

Appendix Report

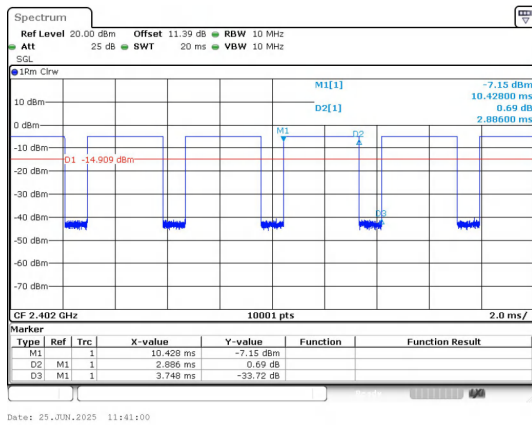
Project No.:	CISR250623246
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

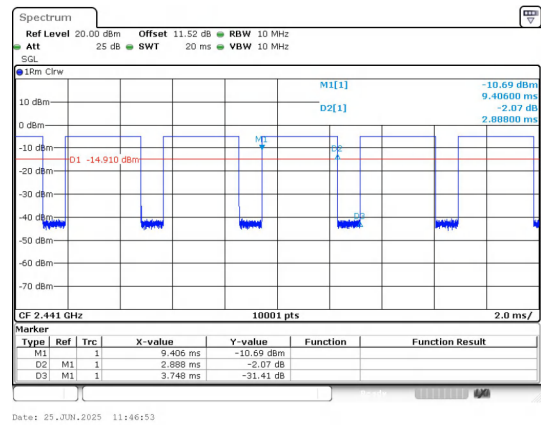
Test Result

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	2.888	3.748	77.05	0.7705	1.1323	0.3463
		78	2.888	3.748	77.05	0.7705	1.1323	0.3463
$\pi/4$ DQPSK	2-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	2.890	3.748	77.11	0.7711	1.1289	0.3460
8DPSK	3-DH5	0	2.894	3.748	77.21	0.7721	1.1233	0.3455
		39	2.894	3.748	77.21	0.7721	1.1233	0.3455
		78	2.894	3.748	77.21	0.7721	1.1233	0.3455

