Appendix A

Report No.:	CISRR240302016
FCC ID:	2BET4-MA-C40
Product Name:	Wireless Bluetooth speaker
Model No.:	MA-C40
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Conducted Peak Output Power

Test Result

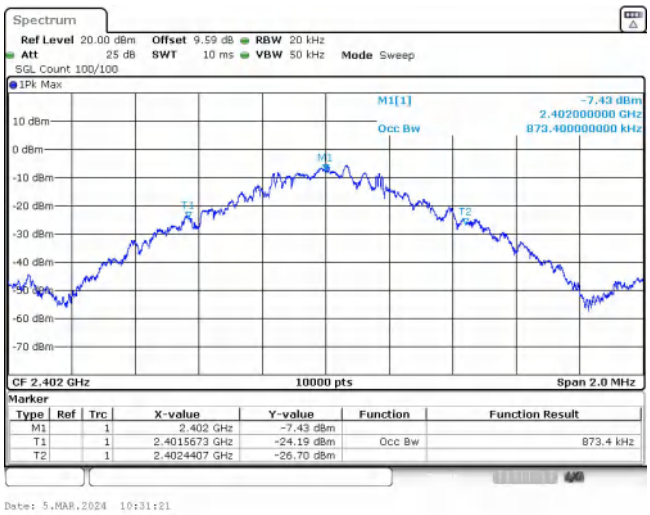
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-2.129	0.612	30	PASS
		39	-1.194	0.760		PASS
		78	-1.204	0.758		PASS
π/4DQPSK	2-DH5	0	-1.363	0.731	20.97	PASS
		39	-0.361	0.920		PASS
		78	-0.317	0.930		PASS
8DPSK	3-DH5	0	-1.429	0.720		PASS
		39	-0.885	0.816		PASS
		78	0.488	1.119		PASS

2) 99% Bandwidth

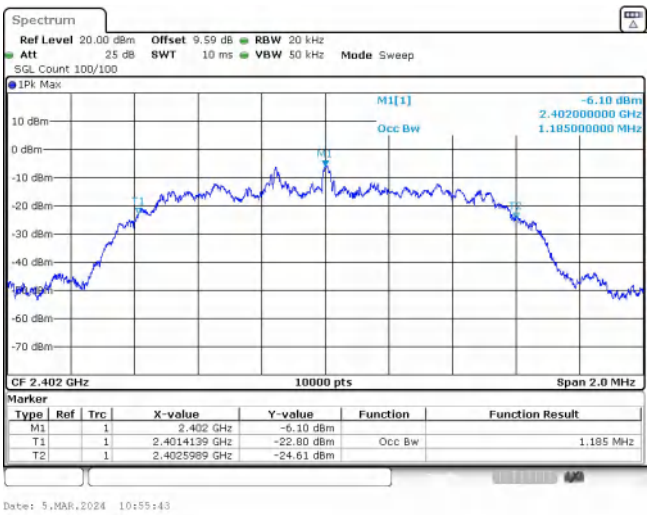
Test Result

Modulation	Channel	99% BW (MHz)
GFSK	0	0.87340
	39	0.88260
	78	0.89220
π/4DQPSK	0	1.1850
	39	1.1860
	78	1.1970
8DPSK	0	1.1910
	39	1.1930
	78	1.1960

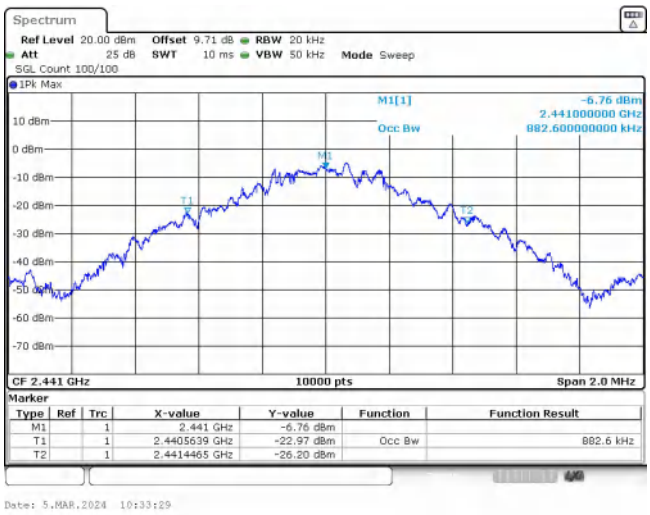
Test Graphs



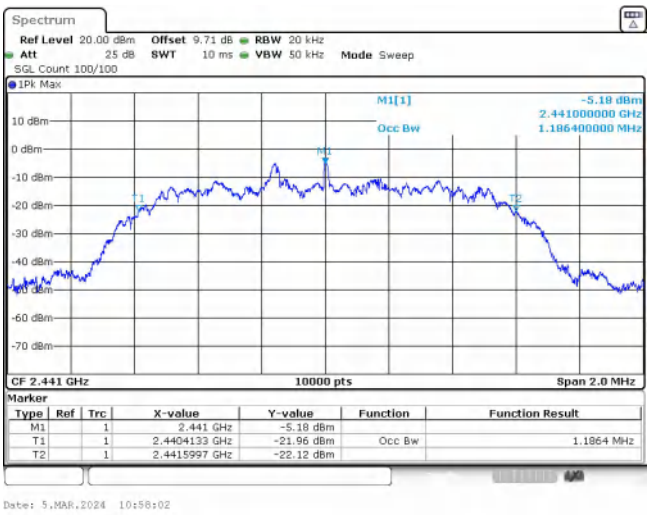
GFSK_DH5_Channel 0



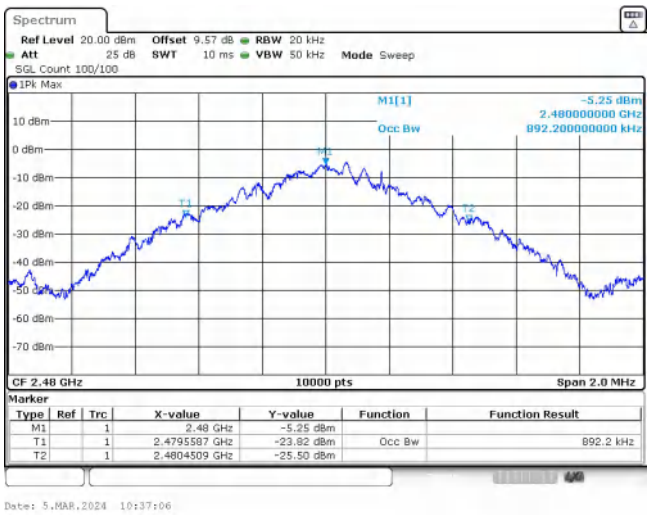
π/4DQPSK_2-DH5_Channel 0



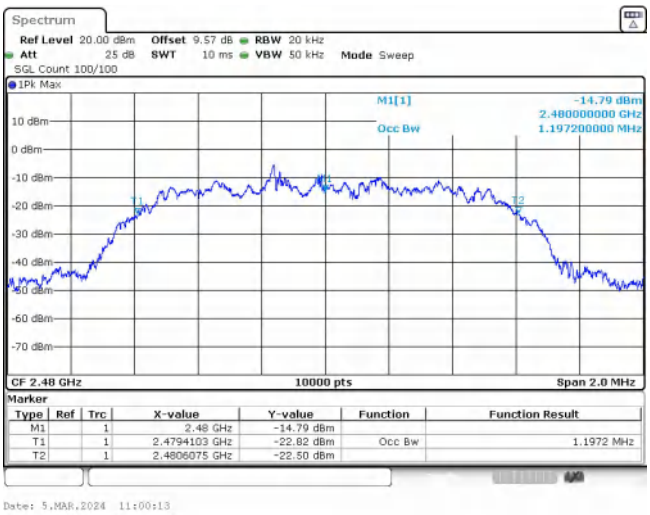
GFSK_DH5_Channel 39



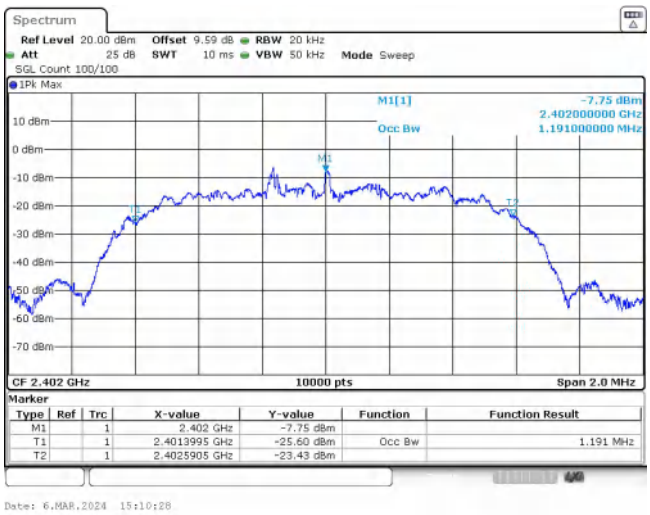
π/4DQPSK_2-DH5_Channel 39



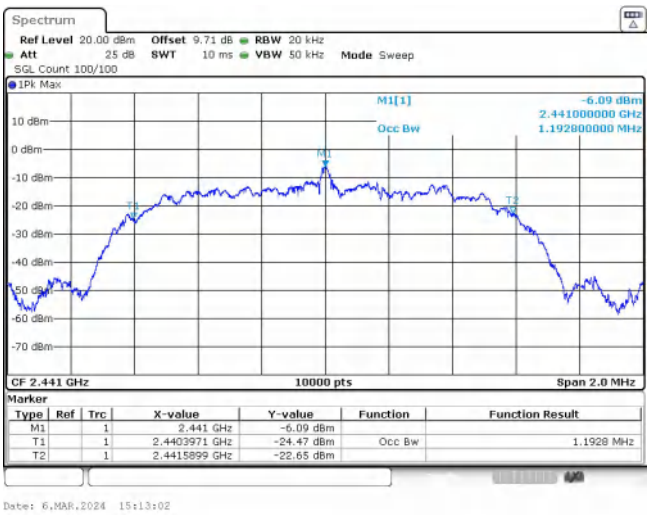
GFSK_DH5_Channel 78



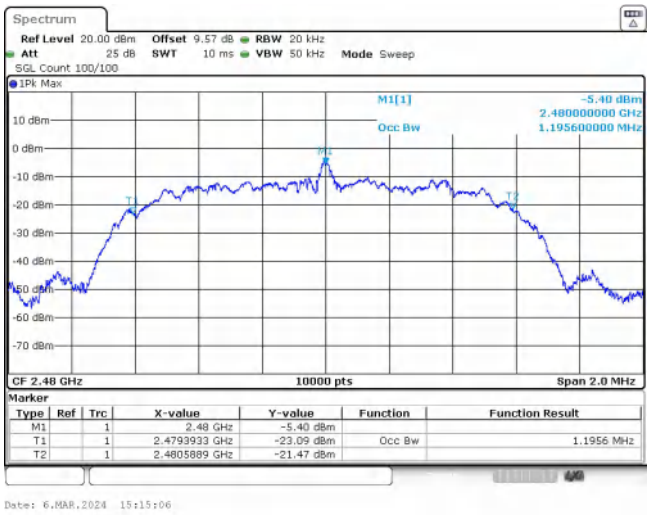
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

