



Appendix A

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

Product Name: Mini Bluetooth Speaker

Trade Mark: iTOUCH

Test Model: EBS-211206

Environmental Conditions

Temperature:	24.4℃
Relative Humidity:	52.2%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



Contents

Page

COVER PAGE

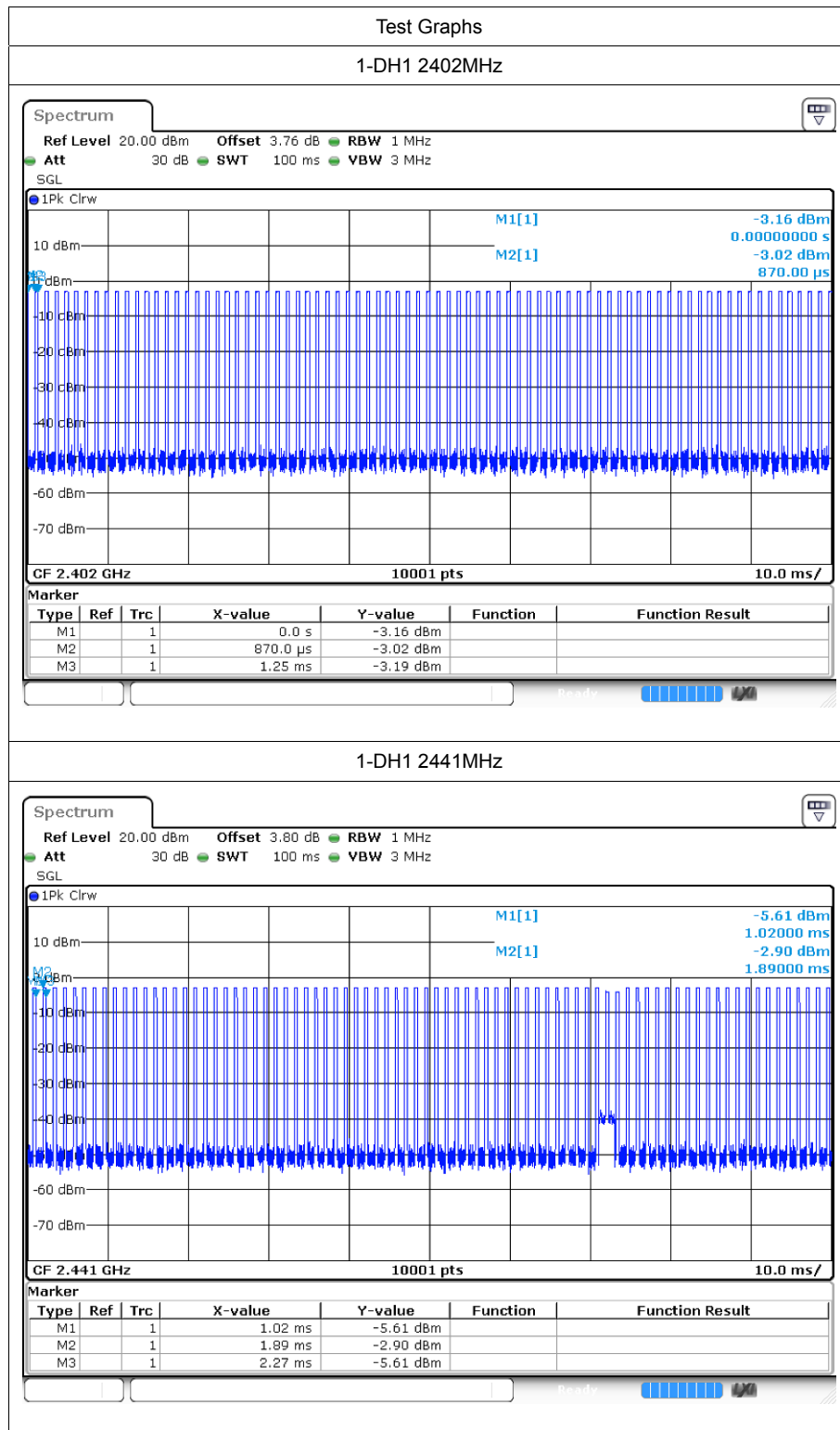
1	Duty Cycle	3
1.1	Test Result.....	3
1.2	Test Graphs	4
2	Maximum Conducted Peak Output Power	9
2.1	Test Result.....	9
2.2	Test Graphs	10
3	20dB Bandwidth	15
3.1	Test Result.....	15
3.2	Test Graphs	16
4	Carrier Frequency Separation	21
4.1	Test Result.....	21
4.2	Test Graphs	22
5	Hopping Channel Number.....	24
5.1	Test Result.....	24
5.2	Test Graphs	25
6	Dwell Time	27
6.1	Test Result.....	27
6.2	Test Graphs	28
7	RF Conducted Spurious Emissions.....	31
7.1	Test Result.....	31
7.2	Test Graphs	32
8	Band-edge for RF Conducted Emissions	41
8.1	Test Result.....	41
8.2	Test Graphs	42
9	Restrict-band band-edge measurements	54
9.1	Test Result.....	54
9.2	Test Graphs	56

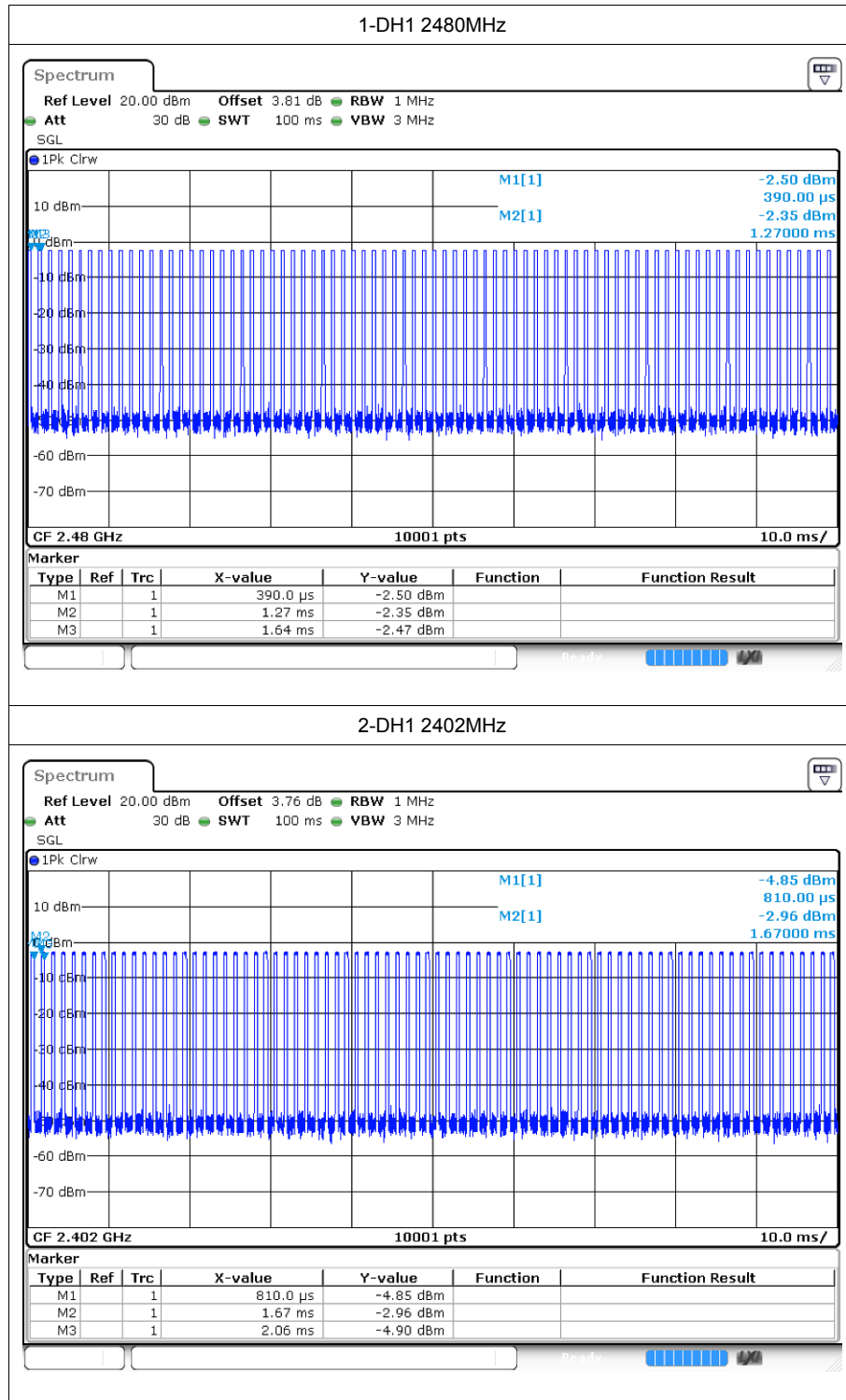
1 Duty Cycle

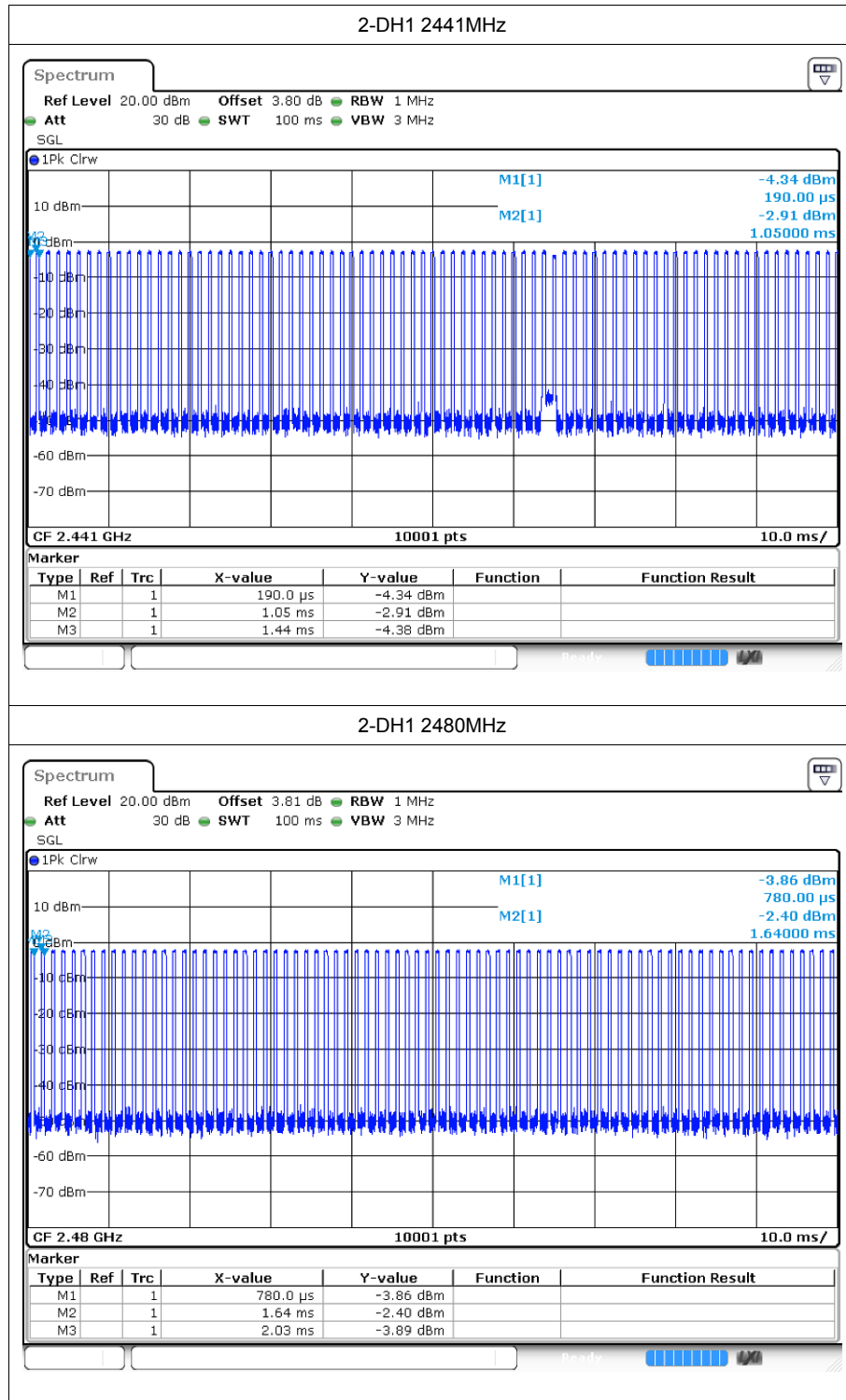
1.1 Test Result

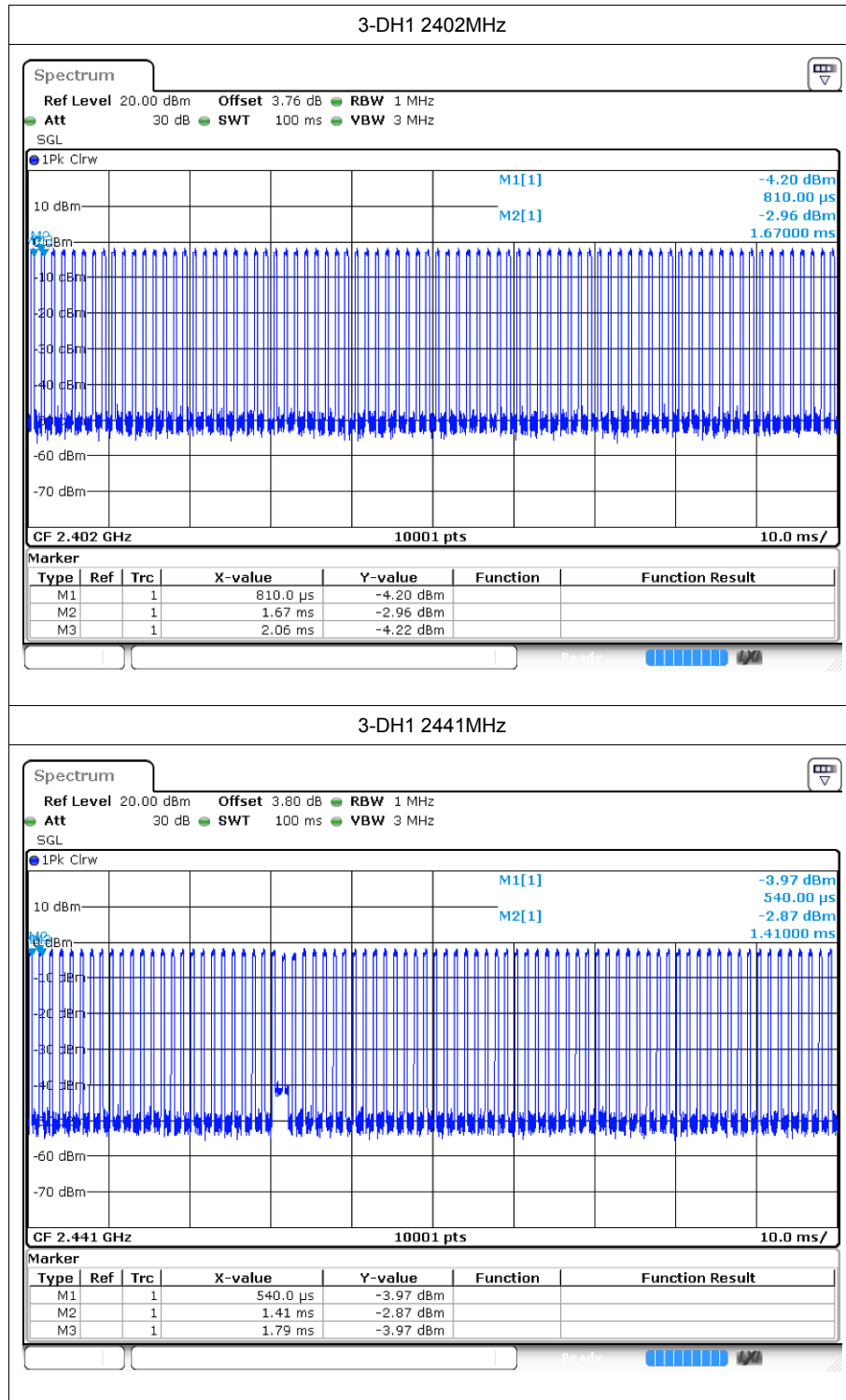
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.21	2.63
1-DH1	2441	31.2	2.63
1-DH1	2480	30.4	2.7
2-DH1	2402	32	2.56
2-DH1	2441	32.01	2.56
2-DH1	2480	32	2.56
3-DH1	2402	32	2.56
3-DH1	2441	31.2	2.63
3-DH1	2480	32	2.56

