



## 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

# Contents

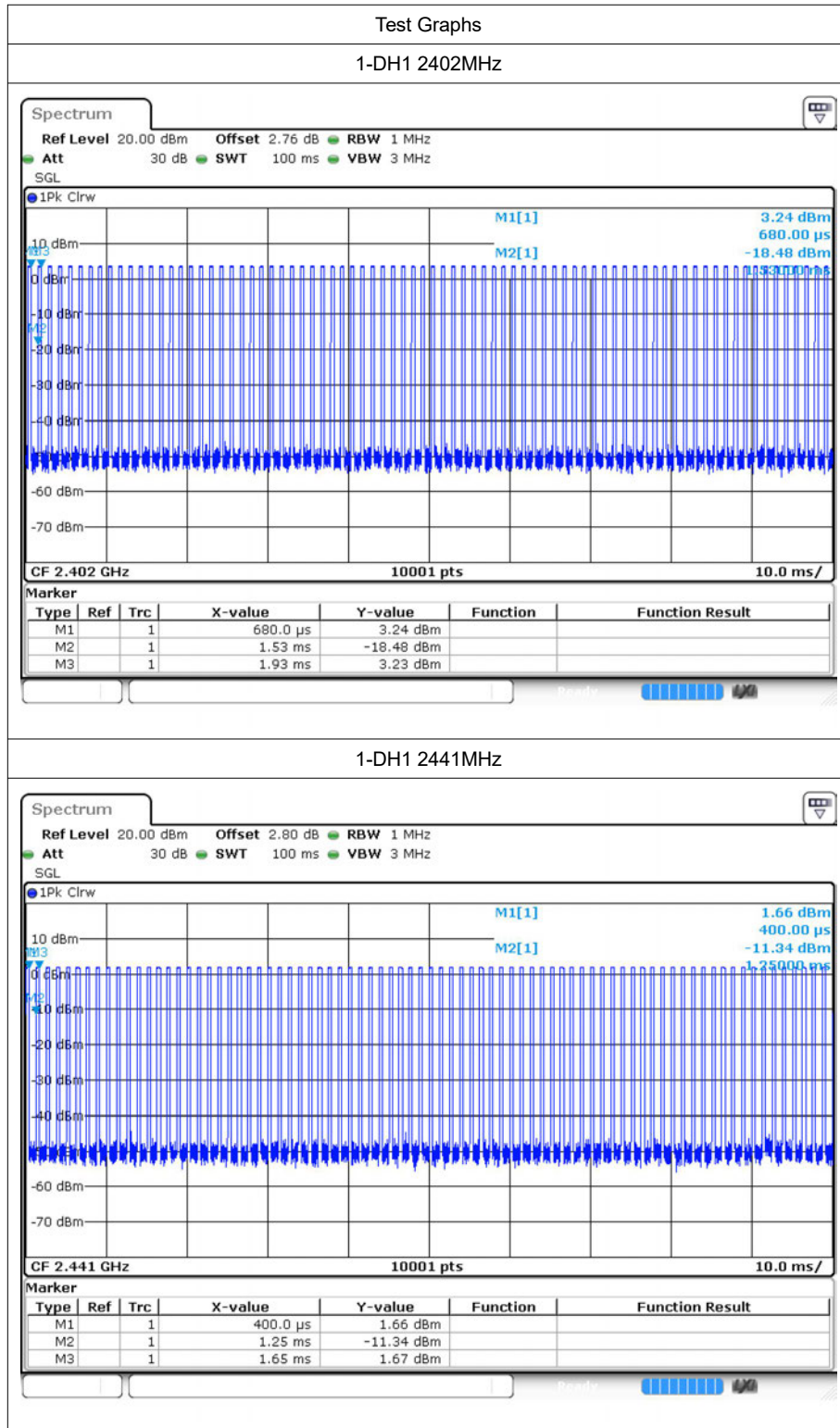
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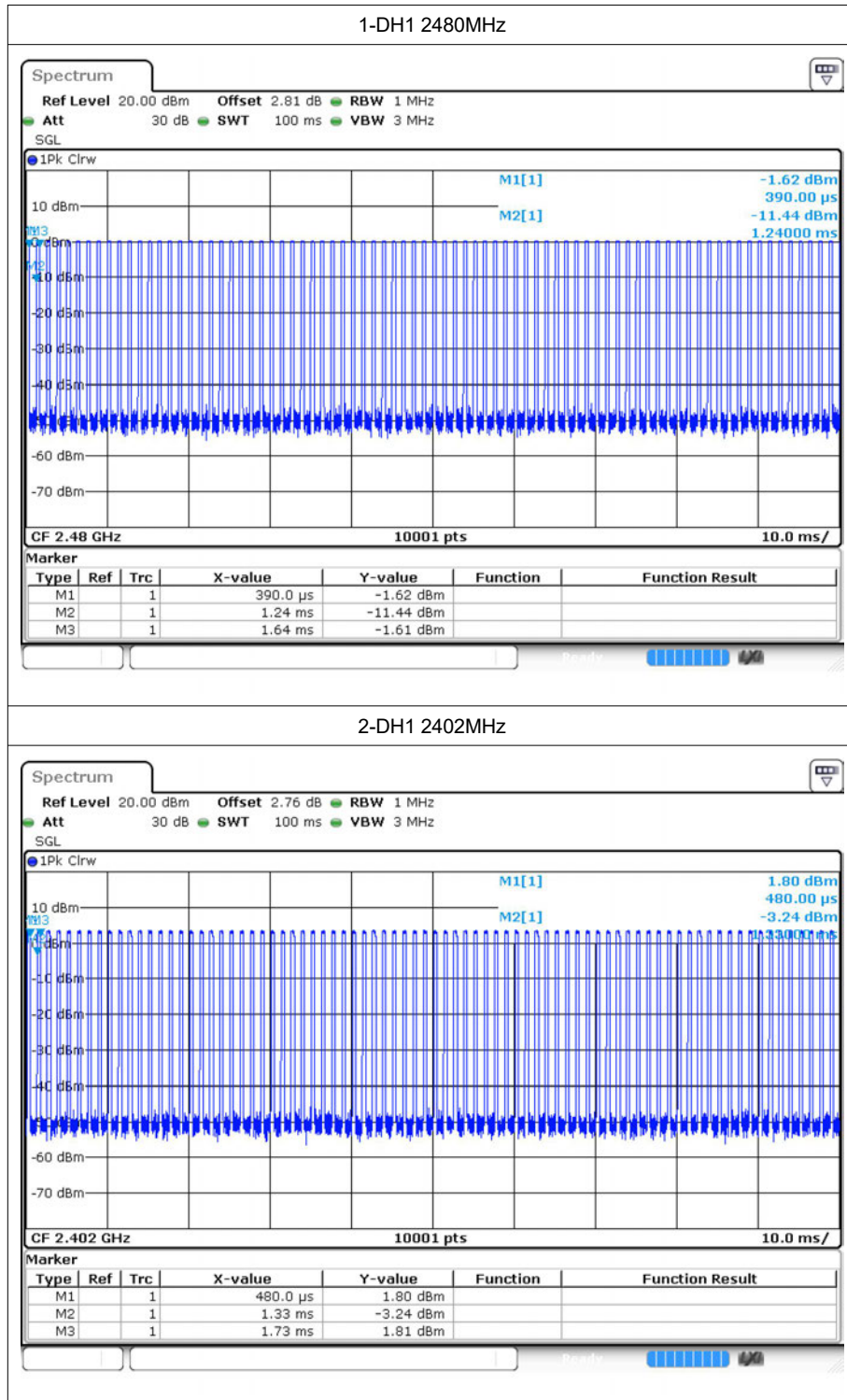
# 1 Duty Cycle

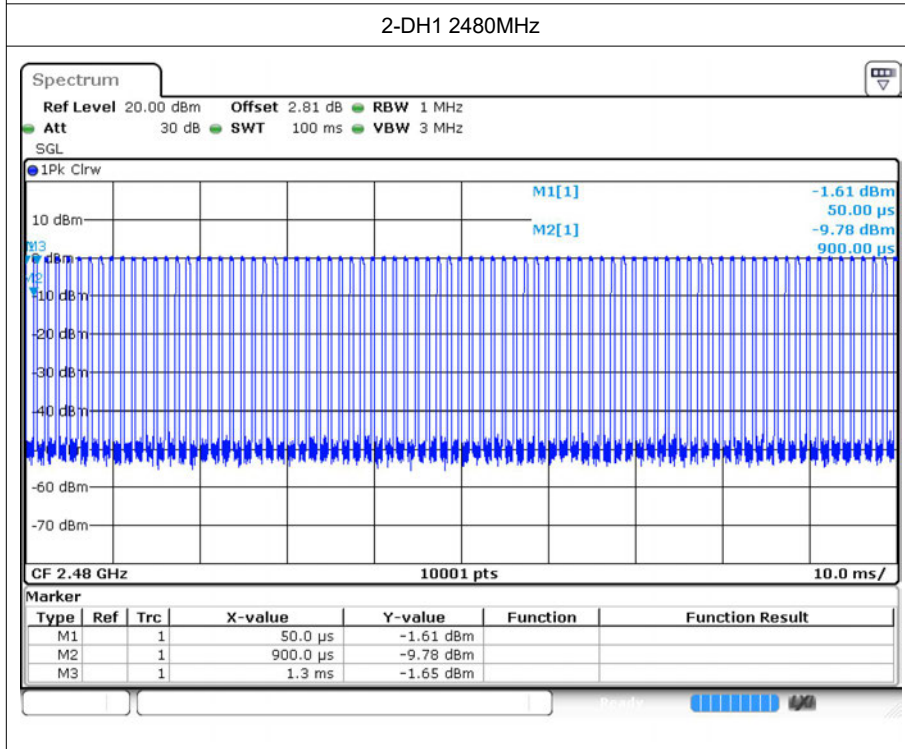
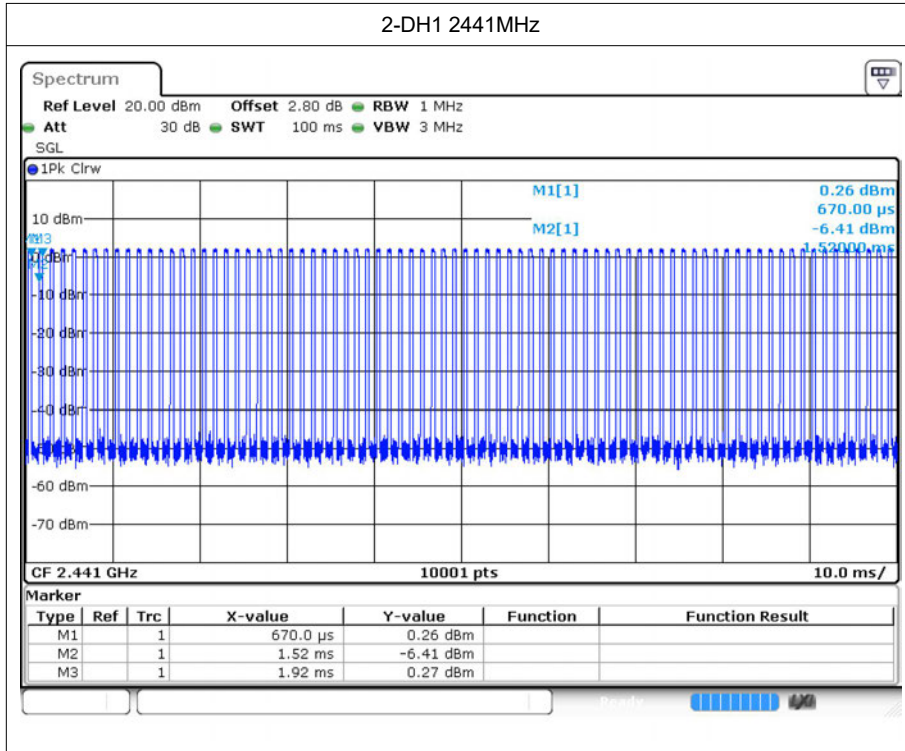
## 1.1 Test Result

