



Appendix A

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

Product Name: Carplay

Trade Mark: N/A

Test Model: M5

Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung



Contents

Page

COVER PAGE

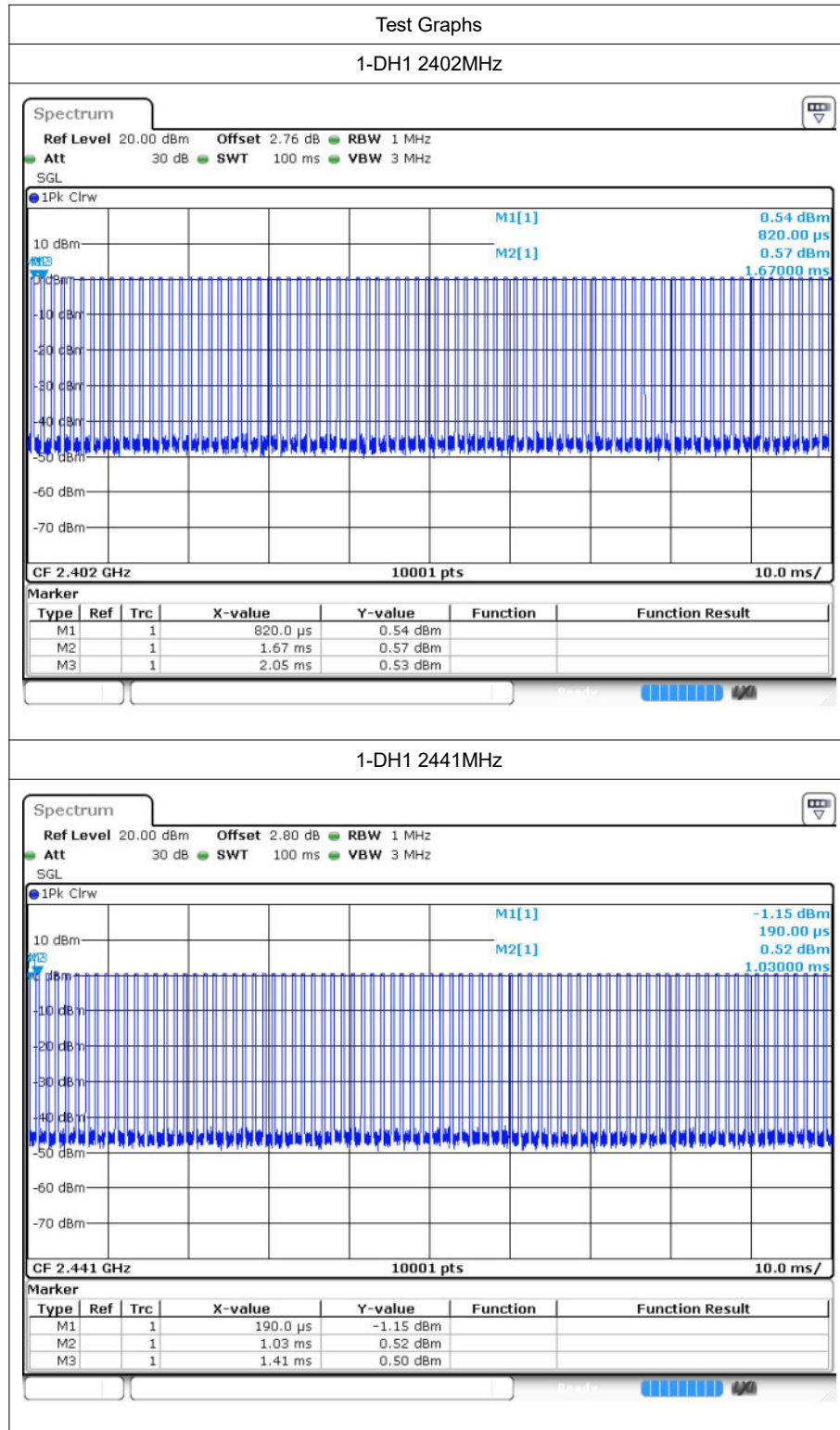
1	Duty Cycle	3
1.1	Test Result	3
1.2	Test Graphs	4
2	Maximum Conducted Peak Output Power	9
2.1	Test Result	9
2.2	Test Graphs	10
3	20dB Bandwidth	15
3.1	Test Result	15
3.2	Test Graphs	16
4	Carrier Frequency Separation	21
4.1	Test Result	21
4.2	Test Graphs	22
5	Hopping Channel Number	24
5.1	Test Result	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

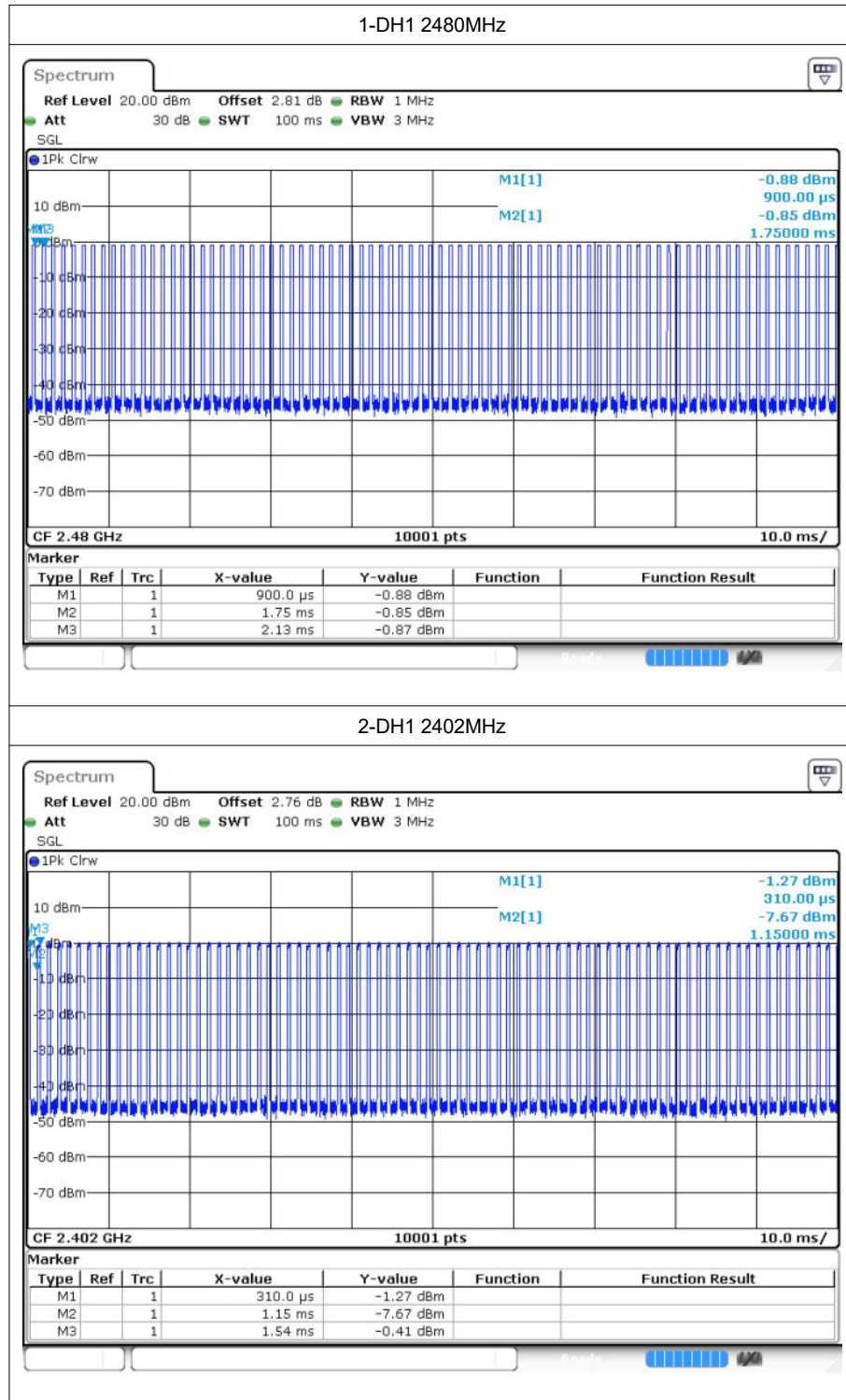
1 Duty Cycle

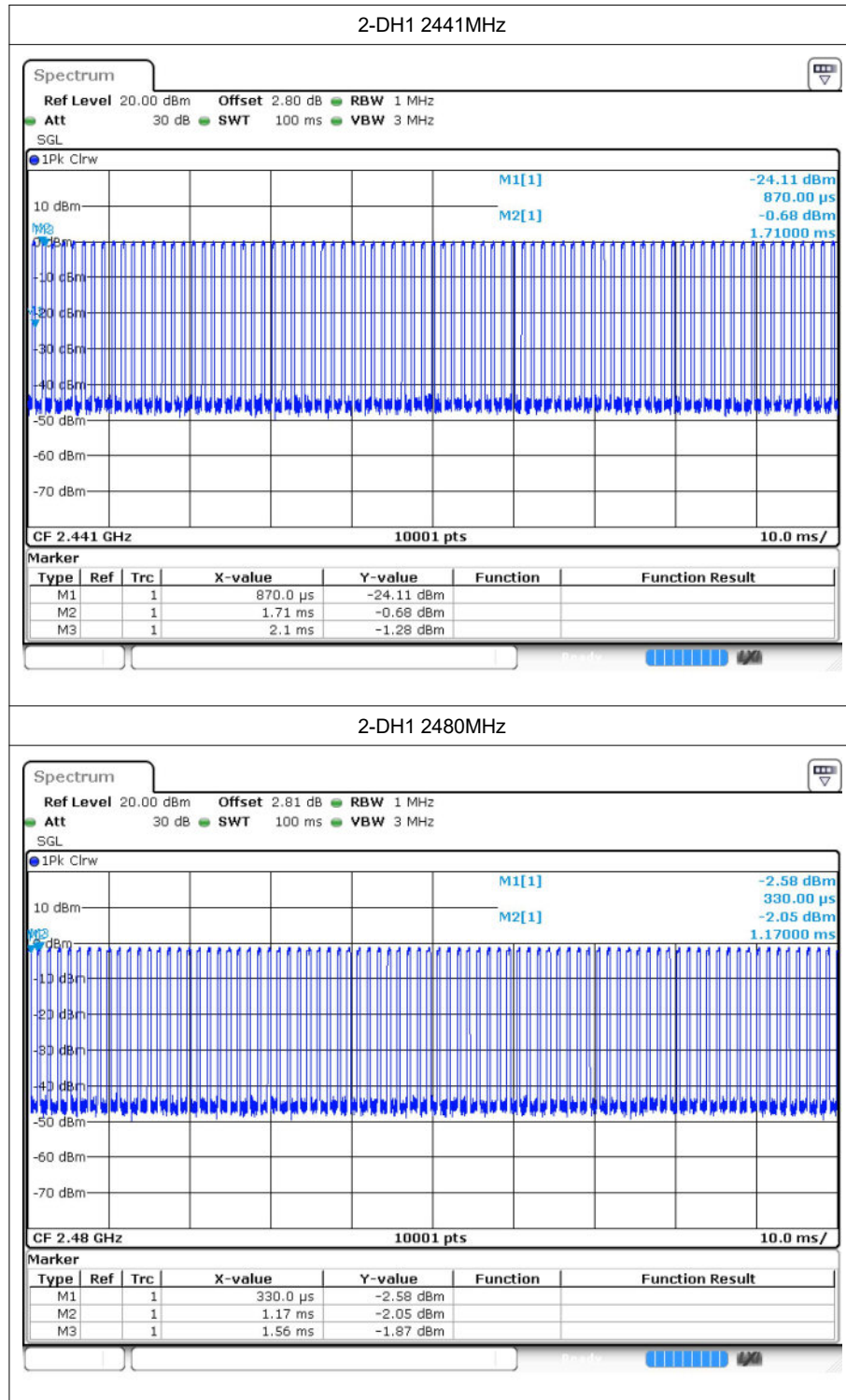
1.1 Test Result

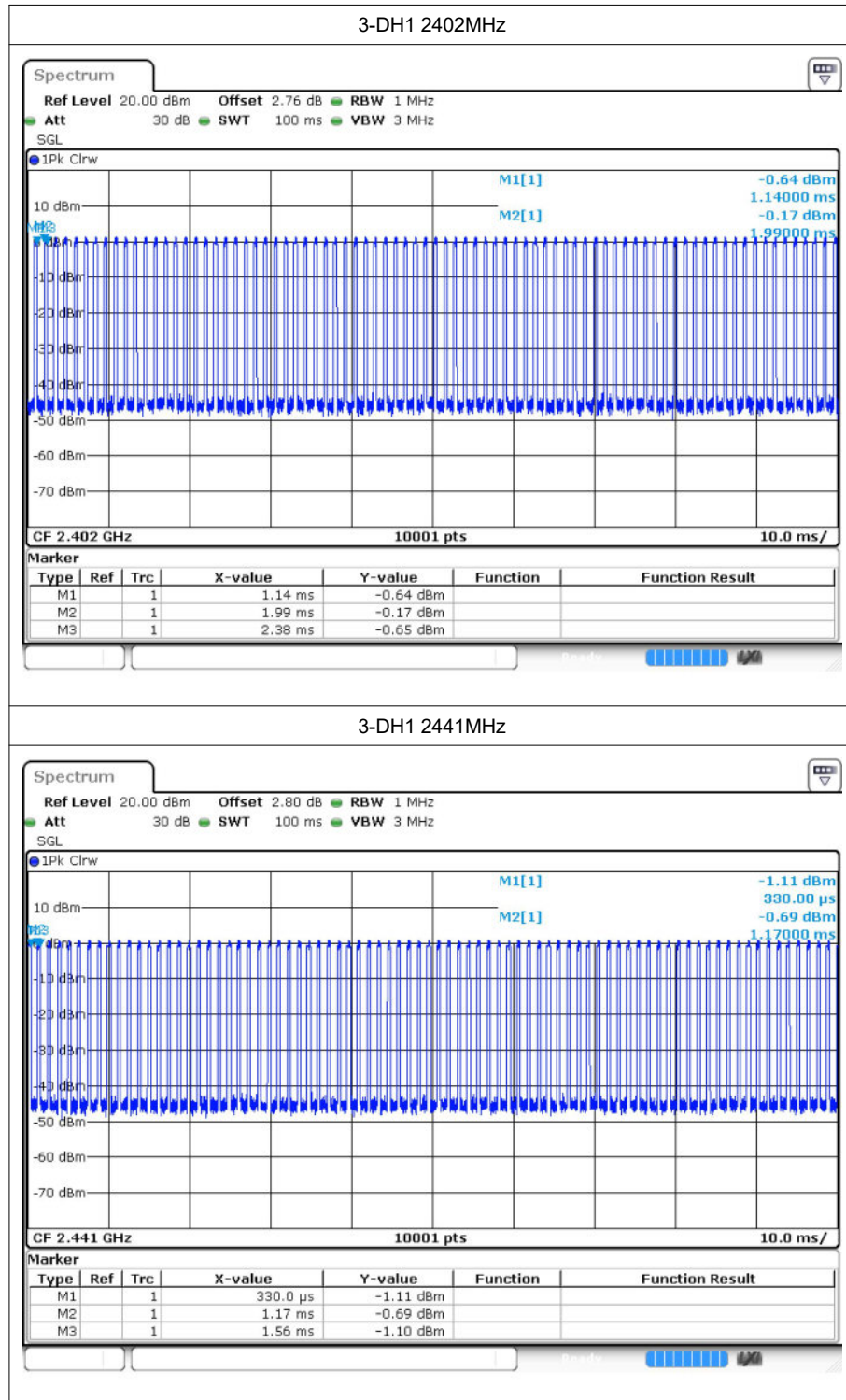
Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
1-DH1	2402	32.01	4.95	2.63
1-DH1	2441	31.79	4.98	2.63
1-DH1	2480	31.93	4.96	2.63
2-DH1	2402	32.35	4.9	2.56
2-DH1	2441	32.28	4.91	2.56
2-DH1	2480	32.31	4.91	2.56
3-DH1	2402	32.31	4.91	2.56
3-DH1	2441	32.35	4.9	2.56
3-DH1	2480	32.35	4.9	2.56

