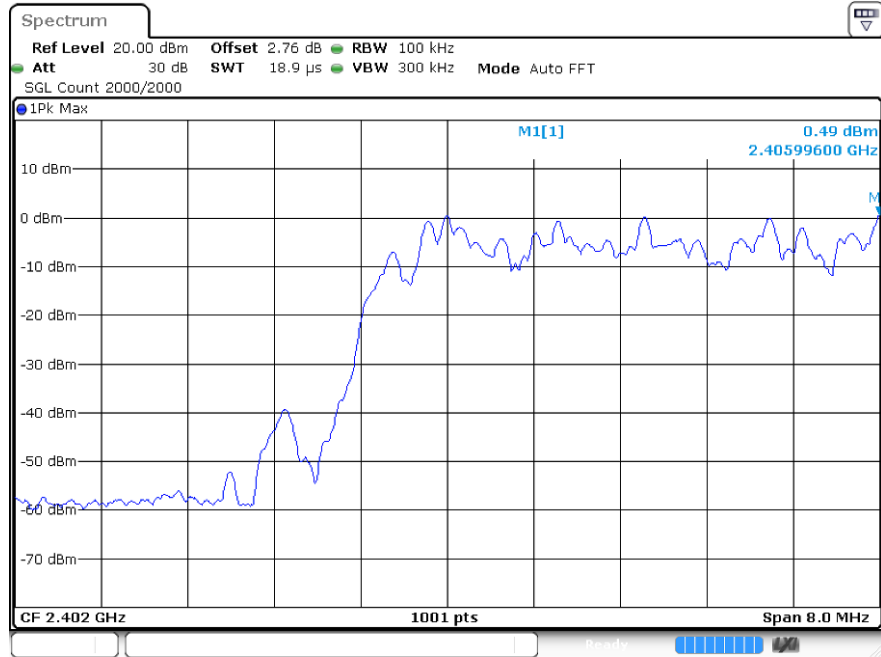
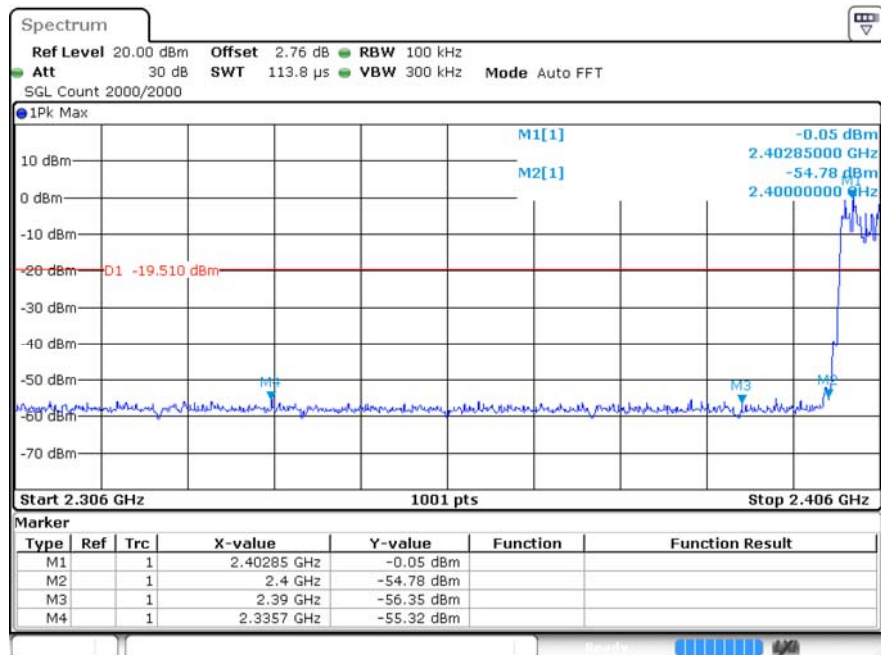
Ref



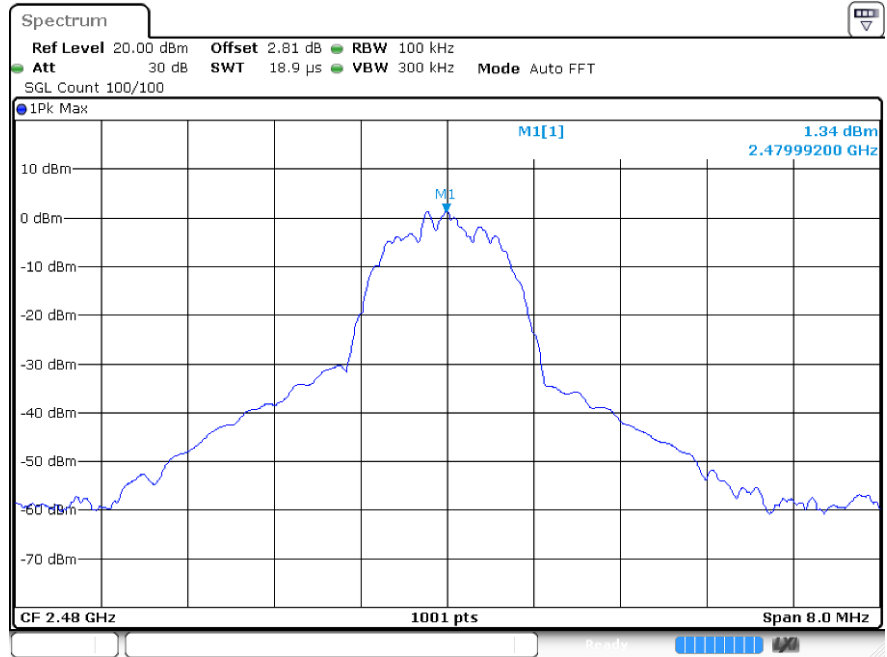
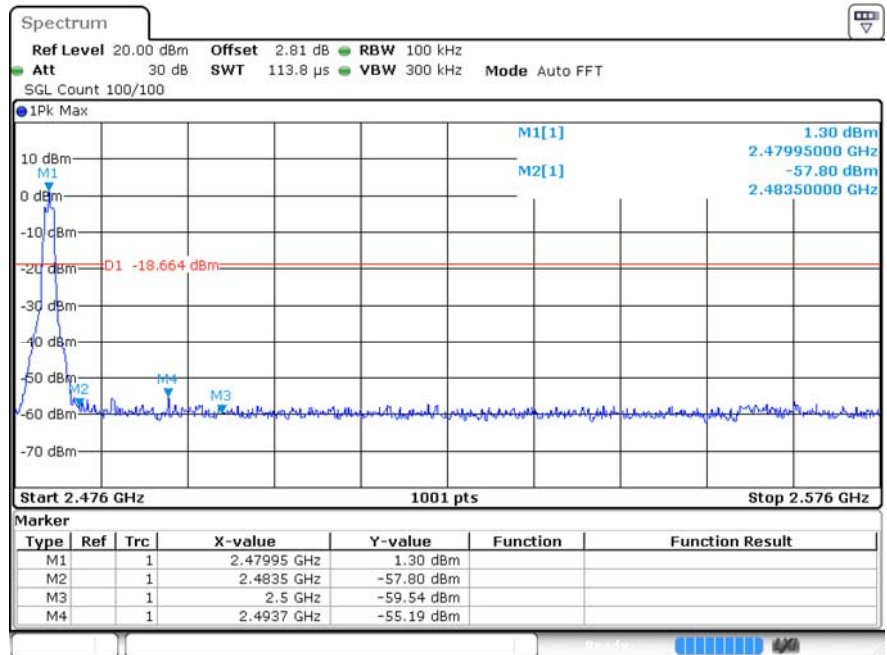
$\pi/4$ DQPSK/LCH/No
Hop



