



Appendix A

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

Product Name: True Wireless Earphone

Trade Mark: N/A

Test Model: TWS-T29

Environmental Conditions

Temperature:	25.5℃
Relative Humidity:	52.2%
ATM Pressure:	101Kpa
Test Engineer:	Simba Haung
Supervised by:	Coin Tang



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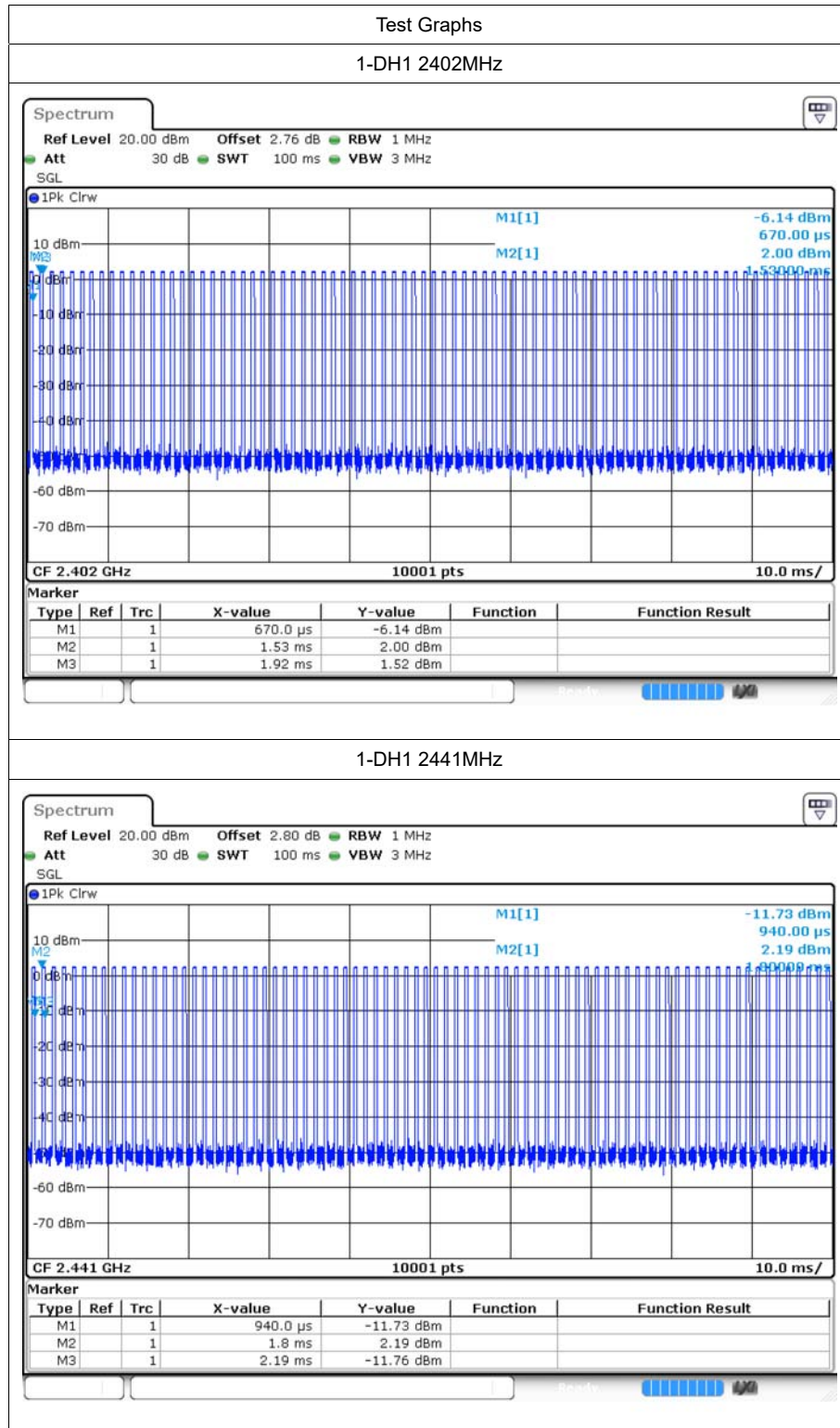
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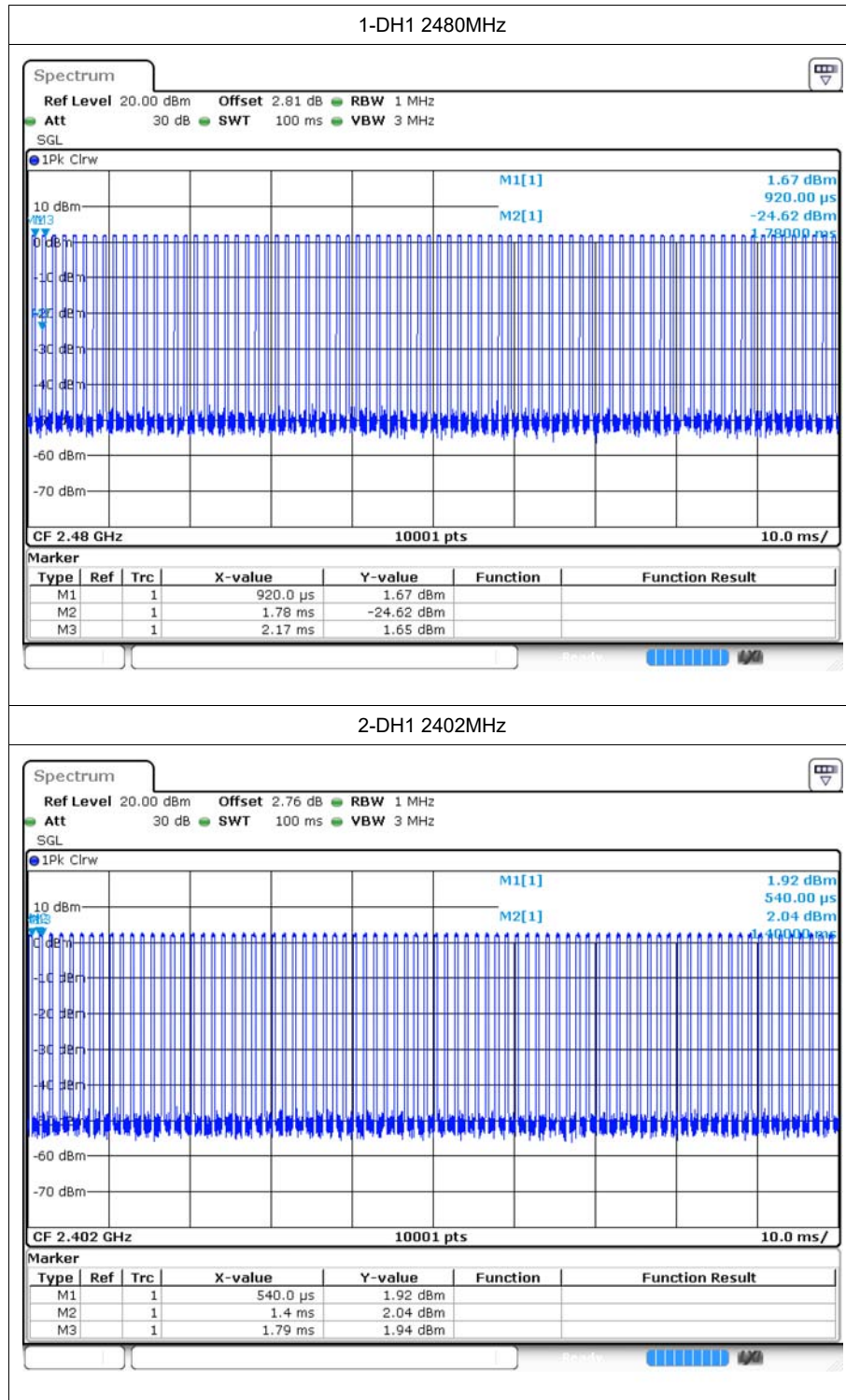
1 Duty Cycle

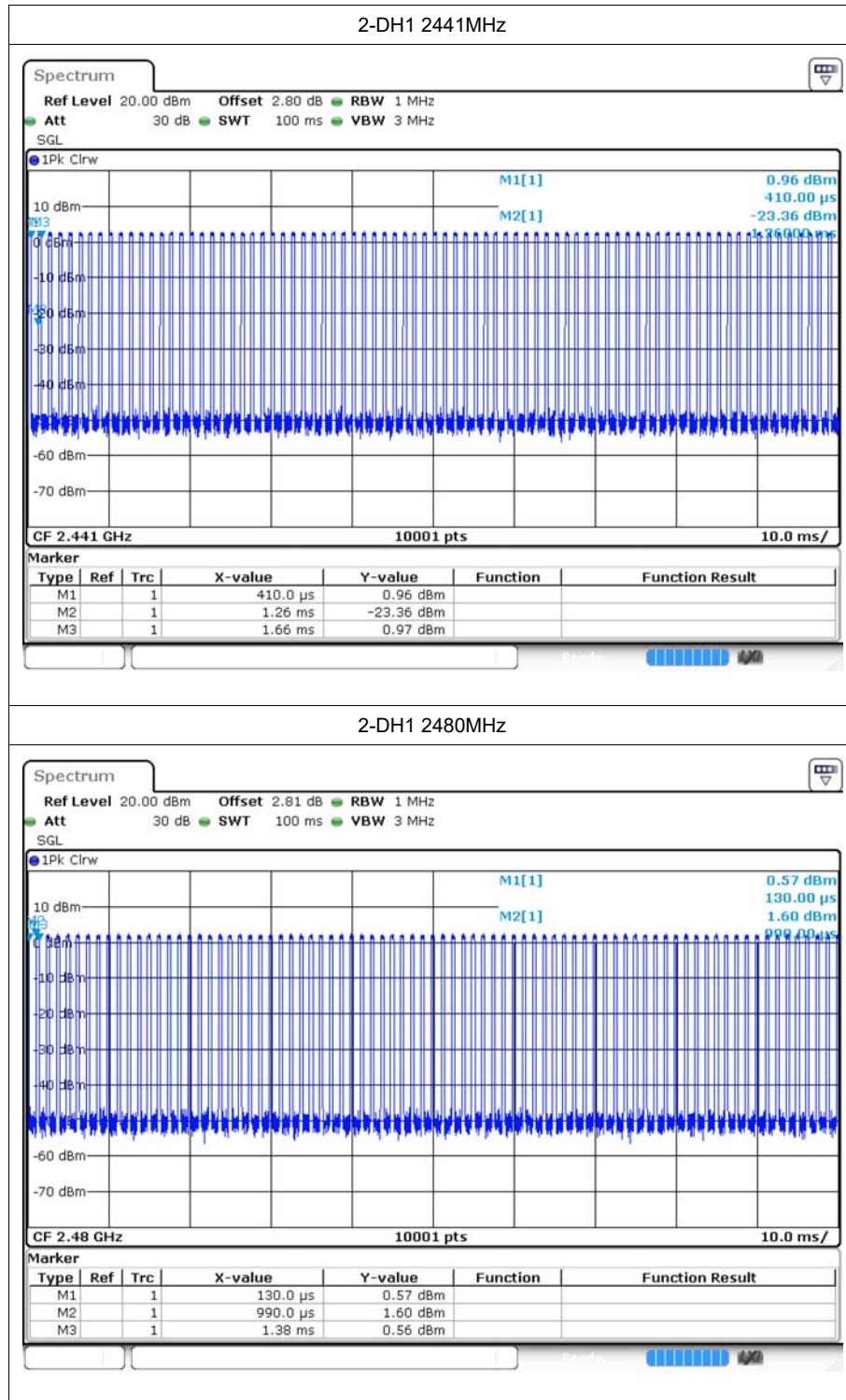
1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
1-DH1	2402	32	4.95	2.56
1-DH1	2441	32	4.95	2.56
1-DH1	2480	31.37	5.04	2.56
2-DH1	2402	32	4.95	2.56
2-DH1	2441	32.8	4.84	2.5
2-DH1	2480	32.01	4.95	2.56