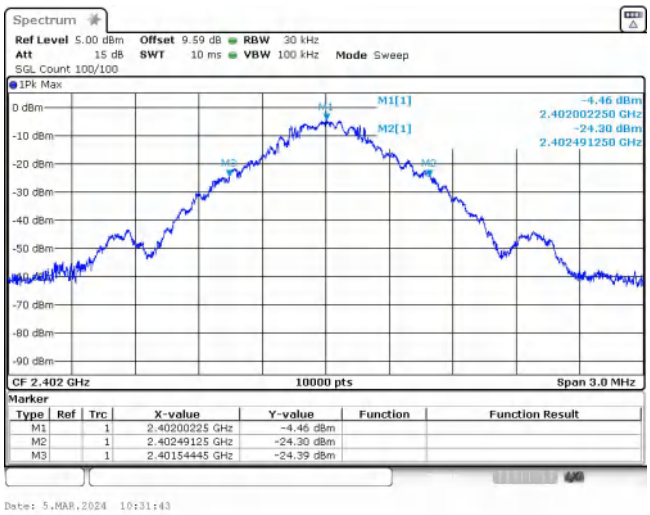
Void

3) 20dB Bandwidth

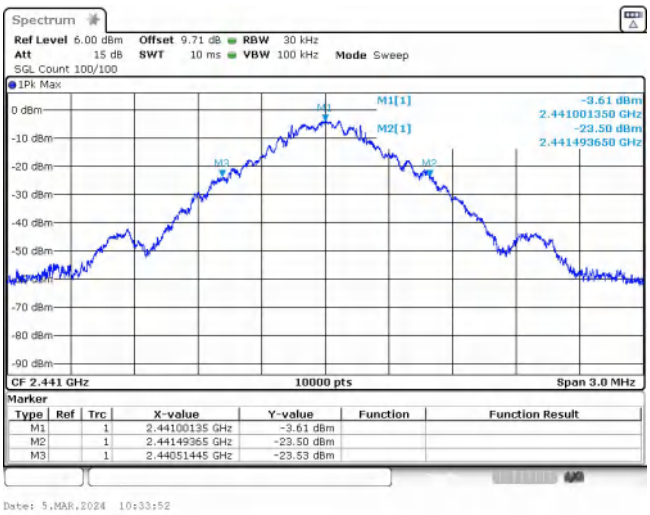
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9500
	39	2441 MHz	0.9800
	78	2480 MHz	1.010
π/4DQPSK	0	2402 MHz	1.310
	39	2441 MHz	1.280
	78	2480 MHz	1.310
8DPSK	0	2402 MHz	1.280
	39	2441 MHz	1.300
	78	2480 MHz	1.300

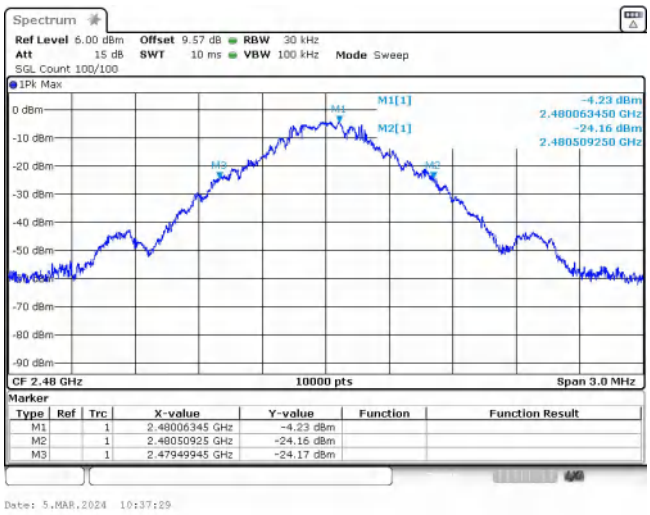
Test Graphs



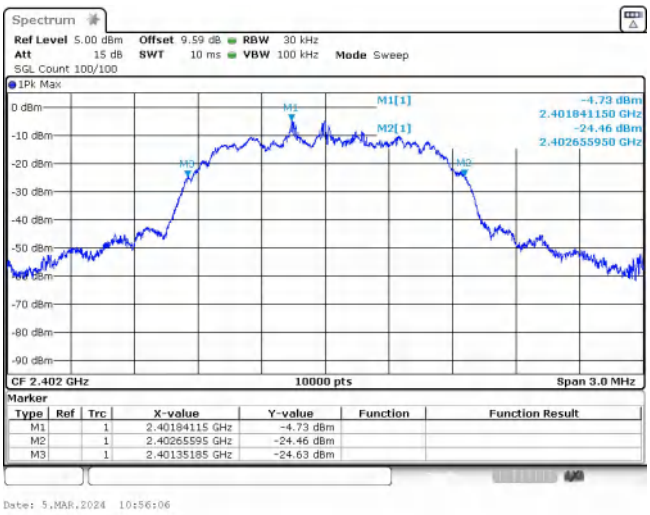
GFSK_DH5_Channel 0



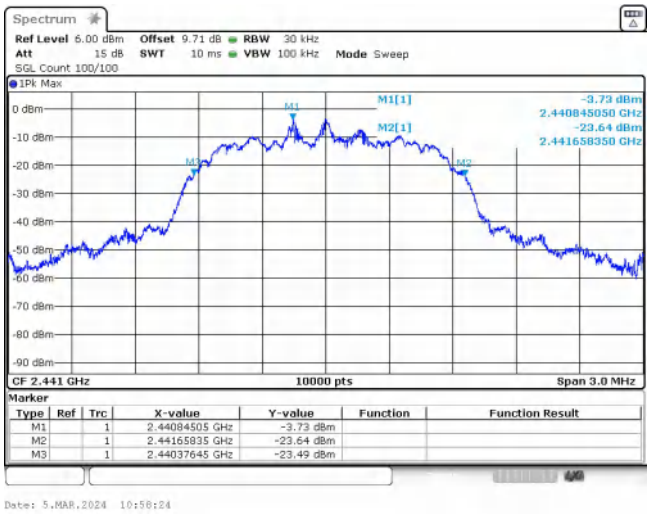
GFSK_DH5_Channel 39



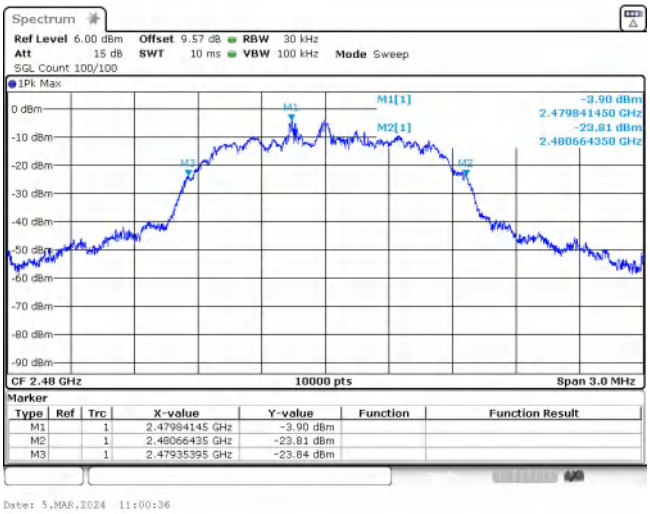
GFSK_DH5_Channel 78



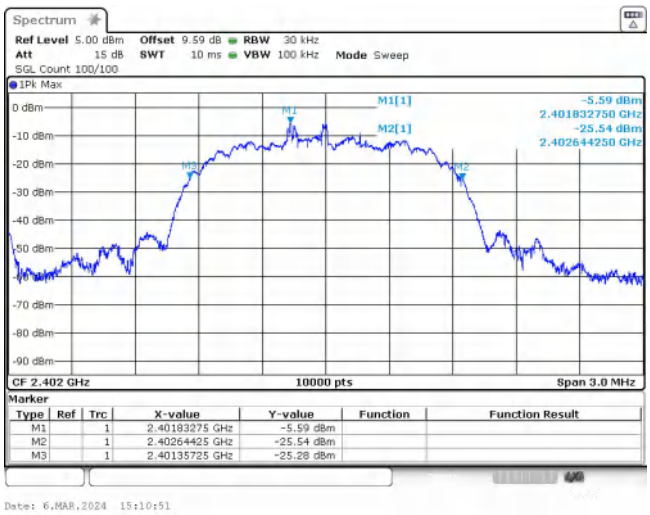
π/4DQPSK_2-DH5_Channel 0



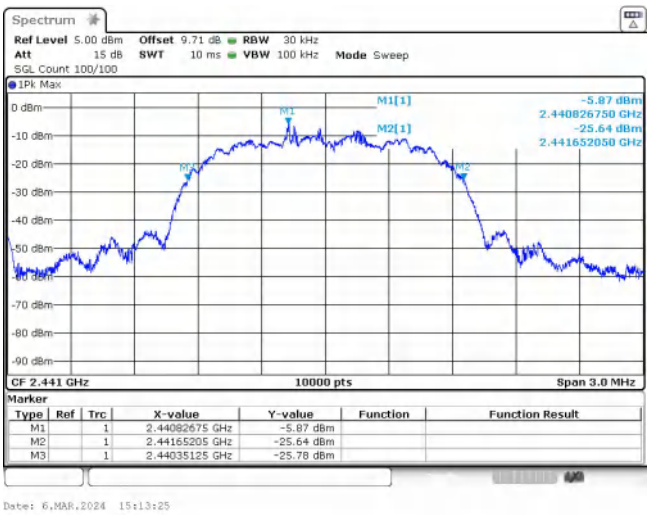
π/4DQPSK_2-DH5_Channel 39



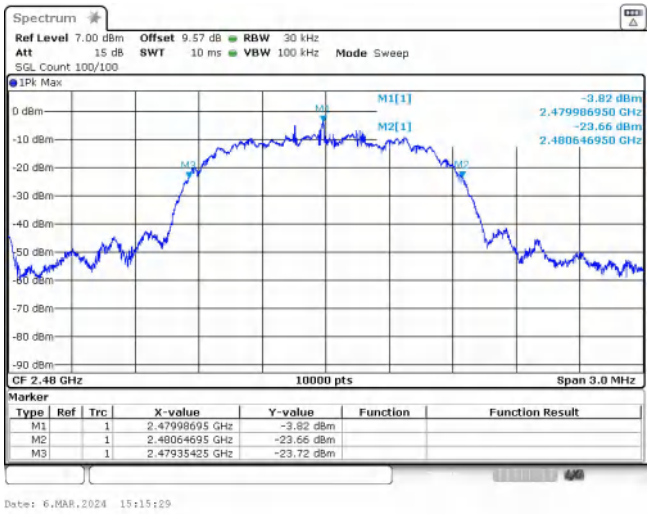
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

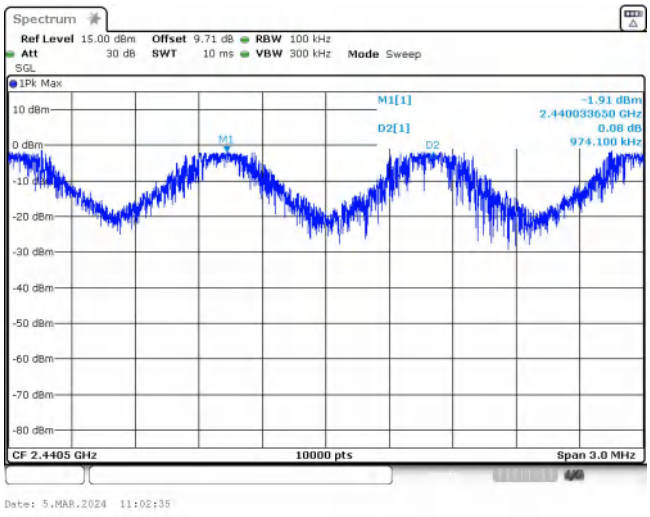
Void

4) Carrier Frequencies Separation

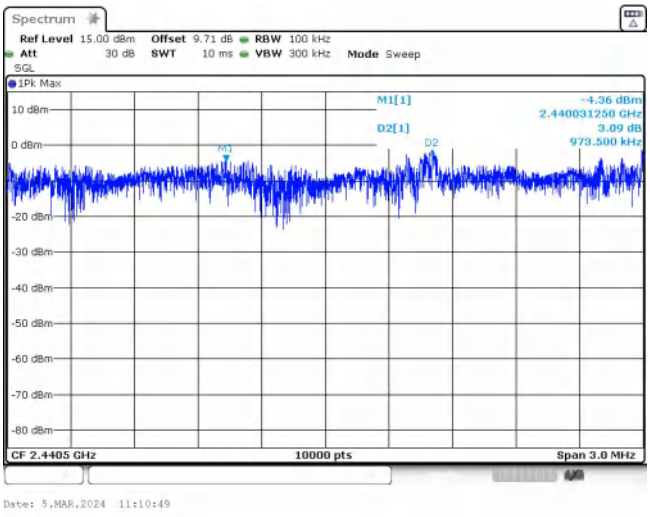
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0336	2441.0078	0.9741	0.633	PASS
π/4DQPSK	2-DH5	2440.0312	2441.0048	0.9735	0.873	PASS
8DPSK	3-DH5	2439.9857	2441.1937	1.2081	0.853	PASS

