Appendix A

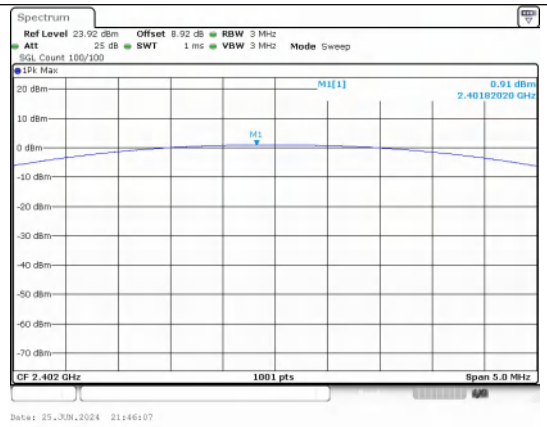
Report No.:	CISRR240528177
FCC ID:	2BGSW-Z68PRO
Product Name:	OPEN WIRELESS HEADSET
Model No.:	Z68 Pro
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

Conducted Peak Output Power

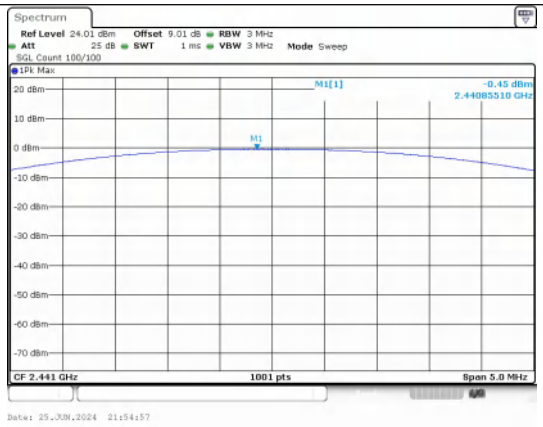
Test Result

Left

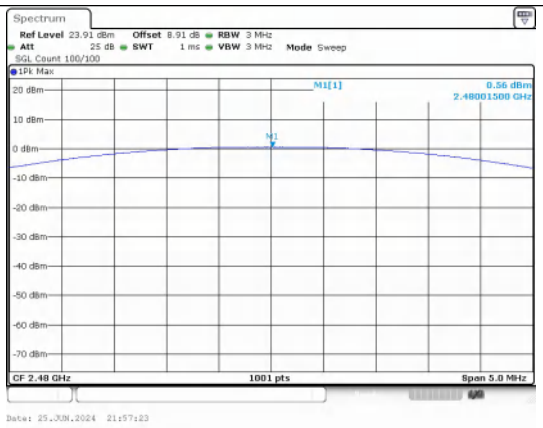
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	0.91	1.23	30	PASS
		39	-0.45	0.90		PASS
		78	0.56	1.14		PASS
π/4DQPSK	2-DH5	0	1.14	1.30	20.97	PASS
		39	-0.15	0.97		PASS
		78	0.99	1.26		PASS
8DPSK	3-DH5	0	1.46	1.40		PASS
		39	0.23	1.05		PASS
		78	1.42	1.39		PASS



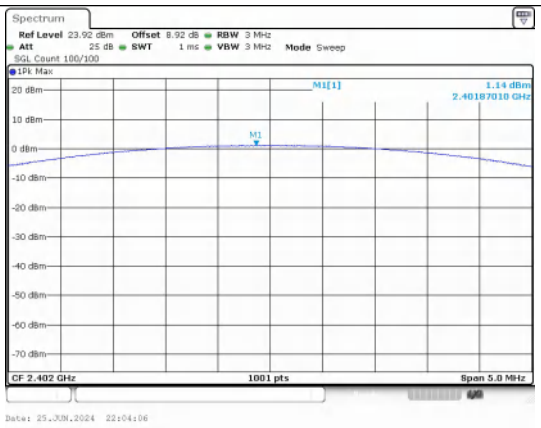
Peak Output Power
GFSK_Channel 0



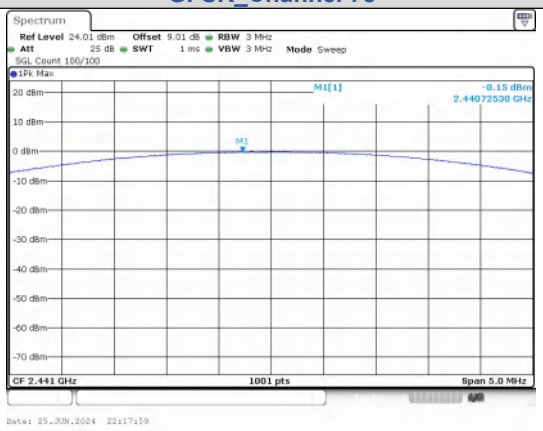
Peak Output Power
GFSK_Channel 39



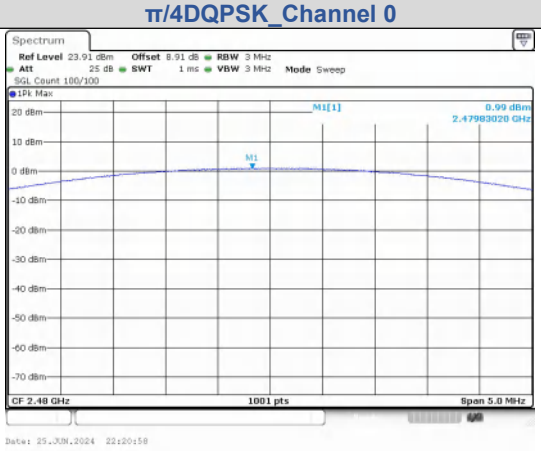
Peak Output Power
GFSK_Channel 78



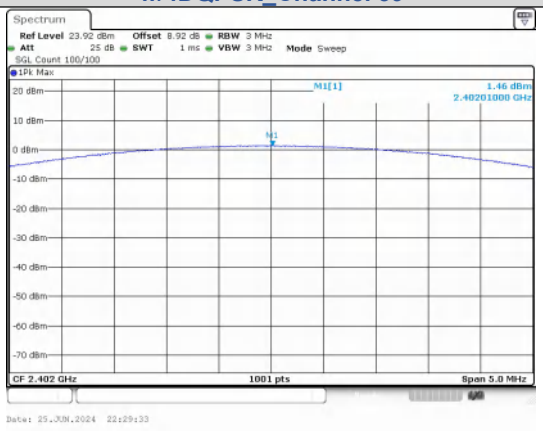
Peak Output Power
π/4DQPSK_Channel 0



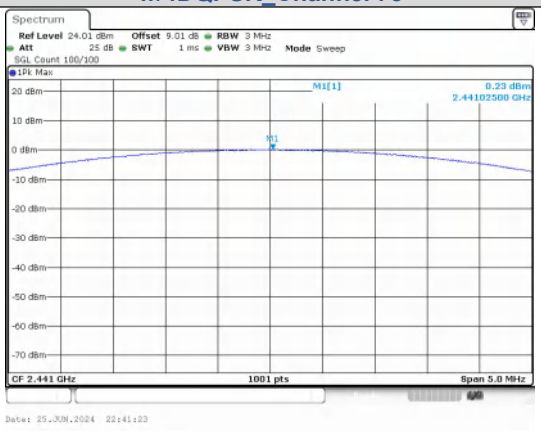
Peak Output Power
π/4DQPSK_Channel 39



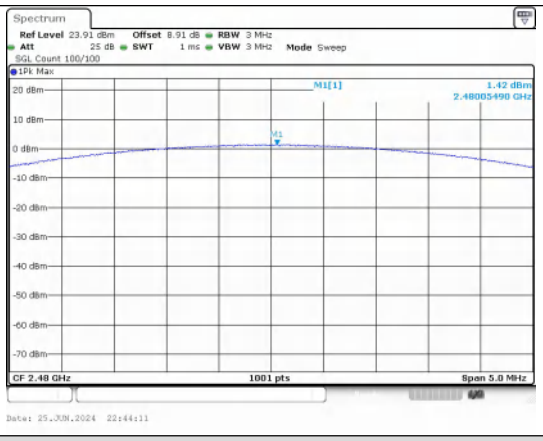
Peak Output Power
π/4DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



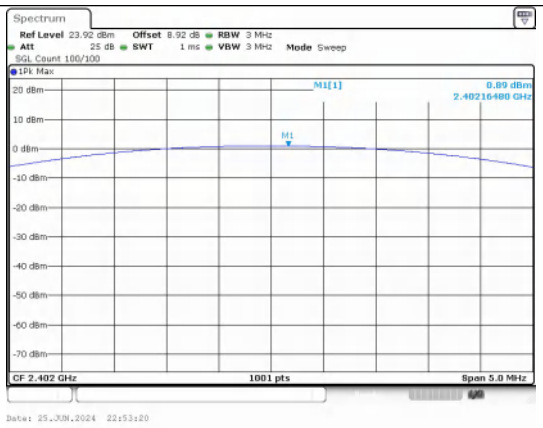
Peak Output Power
8DPSK_Channel 39



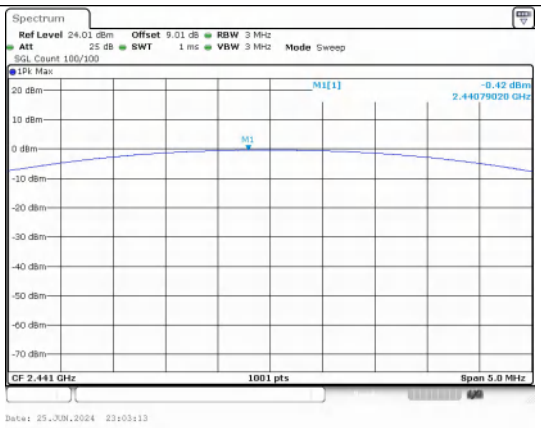
Peak Output Power
8DPSK_Channel 78

Right

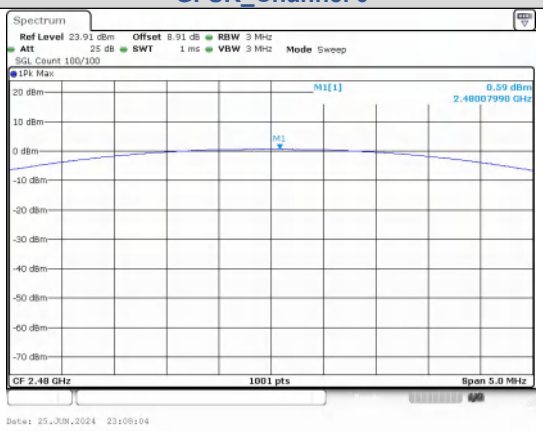
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	0.89	1.23	30	PASS
		39	-0.42	0.91		PASS
		78	0.59	1.15		PASS
π/4DQPSK	2-DH5	0	1.27	1.34	20.97	PASS
		39	0.05	1.01		PASS
		78	1.21	1.32		PASS
8DPSK	3-DH5	0	1.54	1.43		PASS
		39	0.27	1.06		PASS
		78	1.40	1.38		PASS



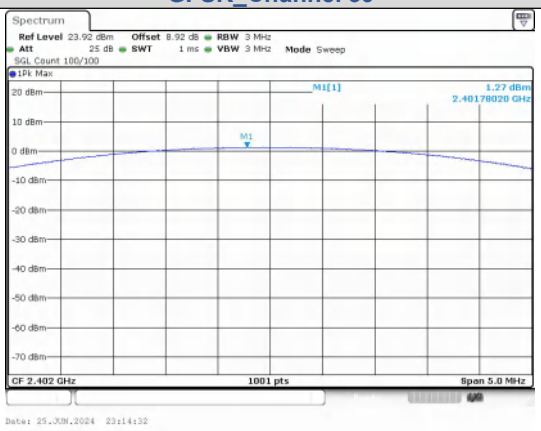
Peak Output Power
GFSK_Channel 0



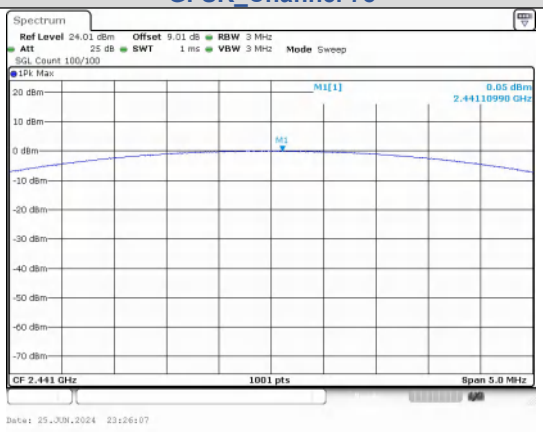
Peak Output Power
GFSK_Channel 39



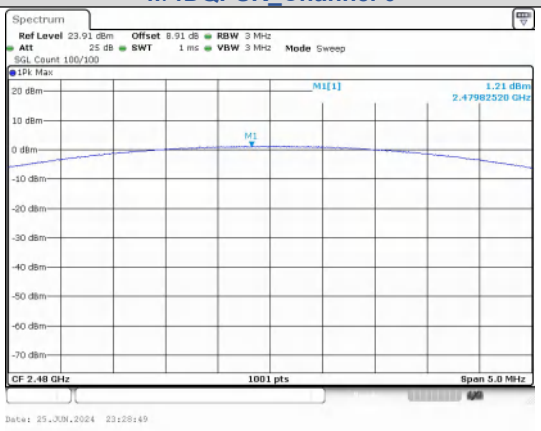
Peak Output Power
GFSK_Channel 78



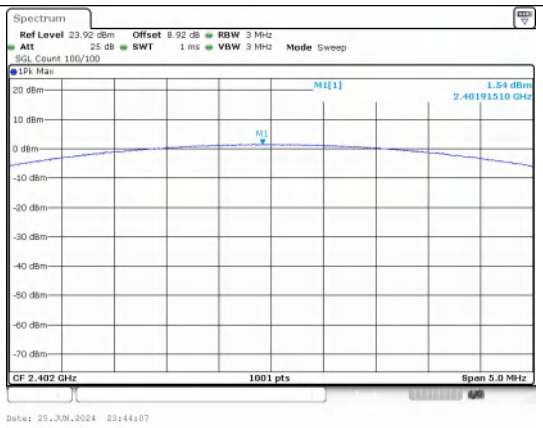
Peak Output Power
π/4DQPSK_Channel 0



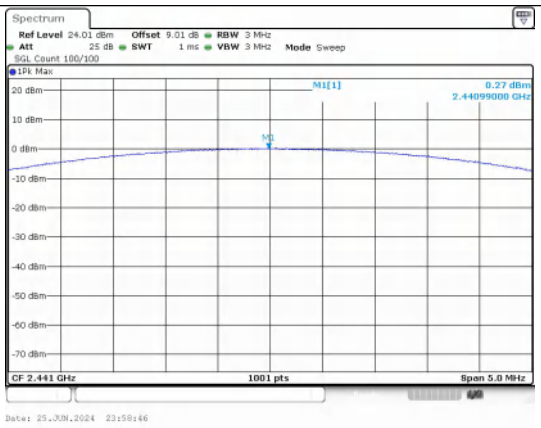
Peak Output Power
π/4DQPSK_Channel 39



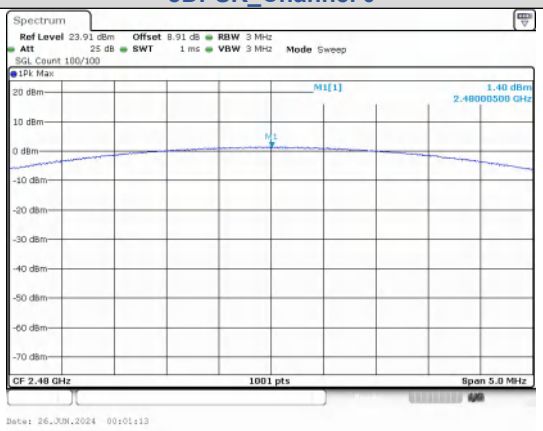
Peak Output Power
π/4DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



Peak Output Power
8DPSK_Channel 78

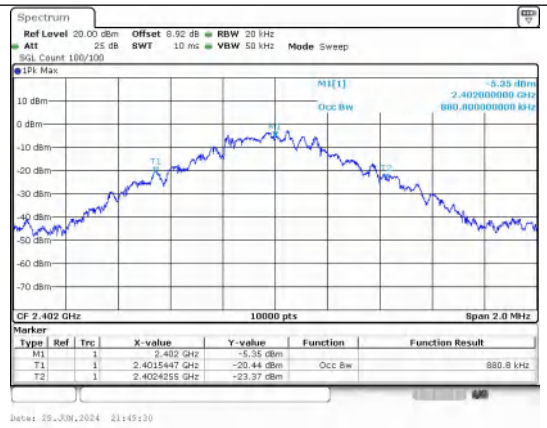
99% Bandwidth

Test Result

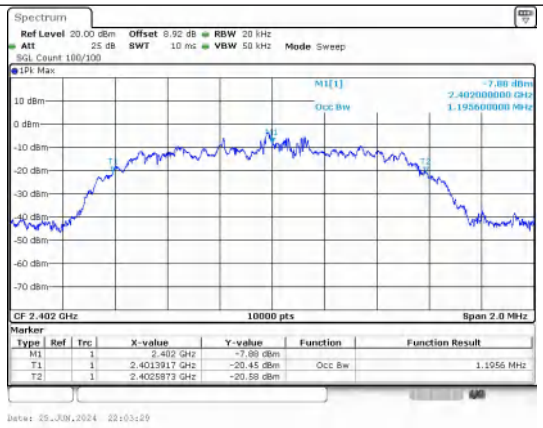
Left

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.8808
	39	2441	0.8718
	78	2480	0.8754
π/4DQPSK	0	2402	1.1956
	39	2441	1.1940
	78	2480	1.1848
8DPSK	0	2402	1.2062
	39	2441	1.2050
	78	2480	1.1954

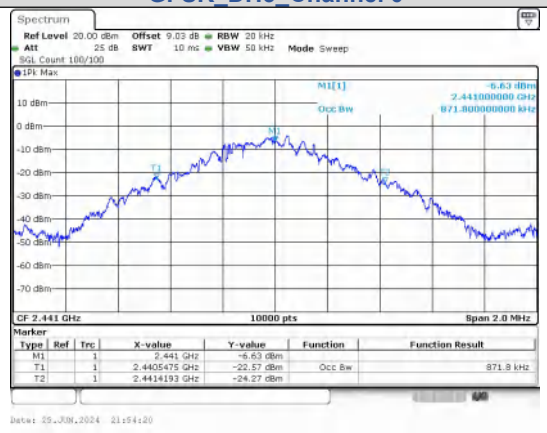
Test Graphs



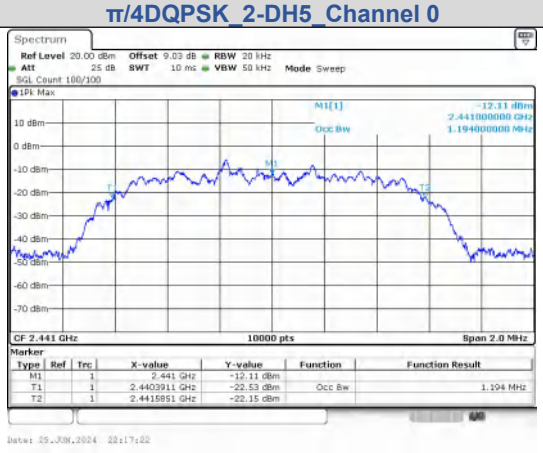
GFSK_DH5_Channel 0



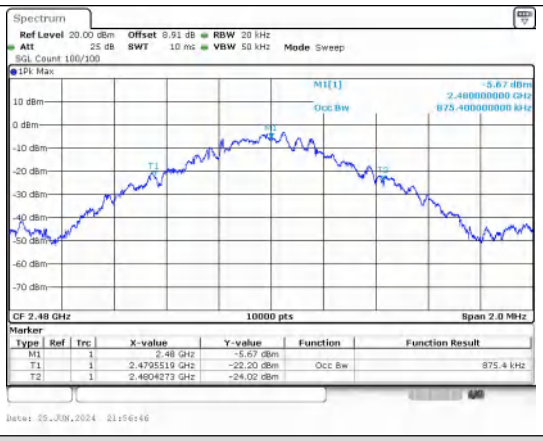
π/4DQPSK_2-DH5_Channel 0



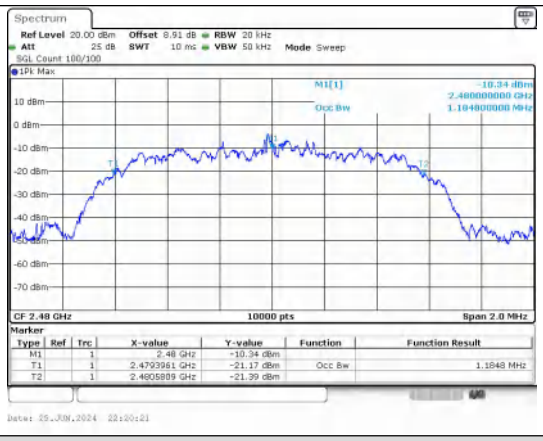
GFSK_DH5_Channel 39



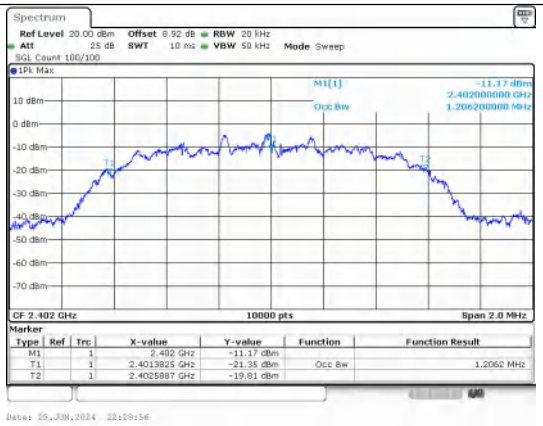
π/4DQPSK_2-DH5_Channel 39



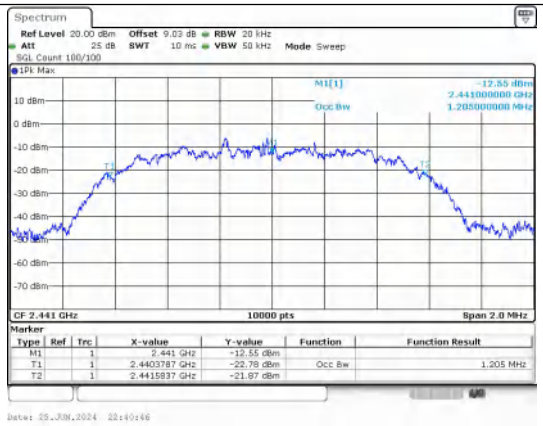
GFSK_DH5_Channel 78



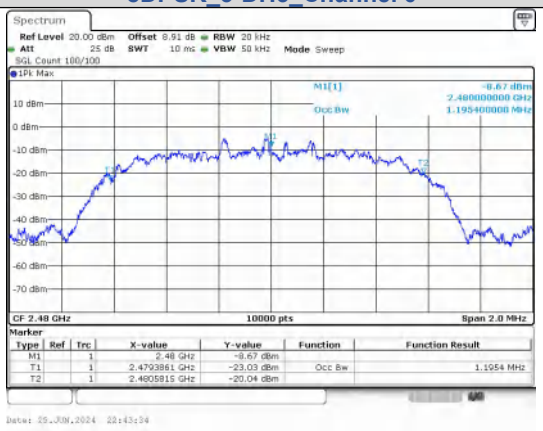
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



