Appendix A

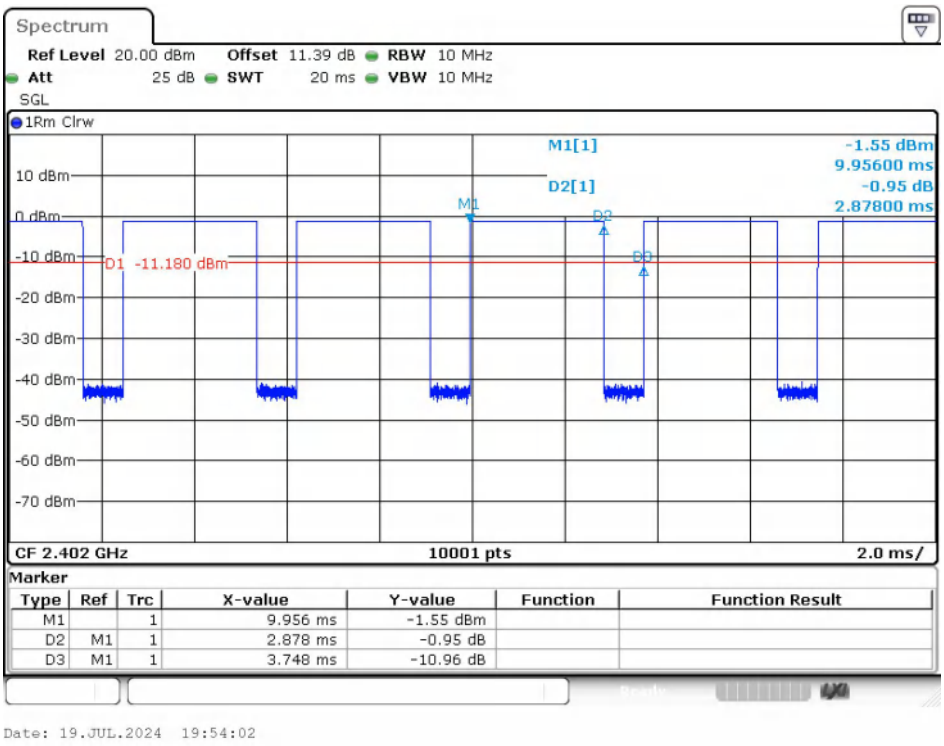
Report No.:	CISRR24071808901
FCC ID:	2BF2Q-KW03-1
Product Name:	White noise speaker
Model No.:	KW03
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Duty Cycle

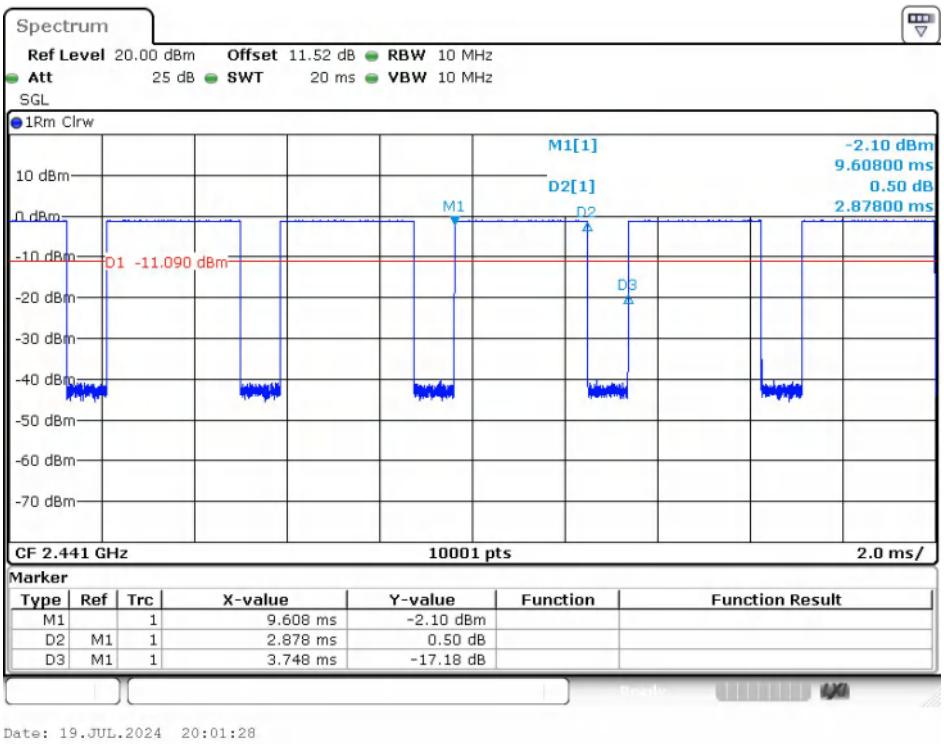
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.878	3.748	76.79	0.7679	1.147	0.35
		39	2.878	3.748	76.79	0.7679	1.147	0.35
		78	2.880	3.748	76.84	0.7684	1.1441	0.35
π/4DQPSK	2-DH5	0	2.884	3.748	76.95	0.7695	1.1379	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
8DPSK	3-DH5	0	2.888	3.748	77.05	0.7705	1.1323	0.35
		39	2.886	3.748	77.00	0.7700	1.1351	0.35
		78	2.888	3.748	77.05	0.7705	1.1323	0.35