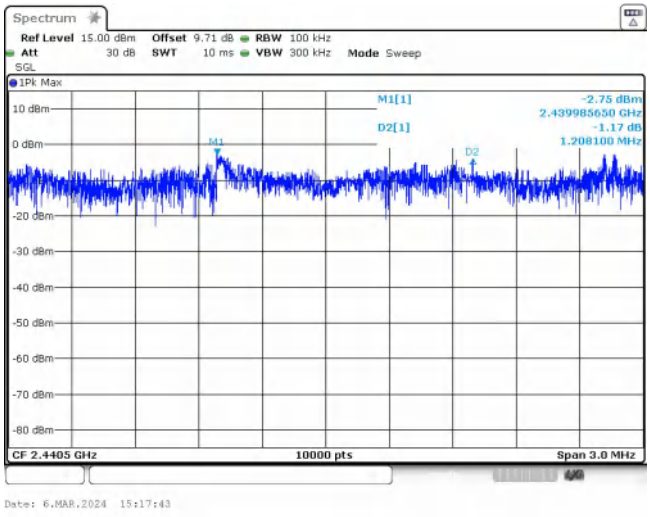
Test Graphs



GFSK



π/4DQPSK



8DPSK

Void

5) Conducted Out Of Band Emission

Test Result

Non-Hopping

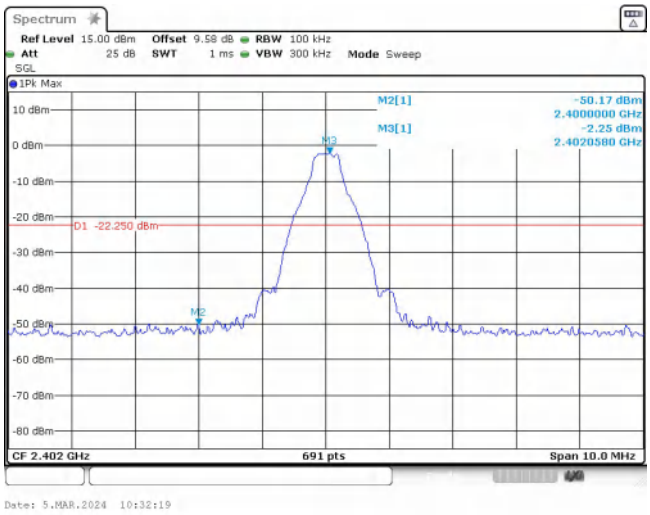
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-50.166	-22.25	-27.916	PASS
			9608.08	-43.937	-22.25	-21.687	PASS
		39	9763.72	-45.183	-21.35	-23.833	PASS
		78	2483.50	-53.095	-21.3	-31.795	PASS
			9920.20	-43.861	-21.3	-22.561	PASS
π/4DQPSK	2-DH5	0	2400.00	-51.150	-22.32	-28.830	PASS
			2397.77	-50.282	-22.32	-27.962	PASS
			9608.10	-43.829	-22.32	-21.509	PASS
		39	9763.72	-43.654	-21.4	-22.254	PASS
		78	2483.50	-51.275	-21.29	-29.985	PASS
			9920.20	-44.365	-21.29	-23.075	PASS
8DPSK	3-DH5	0	2400.00	-52.266	-22.87	-29.396	PASS
			2398.85	-44.681	-22.87	-21.811	PASS
			18262.7	-47.780	-22.87	-24.910	PASS
		39	9757.90	-48.836	-22.62	-26.216	PASS
		78	2483.50	-48.930	-20.95	-27.980	PASS
			23288.3	-49.678	-20.95	-28.728	PASS

Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.41	-49.995	-22.56	-27.435	PASS
			2400.00	-51.281	-22.56	-28.721	PASS
			2483.50	-52.829	-21.2	-31.629	PASS
			2397.48	-49.765	-22.2	-27.565	PASS
			2400.00	-50.093	-22.2	-27.893	PASS
			2483.50	-51.357	-21.14	-30.217	PASS
π/4DQPSK	2-DH5		2397.16	-49.797	-22.06	-27.737	PASS
			2400.00	-51.480	-22.06	-29.420	PASS
			2483.50	-51.676	-21.19	-30.486	PASS
			2396.44	-49.787	-22.25	-27.537	PASS
			2400.00	-52.530	-22.25	-30.280	PASS
			2483.50	-51.307	-21.18	-30.127	PASS
8DPSK	3-DH5		2398.99	-47.989	-23.96	-24.029	PASS
			2400.00	-49.449	-23.96	-25.489	PASS
			2483.50	-50.016	-20.87	-29.146	PASS
			2400.00	-44.523	-23.22	-21.303	PASS

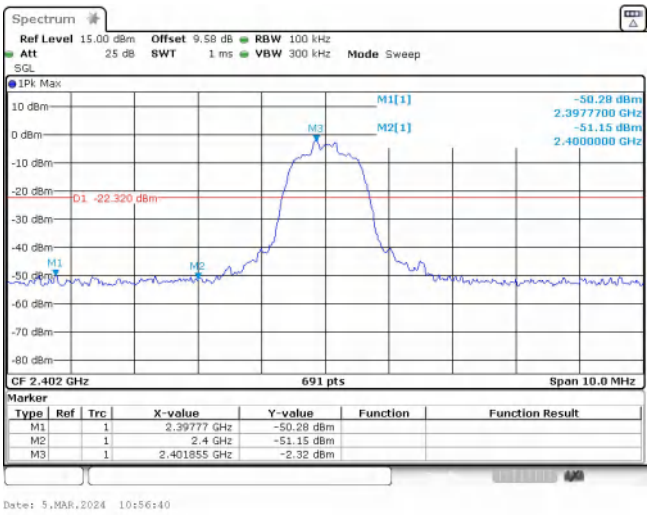
			2483.50	-49.657	-21.09	-28.567	PASS

Test Graphs



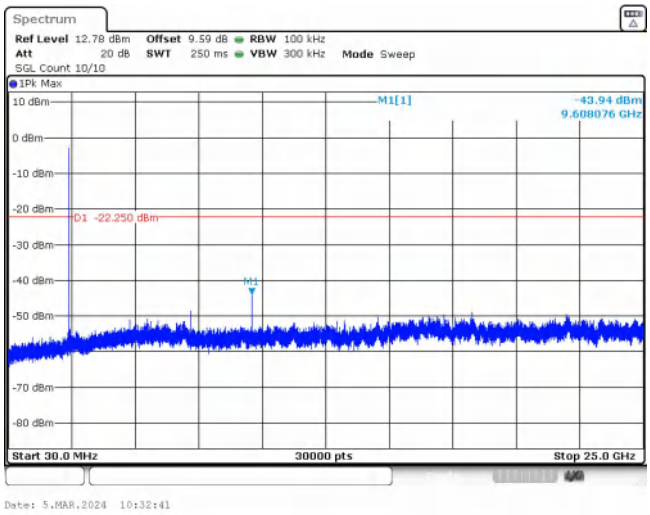
Out Of Band Emission

GFSK_DH5_Channel 0



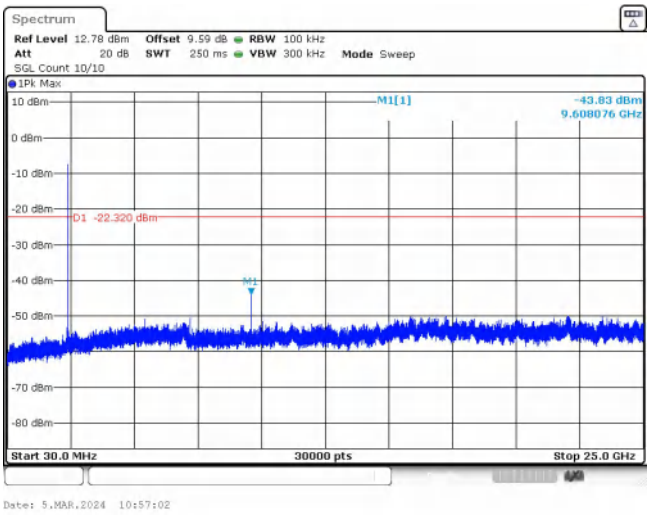
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 0



