Appendix Report

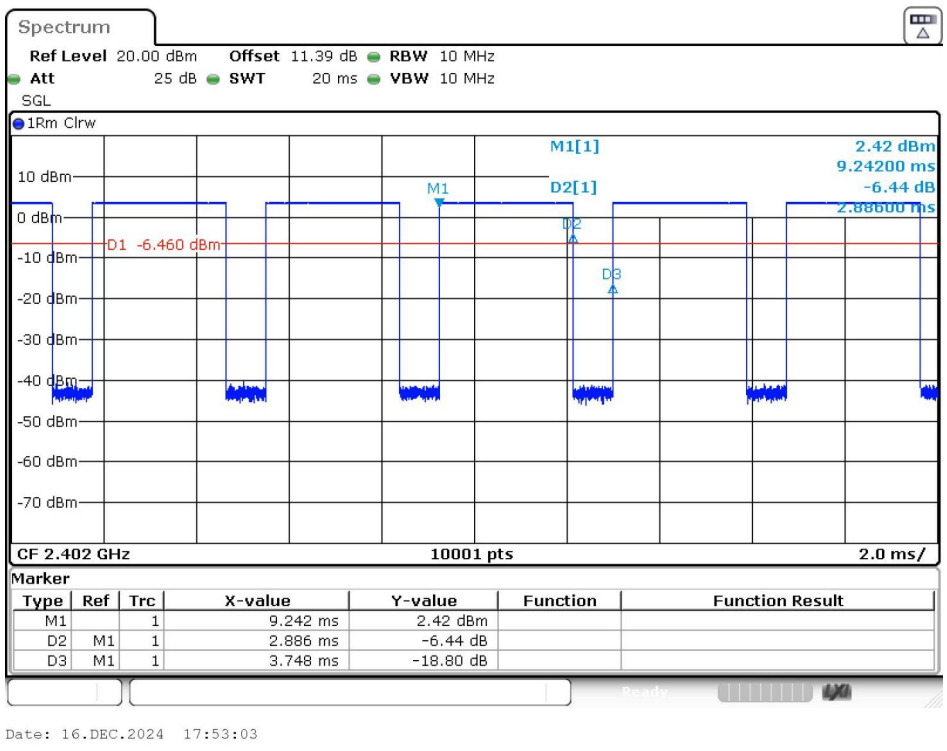
Report No.:	CISRR24121313001
Test Engineer:	Mark Fu
Supervised by:	Rory Huang

1) Duty Cycle

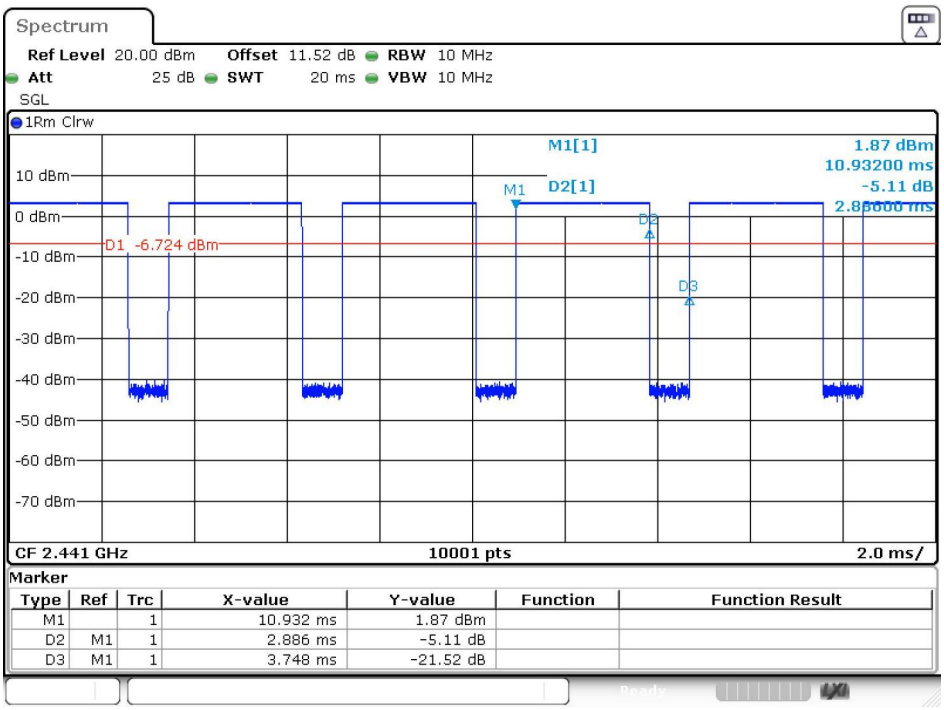
Test Result

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	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
π/4DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.3460
		39	2.890	3.748	77.11	0.7711	1.1289	0.3460
		78	2.890	3.748	77.11	0.7711	1.1289	0.3460
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458

