Appendix Report

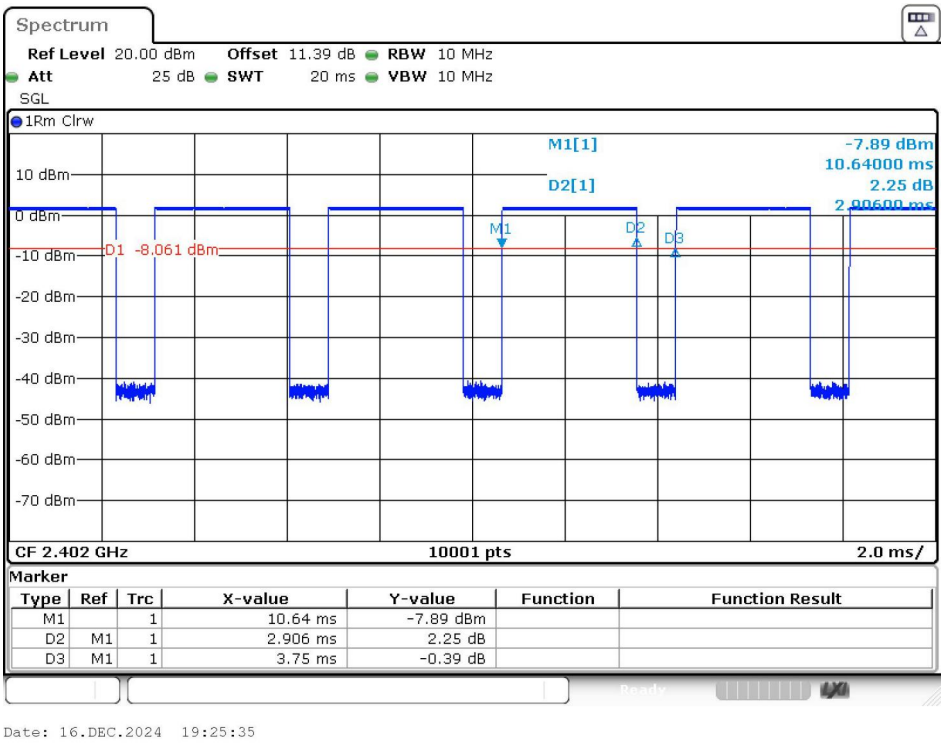
Report No.:	CISRR241214138
Test Engineer:	Mark Fu
Supervised by:	Rory Huang

1) Duty Cycle

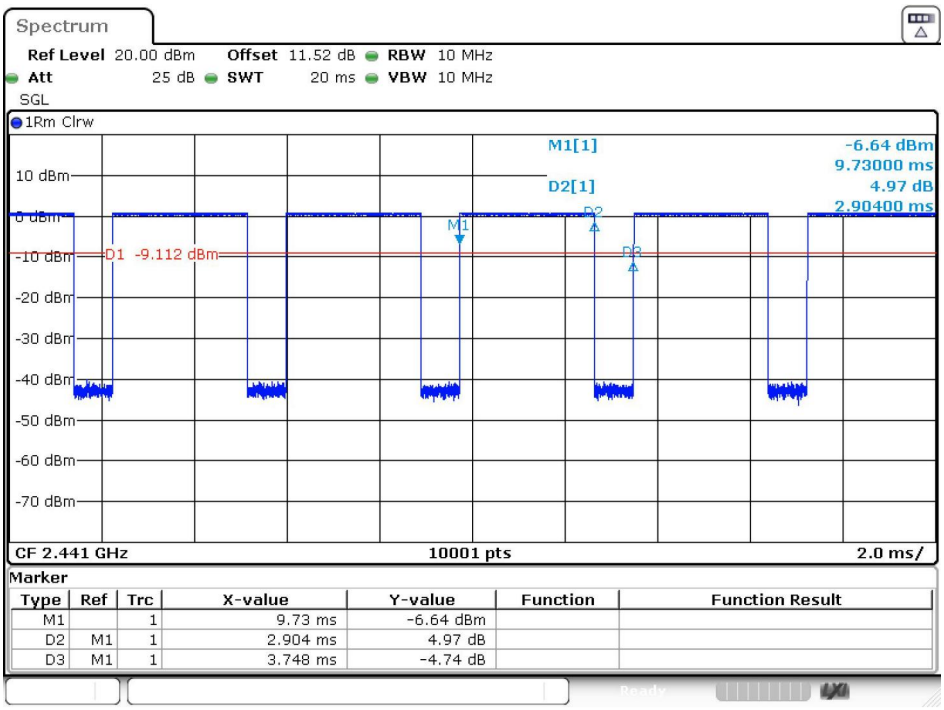
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.906	3.750	77.49	0.7749	1.1075	0.3441
		39	2.904	3.748	77.48	0.7748	1.1081	0.3444
		78	2.904	3.748	77.48	0.7748	1.1081	0.3444
π/4DQPSK	2-DH5	0	2.910	3.748	77.64	0.7764	1.0991	0.3436
		39	2.910	3.748	77.64	0.7764	1.0991	0.3436
		78	2.910	3.748	77.64	0.7764	1.0991	0.3436
8DPSK	3-DH5	0	2.914	3.748	77.75	0.7775	1.093	0.3432
		39	2.914	3.748	77.75	0.7775	1.093	0.3432
		78	2.912	3.748	77.69	0.7769	1.0963	0.3434

