

Appendix A

RF Test Data for BR_EDR

(Conducted Measurement)

Product Name: Cloud Speaker

Test Model: CS20-1

Environmental Conditions

Temperature:	24.6℃
Relative Humidity:	51.4%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



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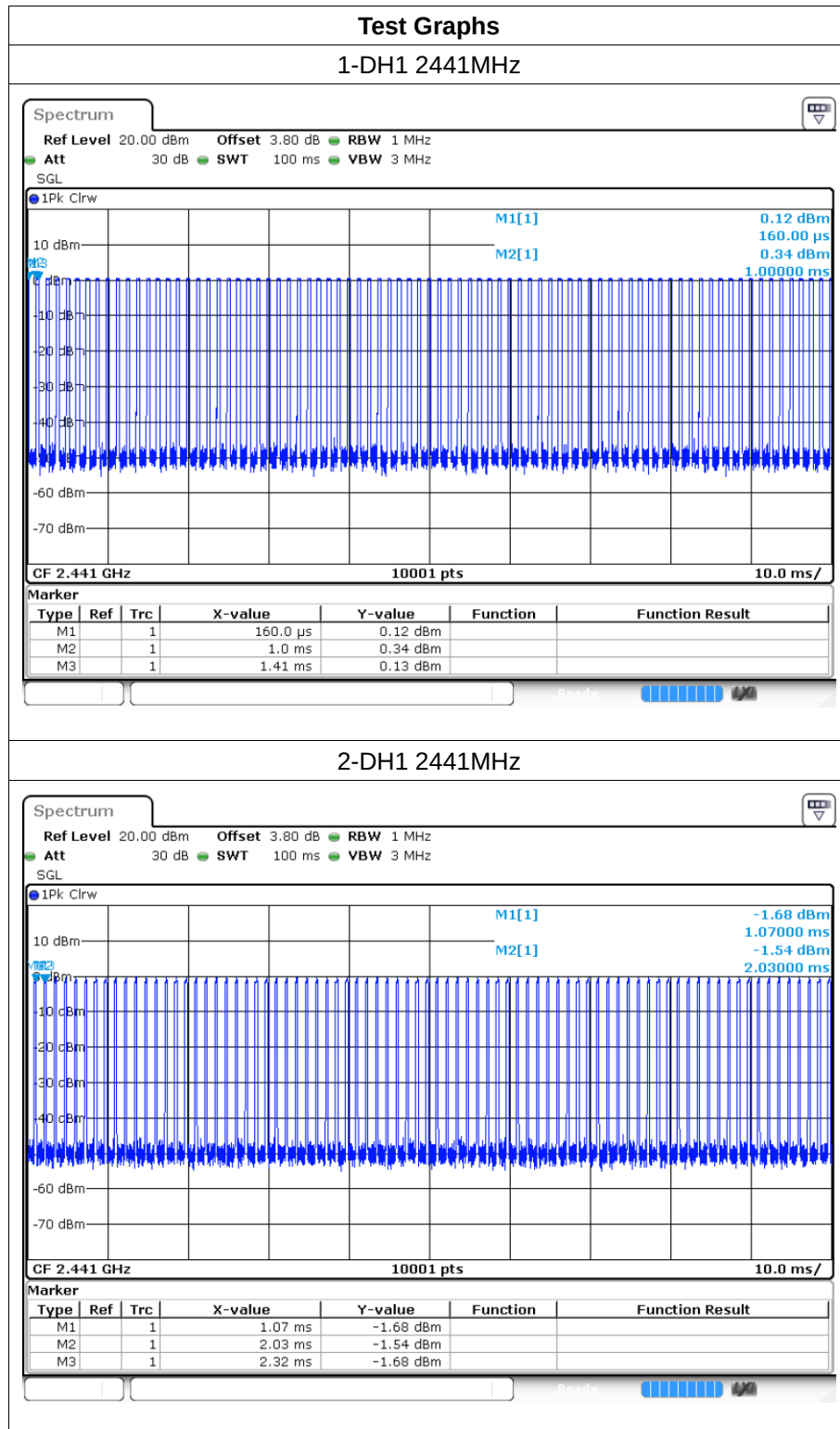
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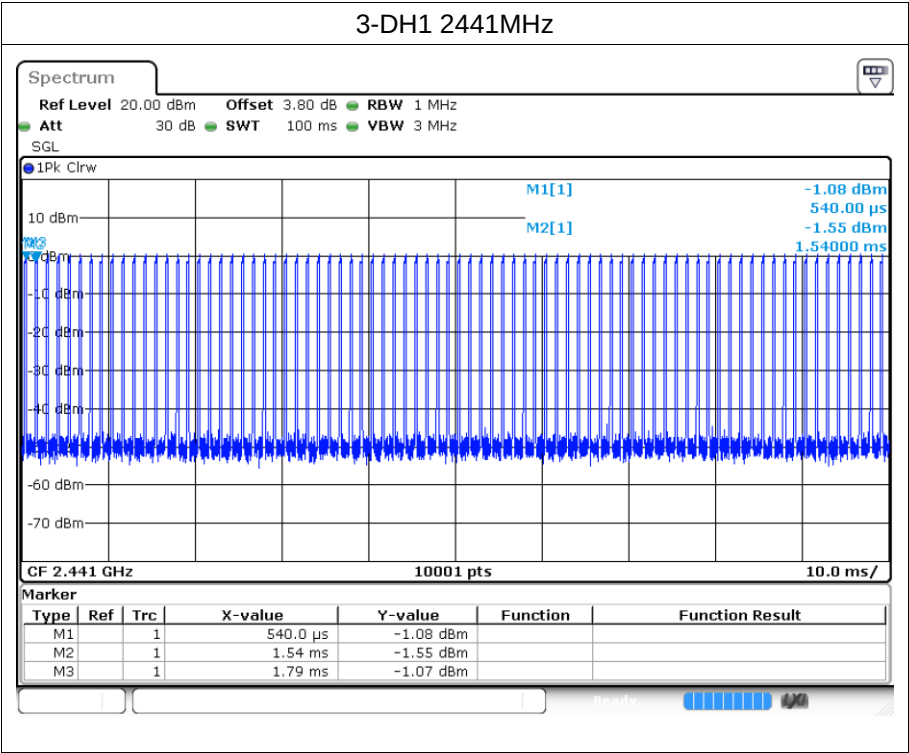
1 .Duty Cycle

1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2441	33.61	2.44
2-DH1	2441	24	3.45
3-DH1	2441	20.8	4

1.2 Test Graphs



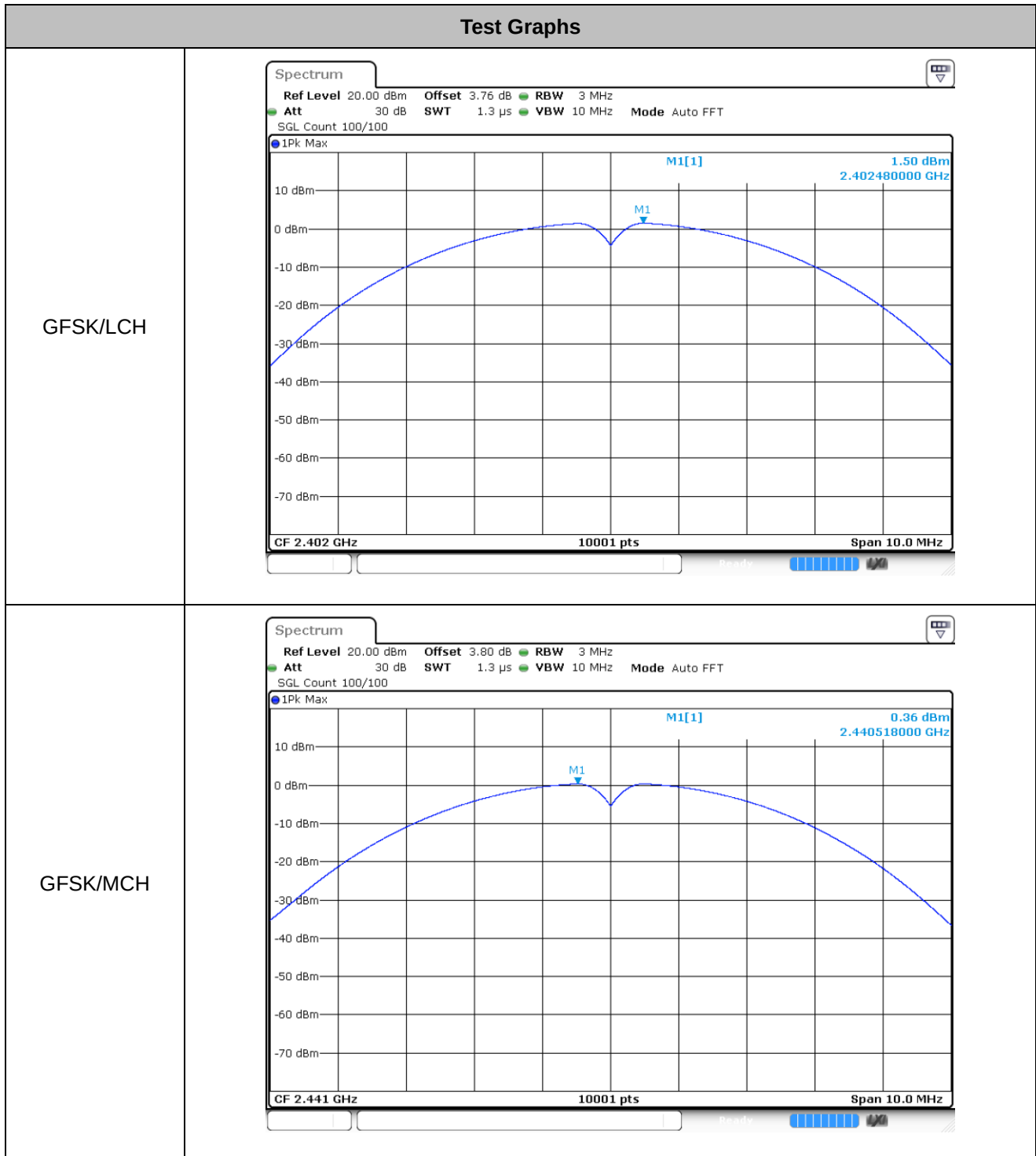


2 Maximum Conducted Peak Output Power

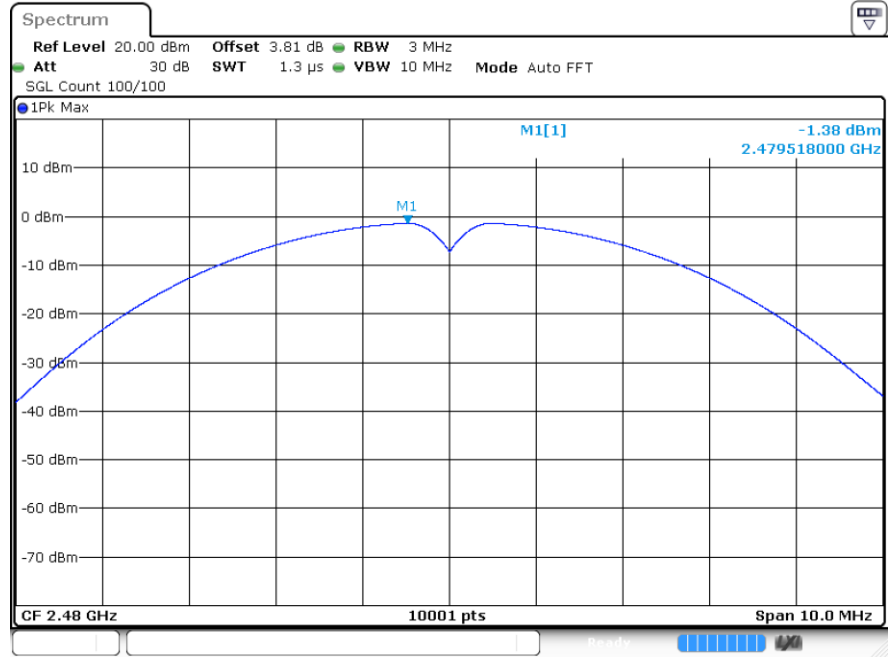
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.5	≤ 21	Pass
	MCH	0.36	≤ 21	Pass
	HCH	-1.38	≤ 21	Pass
$\pi/4$ DQPSK	LCH	1.2	≤ 21	Pass
	MCH	-0.37	≤ 21	Pass
	HCH	-1.71	≤ 21	Pass
8DPSK	LCH	2.16	≤ 21	Pass
	MCH	-1.28	≤ 21	Pass
	HCH	-2.11	≤ 21	Pass

