



Appendix A

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

Product Name: AUTOMOTIVE DIAGNOSIS SYSTEM,COMPREHENSIVE TPMS TOOL

Trade Mark: AUTEL

Test Model: MaxiCheck MX900-TS

Environmental Conditions

Temperature:	25.5℃
Relative Humidity:	52.4%
ATM Pressure:	101Kpa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

Contents

Page

COVER PAGE

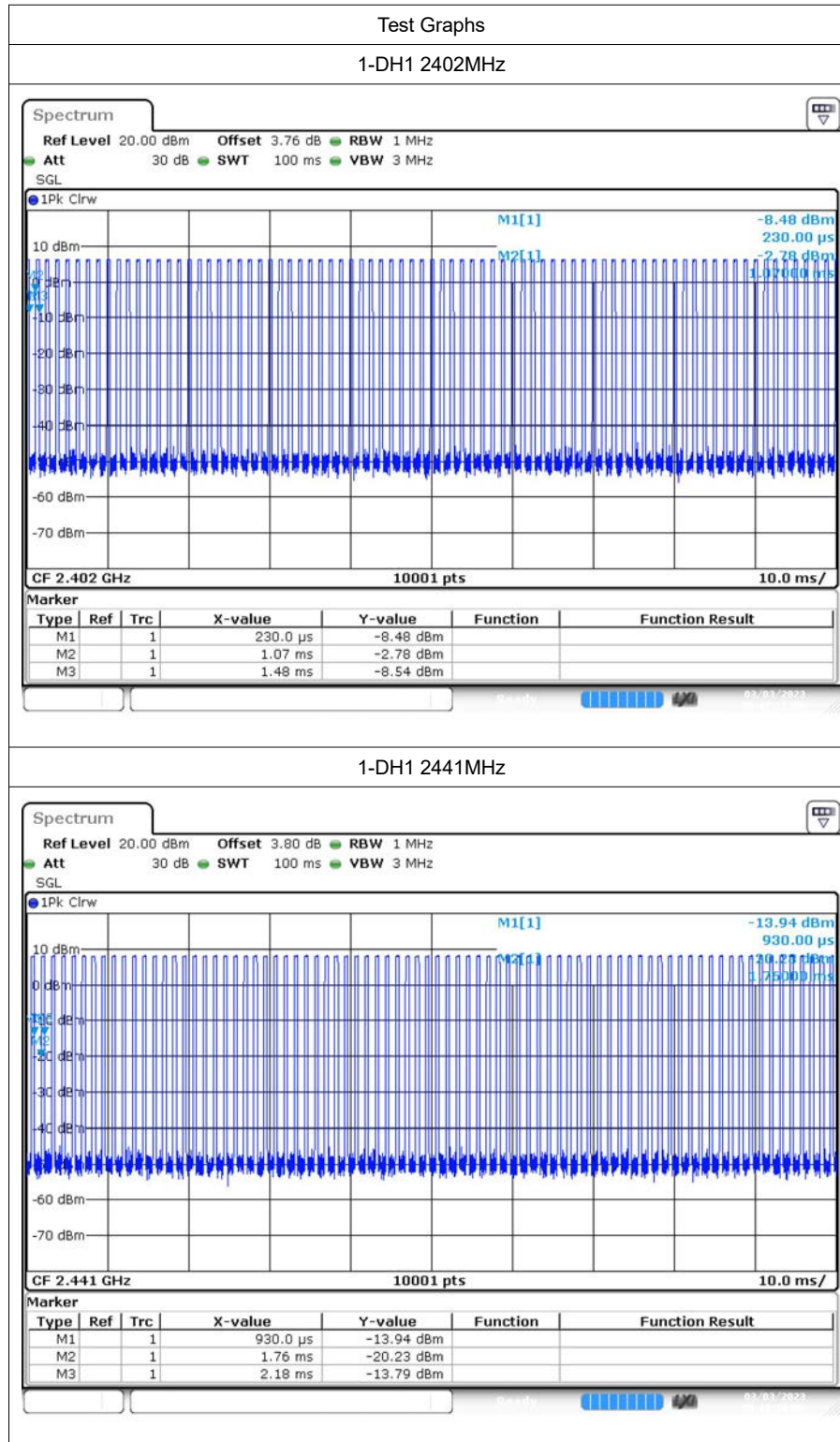
1	Duty Cycle	3
1.1	Test Result	3
1.2	Test Graphs	4
2	Maximum Conducted Peak Output Power	9
2.1	Test Result	9
2.2	Test Graphs	10
3	20dB Bandwidth	15
3.1	Test Result	15
3.2	Test Graphs	16
4	Carrier Frequency Separation	21
4.1	Test Result	21
4.2	Test Graphs	22
5	Hopping Channel Number	24
5.1	Test Result	24
5.2	Test Graphs	25
6	Dwell Time	27
6.1	Test Result	27
6.2	Test Graphs	28
7	RF Conducted Spurious Emissions	31
7.1	Test Result	31
7.2	Test Graphs	32
8	Band-edge for RF Conducted Emissions	41
8.1	Test Result	41
8.2	Test Graphs	42
9	Restrict-band band-edge measurements	54
9.1	Test Result	54
9.2	Test Graphs	56

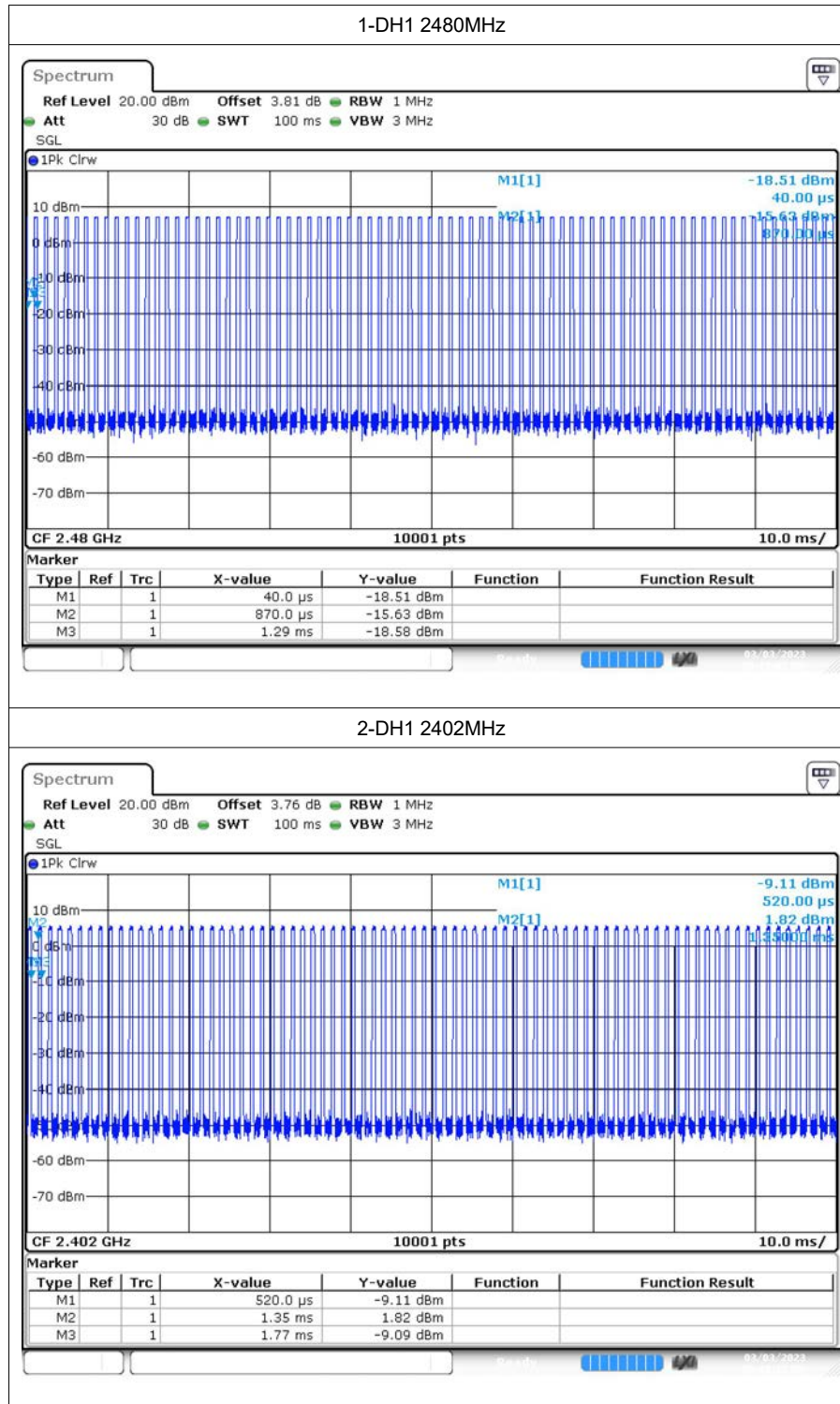
1 Duty Cycle

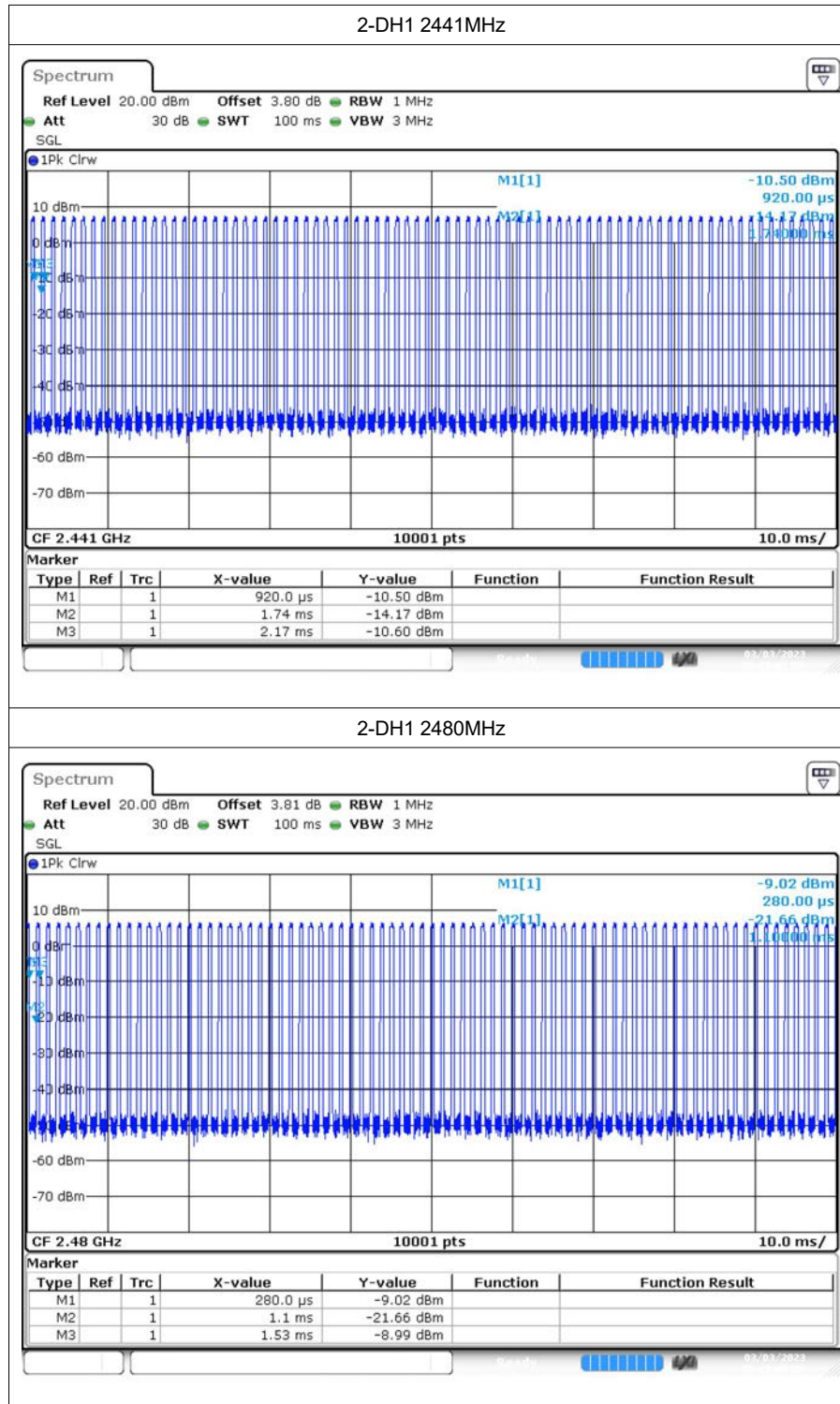
1.1 Test Result

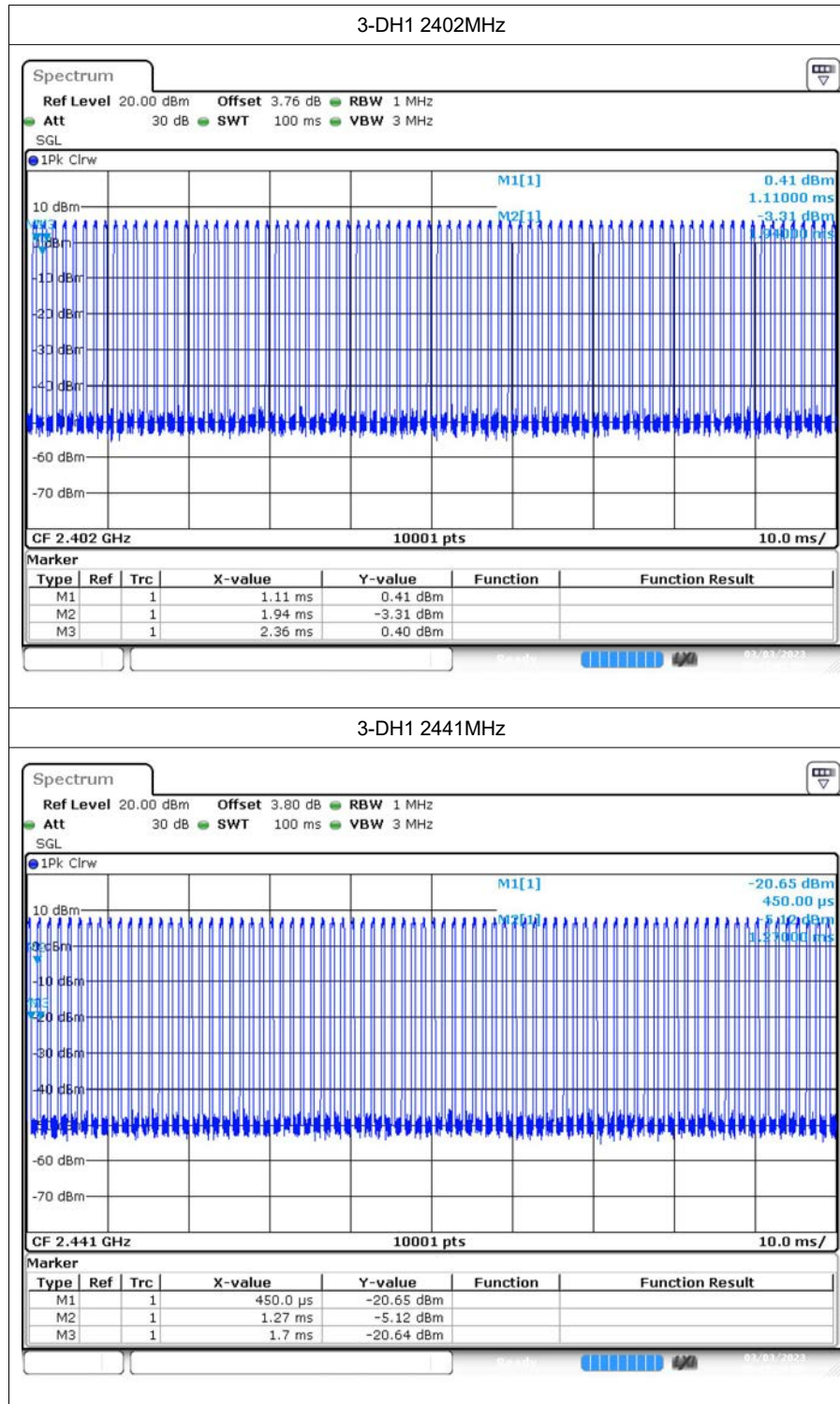
Mode	Frequency (MHz)	Duty Cycle (%)	1/T (kHz)
1-DH1	2402	33.61	2.44
1-DH1	2441	34.4	2.38
1-DH1	2480	34.41	2.38
2-DH1	2402	34.4	2.38
2-DH1	2441	35.2	2.33
2-DH1	2480	35.21	2.33
3-DH1	2402	34.4	2.38
3-DH1	2441	35.2	2.33
3-DH1	2480	35.2	2.33

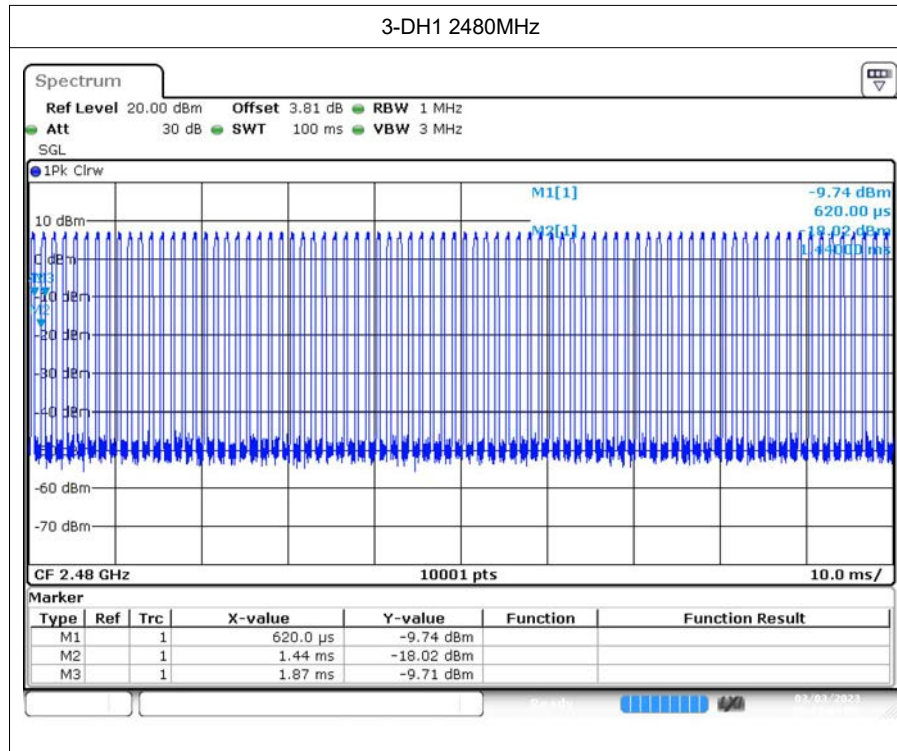
1.2 Test Graphs









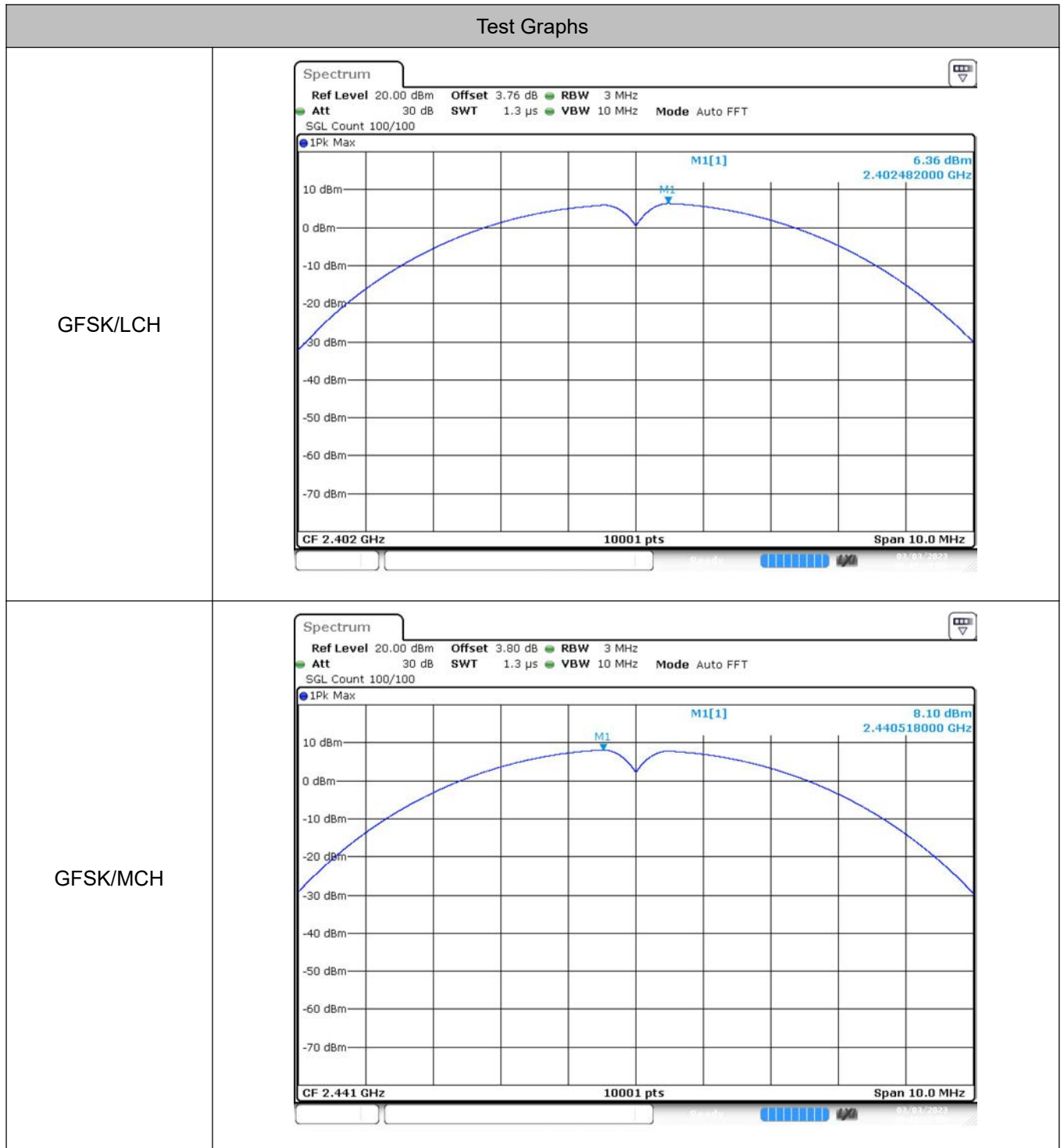


2 Maximum Conducted Peak Output Power

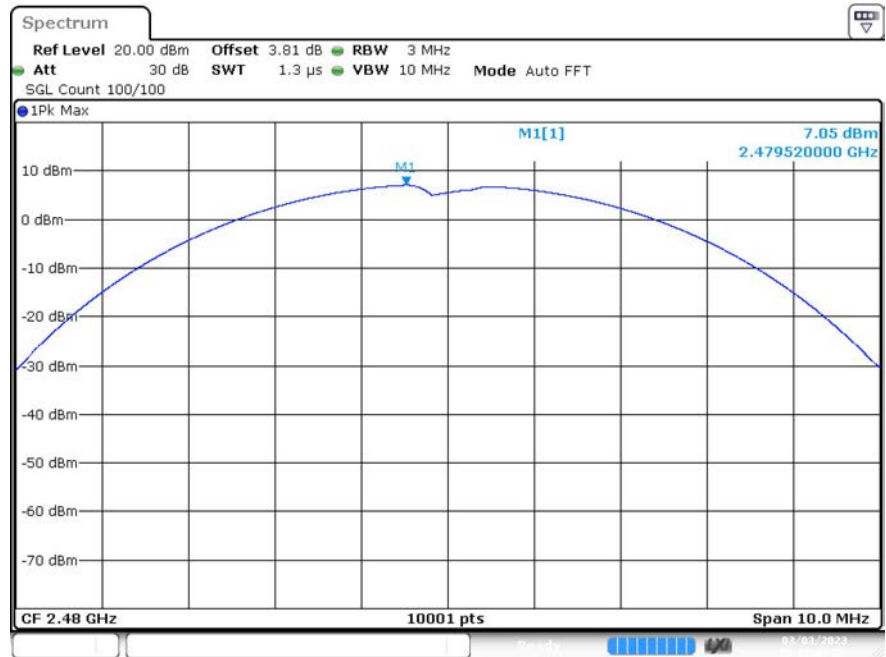
2.1 Test Result

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	6.36	21	Pass
	MCH	8.1	21	Pass
	HCH	7.05	21	Pass
$\pi/4$ DQPSK	LCH	5.95	21	Pass
	MCH	7.14	21	Pass
	HCH	6.03	21	Pass
8DPSK	LCH	6	21	Pass
	MCH	7.36	21	Pass
	HCH	6.87	21	Pass

