

Appendix A

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

Product Name: Bluetooth Speaker

Trade Mark:



Test Model: LBW290

Environmental Conditions

Temperature:	23.9℃
Relative Humidity:	51%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

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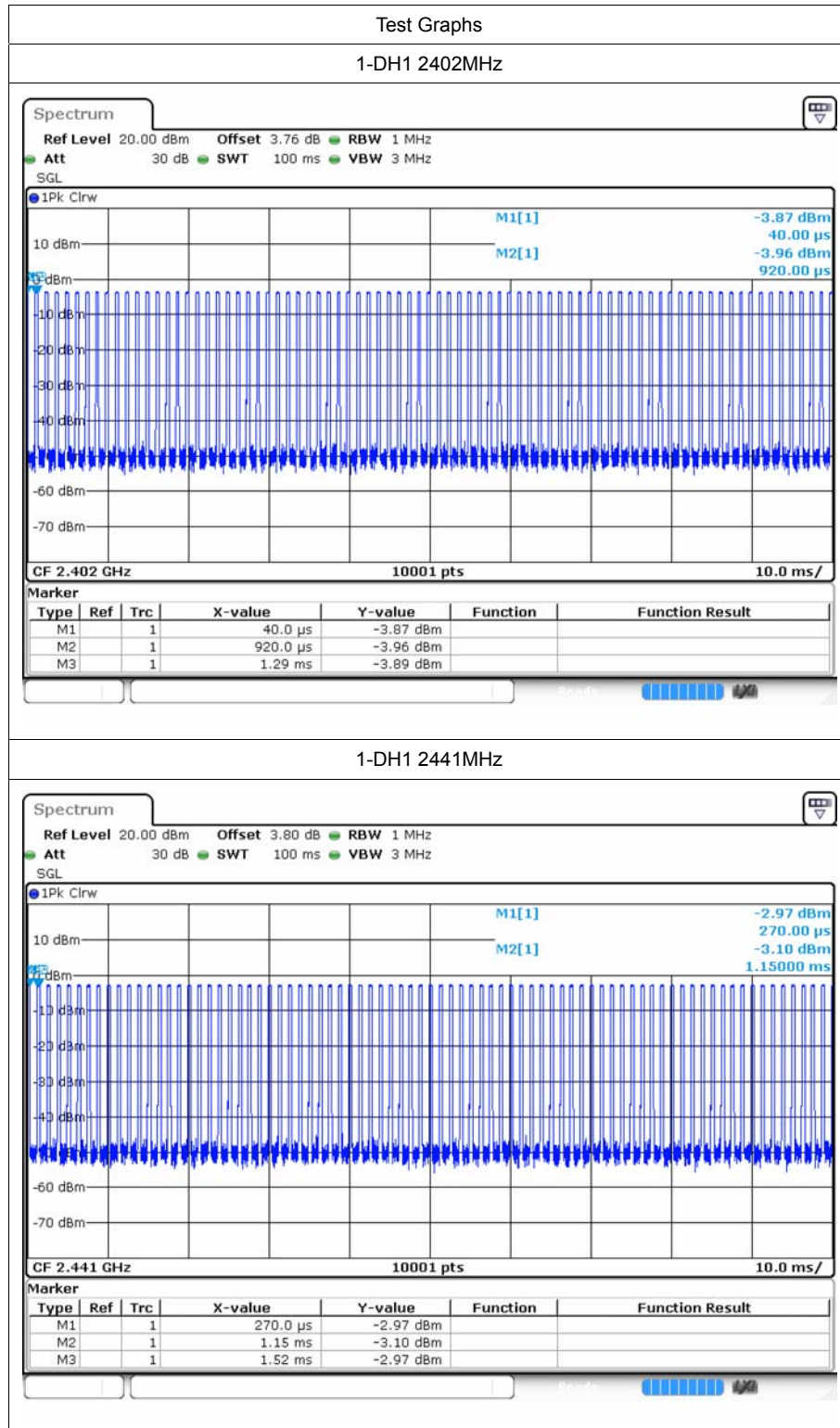
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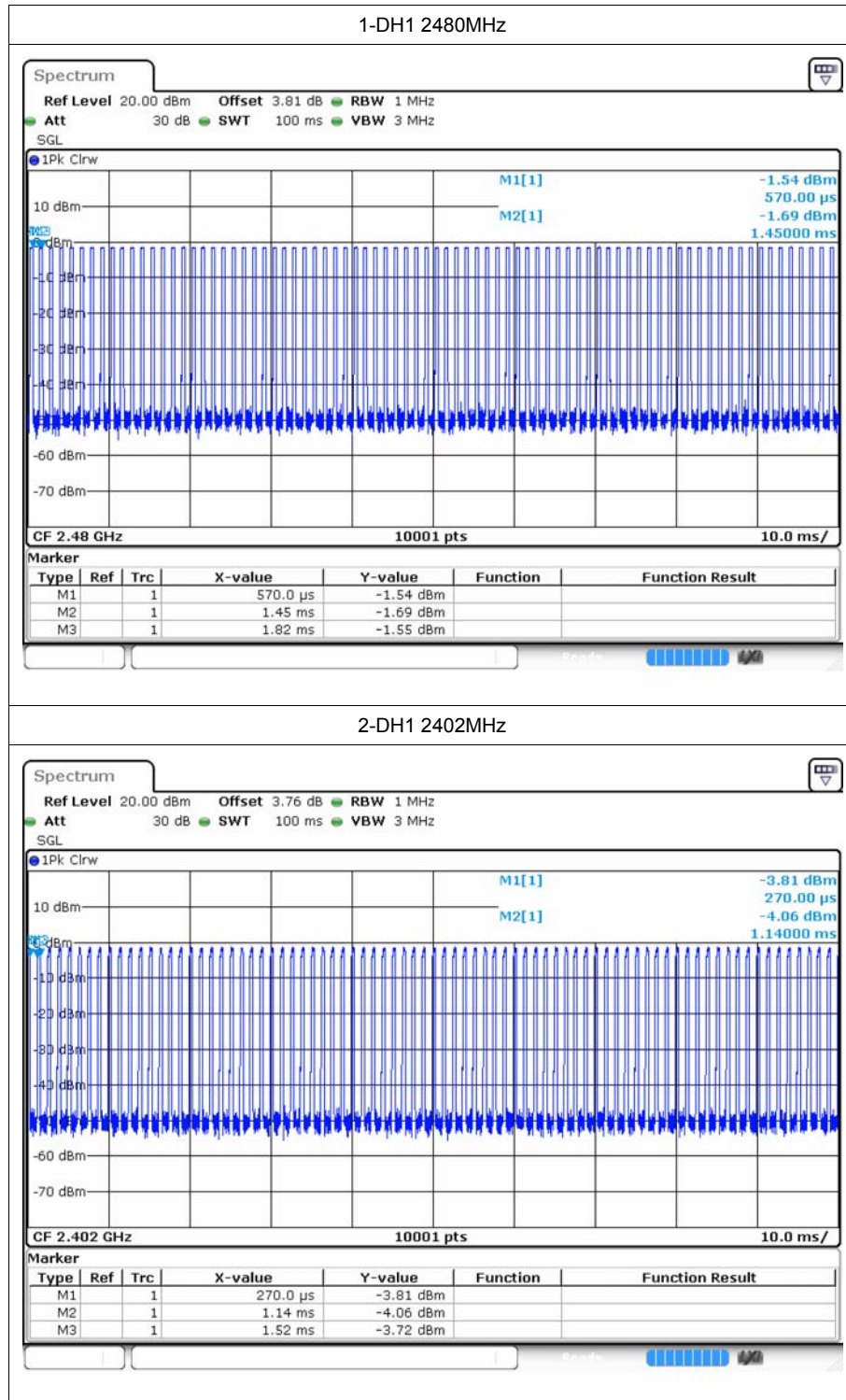
1 Duty Cycle

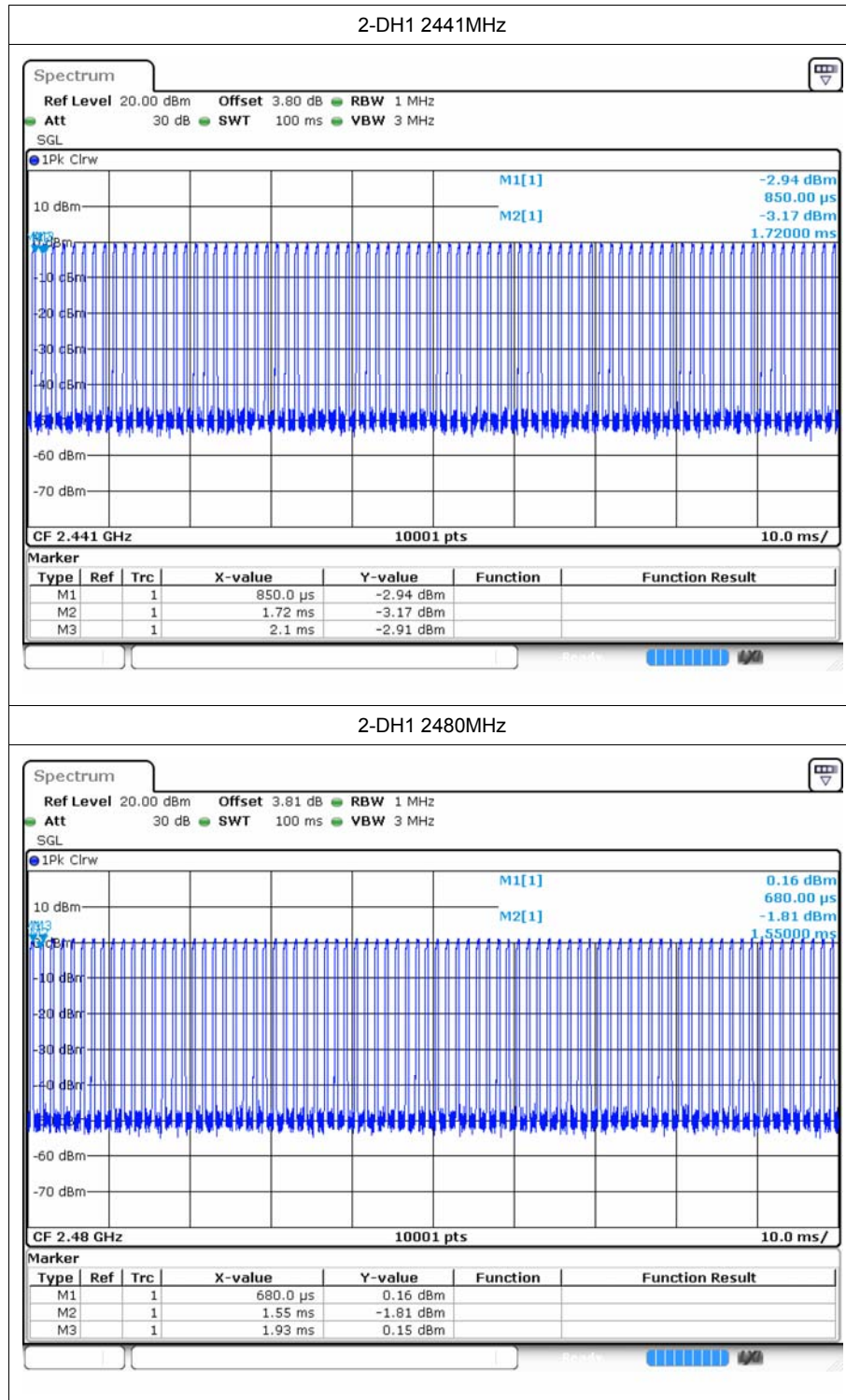
1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	30.41	2.7
1-DH1	2441	30.41	2.7
1-DH1	2480	30.4	2.7
2-DH1	2402	31.21	2.63
2-DH1	2441	31.2	2.63
2-DH1	2480	31.2	2.63

1.2 Test Graphs





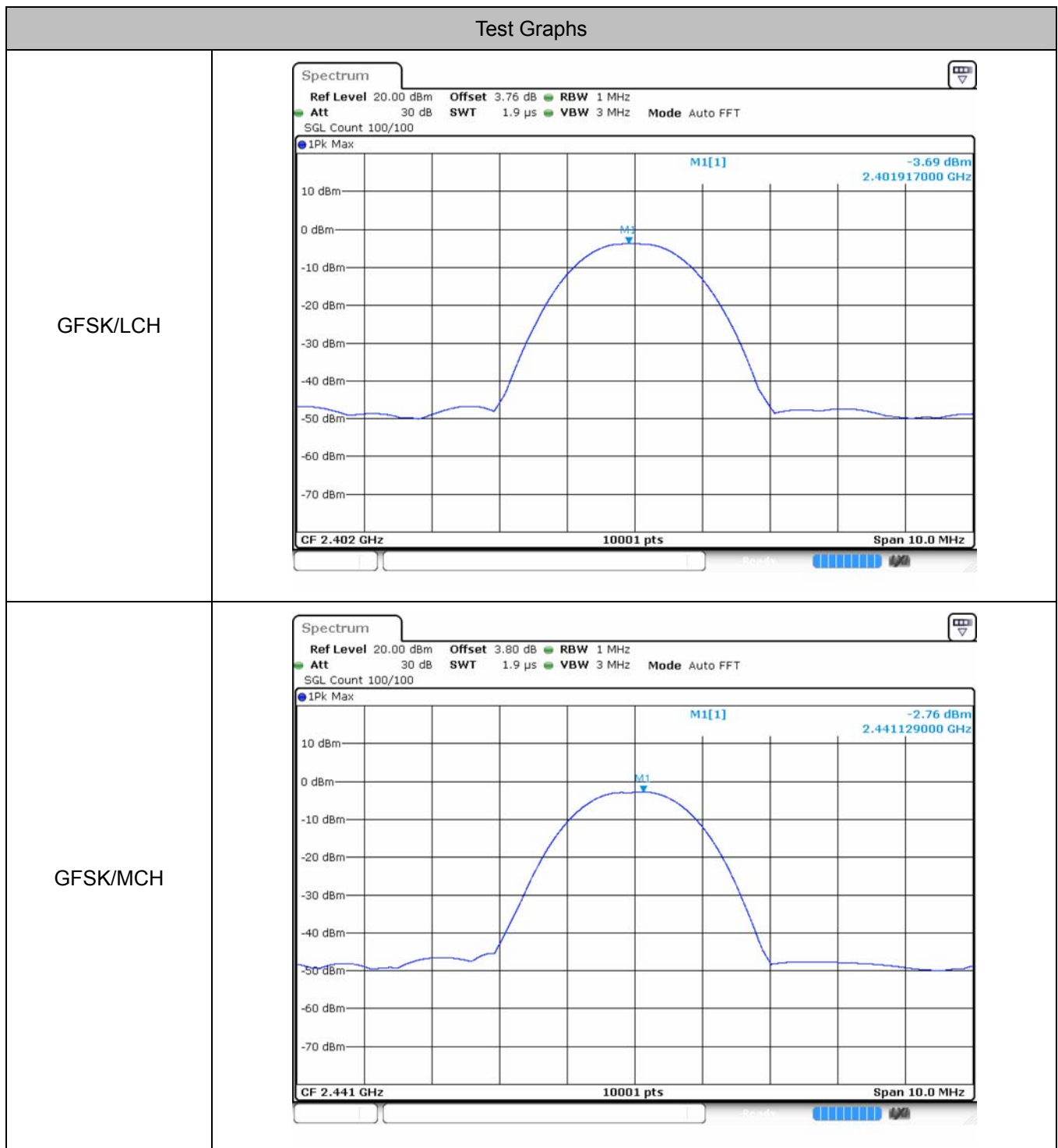


2 Maximum Conducted Peak Output Power

2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.69	21	Pass
	MCH	-2.76	21	Pass
	HCH	-1.46	21	Pass
$\pi/4$ DQPSK	LCH	-1.28	21	Pass
	MCH	-0.53	21	Pass
	HCH	1.12	21	Pass

