



Appendix A

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

Product Name: Recycled Coffee Grounds Speaker

Trade Mark: N/A

Test Model: #2255

Environmental Conditions

Temperature:	25.9℃
Relative Humidity:	52.1%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen



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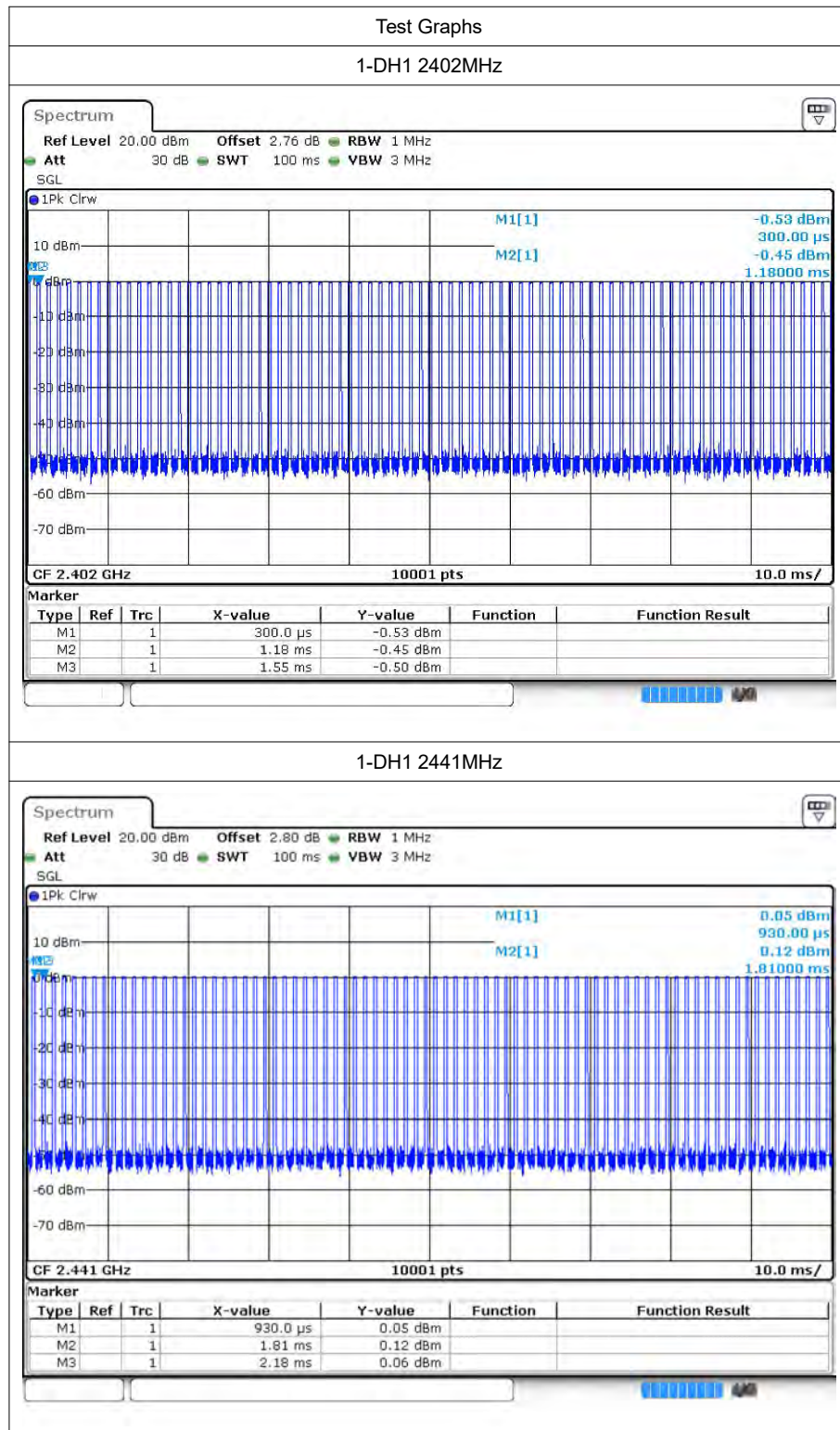
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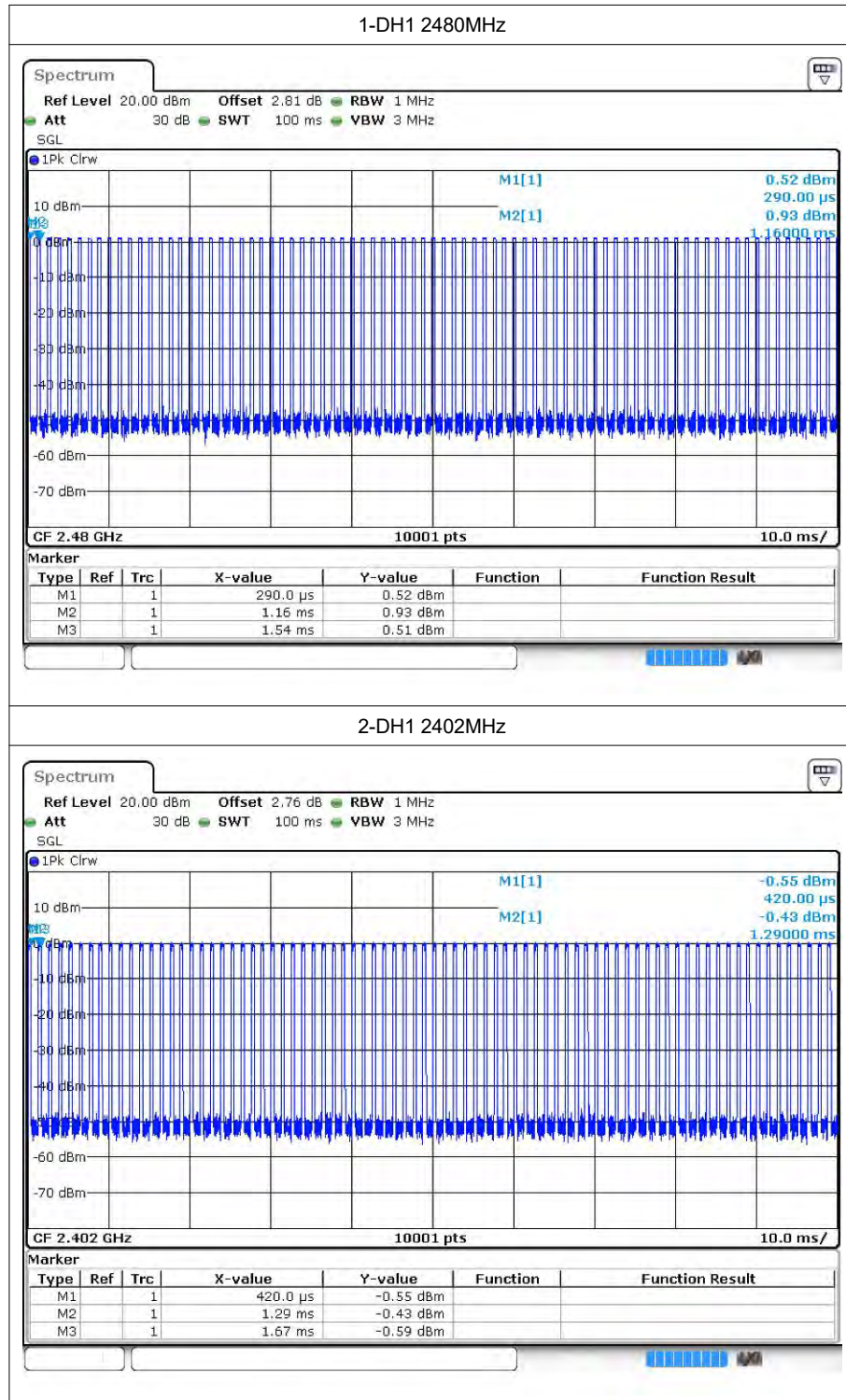
1 Duty Cycle

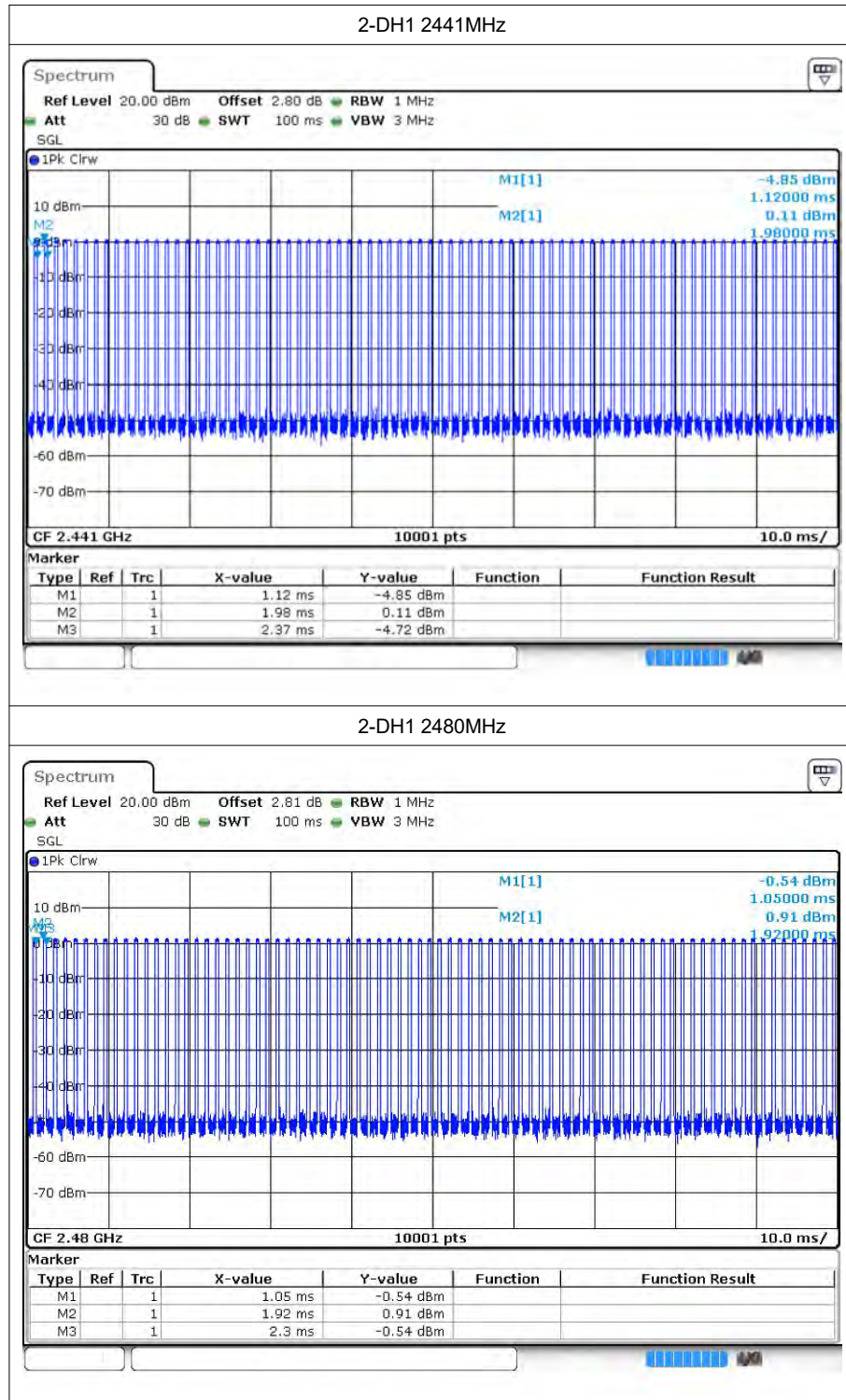
1.1 Test Result

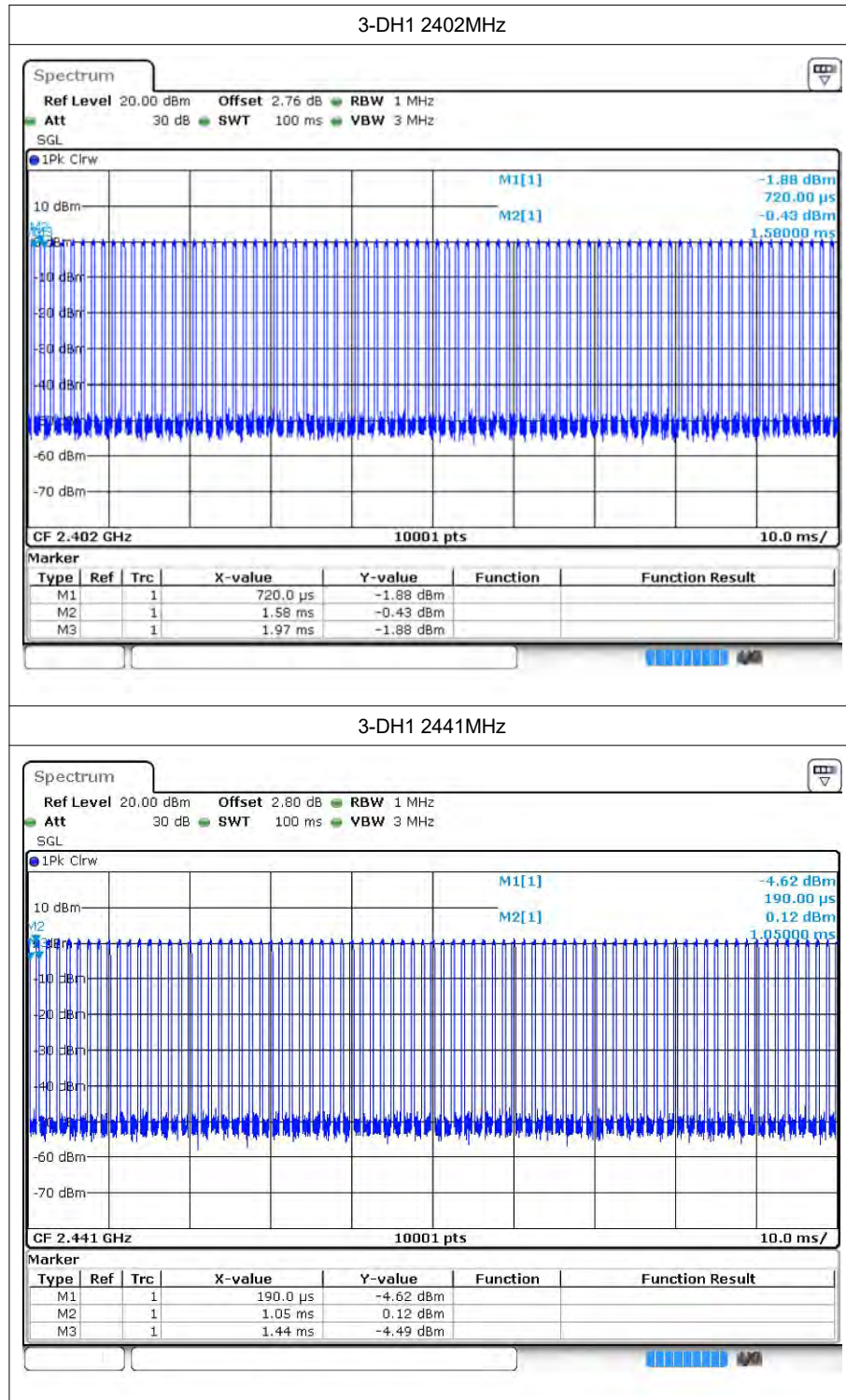
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	30.81	2.7
1-DH1	2441	30.62	2.7
1-DH1	2480	31.21	2.63
2-DH1	2402	31.45	2.63
2-DH1	2441	32	2.56
2-DH1	2480	31.2	2.63
3-DH1	2402	32	2.56
3-DH1	2441	32.01	2.56
3-DH1	2480	31.29	2.63

