



Appendix A

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

Product Name: HEYPLUS OWS

Trade Mark: N/A

Test Model: A12

Environmental Conditions

Temperature:	23.6℃
Relative Humidity:	51.3%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

Contents

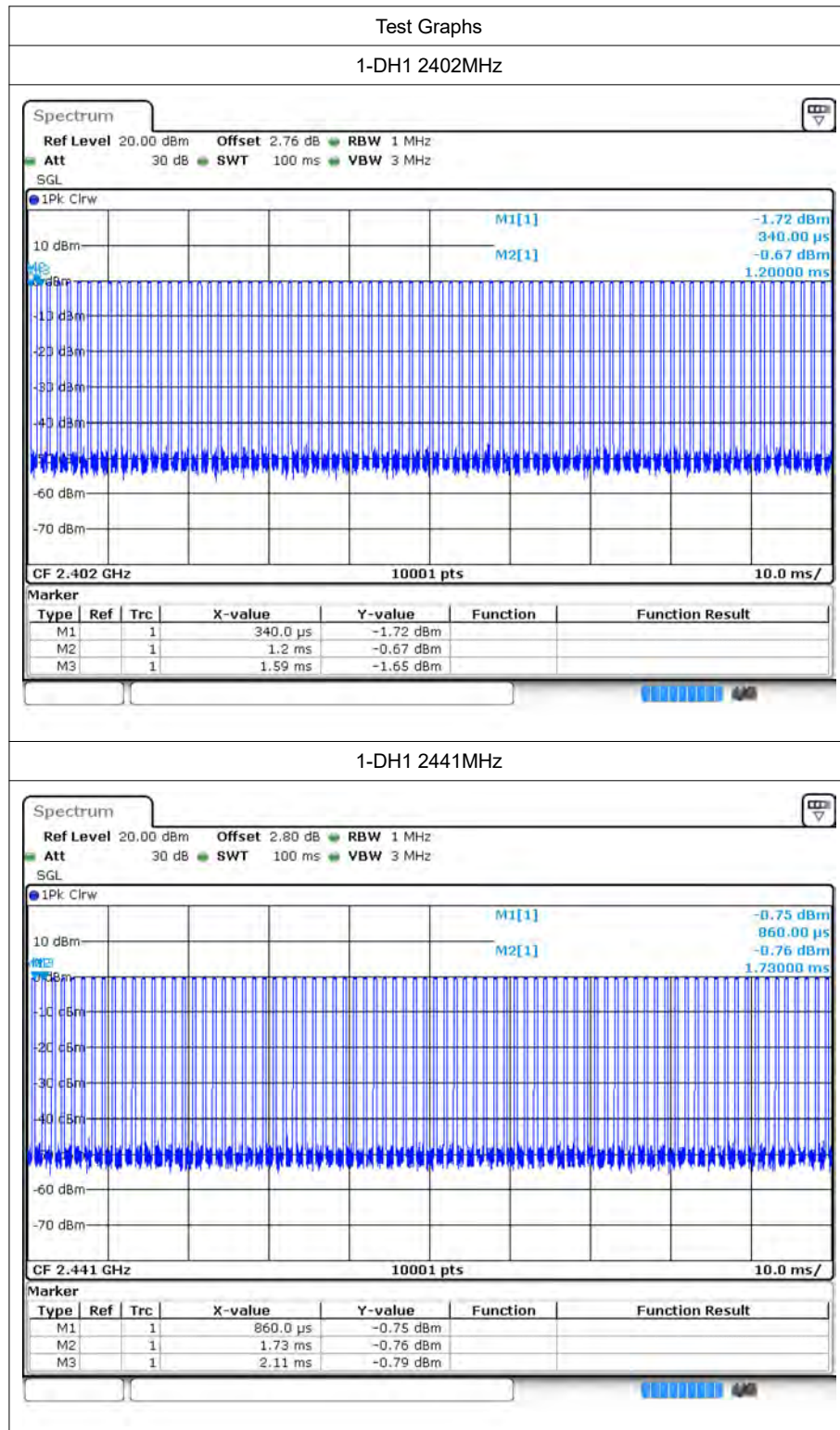
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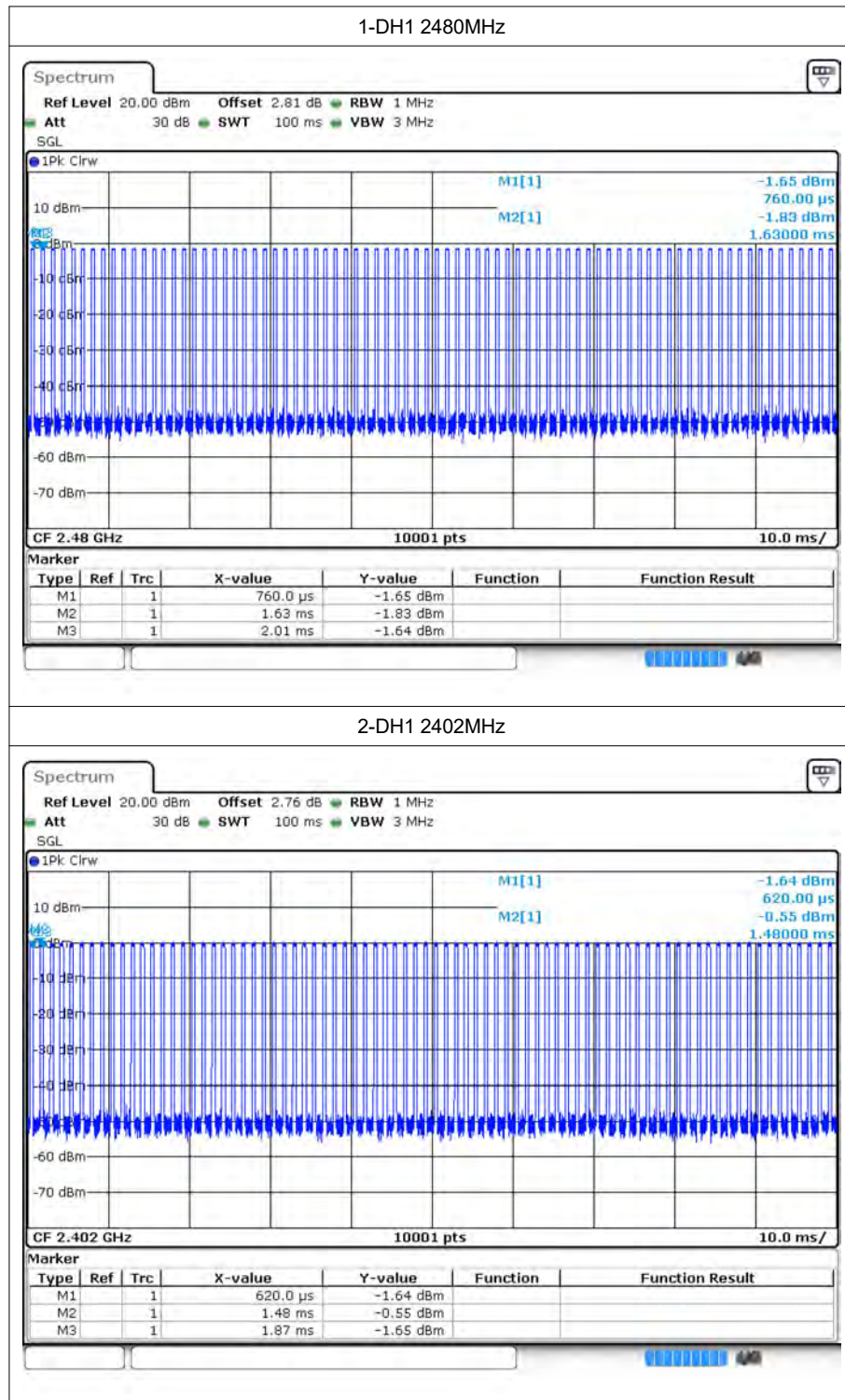
1 Duty Cycle

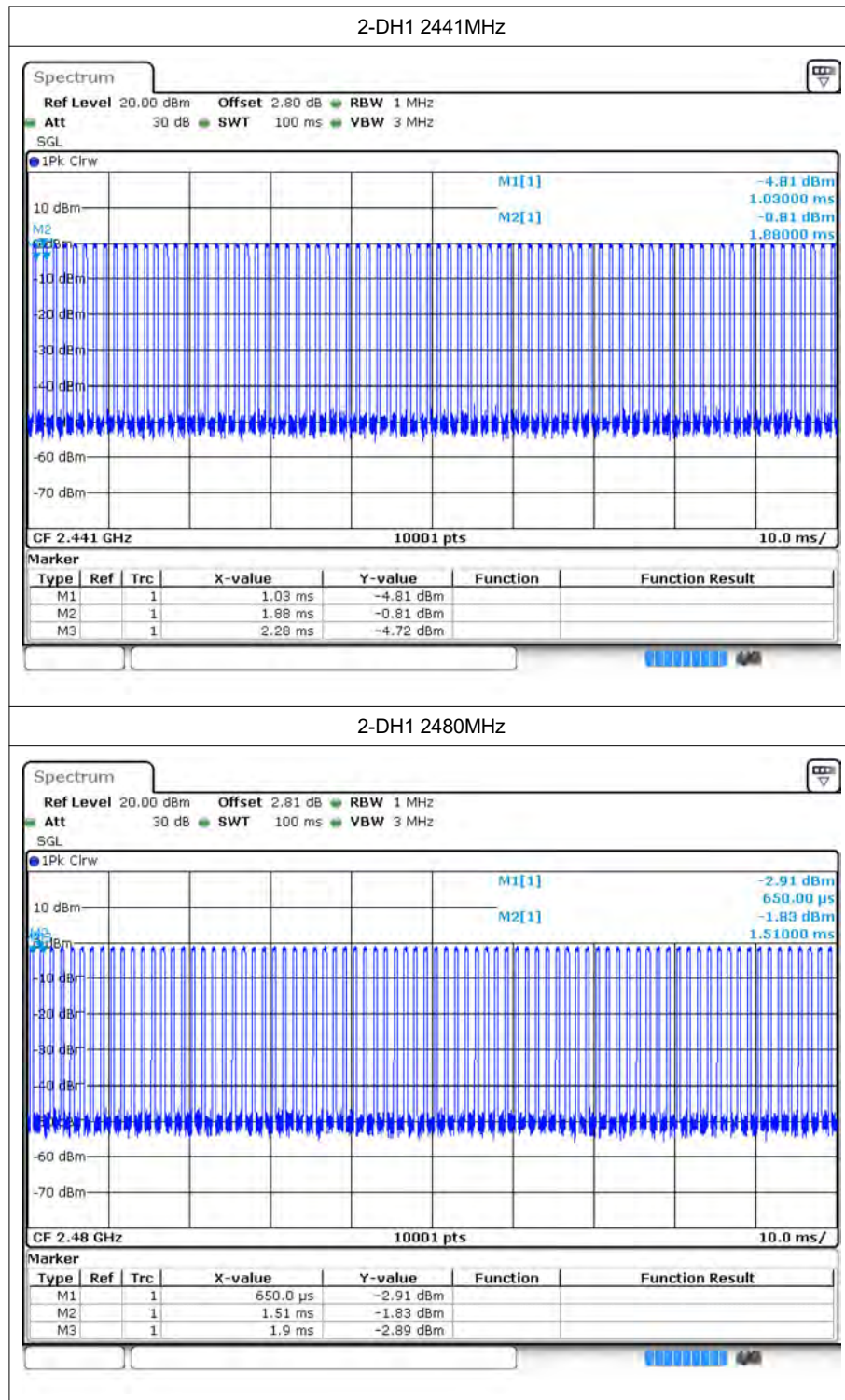
1.1 Test Result

Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
1-DH1	2402	32.01	4.95	2.56
1-DH1	2441	31.2	5.06	2.63
1-DH1	2480	31.2	5.06	2.63
2-DH1	2402	32	4.95	2.56
2-DH1	2441	32.8	4.84	2.5
2-DH1	2480	32	4.95	2.56

