

Appendix Report

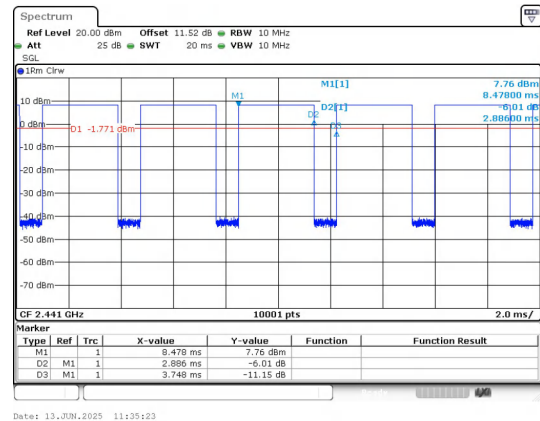
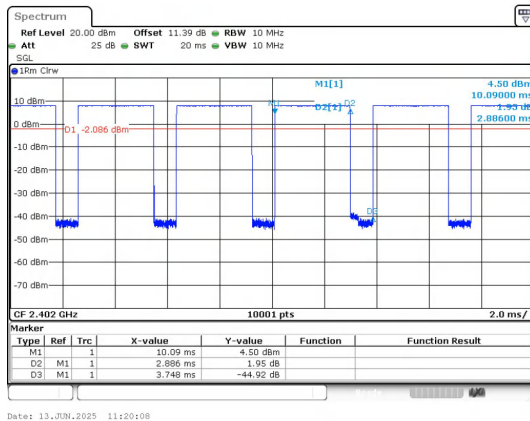
Project No.:	CISR250611063
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

Test Result

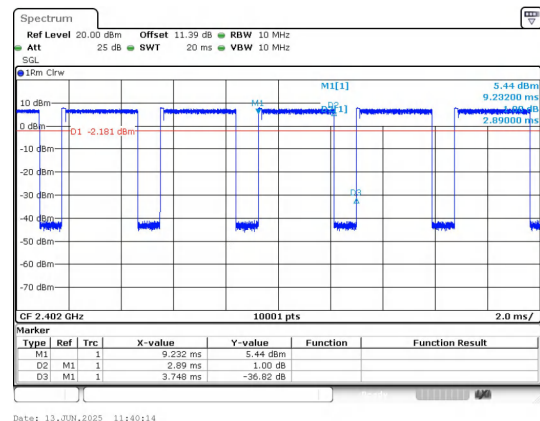
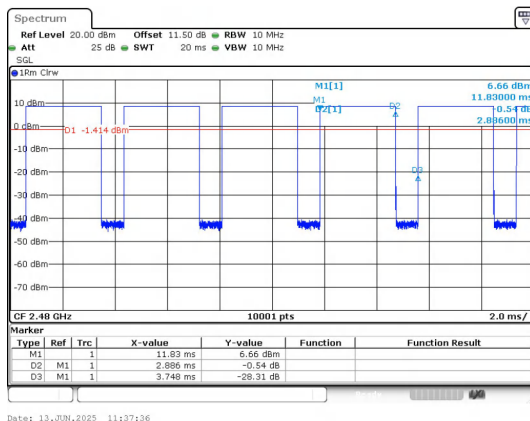
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.3460
		39	2.890	3.748	77.11	0.7711	1.1289	0.3460
		78	2.890	3.748	77.11	0.7711	1.1289	0.3460
8DPSK	3-DH5	0	2.362	3.748	63.02	0.6302	2.0052	0.4234
		39	2.362	3.748	63.02	0.6302	2.0052	0.4234
		78	2.362	3.748	63.02	0.6302	2.0052	0.4234

Test Graphs



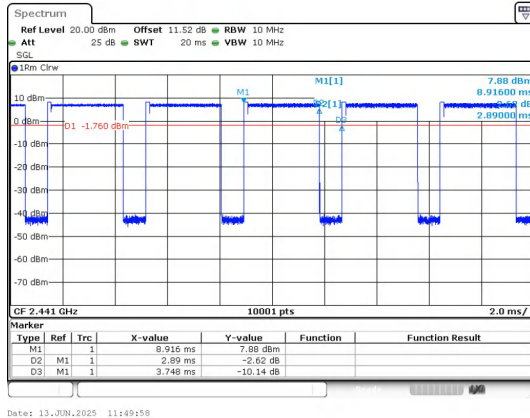
GFSK(DH5)_Channel 0

GFSK(DH5)_Channel 39

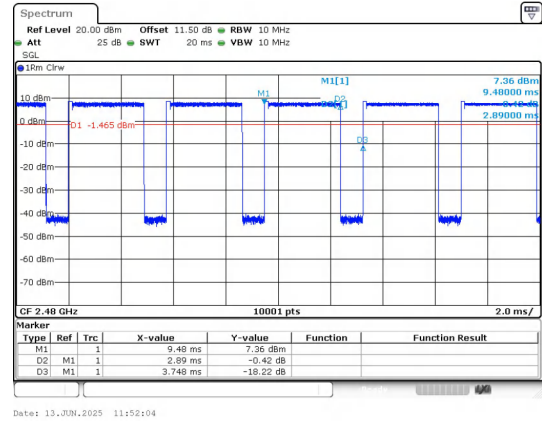


GFSK(DH5)_Channel 78

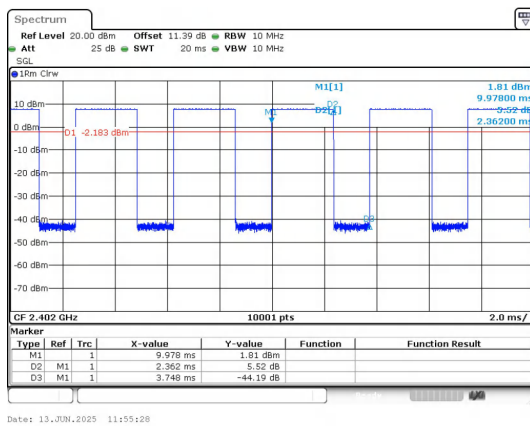
 $\pi/4$ DQPSK(2-DH5)_Channel 0



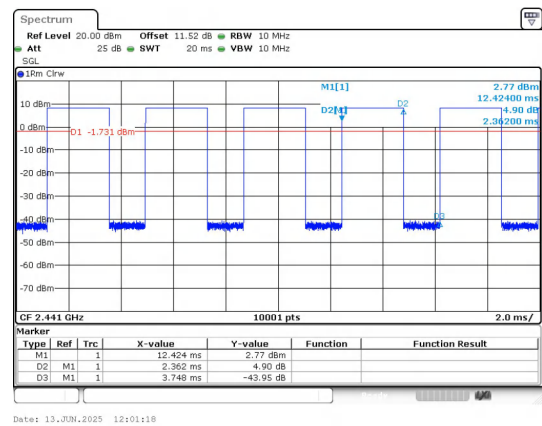
$\pi/4$ DQPSK(2-DH5)_Channel 39



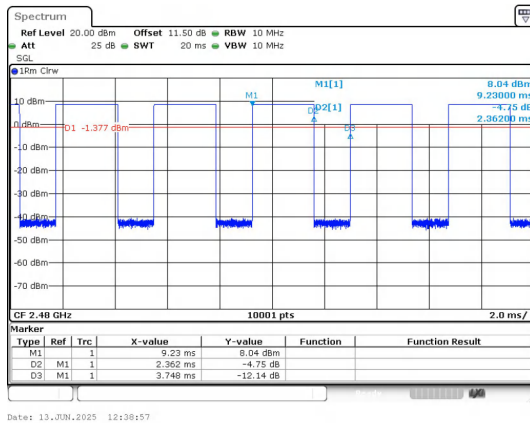
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



