



Appendix A

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

Product Name: TRUE WIRELESS EARPHONES

Trade Mark: N/A

Test Model: Z10

Environmental Conditions

Temperature:	24.6°C
Relative Humidity:	56.4%
ATM Pressure:	101Kpa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung



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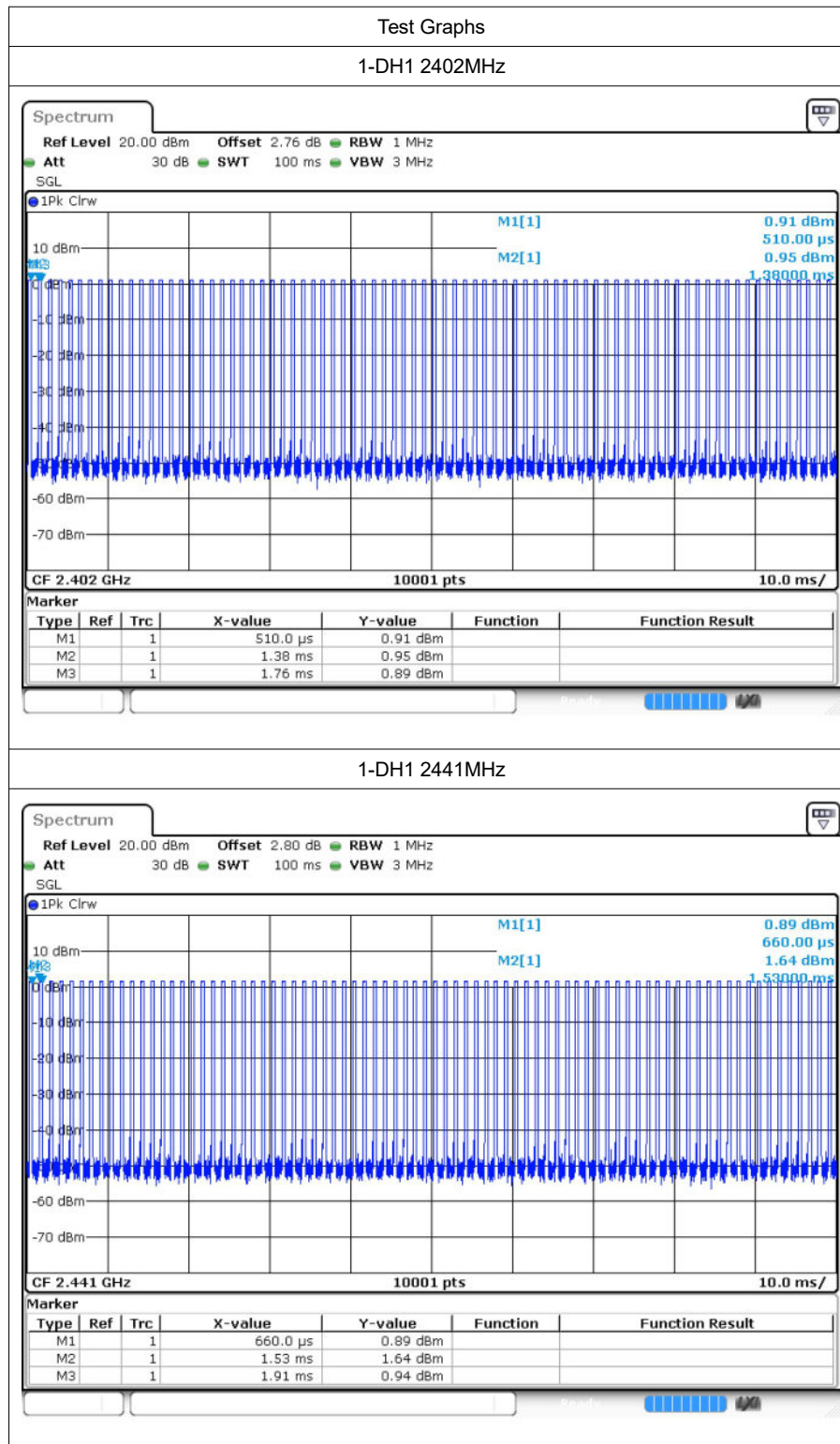
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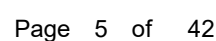
1 Duty Cycle

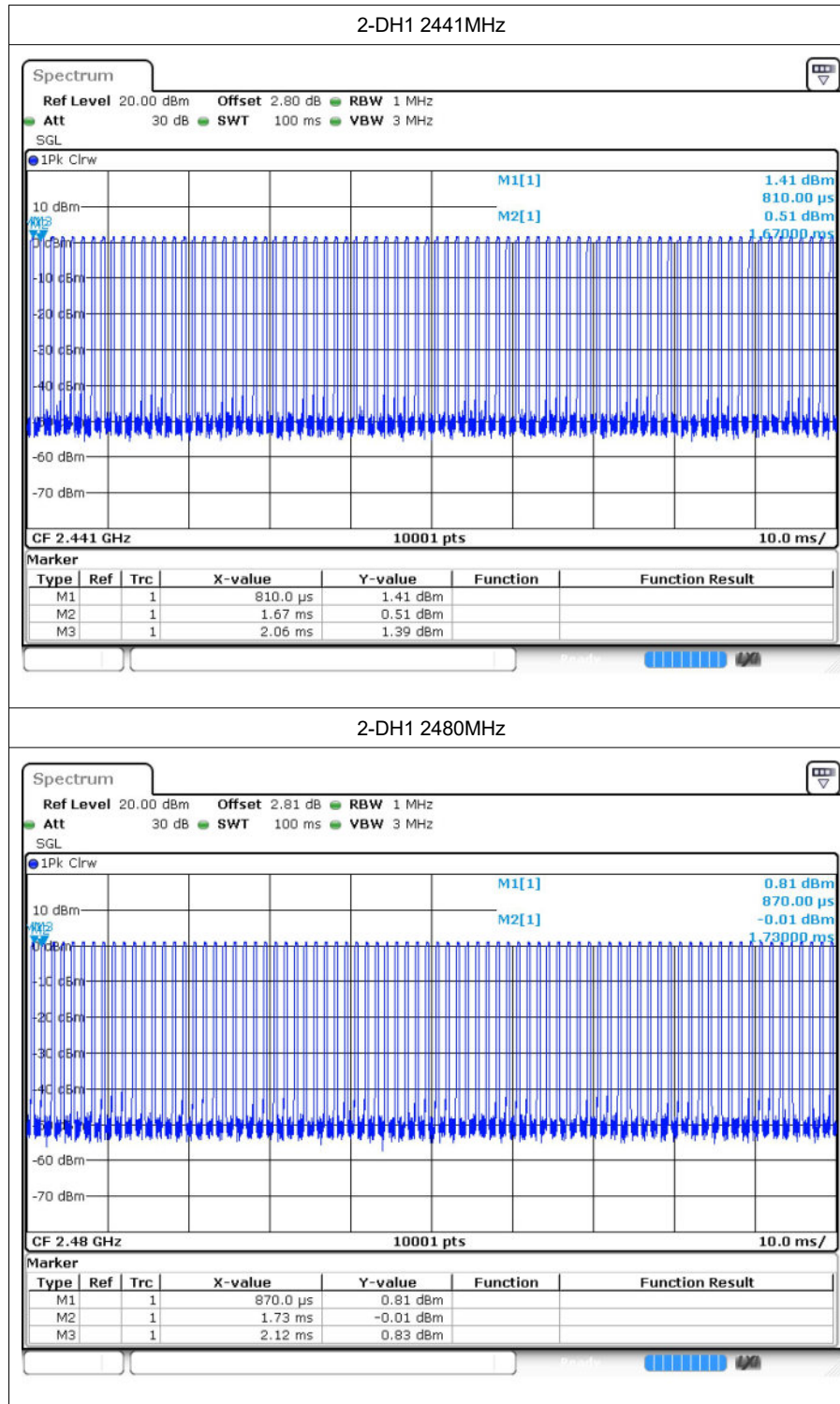
1.1 Test Result

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

1.2 Test Graphs





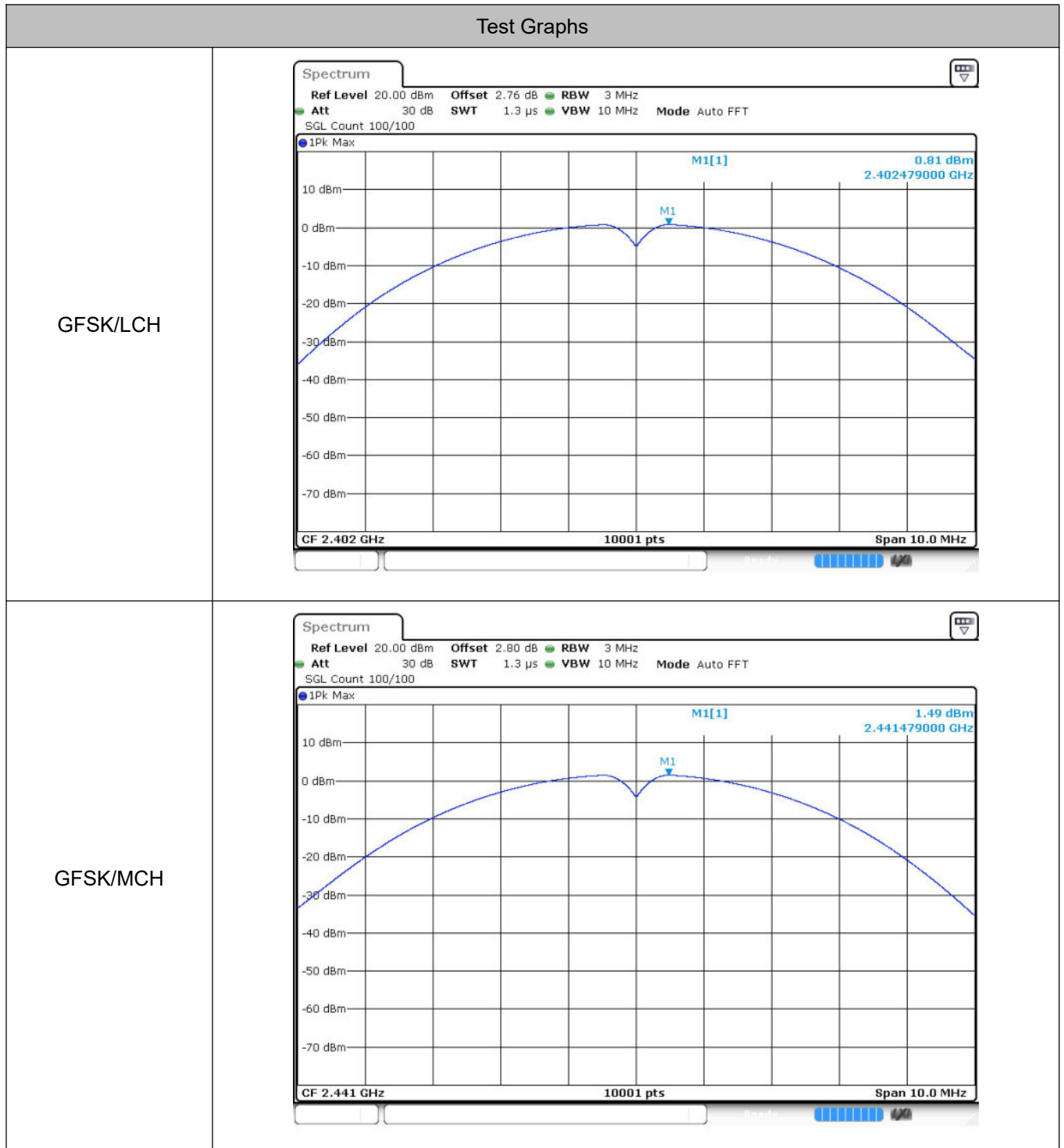


2 Maximum Conducted Peak Output Power

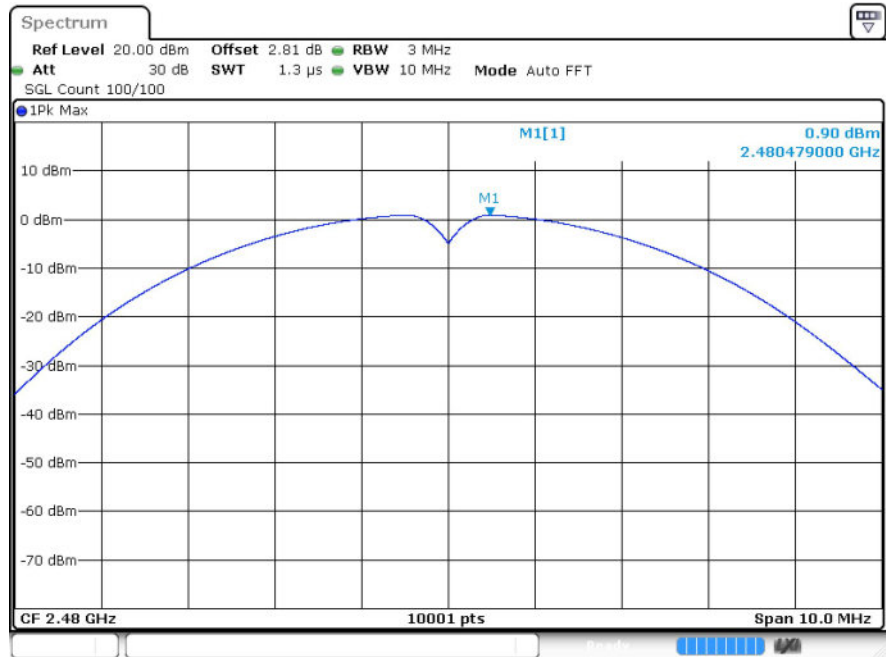
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.81	21	Pass
	MCH	1.49	21	Pass
	HCH	0.9	21	Pass
$\pi/4$ DQPSK	LCH	2.06	21	Pass
	MCH	2.63	21	Pass
	HCH	2.13	21	Pass