Test Graphs

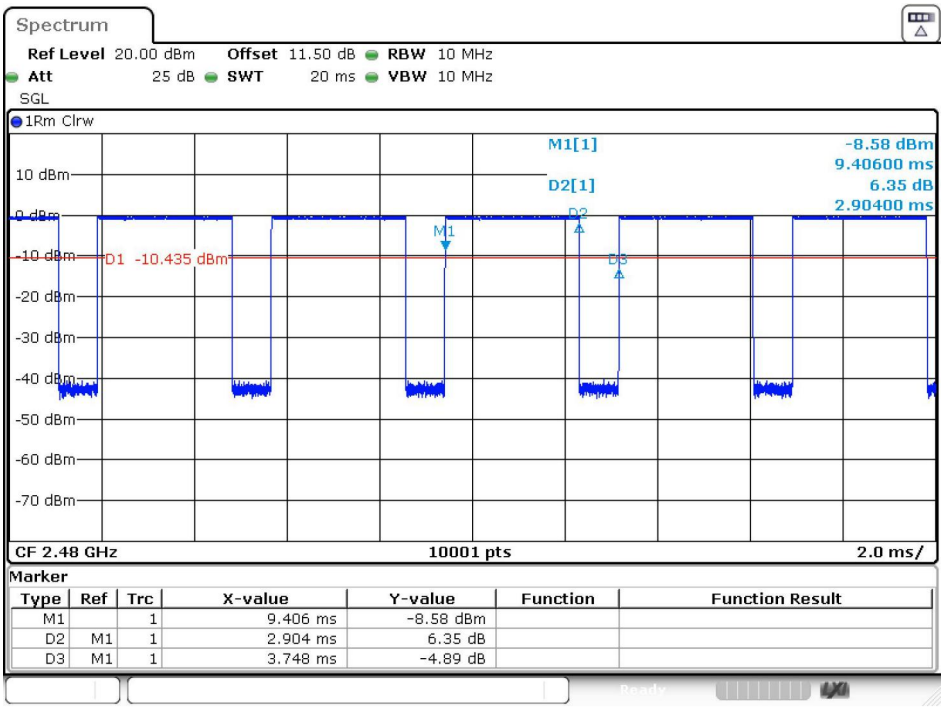


GFSK(DH5)_Channel 0



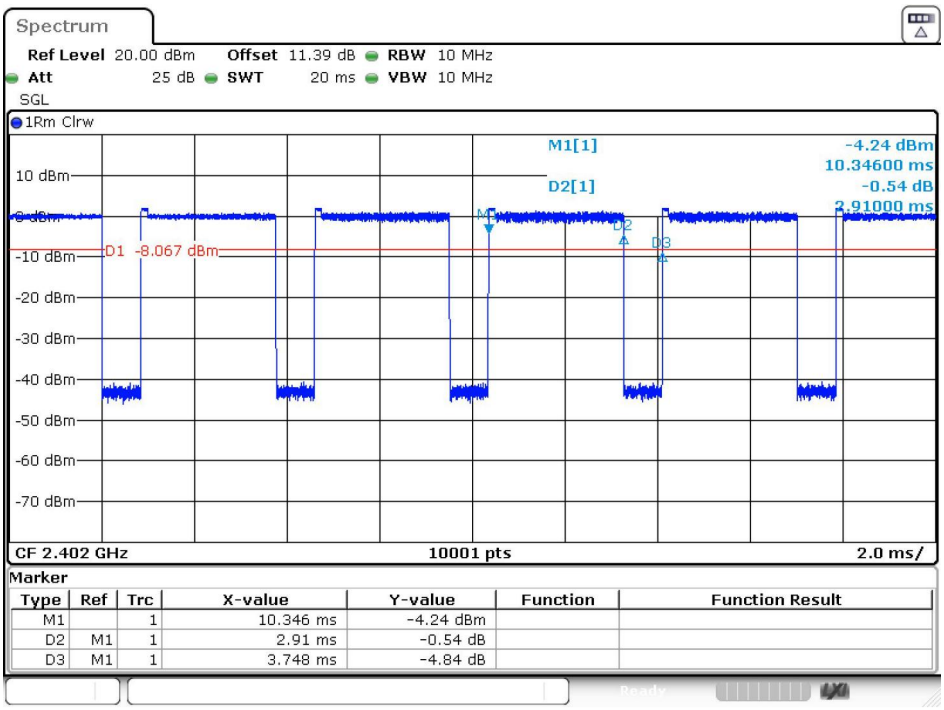
Date: 16.DEC.2024 19:39:28

GFSK(DH5)_Channel 39

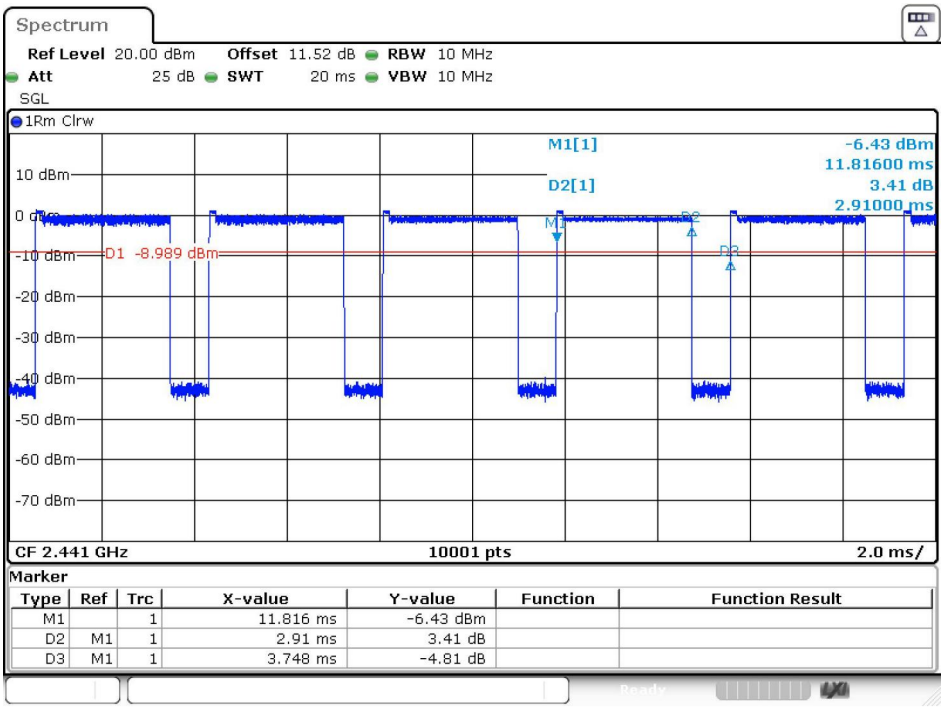


Date: 16.DEC.2024 19:41:17

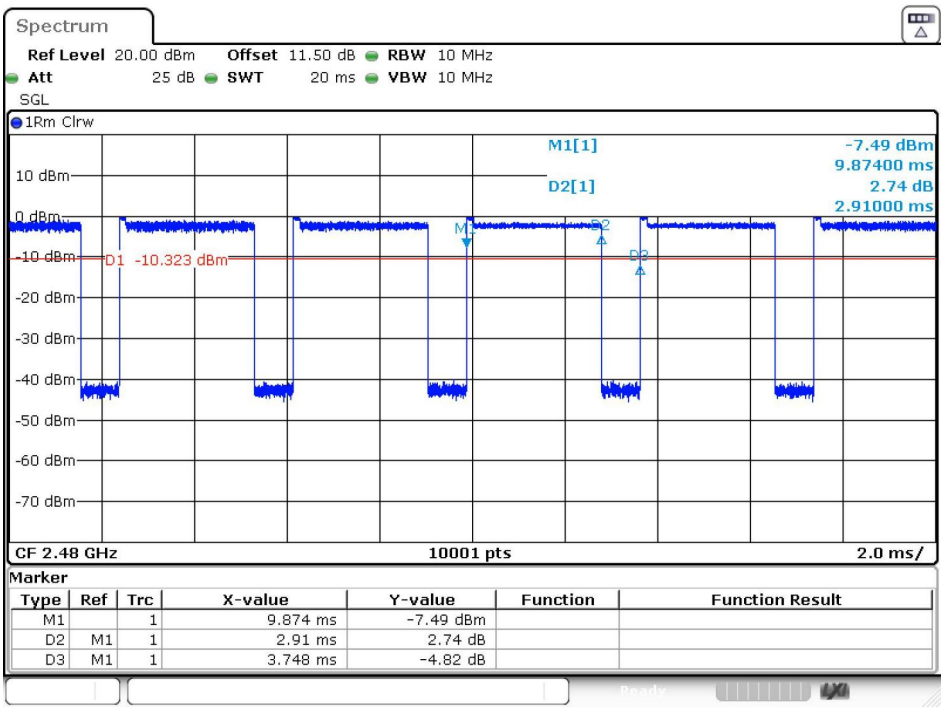
GFSK(DH5)_Channel 78



π/4DQPSK(2-DH5)_Channel 0

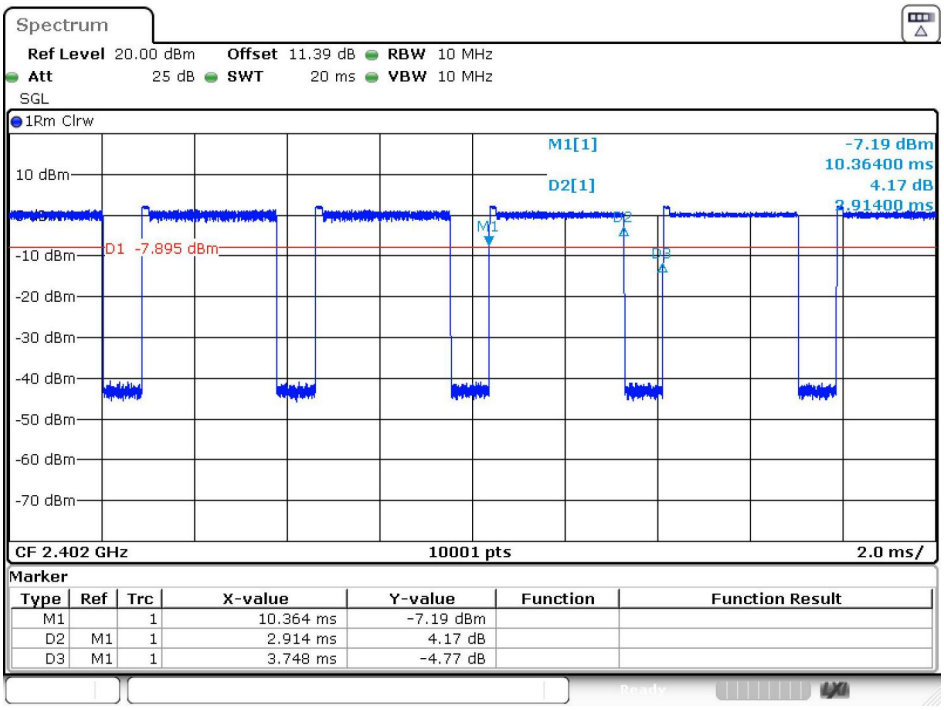


π/4DQPSK(2-DH5)_Channel 39



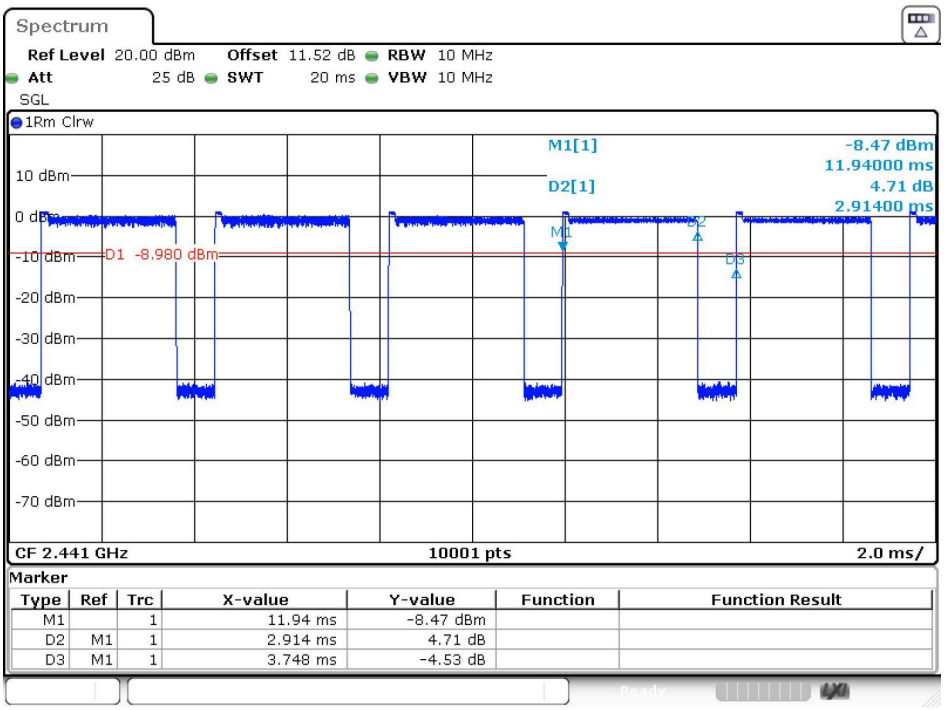
Date: 16.DEC.2024 20:02:23

π/4DQPSK(2-DH5)_Channel 78



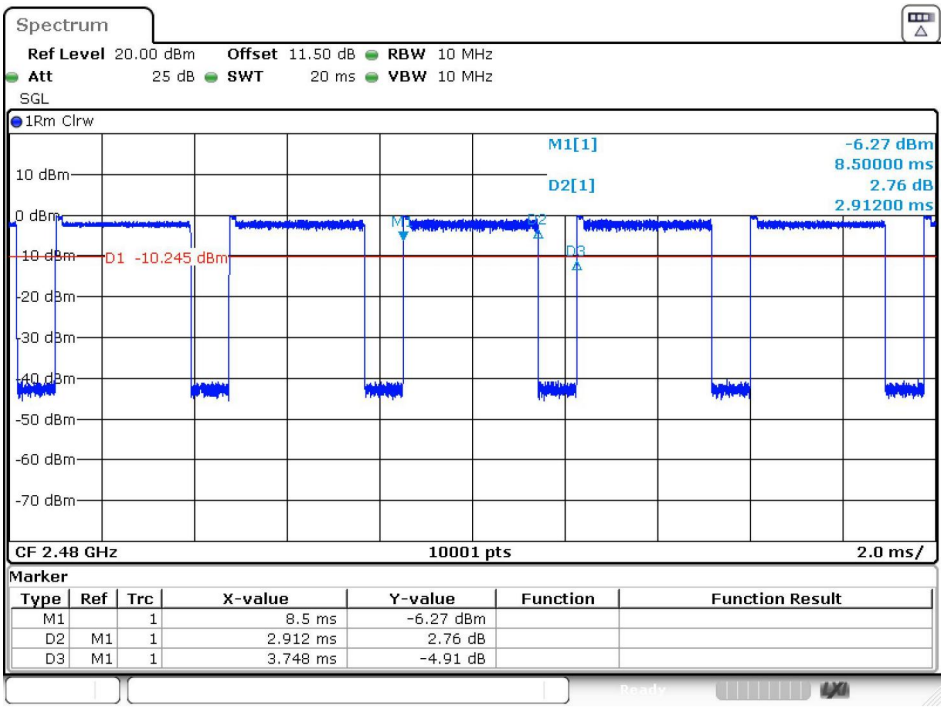
Date: 16.DEC.2024 20:04:29

8DPSK(3-DH5)_Channel 0



Date: 16.DEC.2024 20:24:59

