



Appendix A

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

Product Name: True Wireless Earbuds

Trade Mark: N/A

Test Model: H2203

HVIN: H2203

Environmental Conditions

Temperature:	25.6℃
Relative Humidity:	52.1.%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



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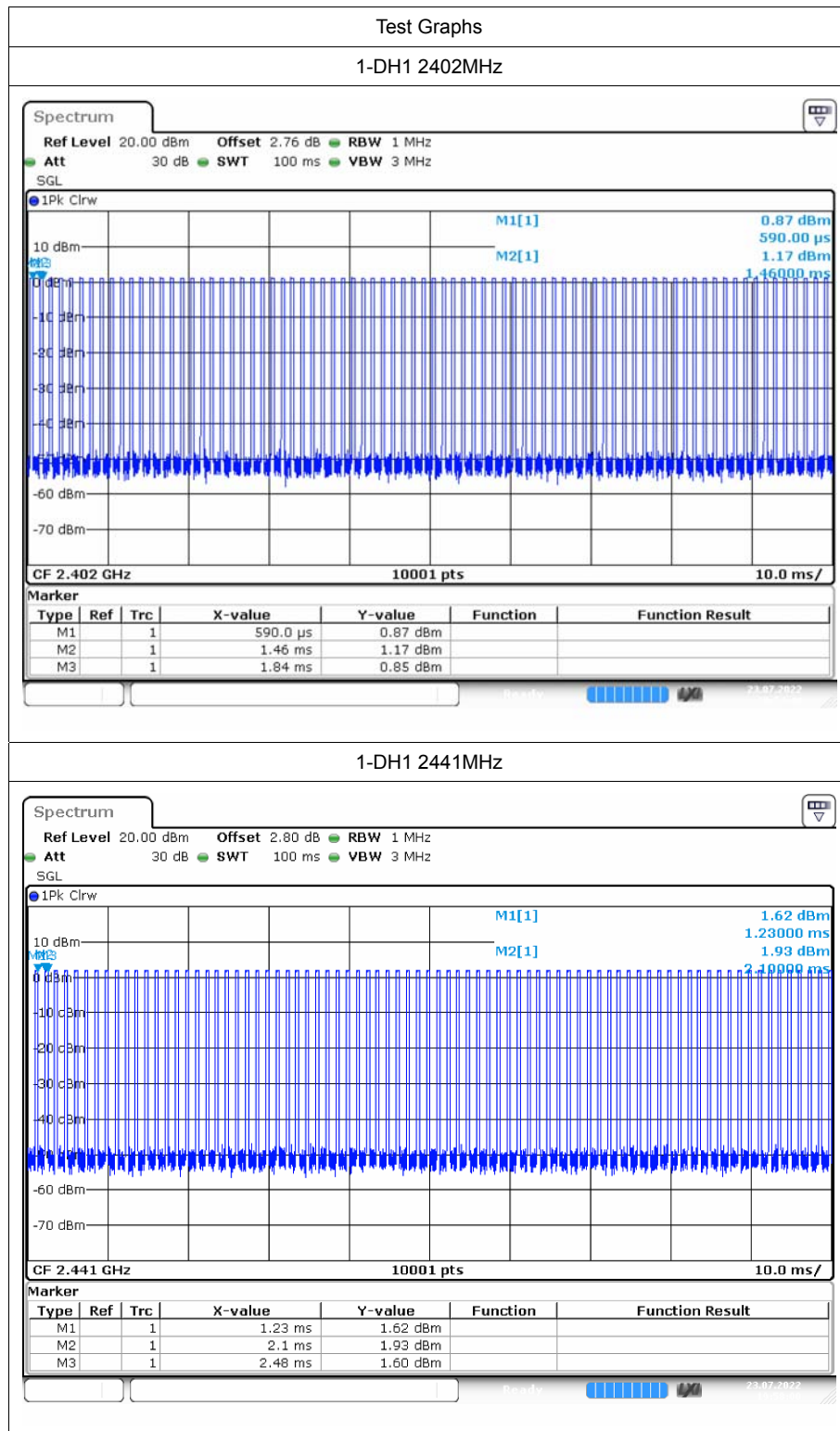


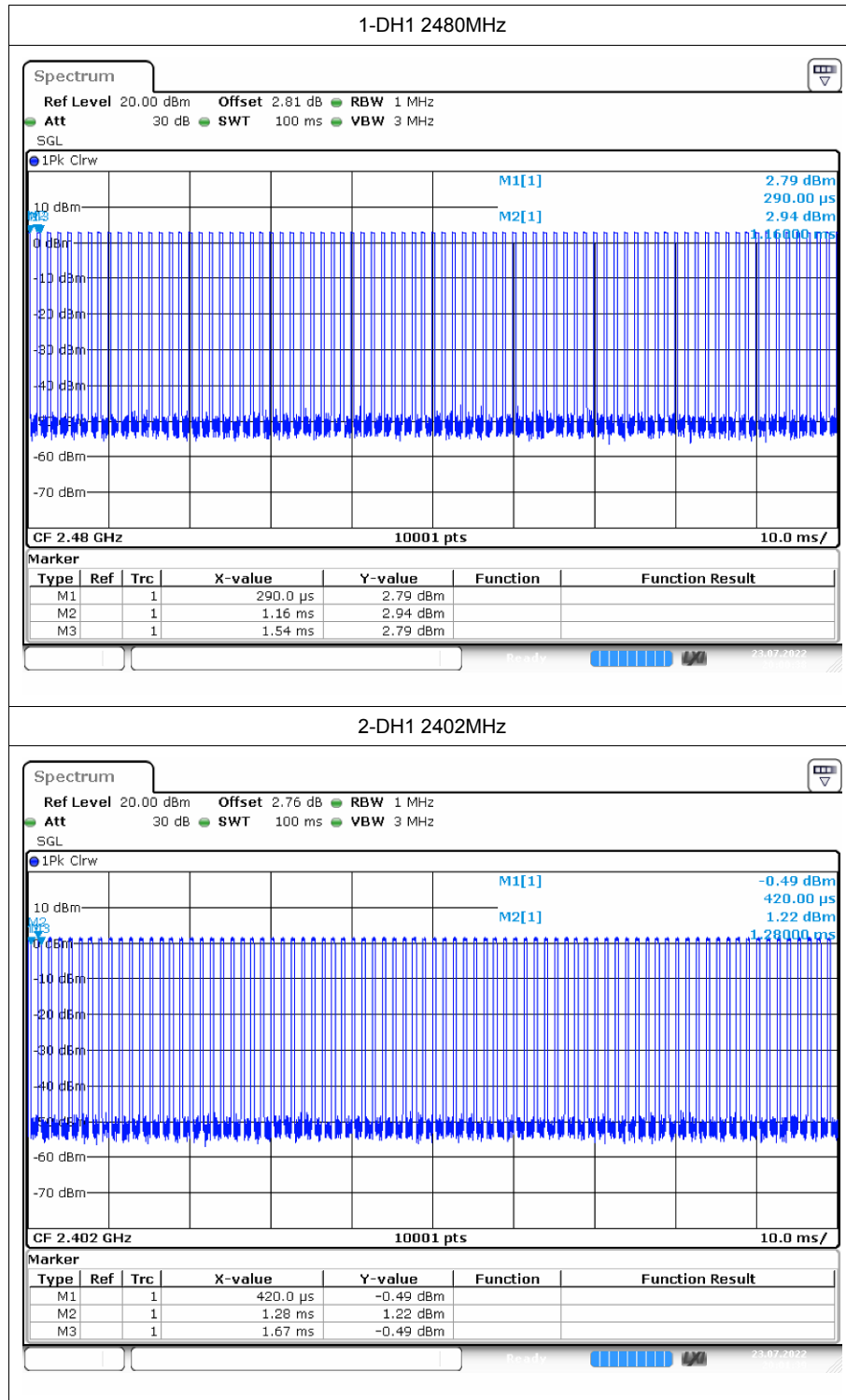
1 Duty Cycle

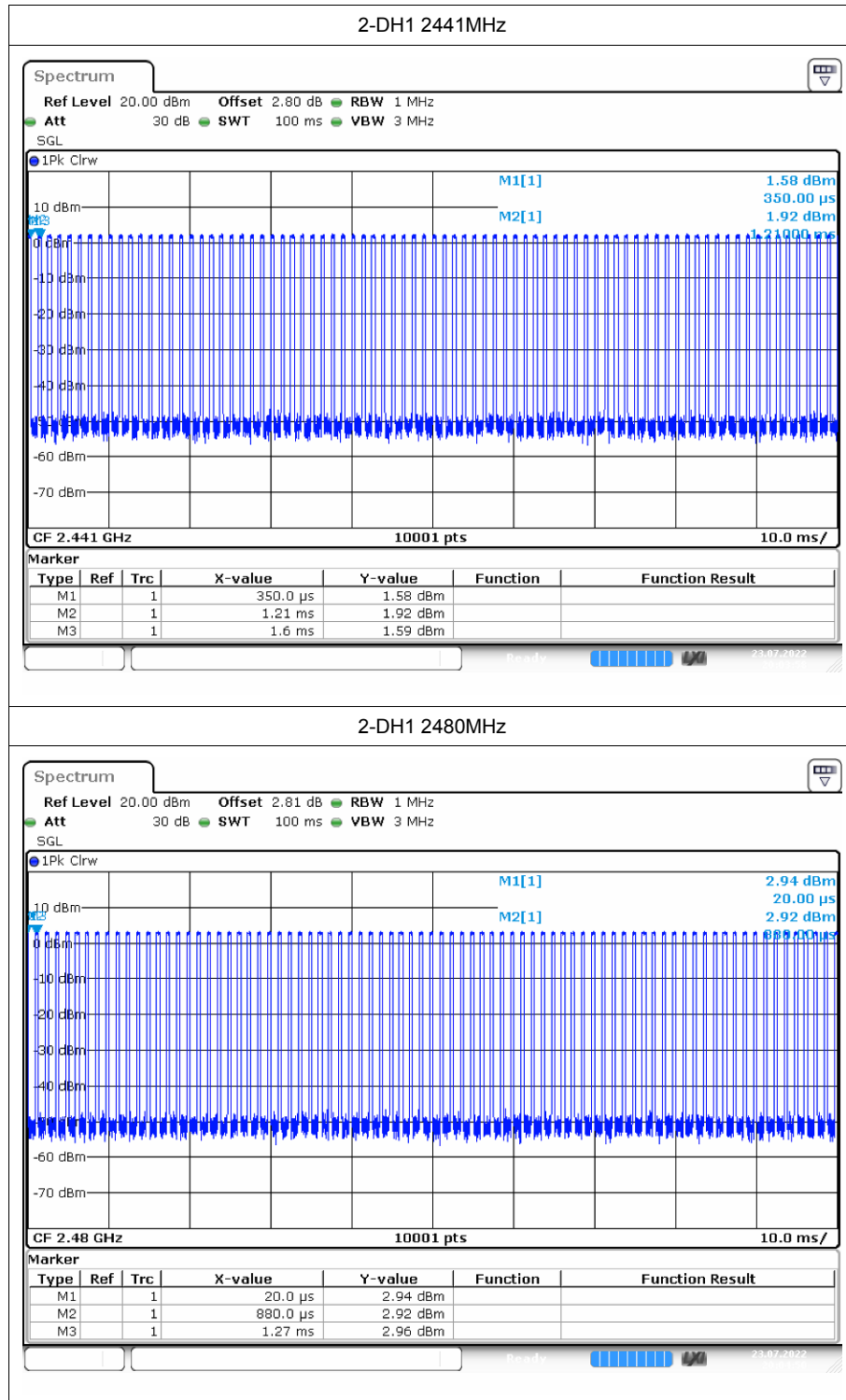
1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.2	2.63
1-DH1	2441	31.2	2.63
1-DH1	2480	31.21	2.63
2-DH1	2402	32	2.56
2-DH1	2441	32.01	2.56
2-DH1	2480	32.01	2.56

1.2 Test Graphs







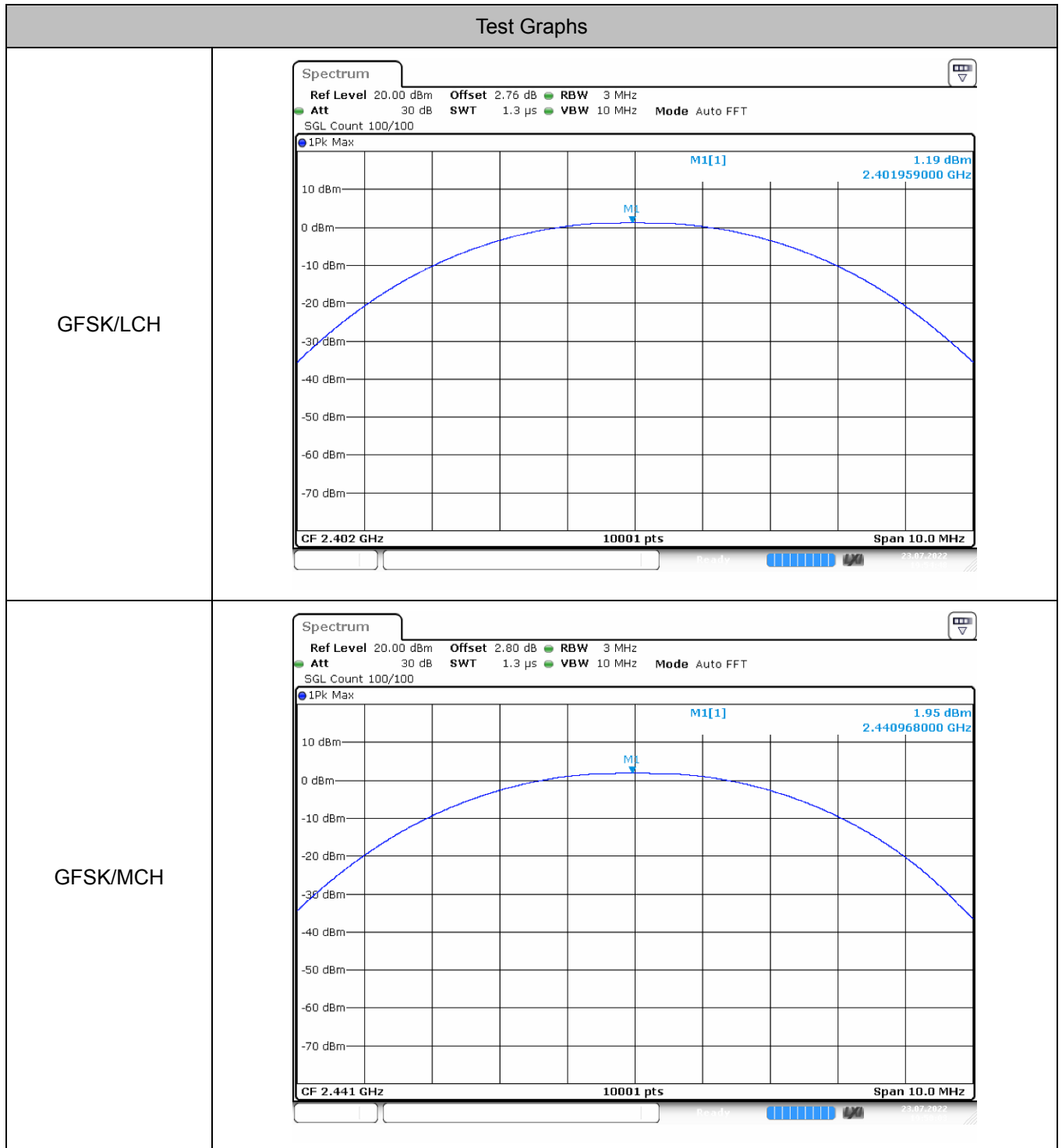


2 Maximum Conducted Peak Output Power

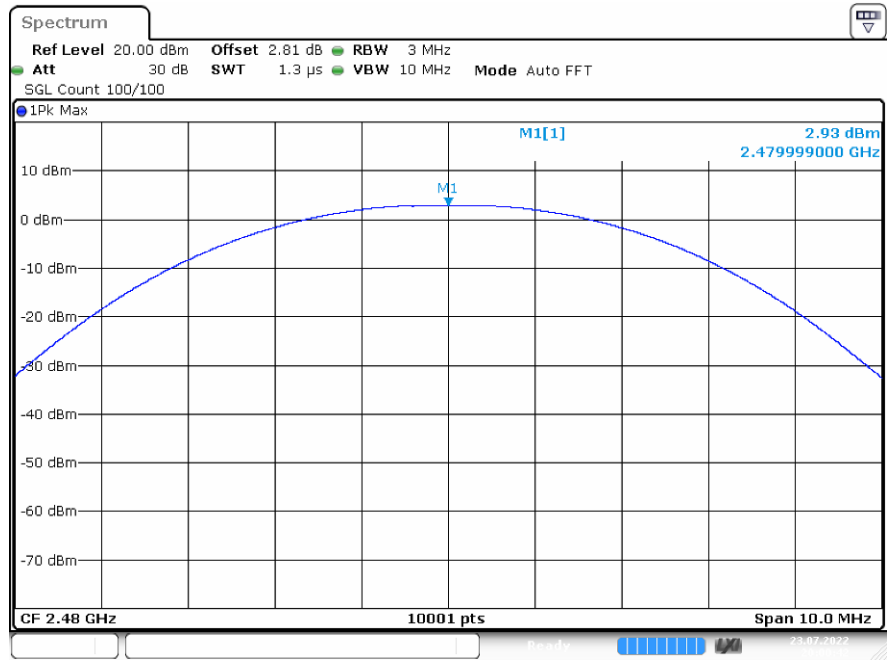
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.19	21	Pass
	MCH	1.95	21	Pass
	HCH	2.93	21	Pass
$\pi/4$ DQPSK	LCH	1.55	21	Pass
	MCH	2.43	21	Pass
	HCH	2.98	21	Pass