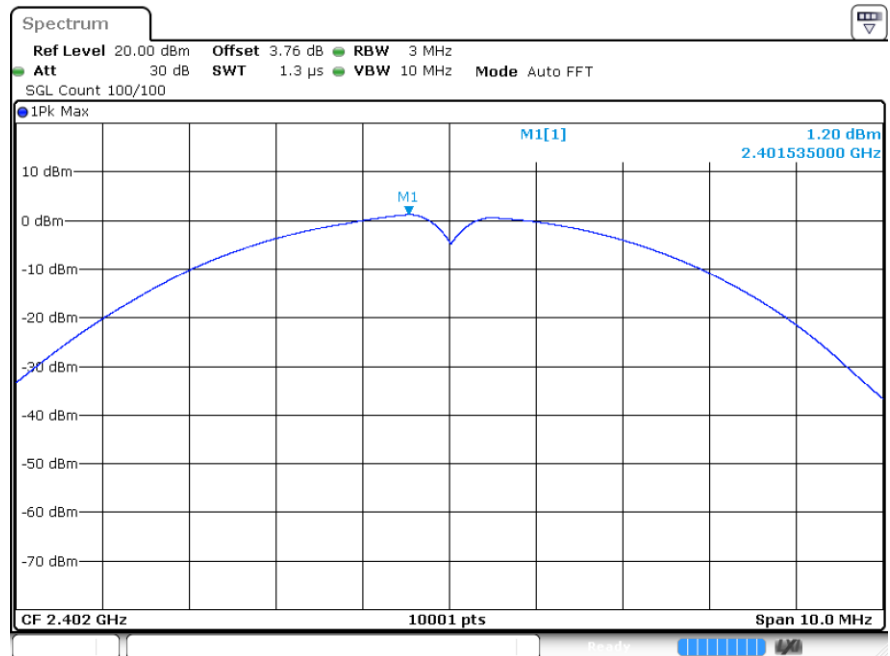
2.2 Test Graphs



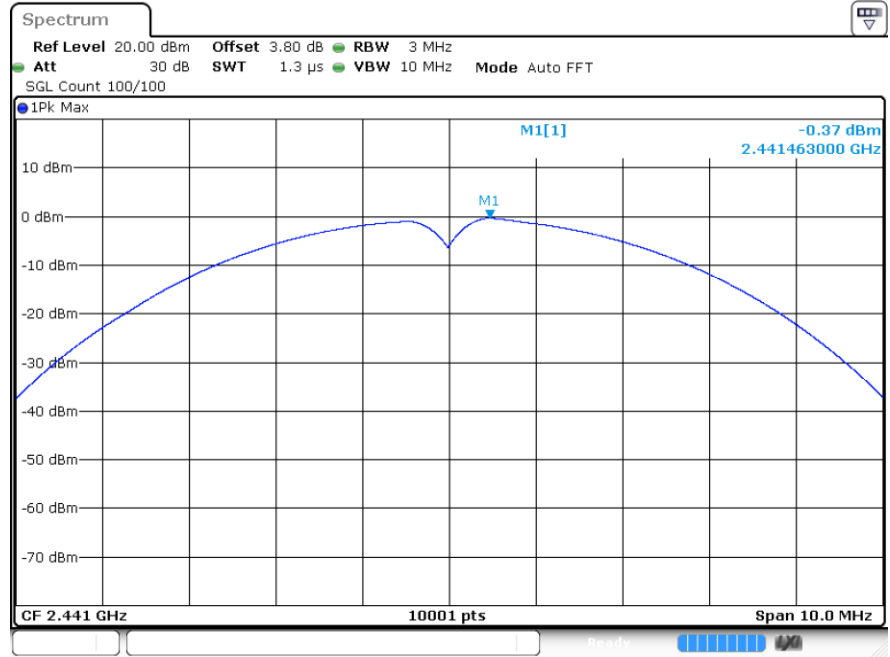
GFSK/HCH



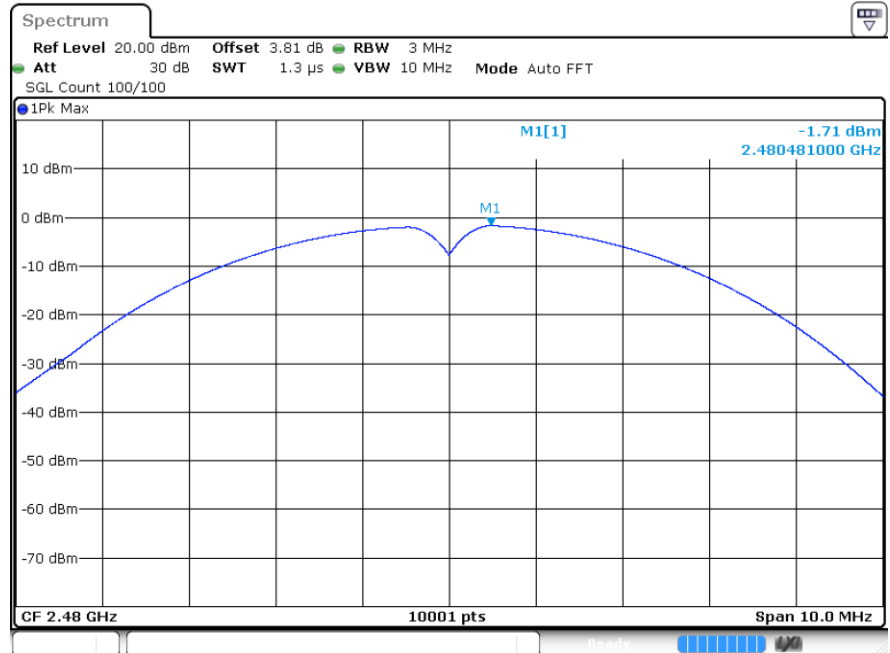
$\pi/4$ DQPSK/LCH



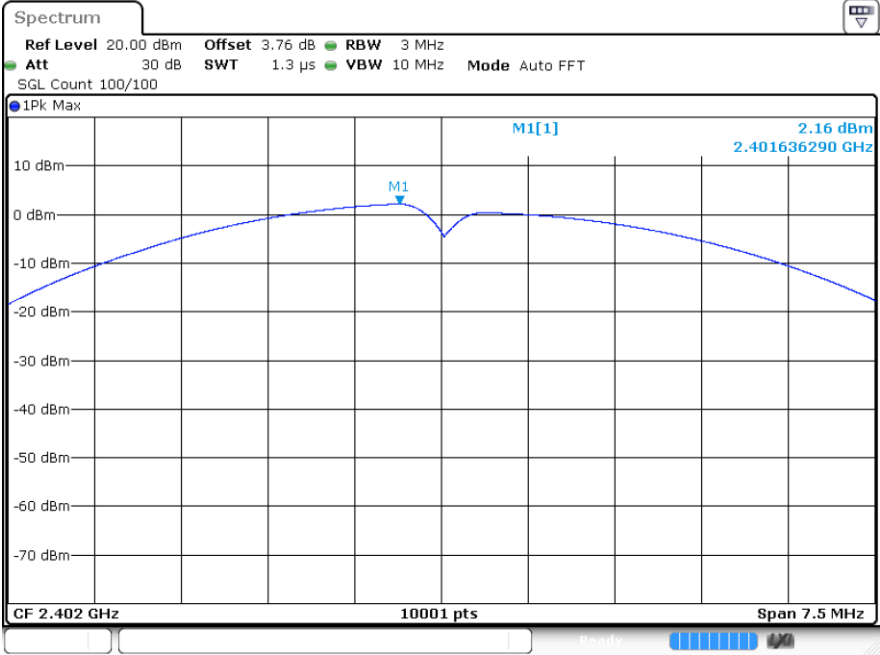
$\pi/4$ DQPSK/MC
H



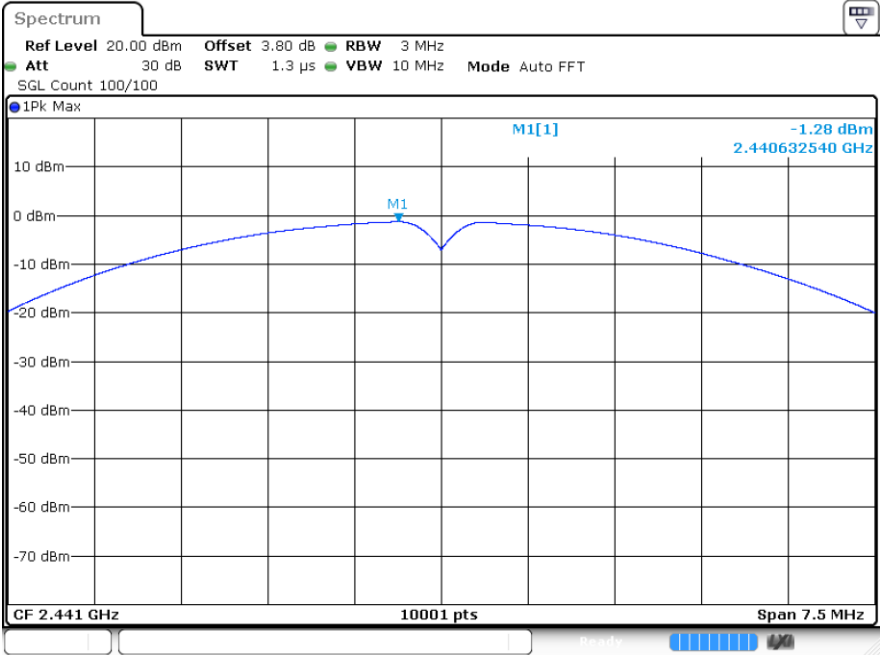
$\pi/4$ DQPSK/HCH



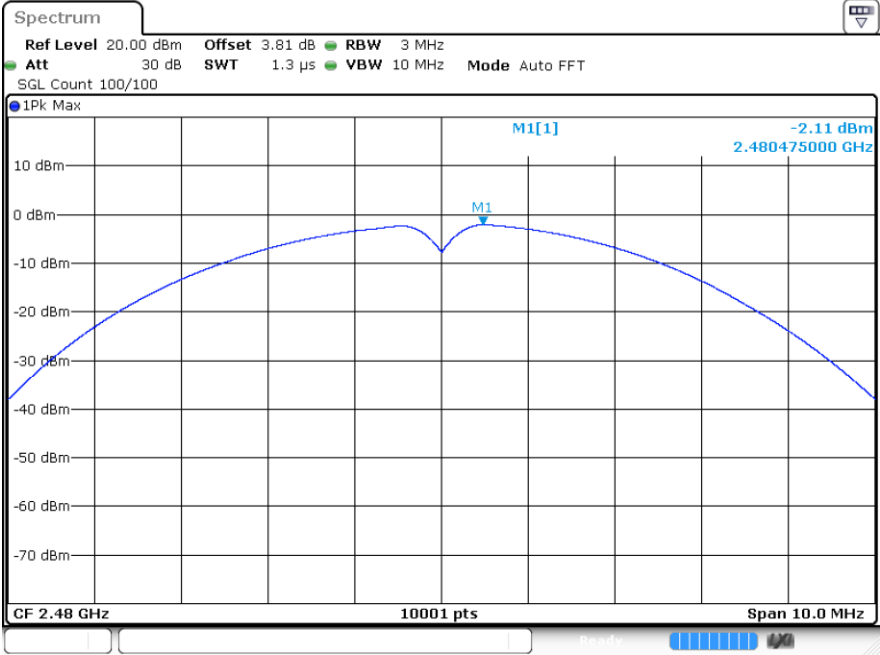
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

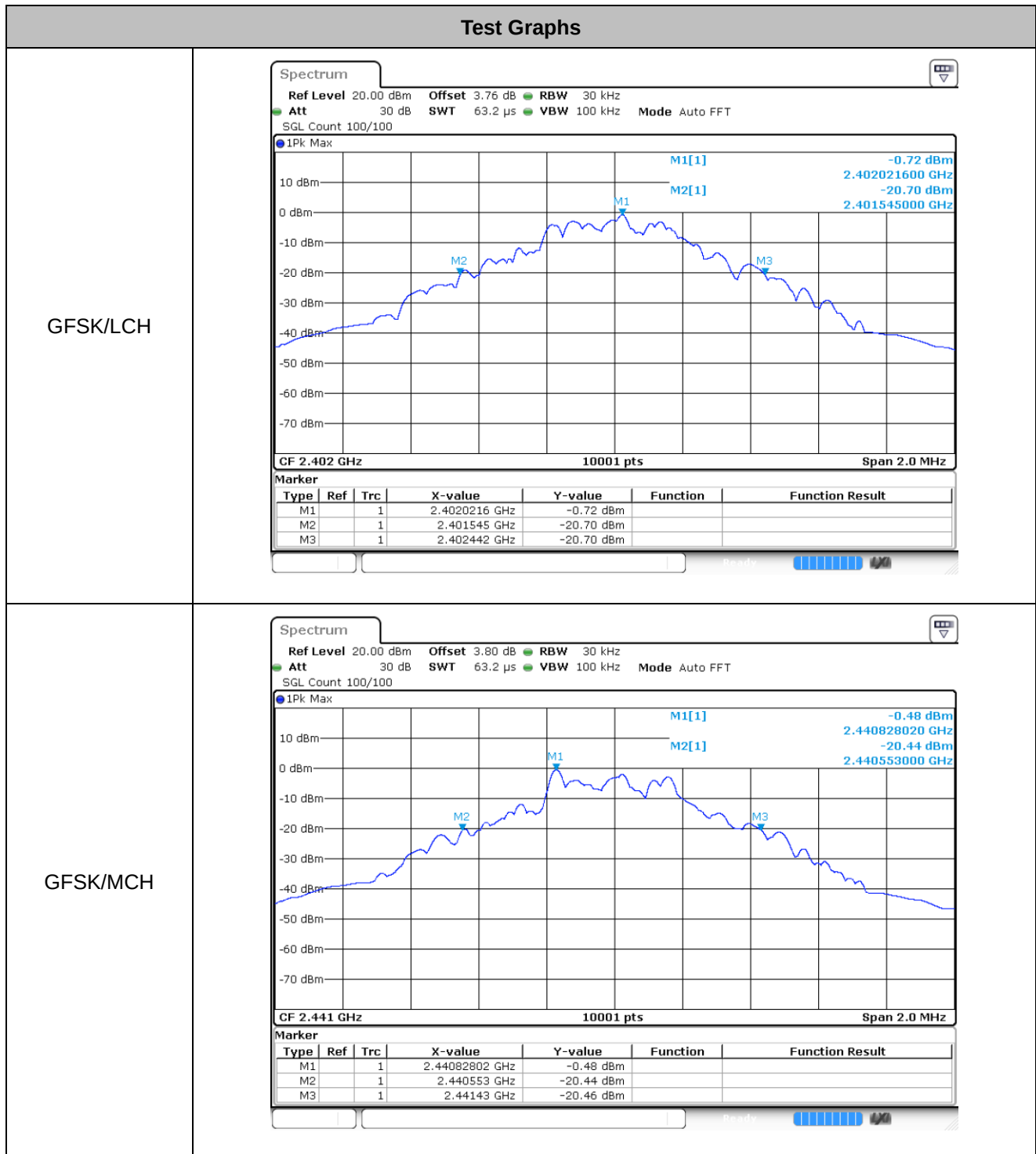


3 20dB Bandwidth

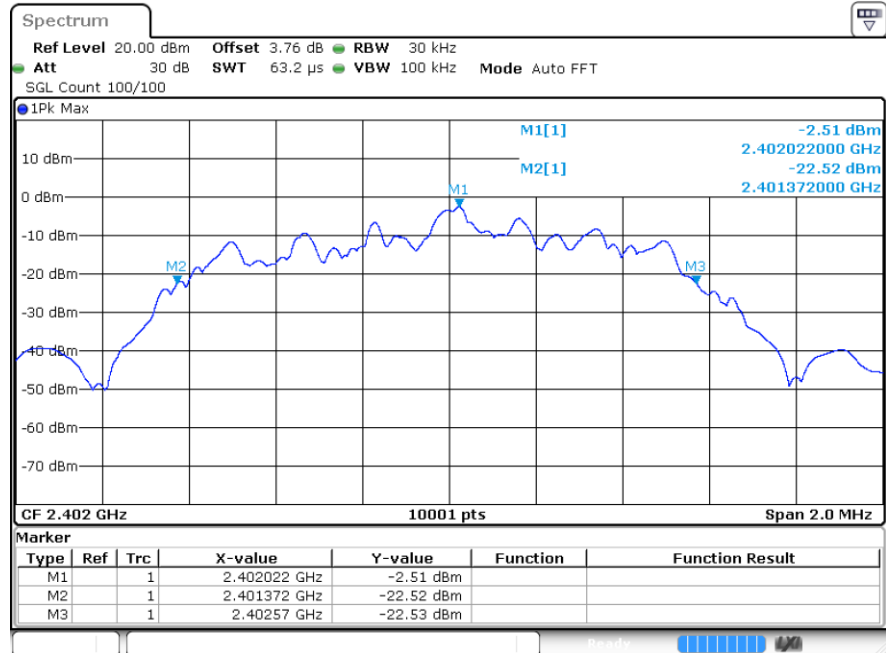
3.1 Test Result

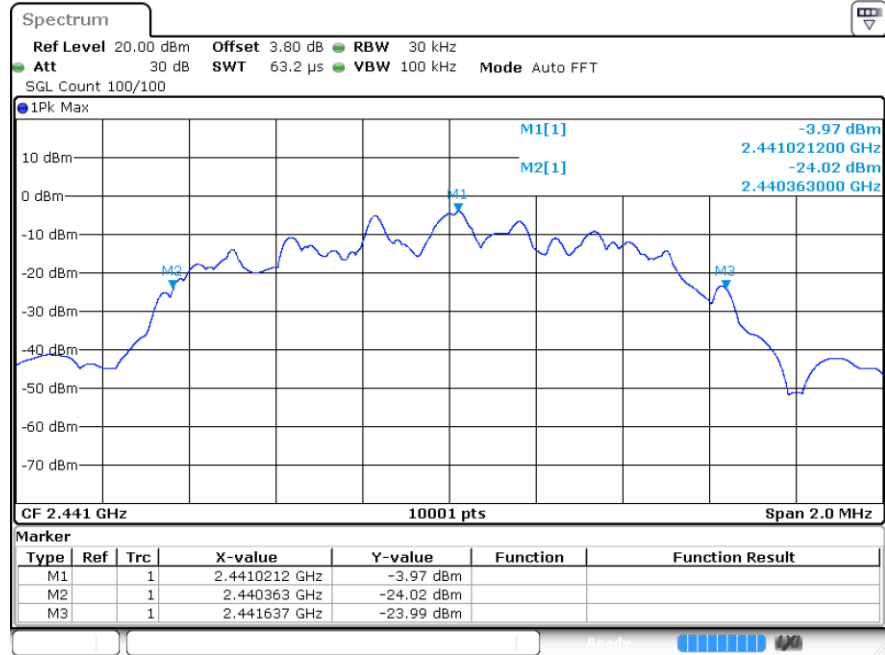
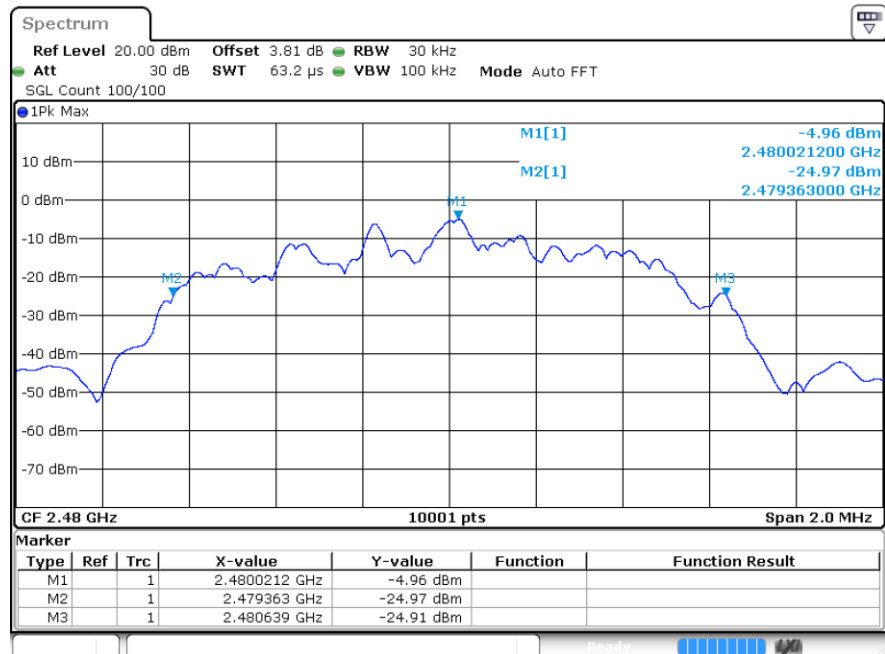
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.897	Not Specified	Pass
	MCH	0.878	Not Specified	Pass
	HCH	0.818	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.198	Not Specified	Pass
	MCH	1.274	Not Specified	Pass
	HCH	1.276	Not Specified	Pass
8DPSK	LCH	1.239	Not Specified	Pass
	MCH	1.196	Not Specified	Pass
	HCH	1.237	Not Specified	Pass

3.2 Test Graphs

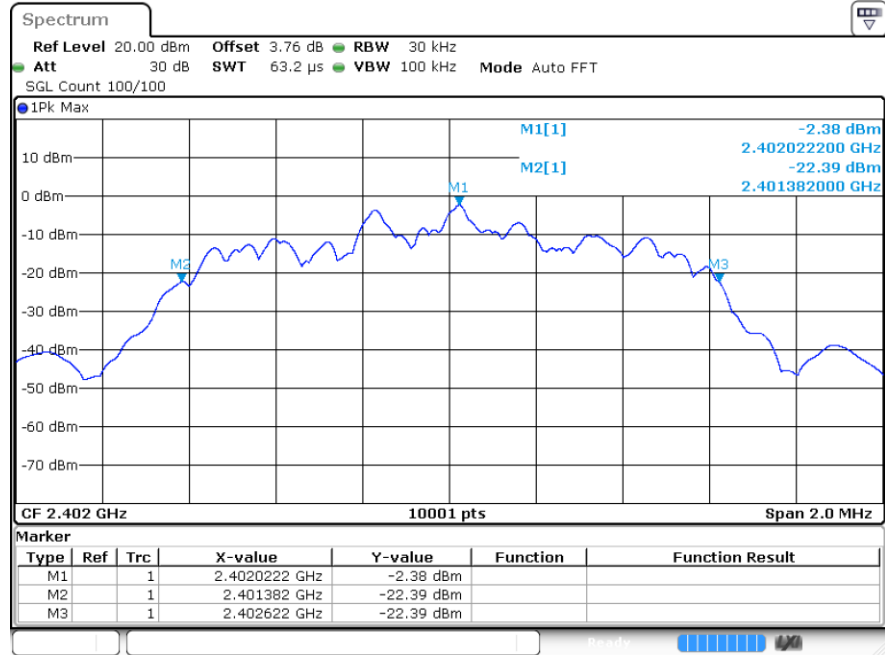


GFSK/HCH

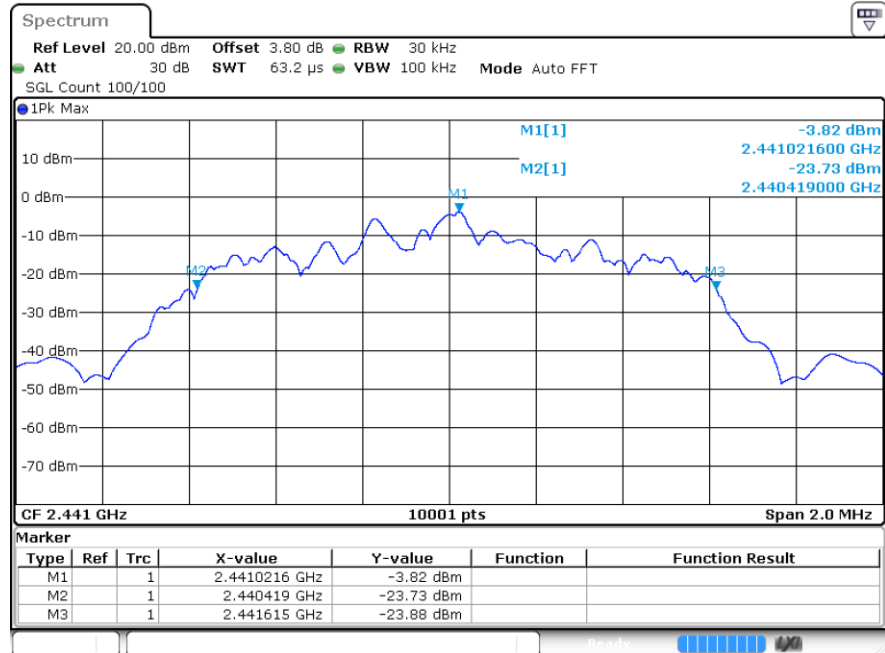

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


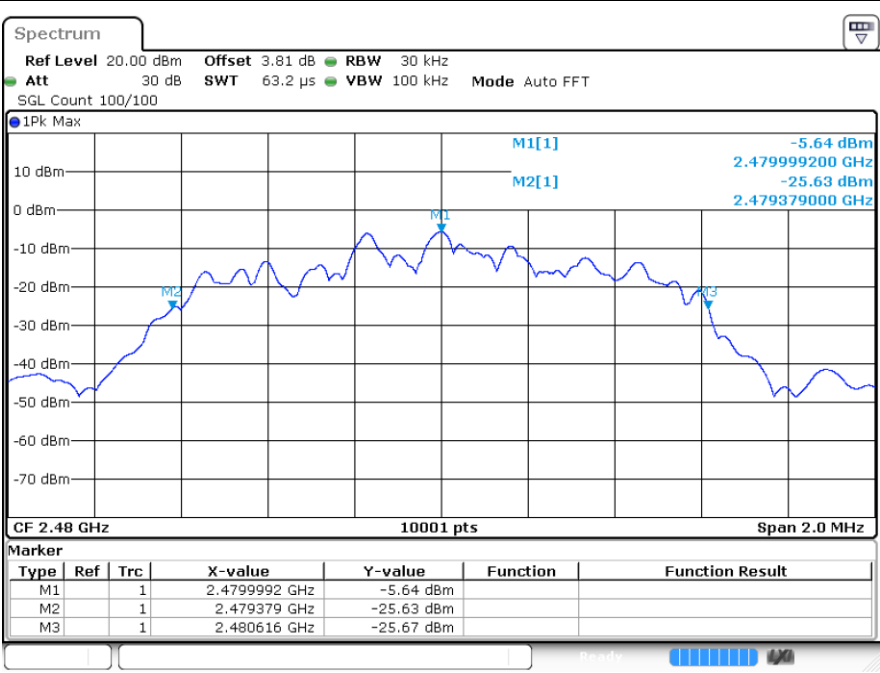
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