8DPSK(3-DH5)_Channel 39



Date: 16.DEC.2024 20:26:57

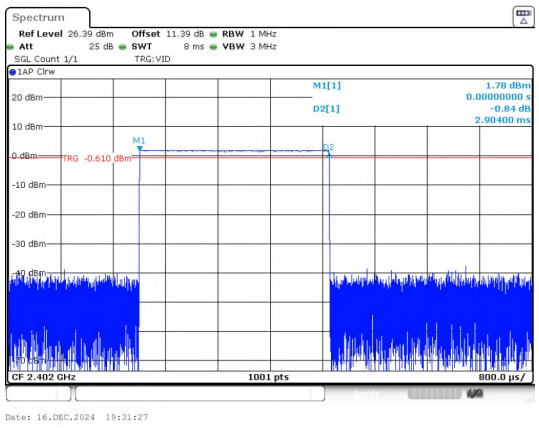
8DPSK(3-DH5)_Channel 78

2) Dwell Time

Test Result

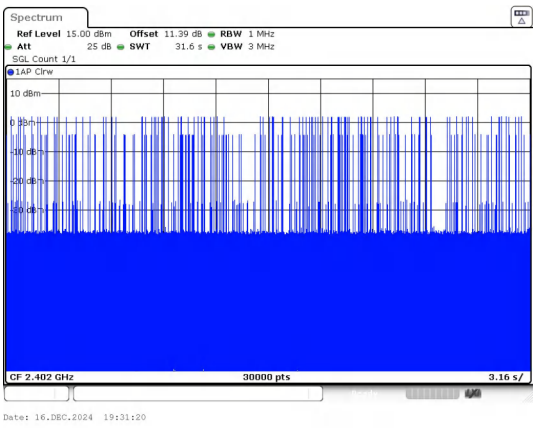
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.904	102	296.21	< 400	PASS
π/4DQPSK	2-DH5		2.912	102	297.02		PASS
8DPSK	3-DH5		2.912	113	329.06		PASS

Test Graphs



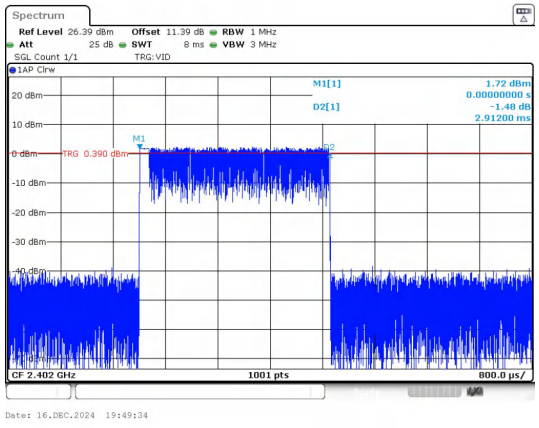
Pulse Width

GFSK_DH5



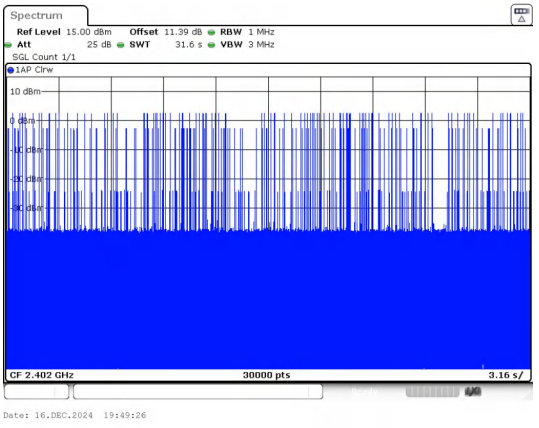
Number of Pulses in 31.6 seconds

GFSK_DH5



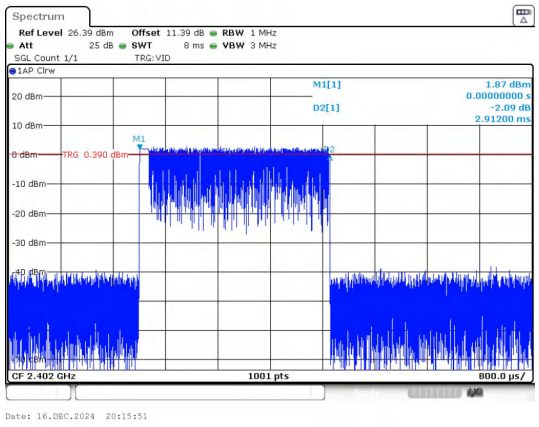
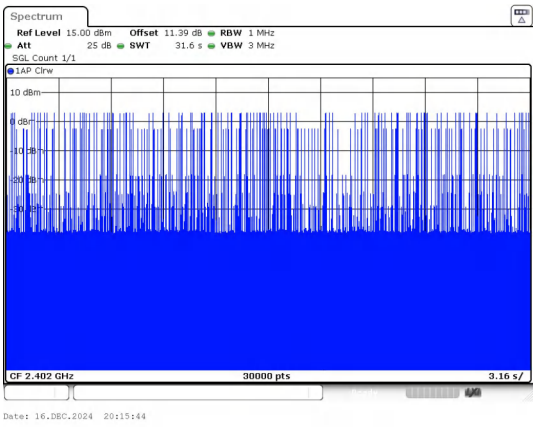
Pulse Width