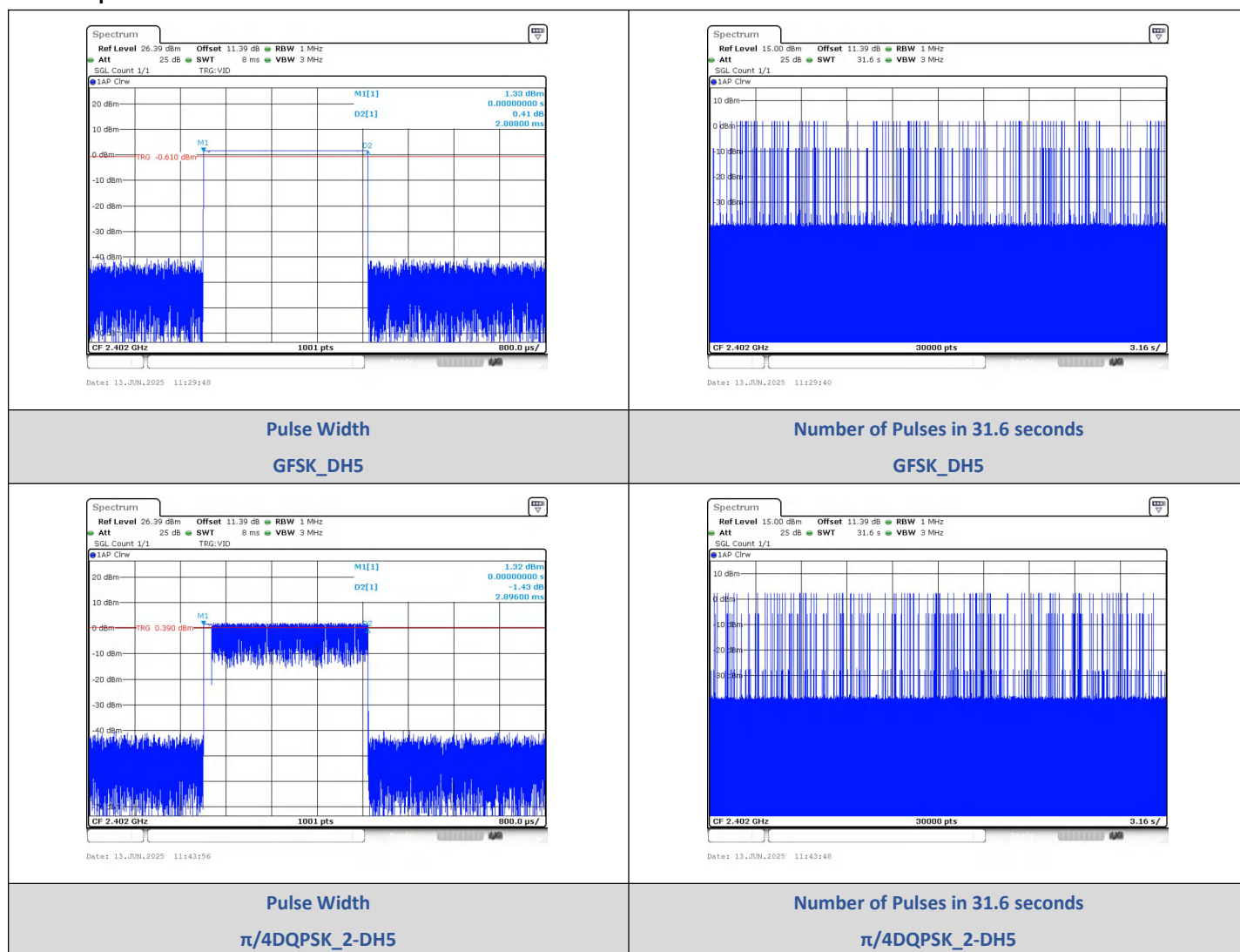
8DPSK(3-DH5)_Channel 78

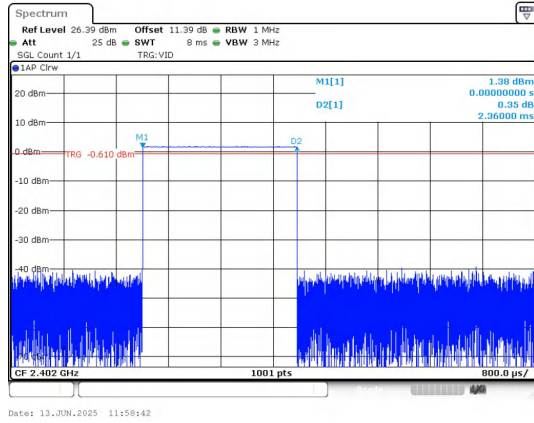
2) Dwell Time

Test Result

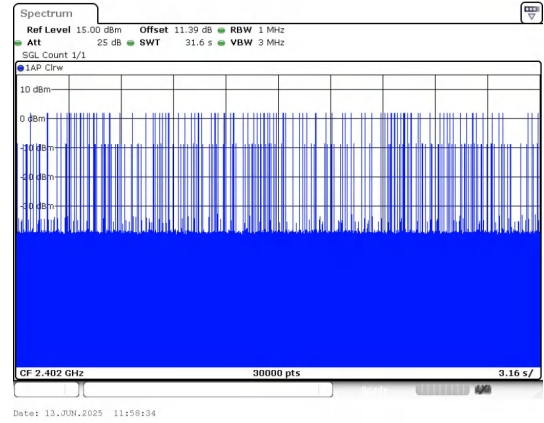
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	96	277.25	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	105	304.08		PASS
8DPSK	3-DH5		2.360	107	252.52		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