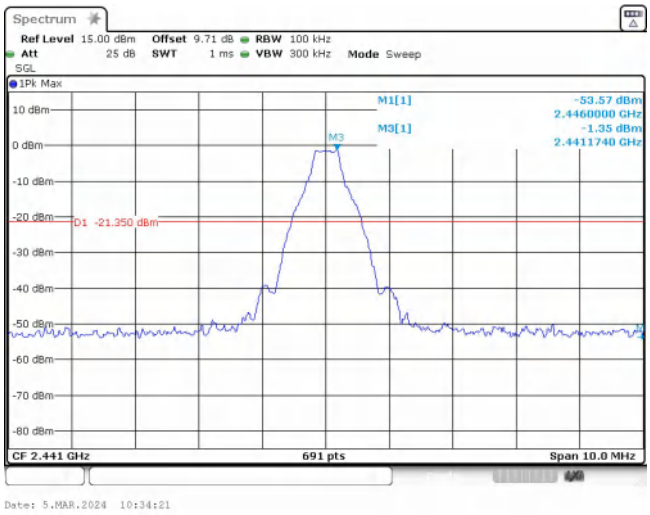
Spurious Emission

GFSK_DH5_Channel 0

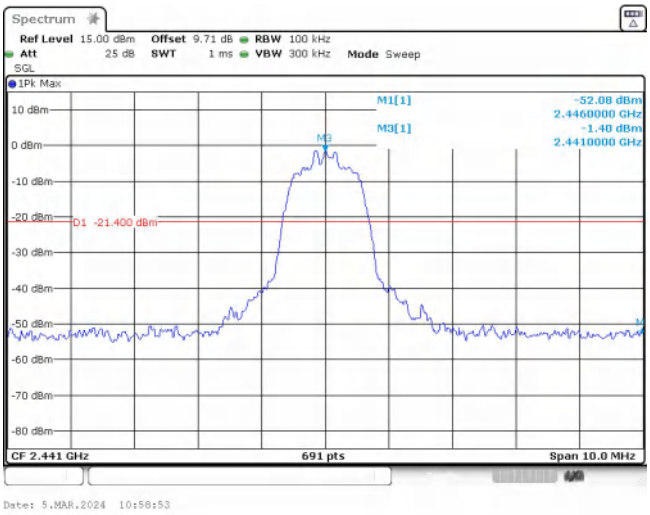


Spurious Emission

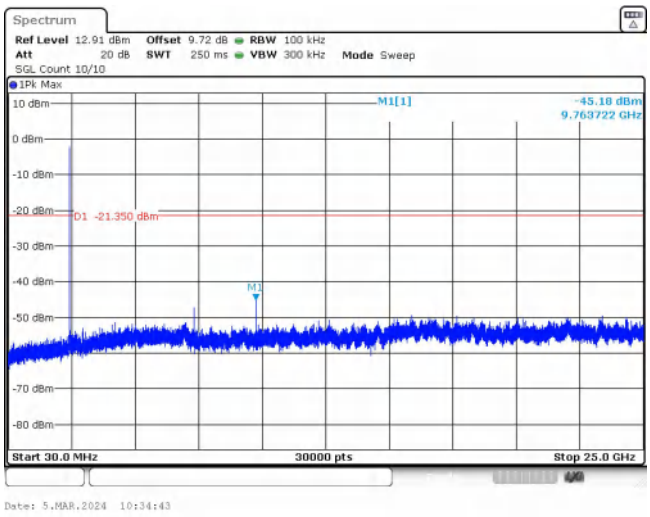
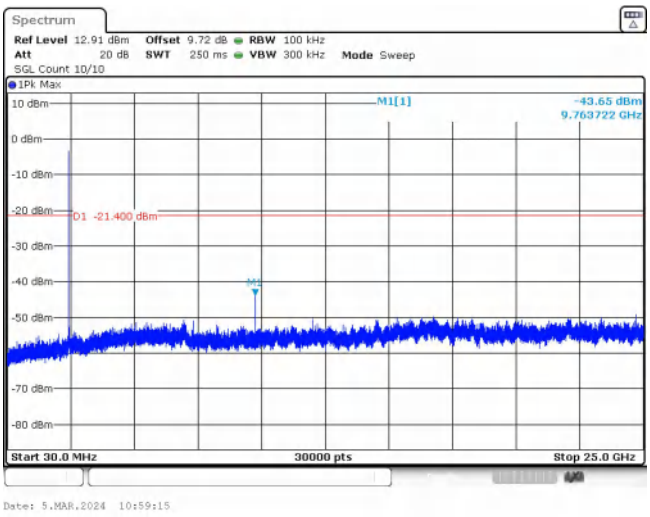
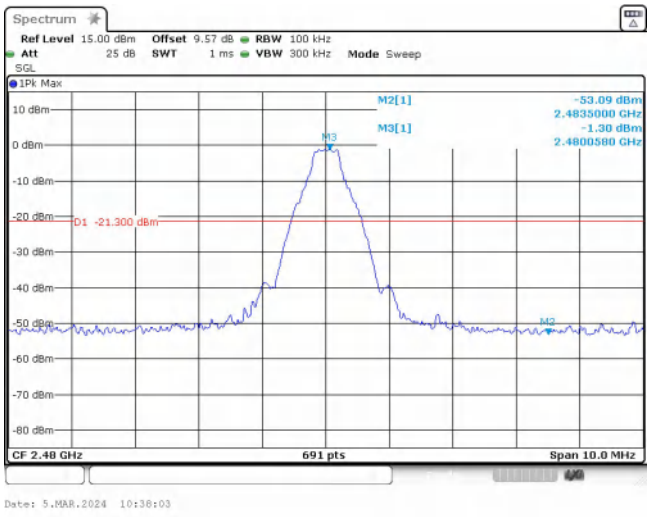
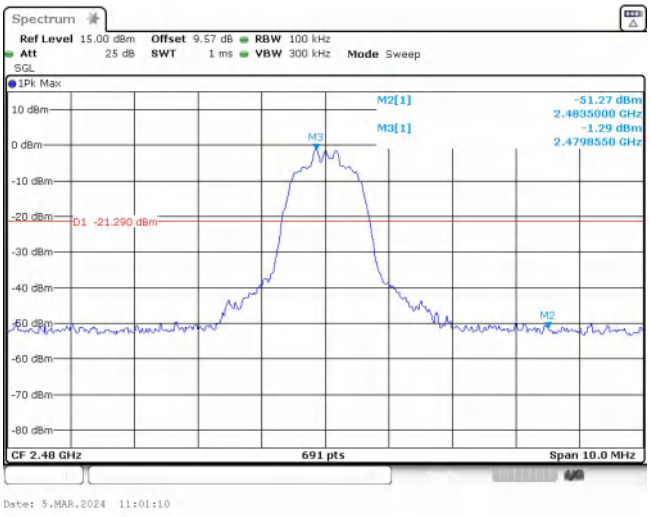
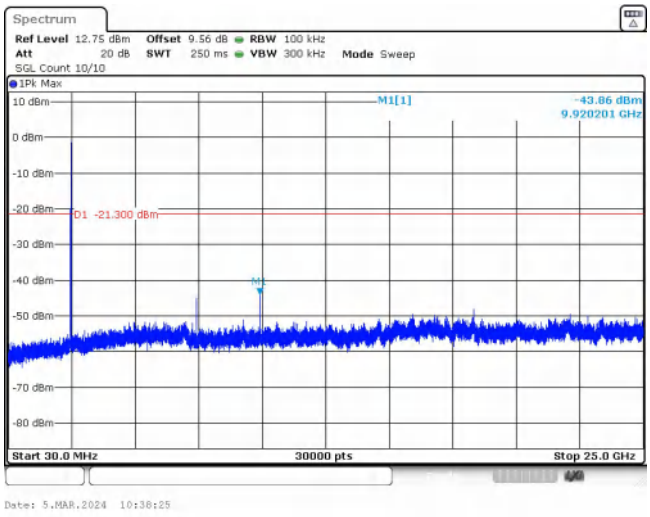
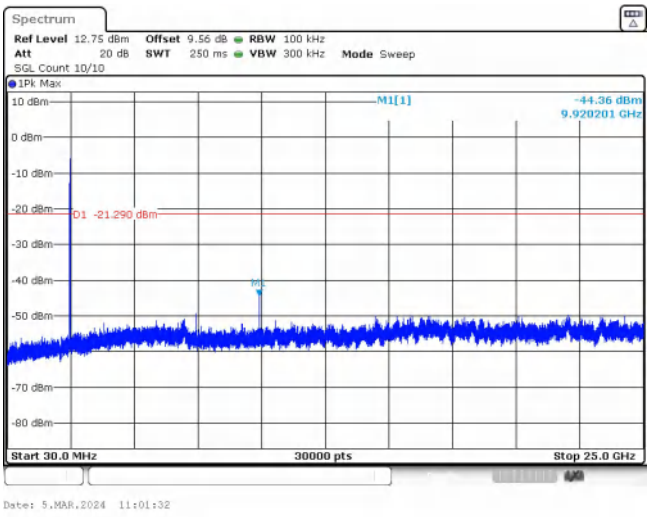
π/4DQPSK_2-DH5_Channel 0

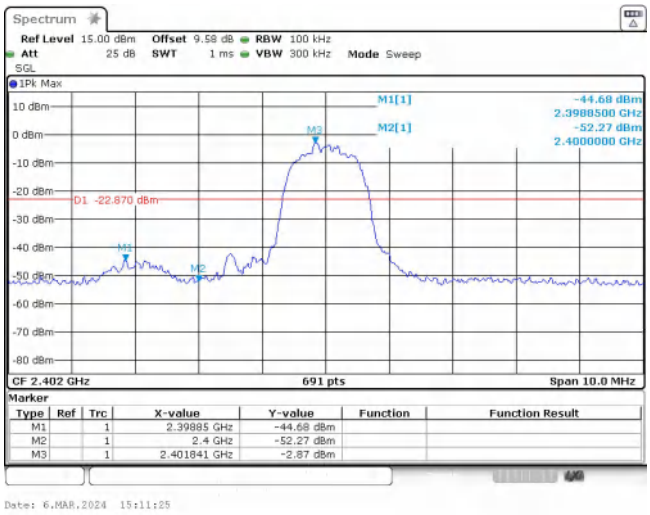


Out Of Band Emission



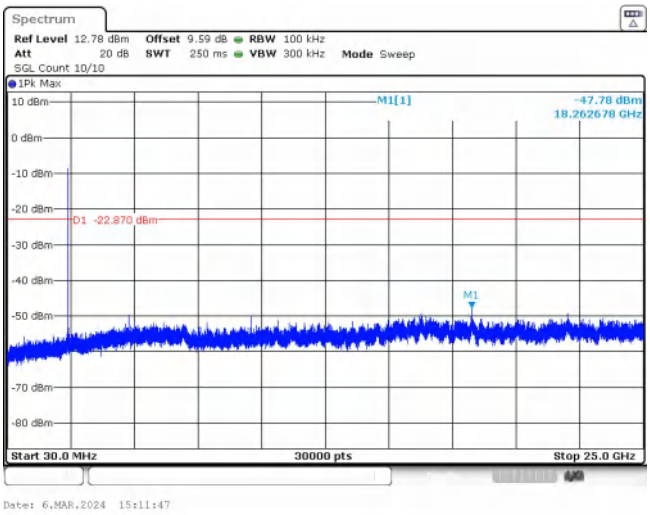
Out Of Band Emission

GFSK_DH5_Channel 39	π/4DQPSK_2-DH5_Channel 39
	
Spurious Emissions GFSK_DH5_Channel 39	Spurious Emissions π/4DQPSK_2-DH5_Channel 39
	
Out Of Band Emission GFSK_DH5_Channel 78	Out Of Band Emission π/4DQPSK_2-DH5_Channel 78
	
Spurious Emission GFSK_DH5_Channel 78	Spurious Emission π/4DQPSK_2-DH5_Channel 78



