

## Appendix A

### RF Test Data for BR\_EDR (Conducted Measurement)

**Product Name:** Cloud Speaker

**Test Model:** CS20-1

#### Environmental Conditions

Temperature:	24.6°C
Relative Humidity:	51.4%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

# Contents

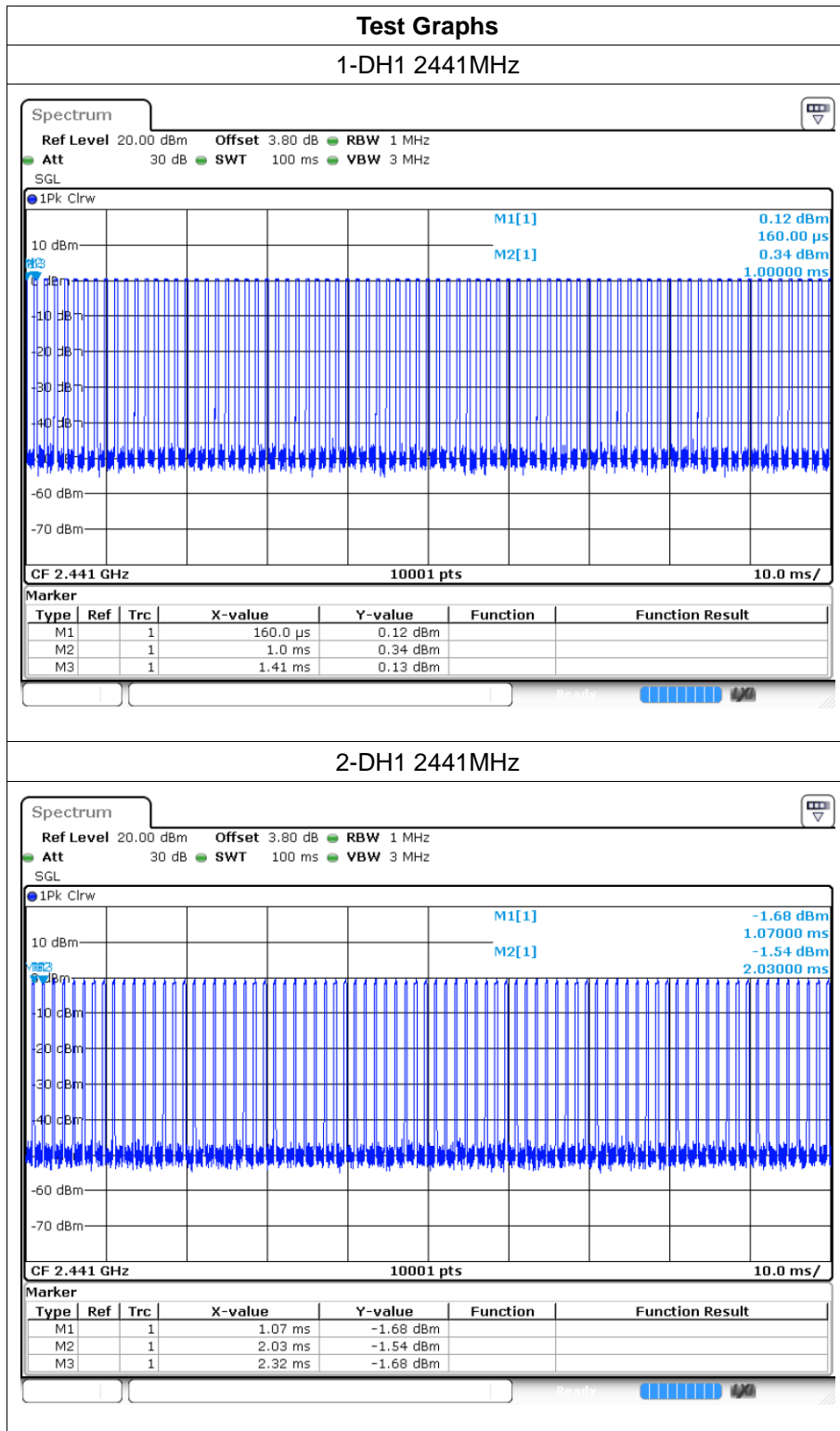
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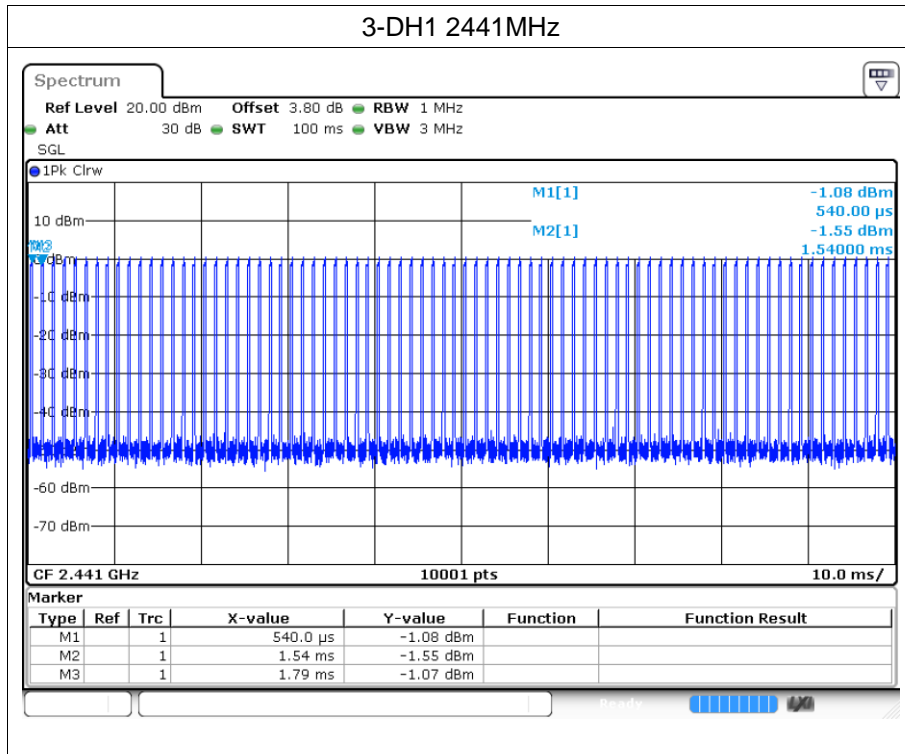
# 1 .Duty Cycle

## 1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2441	33.61	2.44
2-DH1	2441	24	3.45
3-DH1	2441	20.8	4

## 1.2 Test Graphs



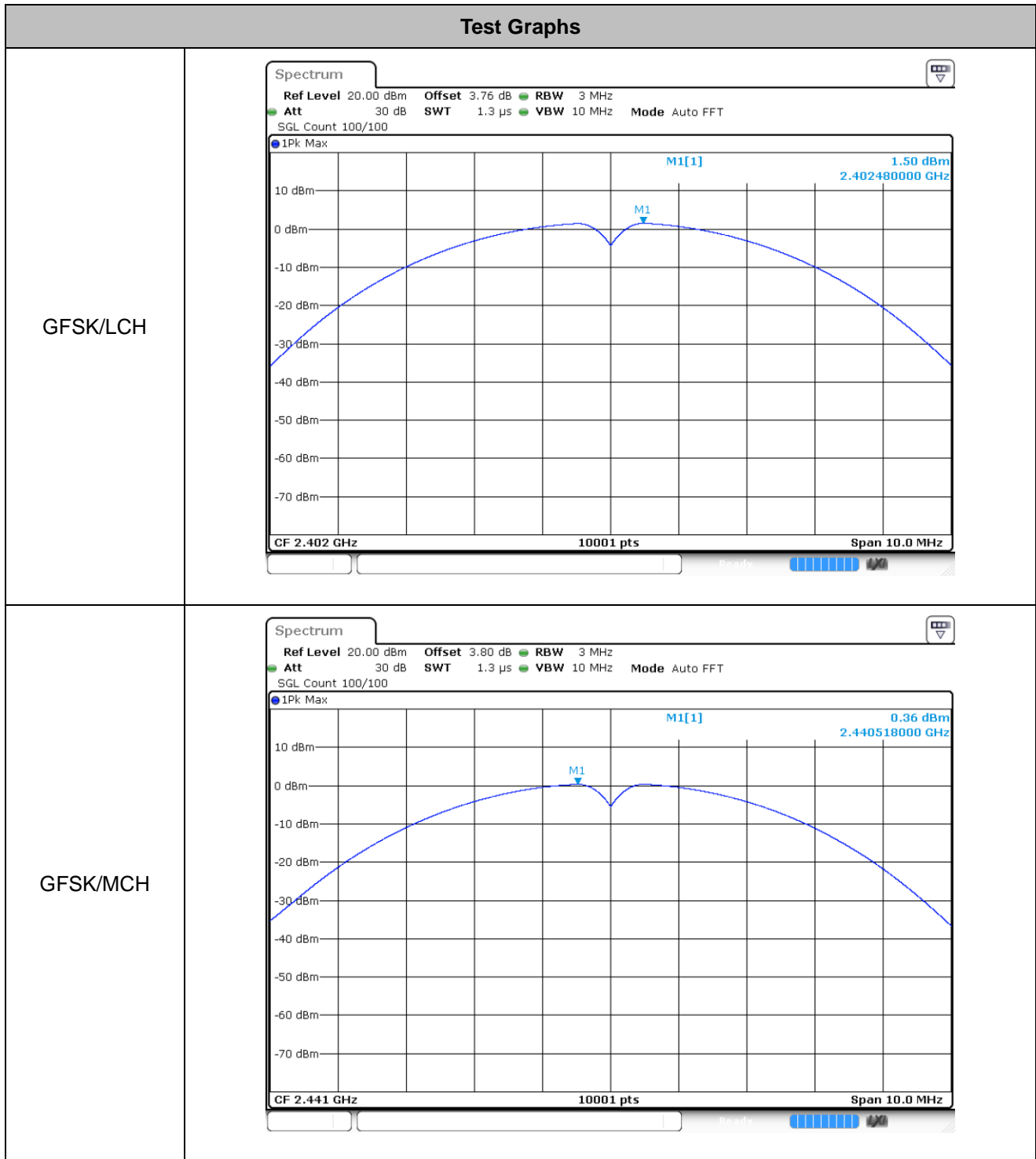


## 2 Maximum Conducted Peak Output Power

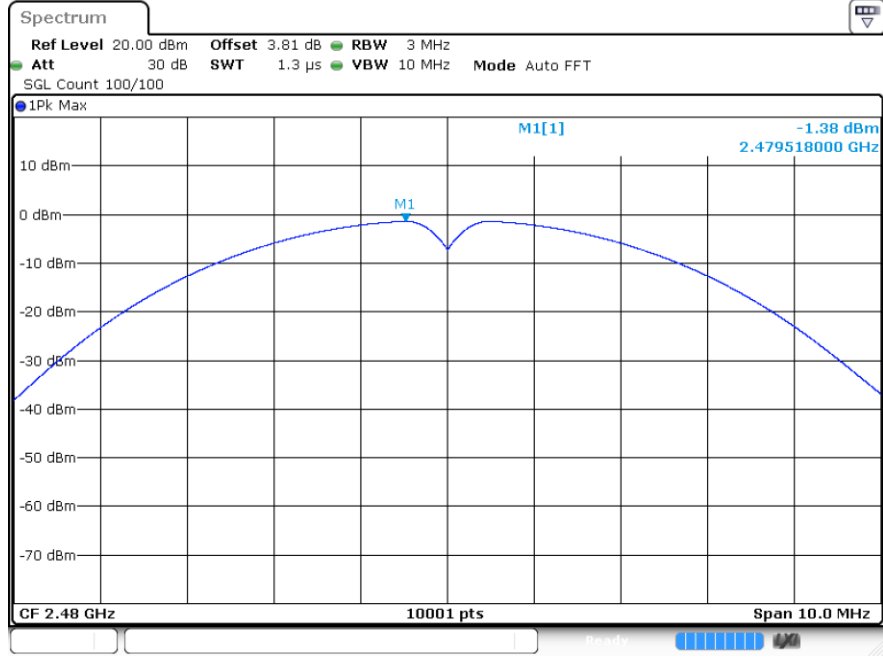
### 2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.5	$\leq 21$	Pass
	MCH	0.36	$\leq 21$	Pass
	HCH	-1.38	$\leq 21$	Pass
$\pi/4$ DQPSK	LCH	1.2	$\leq 21$	Pass
	MCH	-0.37	$\leq 21$	Pass
	HCH	-1.71	$\leq 21$	Pass
8DPSK	LCH	2.16	$\leq 21$	Pass
	MCH	-1.28	$\leq 21$	Pass
	HCH	-2.11	$\leq 21$	Pass

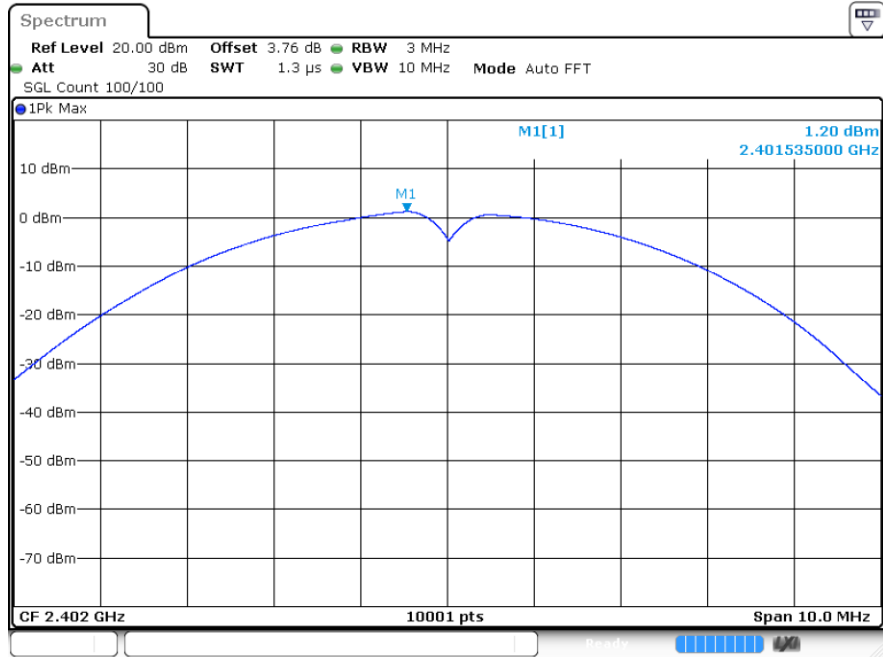
## 2.2 Test Graphs



GFSK/HCH

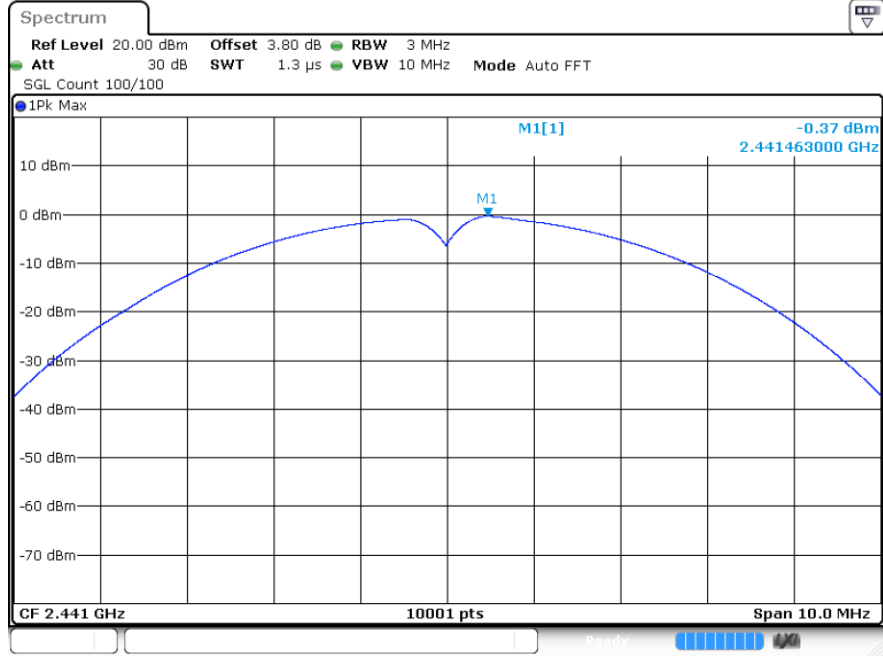


$\pi$ /4DQPSK/LCH

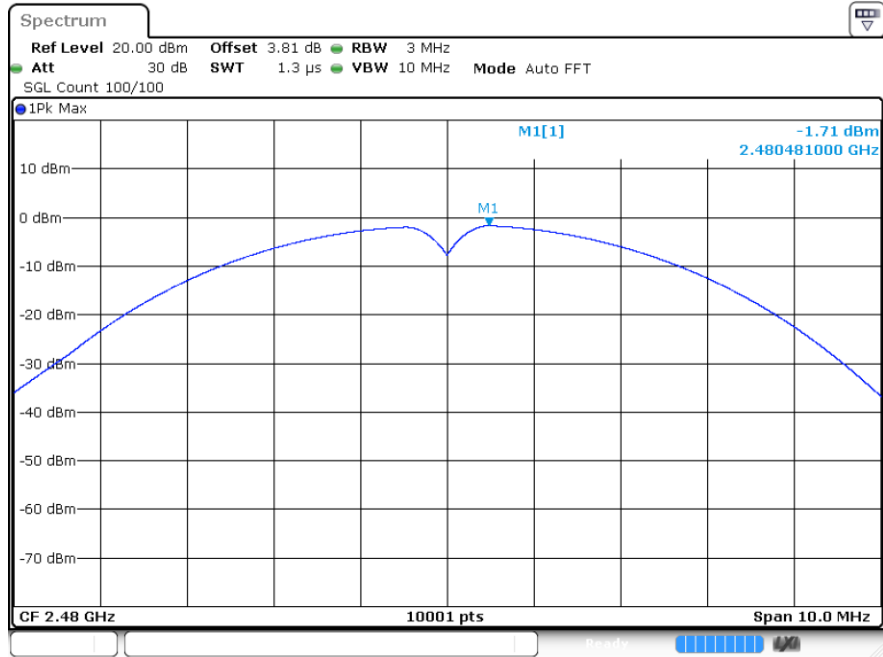




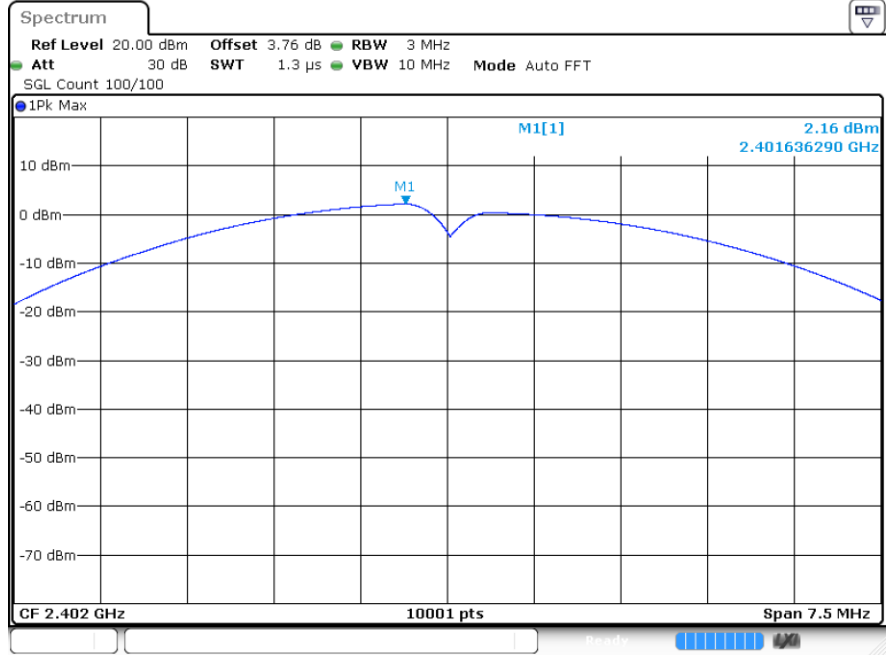
$\pi/4$ DQPSK/MC  
H



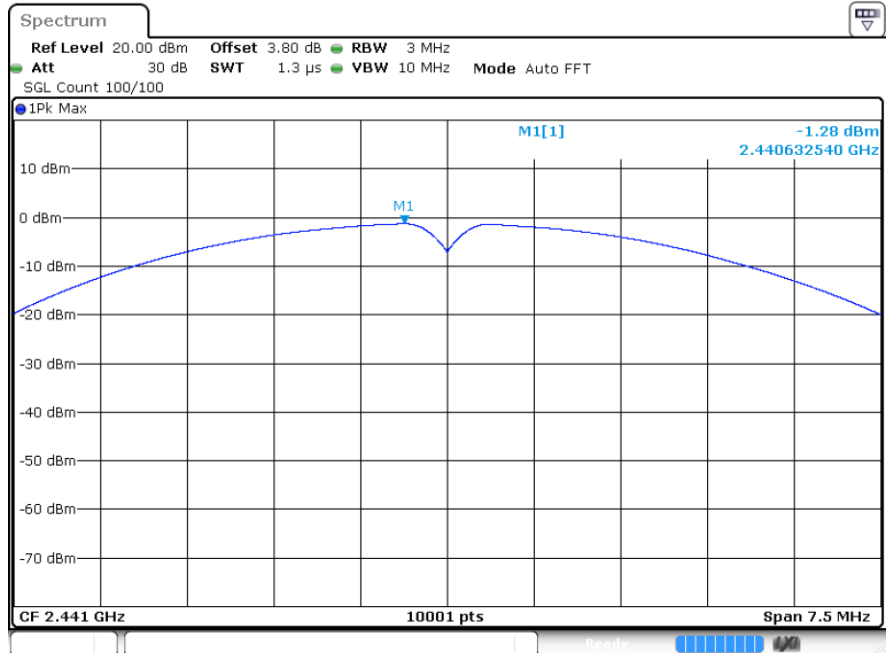
$\pi/4$ DQPSK/HCH



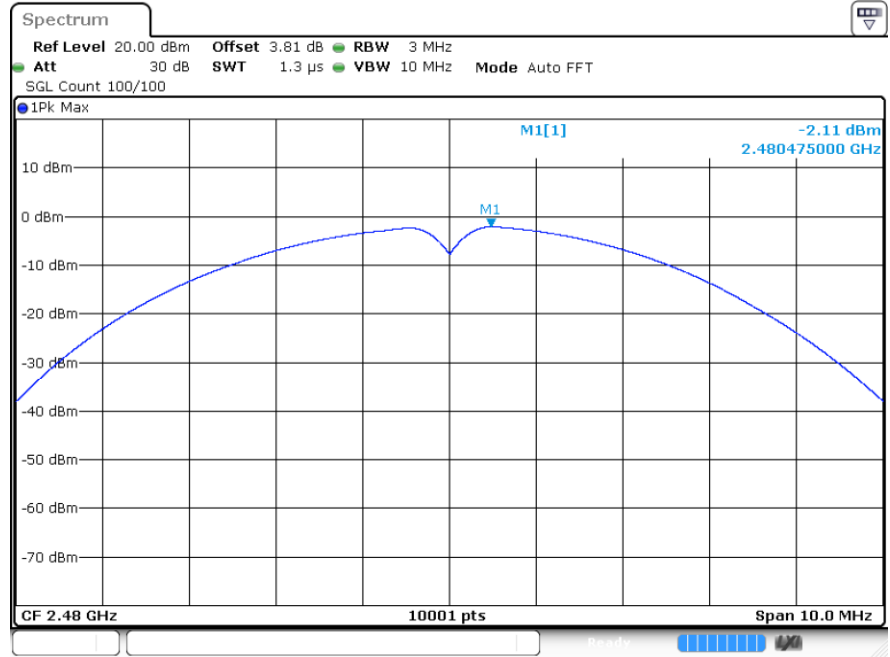
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