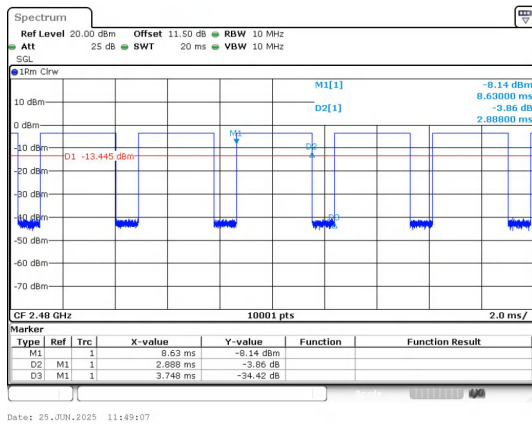
Test Graphs



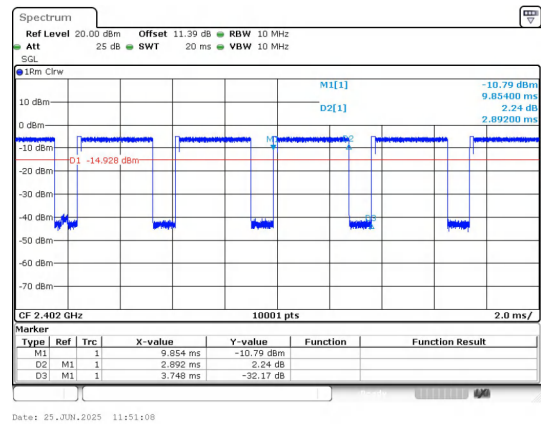
GFSK(DH5)_Channel 0

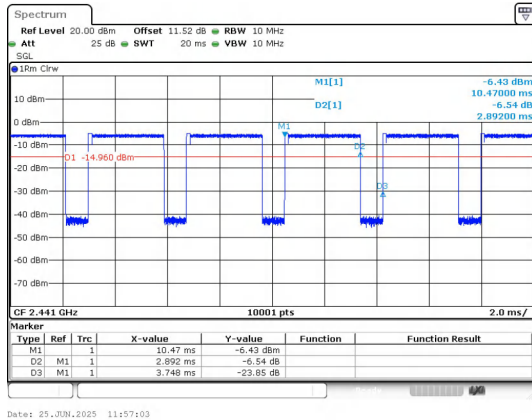


GFSK(DH5)_Channel 39

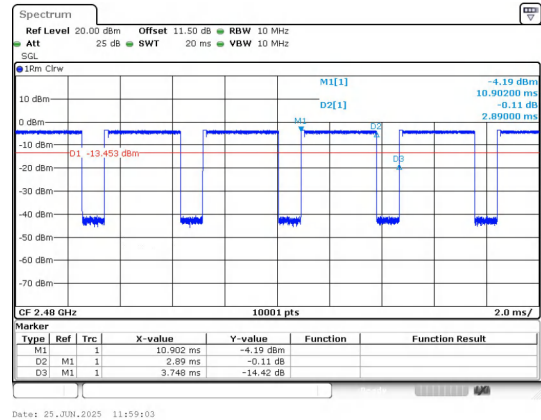


GFSK(DH5)_Channel 78

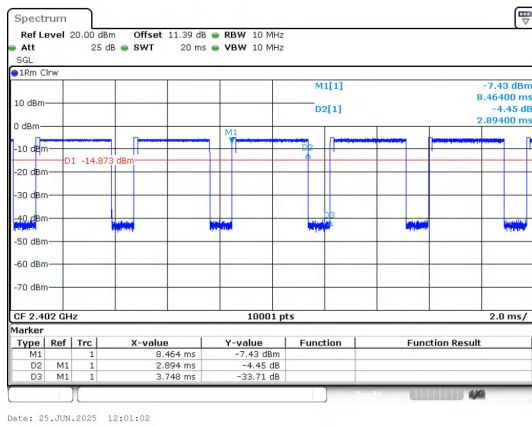

 $\pi/4$ DQPSK(2-DH5)_Channel 0



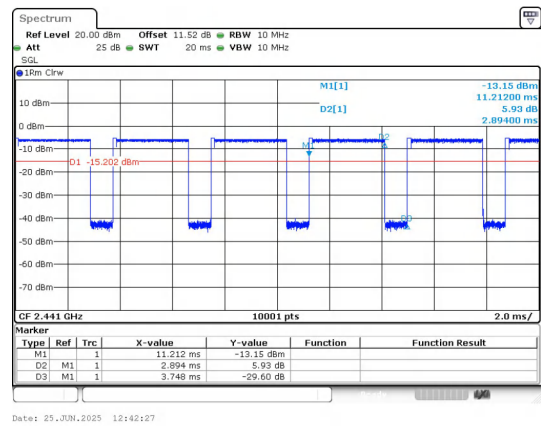
$\pi/4$ DQPSK(2-DH5)_Channel 39



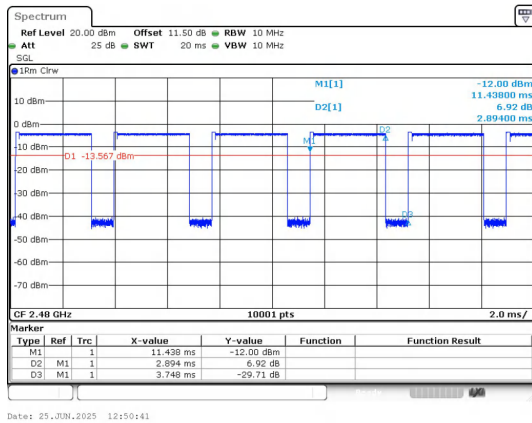
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