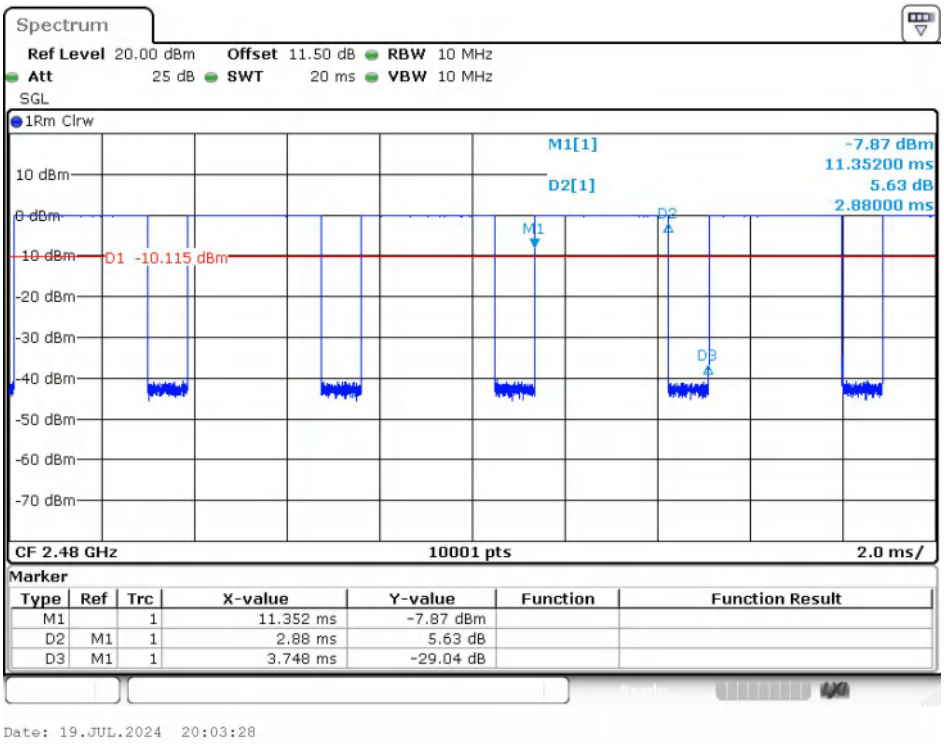
Test Graphs



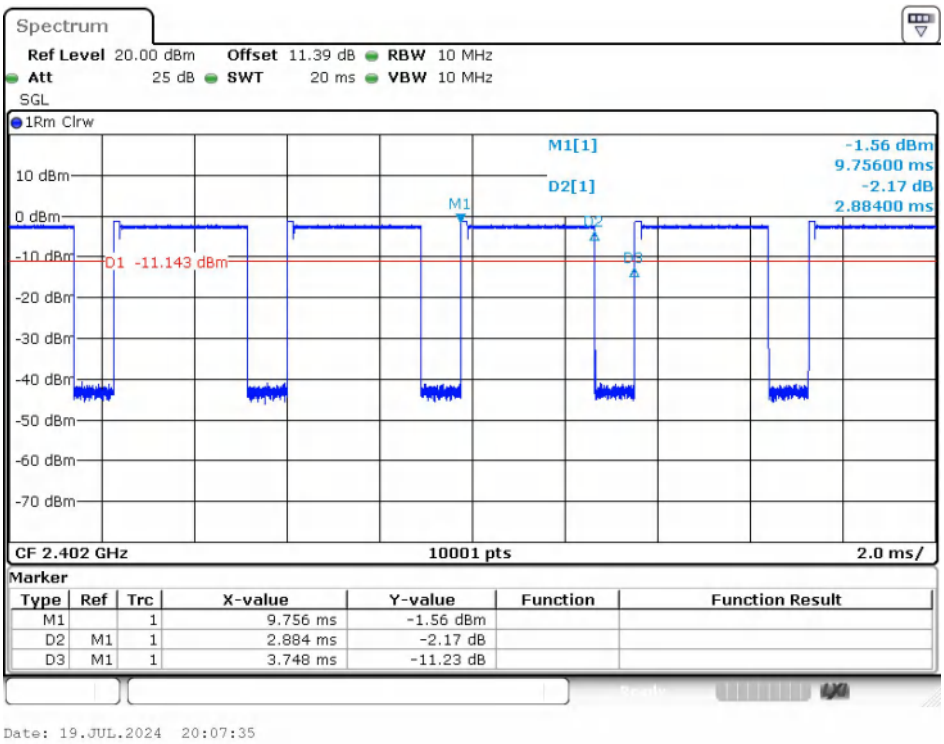
GFSK(DH5)_Channel 0



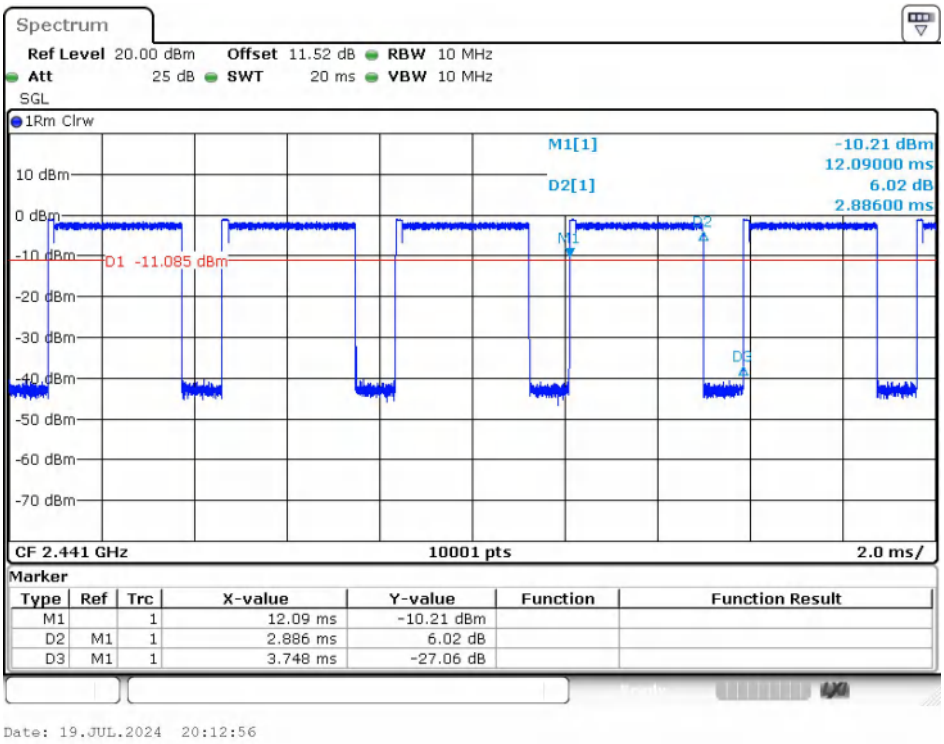
GFSK(DH5)_Channel 39



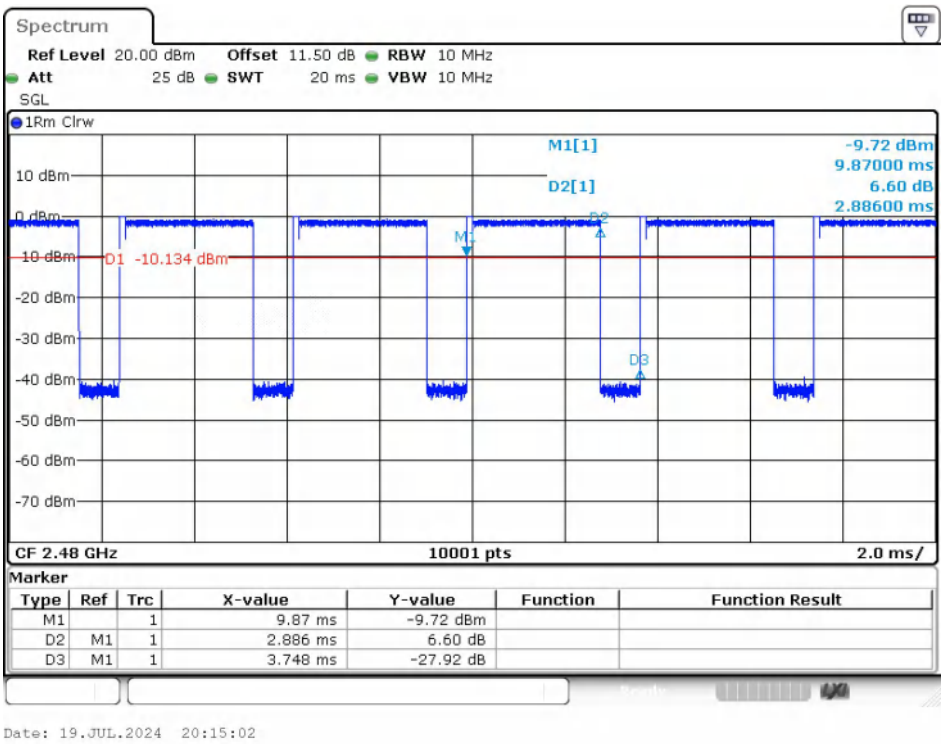
GFSK(DH5)_Channel 78



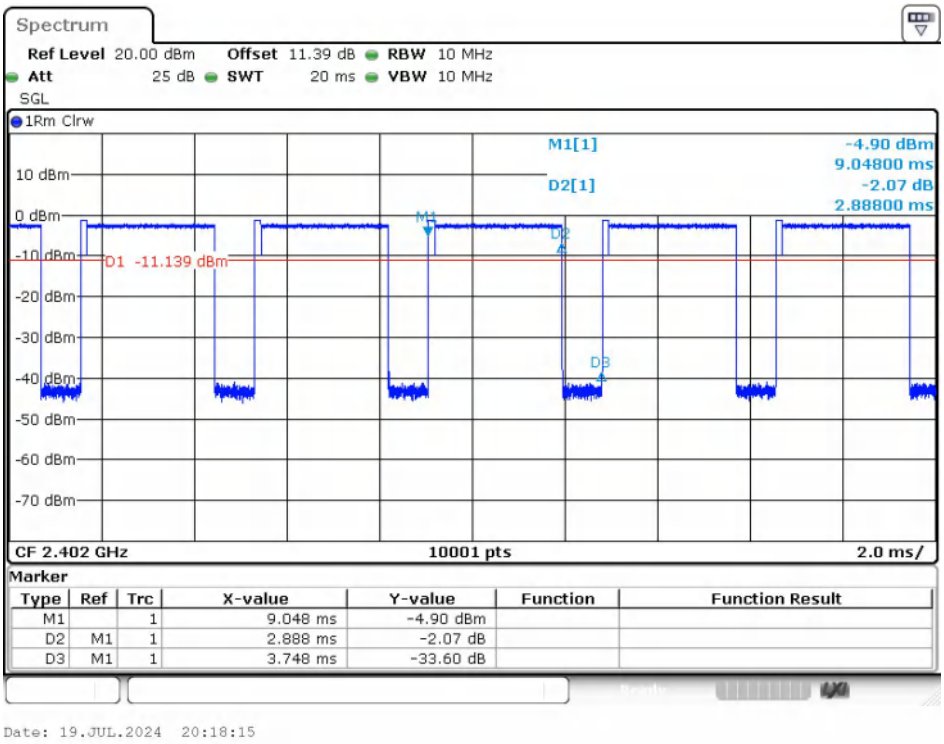
π/4DQPSK(2-DH5)_Channel 0



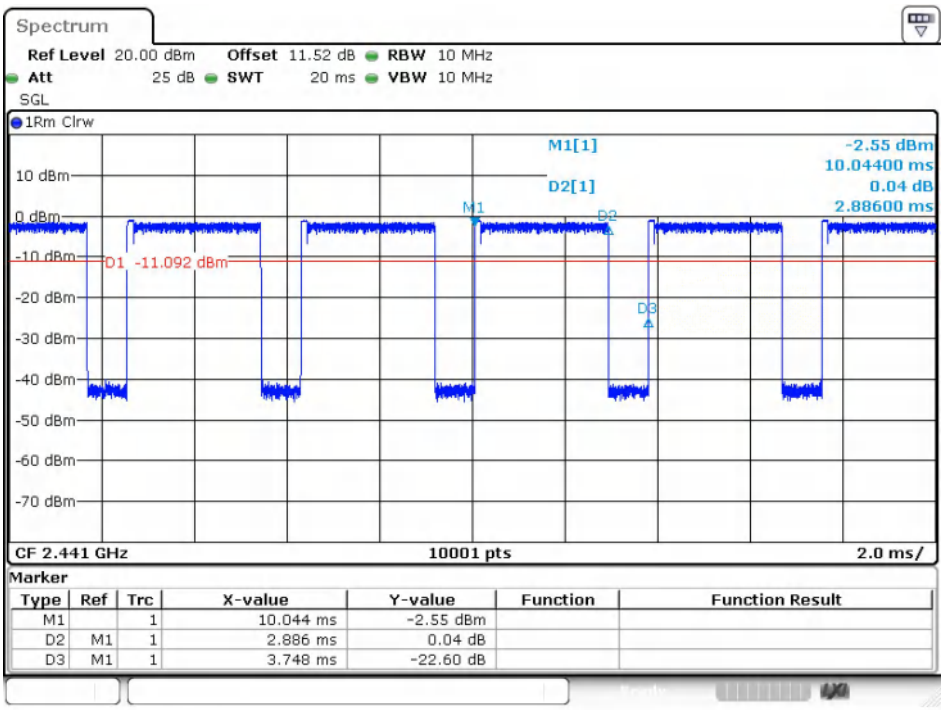
π/4DQPSK(2-DH5)_Channel 39



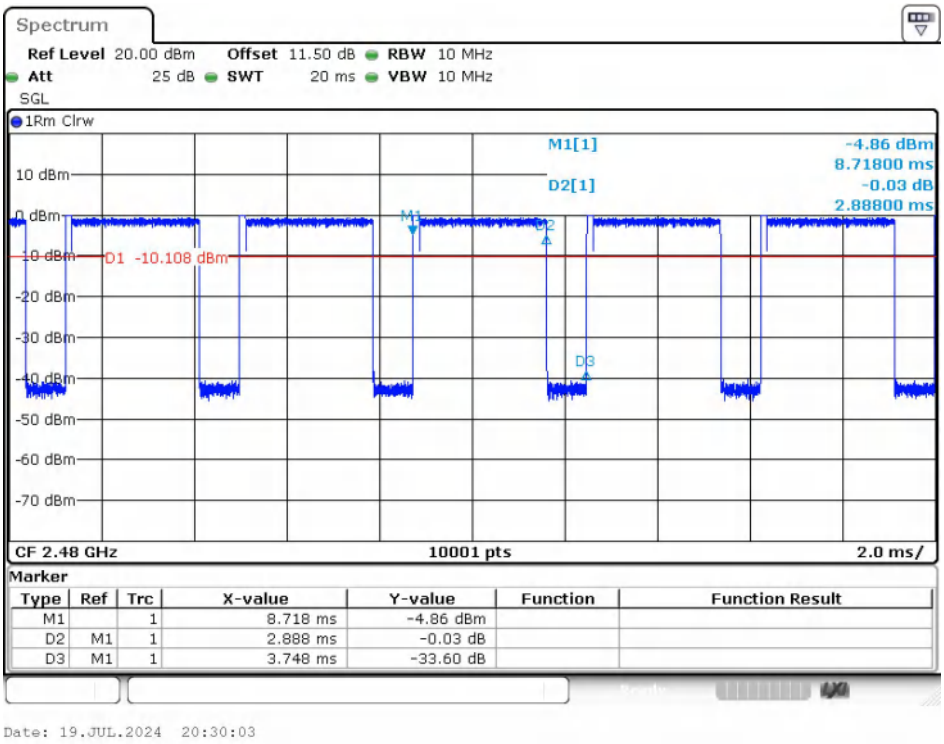
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