π/4DQPSK_2-DH5



Number of Pulses in 31.6 seconds

π/4DQPSK_2-DH5

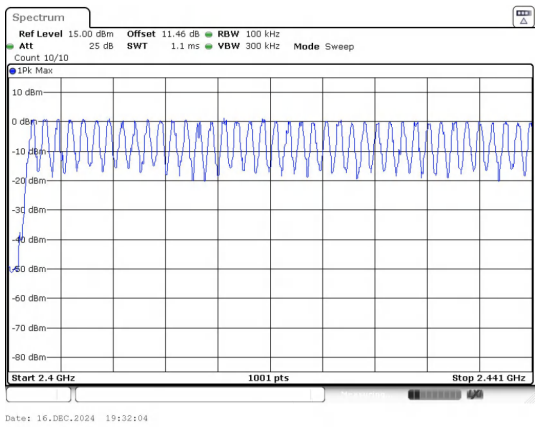
	
Pulse Width **8DPSK_3-DH5**	**Number of Pulses in 31.6 seconds** **8DPSK_3-DH5**

3) Number Of Hopping Channel

Test Result

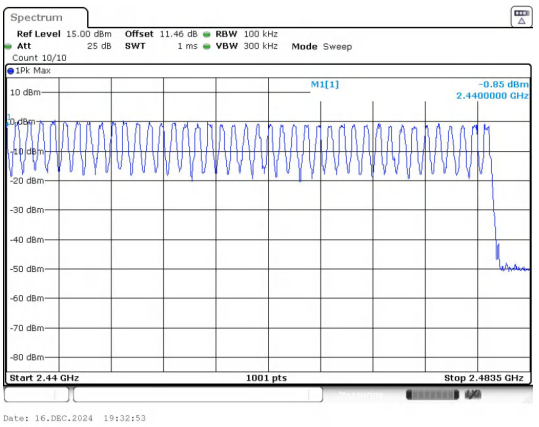
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
π/4DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs



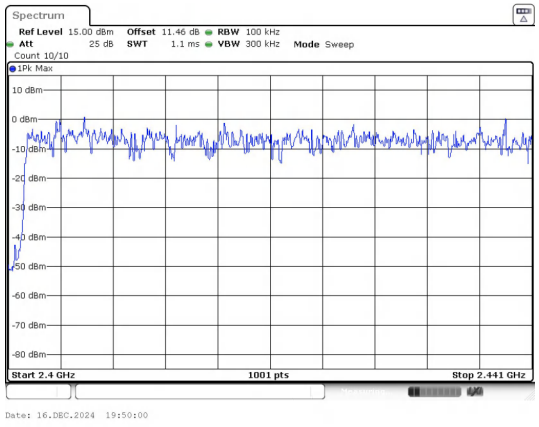
Low End Spectrum Channel Hopping Plot

GFSK



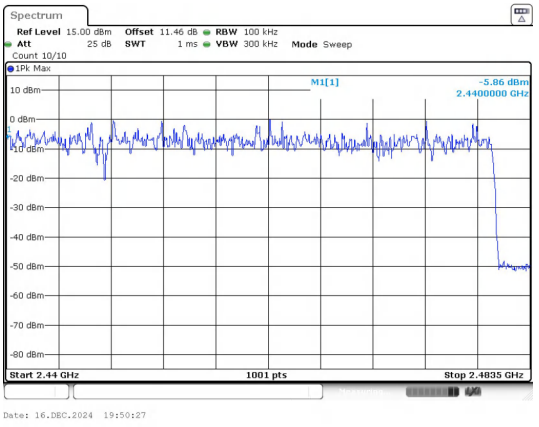
High End Spectrum Channel Hopping Plot

GFSK



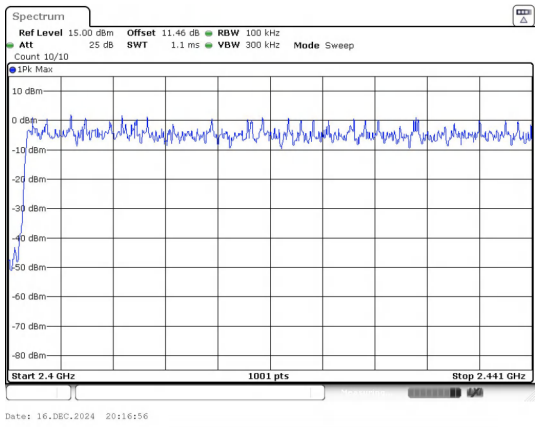
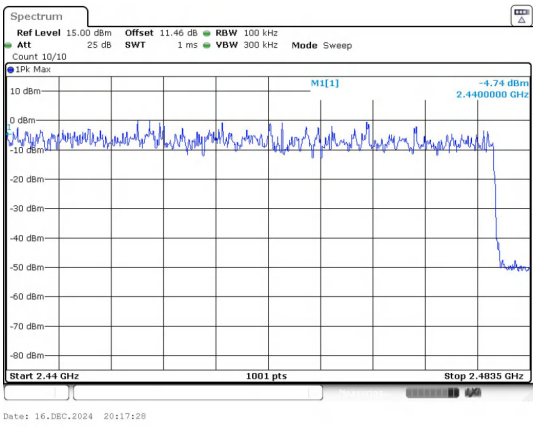
Low End Spectrum Channel Hopping Plot

π/4DQPSK



High End Spectrum Channel Hopping Plot

π/4DQPSK

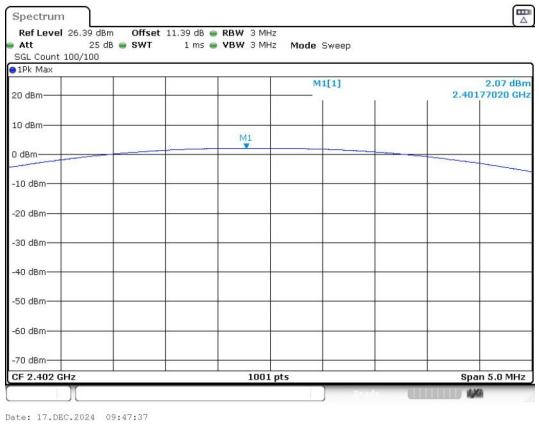
	
Low End Spectrum Channel Hopping Plot **8DPSK**	**High End Spectrum Channel Hopping Plot** **8DPSK**

4) Conducted Output Power

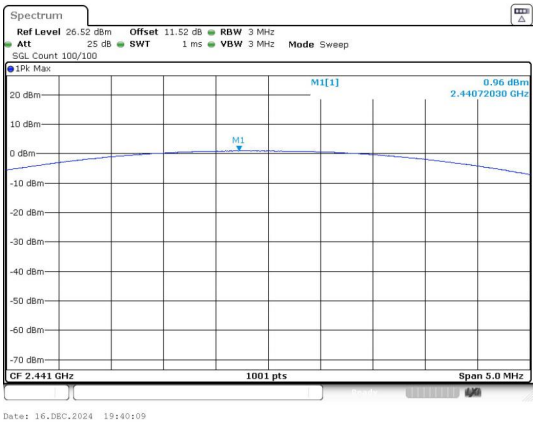
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	2.07	1.61	≤30	PASS
		39	0.96	1.25		PASS
		78	-0.37	0.92		PASS
π/4DQPSK	2-DH5	0	2.81	1.91	≤20.97	PASS
		39	1.87	1.54		PASS
		78	0.57	1.14		PASS
8DPSK	3-DH5	0	3.59	2.29		PASS
		39	2.53	1.79		PASS
		78	1.26	1.34		PASS