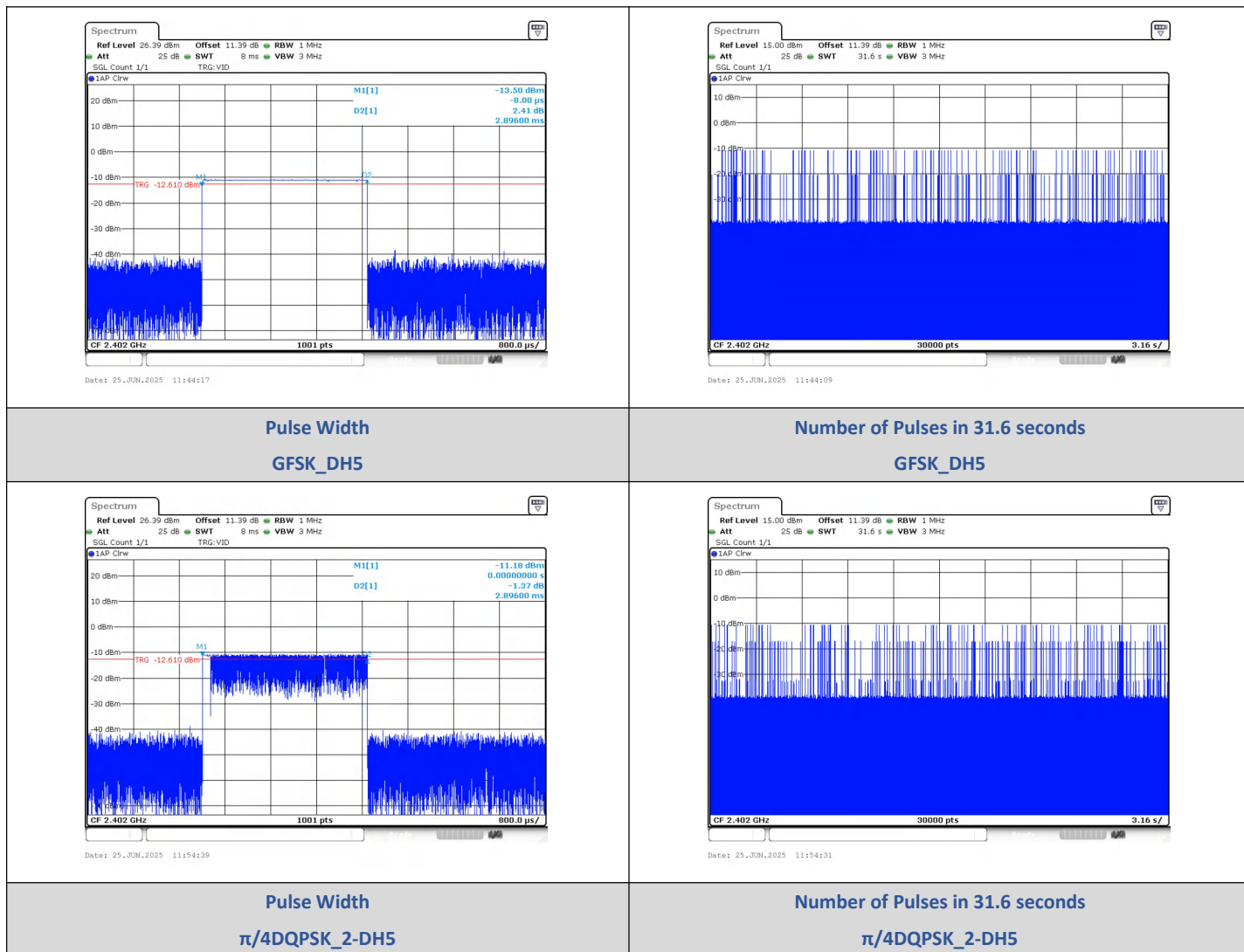
8DPSK(3-DH5)_Channel 78

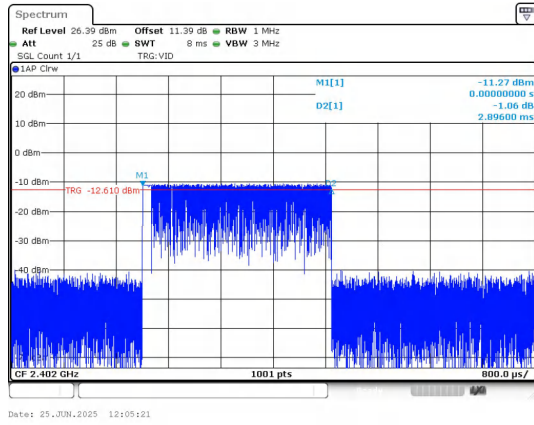
2) Dwell Time

Test Result

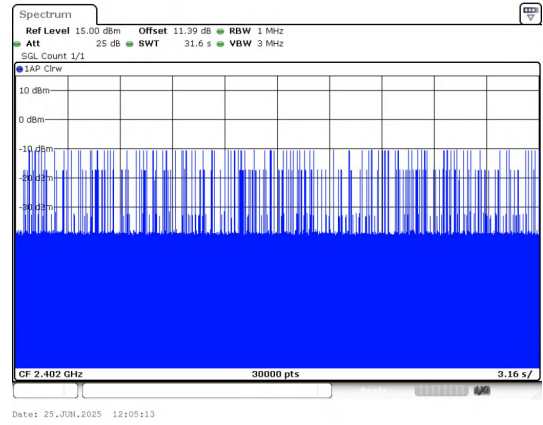
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.896	104	301.18	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	98	283.81		PASS
8DPSK	3-DH5		2.896	104	301.18		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



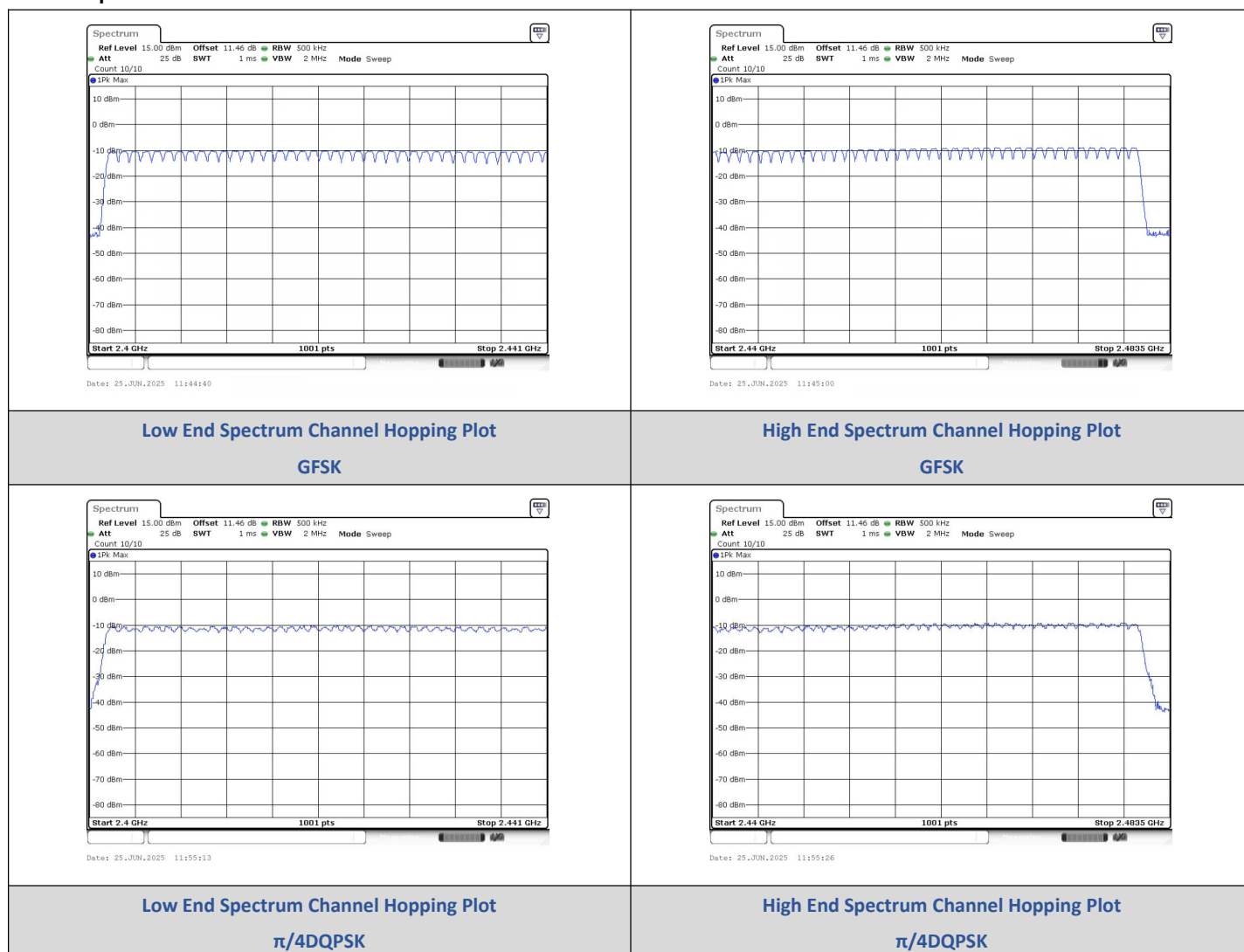
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

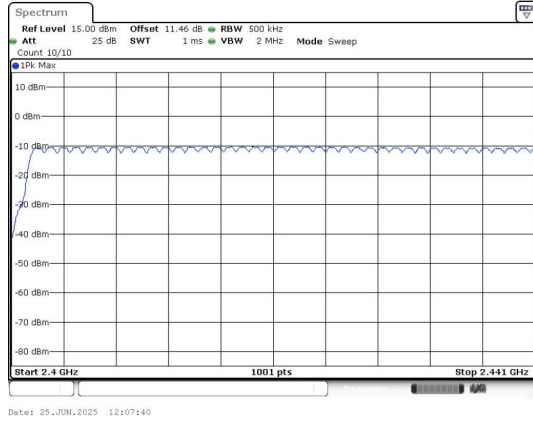
3) Number Of Hopping Channel

Test Result

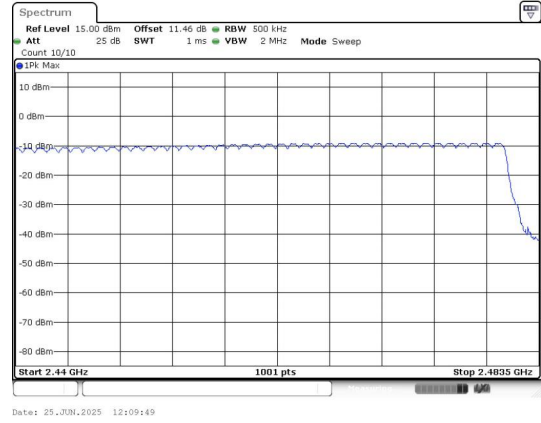
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