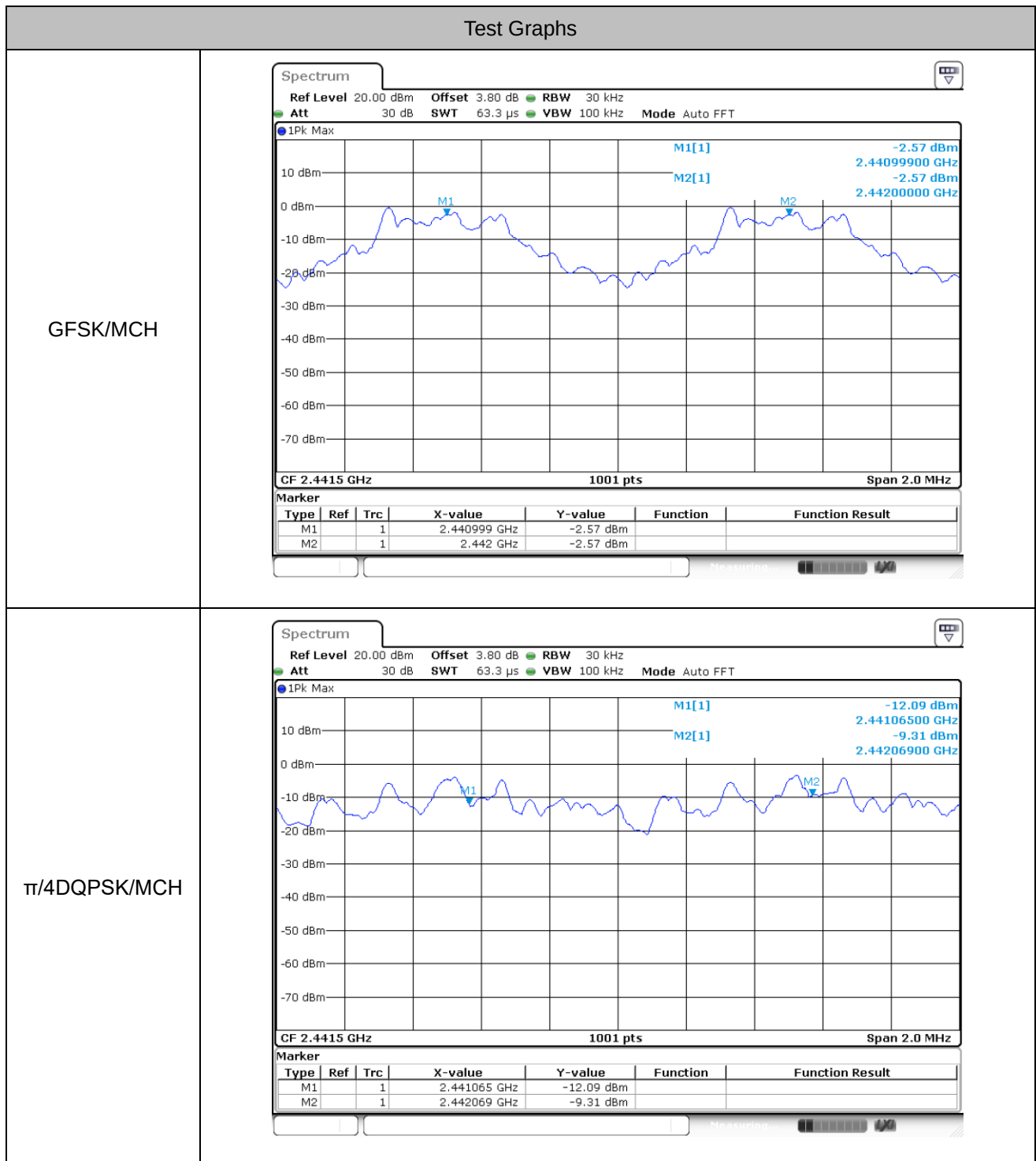


4 Carrier Frequency Separation

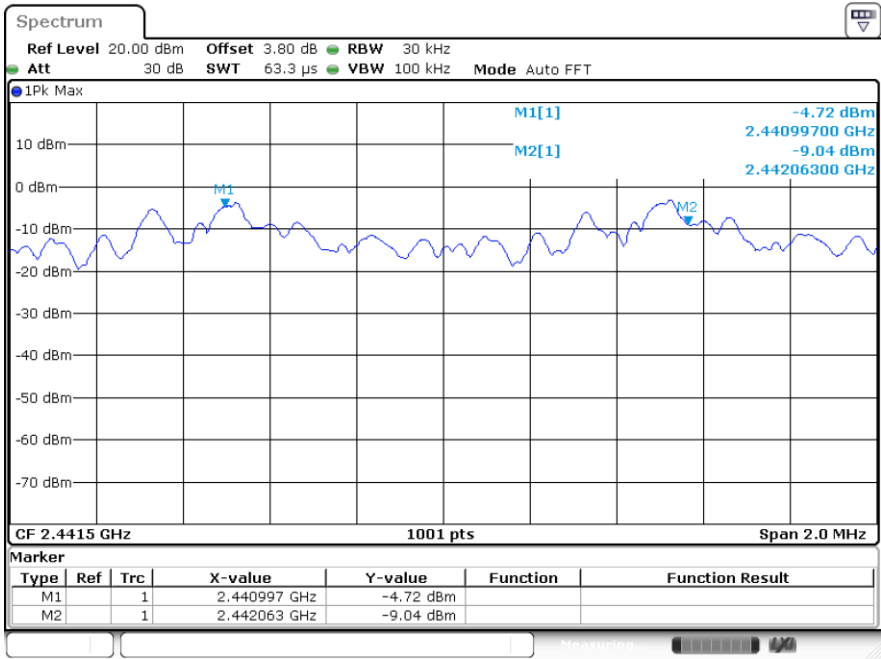
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.585	Pass
$\pi/4$ DQPSK	MCH	1.004	0.849	Pass
8DPSK	MCH	1.066	0.797	Pass

4.2 Test Graphs



8DPSK/MCH

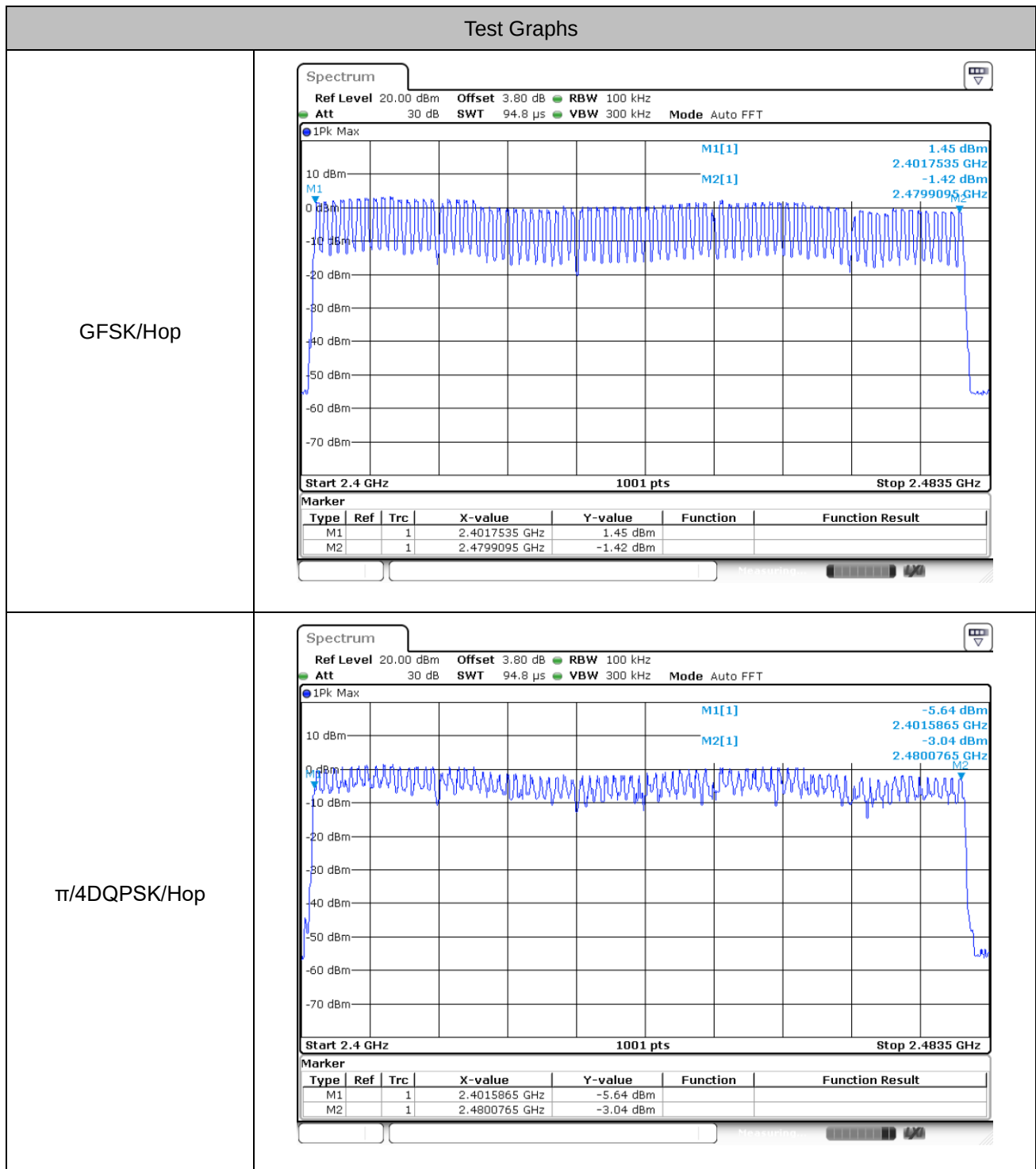


5 Hopping Channel Number

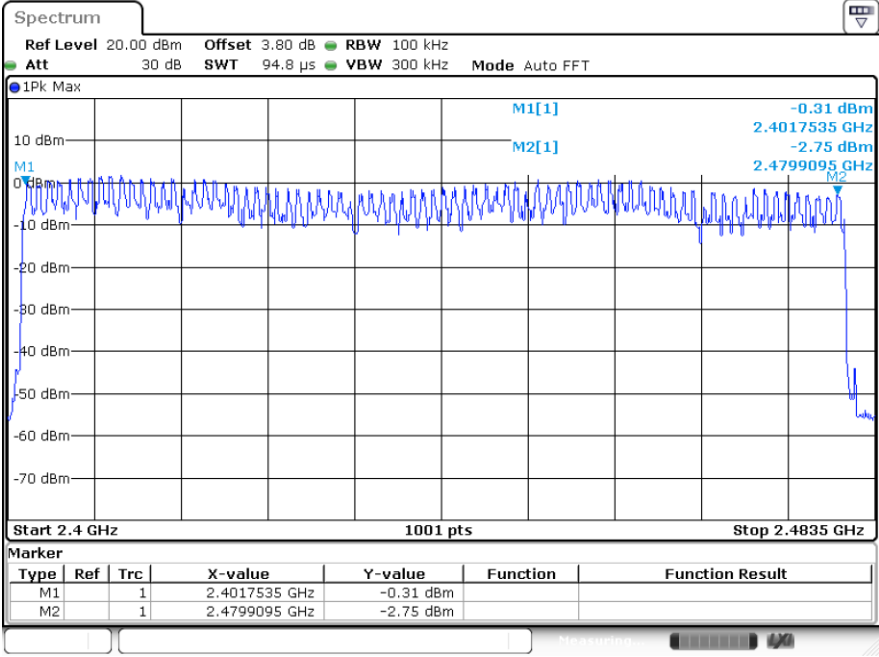
5.1 Test Result

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

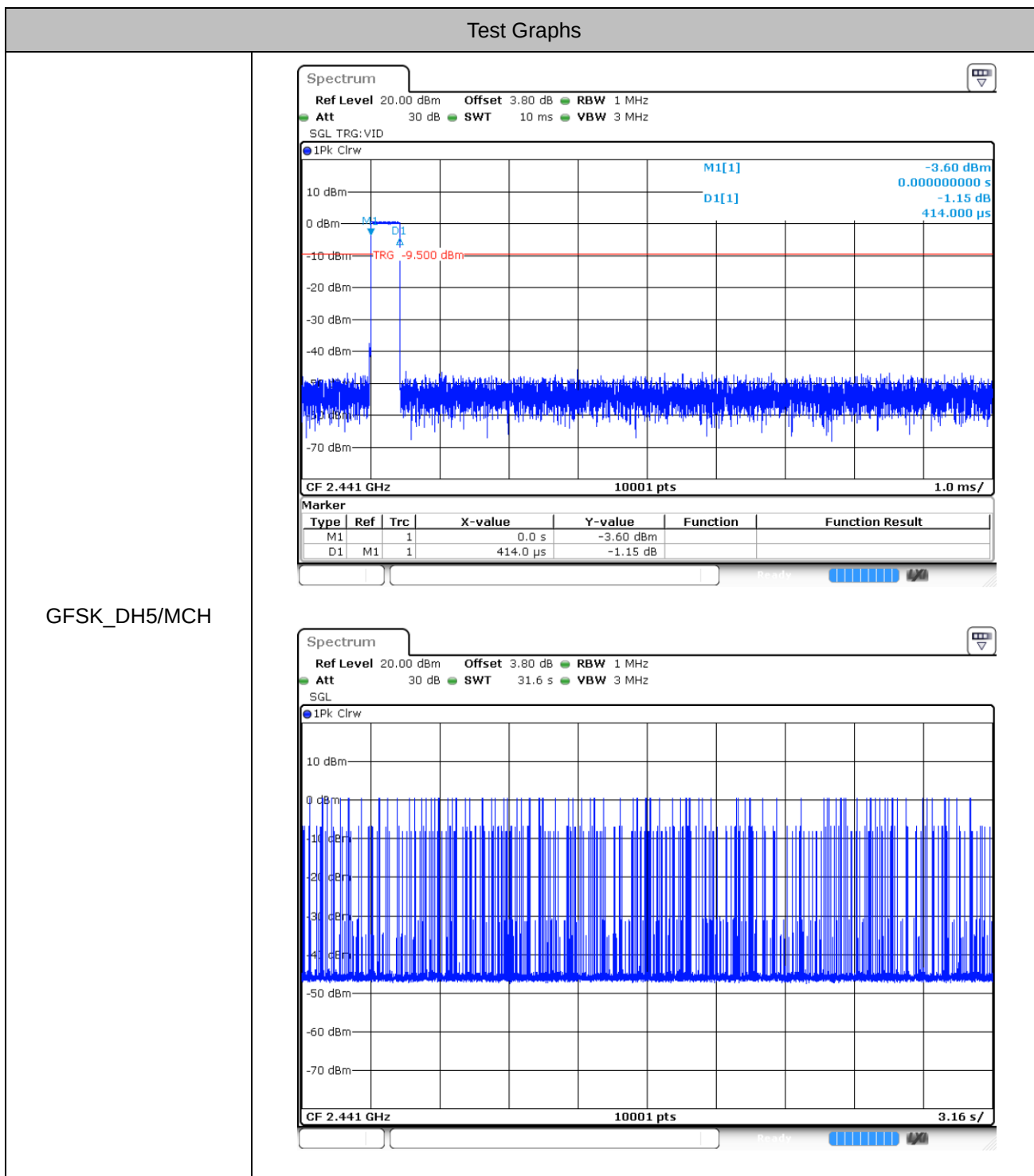


6 Dwell Time

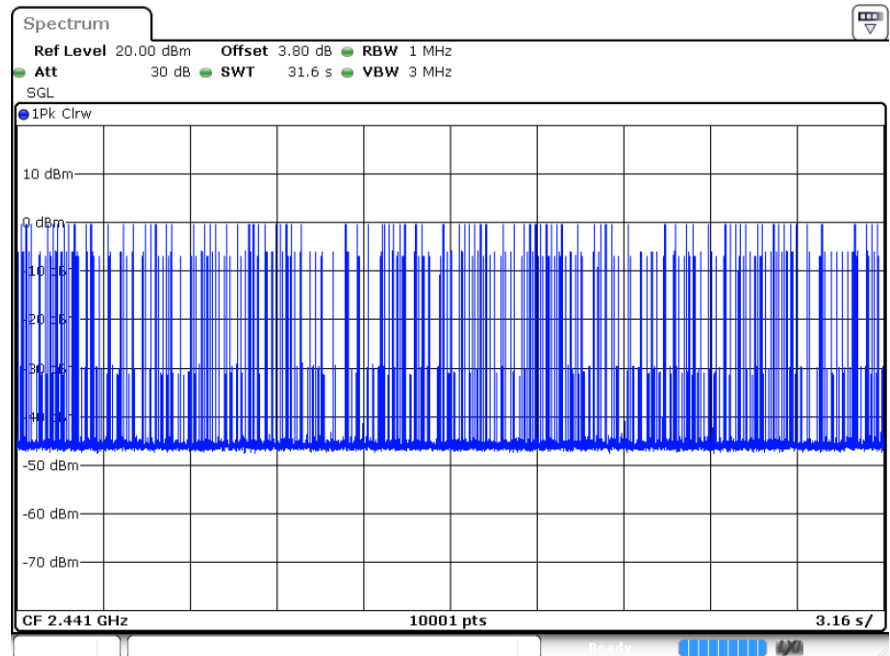
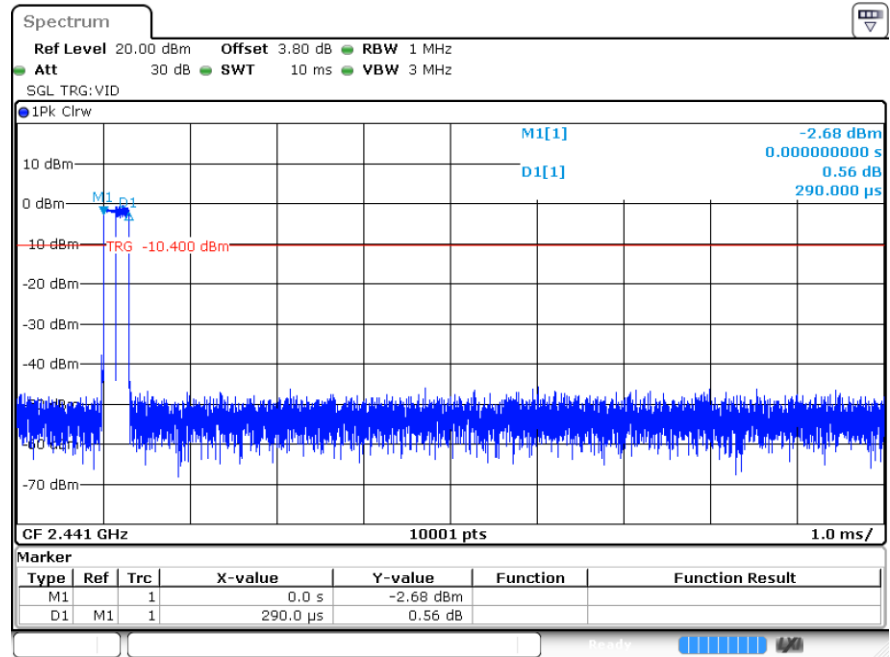
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	0.414	108	44.712	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	0.29	116	33.64	0.4	Pass
8DPSK	3DH5	MCH	0.246	99	24.354	0.4	Pass

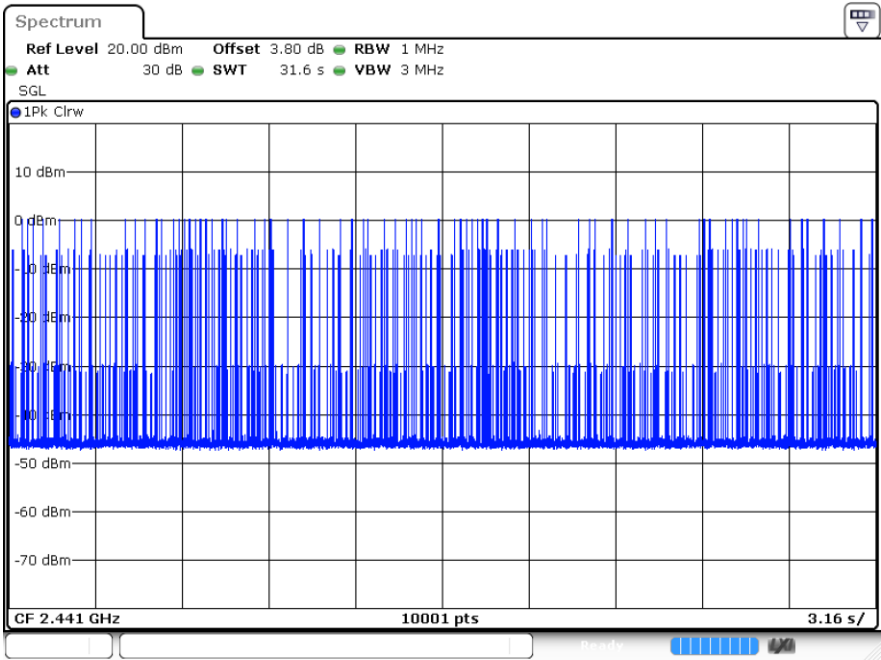
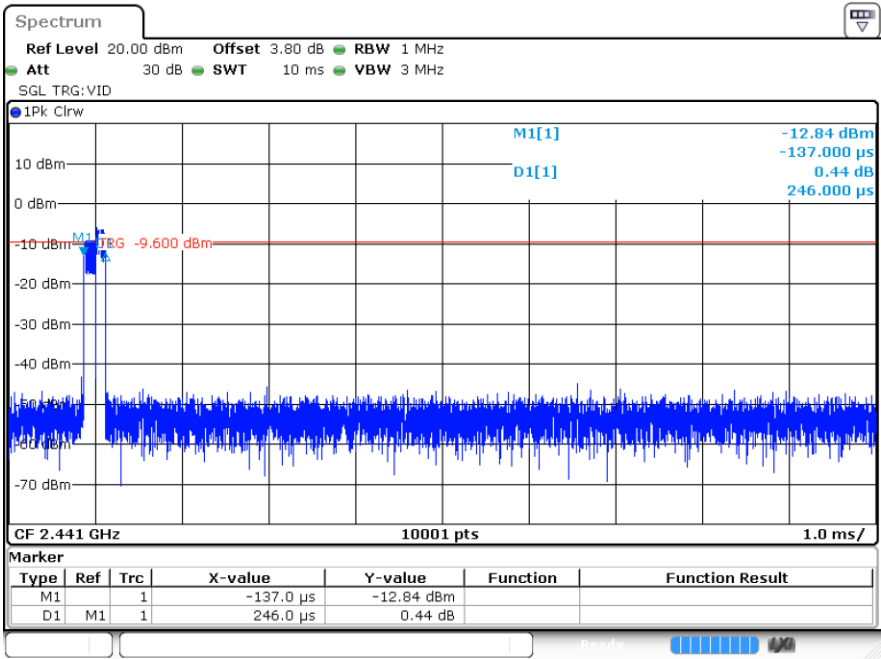
6.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH

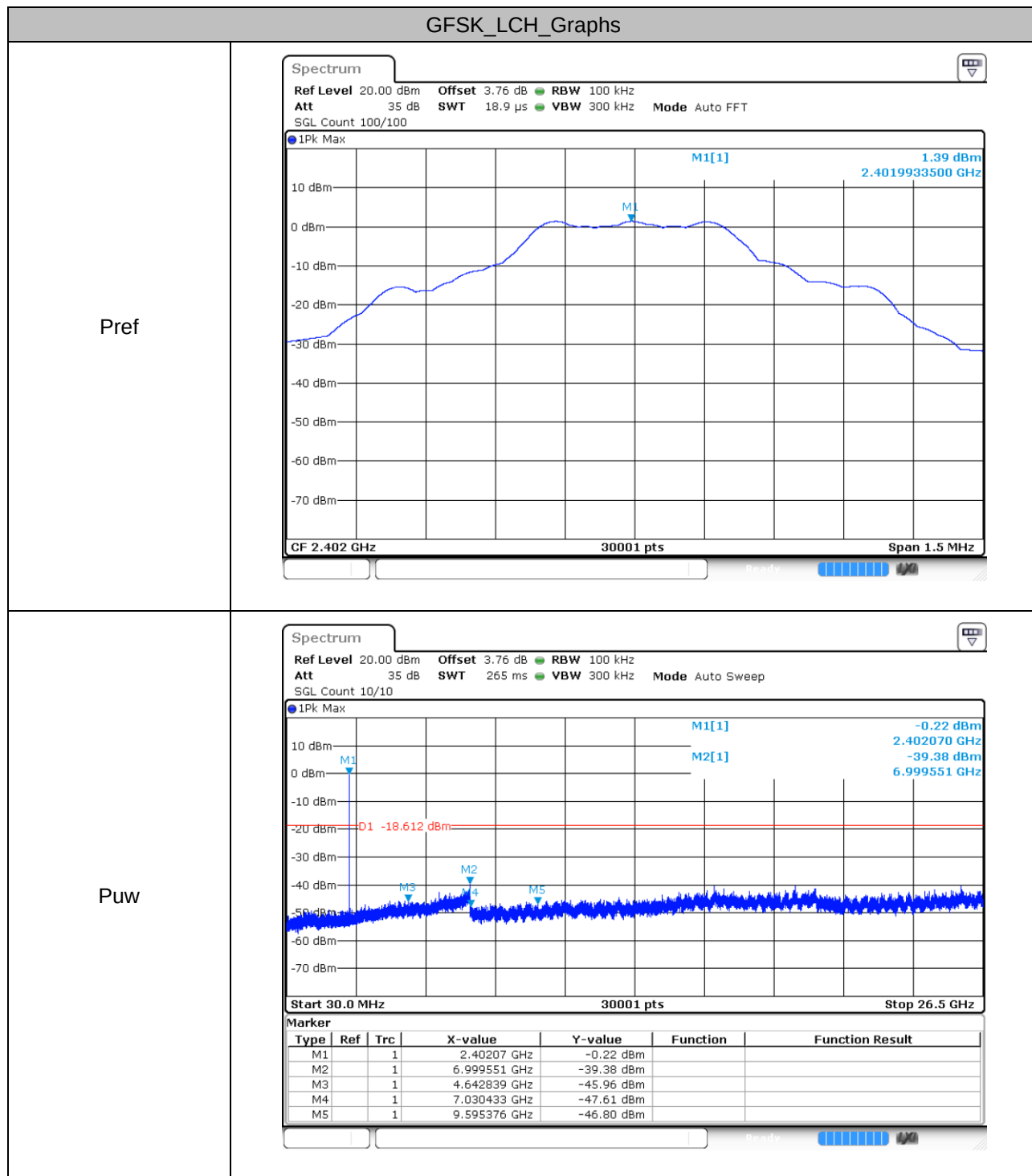


7 RF Conducted Spurious Emissions

7.1 Test Result

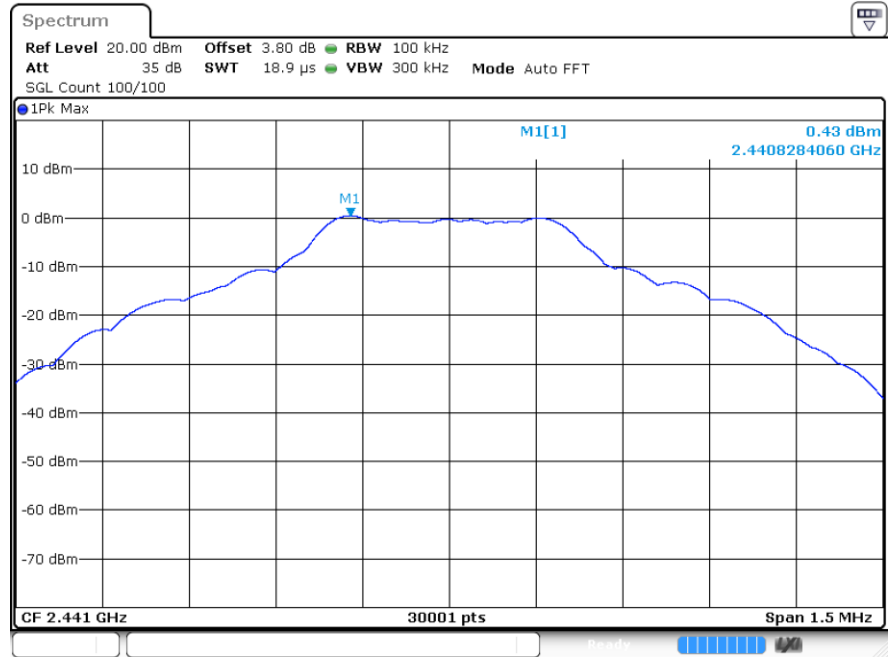
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-40.76	-20	Pass
	MCH	-41.13	-20	Pass
	HCH	-39.06	-20	Pass
$\pi/4$ DQPSK	LCH	-40.42	-20	Pass
	MCH	-39.03	-20	Pass
	HCH	-38.36	-20	Pass
8DPSK	LCH	-40.57	-20	Pass
	MCH	-37.73	-20	Pass
	HCH	-38.26	-20	Pass