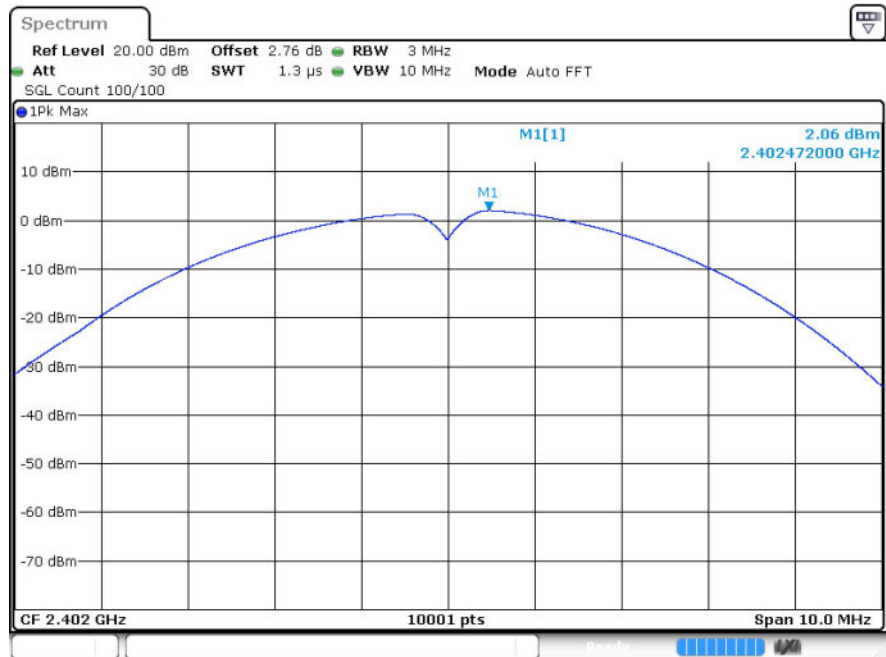
2.2 Test Graphs



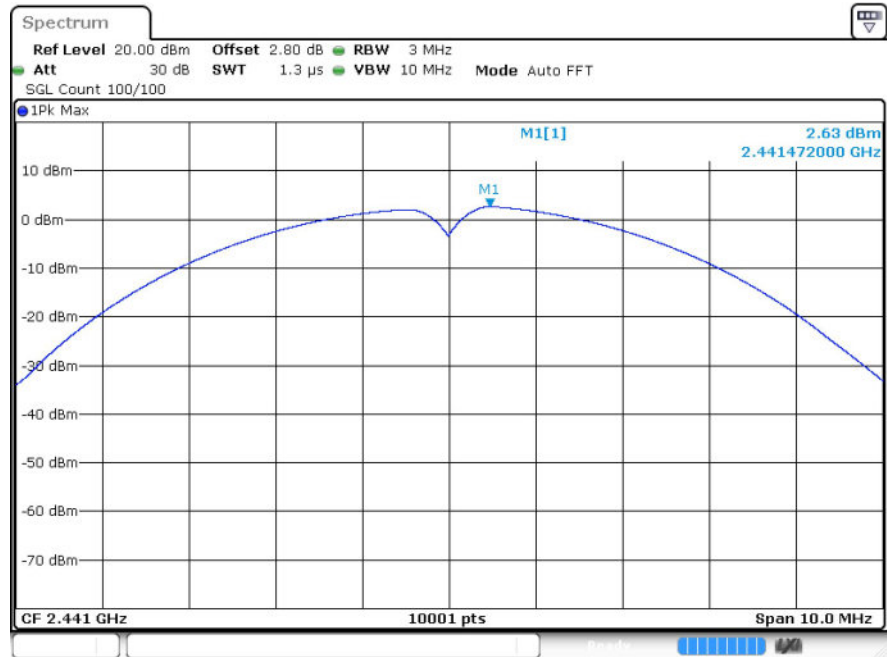
GFSK/HCH



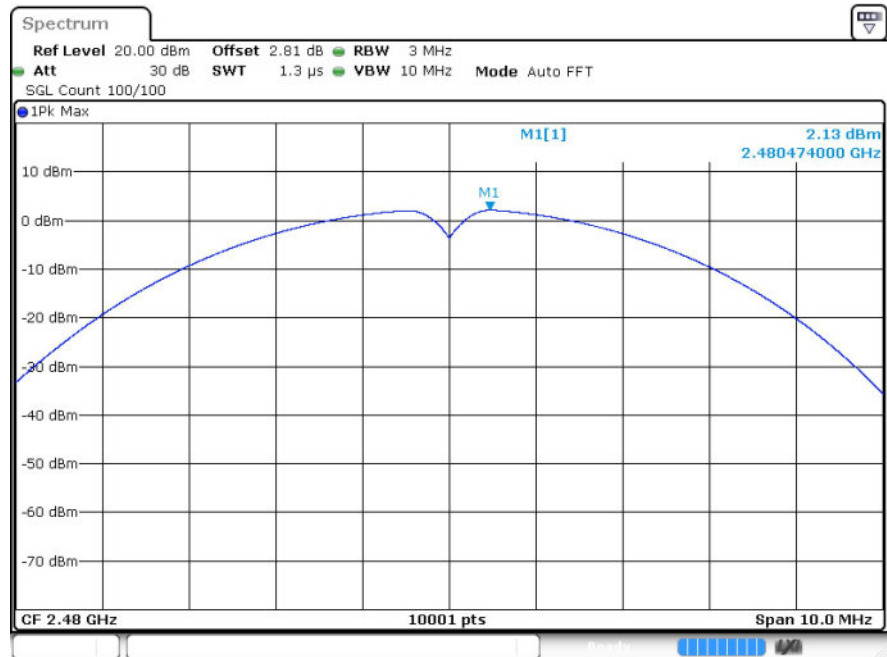
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

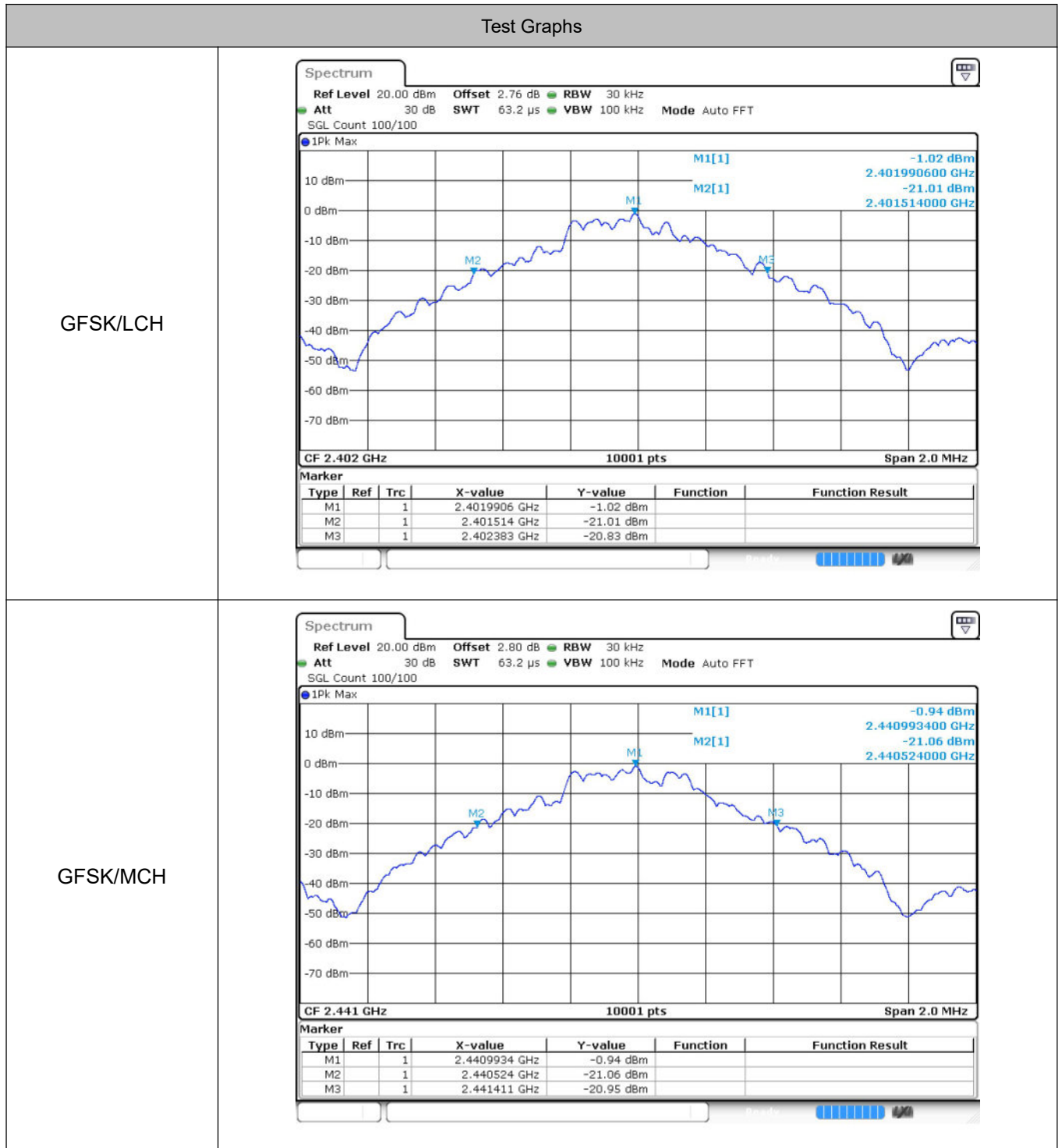


3 20dB Bandwidth

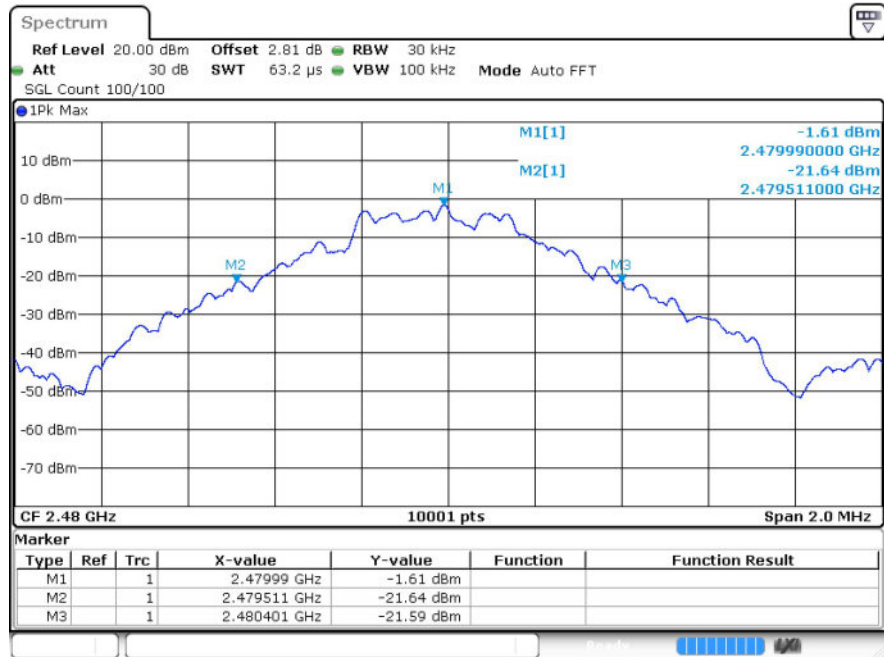
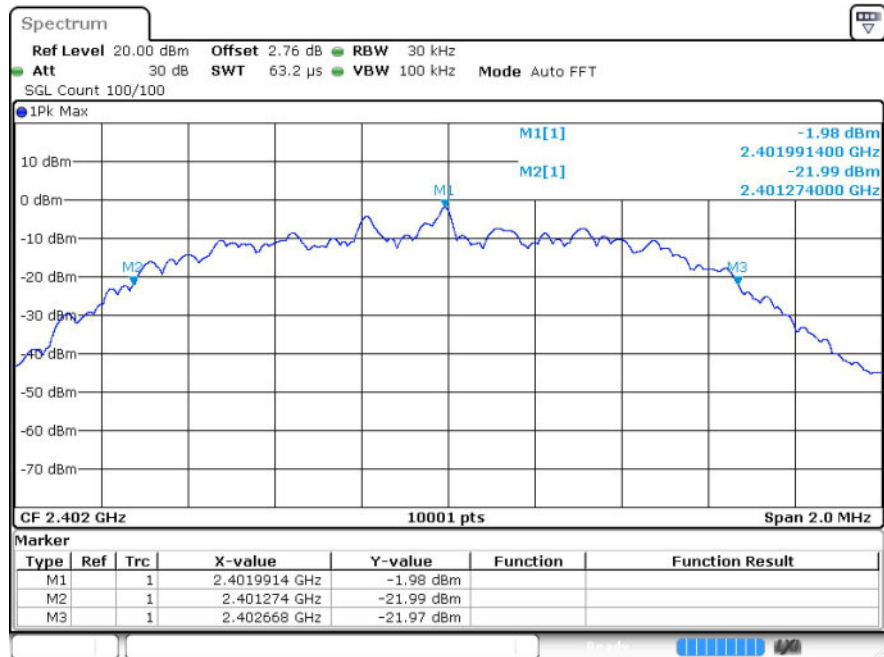
3.1 Test Result