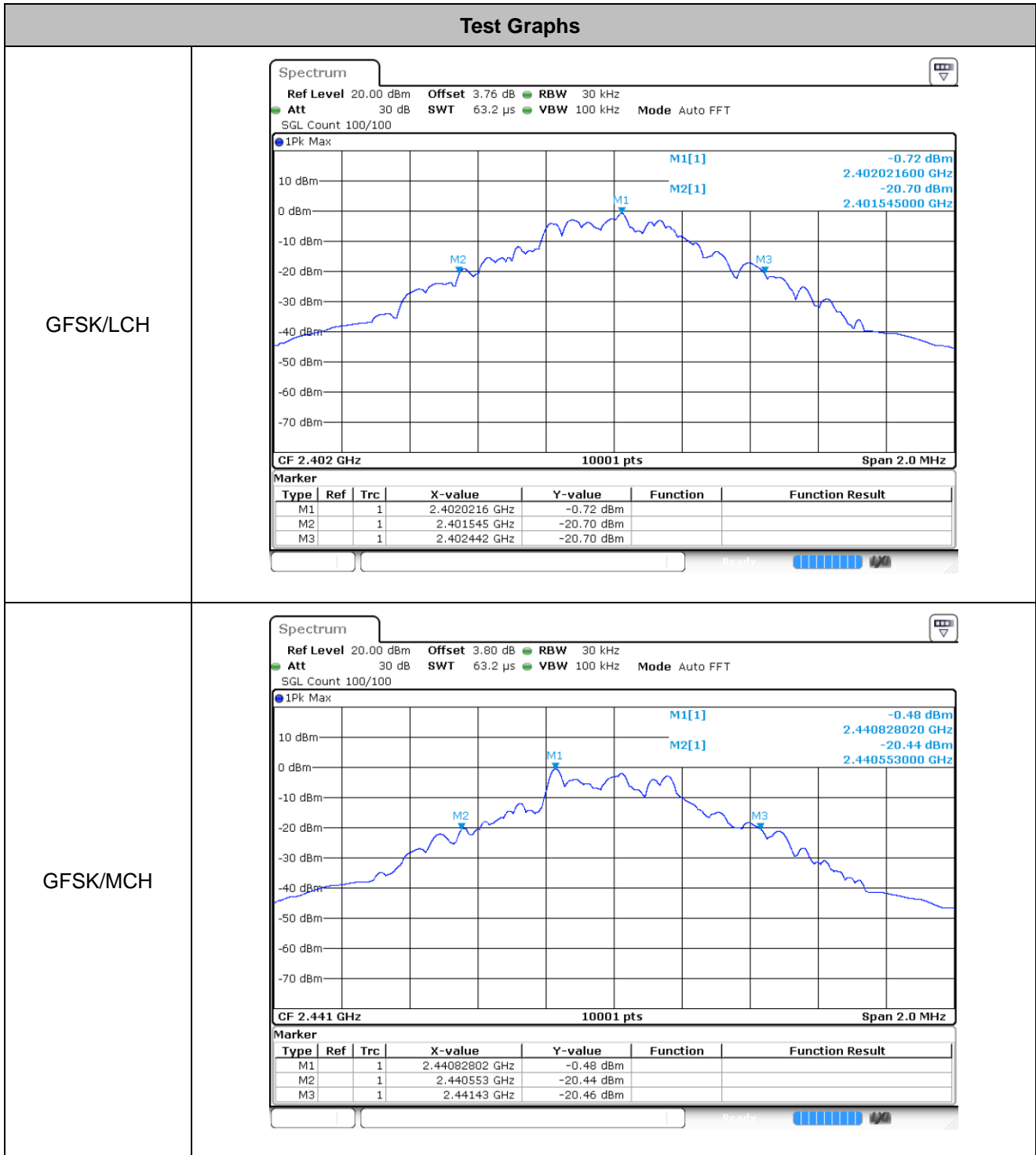


### 3 20dB Bandwidth

#### 3.1 Test Result

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.897	Not Specified	Pass
	MCH	0.878	Not Specified	Pass
	HCH	0.818	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.198	Not Specified	Pass
	MCH	1.274	Not Specified	Pass
	HCH	1.276	Not Specified	Pass
8DPSK	LCH	1.239	Not Specified	Pass
	MCH	1.196	Not Specified	Pass
	HCH	1.237	Not Specified	Pass

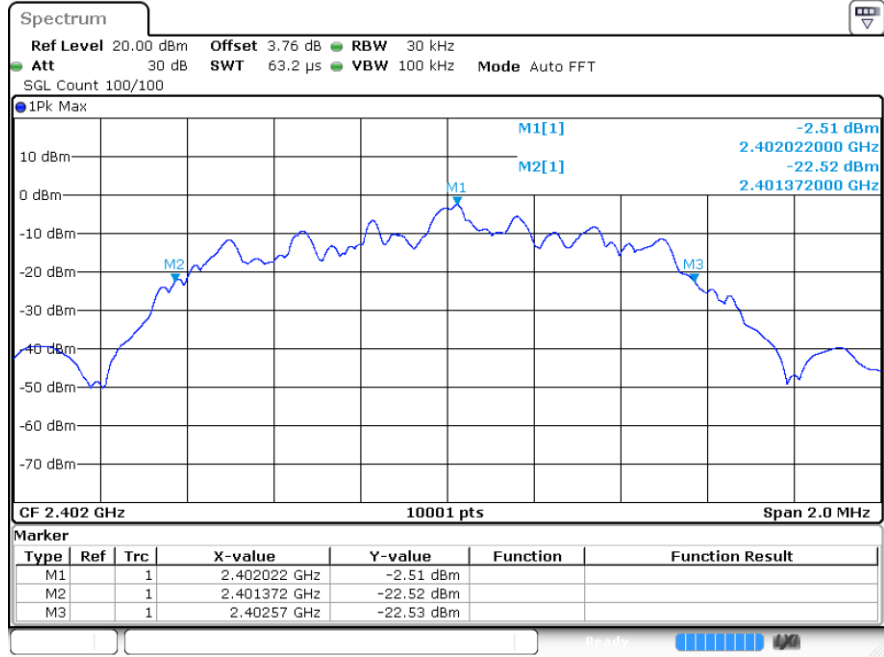
### 3.2 Test Graphs



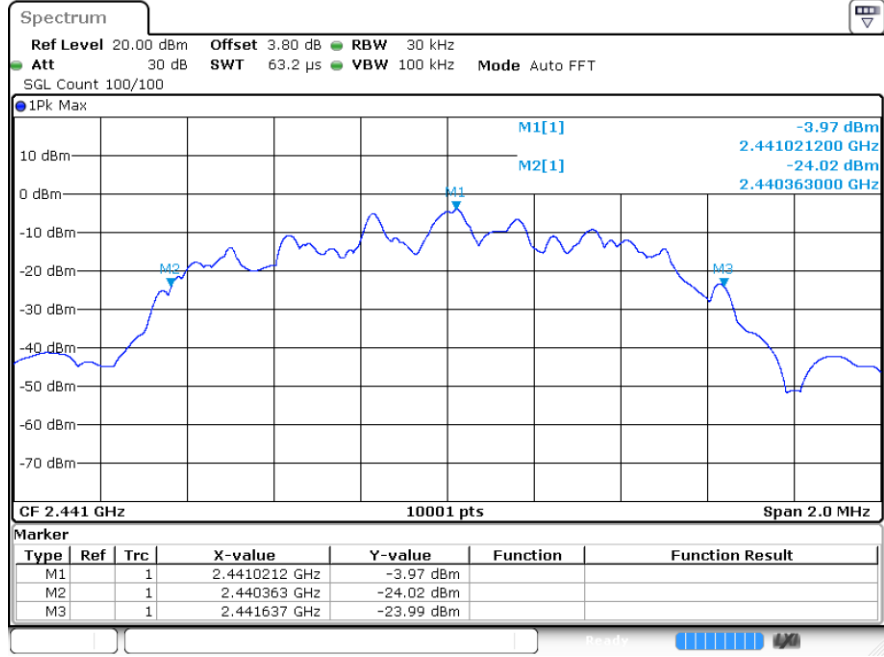
GFSK/HCH



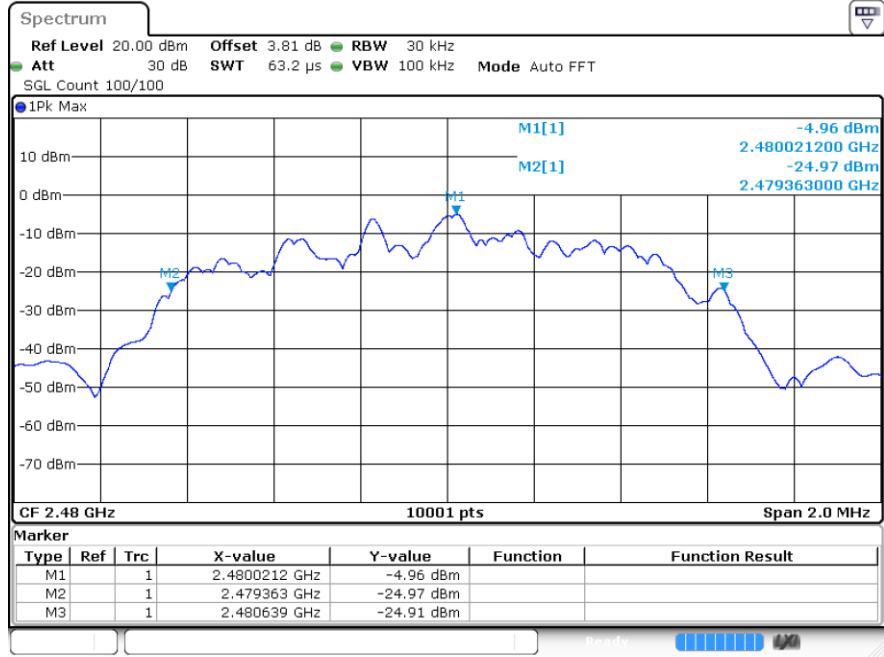
π/4DQPSK/LCH



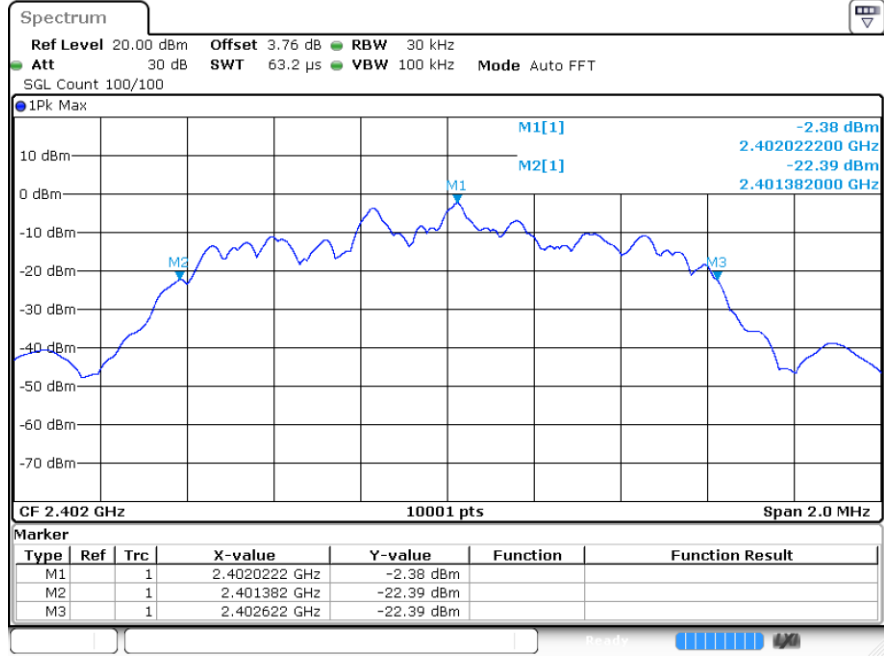
$\pi/4$ DQPSK/MCH



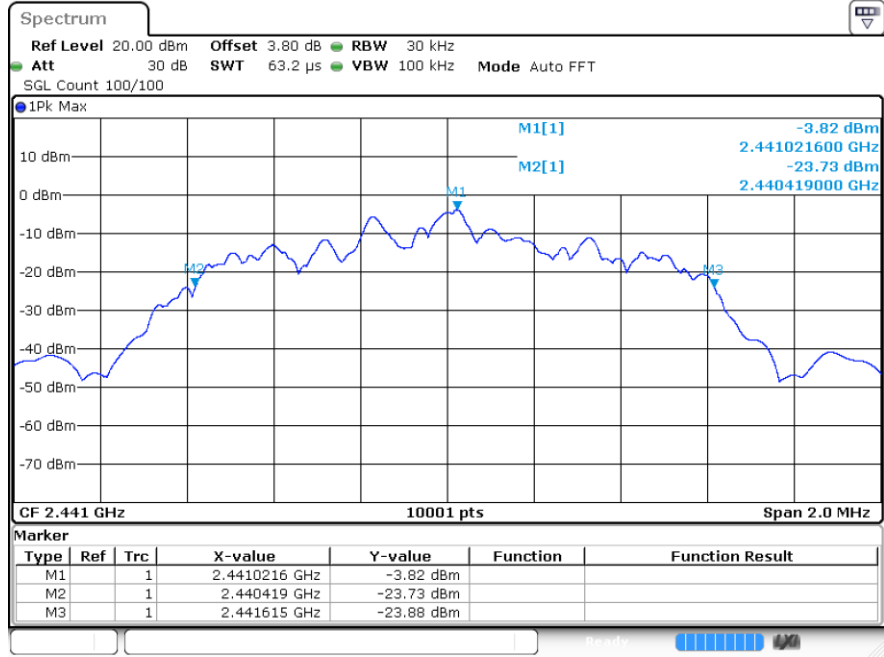
$\pi/4$ DQPSK/HCH



8DPSK/LCH

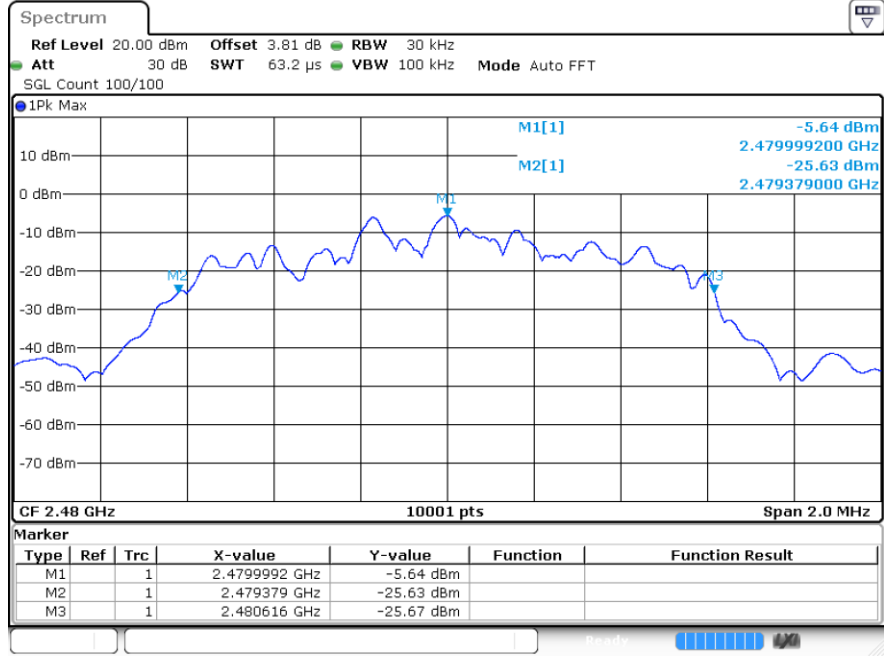


8DPSK/MCH





8DPSK/HCH

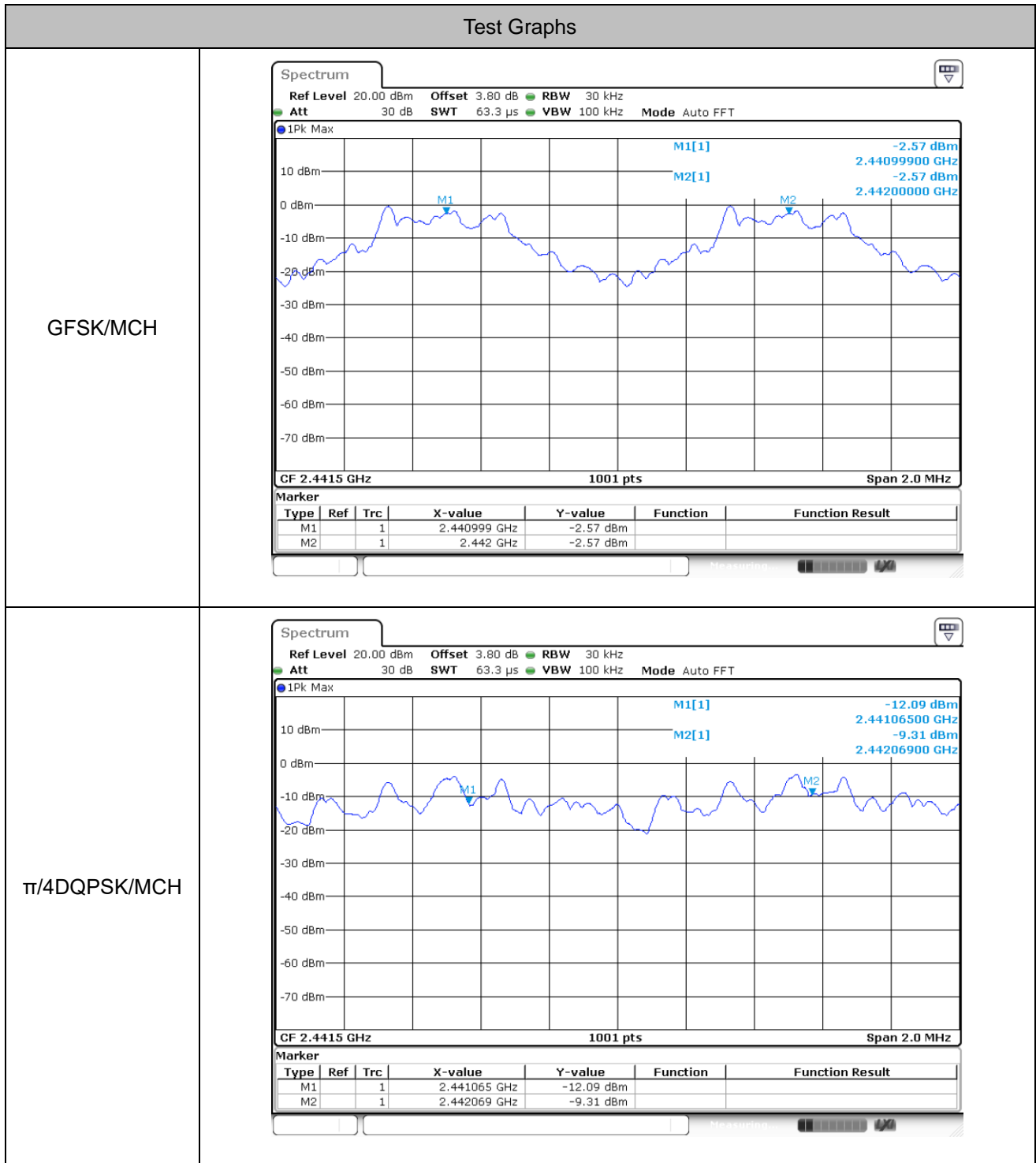


## 4 Carrier Frequency Separation

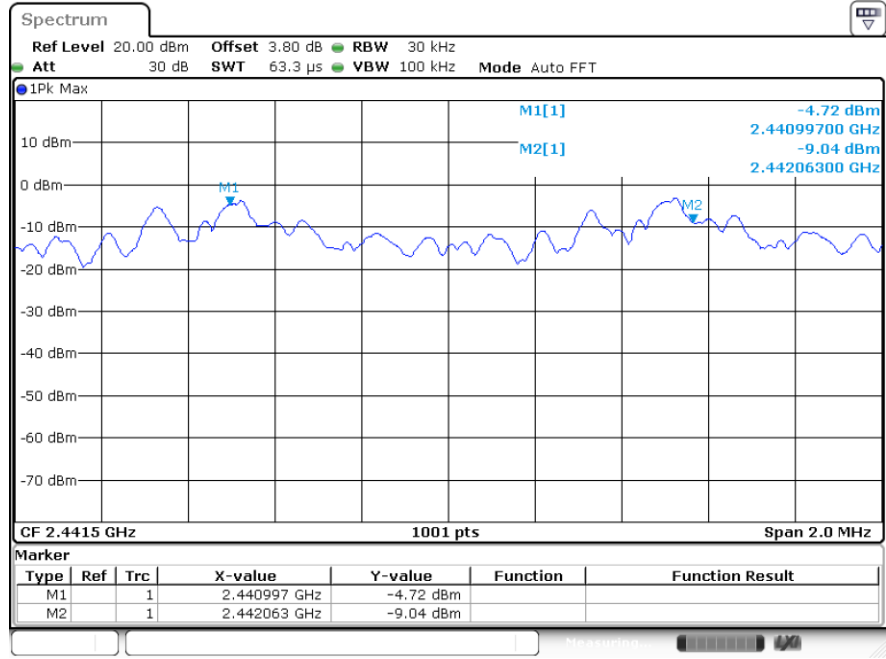
### 4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.585	Pass
$\pi/4$ DQPSK	MCH	1.004	0.849	Pass
8DPSK	MCH	1.066	0.797	Pass