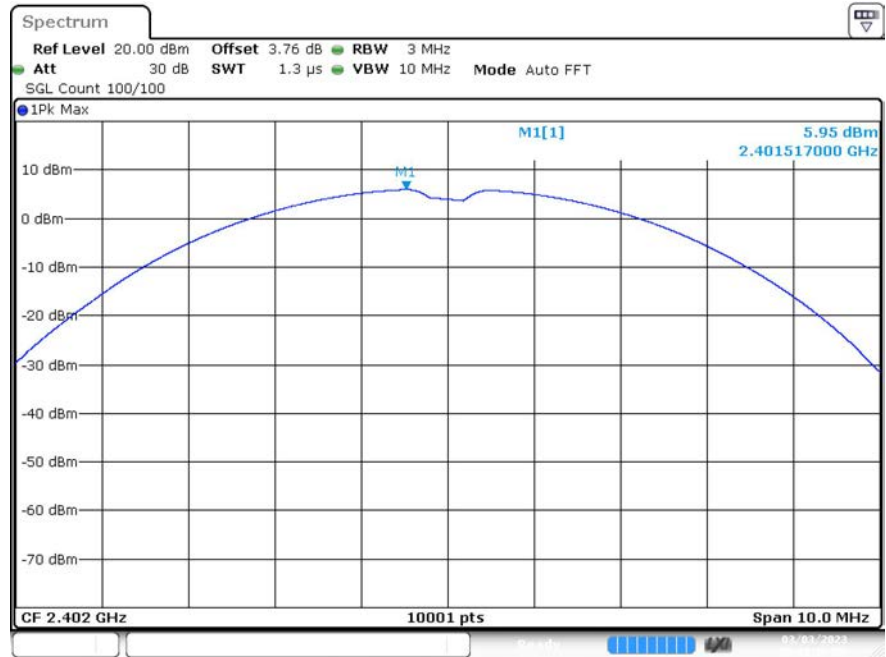
2.2 Test Graphs



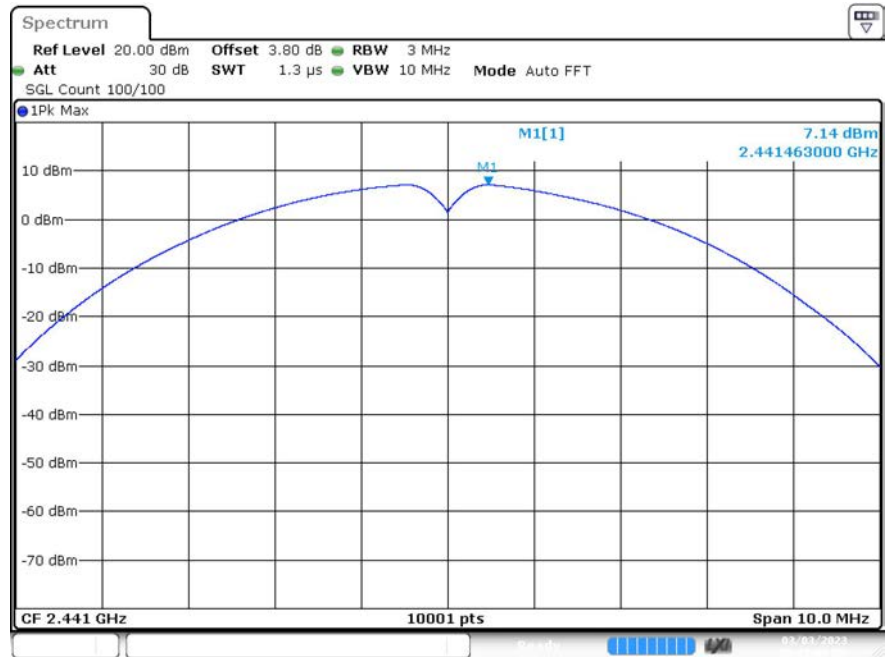
GFSK/HCH



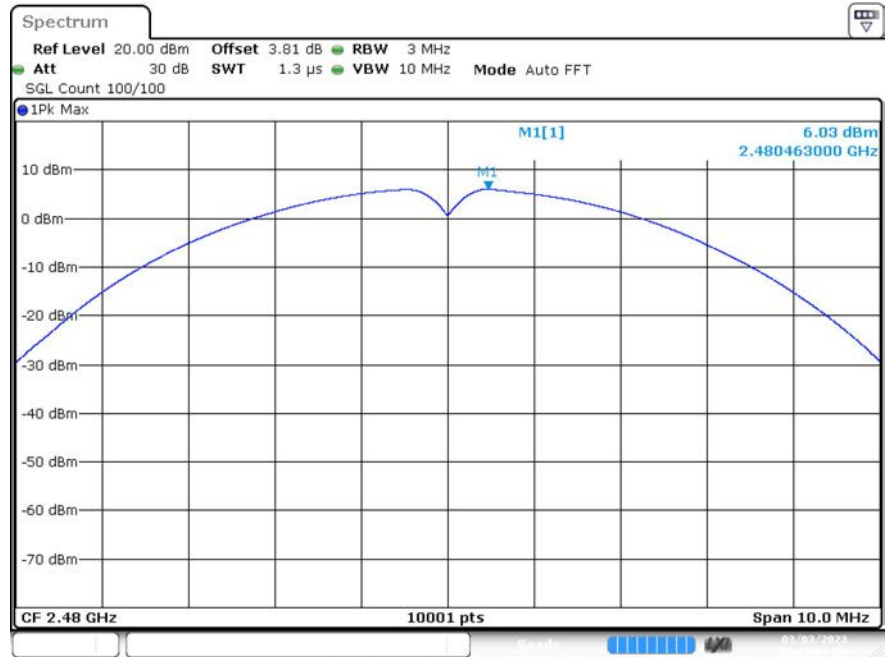
π /4DQPSK/LCH



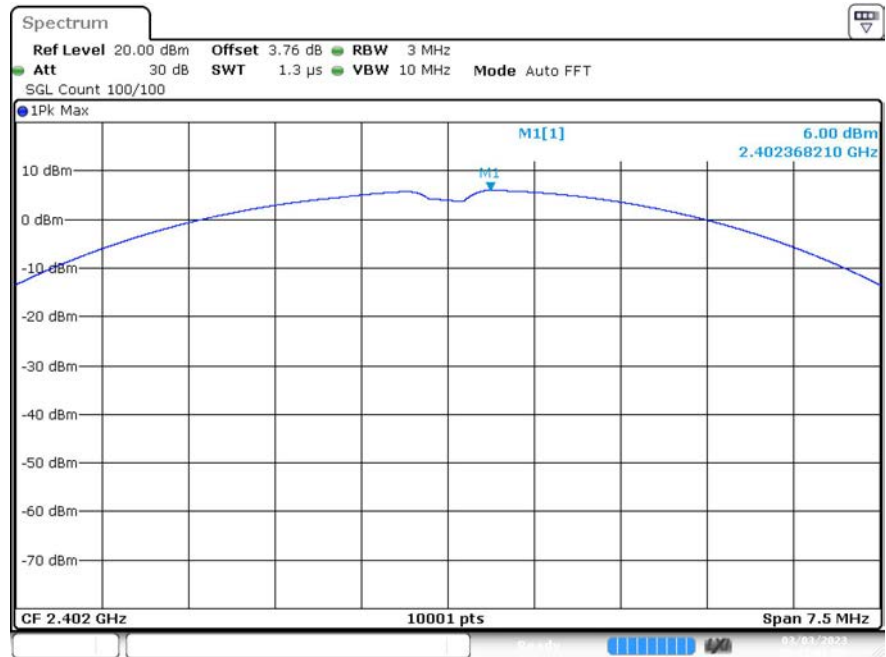
$\pi/4$ DQPSK/MCH



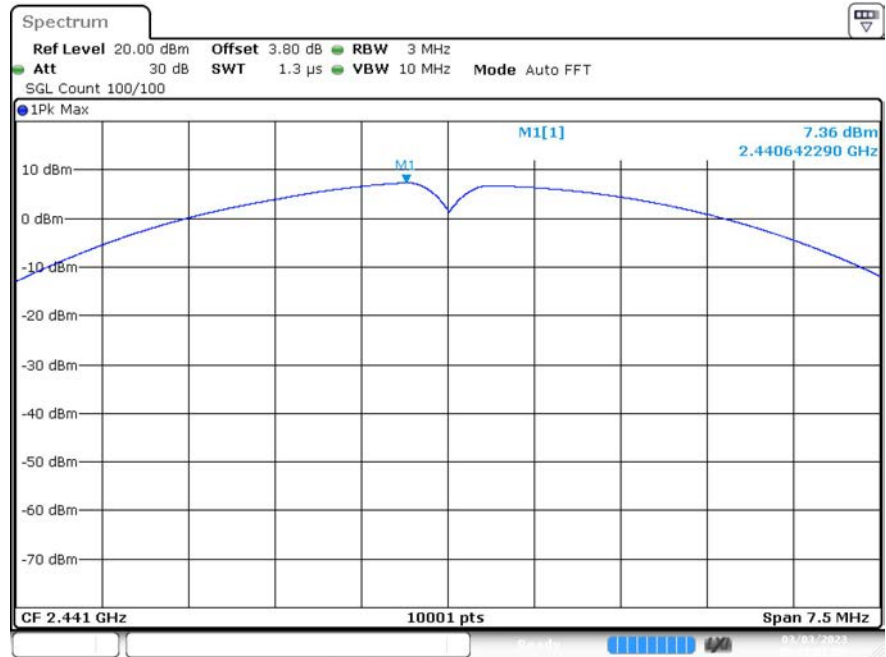
$\pi/4$ DQPSK/HCH



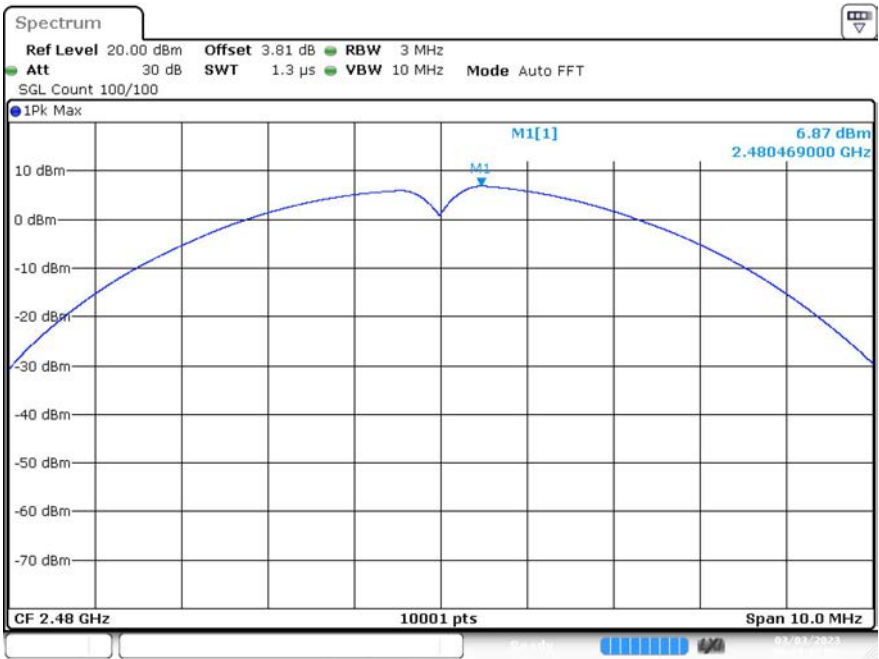
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

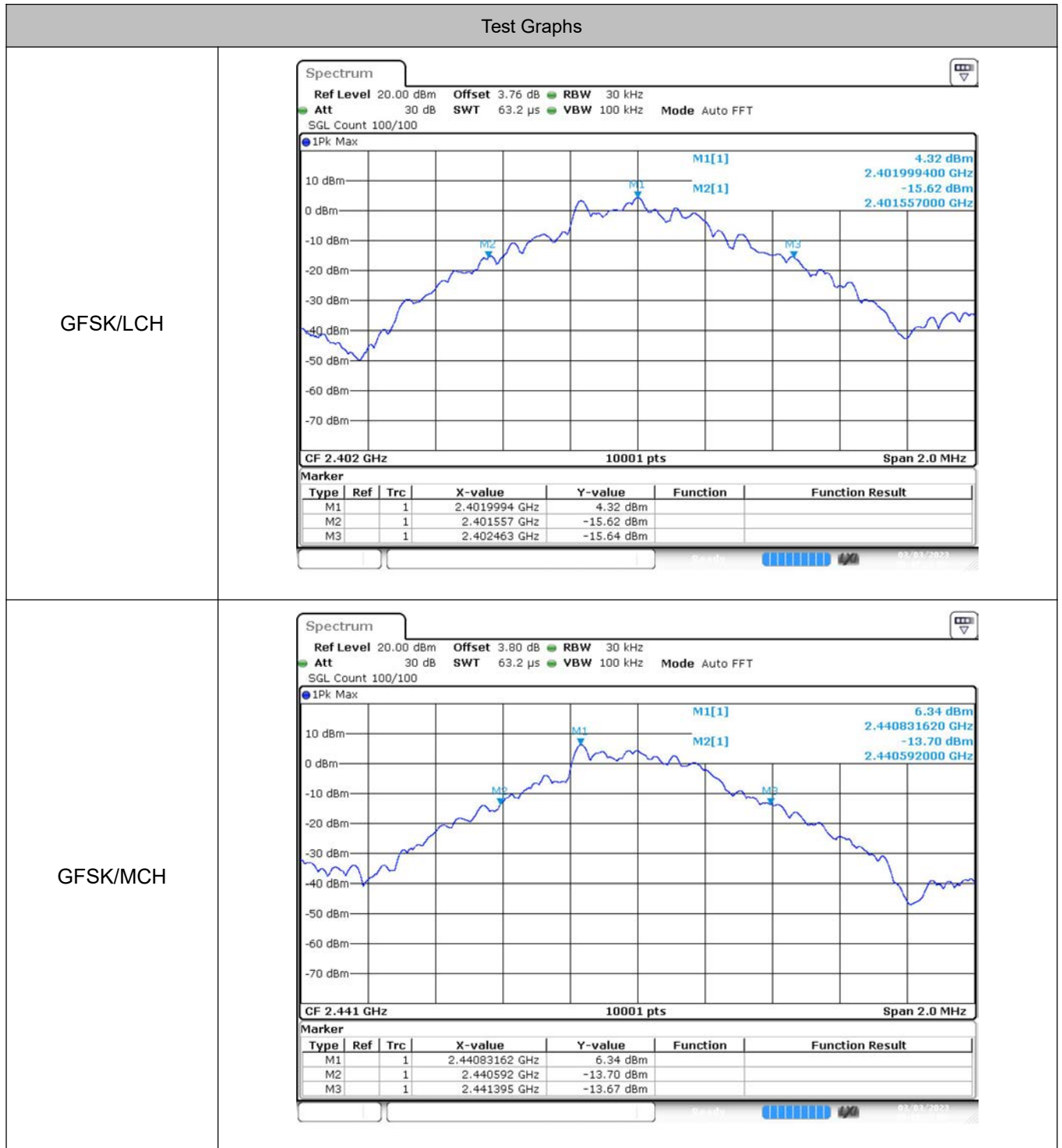


3 20dB Bandwidth

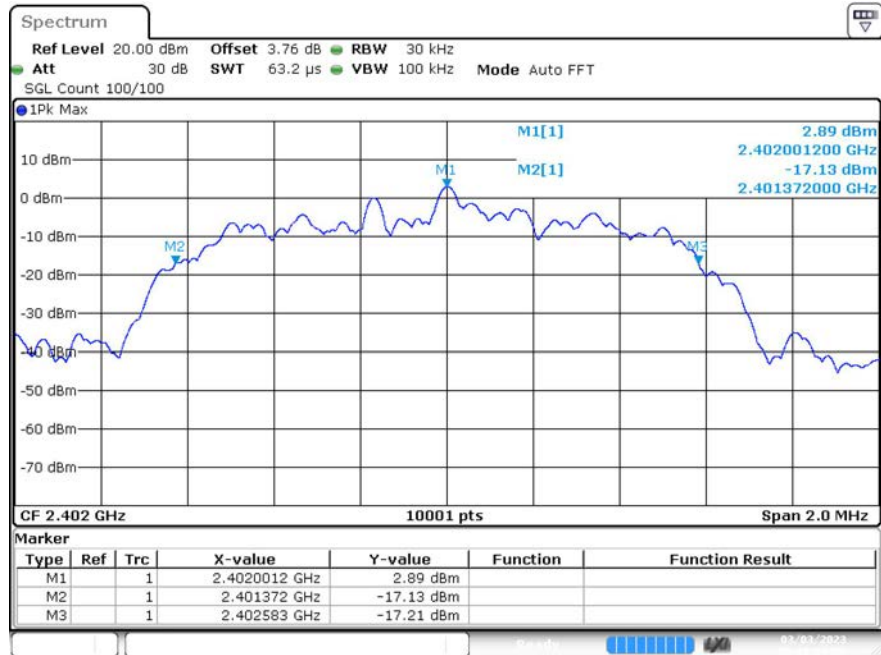
3.1 Test Result

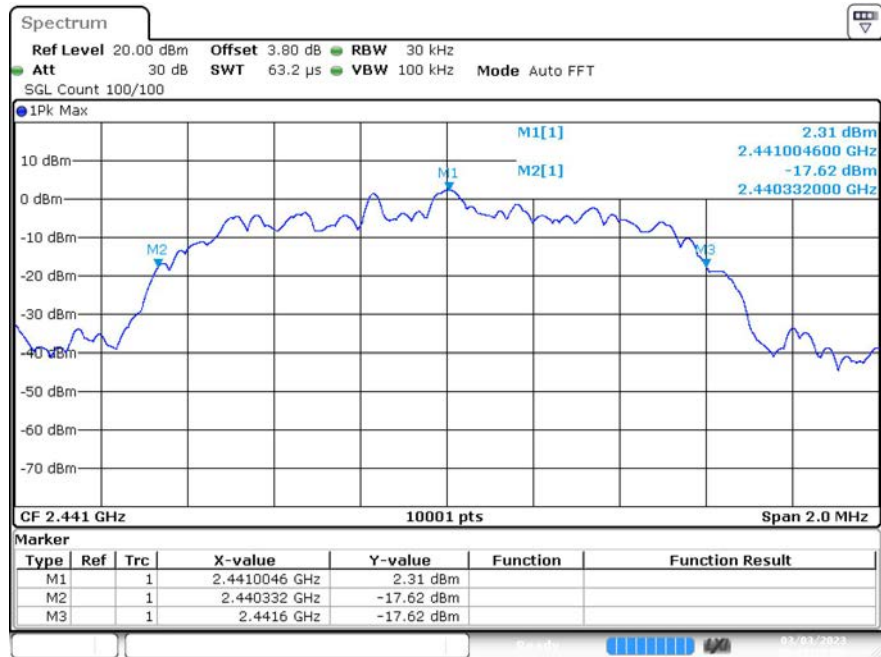
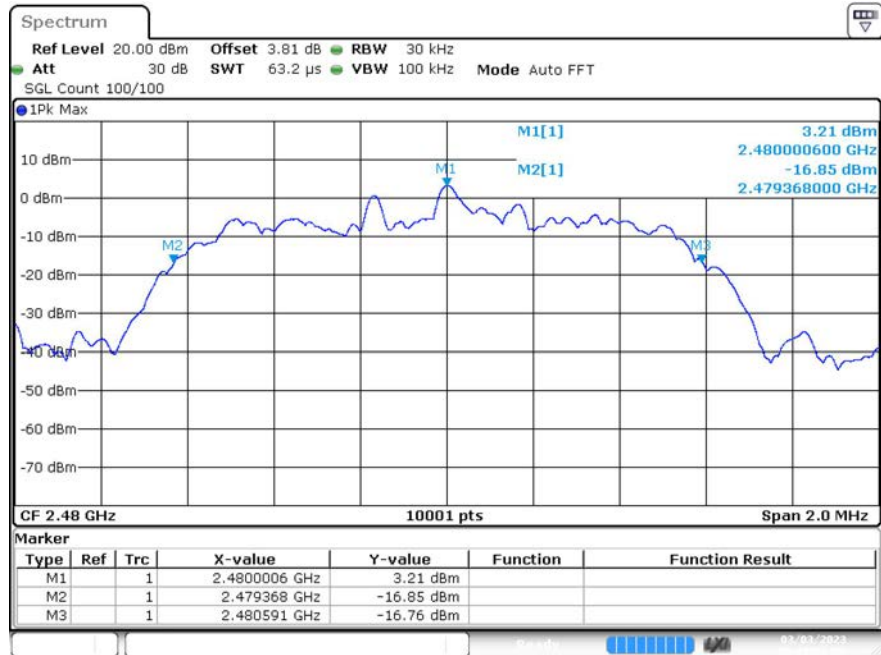
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.907	Not Specified	Pass
	MCH	0.803	Not Specified	Pass
	HCH	0.859	Not Specified	Pass
$\pi/4$ DQPSK	LCH	1.21	Not Specified	Pass
	MCH	1.269	Not Specified	Pass
	HCH	1.223	Not Specified	Pass
8DPSK	LCH	1.164	Not Specified	Pass
	MCH	1.205	Not Specified	Pass
	HCH	1.197	Not Specified	Pass

