



Appendix A

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

Product Name: TWS Spinner Earbuds

Trade Mark: N/A

Test Model: HM-AU-BE-227

Environmental Conditions

Temperature:	25.4 °C
Relative Humidity:	52.3%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

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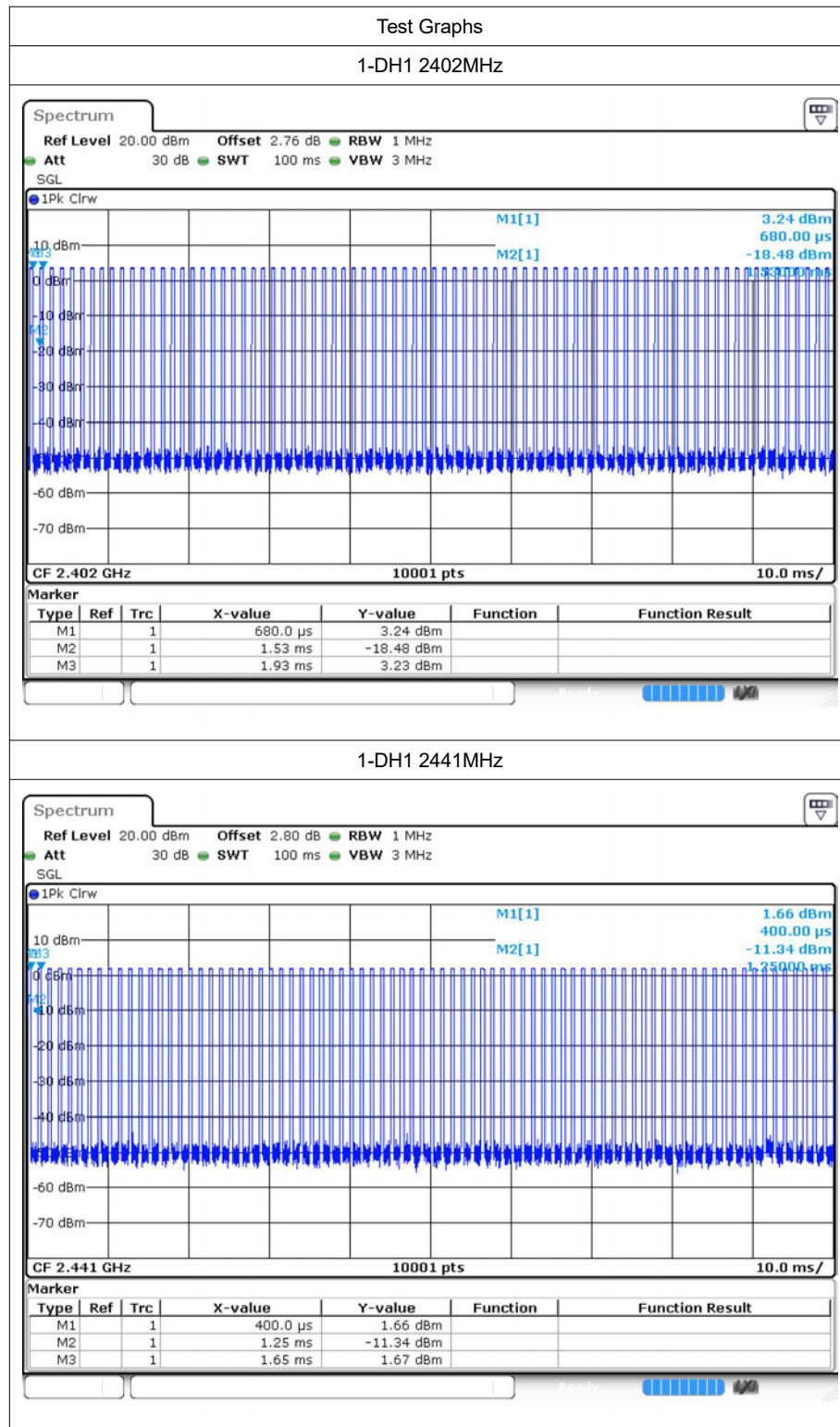
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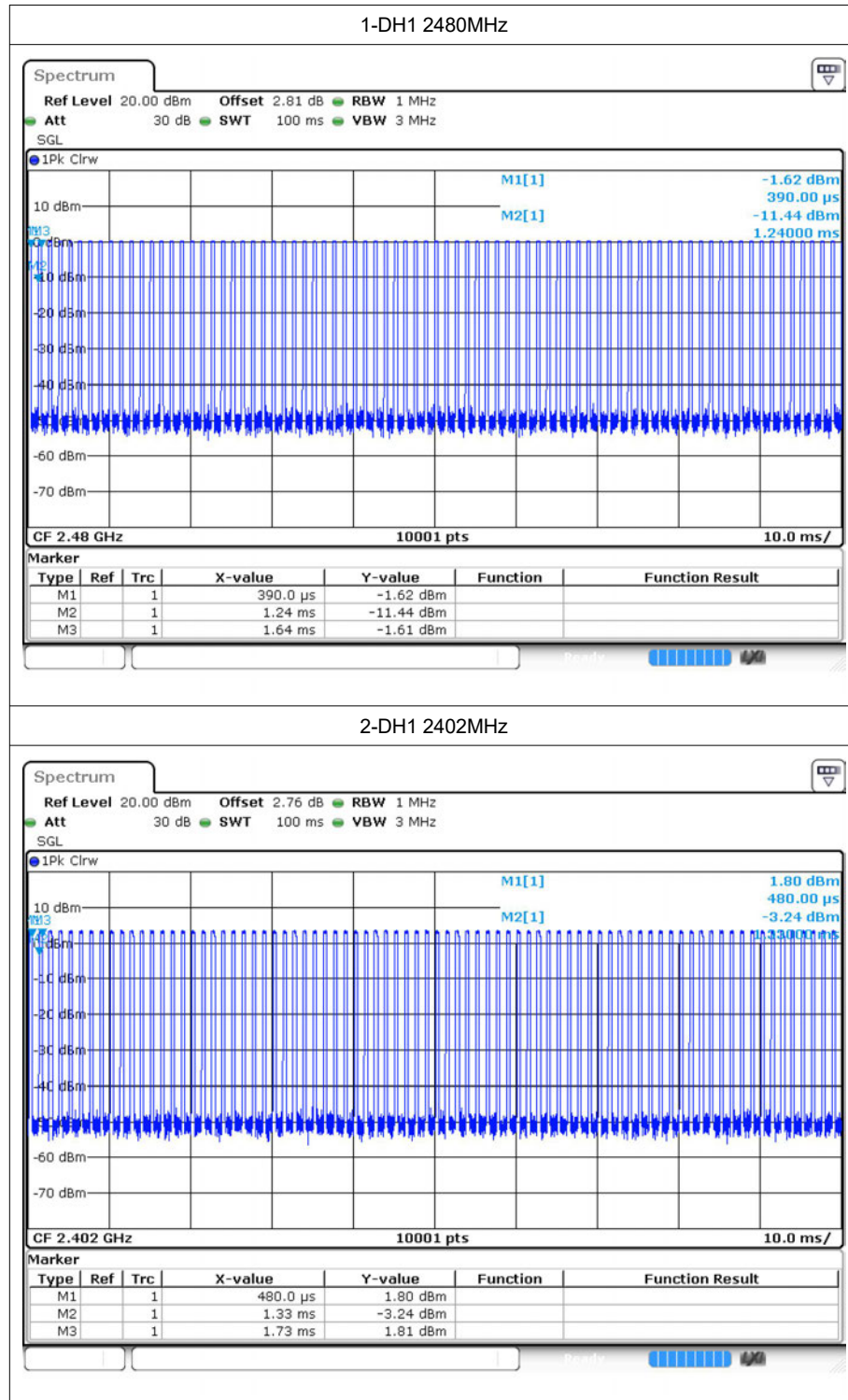
1 Duty Cycle