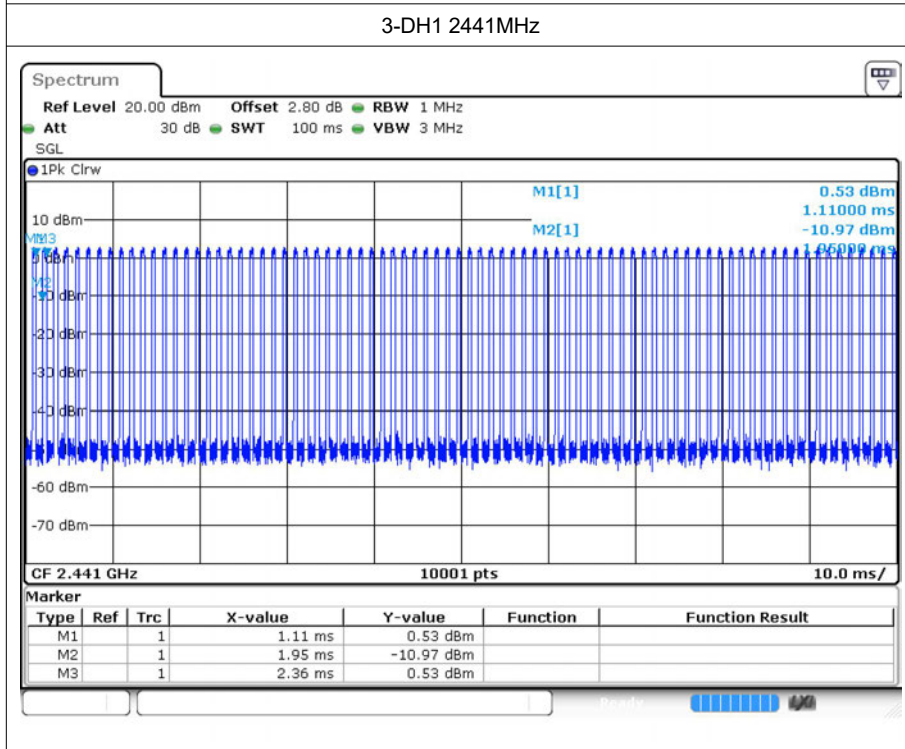
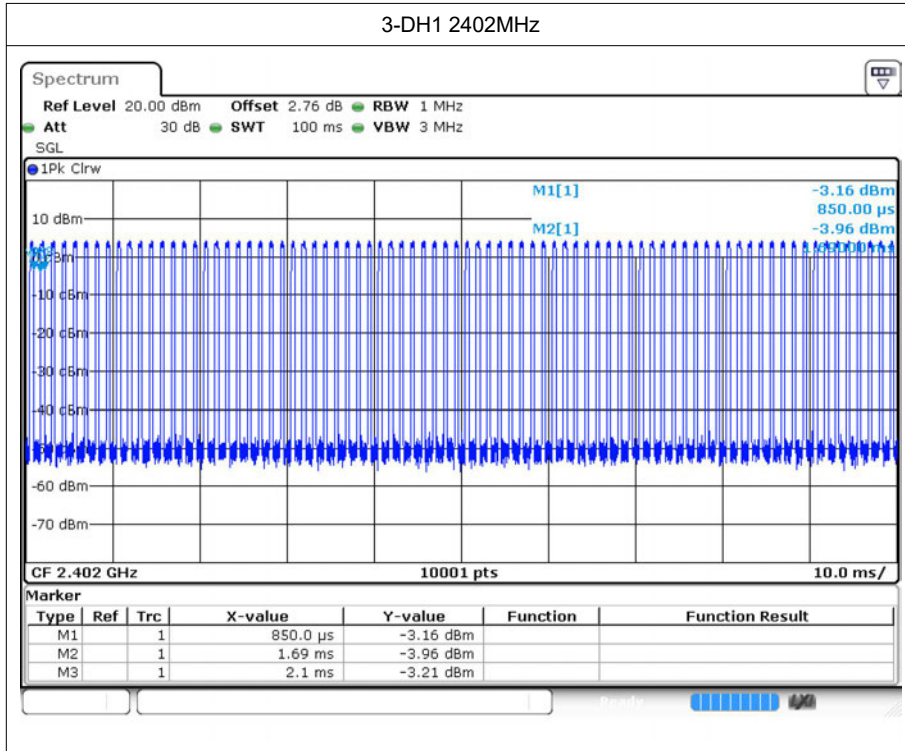
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	32.8	2.5
1-DH1	2441	32.81	2.5
1-DH1	2480	32.81	2.5
2-DH1	2402	32.8	2.5
2-DH1	2441	32.8	2.5
2-DH1	2480	32.81	2.5
3-DH1	2402	33.6	2.44
3-DH1	2441	33.6	2.44
3-DH1	2480	33.6	2.44