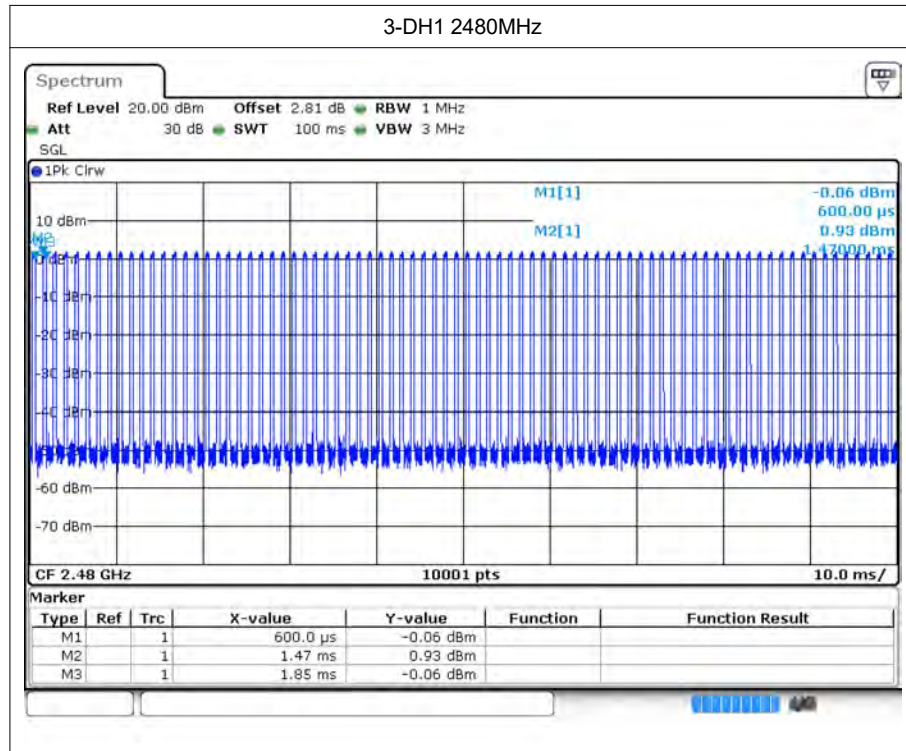
1.2 Test Graphs









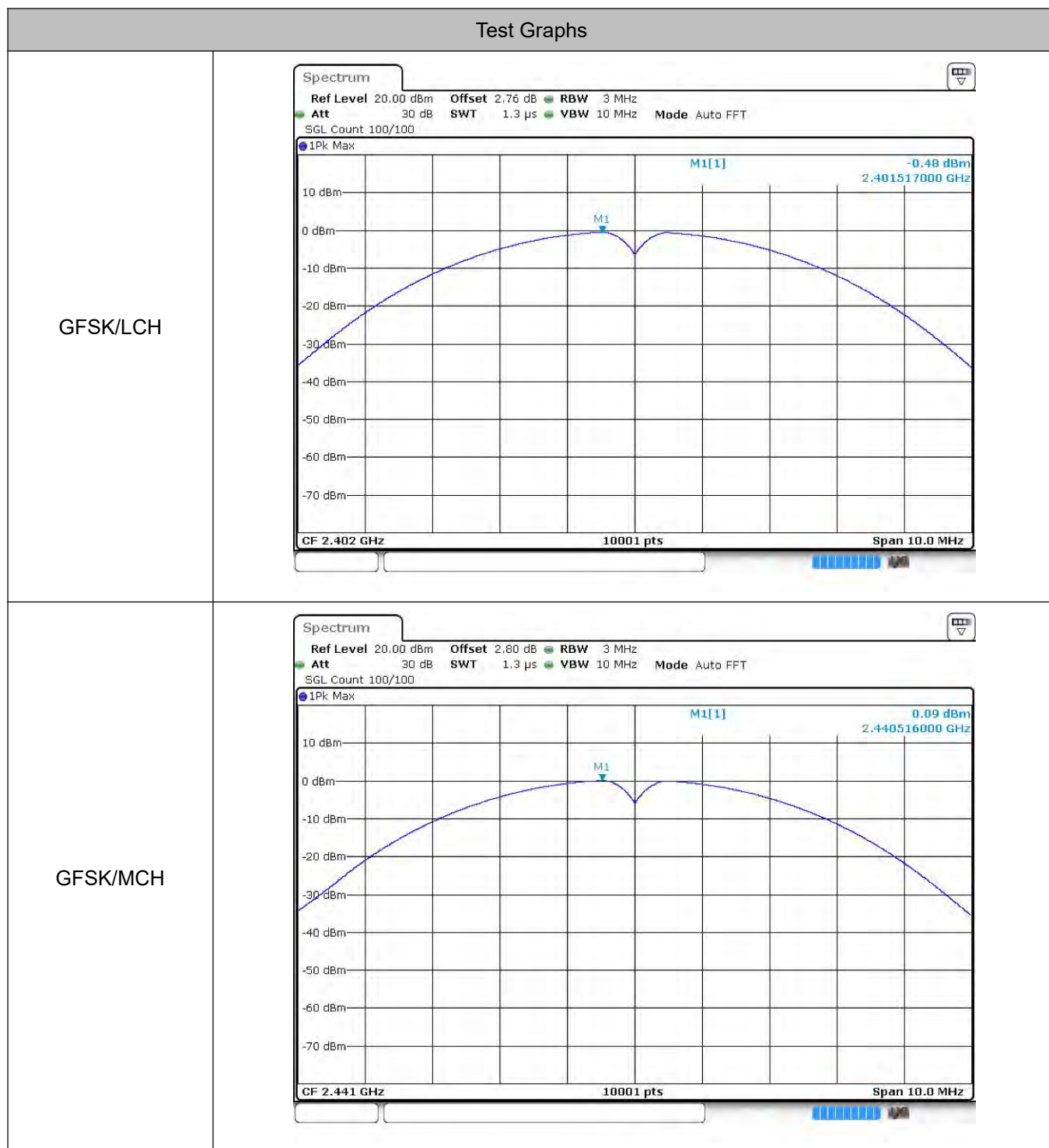


2 Maximum Conducted Peak Output Power

2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.48	21	Pass
	MCH	0.09	21	Pass
	HCH	0.91	21	Pass
$\pi/4$ DQPSK	LCH	0.41	21	Pass
	MCH	0.57	21	Pass
	HCH	1.55	21	Pass
8DPSK	LCH	0.18	21	Pass
	MCH	0.92	21	Pass
	HCH	1.02	21	Pass

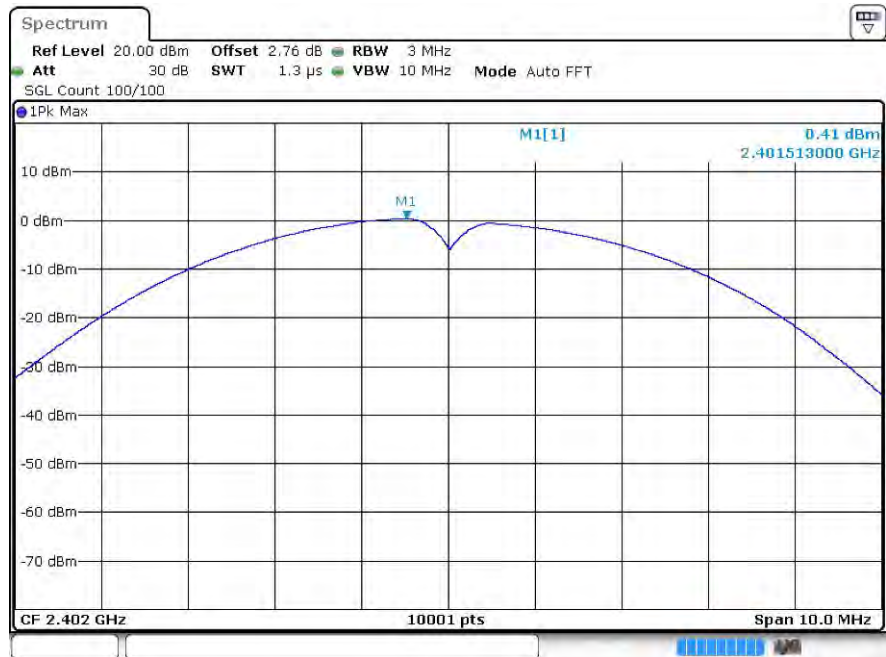
2.2 Test Graphs



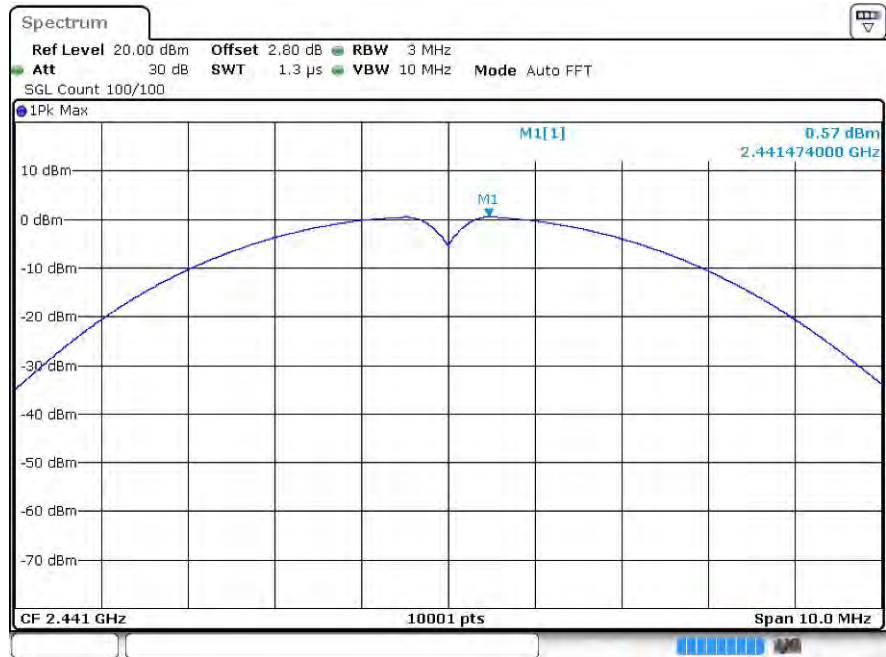
GFSK/HCH



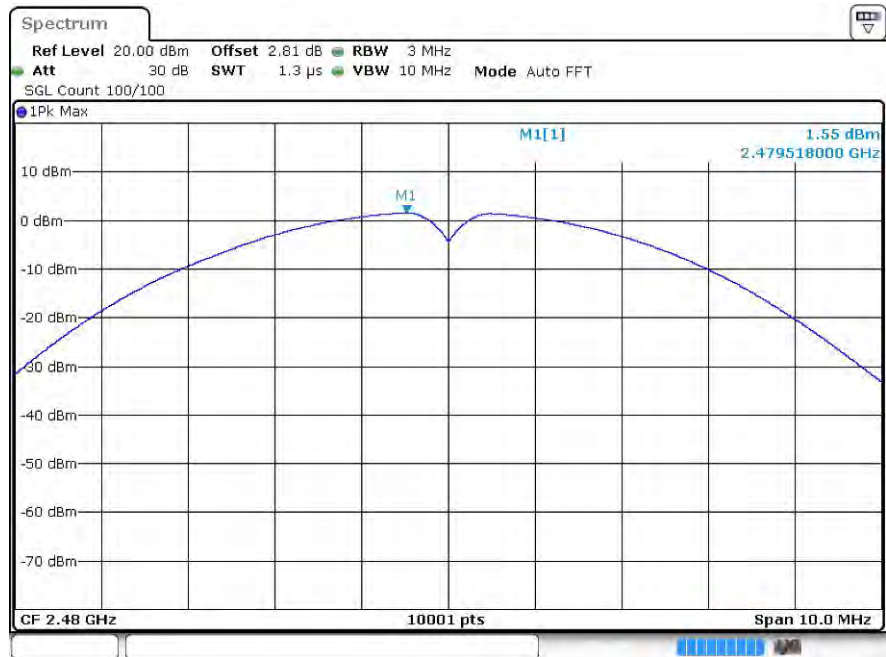
$\pi/4$ DQPSK/LCH



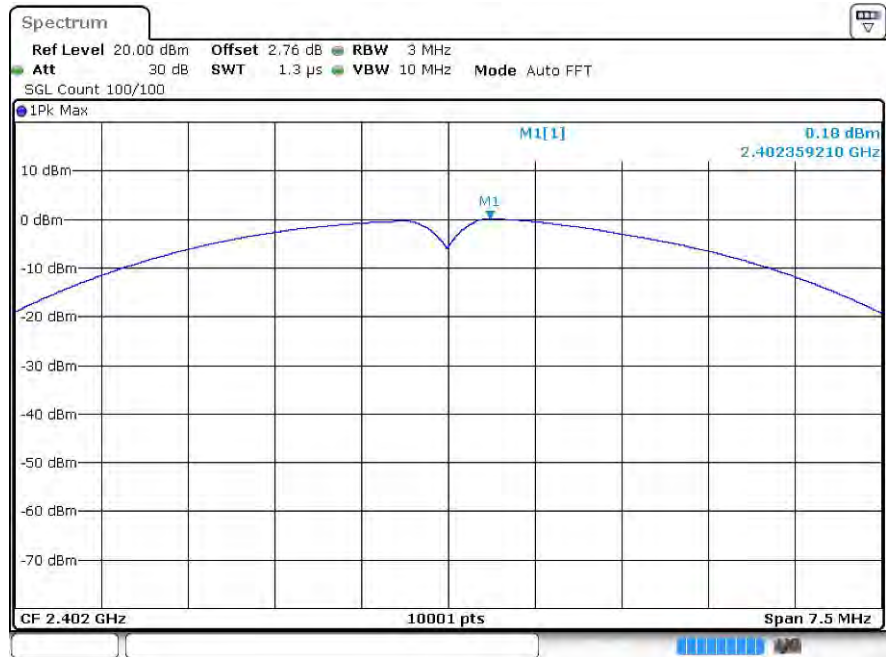
$\pi/4$ DQPSK/MCH



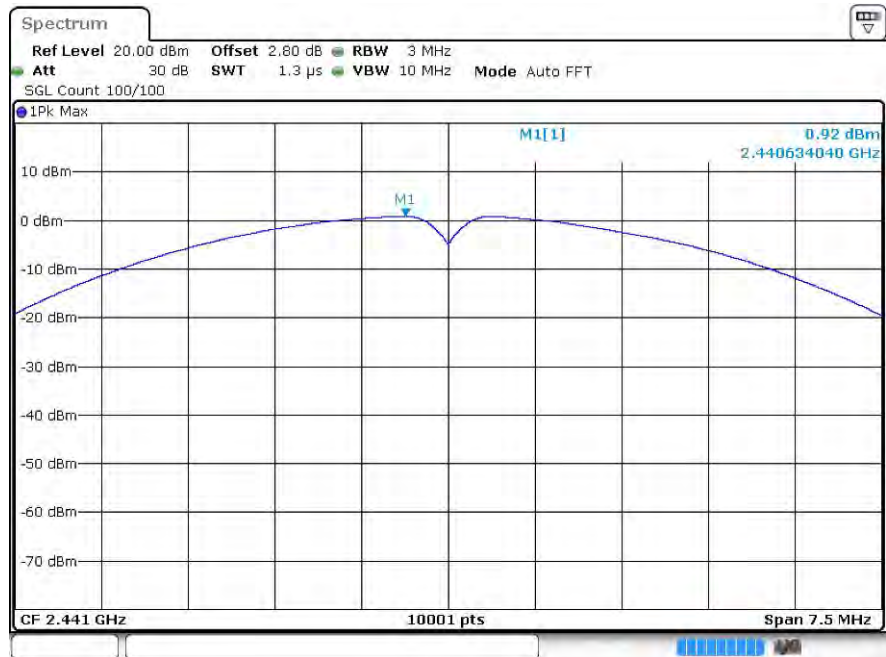
$\pi/4$ DQPSK/HCH



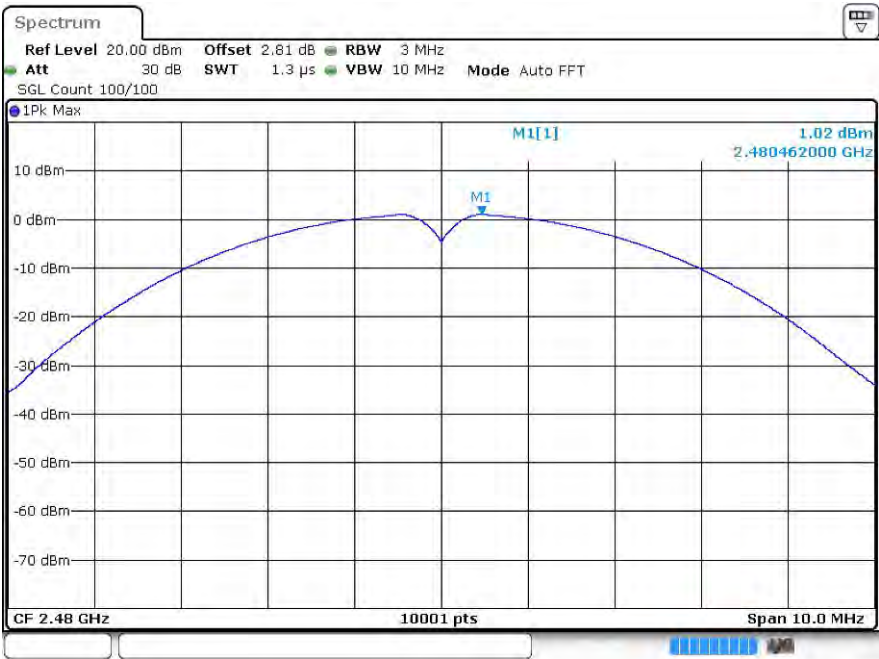
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