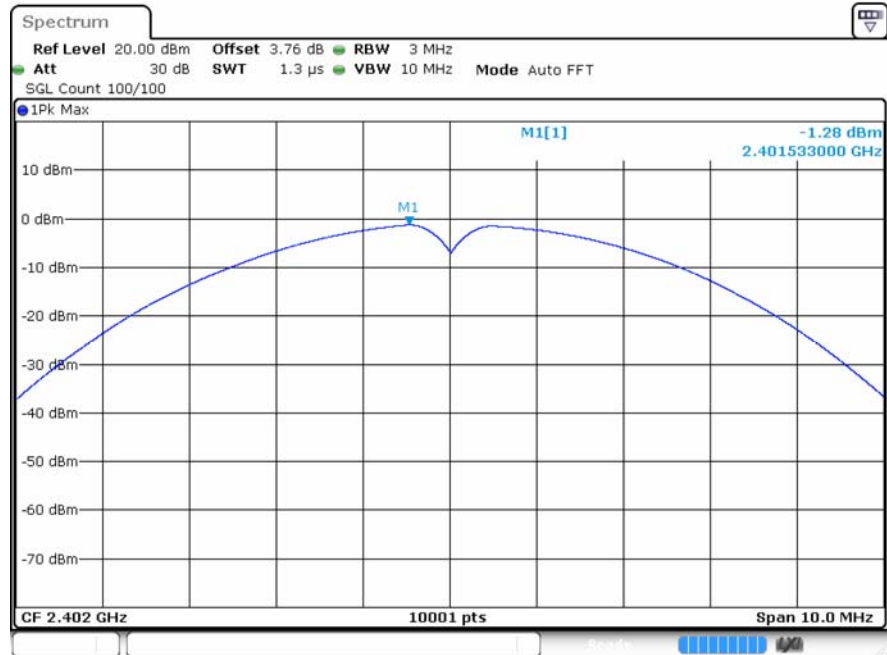
2.2 Test Graphs



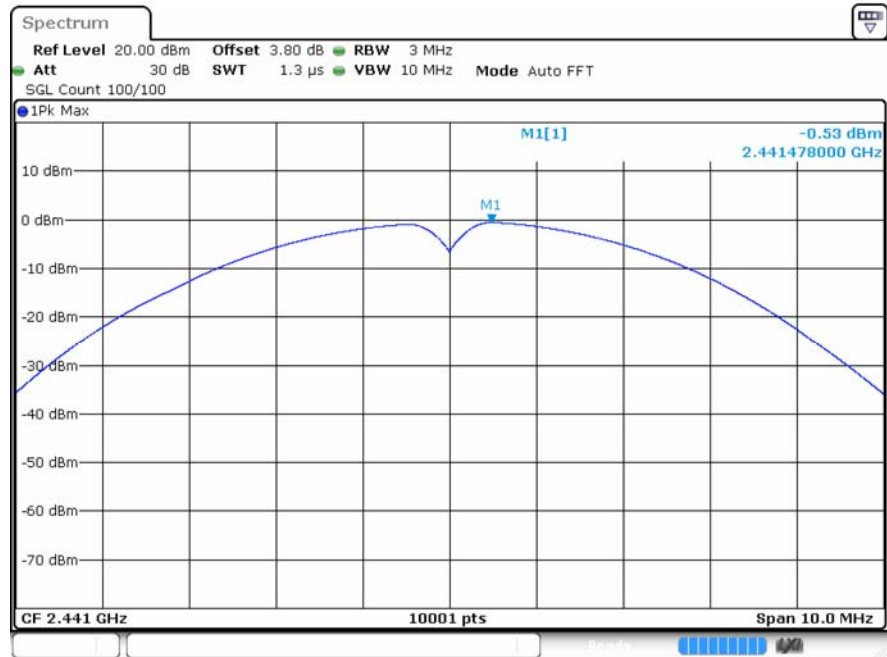
GFSK/HCH



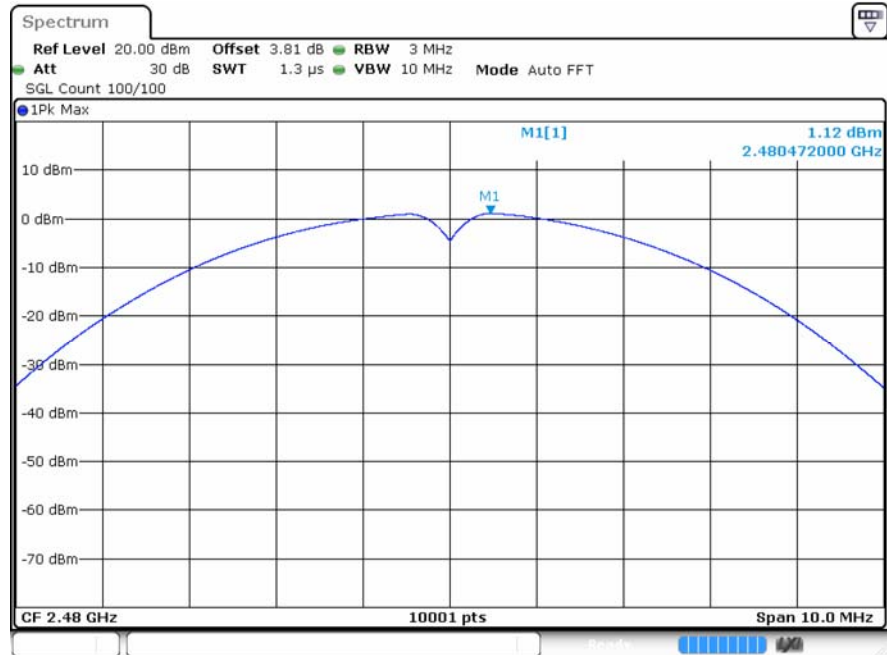
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

