



Appendix A

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

Product Name: Wireless Earphone

Trade Mark: OSCAL

Test Model: HiBuds 5

Environmental Conditions

Temperature:	25.6℃
Relative Humidity:	52.3%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



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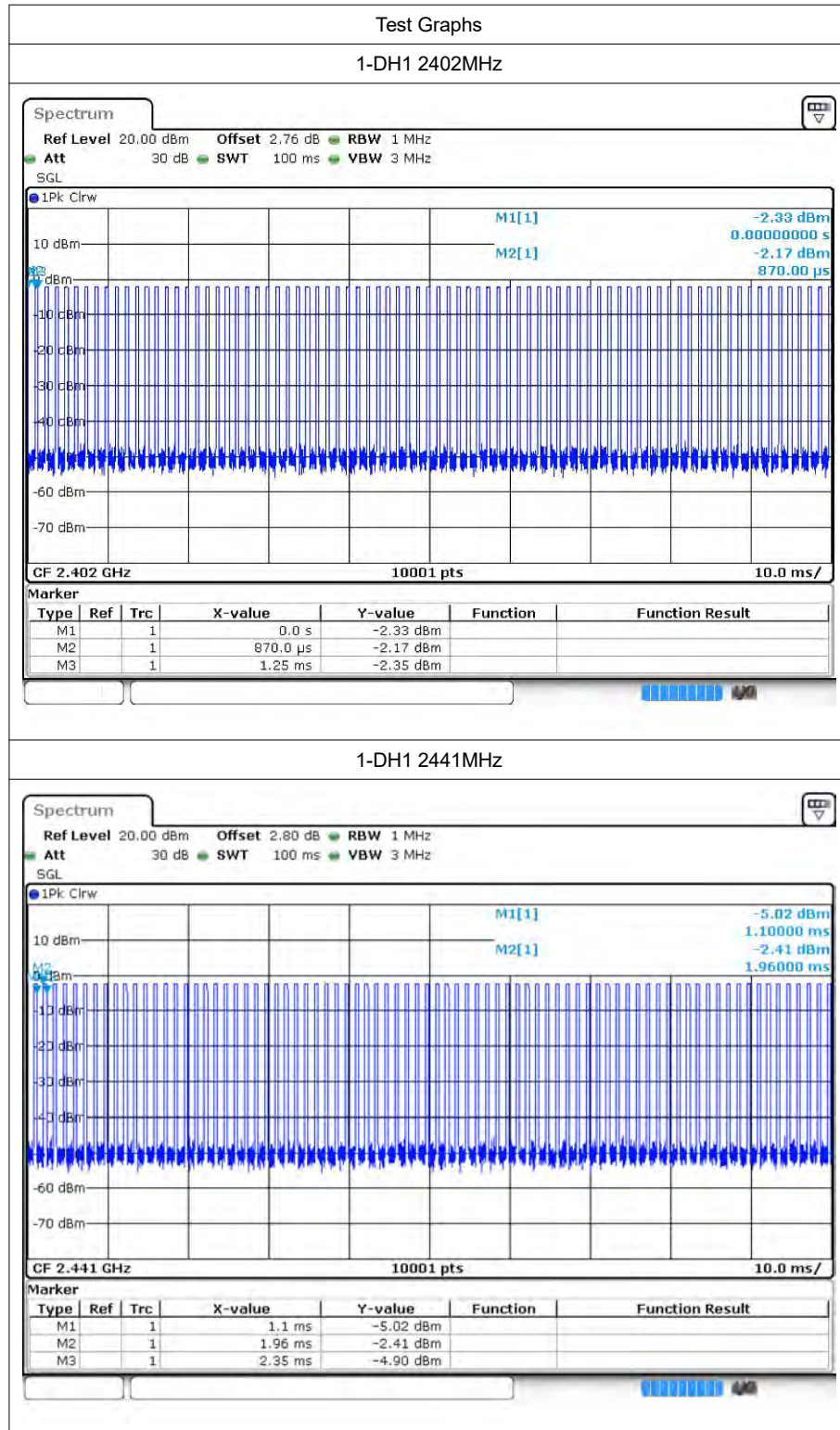
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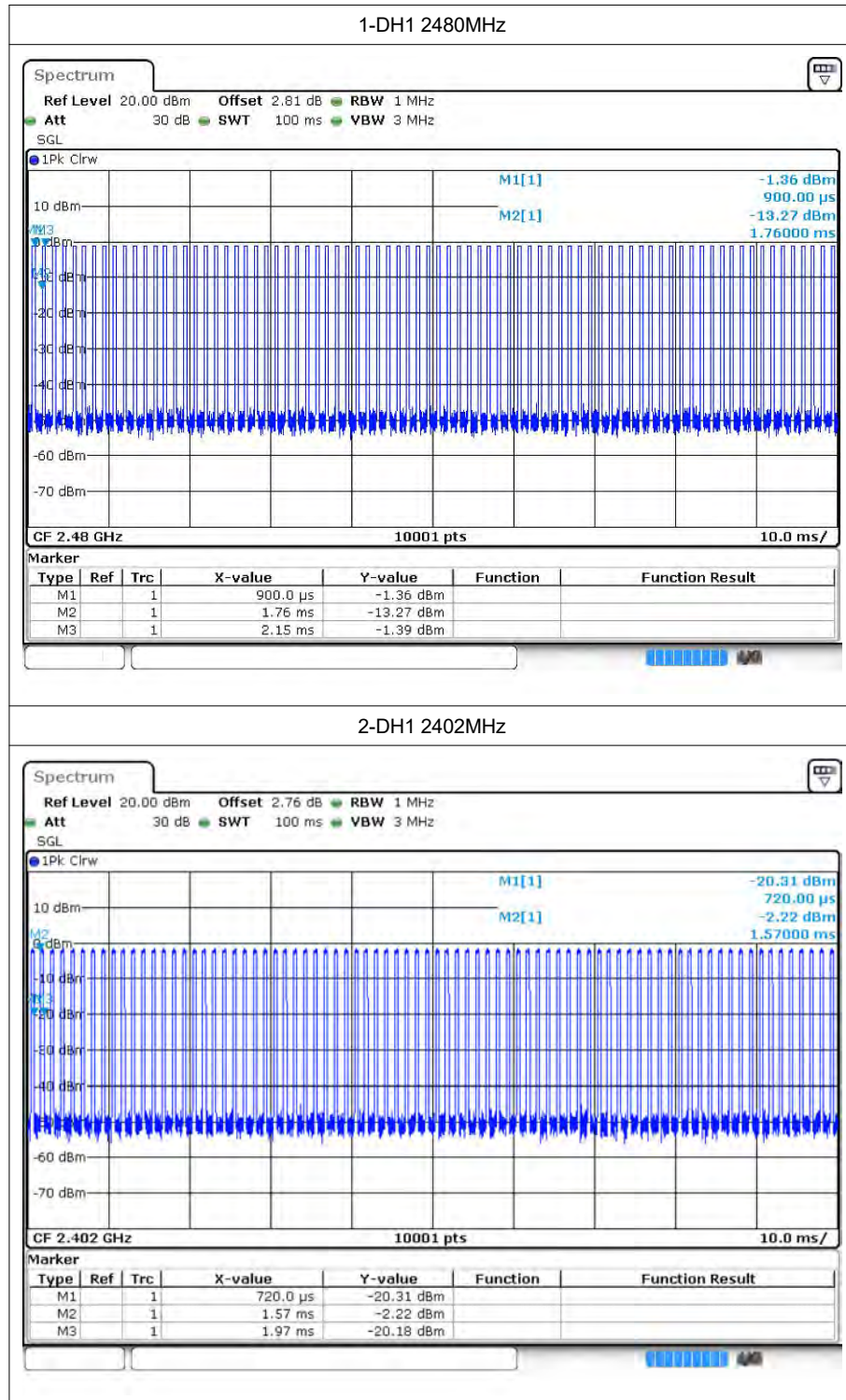
1 Duty Cycle

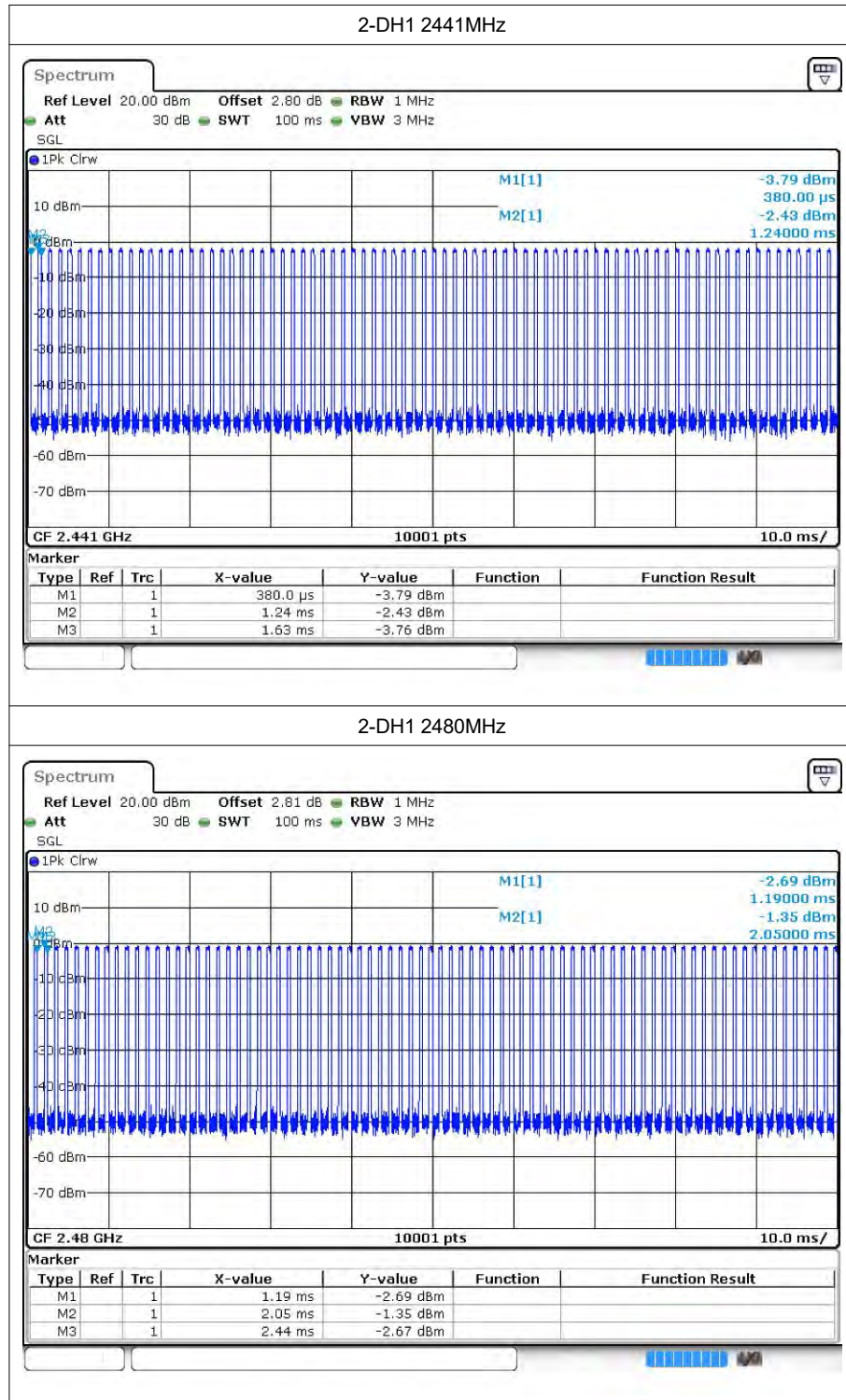
1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	31.21	2.63
1-DH1	2441	32	2.56
1-DH1	2480	31.83	2.56
2-DH1	2402	32.8	2.5
2-DH1	2441	32.01	2.56
2-DH1	2480	32	2.56