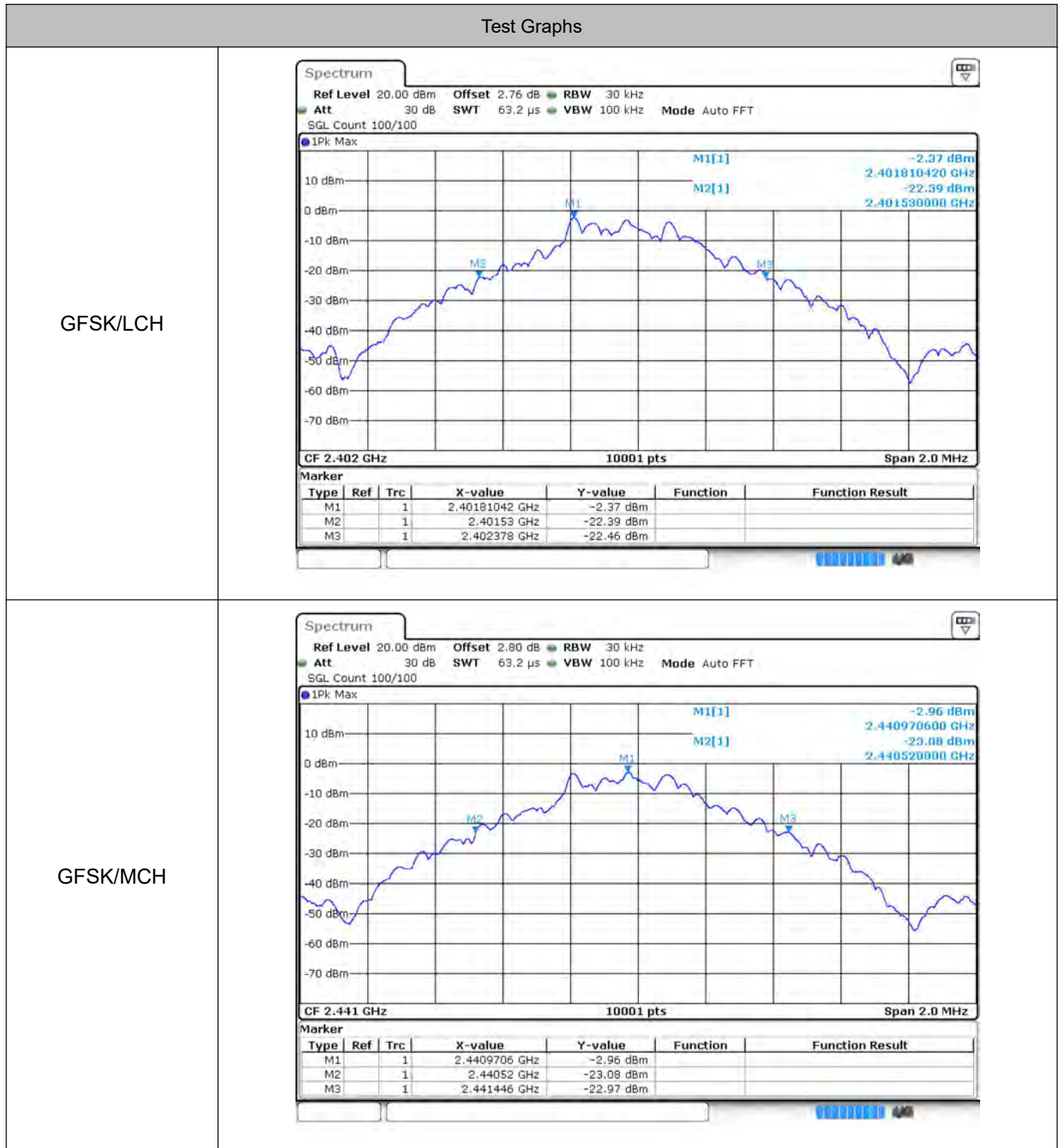


3 20dB Bandwidth

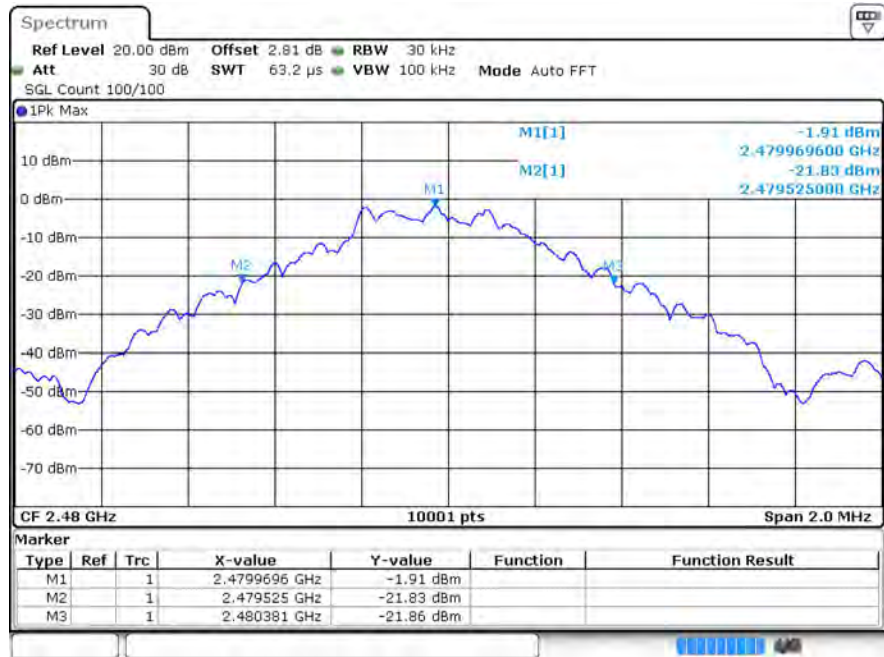
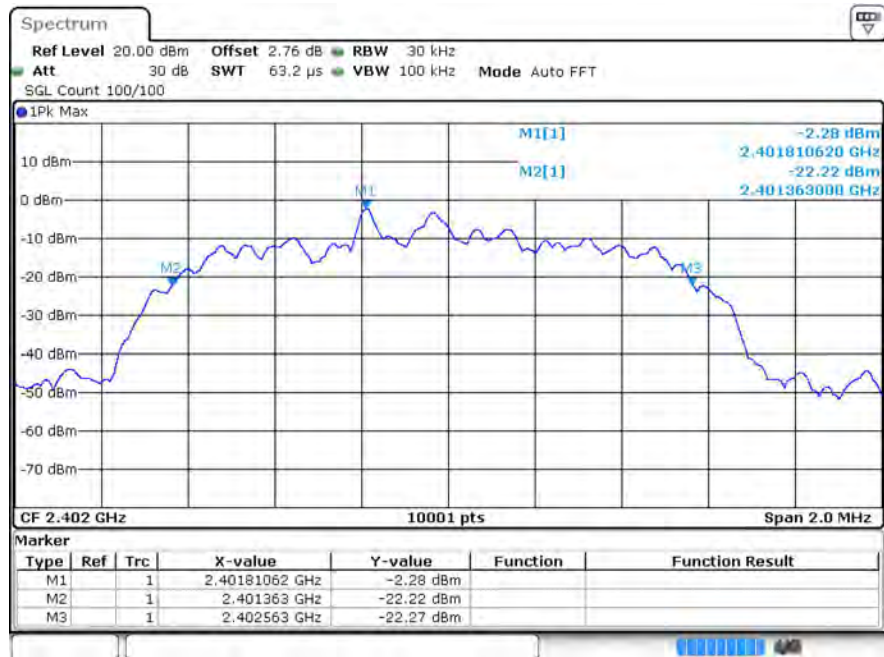
3.1 Test Result

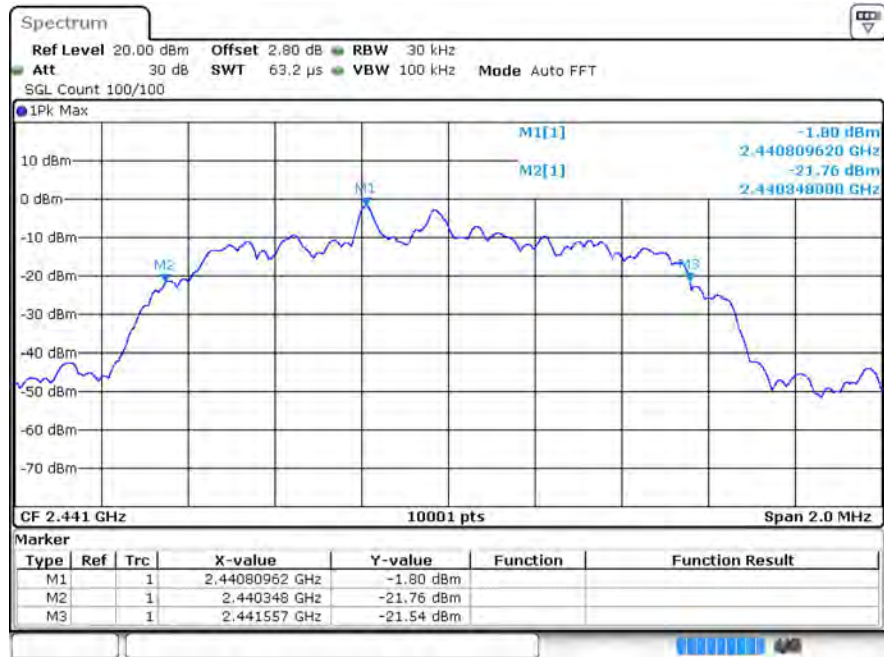
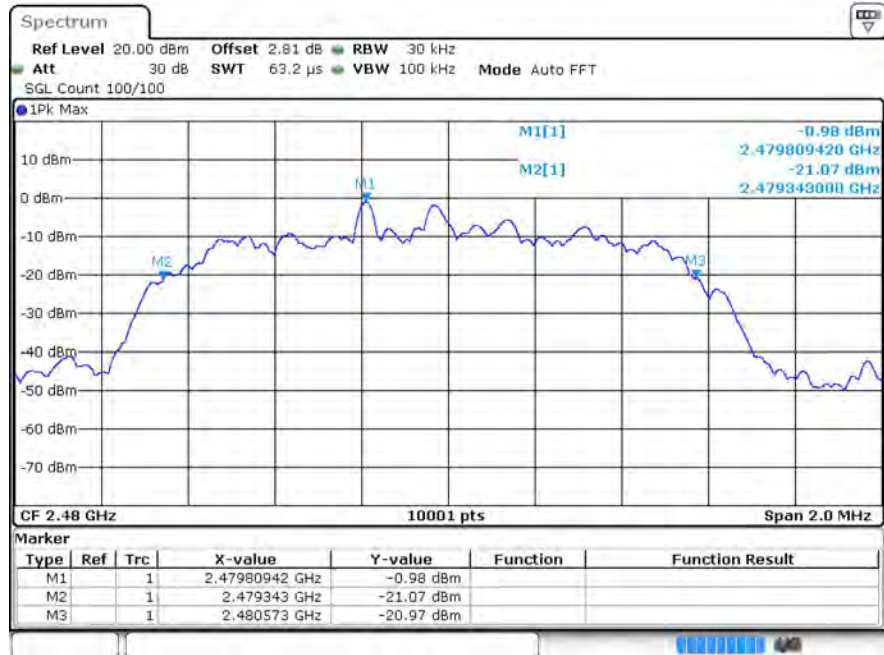
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.847	Not Specified	Pass
	MCH	0.925	Not Specified	Pass
	HCH	0.856	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.201	Not Specified	Pass
	MCH	1.21	Not Specified	Pass
	HCH	1.23	Not Specified	Pass
8DPSK	LCH	1.207	Not Specified	Pass
	MCH	1.217	Not Specified	Pass
	HCH	1.211	Not Specified	Pass

3.2 Test Graphs

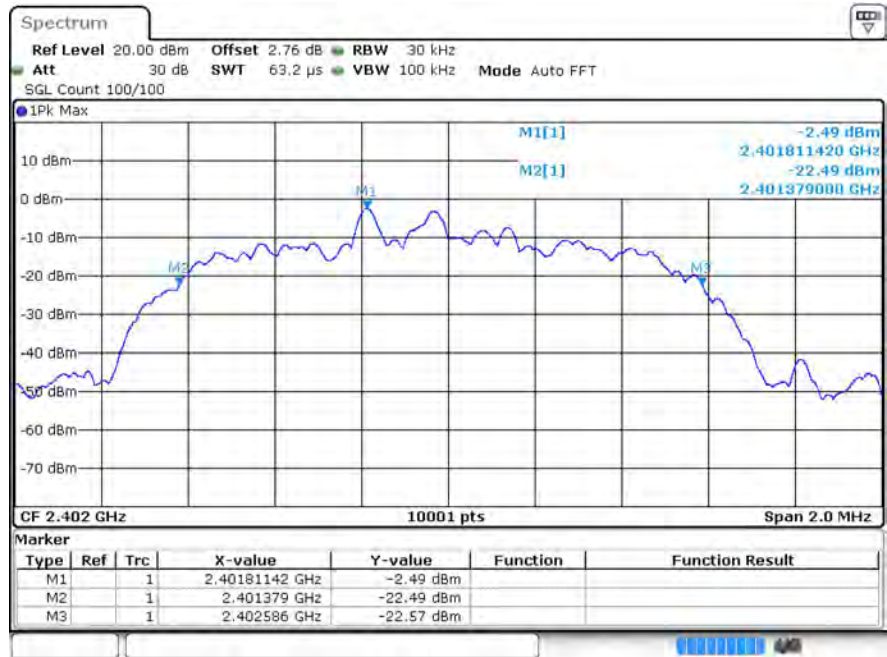


GFSK/HCH

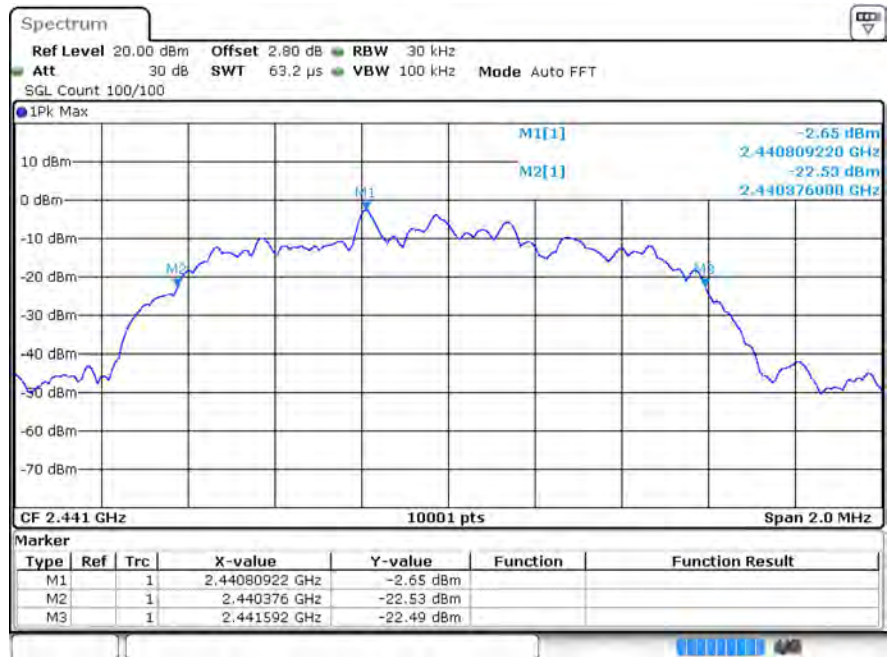

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


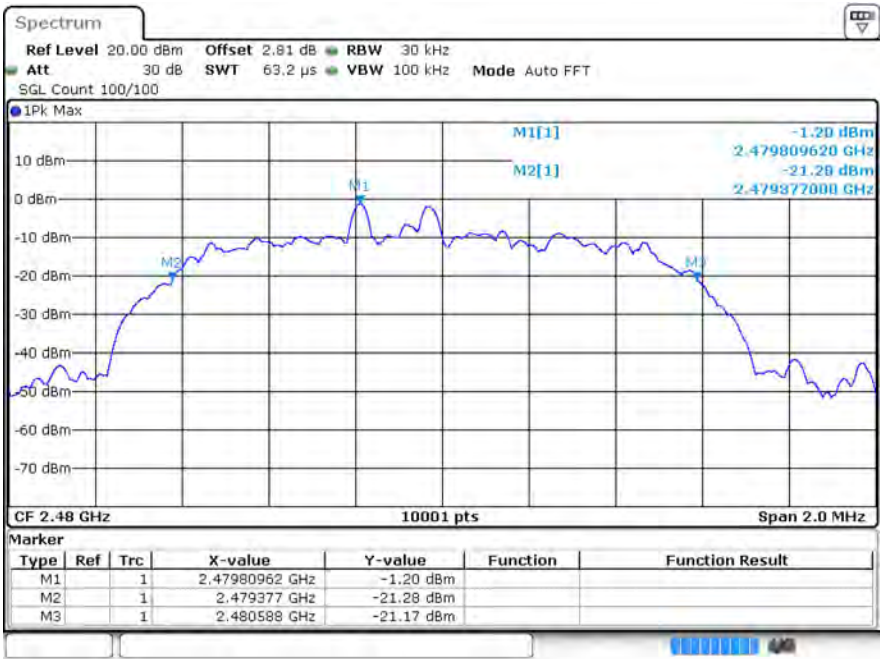
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



4 Carrier Frequency Separation

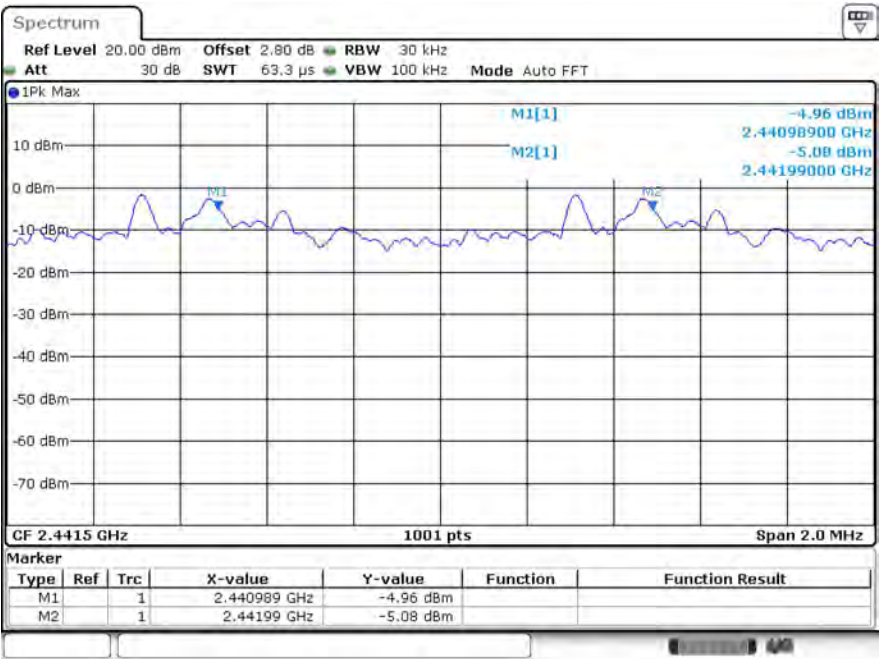
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.001	0.617	Pass
$\pi/4$ DQPSK	MCH	1.002	0.807	Pass
8DPSK	MCH	1.001	0.811	Pass