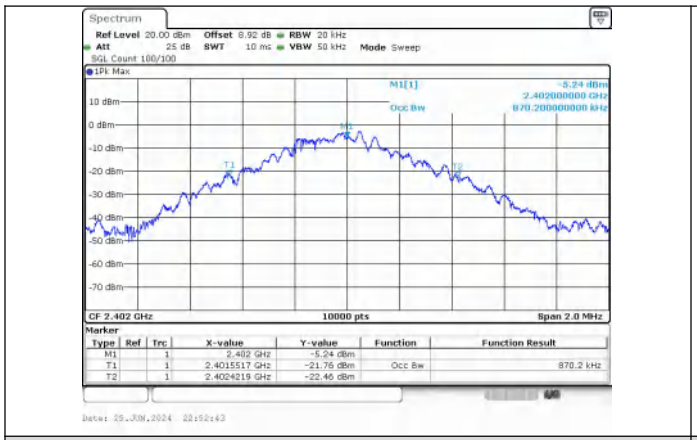
8DPSK_3-DH5_Channel 78

Right

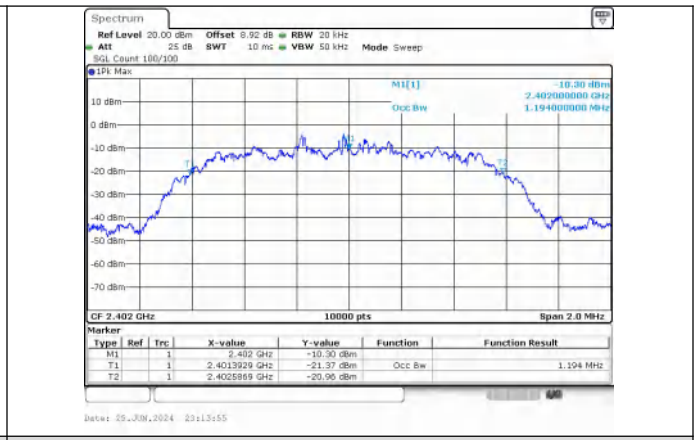
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.8702
	39	2441	0.8686
	78	2480	0.8720
π/4DQPSK	0	2402	1.1940
	39	2441	1.1834
	78	2480	1.1774
8DPSK	0	2402	1.1990
	39	2441	1.2004
	78	2480	1.1896

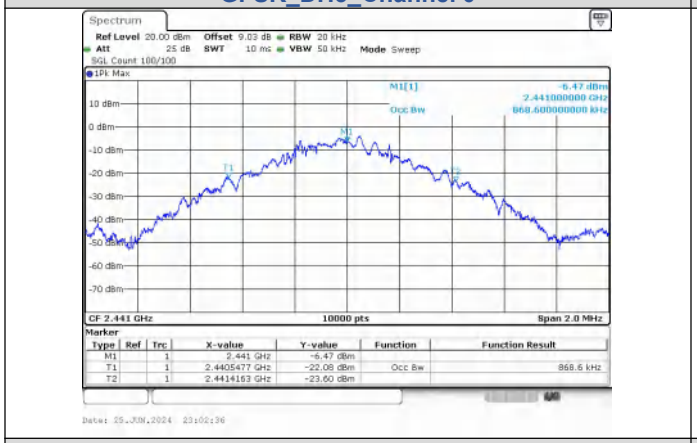
Test Graphs



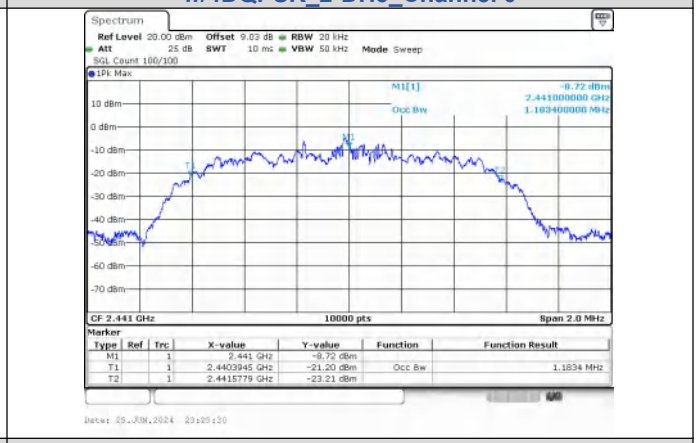
GFSK_DH5_Channel 0



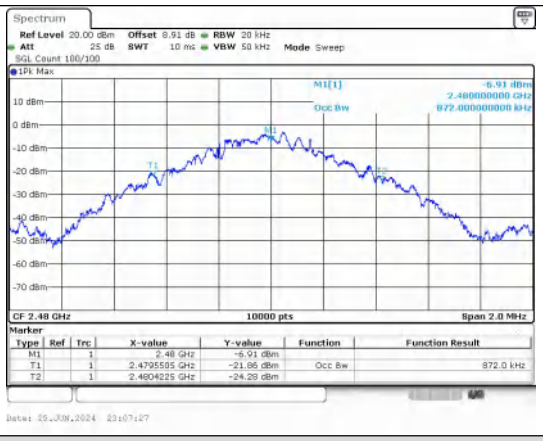
π/4DQPSK_2-DH5_Channel 0



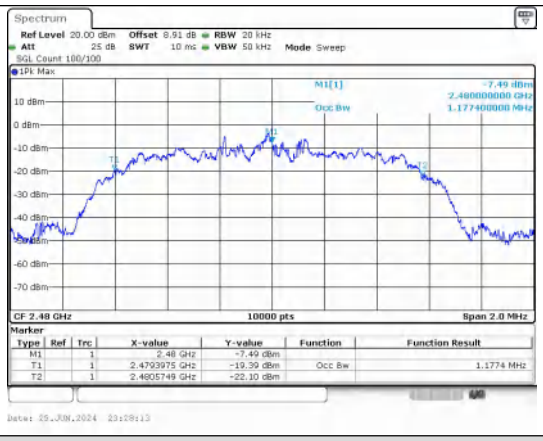
GFSK_DH5_Channel 39



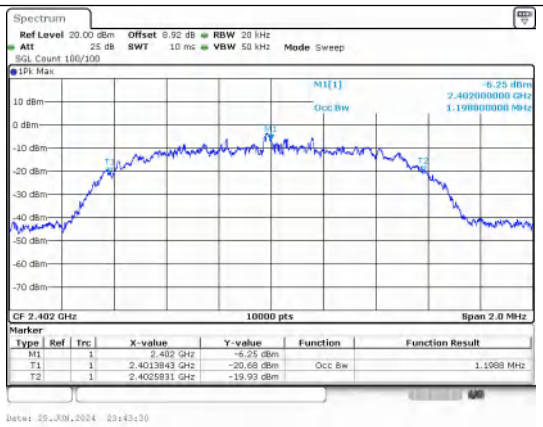
π/4DQPSK_2-DH5_Channel 39



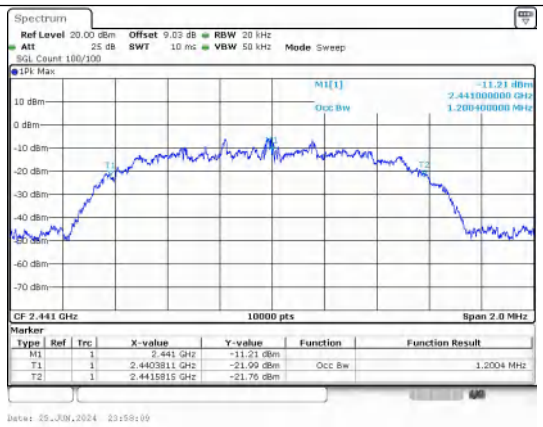
GFSK_DH5_Channel 78



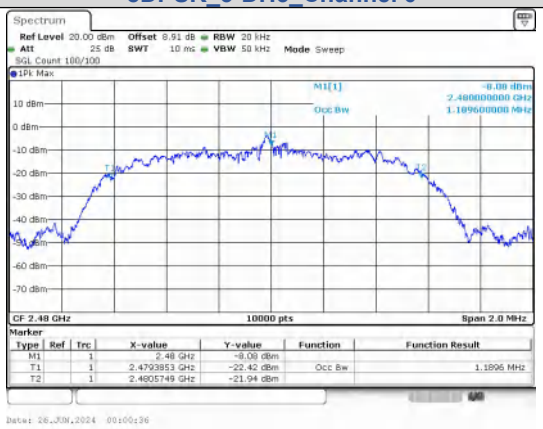
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

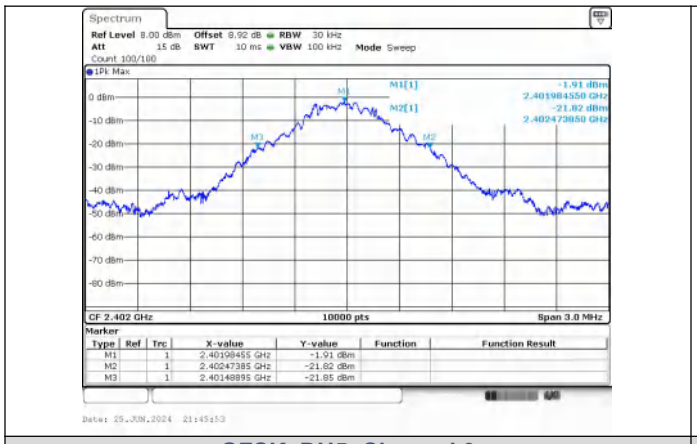
20dB Bandwidth

Test Result

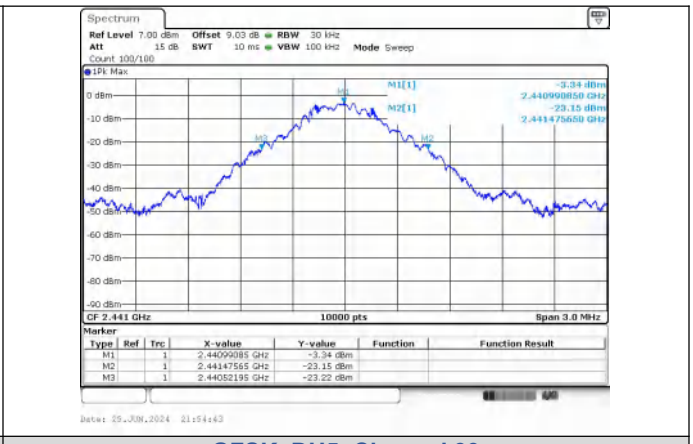
Left

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9800
	39	2441 MHz	0.9600
	78	2480 MHz	0.9500
π/4DQPSK	0	2402 MHz	1.310
	39	2441 MHz	1.300
	78	2480 MHz	1.280
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.290
	78	2480 MHz	1.280

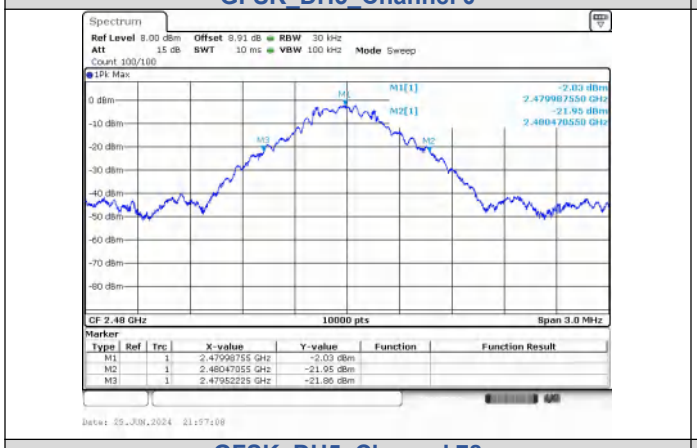
Test Graphs



GFSK_DH5_Channel 0

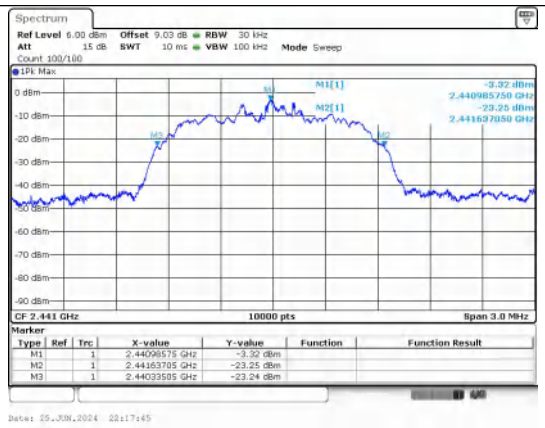


GFSK_DH5_Channel 39

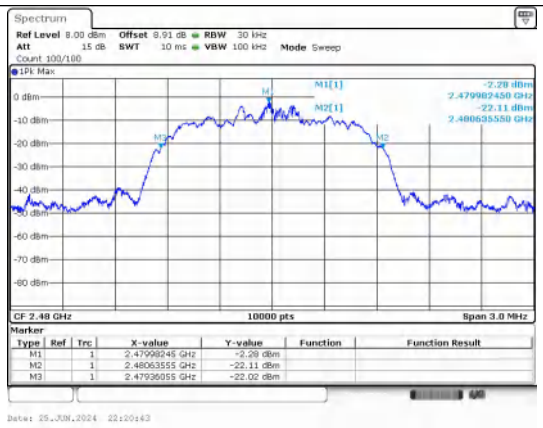


GFSK_DH5_Channel 78

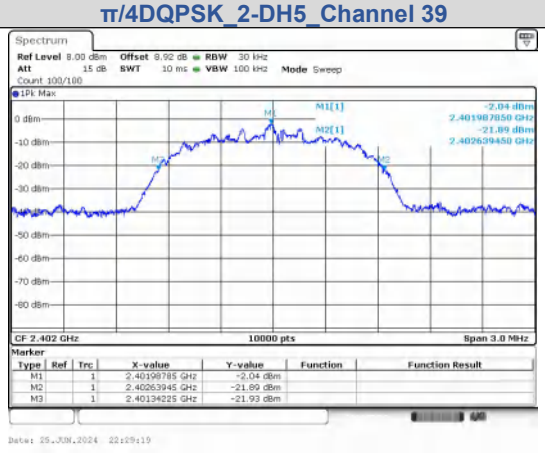
π/4DQPSK_2-DH5_Channel 0



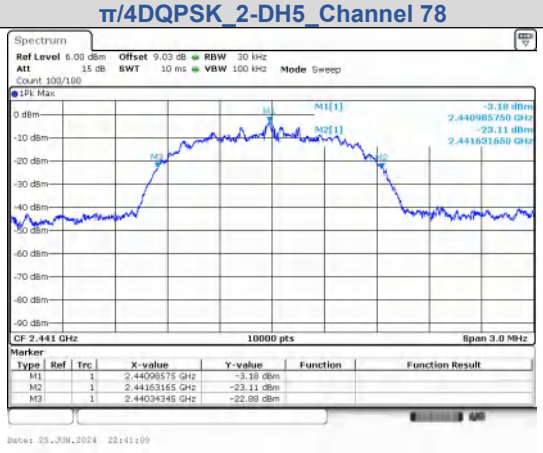
π/4DQPSK_2-DH5_Channel 39



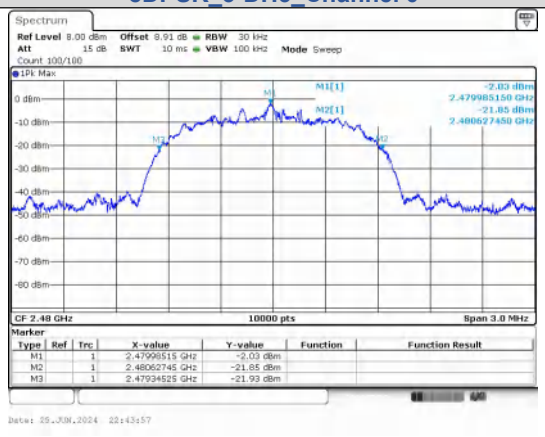
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



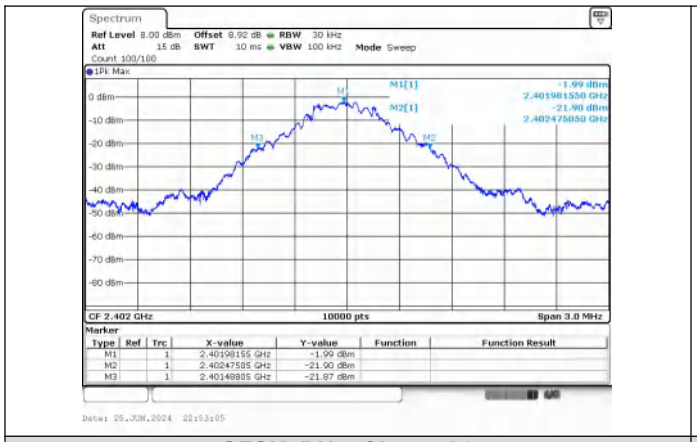
8DPSK_3-DH5_Channel 78

Right

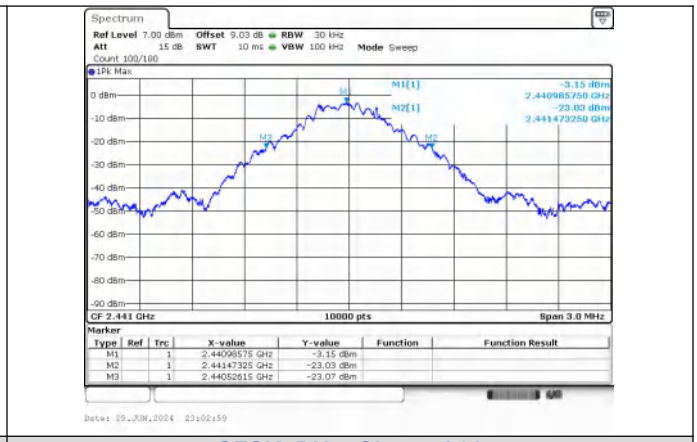
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9900
	39	2441 MHz	0.9400
	78	2480 MHz	0.9600
π/4DQPSK	0	2402 MHz	1.310
	39	2441 MHz	1.320
	78	2480 MHz	1.280
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.290
	78	2480 MHz	1.290