1.2 Test Graphs





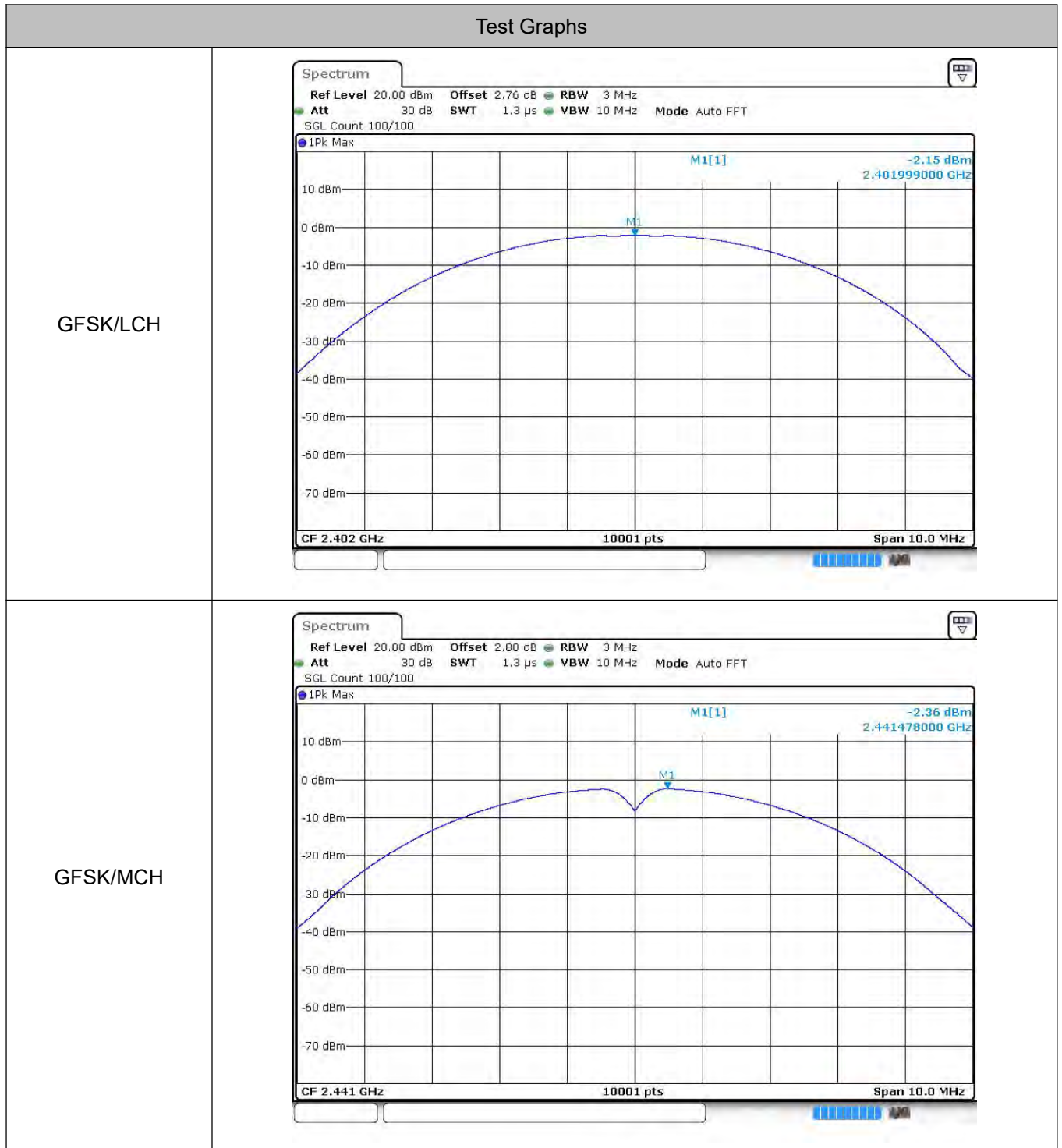


2 Maximum Conducted Peak Output Power

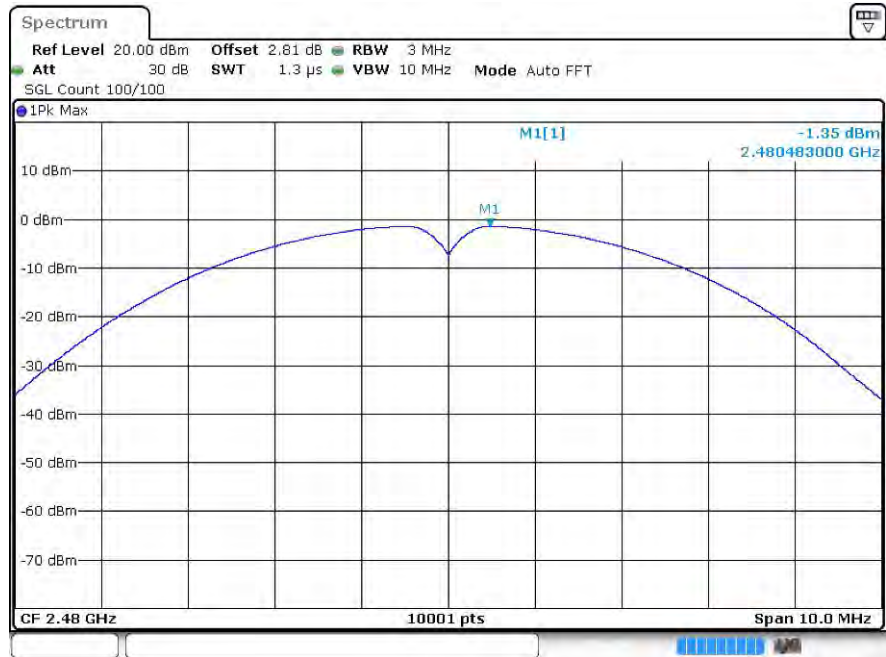
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.15	21	Pass
	MCH	-2.36	21	Pass
	HCH	-1.35	21	Pass
$\pi/4$ DQPSK	LCH	-1.54	21	Pass
	MCH	-1.87	21	Pass
	HCH	-0.67	21	Pass

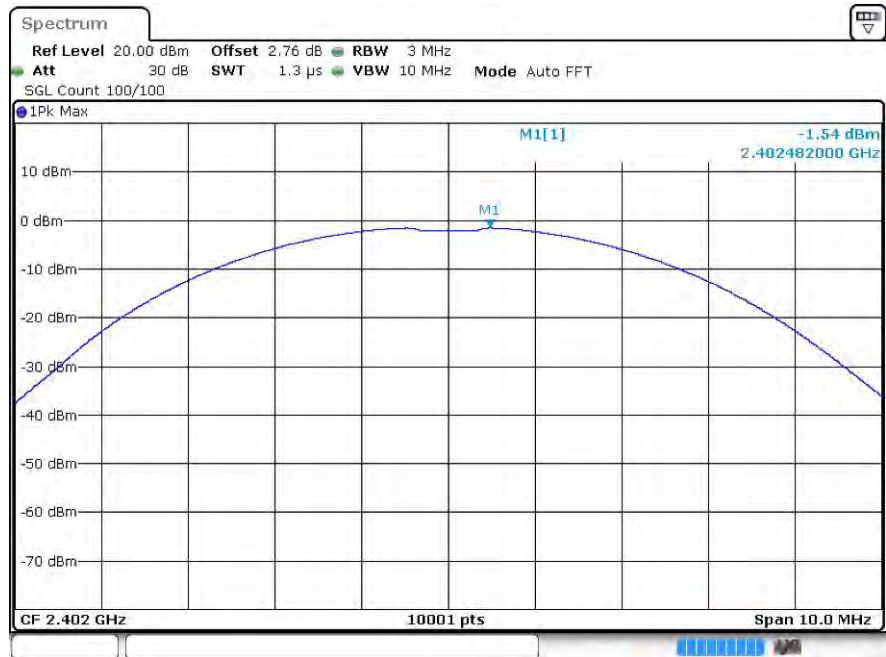
2.2 Test Graphs



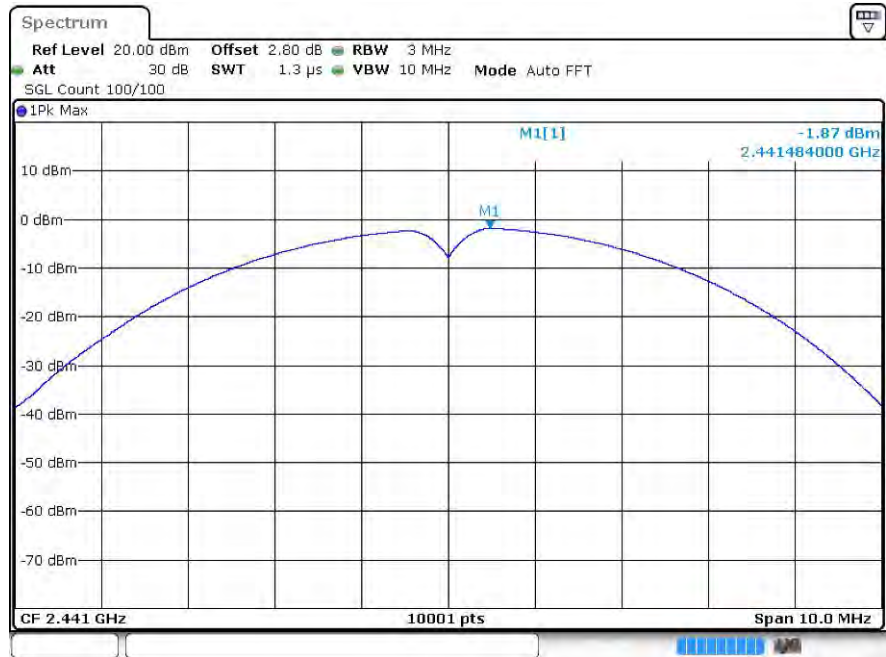
GFSK/HCH



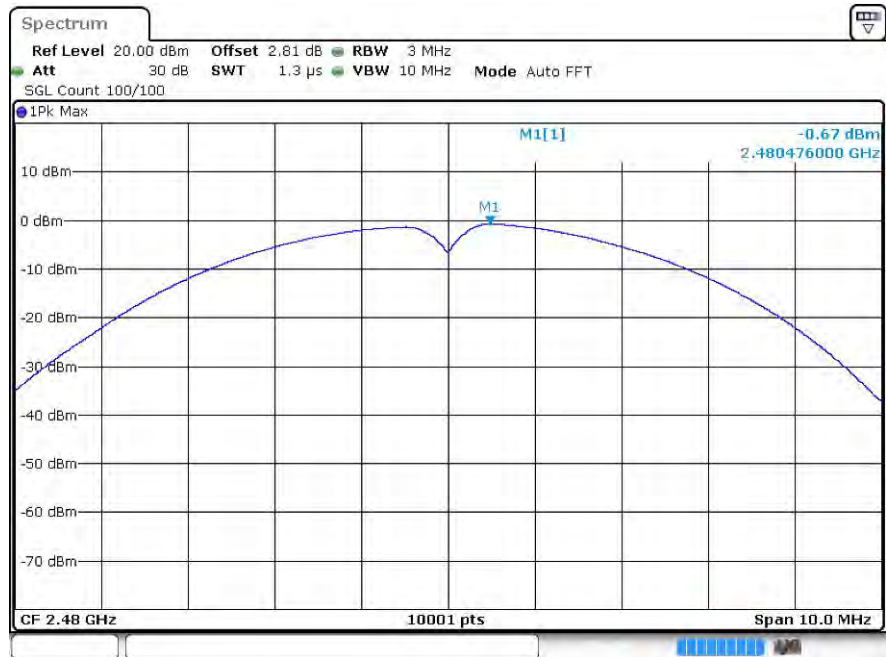
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