4.2 Test Graphs



8DPSK/MCH

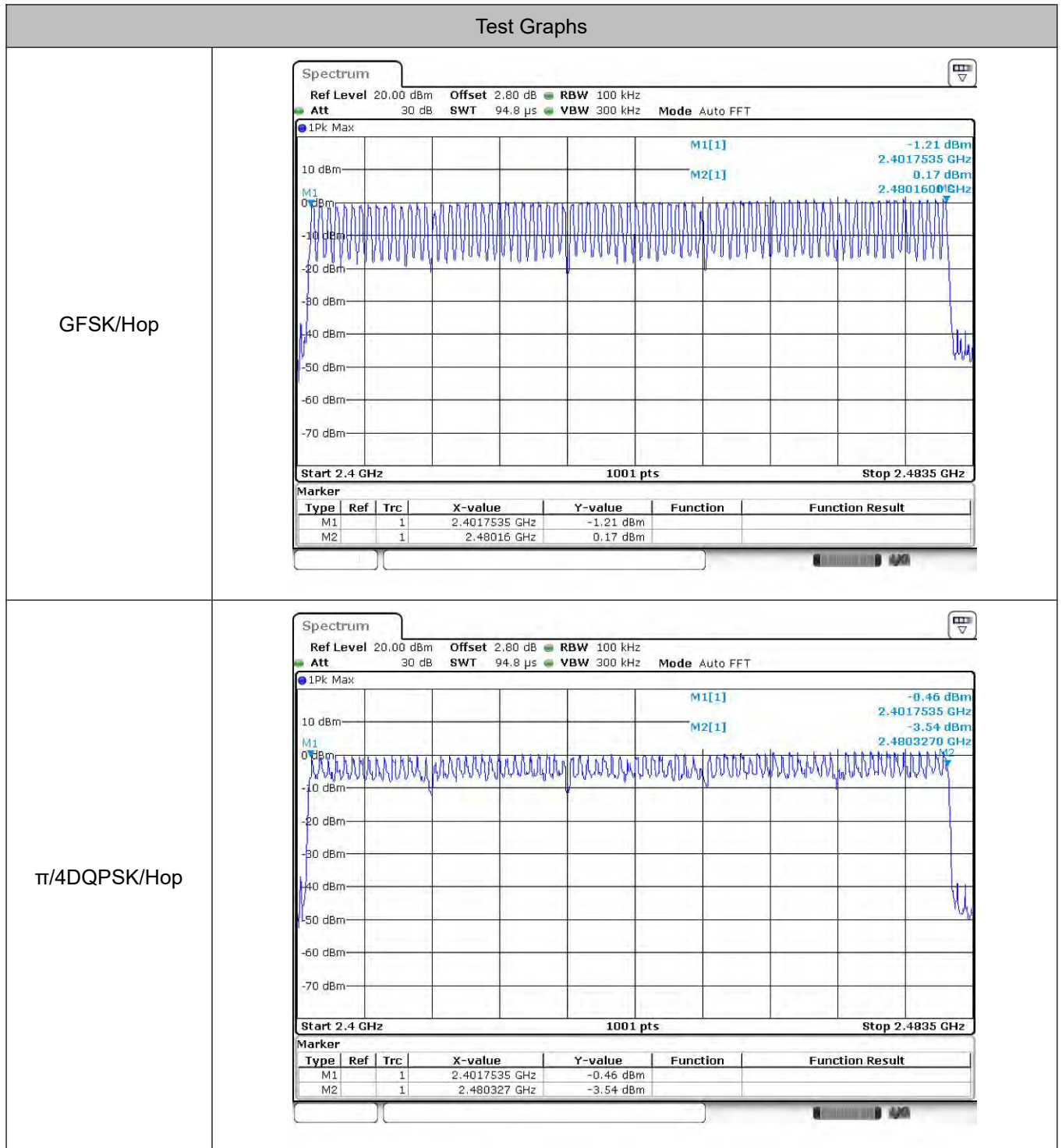


5 Hopping Channel Number

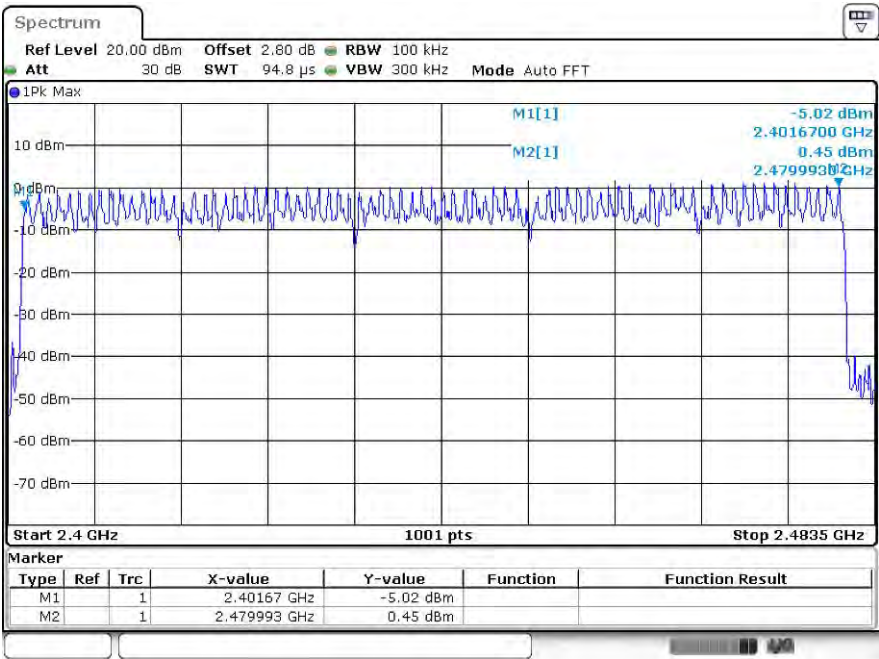
5.1 Test Result

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

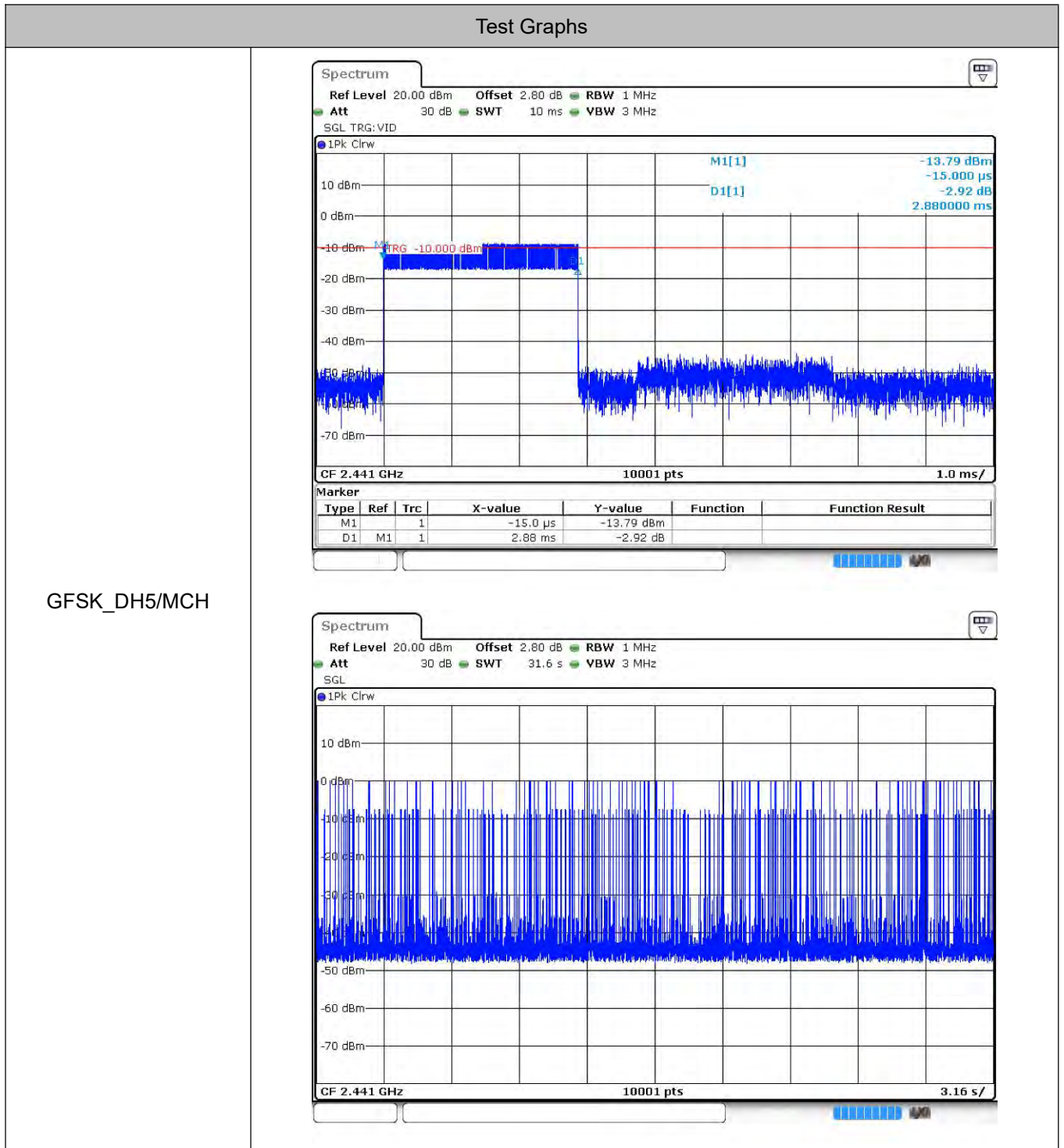


6 Dwell Time

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	2.88	109	313.92	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.885	96	276.96	0.4	Pass
8DPSK	3DH5	MCH	2.887	107	308.909	0.4	Pass

6.2 Test Graphs



Spectrum

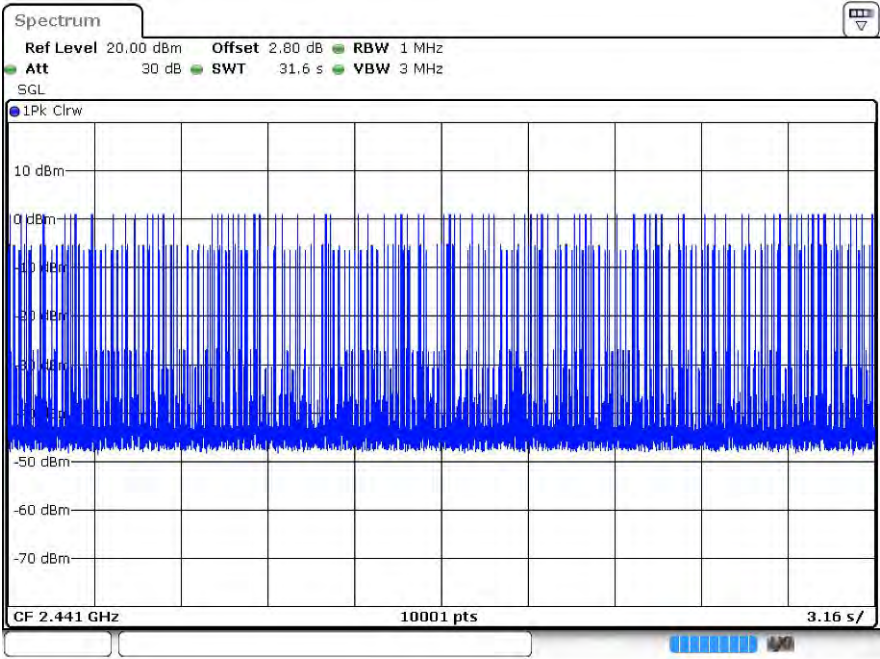
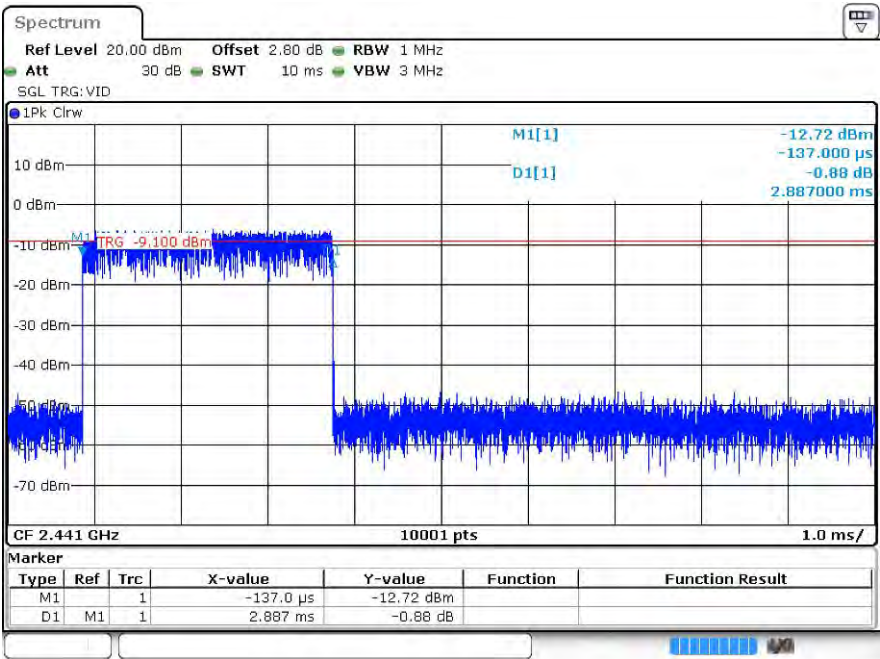
Ref Level 20.00 dBm Offset 2.80 dB RBW 1 MHz
 Att 30 dB SWT 31.6 s VBW 3 MHz
 SGL

● 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

8DPSK_3DH5/MCH



7 RF Conducted Spurious Emissions

7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-40.54	-20	Pass
	MCH	-41.51	-20	Pass
	HCH	-41.96	-20	Pass
$\pi/4$ DQPSK	LCH	-38.91	-20	Pass
	MCH	-41.64	-20	Pass
	HCH	-40.84	-20	Pass
8DPSK	LCH	-41.56	-20	Pass
	MCH	-41.01	-20	Pass
	HCH	-42.98	-20	Pass

