



Appendix A

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

Product Name: Bluetooth Earphone

Trade Mark: N/A

Test Model: GE10

Environmental Conditions

Temperature:	24.7°C
Relative Humidity:	54.9%
ATM Pressure:	101Kpa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung



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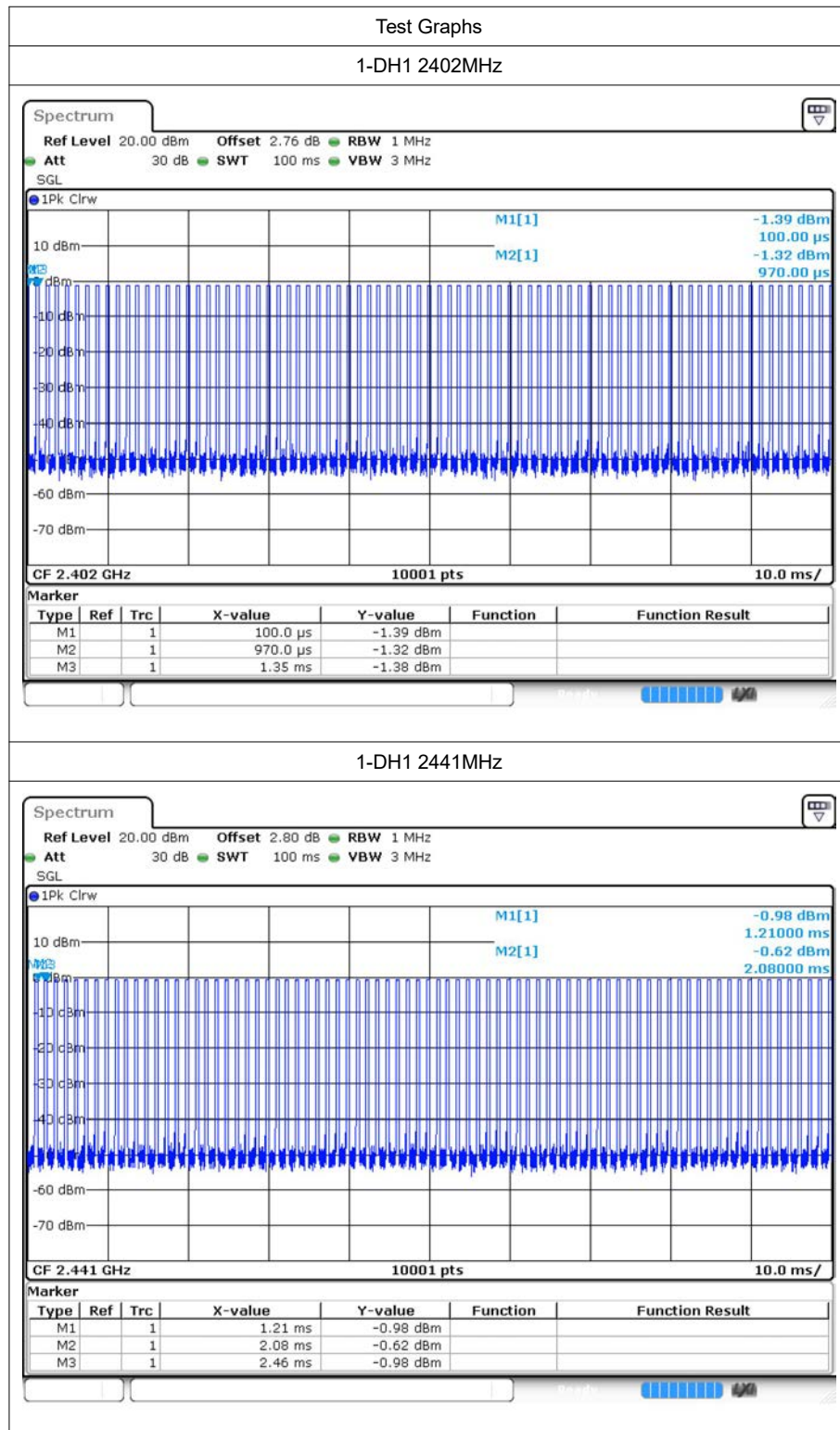
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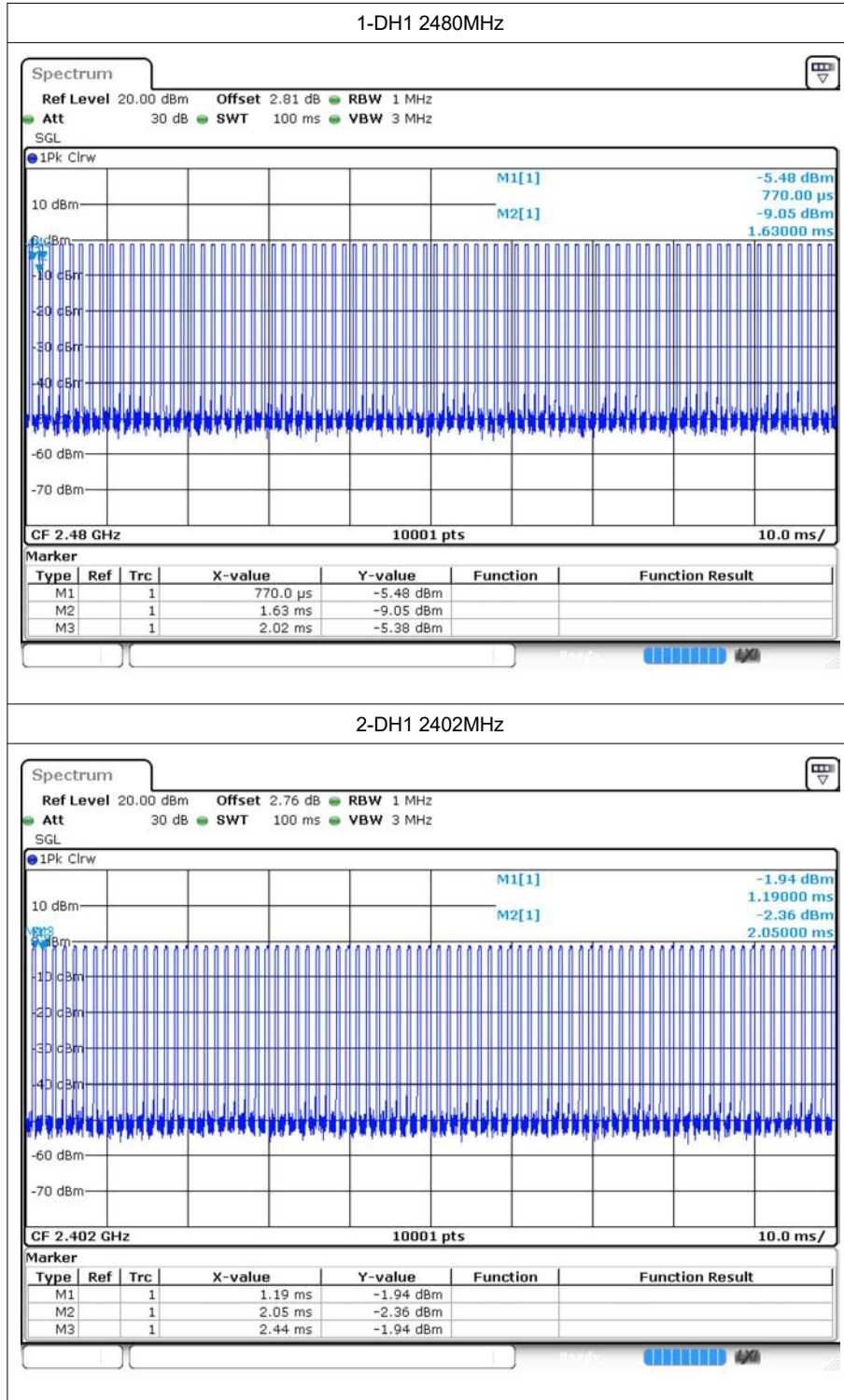
1 Duty Cycle

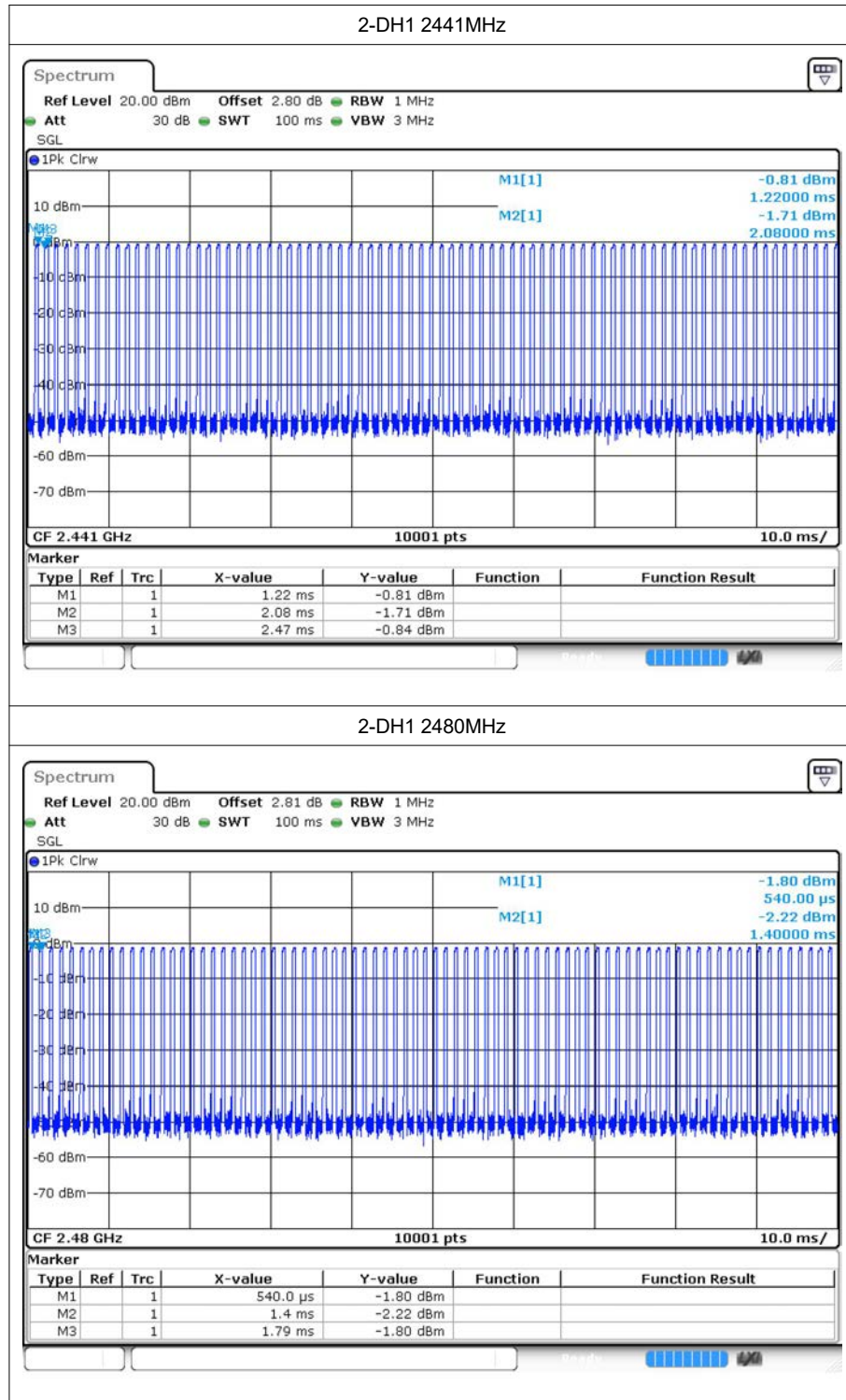
1.1 Test Result

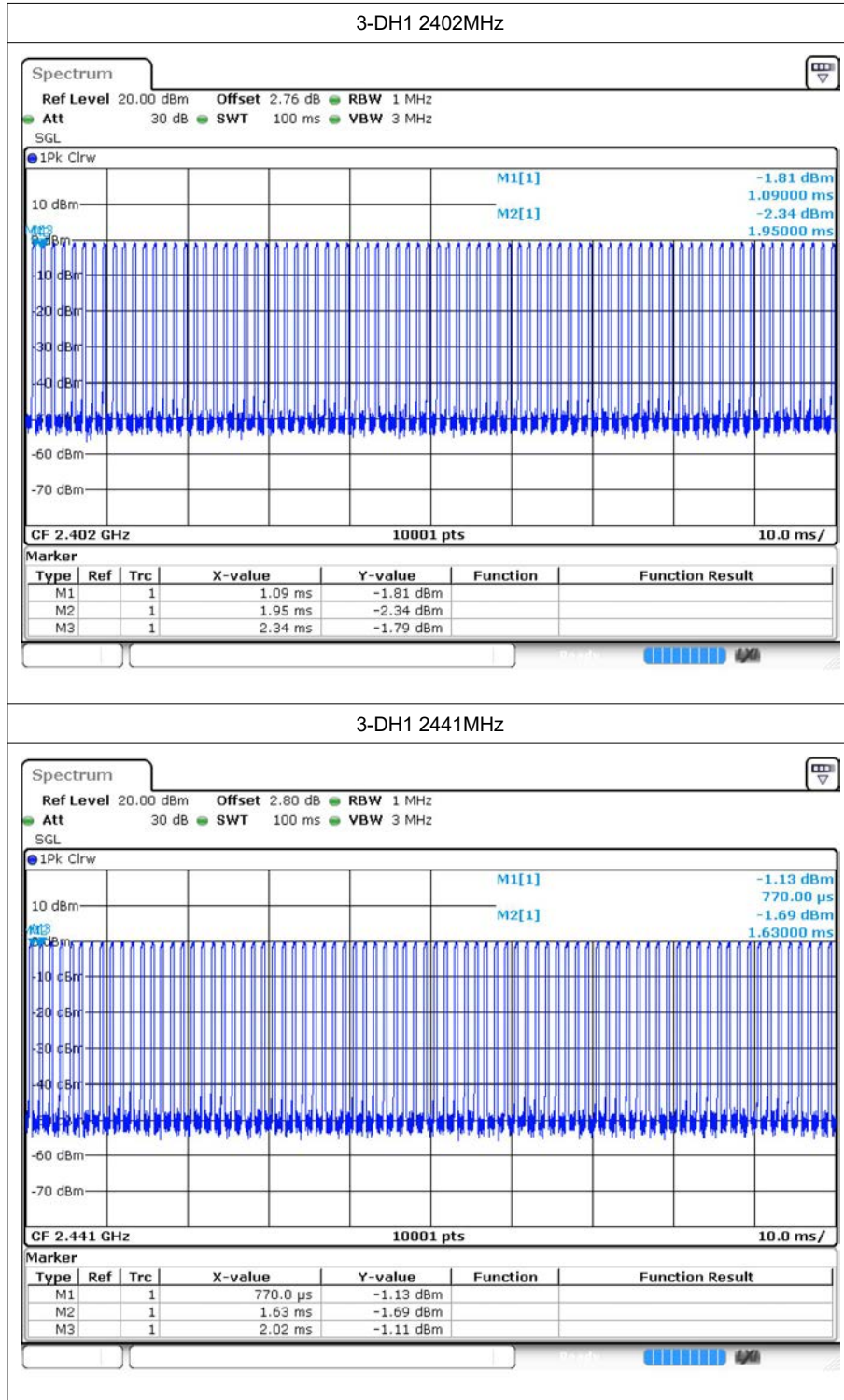
Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor	1/T (kHz)
1-DH1	2402	31.21	5.06	2.63
1-DH1	2441	31.2	5.06	2.63
1-DH1	2480	31.51	5.02	2.56
2-DH1	2402	32	4.95	2.56
2-DH1	2441	32	4.95	2.56
2-DH1	2480	32	4.95	2.56
3-DH1	2402	32	4.95	2.56
3-DH1	2441	32	4.95	2.56
3-DH1	2480	31.99	4.95	2.56

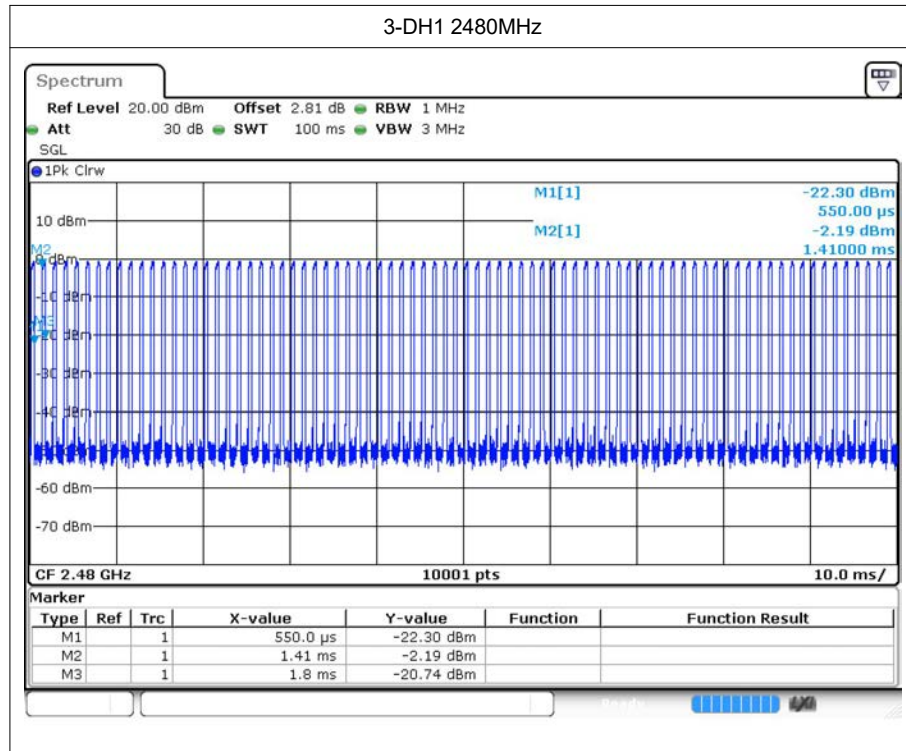
1.2 Test Graphs











Note: Left headphones and Right headphones were tested, only the worst data was recorded

2 Maximum Conducted Peak Output Power

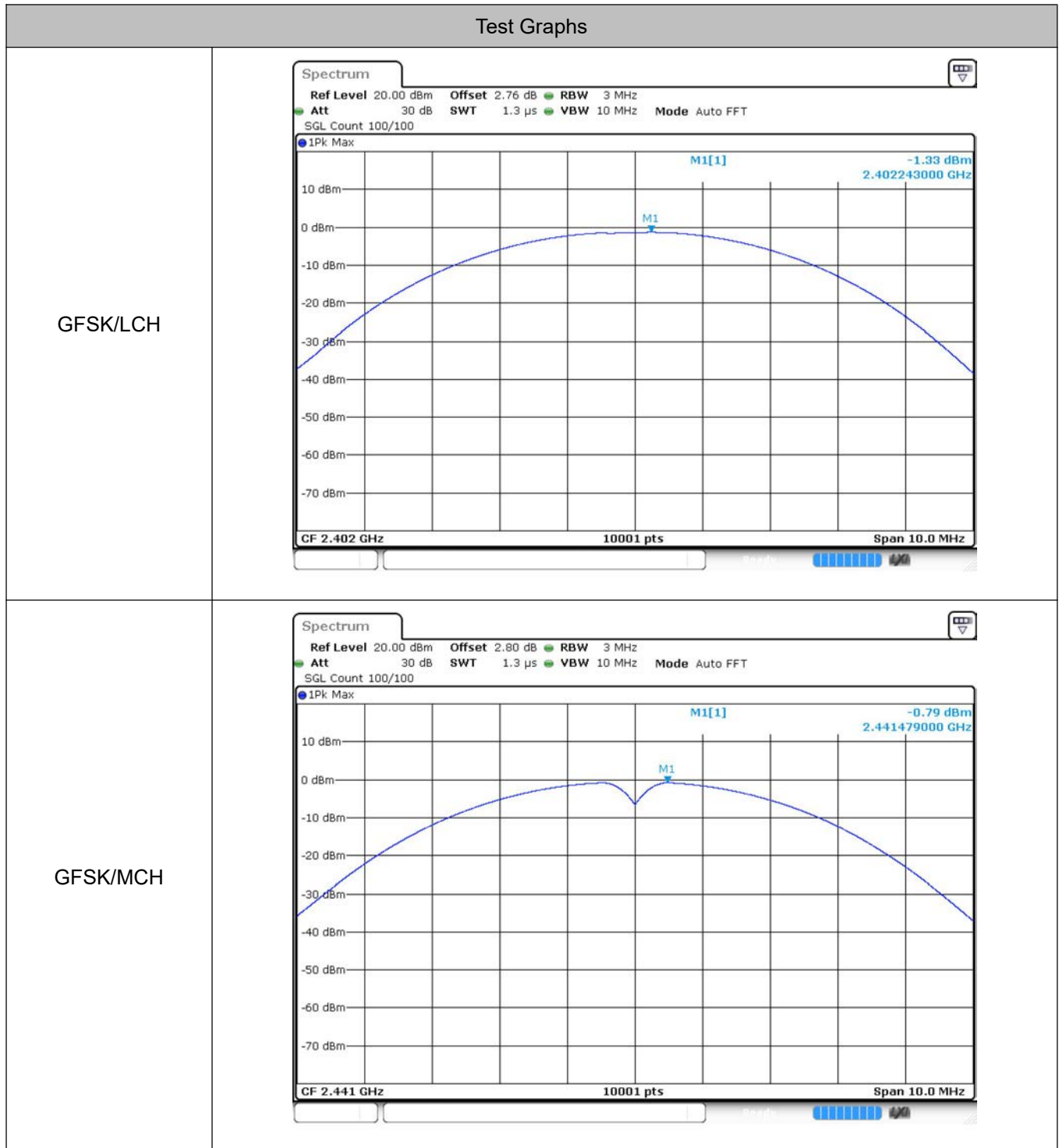
2.1 Test Result(Left)

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.33	21	Pass
	MCH	-0.79	21	Pass
	HCH	-1.31	21	Pass
$\pi/4$ DQPSK	LCH	-0.7	21	Pass
	MCH	0.31	21	Pass
	HCH	-0.54	21	Pass
8DPSK	LCH	-0.17	21	Pass
	MCH	0.58	21	Pass
	HCH	-0.14	21	Pass