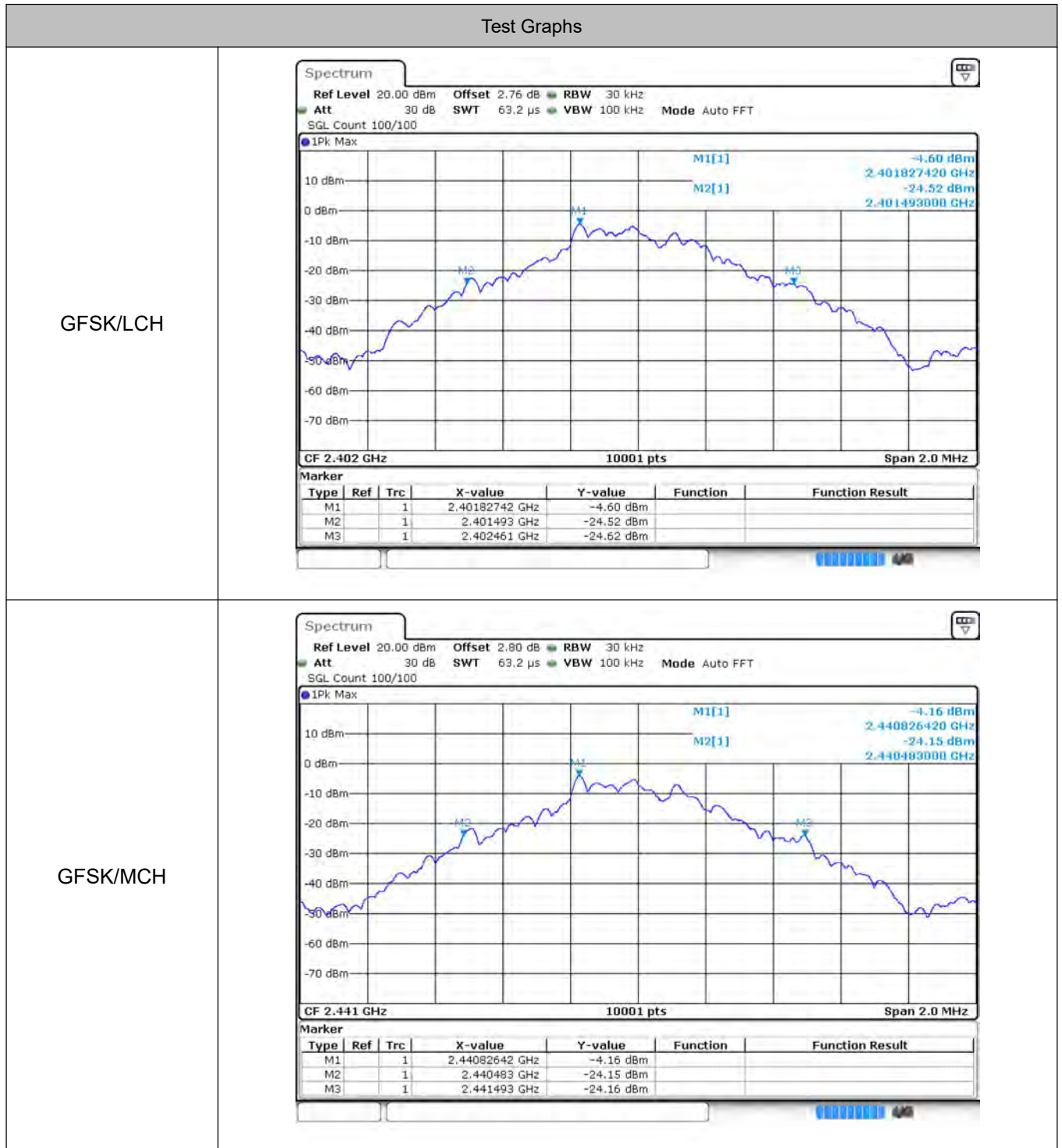


3 20dB Bandwidth

3.1 Test Result

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.968	Not Specified	Pass
	MCH	1.01	Not Specified	Pass
	HCH	1.028	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.248	Not Specified	Pass
	MCH	1.278	Not Specified	Pass
	HCH	1.226	Not Specified	Pass

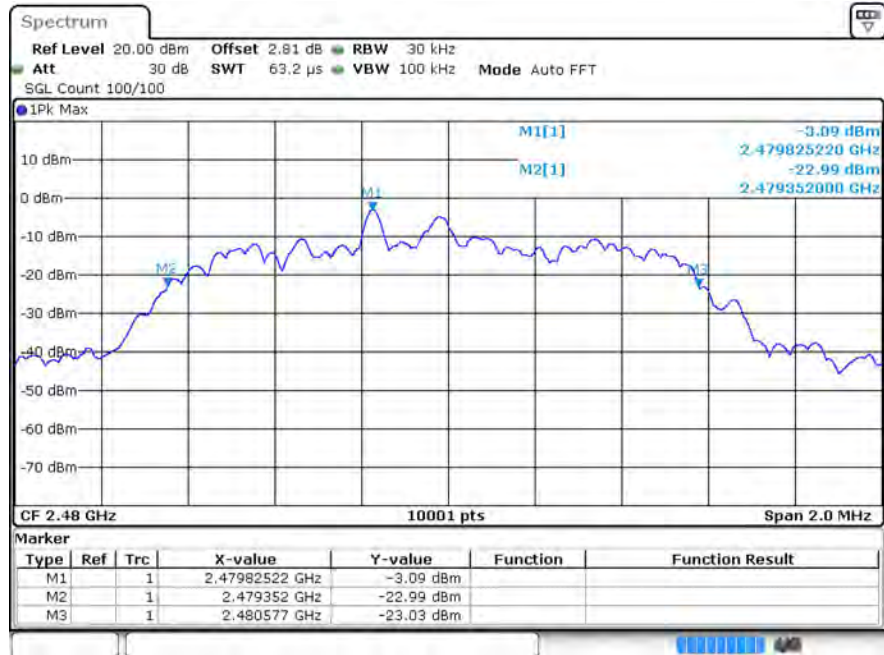
3.2 Test Graphs



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	1.009	0.673	Pass
$\pi/4$ DQPSK	MCH	1.001	0.852	Pass