Number of Pulses in 31.6 seconds
8DPSK_3-DH5

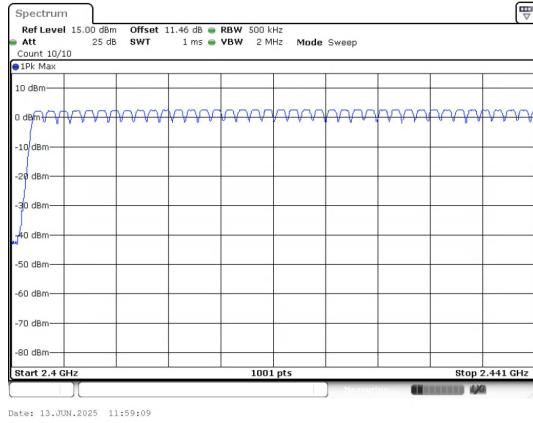
3) Number Of Hopping Channel

Test Result

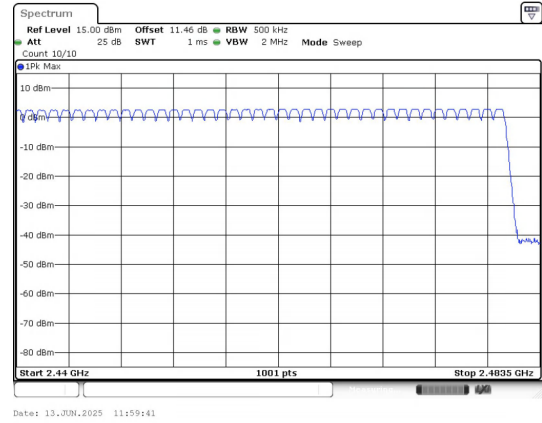
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



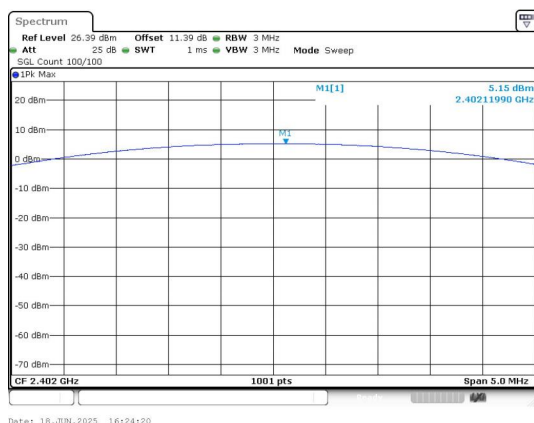
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

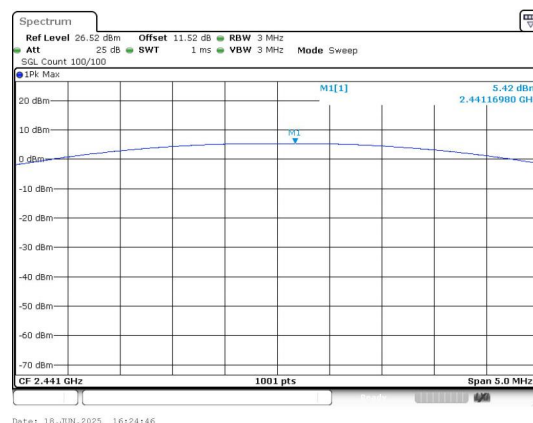
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	5.15	3.27	≤30	PASS
		39	5.42	3.48		PASS
		78	6.08	4.06		PASS
$\pi/4$ DQPSK	2-DH5	0	5.97	3.95	≤20.97	PASS
		39	6.28	4.25		PASS
		78	6.85	4.84		PASS
8DPSK	3-DH5	0	5.17	3.29		PASS
		39	5.44	3.50		PASS
		78	6.11	4.08		PASS