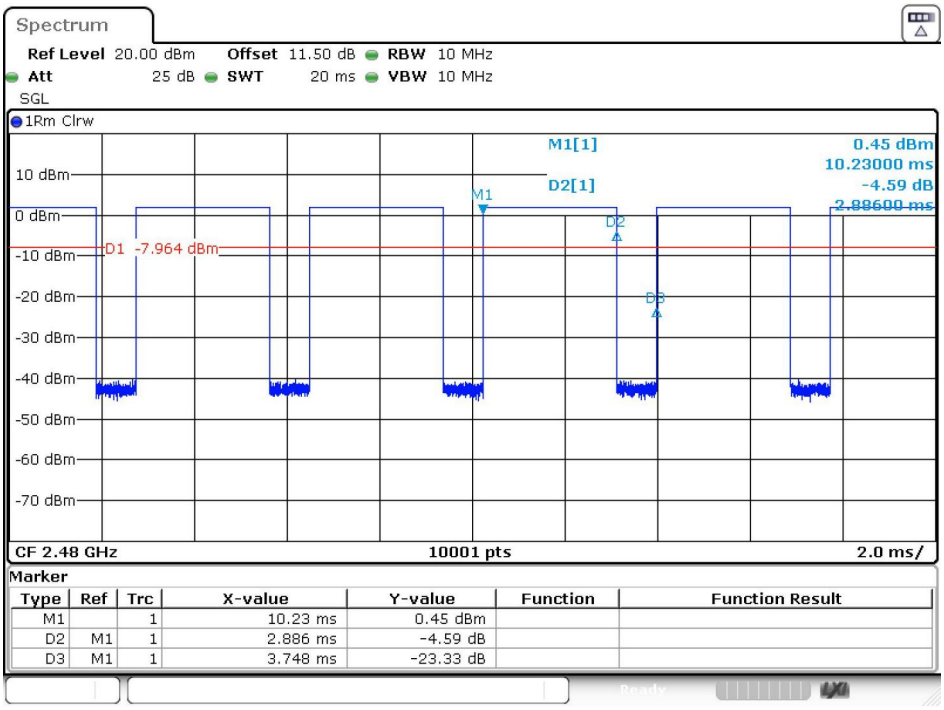
Test Graphs



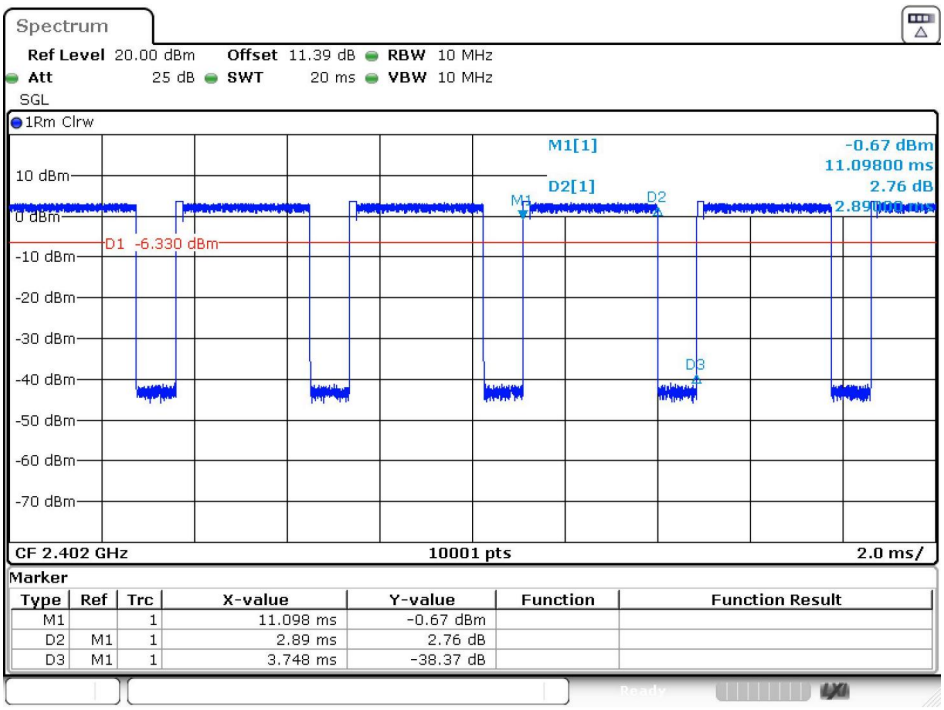
GFSK(DH5)_Channel 0



GFSK(DH5)_Channel 39

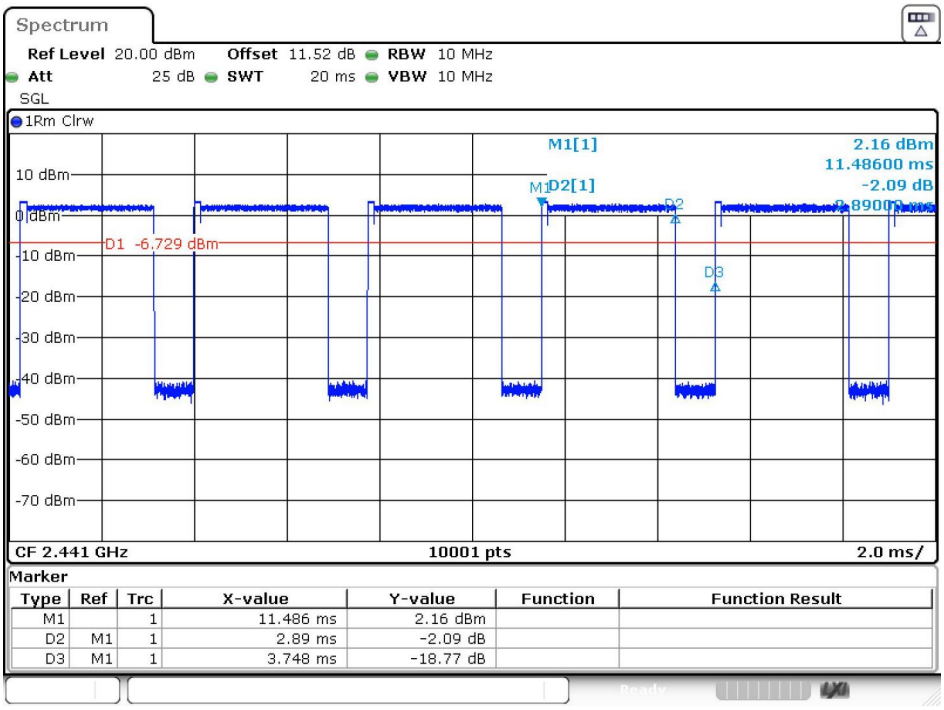


GFSK(DH5)_Channel 78



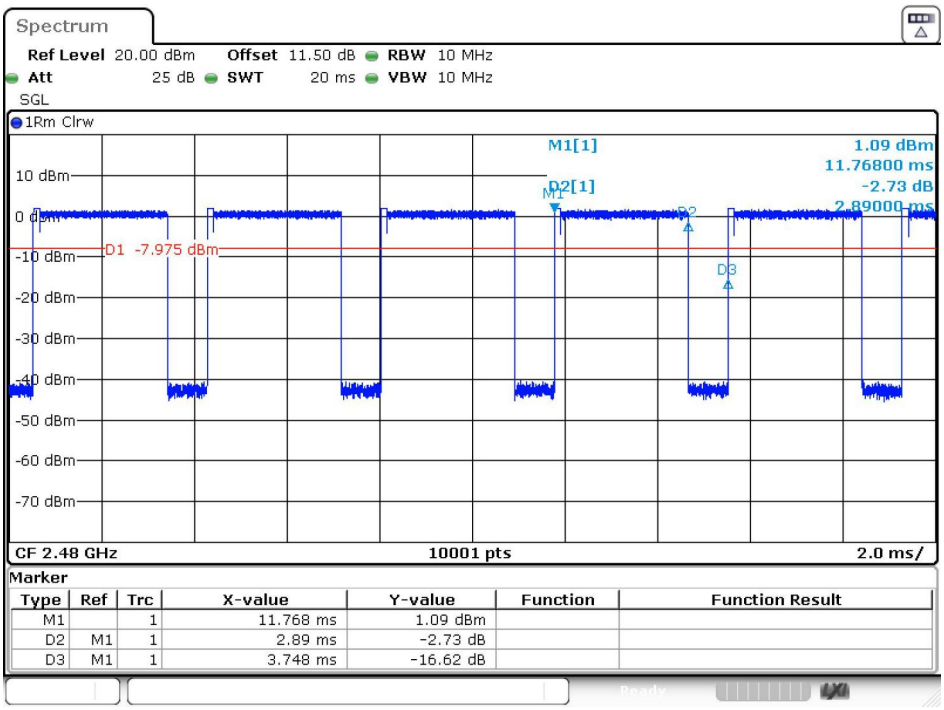
Date: 16.DEC.2024 18:19:31

π/4DQPSK(2-DH5)_Channel 0

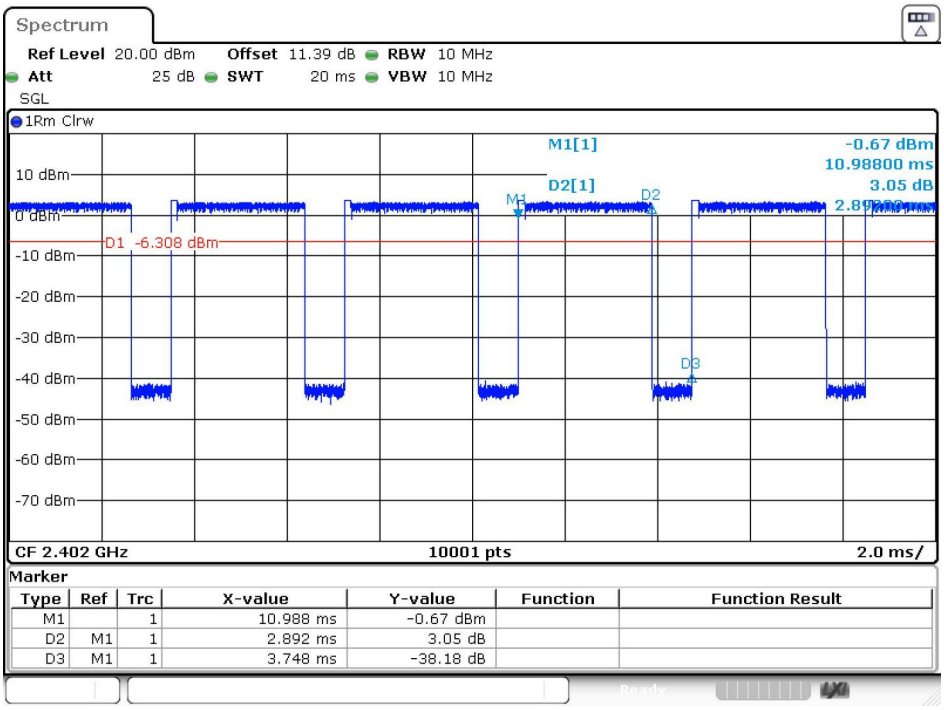


Date: 16.DEC.2024 18:31:46

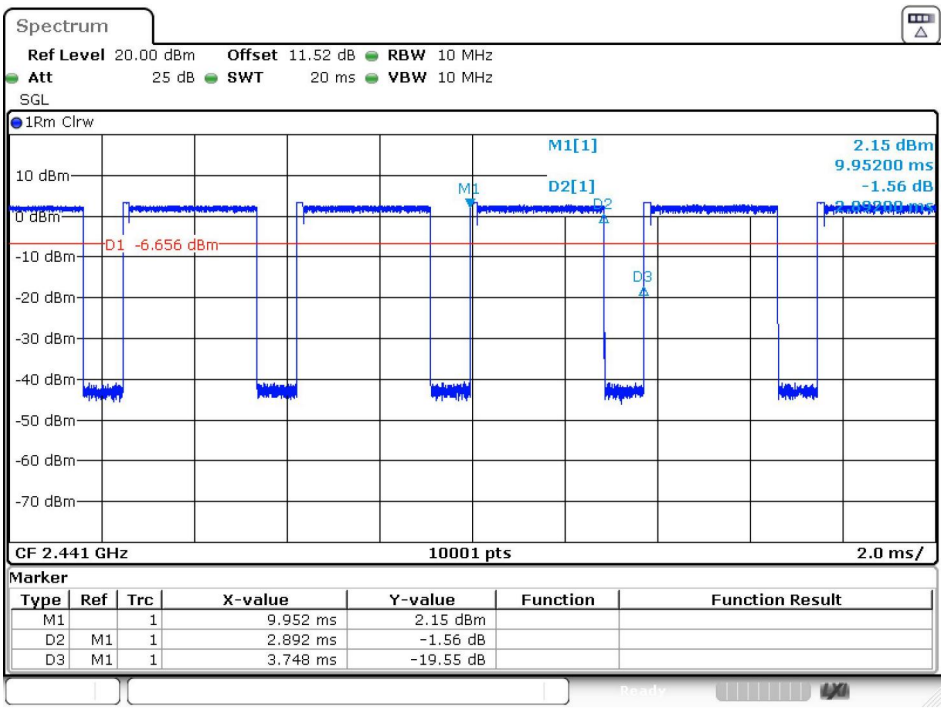
π/4DQPSK(2-DH5)_Channel 39



π/4DQPSK(2-DH5)_Channel 78

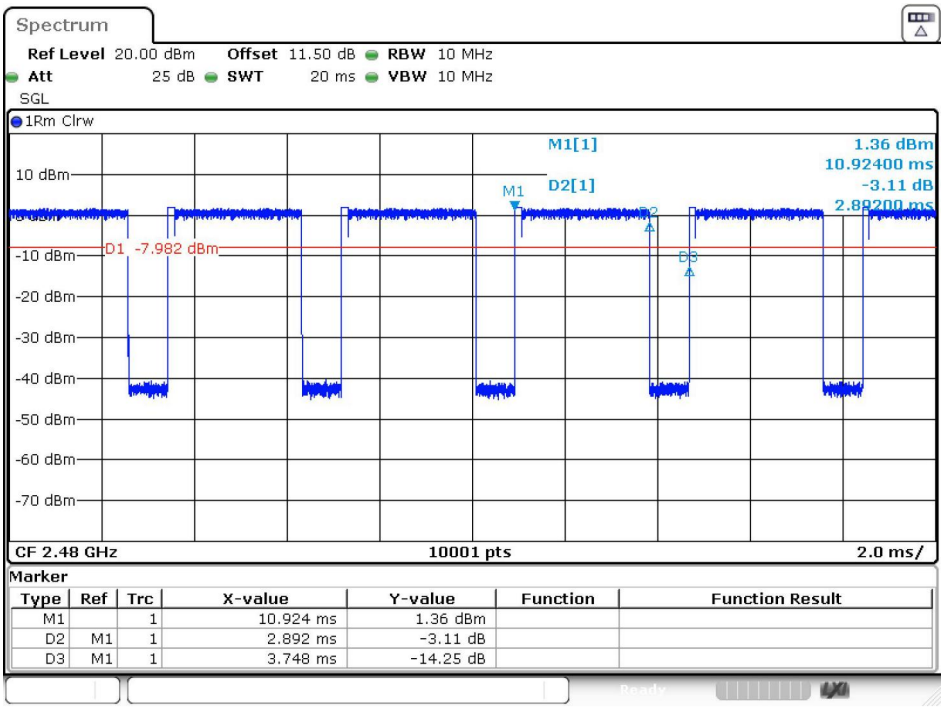


8DPSK(3-DH5)_Channel 0



Date: 16.DEC.2024 18:47:21