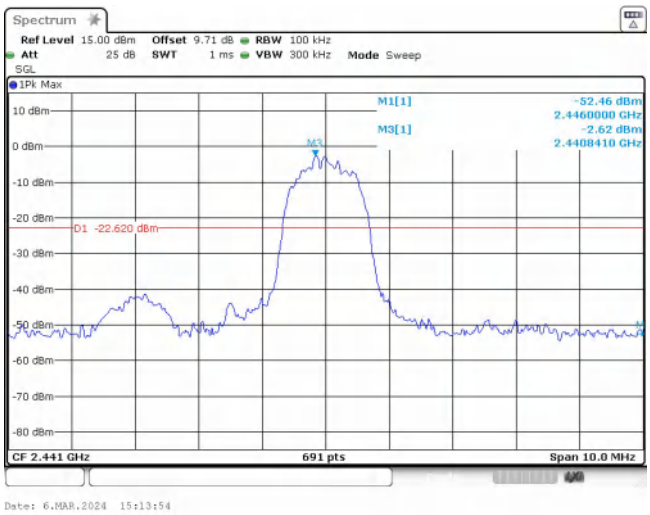
Out Of Band Emission

8DPSK_3-DH5_Channel 0



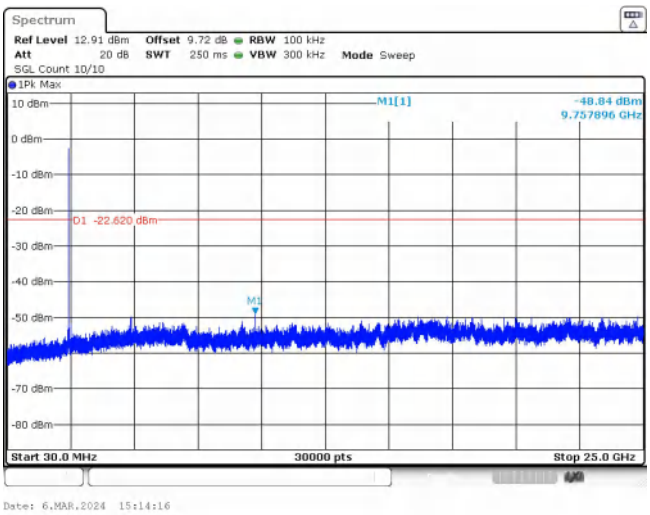
Spurious Emission

8DPSK_3-DH5_Channel 0



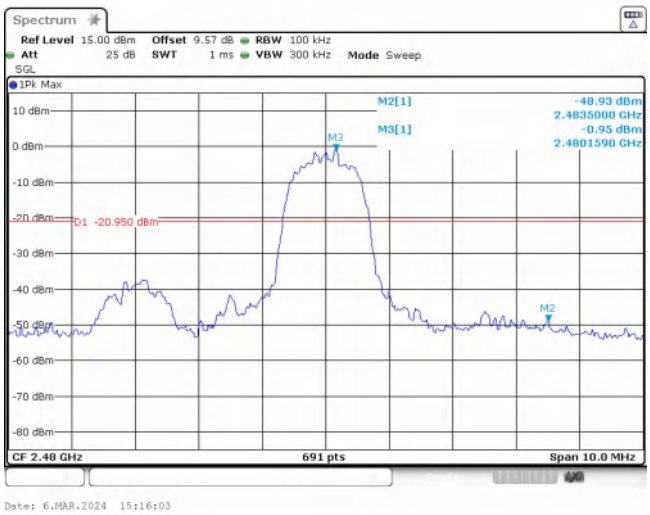
Out Of Band Emission

8DPSK_3-DH5_Channel 39



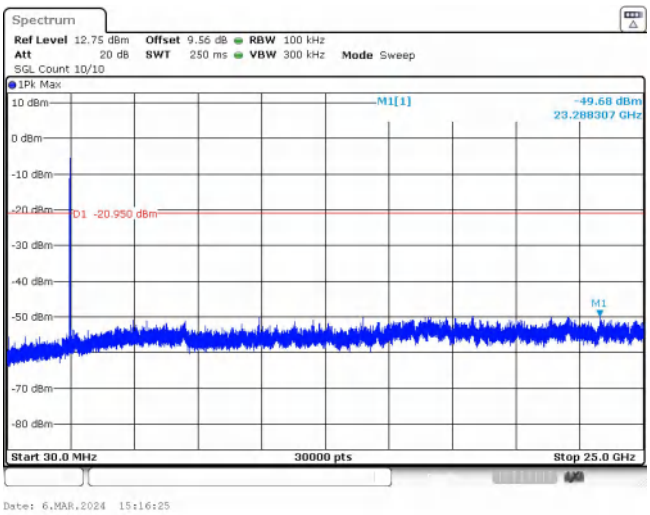
Spurious Emissions

8DPSK_3-DH5_Channel 39



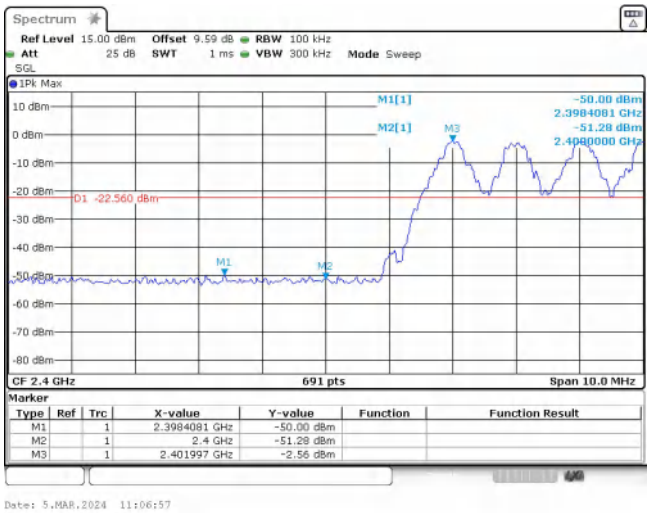
Out Of Band Emission

8DPSK_3-DH5_Channel 78



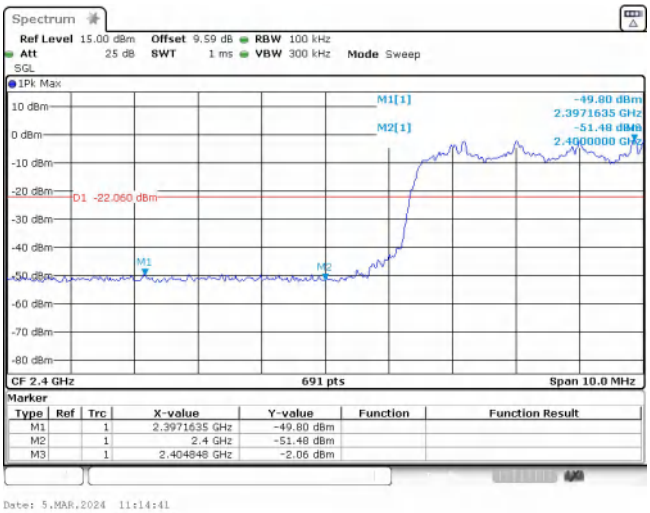
Spurious Emission

8DPSK_3-DH5_Channel 78



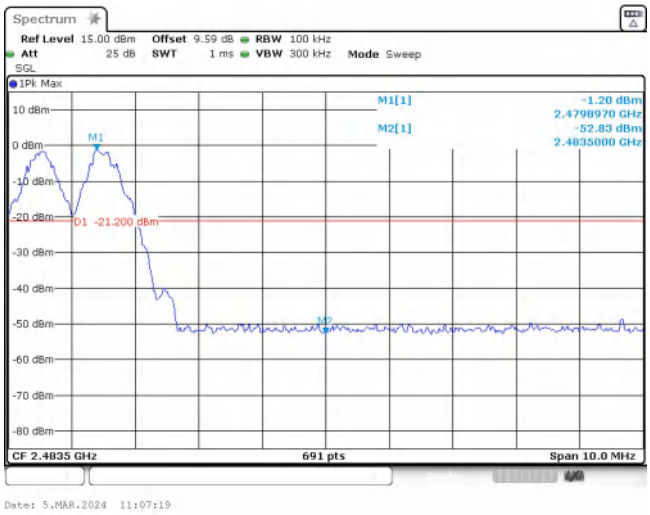
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



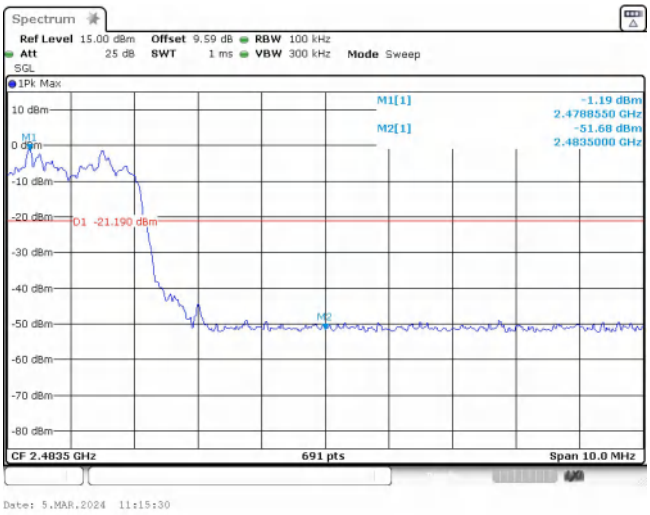
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



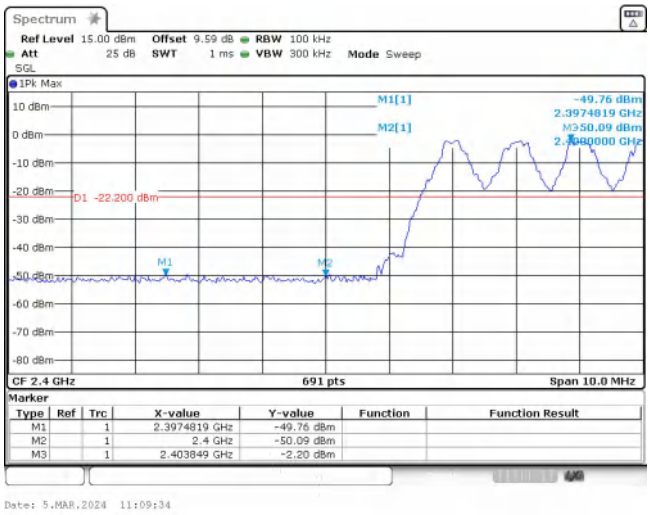
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping

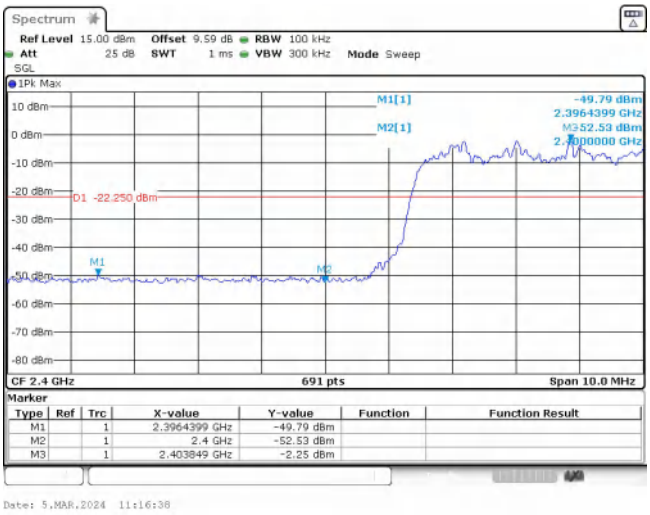


Out Of Band Emission(Right)

π/4DQPSK_2-DH5_Channel Hopping

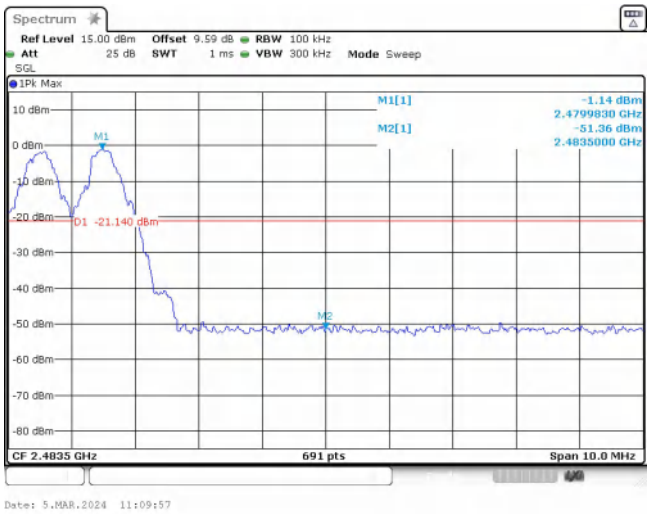


Out Of Band Emission(Left)

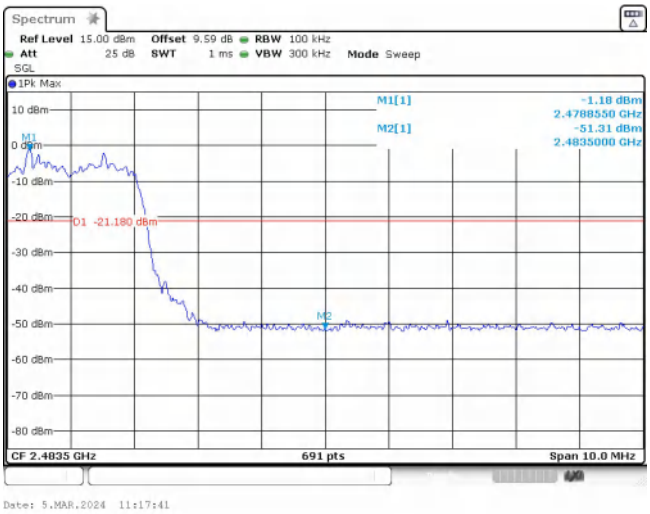


Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping

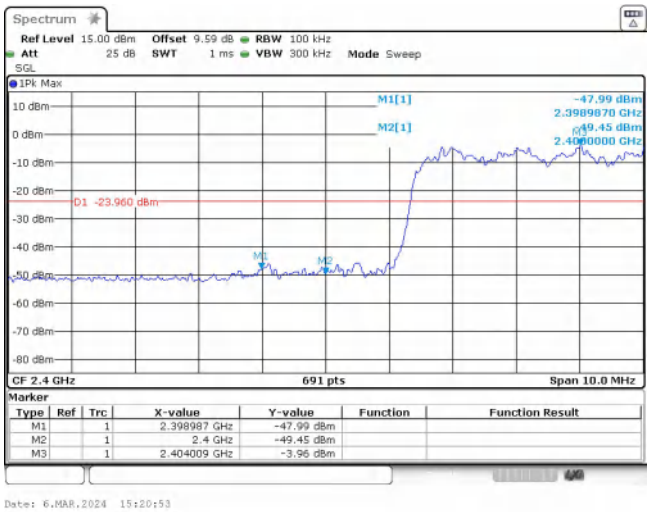


π/4DQPSK_2-DH5_Channel Hopping



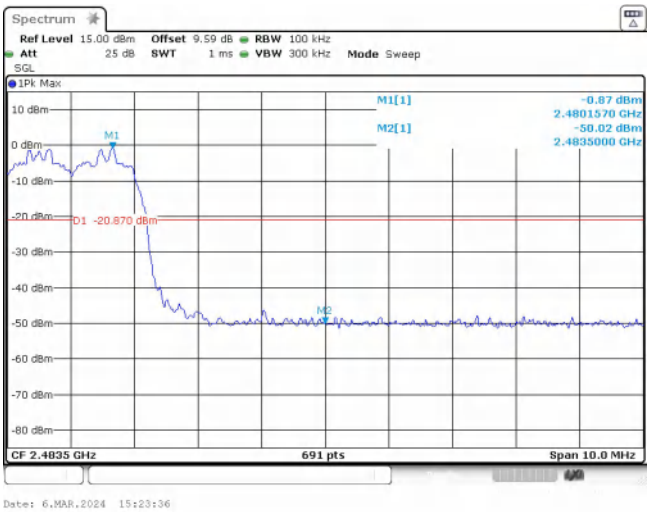
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



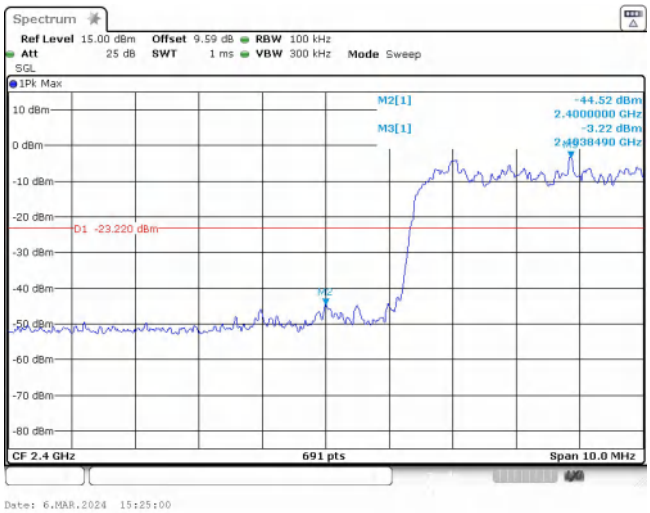
Out Of Band Emission(Right)