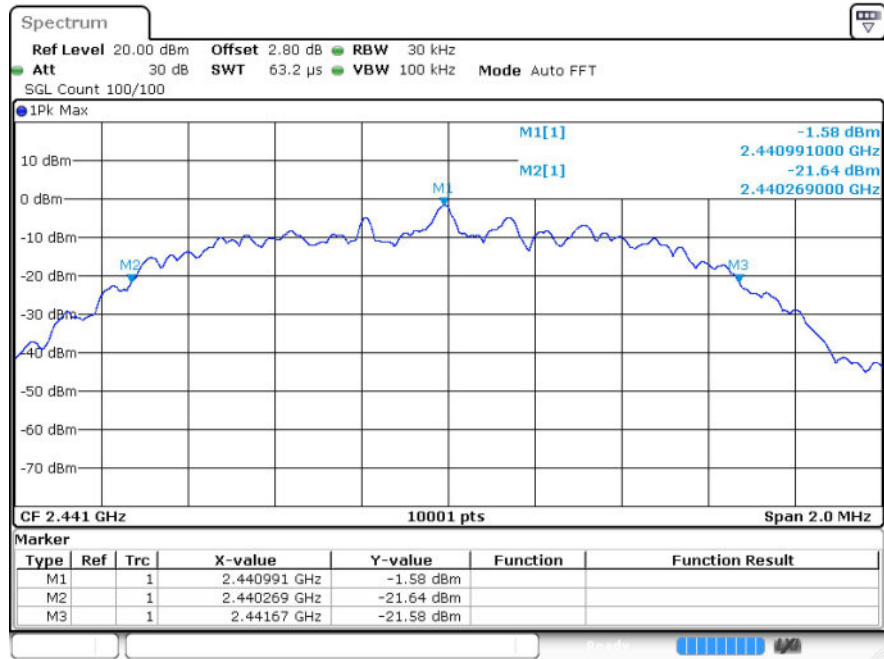
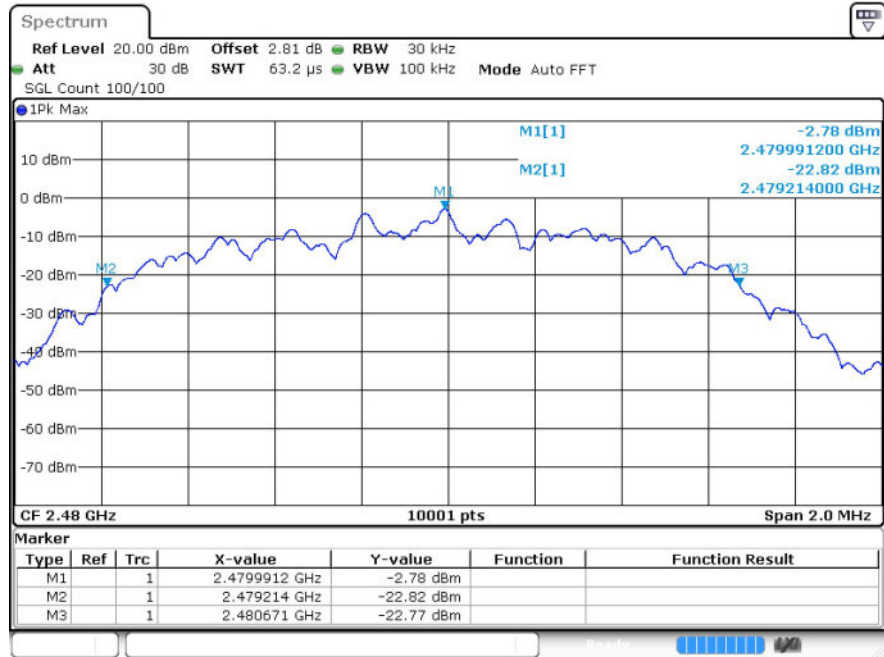
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.869	Not Specified	Pass
	MCH	0.886	Not Specified	Pass
	HCH	0.89	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.394	Not Specified	Pass
	MCH	1.4	Not Specified	Pass
	HCH	1.457	Not Specified	Pass

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	1.004	0.591	Pass
$\pi/4$ DQPSK	MCH	0.998	0.933	Pass

4.2 Test Graphs

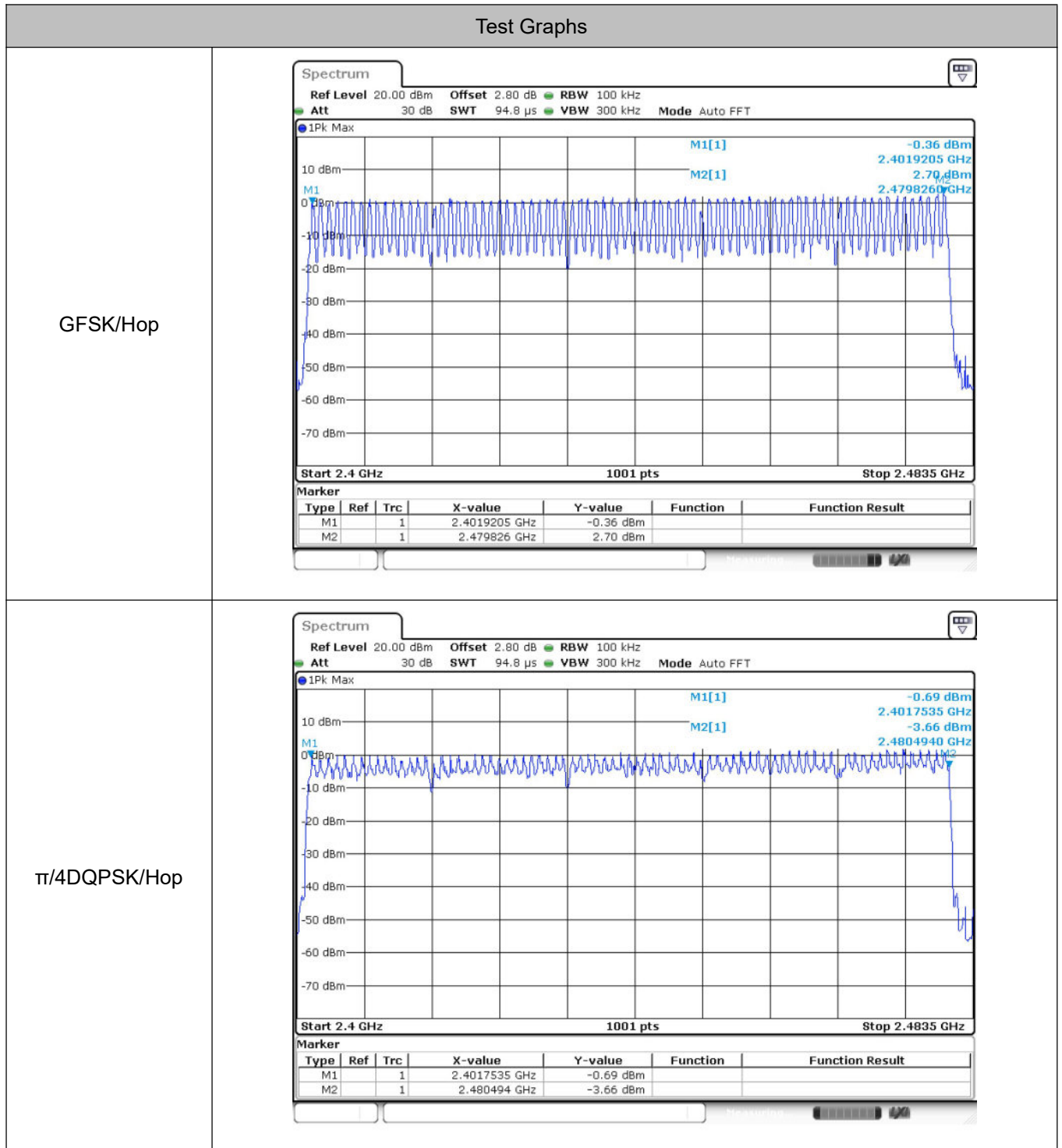


5 Hopping Channel Number

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

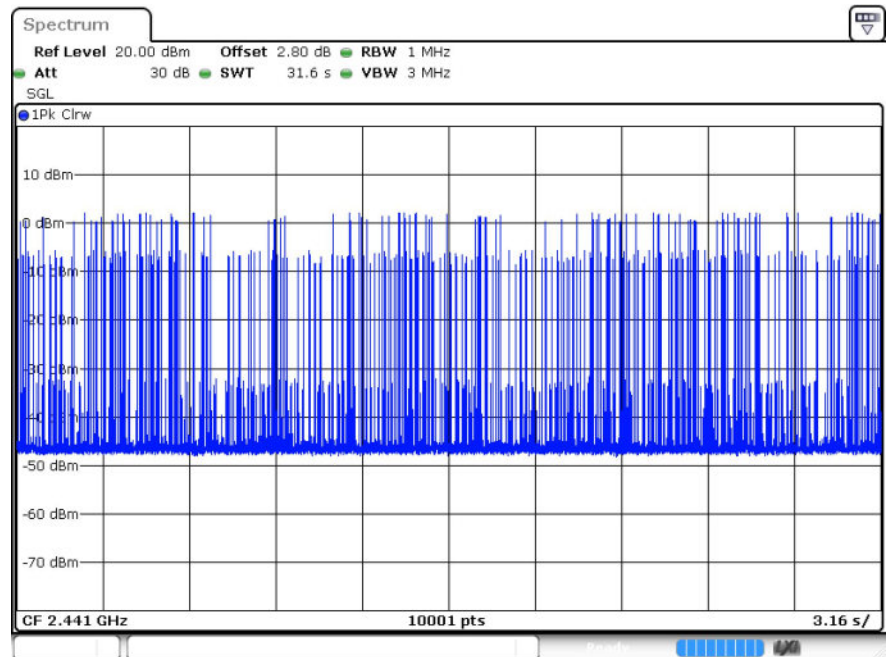
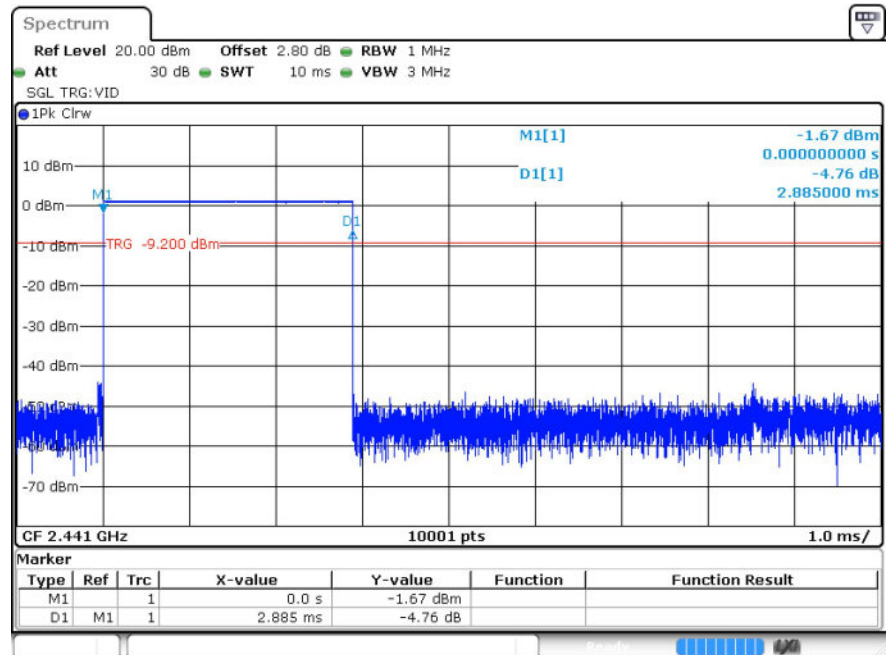
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.885	106	305.81	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.889	111	320.679	0.4	Pass

