Appendix A

Report No.:	CISRR240910076
FCC ID:	2BK6K-J20
Product Name:	Wireless Earphone
Model No.:	J20
Test Engineer:	Jimmy Huang
Supervised by:	Rory Huang

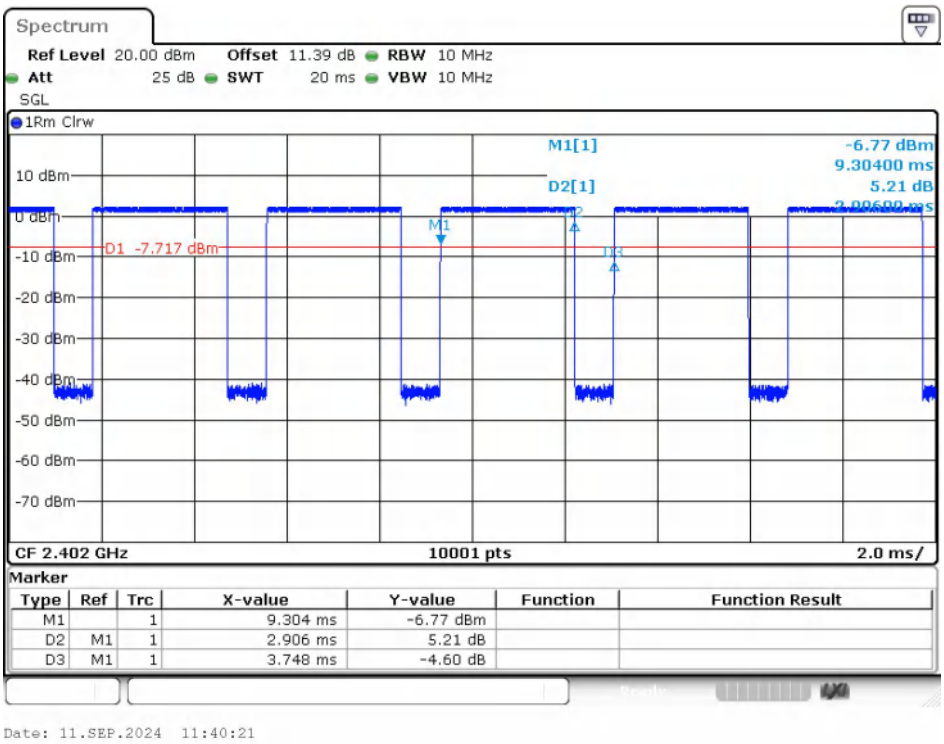
1) Duty Cycle

Right:

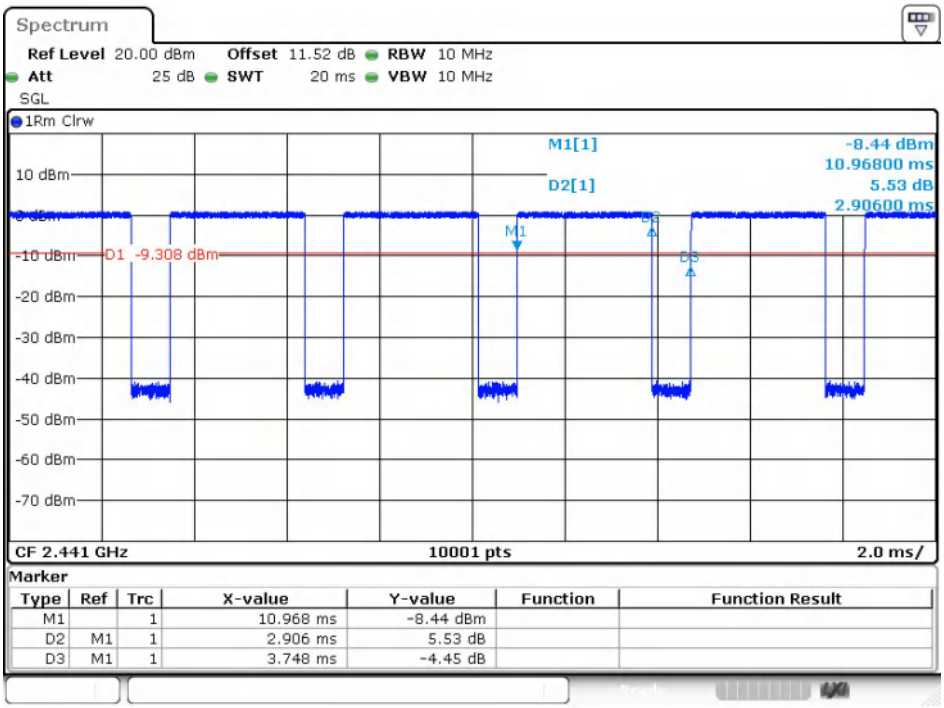
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.906	3.748	77.53	0.7753	1.1053	0.34
		39	2.906	3.748	77.53	0.7753	1.1053	0.34
		78	2.906	3.748	77.53	0.7753	1.1053	0.34
π/4DQPSK	2-DH5	0	2.912	3.748	77.69	0.7769	1.0963	0.34
		39	2.912	3.748	77.69	0.7769	1.0963	0.34
		78	2.912	3.748	77.69	0.7769	1.0963	0.34
8DPSK	3-DH5	0	2.914	3.748	77.75	0.7775	1.093	0.34
		39	2.914	3.748	77.75	0.7775	1.093	0.34
		78	2.914	3.748	77.75	0.7775	1.093	0.34

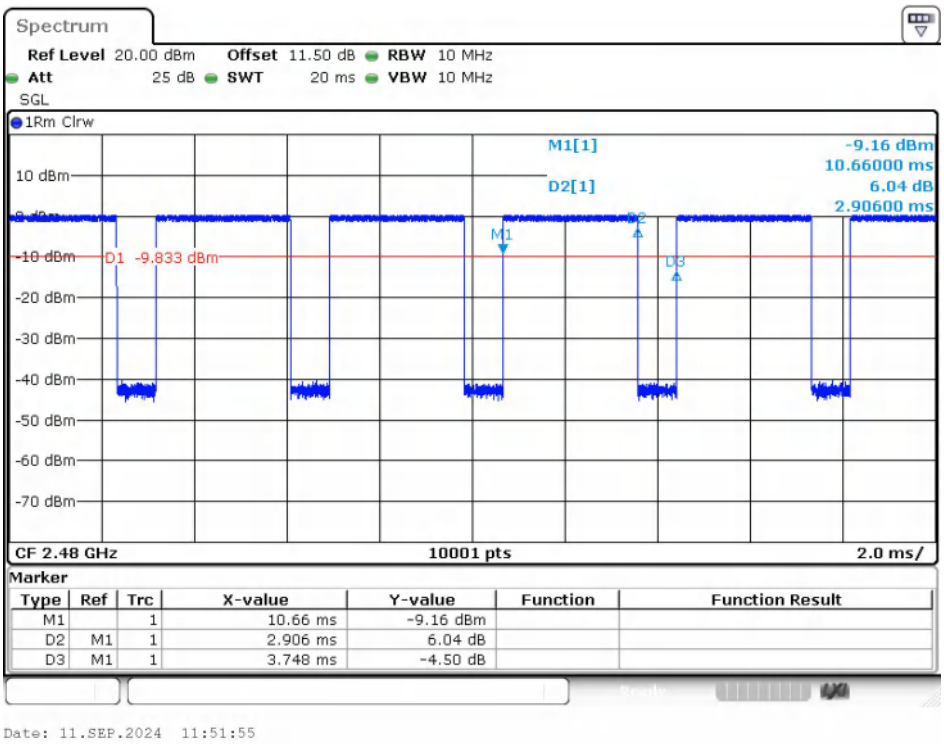
Test Graphs



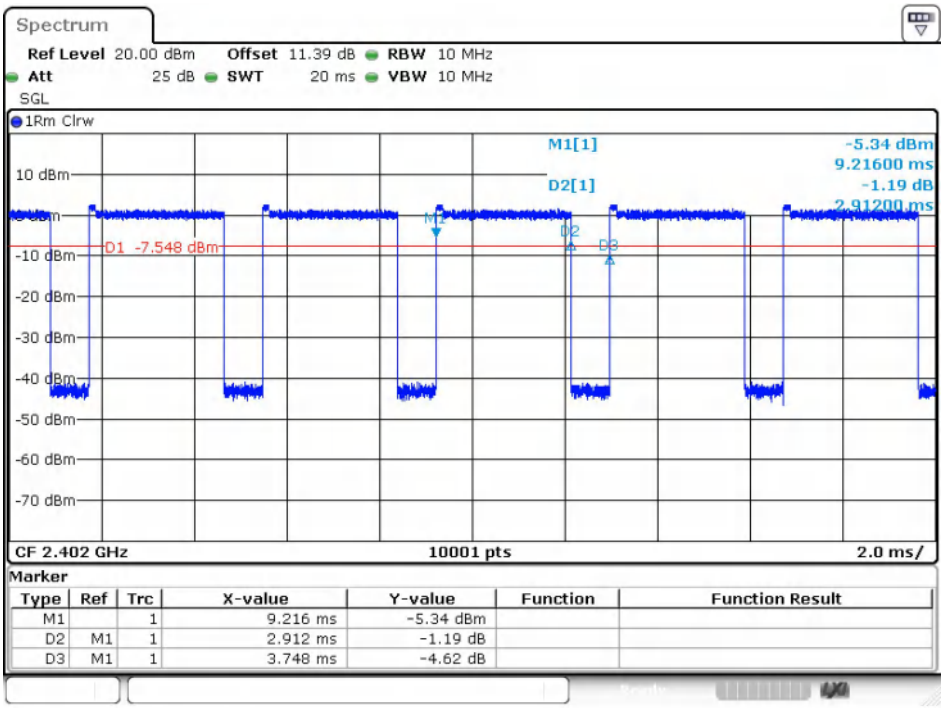
GFSK(DH5)_Channel 0



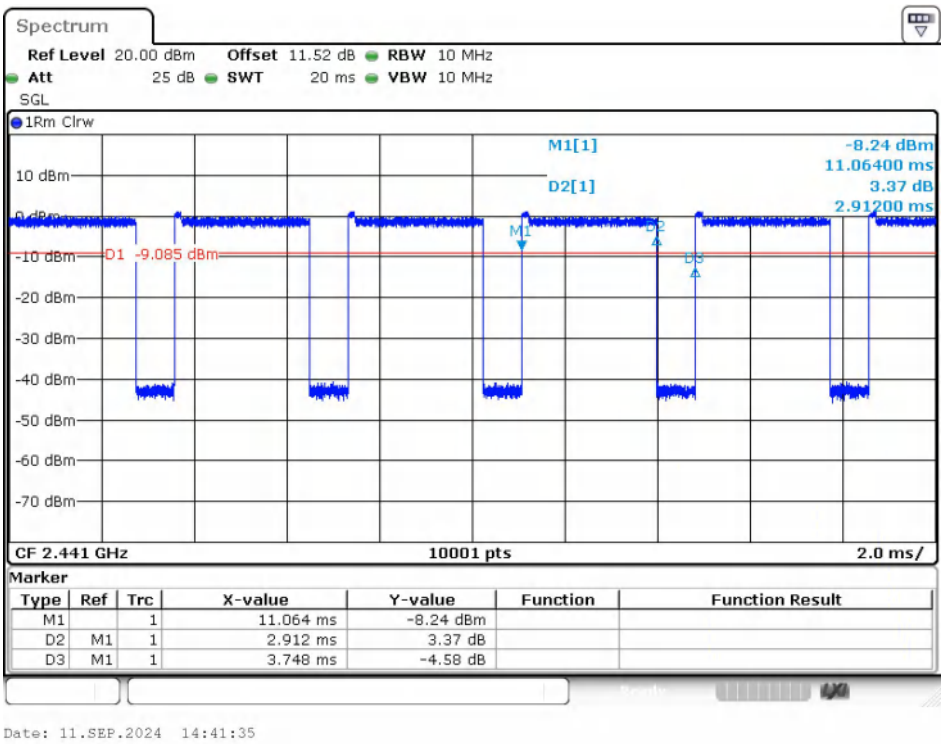
GFSK(DH5)_Channel 39



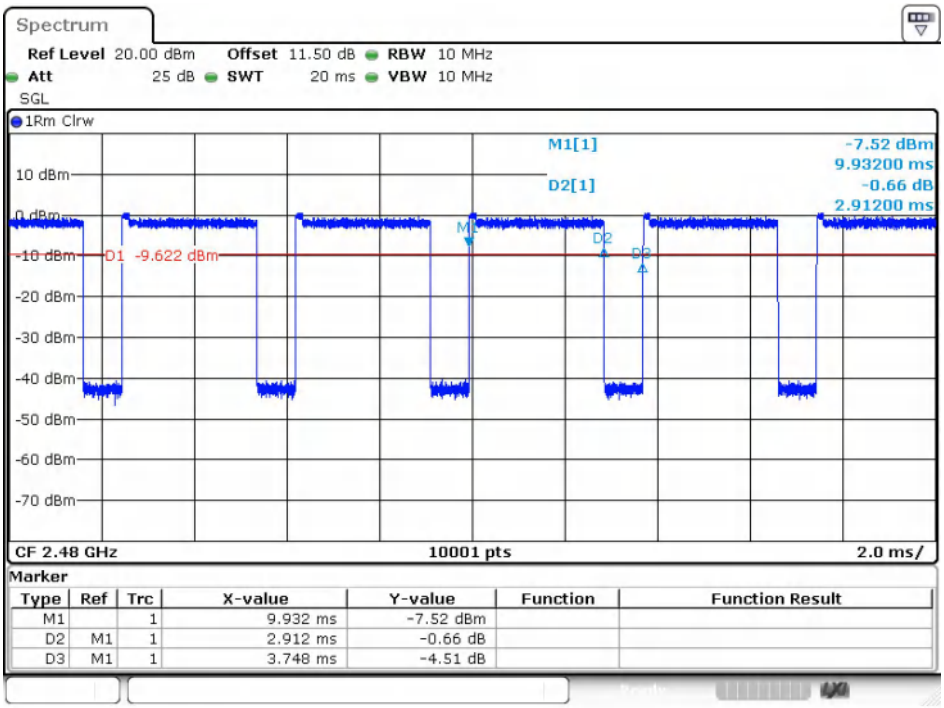
GFSK(DH5)_Channel 78



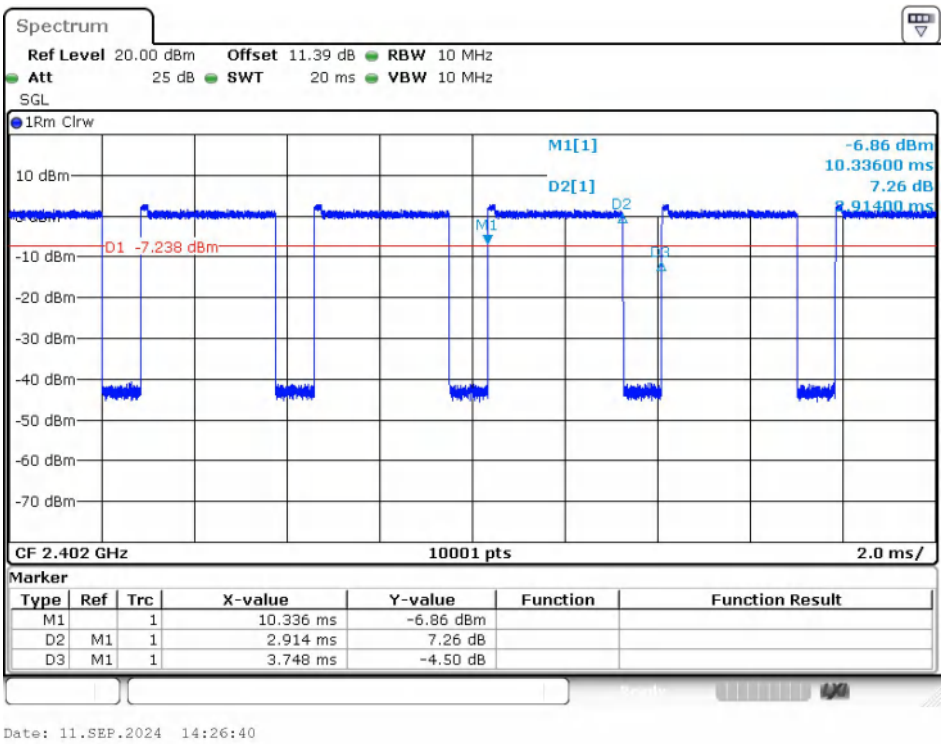
π/4DQPSK(2-DH5)_Channel 0



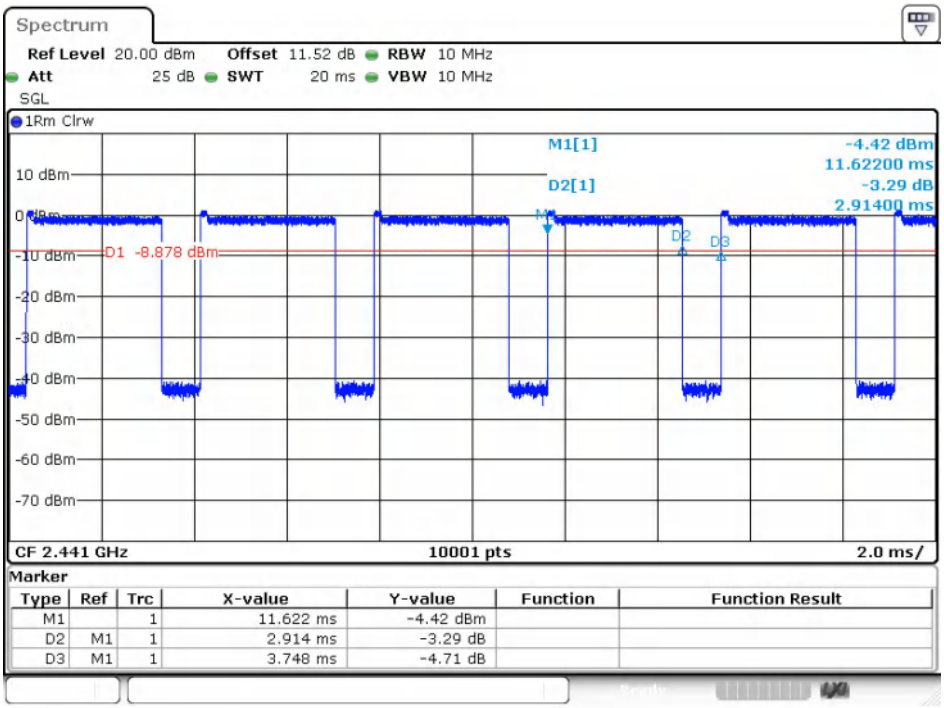
π/4DQPSK(2-DH5)_Channel 39



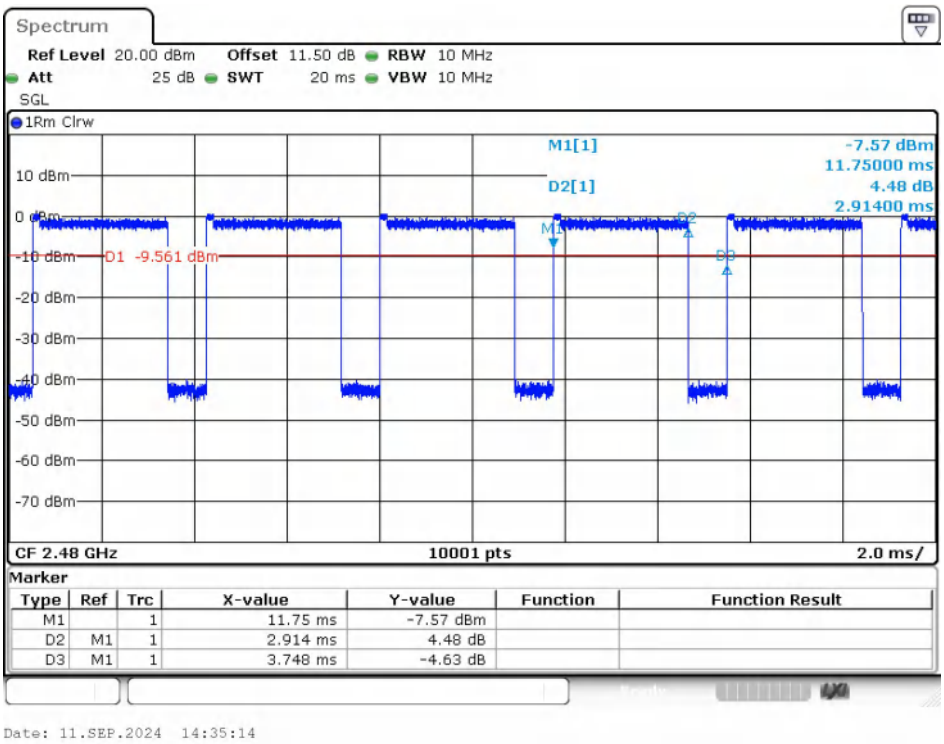
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