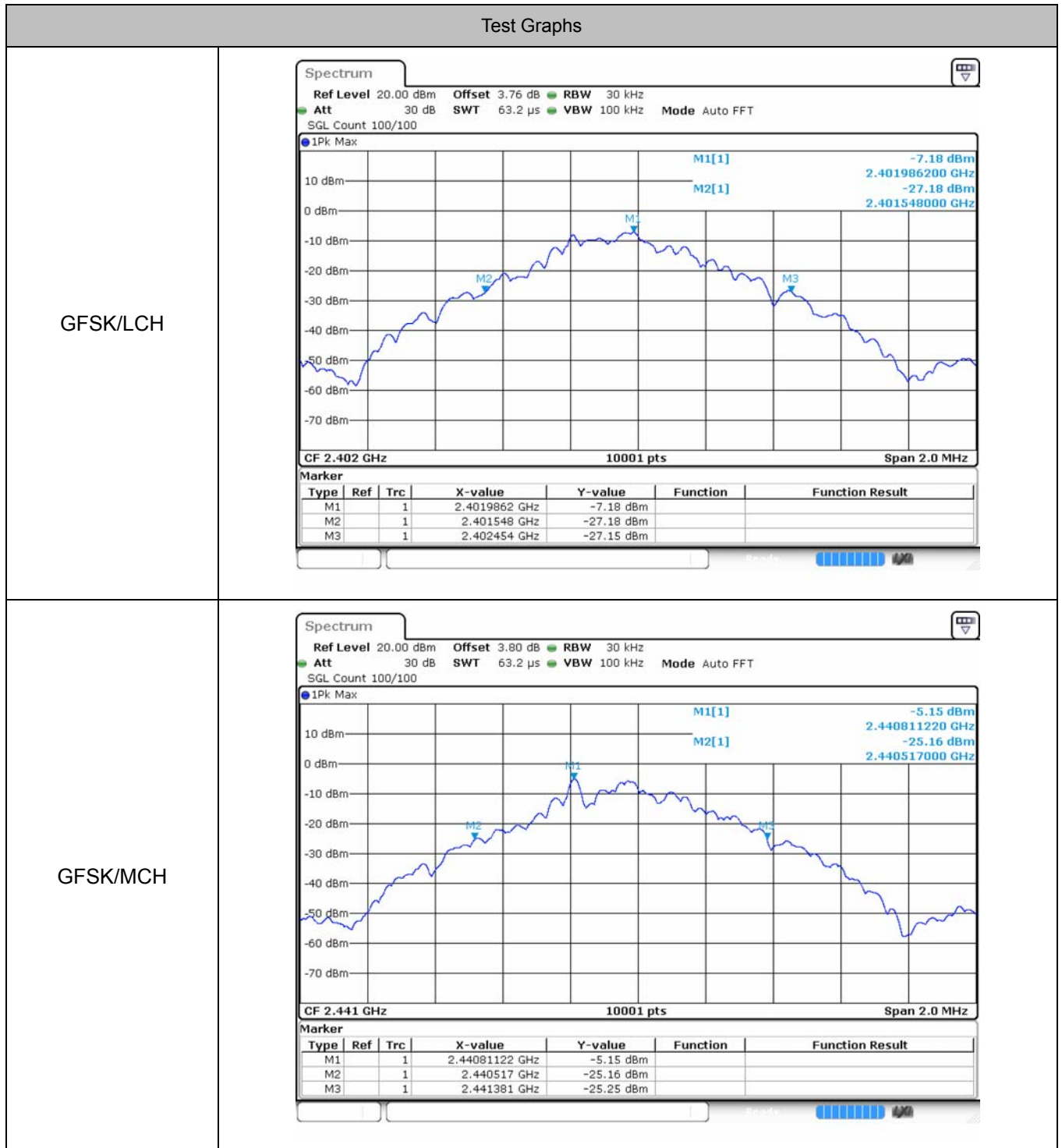


3 20dB Bandwidth

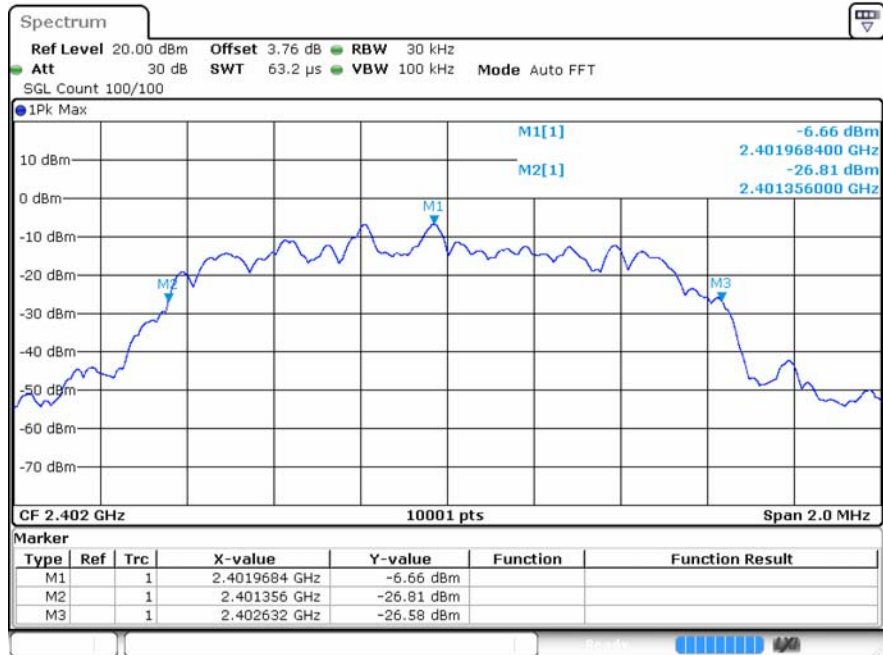
3.1 Test Result

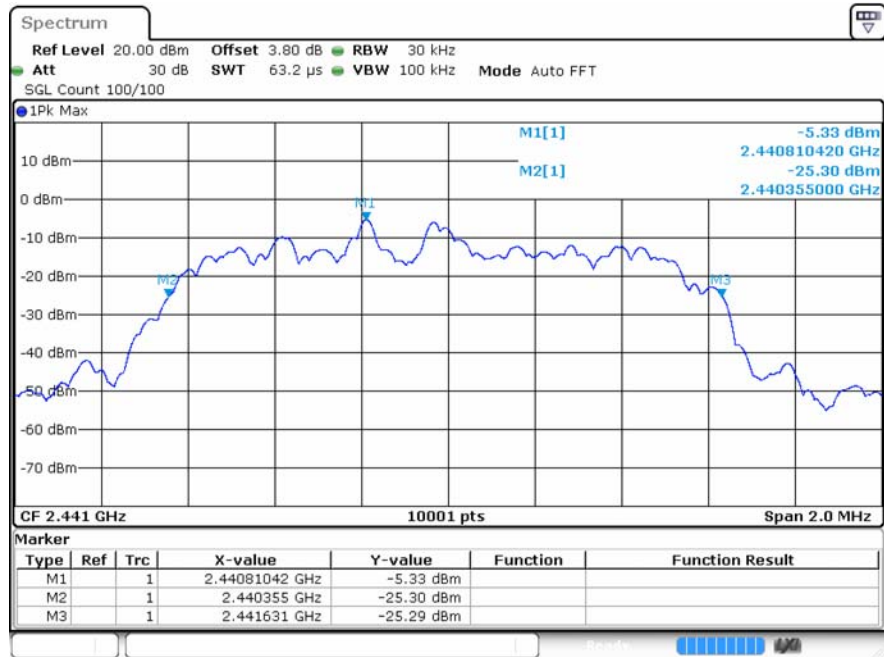
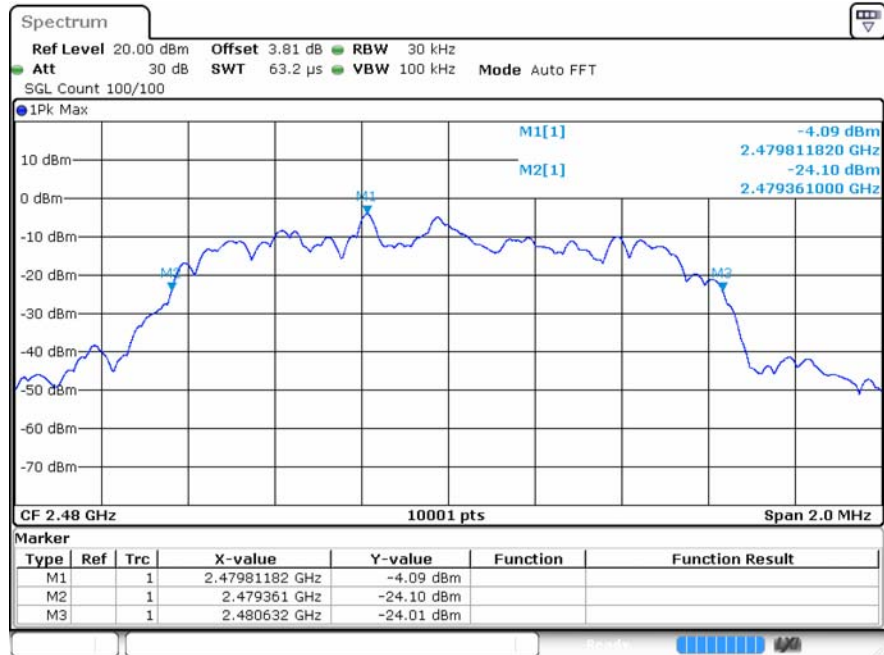
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.906	Not Specified	Pass
	MCH	0.863	Not Specified	Pass
	HCH	0.859	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.276	Not Specified	Pass
	MCH	1.276	Not Specified	Pass
	HCH	1.271	Not Specified	Pass

3.2 Test Graphs



GFSK/HCH


 $\pi/4$ DQPSK/LCH


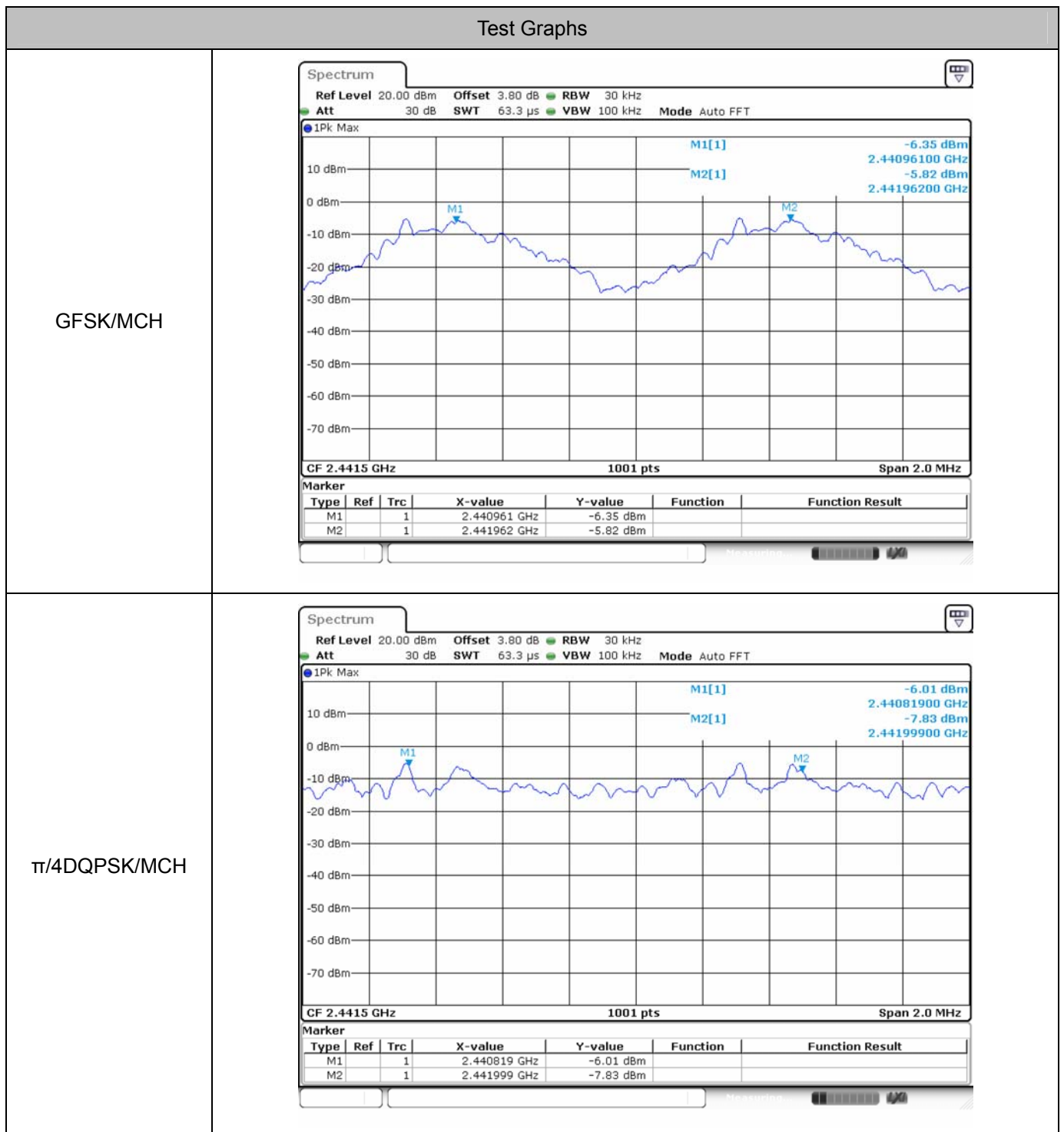
$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


4 Carrier Frequency Separation

4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.575	Pass
$\pi/4$ DQPSK	MCH	1.18	0.851	Pass