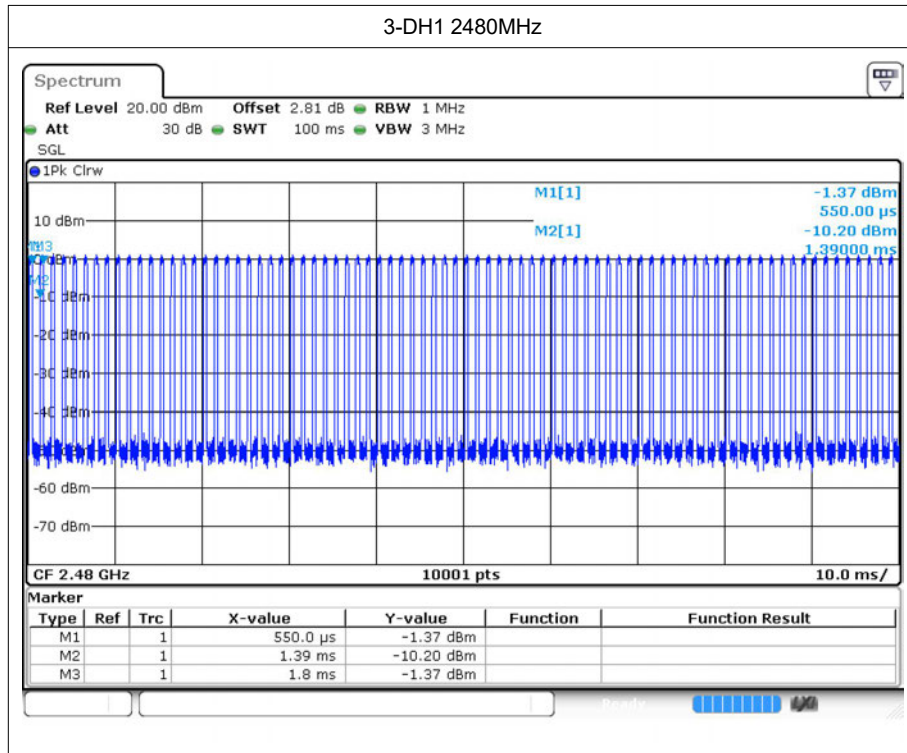
## 1.2 Test Graphs











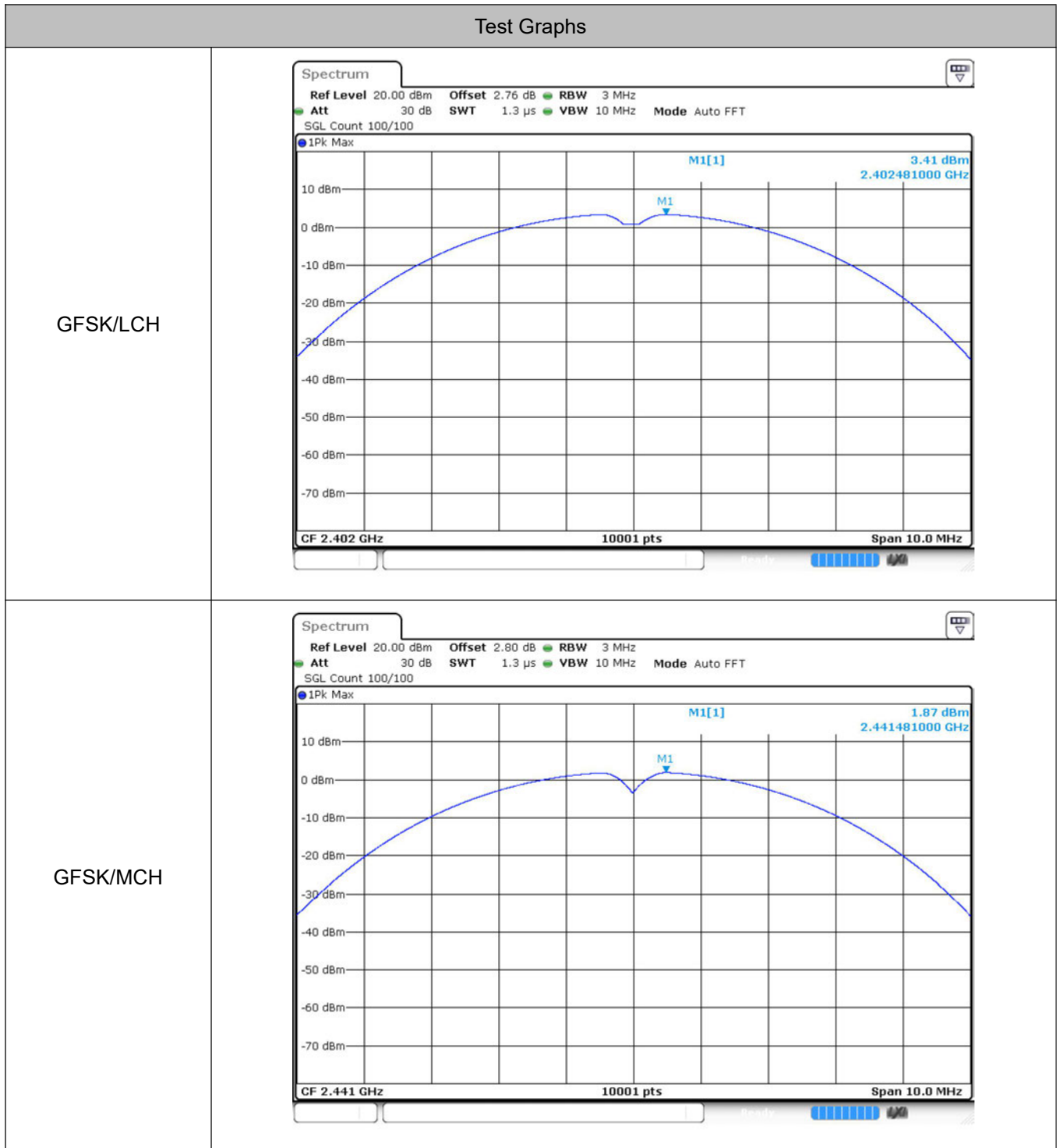


## 2 Maximum Conducted Peak Output Power

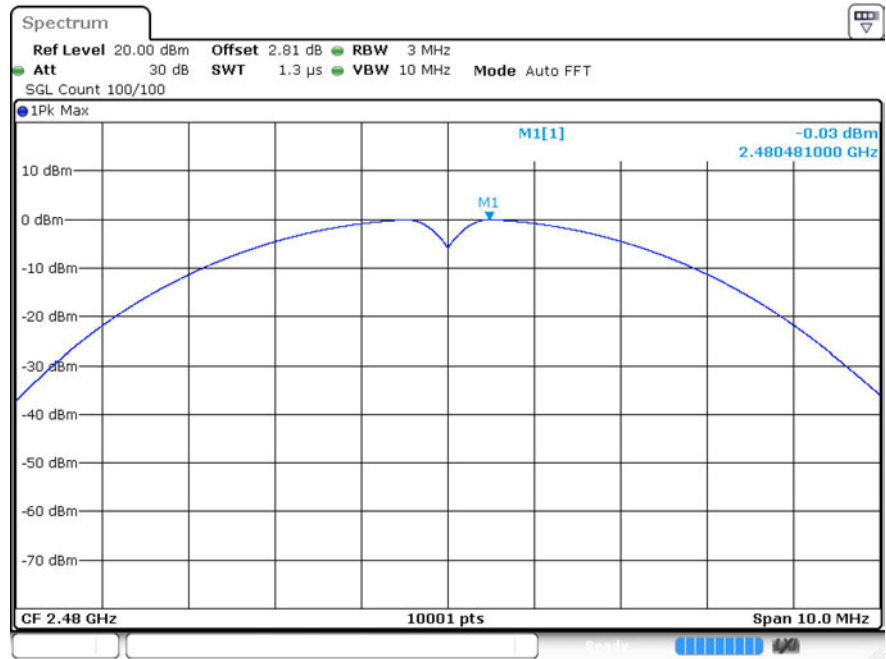
### 2.1 Test Result

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

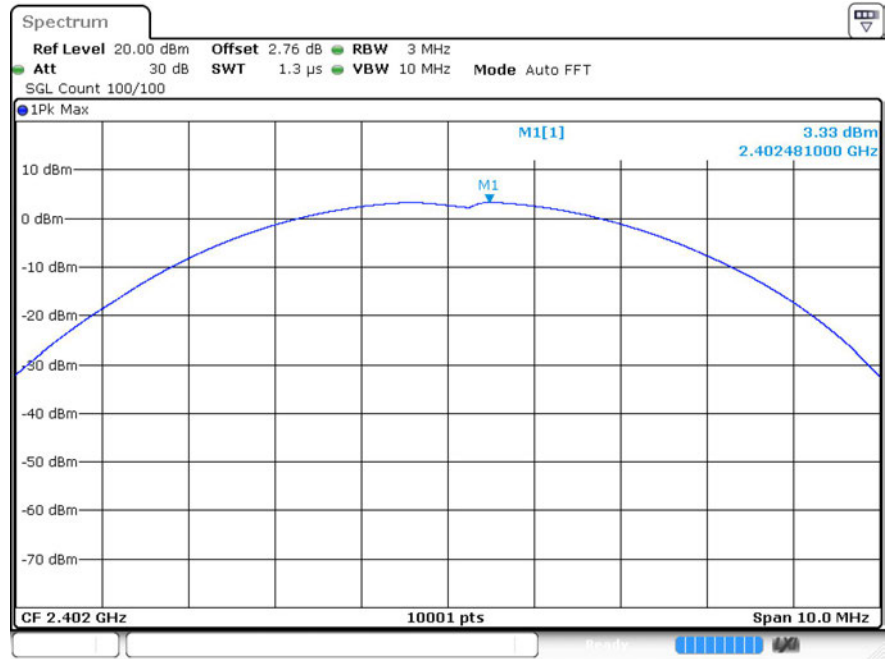
## 2.2 Test Graphs



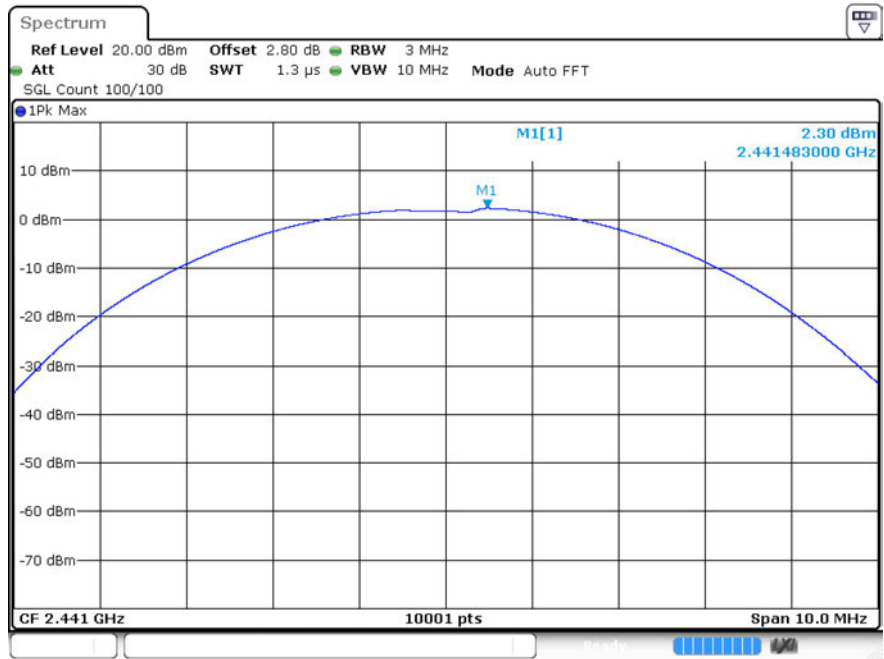
GFSK/HCH



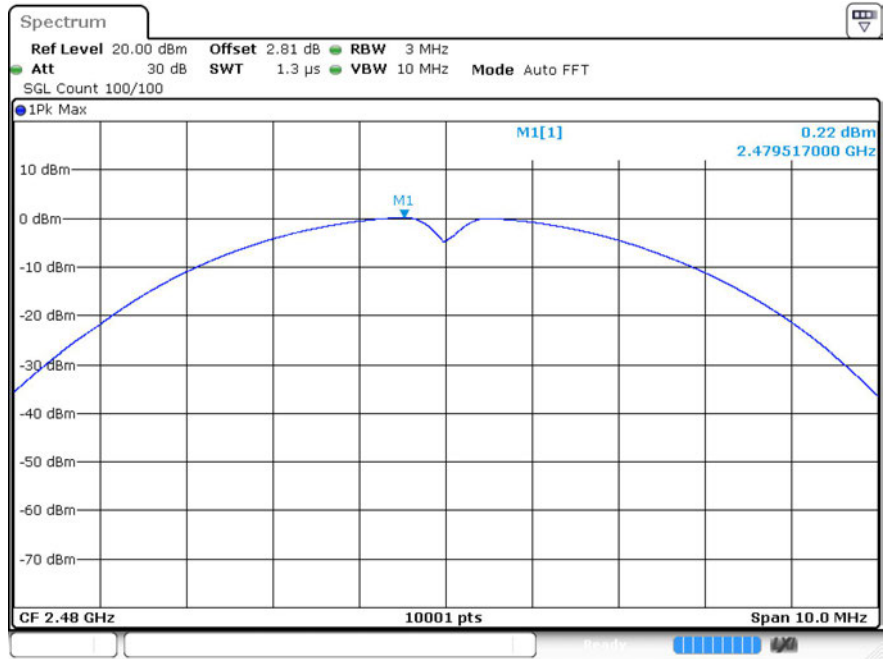
$\pi/4$ DQPSK/LCH



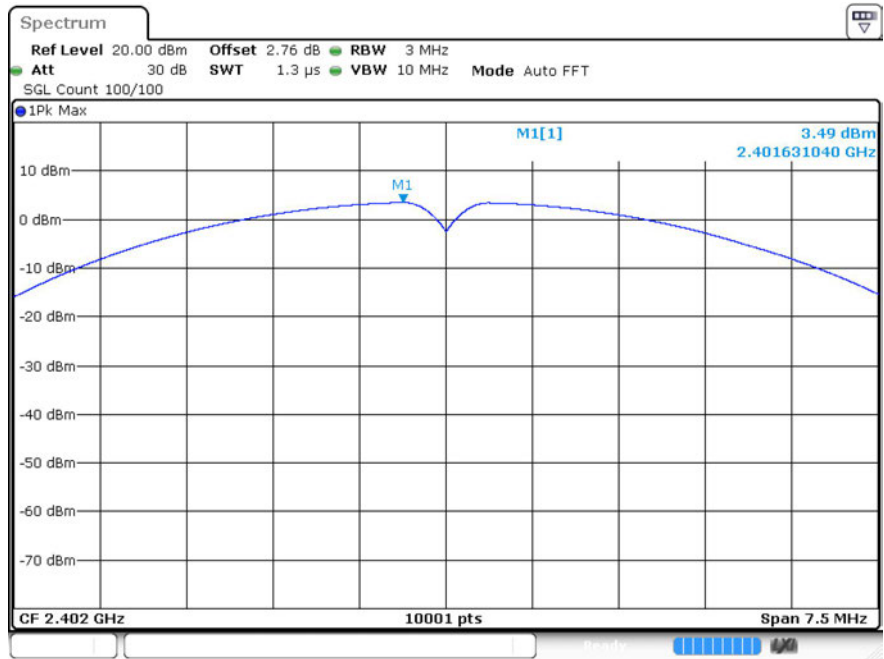
$\pi/4$ DQPSK/MCH



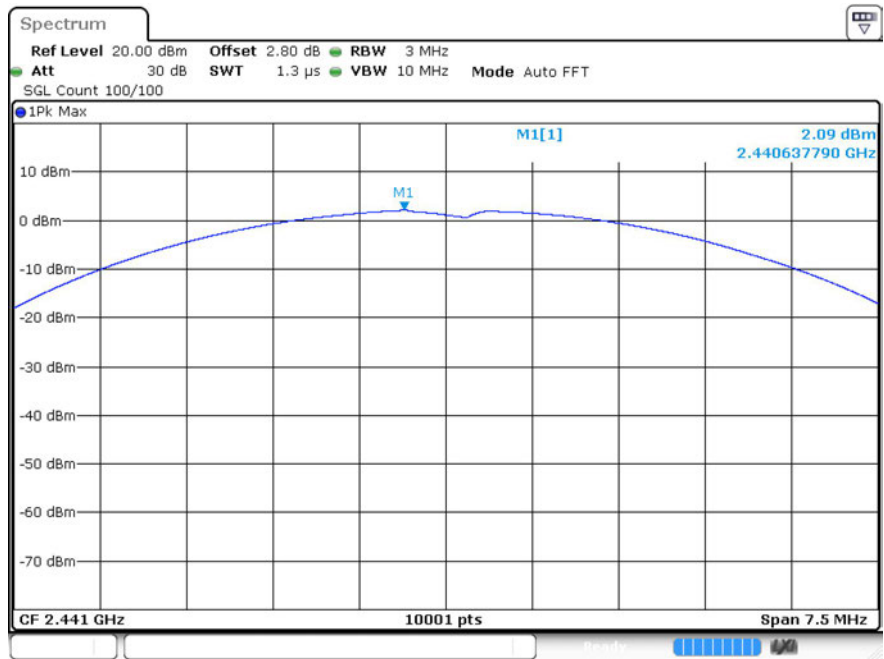
$\pi/4$ DQPSK/HCH



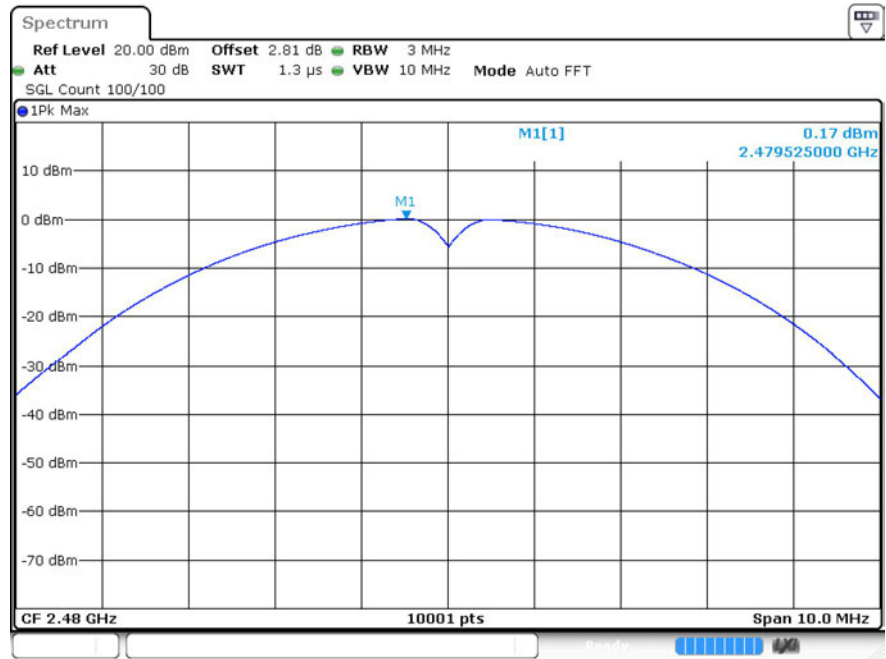
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