1.2 Test Graphs





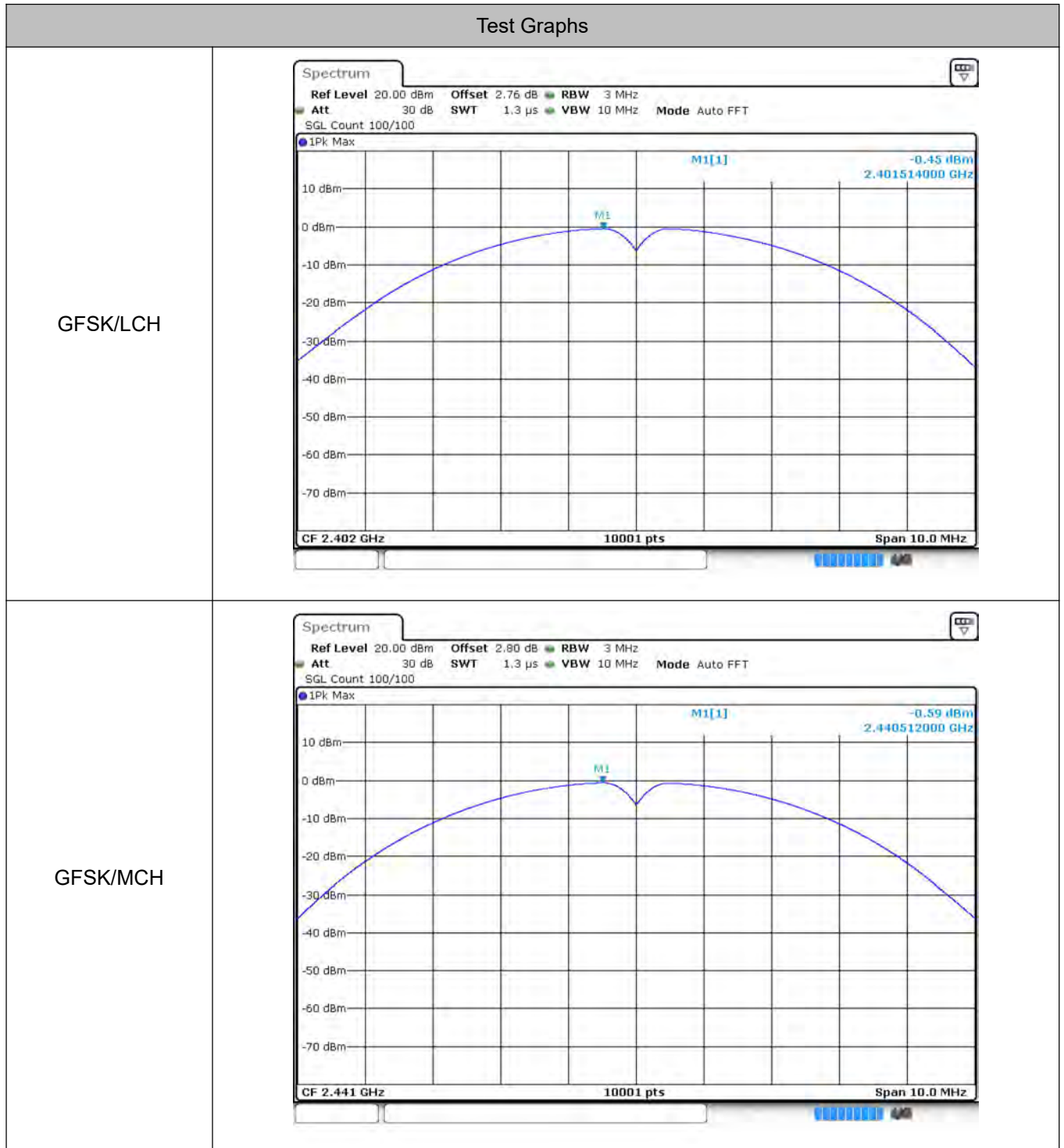


2 Maximum Conducted Peak Output Power

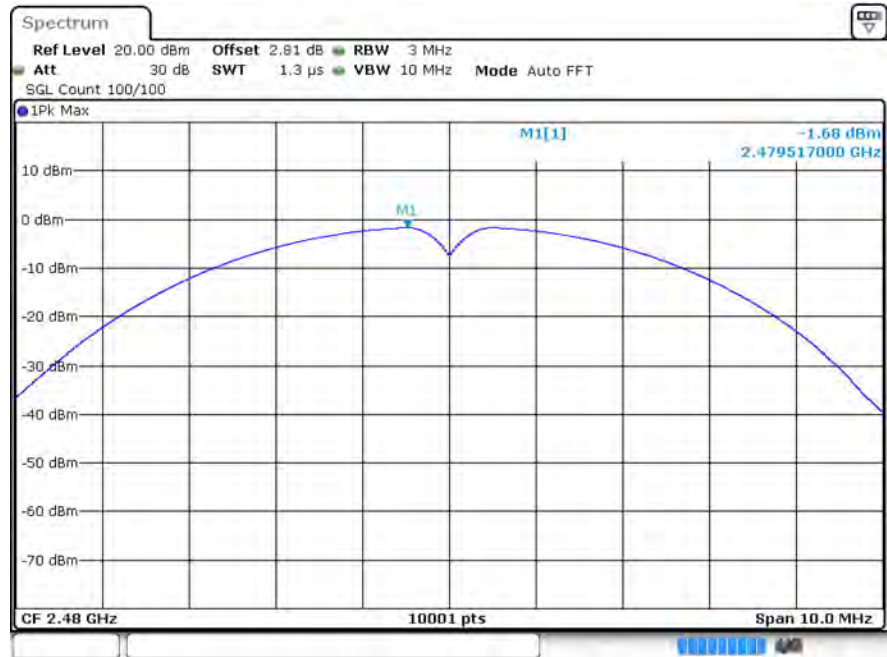
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.45	21	Pass
	MCH	-0.59	21	Pass
	HCH	-1.68	21	Pass
$\pi/4$ DQPSK	LCH	0.13	21	Pass
	MCH	-0.15	21	Pass
	HCH	-1.19	21	Pass

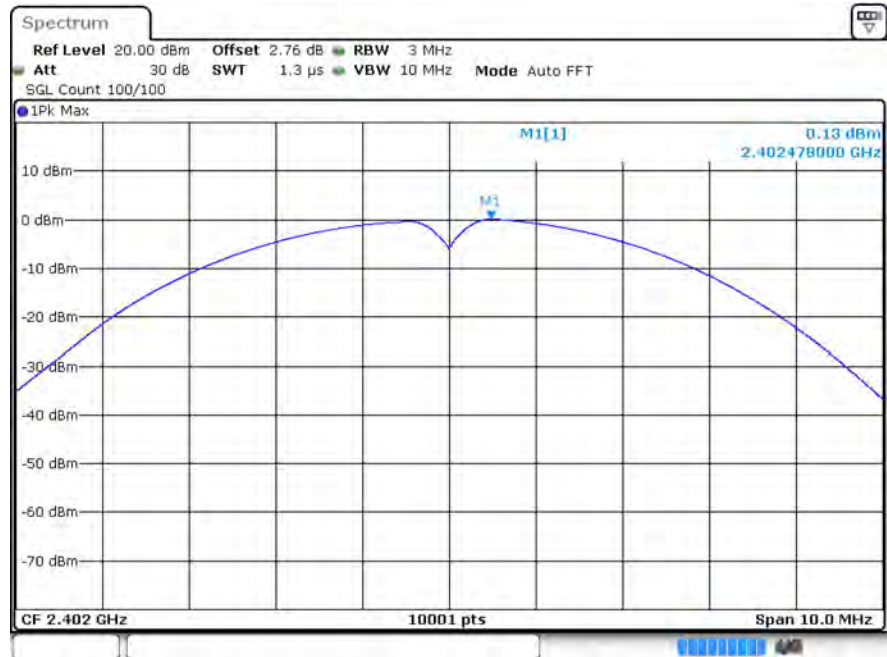
2.2 Test Graphs



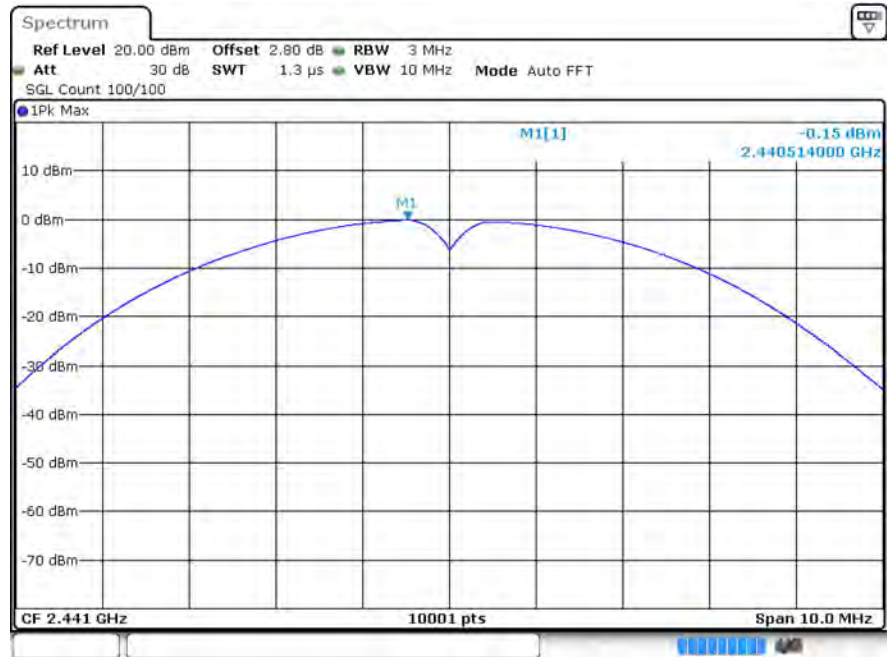
GFSK/HCH



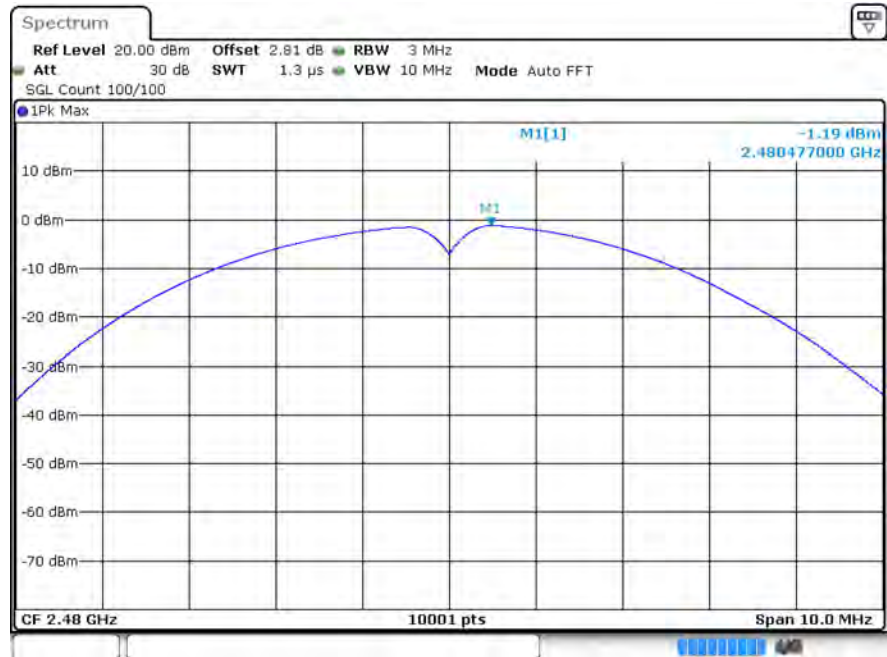
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH



3 20dB Bandwidth

3.1 Test Result

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.979	Not Specified	Pass
	MCH	1.023	Not Specified	Pass
	HCH	1.026	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.223	Not Specified	Pass
	MCH	1.288	Not Specified	Pass
	HCH	1.253	Not Specified	Pass

3.2 Test Graphs

Test Graphs

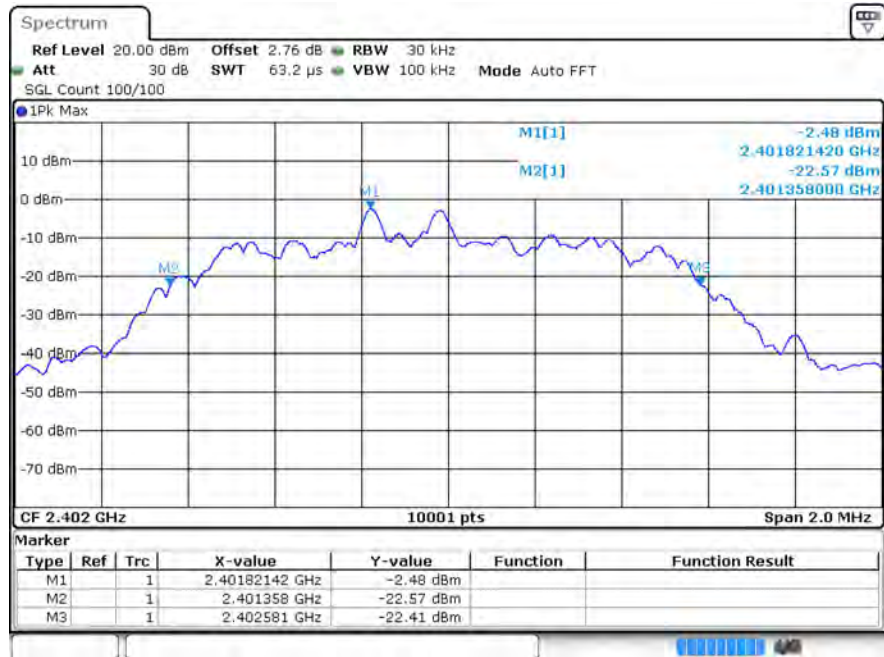
GFSK/LCH



GFSK/MCH



GFSK/HCH


 π /4DQPSK/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	1.002	0.682	Pass
$\pi/4$ DQPSK	MCH	0.999	0.859	Pass

4.2 Test Graphs

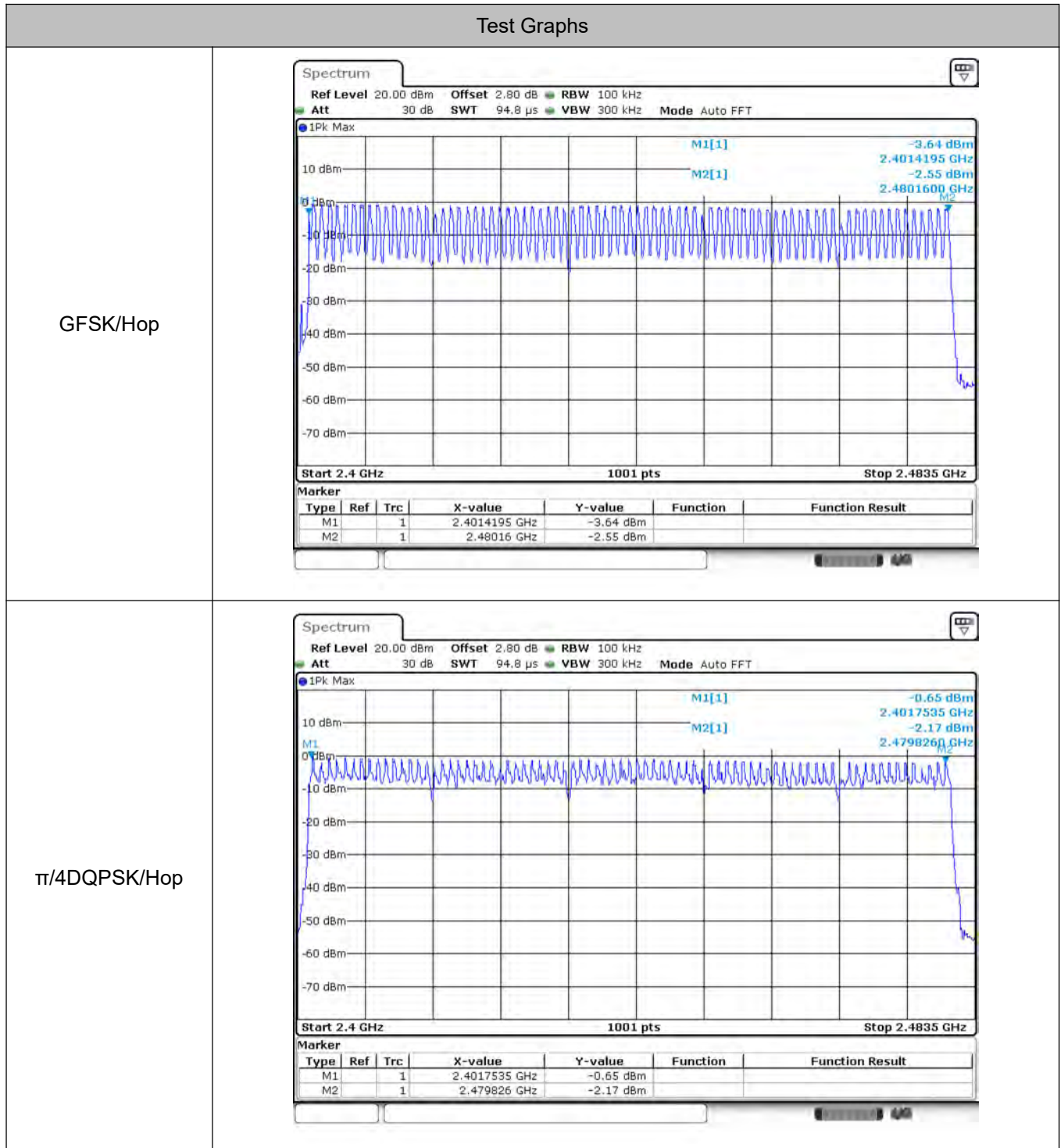


5 Hopping Channel Number

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

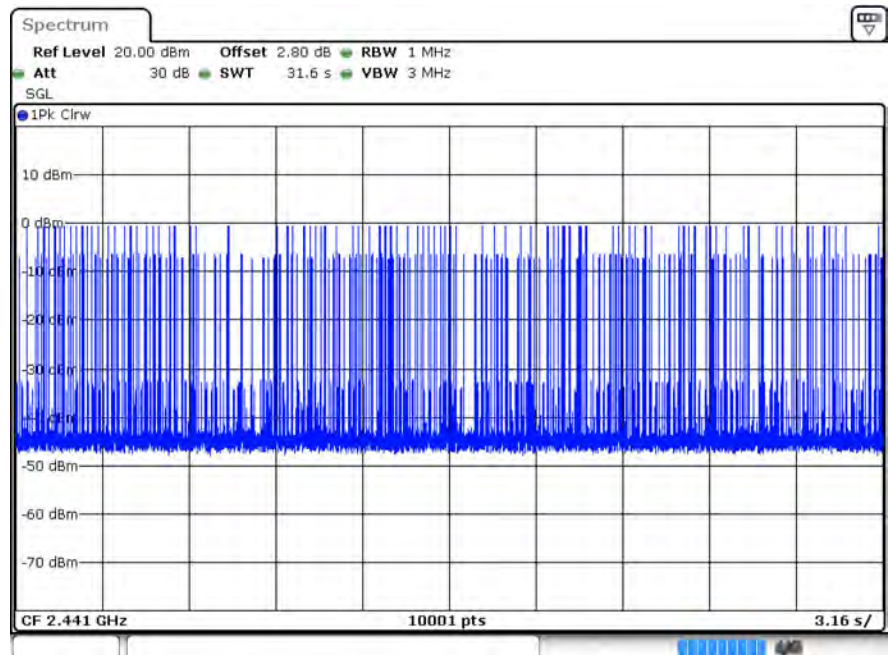
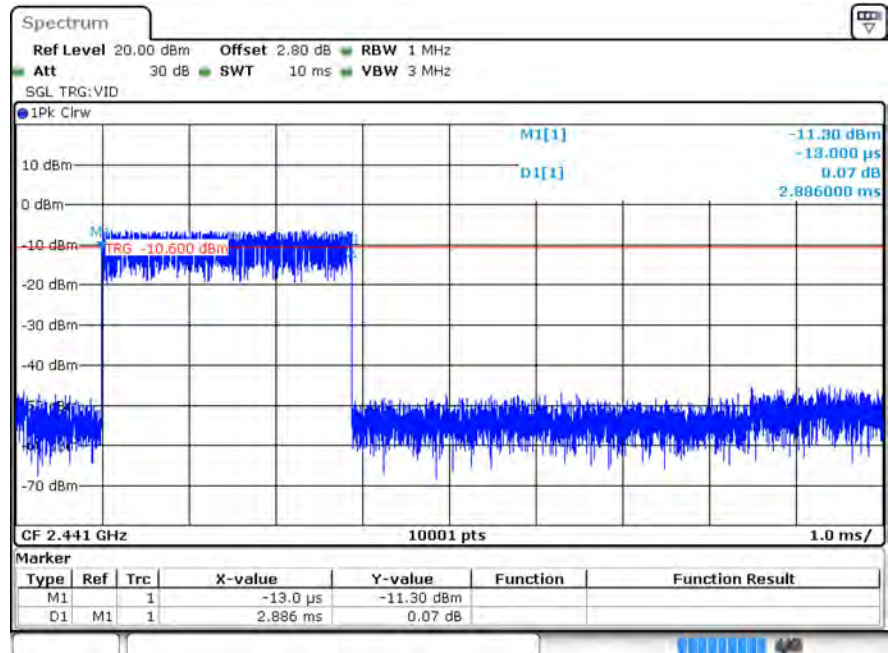
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.886	114	329.004	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.891	109	315.119	0.4	Pass