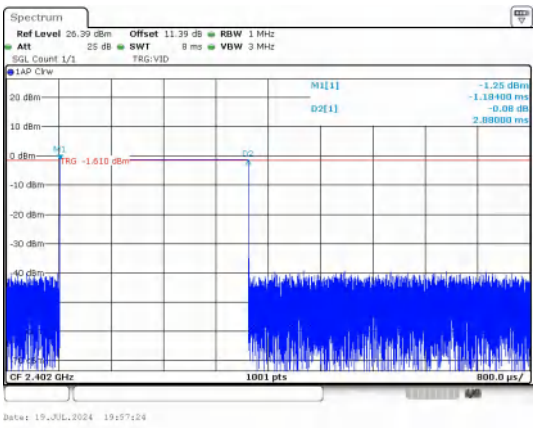
8DPSK(3-DH5)_Channel 78

2) Dwell Time

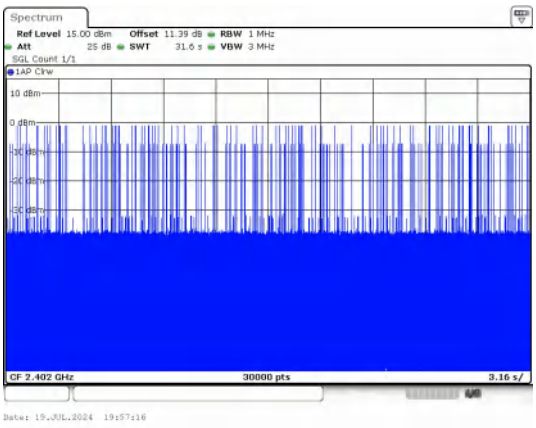
Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.880	98	282.24	< 400	PASS
π/4DQPSK	2-DH5		2.888	113	326.34		PASS
8DPSK	3-DH5		2.888	99	285.91		PASS

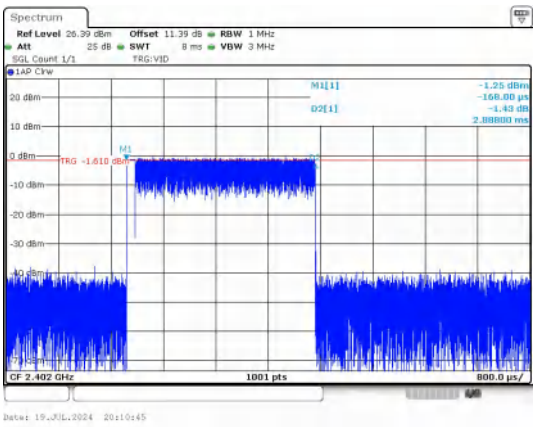
Test Graphs



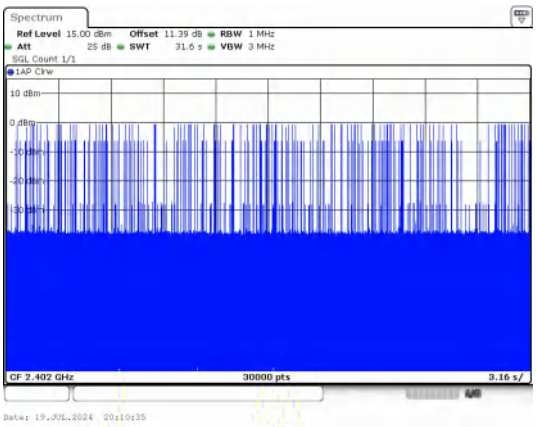
Pulse Width
GFSK_DH5



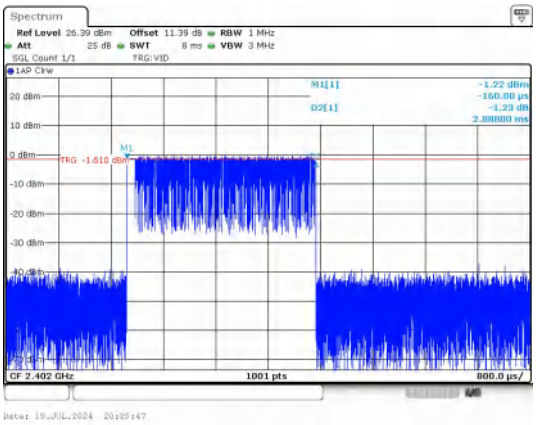
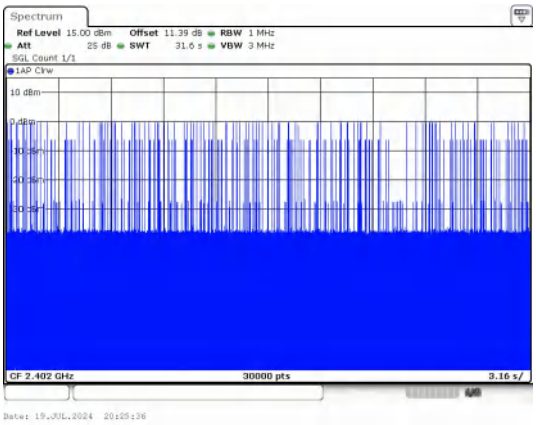
Number of Pulses in 31.6 seconds
GFSK_DH5



Pulse Width
π/4DQPSK_2-DH5



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

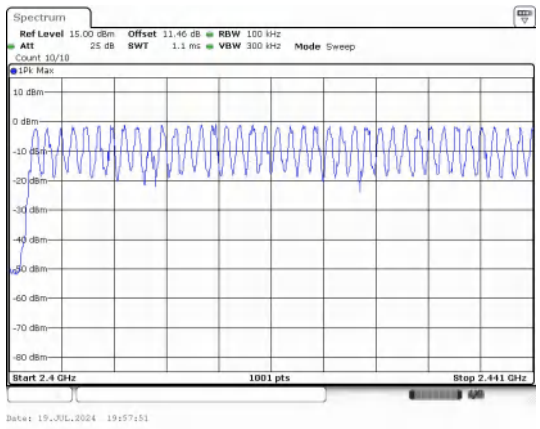
	
Pulse Width **8DPSK_3-DH5**	**Number of Pulses in 31.6 seconds** **8DPSK_3-DH5**

3) Number Of Hopping Channel

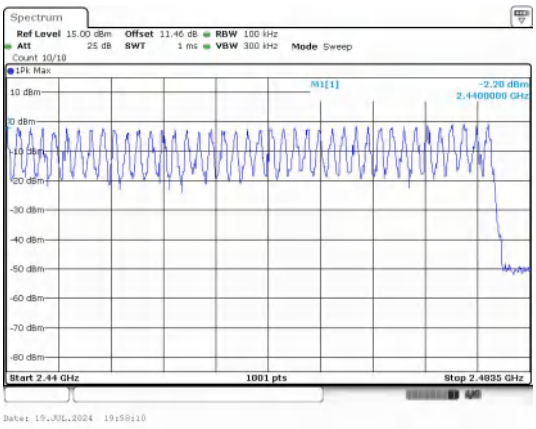
Test Result

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

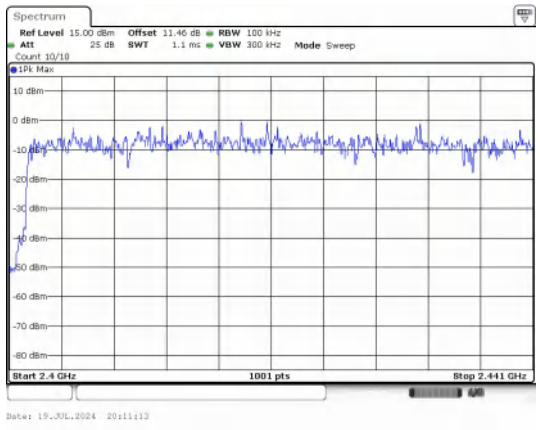
Test Graphs



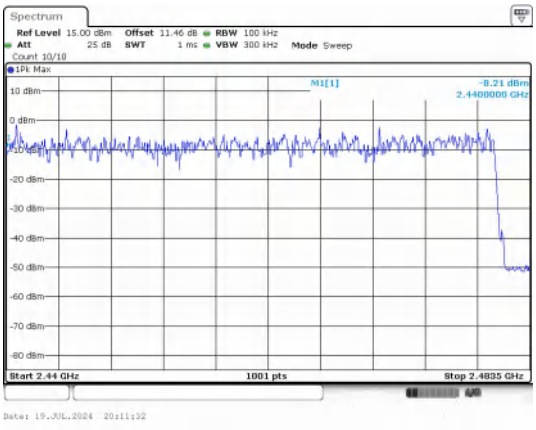
Low End Spectrum Channel Hopping Plot
GFSK



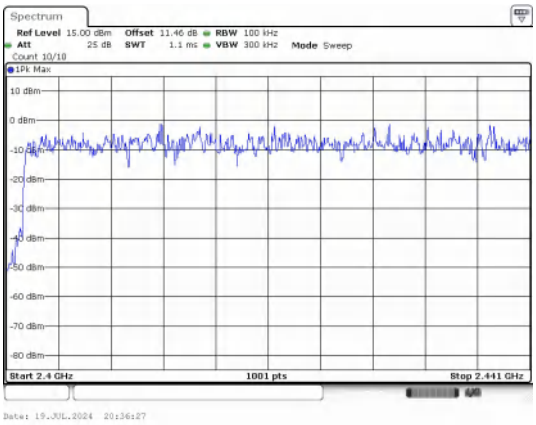
High End Spectrum Channel Hopping Plot
GFSK