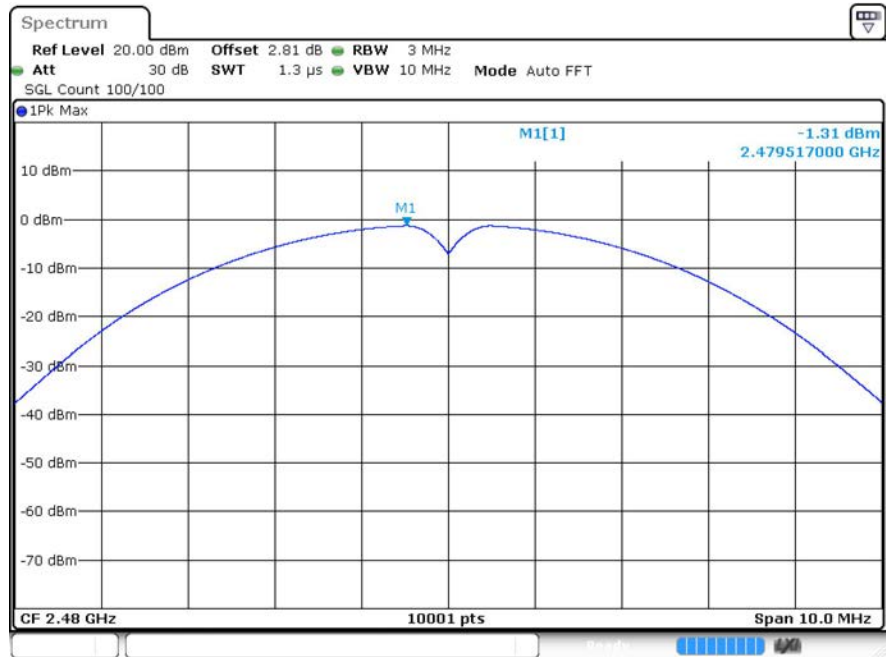
2.2 Test Result(Right)

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.35	21	Pass
	MCH	-2.67	21	Pass
	HCH	-3.2	21	Pass
$\pi/4$ DQPSK	LCH	-2.11	21	Pass
	MCH	-1.55	21	Pass
	HCH	-2.08	21	Pass
8DPSK	LCH	-2.39	21	Pass
	MCH	-1.69	21	Pass
	HCH	-1.94	21	Pass

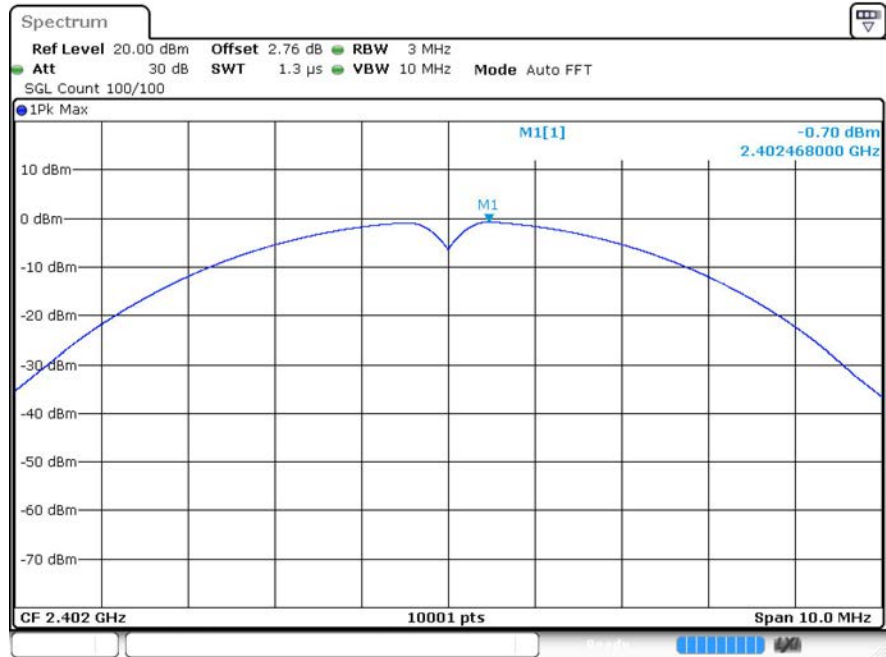
2.3 Test Graphs(Left)



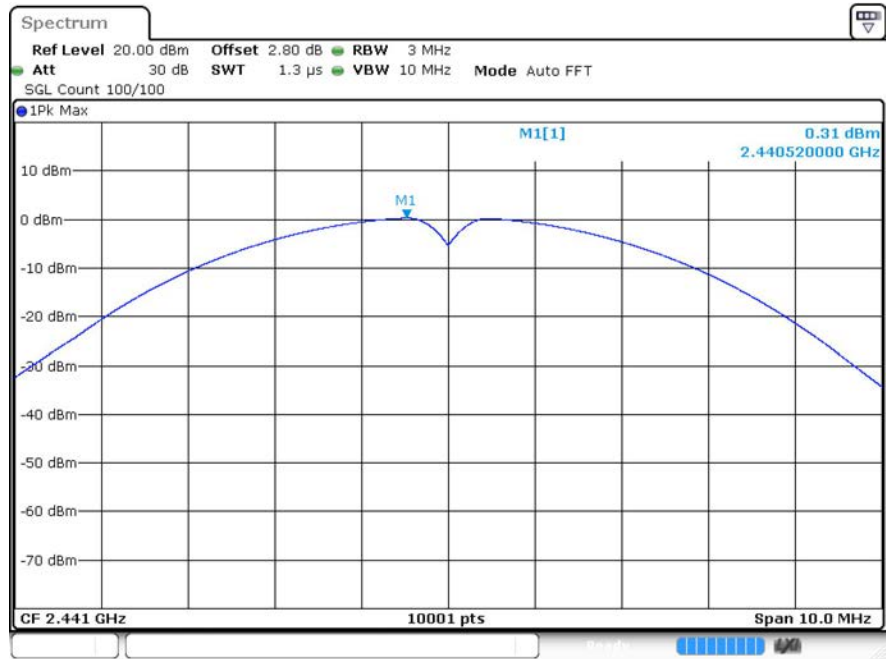
GFSK/HCH



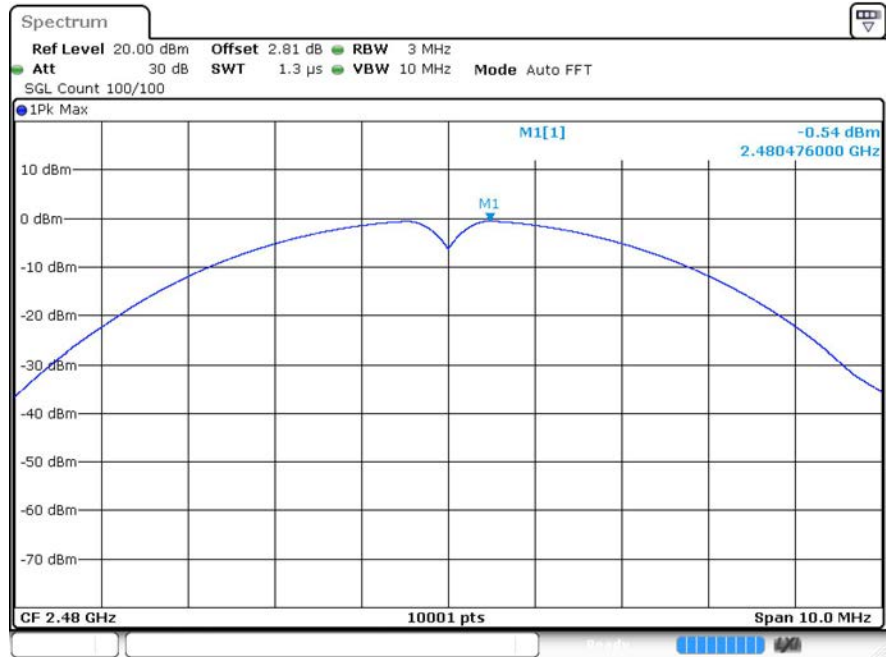
$\pi/4$ DQPSK/LCH



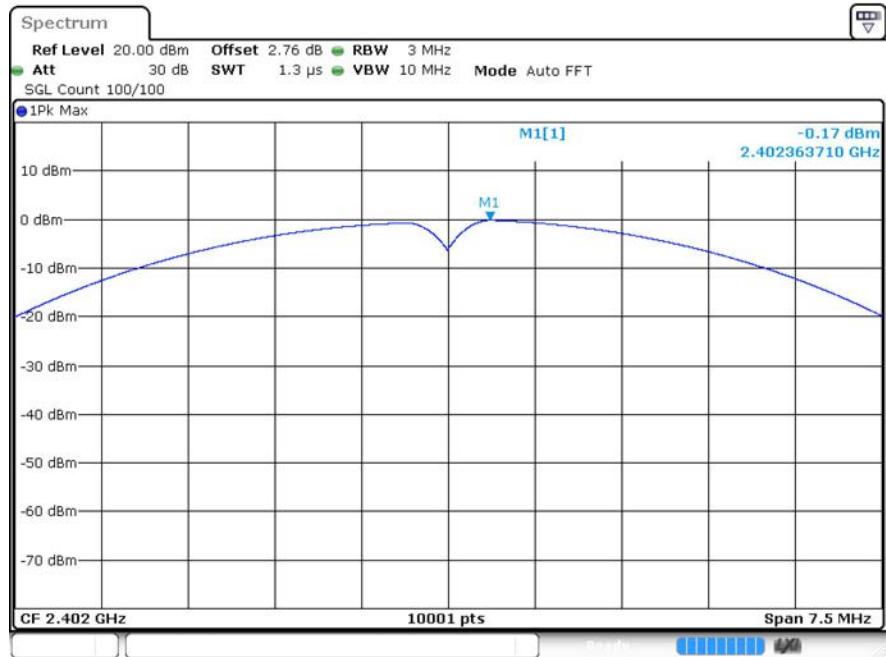
$\pi/4$ DQPSK/MCH



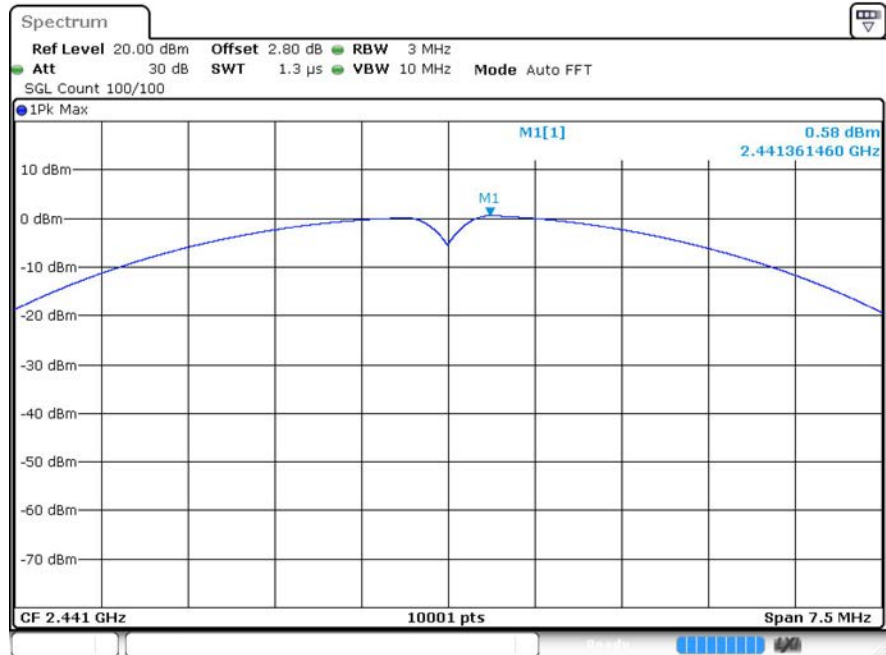
$\pi/4$ DQPSK/HCH



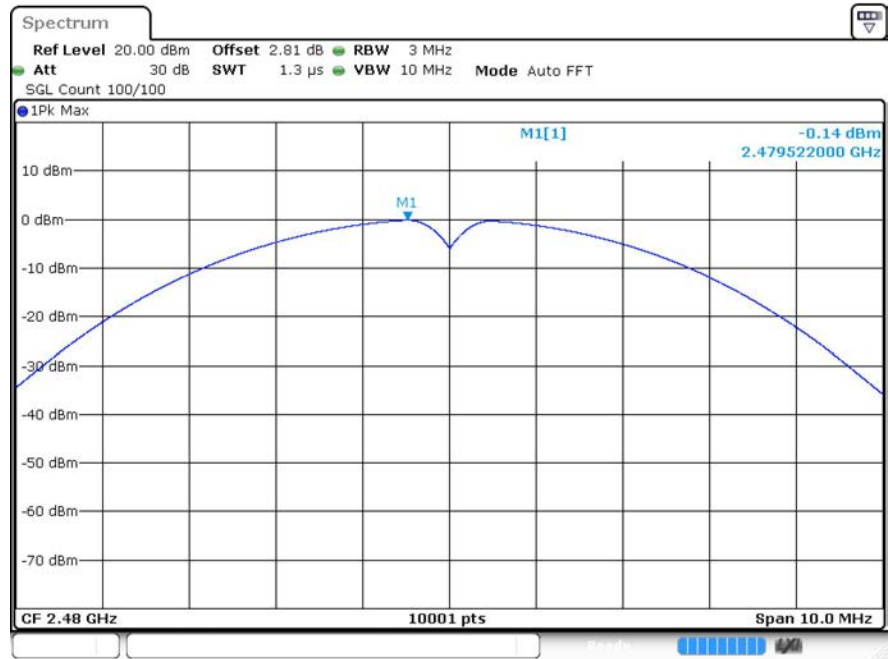
8DPSK/LCH



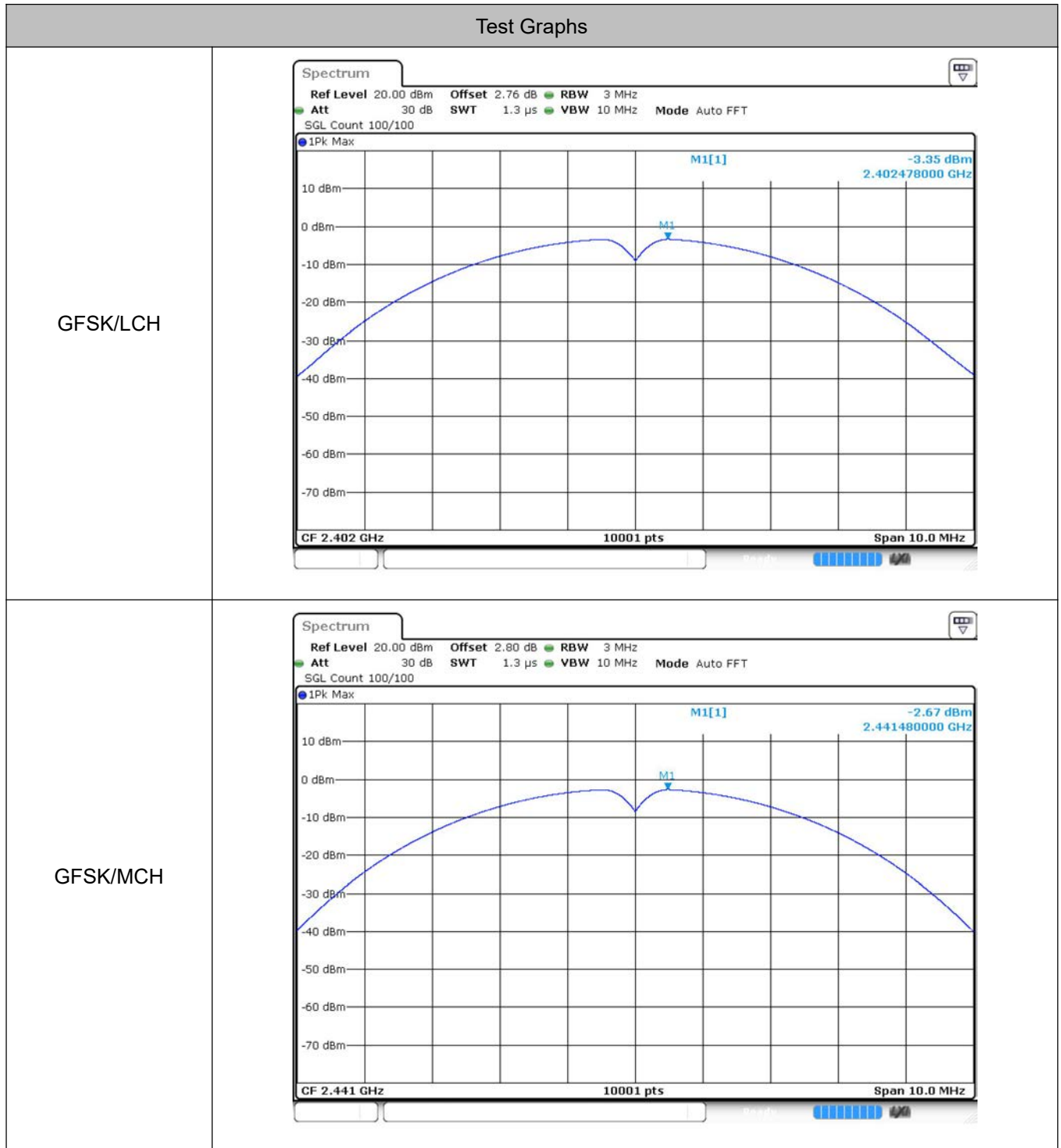
8DPSK/MCH



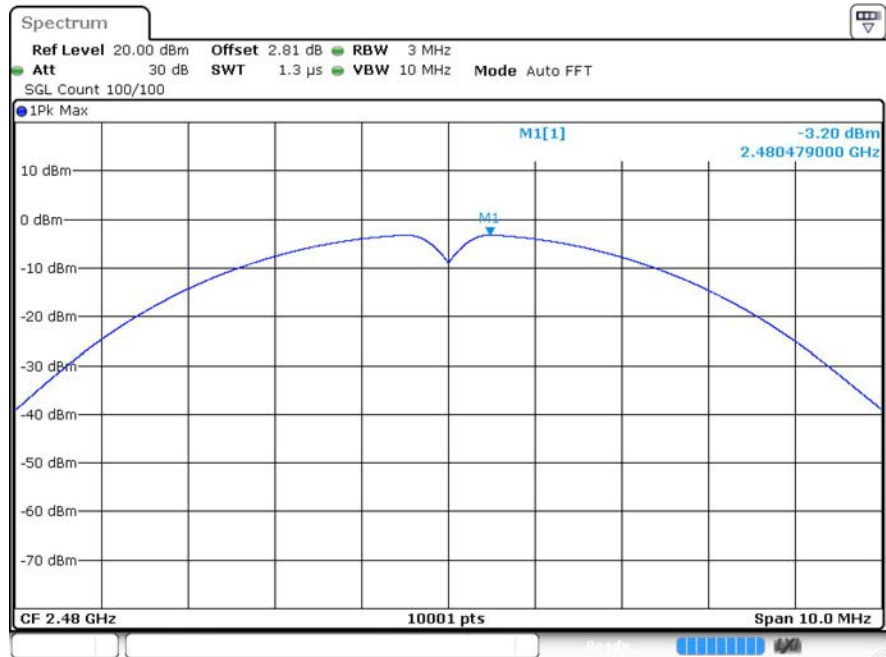
8DPSK/HCH



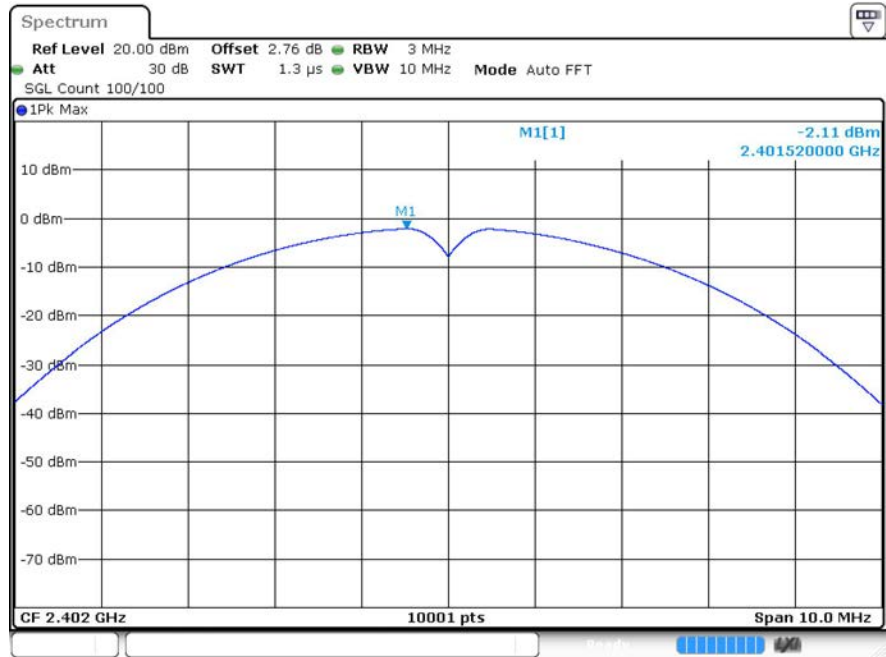
2.4 Test Graphs(Right)



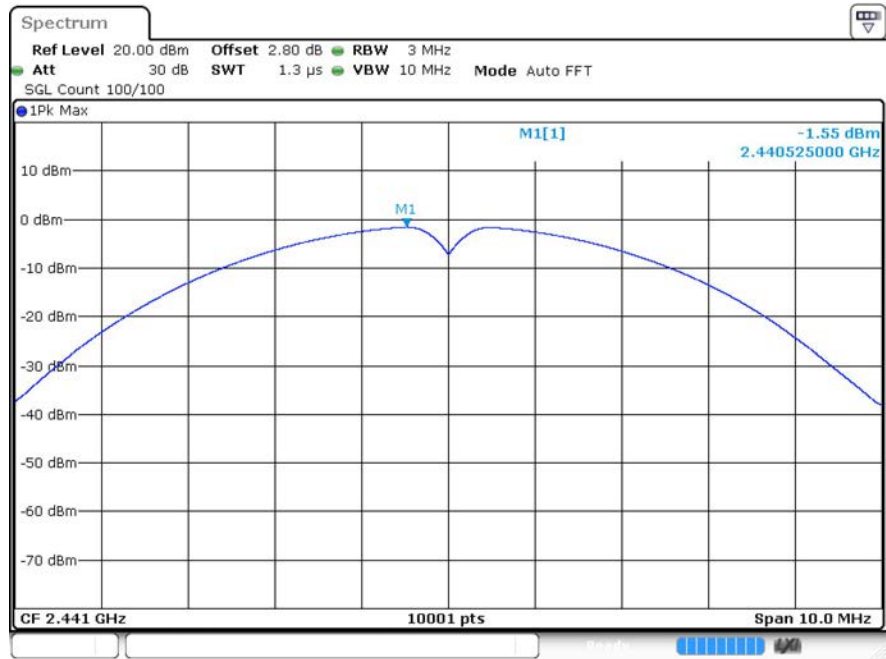
GFSK/HCH



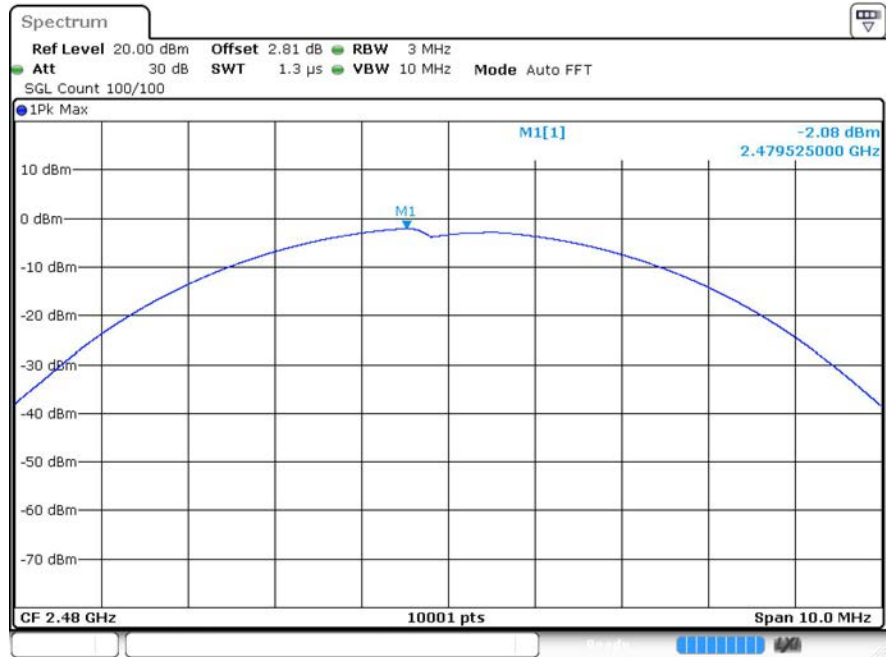
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH



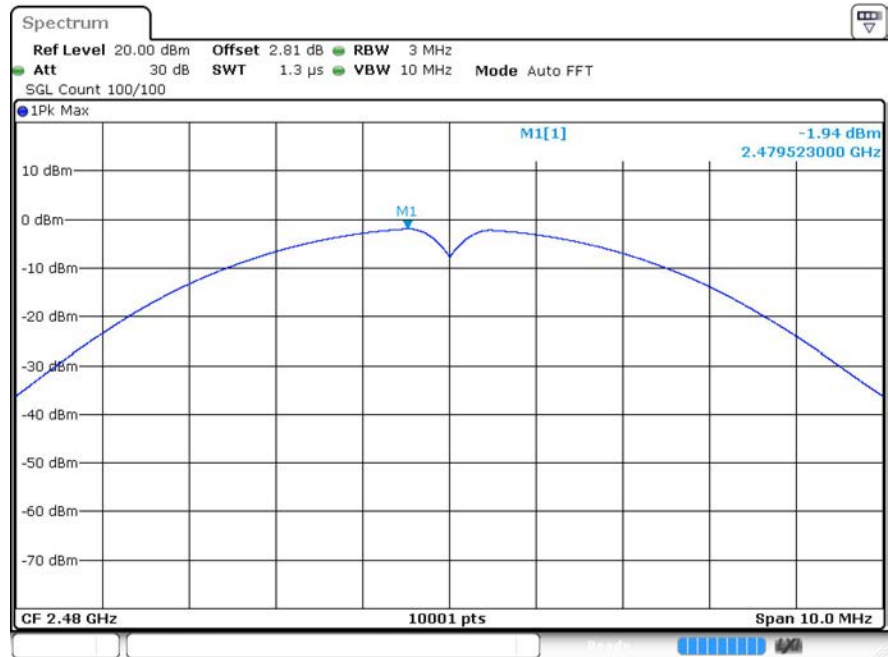
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

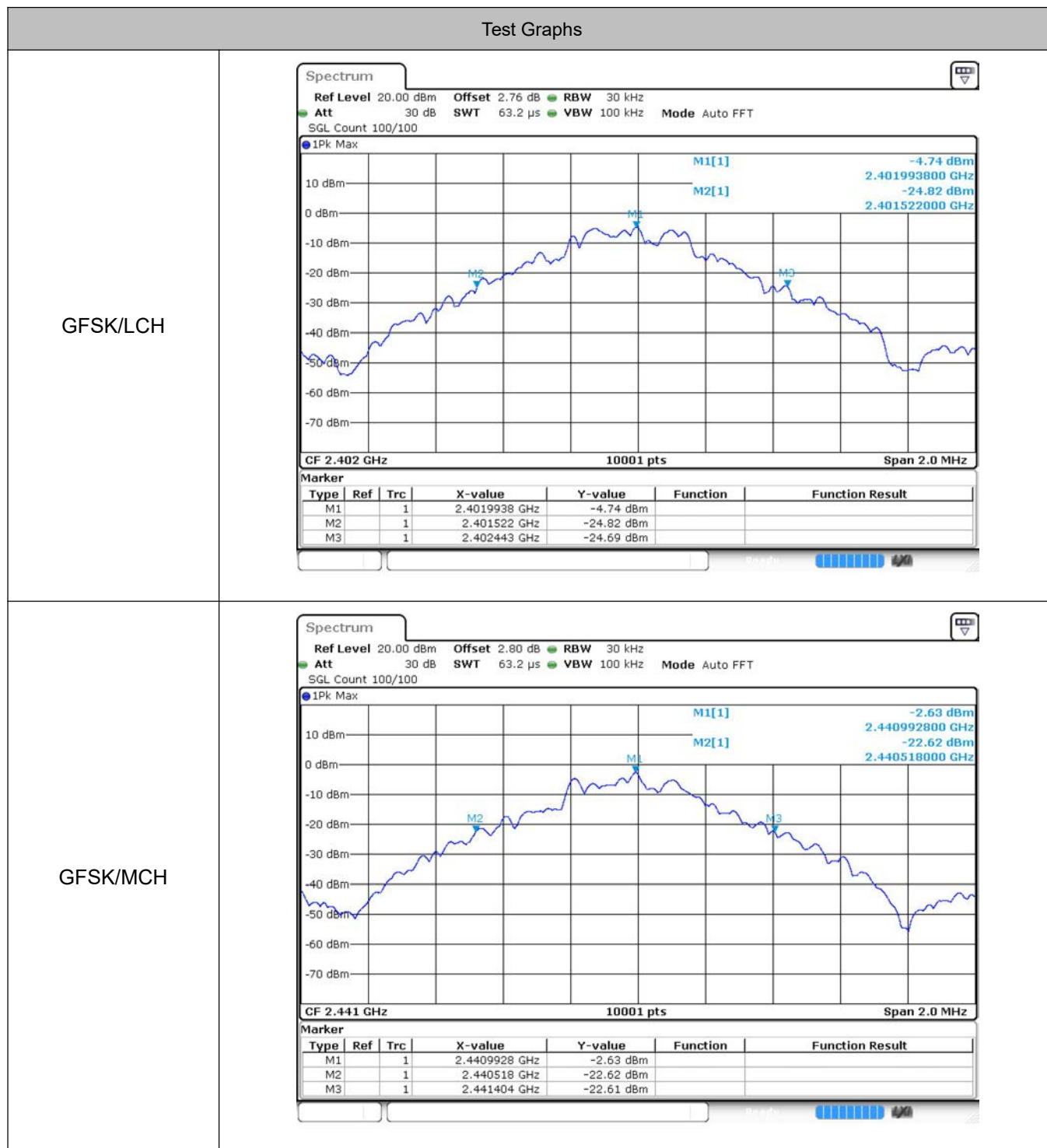


3 20dB Bandwidth

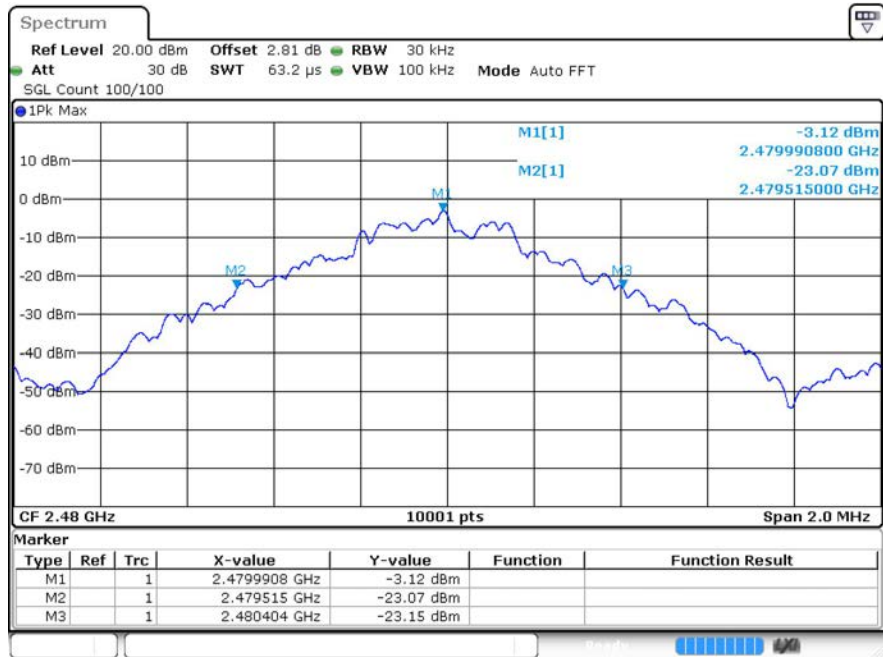
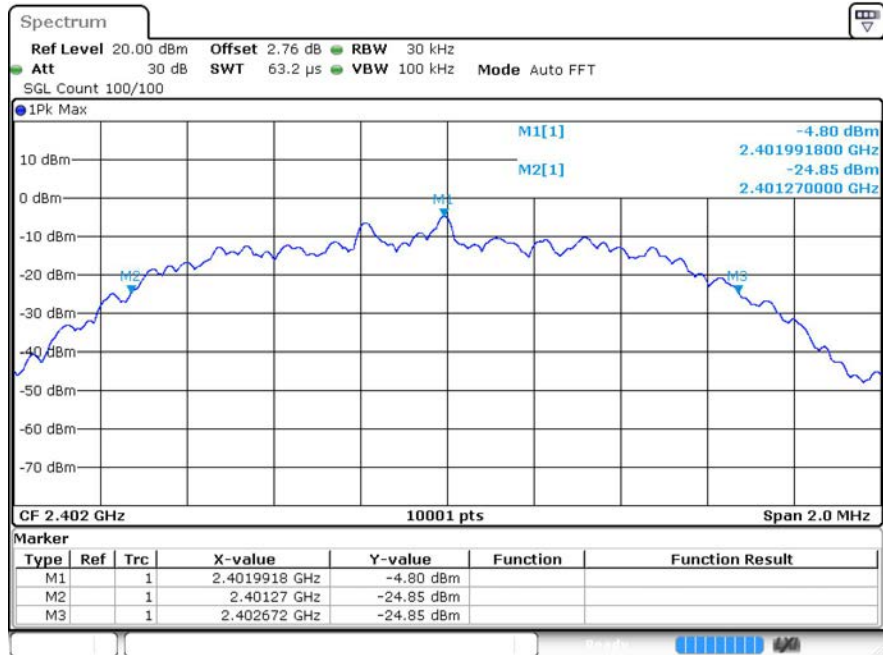
3.1 Test Result

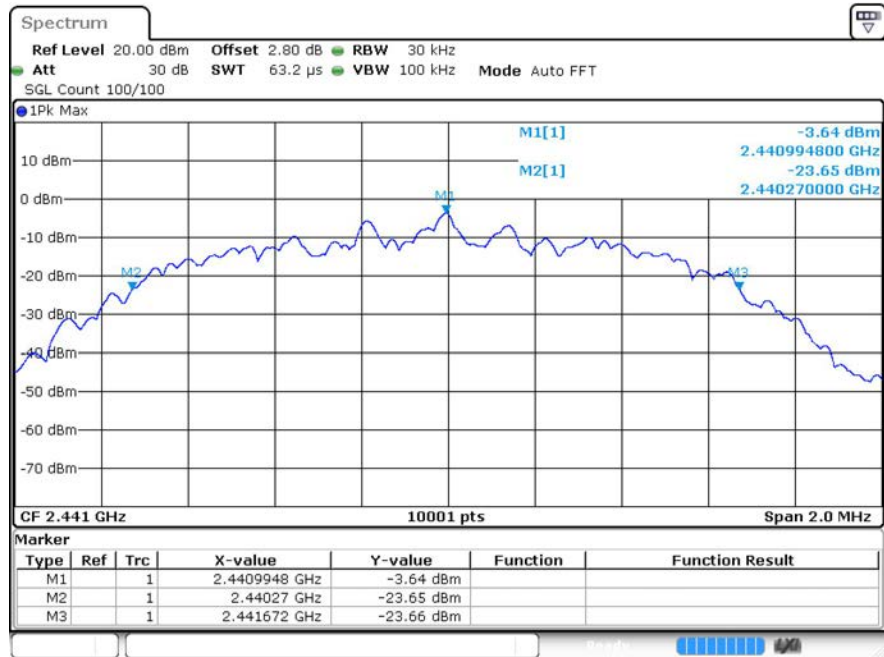
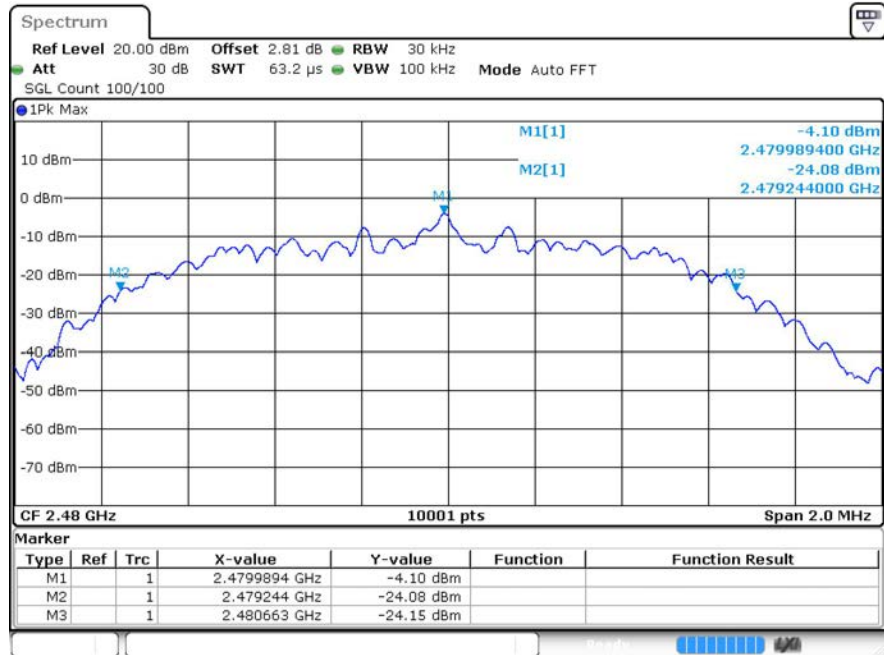
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.921	Not Specified	Pass
	MCH	0.886	Not Specified	Pass
	HCH	0.889	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.401	Not Specified	Pass
	MCH	1.402	Not Specified	Pass
	HCH	1.419	Not Specified	Pass
8DPSK	LCH	1.421	Not Specified	Pass
	MCH	1.414	Not Specified	Pass
	HCH	1.424	Not Specified	Pass

3.2 Test Graphs

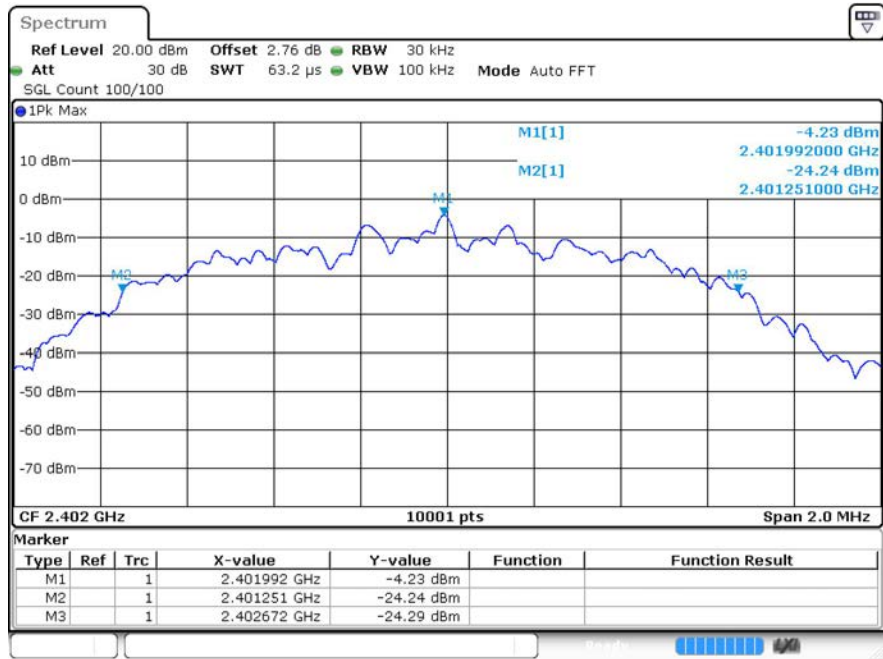


GFSK/HCH

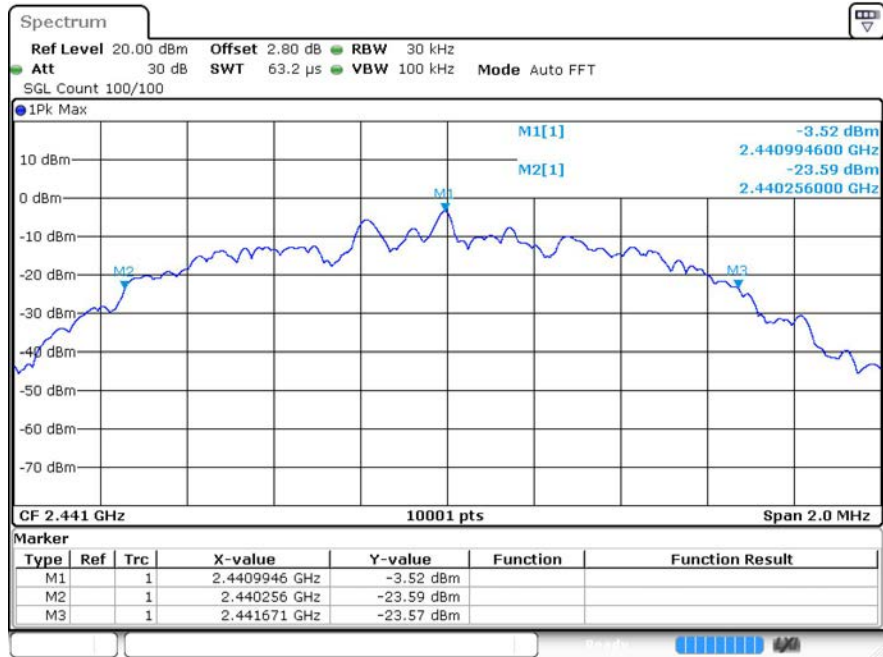

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


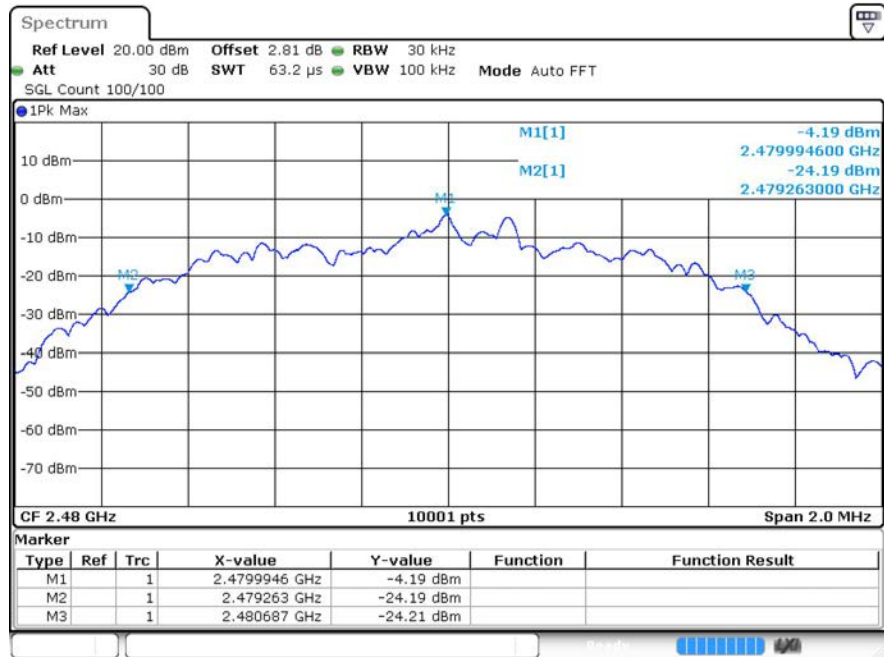
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



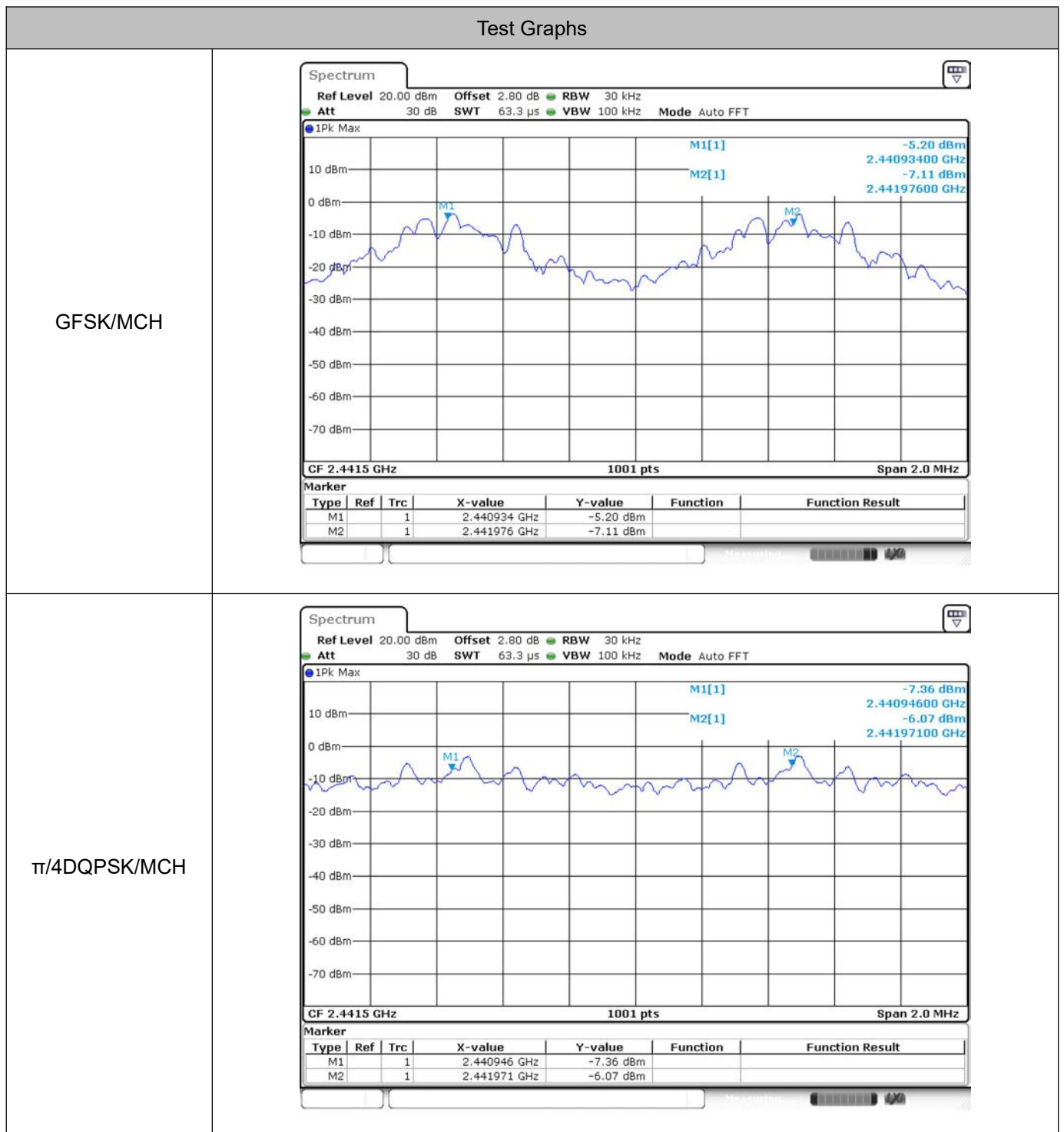
Note: Left headphones and Right headphones were tested, only the worst data was recorded