4.2 Test Graphs

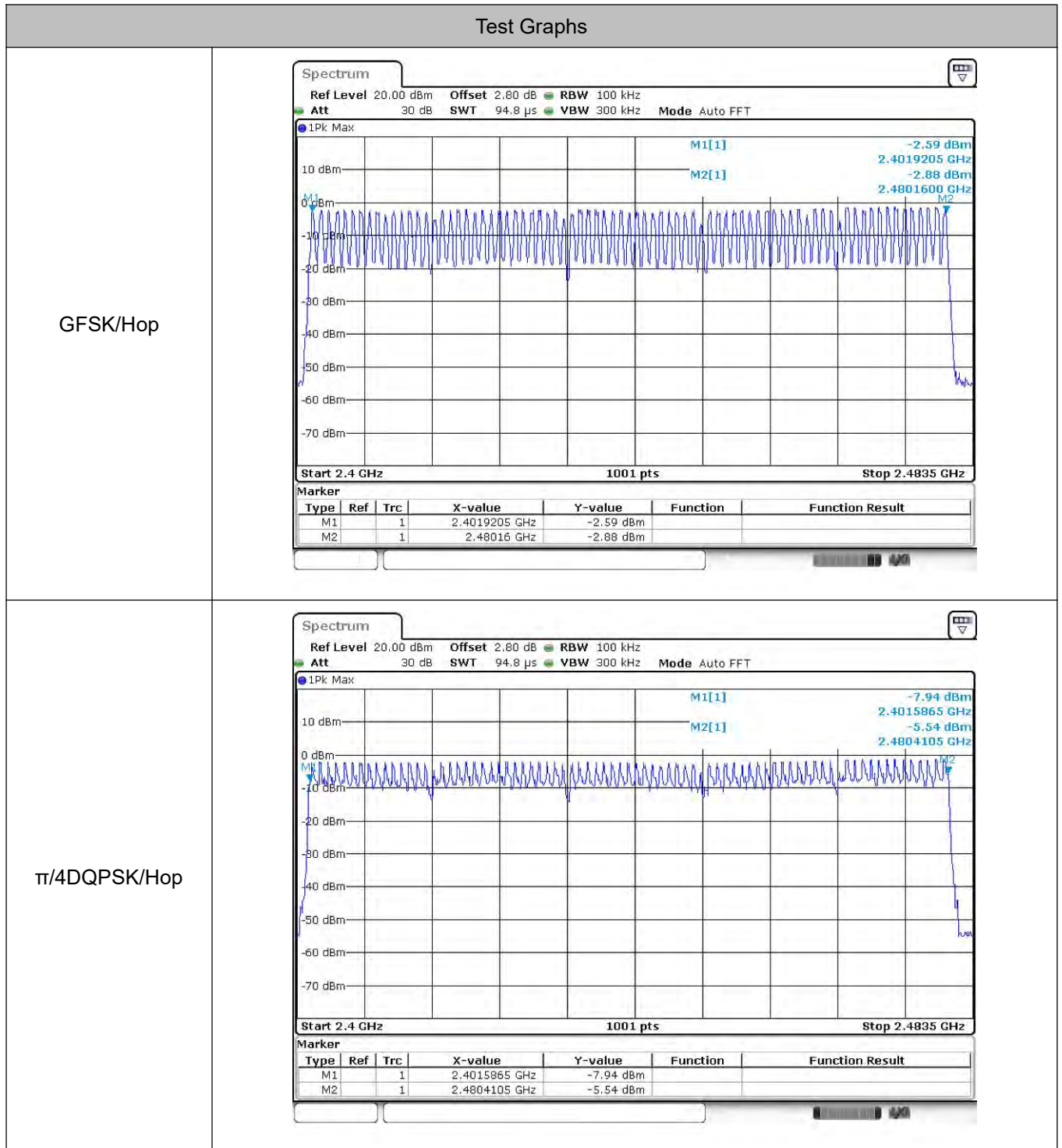


5 Hopping Channel Number

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

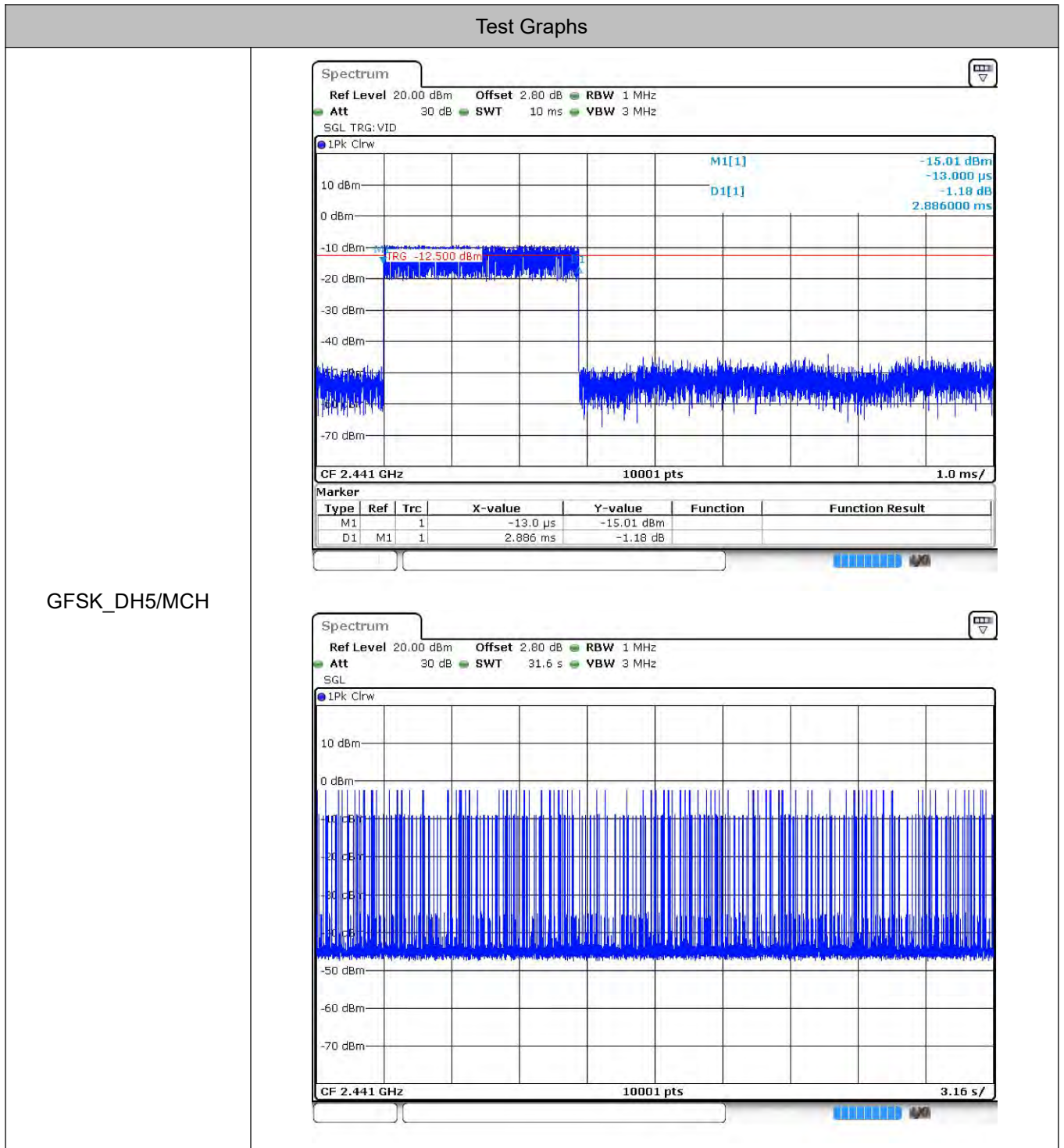


6 Dwell Time

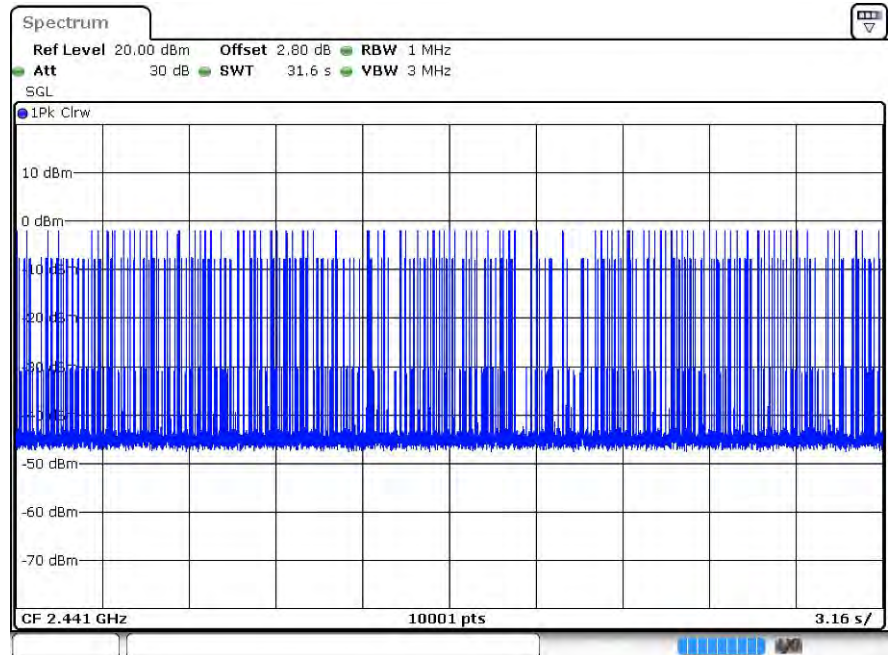
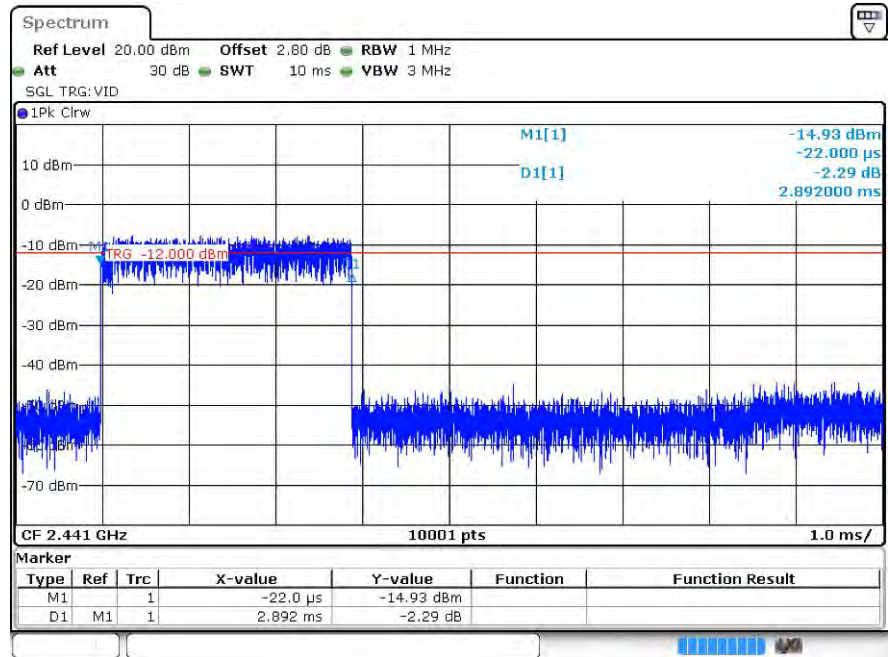
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.886	113	326.118	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.892	123	355.716	0.4	Pass

6.2 Test Graphs



$\pi/4$ DQPSK
_2DH5/MCH



7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-39.06	-20	Pass
	MCH	-38.1	-20	Pass
	HCH	-40	-20	Pass
$\pi/4$ DQPSK	LCH	-39.09	-20	Pass
	MCH	-38.49	-20	Pass
	HCH	-39.77	-20	Pass