Low End Spectrum Channel Hopping Plot
π/4DQPSK

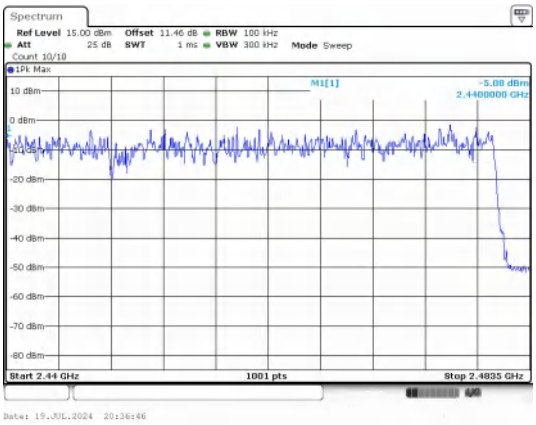


High End Spectrum Channel Hopping Plot
π/4DQPSK



Low End Spectrum Channel Hopping Plot

8DPSK



High End Spectrum Channel Hopping Plot

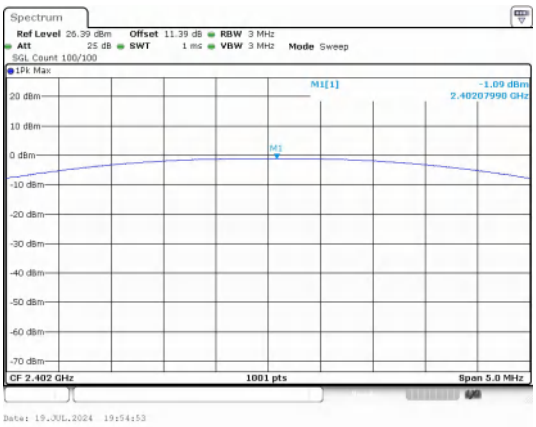
8DPSK

4) Conducted Peak Output Power

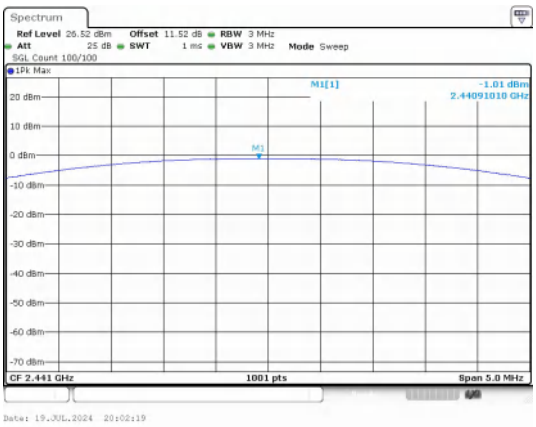
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-1.09	0.78	≤30	PASS
		39	-1.01	0.79		PASS
		78	-0.07	0.98		PASS
π/4DQPSK	2-DH5	0	-0.20	0.96	≤20.97	PASS
		39	-0.19	0.96		PASS
		78	0.77	1.20		PASS
8DPSK	3-DH5	0	0.16	1.04		PASS
		39	0.18	1.04		PASS
		78	1.19	1.32		PASS

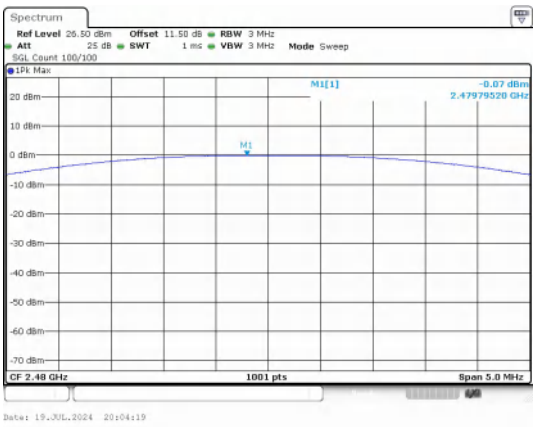
Test Graphs



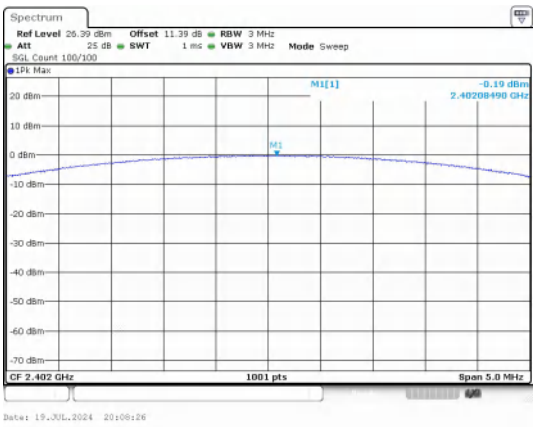
Peak Output Power
GFSK_Channel 0



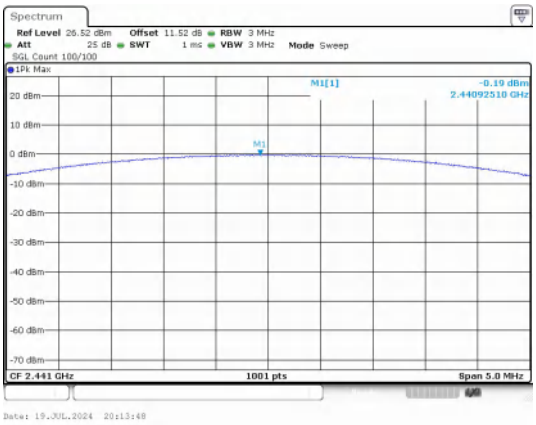
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78

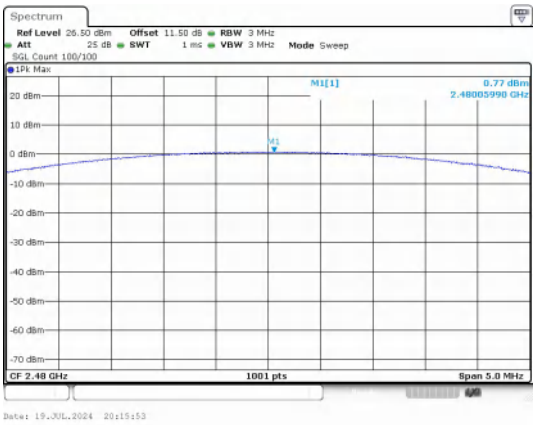


Peak Output Power
π/4DQPSK_Channel 0



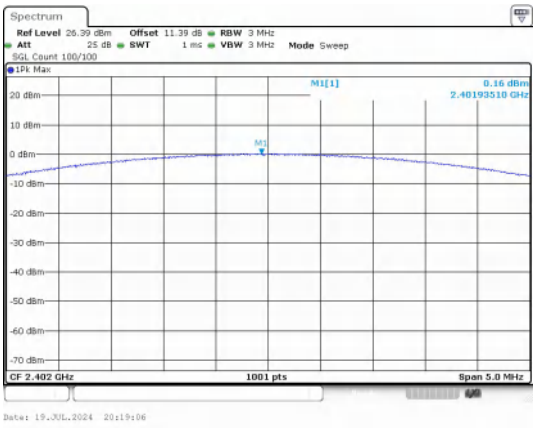
Peak Output Power

π/4DQPSK_Channel 39



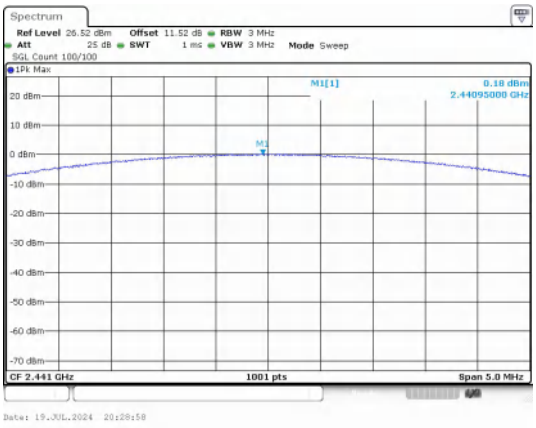
Peak Output Power

π/4DQPSK_Channel 78



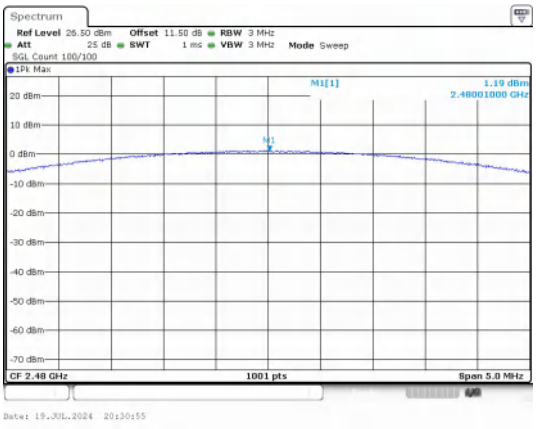
Peak Output Power

8DPSK_Channel 0



Peak Output Power

8DPSK_Channel 39



Peak Output Power

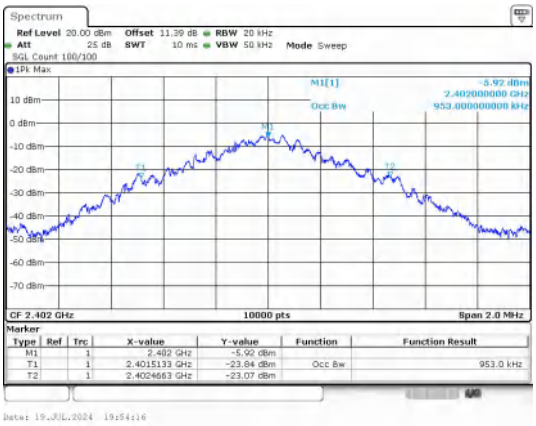
8DPSK_Channel 78

5) 99% Bandwidth

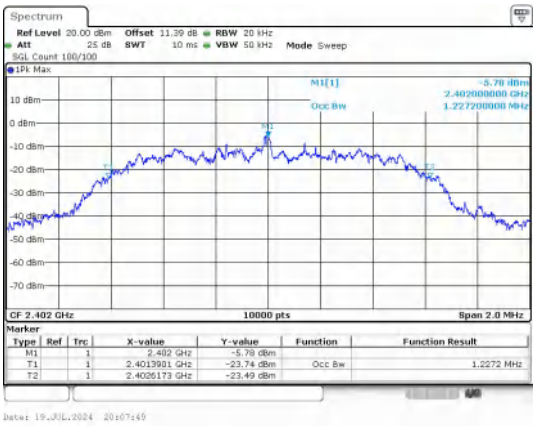
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.95300
	39	2441	0.96020
	78	2480	0.97920
π/4DQPSK	0	2402	1.2270
	39	2441	1.2260
	78	2480	1.2250
8DPSK	0	2402	1.2210
	39	2441	1.2230
	78	2480	1.2270

