



Appendix A

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

Product Name: Smart Audio Glasses

Trade Mark: LEMUNA

Test Model: LEMUNA

Environmental Conditions

Temperature:	24.6℃
Relative Humidity:	52.3%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

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1 Duty Cycle

1.1 Test Result

Left:

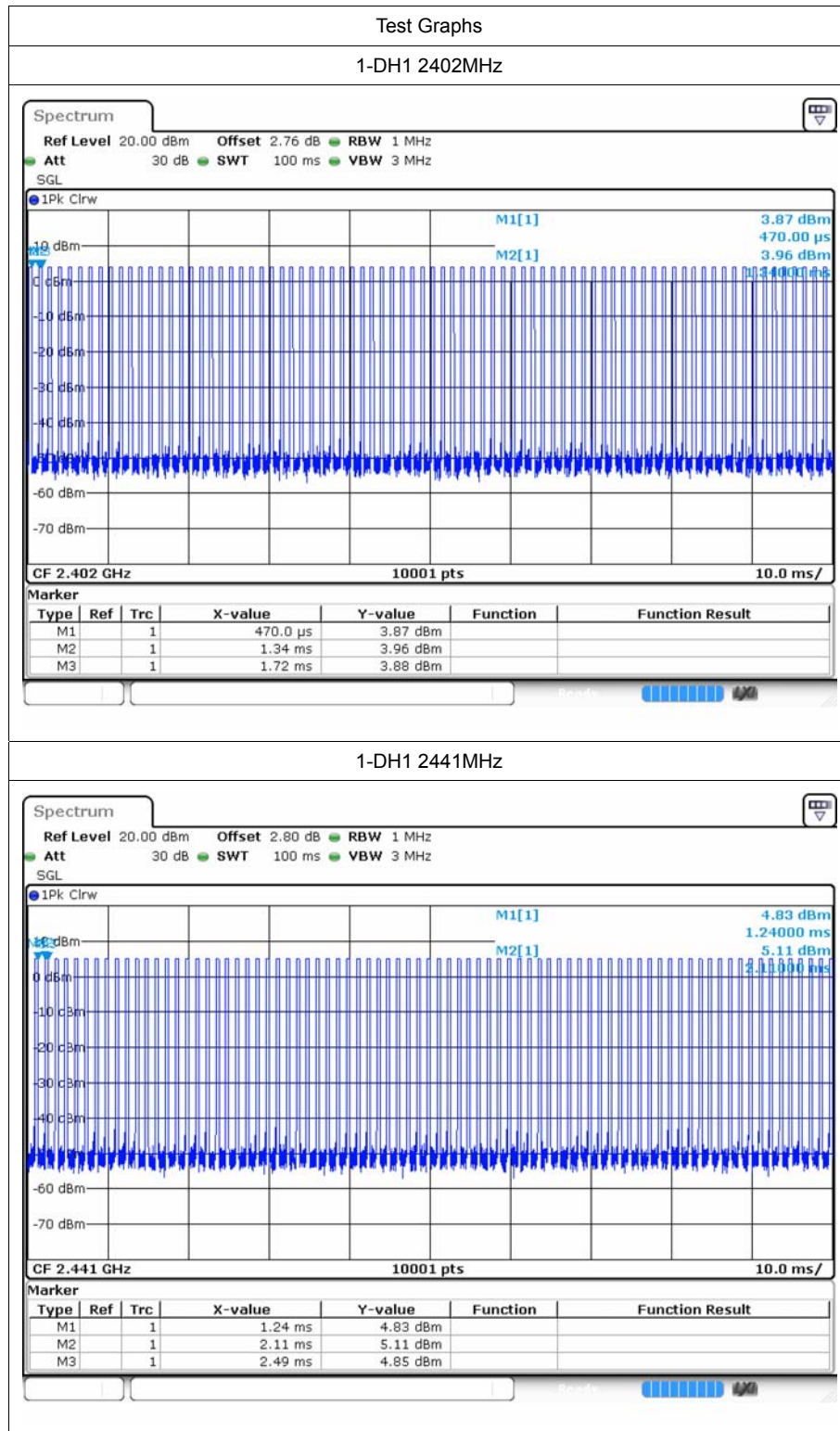
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.88	2.63
1-DH1	2441	31.2	2.63
1-DH1	2480	31.21	2.63
2-DH1	2402	32.09	2.56
2-DH1	2441	32	2.56
2-DH1	2480	32	2.56
3-DH1	2402	32.01	2.56
3-DH1	2441	32.01	2.56
3-DH1	2480	32	2.56

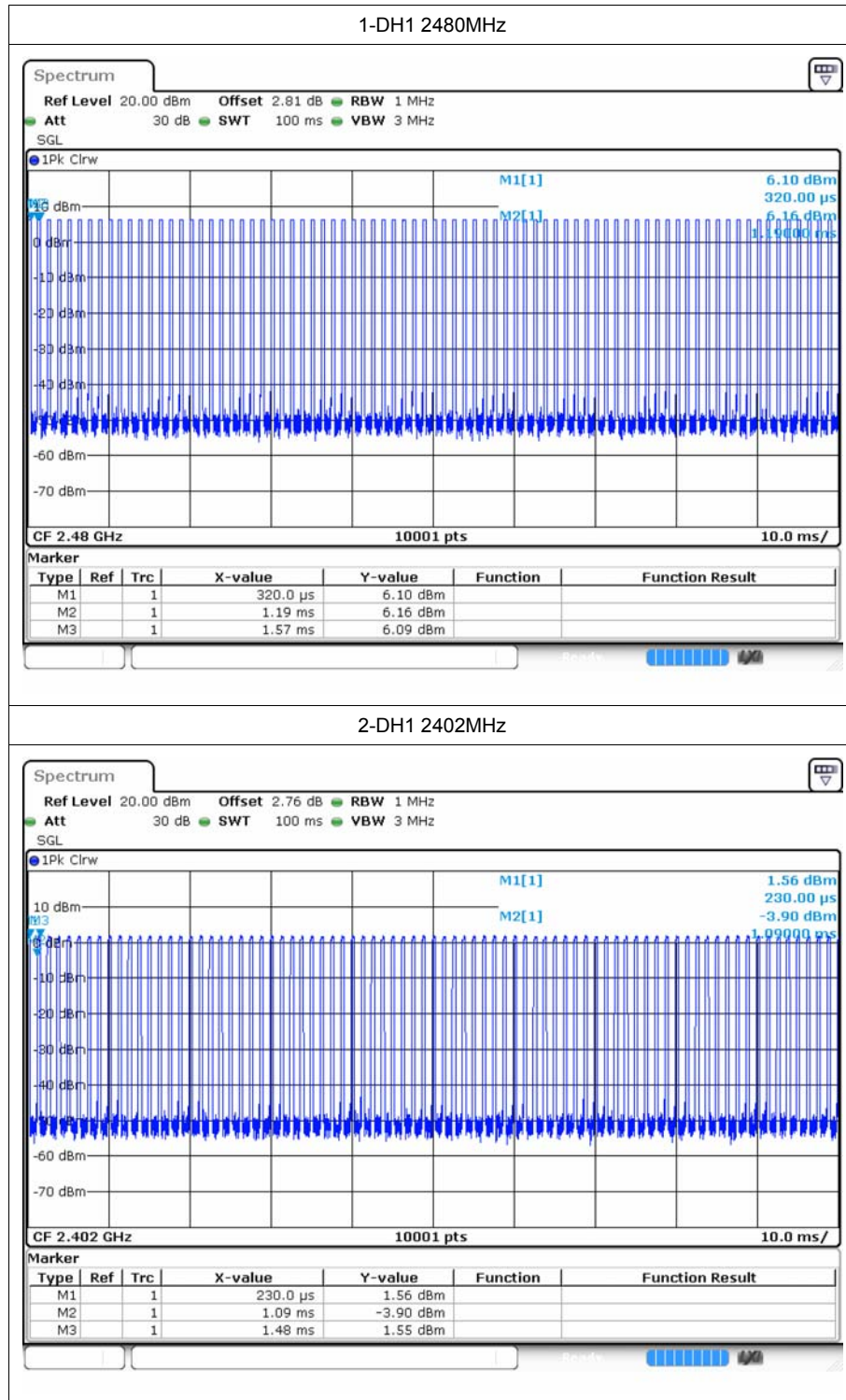
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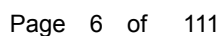
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.21	2.63
1-DH1	2441	31.42	2.63
1-DH1	2480	31.2	2.63
2-DH1	2402	32.01	2.56
2-DH1	2441	32.01	2.56
2-DH1	2480	32	2.56
3-DH1	2402	32.01	2.56
3-DH1	2441	32	2.56
3-DH1	2480	32	2.56

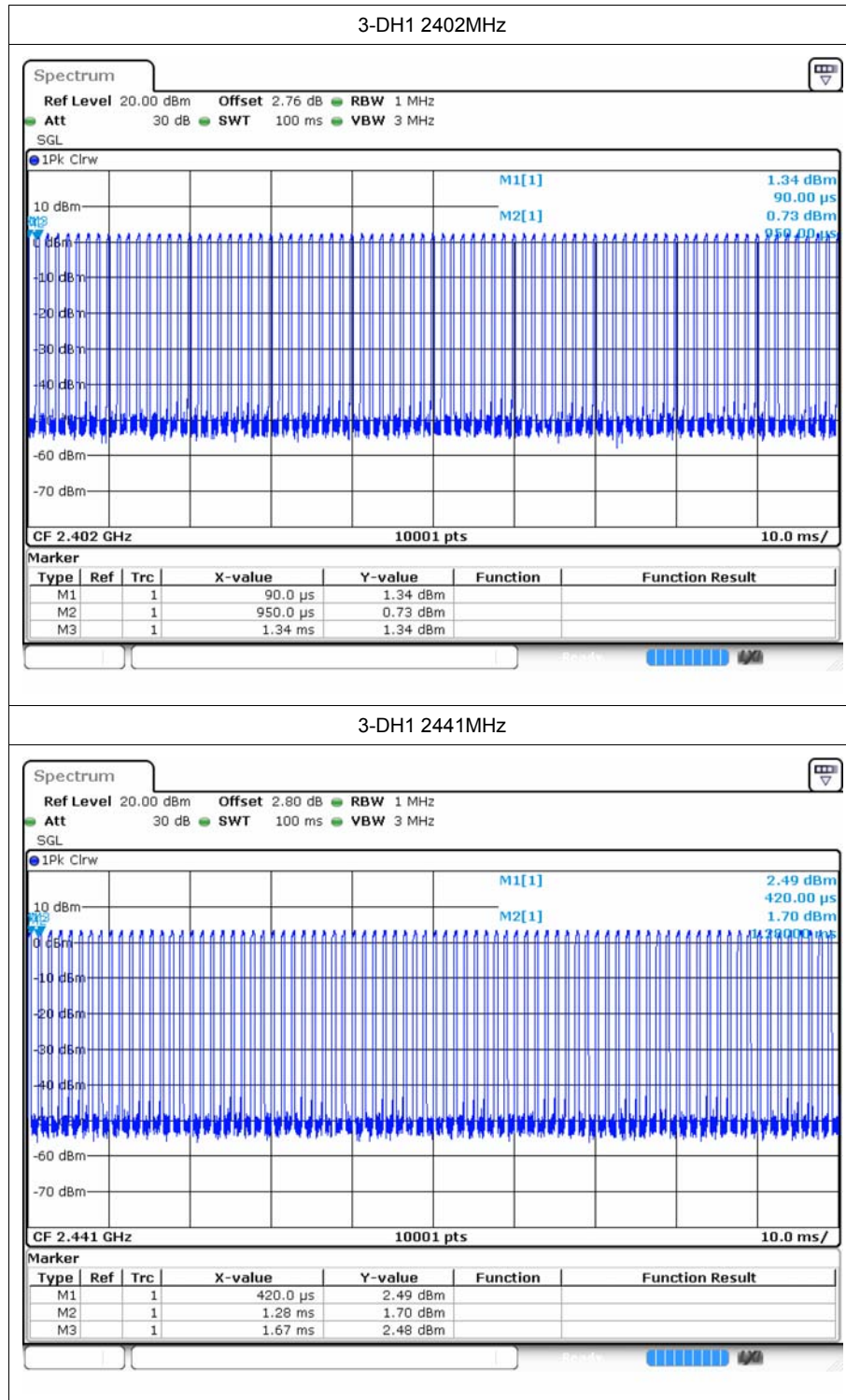
1.2 Test Graphs

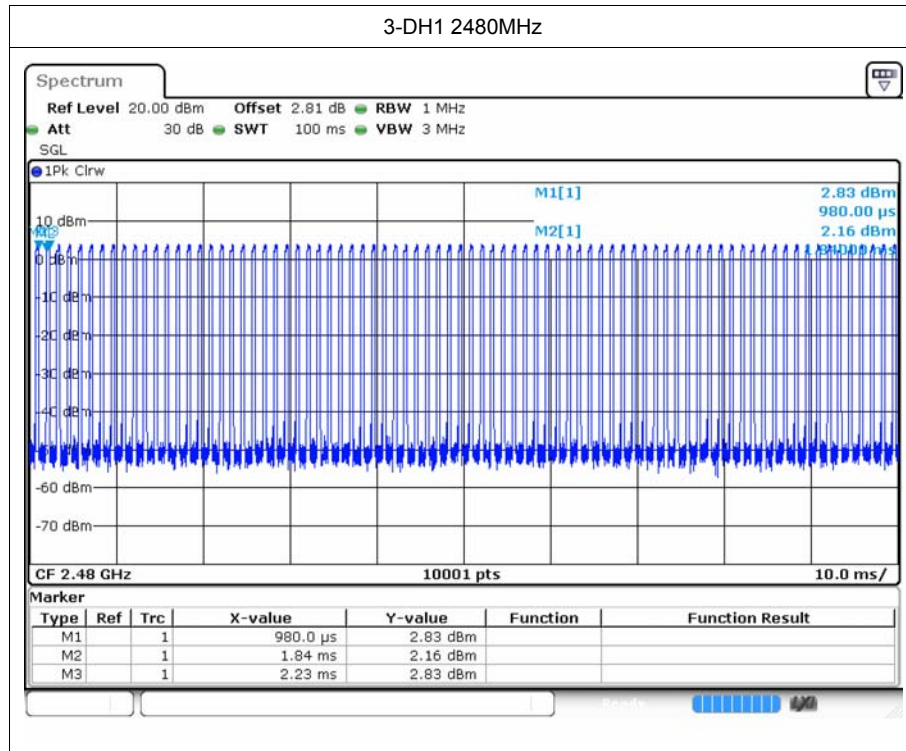
Left:



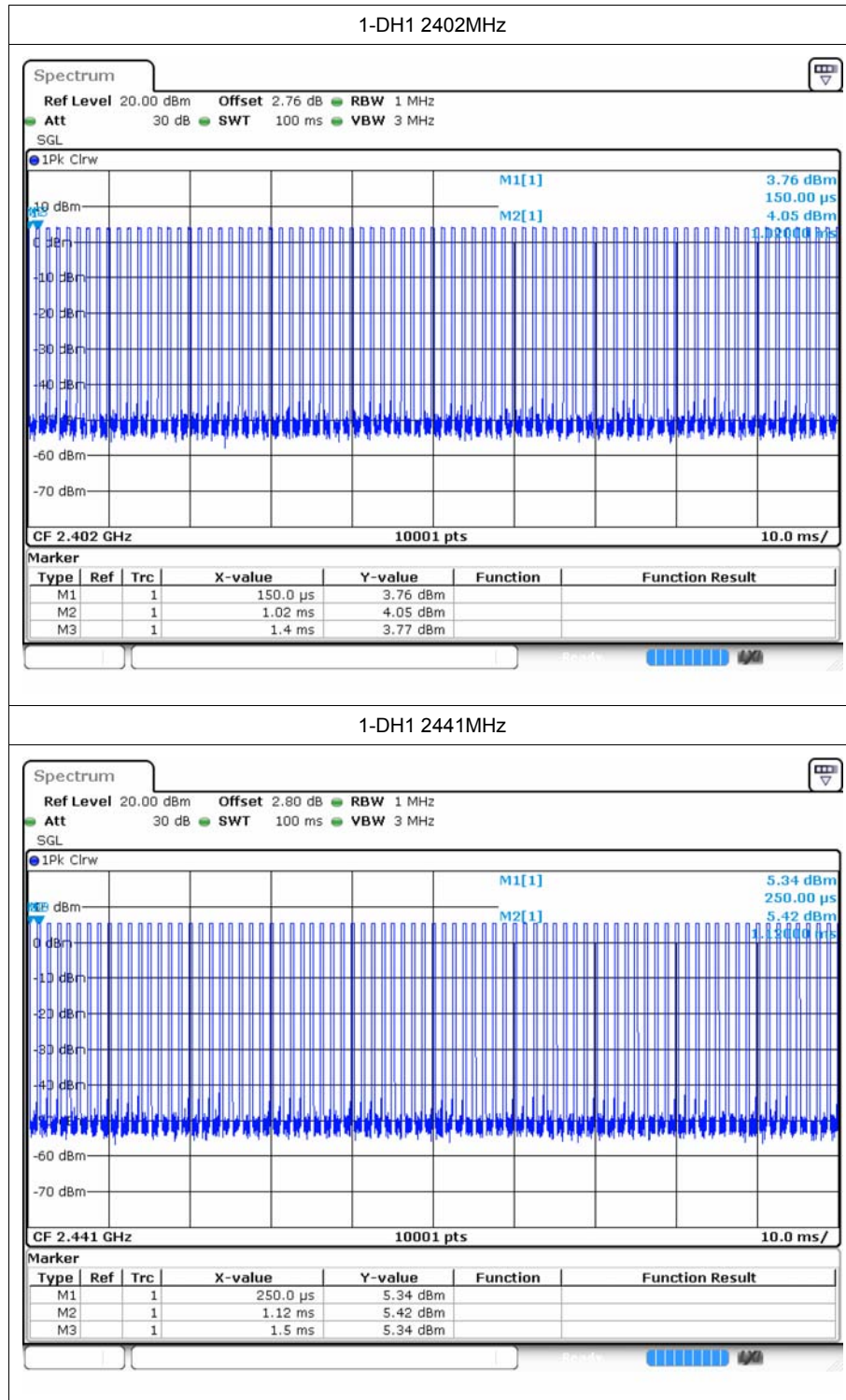


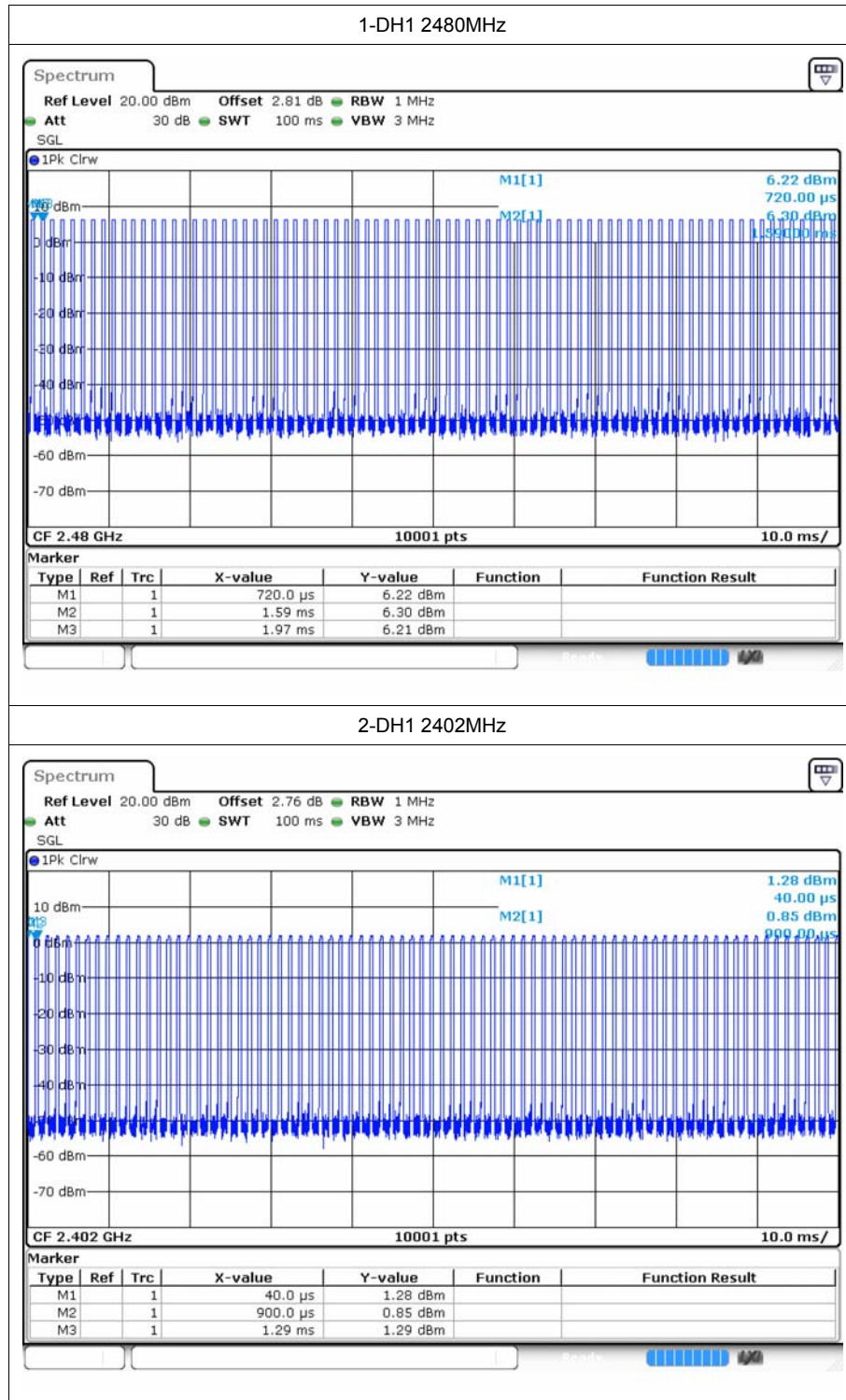


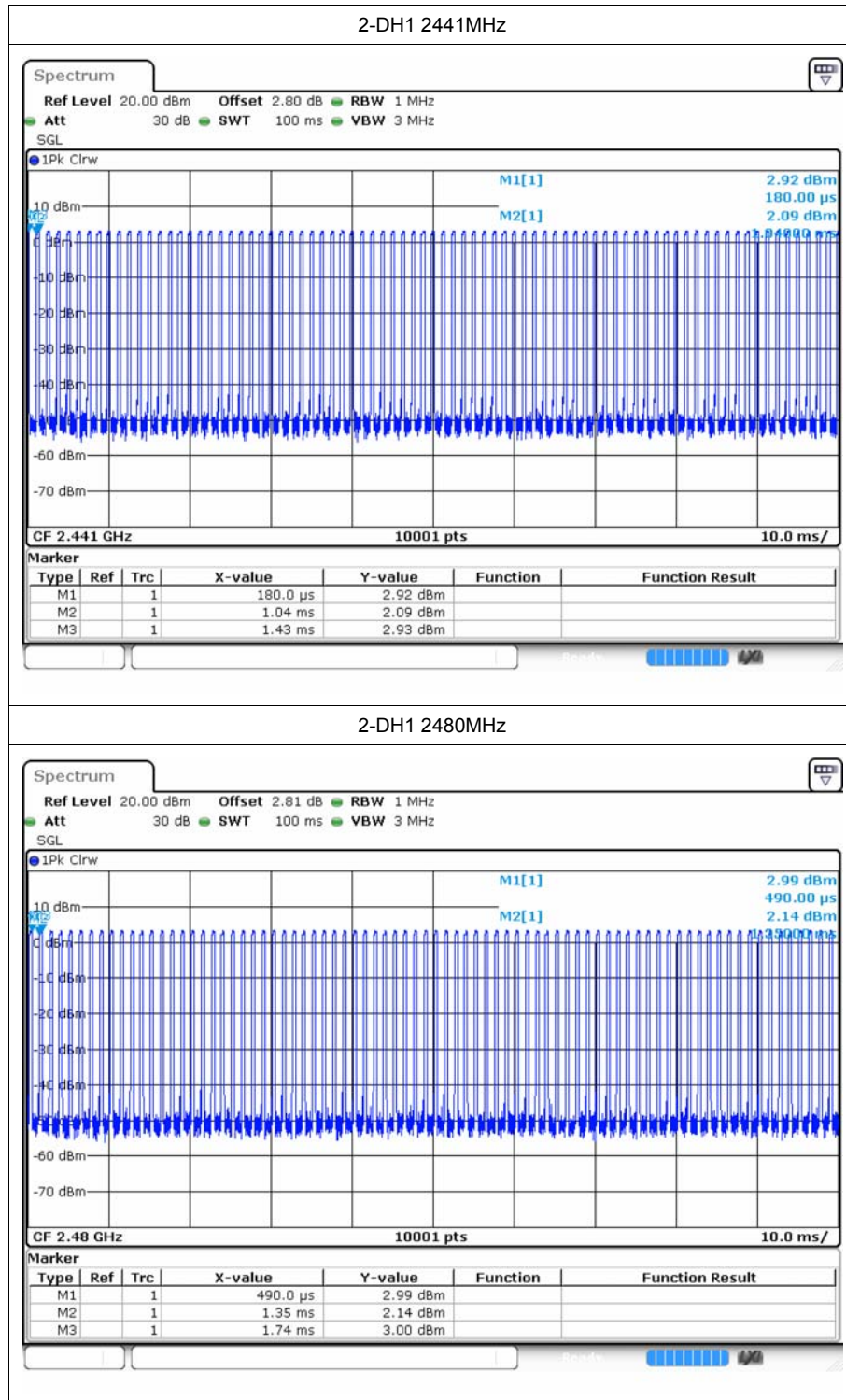


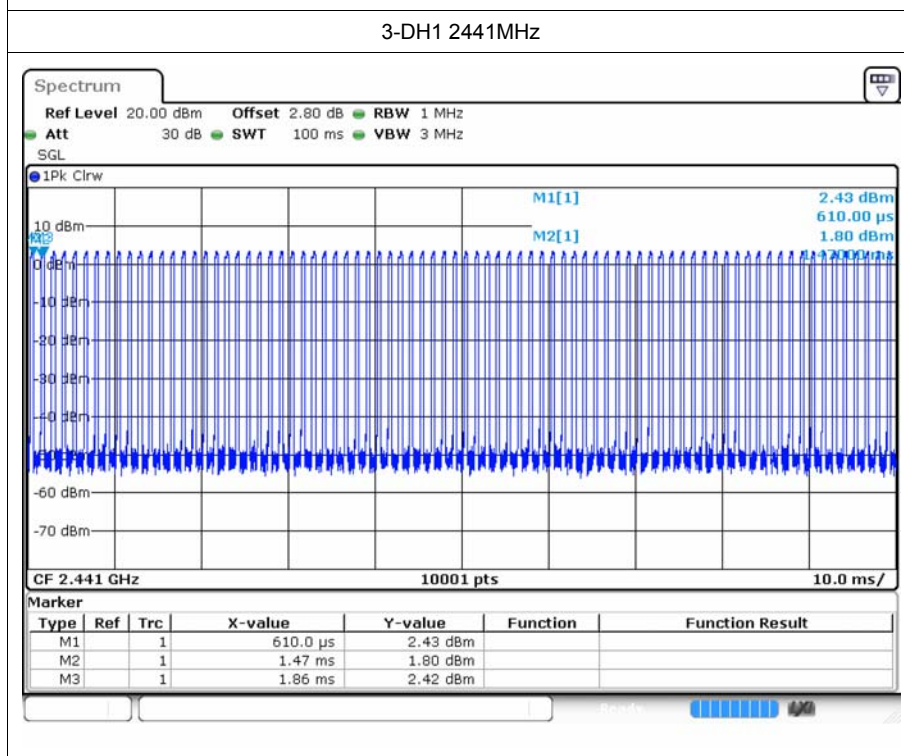


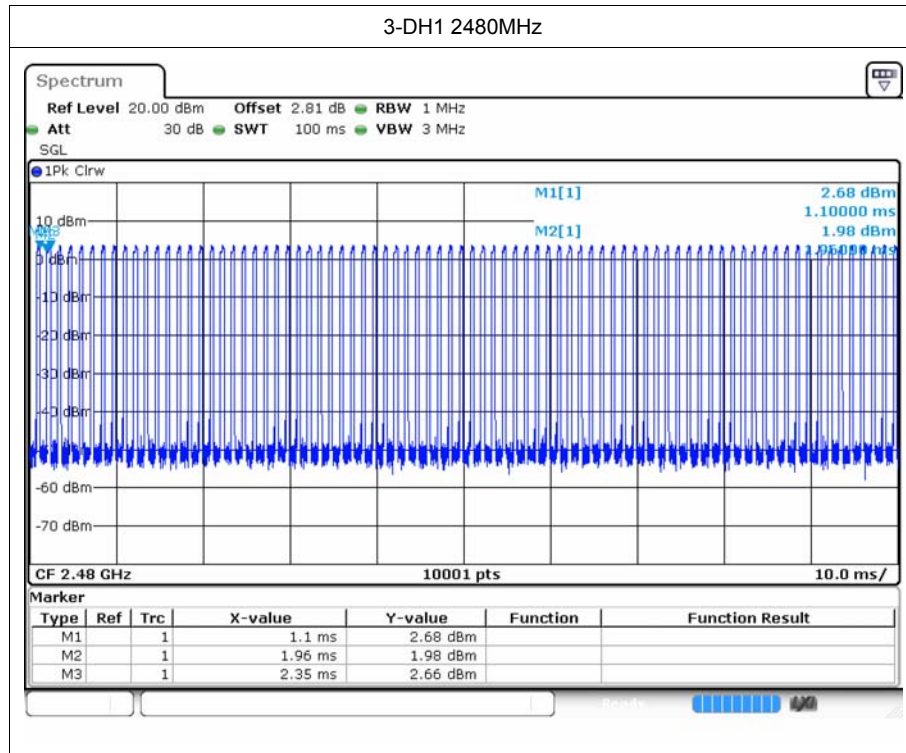
Right:











2 Maximum Conducted Peak Output Power

2.1 Test Result

Left;

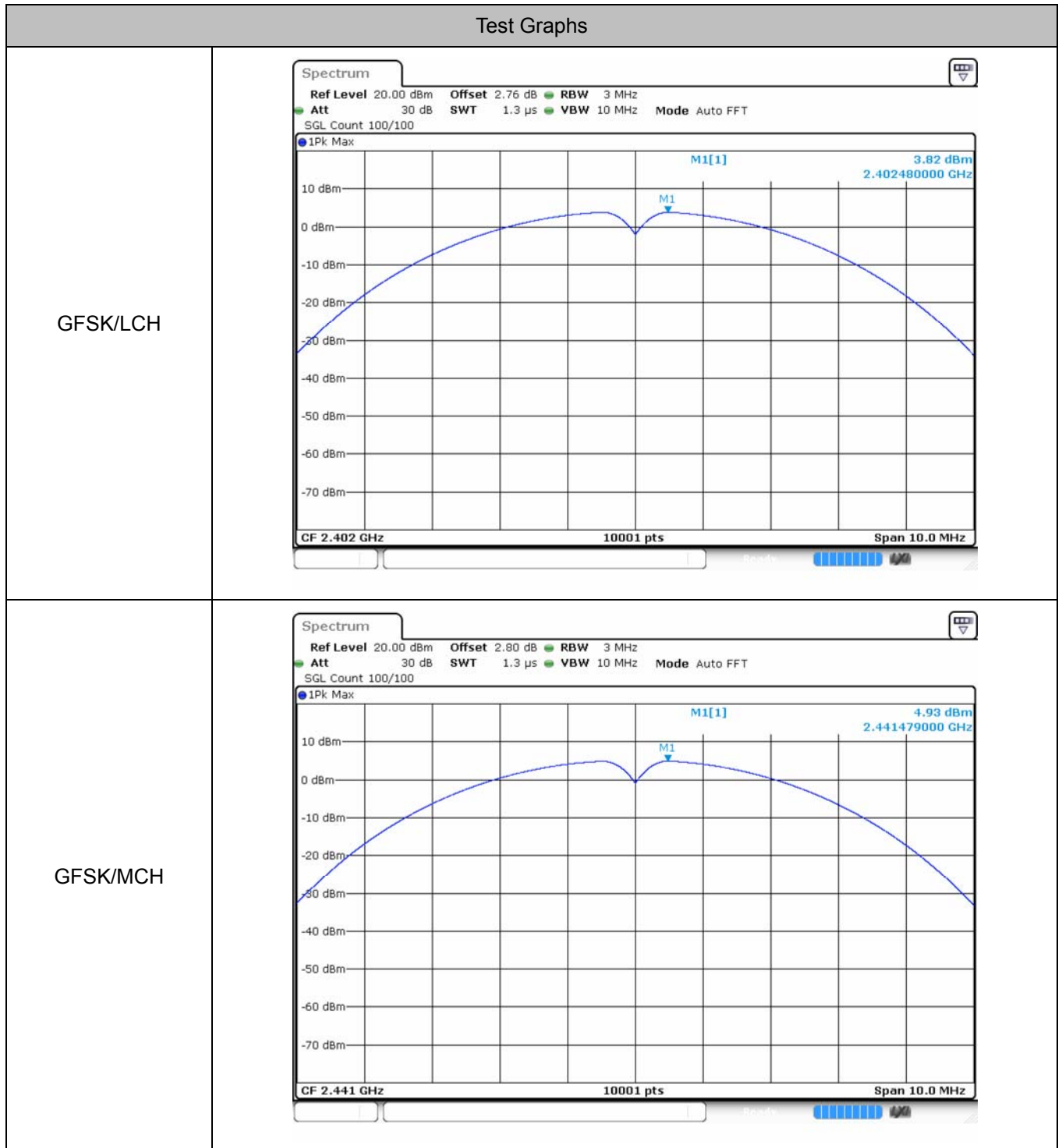
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.82	21	Pass
	MCH	4.93	21	Pass
	HCH	6.01	21	Pass
$\pi/4$ DQPSK	LCH	2.74	21	Pass
	MCH	3.8	21	Pass
	HCH	4.04	21	Pass
8DPSK	LCH	2.91	21	Pass
	MCH	3.94	21	Pass
	HCH	4.28	21	Pass

Right:

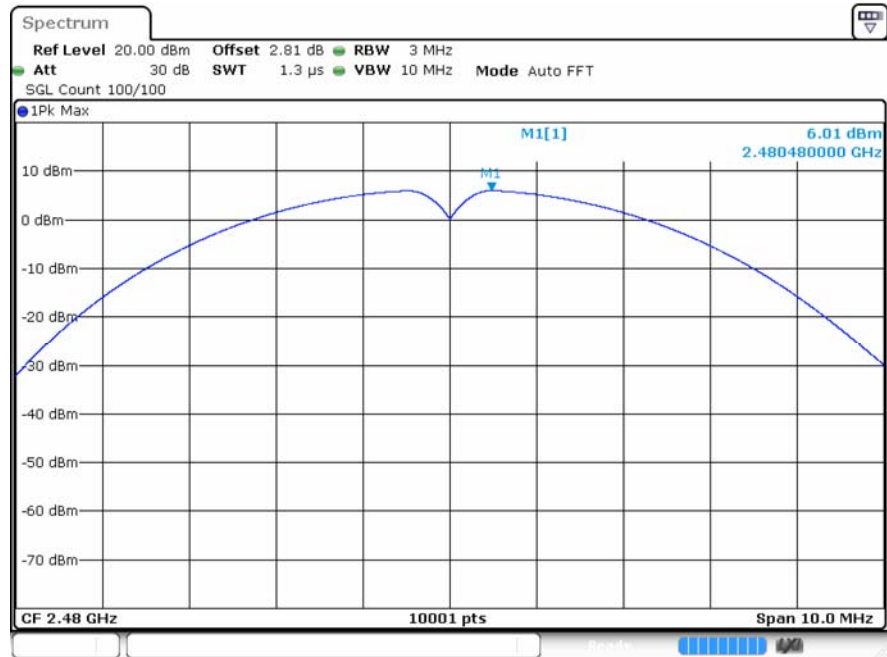
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.89	21	Pass
	MCH	5.27	21	Pass
	HCH	6.16	21	Pass
$\pi/4$ DQPSK	LCH	2.9	21	Pass
	MCH	4.07	21	Pass
	HCH	4.13	21	Pass
8DPSK	LCH	2.83	21	Pass
	MCH	3.98	21	Pass
	HCH	3.97	21	Pass

Test Graphs

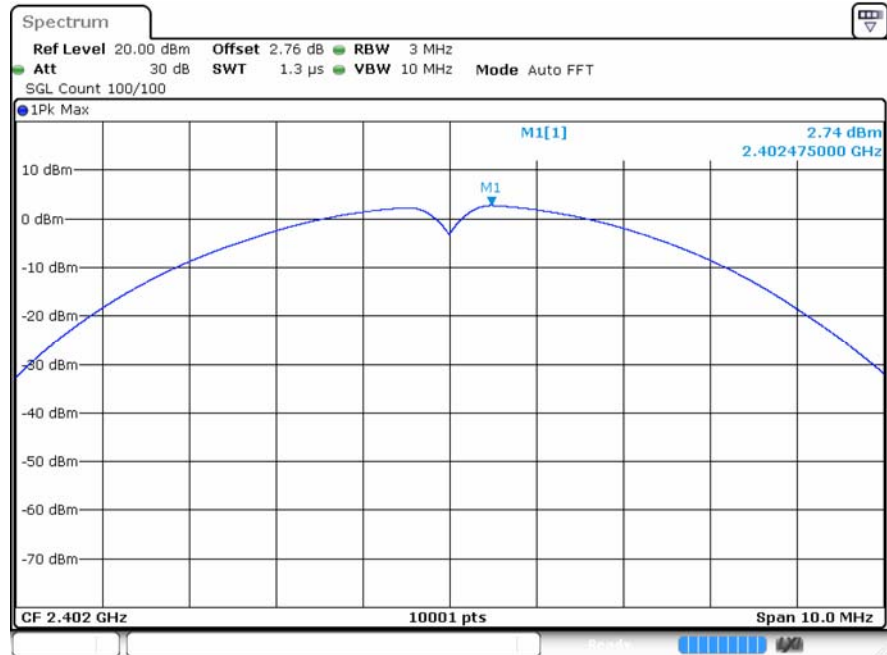
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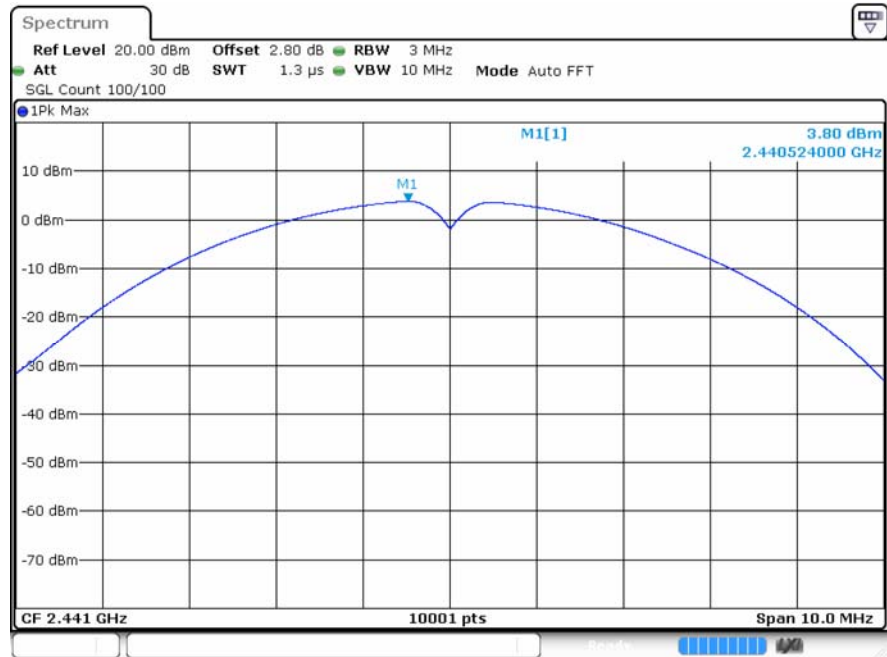
GFSK/HCH



