



## Appendix A

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

Product Name: ART + SOUND TWS FASHION IN EAR BUDS

Trade Mark: N/A

Test Model: EBT4-21167

#### Environmental Conditions

Temperature:	24.8°C
Relative Humidity:	52.5%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

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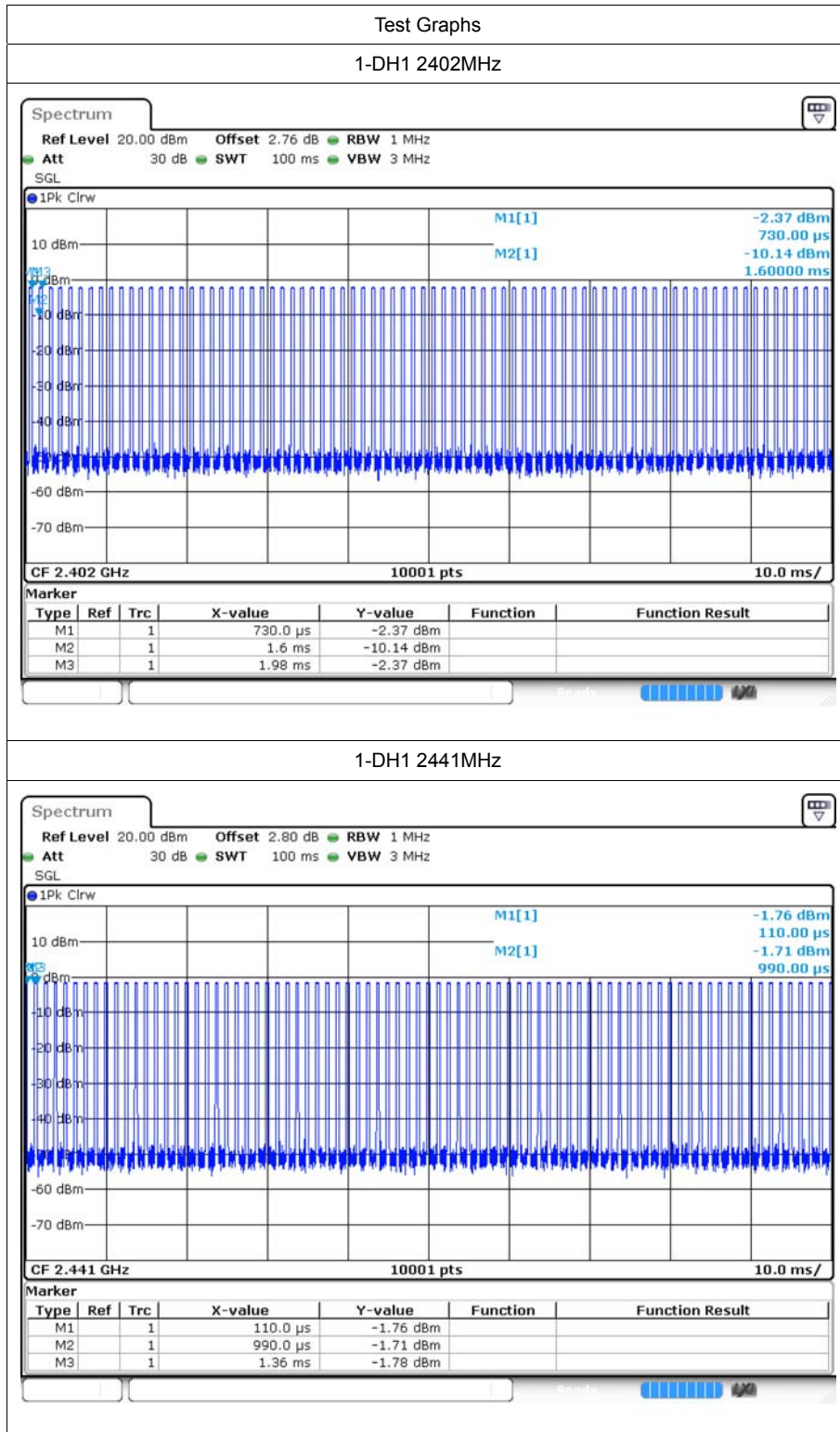
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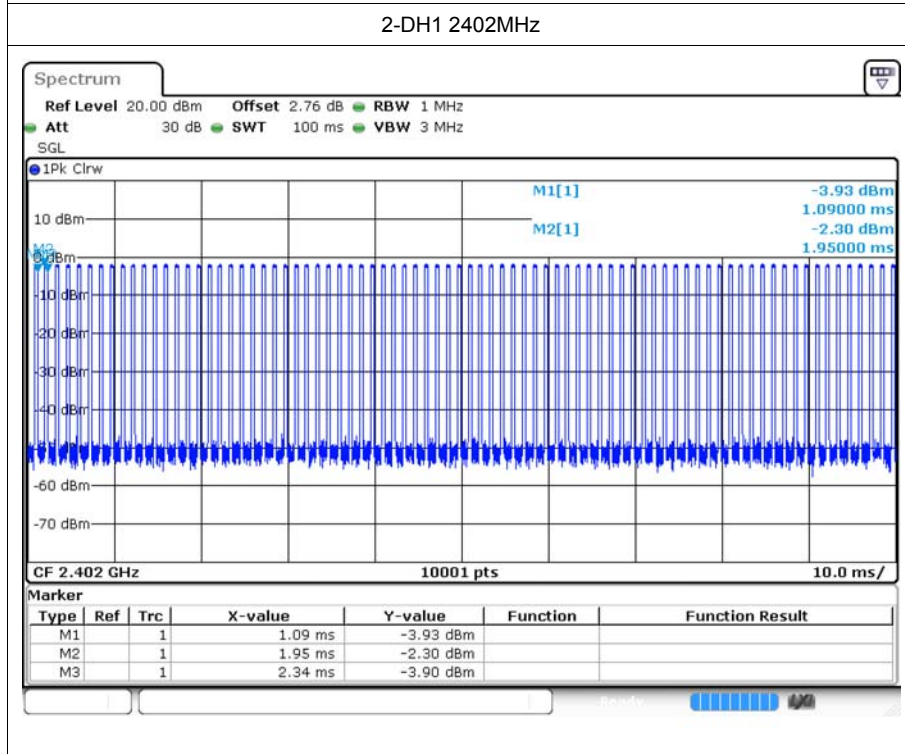
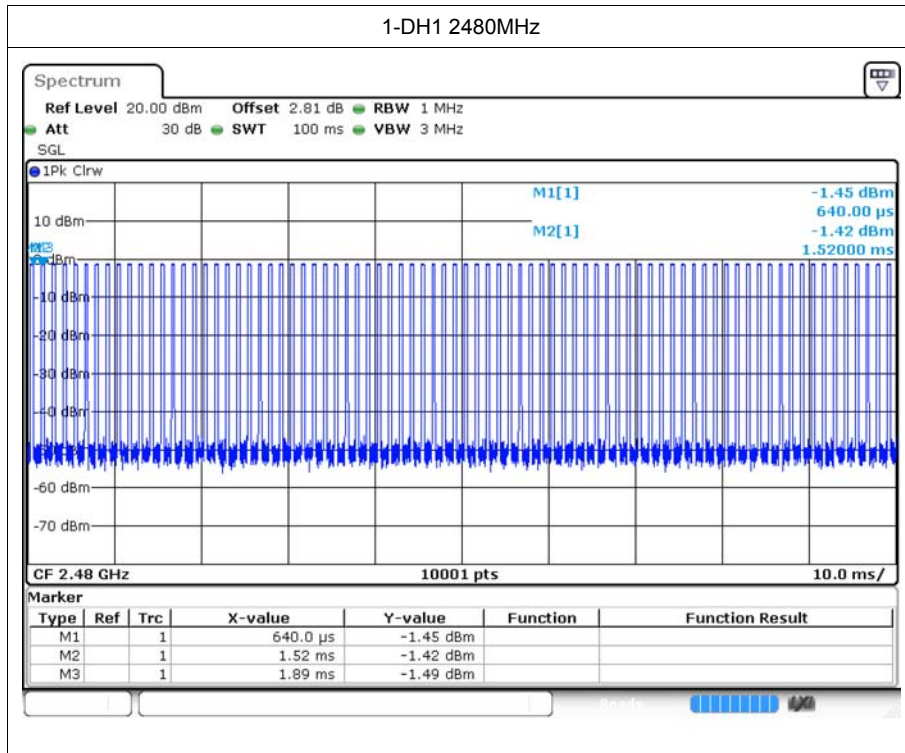
# 1 Duty Cycle

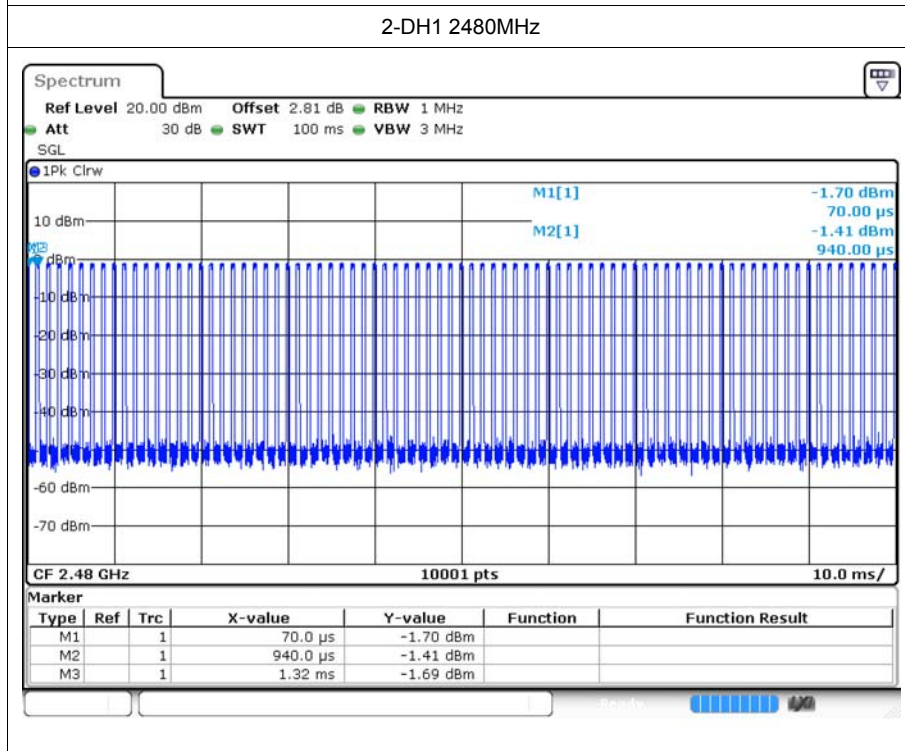
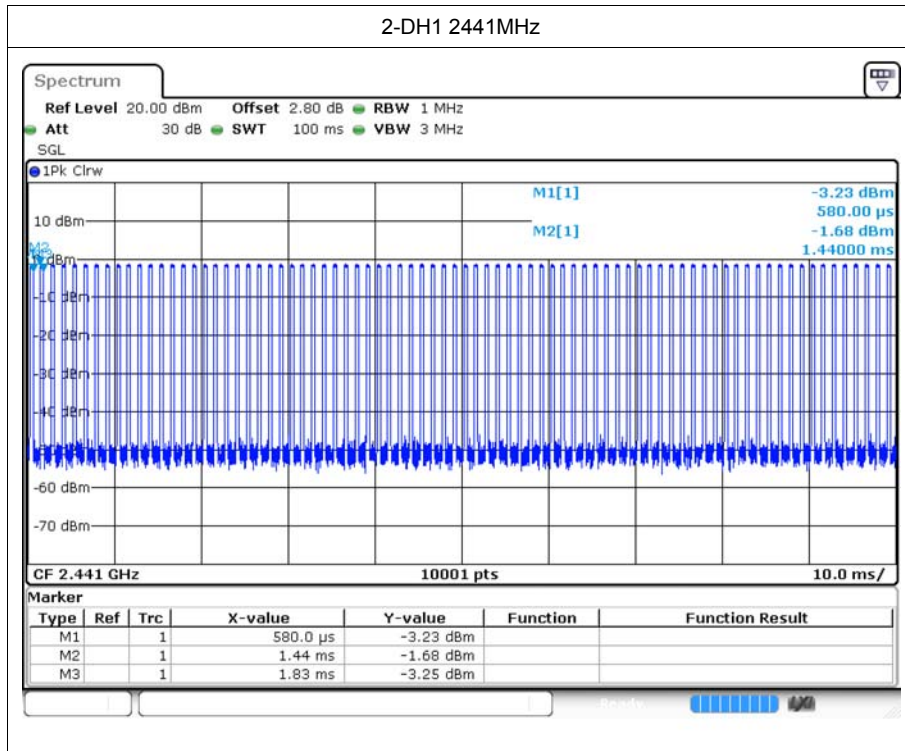
## 1.1 Test Result

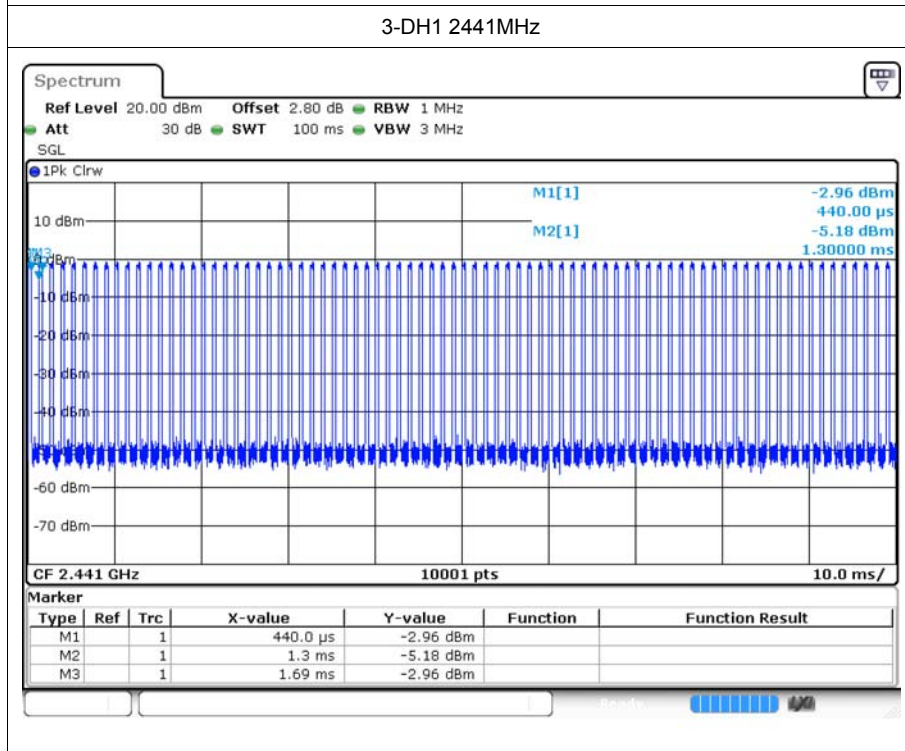
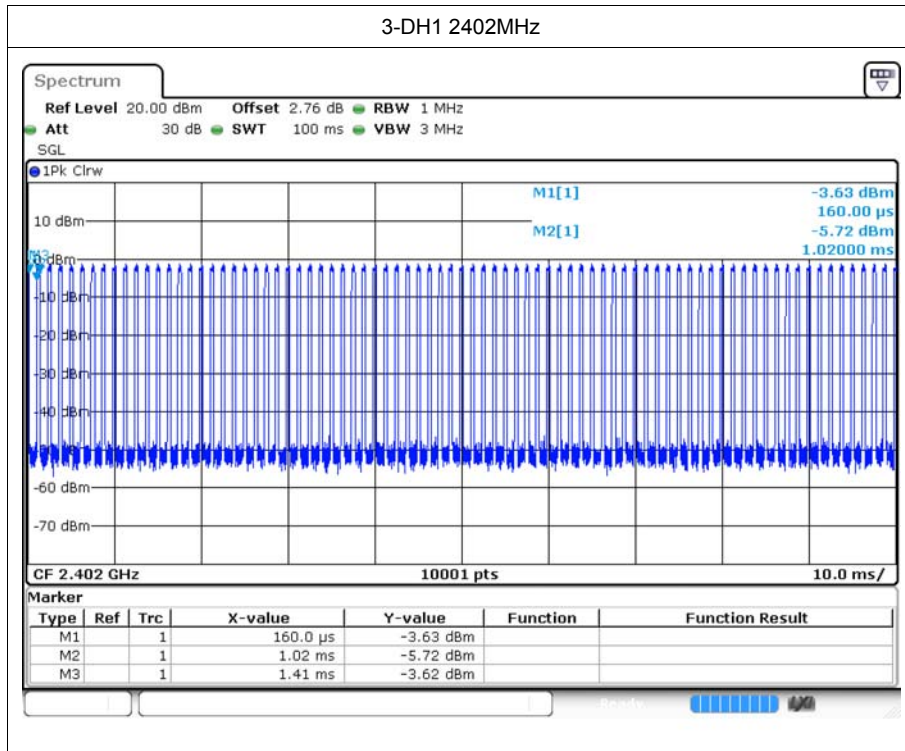
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.08	2.63
1-DH1	2441	30.41	2.7
1-DH1	2480	30.4	2.7
2-DH1	2402	32	2.56
2-DH1	2441	32	2.56
2-DH1	2480	31.21	2.63
3-DH1	2402	32.01	2.56
3-DH1	2441	32	2.56
3-DH1	2480	32	2.56

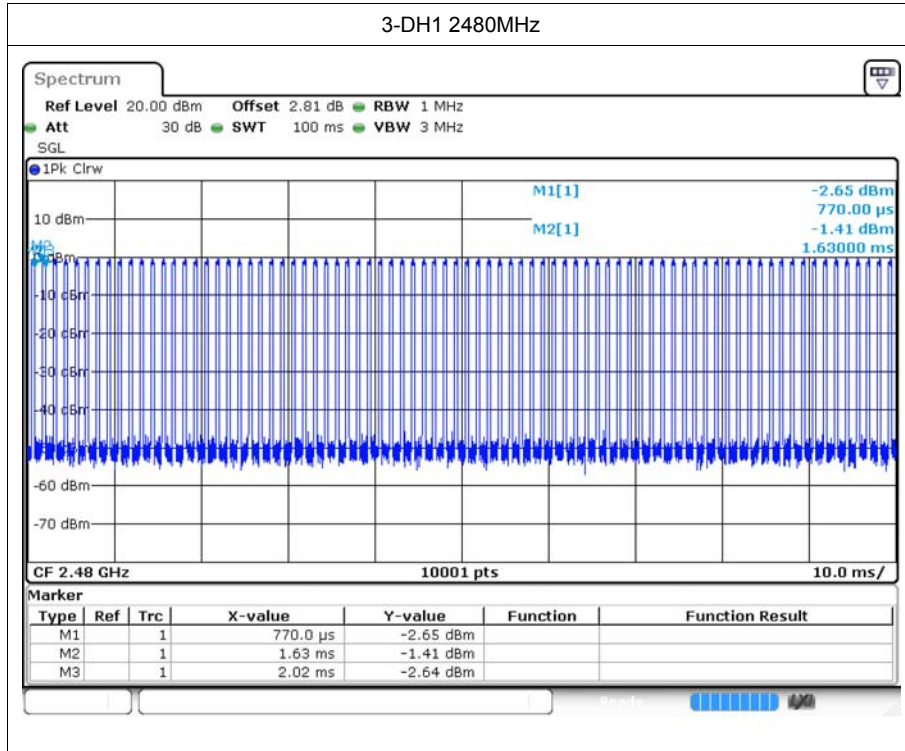
## 1.2 Test Graphs











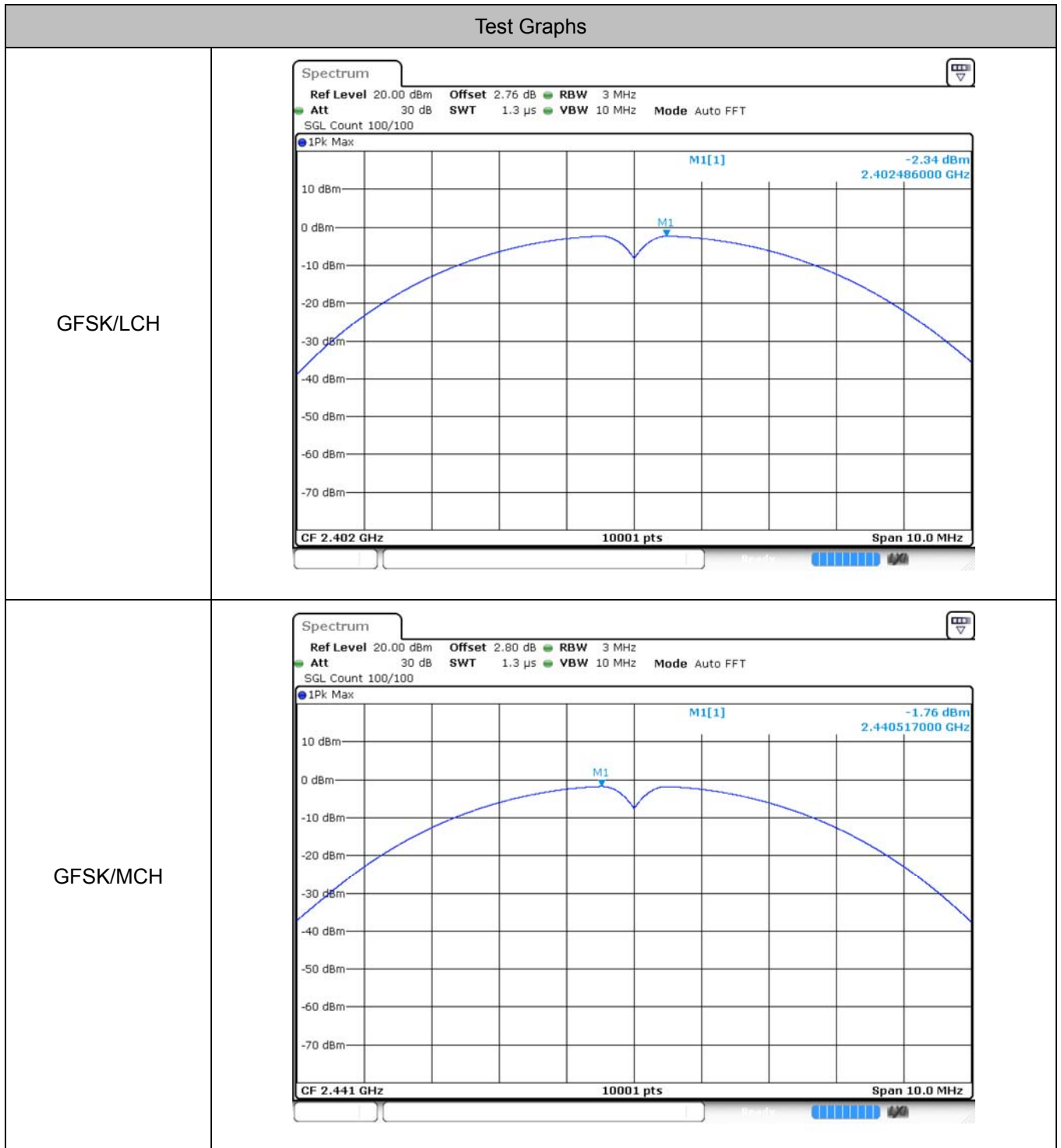


## 2 Maximum Conducted Peak Output Power

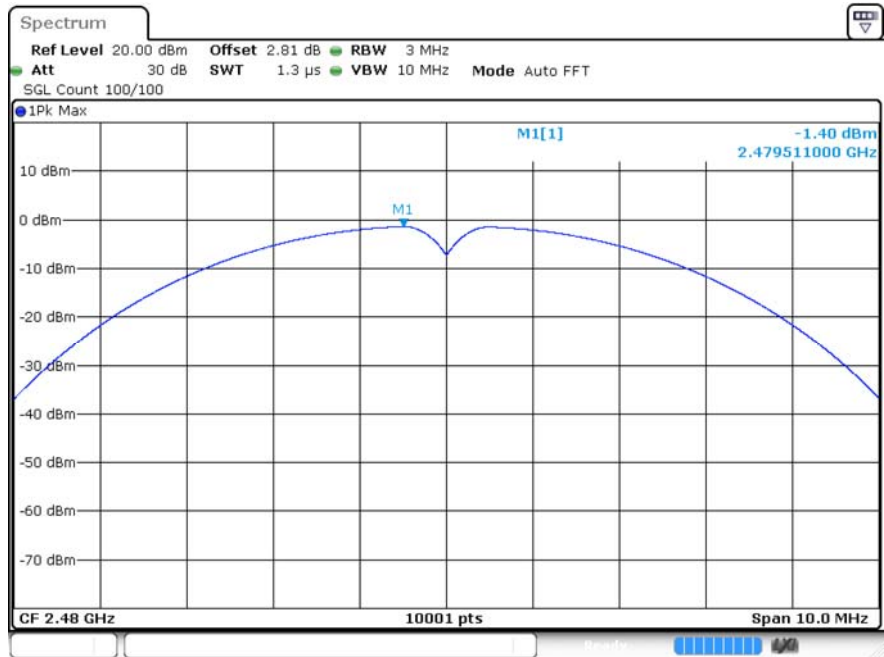
### 2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.34	21	Pass
	MCH	-1.76	21	Pass
	HCH	-1.4	21	Pass
$\pi/4$ DQPSK	LCH	-2.09	21	Pass
	MCH	-1.55	21	Pass
	HCH	-0.98	21	Pass
8DPSK	LCH	-2.07	21	Pass
	MCH	-1.58	21	Pass
	HCH	-1.21	21	Pass

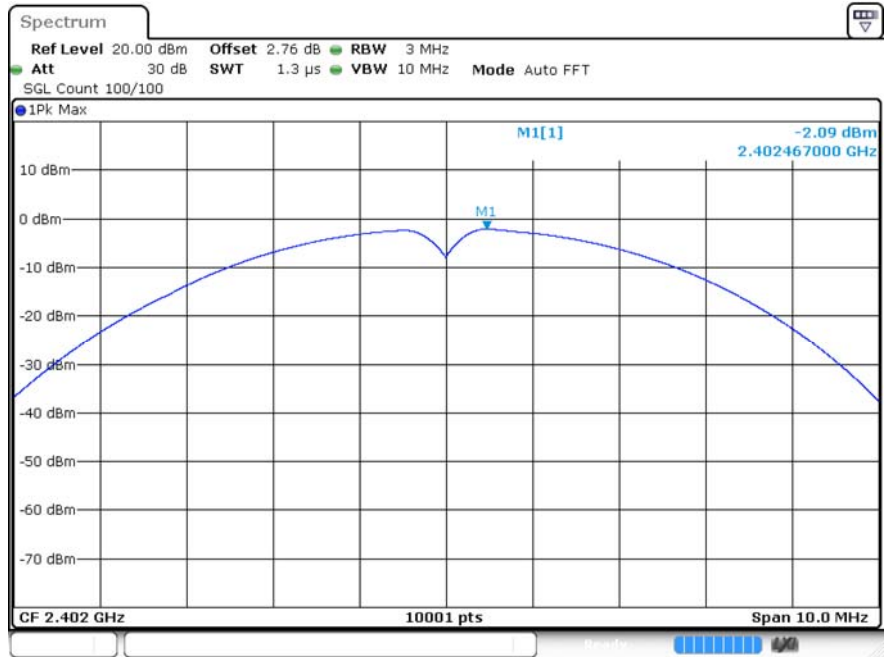
## 2.2 Test Graphs



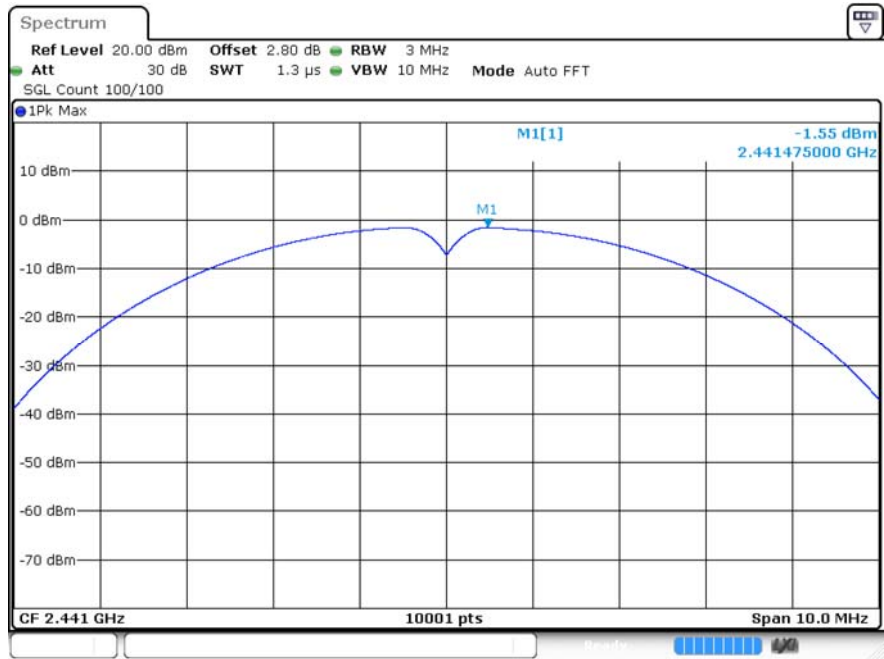
GFSK/HCH



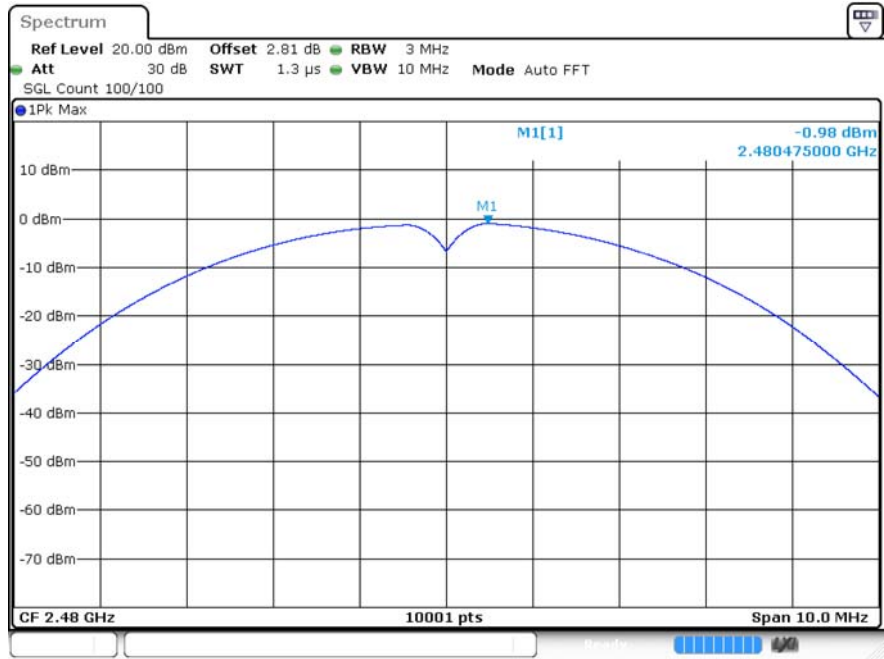
$\pi/4$ DQPSK/LCH



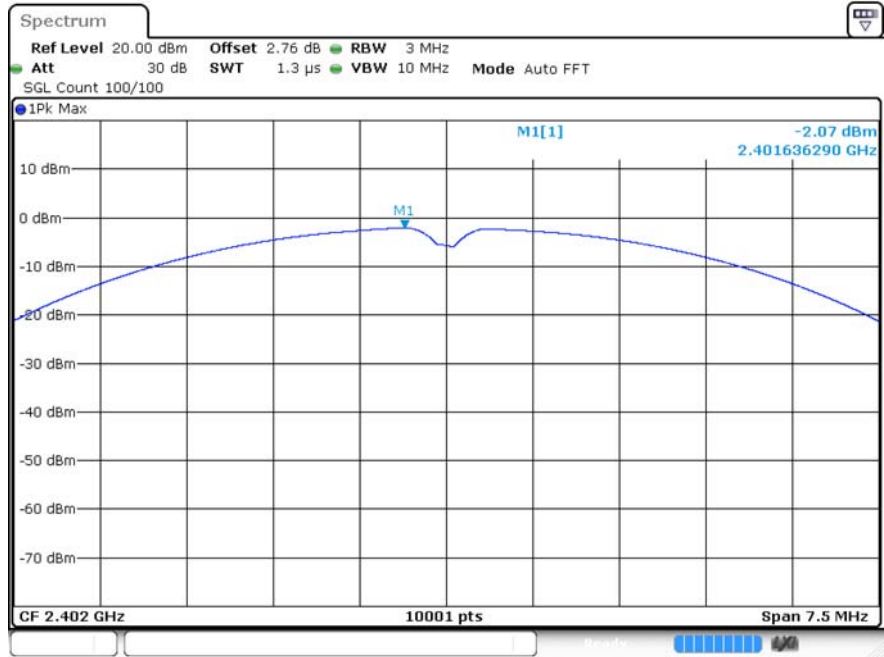
$\pi/4$ DQPSK/MCH



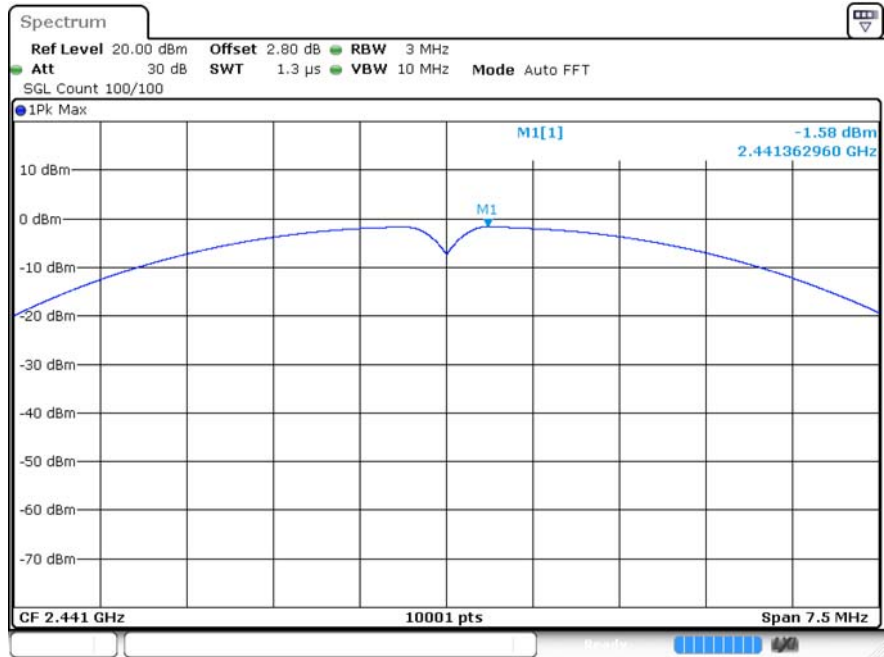
$\pi/4$ DQPSK/HCH



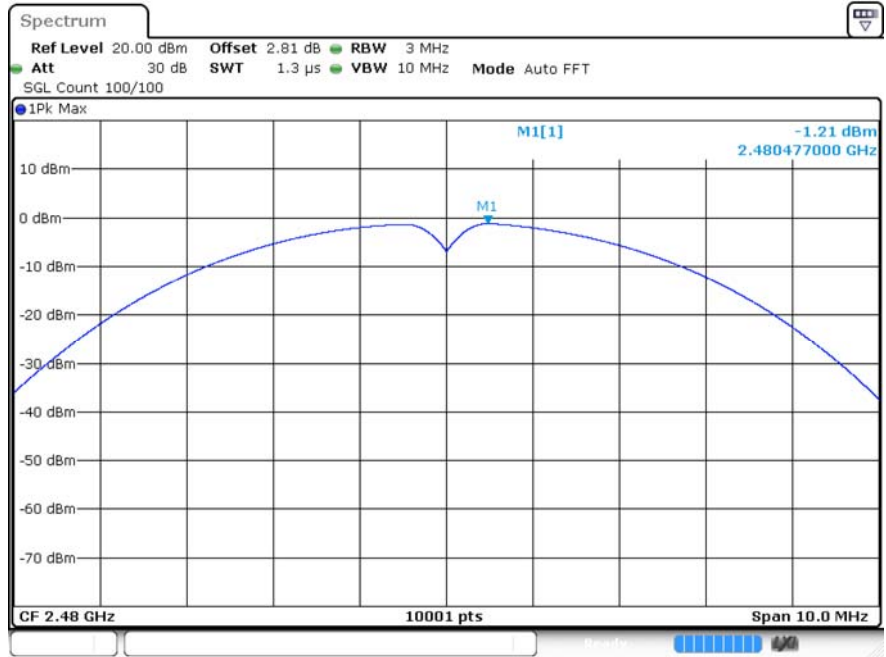
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

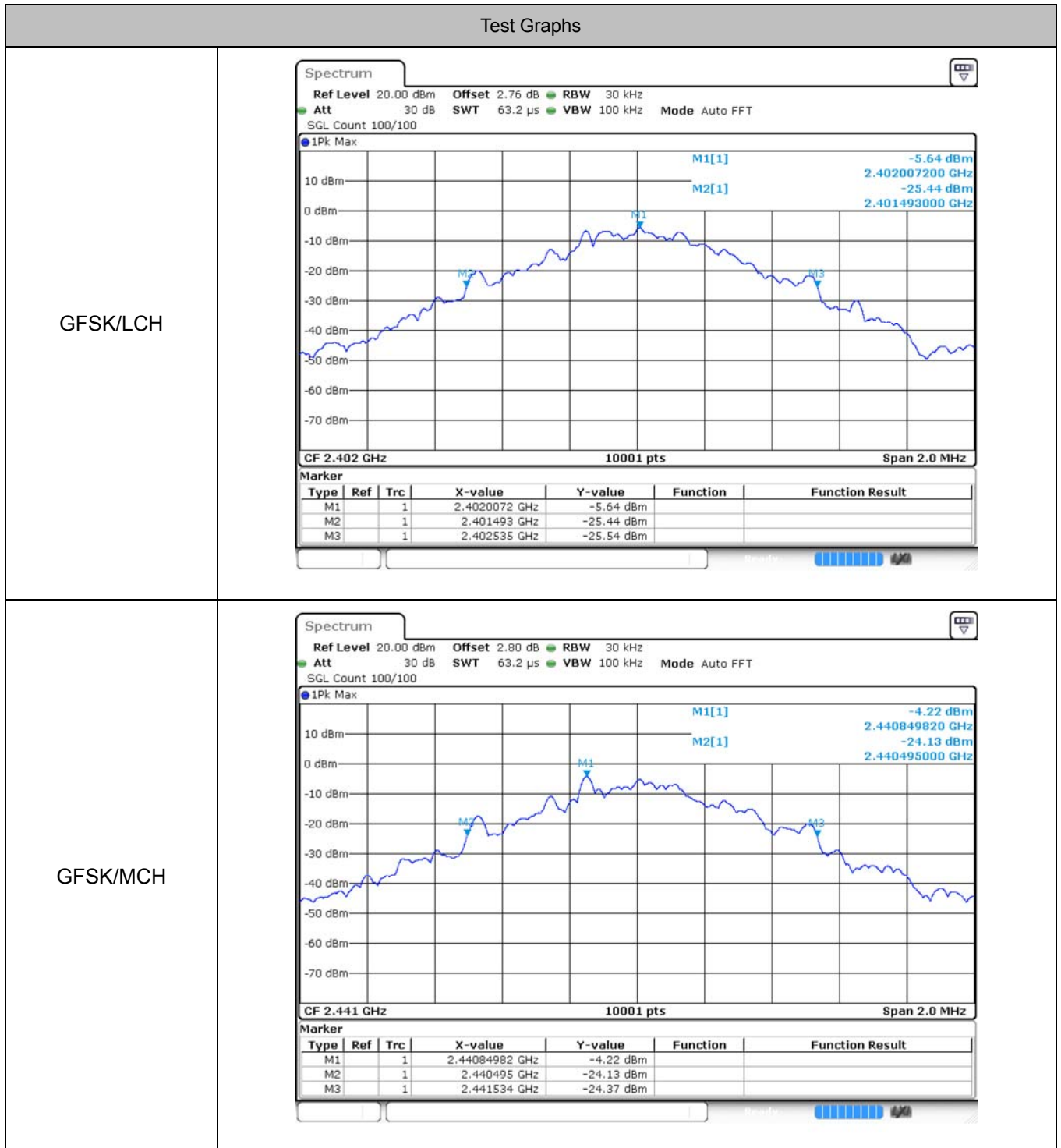


### 3 20dB Bandwidth

#### 3.1 Test Result

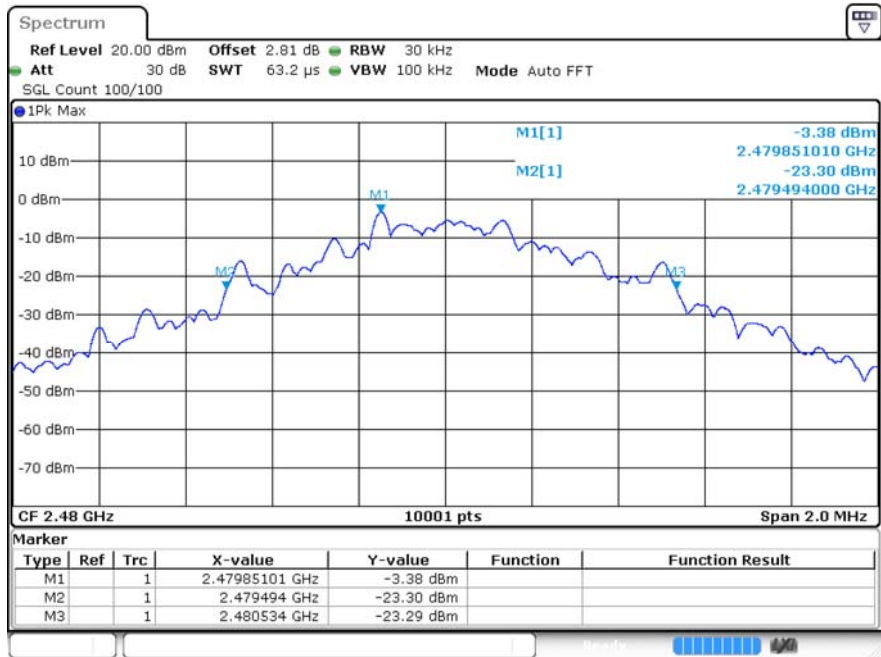
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.043	Not Specified	Pass
	MCH	1.039	Not Specified	Pass
	HCH	1.04	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.29	Not Specified	Pass
	MCH	1.288	Not Specified	Pass
	HCH	1.312	Not Specified	Pass
8DPSK	LCH	1.284	Not Specified	Pass
	MCH	1.269	Not Specified	Pass
	HCH	1.258	Not Specified	Pass

### 3.2 Test Graphs

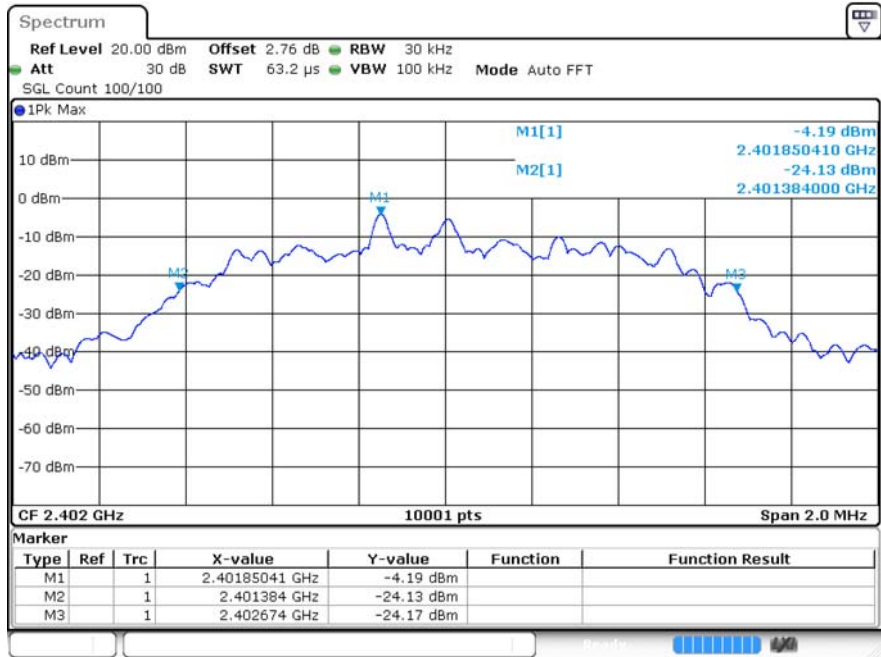




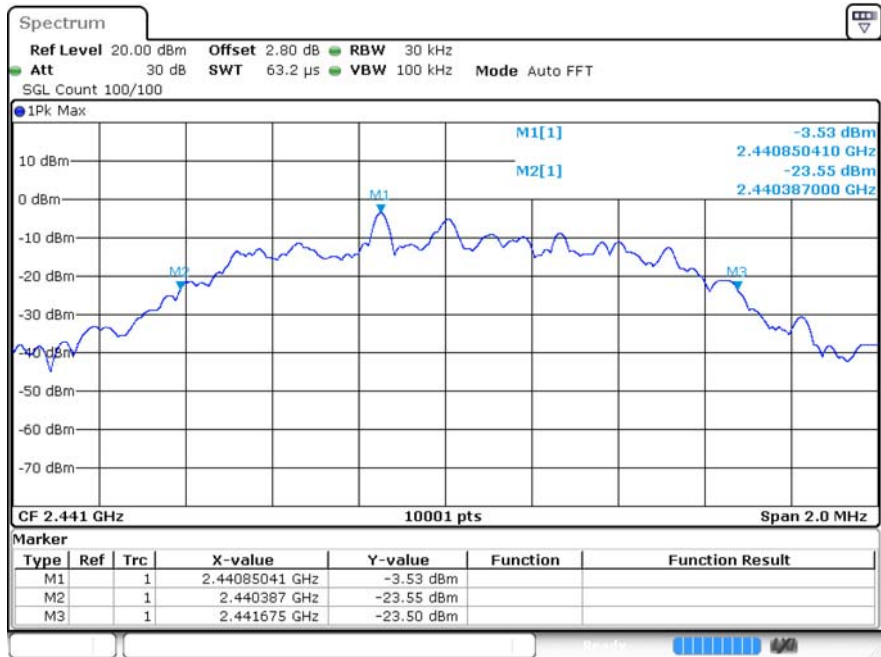
GFSK/HCH



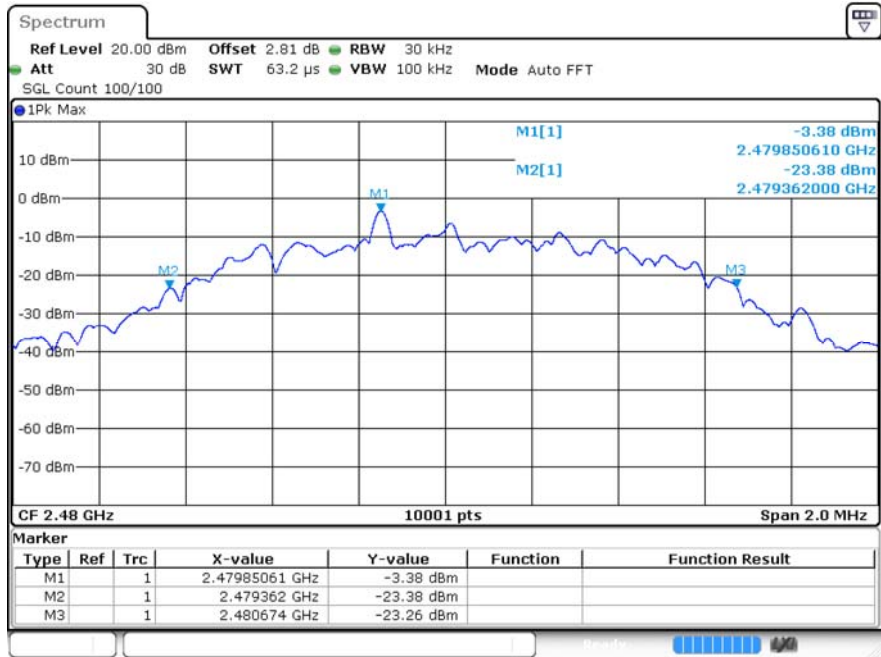
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



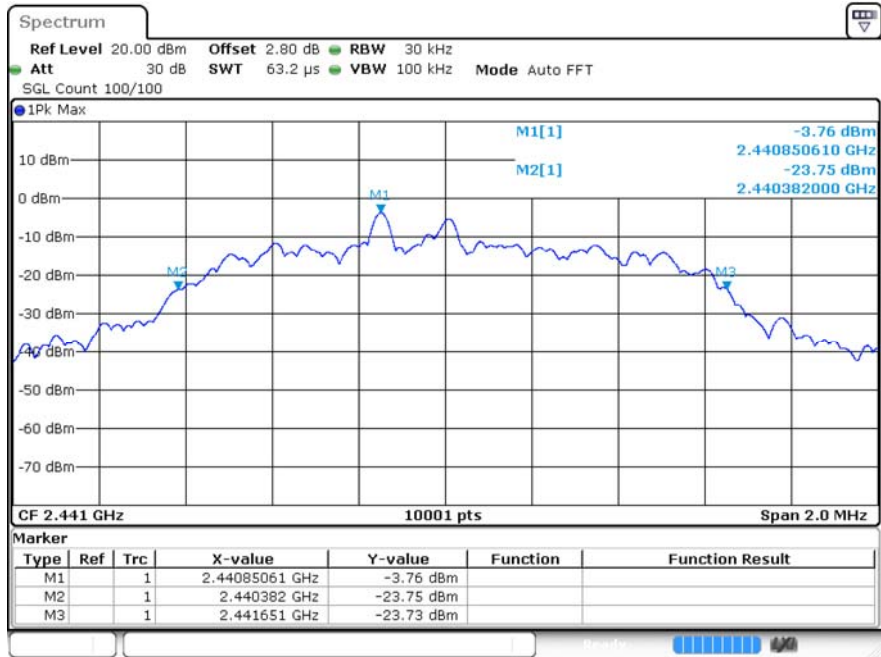
$\pi/4$ DQPSK/HCH



8DPSK/LCH

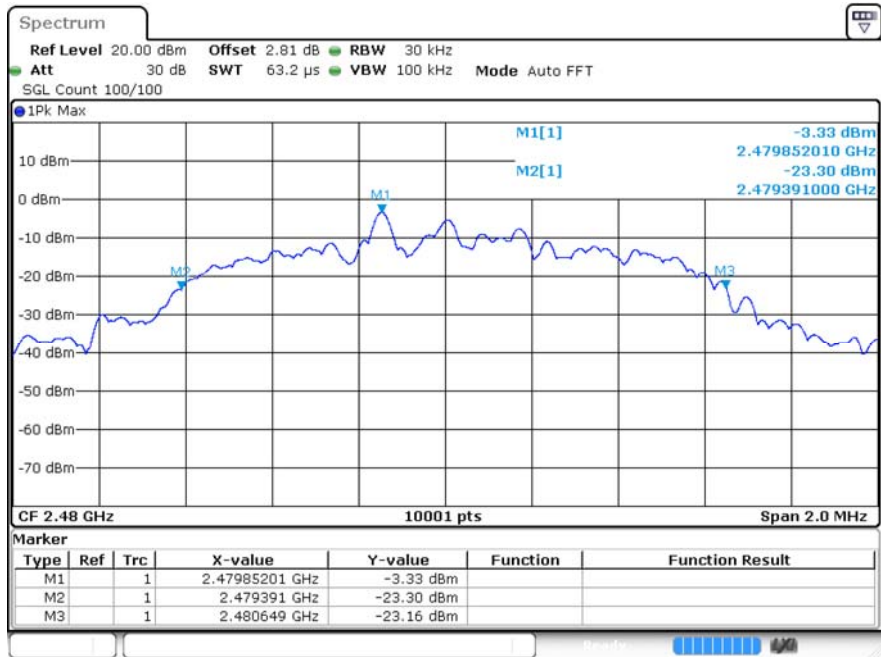


8DPSK/MCH





8DPSK/HCH

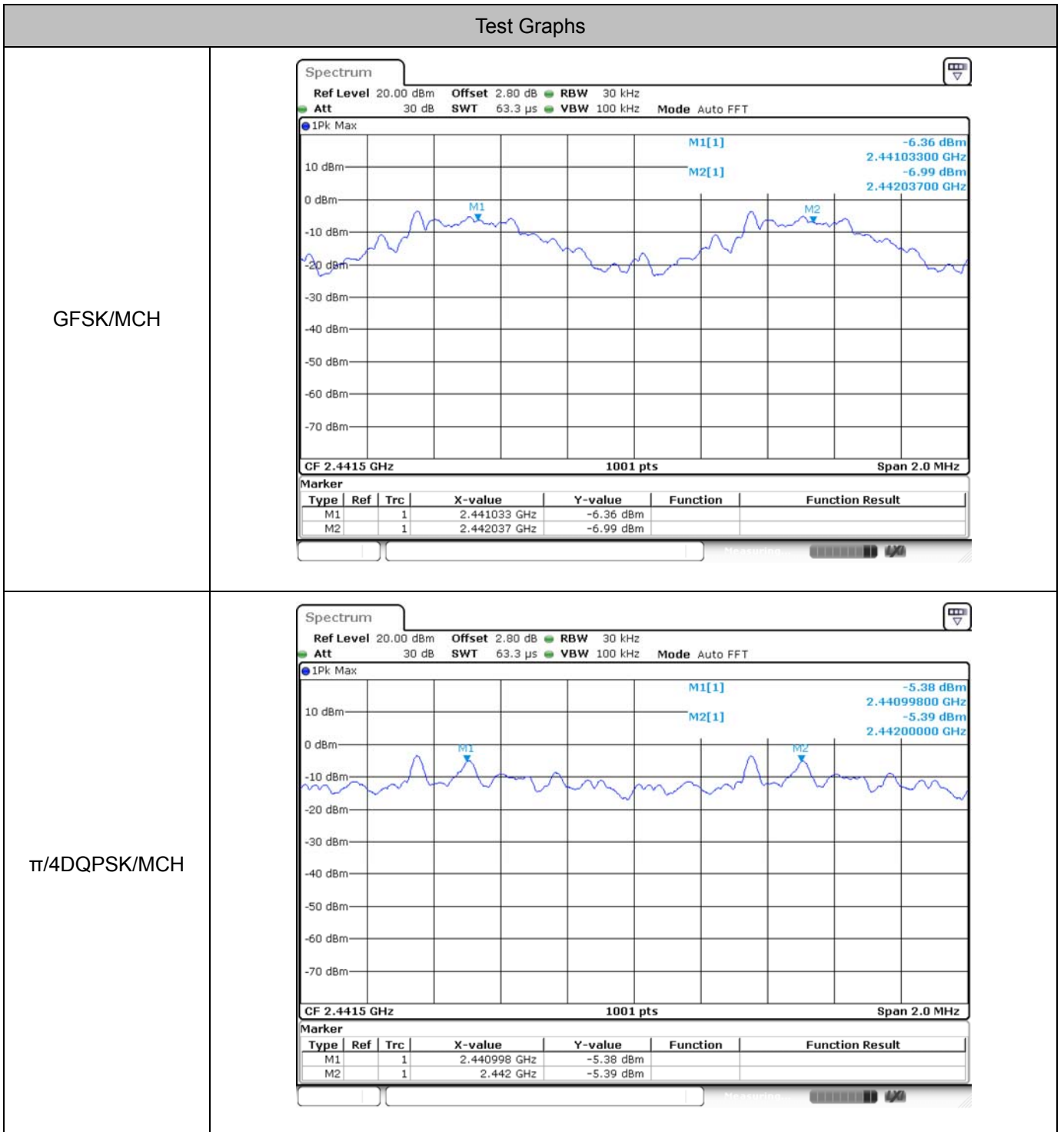


## 4 Carrier Frequency Separation

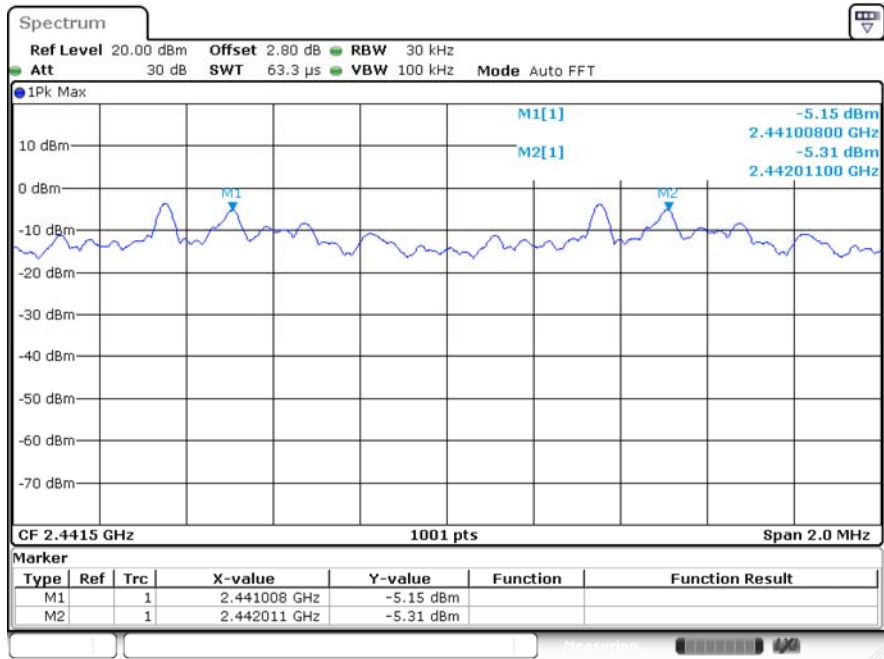
### 4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.004	0.693	Pass
$\pi/4$ DQPSK	MCH	1.002	0.859	Pass
8DPSK	MCH	1.003	0.846	Pass

## 4.2 Test Graphs



8DPSK/MCH



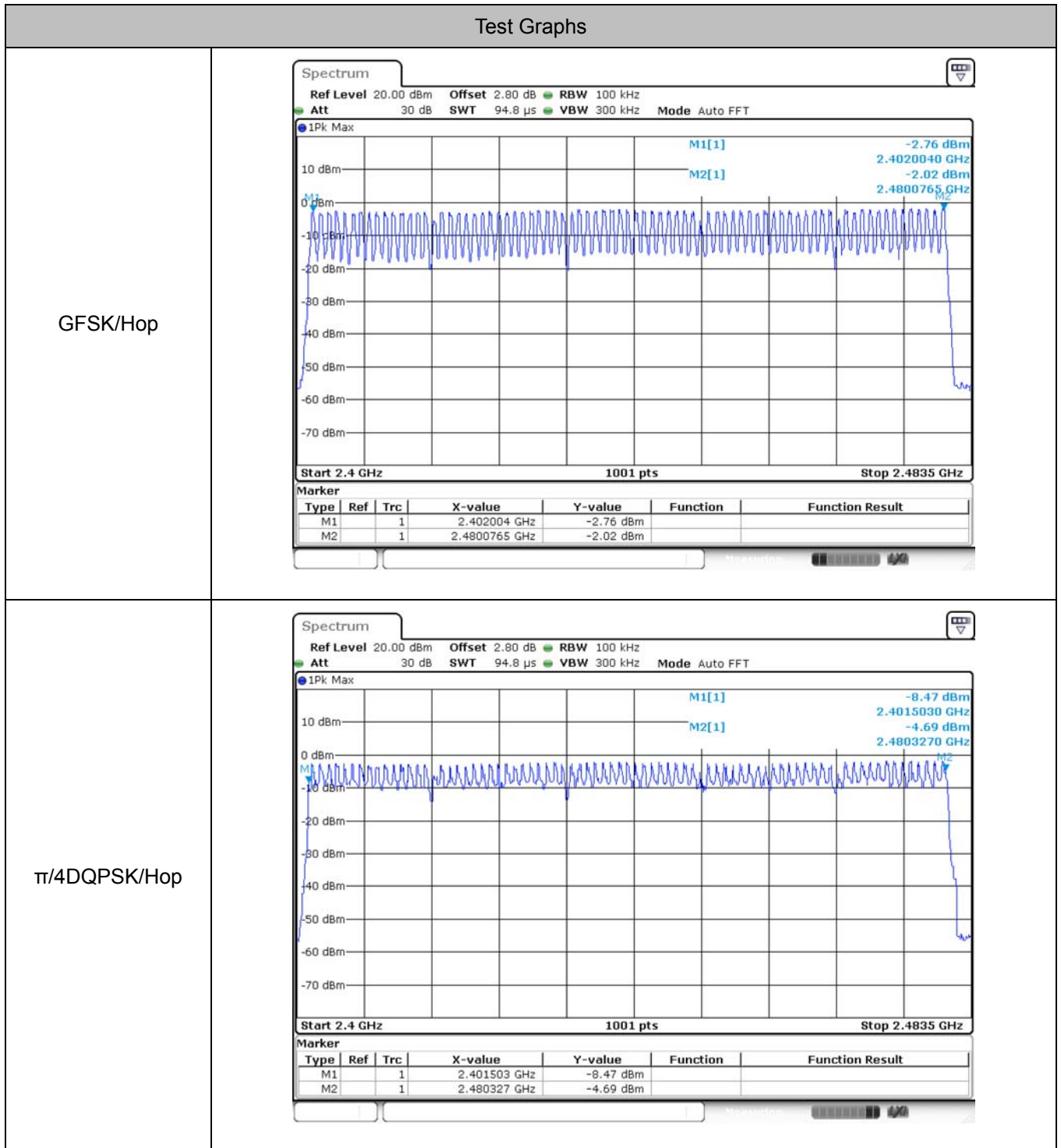
## 5 Hopping Channel Number

### 5.1 Test Result

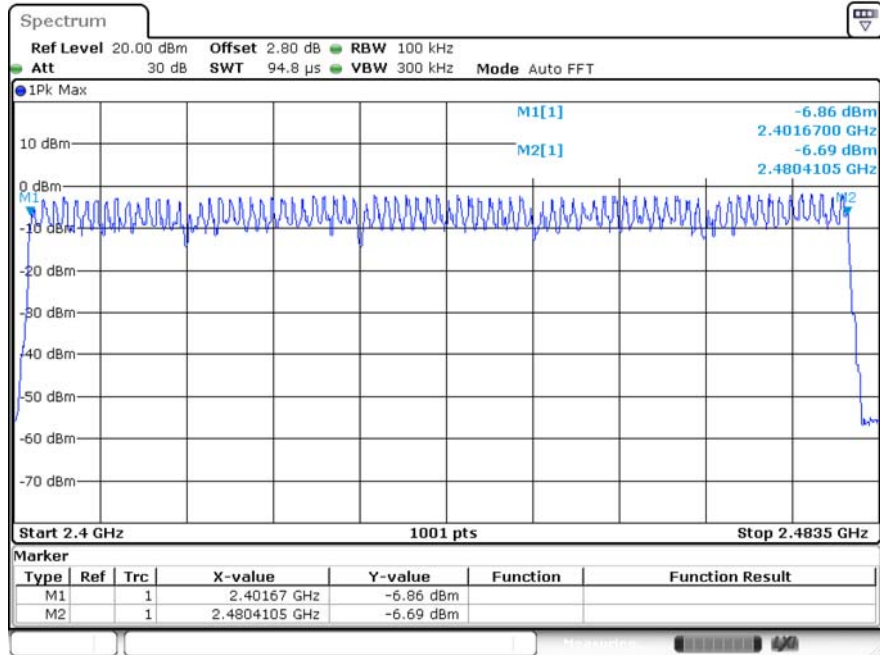
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	$\geq 15$	PASS
$\pi/4$ DQPSK	Hop	79	$\geq 15$	PASS
8DPSK	Hop	79	$\geq 15$	PASS



## 5.2 Test Graphs



8DPSK/Hop

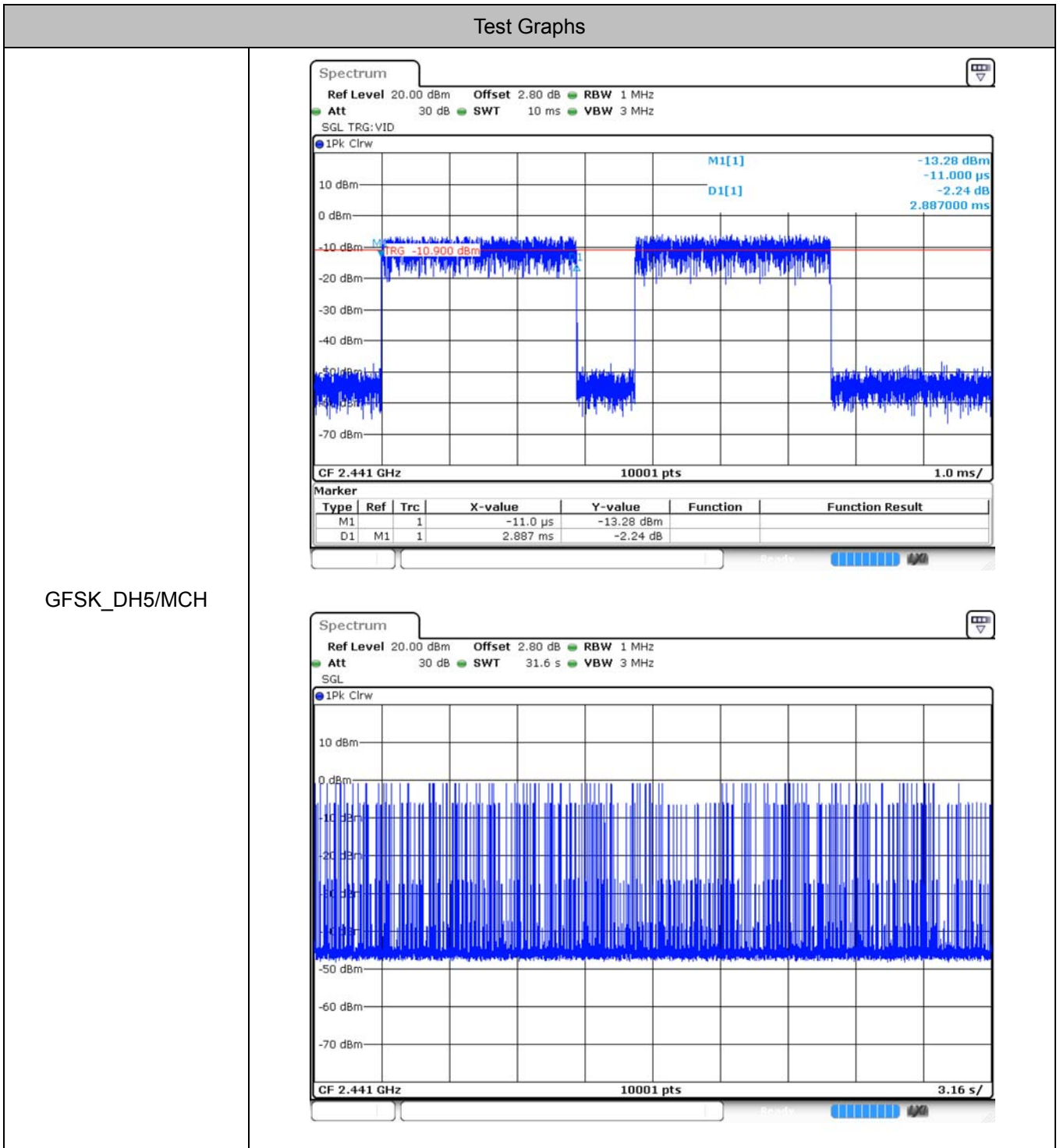


## 6 Dwell Time

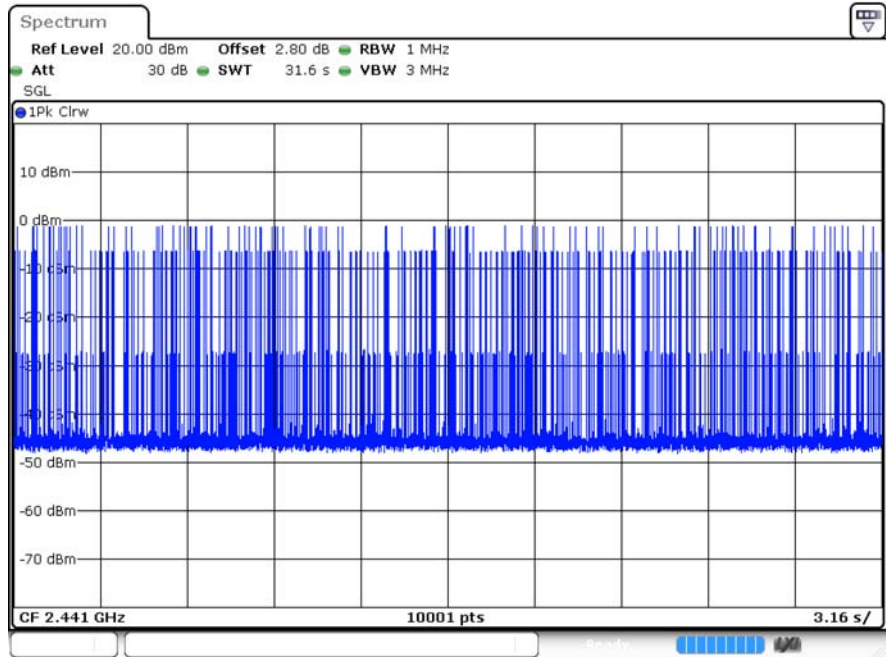
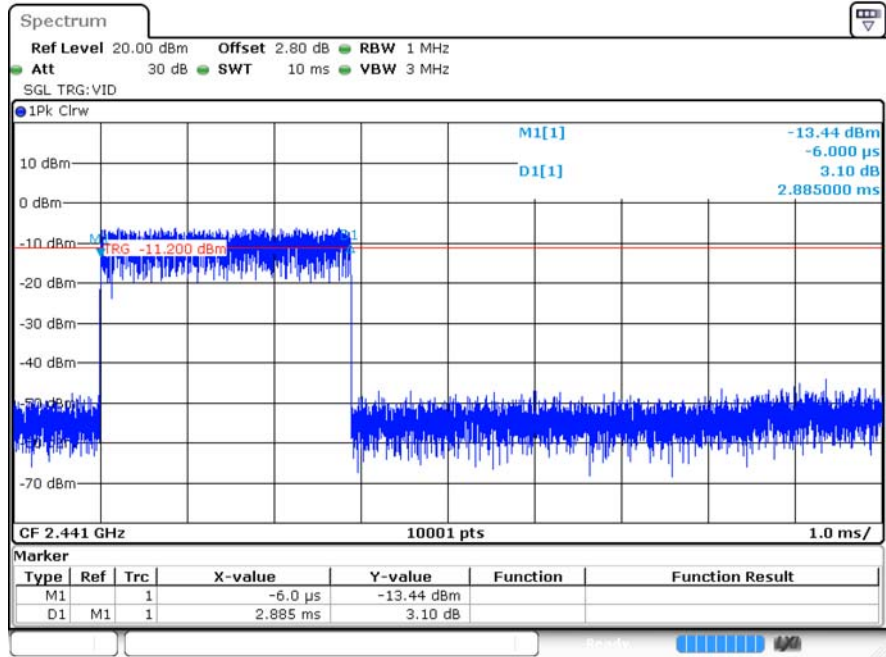
### 6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.887	104	300.248	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.885	107	308.695	0.4	Pass
8DPSK	3DH5	MCH	2.887	104	300.248	0.4	Pass

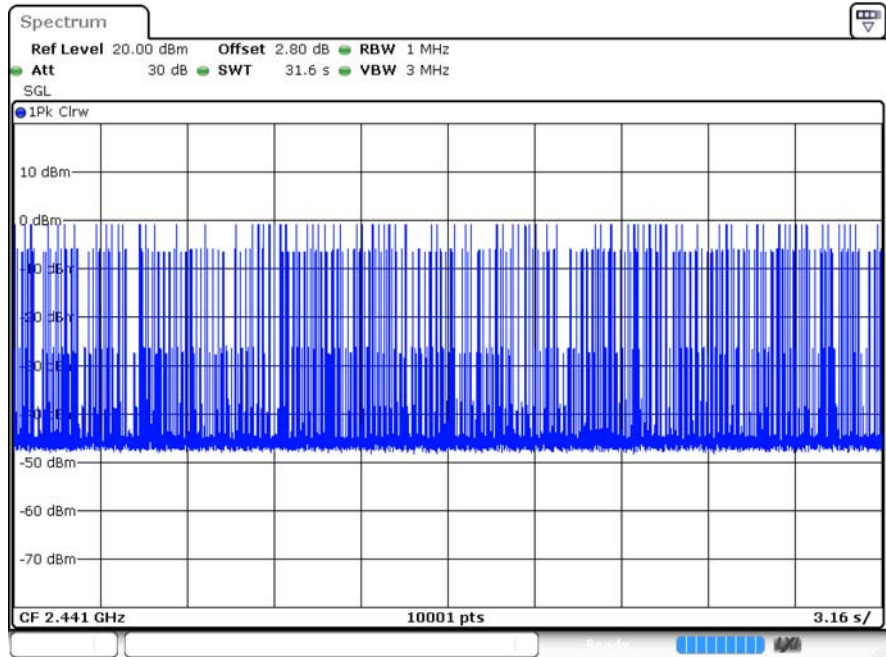
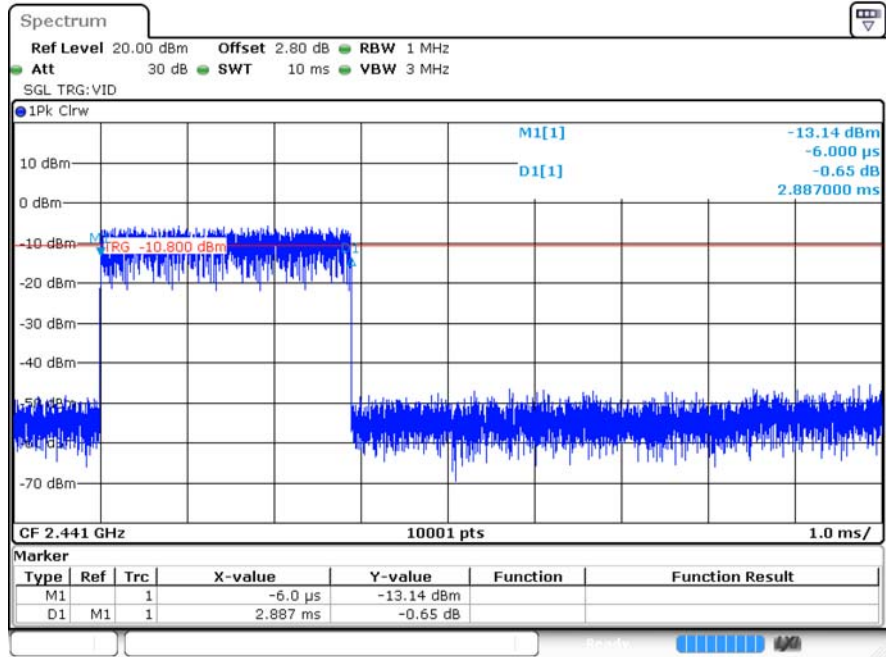
## 6.2 Test Graphs



$\pi/4$ DQPSK  
\_2DH5/MCH



8DPSK\_3DH5/MCH

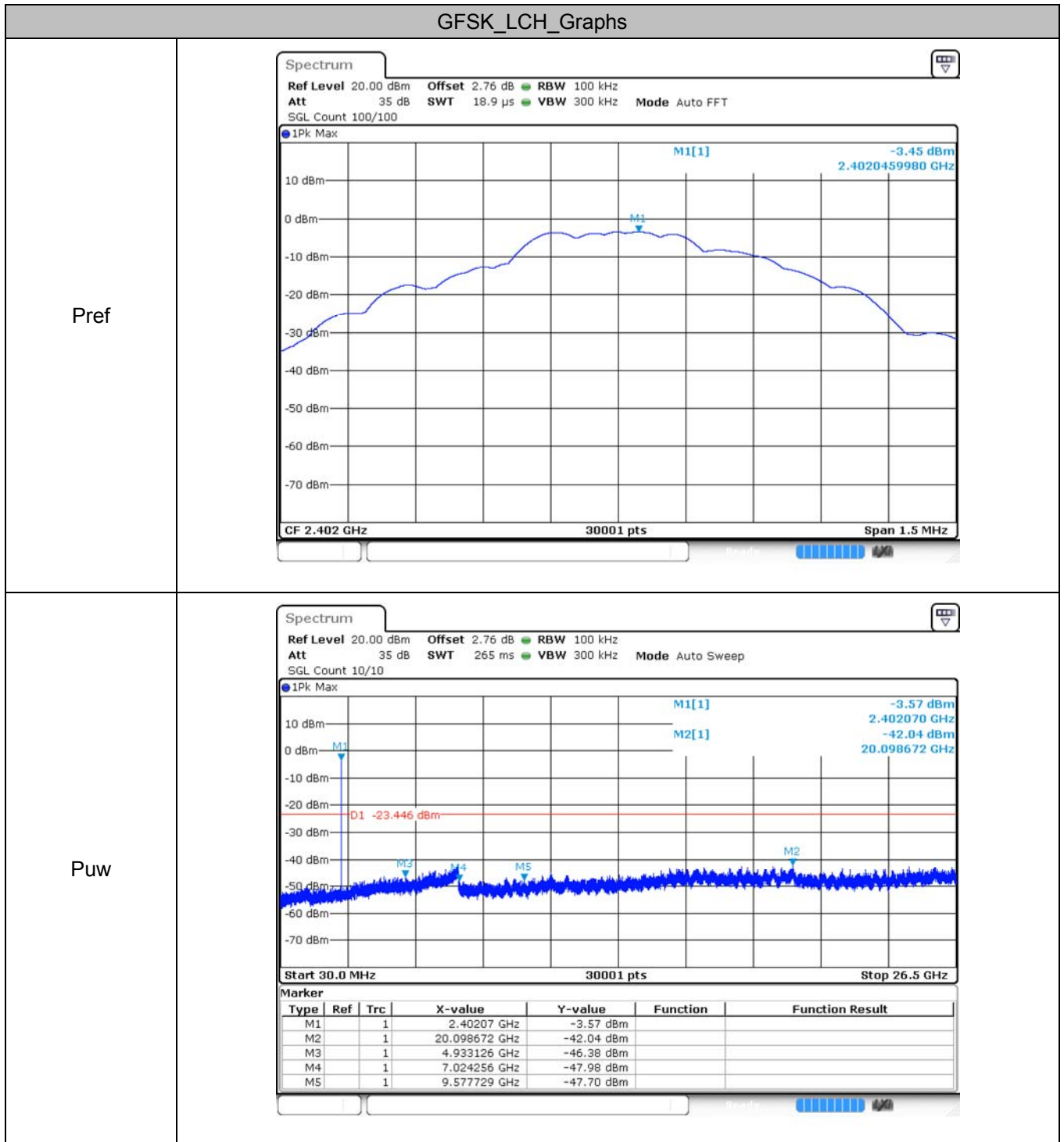


## 7 RF Conducted Spurious Emissions

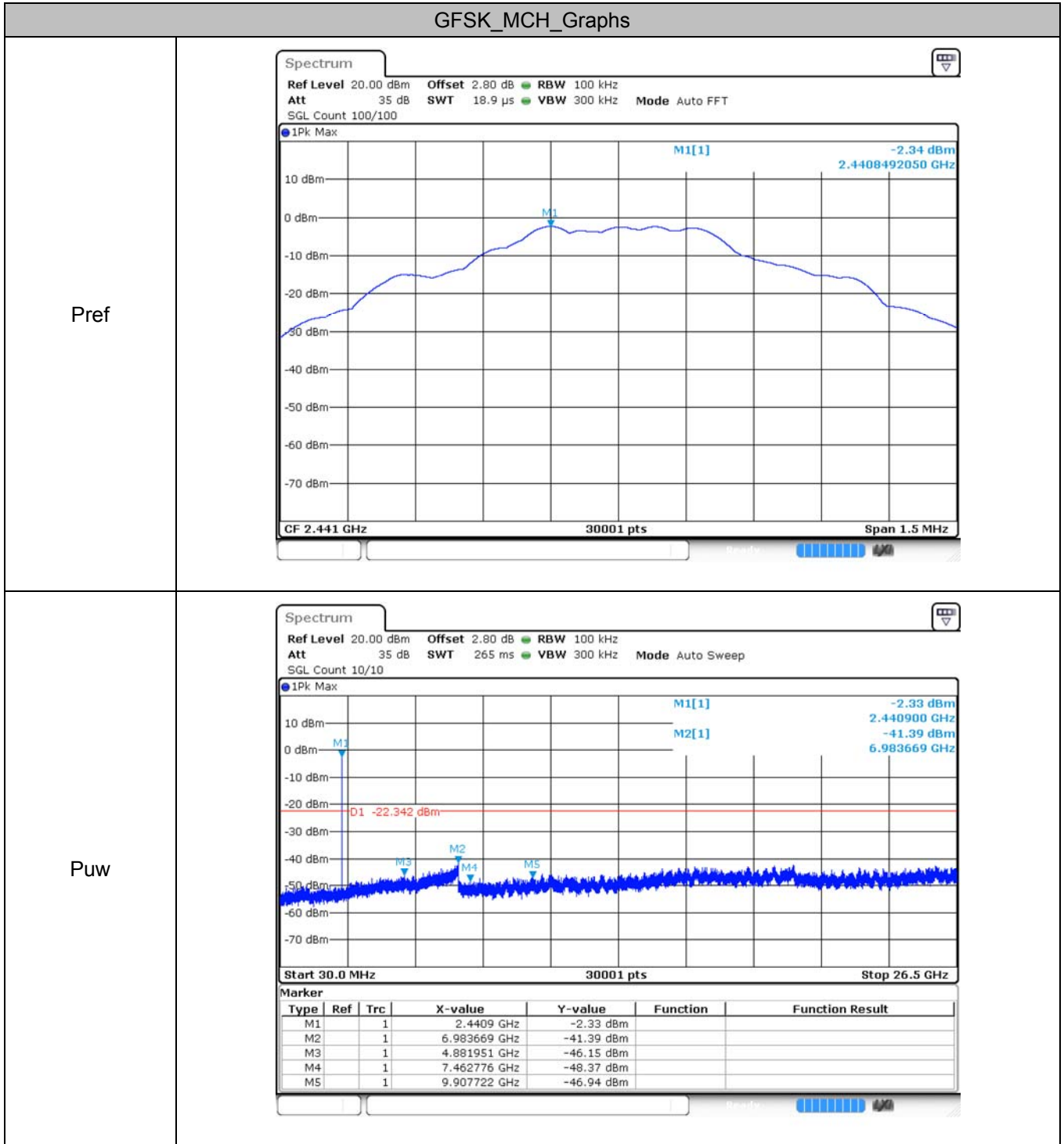
### 7.1 Test Result

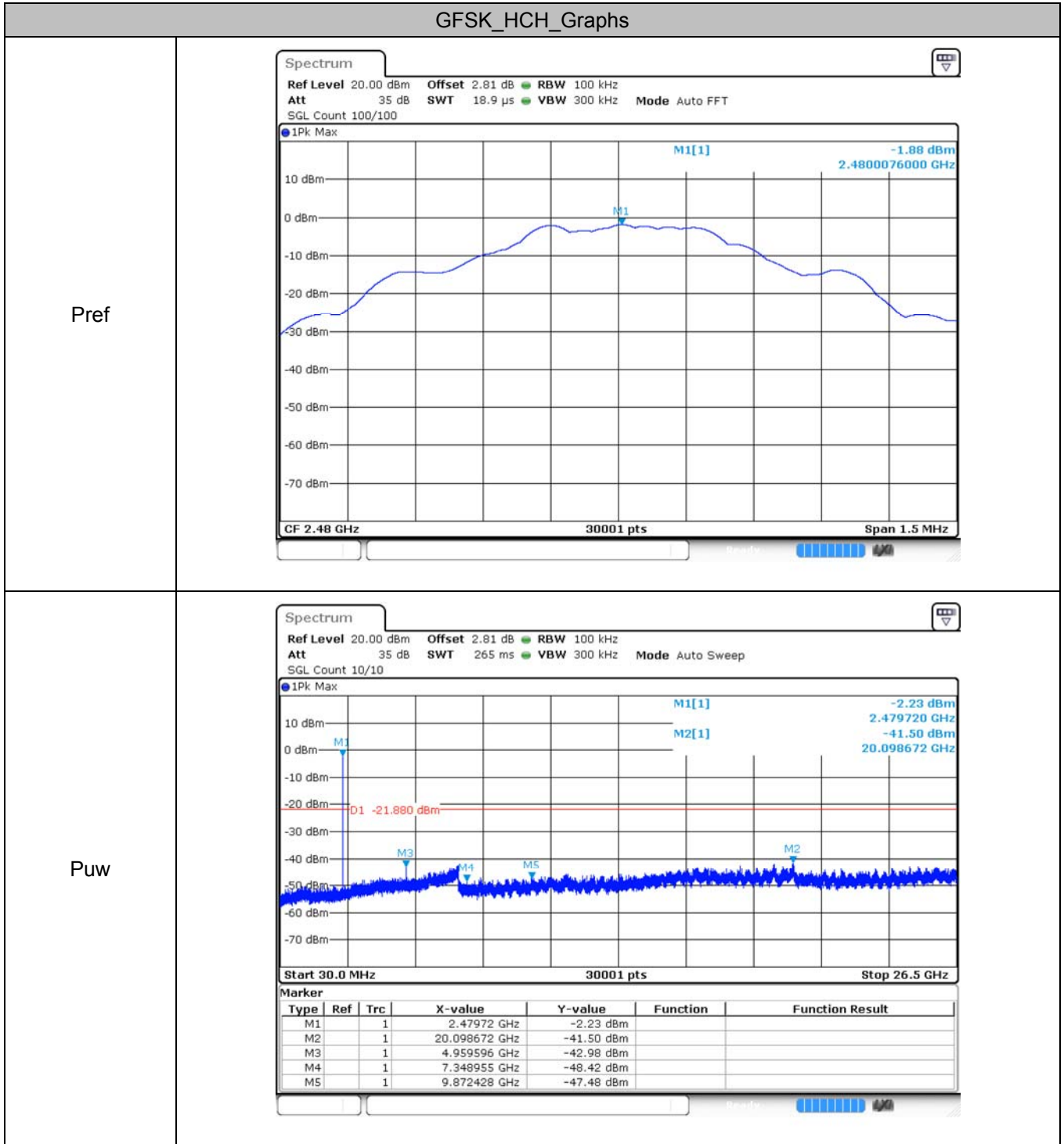
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-38.58	-20	Pass
	MCH	-39.05	-20	Pass
	HCH	-39.61	-20	Pass
$\pi/4$ DQPSK	LCH	-38.23	-20	Pass
	MCH	-34.65	-20	Pass
	HCH	-39.93	-20	Pass
8DPSK	LCH	-38.74	-20	Pass
	MCH	-39.33	-20	Pass
	HCH	-39.41	-20	Pass

## 7.2 Test Graphs



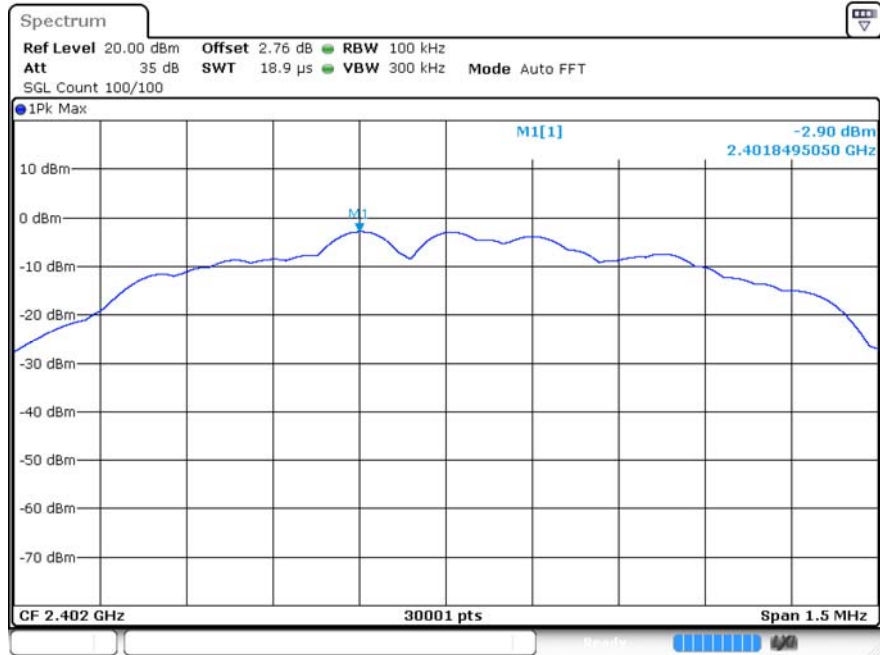




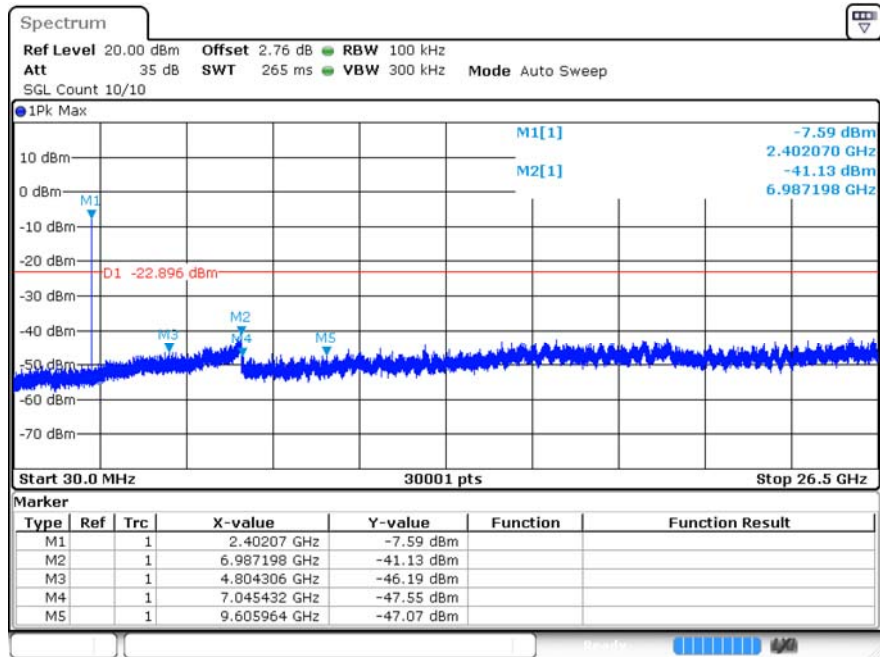


$\pi/4$ DQPSK\_LCH\_Graphs

Pref

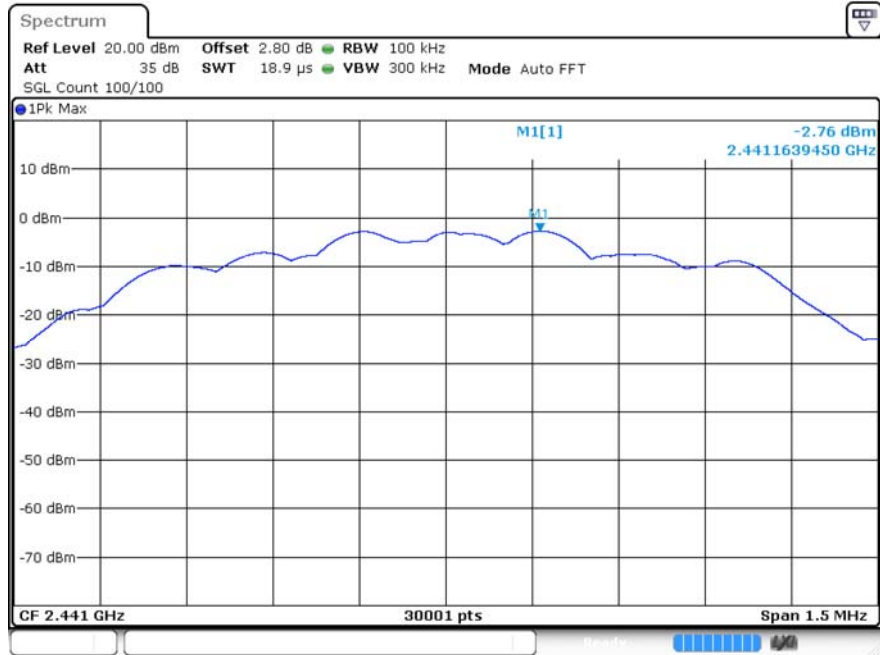


Puw

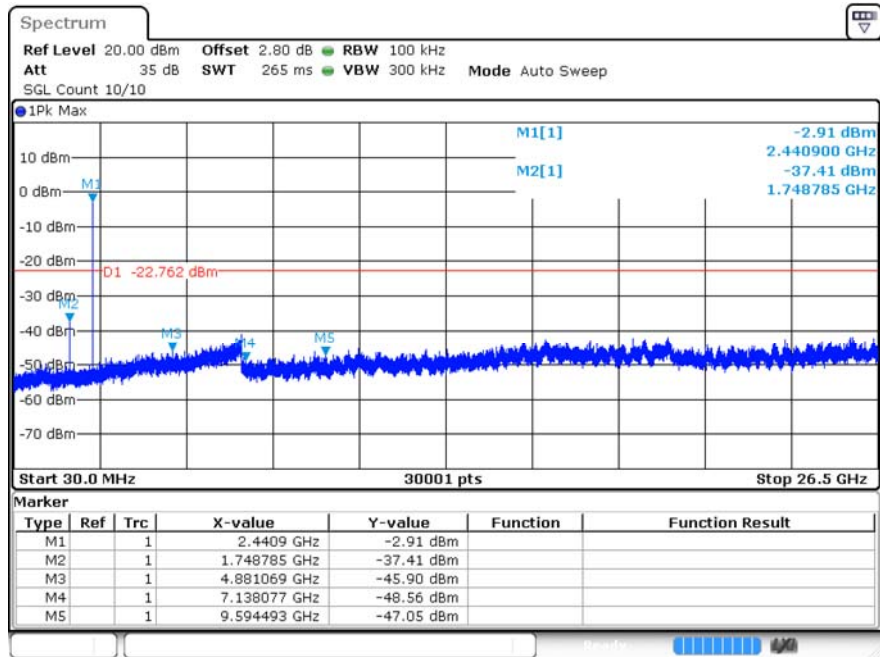


$\pi$ /4DQPSK\_MCH\_Graphs

Pref

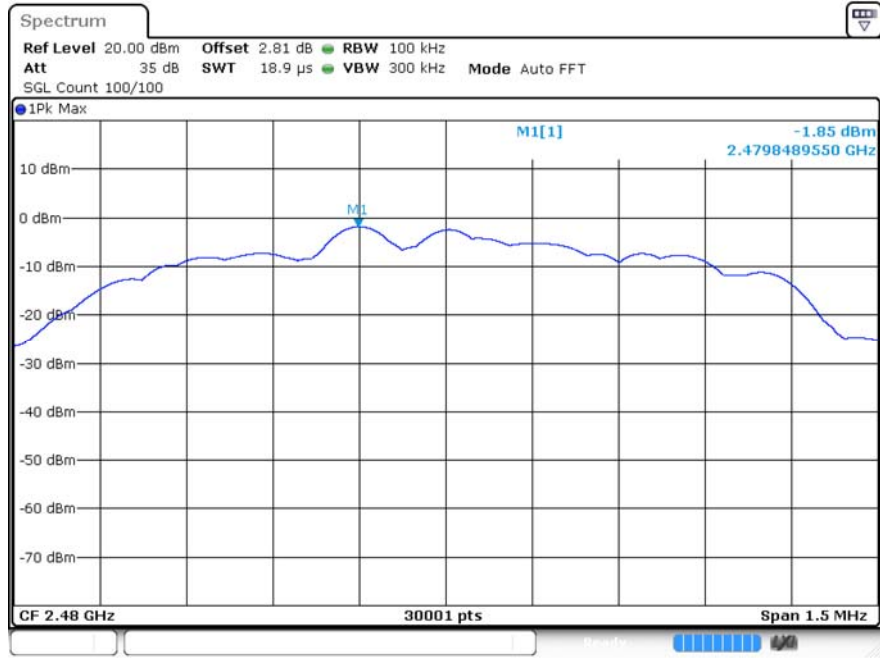


Puw

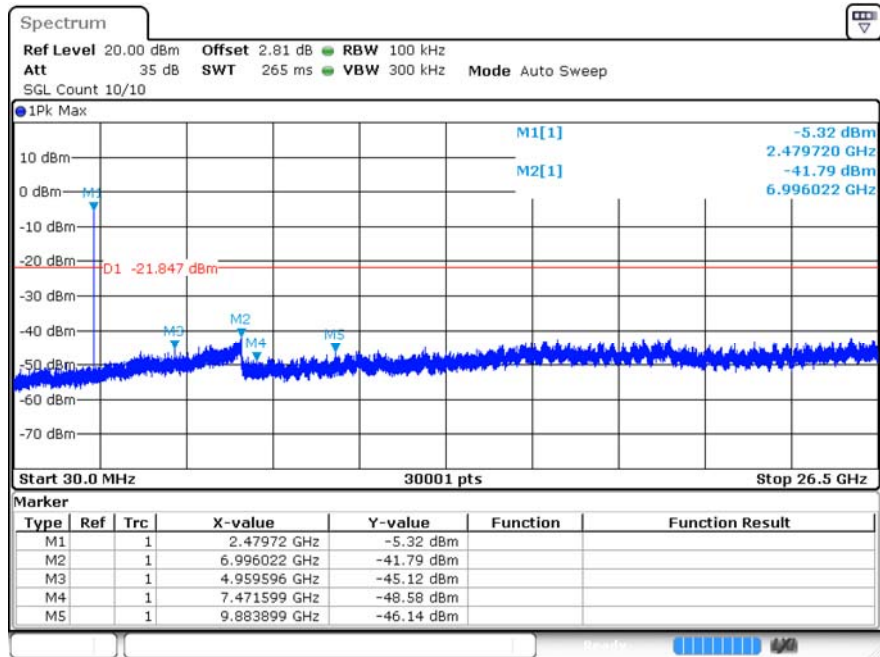


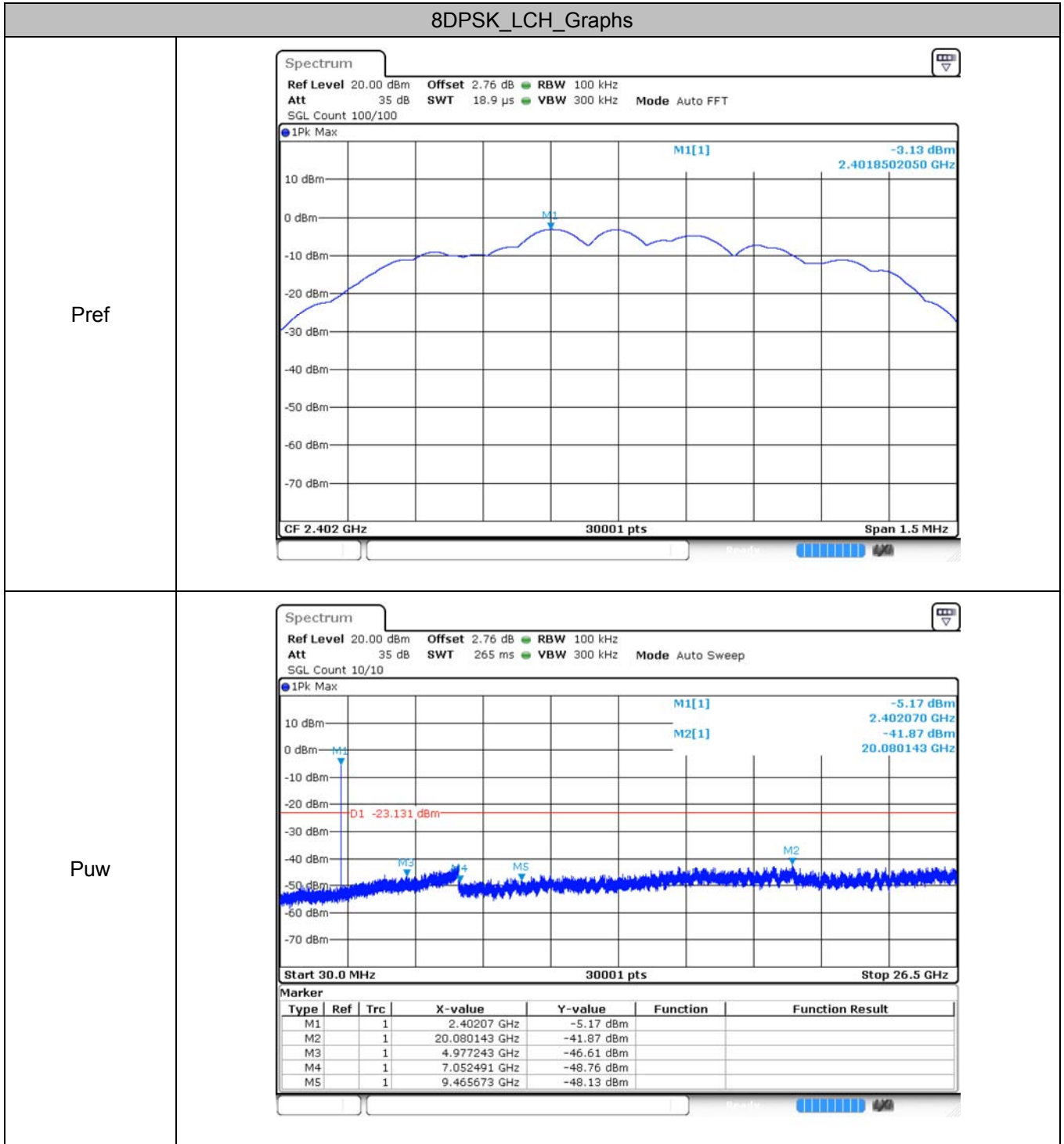
$\pi/4$ DQPSK\_HCH\_Graphs

Pref



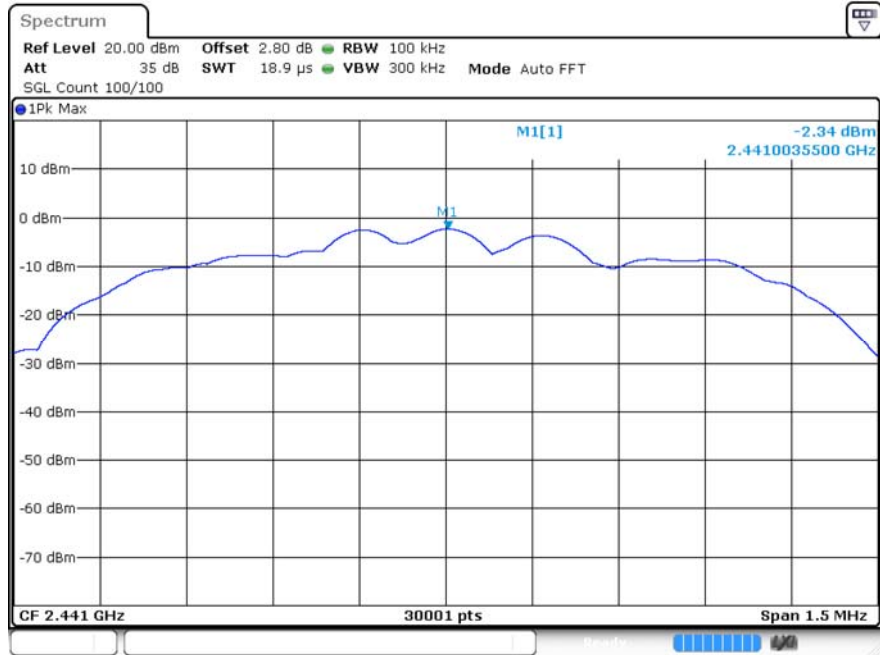
Puw



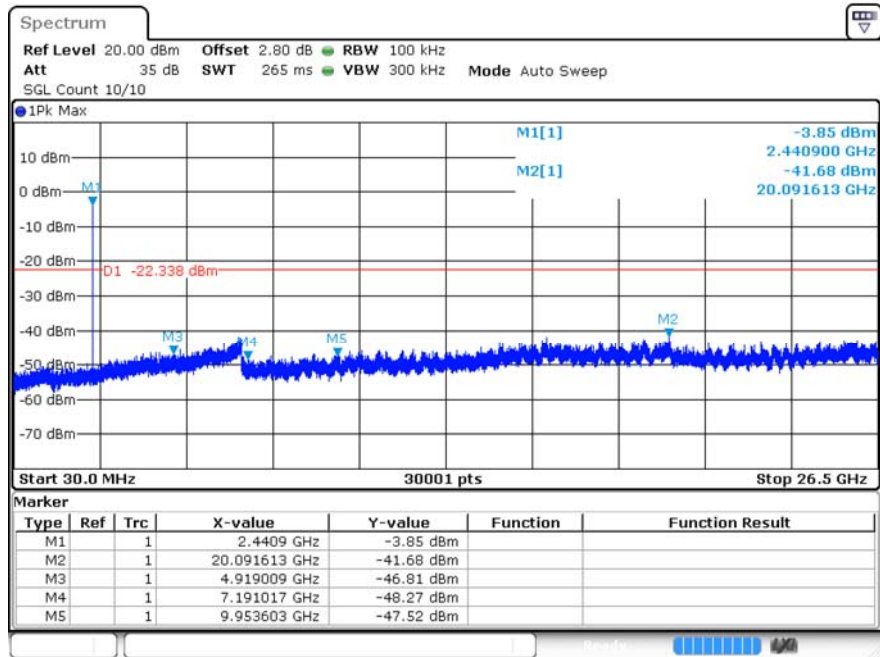


8DPSK\_MCH\_Graphs

Pref

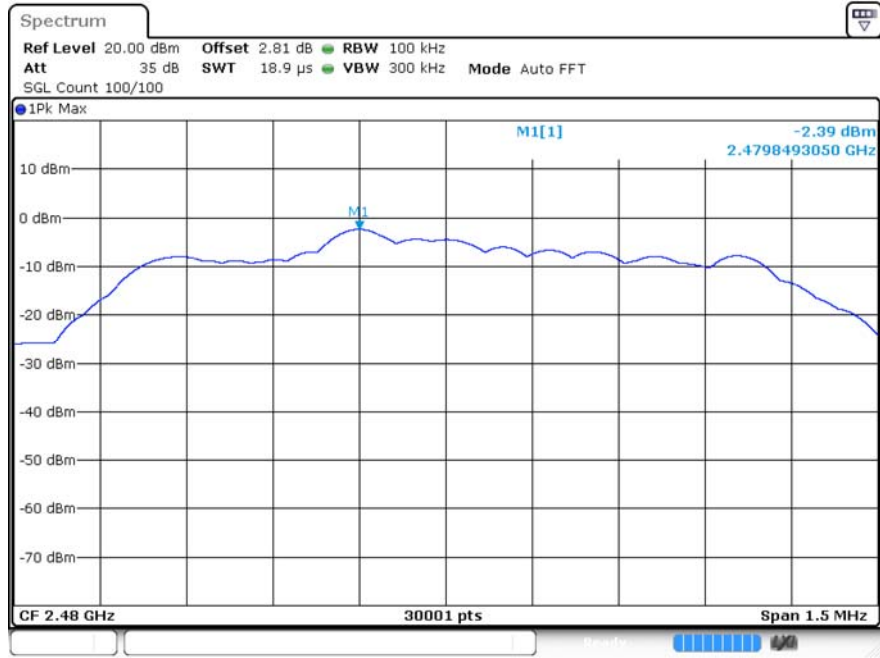


Puw

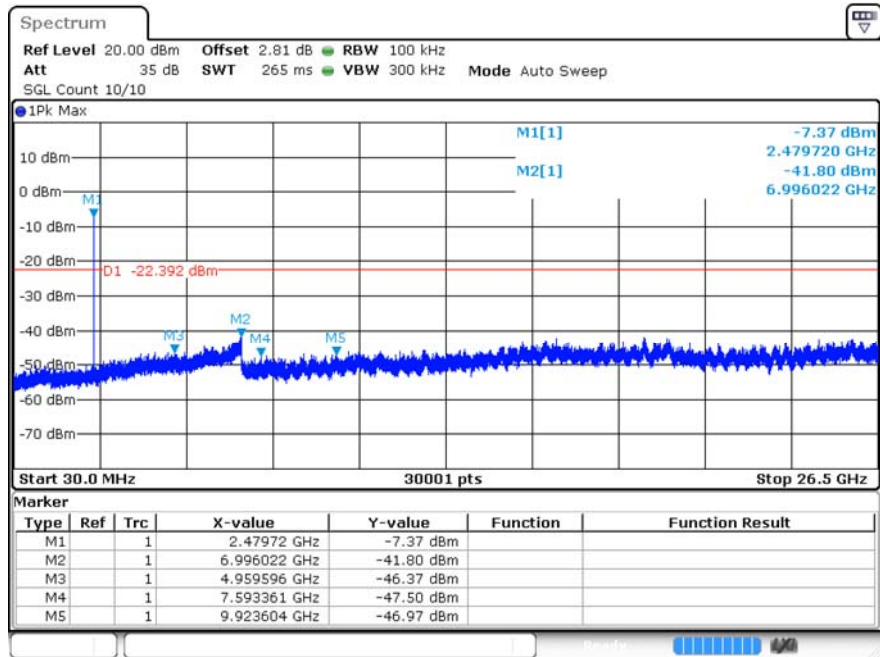


8DPSK\_HCH\_Graphs

Pref



Puw



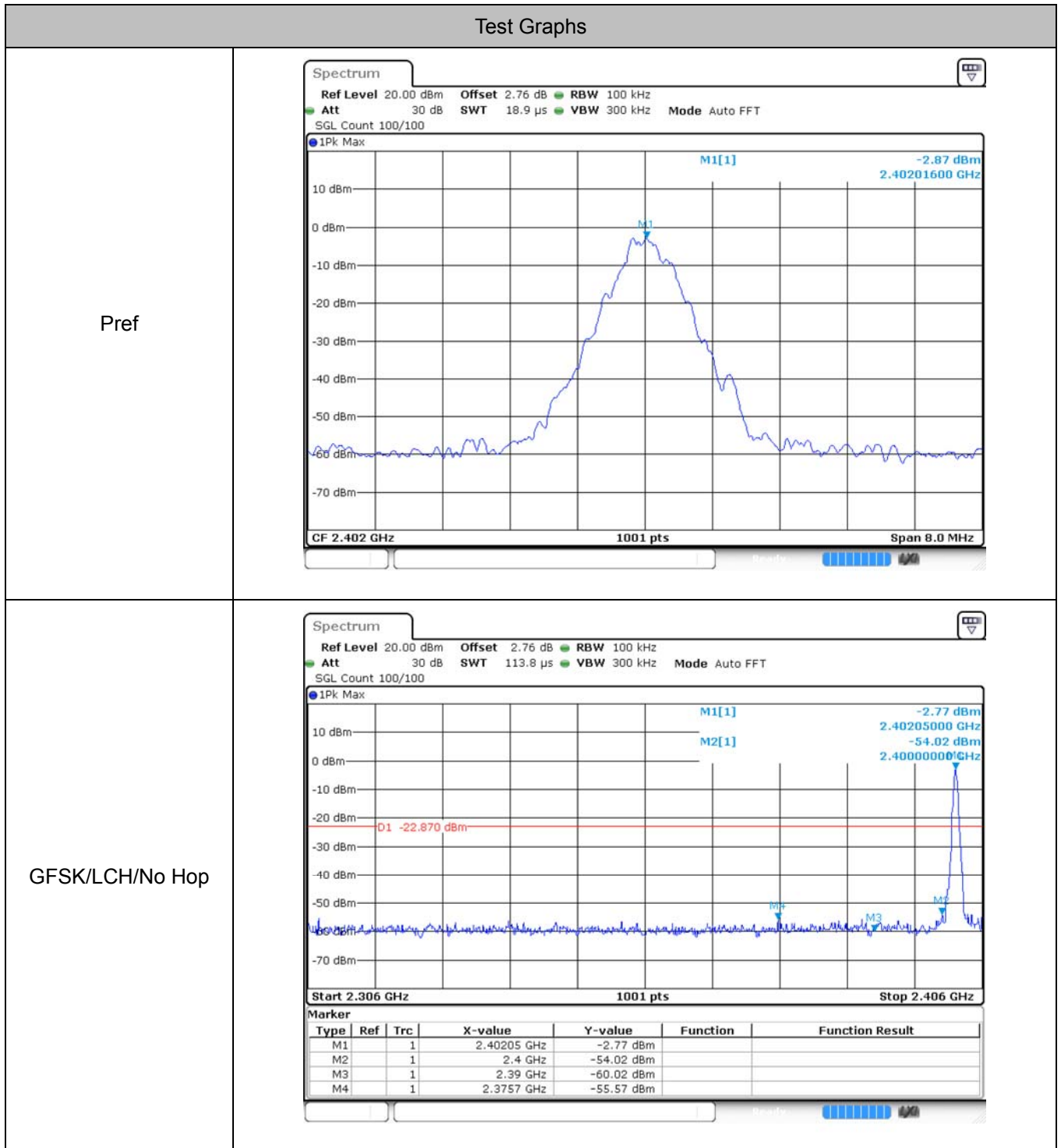


## 8 Band-edge for RF Conducted Emissions

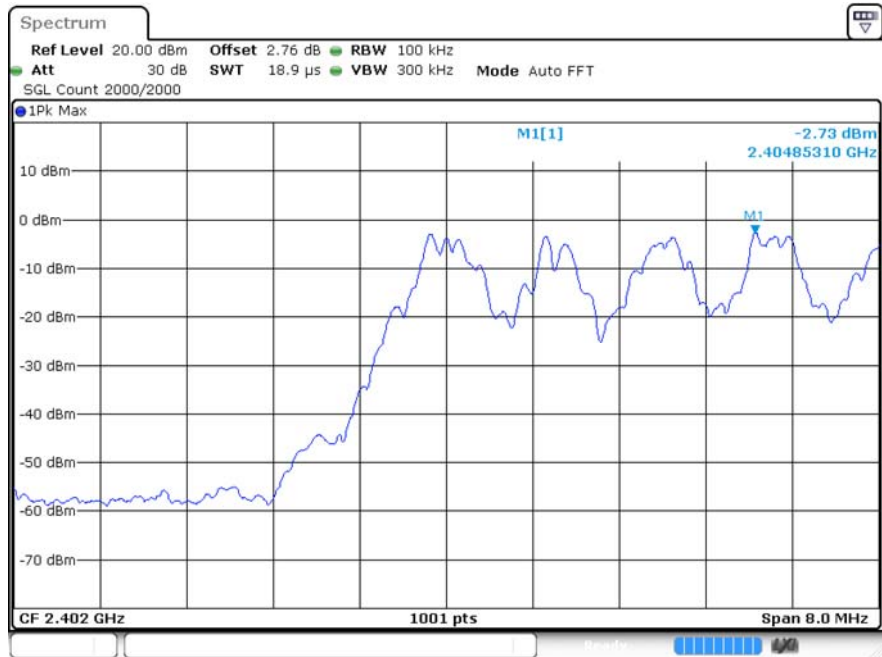
### 8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-52.69	-20	Pass
			On	-52.17	-20	Pass
	HCH	2480	Off	-53.13	-20	Pass
			On	-52.38	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-53.61	-20	Pass
			On	-52.28	-20	Pass
	HCH	2480	Off	-53.44	-20	Pass
			On	-52.52	-20	Pass
8DPSK	LCH	2402	Off	-50.94	-20	Pass
			On	-52.64	-20	Pass
	HCH	2480	Off	-52.77	-20	Pass
			On	-51.74	-20	Pass