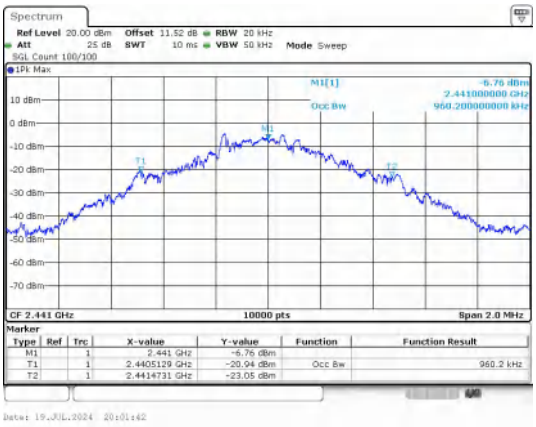
Test Graphs



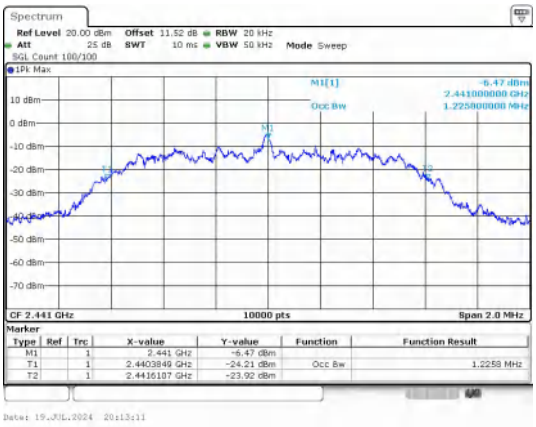
GFSK_DH5_Channel 0



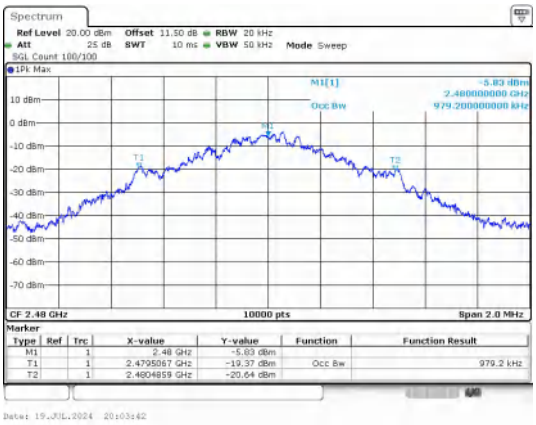
π/4DQPSK_2-DH5_Channel 0



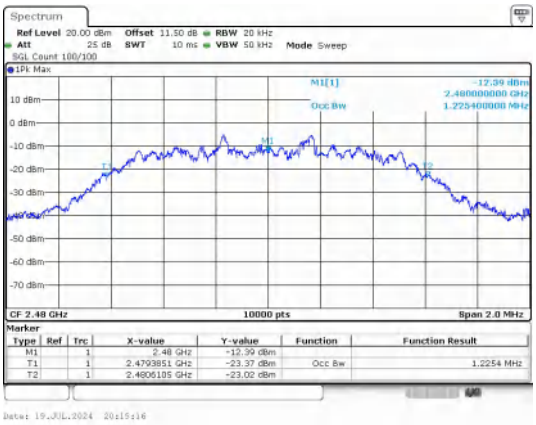
GFSK_DH5_Channel 39



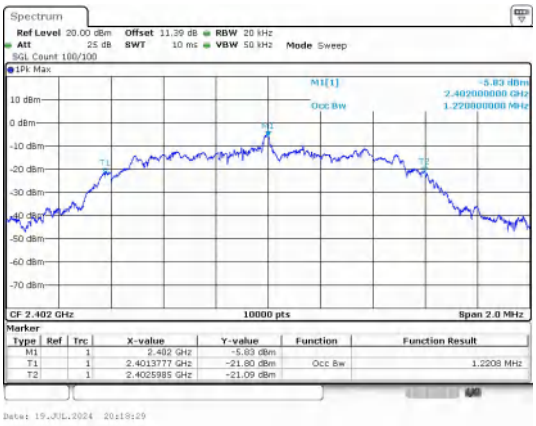
π/4DQPSK_2-DH5_Channel 39



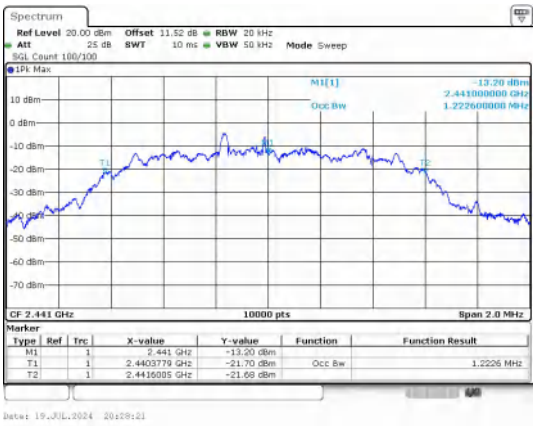
GFSK_DH5_Channel 78



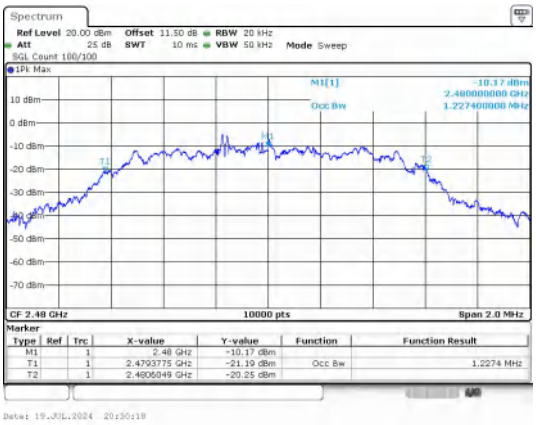
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



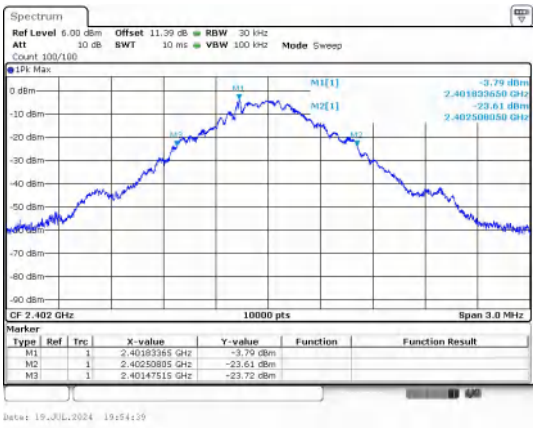
8DPSK_3-DH5_Channel 78

6) 20dB Bandwidth

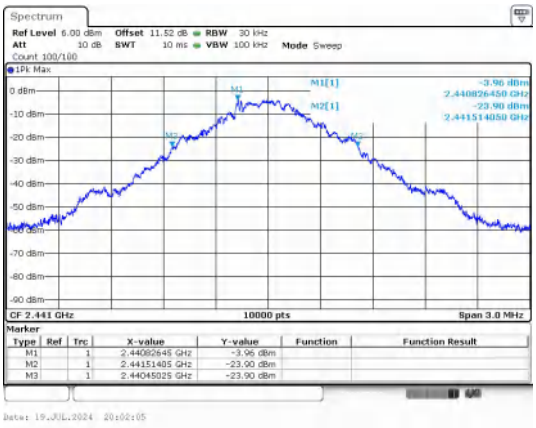
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.030
	39	2441 MHz	1.060
	78	2480 MHz	1.040
π/4DQPSK	0	2402 MHz	1.330
	39	2441 MHz	1.330
	78	2480 MHz	1.330
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.290
	78	2480 MHz	1.290