8DPSK(3-DH5)_Channel 39



Date: 16.DEC.2024 18:49:12

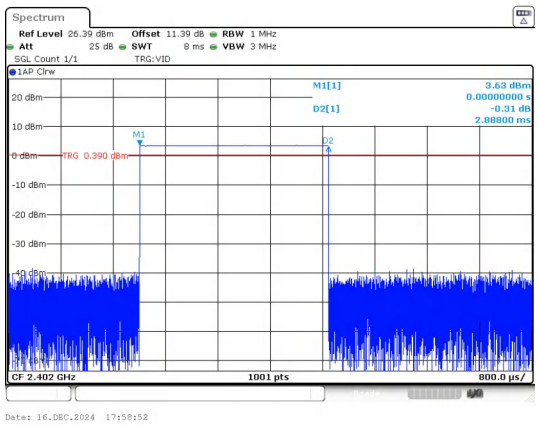
8DPSK(3-DH5)_Channel 78

2) Dwell Time

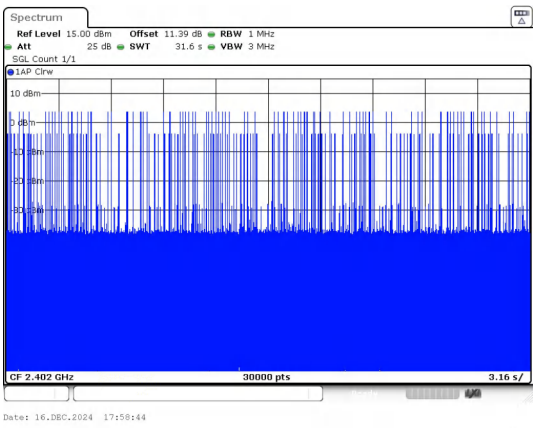
Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	97	280.14	< 400	PASS
π/4DQPSK	2-DH5		2.896	96	278.02		PASS
8DPSK	3-DH5		2.896	106	306.98		PASS

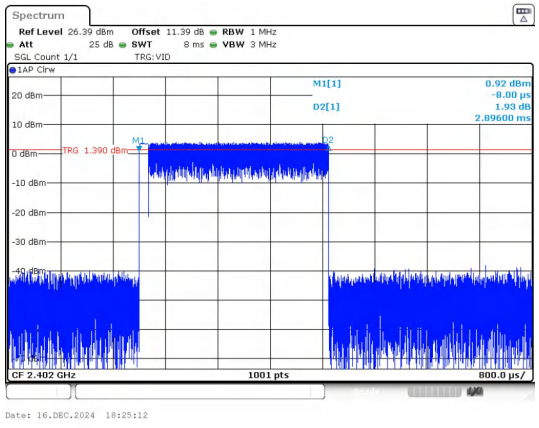
Test Graphs



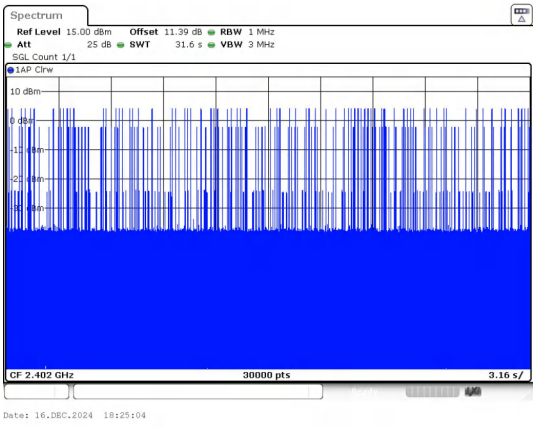
Pulse Width
GFSK_DH5



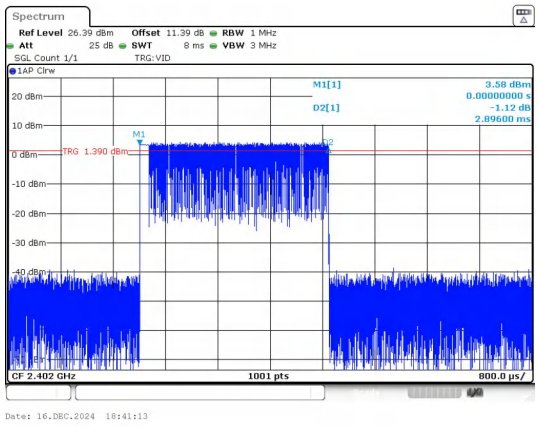
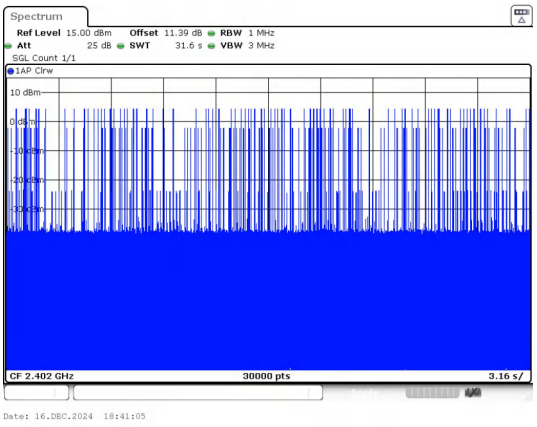
Number of Pulses in 31.6 seconds
GFSK_DH5



