

Appendix Report

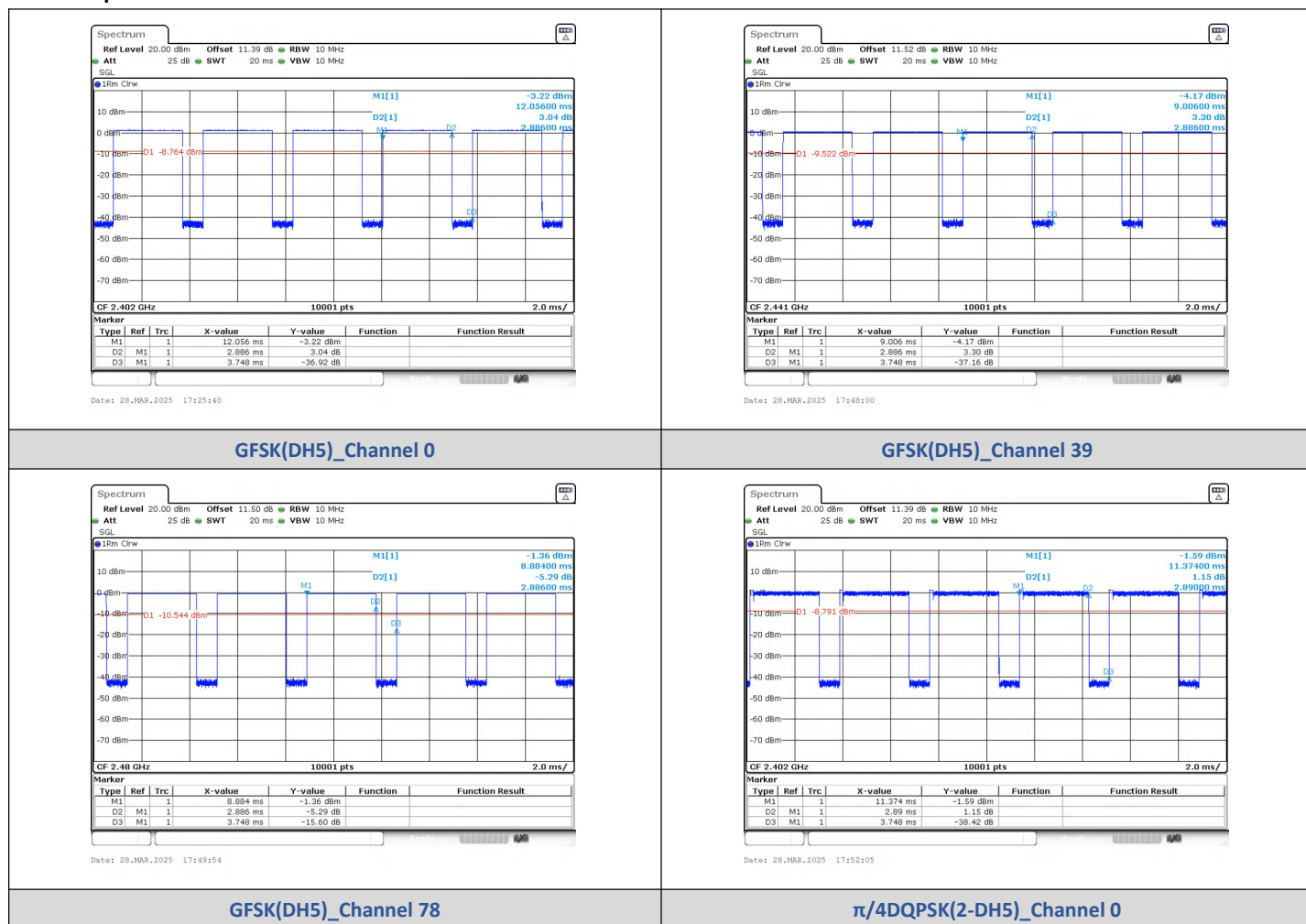
Project No.:	CISR241021117
Test Engineer:	James Wang
Supervised by:	Rory Huang

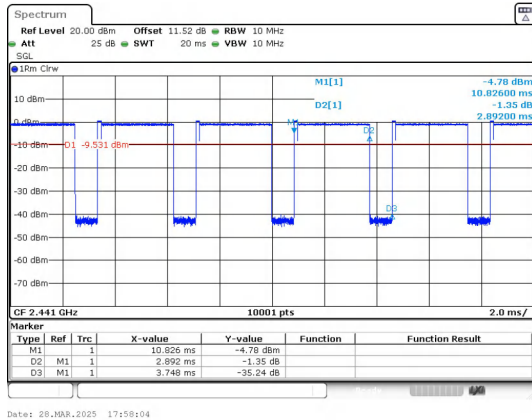
1) Duty Cycle

Test Result

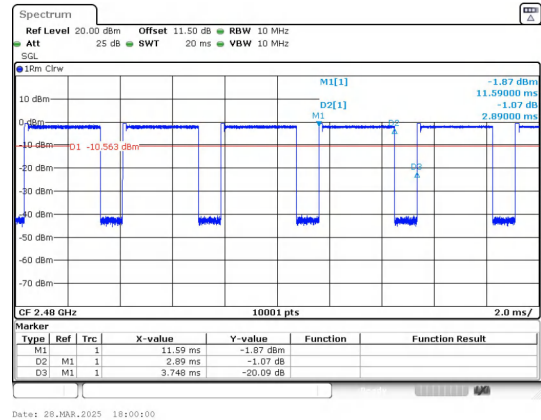
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.3460
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.890	3.748	77.11	0.7711	1.1289	0.3460
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458

Test Graphs

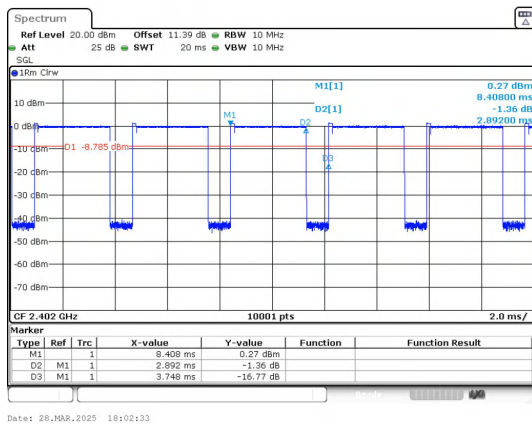




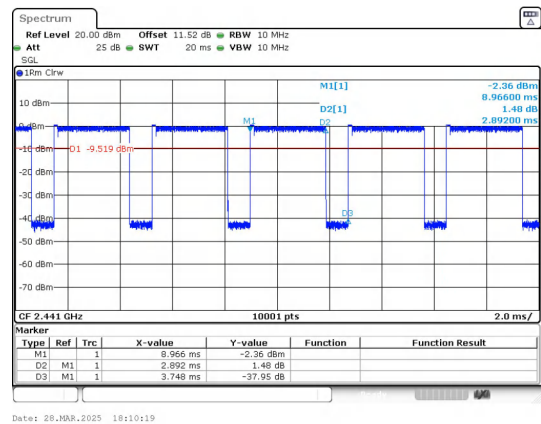
$\pi/4$ DQPSK(2-DH5)_Channel 39



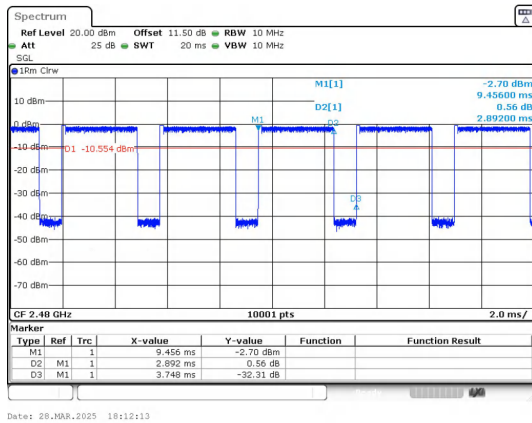
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 39



