



Appendix A

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

Product Name: TYPHOON BLUETOOTH SPEAKER

Trade Mark: N/A

Test Model: TYPH-BS-C3

Environmental Conditions

Temperature:	25.9℃
Relative Humidity:	52.1%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



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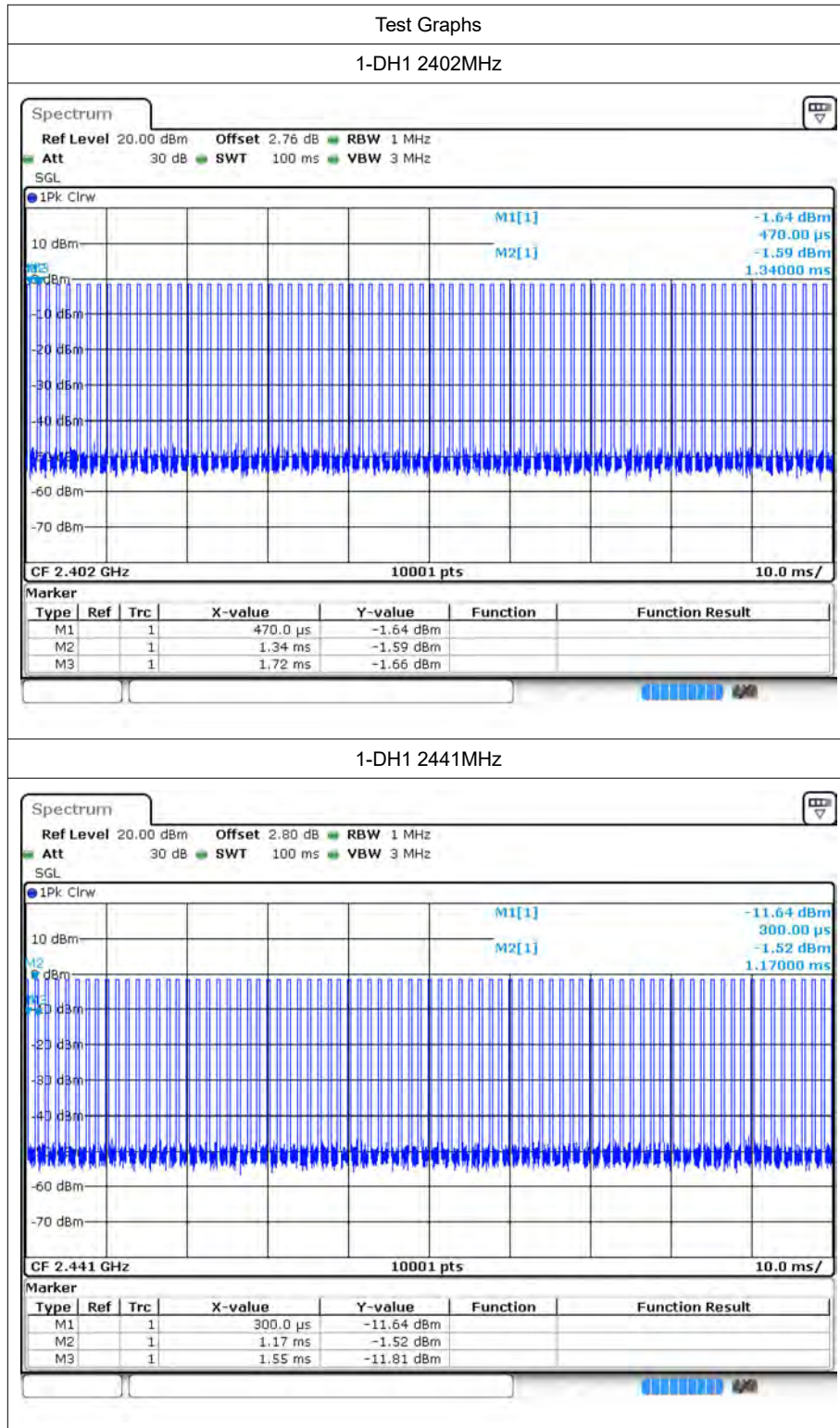
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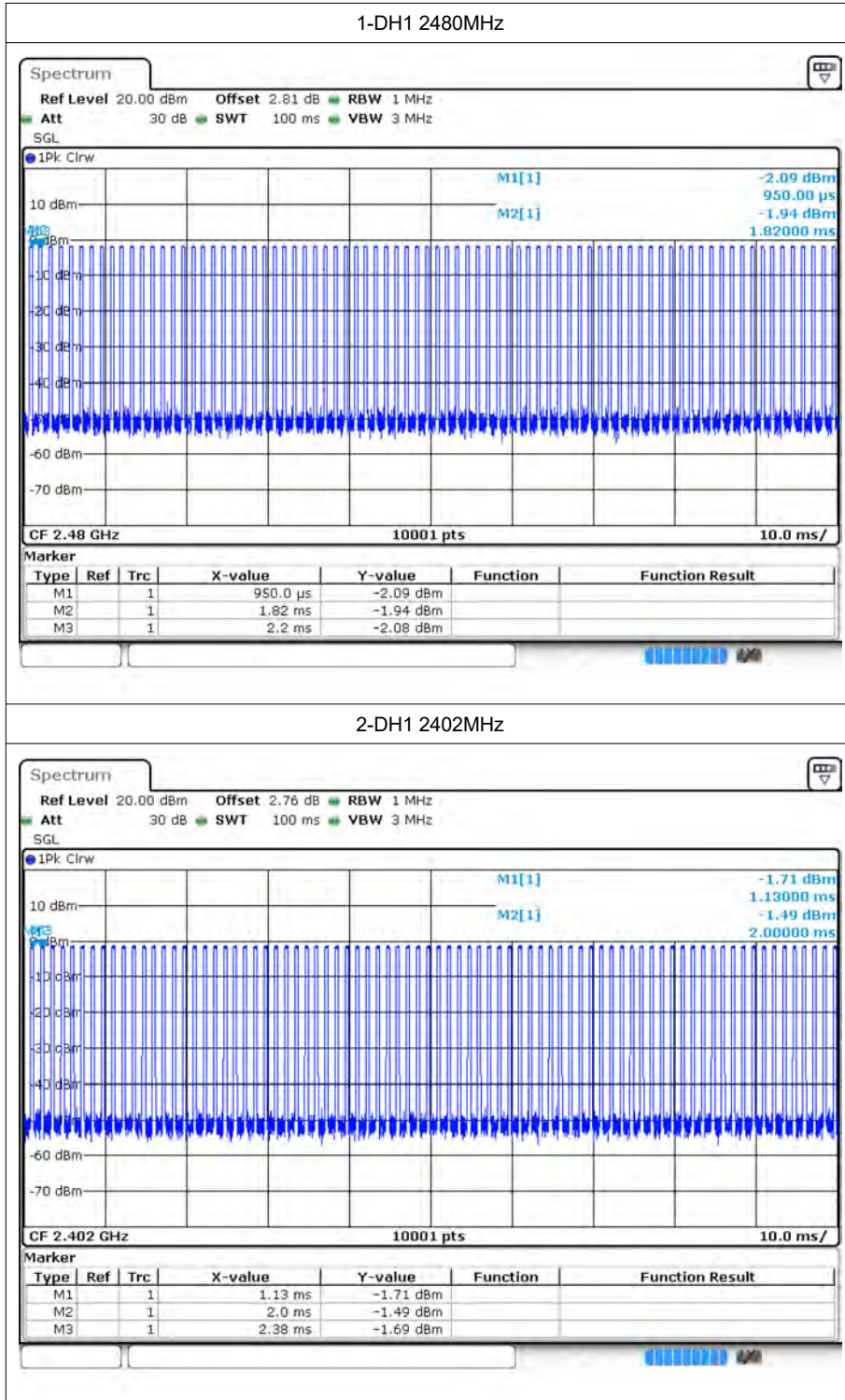
1 Duty Cycle

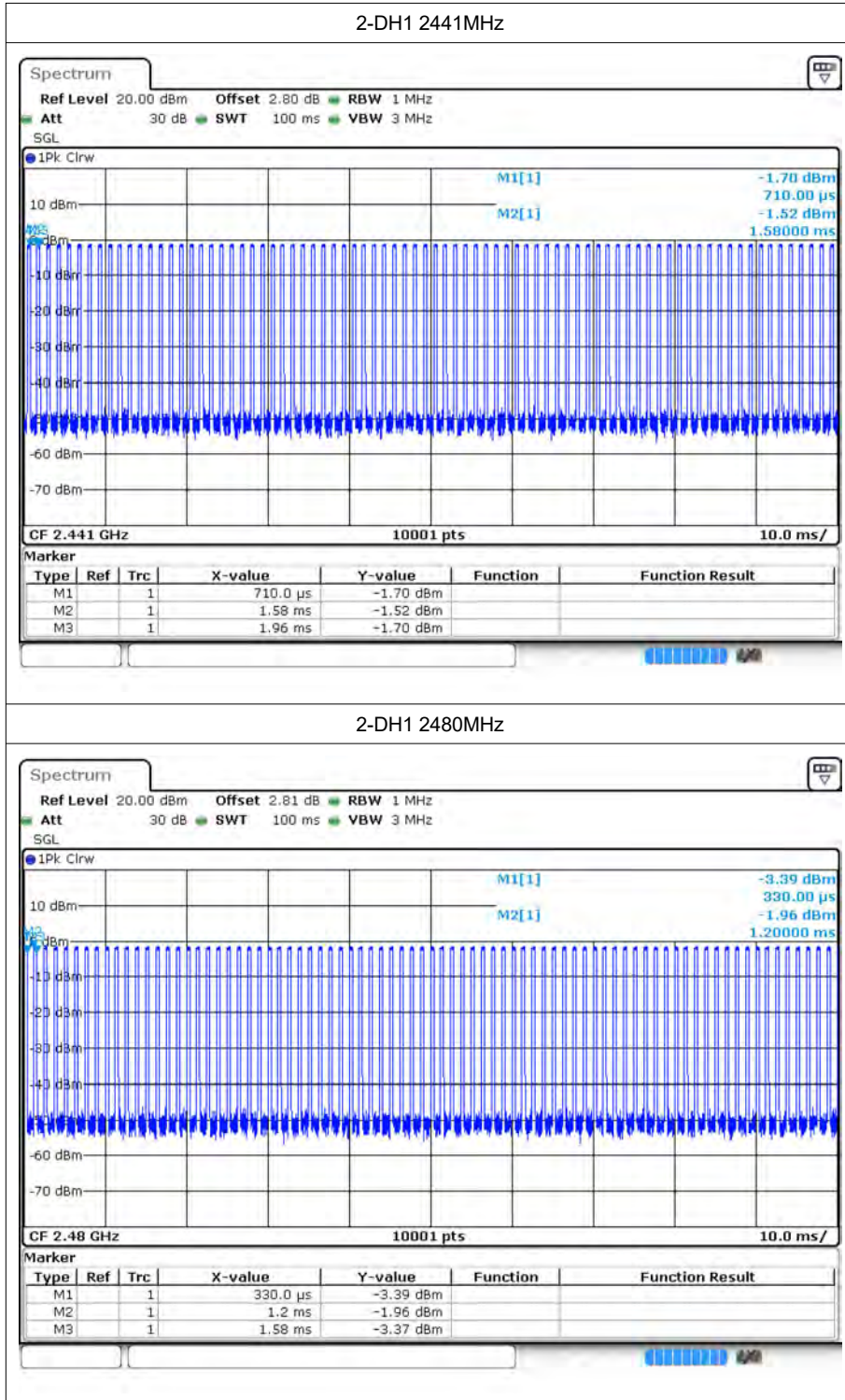
1.1 Test Result

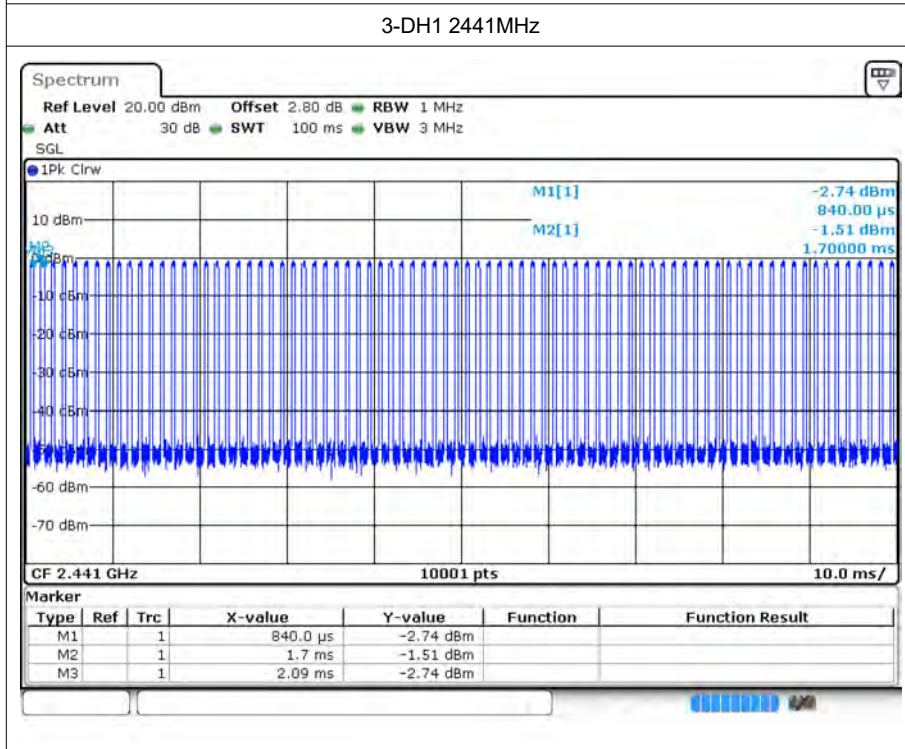
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.2	2.63
1-DH1	2441	30.96	2.63
1-DH1	2480	31.2	2.63
2-DH1	2402	31.2	2.63
2-DH1	2441	31.2	2.63
2-DH1	2480	31.71	2.63
3-DH1	2402	31.98	2.56
3-DH1	2441	32	2.56
3-DH1	2480	31.2	2.63