Pulse Width
π/4DQPSK_2-DH5



Number of Pulses in 31.6 seconds
π/4DQPSK_2-DH5

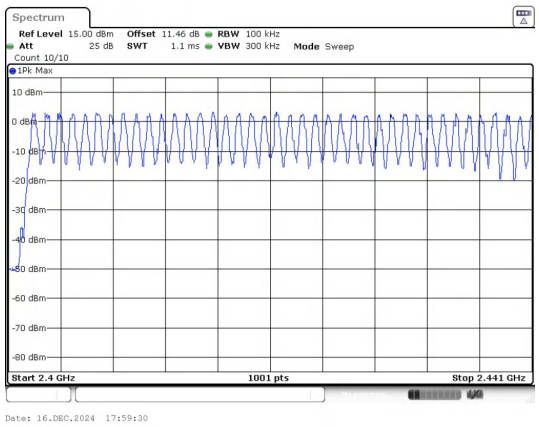
	
Pulse Width **8DPSK_3-DH5**	**Number of Pulses in 31.6 seconds** **8DPSK_3-DH5**

3) Number Of Hopping Channel

Test Result

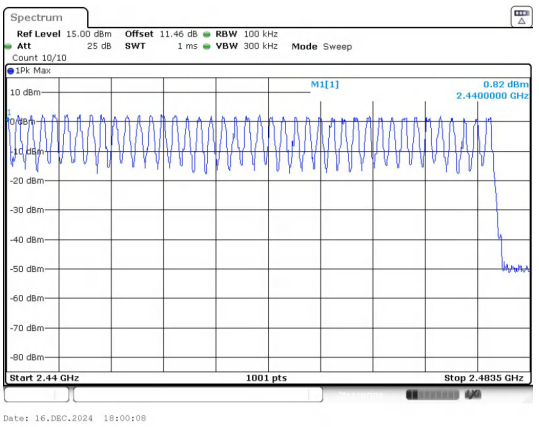
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
π/4DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs



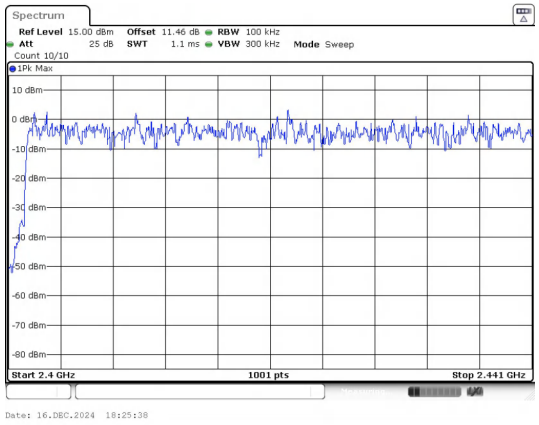
Low End Spectrum Channel Hopping Plot

GFSK



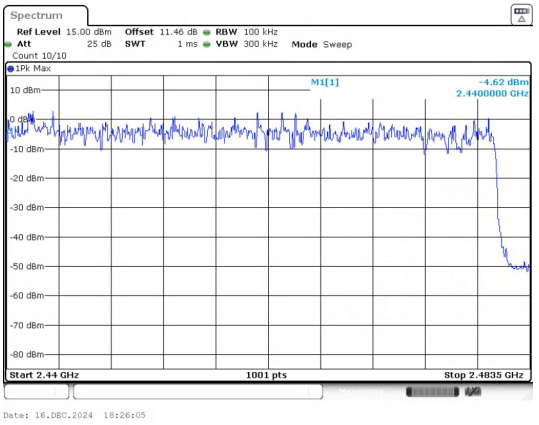
High End Spectrum Channel Hopping Plot

GFSK



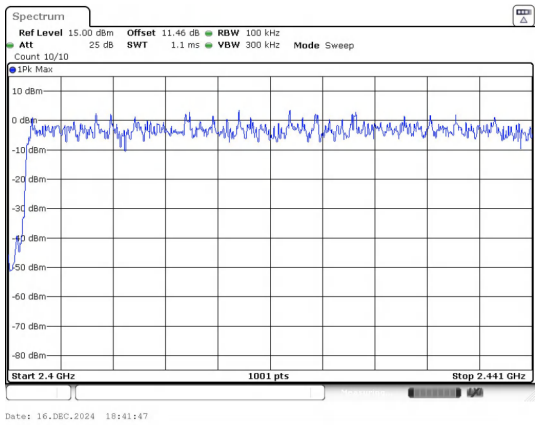
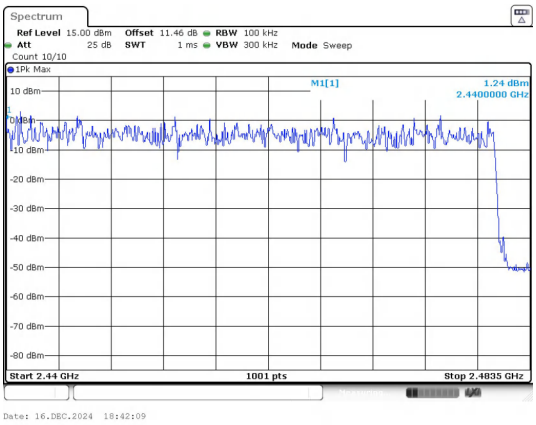
Low End Spectrum Channel Hopping Plot

π/4DQPSK



High End Spectrum Channel Hopping Plot

π/4DQPSK

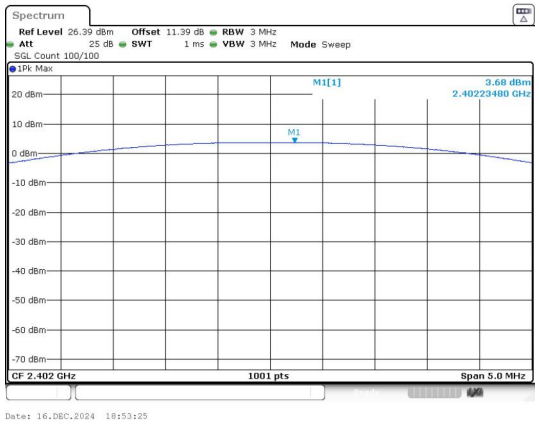
	
Low End Spectrum Channel Hopping Plot **8DPSK**	**High End Spectrum Channel Hopping Plot** **8DPSK**

4) Conducted Output Power

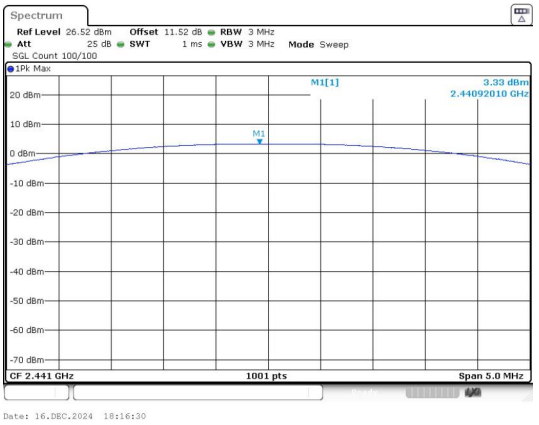
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	3.68	2.33	≤30	PASS
		39	3.33	2.15		PASS
		78	2.10	1.62		PASS
π/4DQPSK	2-DH5	0	4.47	2.80	≤20.97	PASS
		39	4.13	2.59		PASS
		78	2.98	1.99		PASS
8DPSK	3-DH5	0	4.84	3.05		PASS
		39	4.47	2.80		PASS
		78	3.26	2.12		PASS

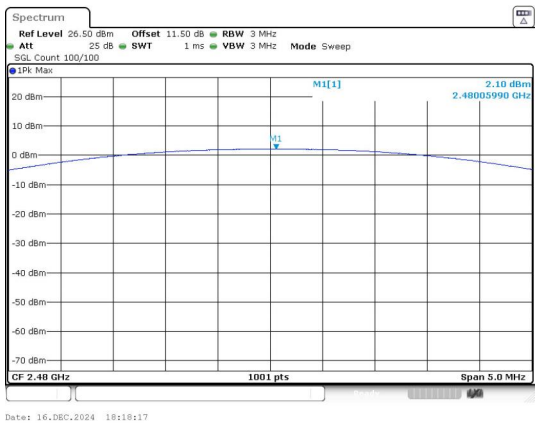
Test Graphs



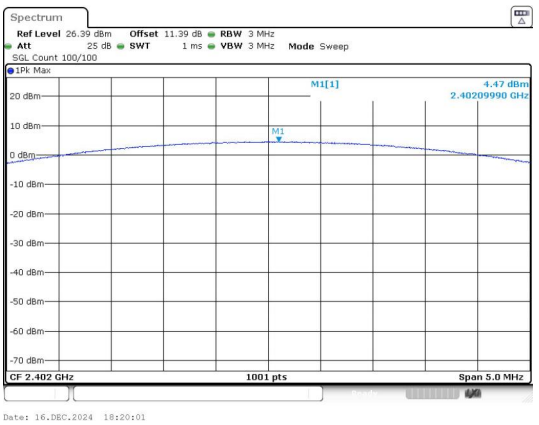
Peak Output Power
GFSK_Channel 0



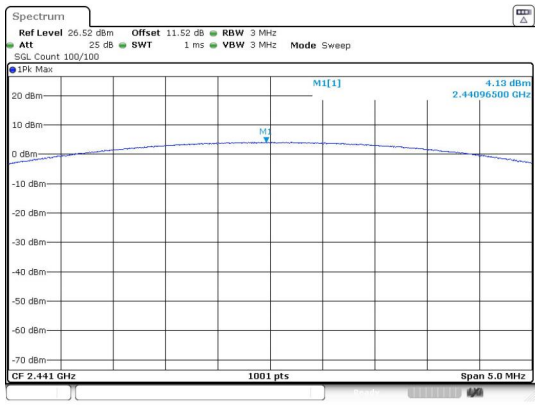
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78