## 4.2 Test Graphs



8DPSK/MCH

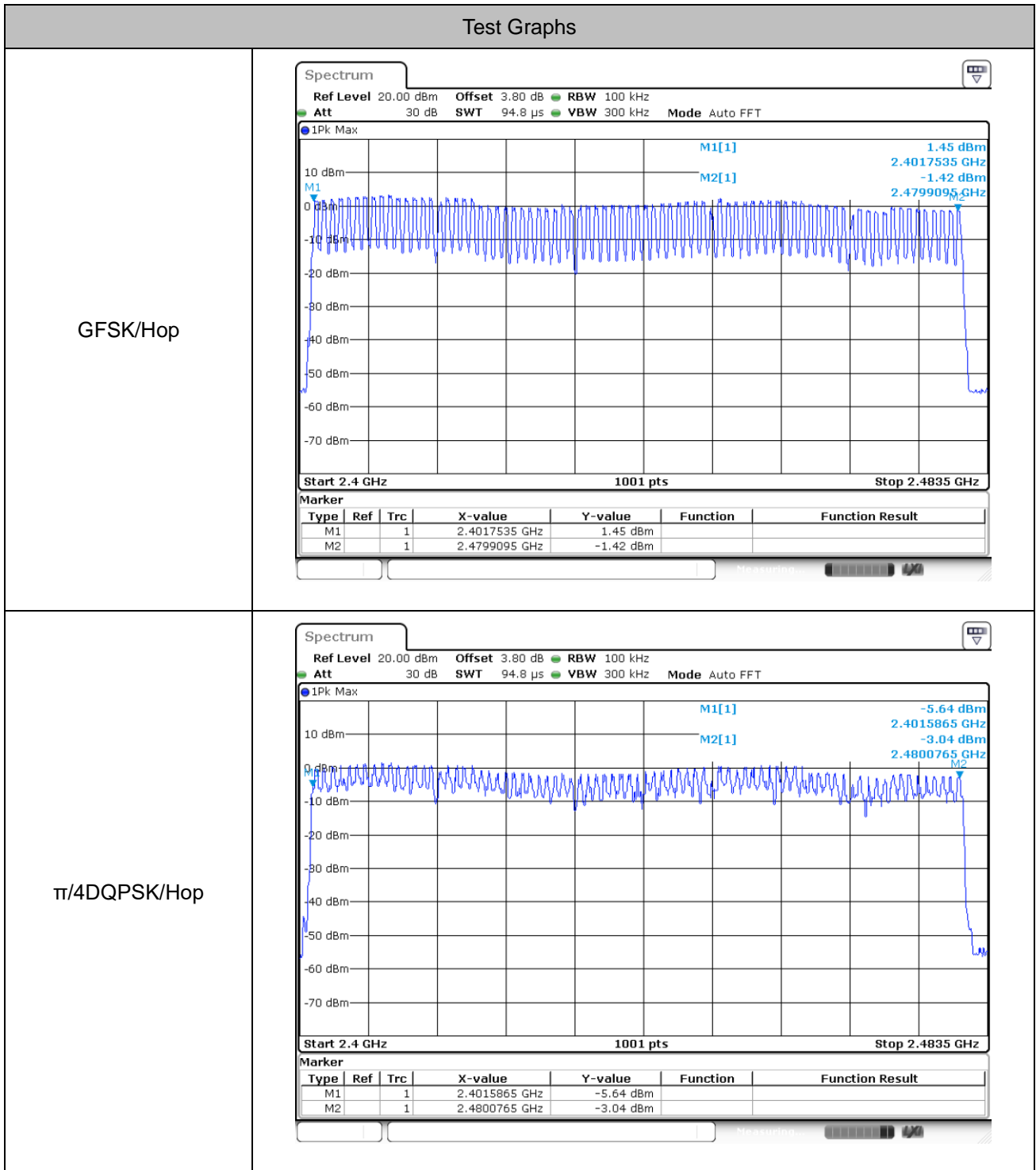


## 5 Hopping Channel Number

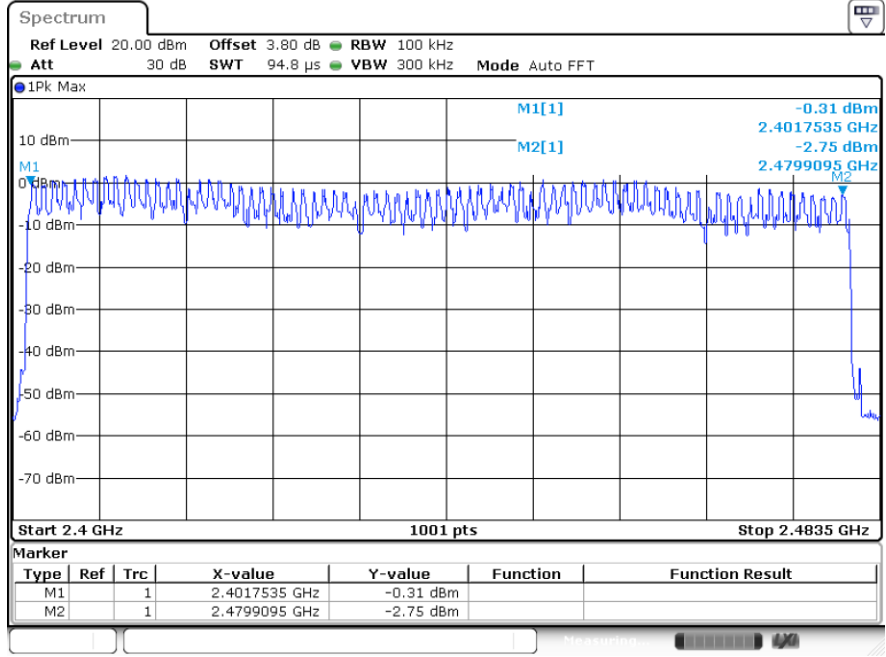
### 5.1 Test Result

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



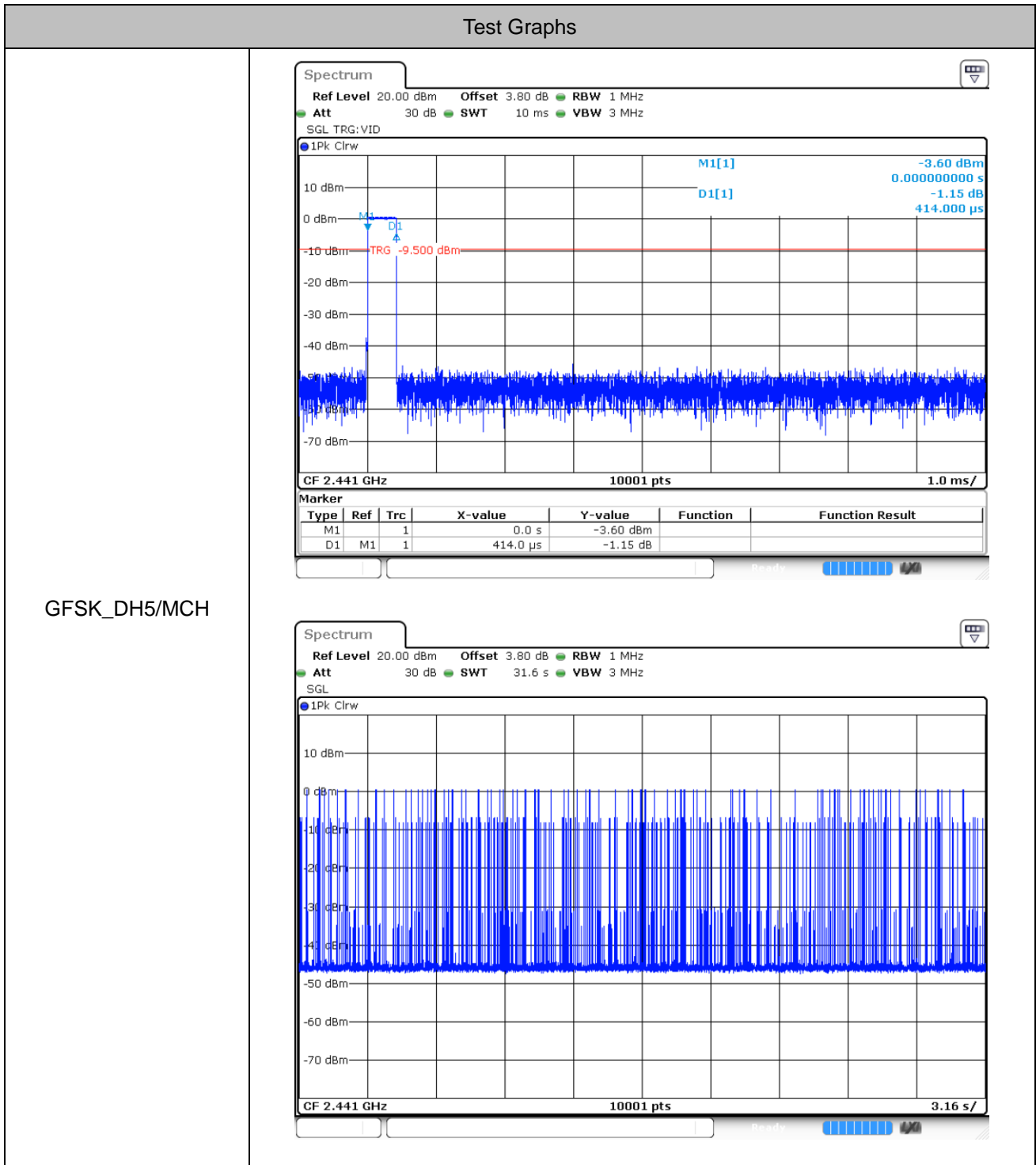
## 6 Dwell Time

### 6.1 Test Result

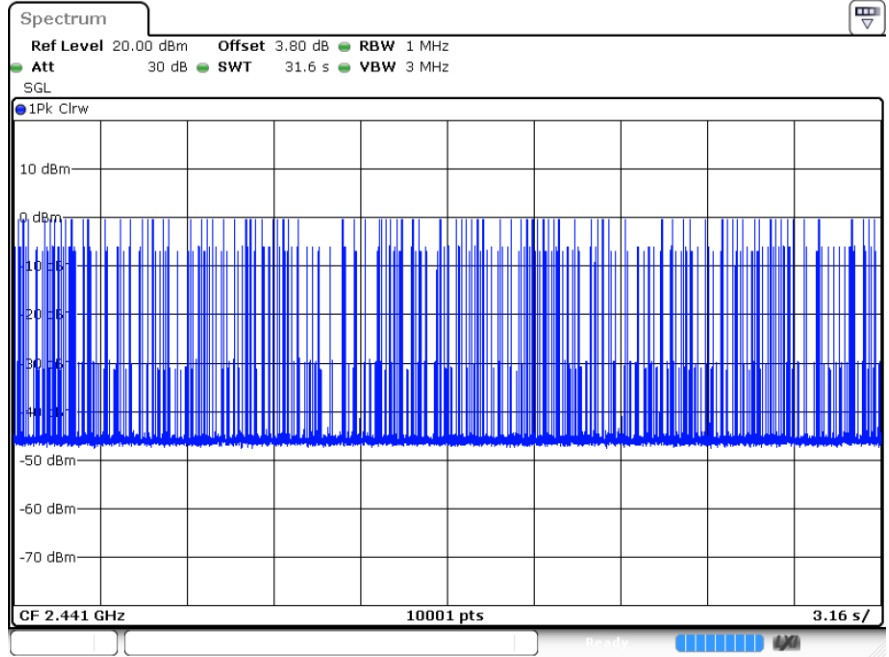
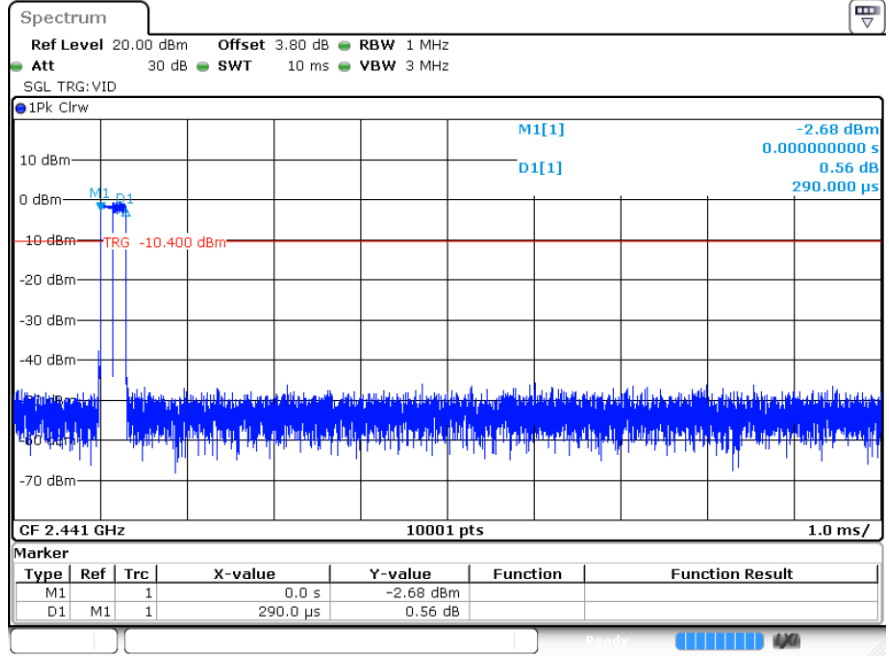
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	0.414	108	44.712	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	0.29	116	33.64	0.4	Pass
8DPSK	3DH5	MCH	0.246	99	24.354	0.4	Pass



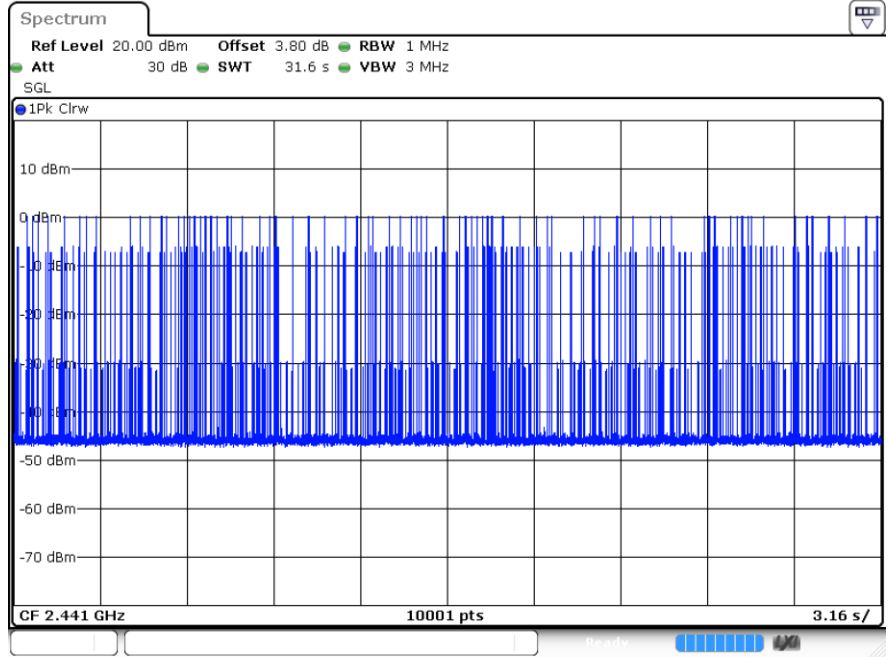
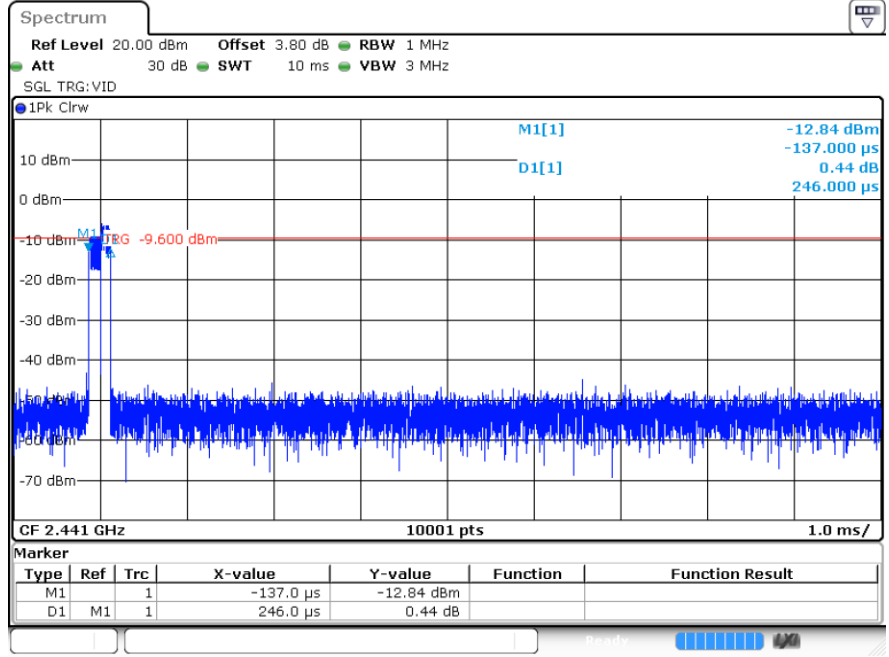
## 6.2 Test Graphs