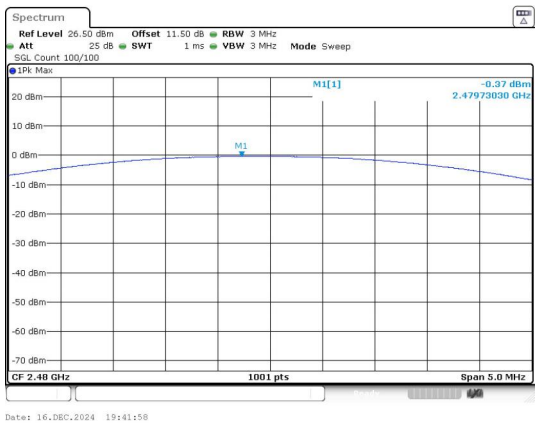
Test Graphs



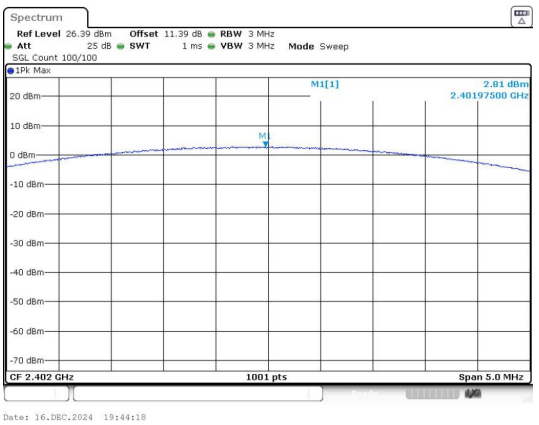
Peak Output Power
GFSK_Channel 0



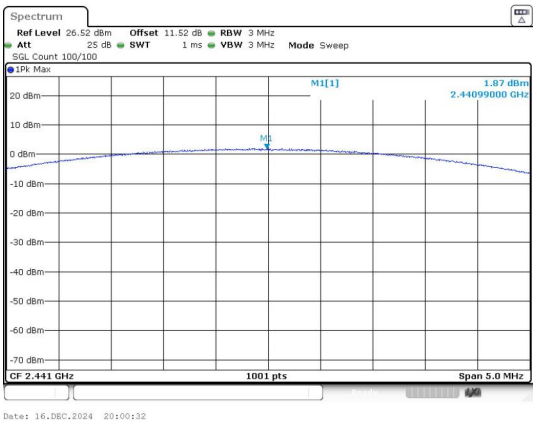
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78

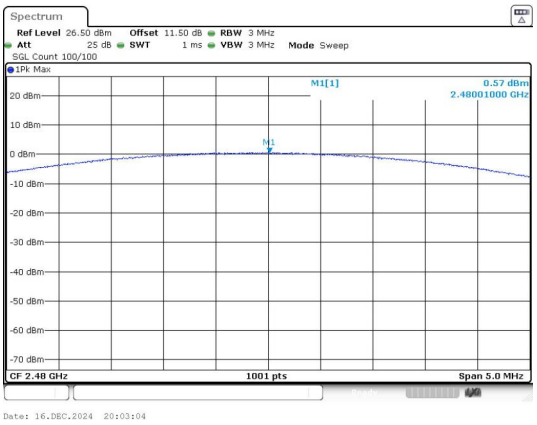


Peak Output Power
π/4DQPSK_Channel 0



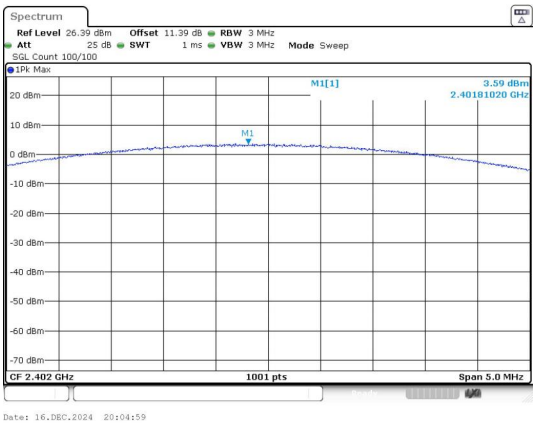
Peak Output Power

π/4DQPSK_Channel 39



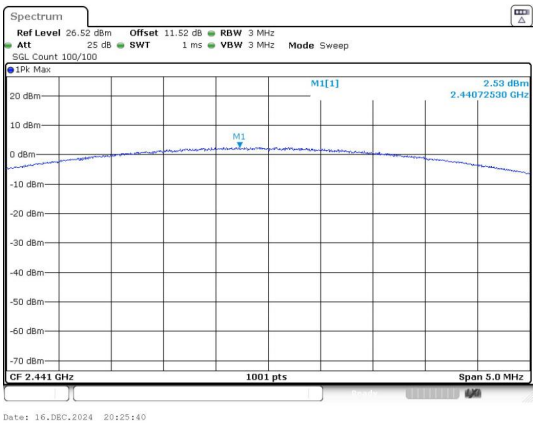
Peak Output Power

π/4DQPSK_Channel 78



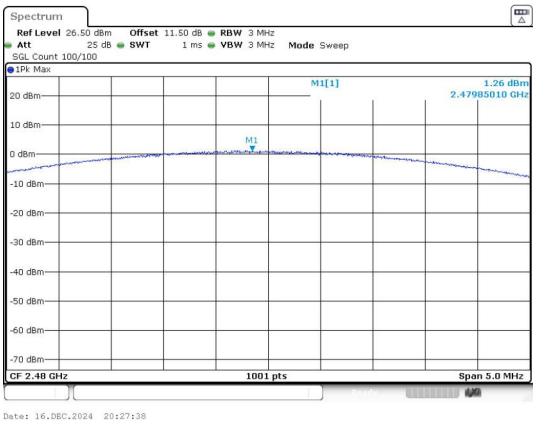
Peak Output Power

8DPSK_Channel 0



Peak Output Power

8DPSK_Channel 39



Peak Output Power

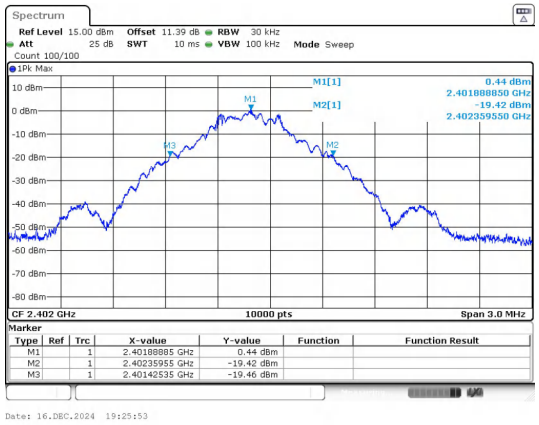
8DPSK_Channel 78

5) 20dB Bandwidth

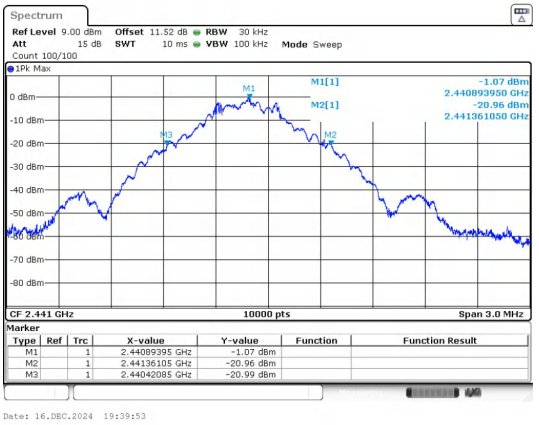
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9300
	39	2441 MHz	0.9400
	78	2480 MHz	0.9300
π/4DQPSK	0	2402 MHz	1.240
	39	2441 MHz	1.250
	78	2480 MHz	1.270
8DPSK	0	2402 MHz	1.280
	39	2441 MHz	1.270
	78	2480 MHz	1.280