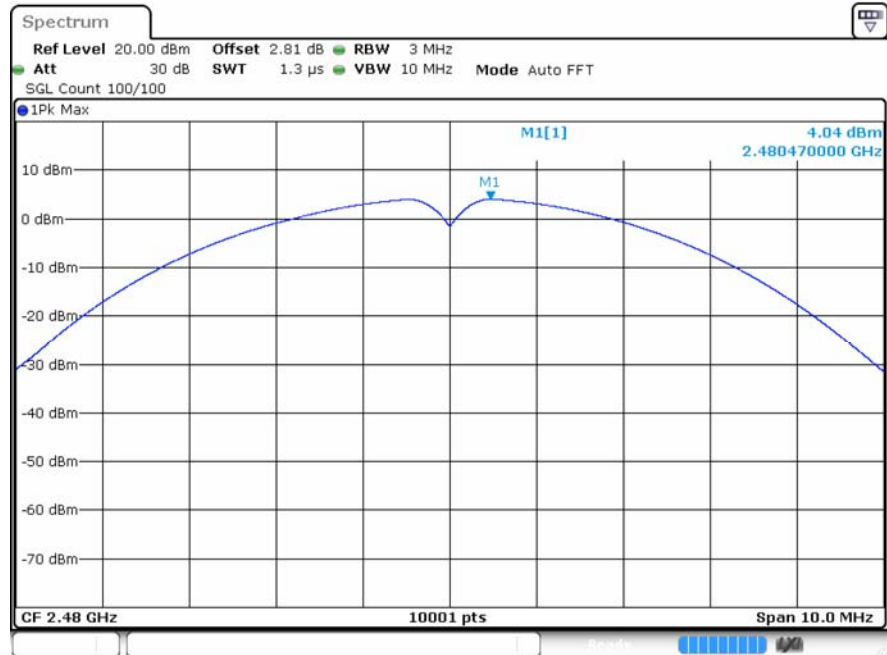
$\pi/4$ DQPSK/LCH



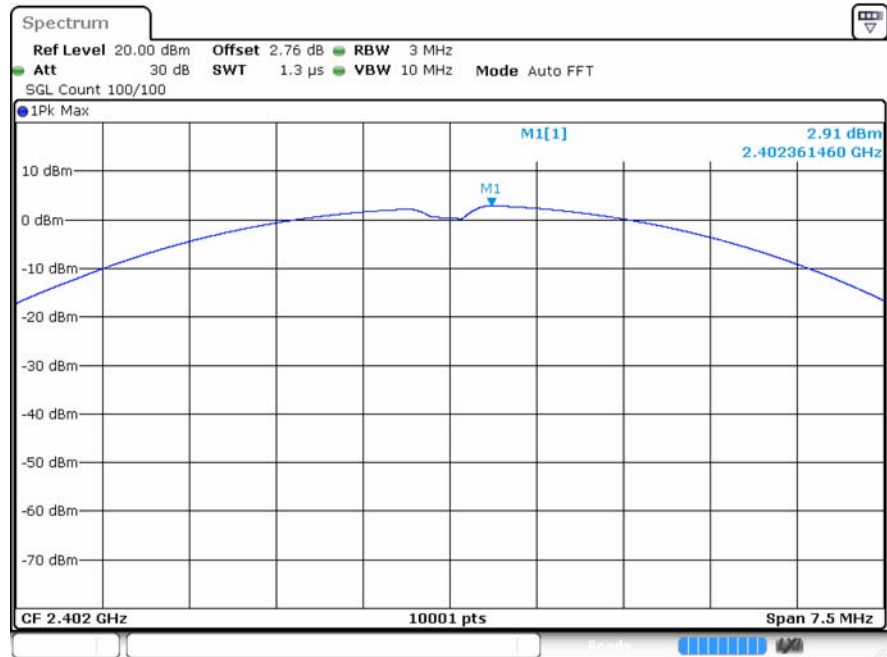
$\pi/4$ DQPSK/MCH



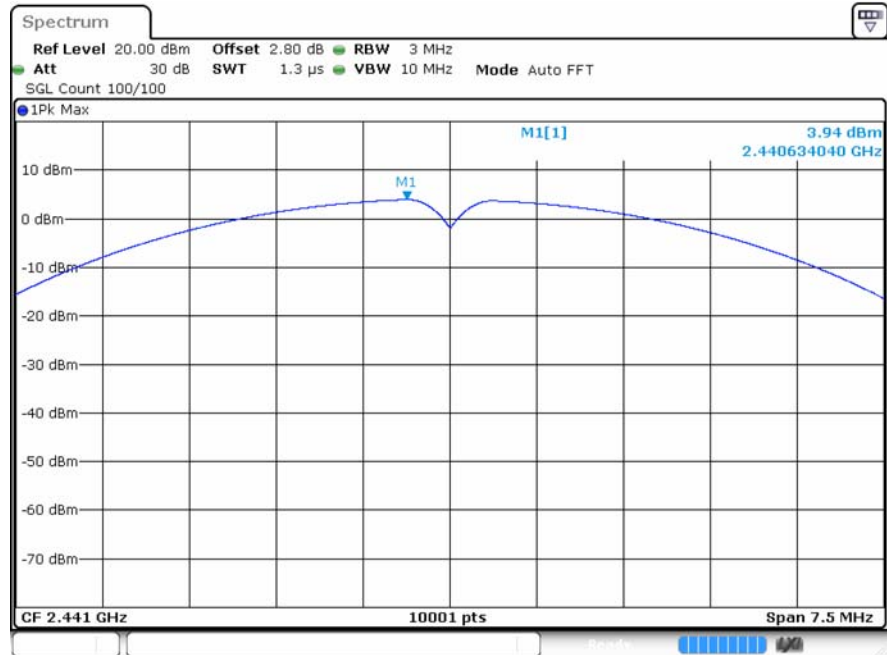
$\pi/4$ DQPSK/HCH



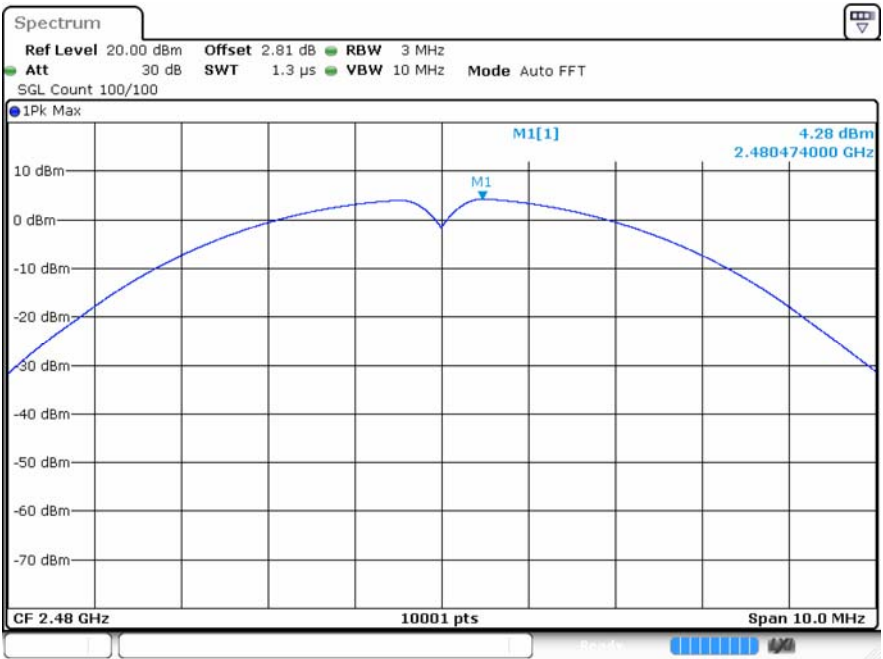
8DPSK/LCH



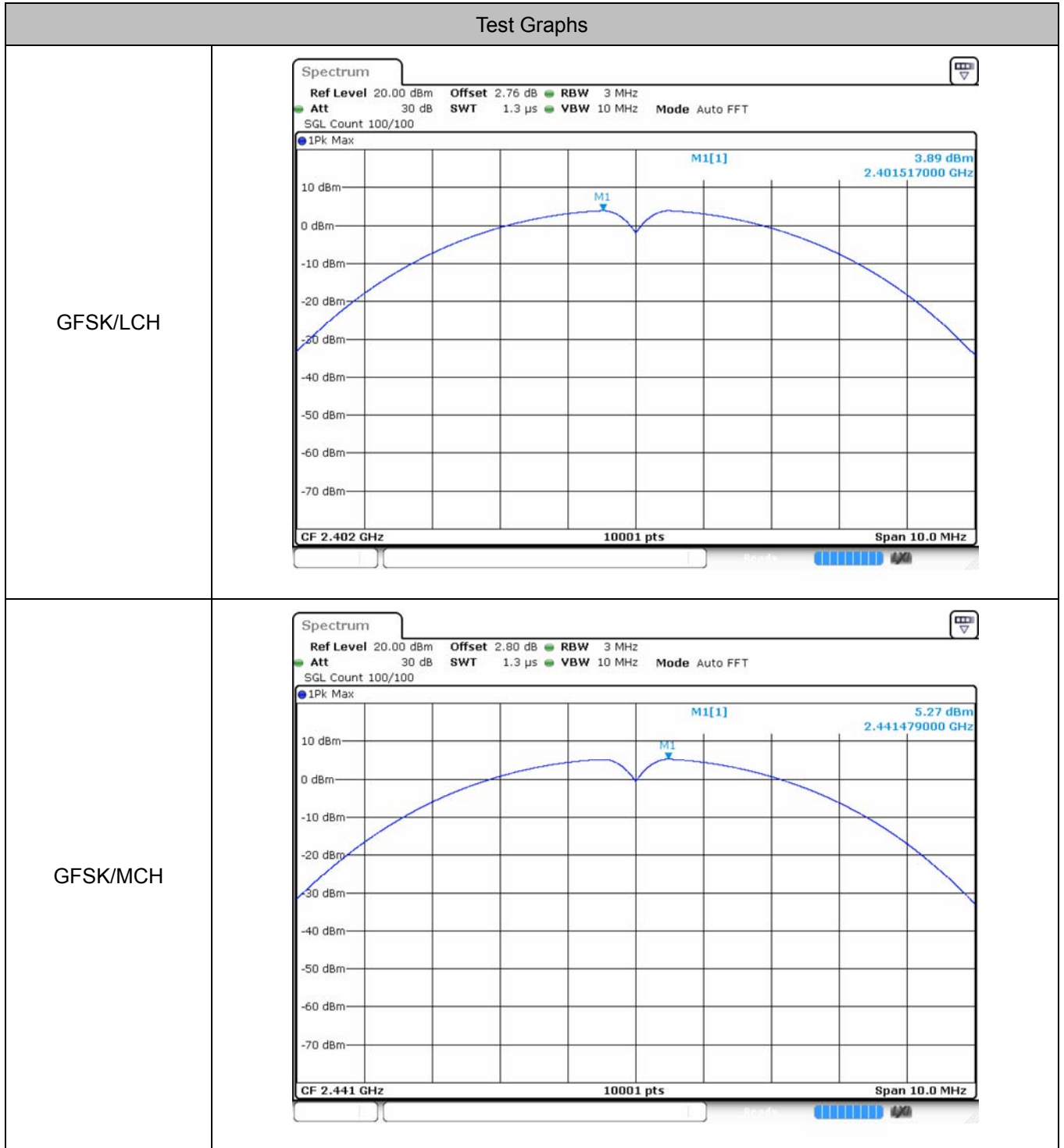
8DPSK/MCH



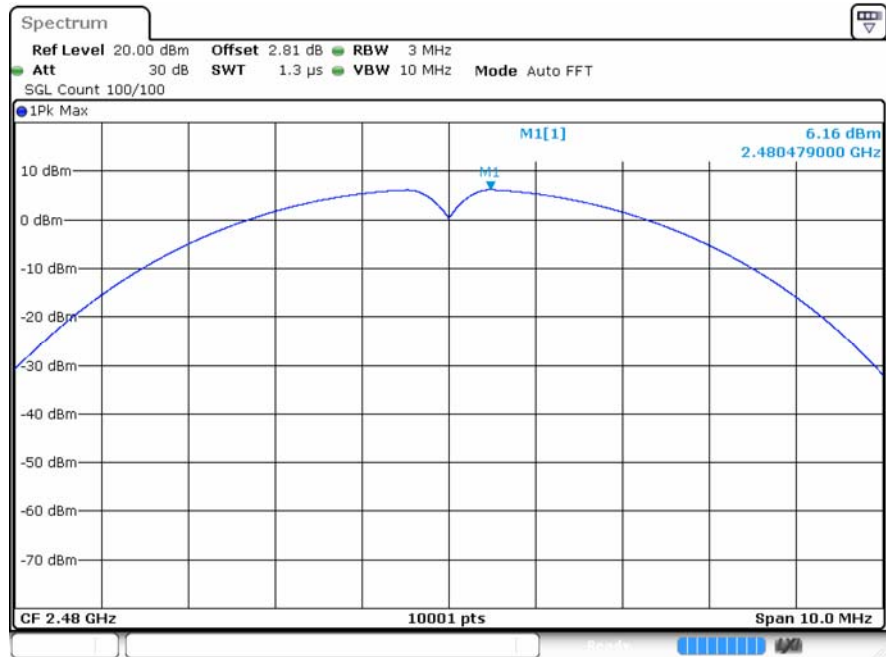
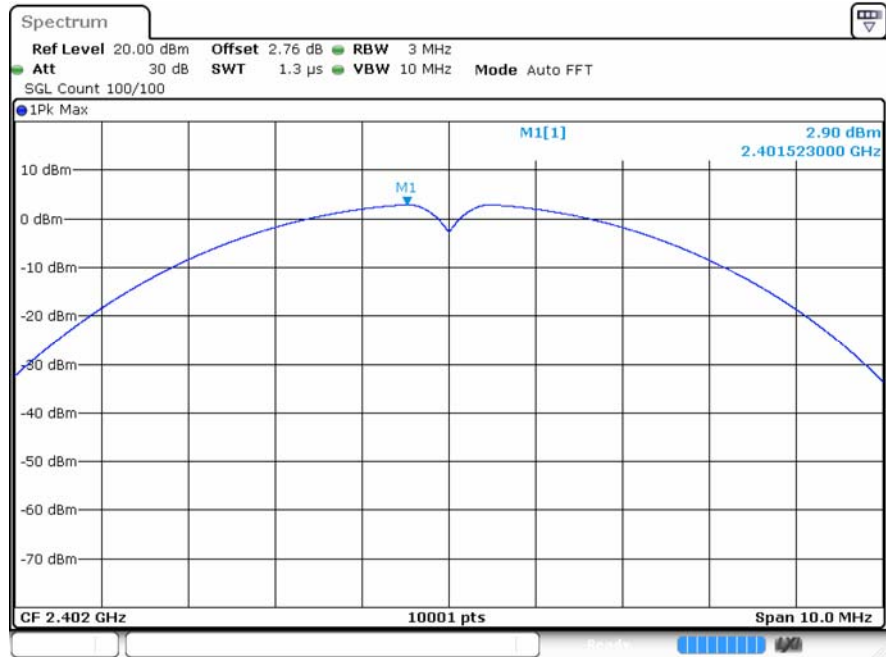
8DPSK/HCH



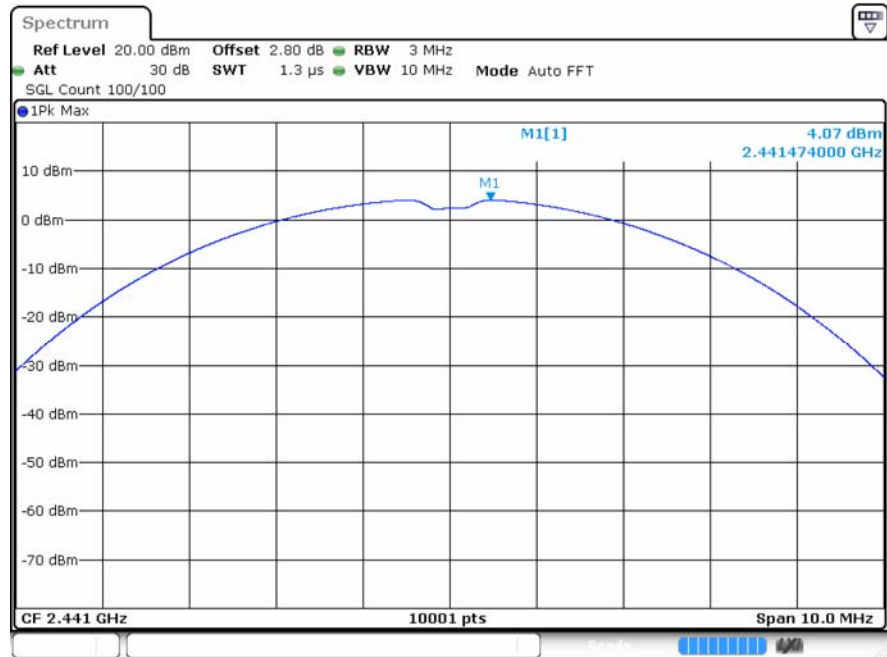
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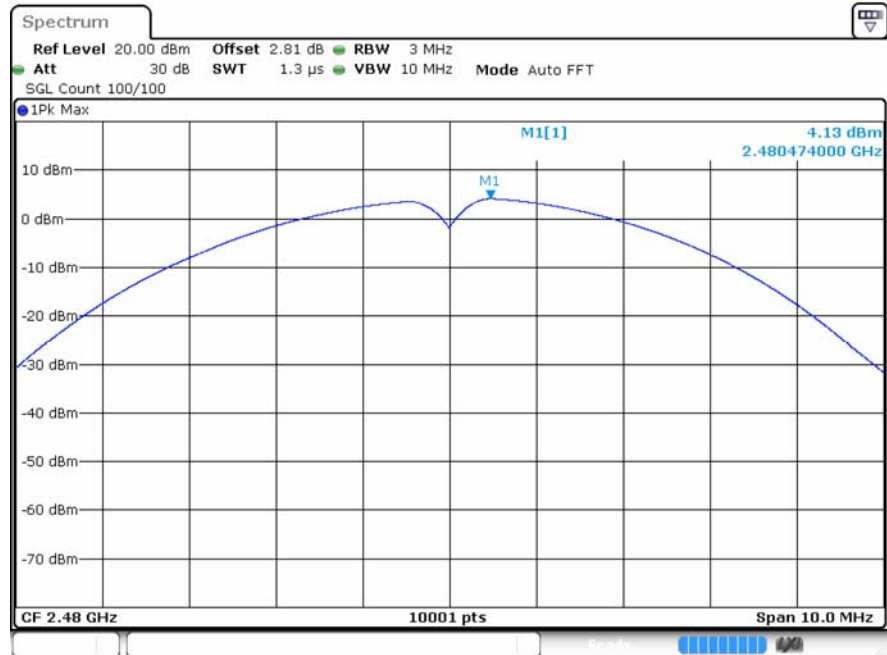
GFSK/HCH