$\pi/4$ DQPSK  
\_2DH5/MCH



8DPSK\_3DH5/MCH

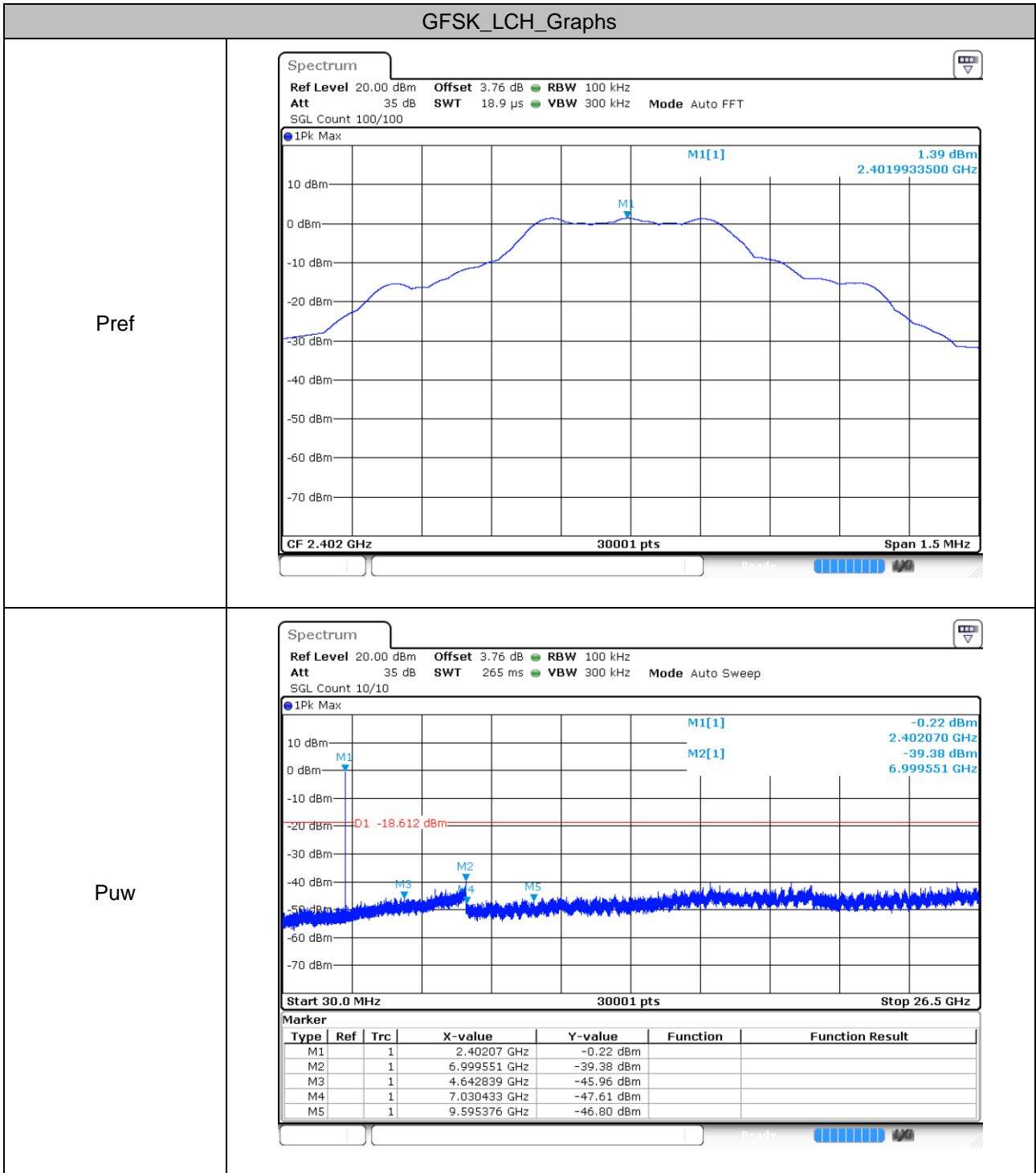


## 7 RF Conducted Spurious Emissions

### 7.1 Test Result

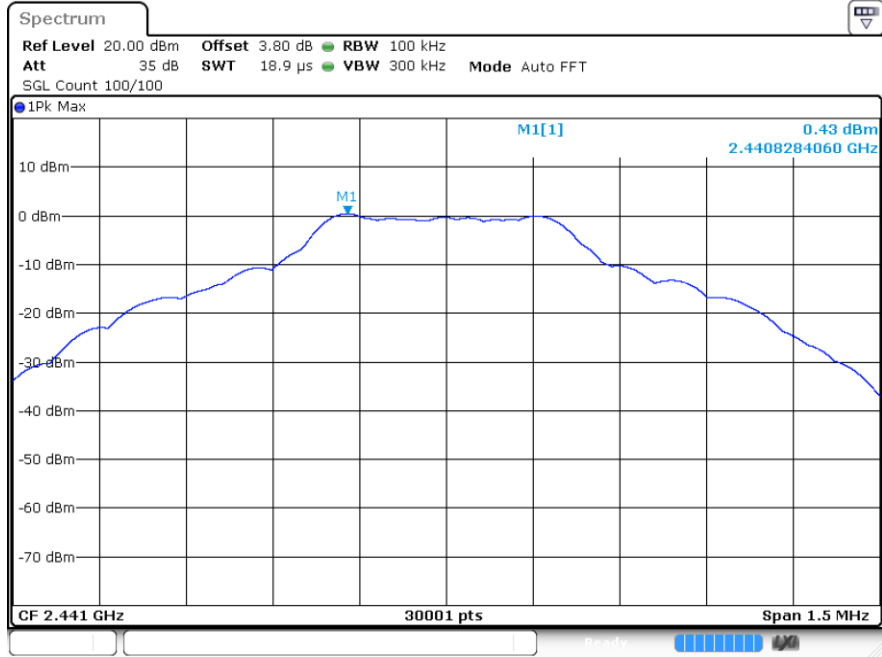
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-40.76	-20	Pass
	MCH	-41.13	-20	Pass
	HCH	-39.06	-20	Pass
$\pi/4$ DQPSK	LCH	-40.42	-20	Pass
	MCH	-39.03	-20	Pass
	HCH	-38.36	-20	Pass
8DPSK	LCH	-40.57	-20	Pass
	MCH	-37.73	-20	Pass
	HCH	-38.26	-20	Pass

## 7.2 Test Graphs

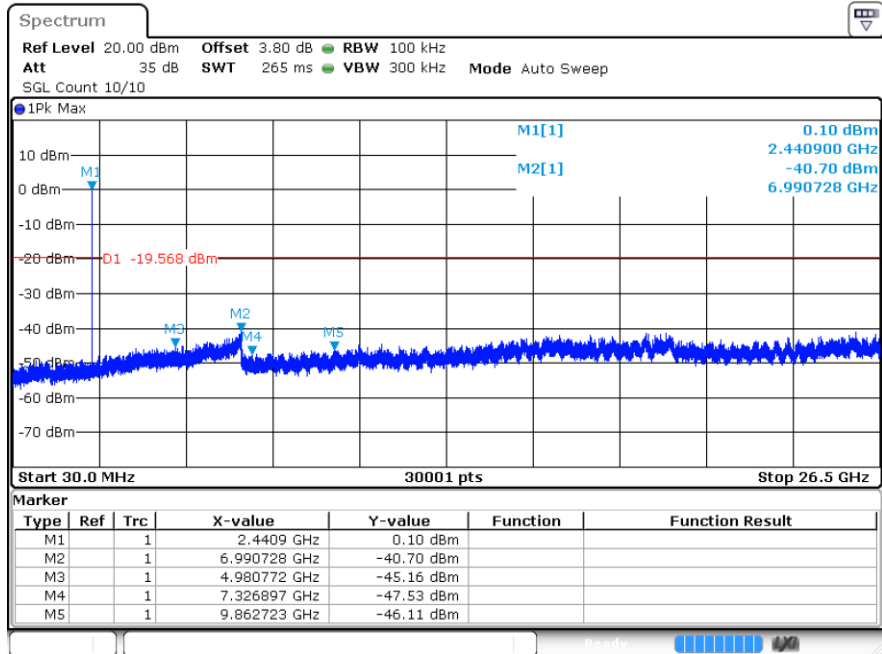


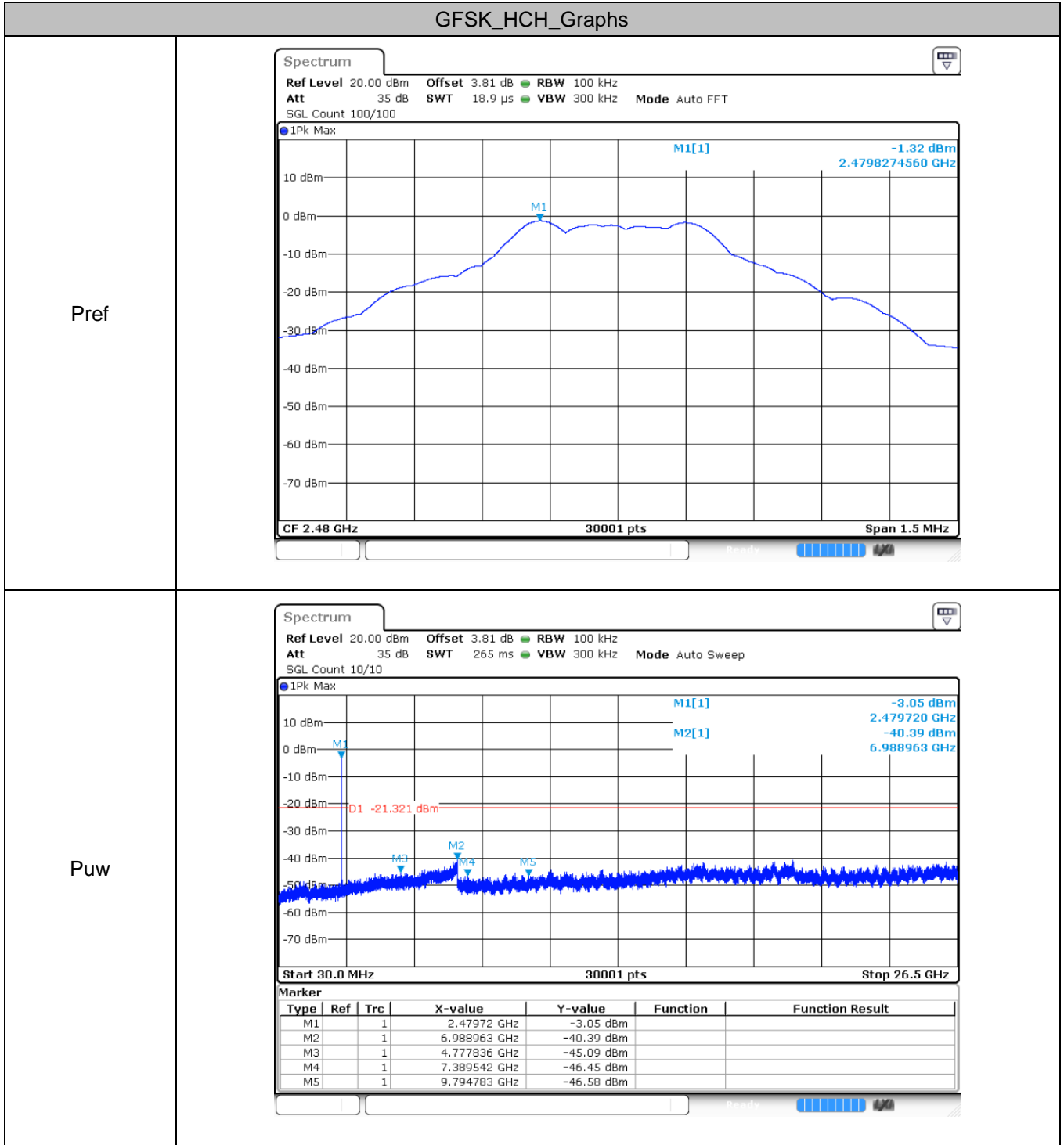
GFSK\_MCH\_Graphs

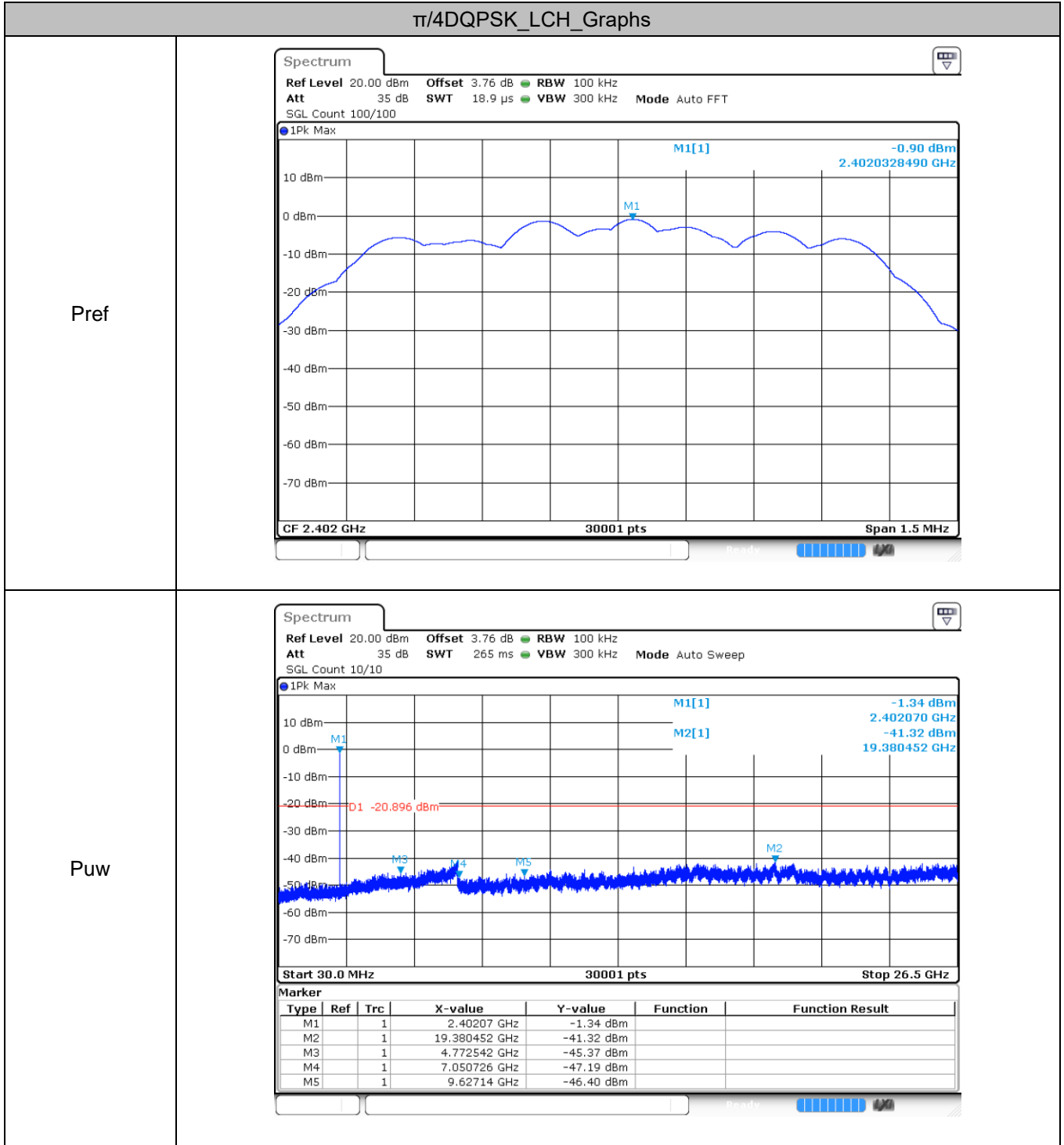
Pref



Puw



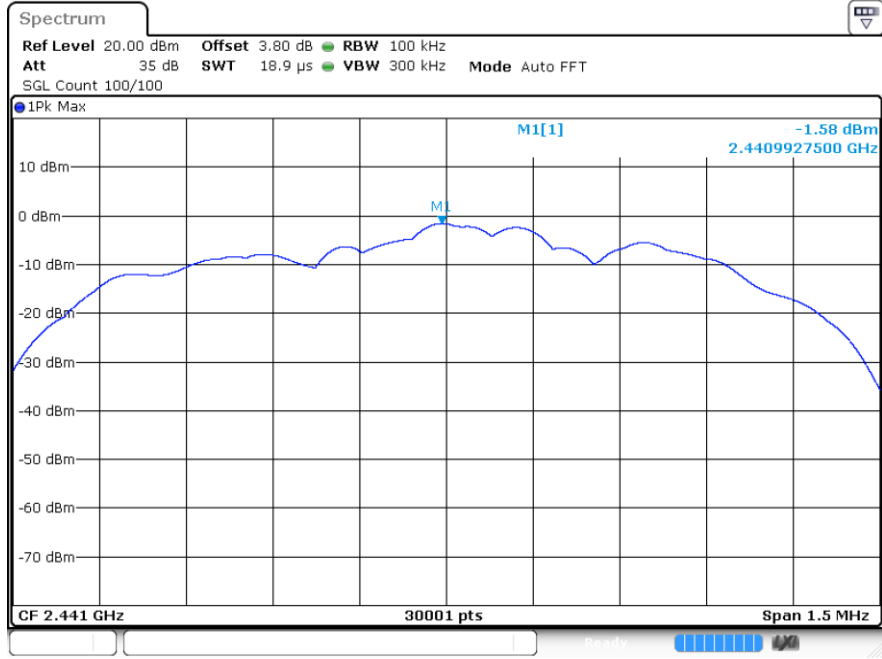




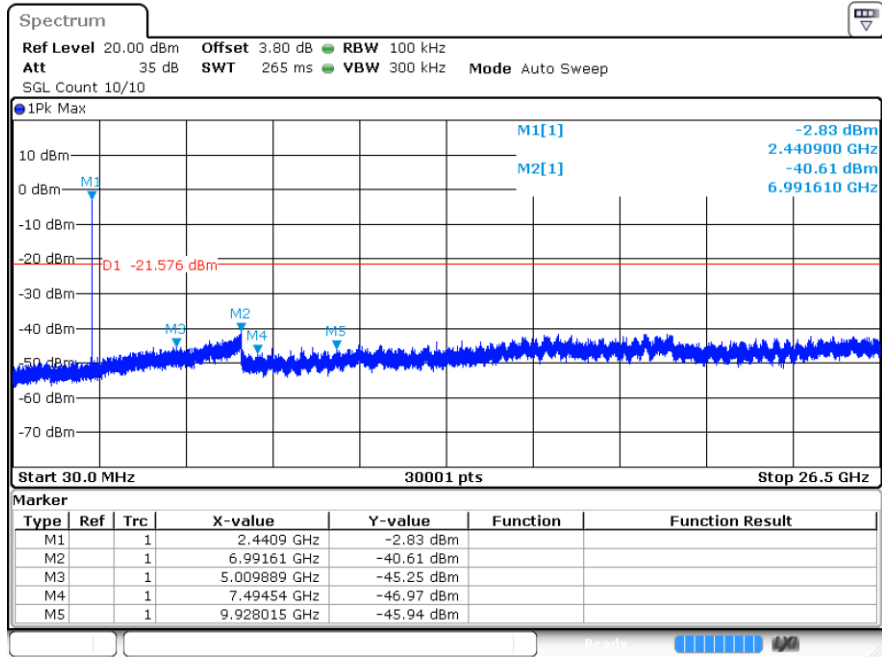


$\pi$ /4DQPSK\_MCH\_Graphs

Pref

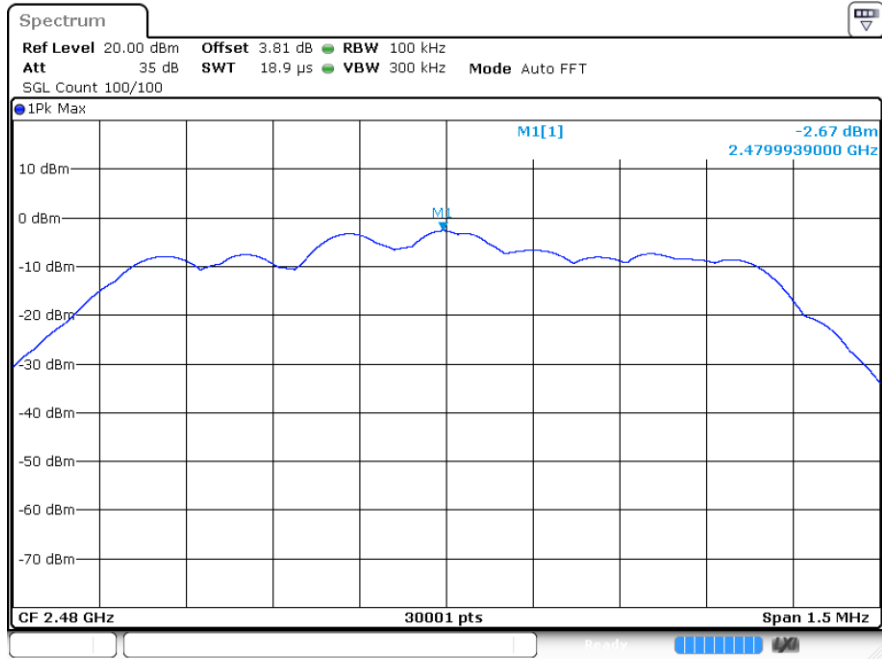


Puw

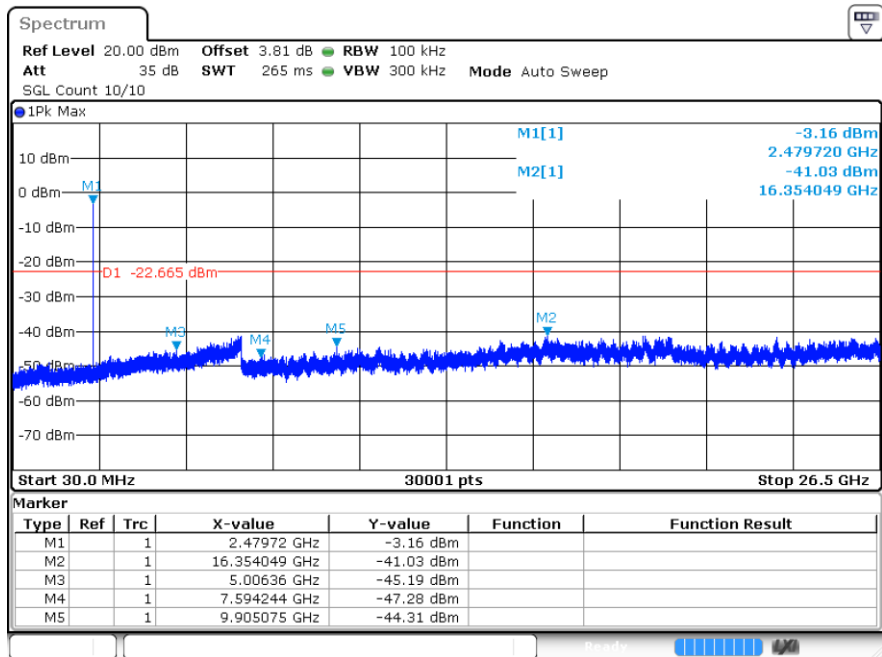


$\pi/4$ DQPSK\_HCH\_Graphs

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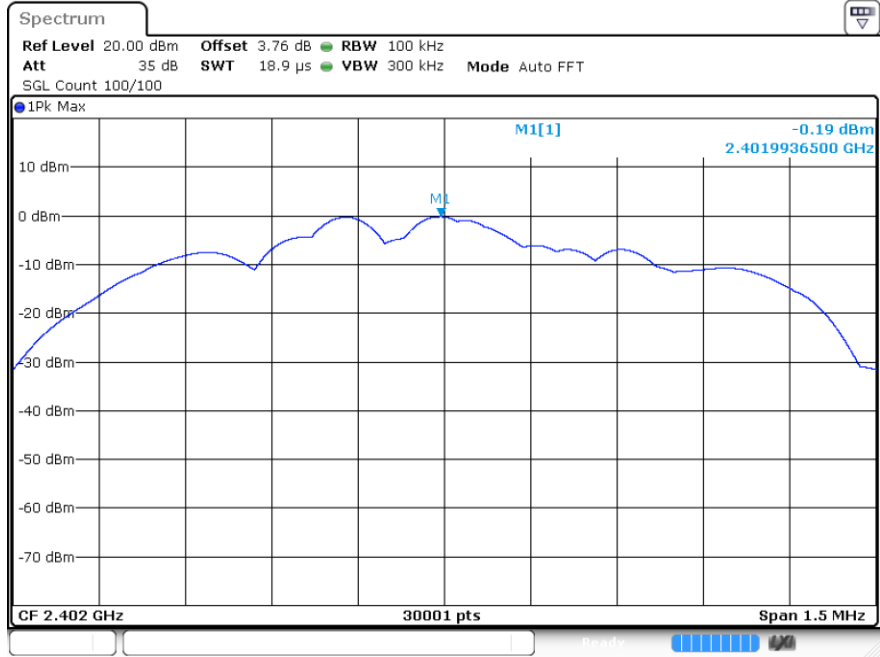