1.2 Test Graphs





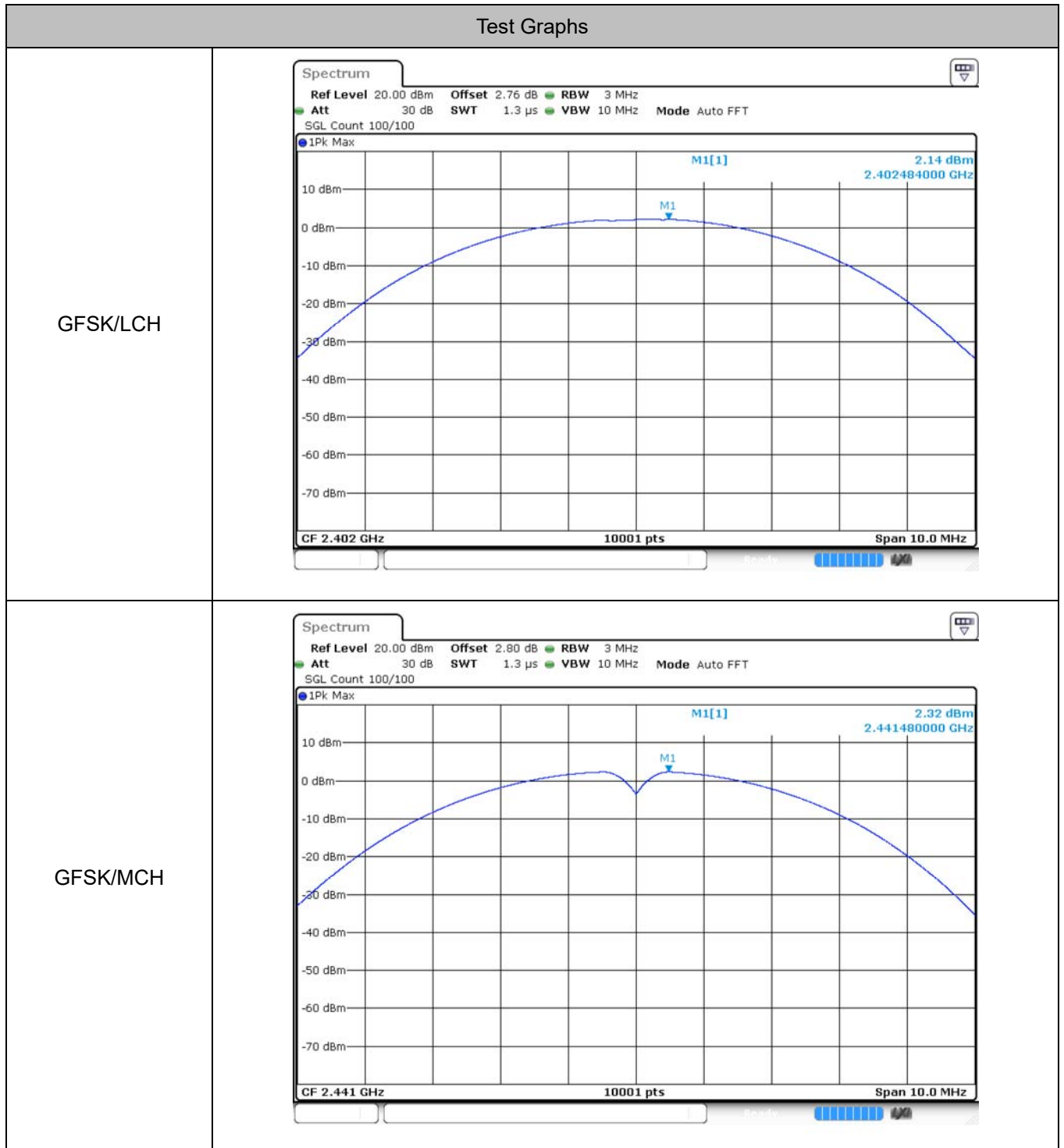


2 Maximum Conducted Peak Output Power

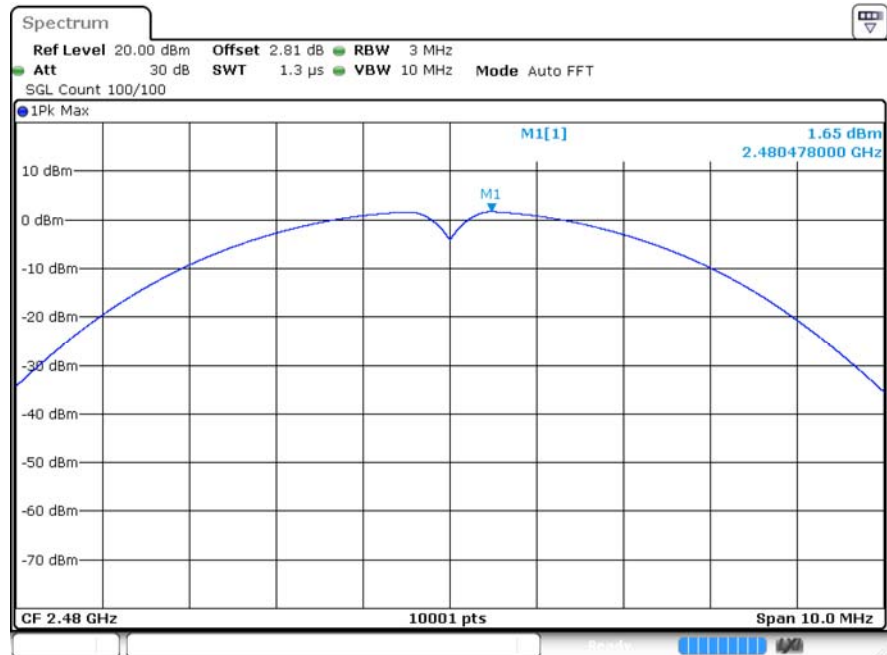
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.14	21	Pass
	MCH	2.32	21	Pass
	HCH	1.65	21	Pass
$\pi/4$ DQPSK	LCH	2.56	21	Pass
	MCH	2.79	21	Pass
	HCH	2.39	21	Pass

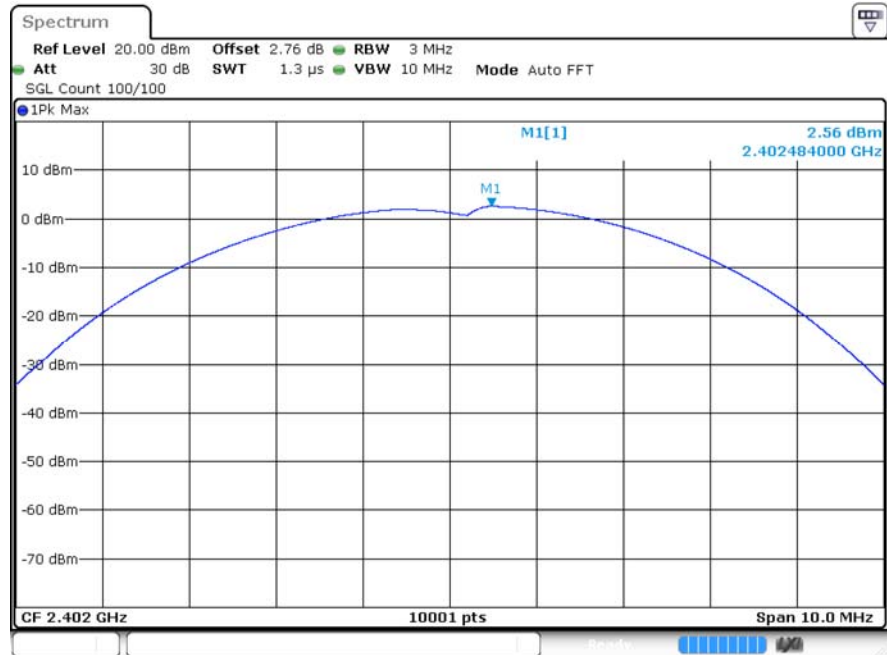
2.2 Test Graphs



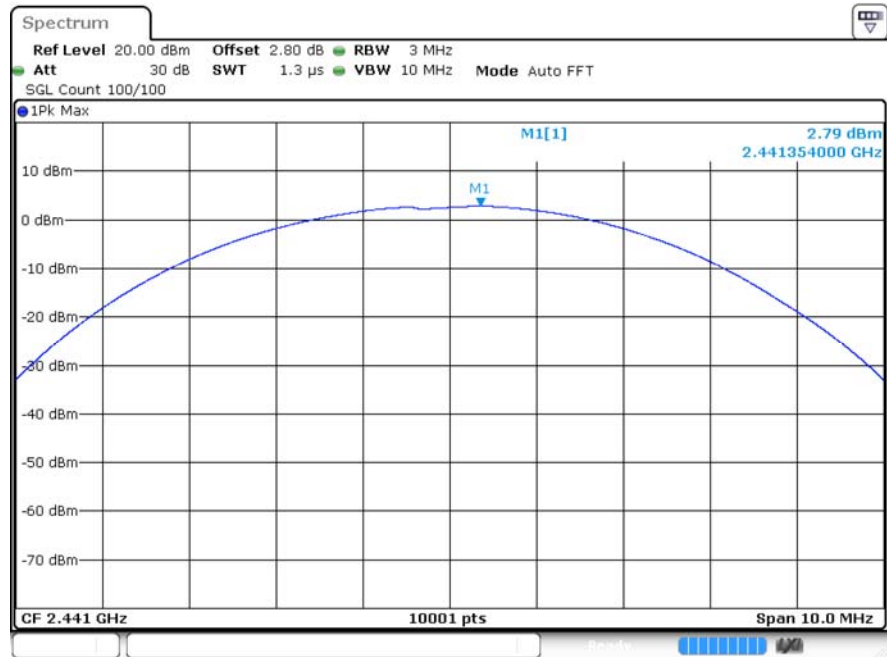
GFSK/HCH



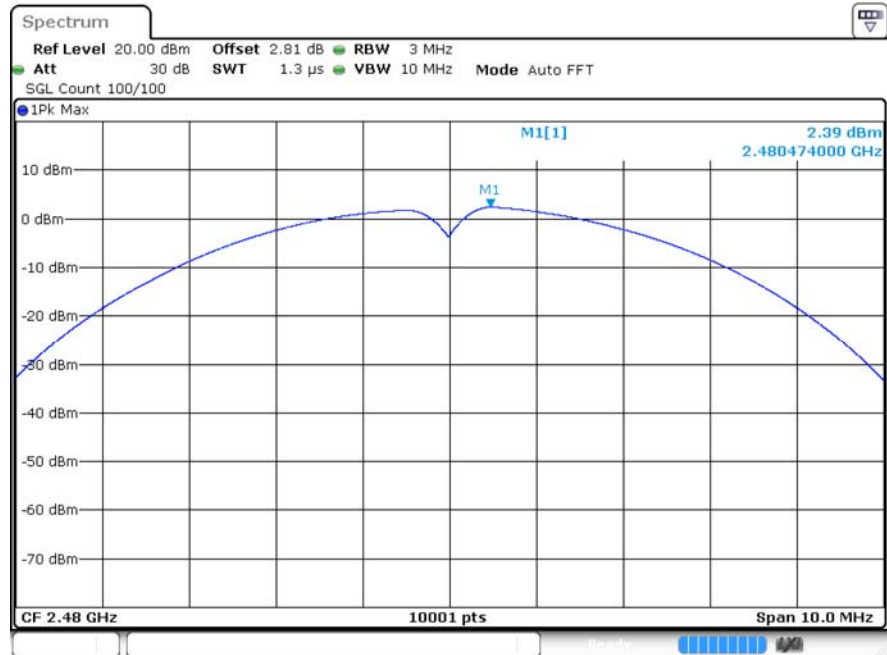
π /4DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