 $\pi/4$ DQPSK/LCH


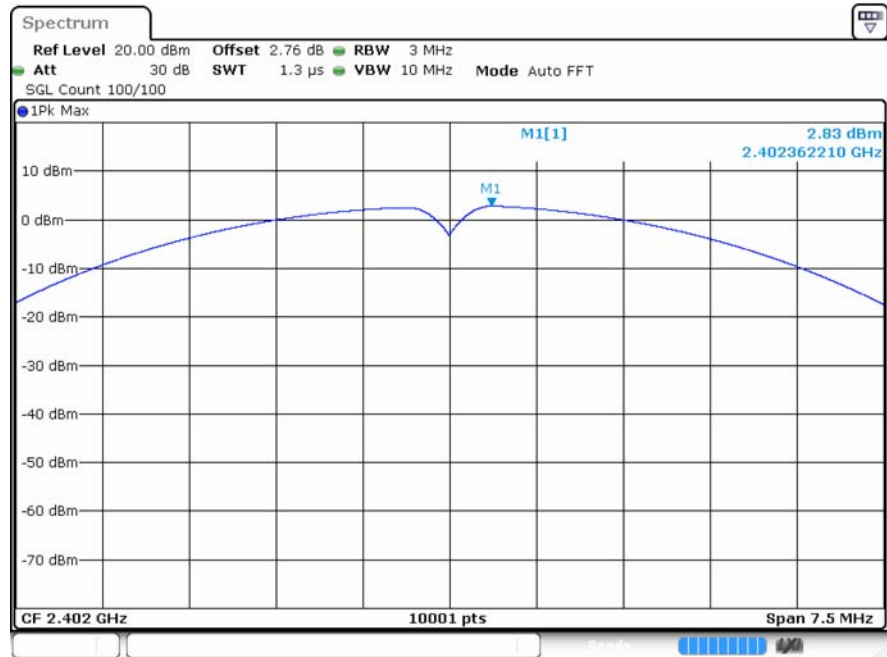
$\pi/4$ DQPSK/MCH



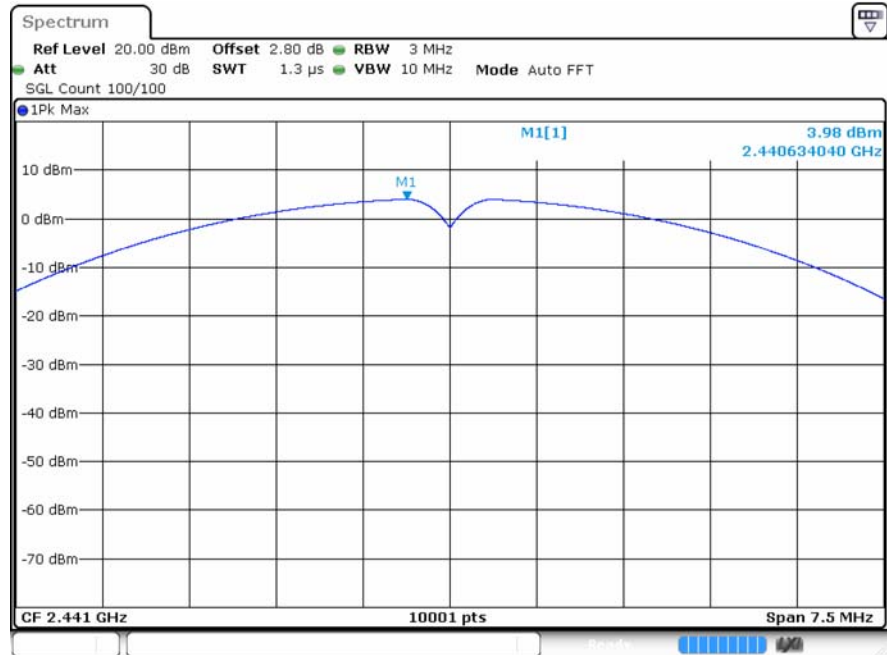
$\pi/4$ DQPSK/HCH



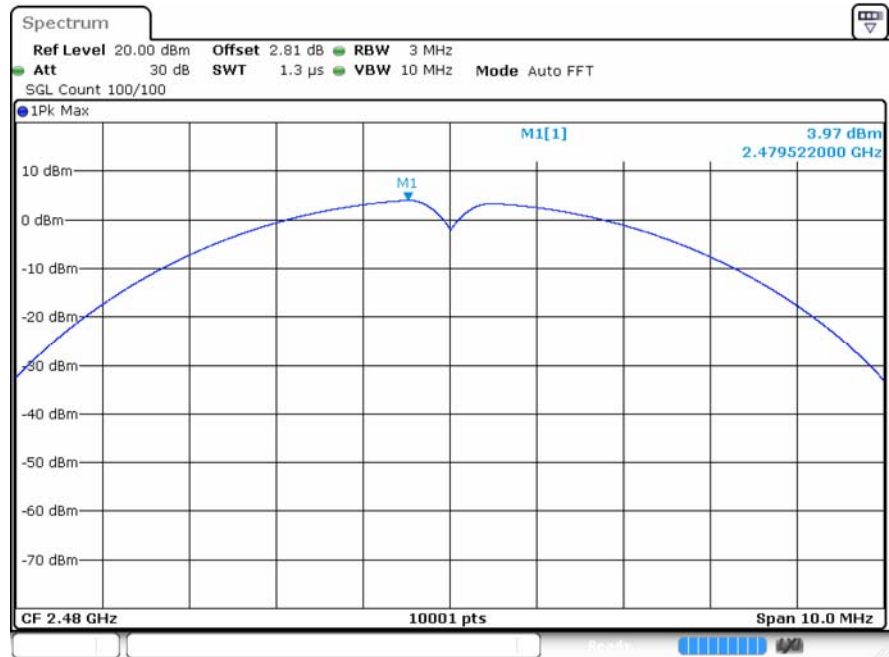
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



3 20dB Bandwidth

3.1 Test Result

Left:

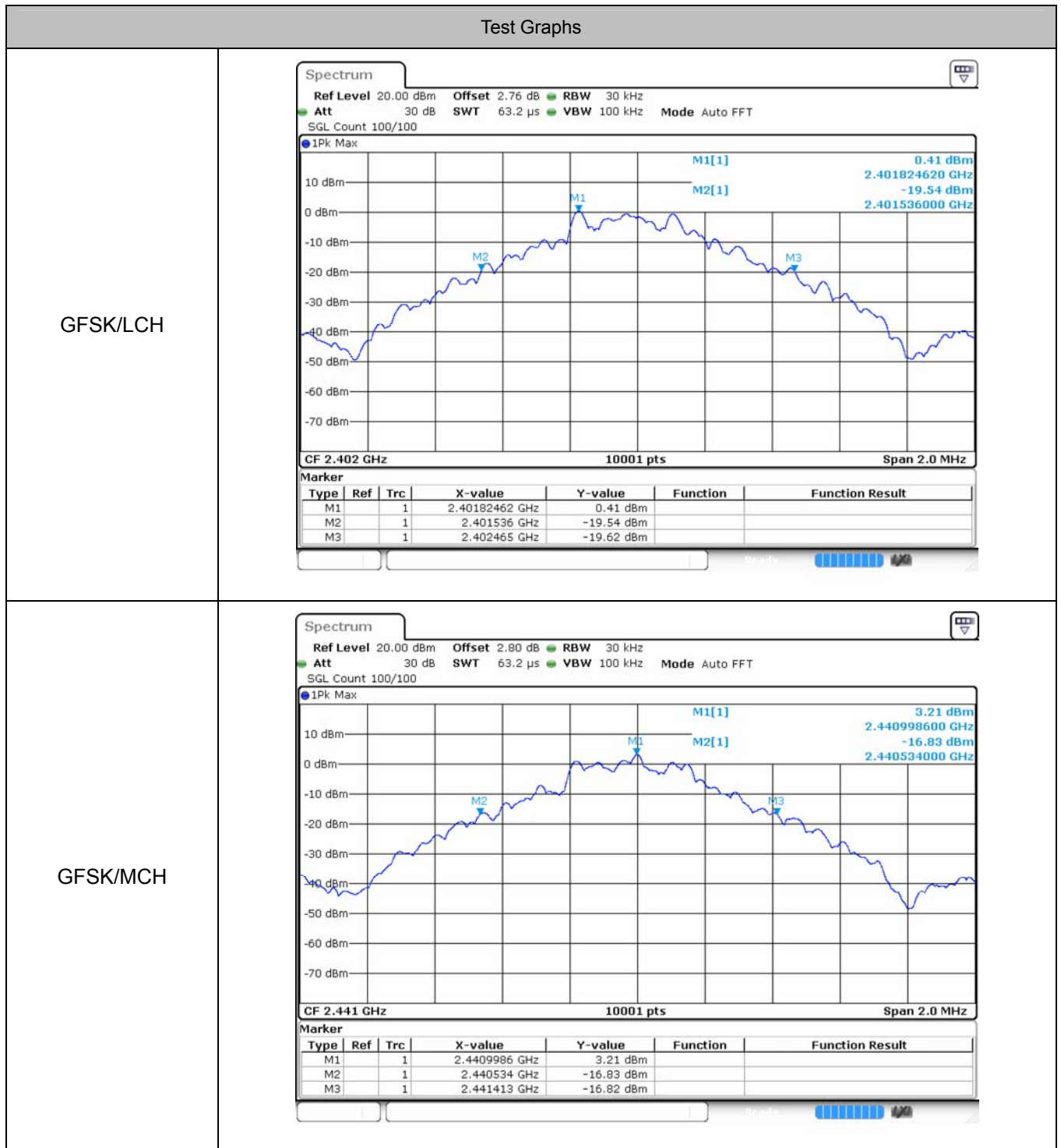
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.929	Not Specified	Pass
	MCH	0.878	Not Specified	Pass
	HCH	0.888	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.398	Not Specified	Pass
	MCH	1.393	Not Specified	Pass
	HCH	1.395	Not Specified	Pass
8DPSK	LCH	1.432	Not Specified	Pass
	MCH	1.432	Not Specified	Pass
	HCH	1.41	Not Specified	Pass

Right:

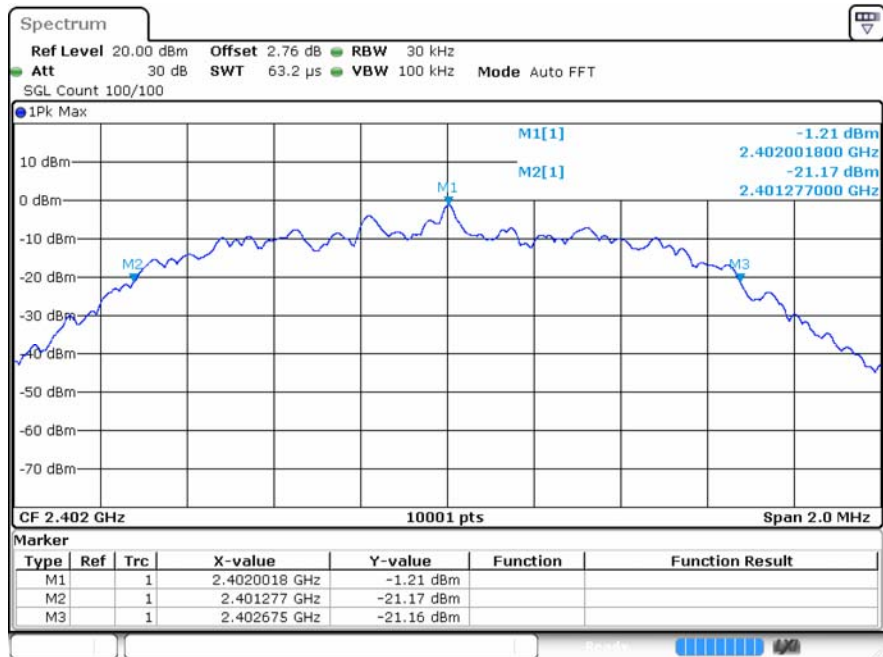
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.880	Not Specified	Pass
	MCH	0.892	Not Specified	Pass
	HCH	0.888	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.392	Not Specified	Pass
	MCH	1.426	Not Specified	Pass
	HCH	1.428	Not Specified	Pass
8DPSK	LCH	1.416	Not Specified	Pass
	MCH	1.437	Not Specified	Pass
	HCH	1.413	Not Specified	Pass

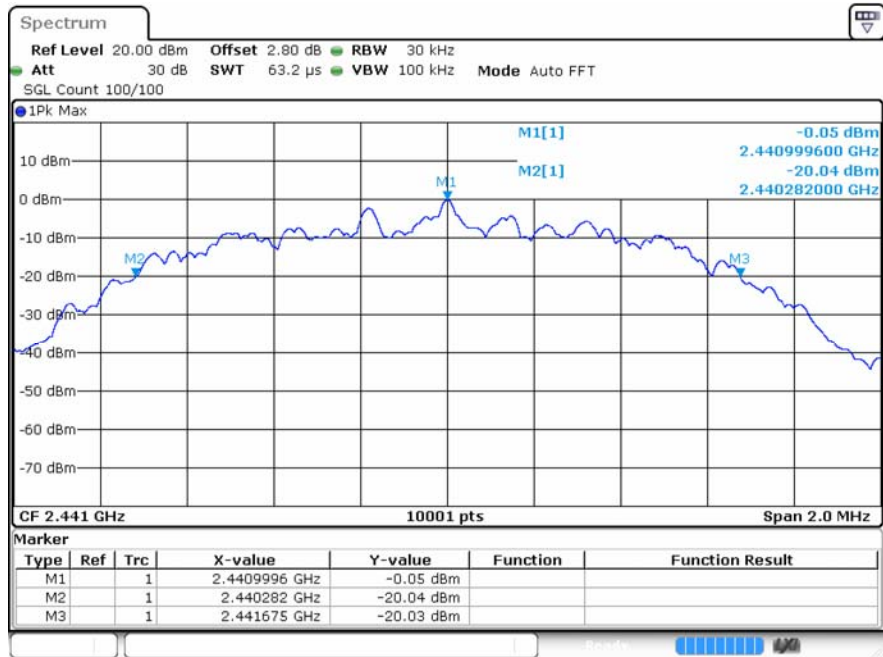
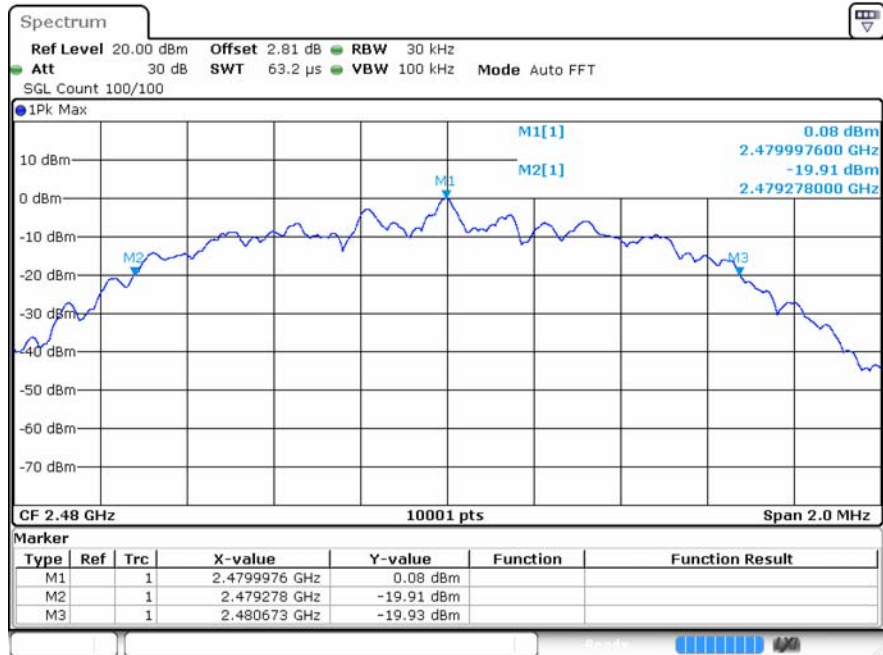
3.2 Test Graphs

Left;