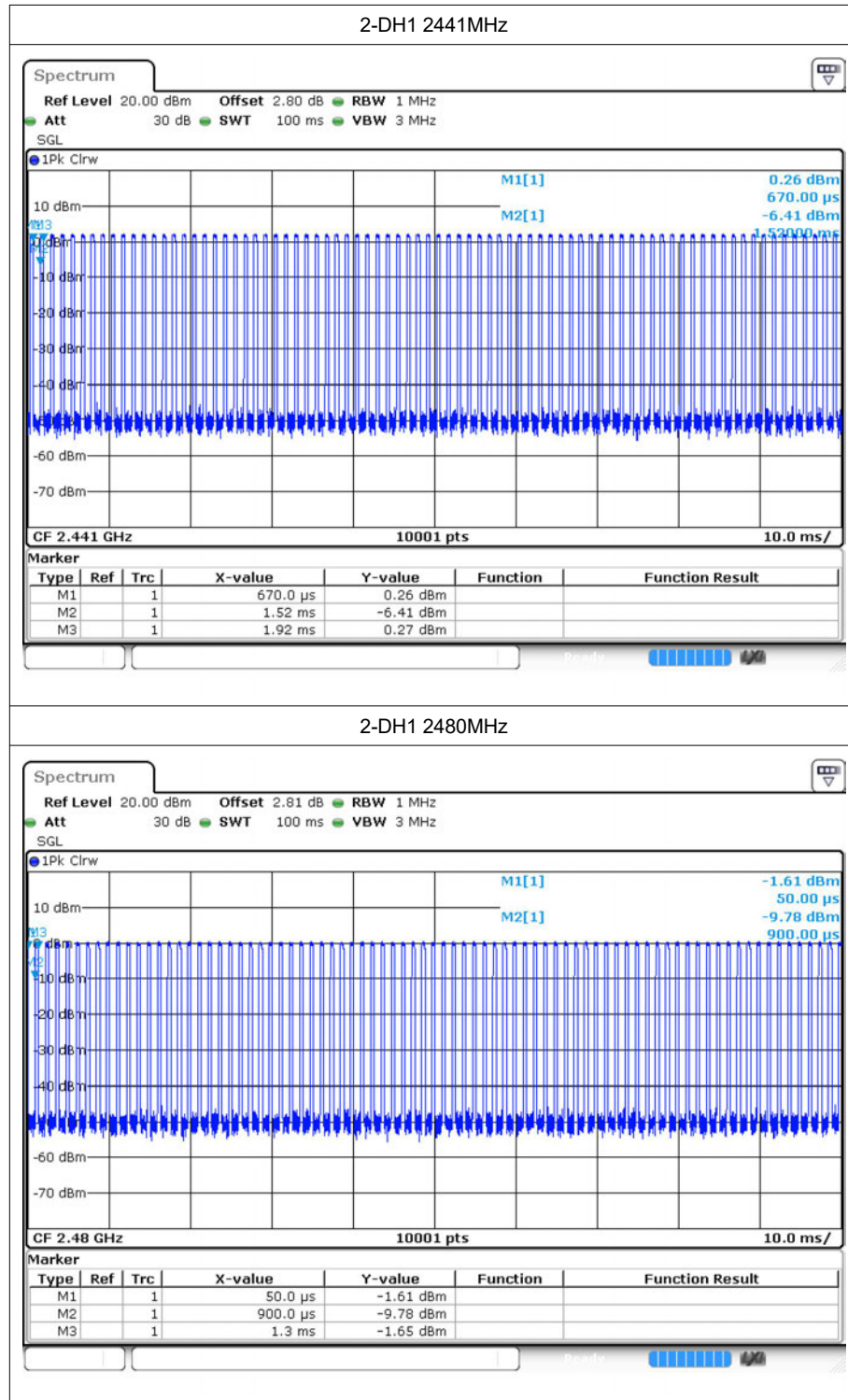
1.1 Test Result

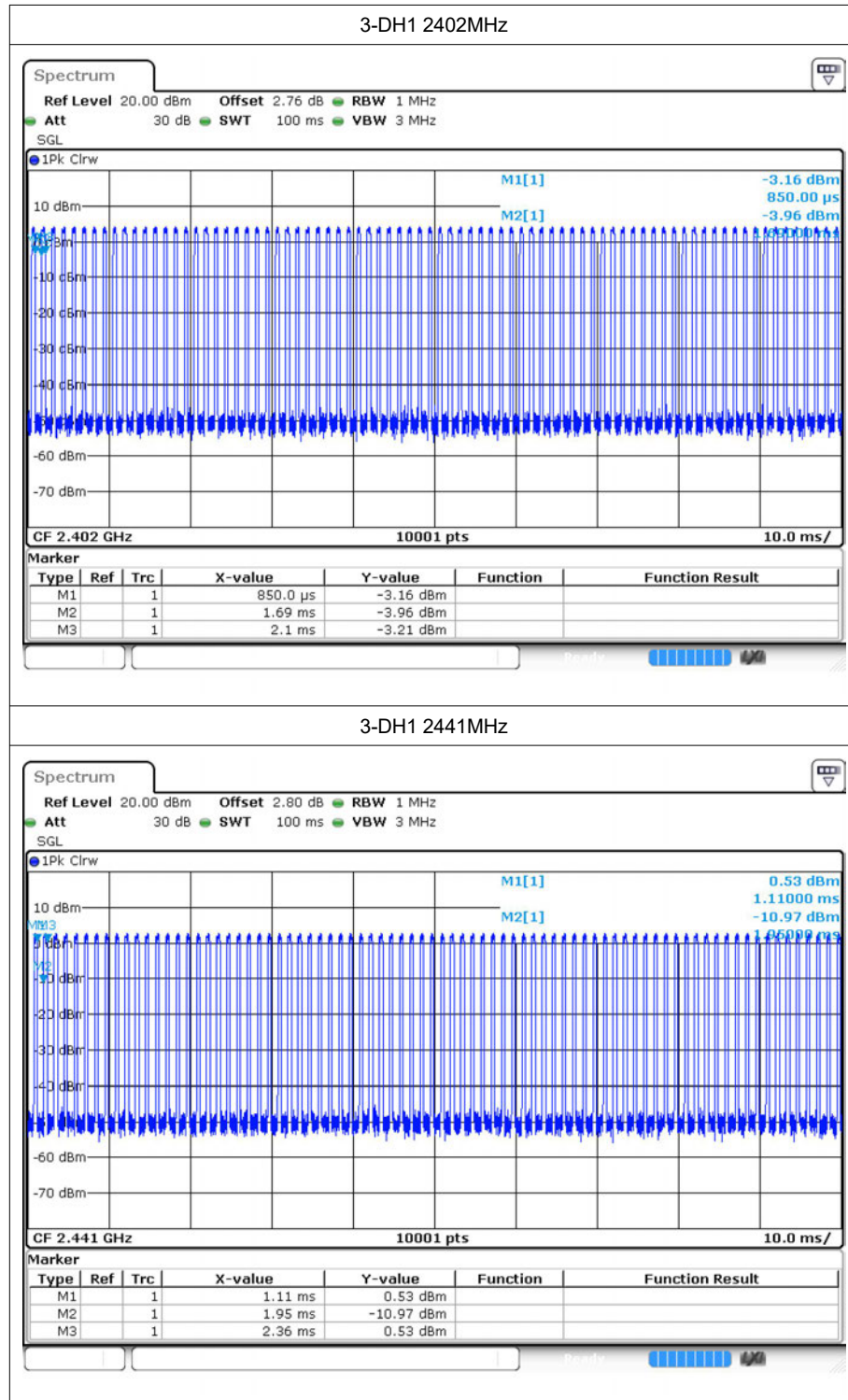
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	32.8	2.5
1-DH1	2441	32.81	2.5
1-DH1	2480	32.81	2.5
2-DH1	2402	32.8	2.5
2-DH1	2441	32.8	2.5
2-DH1	2480	32.81	2.5
3-DH1	2402	33.6	2.44
3-DH1	2441	33.6	2.44
3-DH1	2480	33.6	2.44

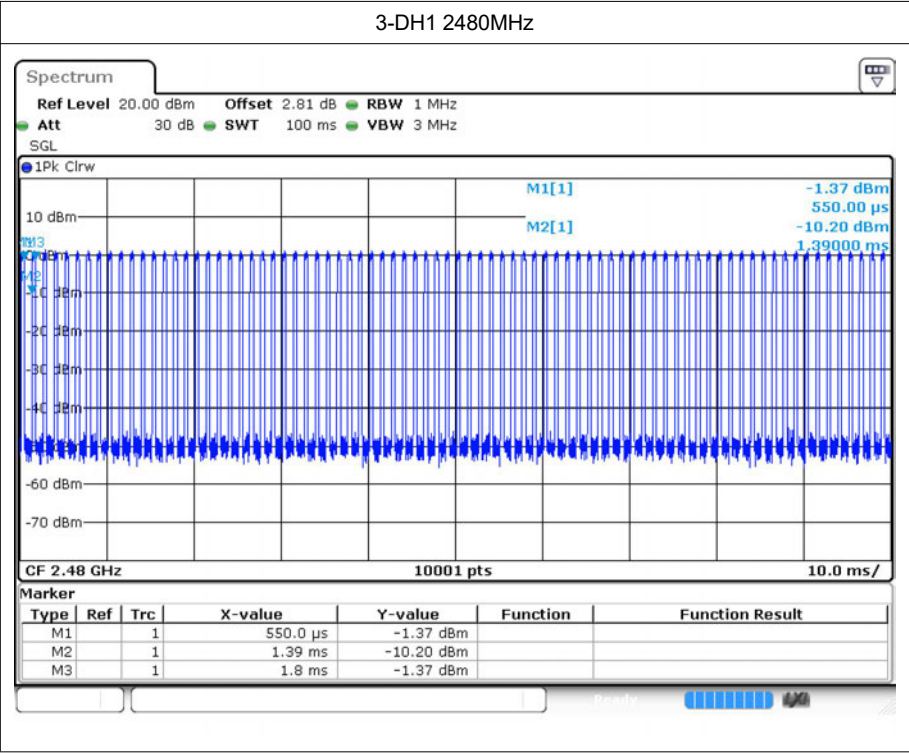
1.2 Test Graphs









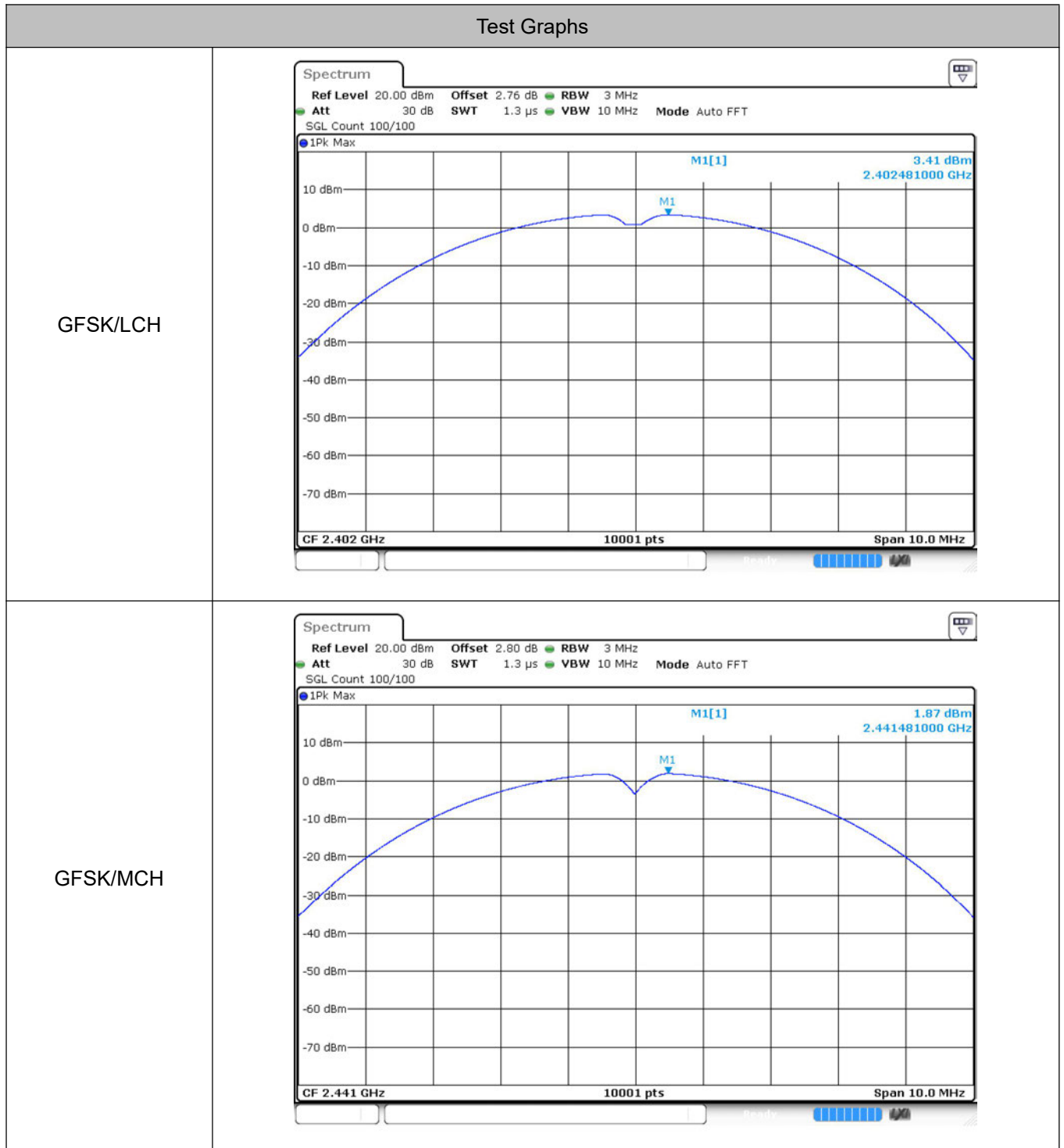


2 Maximum Conducted Peak Output Power

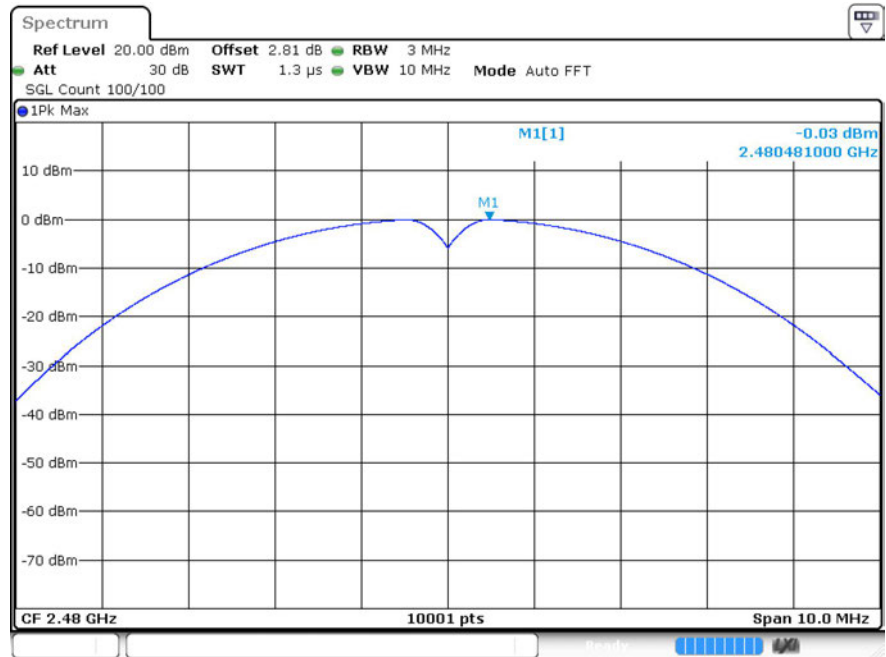
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.41	21	Pass
	MCH	1.87	21	Pass
	HCH	-0.03	21	Pass
$\pi/4$ DQPSK	LCH	3.33	21	Pass
	MCH	2.3	21	Pass
	HCH	0.22	21	Pass
8DPSK	LCH	3.49	21	Pass
	MCH	2.09	21	Pass
	HCH	0.17	21	Pass