6.2 Test Graphs

Test Graphs

GFSK_DH5/MCH



Spectrum

Ref Level 20.00 dBm Offset 2.80 dB RBW 1 MHz
Att 30 dB SWT 31.6 s VBW 3 MHz
SGL

1Pk: Clrw

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz 10001 pts 3.16 s/

7 RF Conducted Spurious Emissions

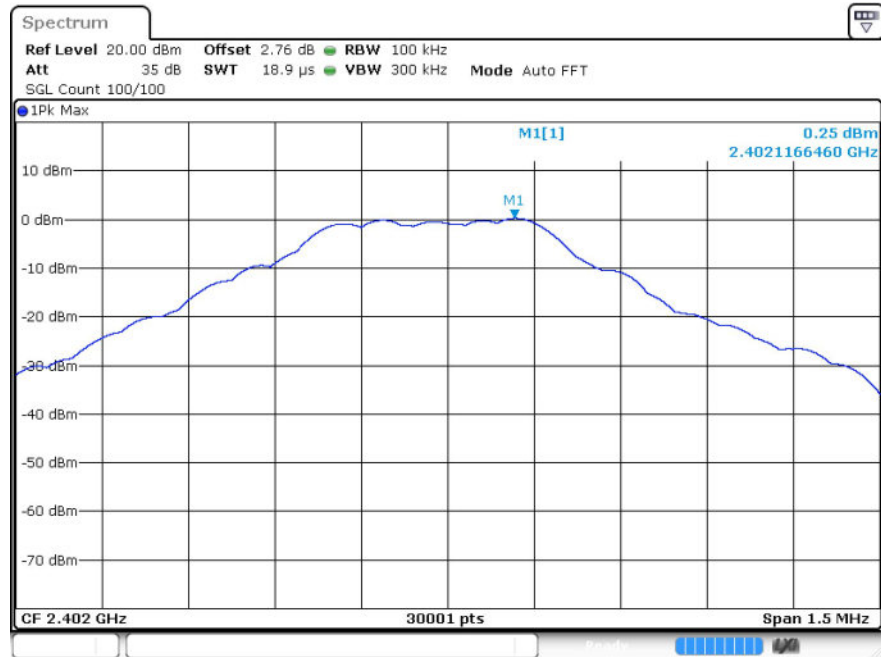
7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-40.45	-20	Pass
	MCH	-43.17	-20	Pass
	HCH	-42.58	-20	Pass
$\pi/4$ DQPSK	LCH	-40.74	-20	Pass
	MCH	-42.19	-20	Pass
	HCH	-40.98	-20	Pass

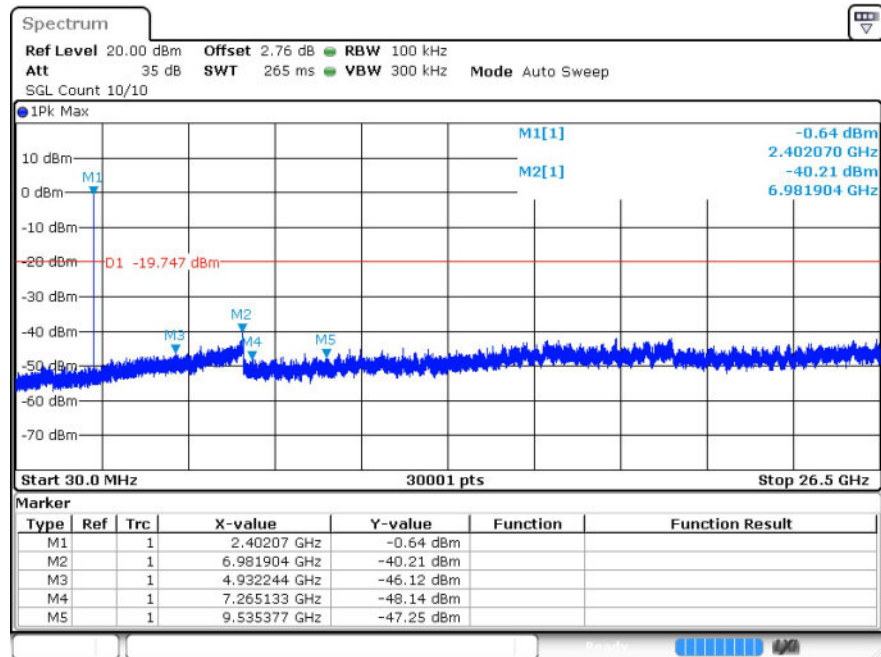
7.2 Test Graphs

GFSK_LCH_Graphs

Pref

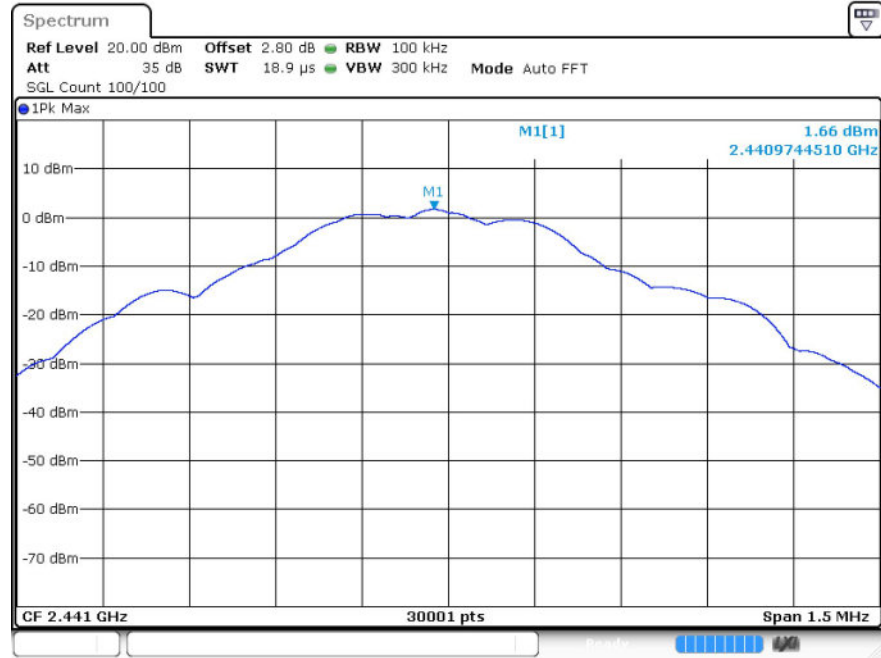


Puw

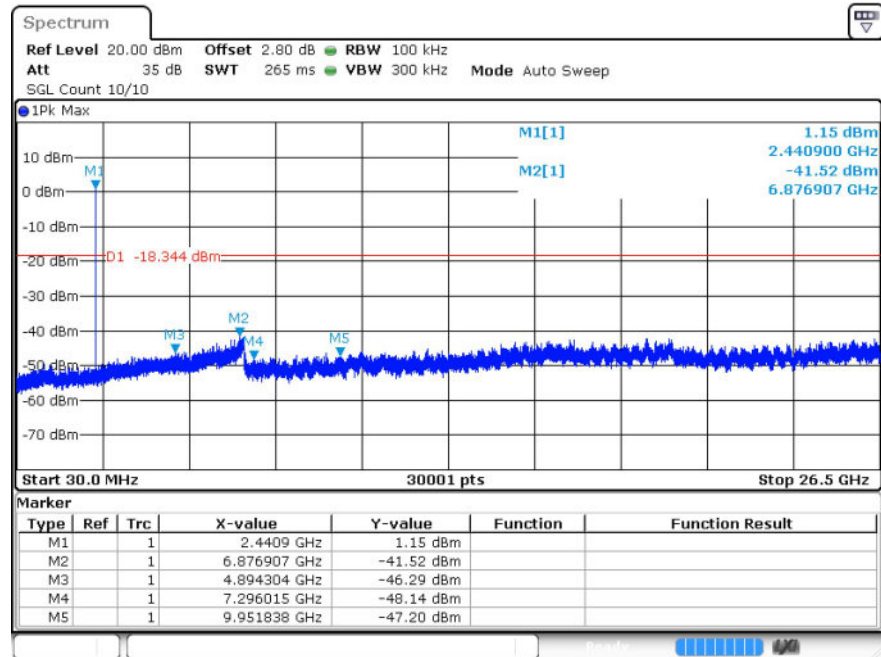


GFSK_MCH_Graphs

Pref

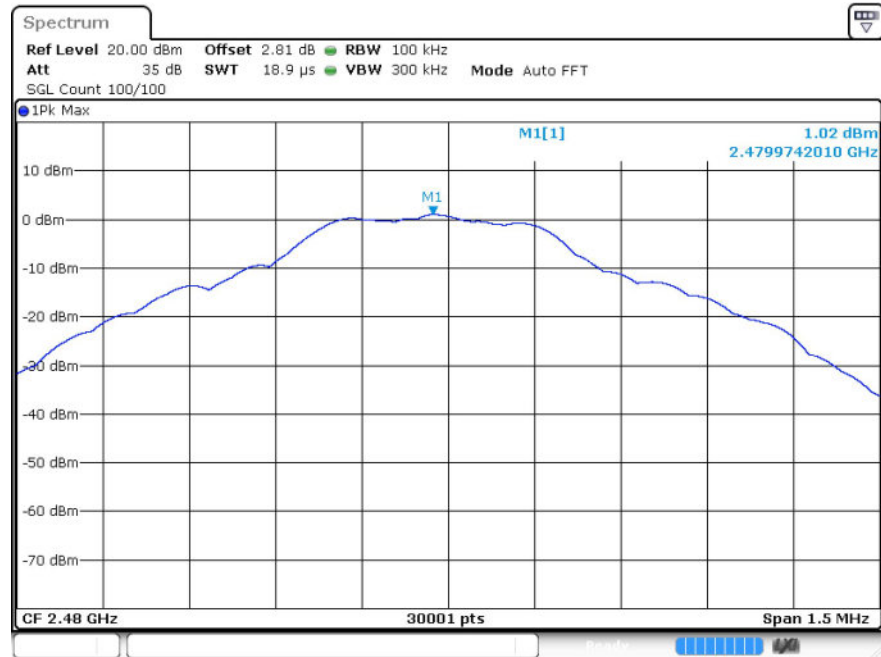


Puw

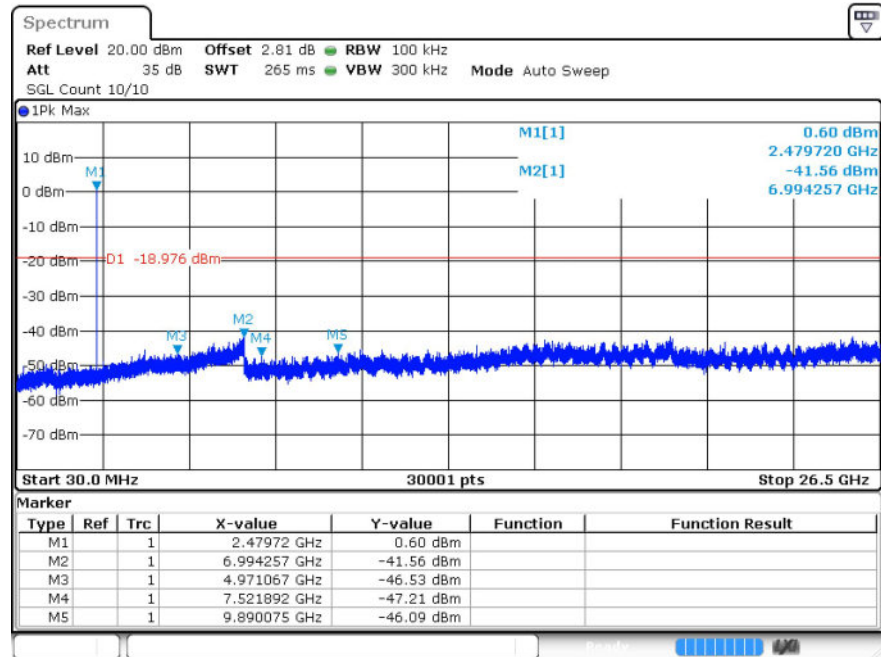


GFSK_HCH_Graphs

Pref

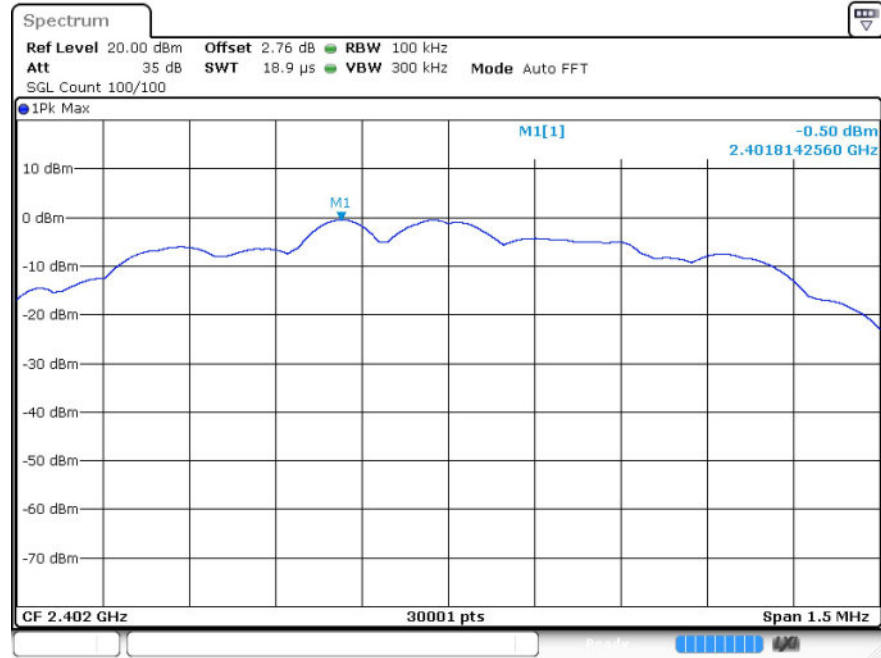


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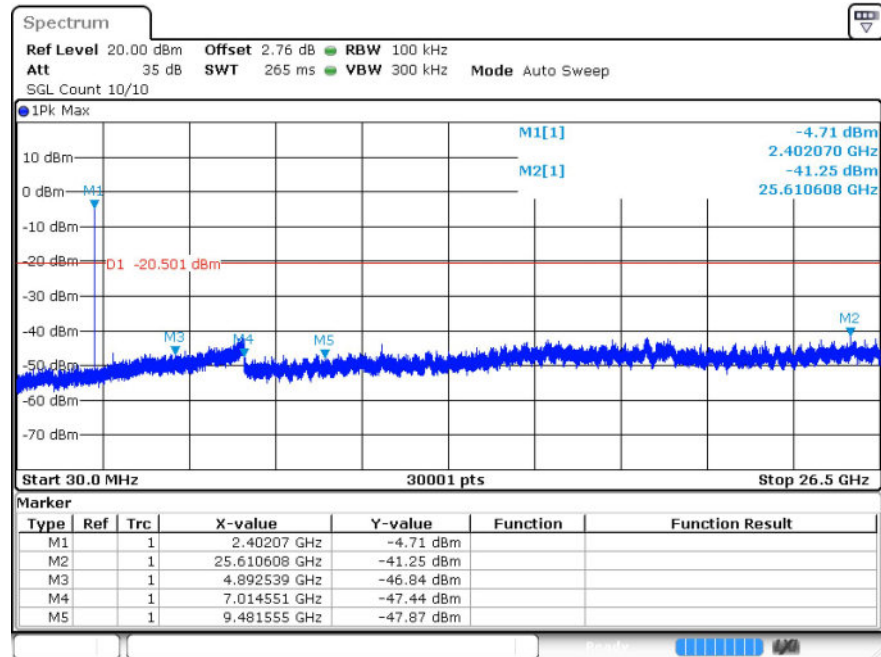