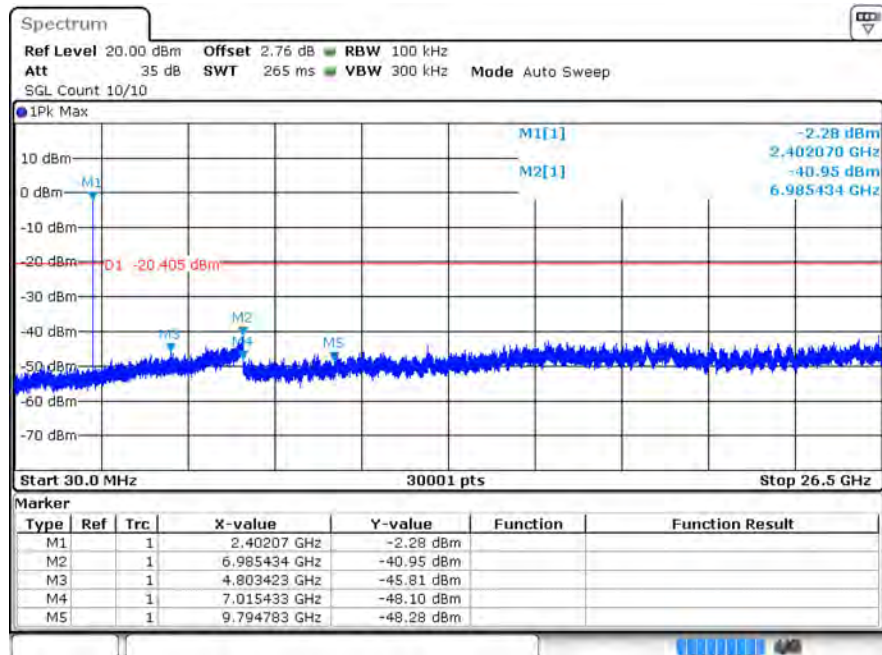
7.2 Test Graphs

GFSK_LCH_Graphs

Pref



Puw

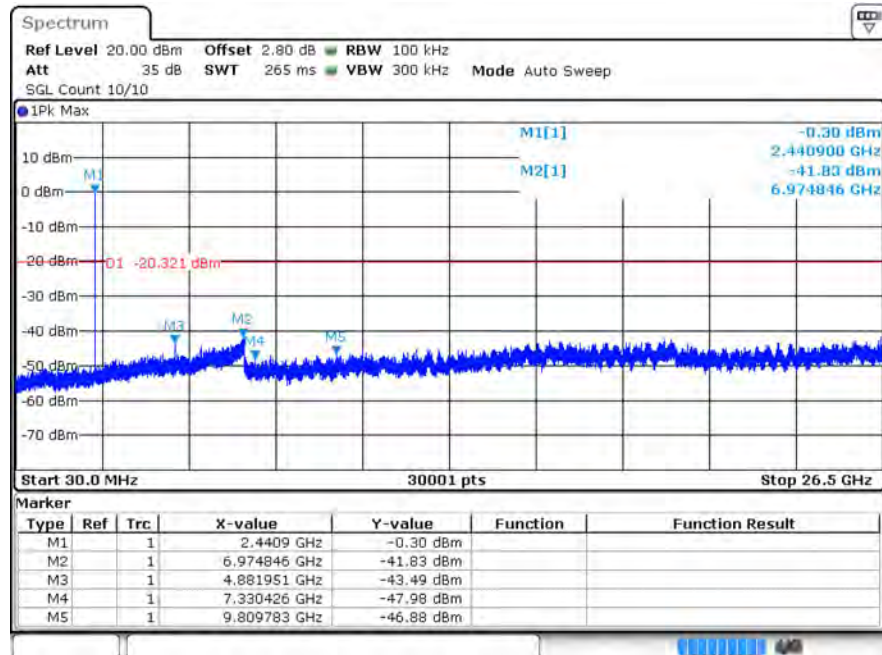


GFSK_MCH_Graphs

Pref



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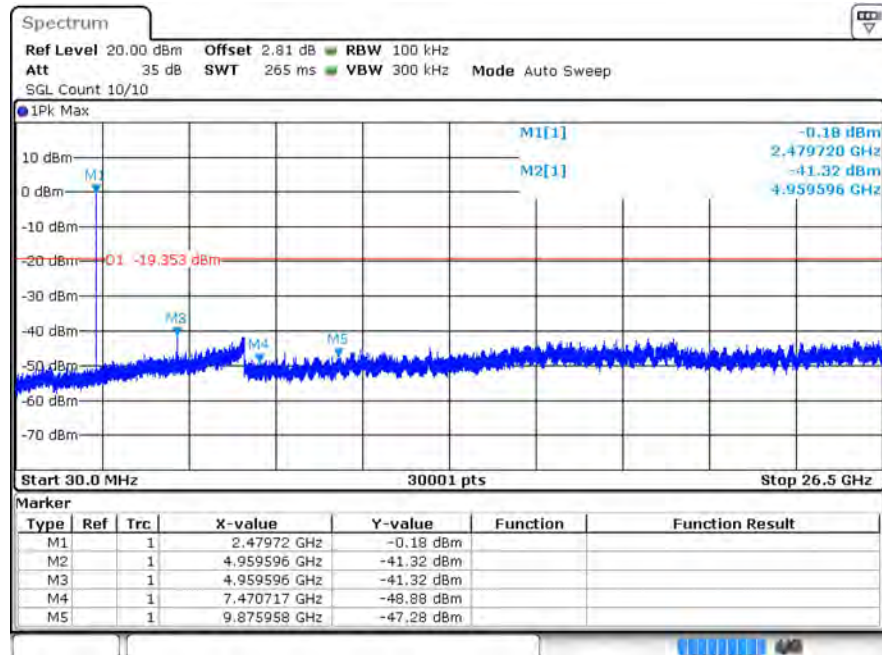


GFSK_HCH_Graphs

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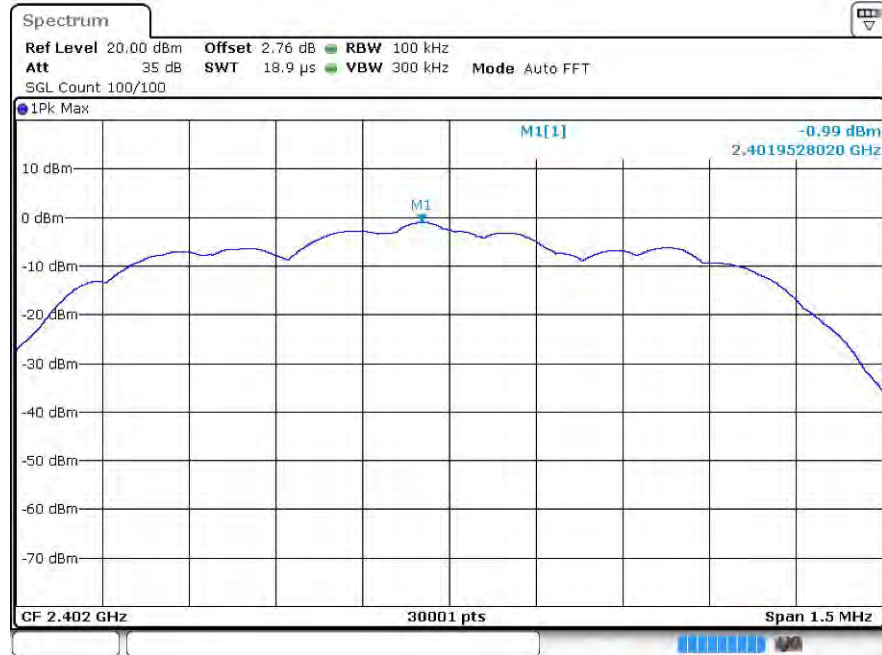


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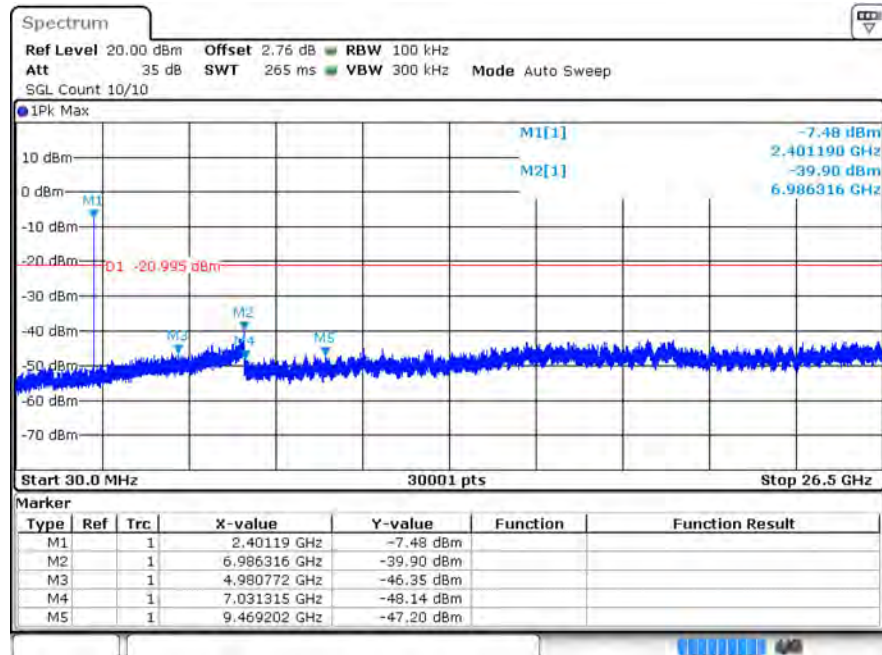


$\pi/4$ DQPSK_LCH_Graphs

Pref

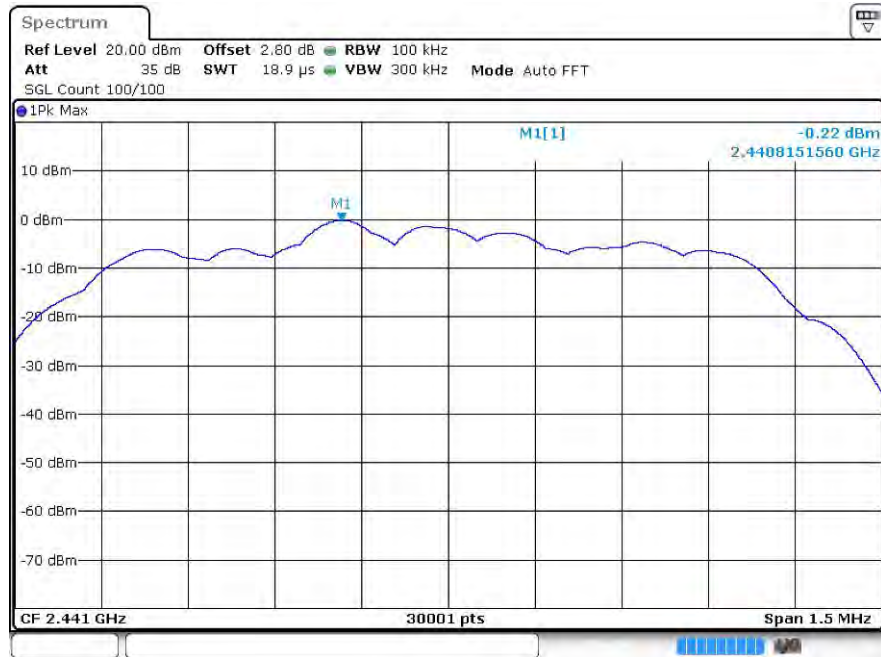


Puw

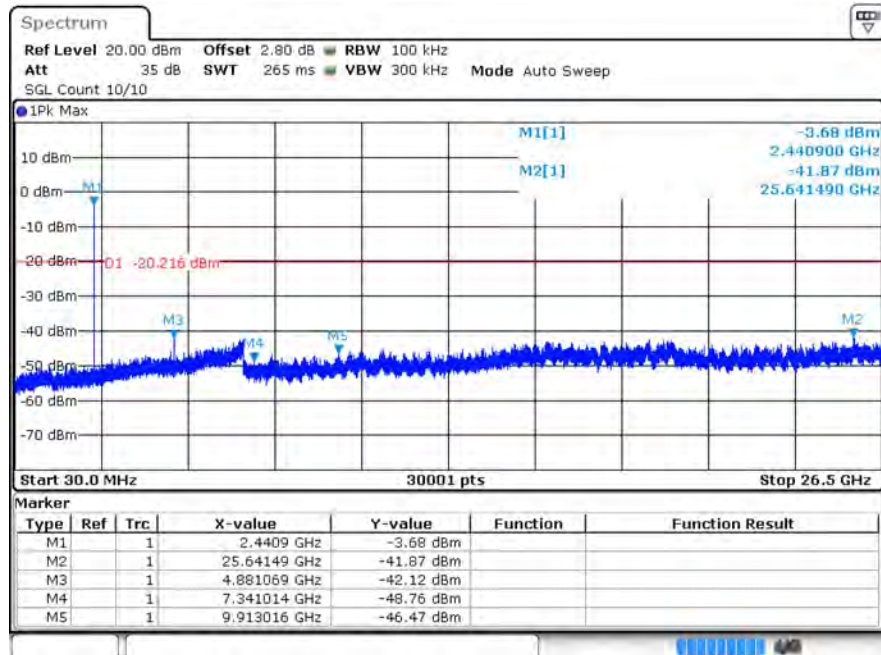


$\pi/4$ DQPSK_MCH_Graphs

Pref

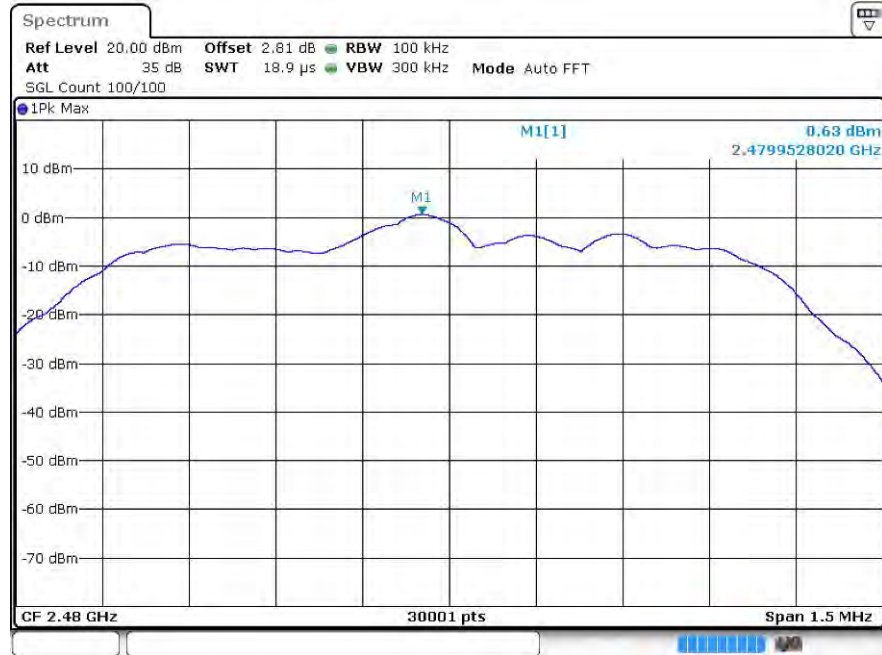


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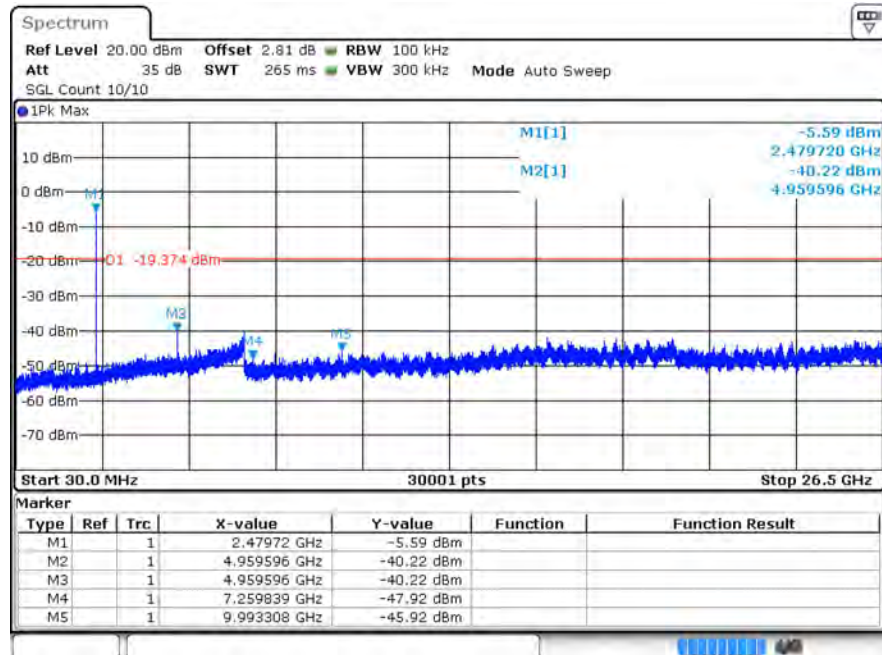


$\pi/4$ DQPSK_HCH_Graphs

Pref

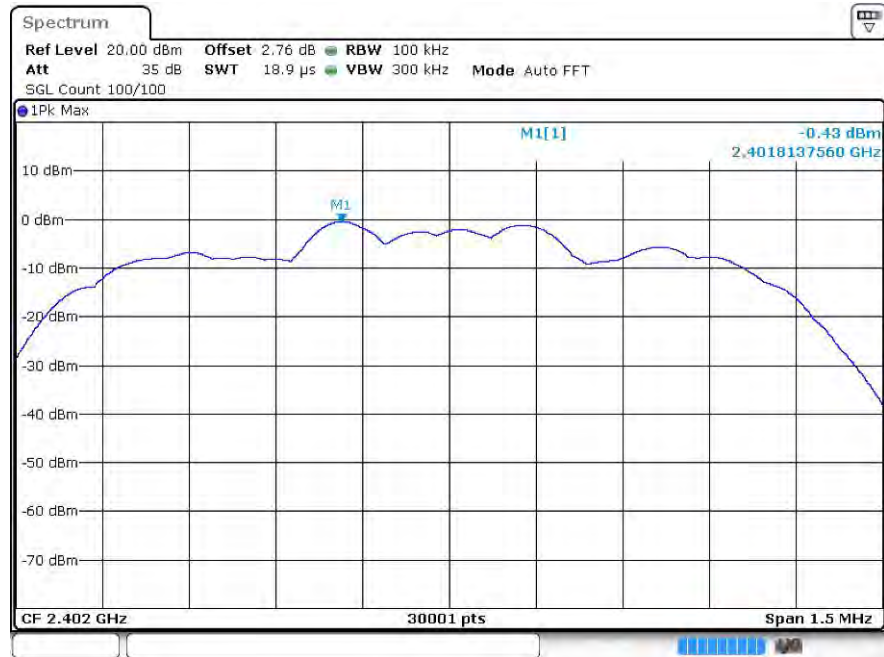


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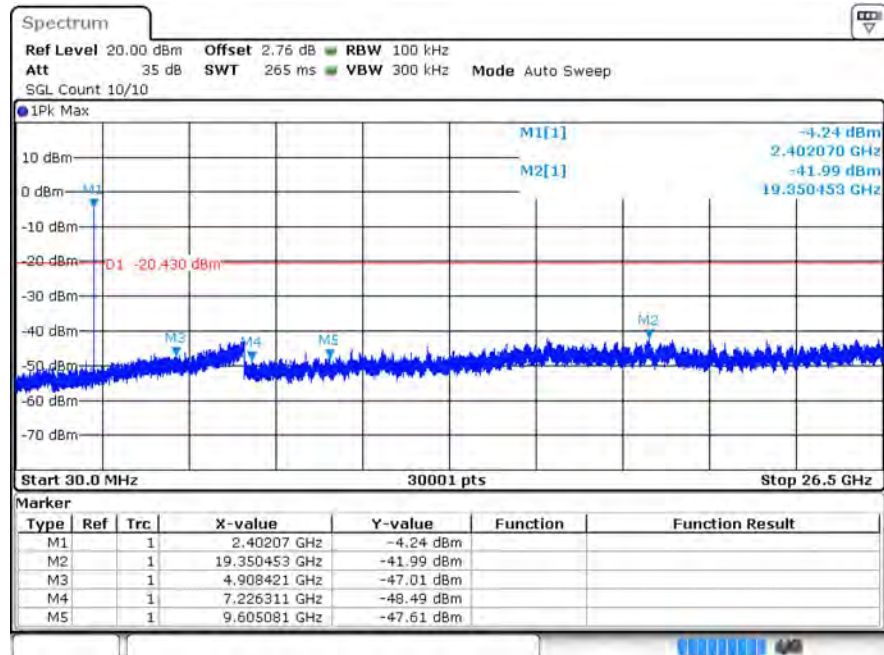