3.2 Test Graphs

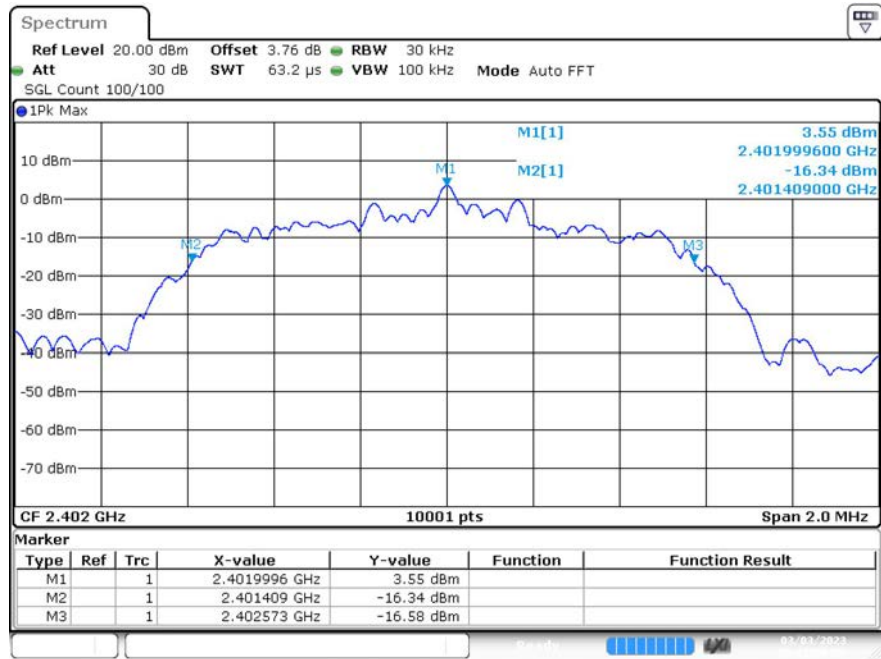


GFSK/HCH

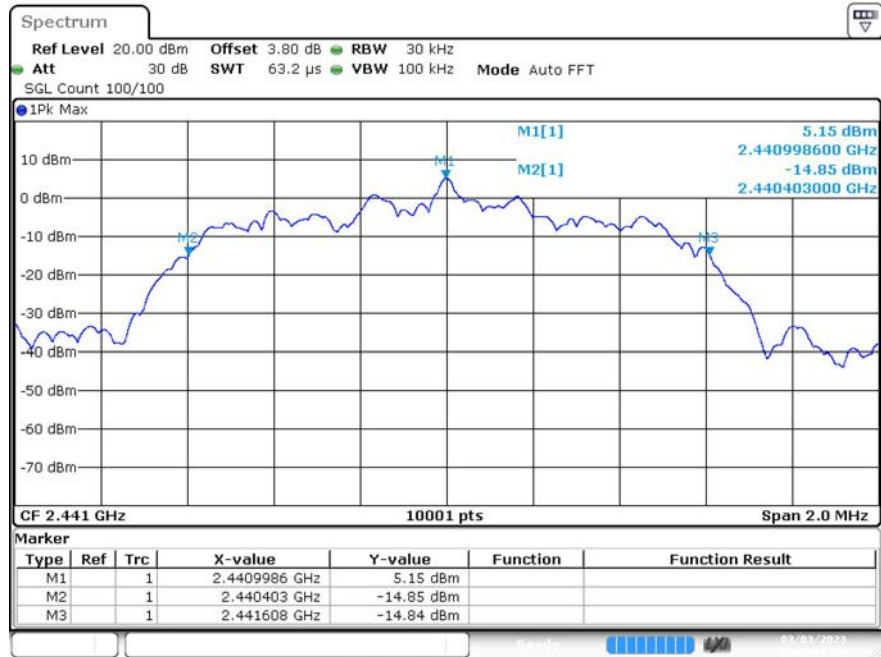

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


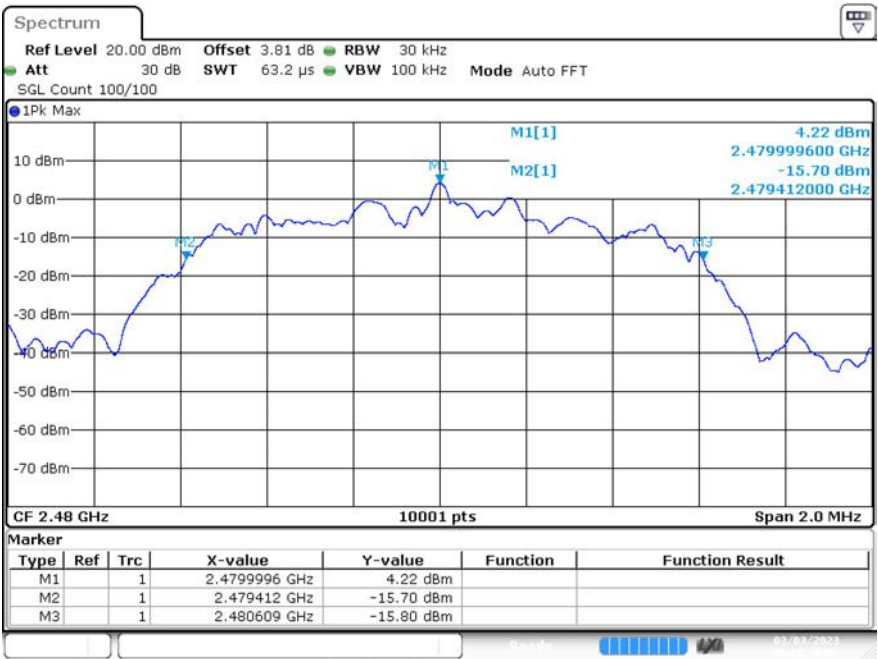
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

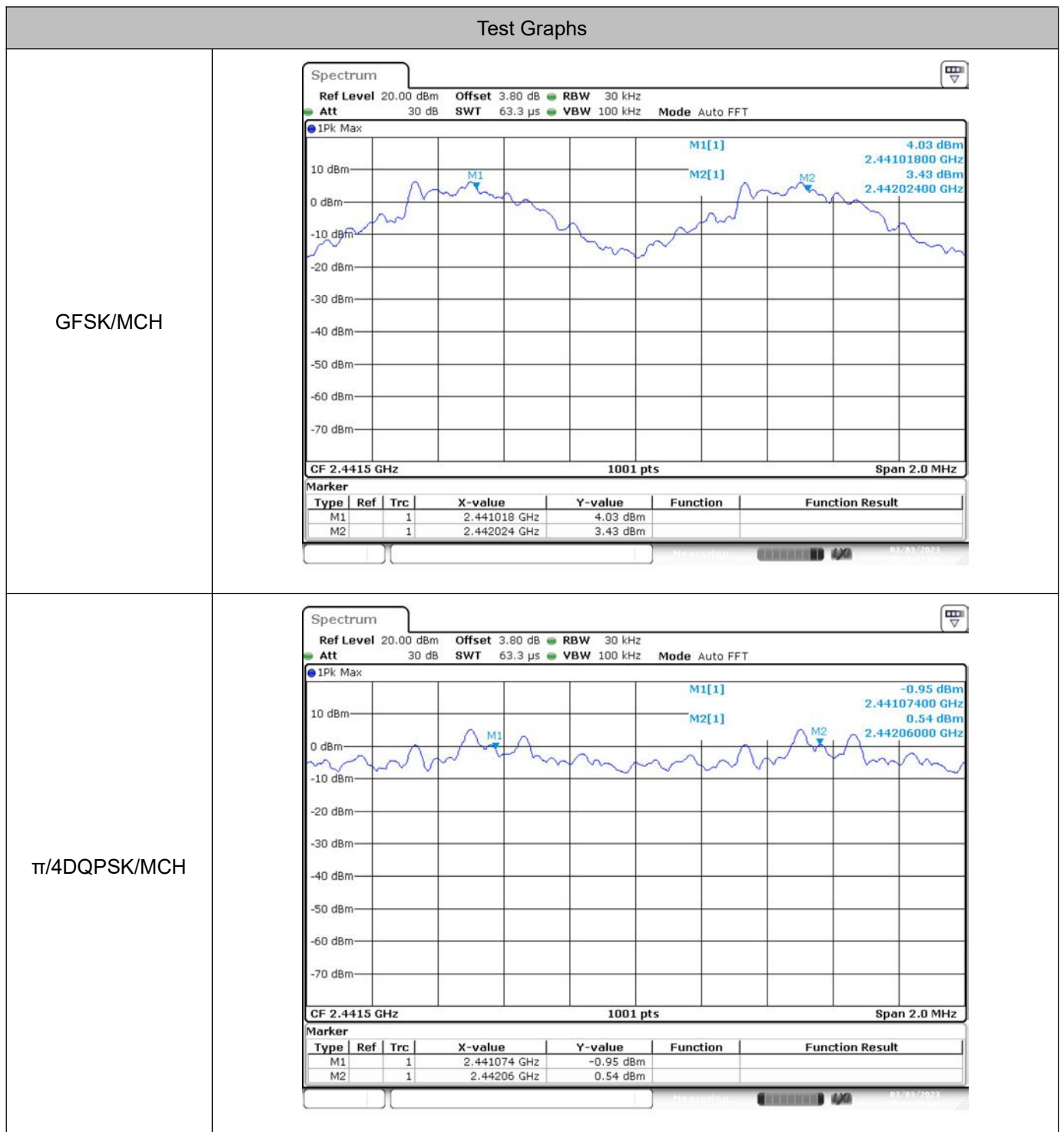


4 Carrier Frequency Separation

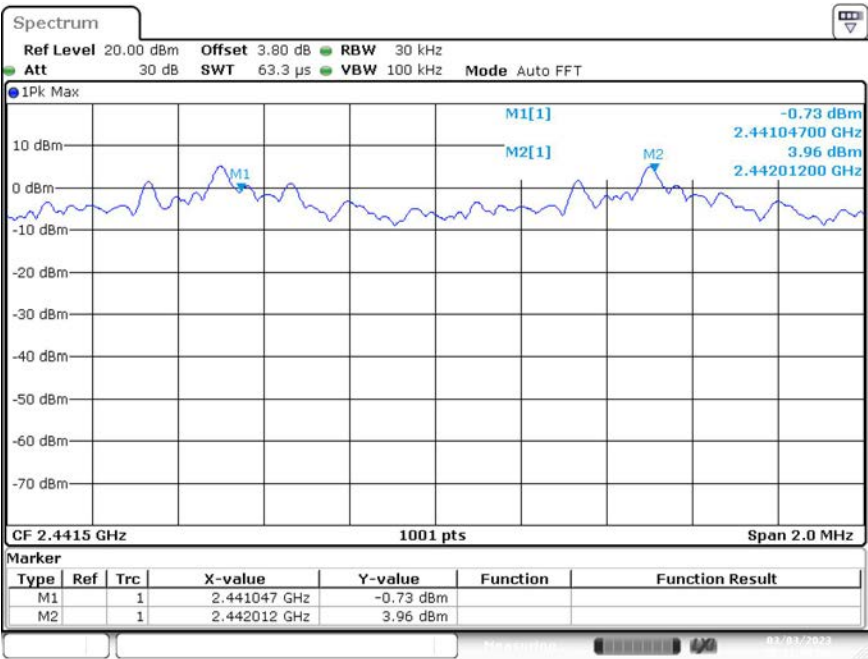
4.1 Test Result

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	MCH	1.006	0.535	Pass
$\pi/4$ DQPSK	MCH	0.986	0.846	Pass
8DPSK	MCH	0.965	0.803	Pass

4.2 Test Graphs



8DPSK/MCH

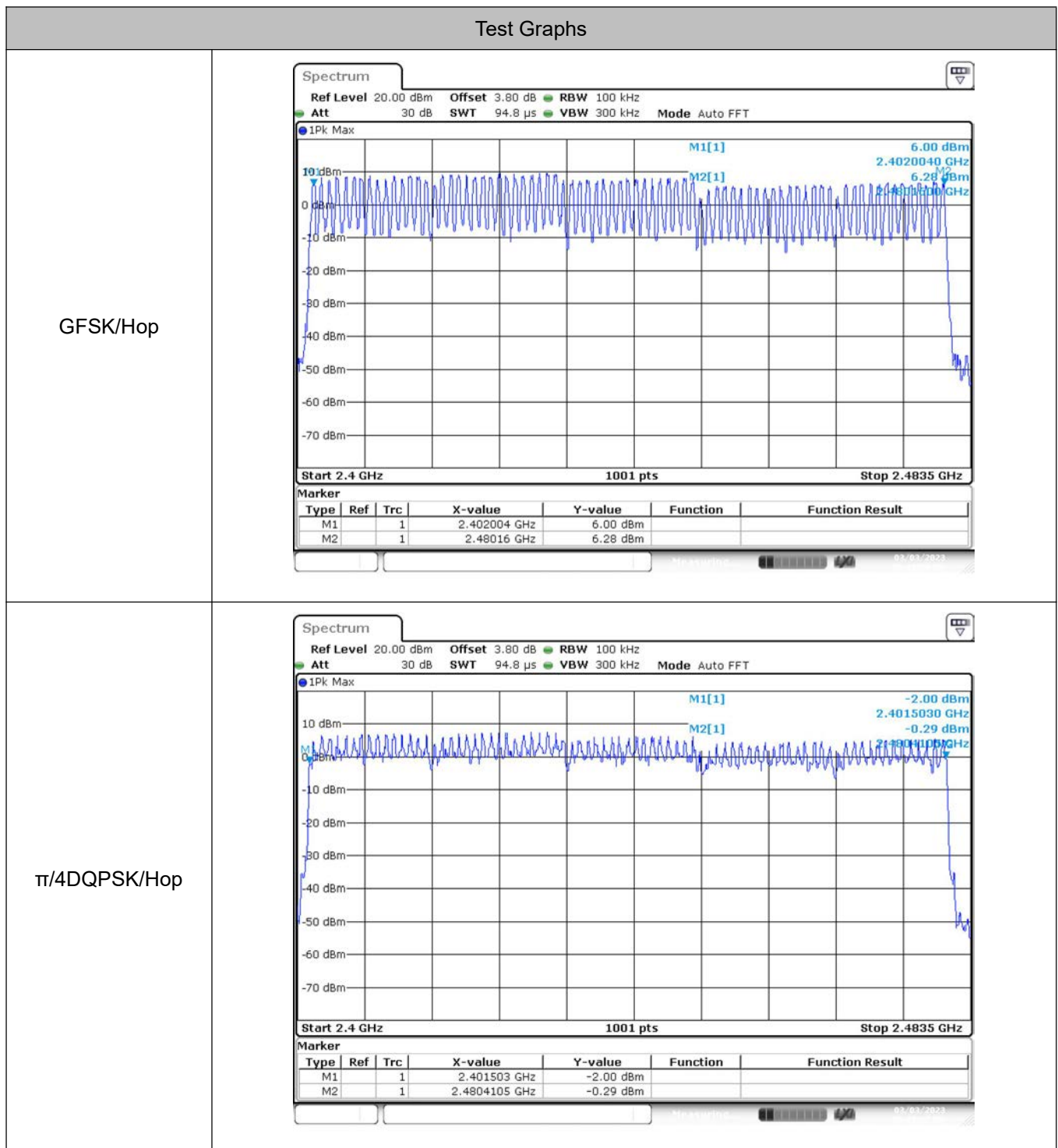


5 Hopping Channel Number

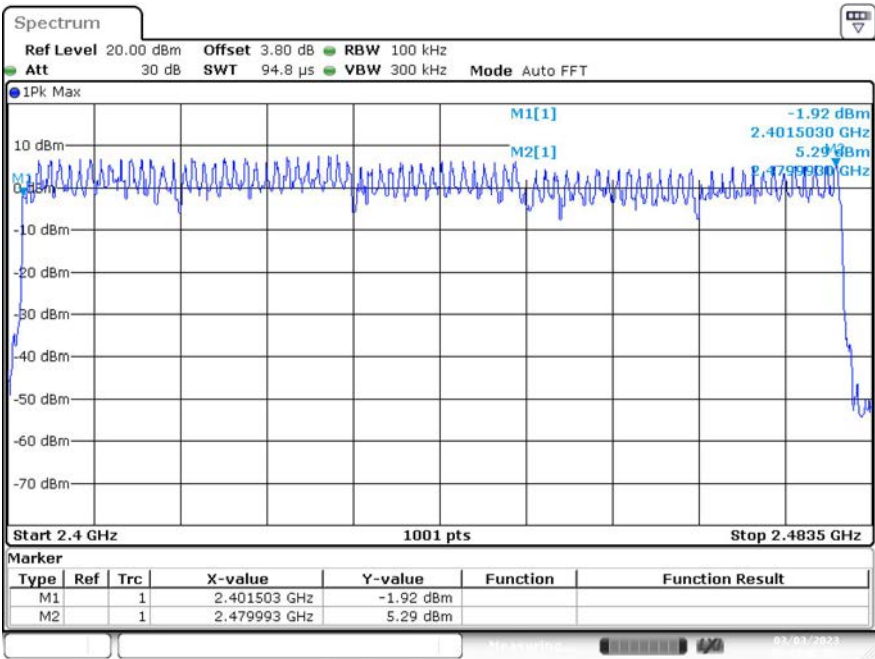
5.1 Test Result

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

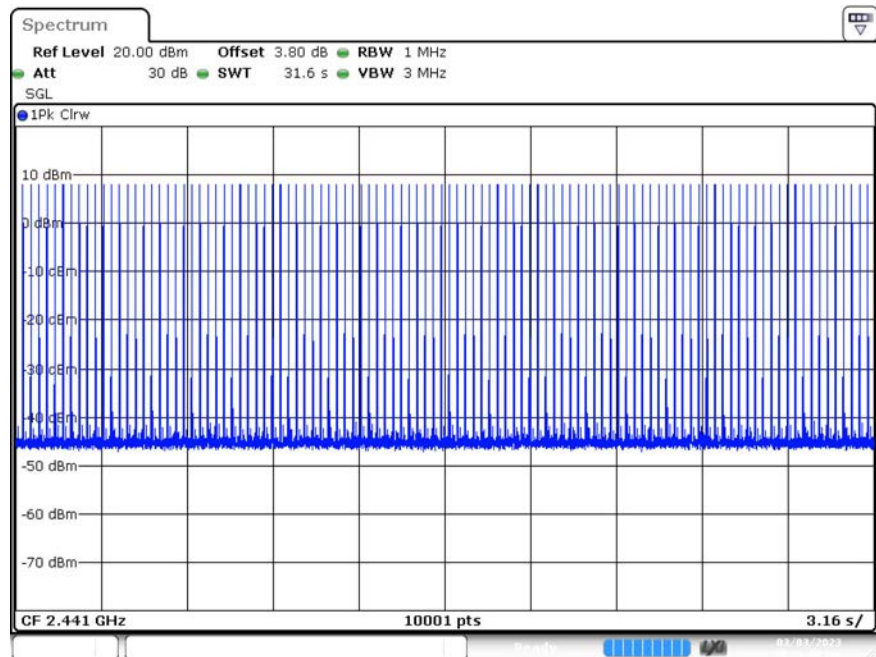
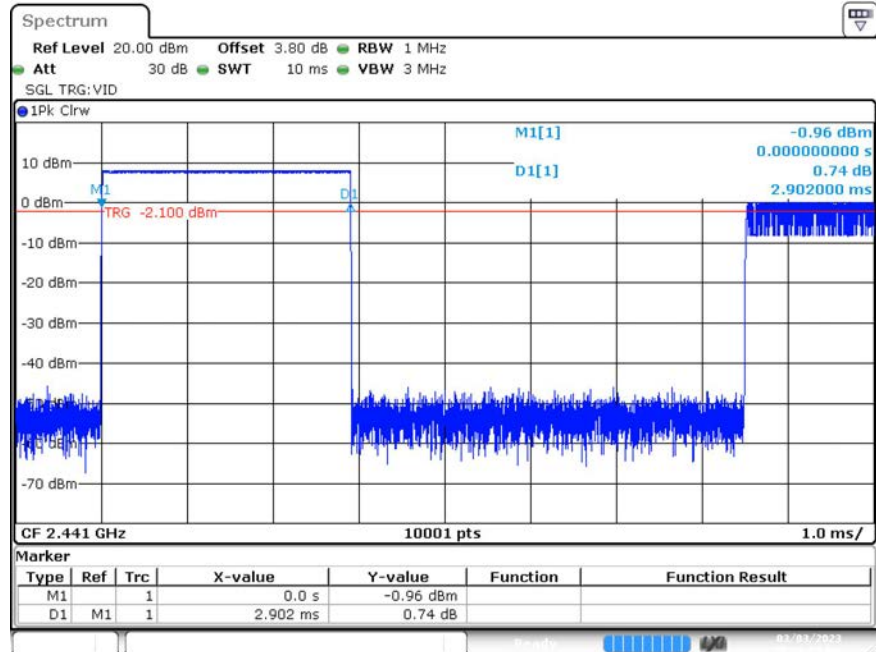
6.1 Test Result