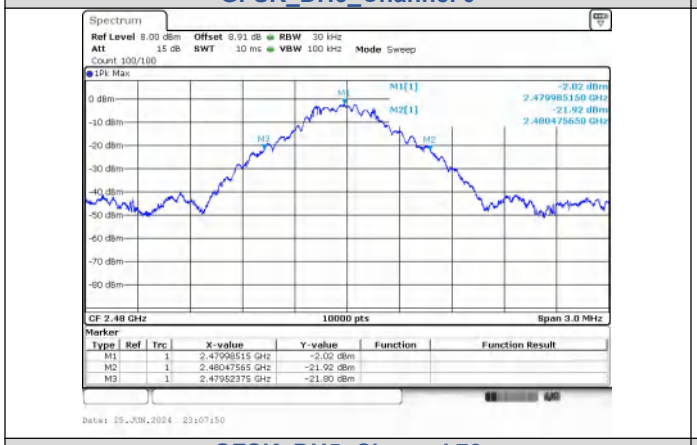
Test Graphs



GFSK_DH5_Channel 0

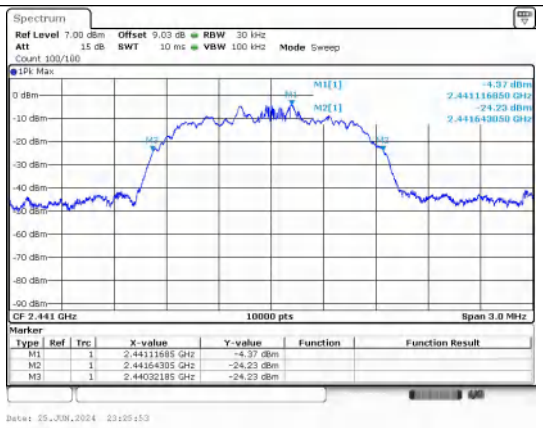


GFSK_DH5_Channel 39

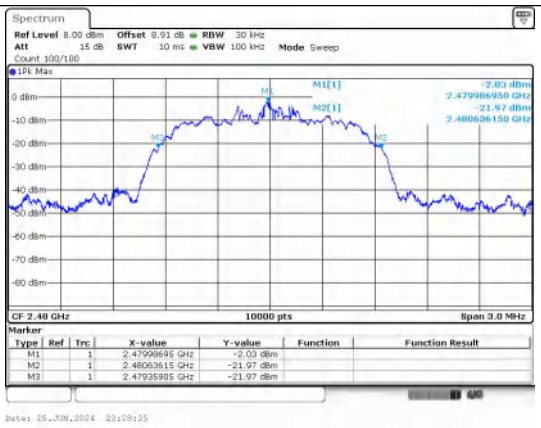


GFSK_DH5_Channel 78

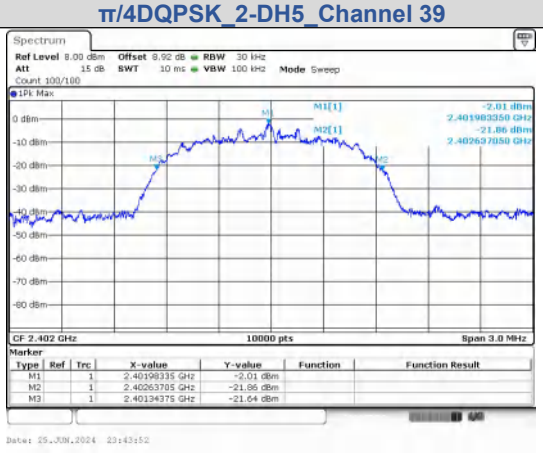
π/4DQPSK_2-DH5_Channel 0



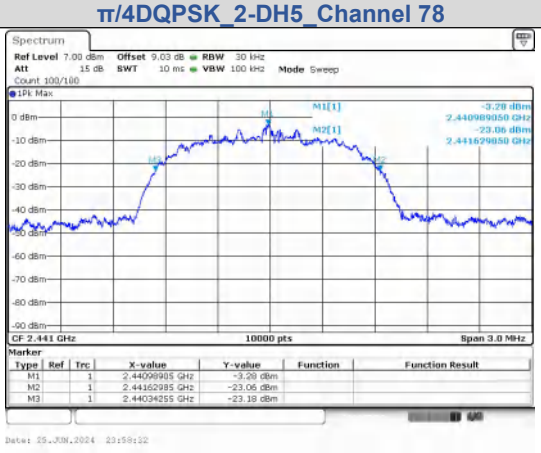
π/4DQPSK_2-DH5_Channel 39



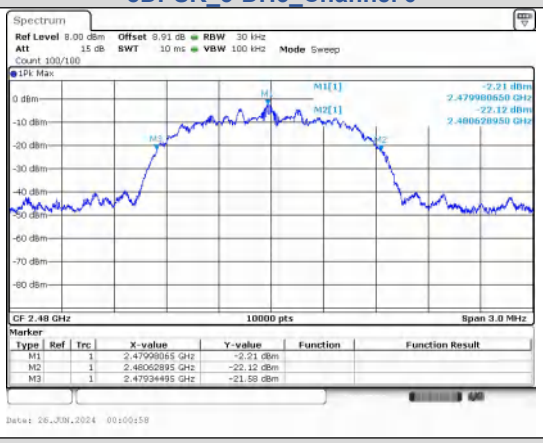
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

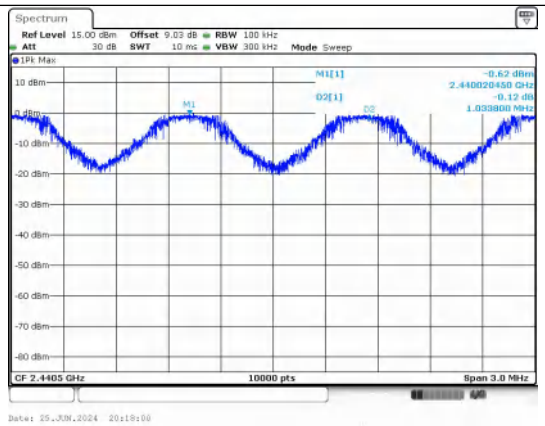
Carrier Frequencies Separation

Test Result

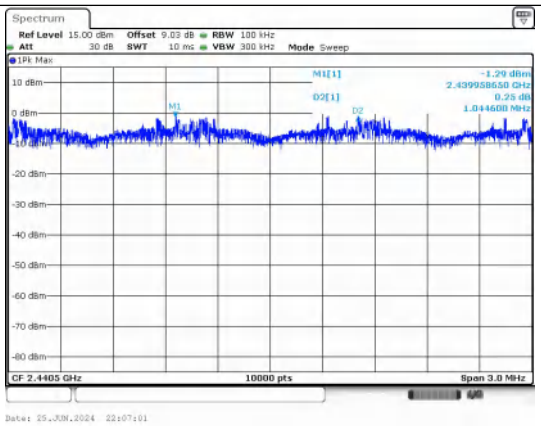
Left

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0579	2440.9913	1.0338	0.980	PASS
π/4DQPSK	2-DH5	2439.9587	2441.0033	1.0446	0.873	PASS
8DPSK	3-DH5	2440.0253	2441.0069	0.9816	0.867	PASS

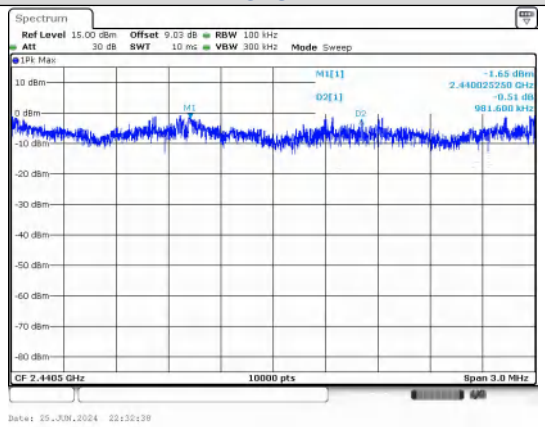
Test Graphs



GFSK



π/4DQPSK

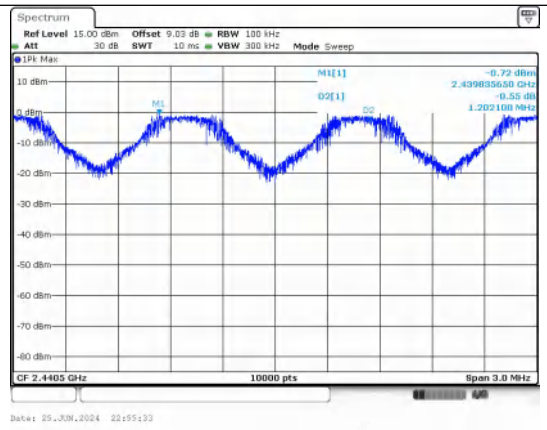


8DPSK

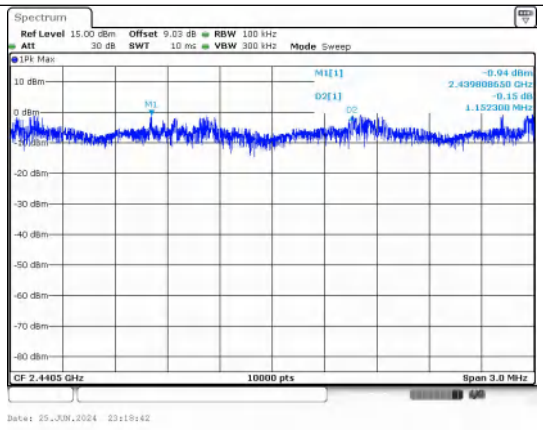
Right

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8356	2441.0377	1.2021	0.990	PASS
π/4DQPSK	2-DH5	2439.8086	2440.961	1.1523	0.873	PASS
8DPSK	3-DH5	2439.9952	2441.1494	1.1541	0.867	PASS

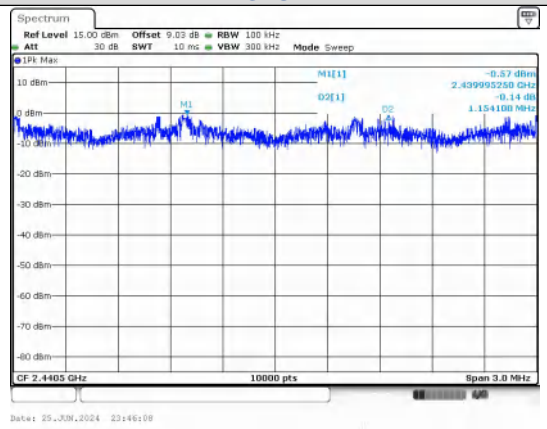
Test Graphs



GFSK



π/4DQPSK



8DPSK

Conducted Out Of Band Emission

Test Result

Left

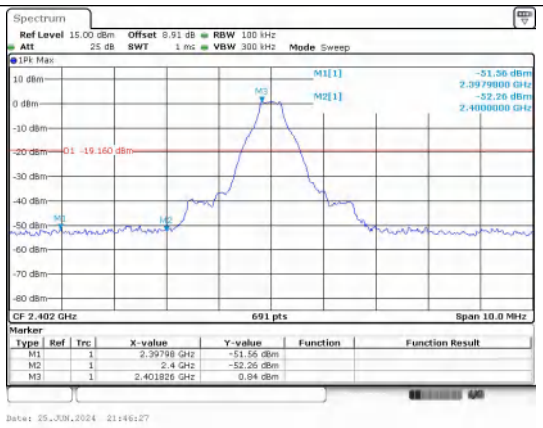
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2397.98	-51.558	-19.16	-32.398	PASS
			2400.00	-52.258	-19.16	-33.098	PASS
			4804.70	-25.148	-19.16	-5.988	PASS
		39	4881.25	-25.411	-20.63	-4.781	PASS
		78	2483.50	-53.085	-19.37	-33.715	PASS
			4960.33	-24.738	-19.37	-5.368	PASS
π/4DQPSK	2-DH5	0	2400.00	-41.980	-19.26	-22.720	PASS
			4804.68	-28.218	-19.26	-8.958	PASS
		39	4881.25	-23.577	-20.59	-2.987	PASS
		78	2483.50	-52.747	-19.84	-32.907	PASS
			4959.49	-28.045	-19.84	-8.205	PASS
8DPSK	3-DH5	0	2400.00	-42.913	-19.6	-23.312	PASS
			4803.85	-26.386	-19.6	-6.786	PASS
		39	4882.09	-28.408	-20.42	-7.988	PASS
		78	2483.50	-52.180	-19.36	-32.820	PASS
			4960.33	-30.195	-19.36	-10.835	PASS

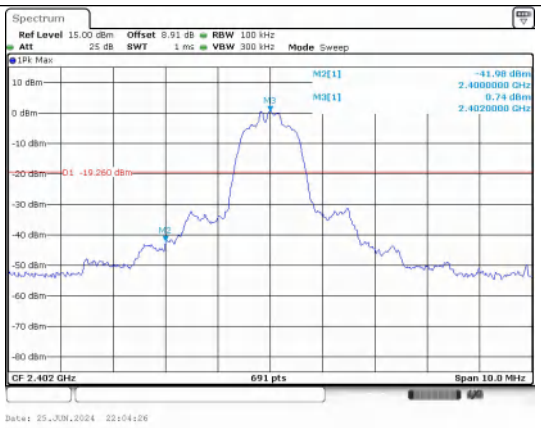
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.72	-50.922	-19.15	-31.772	PASS
			2400.00	-53.152	-19.15	-34.002	PASS
			2483.50	-51.924	-19.65	-32.274	PASS
			2395.22	-51.069	-19.3	-31.769	PASS
			2400.00	-52.057	-19.3	-32.757	PASS
			2483.50	-50.934	-19.71	-31.224	PASS
π/4DQPSK	2-DH5		2400.00	-44.843	-19.57	-25.273	PASS
			2483.50	-51.973	-19.48	-32.493	PASS
			2400.00	-44.654	-19.31	-25.344	PASS
			2483.50	-51.835	-20.06	-31.775	PASS
8DPSK	3-DH5		2400.00	-44.254	-19.71	-24.544	PASS
			2483.50	-52.288	-20.23	-32.058	PASS
			2400.00	-46.056	-19.12	-26.936	PASS
			2483.50	-53.176	-20.39	-32.786	PASS

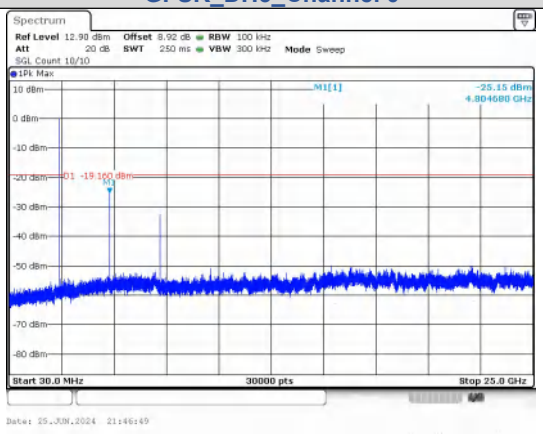
Test Graphs



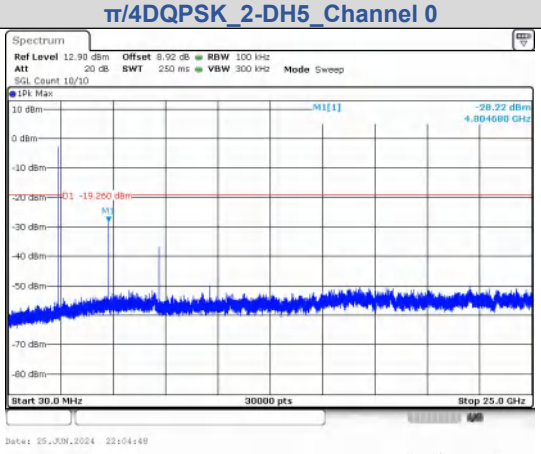
Out Of Band Emission
GFSK_DH5_Channel 0



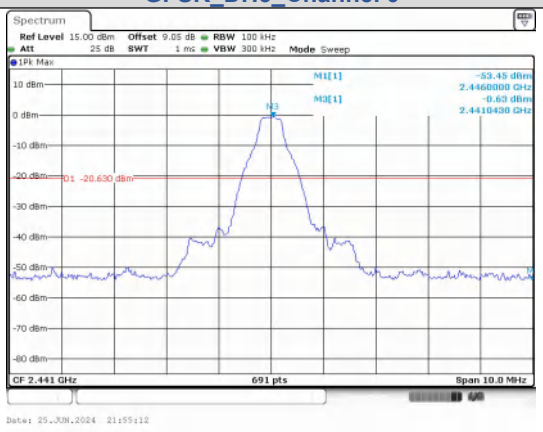
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 0



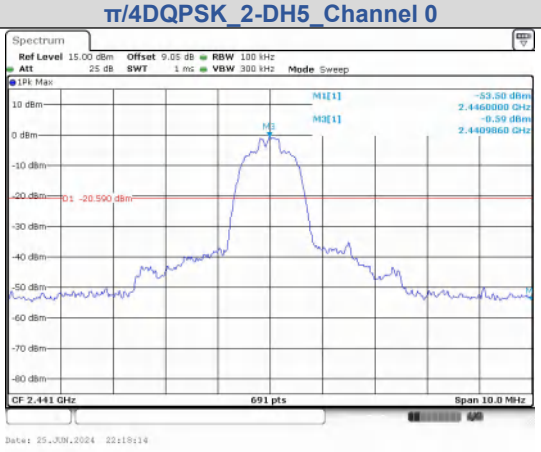
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



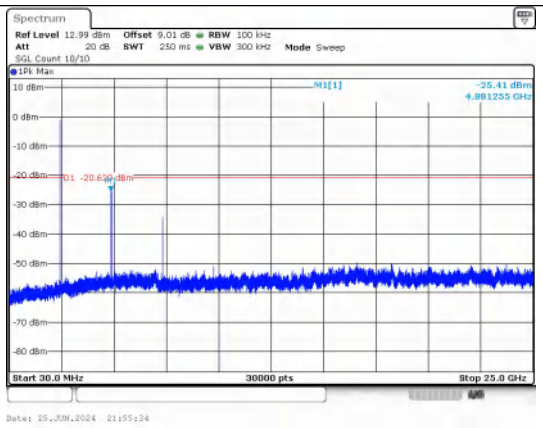
30.0 MHz - 25000.0 MHz
π/4DQPSK_2-DH5_Channel 0



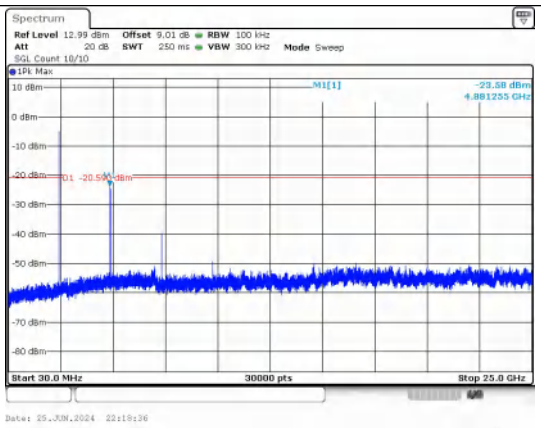
Out Of Band Emission
GFSK_DH5_Channel 39



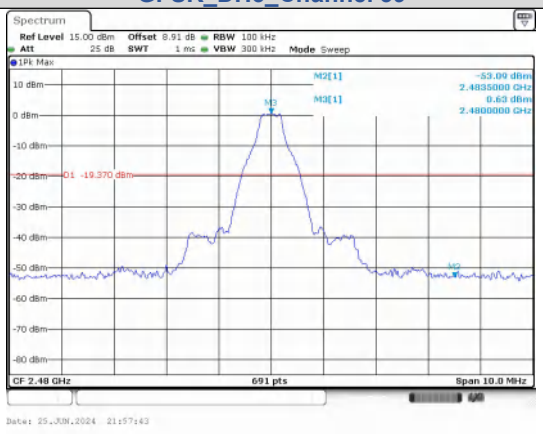
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 39



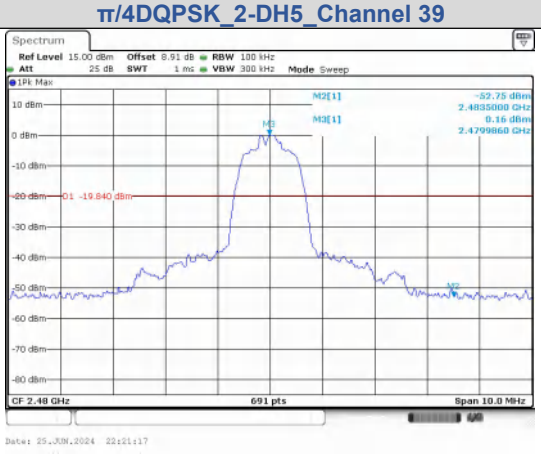
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



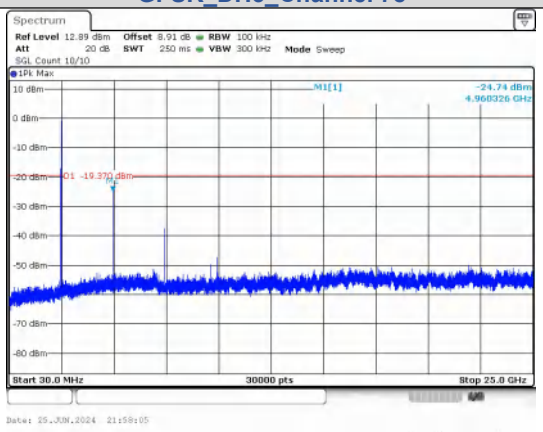
30.0 MHz - 25000.0 MHz
π/4DQPSK_2-DH5_Channel 39