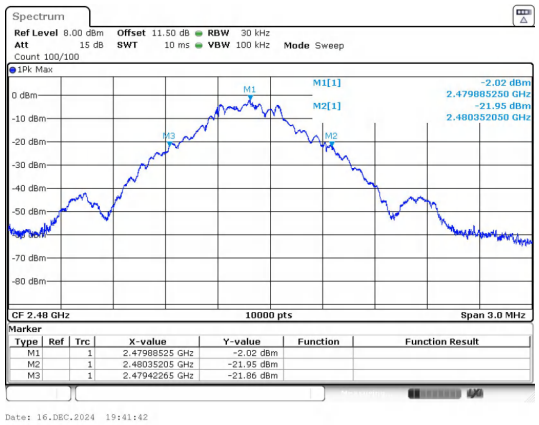
Test Graphs



GFSK_DH5_Channel 0



GFSK_DH5_Channel 39

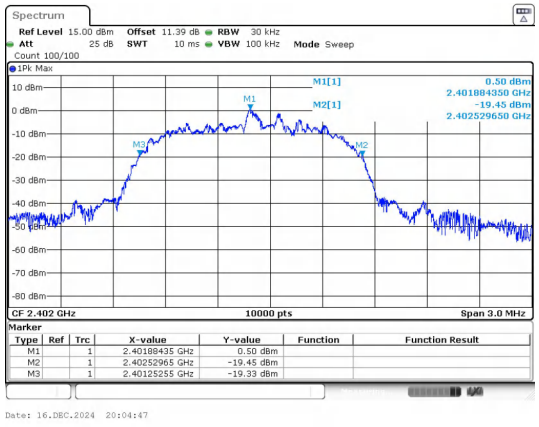


GFSK_DH5_Channel 78

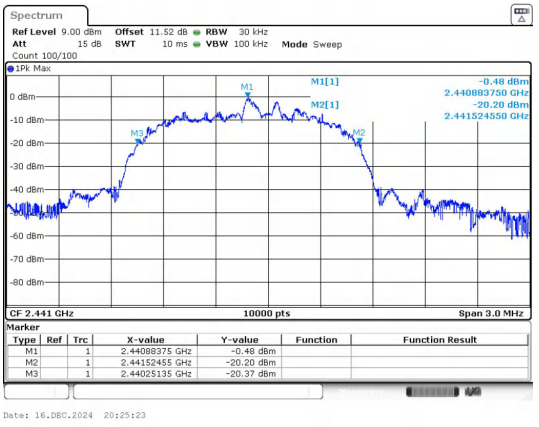
π/4DQPSK_2-DH5_Channel 0

π/4DQPSK_2-DH5_Channel 39

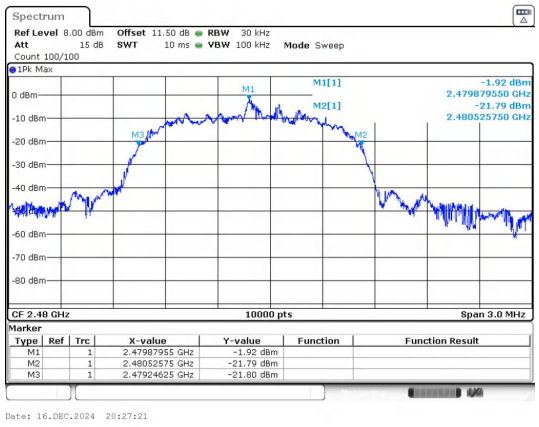
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



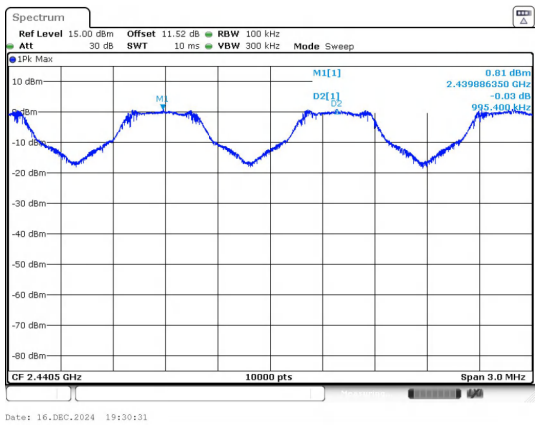
8DPSK_3-DH5_Channel 78

6) Carrier Frequencies Separation

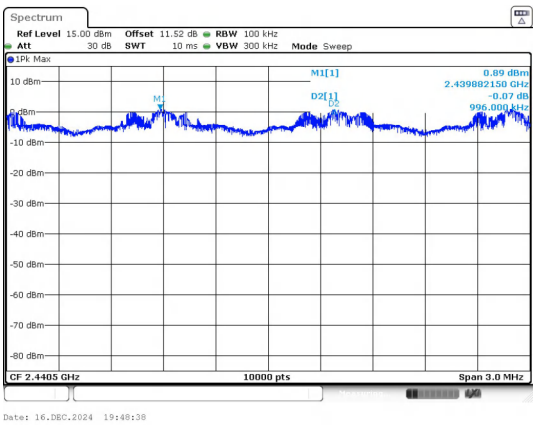
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8864	2440.8818	0.9954	0.93	PASS
π/4DQPSK	2-DH5	2439.8821	2440.8782	0.9960	0.827	PASS
8DPSK	3-DH5	2439.8908	2440.8839	0.9930	0.853	PASS

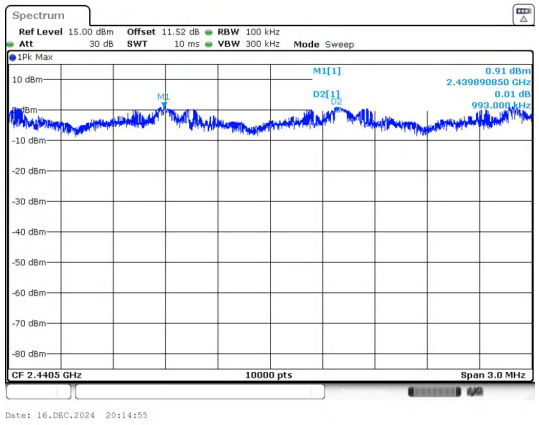
Test Graphs



GFSK



π/4DQPSK



8DPSK

7) Conducted Out Of Band Emission

Test Result

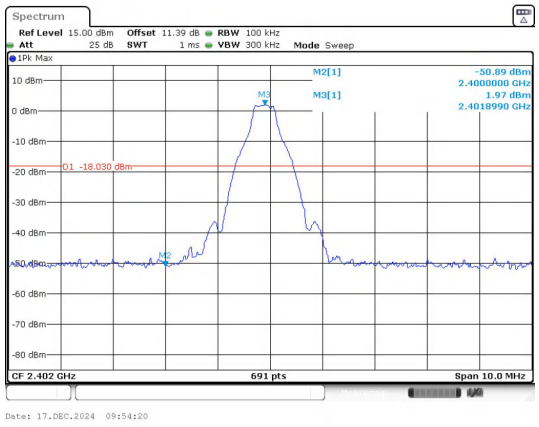
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2399.00	-48.685	-18.03	-30.655	PASS
			2400.00	-50.890	-18.03	-32.860	PASS
			4803.80	-25.112	-18.03	-7.082	PASS
		39	4882.09	-27.572	-19.03	-8.542	PASS
		78	2483.50	-50.310	-20.63	-29.680	PASS
			4959.49	-26.159	-20.63	-5.529	PASS
π/4DQPSK	2-DH5	0	2400.00	-46.270	-17.73	-28.540	PASS
			4803.85	-32.545	-17.73	-14.815	PASS
		39	4882.09	-32.940	-18.98	-13.960	PASS
		78	2483.50	-50.410	-20.27	-30.140	PASS
			4959.49	-33.774	-20.27	-13.504	PASS
8DPSK	3-DH5	0	2400.00	-40.780	-18.11	-22.670	PASS
			4803.85	-28.944	-18.11	-10.834	PASS
		39	4881.25	-32.443	-19.07	-13.373	PASS
		78	2483.50	-50.320	-20.3	-30.020	PASS
			4960.33	-32.865	-20.3	-12.565	PASS

Hopping

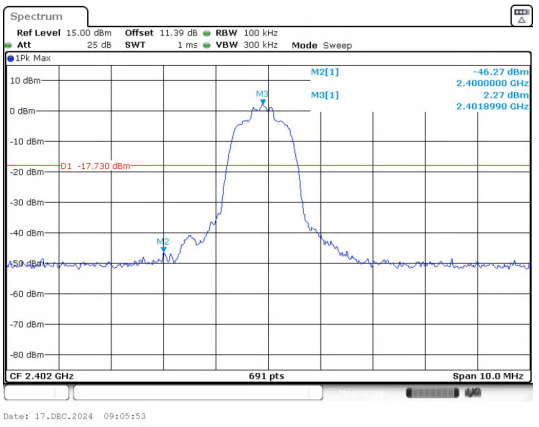
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.77	-46.471	-18.04	-28.431	PASS
			2400.00	-49.280	-18.04	-31.240	PASS
			2483.50	-49.300	-20.52	-28.780	PASS
π/4DQPSK	2-DH5		2395.88	-47.125	-17.75	-29.375	PASS
			2400.00	-48.990	-17.75	-31.240	PASS
			2483.50	-49.080	-20.39	-28.690	PASS
8DPSK	3-DH5		2398.97	-44.355	-18.5	-25.855	PASS
			2400.00	-46.480	-18.5	-27.980	PASS
			2483.50	-49.060	-20.28	-28.780	PASS