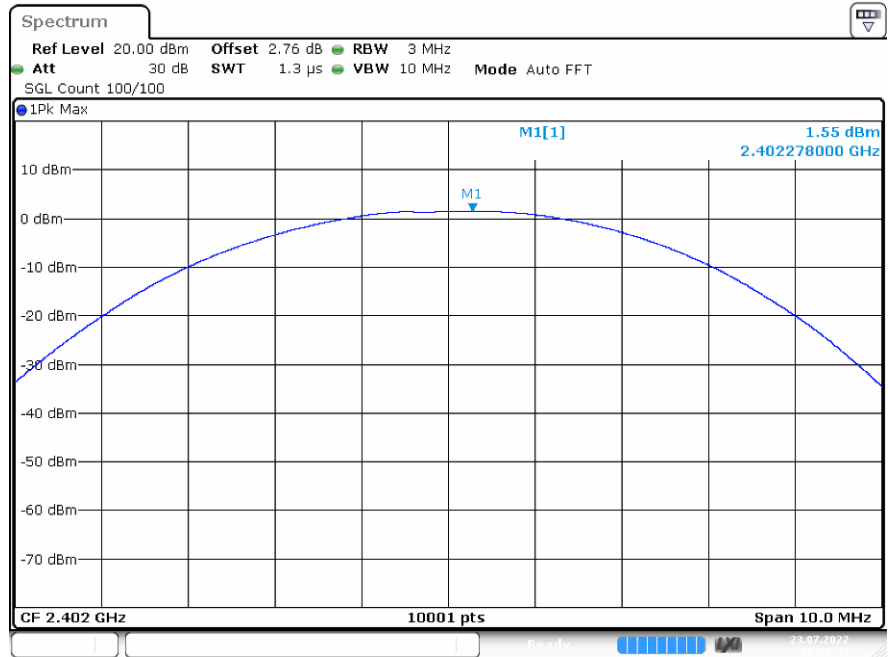
2.2 Test Graphs

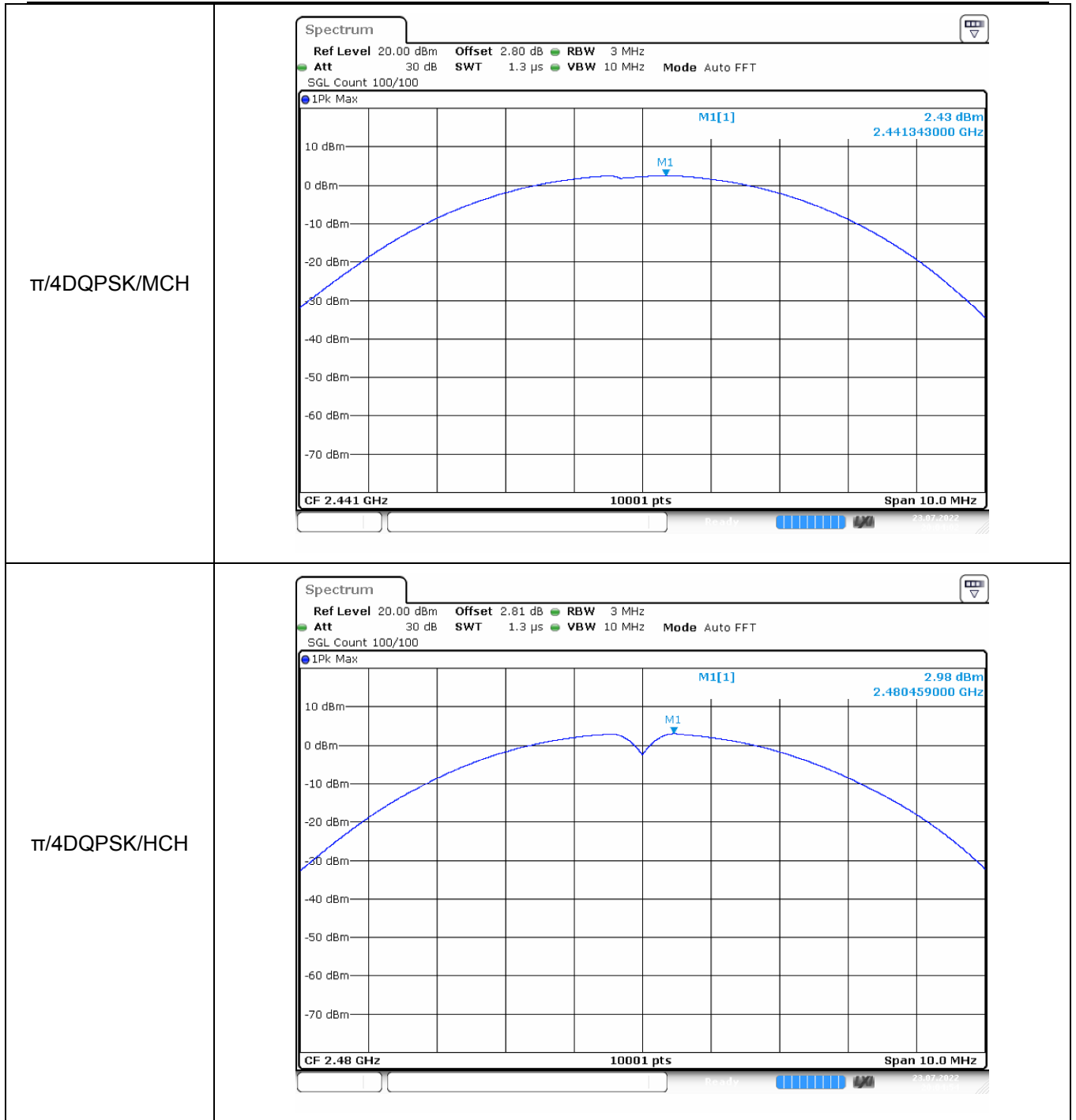


GFSK/HCH



$\pi/4$ DQPSK/LCH





3 20dB Bandwidth

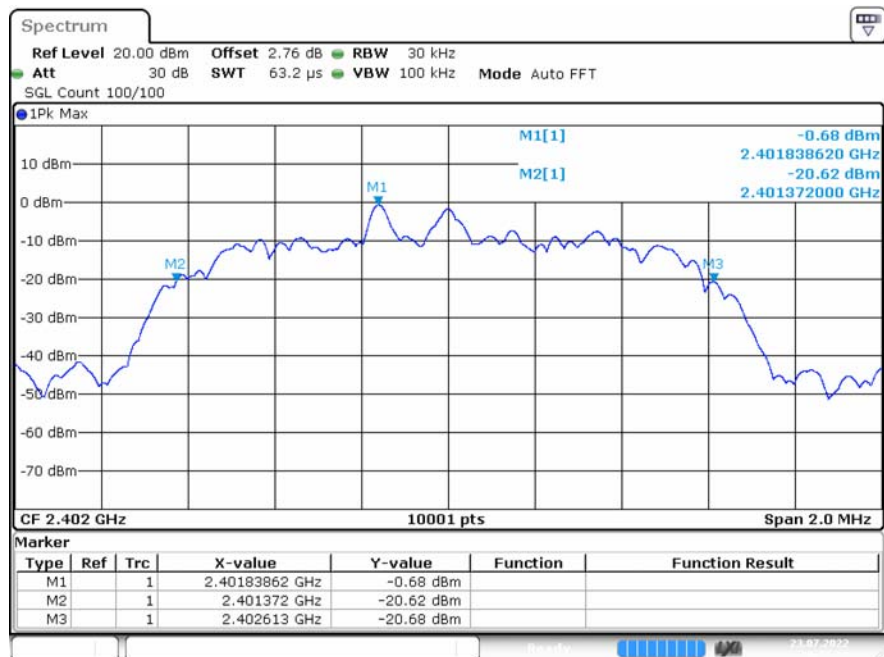
3.1 Test Result

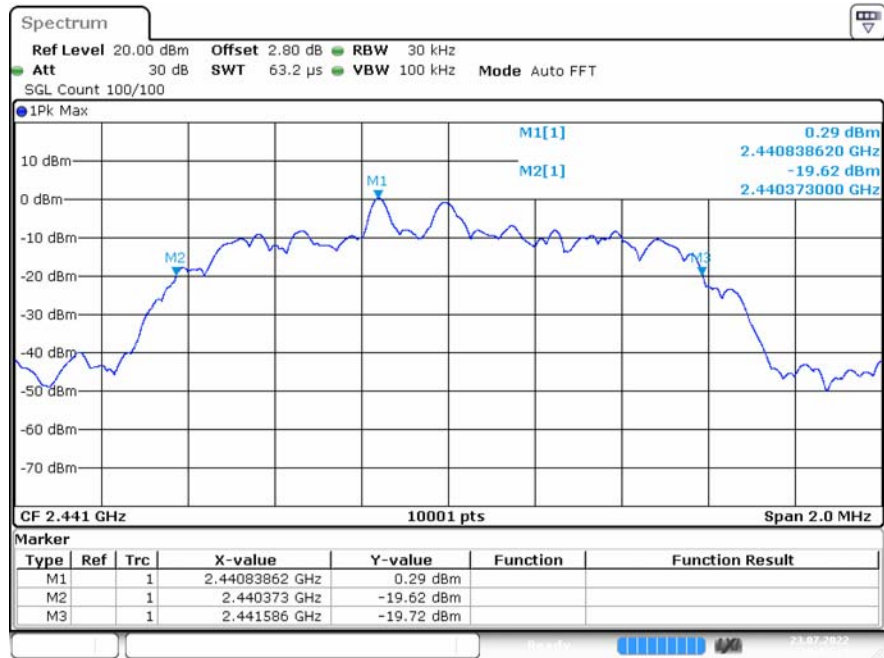
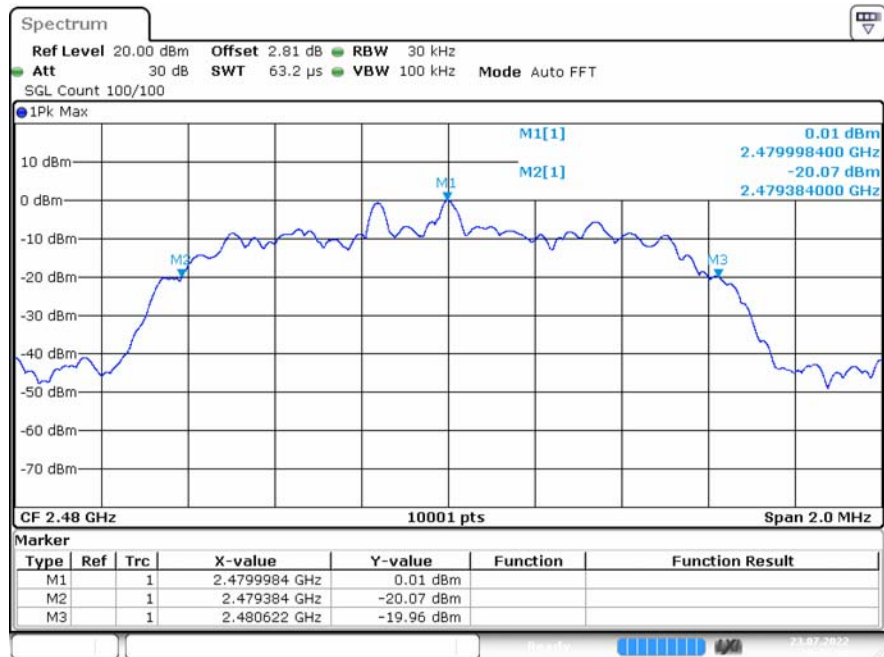
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.85	Not Specified	Pass
	MCH	0.854	Not Specified	Pass
	HCH	0.802	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.241	Not Specified	Pass
	MCH	1.213	Not Specified	Pass
	HCH	1.238	Not Specified	Pass

3.2 Test Graphs



GFSK/HCH


 $\pi/4$ DQPSK/LCH


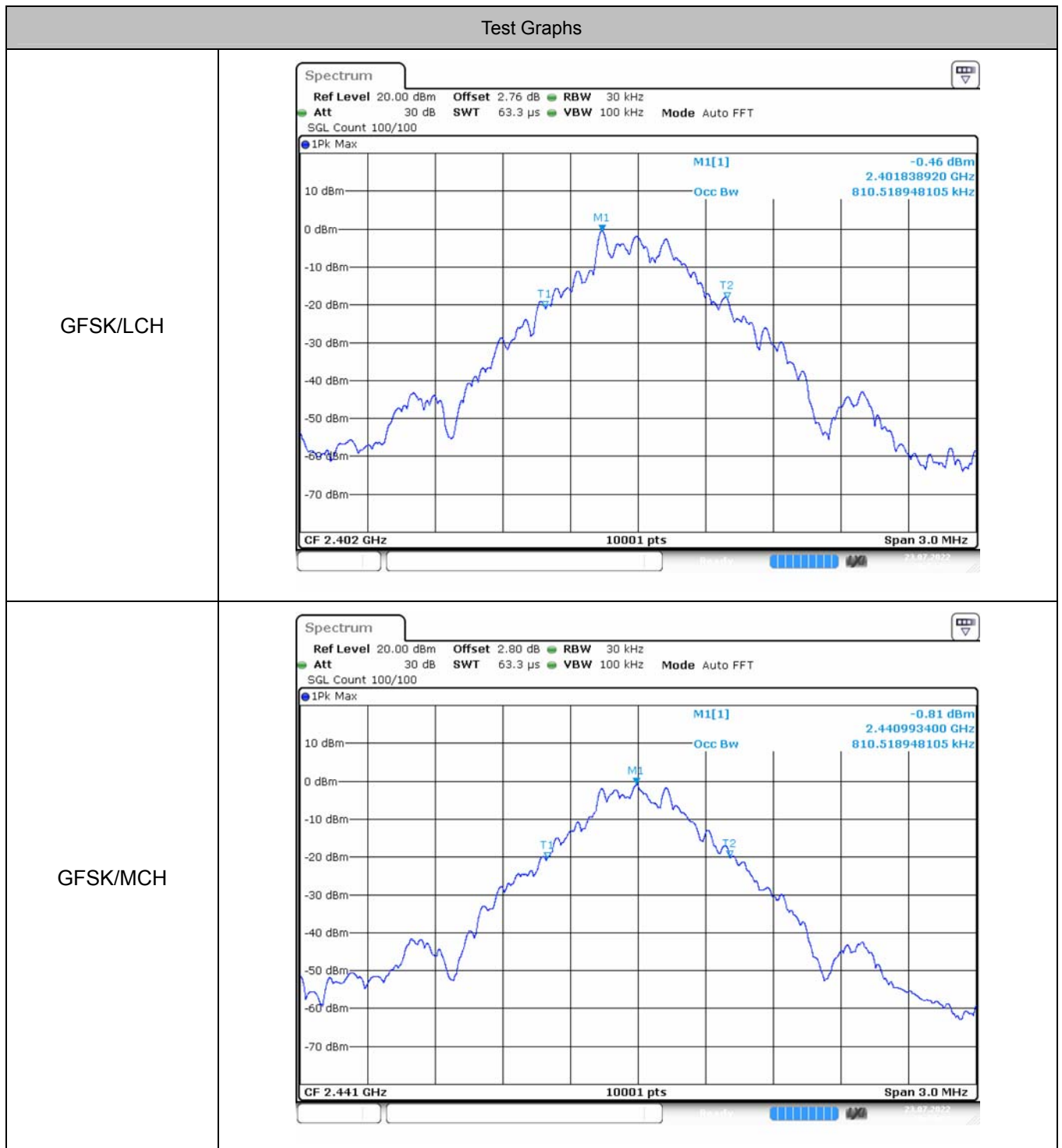
$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