7.2 Test Graphs

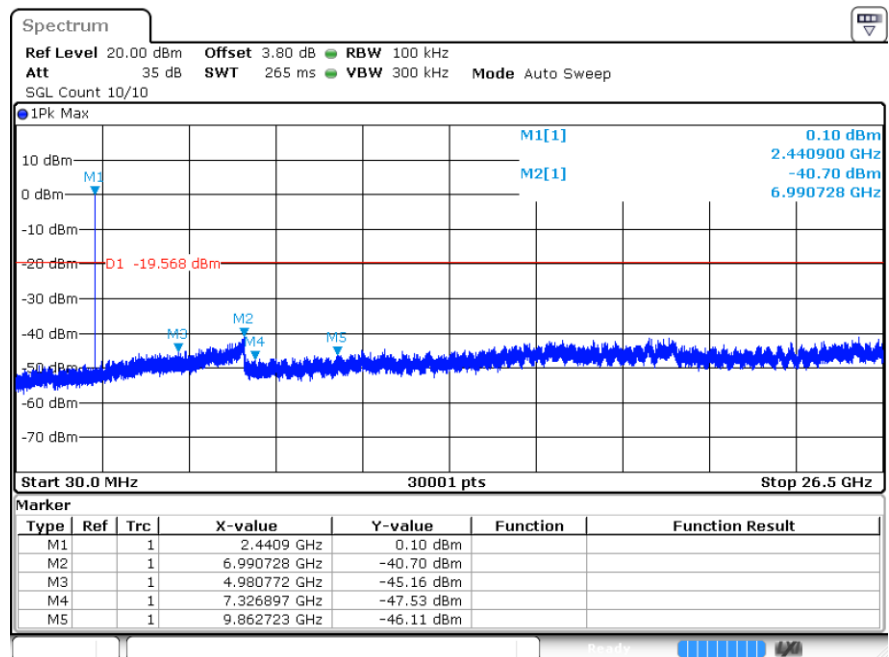


GFSK_MCH_Graphs

Pref

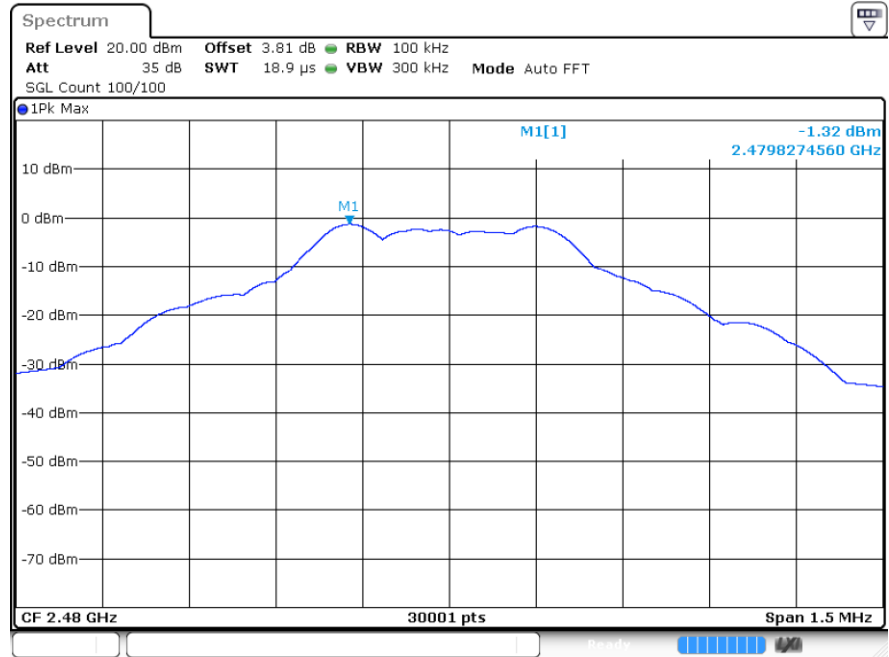


Puw

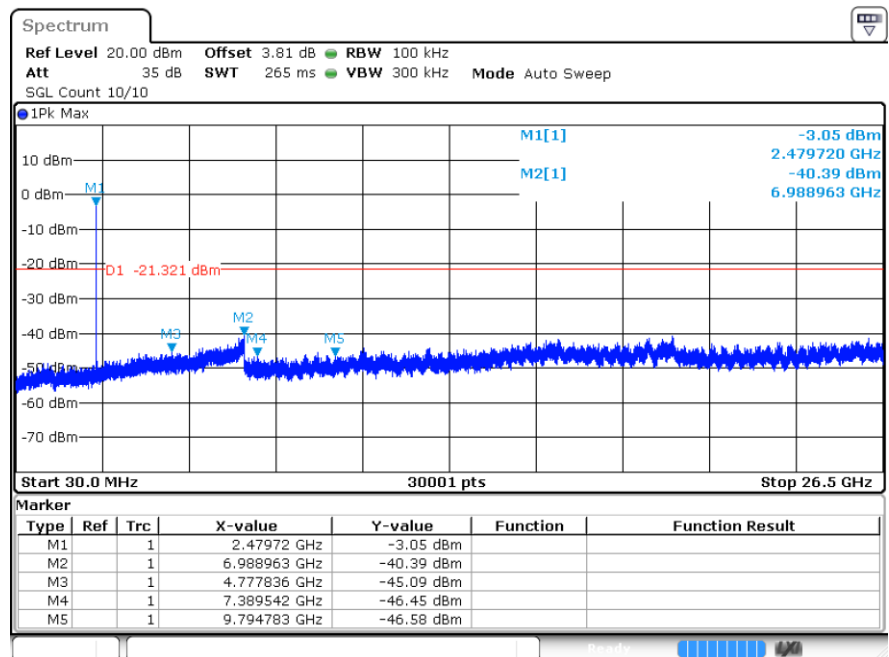


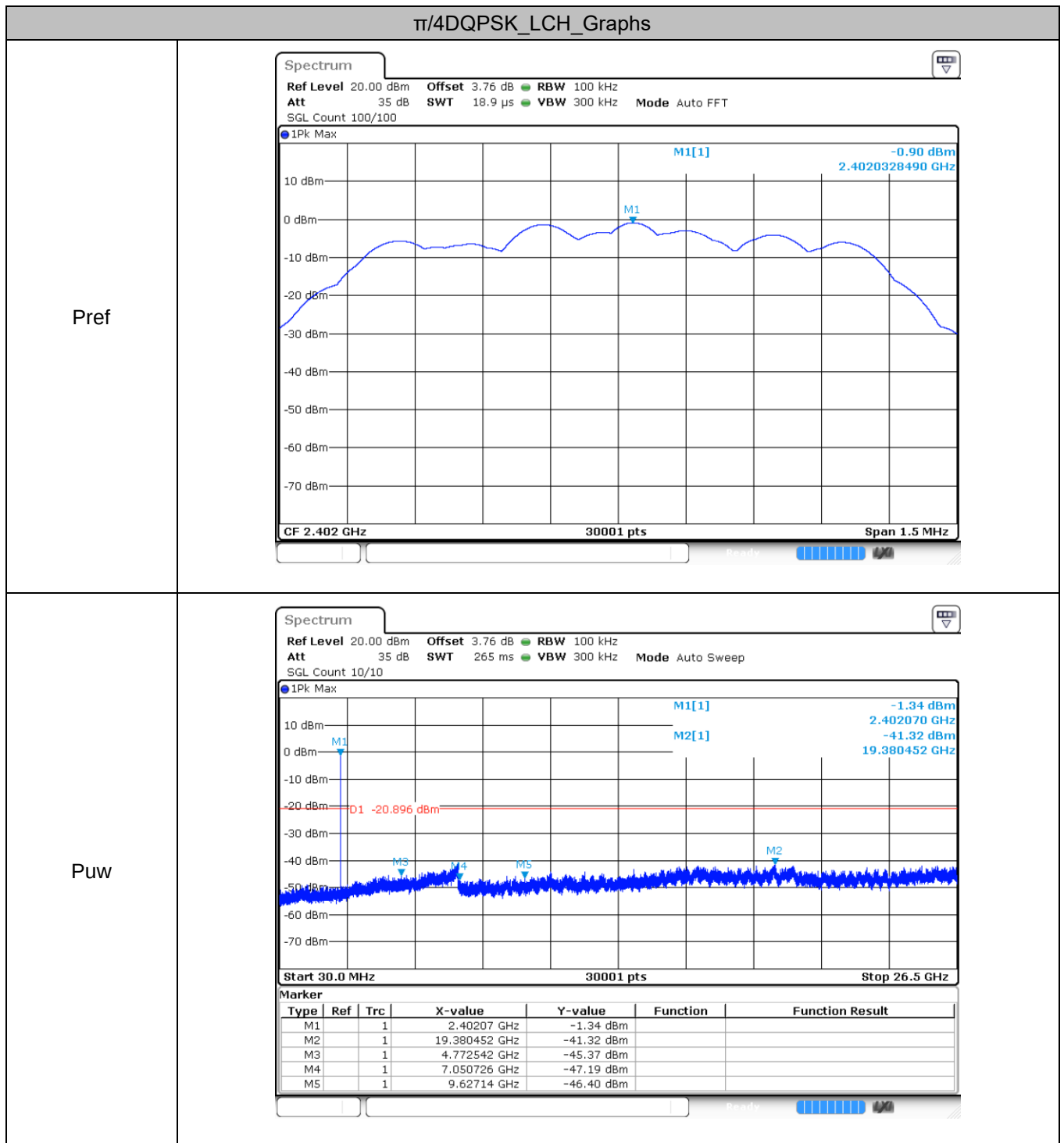
GFSK_HCH_Graphs

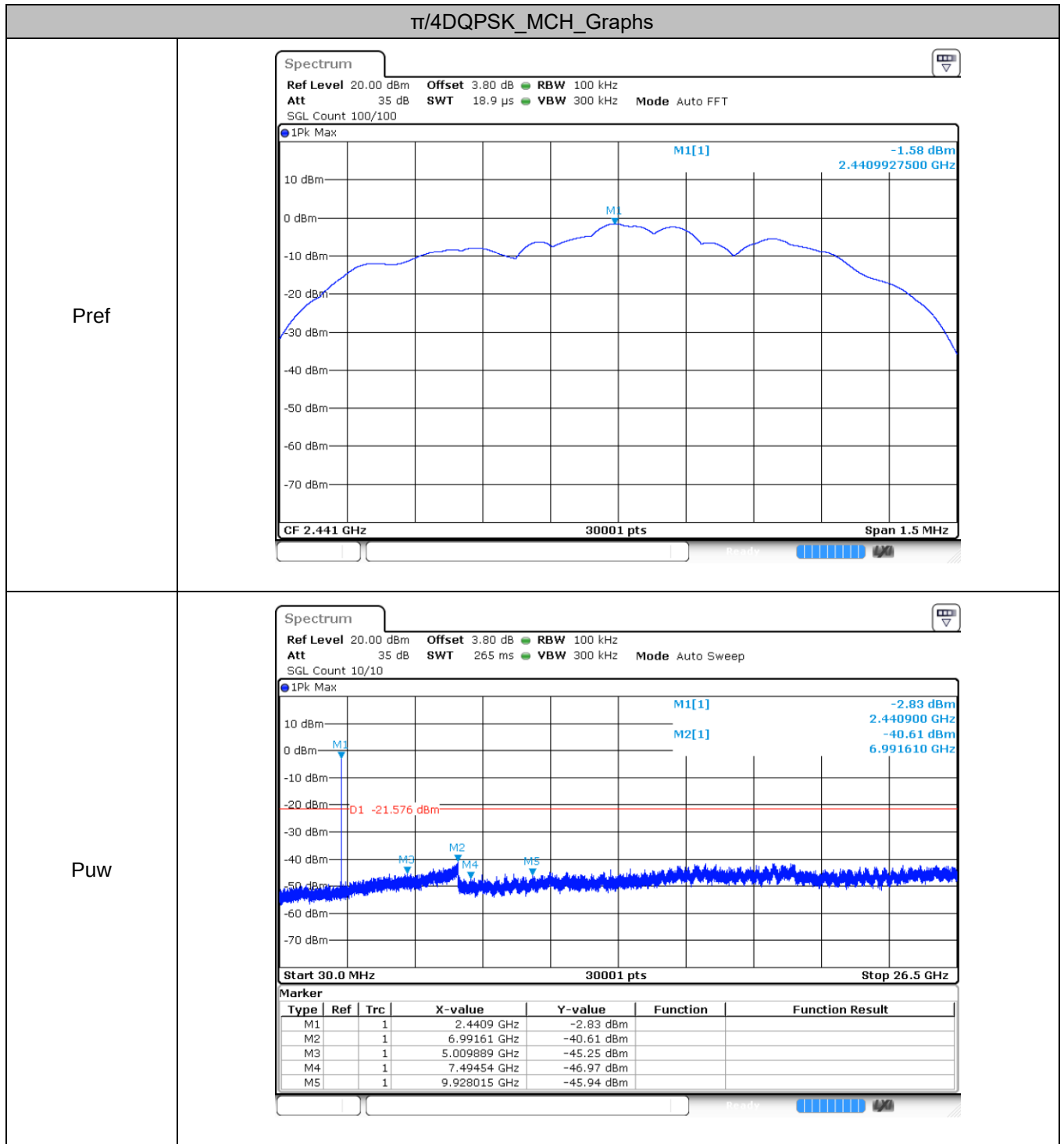
Pref



Puw

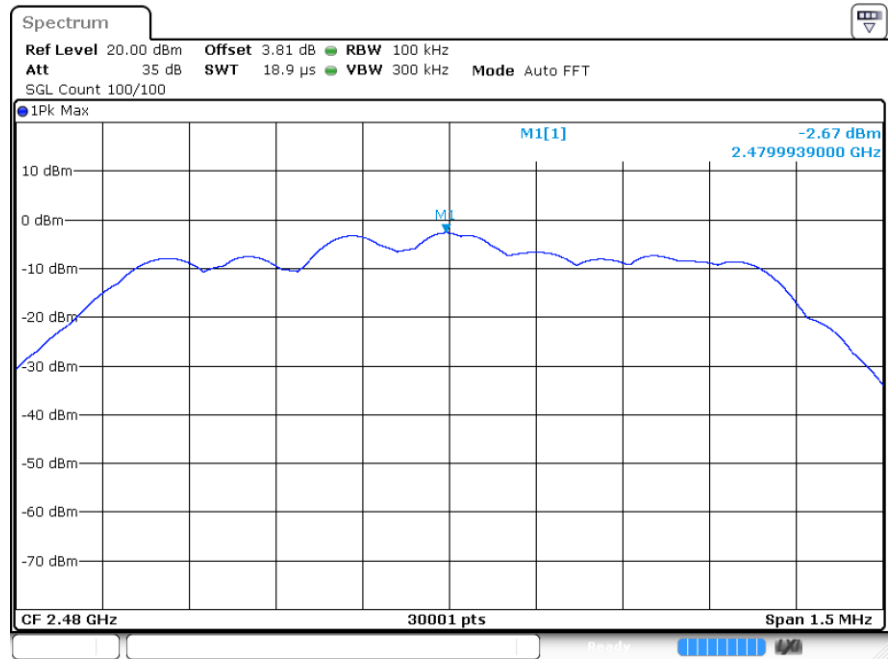




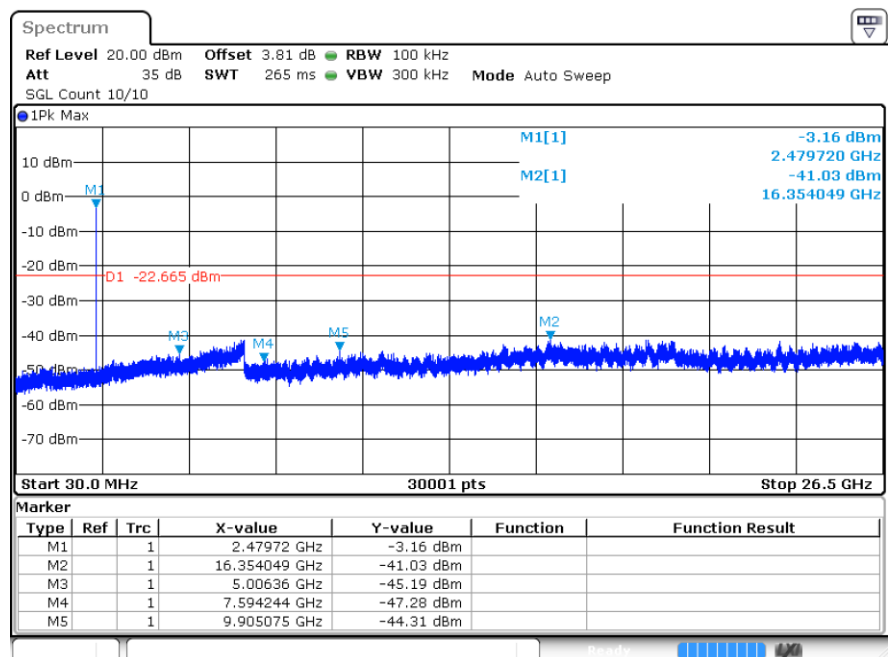


π /4DQPSK_HCH_Graphs

Pref

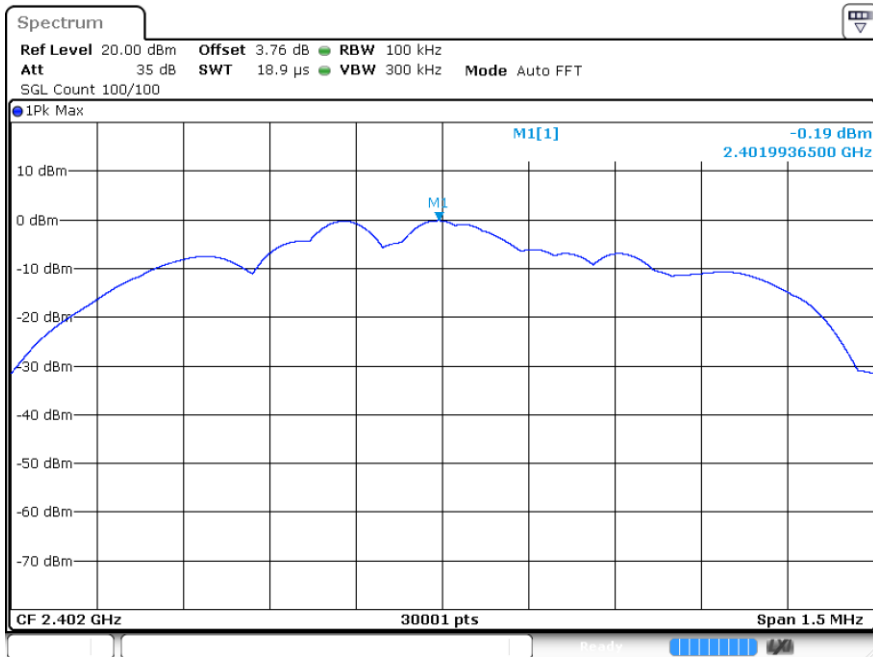


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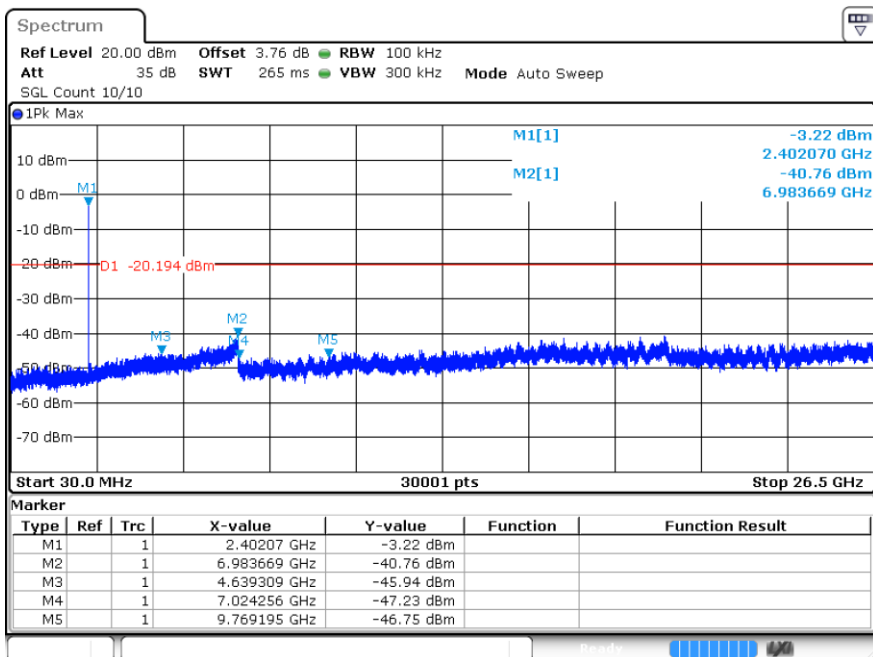


8DPSK_LCH_Graphs

Pref

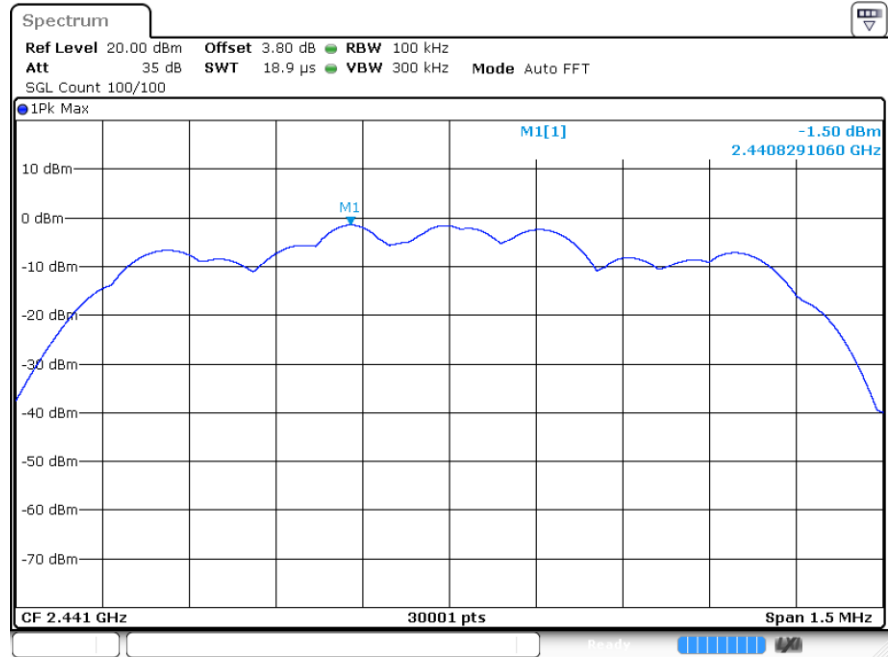


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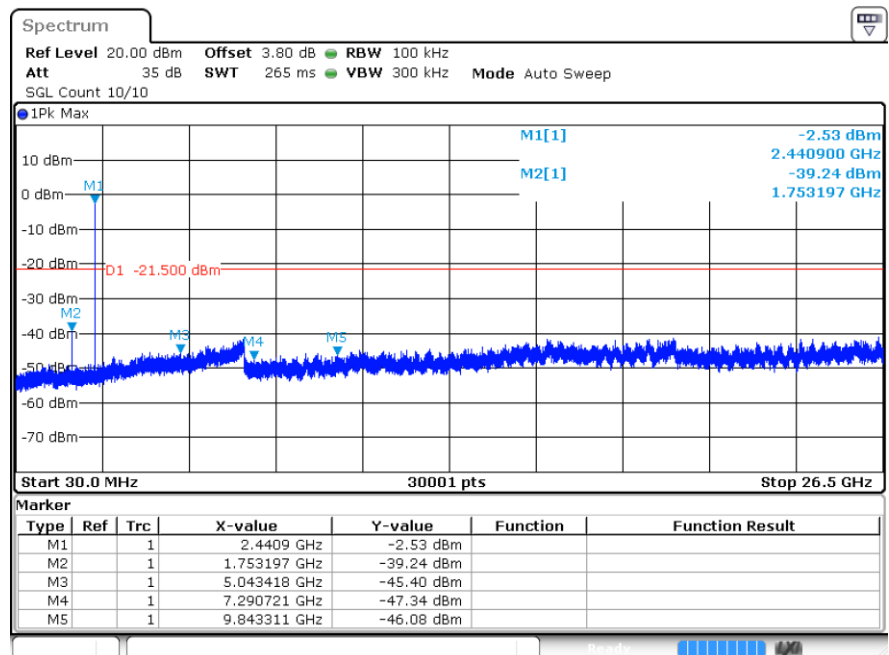


8DPSK_MCH_Graphs

Pref

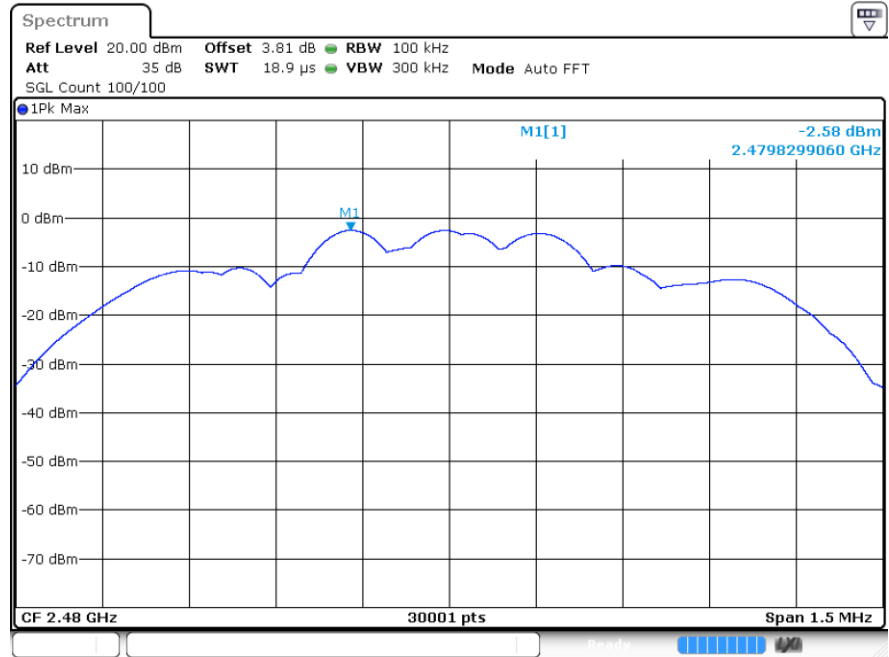


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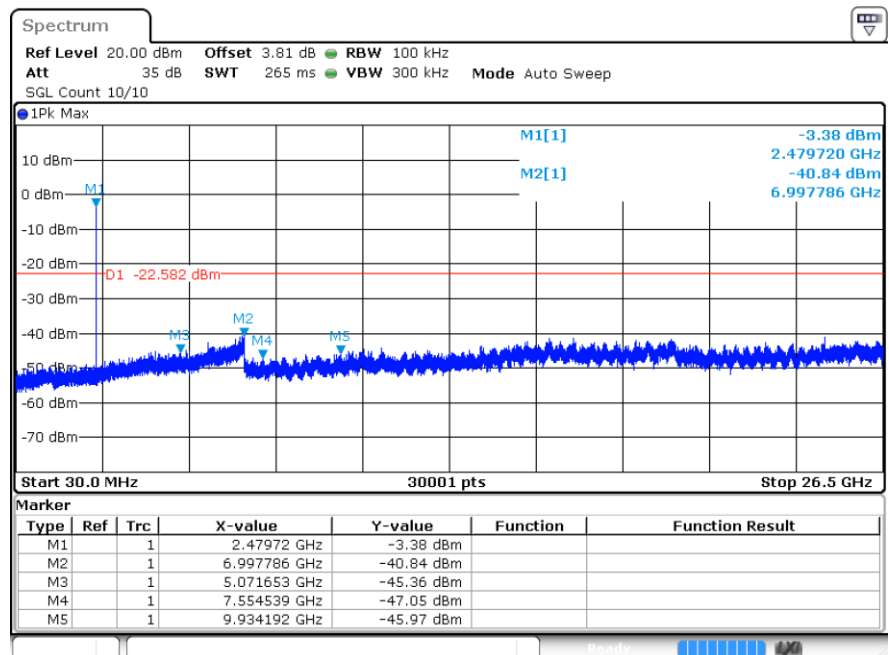


8DPSK_HCH_Graphs

Pref



Puw

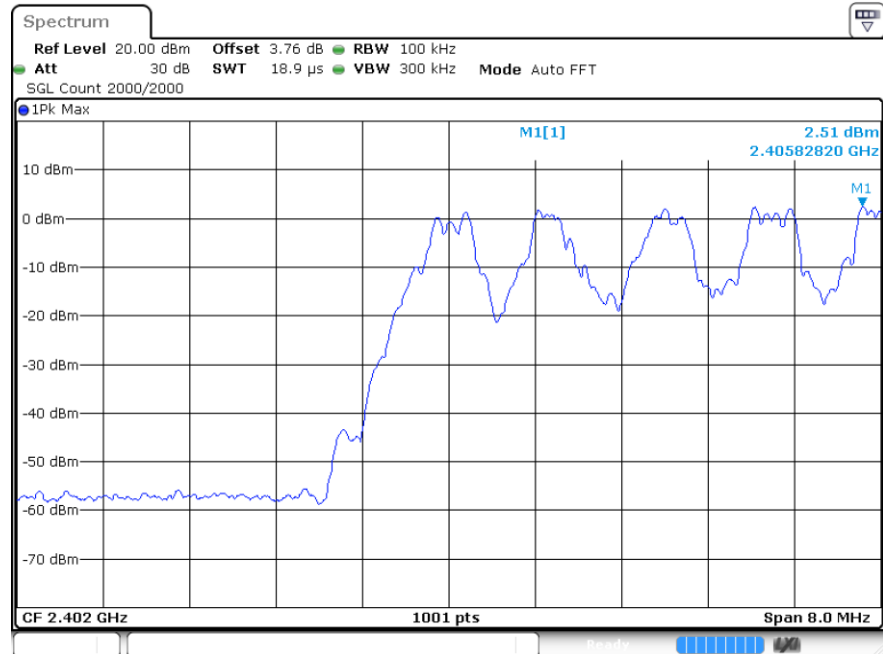


8 Band-edge for RF Conducted Emissions

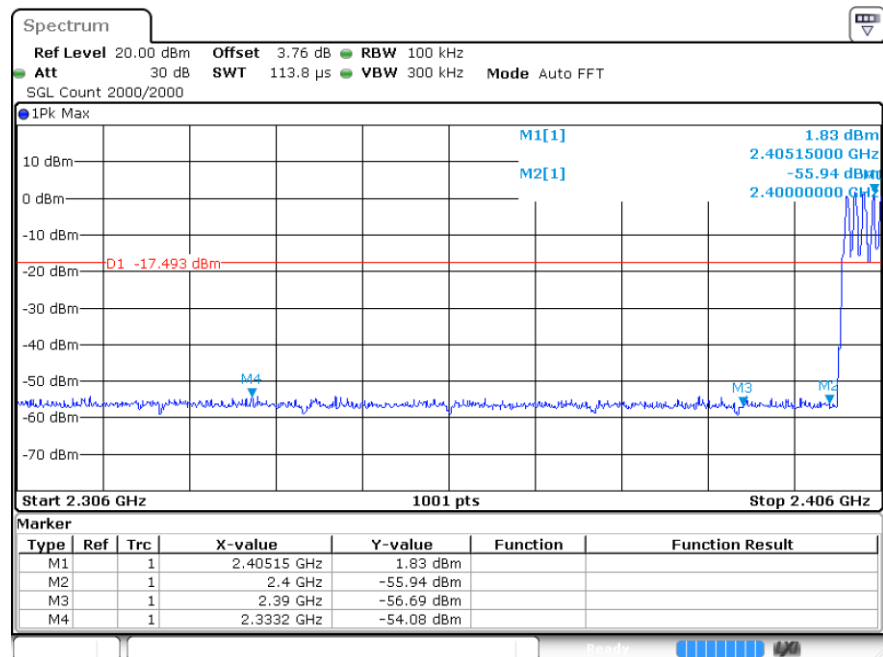
8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-56.61	-20	Pass
			On	-56.58	-20	Pass
	HCH	2480	Off	-54.28	-20	Pass
			On	-53.12	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-53.7	-20	Pass
			On	-54	-20	Pass
	HCH	2480	Off	-53.38	-20	Pass
			On	-51.73	-20	Pass
8DPSK	LCH	2402	Off	-54.59	-20	Pass
			On	-54.06	-20	Pass
	HCH	2480	Off	-53.16	-20	Pass
			On	-51.56	-20	Pass