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[ms]	Limit [s]	Verdict
GFSK	DH5	MCH	2.902	106	307.612	0.4	Pass
$\pi/4$ DQPSK	2DH5	MCH	2.866	106	303.796	0.4	Pass
8DPSK	3DH5	MCH	2.74	106	290.44	0.4	Pass

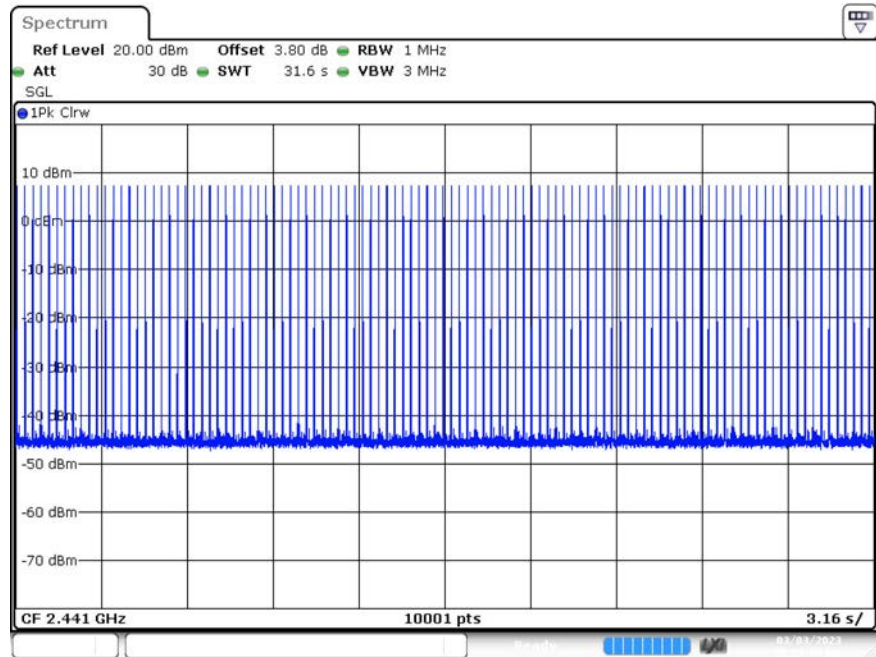
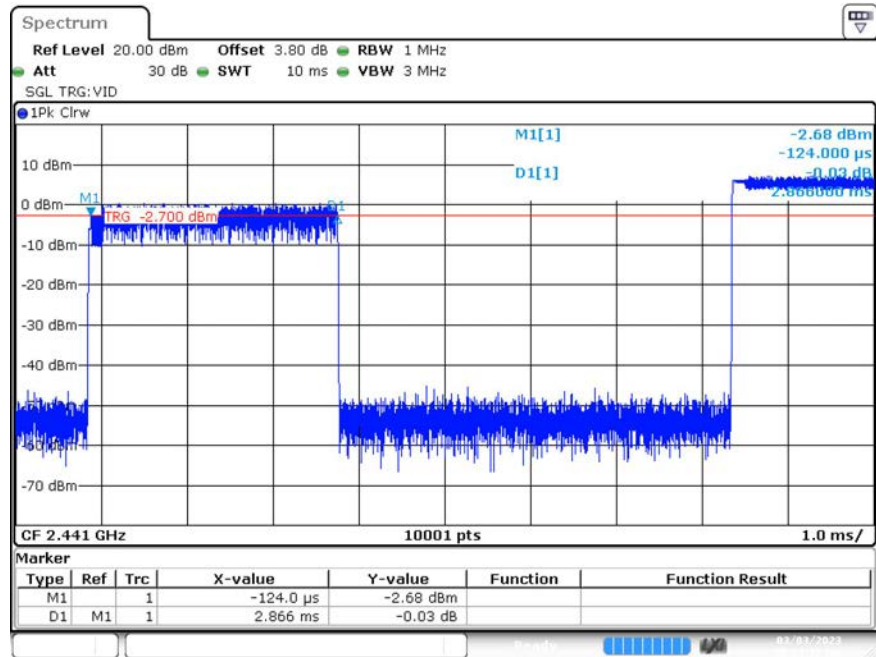
6.2 Test Graphs

Test Graphs

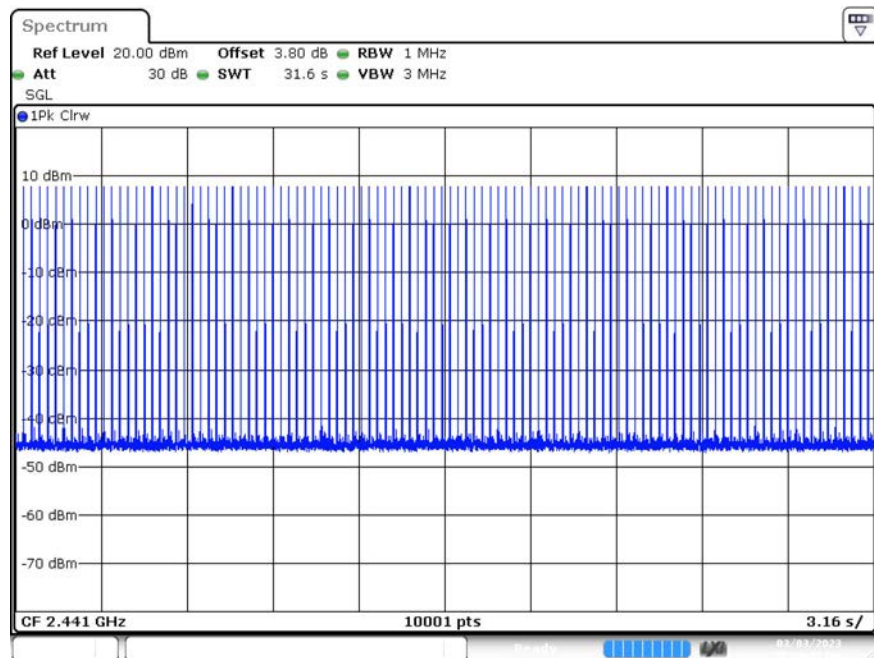
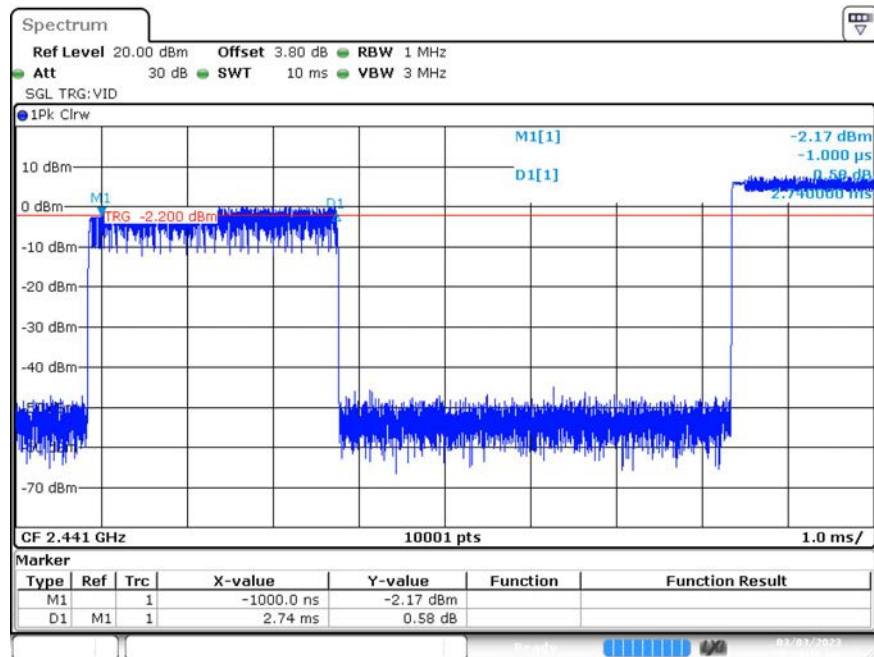
GFSK_DH5/MCH



$\pi/4$ DQPSK
_2DH5/MCH



8DPSK_3DH5/MCH



7 RF Conducted Spurious Emissions

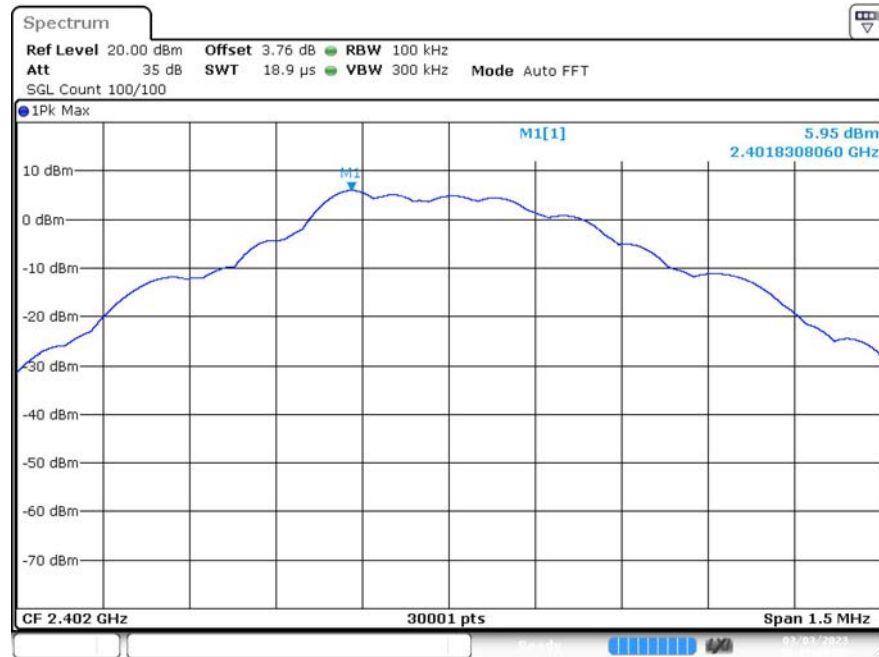
7.1 Test Result

Mode	Channel	Max. Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	-44.98	-20	Pass
	MCH	-46.38	-20	Pass
	HCH	-45.87	-20	Pass
$\pi/4$ DQPSK	LCH	-45.14	-20	Pass
	MCH	-46.41	-20	Pass
	HCH	-44.8	-20	Pass
8DPSK	LCH	-44.78	-20	Pass
	MCH	-47.18	-20	Pass
	HCH	-45.86	-20	Pass

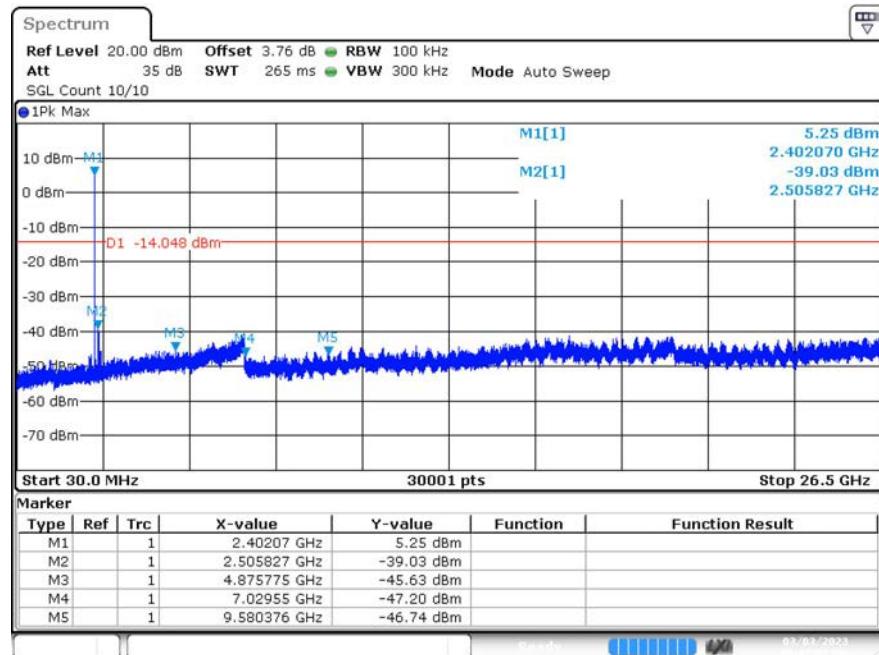
7.2 Test Graphs

GFSK_LCH_Graphs

Pref

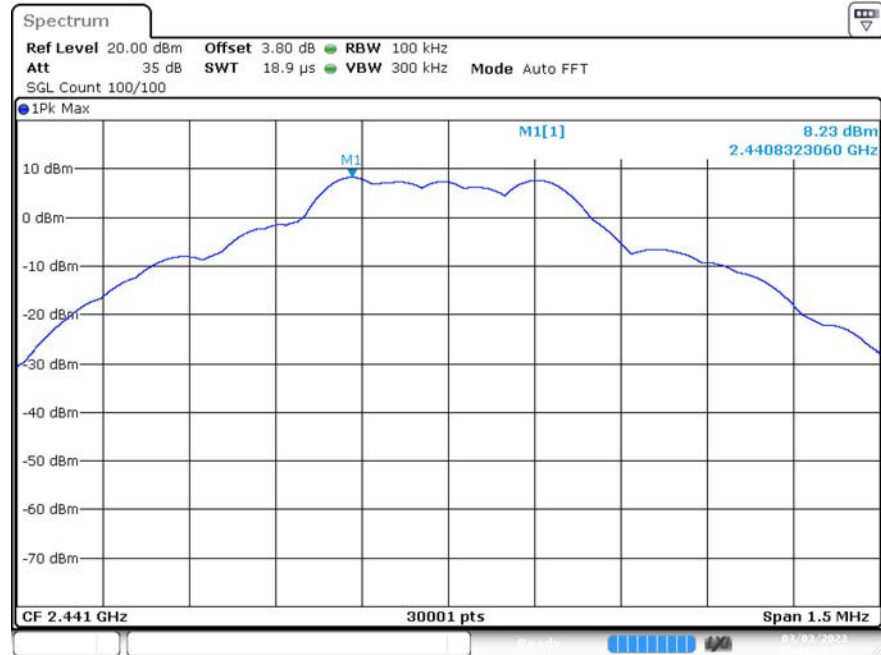


Puw

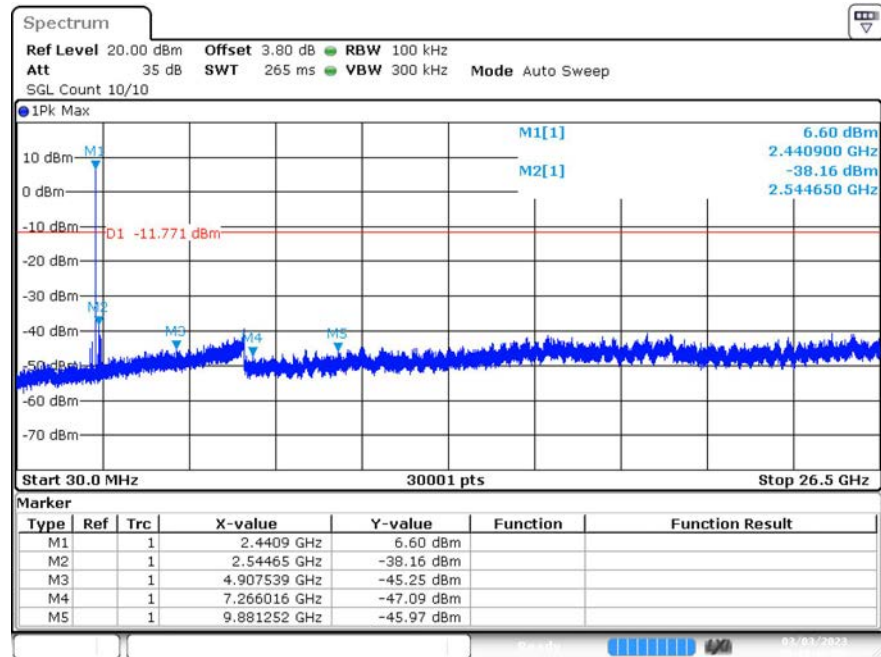


GFSK_MCH_Graphs

Pref

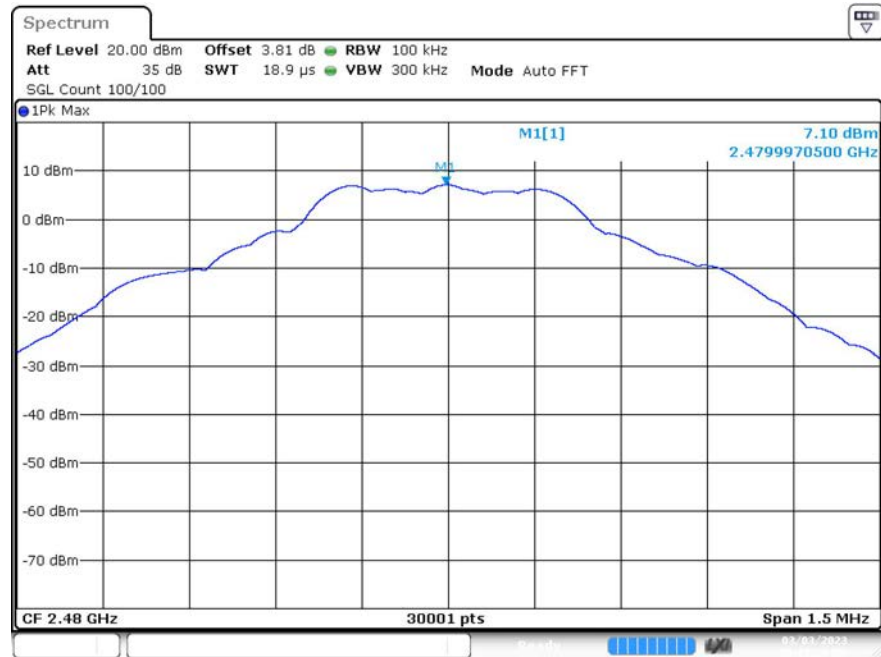


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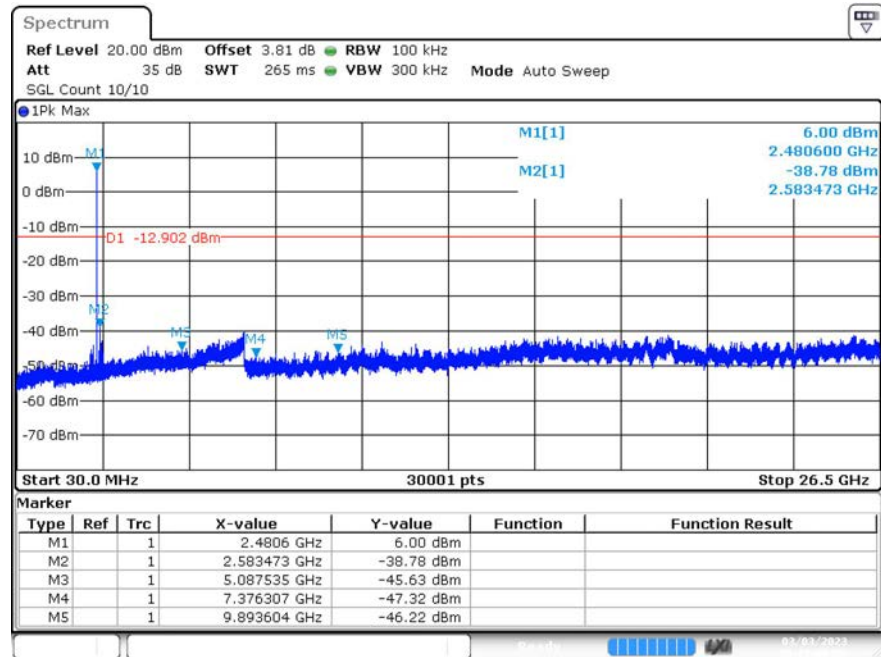