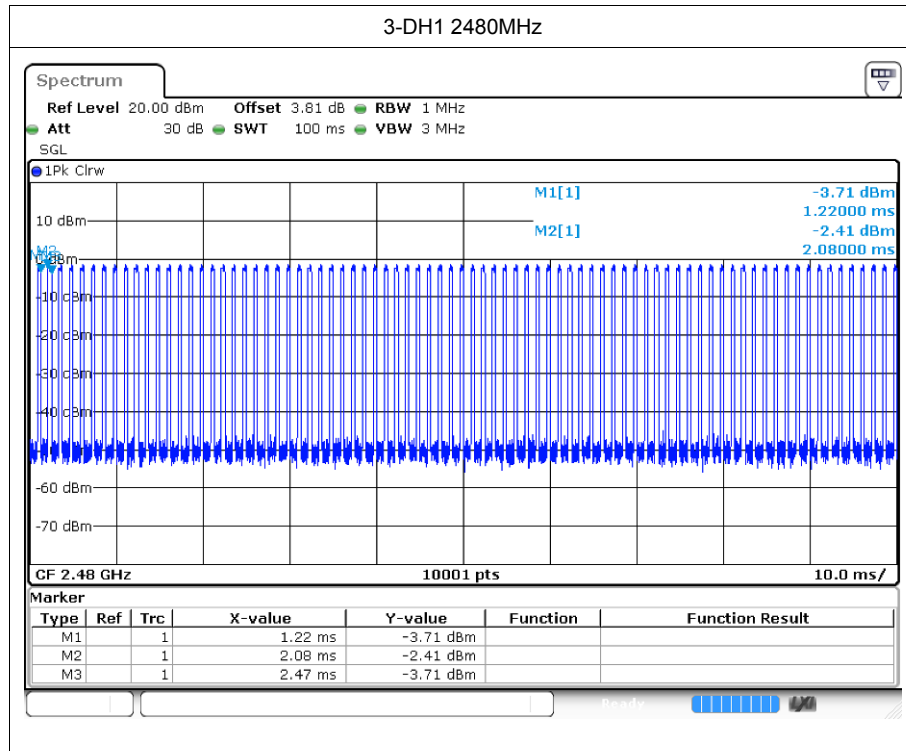
1.2 Test Graphs









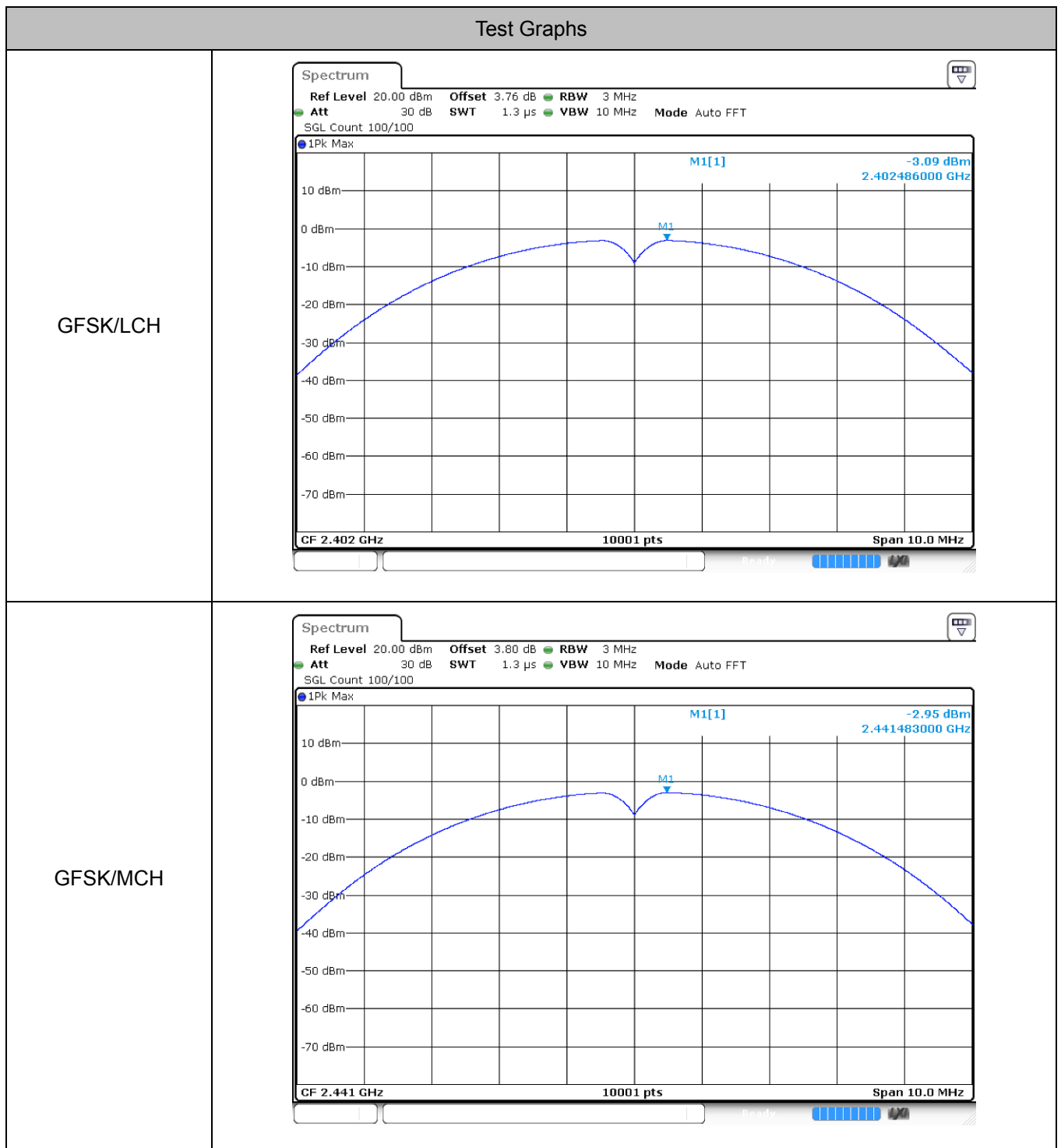


2 Maximum Conducted Peak Output Power

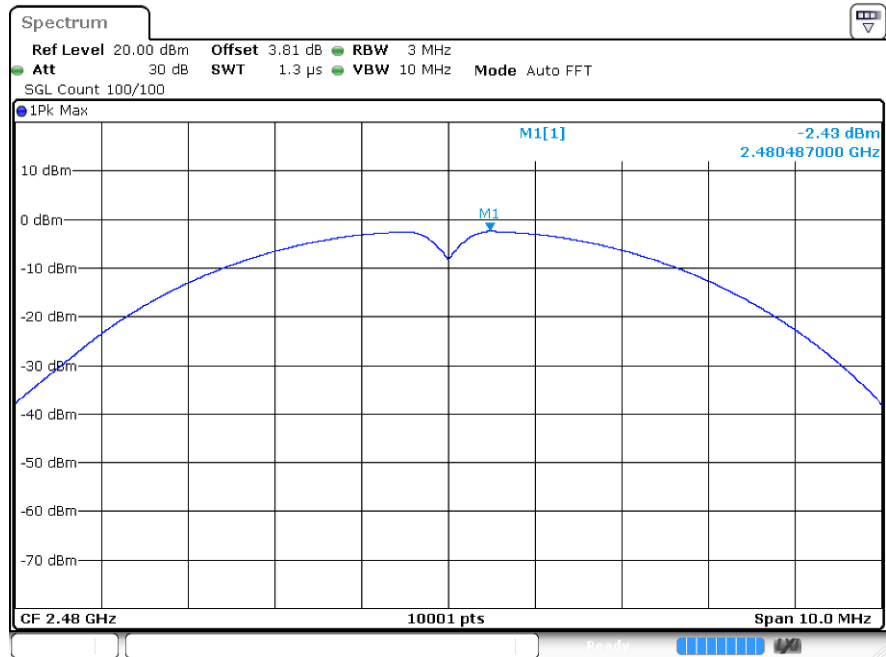
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.09	21	Pass
	MCH	-2.95	21	Pass
	HCH	-2.43	21	Pass
$\pi/4$ DQPSK	LCH	-2.39	21	Pass
	MCH	-2.44	21	Pass
	HCH	-2.23	21	Pass
8DPSK	LCH	-2.31	21	Pass
	MCH	-2.16	21	Pass
	HCH	-1.55	21	Pass

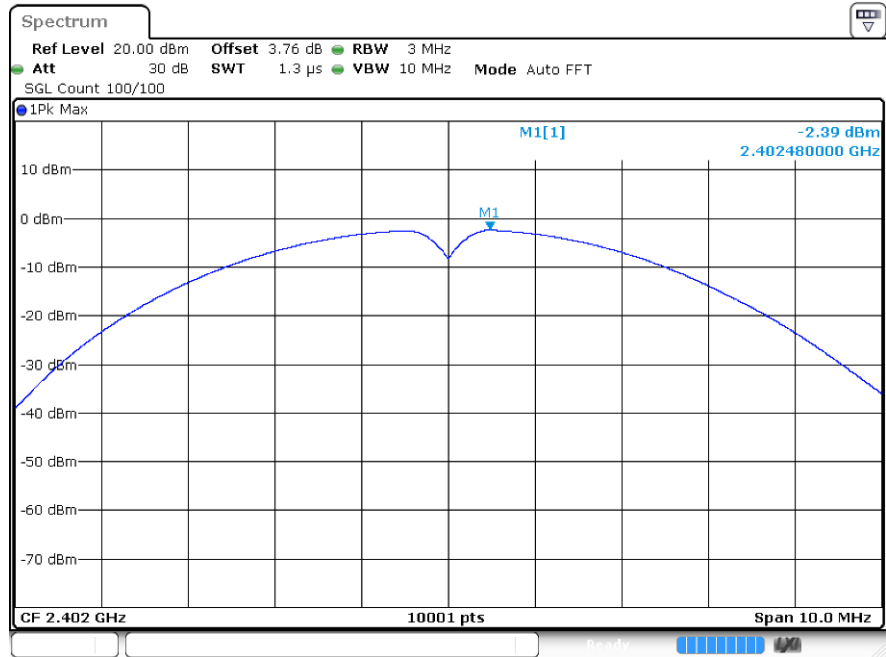
2.2 Test Graphs



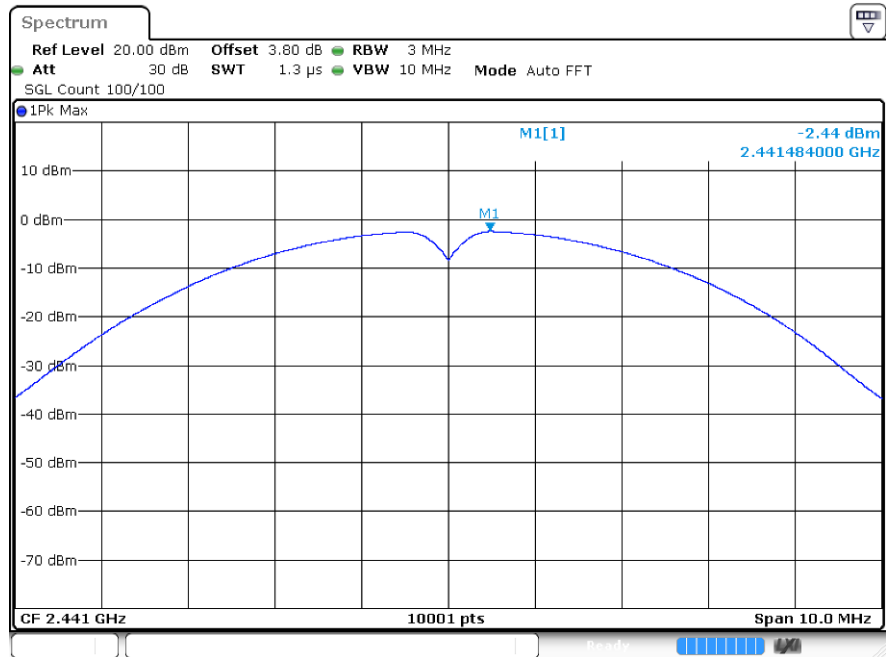
GFSK/HCH



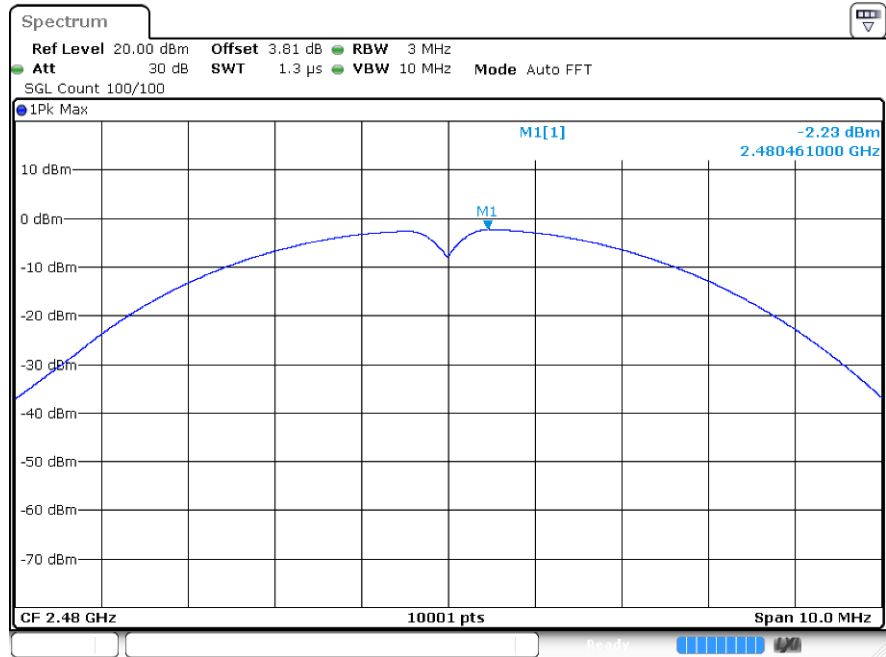
$\pi/4$ DQPSK/LCH



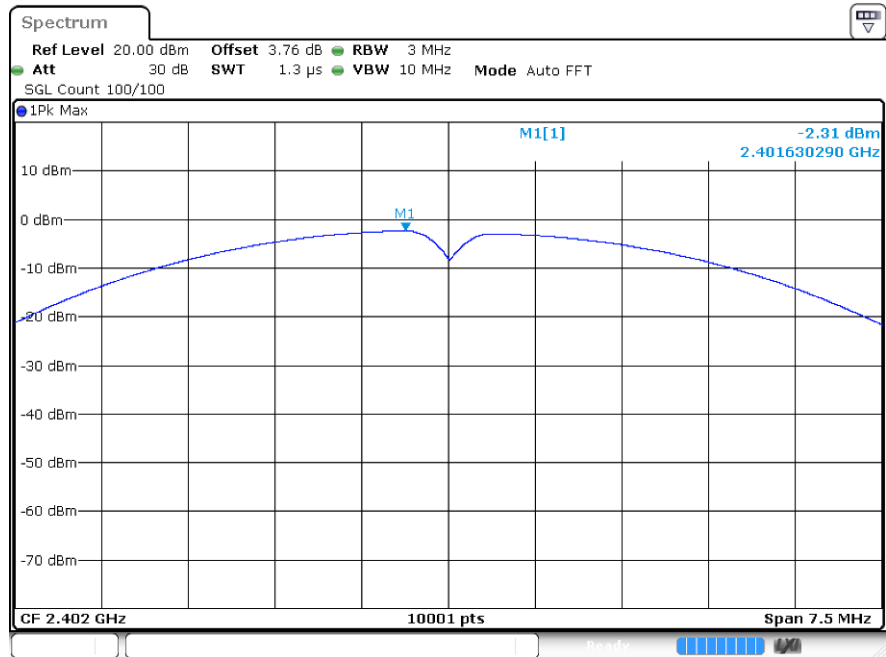
$\pi/4$ DQPSK/MCH



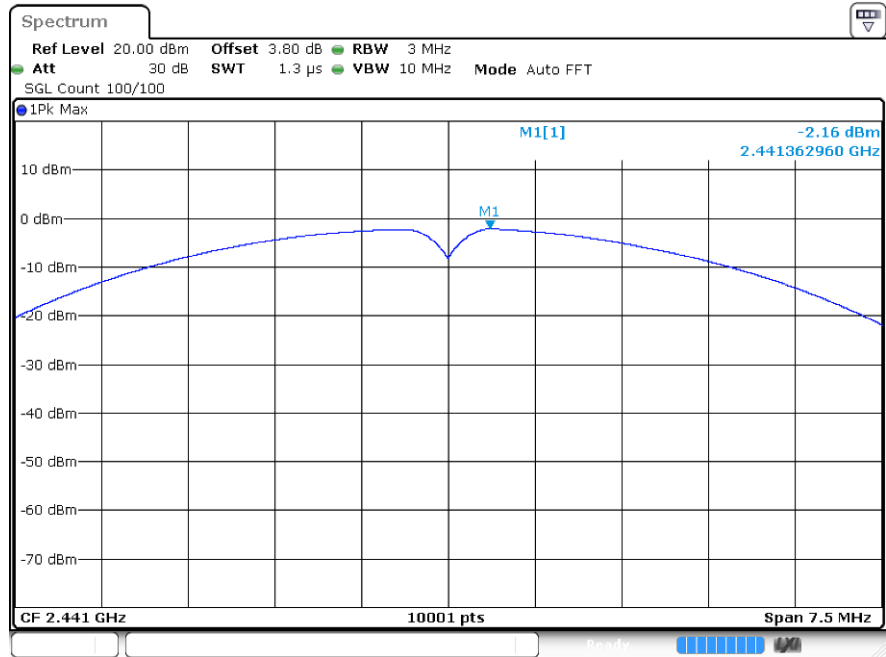
$\pi/4$ DQPSK/HCH



8DPSK/LCH

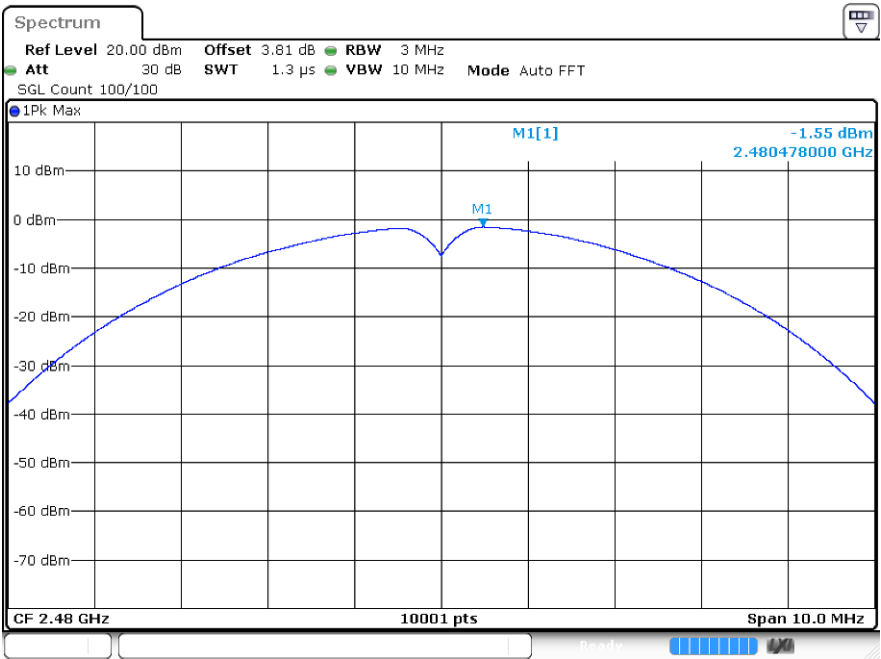


8DPSK/MCH





8DPSK/HCH

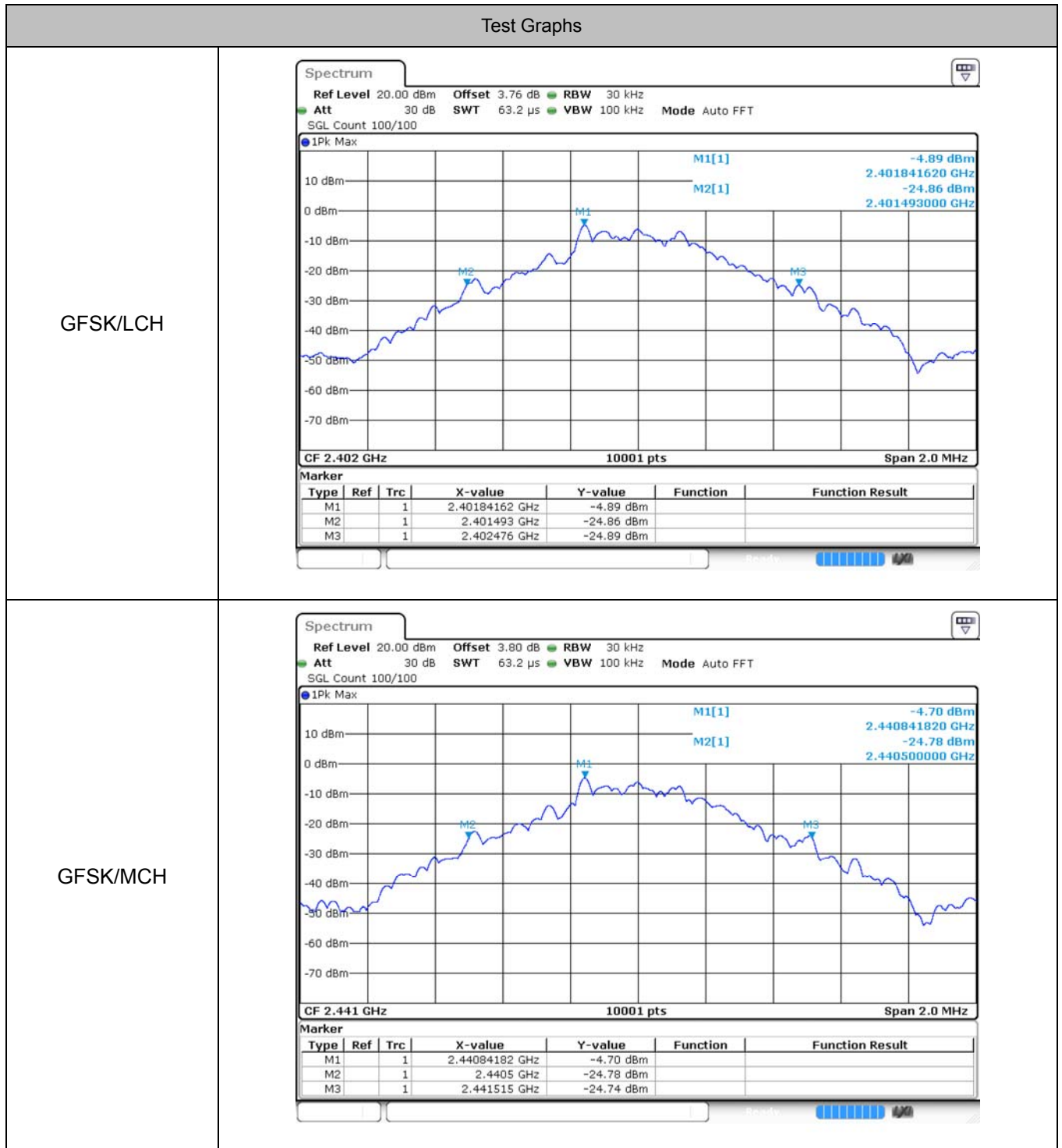


3 20dB Bandwidth

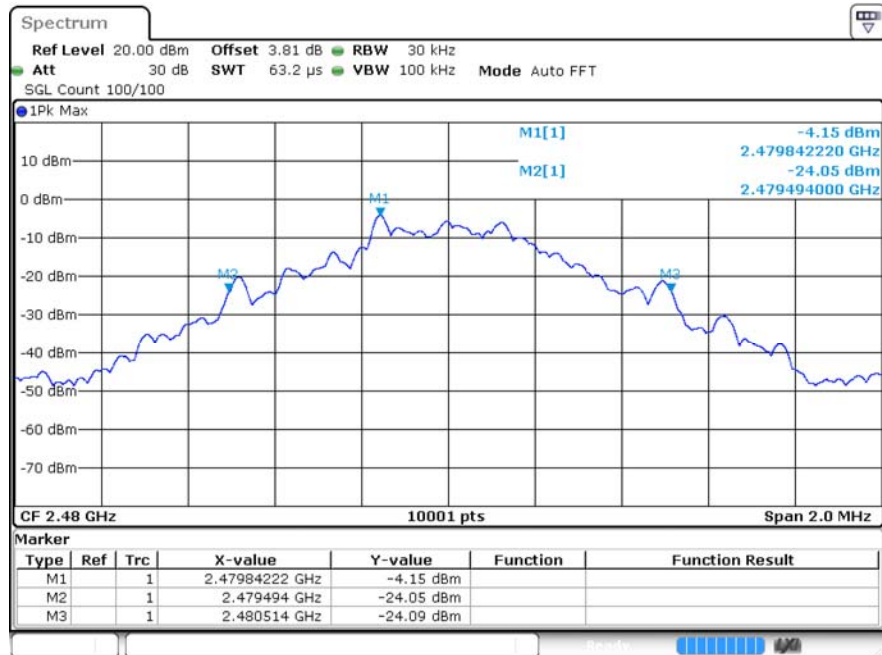
3.1 Test Result

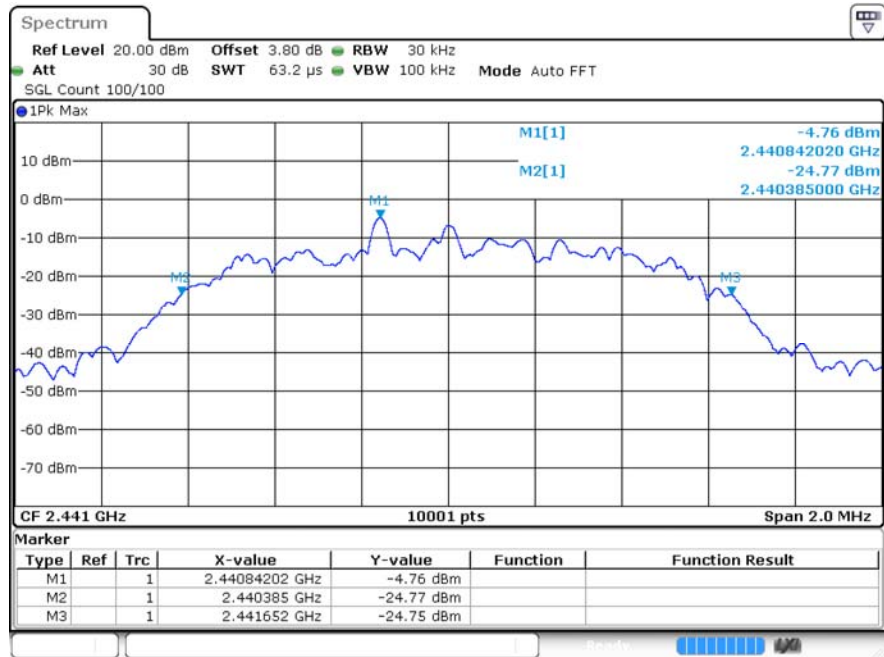
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.983	Not Specified	Pass
	MCH	1.014	Not Specified	Pass
	HCH	1.021	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.269	Not Specified	Pass
	MCH	1.267	Not Specified	Pass
	HCH	1.255	Not Specified	Pass
8DPSK	LCH	1.255	Not Specified	Pass
	MCH	1.274	Not Specified	Pass
	HCH	1.224	Not Specified	Pass