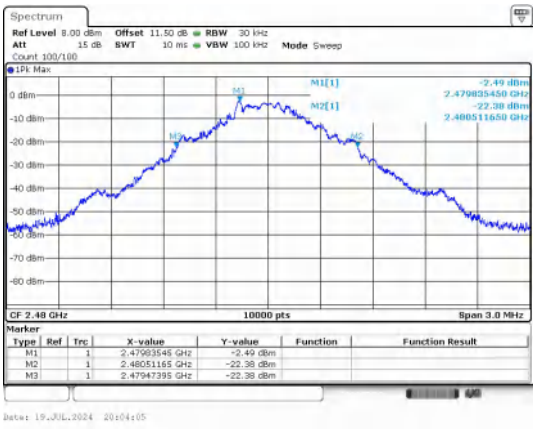
Test Graphs



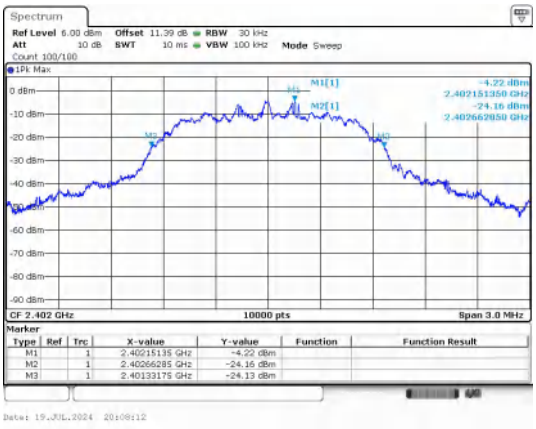
GFSK_DH5_Channel 0



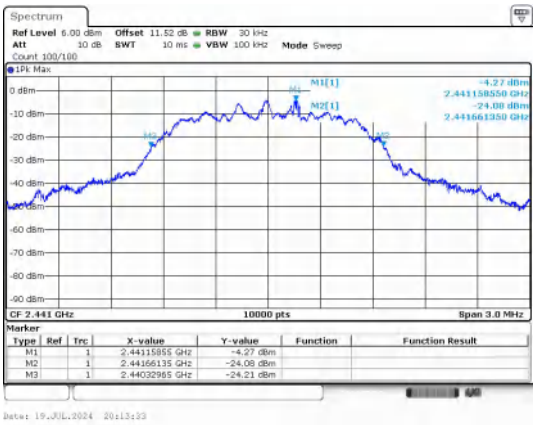
GFSK_DH5_Channel 39



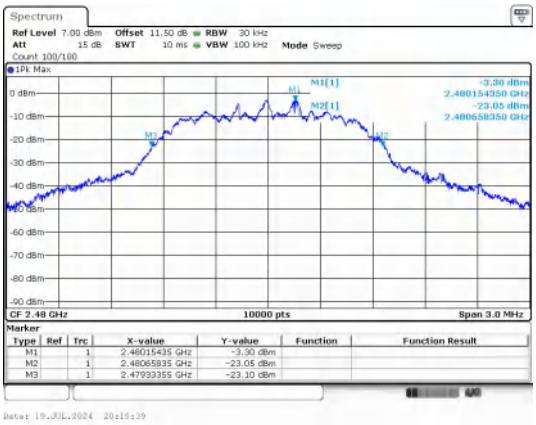
GFSK_DH5_Channel 78



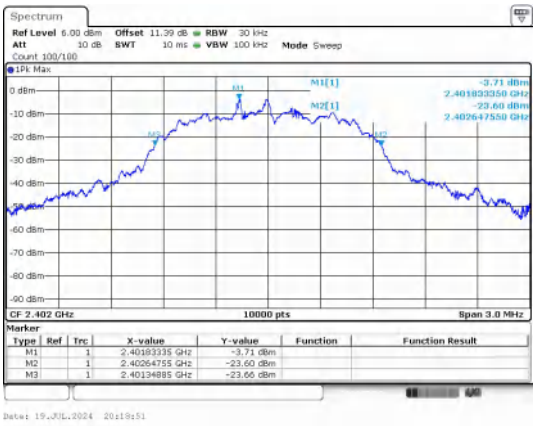
π/4DQPSK_2-DH5_Channel 0



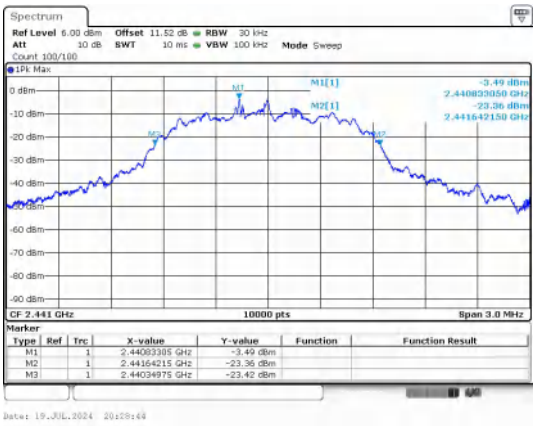
π/4DQPSK_2-DH5_Channel 39



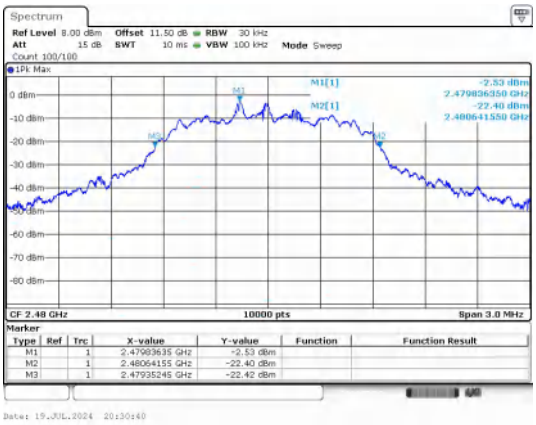
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



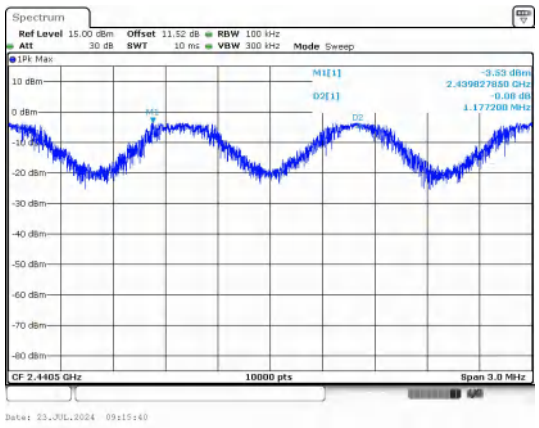
8DPSK_3-DH5_Channel 78

7) Carrier Frequencies Separation

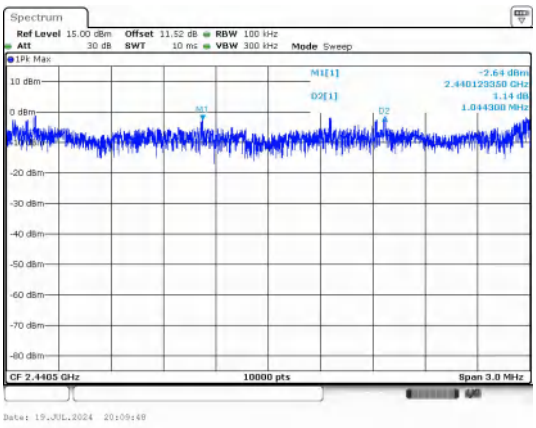
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8279	2441.0051	1.1772	1.060	PASS
π/4DQPSK	2-DH5	2440.1233	2441.1676	1.0443	0.887	PASS
8DPSK	3-DH5	2439.9716	2441.1449	1.1733	0.867	PASS

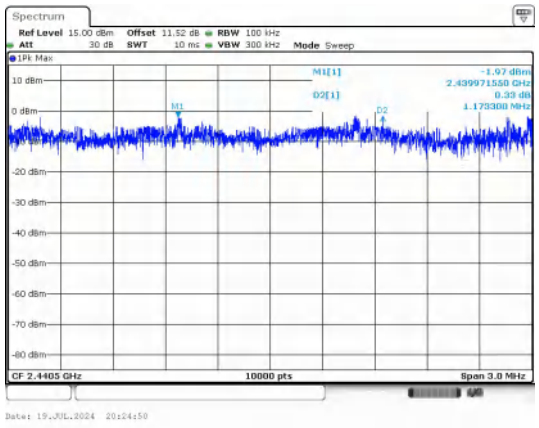
Test Graphs



GFSK



π/4DQPSK



8DPSK

8) Conducted Out Of Band Emission

Test Result

Non-Hopping

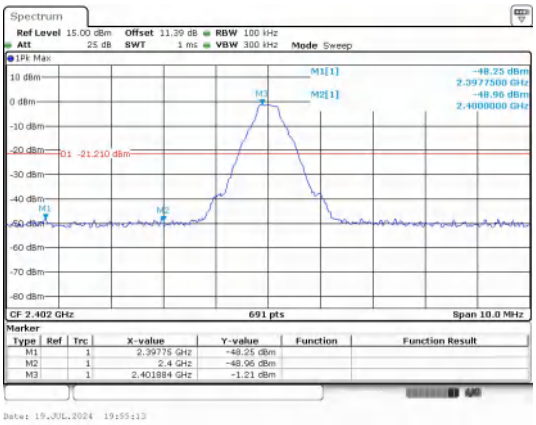
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2397.75	-48.253	-21.21	-27.043	PASS
			2400.00	-48.955	-21.21	-27.745	PASS
			4804.70	-46.516	-21.21	-25.306	PASS
		39	9763.72	-42.727	-21.15	-21.577	PASS
		78	2483.50	-49.750	-20.21	-29.540	PASS
			9920.20	-45.249	-20.21	-25.039	PASS
π/4DQPSK	2-DH5	0	2398.27	-49.281	-21.19	-28.091	PASS
			2400.00	-50.104	-21.19	-28.914	PASS
			9608.10	-46.408	-21.19	-25.218	PASS
		39	9763.72	-43.138	-21.5	-21.638	PASS
		78	2483.50	-50.571	-20.38	-30.191	PASS
			9920.20	-44.294	-20.38	-23.914	PASS
8DPSK	3-DH5	0	2398.31	-47.530	-21.27	-26.260	PASS
			2400.00	-50.591	-21.27	-29.321	PASS
			9608.10	-45.567	-21.27	-24.297	PASS
		39	9763.72	-44.284	-21.72	-22.564	PASS
		78	2483.50	-50.015	-20.36	-29.655	PASS
			9920.20	-44.252	-20.36	-23.892	PASS

Hopping

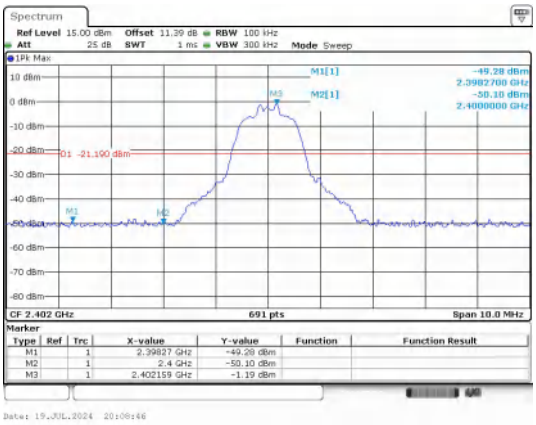
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.22	-48.722	-21.6	-27.122	PASS
			2400.00	-49.969	-21.6	-28.369	PASS
			2483.50	-49.183	-20.45	-28.733	PASS
			2398.47	-47.174	-21.25	-25.924	PASS
			2400.00	-49.720	-21.25	-28.470	PASS
			2483.50	-49.047	-20.64	-28.407	PASS
π/4DQPSK	2-DH5		2395.89	-48.549	-22.24	-26.309	PASS
			2400.00	-50.942	-22.24	-28.702	PASS
			2483.50	-50.264	-20.83	-29.434	PASS
			2398.52	-49.037	-22.63	-26.407	PASS
			2400.00	-49.824	-22.63	-27.194	PASS
			2483.50	-49.632	-22.19	-27.442	PASS
8DPSK	3-DH5		2396.63	-48.432	-21.32	-27.112	PASS

			2400.00	-50.114	-21.32	-28.794	PASS
			2483.50	-49.065	-22.47	-26.595	PASS
			2395.12	-48.674	-22.1	-26.574	PASS
			2400.00	-50.551	-22.1	-28.451	PASS
			2483.50	-49.167	-22.71	-26.457	PASS

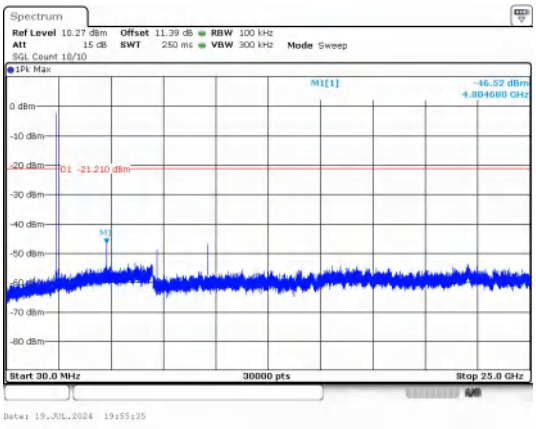
Test Graphs



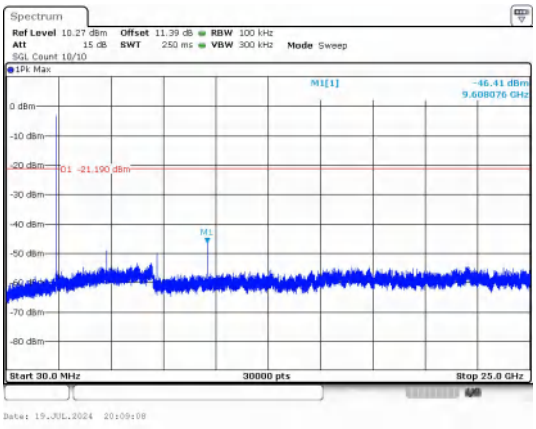
Out Of Band Emission
GFSK_DH5_Channel 0



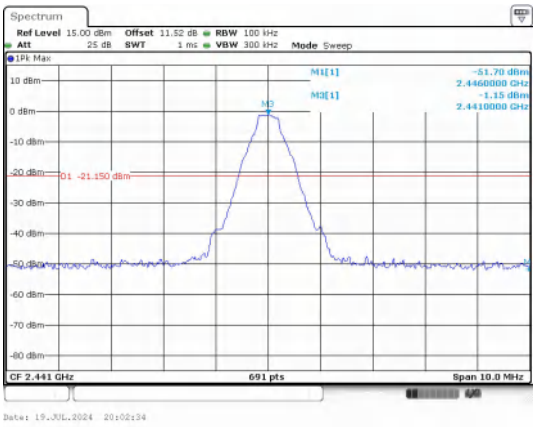
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 0