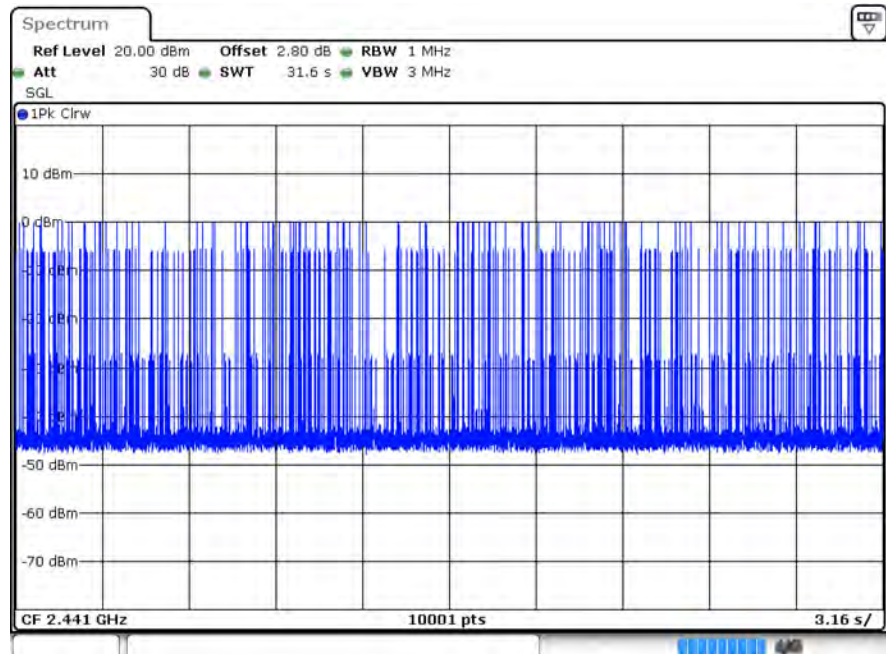
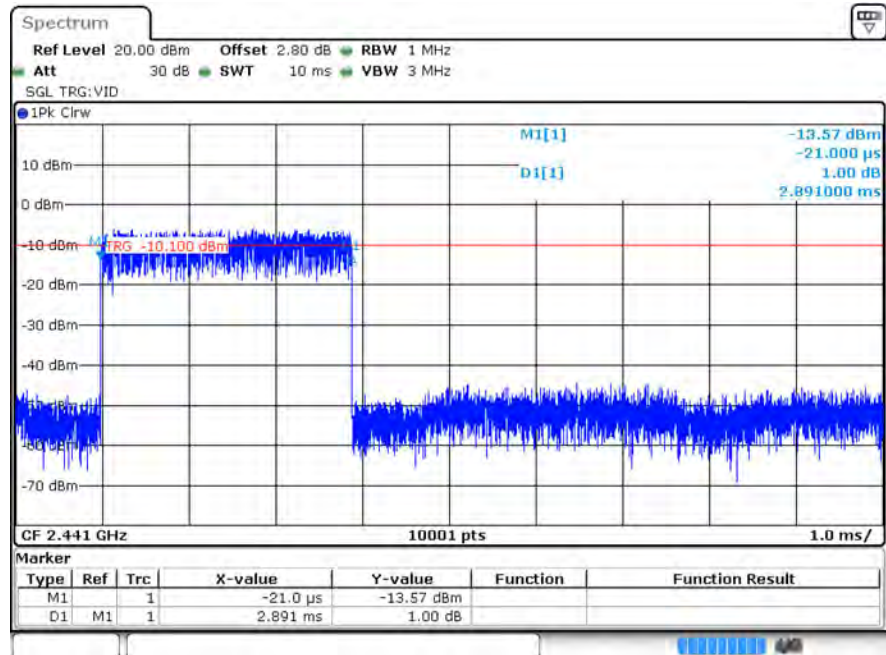
6.2 Test Graphs

Test Graphs

GFSK_DH5/MCH



$\pi/4$ DQPSK
_2DH5/MCH



7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-40.84	-20	Pass
	MCH	-40.38	-20	Pass
	HCH	-39.26	-20	Pass
$\pi/4$ DQPSK	LCH	-39.75	-20	Pass
	MCH	-40.13	-20	Pass
	HCH	-37	-20	Pass