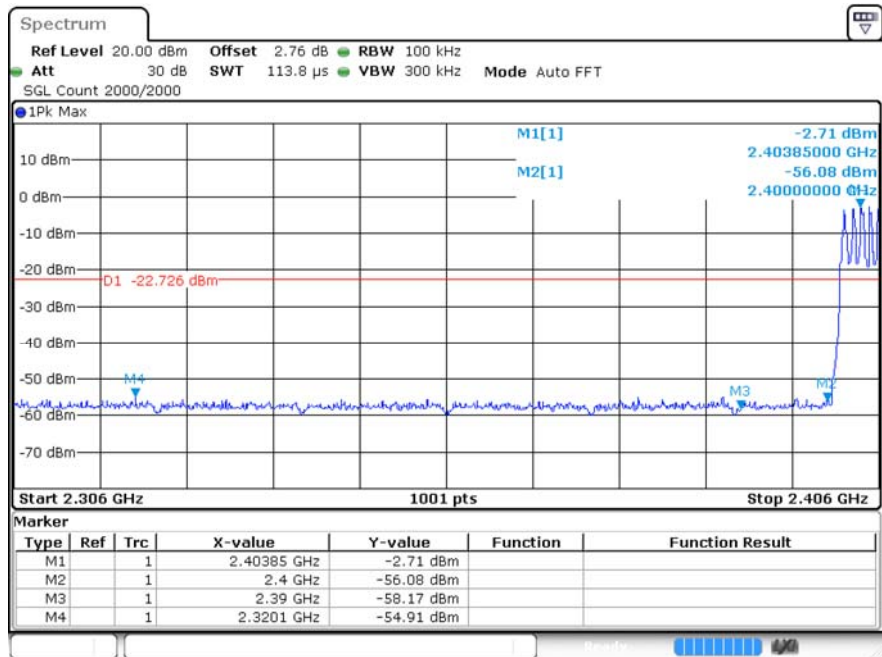
## 8.2 Test Graphs

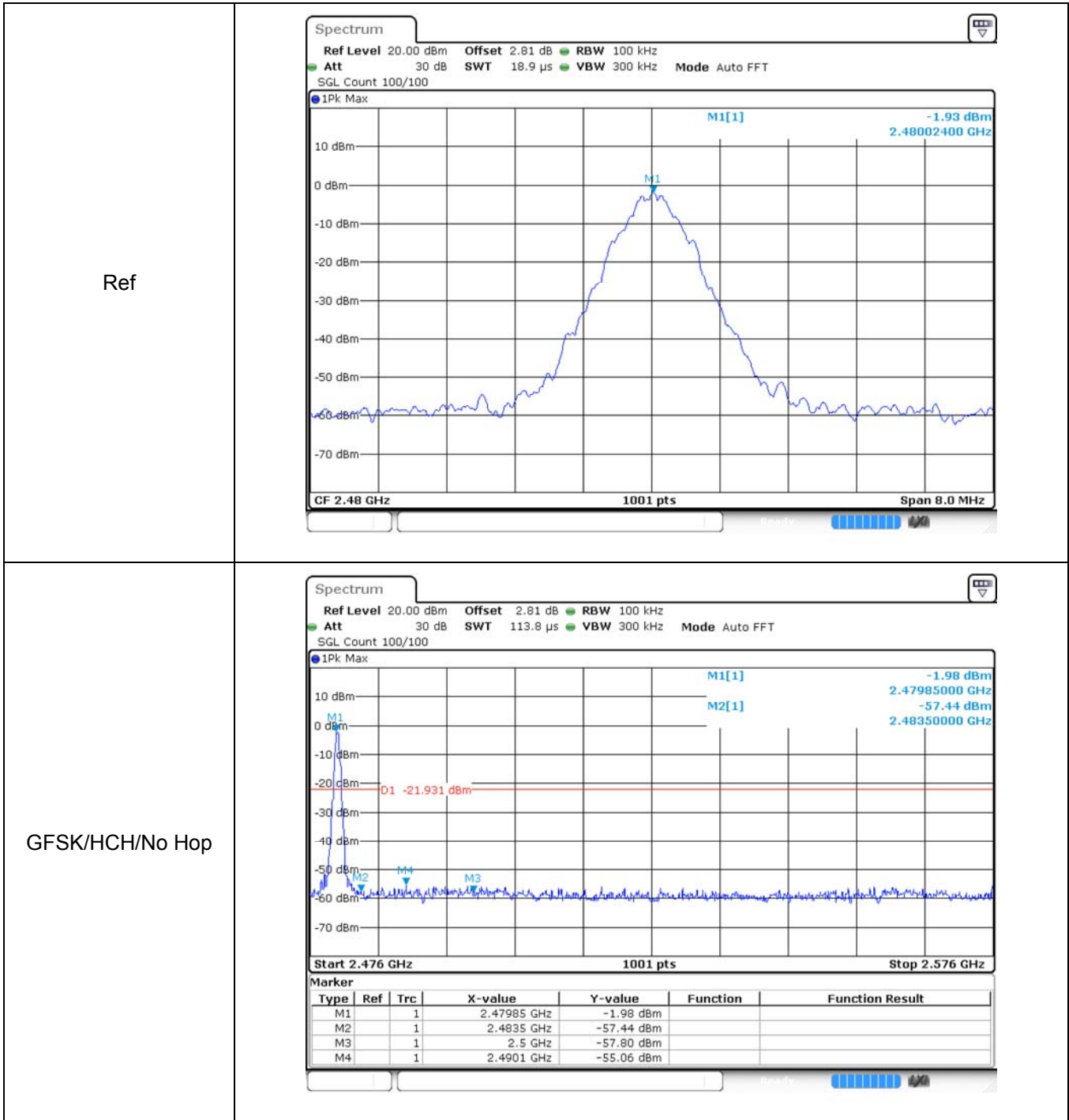


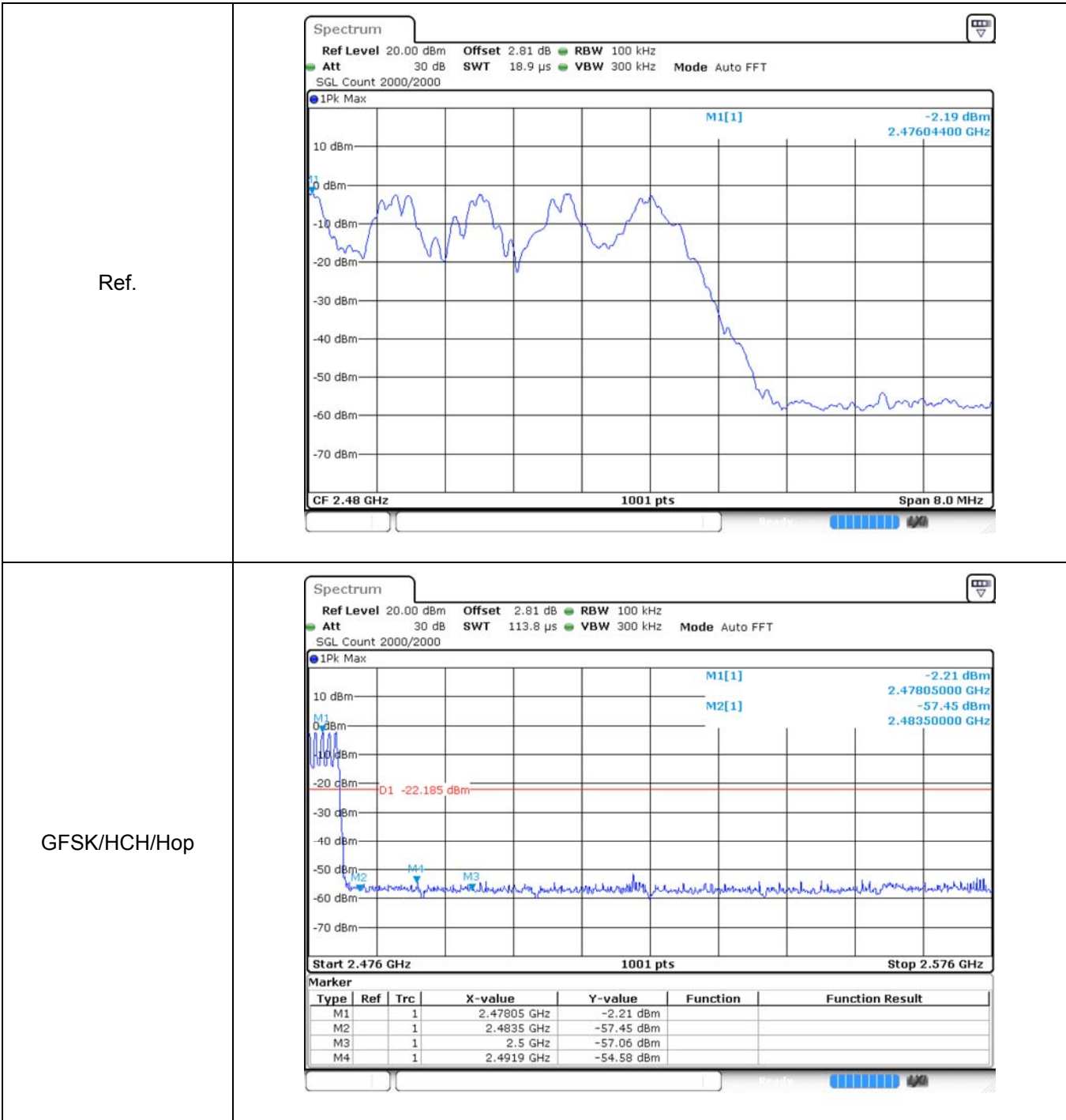
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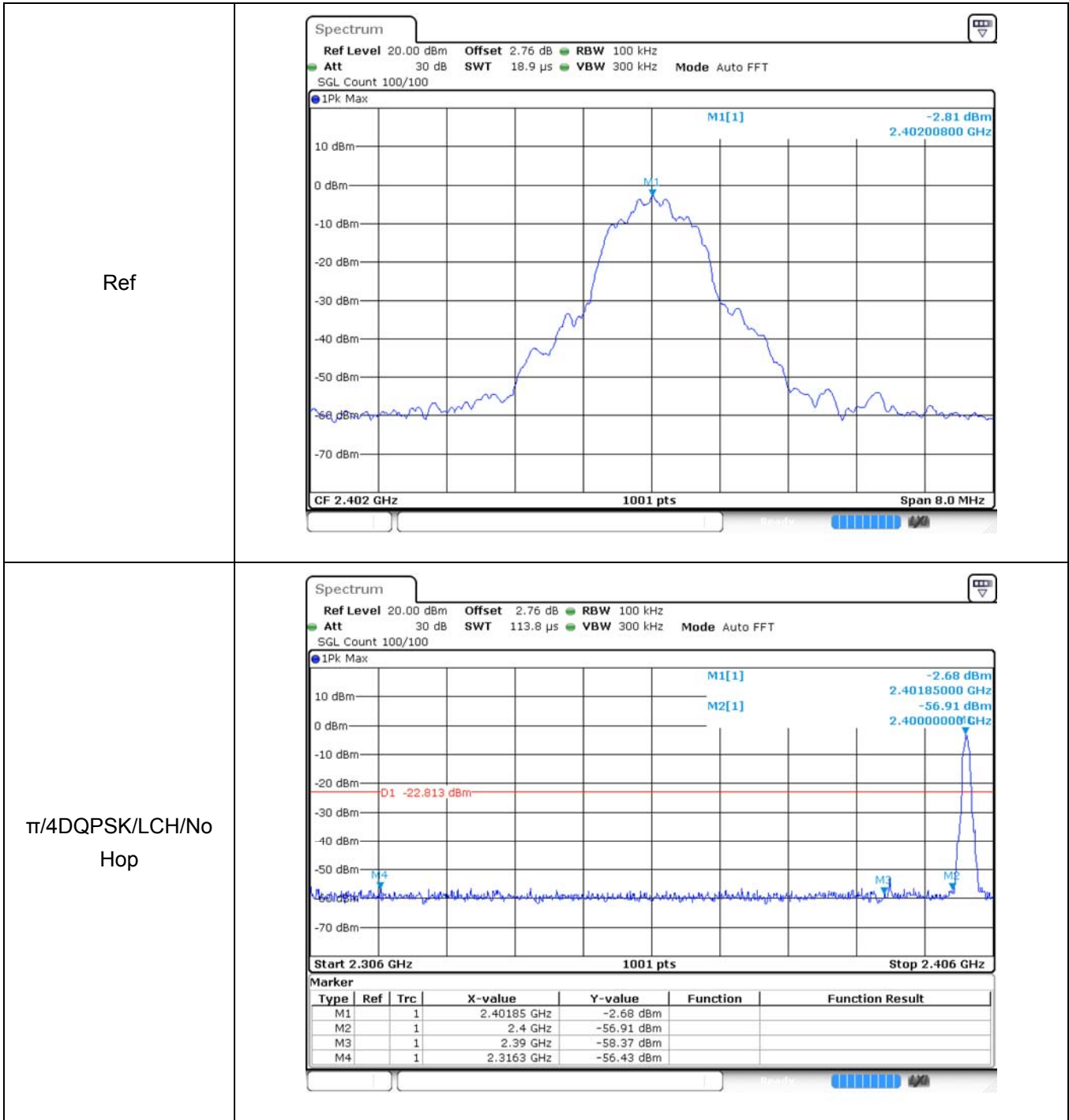