4 Occupied Bandwidth

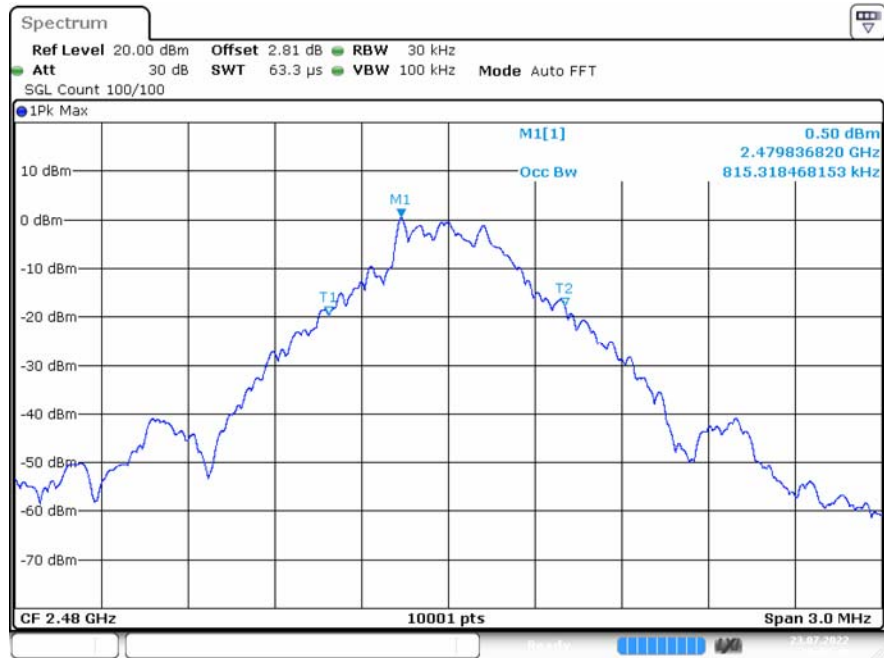
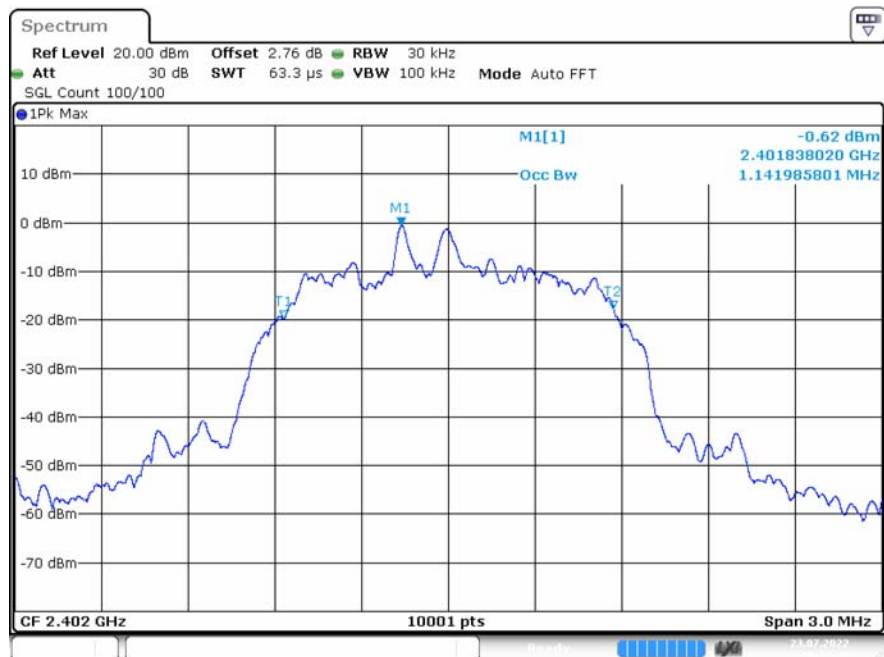
4.1 Test Result

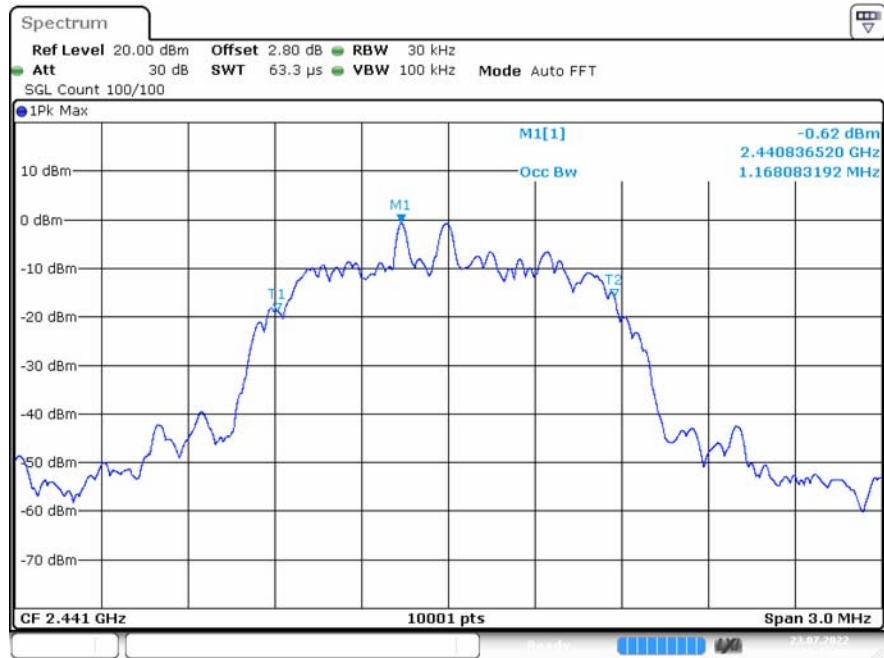
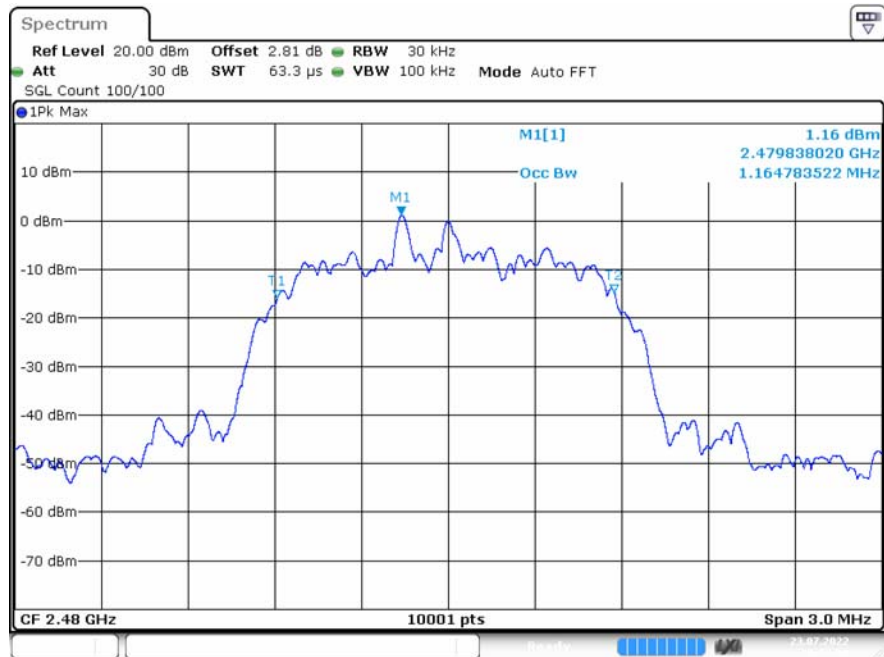
Mode	Channel.	99% Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.811	Not Specified	PASS
	MCH	0.811	Not Specified	PASS
	HCH	0.815	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.142	Not Specified	PASS
	MCH	1.168	Not Specified	PASS
	HCH	1.165	Not Specified	PASS

4.2 Test Graphs



GFSK/HCH


 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


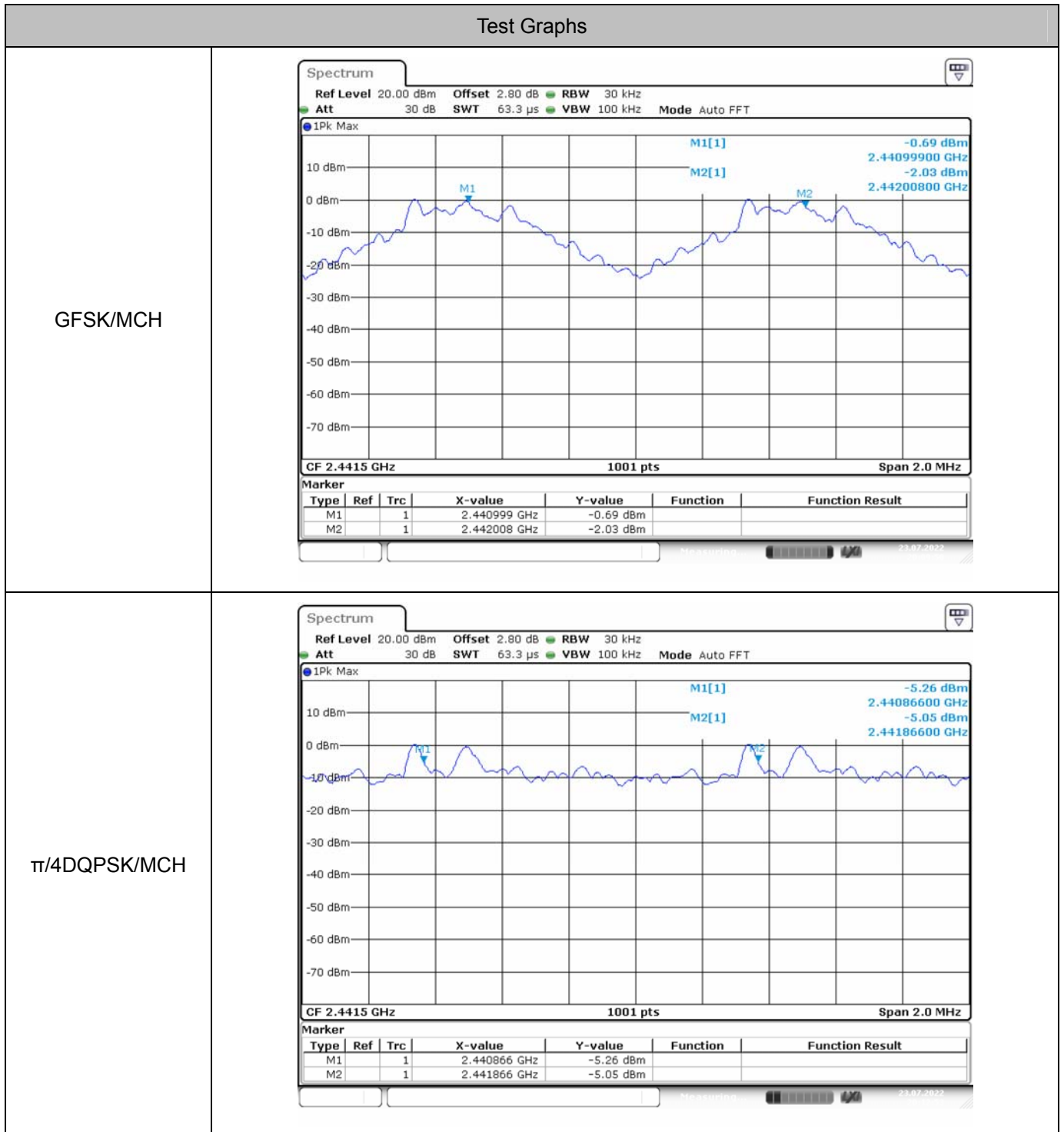


5 Carrier Frequency Separation

5.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.009	0.569	Pass
$\pi/4$ DQPSK	MCH	1	0.809	Pass