$\pi/4$ DQPSK_LCH_Graphs

Pref

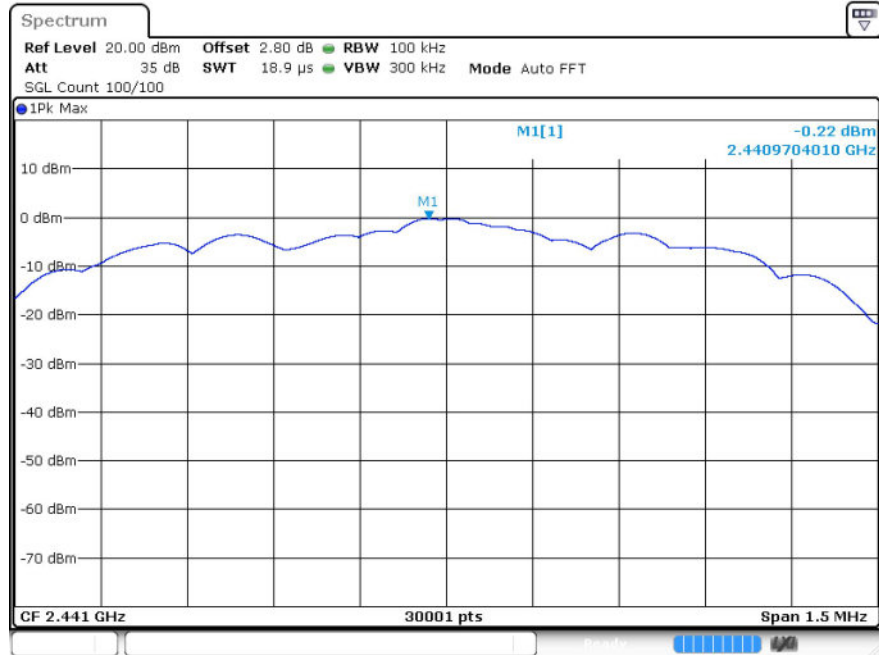


Puw

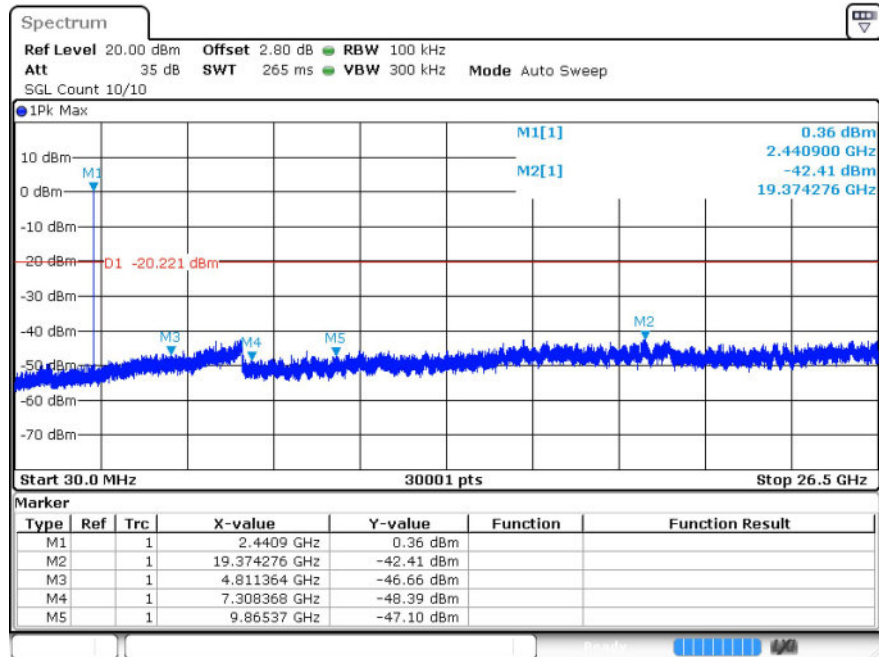


π /4DQPSK_MCH_Graphs

Pref

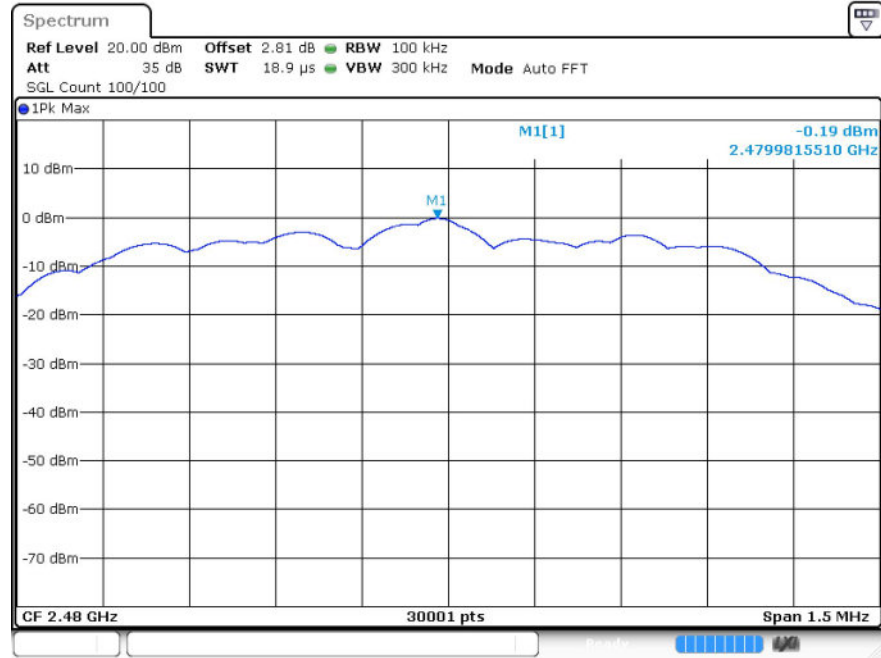


Puw

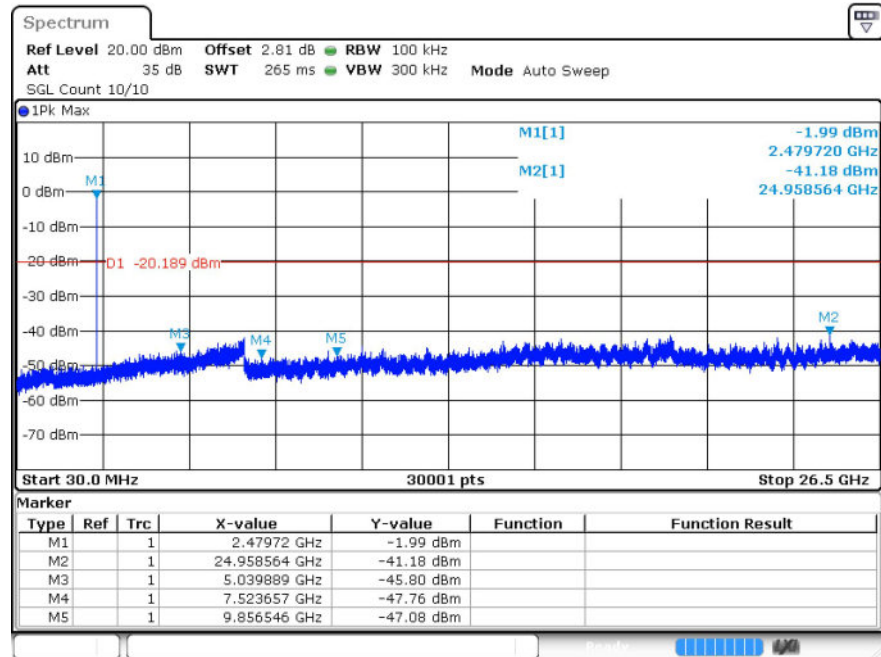


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

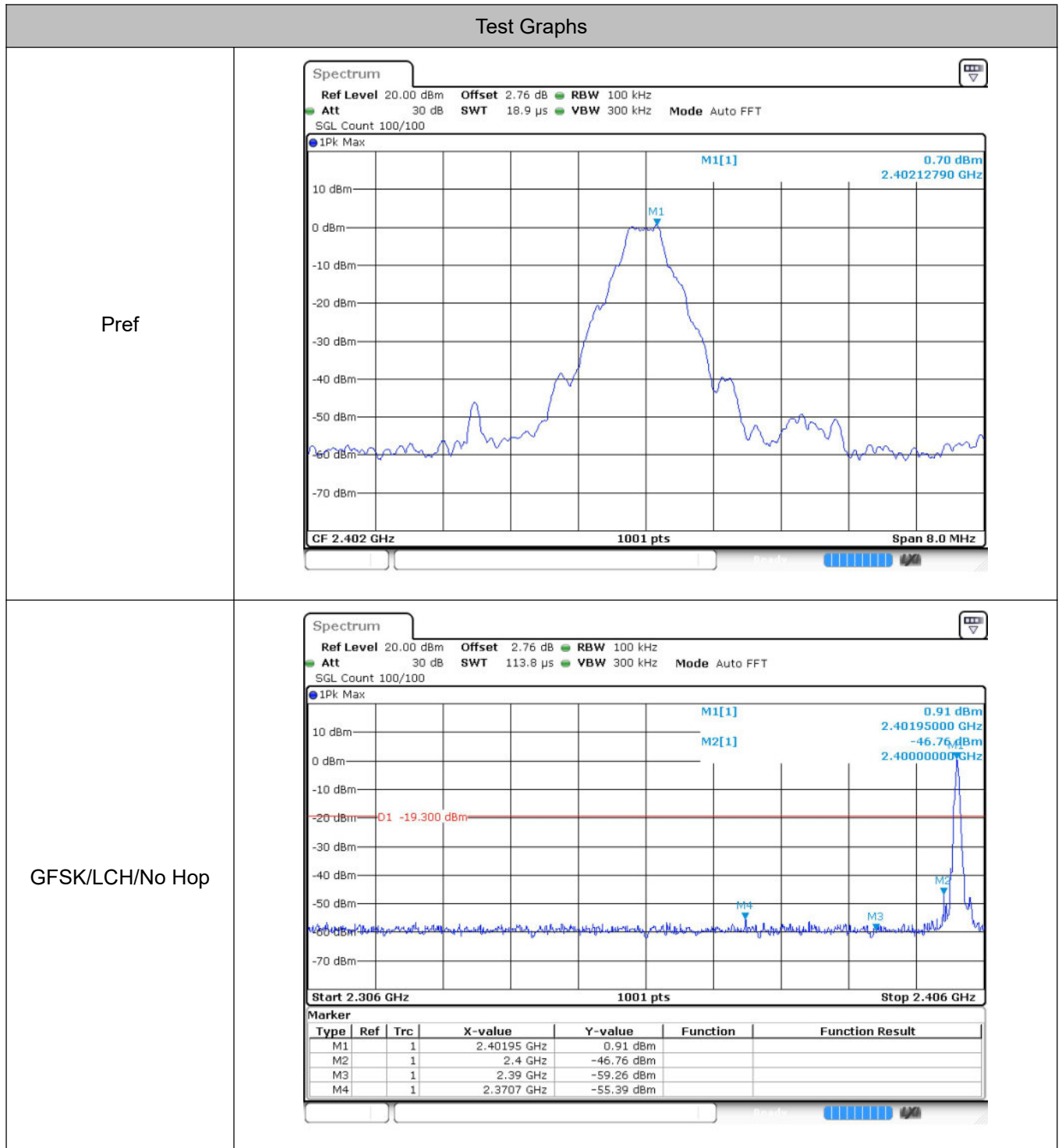


8 Band-edge for RF Conducted Emissions

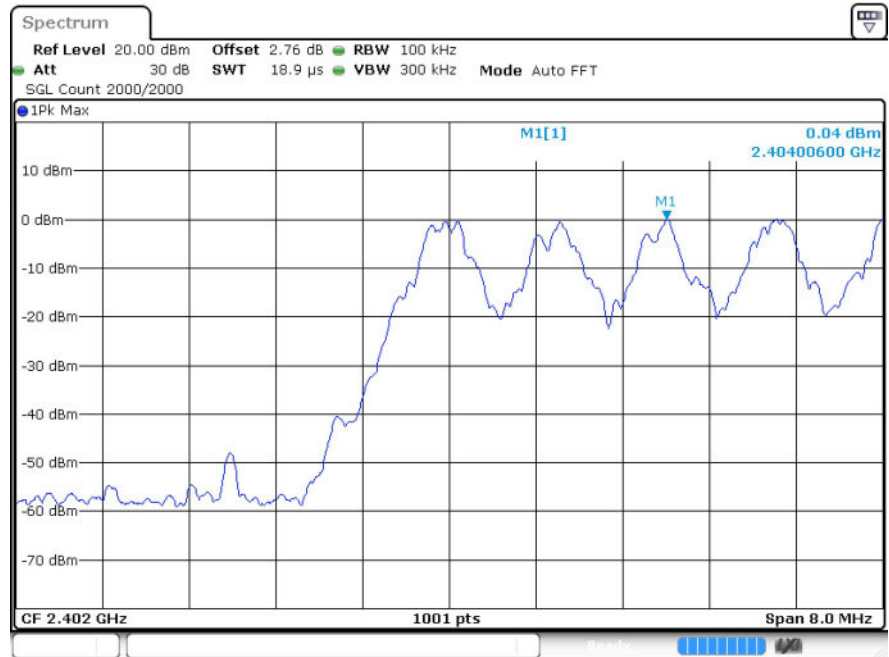
8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-56.08	-20	Pass
			On	-53.69	-20	Pass
	HCH	2480	Off	-47.29	-20	Pass
			On	-47.97	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-55.66	-20	Pass
			On	-53.04	-20	Pass
	HCH	2480	Off	-47.26	-20	Pass
			On	-49.64	-20	Pass