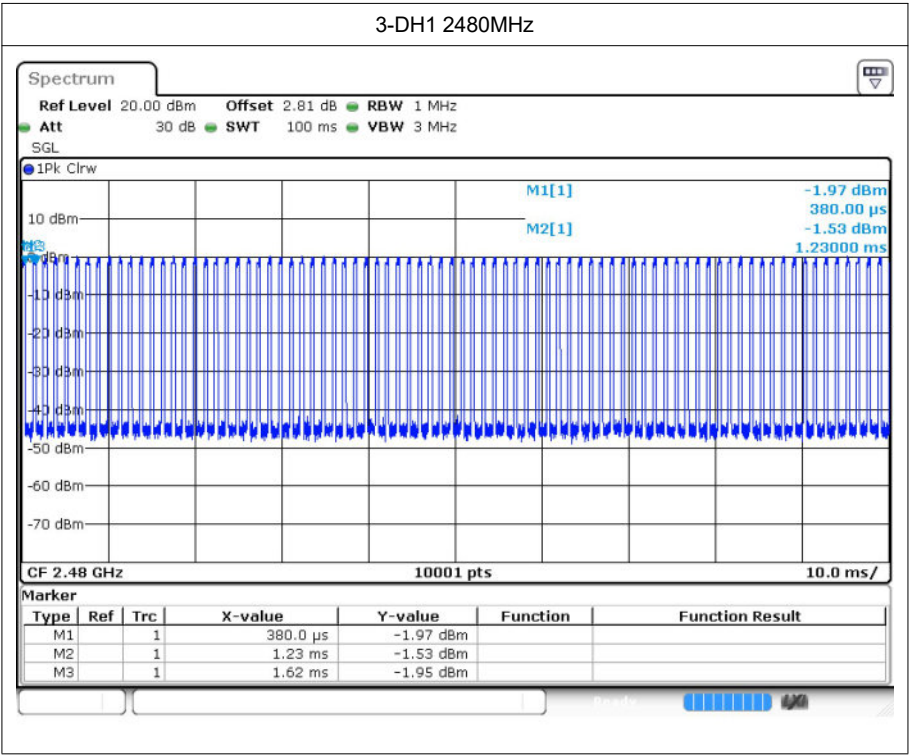
1.2 Test Graphs









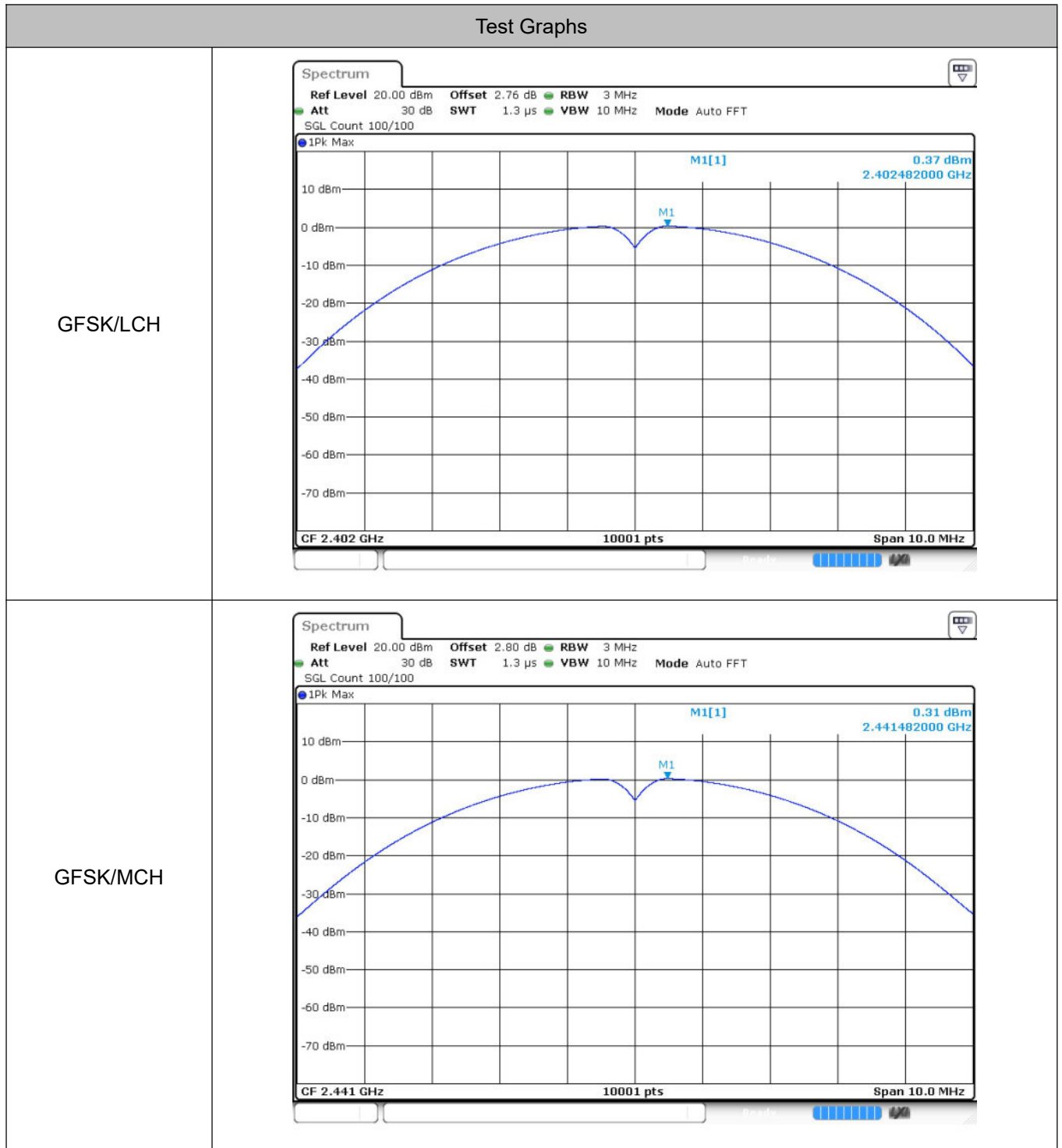


2 Maximum Conducted Peak Output Power

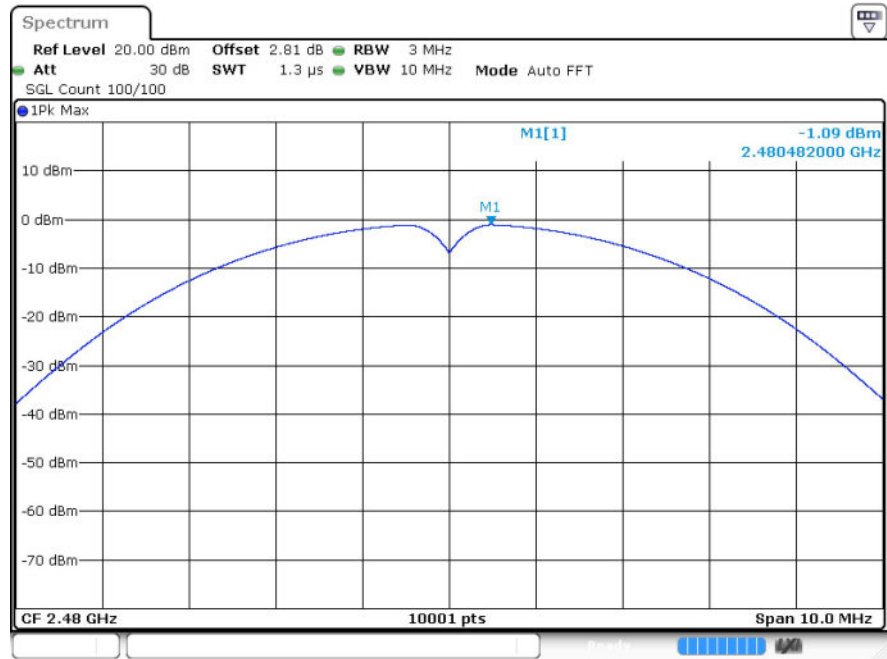
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.37	21	Pass
	MCH	0.31	21	Pass
	HCH	-1.09	21	Pass
$\pi/4$ DQPSK	LCH	0.24	21	Pass
	MCH	-0.06	21	Pass
	HCH	-1.21	21	Pass
8DPSK	LCH	0.2	21	Pass
	MCH	0.71	21	Pass
	HCH	-1.17	21	Pass

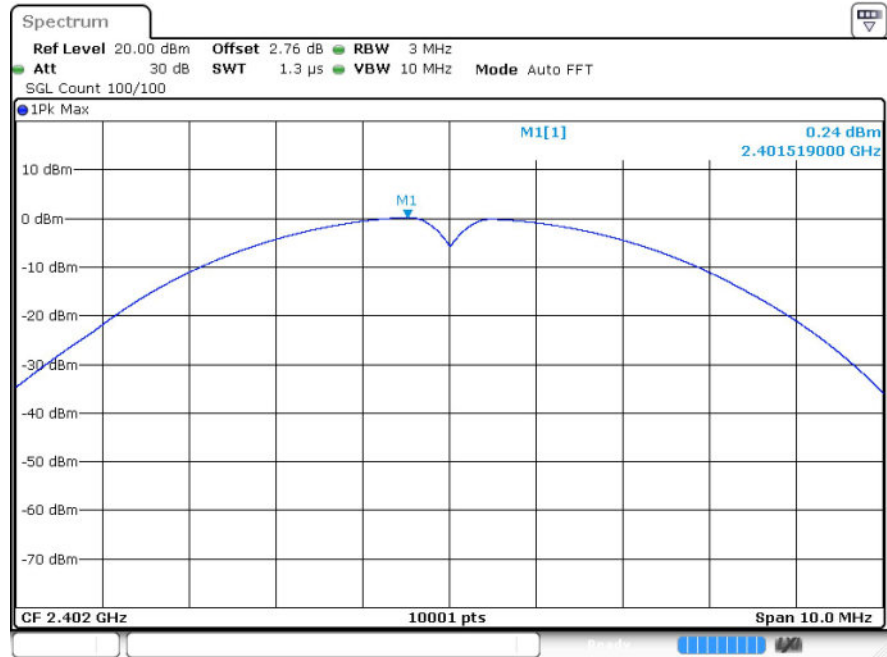
2.2 Test Graphs



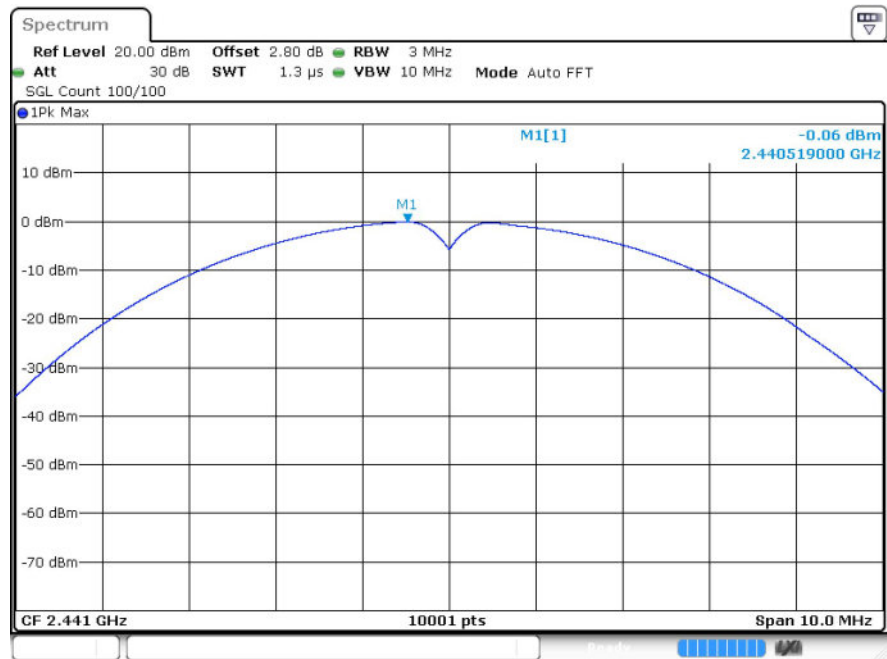
GFSK/HCH



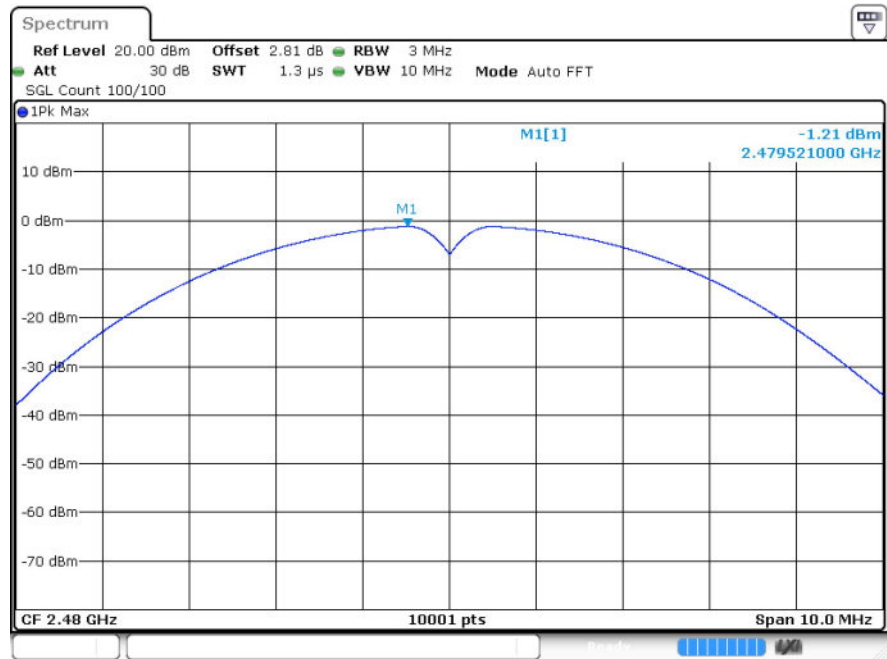
$\pi/4$ DQPSK/LCH



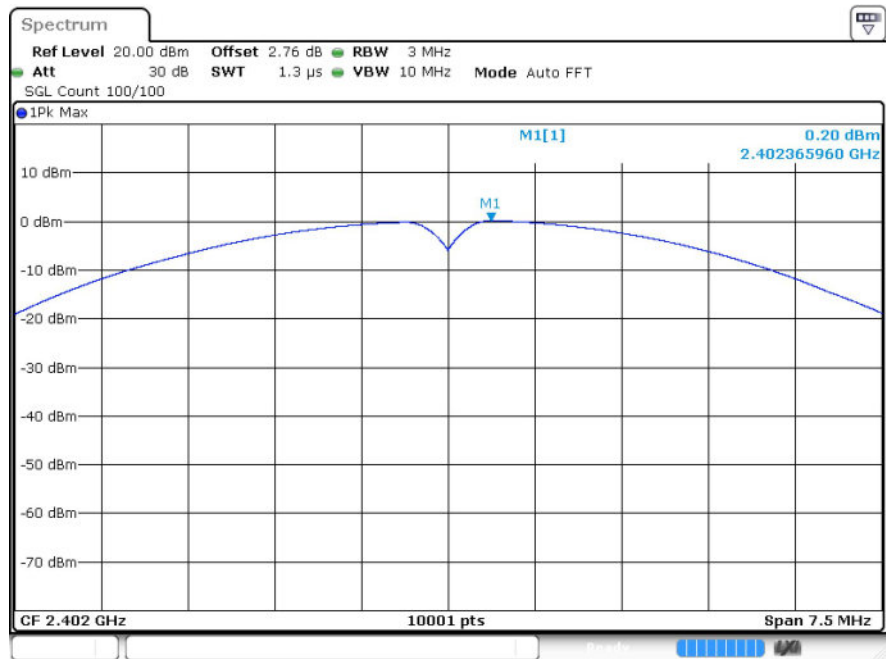
$\pi/4$ DQPSK/MCH



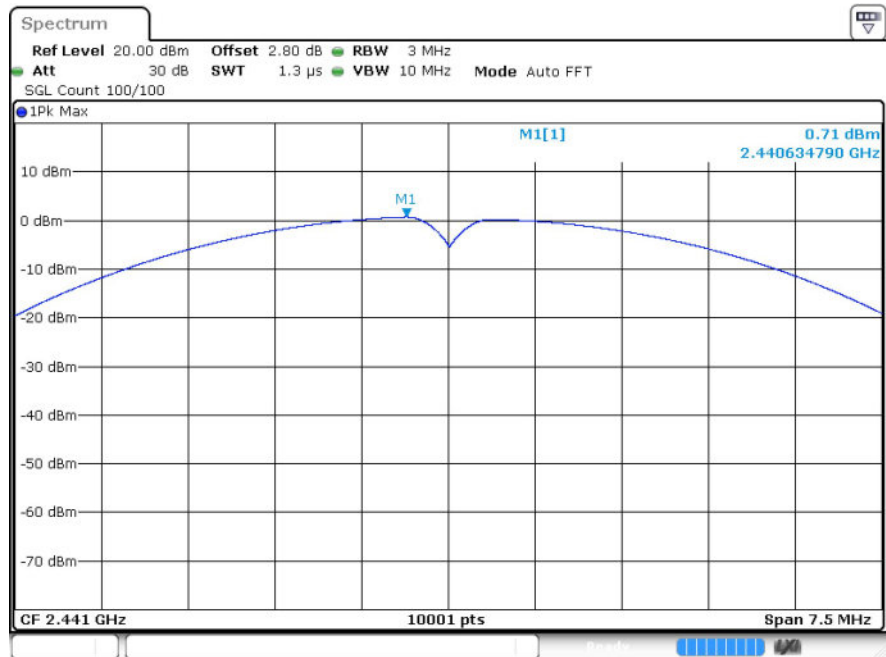
$\pi/4$ DQPSK/HCH



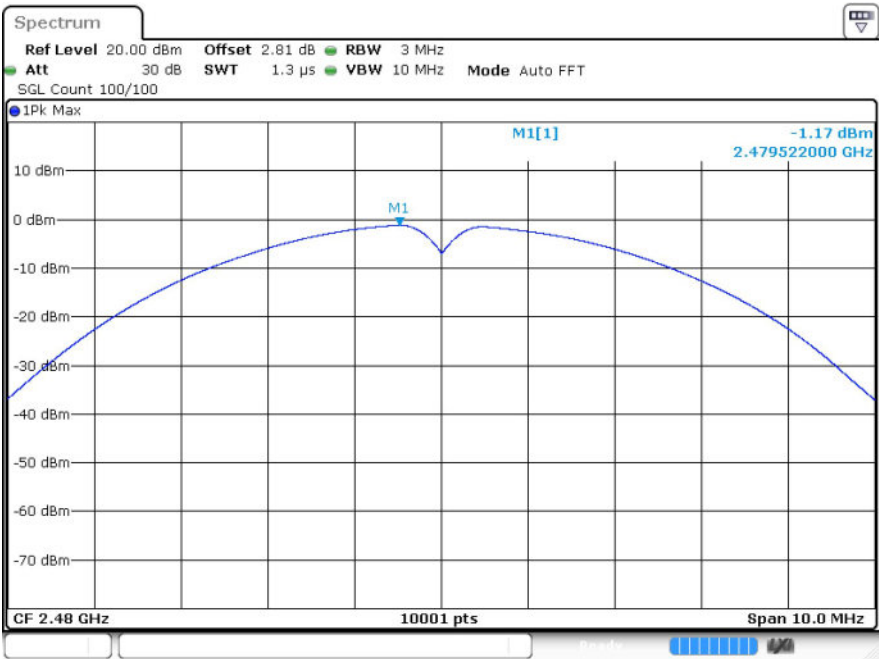
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