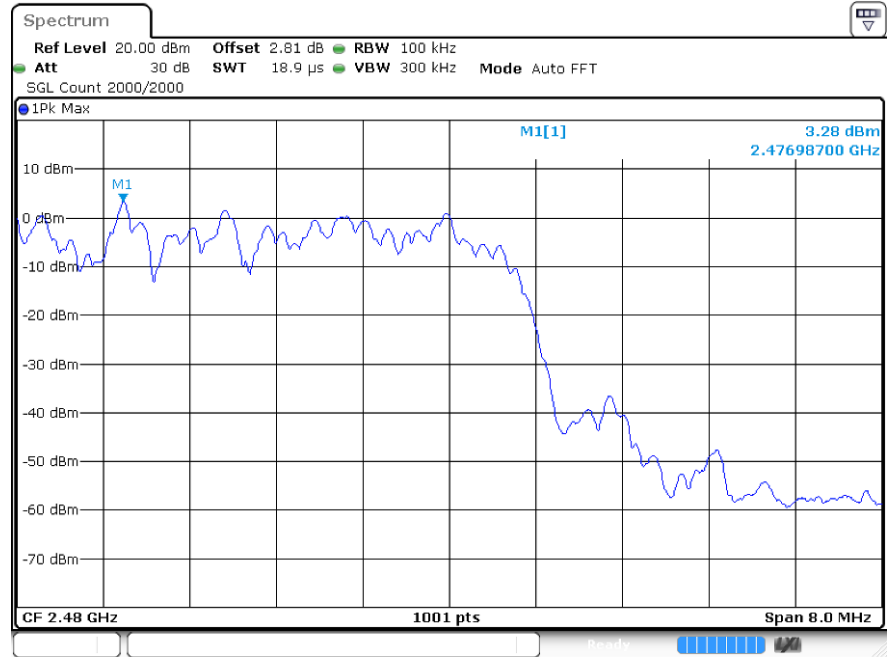
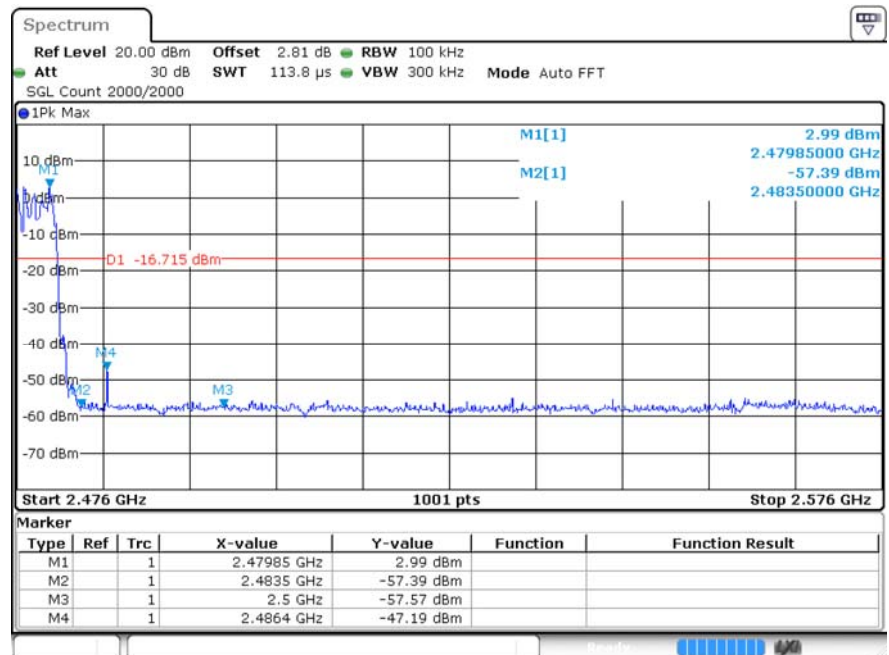
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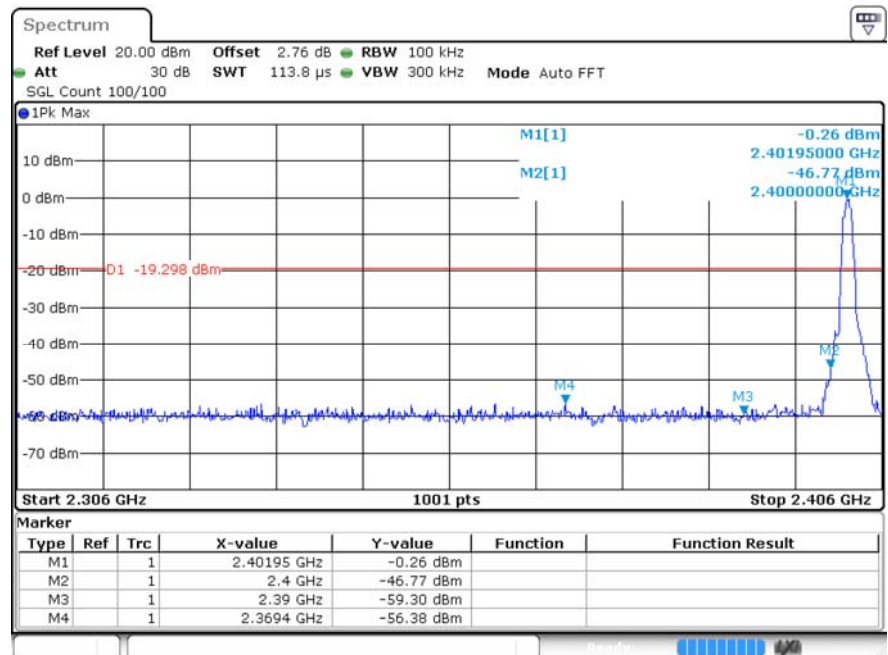