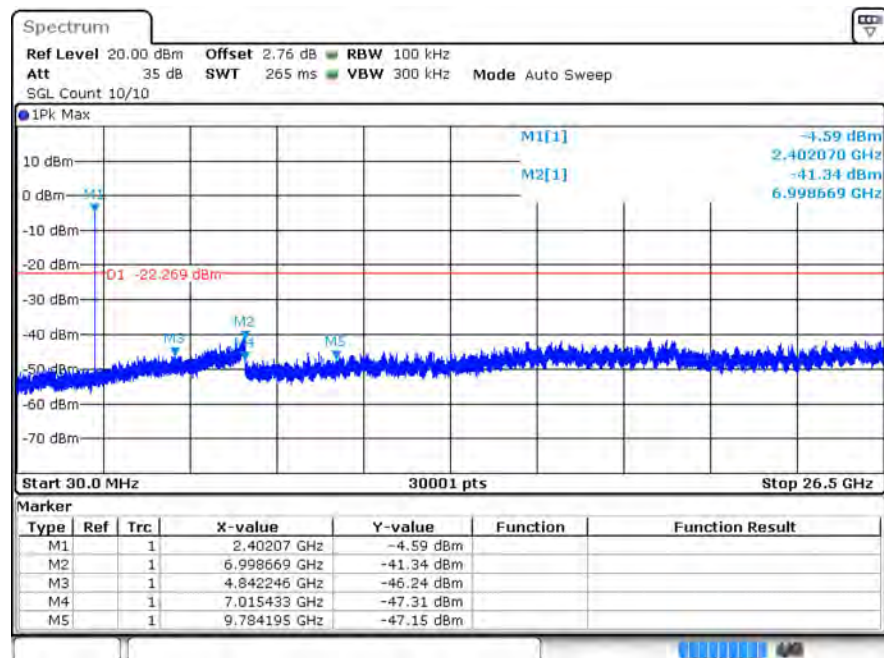
7.2 Test Graphs

GFSK_LCH_Graphs

Pref



Puw

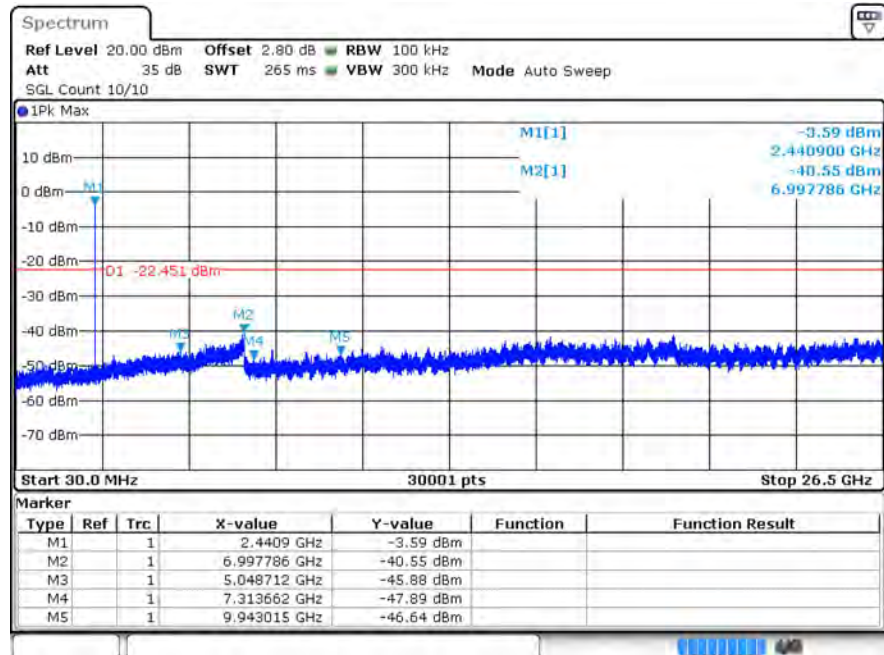


GFSK_MCH_Graphs

Pref



Puw

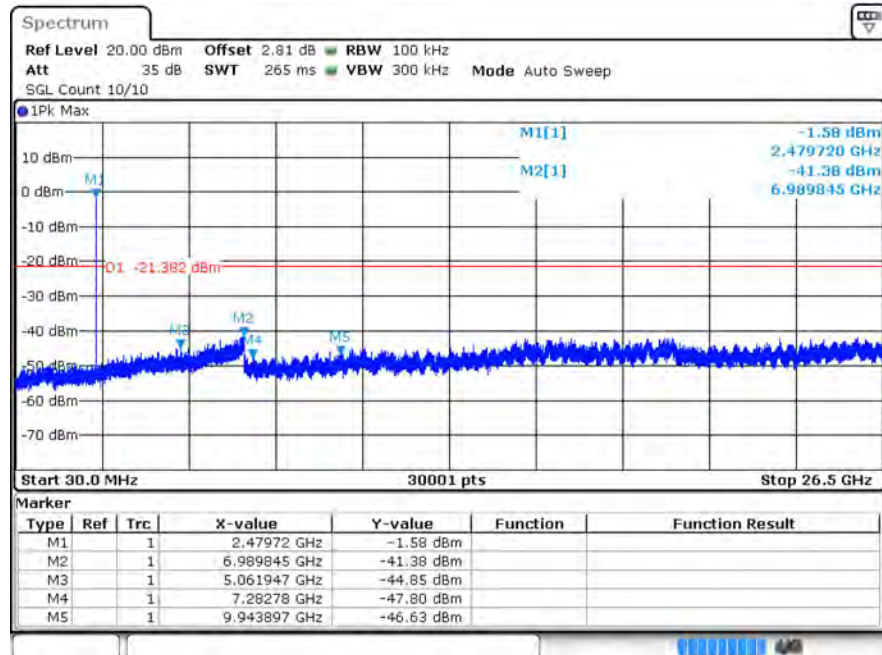


GFSK_HCH_Graphs

Pref

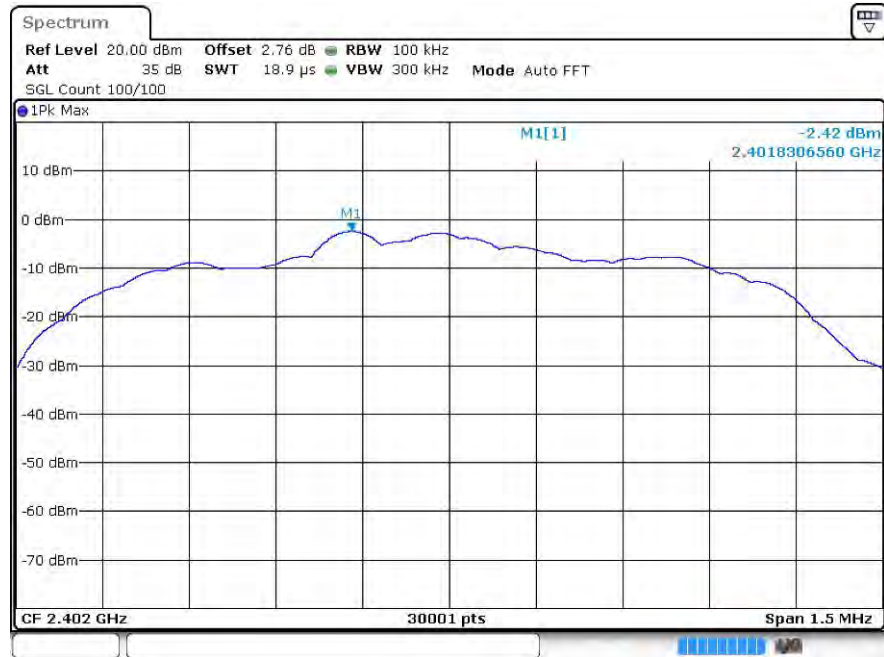


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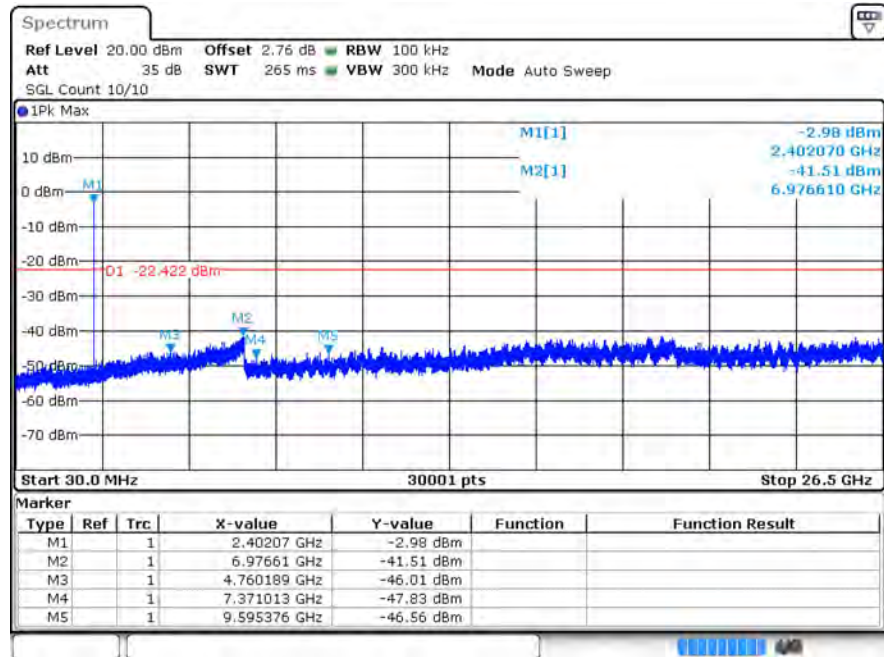


$\pi/4$ DQPSK_LCH_Graphs

Pref

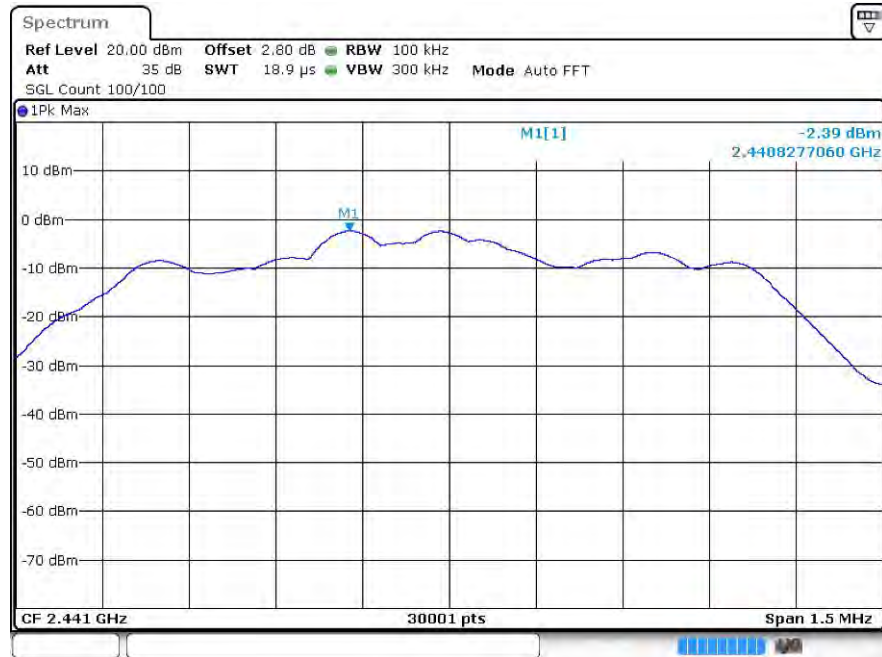


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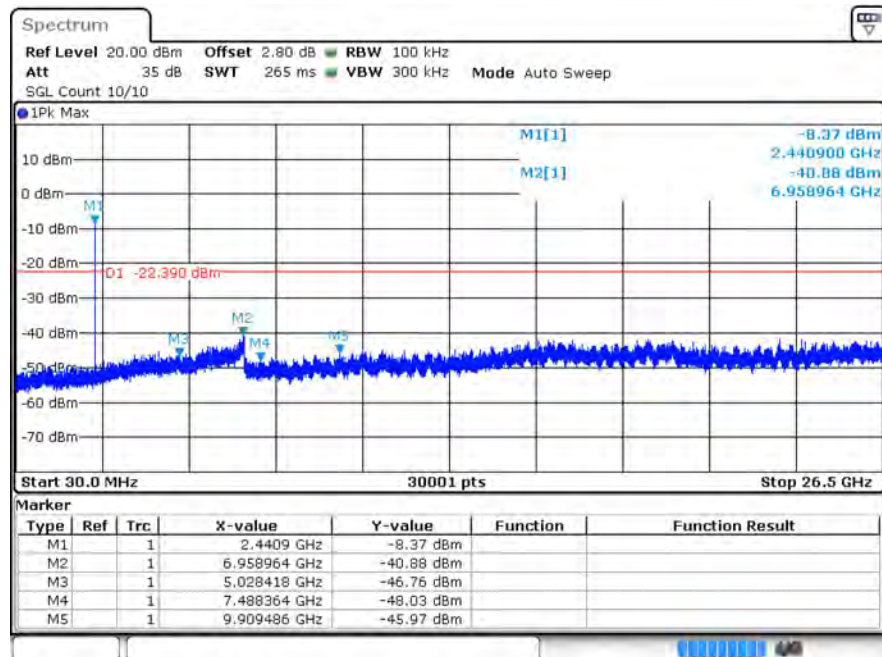


$\pi/4$ DQPSK_MCH_Graphs

Pref

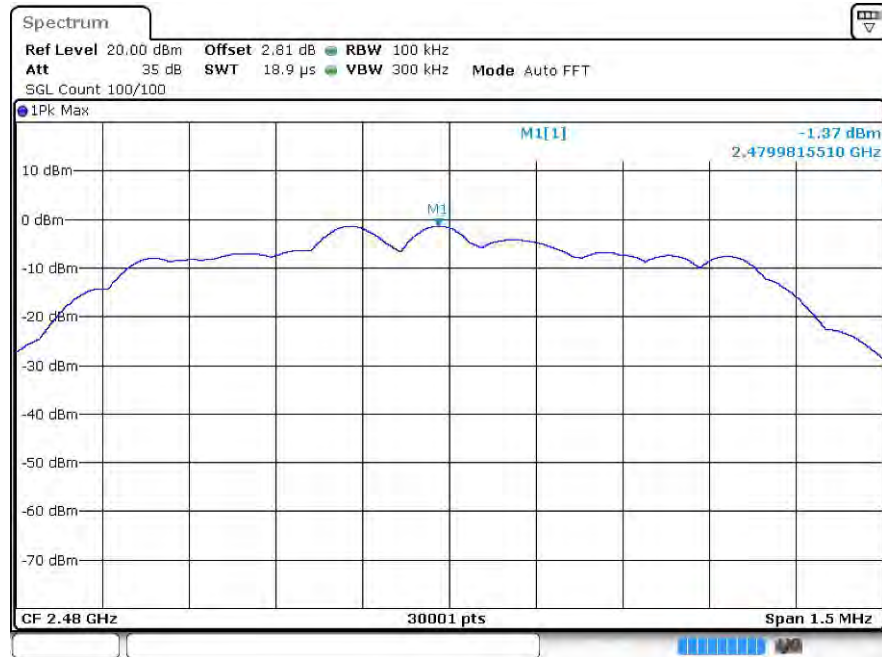


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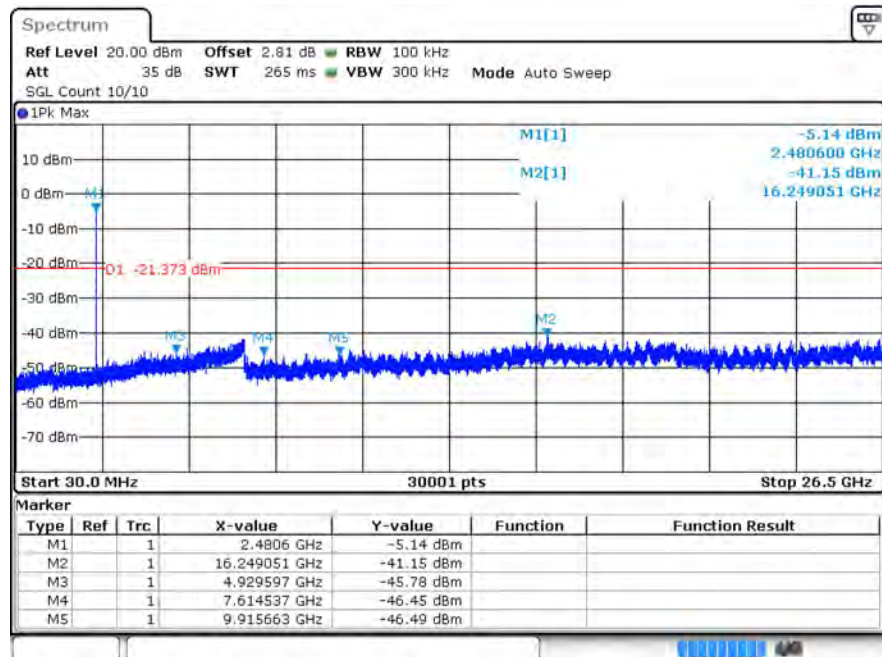