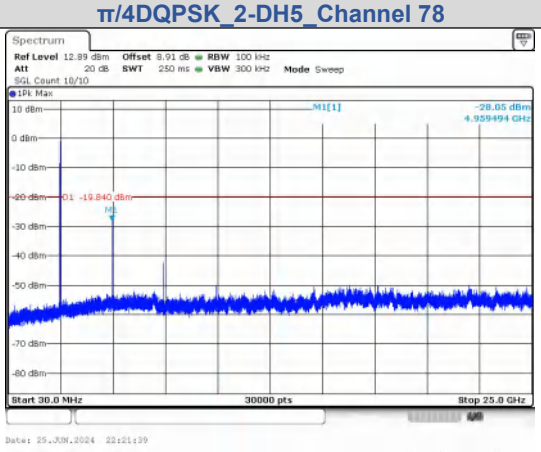
Out Of Band Emission
GFSK_DH5_Channel 78



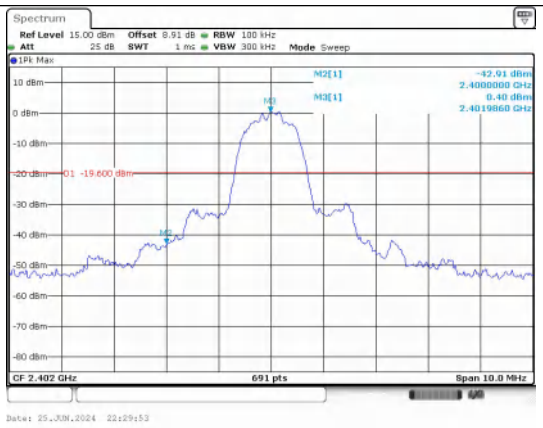
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 78



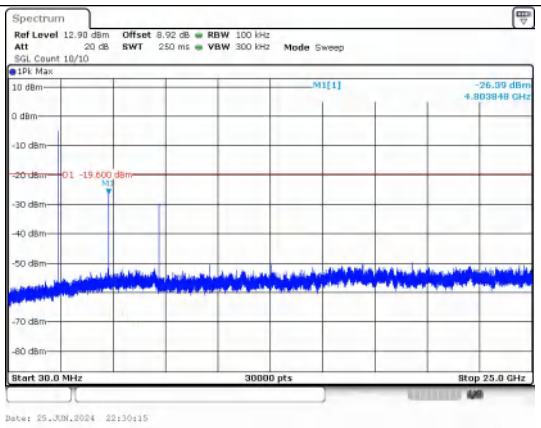
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



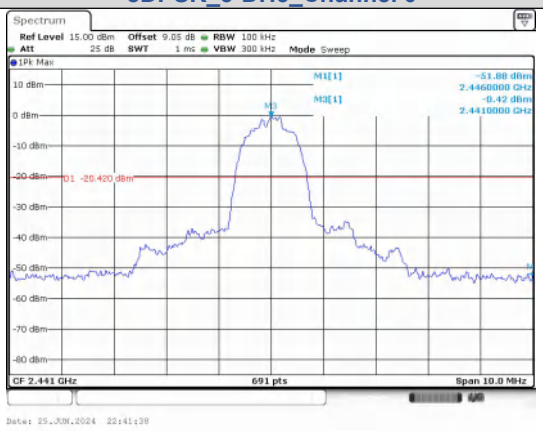
30.0 MHz - 25000.0 MHz
π/4DQPSK_2-DH5_Channel 78



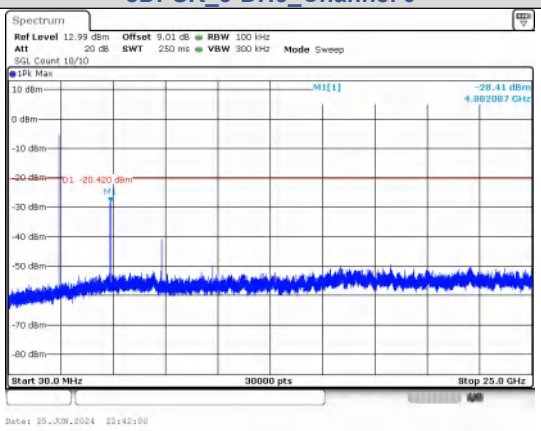
Out Of Band Emission
8DPSK_3-DH5_Channel 0



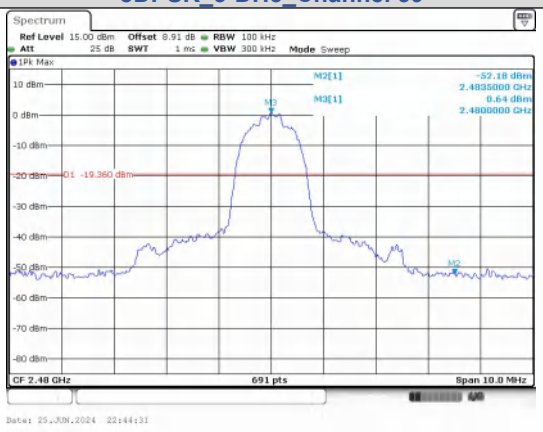
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



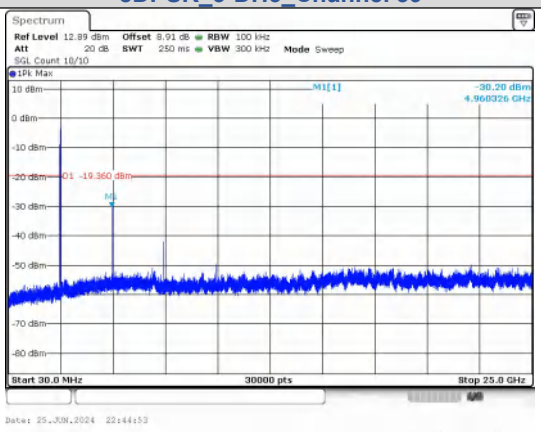
Out Of Band Emission
8DPSK_3-DH5_Channel 39



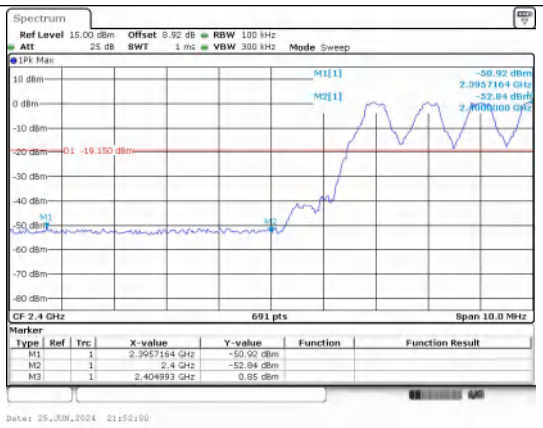
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



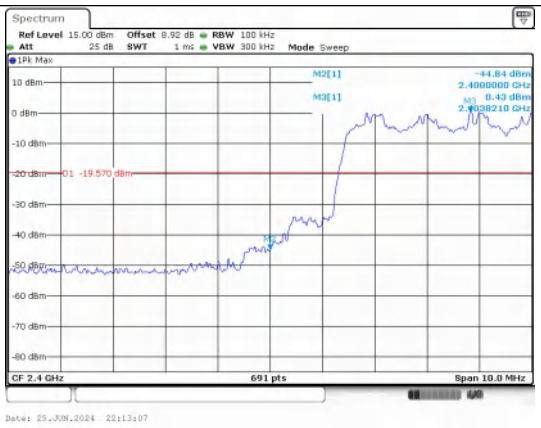
Out Of Band Emission
8DPSK_3-DH5_Channel 78



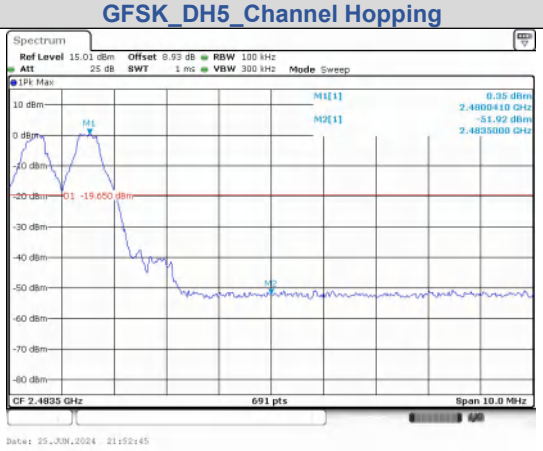
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



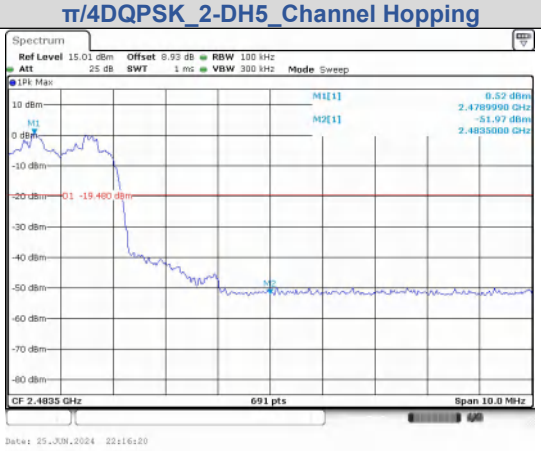
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



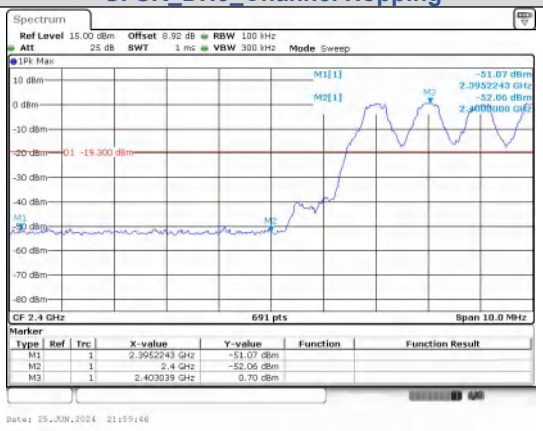
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



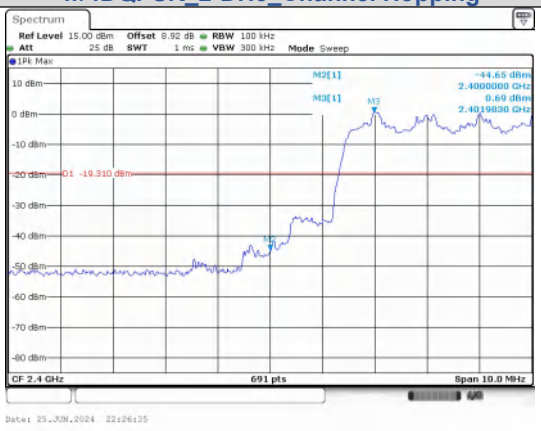
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



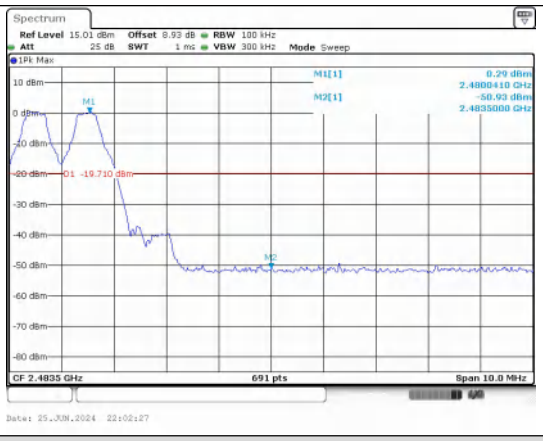
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



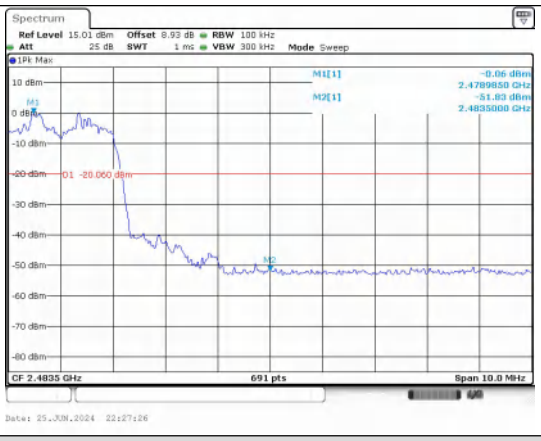
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



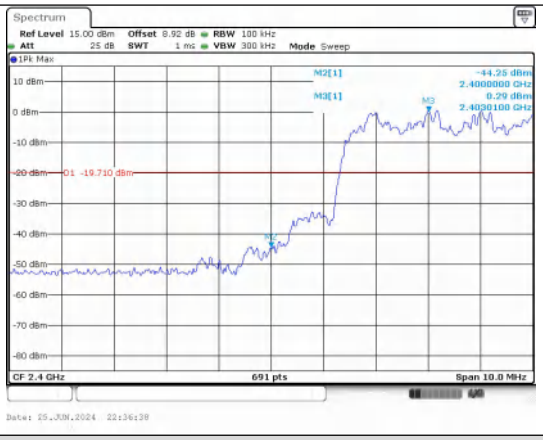
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



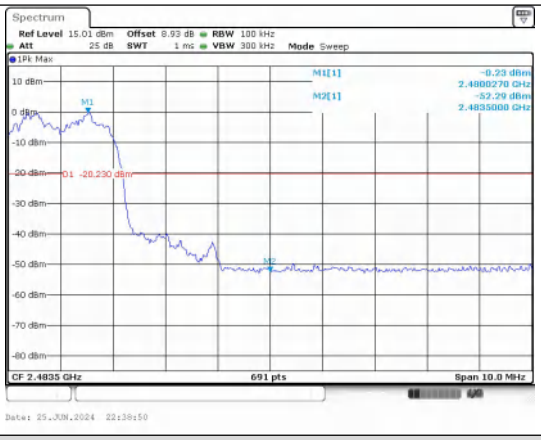
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



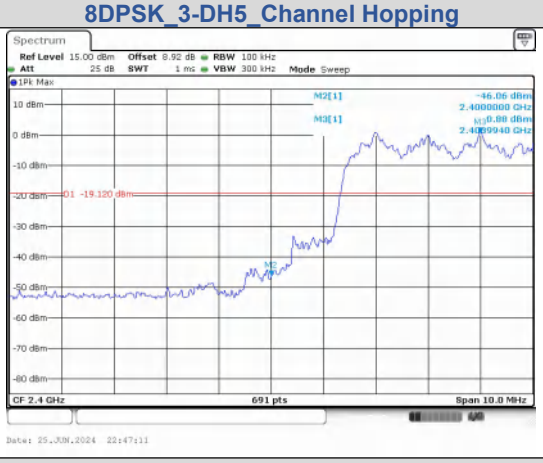
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



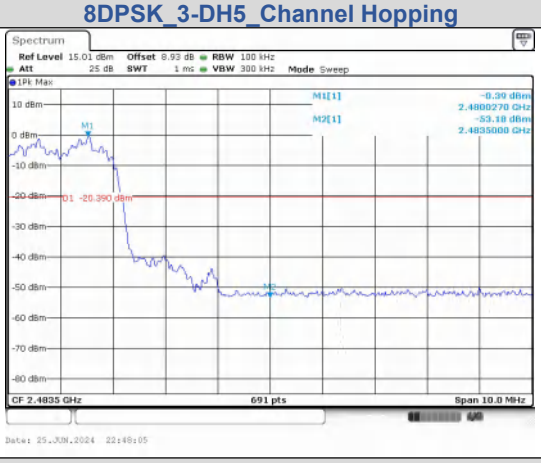
Out Of Band Emission(Left)
8DPSK_3-DH5_Channel Hopping



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

Right

Test Result

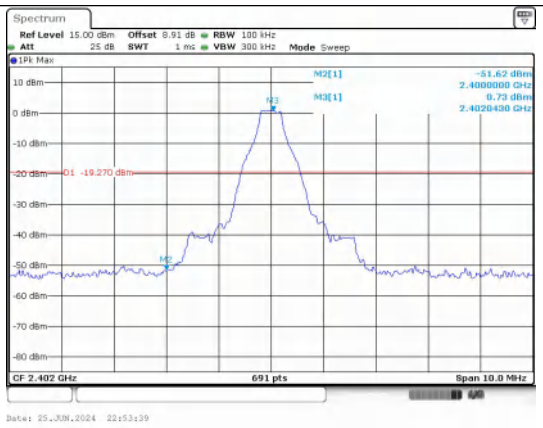
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-51.618	-19.27	-32.349	PASS
			4803.85	-23.872	-19.27	-4.602	PASS
		39	4882.09	-27.569	-20.64	-6.929	PASS
		78	2483.50	-52.423	-19.33	-33.093	PASS
			4960.33	-26.710	-19.33	-7.380	PASS
π/4DQPSK	2-DH5	0	2400.00	-43.008	-19.34	-23.668	PASS
			4803.85	-27.511	-19.34	-8.171	PASS
		39	4882.09	-27.069	-20.62	-6.449	PASS
		78	2483.50	-53.710	-19.71	-34.000	PASS
			4960.33	-30.224	-19.71	-10.514	PASS
8DPSK	3-DH5	0	2400.00	-43.130	-19.34	-23.790	PASS
			4804.68	-23.110	-19.34	-3.770	PASS
		39	4882.09	-25.733	-20.38	-5.353	PASS
		78	2483.50	-51.223	-19.95	-31.273	PASS
			4960.33	-30.073	-19.95	-10.123	PASS

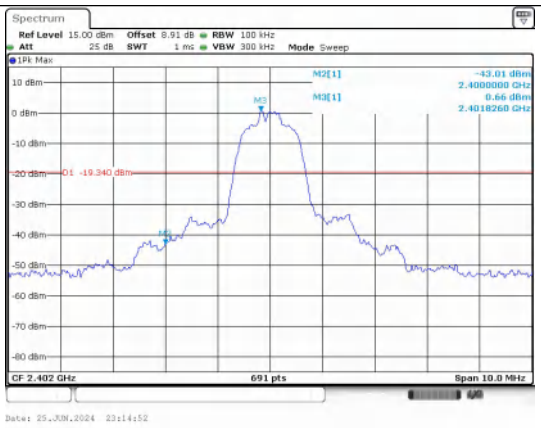
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.77	-50.318	-19.36	-30.958	PASS
			2400.00	-51.932	-19.36	-32.572	PASS
			2483.50	-50.690	-19.61	-31.080	PASS
			2396.63	-50.645	-19.47	-31.175	PASS
			2400.00	-51.894	-19.47	-32.424	PASS
			2483.50	-51.893	-19.54	-32.353	PASS
π/4DQPSK	2-DH5		2400.00	-44.895	-19.38	-25.515	PASS
			2483.50	-51.965	-19.72	-32.245	PASS
			2400.00	-44.102	-19.49	-24.612	PASS
			2483.50	-51.386	-19.46	-31.926	PASS
8DPSK	3-DH5		2400.00	-43.995	-19.17	-24.825	PASS
			2483.50	-51.216	-19.39	-31.826	PASS
			2400.00	-45.411	-19.72	-25.691	PASS
			2483.50	-51.614	-19.72	-31.894	PASS

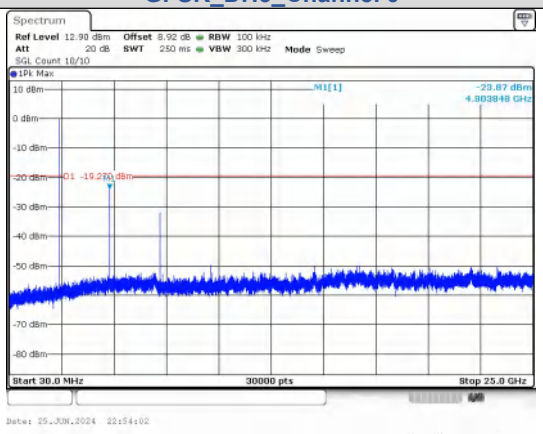
Test Graphs



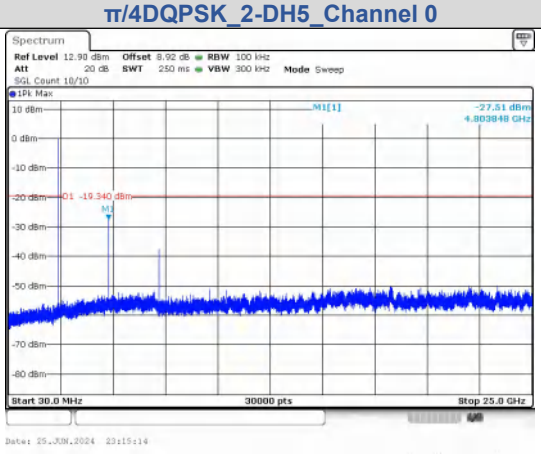
Out Of Band Emission
GFSK_DH5_Channel 0



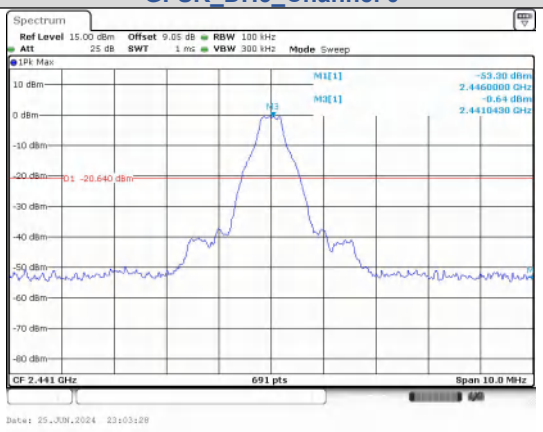
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 0