GFSK_HCH_Graphs

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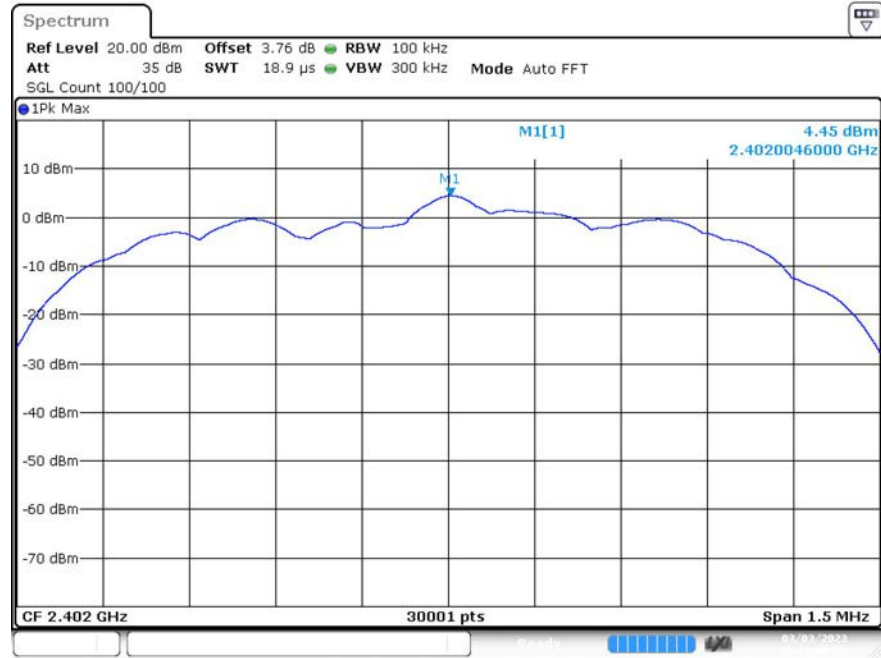


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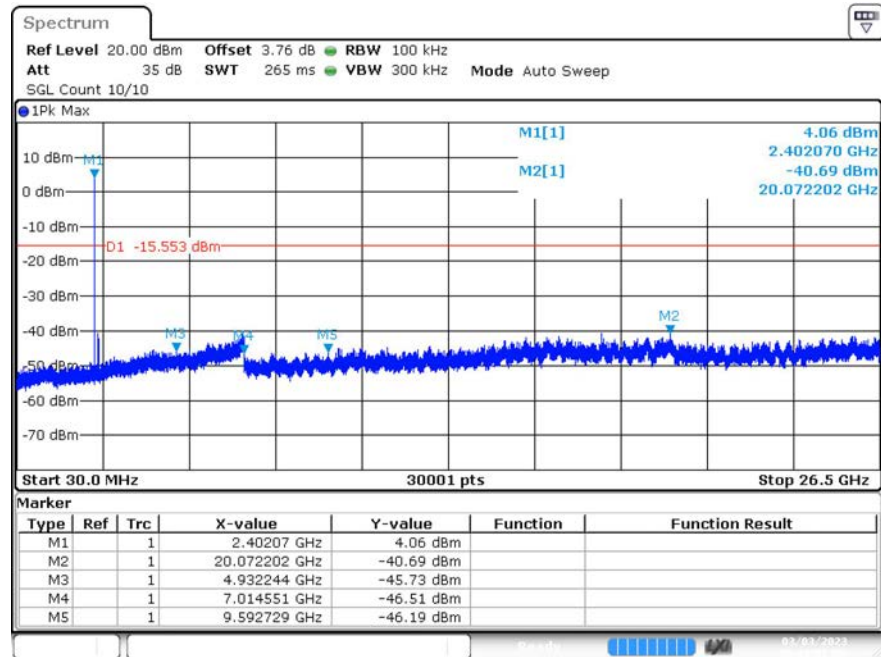


$\pi/4$ DQPSK_LCH_Graphs

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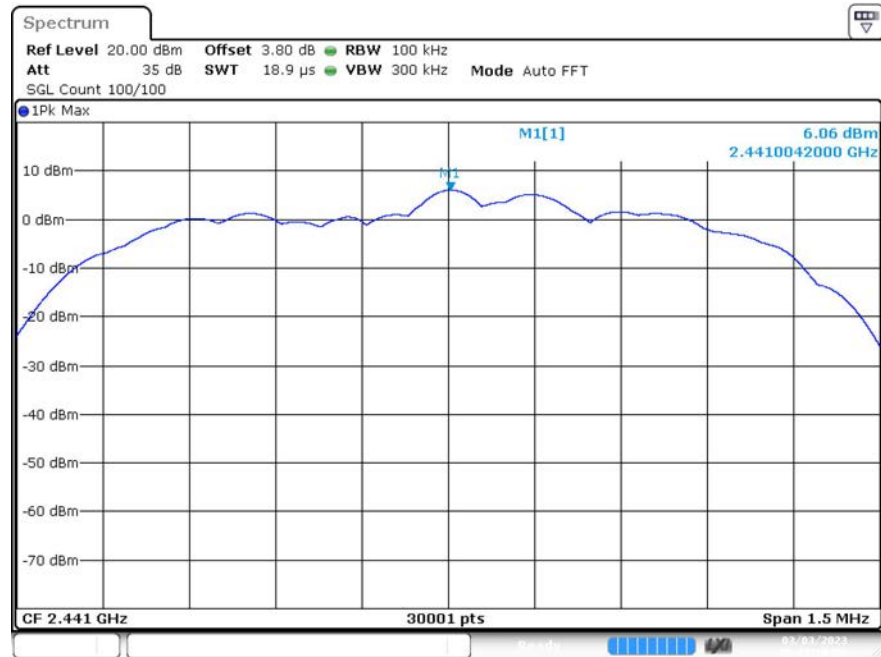


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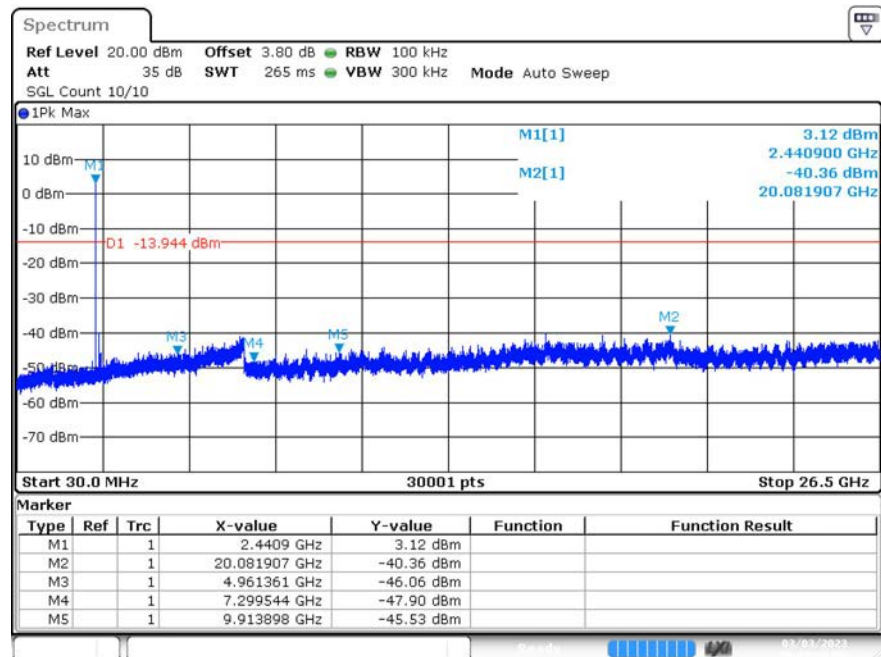


π /4DQPSK_MCH_Graphs

Pref

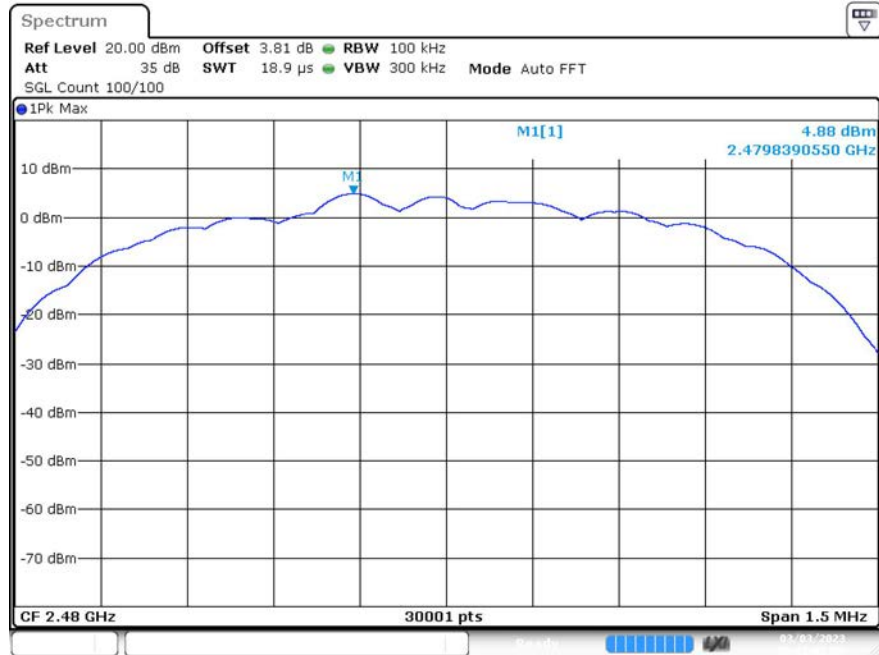


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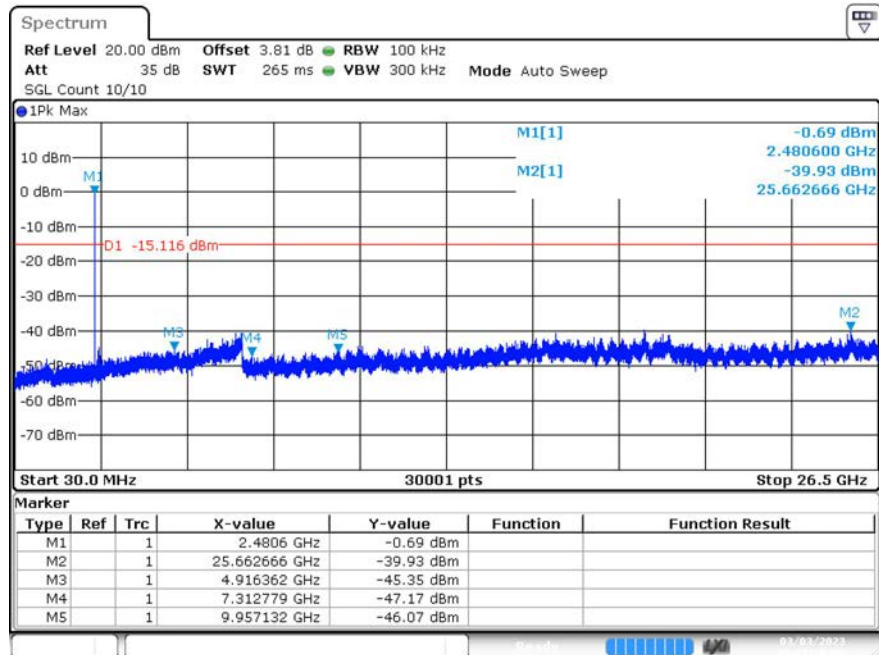


$\pi/4$ DQPSK_HCH_Graphs

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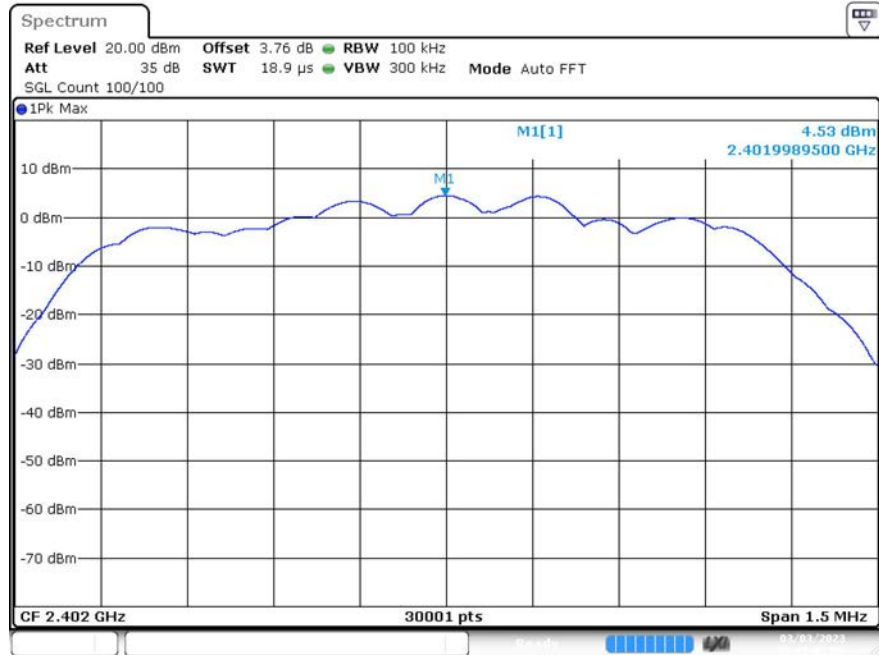


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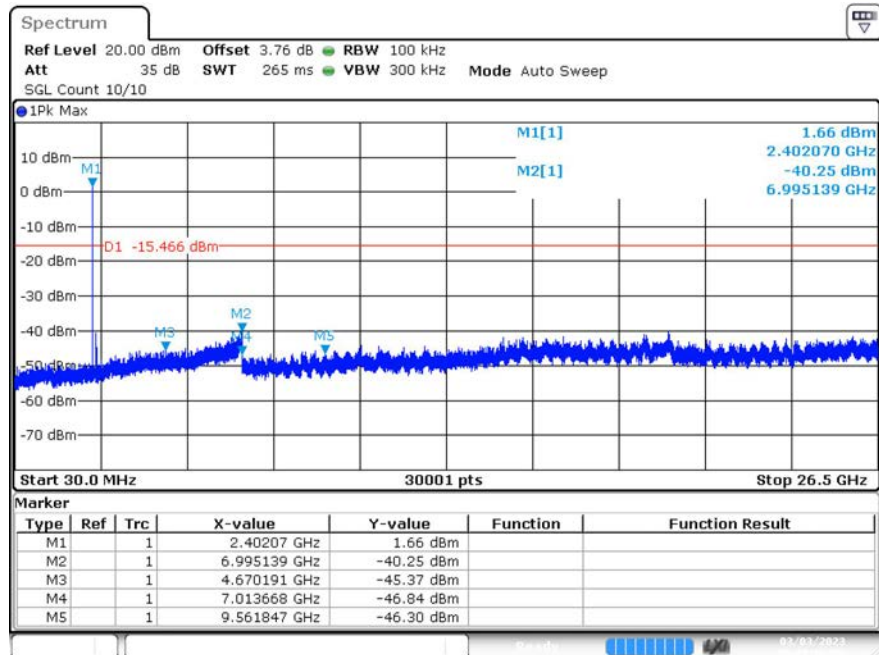


8DPSK_LCH_Graphs

Pref

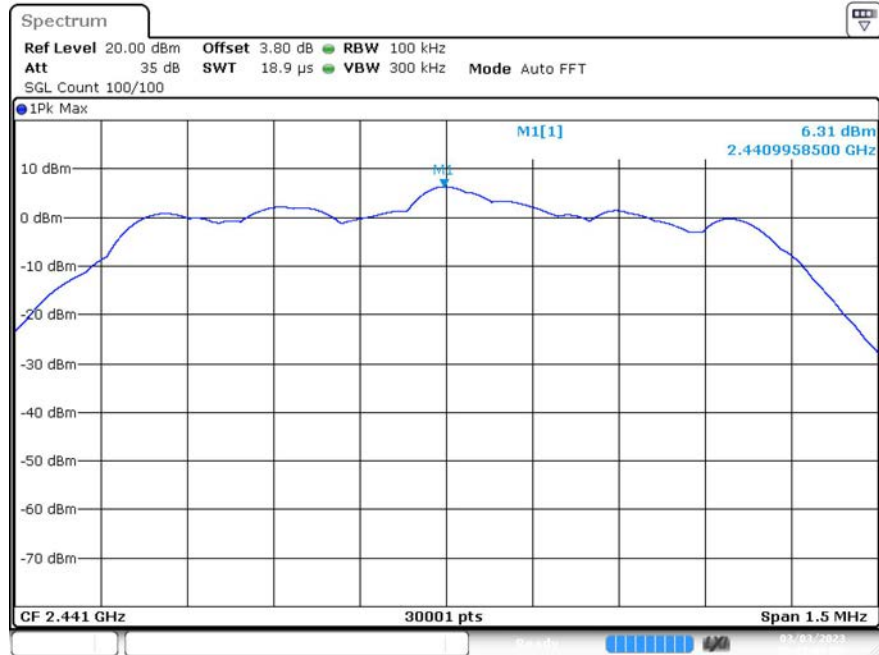


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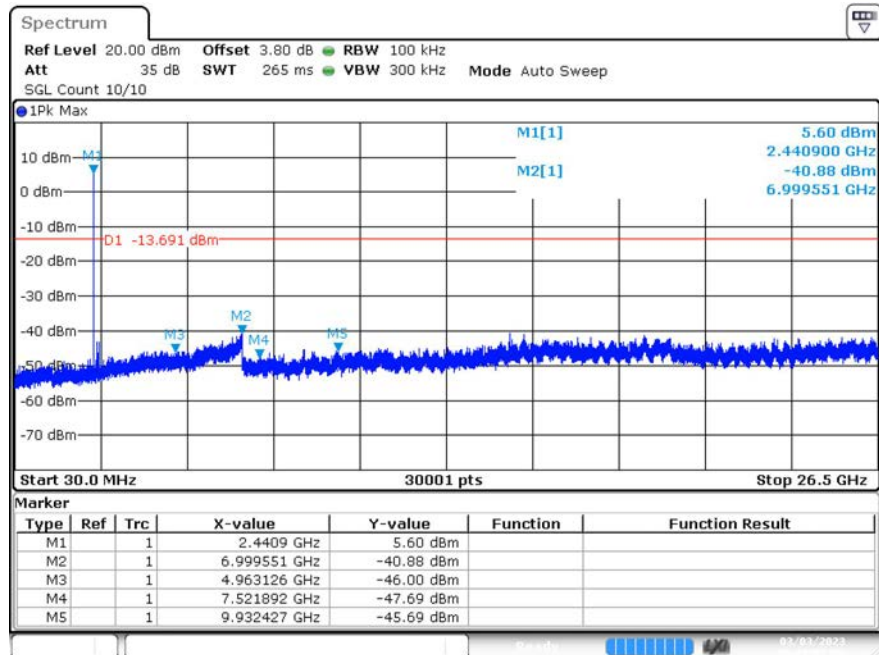


8DPSK_MCH_Graphs

Pref

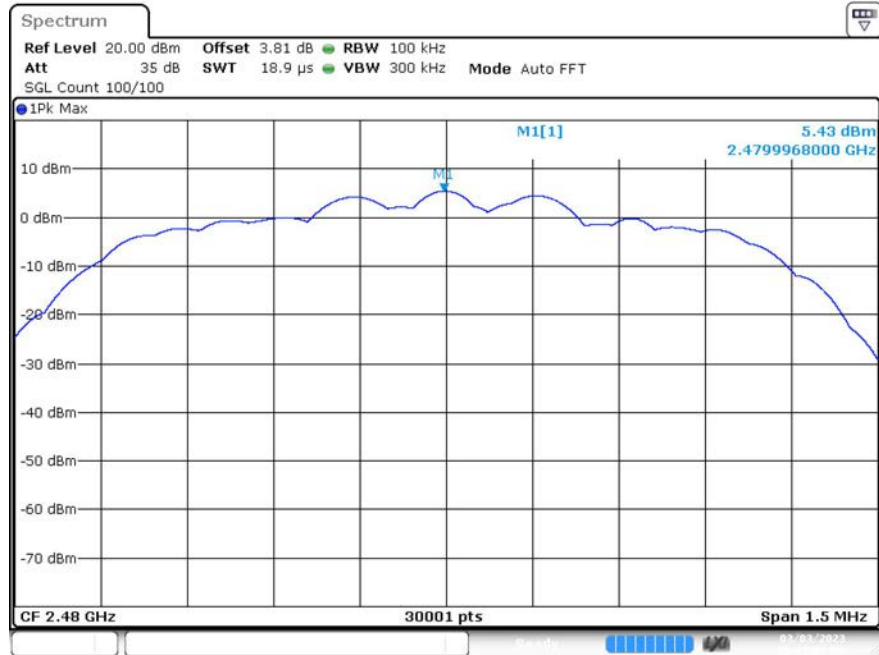


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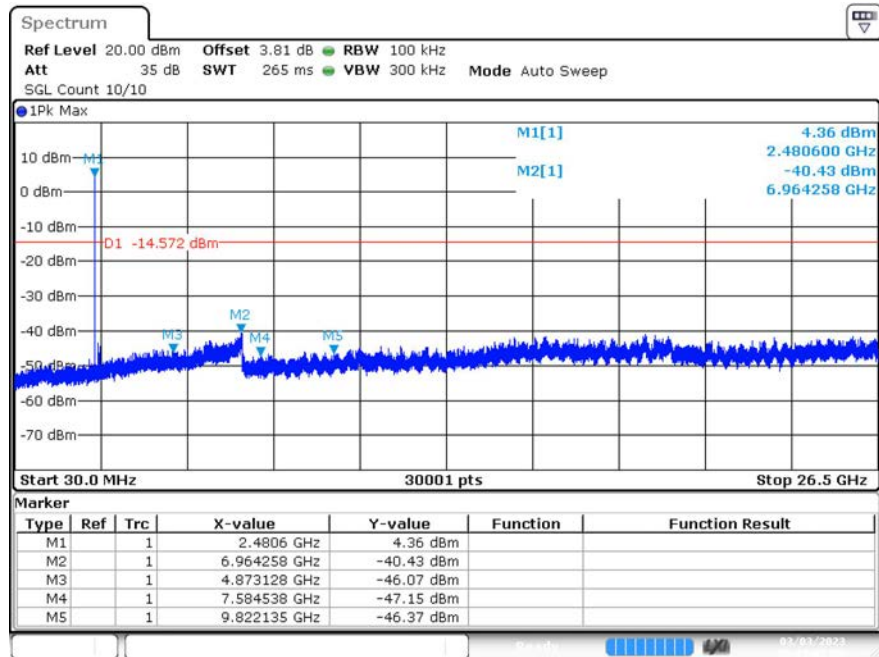