4 Carrier Frequency Separation

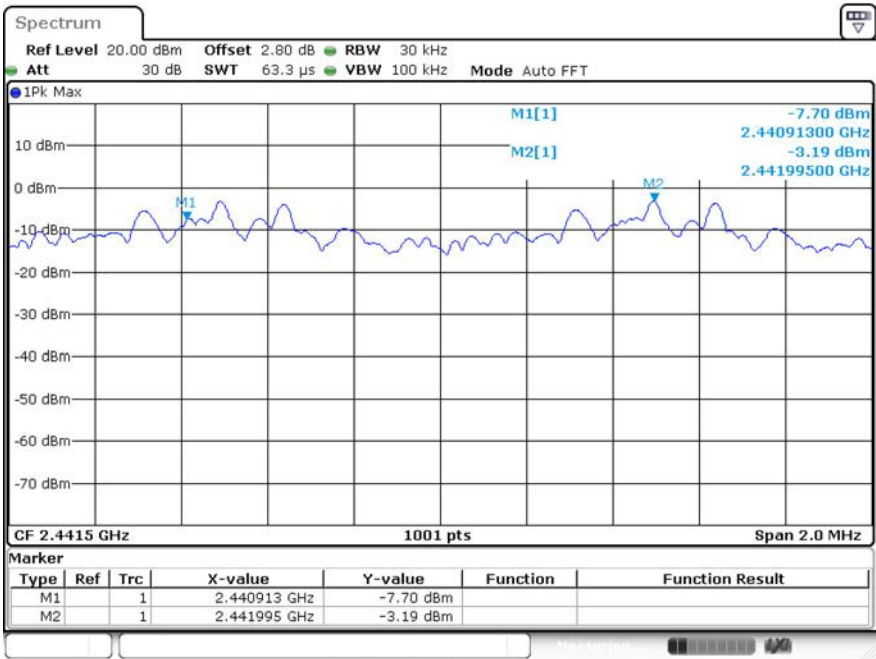
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.042	0.591	Pass
$\pi/4$ DQPSK	MCH	1.025	0.935	Pass
8DPSK	MCH	1.082	0.943	Pass

4.2 Test Graphs



8DPSK/MCH



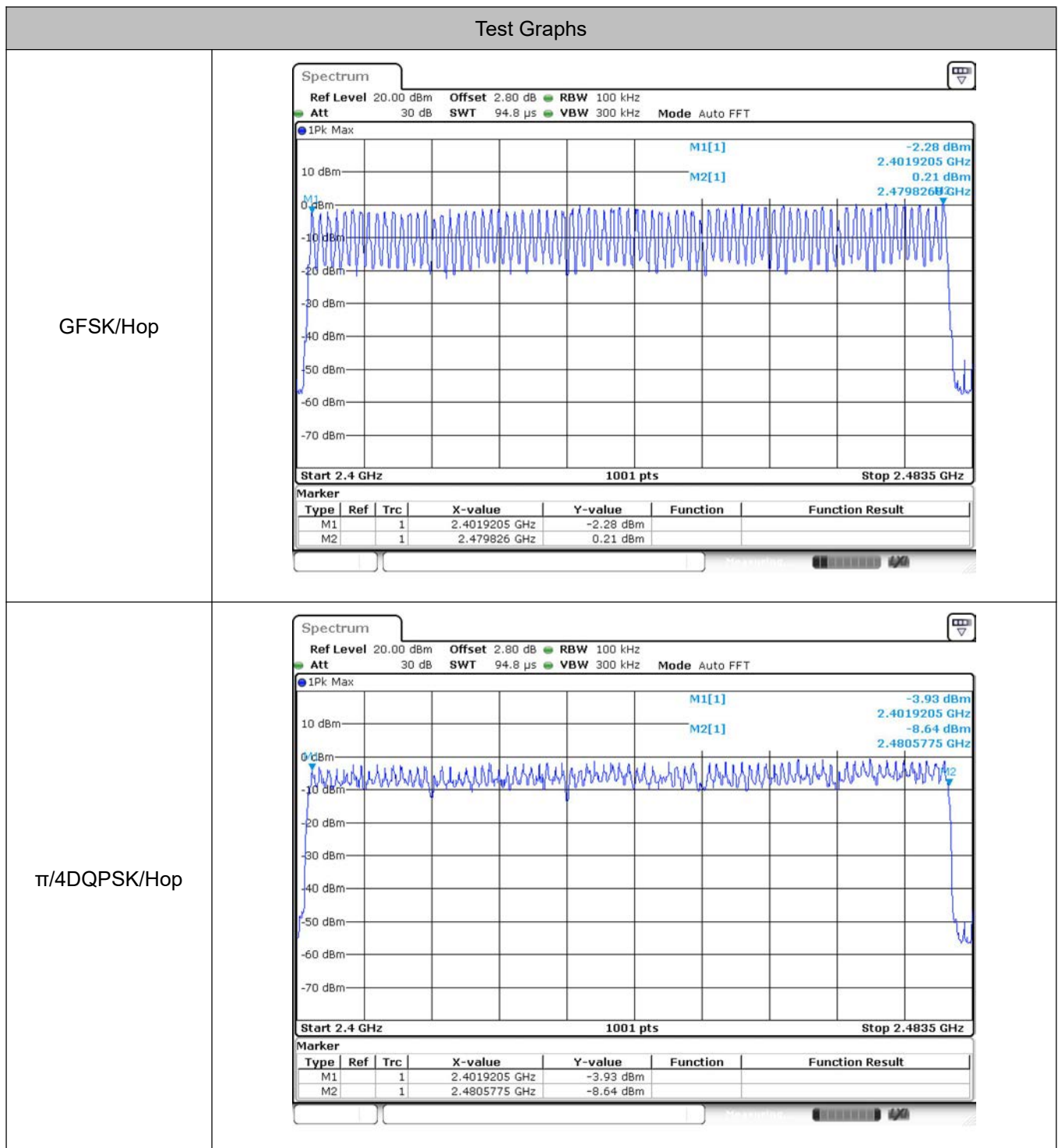
Note: Left headphones and Right headphones were tested, only the worst data was recorded

5 Hopping Channel Number

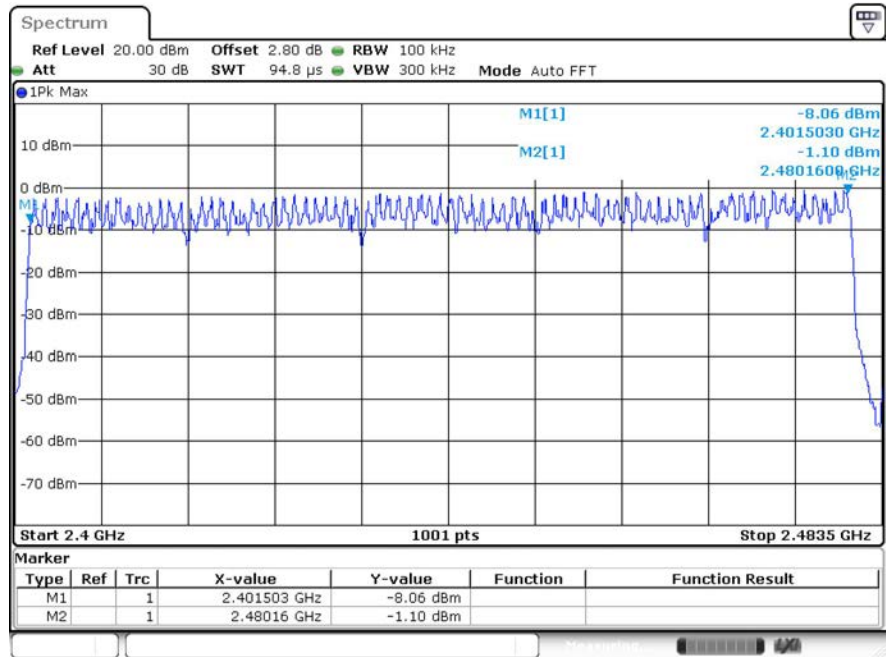
5.1 Test Result

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

5.2 Test Graphs



8DPSK/Hop



Note: Left headphones and Right headphones were tested, only the worst data was recorded

6 Dwell Time

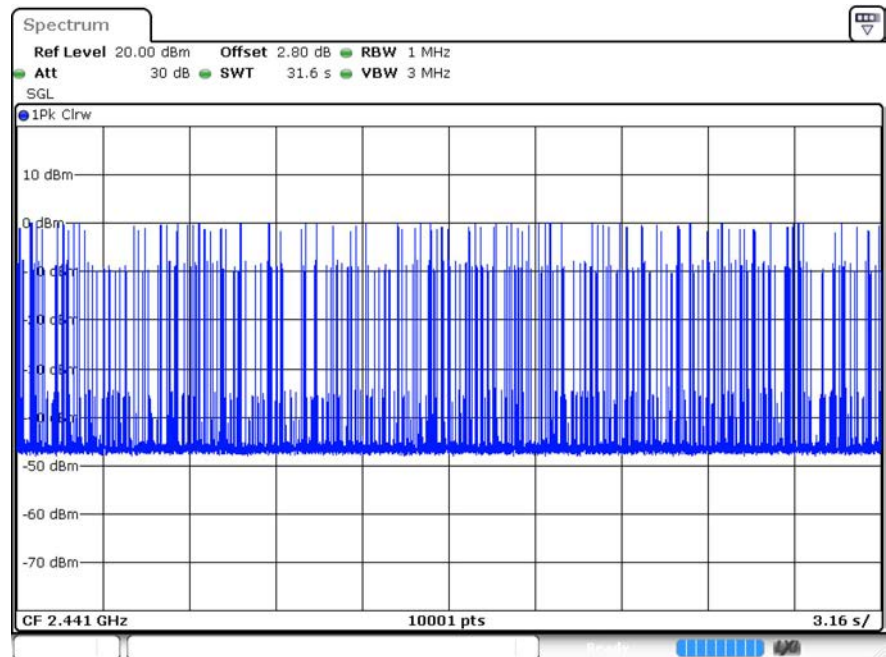
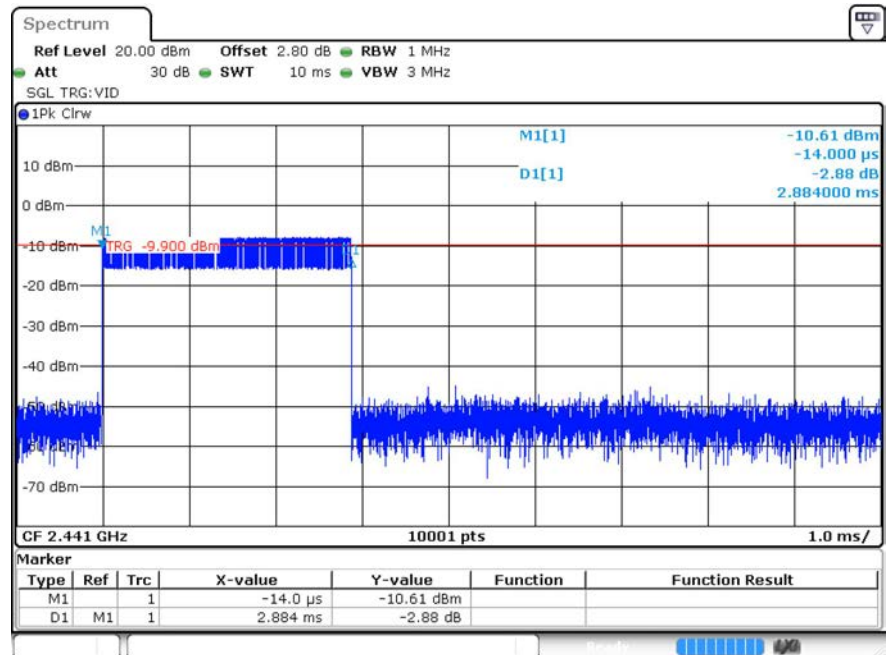
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.884	102	294.168	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.889	101	291.789	0.4	Pass
8DPSK	3DH5	MCH	2.891	100	289.1	0.4	Pass

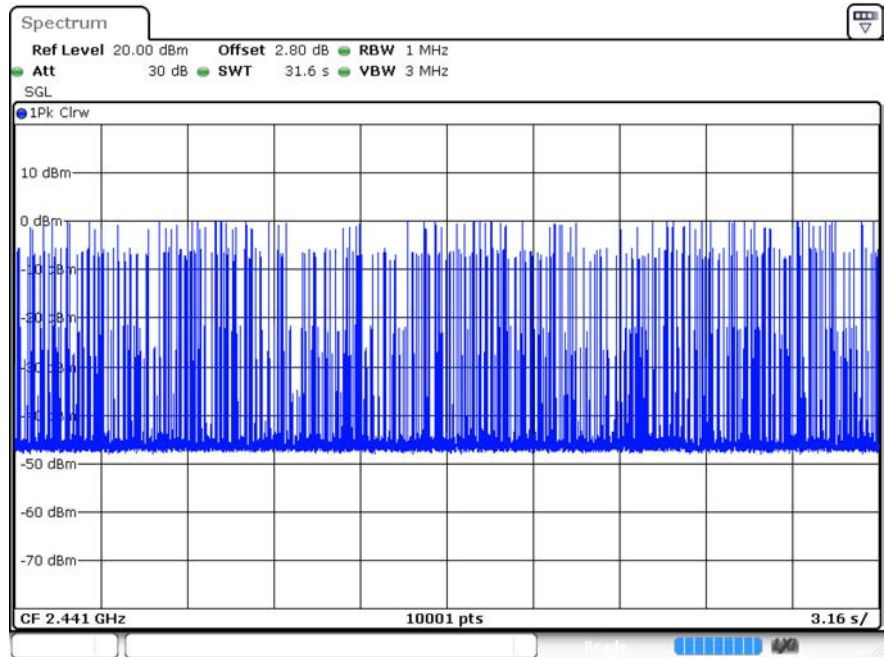
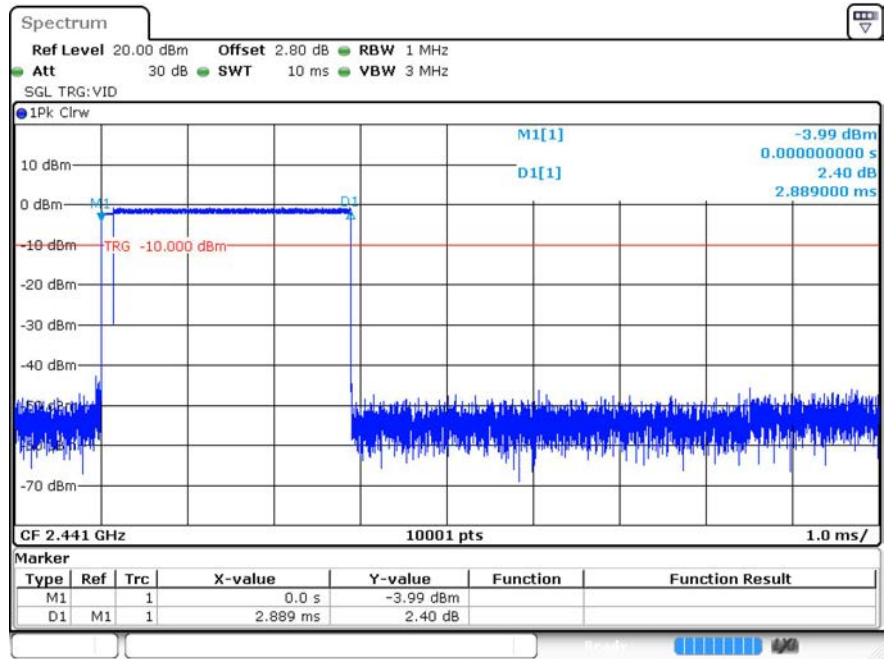
6.2 Test Graphs

Test Graphs

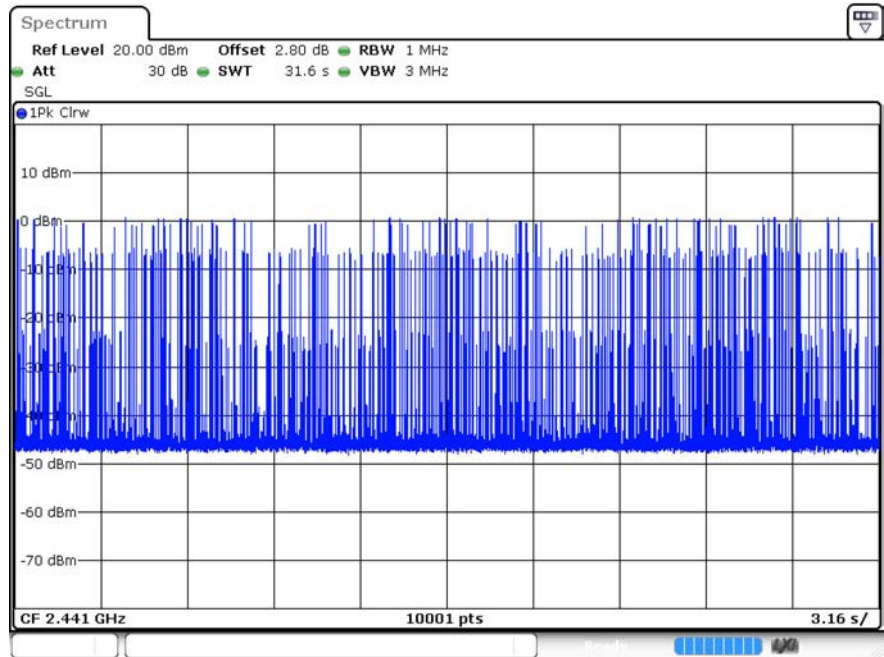
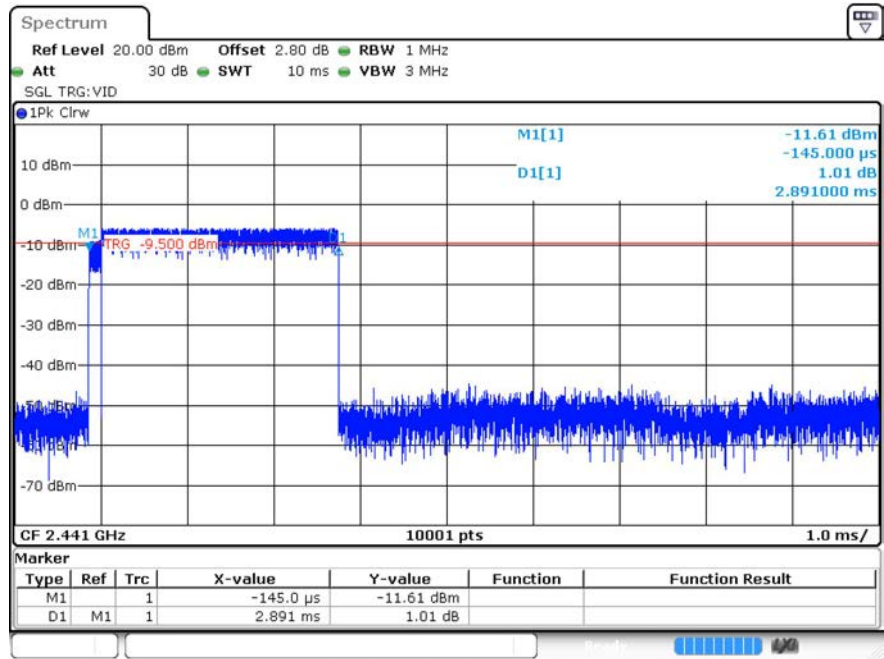
GFSK_DH5/MCH



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH



Note: Left headphones and Right headphones were tested, only the worst data was recorded

7 RF Conducted Spurious Emissions

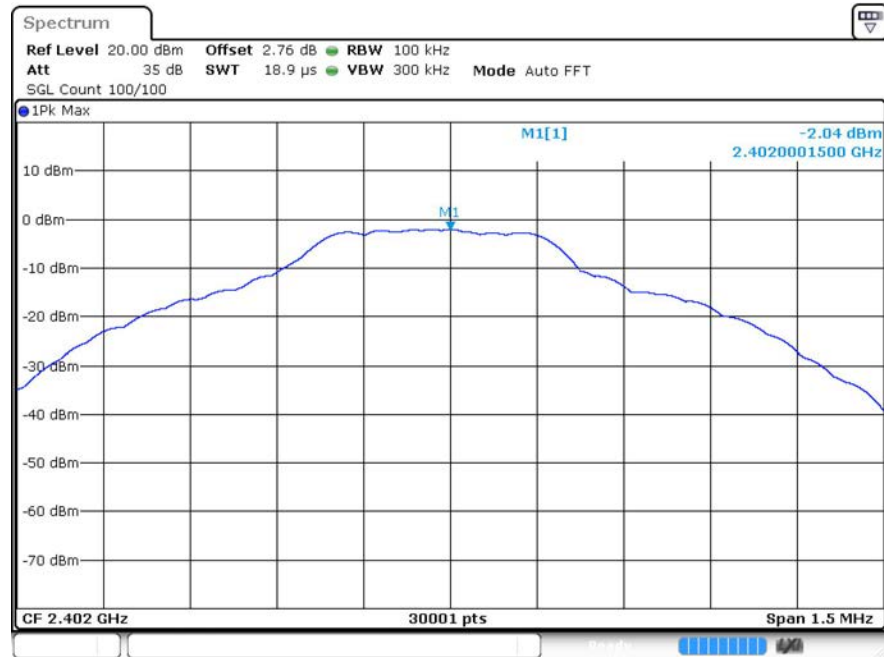
7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-38.86	-20	Pass
	MCH	-40.9	-20	Pass
	HCH	-40.03	-20	Pass
$\pi/4$ DQPSK	LCH	-38.88	-20	Pass
	MCH	-37.99	-20	Pass
	HCH	-38.65	-20	Pass
8DPSK	LCH	-39.49	-20	Pass
	MCH	-39.36	-20	Pass
	HCH	-38.38	-20	Pass