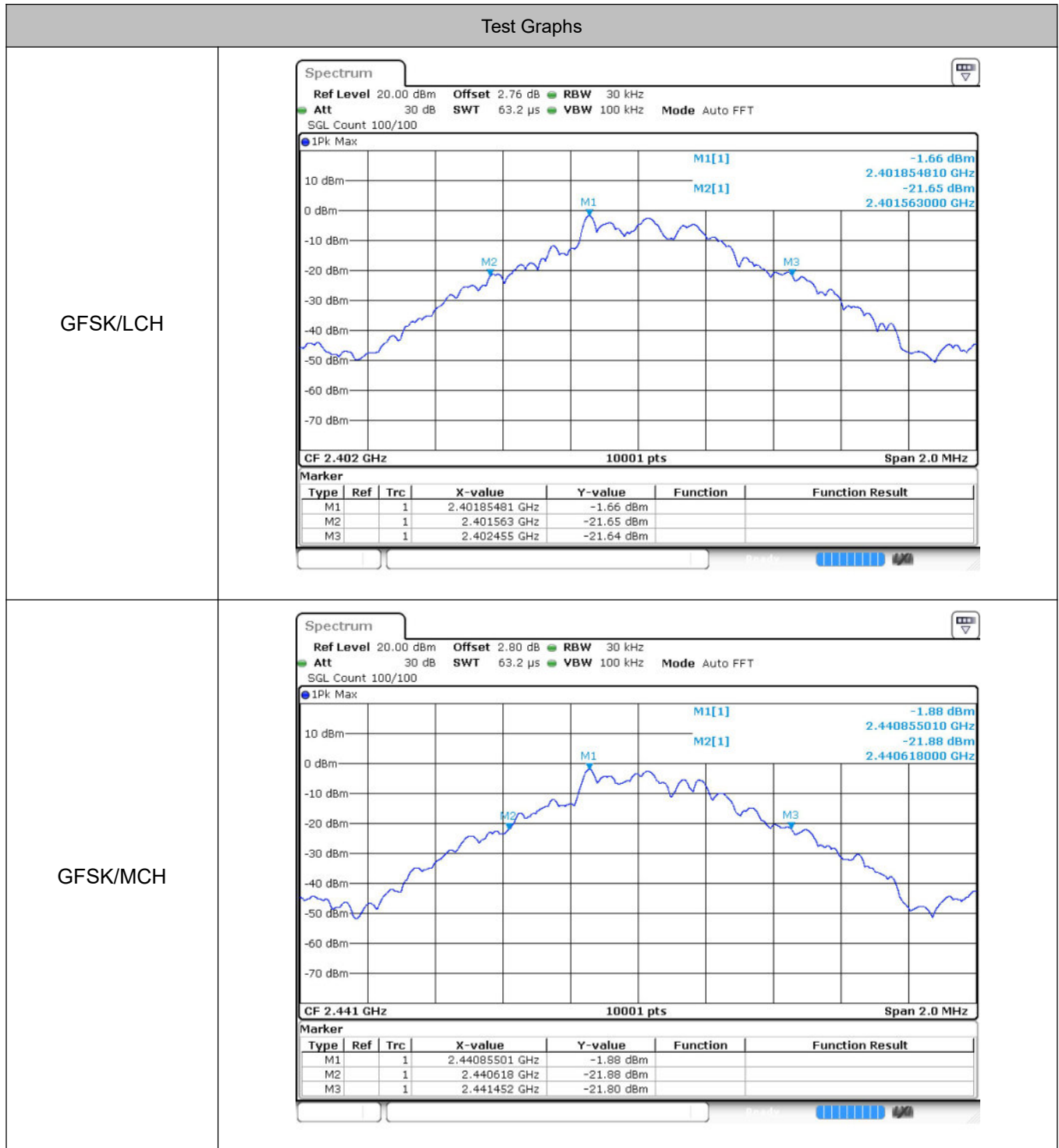


3 20dB Bandwidth

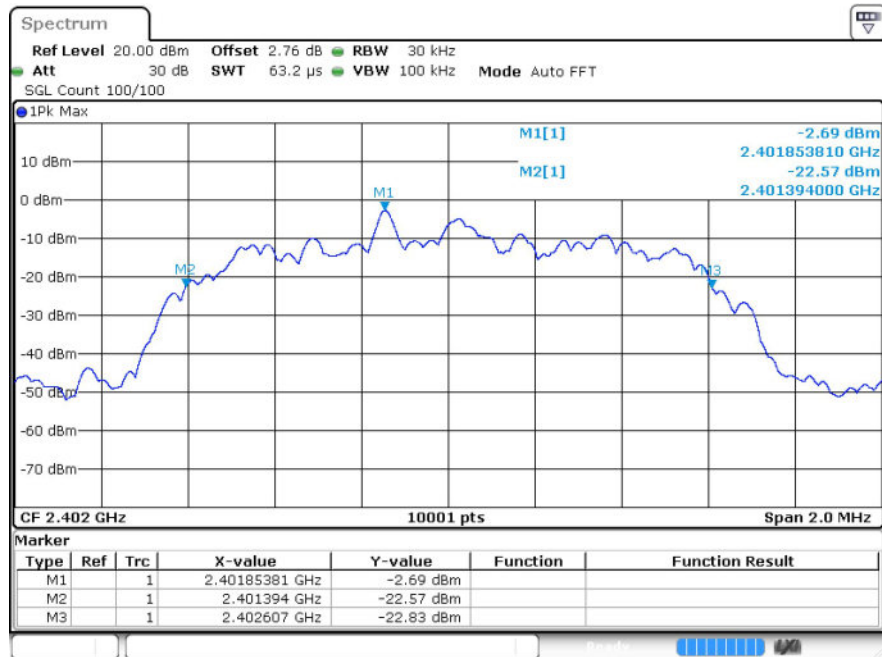
3.1 Test Result

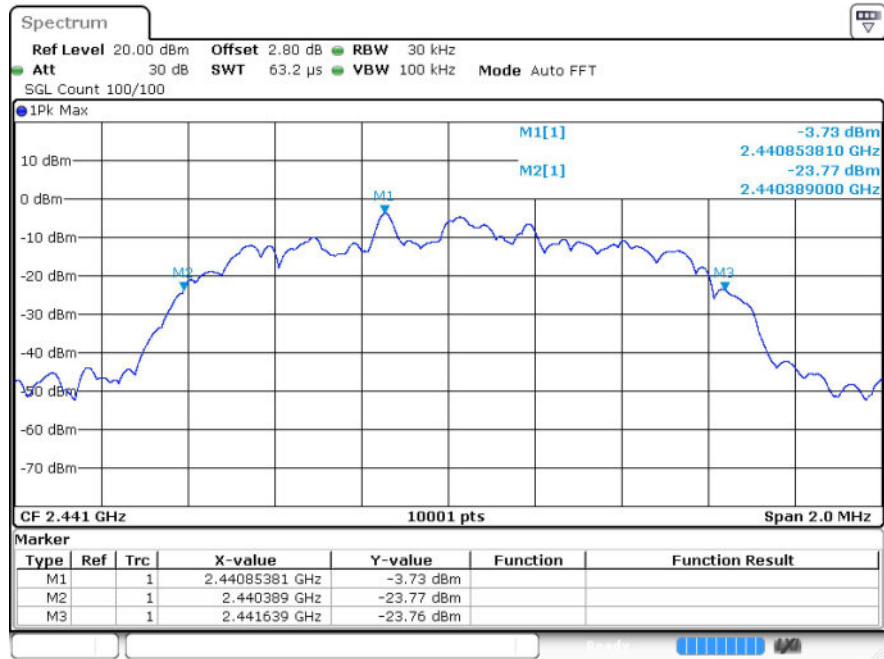
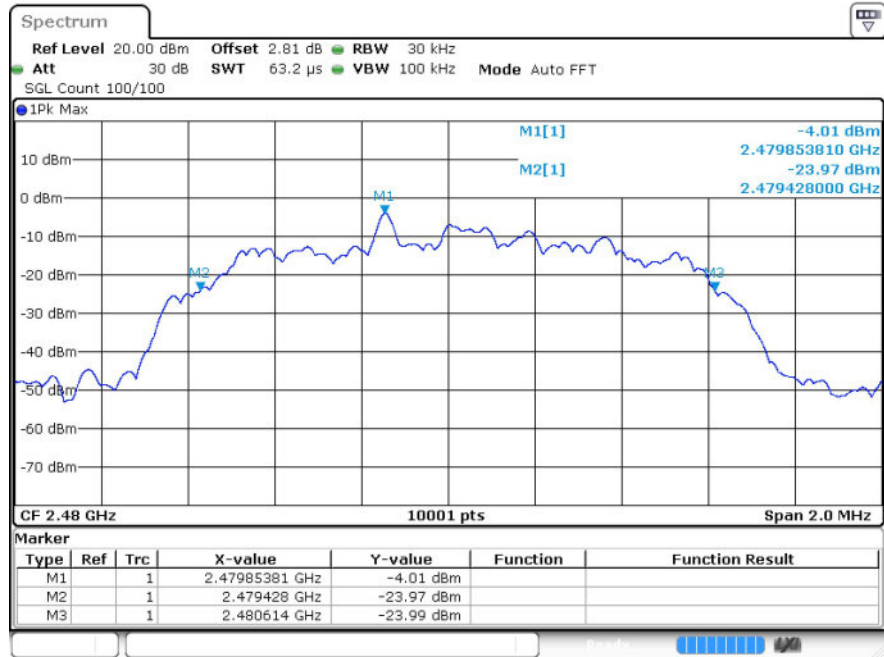
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.892	Not Specified	Pass
	MCH	0.834	Not Specified	Pass
	HCH	0.92	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.213	Not Specified	Pass
	MCH	1.249	Not Specified	Pass
	HCH	1.186	Not Specified	Pass
8DPSK	LCH	1.195	Not Specified	Pass
	MCH	1.201	Not Specified	Pass
	HCH	1.209	Not Specified	Pass