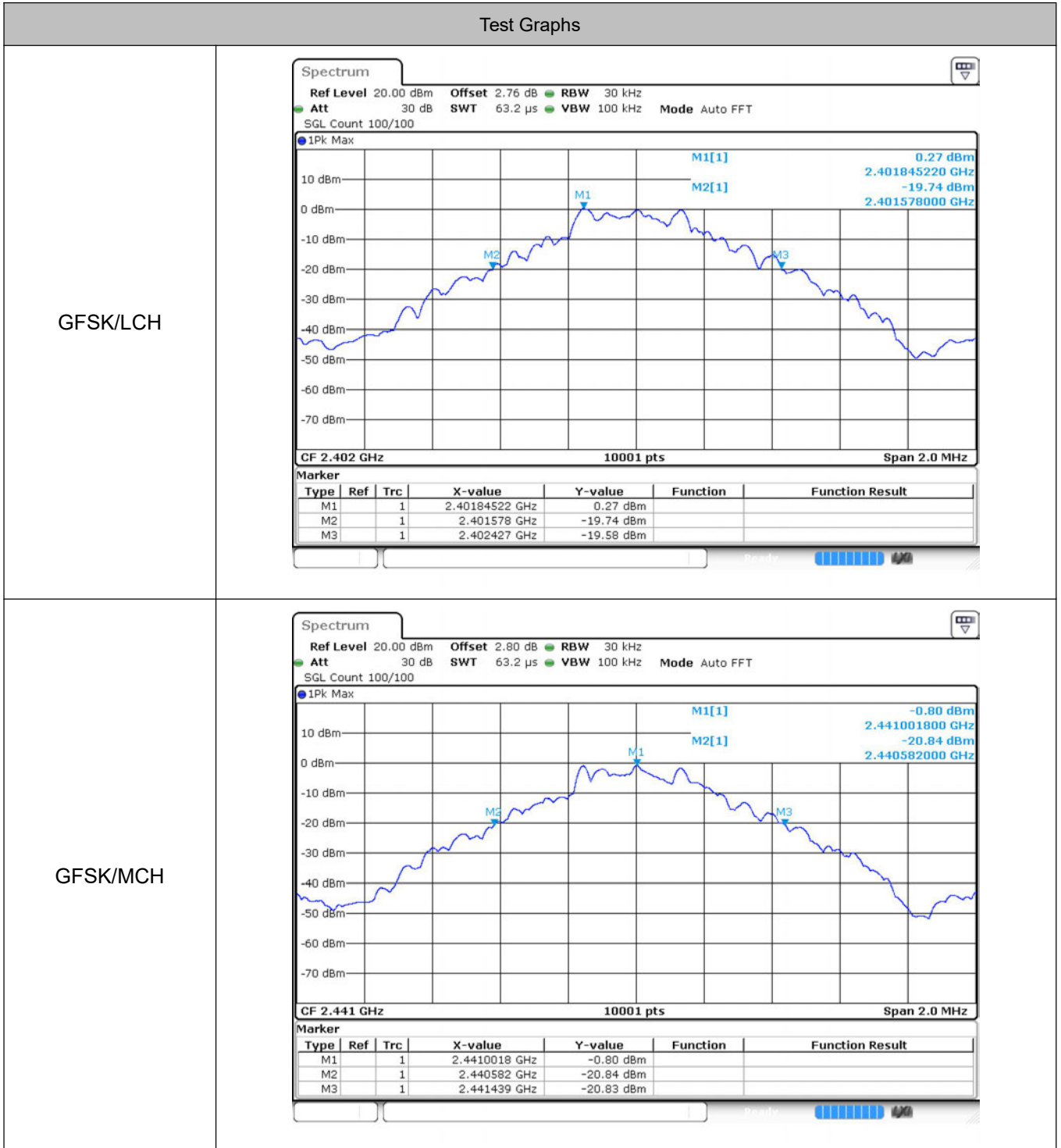


### 3 20dB Bandwidth

#### 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

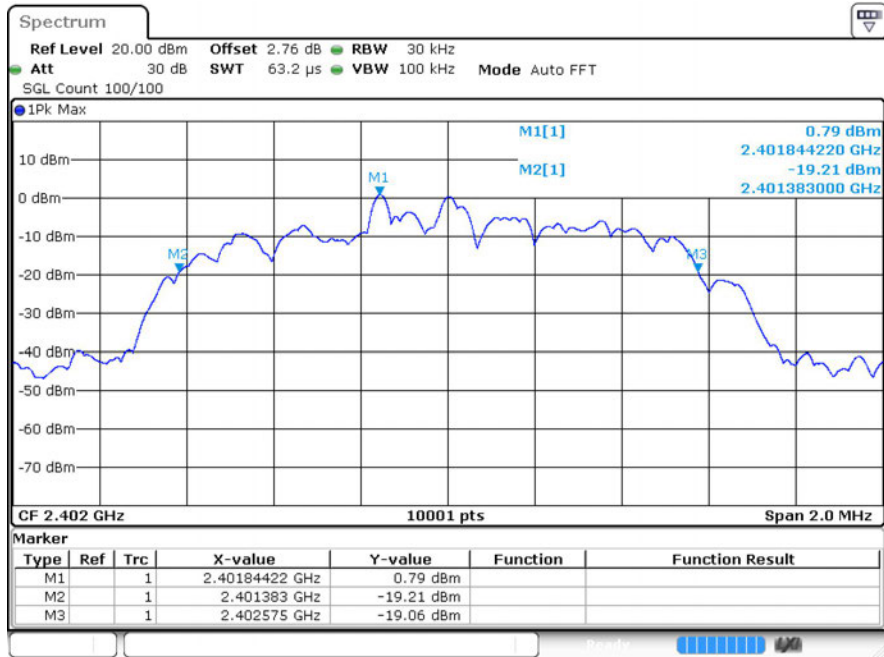




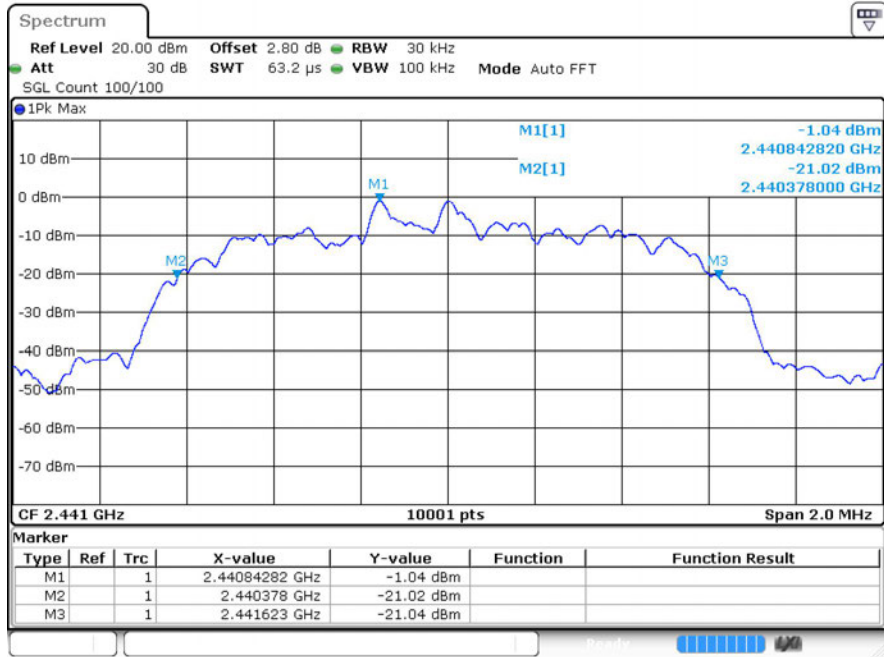
GFSK/HCH



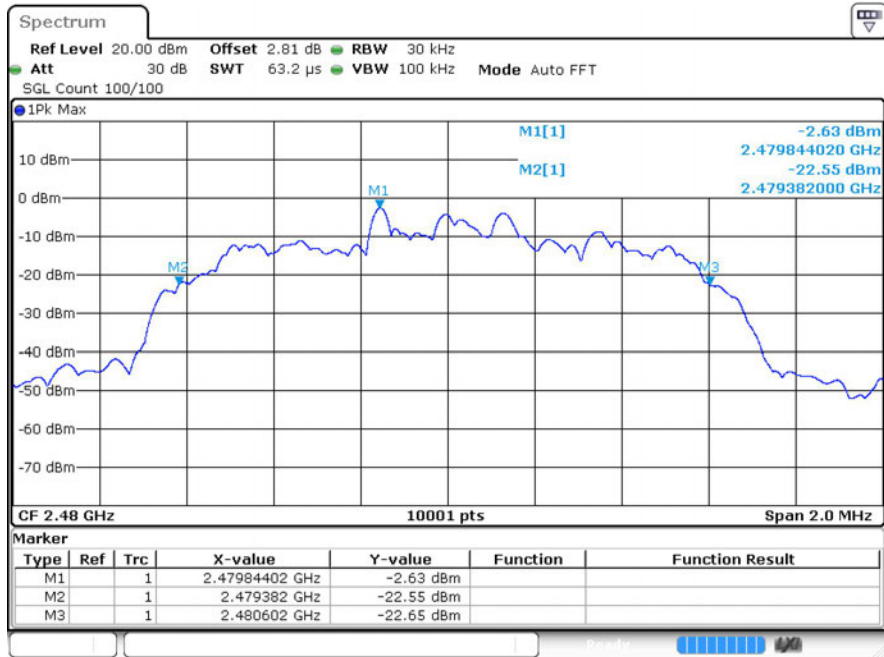
$\pi/4$ DQPSK/LCH



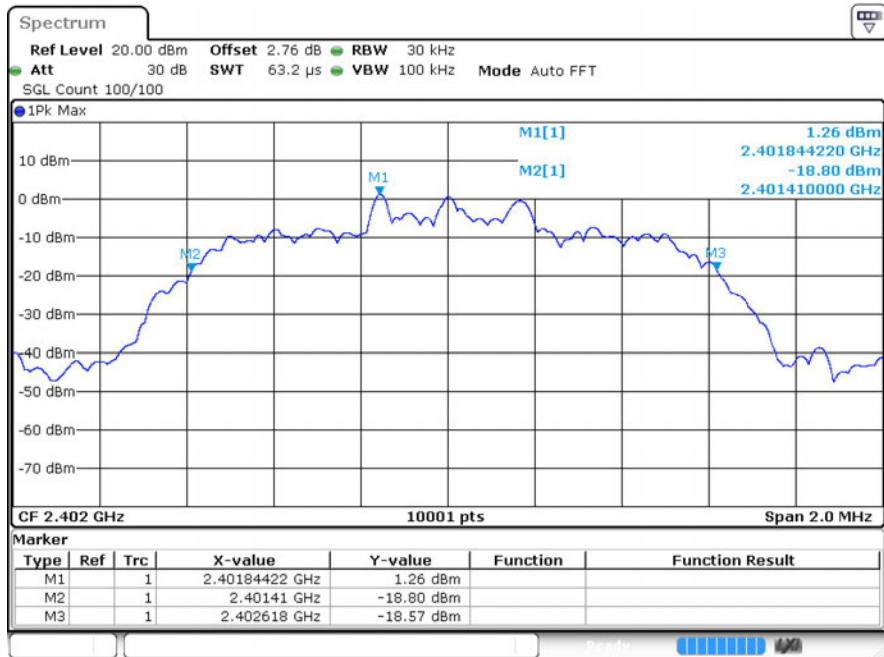
$\pi/4$ DQPSK/MCH



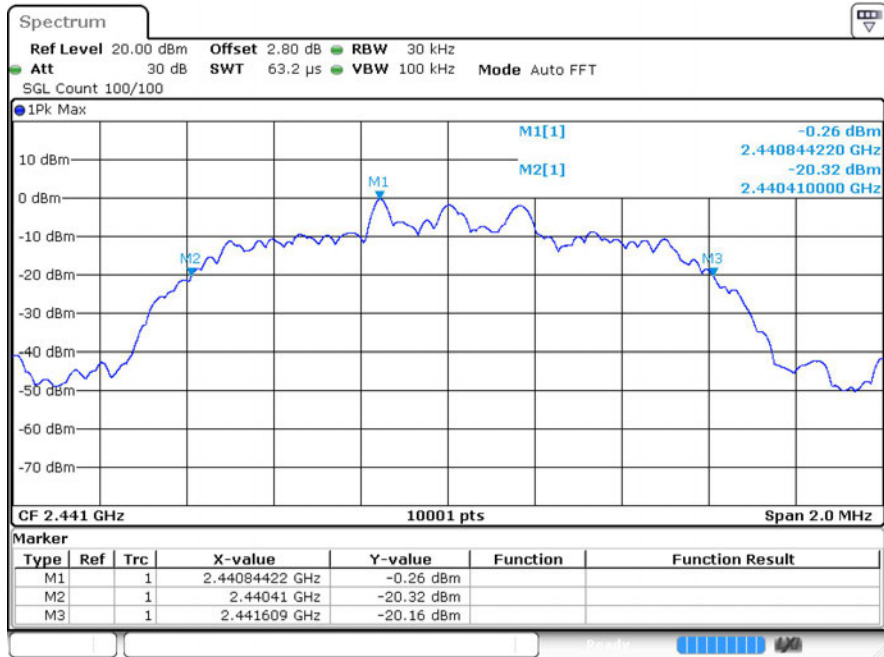
$\pi/4$ DQPSK/HCH



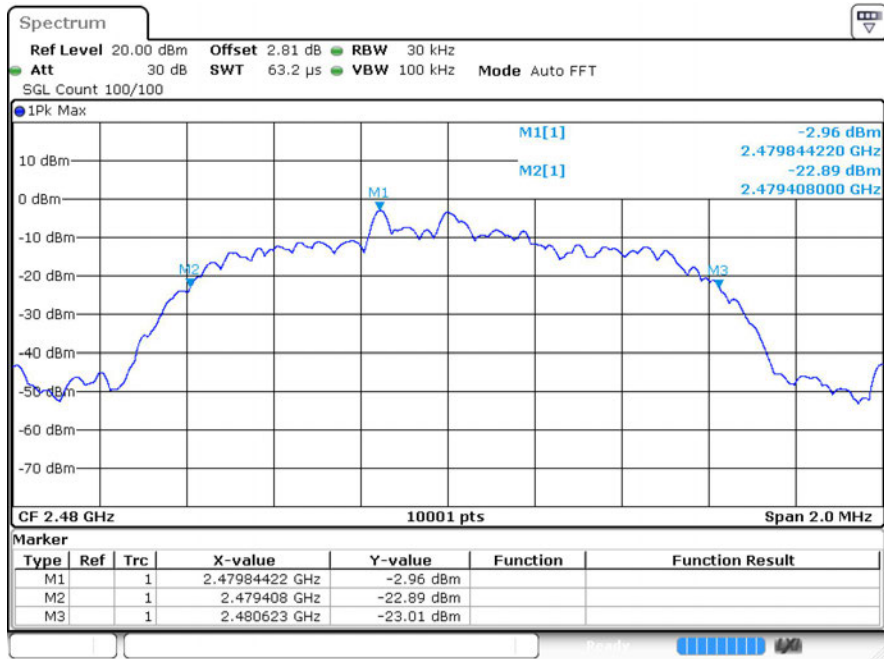
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