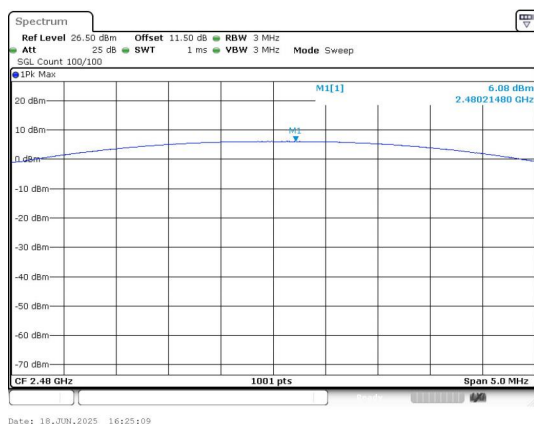
Test Graphs



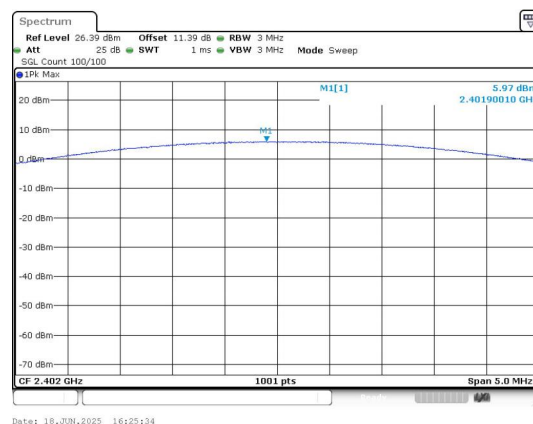
Peak Output Power
GFSK_Channel 0



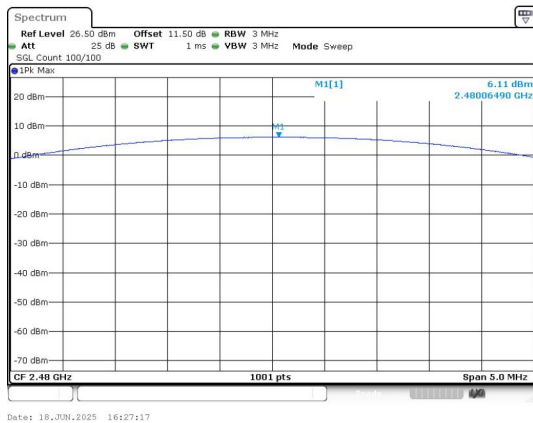
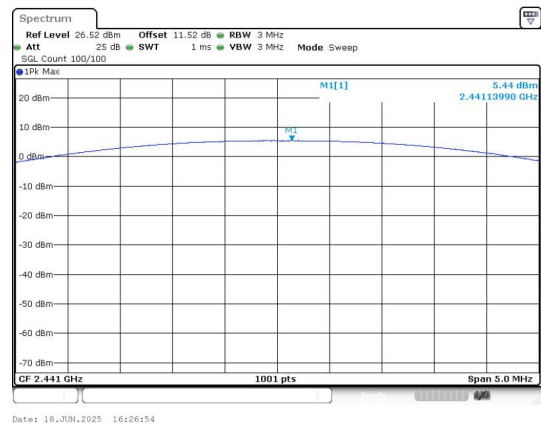
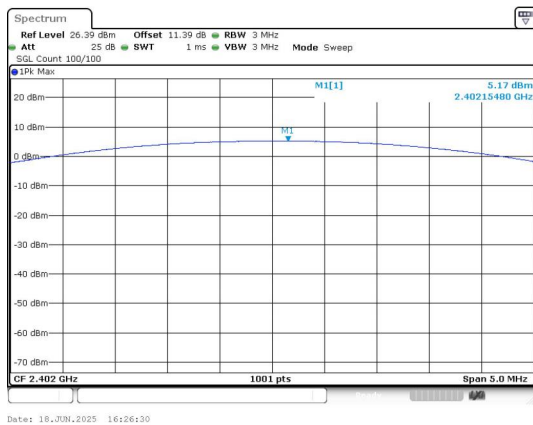
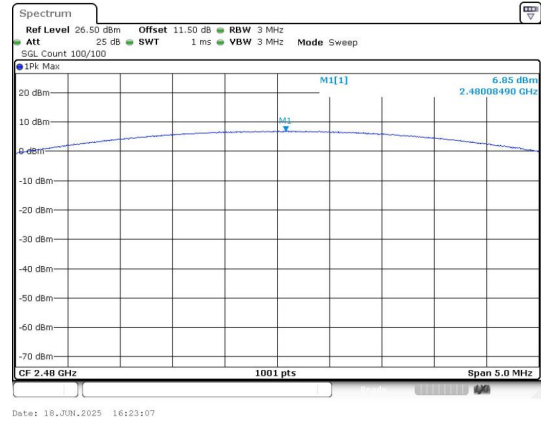
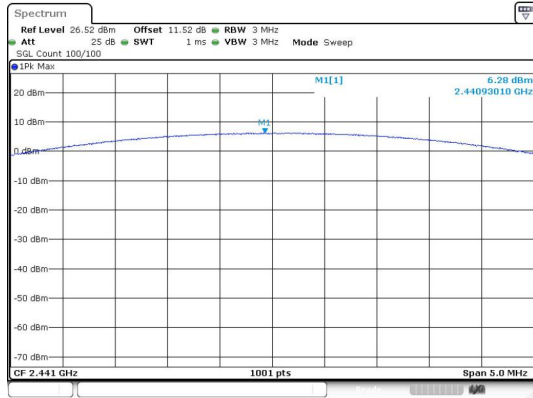
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78



Peak Output Power
 $\pi/4$ DQPSK_Channel 0

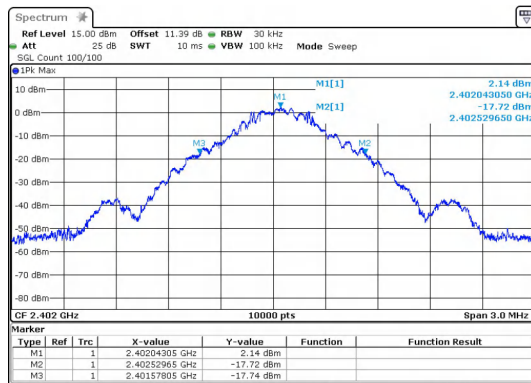


5) 20dB Bandwidth

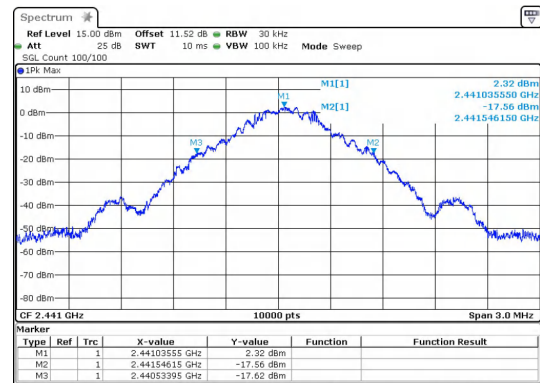
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.95
	39	2441 MHz	0.95
	78	2480 MHz	0.95
$\pi/4$ DQPSK	0	2402 MHz	1.290
	39	2441 MHz	1.310
	78	2480 MHz	1.310
8DPSK	0	2402 MHz	0.9600
	39	2441 MHz	1.010
	78	2480 MHz	1.010

Test Graphs



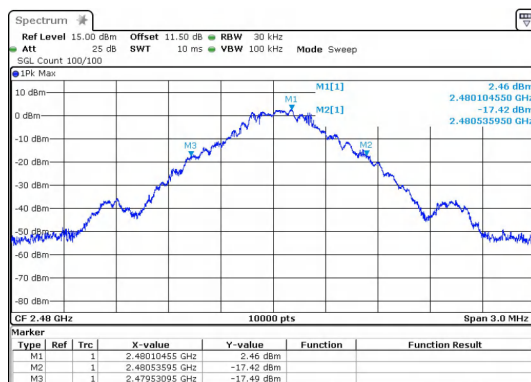
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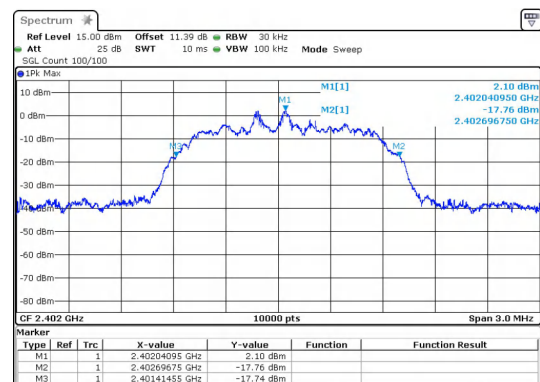
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GFSK_DH5_Channel 0

GFSK_DH5_Channel 39



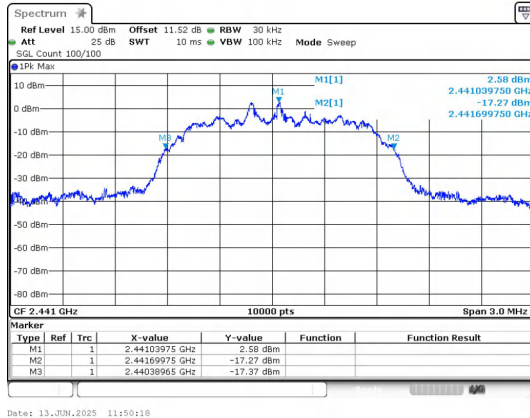
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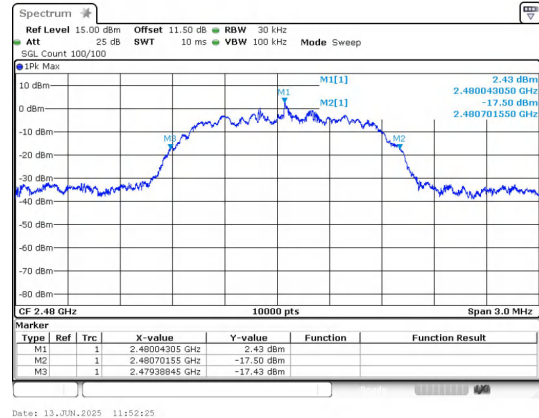
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GFSK_DH5_Channel 78