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

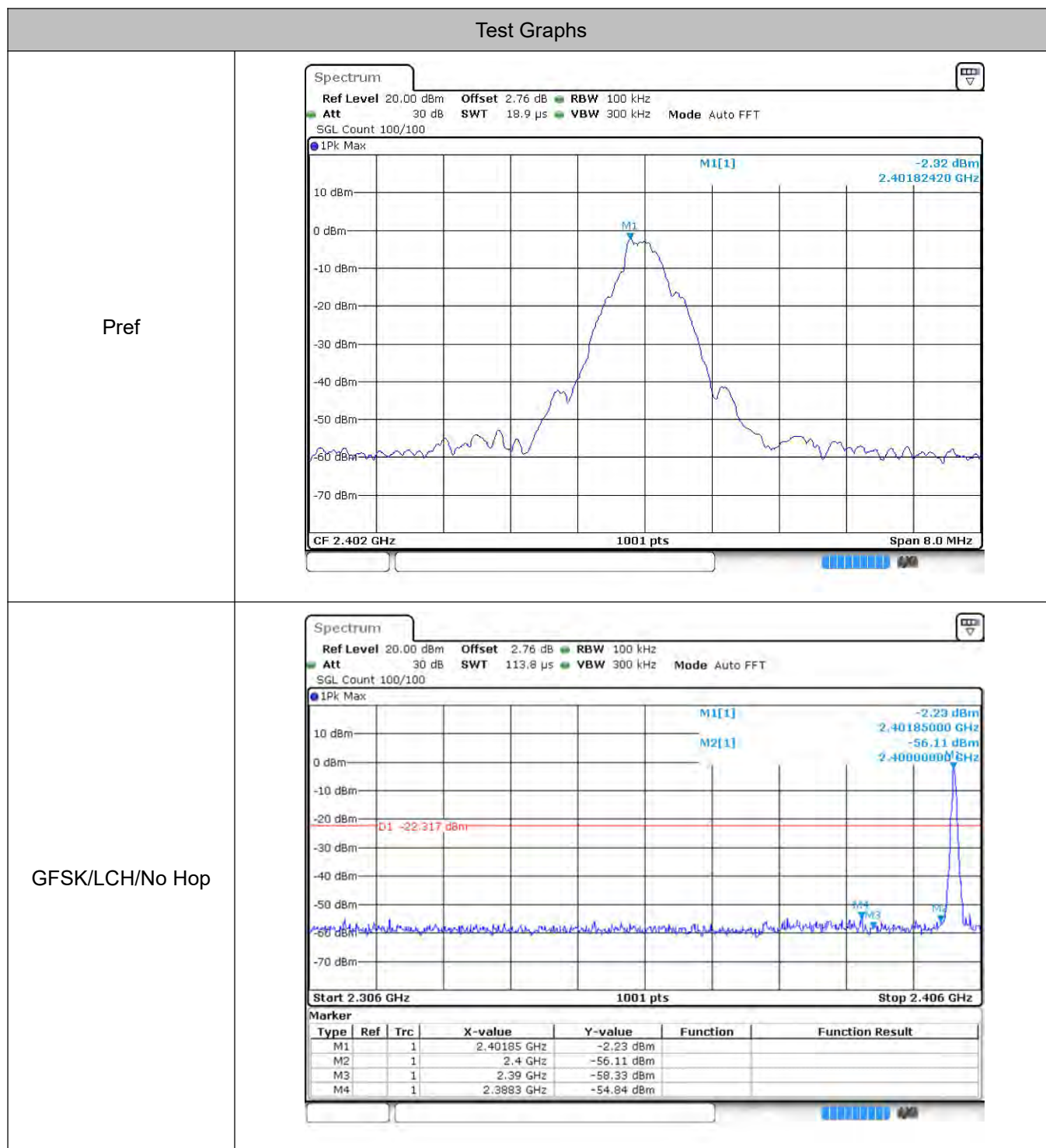


8 Band-edge for RF Conducted Emissions

8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-52.51	-20	Pass
			On	-51.46	-20	Pass
	HCH	2480	Off	-52.19	-20	Pass
			On	-52.01	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-52.94	-20	Pass
			On	-51.84	-20	Pass
	HCH	2480	Off	-52.37	-20	Pass
			On	-51.5	-20	Pass

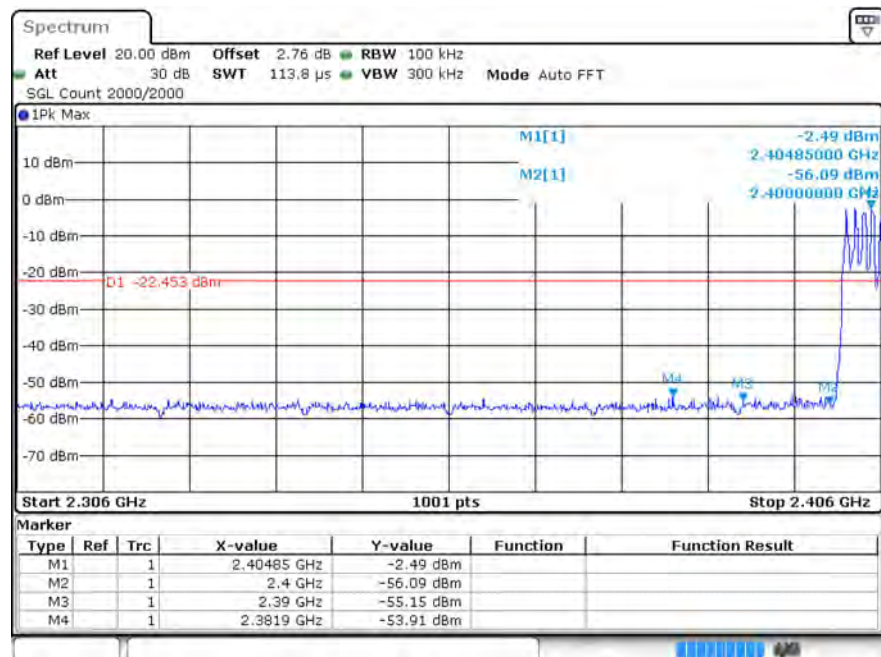
8.2 Test Graphs



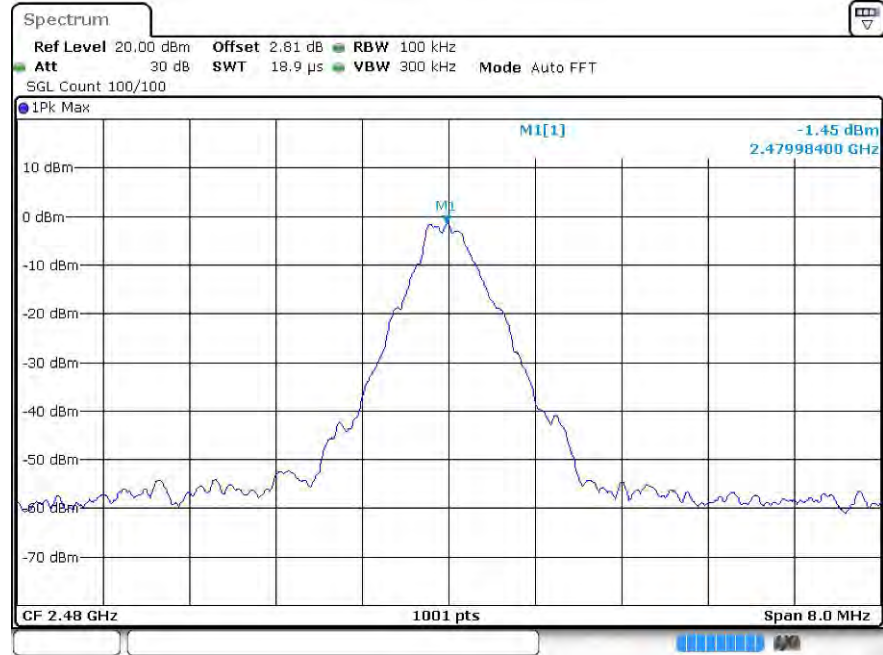
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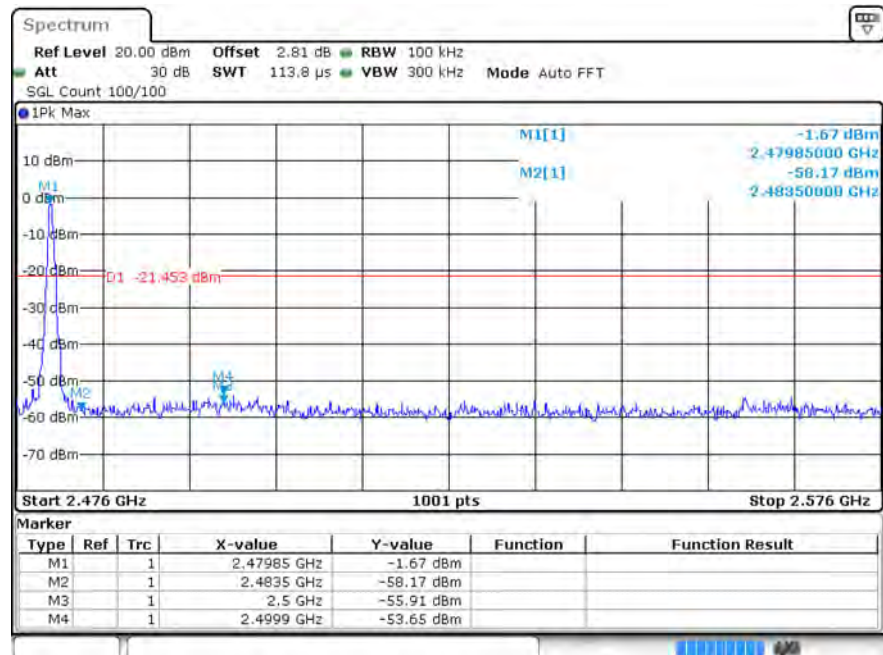
GFSK/LCH/Hop