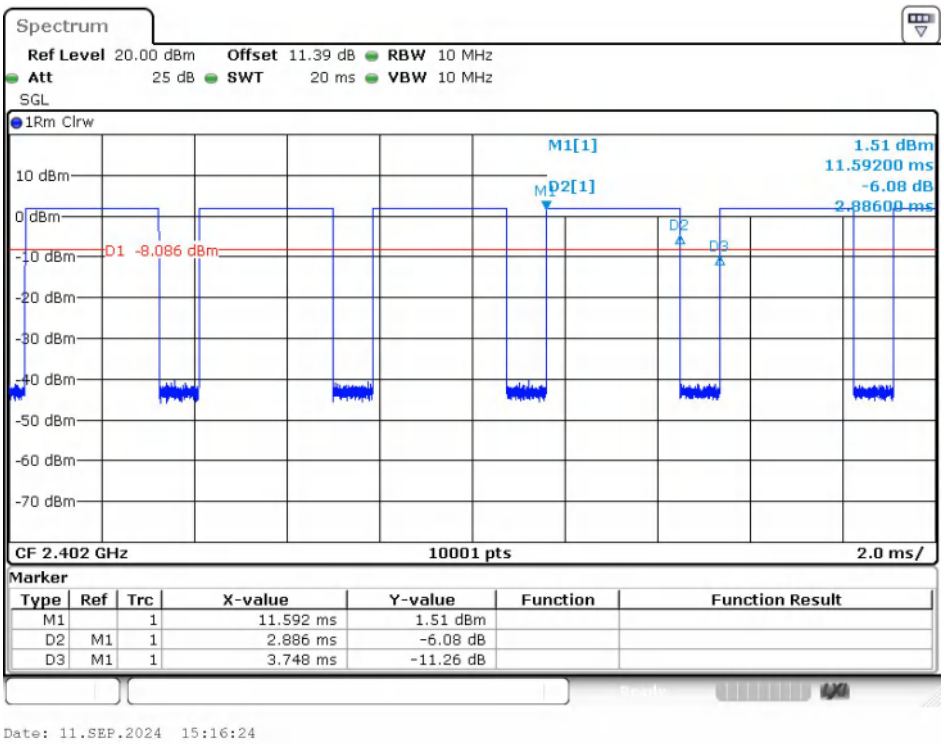
8DPSK(3-DH5)_Channel 78

Left:

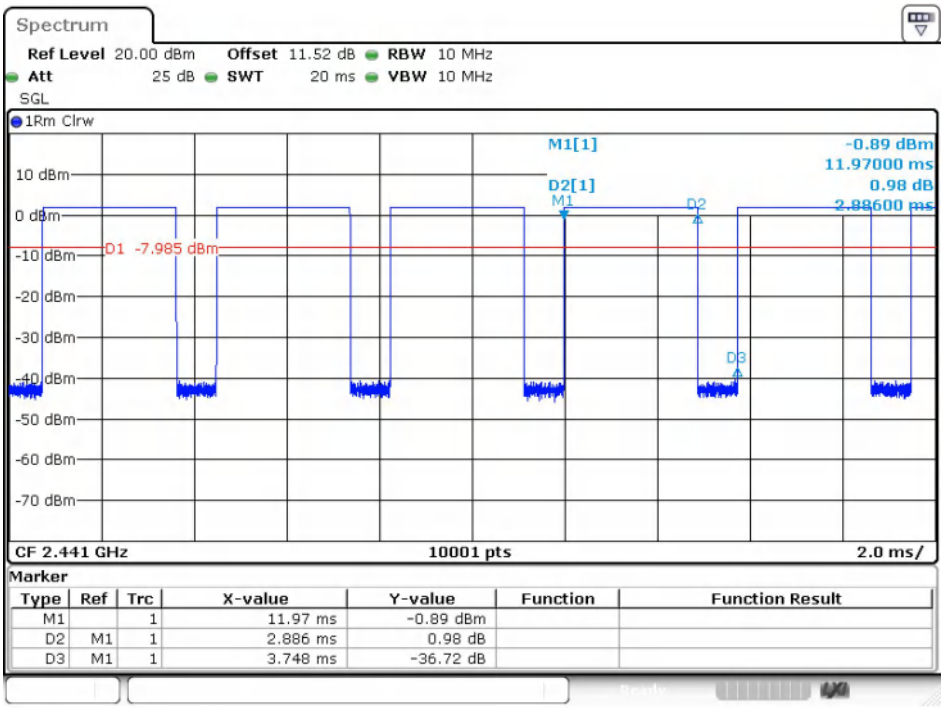
Test Result

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	2.894	3.748	77.21	0.7721	1.1233	0.35
		39	2.892	3.748	77.16	0.7716	1.1261	0.35
		78	2.892	3.748	77.16	0.7716	1.1261	0.35

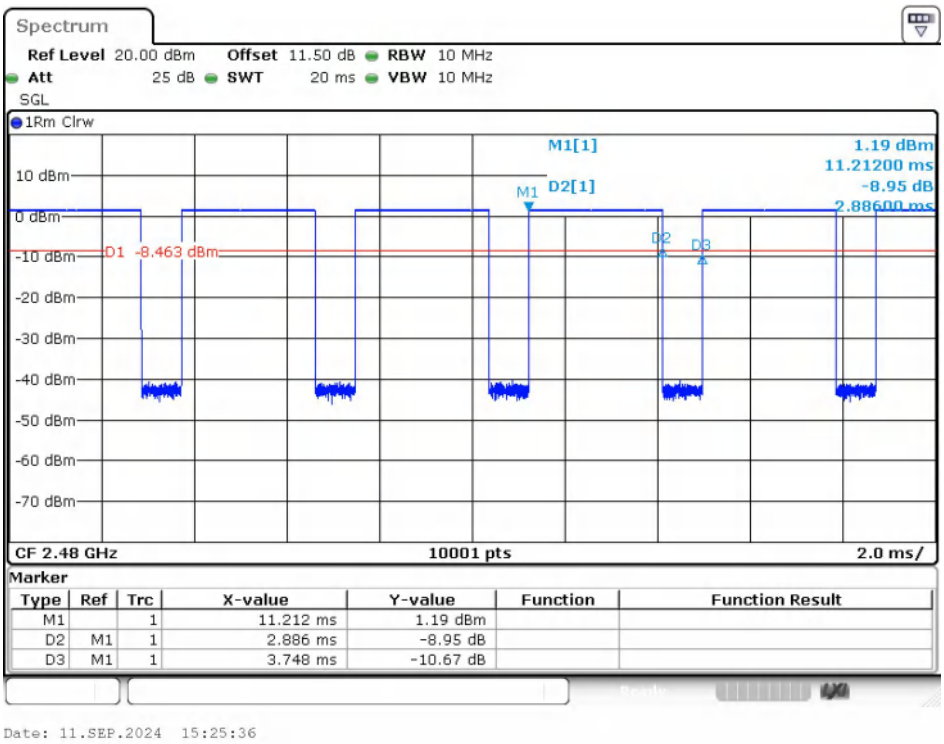
Test Graphs



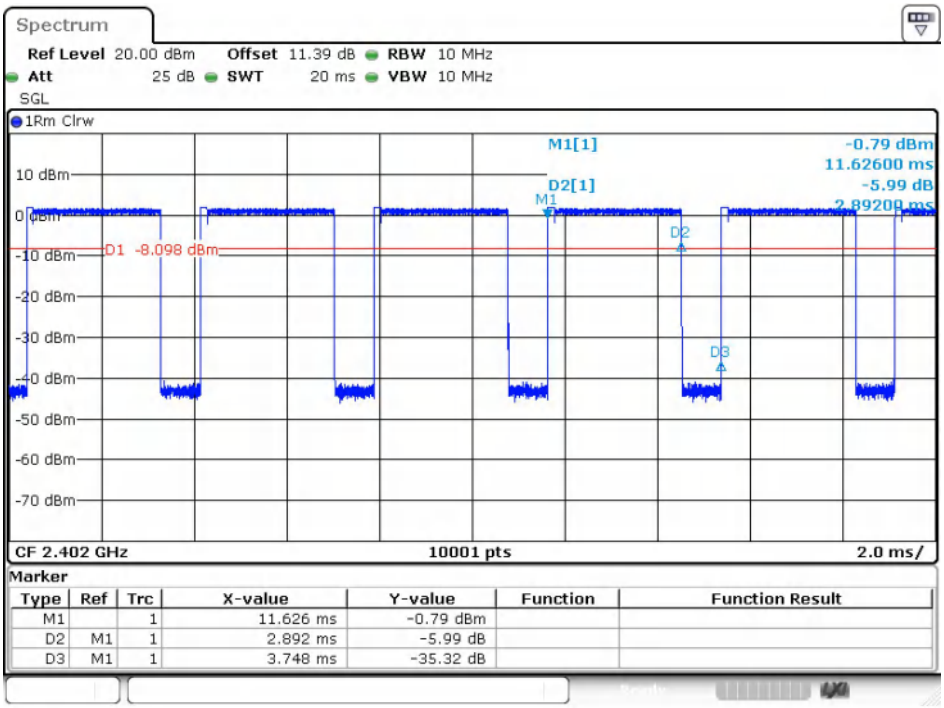
GFSK(DH5)_Channel 0



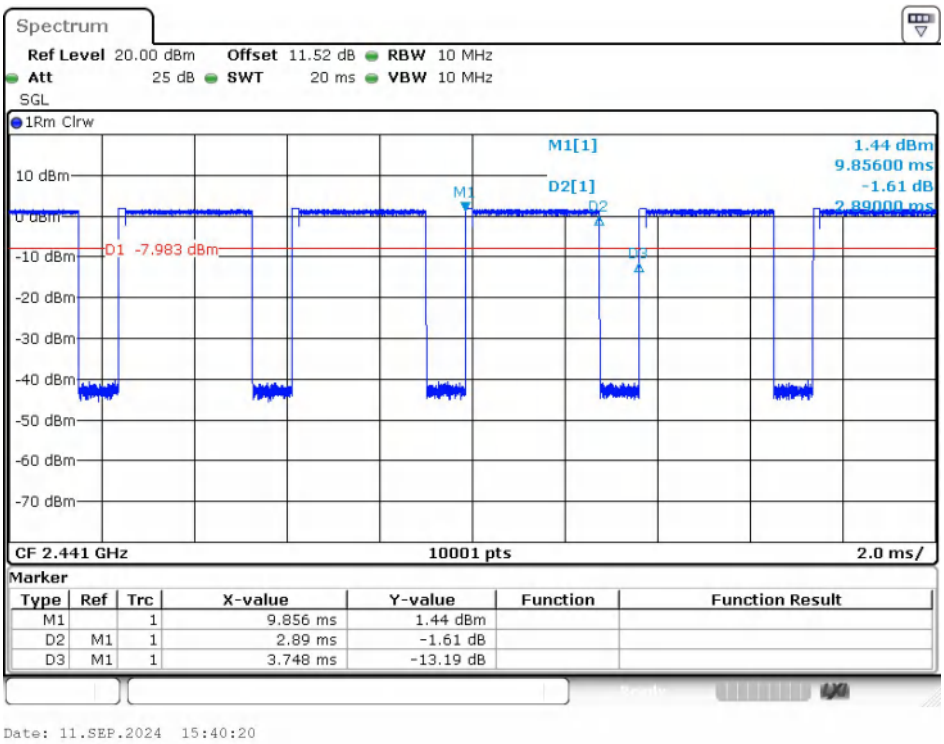
GFSK(DH5)_Channel 39



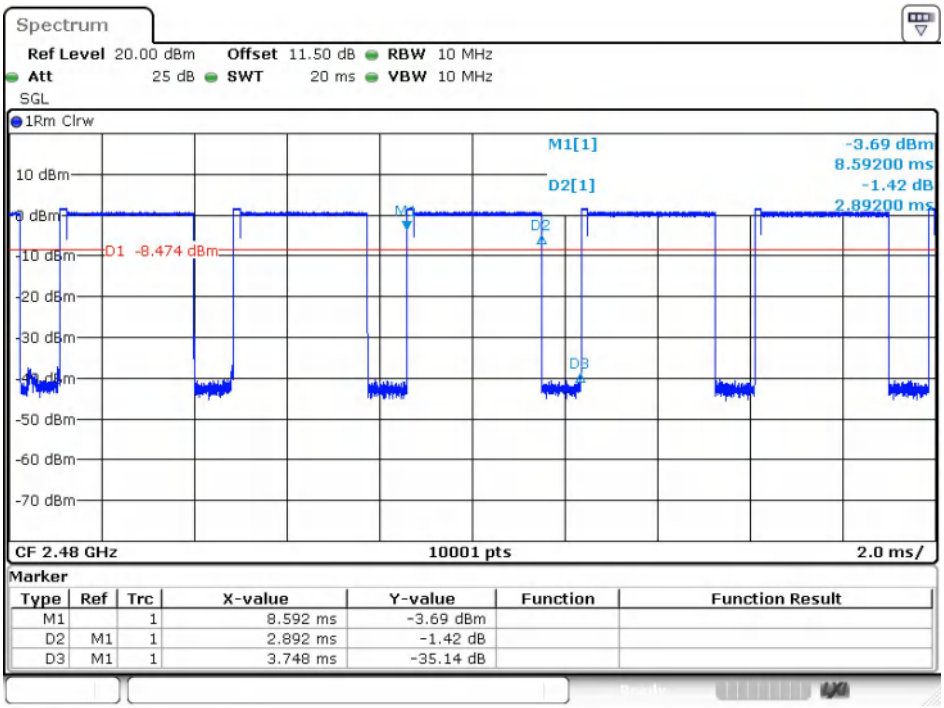
GFSK(DH5)_Channel 78



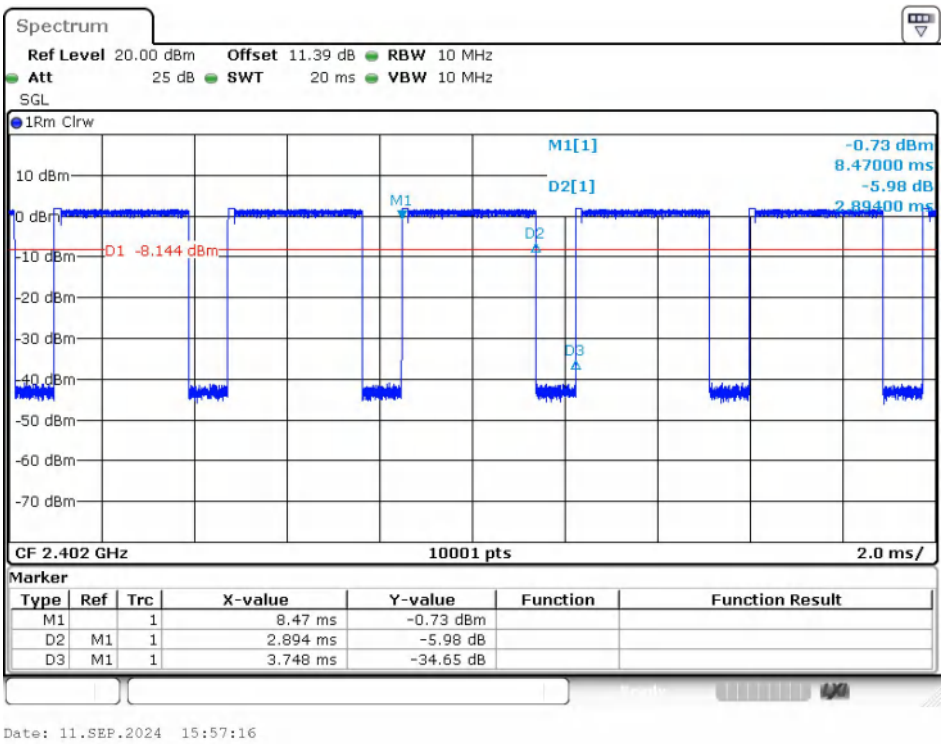
π/4DQPSK(2-DH5)_Channel 0



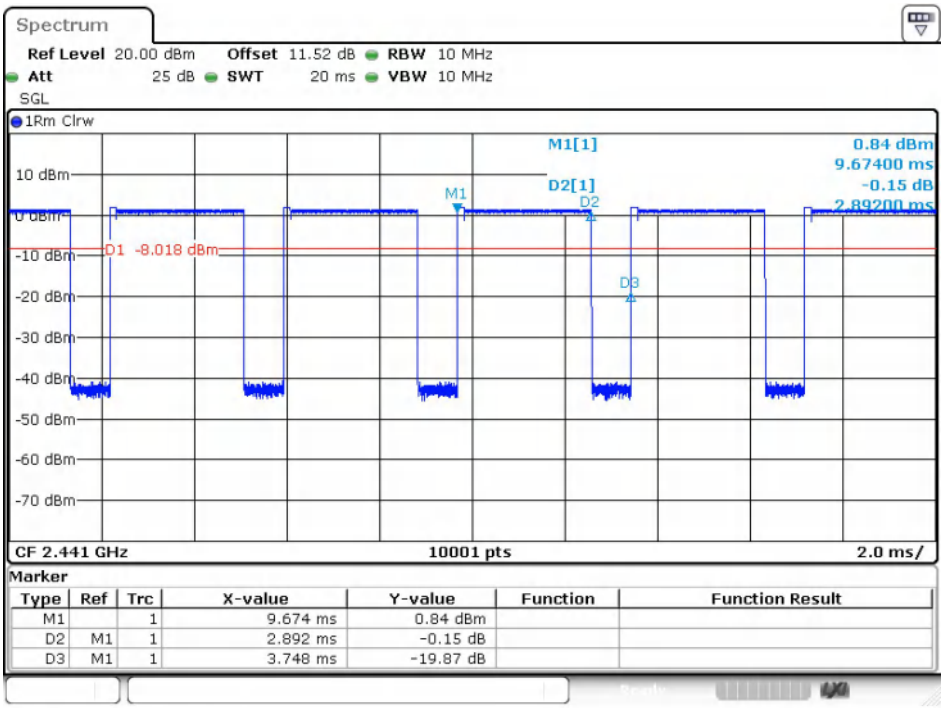
π/4DQPSK(2-DH5)_Channel 39



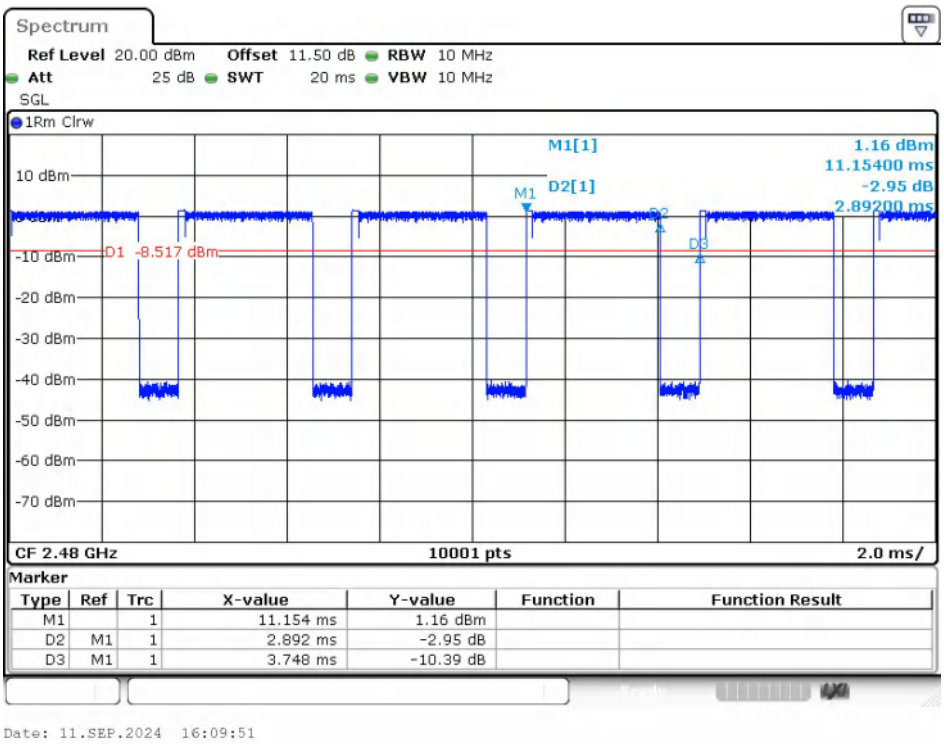
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