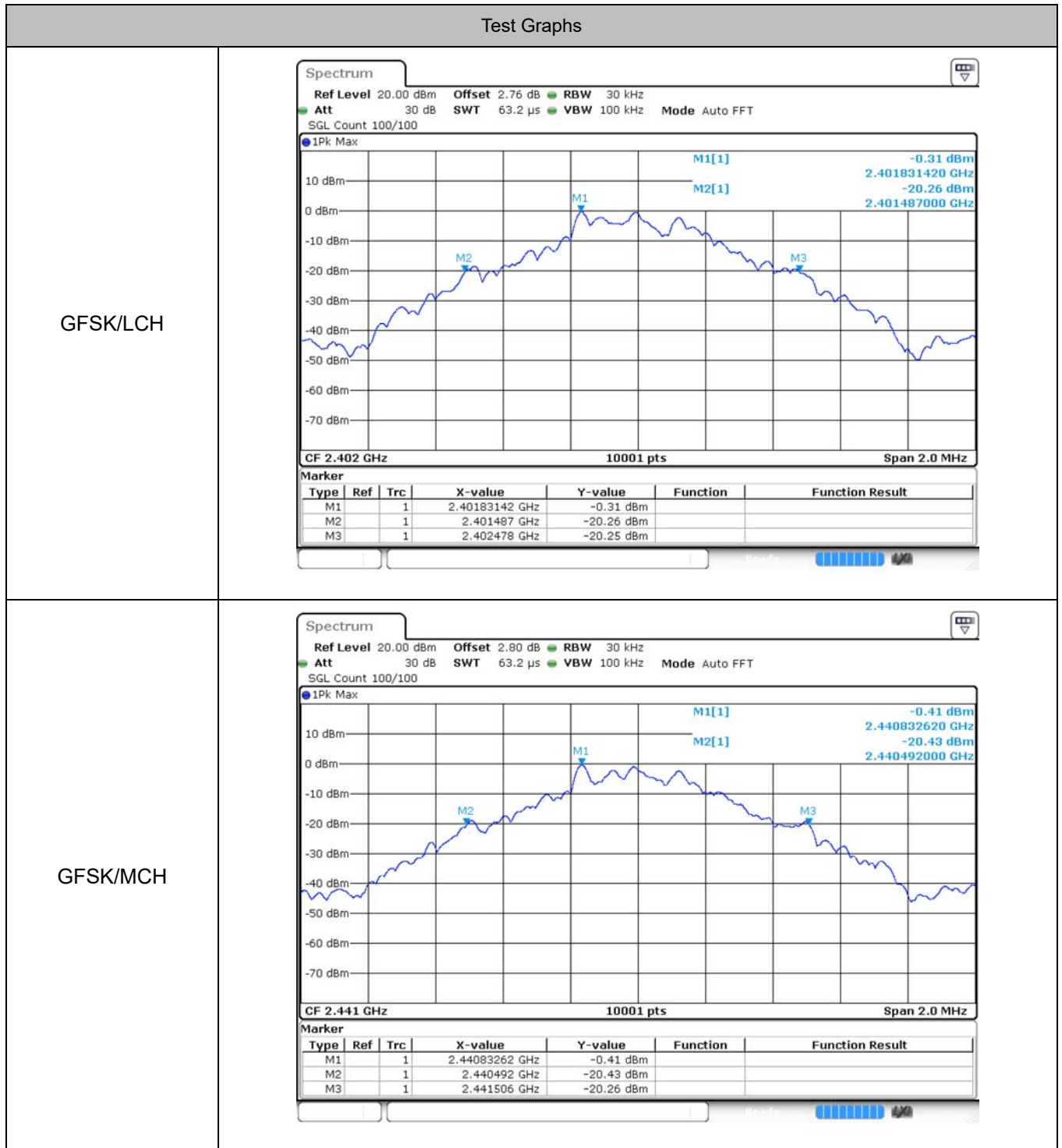


3 20dB Bandwidth

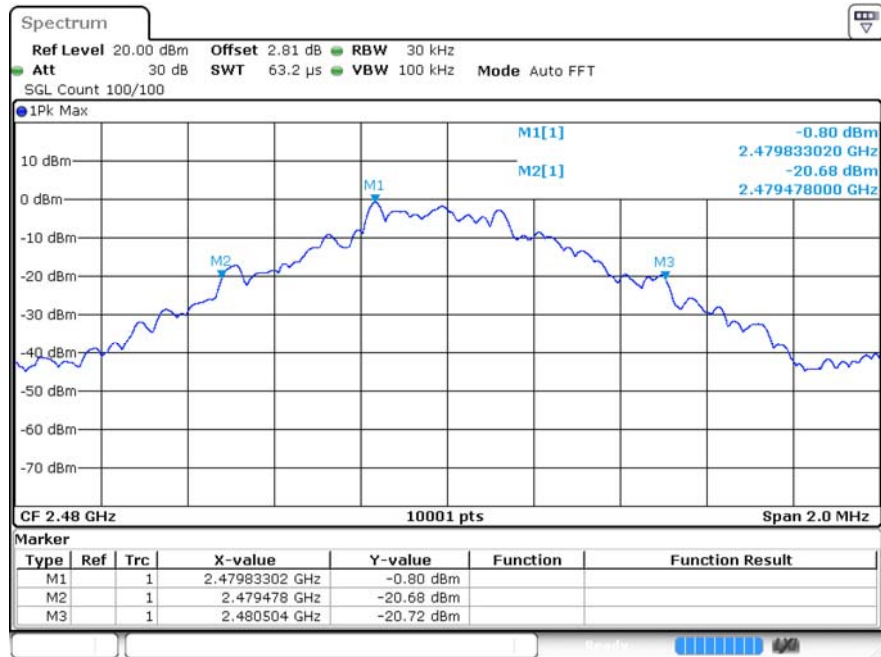
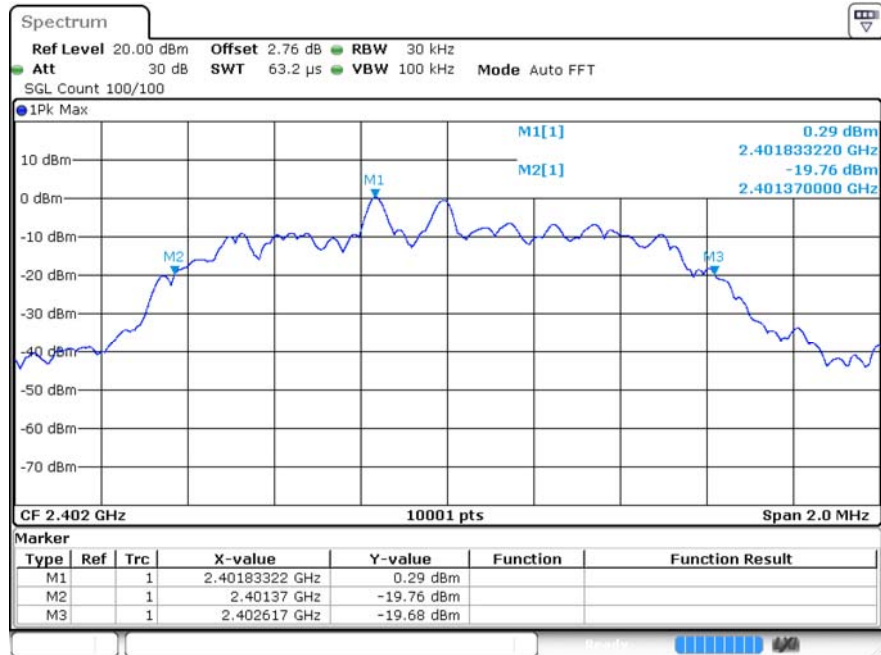
3.1 Test Result

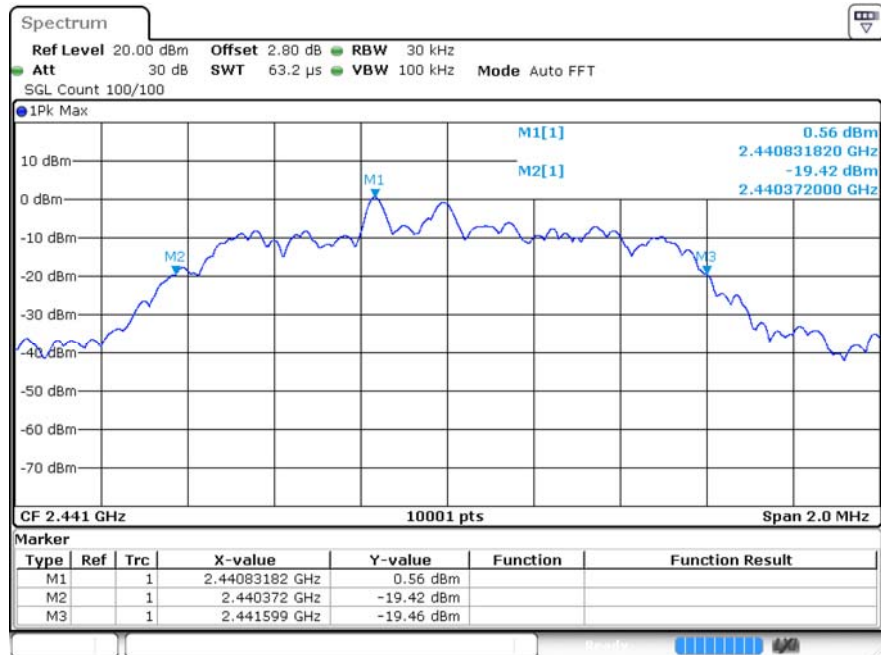
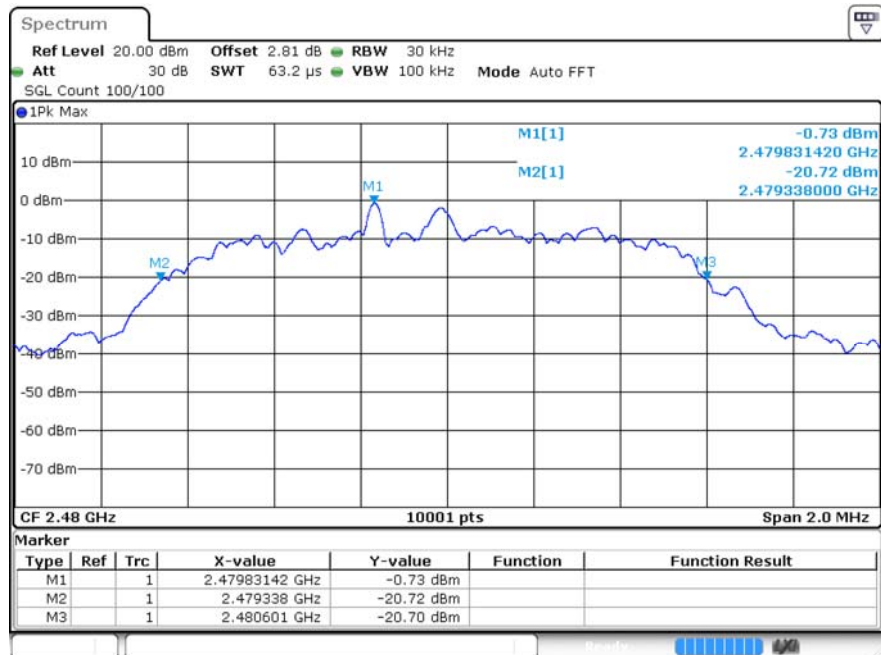
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.992	Not Specified	Pass
	MCH	1.014	Not Specified	Pass
	HCH	1.027	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.247	Not Specified	Pass
	MCH	1.227	Not Specified	Pass
	HCH	1.263	Not Specified	Pass

3.2 Test Graphs



GFSK/HCH


 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


4 Carrier Frequency Separation

4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.012	0.676	Pass
$\pi/4$ DQPSK	MCH	0.935	0.818	Pass