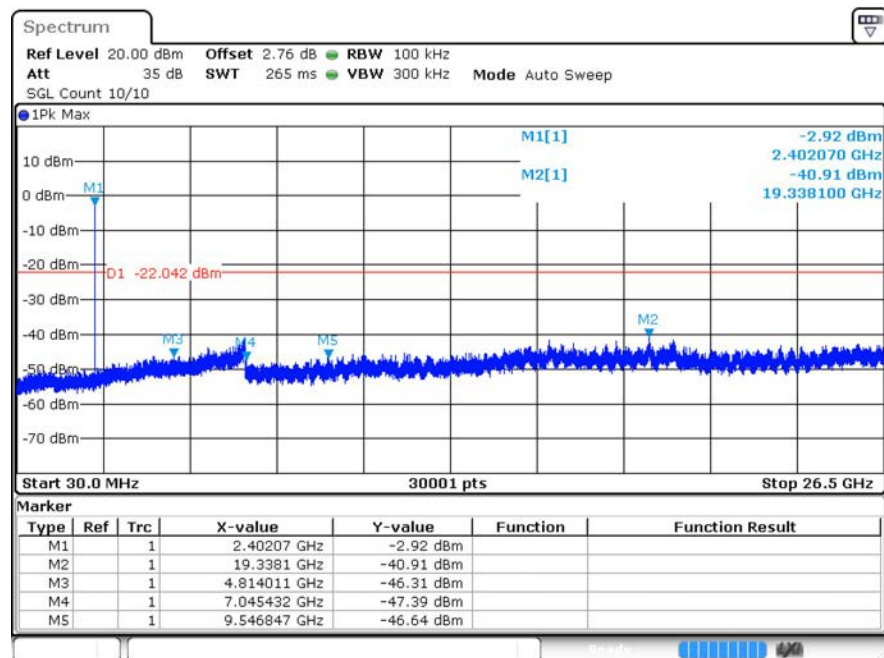
7.2 Test Graphs

GFSK_LCH_Graphs

Pref

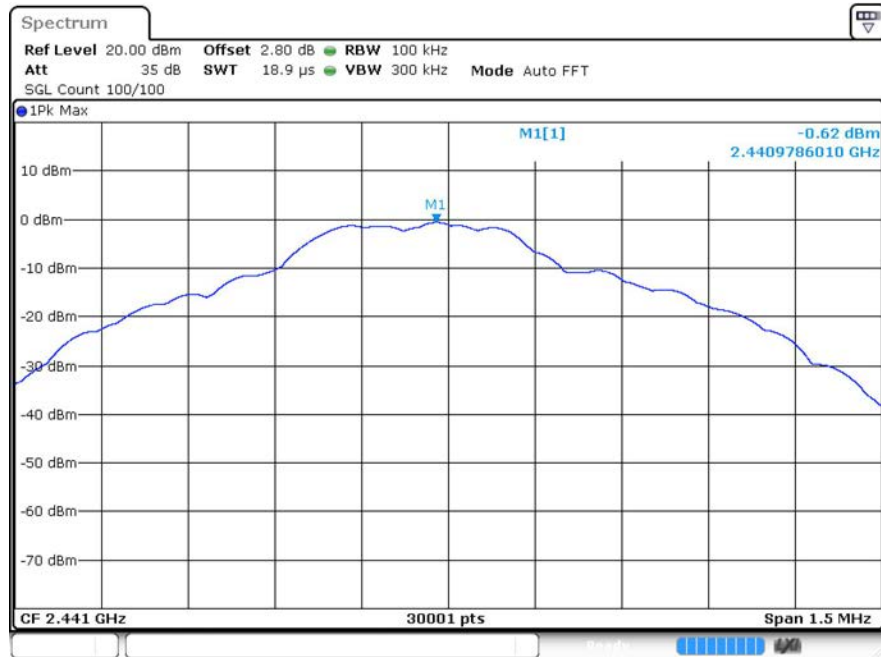


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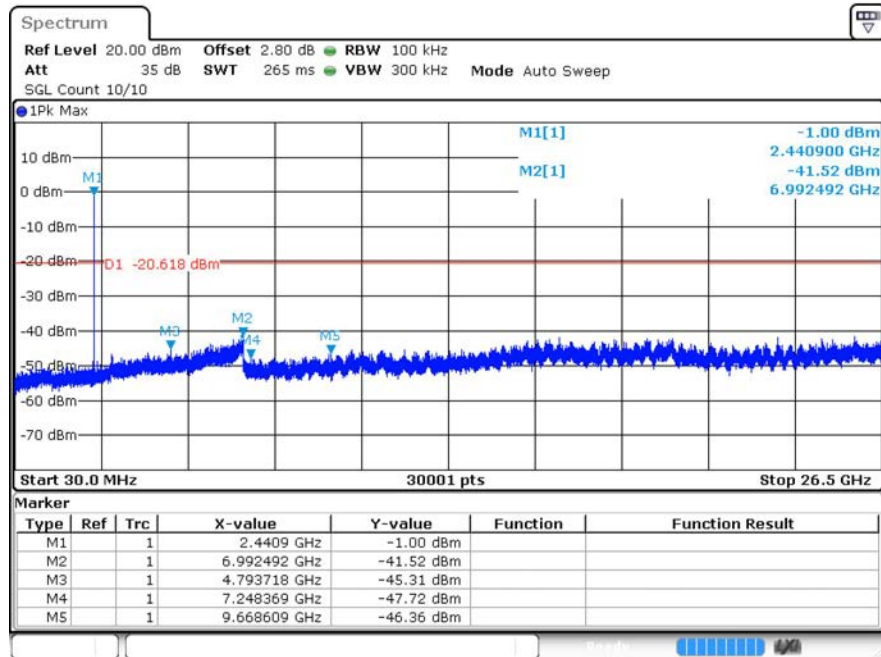


GFSK_MCH_Graphs

Pref

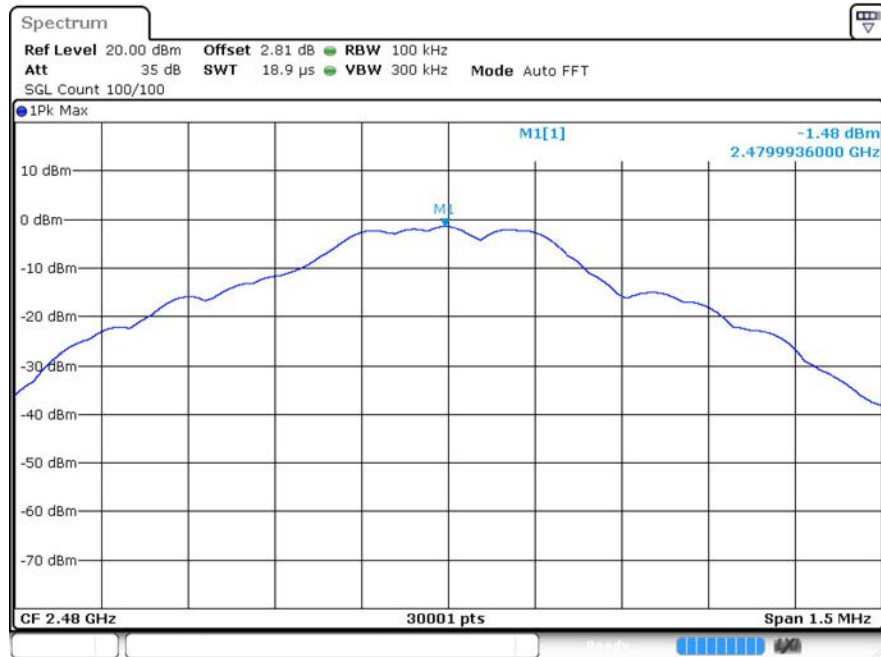


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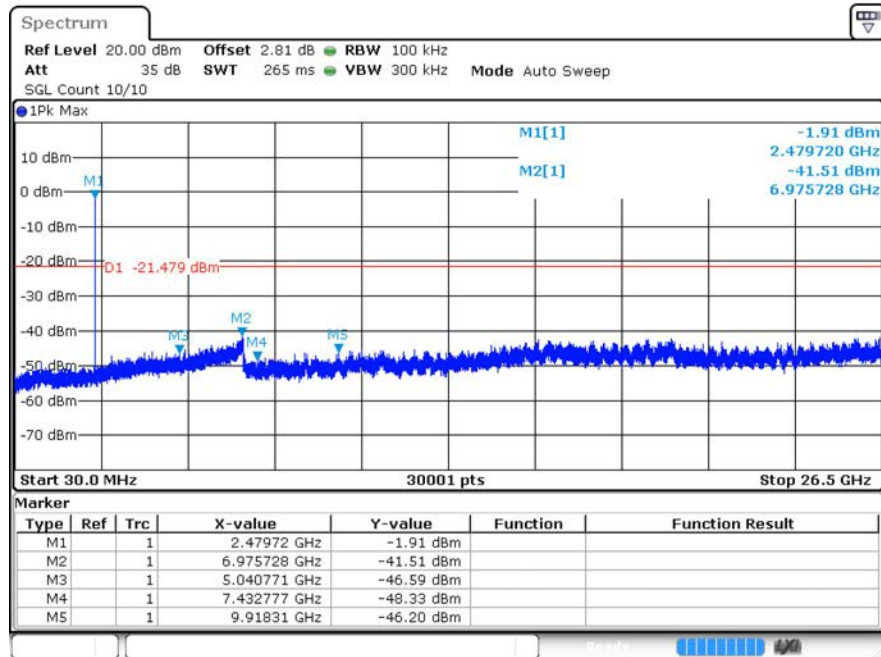


GFSK_HCH_Graphs

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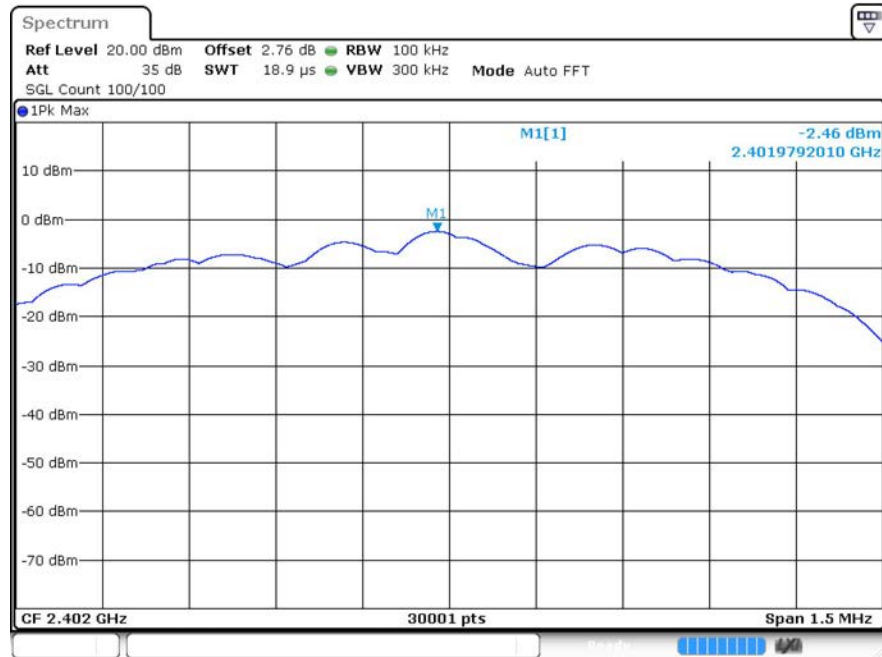


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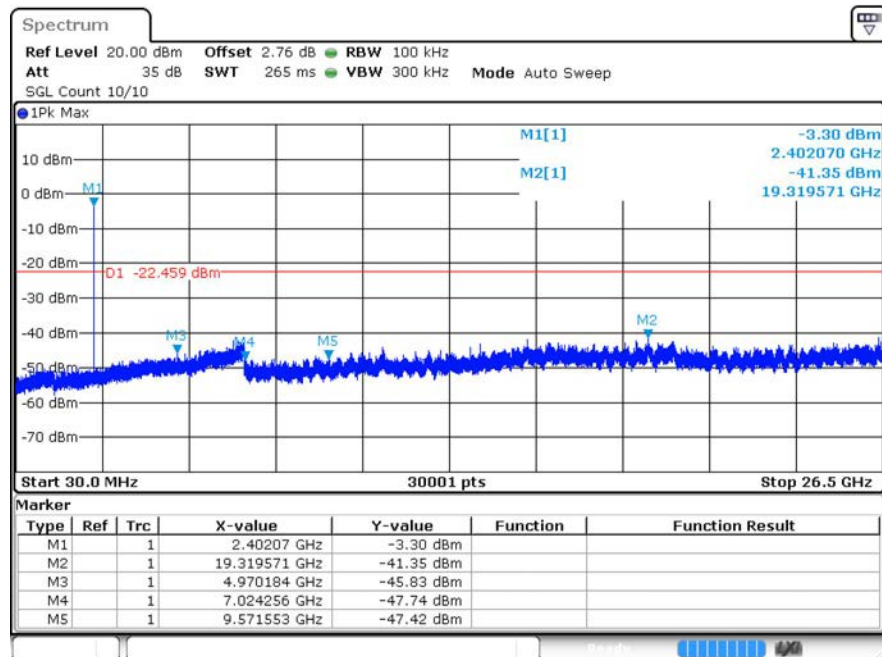


$\pi/4$ DQPSK_LCH_Graphs

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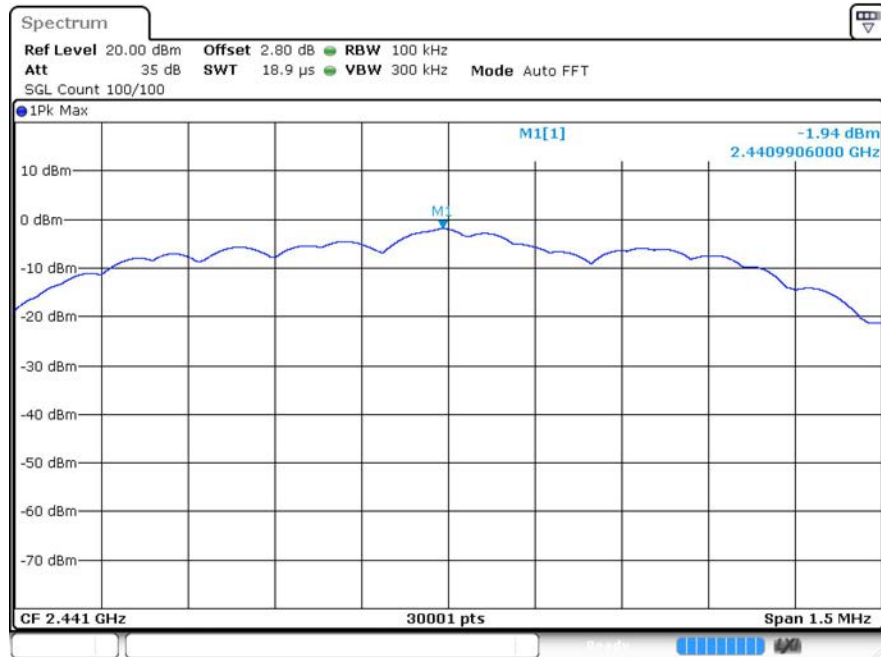


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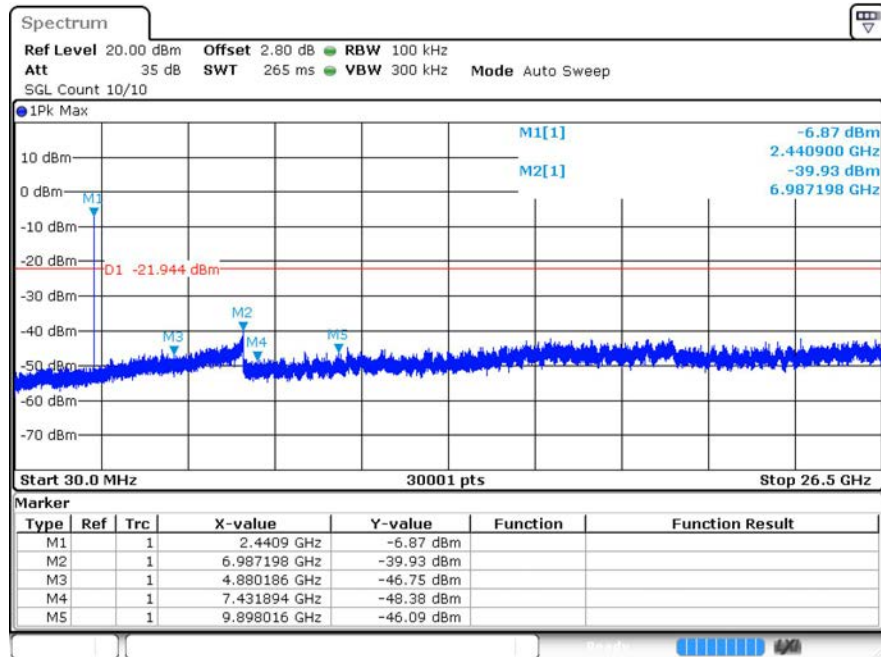


π /4DQPSK_MCH_Graphs

Pref

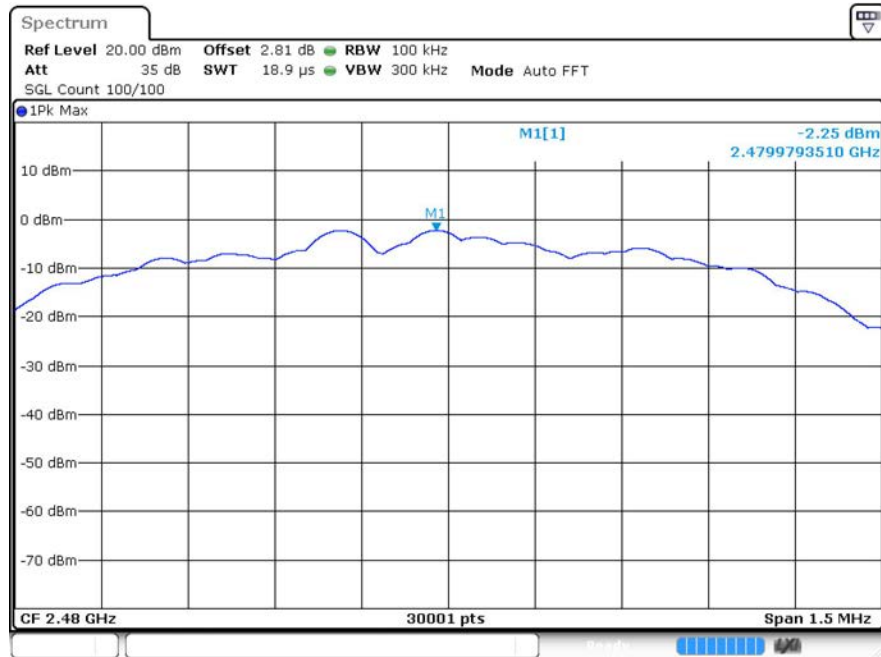


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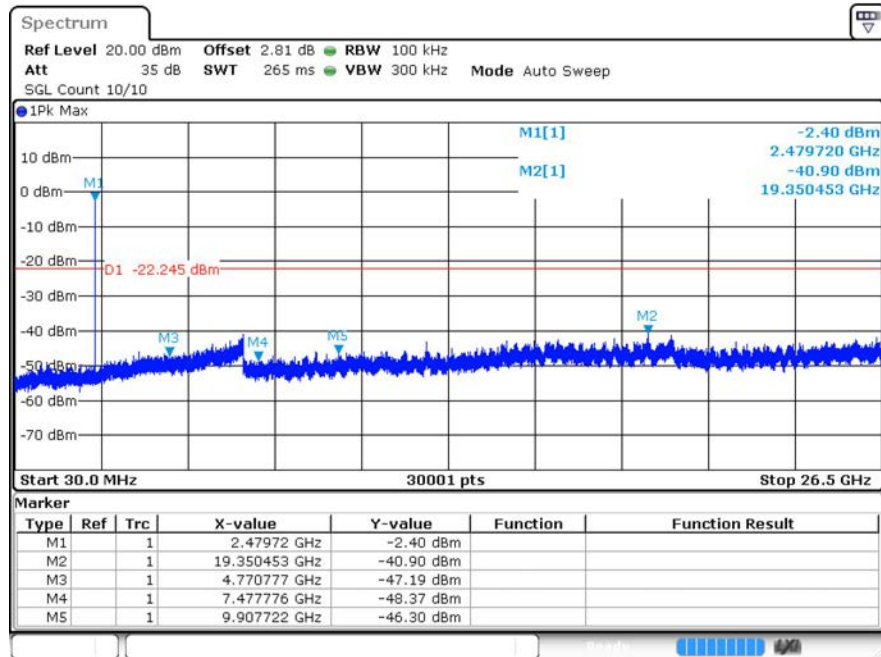


$\pi/4$ DQPSK_HCH_Graphs

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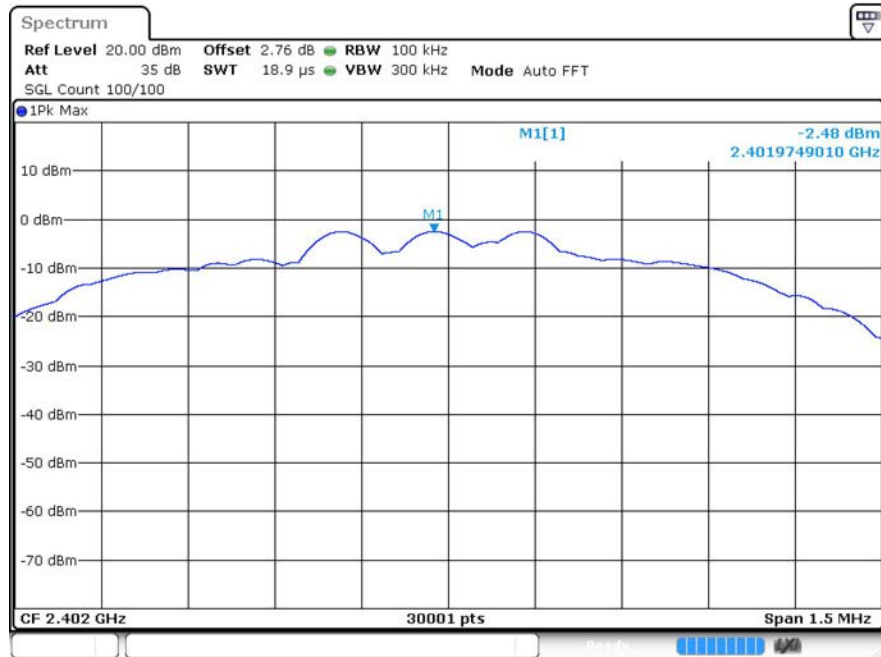