3.2 Test Graphs

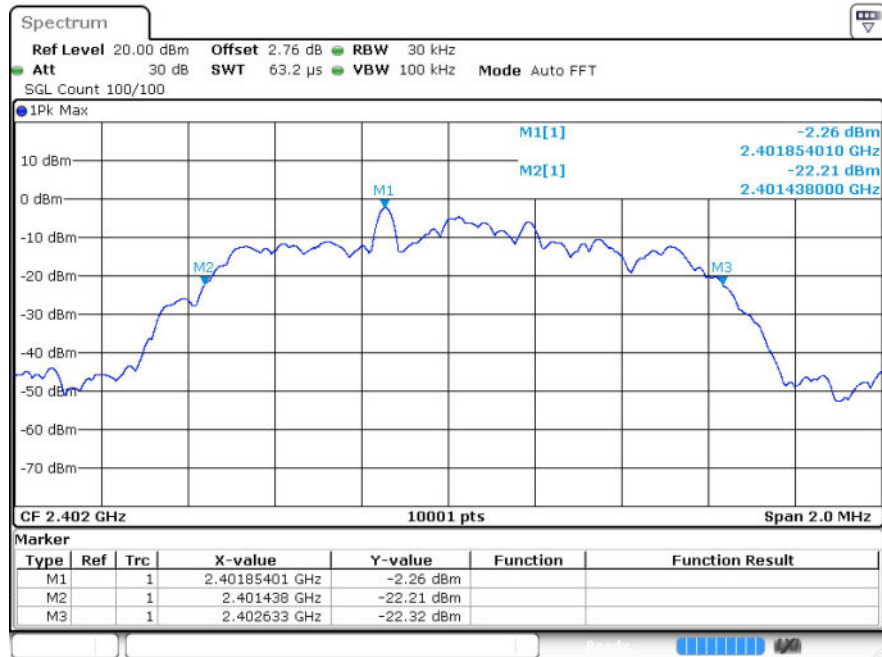


GFSK/HCH

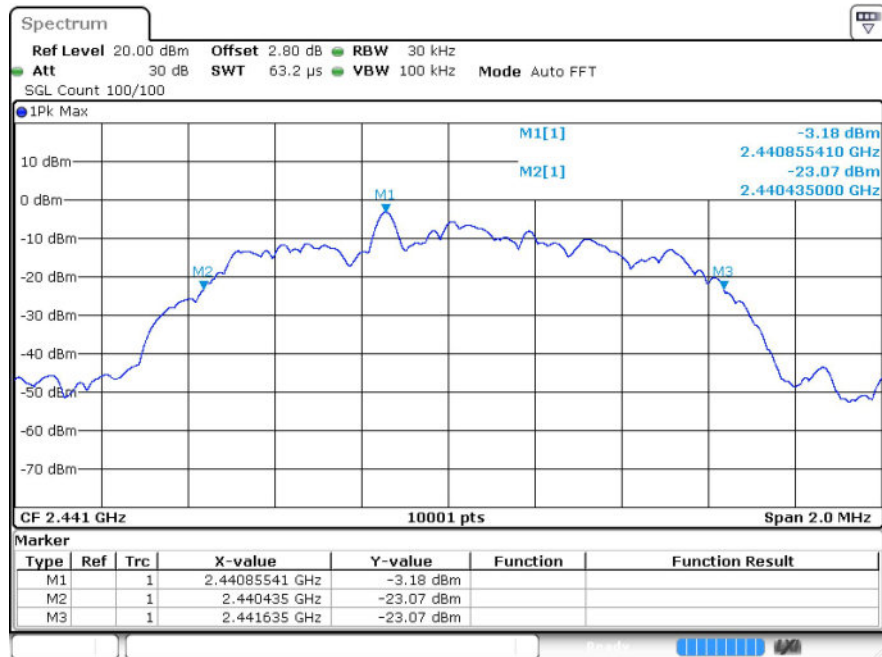

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

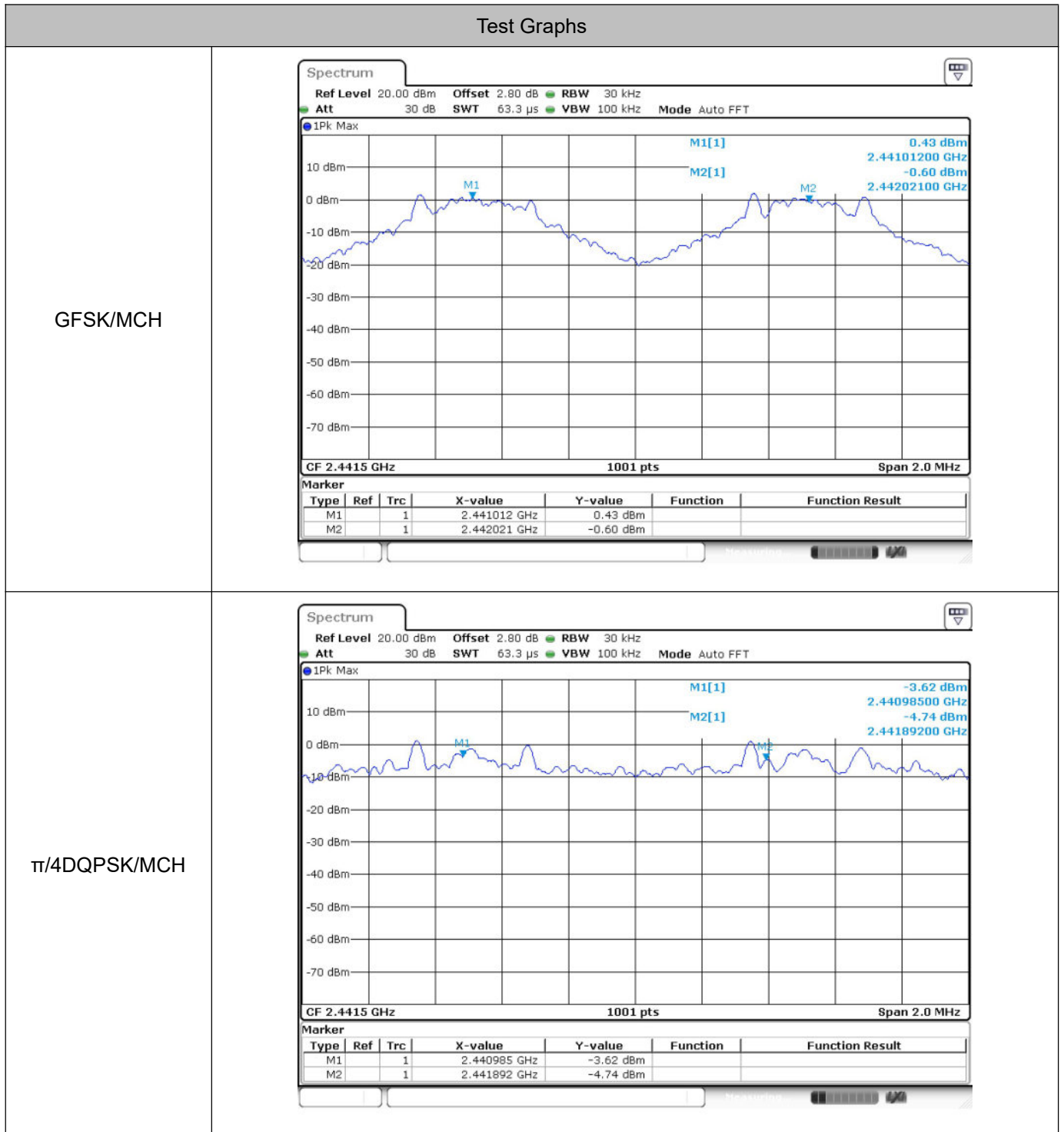


4 Carrier Frequency Separation

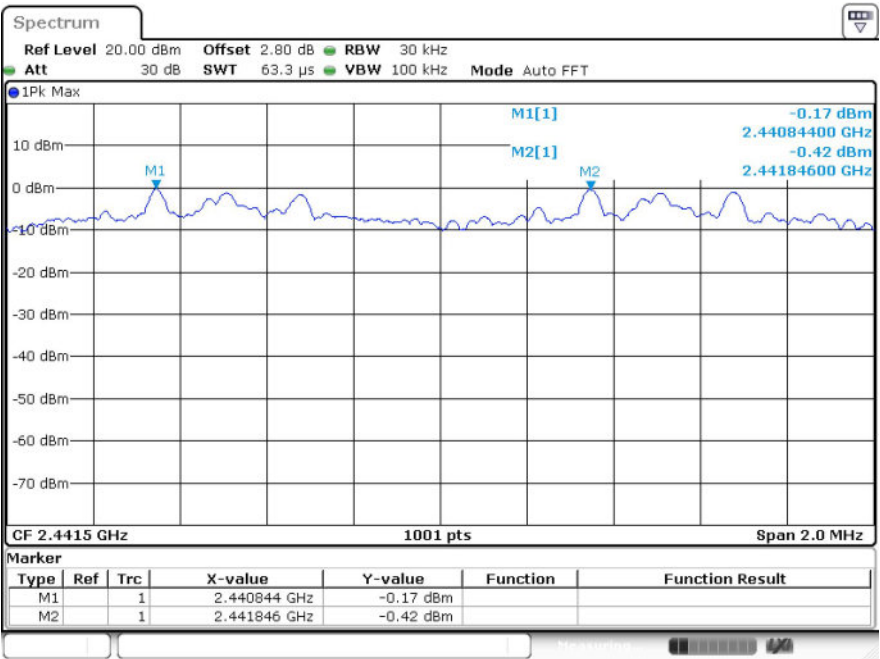
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.009	0.556	Pass
$\pi/4$ DQPSK	MCH	0.907	0.833	Pass
8DPSK	MCH	1.002	0.801	Pass

4.2 Test Graphs



8DPSK/MCH

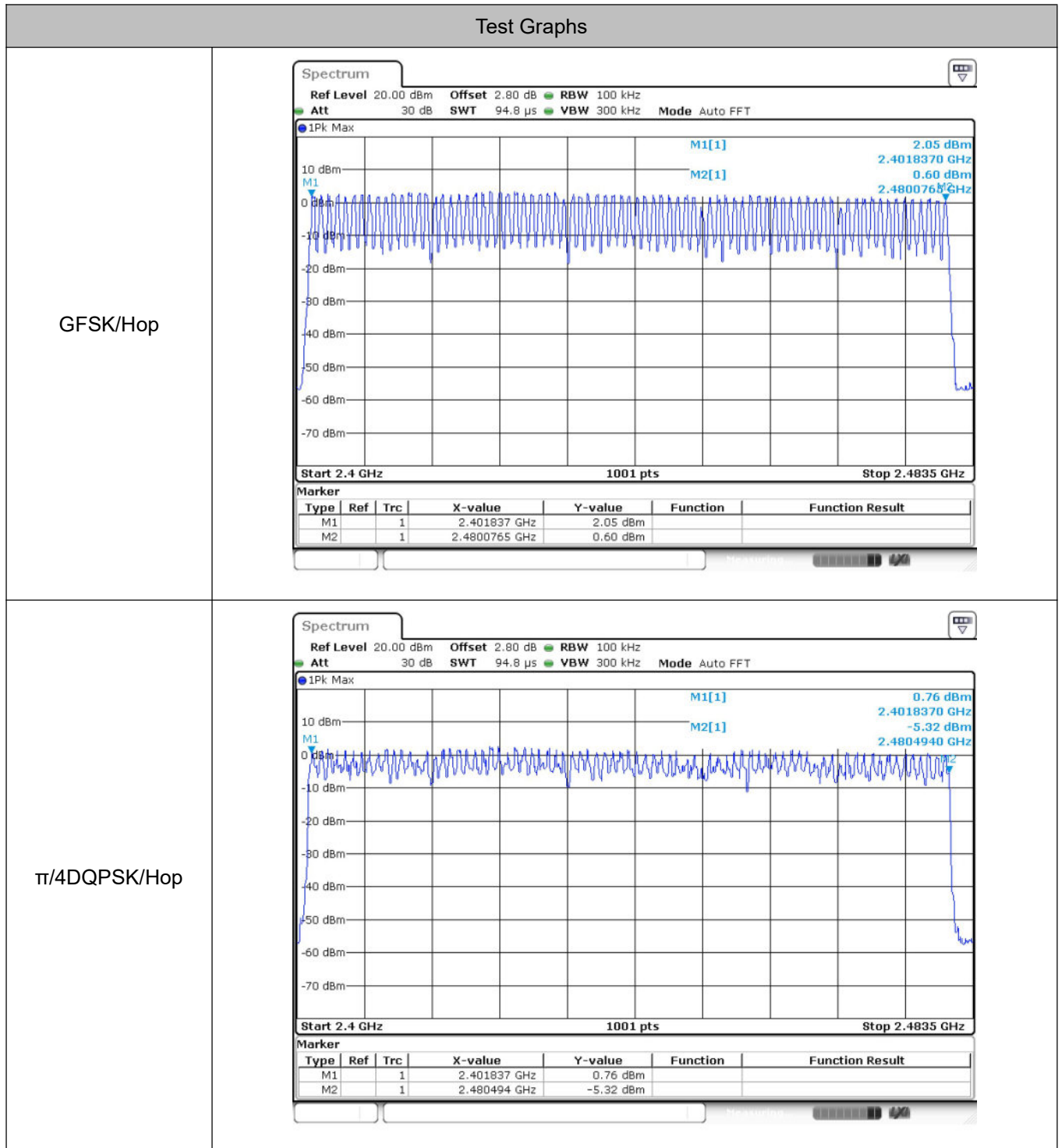


5 Hopping Channel Number

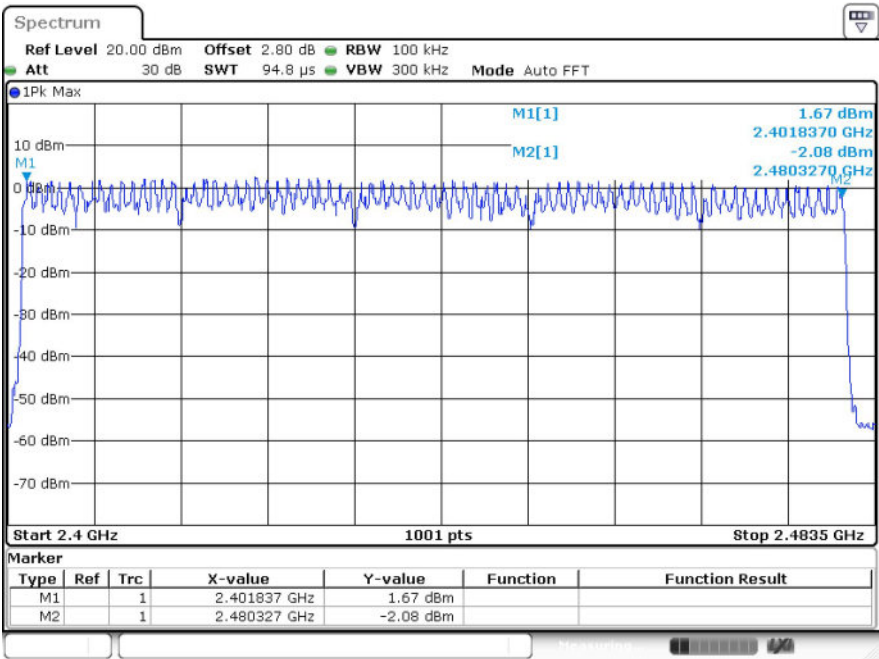
5.1 Test Result

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

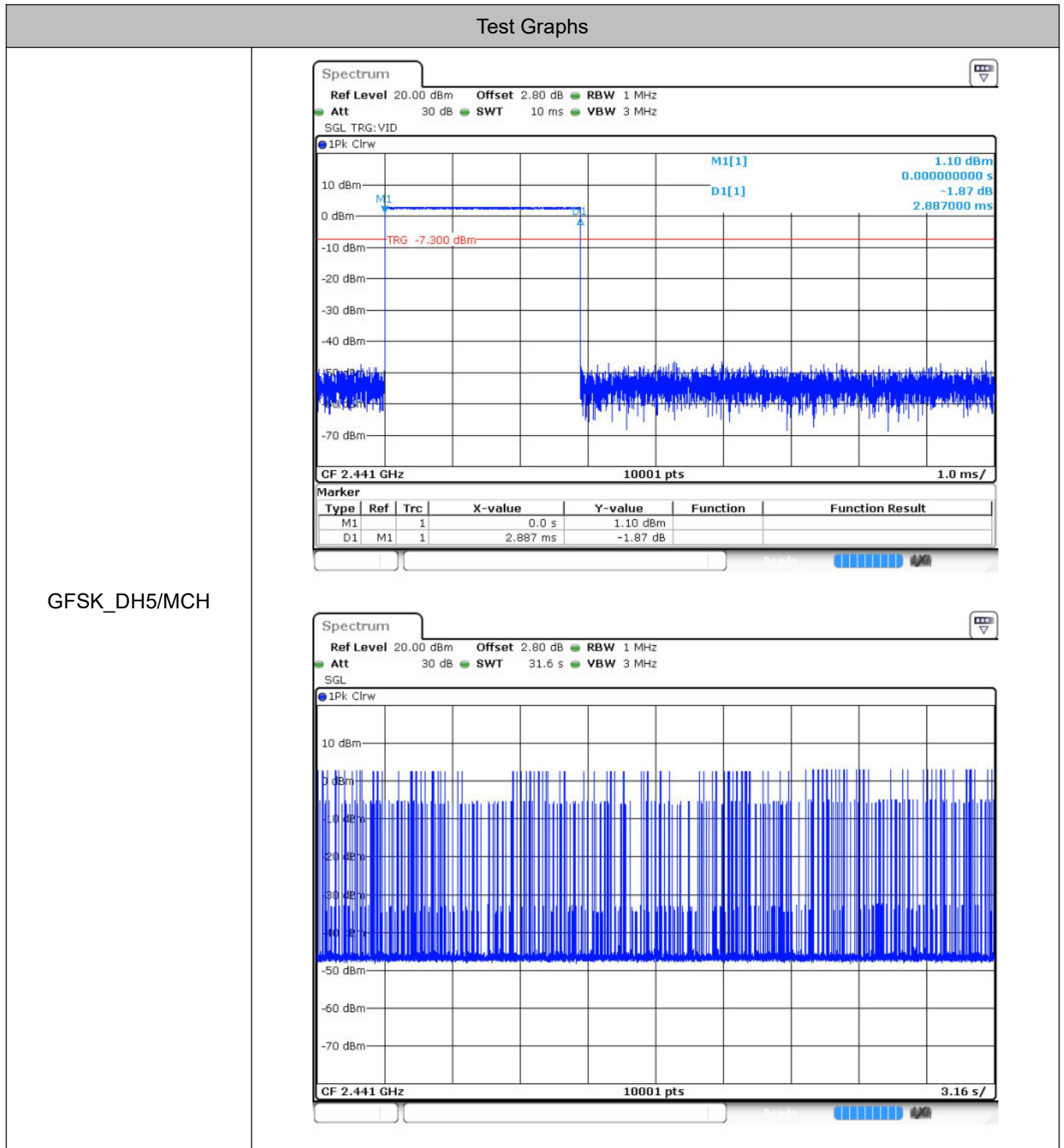


6 Dwell Time

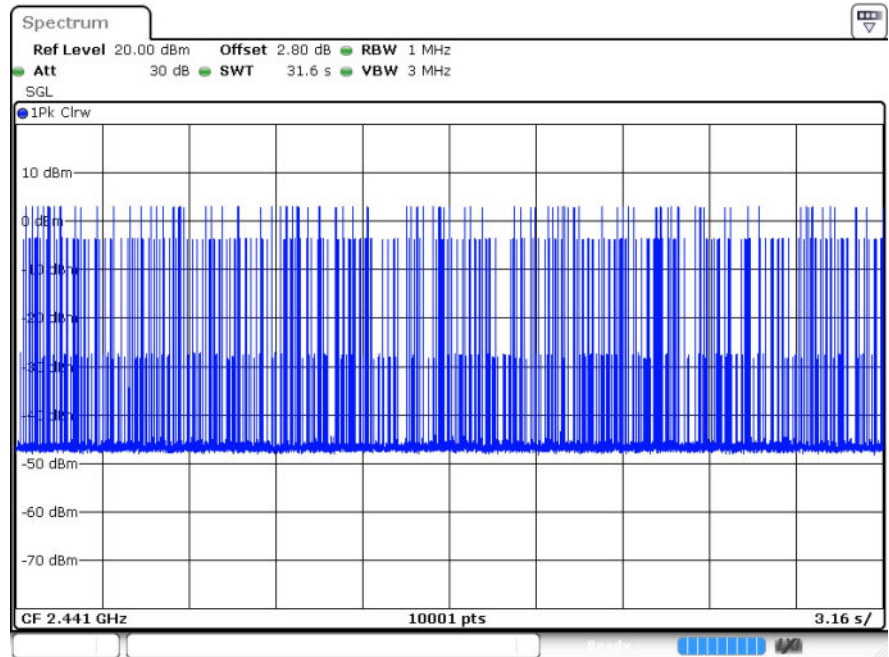
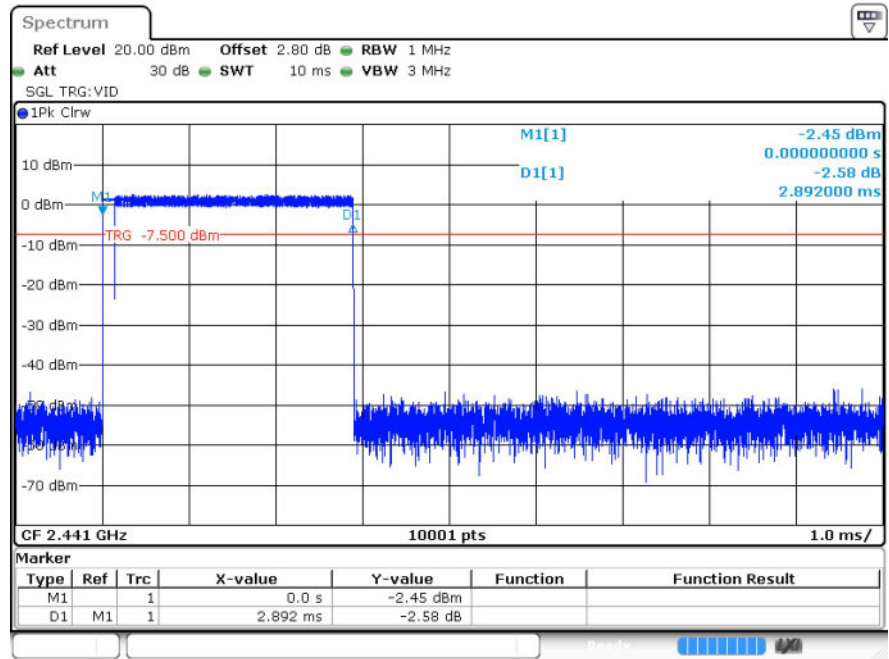
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.887	110	317.57	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.892	103	297.876	0.4	Pass
8DPSK	3DH5	MCH	2.893	108	312.444	0.4	Pass