8DPSK(3-DH5)_Channel 78

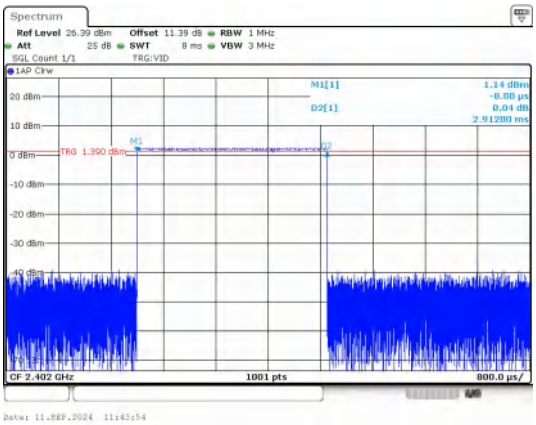
2) Dwell Time

Right:

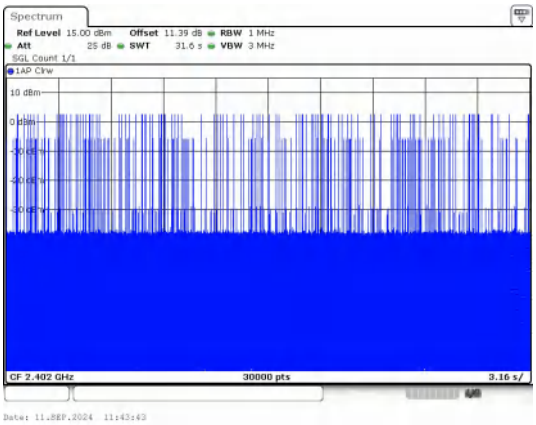
Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.912	110	320.32	< 400	PASS
π/4DQPSK	2-DH5		2.912	109	317.41		PASS
8DPSK	3-DH5		2.912	101	294.11		PASS

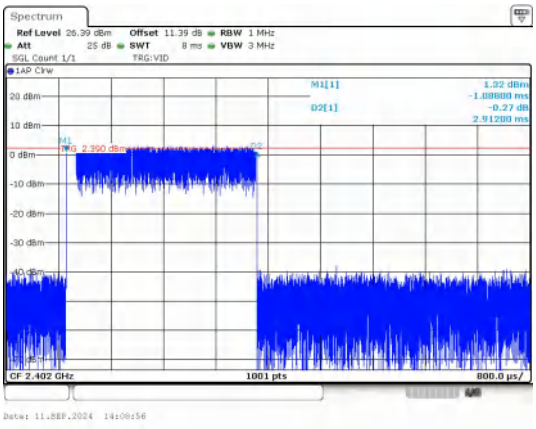
Test Graphs



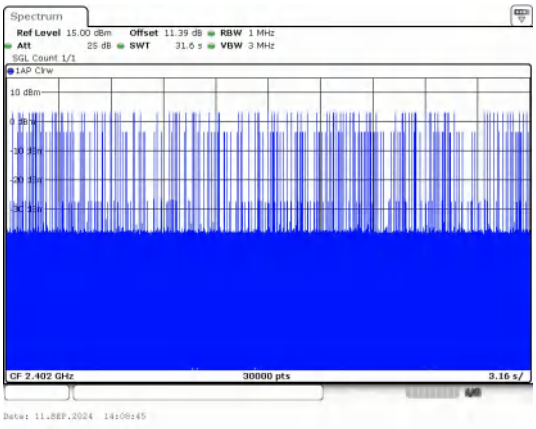
Pulse Width
GFSK_DH5



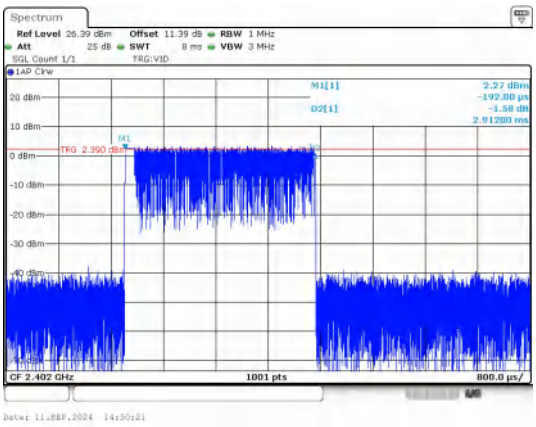
Number of Pulses in 31.6 seconds
GFSK_DH5



Pulse Width
π/4DQPSK_2-DH5

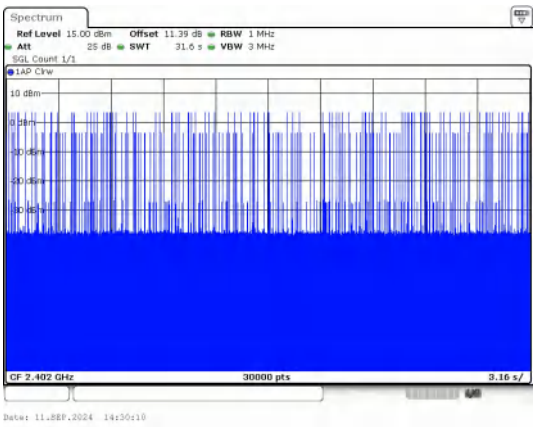


Number of Pulses in 31.6 seconds
π/4DQPSK_2-DH5



Pulse Width

8DPSK_3-DH5



Number of Pulses in 31.6 seconds

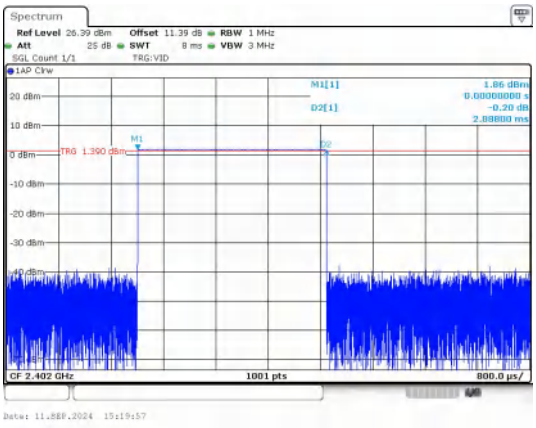
8DPSK_3-DH5

Left:

Test Result

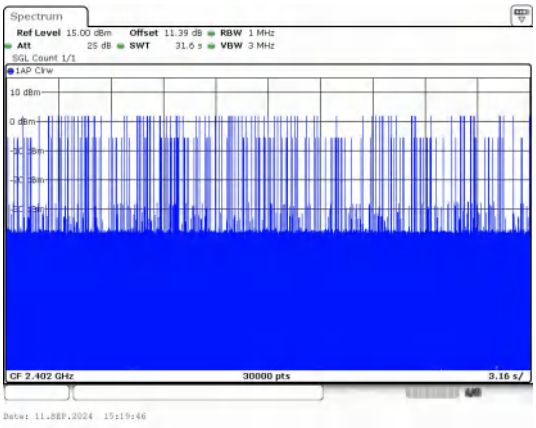
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	99	285.91	< 400	PASS
π/4DQPSK	2-DH5		2.896	118	341.73		PASS
8DPSK	3-DH5		2.896	116	335.94		PASS

Test Graphs



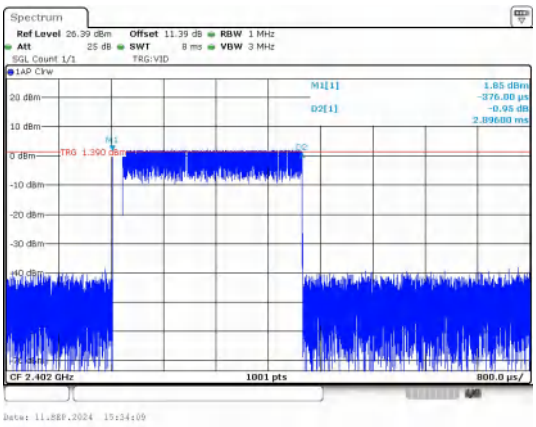
Pulse Width

GFSK_DH5



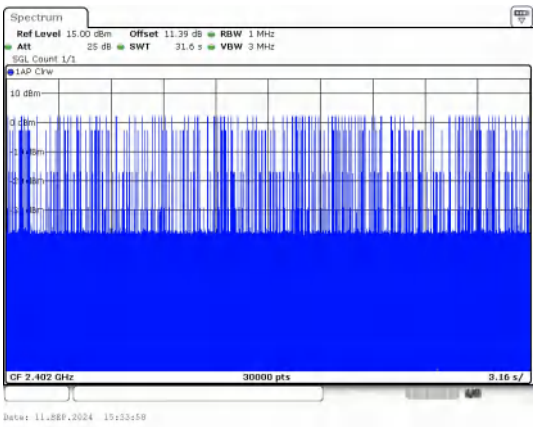
Number of Pulses in 31.6 seconds

GFSK_DH5



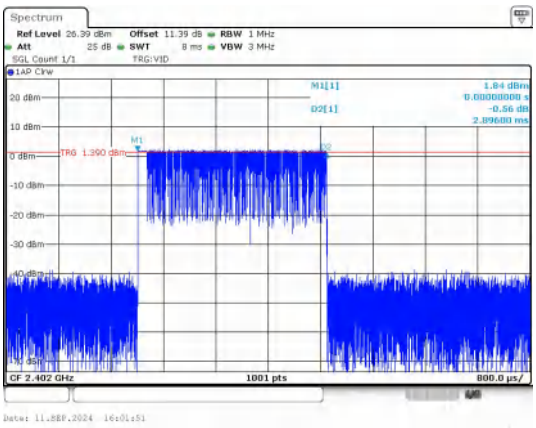
Pulse Width

π/4DQPSK_2-DH5



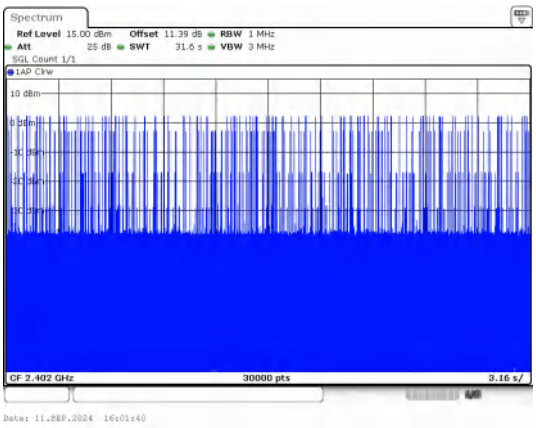
Number of Pulses in 31.6 seconds

π/4DQPSK_2-DH5



Pulse Width

8DPSK_3-DH5



Number of Pulses in 31.6 seconds

8DPSK_3-DH5

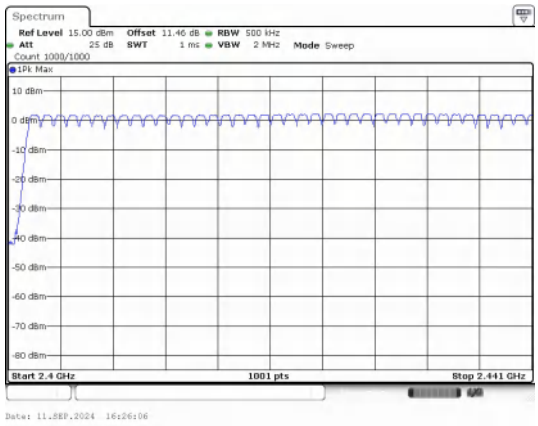
3) Number Of Hopping Channel

Right:

Test Result

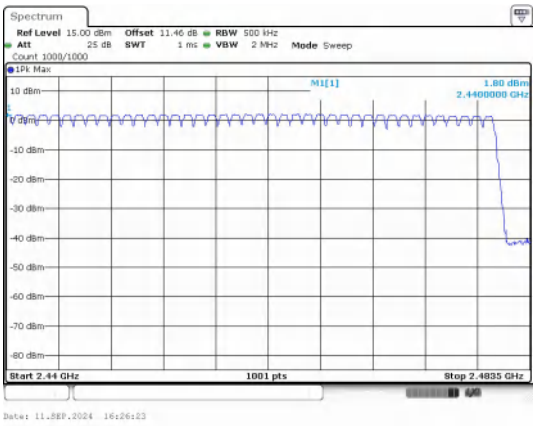
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
π/4DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs



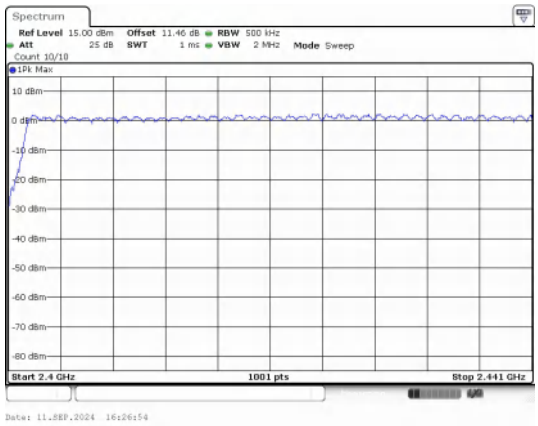
Low End Spectrum Channel Hopping Plot

GFSK



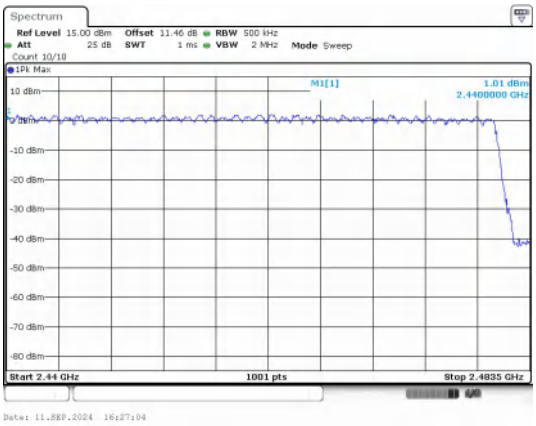
High End Spectrum Channel Hopping Plot

GFSK



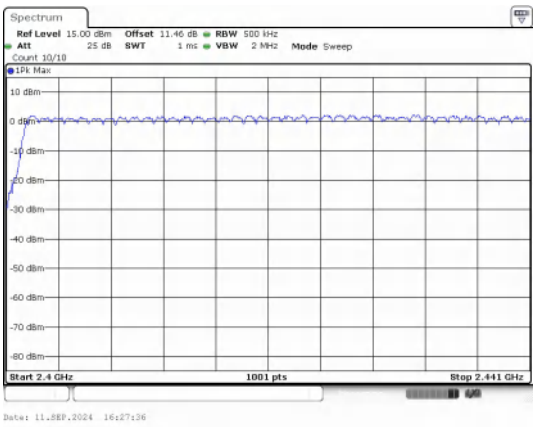
Low End Spectrum Channel Hopping Plot

π/4DQPSK



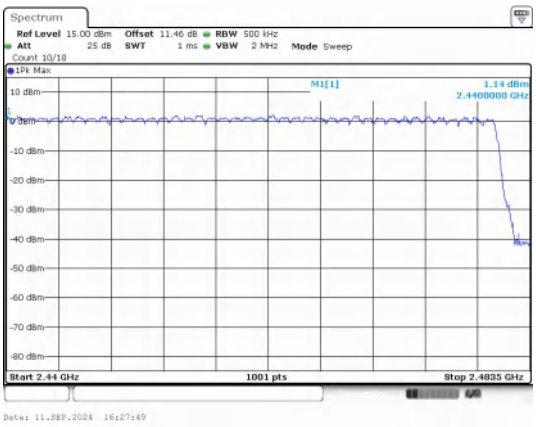
High End Spectrum Channel Hopping Plot

π/4DQPSK



Low End Spectrum Channel Hopping Plot

8DPSK



High End Spectrum Channel Hopping Plot

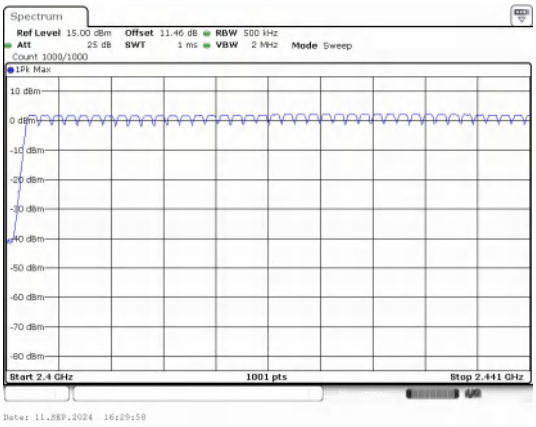
8DPSK

Left:

Test Result

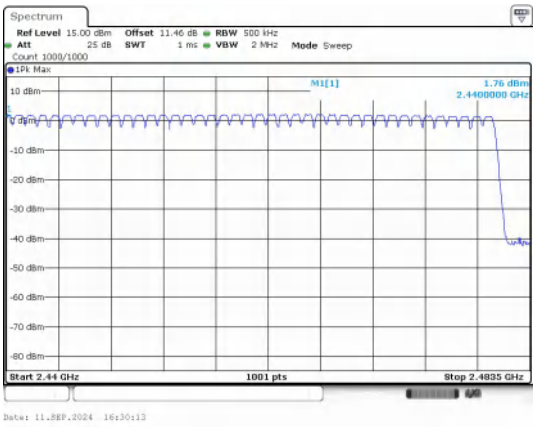
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
π/4DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs



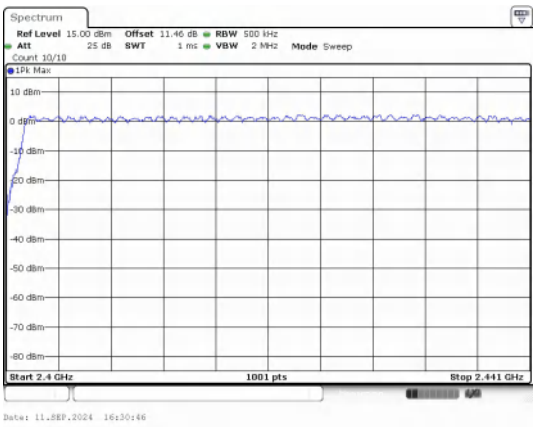
Low End Spectrum Channel Hopping Plot

GFSK



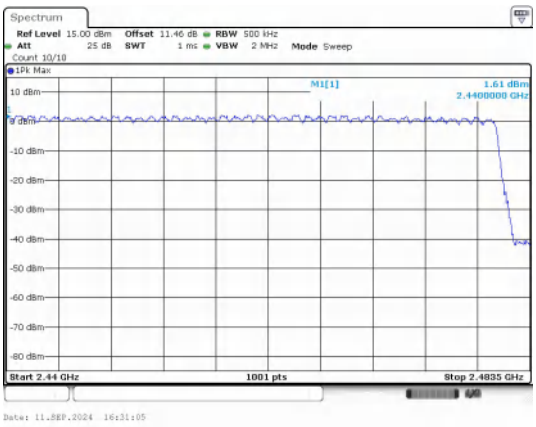
High End Spectrum Channel Hopping Plot

GFSK



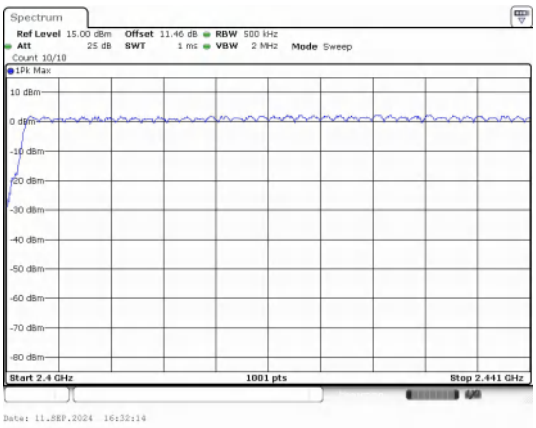
Low End Spectrum Channel Hopping Plot

π/4DQPSK



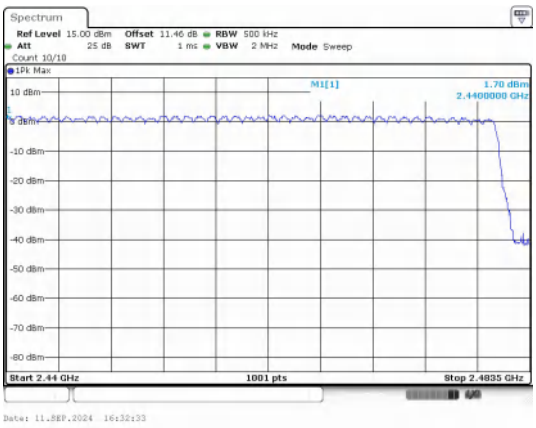
High End Spectrum Channel Hopping Plot

π/4DQPSK



Low End Spectrum Channel Hopping Plot

8DPSK



High End Spectrum Channel Hopping Plot

8DPSK

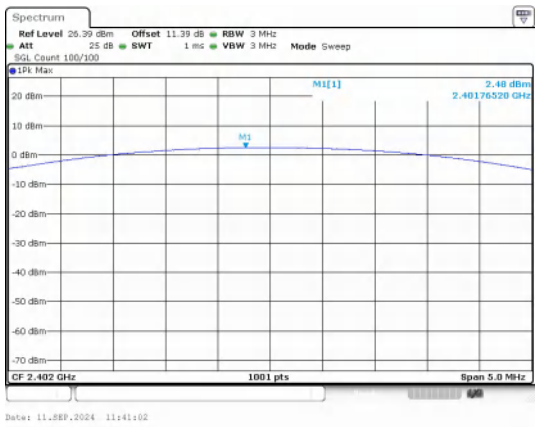
4) Conducted Peak Output Power

Right:

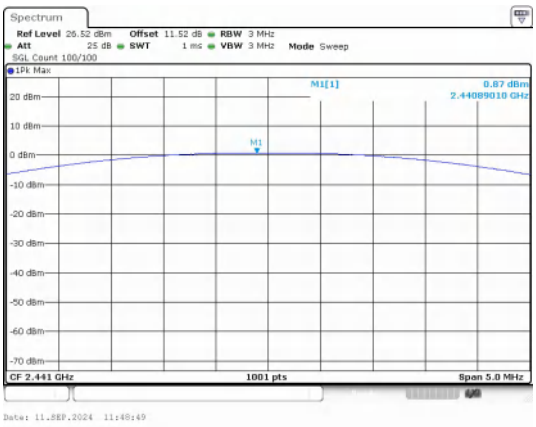
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	2.48	1.77	≤30	PASS
		39	0.88	1.22		PASS
		78	0.36	1.09		PASS
π/4DQPSK	2-DH5	0	3.45	2.21	≤20.97	PASS
		39	0.58	1.14		PASS
		78	2.21	1.66		PASS
8DPSK	3-DH5	0	0.20	1.05		PASS
		39	2.59	1.82		PASS
		78	2.25	1.68		PASS

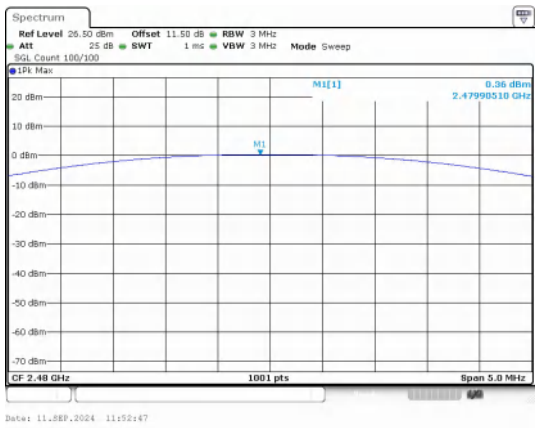
Test Graphs



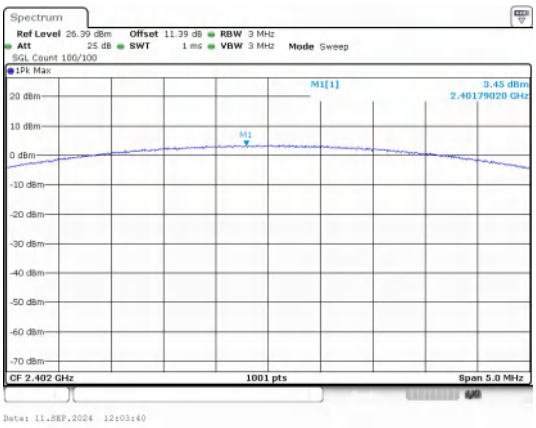
Peak Output Power
GFSK_Channel 0



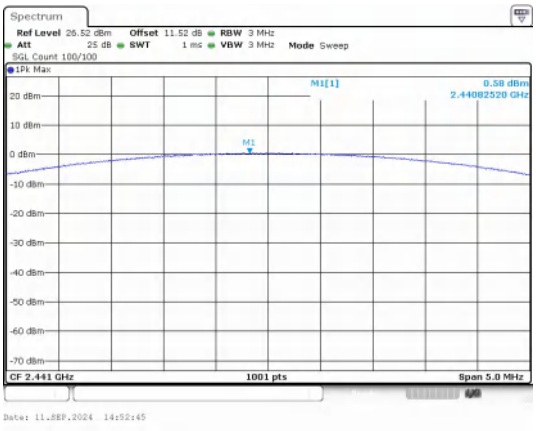
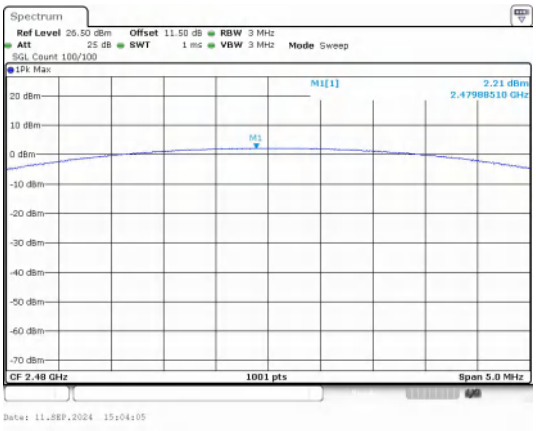
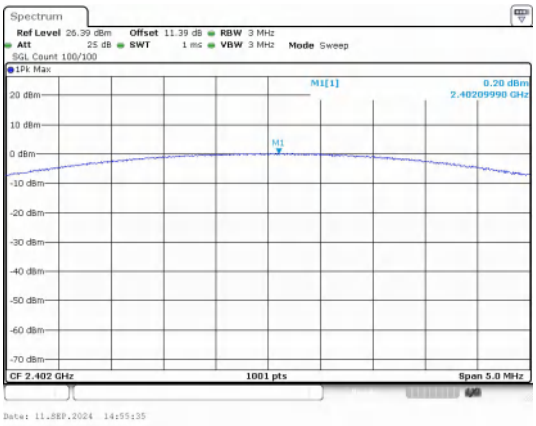
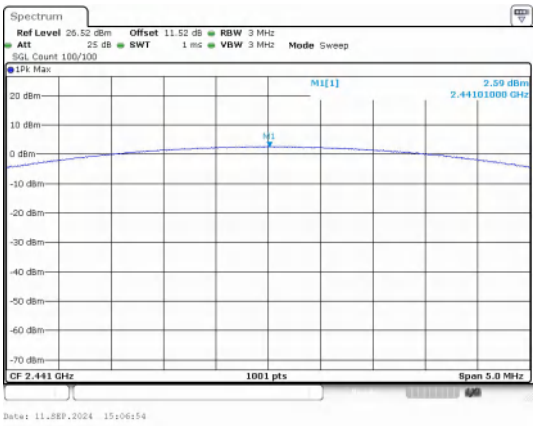
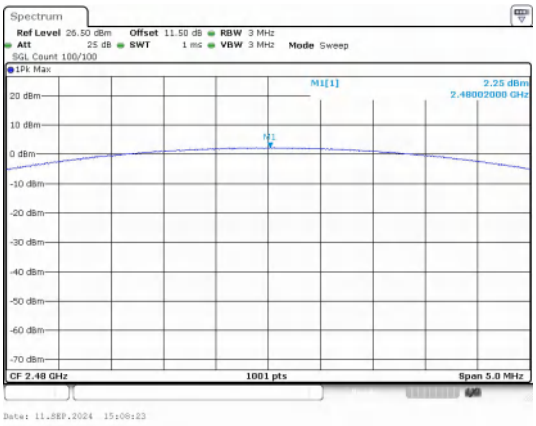
Peak Output Power
GFSK_Channel 39



Peak Output Power



Peak Output Power

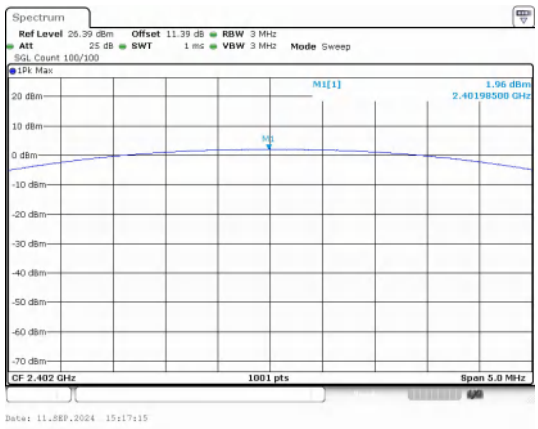
GFSK_Channel 78	π/4DQPSK_Channel 0
	
Peak Output Power	**Peak Output Power**
π/4DQPSK_Channel 39	**π/4DQPSK_Channel 78**
	
Peak Output Power	**Peak Output Power**
8DPSK_Channel 0	**8DPSK_Channel 39**
	
Peak Output Power	
8DPSK_Channel 78	

Left:

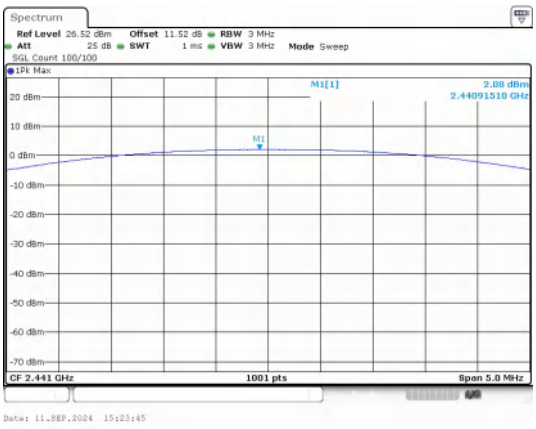
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.96	1.57	≤30	PASS
		39	2.08	1.61		PASS
		78	1.63	1.45		PASS
π/4DQPSK	2-DH5	0	2.34	1.71	≤20.97	PASS
		39	2.49	1.78		PASS
		78	2.12	1.63		PASS
8DPSK	3-DH5	0	2.46	1.76		PASS
		39	2.59	1.82		PASS
		78	2.26	1.68		PASS

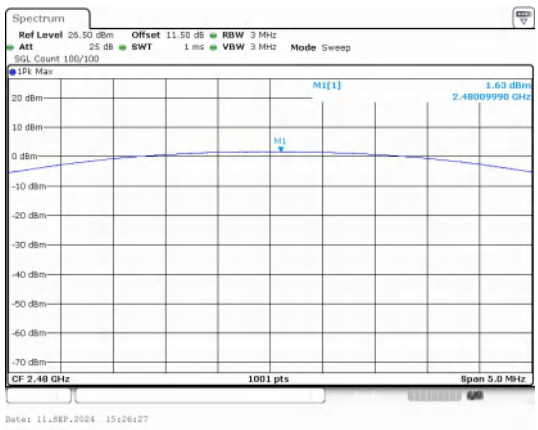
Test Graphs



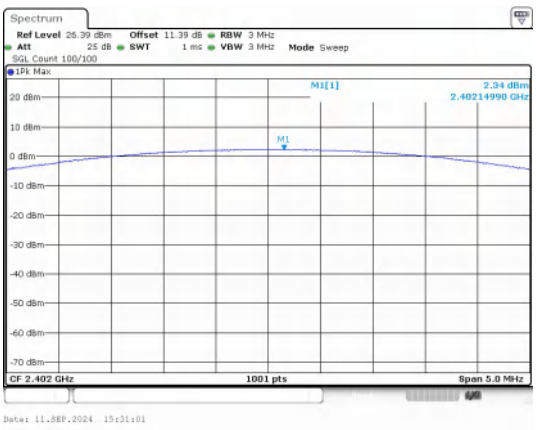
Peak Output Power
GFSK_Channel 0



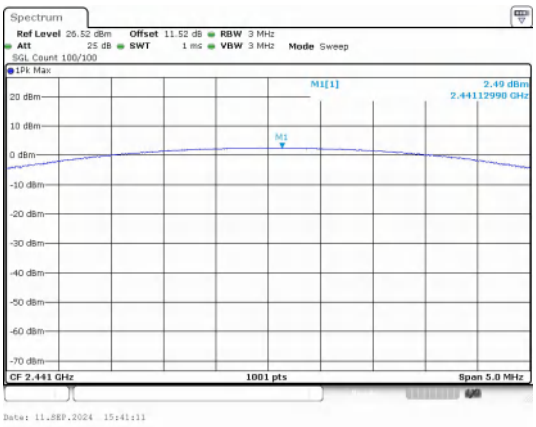
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78

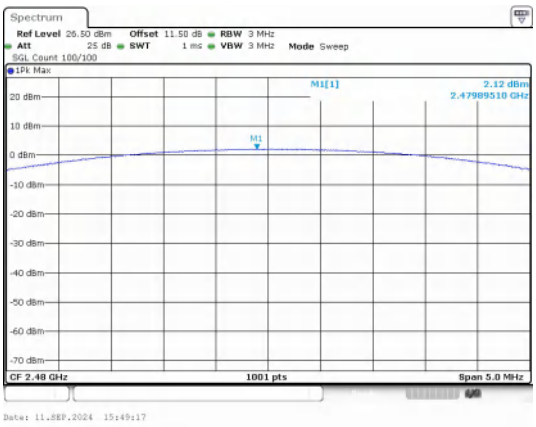


Peak Output Power
π/4DQPSK_Channel 0



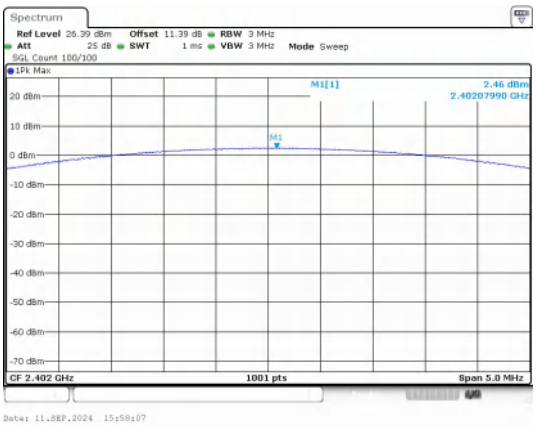
Peak Output Power

π/4DQPSK_Channel 39



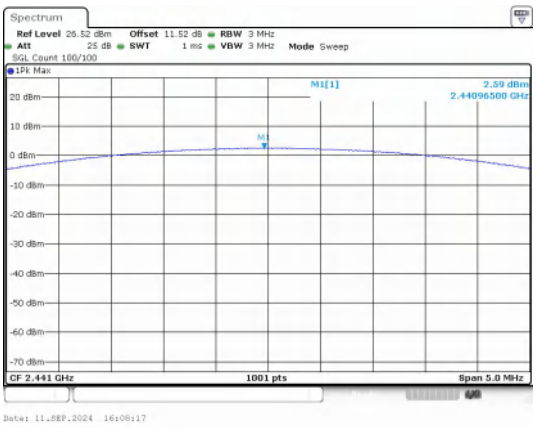
Peak Output Power

π/4DQPSK_Channel 78



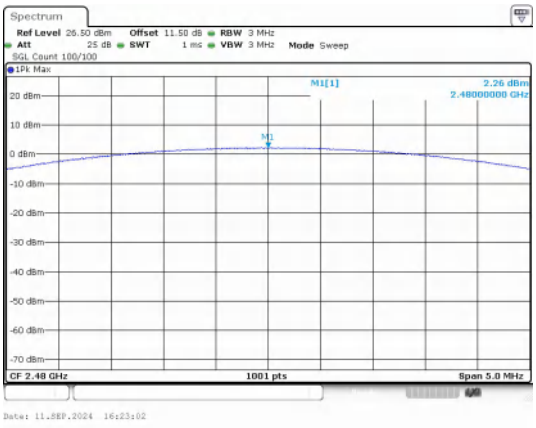
Peak Output Power

8DPSK_Channel 0



Peak Output Power

8DPSK_Channel 39



Peak Output Power

8DPSK_Channel 78

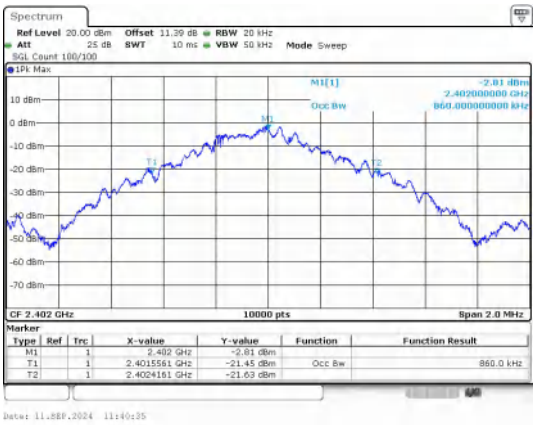
5) 99% Bandwidth

Right:

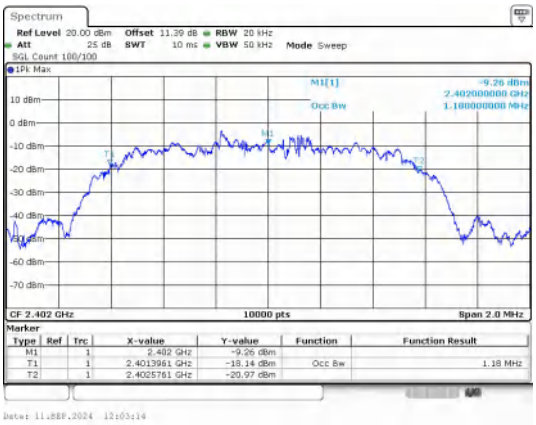
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.86000
	39	2441	0.86240
	78	2480	0.87520
π/4DQPSK	0	2402	1.1800
	39	2441	1.1838
	78	2480	1.1812
8DPSK	0	2402	1.1780
	39	2441	1.1712
	78	2480	1.1728

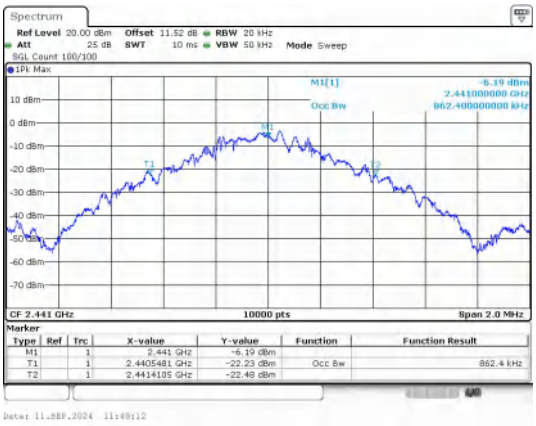
Test Graphs



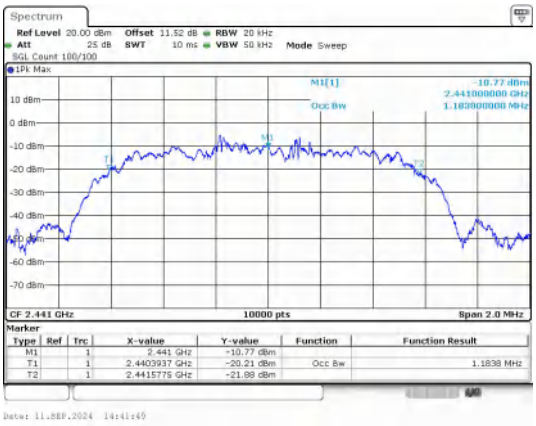
GFSK_DH5_Channel 0



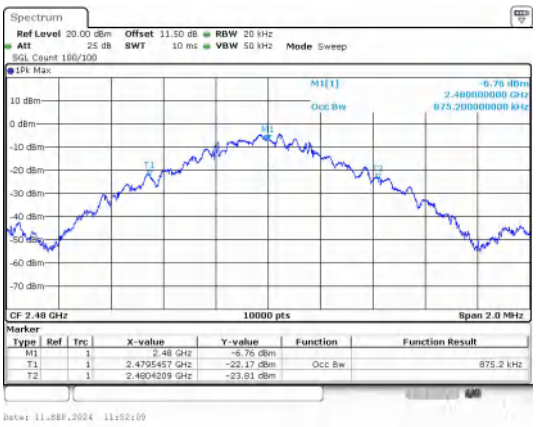
π/4DQPSK_2-DH5_Channel 0



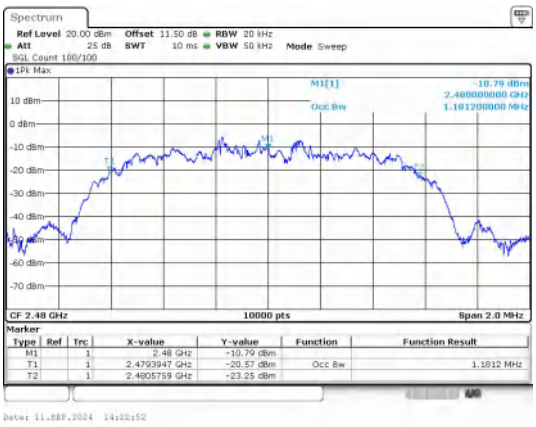
GFSK_DH5_Channel 39



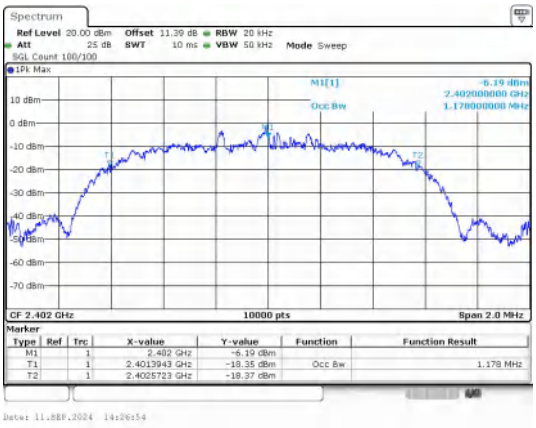
π/4DQPSK_2-DH5_Channel 39



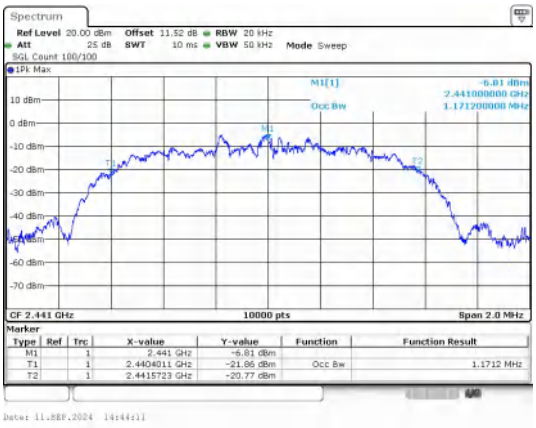
GFSK_DH5_Channel 78



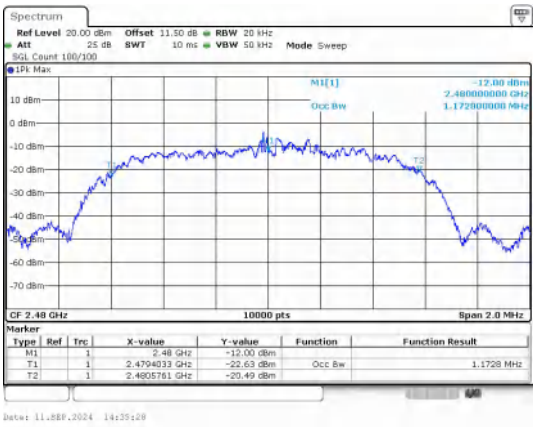
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



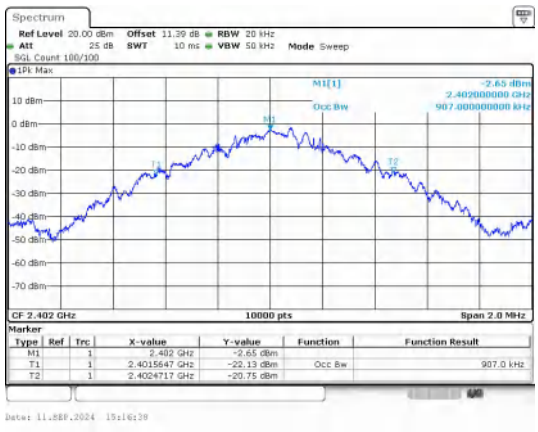
8DPSK_3-DH5_Channel 78

Left:

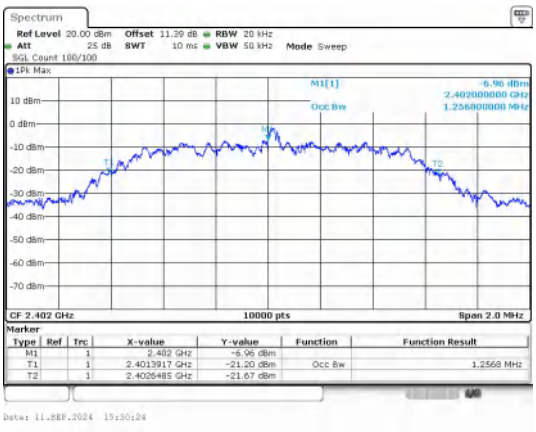
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.90700
	39	2441	0.92160
	78	2480	0.90240
π/4DQPSK	0	2402	1.2568
	39	2441	1.2536
	78	2480	1.2266
8DPSK	0	2402	1.2372
	39	2441	1.2370
	78	2480	1.2274

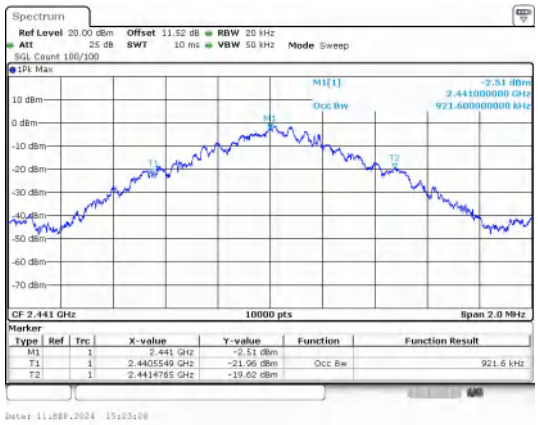
Test Graphs



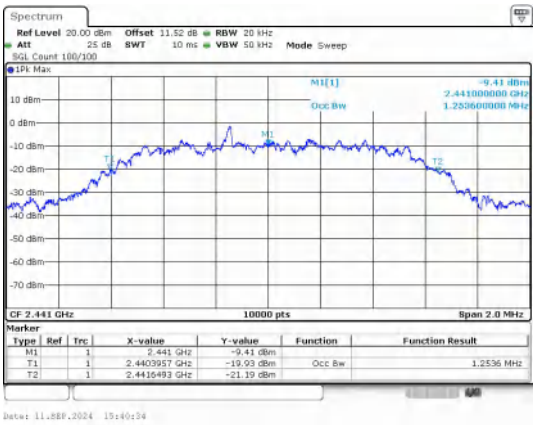
GFSK_DH5_Channel 0



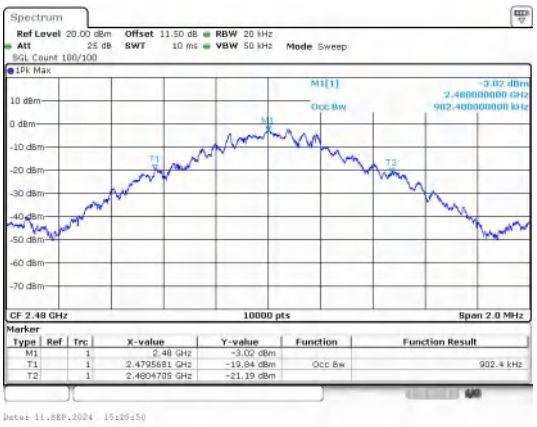
π/4DQPSK_2-DH5_Channel 0



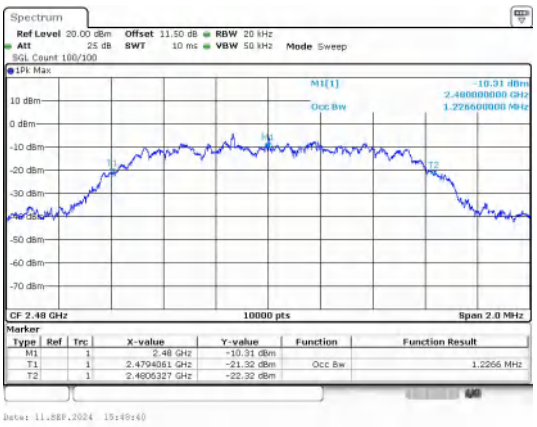
GFSK_DH5_Channel 39



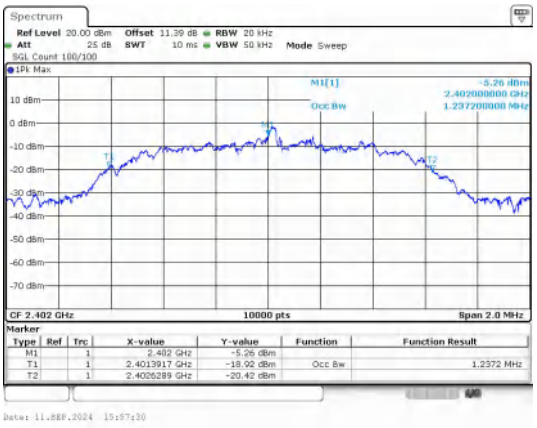
π/4DQPSK_2-DH5_Channel 39



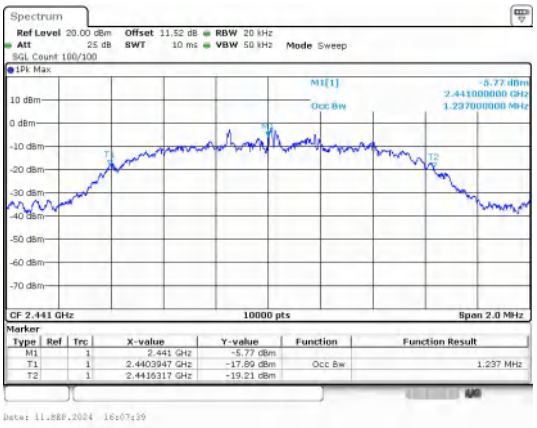
GFSK_DH5_Channel 78



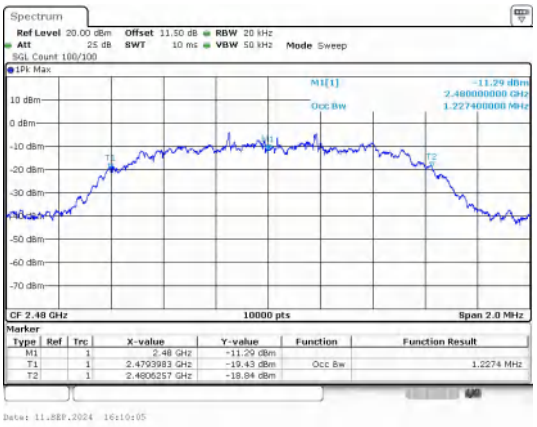
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

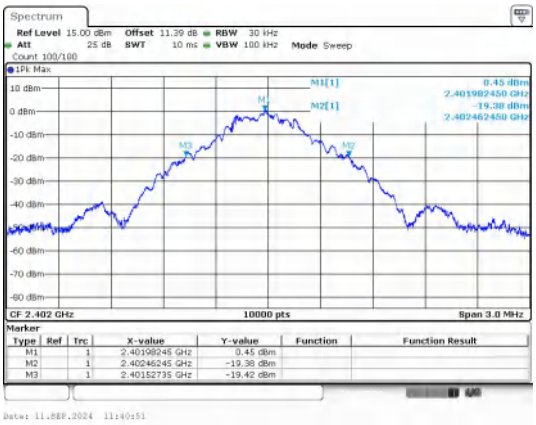
6) 20dB Bandwidth

Right:

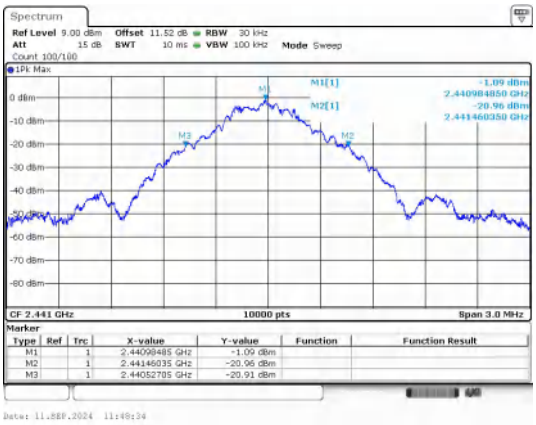
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9300
	39	2441 MHz	0.9300
	78	2480 MHz	0.9500
π/4DQPSK	0	2402 MHz	1.240
	39	2441 MHz	1.250
	78	2480 MHz	1.240
8DPSK	0	2402 MHz	1.260
	39	2441 MHz	1.260
	78	2480 MHz	1.260