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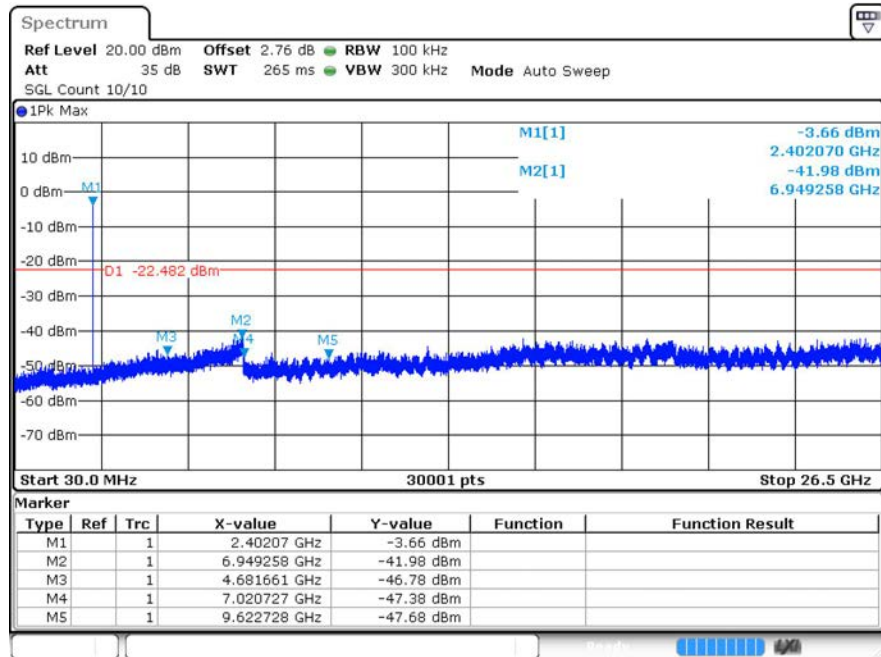


8DPSK_LCH_Graphs

Pref

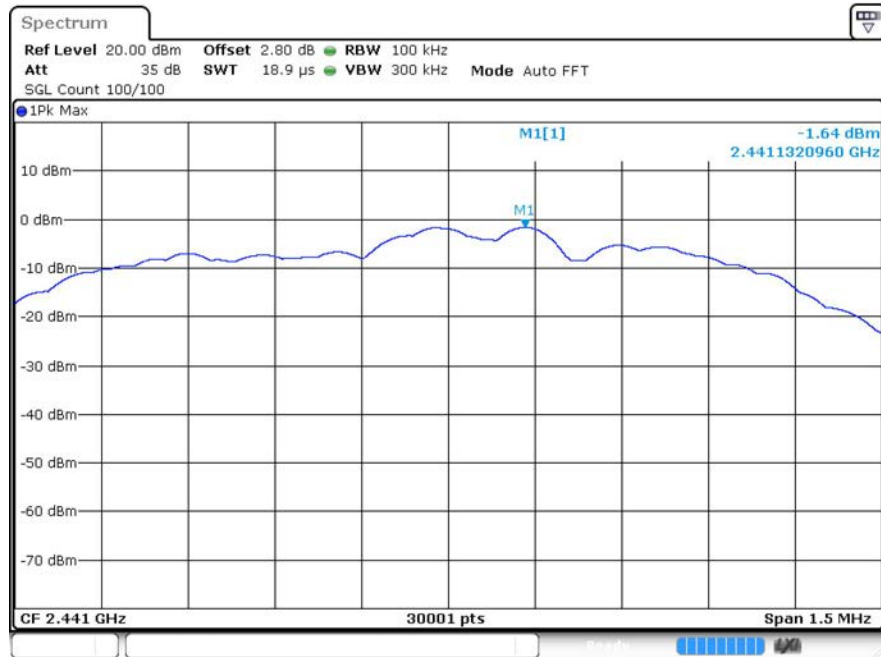


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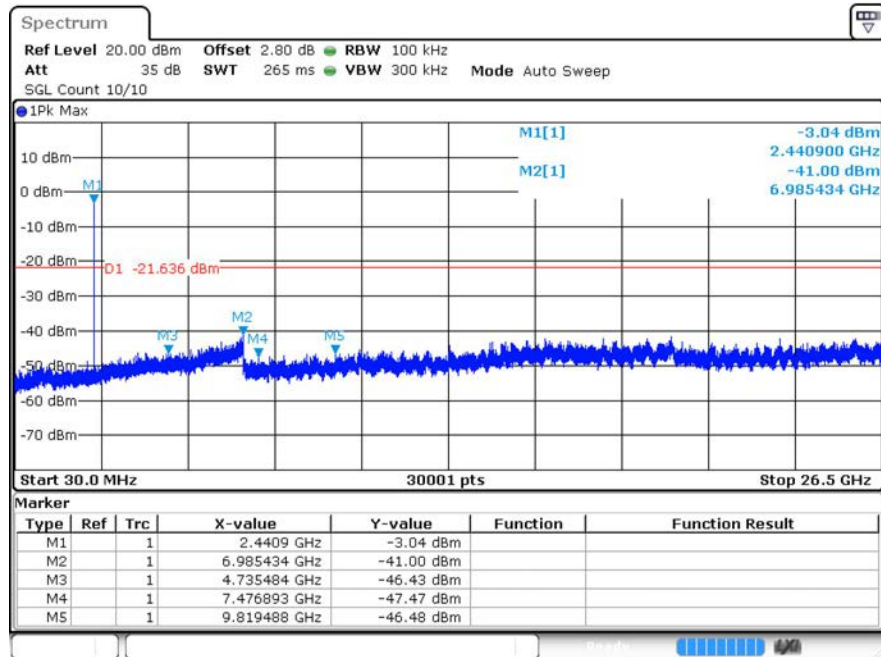


8DPSK_MCH_Graphs

Pref

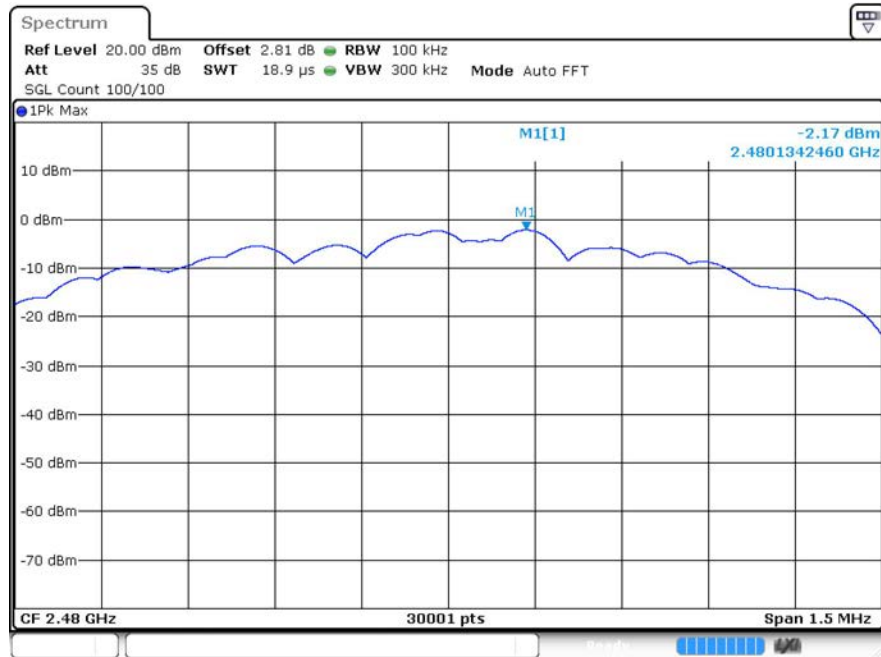


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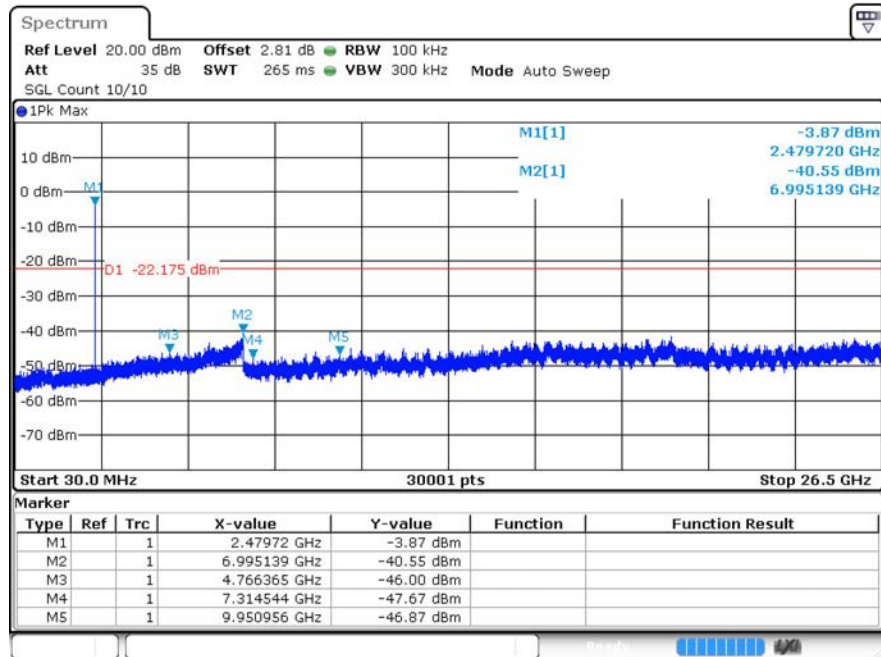


8DPSK_HCH_Graphs

Pref



Puw



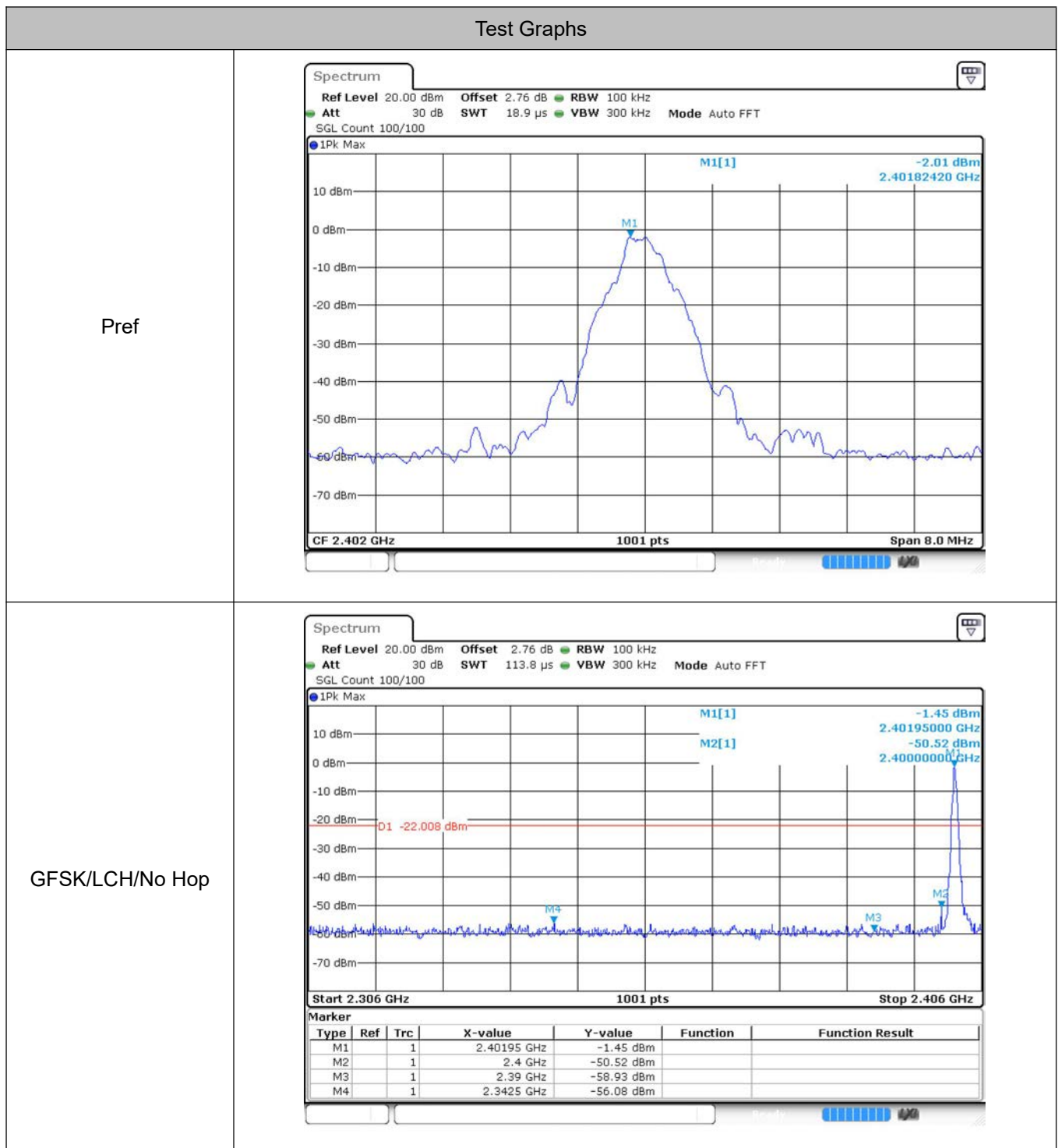
Note: Left headphones and Right headphones were tested, only the worst data was recorded

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	-54.07	-20	Pass
			On	-52.28	-20	Pass
	HCH	2480	Off	-49.12	-20	Pass
			On	-47.7	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-52.45	-20	Pass
			On	-52.71	-20	Pass
	HCH	2480	Off	-53.43	-20	Pass
			On	-53.67	-20	Pass
8DPSK	LCH	2402	Off	-53.71	-20	Pass
			On	-52.03	-20	Pass
	HCH	2480	Off	-51.04	-20	Pass
			On	-47.36	-20	Pass

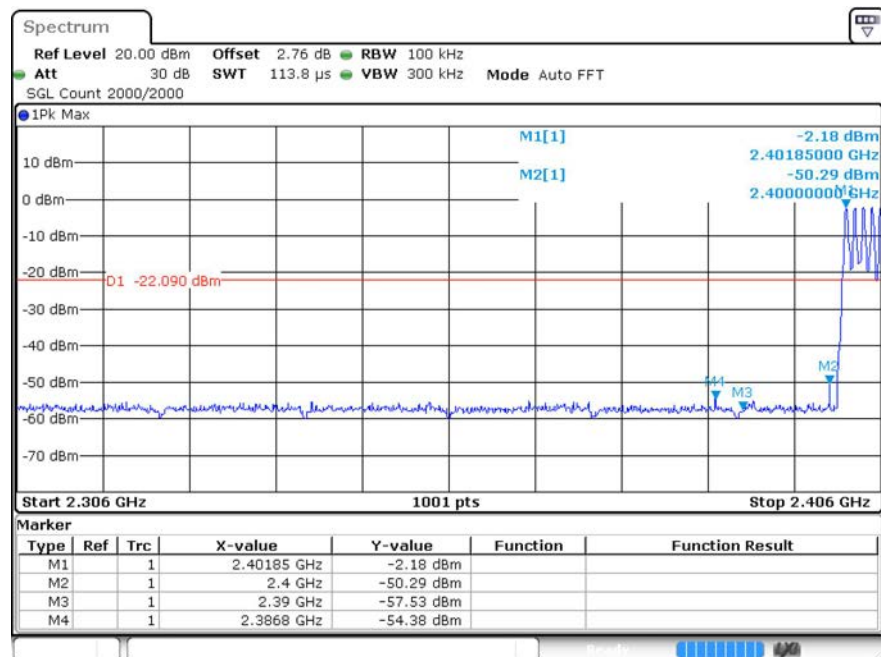
8.2 Test Graphs



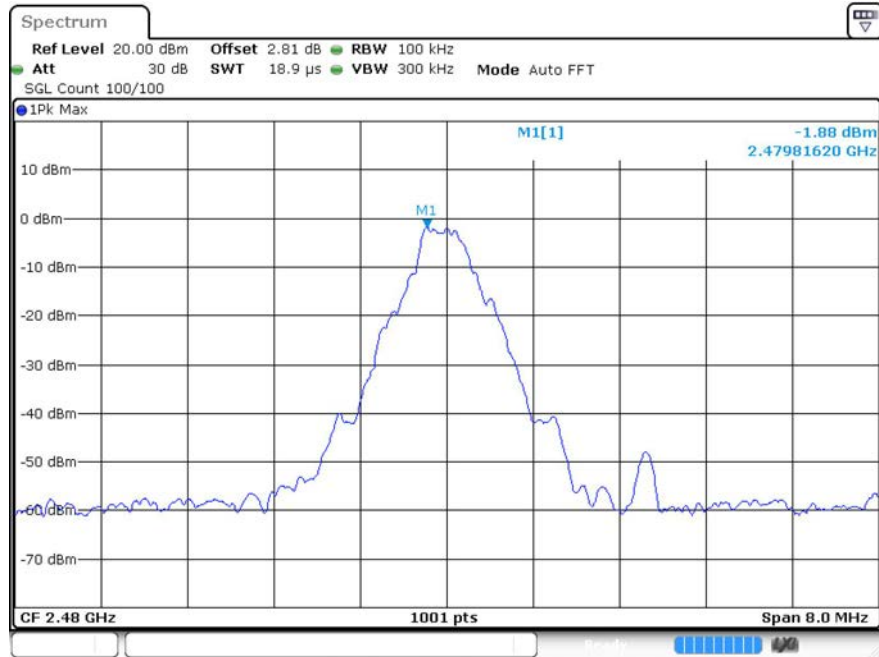
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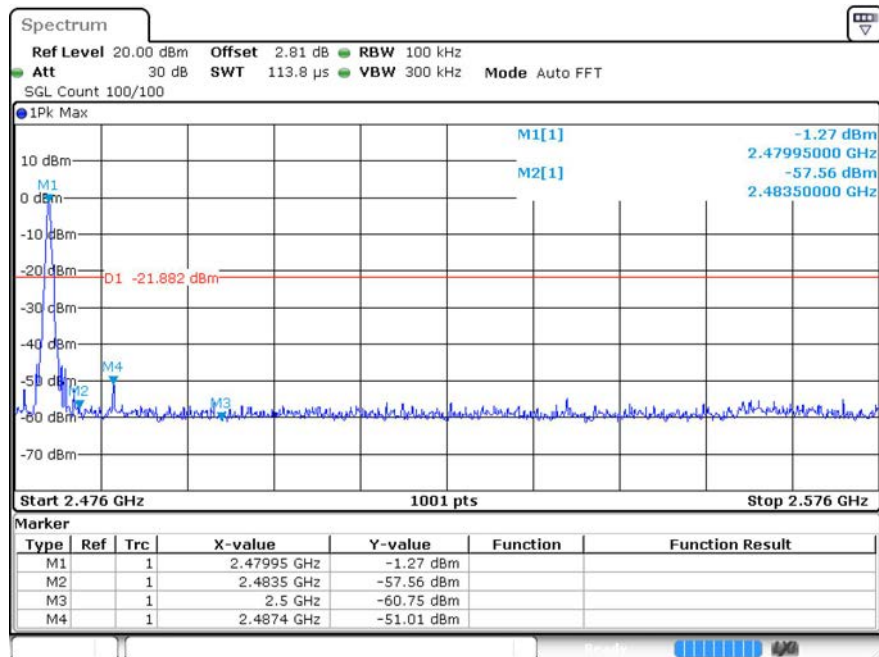
GFSK/LCH/Hop



Ref



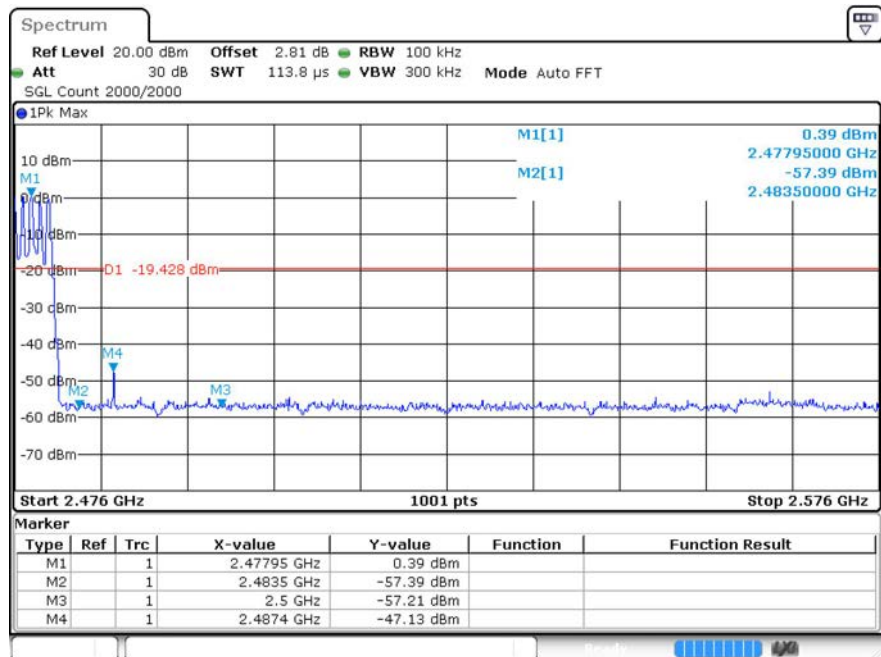
GFSK/HCH/No Hop



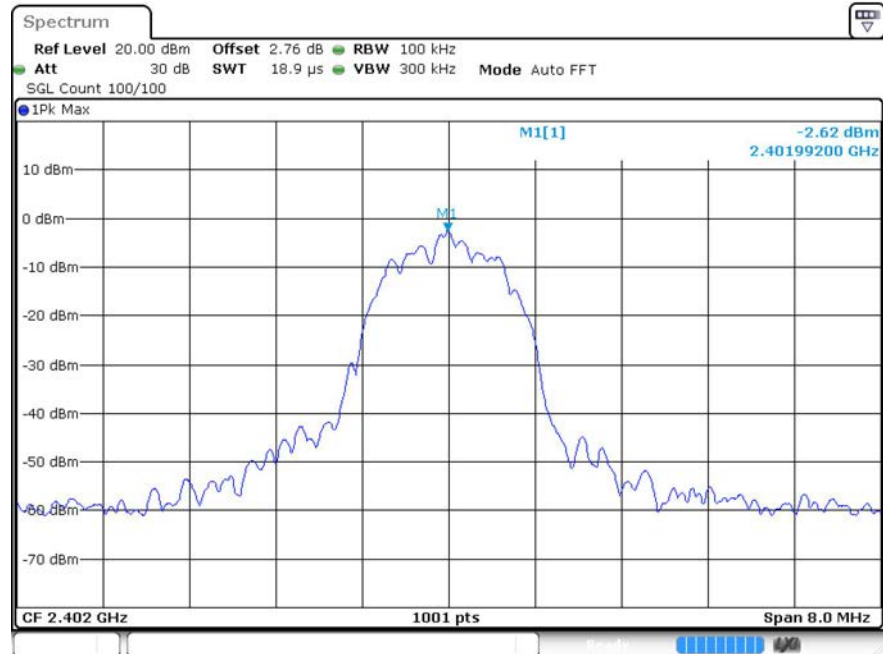
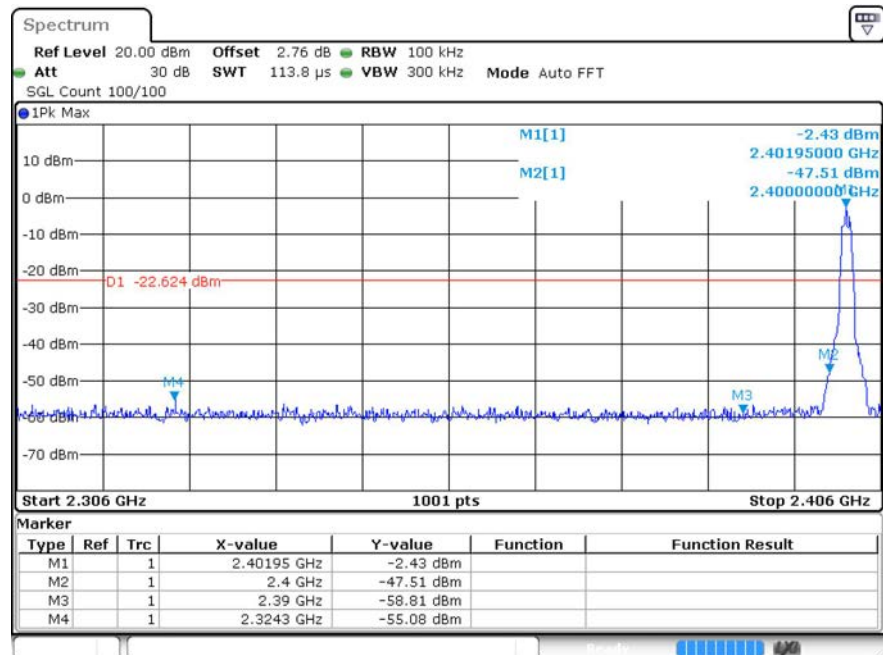
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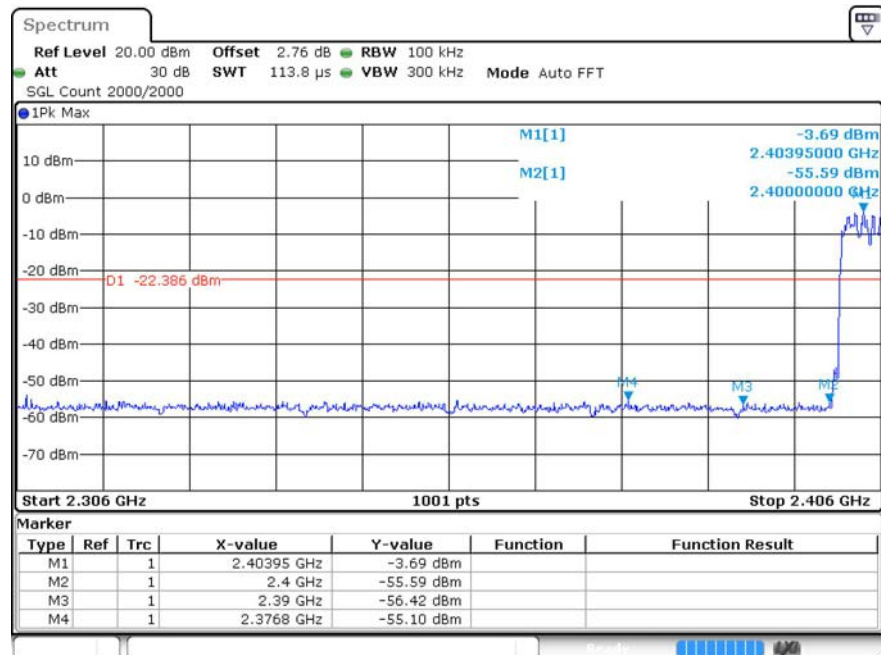
GFSK/HCH/Hop