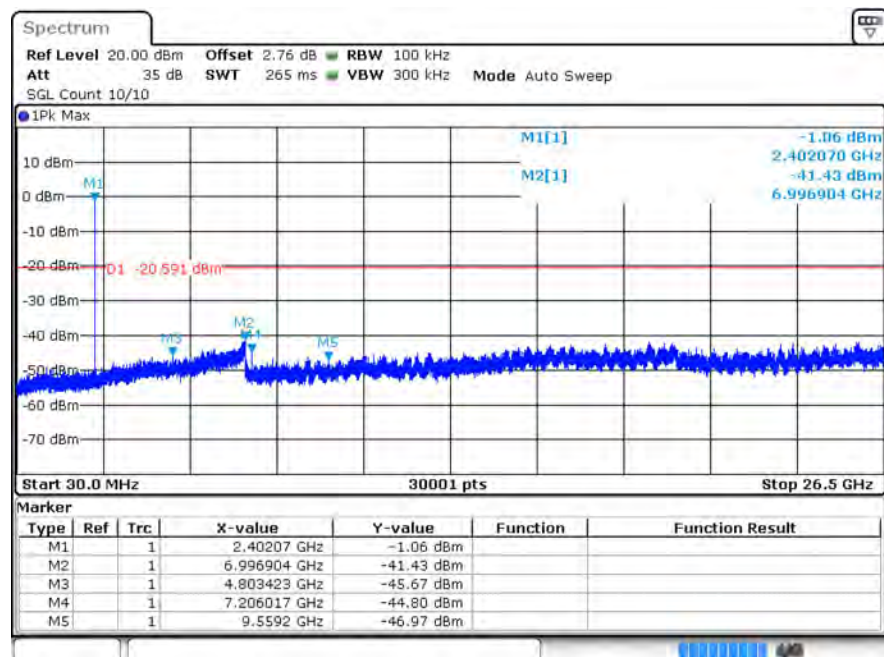
7.2 Test Graphs

GFSK_LCH_Graphs

Pref



Puw

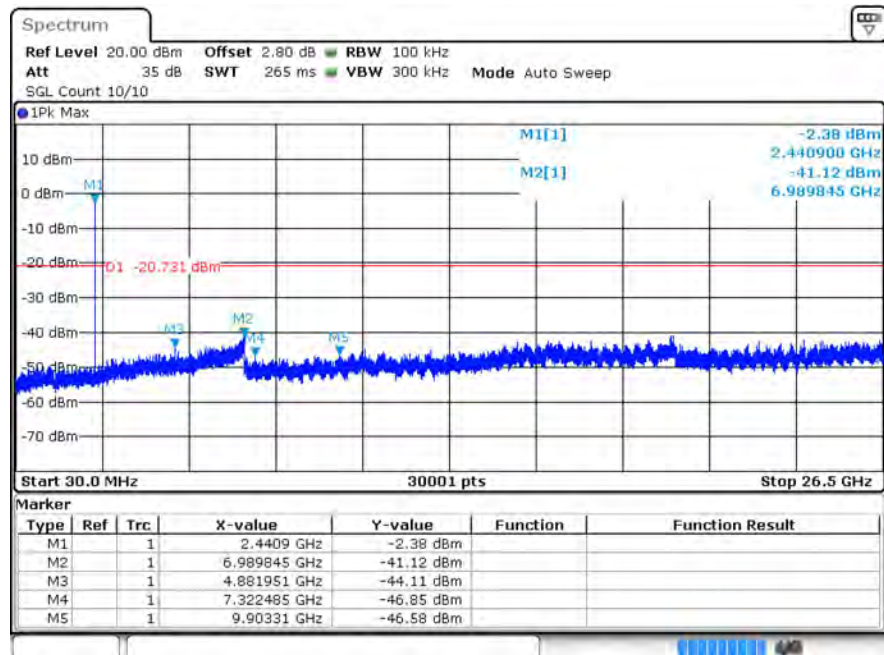


GFSK_MCH_Graphs

Pref



Puw

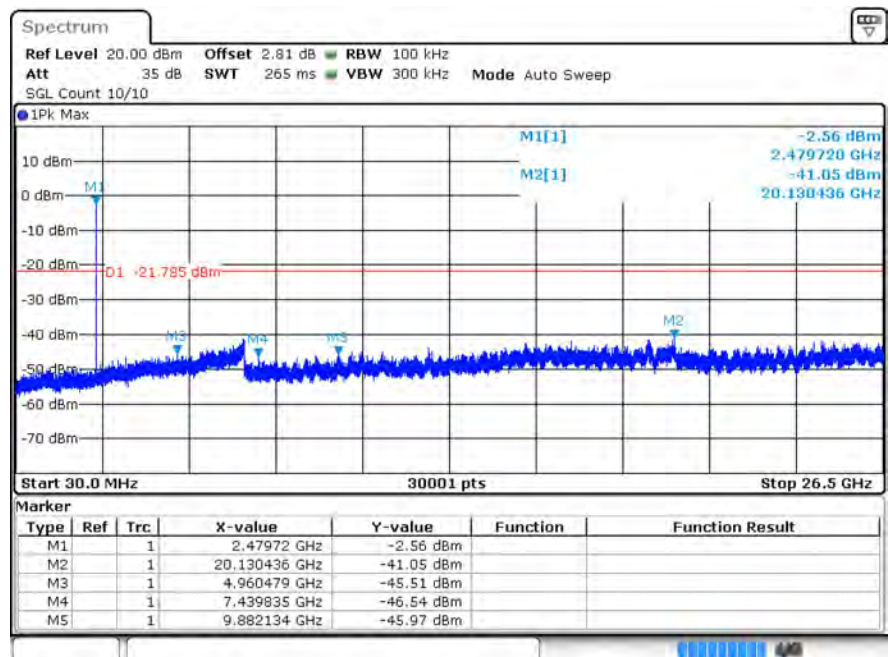


GFSK_HCH_Graphs

Pref



Puw

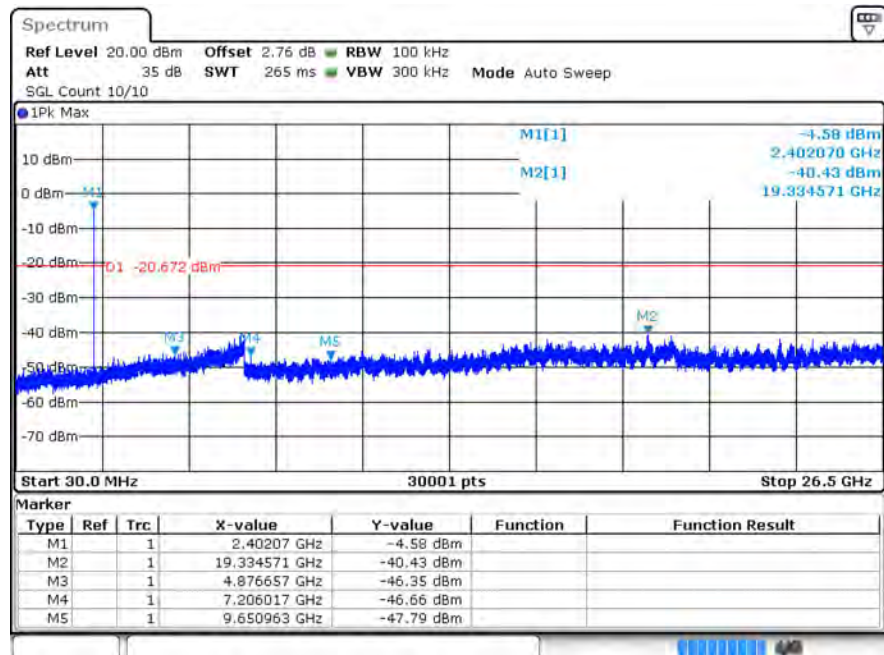


$\pi/4$ DQPSK_LCH_Graphs

Pref



Puw

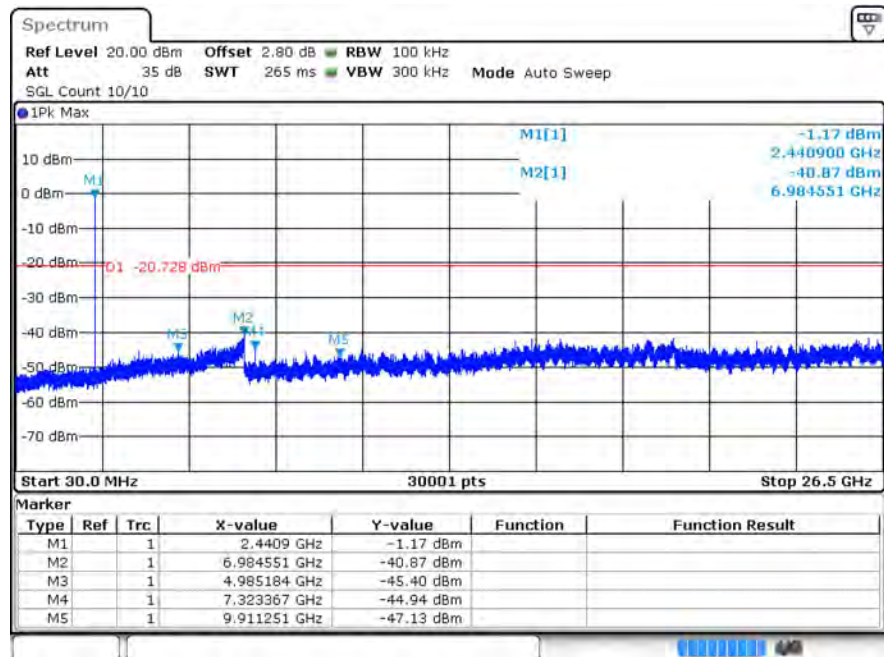


$\pi/4$ DQPSK_MCH_Graphs

Pref

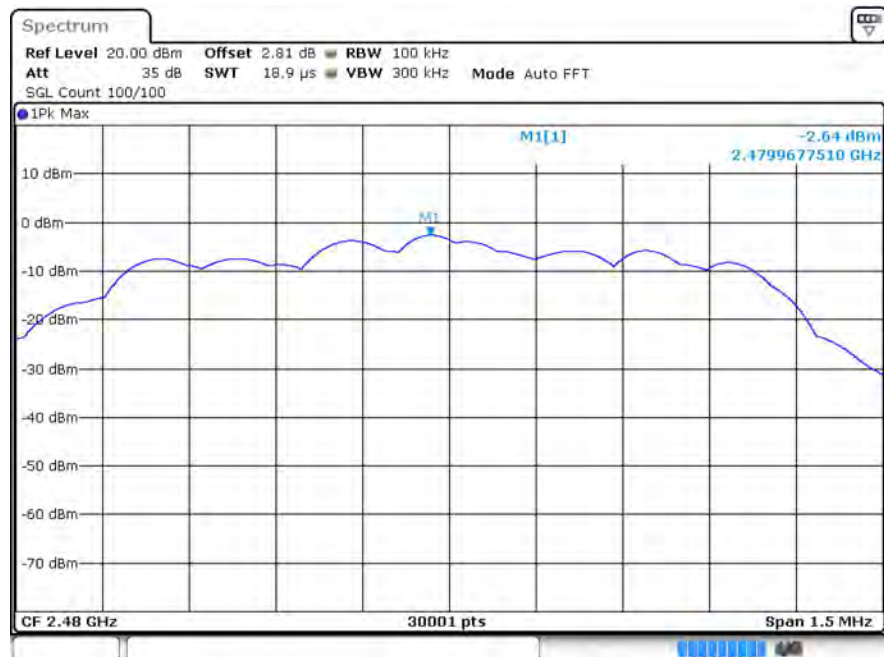


Puw

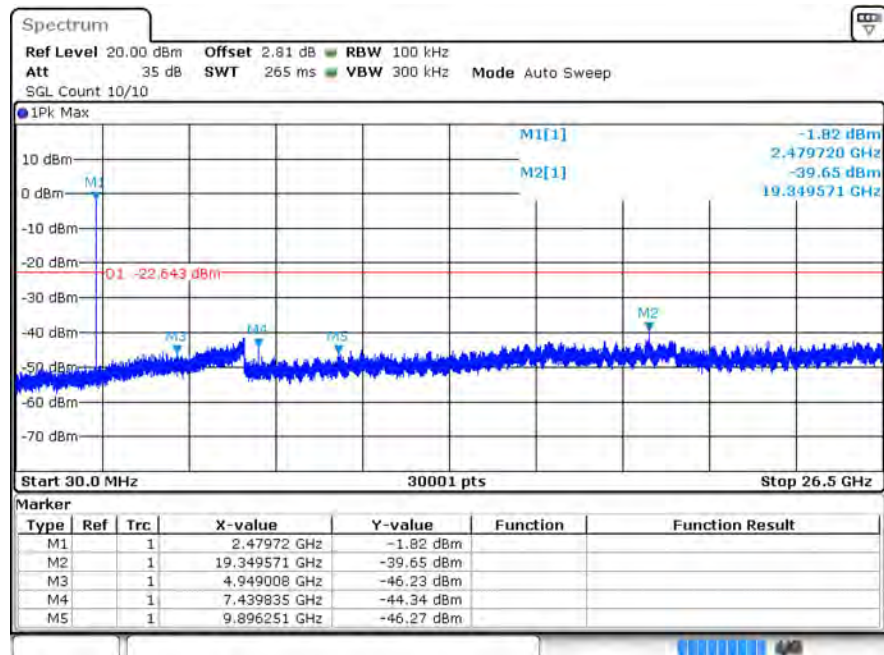


π /4DQPSK_HCH_Graphs

Pref



Puw

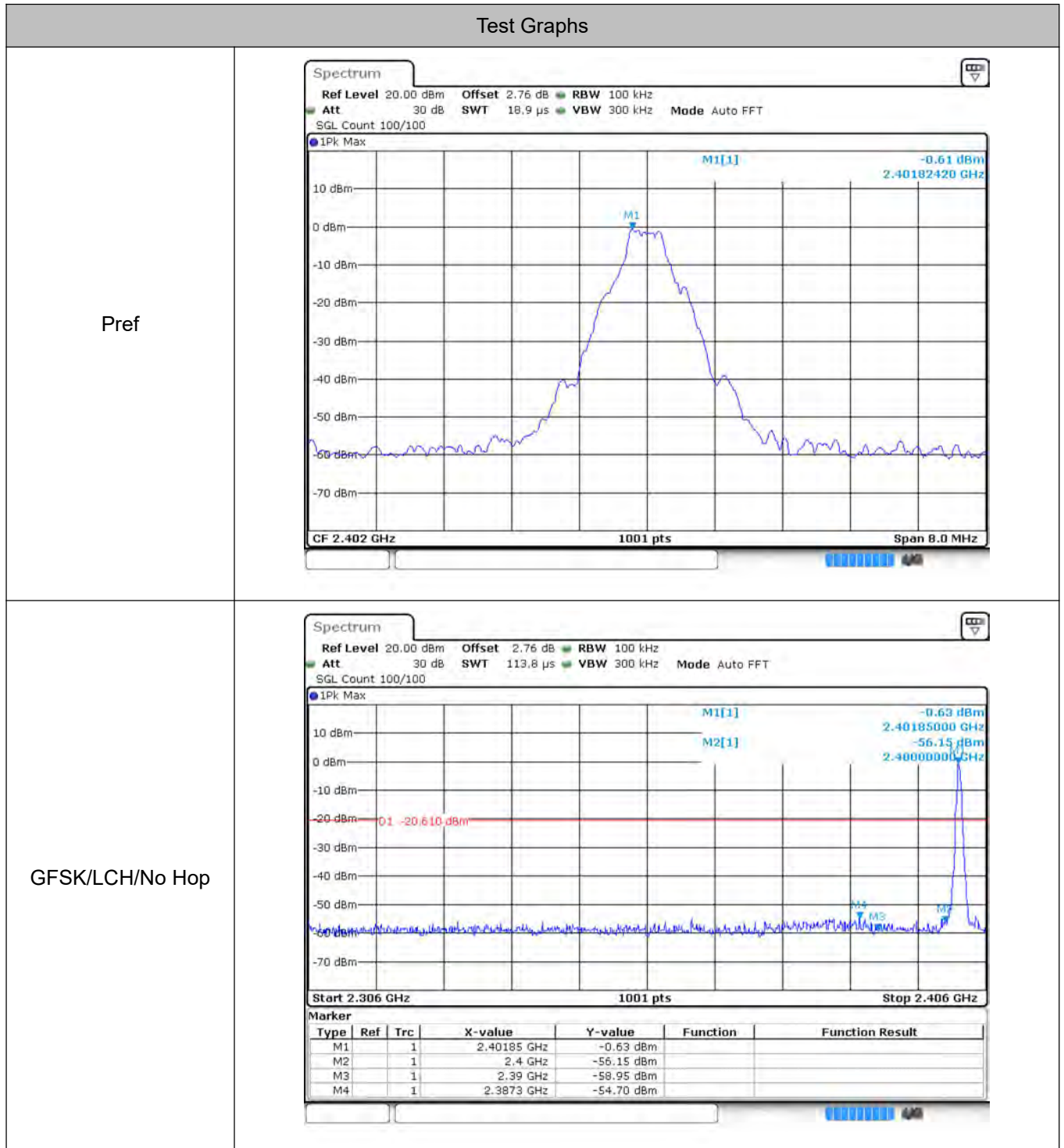


8 Band-edge for RF Conducted Emissions

8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-54.09	-20	Pass
			On	-53.18	-20	Pass
	HCH	2480	Off	-52.57	-20	Pass
			On	-52.24	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-52.87	-20	Pass
			On	-53.08	-20	Pass
	HCH	2480	Off	-52.58	-20	Pass
			On	-51.23	-20	Pass