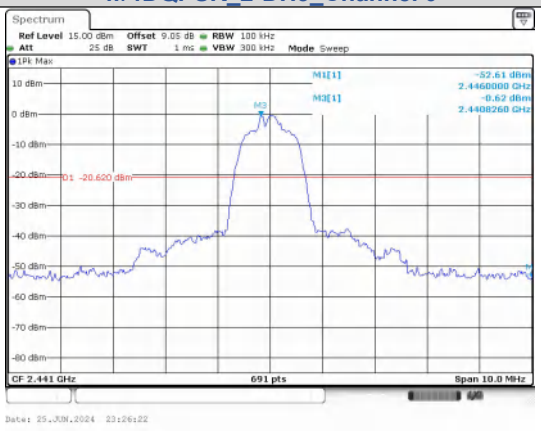
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



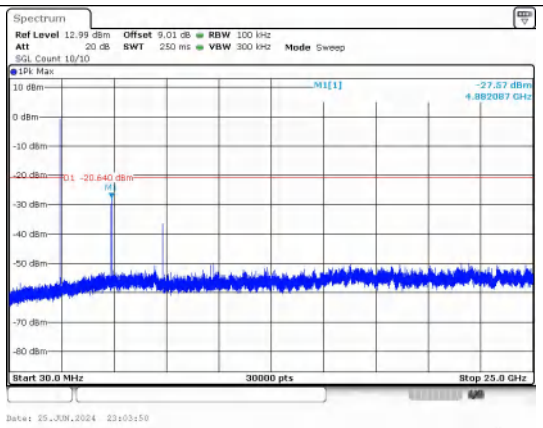
30.0 MHz - 25000.0 MHz
π/4DQPSK_2-DH5_Channel 0



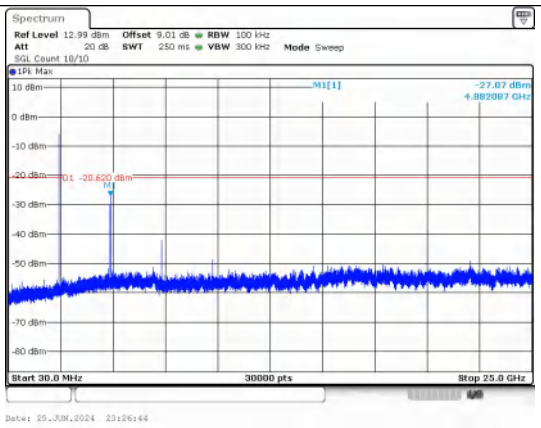
Out Of Band Emission
GFSK_DH5_Channel 39



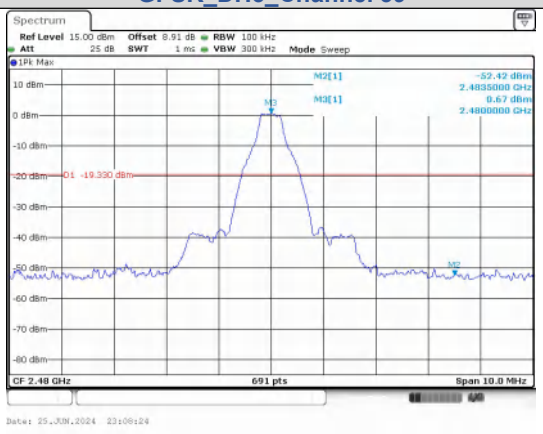
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 39



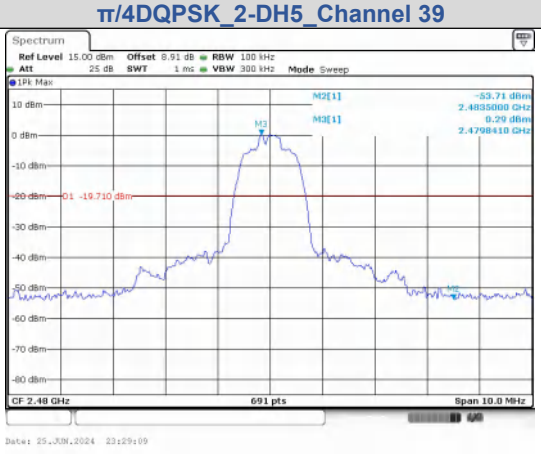
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



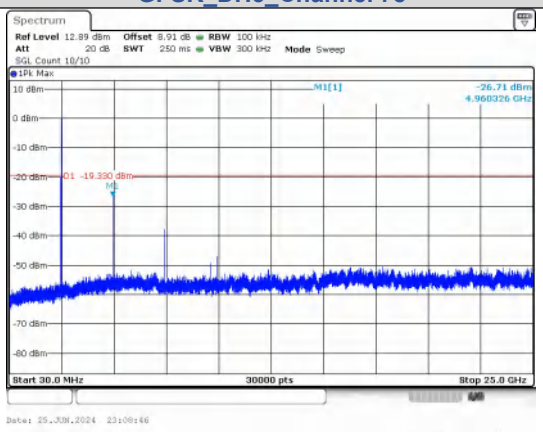
30.0 MHz - 25000.0 MHz
π/4DQPSK_2-DH5_Channel 39



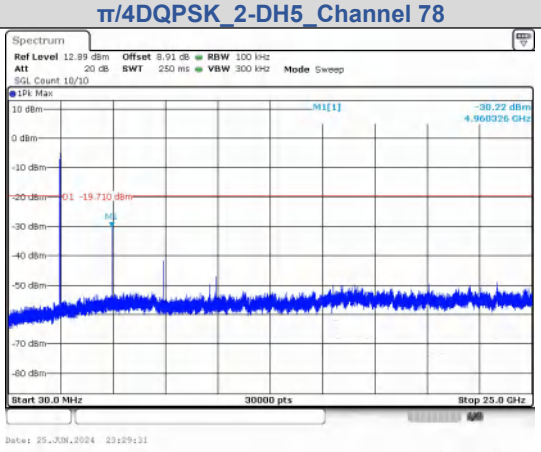
Out Of Band Emission
GFSK_DH5_Channel 78



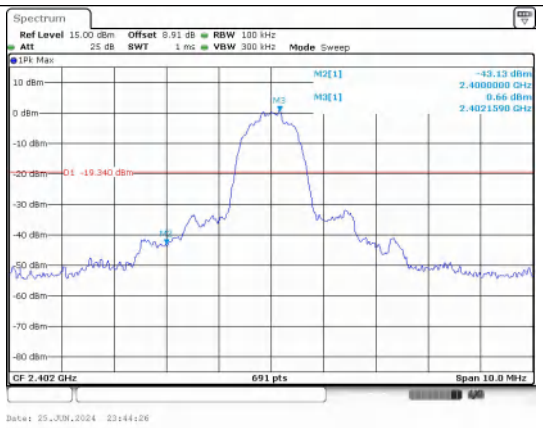
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 78



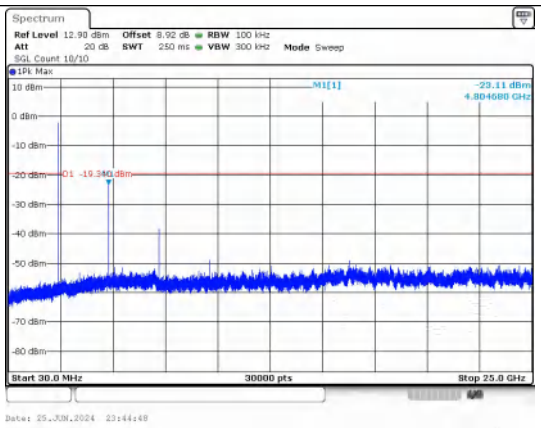
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



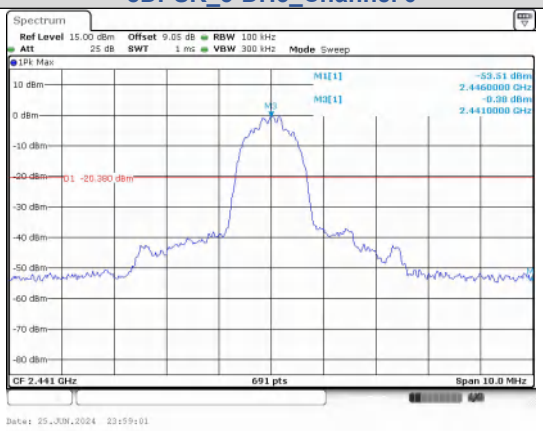
30.0 MHz - 25000.0 MHz
π/4DQPSK_2-DH5_Channel 78



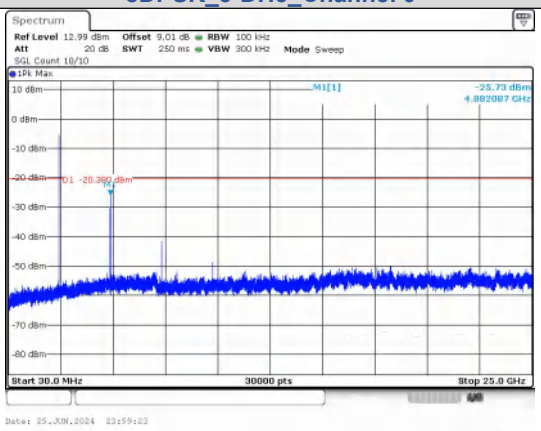
Out Of Band Emission
8DPSK_3-DH5_Channel 0



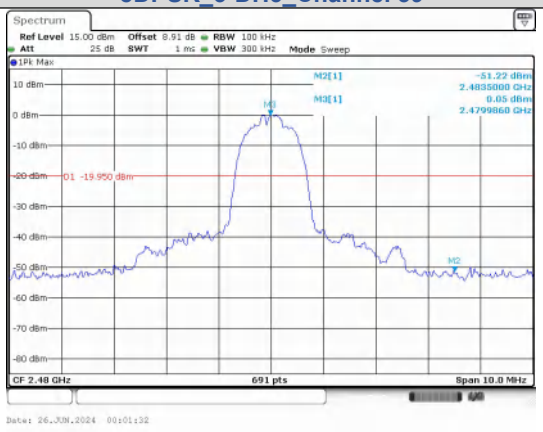
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



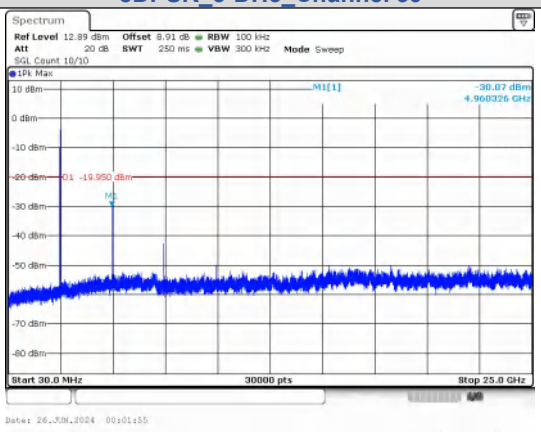
Out Of Band Emission
8DPSK_3-DH5_Channel 39



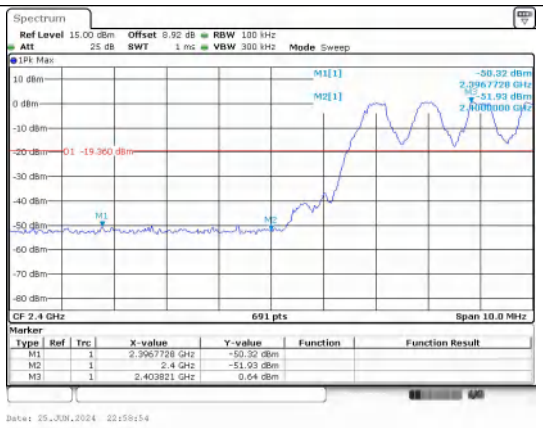
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



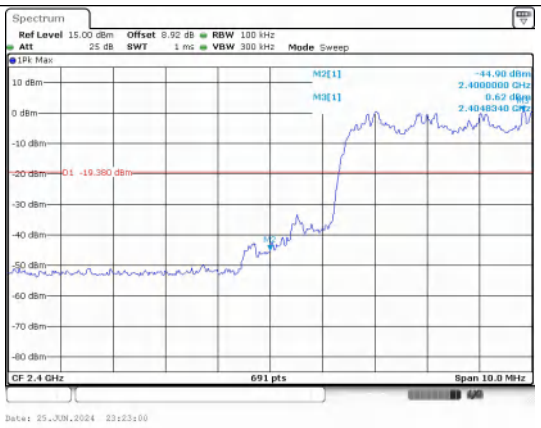
Out Of Band Emission
8DPSK_3-DH5_Channel 78



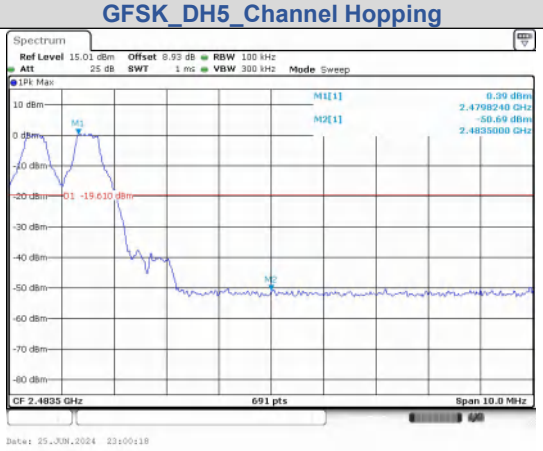
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



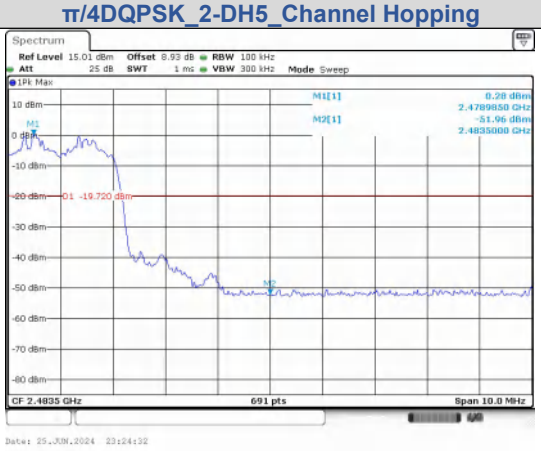
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



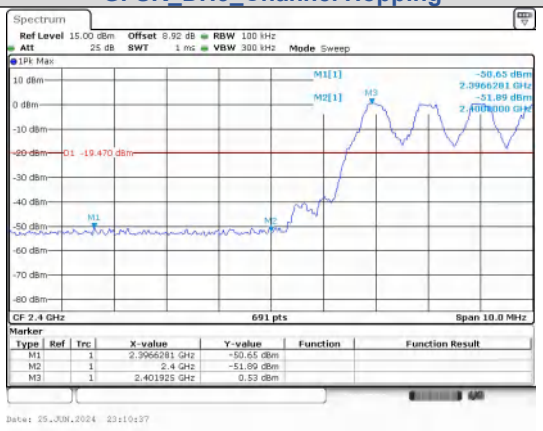
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



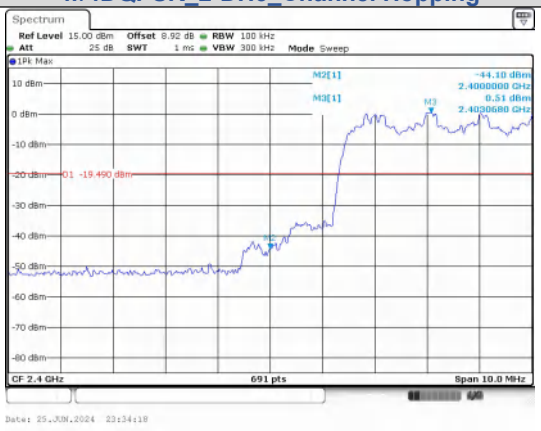
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



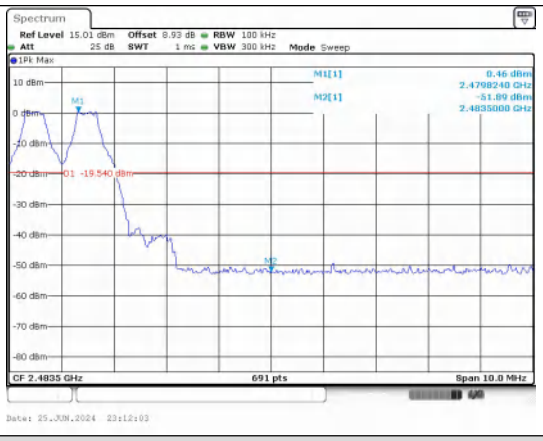
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



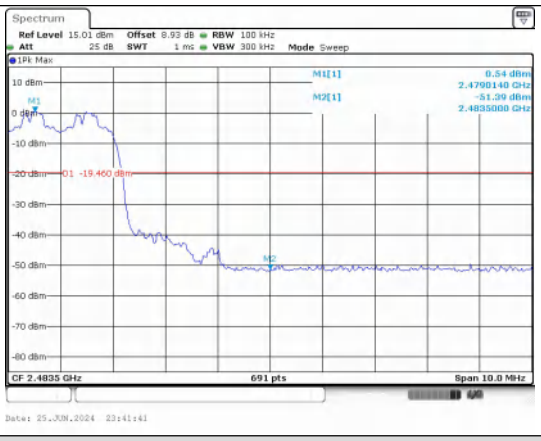
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



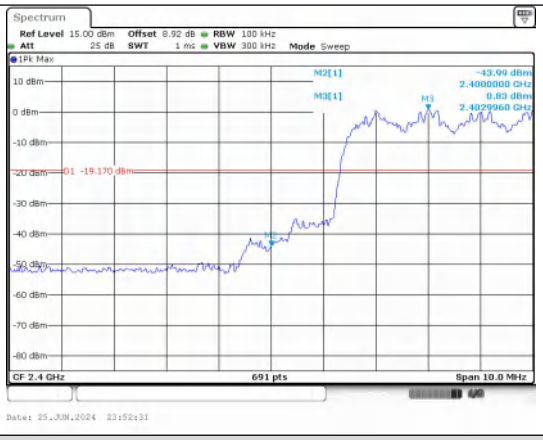
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



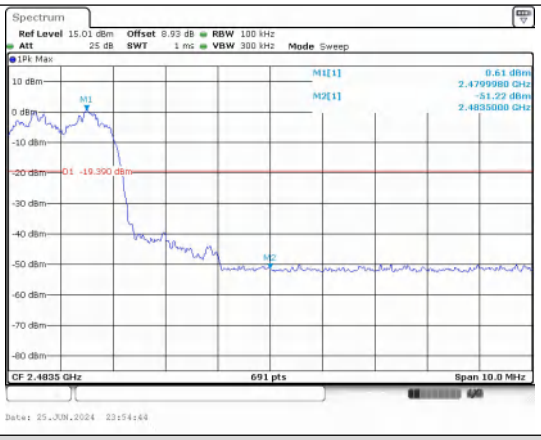
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



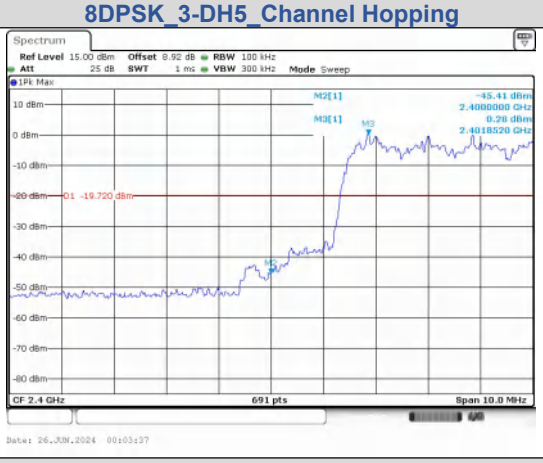
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



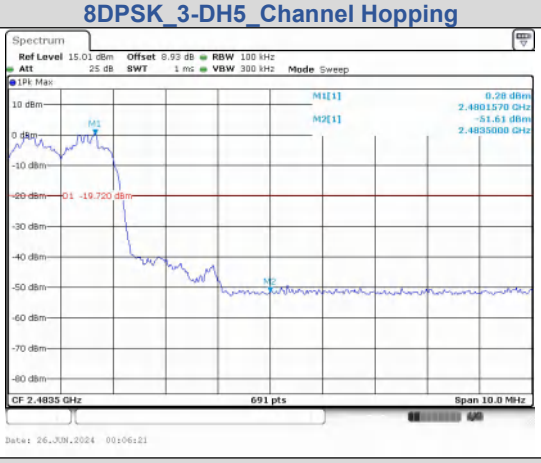
Out Of Band Emission(Left)
8DPSK_3-DH5_Channel Hopping