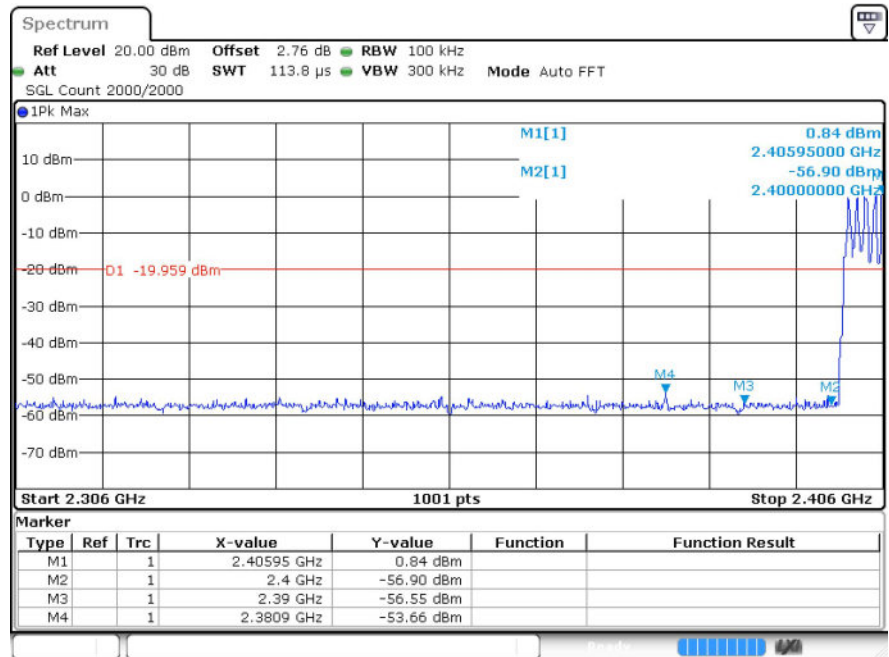
8.2 Test Graphs



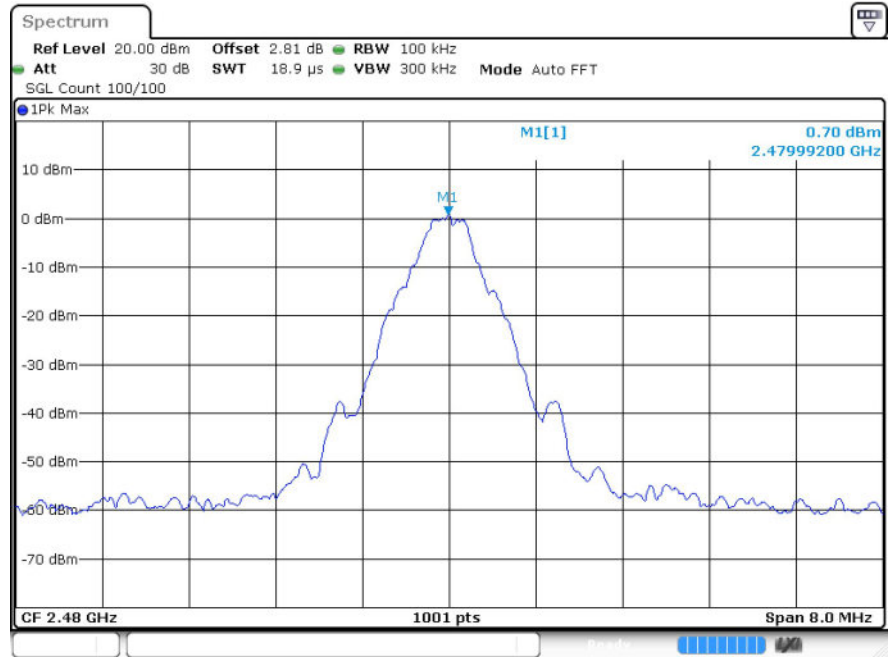
Ref



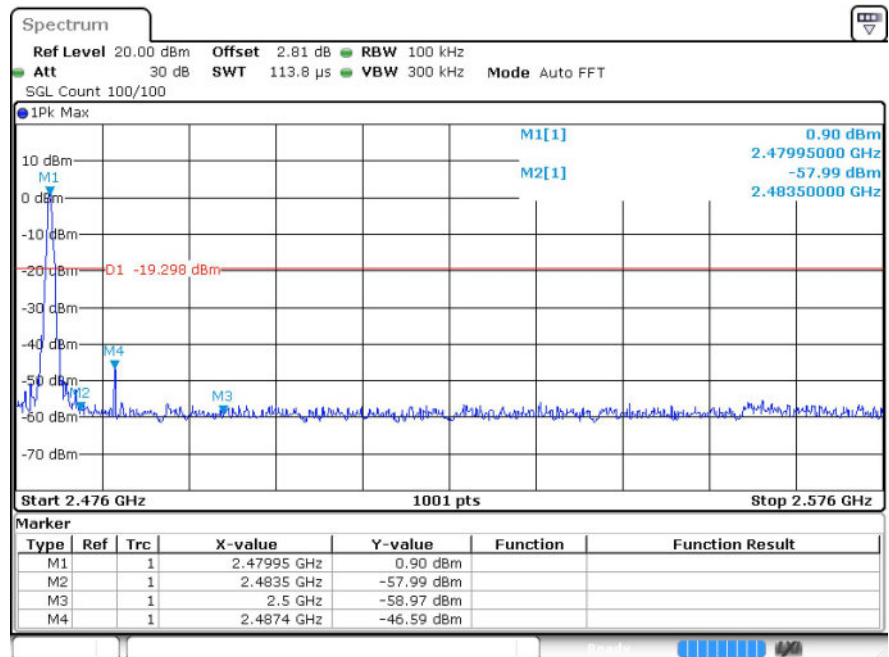
GFSK/LCH/Hop



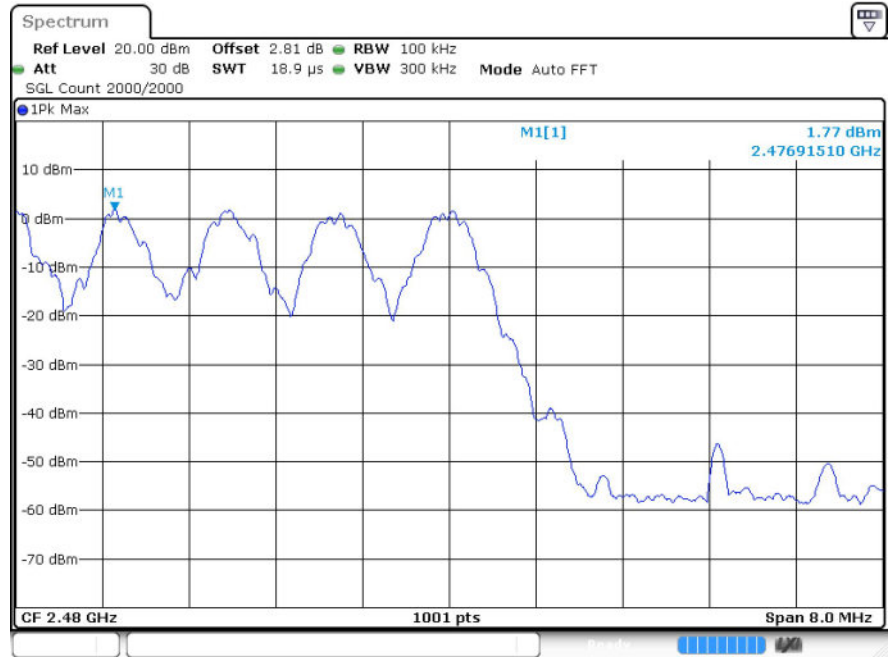
Ref



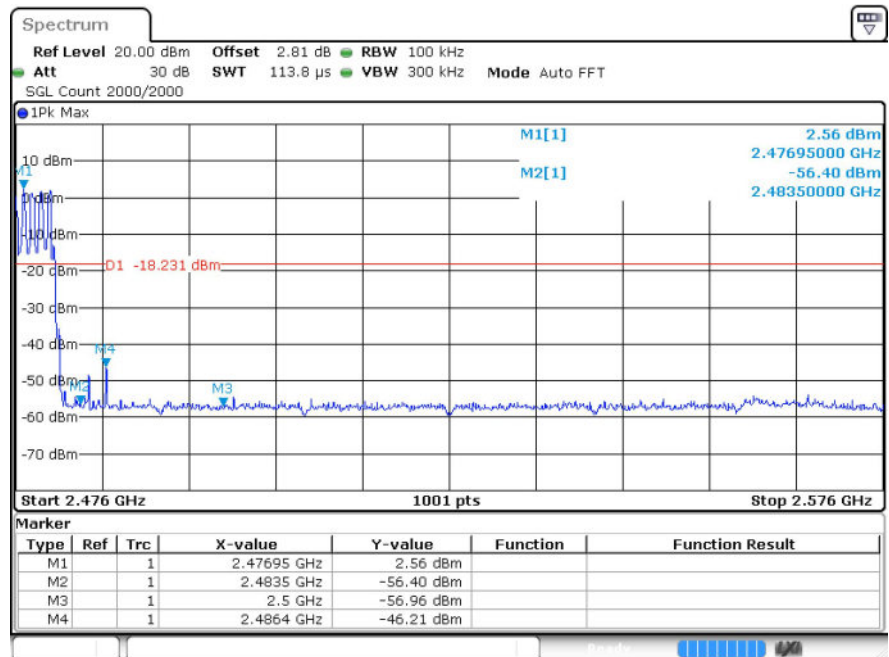
GFSK/HCH/No Hop



Ref.