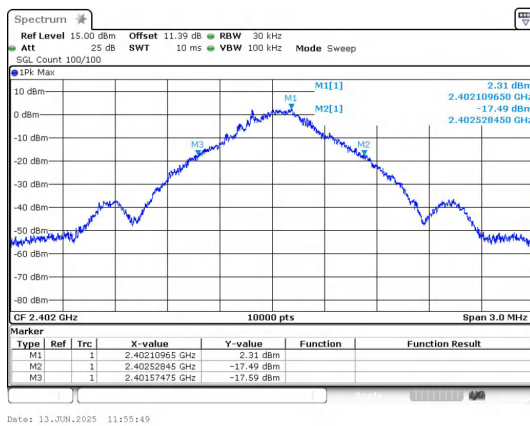
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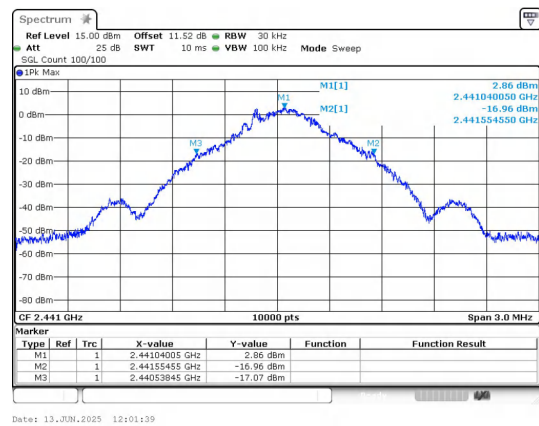
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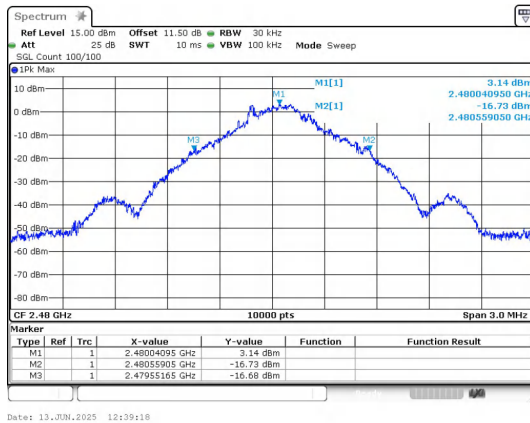
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



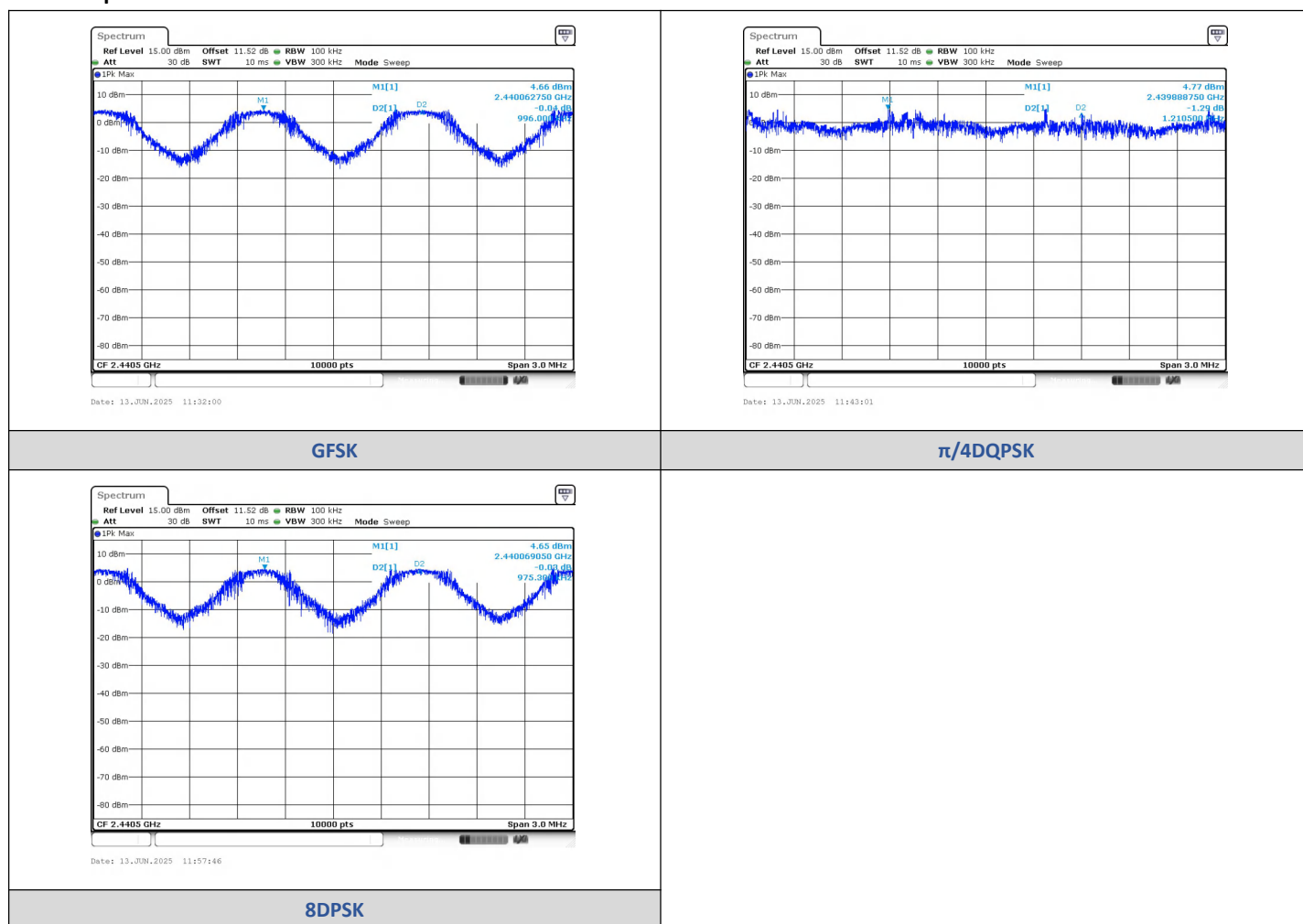
8DPSK_3-DH5_Channel 78

6) Carrier Frequencies Separation

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0628	2441.0588	0.9960	0.95	PASS
$\pi/4$ DQPSK	2-DH5	2439.8888	2441.0993	1.2105	0.86	PASS
8DPSK	3-DH5	2440.0691	2441.0444	0.9753	0.64	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