4.2 Test Graphs

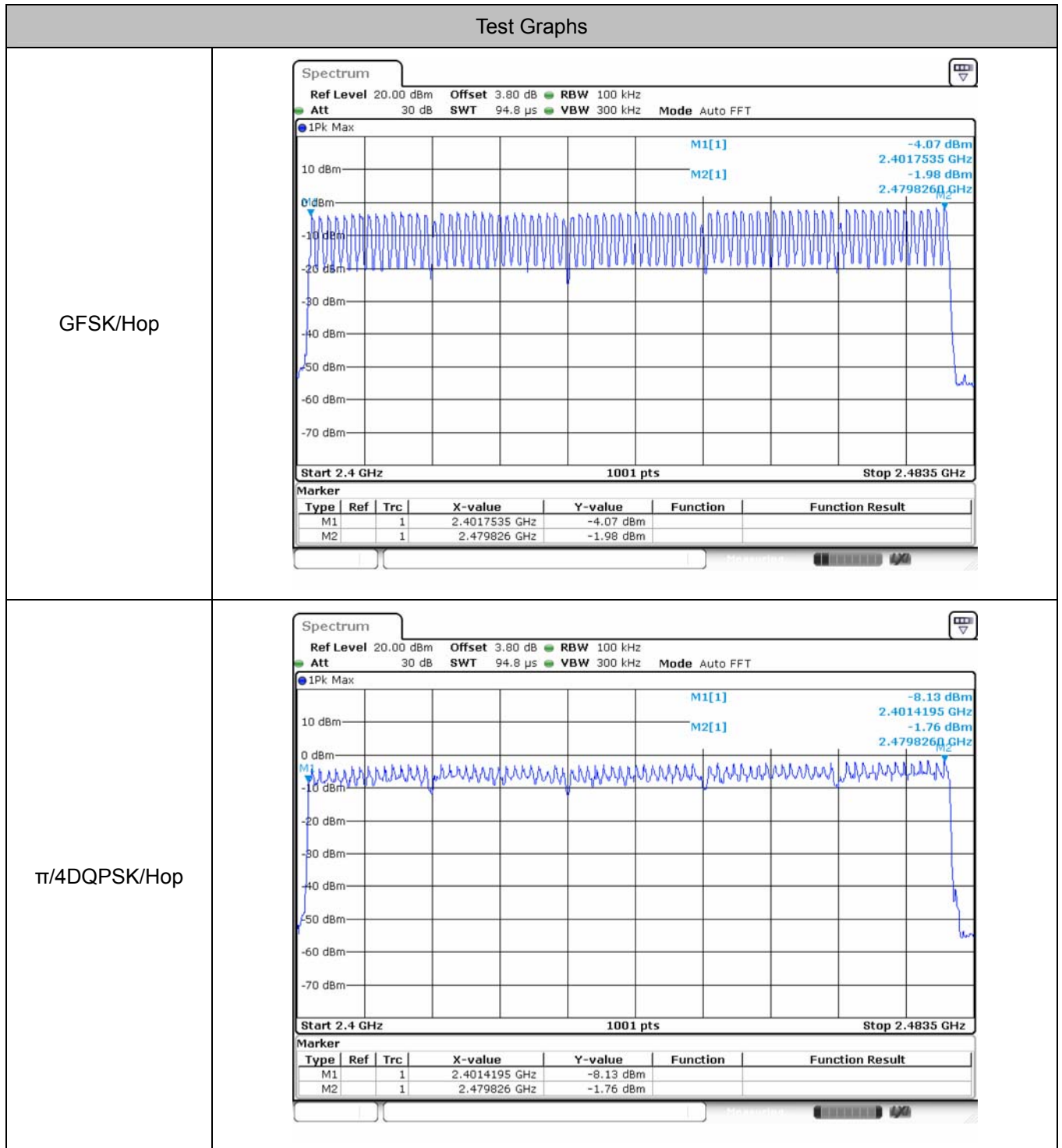


5 Hopping Channel Number

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

5.2 Test Graphs

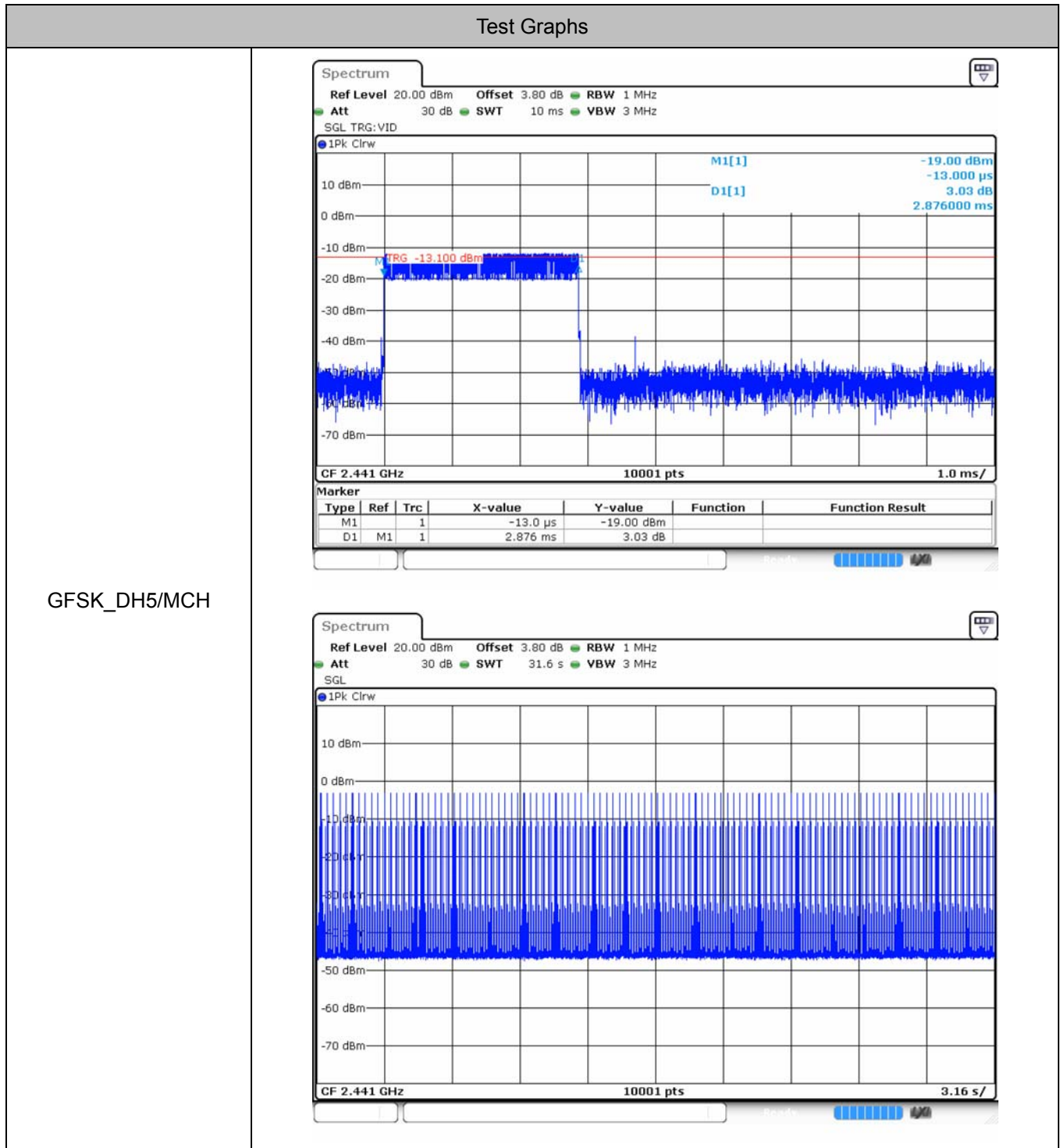


6 Dwell Time

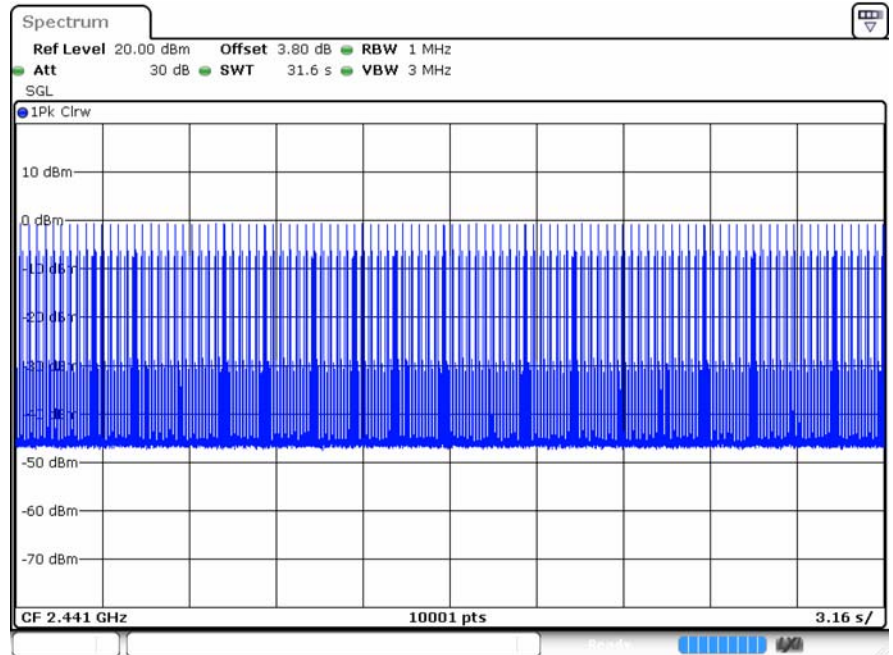
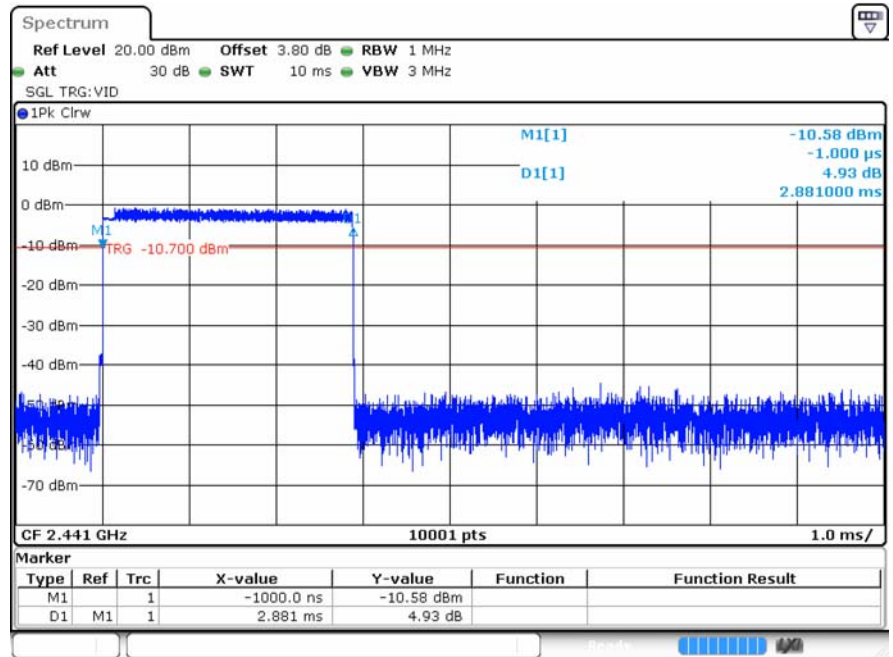
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.876	106	304.856	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.881	107	308.267	0.4	Pass

6.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH

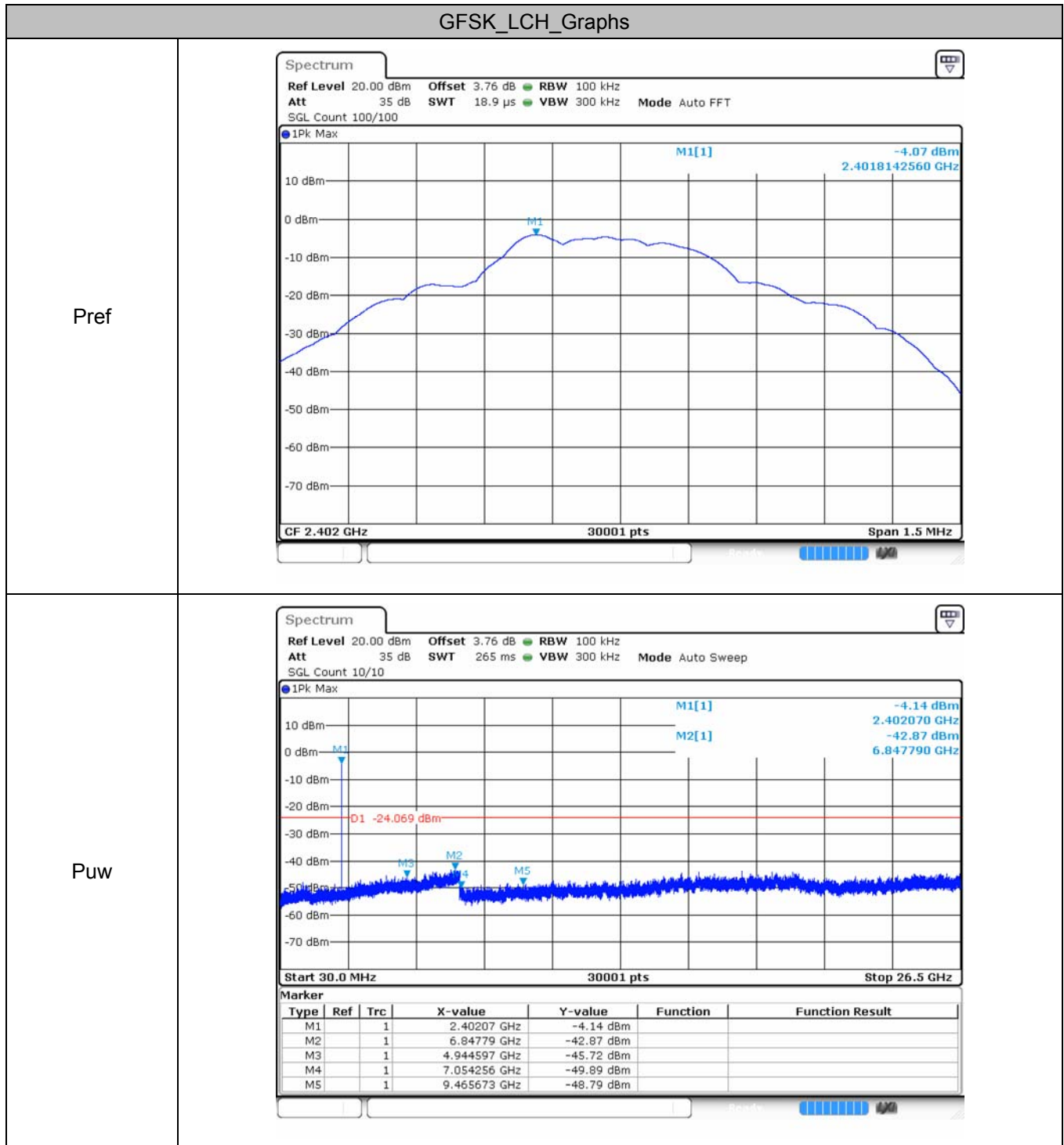


7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-38.8	-20	Pass
	MCH	-40.27	-20	Pass
	HCH	-41.23	-20	Pass
$\pi/4$ DQPSK	LCH	-38.66	-20	Pass
	MCH	-39.56	-20	Pass
	HCH	-40.57	-20	Pass