 $\pi/4$ DQPSK/LCH/Hop


Ref


 $\pi/4$ DQPSK/HCH/No
Hop


Ref

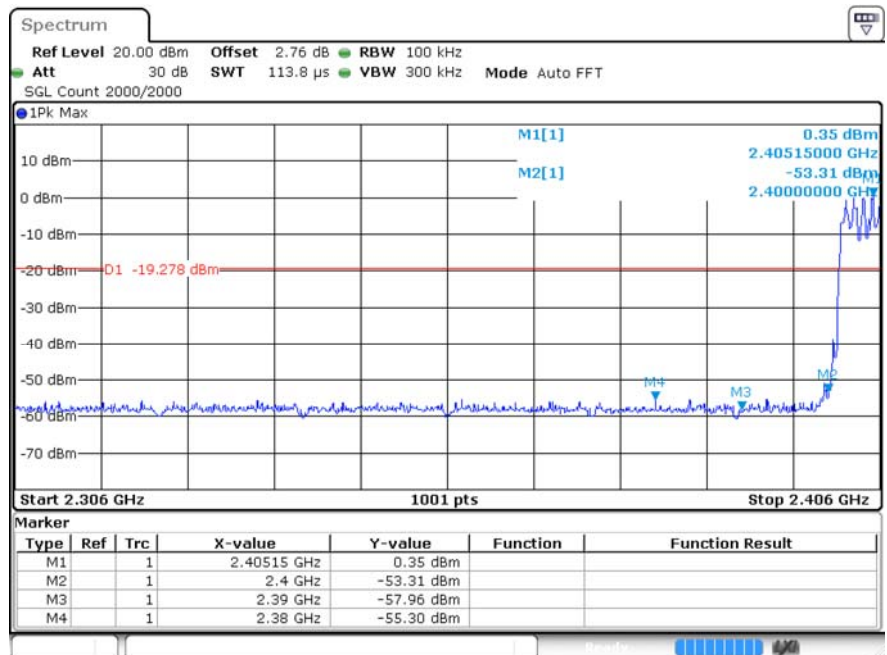

 $\pi/4$ DQPSK/HCH/Hop




Ref



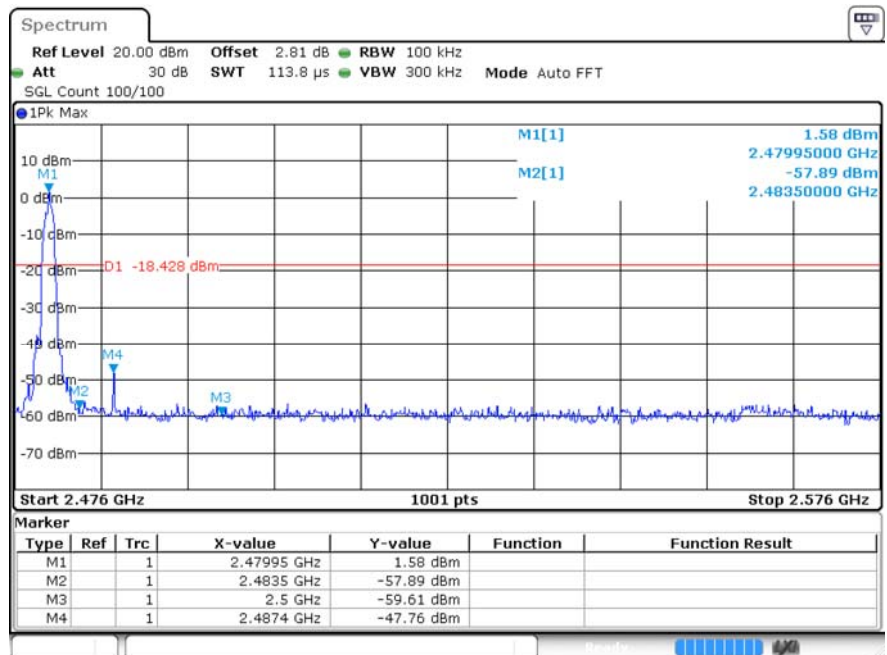
8DPSK/LCH/Hop



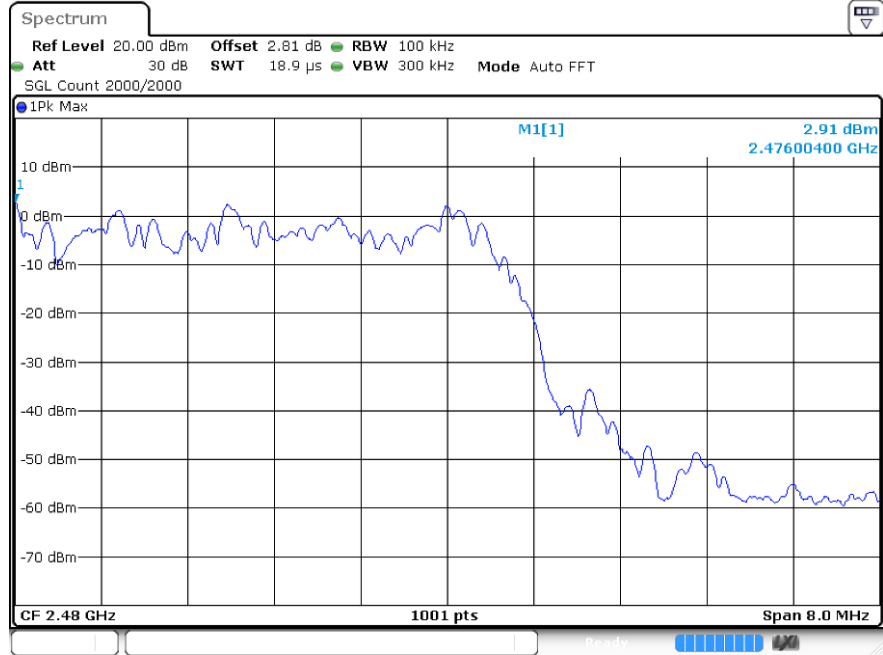
Ref



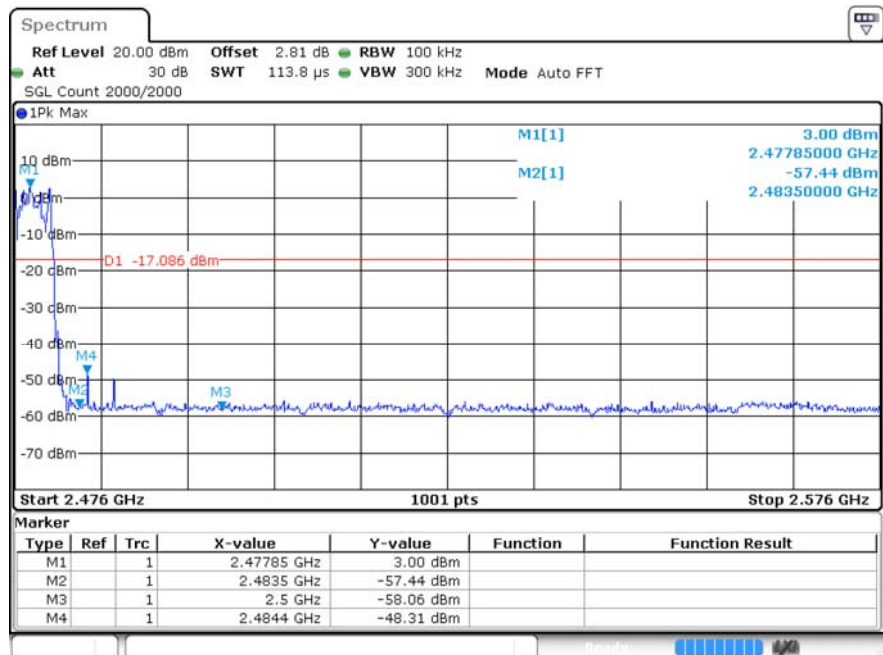
8DPSK/HCH/No Hop



Ref



8DPSK/HCH/Hop



9 Restrict-band band-edge measurements

9.1 Test Result

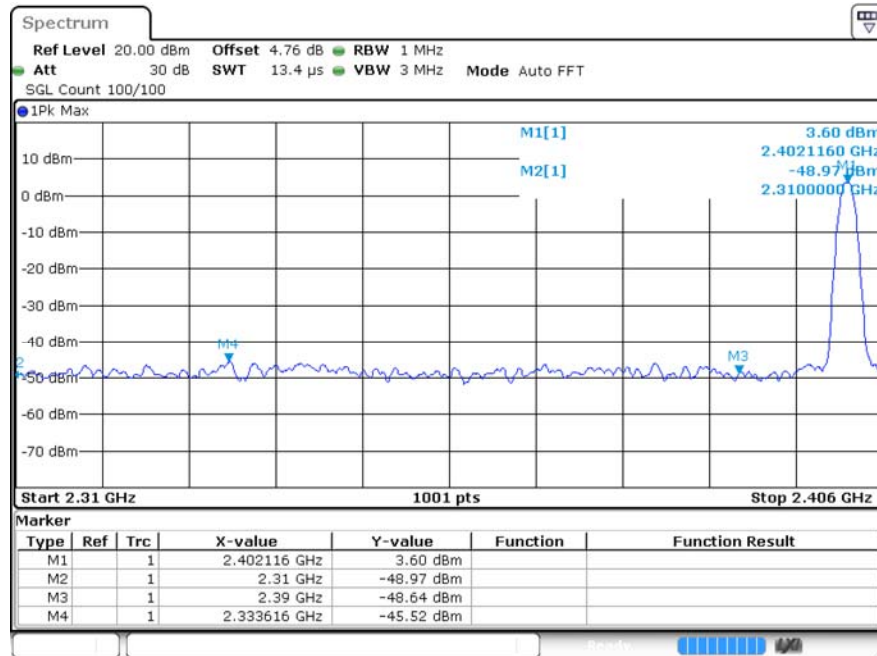
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.97	2	48.29	PEAK	74	Pass
	Off	2310.0	-56.82	2	40.44	AV	54	Pass
	Off	2333.616	-45.52	2	51.74	PEAK	74	Pass
	Off	2341.968	-54.77	2	42.49	AV	54	Pass
	Off	2390.0	-48.63	2	48.63	PEAK	74	Pass
	Off	2390.0	-56.66	2	40.6	AV	54	Pass
	Off	2483.5	-46.21	2	51.05	PEAK	74	Pass
	Off	2483.5	-54.39	2	42.87	AV	54	Pass
	Off	2487.352	-44.03	2	53.23	PEAK	74	Pass