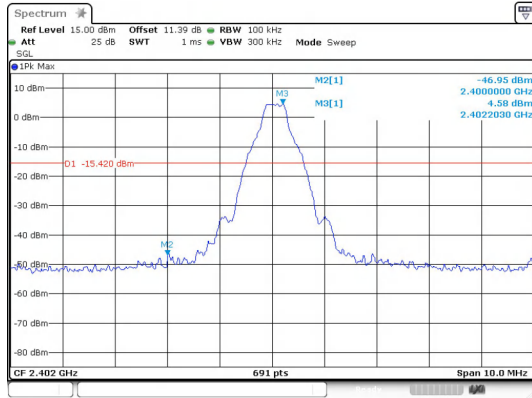
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-46.950	-15.42	-31.530	PASS
			2594.00	-45.913	-15.42	-30.493	PASS
		39	2633.12	-45.809	-15.14	-30.669	PASS
		78	2483.50	-51.250	-14.71	-36.540	PASS
			2672.24	-46.868	-14.71	-32.158	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-49.810	-15.43	-34.380	PASS
			2594.00	-47.458	-15.43	-32.028	PASS
		39	2248.58	-47.297	-15.16	-32.137	PASS
		78	2287.70	-50.215	-14.73	-35.485	PASS
			2483.50	-50.180	-14.73	-35.450	PASS
8DPSK	3-DH5	0	2397.79	-49.843	-15.4	-34.443	PASS
			2400.00	-50.500	-15.4	-35.100	PASS
			2594.00	-45.059	-15.4	-29.659	PASS
		39	2633.12	-46.616	-14.87	-31.746	PASS
		78	2483.50	-51.530	-14.61	-36.920	PASS
			2672.24	-46.523	-14.61	-31.913	PASS

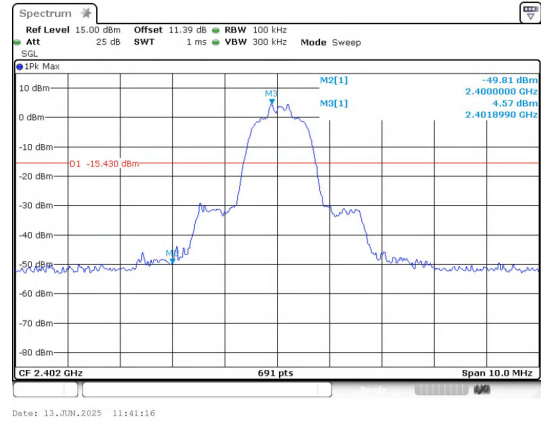
Hopping

Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.21	-48.870	-15.6	-33.270	PASS
			2400.00	-50.690	-15.6	-35.090	PASS
			2483.50	-51.660	-14.84	-36.820	PASS
$\pi/4$ DQPSK	2-DH5		2398.41	-49.742	-15.87	-33.872	PASS
			2400.00	-51.330	-15.87	-35.460	PASS
			2483.50	-50.480	-15.34	-35.140	PASS
8DPSK	3-DH5		2397.24	-48.826	-15.51	-33.316	PASS
			2400.00	-50.300	-15.51	-34.790	PASS
			2483.50	-49.850	-14.55	-35.300	PASS

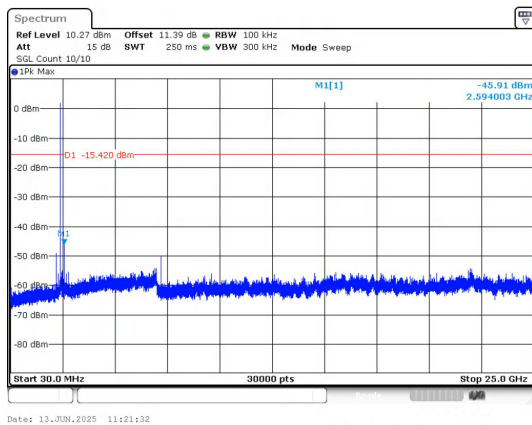
Test Graphs



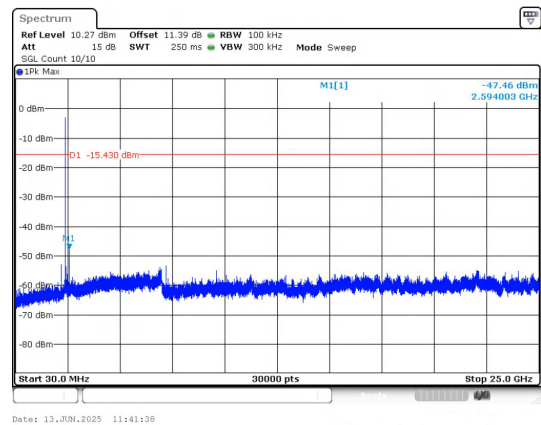
Out Of Band Emission
GFSK_DH5_Channel 0



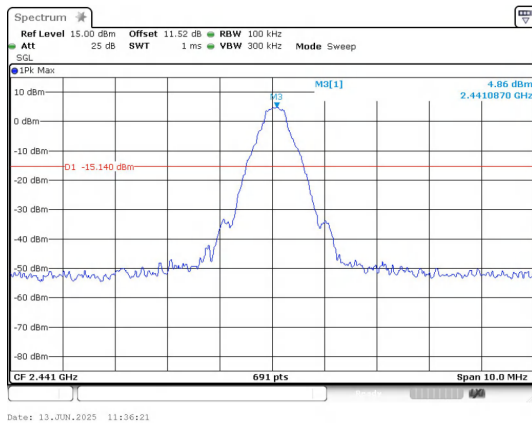
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



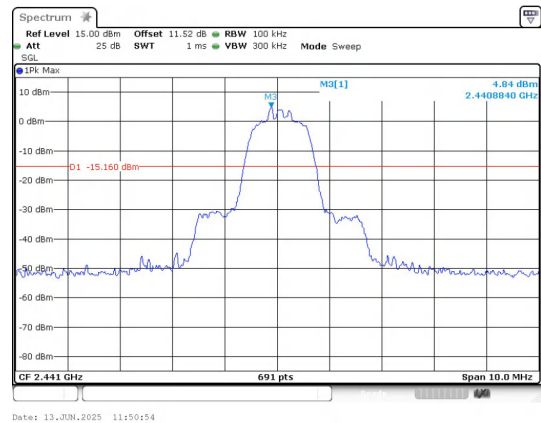
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



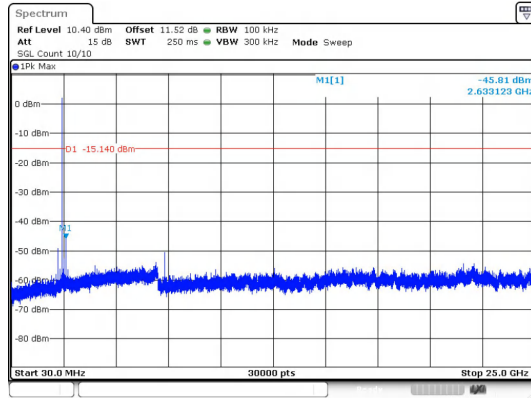
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