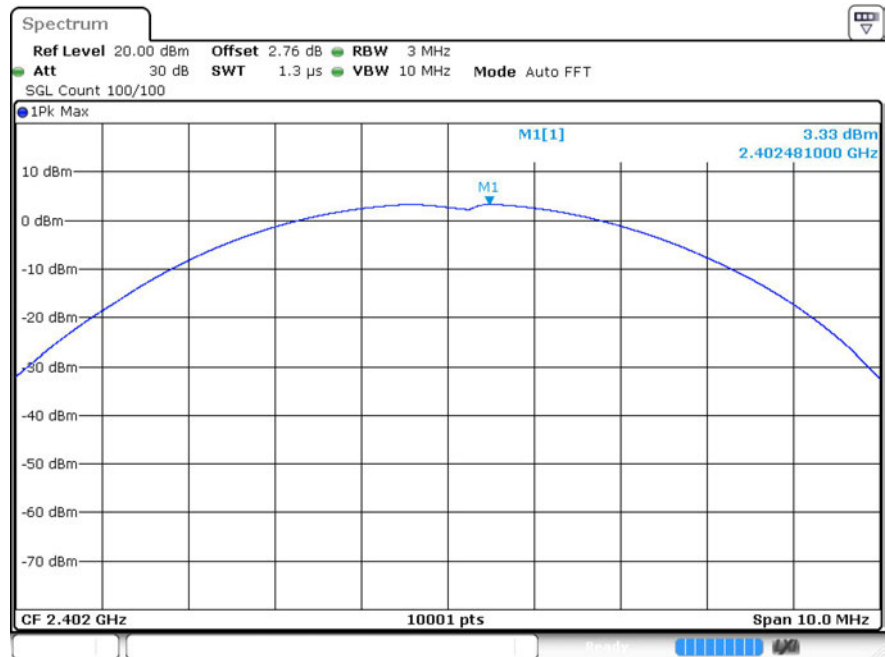
2.2 Test Graphs



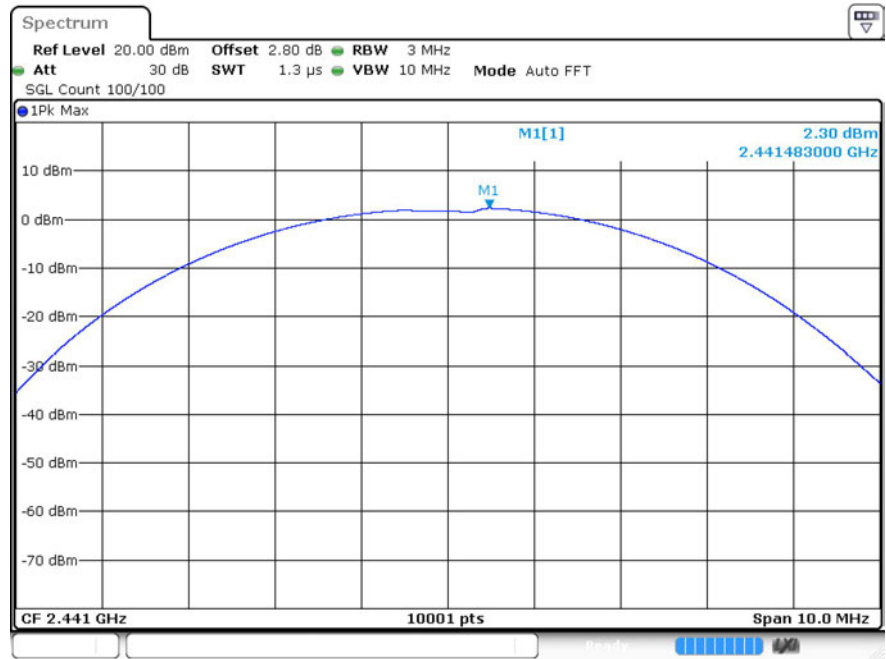
GFSK/HCH



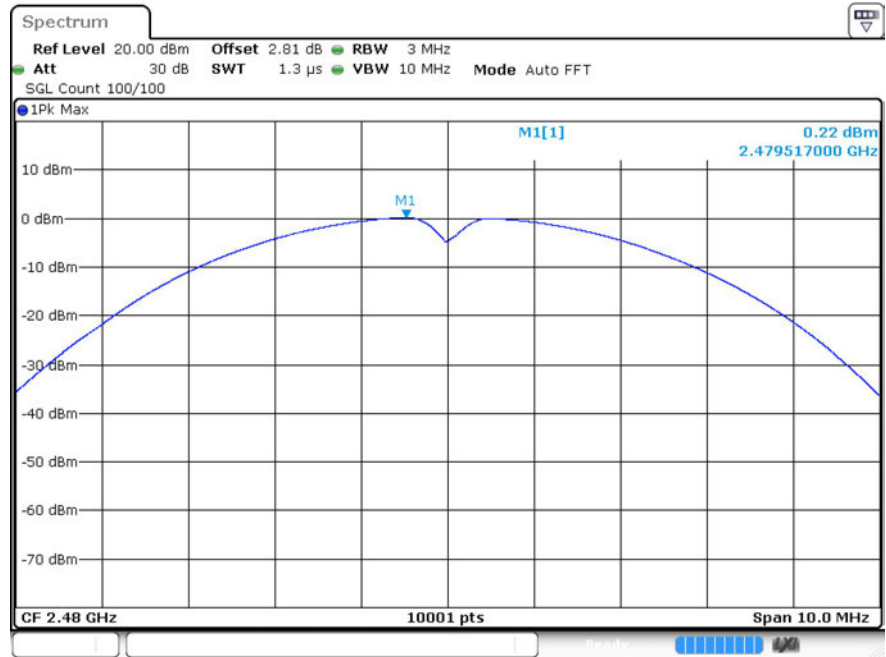
$\pi/4$ DQPSK/LCH



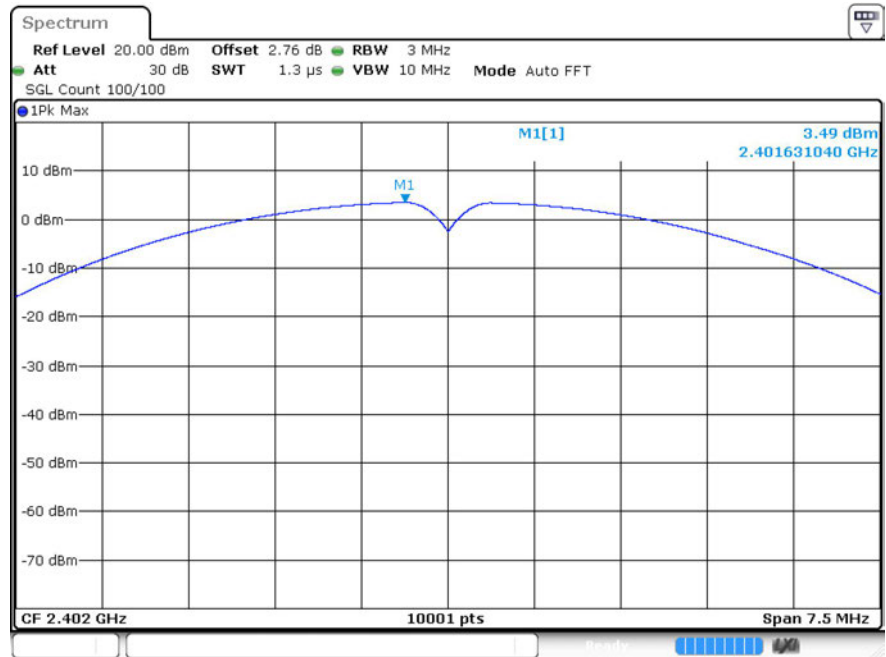
$\pi/4$ DQPSK/MCH



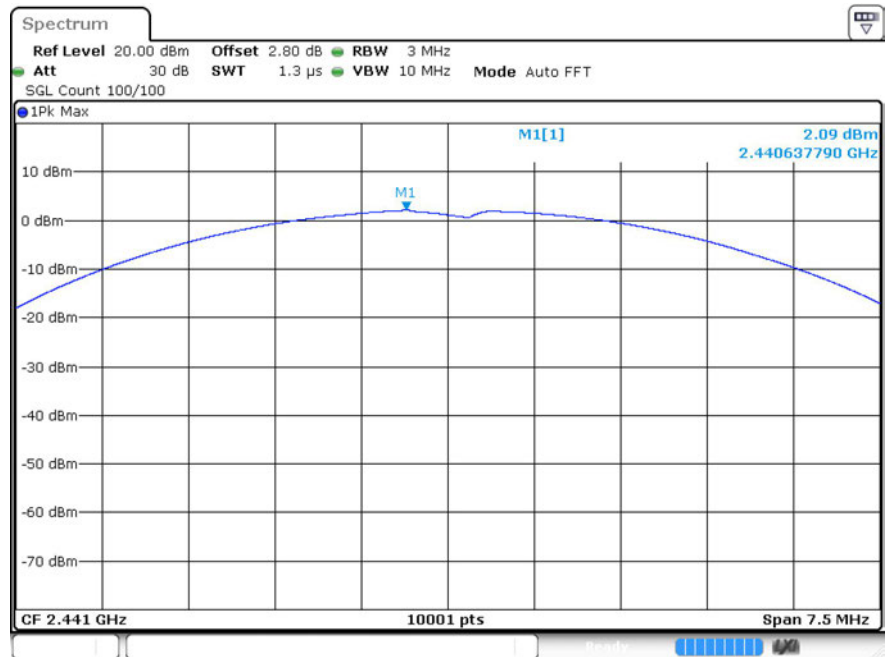
$\pi/4$ DQPSK/HCH



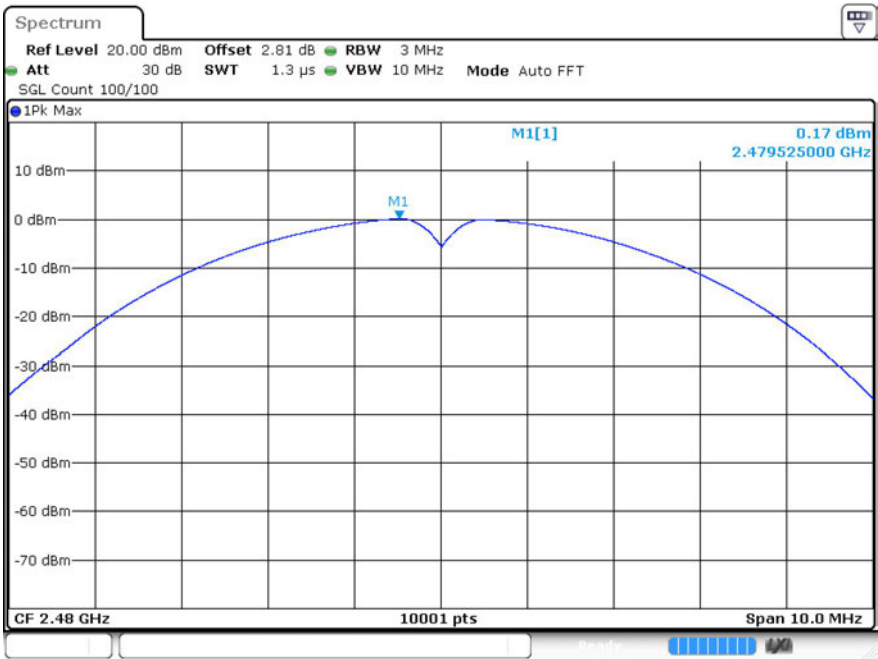
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