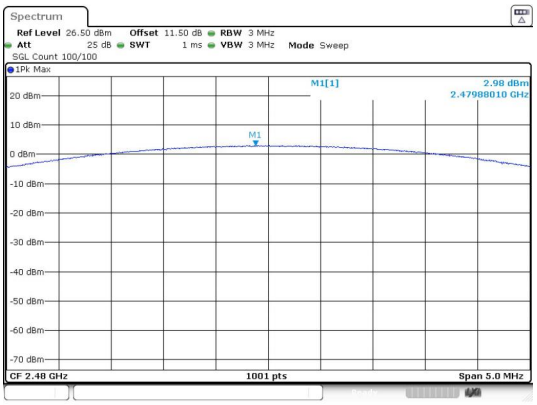


Peak Output Power
π/4DQPSK_Channel 0



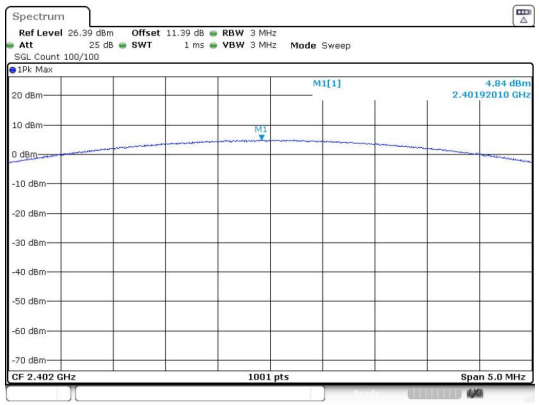
Peak Output Power

π/4DQPSK_Channel 39



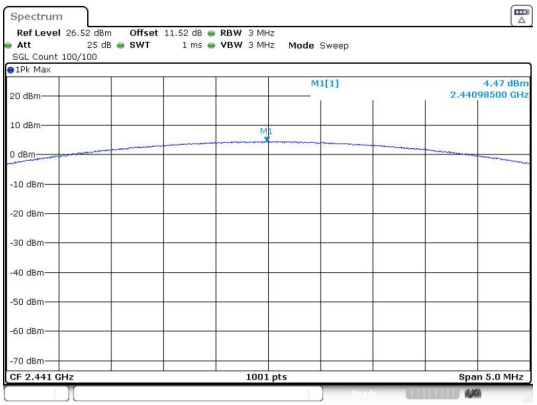
Peak Output Power

π/4DQPSK_Channel 78



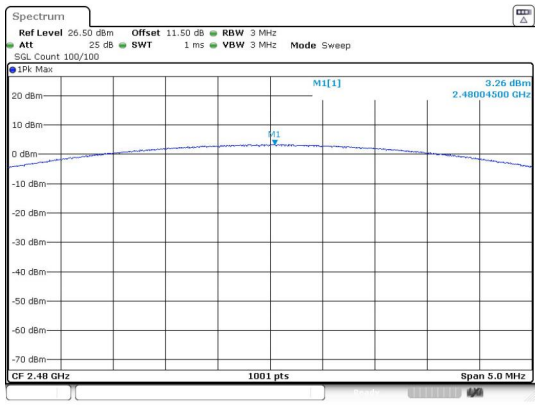
Peak Output Power

8DPSK_Channel 0



Peak Output Power

8DPSK_Channel 39



Peak Output Power

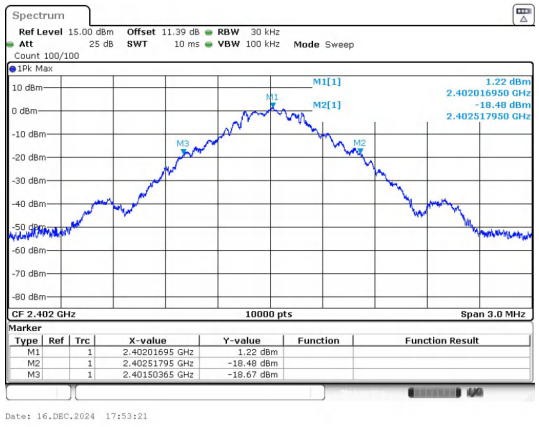
8DPSK_Channel 78

5) 20dB Bandwidth

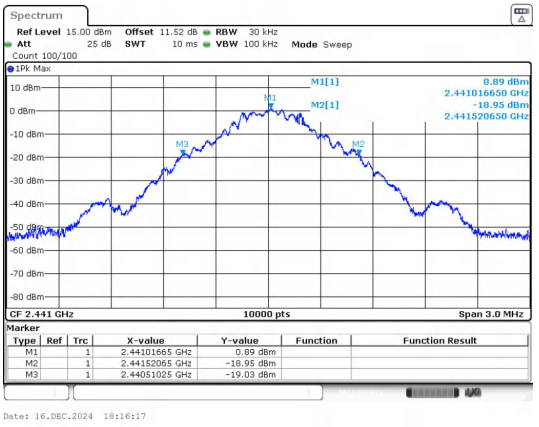
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.020
	39	2441 MHz	1.010
	78	2480 MHz	1.010
π/4DQPSK	0	2402 MHz	1.280
	39	2441 MHz	1.310
	78	2480 MHz	1.300
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.290