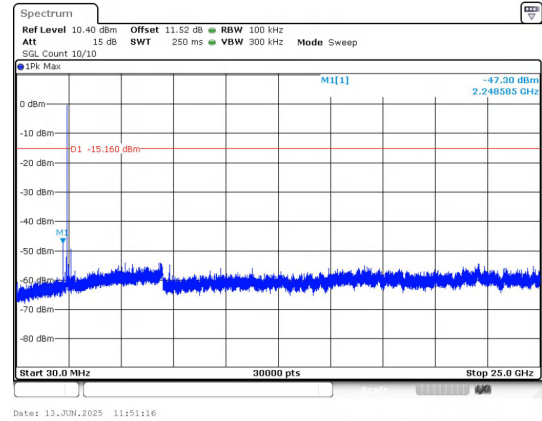
Out Of Band Emission
GFSK_DH5_Channel 39



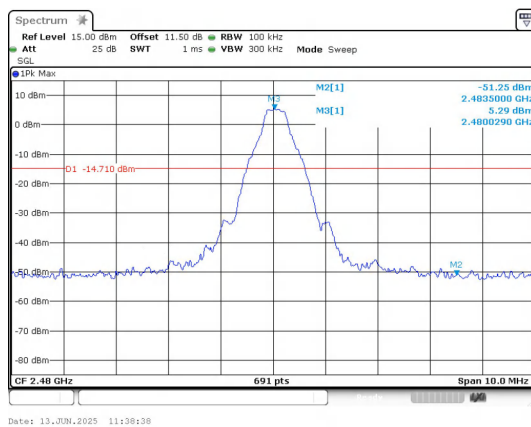
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



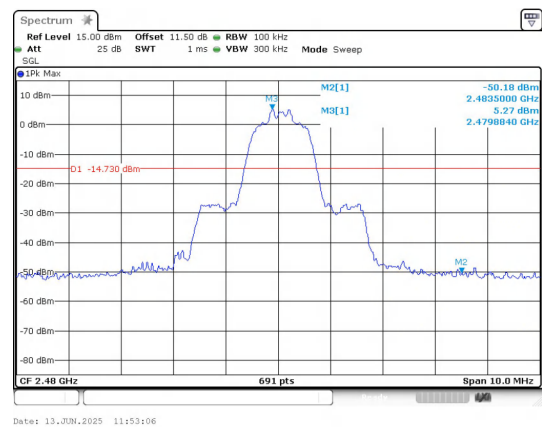
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



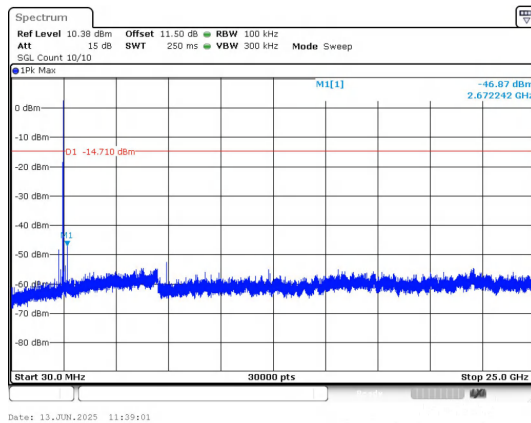
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



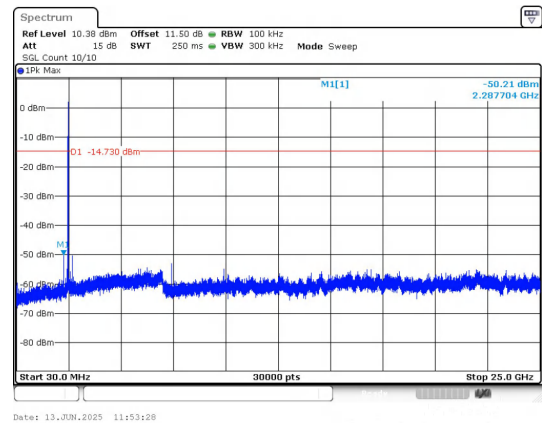
Out Of Band Emission
GFSK_DH5_Channel 78



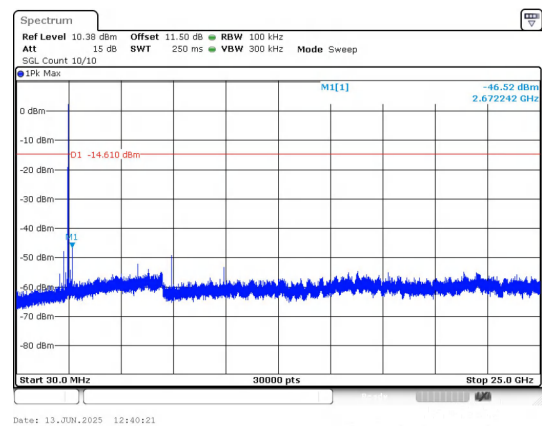
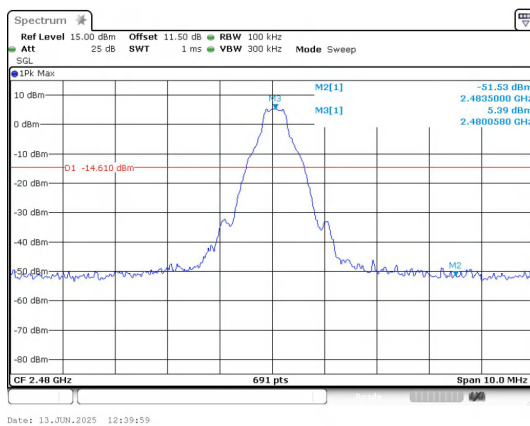
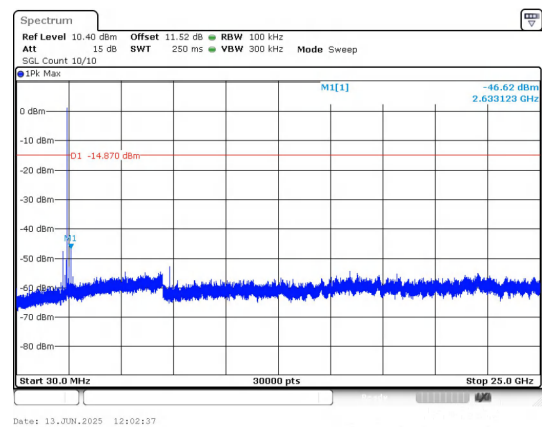
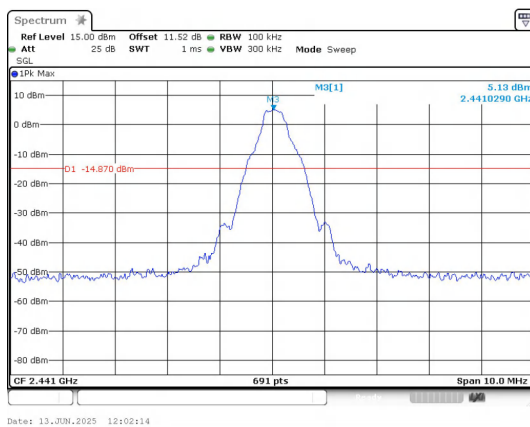
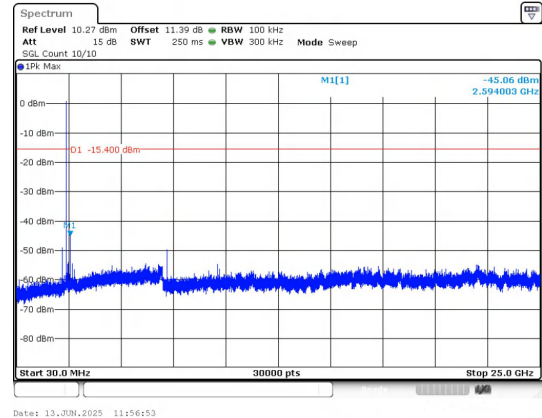
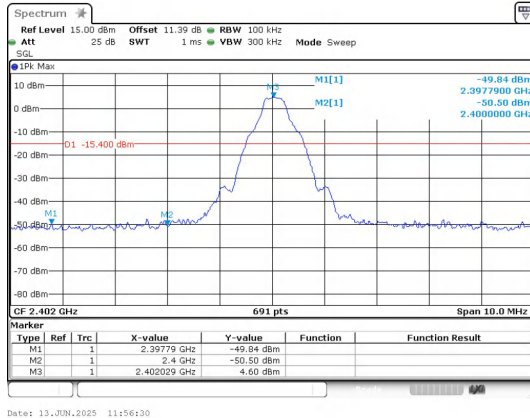
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78

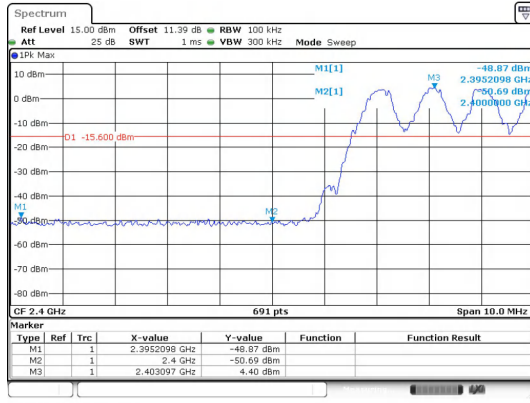


30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78

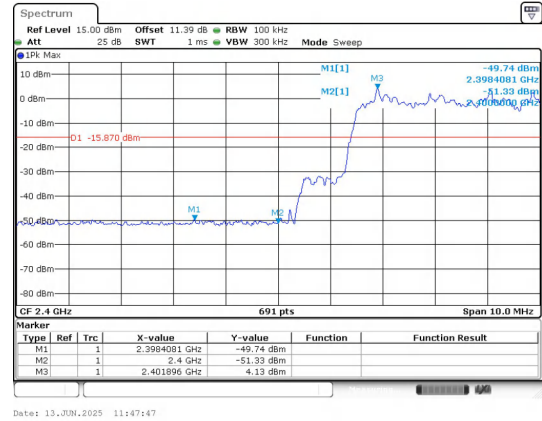


30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78

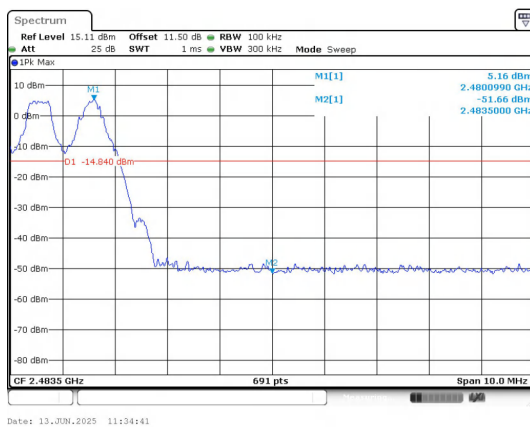




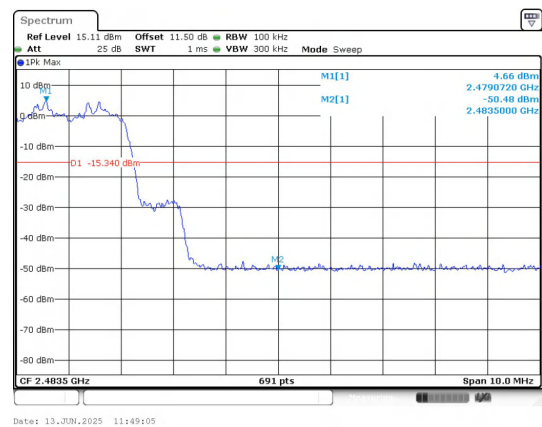
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



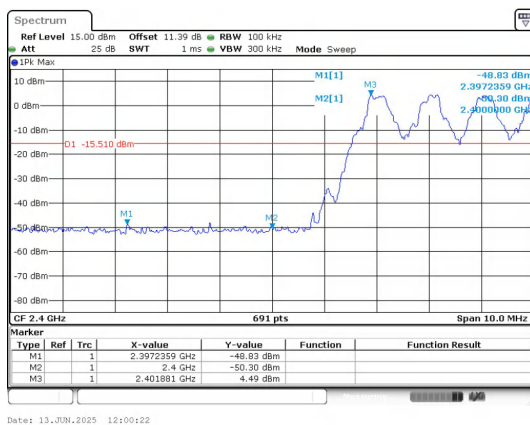
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



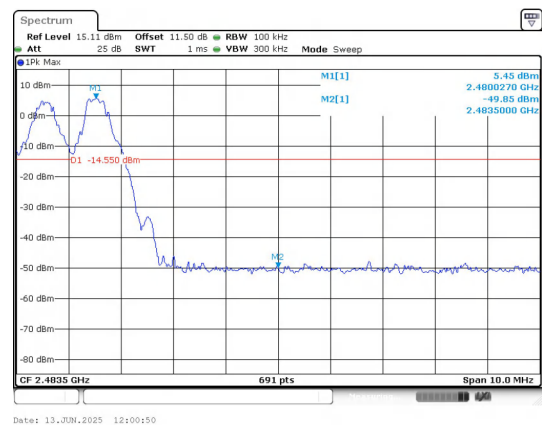
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



Out Of Band Emission(Right)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



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



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

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