3.2 Test Graphs

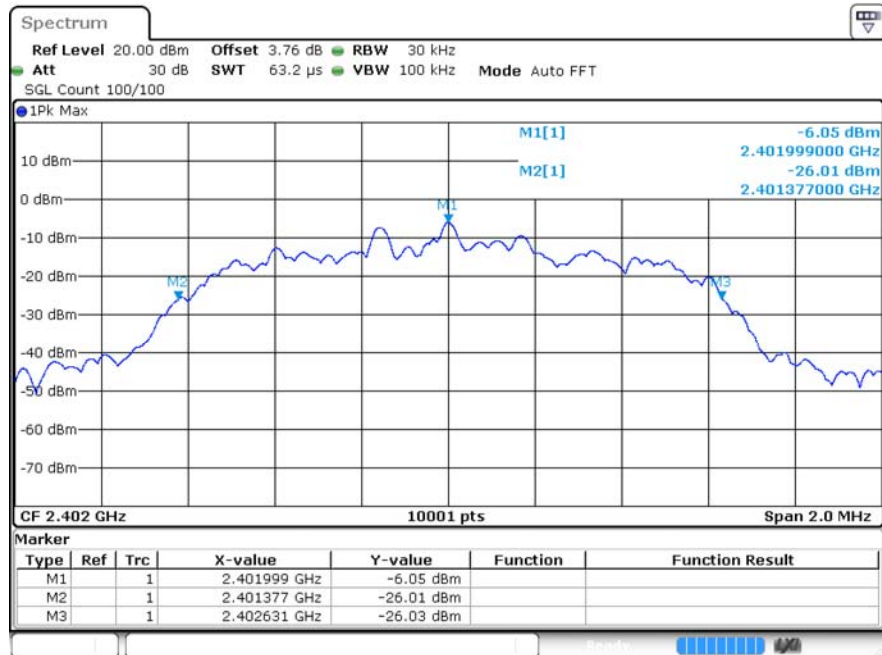


GFSK/HCH

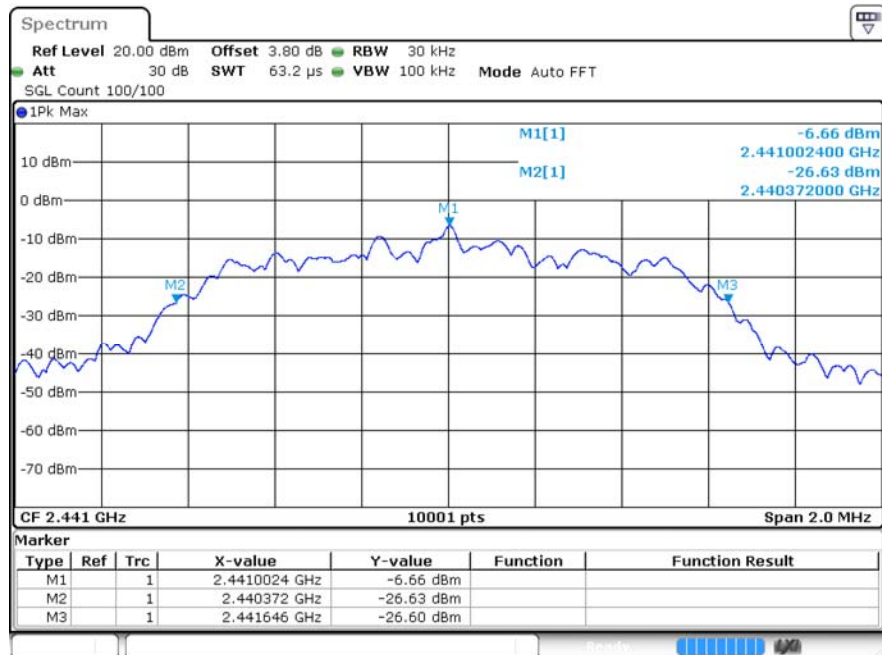

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

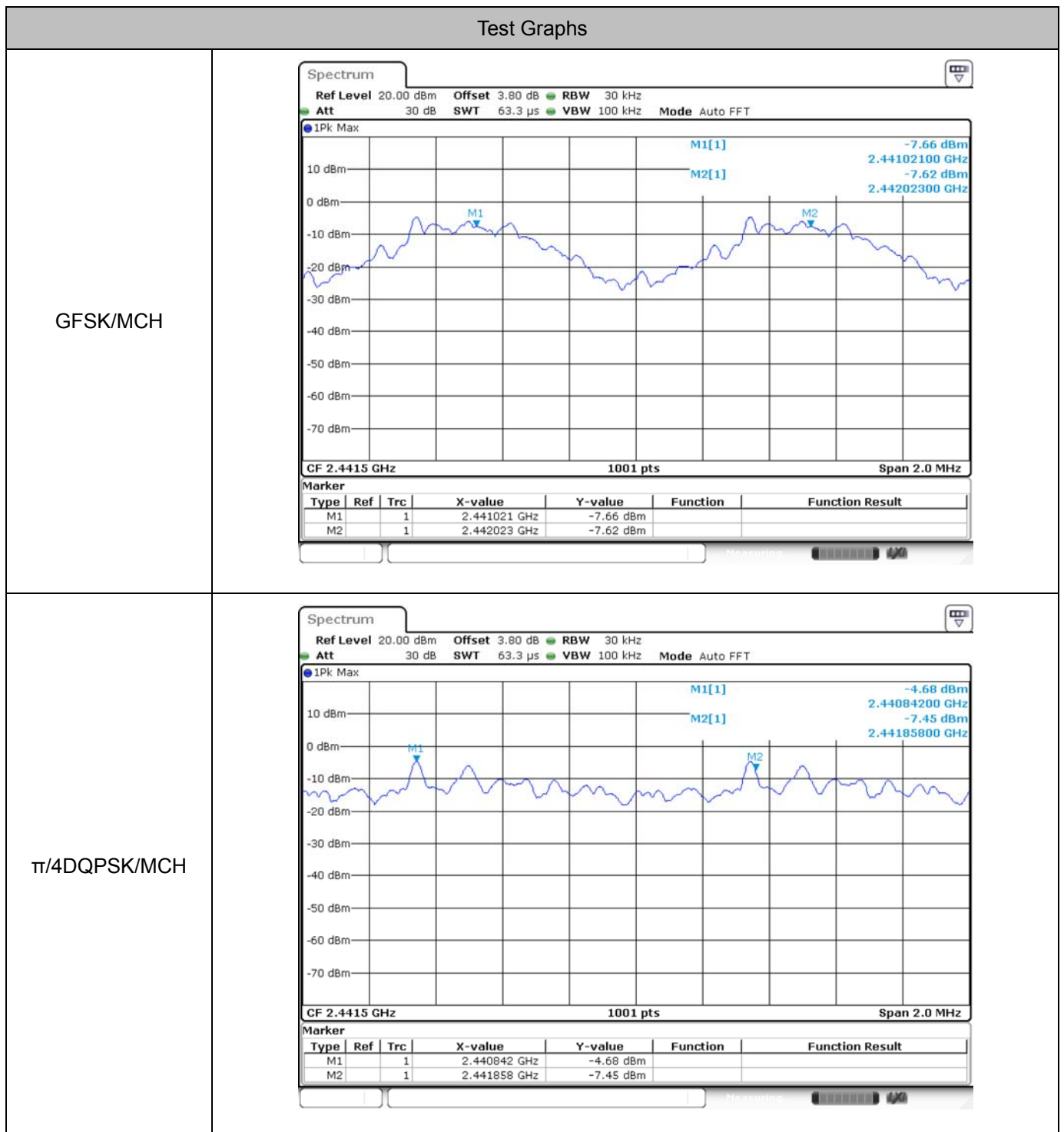


4 Carrier Frequency Separation

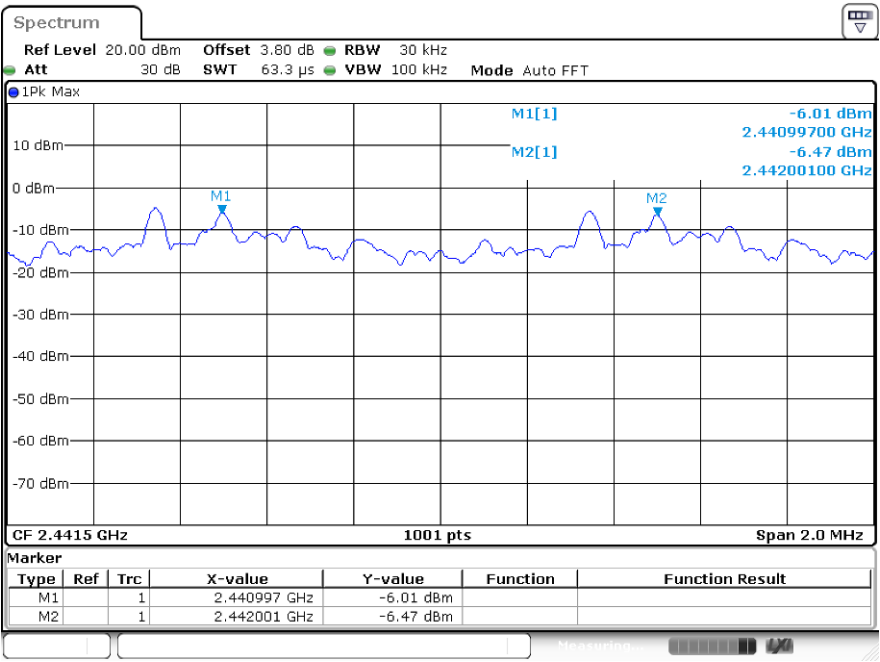
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.002	0.676	Pass
$\pi/4$ DQPSK	MCH	1.016	0.845	Pass
8DPSK	MCH	1.004	0.849	Pass

4.2 Test Graphs



8DPSK/MCH

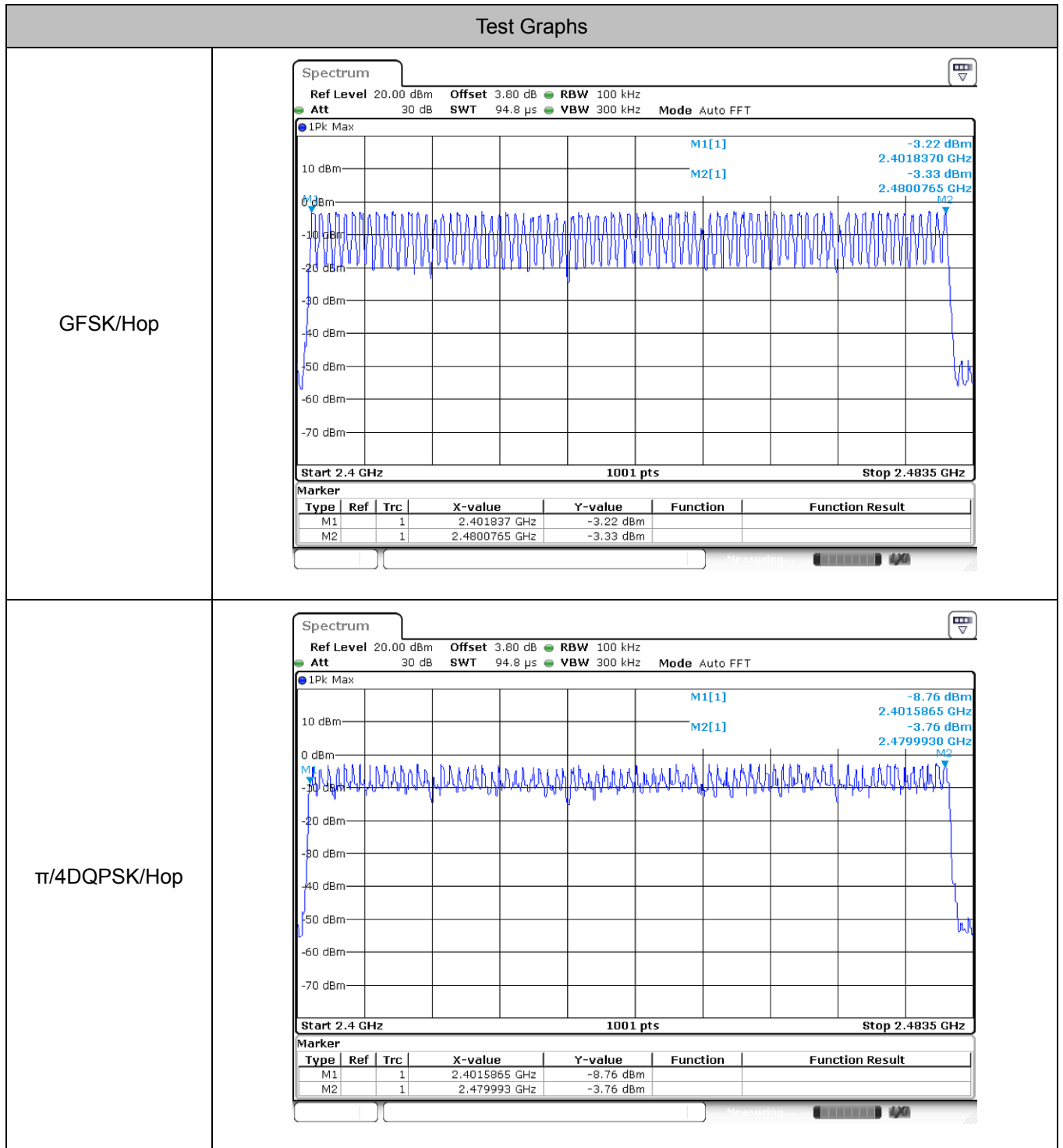


5 Hopping Channel Number

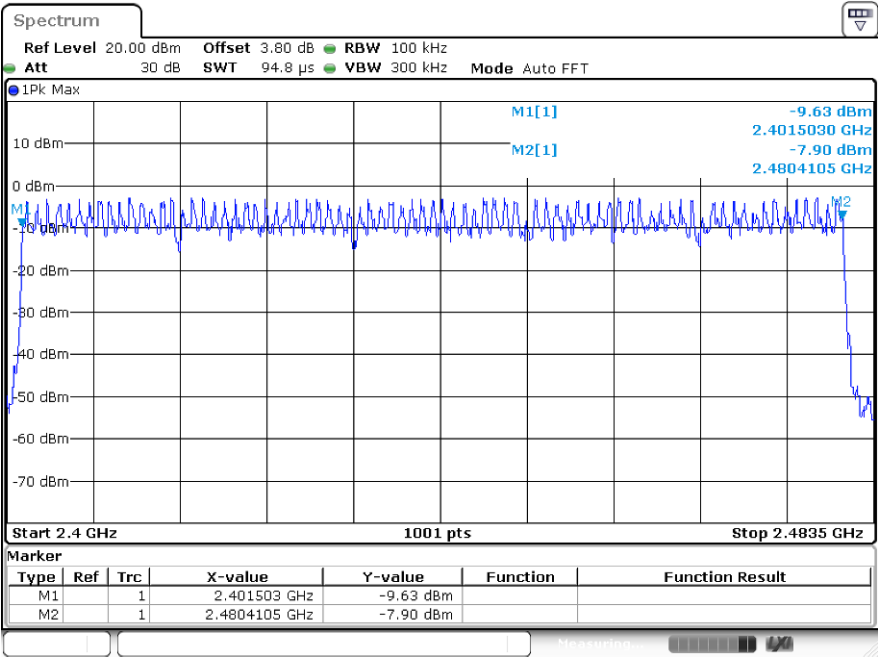
5.1 Test Result

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

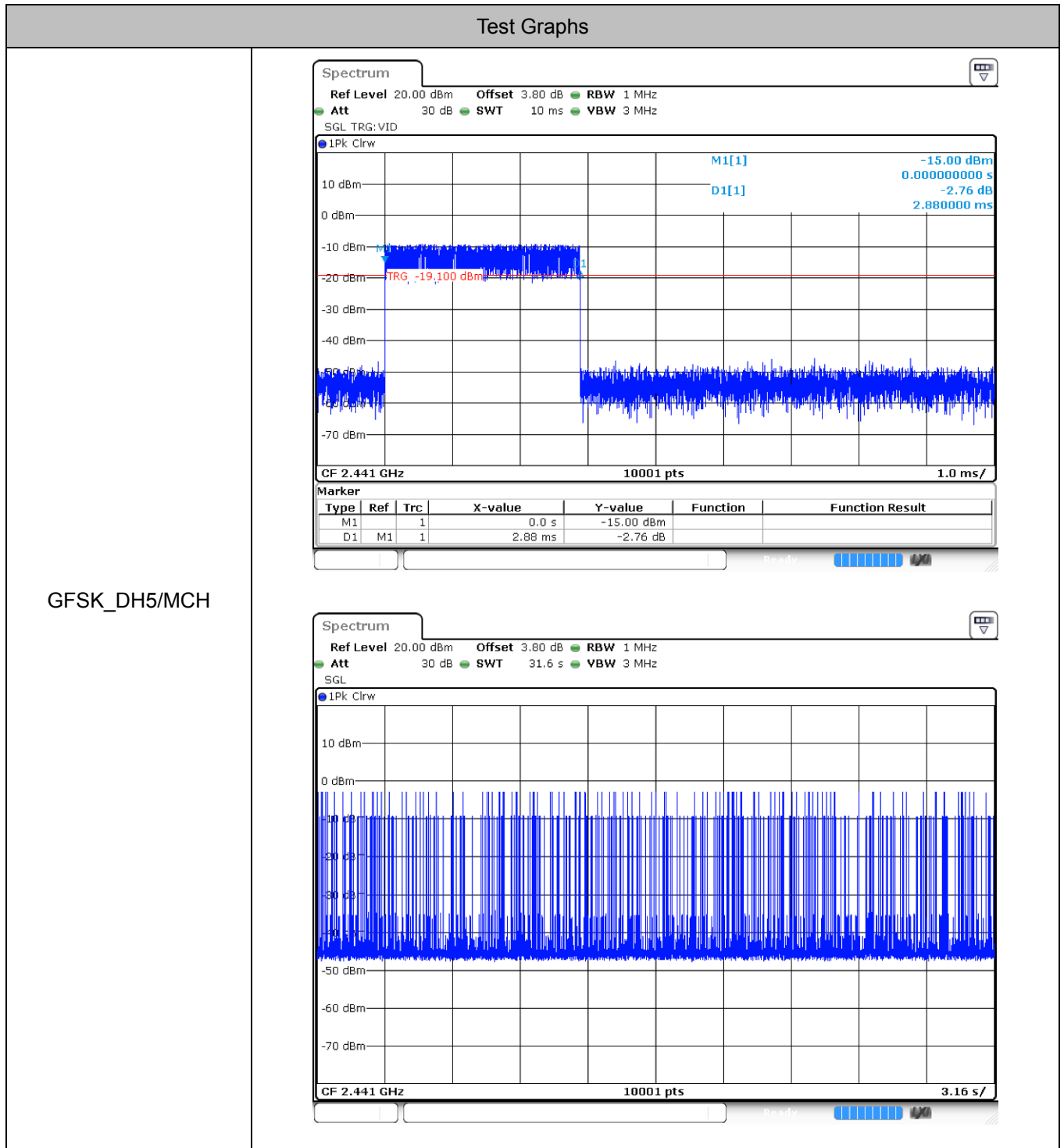


6 Dwell Time

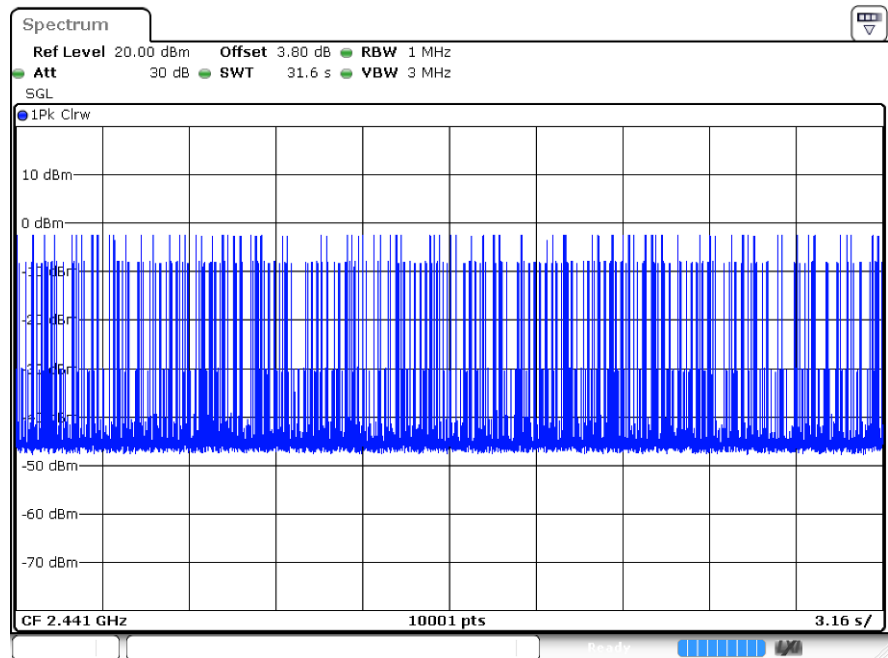
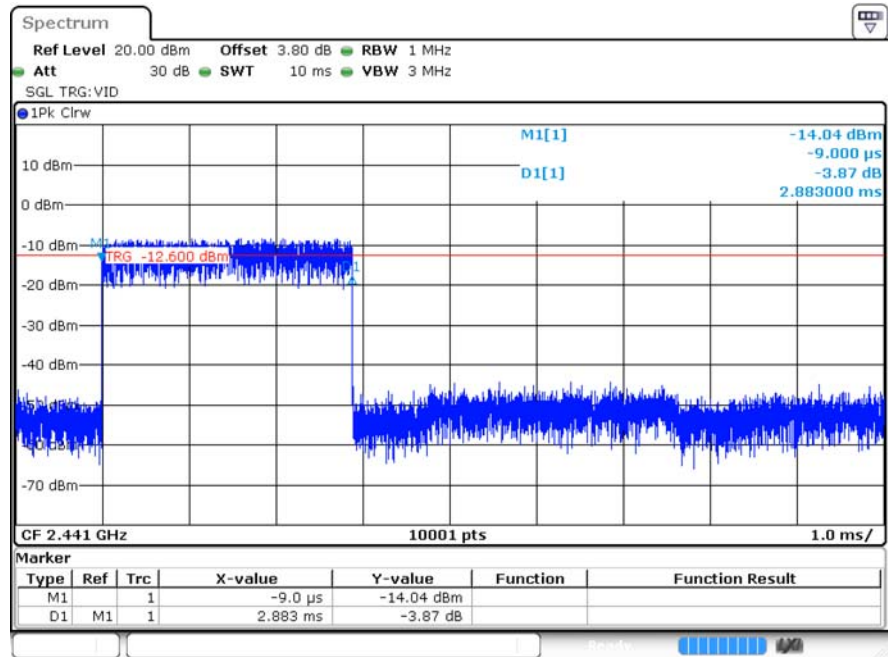
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.88	113	325.44	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.883	102	294.066	0.4	Pass
8DPSK	3DH5	MCH	2.887	103	297.361	0.4	Pass