Ref



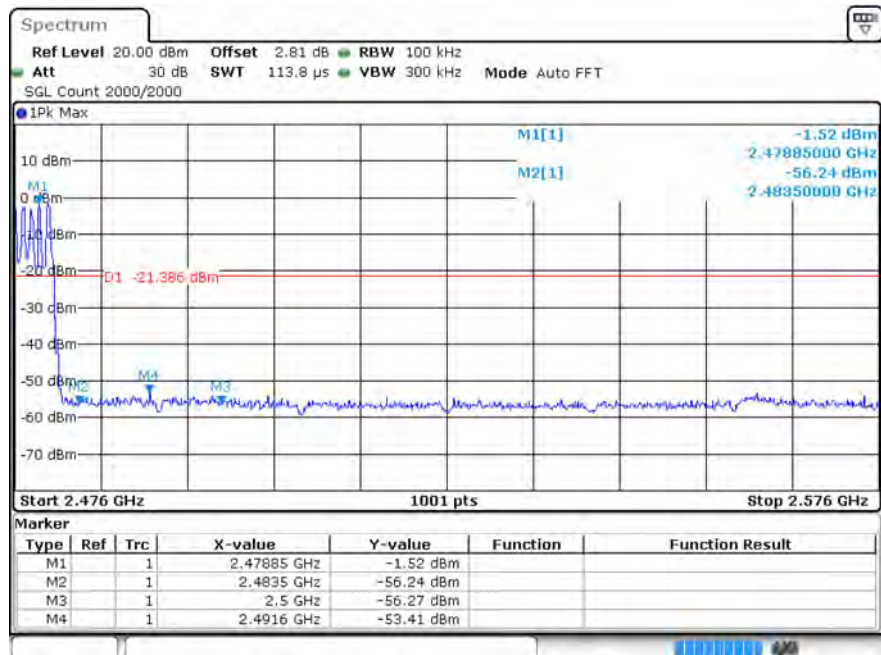
GFSK/HCH/No Hop



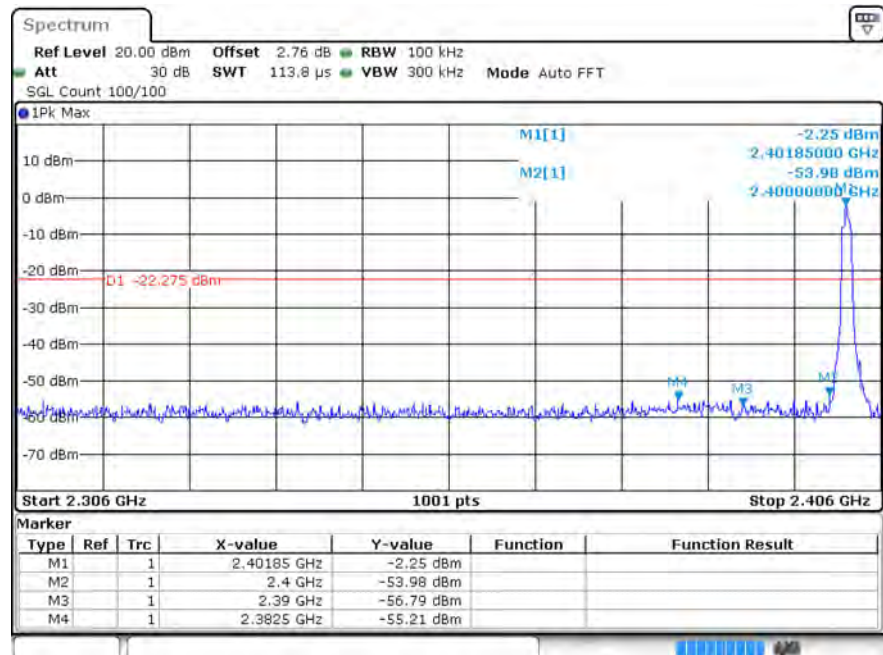
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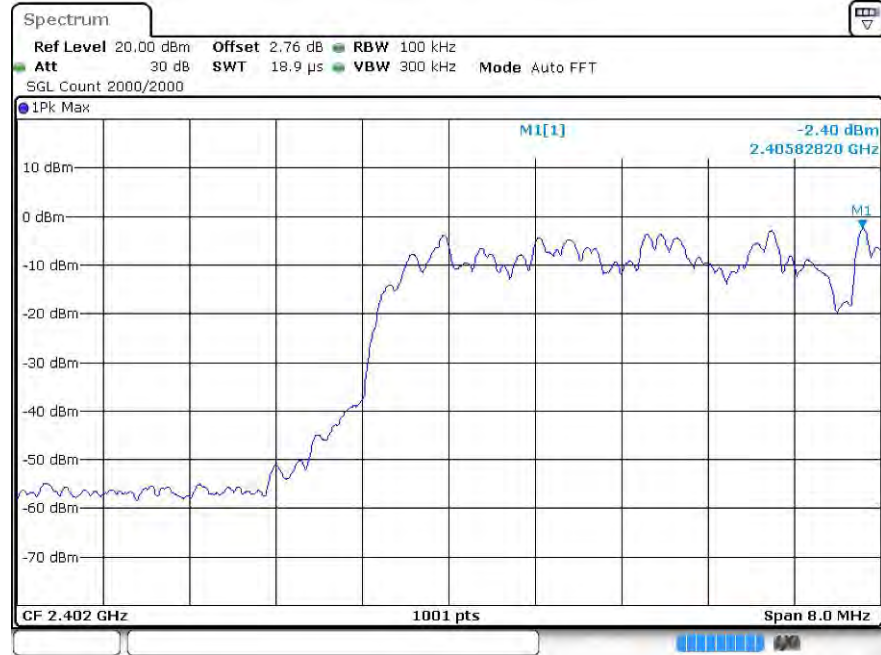
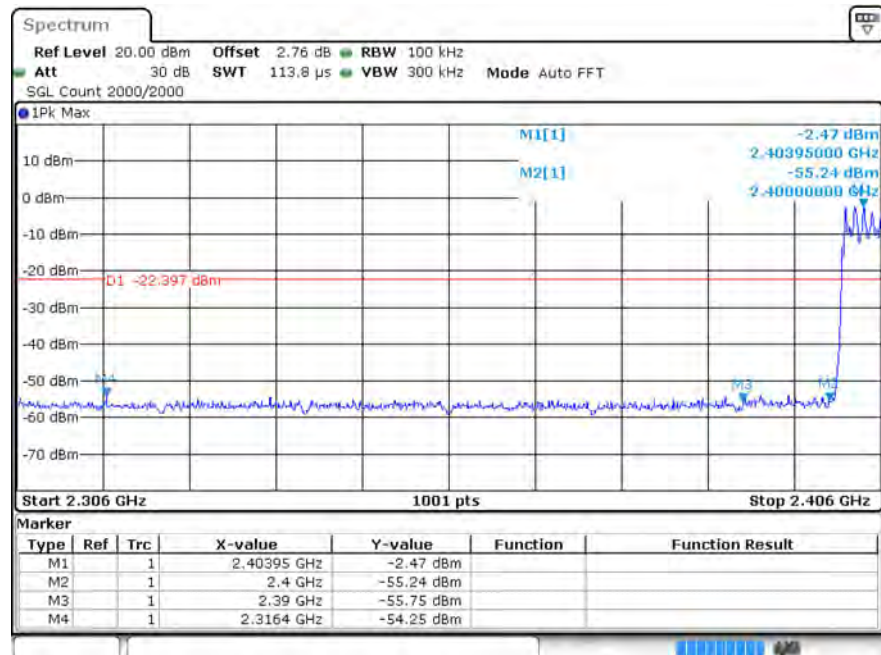
GFSK/HCH/Hop