	Off	2483.512	-54.39	2	42.87	AV	54	Pass
	Off	2500.0	-47.78	2	49.48	PEAK	74	Pass
	Off	2500.0	-56.26	2	41	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-49.07	2	48.19	PEAK	74	Pass
	Off	2310.0	-56.84	2	40.42	AV	54	Pass
	Off	2339.28	-45.94	2	51.32	PEAK	74	Pass
	Off	2342.064	-54.06	2	43.2	AV	54	Pass
	Off	2390.0	-48.02	2	49.24	PEAK	74	Pass
	Off	2390.0	-56.64	2	40.62	AV	54	Pass
	Off	2483.5	-48.15	2	49.11	PEAK	74	Pass
	Off	2483.5	-54.17	2	43.09	AV	54	Pass
	Off	2487.376	-44.24	2	53.02	PEAK	74	Pass
	Off	2483.512	-54.17	2	43.09	AV	54	Pass
	Off	2500.0	-48.3	2	48.96	PEAK	74	Pass
	Off	2500.0	-56.21	2	41.05	AV	54	Pass
8DPSK	Off	2310.0	-49.11	2	48.15	PEAK	74	Pass
	Off	2310.0	-56.41	2	40.85	AV	54	Pass
	Off	2376.528	-45.31	2	51.95	PEAK	74	Pass
	Off	2342.256	-54.27	2	42.99	AV	54	Pass