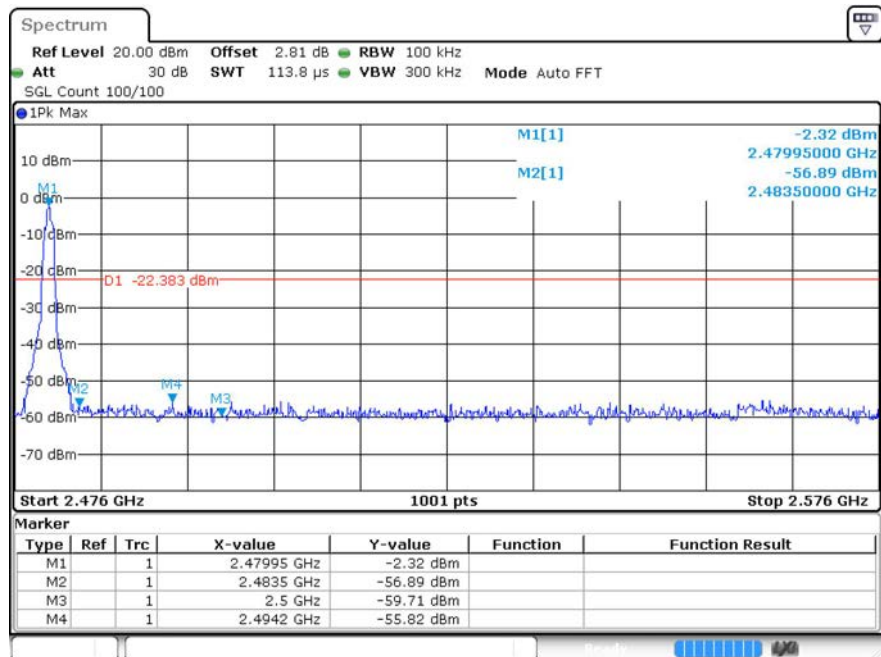
Ref


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


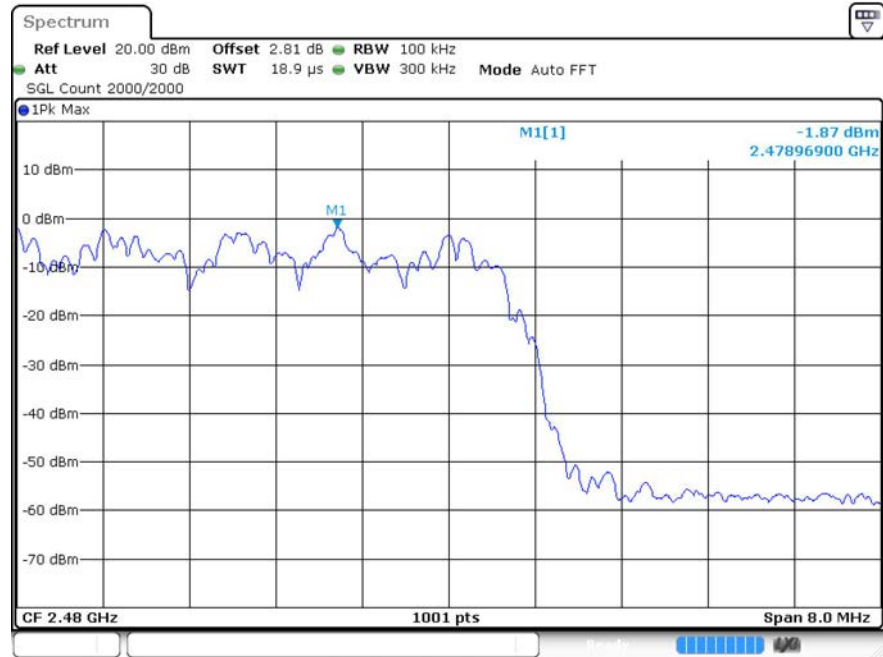
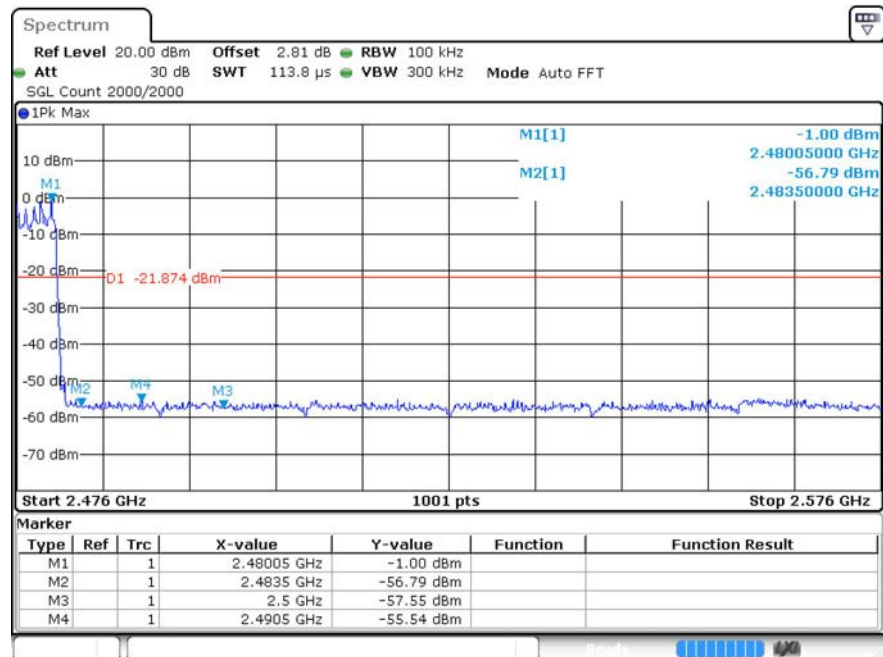
Ref


 $\pi/4$ DQPSK/LCH/Hop


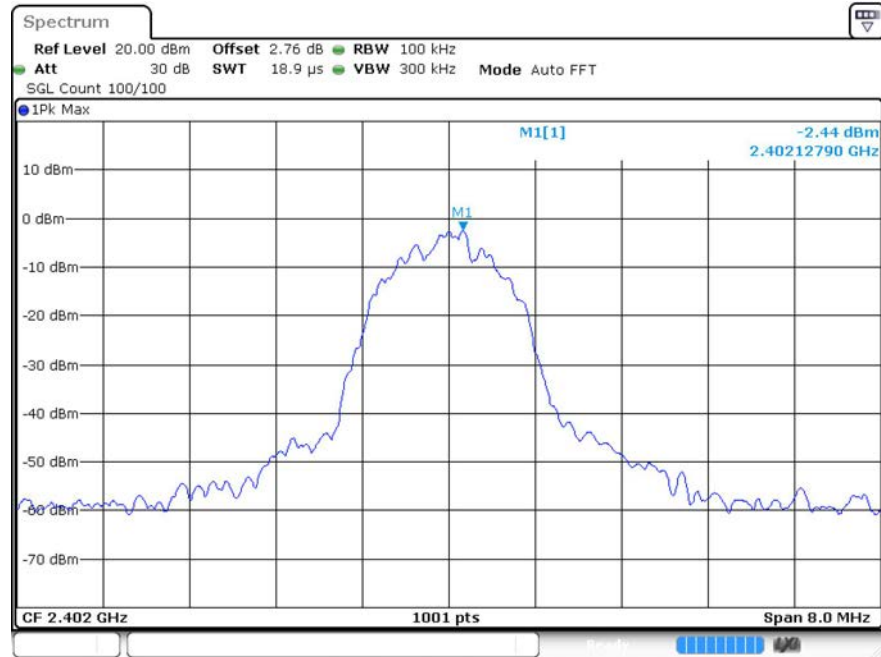
Ref


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


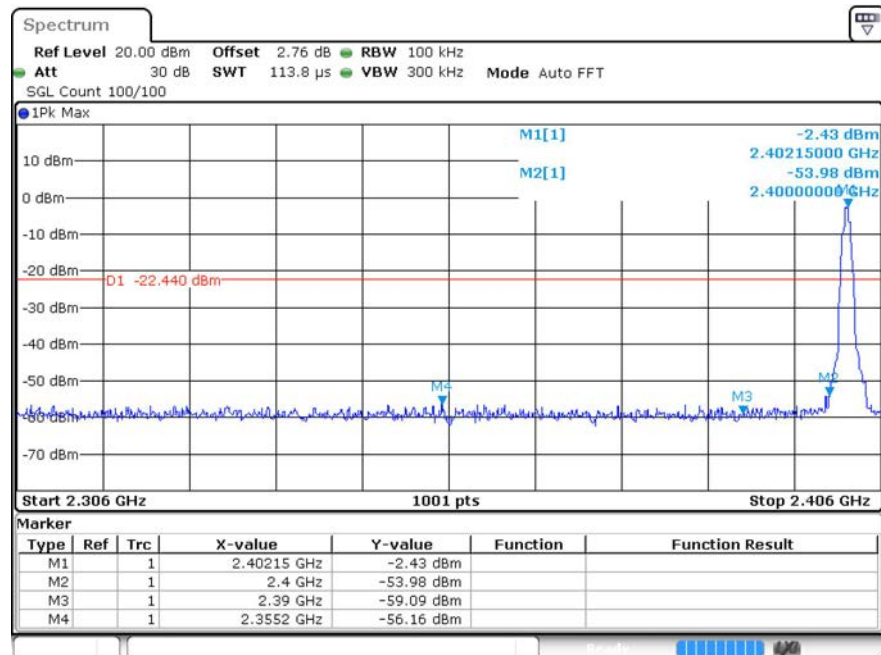
Ref


 $\pi/4$ DQPSK/HCH/Hop


Ref



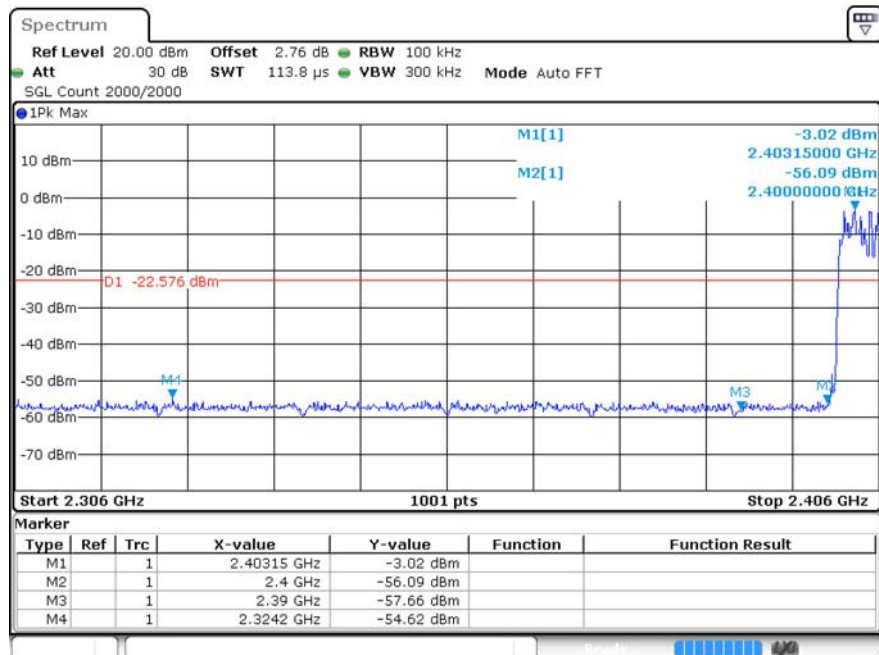
8DPSK/LCH/No Hop



Ref



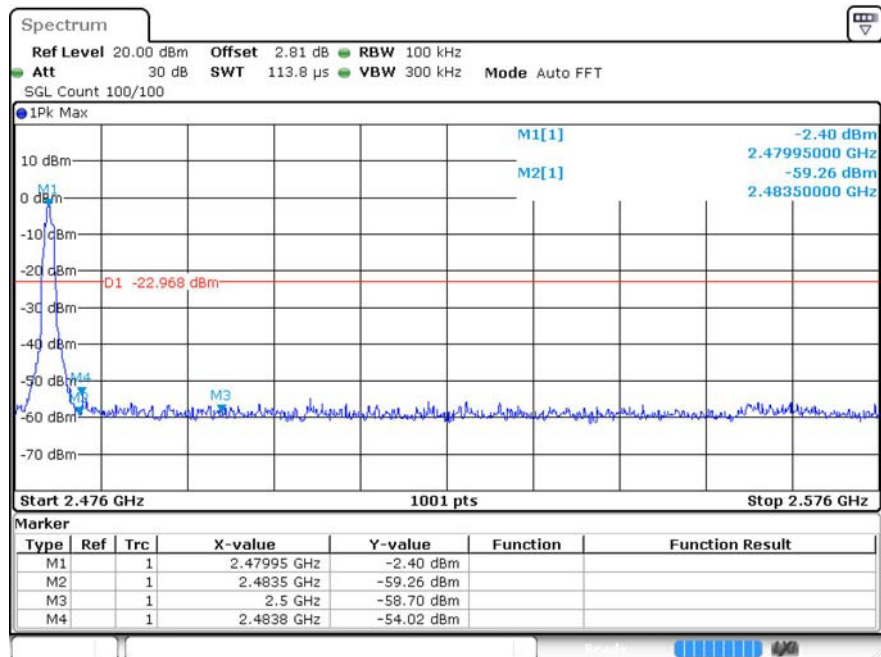
8DPSK/LCH/Hop



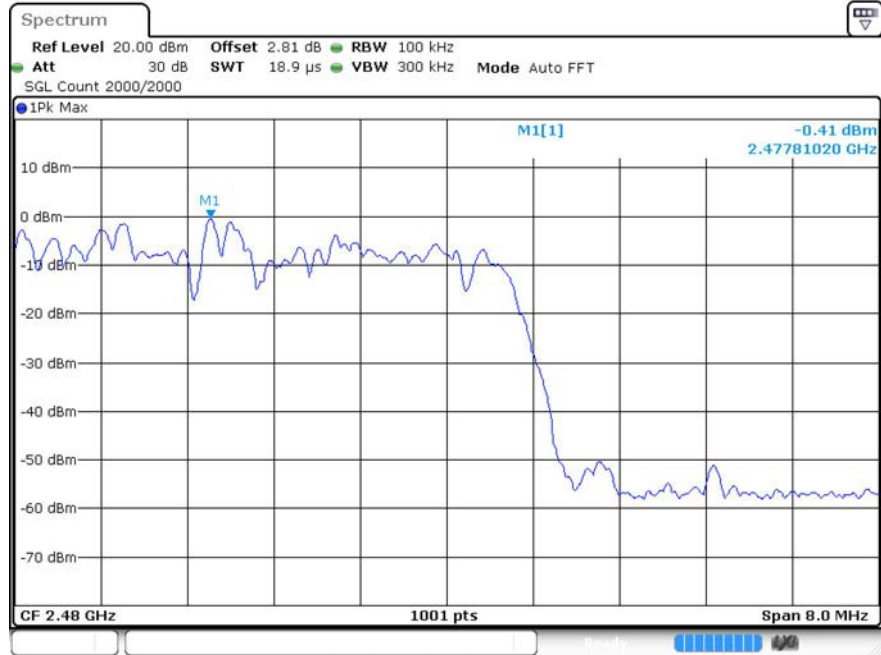
Ref



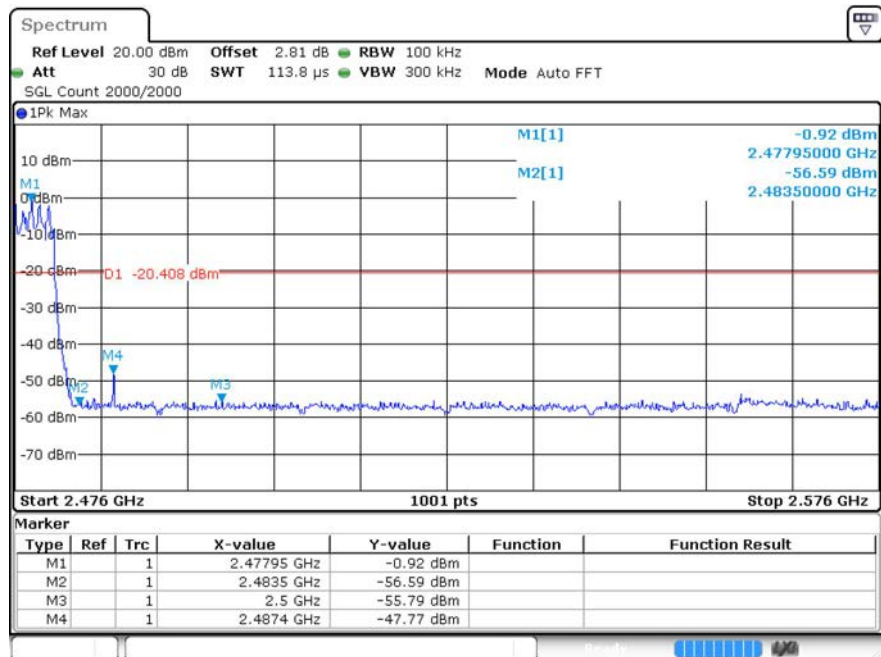
8DPSK/HCH/No Hop



Ref



8DPSK/HCH/Hop



Note: Left headphones and Right headphones were tested, only the worst data was recorded

9 Restrict-band band-edge measurements

9.1 Test Result

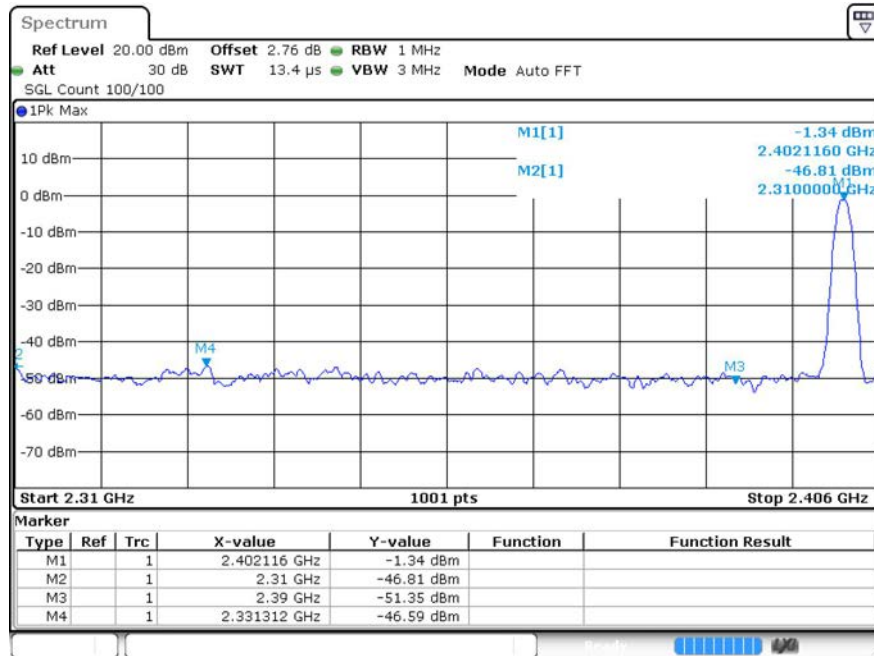
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Duty Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-46.81	2.31	-	50.73	PEAK	74	Pass
	Off	2310.0	-55.99	2.31	5.06	46.61	AV	54	Pass
	Off	2331.312	-46.58	2.31	-	50.96	PEAK	74	Pass
	Off	2338.224	-54.56	2.31	5.06	48.04	AV	54	Pass
	Off	2390.0	-51.35	2.31	-	46.19	PEAK	74	Pass
	Off	2390.0	-57.22	2.31	5.06	45.38	AV	54	Pass
	Off	2483.5	-47.7	2.31	-	49.84	PEAK	74	Pass
	Off	2483.5	-56.52	2.31	5.02	46.04	AV	54	Pass
	Off	2487.376	-44.38	2.31	-	53.16	PEAK	74	Pass
	Off	2485.768	-55.65	2.31	5.02	46.91	AV	54	Pass
	Off	2500.0	-50.17	2.31	-	47.37	PEAK	74	Pass
	Off	2500.0	-56.97	2.31	5.02	45.59	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-51.57	2.31	-	45.97	PEAK	74	Pass
	Off	2310.0	-56.04	2.31	4.95	46.45	AV	54	Pass
	Off	2346.864	-46.16	2.31	-	51.38	PEAK	74	Pass
	Off	2338.128	-54.41	2.31	4.95	48.08	AV	54	Pass
	Off	2390.0	-49.31	2.31	-	48.23	PEAK	74	Pass
	Off	2390.0	-57	2.31	4.95	45.49	AV	54	Pass
	Off	2483.5	-48.76	2.31	-	48.78	PEAK	74	Pass
	Off	2483.5	-55.81	2.31	4.95	46.68	AV	54	Pass
	Off	2486.2	-47.06	2.31	-	50.48	PEAK	74	Pass
	Off	2487.352	-55.49	2.31	4.95	47.00	AV	54	Pass
	Off	2500.0	-49.54	2.31	-	48.00	PEAK	74	Pass
	Off	2500.0	-55.87	2.31	4.95	46.62	AV	54	Pass
8DPSK	Off	2310.0	-50.01	2.31	-	47.53	PEAK	74	Pass
	Off	2310.0	-55.83	2.31	4.95	46.66	AV	54	Pass
	Off	2340.048	-46.57	2.31	-	50.97	PEAK	74	Pass
	Off	2341.392	-54.34	2.31	4.95	48.15	AV	54	Pass