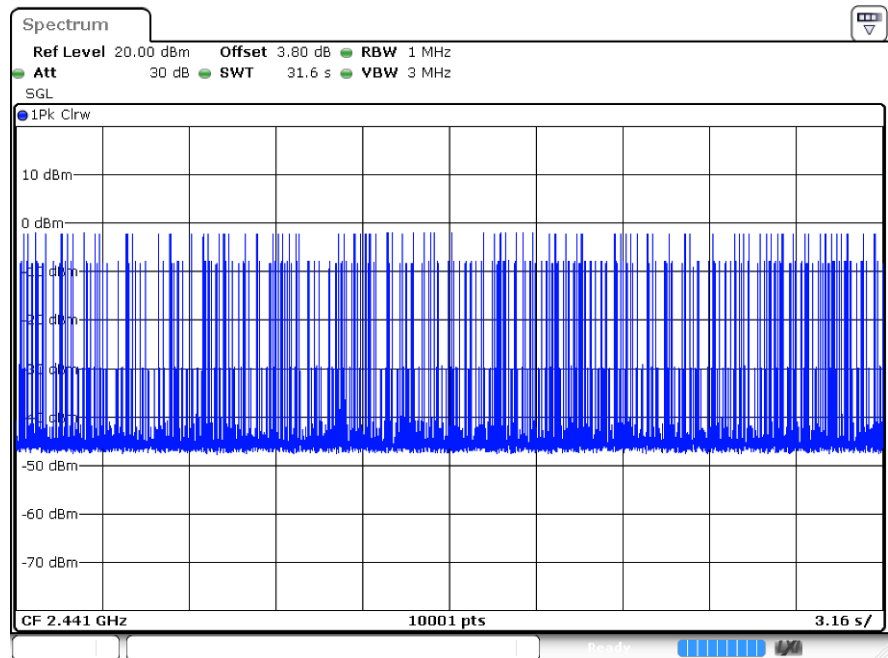
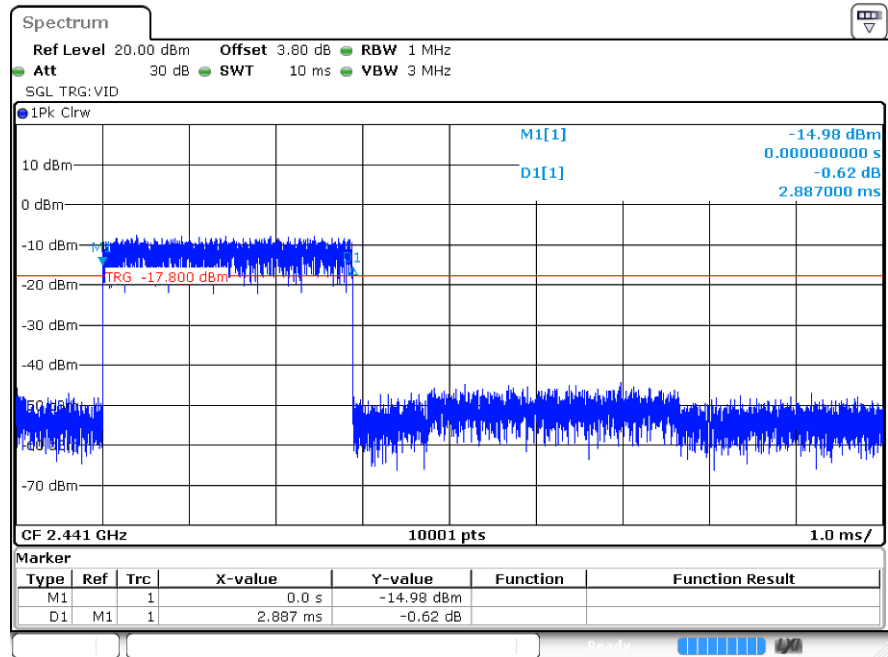
6.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH

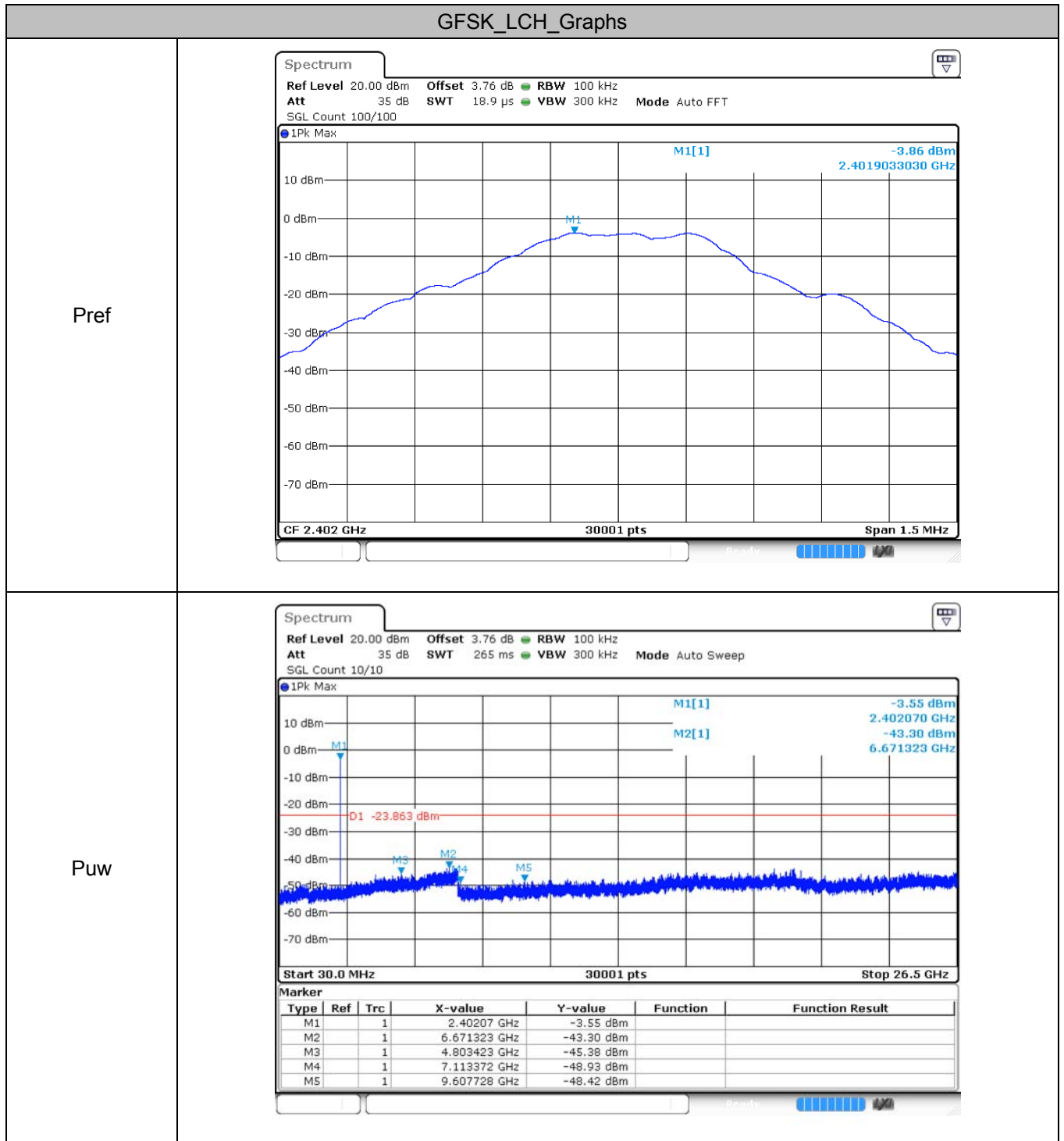


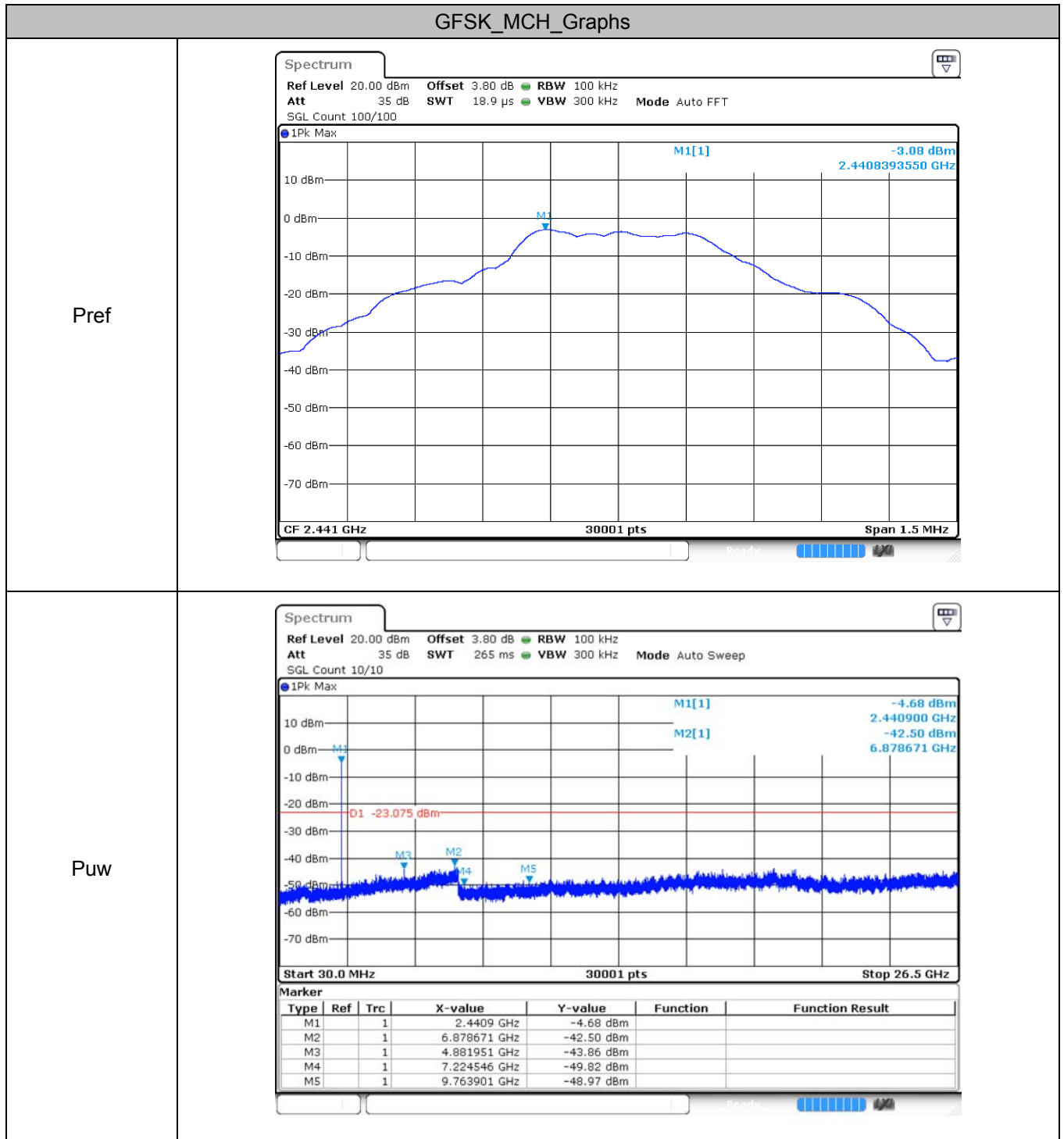
7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-39.43	-20	Pass
	MCH	-39.42	-20	Pass
	HCH	-38.63	-20	Pass
$\pi/4$ DQPSK	LCH	-40.08	-20	Pass
	MCH	-39.45	-20	Pass
	HCH	-38.04	-20	Pass
8DPSK	LCH	-39.74	-20	Pass
	MCH	-38.8	-20	Pass
	HCH	-40	-20	Pass