Puw

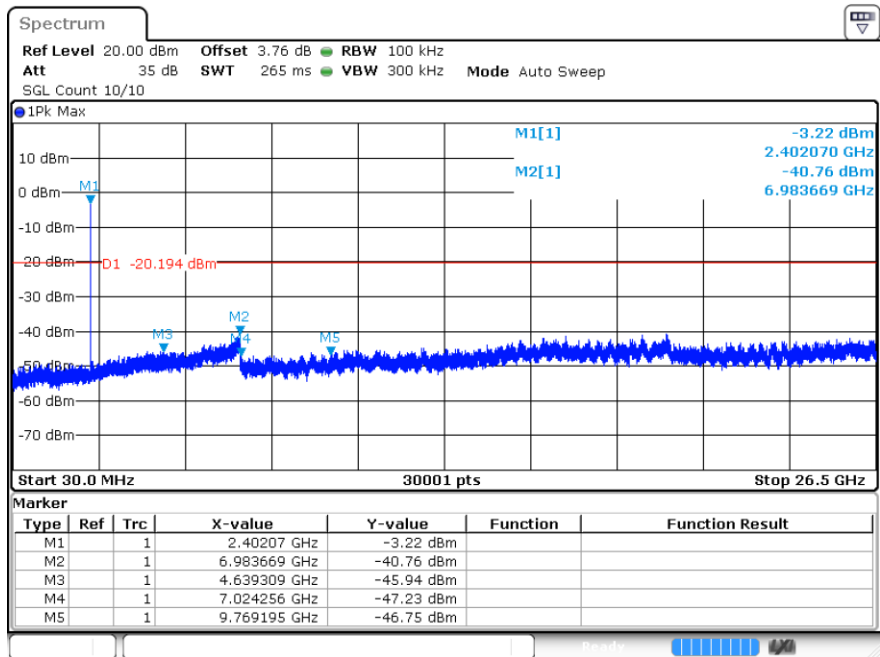


8DPSK\_LCH\_Graphs

Pref

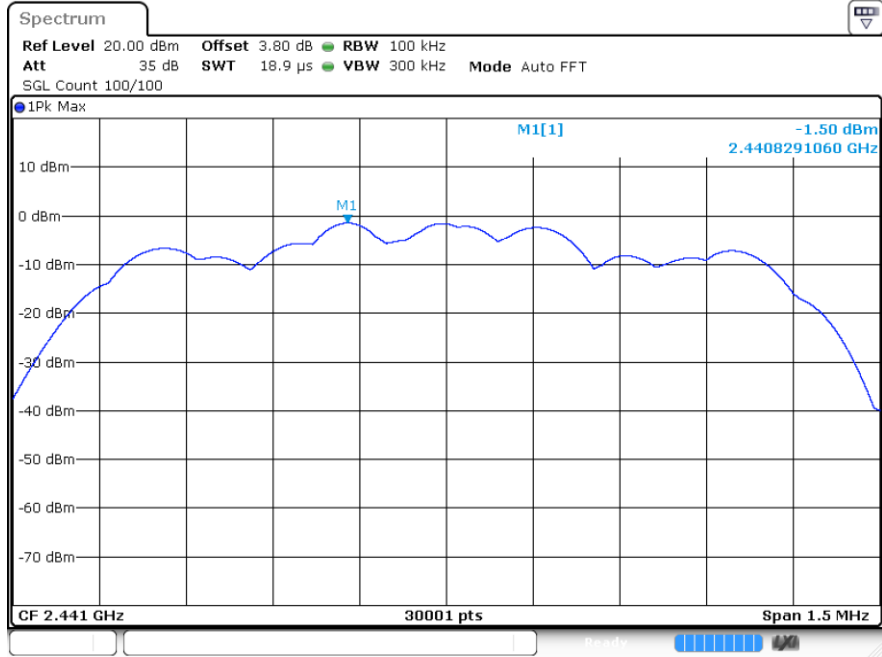


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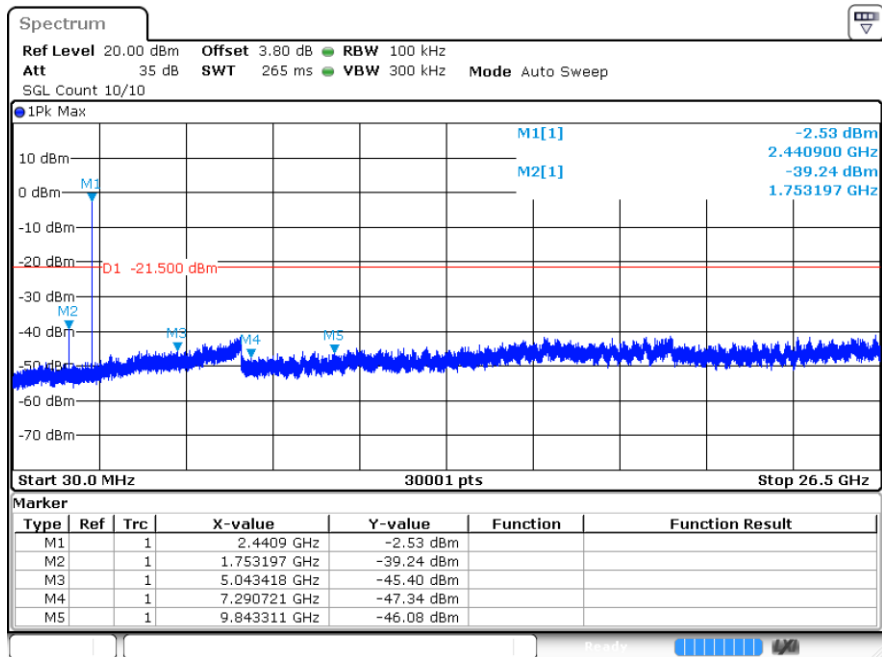


8DPSK\_MCH\_Graphs

Pref

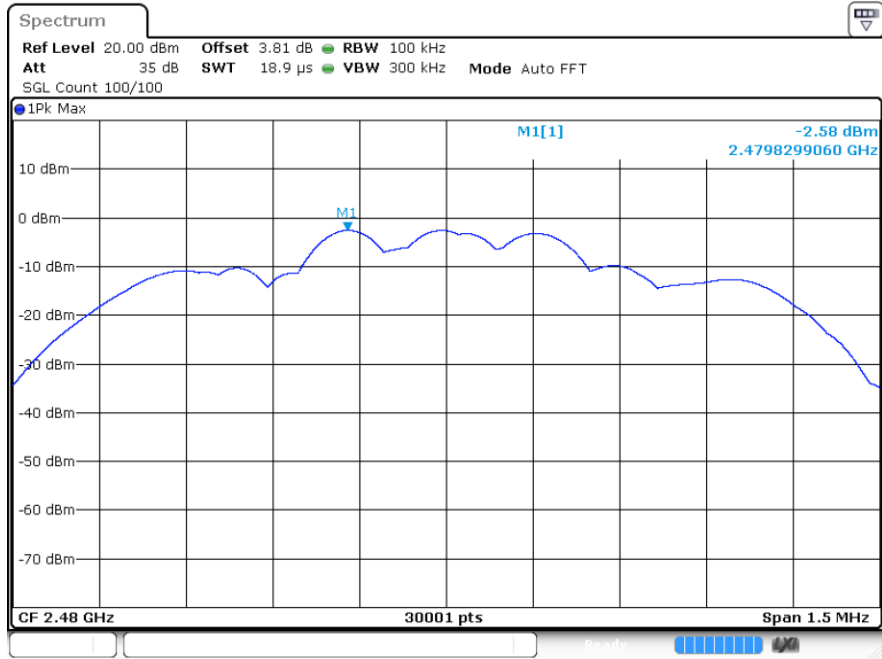


Puw

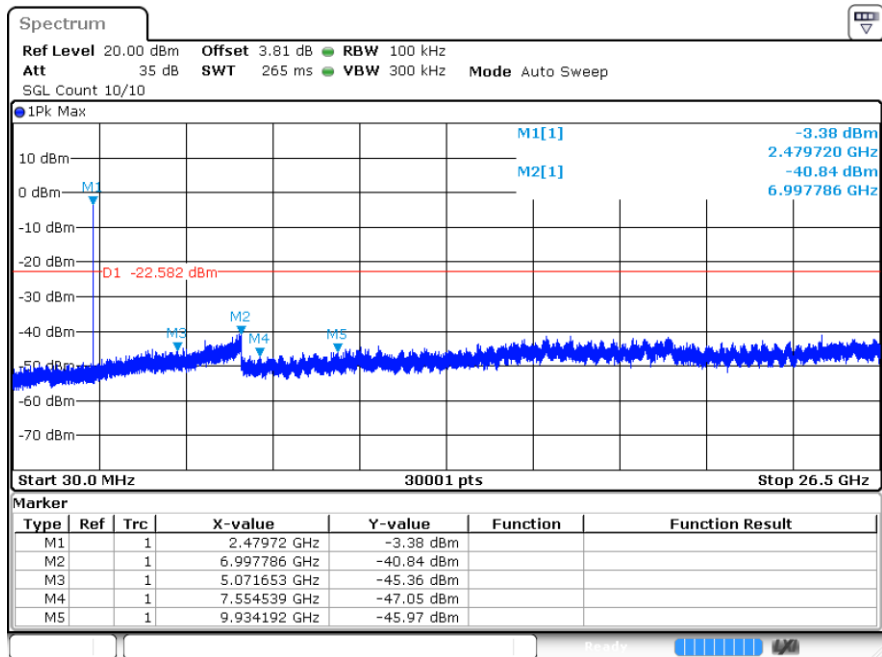


8DPSK\_HCH\_Graphs

Pref



Puw

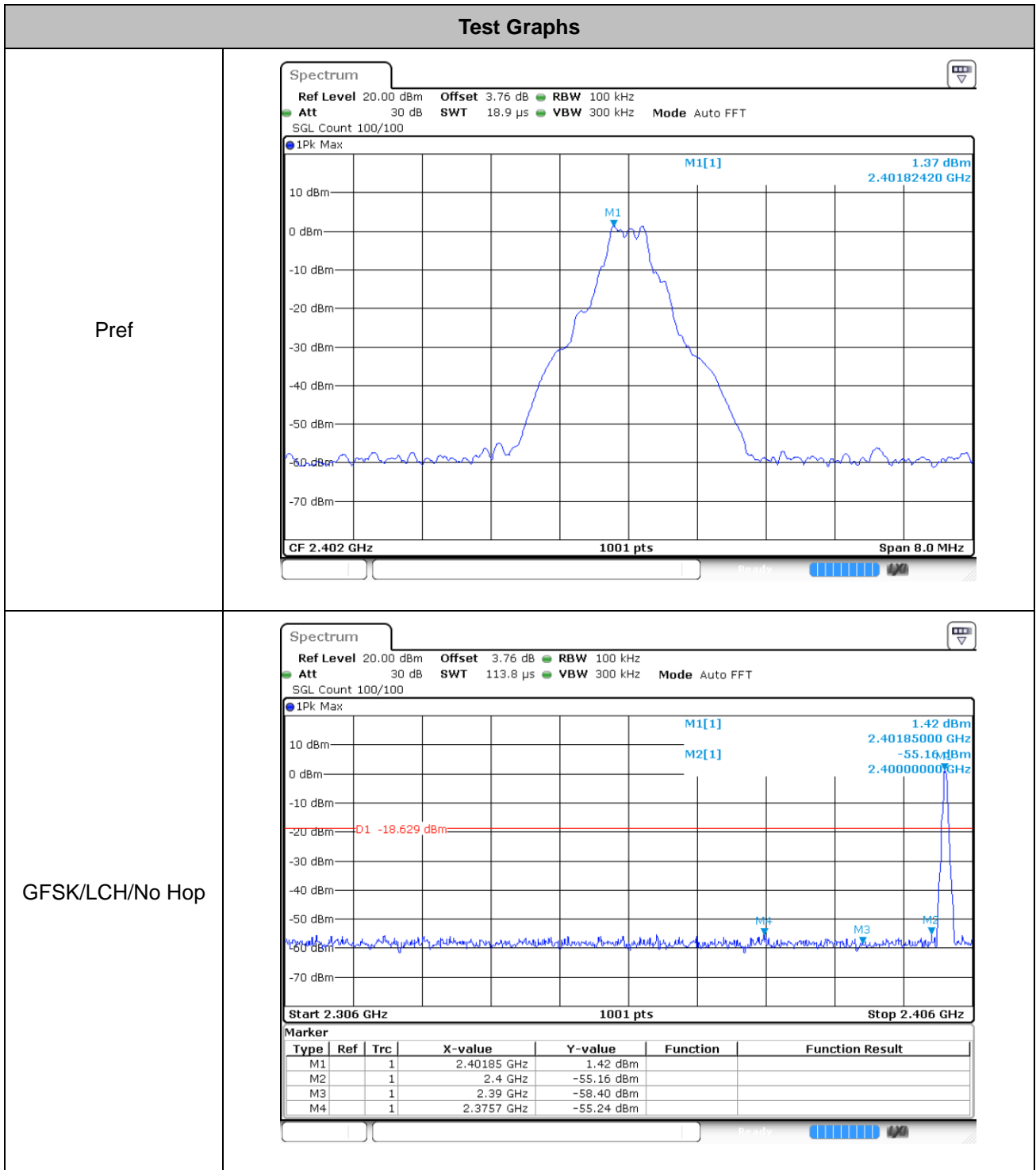


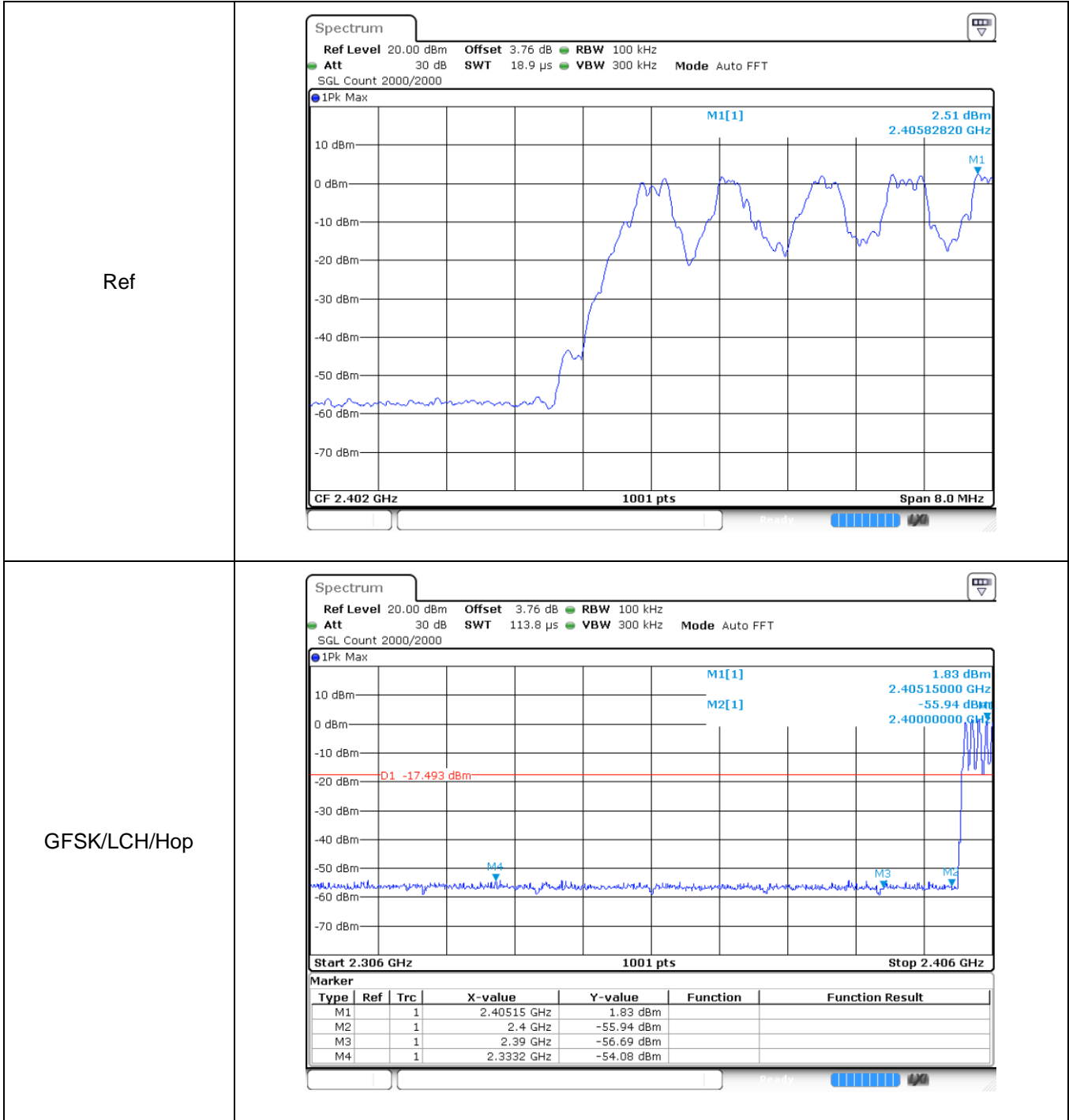
## 8 Band-edge for RF Conducted Emissions

### 8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-56.61	-20	Pass
			On	-56.58	-20	Pass
	HCH	2480	Off	-54.28	-20	Pass
			On	-53.12	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-53.7	-20	Pass
			On	-54	-20	Pass
	HCH	2480	Off	-53.38	-20	Pass
			On	-51.73	-20	Pass
8DPSK	LCH	2402	Off	-54.59	-20	Pass
			On	-54.06	-20	Pass
	HCH	2480	Off	-53.16	-20	Pass
			On	-51.56	-20	Pass