Test Graphs



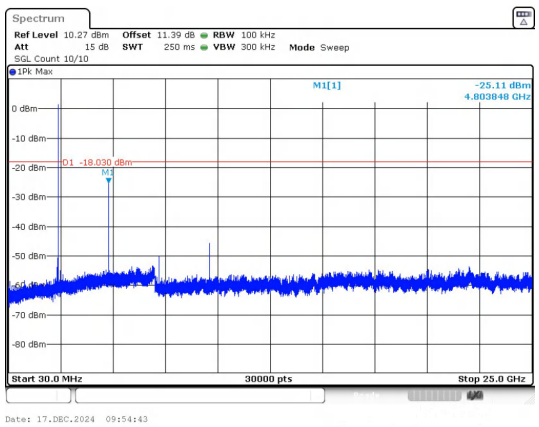
Out Of Band Emission

GFSK_DH5_Channel 0



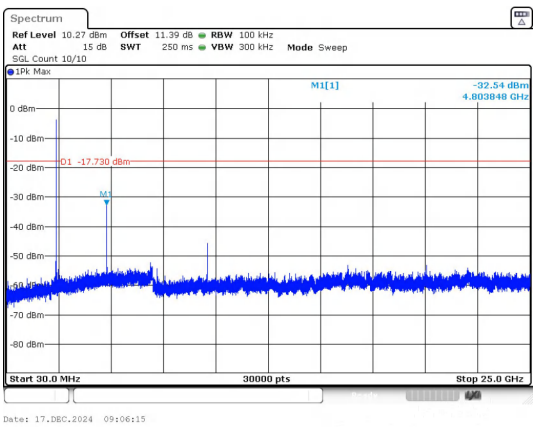
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 0



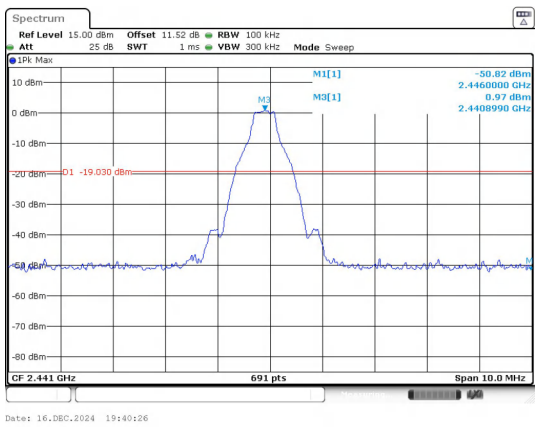
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 0



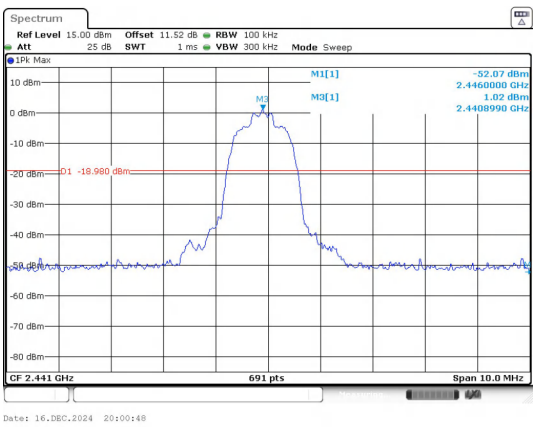
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 0



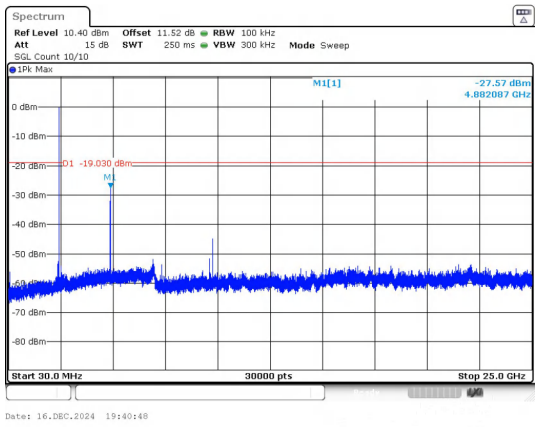
Out Of Band Emission

GFSK_DH5_Channel 39



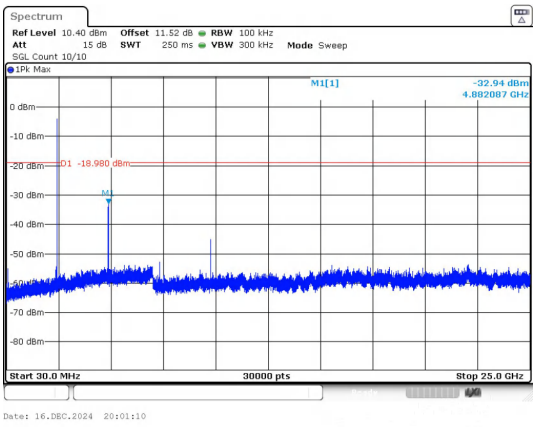
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 39



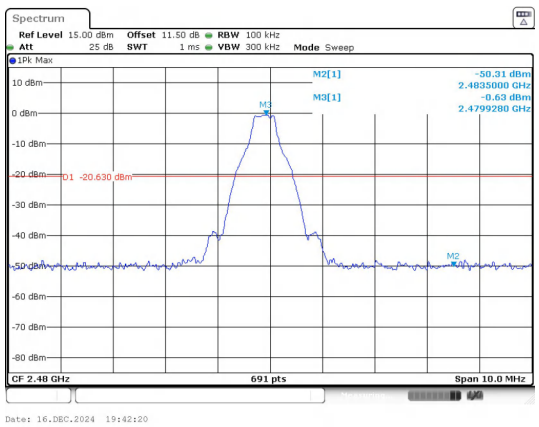
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 39



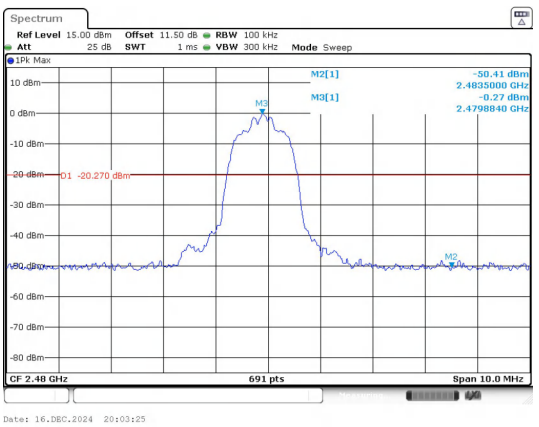
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 39



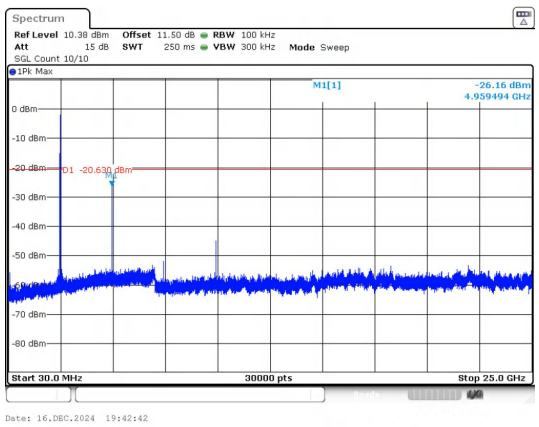
Out Of Band Emission

GFSK_DH5_Channel 78



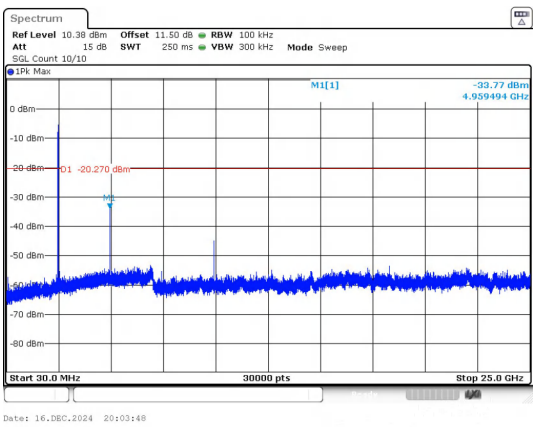
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 78



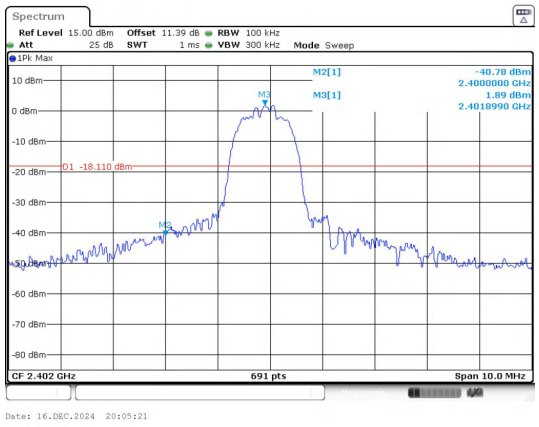
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 78