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

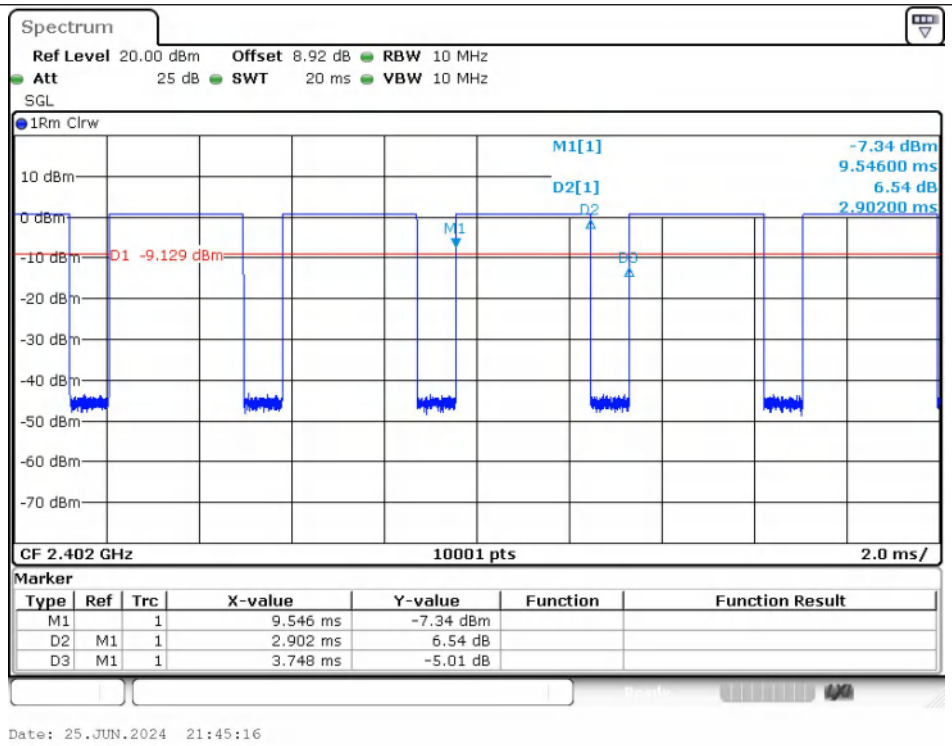
Duty Cycle

Test Result

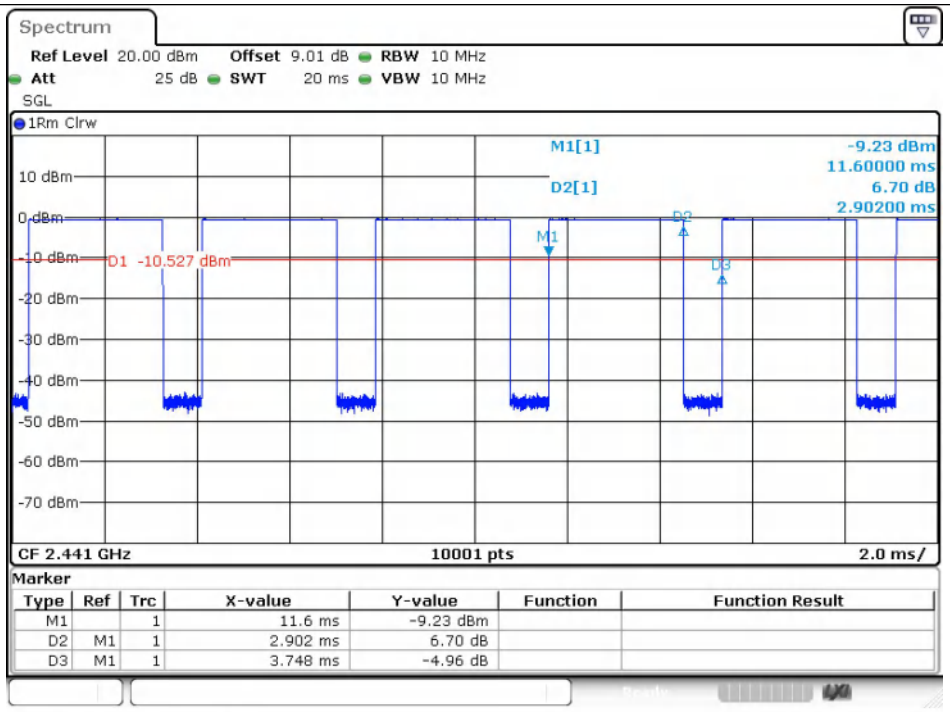
Left

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)
GFSK	DH5	0	2.902	3.748	77.43	0.7743	1.1109
		39	2.902	3.748	77.43	0.7743	1.1109
		78	2.902	3.748	77.43	0.7743	1.1109
π/4DQPSK	2-DH5	0	2.908	3.748	77.59	0.7759	1.1019
		39	2.908	3.748	77.59	0.7759	1.1019
		78	2.908	3.748	77.59	0.7759	1.1019
8DPSK	3-DH5	0	2.910	3.748	77.64	0.7764	1.0991
		39	2.912	3.748	77.69	0.7769	1.0963
		78	2.910	3.748	77.64	0.7764	1.0991

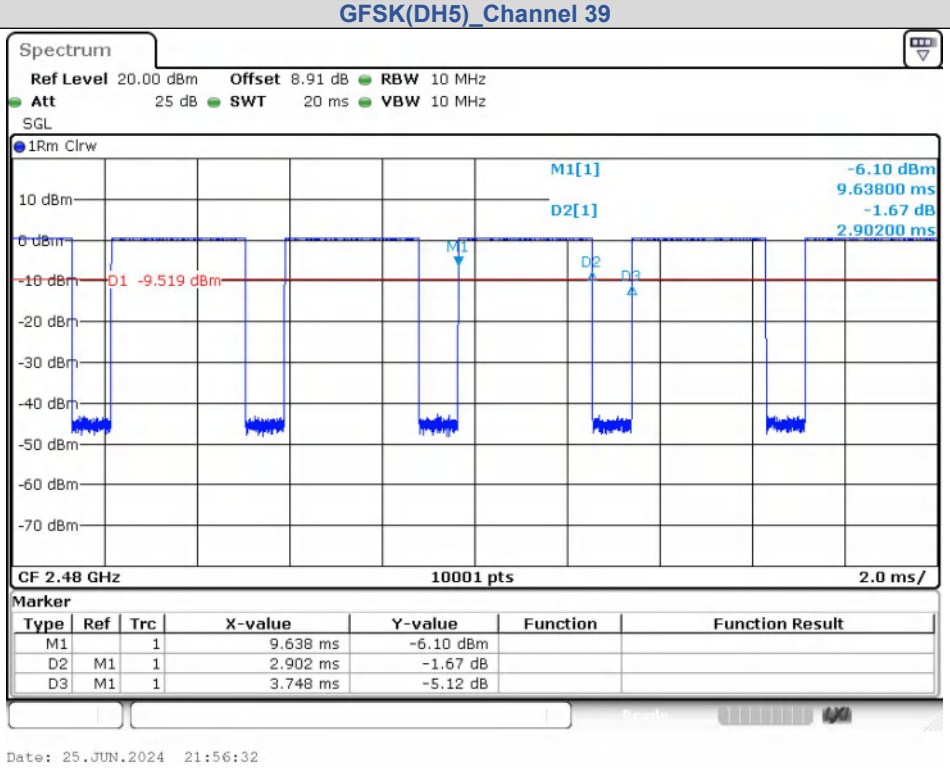
Test Graphs



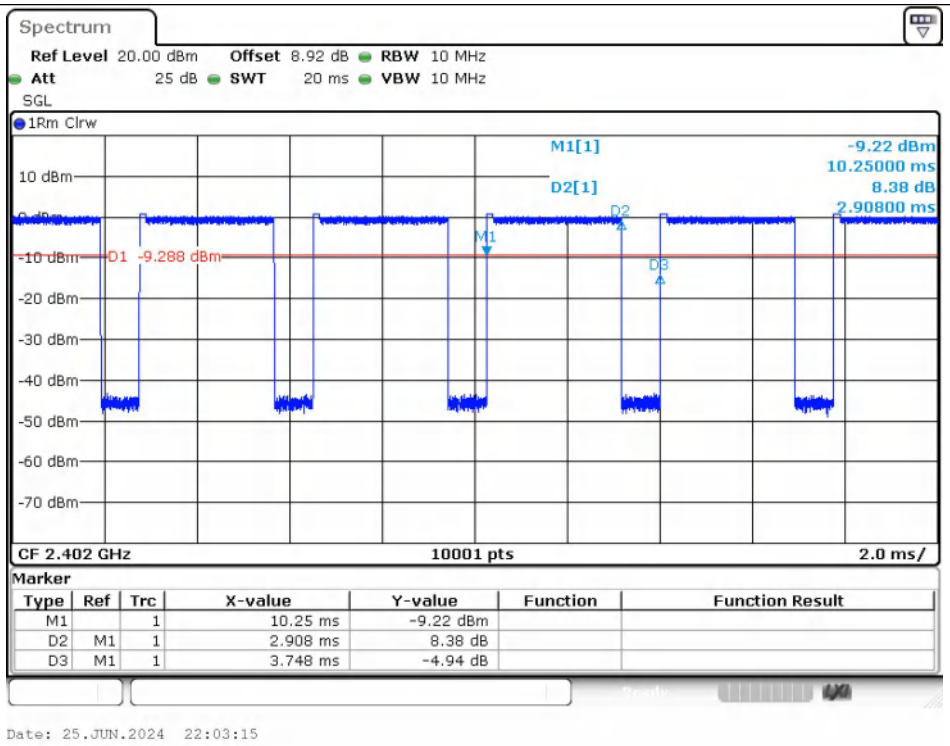
GFSK(DH5)_Channel 0



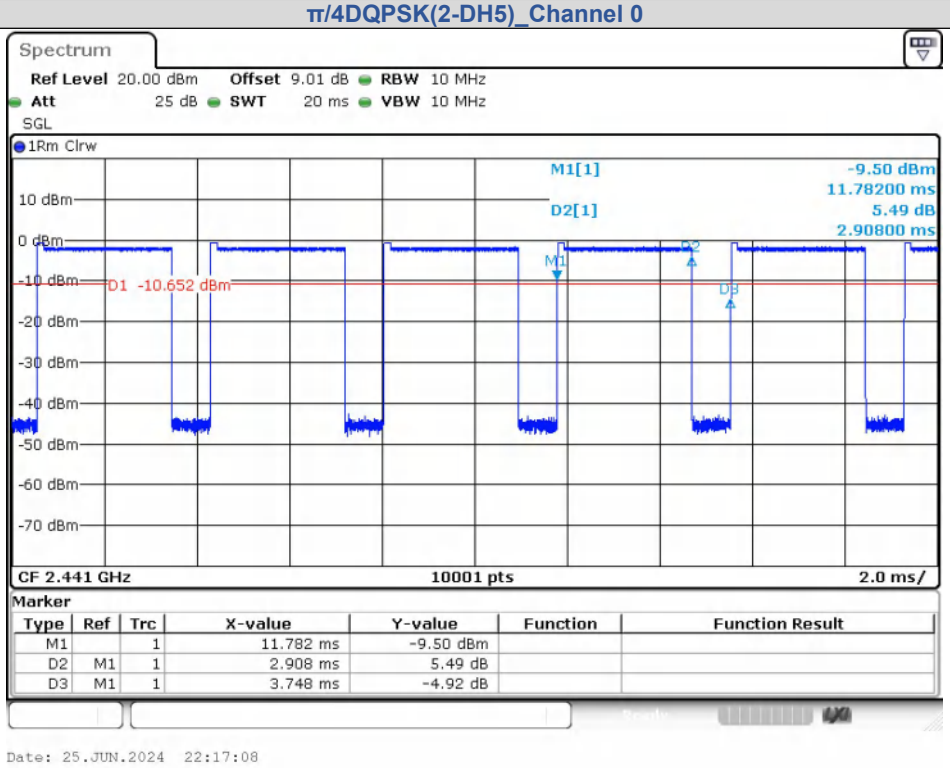
GFSK(DH5)_Channel 39



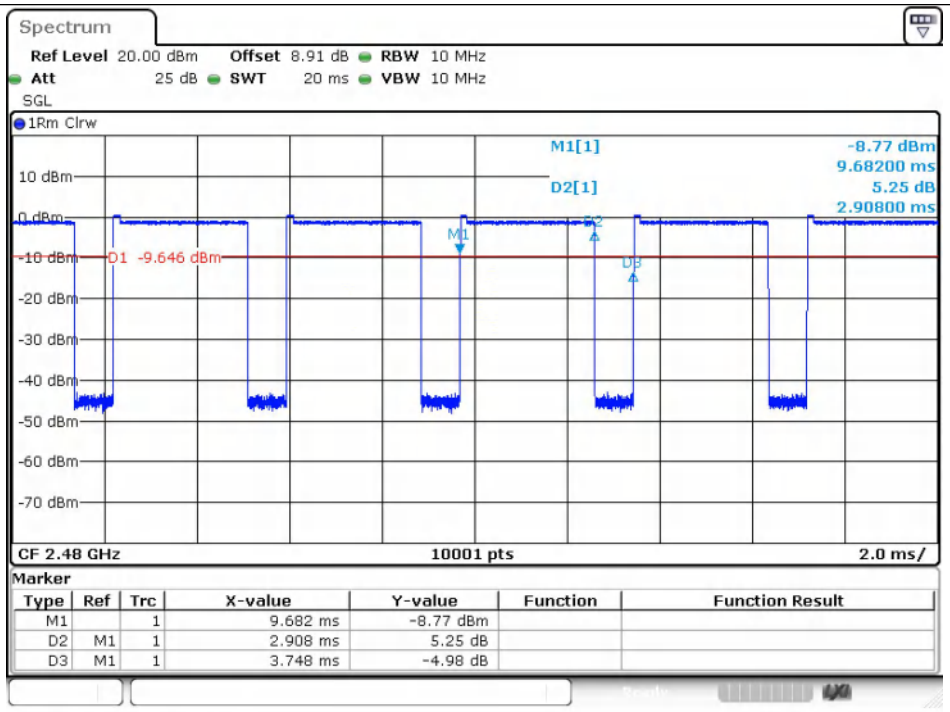
GFSK(DH5)_Channel 78



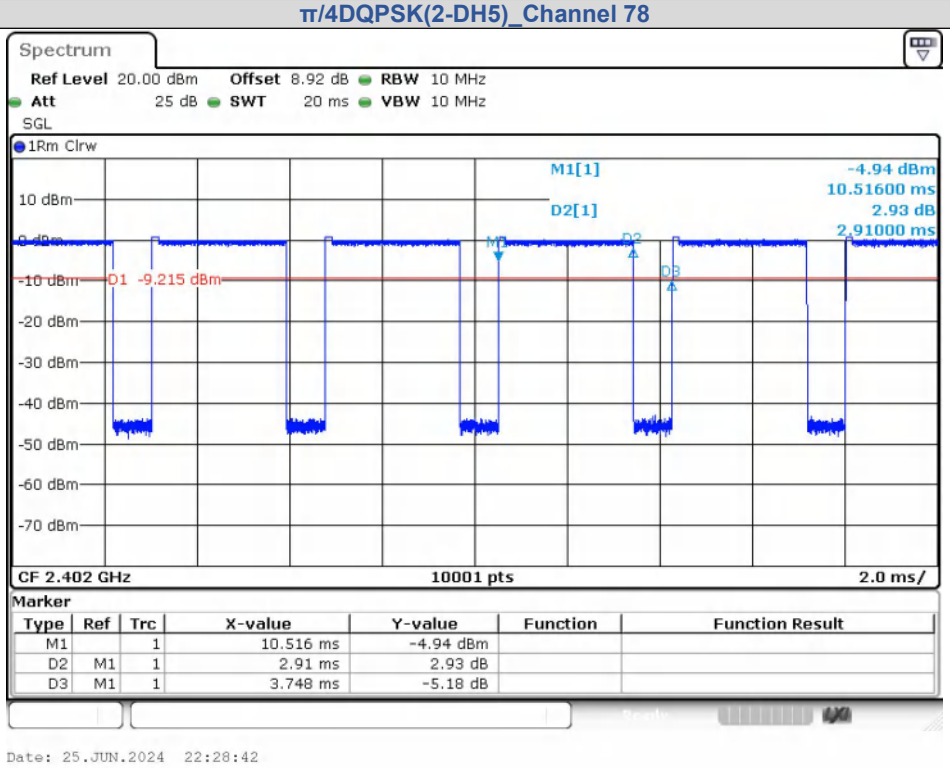
π/4DQPSK(2-DH5)_Channel 0



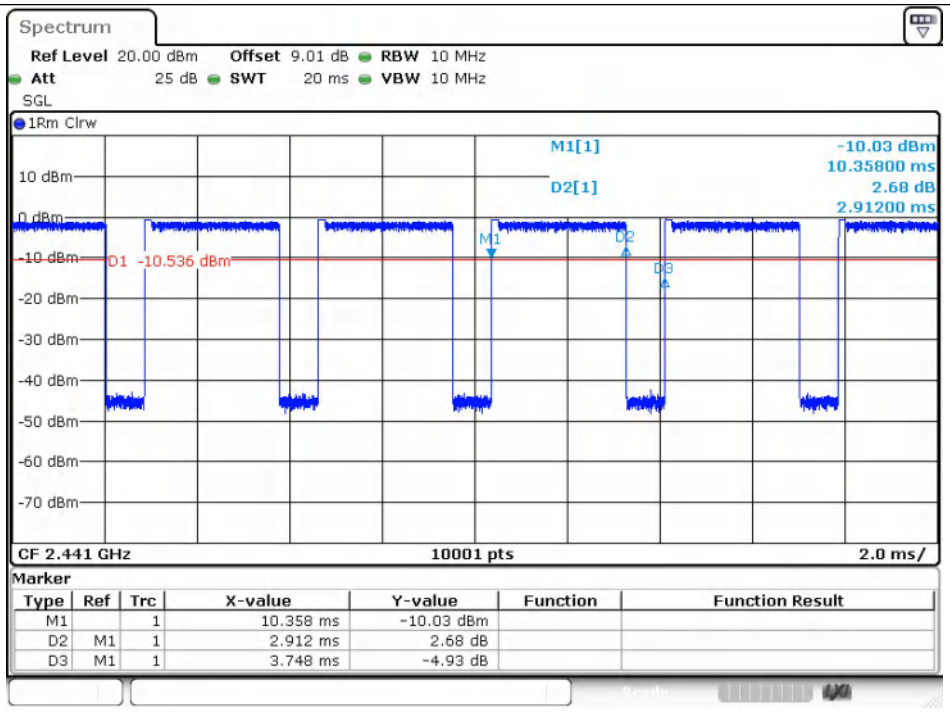
π/4DQPSK(2-DH5)_Channel 39



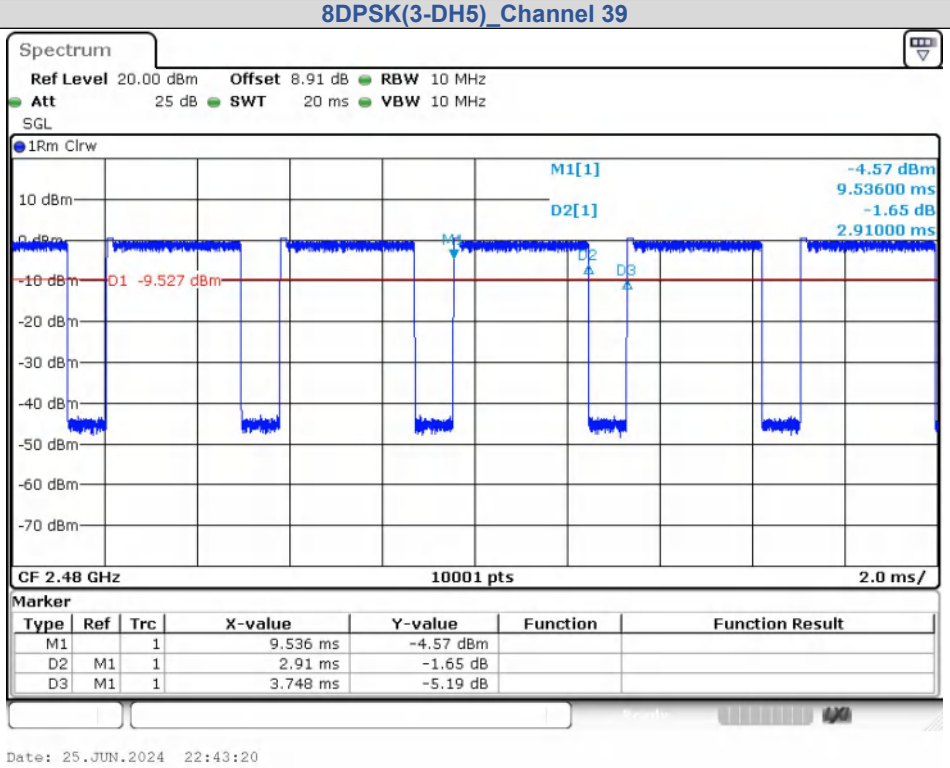
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