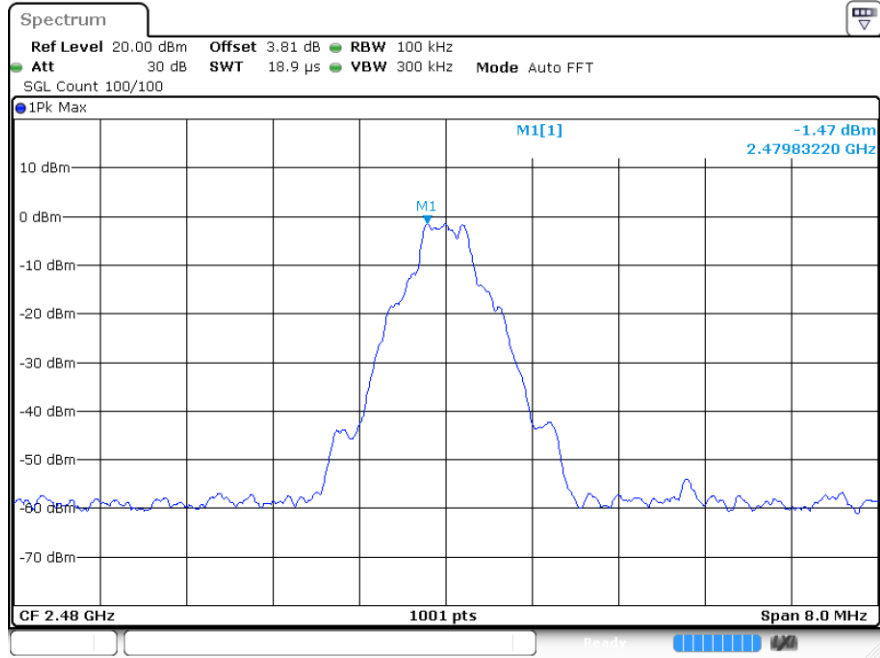
## 8.2 Test Graphs



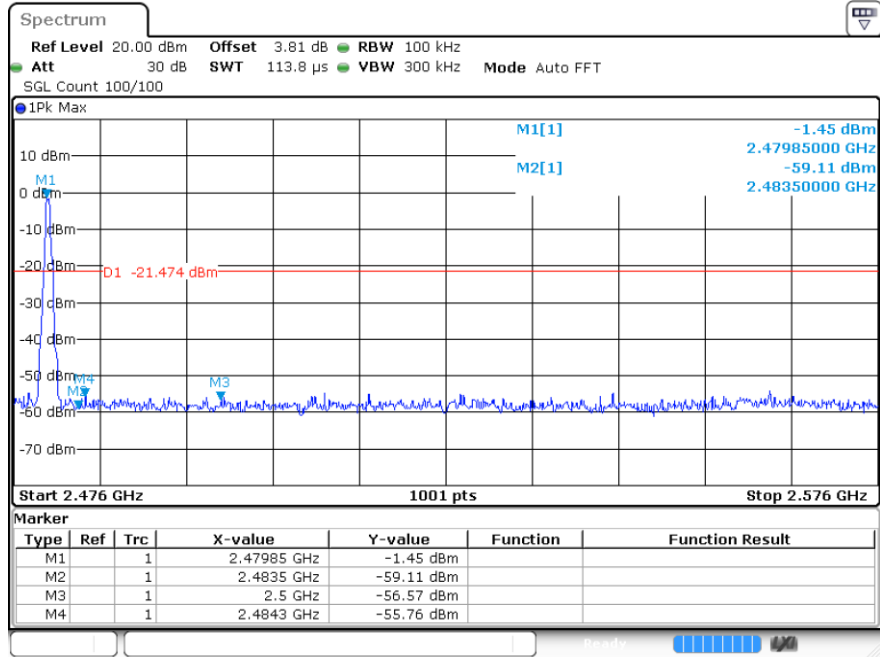




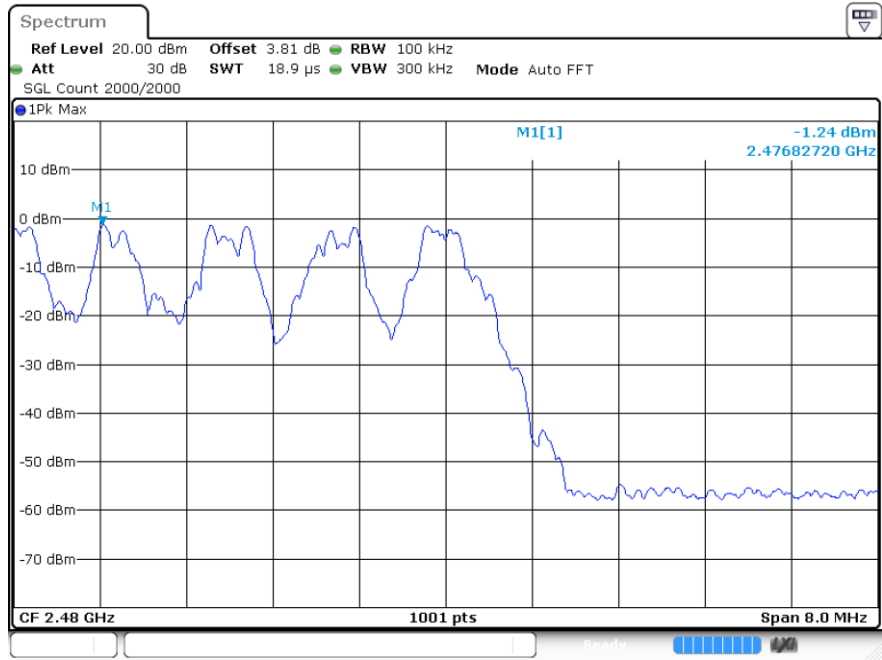
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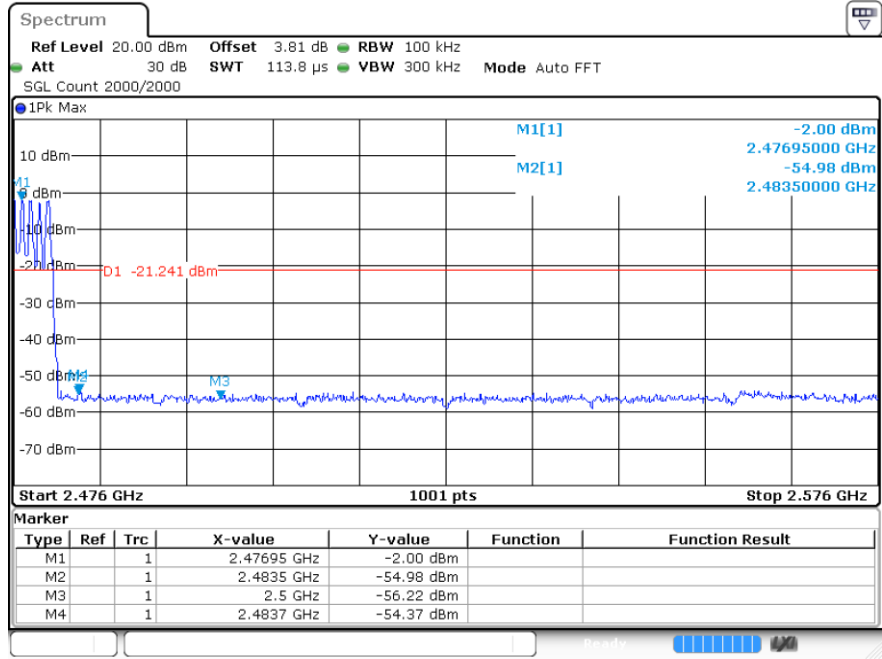
GFSK/HCH/No Hop

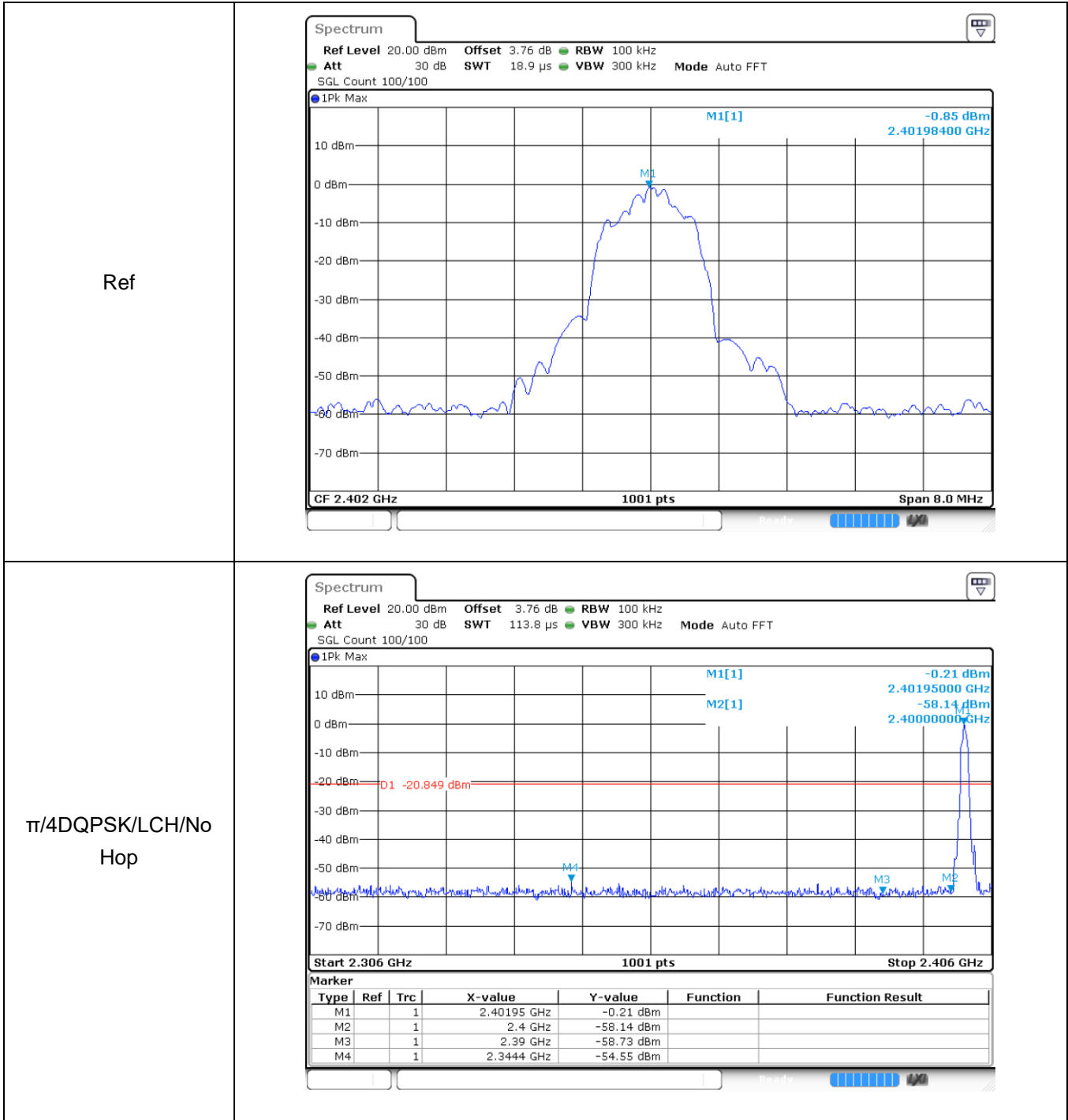


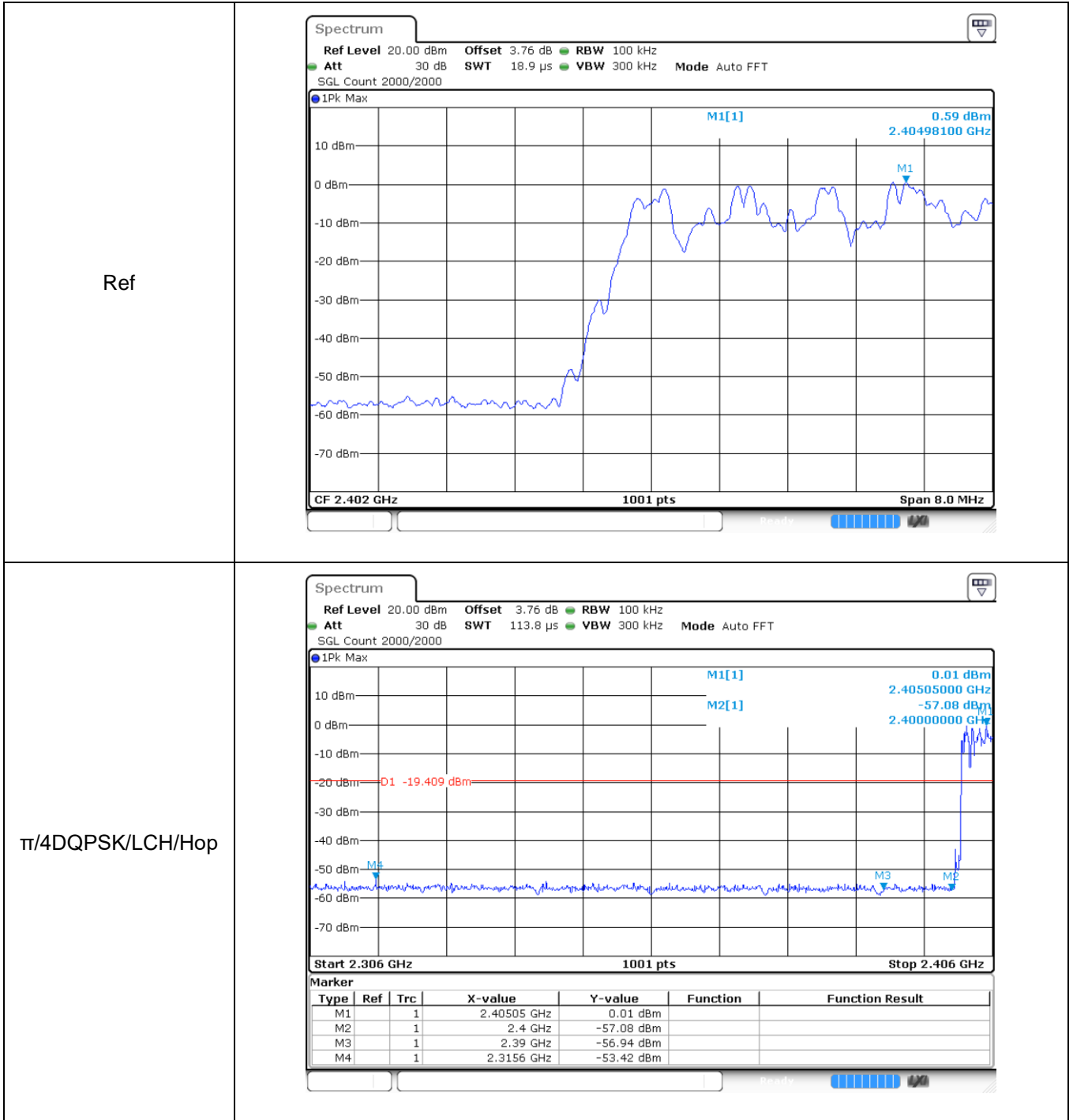
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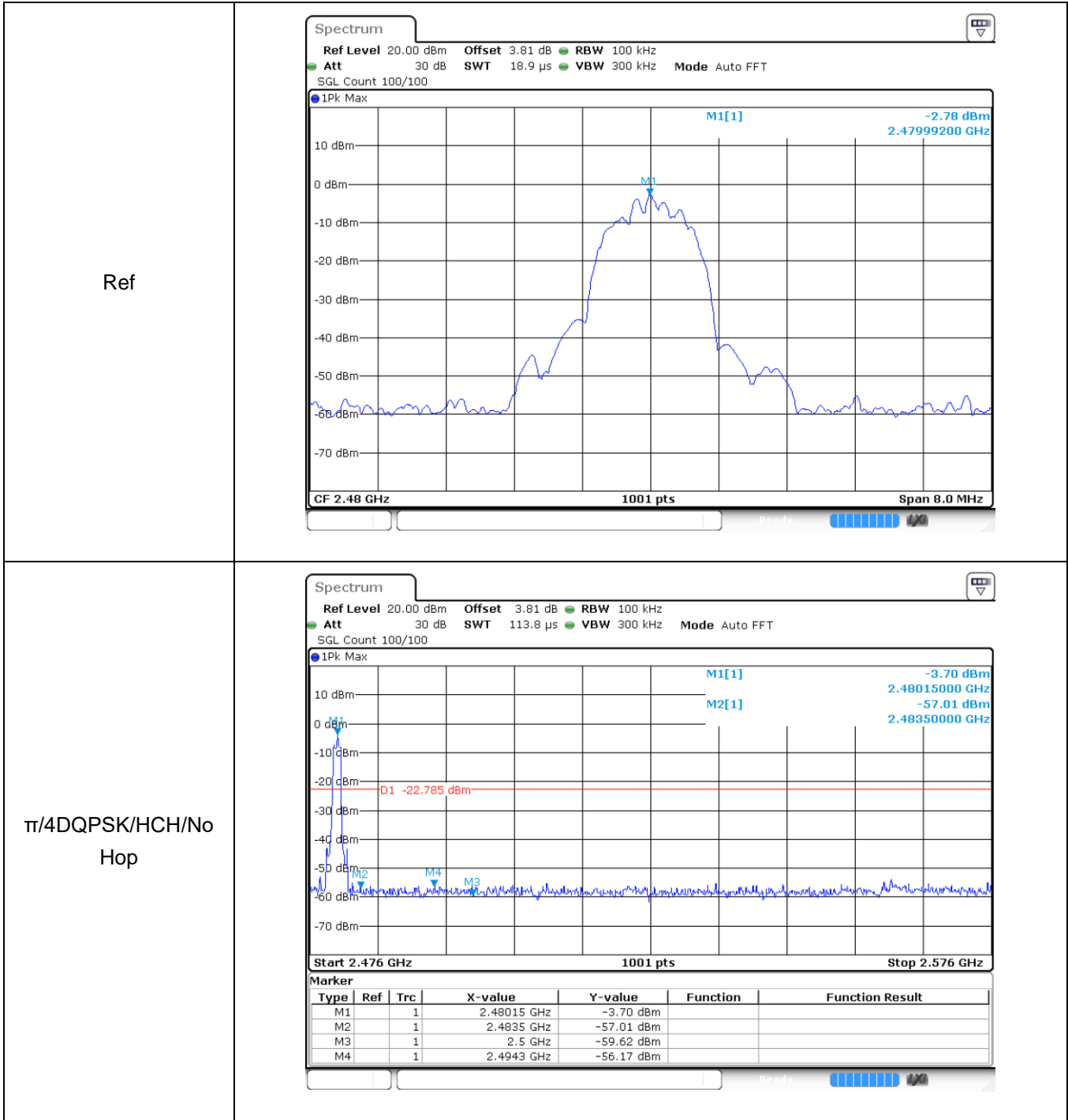


GFSK/HCH/Hop





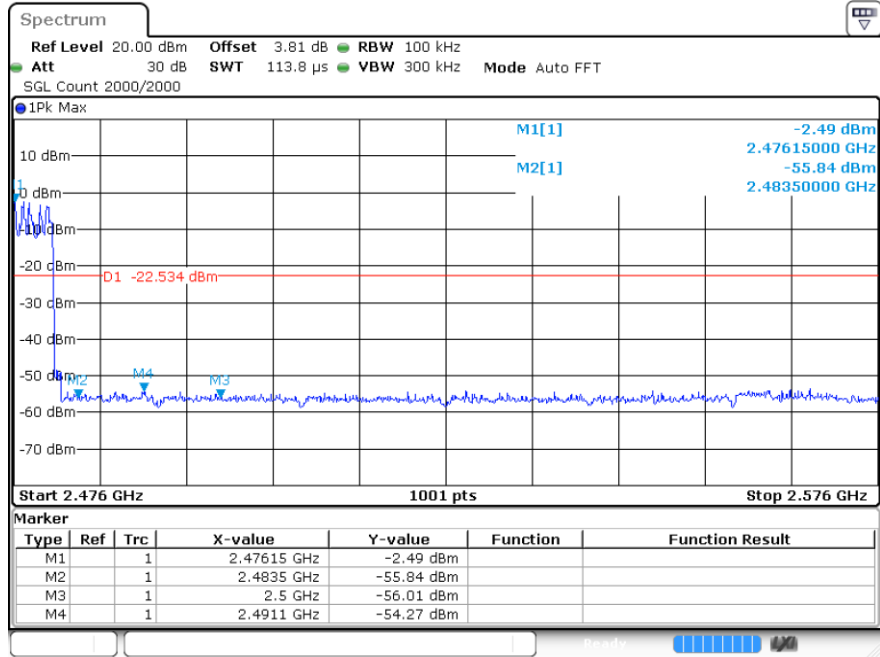




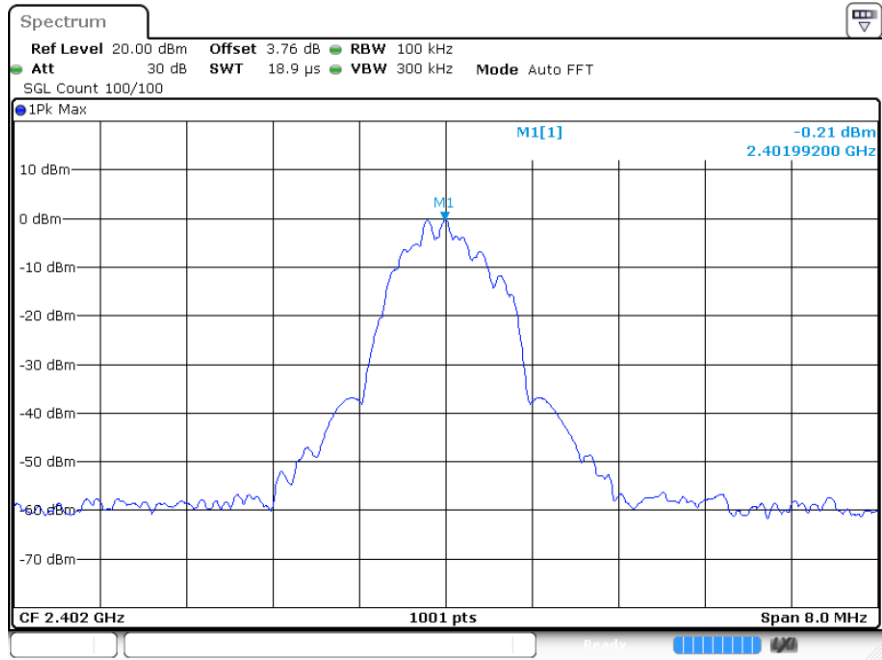
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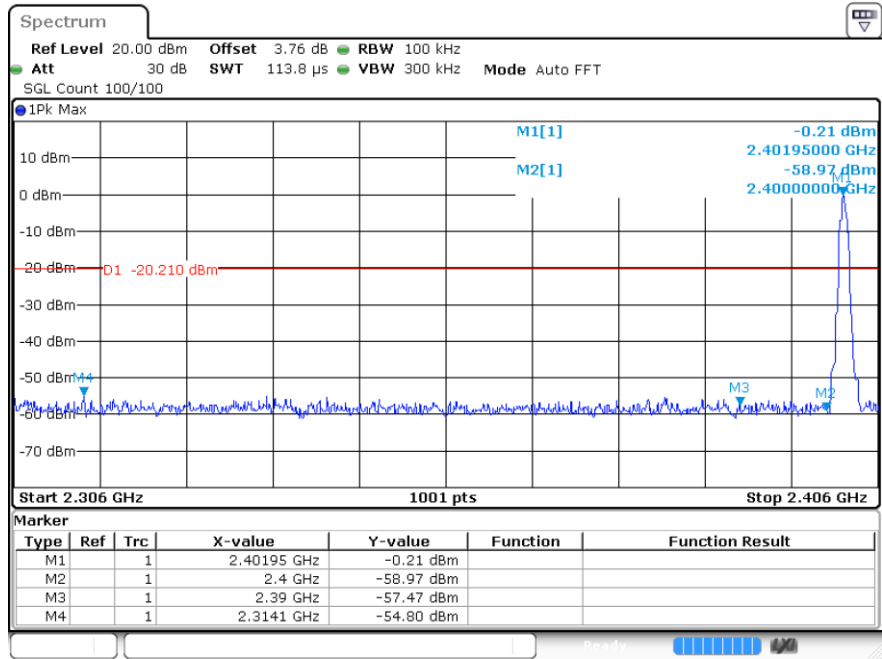
$\pi/4$ DQPSK/HCH/Hop