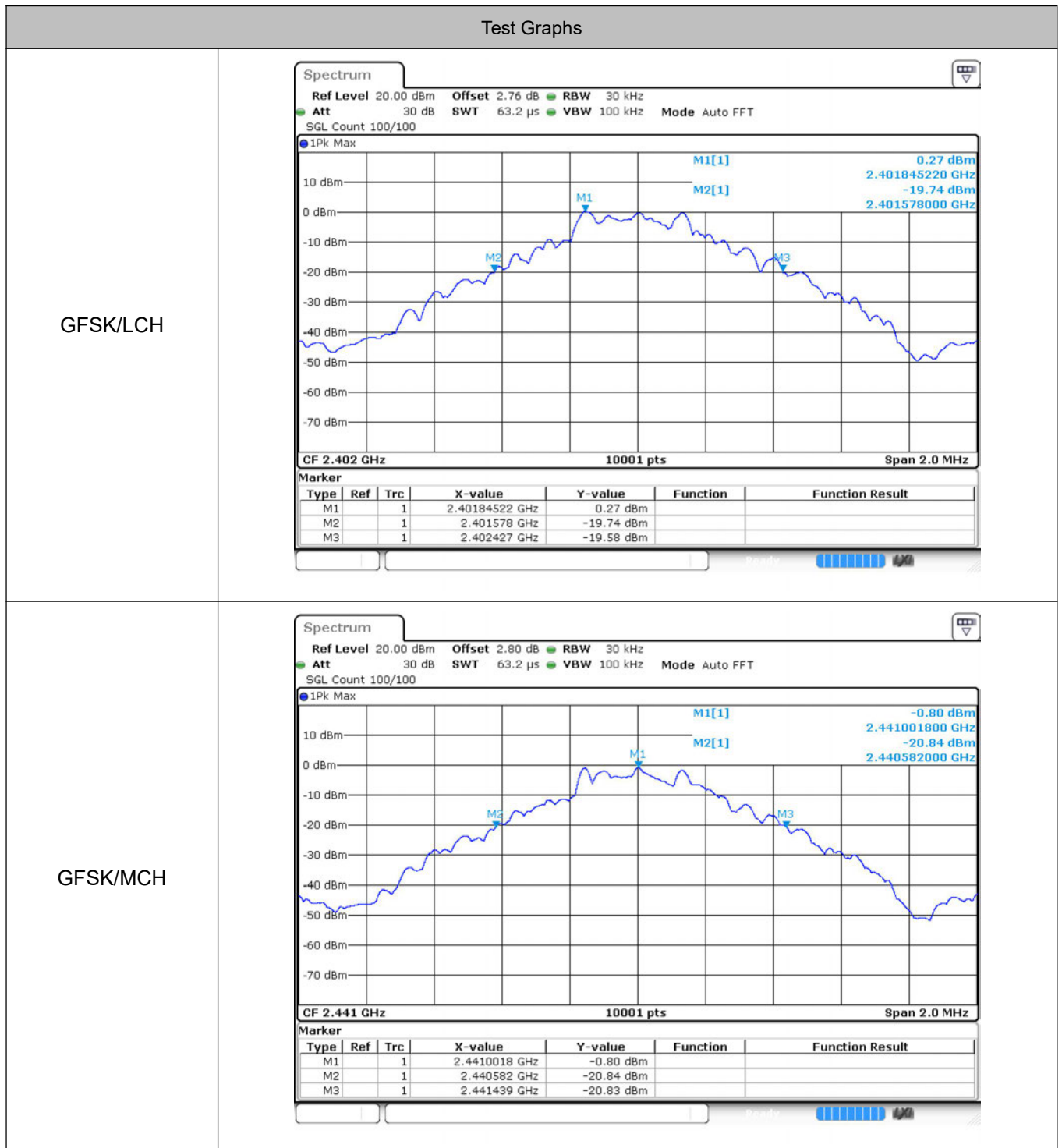


3 20dB Bandwidth

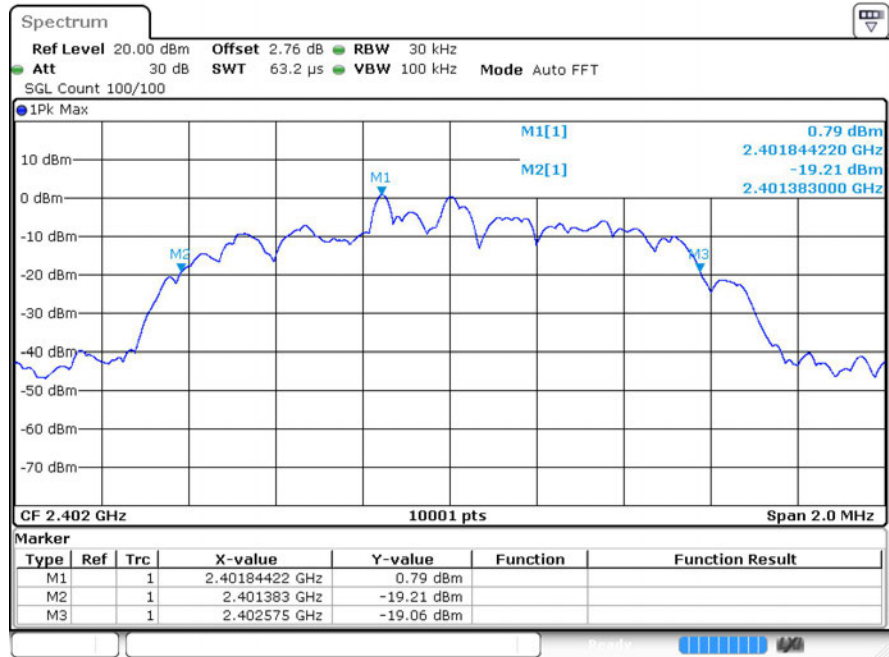
3.1 Test Result

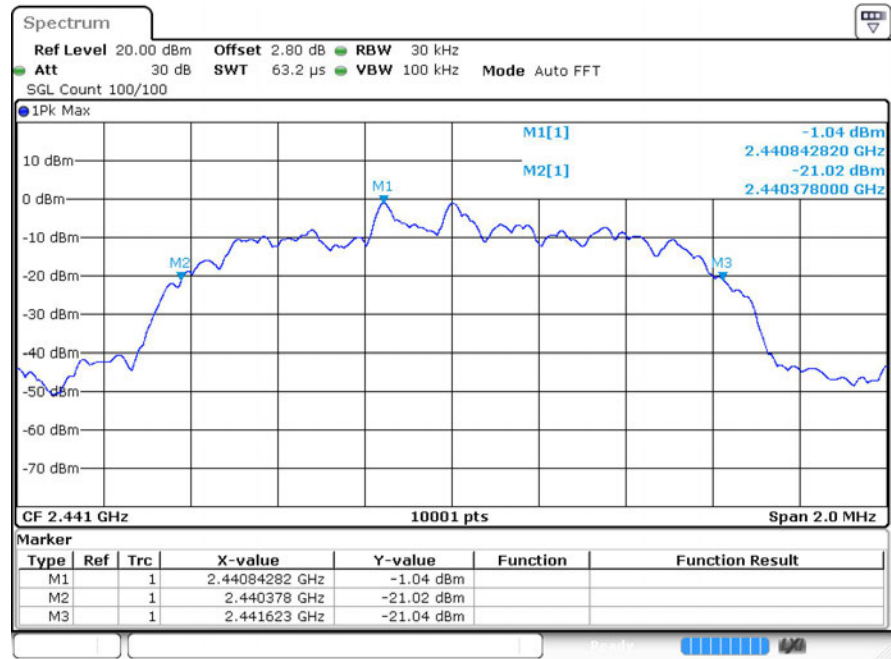
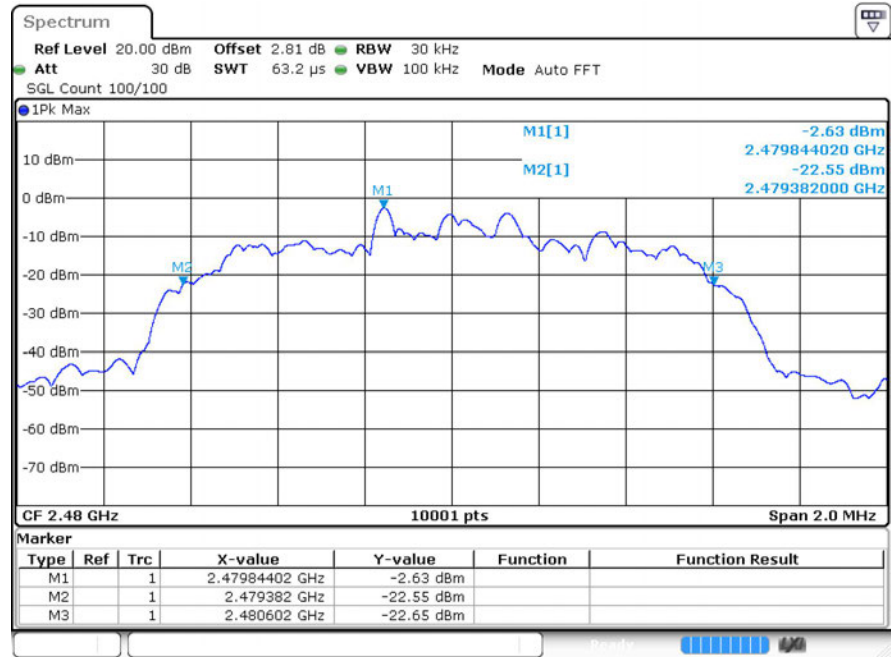
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.849	Not Specified	Pass
	MCH	0.856	Not Specified	Pass
	HCH	0.852	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.192	Not Specified	Pass
	MCH	1.245	Not Specified	Pass
	HCH	1.22	Not Specified	Pass
8DPSK	LCH	1.208	Not Specified	Pass
	MCH	1.199	Not Specified	Pass
	HCH	1.215	Not Specified	Pass

3.2 Test Graphs

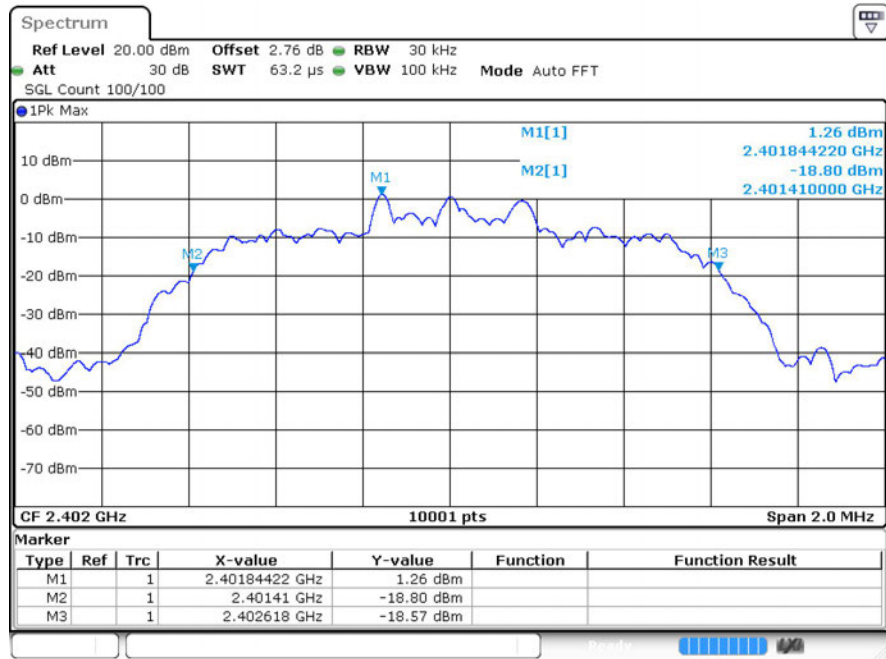


GFSK/HCH

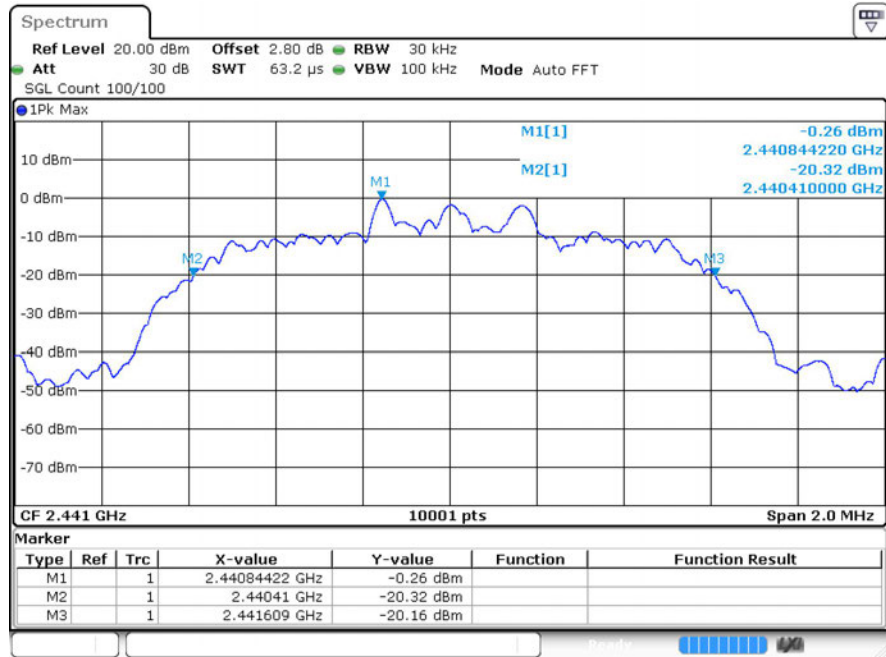

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


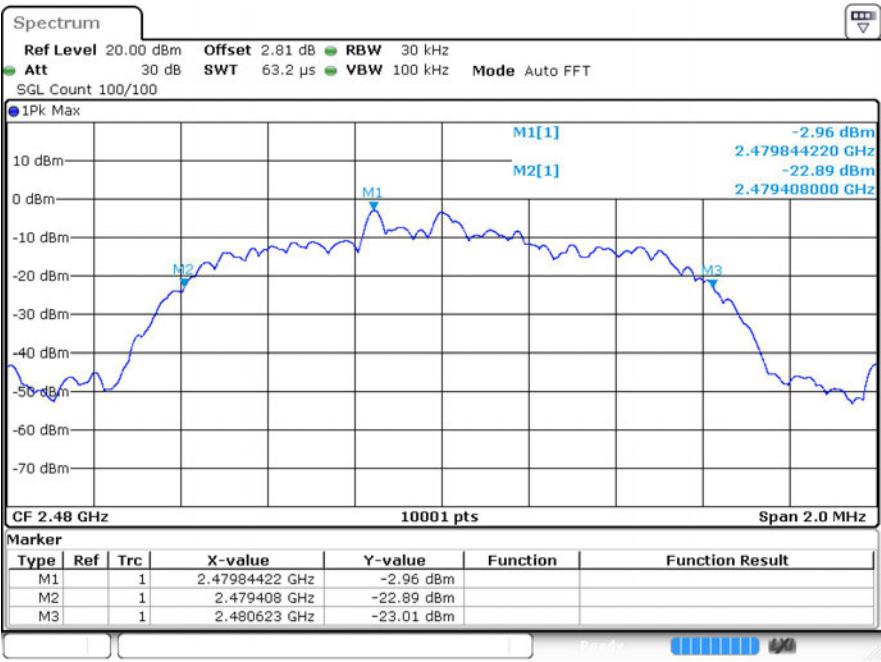
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