7.2 Test Graphs

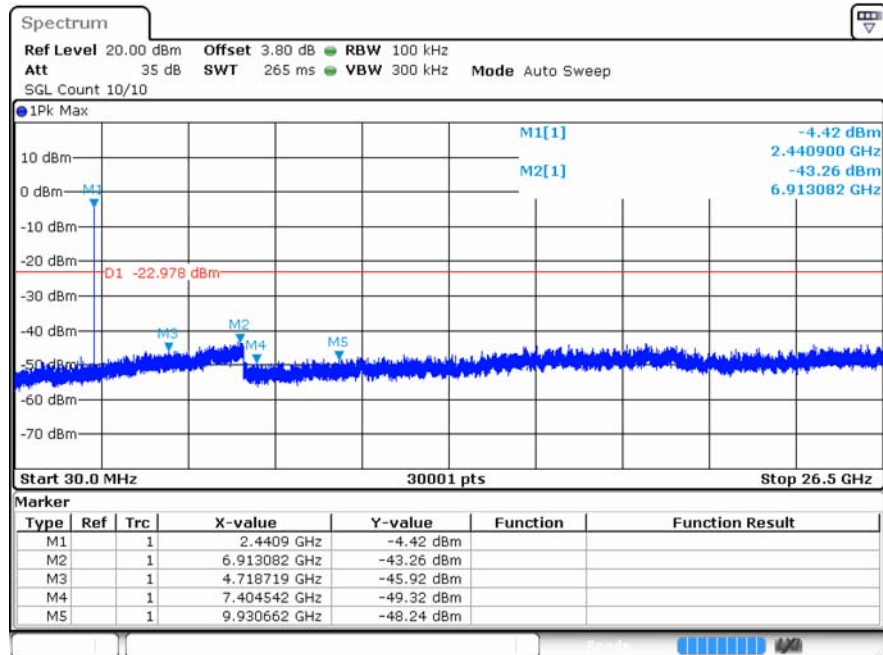


GFSK_MCH_Graphs

Pref



Puw

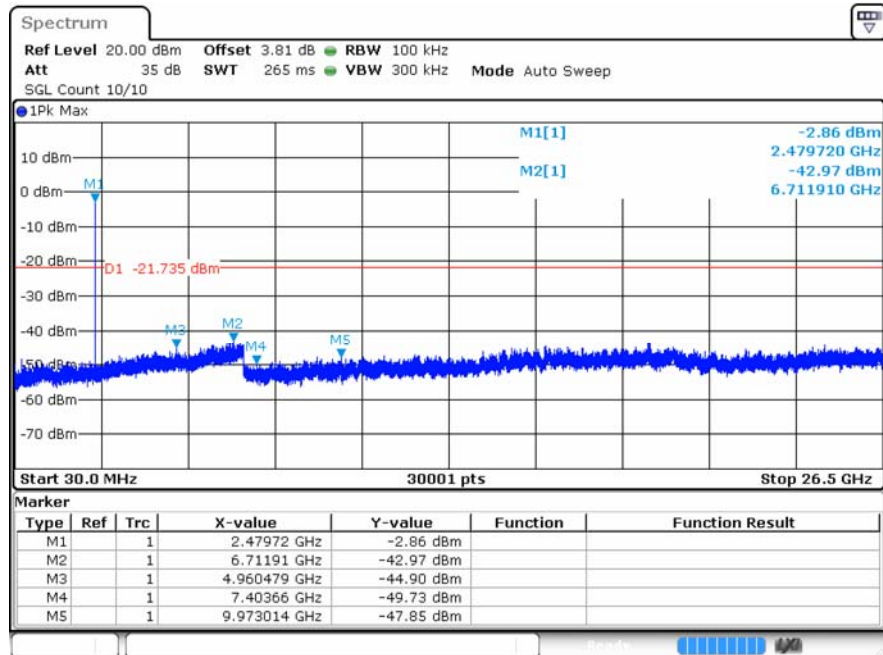


GFSK_HCH_Graphs

Pref

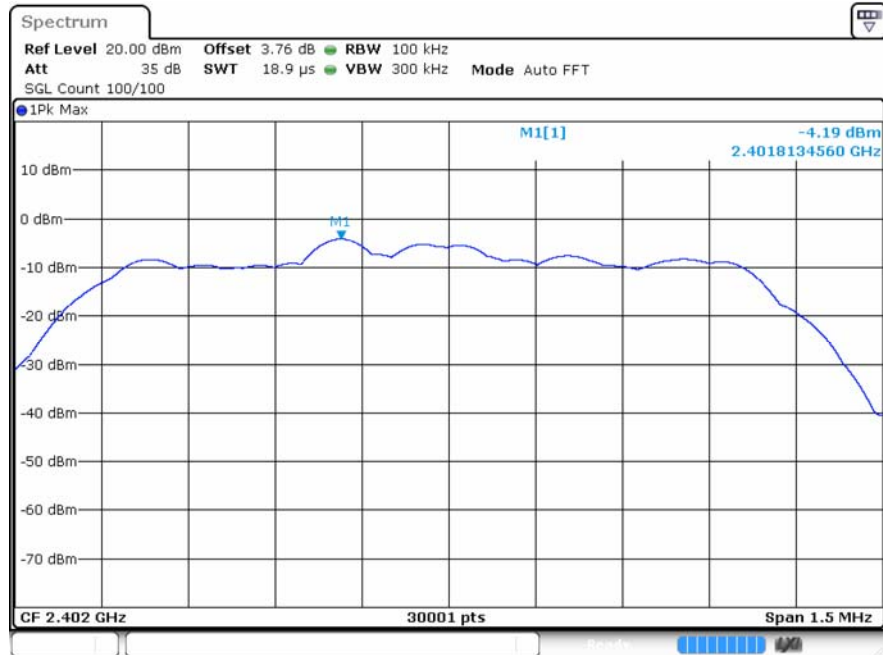


Puw

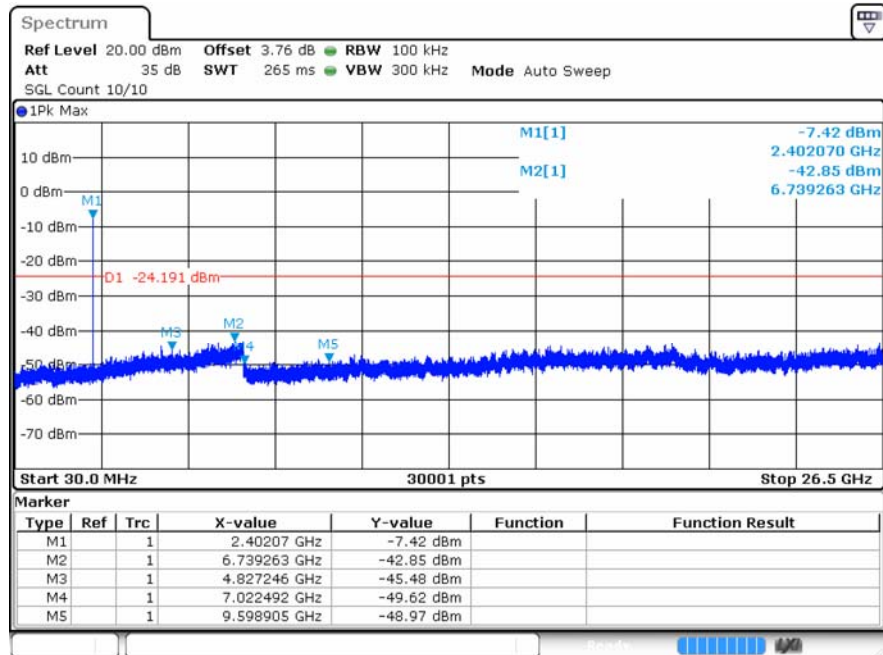


$\pi/4$ DQPSK_LCH_Graphs

Pref

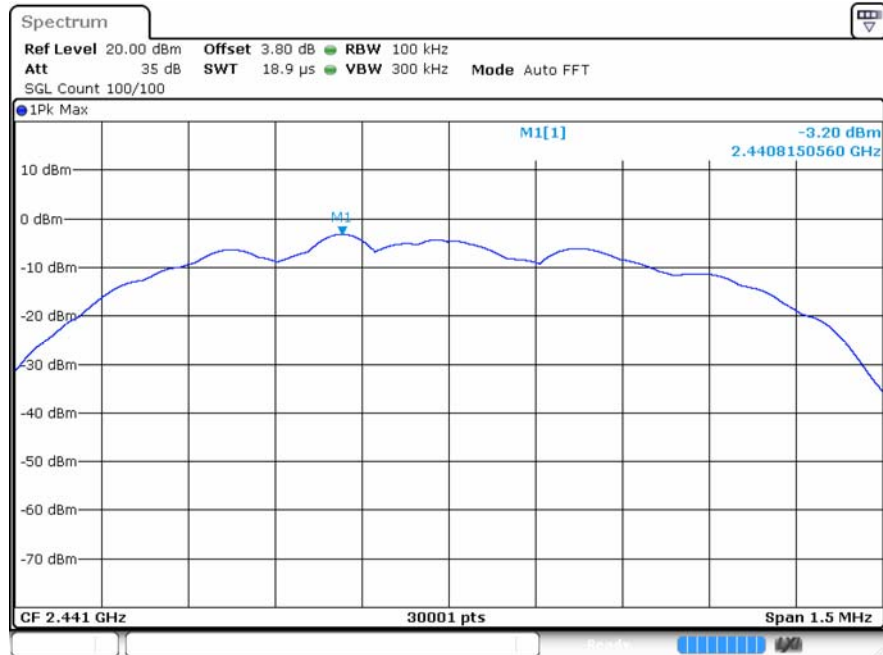


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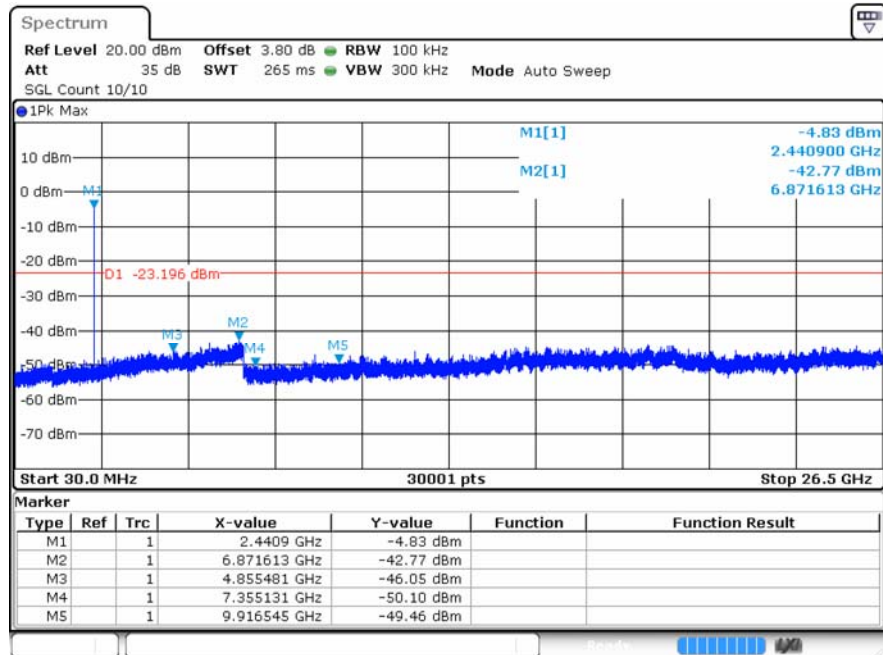


$\pi/4$ DQPSK_MCH_Graphs

Pref

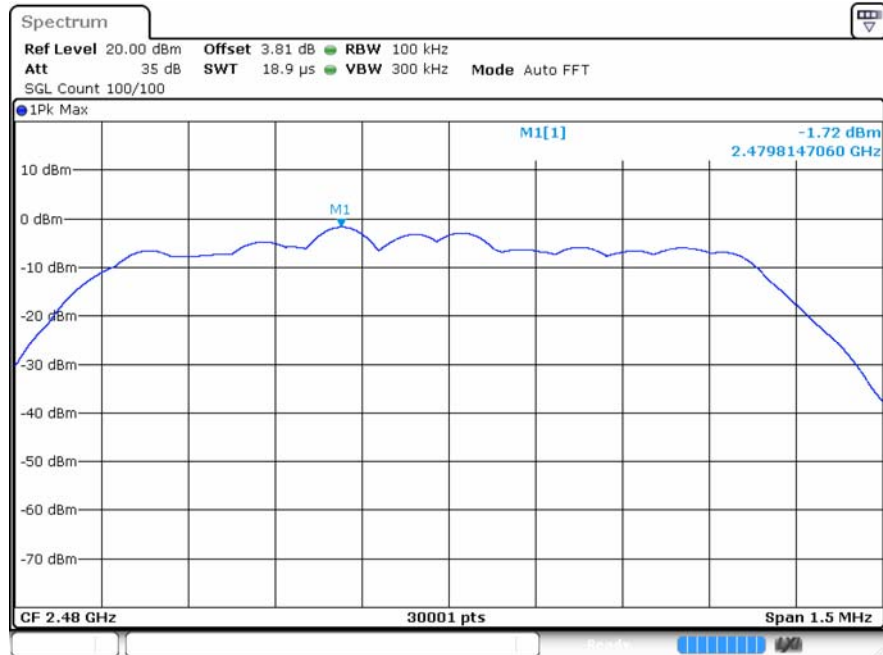


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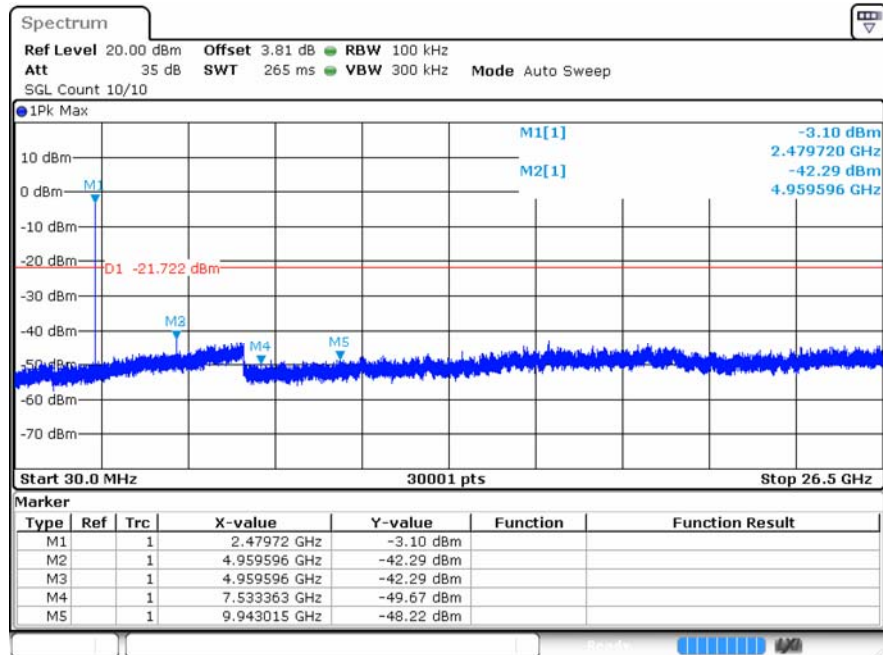