5.2 Test Graphs



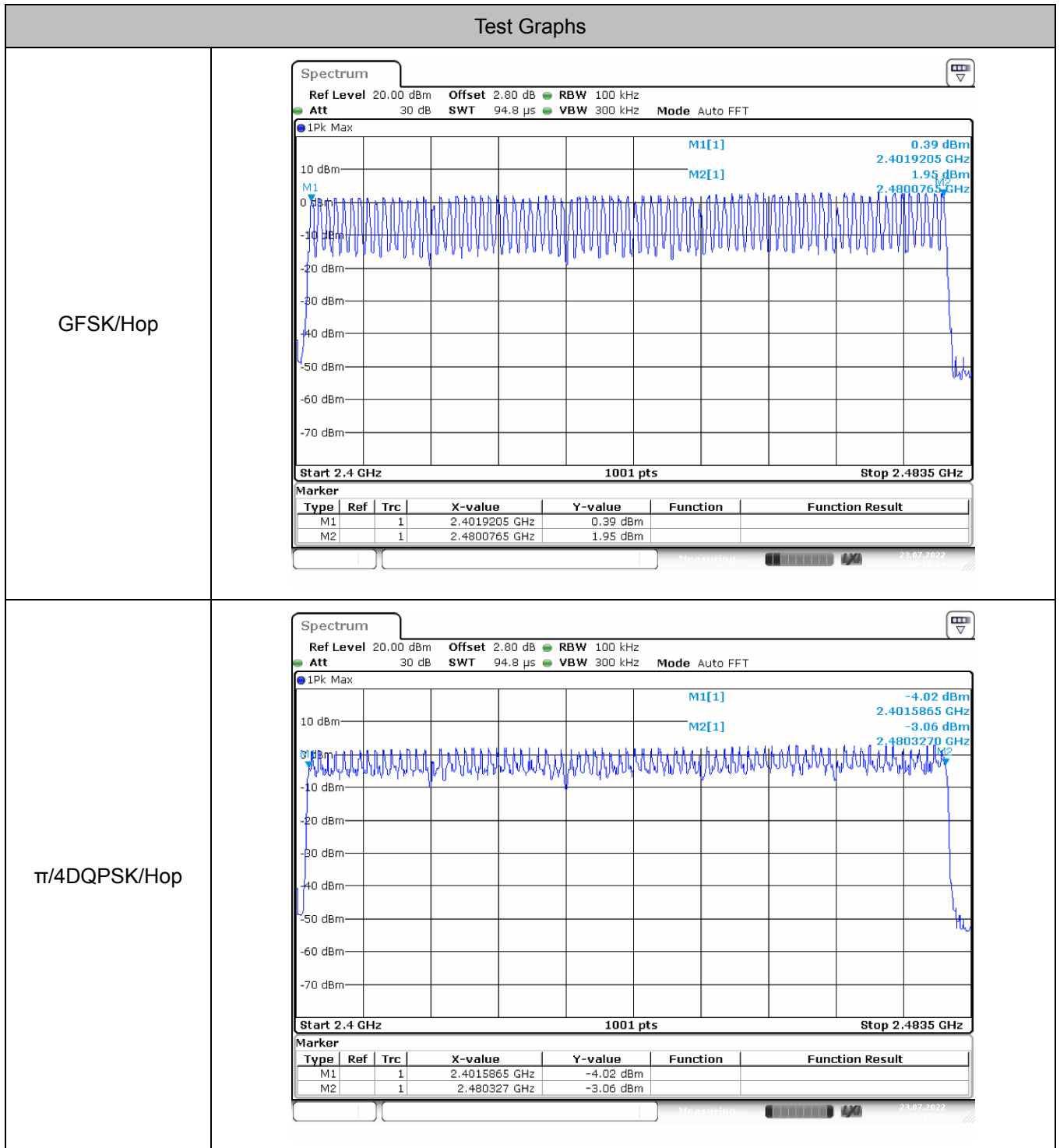


6 Hopping Channel Number

6.1 Test Result

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

6.2 Test Graphs



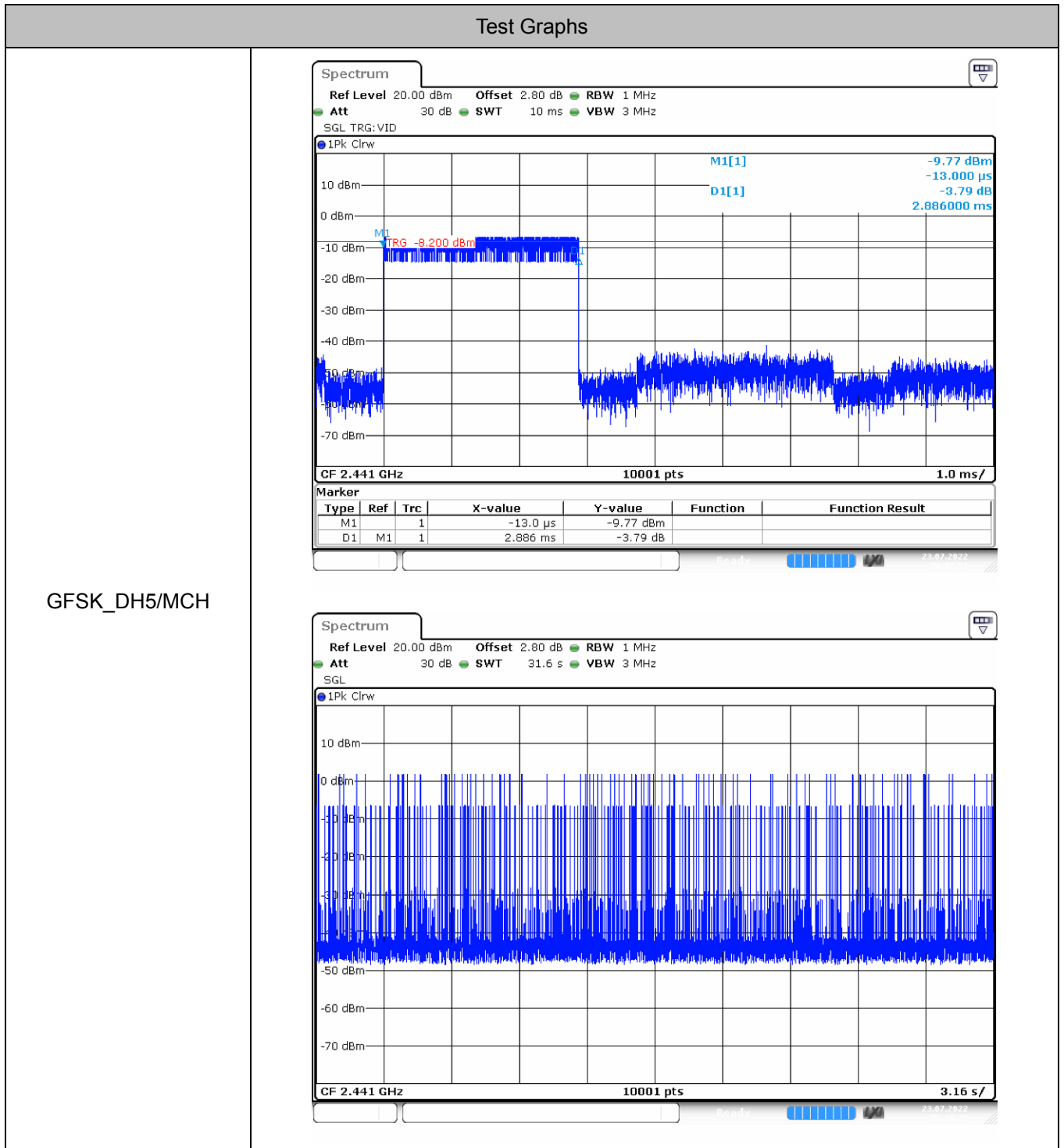


7 Dwell Time

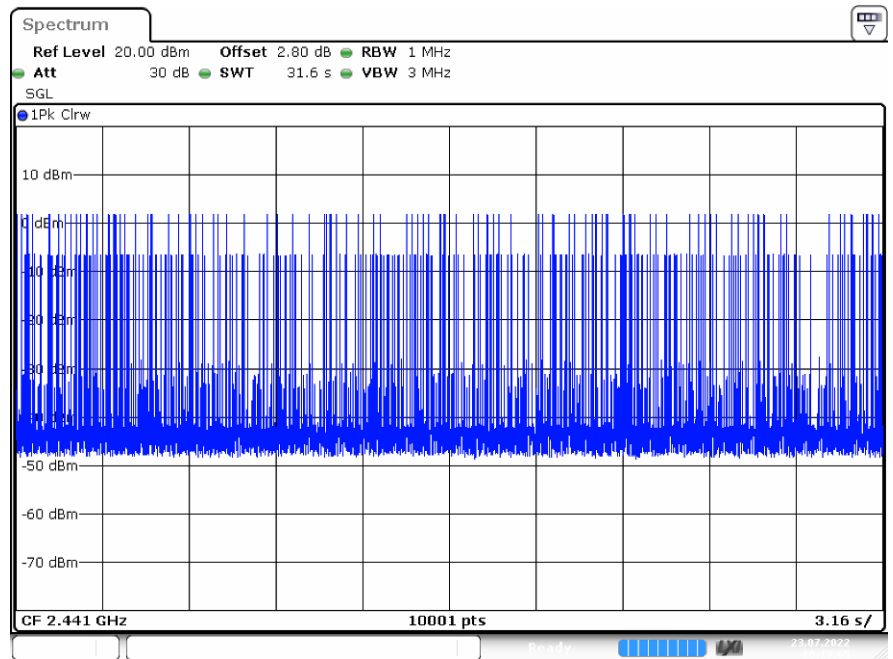
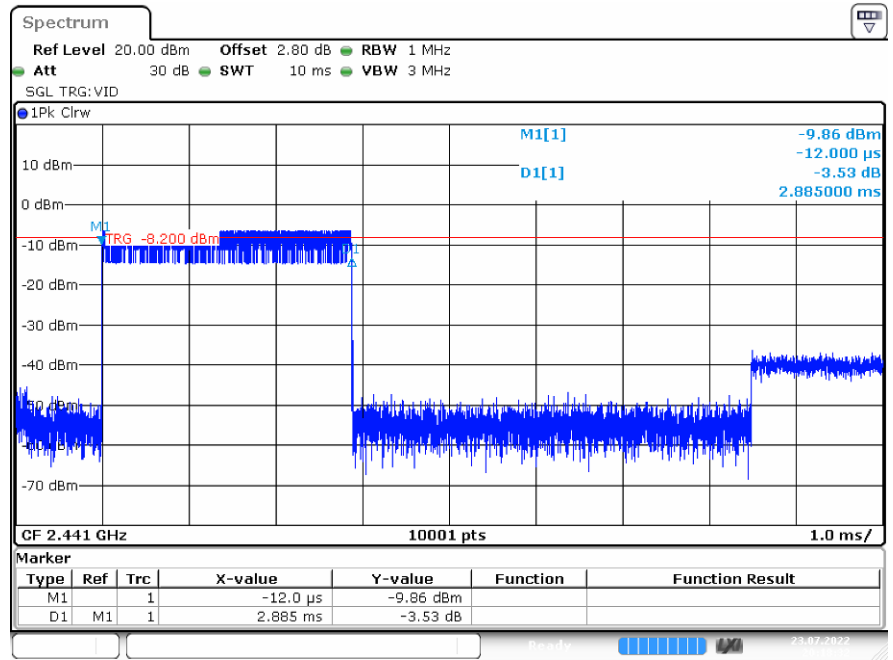
7.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.886	93	268.398	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.885	109	314.465	0.4	Pass

7.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH

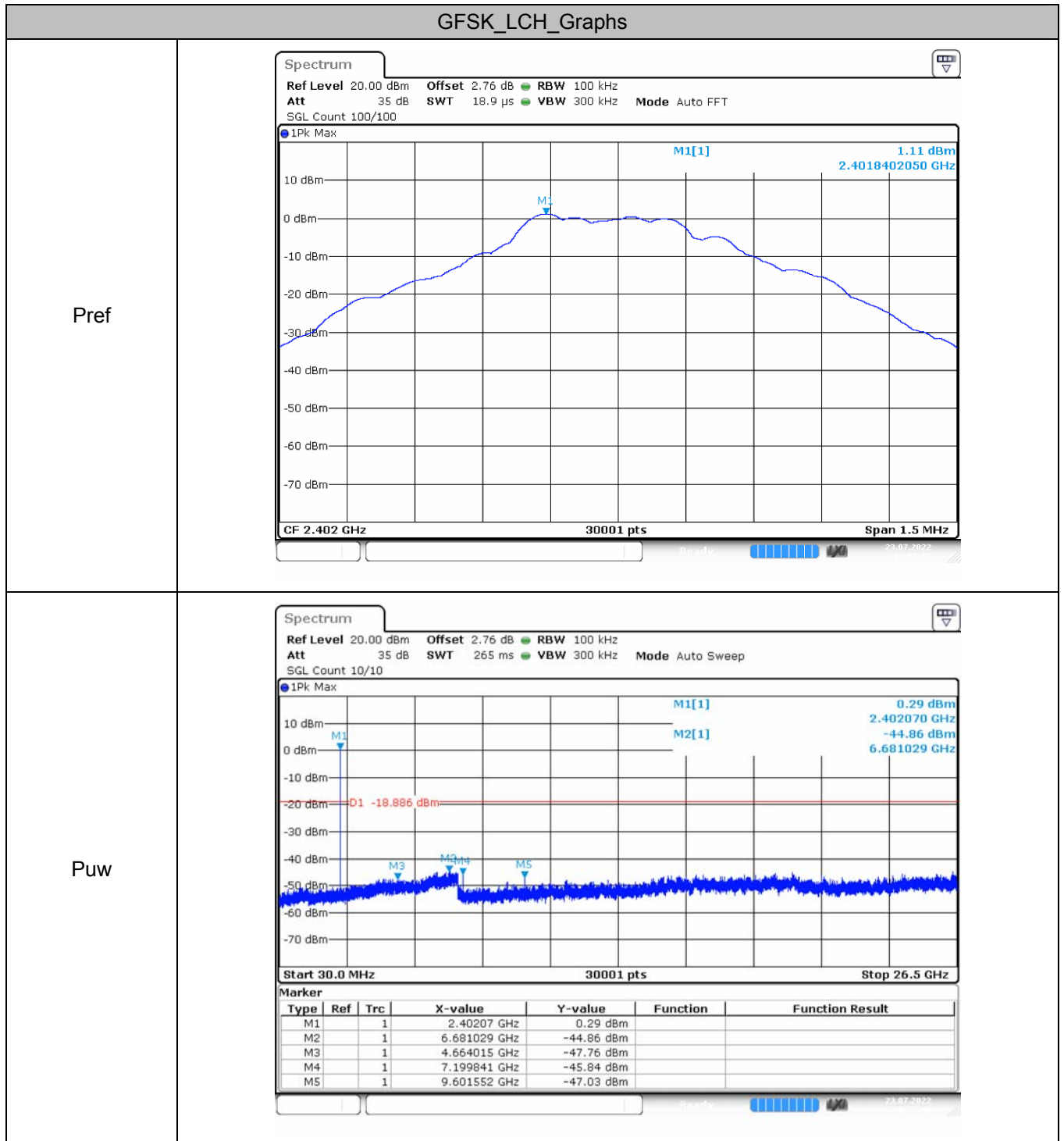


8 RF Conducted Spurious Emissions

8.1 Test Result

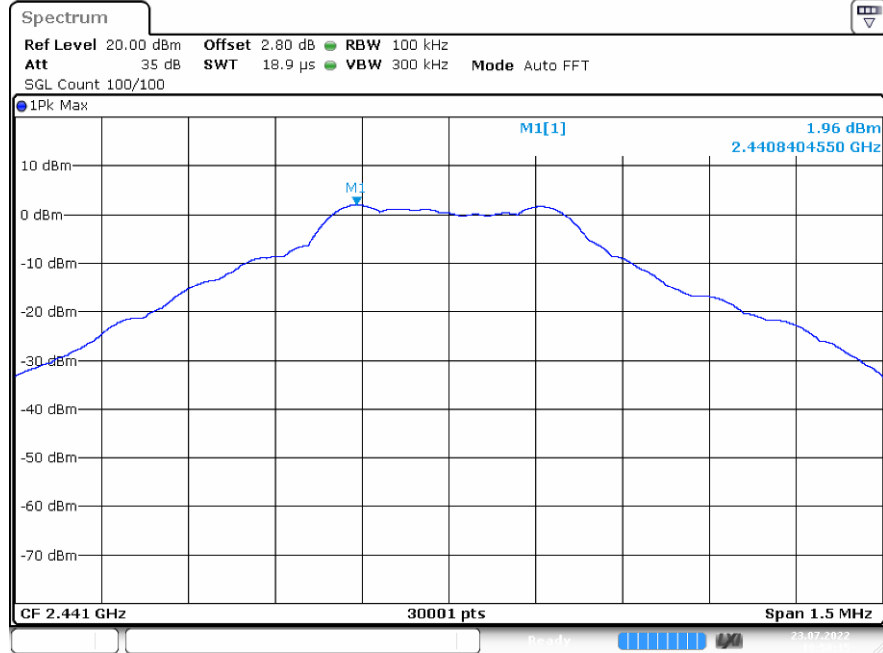
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-45.97	-20	Pass
	MCH	-46.56	-20	Pass
	HCH	-47.13	-20	Pass
$\pi/4$ DQPSK	LCH	-45.06	-20	Pass
	MCH	-45.45	-20	Pass
	HCH	-46.69	-20	Pass