4 Carrier Frequency Separation

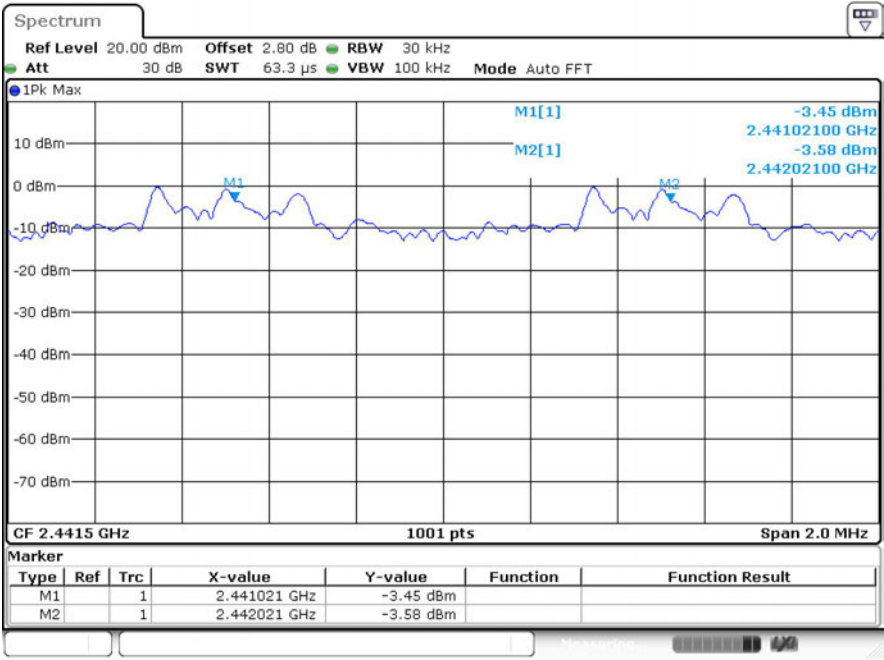
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.571	Pass
$\pi/4$ DQPSK	MCH	1.003	0.83	Pass
8DPSK	MCH	1	0.799	Pass

4.2 Test Graphs



8DPSK/MCH

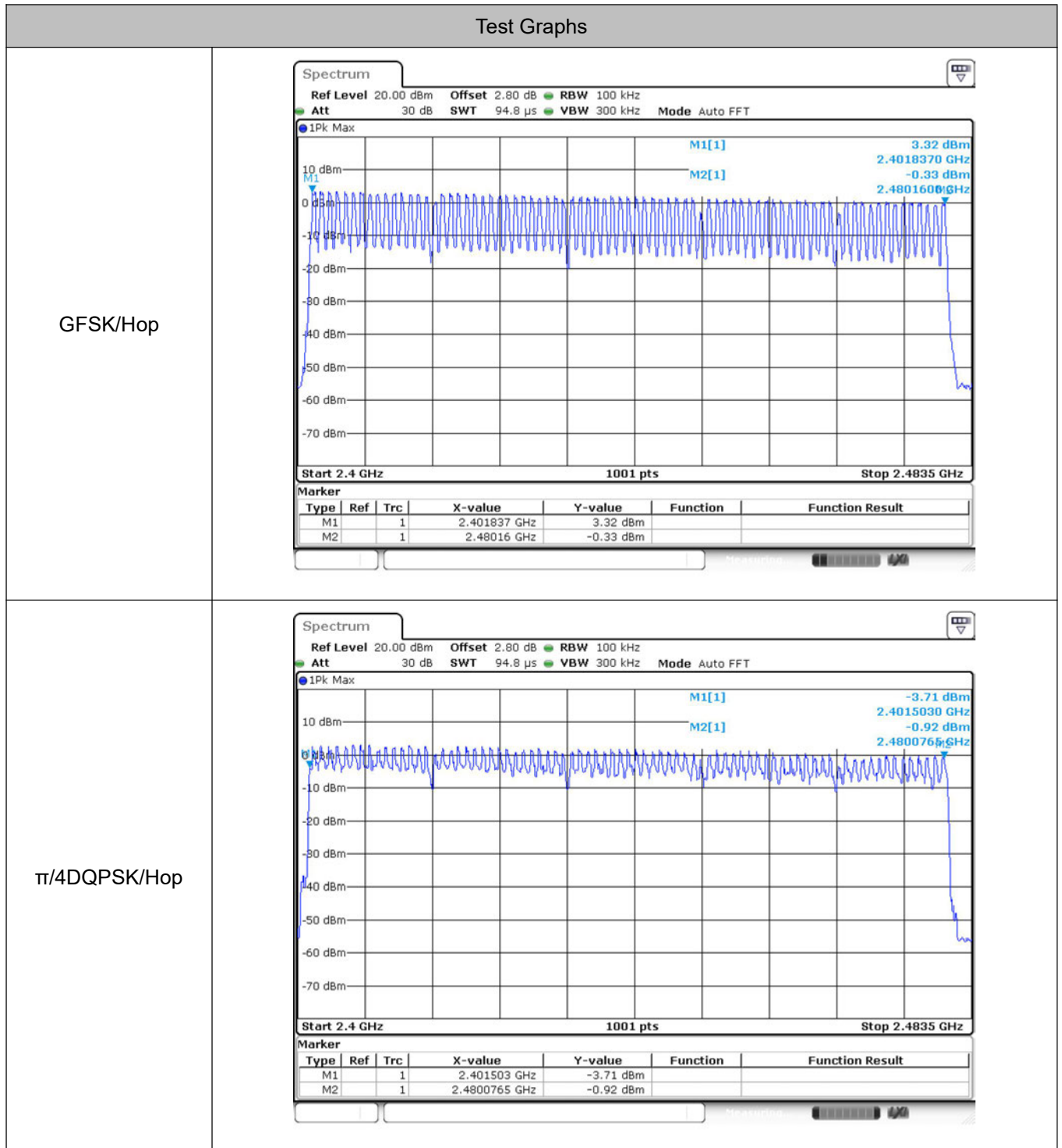


5 Hopping Channel Number

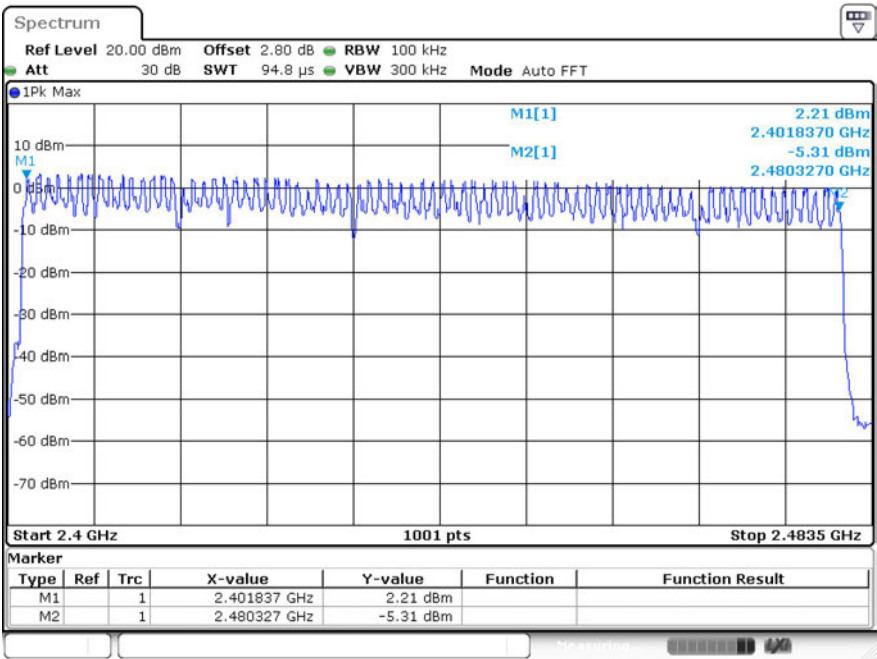
5.1 Test Result

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

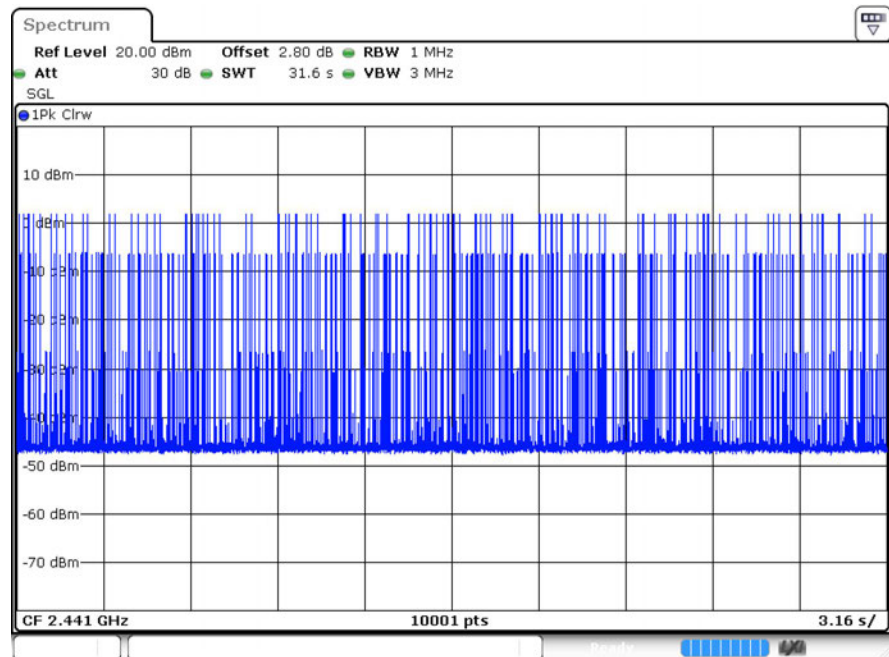
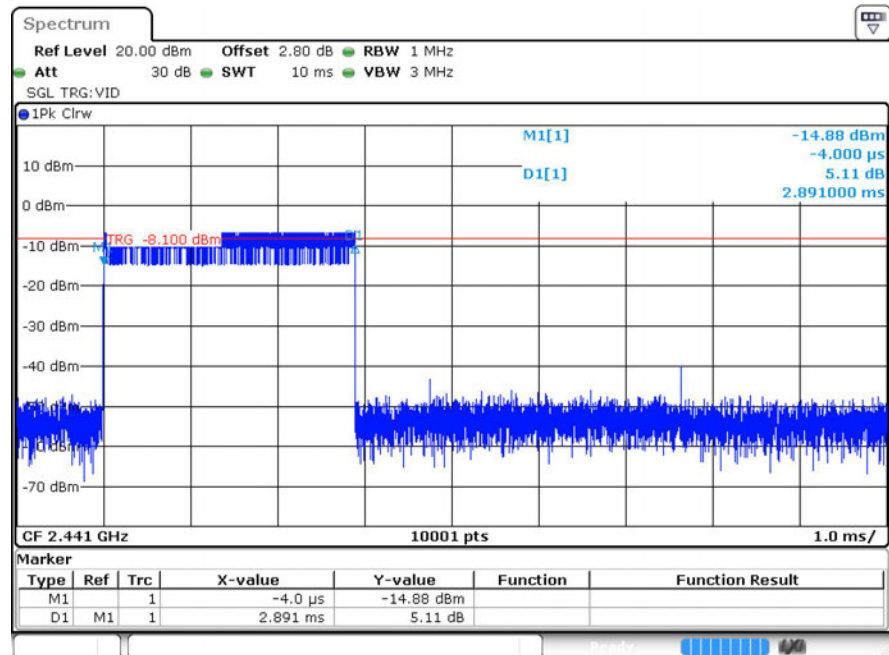
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.891	111	320.901	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.9	104	301.6	0.4	Pass
8DPSK	3DH5	MCH	2.902	104	301.808	0.4	Pass