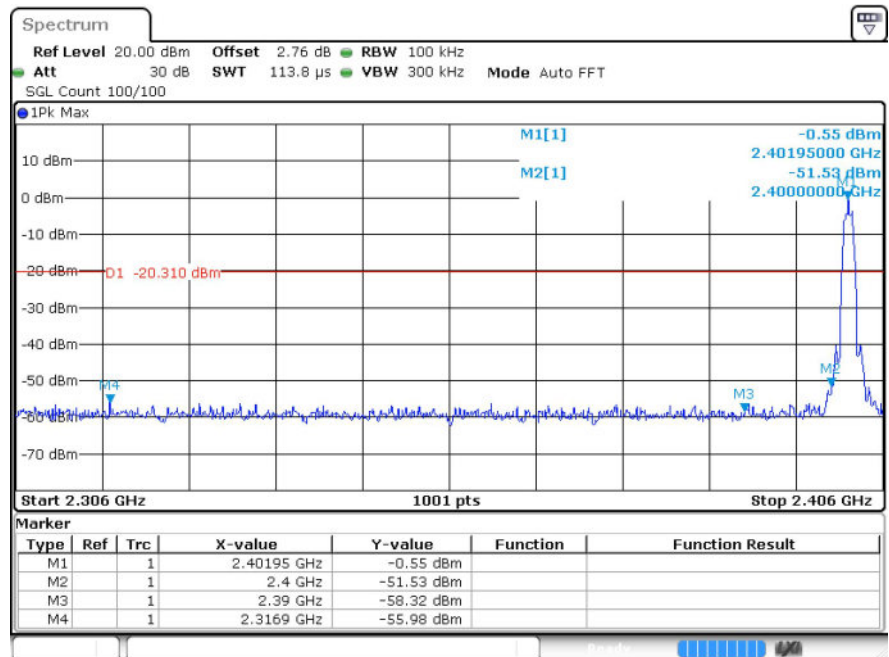
GFSK/HCH/Hop



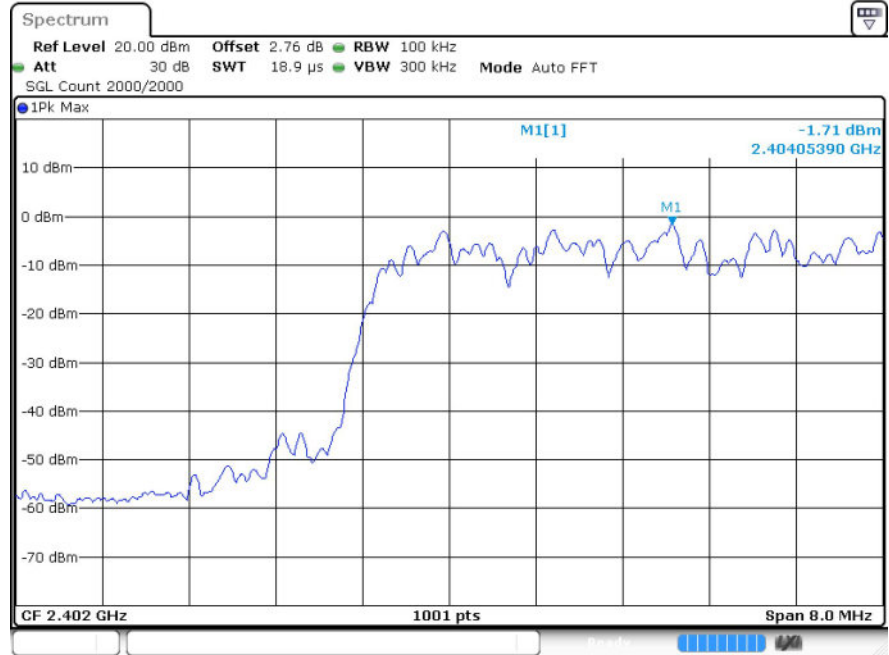
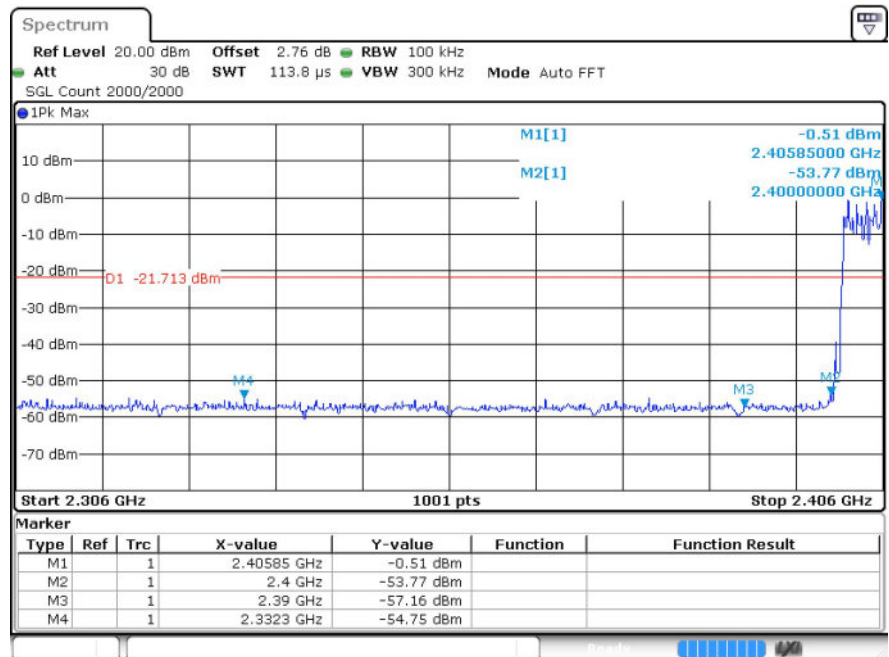
Ref



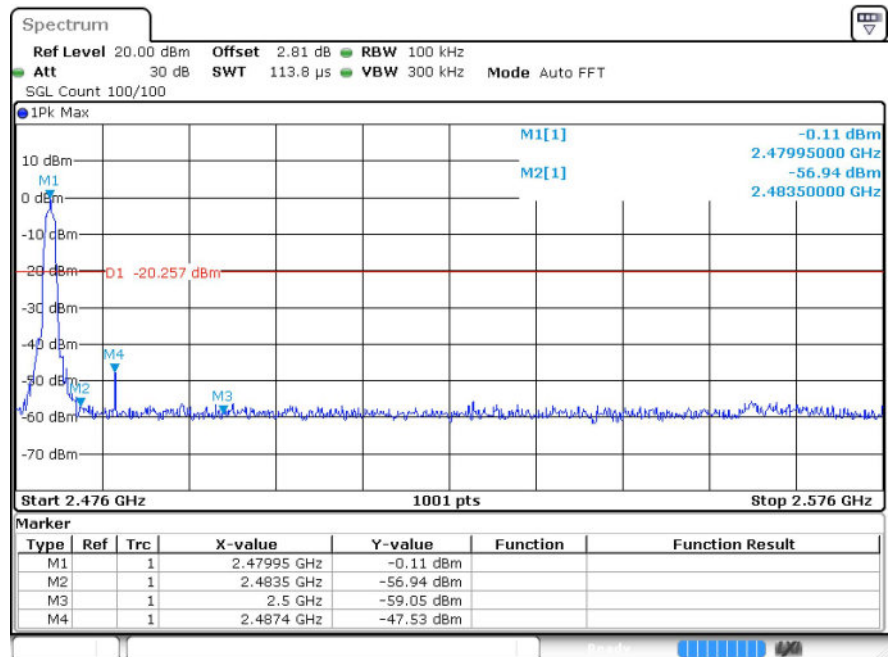
$\pi/4$ DQPSK/LCH/No
Hop



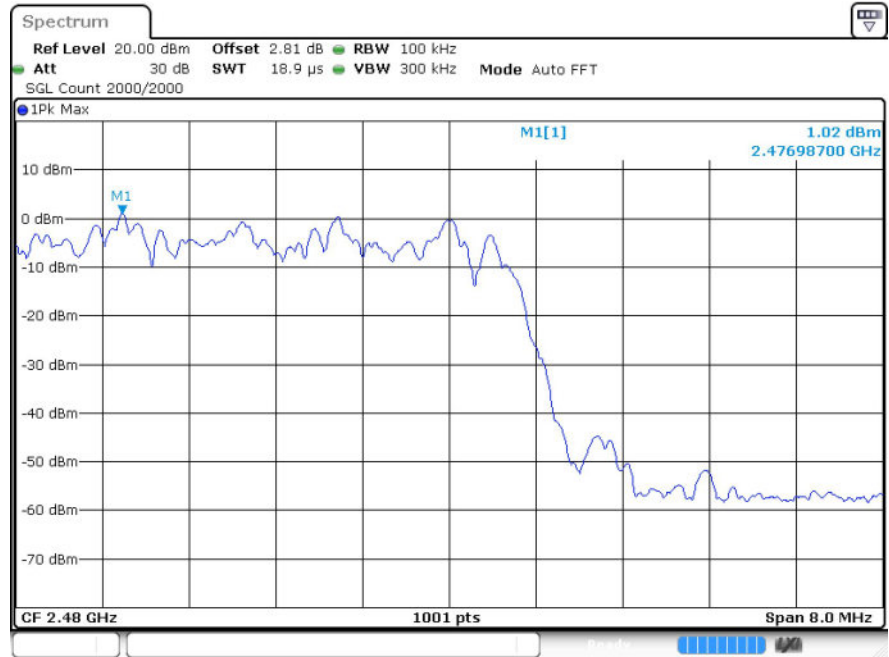
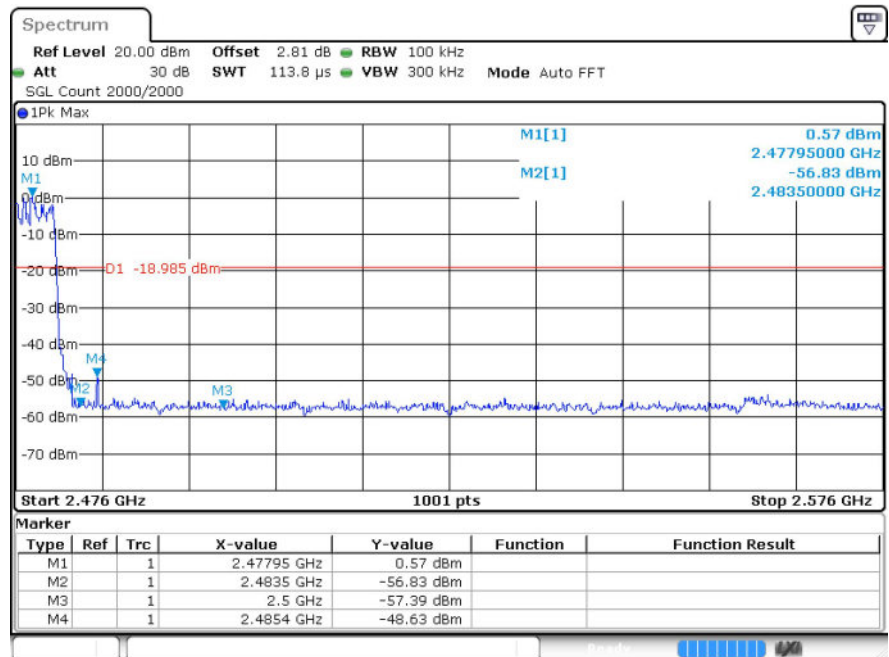
Ref