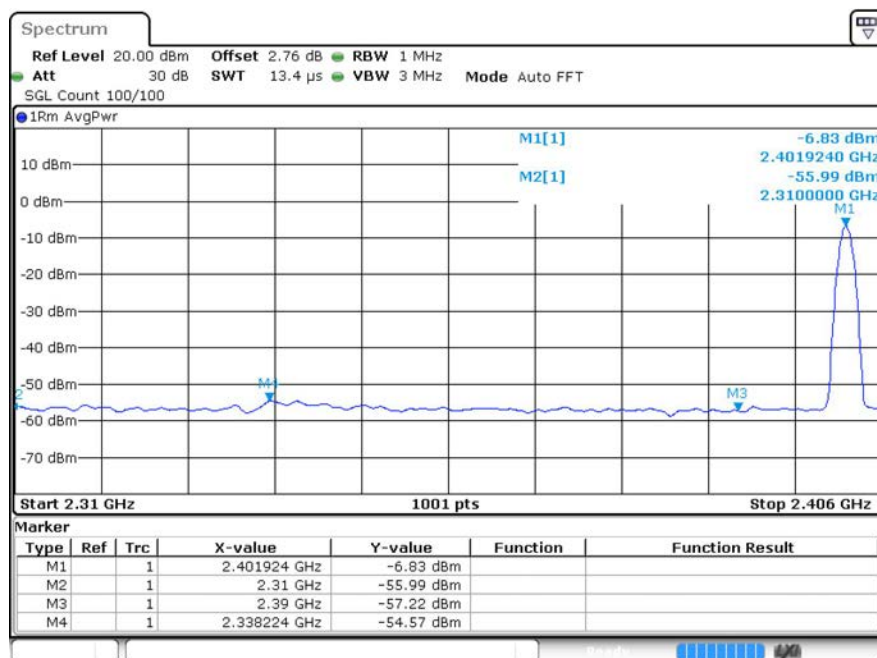
Off	2390.0	-49.33	2.31	-	48.21	PEAK	74	Pass
Off	2390.0	-56.99	2.31	4.95	45.50	AV	54	Pass
Off	2483.5	-45.69	2.31	-	51.85	PEAK	74	Pass
Off	2483.5	-55.13	2.31	4.95	47.36	AV	54	Pass
Off	2487.376	-44.69	2.31	-	52.85	PEAK	74	Pass
Off	2483.512	-55.14	2.31	4.95	47.35	AV	54	Pass
Off	2500.0	-49.24	2.31	-	48.30	PEAK	74	Pass
Off	2500.0	-56.39	2.31	4.95	46.10	AV	54	Pass

9.2 Test Graphs

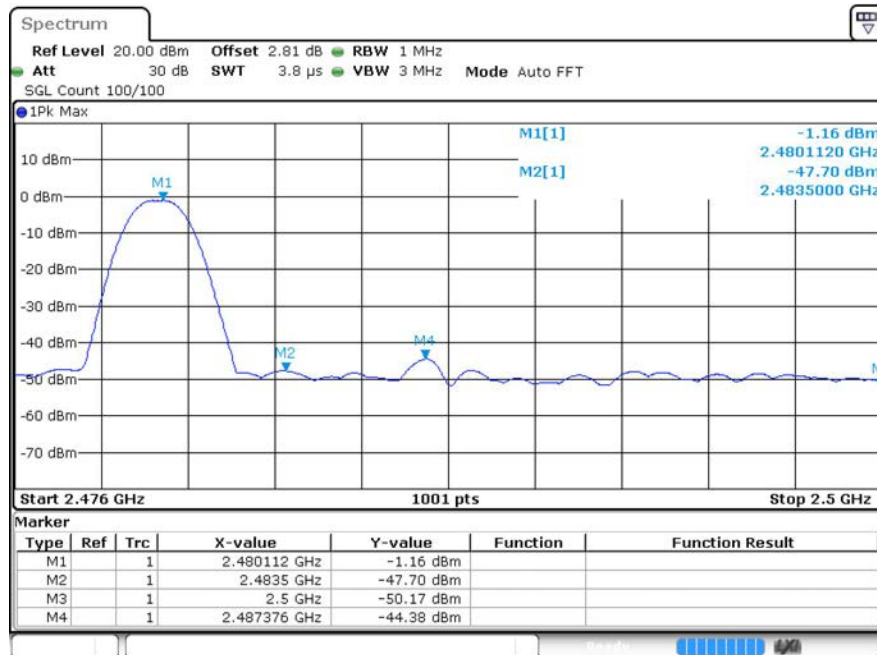
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



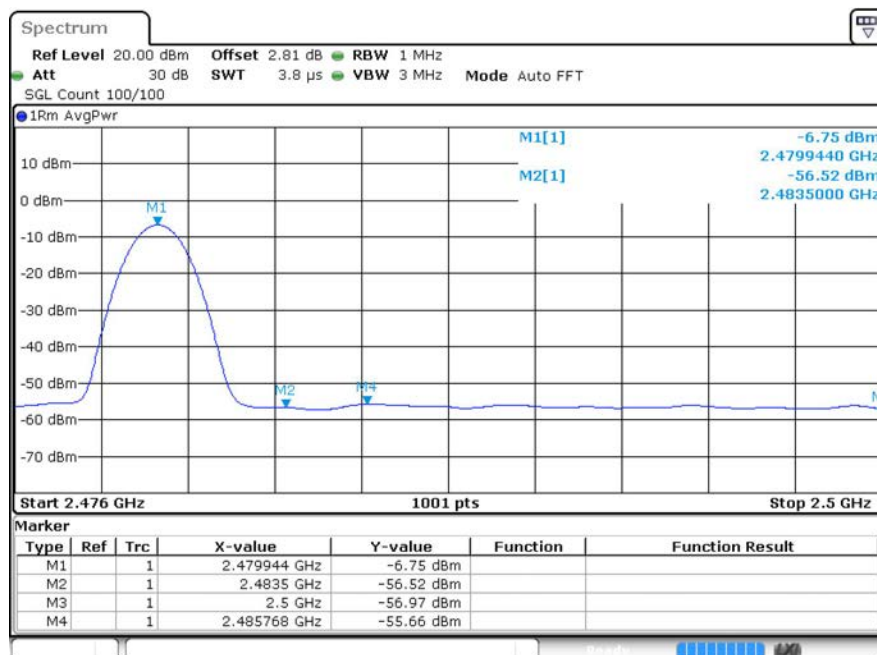
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



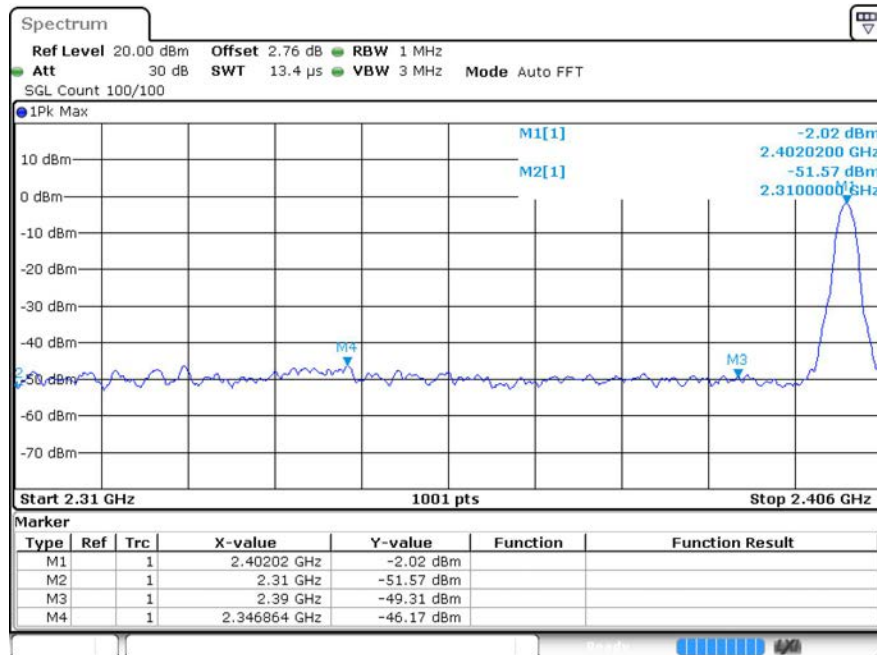
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



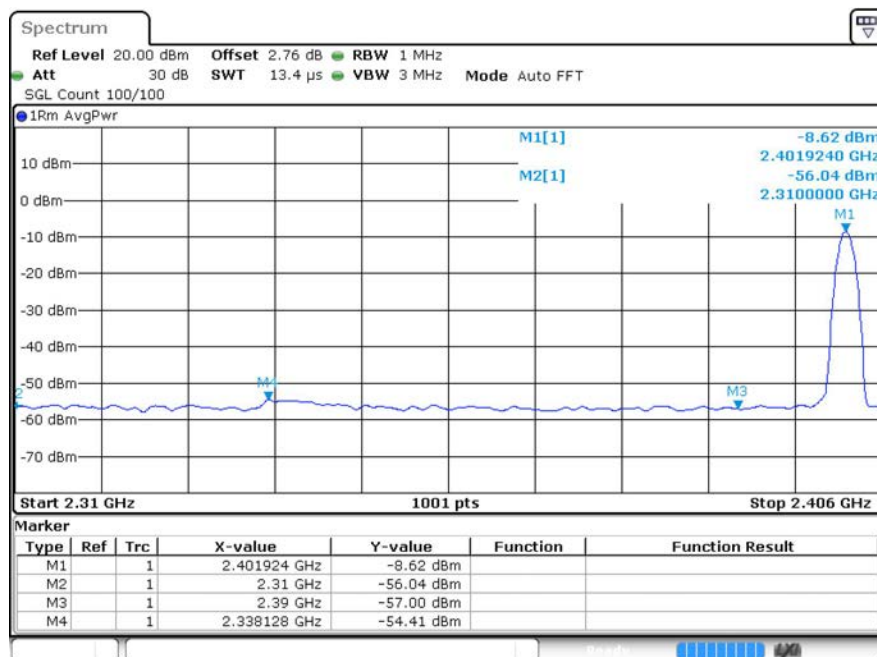
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



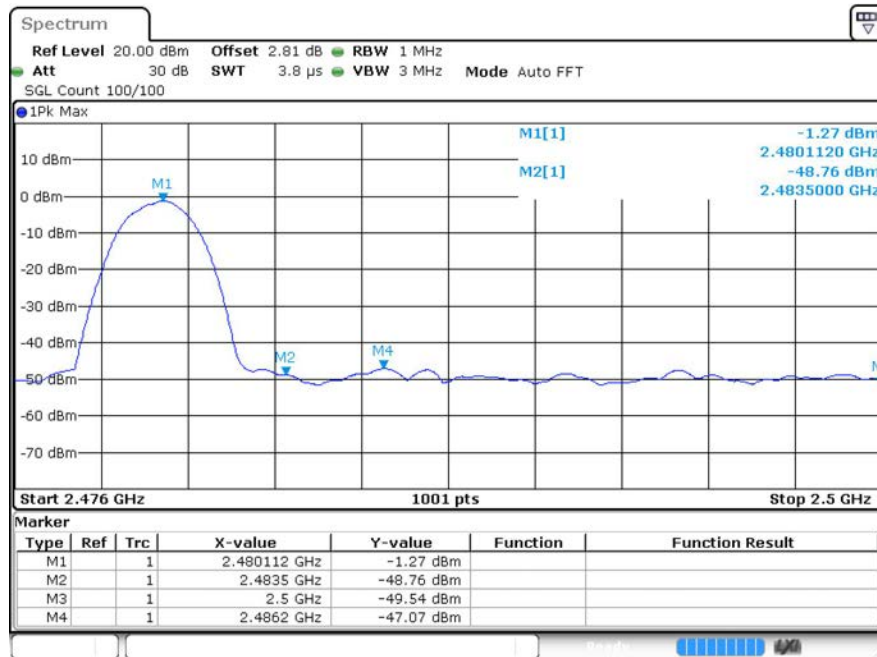
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



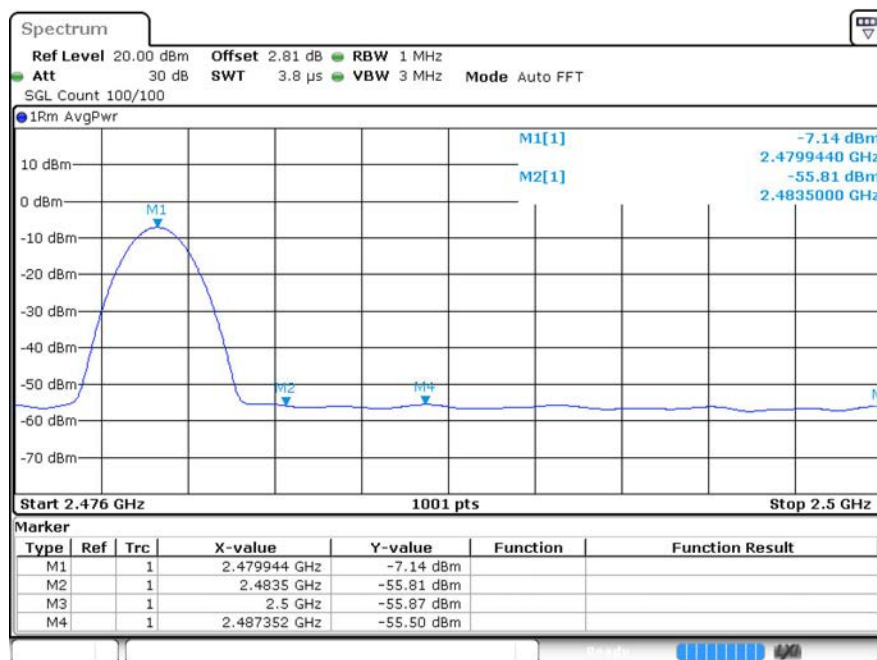
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



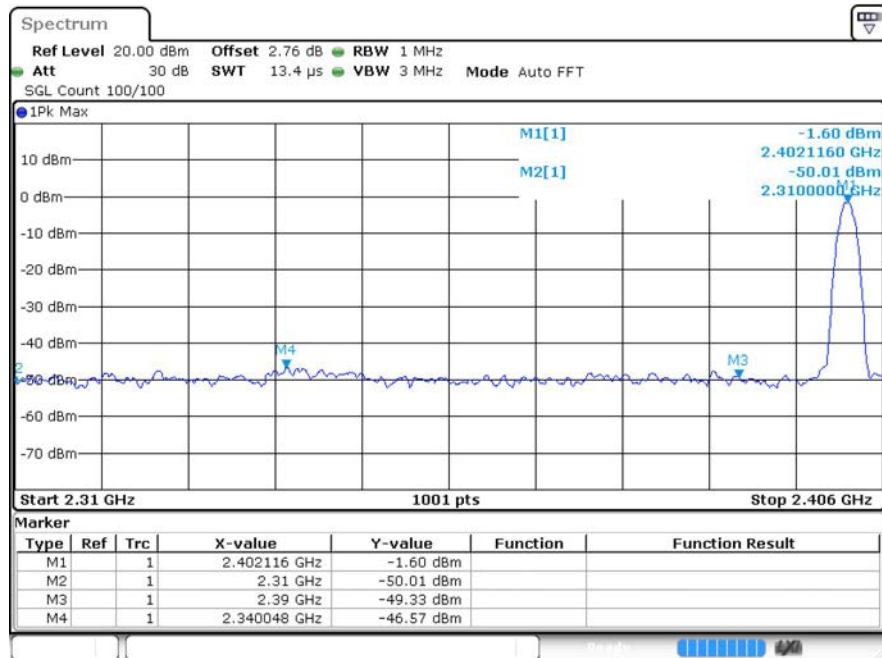
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



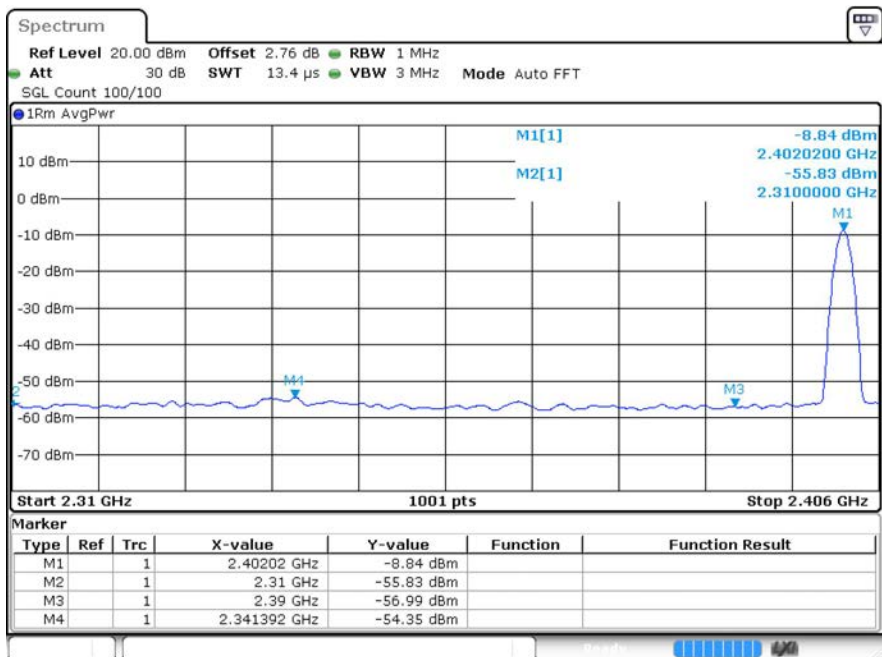
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



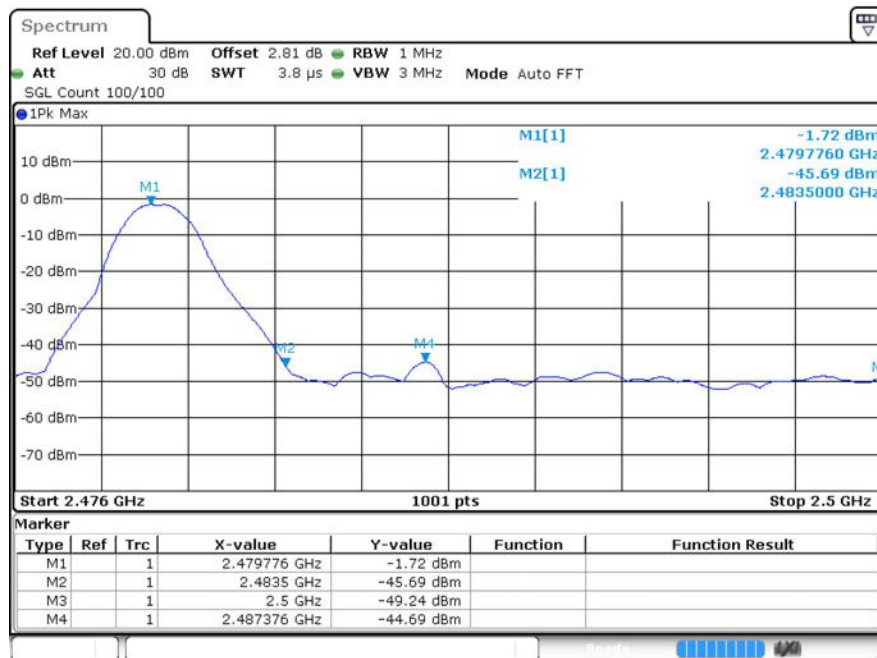
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



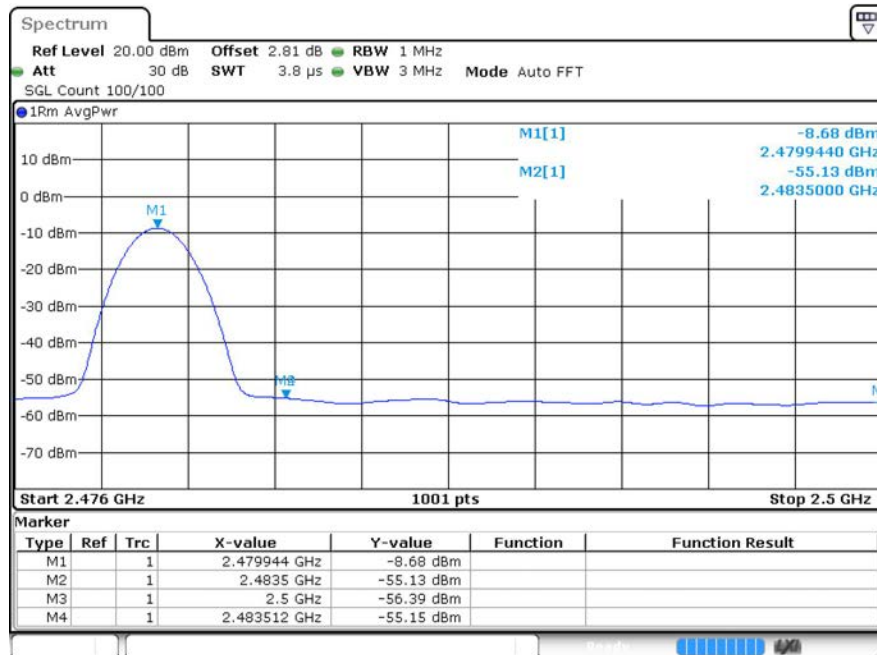
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)



Note: Left headphones and Right headphones were tested, only the worst data was recorded

---The End---