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

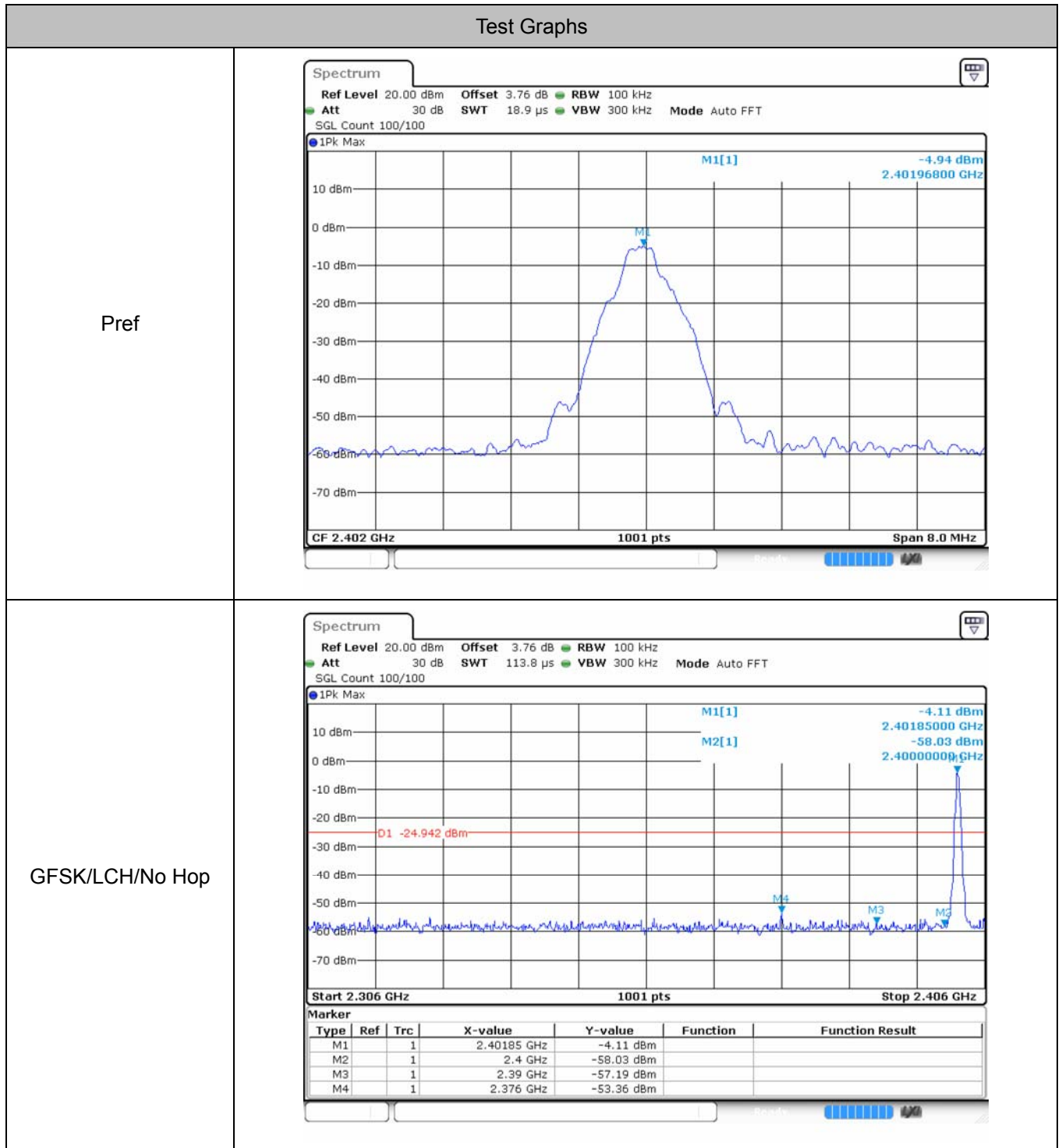


8 Band-edge for RF Conducted Emissions

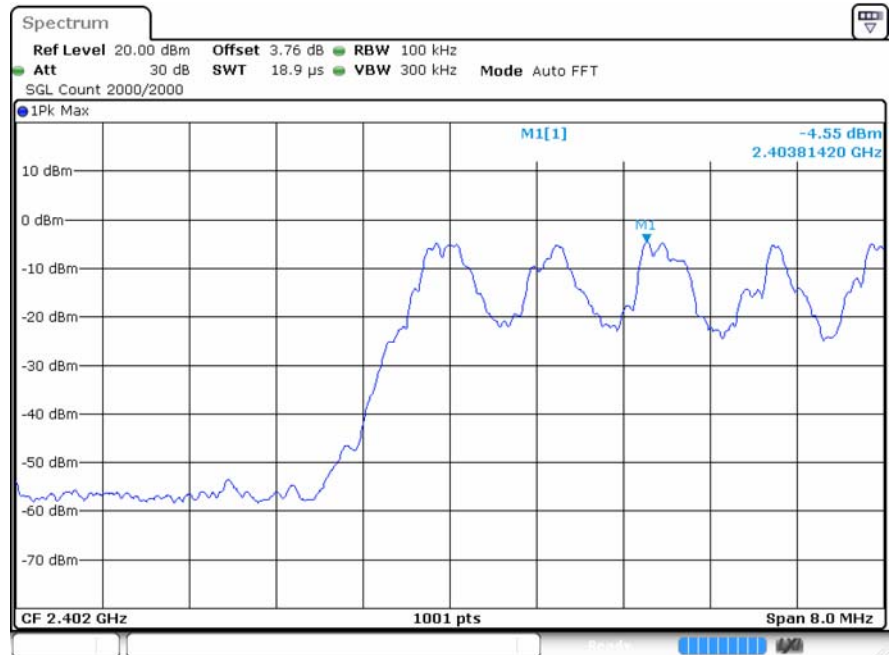
8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-48.42	-20	Pass
			On	-46.96	-20	Pass
	HCH	2480	Off	-53.83	-20	Pass
			On	-52.16	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-47.17	-20	Pass
			On	-47.1	-20	Pass
	HCH	2480	Off	-53.82	-20	Pass
			On	-52.68	-20	Pass

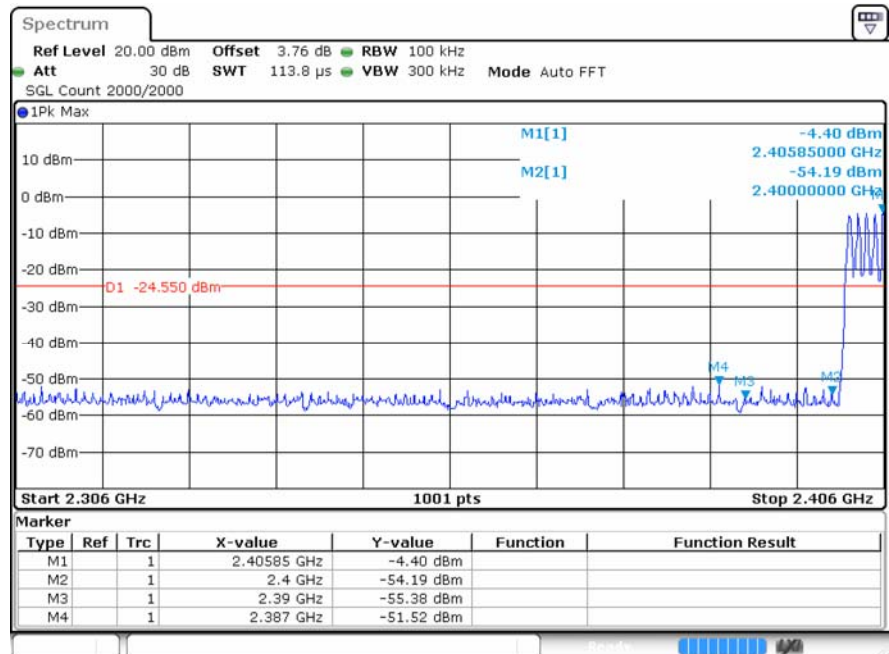
8.2 Test Graphs



Ref



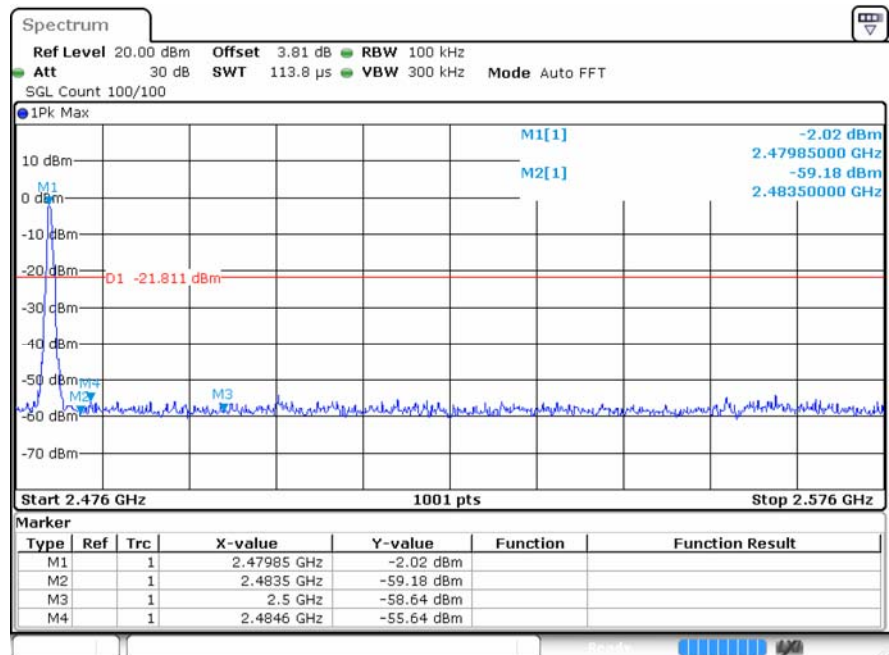
GFSK/LCH/Hop



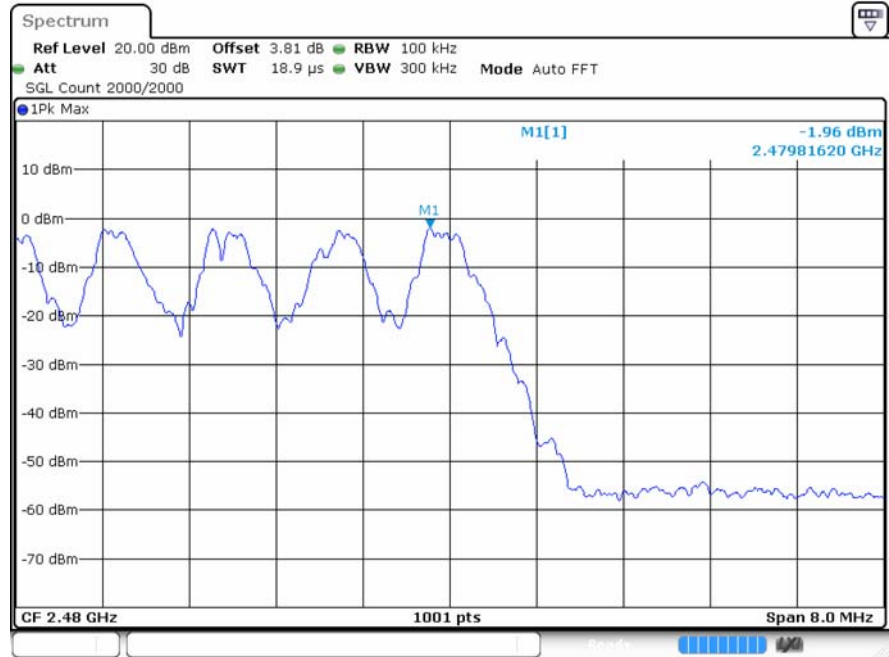
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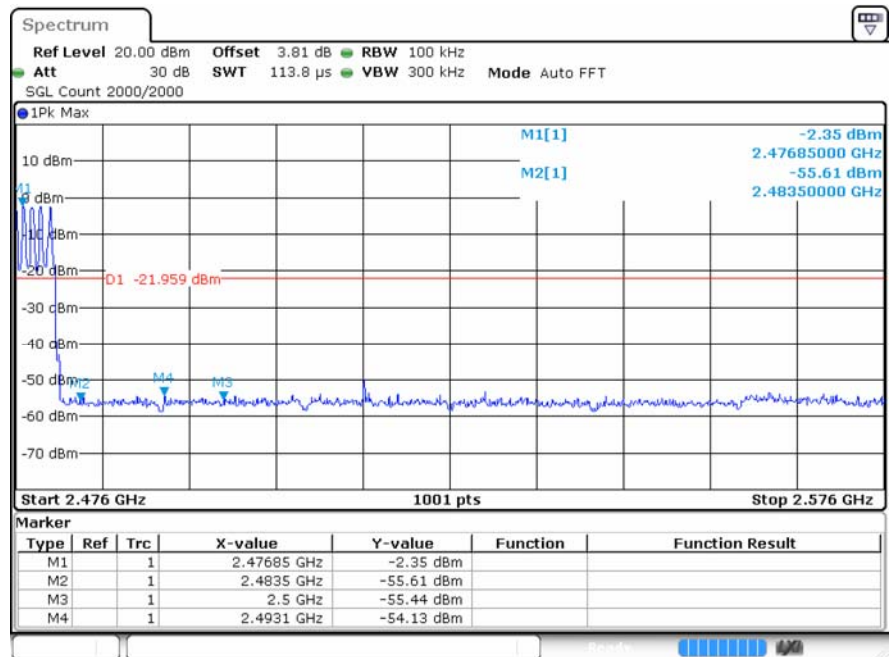
GFSK/HCH/No Hop



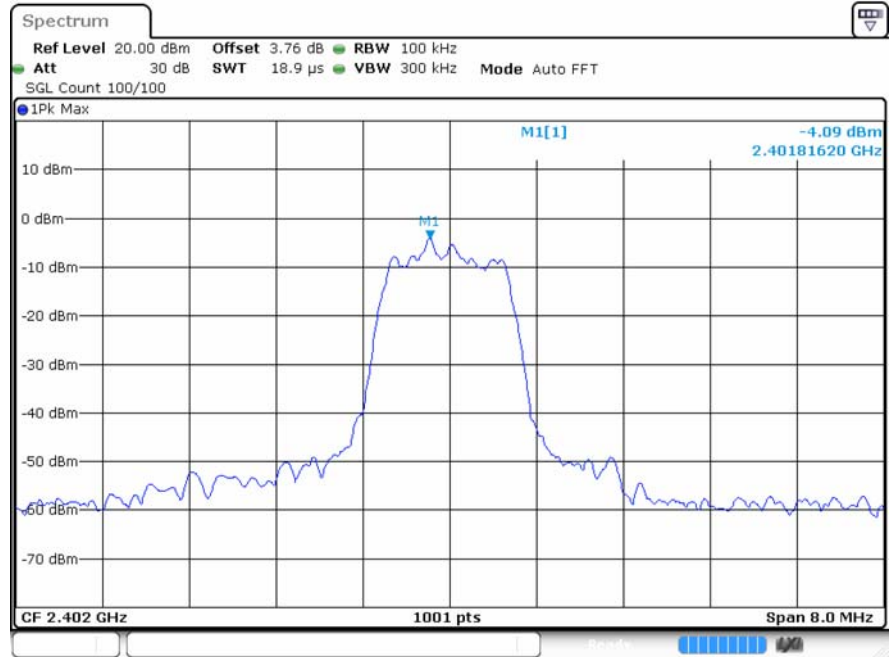
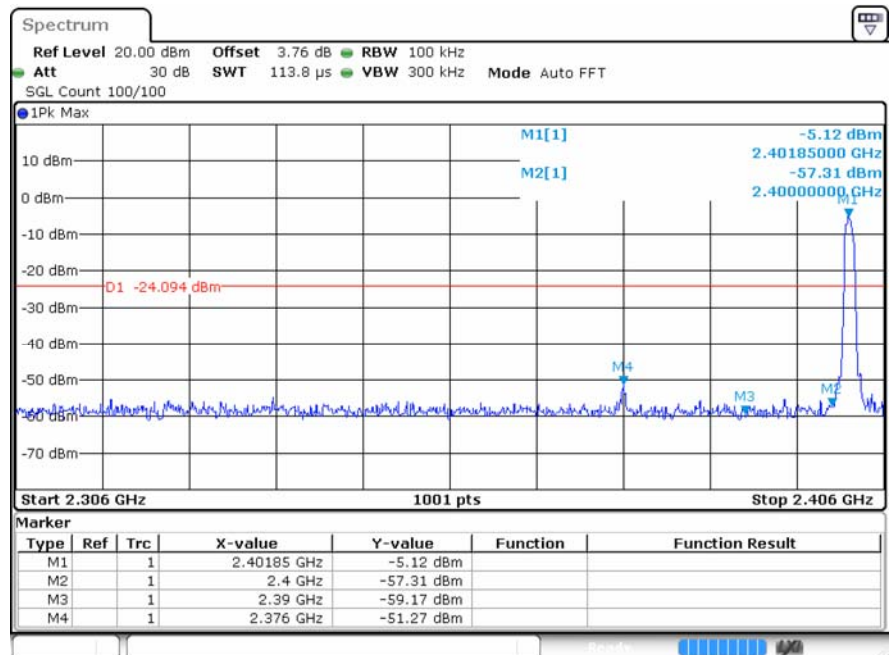
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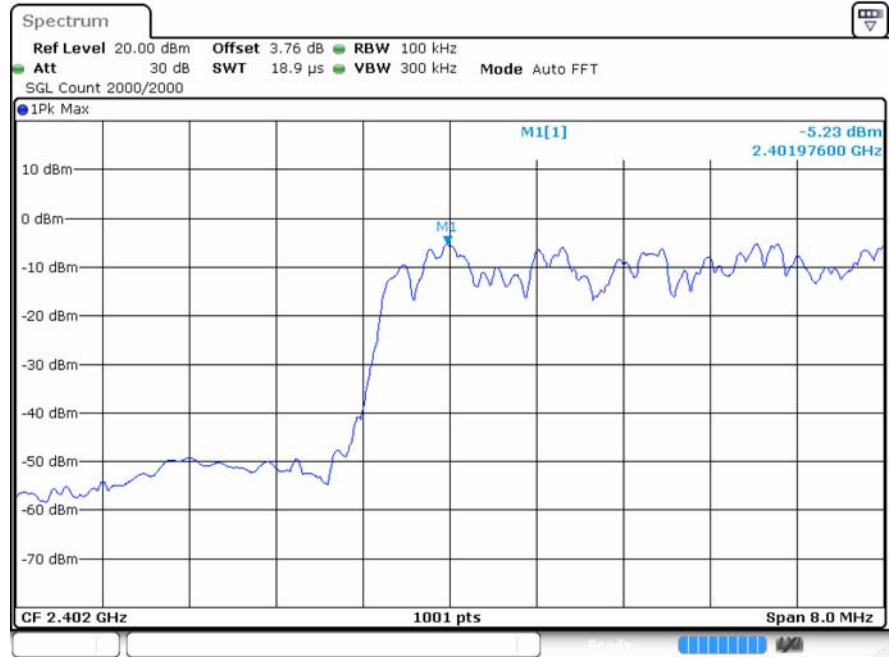
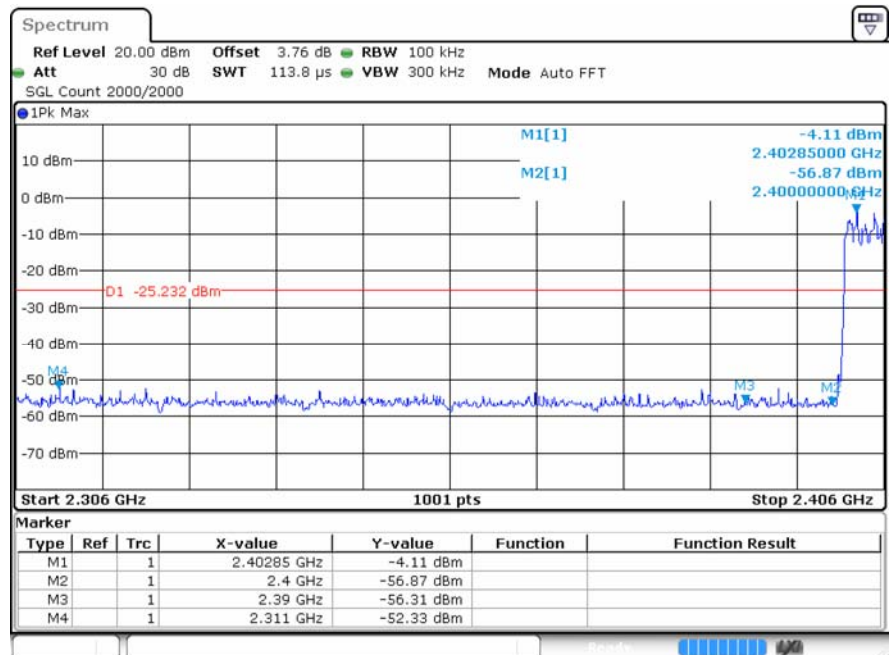
GFSK/HCH/Hop