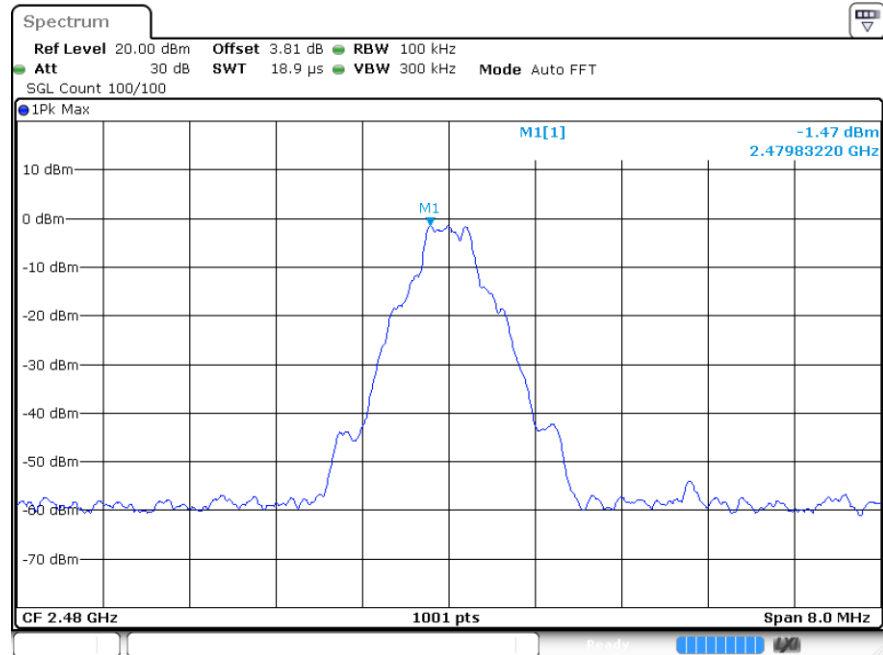
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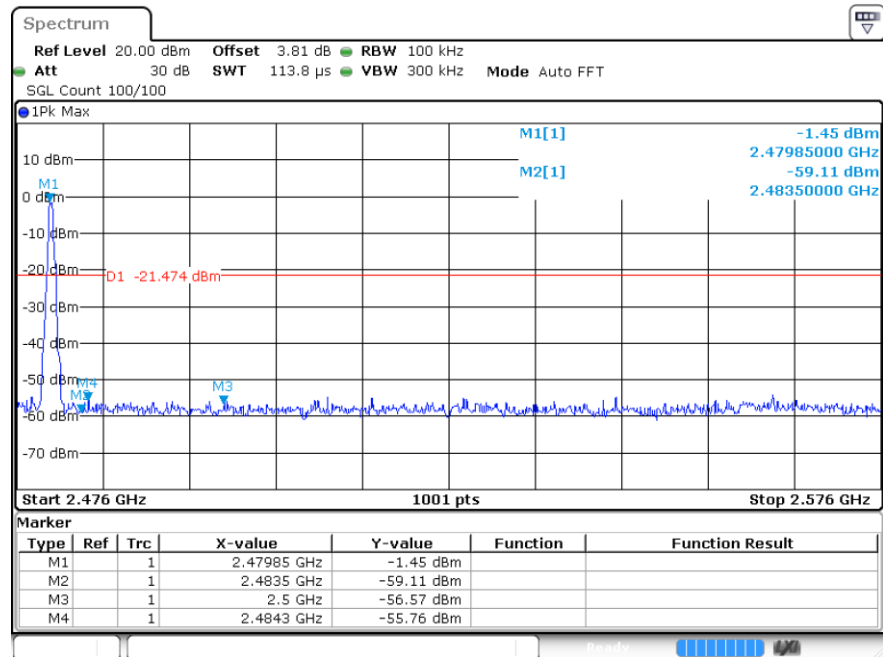
GFSK/LCH/Hop



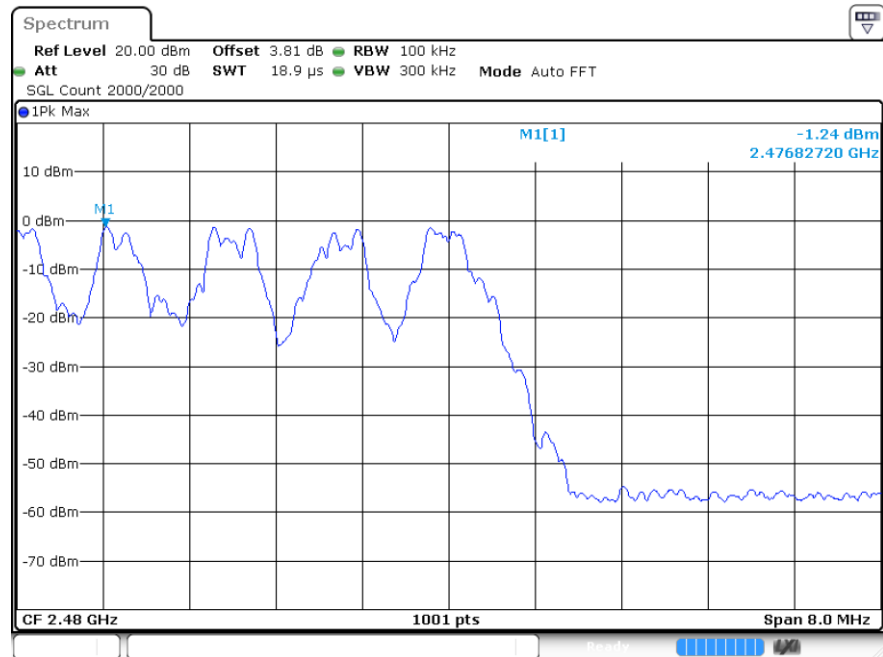
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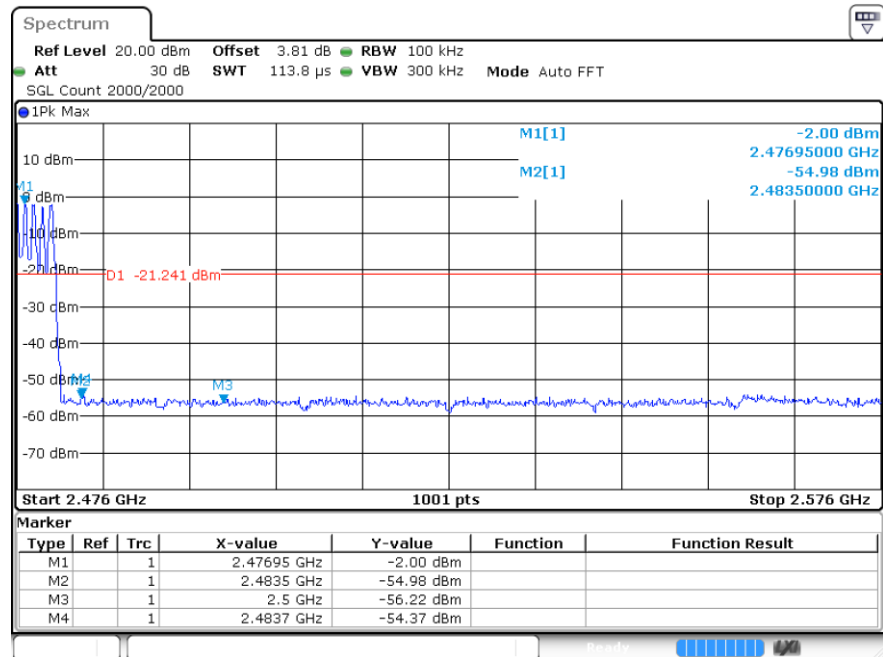
GFSK/HCH/No Hop



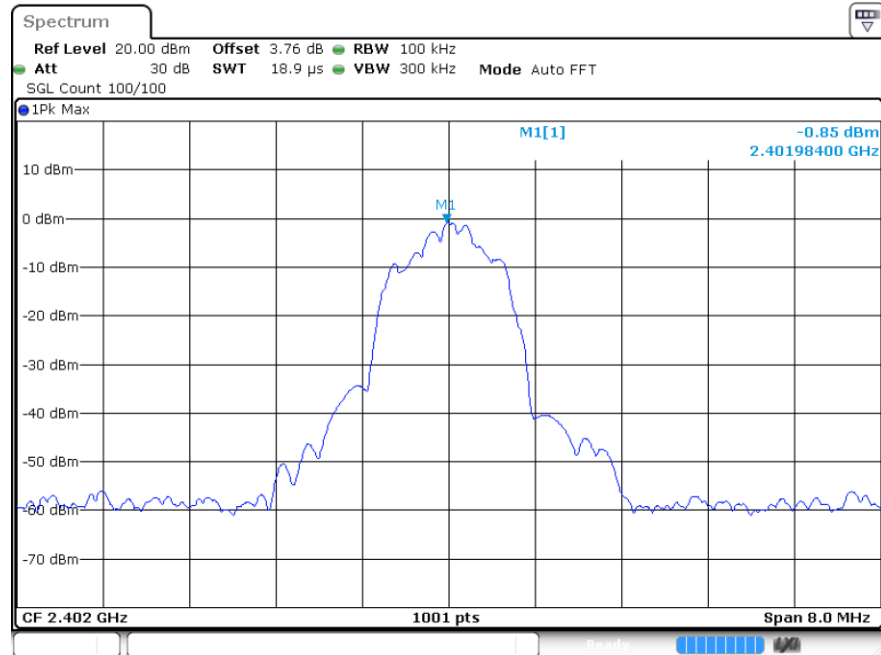
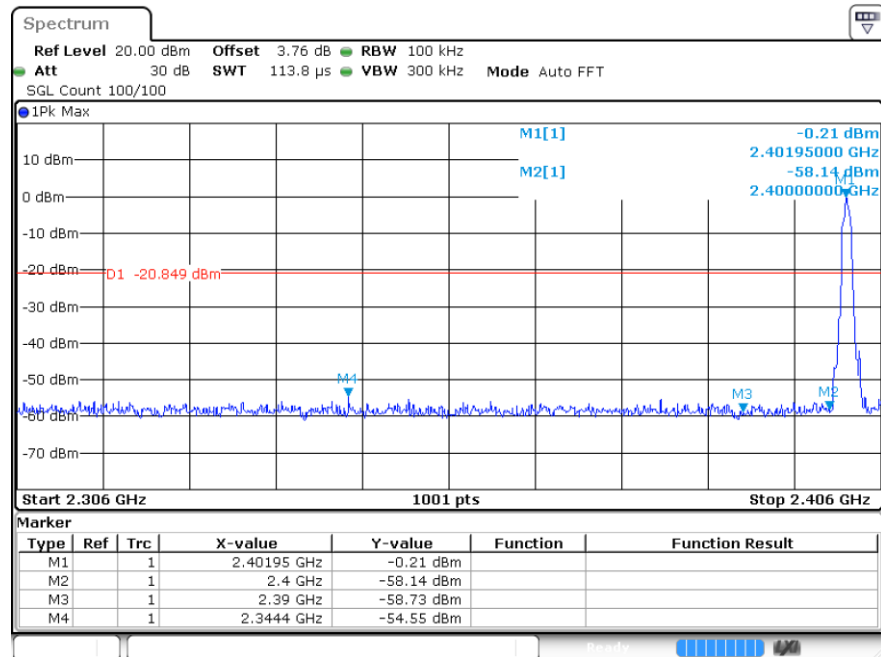
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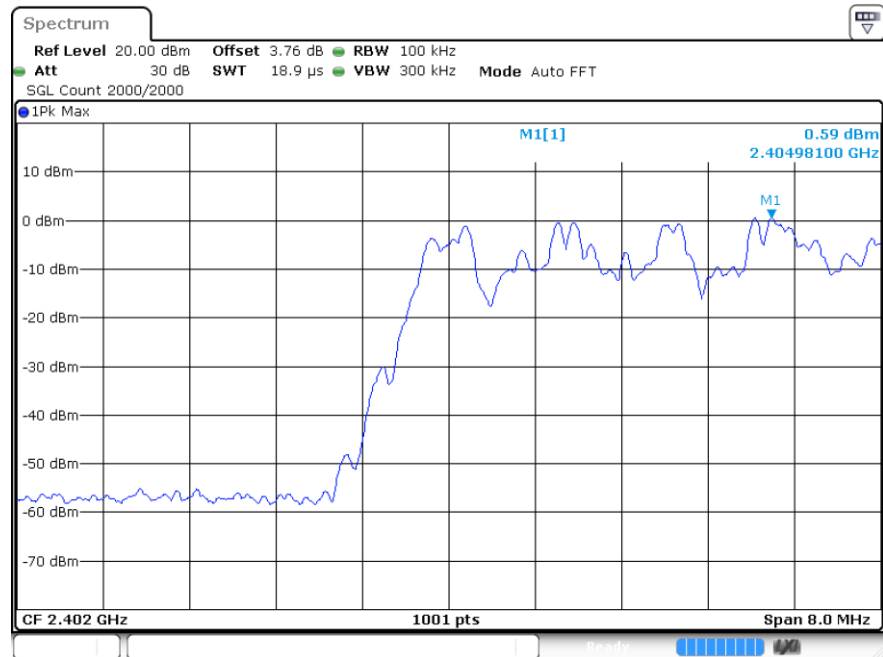
GFSK/HCH/Hop



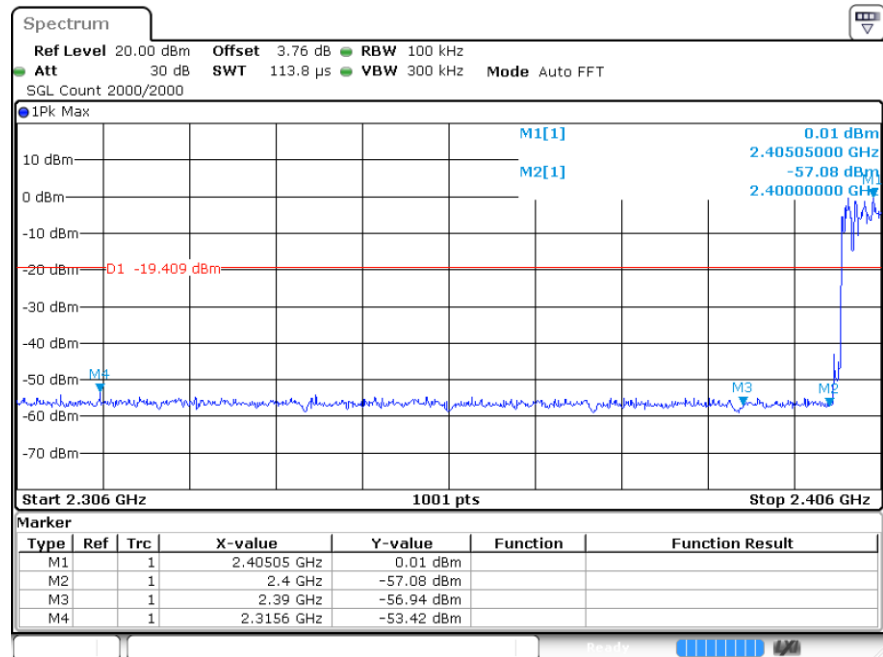
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 $\pi/4$ DQPSK/LCH/No
Hop


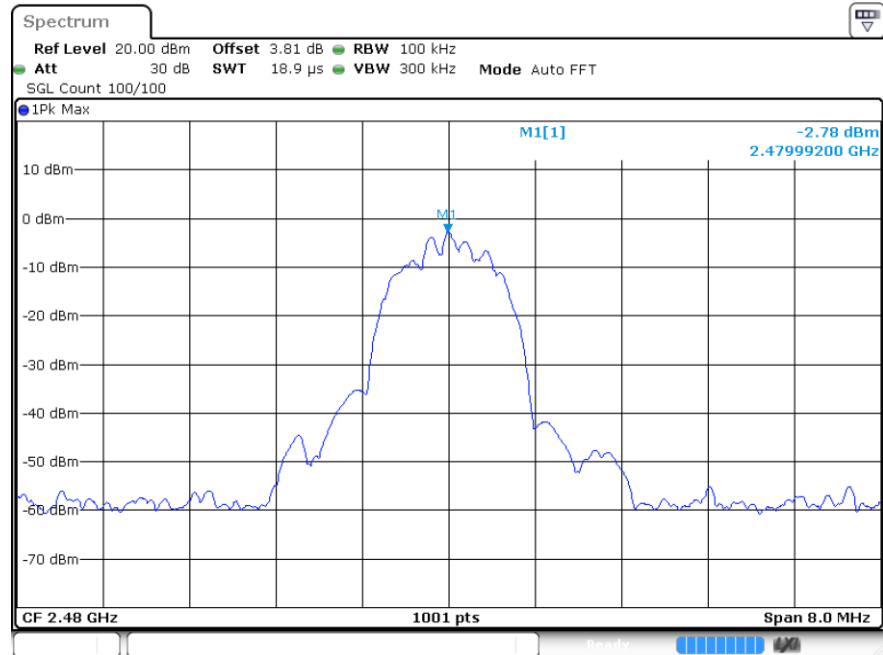
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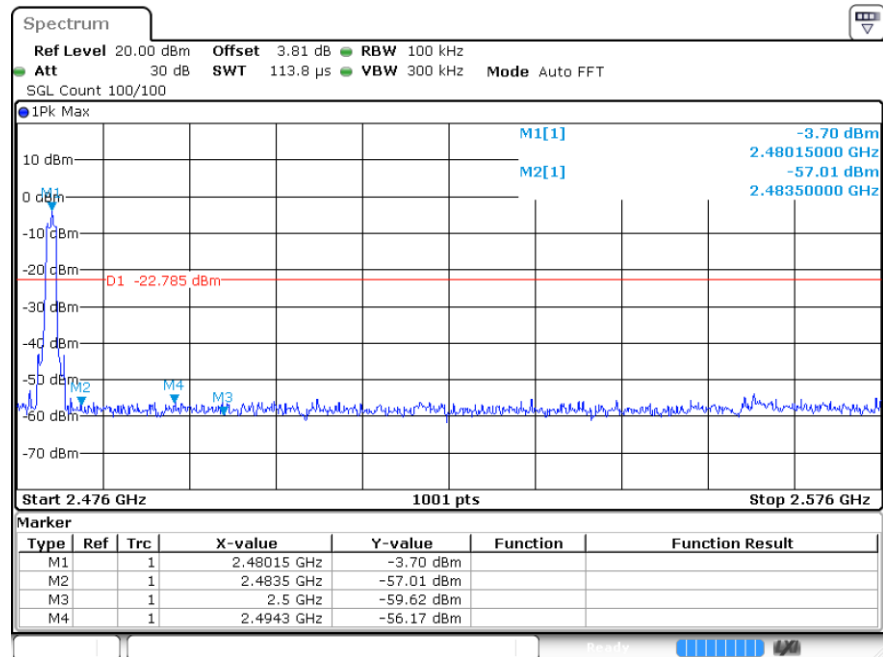
$\pi/4$ DQPSK/LCH/Hop



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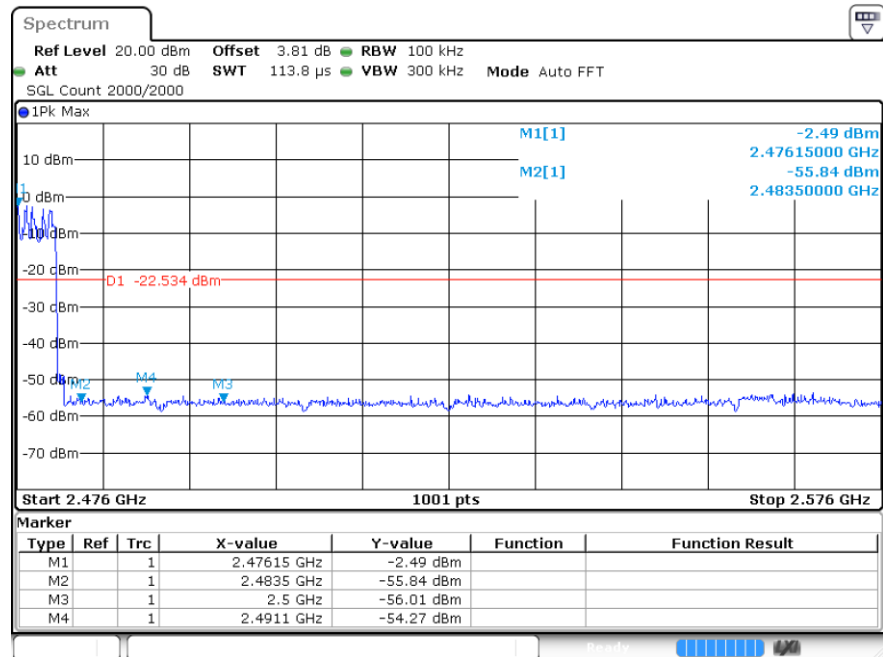
$\pi/4$ DQPSK/HCH/No
Hop