π/4DQPSK_2-DH5_Channel Hopping



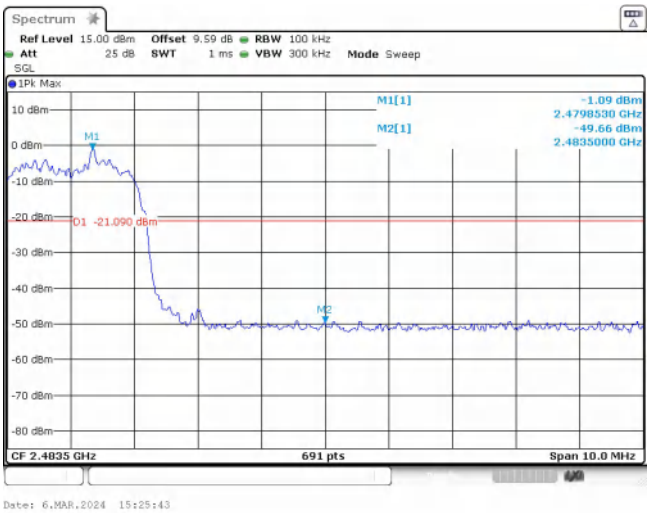
Out Of Band Emission(Left)

8DPSK_3-DH5_Channel Hopping



Out Of Band Emission(Right)

8DPSK_3-DH5_Channel Hopping



Out Of Band Emission(Left)

8DPSK_3-DH5_Channel Hopping

Out Of Band Emission(Right)

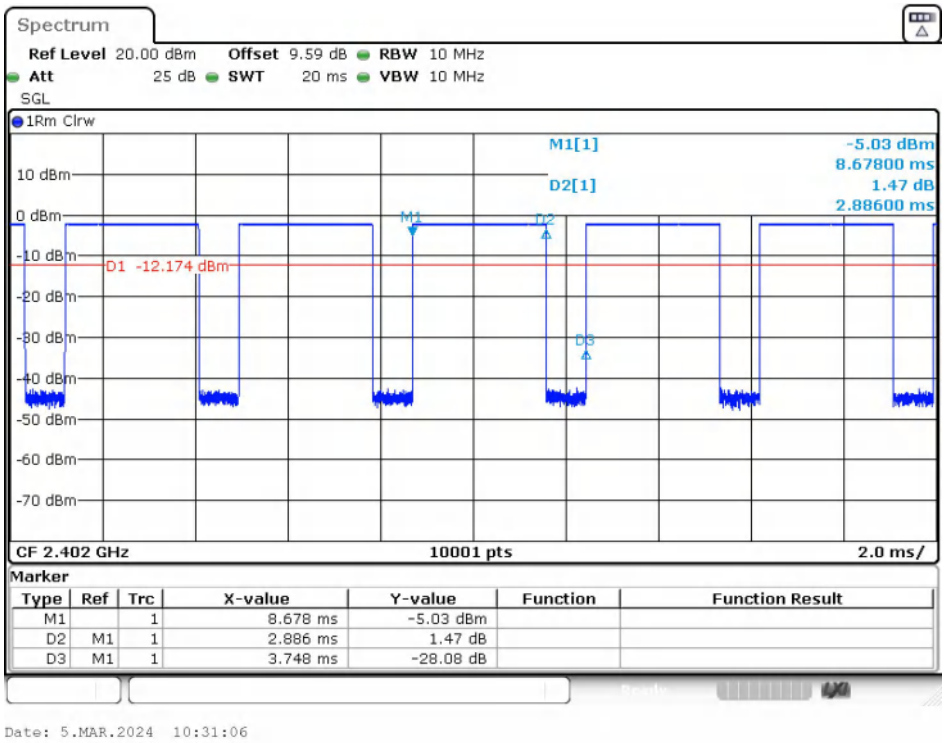
8DPSK_3-DH5_Channel Hopping

6) Duty Cycle

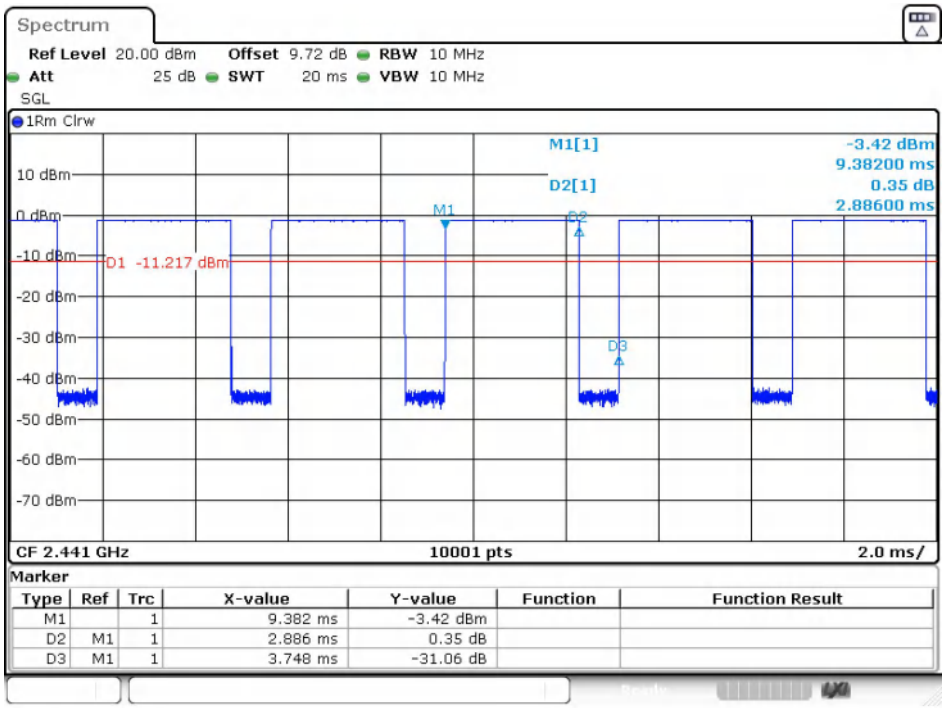
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.35
		39	2.886	3.748	77.00	0.7700	1.1351	0.35
		78	2.886	3.748	77.00	0.7700	1.1351	0.35
π/4DQPSK	2-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.35
		39	2.890	3.748	77.11	0.7711	1.1289	0.35
		78	2.892	3.748	77.16	0.7716	1.1261	0.35
8DPSK	3-DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.35
		39	2.888	3.748	77.05	0.7705	1.1323	0.35
		78	2.888	3.748	77.05	0.7705	1.1323	0.35