4.2 Test Graphs

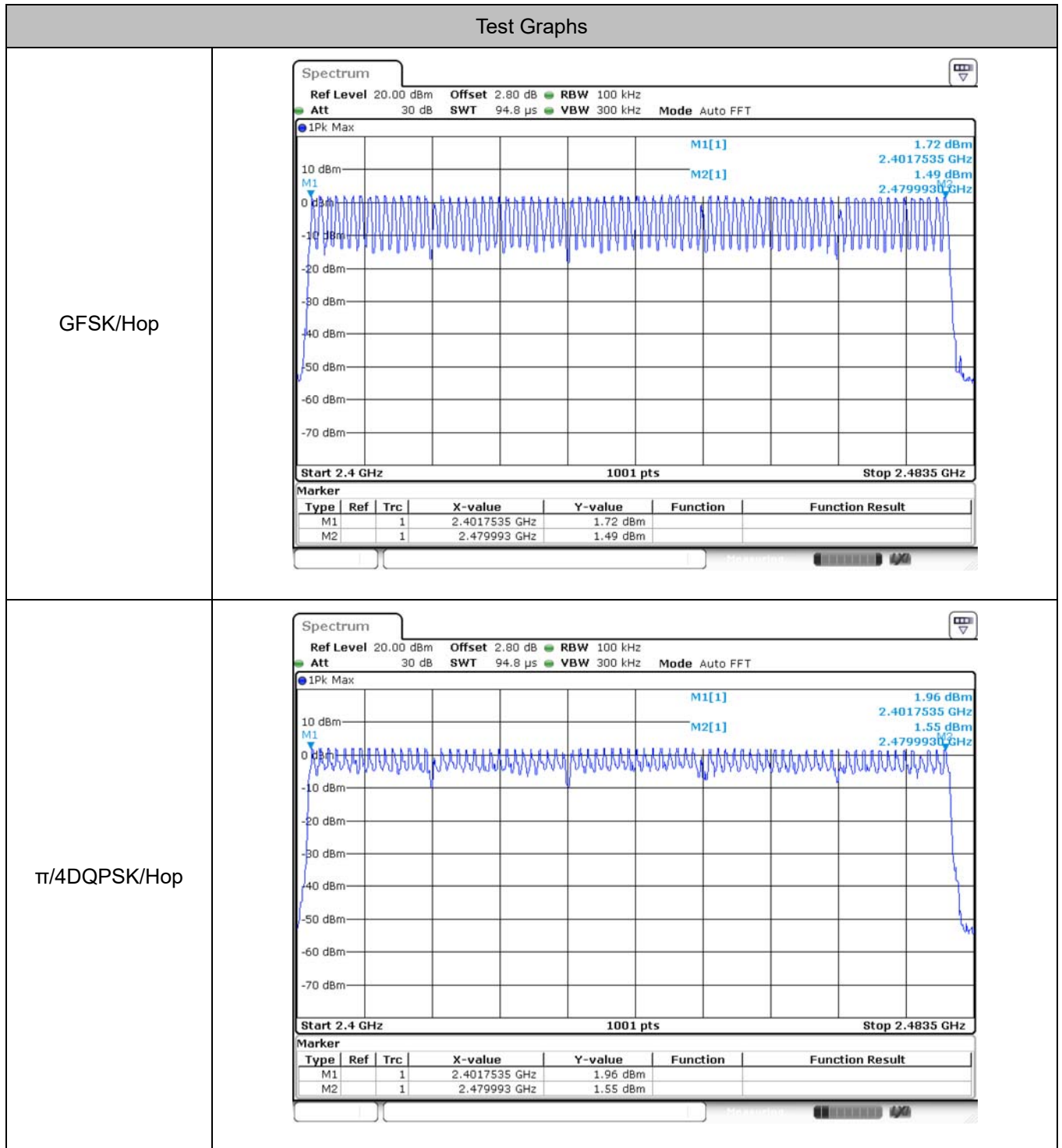


5 Hopping Channel Number

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

5.2 Test Graphs

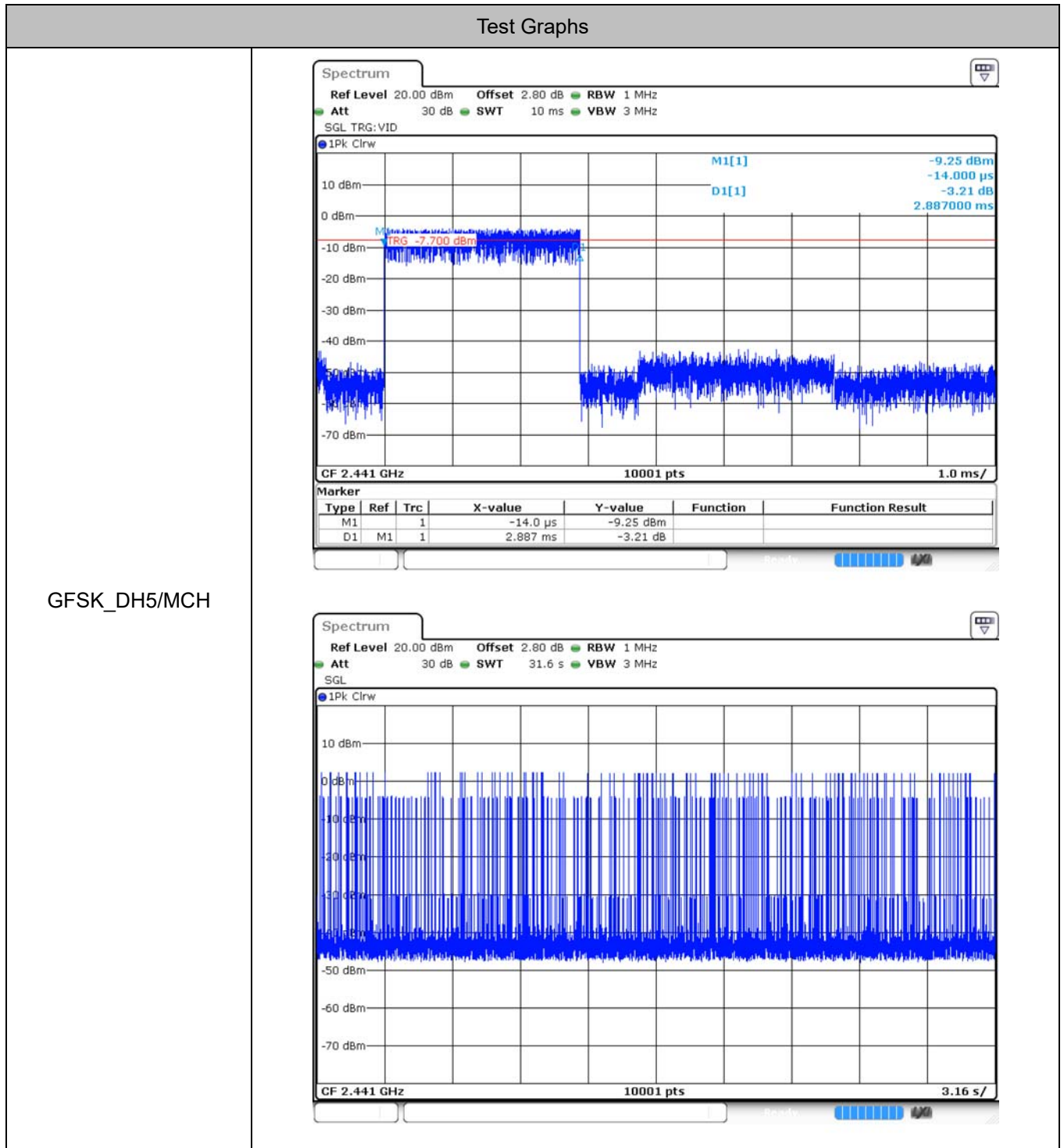


6 Dwell Time

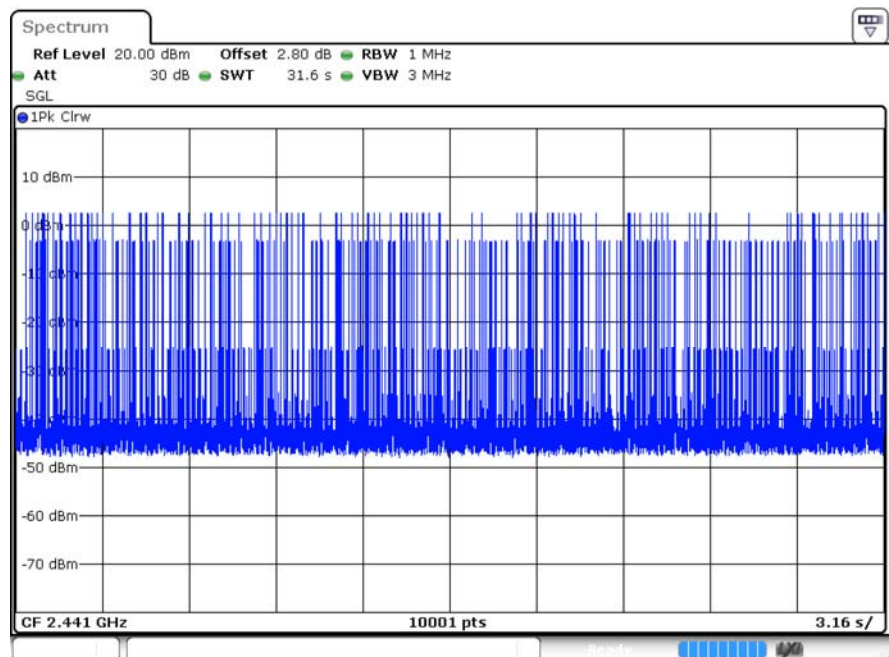
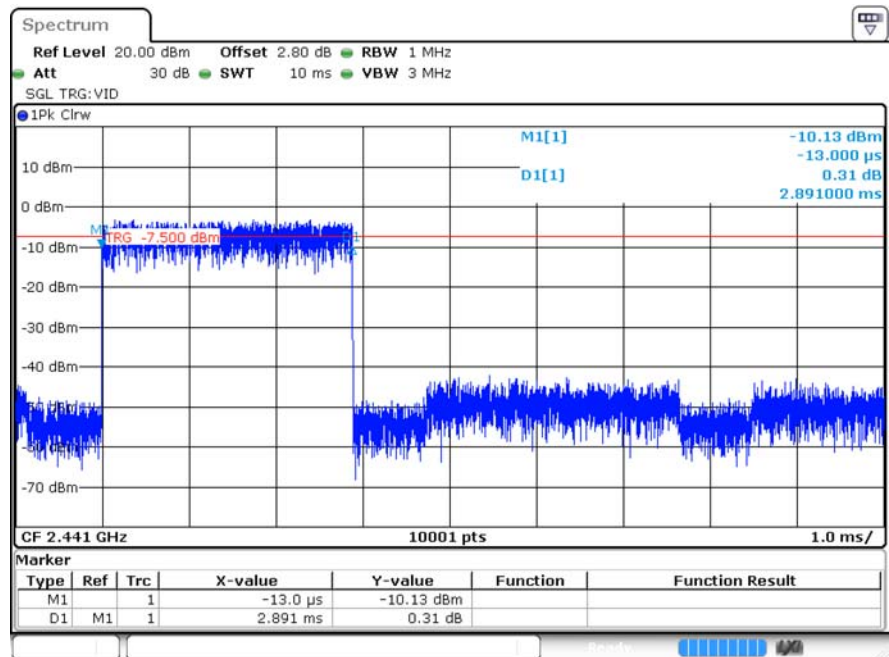
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.887	113	326.231	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.891	115	332.465	0.4	Pass

6.2 Test Graphs



π/4DQPSK
_2DH5/MCH

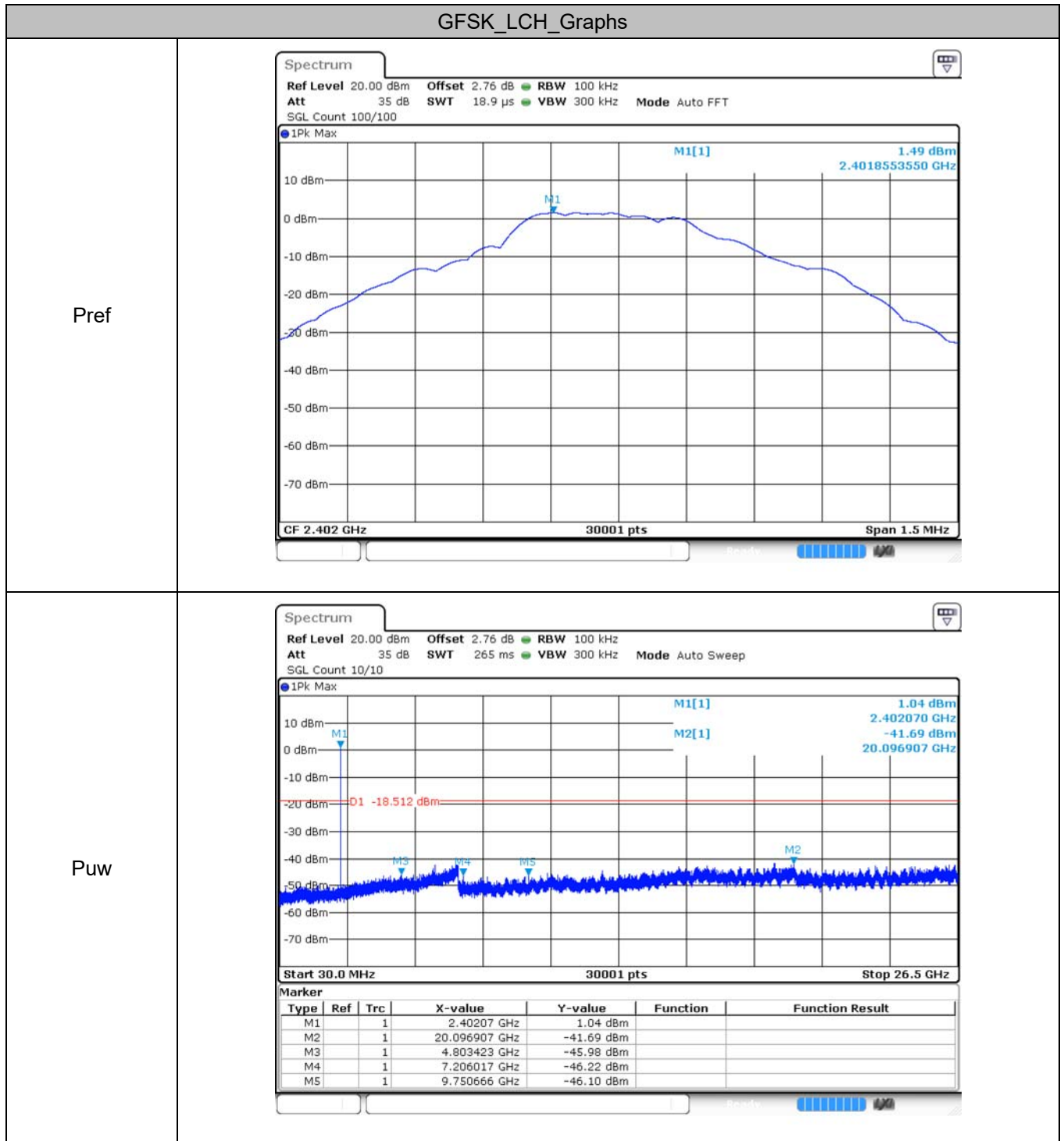


7 RF Conducted Spurious Emissions

7.1 Test Result

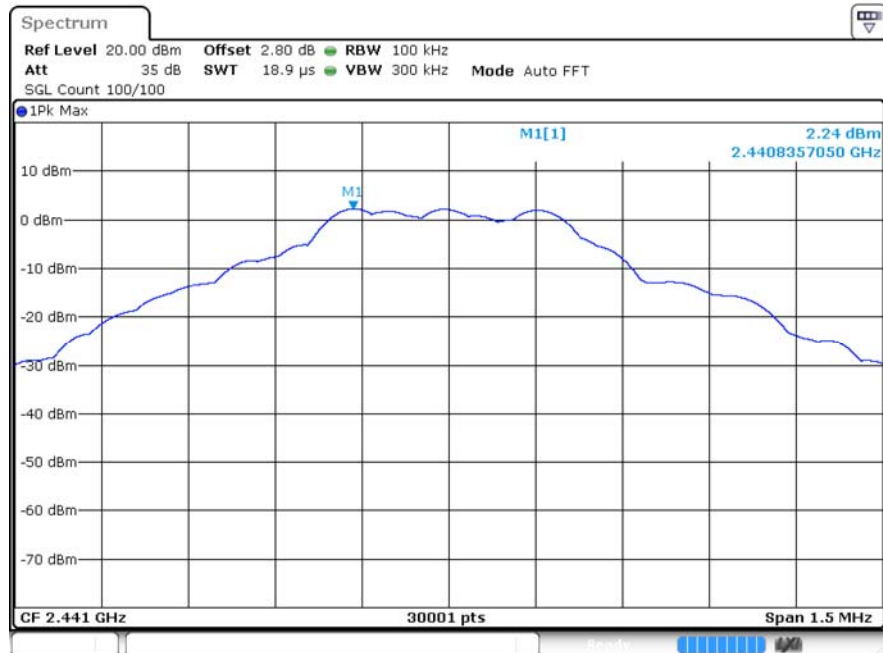
Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-43.17	-20	Pass
	MCH	-43.64	-20	Pass
	HCH	-41.73	-20	Pass
$\pi/4$ DQPSK	LCH	-43.56	-20	Pass
	MCH	-43.5	-20	Pass
	HCH	-43.39	-20	Pass