8.2 Test Graphs

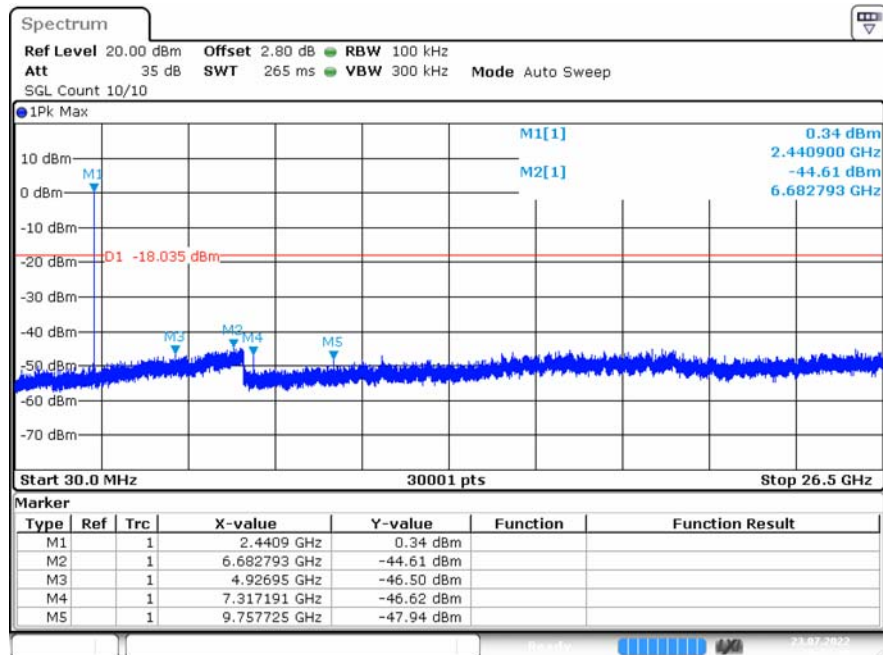


GFSK_MCH_Graphs

Pref

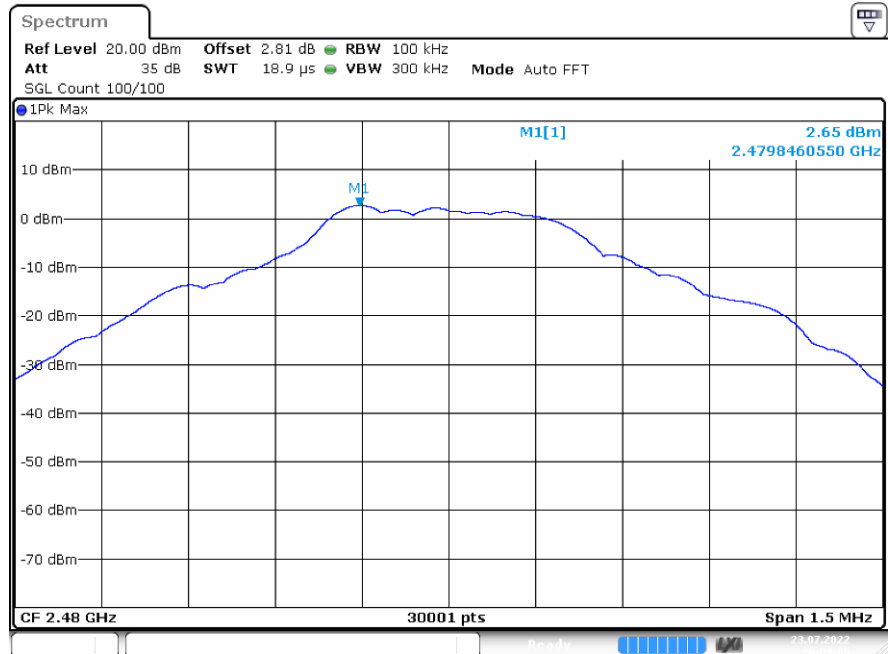


Puw

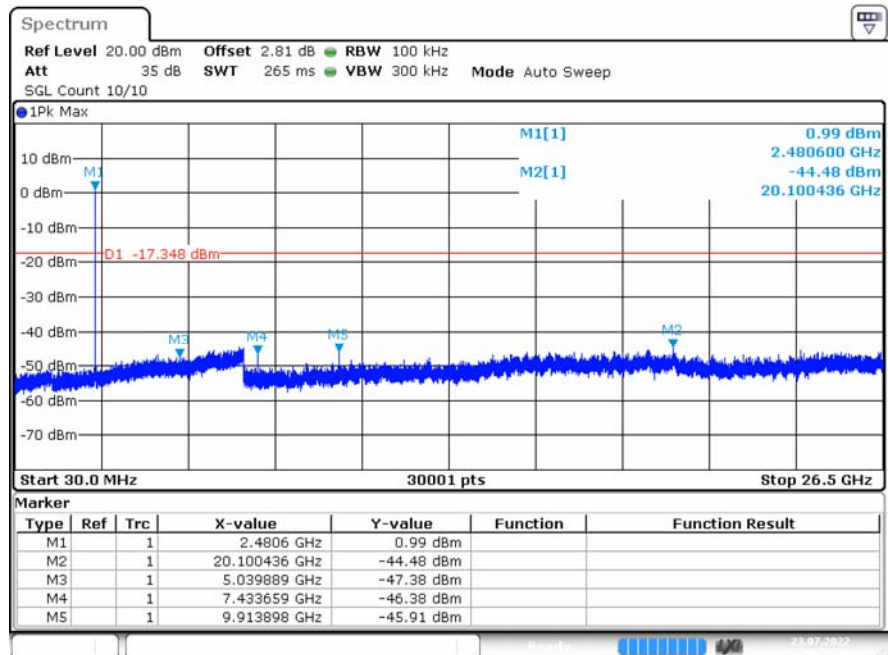


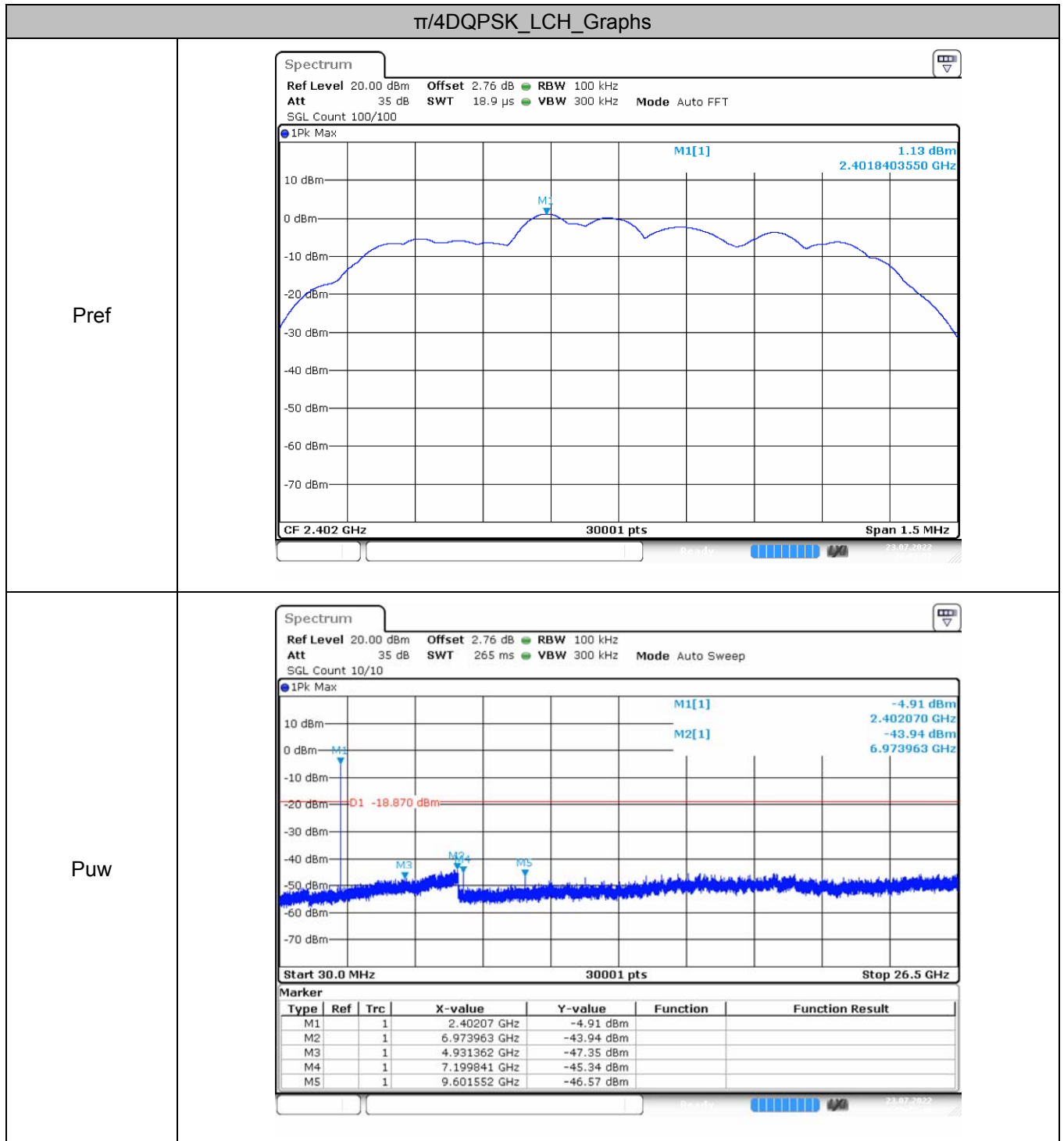
GFSK_HCH_Graphs

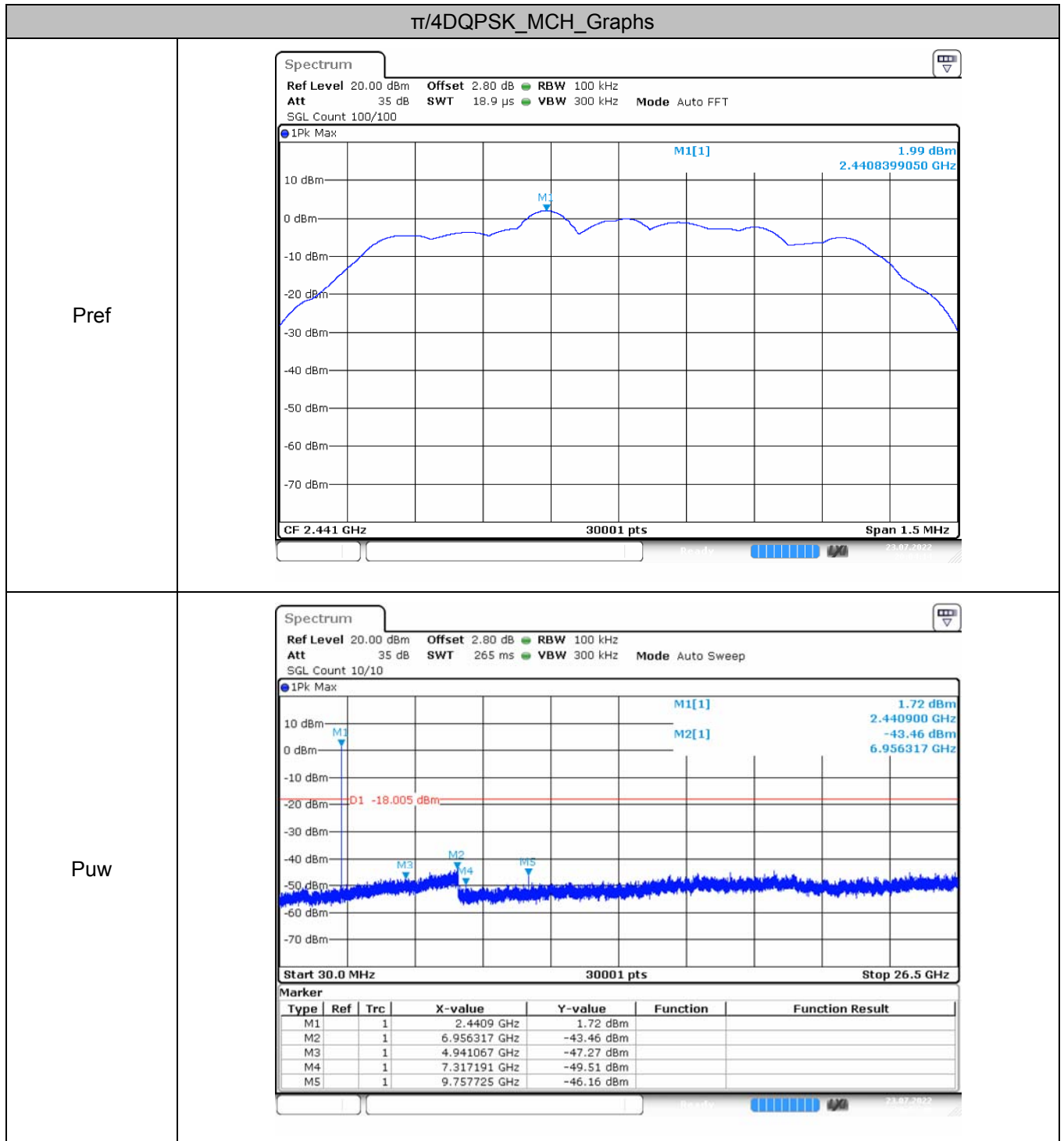
Pref



Puw

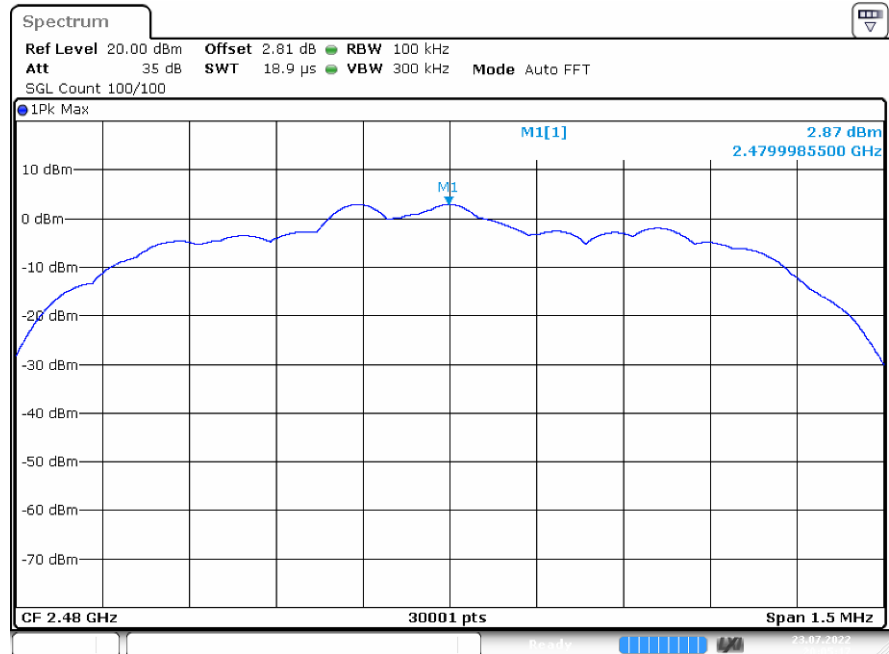




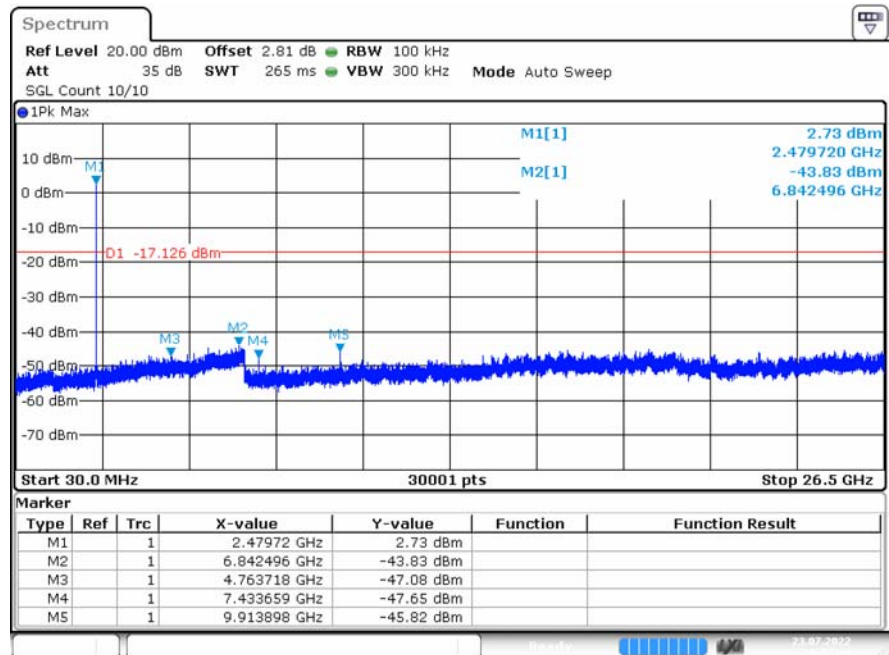


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