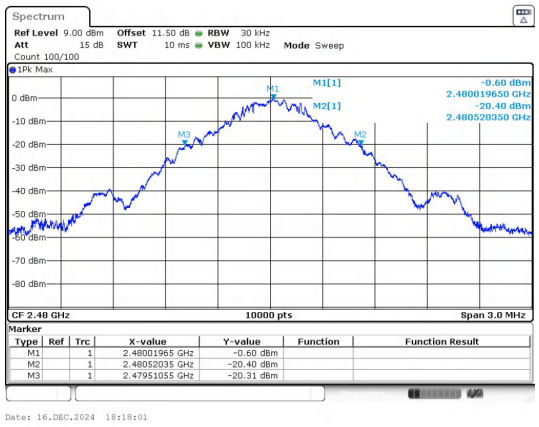
Test Graphs



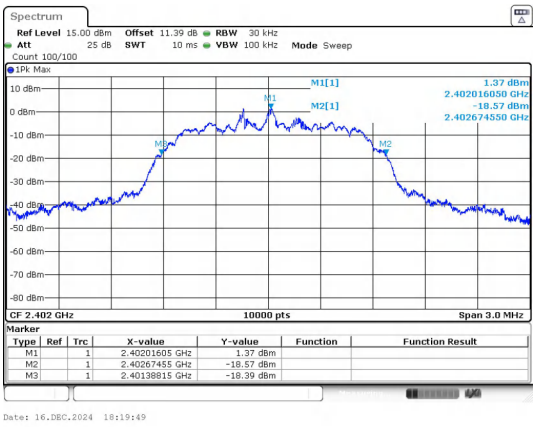
GFSK_DH5_Channel 0



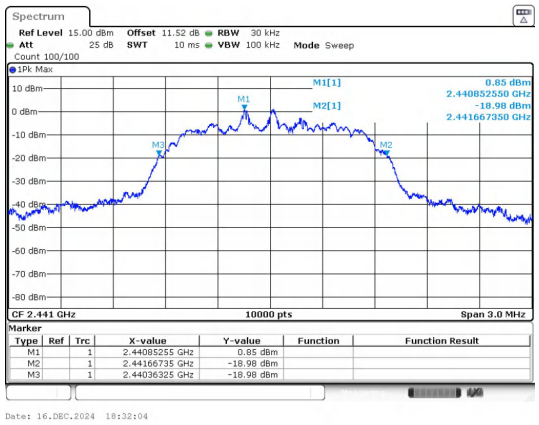
GFSK_DH5_Channel 39



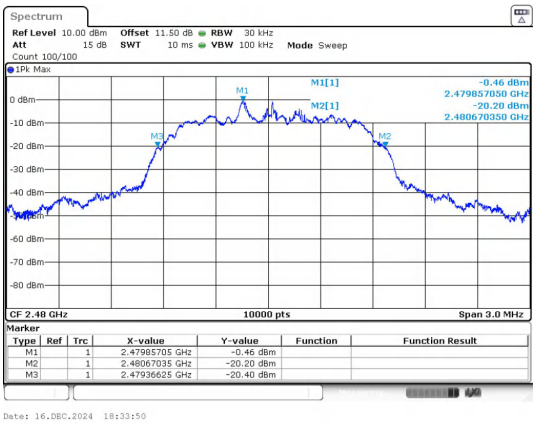
GFSK_DH5_Channel 78



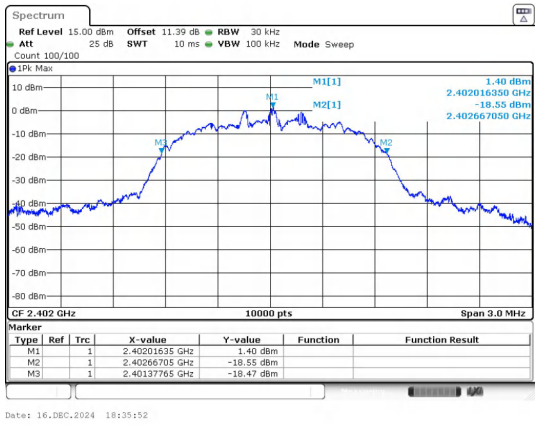
π/4DQPSK_2-DH5_Channel 0



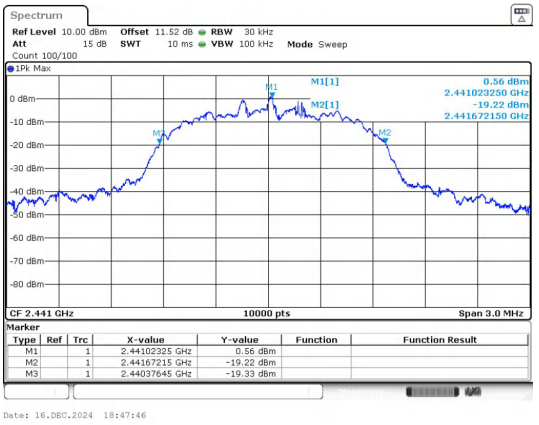
π/4DQPSK_2-DH5_Channel 39



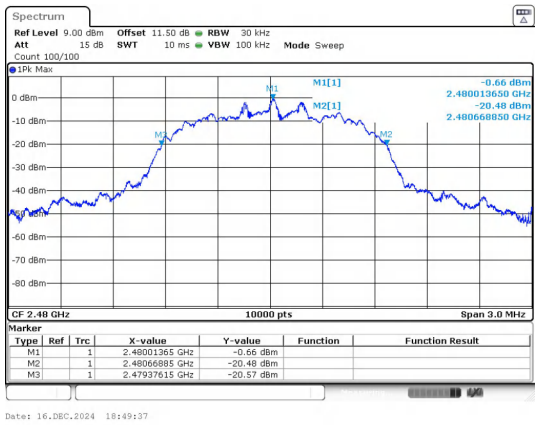
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



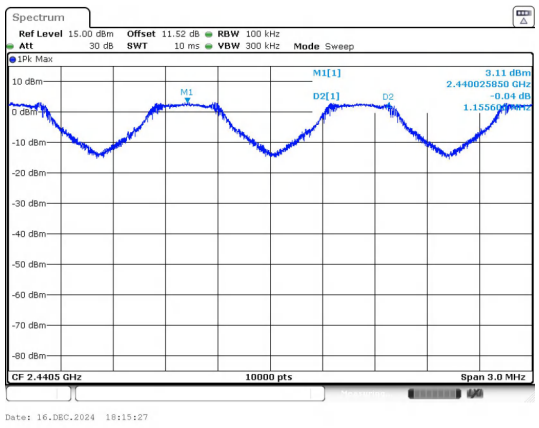
8DPSK_3-DH5_Channel 78

6) Carrier Frequencies Separation

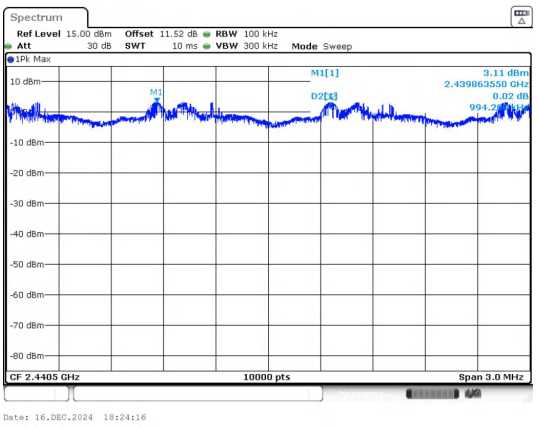
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0258	2441.1815	1.1556	1.03	PASS
π/4DQPSK	2-DH5	2439.8636	2440.8578	0.9942	0.867	PASS
8DPSK	3-DH5	2440.0312	2441.1775	1.1463	0.86	PASS

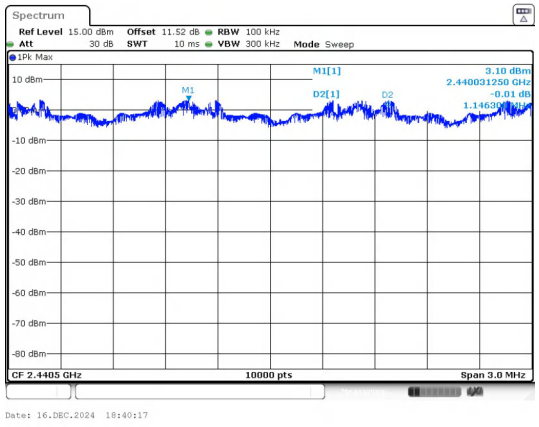
Test Graphs



GFSK



π/4DQPSK



8DPSK

7) Conducted Out Of Band Emission

Test Result

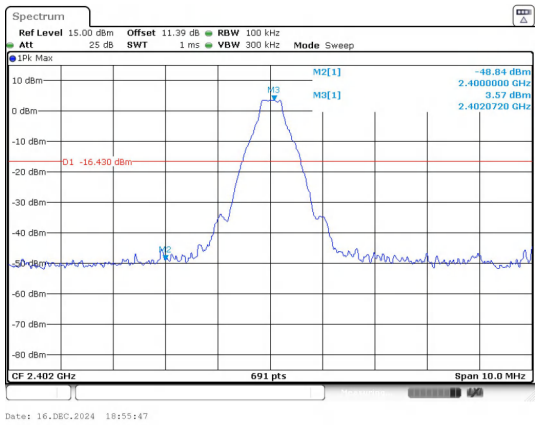
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.840	-16.43	-32.410	PASS
			4803.85	-45.357	-16.43	-28.927	PASS
		39	838.61	-24.566	-16.83	-7.736	PASS
		78	837.78	-37.078	-18.09	-18.988	PASS
			2483.50	-50.780	-18.09	-32.690	PASS
π/4DQPSK	2-DH5	0	831.12	-38.740	-16.69	-22.050	PASS
			2400.00	-45.500	-16.69	-28.810	PASS
		39	9763.72	-41.009	-17.34	-23.669	PASS
		78	2483.50	-49.870	-18.06	-31.810	PASS
			9920.20	-41.229	-18.06	-23.169	PASS
8DPSK	3-DH5	0	2400.00	-46.690	-16.79	-29.900	PASS
			9608.08	-44.646	-16.79	-27.856	PASS
		39	829.46	-37.015	-16.97	-20.045	PASS
		78	837.78	-38.792	-18.13	-20.662	PASS
			2483.50	-51.120	-18.13	-32.990	PASS

Hopping

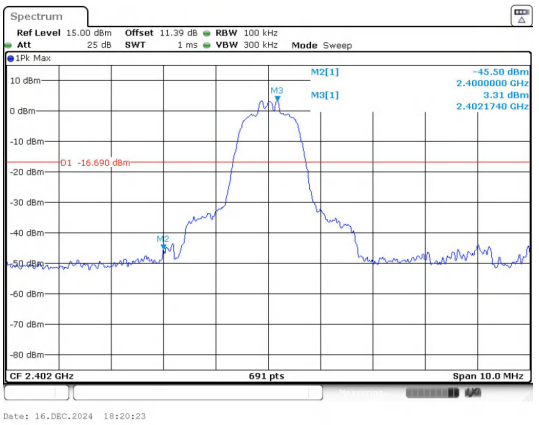
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.51	-47.866	-16.39	-31.476	PASS
			2400.00	-49.850	-16.39	-33.460	PASS
			2483.50	-48.260	-18.06	-30.200	PASS
π/4DQPSK	2-DH5		2396.01	-48.098	-16.57	-31.528	PASS
			2400.00	-49.570	-16.57	-33.000	PASS
			2483.50	-49.120	-18.35	-30.770	PASS
8DPSK	3-DH5		2397.96	-48.243	-16.62	-31.623	PASS
			2400.00	-49.620	-16.62	-33.000	PASS
			2483.50	-48.730	-18.15	-30.580	PASS