7.2 Test Graphs

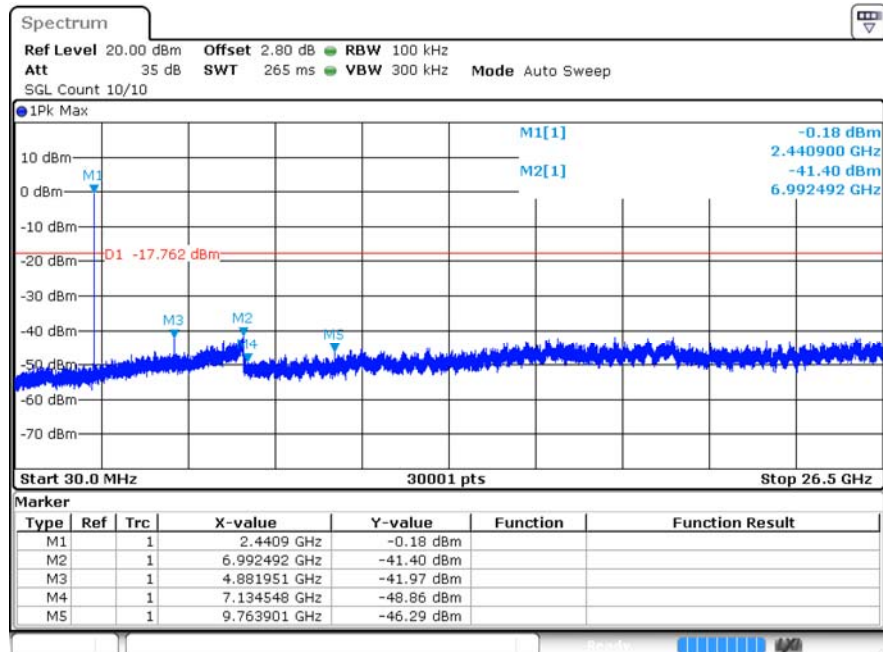


GFSK_MCH_Graphs

Pref



Puw

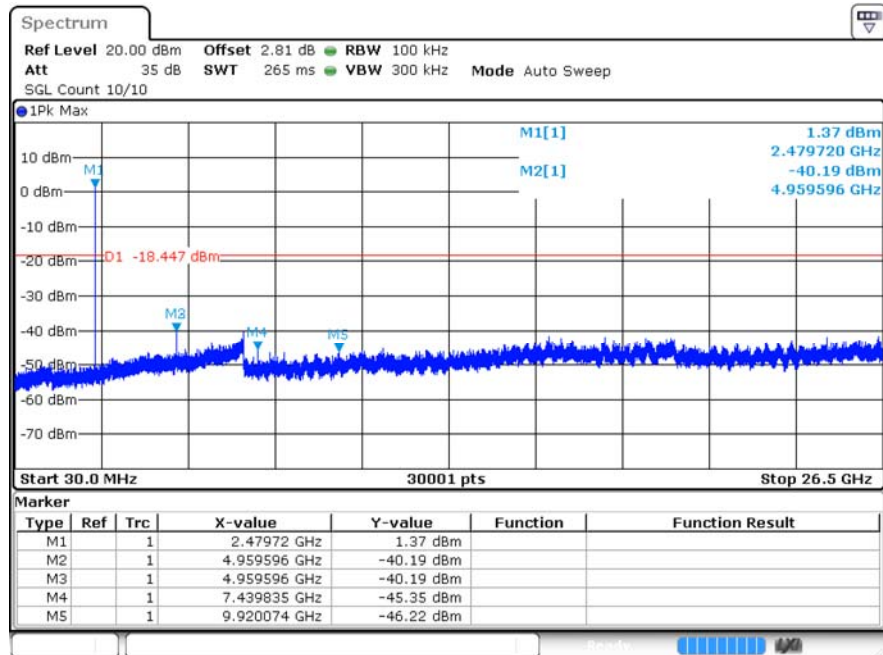


GFSK_HCH_Graphs

Pref

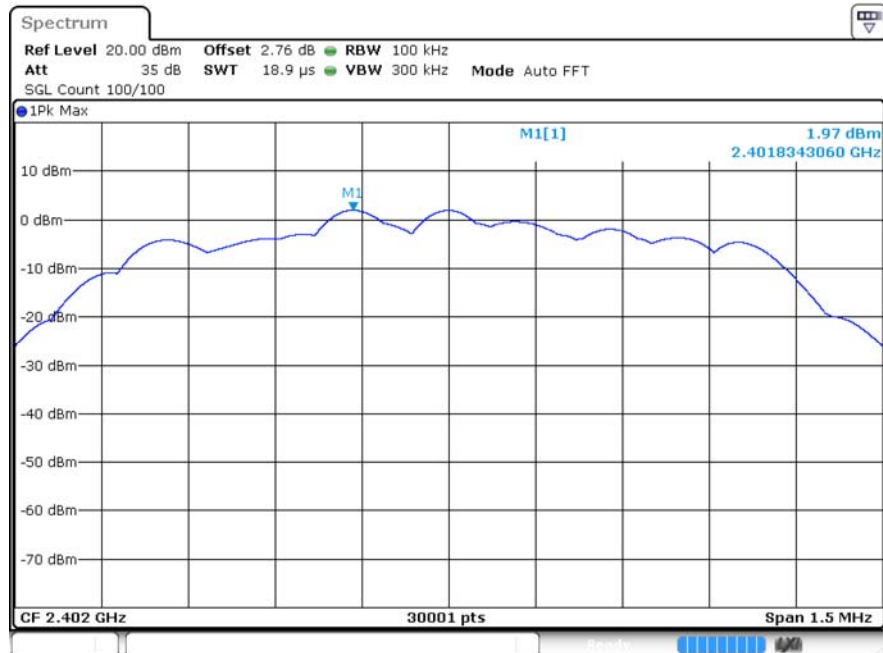


Puw

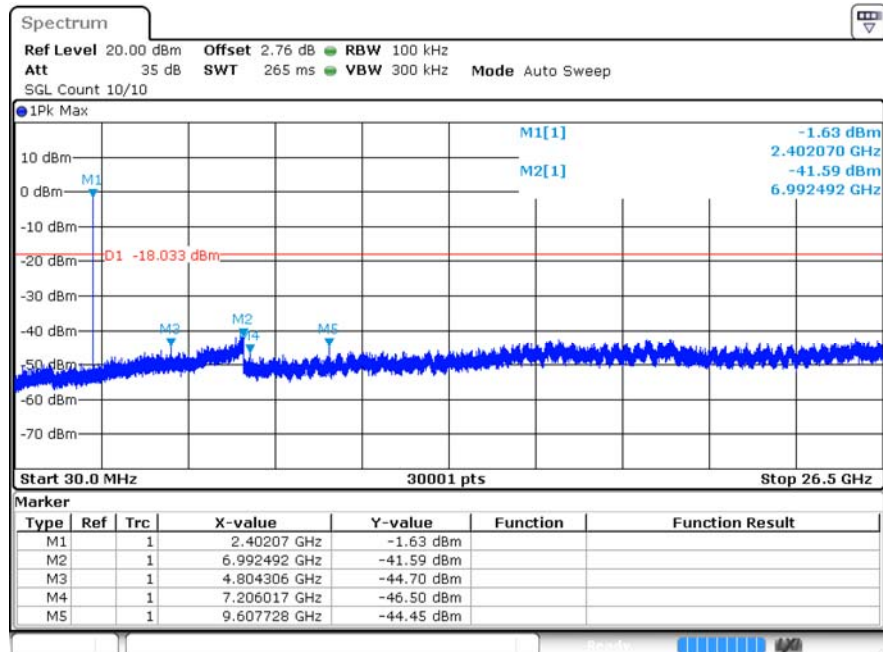


$\pi/4$ DQPSK_LCH_Graphs

Pref

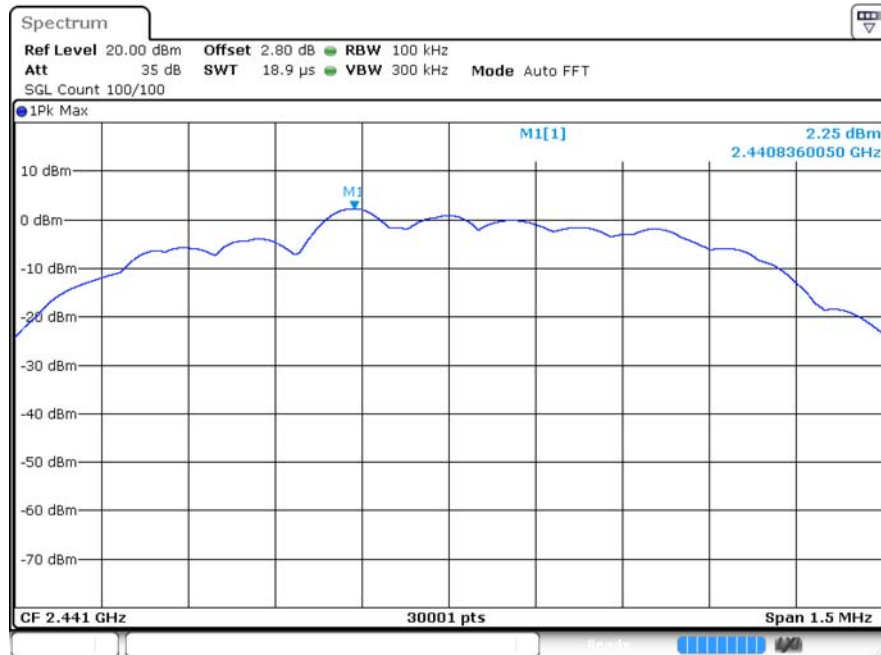


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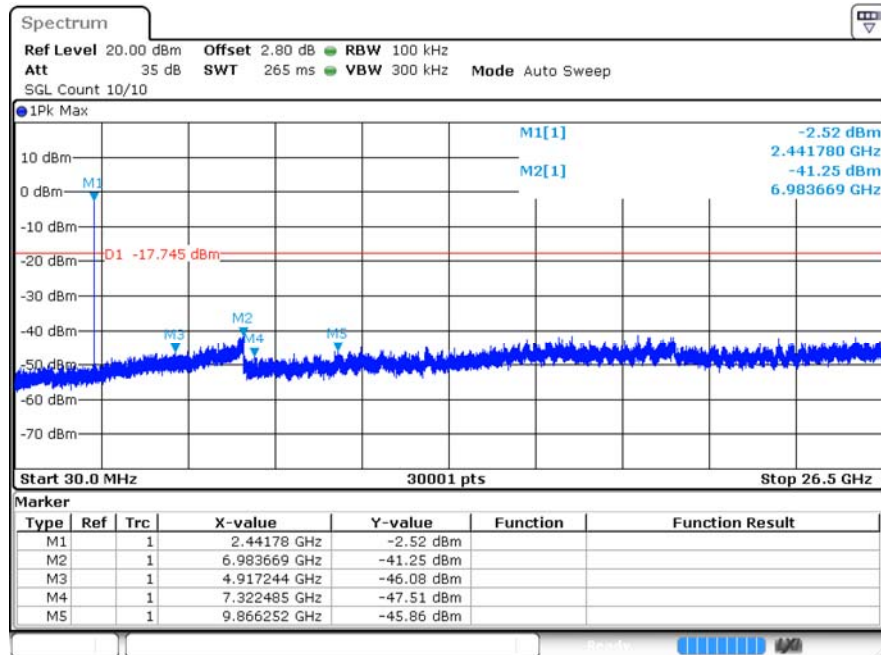


$\pi/4$ DQPSK_MCH_Graphs

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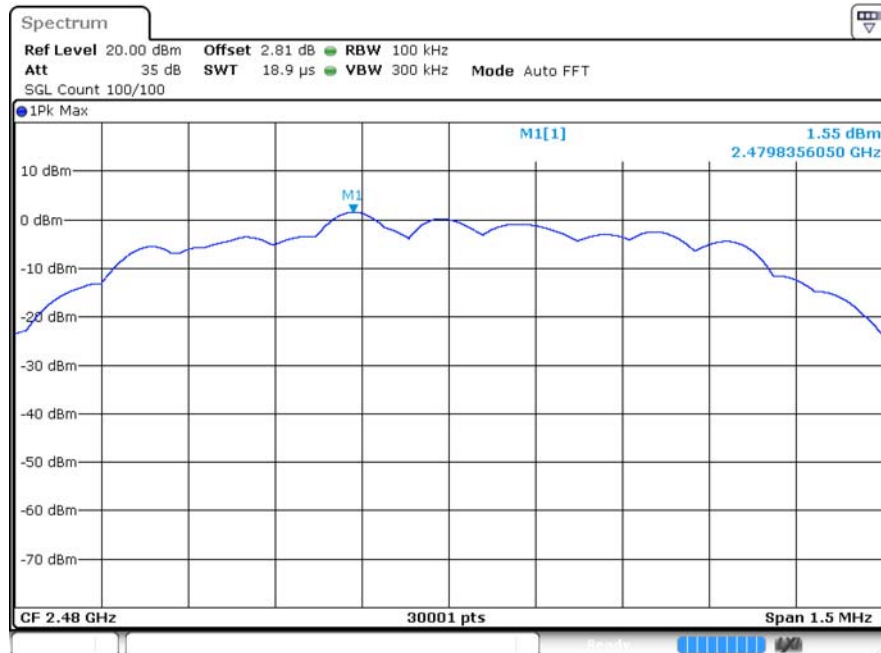