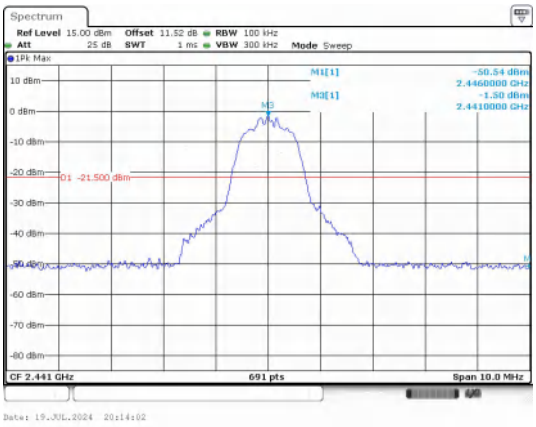
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



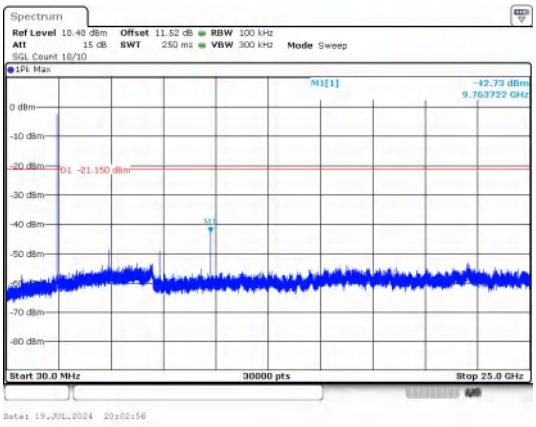
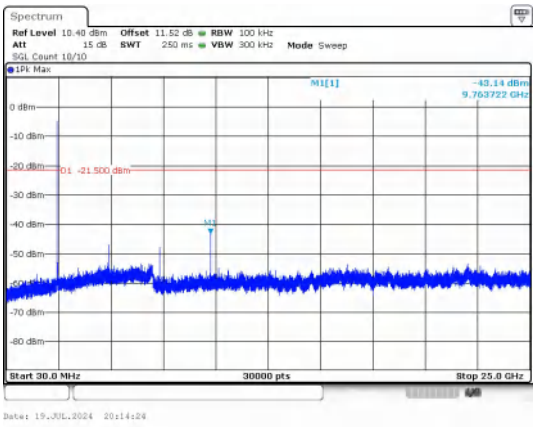
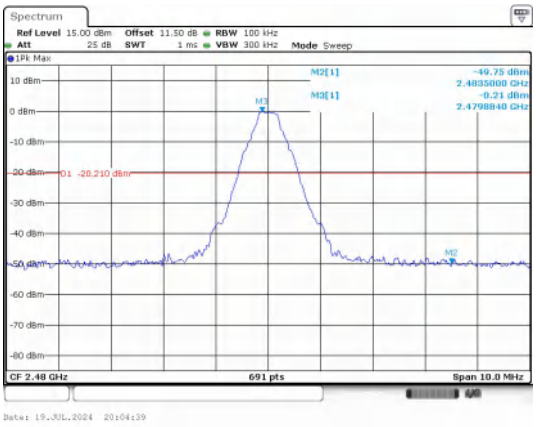
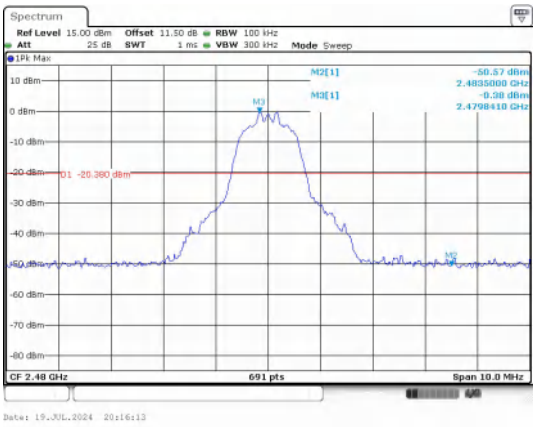
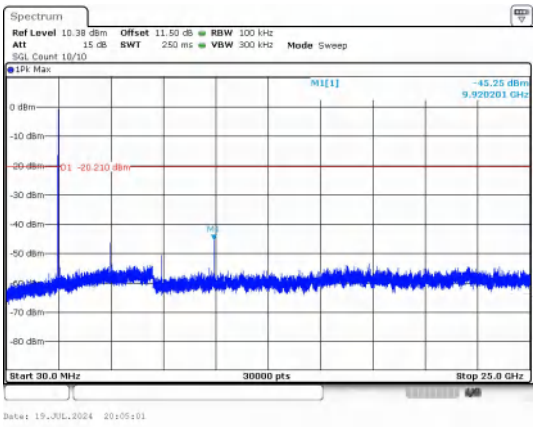
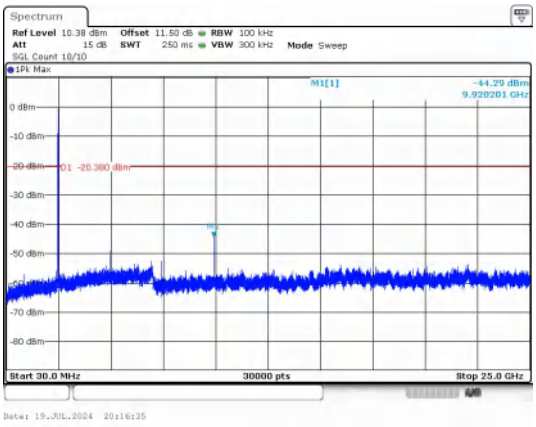
30.0 MHz - 25000.0 MHz
π/4DQPSK_2-DH5_Channel 0

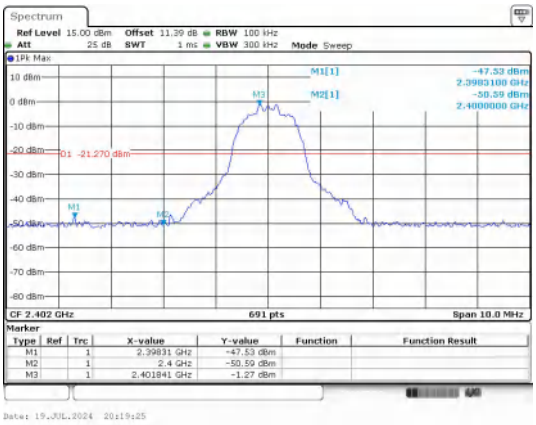


Out Of Band Emission



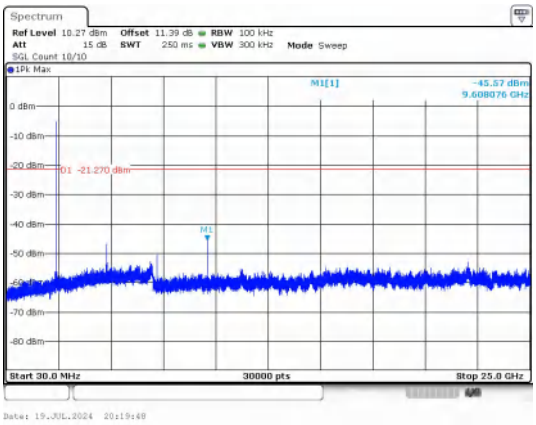
Out Of Band Emission

GFSK_DH5_Channel 39	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



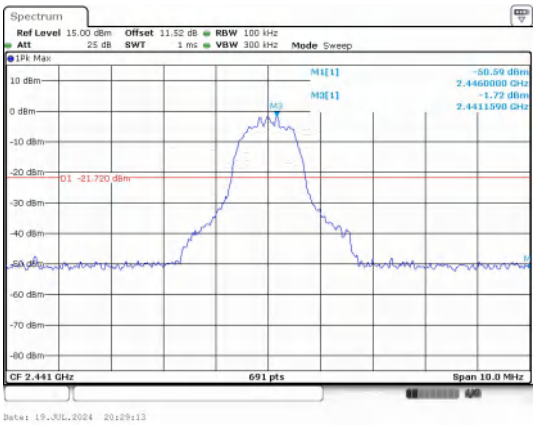
Out Of Band Emission

8DPSK_3-DH5_Channel 0



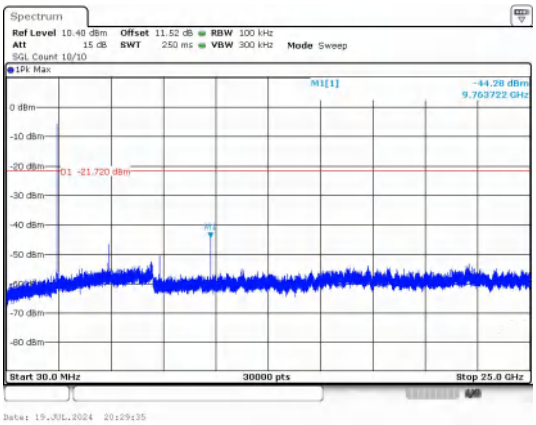
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 0



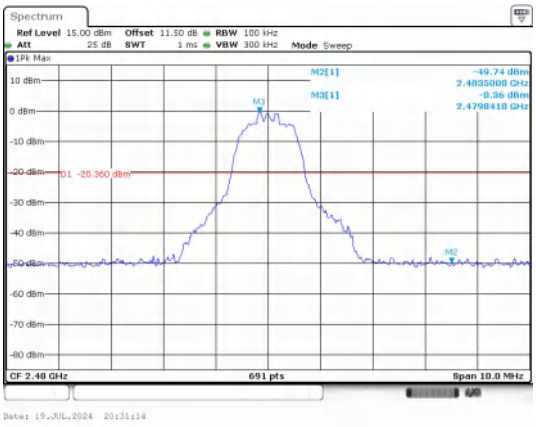
Out Of Band Emission

8DPSK_3-DH5_Channel 39



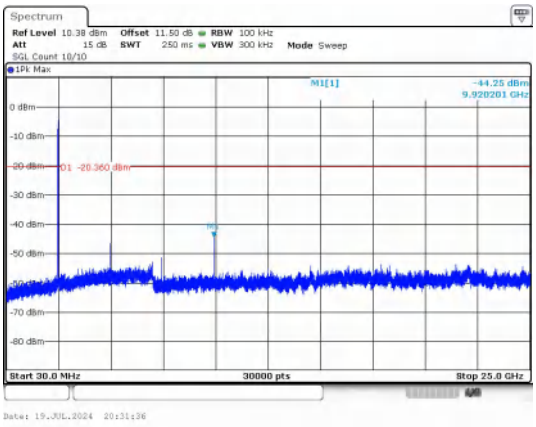
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 39