8DPSK_HCH_Graphs

Pref



Puw

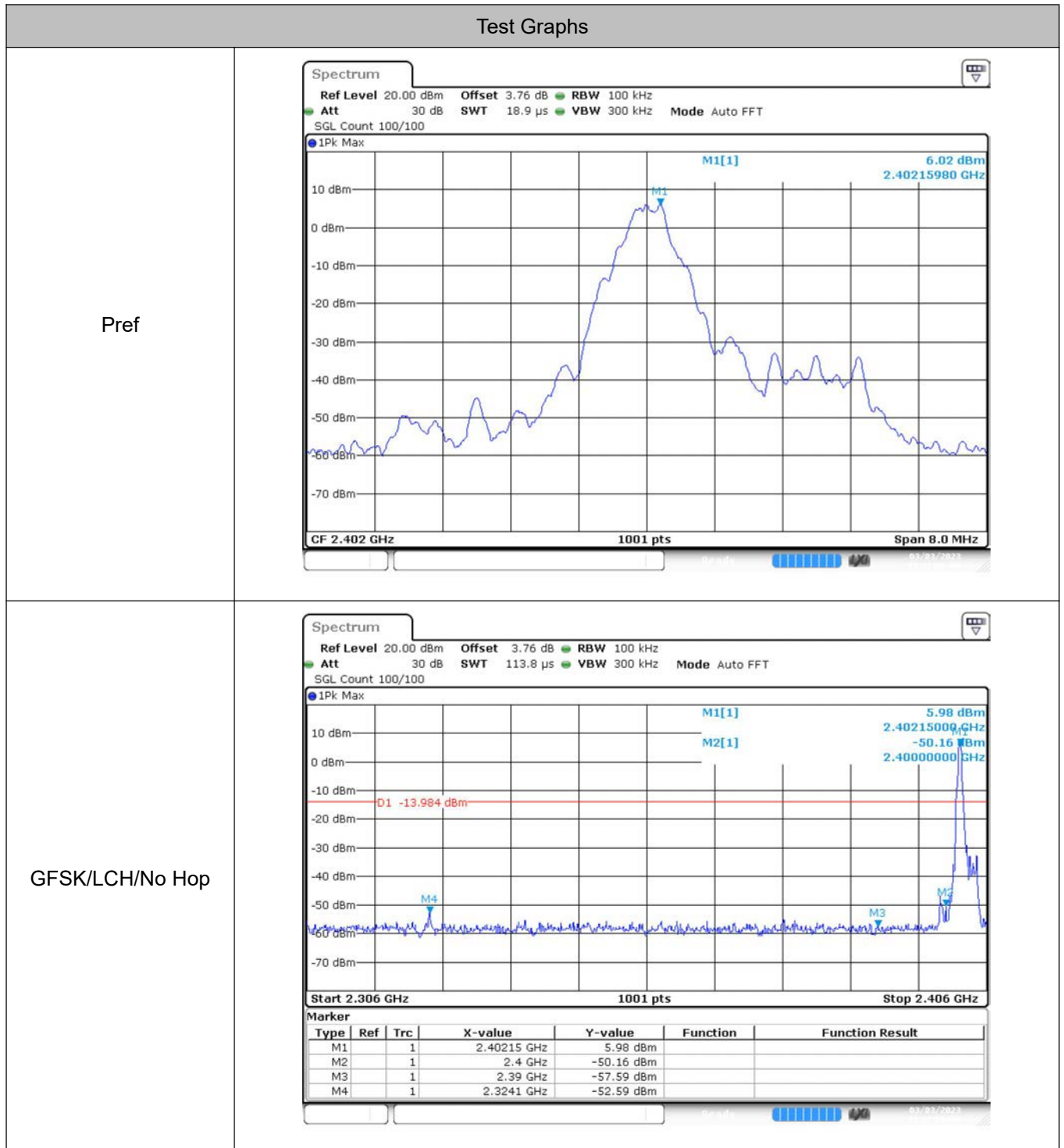


8 Band-edge for RF Conducted Emissions

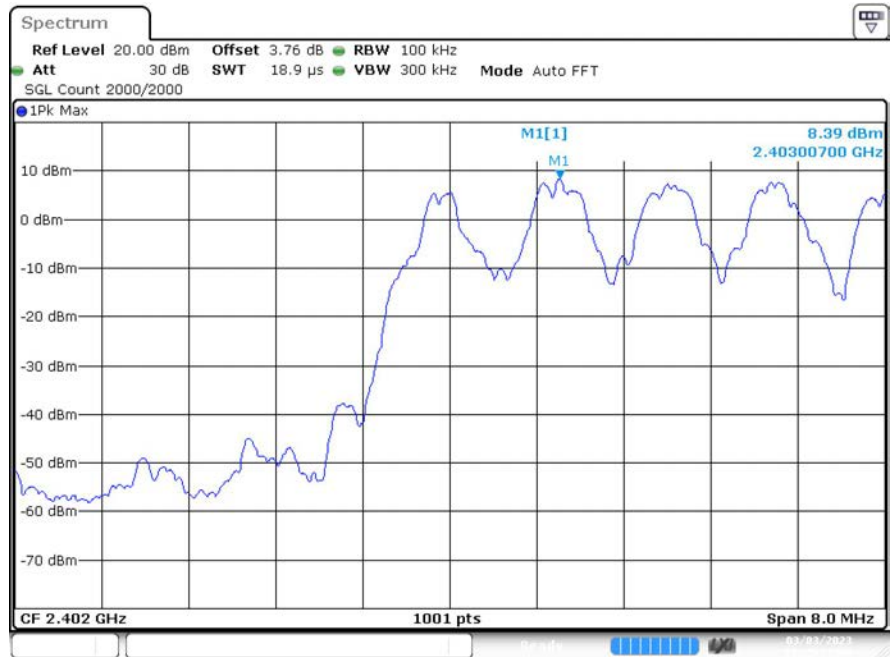
8.1 Test Result

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Max Spurious Level [dBc]	Limit [dBc]	Verdict
GFSK	LCH	2402	Off	-58.6	-20	Pass
			On	-50.25	-20	Pass
	HCH	2480	Off	-60.44	-20	Pass
			On	-51.13	-20	Pass
$\pi/4$ DQPSK	LCH	2402	Off	-57.94	-20	Pass
			On	-51.7	-20	Pass
	HCH	2480	Off	-60.27	-20	Pass
			On	-52.64	-20	Pass
8DPSK	LCH	2402	Off	-59.29	-20	Pass
			On	-52.2	-20	Pass
	HCH	2480	Off	-60.83	-20	Pass
			On	-52.8	-20	Pass

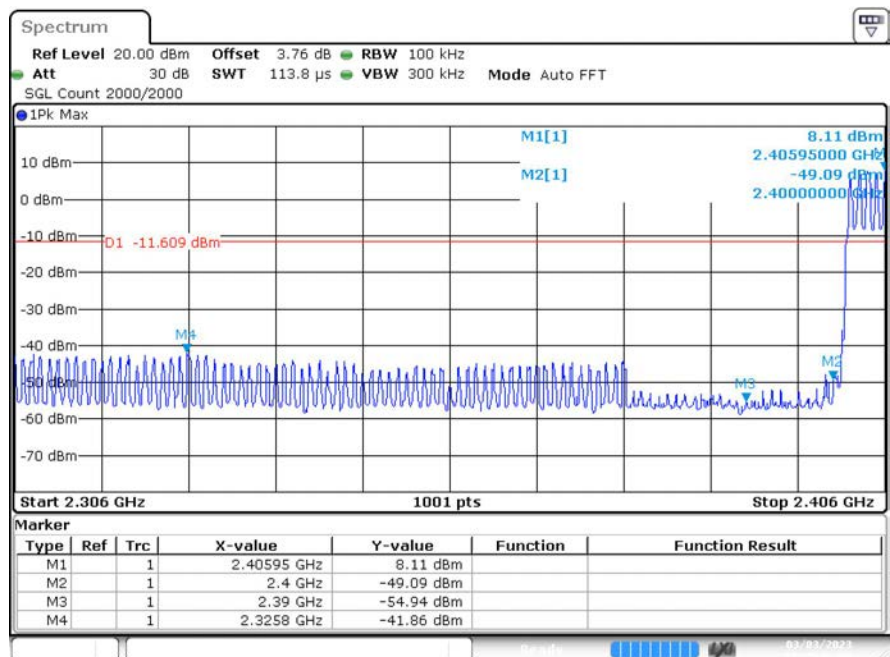
8.2 Test Graphs



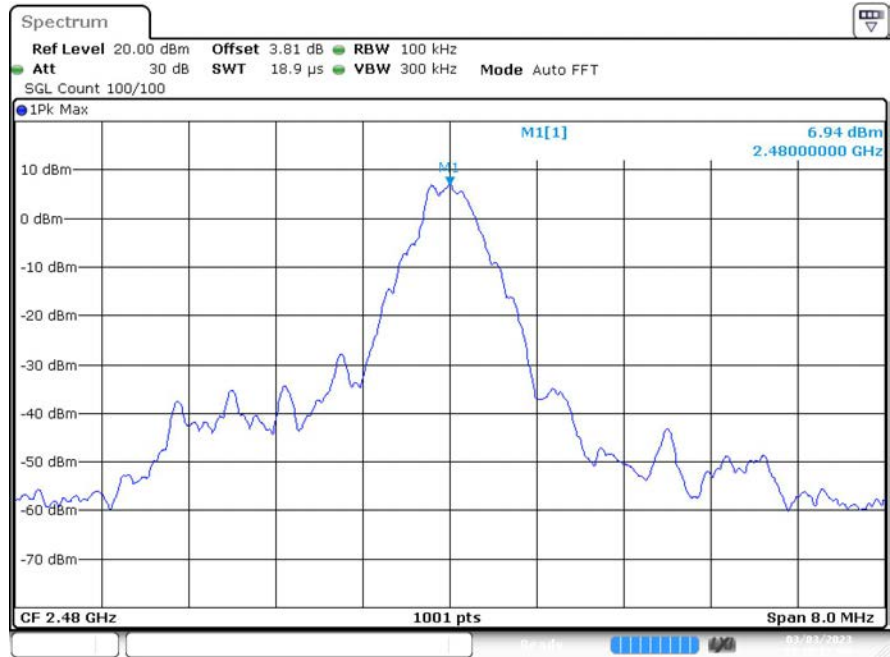
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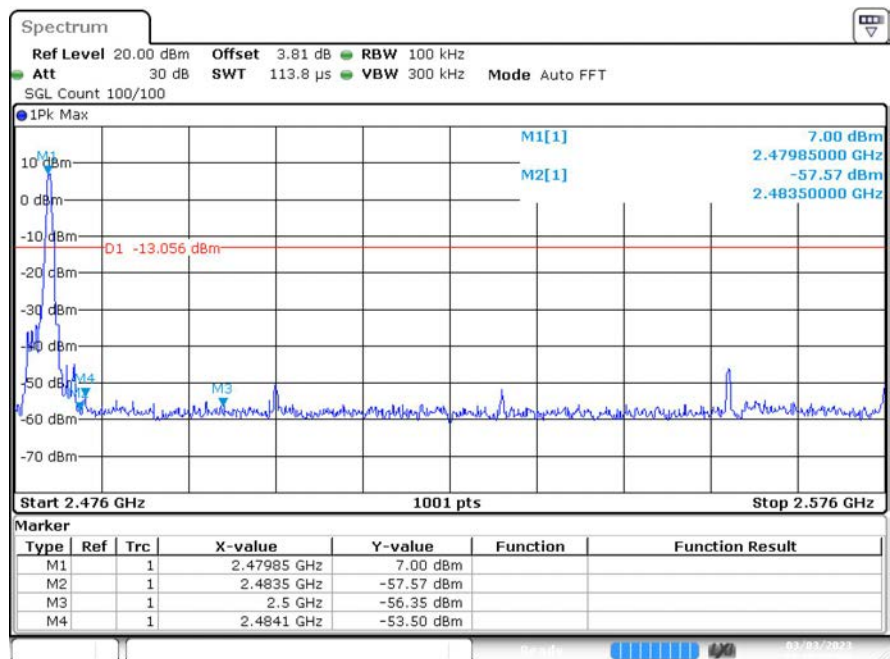
GFSK/LCH/Hop



Ref



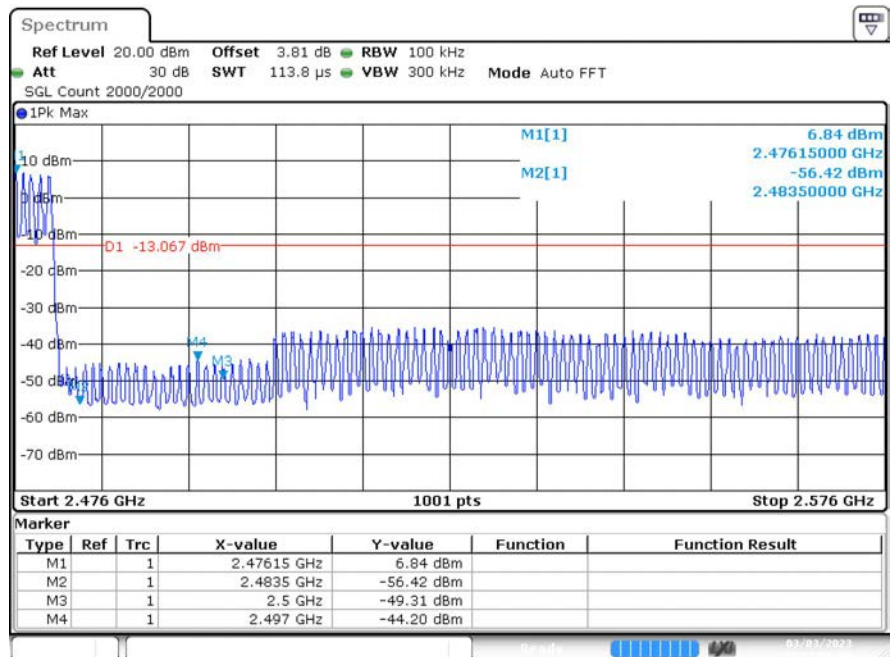
GFSK/HCH/No Hop



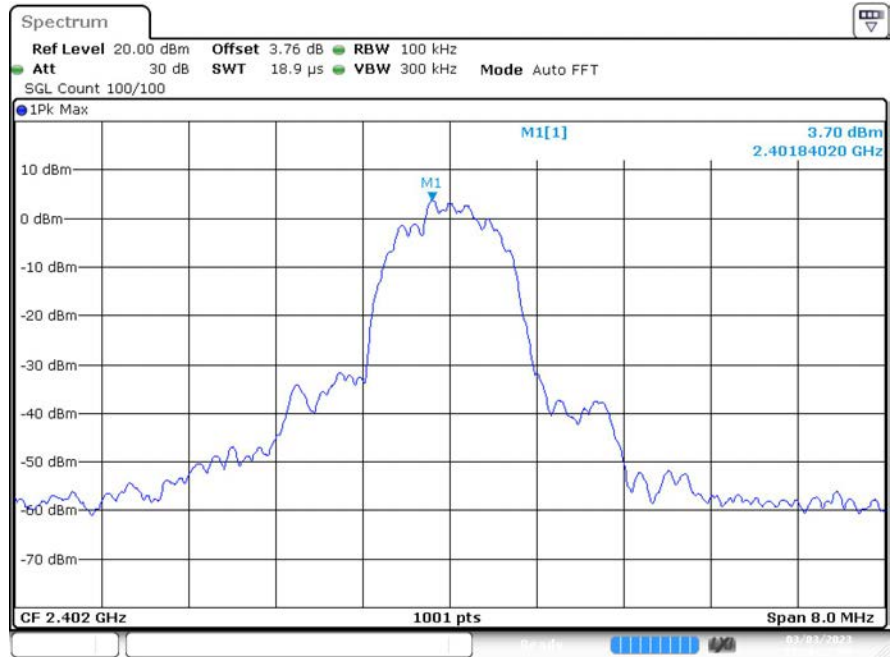
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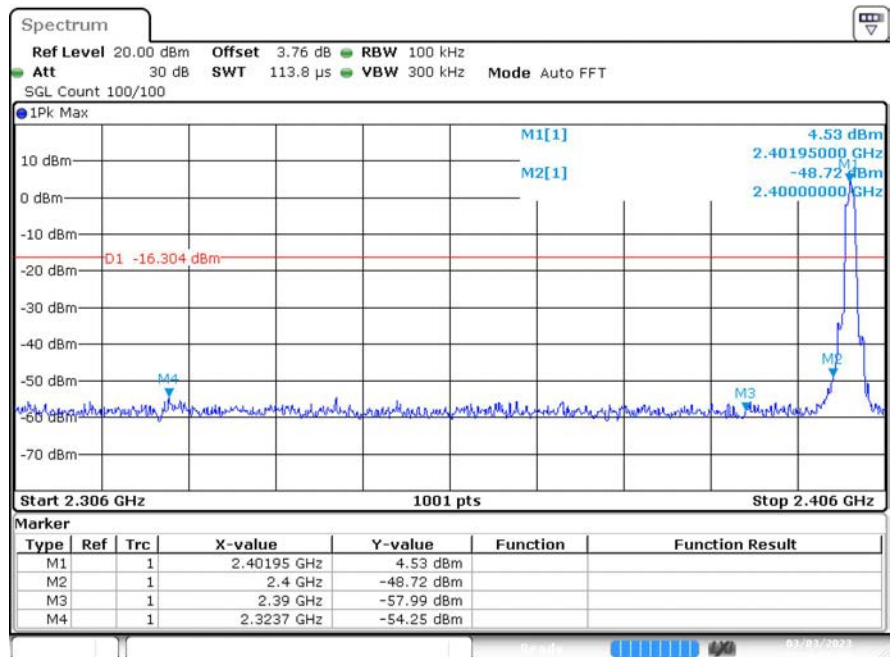
GFSK/HCH/Hop



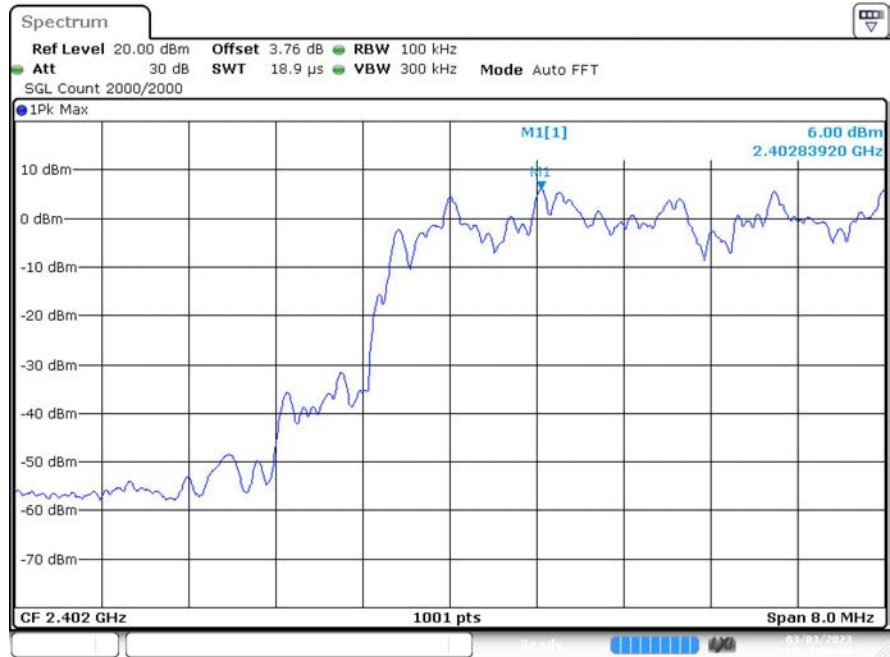
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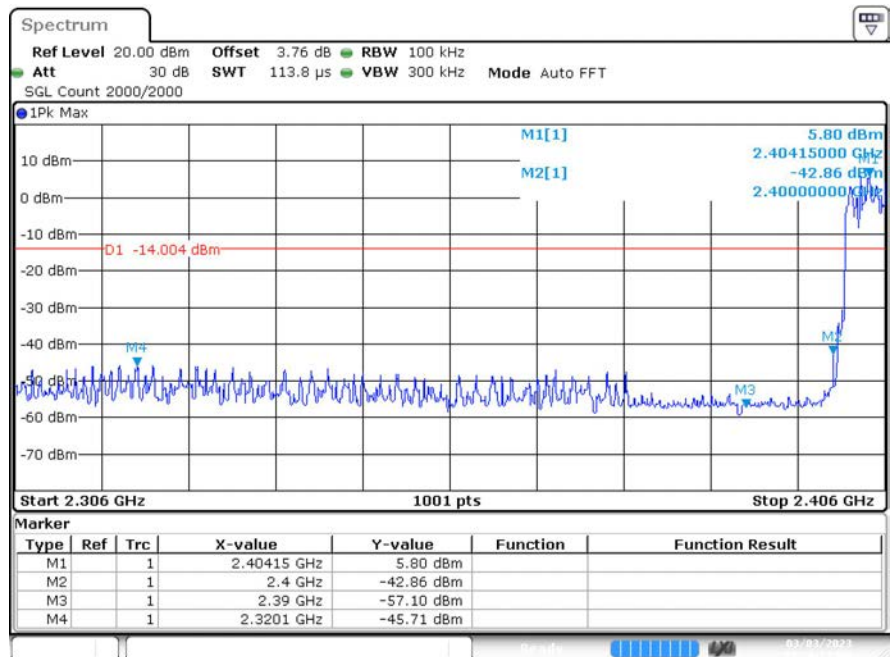
$\pi/4$ DQPSK/LCH/No
Hop