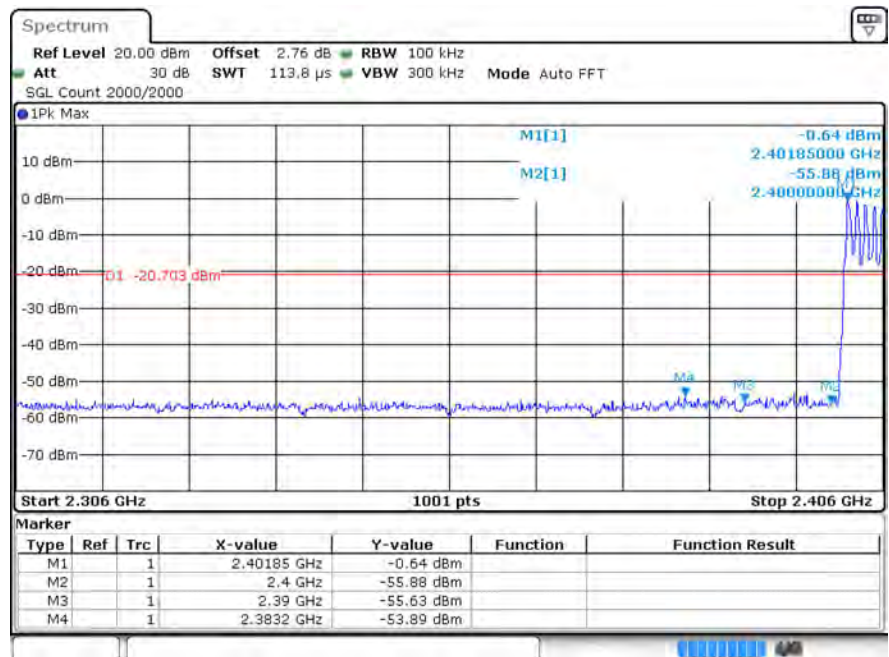
8.2 Test Graphs



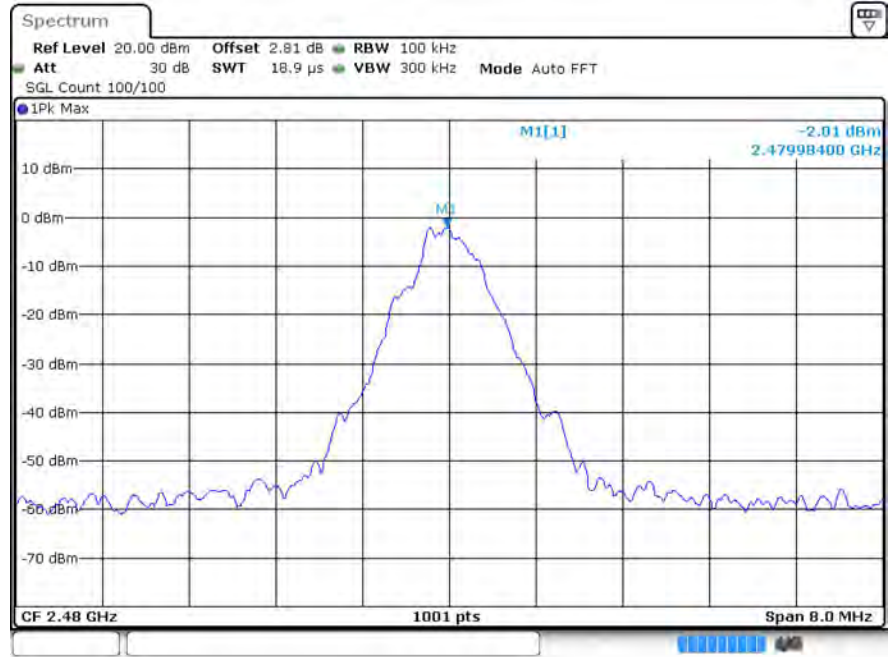
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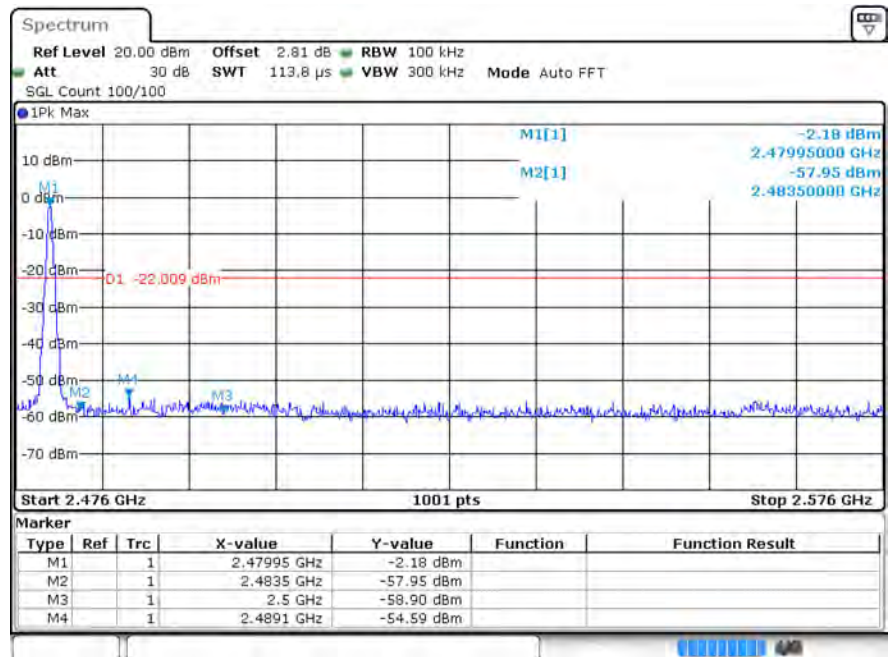
GFSK/LCH/Hop



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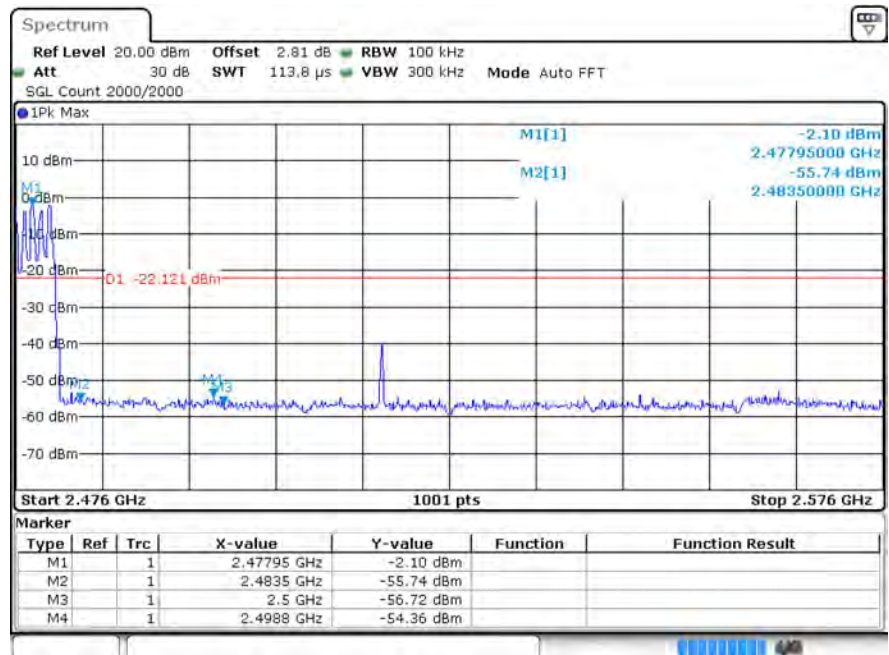
GFSK/HCH/No Hop



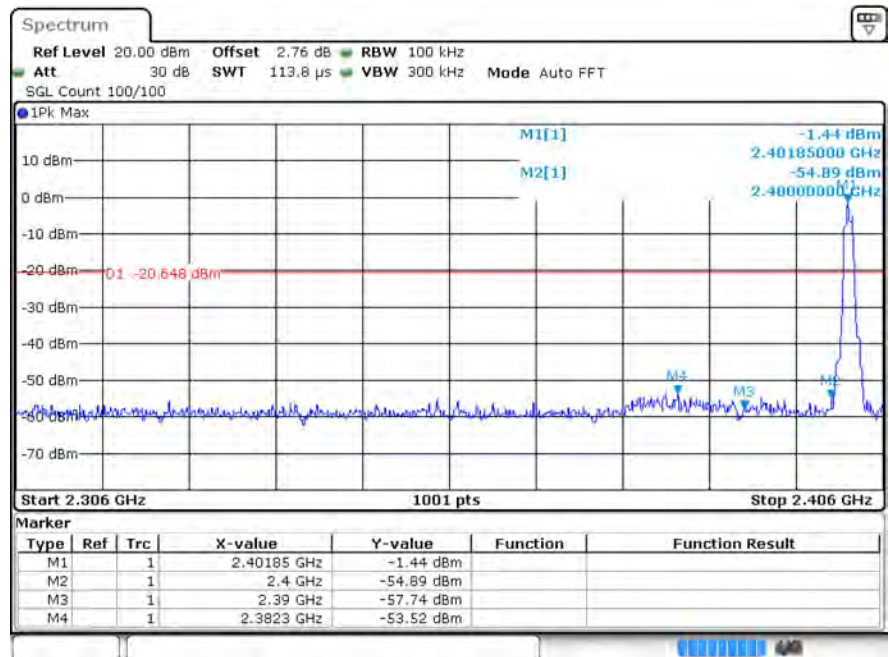
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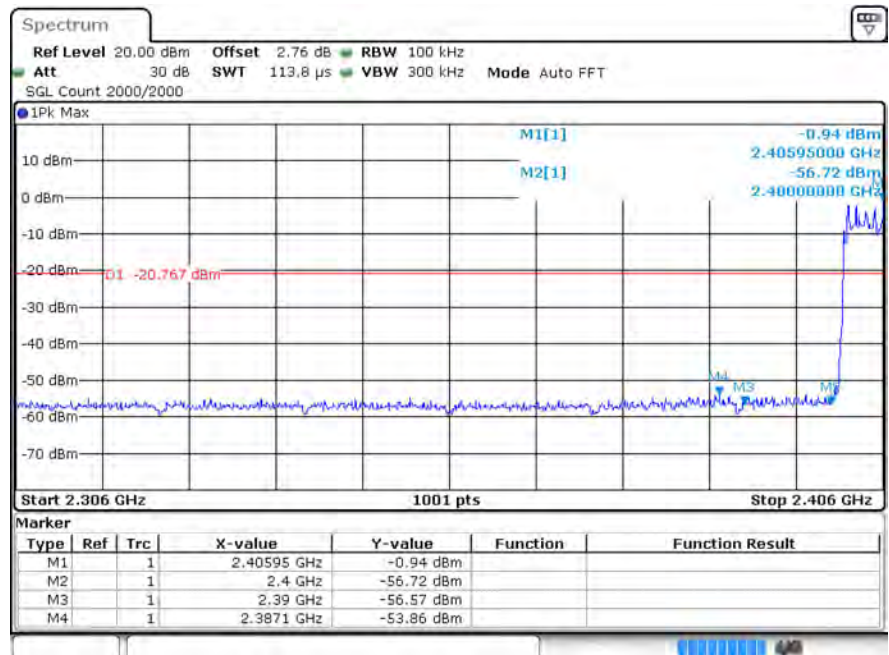
GFSK/HCH/Hop