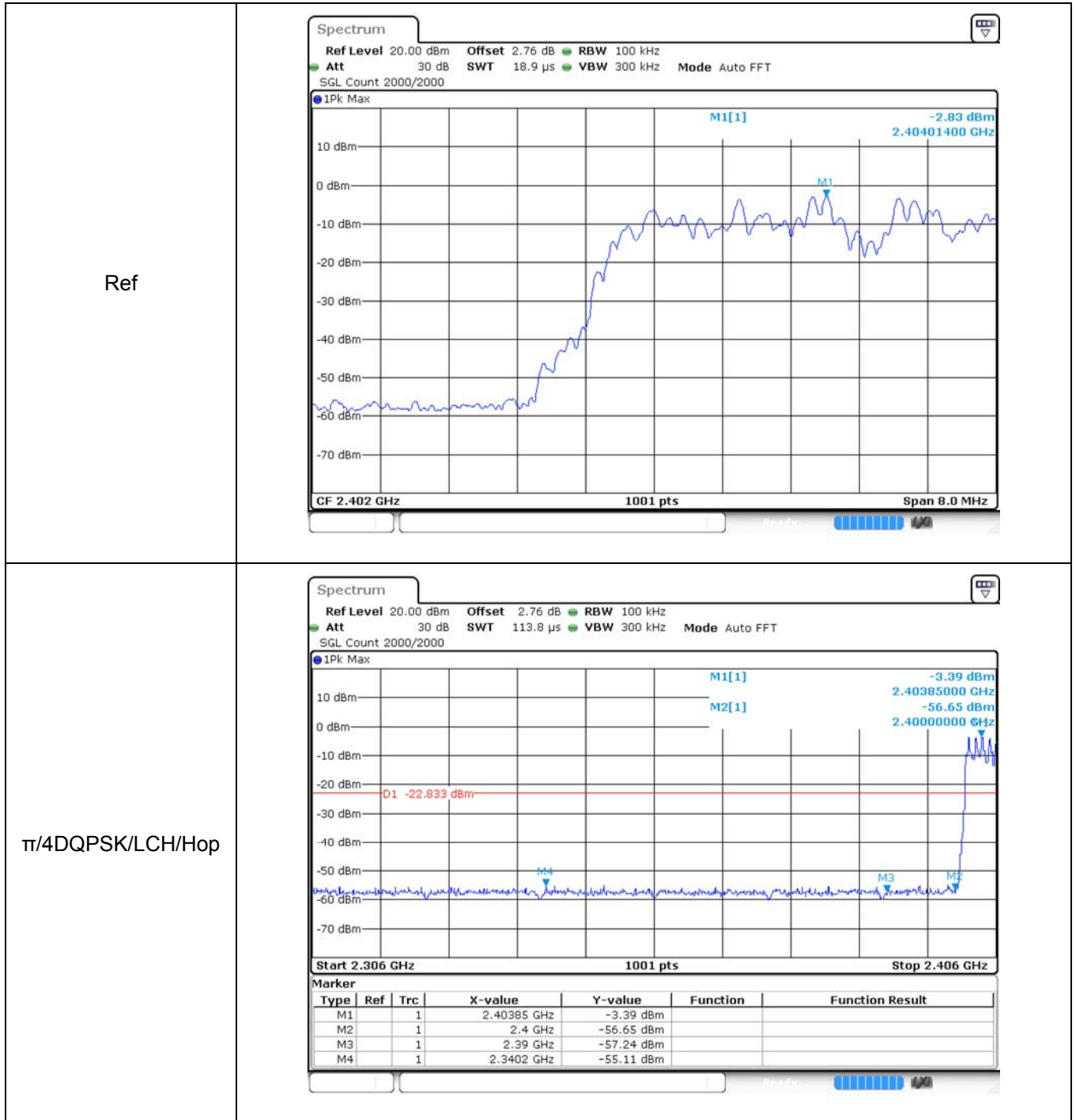
GFSK/LCH/Hop

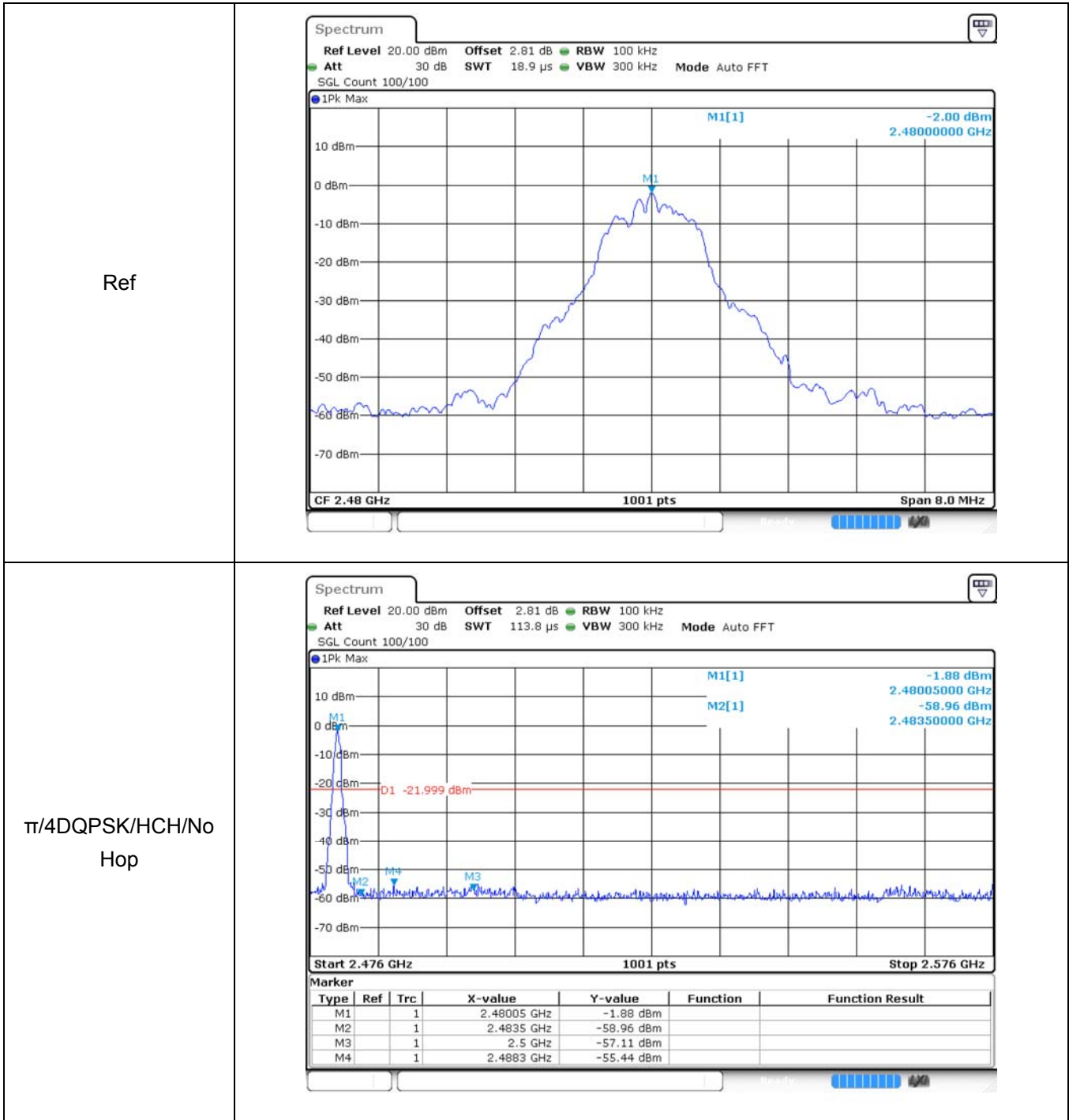




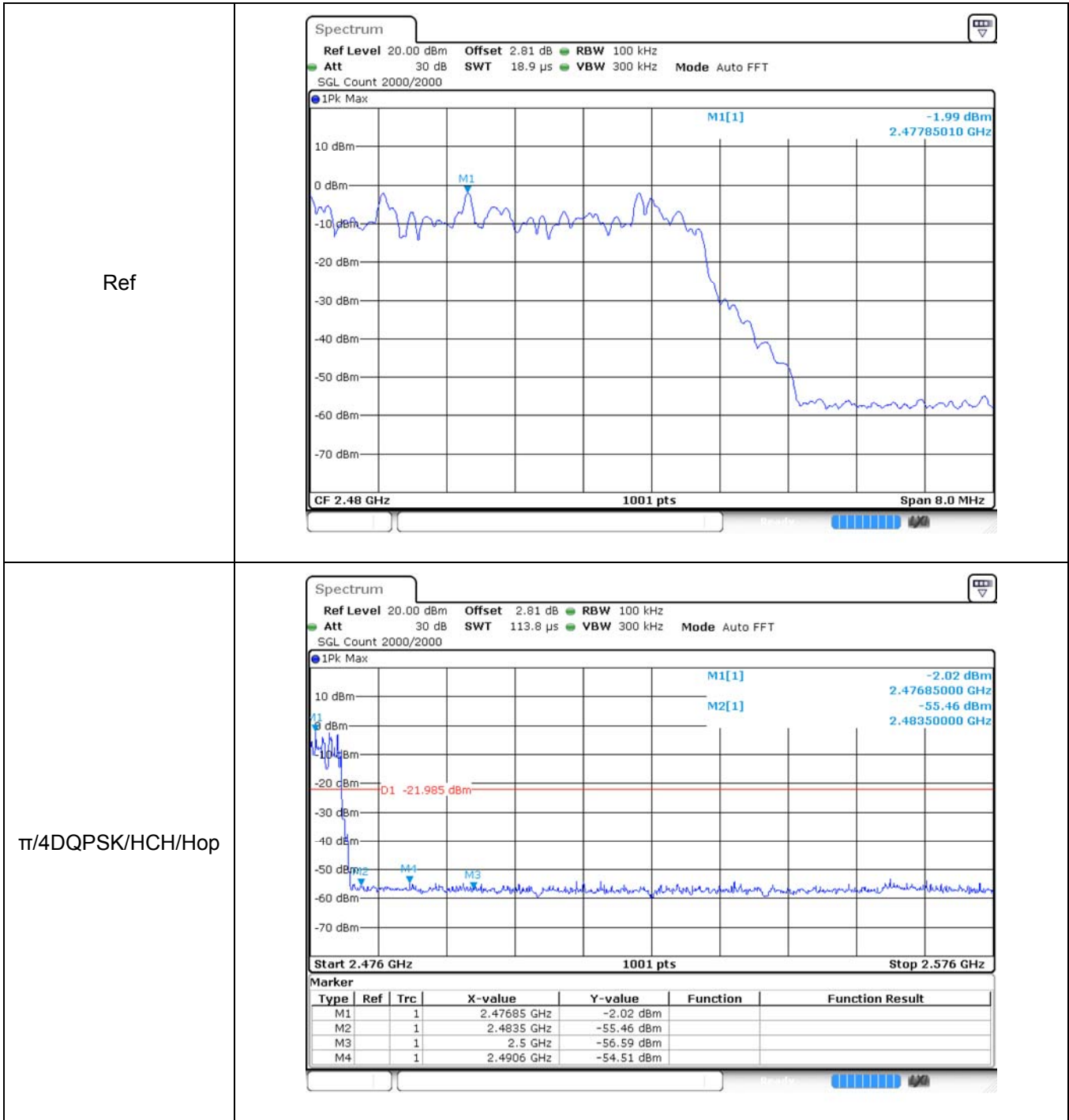


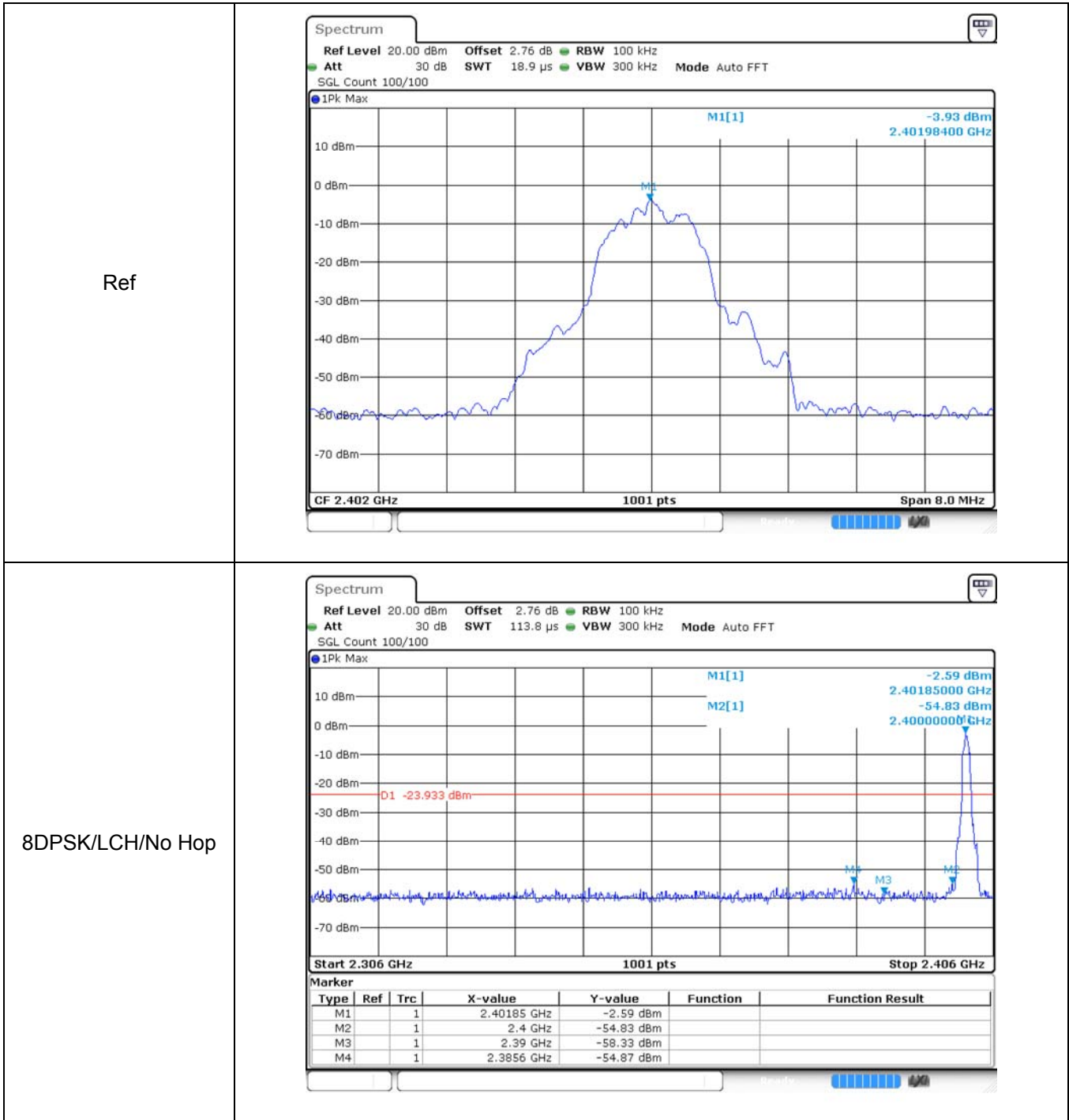


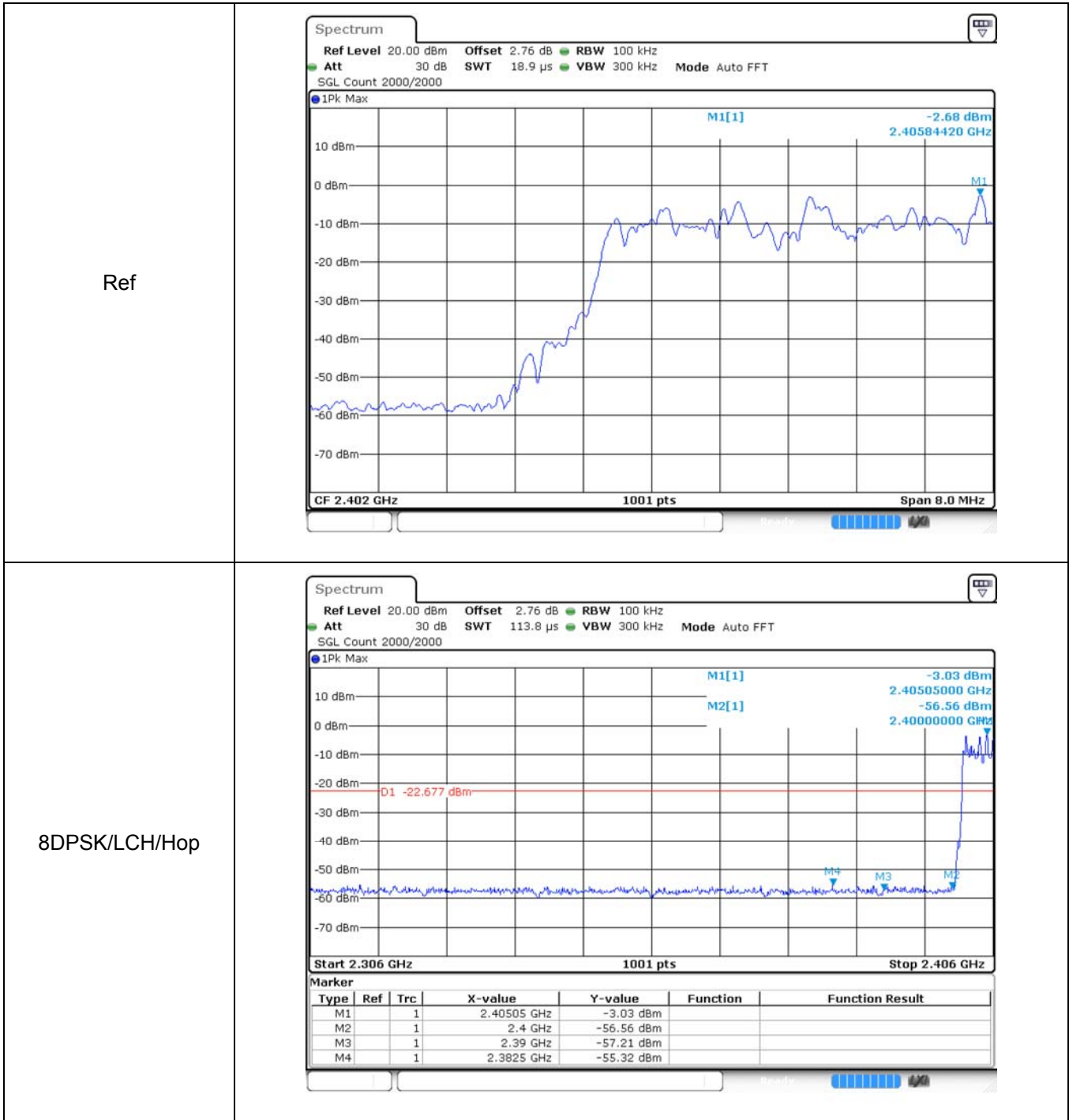


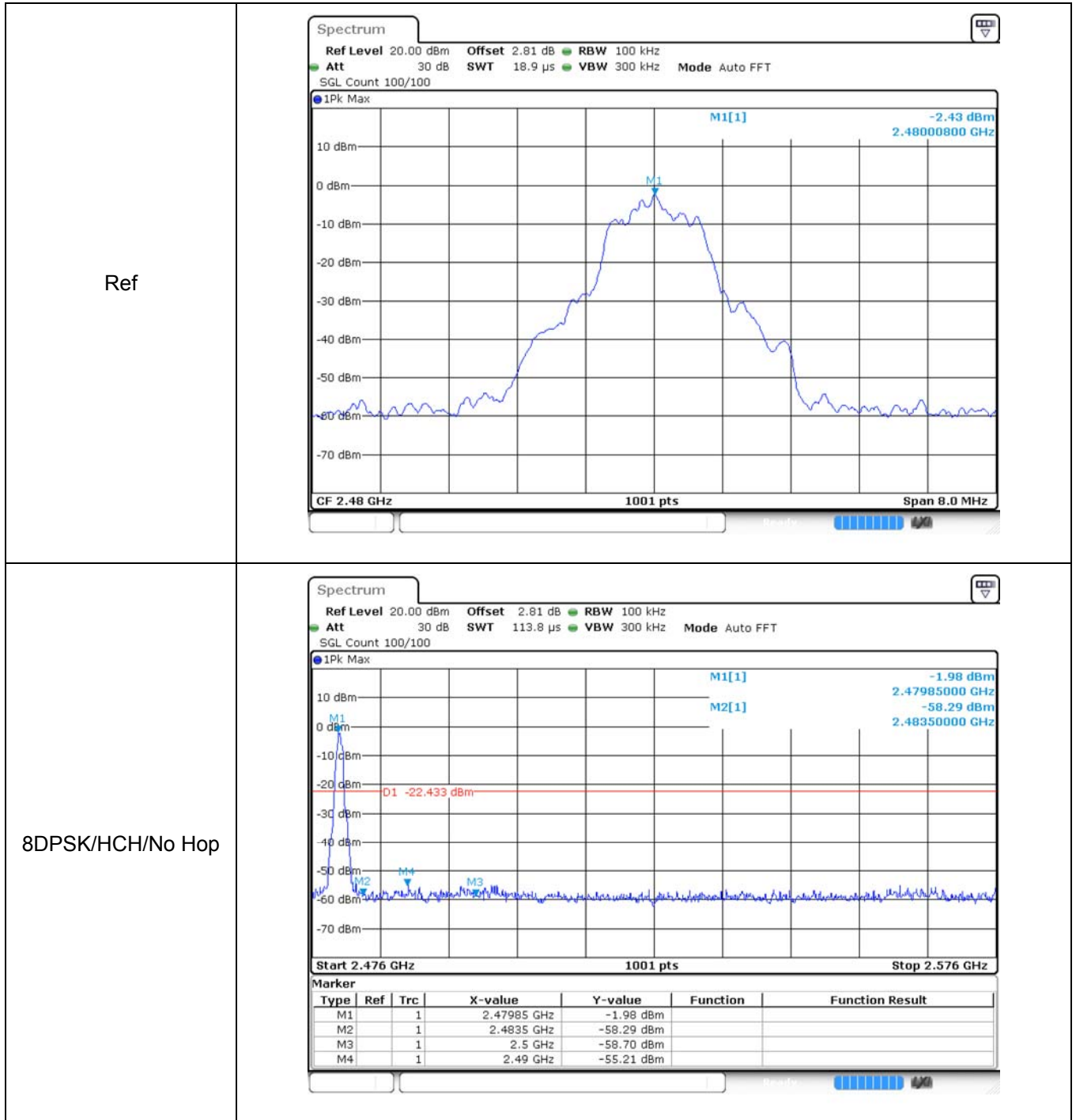


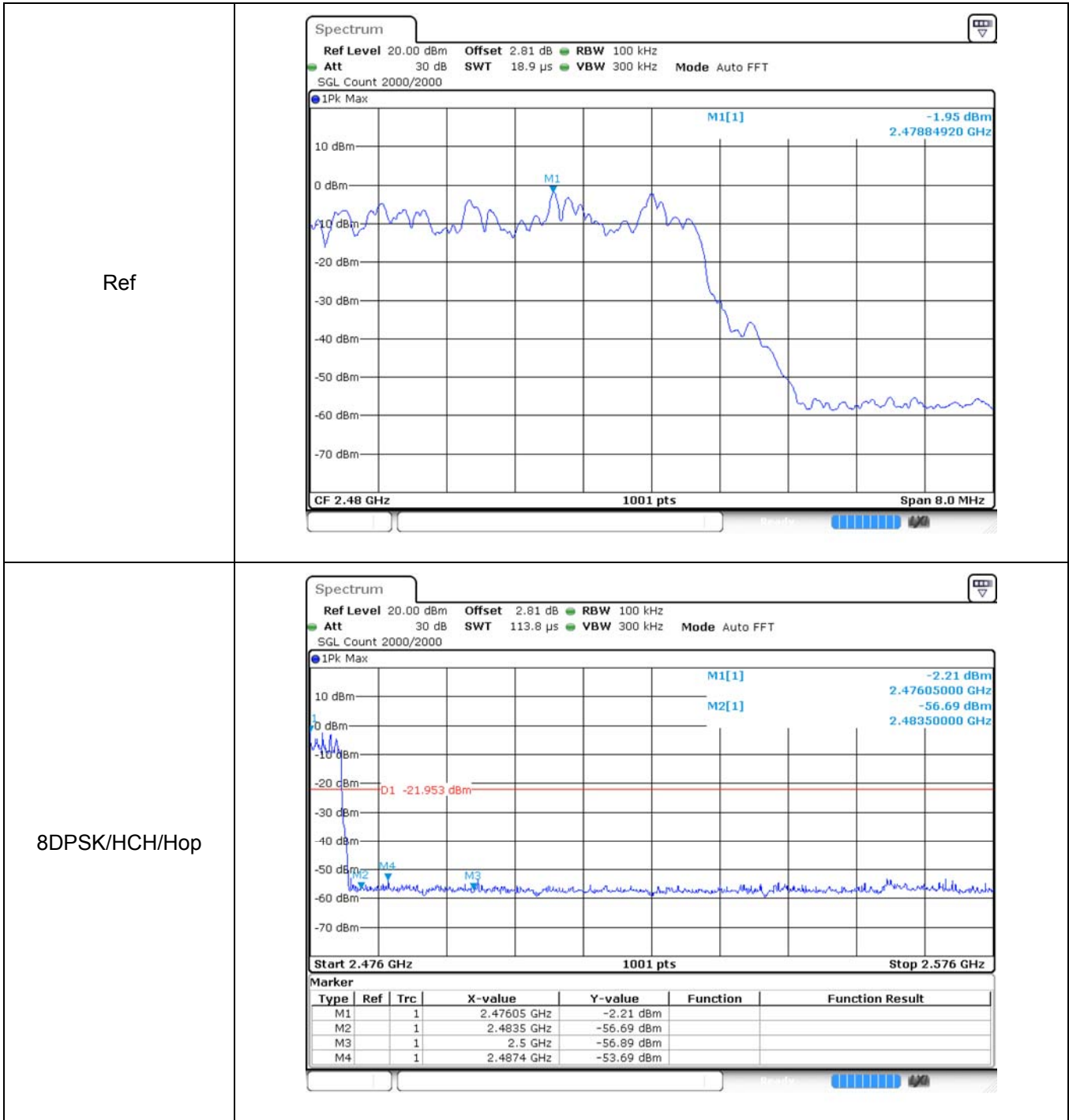












## 9 Restrict-band band-edge measurements

### 9.1 Test Result

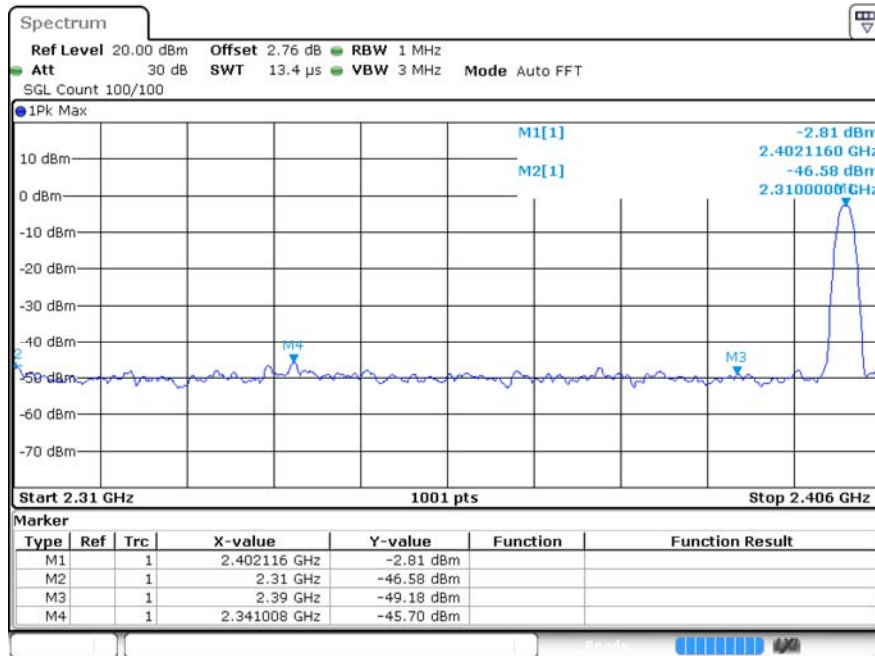
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-46.58	2	50.68	PEAK	74	Pass
	Off	2310.0	-58.35	2	38.91	AV	54	Pass
	Off	2341.008	-45.7	2	51.56	PEAK	74	Pass
	Off	2339.088	-56.67	2	40.59	AV	54	Pass
	Off	2390.0	-49.17	2	48.09	PEAK	74	Pass
	Off	2390.0	-58.14	2	39.12	AV	54	Pass
	Off	2483.5	-49	2	48.26	PEAK	74	Pass
	Off	2483.5	-57.35	2	39.91	AV	54	Pass
	Off	2499.736	-46.57	2	50.69	PEAK	74	Pass
	Off	2499.376	-56.22	2	41.04	AV	54	Pass
	Off	2500.0	-47.18	2	50.08	PEAK	74	Pass
	Off	2500.0	-56.57	2	40.69	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-50.23	2	47.03	PEAK	74	Pass
	Off	2310.0	-58.93	2	38.33	AV	54	Pass
	Off	2328.624	-46.47	2	50.79	PEAK	74	Pass
	Off	2341.584	-56.66	2	40.6	AV	54	Pass
	Off	2390.0	-48.82	2	48.44	PEAK	74	Pass
	Off	2390.0	-58.02	2	39.24	AV	54	Pass
	Off	2483.5	-50.01	2	47.25	PEAK	74	Pass
	Off	2483.5	-57.6	2	39.66	AV	54	Pass
	Off	2495.776	-46.83	2	50.43	PEAK	74	Pass
	Off	2499.76	-56.3	2	40.96	AV	54	Pass
	Off	2500.0	-48.33	2	48.93	PEAK	74	Pass
	Off	2500.0	-56.59	2	40.67	AV	54	Pass
8DPSK	Off	2310.0	-50.16	2	47.1	PEAK	74	Pass
	Off	2310.0	-58.51	2	38.75	AV	54	Pass
	Off	2338.512	-47.47	2	49.79	PEAK	74	Pass
	Off	2345.232	-56.77	2	40.49	AV	54	Pass