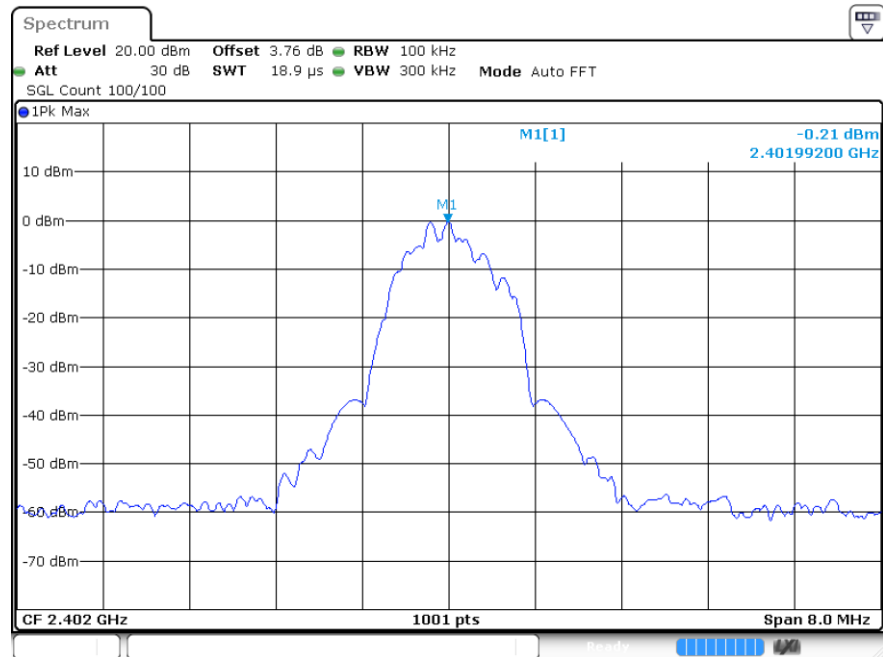
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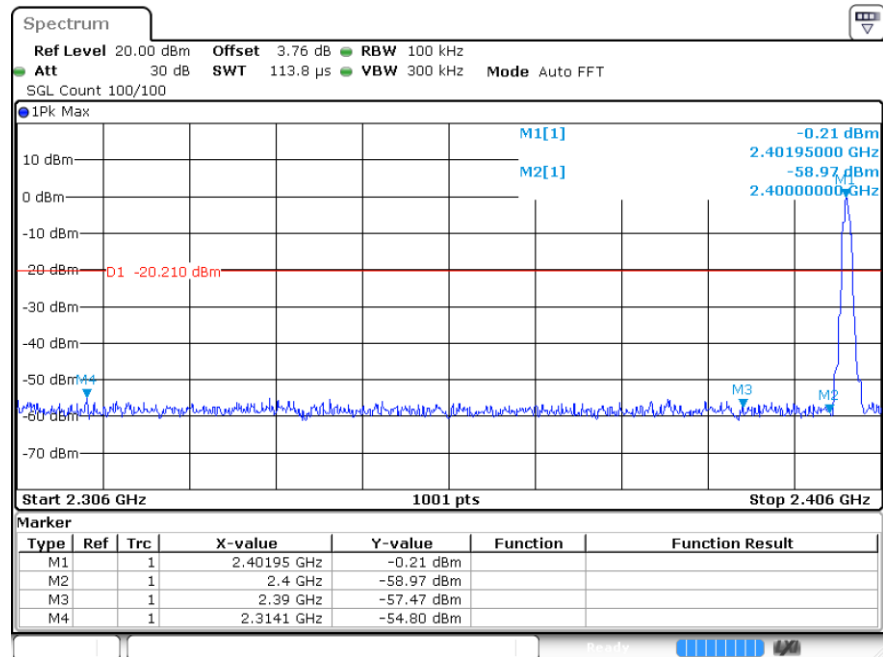
$\pi/4$ DQPSK/HCH/Hop



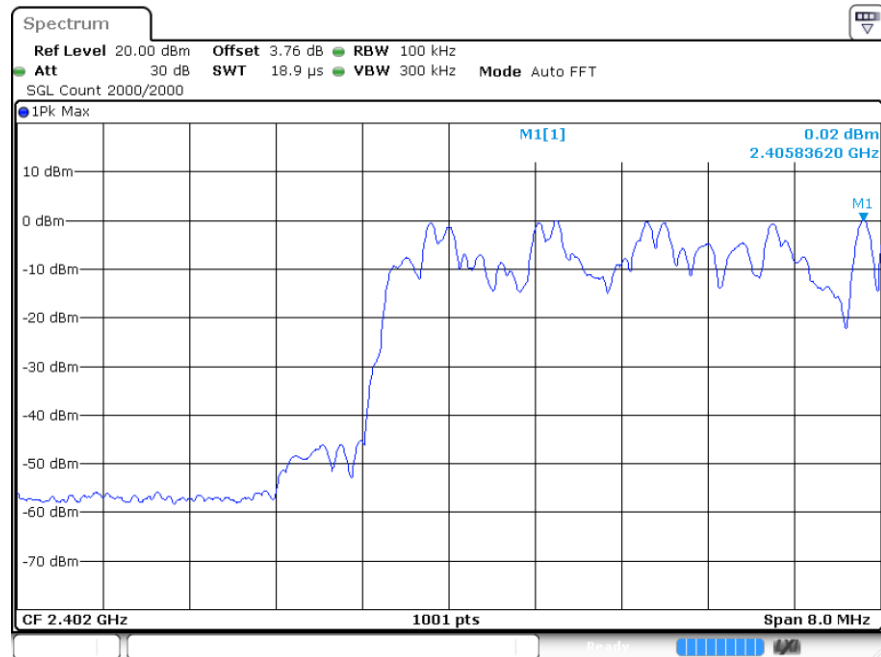
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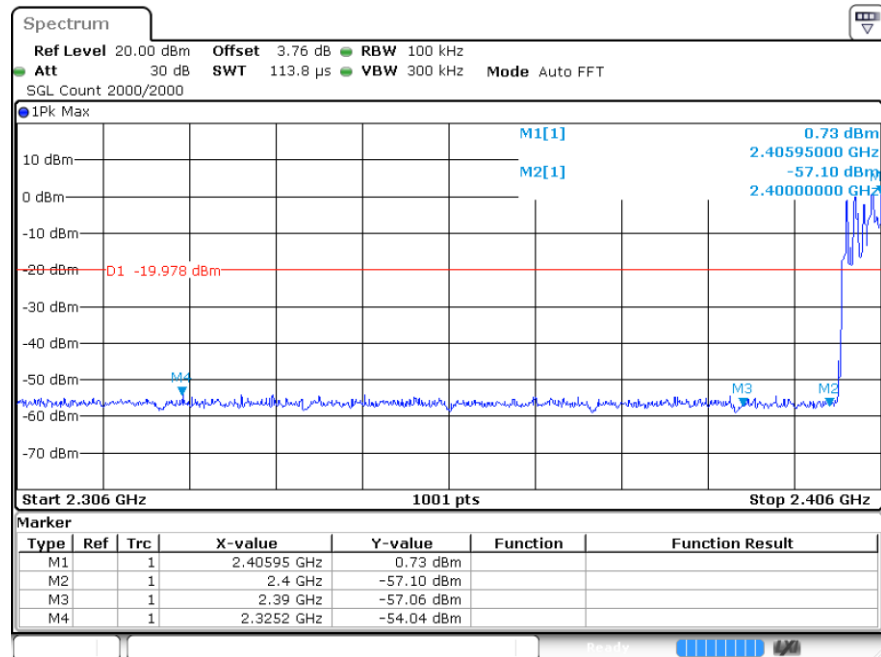
8DPSK/LCH/No Hop



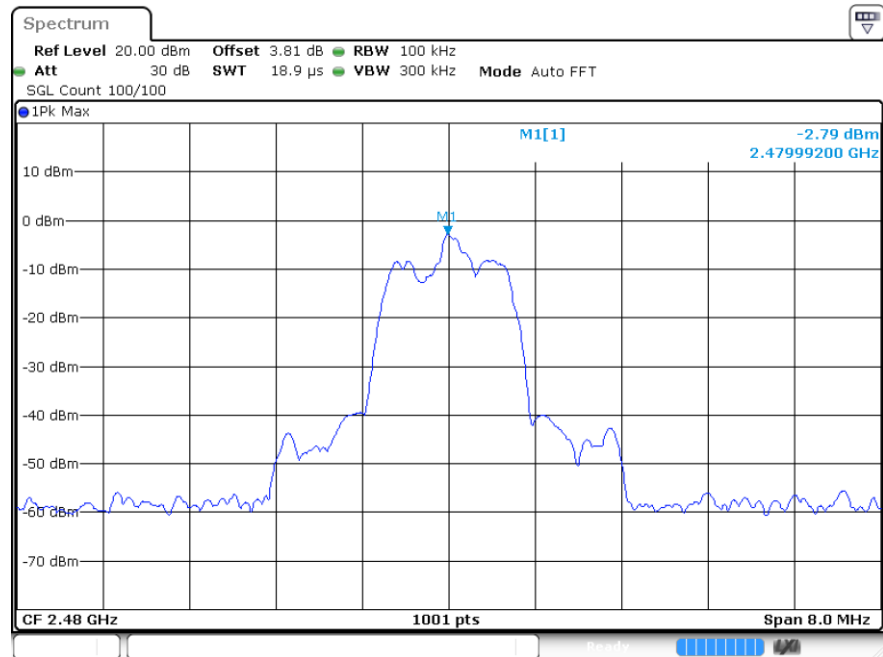
Ref



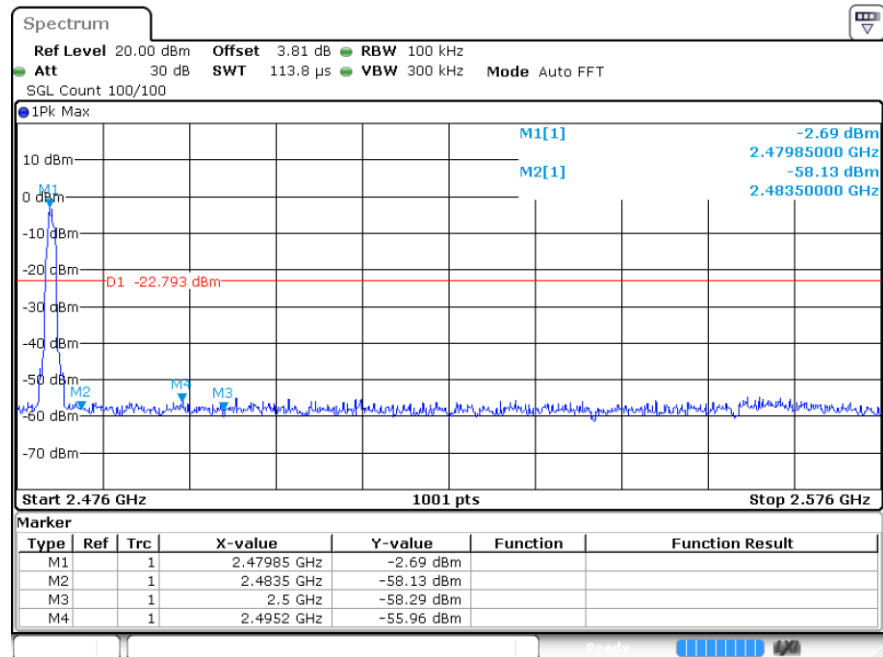
8DPSK/LCH/Hop



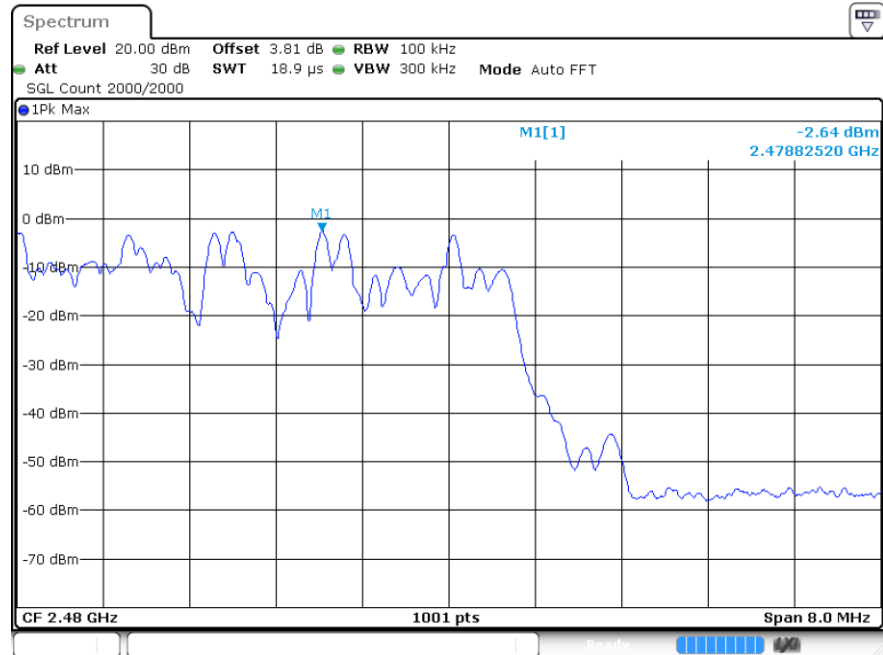
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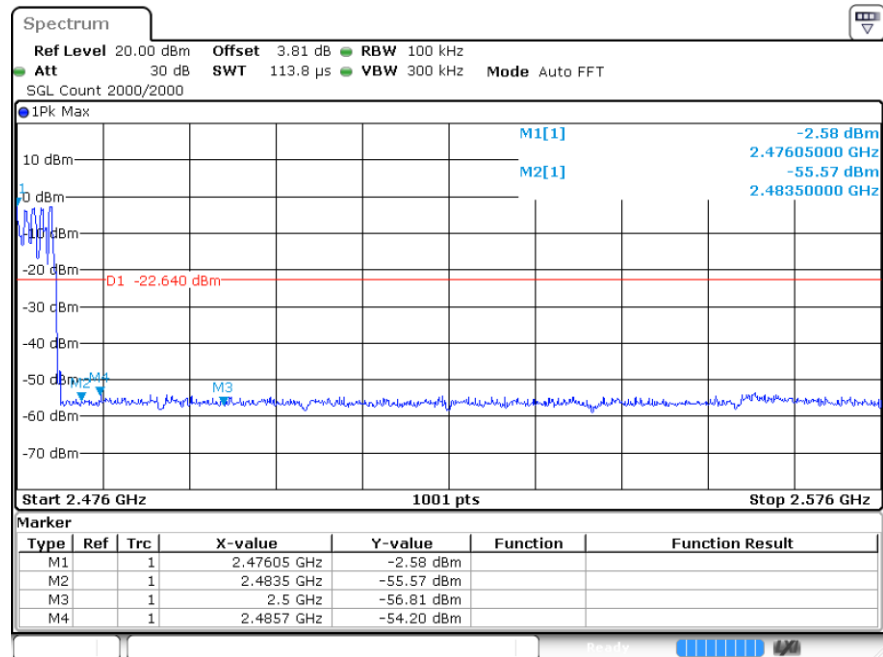
8DPSK/HCH/No Hop



Ref



8DPSK/HCH/Hop



9 Restrict-band band-edge measurements

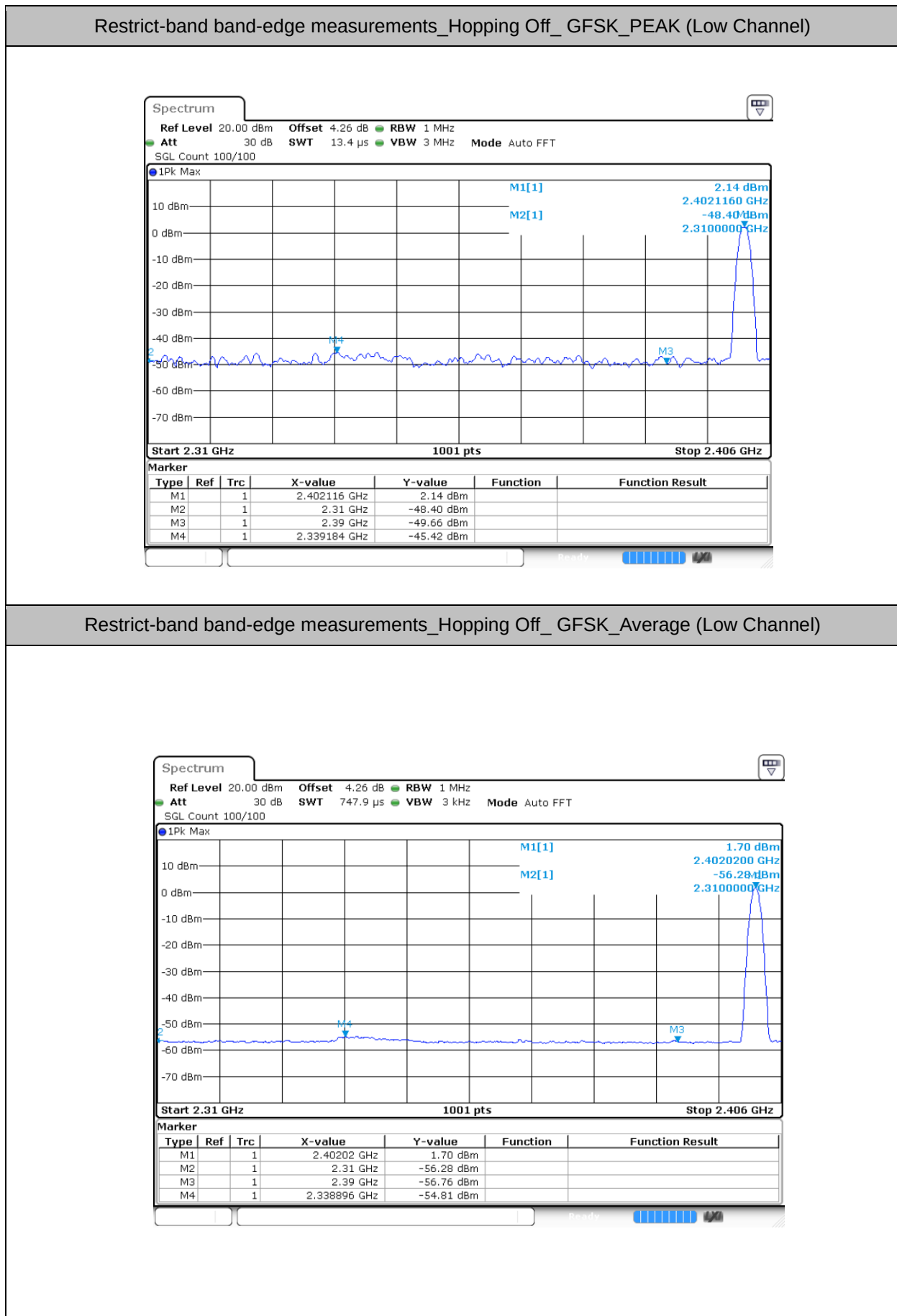
9.1 Test Result

Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.4	2	48.86	PEAK	74	Pass
	Off	2310.0	-56.28	2	40.98	AV	54	Pass
	Off	2339.184	-45.42	2	51.84	PEAK	74	Pass
	Off	2338.896	-54.8	2	42.46	AV	54	Pass
	Off	2390.0	-49.65	2	47.61	PEAK	74	Pass
	Off	2390.0	-56.75	2	40.51	AV	54	Pass
	Off	2483.5	-47.69	2	49.57	PEAK	74	Pass
	Off	2483.5	-56.31	2	40.95	AV	54	Pass
	Off	2487.616	-46.13	2	51.13	PEAK	74	Pass
	Off	2498.344	-55.91	2	41.35	AV	54	Pass
	Off	2500.0	-47.89	2	49.37	PEAK	74	Pass
	Off	2500.0	-56.38	2	40.88	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-49.06	2	48.2	PEAK	74	Pass
	Off	2310.0	-56	2	41.26	AV	54	Pass
	Off	2372.976	-45.41	2	51.85	PEAK	74	Pass
	Off	2338.032	-54.67	2	42.59	AV	54	Pass
	Off	2390.0	-45.7	2	51.56	PEAK	74	Pass
	Off	2390.0	-56.83	2	40.43	AV	54	Pass
	Off	2483.5	-48.16	2	49.1	PEAK	74	Pass
	Off	2483.5	-55.82	2	41.44	AV	54	Pass
	Off	2496.328	-46.03	2	51.23	PEAK	74	Pass
	Off	2483.824	-55.7	2	41.56	AV	54	Pass
	Off	2500.0	-48.91	2	48.35	PEAK	74	Pass
	Off	2500.0	-56.41	2	40.85	AV	54	Pass
8DPSK	Off	2310.0	-49.08	2	48.18	PEAK	74	Pass
	Off	2310.0	-55.99	2	41.27	AV	54	Pass
	Off	2338.608	-45.79	2	51.47	PEAK	74	Pass
	Off	2338.128	-54.13	2	43.13	AV	54	Pass