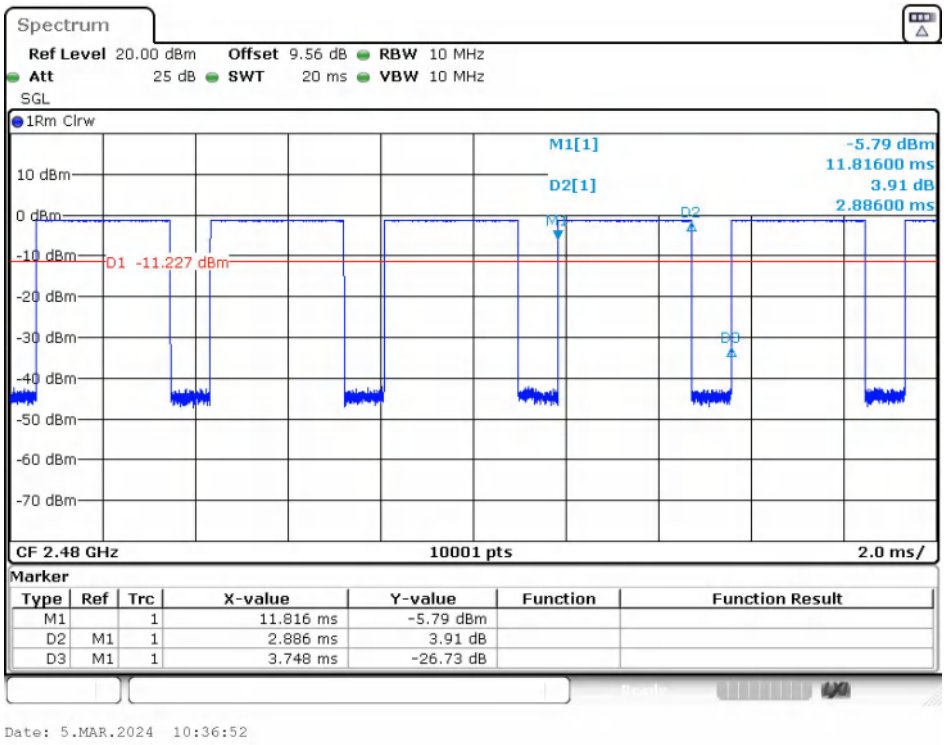
Test Graphs



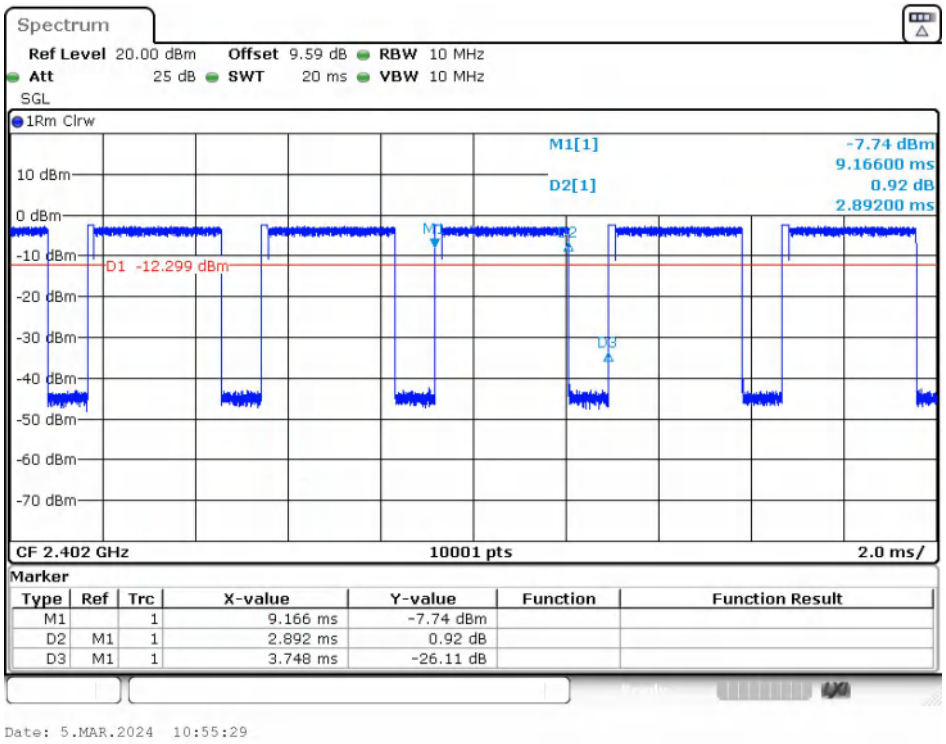
GFSK(DH5)_Channel 0



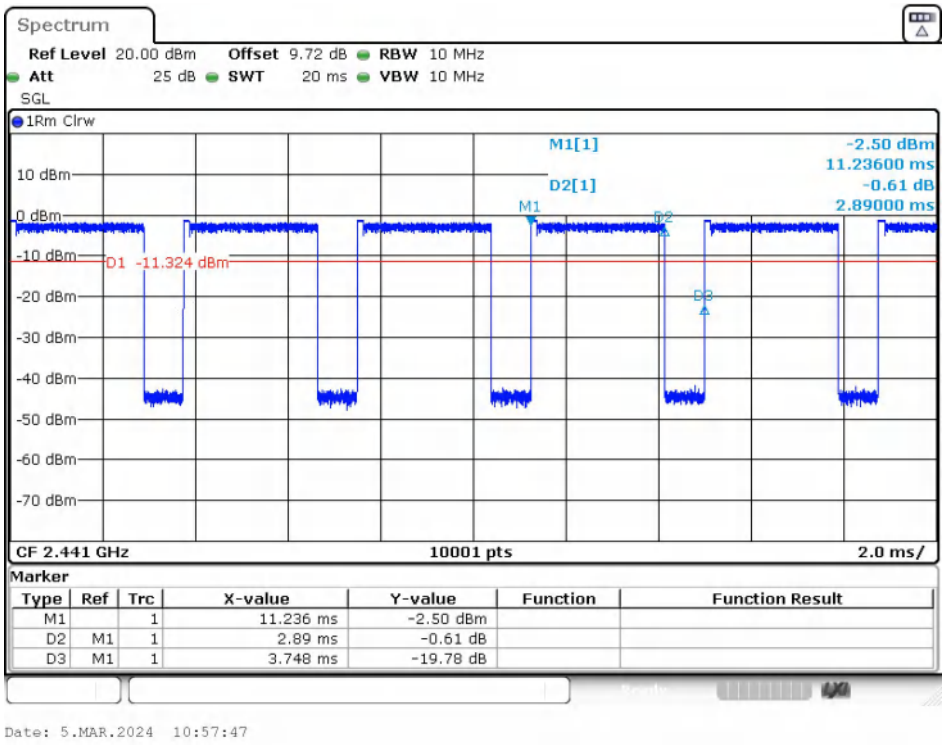
GFSK(DH5)_Channel 39



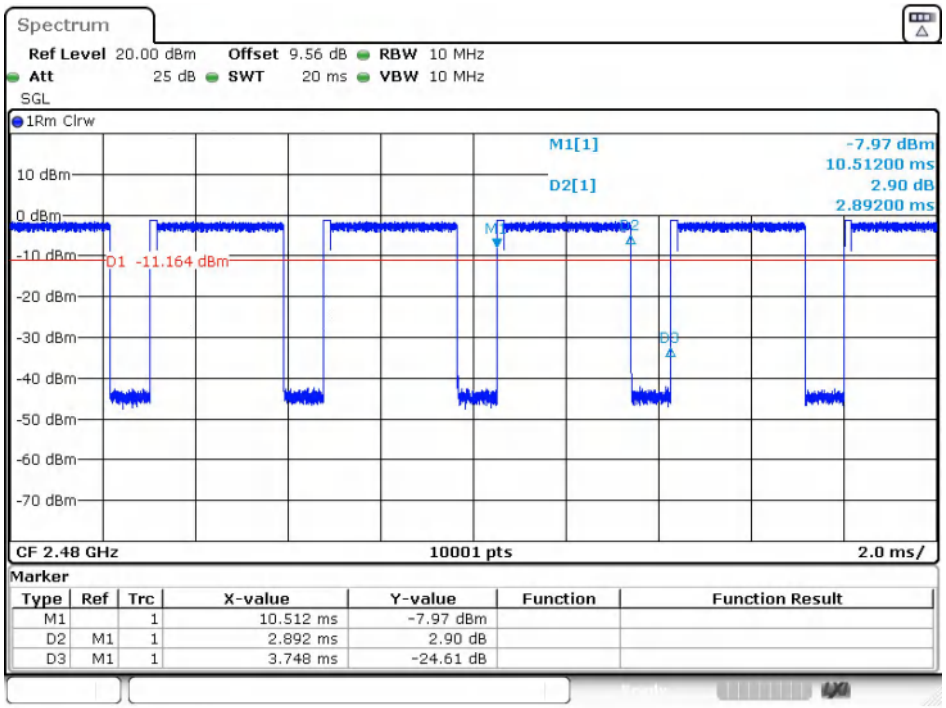
GFSK(DH5)_Channel 78



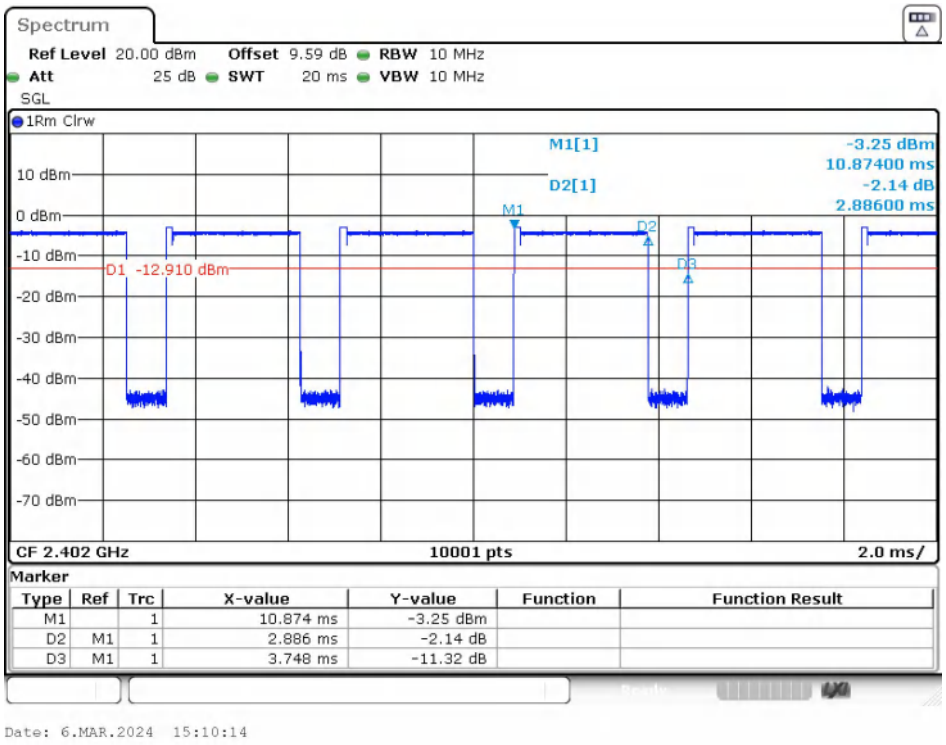
π/4DQPSK(2-DH5)_Channel 0



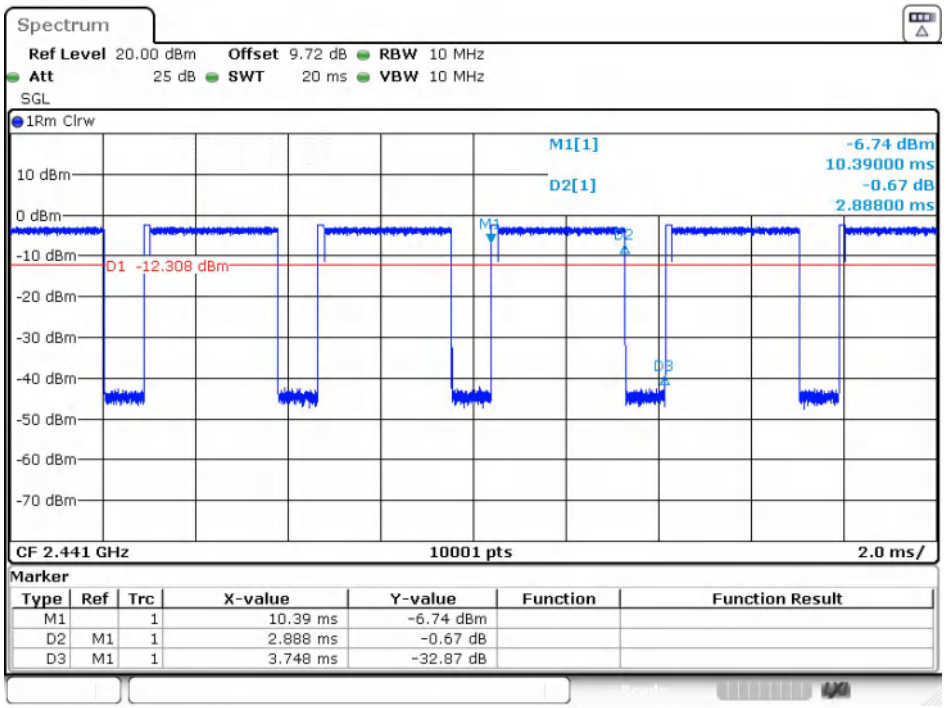
π/4DQPSK(2-DH5)_Channel 39



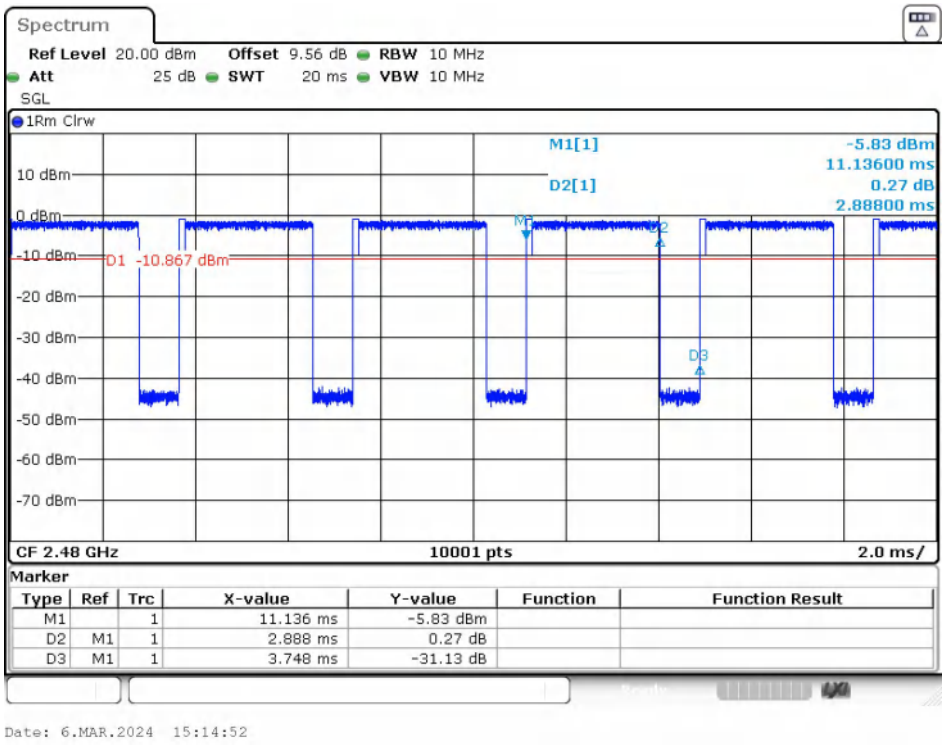
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



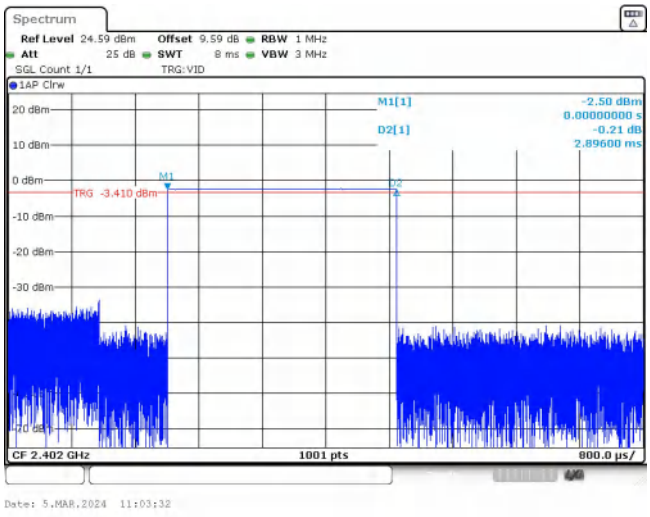
8DPSK(3-DH5)_Channel 78

7) Dwell Time

Test Result

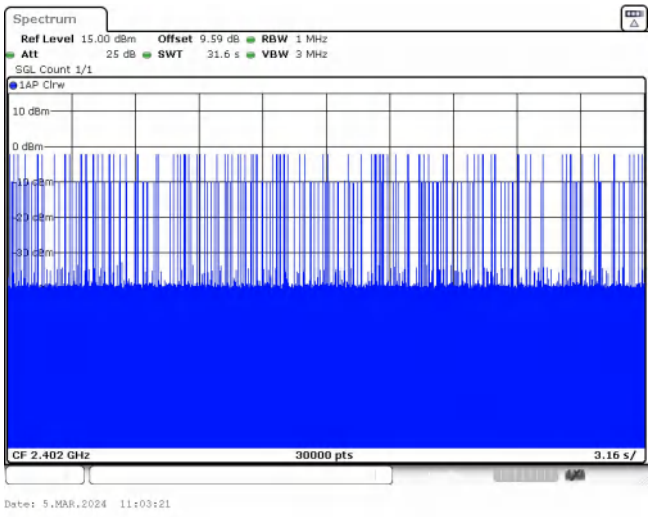
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.896	109	315.66	< 400	PASS
π/4DQPSK	2-DH5		2.896	97	280.91		PASS
8DPSK	3-DH5		2.896	111	321.46		PASS