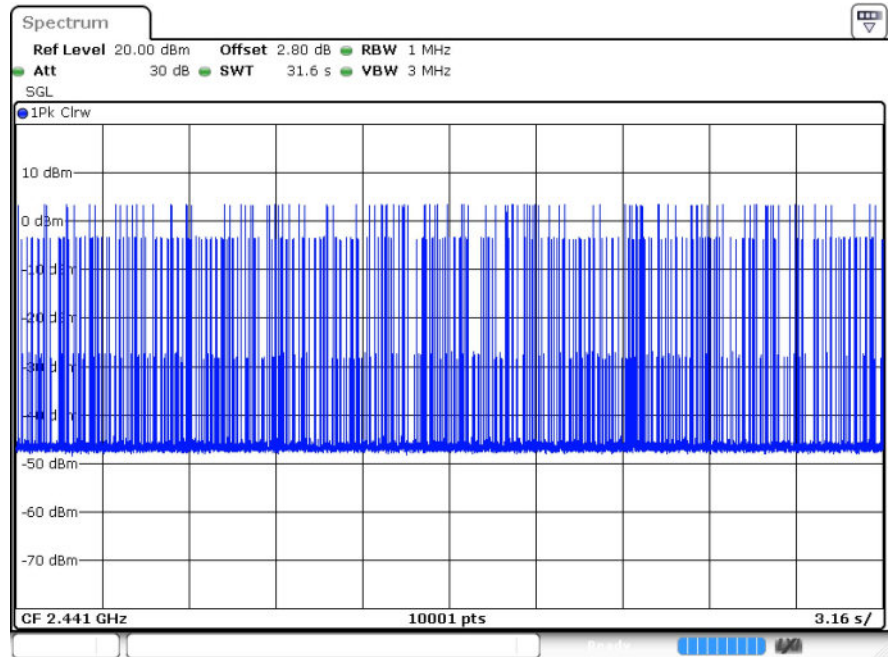
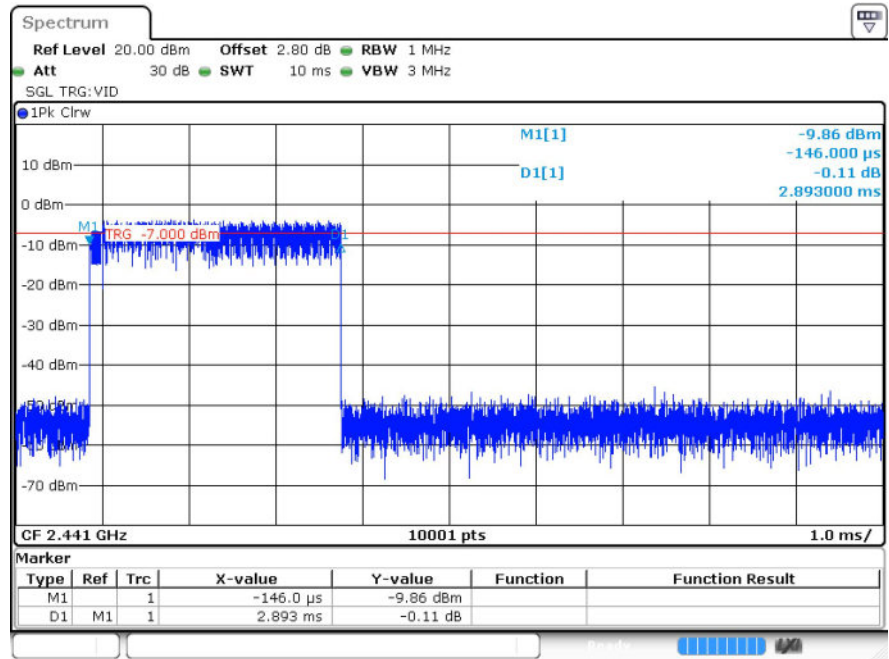
6.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH



7 RF Conducted Spurious Emissions

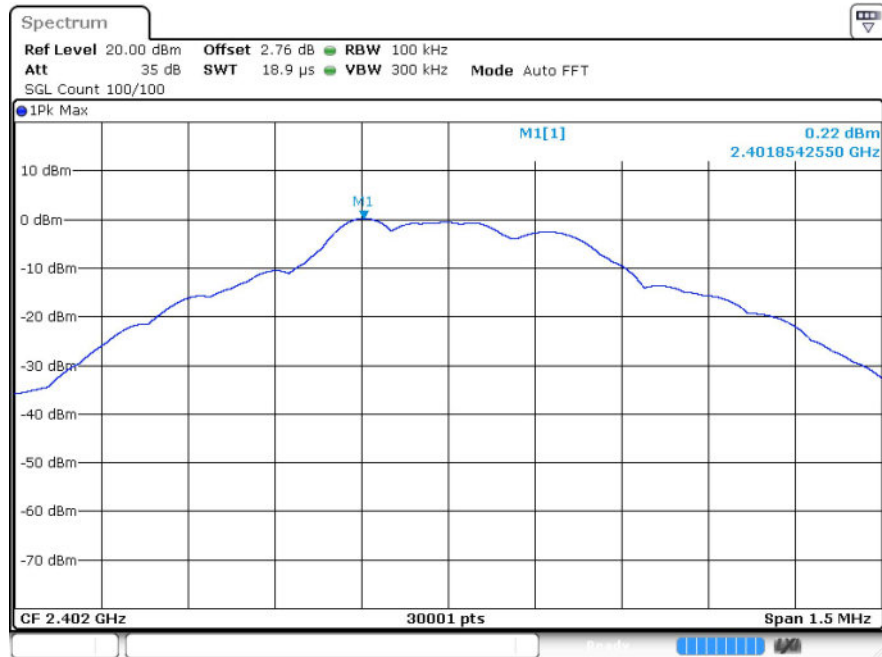
7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-35.67	-20	Pass
	MCH	-36.08	-20	Pass
	HCH	-34.36	-20	Pass
π /4DQPSK	LCH	-34.91	-20	Pass
	MCH	-34.69	-20	Pass
	HCH	-32.25	-20	Pass
8DPSK	LCH	-34.59	-20	Pass
	MCH	-34.01	-20	Pass
	HCH	-33.65	-20	Pass