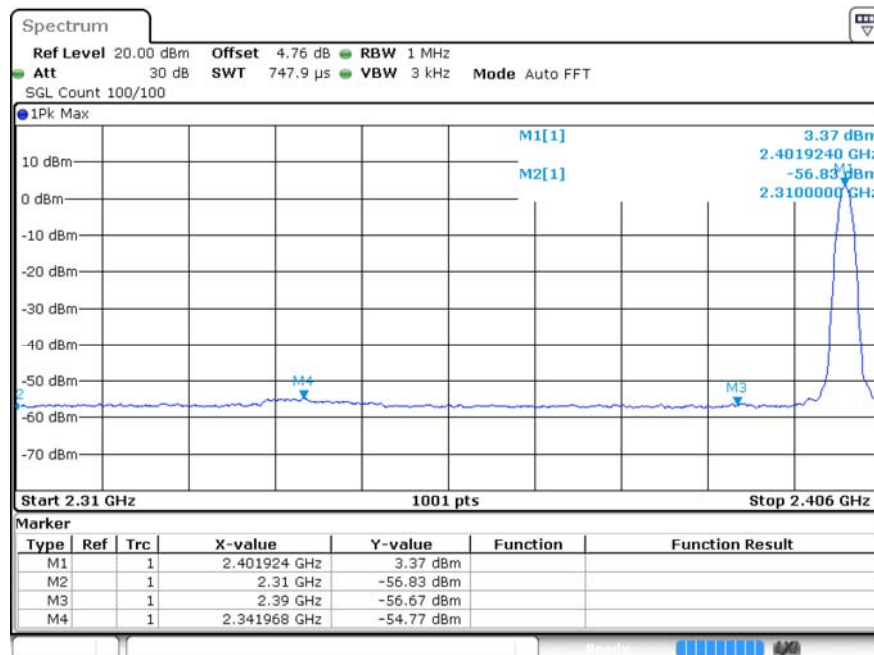
	Off	2390.0	-48.67	2	48.59	PEAK	74	Pass
	Off	2390.0	-56.45	2	40.81	AV	54	Pass
	Off	2483.5	-47.64	2	49.62	PEAK	74	Pass
	Off	2483.5	-53.73	2	43.53	AV	54	Pass
	Off	2486.968	-43.43	2	53.83	PEAK	74	Pass
	Off	2483.56	-53.69	2	43.57	AV	54	Pass
	Off	2500.0	-46.76	2	50.5	PEAK	74	Pass
	Off	2500.0	-56.22	2	41.04	AV	54	Pass

9.2 Test Graphs

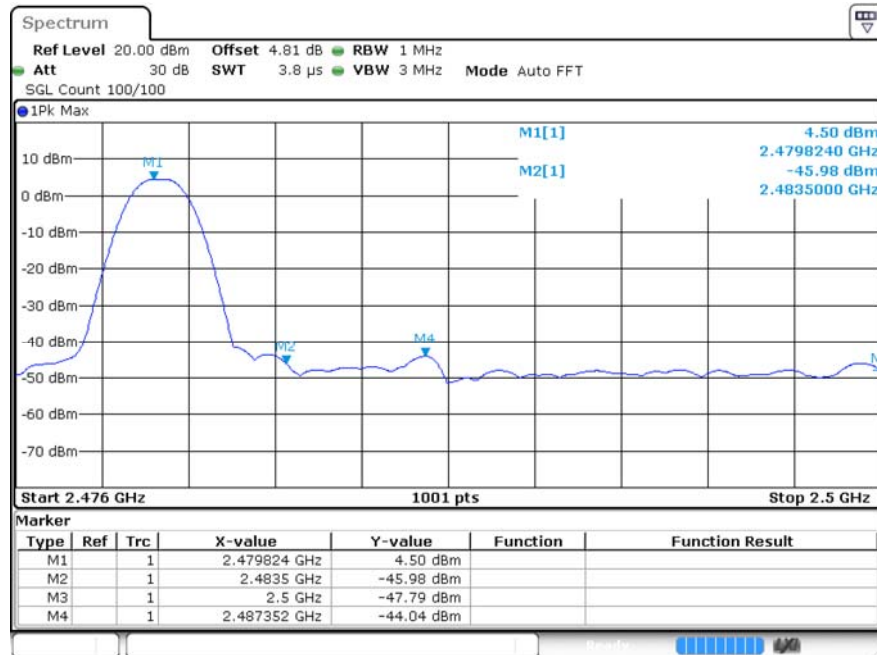
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