## 4 Carrier Frequency Separation

### 4.1 Test Result

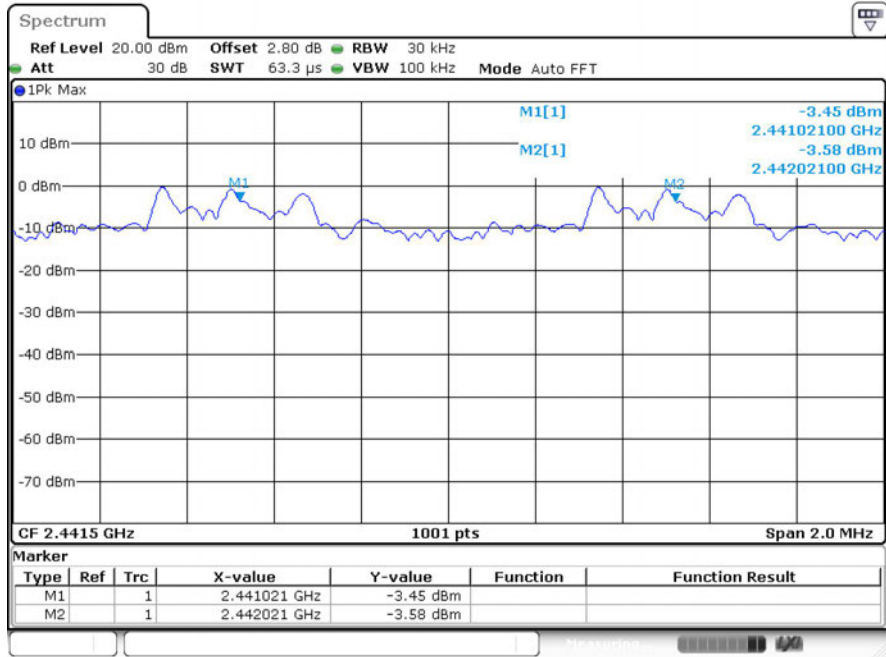
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.571	Pass
$\pi/4$ DQPSK	MCH	1.003	0.83	Pass
8DPSK	MCH	1	0.799	Pass

## 4.2 Test Graphs





8DPSK/MCH



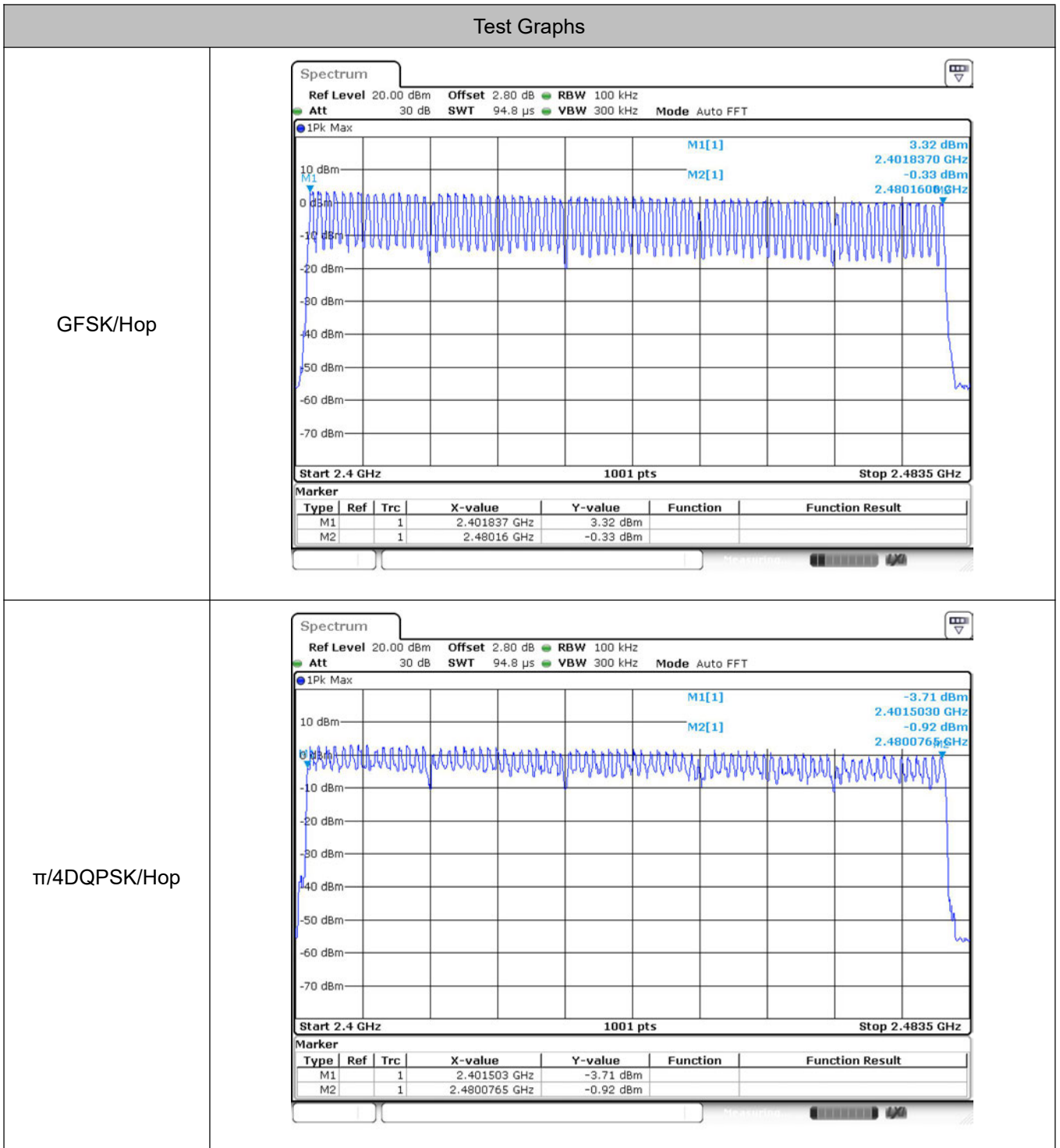
## 5 Hopping Channel Number

### 5.1 Test Result

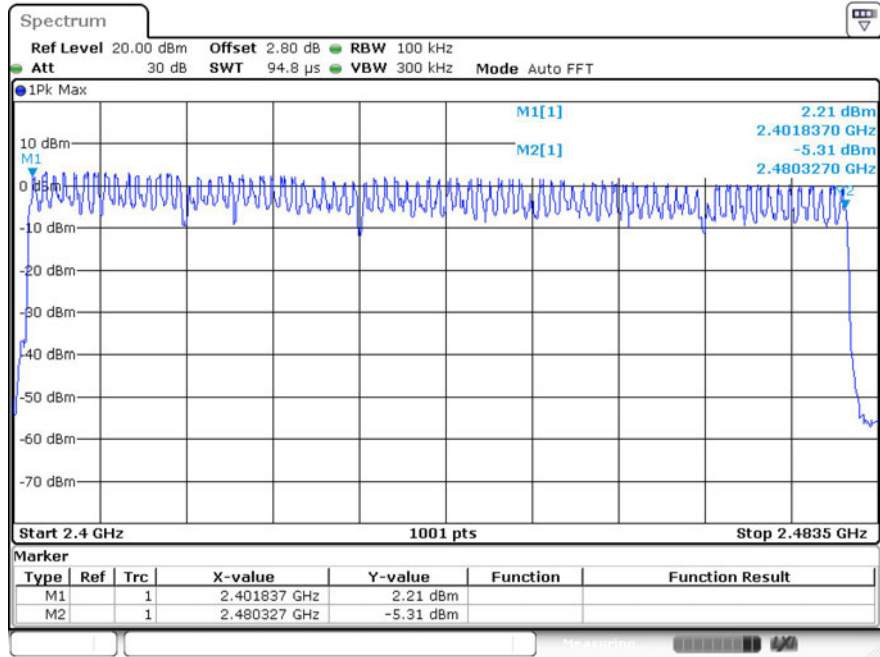
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	$\geq 15$	PASS
$\pi/4$ DQPSK	Hop	79	$\geq 15$	PASS
8DPSK	Hop	79	$\geq 15$	PASS