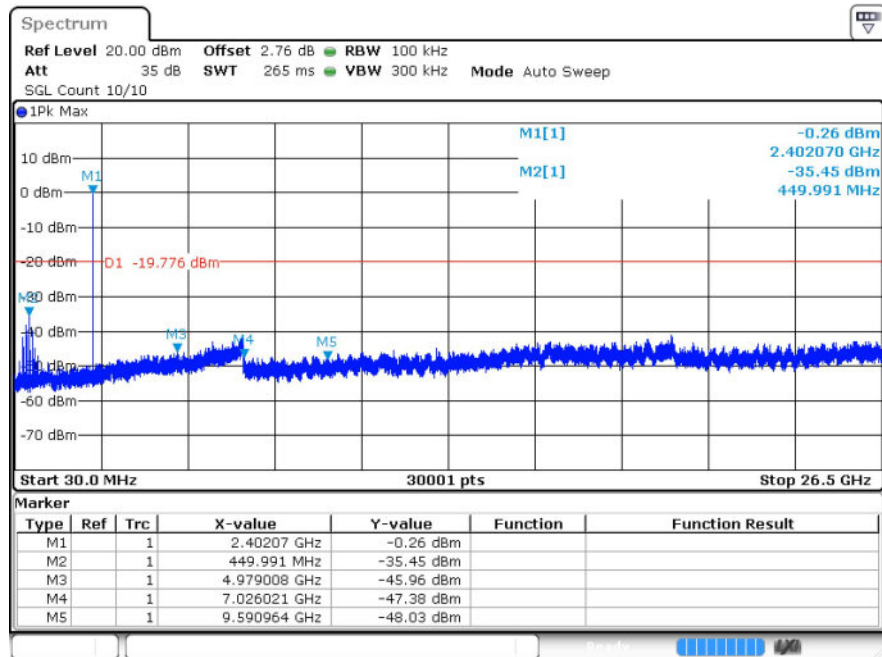
7.2 Test Graphs

GFSK_LCH_Graphs

Pref



Puw

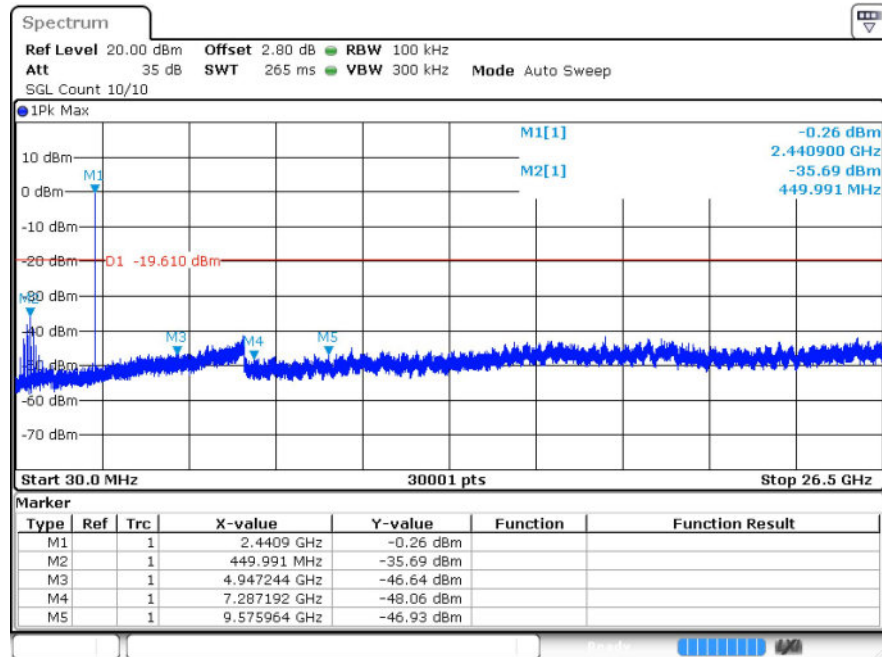


GFSK_MCH_Graphs

Pref

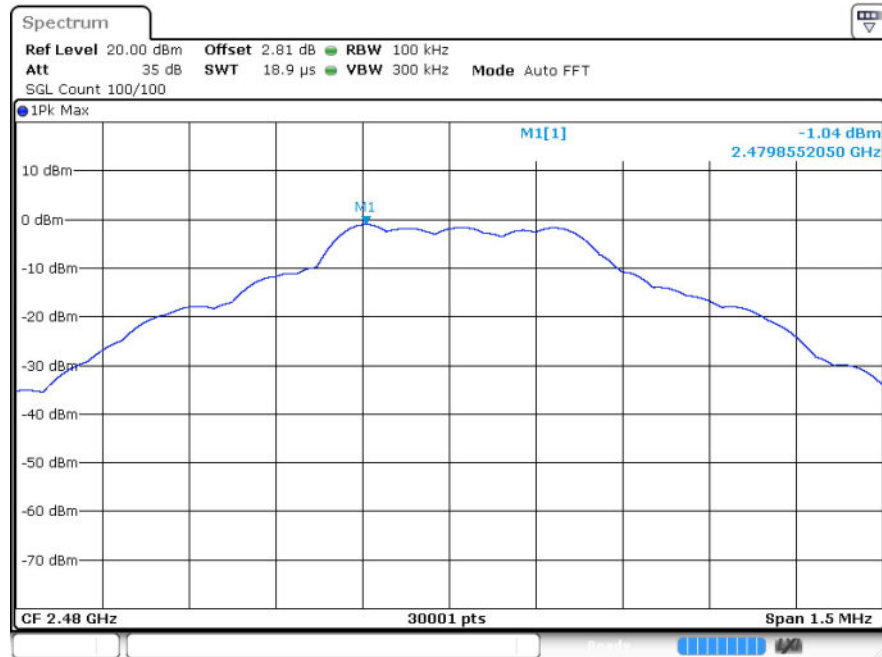


Puw

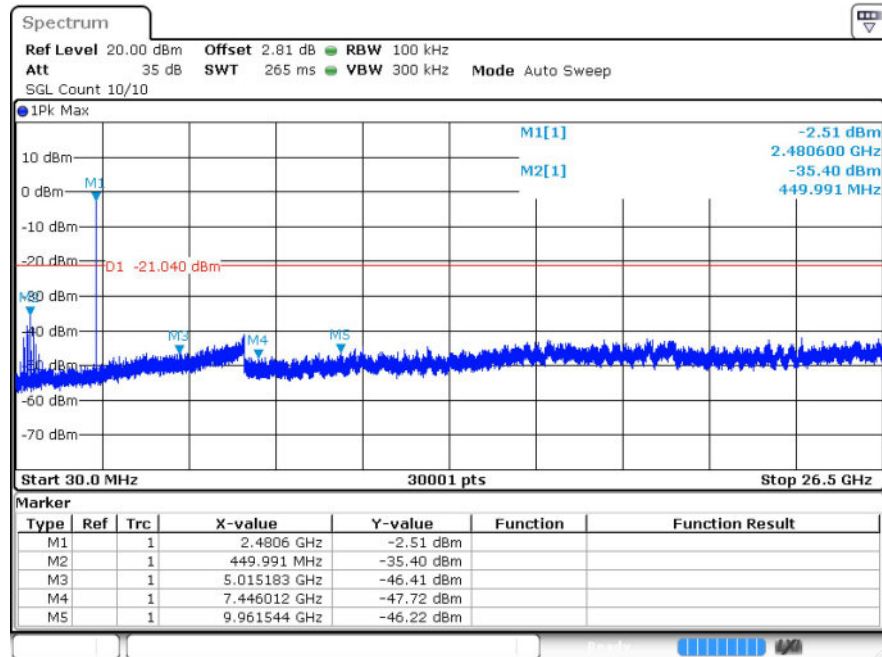


GFSK_HCH_Graphs

Pref

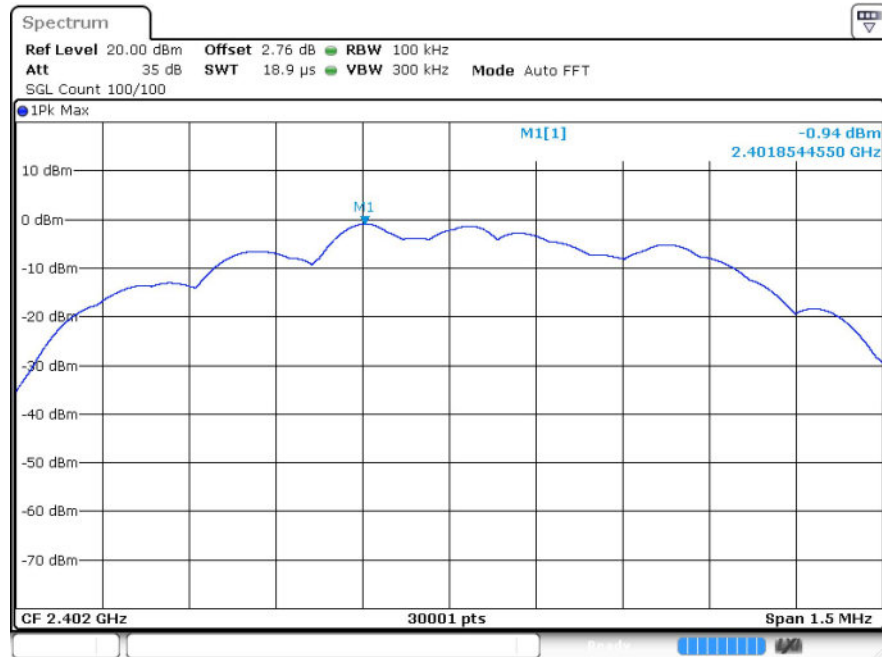


Puw

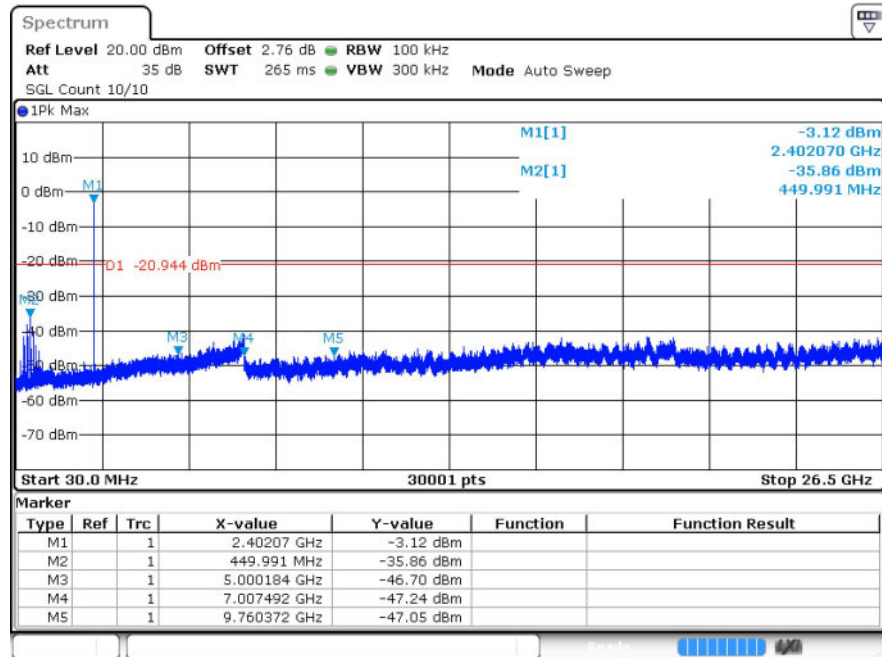


$\pi/4$ DQPSK_LCH_Graphs

Pref

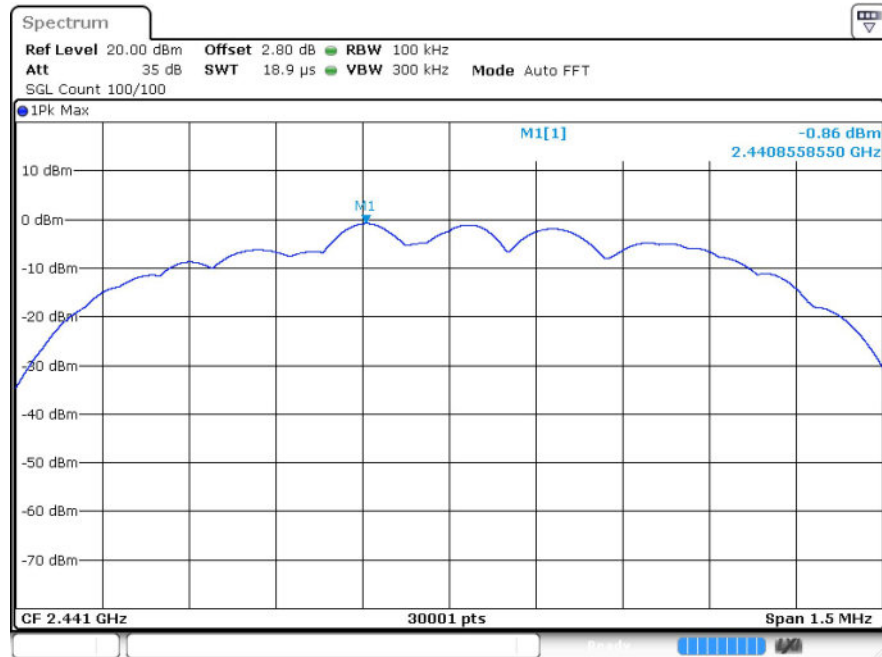


Puw

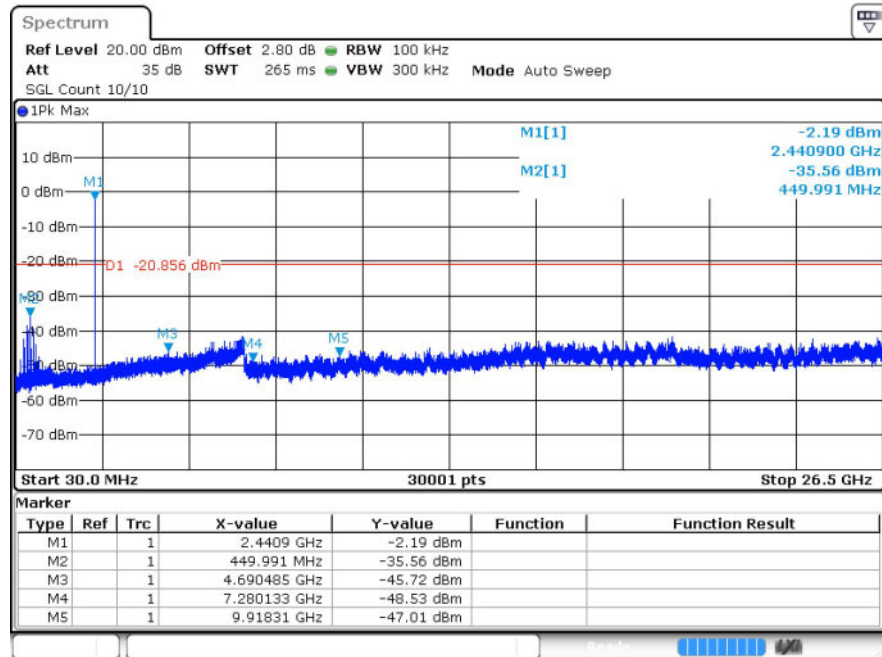


π /4DQPSK_MCH_Graphs

Pref

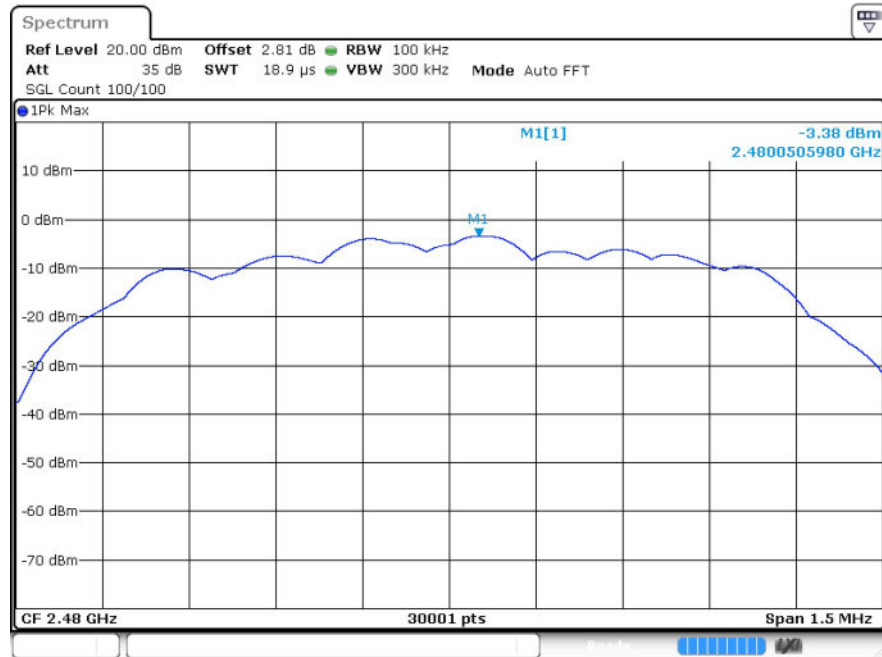


Puw

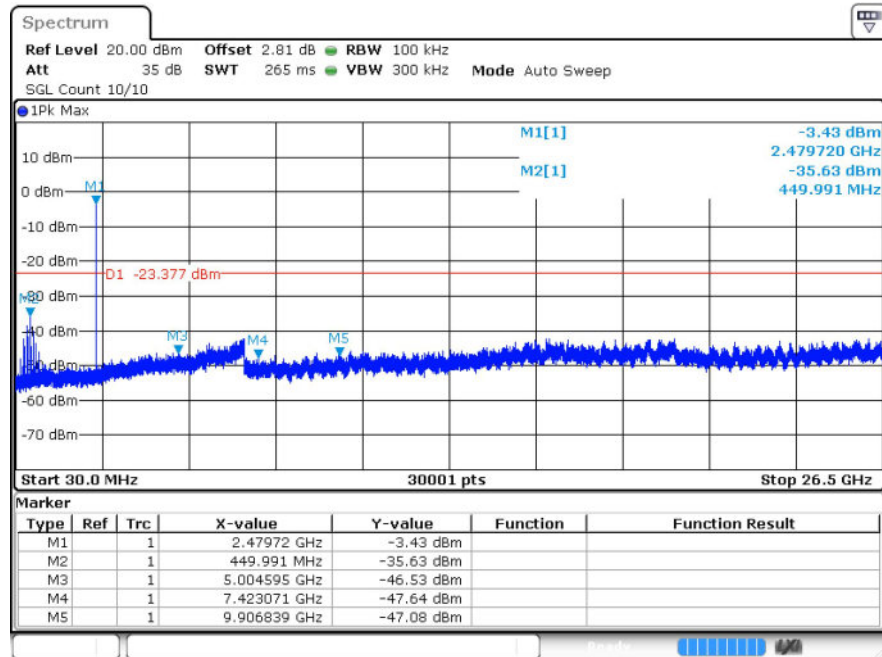


π /4DQPSK_HCH_Graphs

Pref

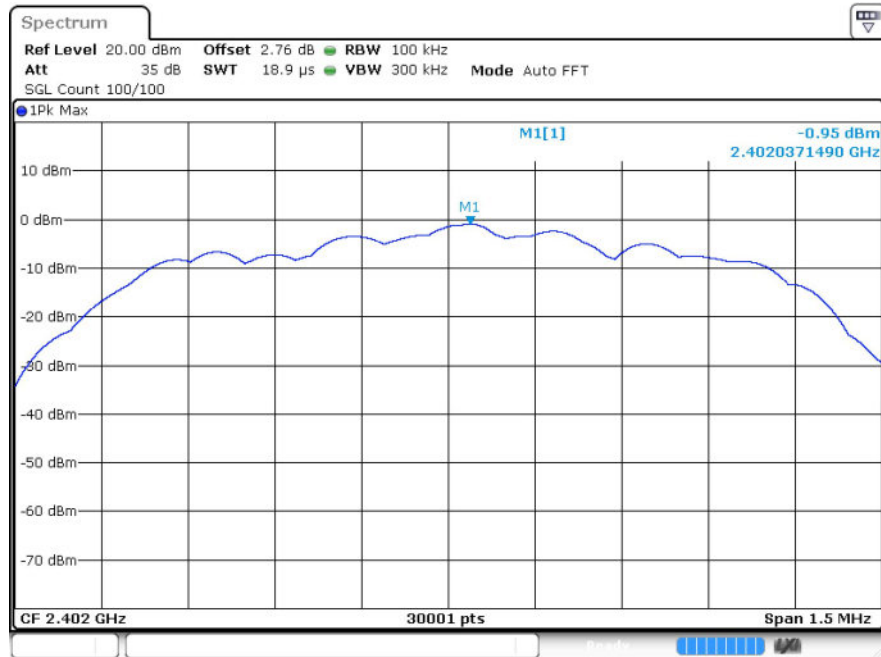


Puw

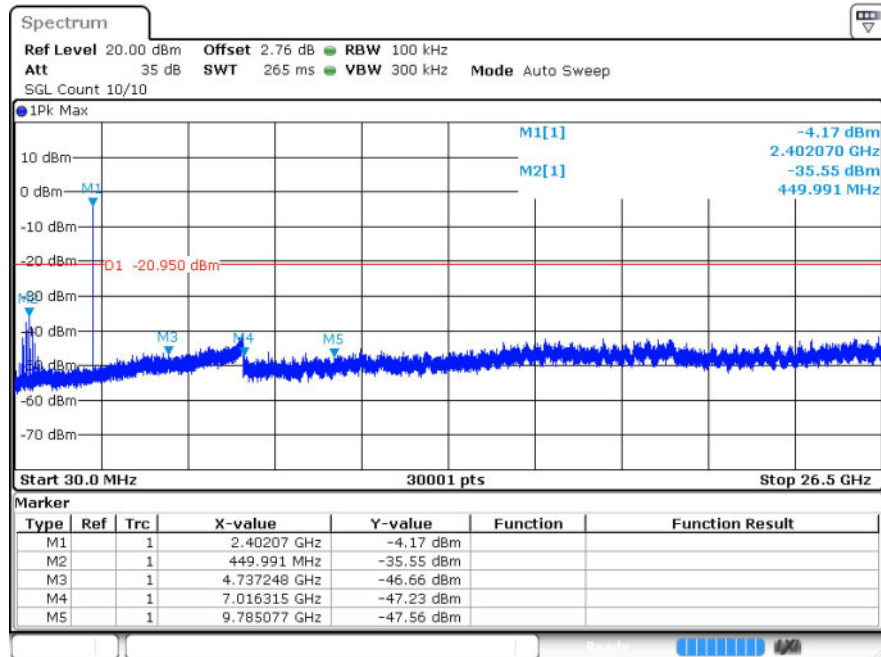


8DPSK_LCH_Graphs

Pref