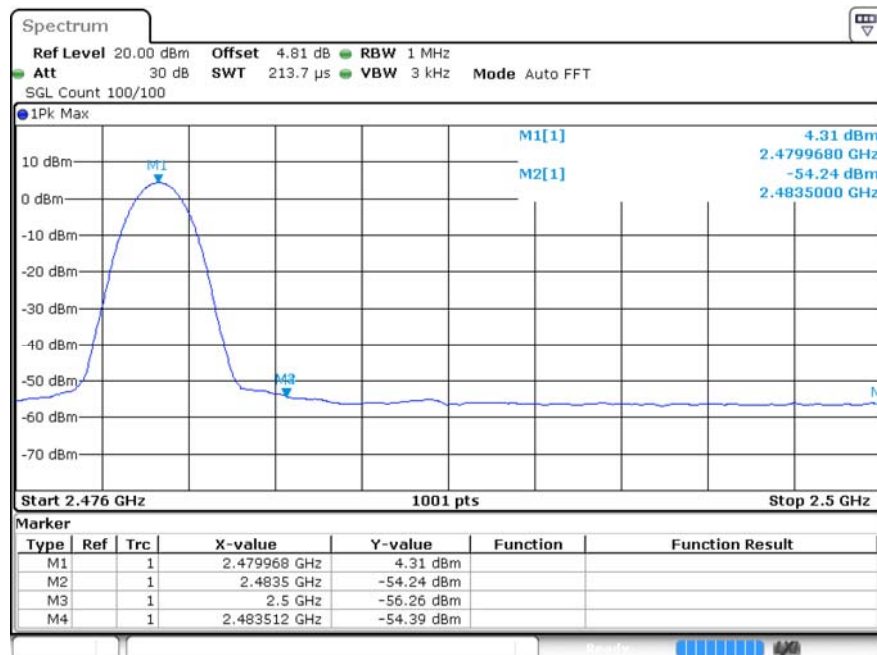
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



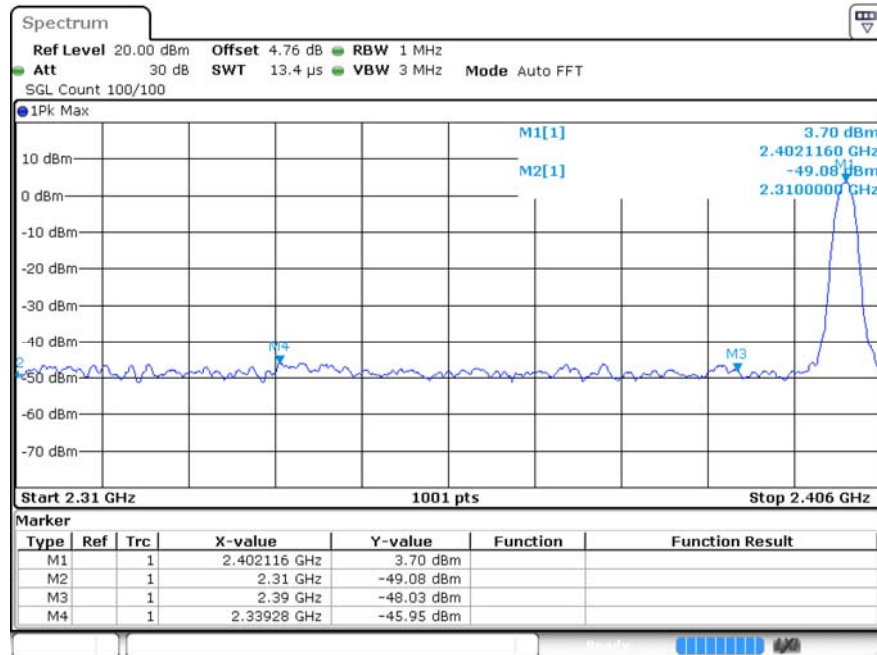
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



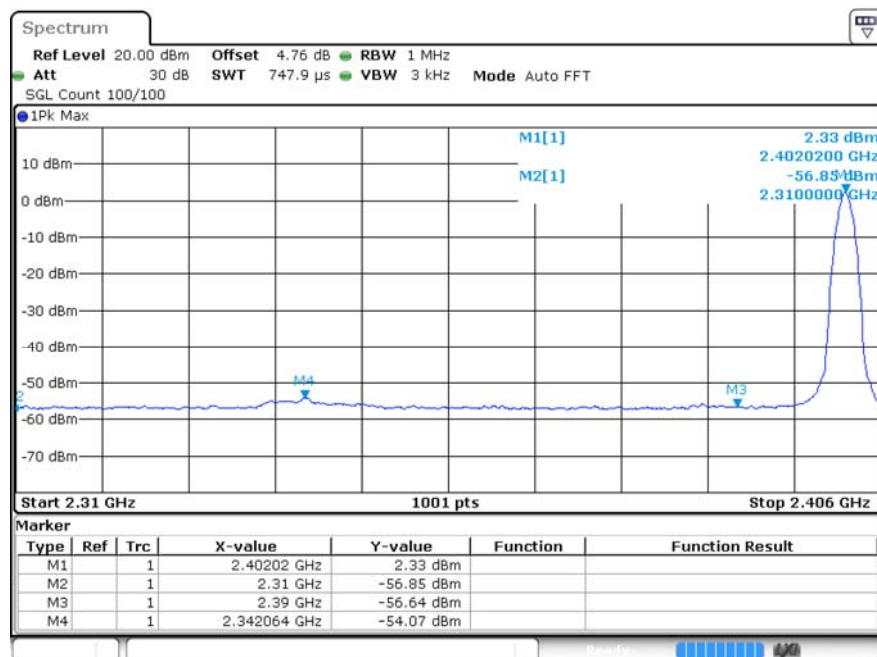
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