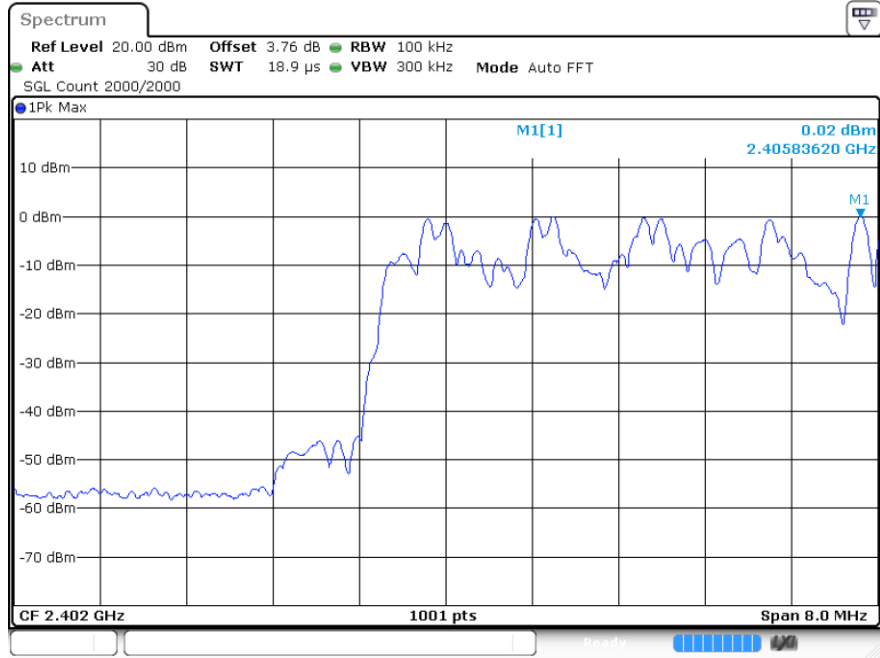
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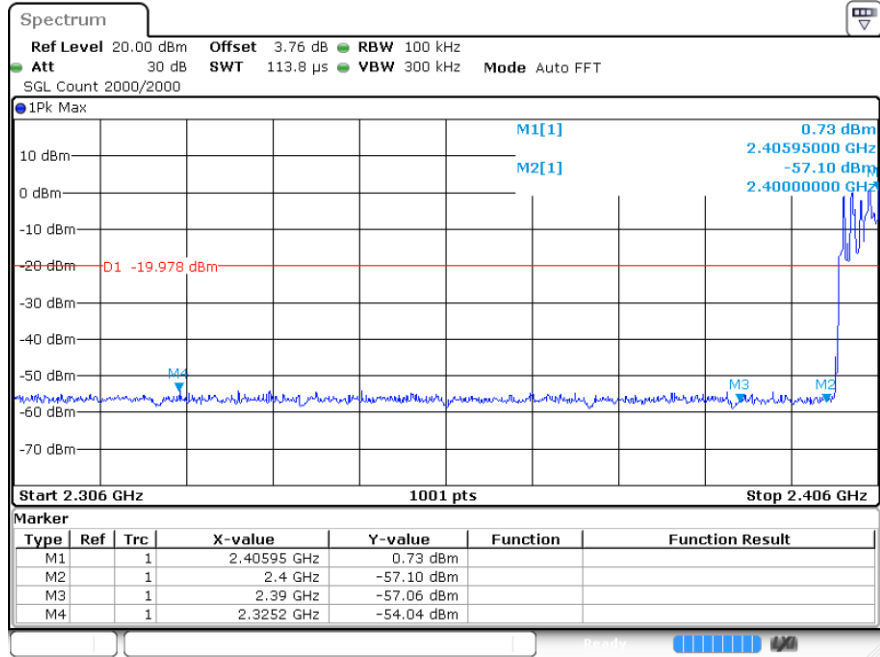
8DPSK/LCH/No Hop



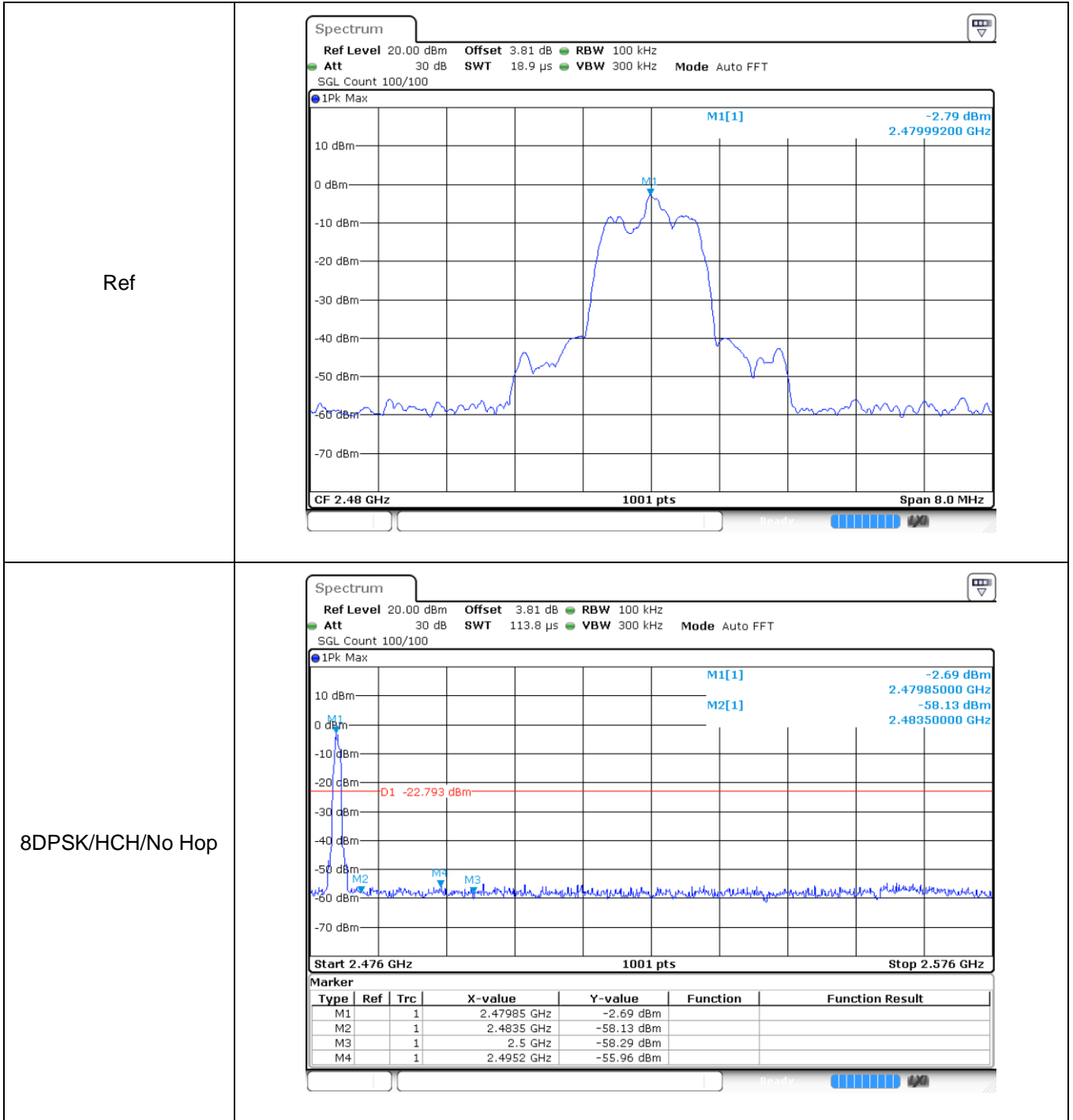
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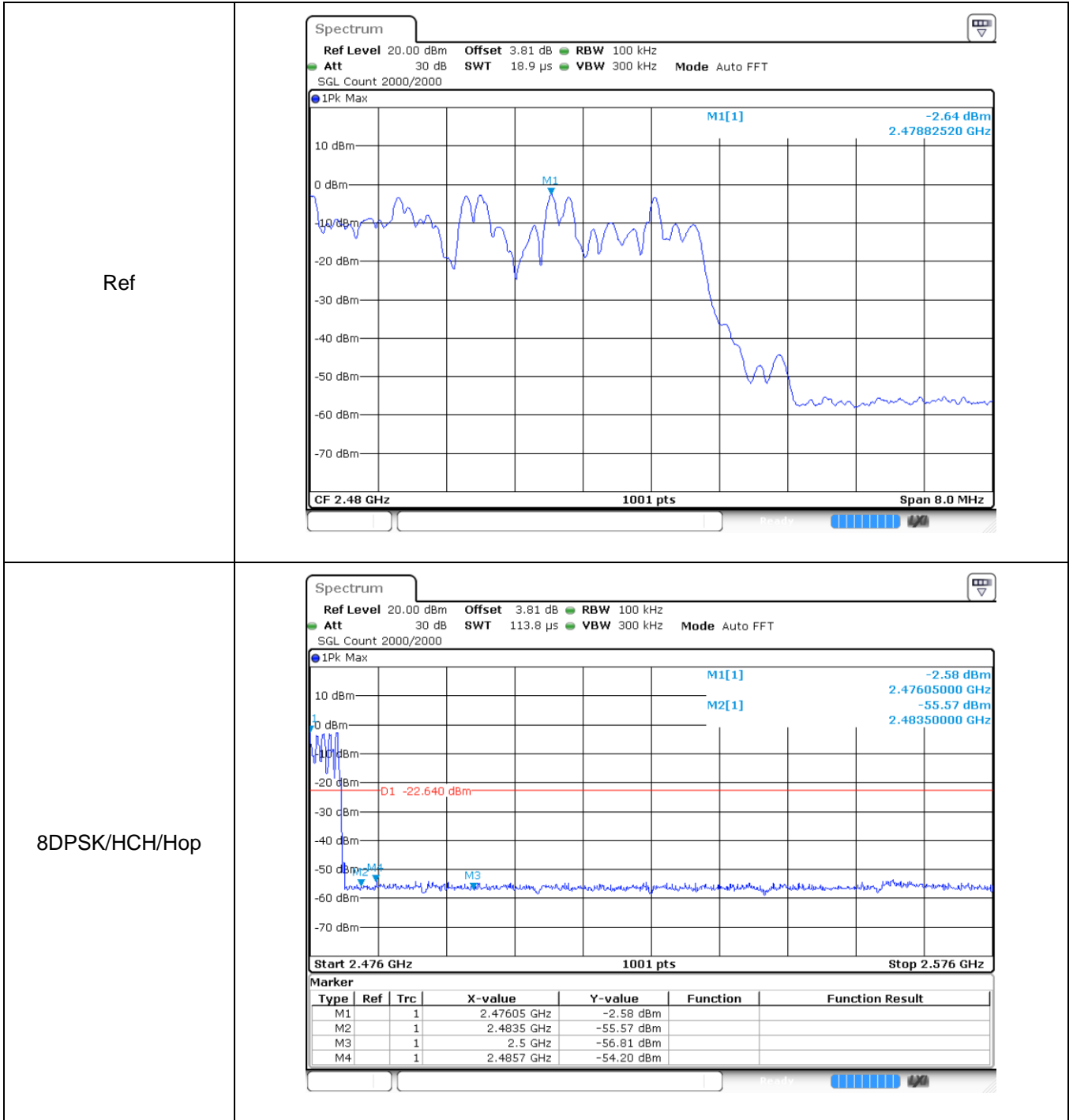


8DPSK/LCH/Hop









## 9 Restrict-band band-edge measurements

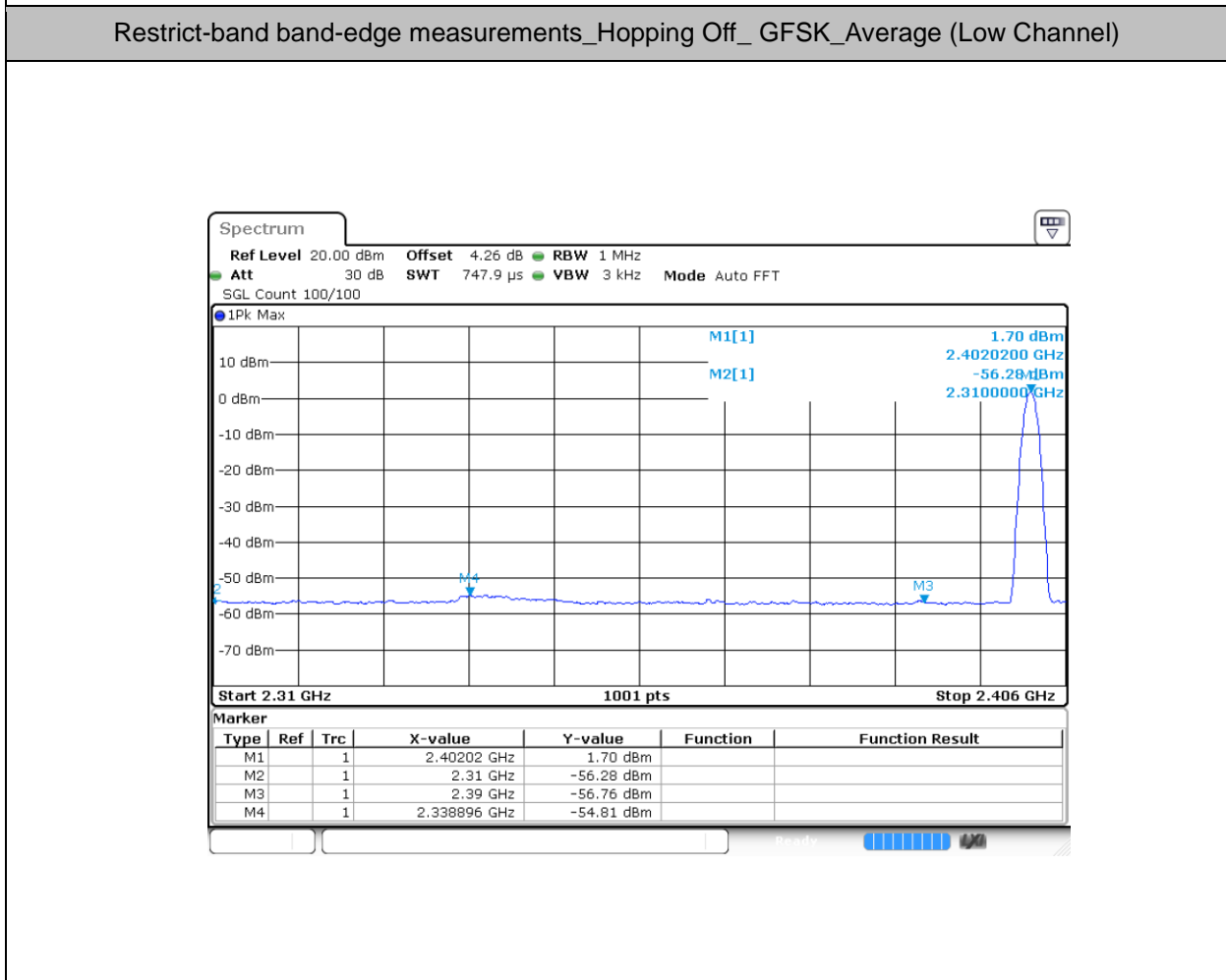
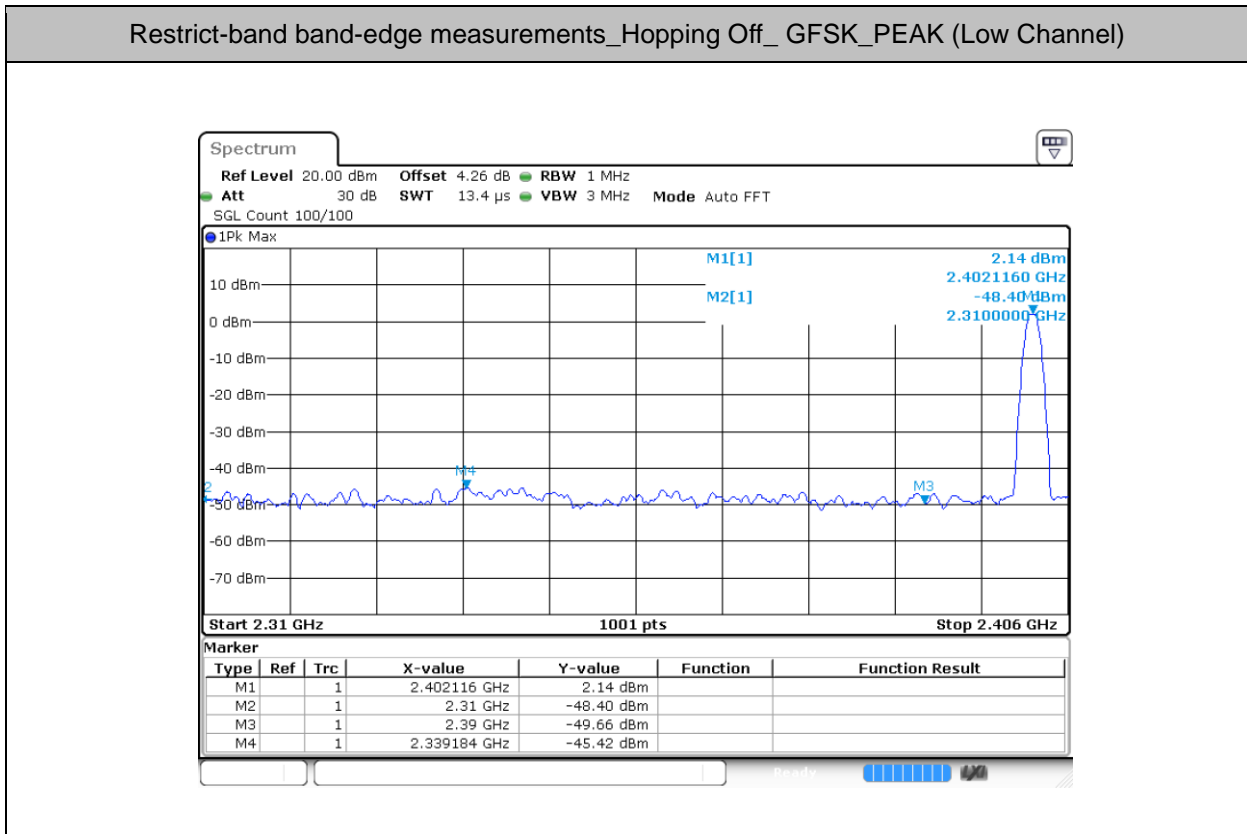
### 9.1 Test Result

Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.4	2	48.86	PEAK	74	Pass
	Off	2310.0	-56.28	2	40.98	AV	54	Pass
	Off	2339.184	-45.42	2	51.84	PEAK	74	Pass
	Off	2338.896	-54.8	2	42.46	AV	54	Pass
	Off	2390.0	-49.65	2	47.61	PEAK	74	Pass
	Off	2390.0	-56.75	2	40.51	AV	54	Pass
	Off	2483.5	-47.69	2	49.57	PEAK	74	Pass
	Off	2483.5	-56.31	2	40.95	AV	54	Pass
	Off	2487.616	-46.13	2	51.13	PEAK	74	Pass
	Off	2498.344	-55.91	2	41.35	AV	54	Pass
	Off	2500.0	-47.89	2	49.37	PEAK	74	Pass
	Off	2500.0	-56.38	2	40.88	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-49.06	2	48.2	PEAK	74	Pass
	Off	2310.0	-56	2	41.26	AV	54	Pass
	Off	2372.976	-45.41	2	51.85	PEAK	74	Pass
	Off	2338.032	-54.67	2	42.59	AV	54	Pass
	Off	2390.0	-45.7	2	51.56	PEAK	74	Pass
	Off	2390.0	-56.83	2	40.43	AV	54	Pass
	Off	2483.5	-48.16	2	49.1	PEAK	74	Pass
	Off	2483.5	-55.82	2	41.44	AV	54	Pass
	Off	2496.328	-46.03	2	51.23	PEAK	74	Pass
	Off	2483.824	-55.7	2	41.56	AV	54	Pass
	Off	2500.0	-48.91	2	48.35	PEAK	74	Pass
	Off	2500.0	-56.41	2	40.85	AV	54	Pass
8DPSK	Off	2310.0	-49.08	2	48.18	PEAK	74	Pass
	Off	2310.0	-55.99	2	41.27	AV	54	Pass
	Off	2338.608	-45.79	2	51.47	PEAK	74	Pass
	Off	2338.128	-54.13	2	43.13	AV	54	Pass

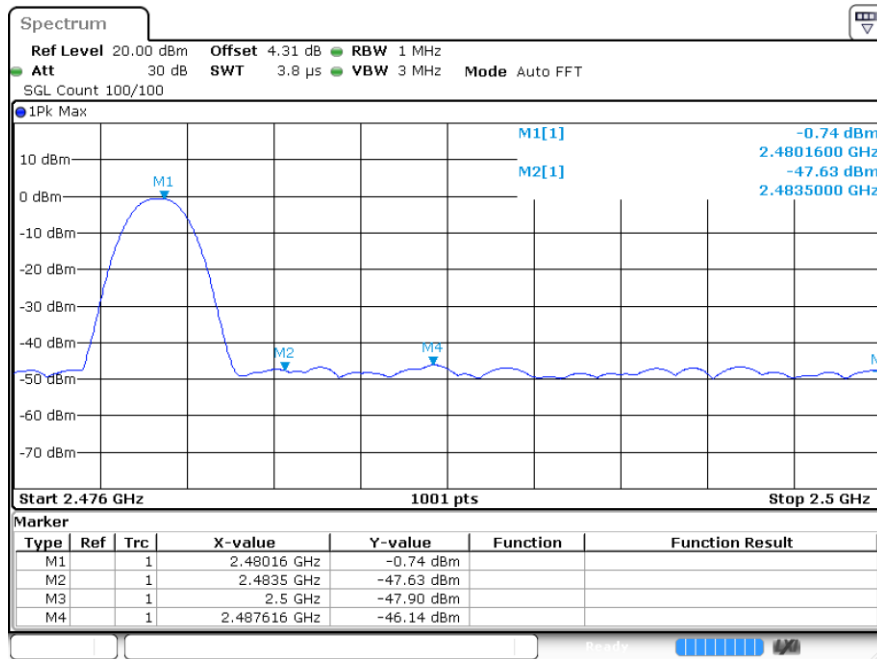


Off	2390.0	-49.35	2	47.91	PEAK	74	Pass
Off	2390.0	-56.3	2	40.96	AV	54	Pass
Off	2483.5	-49.24	2	48.02	PEAK	74	Pass
Off	2483.5	-56.4	2	40.86	AV	54	Pass
Off	2489.968	-46.98	2	50.28	PEAK	74	Pass
Off	2485.744	-55.49	2	41.77	AV	54	Pass
Off	2500.0	-48.49	2	48.77	PEAK	74	Pass
Off	2500.0	-56.39	2	40.87	AV	54	Pass

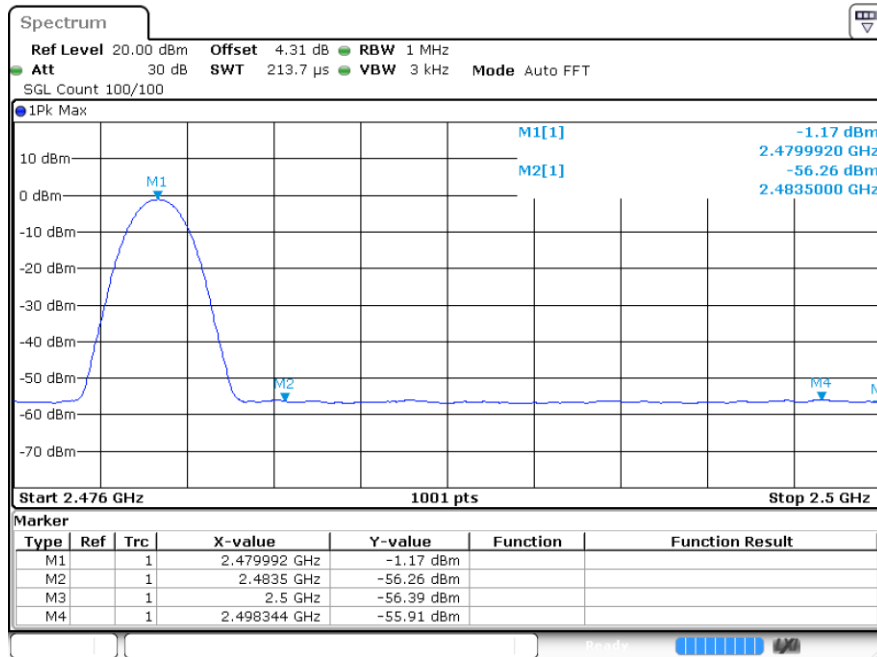
## 9.2 Test Graphs



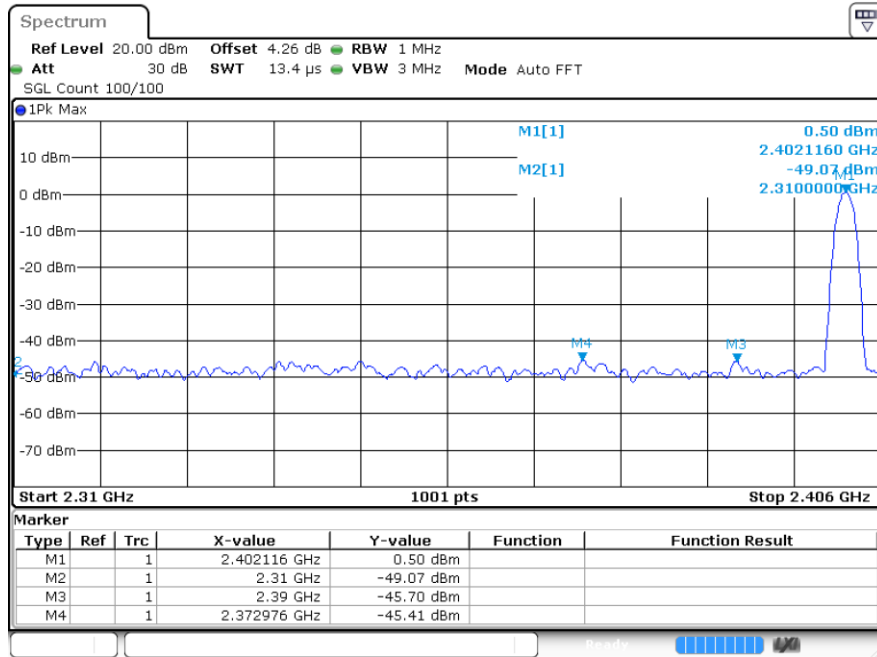
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)



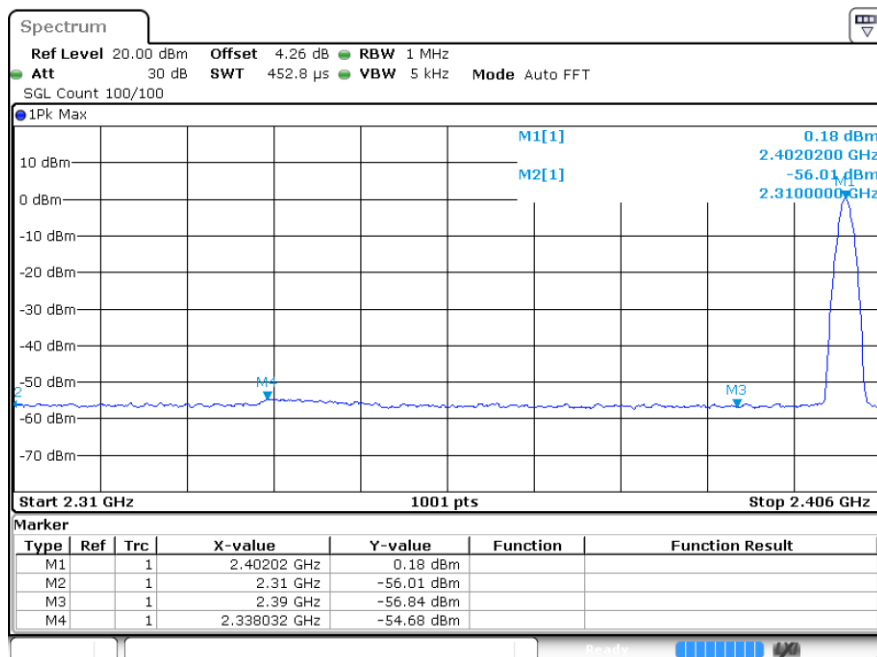
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)



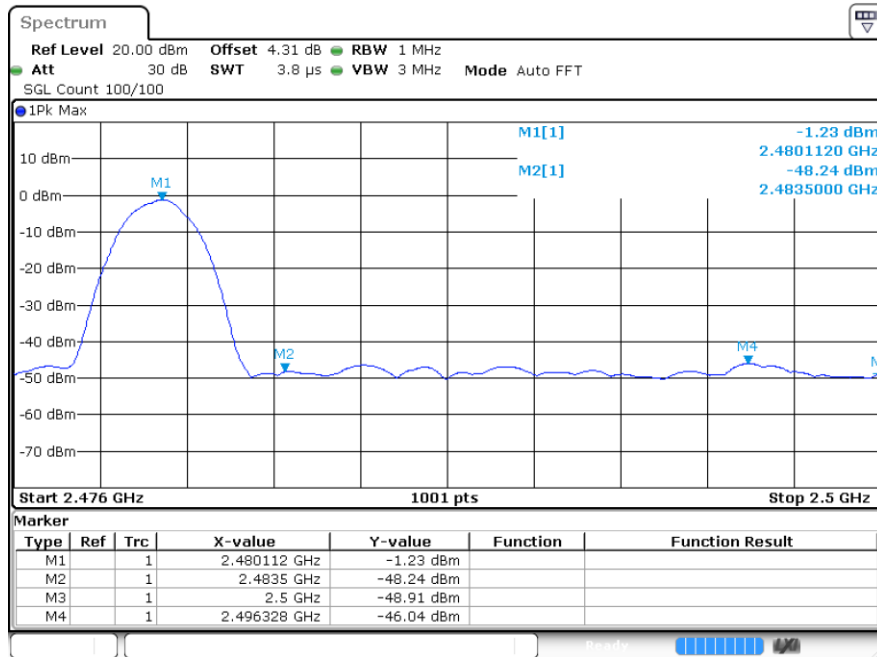
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (Low Channel)



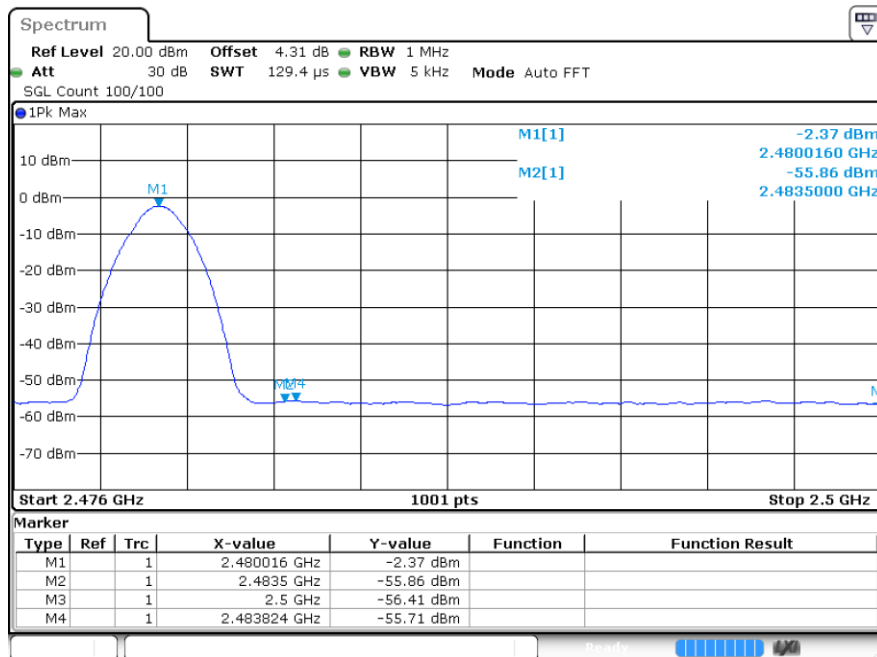
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (Low Channel)



Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)

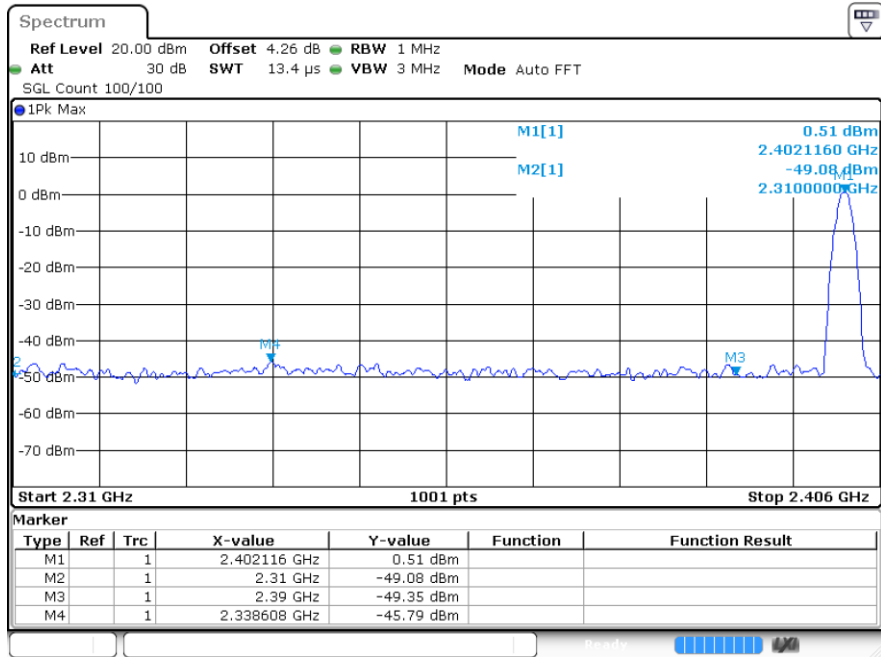


Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)

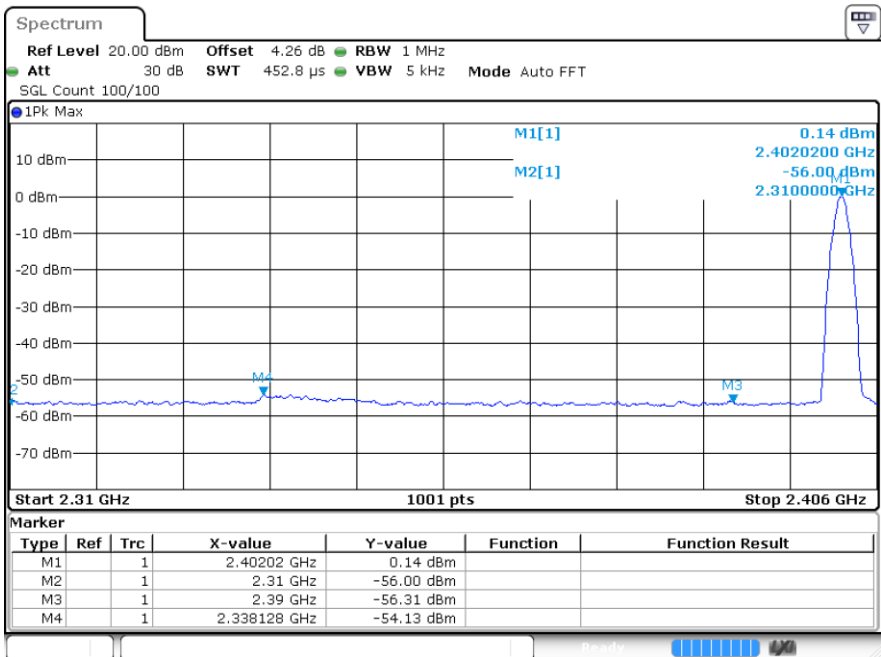




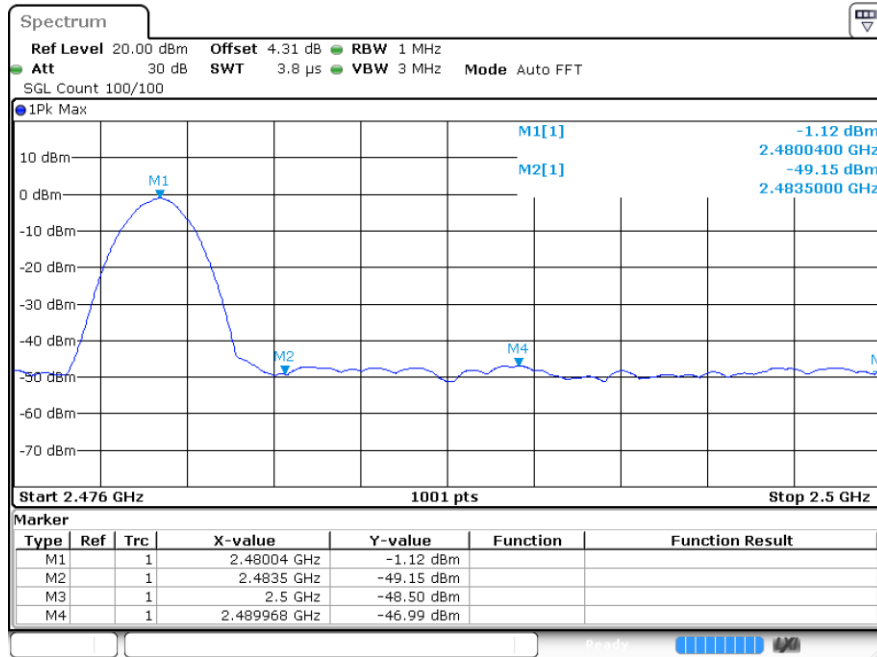
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



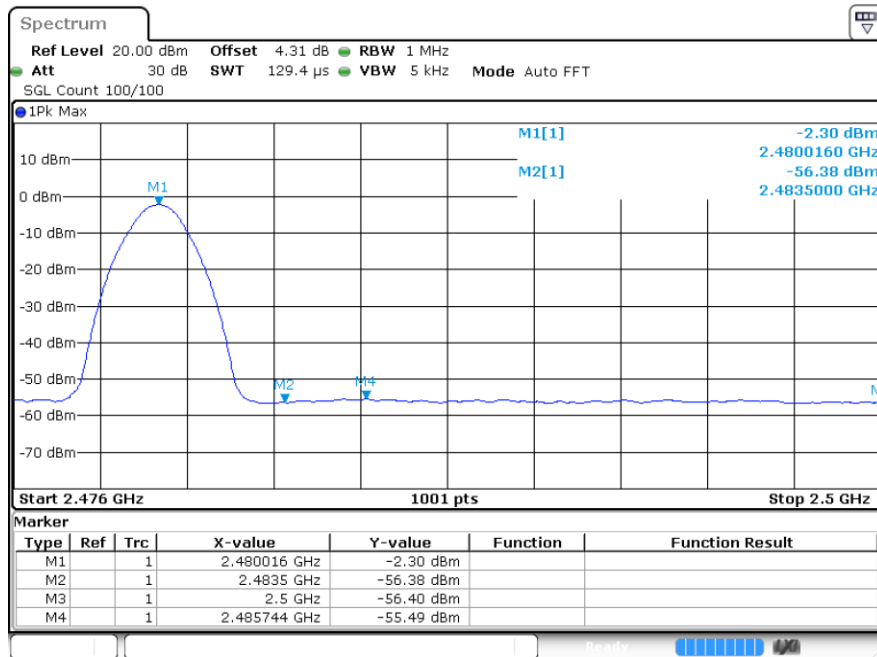
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (Low Channel)



Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (High Channel)



Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (High Channel)



---The End---