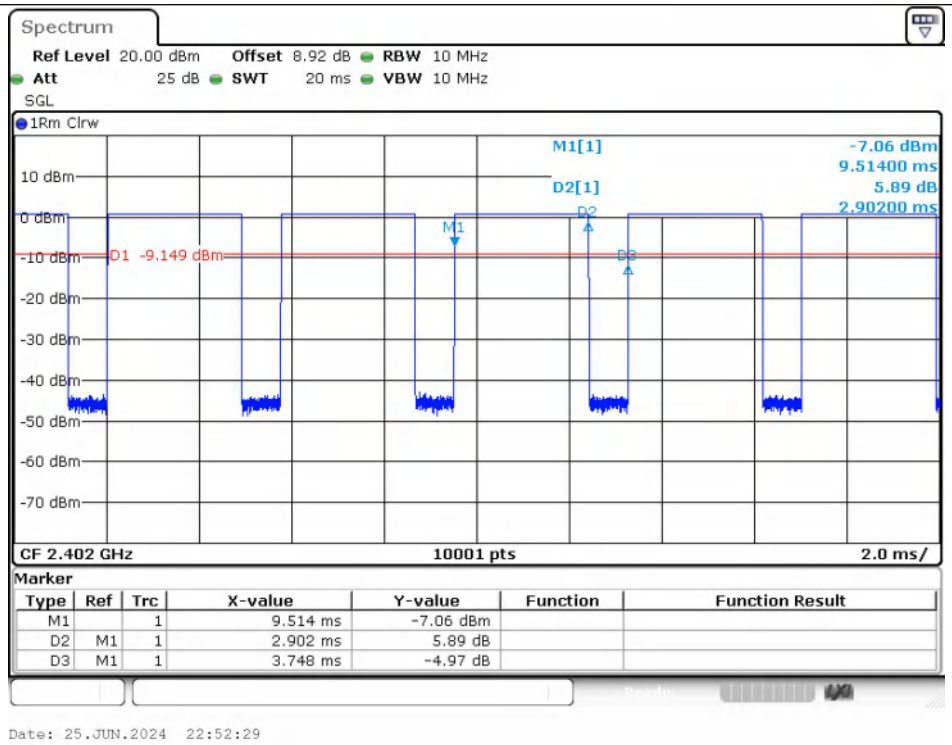
8DPSK(3-DH5)_Channel 78

Right

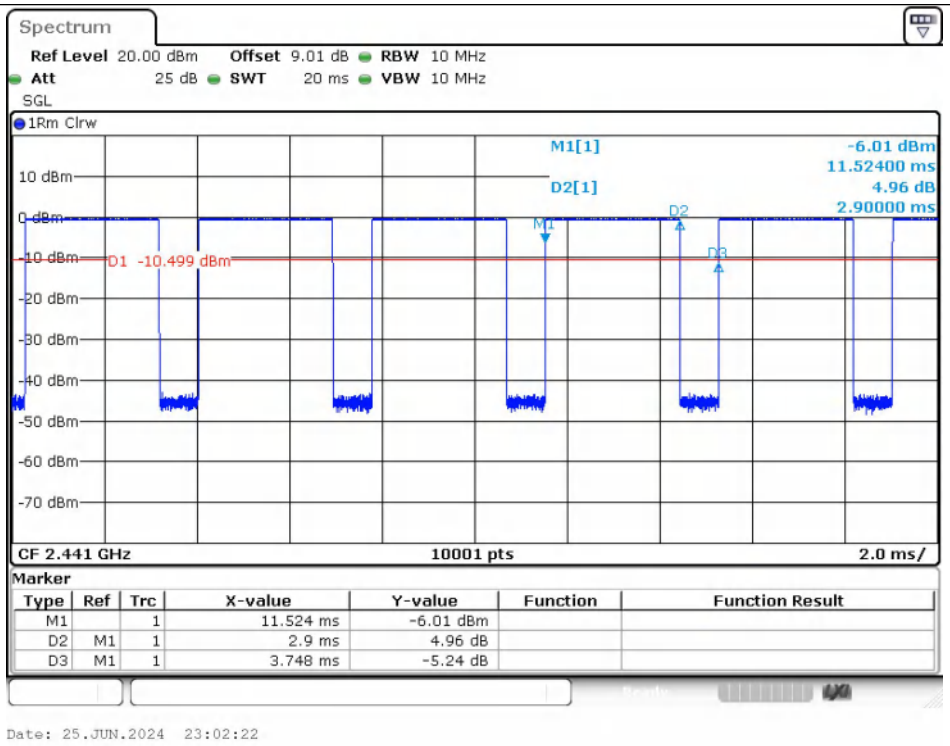
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)
GFSK	DH5	0	2.902	3.748	77.43	0.7743	1.1109
		39	2.900	3.748	77.37	0.7737	1.1143
		78	2.902	3.748	77.43	0.7743	1.1109
π/4DQPSK	2-DH5	0	2.908	3.748	77.59	0.7759	1.1019
		39	2.908	3.748	77.59	0.7759	1.1019
		78	2.906	3.748	77.53	0.7753	1.1053
8DPSK	3-DH5	0	2.912	3.750	77.65	0.7765	1.0986
		39	2.910	3.748	77.64	0.7764	1.0991
		78	2.910	3.748	77.64	0.7764	1.0991

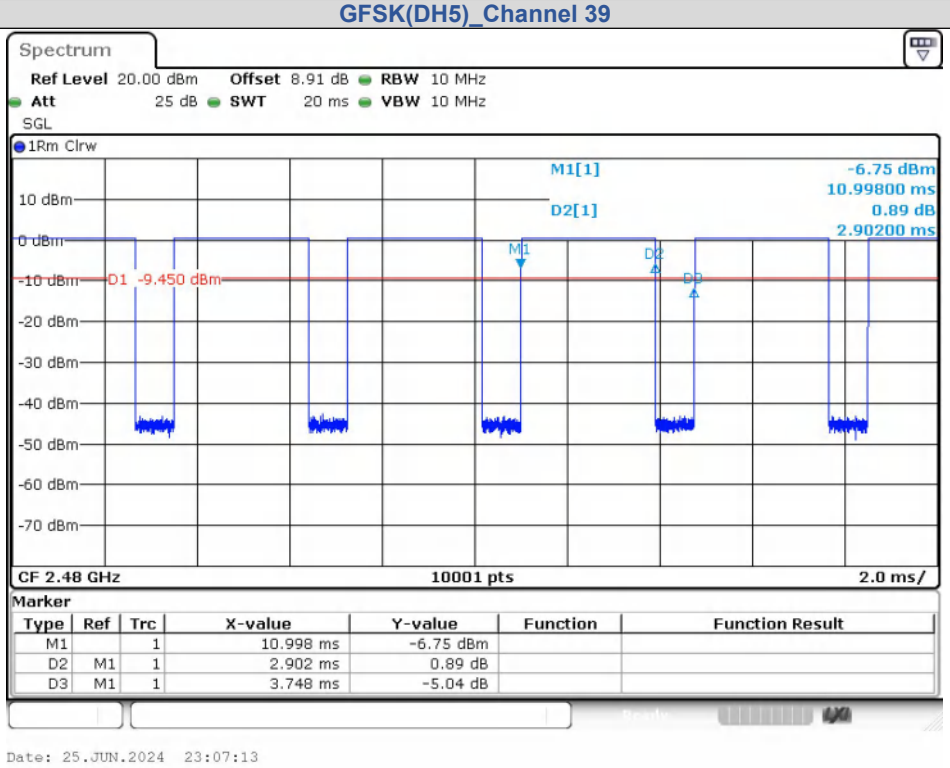
Test Graphs



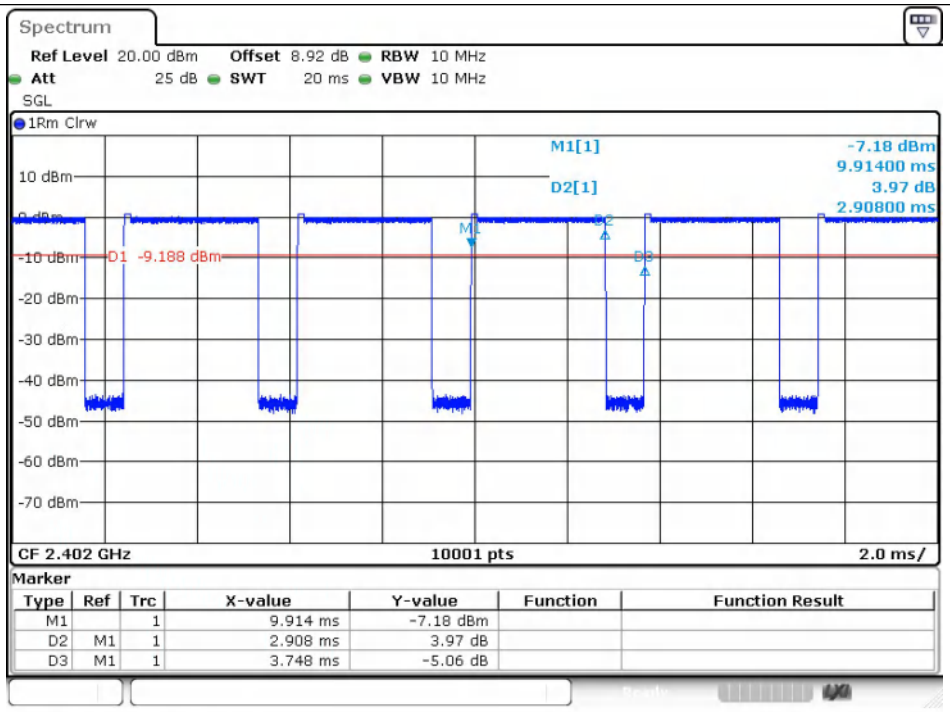
GFSK(DH5)_Channel 0



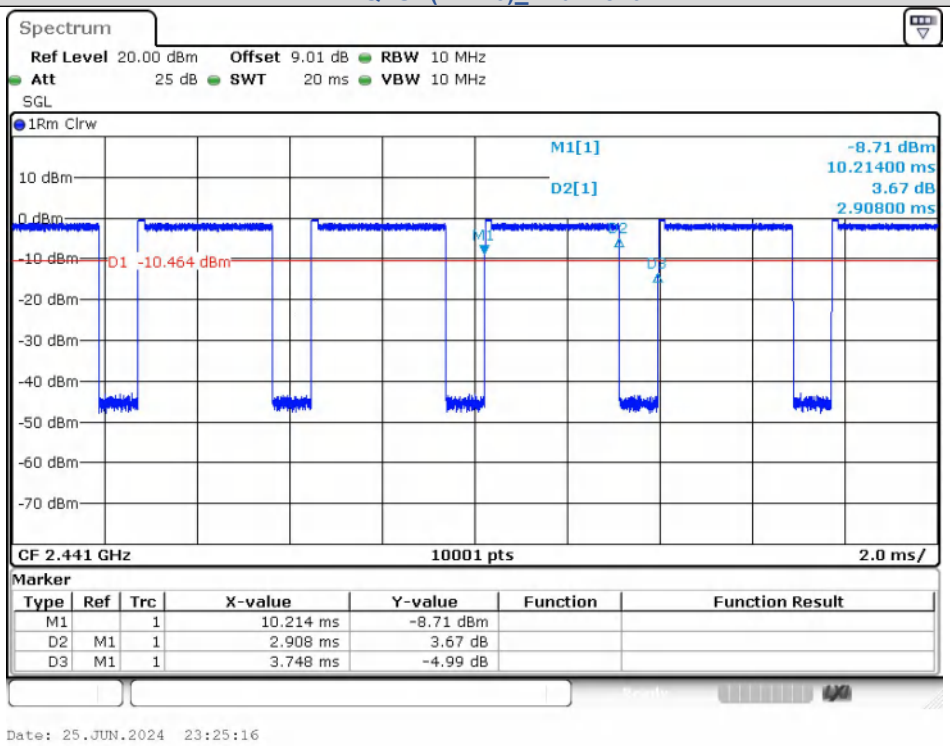
GFSK(DH5)_Channel 39



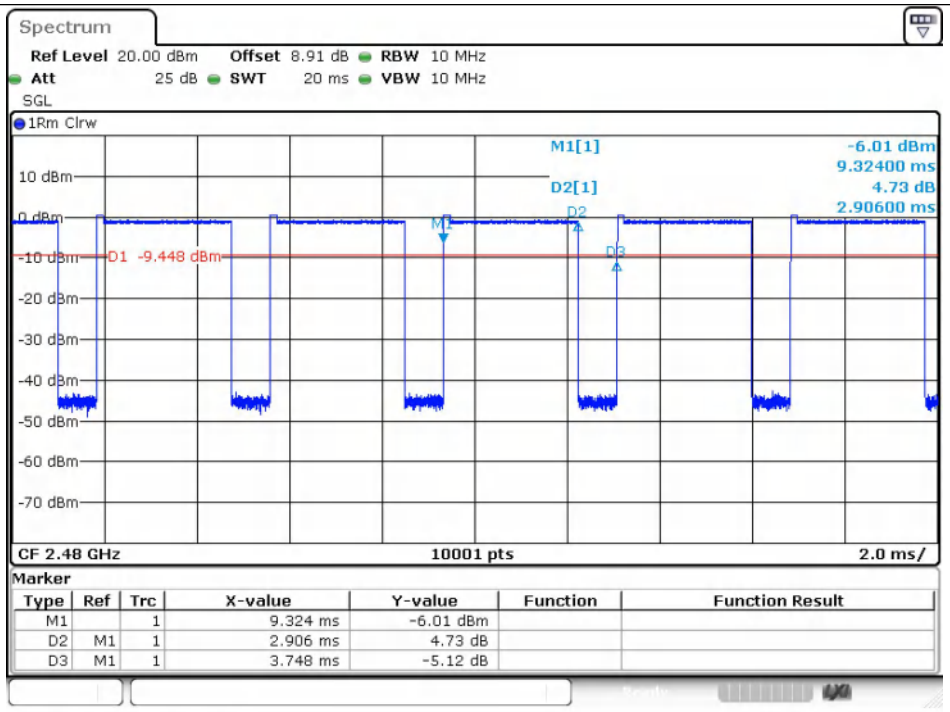
GFSK(DH5)_Channel 78



π/4DQPSK(2-DH5)_Channel 0



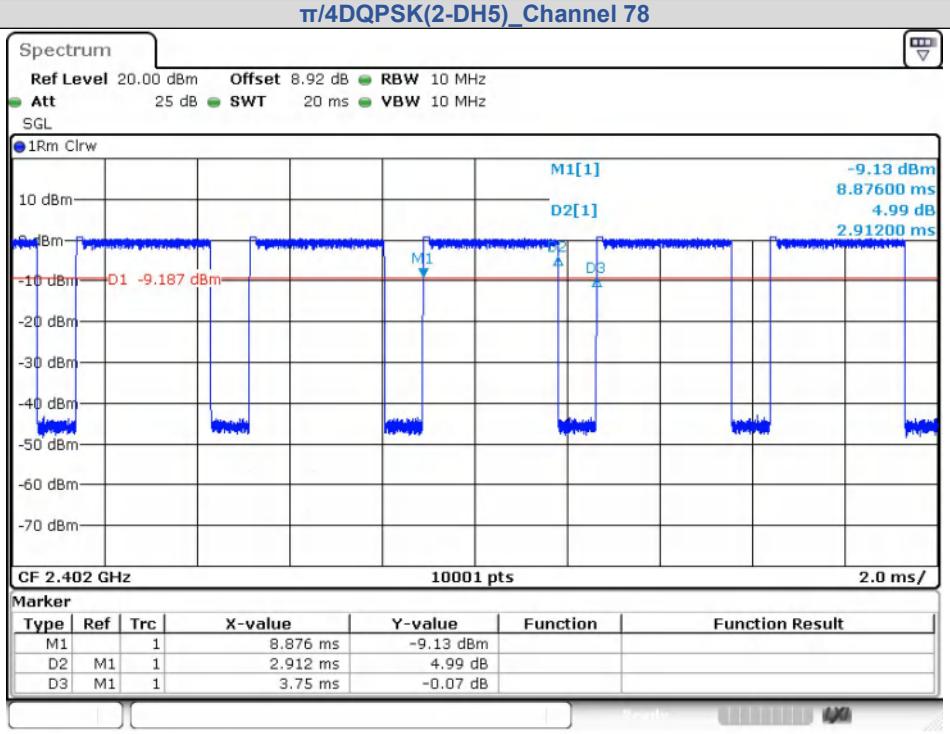
π/4DQPSK(2-DH5)_Channel 39



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	9.324 ms	-6.01 dBm		
D2	M1	1	2.906 ms	4.73 dB		
D3	M1	1	3.748 ms	-5.12 dB		

Date: 25.JUN.2024 23:27:59

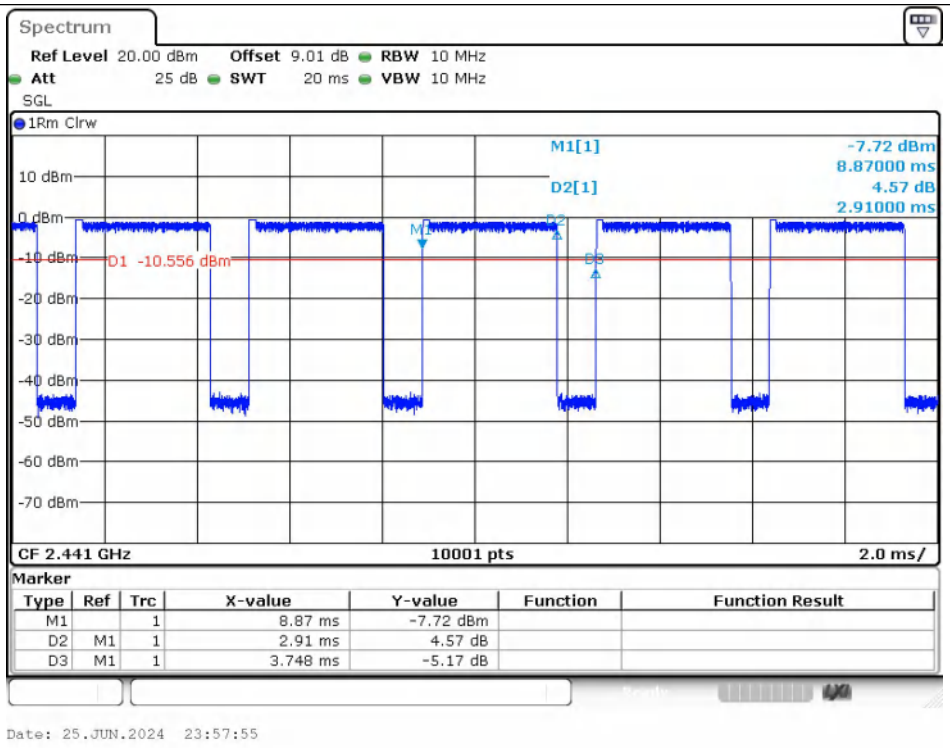
π/4DQPSK(2-DH5)_Channel 78



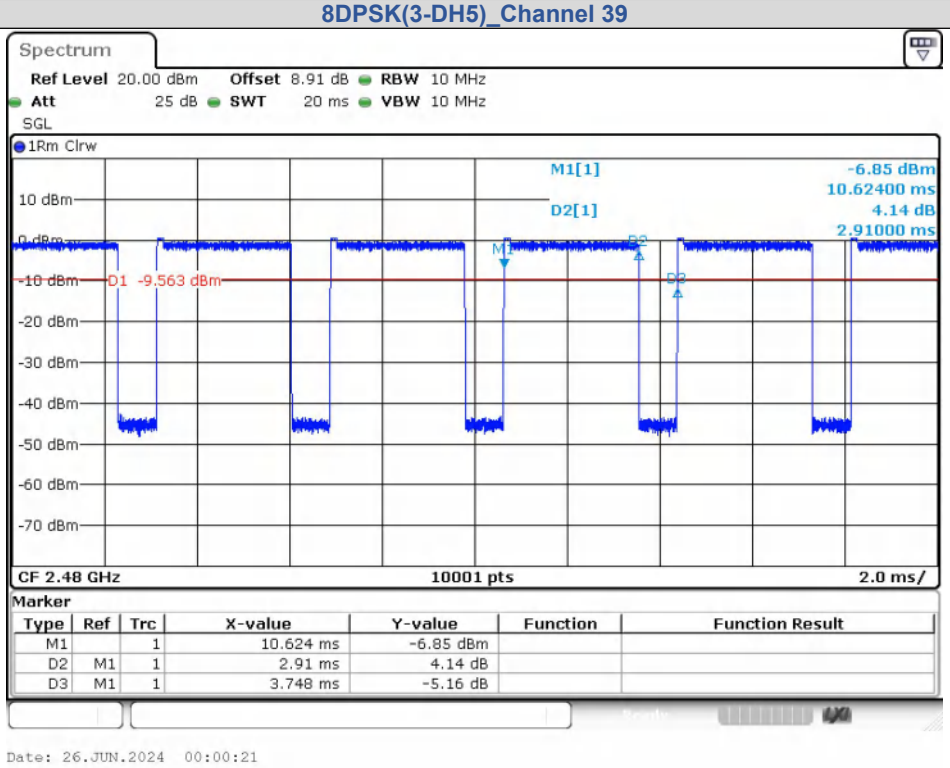
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	8.876 ms	-9.13 dBm		
D2	M1	1	2.912 ms	4.99 dB		
D3	M1	1	3.75 ms	-0.07 dB		