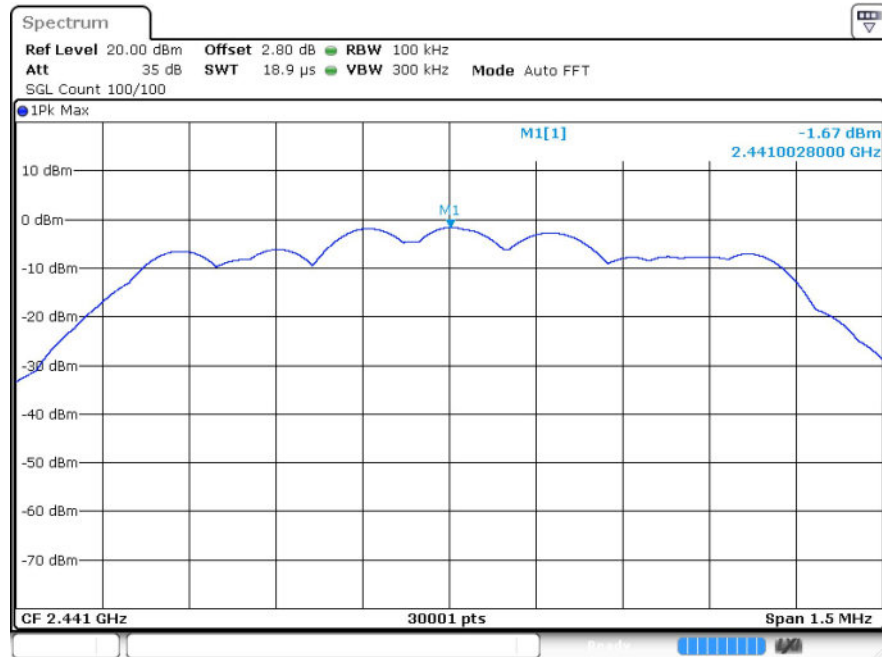


Puw

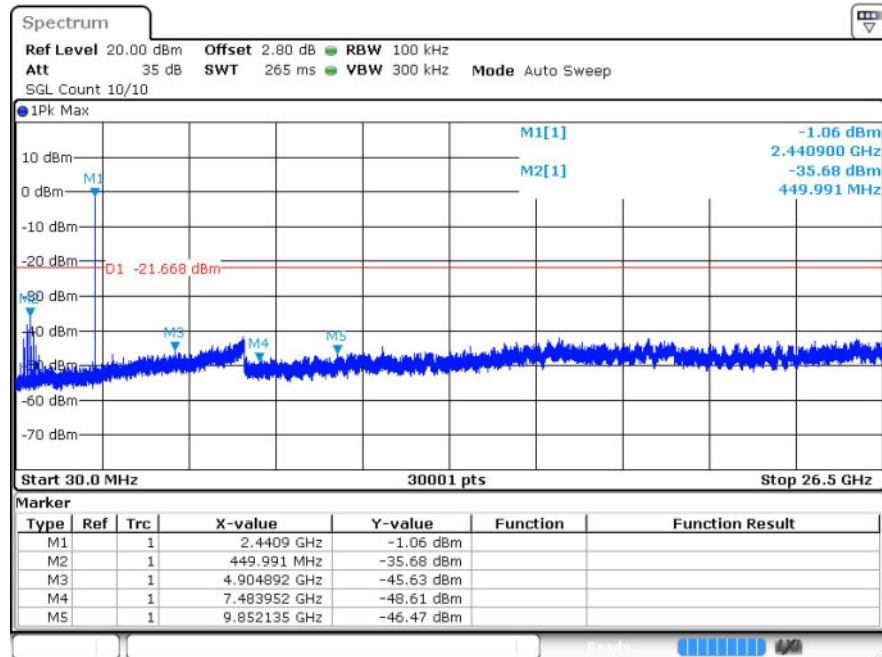


8DPSK_MCH_Graphs

Pref

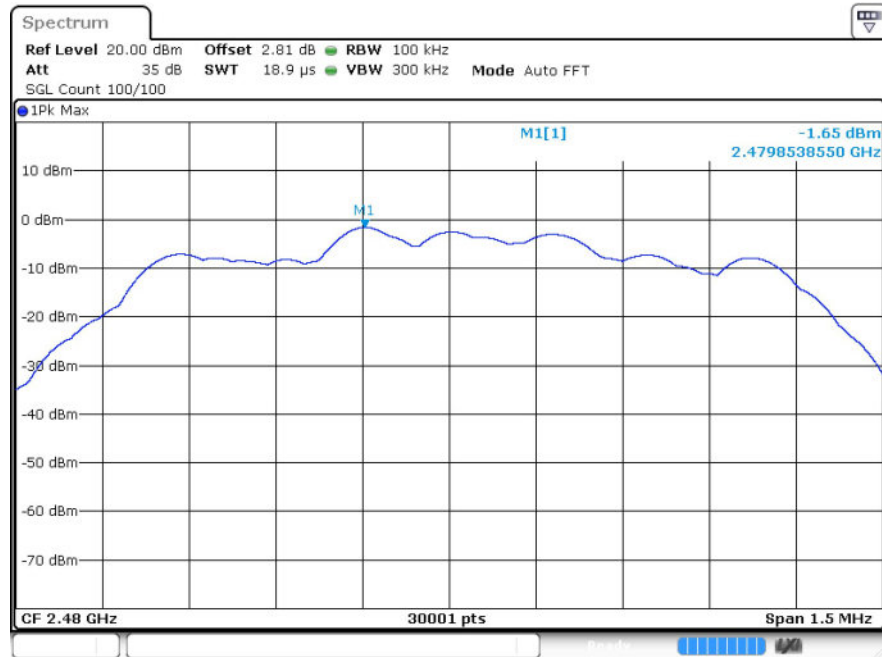


Puw

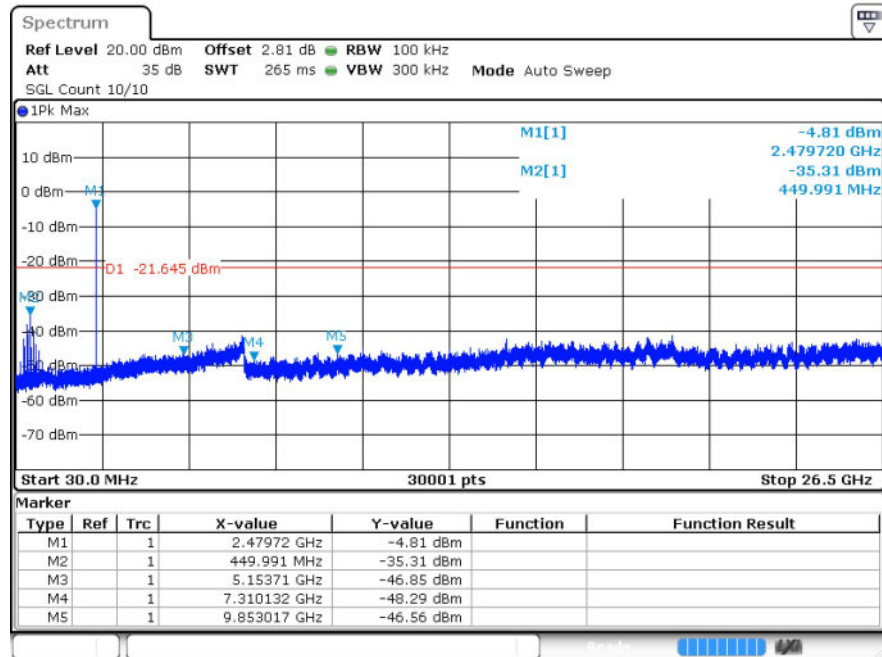


8DPSK_HCH_Graphs

Pref



Puw

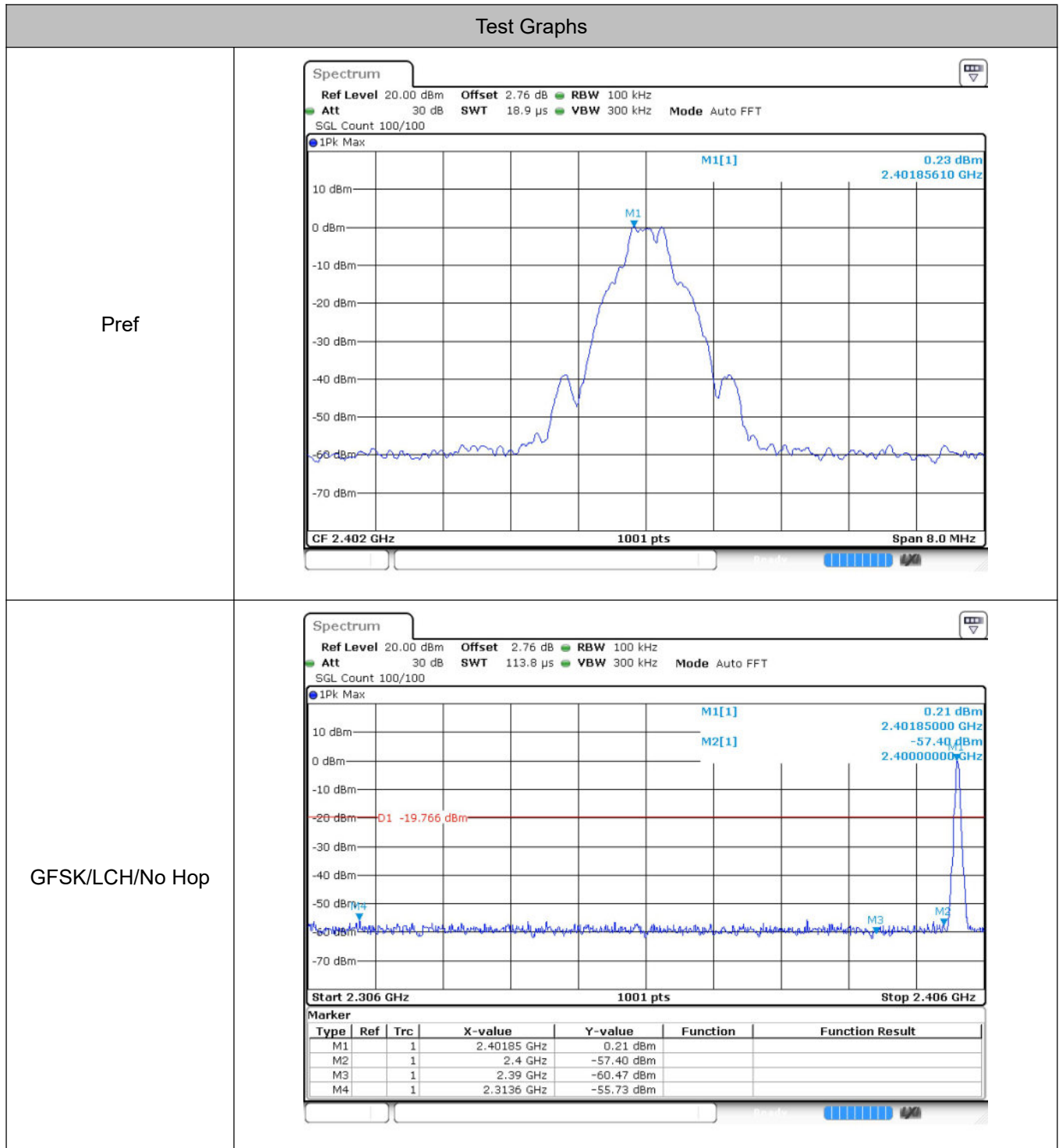


8 Band-edge for RF Conducted Emissions

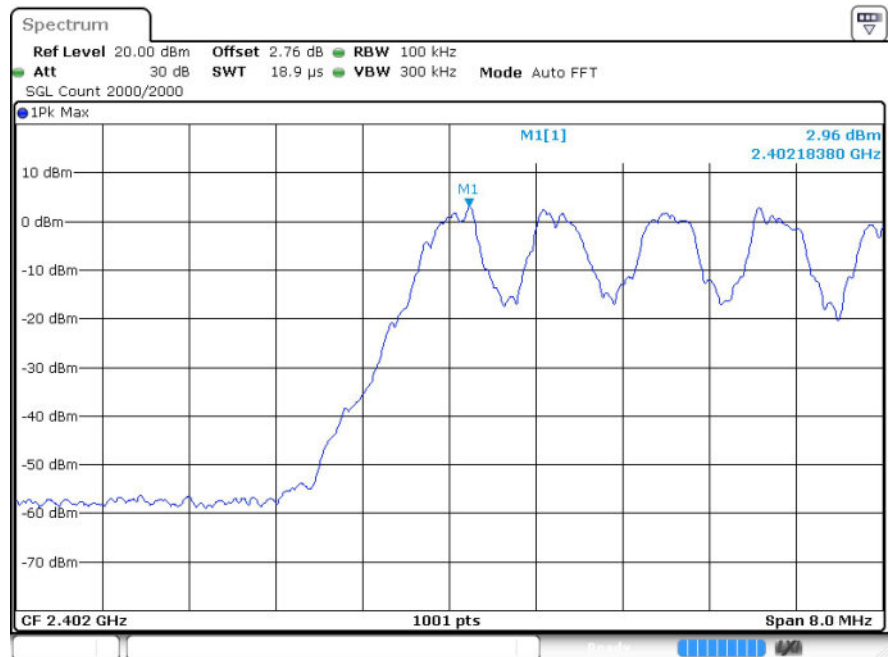
8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-55.95	-20	Pass
			On	-57.8	-20	Pass
	HCH	2480	Off	-54.94	-20	Pass
			On	-55.79	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-54.55	-20	Pass
			On	-56.51	-20	Pass
	HCH	2480	Off	-54.56	-20	Pass
			On	-55.17	-20	Pass
8DPSK	LCH	2402	Off	-55.05	-20	Pass
			On	-55.88	-20	Pass
	HCH	2480	Off	-54.95	-20	Pass
			On	-55.34	-20	Pass