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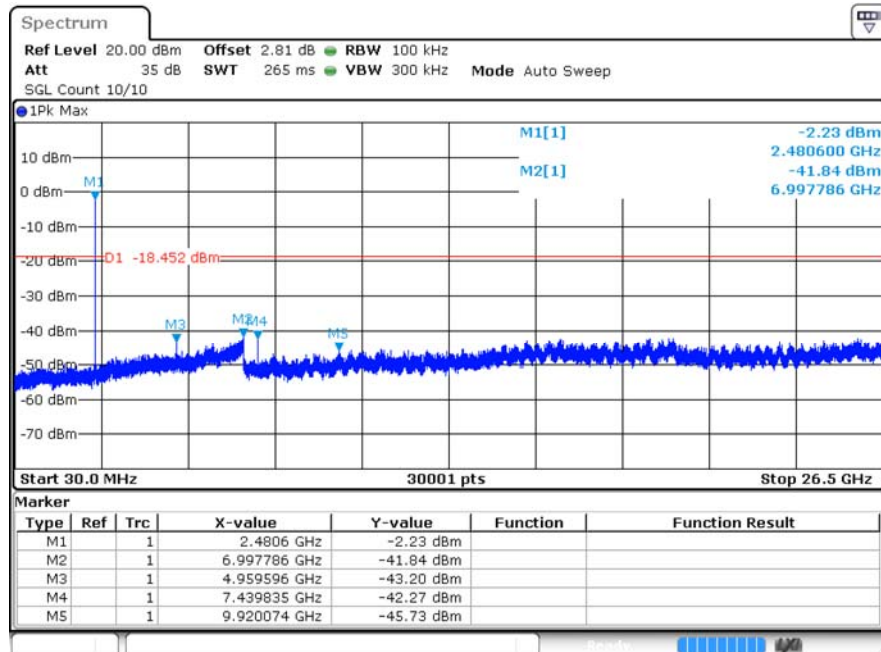


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

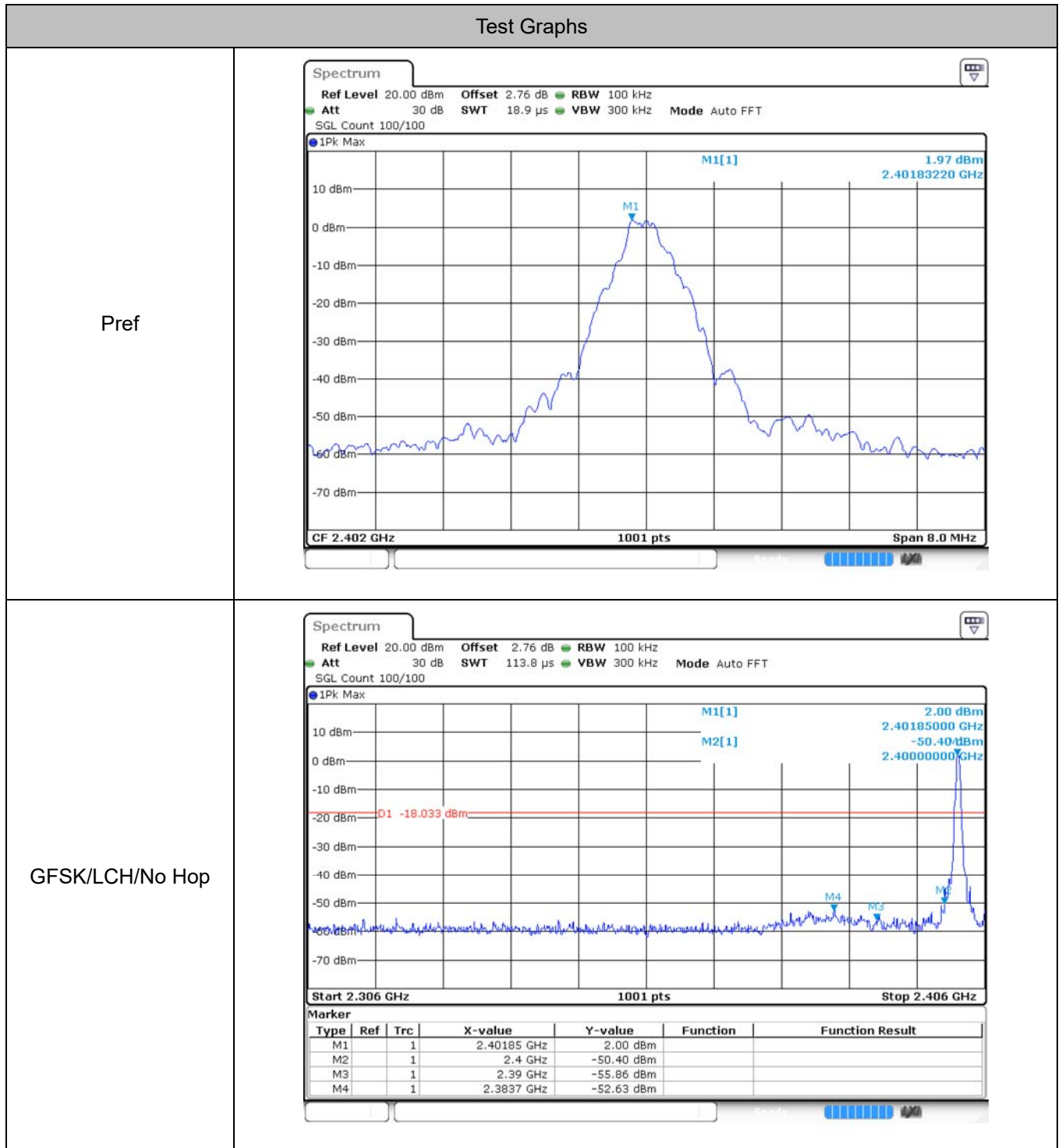


8 Band-edge for RF Conducted Emissions

8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-54.6	-20	Pass
			On	-54.15	-20	Pass
	HCH	2480	Off	-53.63	-20	Pass
			On	-53.73	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-54.04	-20	Pass
			On	-51.14	-20	Pass
	HCH	2480	Off	-54.12	-20	Pass
			On	-52.91	-20	Pass

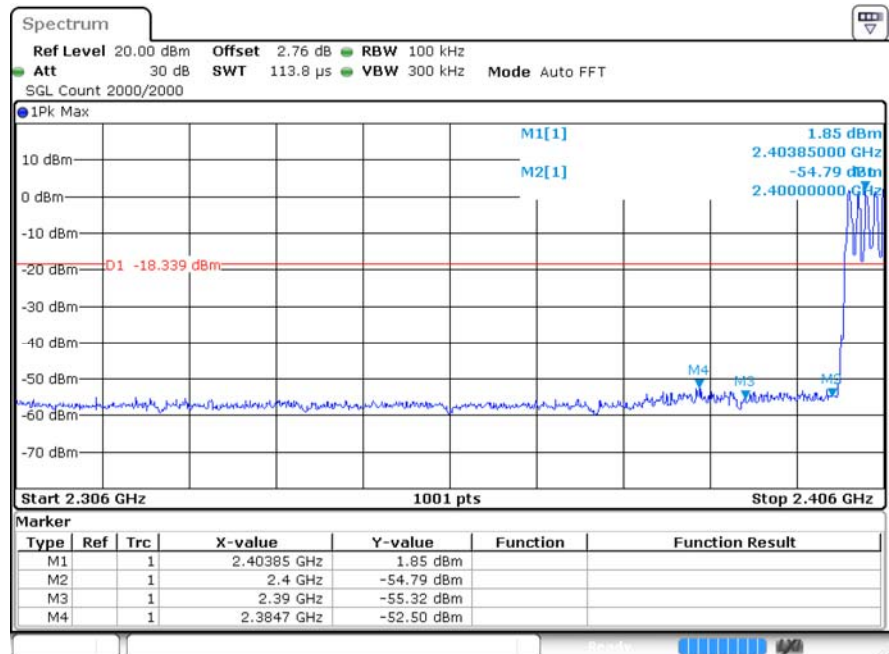
8.2 Test Graphs



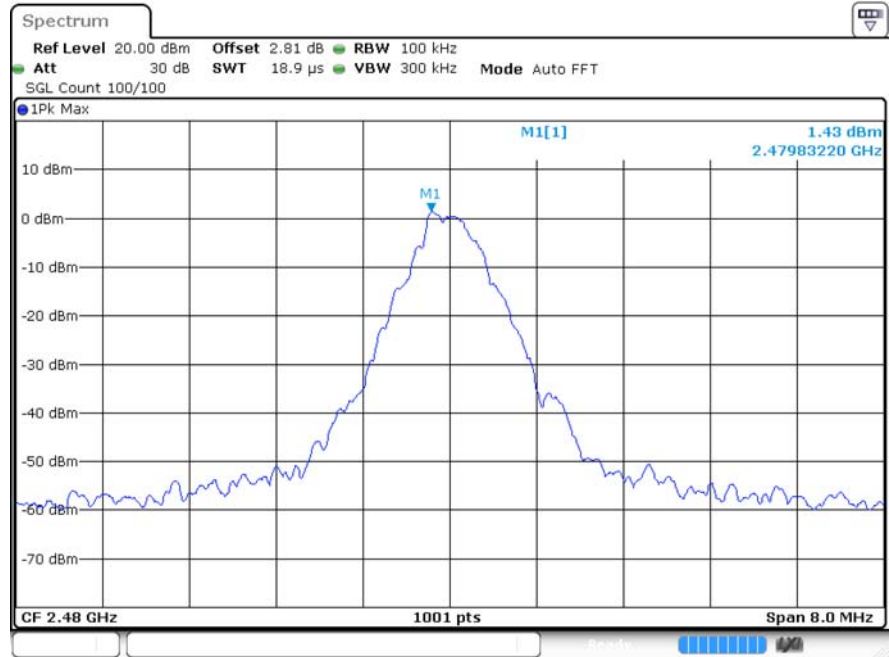
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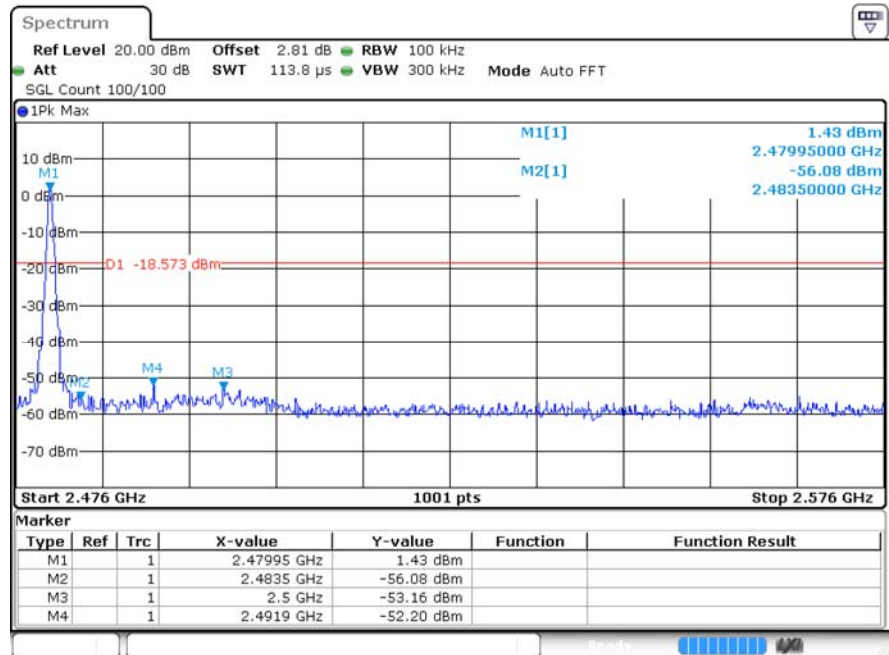
GFSK/LCH/Hop



Ref



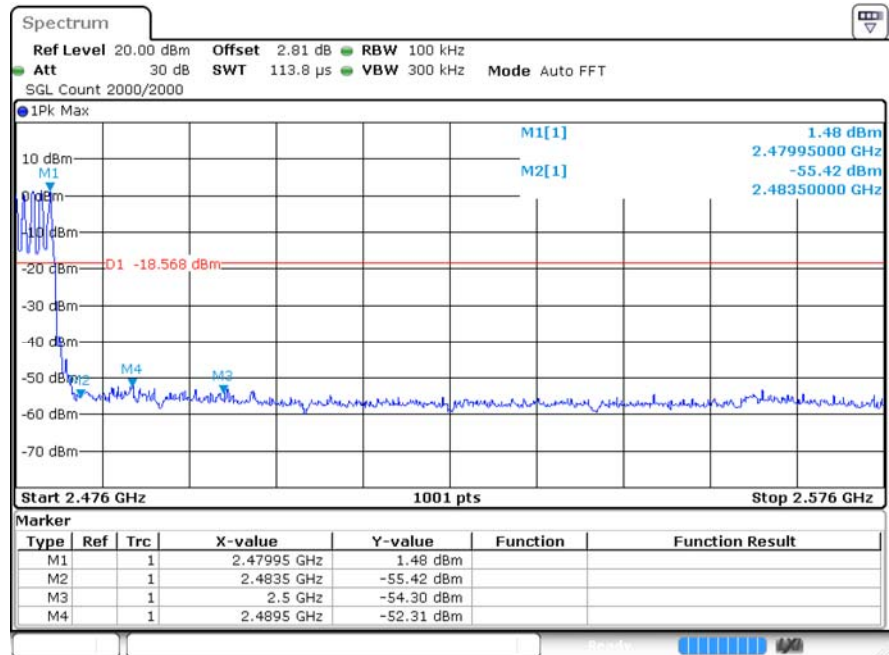
GFSK/HCH/No Hop



Ref.