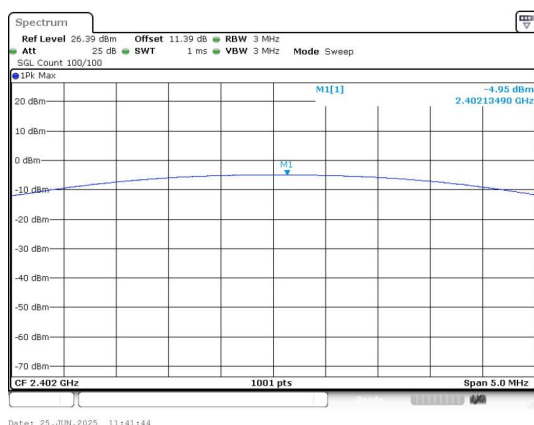
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

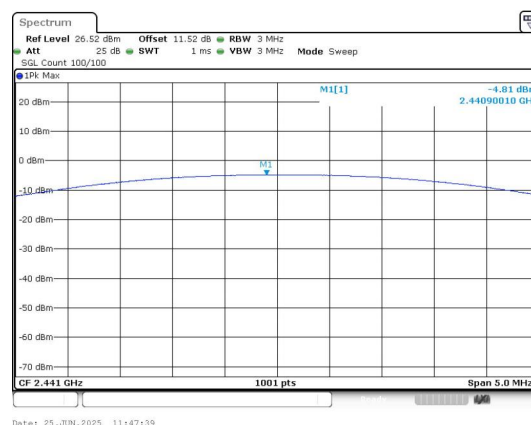
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-4.95	0.32	≤30	PASS
		39	-4.81	0.33		PASS
		78	-3.40	0.46		PASS
$\pi/4$ DQPSK	2-DH5	0	-4.30	0.37	≤20.97	PASS
		39	-4.48	0.36		PASS
		78	-2.94	0.51		PASS
8DPSK	3-DH5	0	-3.98	0.40		PASS
		39	-4.36	0.37		PASS
		78	-2.93	0.51		PASS

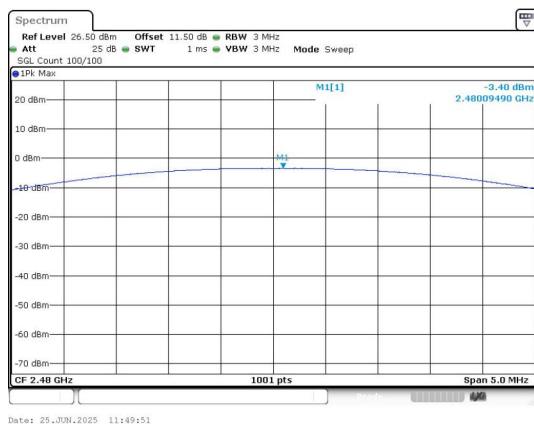
Test Graphs



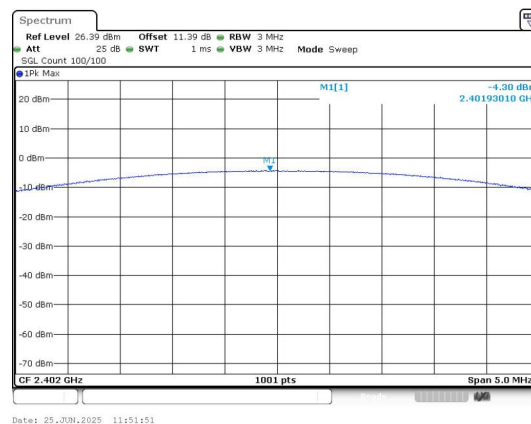
Peak Output Power
GFSK_Channel 0



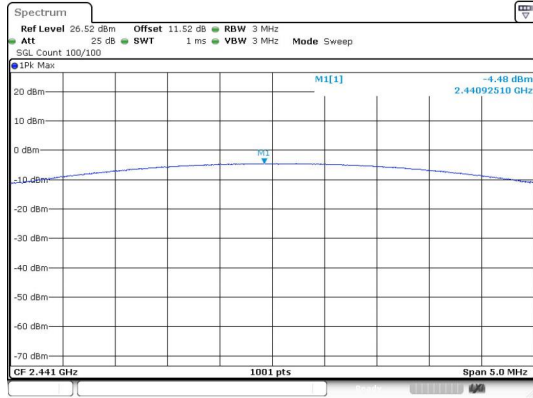
Peak Output Power
GFSK_Channel 39



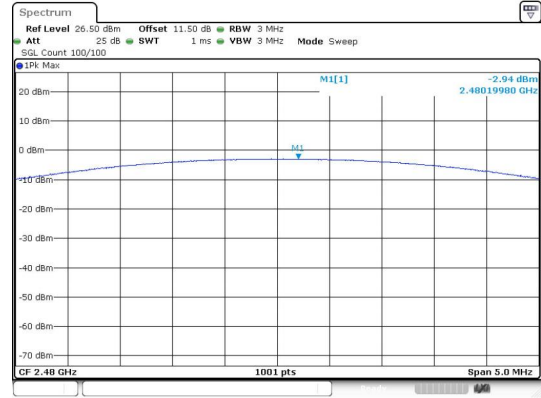
Peak Output Power
GFSK_Channel 78



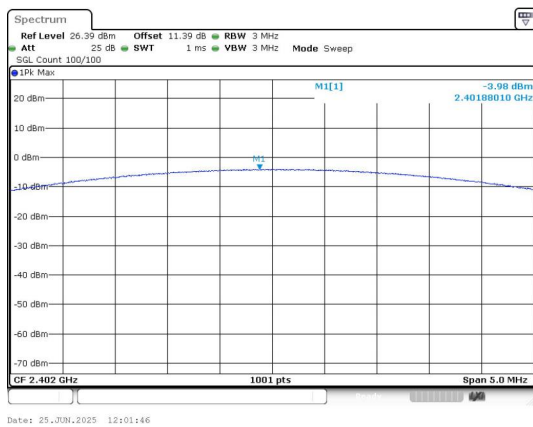
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