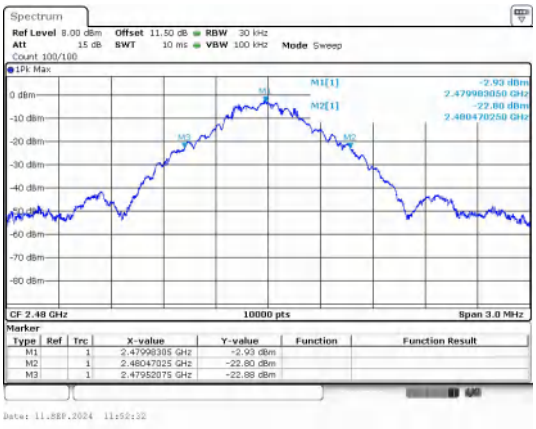
Test Graphs



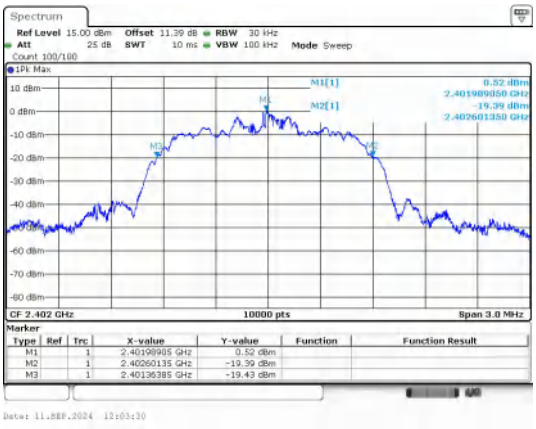
GFSK_DH5_Channel 0



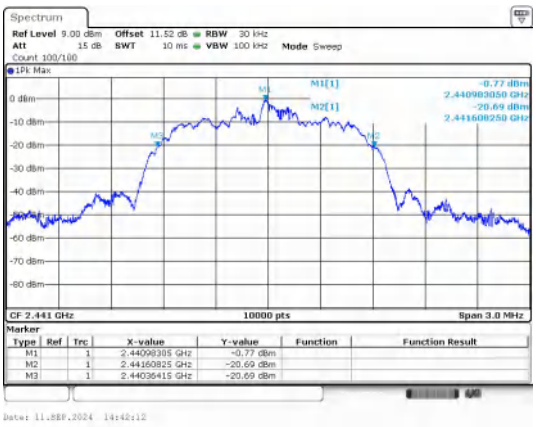
GFSK_DH5_Channel 39



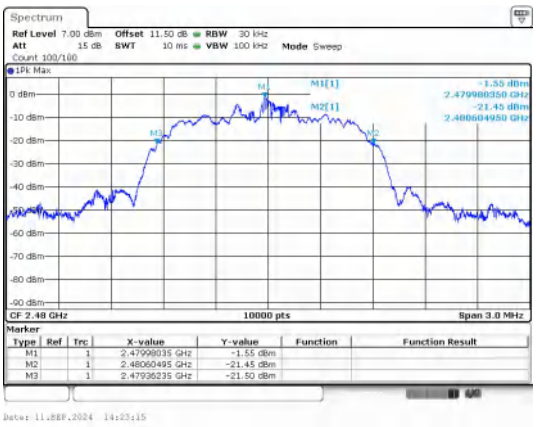
GFSK_DH5_Channel 78



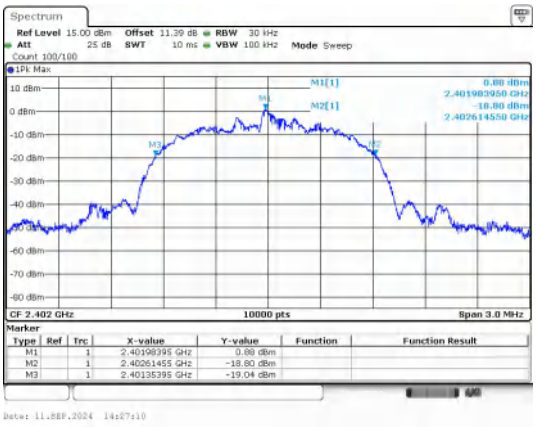
π/4DQPSK_2-DH5_Channel 0



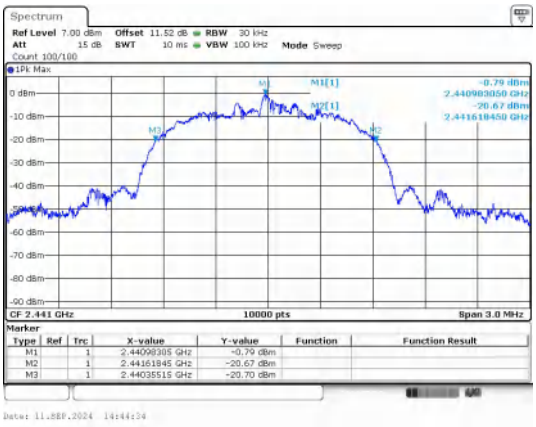
π/4DQPSK_2-DH5_Channel 39



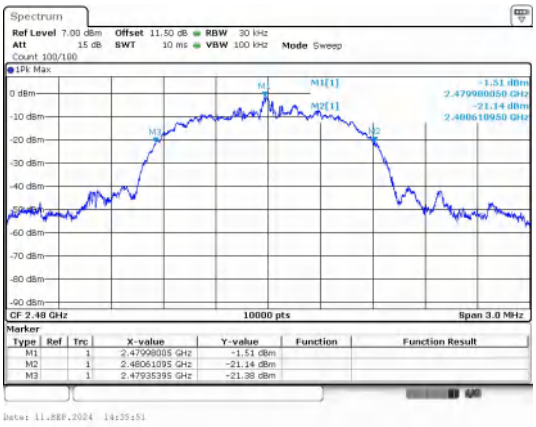
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



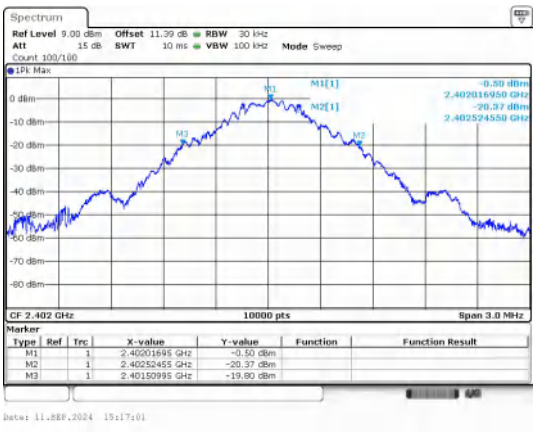
8DPSK_3-DH5_Channel 78

Left:

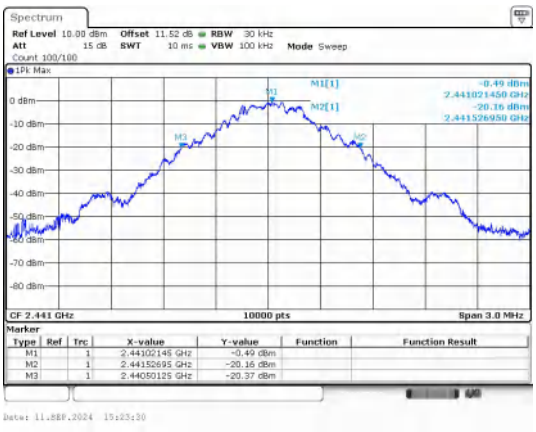
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.010
	39	2441 MHz	1.030
	78	2480 MHz	1.020
π/4DQPSK	0	2402 MHz	1.360
	39	2441 MHz	1.350
	78	2480 MHz	1.320
8DPSK	0	2402 MHz	1.310
	39	2441 MHz	1.310
	78	2480 MHz	1.310

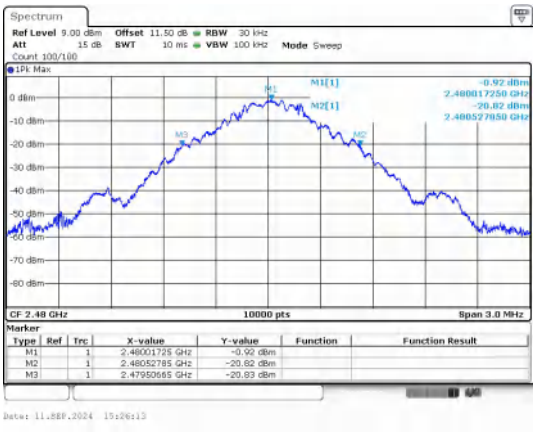
Test Graphs



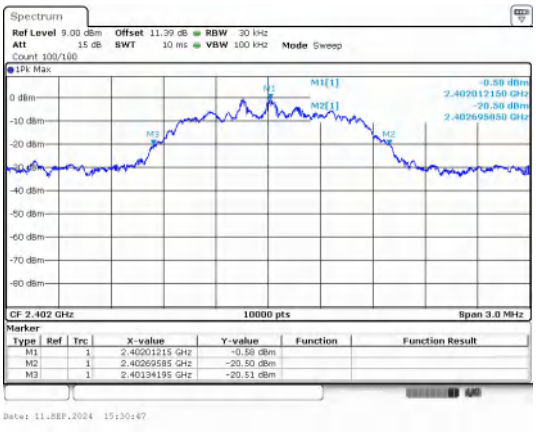
GFSK_DH5_Channel 0



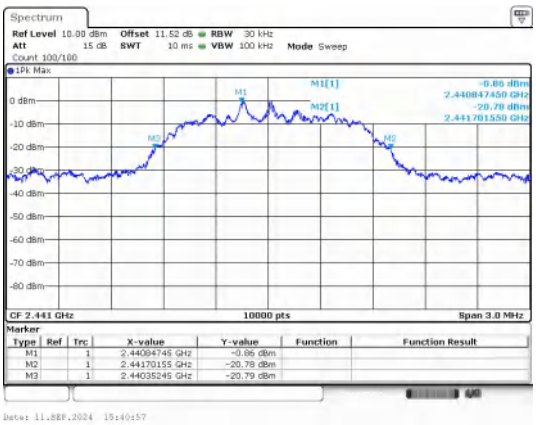
GFSK_DH5_Channel 39



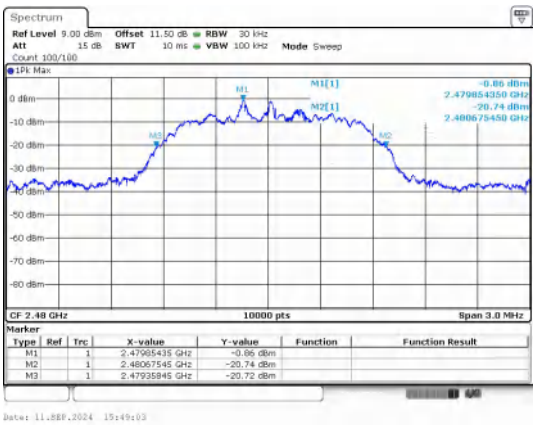
GFSK_DH5_Channel 78



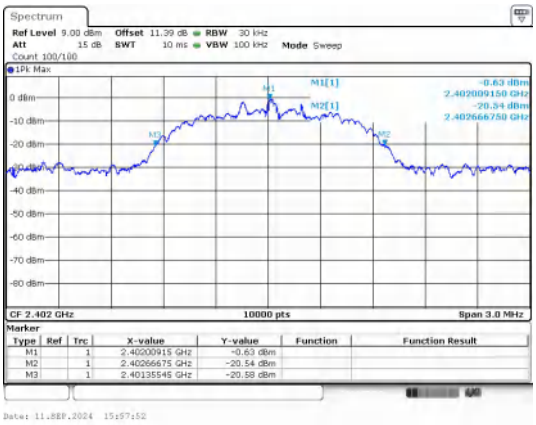
π/4DQPSK_2-DH5_Channel 0



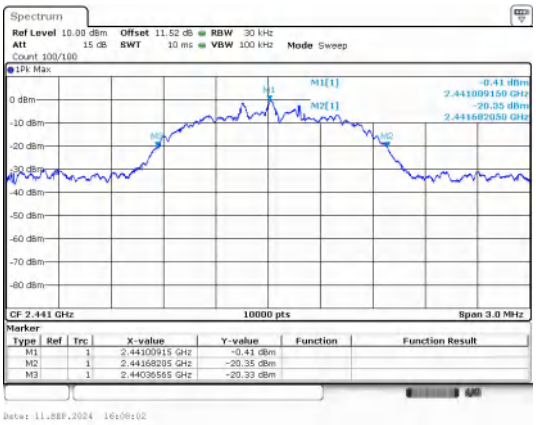
π/4DQPSK_2-DH5_Channel 39



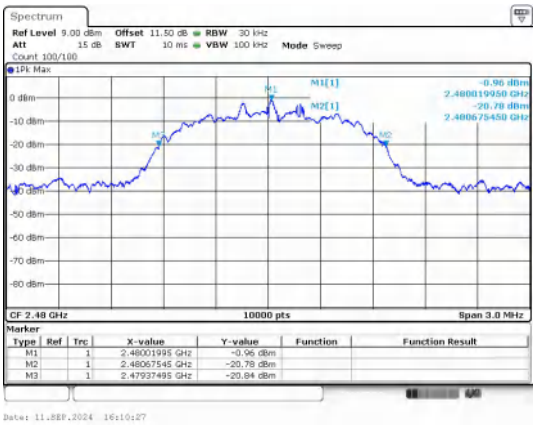
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

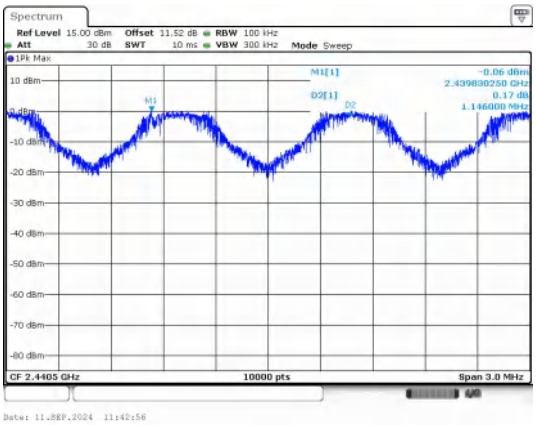
7) Carrier Frequencies Separation

Right:

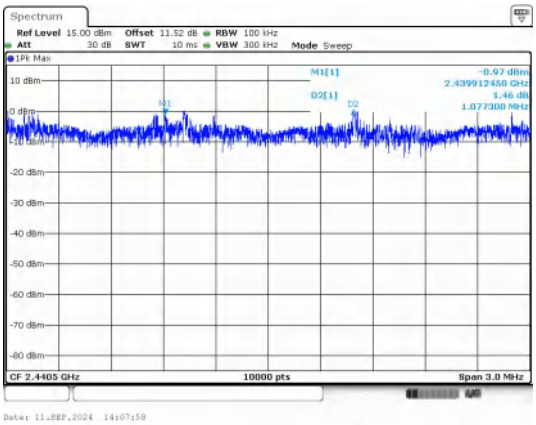
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8302	2440.9763	1.1460	0.9500	PASS
π/4DQPSK	2-DH5	2439.9124	2440.9898	1.0773	0.827	PASS
8DPSK	3-DH5	2439.9848	2440.9147	0.9300	0.84	PASS

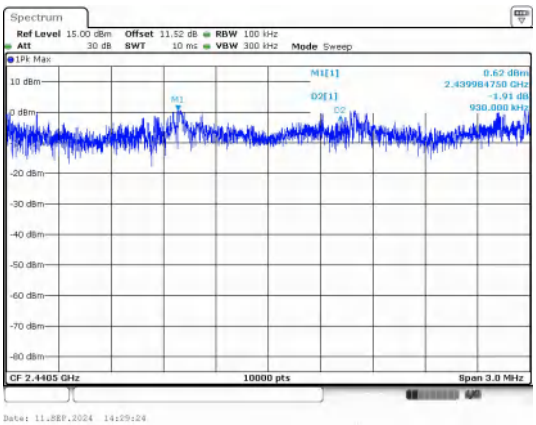
Test Graphs



GFSK



π/4DQPSK



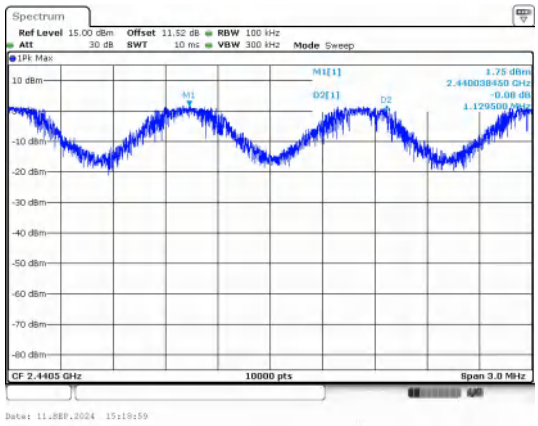
8DPSK

Left:

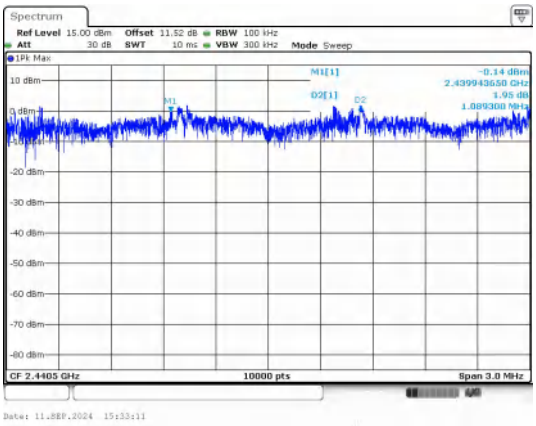
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0385	2441.168	1.1295	1.030	PASS
π/4DQPSK	2-DH5	2439.9437	2441.0329	1.0893	0.907	PASS
8DPSK	3-DH5	2439.8407	2440.8463	1.0056	0.873	PASS

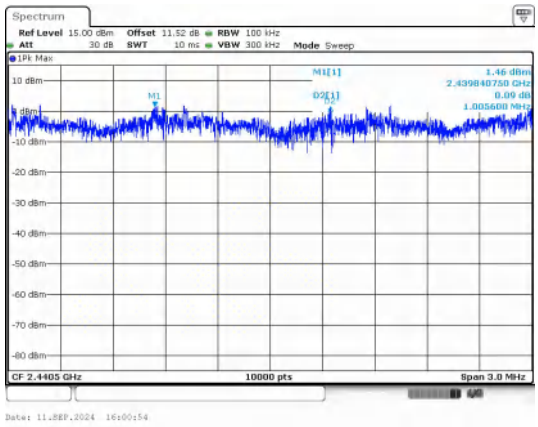
Test Graphs



GFSK



π/4DQPSK



8DPSK

8) Conducted Out Of Band Emission

Right:

Test Result

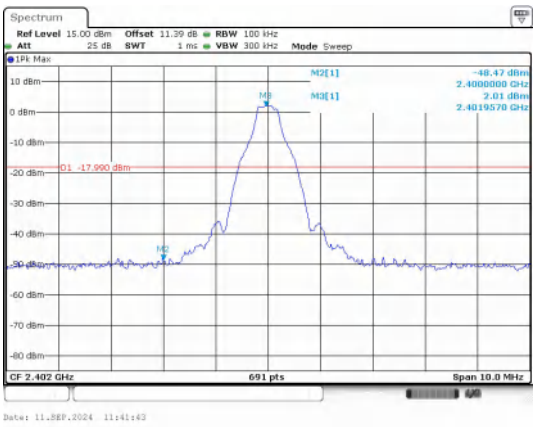
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.474	-17.99	-30.484	PASS
			4804.68	-24.252	-17.99	-6.262	PASS
		39	4881.25	-28.212	-19.5	-8.712	PASS
		78	2483.50	-50.741	-20.2	-30.541	PASS
			4959.49	-29.514	-20.2	-9.314	PASS
π/4DQPSK	2-DH5	0	2400.00	-45.384	-17.5	-27.884	PASS
			4803.85	-23.560	-17.5	-6.060	PASS
		39	9763.72	-46.837	-20.83	-26.007	PASS
		78	2483.50	-49.677	-18.47	-31.207	PASS
			9920.20	-37.114	-18.47	-18.644	PASS
8DPSK	3-DH5	0	2400.00	-48.143	-20.74	-27.403	PASS
			9608.08	-46.312	-20.74	-25.572	PASS
		39	7323.32	-38.410	-18.18	-20.230	PASS
		78	2483.50	-50.036	-18.69	-31.346	PASS
			9920.20	-36.966	-18.69	-18.276	PASS

Hopping

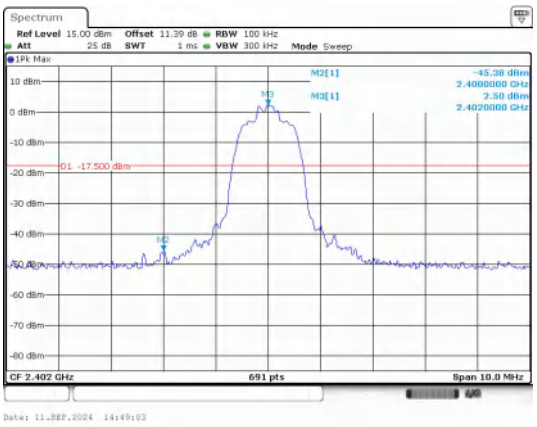
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.08	-47.757	-18.01	-29.747	PASS
			2400.00	-49.174	-18.01	-31.164	PASS
			2483.50	-50.445	-20.37	-30.075	PASS
π/4DQPSK	2-DH5		2400.00	-47.363	-17.62	-29.743	PASS
			2483.50	-49.544	-20.44	-29.104	PASS
8DPSK	3-DH5		2395.50	-48.165	-19.16	-29.005	PASS
			2400.00	-50.462	-19.16	-31.302	PASS
			2483.50	-51.121	-23.71	-27.411	PASS