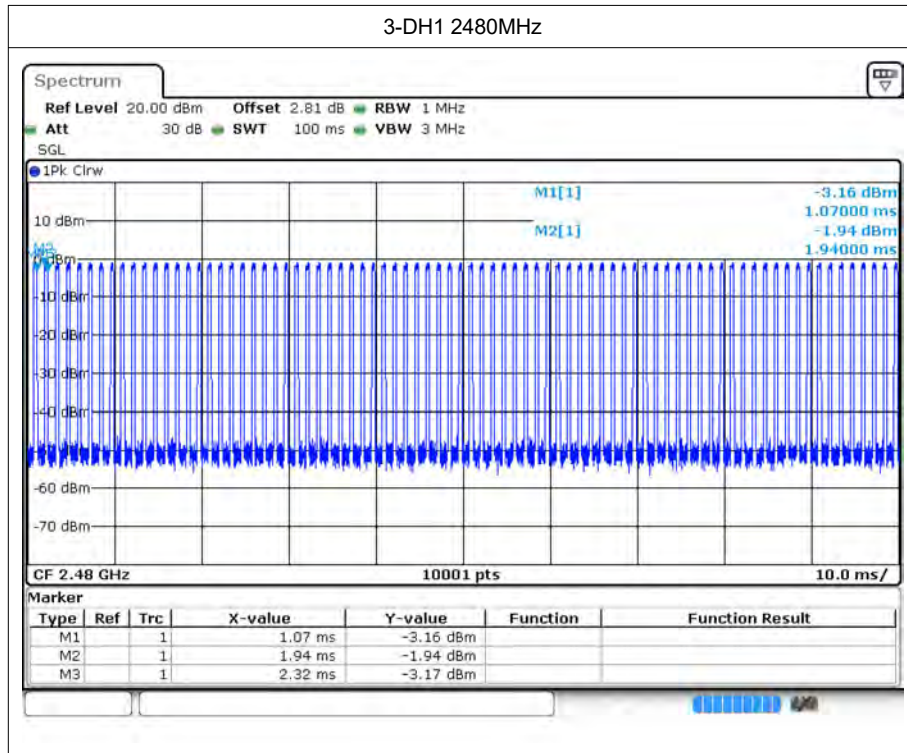
1.2 Test Graphs









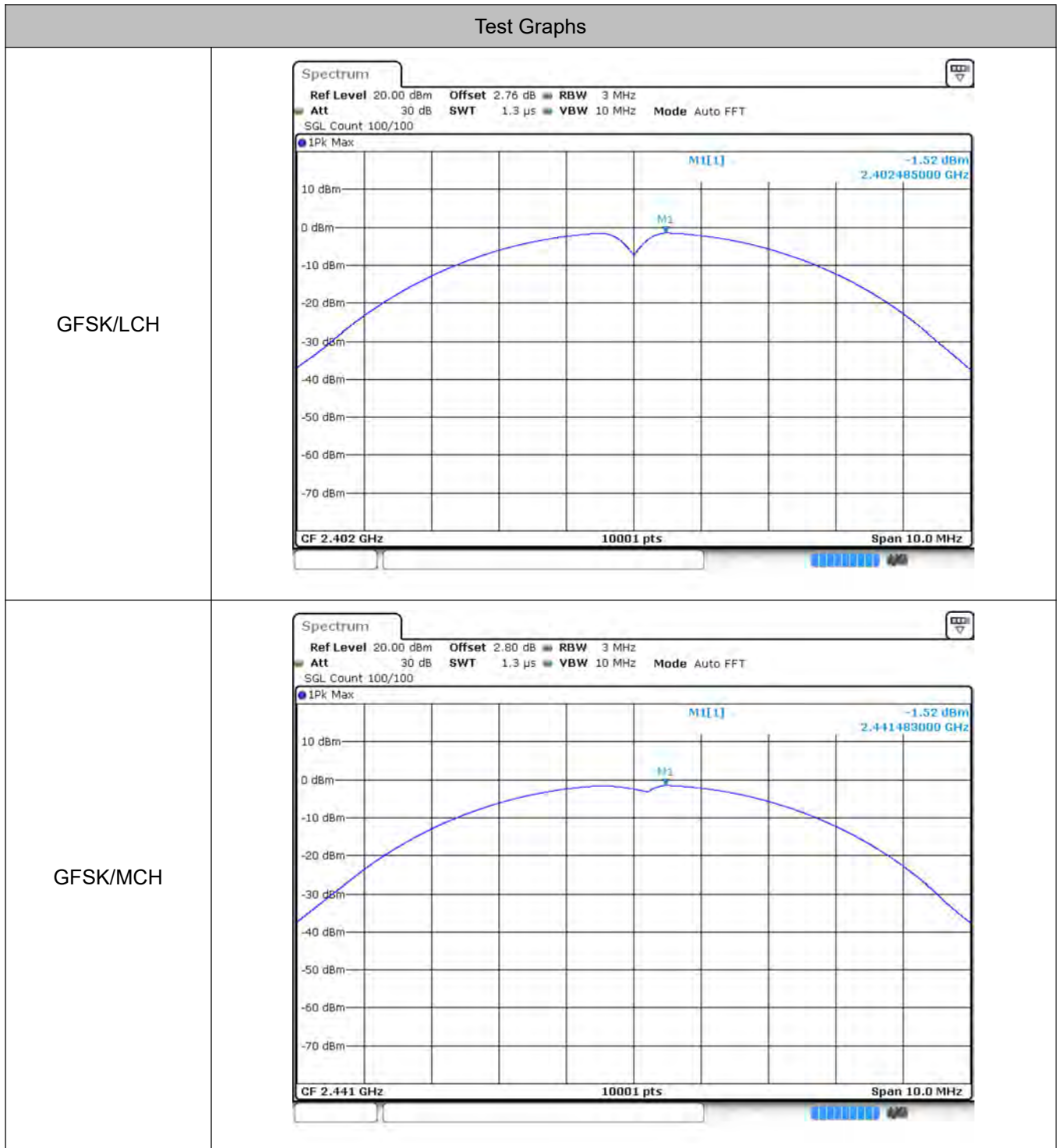


2 Maximum Conducted Peak Output Power

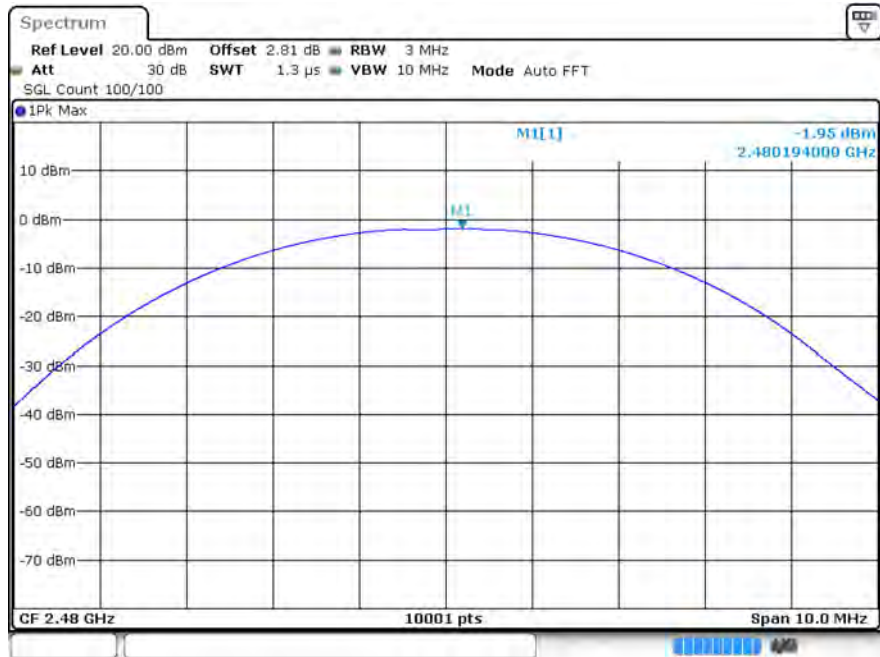
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.52	21	Pass
	MCH	-1.52	21	Pass
	HCH	-1.95	21	Pass
$\pi/4$ DQPSK	LCH	-0.82	21	Pass
	MCH	-1	21	Pass
	HCH	-1.55	21	Pass
8DPSK	LCH	-0.93	21	Pass
	MCH	-1.18	21	Pass
	HCH	-1.48	21	Pass

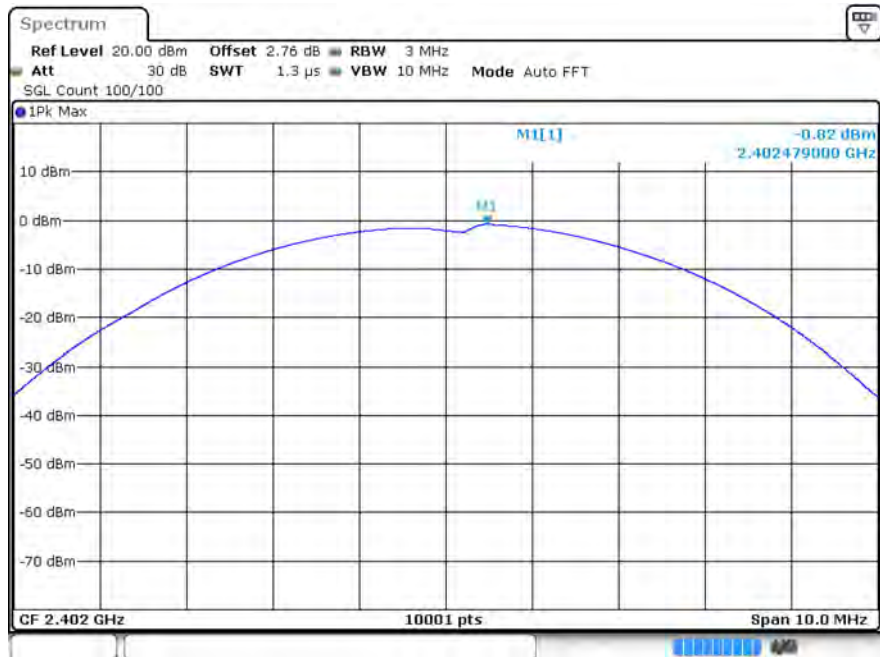
2.2 Test Graphs


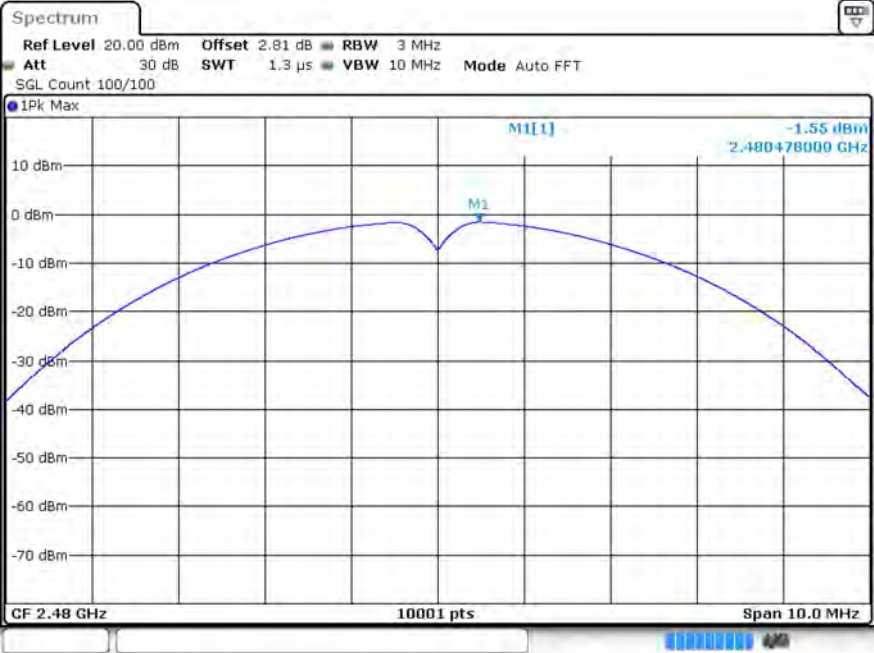


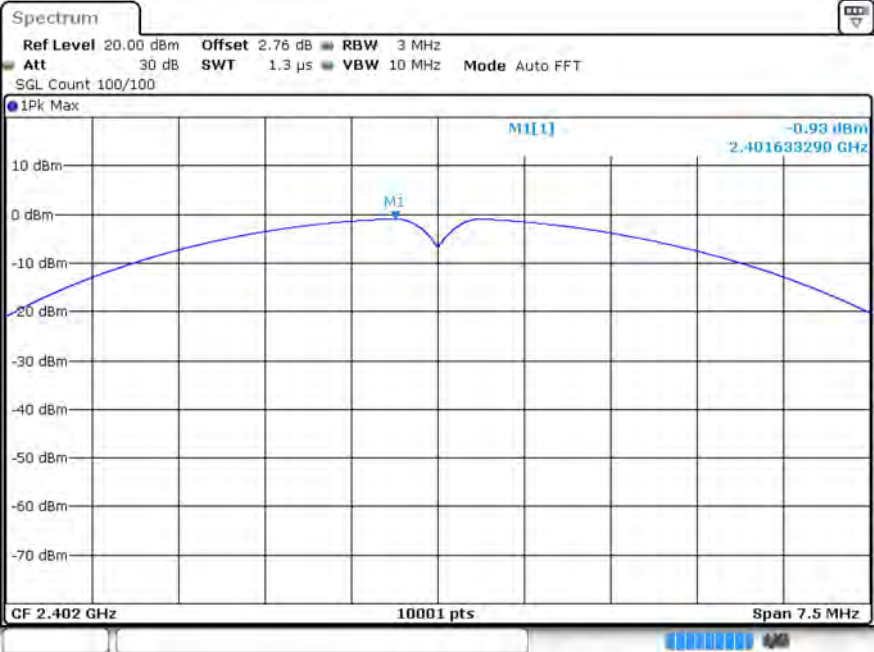

GFSK/HCH



$\pi/4$ DQPSK/LCH



<p>$\pi/4$DQPSK/MCH</p>	 <p>Spectrum Ref Level 20.00 dBm Offset 2.80 dB RBW 3 MHz Att 30 dB SWT 1.3 μs VBW 10 MHz Mode Auto FFT SGL Count 100/100 1Pk Max -1.00 dBm 2.440520000 GHz CF 2.441 GHz 10001 pts Span 10.0 MHz</p>
<p>$\pi/4$DQPSK/HCH</p>	 <p>Spectrum Ref Level 20.00 dBm Offset 2.81 dB RBW 3 MHz Att 30 dB SWT 1.3 μs VBW 10 MHz Mode Auto FFT SGL Count 100/100 1Pk Max -1.55 dBm 2.480478000 GHz CF 2.48 GHz 10001 pts Span 10.0 MHz</p>

<p>8DPSK/LCH</p>	
<p>8DPSK/MCH</p>	

8DPSK/HCH

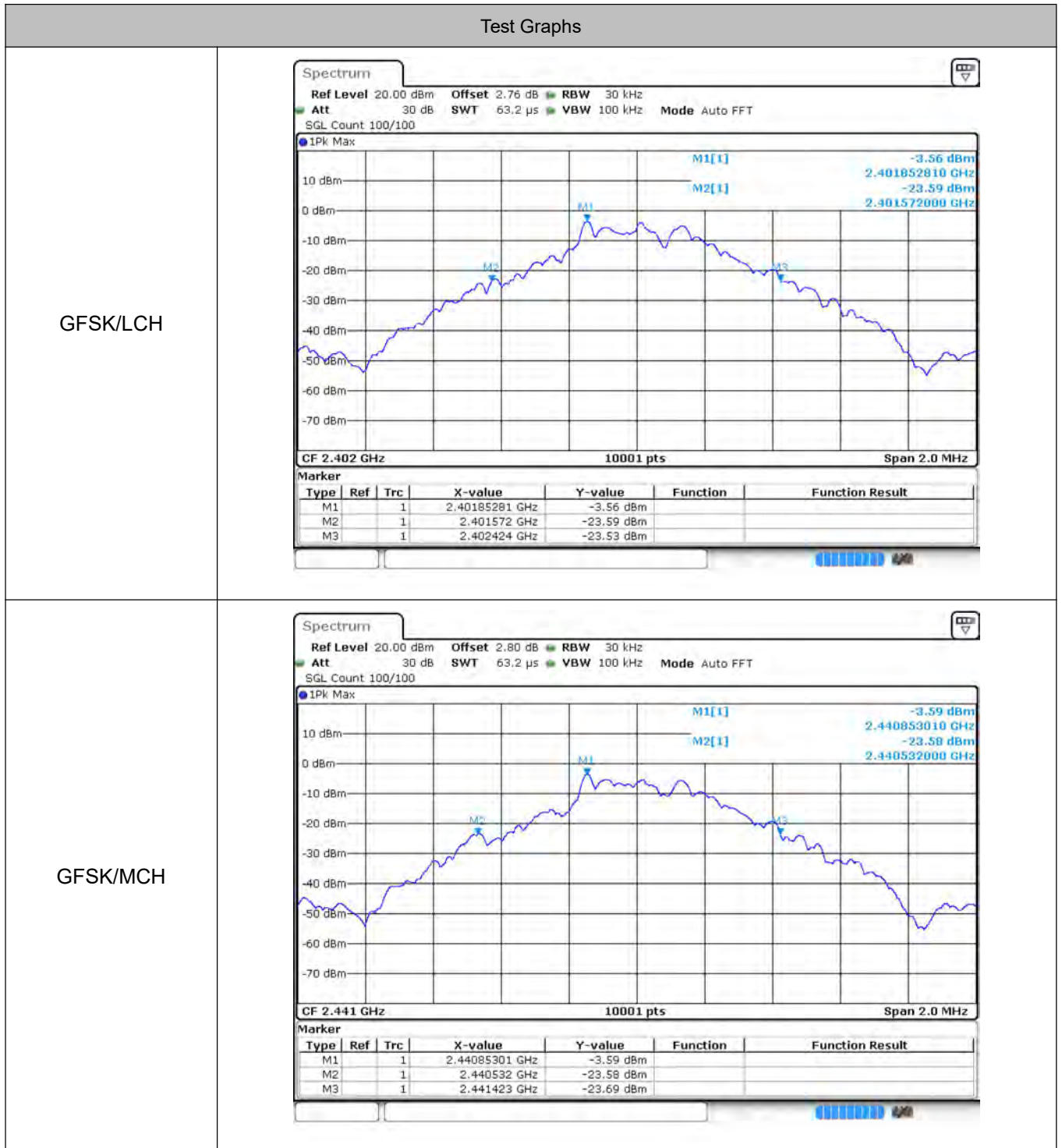


3 20dB Bandwidth

3.1 Test Result

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.852	Not Specified	Pass
	MCH	0.89	Not Specified	Pass
	HCH	0.979	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.207	Not Specified	Pass
	MCH	1.219	Not Specified	Pass
	HCH	1.258	Not Specified	Pass
8DPSK	LCH	1.202	Not Specified	Pass
	MCH	1.25	Not Specified	Pass
	HCH	1.216	Not Specified	Pass