## 5.2 Test Graphs



8DPSK/Hop

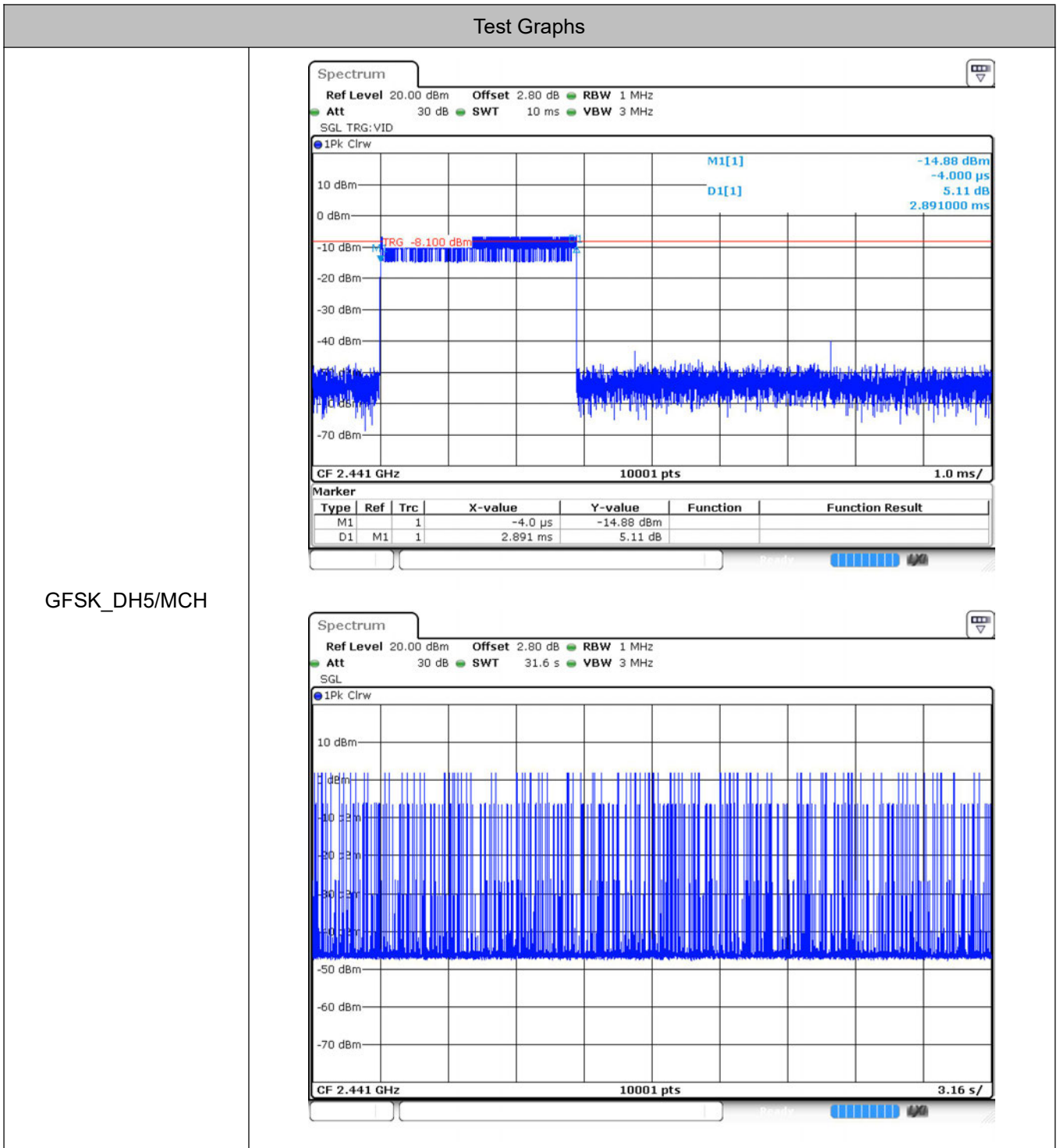


## 6 Dwell Time

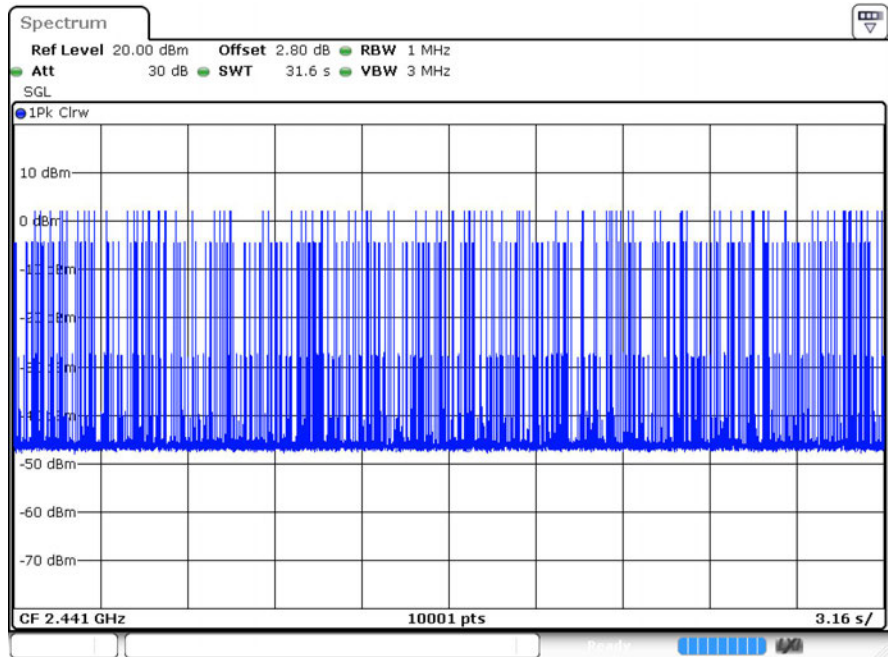
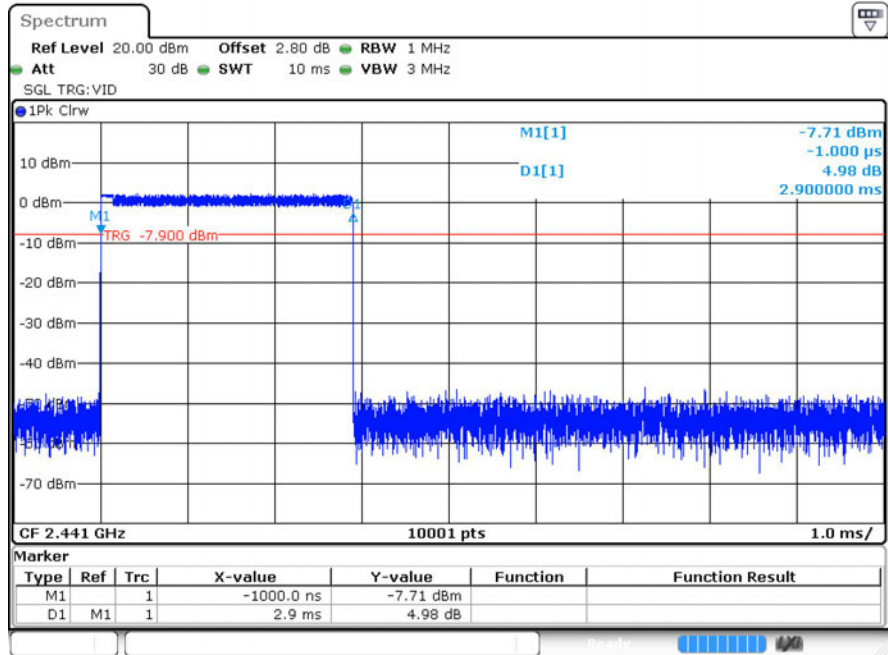
### 6.1 Test Result

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

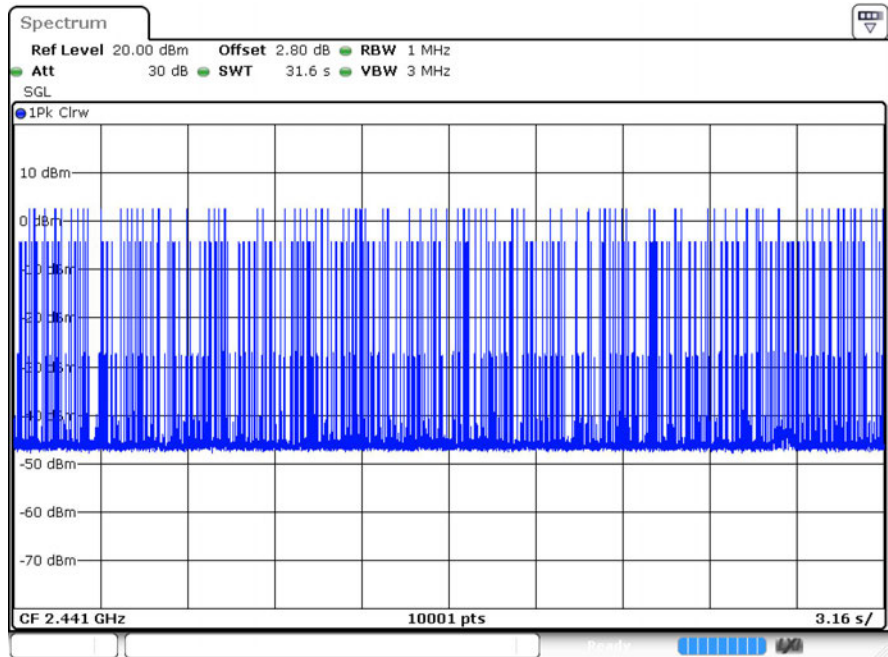
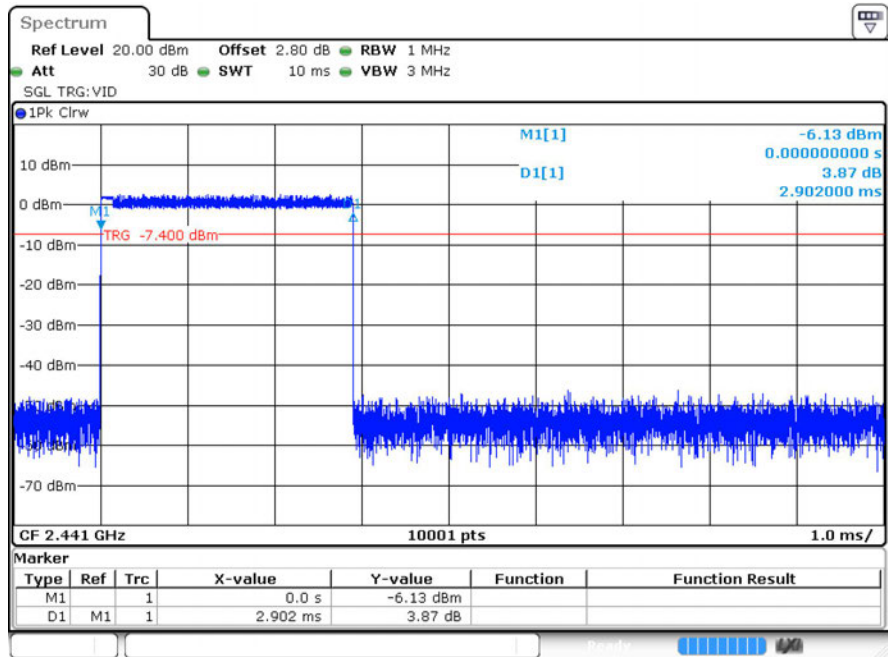
## 6.2 Test Graphs



$\pi/4$ DQPSK  
\_2DH5/MCH



8DPSK\_3DH5/MCH

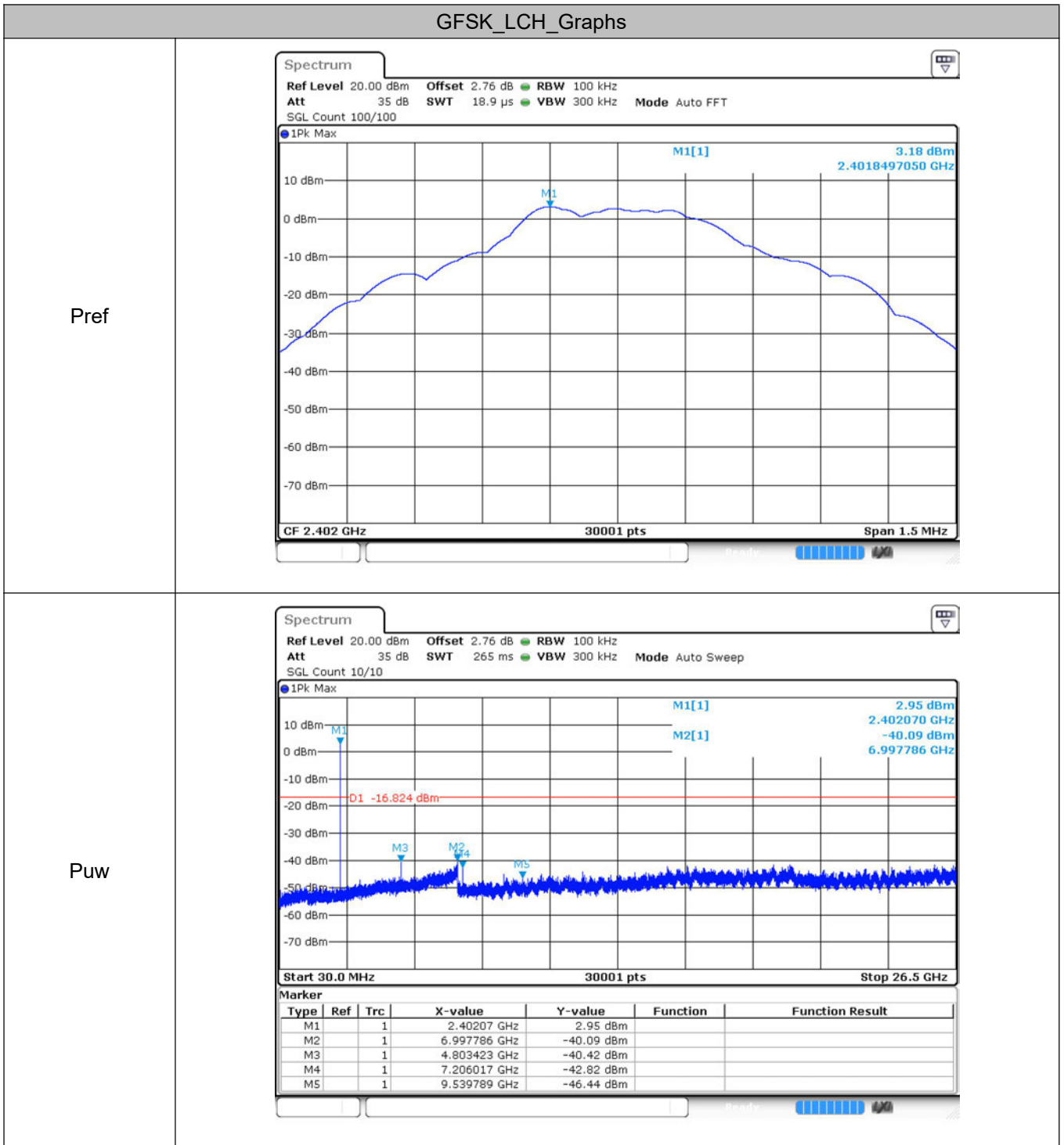


## 7 RF Conducted Spurious Emissions

### 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
$\pi/4$ DQPSK	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