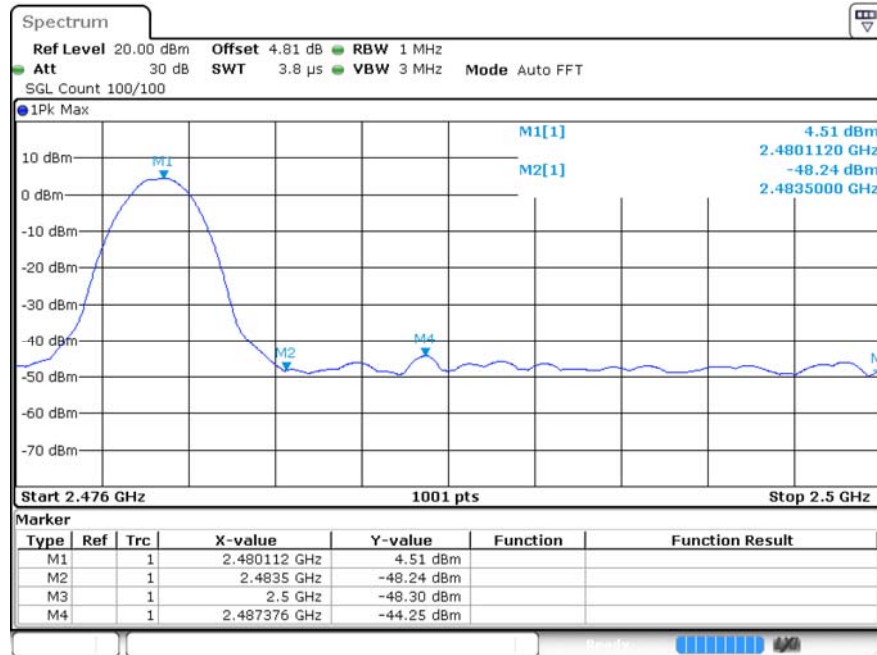
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



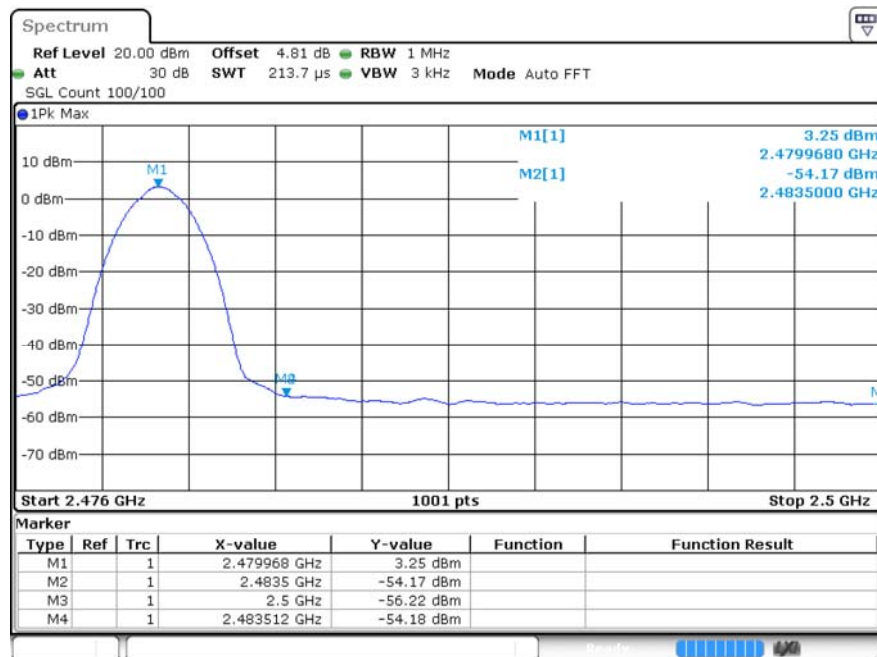
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



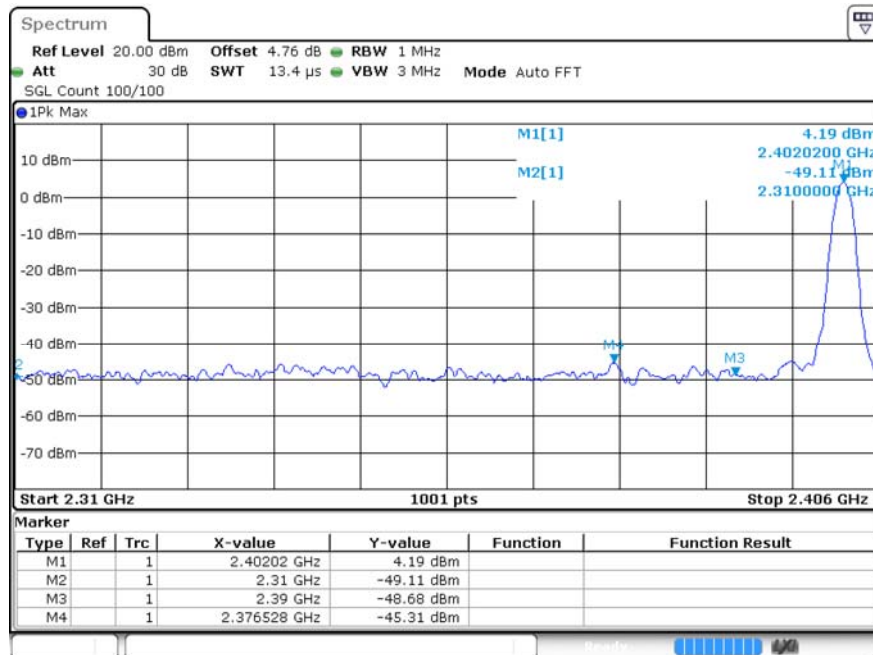
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