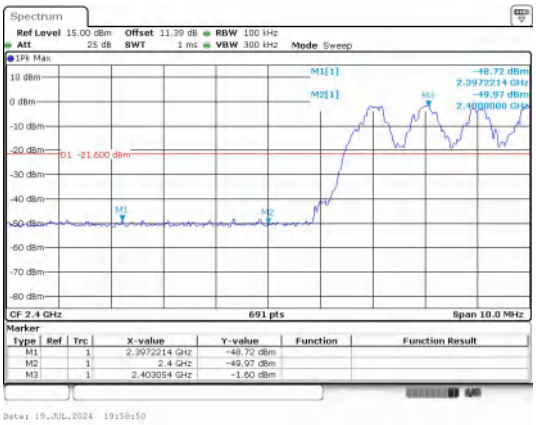
Out Of Band Emission

8DPSK_3-DH5_Channel 78



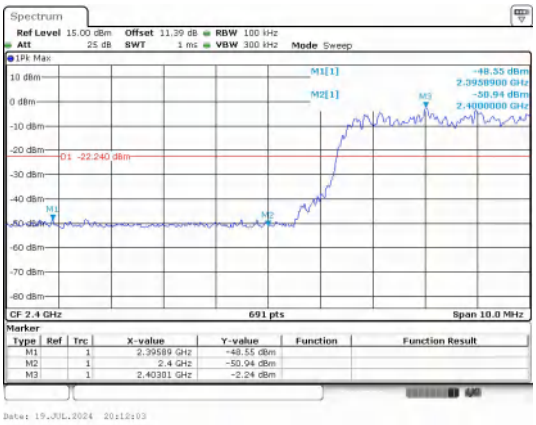
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 78



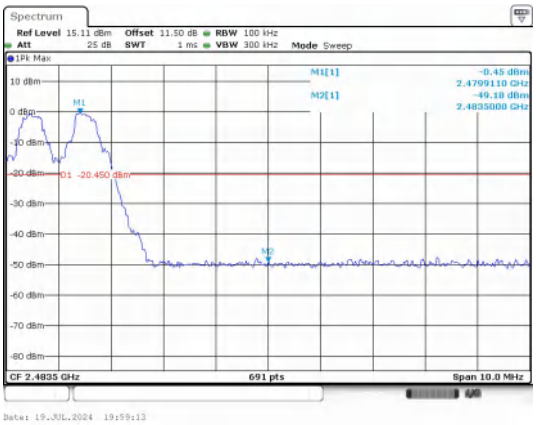
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



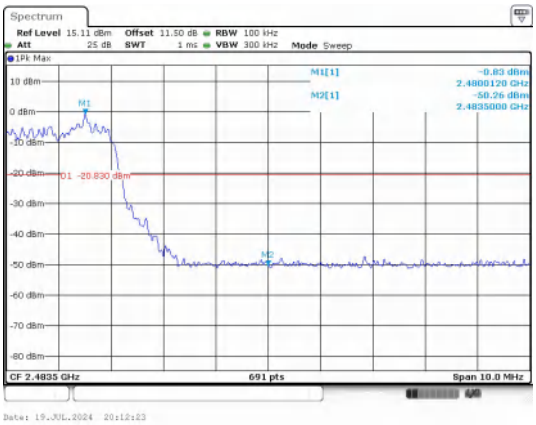
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



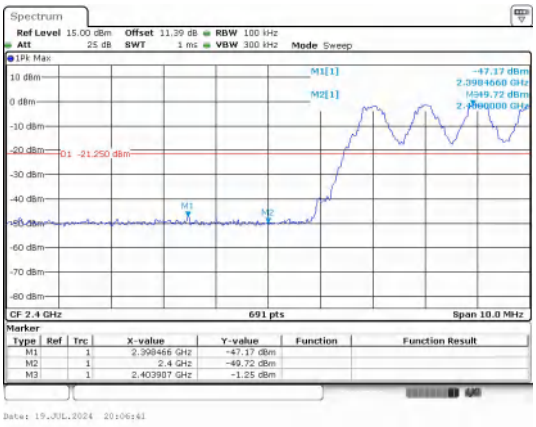
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



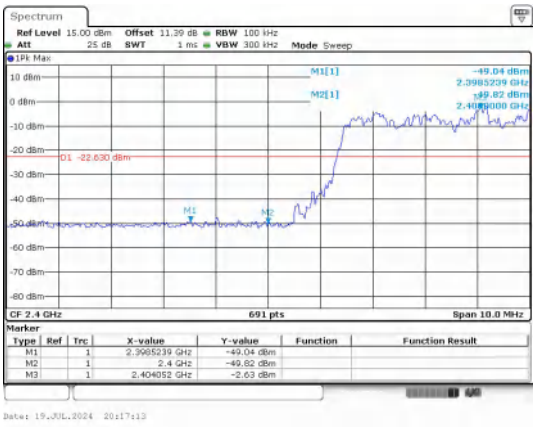
Out Of Band Emission(Right)

π/4DQPSK_2-DH5_Channel Hopping



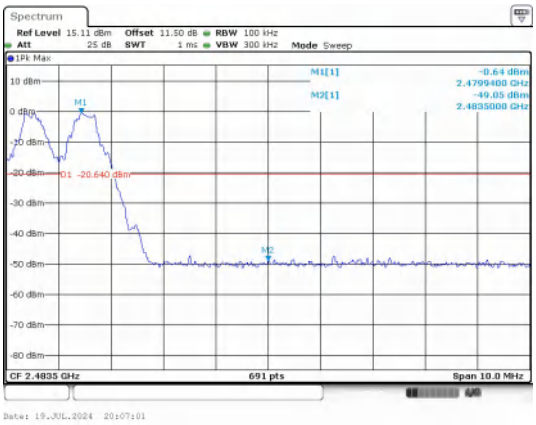
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



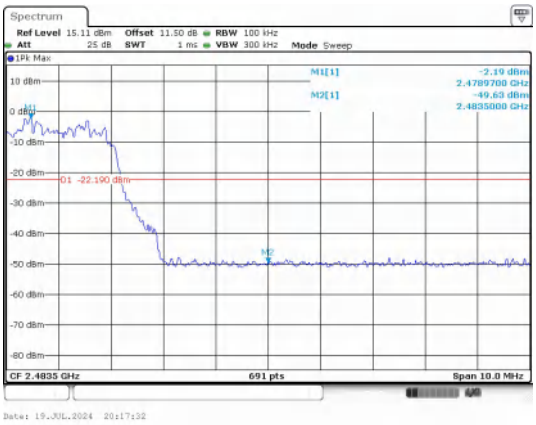
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



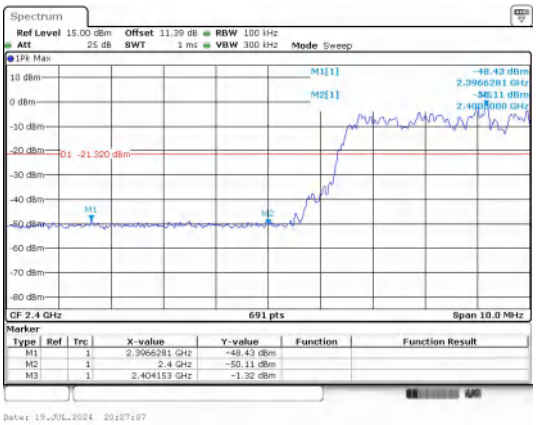
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



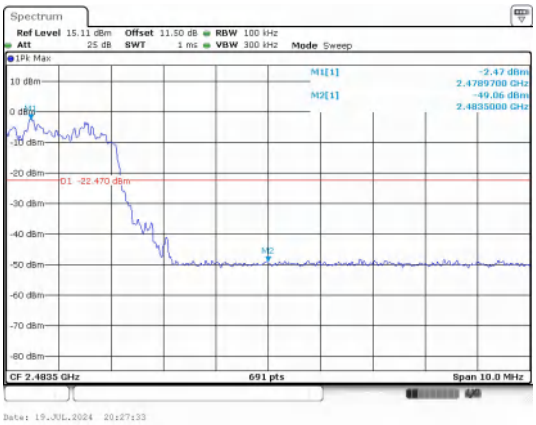
Out Of Band Emission(Right)

π/4DQPSK_2-DH5_Channel Hopping



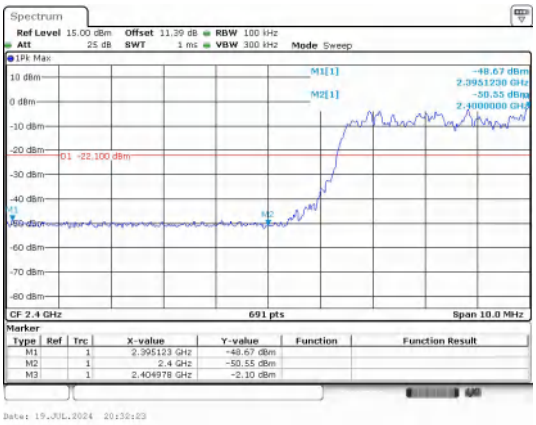
Out Of Band Emission(Left)

8DPSK_3-DH5_Channel Hopping



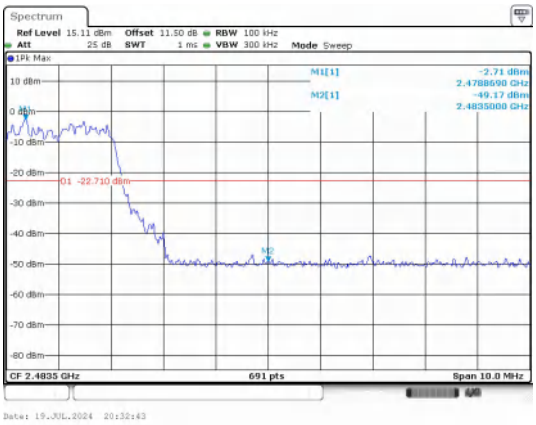
Out Of Band Emission(Right)

8DPSK_3-DH5_Channel Hopping



Out Of Band Emission(Left)

8DPSK_3-DH5_Channel Hopping



Out Of Band Emission(Right)

8DPSK_3-DH5_Channel Hopping