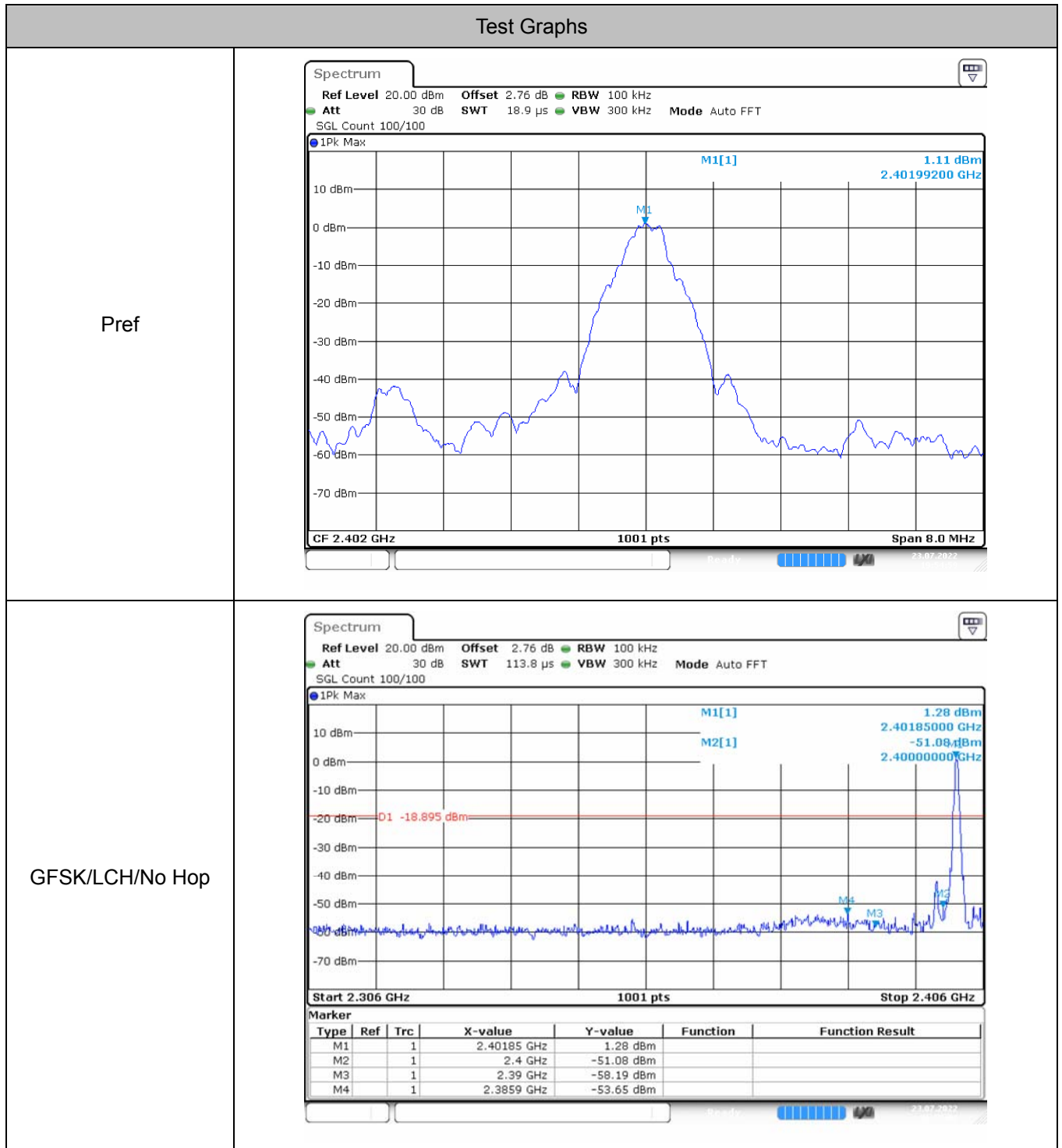


9 Band-edge for RF Conducted Emissions

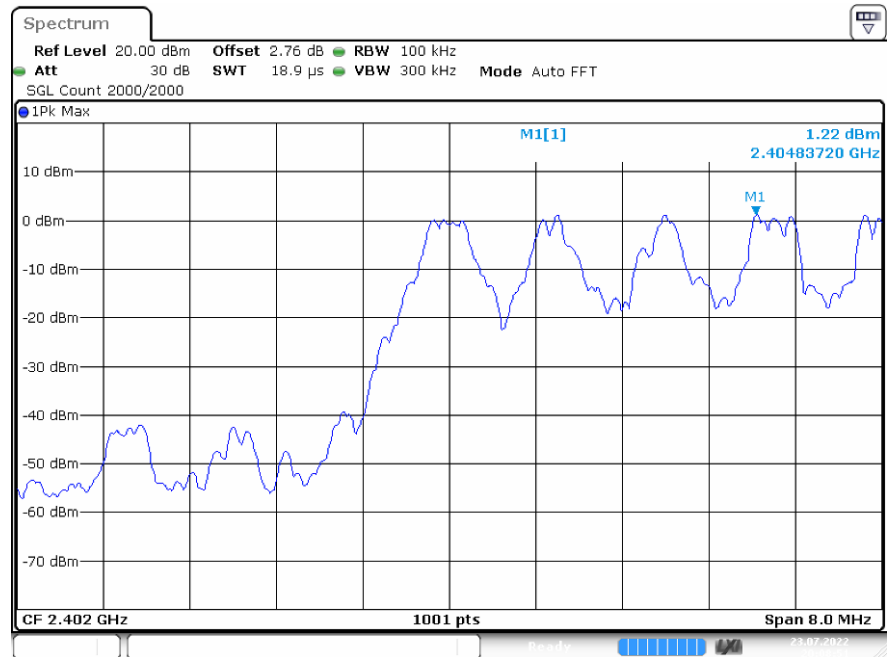
9.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-54.76	-20	Pass
			On	-53.11	-20	Pass
	HCH	2480	Off	-53.42	-20	Pass
			On	-53.25	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-54.27	-20	Pass
			On	-53.84	-20	Pass
	HCH	2480	Off	-54.7	-20	Pass
			On	-53.61	-20	Pass