Test Graphs



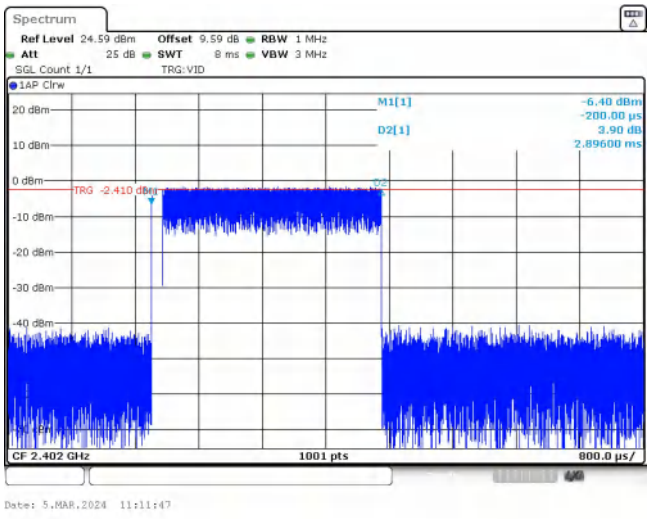
Pulse Width

GFSK_DH5



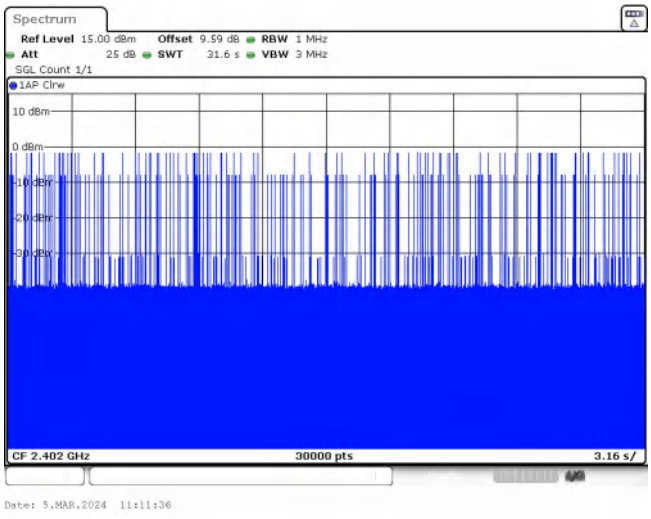
Number of Pulses in 31.6 seconds

GFSK_DH5



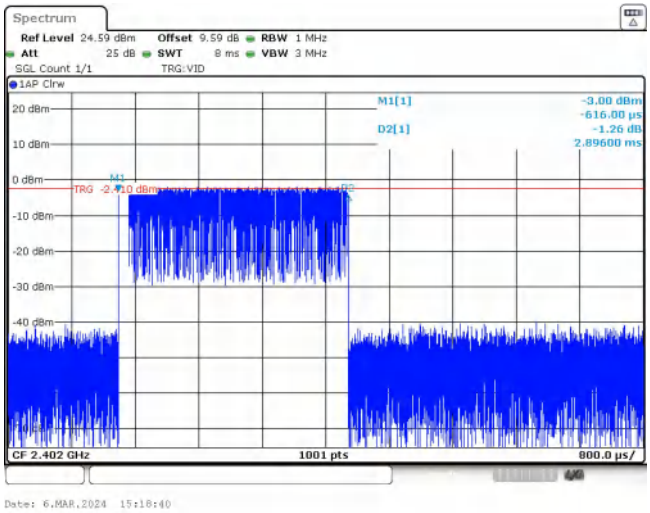
Pulse Width

π/4DQPSK_2-DH5



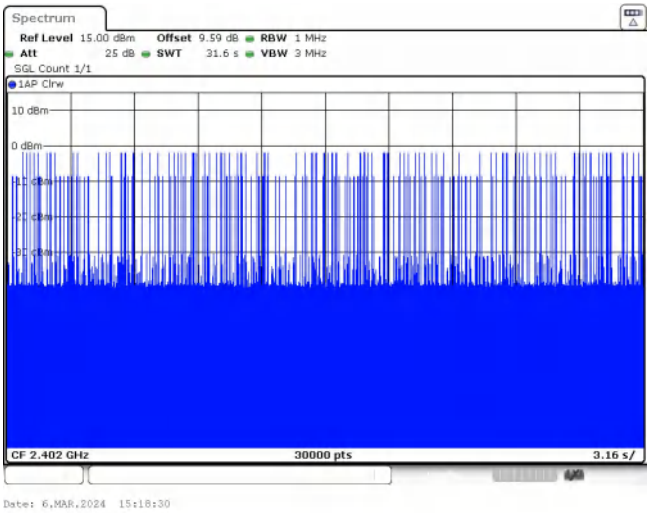
Number of Pulses in 31.6 seconds

π/4DQPSK_2-DH5



Pulse Width

8DPSK_3-DH5



Number of Pulses in 31.6 seconds

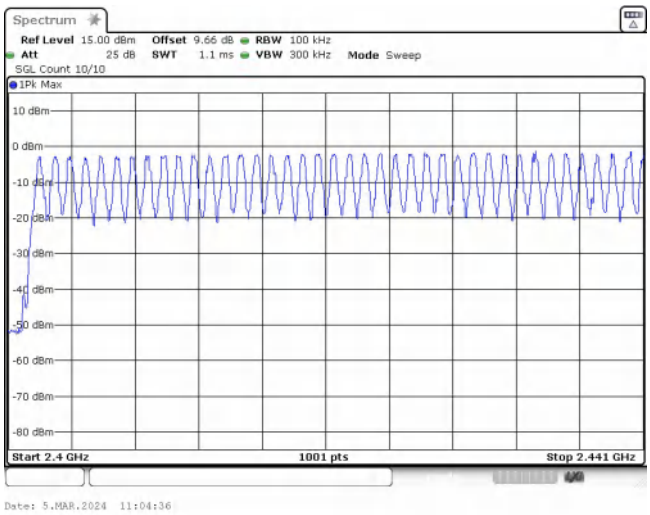
8DPSK_3-DH5

8) Number Of Hopping Channel

Test Result

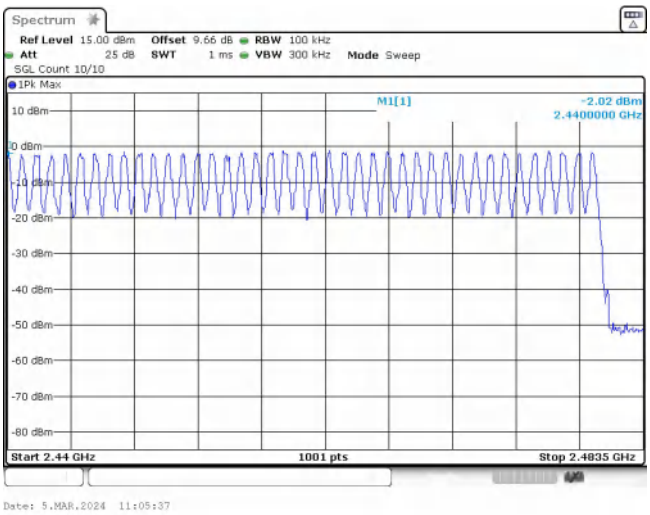
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
π/4DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs



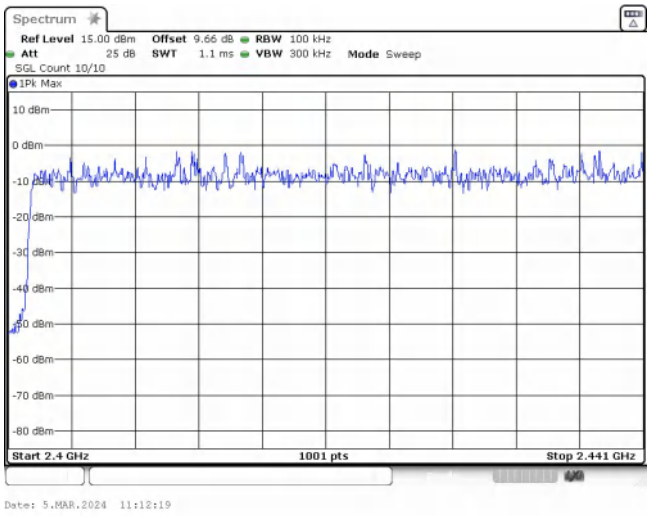
Low End Spectrum Channel Hopping Plot

GFSK



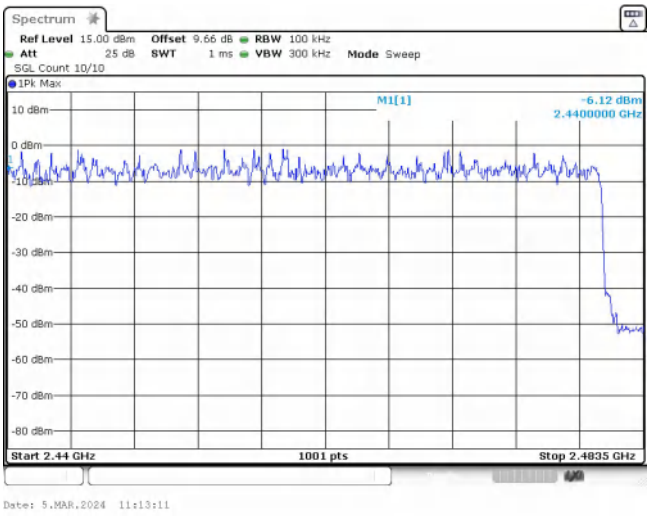
High End Spectrum Channel Hopping Plot

GFSK



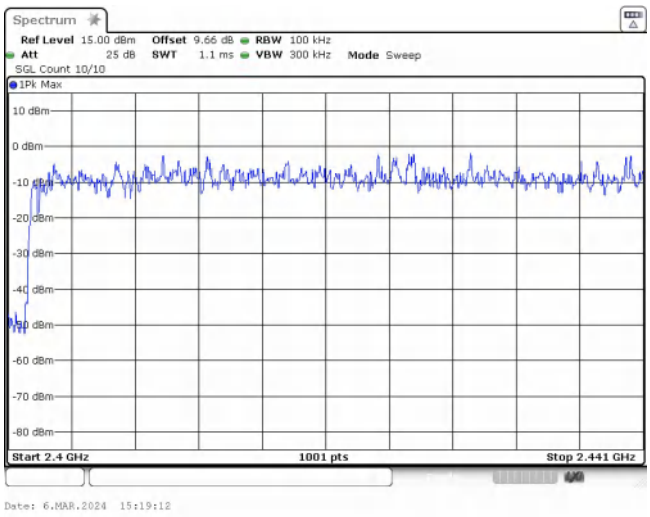
Low End Spectrum Channel Hopping Plot

π/4DQPSK



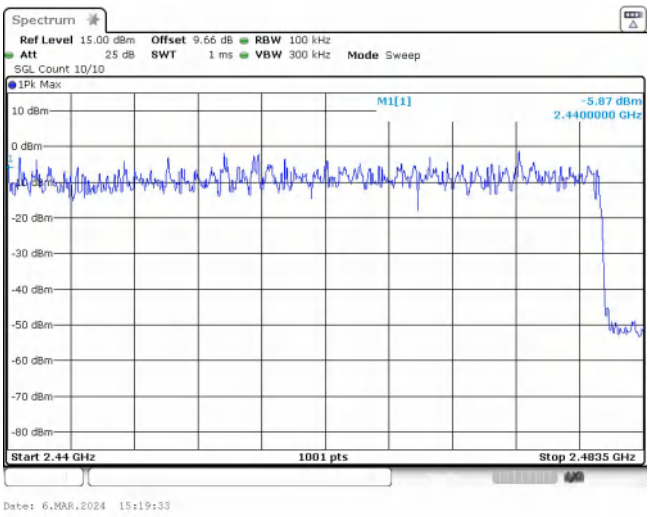
High End Spectrum Channel Hopping Plot

π/4DQPSK



Low End Spectrum Channel Hopping Plot

8DPSK



High End Spectrum Channel Hopping Plot

8DPSK