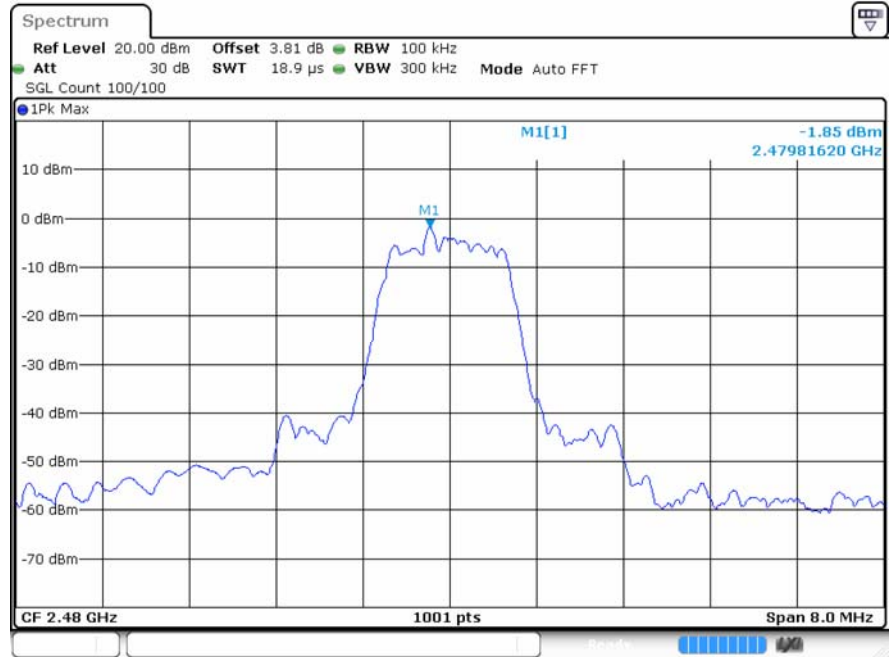
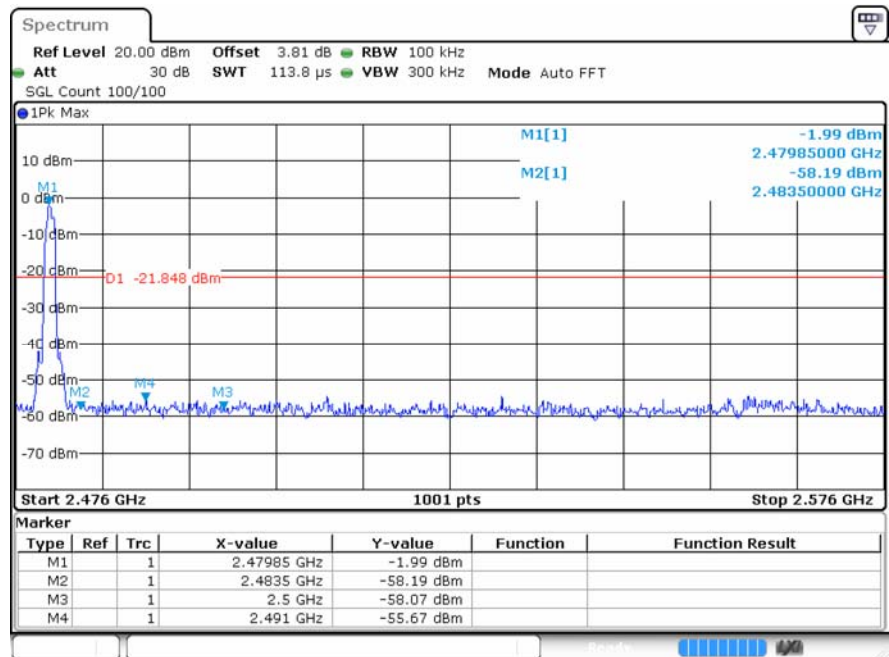
Ref


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


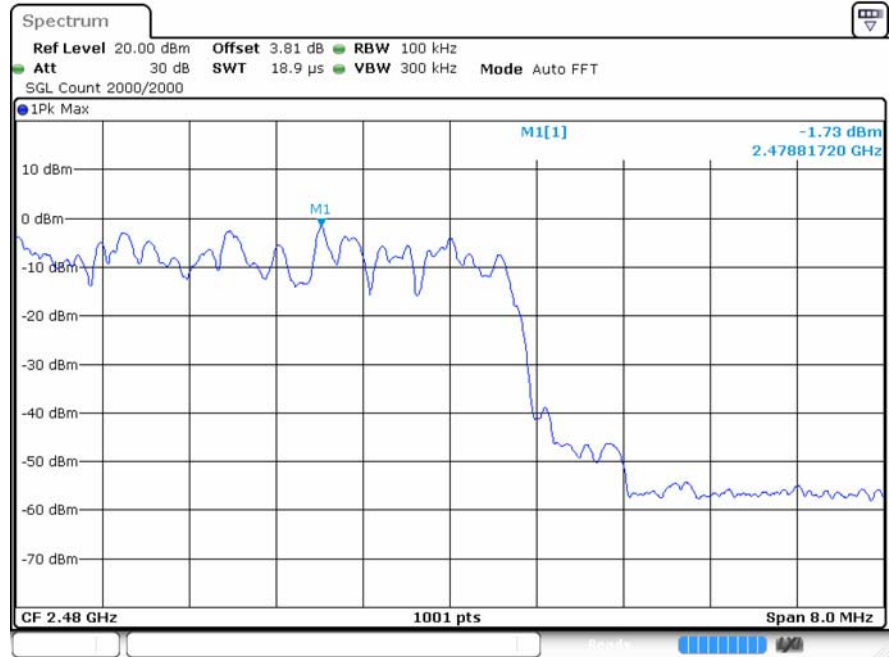
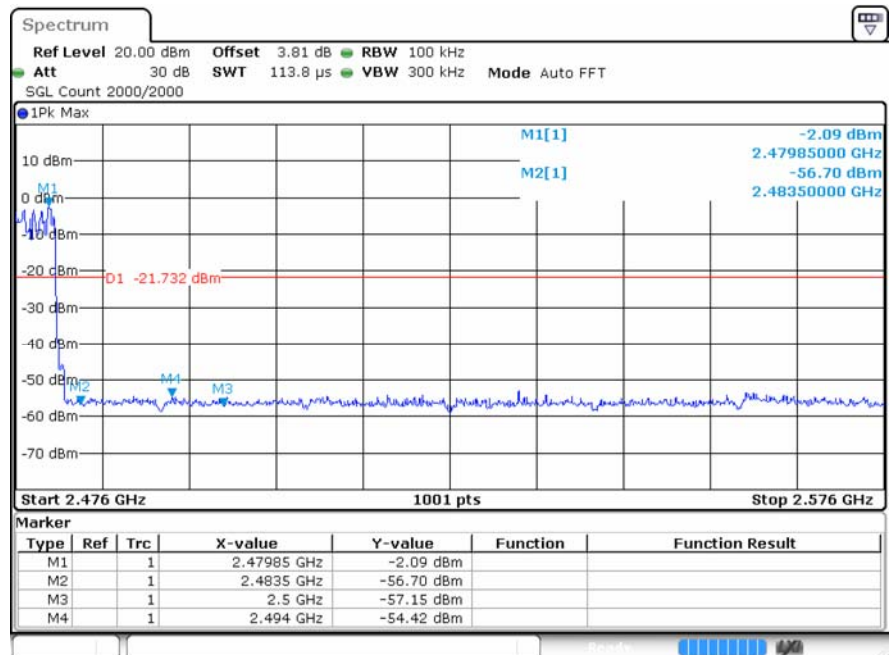
Ref


 $\pi/4$ DQPSK/LCH/Hop


Ref


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


Ref


 $\pi/4$ DQPSK/HCH/Hop


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1		2.47985 GHz	-2.09 dBm		
M2	1		2.4835 GHz	-56.70 dBm		
M3	1		2.5 GHz	-57.15 dBm		
M4	1		2.494 GHz	-54.42 dBm		

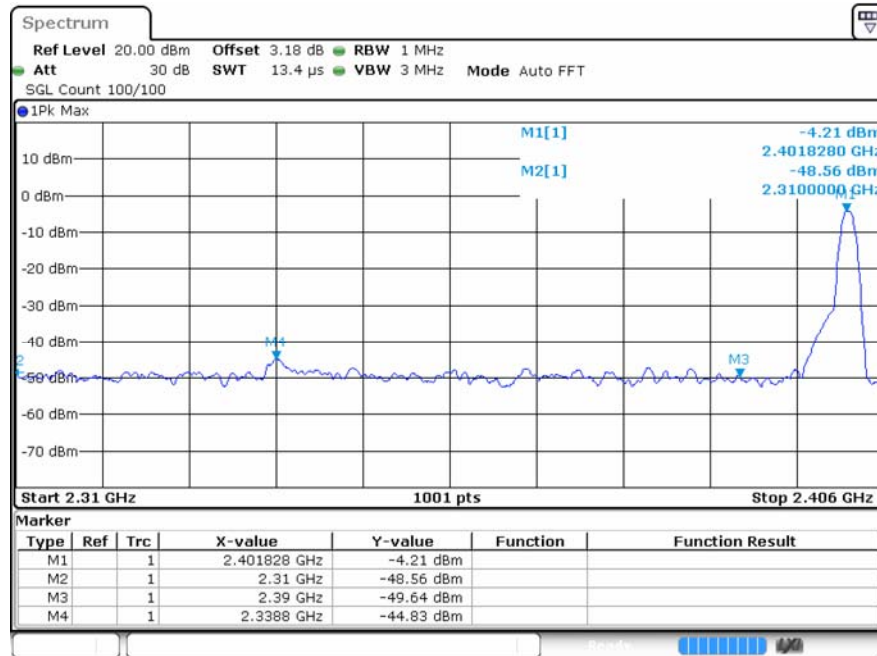
9 Restrict-band band-edge measurements

9.1 Test Result

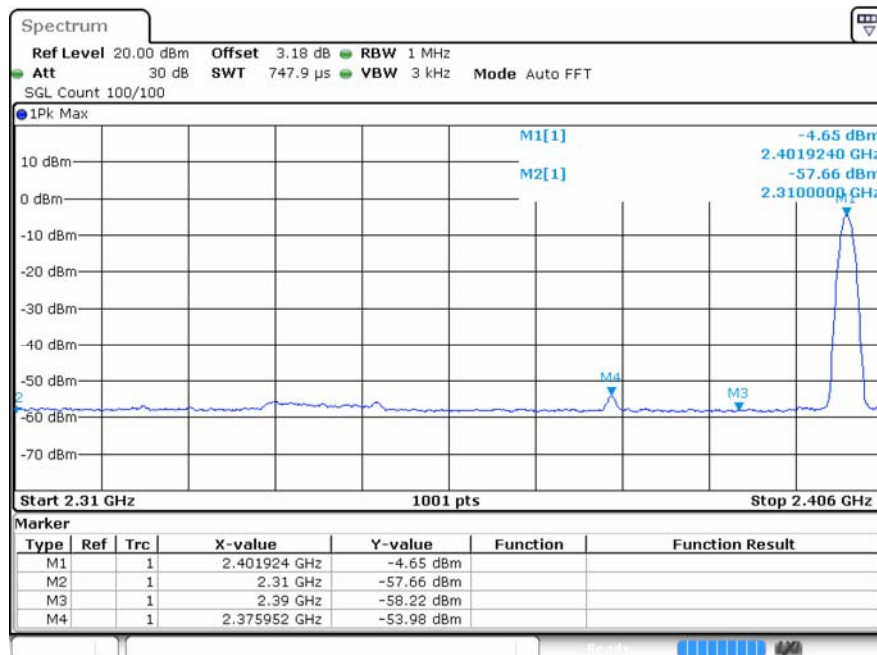
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.55	2	48.71	PEAK	74	Pass
	Off	2310.0	-57.66	2	39.6	AV	54	Pass
	Off	2338.8	-44.82	2	52.44	PEAK	74	Pass
	Off	2375.952	-53.98	2	43.28	AV	54	Pass
	Off	2390.0	-49.64	2	47.62	PEAK	74	Pass
	Off	2390.0	-58.21	2	39.05	AV	54	Pass
	Off	2483.5	-48.76	2	48.5	PEAK	74	Pass
	Off	2483.5	-57.49	2	39.77	AV	54	Pass
	Off	2493.328	-46.71	2	50.55	PEAK	74	Pass
	Off	2484.688	-55.88	2	41.38	AV	54	Pass
	Off	2500.0	-49.68	2	47.58	PEAK	74	Pass
	Off	2500.0	-57.59	2	39.67	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-49.17	2	48.09	PEAK	74	Pass
	Off	2310.0	-58.09	2	39.17	AV	54	Pass
	Off	2338.896	-46.2	2	51.06	PEAK	74	Pass
	Off	2376.048	-54.52	2	42.74	AV	54	Pass
	Off	2390.0	-49.15	2	48.11	PEAK	74	Pass
	Off	2390.0	-57.96	2	39.3	AV	54	Pass
	Off	2483.5	-48.96	2	48.3	PEAK	74	Pass
	Off	2483.5	-56.87	2	40.39	AV	54	Pass
	Off	2485.6	-45.57	2	51.69	PEAK	74	Pass
	Off	2484.376	-55.83	2	41.43	AV	54	Pass
	Off	2500.0	-48.94	2	48.32	PEAK	74	Pass
	Off	2500.0	-57.49	2	39.77	AV	54	Pass

9.2 Test Graphs

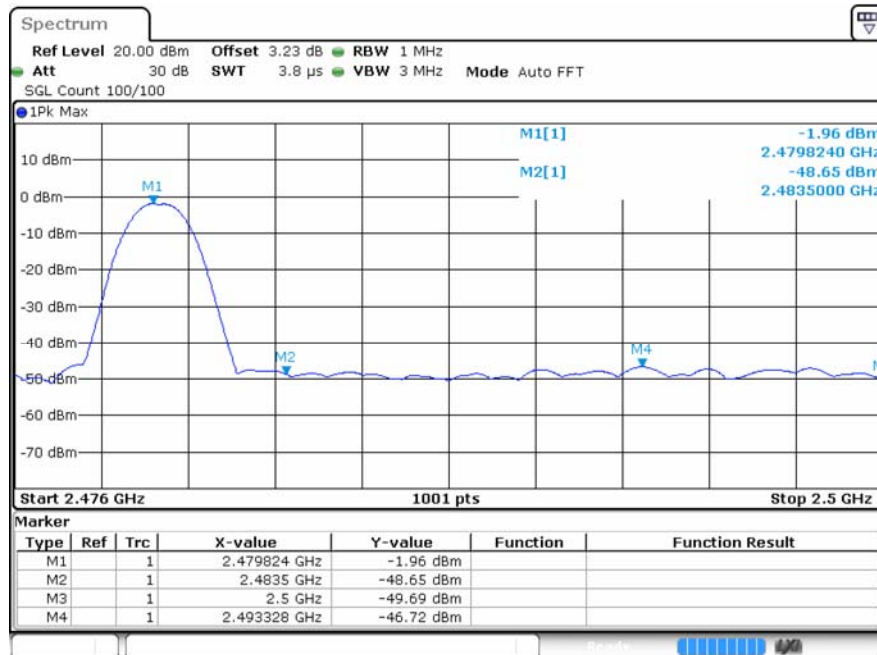
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



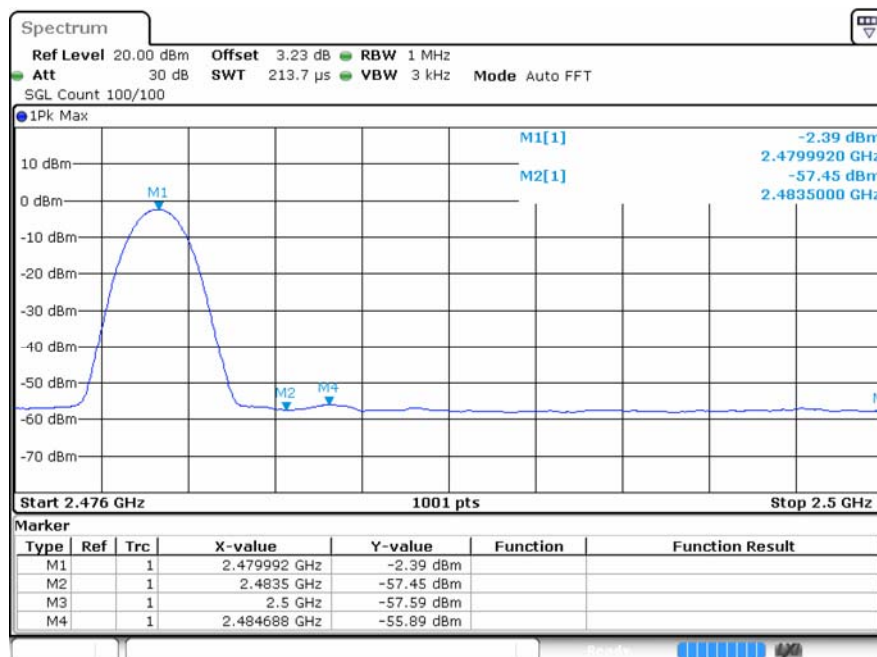
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



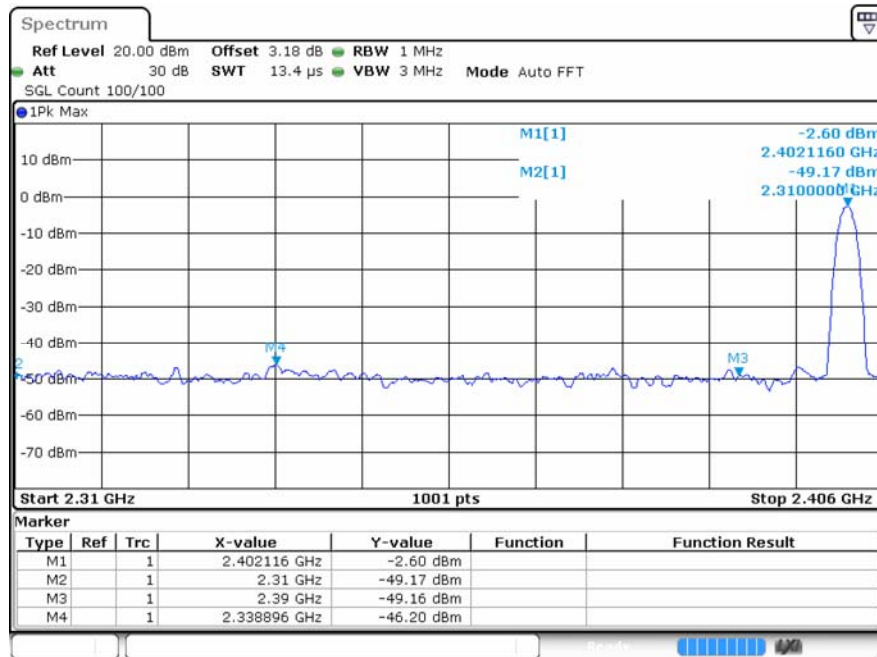
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



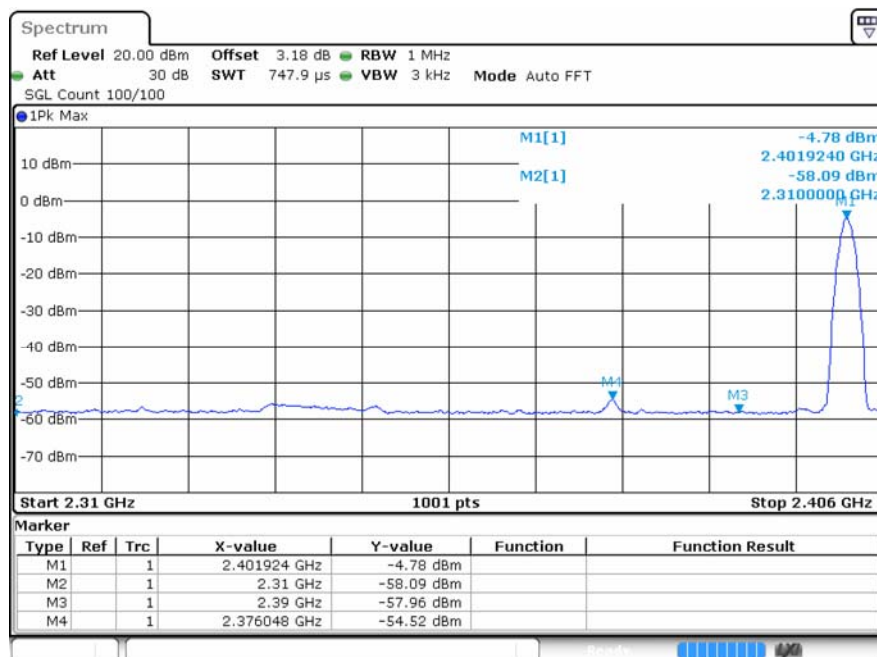
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



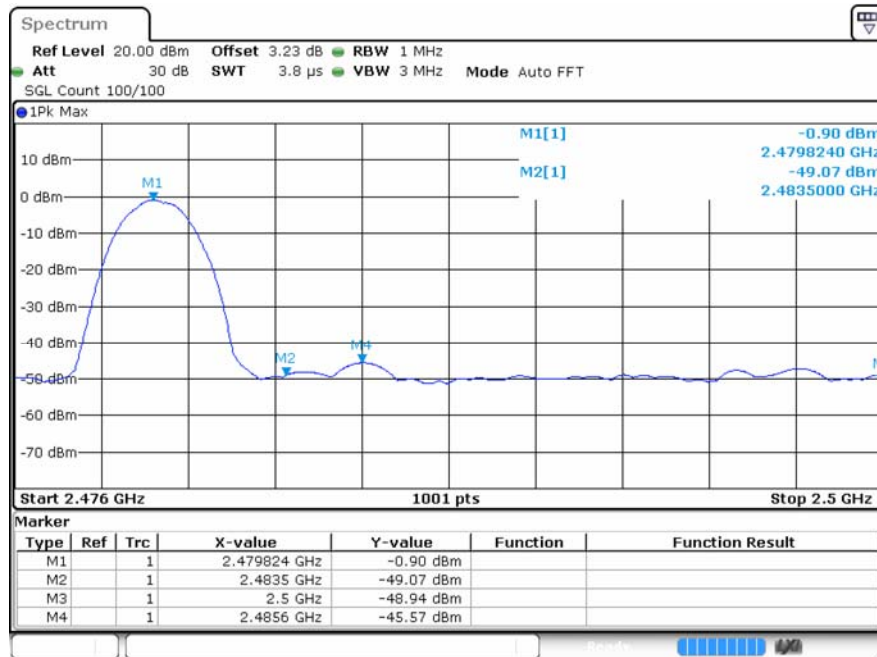
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



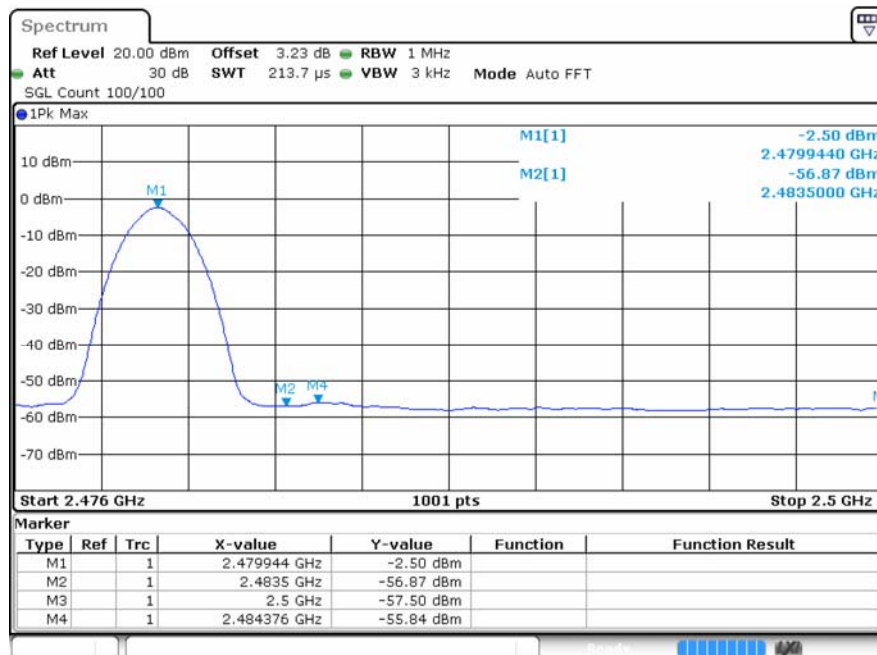
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



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---