8DPSK_LCH_Graphs

Pref



Puw

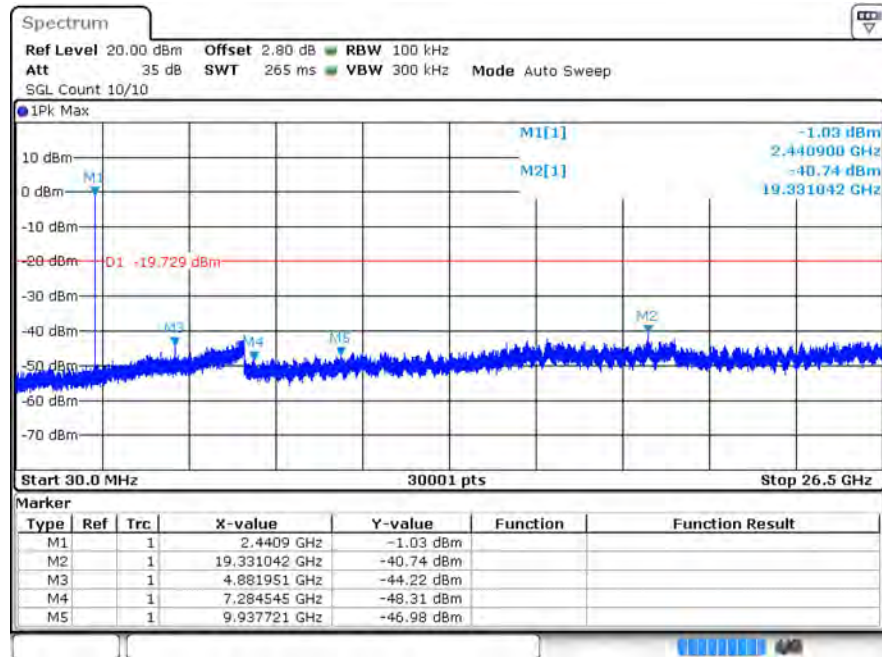


8DPSK_MCH_Graphs

Pref

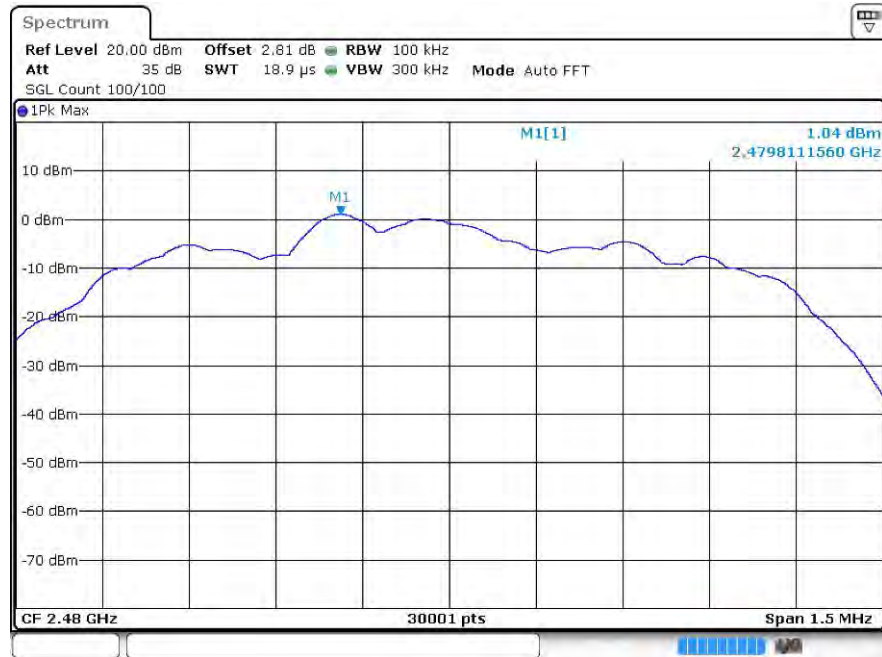


Puw

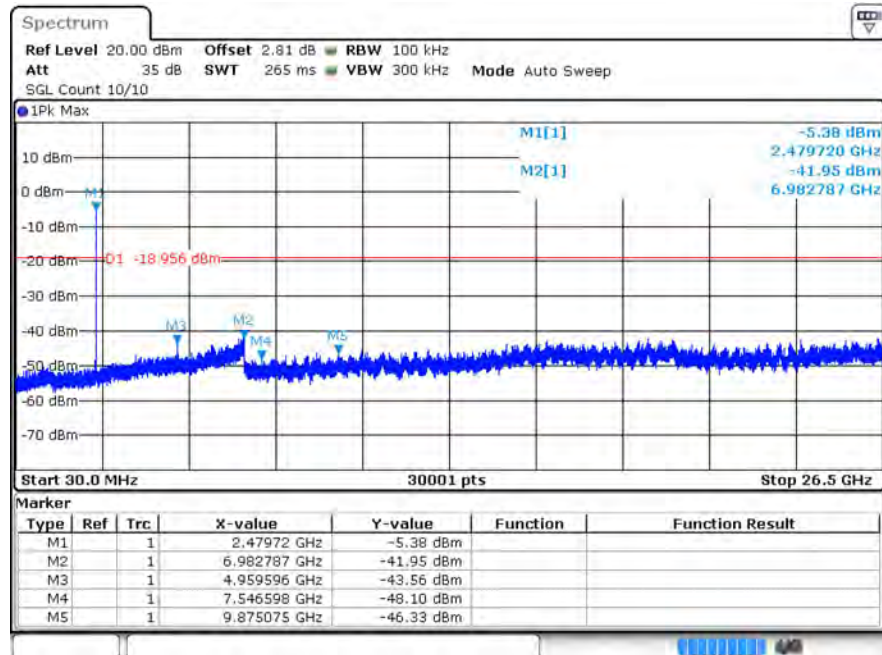


8DPSK_HCH_Graphs

Pref



Puw

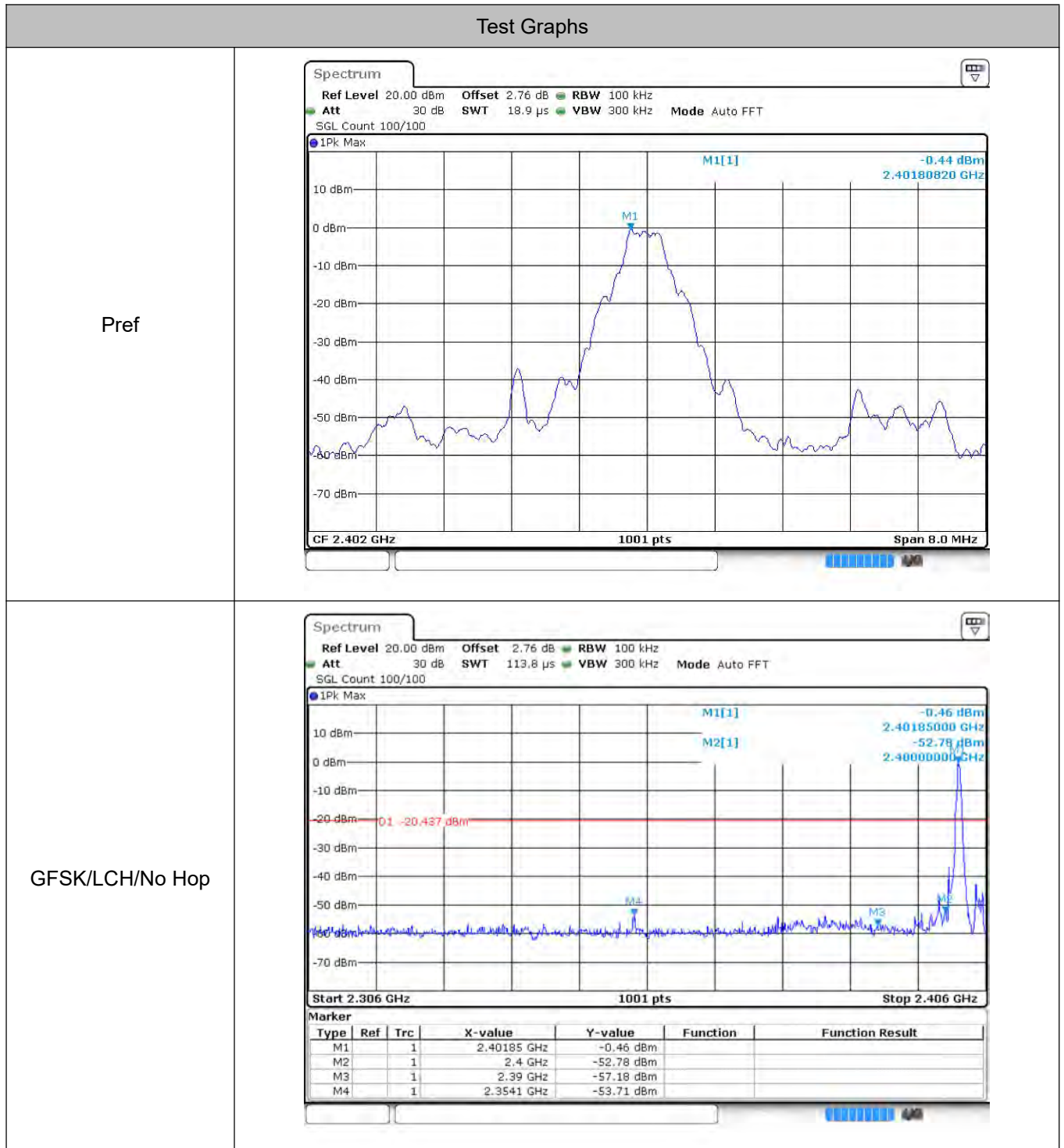


8 Band-edge for RF Conducted Emissions

8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-53.27	-20	Pass
			On	-52.25	-20	Pass
	HCH	2480	Off	-46.36	-20	Pass
			On	-46.22	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-54.38	-20	Pass
			On	-51.91	-20	Pass
	HCH	2480	Off	-48.37	-20	Pass
			On	-47.03	-20	Pass
8DPSK	LCH	2402	Off	-51.5	-20	Pass
			On	-52.5	-20	Pass
	HCH	2480	Off	-47.42	-20	Pass
			On	-48.84	-20	Pass

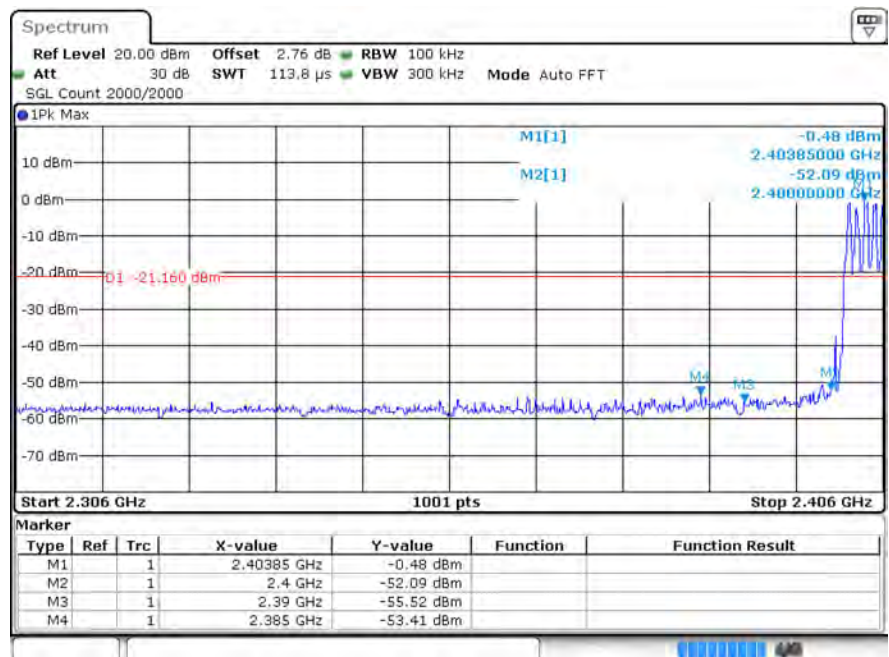
8.2 Test Graphs



Ref



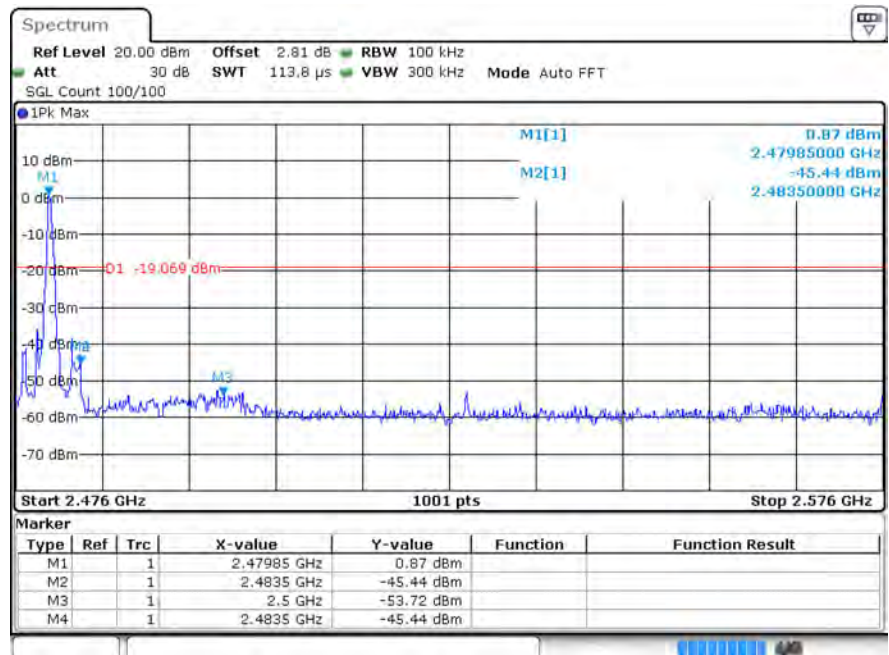
GFSK/LCH/Hop



Ref



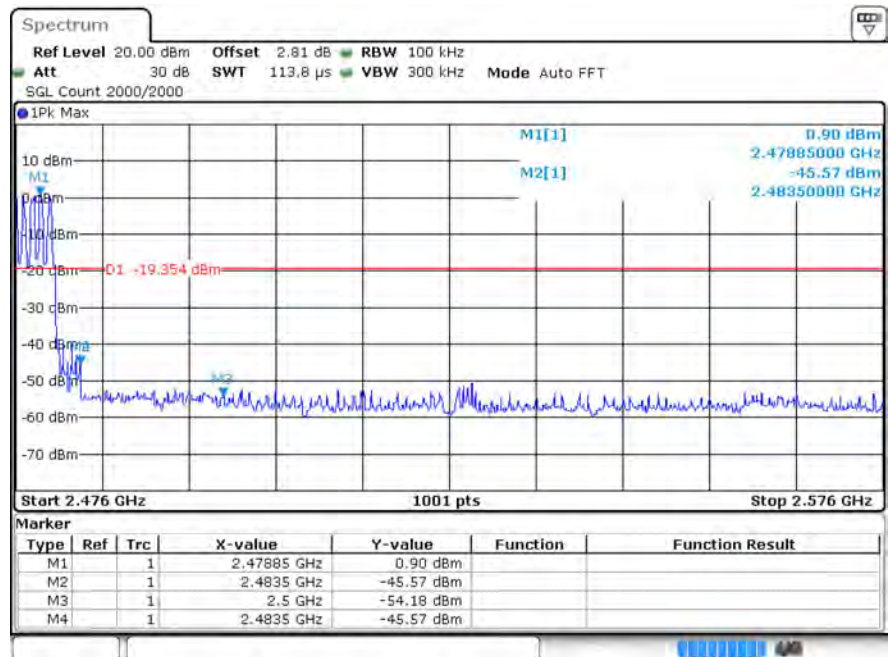
GFSK/HCH/No Hop



Ref.