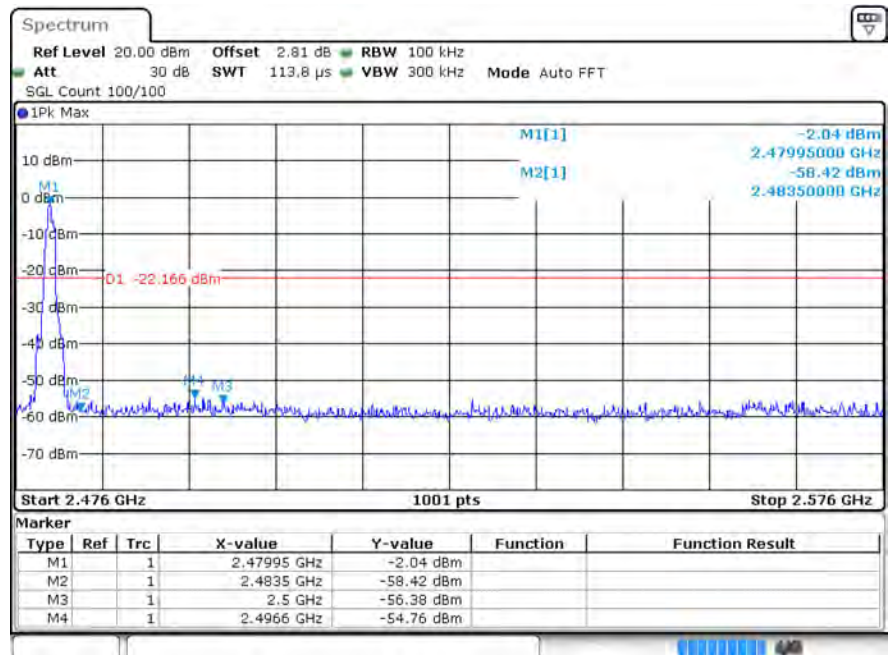
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 $\pi/4$ DQPSK/LCH/No Hop


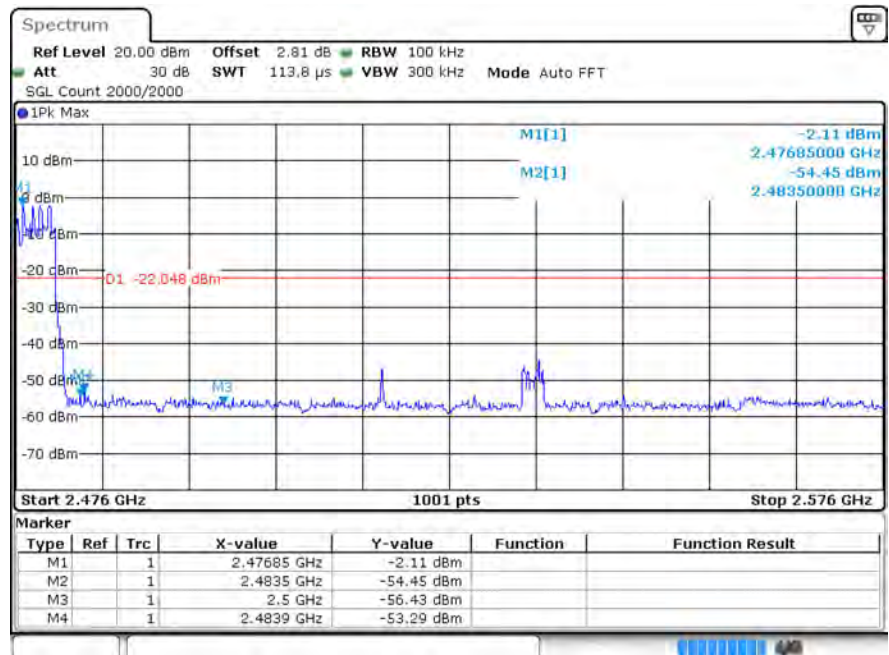
Ref


 $\pi/4$ DQPSK/LCH/Hop


Ref


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


Ref


 $\pi/4$ DQPSK/HCH/Hop


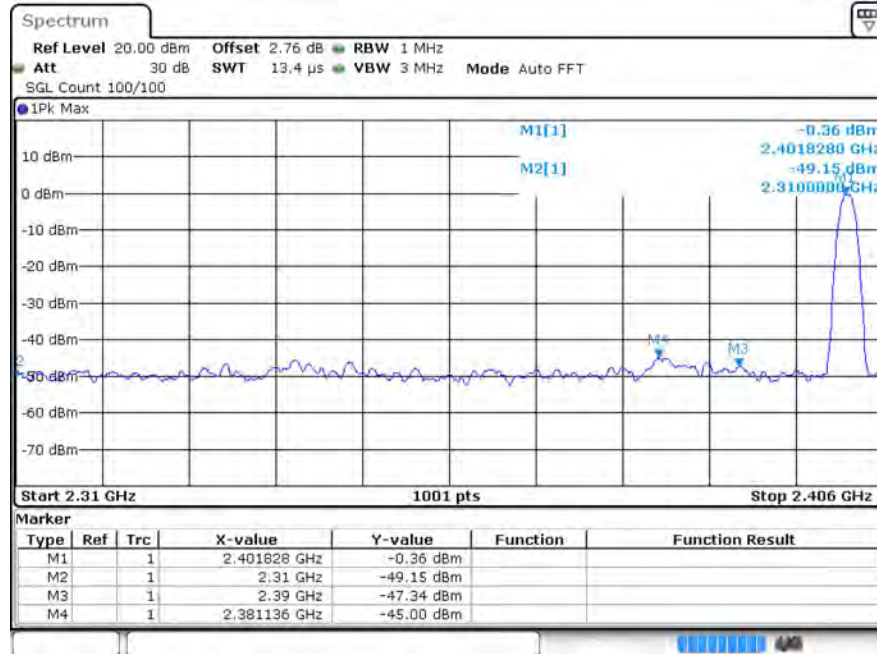
9 Restrict-band band-edge measurements

9.1 Test Result

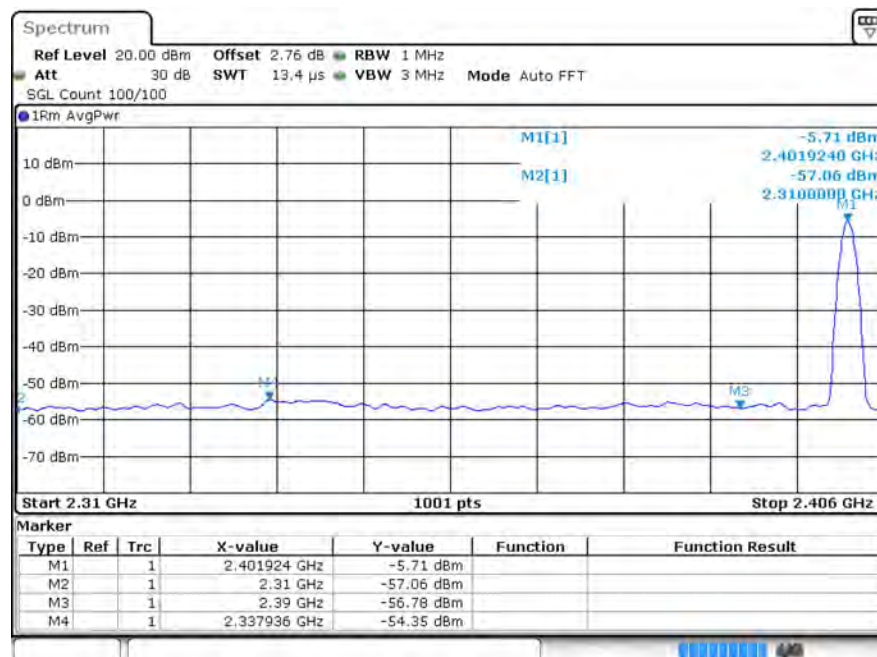
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Duty Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-49.15	2	-	48.11	PEAK	74	Pass
	Off	2310.0	-57.06	2	4.95	45.15	AV	54	Pass
	Off	2381.136	-45	2	-	52.26	PEAK	74	Pass
	Off	2337.936	-54.34	2	4.95	47.87	AV	54	Pass
	Off	2390.0	-47.34	2	-	49.92	PEAK	74	Pass
	Off	2390.0	-56.78	2	4.95	45.43	AV	54	Pass
	Off	2483.5	-48.26	2	-	49	PEAK	74	Pass
	Off	2483.5	-55.92	2	5.06	46.4	AV	54	Pass
	Off	2494.552	-46.01	2	-	51.25	PEAK	74	Pass
	Off	2499.976	-54.97	2	5.06	47.35	AV	54	Pass
	Off	2500.0	-49.76	2	-	47.5	PEAK	74	Pass
	Off	2500.0	-54.97	2	5.06	47.35	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-51	2	-	46.26	PEAK	74	Pass
	Off	2310.0	-57.25	2	4.95	44.96	AV	54	Pass
	Off	2383.44	-45.58	2	-	51.68	PEAK	74	Pass
	Off	2340.72	-54.05	2	4.95	48.16	AV	54	Pass
	Off	2390.0	-47.63	2	-	49.63	PEAK	74	Pass
	Off	2390.0	-55.77	2	4.95	46.44	AV	54	Pass
	Off	2483.5	-49.76	2	-	47.5	PEAK	74	Pass
	Off	2483.5	-56.22	2	4.95	45.99	AV	54	Pass
	Off	2484.448	-46.53	2	-	50.73	PEAK	74	Pass
	Off	2495.464	-54.94	2	4.95	47.27	AV	54	Pass
	Off	2500.0	-48.12	2	-	49.14	PEAK	74	Pass
	Off	2500.0	-55.57	2	4.95	46.64	AV	54	Pass