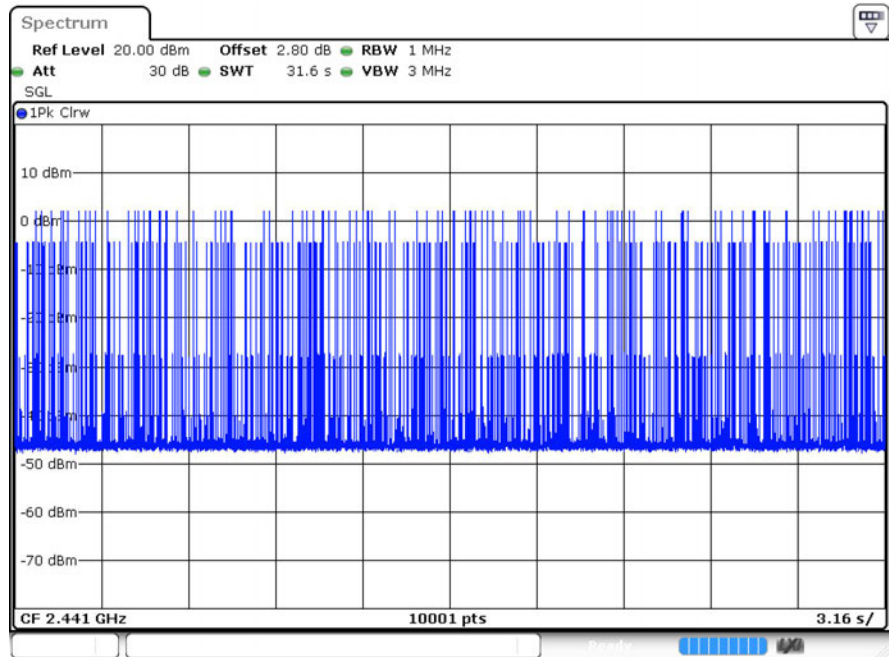
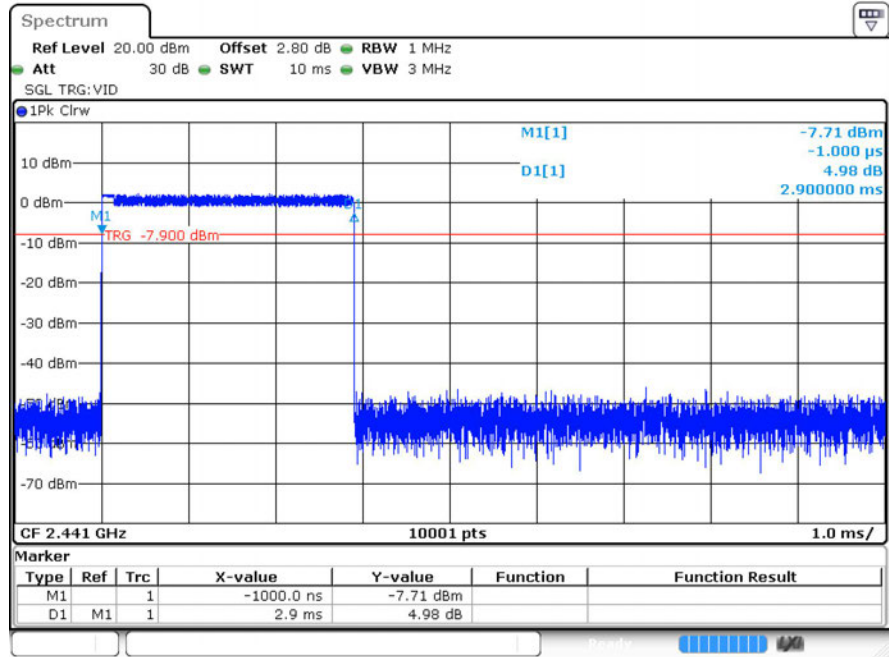
6.2 Test Graphs

Test Graphs

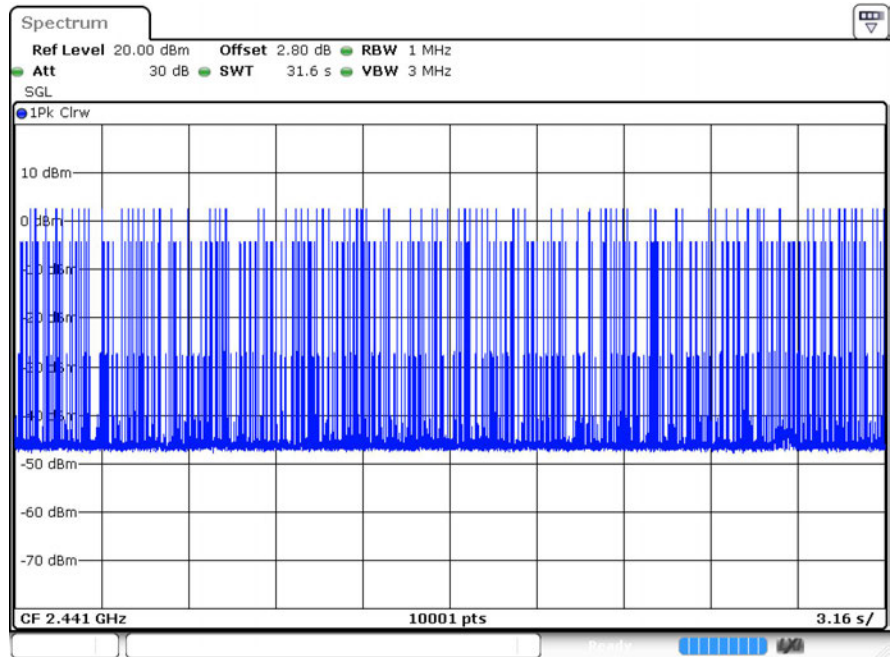
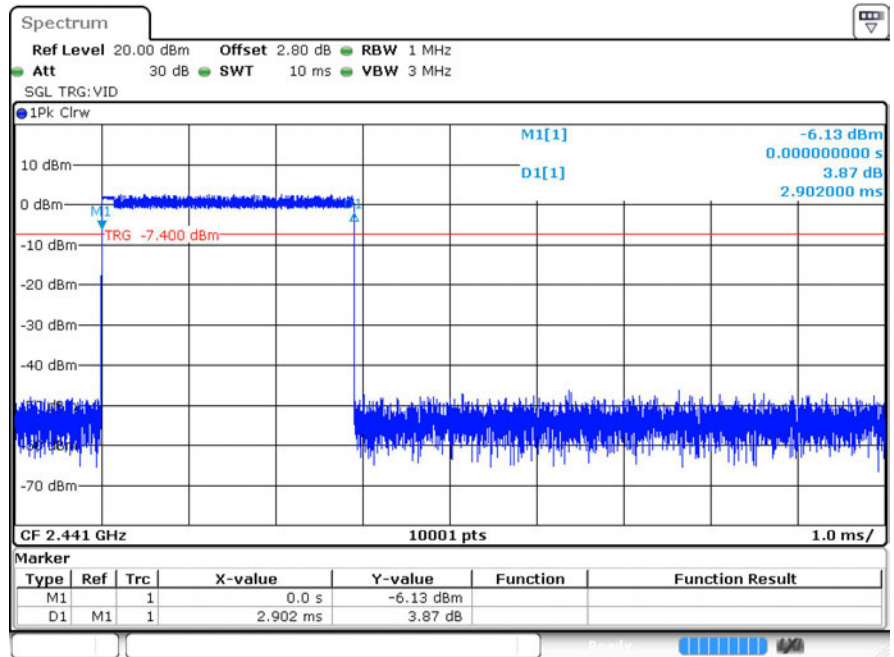
GFSK_DH5/MCH



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH



7 RF Conducted Spurious Emissions

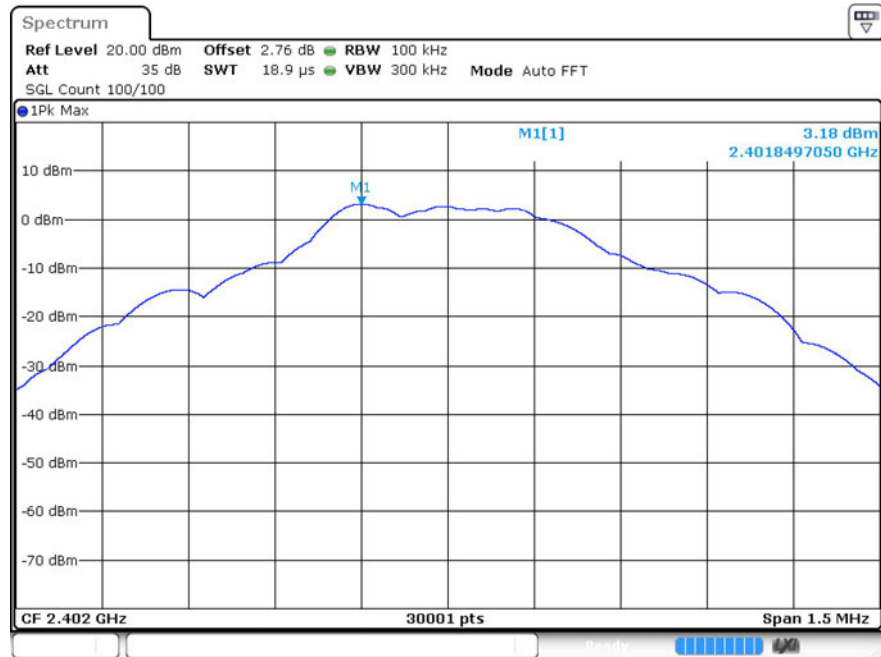
7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-43.26	-20	Pass
	MCH	-42.39	-20	Pass
	HCH	-40.93	-20	Pass
π /4DQPSK	LCH	-44.21	-20	Pass
	MCH	-43.01	-20	Pass
	HCH	-40.97	-20	Pass
8DPSK	LCH	-44.42	-20	Pass
	MCH	-41.36	-20	Pass
	HCH	-40.92	-20	Pass

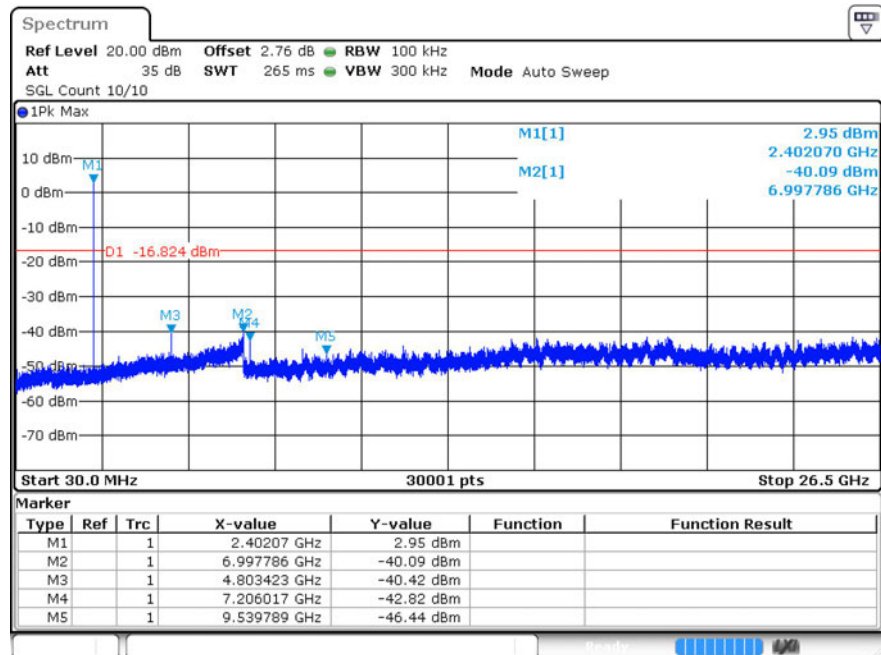
7.2 Test Graphs

GFSK_LCH_Graphs

Pref

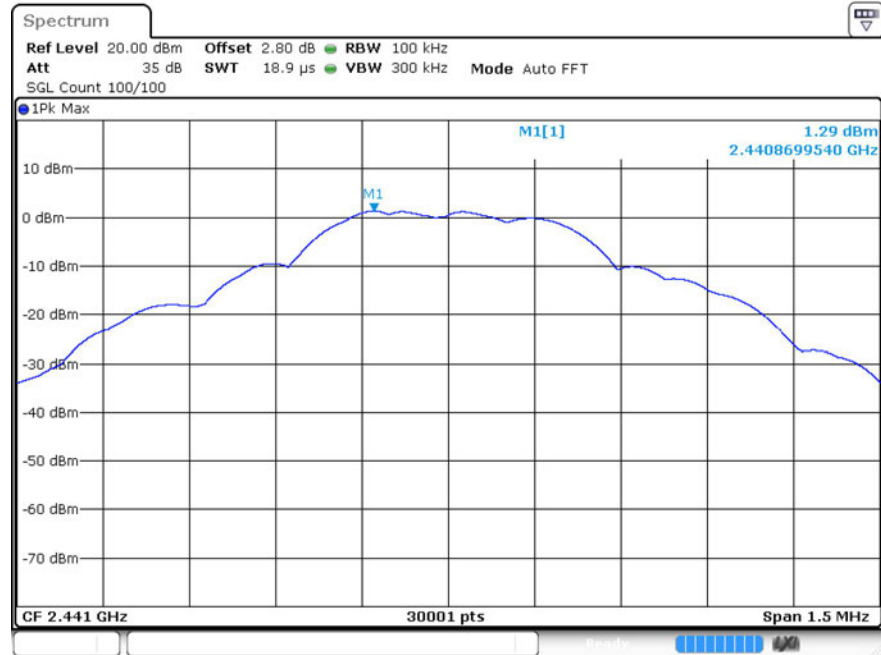


Puw

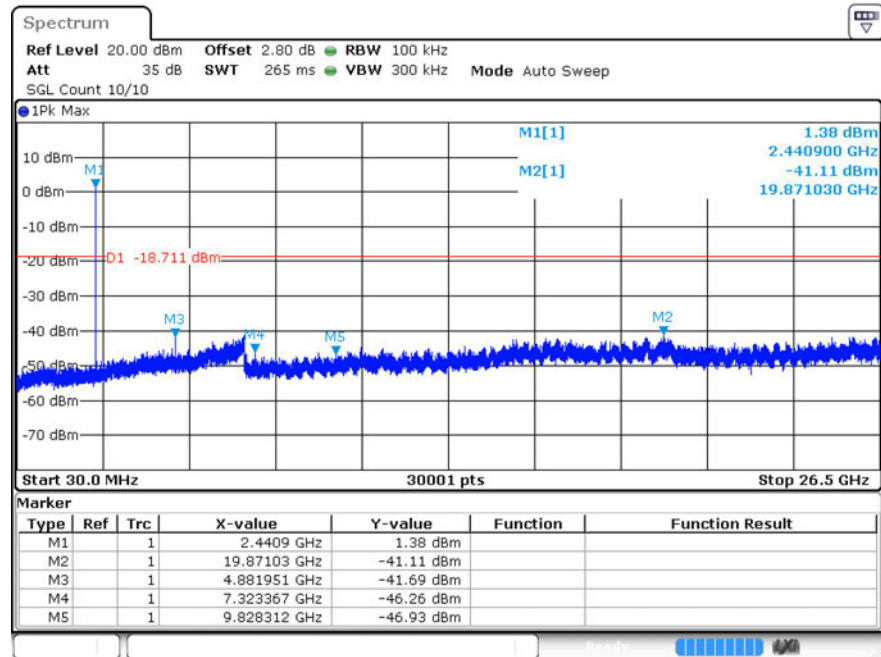


GFSK_MCH_Graphs

Pref

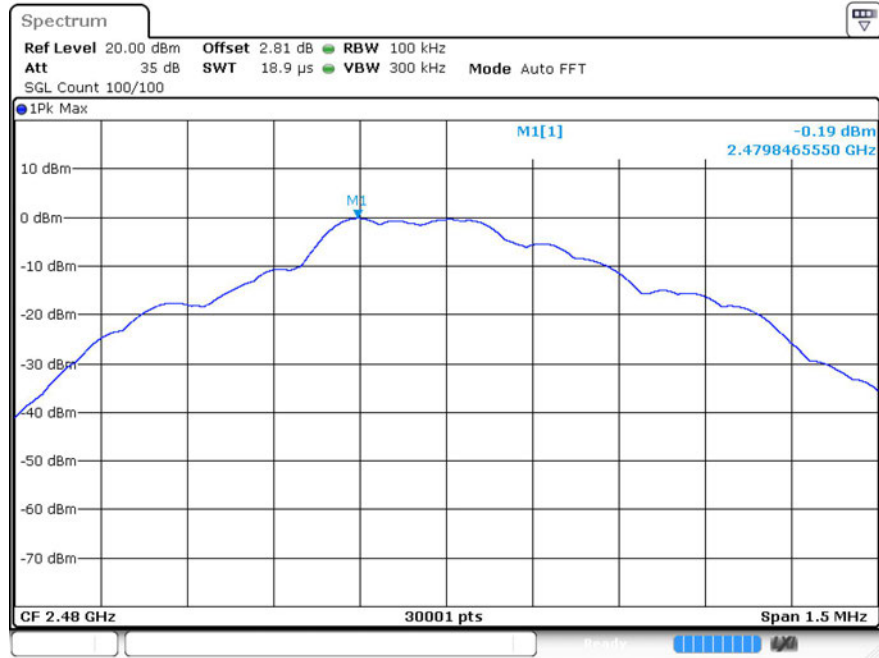


Puw

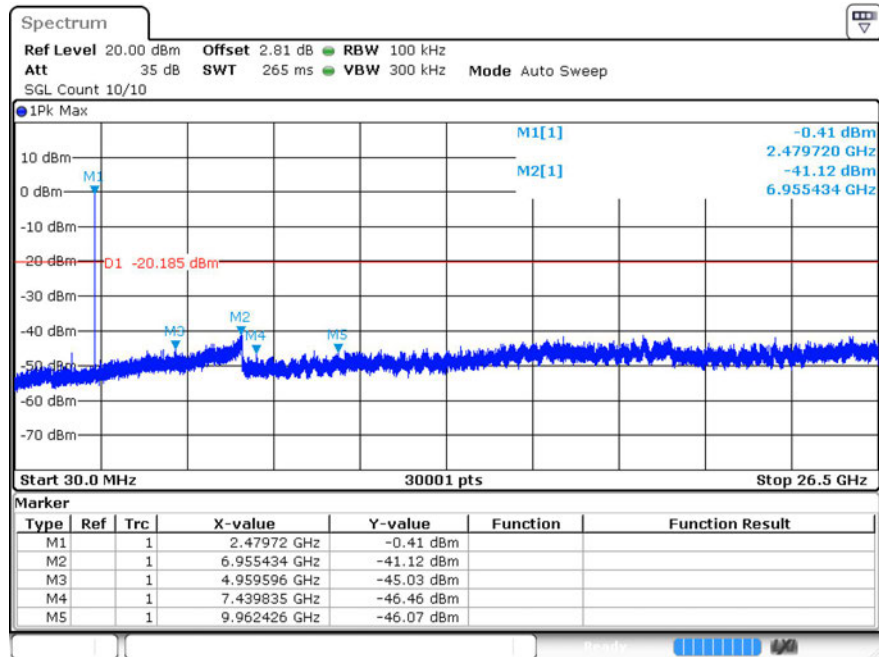


GFSK_HCH_Graphs

Pref

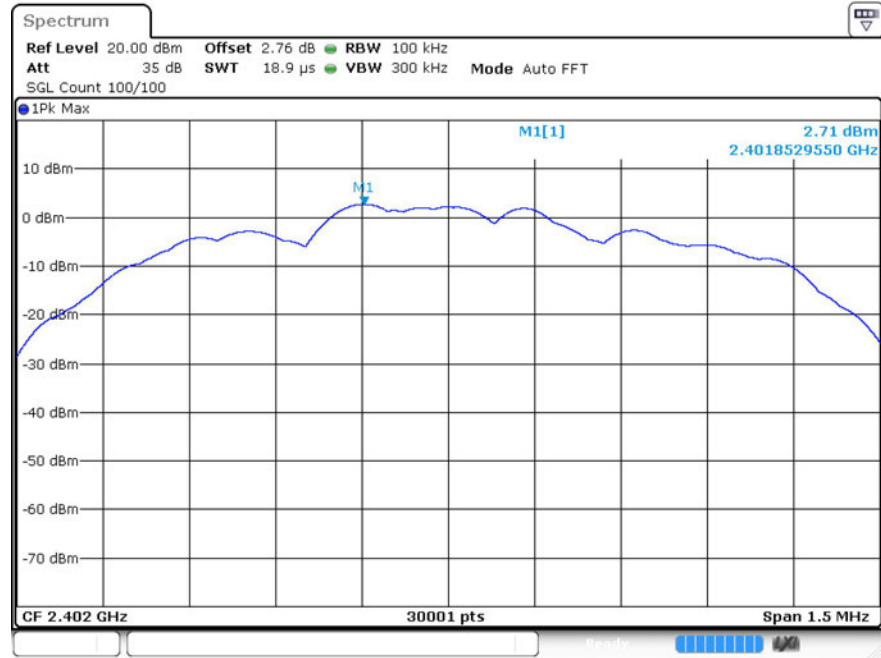


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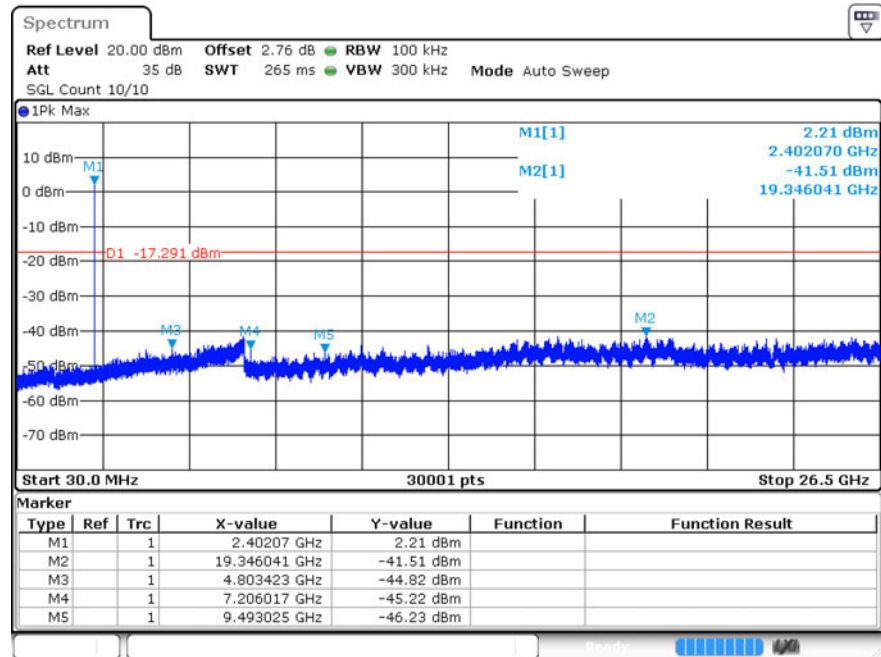


$\pi/4$ DQPSK_LCH_Graphs

Pref

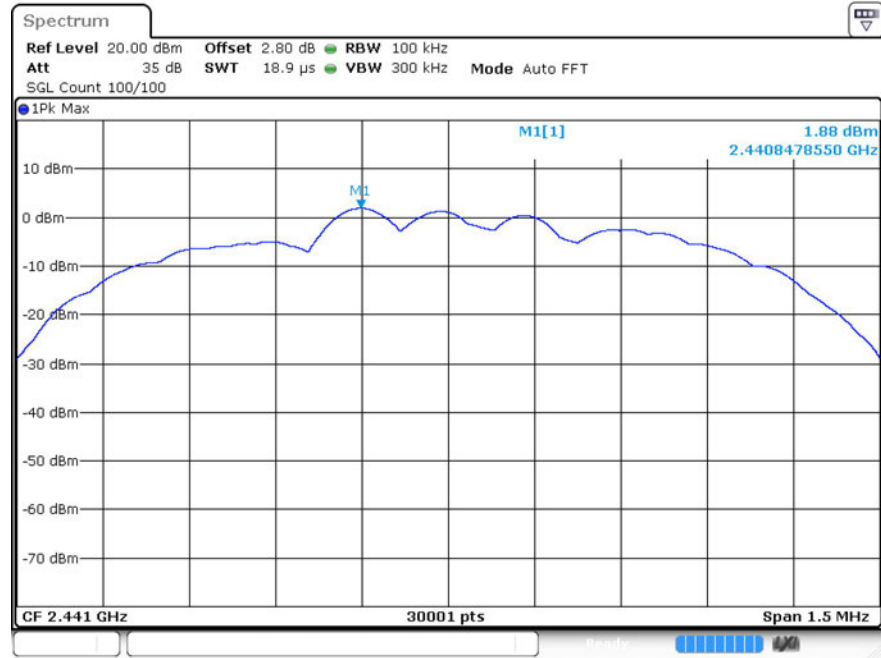


Puw

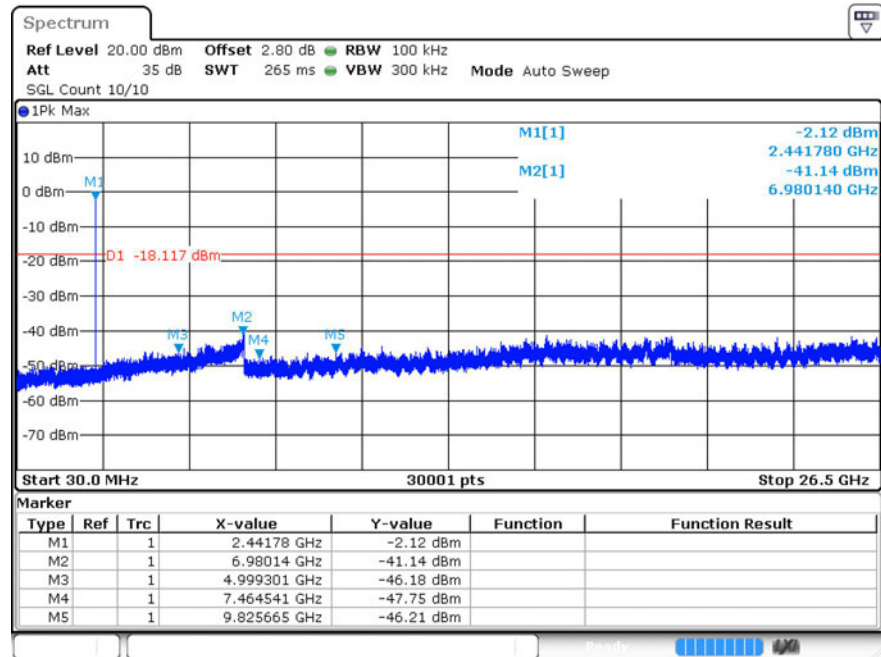


π /4DQPSK_MCH_Graphs

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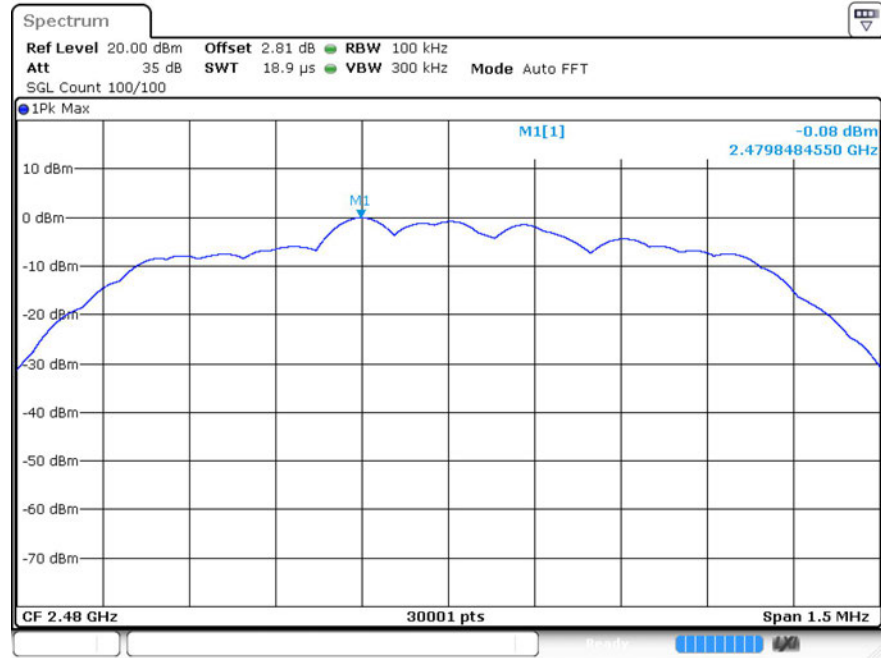