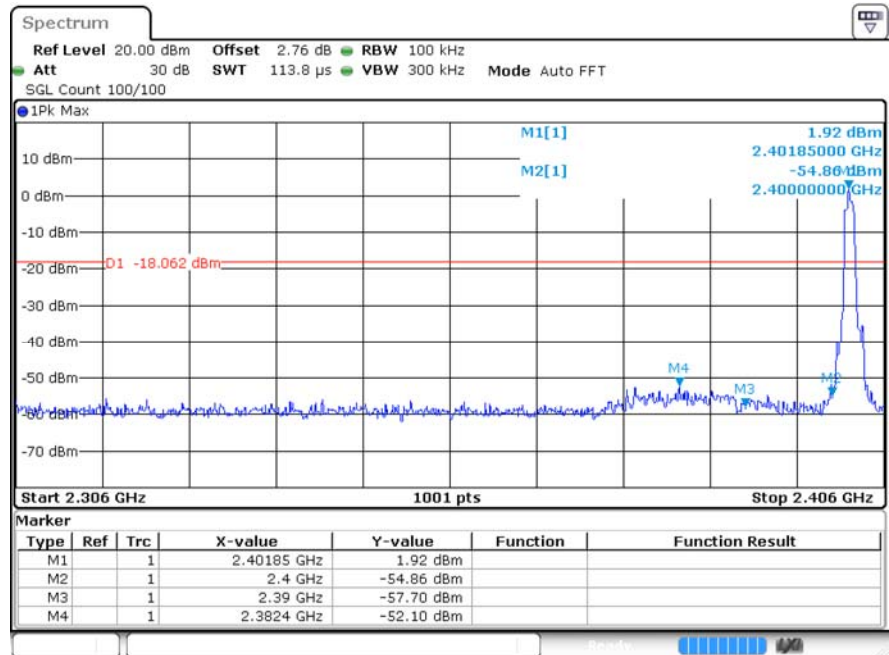
GFSK/HCH/Hop



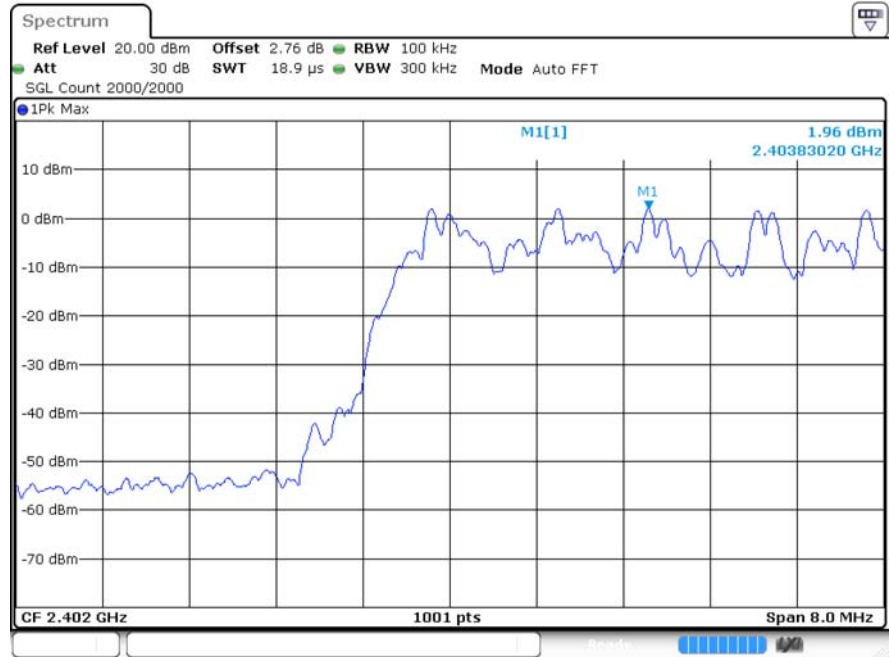
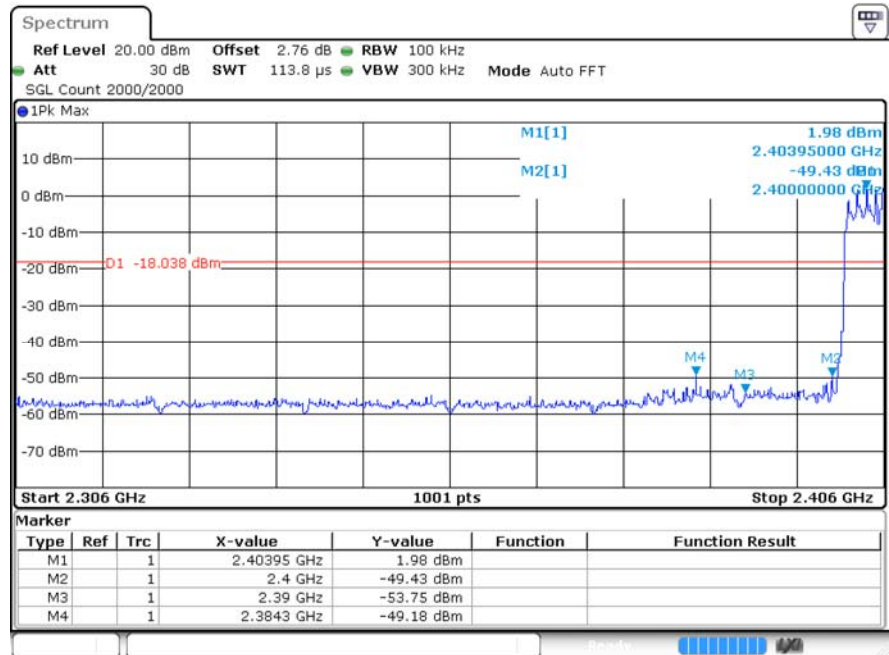
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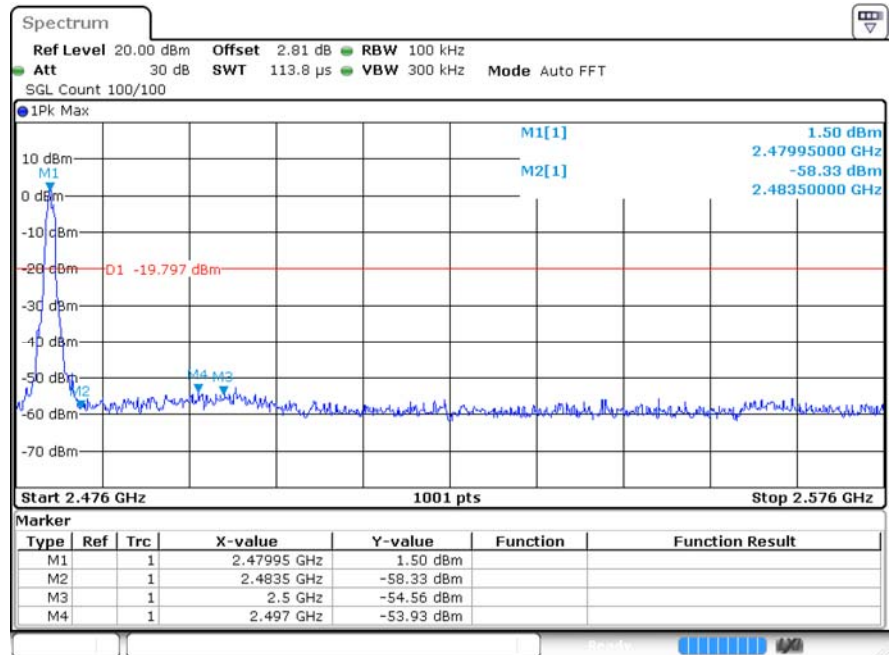
$\pi/4$ DQPSK/LCH/No
Hop