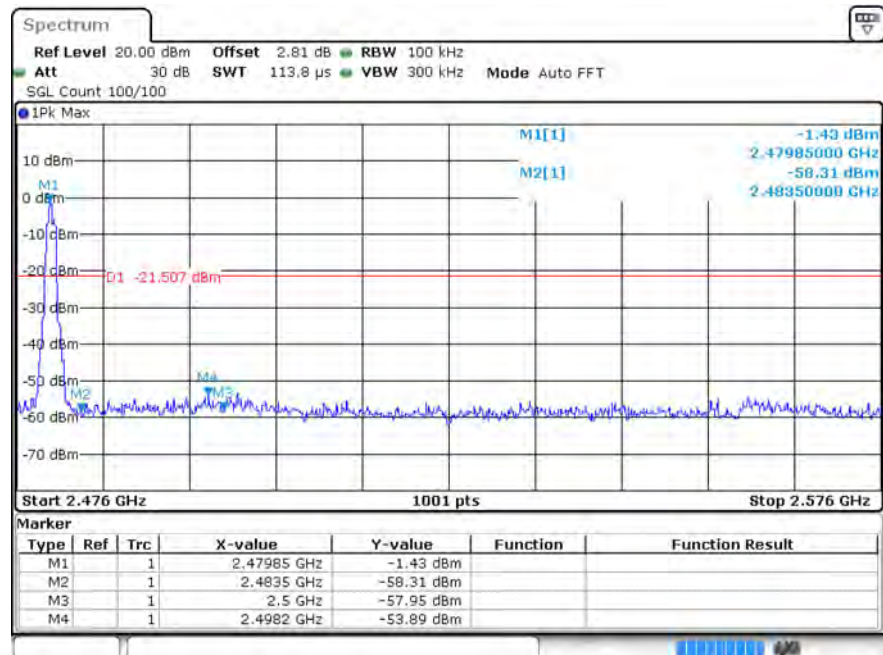
Ref


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


Ref


 $\pi/4$ DQPSK/LCH/Hop


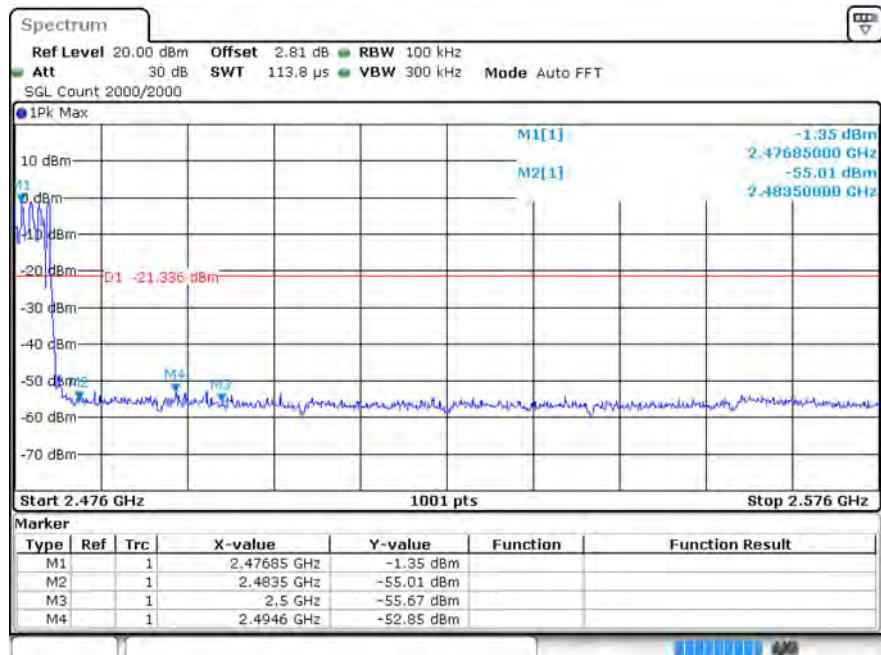
Ref


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


Ref



$\pi/4$ DQPSK/HCH/Hop



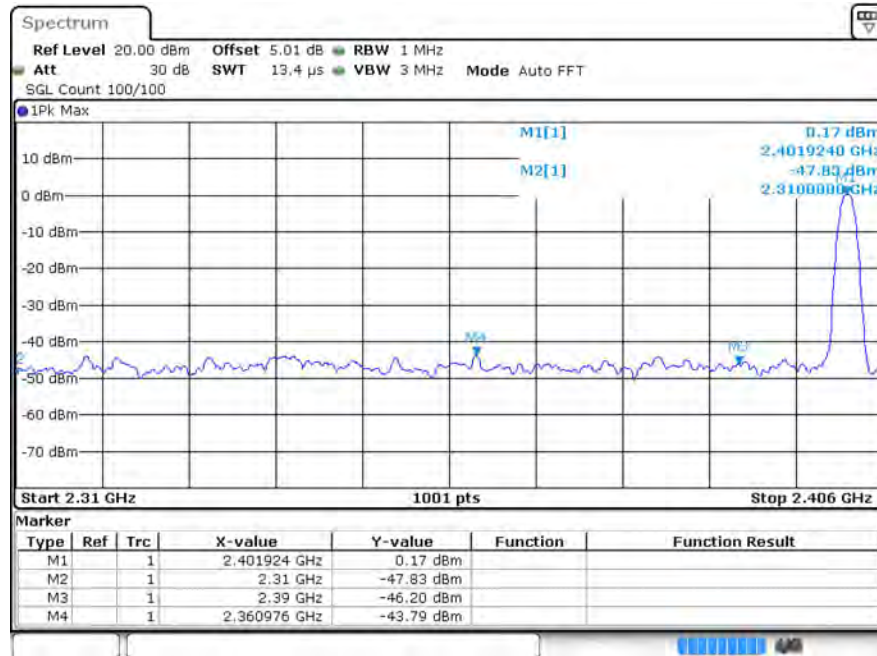
9 Restrict-band band-edge measurements

9.1 Test Result

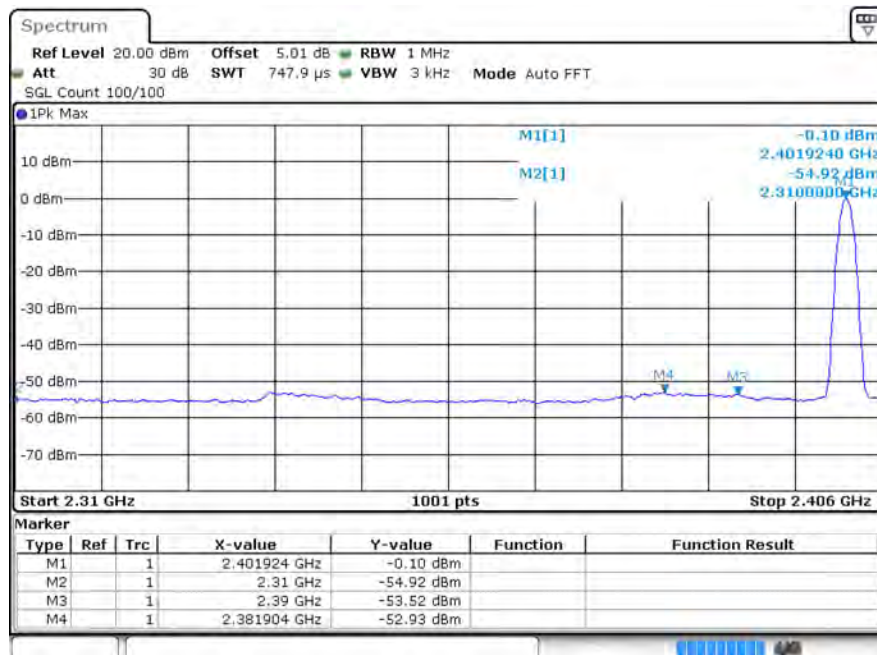
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-47.82	3	50.41	PEAK	74	Pass
	Off	2310.0	-54.91	3	43.32	AV	54	Pass
	Off	2360.976	-43.79	3	54.44	PEAK	74	Pass
	Off	2381.904	-52.92	3	45.31	AV	54	Pass
	Off	2390.0	-46.19	3	52.04	PEAK	74	Pass
	Off	2390.0	-53.52	3	44.71	AV	54	Pass
	Off	2483.5	-45.75	3	52.48	PEAK	74	Pass
	Off	2483.5	-54.55	3	43.68	AV	54	Pass
	Off	2495.224	-42.07	3	56.16	PEAK	74	Pass
	Off	2499.016	-51.84	3	46.39	AV	54	Pass
	Off	2500.0	-45.61	3	52.62	PEAK	74	Pass
	Off	2500.0	-52.3	3	45.93	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-45.78	3	52.45	PEAK	74	Pass
	Off	2310.0	-55.1	3	43.13	AV	54	Pass
	Off	2341.104	-43.51	3	54.72	PEAK	74	Pass
	Off	2383.92	-53.04	3	45.19	AV	54	Pass
	Off	2390.0	-46.23	3	52.00	PEAK	74	Pass
	Off	2390.0	-54.11	3	44.12	AV	54	Pass
	Off	2483.5	-46.62	3	51.61	PEAK	74	Pass
	Off	2483.5	-54.5	3	43.73	AV	54	Pass
	Off	2496.352	-41.54	3	56.69	PEAK	74	Pass
	Off	2497.96	-52.13	3	46.10	AV	54	Pass
	Off	2500.0	-42.34	3	55.89	PEAK	74	Pass
	Off	2500.0	-52.23	3	46.00	AV	54	Pass

9.2 Test Graphs

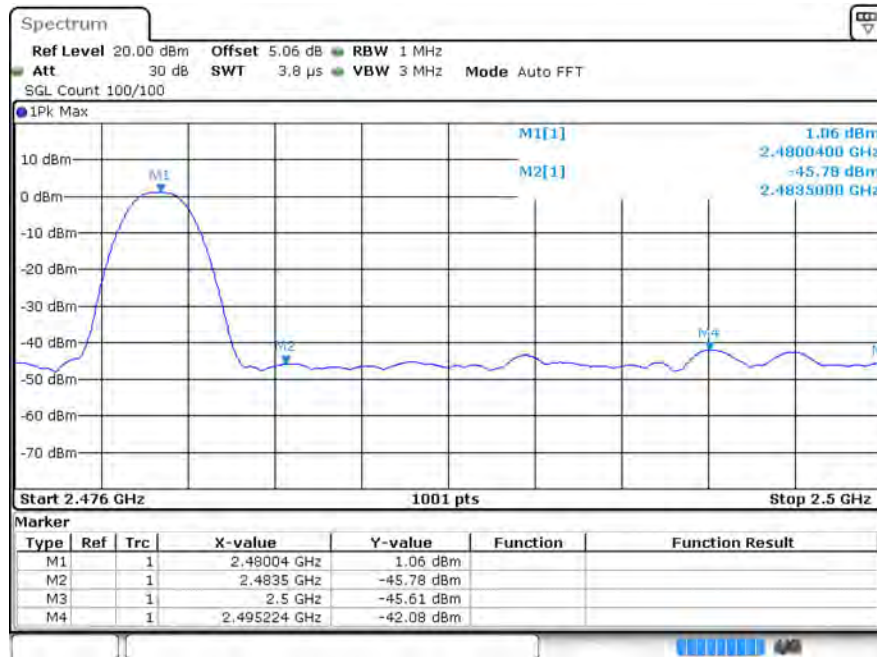
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



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



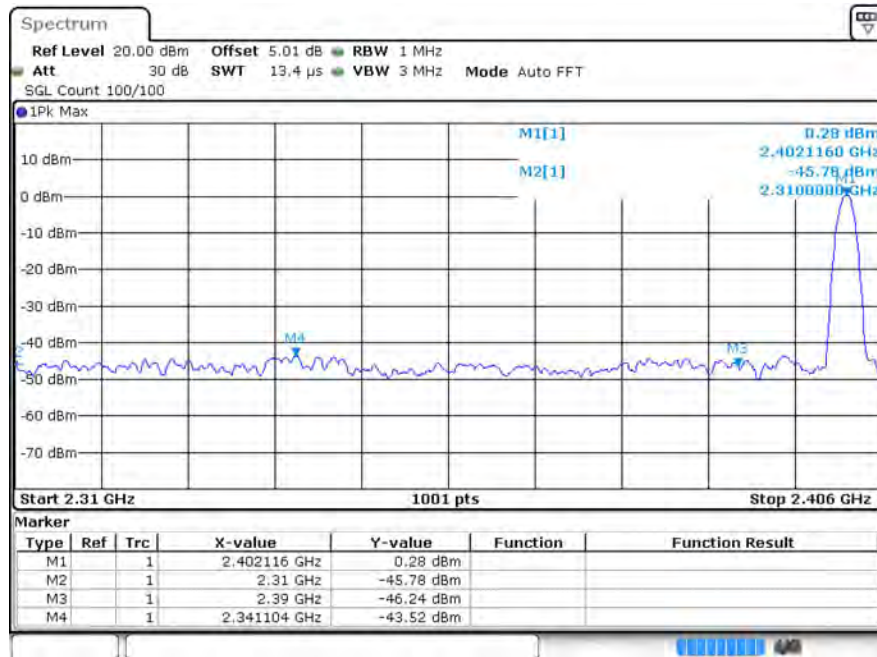
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



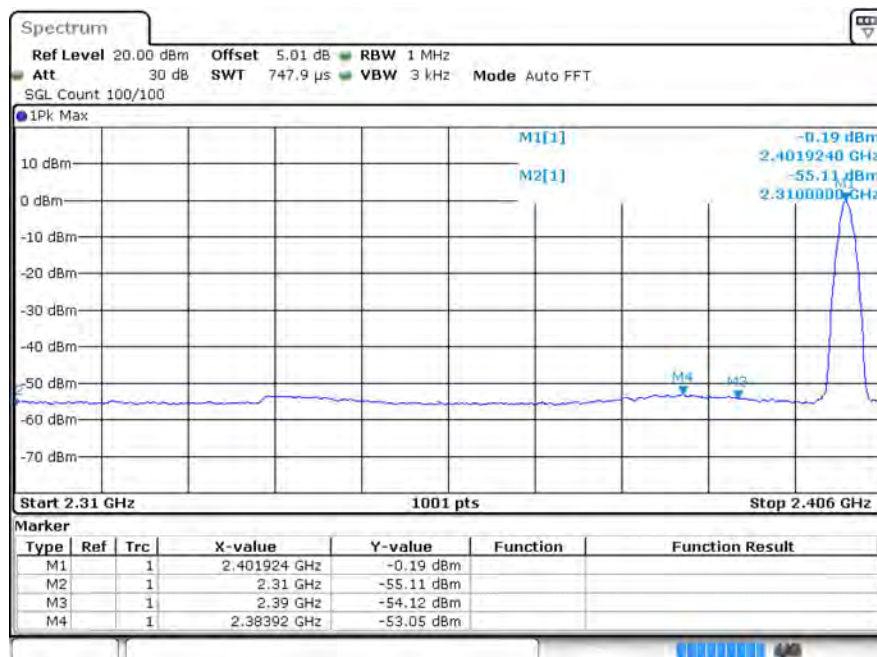
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



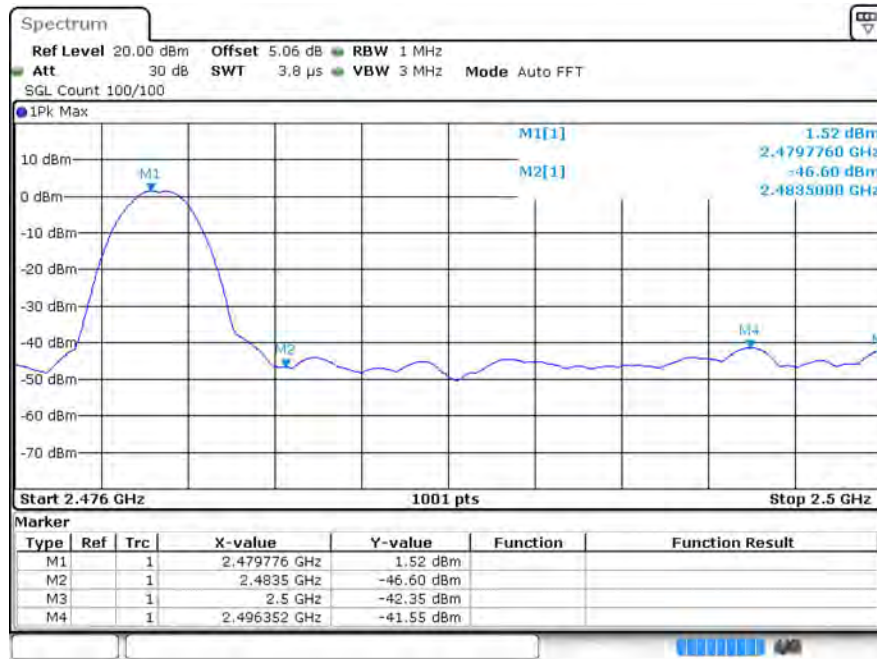
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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---