

Appendix Report

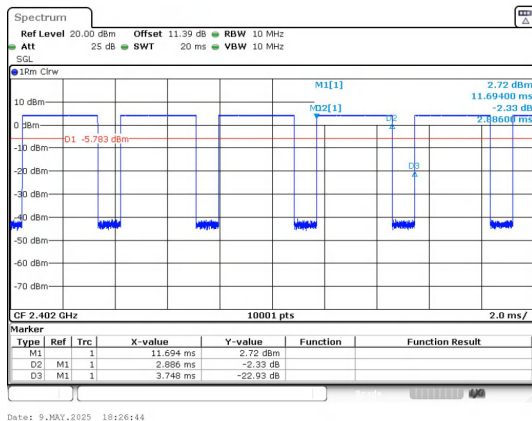
Project No.:	CISR250507005
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

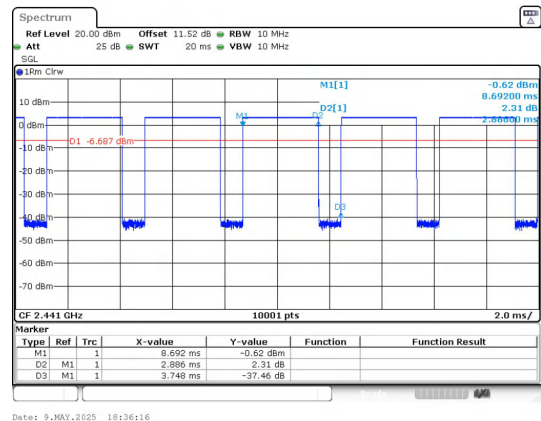
Test Result

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	3.746	77.15	0.7715	1.1266	0.3460
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.894	3.748	77.21	0.7721	1.1233	0.3455
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458

Test Graphs



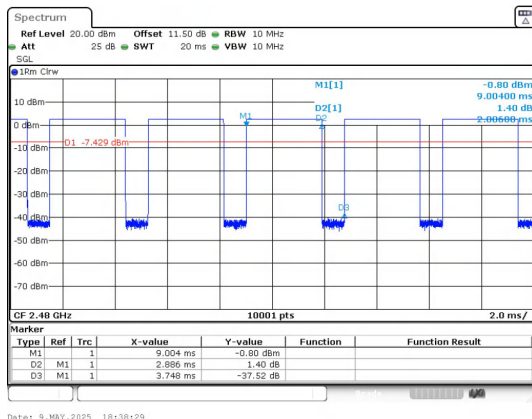
Date: 9.MAY.2025 18:26:44



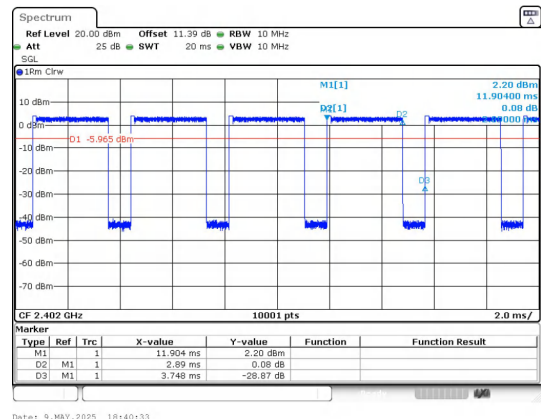
Date: 9.MAY.2025 18:36:16

GFSK(DH5)_Channel 0

GFSK(DH5)_Channel 39



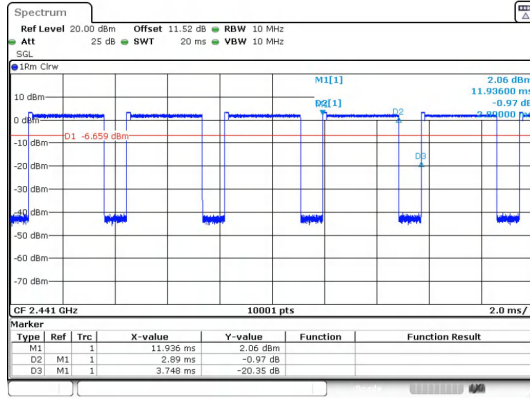
Date: 9.MAY.2025 18:38:29



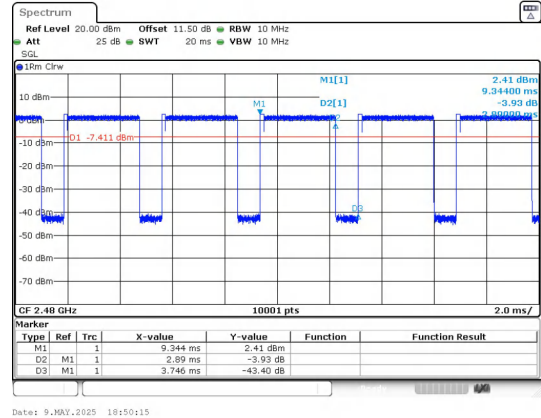
Date: 9.MAY.2025 18:40:33

GFSK(DH5)_Channel 78

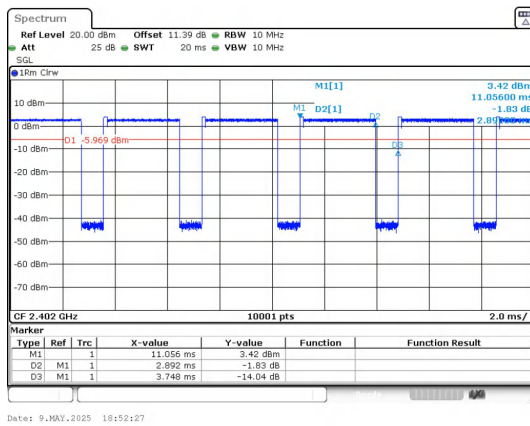
 $\pi/4$ DQPSK(2-DH5)_Channel 0



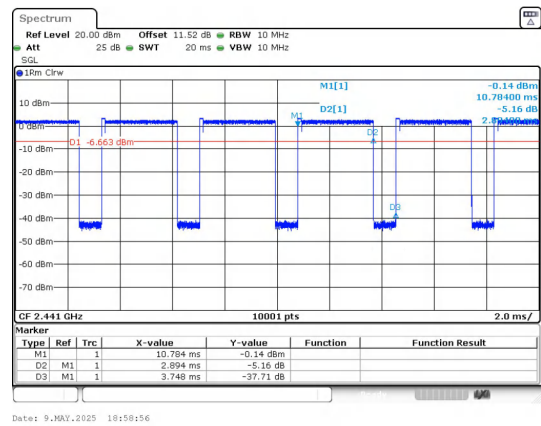
$\pi/4$ DQPSK(2-DH5)_Channel 39



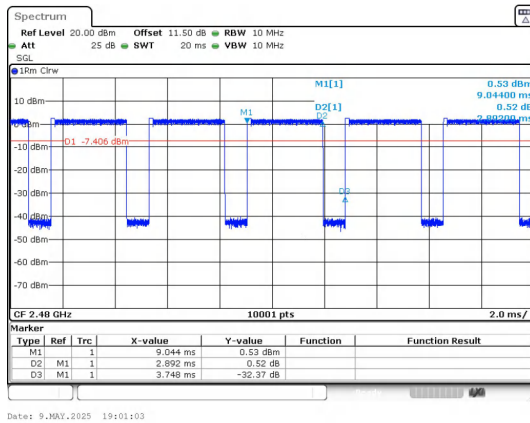
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



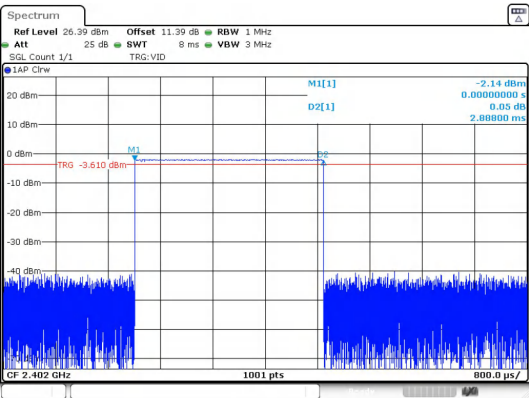
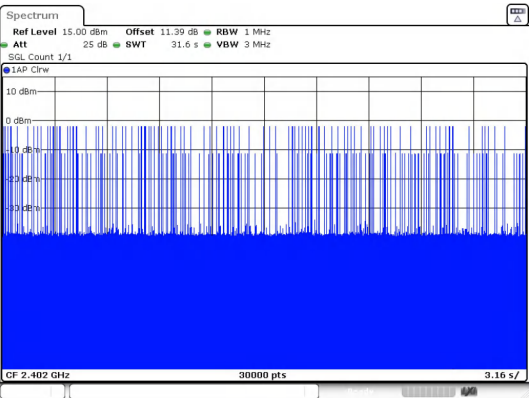
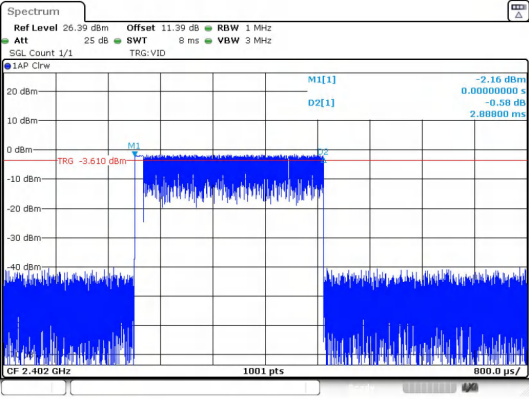
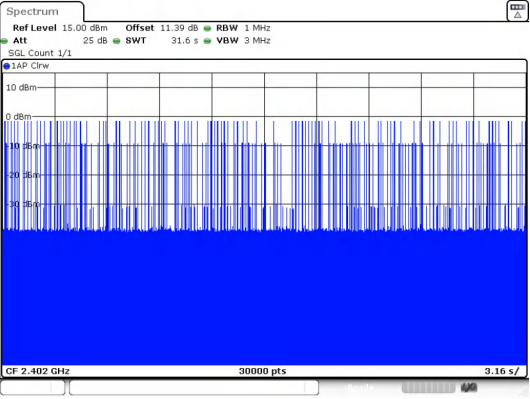
8DPSK(3-DH5)_Channel 78

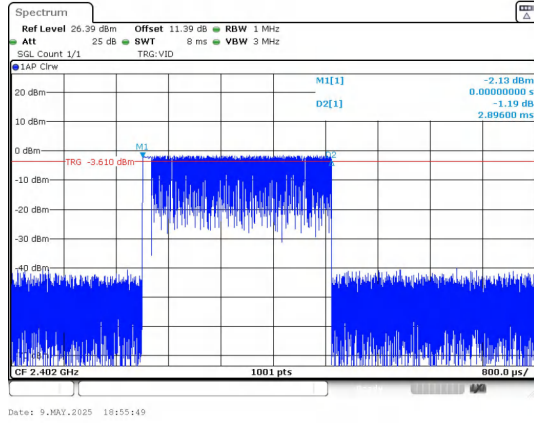
2) Dwell Time

Test Result

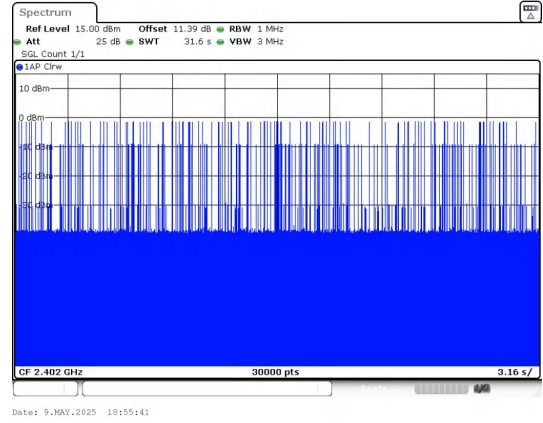
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	106	306.13	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	112	323.46		PASS
8DPSK	3-DH5		2.896	105	304.08		PASS

Test Graphs

 Date: 9.MAY.2025 18:30:07	 Date: 9.MAY.2025 18:29:59
Pulse Width GFSK_DH5	Number of Pulses in 31.6 seconds GFSK_DH5
 Date: 9.MAY.2025 18:44:01	 Date: 9.MAY.2025 18:43:53
Pulse Width $\pi/4$DQPSK_2-DH5	Number of Pulses in 31.6 seconds $\pi/4$DQPSK_2-DH5



Pulse Width
8DPSK_3-DH5



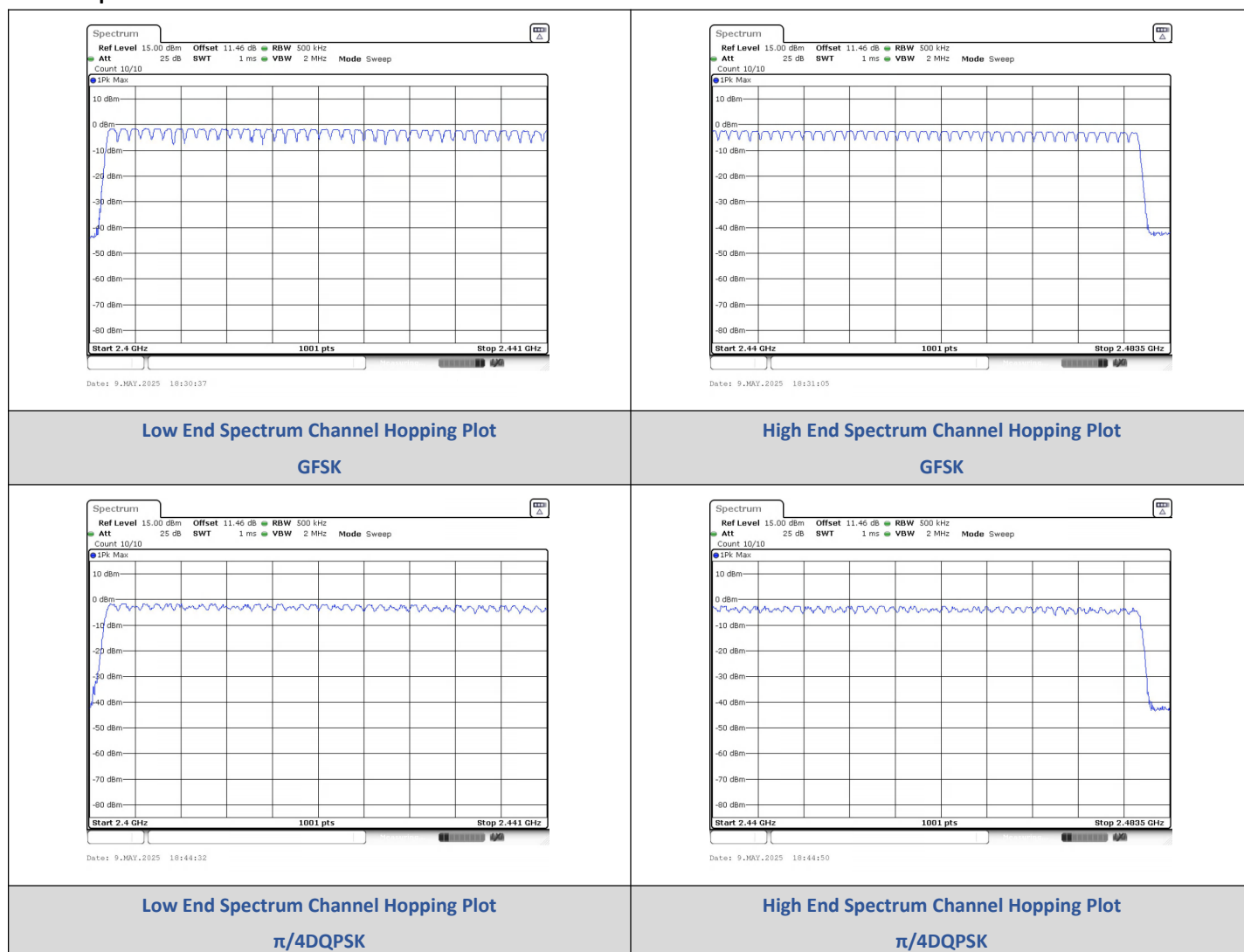
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

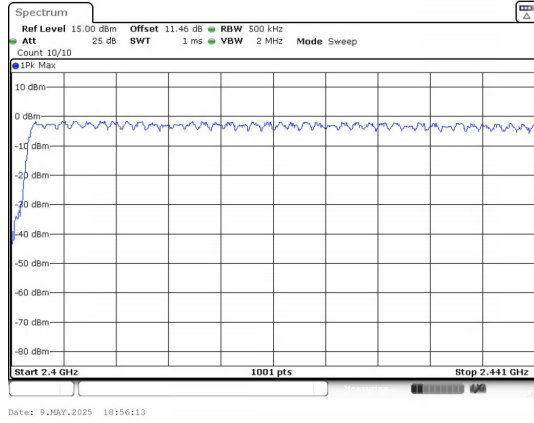
3) Number Of Hopping Channel

Test Result

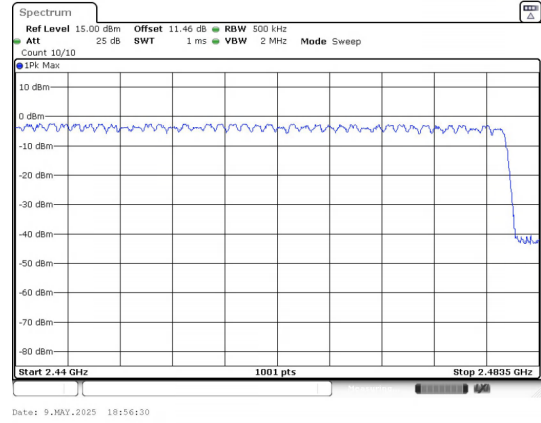
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



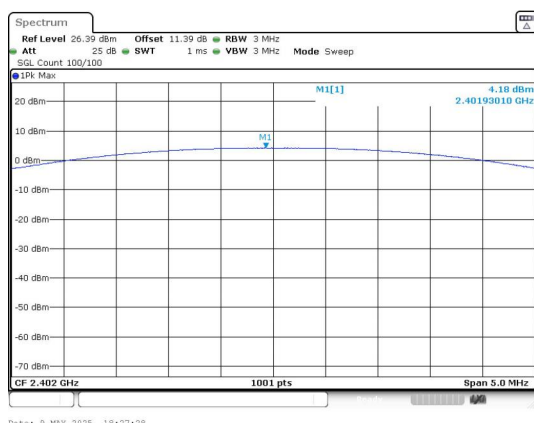
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

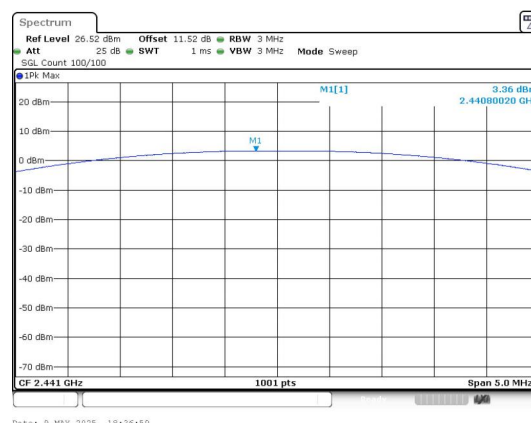
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	4.18	2.62	≤30	PASS
		39	3.36	2.17		PASS
		78	2.65	1.84		PASS
$\pi/4$ DQPSK	2-DH5	0	4.78	3.01	≤20.97	PASS
		39	4.21	2.64		PASS
		78	3.46	2.22		PASS
8DPSK	3-DH5	0	5.01	3.17		PASS
		39	4.50	2.82		PASS
		78	3.78	2.39		PASS

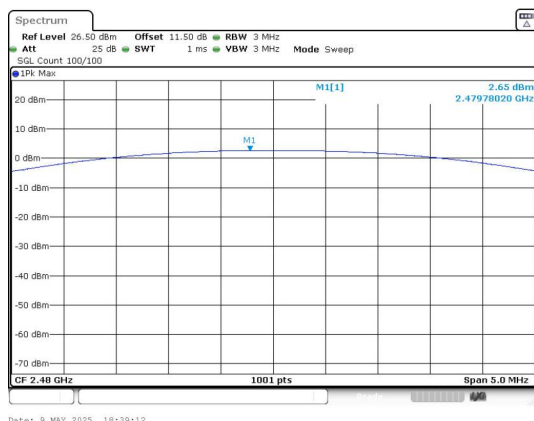
Test Graphs



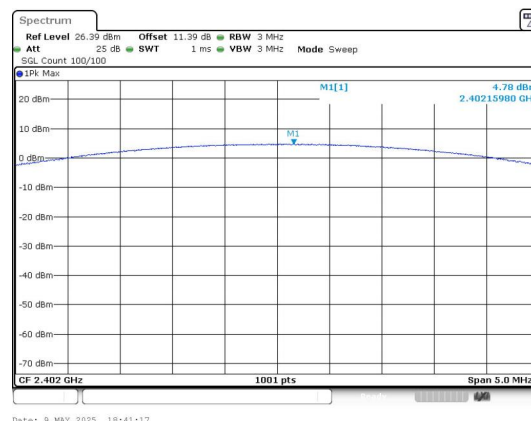
Peak Output Power
GFSK_Channel 0



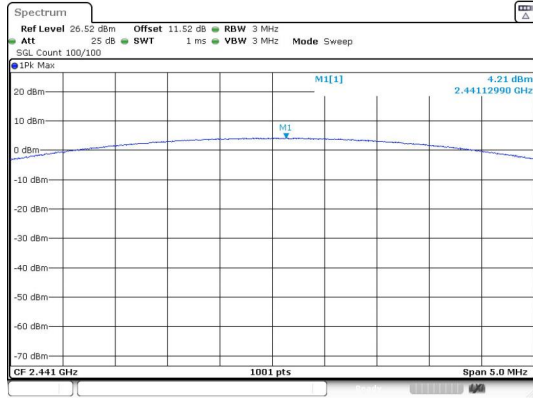
Peak Output Power
GFSK_Channel 39



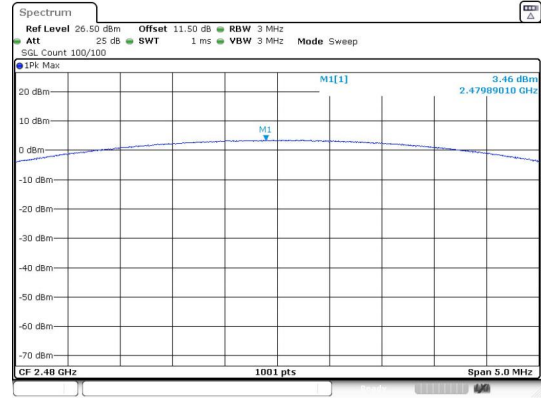
Peak Output Power
GFSK_Channel 78



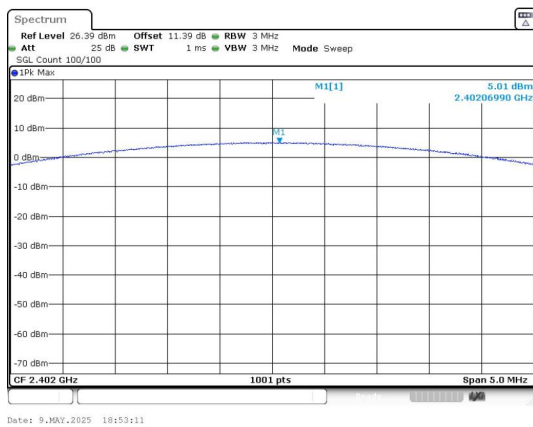
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



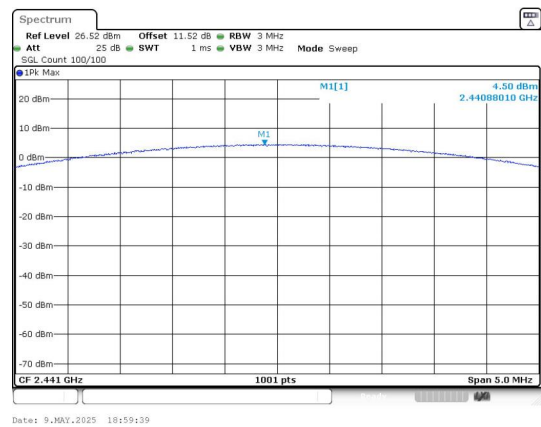
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



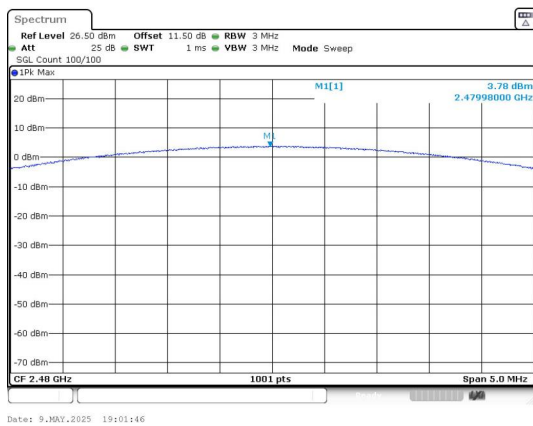
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



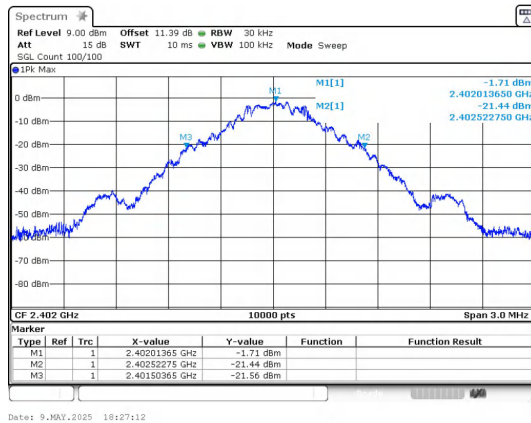
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

Test Result

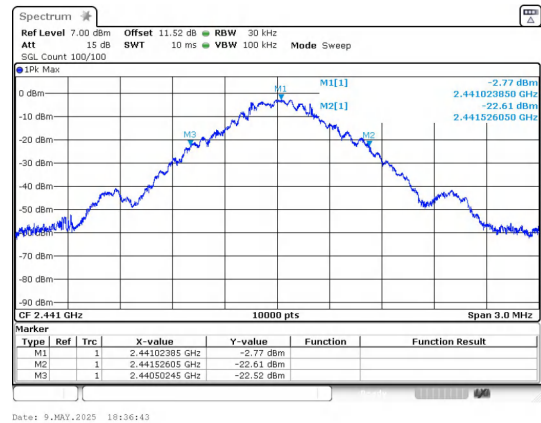
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.02
	39	2441 MHz	1.02
	78	2480 MHz	1.02
$\pi/4$ DQPSK	0	2402 MHz	1.280
	39	2441 MHz	1.300
	78	2480 MHz	1.310
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.300
	78	2480 MHz	1.290

Test Graphs



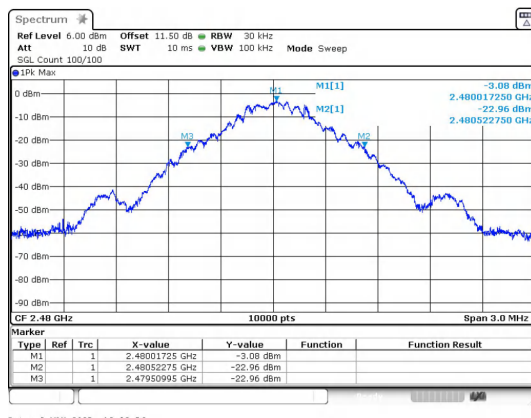
Date: 9.MAY.2025 18:27:12

GFSK_DH5_Channel 0



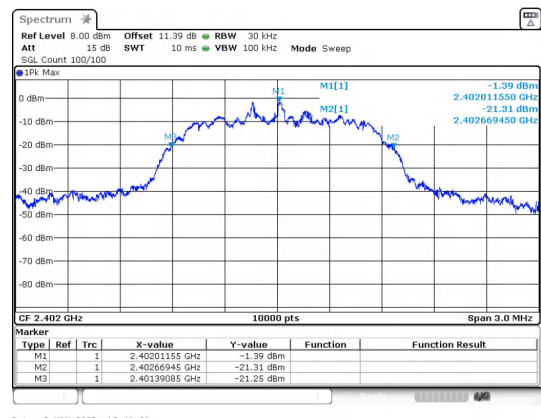
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GFSK_DH5_Channel 39



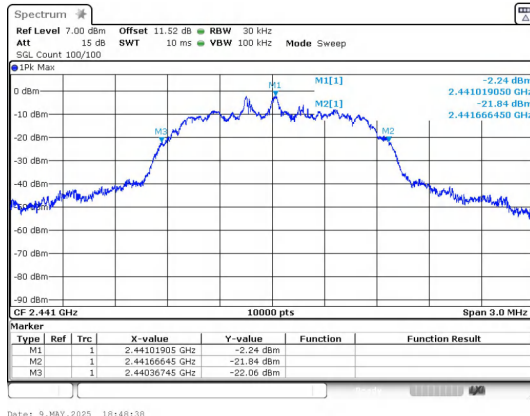
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GFSK_DH5_Channel 78

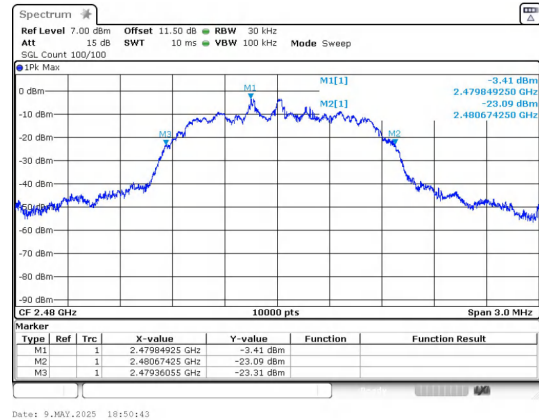


Date: 9.MAY.2025 18:41:01

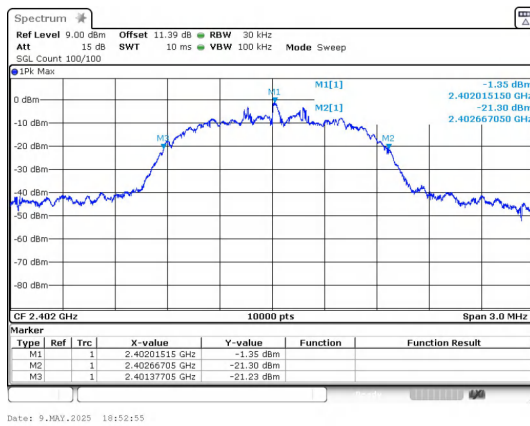
 $\pi/4$ DQPSK_2-DH5_Channel 0



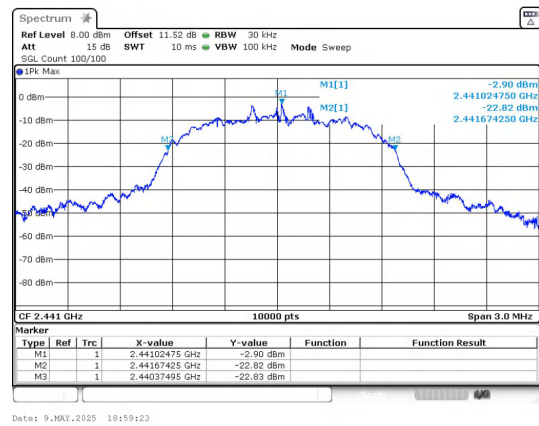
$\pi/4$ DQPSK_2-DH5_Channel 39



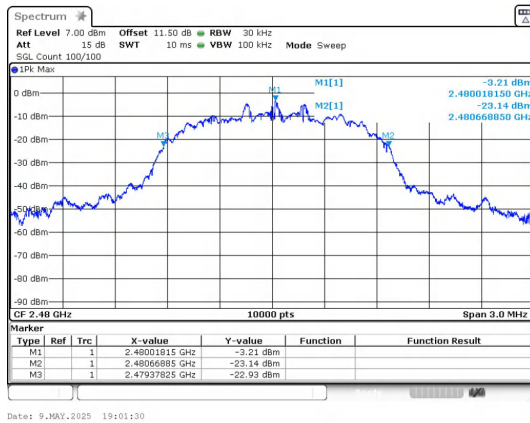
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



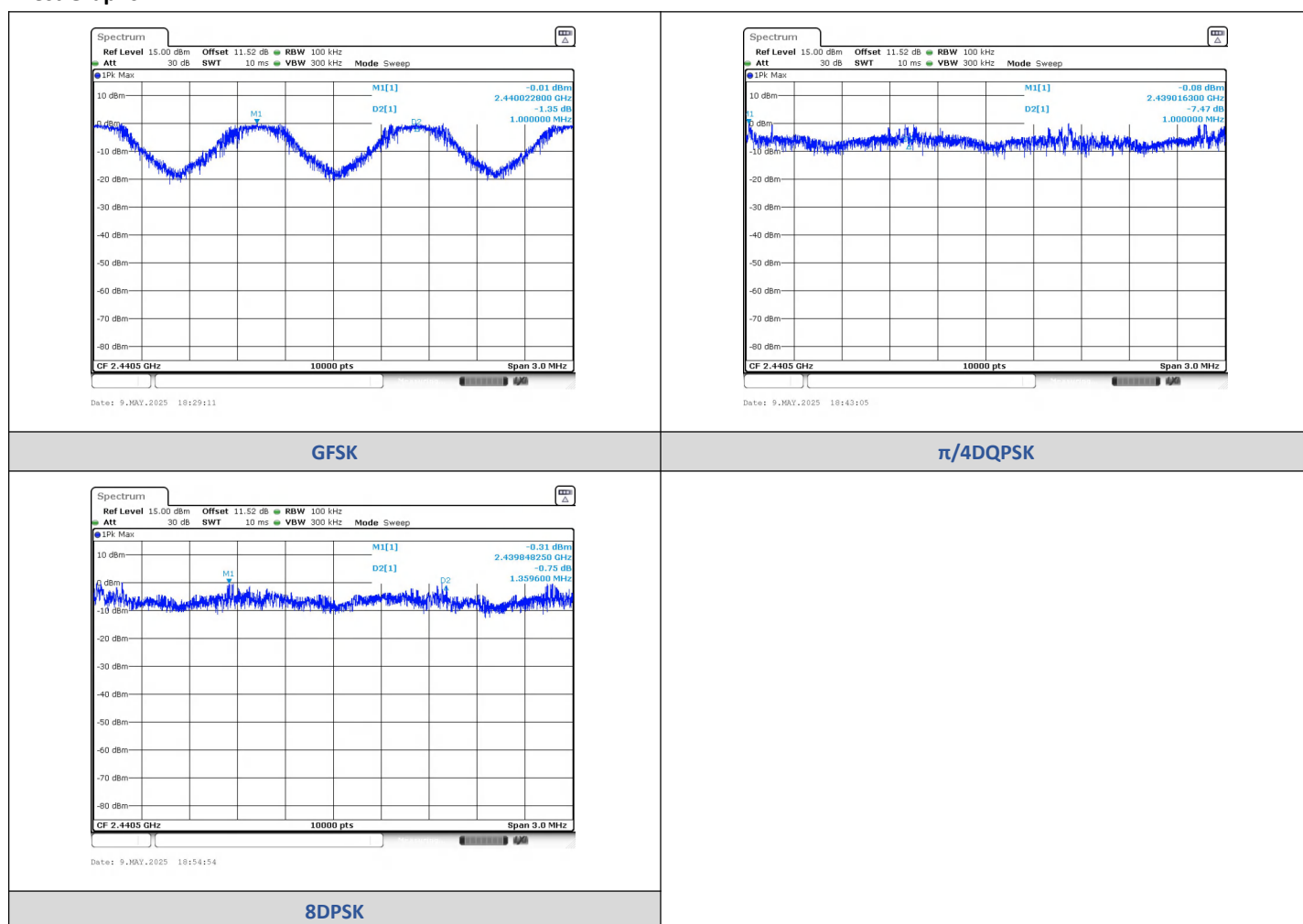
8DPSK_3-DH5_Channel 78

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	2440.0228	2441.1874	1	1.02	PASS
$\pi/4$ QPSK	2-DH5	2440.0622	2441.0192	1	0.853	PASS
8DPSK	3-DH5	2439.8483	2441.2078	1.3596	0.86	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

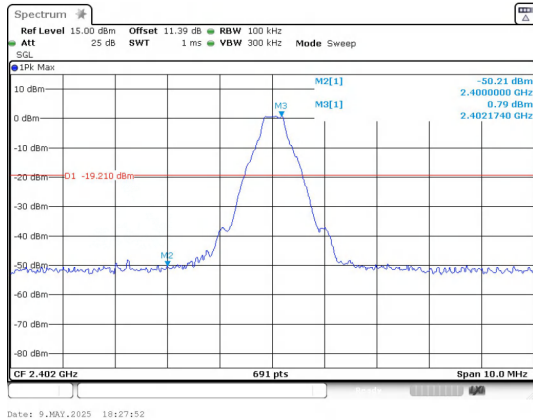
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2399.00	-49.516	-19.21	-30.306	PASS
			2400.00	-50.210	-19.21	-31.000	PASS
			4803.80	-49.283	-19.21	-30.073	PASS
		39	4882.09	-48.035	-20.08	-27.955	PASS
		78	2483.50	-52.420	-20.72	-31.700	PASS
			9920.20	-45.181	-20.72	-24.461	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-49.680	-19.33	-30.350	PASS
			9608.08	-48.463	-19.33	-29.133	PASS
		39	9763.72	-47.244	-20.09	-27.154	PASS
		78	2483.50	-52.070	-20.79	-31.280	PASS
			9920.20	-44.362	-20.79	-23.572	PASS
8DPSK	3-DH5	0	2400.00	-50.260	-19.43	-30.830	PASS
			9608.08	-48.555	-19.43	-29.125	PASS
		39	9763.72	-46.774	-20.05	-26.724	PASS
		78	2483.50	-50.520	-20.78	-29.740	PASS
			9920.20	-44.128	-20.78	-23.348	PASS

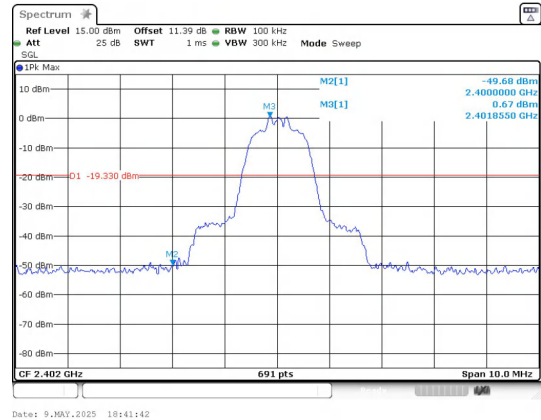
Hopping

Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.86	-49.362	-19.32	-30.042	PASS
			2400.00	-50.750	-19.32	-31.430	PASS
			2483.50	-50.570	-20.75	-29.820	PASS
$\pi/4$ DQPSK	2-DH5		2397.54	-49.599	-21.5	-28.099	PASS
			2400.00	-51.950	-21.5	-30.450	PASS
			2483.50	-51.080	-20.97	-30.110	PASS
8DPSK	3-DH5		2396.69	-49.118	-20.75	-28.368	PASS
			2400.00	-51.490	-20.75	-30.740	PASS
			2483.50	-51.430	-21.29	-30.140	PASS

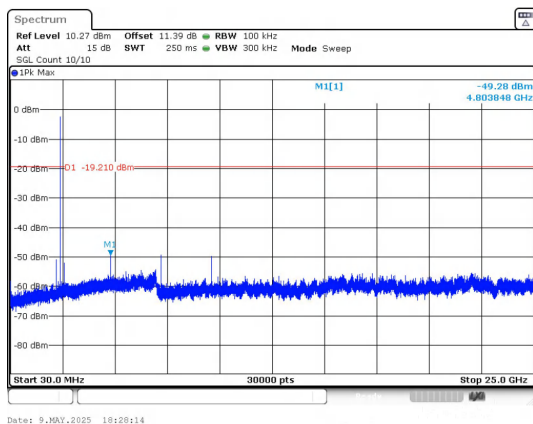
Test Graphs



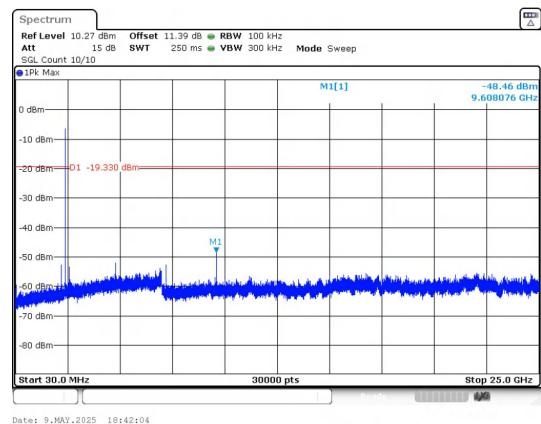
Out Of Band Emission
GFSK_DH5_Channel 0



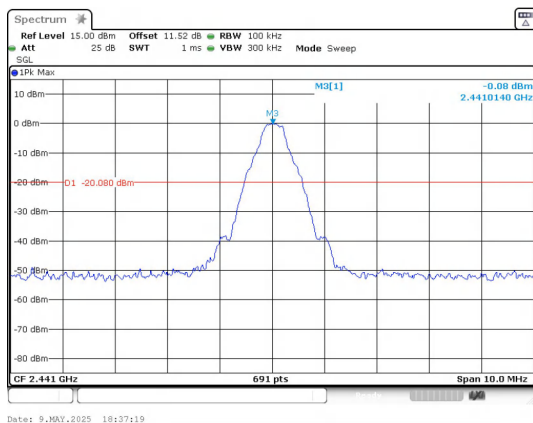
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 0



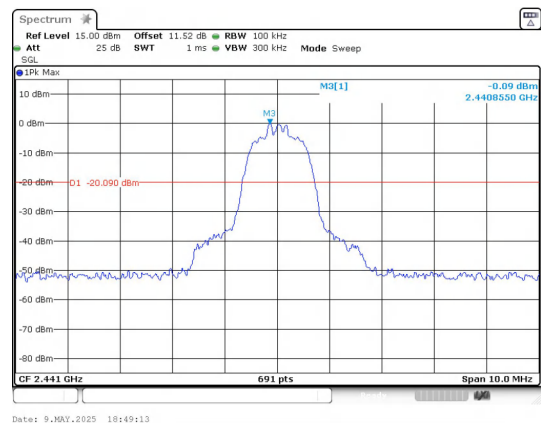
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



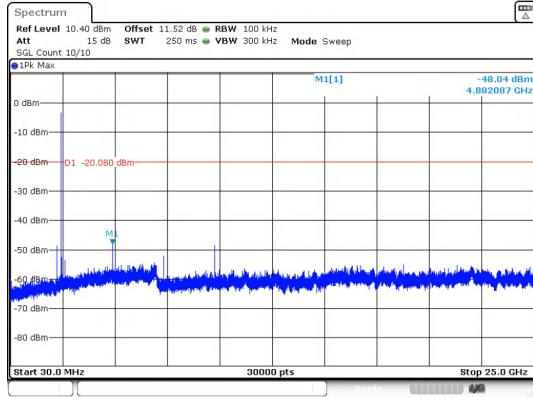
30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 0



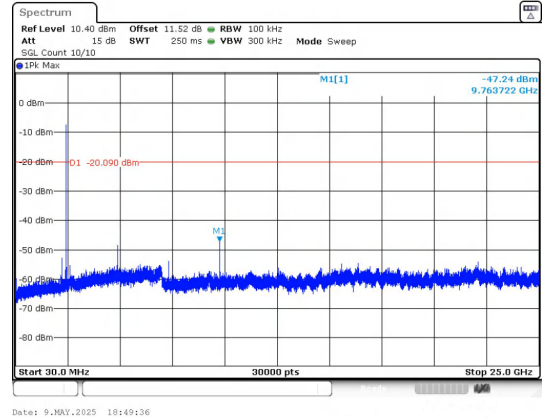
Out Of Band Emission
GFSK_DH5_Channel 39



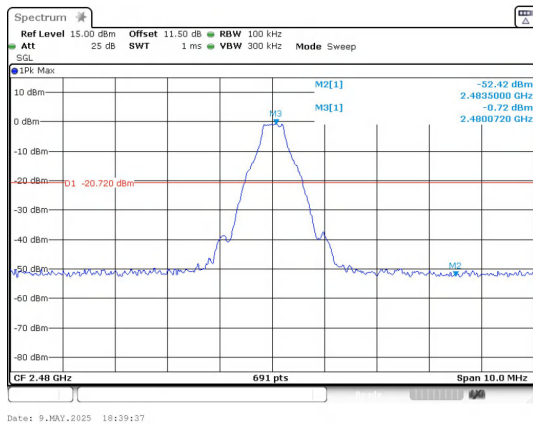
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



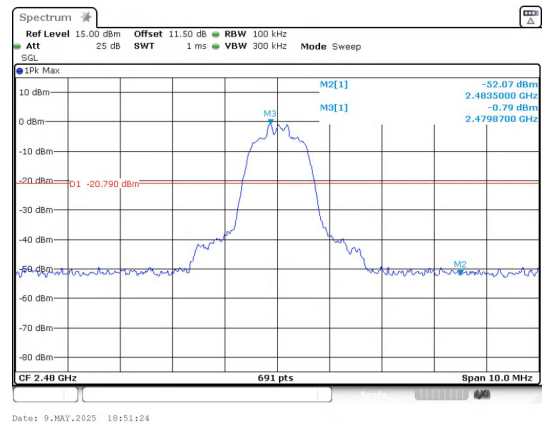
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



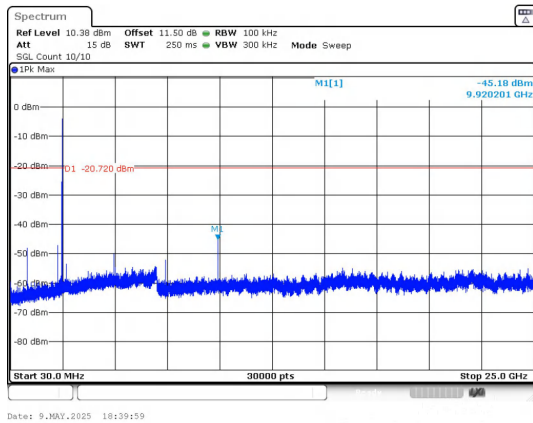
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



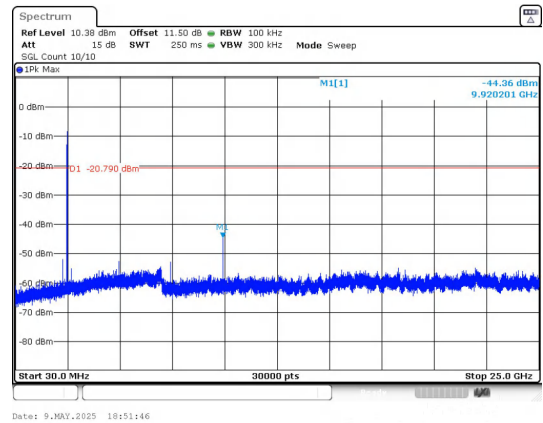
Out Of Band Emission
GFSK_DH5_Channel 78



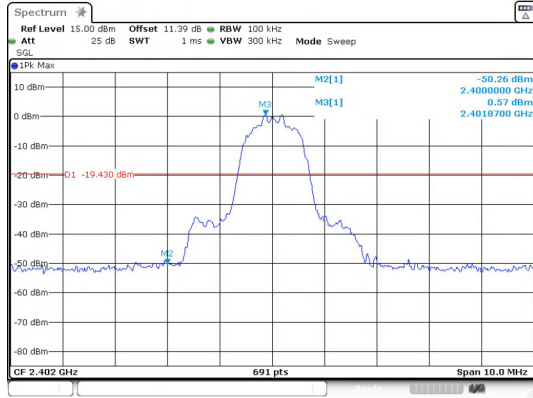
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



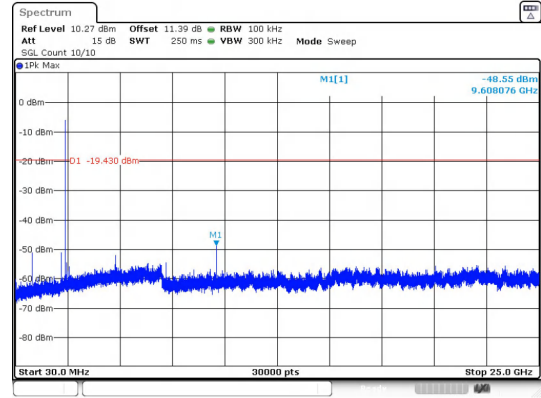
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



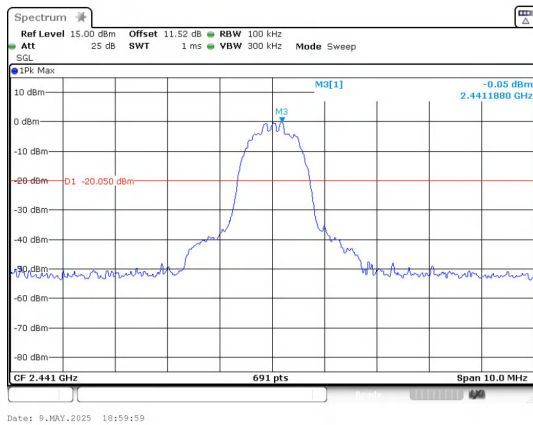
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



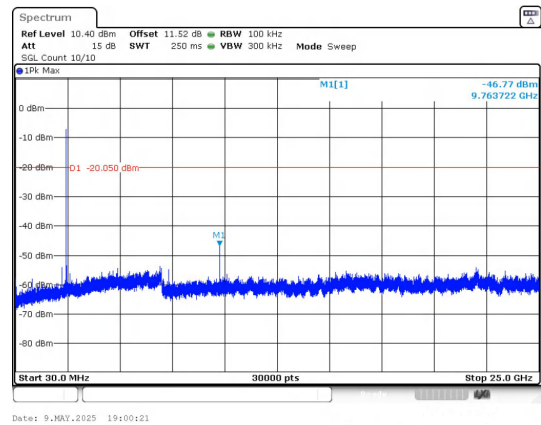
Out Of Band Emission
8DPSK_3-DH5_Channel 0



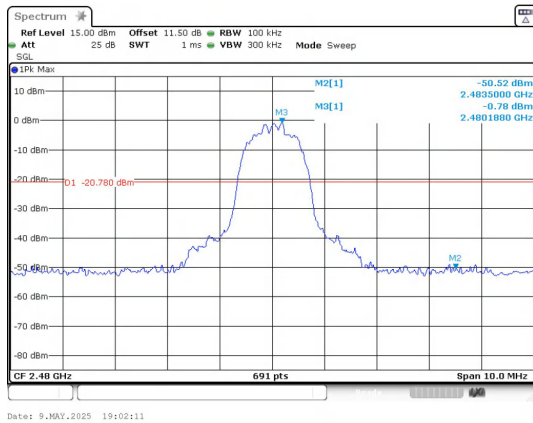
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



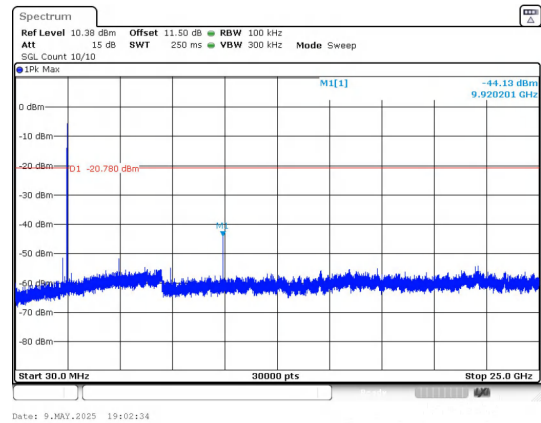
Out Of Band Emission
8DPSK_3-DH5_Channel 39



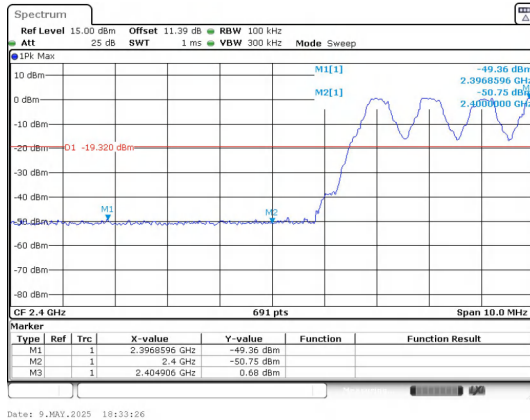
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



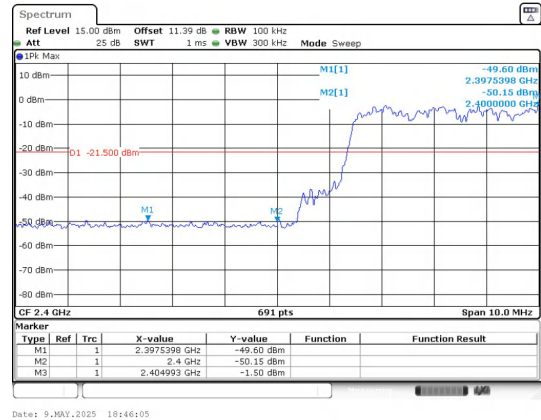
Out Of Band Emission
8DPSK_3-DH5_Channel 78



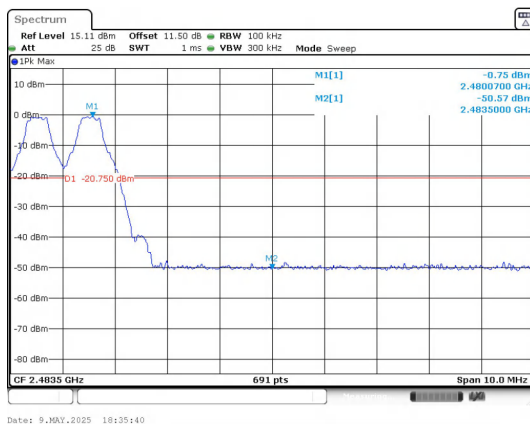
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



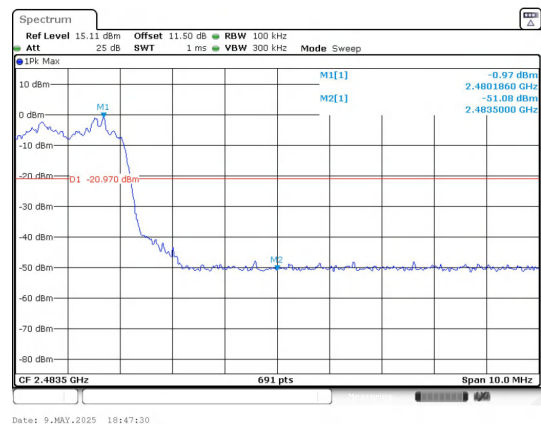
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



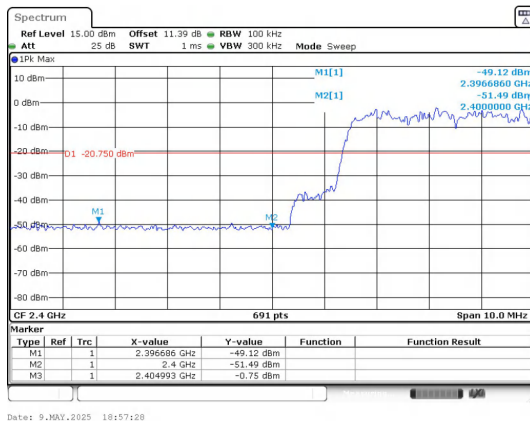
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



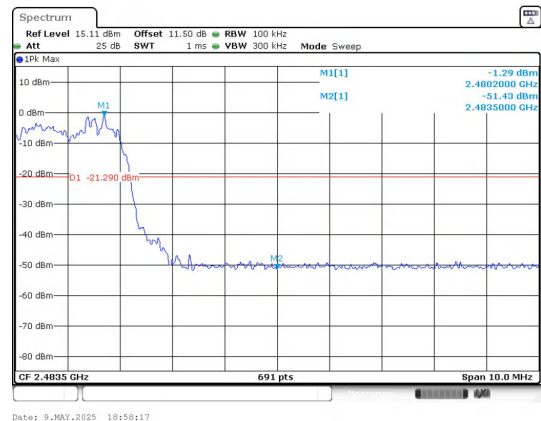
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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-----