 $\pi/4$ DQPSK/LCH/Hop


Ref


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


Ref


 $\pi/4$ DQPSK/HCH/Hop


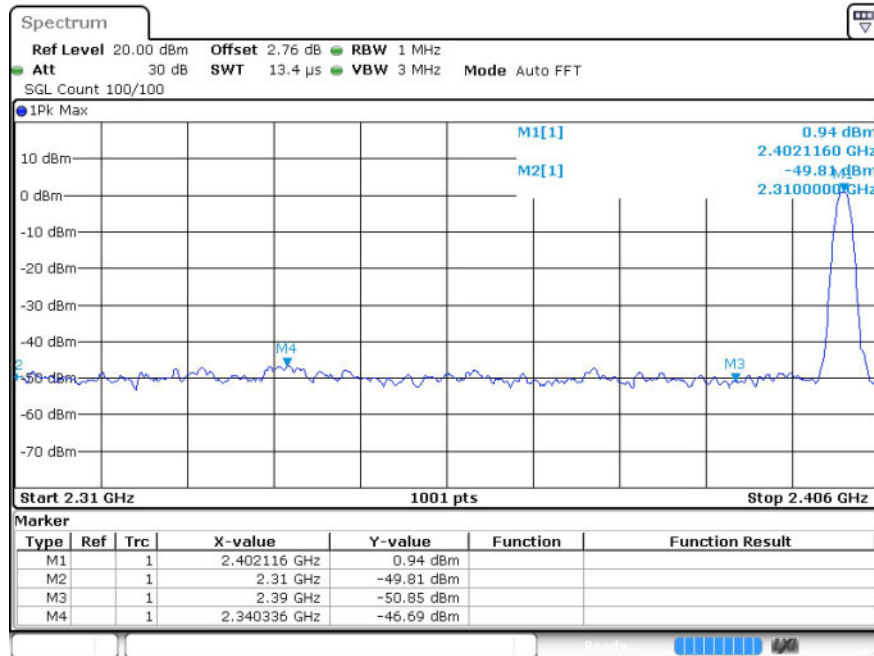
9 Restrict-band band-edge measurements

9.1 Test Result

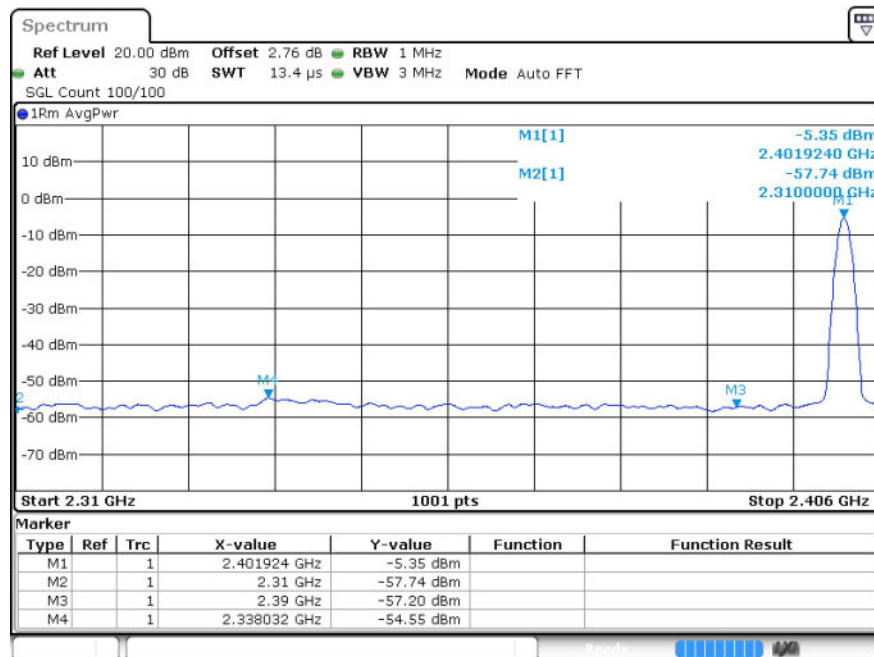
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Duty Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-49.81	2.7	-	48.15	PEAK	74	Pass
	Off	2310.0	-57.74	2.7	5.06	45.28	AV	54	Pass
	Off	2340.336	-46.68	2.7	-	51.28	PEAK	74	Pass
	Off	2338.032	-54.55	2.7	5.06	48.47	AV	54	Pass
	Off	2390.0	-50.85	2.7	-	47.11	PEAK	74	Pass
	Off	2390.0	-57.2	2.7	5.06	45.82	AV	54	Pass
	Off	2483.5	-48.99	2.7	-	48.97	PEAK	74	Pass
	Off	2483.5	-55.99	2.7	5.06	47.03	AV	54	Pass
	Off	2487.4	-43.99	2.7	-	53.97	PEAK	74	Pass
	Off	2487.496	-55.15	2.7	5.06	47.87	AV	54	Pass
	Off	2500.0	-50.2	2.7	-	47.76	PEAK	74	Pass
	Off	2500.0	-56.89	2.7	5.06	46.13	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-49.02	2.7	-	48.94	PEAK	74	Pass
	Off	2310.0	-56.1	2.7	4.95	46.81	AV	54	Pass
	Off	2339.184	-47.31	2.7	-	50.65	PEAK	74	Pass
	Off	2338.608	-54.57	2.7	4.95	48.34	AV	54	Pass
	Off	2390.0	-49.29	2.7	-	48.67	PEAK	74	Pass
	Off	2390.0	-56.83	2.7	4.95	46.08	AV	54	Pass
	Off	2483.5	-47.64	2.7	-	50.32	PEAK	74	Pass
	Off	2483.5	-56.03	2.7	4.95	46.88	AV	54	Pass
	Off	2487.4	-43.67	2.7	-	54.29	PEAK	74	Pass
	Off	2498.872	-54.77	2.7	4.95	48.14	AV	54	Pass
	Off	2500.0	-48.77	2.7	-	49.19	PEAK	74	Pass
	Off	2500.0	-55.83	2.7	4.95	47.08	AV	54	Pass

9.2 Test Graphs

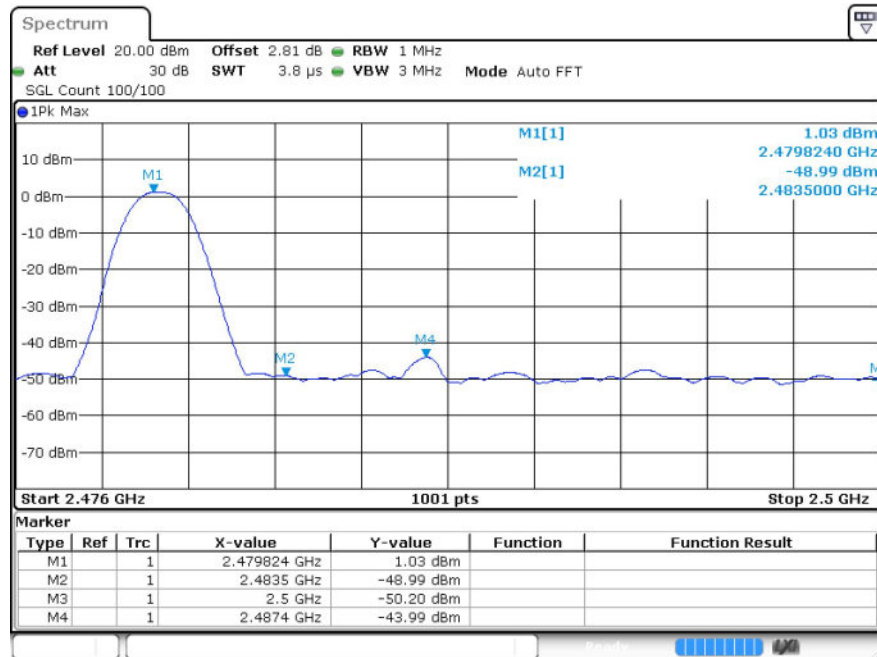
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



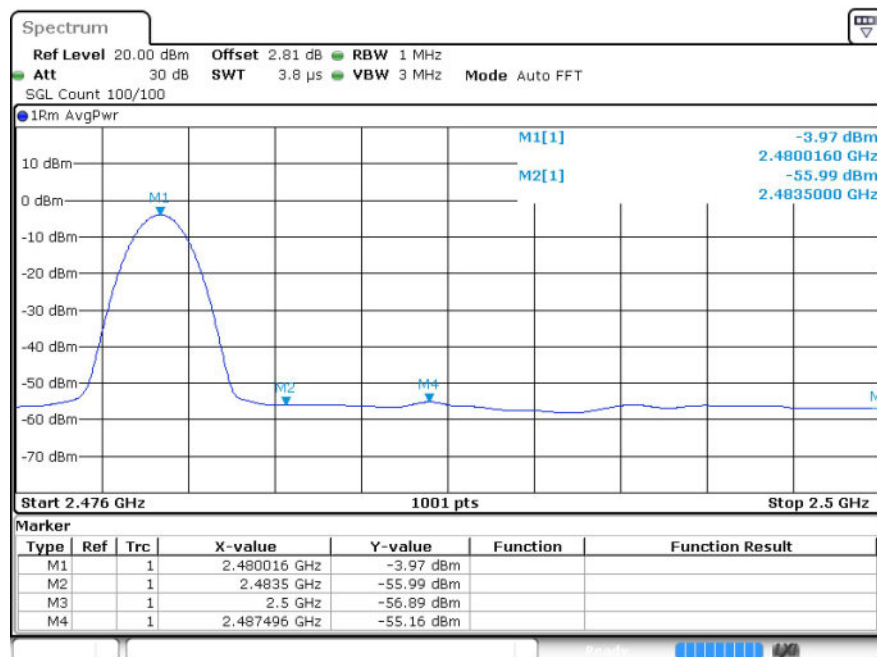
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



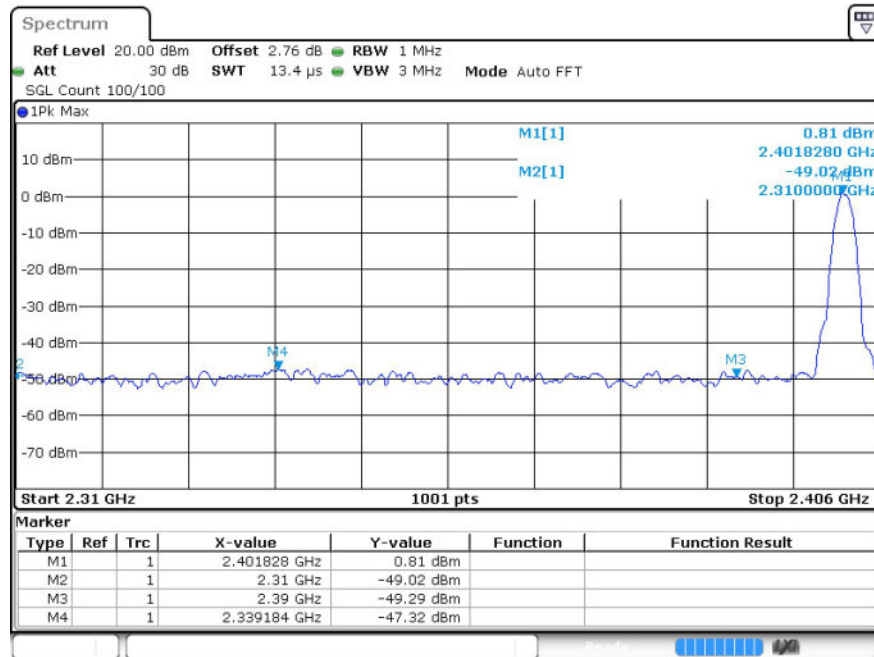
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



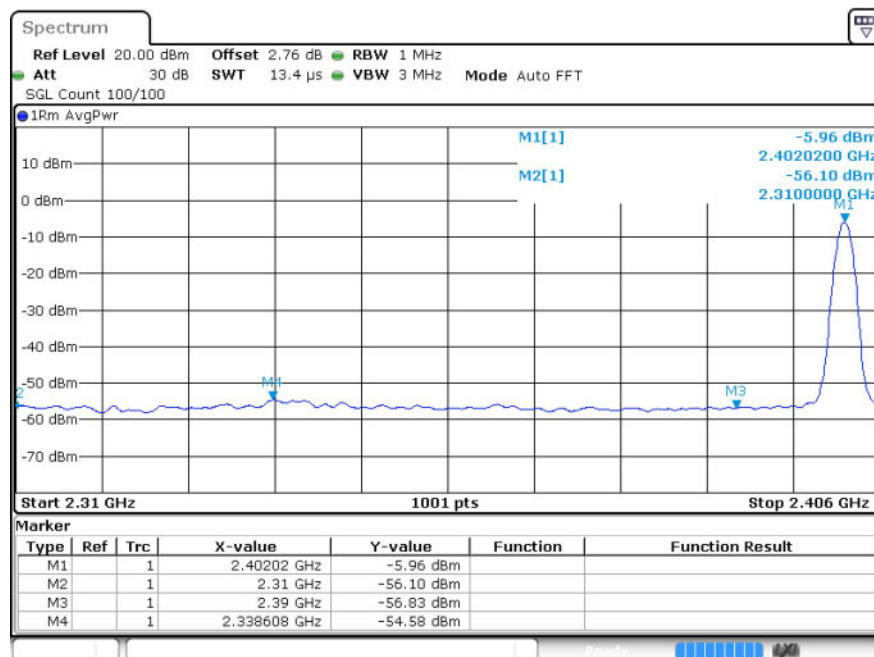
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



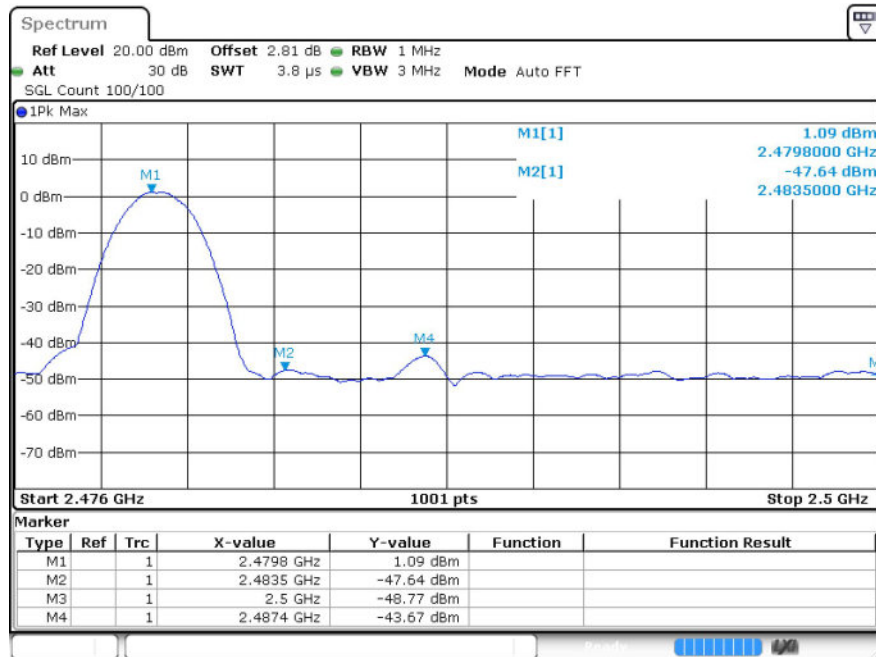
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



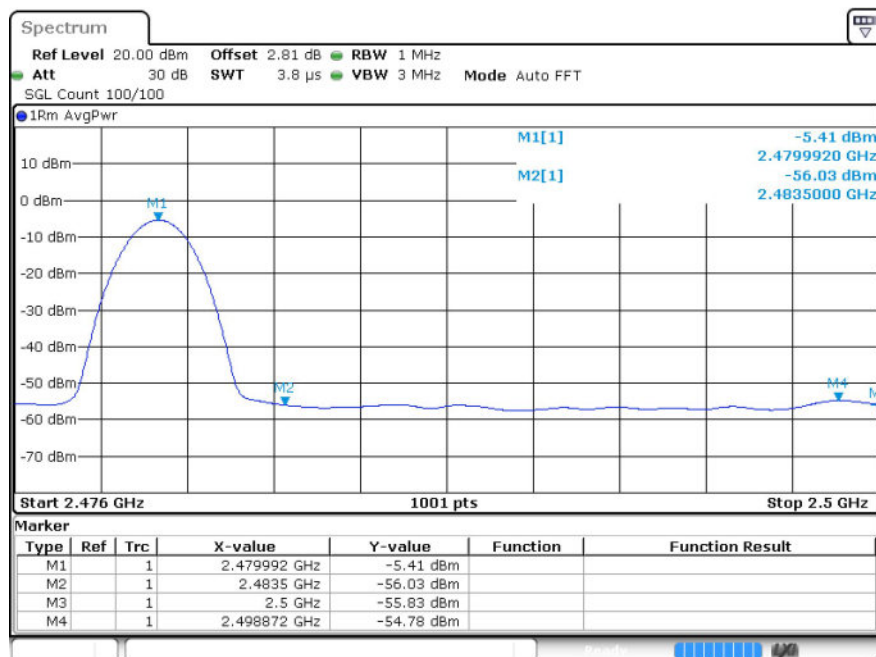
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



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---