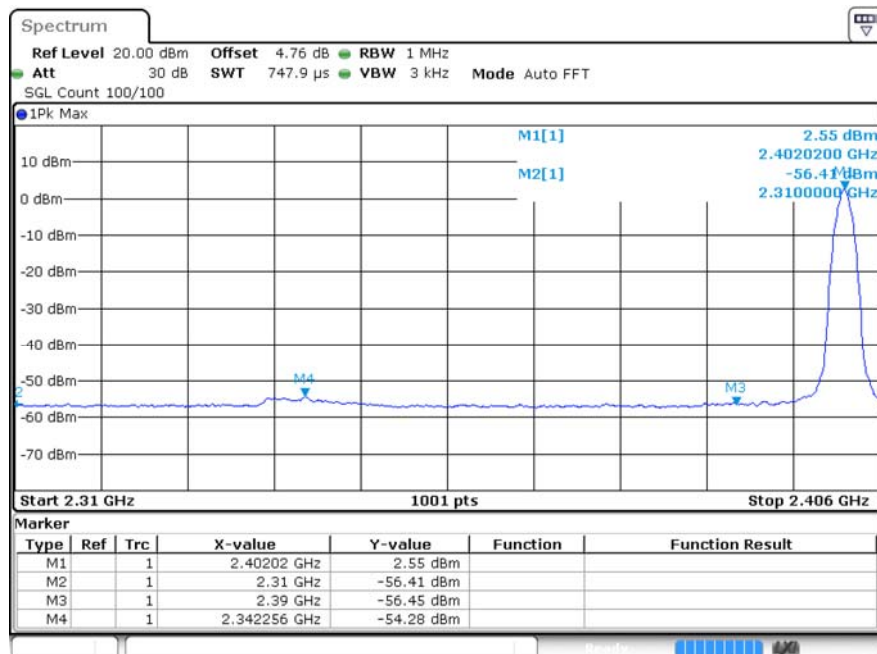
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



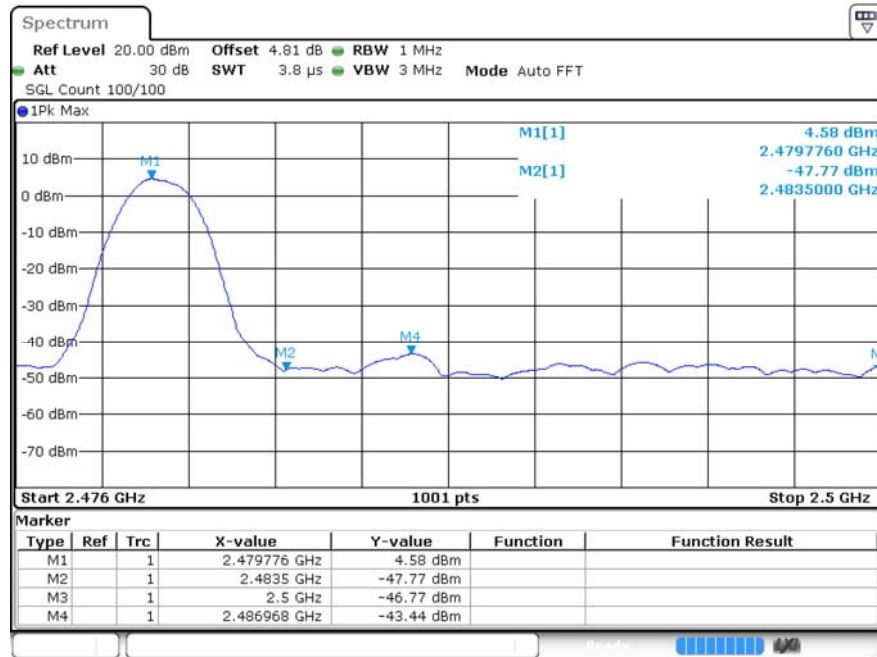
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



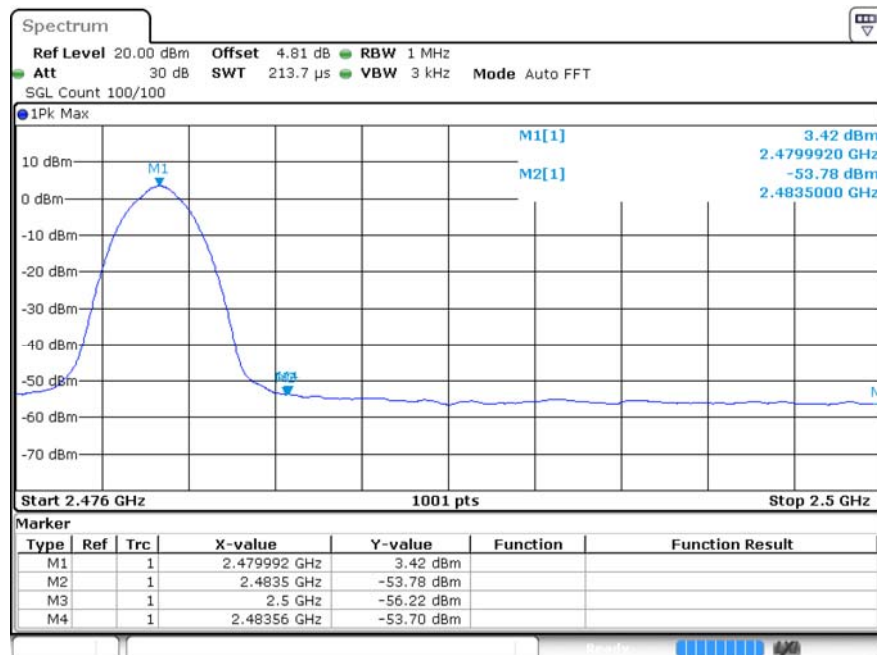
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



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



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



---The End---