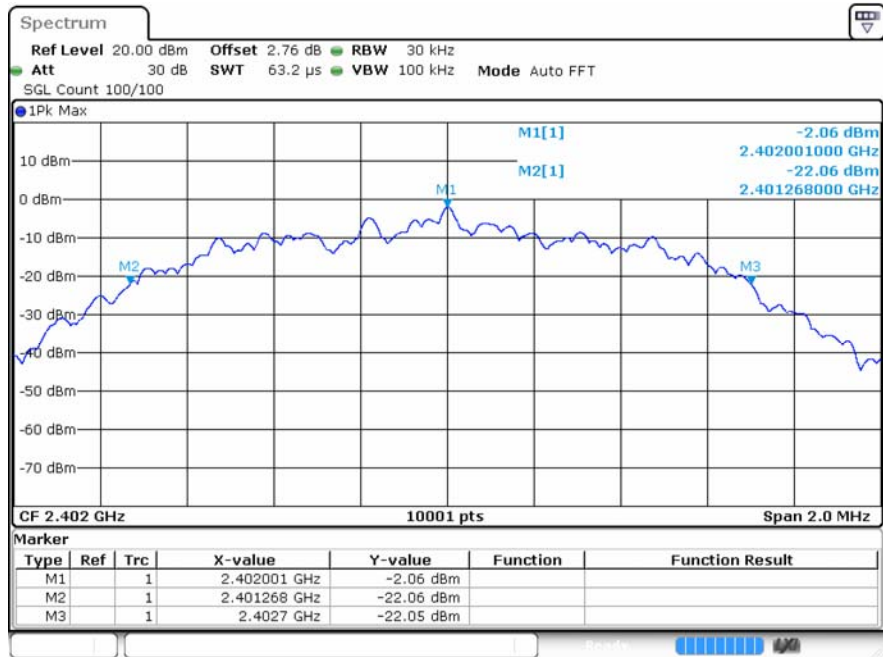


GFSK/HCH

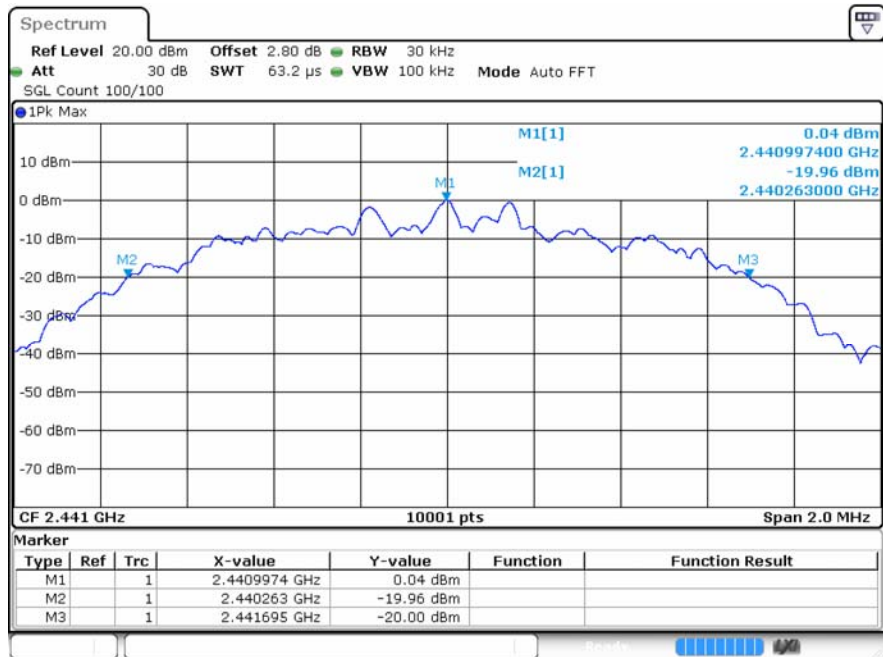

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


8DPSK/LCH

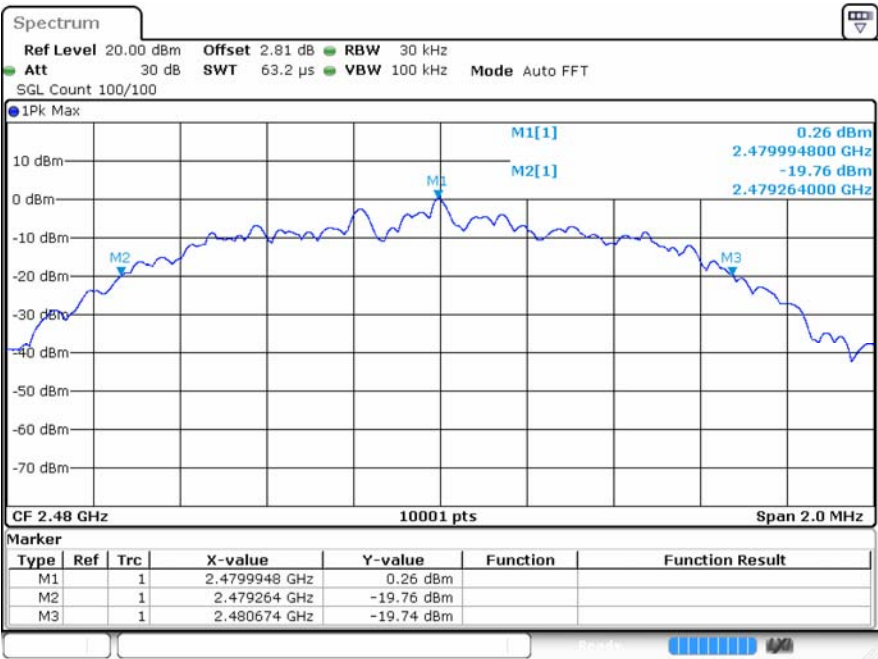


8DPSK/MCH





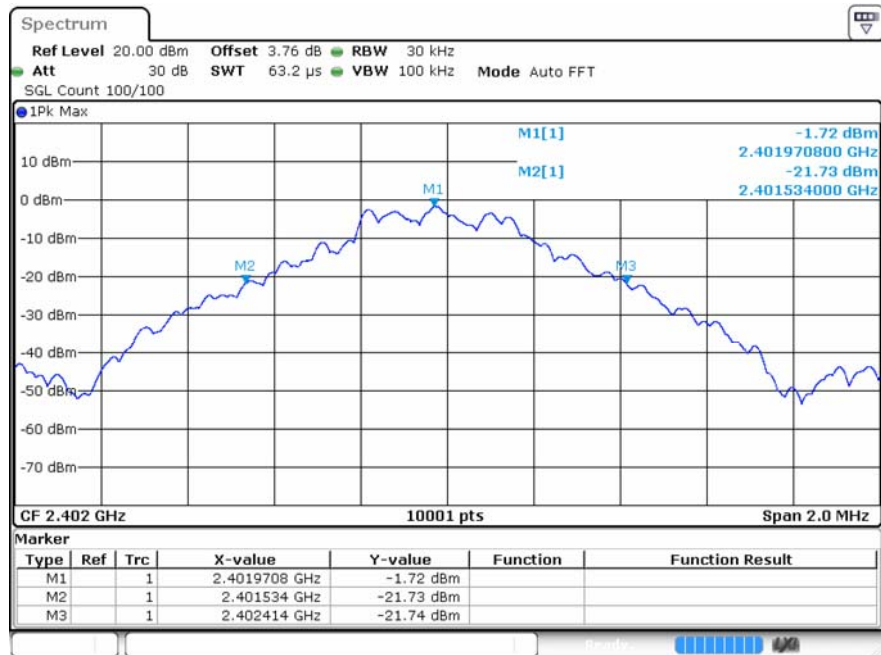
8DPSK/HCH



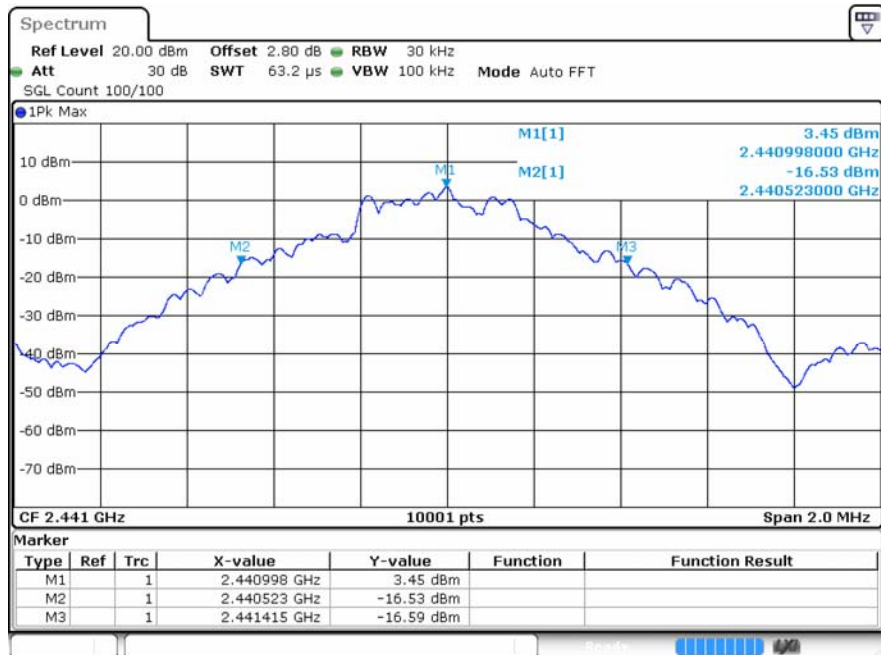
Right:

Test Graphs

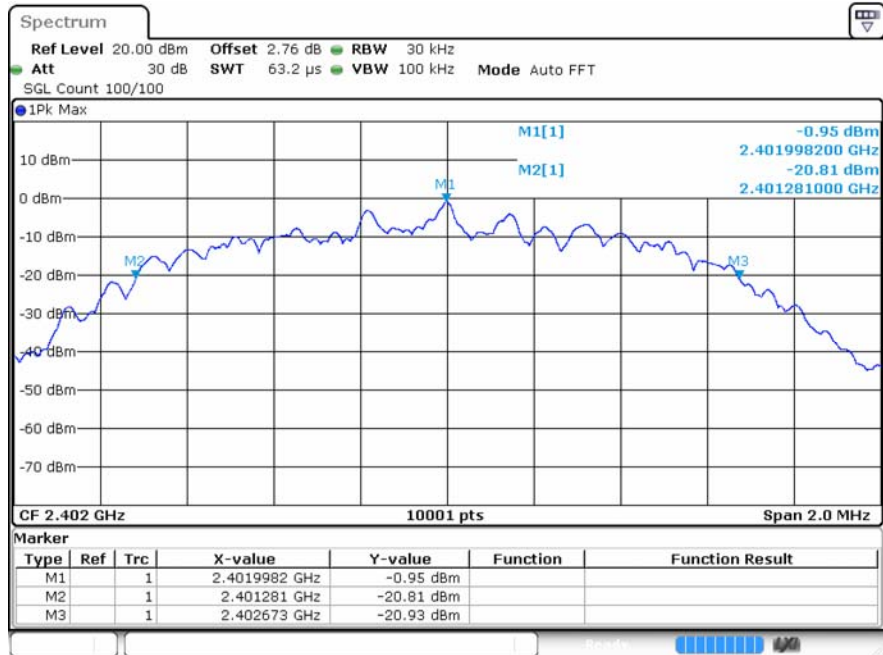
GFSK/LCH

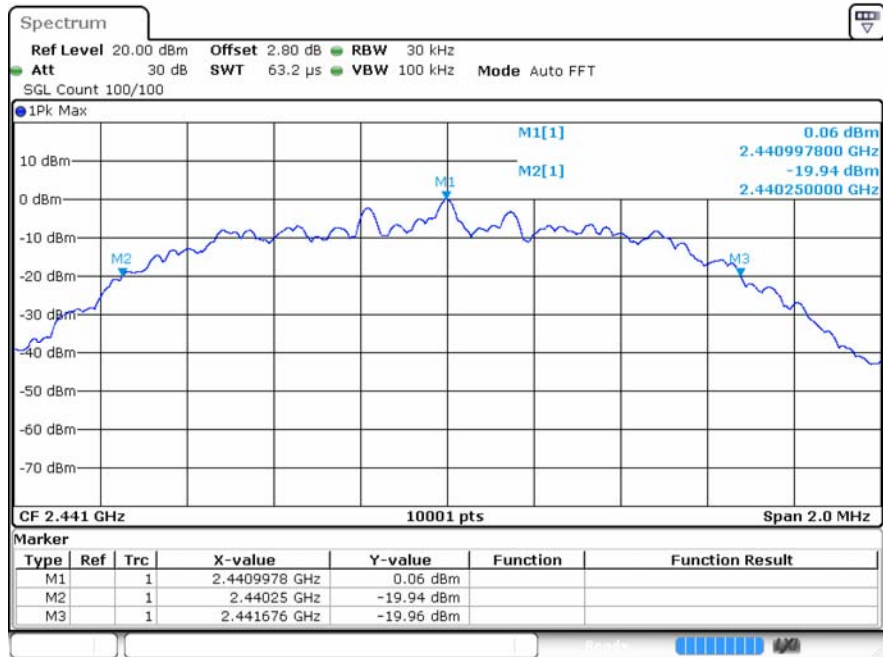
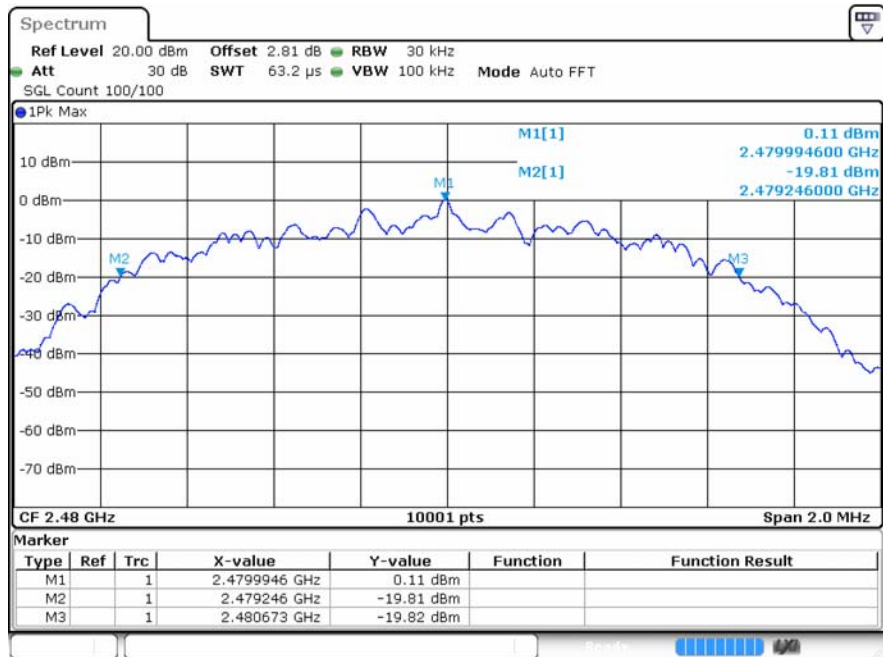


GFSK/MCH

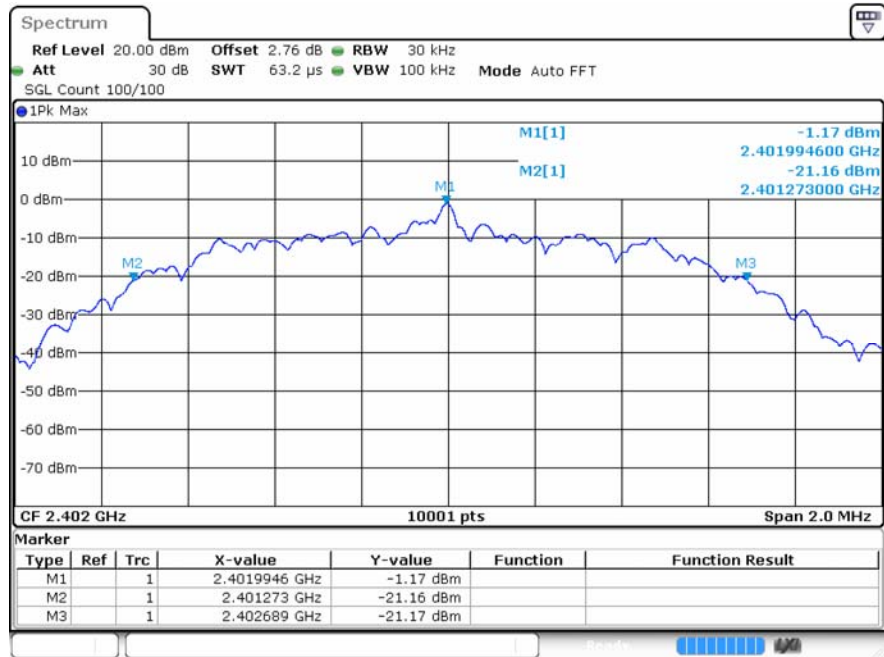


GFSK/HCH

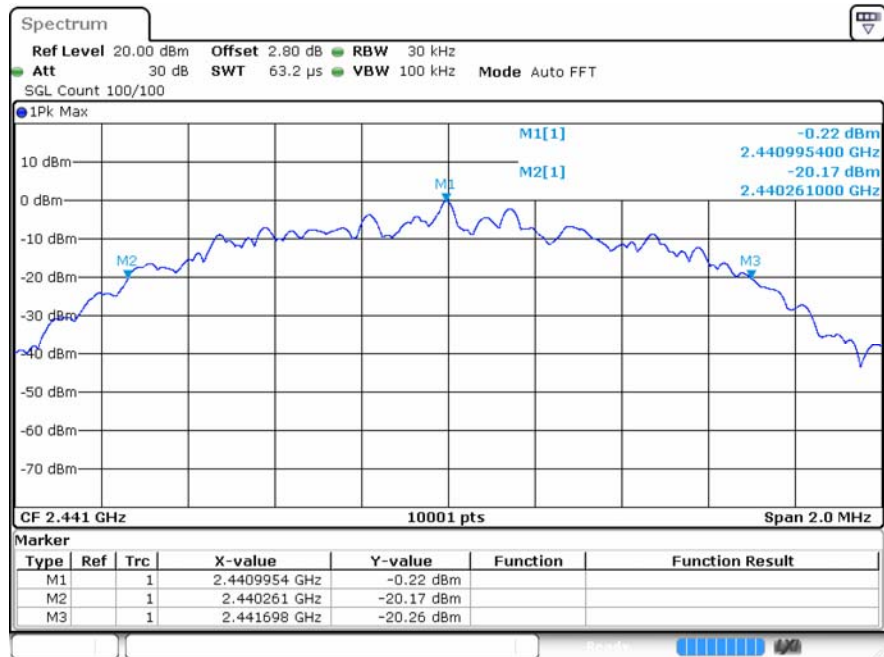

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


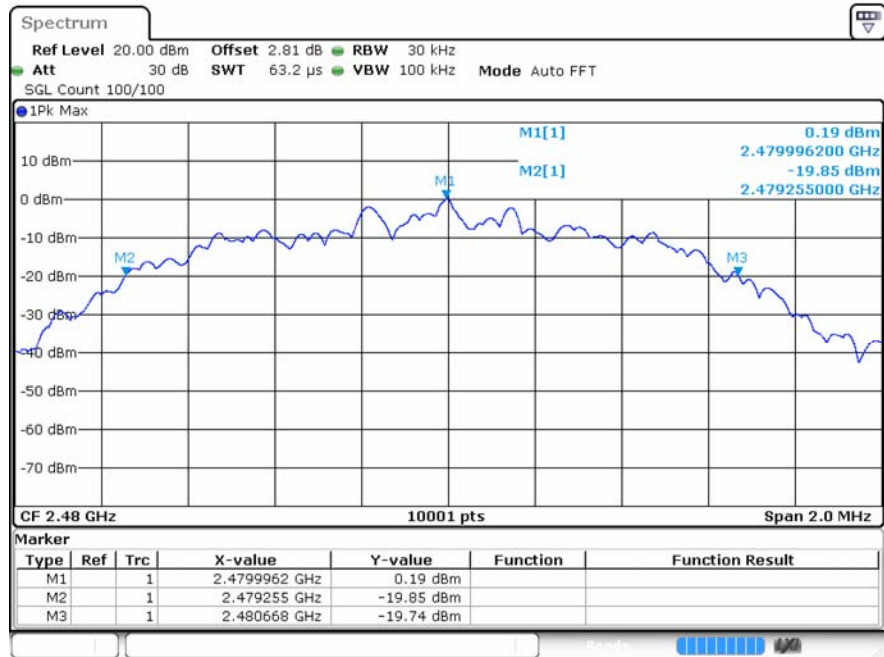
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



4 Carrier Frequency Separation

4.1 Test Result

Left:

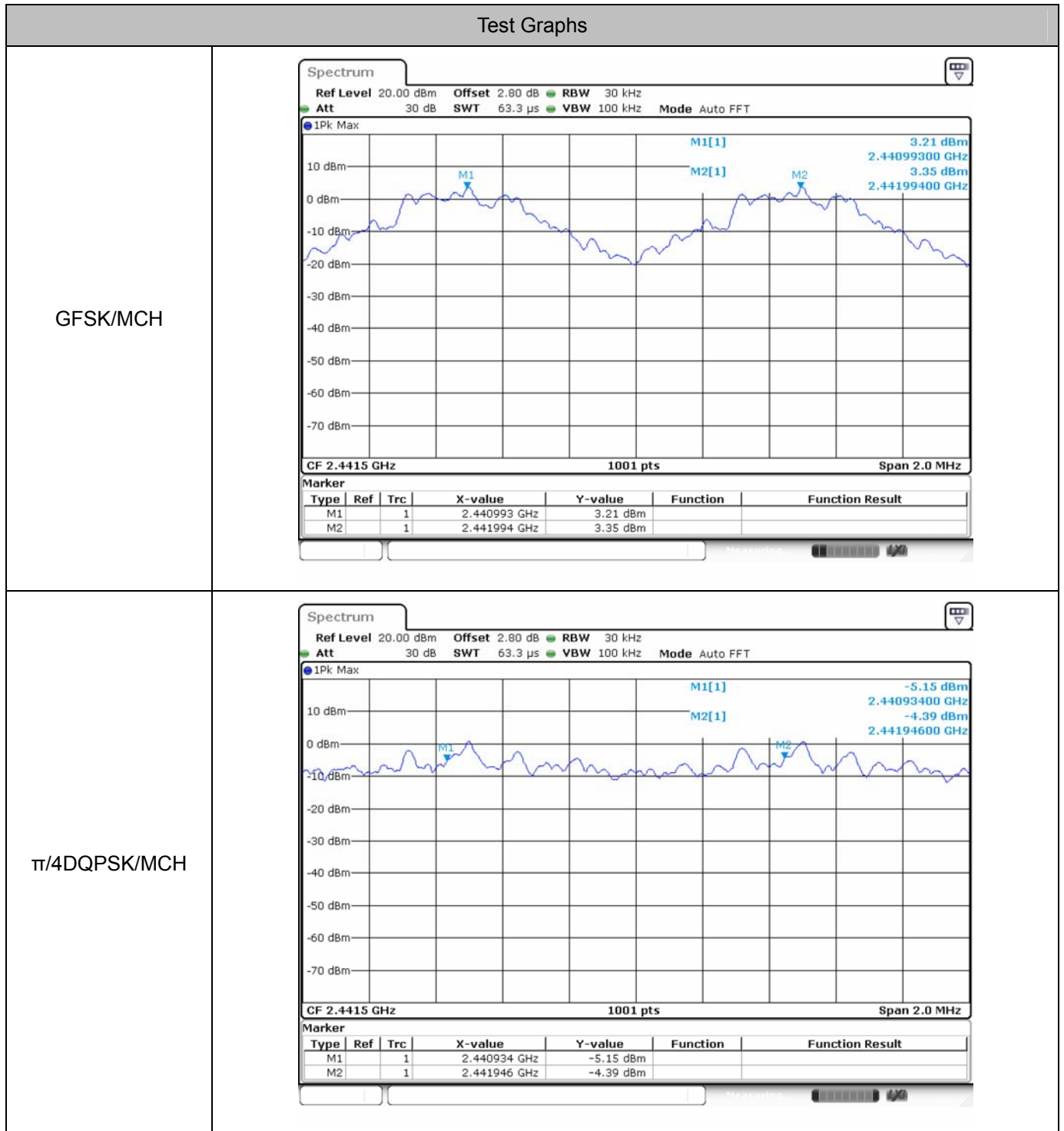
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.585	Pass
$\pi/4$ DQPSK	MCH	1.012	0.929	Pass
8DPSK	MCH	0.99	0.955	Pass

Right:

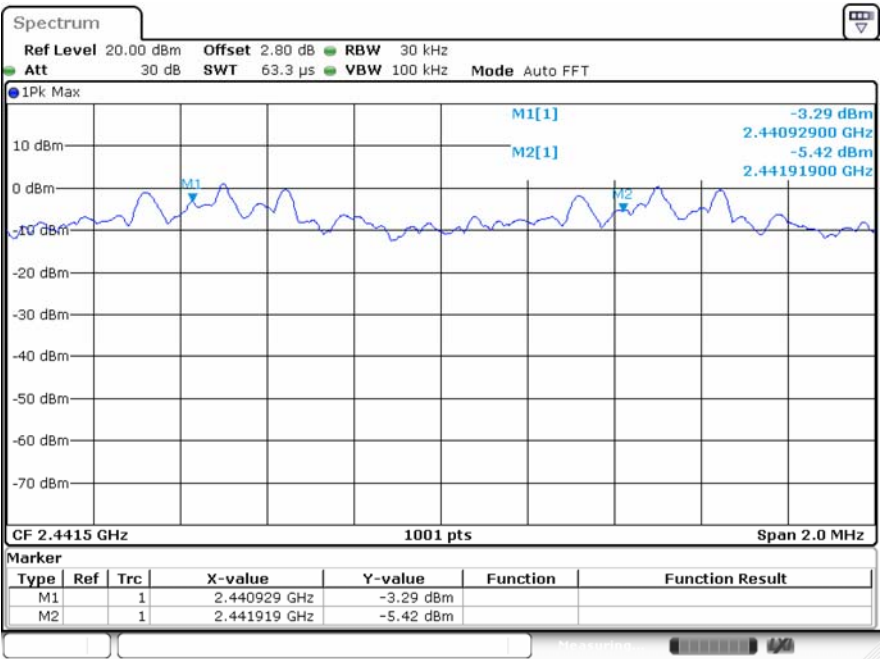
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.005	0.585	Pass
$\pi/4$ DQPSK	MCH	1.004	0.929	Pass
8DPSK	MCH	1.079	0.955	Pass

4.2 Test Graphs

Left:



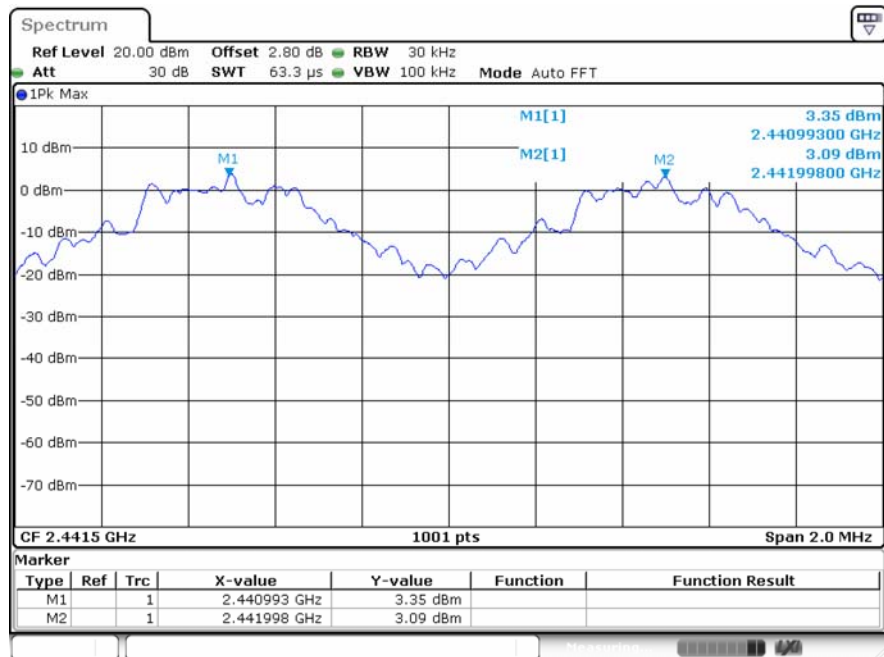
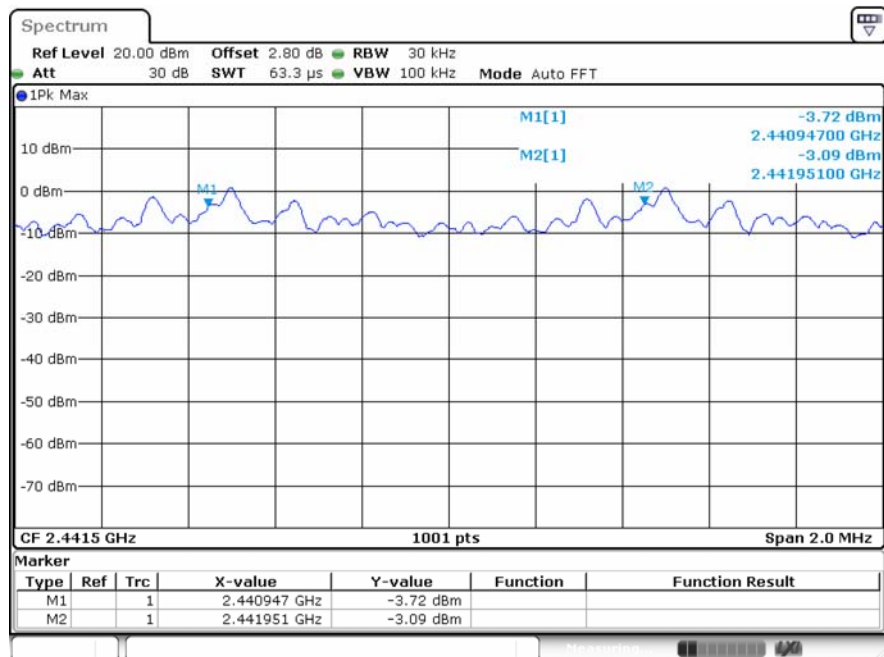
8DPSK/MCH



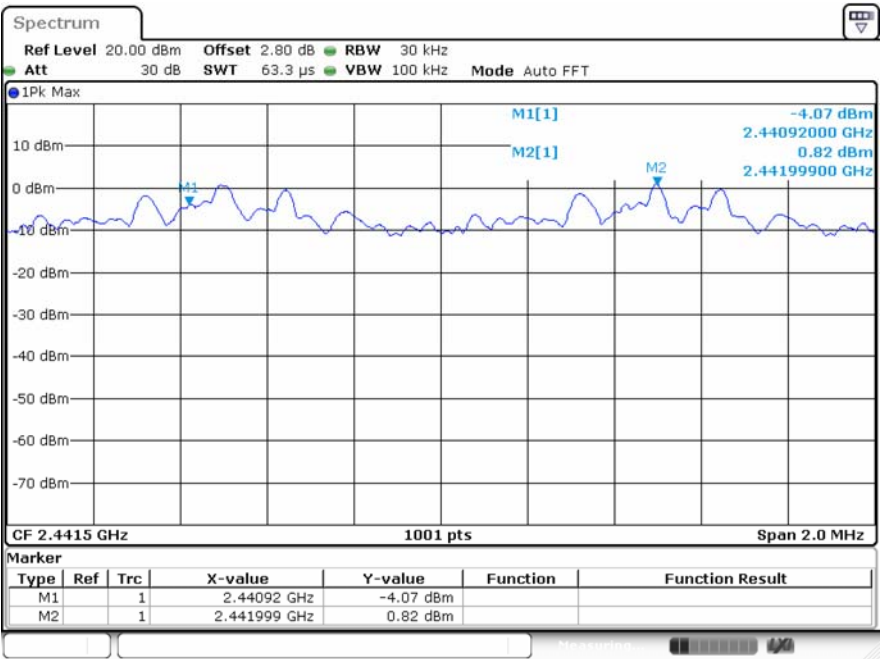
Right:

Test Graphs

GFSK/MCH


 π /4DQPSK/MCH


8DPSK/MCH



5 Hopping Channel Number

5.1 Test Result

Left;

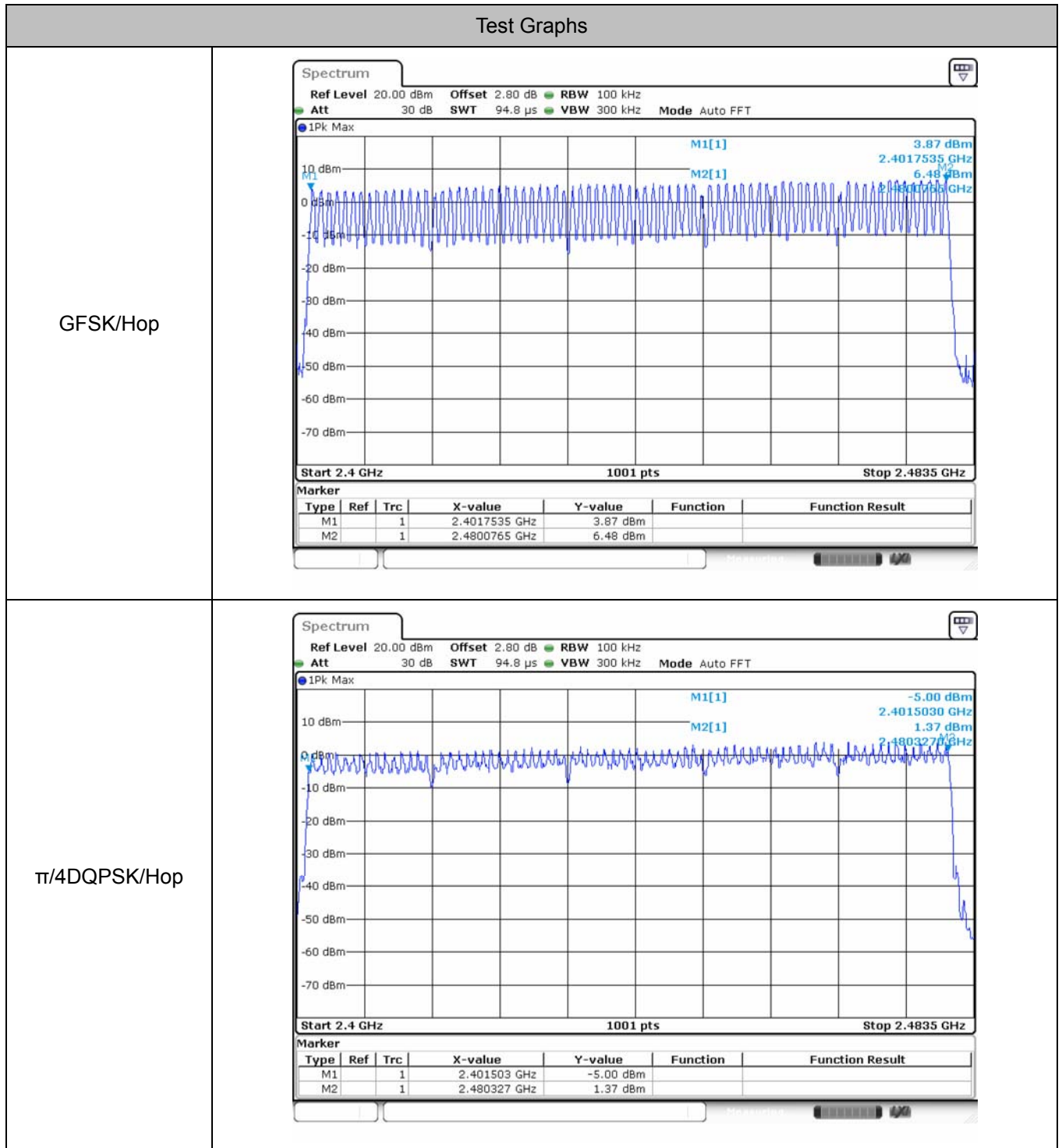
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Right:

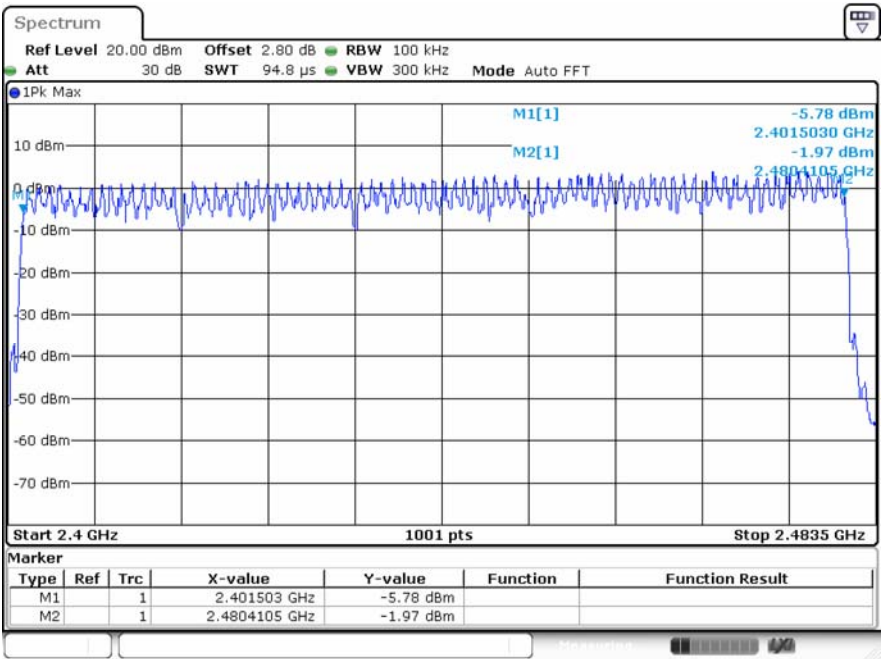
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

5.2 Test Graphs

Left:



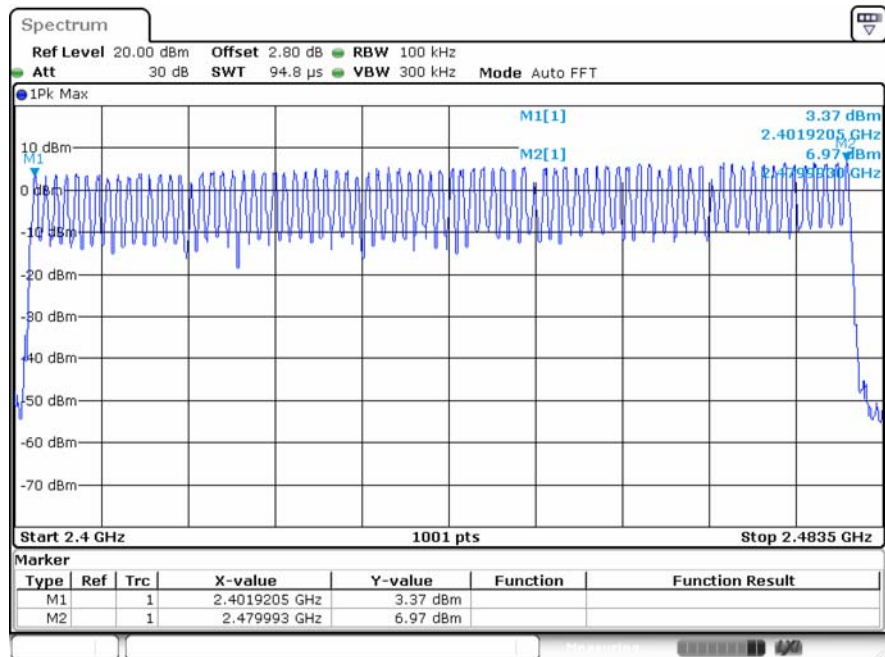
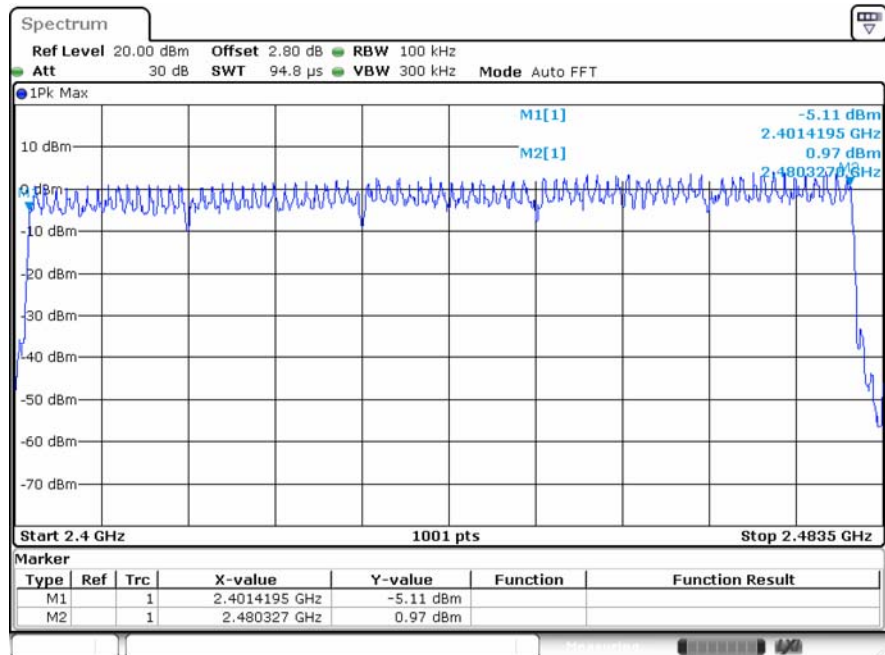
8DPSK/Hop



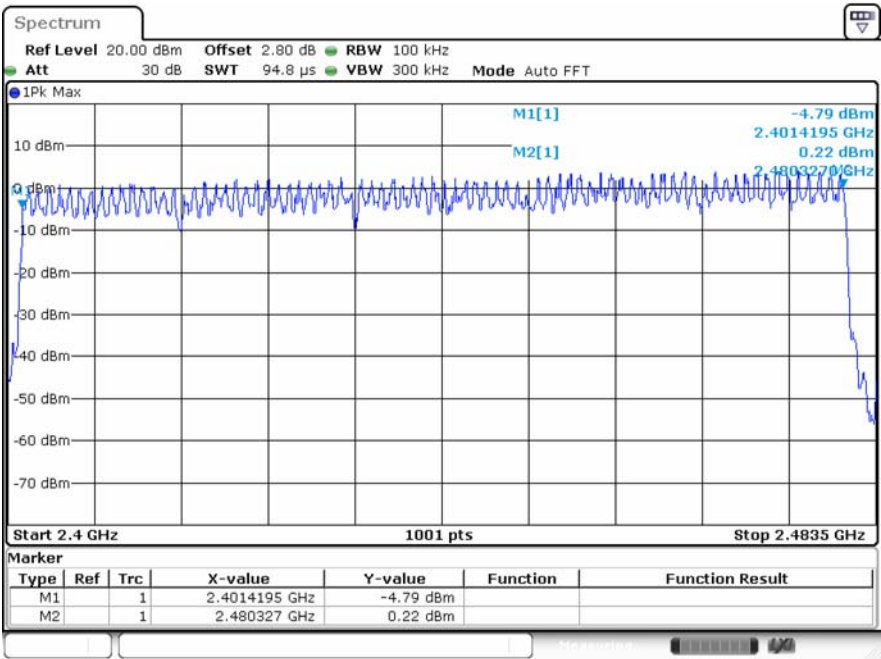
Right:

Test Graphs

GFSK/Hop


 $\pi/4$ DQPSK/Hop


8DPSK/Hop



6 Dwell Time

6.1 Test Result

Left:

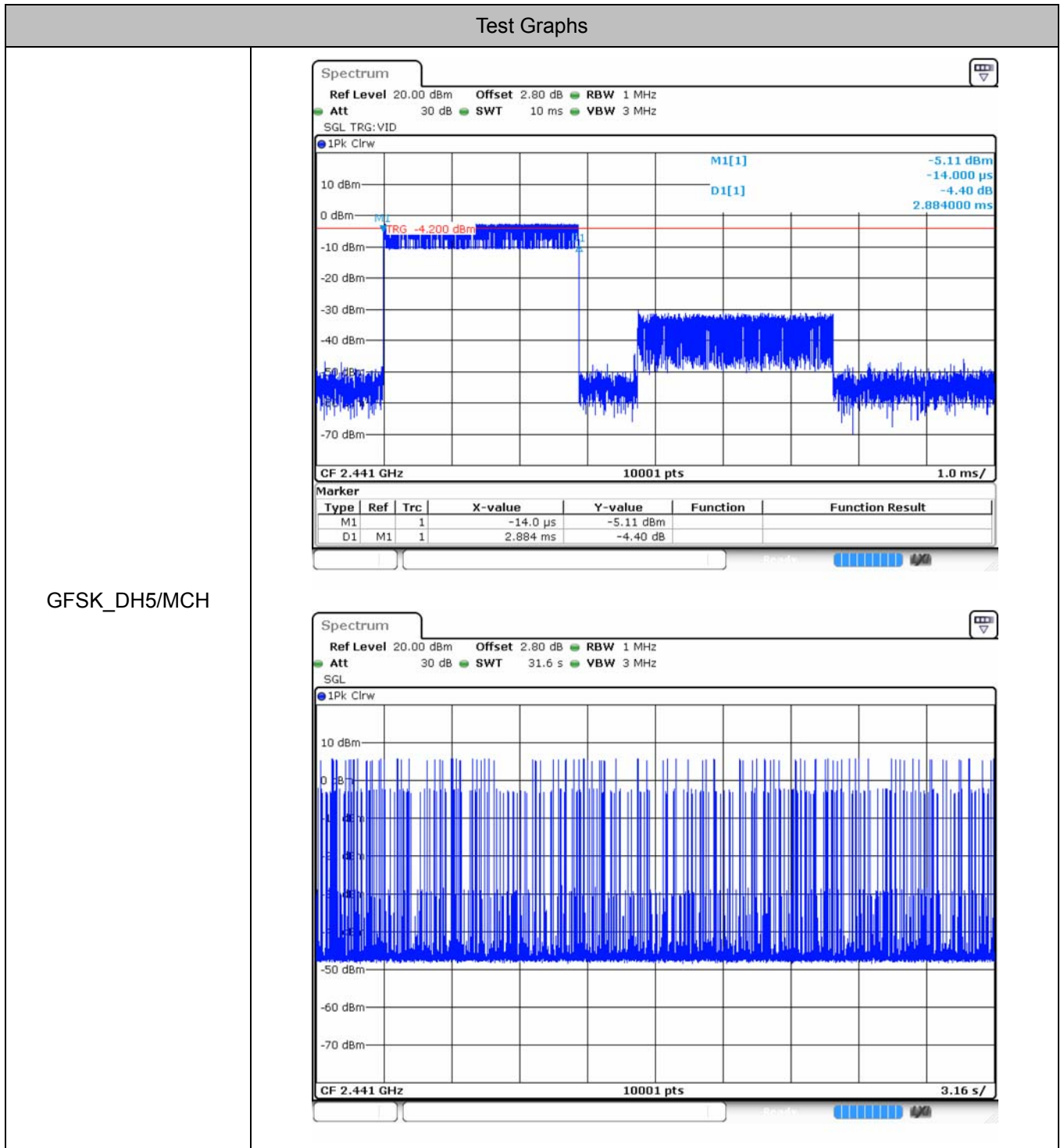
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.884	107	308.588	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.889	113	326.457	0.4	Pass
8DPSK	3DH5	MCH	2.891	118	341.138	0.4	Pass

Right:

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.885	103	297.155	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.889	103	297.567	0.4	Pass
8DPSK	3DH5	MCH	2.891	119	344.029	0.4	Pass

6.2 Test Graphs

Left:



Spectrum

Ref Level 20.00 dBm Offset 2.80 dB RBW 1 MHz

Att 30 dB SWT 31.6 s VBW 3 MHz

SGL

1Pk Clrw

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

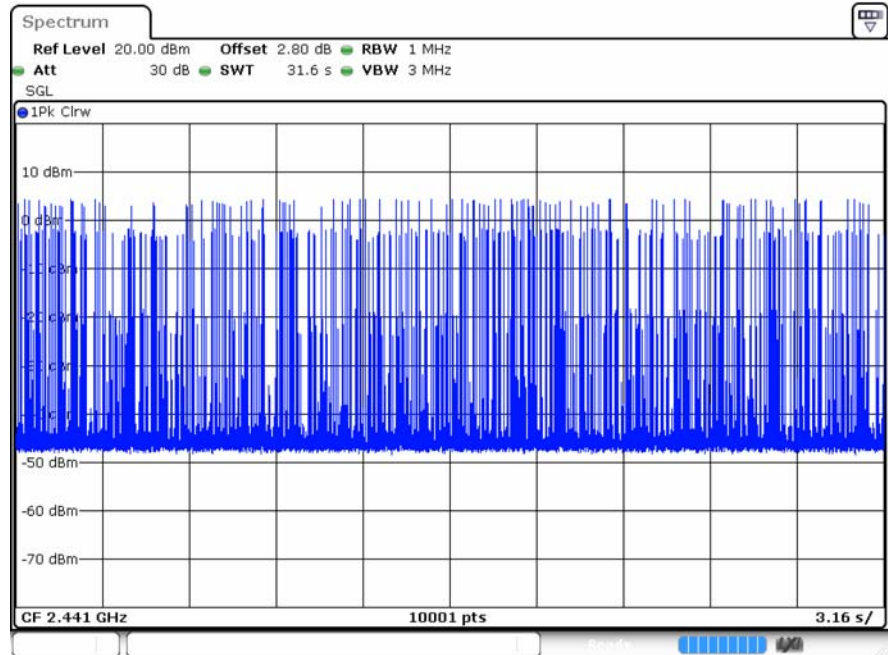
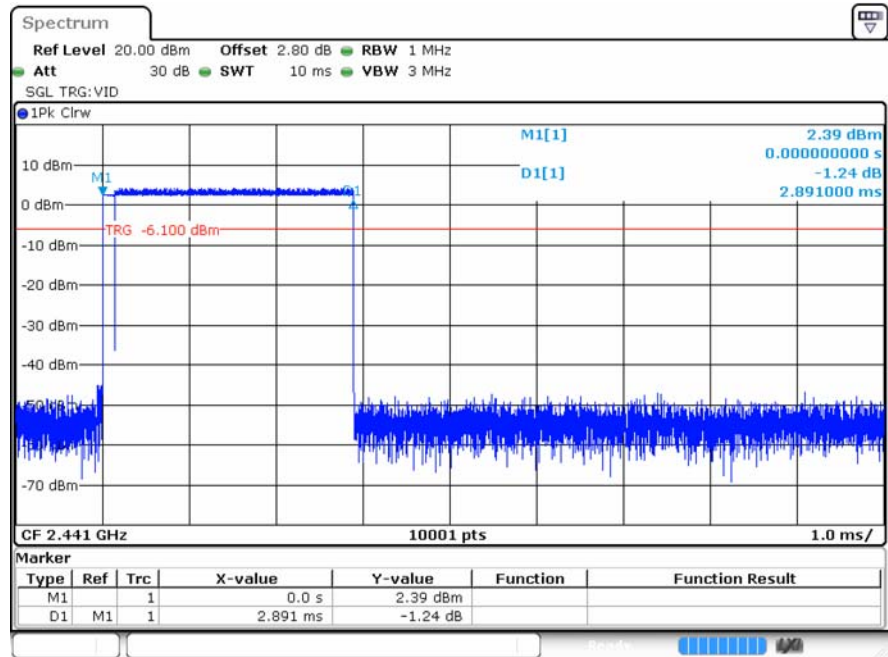
-50 dBm

-60 dBm

-70 dBm

CF 2.441 GHz 10001 pts 3.16 s

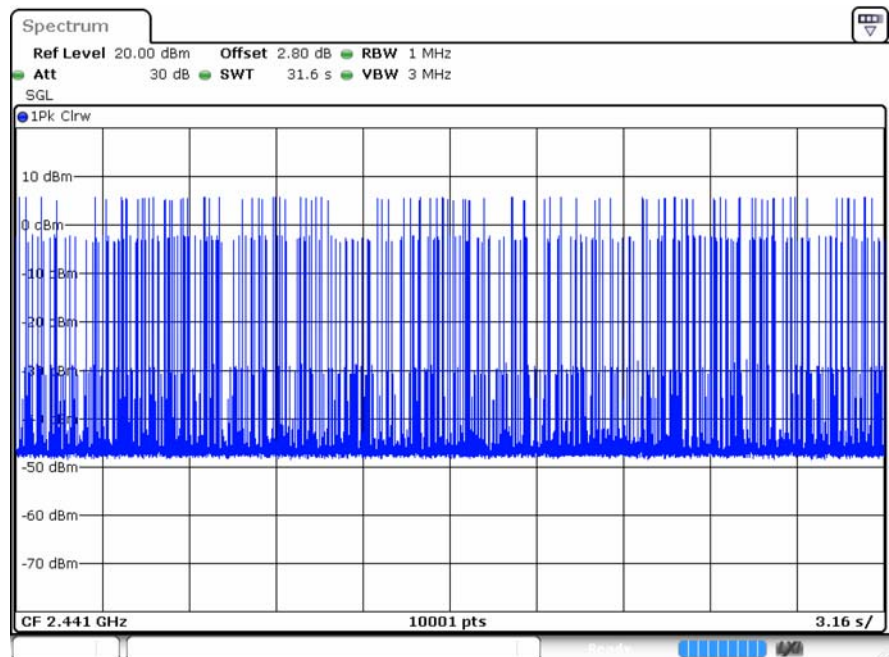
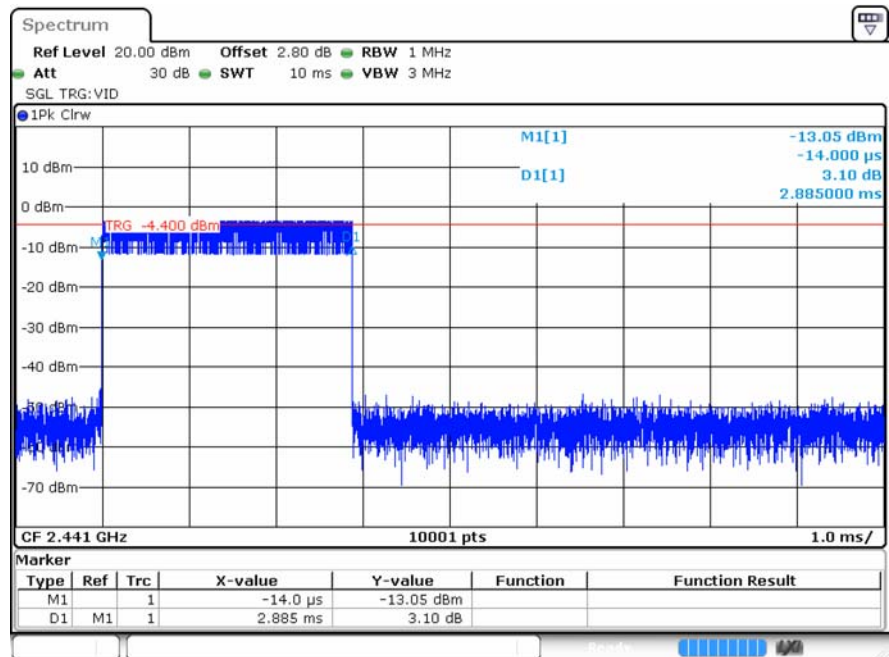
8DPSK_3DH5/MCH



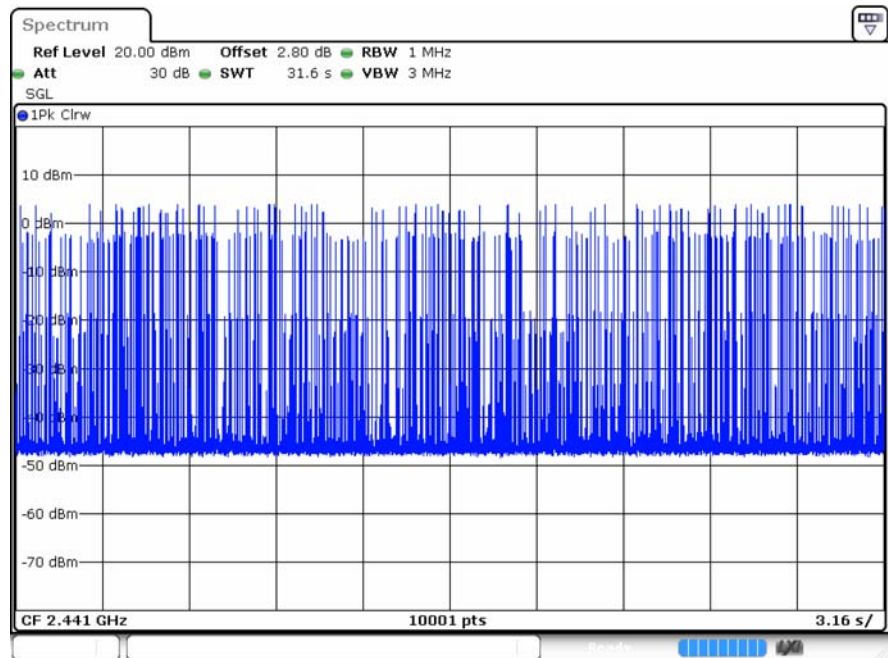
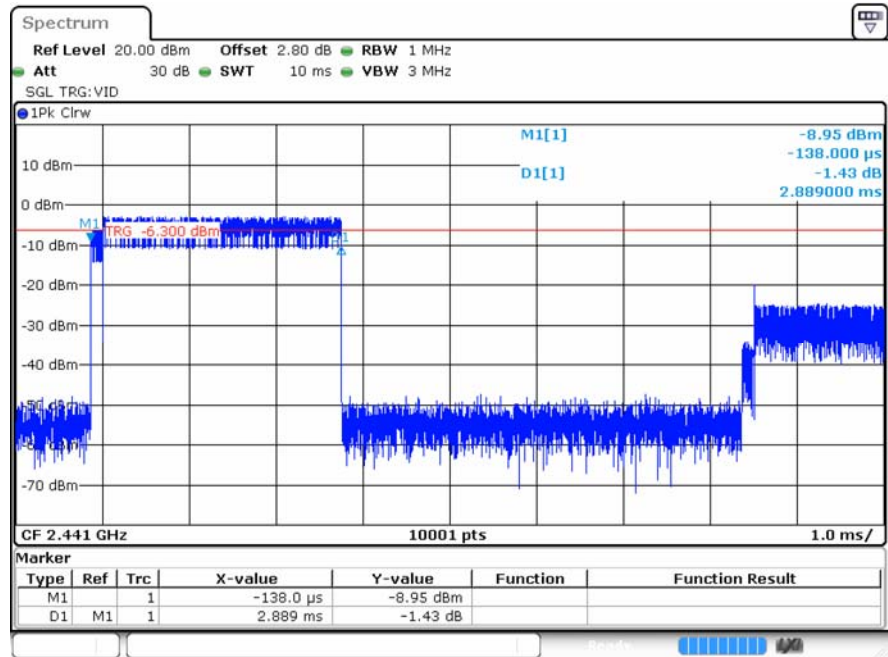
Right:

Test Graphs

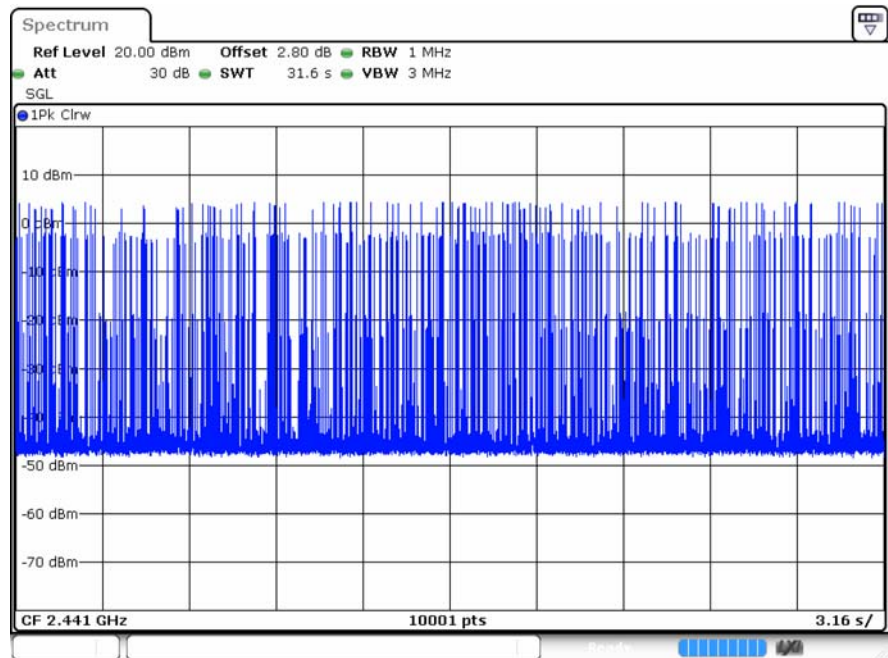
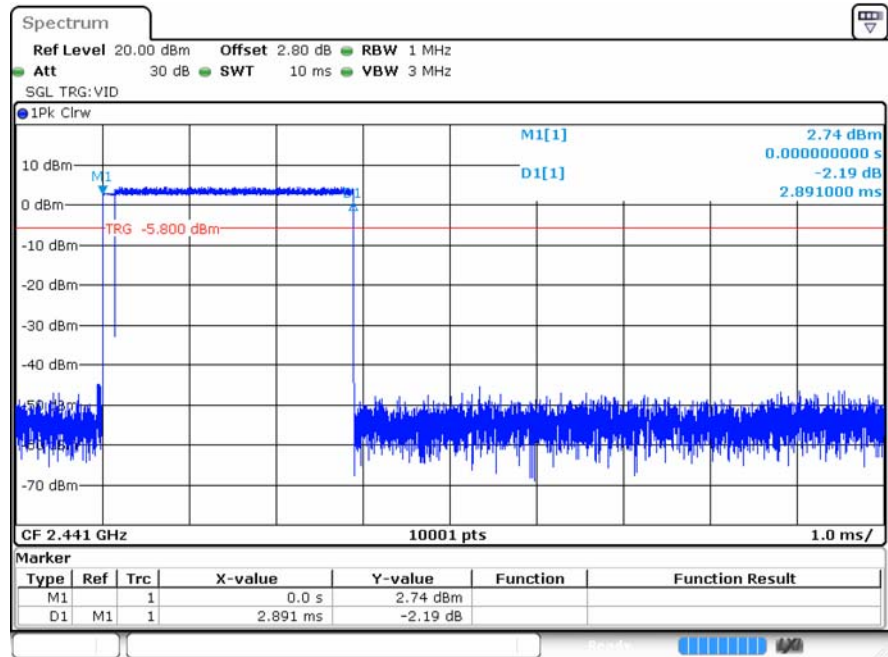
GFSK_DH5/MCH



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH



7 RF Conducted Spurious Emissions

7.1 Test Result

Left:

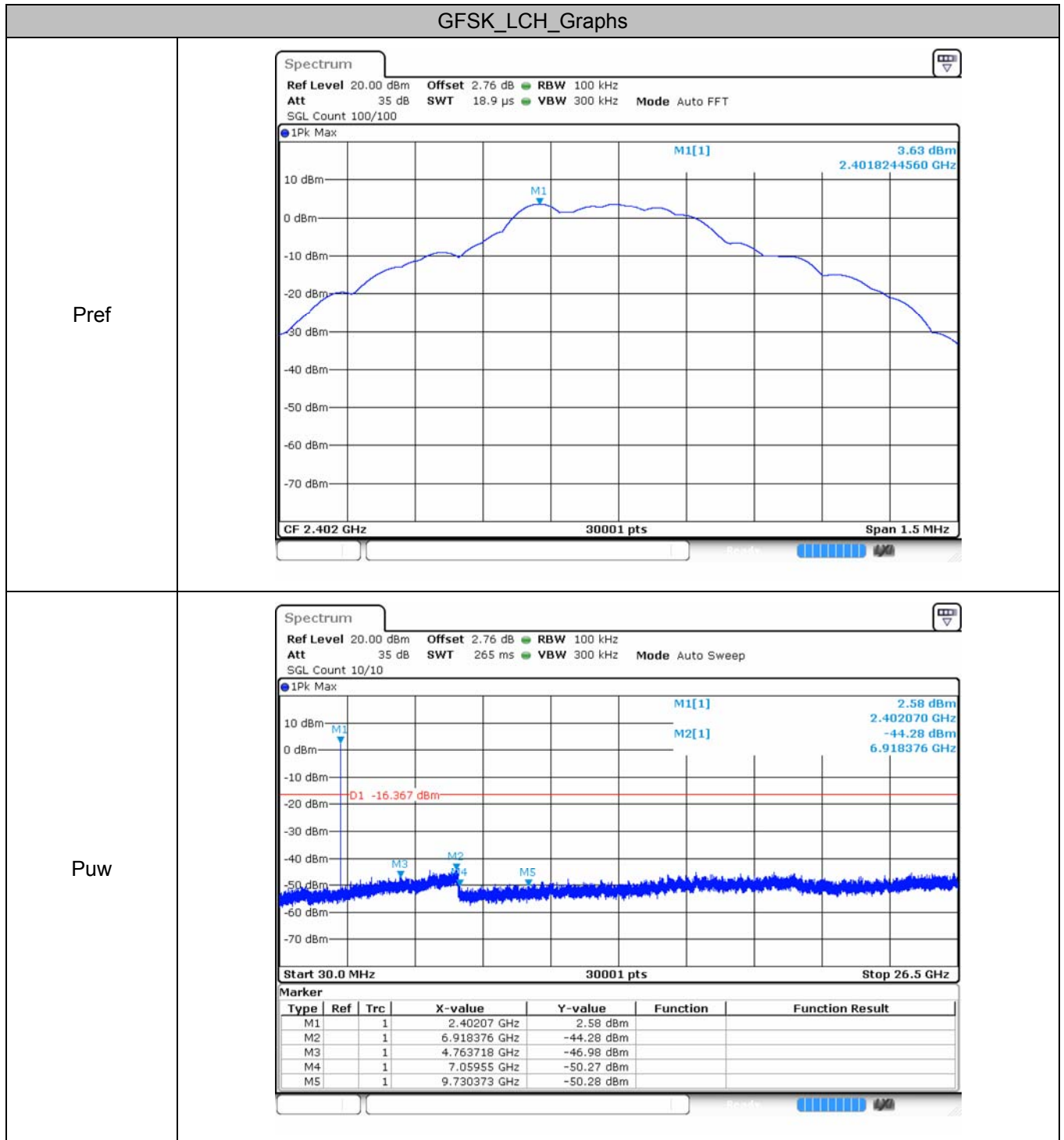
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-47.9	-20	Pass
	MCH	-49.18	-20	Pass
	HCH	-49.96	-20	Pass
$\pi/4$ DQPSK	LCH	-43.43	-20	Pass
	MCH	-44.51	-20	Pass
	HCH	-44.38	-20	Pass
8DPSK	LCH	-44.69	-20	Pass
	MCH	-45.66	-20	Pass
	HCH	-47.08	-20	Pass

Right:

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-47.73	-20	Pass
	MCH	-48.96	-20	Pass
	HCH	-48.71	-20	Pass
$\pi/4$ DQPSK	LCH	-43.5	-20	Pass
	MCH	-44.33	-20	Pass
	HCH	-45.7	-20	Pass
8DPSK	LCH	-44.4	-20	Pass
	MCH	-45.89	-20	Pass
	HCH	-46.59	-20	Pass

7.2 Test Graphs

Left:

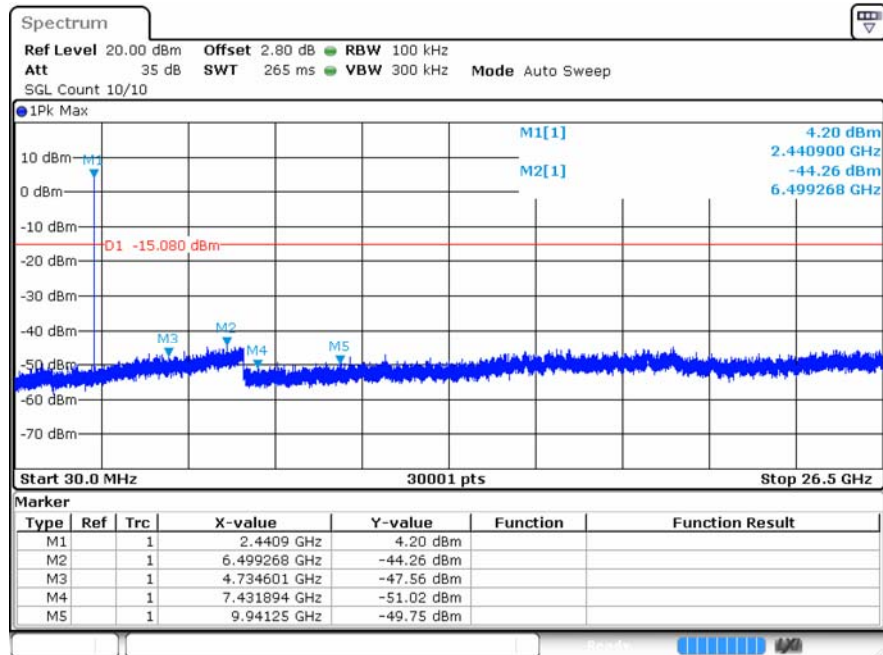


GFSK_MCH_Graphs

Pref

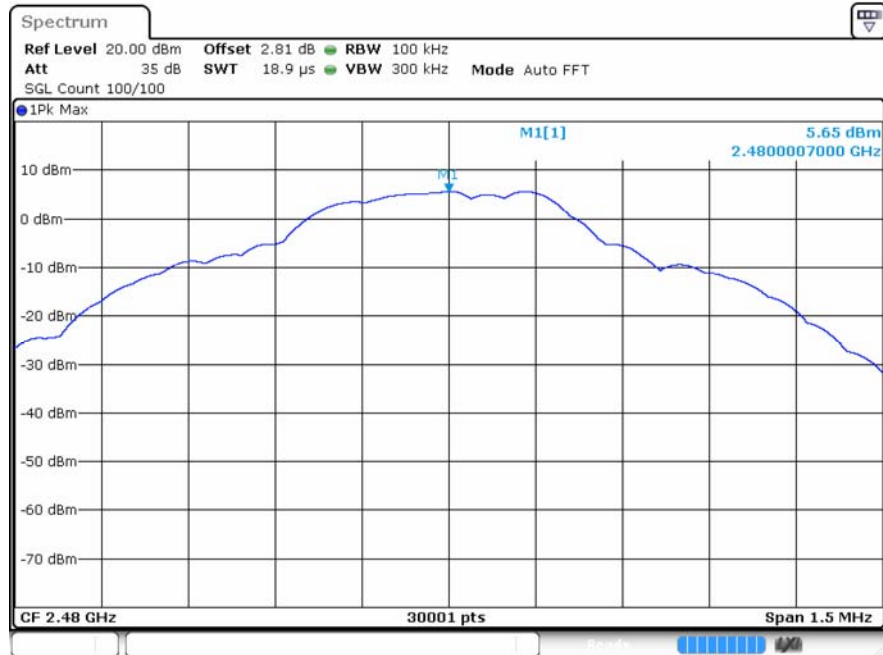


Puw

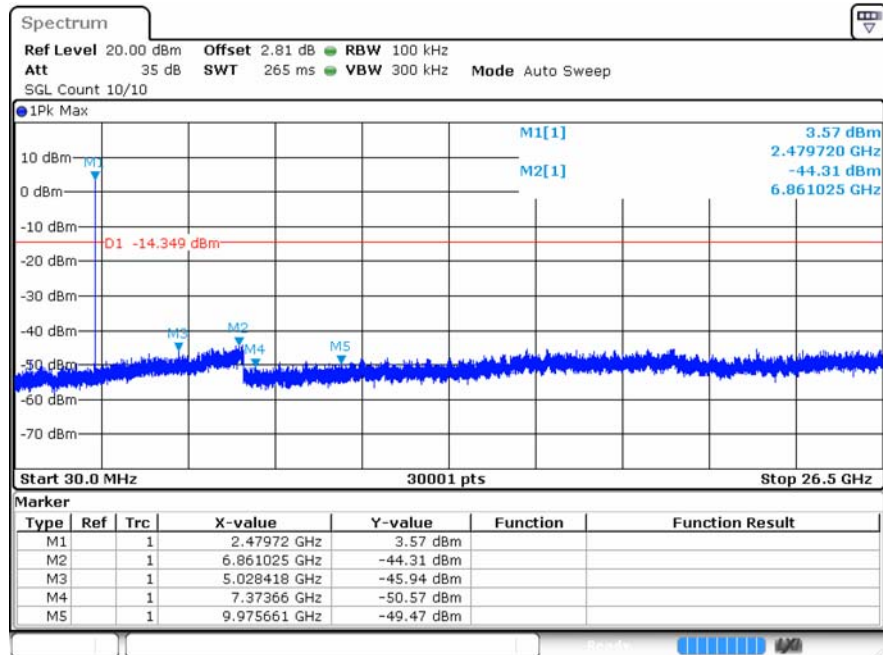


GFSK_HCH_Graphs

Pref

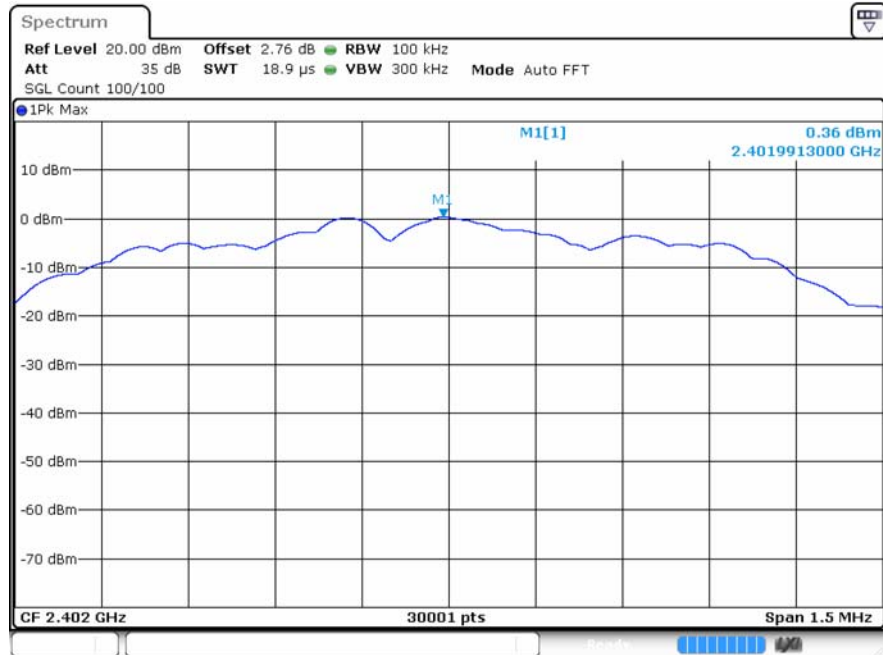


Puw

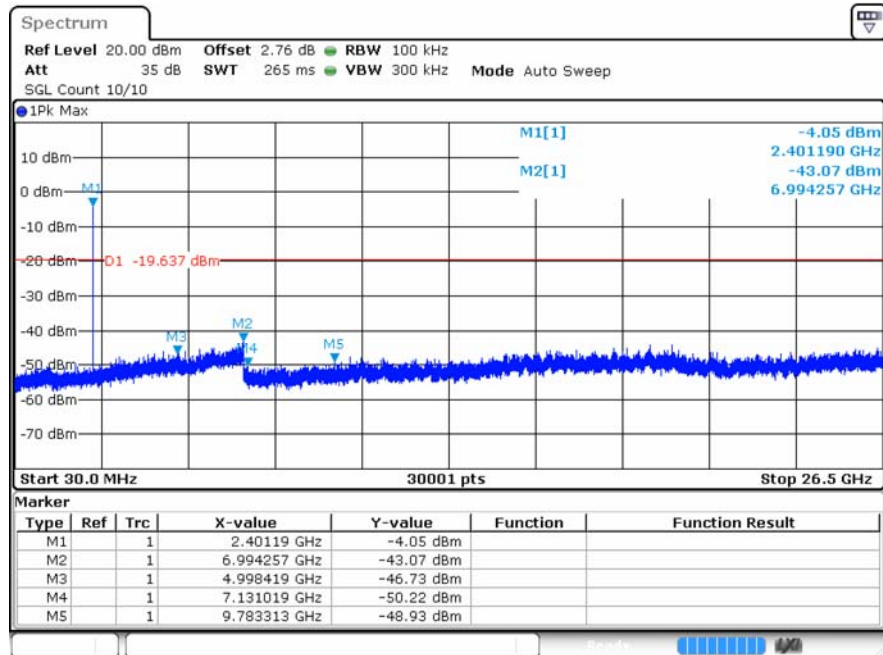


$\pi/4$ DQPSK_LCH_Graphs

Pref

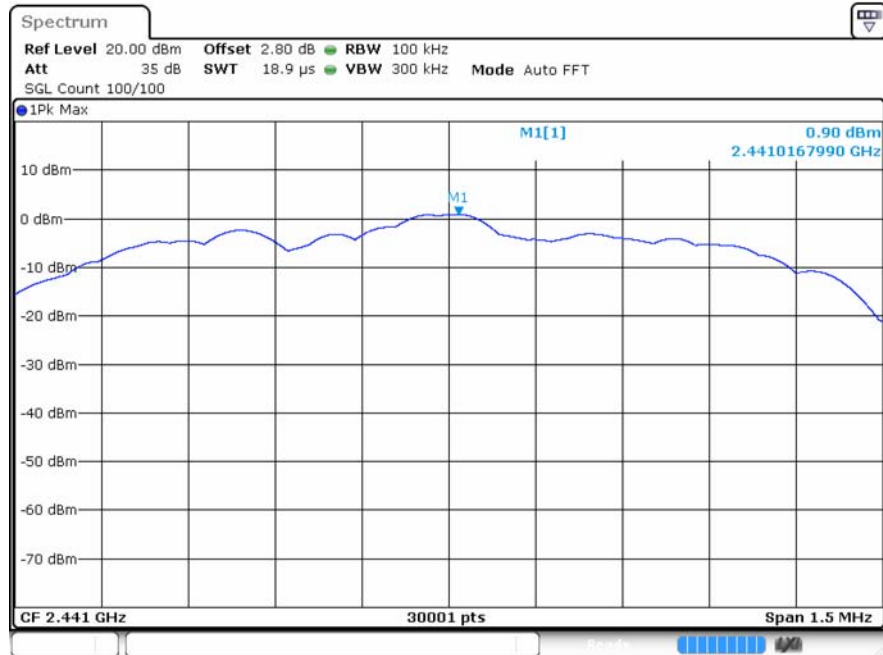


Puw



$\pi/4$ DQPSK_MCH_Graphs

Pref



Puw