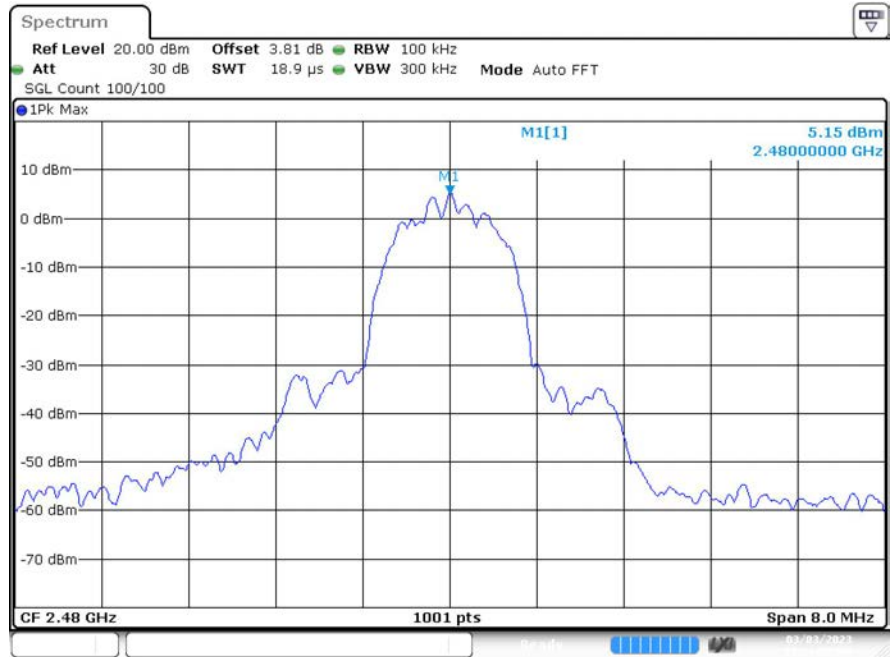
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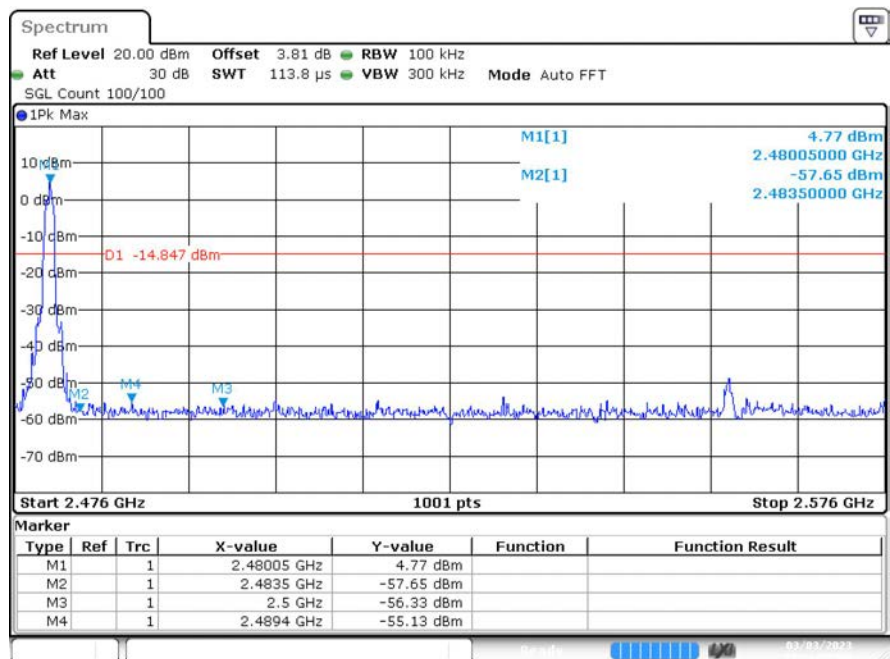
$\pi/4$ DQPSK/LCH/Hop



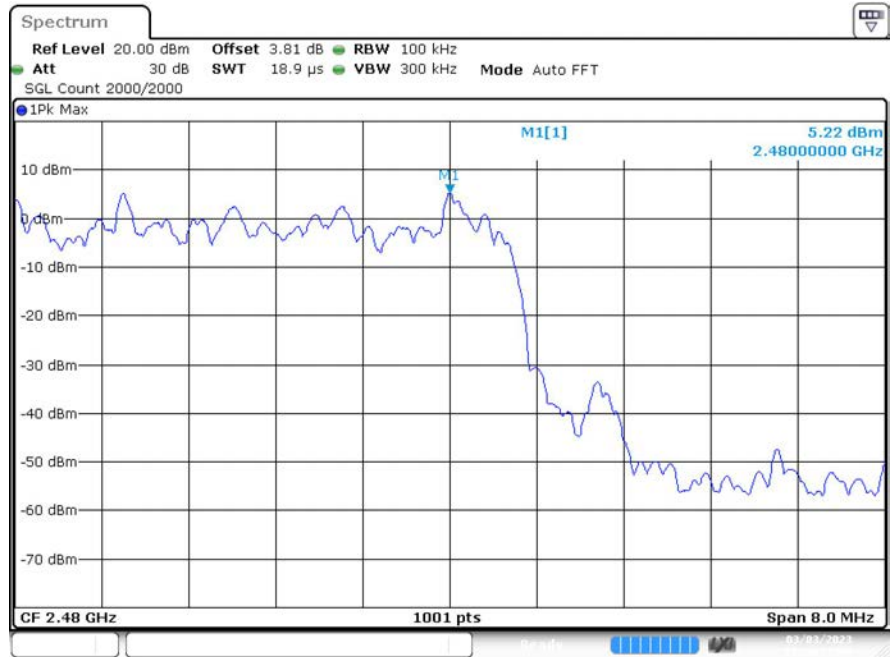
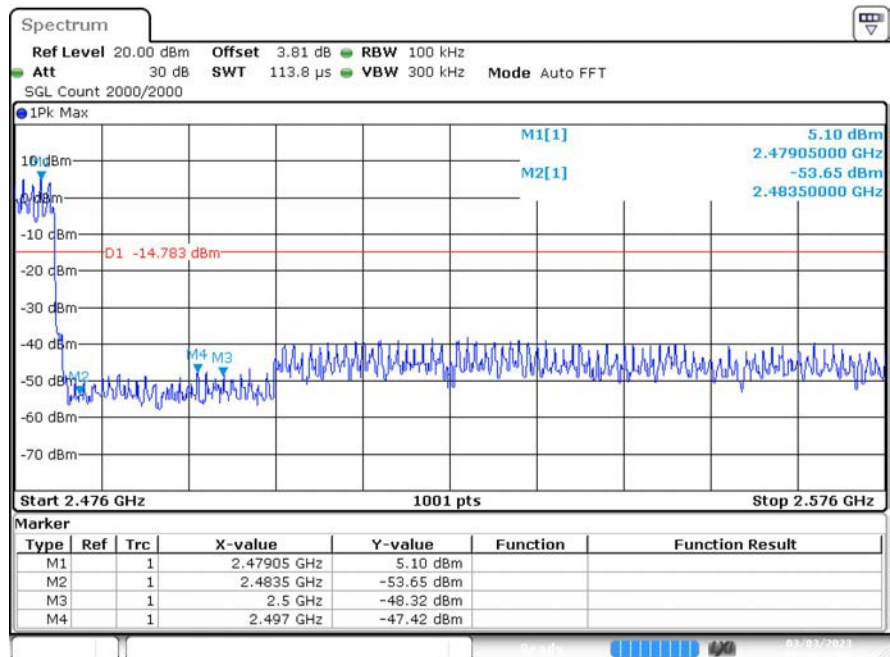
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$\pi/4$ DQPSK/HCH/No
Hop



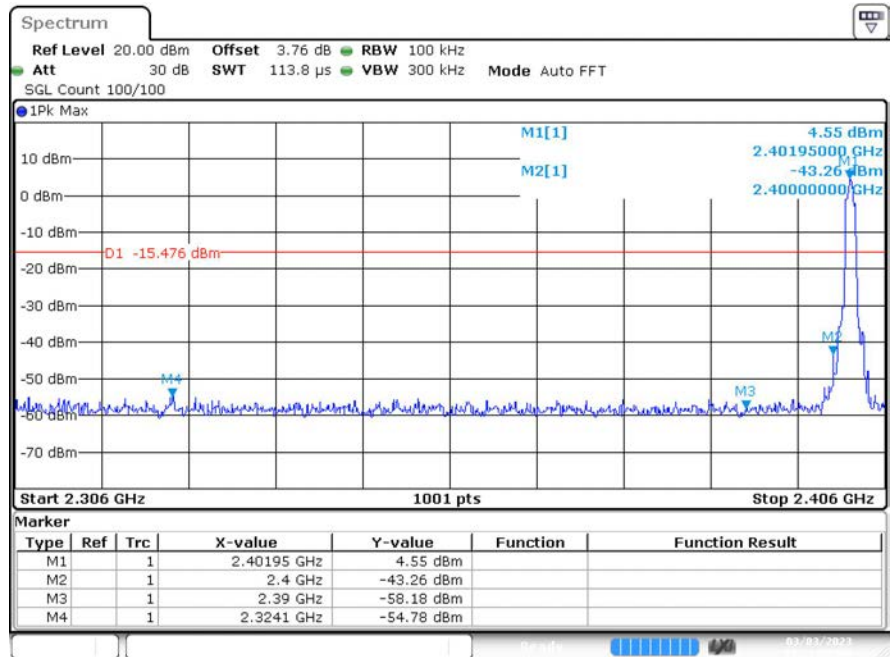
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 $\pi/4$ DQPSK/HCH/Hop


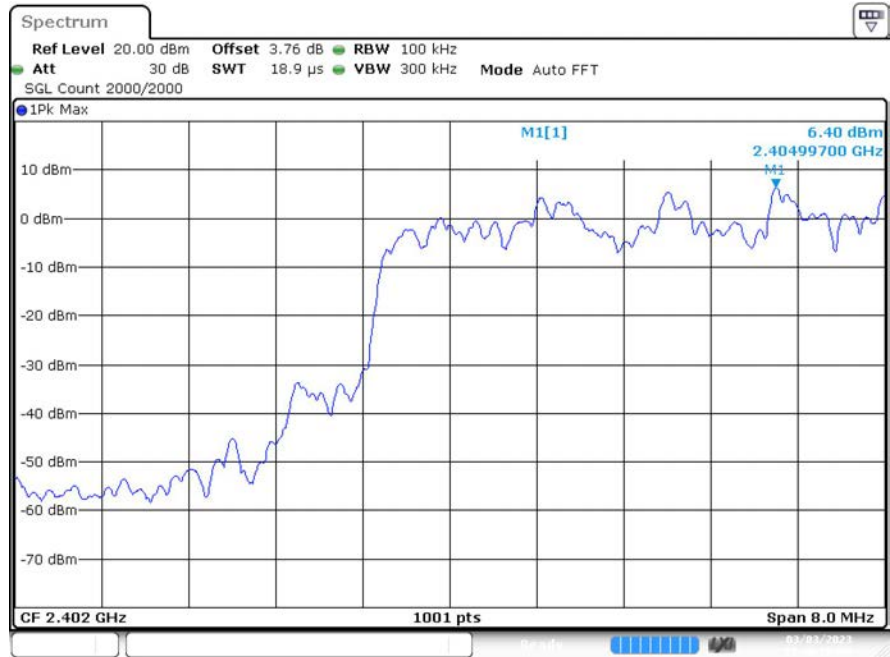
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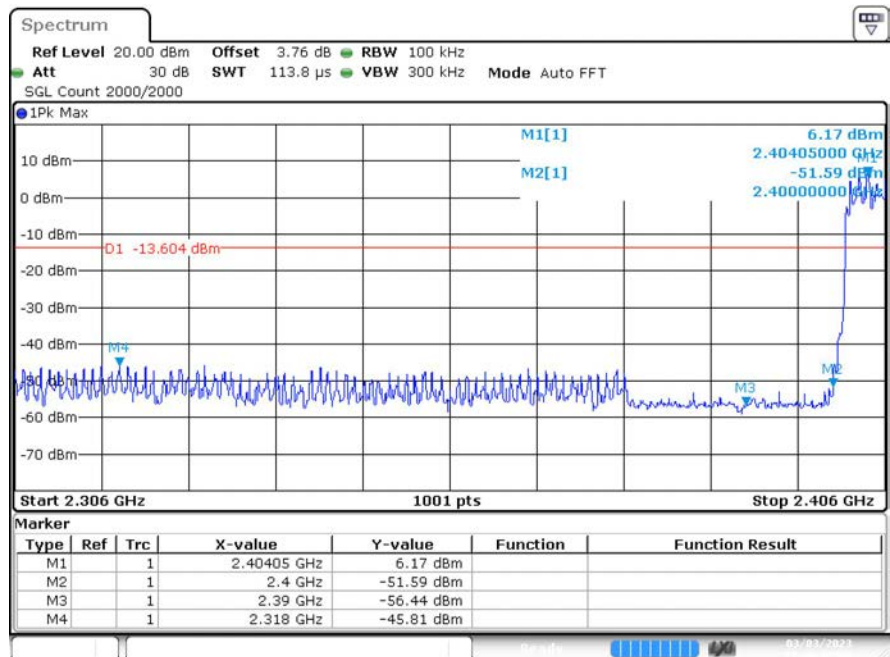
8DPSK/LCH/No Hop



Ref



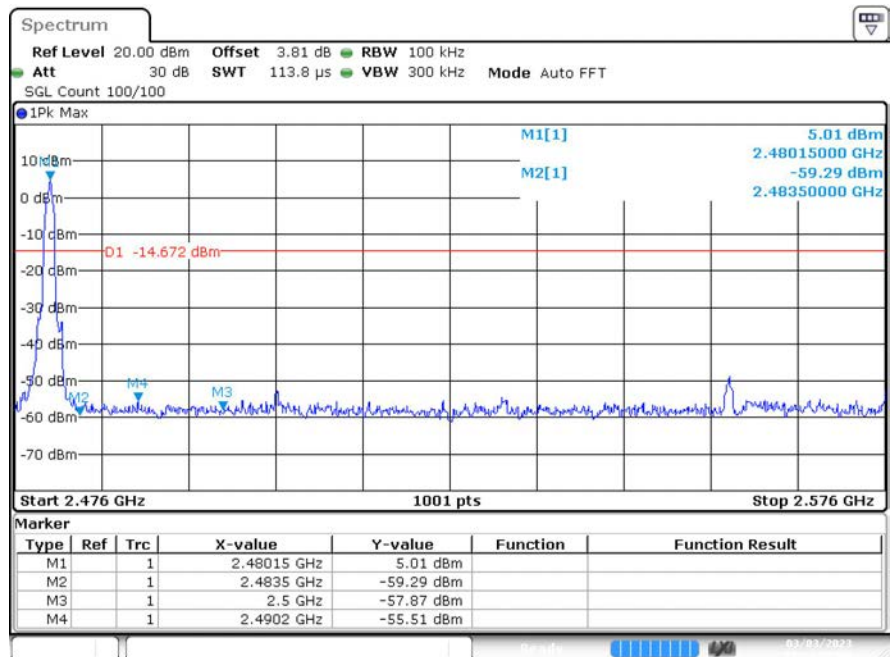
8DPSK/LCH/Hop



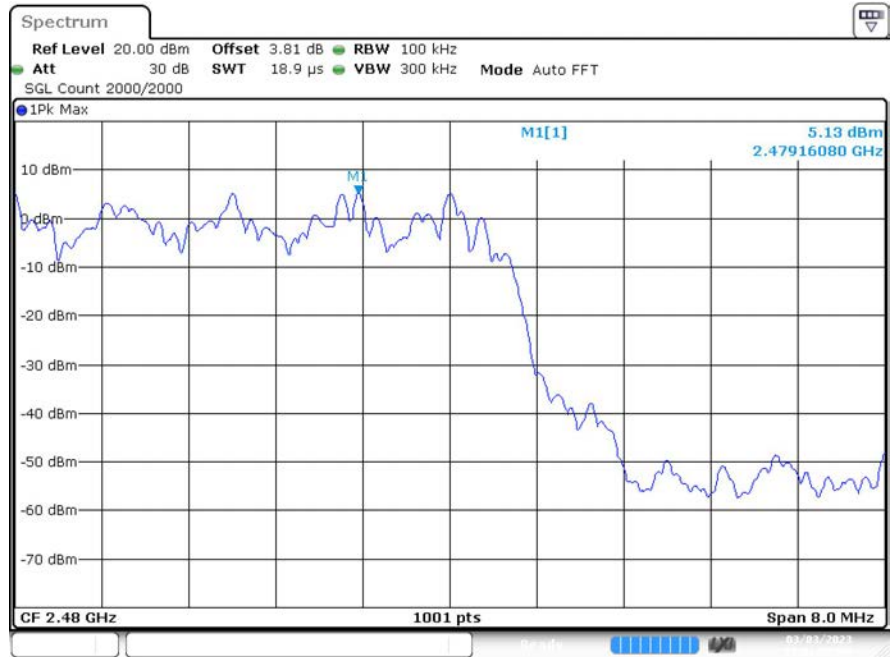
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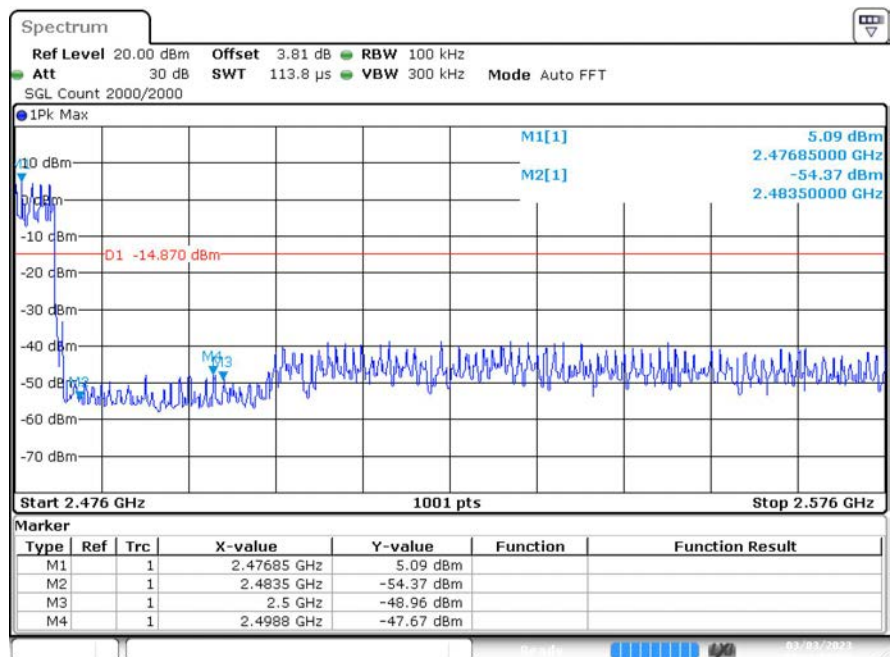
8DPSK/HCH/No Hop



Ref



8DPSK/HCH/Hop



9 Restrict-band band-edge measurements

9.1 Test Result

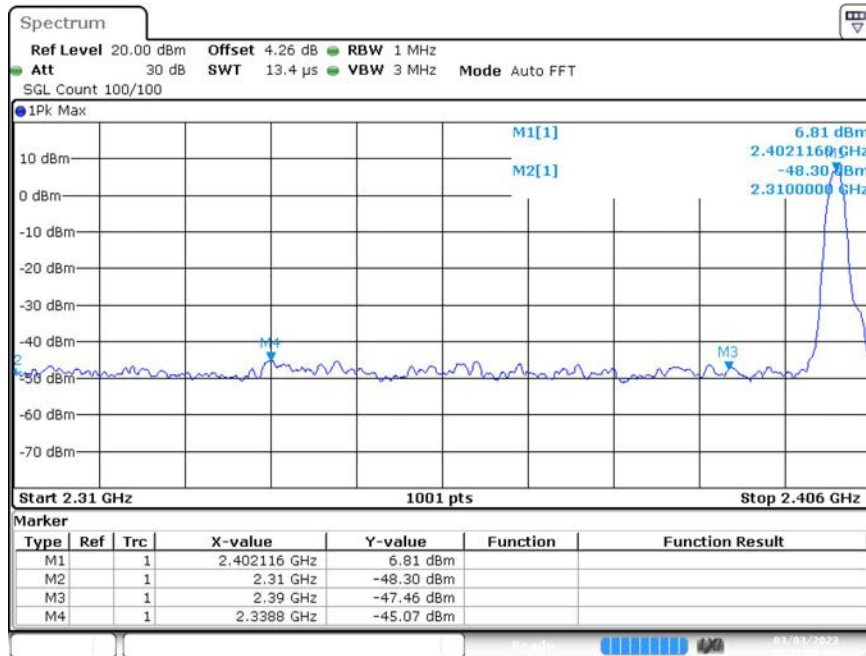
Test Mode	Hopping	Freq.	Power [dBm]	Gain	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.29	2	48.97	PEAK	74	Pass
	Off	2310.0	-56.57	2	40.69	AV	54	Pass
	Off	2338.8	-45.07	2	52.19	PEAK	74	Pass
	Off	2324.112	-54.04	2	43.22	AV	54	Pass
	Off	2390.0	-47.46	2	49.8	PEAK	74	Pass
	Off	2390.0	-56.09	2	41.17	AV	54	Pass
	Off	2483.5	-43.39	2	53.87	PEAK	74	Pass
	Off	2483.5	-53.3	2	43.96	AV	54	Pass
	Off	2483.512	-43.39	2	53.87	PEAK	74	Pass
	Off	2483.512	-53.3	2	43.96	AV	54	Pass
	Off	2500.0	-46.49	2	50.77	PEAK	74	Pass
	Off	2500.0	-56.22	2	41.04	AV	54	Pass
$\pi/4$ DQPSK	Off	2310.0	-49.19	2	48.07	PEAK	74	Pass
	Off	2310.0	-56.51	2	40.75	AV	54	Pass
	Off	2322.48	-44.01	2	53.25	PEAK	74	Pass
	Off	2338.224	-54.27	2	42.99	AV	54	Pass
	Off	2390.0	-48.42	2	48.84	PEAK	74	Pass
	Off	2390.0	-56.88	2	40.38	AV	54	Pass
	Off	2483.5	-48.19	2	49.07	PEAK	74	Pass
	Off	2483.5	-55.43	2	41.83	AV	54	Pass
	Off	2489.944	-44.98	2	52.28	PEAK	74	Pass
	Off	2483.512	-55.43	2	41.83	AV	54	Pass
	Off	2500.0	-47.7	2	49.56	PEAK	74	Pass
	Off	2500.0	-55.64	2	41.62	AV	54	Pass
8DPSK	Off	2310.0	-46.87	2	50.39	PEAK	74	Pass
	Off	2310.0	-56.45	2	40.81	AV	54	Pass
	Off	2383.824	-44.53	2	52.73	PEAK	74	Pass
	Off	2340.336	-54.34	2	42.92	AV	54	Pass



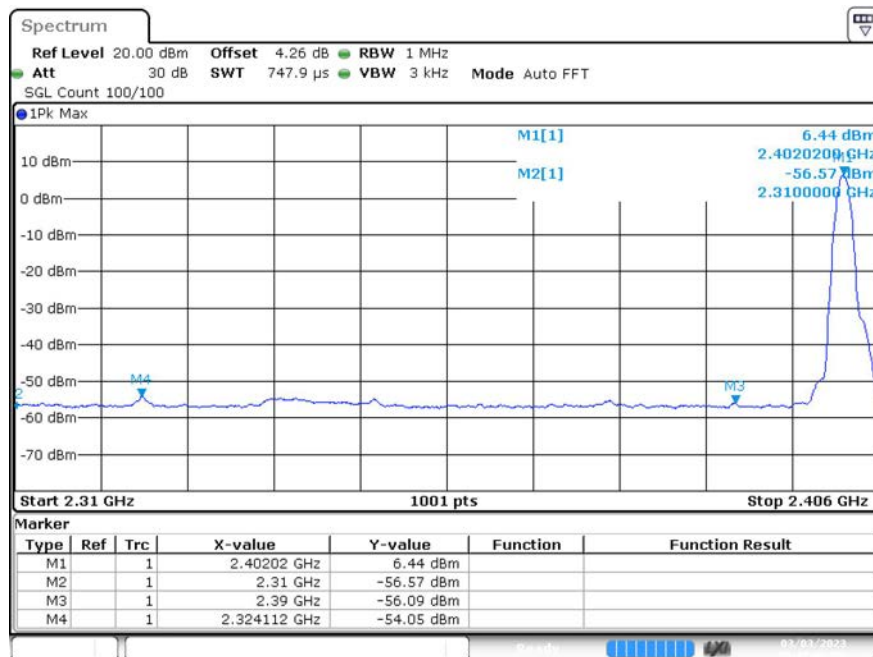
	Off	2390.0	-46.4	2	50.86	PEAK	74	Pass
	Off	2390.0	-56.61	2	40.65	AV	54	Pass
	Off	2483.5	-48.79	2	48.47	PEAK	74	Pass
	Off	2483.5	-55.79	2	41.47	AV	54	Pass
	Off	2487.352	-45.68	2	51.58	PEAK	74	Pass
	Off	2499.976	-55.72	2	41.54	AV	54	Pass
	Off	2500.0	-48.01	2	49.25	PEAK	74	Pass
	Off	2500.0	-55.72	2	41.54	AV	54	Pass

9.2 Test Graphs

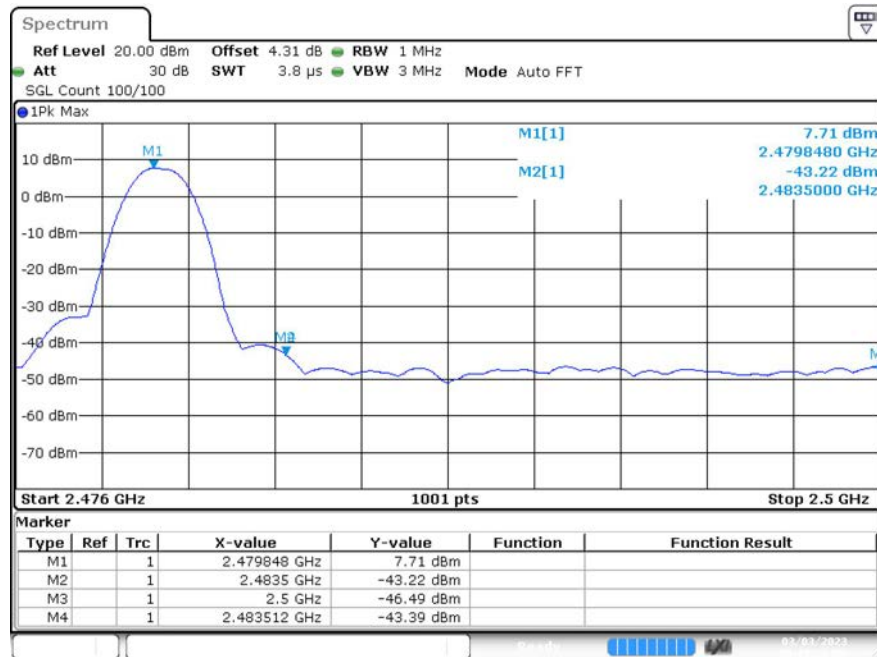
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



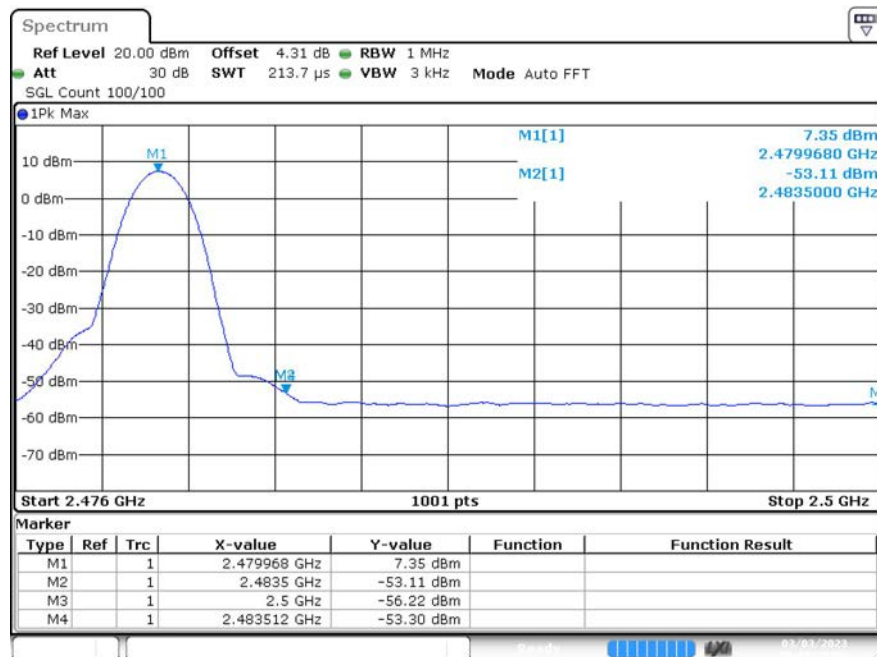
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



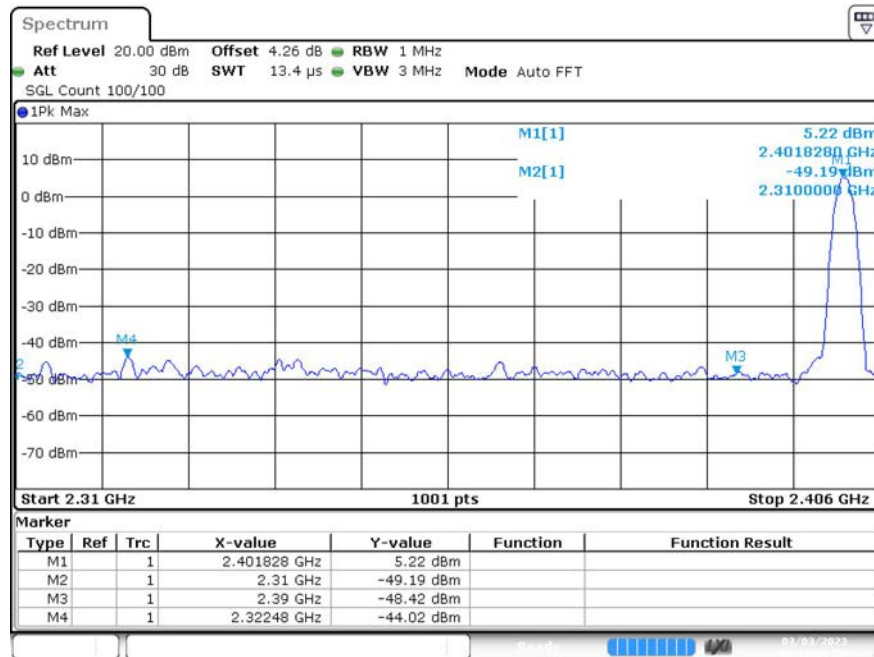
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



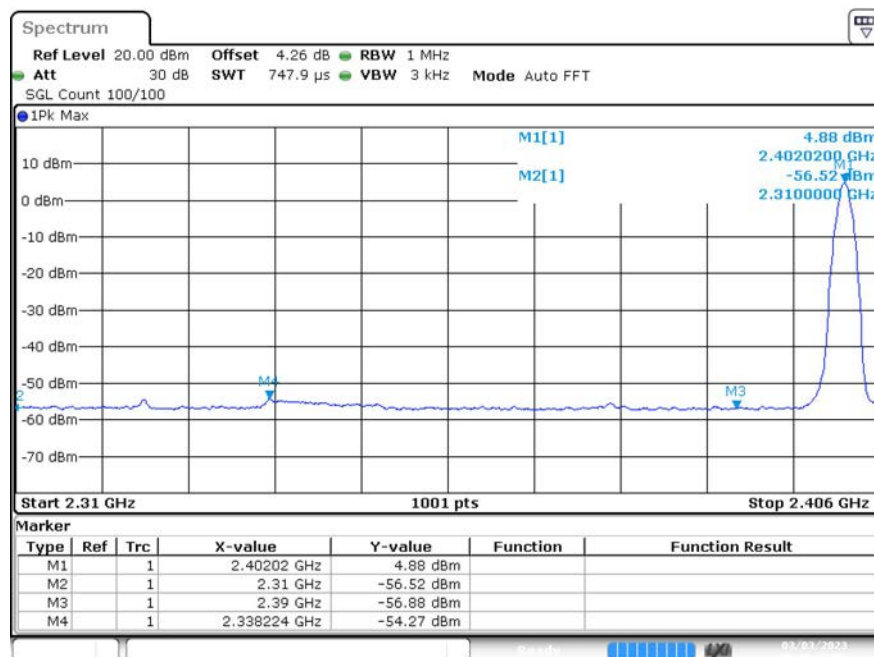
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



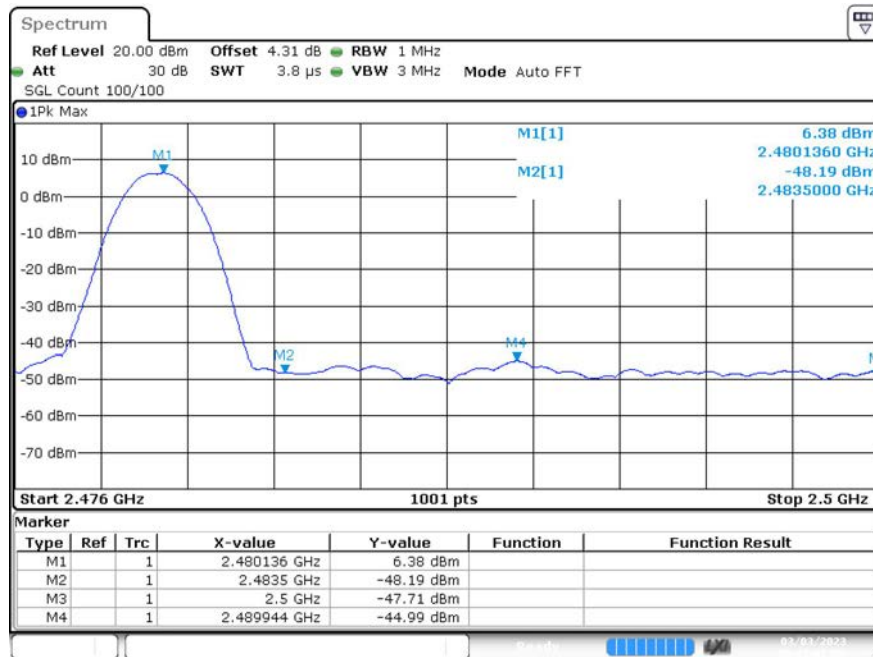
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



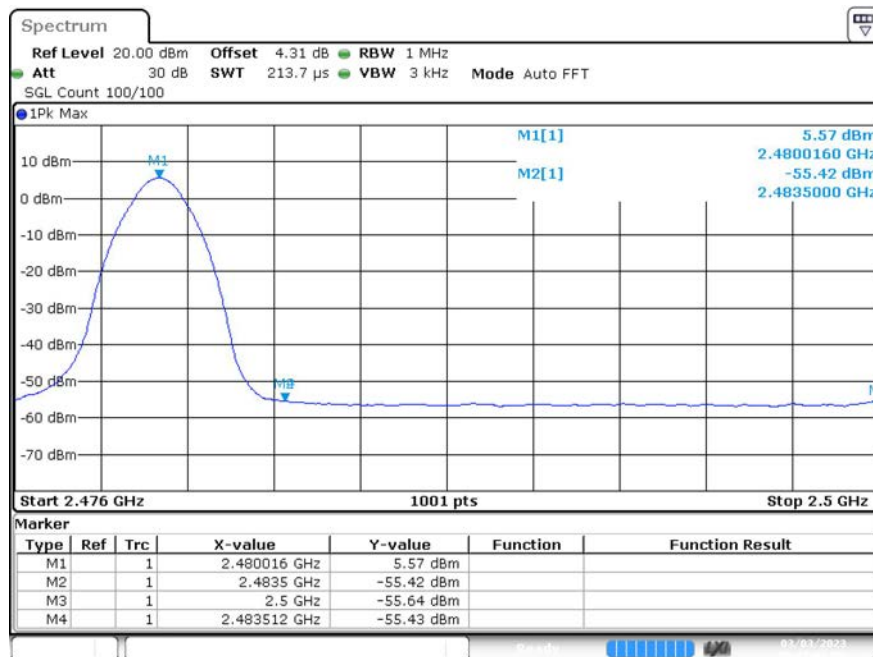
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



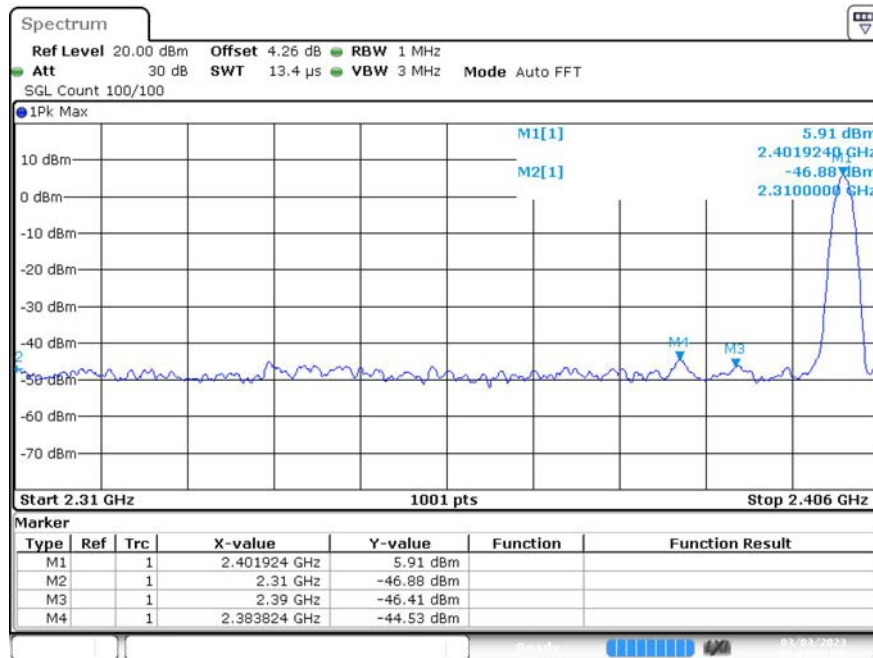
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



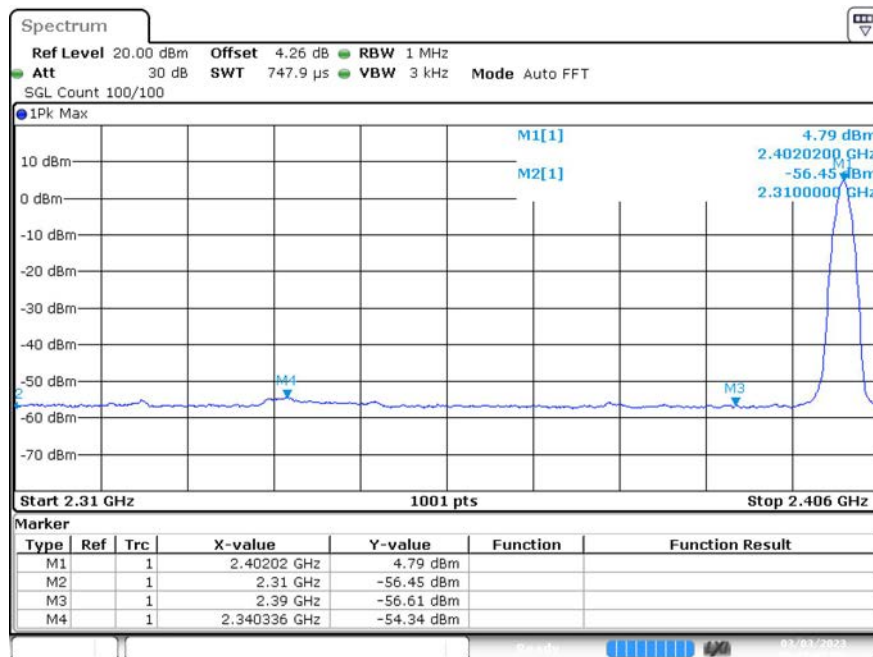
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



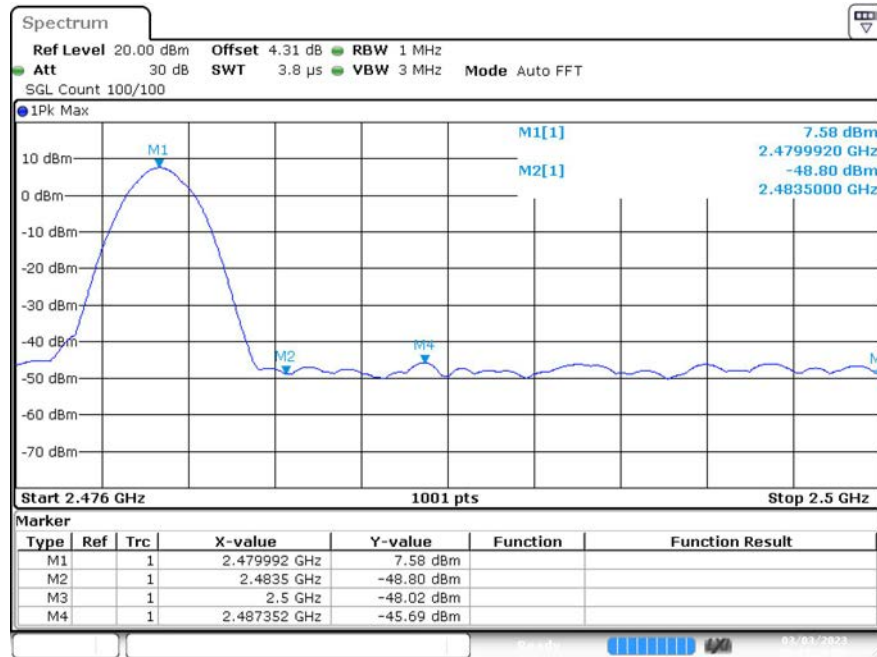
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



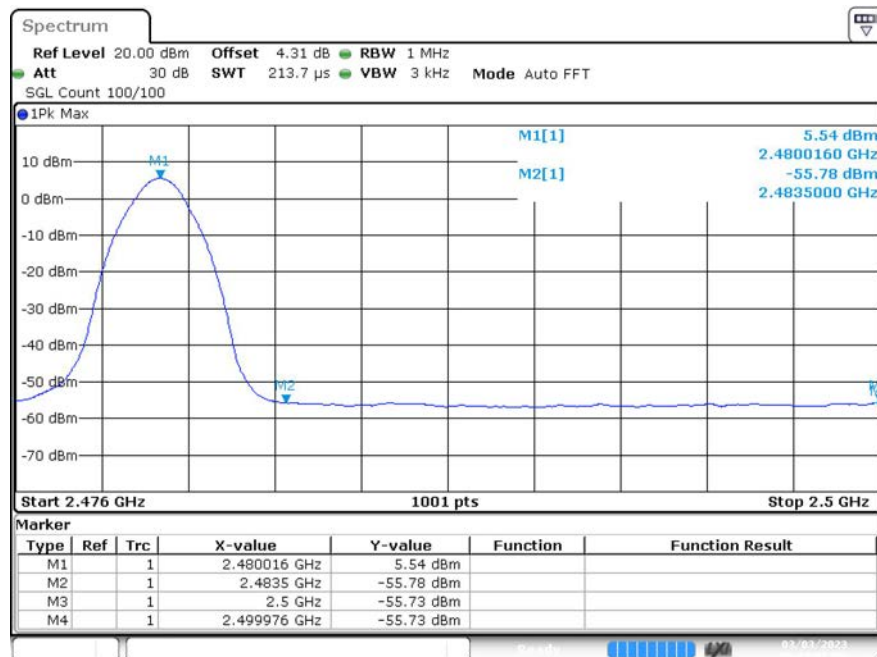
Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



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



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



---The End---