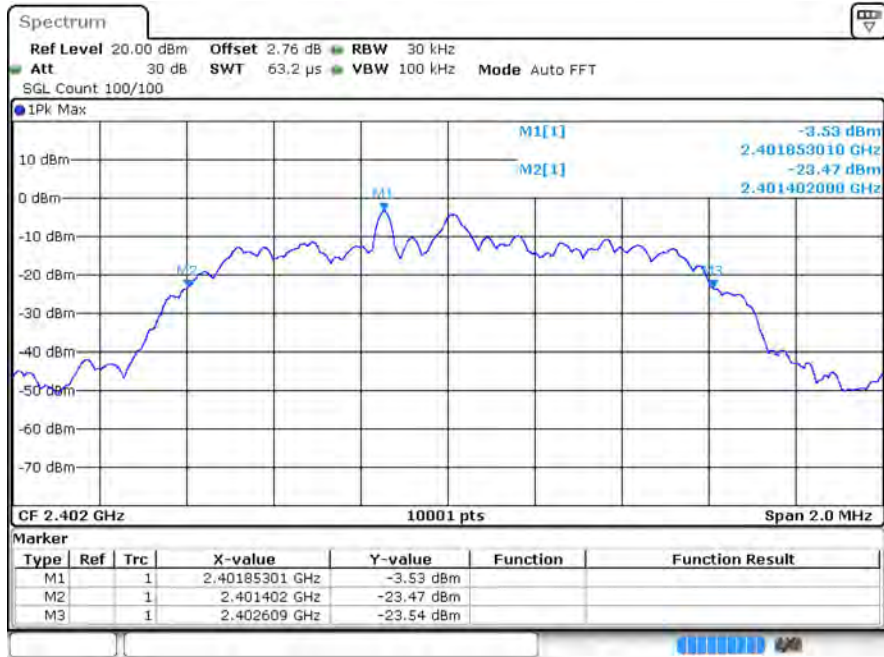
3.2 Test Graphs



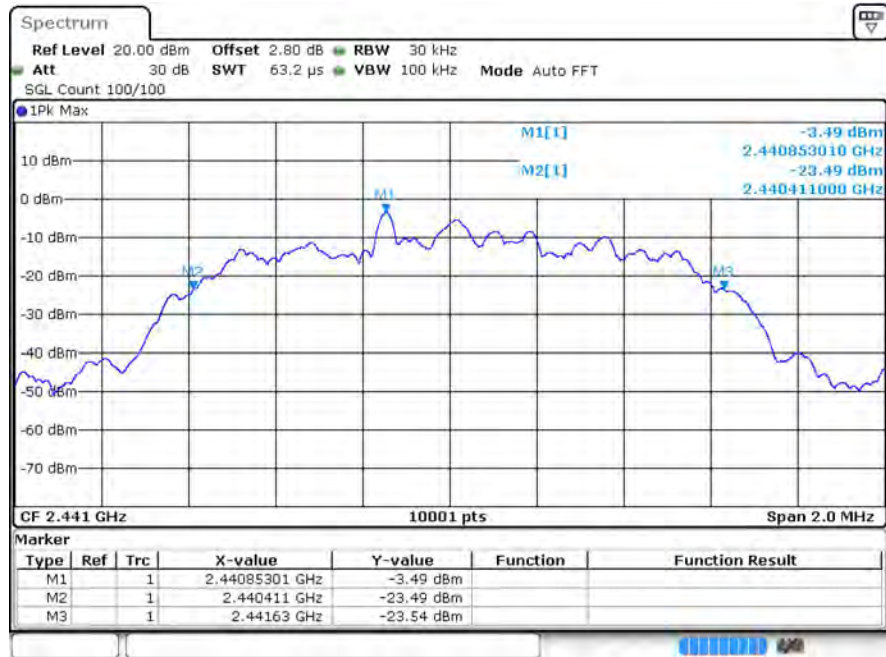
GFSK/HCH



$\pi/4$ DQPSK/LCH



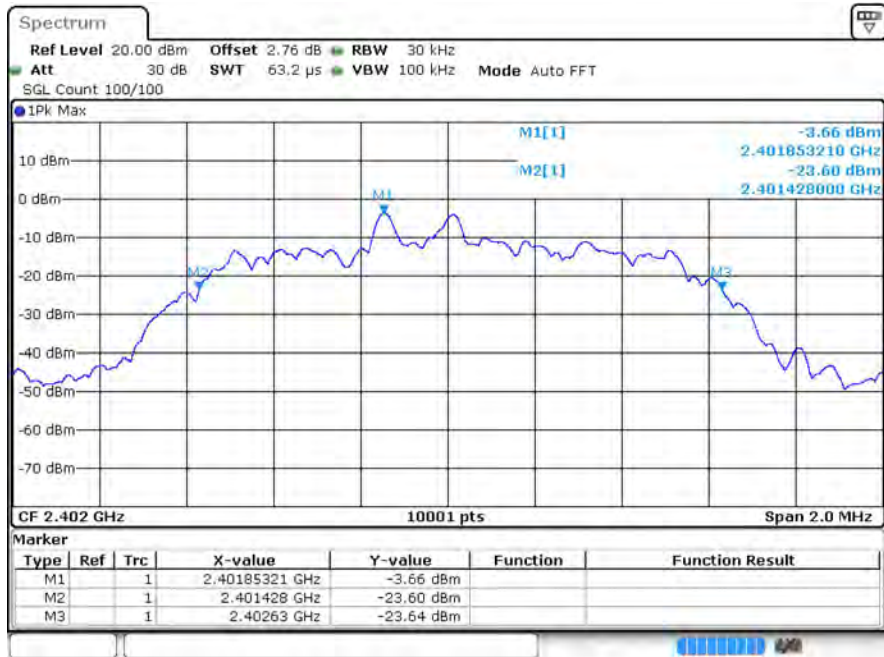
$\pi/4$ DQPSK/MCH



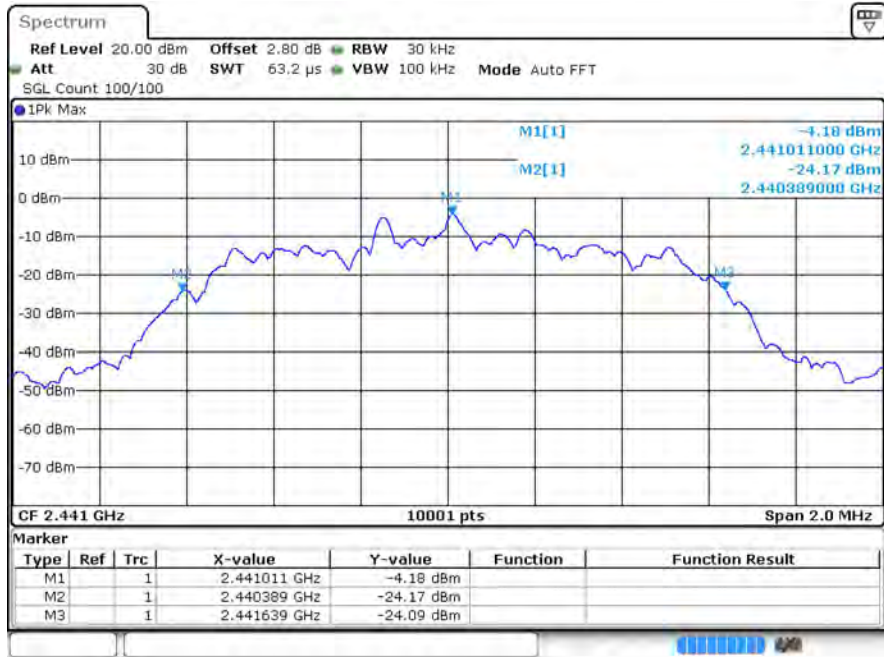
$\pi/4$ DQPSK/HCH



8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

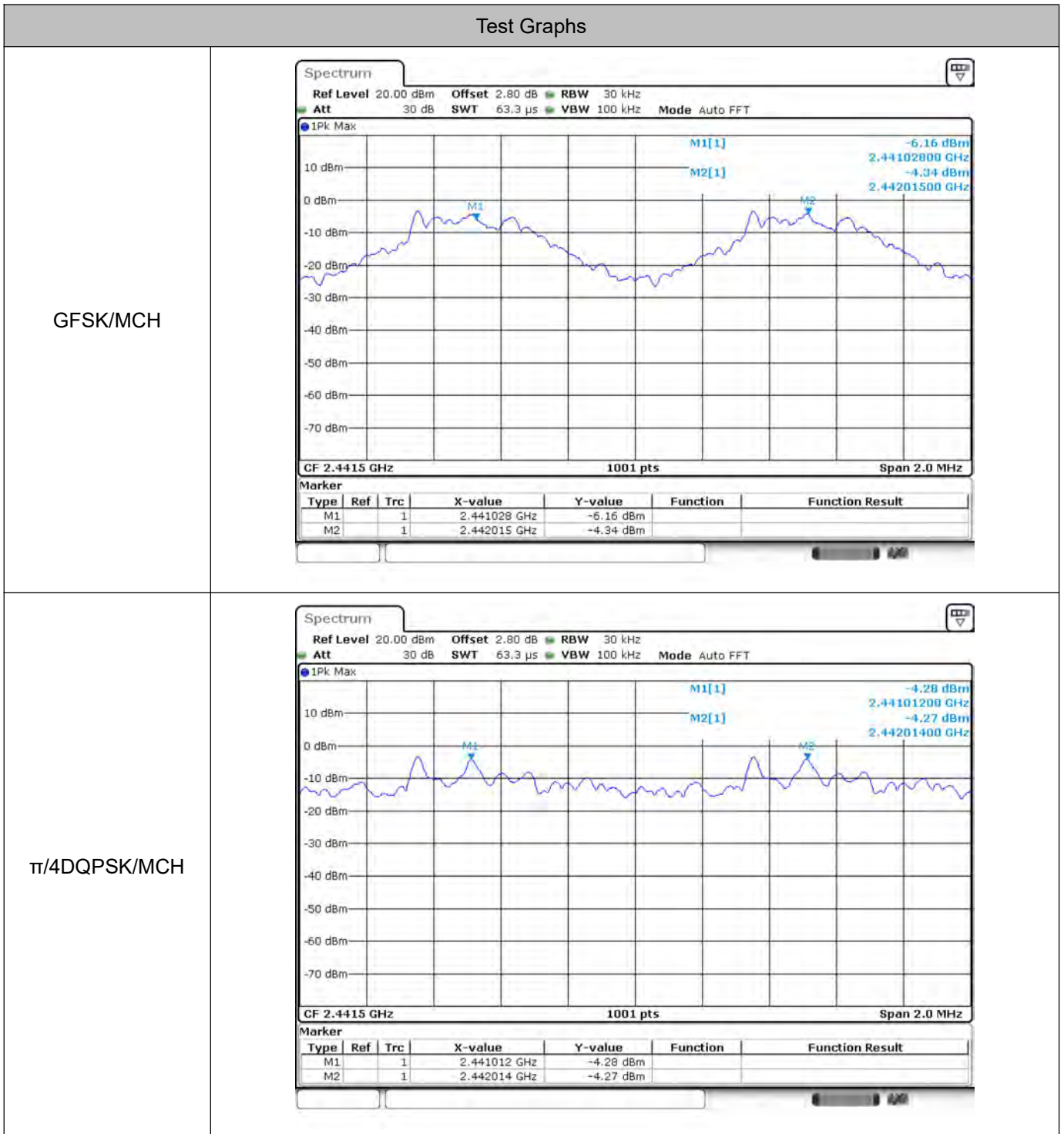


4 Carrier Frequency Separation

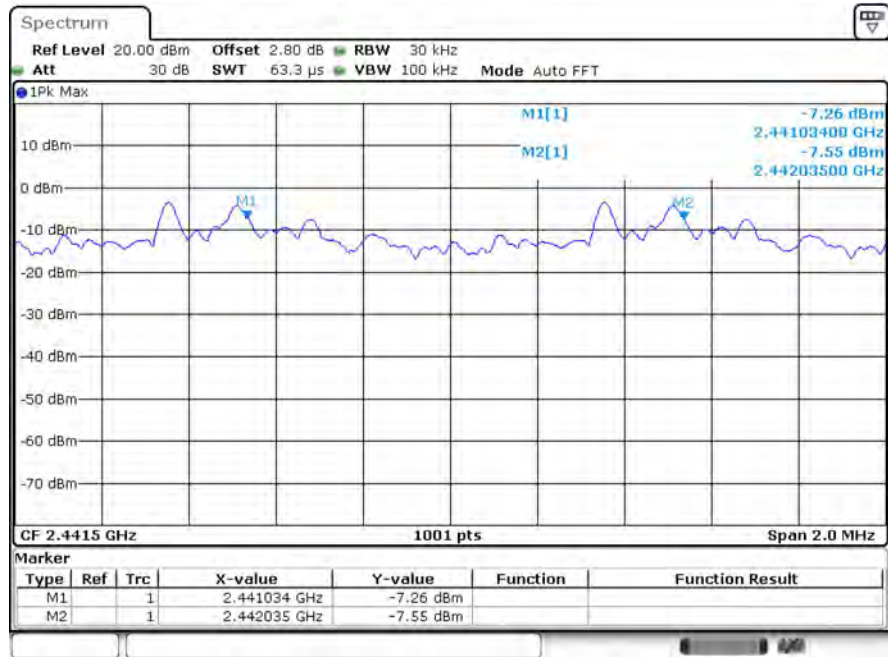
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	0.987	0.593	Pass
$\pi/4$ DQPSK	MCH	1.002	0.813	Pass
8DPSK	MCH	1.001	0.833	Pass

4.2 Test Graphs



8DPSK/MCH

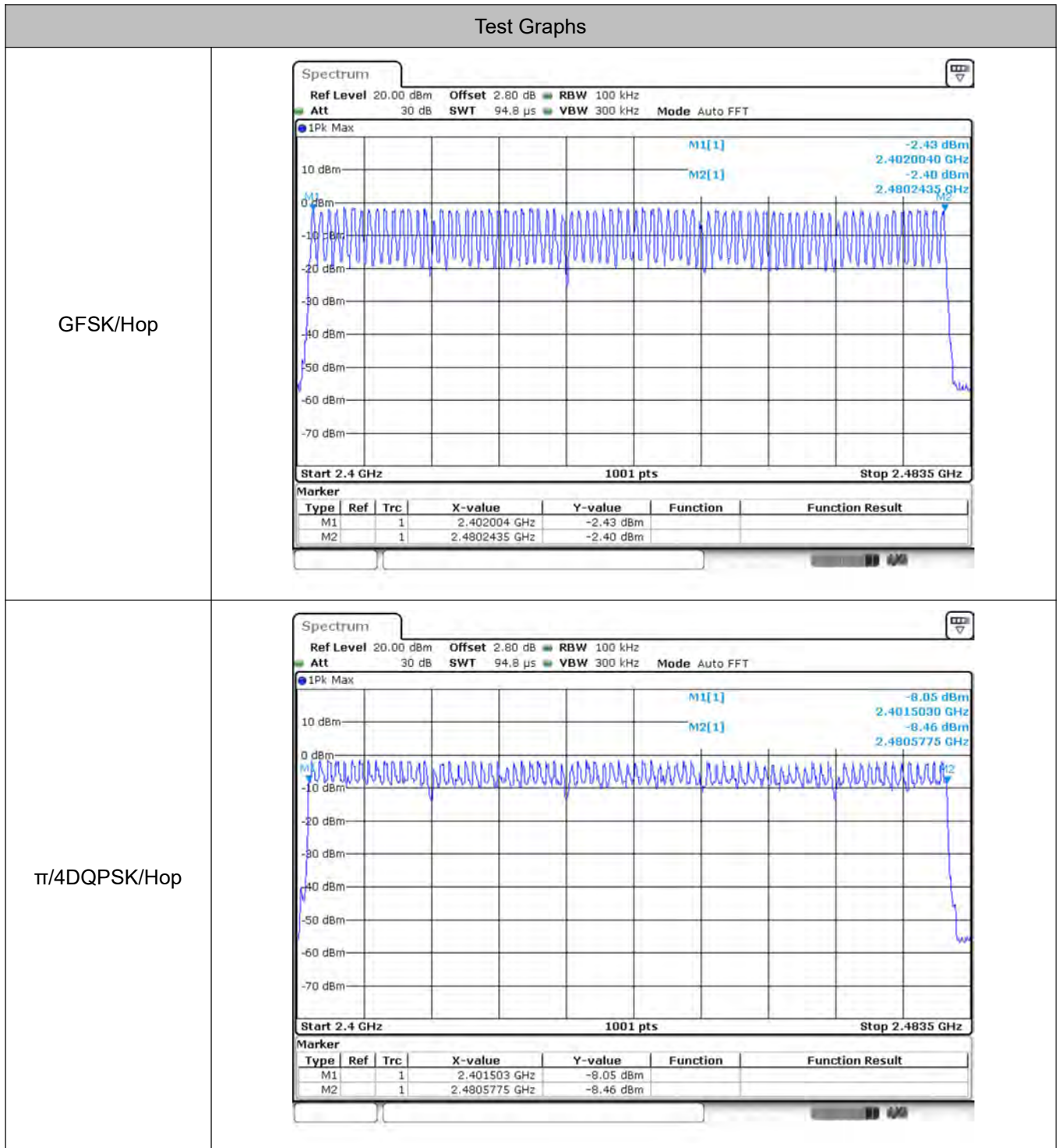


5 Hopping Channel Number

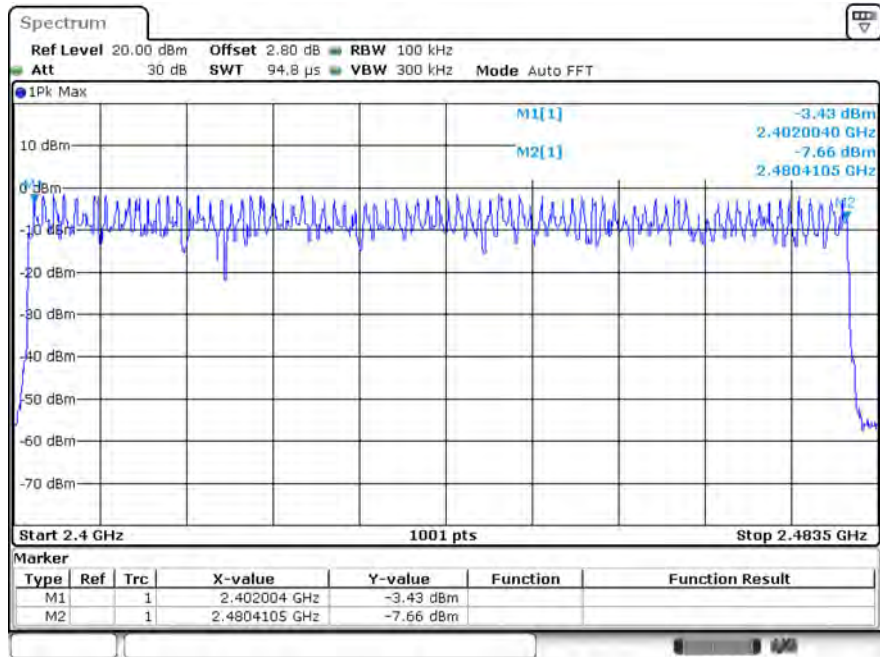
5.1 Test Result

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

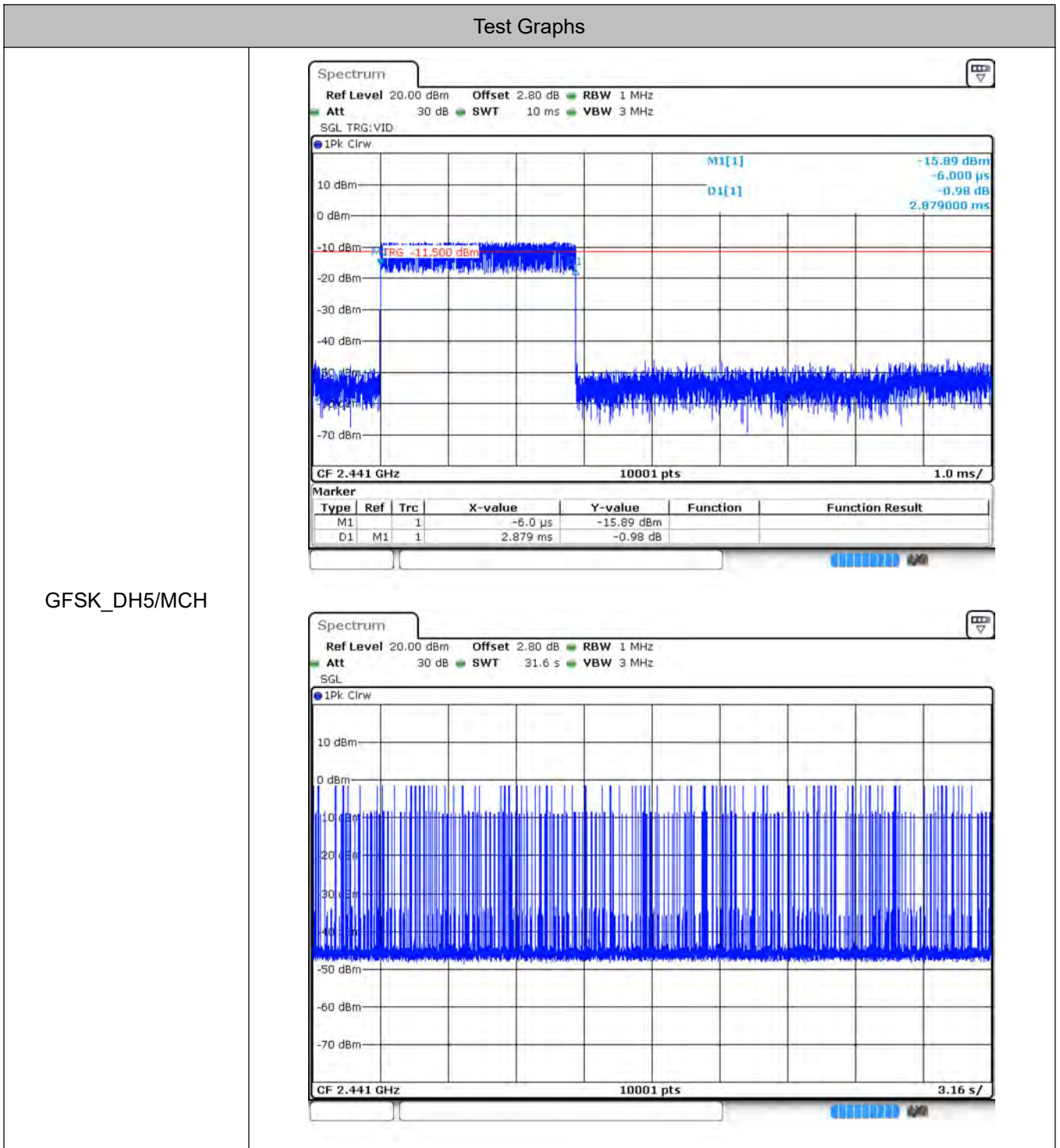


6 Dwell Time

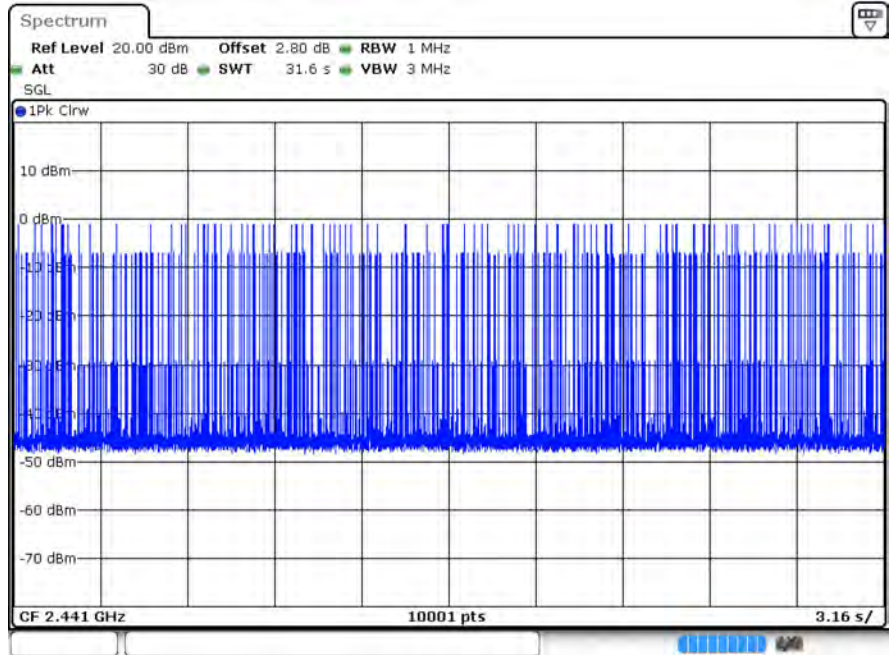
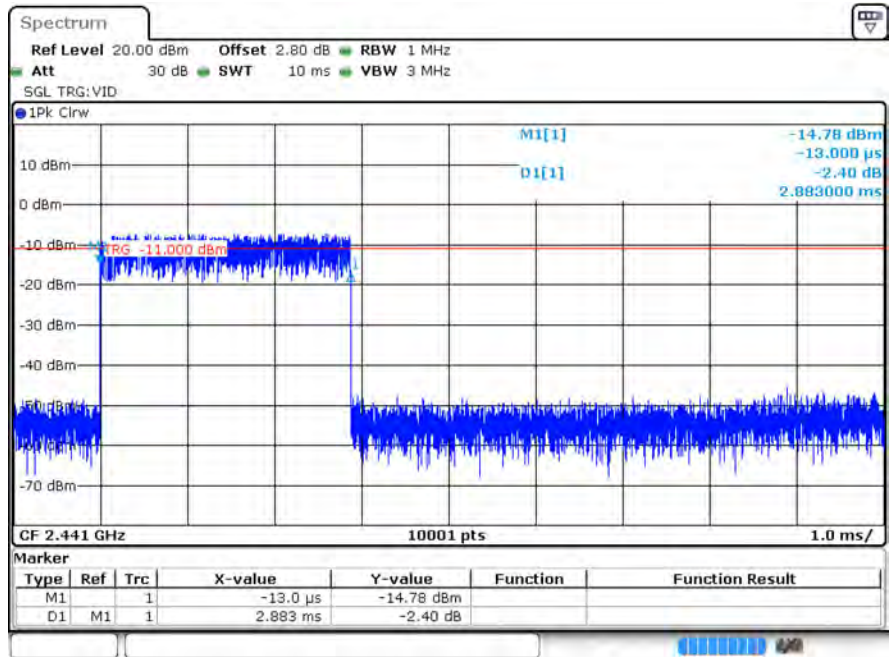
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.879	108	310.932	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.883	106	305.598	0.4	Pass
8DPSK	3DH5	MCH	2.887	99	285.813	0.4	Pass