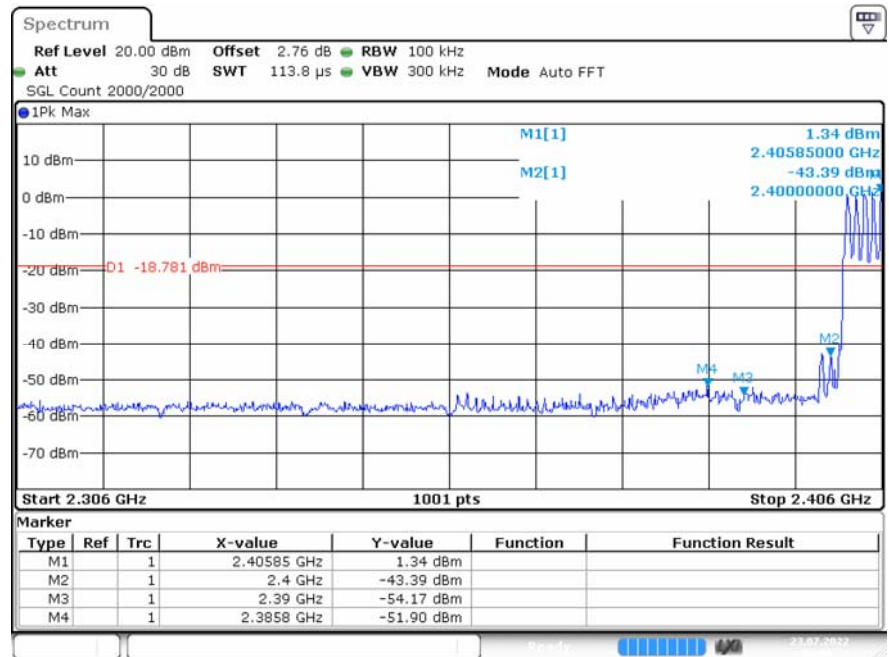
9.2 Test Graphs



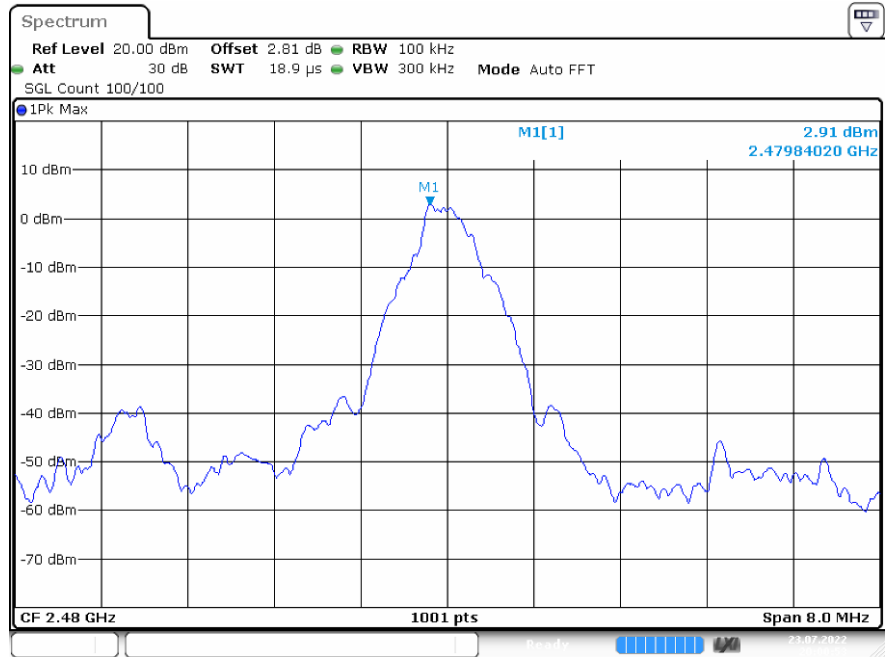
Ref



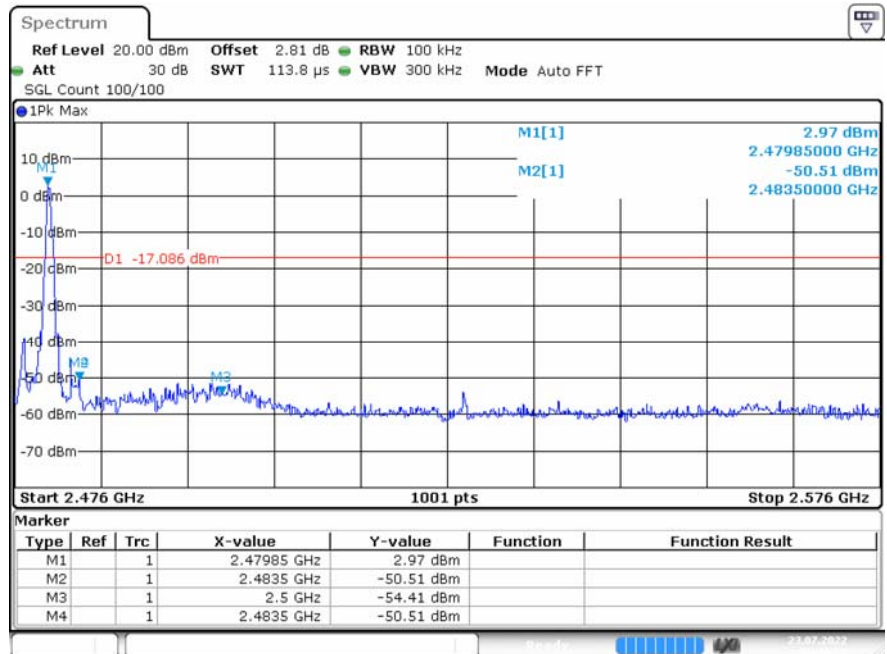
GFSK/LCH/Hop



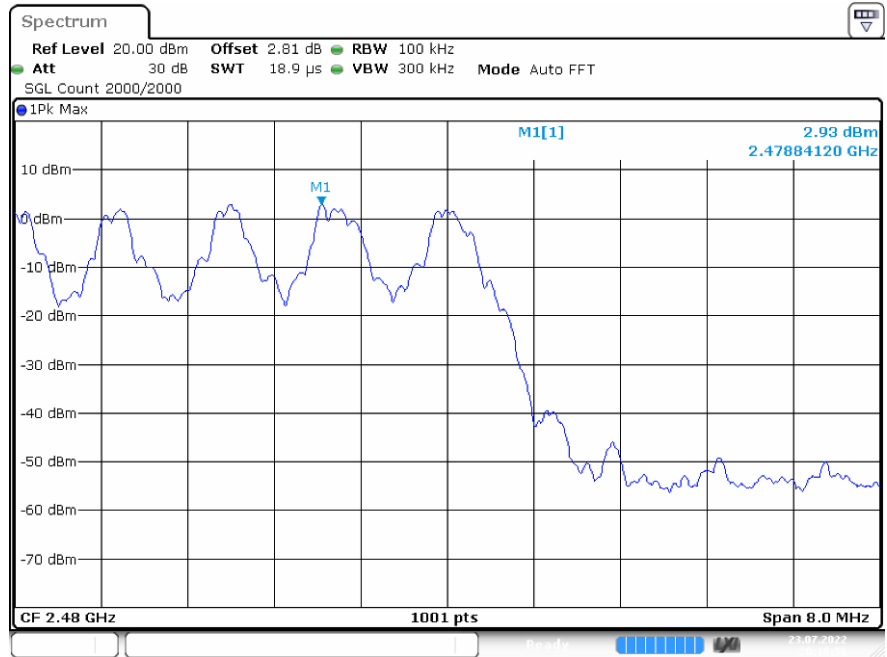
Ref



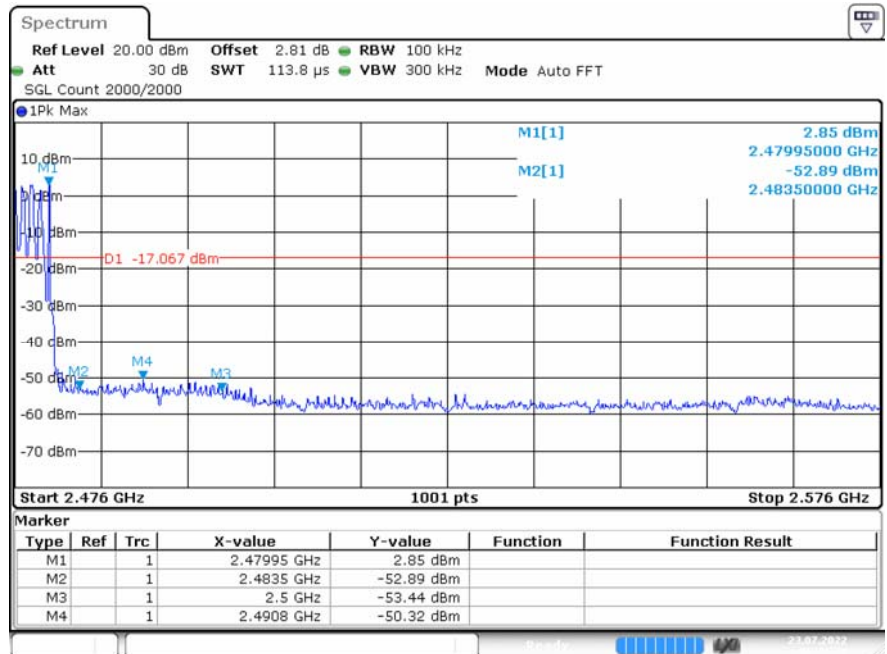
GFSK/HCH/No Hop



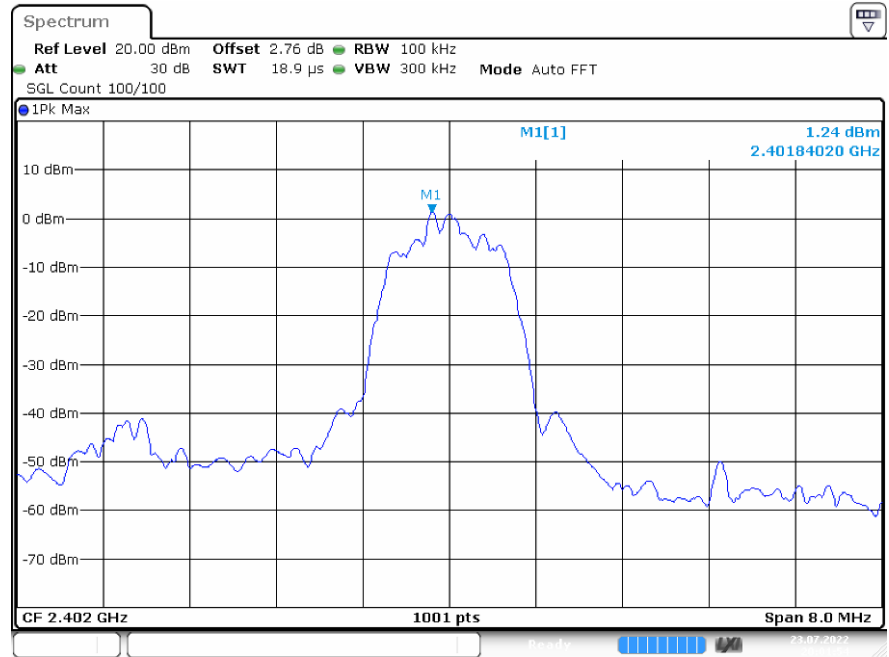
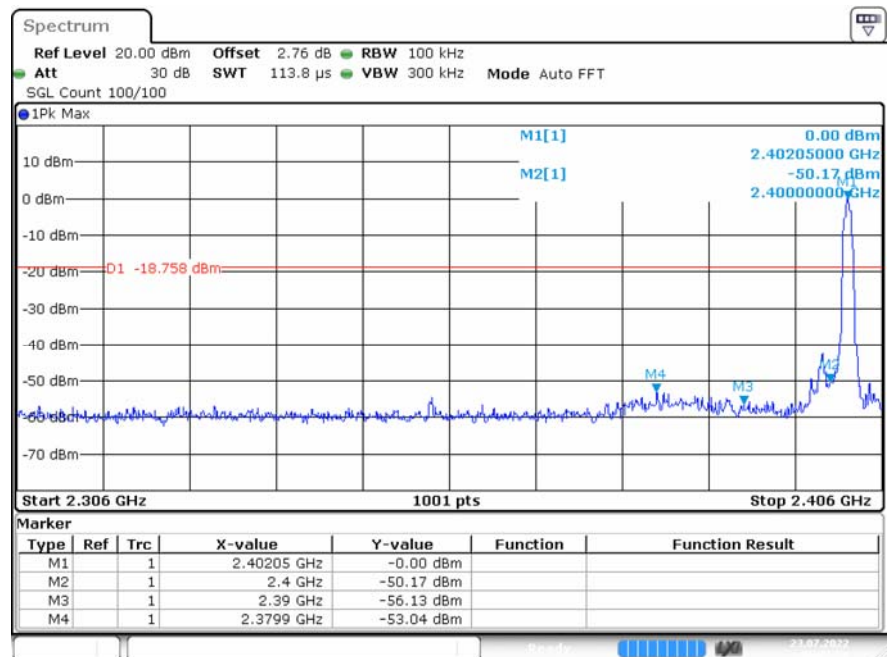
Ref.



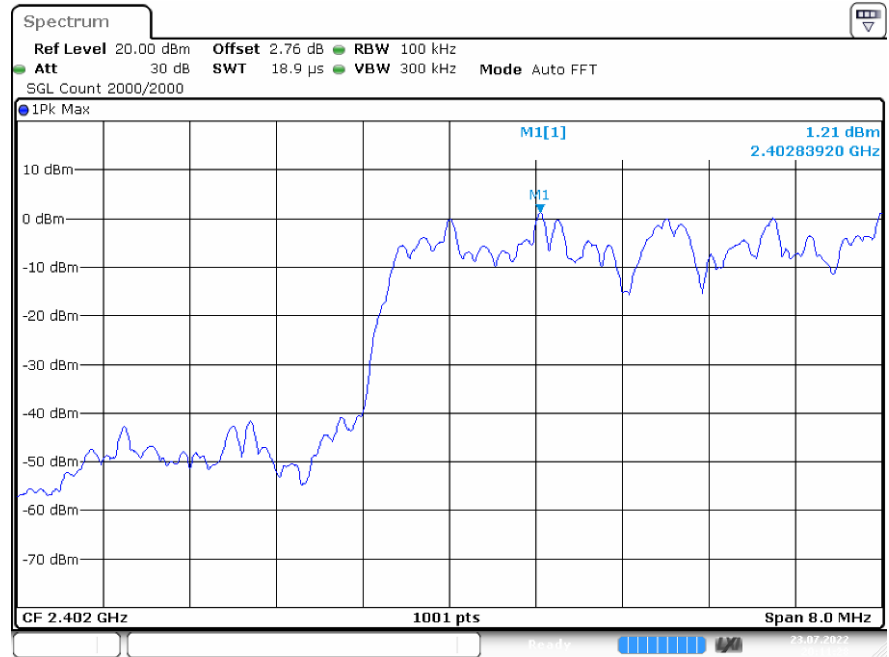
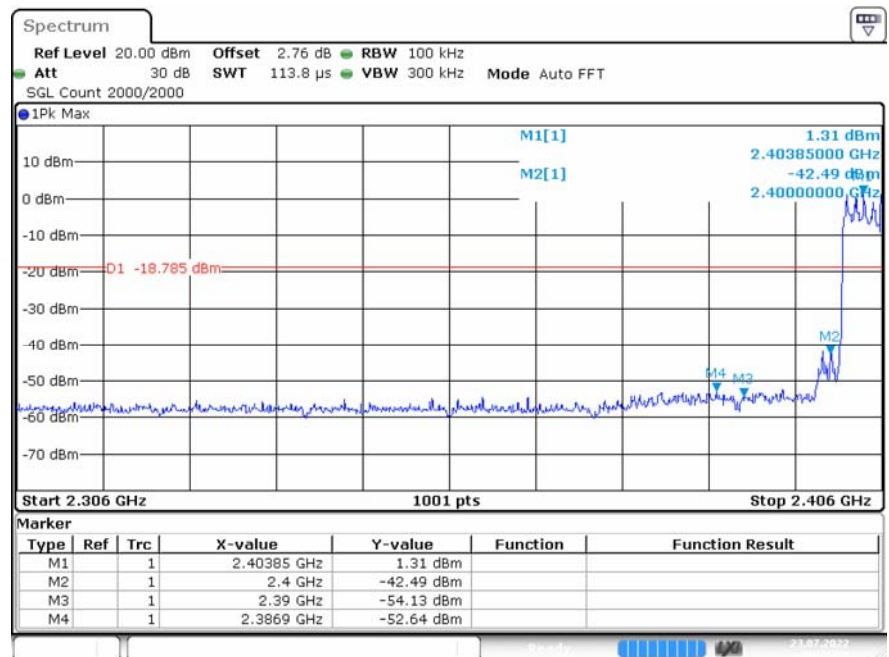
GFSK/HCH/Hop



Ref


 $\pi/4$ DQPSK/LCH/No
Hop


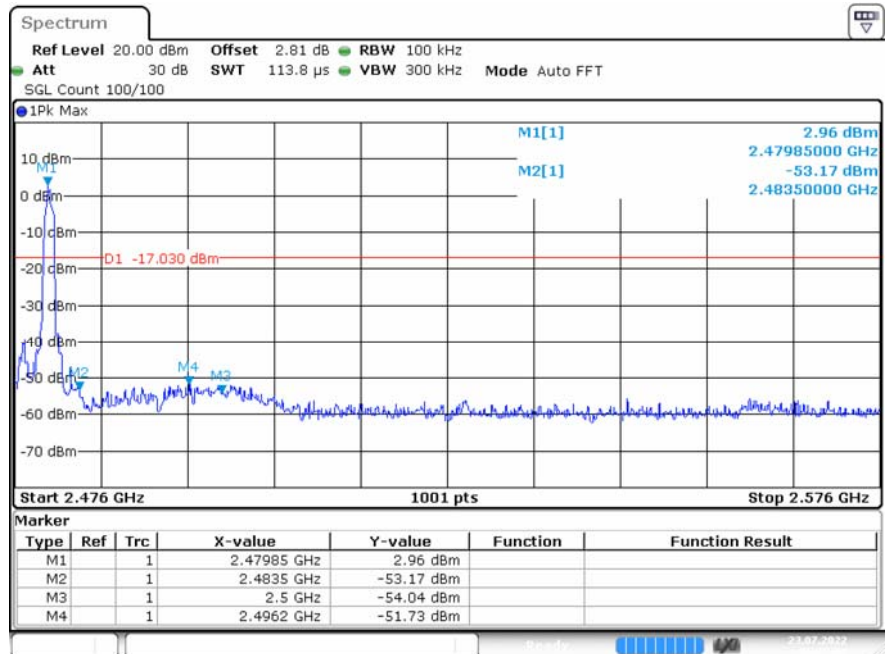
Ref


 $\pi/4$ DQPSK/LCH/Hop


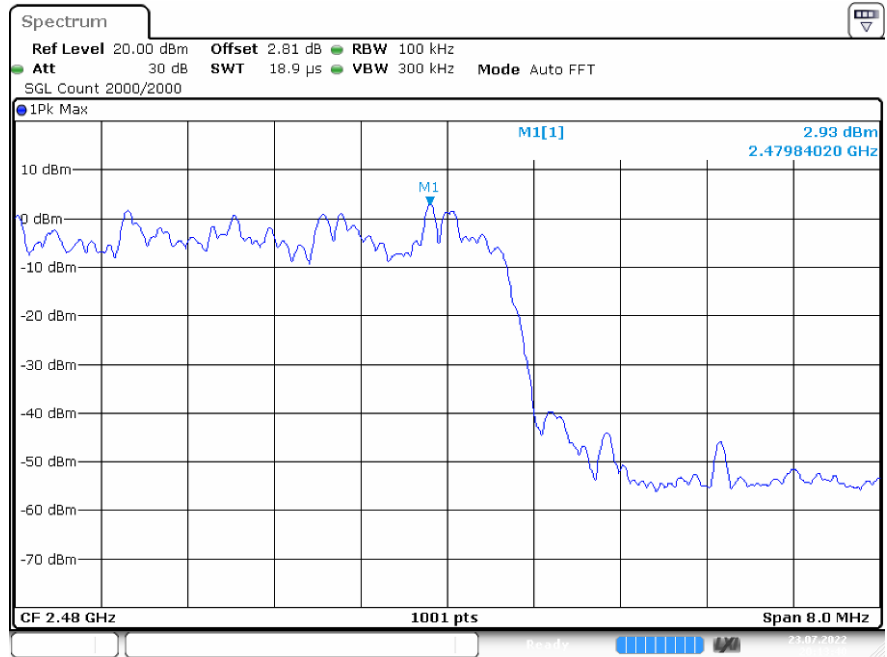
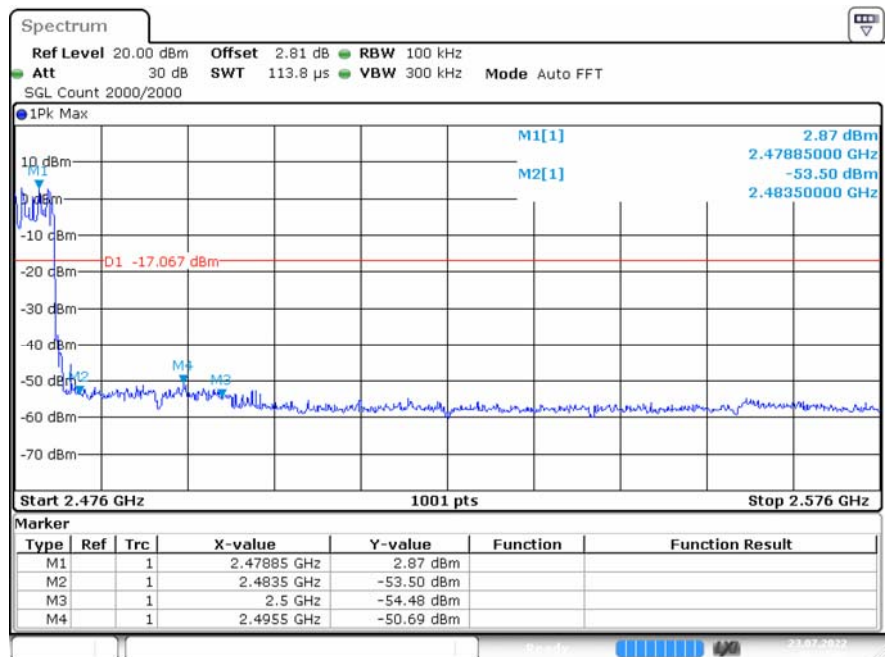
Ref