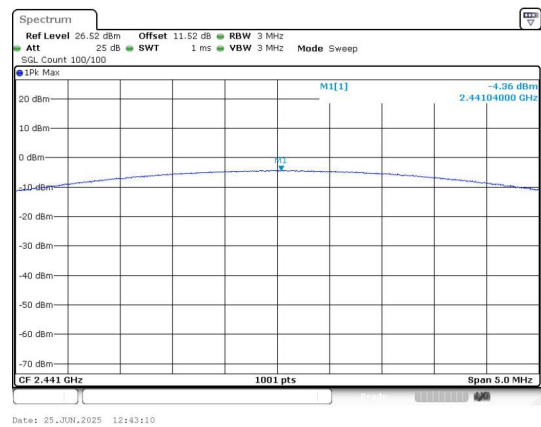
Peak Output Power
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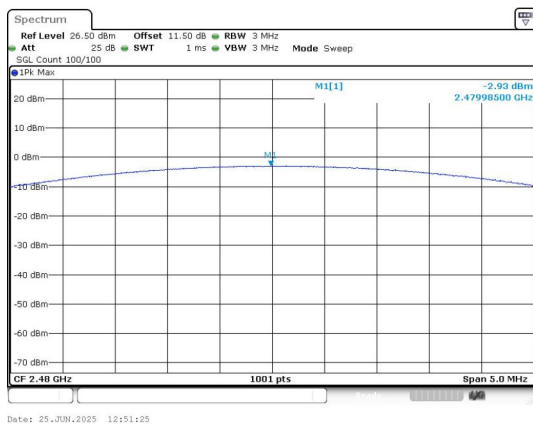
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



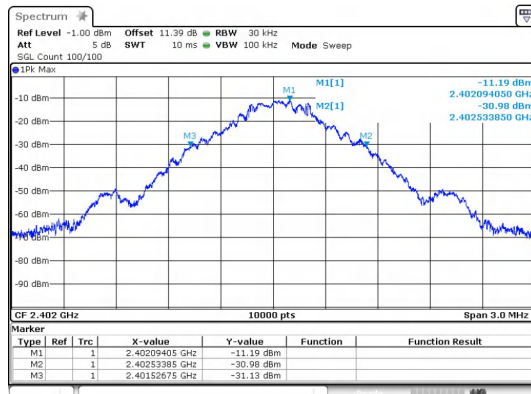
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

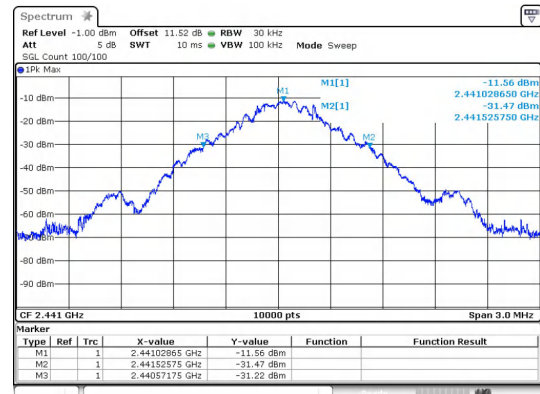
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.0
	39	2441 MHz	1.0
	78	2480 MHz	1.0
$\pi/4$ DQPSK	0	2402 MHz	1.330
	39	2441 MHz	1.350
	78	2480 MHz	1.340
8DPSK	0	2402 MHz	1.310
	39	2441 MHz	1.320
	78	2480 MHz	1.320

Test Graphs



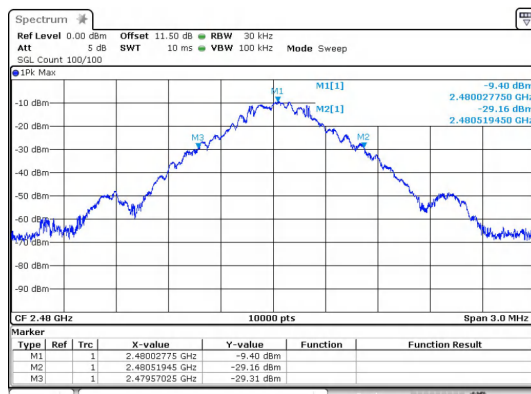
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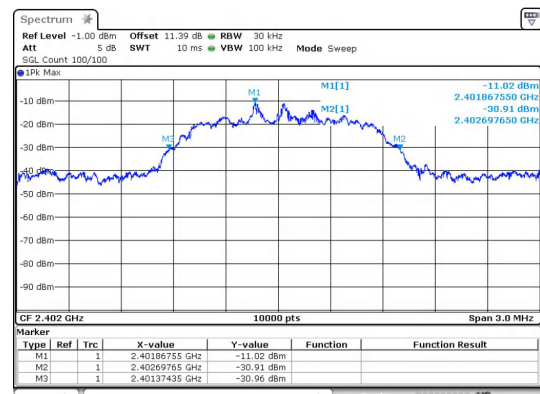
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GFSK_DH5_Channel 0