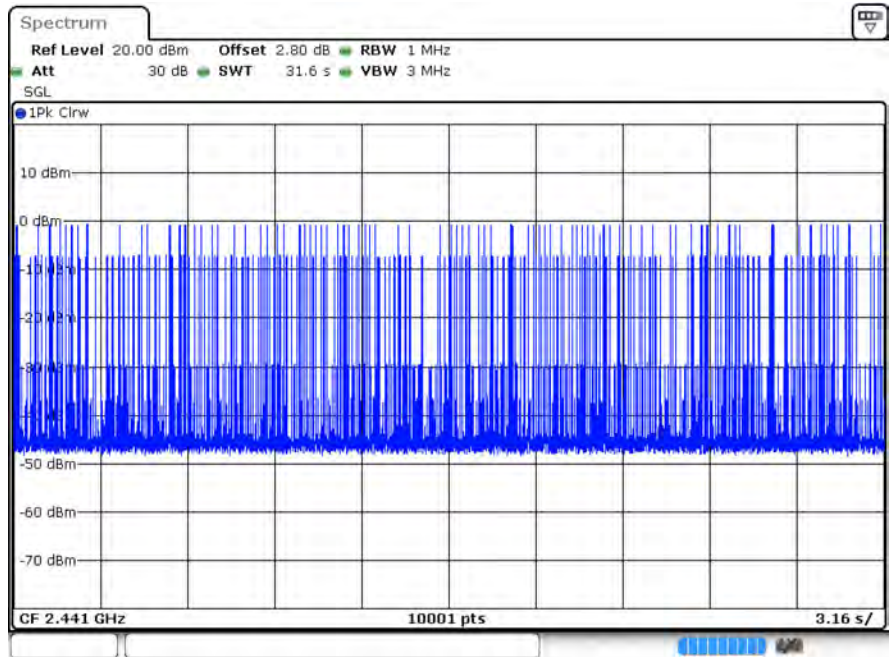
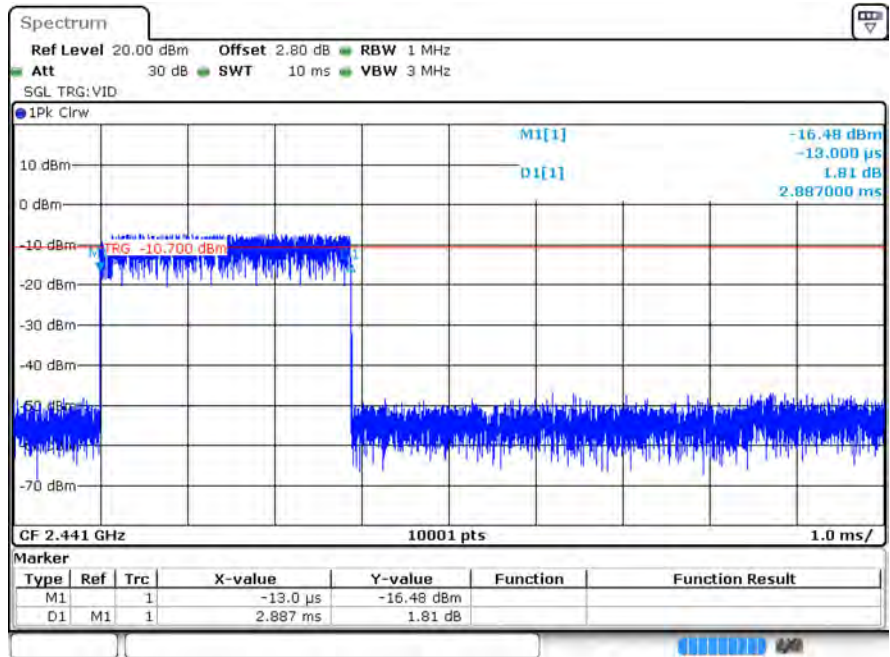
6.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH

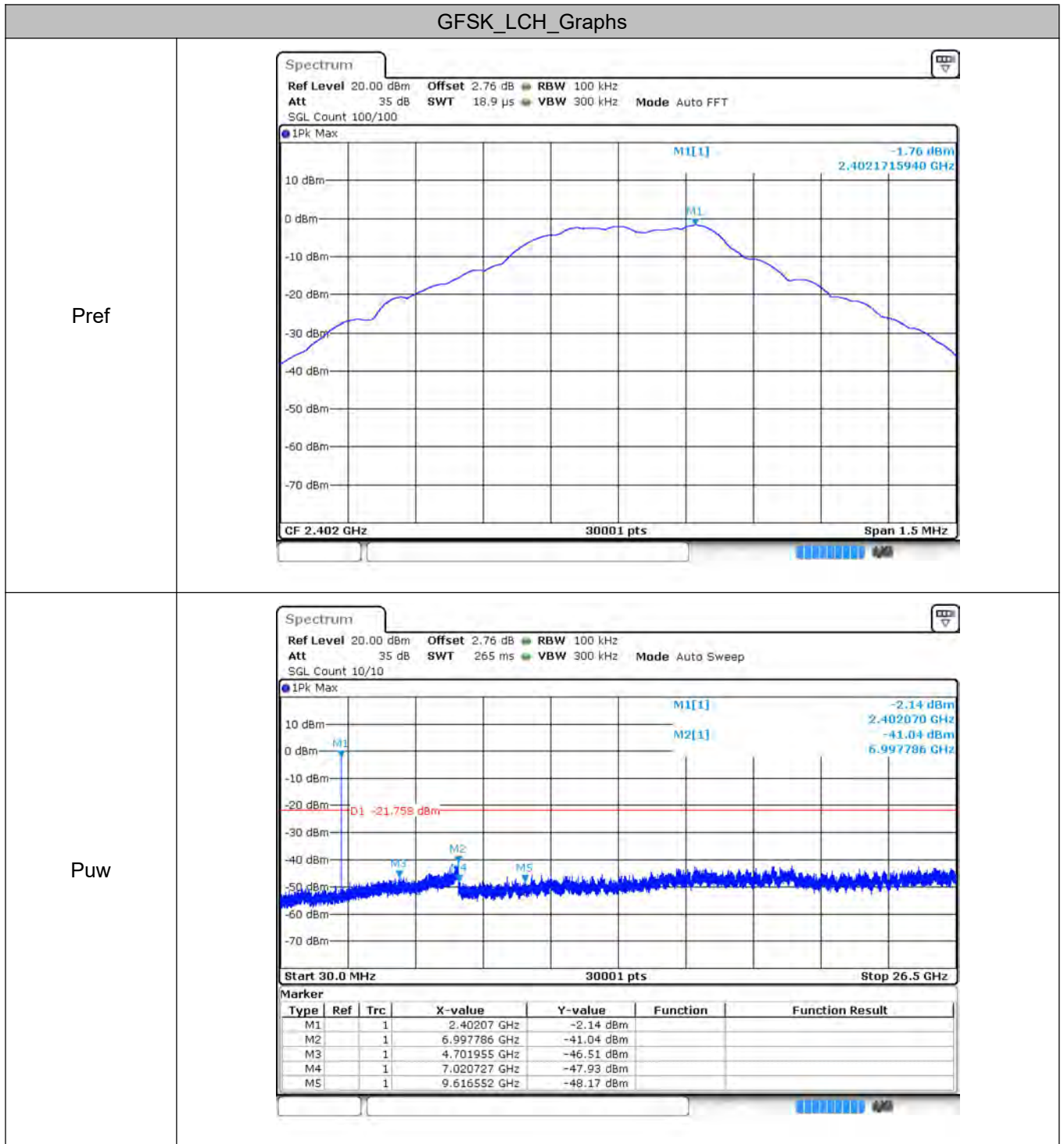


7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-39.27	-20	Pass
	MCH	-39.62	-20	Pass
	HCH	-39.26	-20	Pass
$\pi/4$ DQPSK	LCH	-38.04	-20	Pass
	MCH	-39.3	-20	Pass
	HCH	-37.57	-20	Pass
8DPSK	LCH	-38.34	-20	Pass
	MCH	-40.26	-20	Pass
	HCH	-39.34	-20	Pass