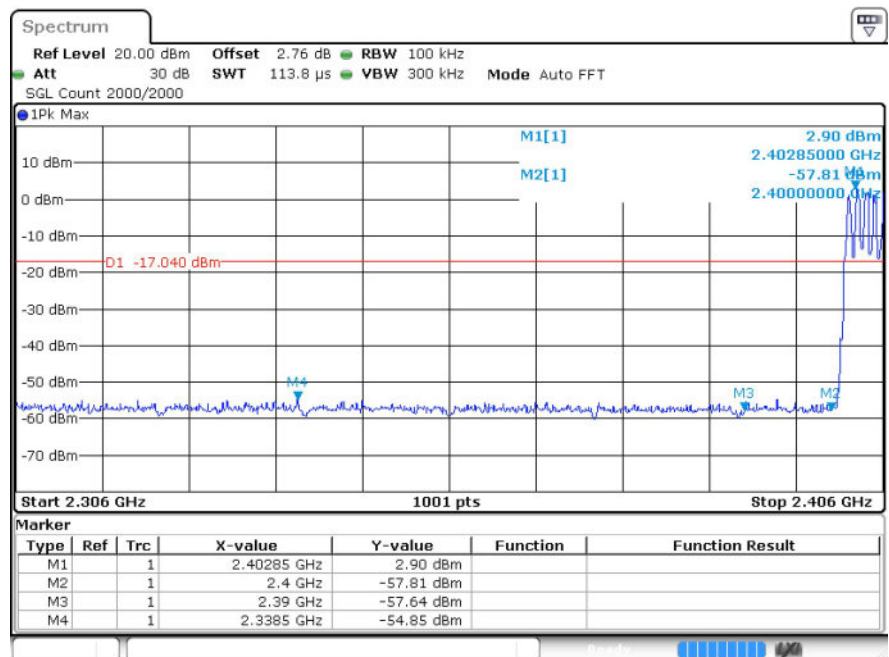
8.2 Test Graphs

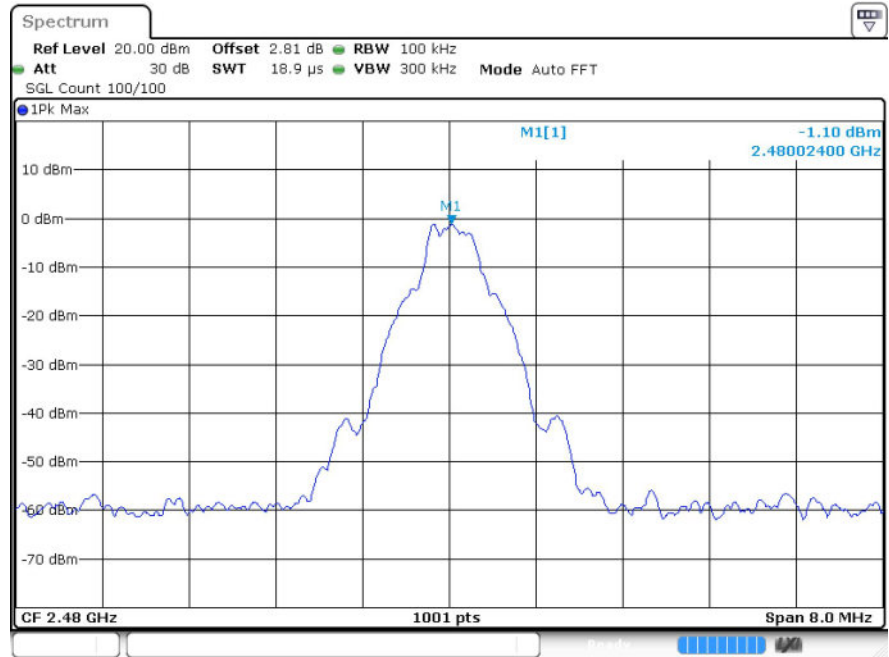


Ref

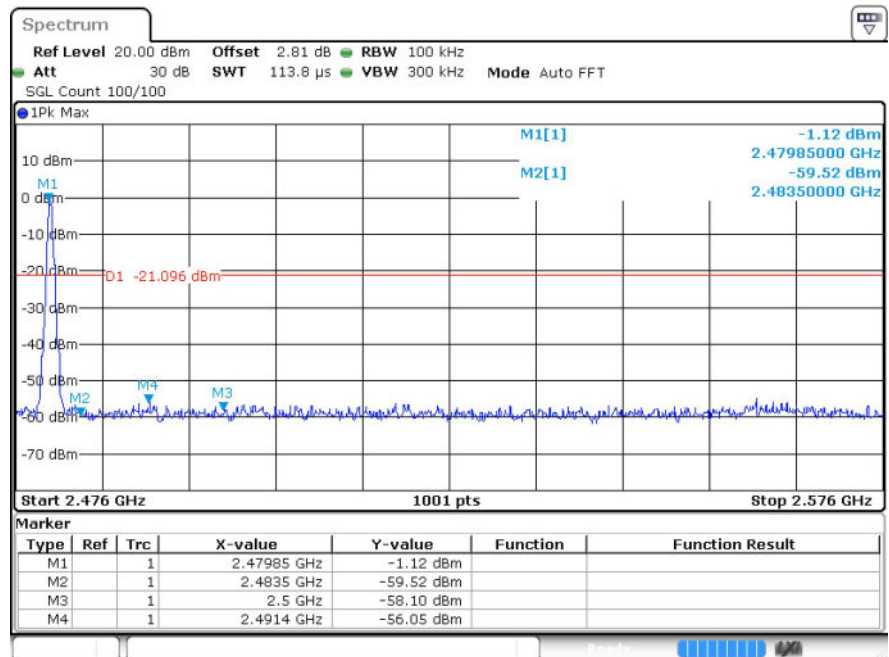


GFSK/LCH/Hop

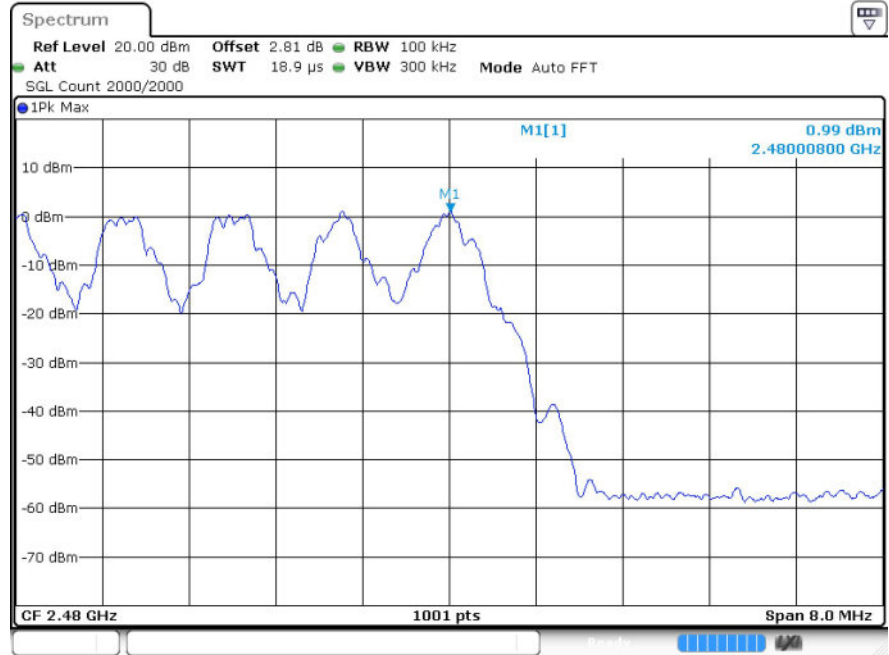




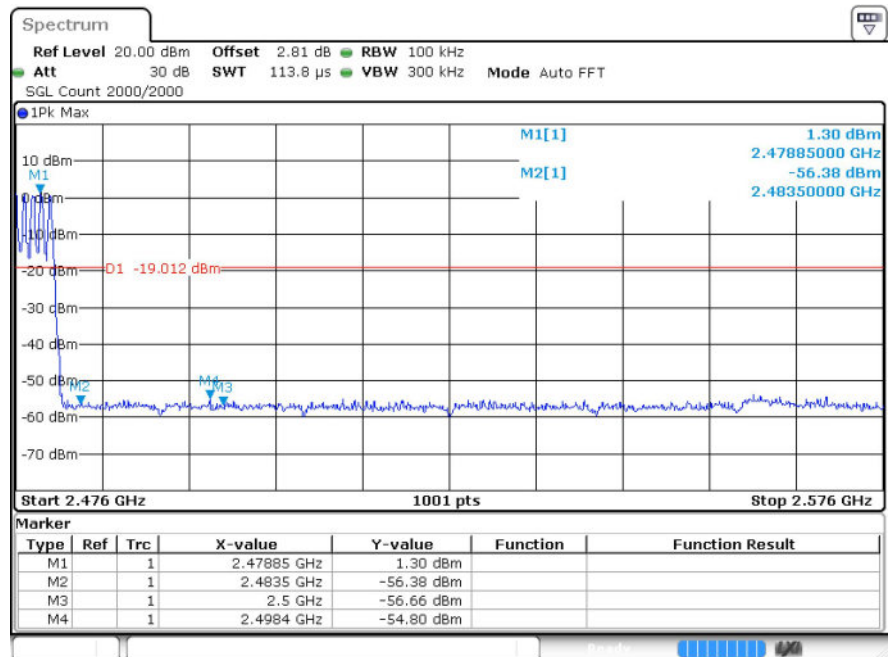
GFSK/HCH/No Hop



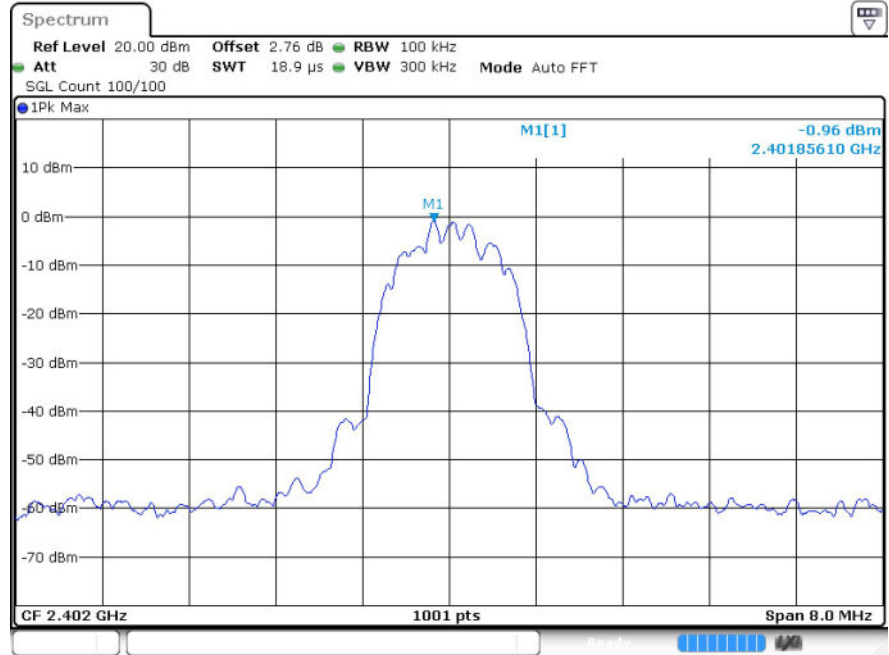
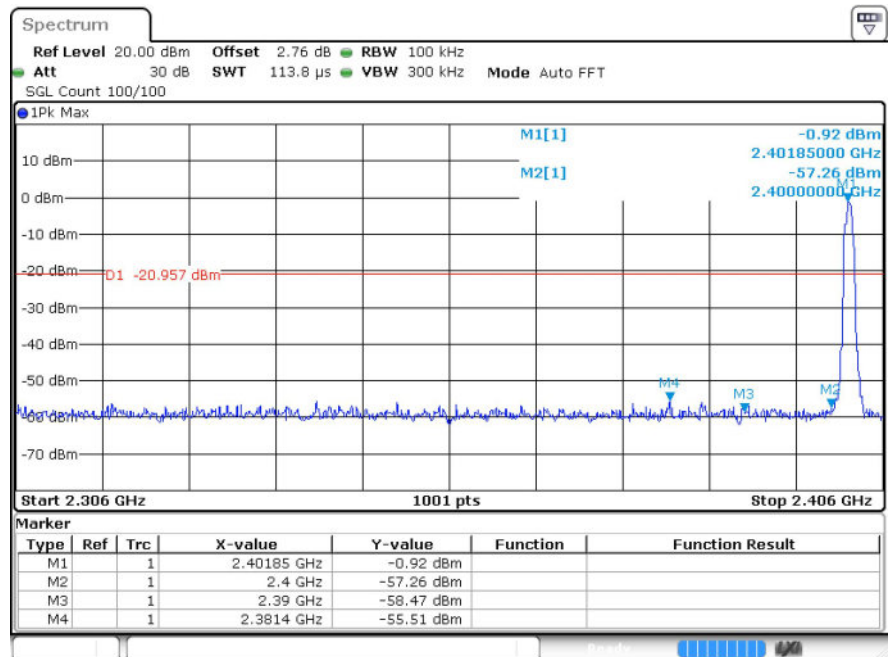
Ref.



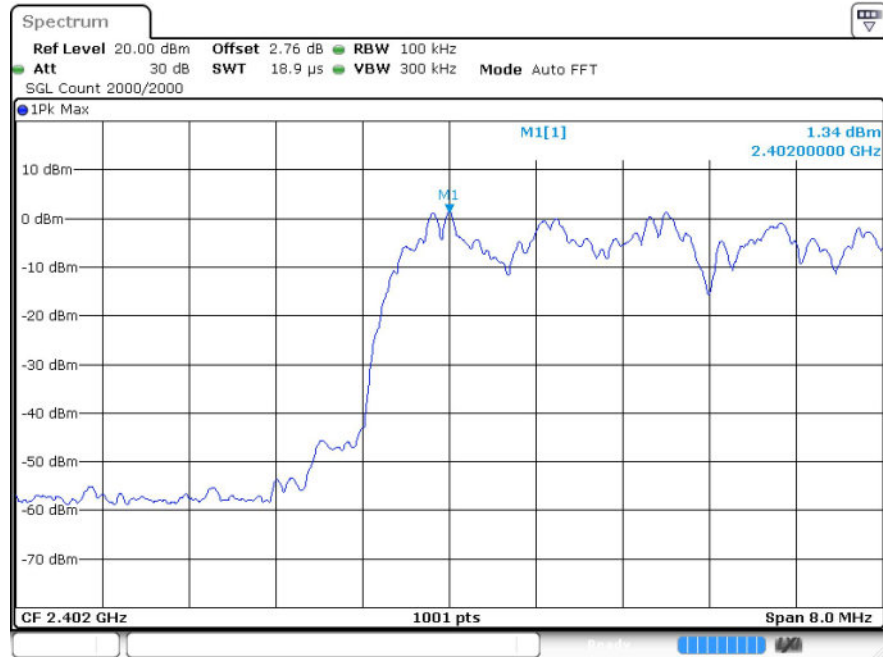
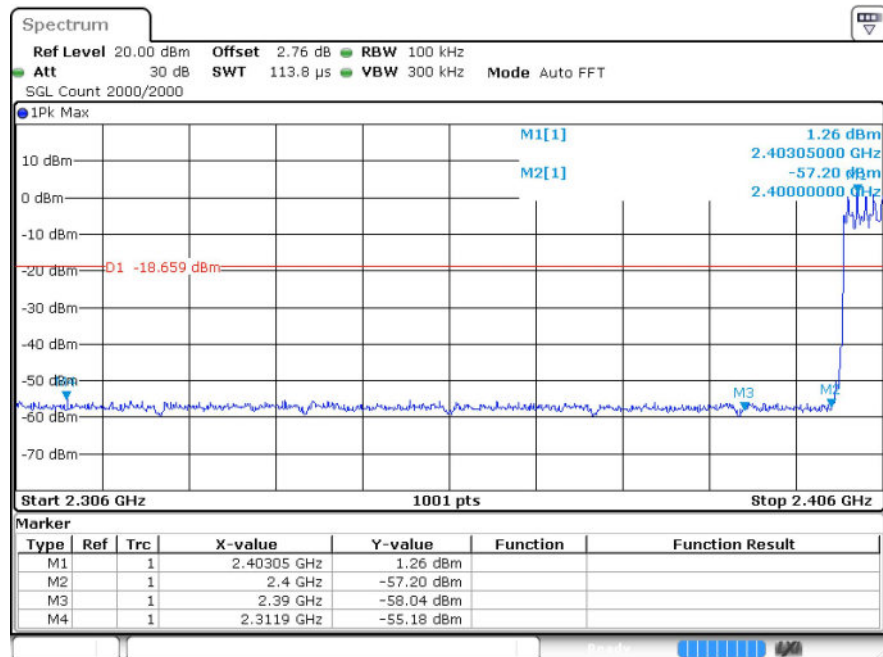
GFSK/HCH/Hop



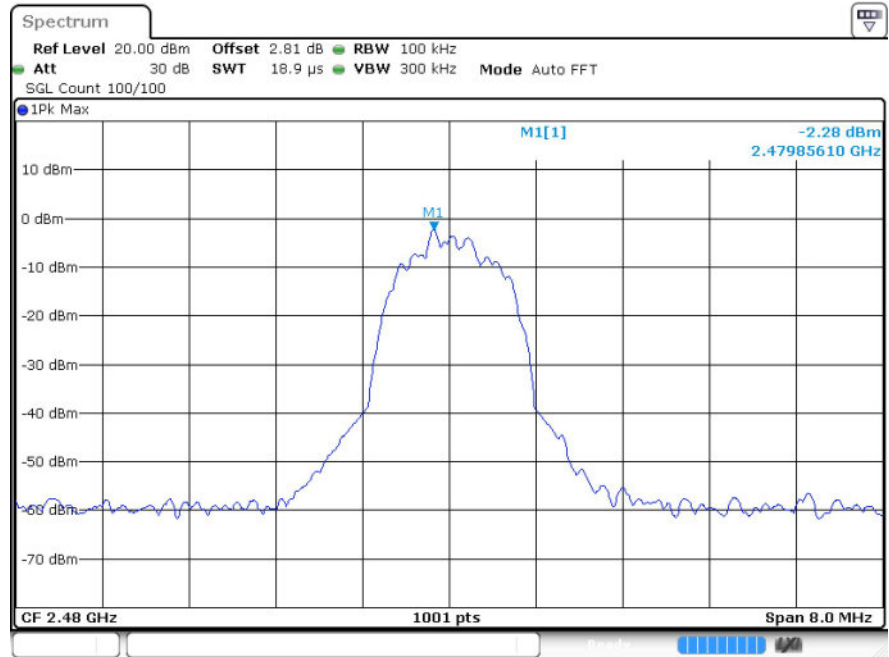
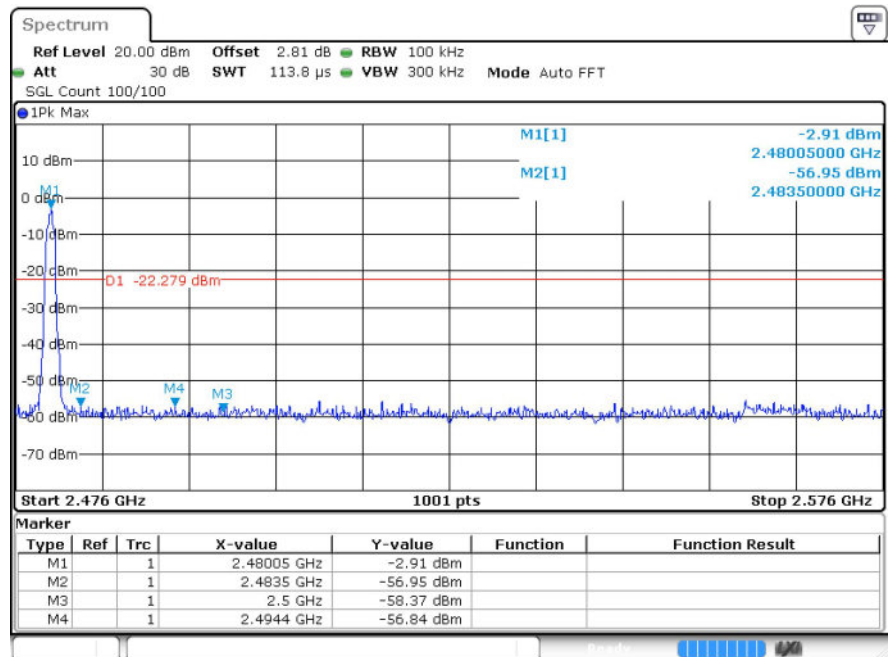
Ref


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


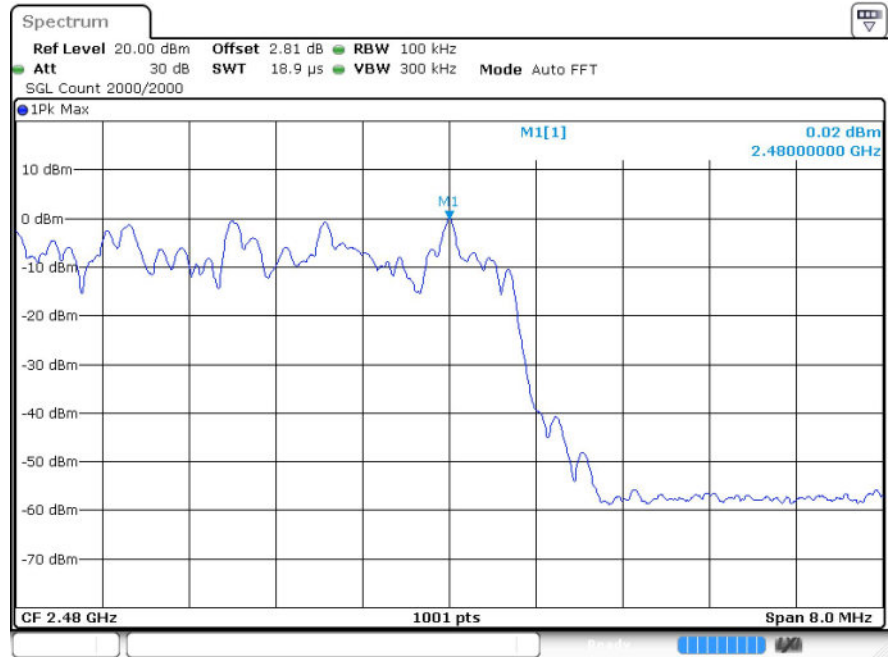
Ref


 $\pi/4$ DQPSK/LCH/Hop


Ref


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


Ref


 $\pi/4$ DQPSK/HCH/Hop