GFSK_DH5_Channel 39



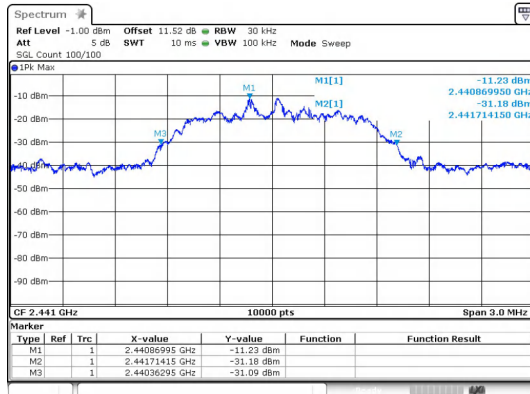
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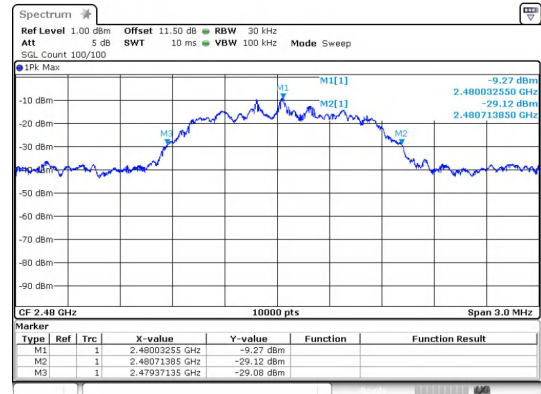
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GFSK_DH5_Channel 78

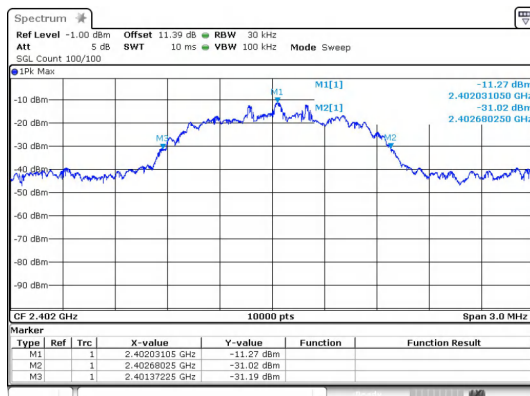
 $\pi/4$ DQPSK_2-DH5_Channel 0



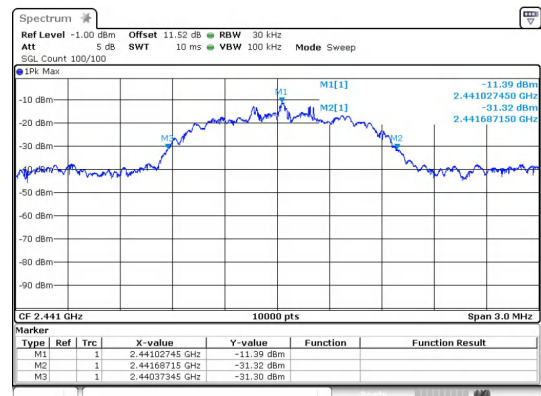
$\pi/4$ DQPSK_2-DH5_Channel 39



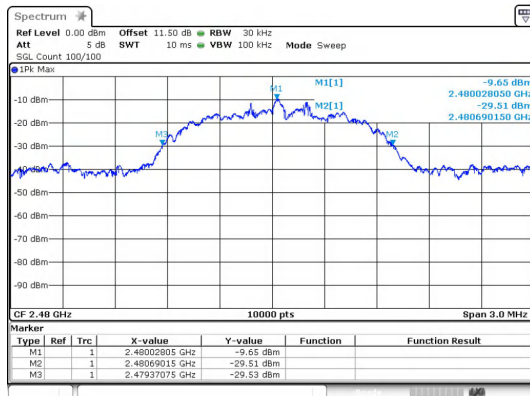
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