7.2 Test Graphs

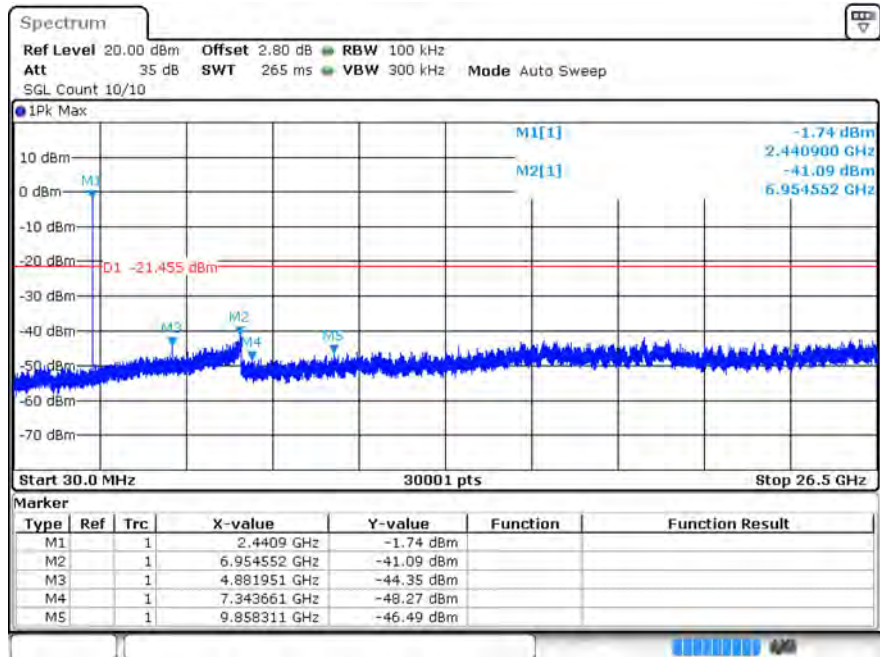


GFSK_MCH_Graphs

Pref



Puw

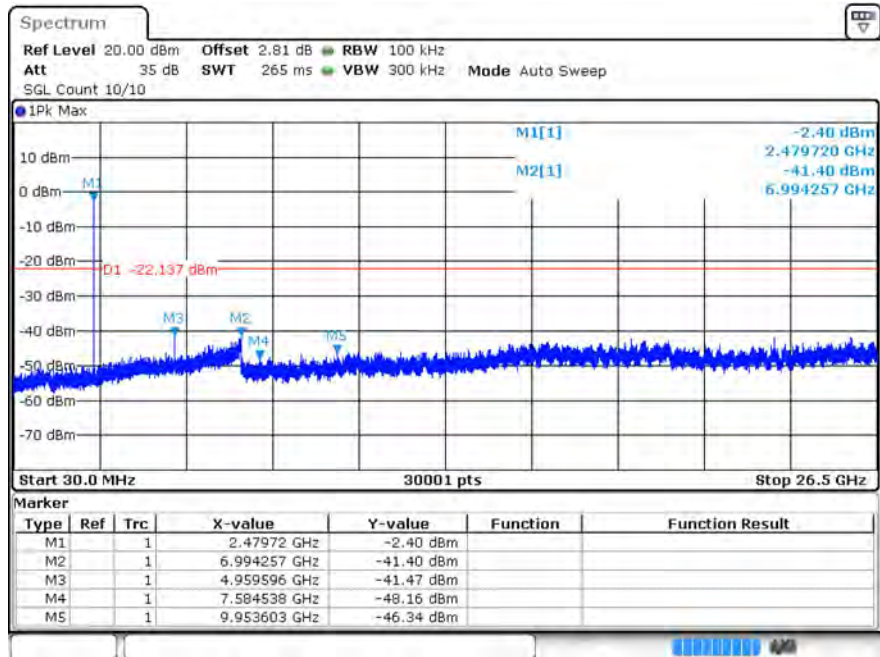


GFSK_HCH_Graphs

Pref



Puw

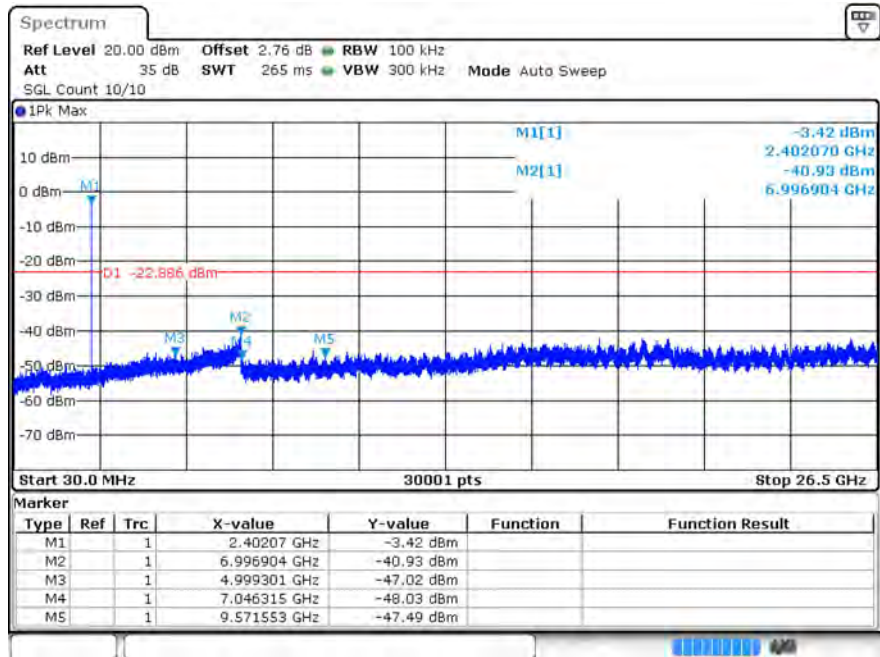


$\pi/4$ DQPSK_LCH_Graphs

Pref



Puw

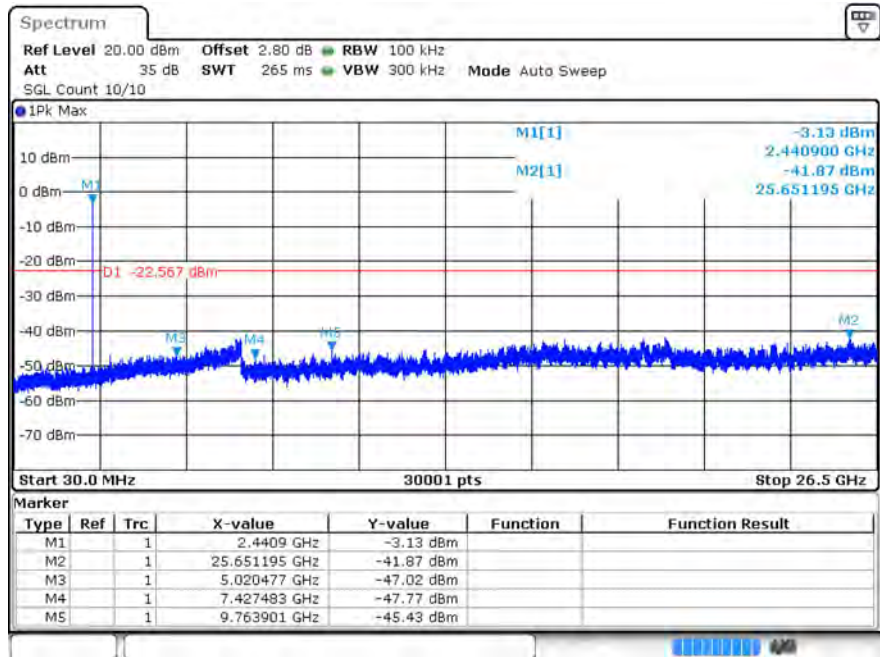


π /4DQPSK_MCH_Graphs

Pref



Puw

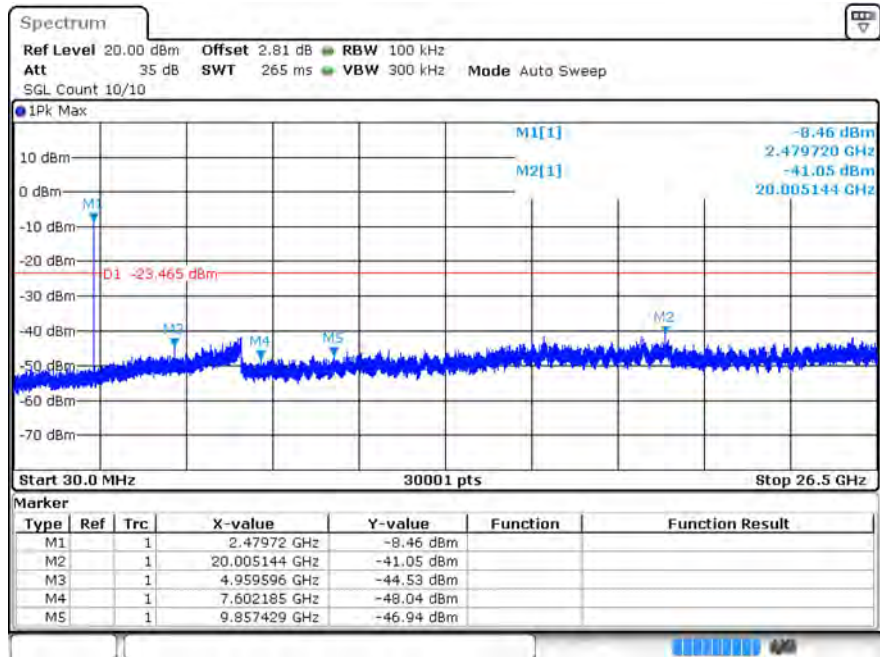


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

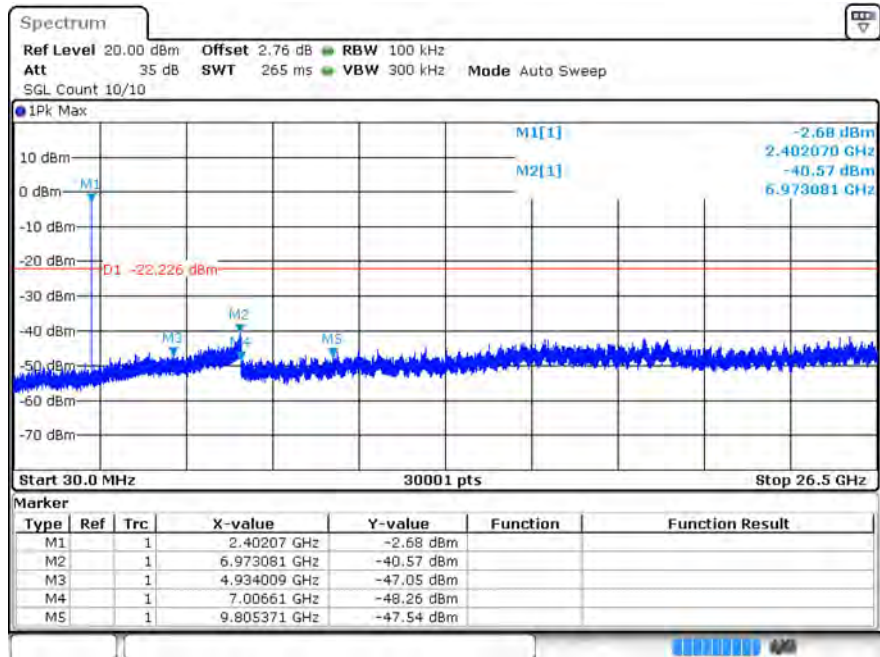


8DPSK_LCH_Graphs

Pref



Puw

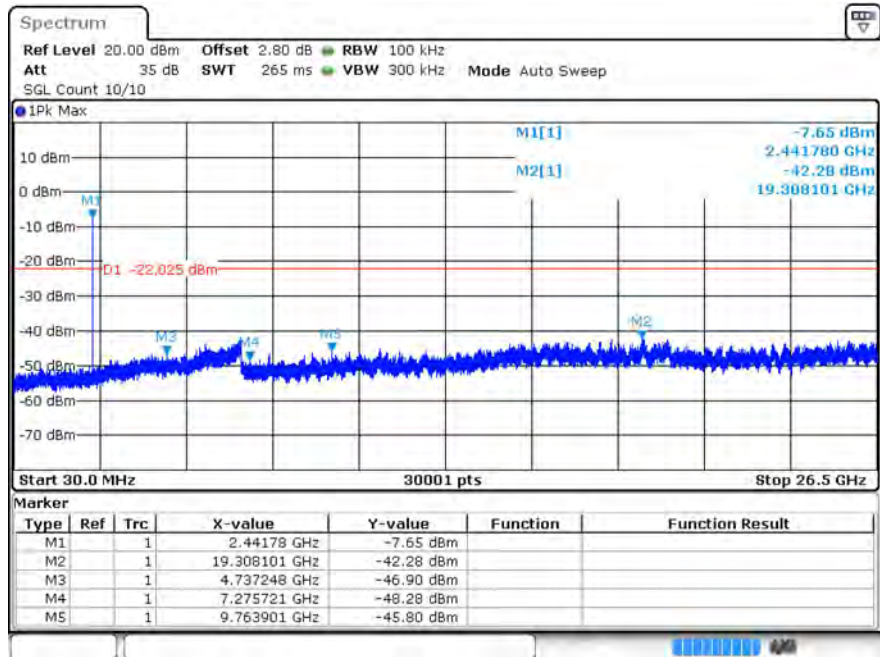


8DPSK_MCH_Graphs

Pref



Puw

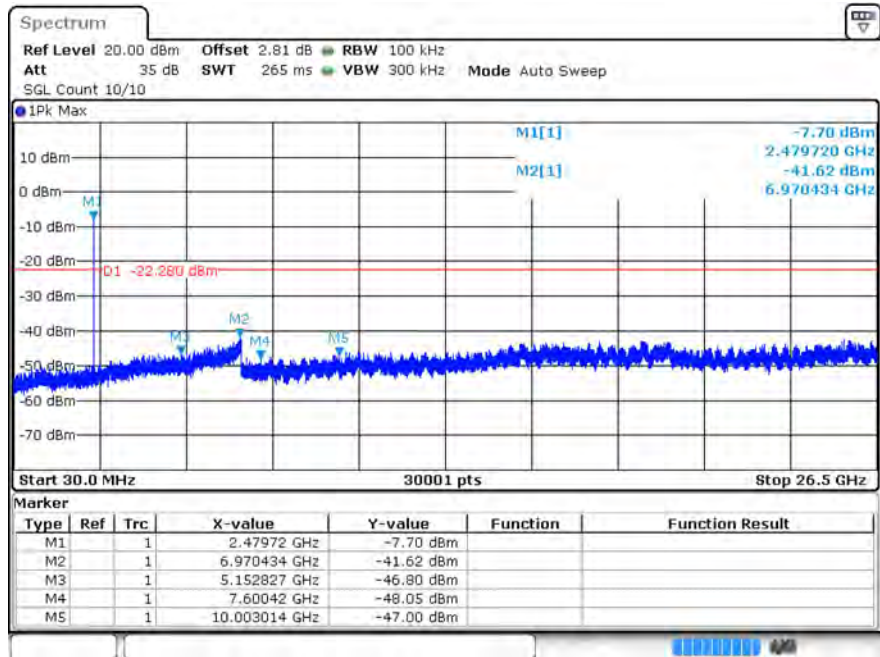


8DPSK_HCH_Graphs

Pref



Puw

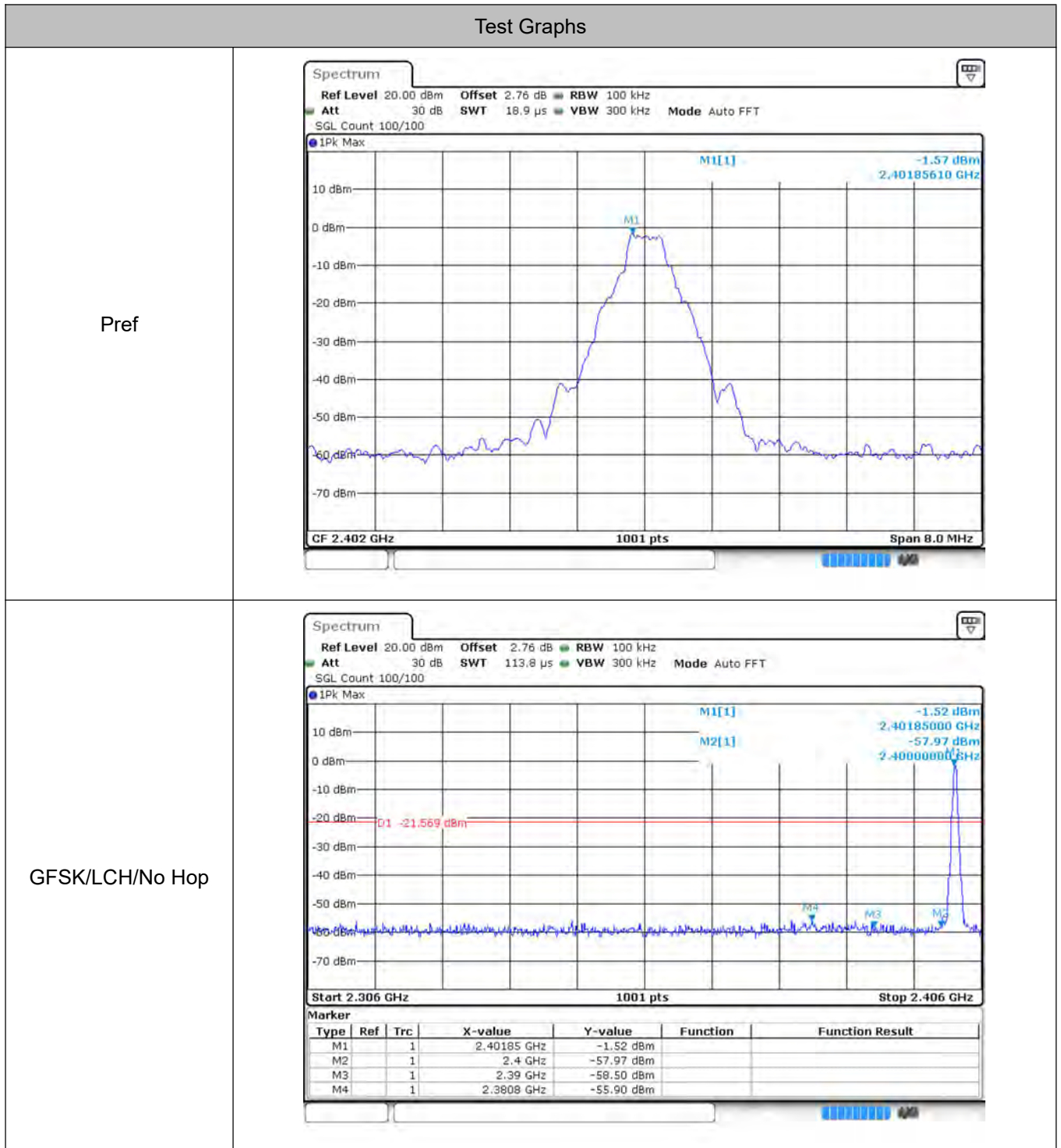


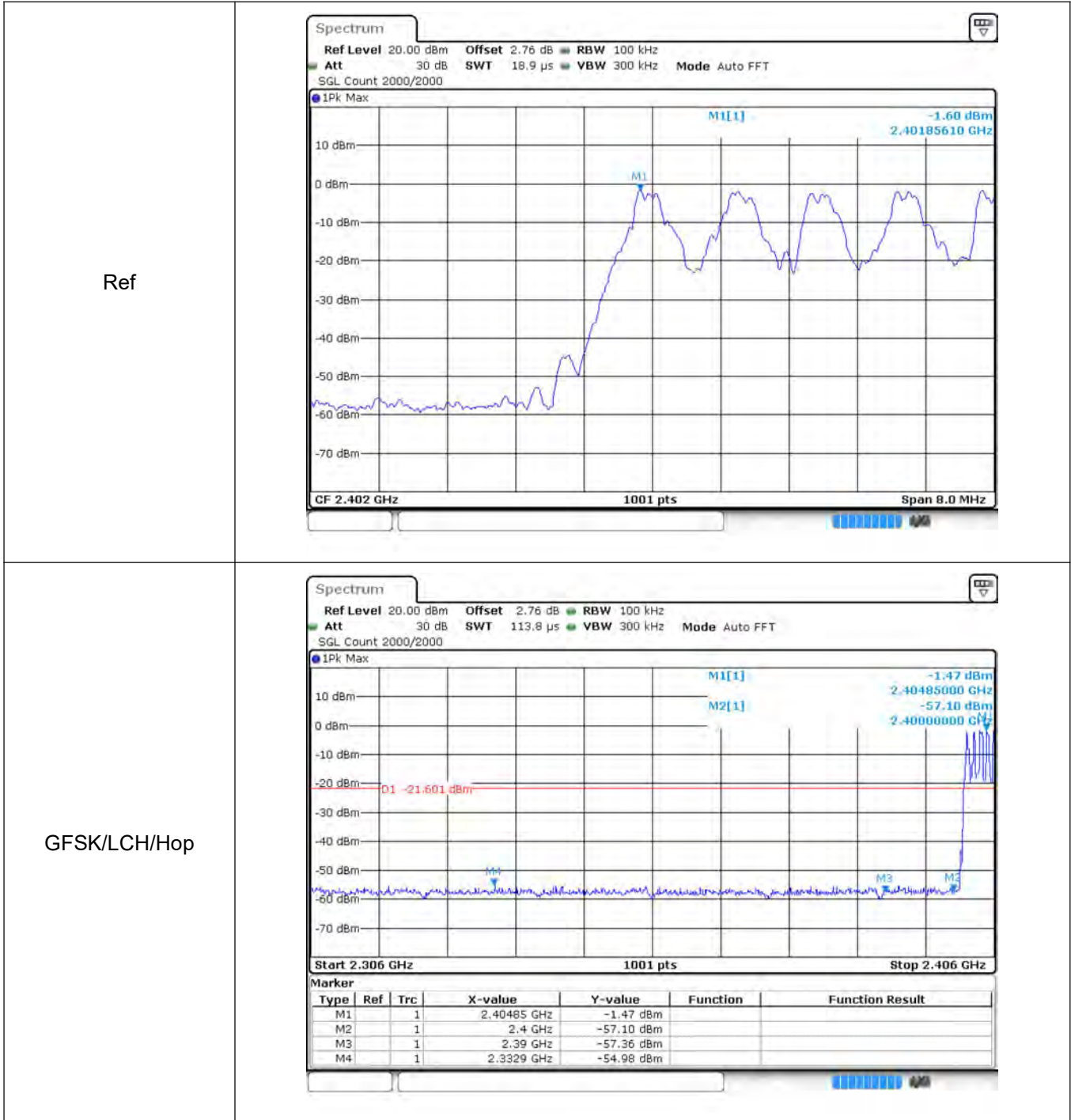
8 Band-edge for RF Conducted Emissions

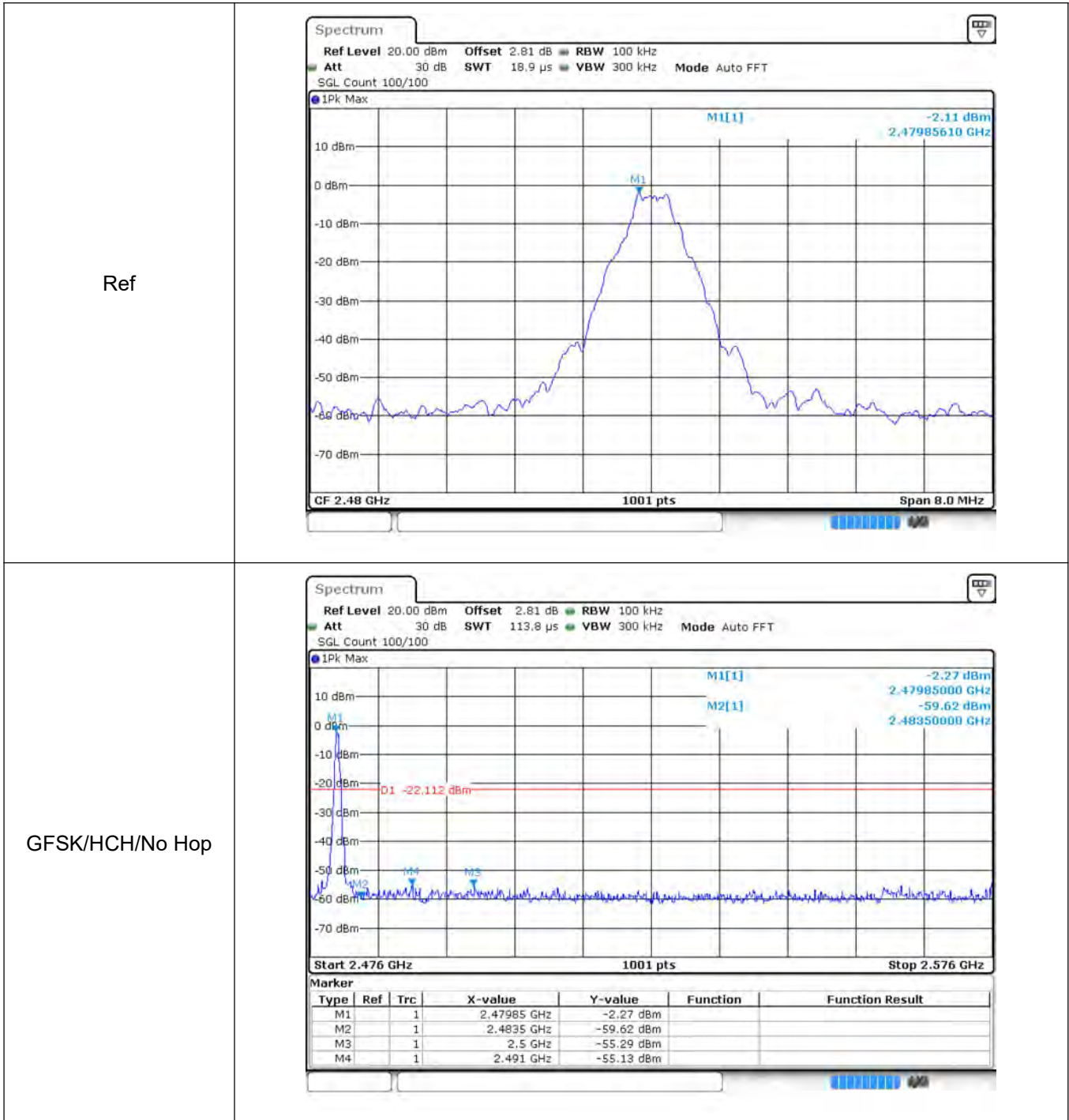
8.1 Test Result

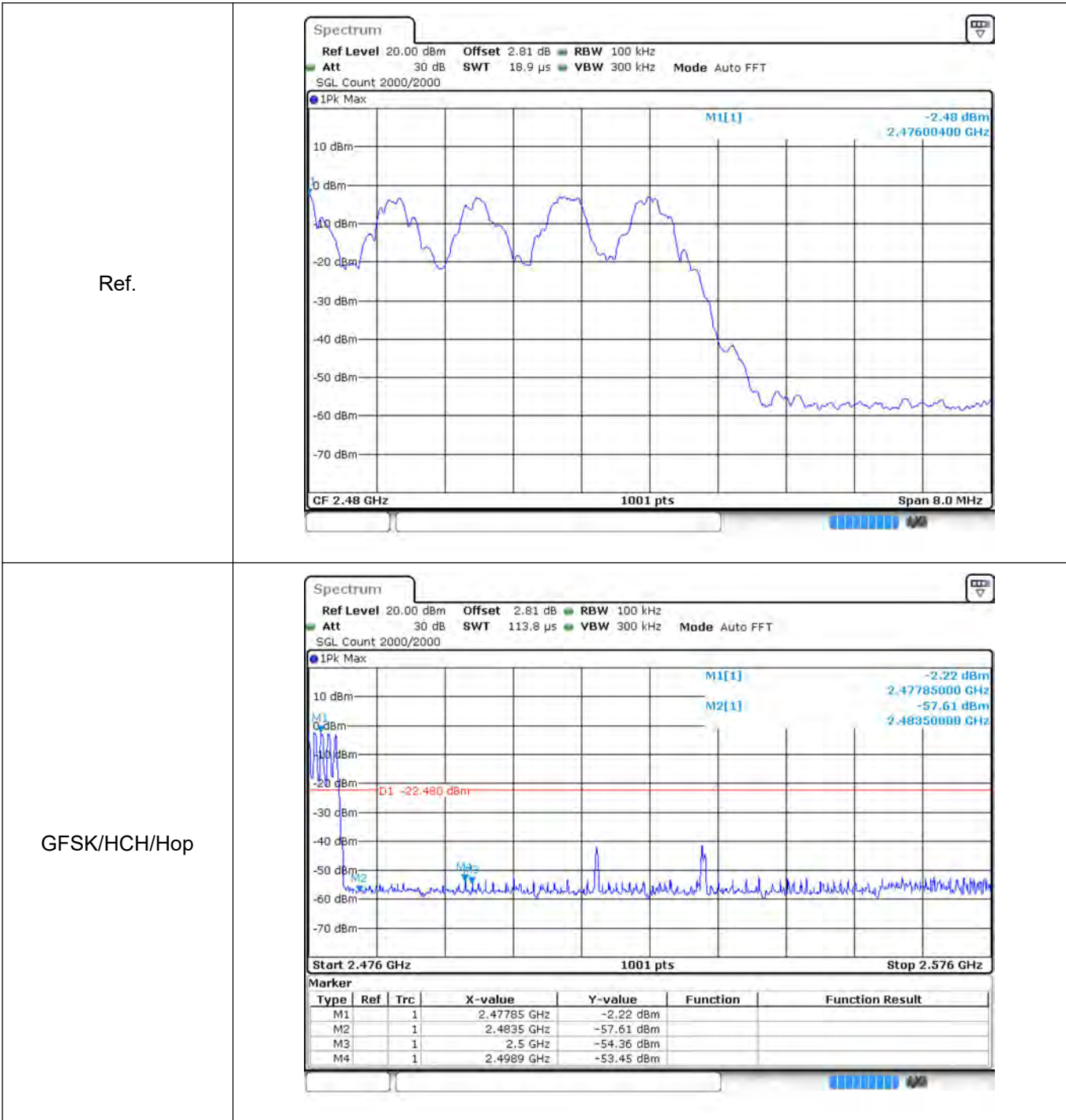
Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-54.32	-20	Pass
			On	-53.38	-20	Pass
	HCH	2480	Off	-53.02	-20	Pass
			On	-50.97	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-52.86	-20	Pass
			On	-52.55	-20	Pass
	HCH	2480	Off	-54.37	-20	Pass
			On	-49.4	-20	Pass
8DPSK	LCH	2402	Off	-54.23	-20	Pass
			On	-52.6	-20	Pass
	HCH	2480	Off	-52.15	-20	Pass
			On	-52.47	-20	Pass