Test Graphs



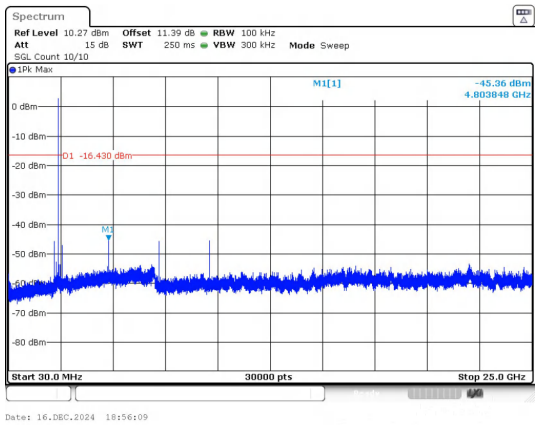
Out Of Band Emission

GFSK_DH5_Channel 0



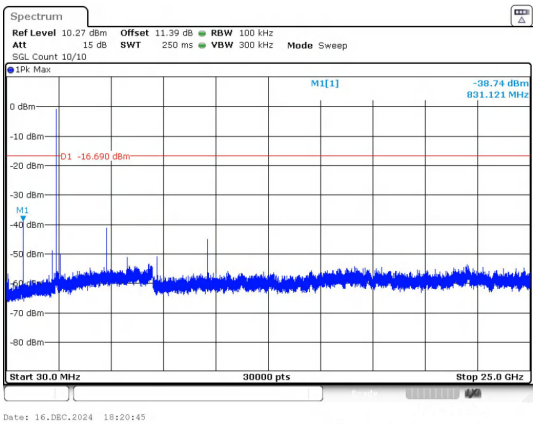
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 0



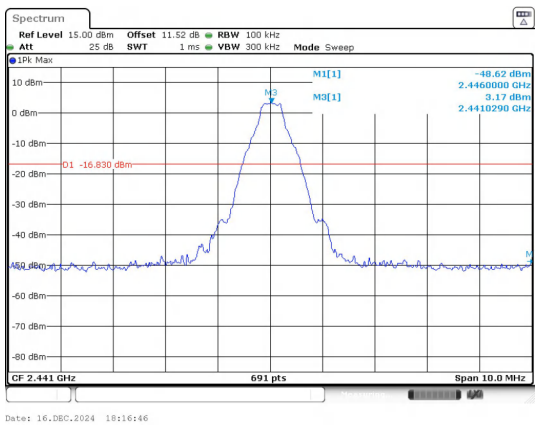
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 0



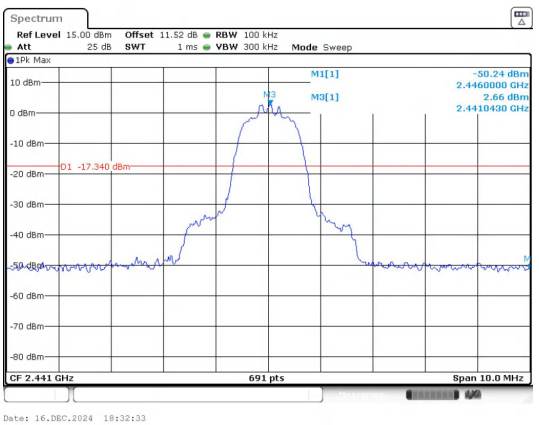
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 0



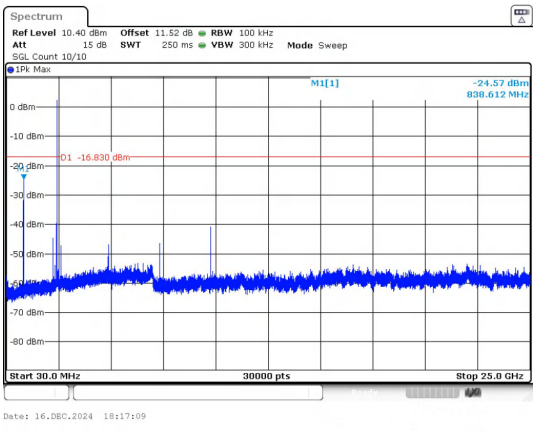
Out Of Band Emission

GFSK_DH5_Channel 39



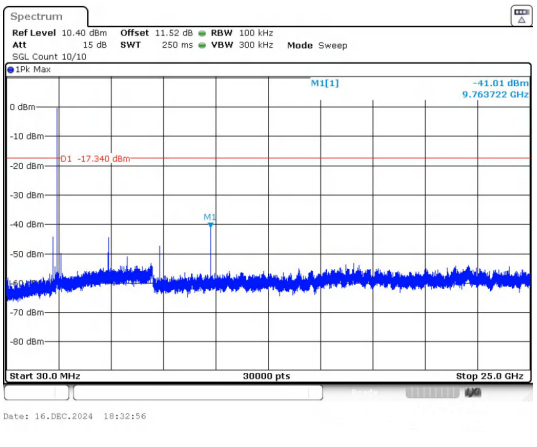
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 39



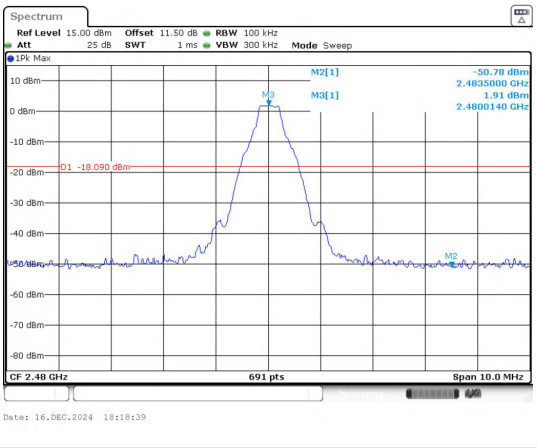
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 39



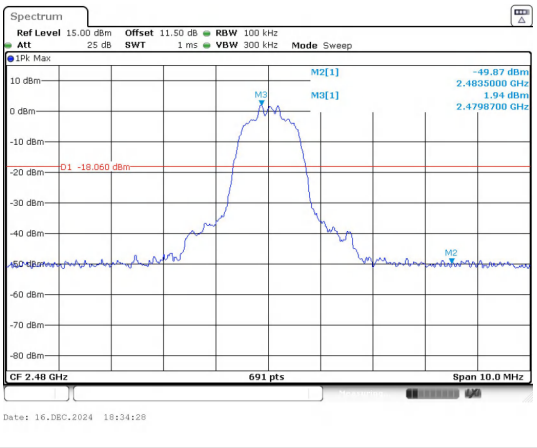
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 39



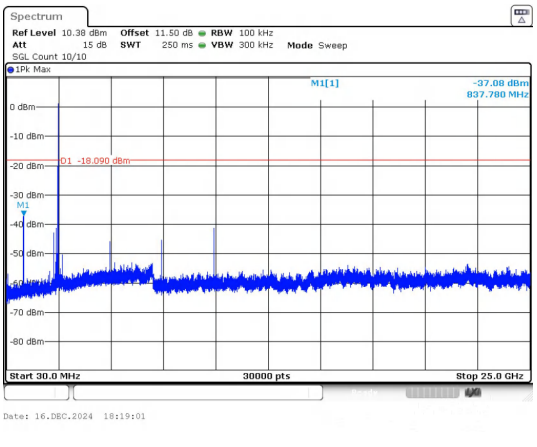
Out Of Band Emission

GFSK_DH5_Channel 78



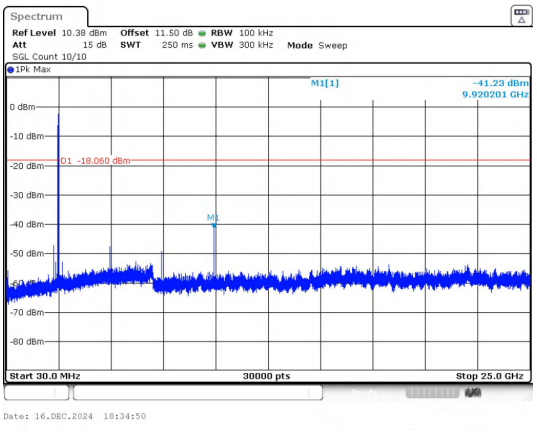
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 78



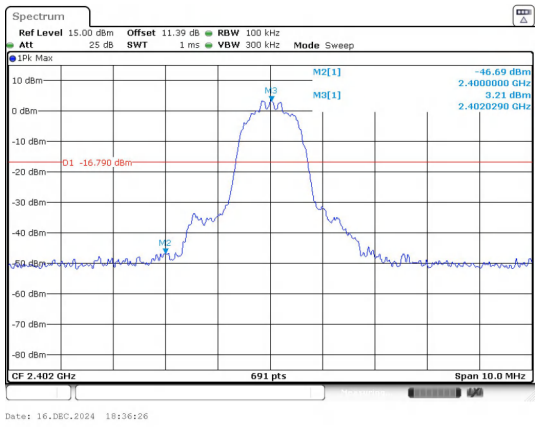
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 78



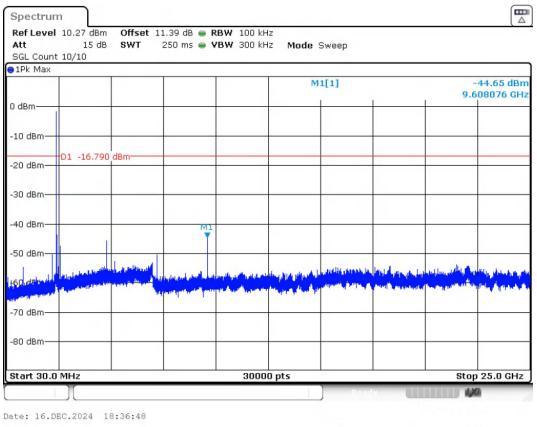
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 78