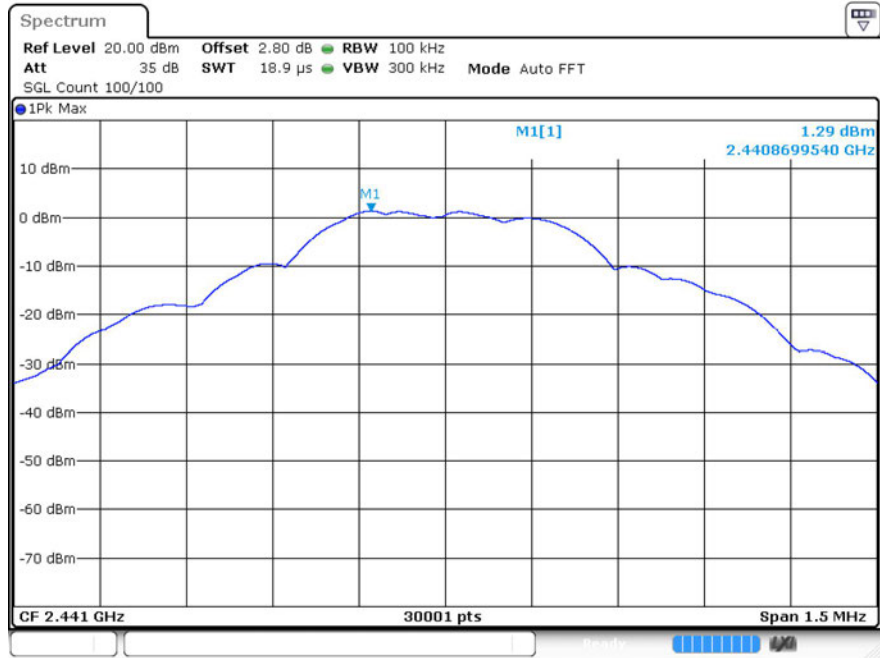
## 7.2 Test Graphs



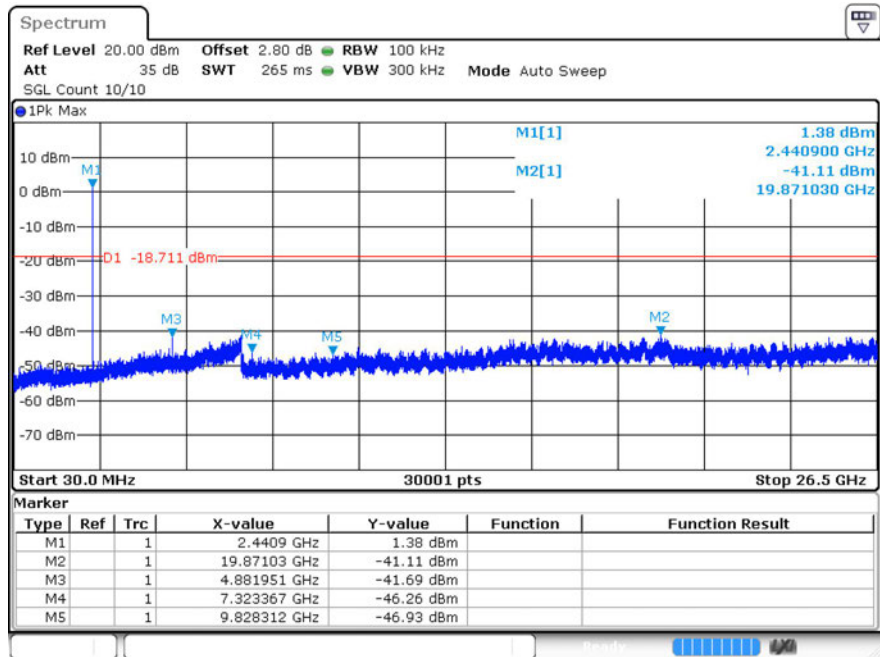


GFSK\_MCH\_Graphs

Pref

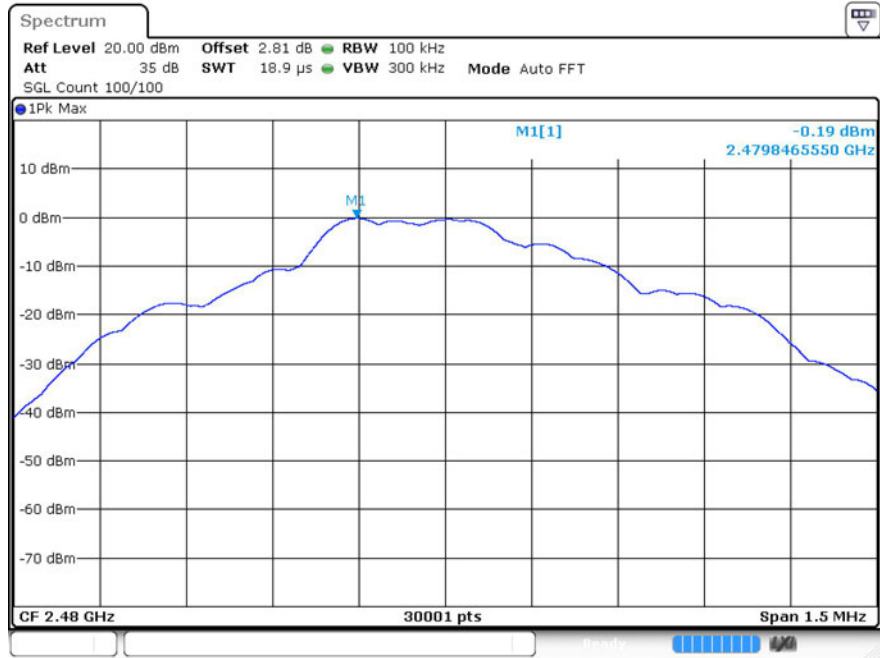


Puw

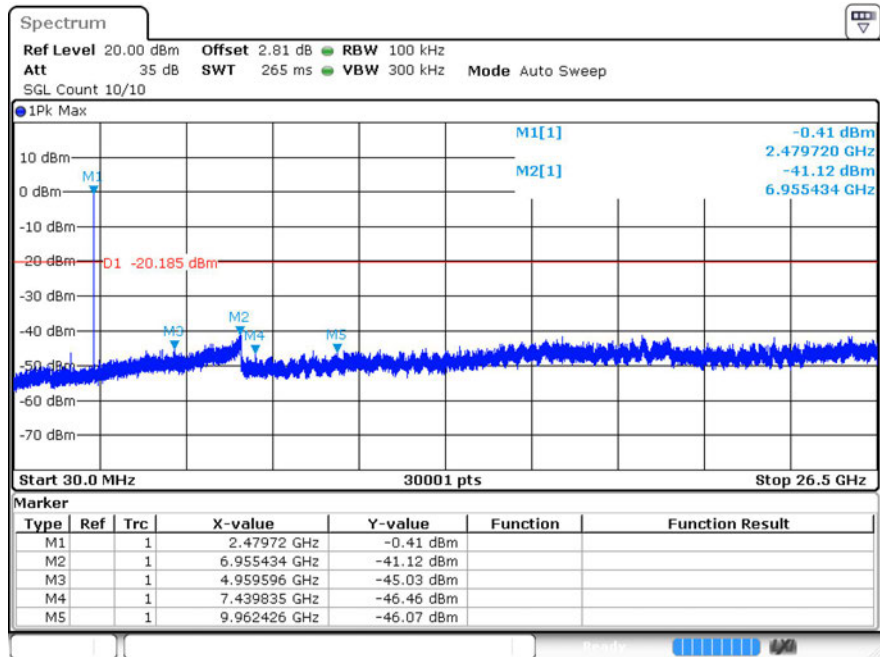


GFSK\_HCH\_Graphs

Pref

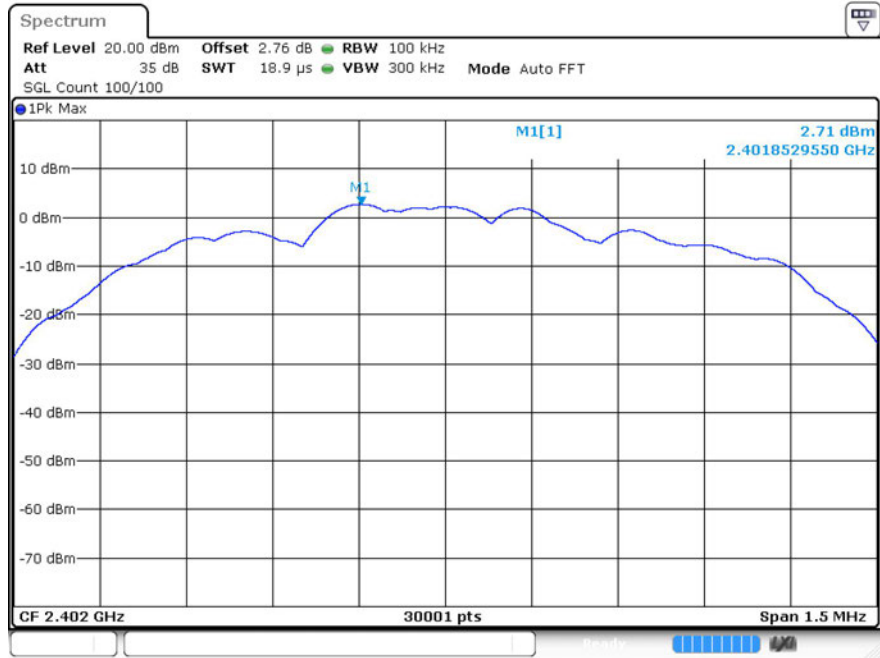


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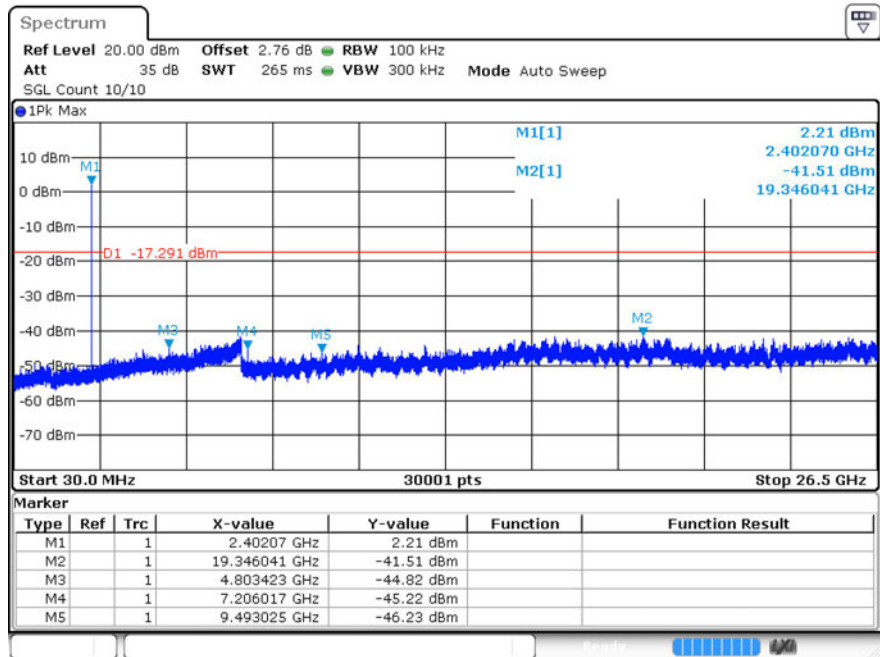


$\pi/4$ DQPSK\_LCH\_Graphs

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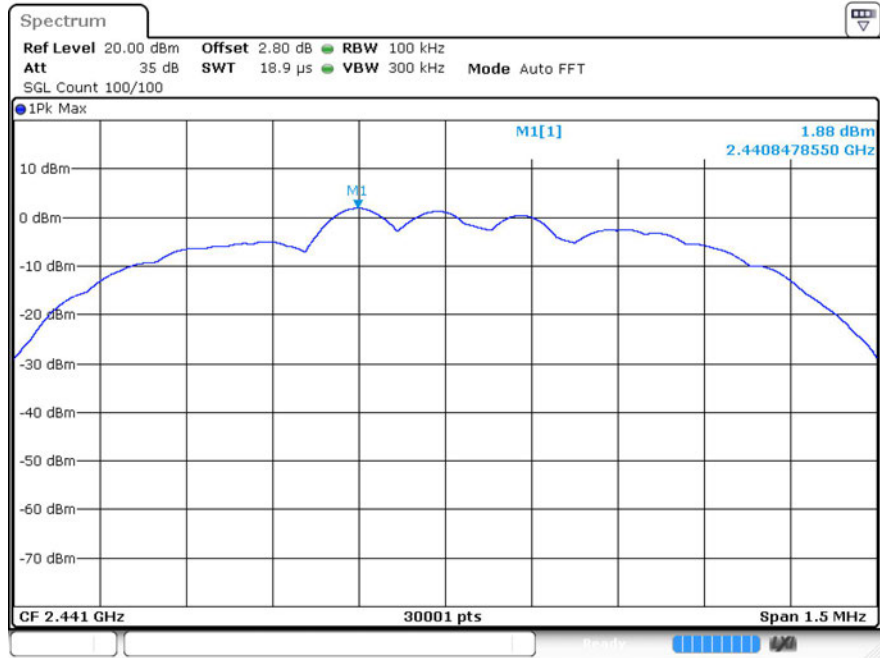


Puw

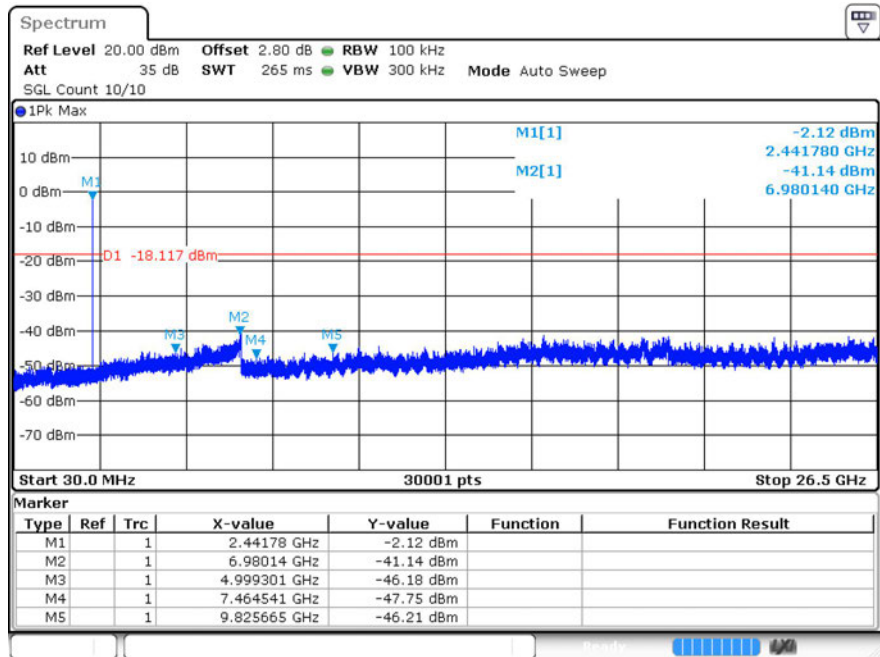


$\pi$ /4DQPSK\_MCH\_Graphs

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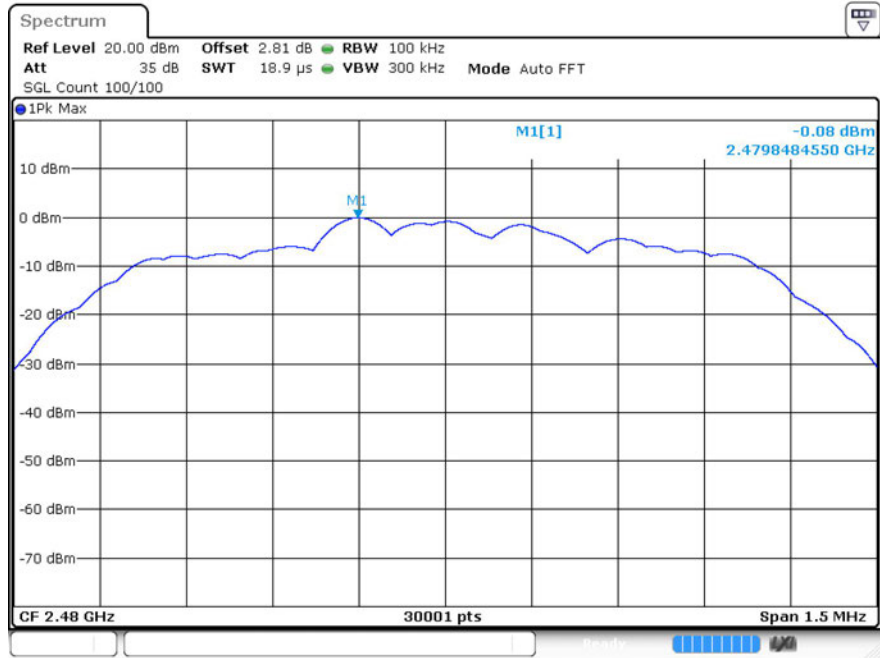