Test Graphs



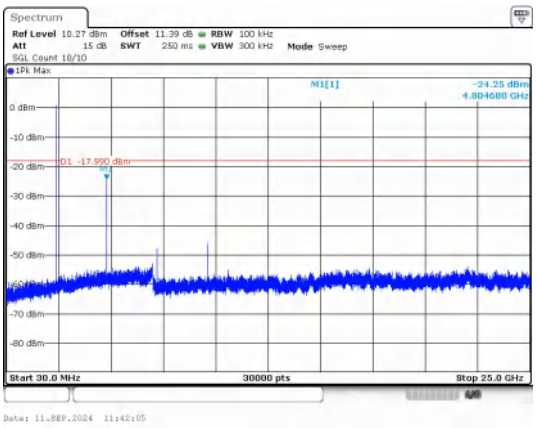
Out Of Band Emission

GFSK_DH5_Channel 0



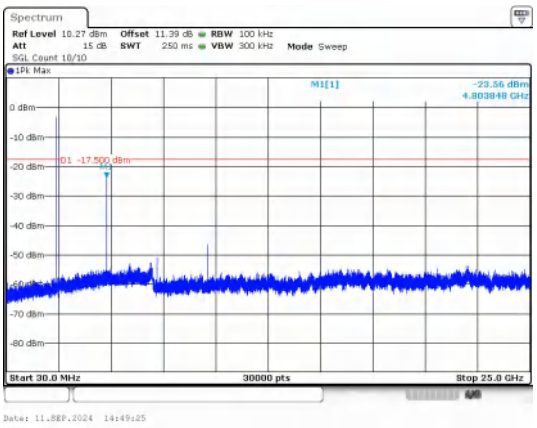
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 0



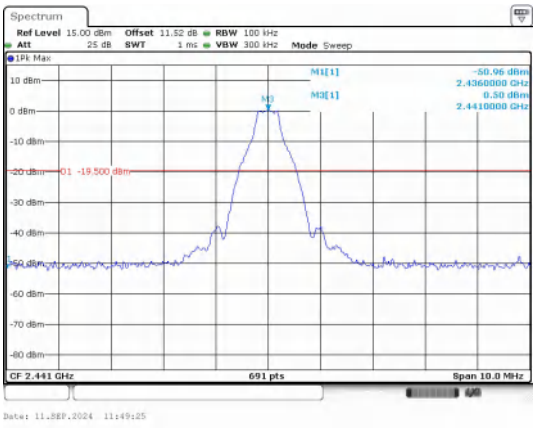
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 0



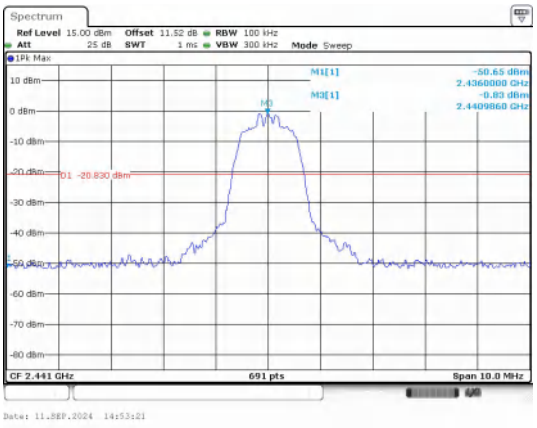
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 0



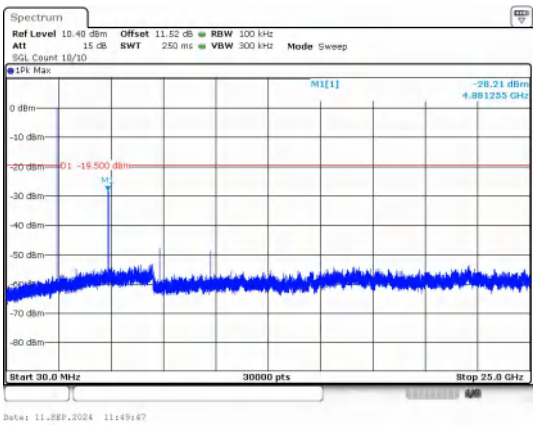
Out Of Band Emission

GFSK_DH5_Channel 39



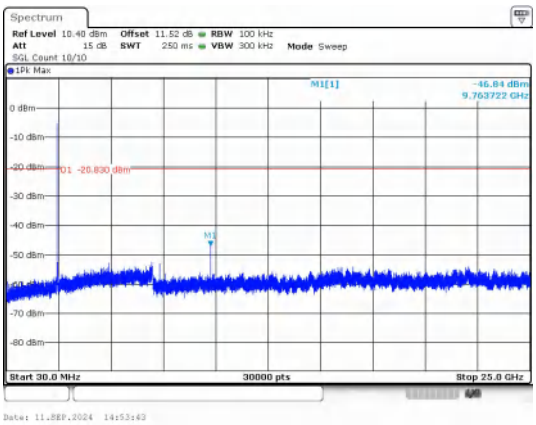
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 39



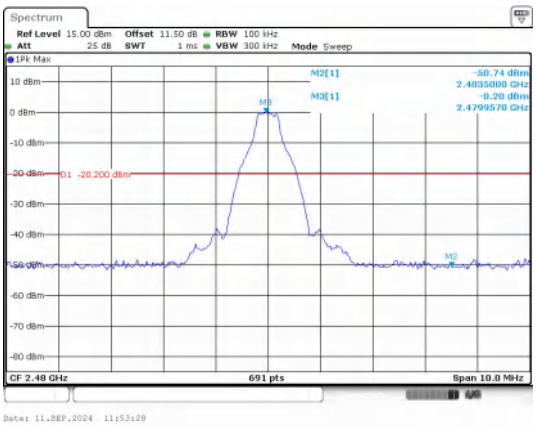
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 39



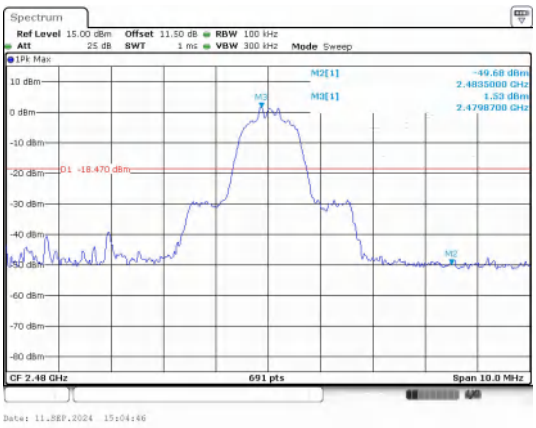
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 39



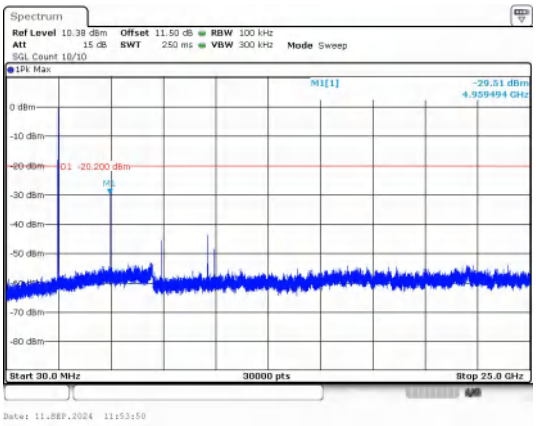
Out Of Band Emission

GFSK_DH5_Channel 78



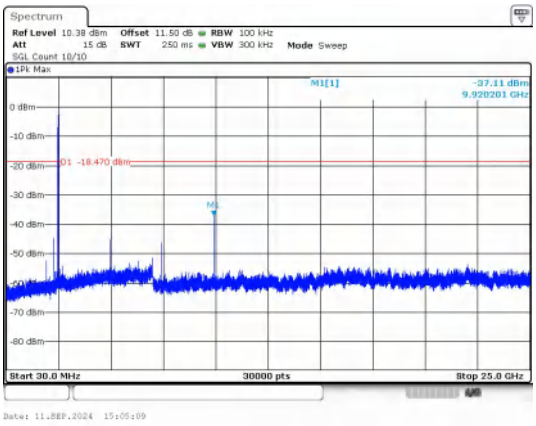
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 78



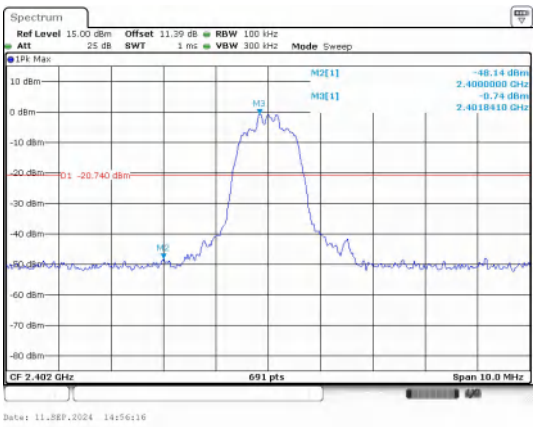
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 78



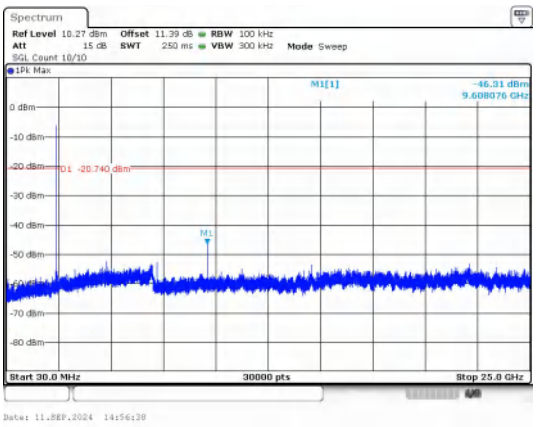
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 78



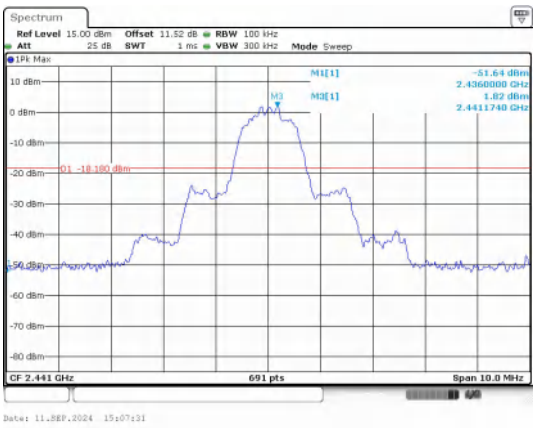
Out Of Band Emission

8DPSK_3-DH5_Channel 0



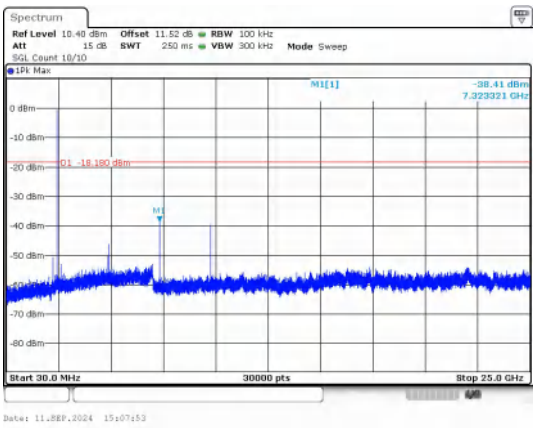
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 0



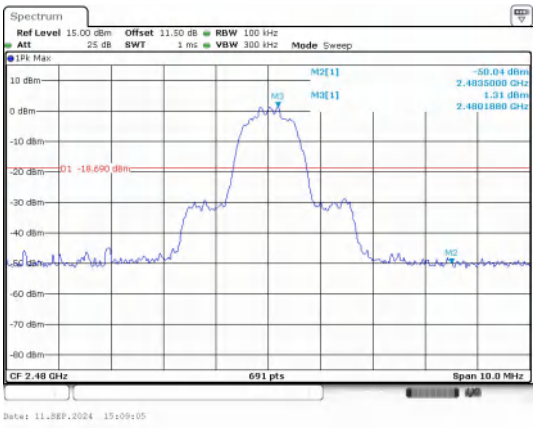
Out Of Band Emission

8DPSK_3-DH5_Channel 39



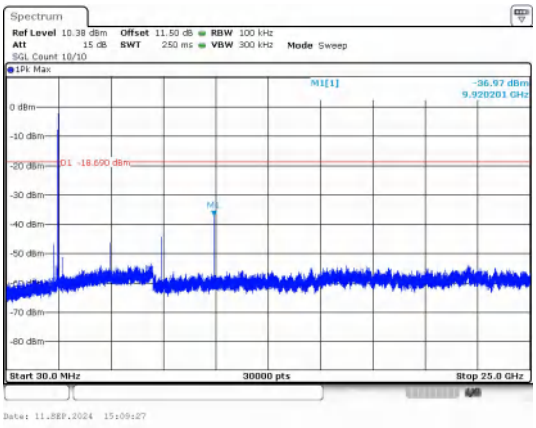
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 39



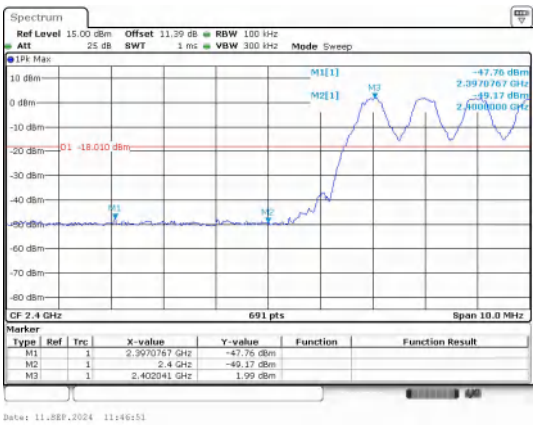
Out Of Band Emission

8DPSK_3-DH5_Channel 78



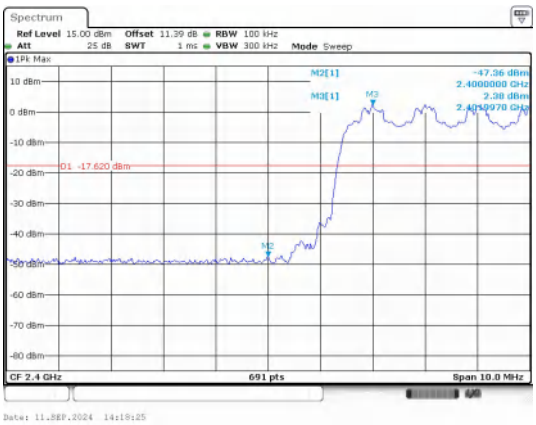
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 78



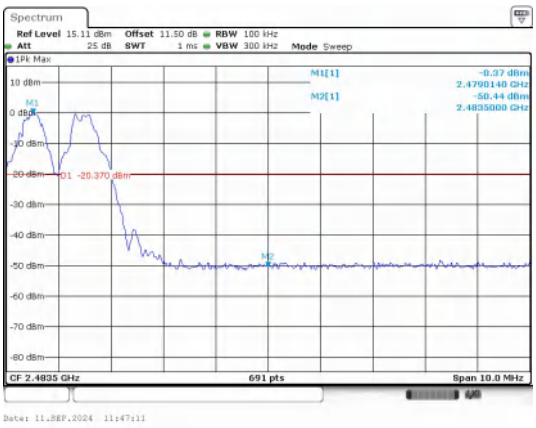
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



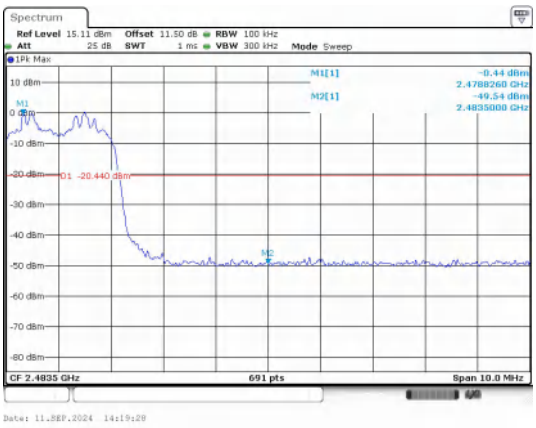
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



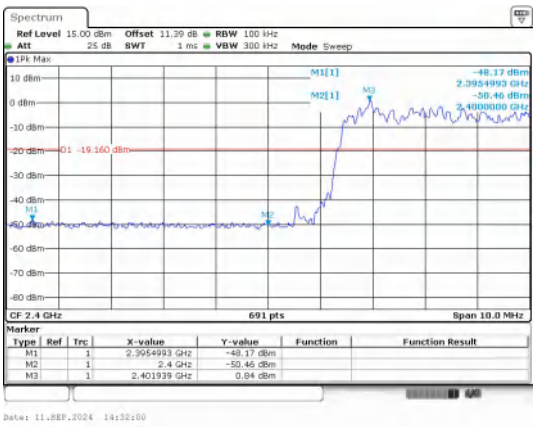
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



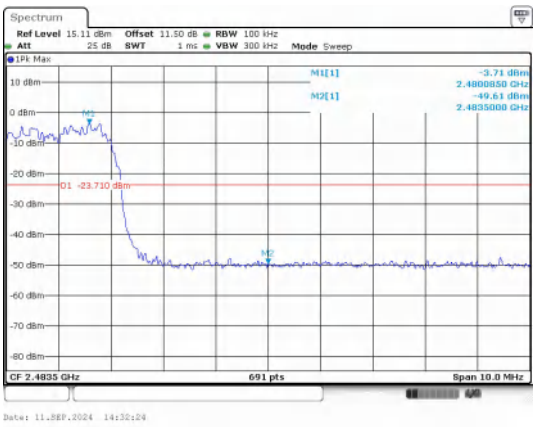
Out Of Band Emission(Right)

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

Left:

Test Result

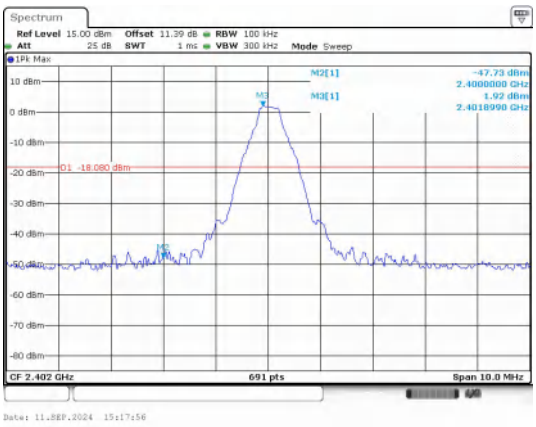
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-47.726	-18.08	-29.646	PASS
			7205.96	-31.462	-18.08	-13.382	PASS
		39	7323.32	-35.661	-18.03	-17.631	PASS
		78	2483.50	-49.277	-18.59	-30.687	PASS
			9920.20	-37.411	-18.59	-18.821	PASS
π/4DQPSK	2-DH5	0	2400.00	-39.686	-18.12	-21.566	PASS
			7205.96	-36.324	-18.12	-18.204	PASS
		39	1958.93	-32.558	-18.06	-14.498	PASS
		78	2483.50	-50.409	-18.56	-31.849	PASS
			9920.20	-37.339	-18.56	-18.779	PASS
8DPSK	3-DH5	0	2400.00	-38.261	-18.16	-20.101	PASS
			7205.96	-33.687	-18.16	-15.527	PASS
		39	9763.72	-39.726	-18.41	-21.316	PASS
		78	2483.50	-49.180	-18.62	-30.560	PASS
			9920.20	-37.370	-18.62	-18.750	PASS