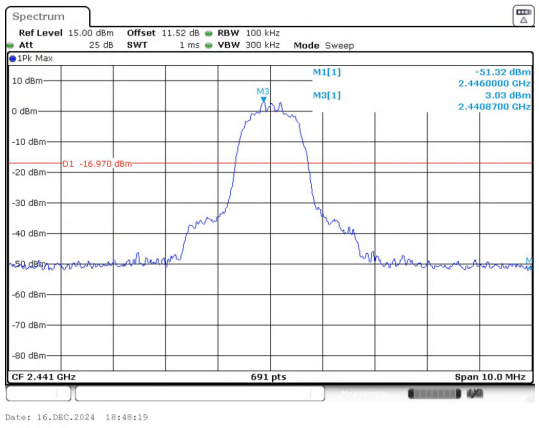
Out Of Band Emission

8DPSK_3-DH5_Channel 0



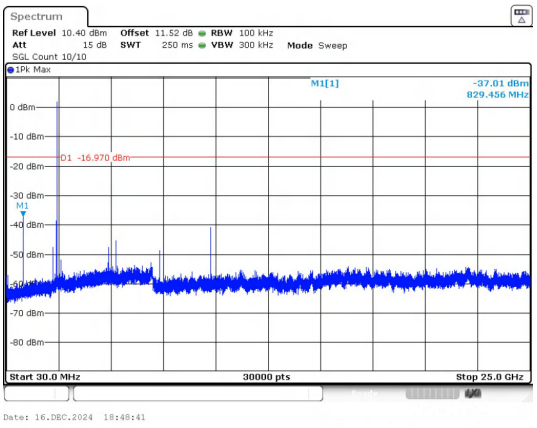
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 0



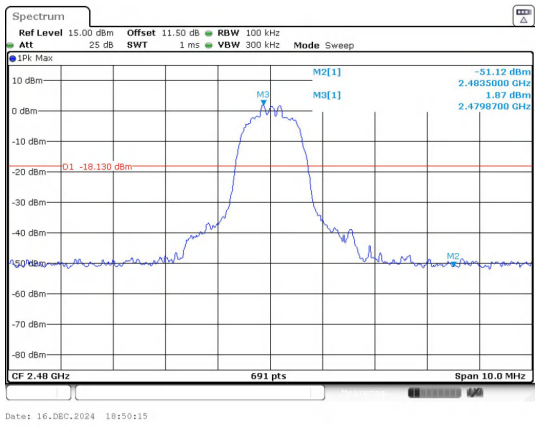
Out Of Band Emission

8DPSK_3-DH5_Channel 39



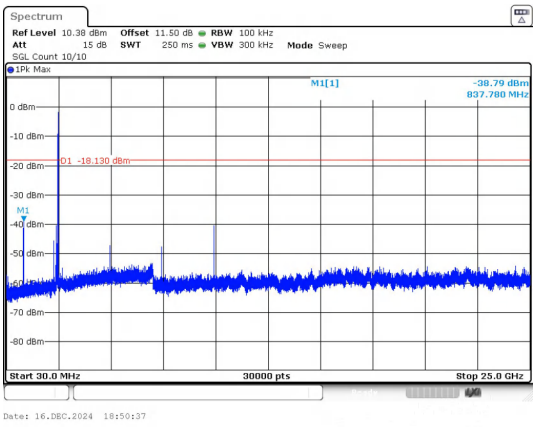
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 39



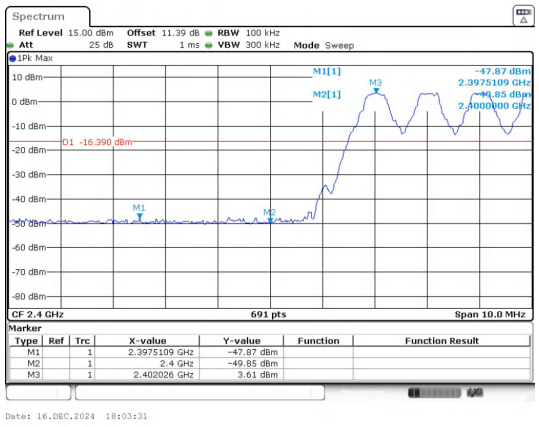
Out Of Band Emission

8DPSK_3-DH5_Channel 78



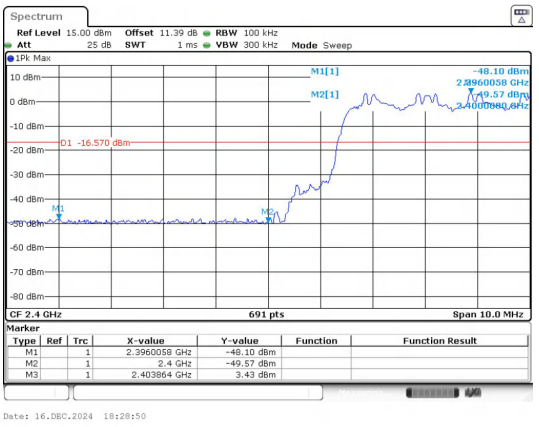
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 78



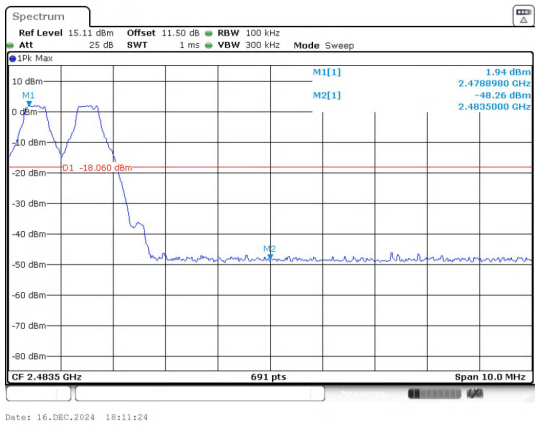
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



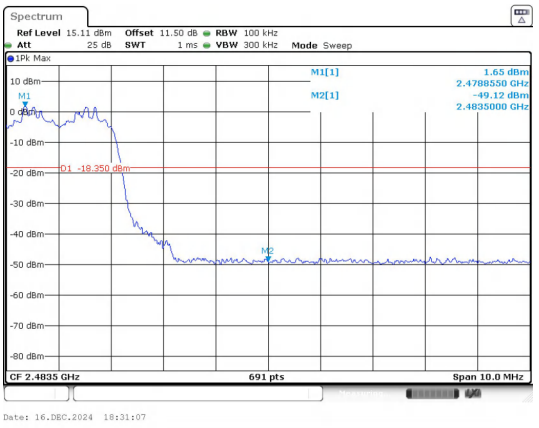
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



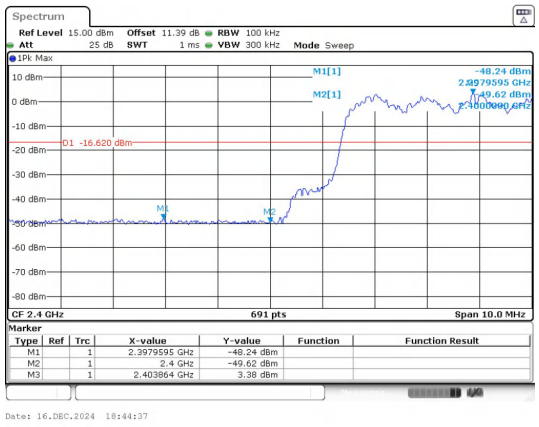
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



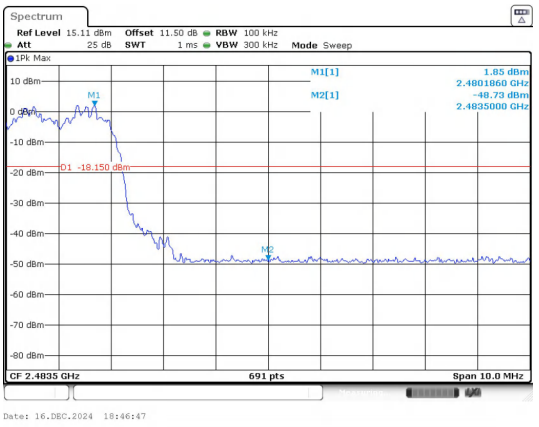
Out Of Band Emission(Right)

π/4DQPSK_2-DH5_Channel Hopping



Out Of Band Emission(Left)

8DPSK_3-DH5_Channel Hopping



Out Of Band Emission(Right)

8DPSK_3-DH5_Channel Hopping

------End of the report-----