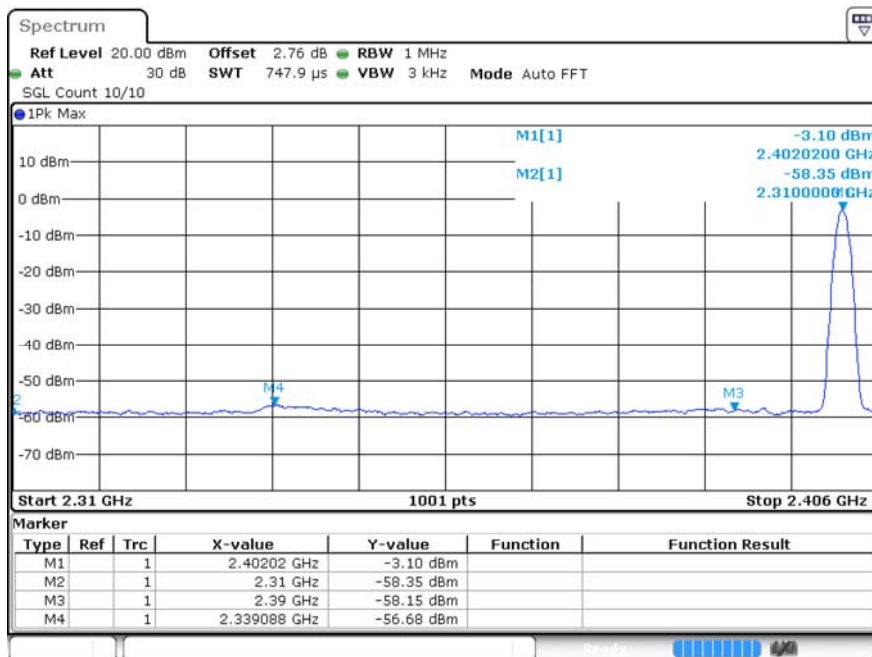
Off	2390.0	-49.79	2	47.47	PEAK	74	Pass
Off	2390.0	-58.31	2	38.95	AV	54	Pass
Off	2483.5	-48.9	2	48.36	PEAK	74	Pass
Off	2483.5	-58.19	2	39.07	AV	54	Pass
Off	2496.28	-45.66	2	51.6	PEAK	74	Pass
Off	2500	-56.32	2	40.94	AV	54	Pass
Off	2500.0	-48.97	2	48.29	PEAK	74	Pass
Off	2500.0	-56.32	2	40.94	AV	54	Pass

## 9.2 Test Graphs

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

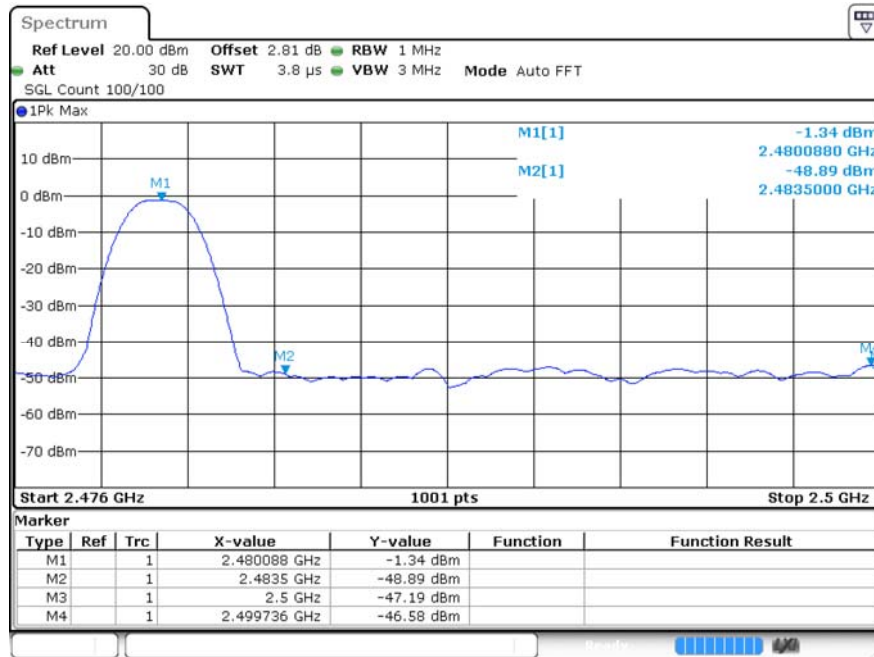


Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (Low Channel)

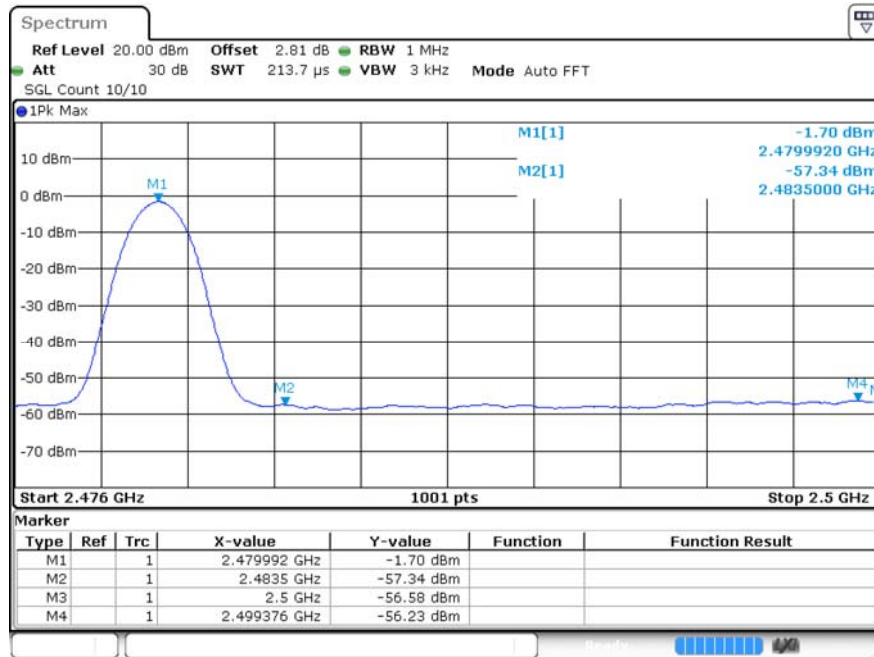




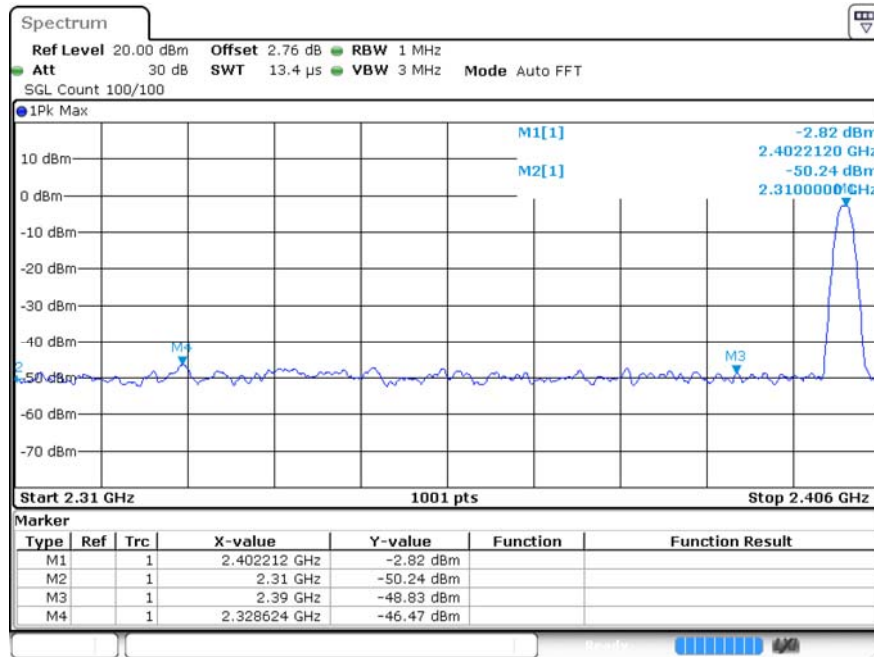
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



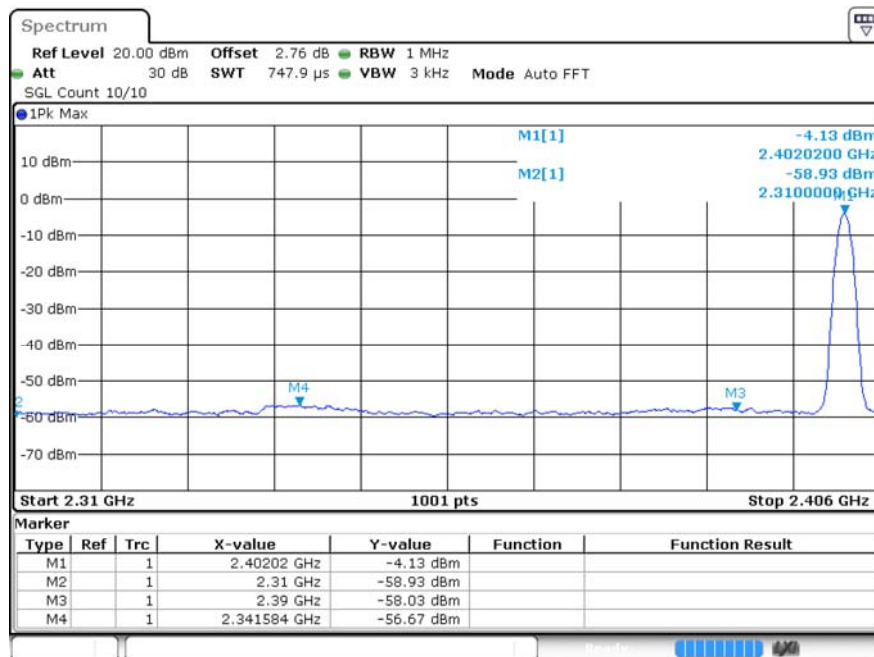
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



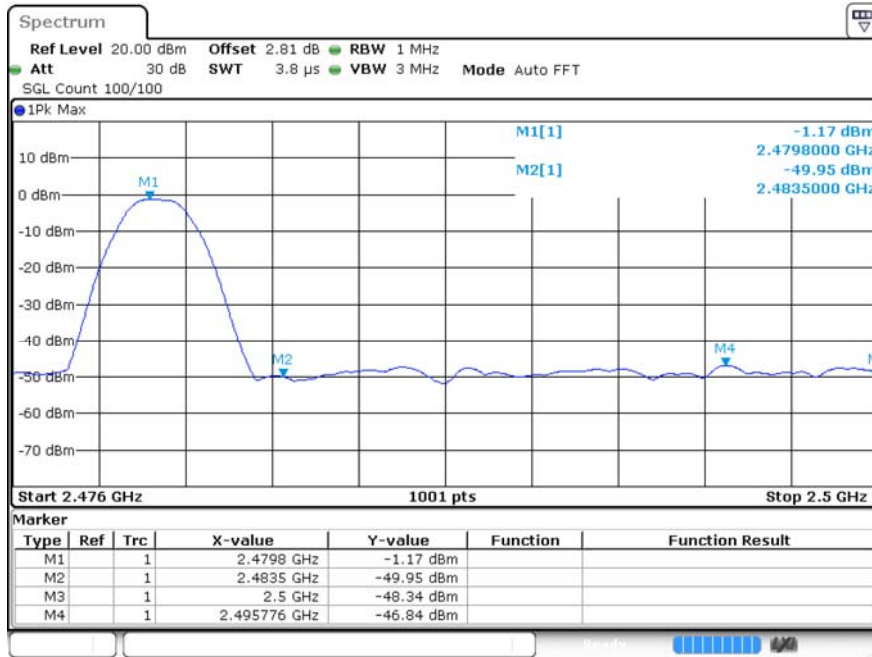
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (Low Channel)



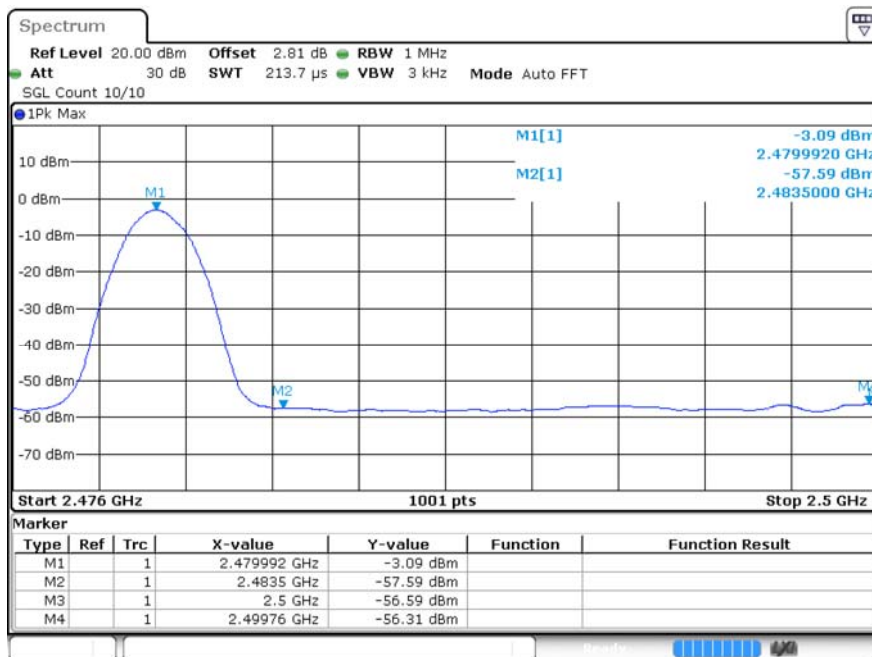
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (Low Channel)



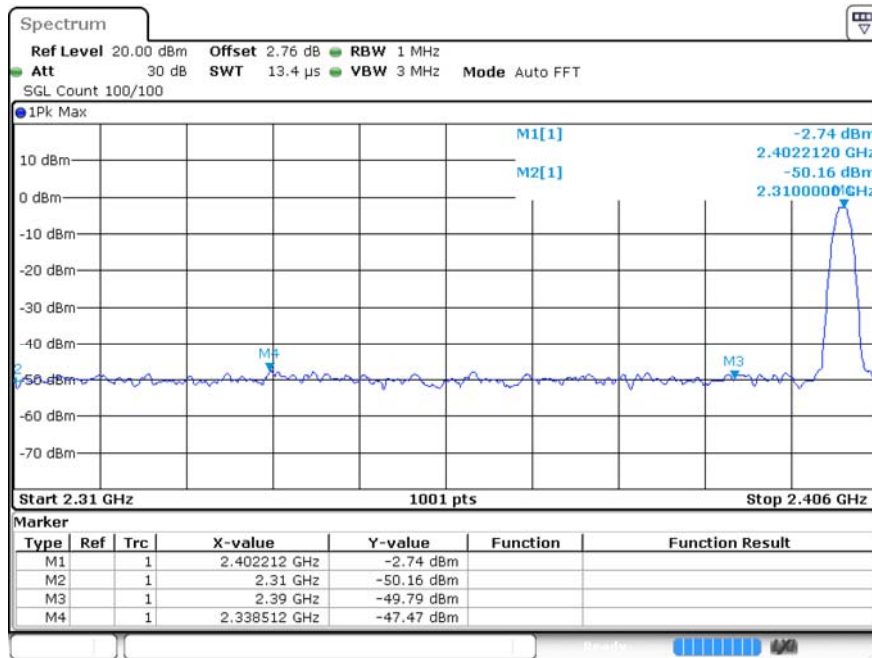
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



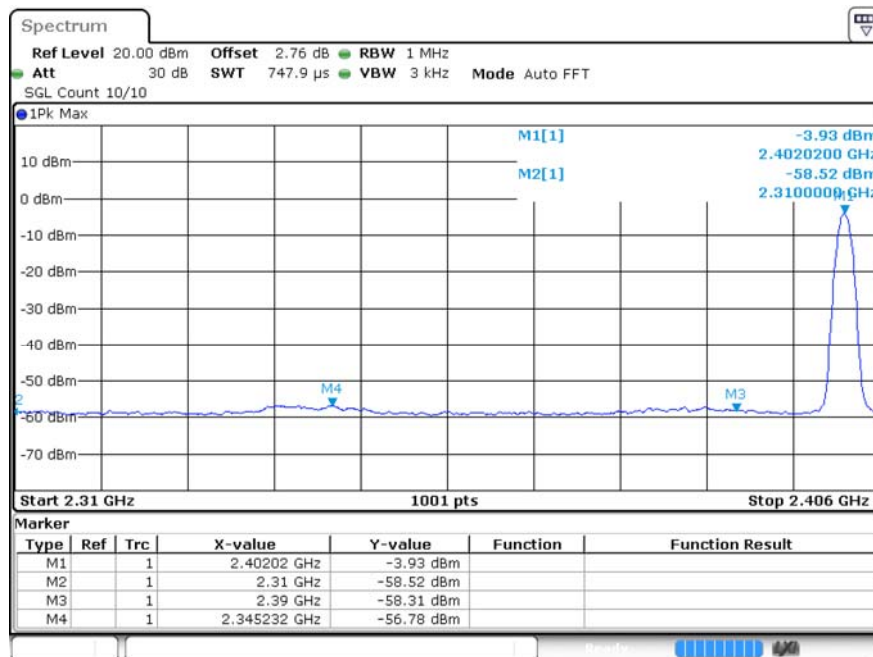
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



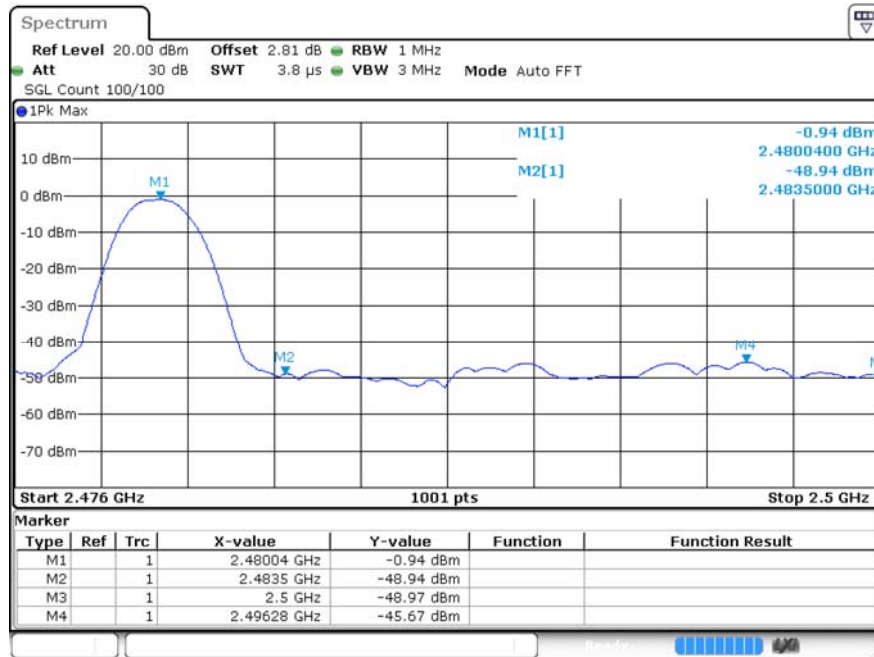
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



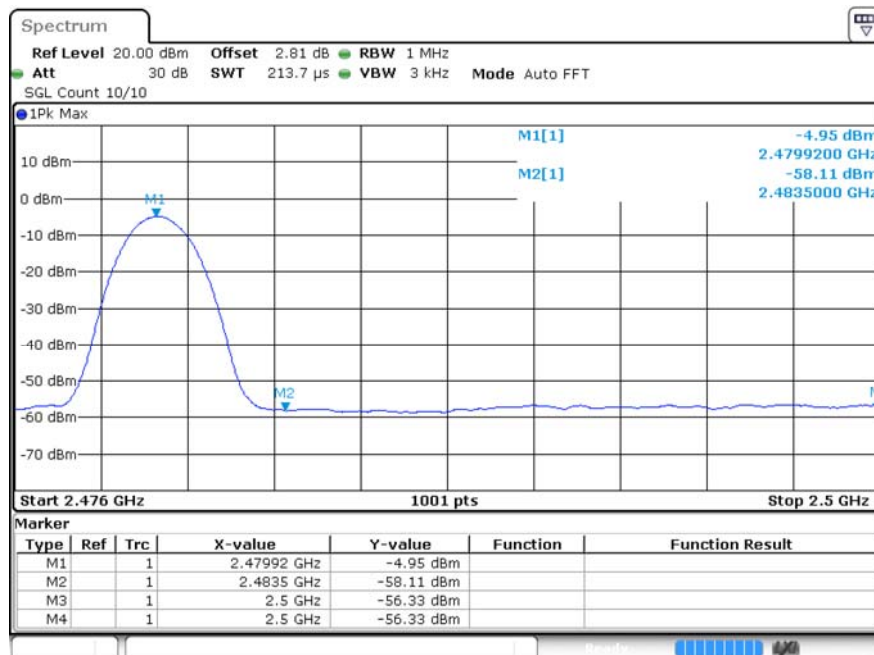
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (Low Channel)



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



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



---The End---