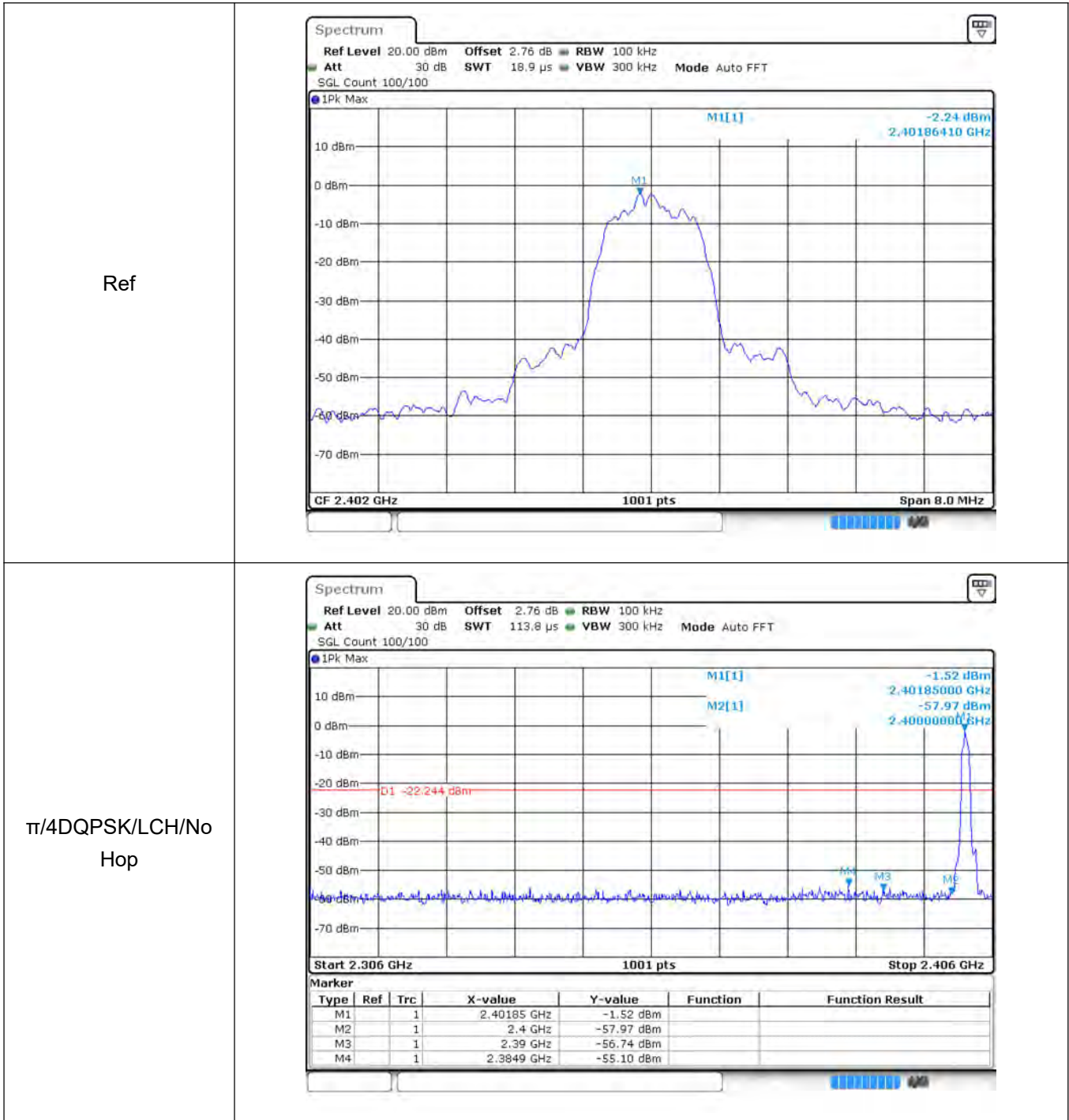
8.2 Test Graphs

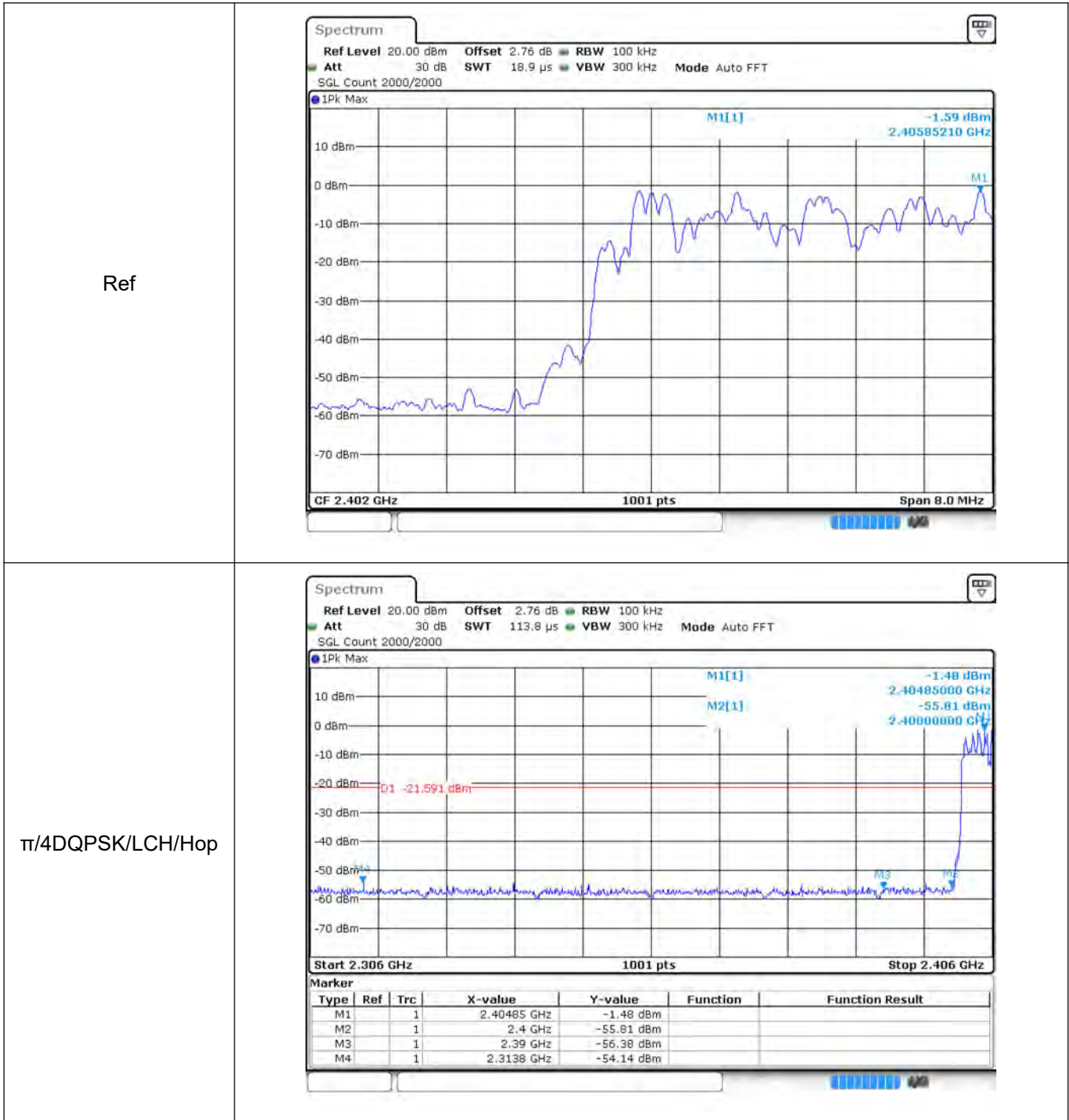


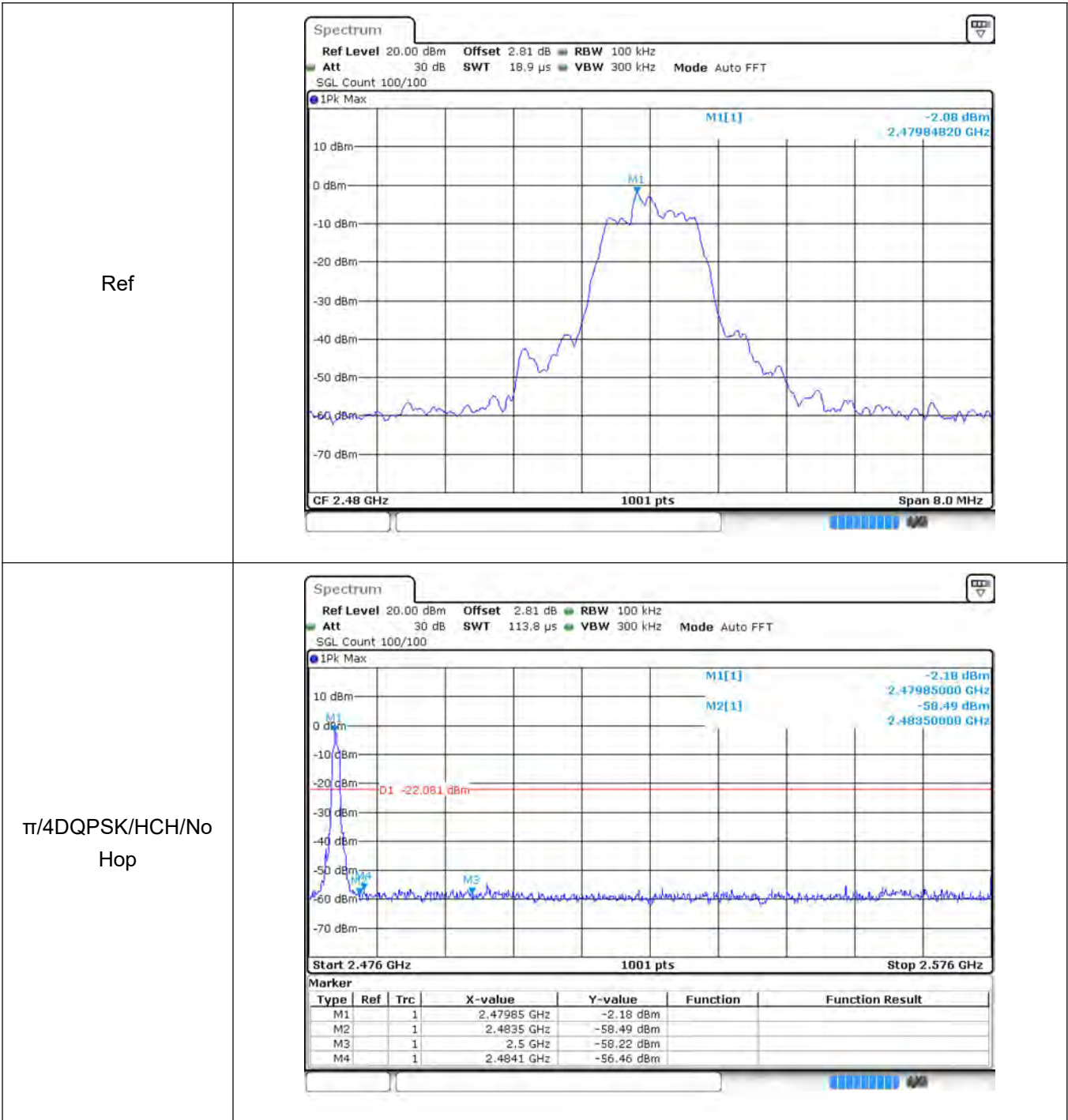


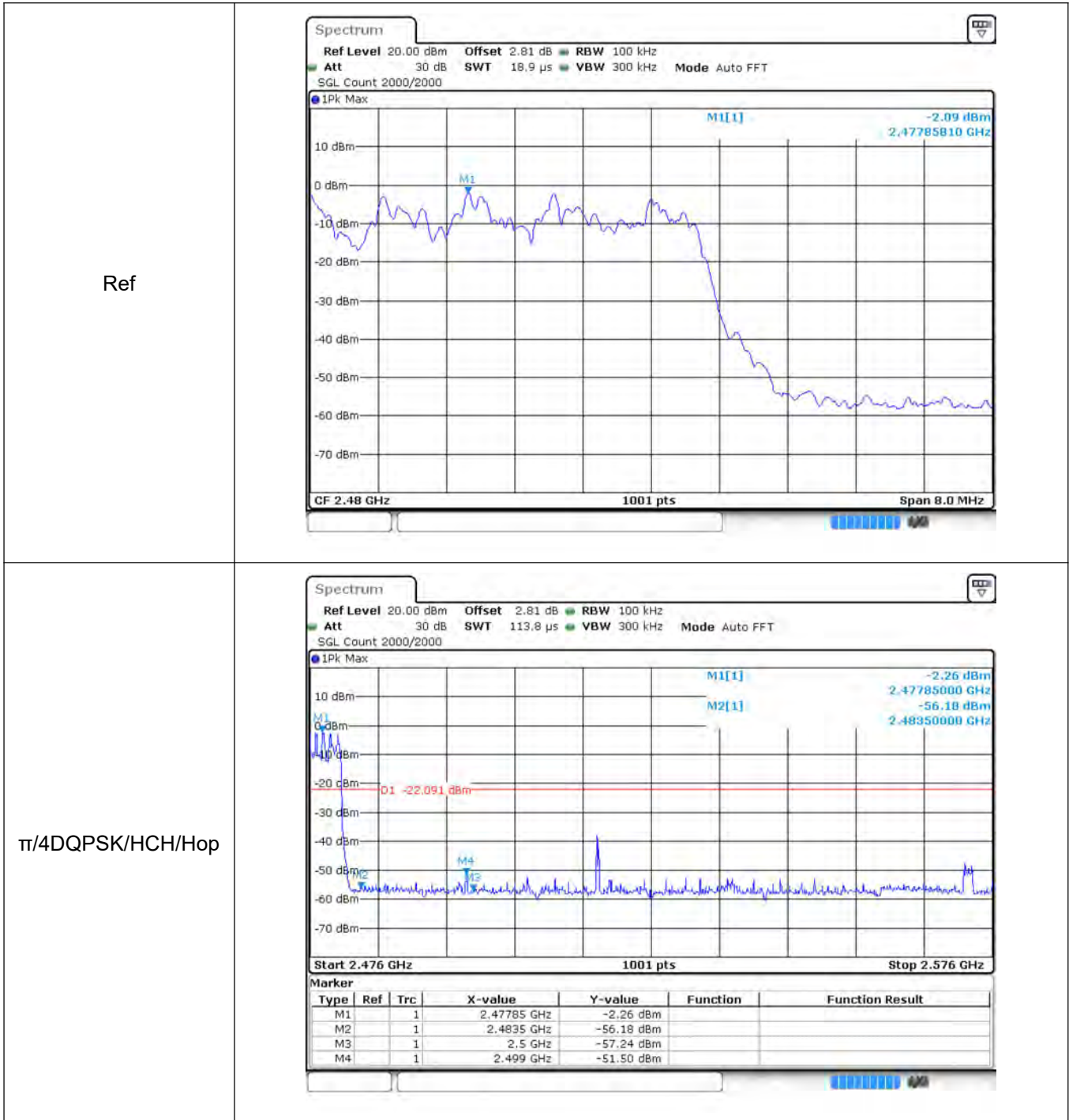


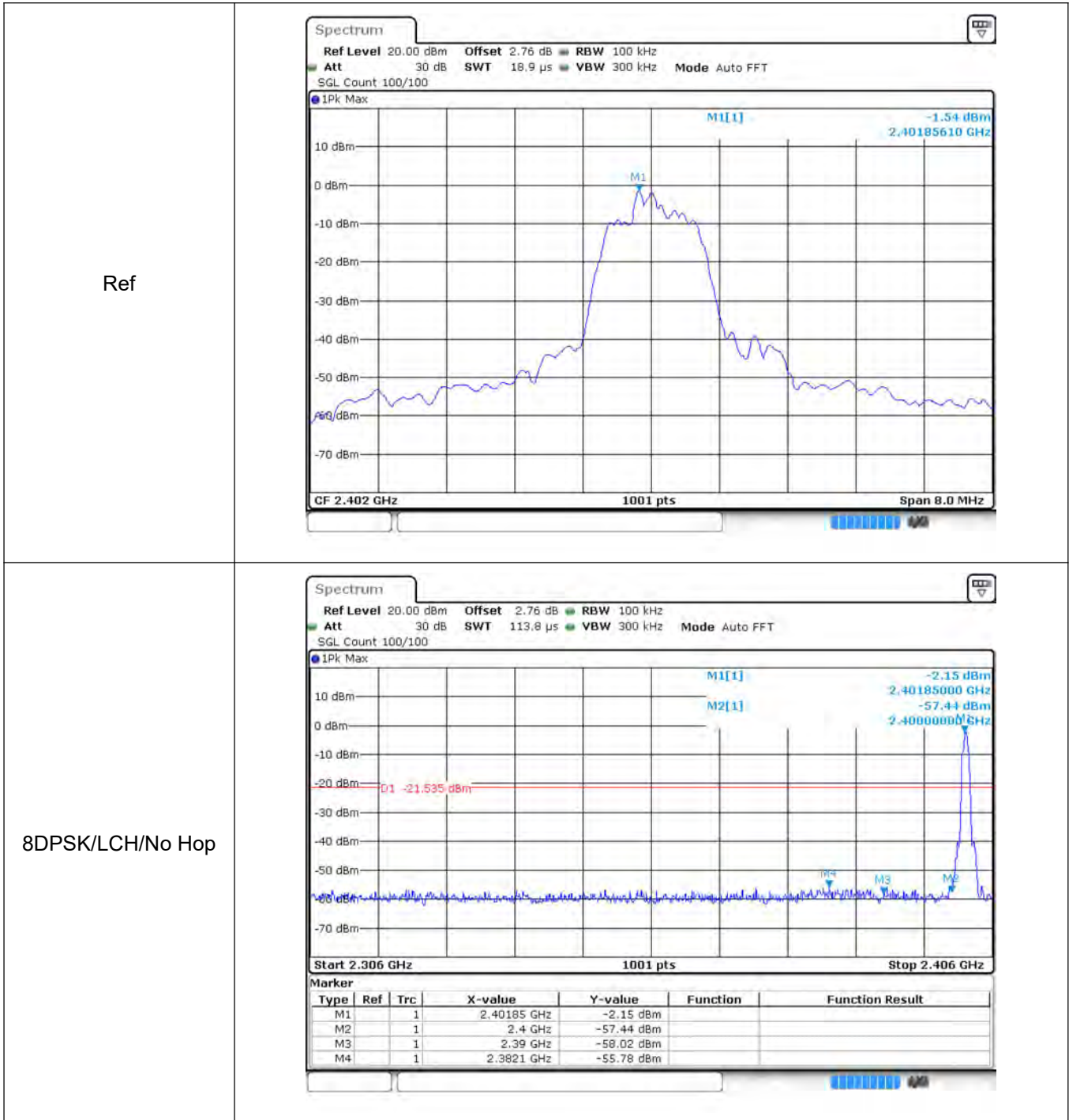


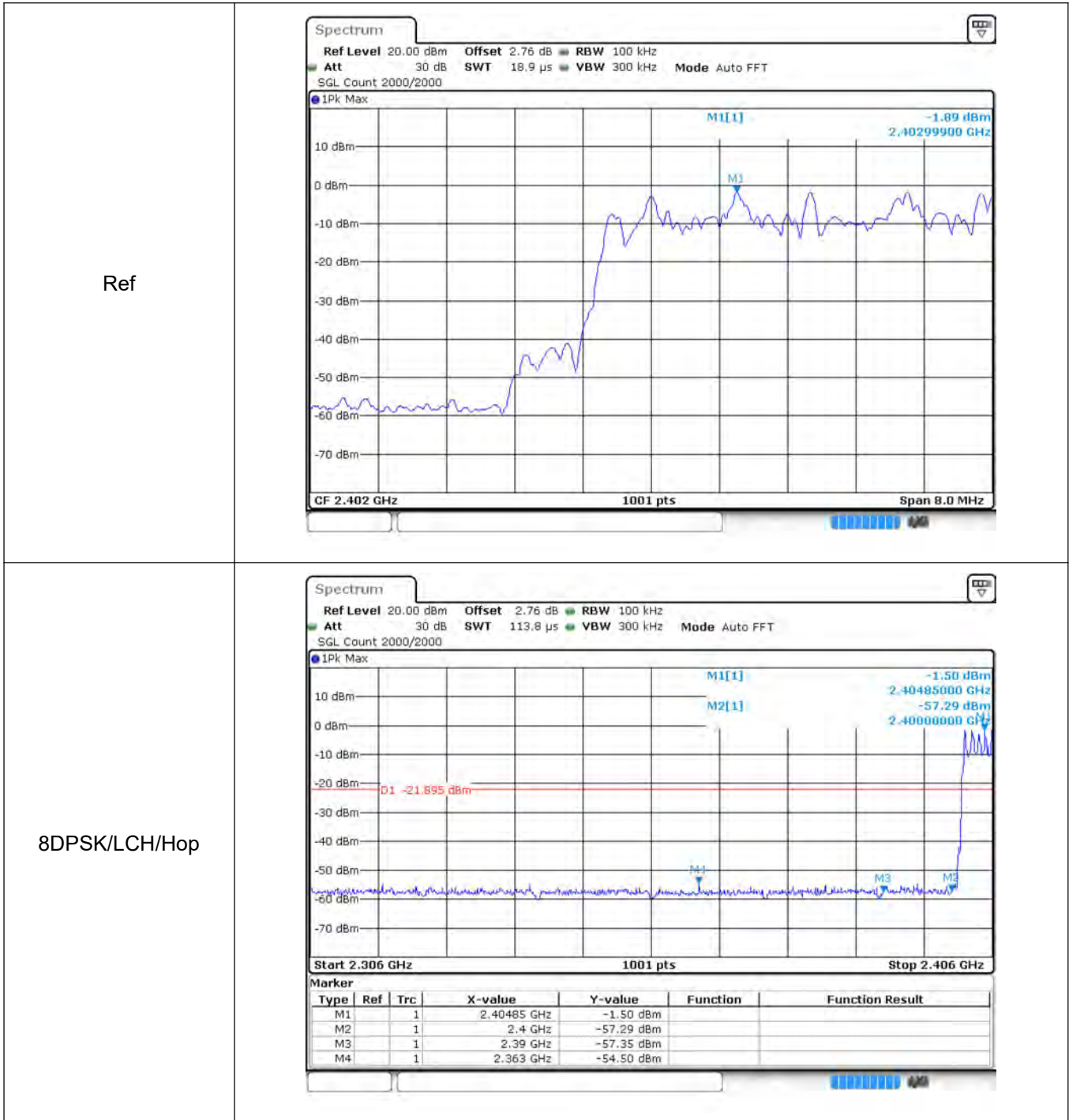


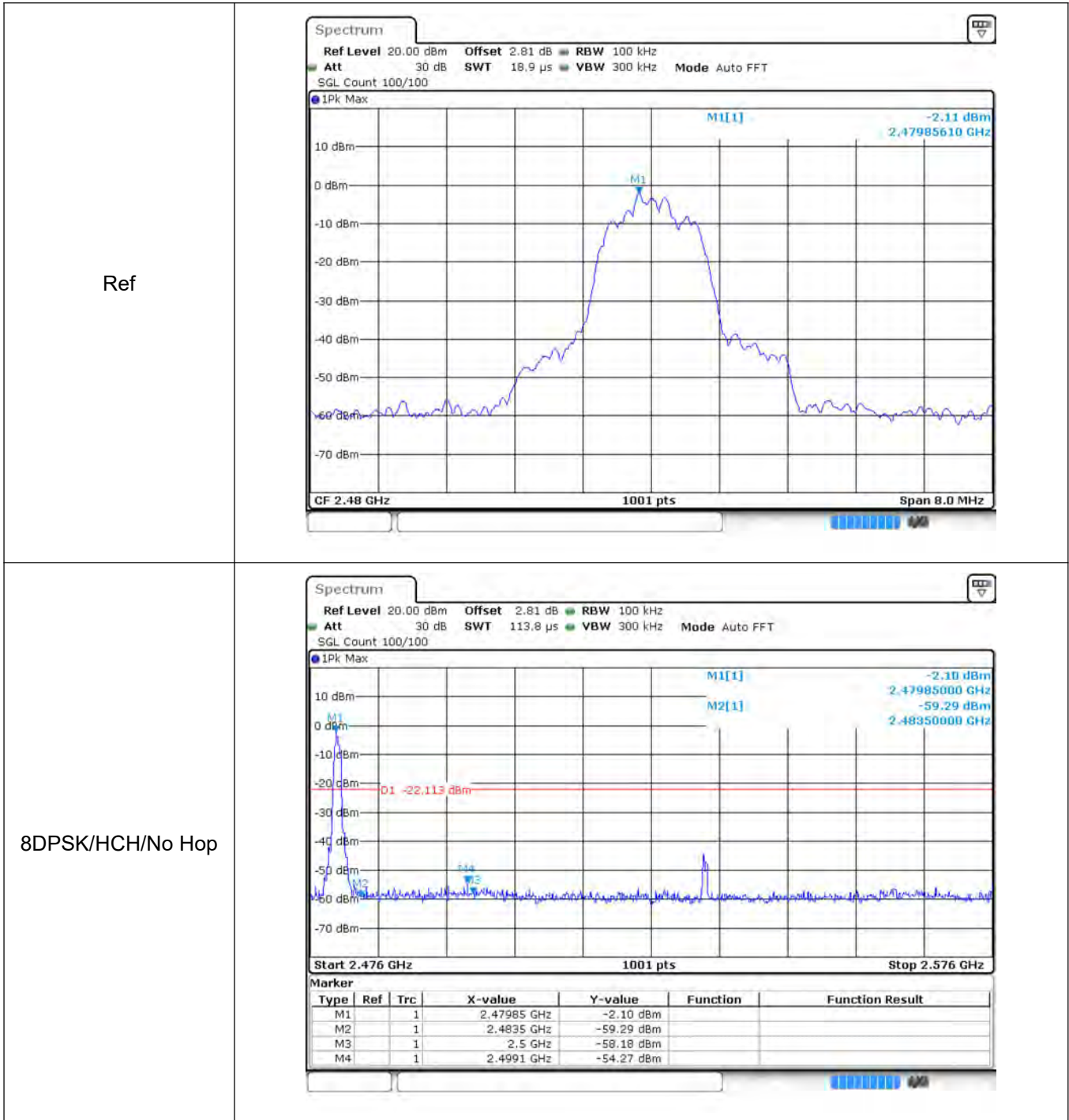


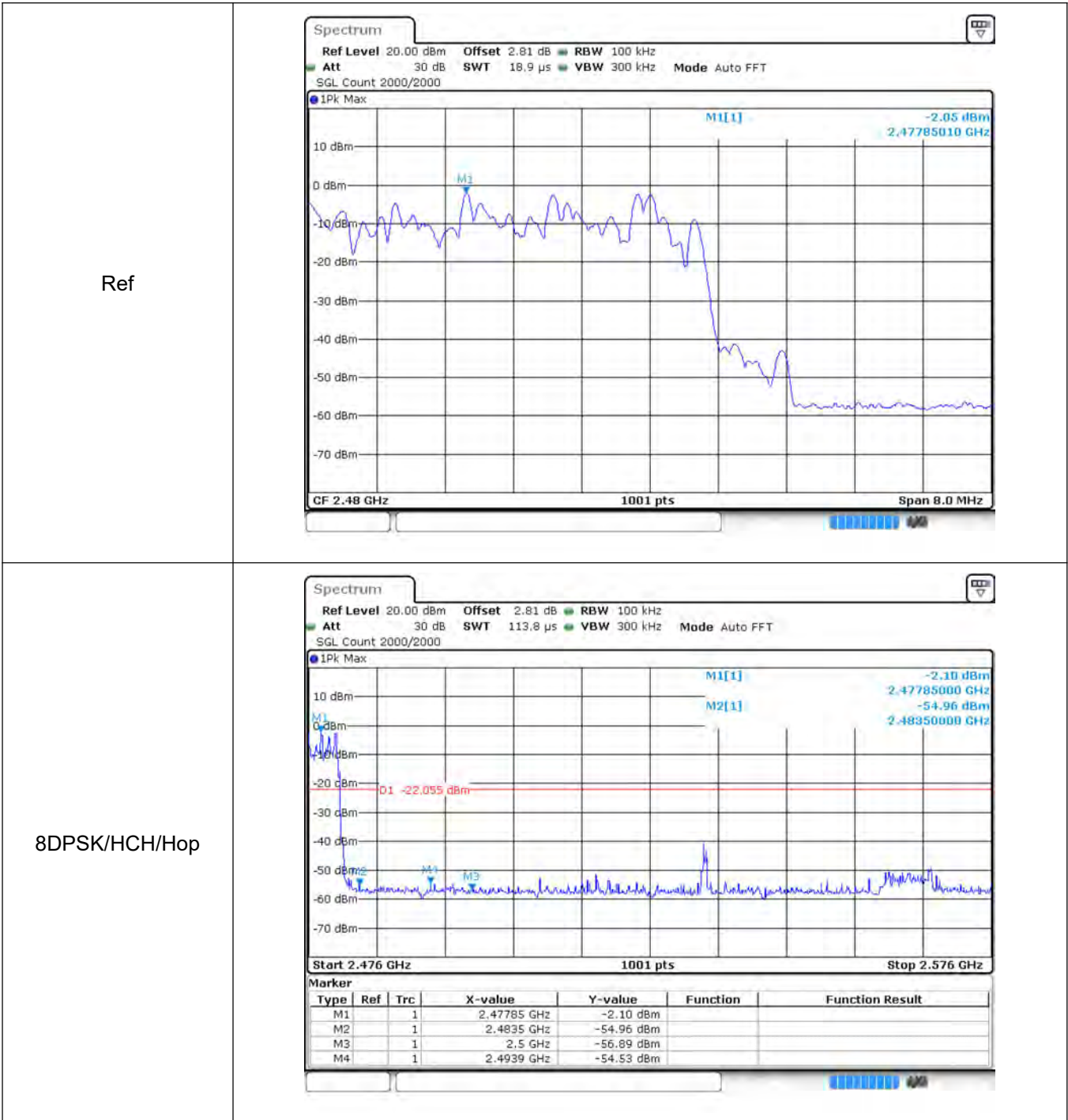












9 Restrict-band band-edge measurements

9.1 Test Result

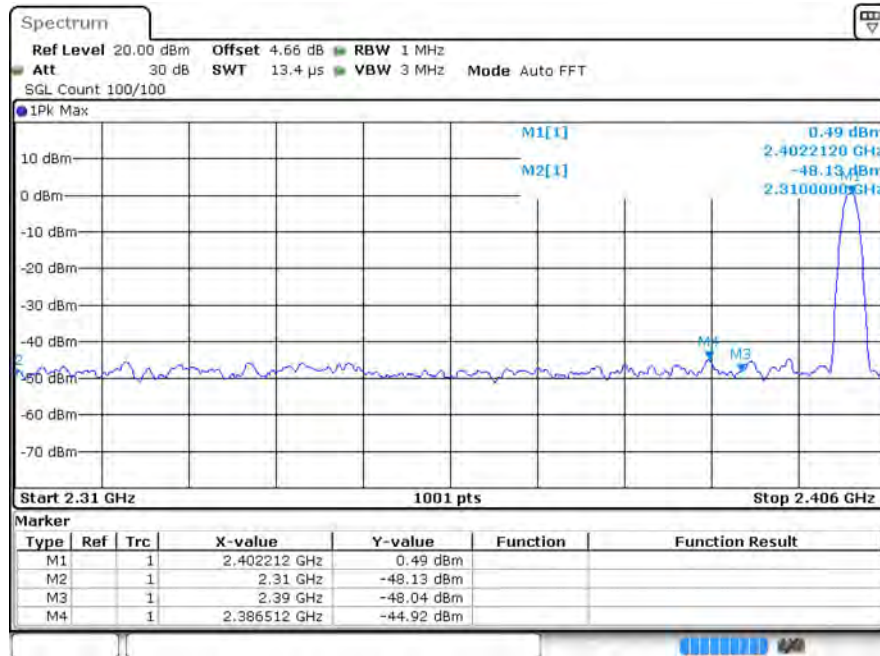
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.12	2	49.14	PEAK	74	Pass
	Off	2310.0	-56.09	2	41.17	AV	54	Pass
	Off	2386.512	-44.91	2	52.35	PEAK	74	Pass
	Off	2381.424	-53.94	2	43.32	AV	54	Pass
	Off	2390.0	-48.03	2	49.23	PEAK	74	Pass
	Off	2390.0	-55.06	2	42.2	AV	54	Pass
	Off	2483.5	-49.21	2	48.05	PEAK	74	Pass
	Off	2483.5	-55.51	2	41.75	AV	54	Pass
	Off	2499.064	-44.8	2	52.46	PEAK	74	Pass
	Off	2499.064	-54	2	43.26	AV	54	Pass
	Off	2500.0	-48.32	2	48.94	PEAK	74	Pass
	Off	2500.0	-54.81	2	42.45	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-48.05	2	49.21	PEAK	74	Pass
	Off	2310.0	-55.88	2	41.38	AV	54	Pass
	Off	2375.568	-44.35	2	52.91	PEAK	74	Pass
	Off	2338.8	-54.01	2	43.25	AV	54	Pass
	Off	2390.0	-46.82	2	50.44	PEAK	74	Pass
	Off	2390.0	-54.73	2	42.53	AV	54	Pass
	Off	2483.5	-48.37	2	48.89	PEAK	74	Pass
	Off	2483.5	-55.38	2	41.88	AV	54	Pass
	Off	2499.136	-45.49	2	51.77	PEAK	74	Pass
	Off	2499.76	-53.56	2	43.7	AV	54	Pass
	Off	2500.0	-46.78	2	50.48	PEAK	74	Pass
	Off	2500.0	-53.82	2	43.44	AV	54	Pass
8DPSK	Off	2310.0	-49.17	2	48.09	PEAK	74	Pass
	Off	2310.0	-56.38	2	40.88	AV	54	Pass
	Off	2348.208	-44.35	2	52.91	PEAK	74	Pass
	Off	2338.128	-54.21	2	43.05	AV	54	Pass



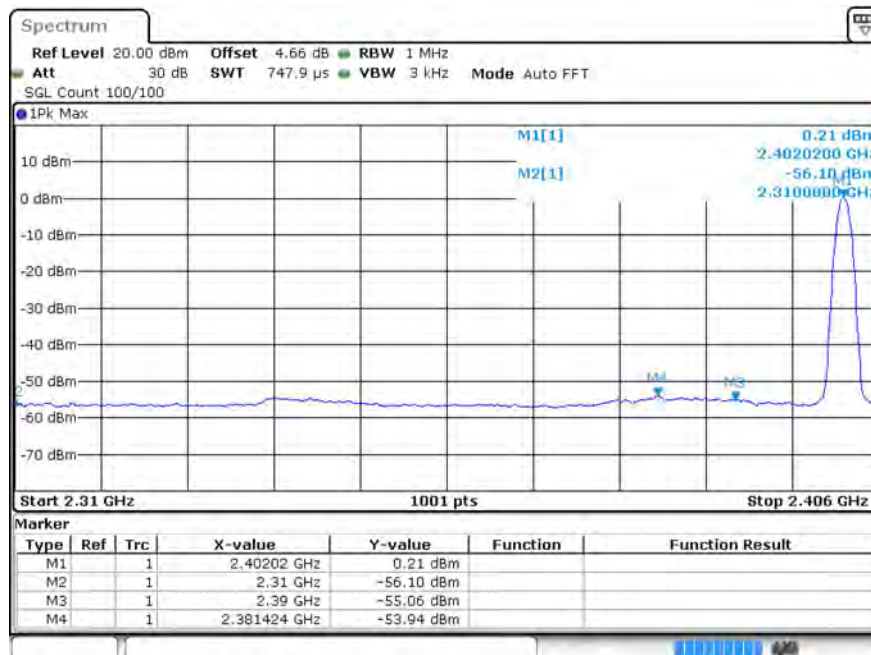
Off	2390.0	-47.36	2	49.9	PEAK	74	Pass
Off	2390.0	-54.95	2	42.31	AV	54	Pass
Off	2483.5	-45.27	2	51.99	PEAK	74	Pass
Off	2483.5	-55.4	2	41.86	AV	54	Pass
Off	2483.584	-45.24	2	52.02	PEAK	74	Pass
Off	2498.44	-54.1	2	43.16	AV	54	Pass
Off	2500.0	-47.23	2	50.03	PEAK	74	Pass
Off	2500.0	-54.6	2	42.66	AV	54	Pass