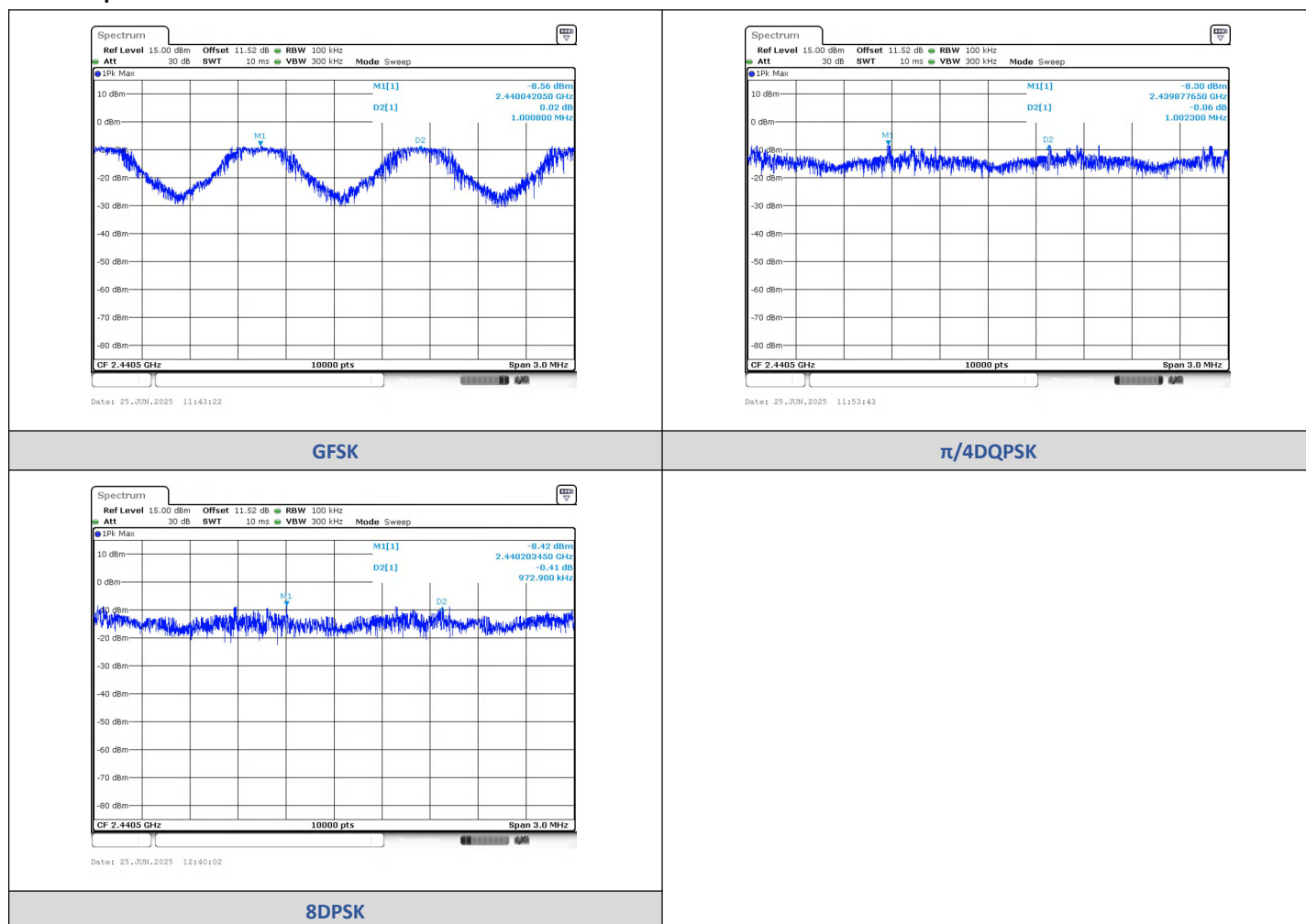
8DPSK_3-DH5_Channel 78

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	2440.0421	2441.0428	1.0008	1.0	PASS
$\pi/4$ DQPSK	2-DH5	2439.8776	2440.88	1.0023	0.887	PASS
8DPSK	3-DH5	2440.2034	2441.1764	0.9729	0.873	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

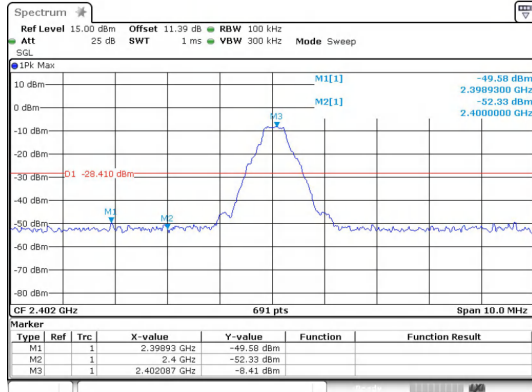
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2398.93	-49.577	-28.41	-21.167	PASS
			2400.00	-52.330	-28.41	-23.920	PASS
			7206.00	-38.785	-28.41	-10.375	PASS
		39	7323.32	-41.148	-28.24	-12.908	PASS
		78	2483.50	-52.450	-26.83	-25.620	PASS
			9920.20	-38.851	-26.83	-12.021	PASS
$\pi/4$ DQPSK	2-DH5	0	2398.79	-49.585	-28.31	-21.275	PASS
			2400.00	-50.200	-28.31	-21.890	PASS
			9608.10	-43.990	-28.31	-15.680	PASS
		39	9764.55	-42.418	-28.34	-14.078	PASS
		78	2483.50	-52.190	-26.87	-25.320	PASS
			9920.20	-39.034	-26.87	-12.164	PASS
8DPSK	3-DH5	0	2397.14	-49.260	-28.29	-20.970	PASS
			2400.00	-50.620	-28.29	-22.330	PASS
			9608.10	-43.776	-28.29	-15.486	PASS
		39	9764.55	-41.749	-28.54	-13.209	PASS
		78	2483.50	-51.670	-27.51	-24.160	PASS
			9920.20	-39.085	-27.51	-11.575	PASS

Hopping

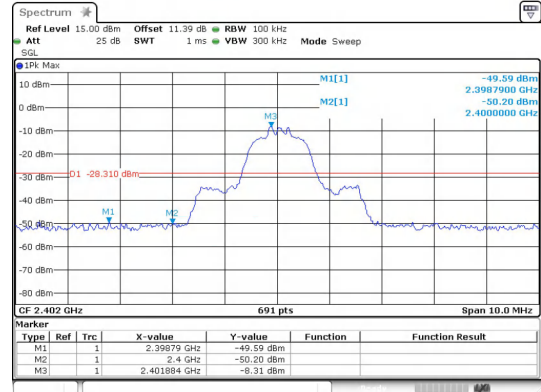
Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.78	-49.163	-28.6	-20.563	PASS
			2400.00	-50.650	-28.6	-22.050	PASS
			2483.50	-50.660	-27.07	-23.590	PASS
$\pi/4$ DQPSK	2-DH5		2396.70	-49.512	-28.6	-20.912	PASS
			2400.00	-52.240	-28.6	-23.640	PASS
			2483.50	-50.310	-27.53	-22.780	PASS
8DPSK	3-DH5		2398.87	-49.296	-29.96	-19.336	PASS
			2400.00	-50.590	-29.96	-20.630	PASS
			2483.50	-50.040	-26.88	-23.160	PASS

Test Graphs



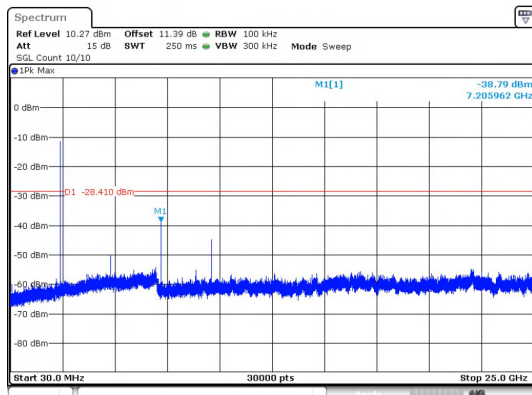
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Out Of Band Emission
GFSK_DH5_Channel 0