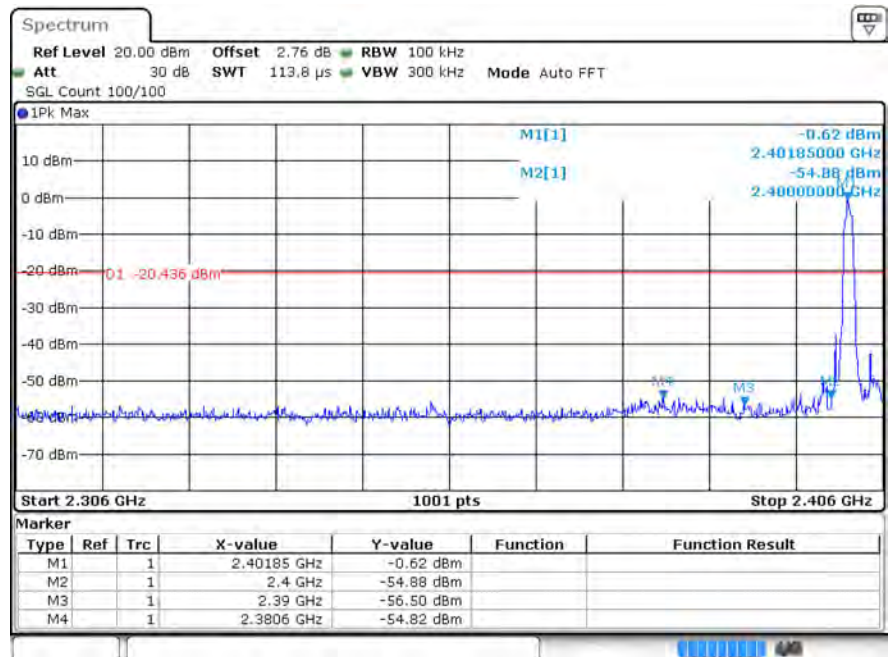
GFSK/HCH/Hop



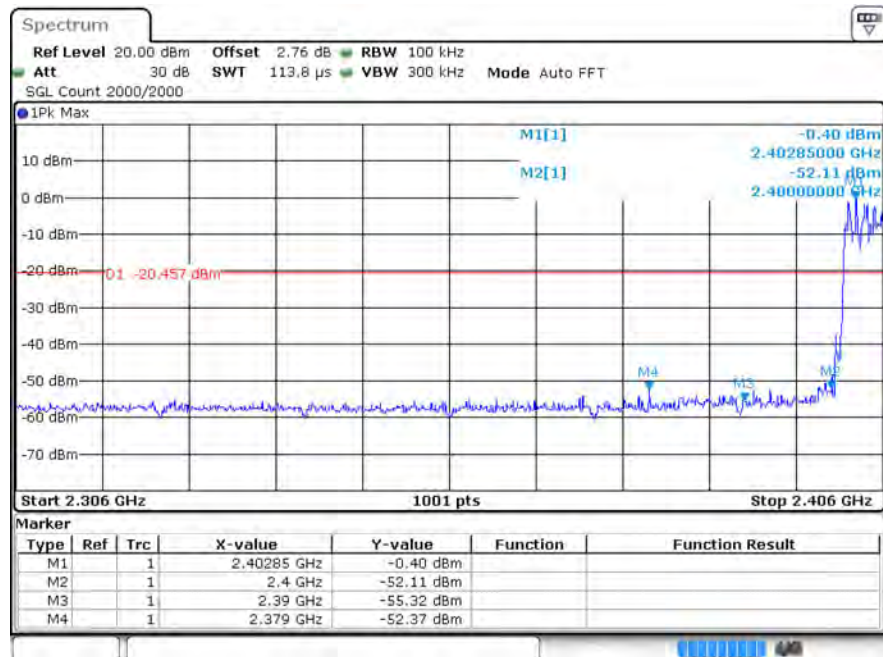
Ref



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



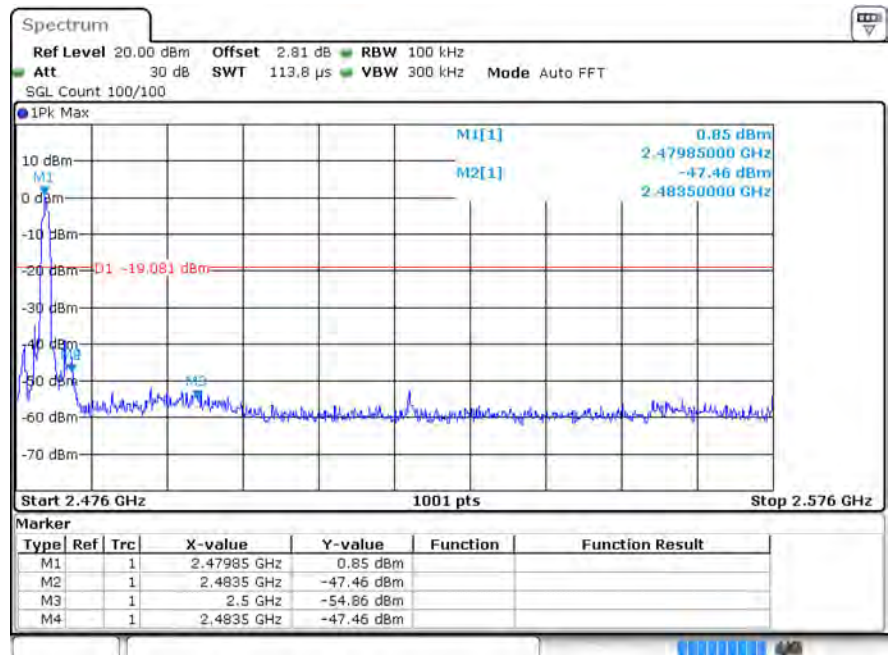
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 $\pi/4$ DQPSK/LCH/Hop


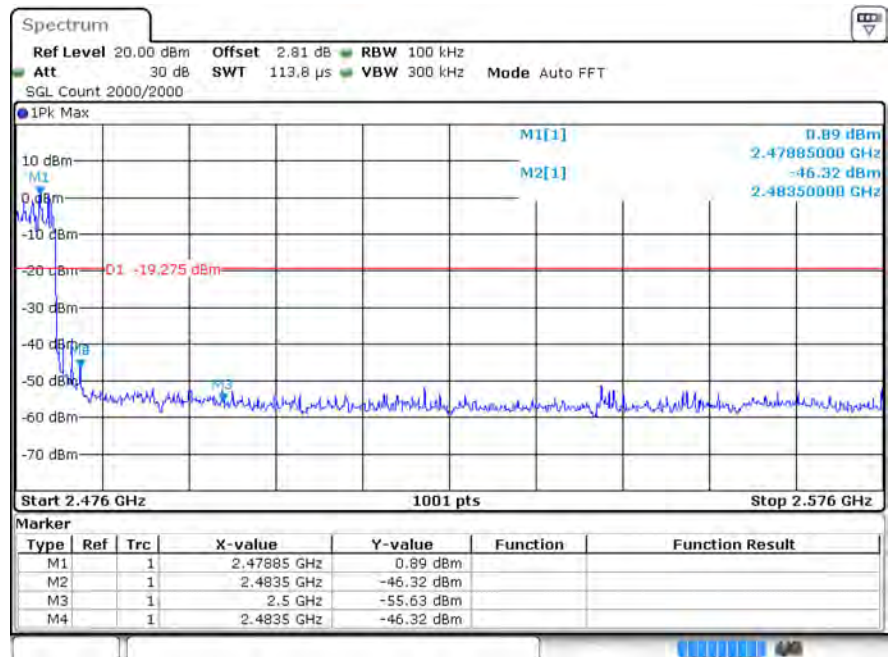
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$\pi/4$ DQPSK/HCH/No
Hop



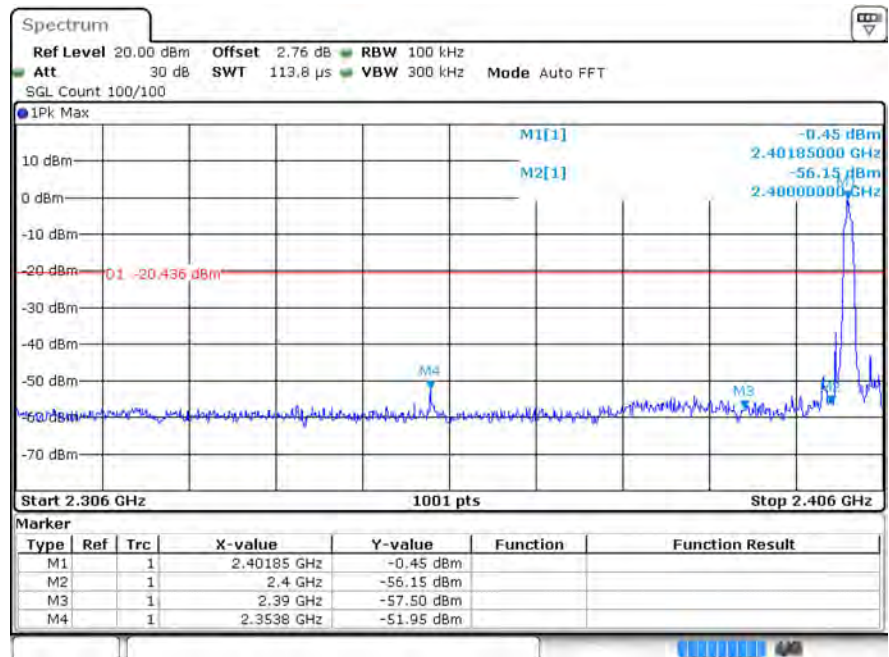
Ref


 $\pi/4$ DQPSK/HCH/Hop


Ref



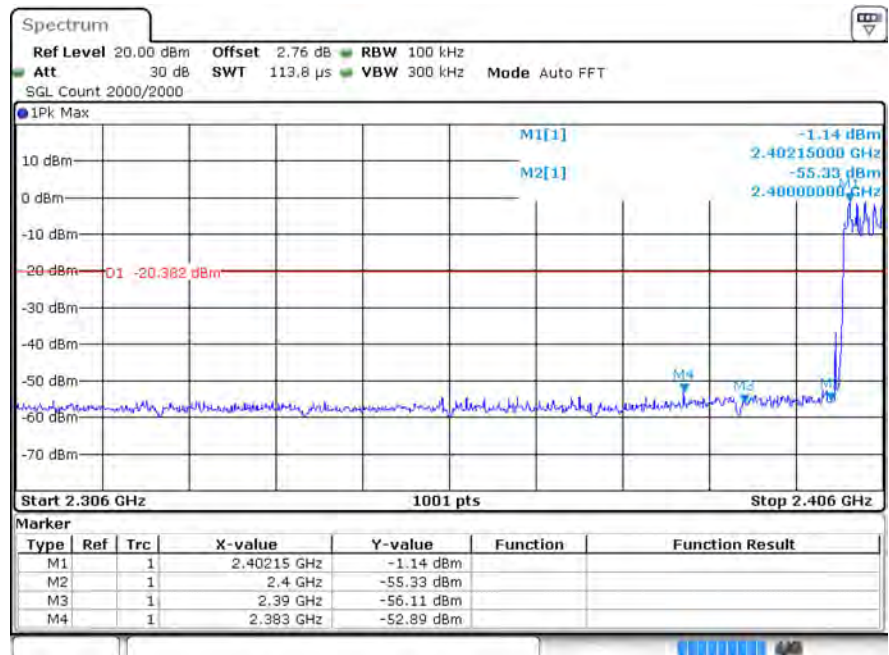
8DPSK/LCH/No Hop



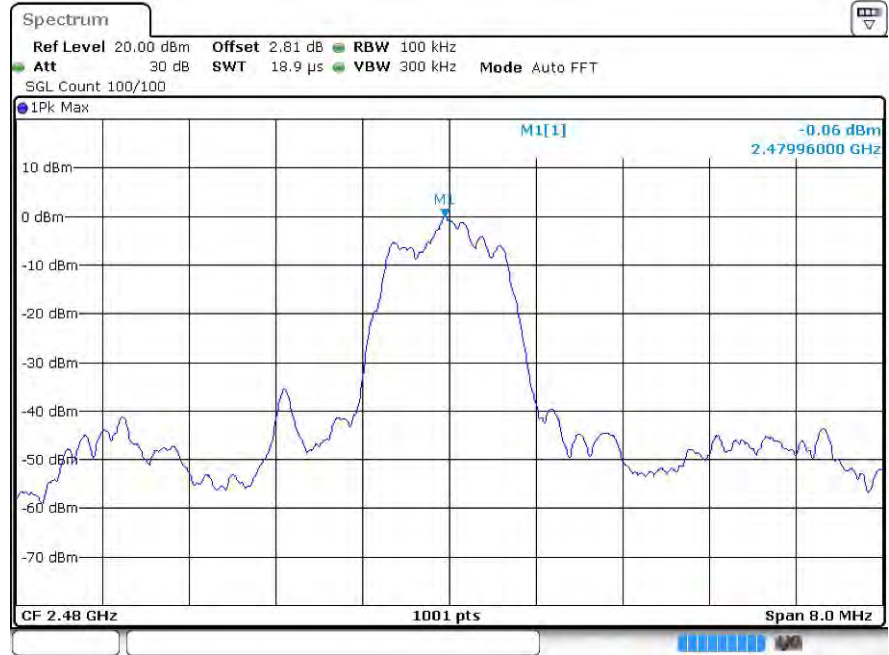
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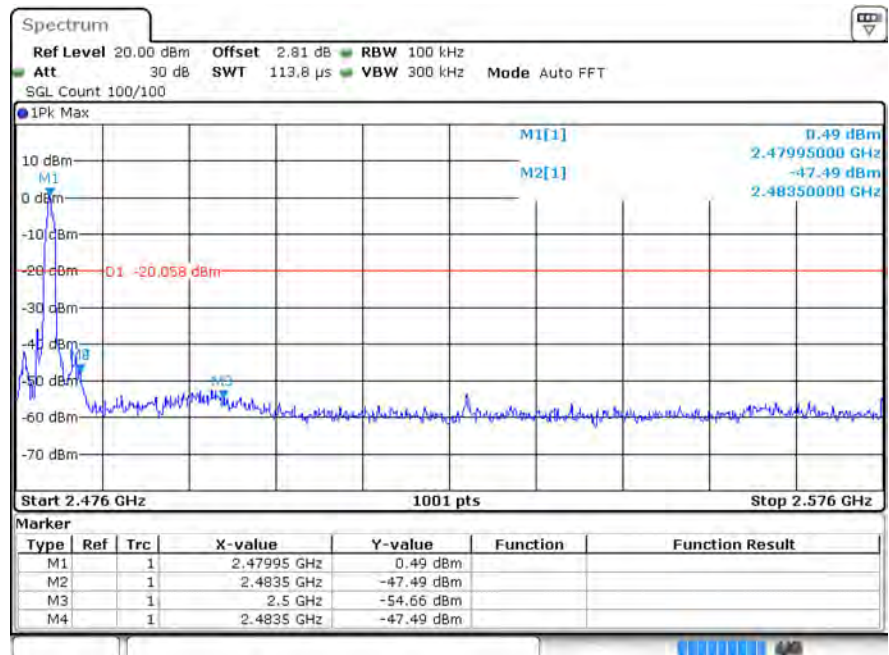
8DPSK/LCH/Hop