8DPSK(3-DH5)_Channel 78



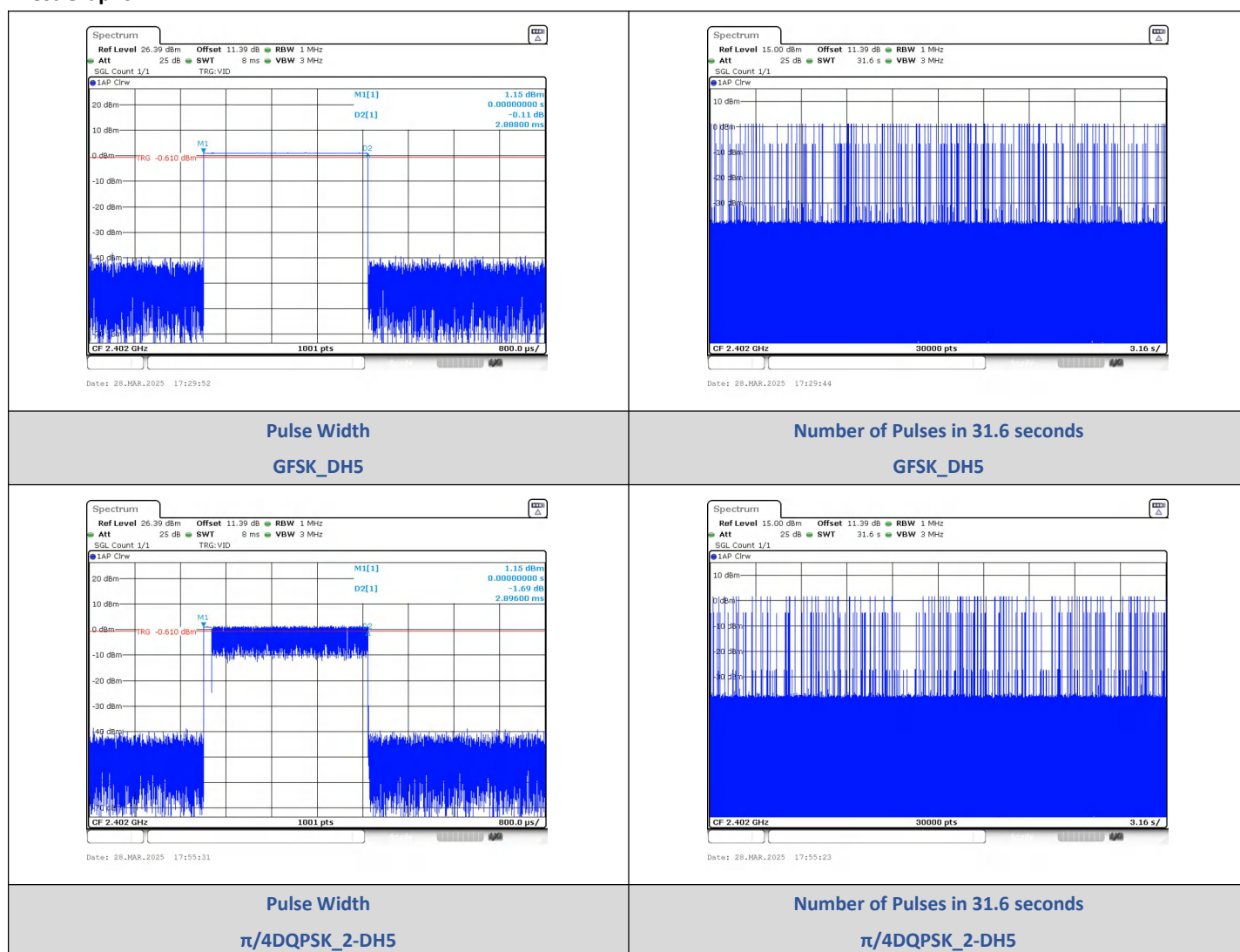
8DPSK(3-DH5)_Channel 78

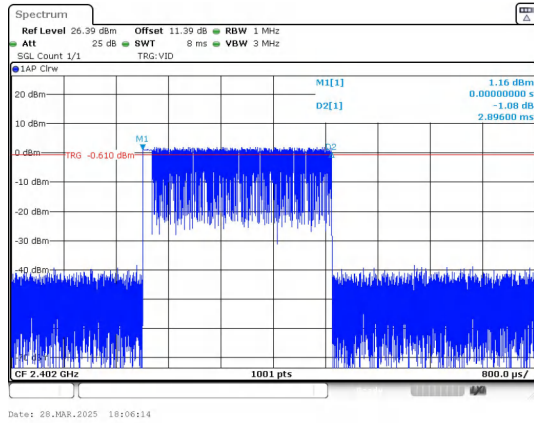
2) Dwell Time

Test Result

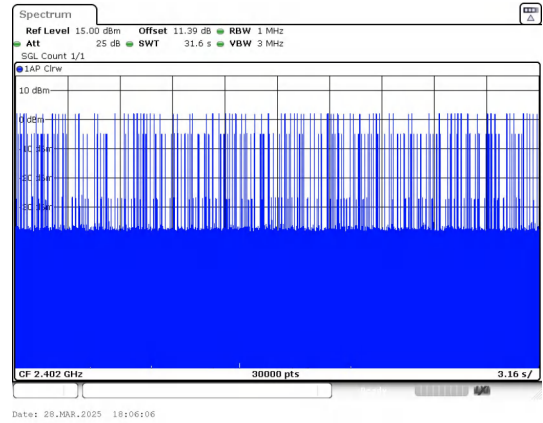
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	115	332.12	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	95	275.12		PASS
8DPSK	3-DH5		2.896	104	301.18		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



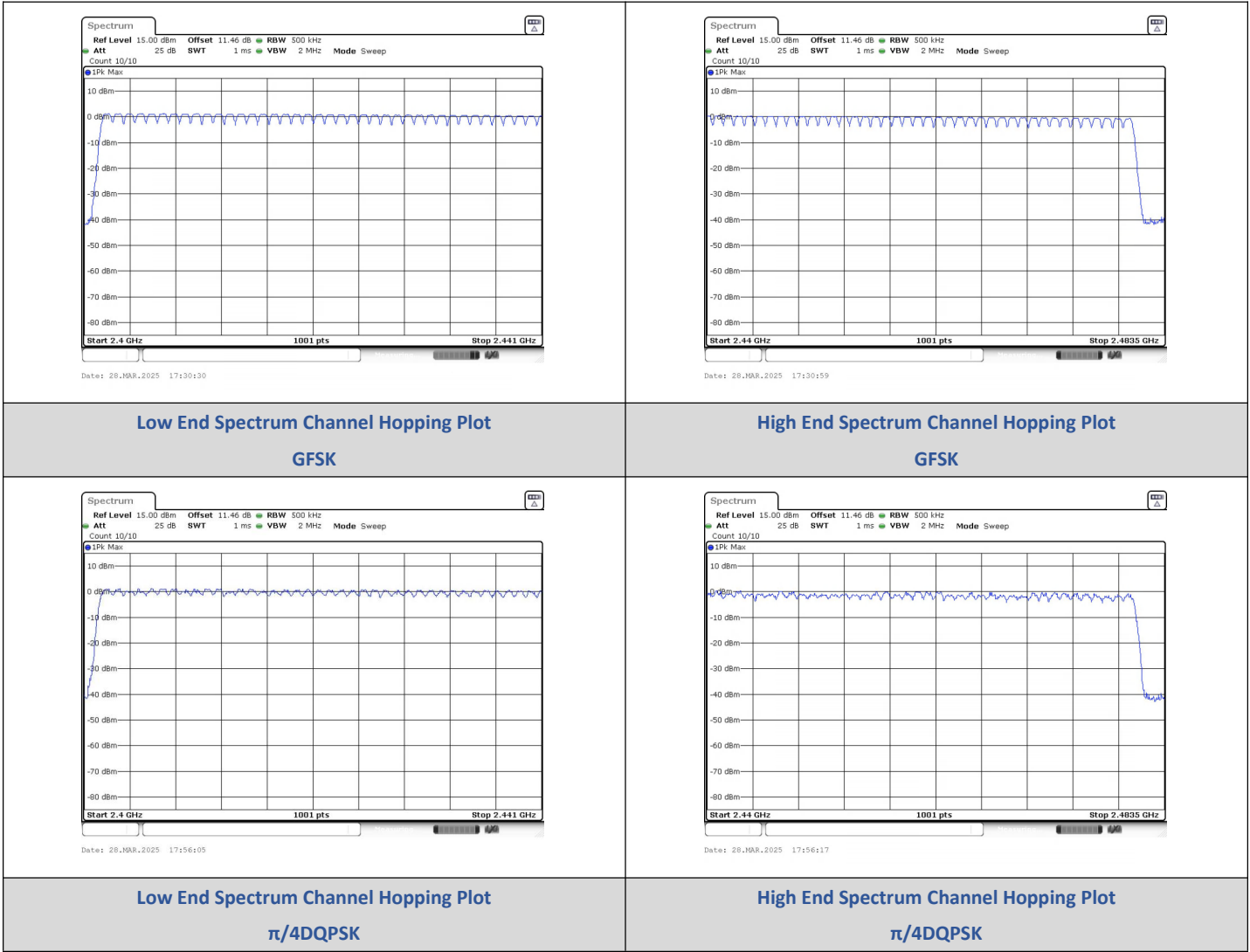
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

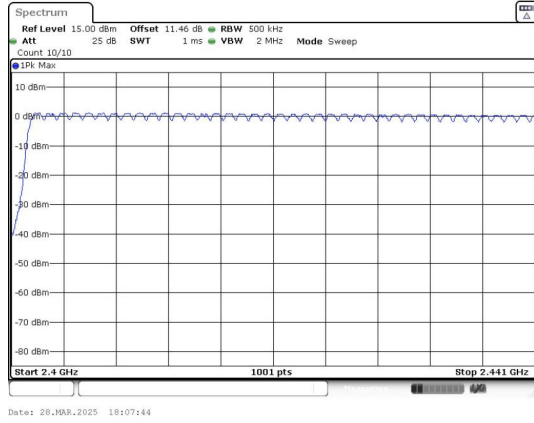
3) Number Of Hopping Channel

Test Result

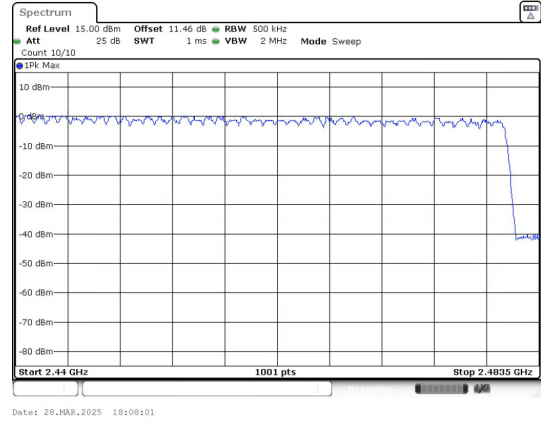
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



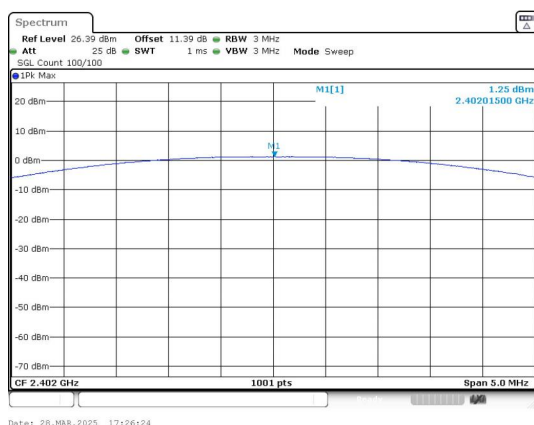
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

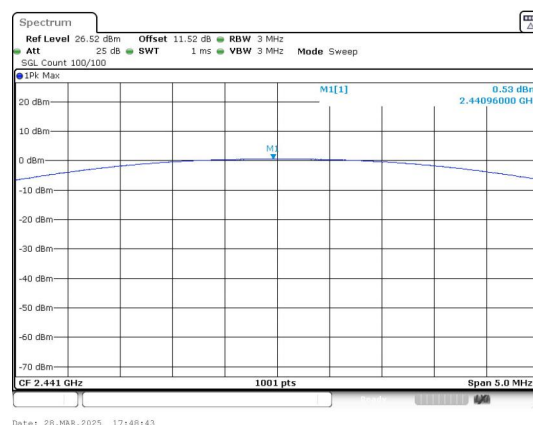
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.25	1.33	≤30	PASS
		39	0.53	1.13		PASS
		78	-0.48	0.90		PASS
$\pi/4$ DQPSK	2-DH5	0	2.08	1.61	≤20.97	PASS
		39	1.35	1.36		PASS
		78	0.36	1.09		PASS
8DPSK	3-DH5	0	2.48	1.77		PASS
		39	1.73	1.49		PASS
		78	0.68	1.17		PASS

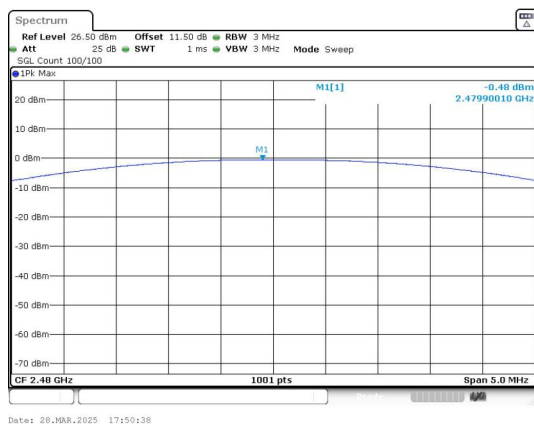
Test Graphs



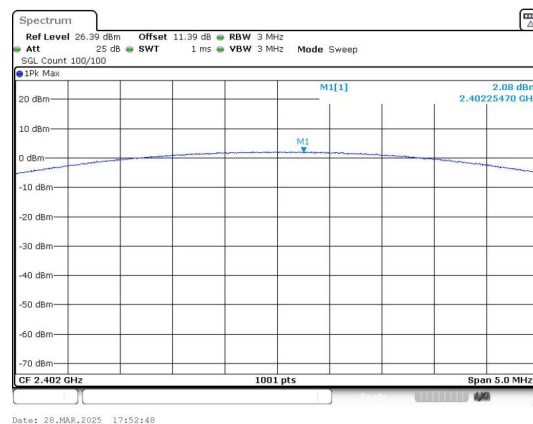
Peak Output Power
GFSK_Channel 0



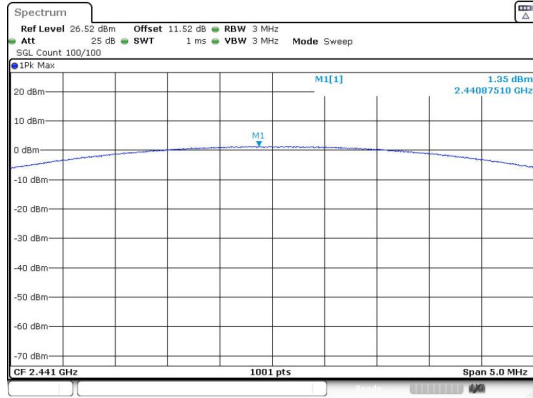
Peak Output Power
GFSK_Channel 39



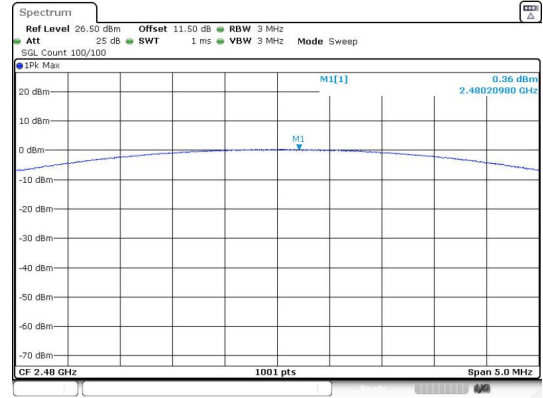
Peak Output Power
GFSK_Channel 78



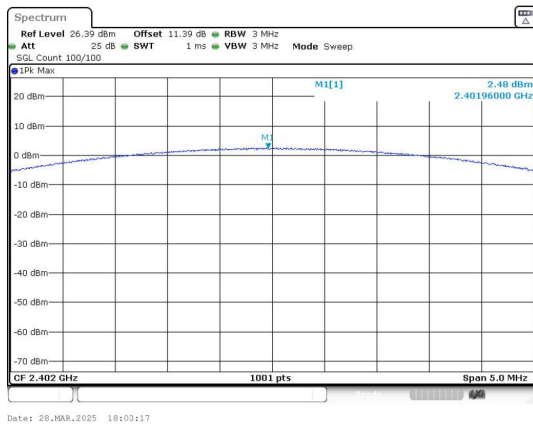
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



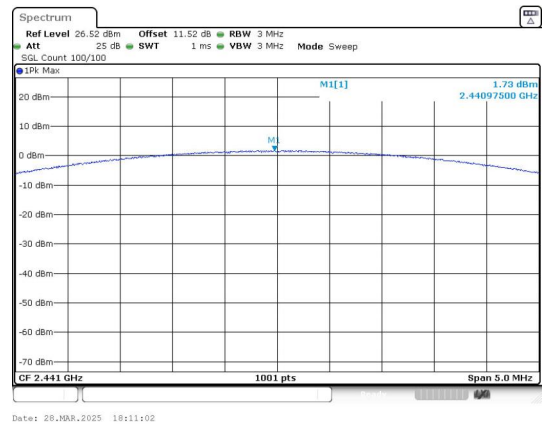
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



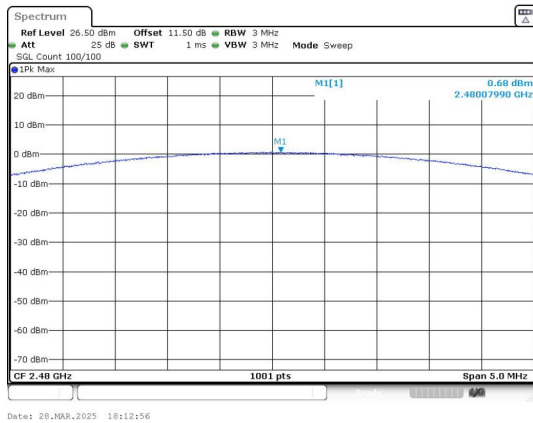
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



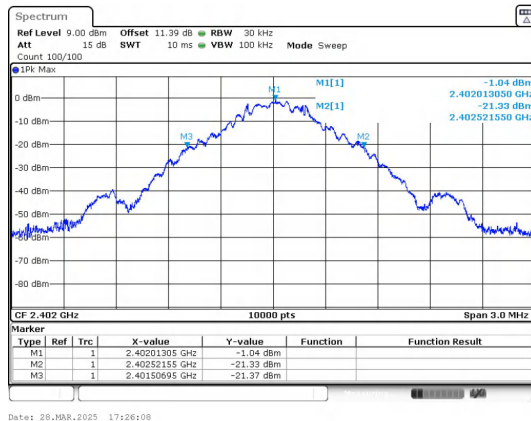
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

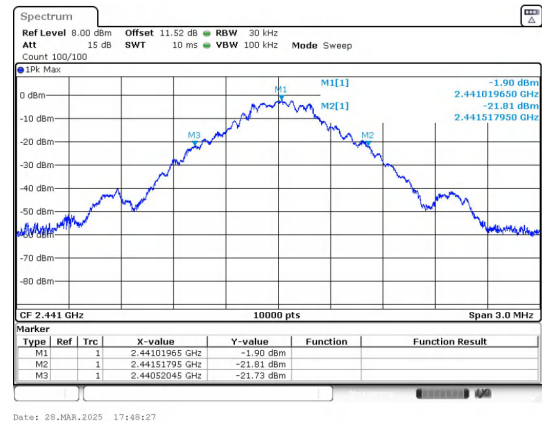
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.01
	39	2441 MHz	1.01
	78	2480 MHz	1.01
$\pi/4$ DQPSK	0	2402 MHz	1.280
	39	2441 MHz	1.280
	78	2480 MHz	1.300
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.300

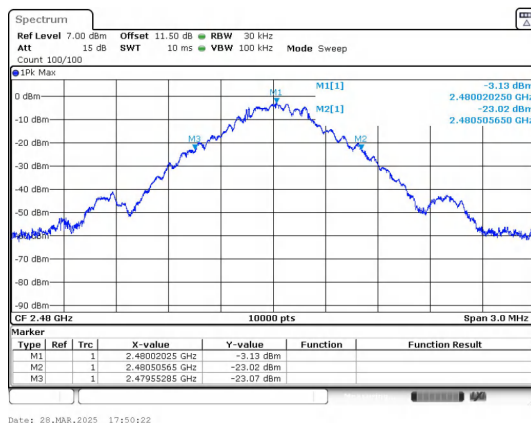
Test Graphs



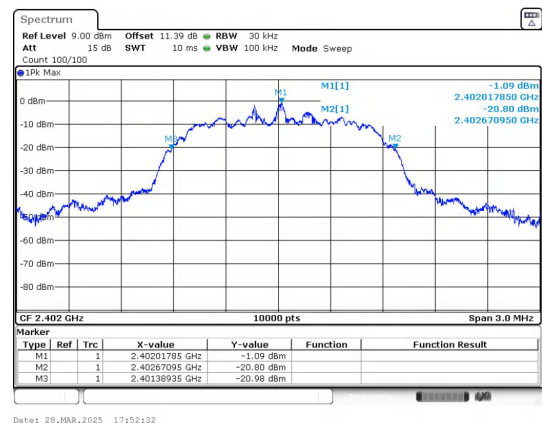
GFSK_DH5_Channel 0

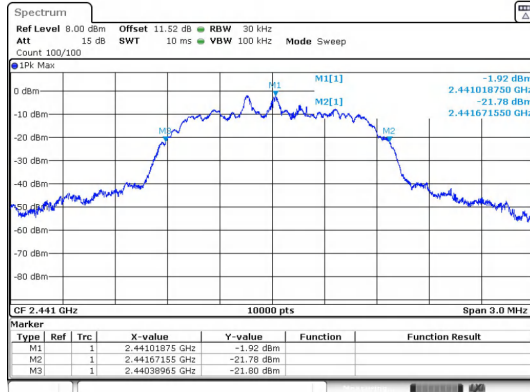


GFSK_DH5_Channel 39

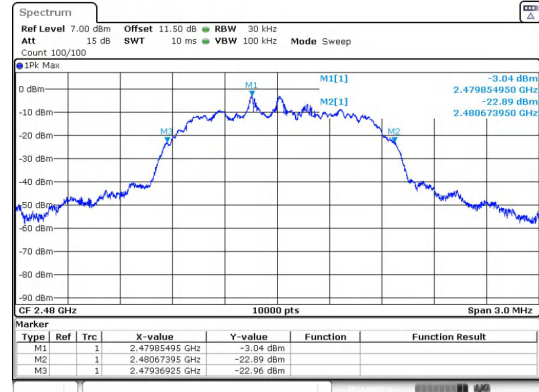


GFSK_DH5_Channel 78

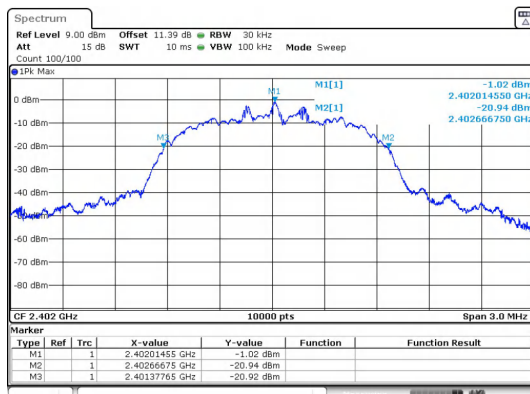

 $\pi/4$ DQPSK_2-DH5_Channel 0



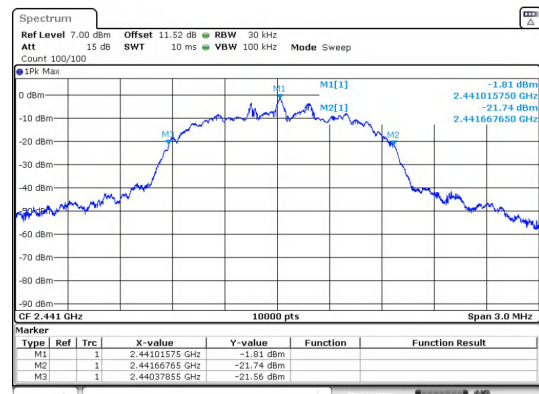
$\pi/4$ DQPSK_2-DH5_Channel 39



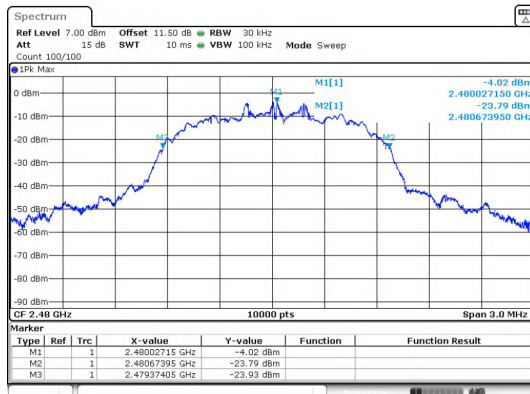
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



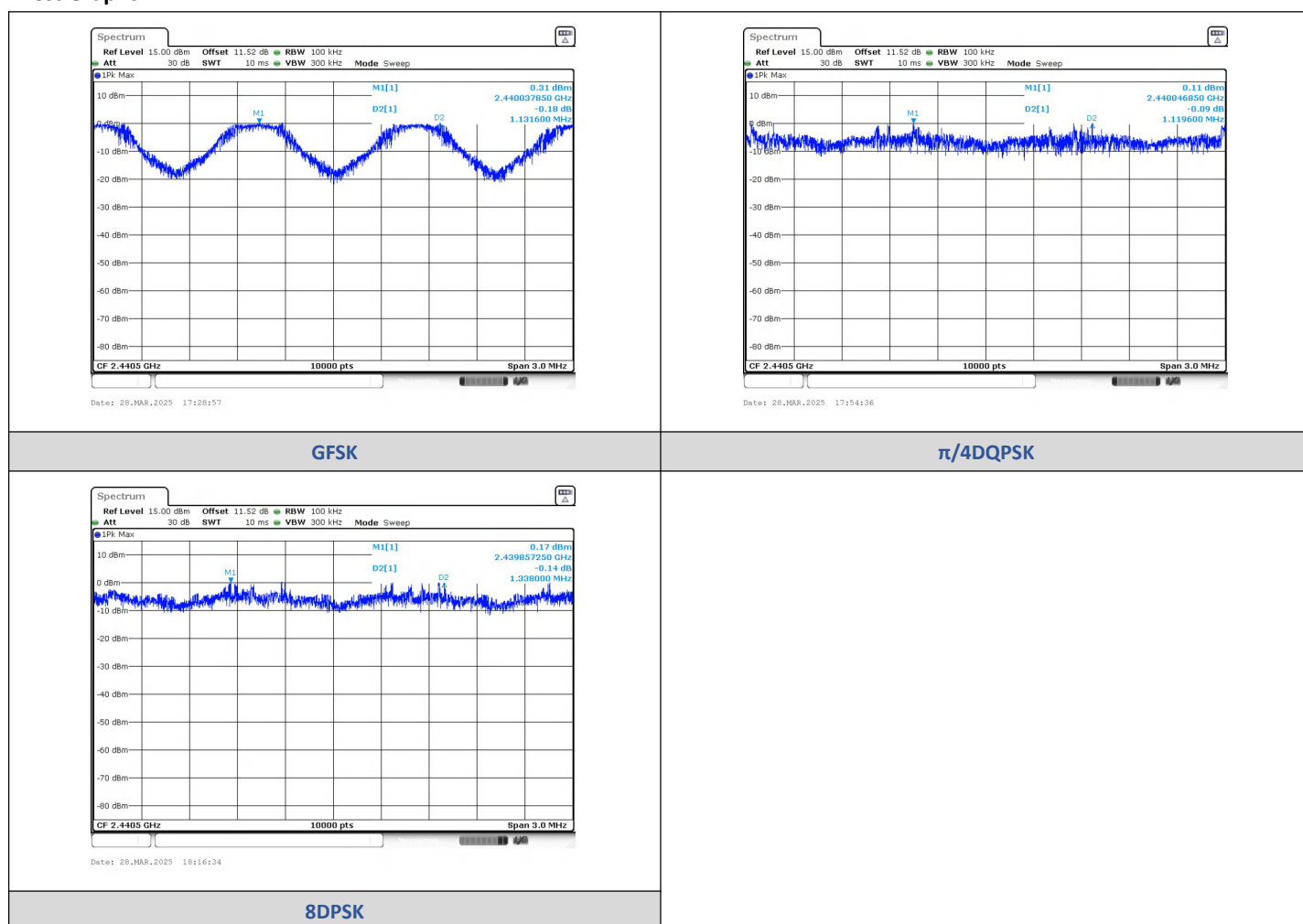
8DPSK_3-DH5_Channel 78

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	2440.0379	2441.1694	1.1316	1.01	PASS
$\pi/4$ QPSK	2-DH5	2440.0469	2441.1665	1.1196	0.853	PASS
8DPSK	3-DH5	2439.8573	2441.1953	1.3380	0.867	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

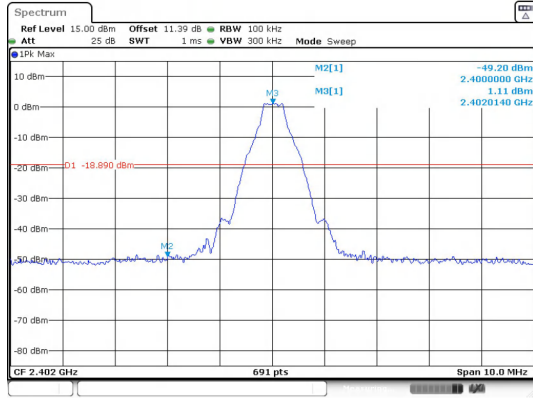
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	1742.53	-40.741	-18.89	-21.851	PASS
			2400.00	-49.200	-18.89	-30.310	PASS
		39	9763.72	-43.124	-19.66	-23.464	PASS
		78	2483.50	-51.520	-20.65	-30.870	PASS
			9920.20	-39.922	-20.65	-19.272	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-49.190	-18.97	-30.220	PASS
			9608.08	-44.296	-18.97	-25.326	PASS
		39	9763.72	-42.321	-19.92	-22.401	PASS
		78	2483.50	-51.220	-20.61	-30.610	PASS
			9920.20	-39.398	-20.61	-18.788	PASS
8DPSK	3-DH5	0	2398.77	-48.693	-18.84	-29.853	PASS
			2400.00	-48.850	-18.84	-30.010	PASS
			9608.10	-44.398	-18.84	-25.558	PASS
		39	9763.72	-42.943	-19.7	-23.243	PASS
		78	2483.50	-50.090	-20.7	-29.390	PASS
			9920.20	-39.696	-20.7	-18.996	PASS

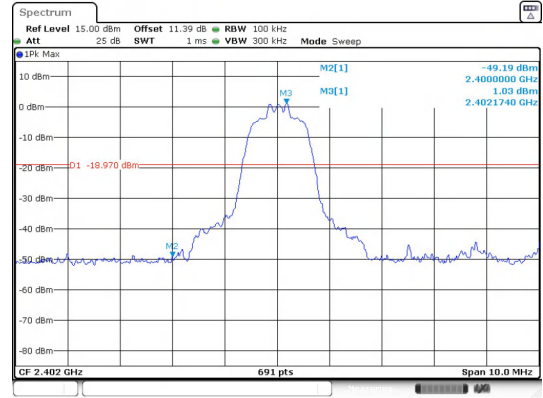
Hopping

Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.15	-47.171	-18.86	-28.311	PASS
			2400.00	-48.970	-18.86	-30.110	PASS
			2483.50	-49.430	-20.72	-28.710	PASS
$\pi/4$ DQPSK	2-DH5		2395.93	-48.713	-19.34	-29.373	PASS
			2400.00	-49.070	-19.34	-29.730	PASS
			2483.50	-50.050	-20.81	-29.240	PASS
8DPSK	3-DH5		2395.95	-48.171	-19.33	-28.841	PASS
			2400.00	-51.470	-19.33	-32.140	PASS
			2483.50	-49.460	-20.73	-28.730	PASS

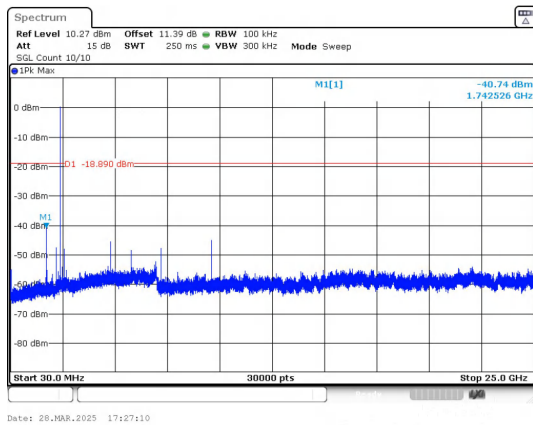
Test Graphs



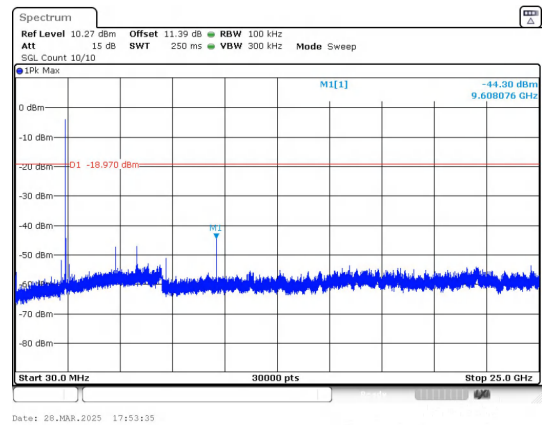
Out Of Band Emission
GFSK_DH5_Channel 0



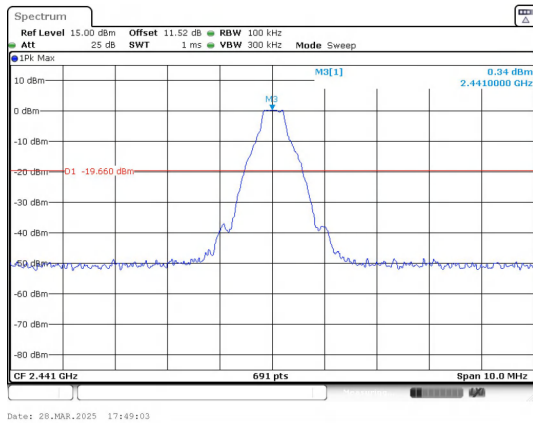
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



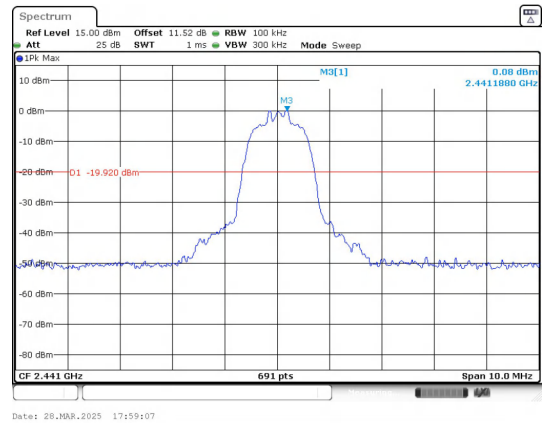
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



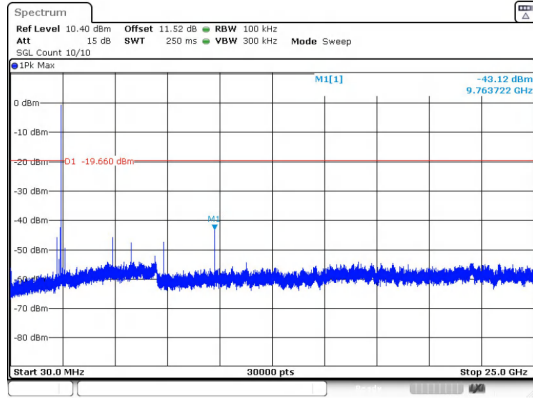
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



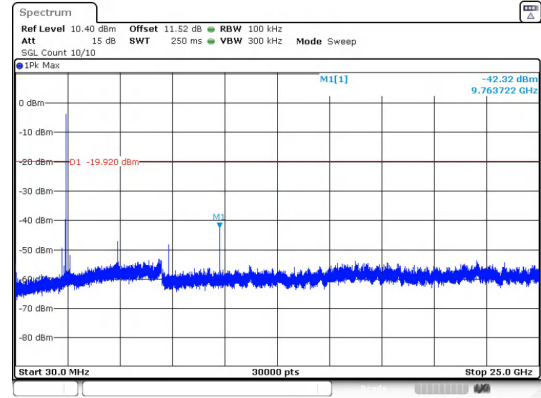
Out Of Band Emission
GFSK_DH5_Channel 39



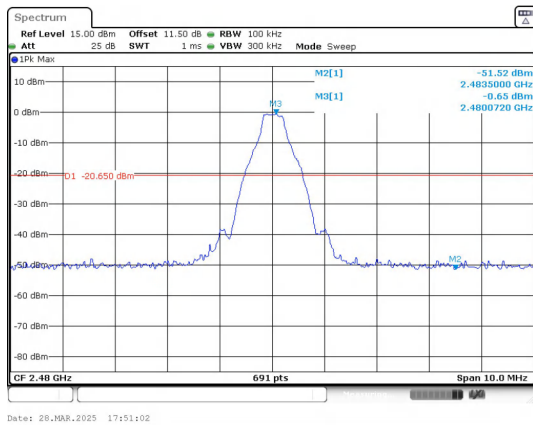
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 $\pi/4$ DQPSK_2-DH5_Channel 39



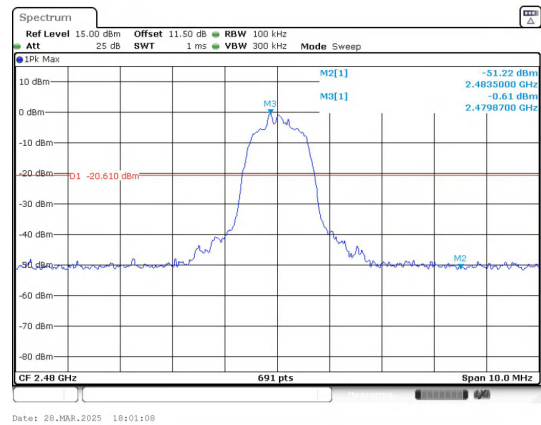
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



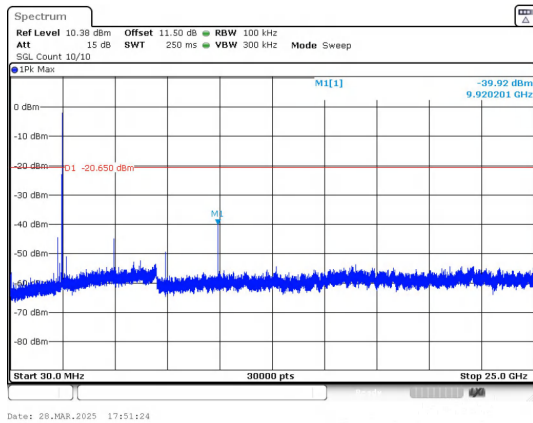
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



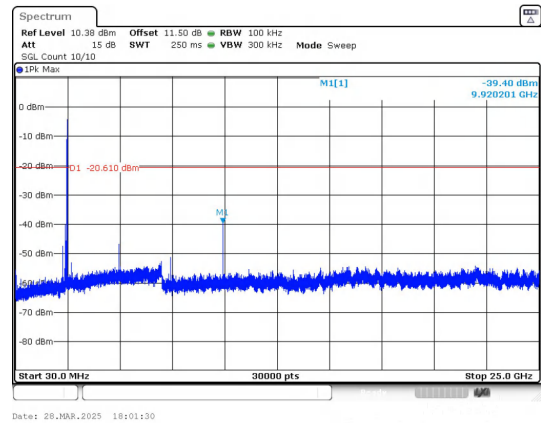
Out Of Band Emission
GFSK_DH5_Channel 78



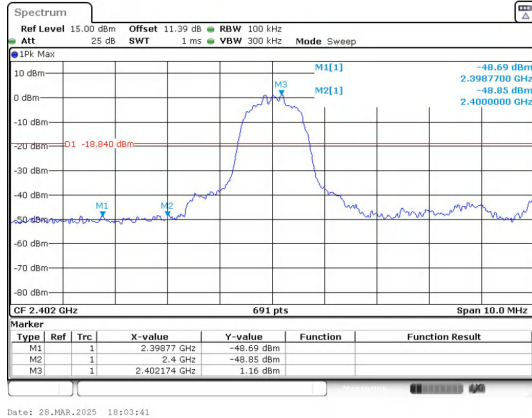
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



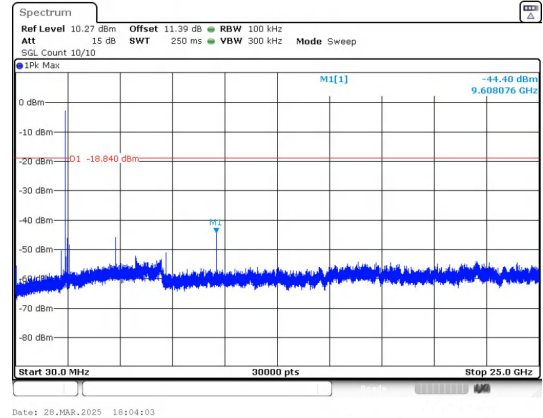
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GFSK_DH5_Channel 78



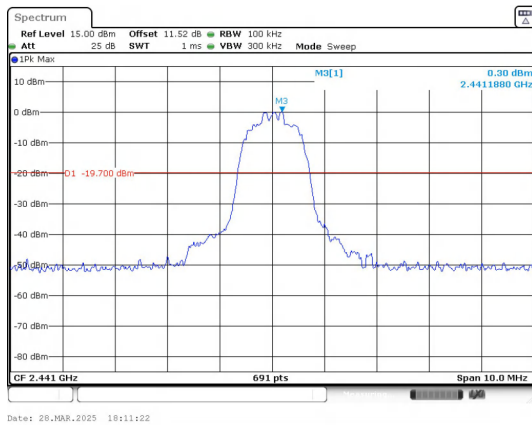
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 $\pi/4$ DQPSK_2-DH5_Channel 78



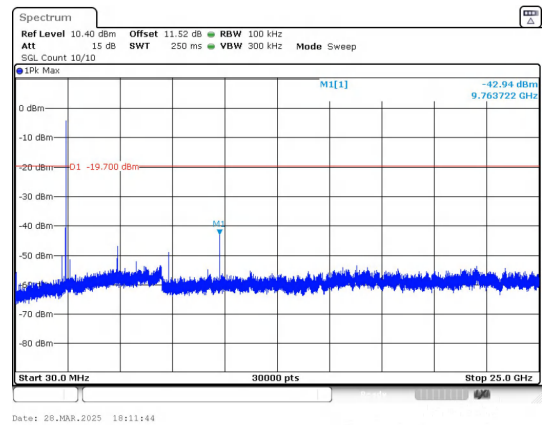
Out Of Band Emission
8DPSK_3-DH5_Channel 0



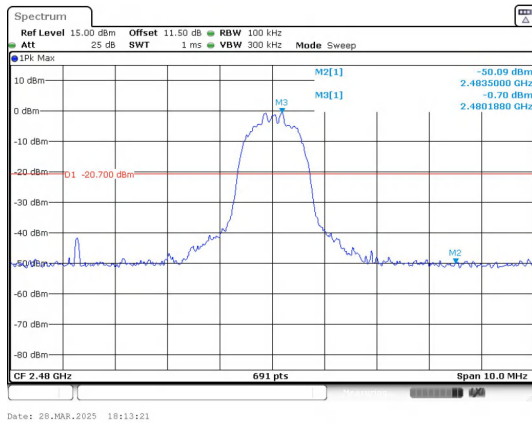
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



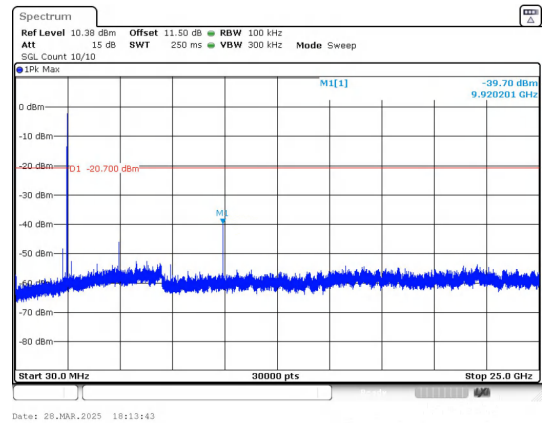
Out Of Band Emission
8DPSK_3-DH5_Channel 39



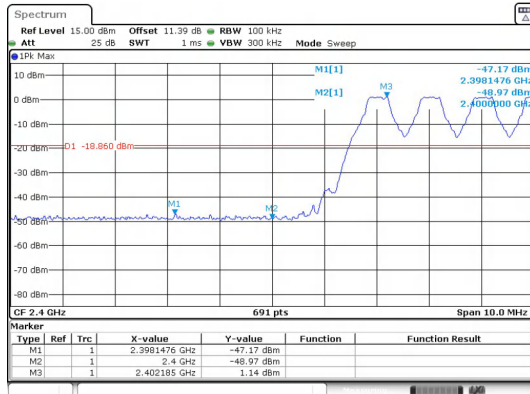
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



Out Of Band Emission
8DPSK_3-DH5_Channel 78

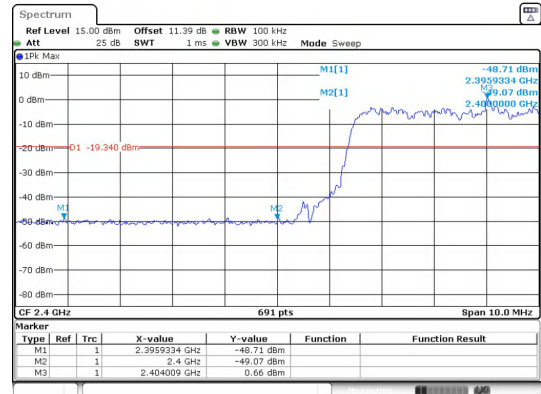


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



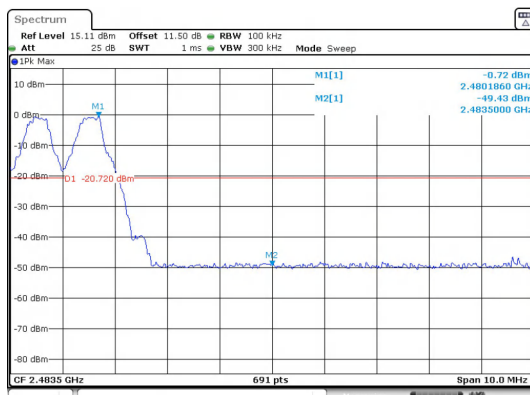
Date: 28.MAR.2025 17:46:33

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



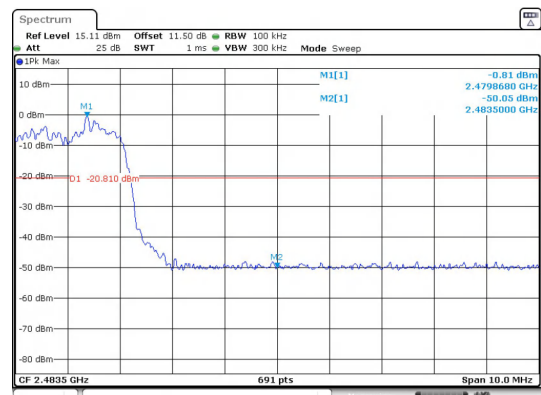
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Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



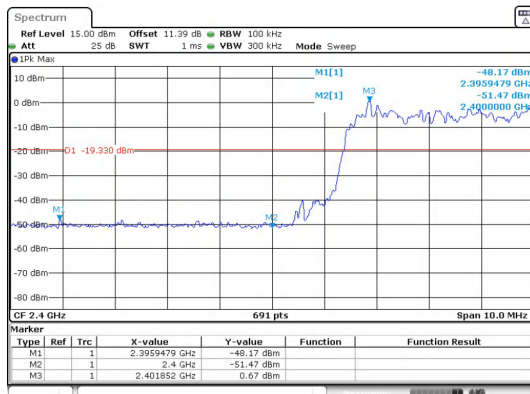
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Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



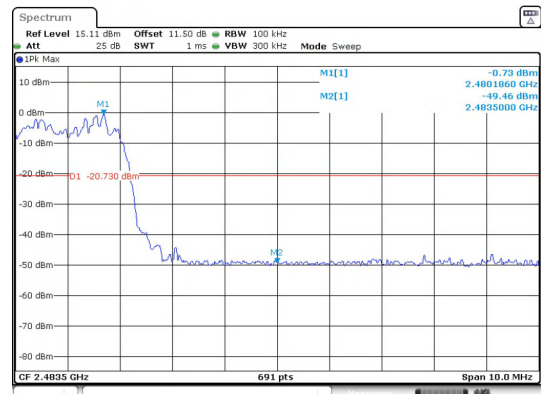
Date: 28.MAR.2025 17:57:30

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



Date: 28.MAR.2025 18:08:44

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



Date: 28.MAR.2025 18:09:38

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

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