Hopping

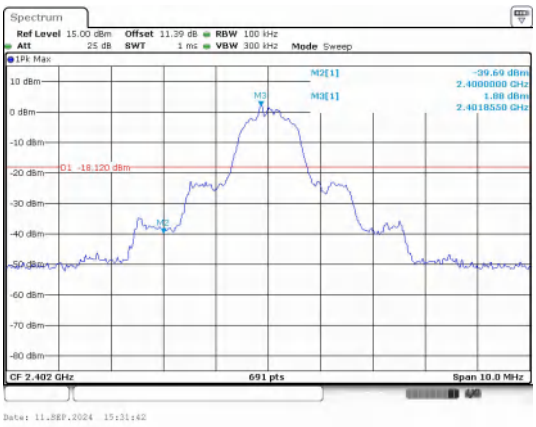
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.15	-48.486	-18.13	-30.356	PASS
			2400.00	-50.162	-18.13	-32.032	PASS
			2483.50	-50.619	-18.69	-31.929	PASS
π/4DQPSK	2-DH5		2400.00	-41.076	-18.14	-22.936	PASS
			2483.50	-48.798	-18.95	-29.848	PASS
8DPSK	3-DH5		2400.00	-39.310	-18.53	-20.780	PASS
			2483.50	-50.842	-21.47	-29.372	PASS

Test Graphs



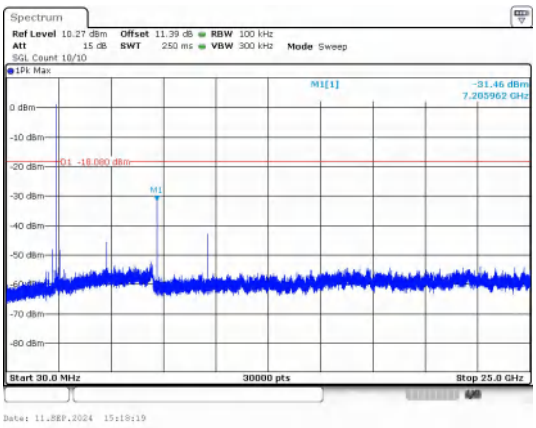
Out Of Band Emission

GFSK_DH5_Channel 0



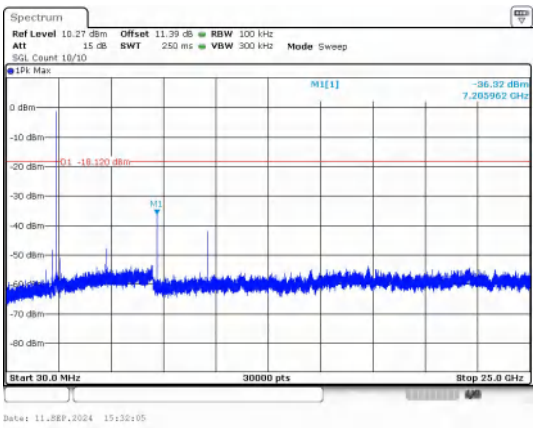
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 0



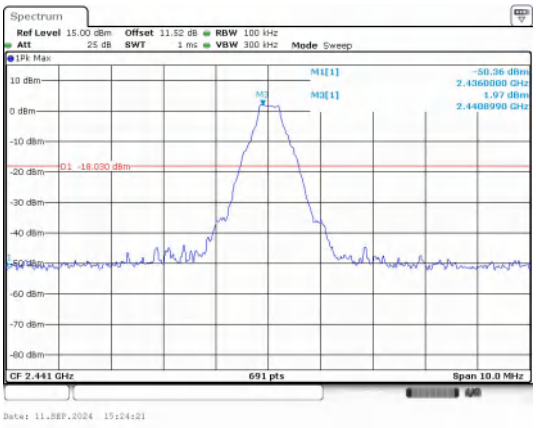
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 0



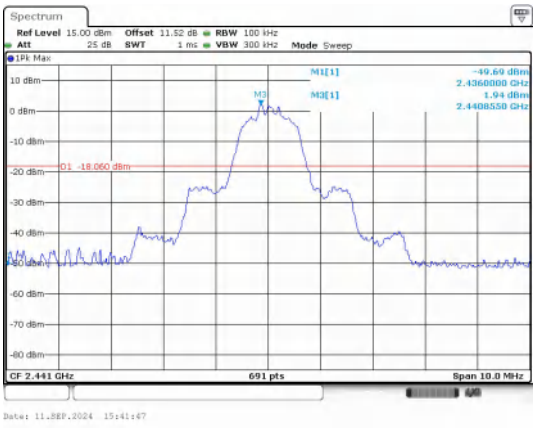
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 0



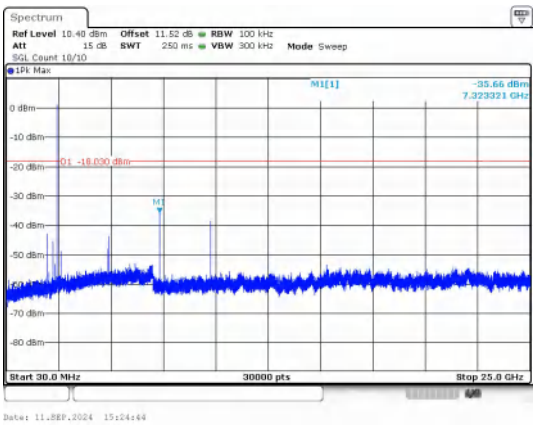
Out Of Band Emission

GFSK_DH5_Channel 39



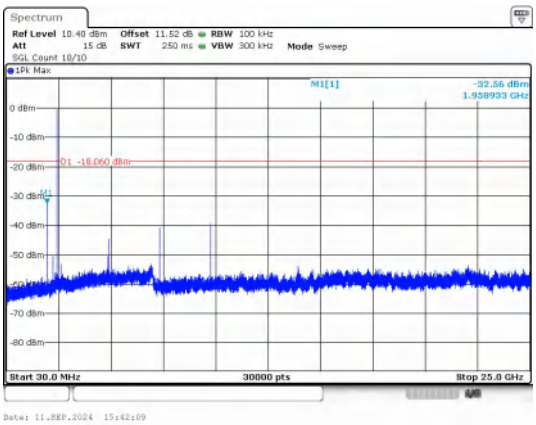
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 39



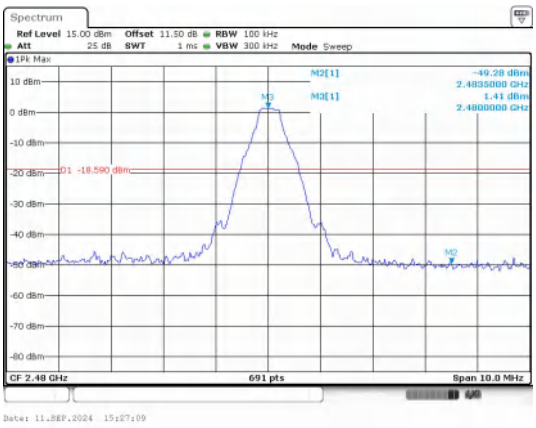
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 39



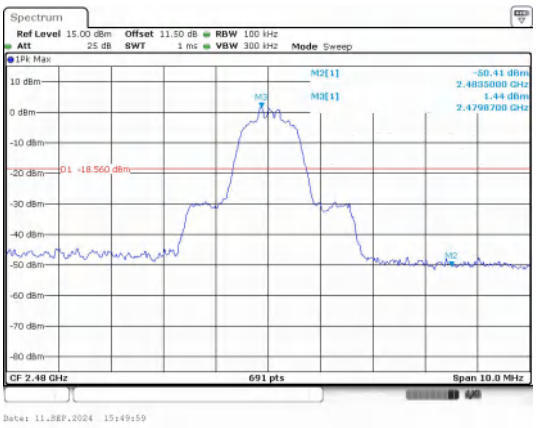
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 39



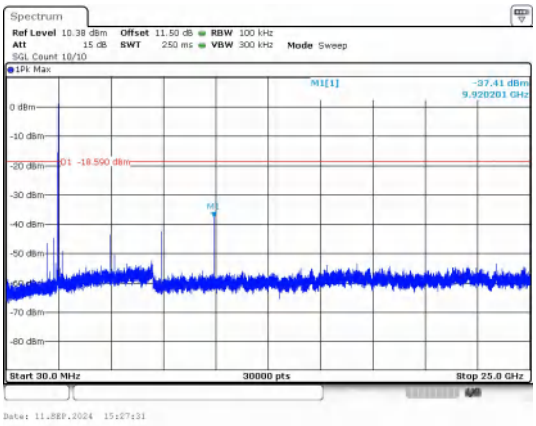
Out Of Band Emission

GFSK_DH5_Channel 78



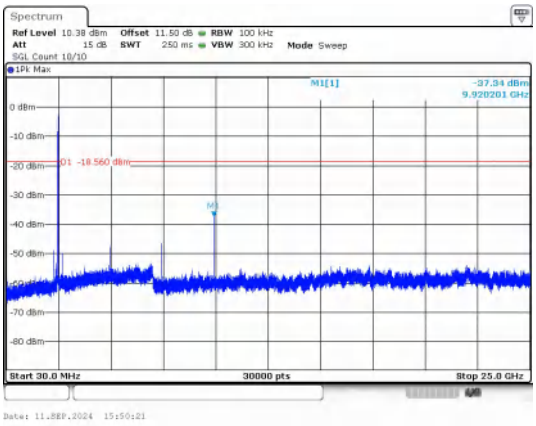
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 78



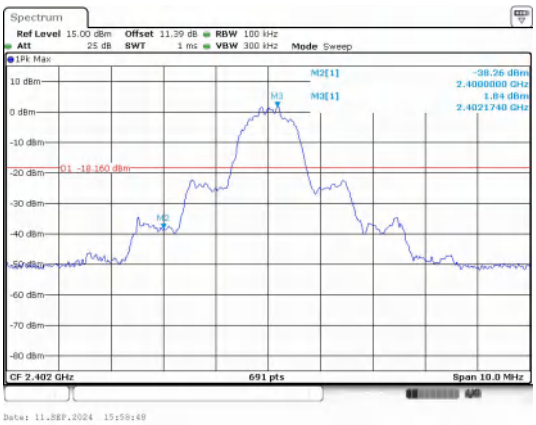
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 78



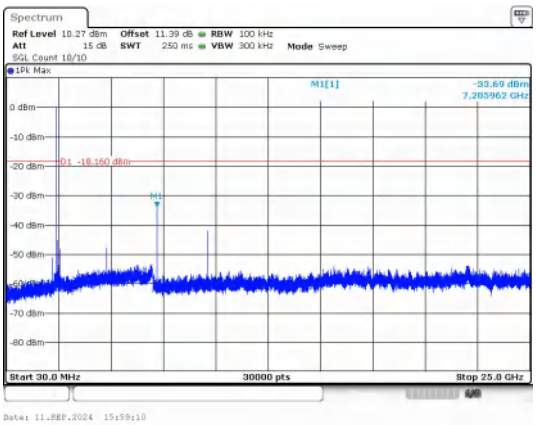
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 78



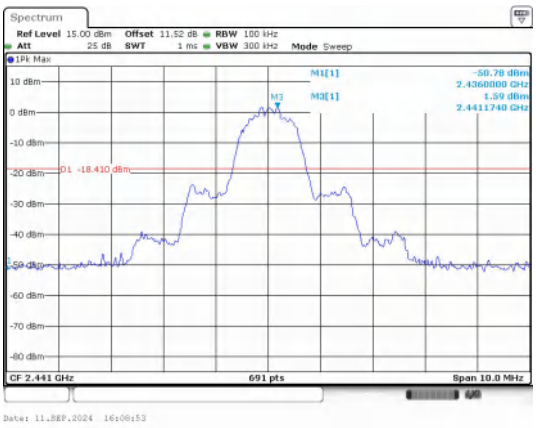
Out Of Band Emission

8DPSK_3-DH5_Channel 0



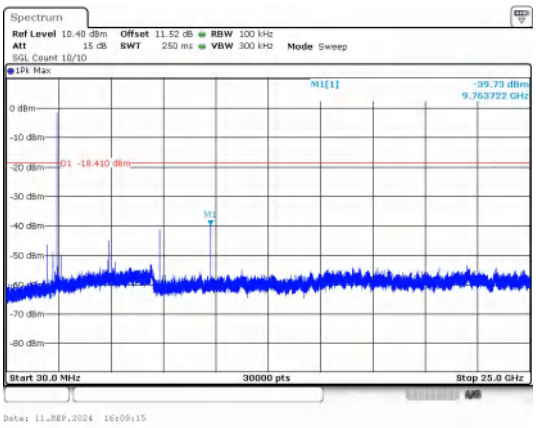
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 0



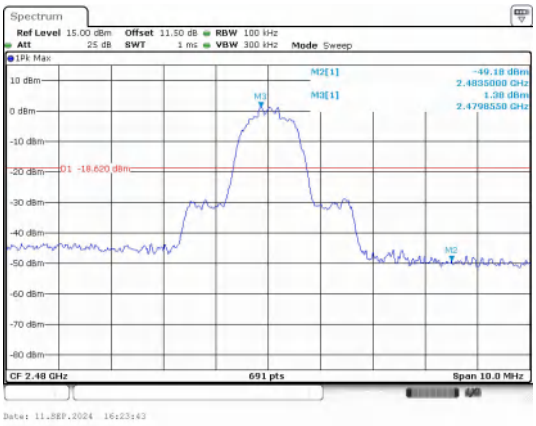
Out Of Band Emission

8DPSK_3-DH5_Channel 39



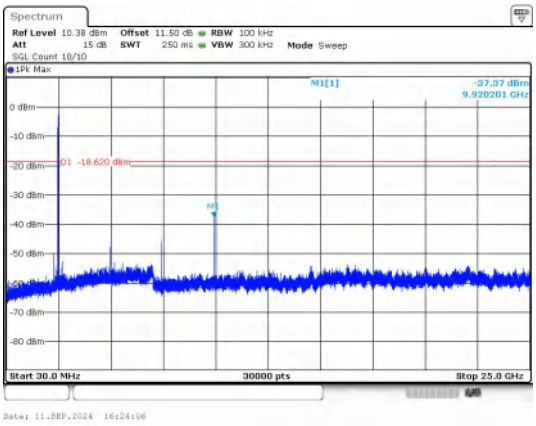
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 39



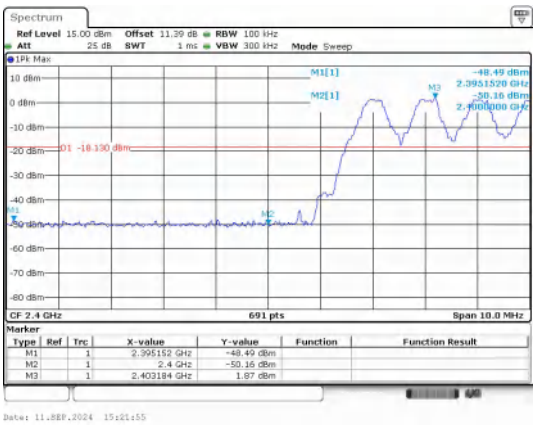
Out Of Band Emission

8DPSK_3-DH5_Channel 78



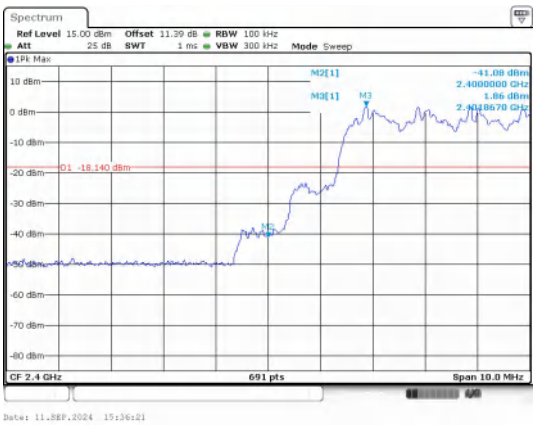
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 78



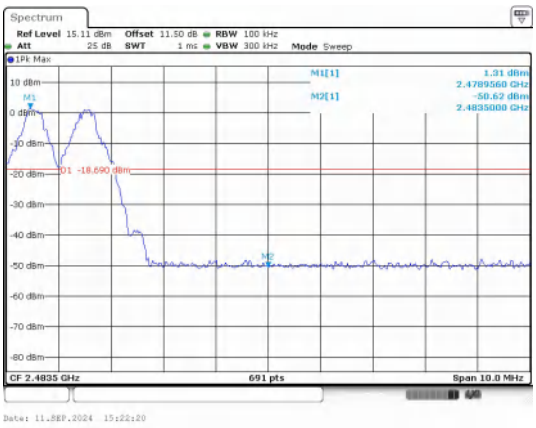
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



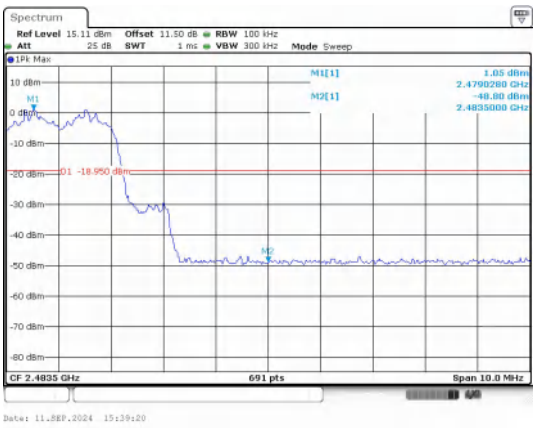
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



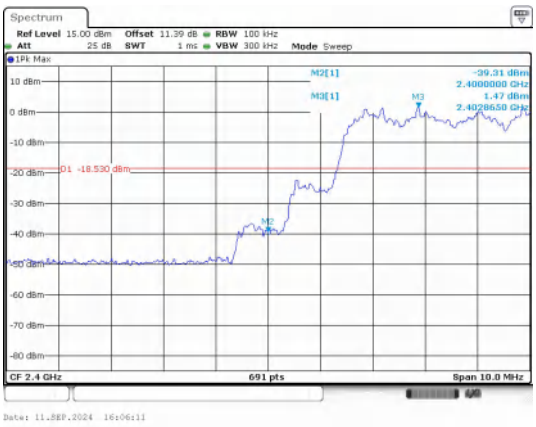
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



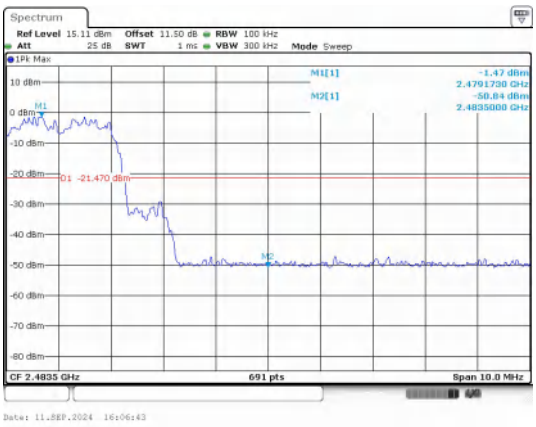
Out Of Band Emission(Right)

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