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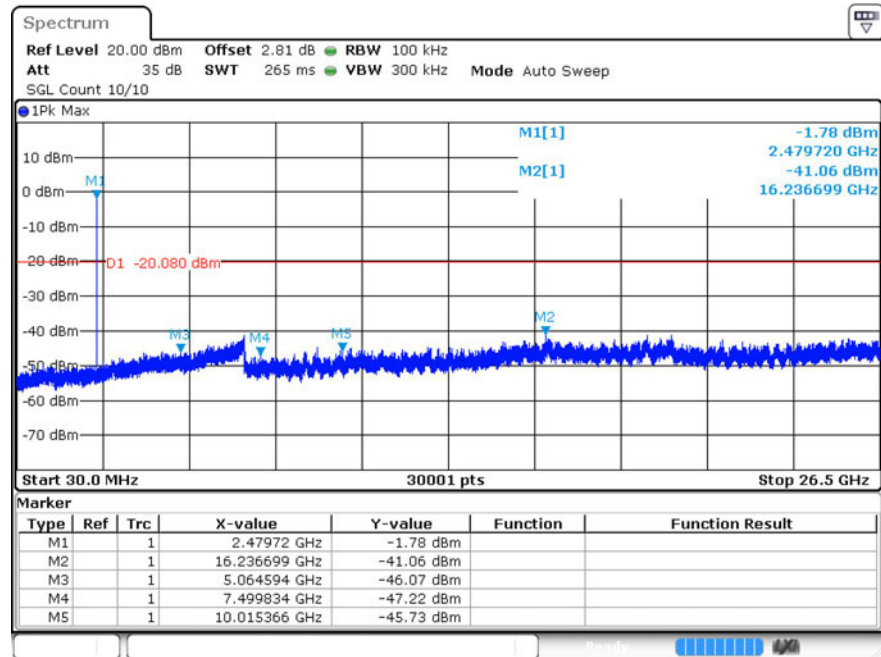


$\pi/4$ DQPSK_HCH_Graphs

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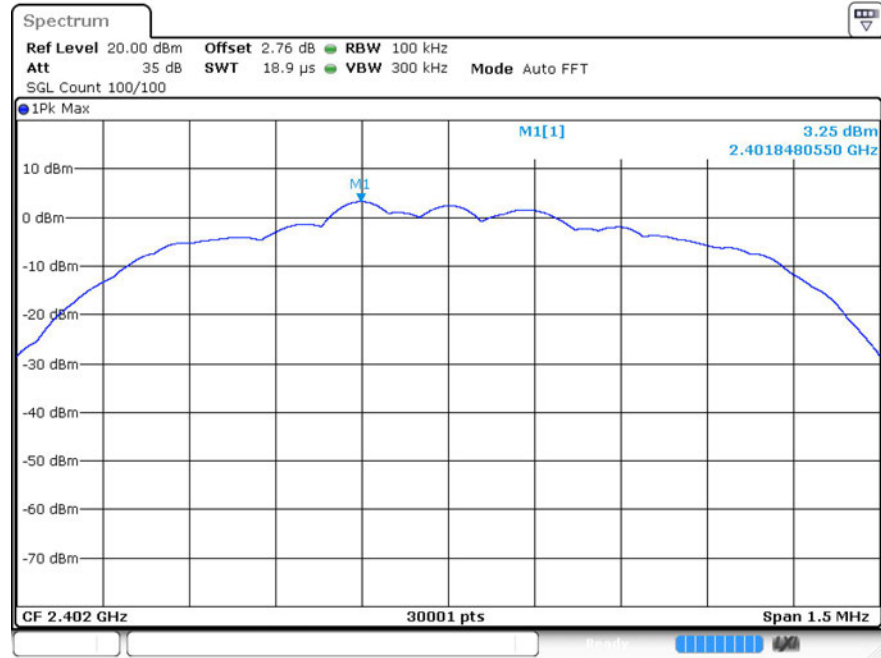


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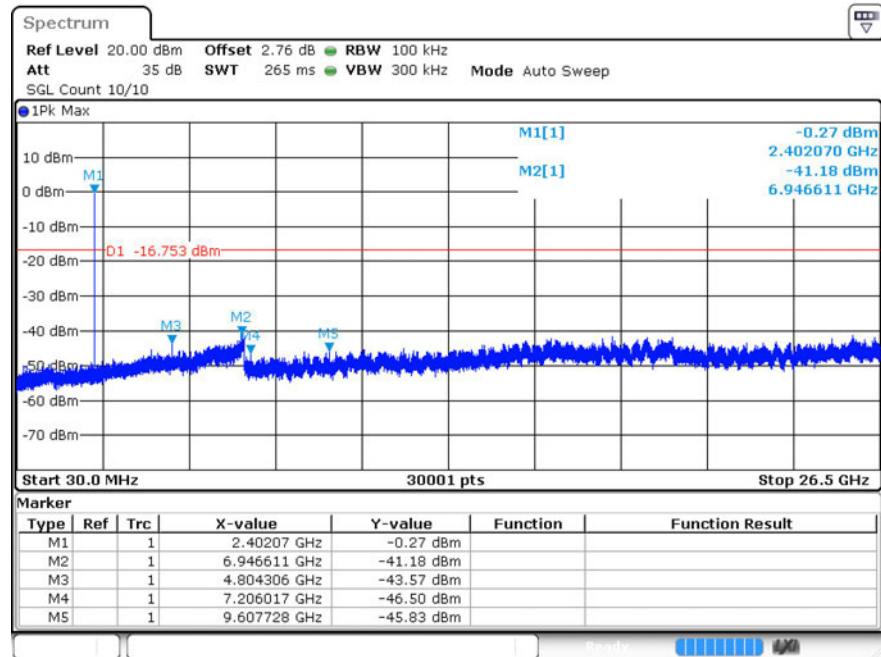


8DPSK_LCH_Graphs

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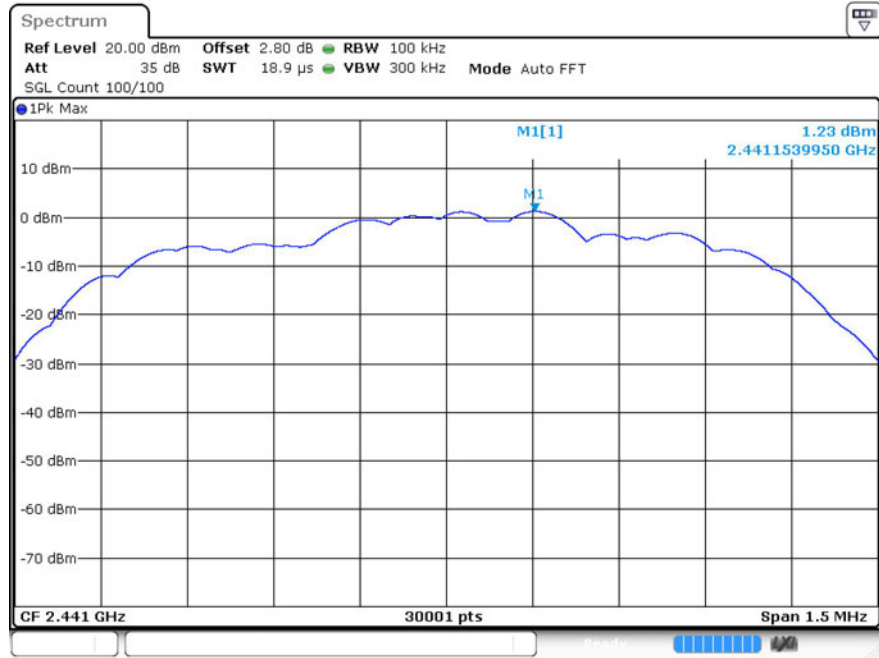


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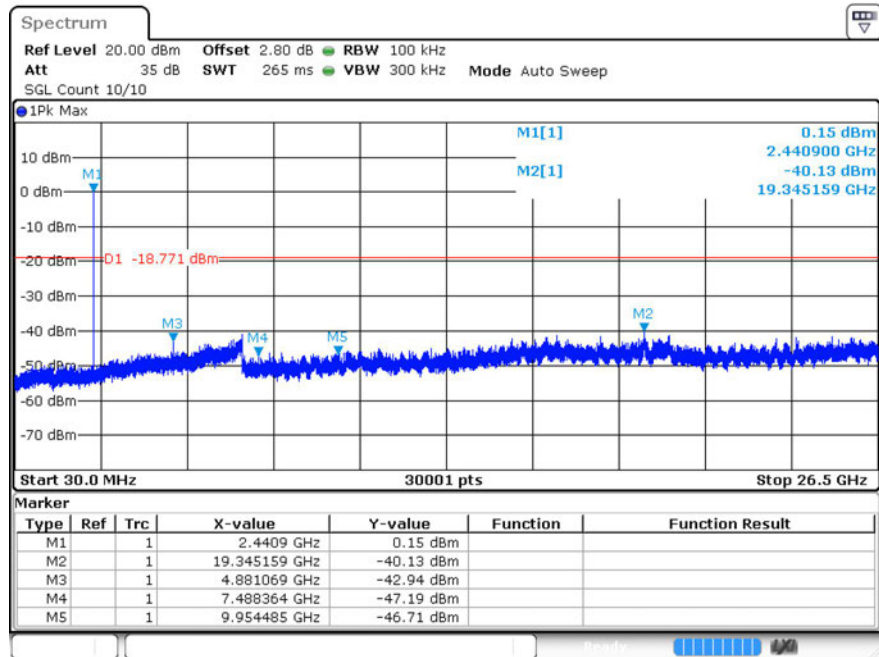


8DPSK_MCH_Graphs

Pref

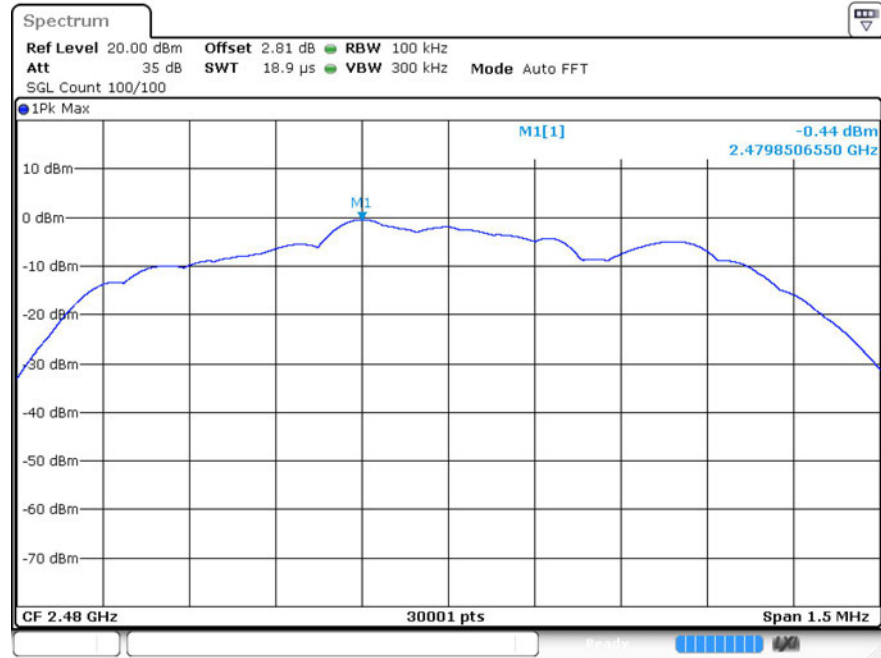


Puw



8DPSK_HCH_Graphs

Pref



Puw