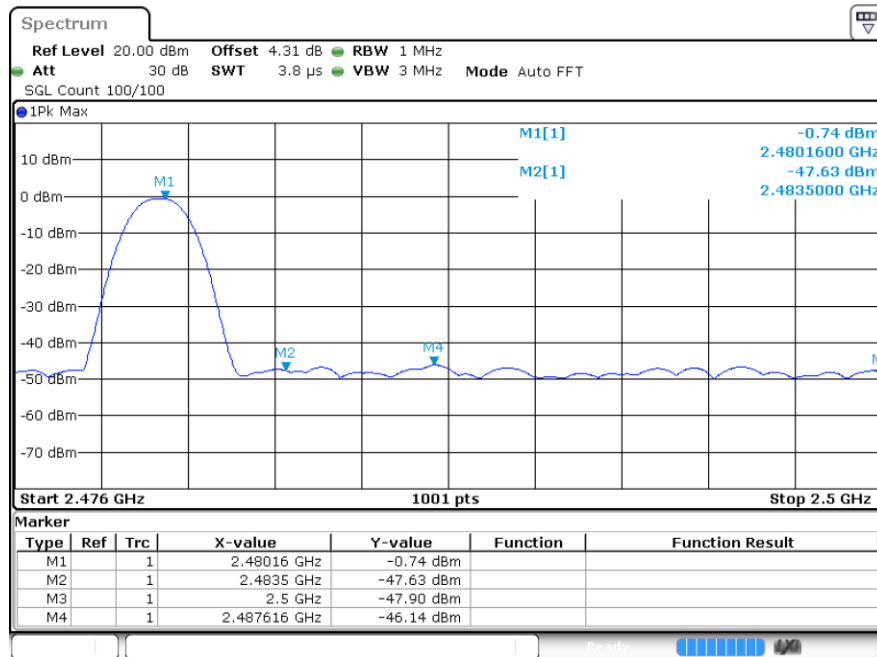


	Off	2390.0	-49.35	2	47.91	PEAK	74	Pass
	Off	2390.0	-56.3	2	40.96	AV	54	Pass
	Off	2483.5	-49.24	2	48.02	PEAK	74	Pass
	Off	2483.5	-56.4	2	40.86	AV	54	Pass
	Off	2489.968	-46.98	2	50.28	PEAK	74	Pass
	Off	2485.744	-55.49	2	41.77	AV	54	Pass
	Off	2500.0	-48.49	2	48.77	PEAK	74	Pass
	Off	2500.0	-56.39	2	40.87	AV	54	Pass

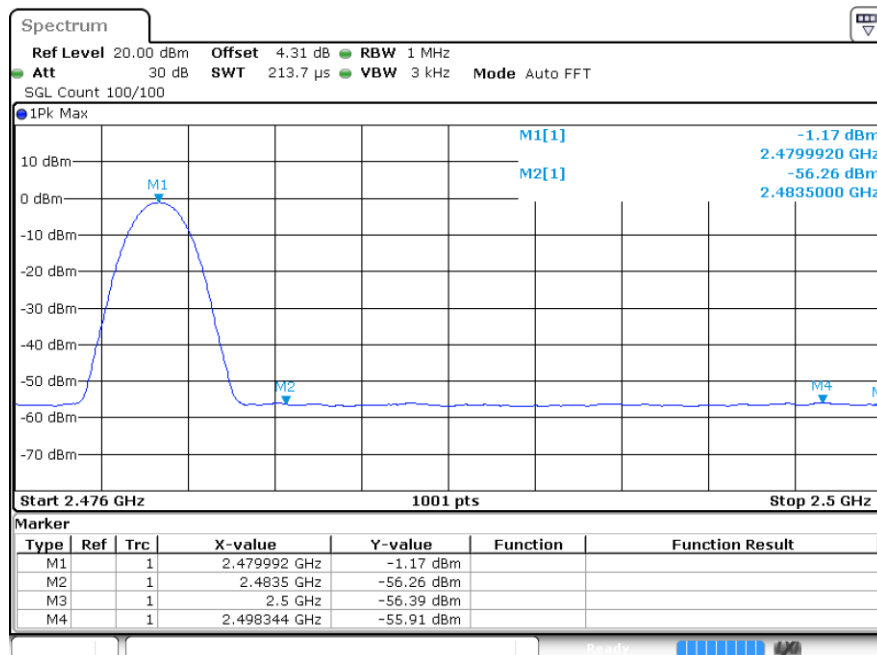
9.2 Test Graphs



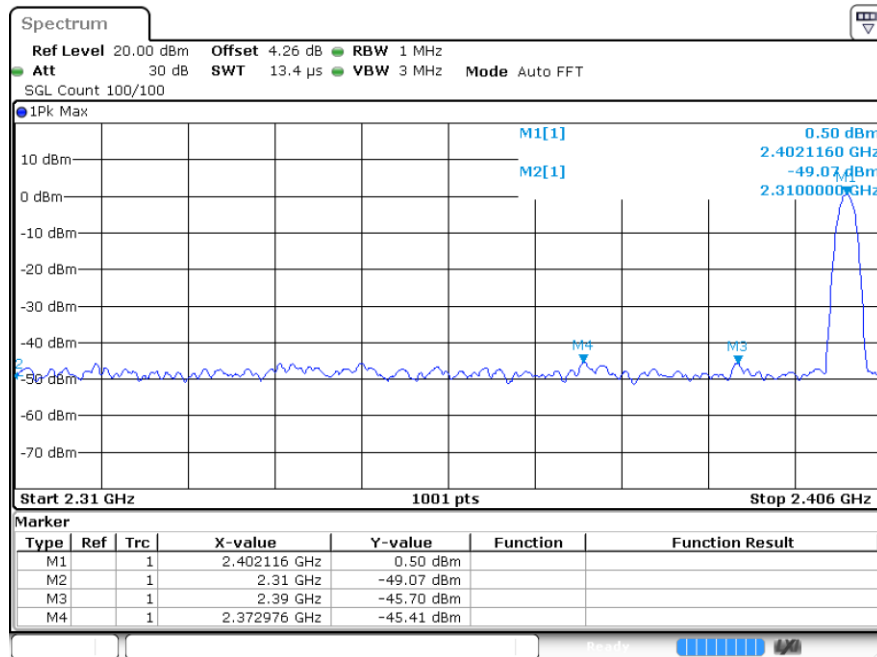
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



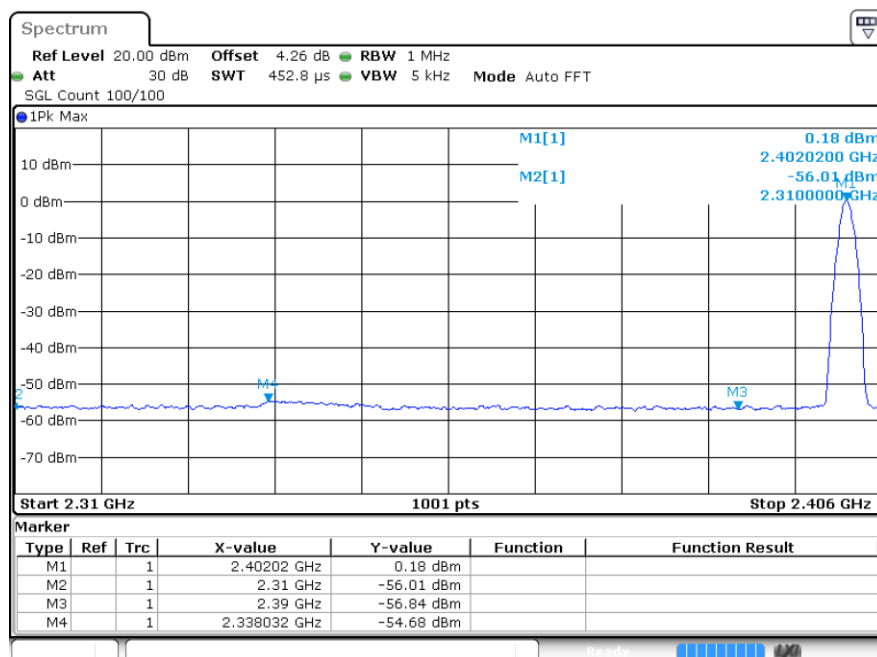
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



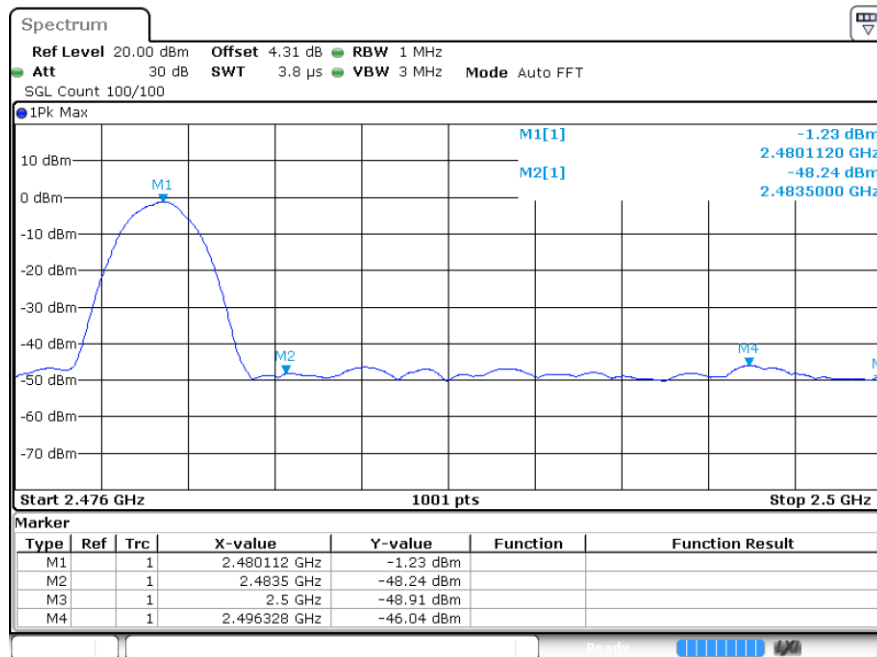
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



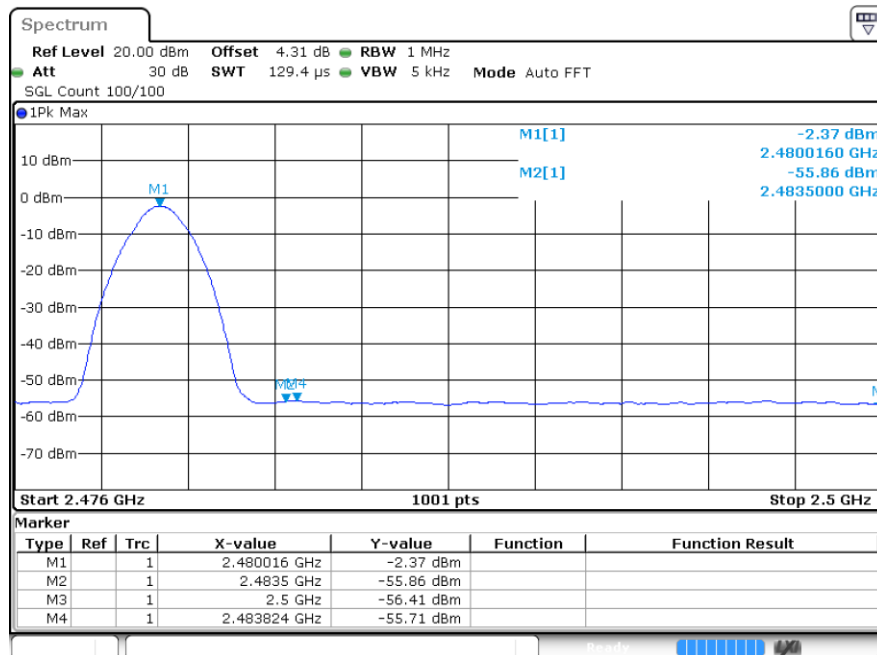
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



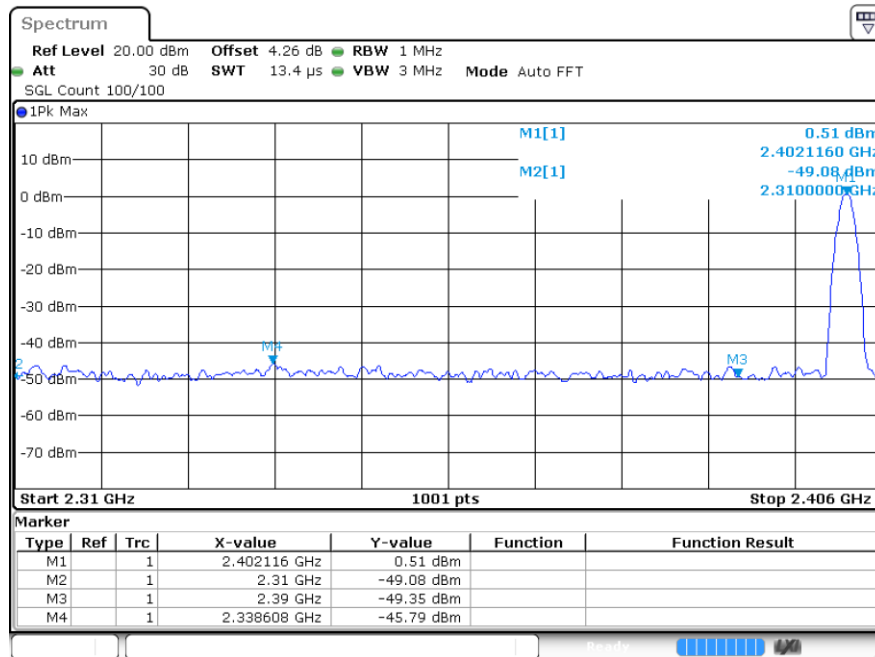
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



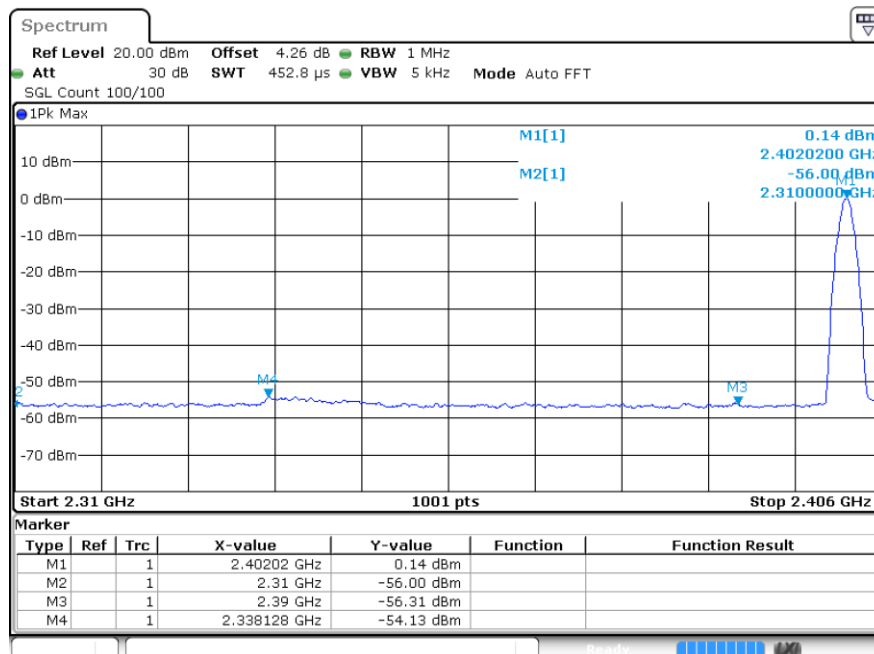
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



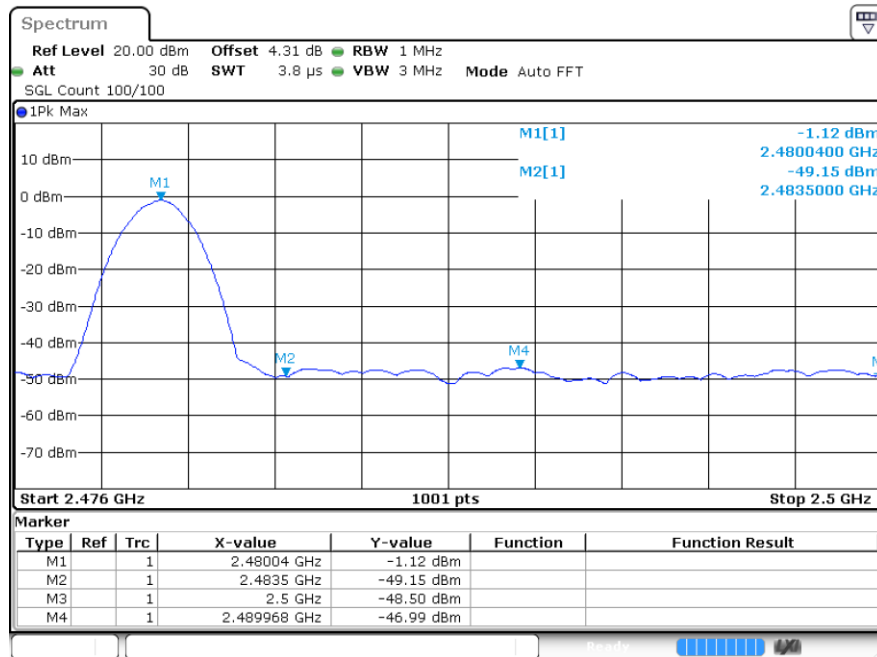
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



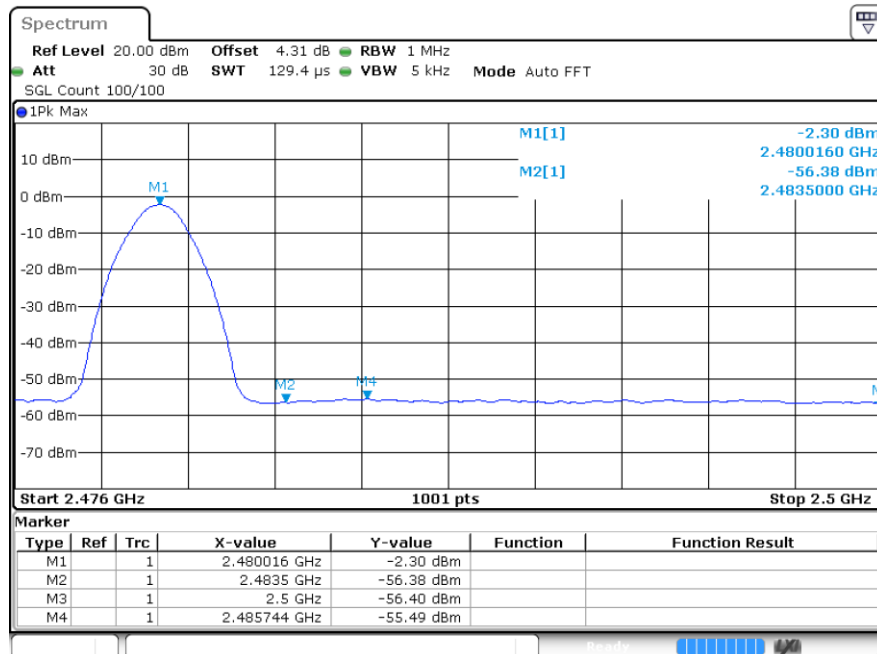
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



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



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



---The End---