Ref



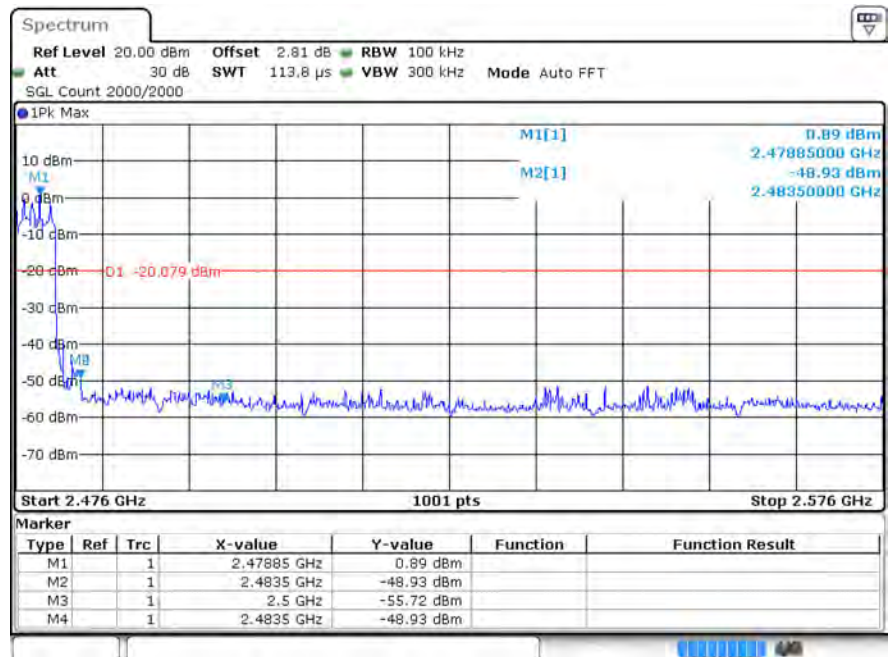
8DPSK/HCH/No Hop



Ref



8DPSK/HCH/Hop



9 Restrict-band band-edge measurements

9.1 Test Result

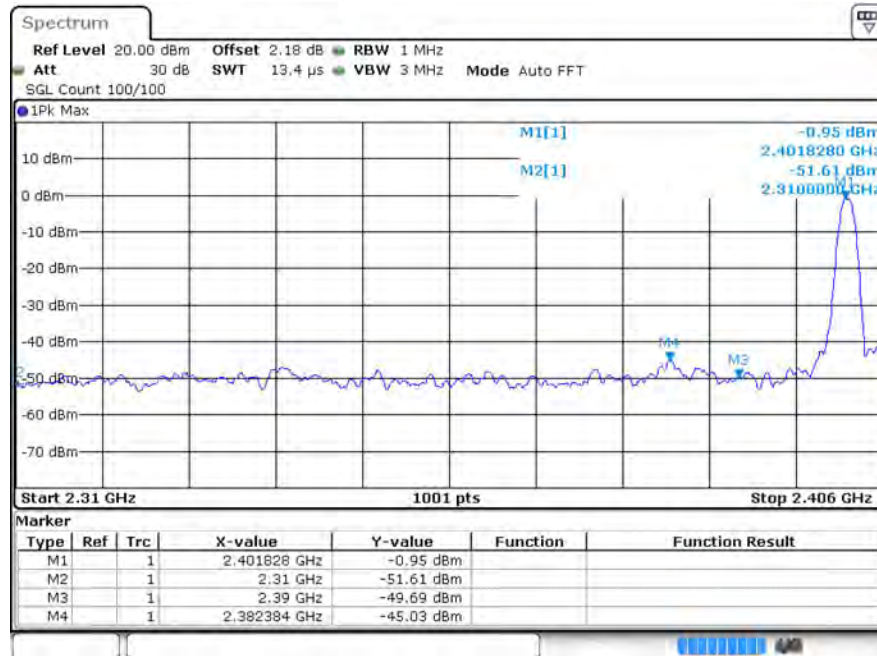
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-51.6	2	45.66	PEAK	74	Pass
	Off	2310.0	-58.69	2	38.57	AV	54	Pass
	Off	2382.384	-45.02	2	52.24	PEAK	74	Pass
	Off	2381.136	-55.26	2	42	AV	54	Pass
	Off	2390.0	-49.68	2	47.58	PEAK	74	Pass
	Off	2390.0	-56.35	2	40.91	AV	54	Pass
	Off	2483.5	-39.93	2	57.33	PEAK	74	Pass
	Off	2483.5	-45.64	2	51.62	AV	54	Pass
	Off	2483.512	-39.93	2	57.33	PEAK	74	Pass
	Off	2483.512	-45.64	2	51.62	AV	54	Pass
	Off	2500.0	-45.86	2	51.4	PEAK	74	Pass
	Off	2500.0	-54.02	2	43.24	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-50.94	2	46.32	PEAK	74	Pass
	Off	2310.0	-58.91	2	38.35	AV	54	Pass
	Off	2379.984	-46.88	2	50.38	PEAK	74	Pass
	Off	2383.536	-55.37	2	41.89	AV	54	Pass
	Off	2390.0	-48.63	2	48.63	PEAK	74	Pass
	Off	2390.0	-56.4	2	40.86	AV	54	Pass
	Off	2483.5	-39.97	2	57.29	PEAK	74	Pass
	Off	2483.5	-47.4	2	49.86	AV	54	Pass
	Off	2483.512	-39.97	2	57.29	PEAK	74	Pass
	Off	2483.512	-47.4	2	49.86	AV	54	Pass
	Off	2500.0	-48.4	2	48.86	PEAK	74	Pass
	Off	2500.0	-54.23	2	43.03	AV	54	Pass
8DPSK	Off	2310.0	-47.96	2	49.3	PEAK	74	Pass
	Off	2310.0	-58.72	2	38.54	AV	54	Pass
	Off	2340.528	-46.19	2	51.07	PEAK	74	Pass
	Off	2382.384	-55.1	2	42.16	AV	54	Pass



	Off	2390.0	-50.46	2	46.8	PEAK	74	Pass
	Off	2390.0	-56.1	2	41.16	AV	54	Pass
	Off	2483.5	-40.29	2	56.97	PEAK	74	Pass
	Off	2483.5	-47.57	2	49.69	AV	54	Pass
	Off	2483.512	-40.29	2	56.97	PEAK	74	Pass
	Off	2483.512	-47.57	2	49.69	AV	54	Pass
	Off	2500.0	-45.52	2	51.74	PEAK	74	Pass
	Off	2500.0	-53.79	2	43.47	AV	54	Pass

9.2 Test Graphs

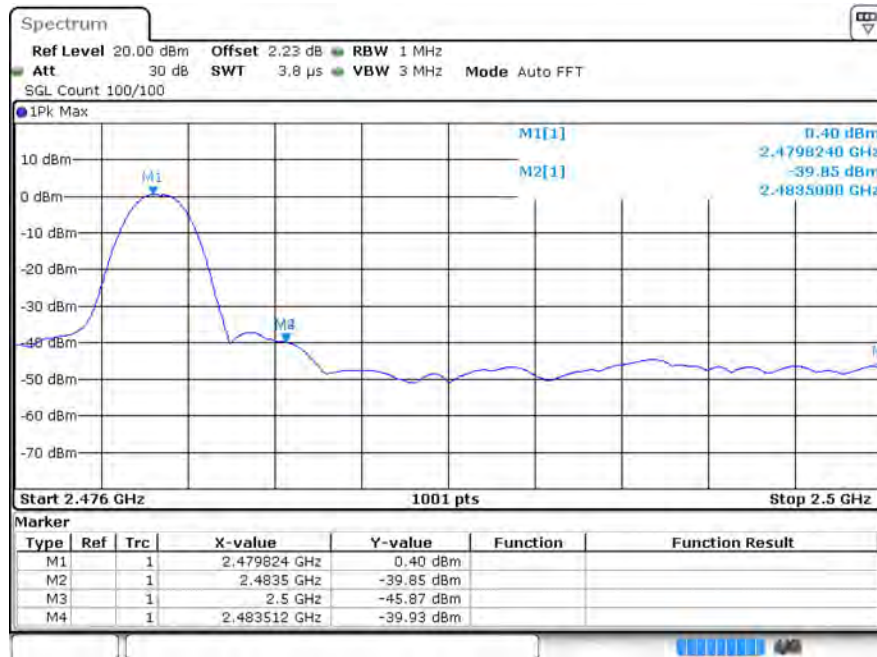
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



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



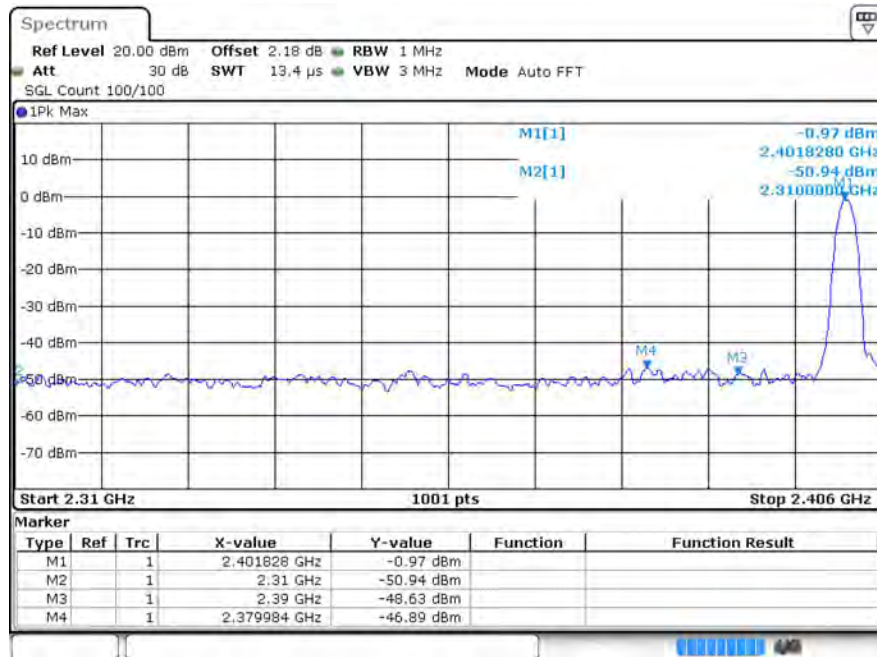
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



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



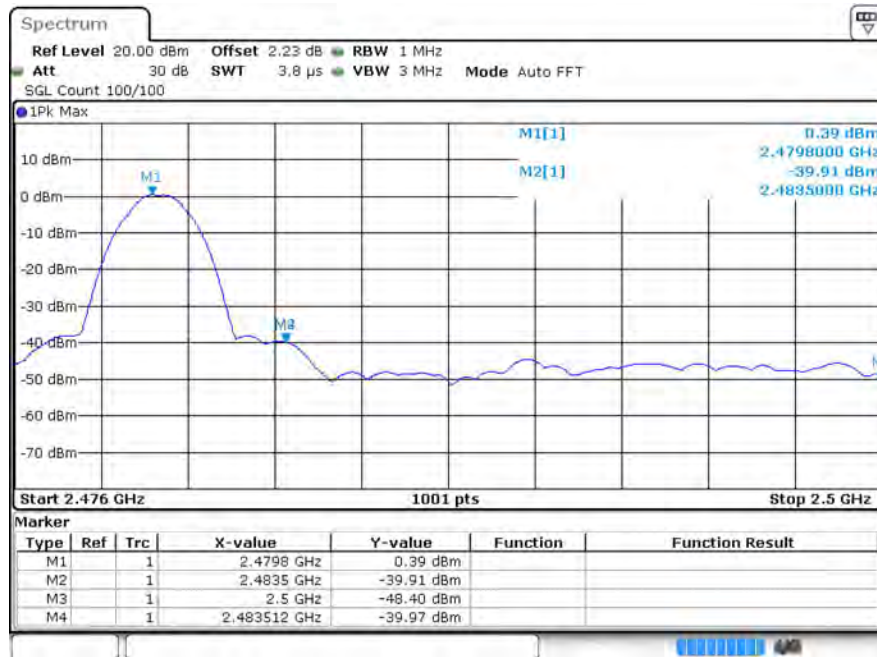
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



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



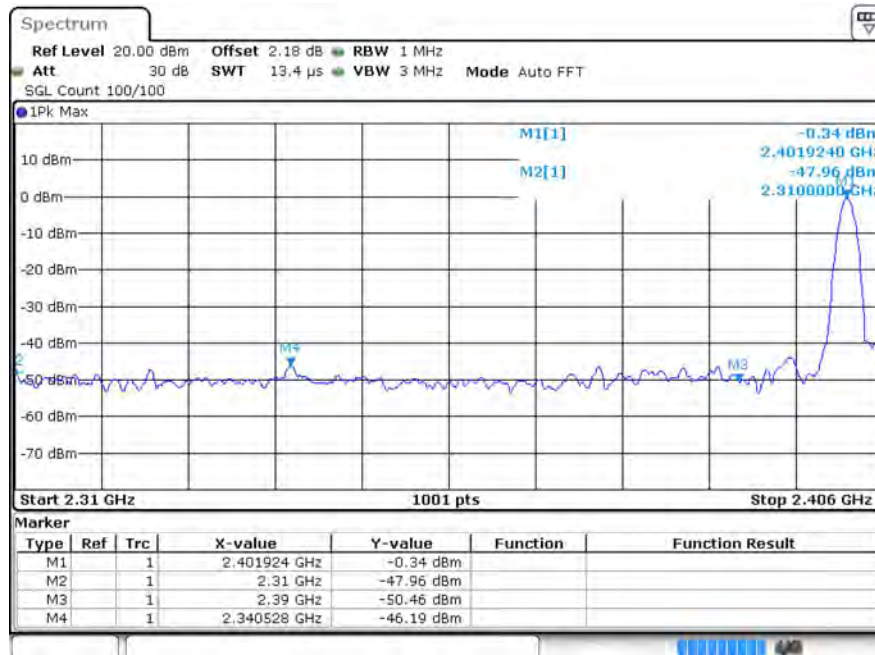
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



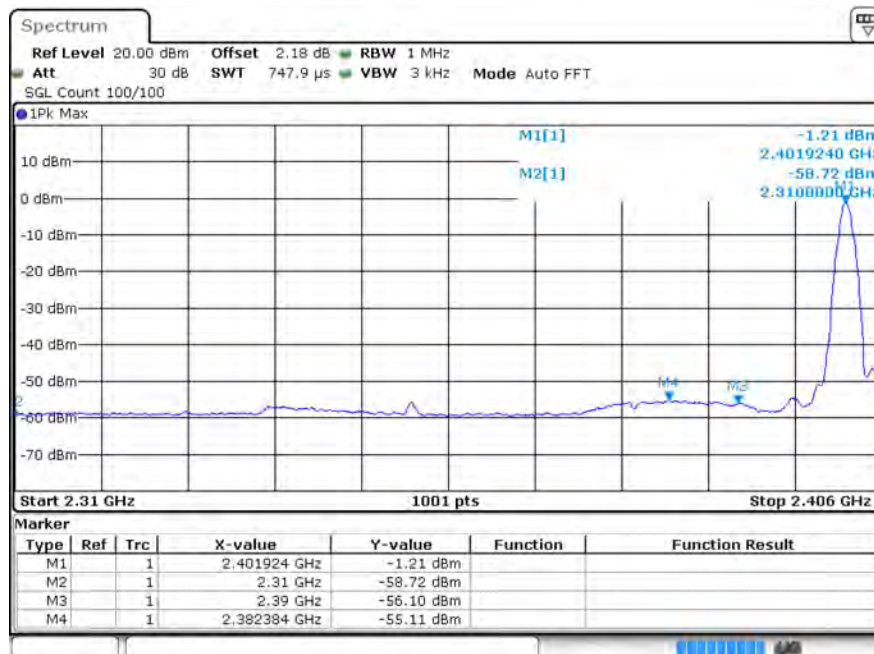
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



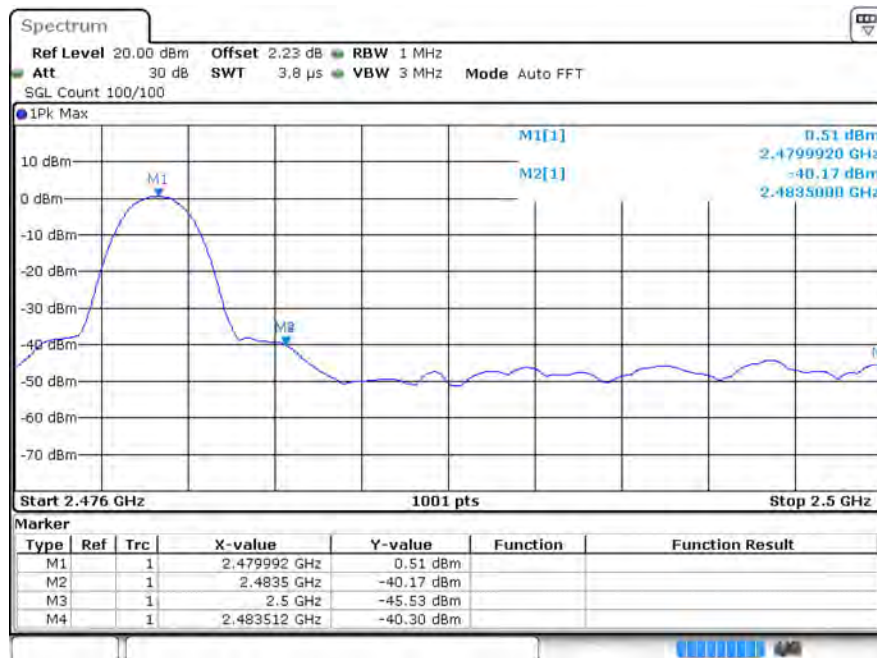
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



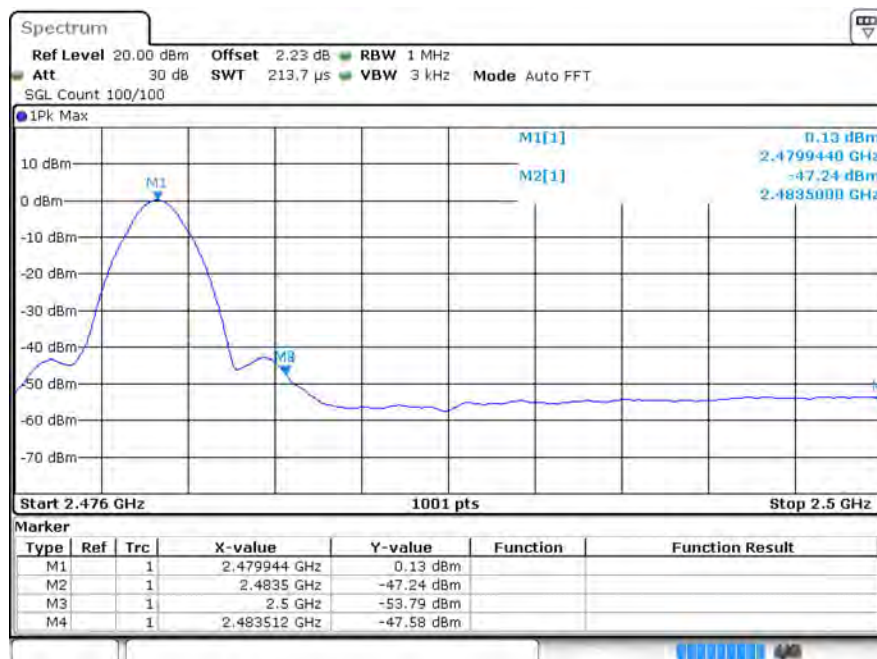
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



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



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



---The End---