Puw

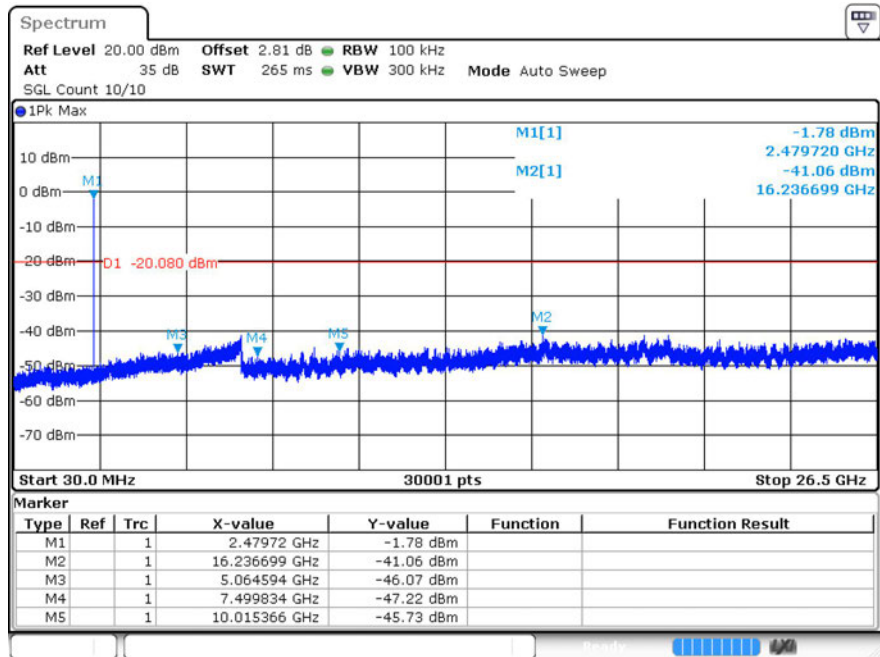


$\pi/4$ DQPSK\_HCH\_Graphs

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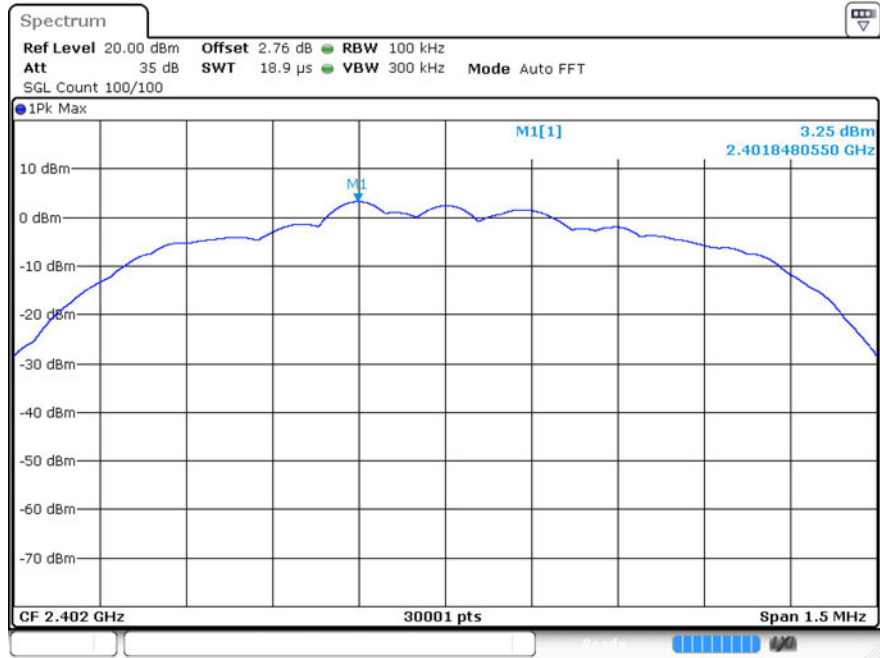


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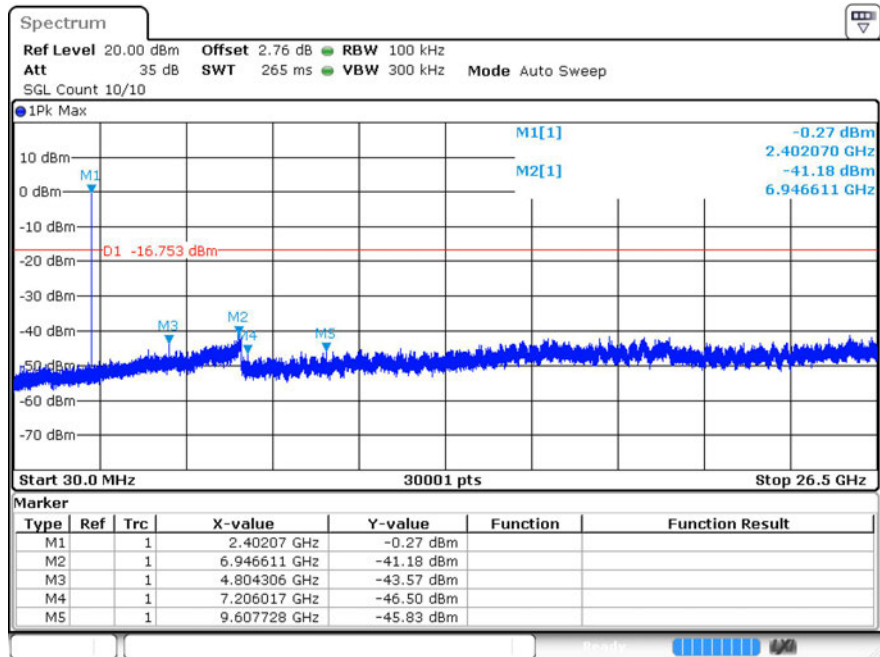


8DPSK\_LCH\_Graphs

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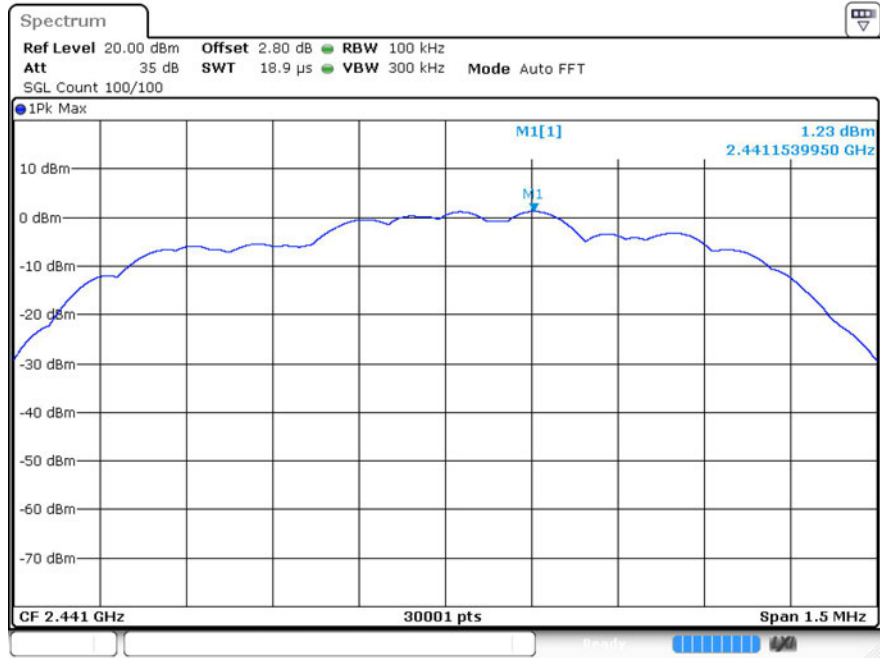


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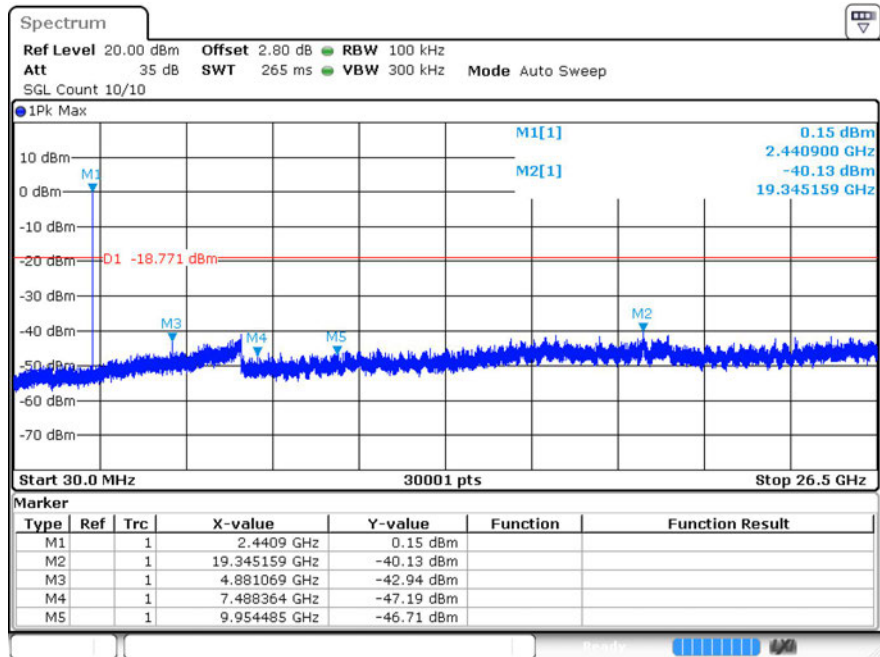


8DPSK\_MCH\_Graphs

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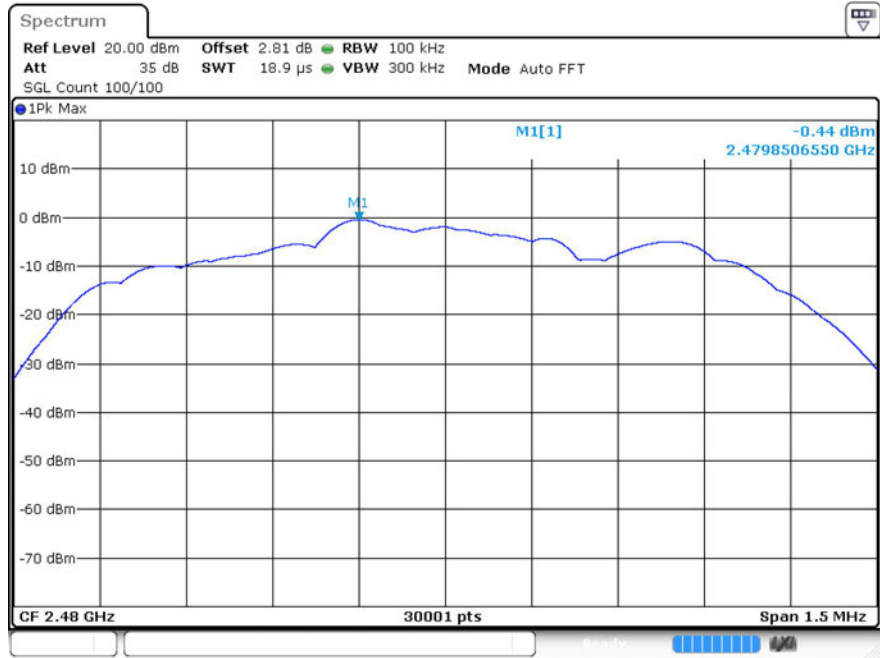


Puw



8DPSK\_HCH\_Graphs

Pref



Puw