Date: 25.JUN.2024 23:43:15

8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



8DPSK(3-DH5)_Channel 78

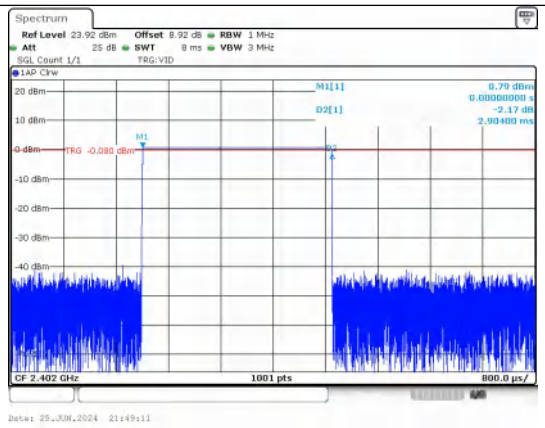
Dwell Time

Test Result

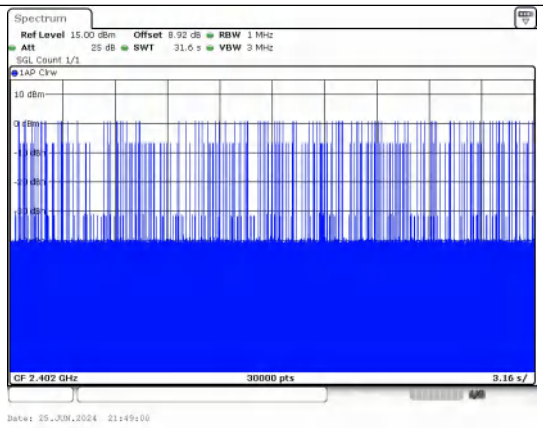
Left

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	104	302.02	< 400	PASS
π/4DQPSK	2-DH5		2.912	97	282.46		PASS
8DPSK	3-DH5		2.912	117	340.7		PASS

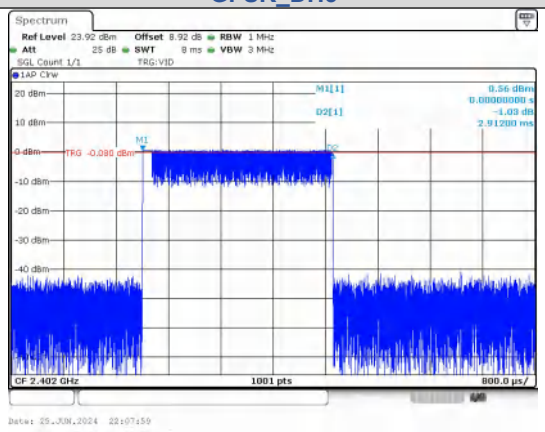
Test Graphs



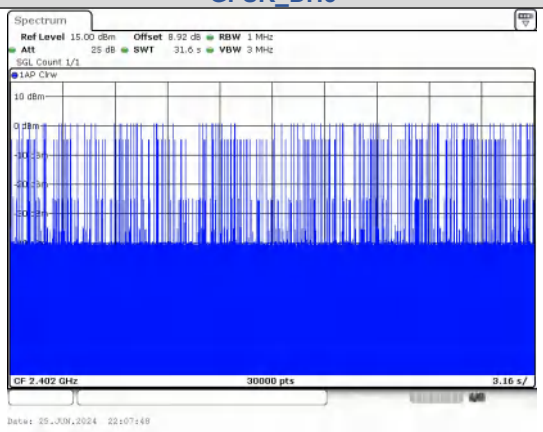
Pulse Width
GFSK_DH5



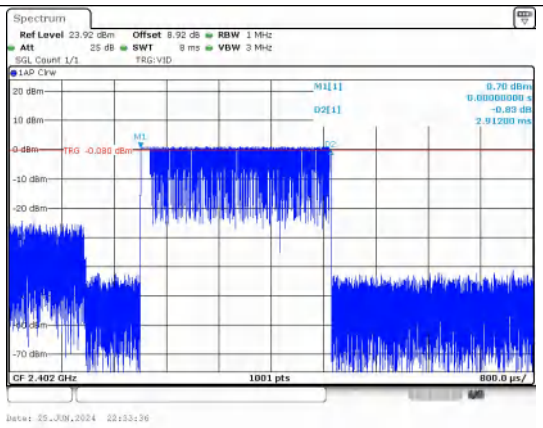
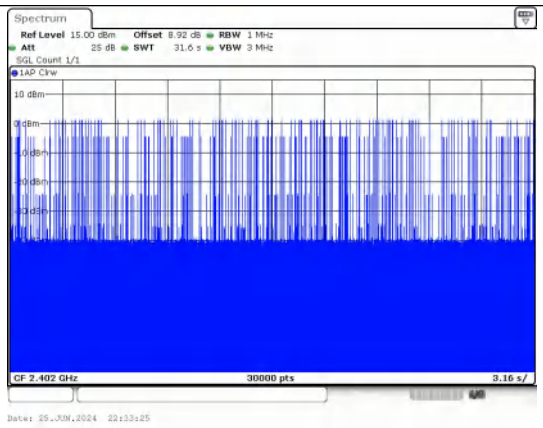
Number of Pulses in 31.6 seconds
GFSK_DH5



Pulse Width
π/4DQPSK_2-DH5



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

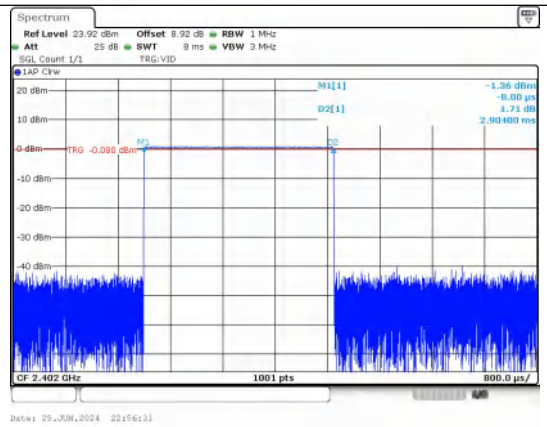
	
Pulse Width **8DPSK_3-DH5**	**Number of Pulses in 31.6 seconds** **8DPSK_3-DH5**

Right

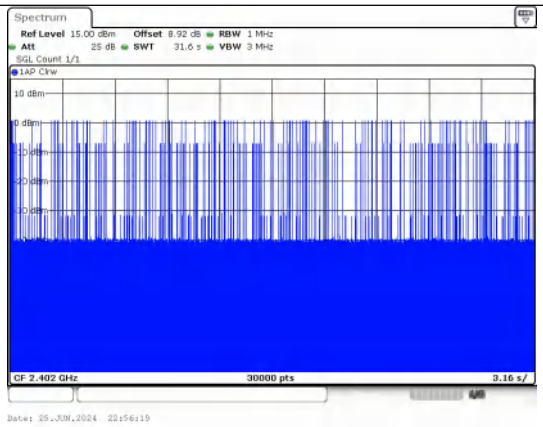
Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.904	118	342.67	< 400	PASS
π/4DQPSK	2-DH5		2.904	119	345.58		PASS
8DPSK	3-DH5		2.912	116	337.79		PASS

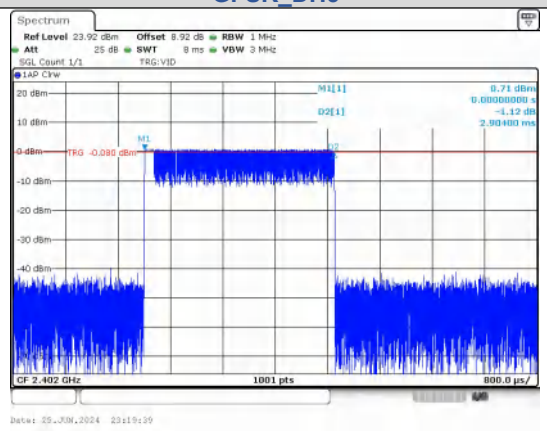
Test Graphs



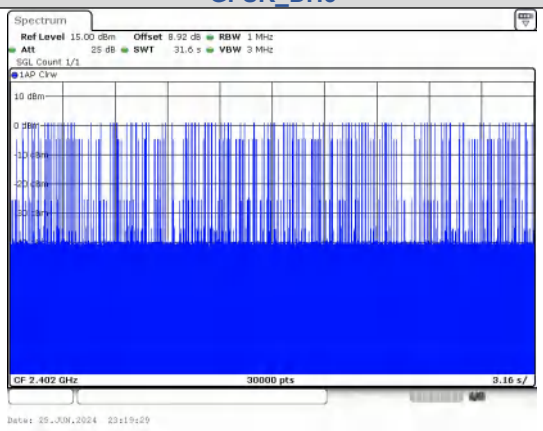
Pulse Width
GFSK_DH5



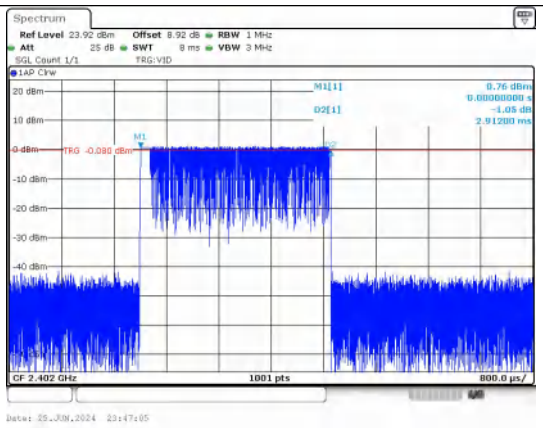
Number of Pulses in 31.6 seconds
GFSK_DH5



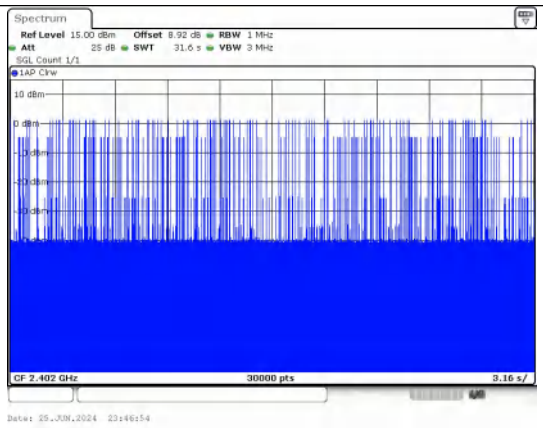
Pulse Width
π/4DQPSK_2-DH5



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

Number Of Hopping Channel

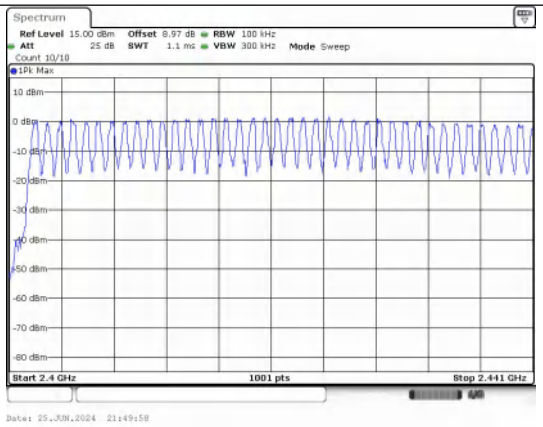
Test Result

Left

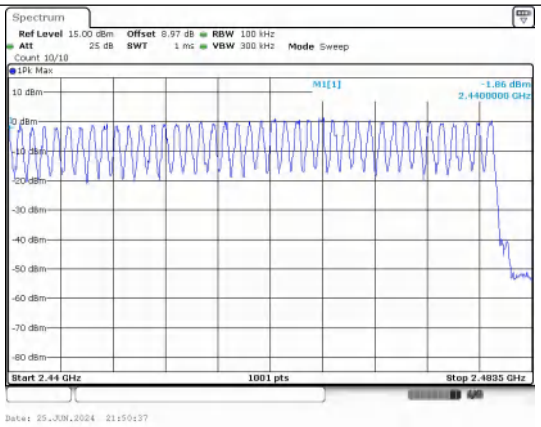
Test Result

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

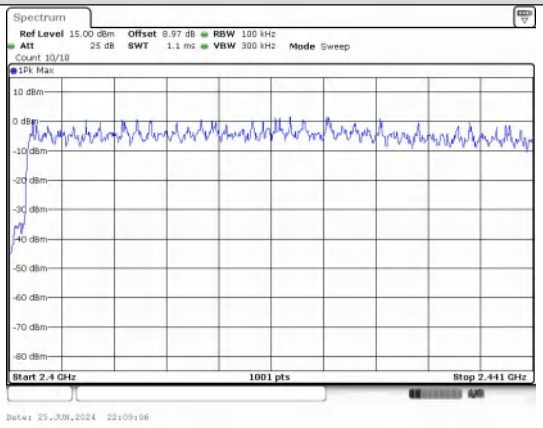
Test Graphs



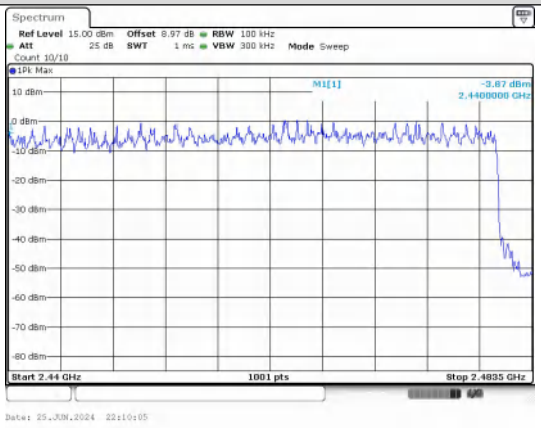
Low End Spectrum Channel Hopping Plot
GFSK



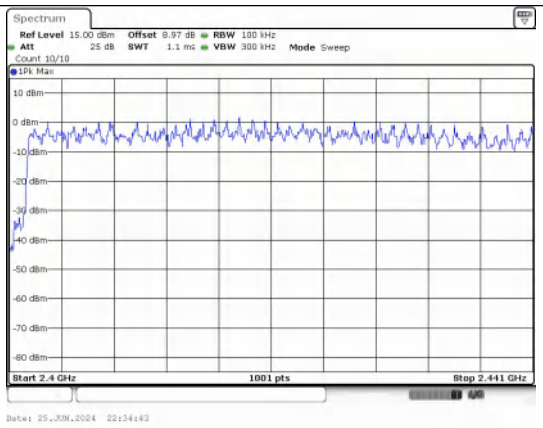
High End Spectrum Channel Hopping Plot
GFSK



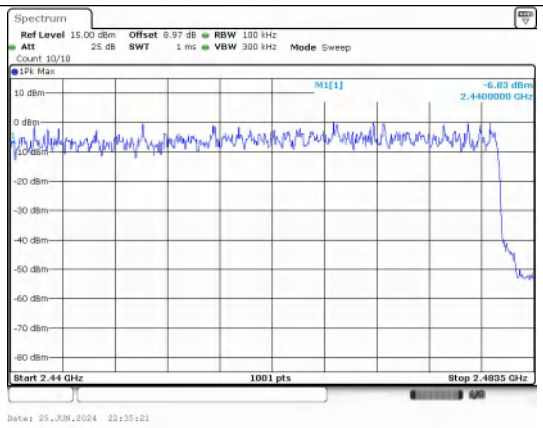
Low End Spectrum Channel Hopping Plot
π/4DQPSK



High End Spectrum Channel Hopping Plot
π/4DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



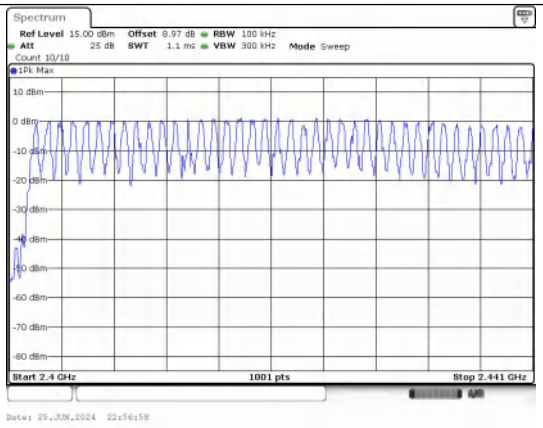
High End Spectrum Channel Hopping Plot
8DPSK

Right

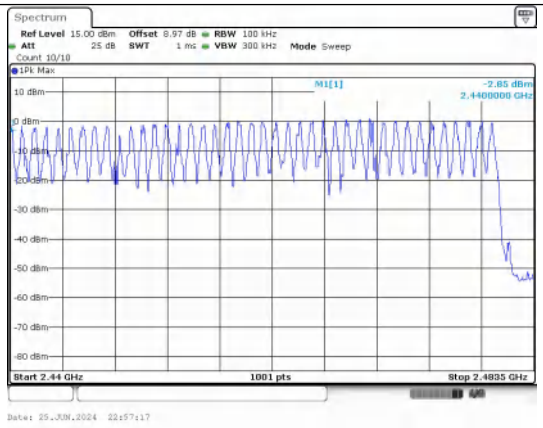
Test Result

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

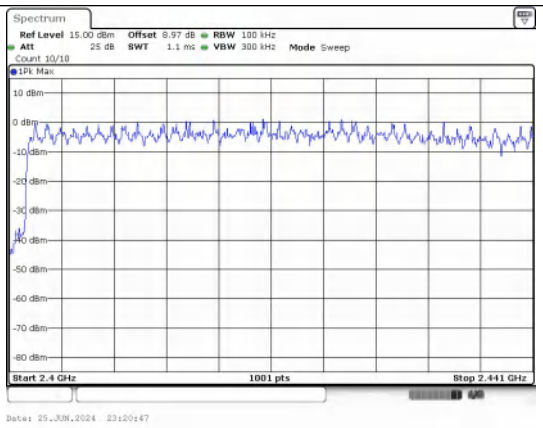
Test Graphs



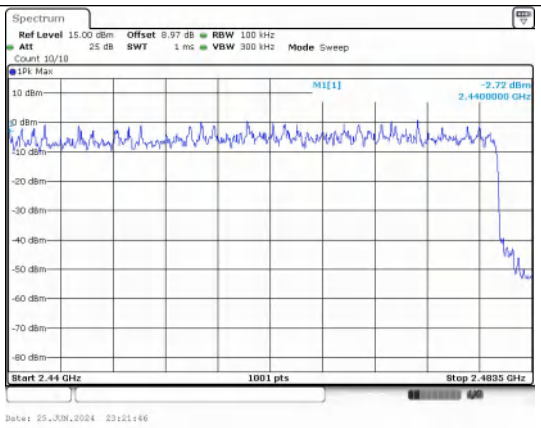
Low End Spectrum Channel Hopping Plot
GFSK



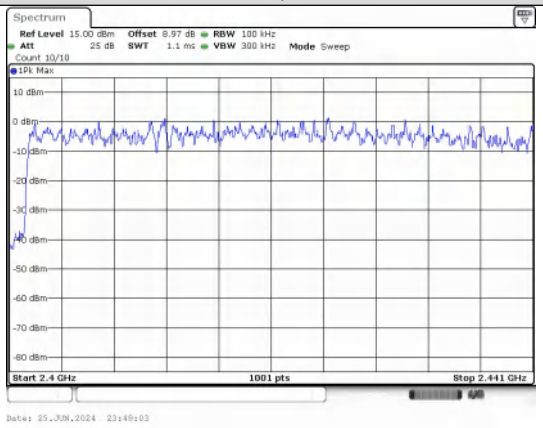
High End Spectrum Channel Hopping Plot
GFSK



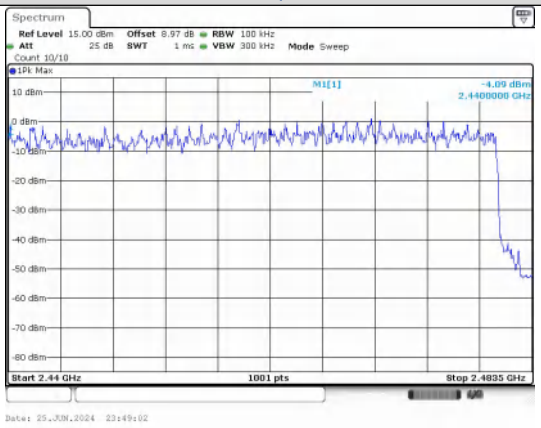
Low End Spectrum Channel Hopping Plot
π/4DQPSK



High End Spectrum Channel Hopping Plot
π/4DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK