

Appendix Report

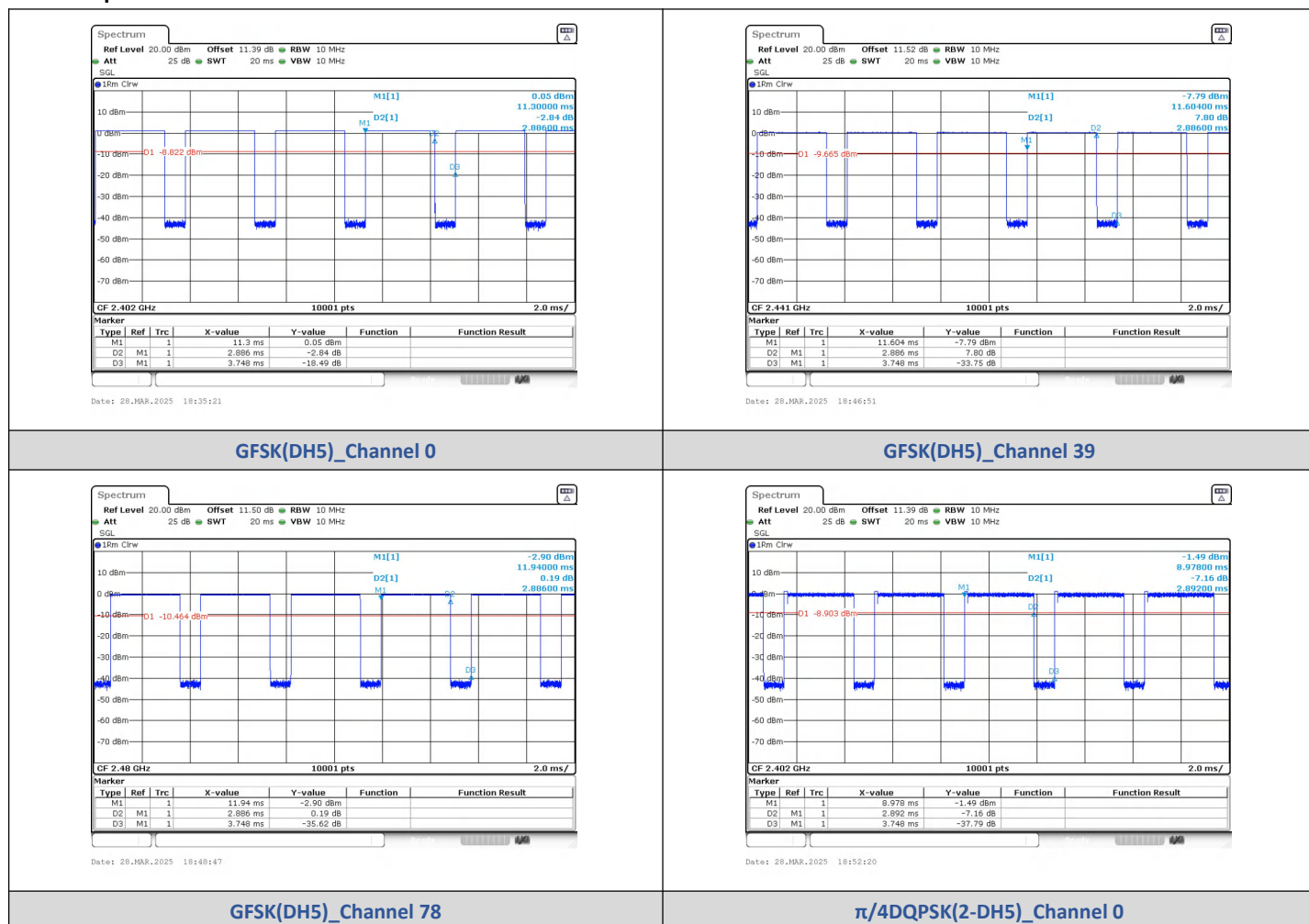
Project No.:	CISR250327248
Test Engineer:	James Wang
Supervised by:	Rory Huang

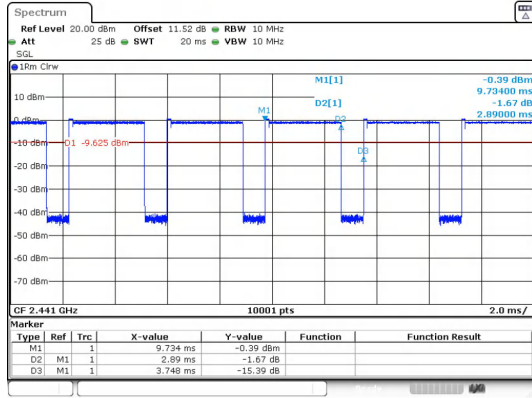
1) Duty Cycle

Test Result

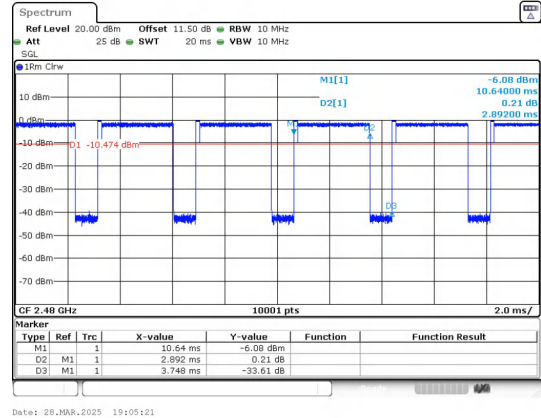
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.890	3.748	77.11	0.7711	1.1289	0.3460
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458
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	2.894	3.748	77.21	0.7721	1.1233	0.3455

Test Graphs

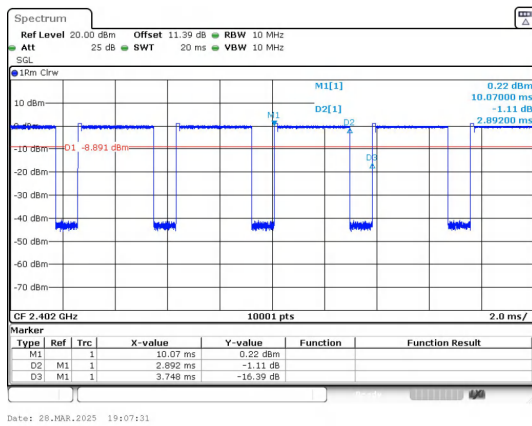




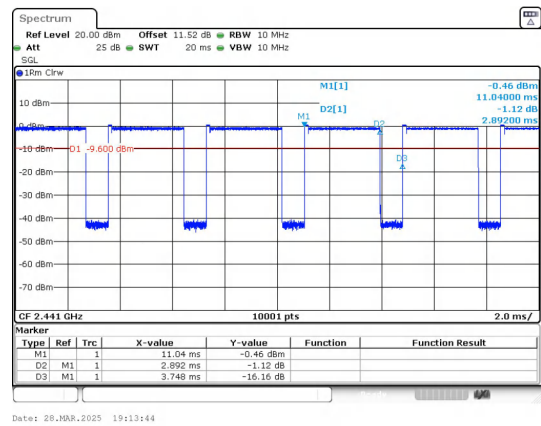
$\pi/4$ DQPSK(2-DH5)_Channel 39



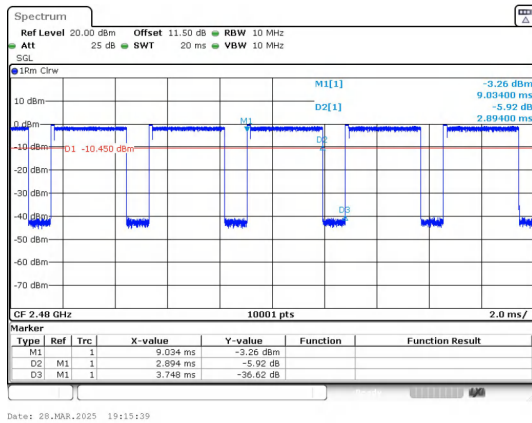
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 39



8DPSK(3-DH5)_Channel 78



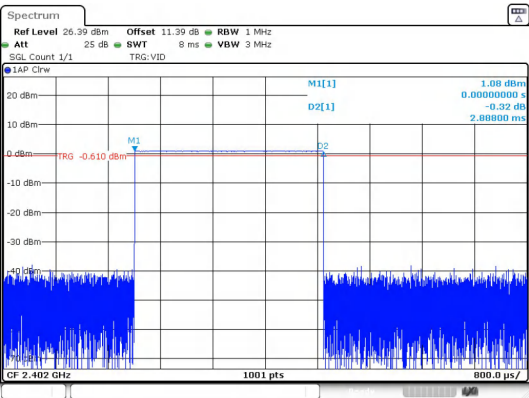
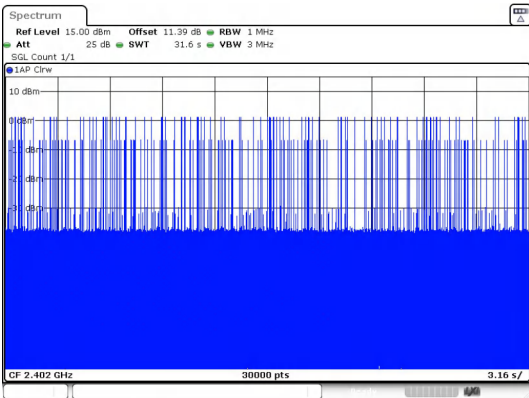
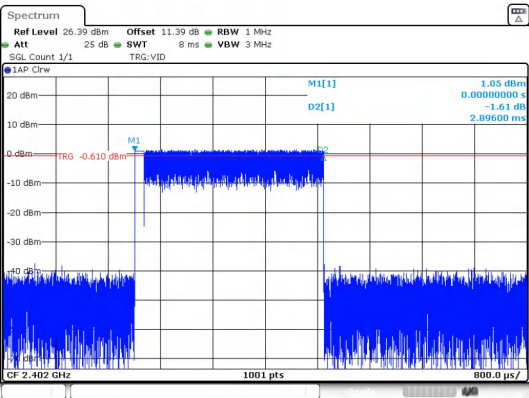
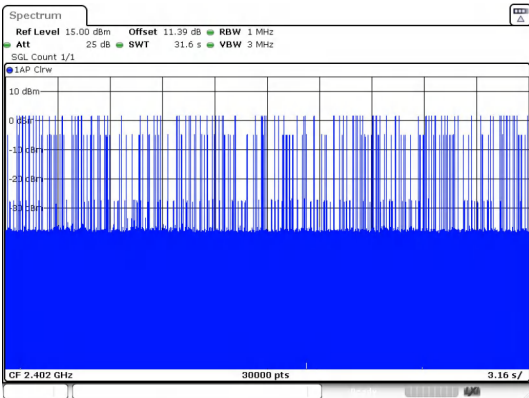
8DPSK(3-DH5)_Channel 78

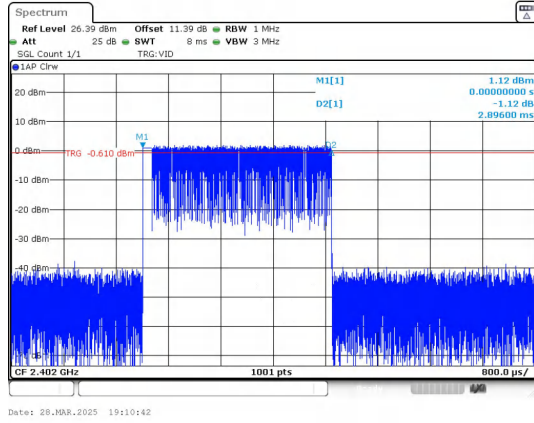
2) Dwell Time

Test Result

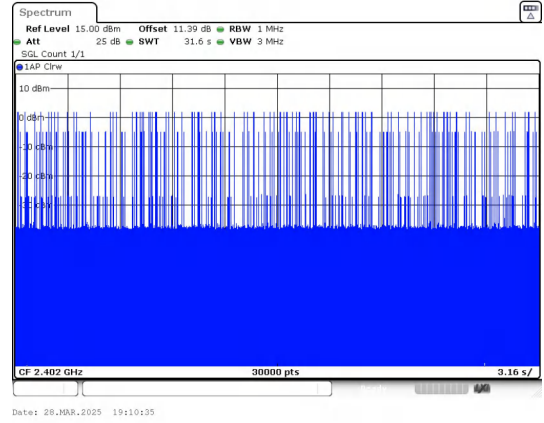
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	98	283.02	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	106	306.98		PASS
8DPSK	3-DH5		2.896	104	301.18		PASS

Test Graphs

 Date: 28.MAR.2025 18:43:21	 Date: 28.MAR.2025 18:43:13
Pulse Width GFSK_DH5	Number of Pulses in 31.6 seconds GFSK_DH5
 Date: 28.MAR.2025 18:56:31	 Date: 28.MAR.2025 18:56:23
Pulse Width $\pi/4$DQPSK_2-DH5	Number of Pulses in 31.6 seconds $\pi/4$DQPSK_2-DH5



Pulse Width
8DPSK_3-DH5



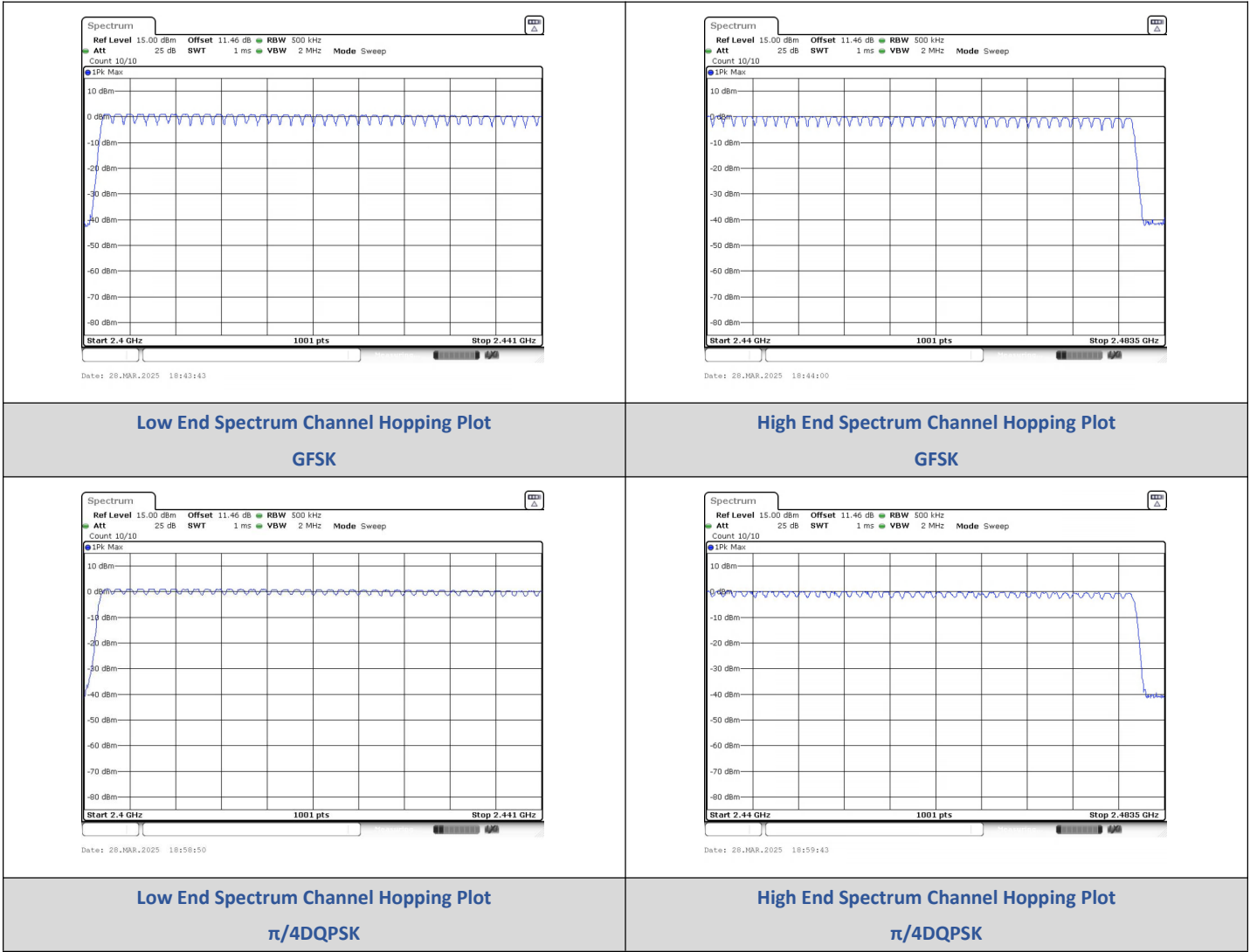
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

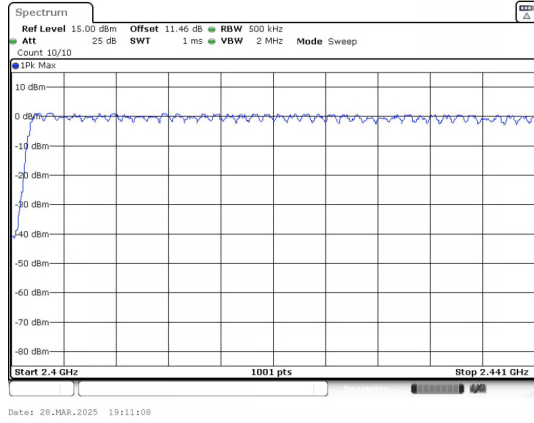
3) Number Of Hopping Channel

Test Result

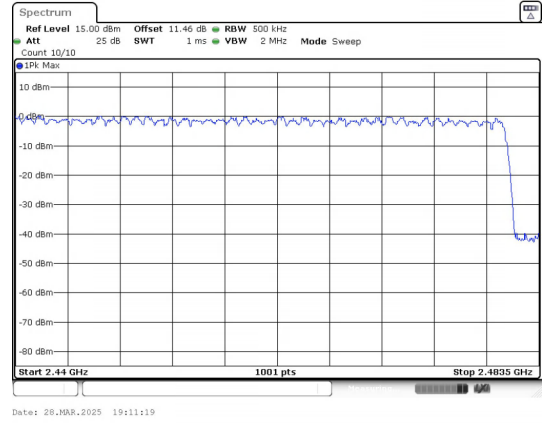
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



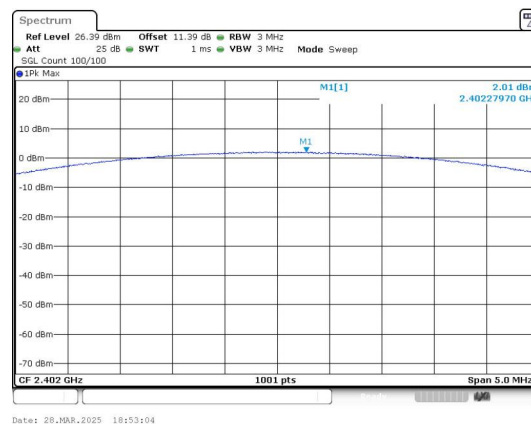
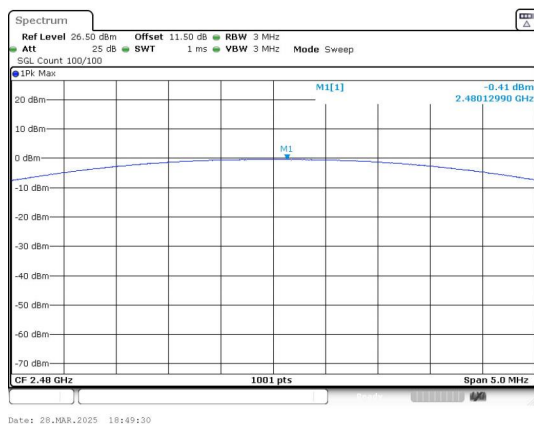
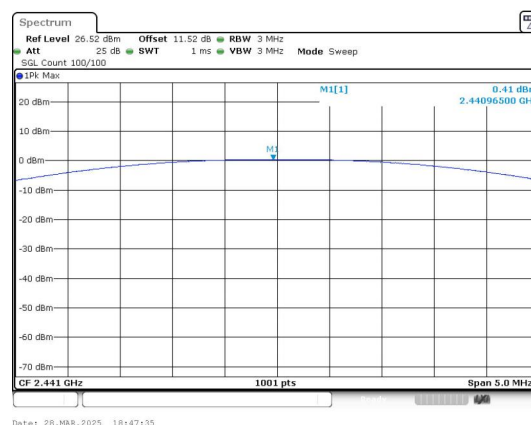
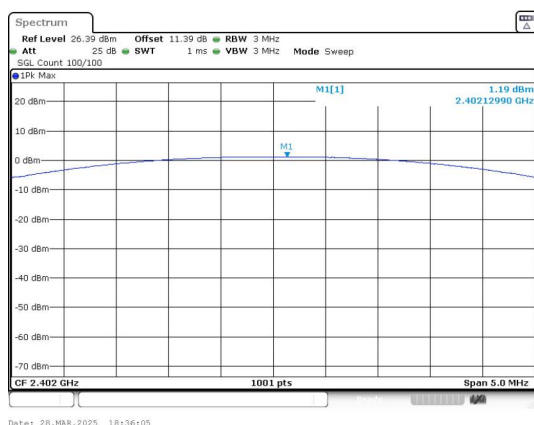
High End Spectrum Channel Hopping Plot
8DPSK

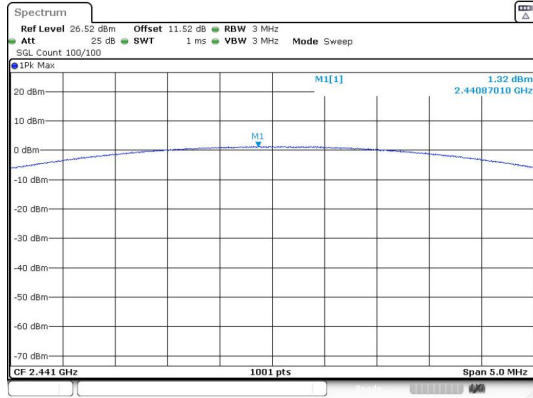
4) Conducted Output Power

Test Result

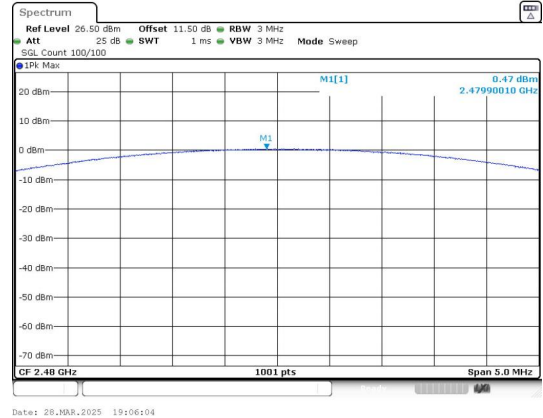
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.19	1.32	≤30	PASS
		39	0.41	1.10		PASS
		78	-0.41	0.91		PASS
$\pi/4$ DQPSK	2-DH5	0	2.01	1.59	≤20.97	PASS
		39	1.32	1.36		PASS
		78	0.47	1.11		PASS
8DPSK	3-DH5	0	2.39	1.73		PASS
		39	1.64	1.46		PASS
		78	0.80	1.20		PASS

Test Graphs

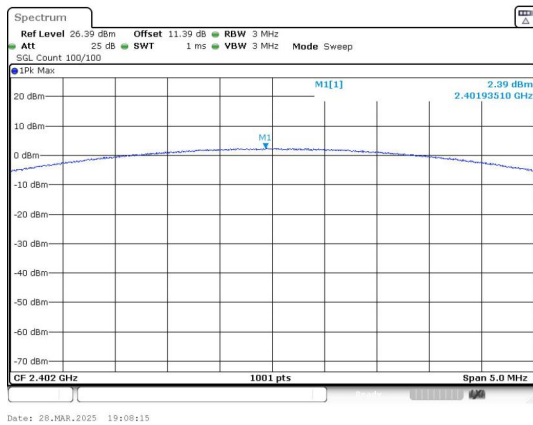




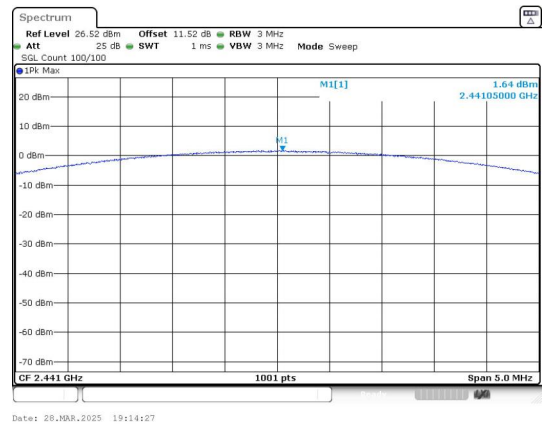
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



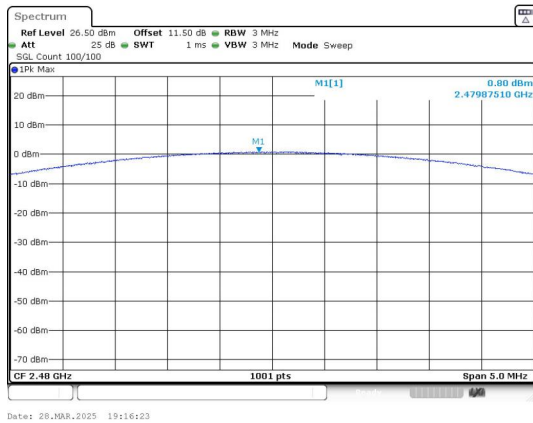
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



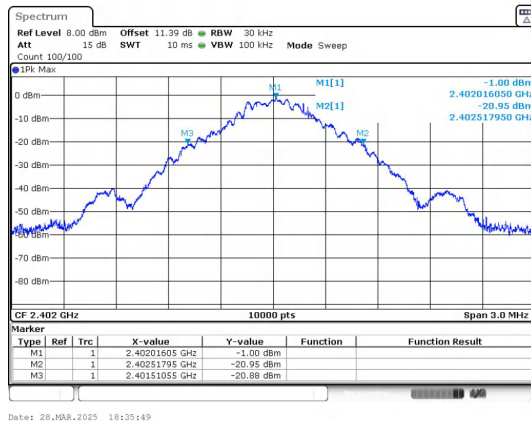
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

Test Result

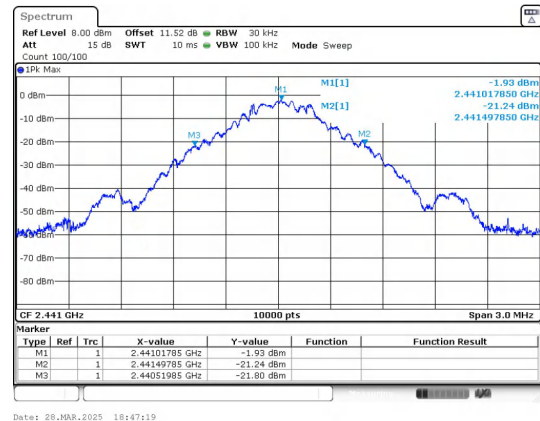
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.01
	39	2441 MHz	1.01
	78	2480 MHz	1.01
$\pi/4$ DQPSK	0	2402 MHz	1.280
	39	2441 MHz	1.280
	78	2480 MHz	1.280
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.280
	78	2480 MHz	1.290

Test Graphs



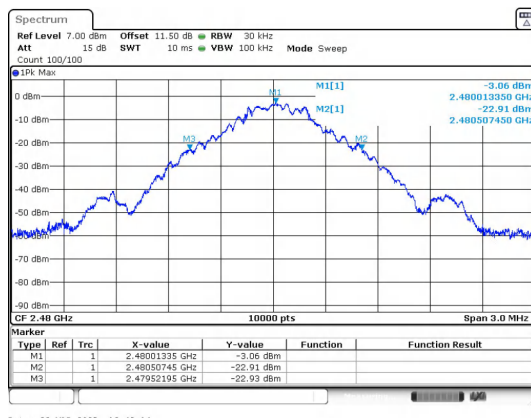
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GFSK_DH5_Channel 0



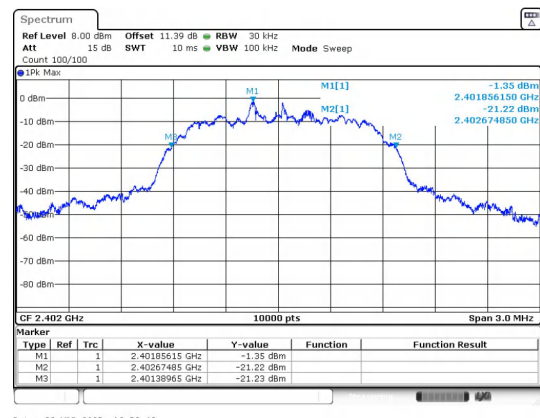
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GFSK_DH5_Channel 39



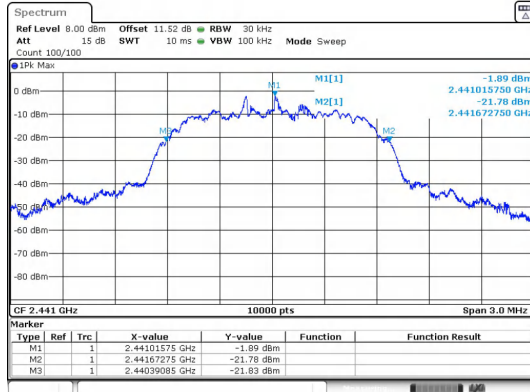
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GFSK_DH5_Channel 78

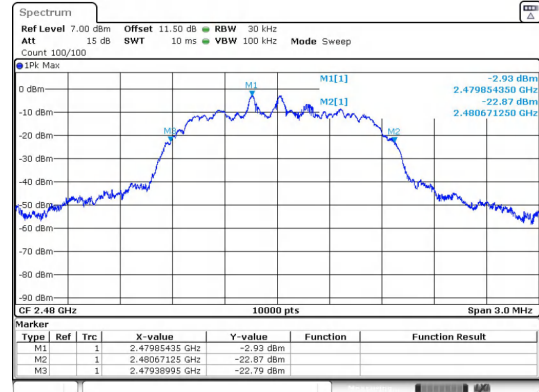


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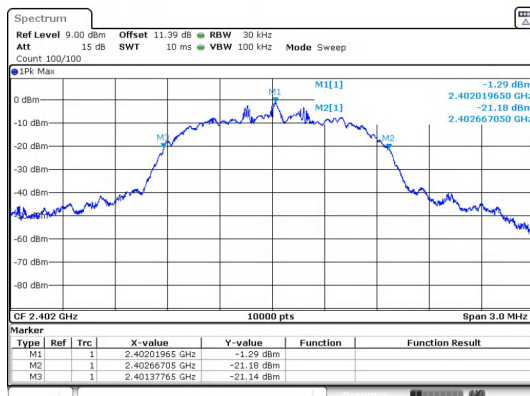
 $\pi/4$ DQPSK_2-DH5_Channel 0



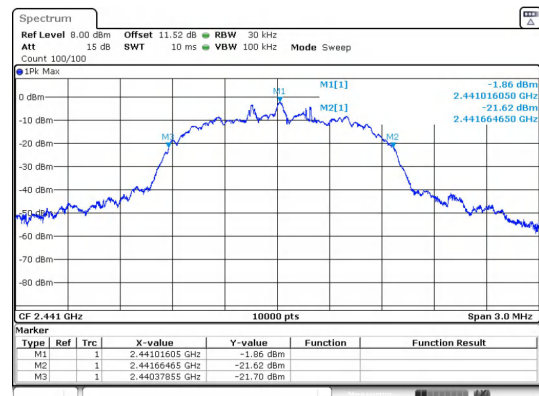
$\pi/4$ DQPSK_2-DH5_Channel 39



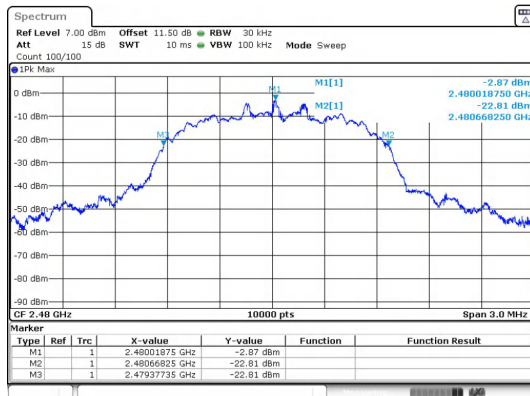
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



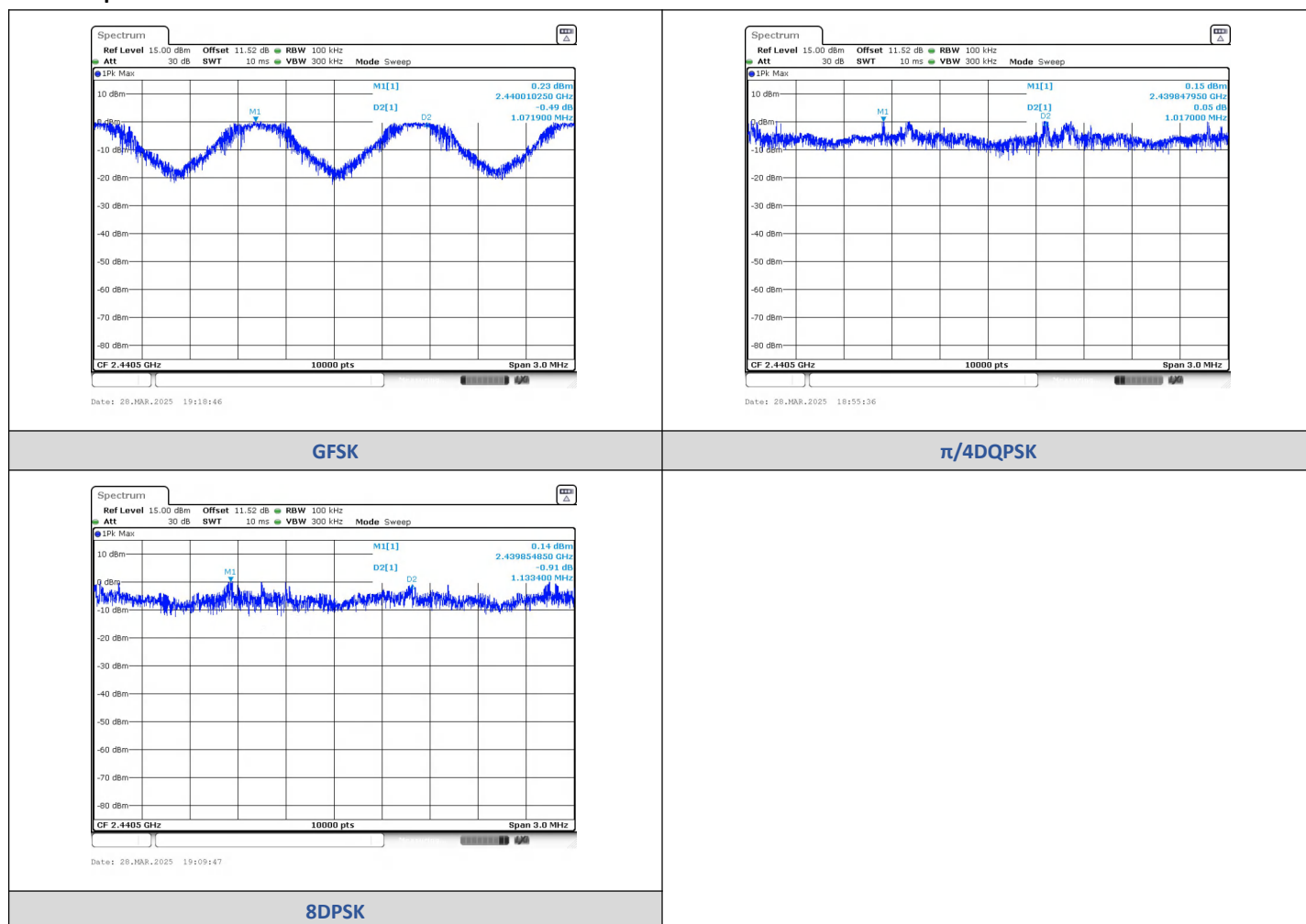
8DPSK_3-DH5_Channel 78

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	2440.0102	2441.0822	1.0719	1.01	PASS
$\pi/4$ QPSK	2-DH5	2439.8479	2440.865	1.0170	0.853	PASS
8DPSK	3-DH5	2439.8549	2440.9882	1.1334	0.86	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

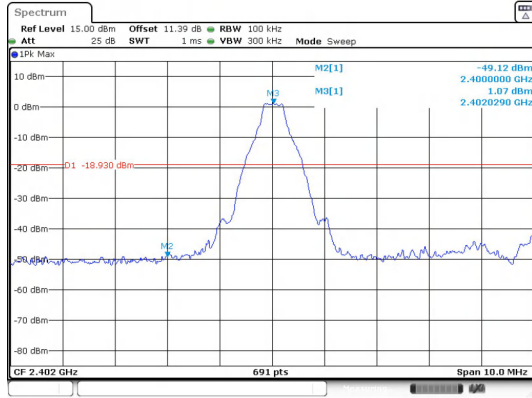
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-49.120	-18.93	-30.190	PASS
			9608.08	-44.821	-18.93	-25.891	PASS
		39	5824.29	-41.737	-19.78	-21.957	PASS
		78	2483.50	-50.090	-20.55	-29.540	PASS
			9920.20	-40.174	-20.55	-19.624	PASS
$\pi/4$ DQPSK	2-DH5	0	833.62	-43.748	-19.0	-24.748	PASS
			2400.00	-48.310	-19.0	-29.310	PASS
		39	9763.72	-43.425	-19.77	-23.655	PASS
		78	2483.50	-51.050	-20.58	-30.470	PASS
			9920.20	-39.623	-20.58	-19.043	PASS
8DPSK	3-DH5	0	2398.83	-49.173	-18.92	-30.253	PASS
			2400.00	-49.310	-18.92	-30.390	PASS
			9608.10	-43.972	-18.92	-25.052	PASS
		39	9763.72	-42.658	-19.74	-22.918	PASS
		78	2483.50	-50.270	-20.67	-29.600	PASS
			9920.20	-39.408	-20.67	-18.738	PASS

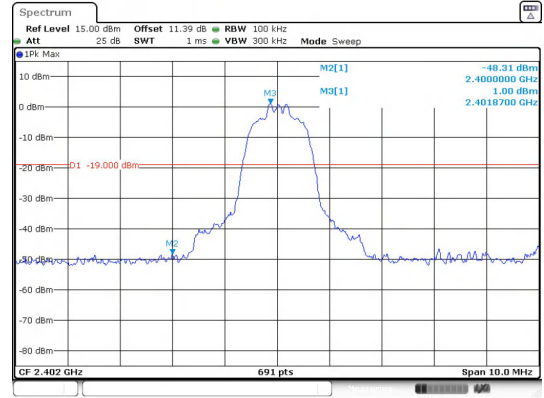
Hopping

Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.99	-48.276	-19.06	-29.216	PASS
			2400.00	-50.860	-19.06	-31.800	PASS
			2483.50	-49.110	-20.53	-28.580	PASS
$\pi/4$ DQPSK	2-DH5		2395.75	-48.134	-19.34	-28.794	PASS
			2400.00	-50.570	-19.34	-31.230	PASS
			2483.50	-48.960	-20.49	-28.470	PASS
8DPSK	3-DH5		2398.63	-48.711	-18.93	-29.781	PASS
			2400.00	-50.310	-18.93	-31.380	PASS
			2483.50	-50.280	-22.47	-27.810	PASS

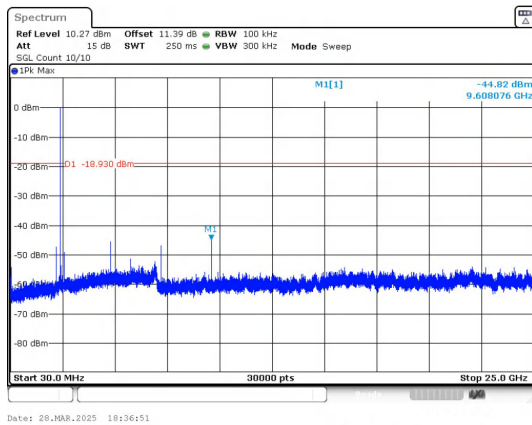
Test Graphs



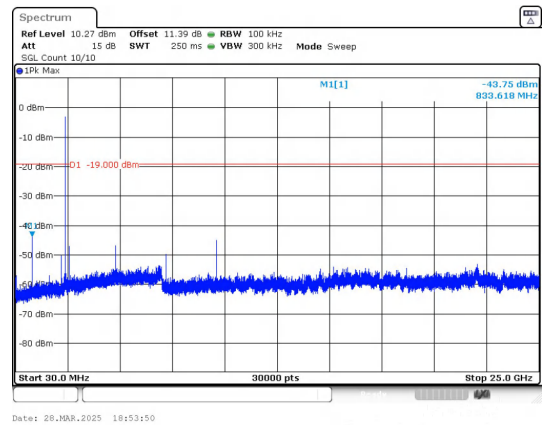
Out Of Band Emission
GFSK_DH5_Channel 0



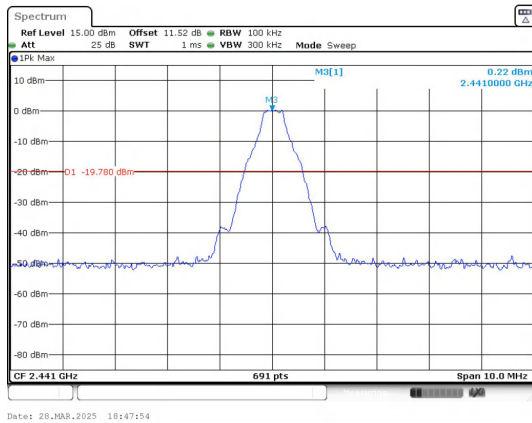
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



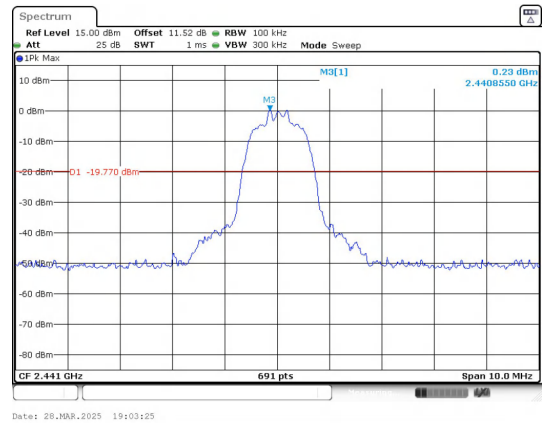
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



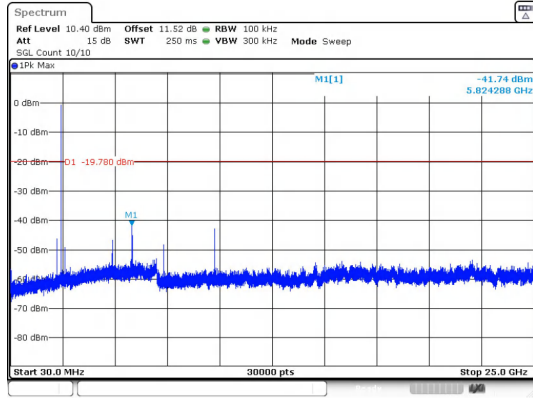
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



Out Of Band Emission
GFSK_DH5_Channel 39

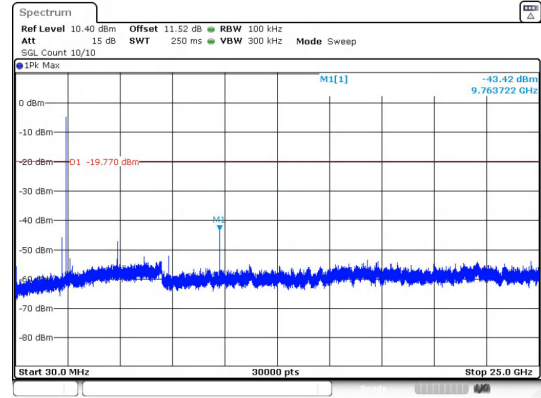


Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



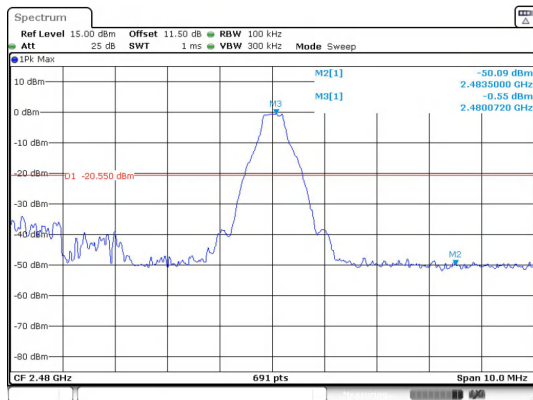
Date: 28.MAR.2025 18:48:16

30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



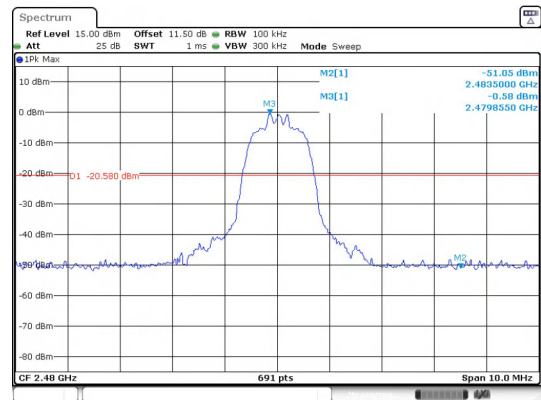
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30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



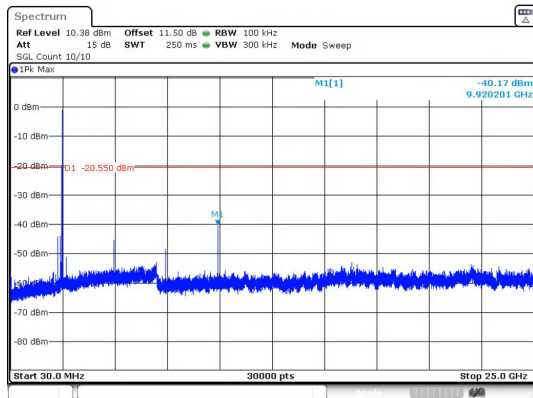
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Out Of Band Emission
GFSK_DH5_Channel 78



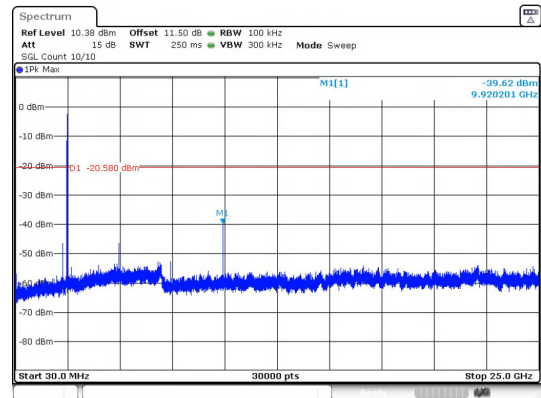
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



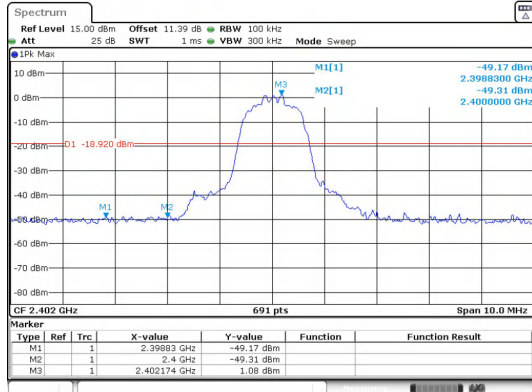
Date: 28.MAR.2025 18:50:17

30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78

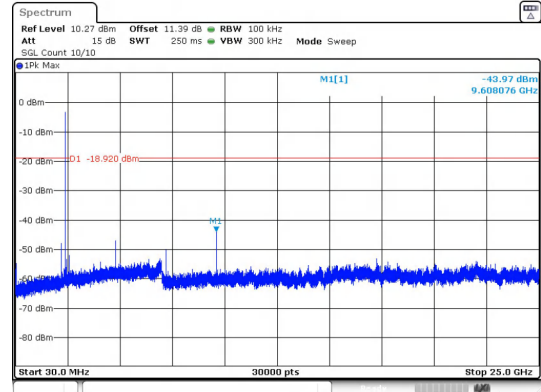


Date: 28.MAR.2025 19:06:51

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



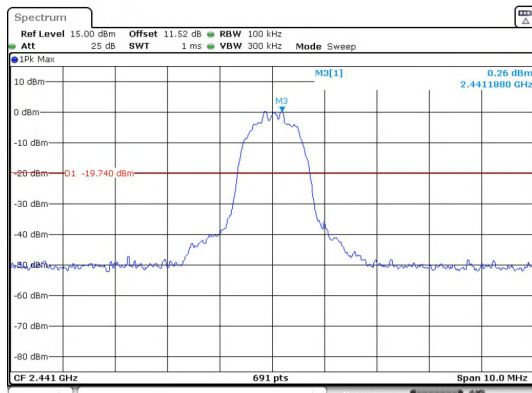
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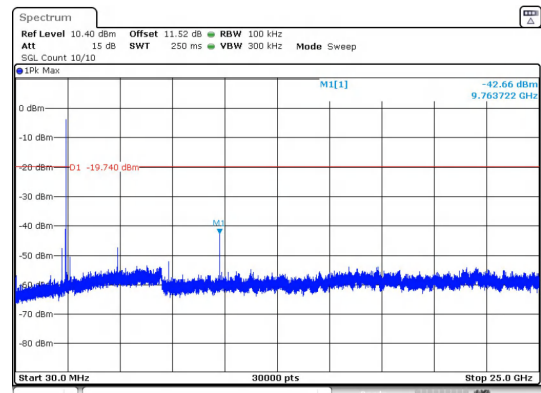
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Out Of Band Emission
8DPSK_3-DH5_Channel 0

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



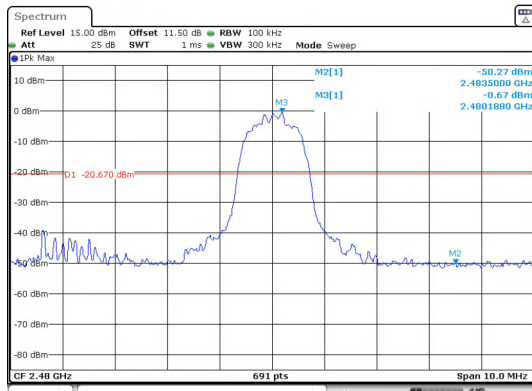
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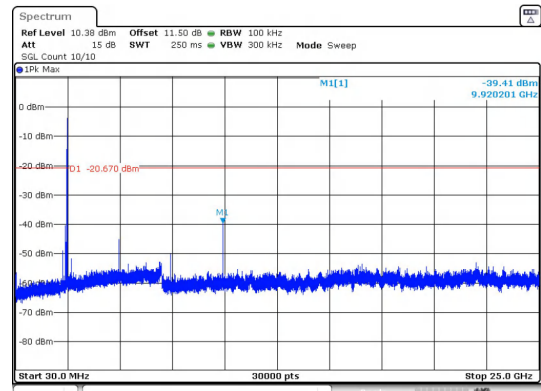
Date: 28.MAR.2025 19:15:109

Out Of Band Emission
8DPSK_3-DH5_Channel 39

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



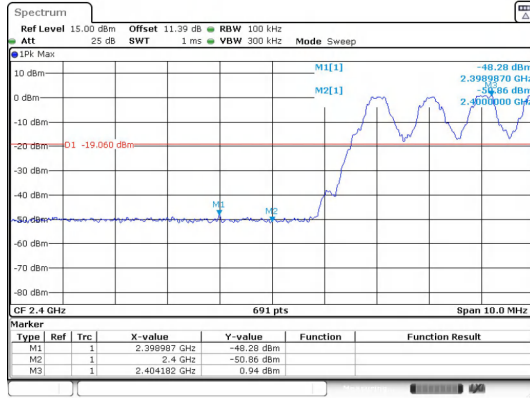
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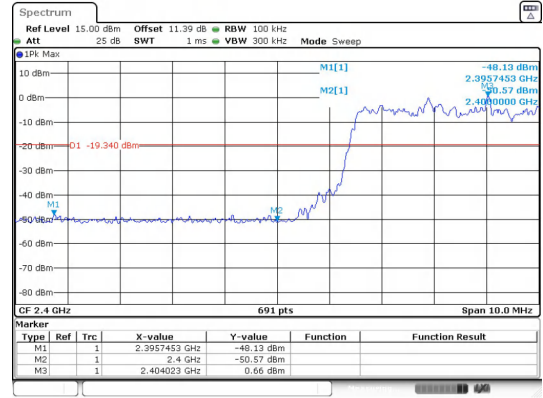
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Out Of Band Emission
8DPSK_3-DH5_Channel 78

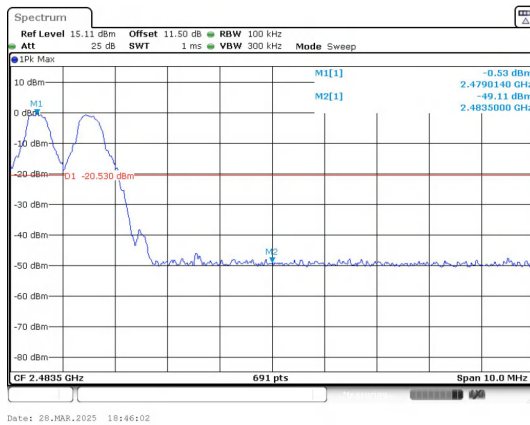
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



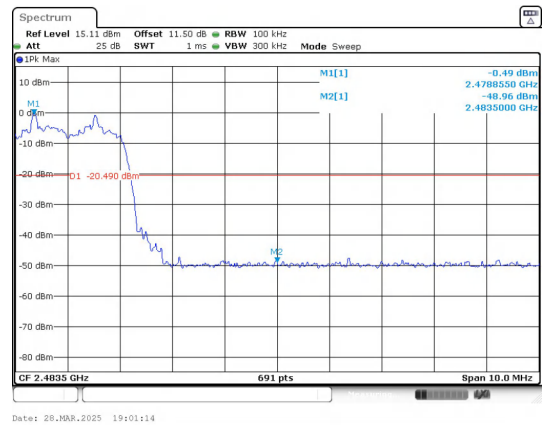
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



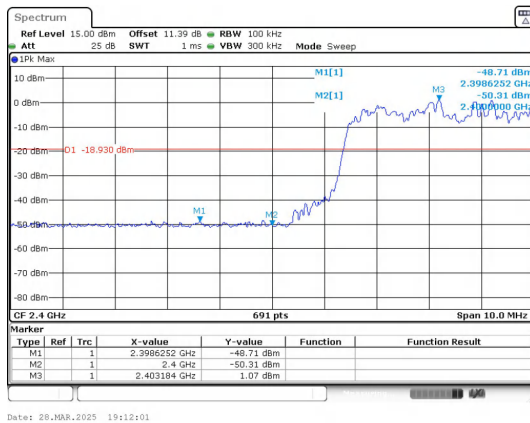
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



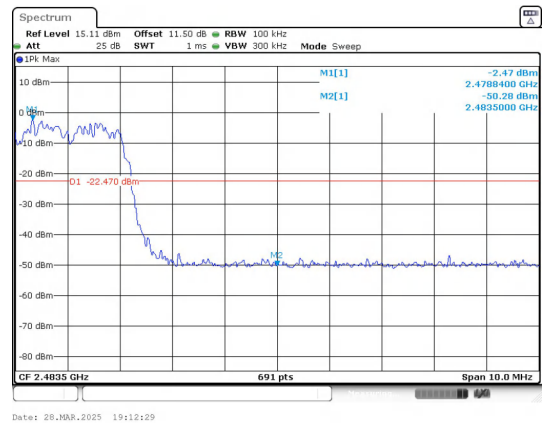
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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-----