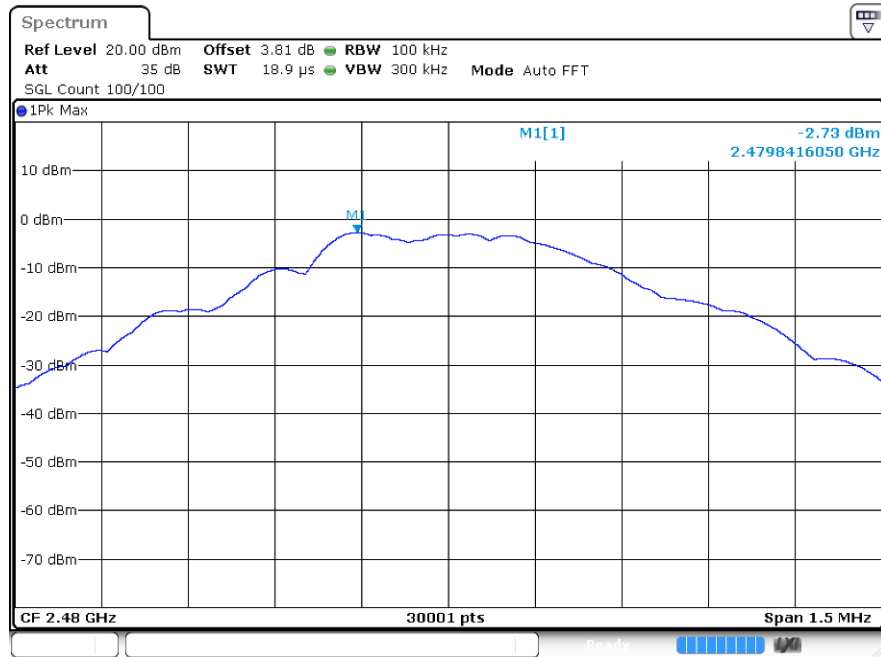
7.2 Test Graphs



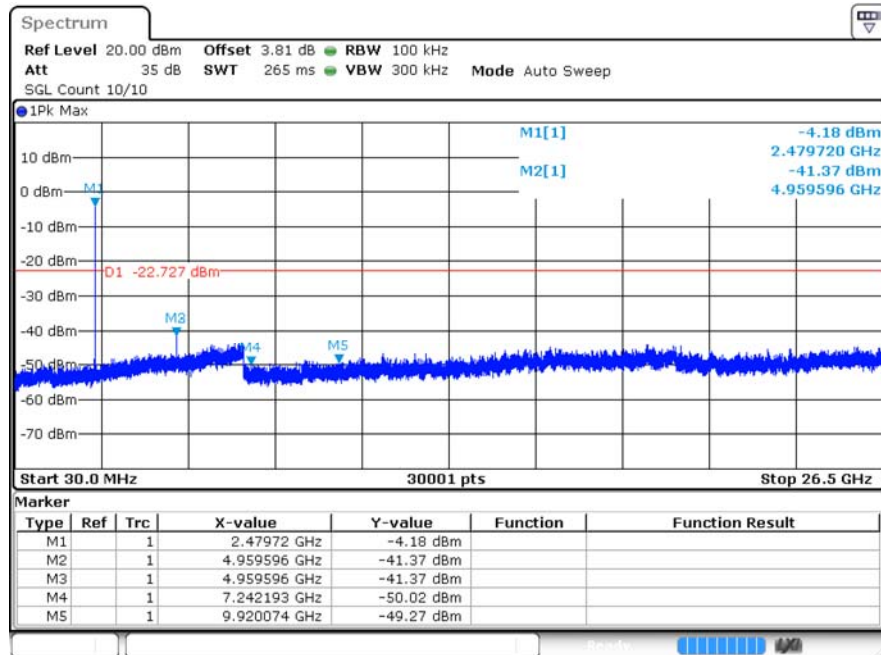


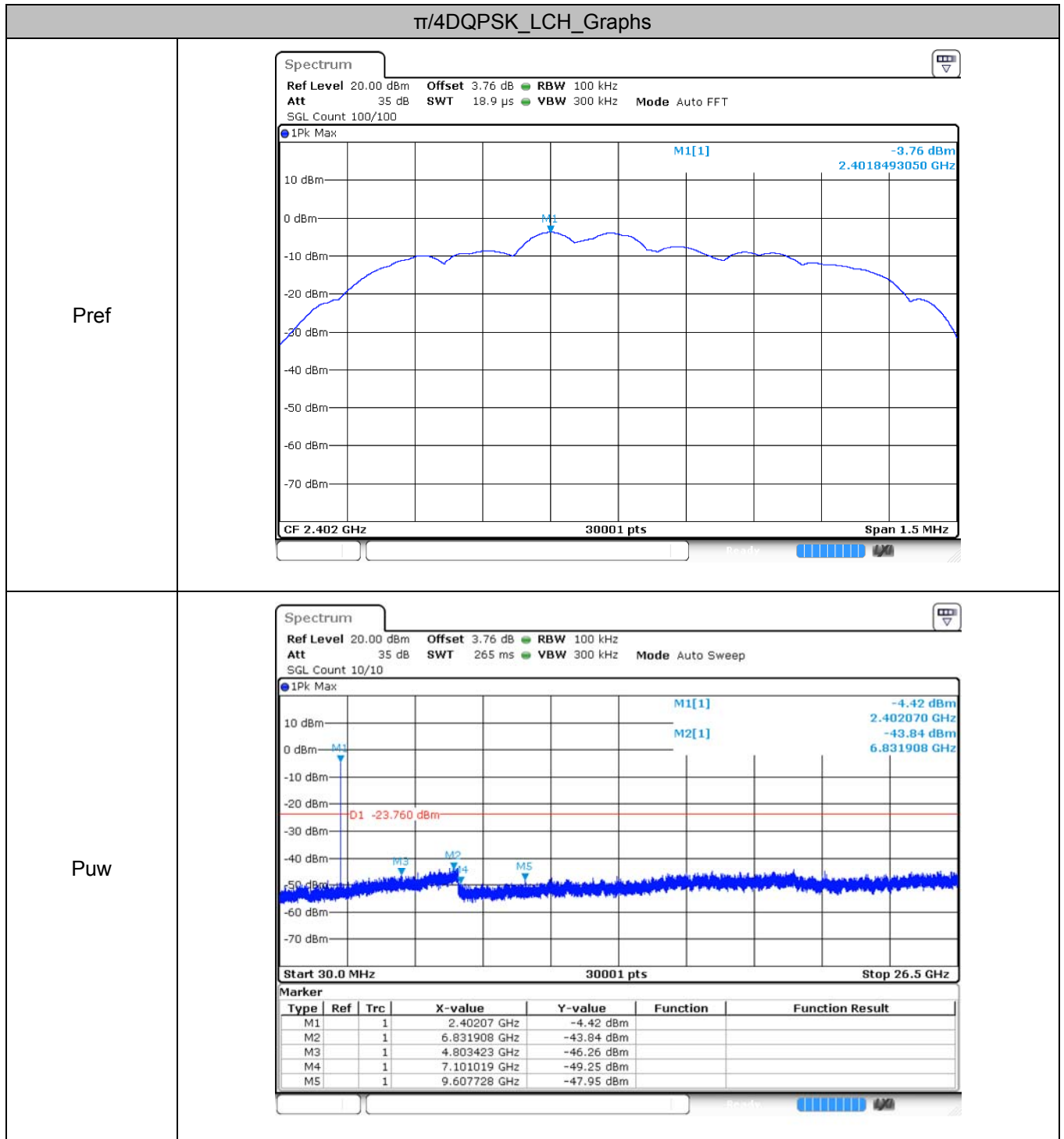
GFSK_HCH_Graphs

Pref



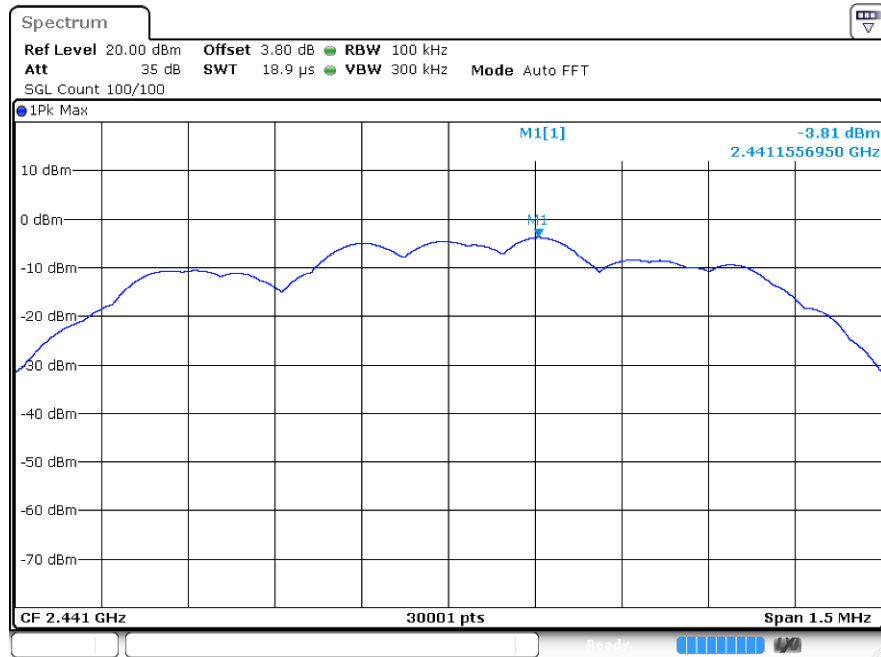
Puw



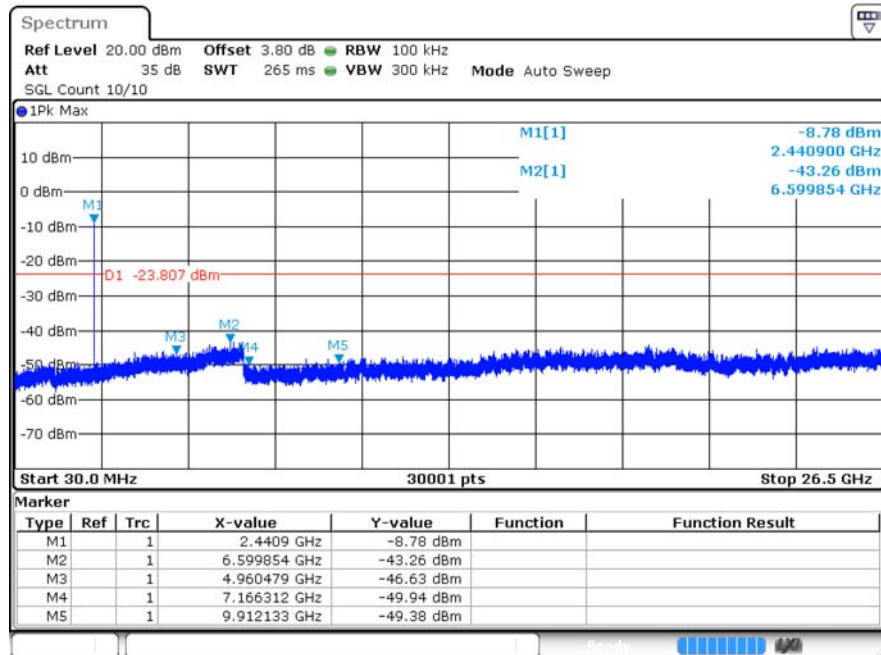


$\pi/4$ DQPSK_MCH_Graphs

Pref

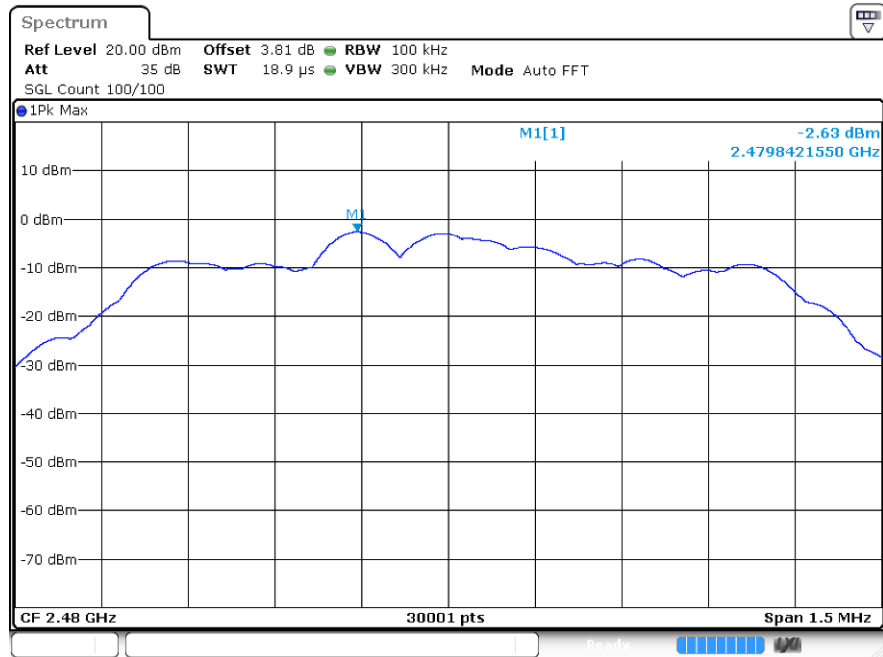


Puw

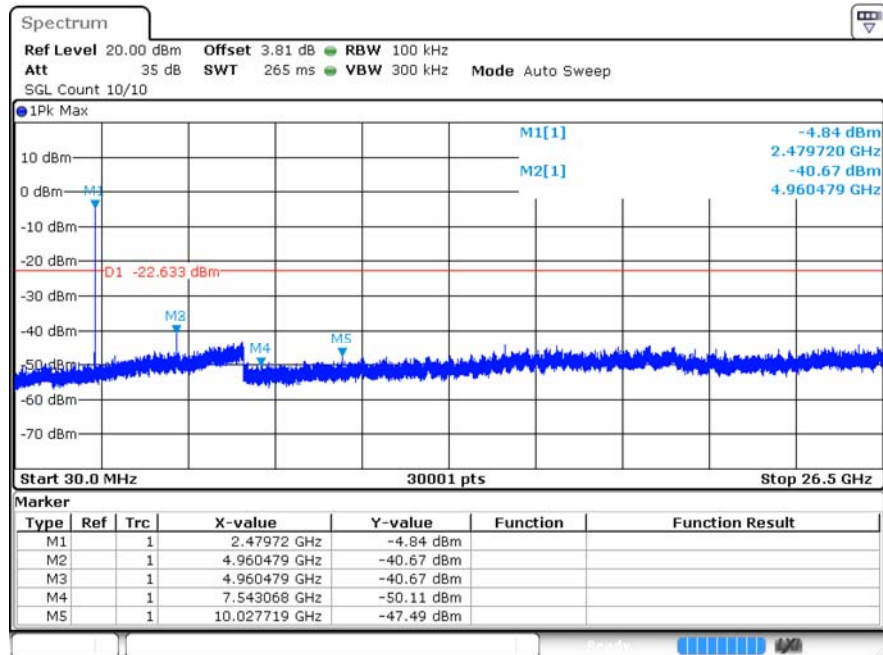


$\pi/4$ DQPSK_HCH_Graphs

Pref

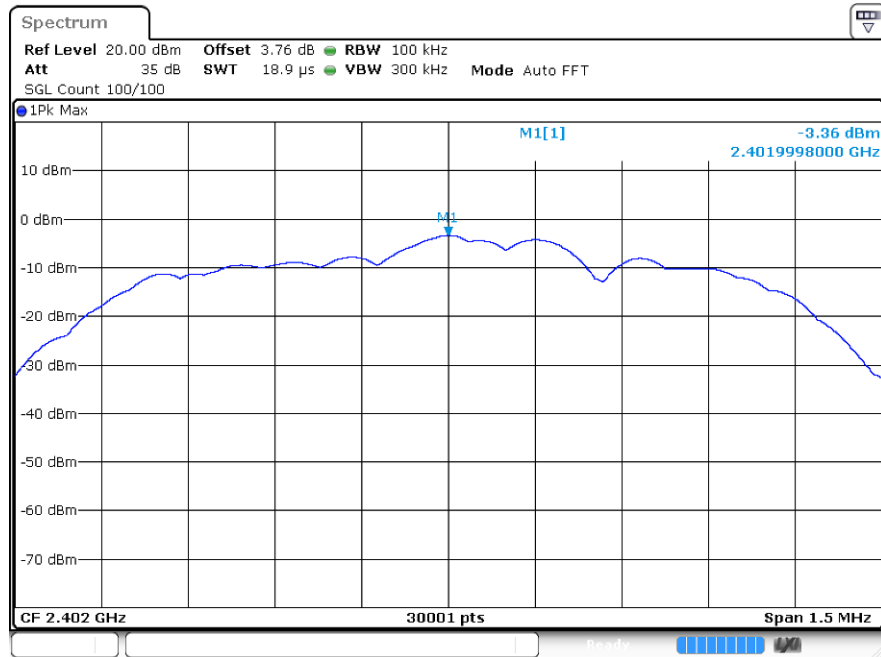


Puw

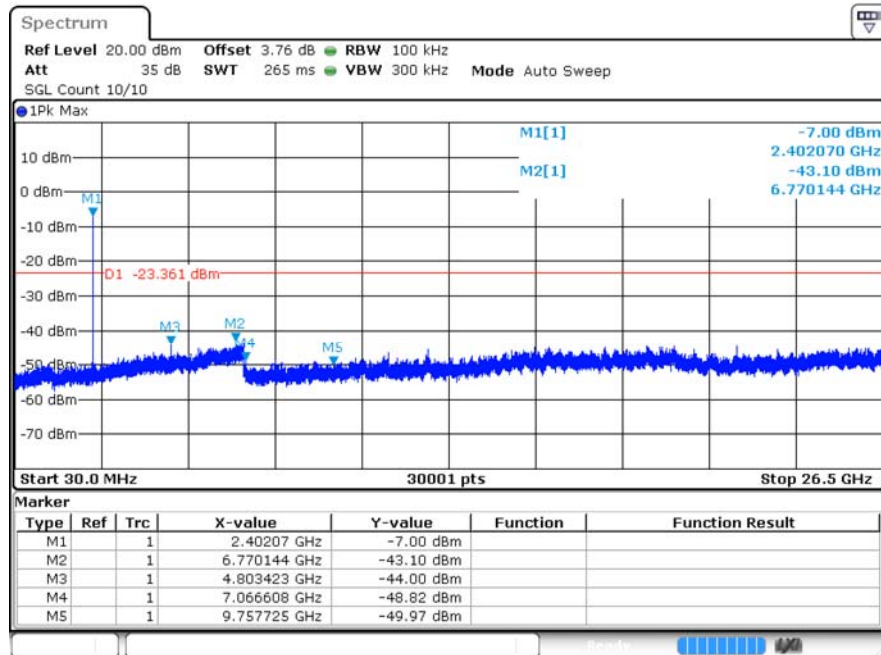


8DPSK_LCH_Graphs

Pref

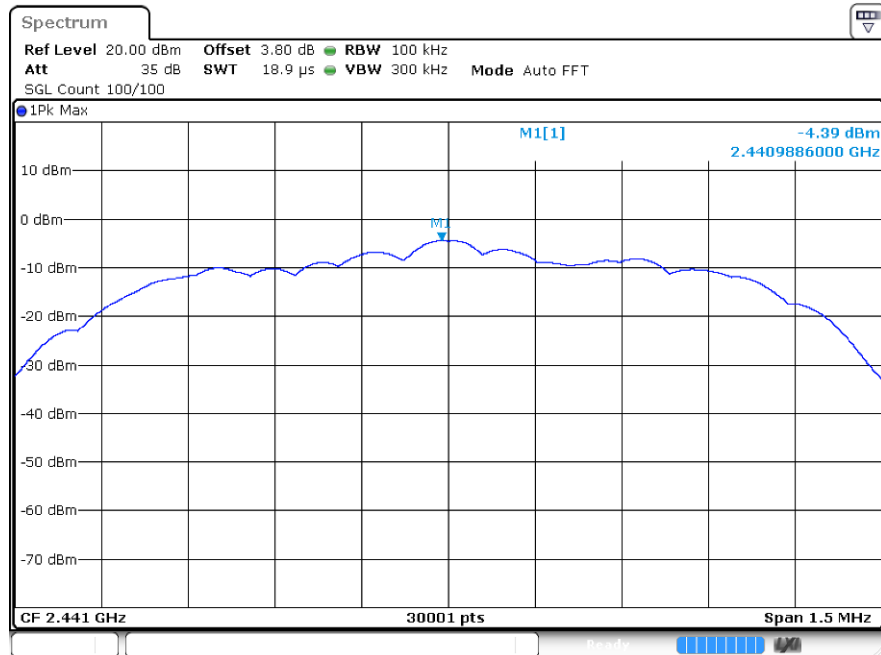


Puw

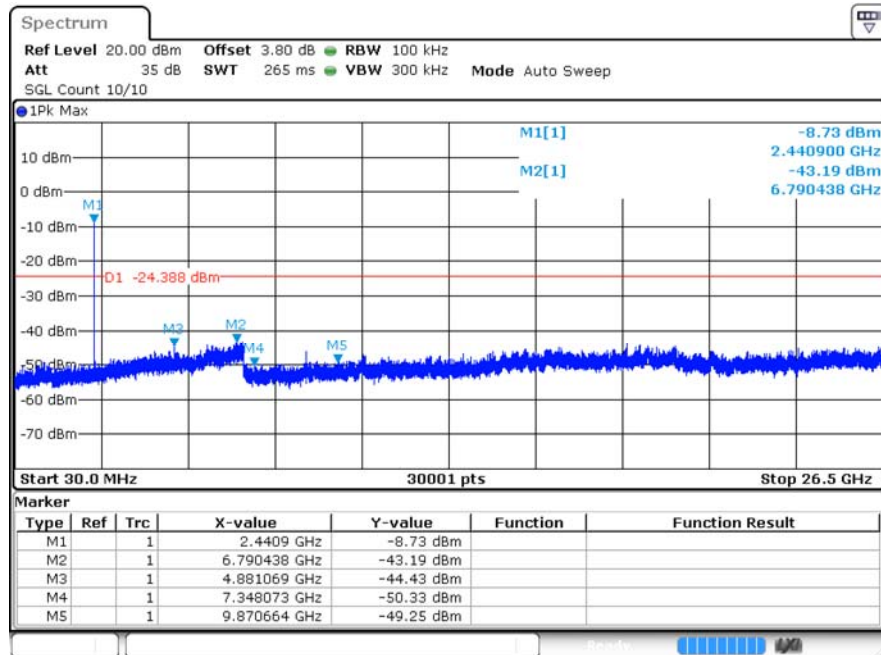


8DPSK_MCH_Graphs

Pref

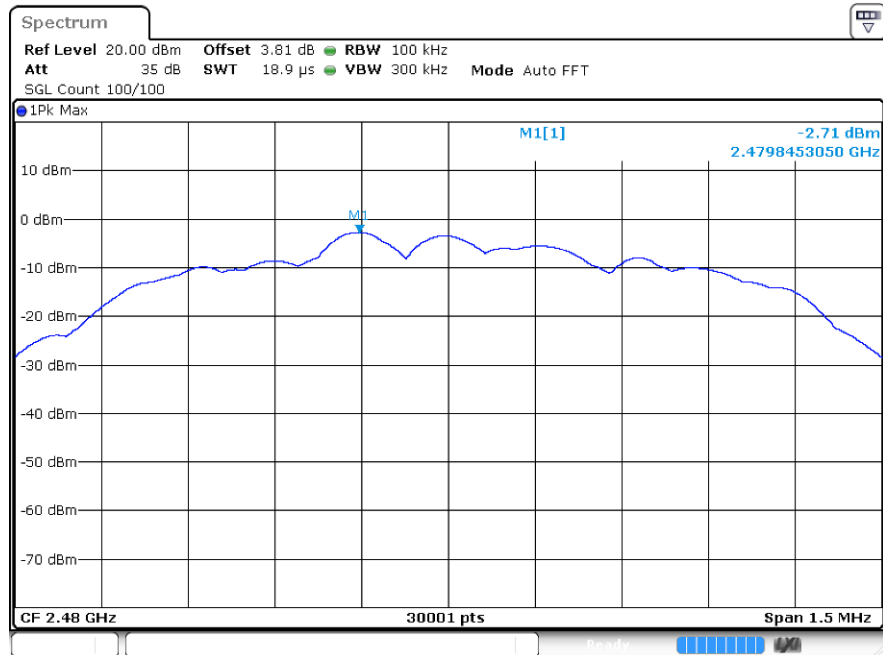


Puw

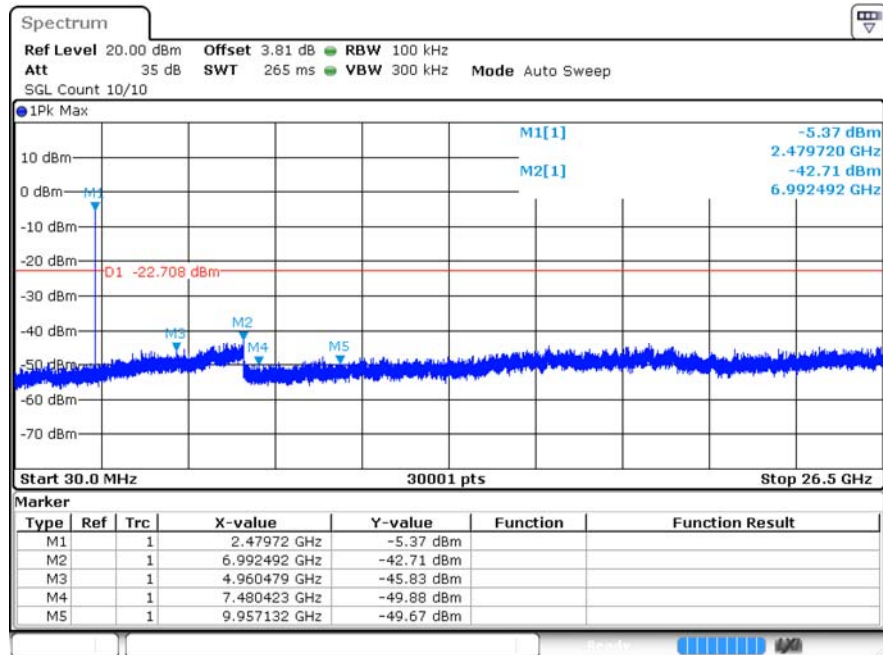


8DPSK_HCH_Graphs

Pref



Puw

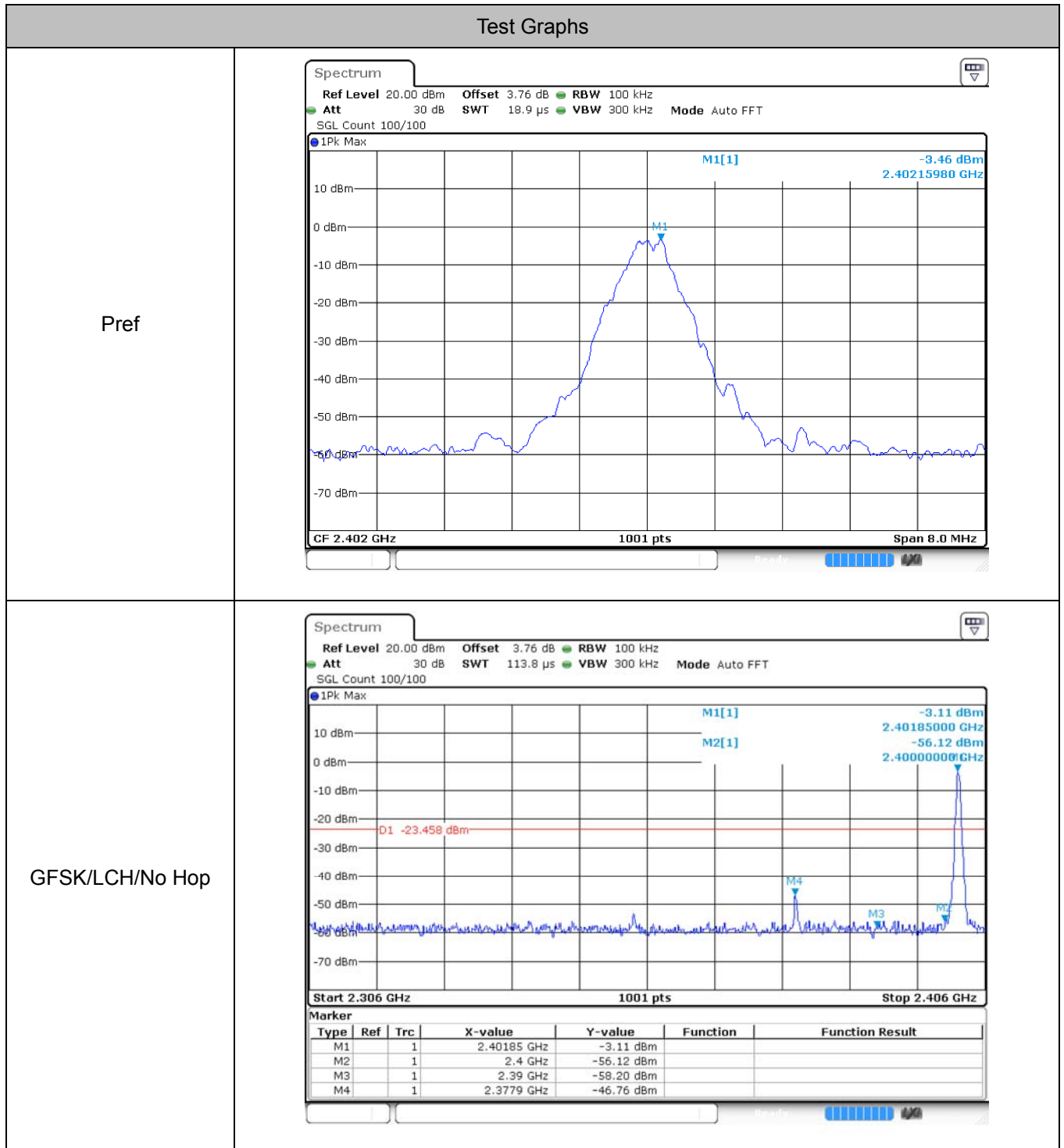


8 Band-edge for RF Conducted Emissions

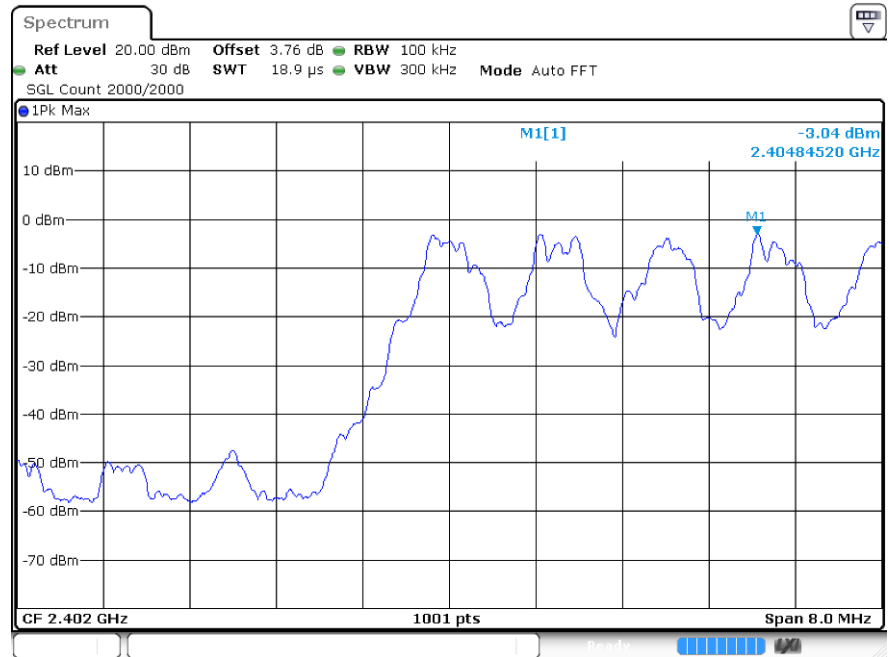
8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-43.3	-20	Pass
			On	-43.94	-20	Pass
	HCH	2480	Off	-51.81	-20	Pass
			On	-44.43	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-45.49	-20	Pass
			On	-44.68	-20	Pass
	HCH	2480	Off	-51.73	-20	Pass
			On	-44.37	-20	Pass
8DPSK	LCH	2402	Off	-45.61	-20	Pass
			On	-44.51	-20	Pass
	HCH	2480	Off	-51.28	-20	Pass
			On	-43.37	-20	Pass

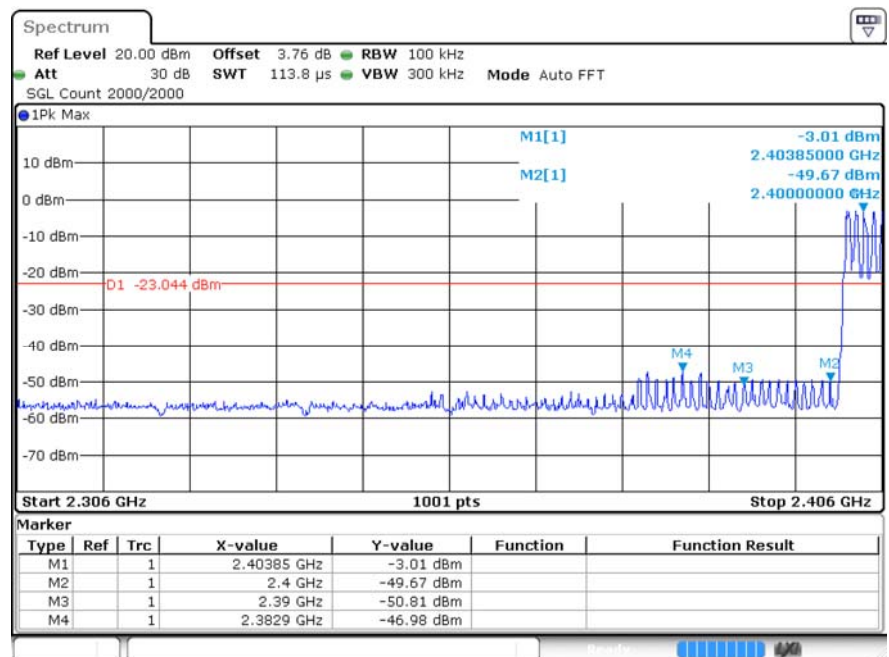
8.2 Test Graphs



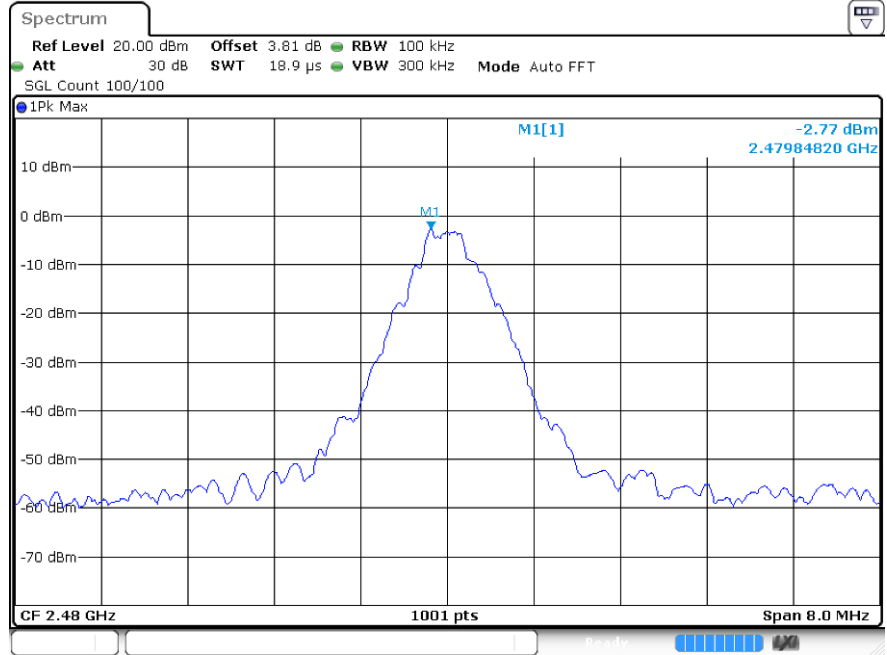
Ref



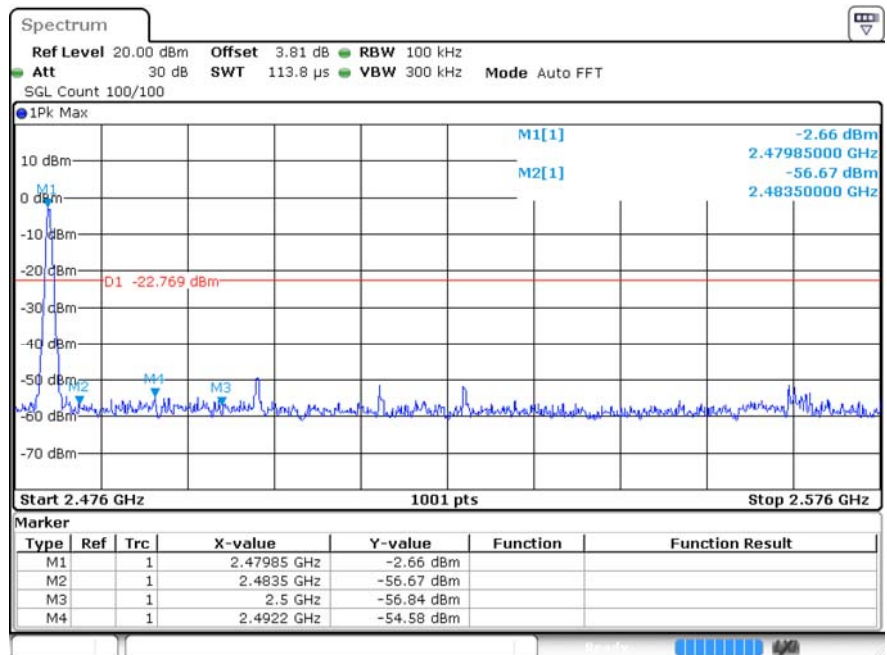
GFSK/LCH/Hop



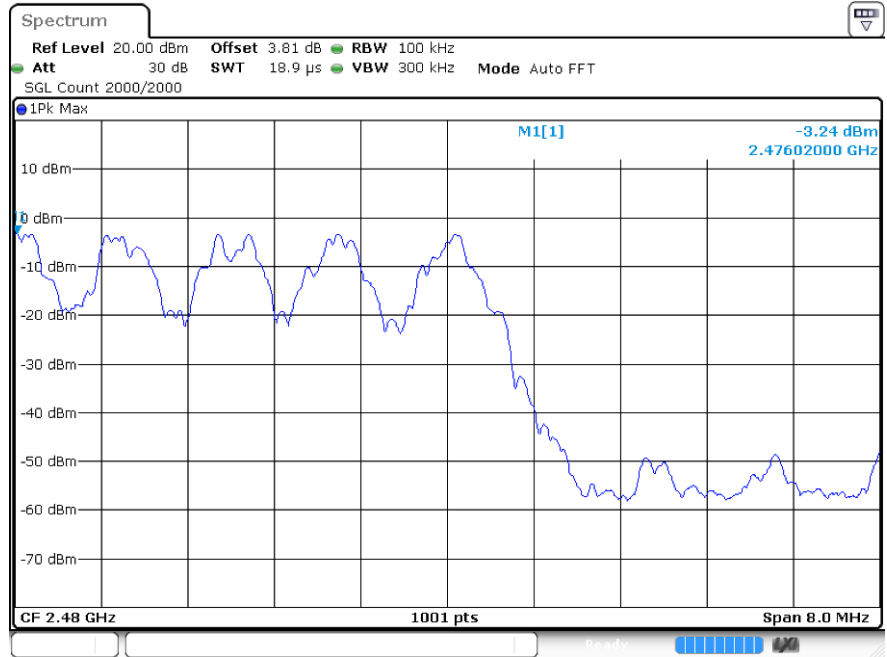
Ref



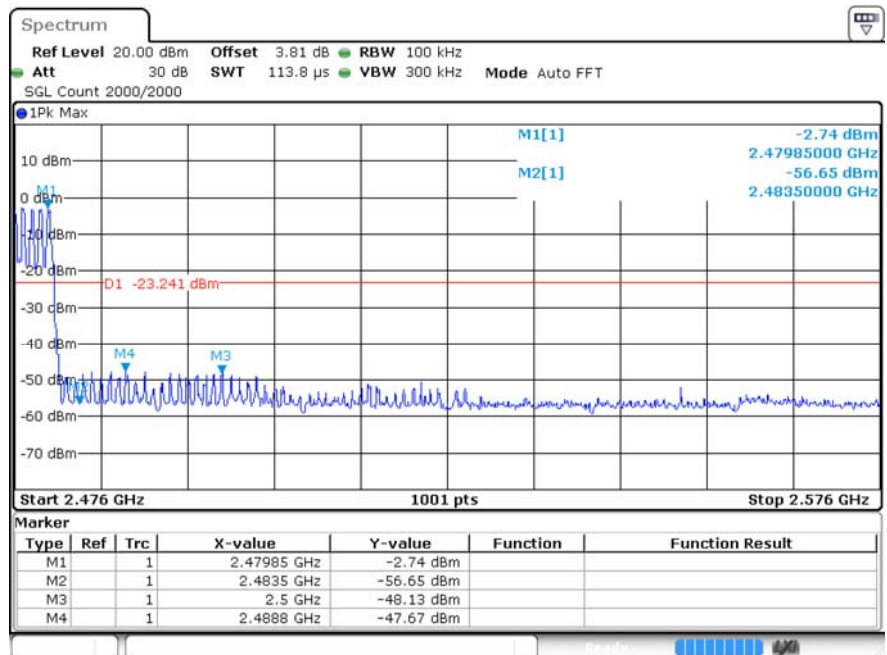
GFSK/HCH/No Hop



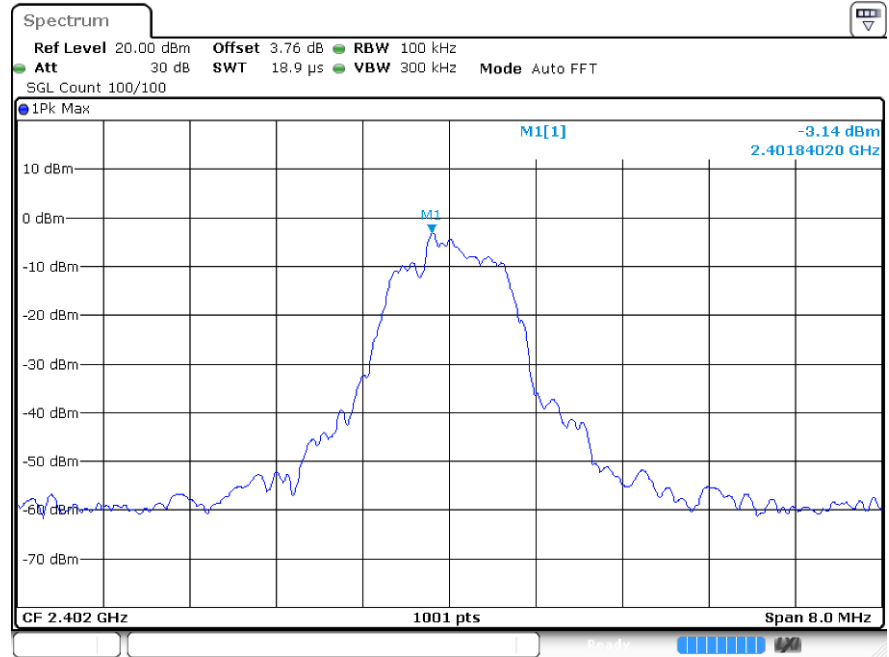
Ref.



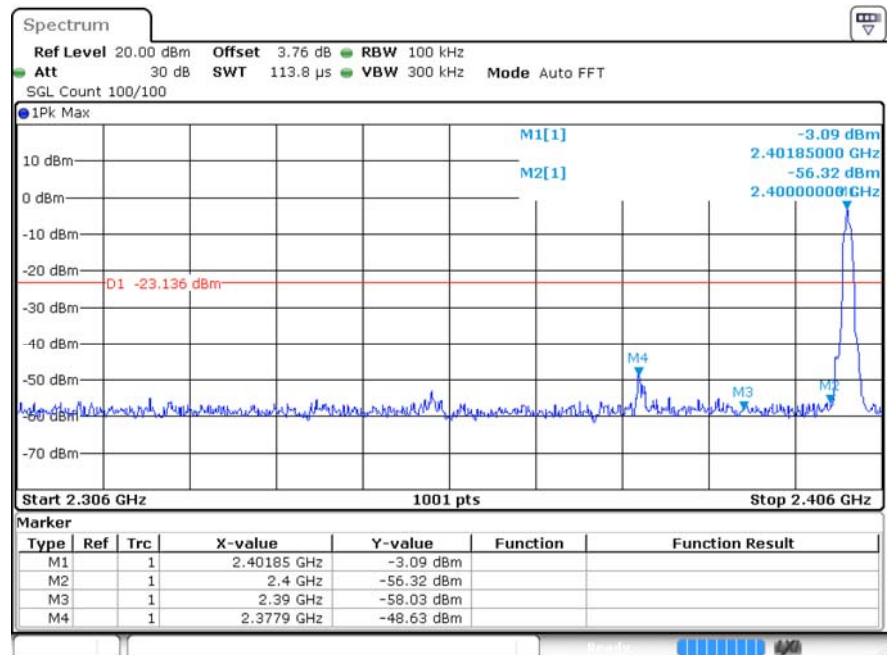
GFSK/HCH/Hop



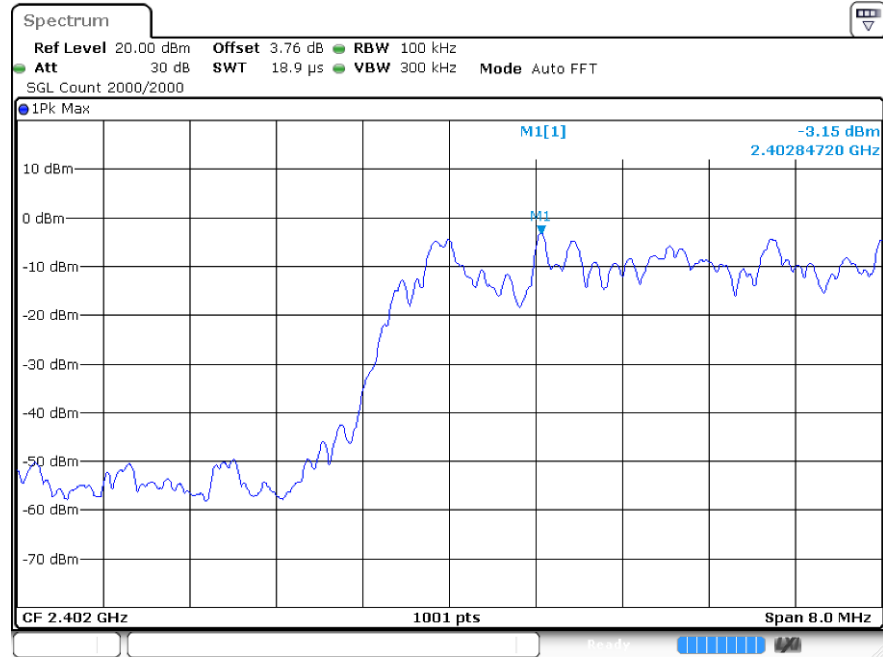
Ref



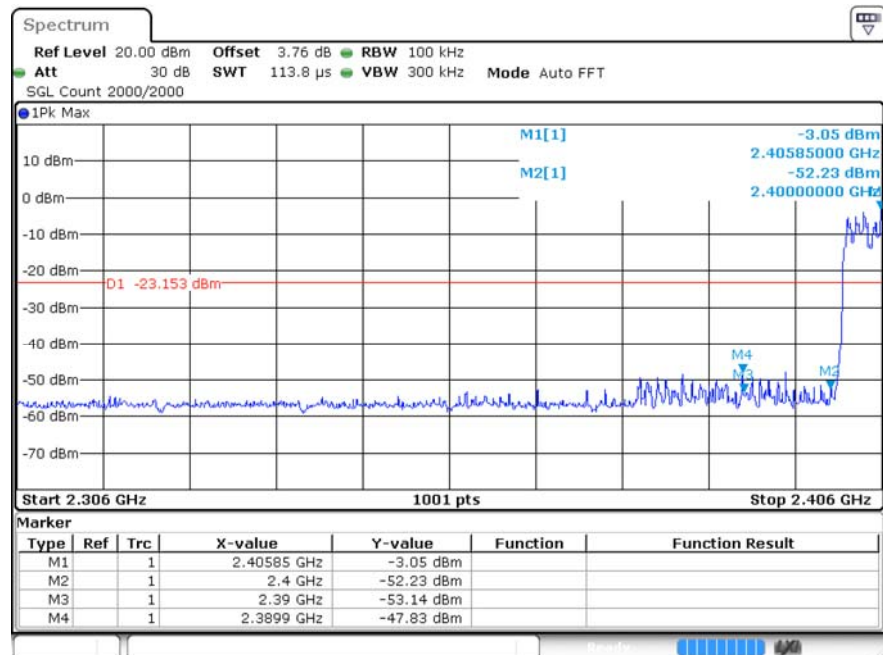
$\pi/4$ DQPSK/LCH/No
Hop



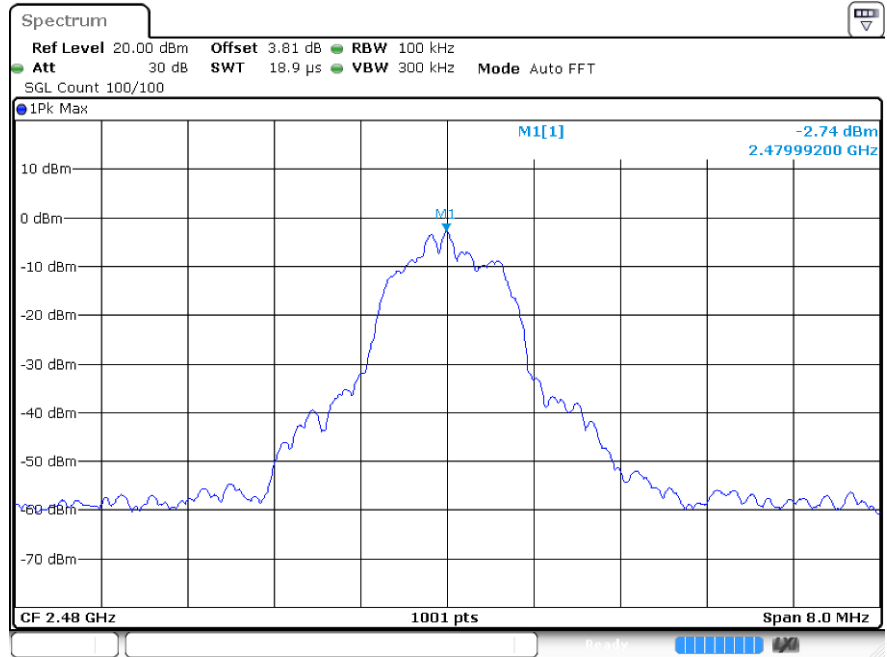
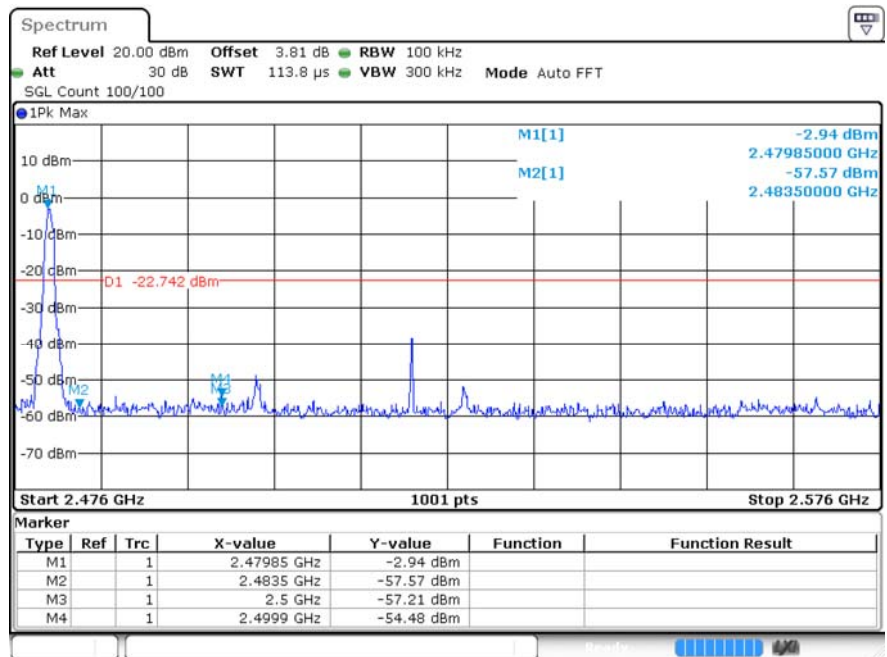
Ref



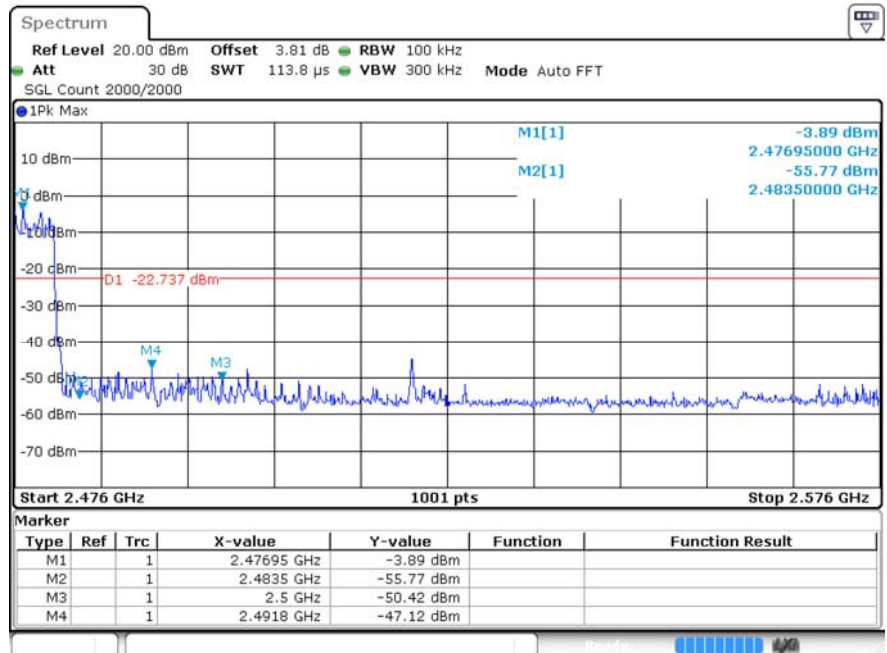
$\pi/4$ DQPSK/LCH/Hop



Ref


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


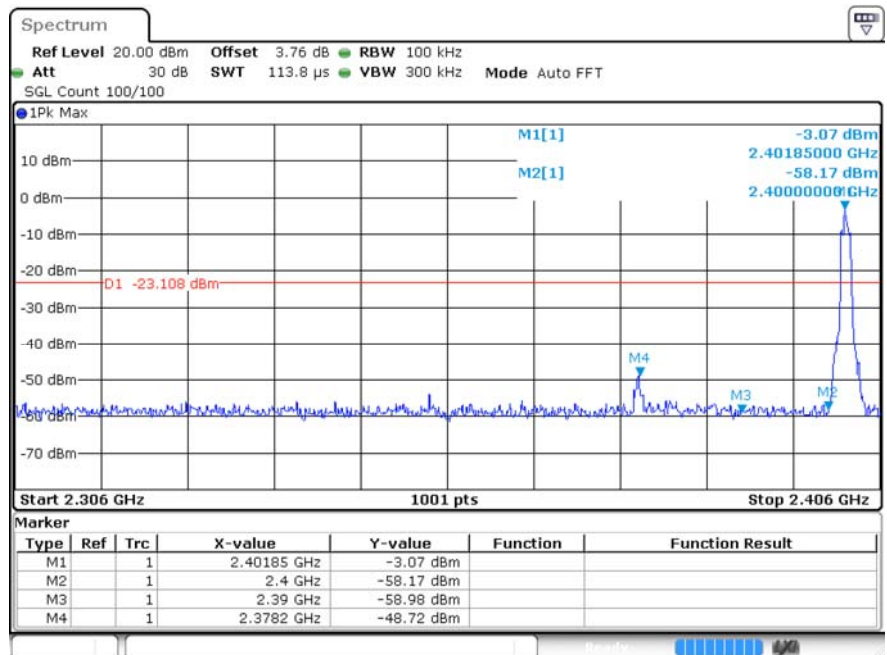
Ref


 $\pi/4$ DQPSK/HCH/Hop


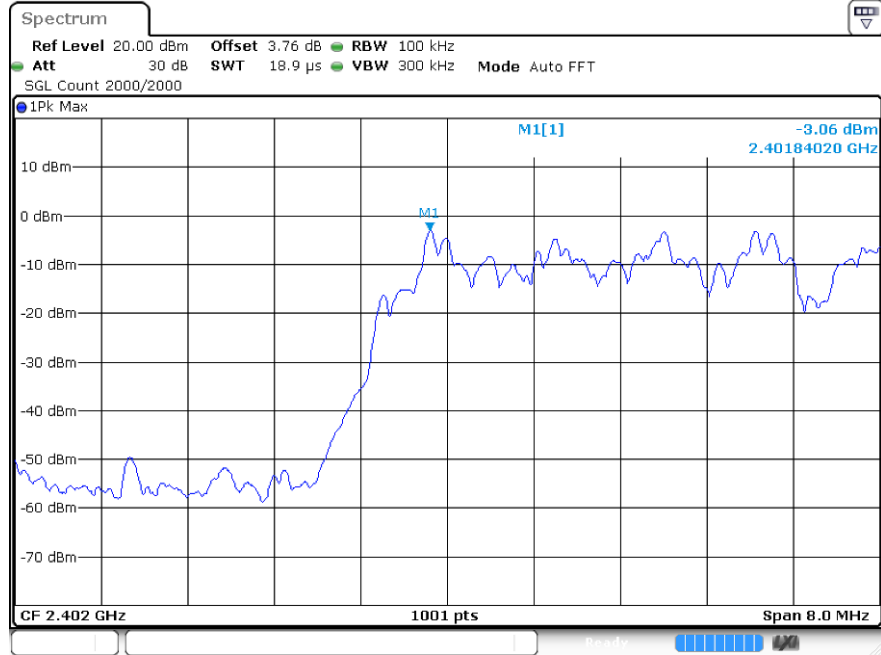
Ref



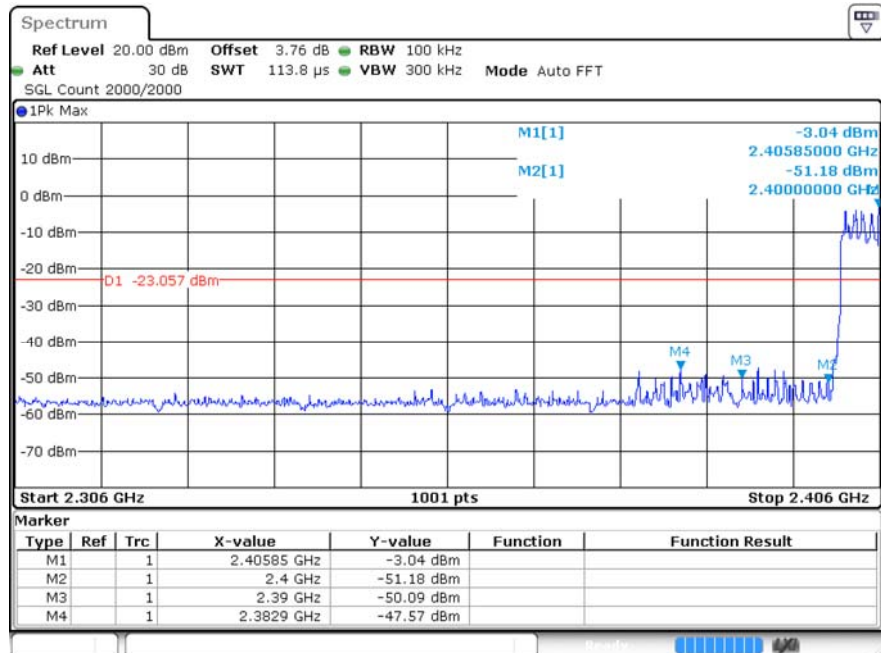
8DPSK/LCH/No Hop



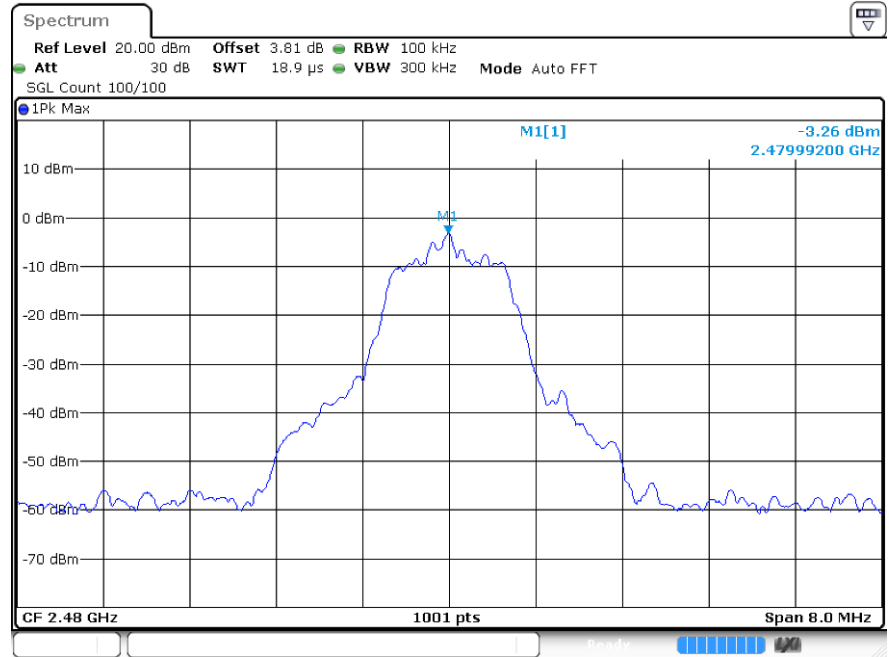
Ref



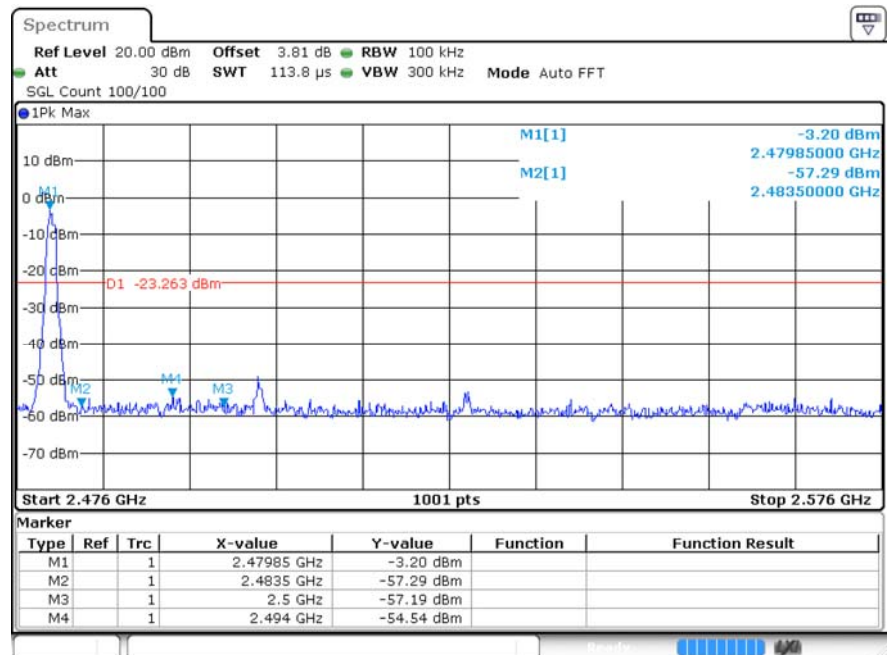
8DPSK/LCH/Hop



Ref



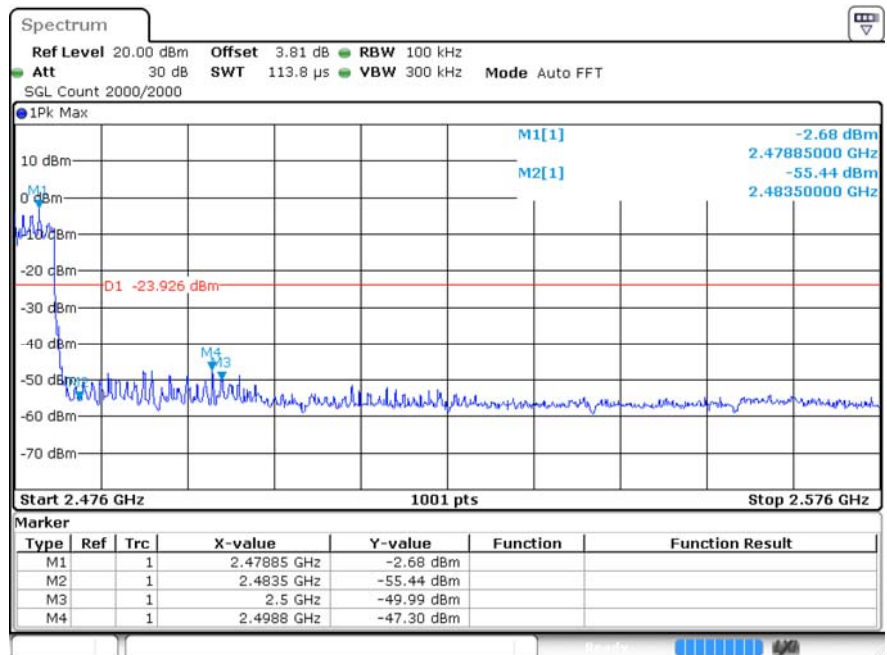
8DPSK/HCH/No Hop



Ref



8DPSK/HCH/Hop



9 Restrict-band band-edge measurements

9.1 Test Result

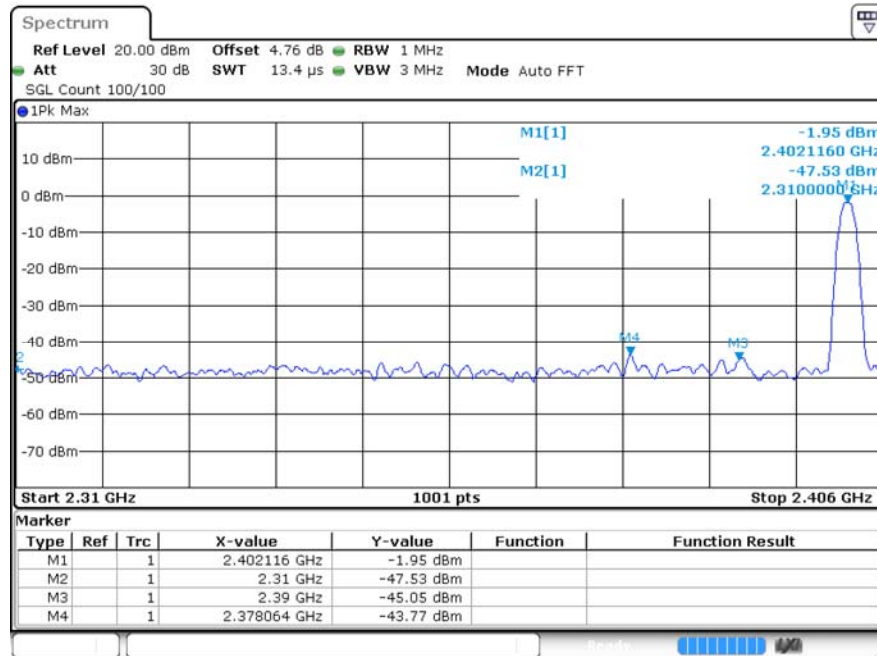
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-47.53	2	49.73	PEAK	74	Pass
	Off	2310.0	-56.49	2	40.77	AV	54	Pass
	Off	2378.064	-43.77	2	53.49	PEAK	74	Pass
	Off	2377.968	-47.38	2	49.88	AV	54	Pass
	Off	2390.0	-45.04	2	52.22	PEAK	74	Pass
	Off	2390.0	-55.84	2	41.42	AV	54	Pass
	Off	2483.5	-46.23	2	51.03	PEAK	74	Pass
	Off	2483.5	-55.86	2	41.4	AV	54	Pass
	Off	2497.36	-43.82	2	53.44	PEAK	74	Pass
	Off	2498.872	-54.56	2	42.7	AV	54	Pass
	Off	2500.0	-48.39	2	48.87	PEAK	74	Pass
	Off	2500.0	-54.97	2	42.29	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-48.9	2	48.36	PEAK	74	Pass
	Off	2310.0	-56.46	2	40.8	AV	54	Pass
	Off	2377.872	-43.63	2	53.63	PEAK	74	Pass
	Off	2377.968	-47.93	2	49.33	AV	54	Pass
	Off	2390.0	-49.35	2	47.91	PEAK	74	Pass
	Off	2390.0	-55.93	2	41.33	AV	54	Pass
	Off	2483.5	-47.77	2	49.49	PEAK	74	Pass
	Off	2483.5	-55.61	2	41.65	AV	54	Pass
	Off	2497.288	-44.08	2	53.18	PEAK	74	Pass
	Off	2492.416	-54.53	2	42.73	AV	54	Pass
	Off	2500.0	-47.81	2	49.45	PEAK	74	Pass
	Off	2500.0	-54.73	2	42.53	AV	54	Pass
8DPSK	Off	2310.0	-48.65	2	48.61	PEAK	74	Pass
	Off	2310.0	-56.36	2	40.9	AV	54	Pass
	Off	2377.968	-41.67	2	55.59	PEAK	74	Pass
	Off	2377.968	-47.9	2	49.36	AV	54	Pass



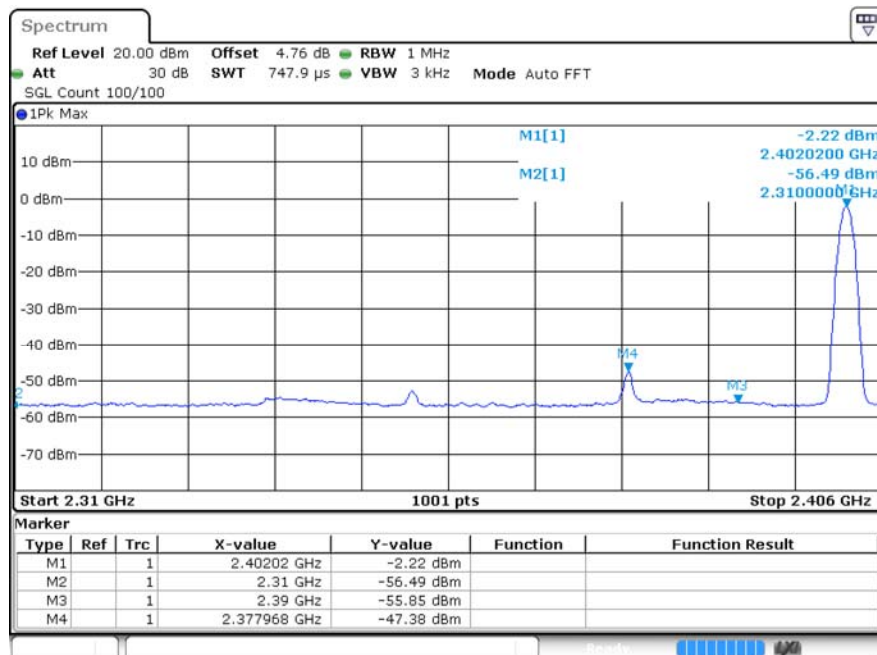
	Off	2390.0	-45.18	2	52.08	PEAK	74	Pass
	Off	2390.0	-55.52	2	41.74	AV	54	Pass
	Off	2483.5	-47.79	2	49.47	PEAK	74	Pass
	Off	2483.5	-55.7	2	41.56	AV	54	Pass
	Off	2499.808	-43.93	2	53.33	PEAK	74	Pass
	Off	2499.856	-54.61	2	42.65	AV	54	Pass
	Off	2500.0	-44.13	2	53.13	PEAK	74	Pass
	Off	2500.0	-54.74	2	42.52	AV	54	Pass

9.2 Test Graphs

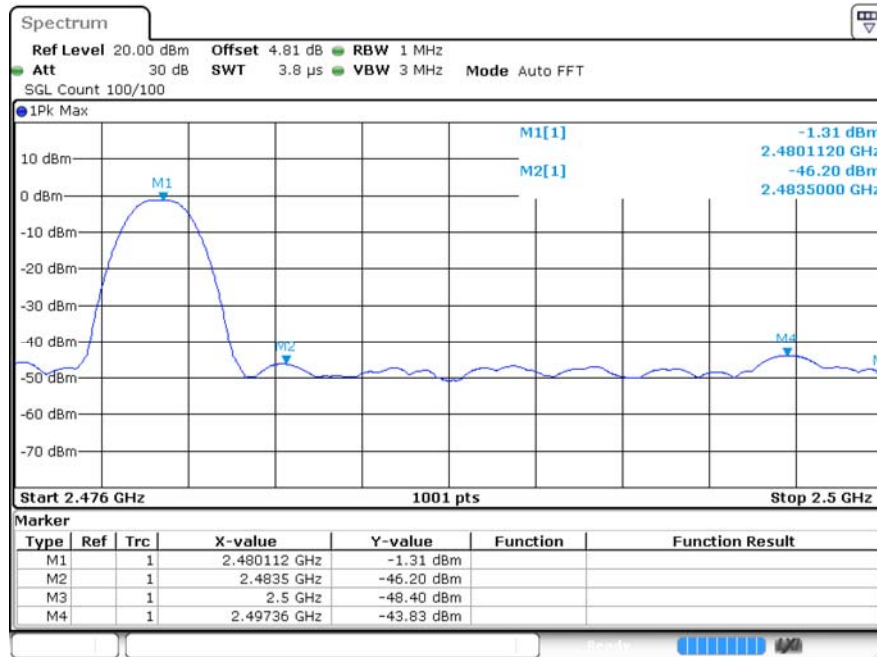
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



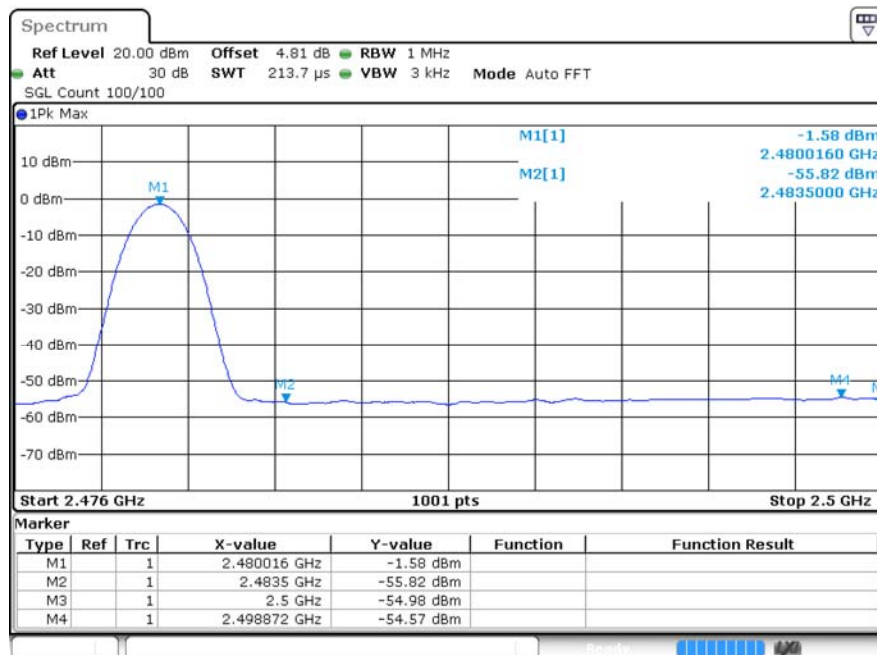
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



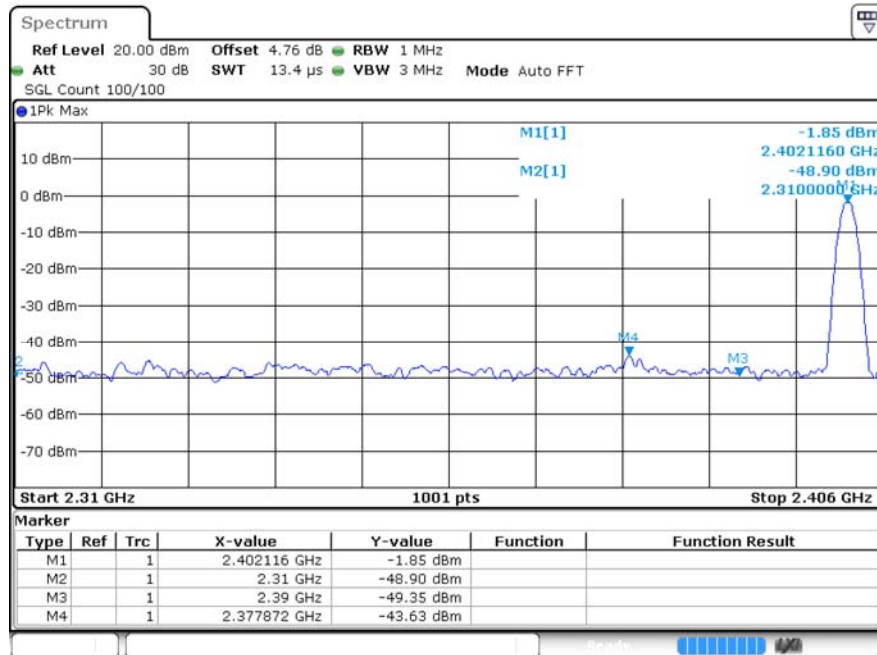
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



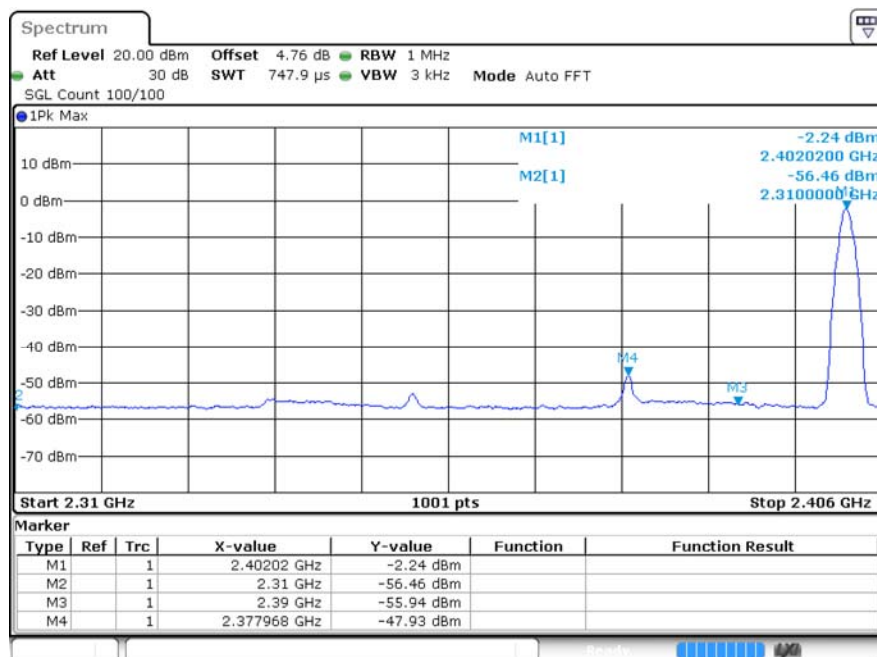
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



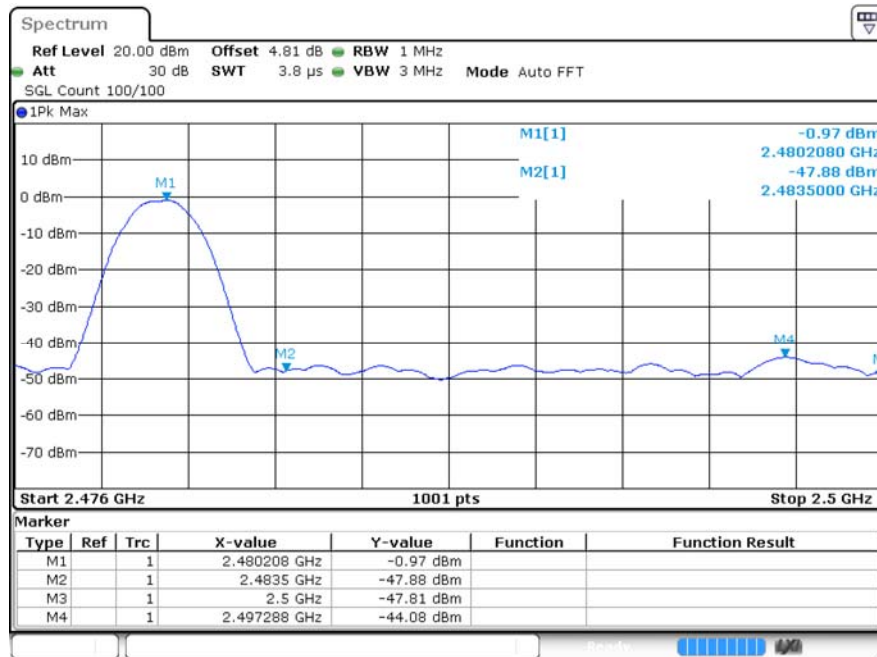
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



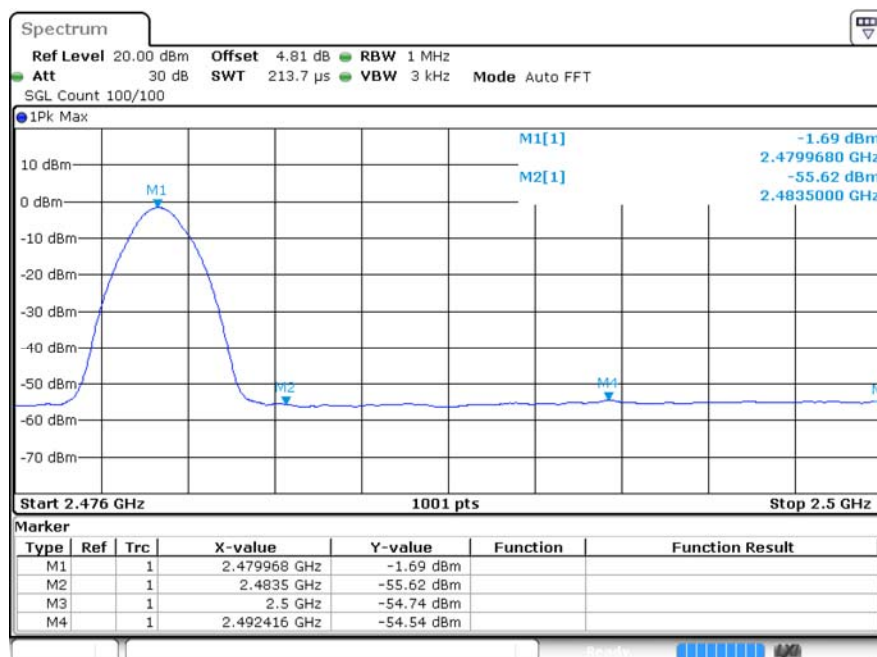
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



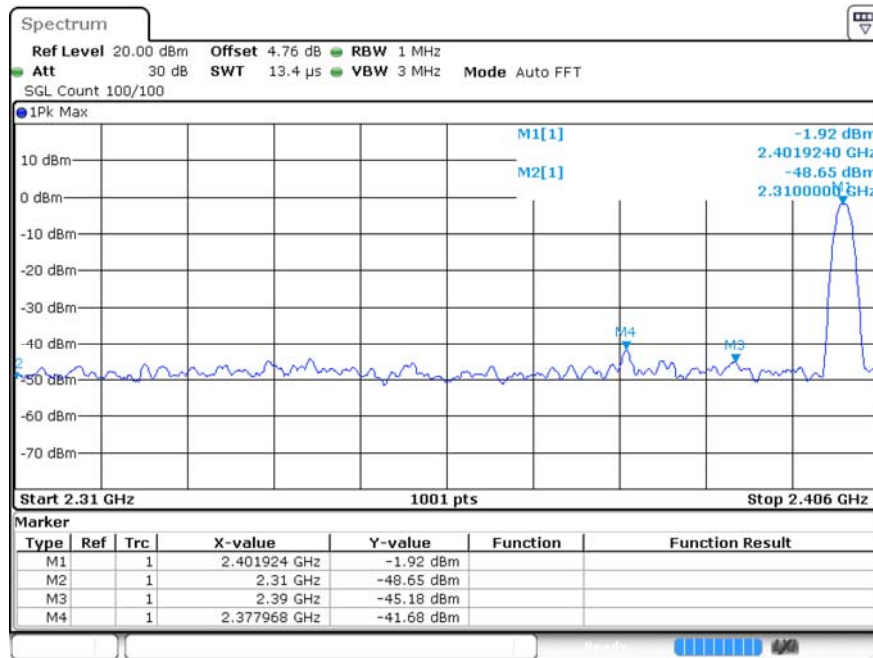
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



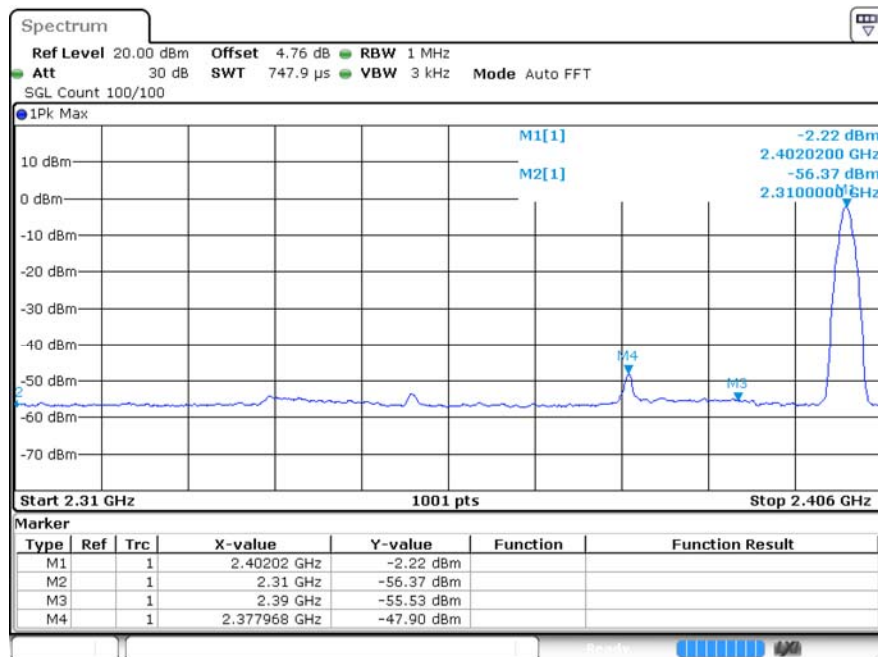
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



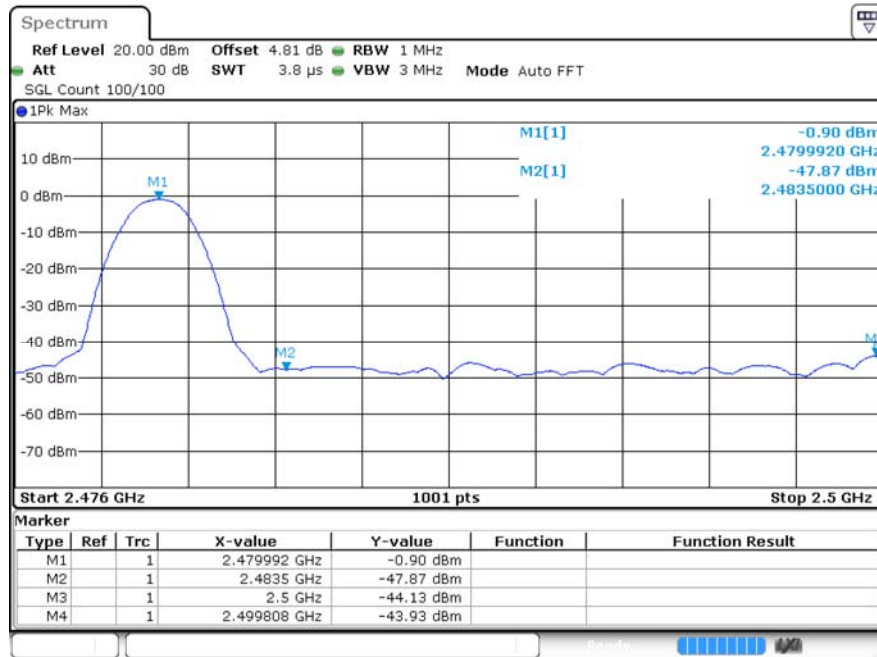
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



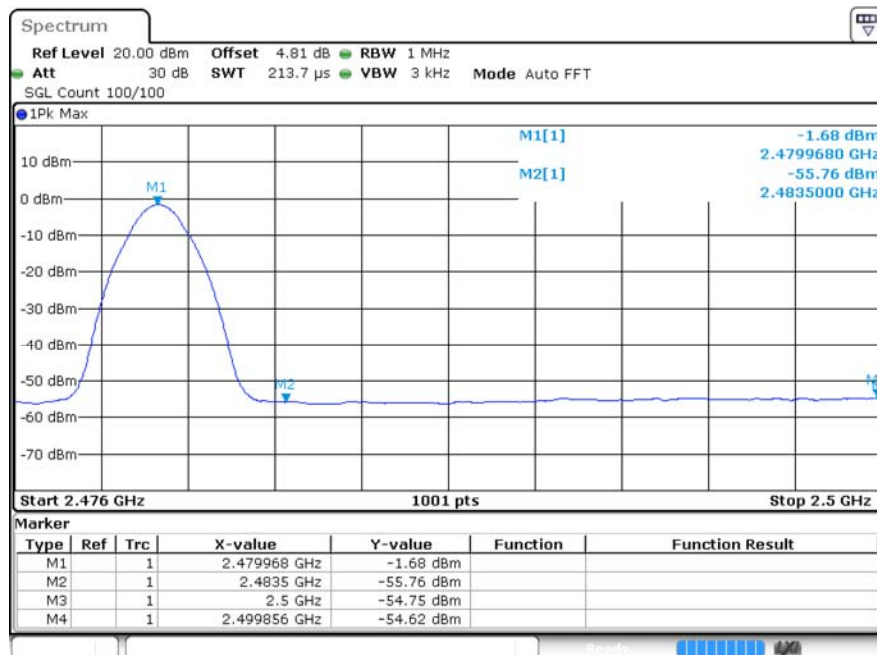
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



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



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



---The End---