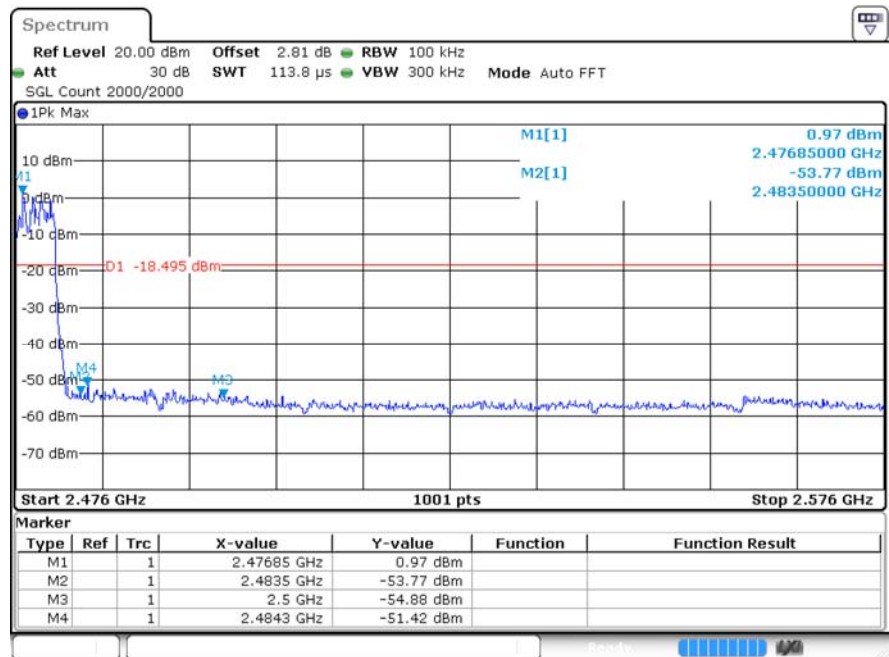
Ref


 $\pi/4$ DQPSK/LCH/Hop


Ref


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


Ref


 $\pi/4$ DQPSK/HCH/Hop


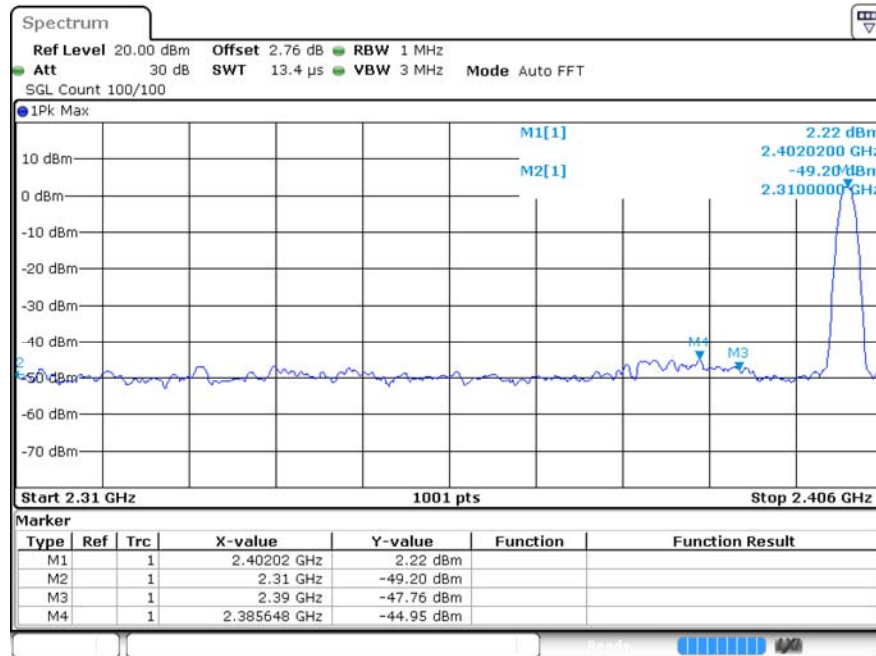
9 Restrict-band band-edge measurements

9.1 Test Result

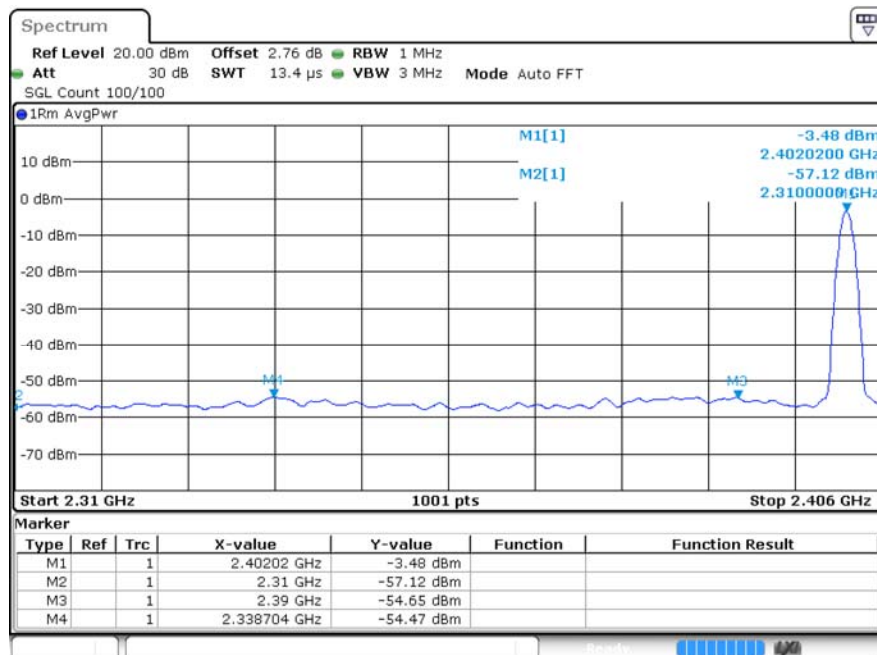
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Duty Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-49.2	2.8	-	48.83	PEAK	74	Pass
	Off	2310.0	-57.12	2.8	4.95	45.86	AV	54	Pass
	Off	2385.648	-44.95	2.8	-	53.08	PEAK	74	Pass
	Off	2338.704	-54.46	2.8	4.95	48.52	AV	54	Pass
	Off	2390.0	-47.76	2.8	-	50.27	PEAK	74	Pass
	Off	2390.0	-54.65	2.8	4.95	48.33	AV	54	Pass
	Off	2483.5	-49.49	2.8	-	48.54	PEAK	74	Pass
	Off	2483.5	-55.32	2.8	5.04	47.75	AV	54	Pass
	Off	2491.36	-43.73	2.8	-	54.3	PEAK	74	Pass
	Off	2499.376	-54.41	2.8	5.04	48.66	AV	54	Pass
	Off	2500.0	-46.91	2.8	-	51.12	PEAK	74	Pass
	Off	2500.0	-54.47	2.8	5.04	48.6	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-49.85	2.8	-	48.18	PEAK	74	Pass
	Off	2310.0	-56.41	2.8	4.95	46.57	AV	54	Pass
	Off	2383.152	-43.49	2.8	-	54.54	PEAK	74	Pass
	Off	2384.4	-54.44	2.8	4.95	48.54	AV	54	Pass
	Off	2390.0	-44.81	2.8	-	53.22	PEAK	74	Pass
	Off	2390.0	-55.55	2.8	4.95	47.43	AV	54	Pass
	Off	2483.5	-45.65	2.8	-	52.38	PEAK	74	Pass
	Off	2483.5	-55.54	2.8	4.95	47.44	AV	54	Pass
	Off	2497.168	-43.99	2.8	-	54.04	PEAK	74	Pass
	Off	2497.552	-54.53	2.8	4.95	48.45	AV	54	Pass
	Off	2500.0	-47.12	2.8	-	50.91	PEAK	74	Pass
	Off	2500.0	-54.84	2.8	4.95	48.14	AV	54	Pass

9.2 Test Graphs

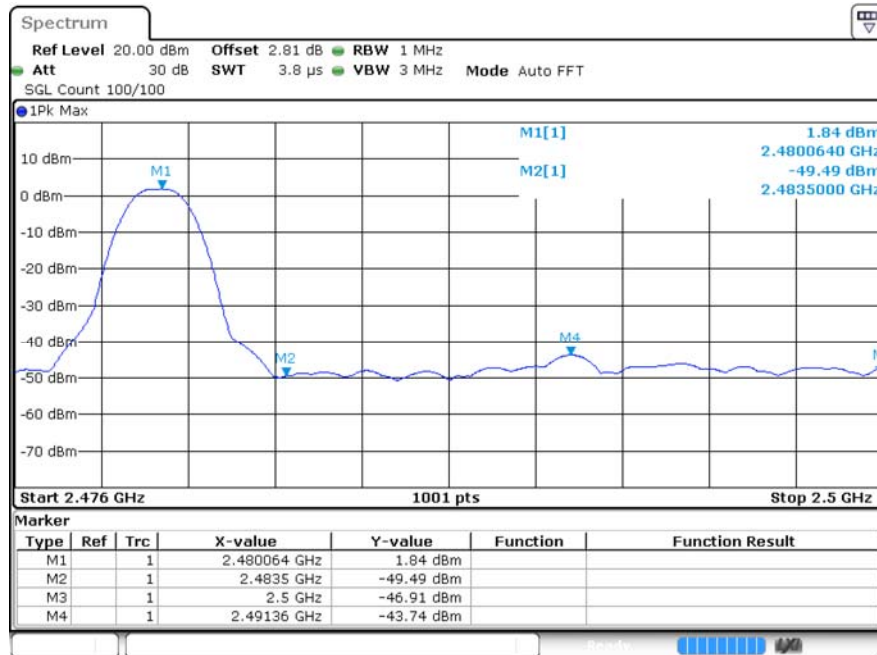
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



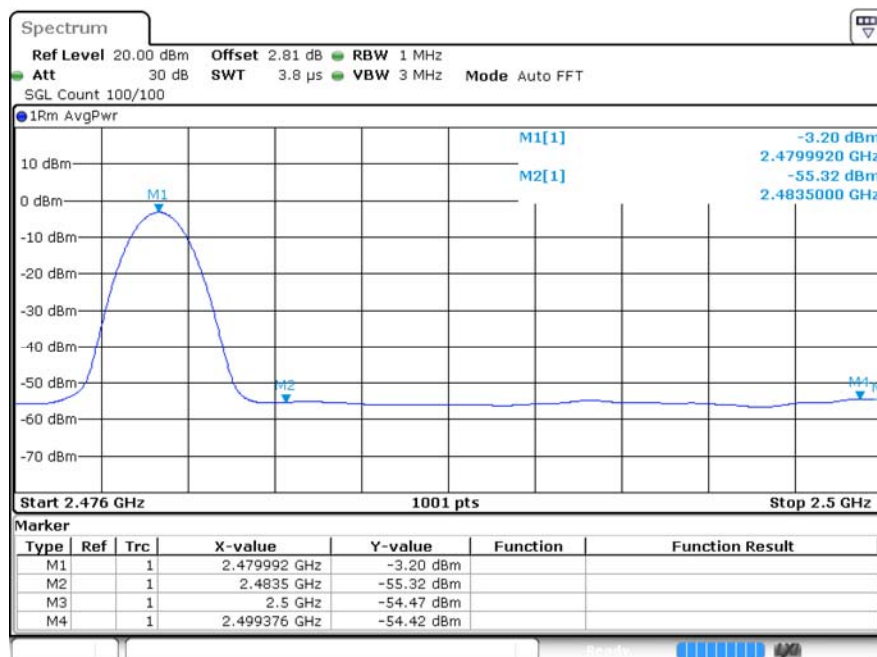
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



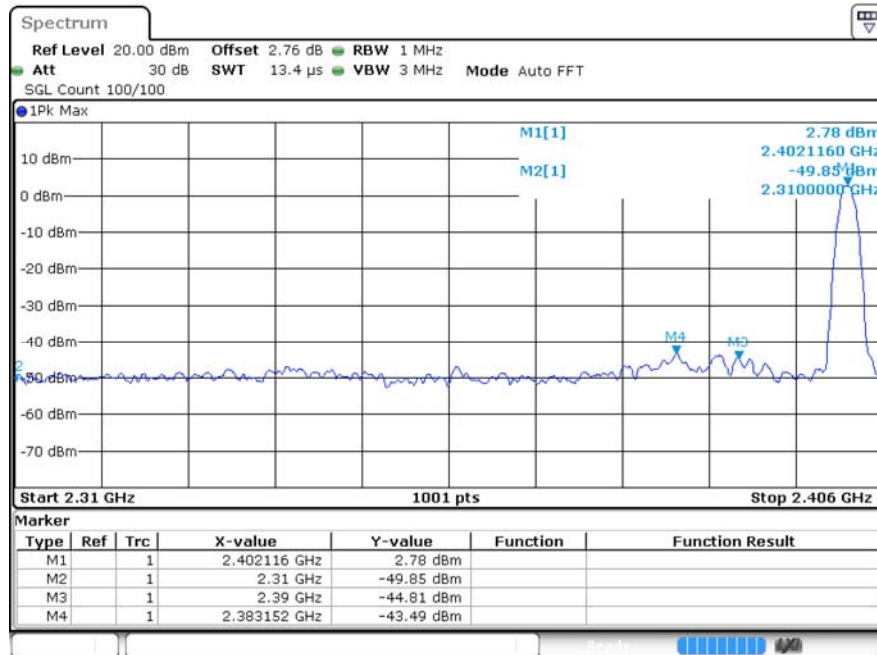
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



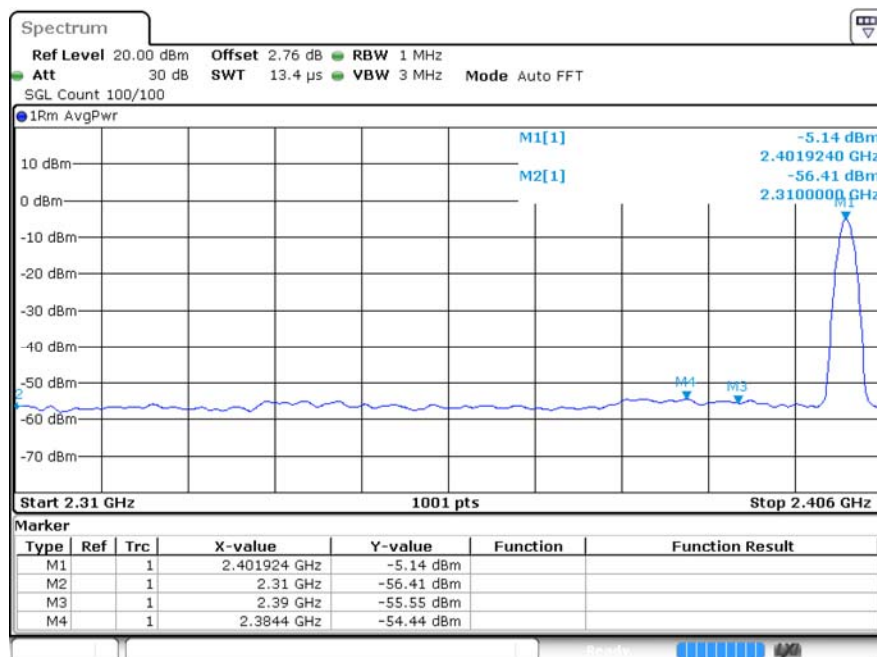
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



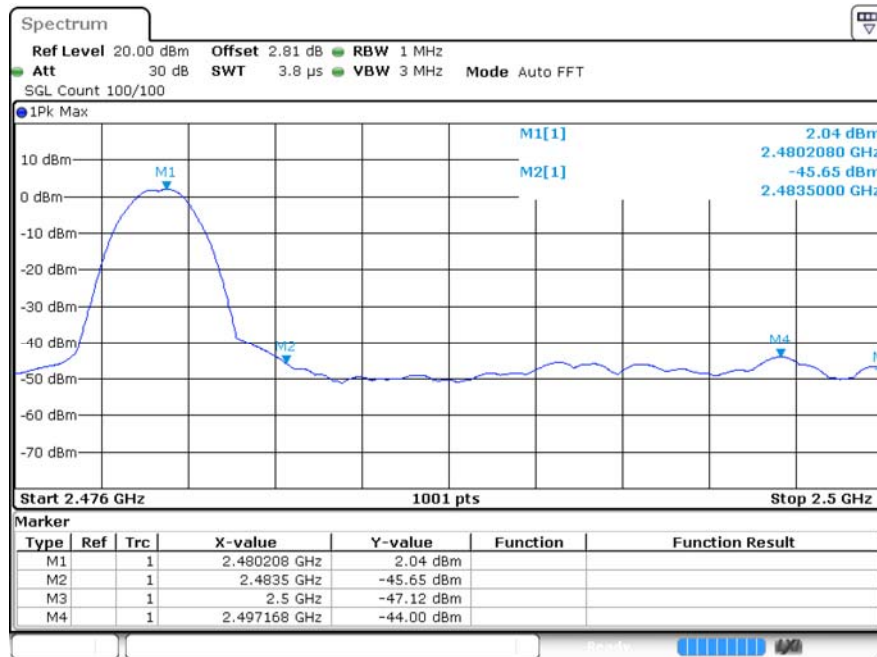
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



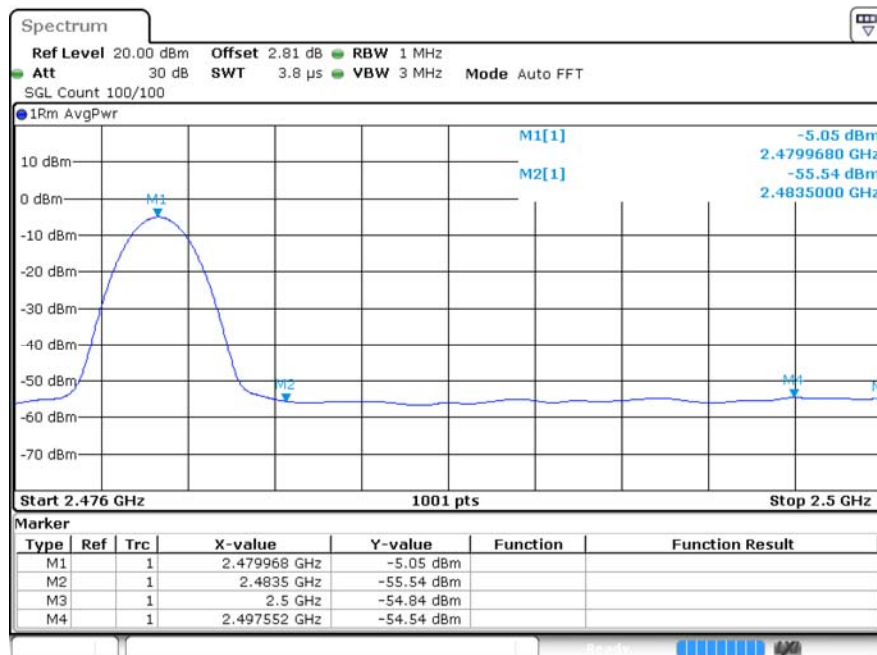
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



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)



---The End---