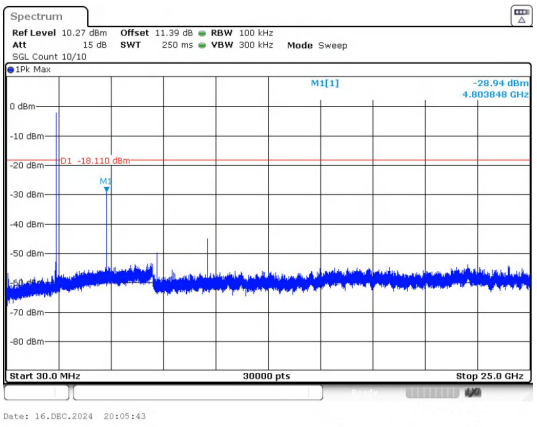
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 78



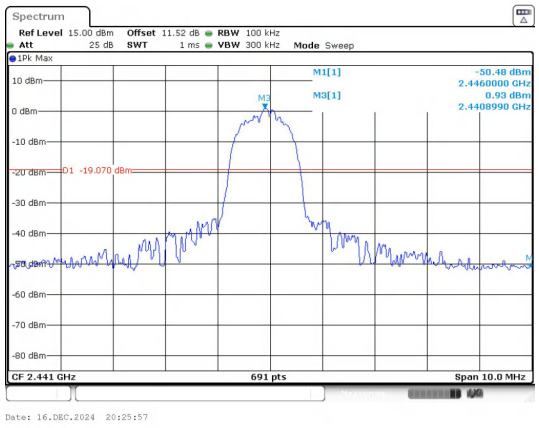
Out Of Band Emission

8DPSK_3-DH5_Channel 0



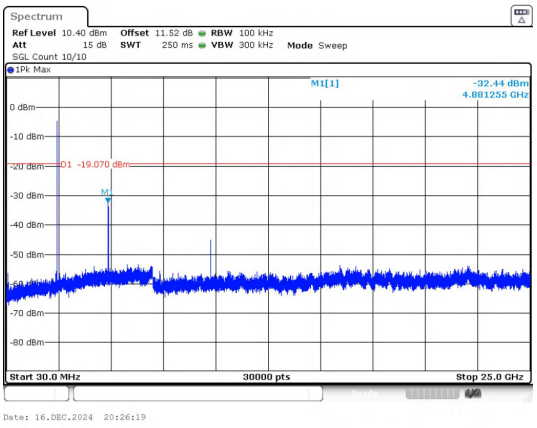
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 0



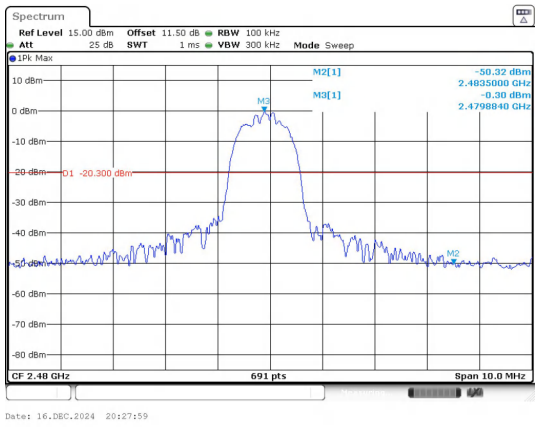
Out Of Band Emission

8DPSK_3-DH5_Channel 39



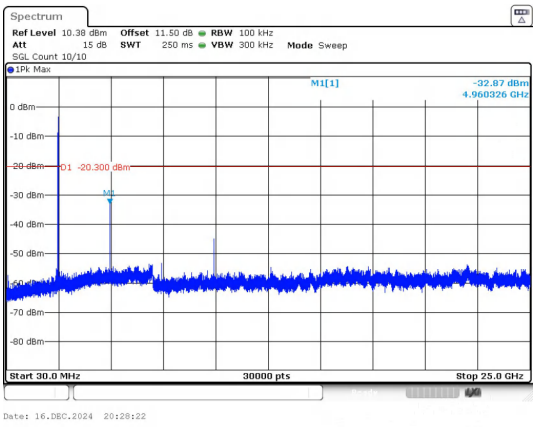
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 39



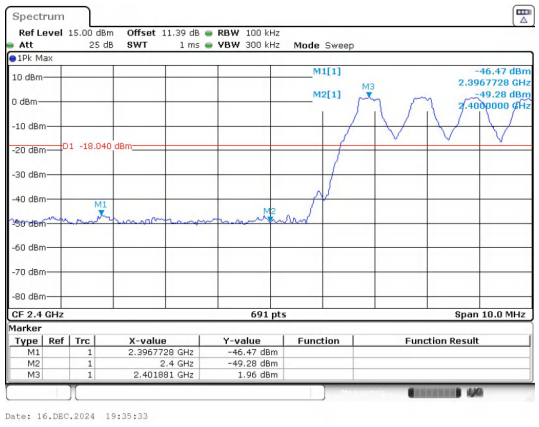
Out Of Band Emission

8DPSK_3-DH5_Channel 78



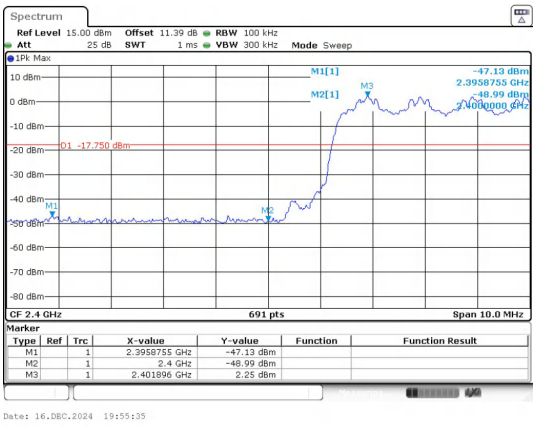
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 78



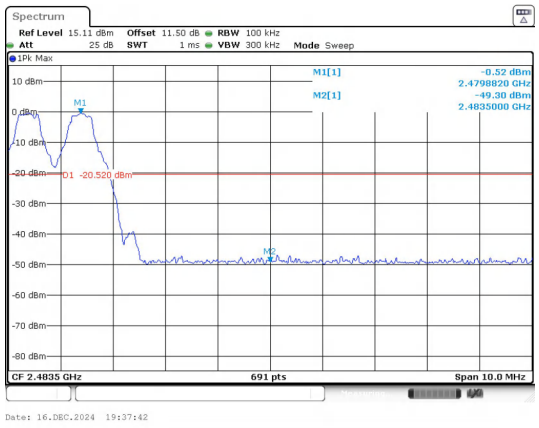
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



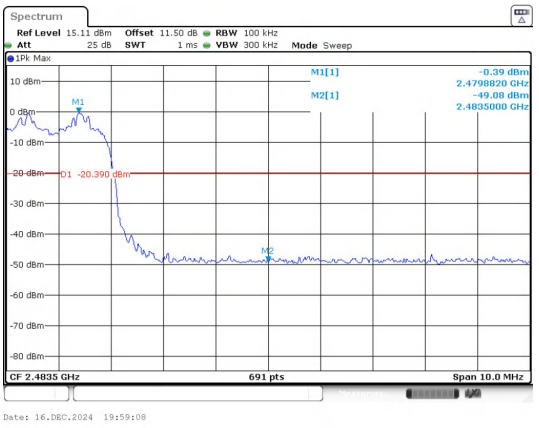
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



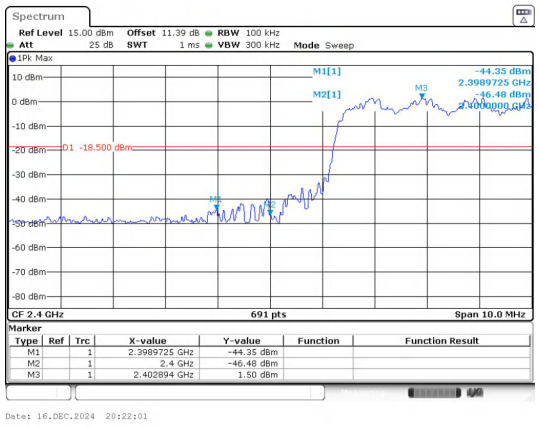
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



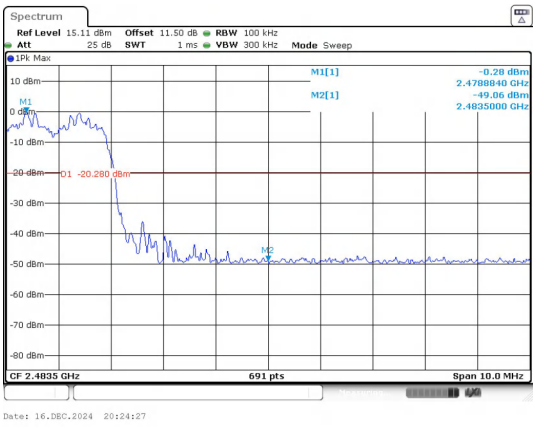
Out Of Band Emission(Right)

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-----