9.2 Test Graphs

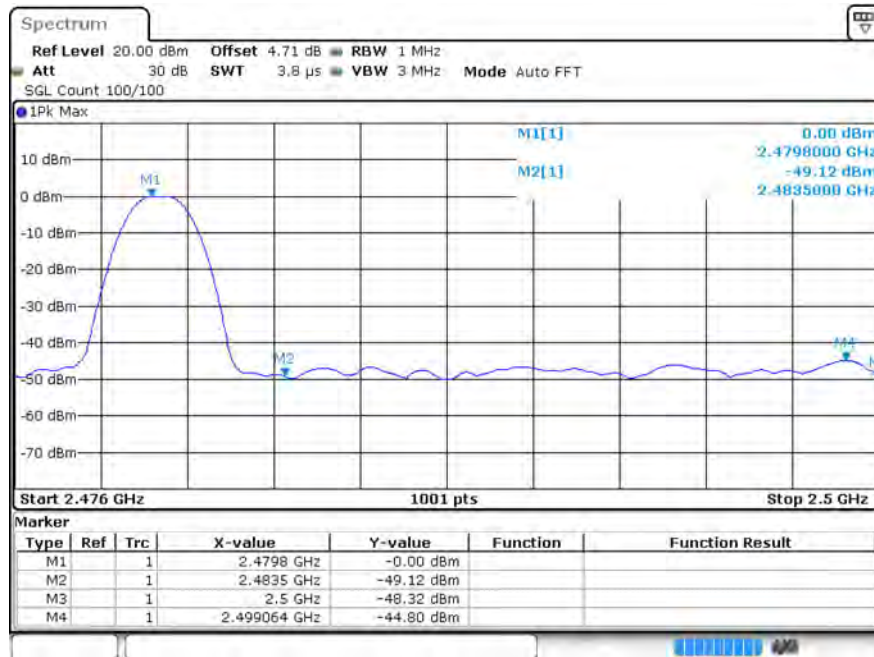
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



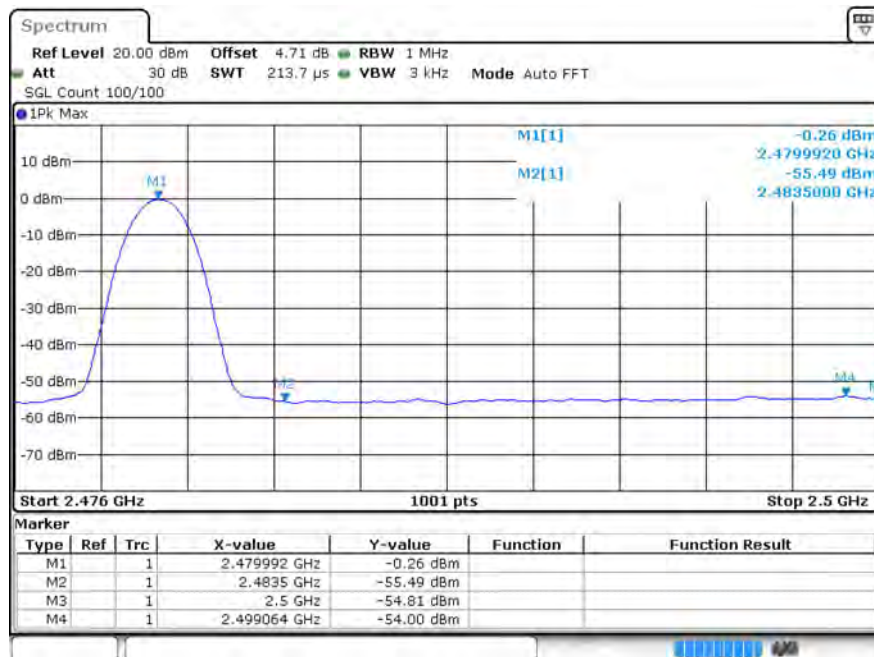
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



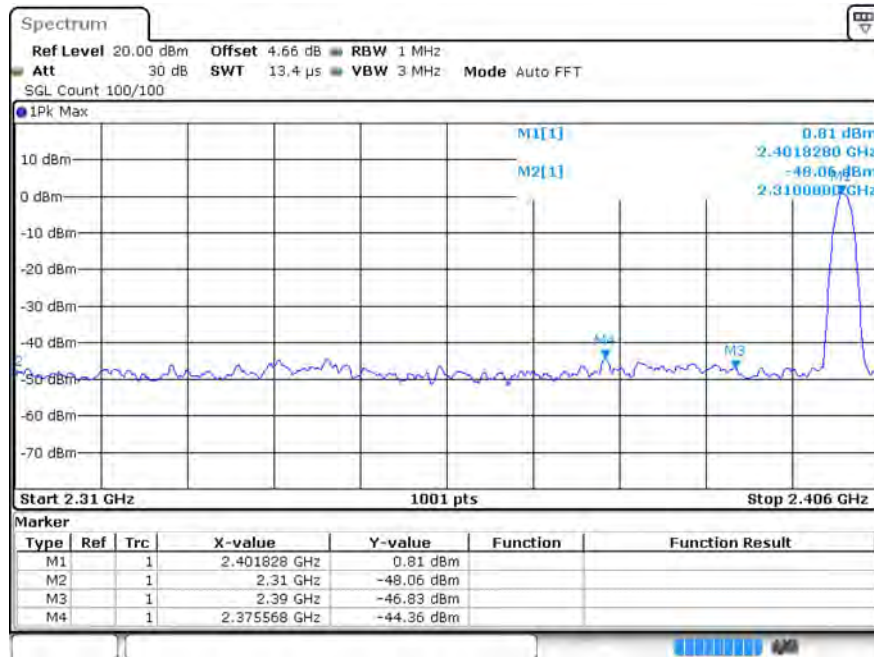
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



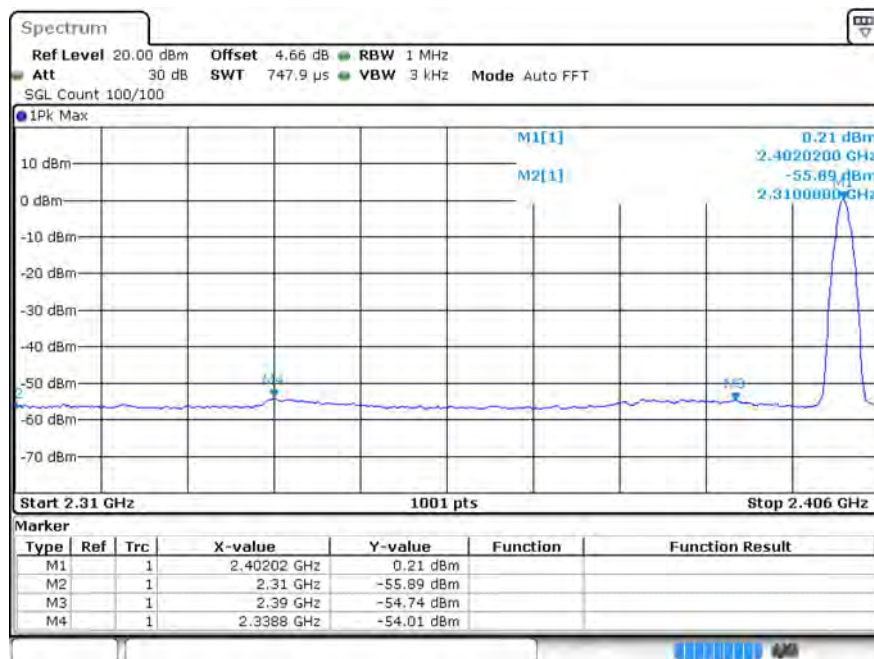
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



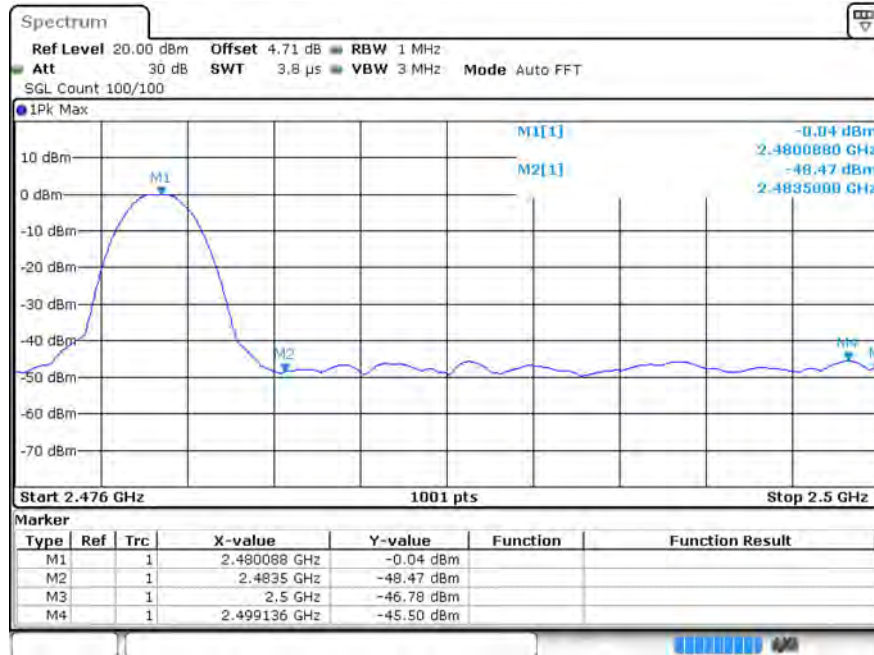
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



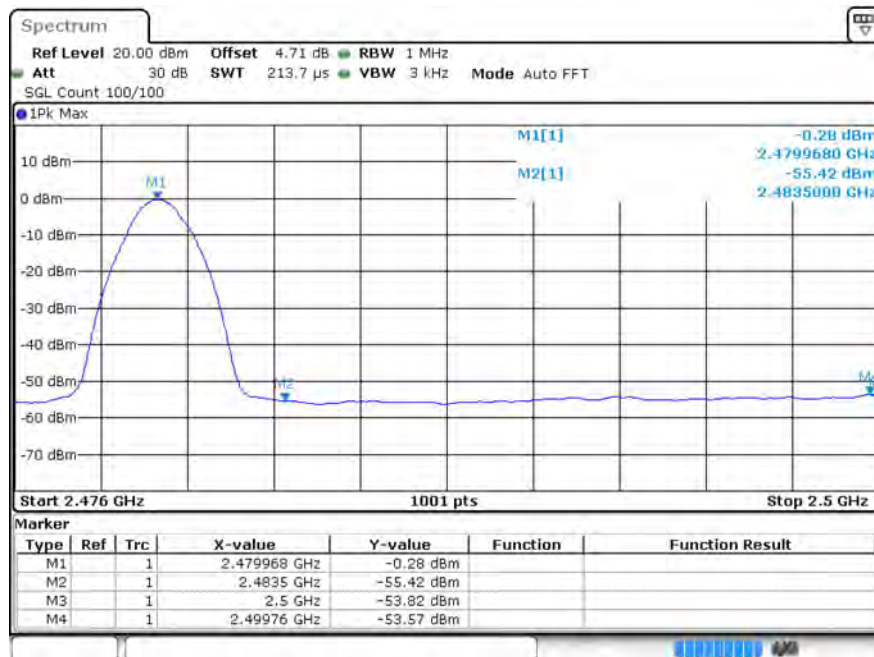
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



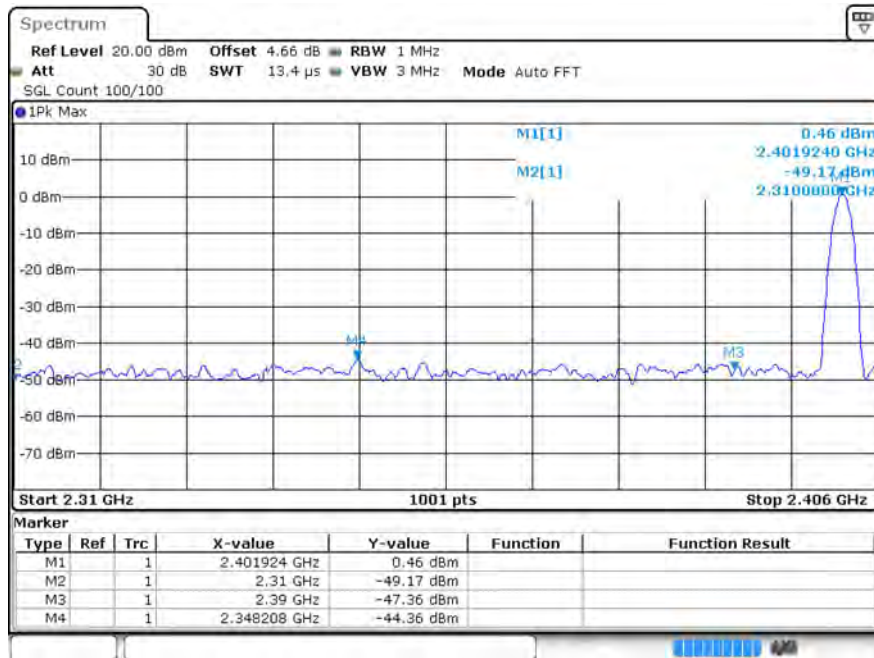
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



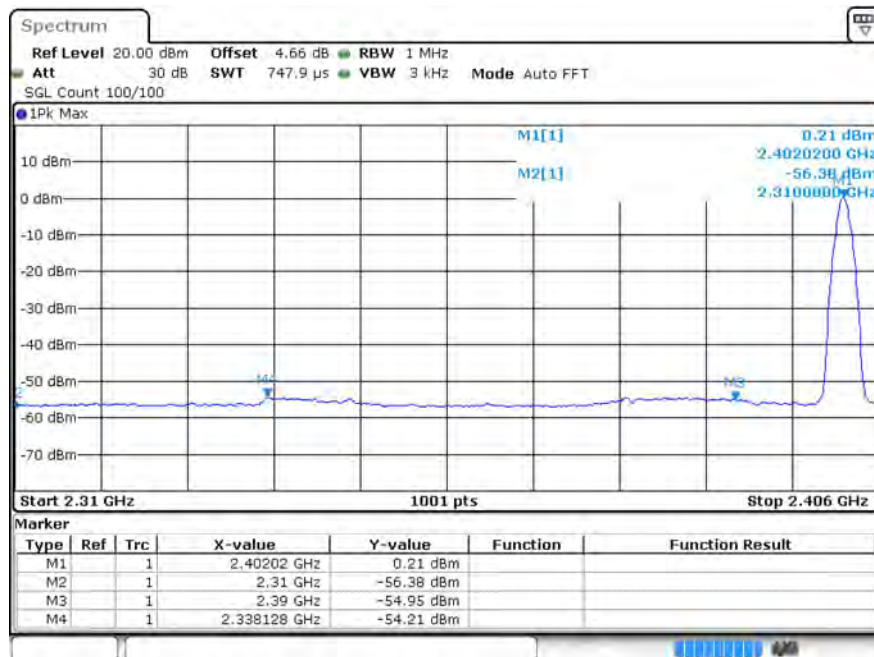
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



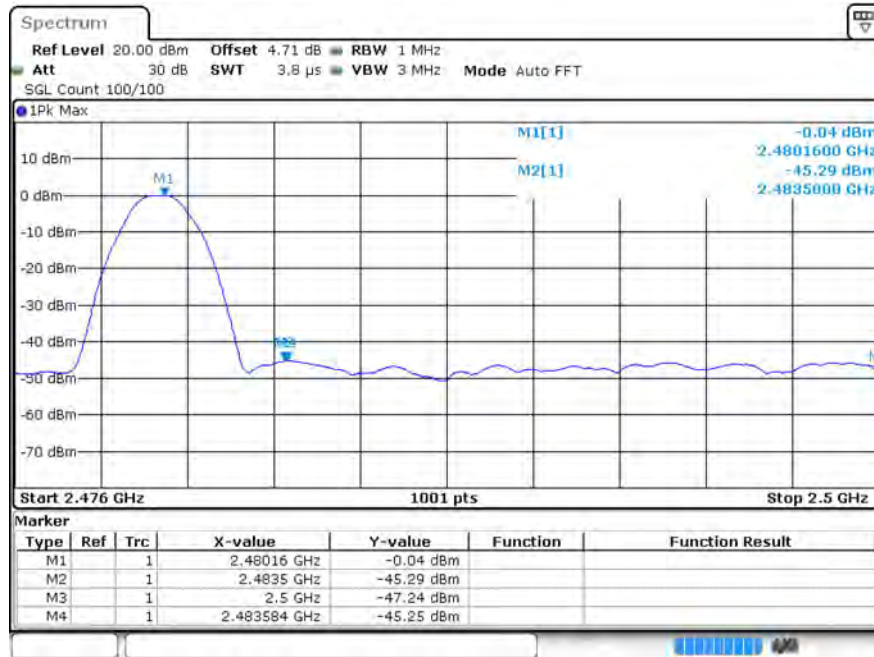
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



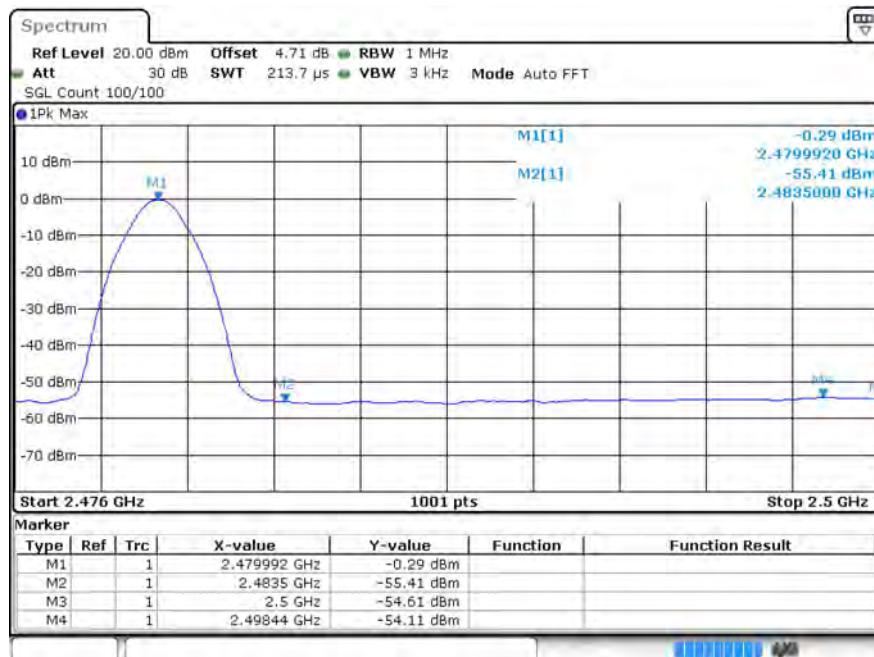
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)



---The End---