9.2 Test Graphs

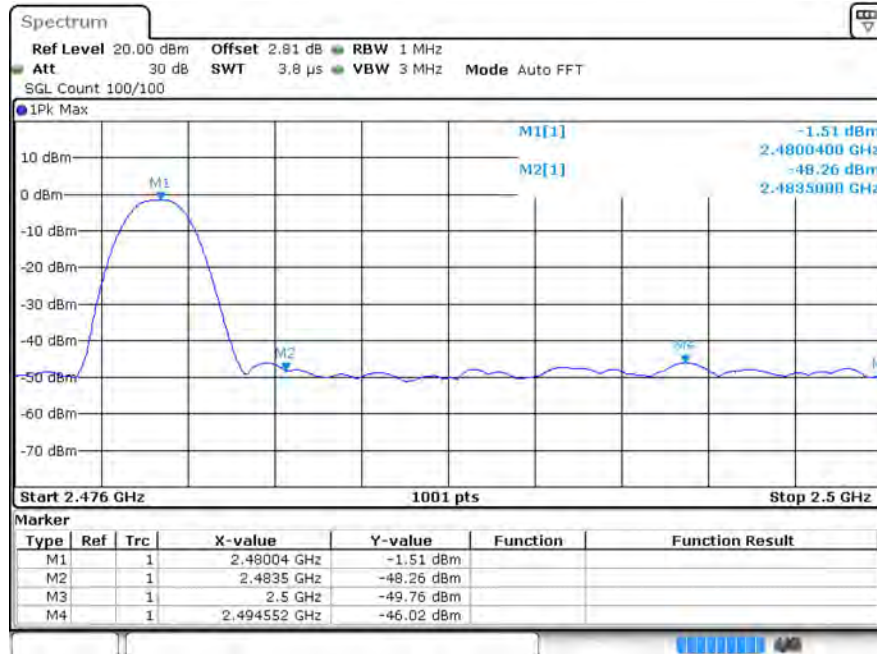
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



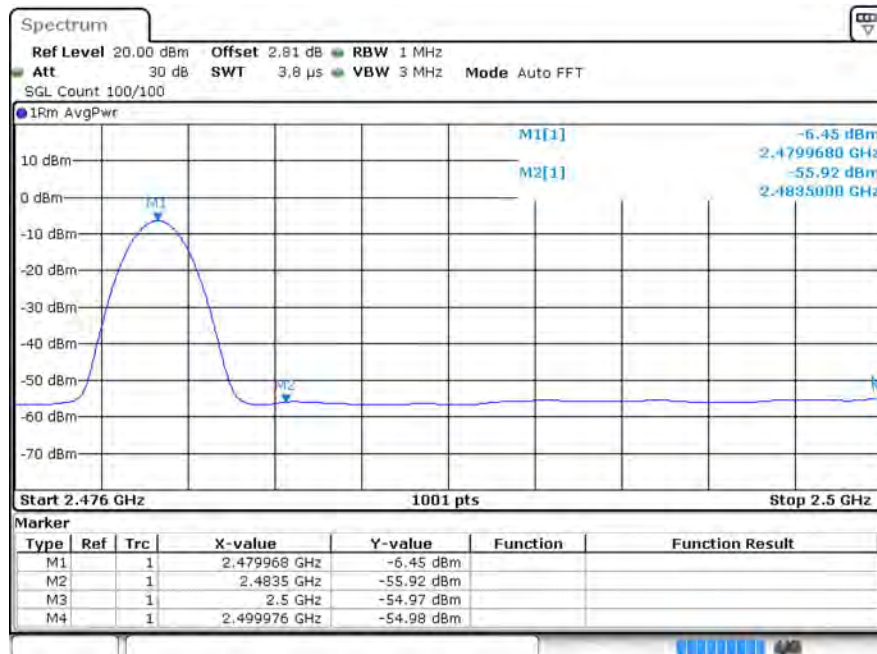
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



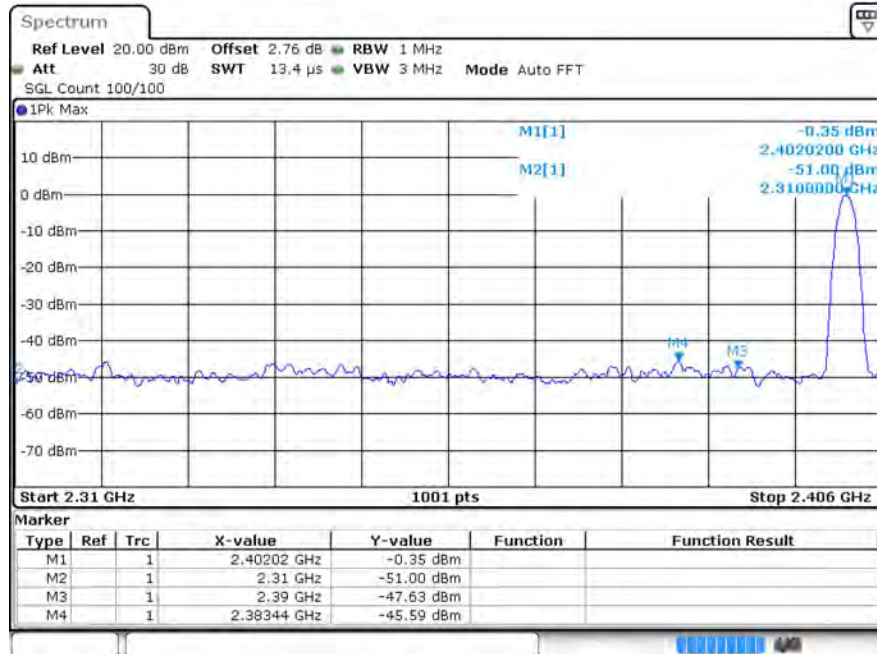
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



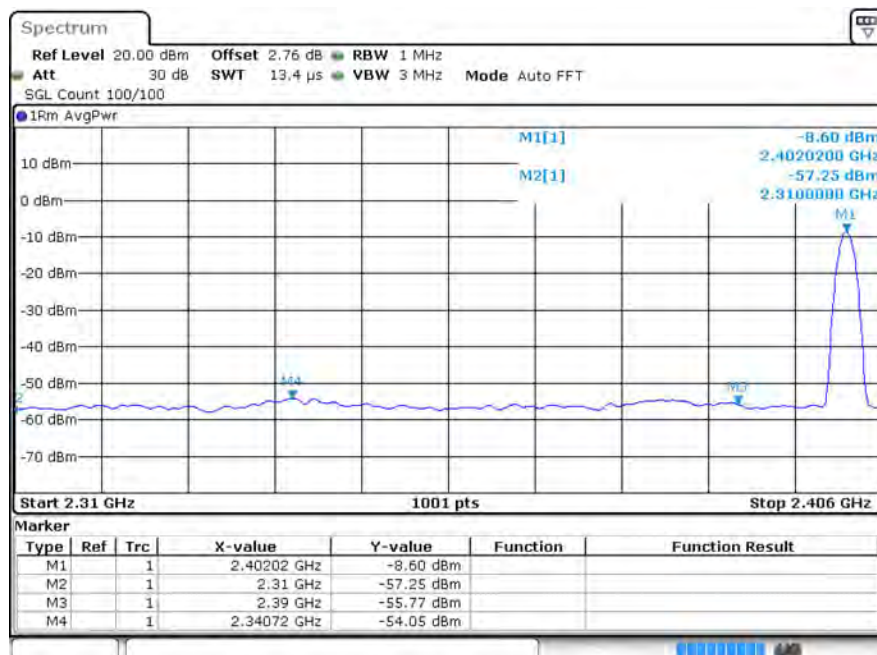
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



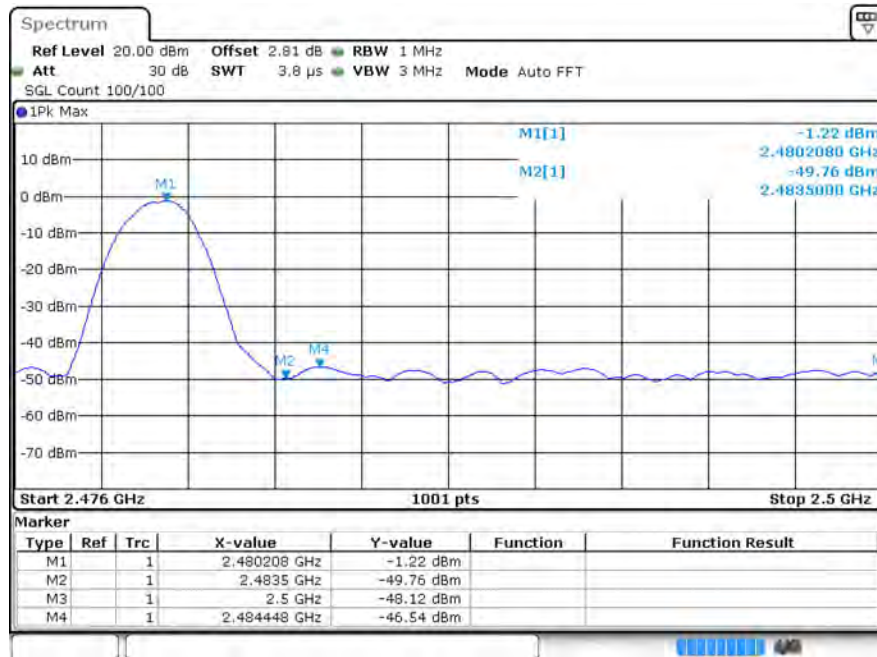
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



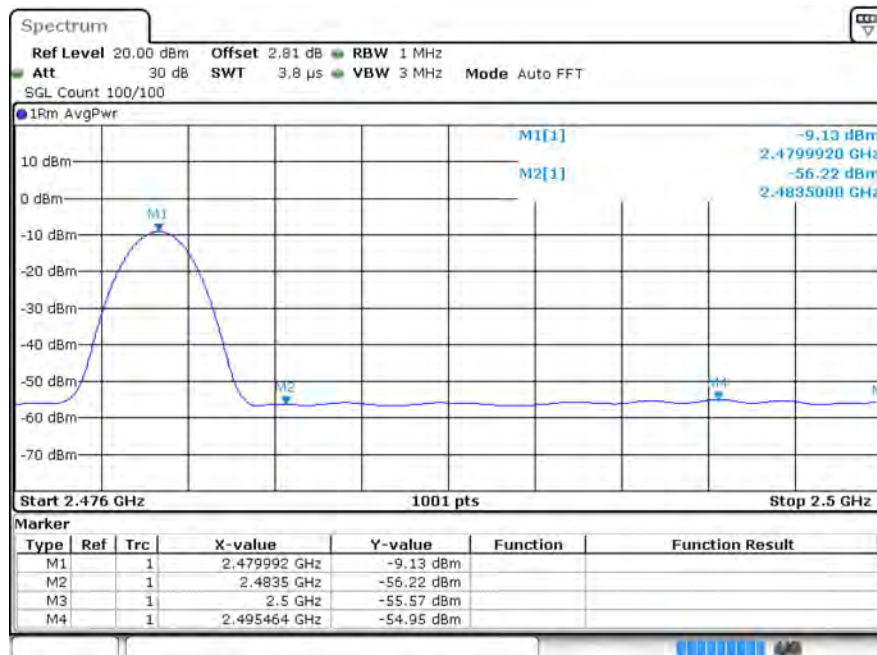
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



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---