$\pi/4$ DQPSK/HCH/No
Hop



Ref


 $\pi/4$ DQPSK/HCH/Hop


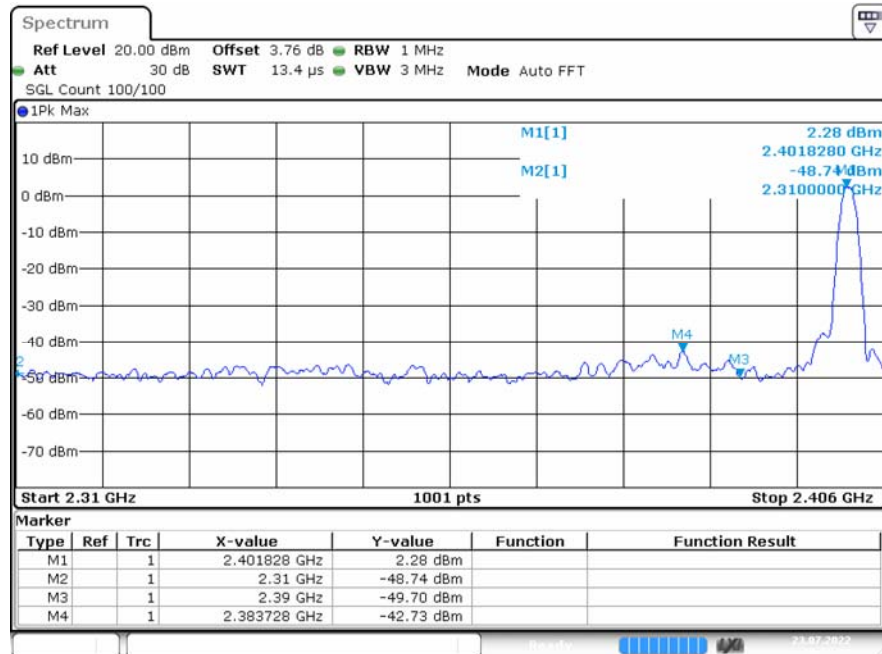
10 Restrict-band band-edge measurements

10.1 Test Result

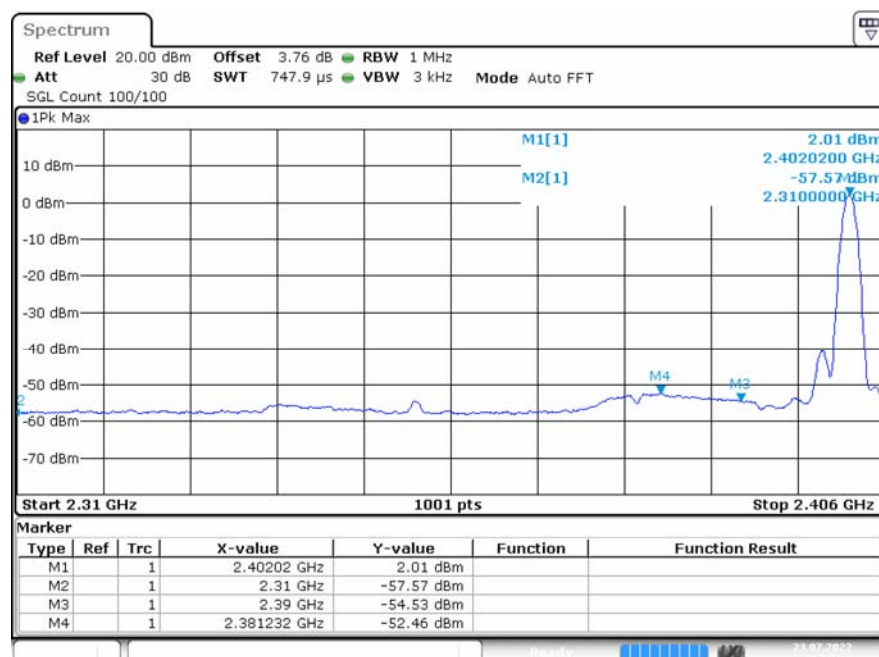
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.73	2.56	48.53	PEAK	74	Pass
	Off	2310.0	-57.56	2.56	39.7	AV	54	Pass
	Off	2383.728	-42.72	2.56	54.54	PEAK	74	Pass
	Off	2381.232	-52.45	2.56	44.81	AV	54	Pass
	Off	2390.0	-49.7	2.56	47.56	PEAK	74	Pass
	Off	2390.0	-54.53	2.56	42.73	AV	54	Pass
	Off	2483.5	-43.92	2.56	53.34	PEAK	74	Pass
	Off	2483.5	-50.25	2.56	47.01	AV	54	Pass
	Off	2497.72	-41.92	2.56	55.34	PEAK	74	Pass
	Off	2483.512	-50.25	2.56	47.01	AV	54	Pass
	Off	2500.0	-44.28	2.56	52.98	PEAK	74	Pass
	Off	2500.0	-50.92	2.56	46.34	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-50.96	2.56	46.3	PEAK	74	Pass
	Off	2310.0	-57.48	2.56	39.78	AV	54	Pass
	Off	2376.432	-43.44	2.56	53.82	PEAK	74	Pass
	Off	2380.56	-51.94	2.56	45.32	AV	54	Pass
	Off	2390.0	-47.63	2.56	49.63	PEAK	74	Pass
	Off	2390.0	-53.94	2.56	43.32	AV	54	Pass
	Off	2483.5	-44.54	2.56	52.72	PEAK	74	Pass
	Off	2483.5	-51.54	2.56	45.72	AV	54	Pass
	Off	2500	-41.09	2.56	56.17	PEAK	74	Pass
	Off	2497.792	-50.69	2.56	46.57	AV	54	Pass
	Off	2500.0	-41.09	2.56	56.17	PEAK	74	Pass
	Off	2500.0	-50.79	2.56	46.47	AV	54	Pass

10.2 Test Graphs

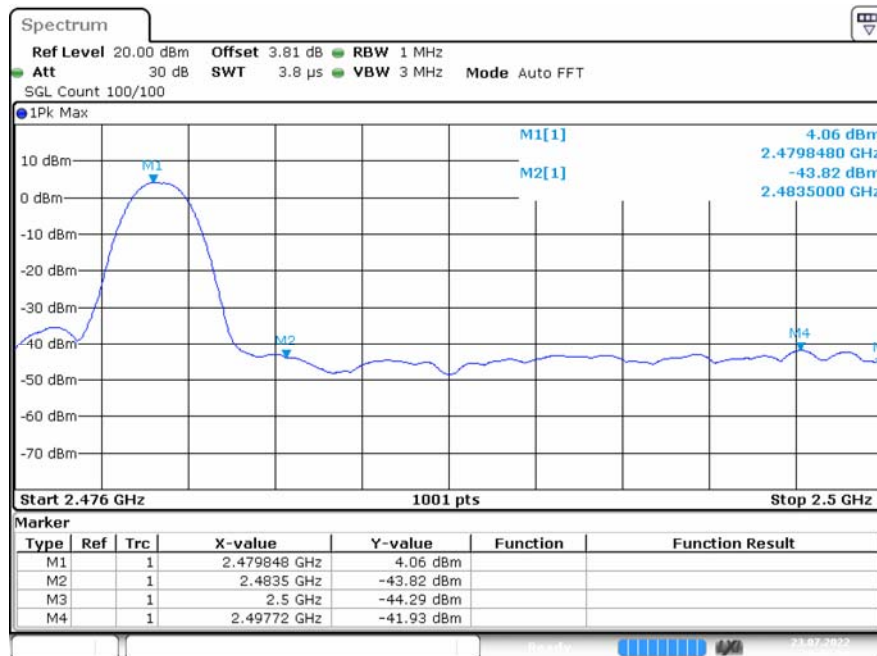
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



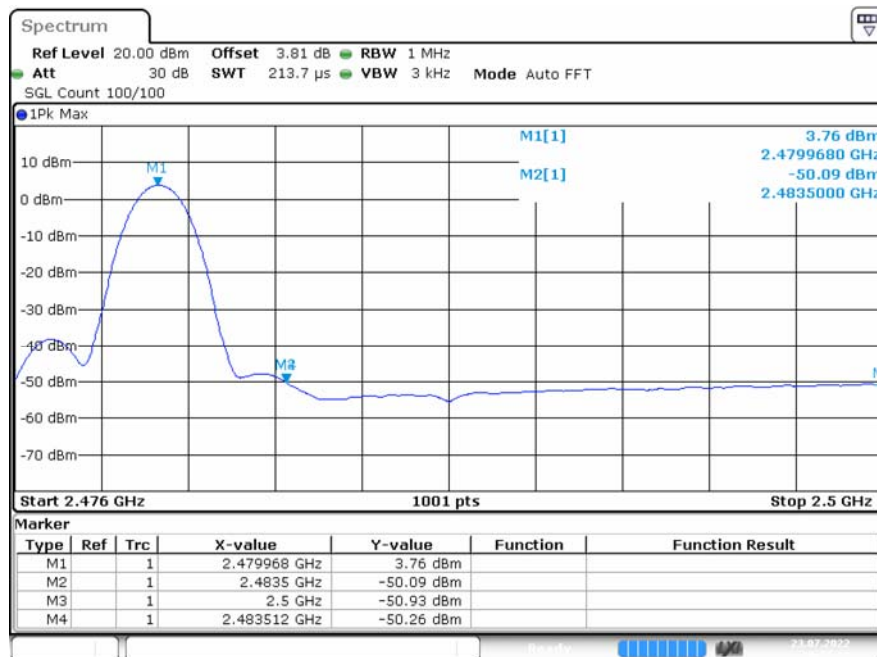
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



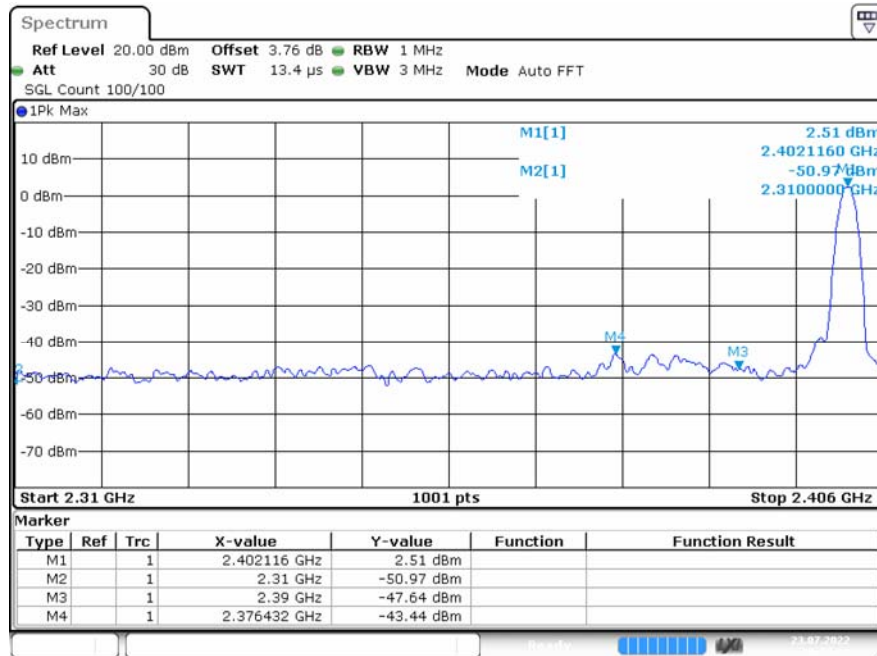
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



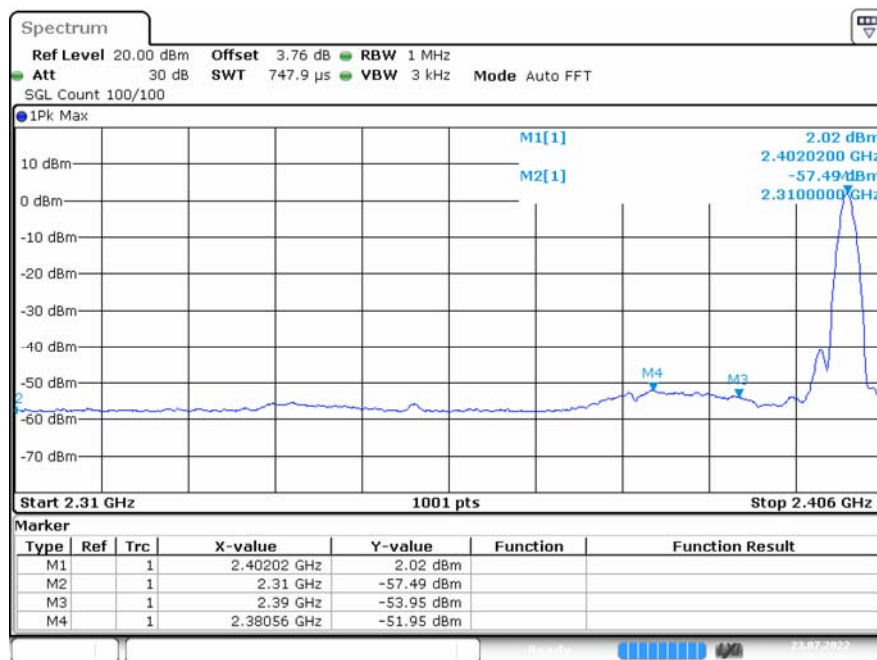
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



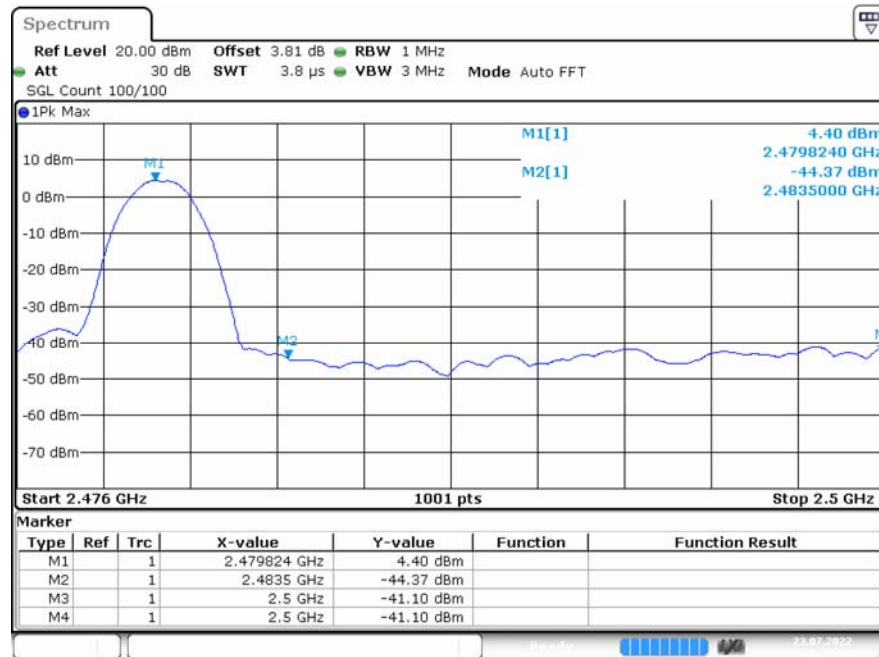
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



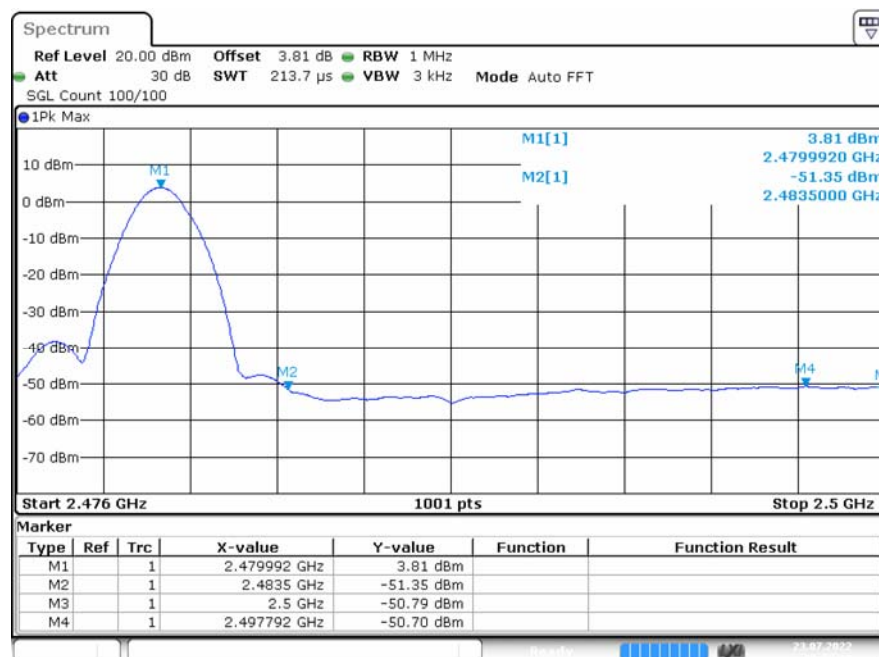
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



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)



---The End---