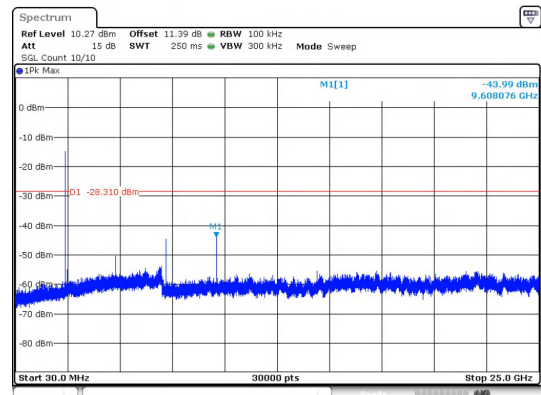
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Out Of Band Emission
π/4QPSK_2-DH5_Channel 0



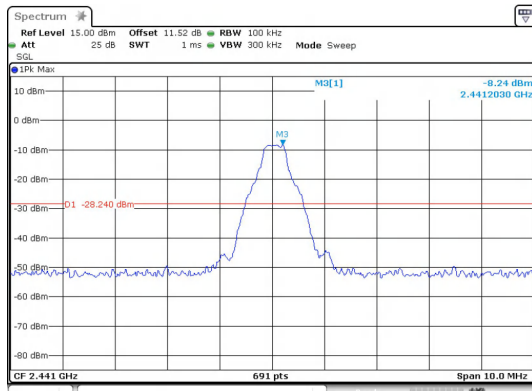
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30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



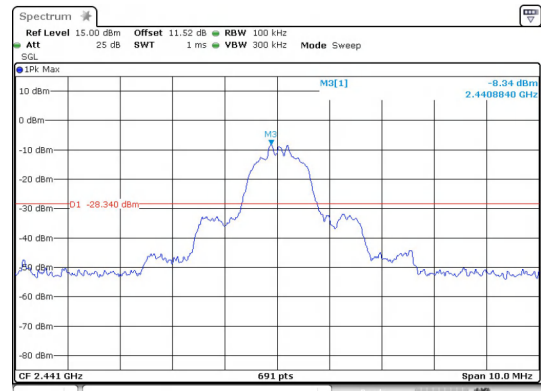
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30.0 MHz - 25000.0 MHz
π/4QPSK_2-DH5_Channel 0



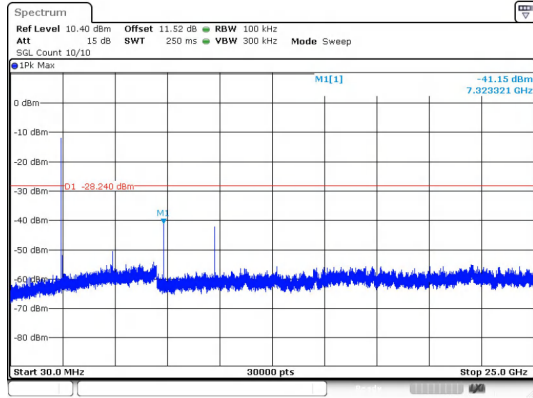
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Out Of Band Emission
GFSK_DH5_Channel 39

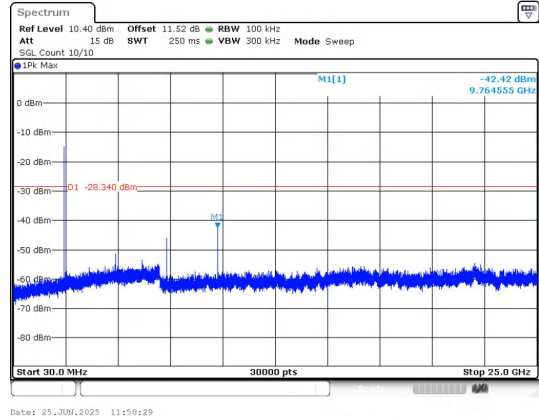


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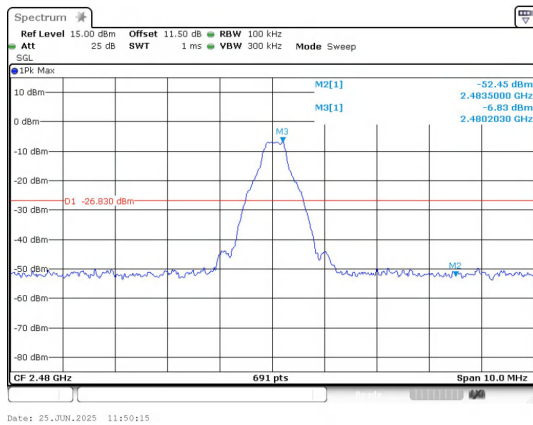
Out Of Band Emission
π/4QPSK_2-DH5_Channel 39



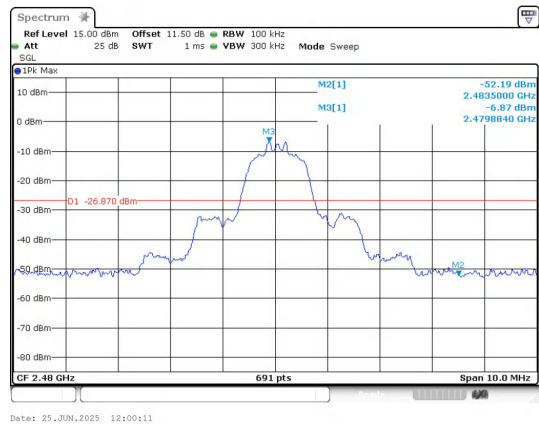
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



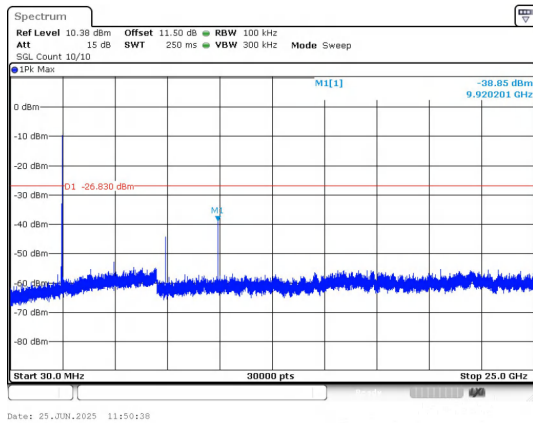
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



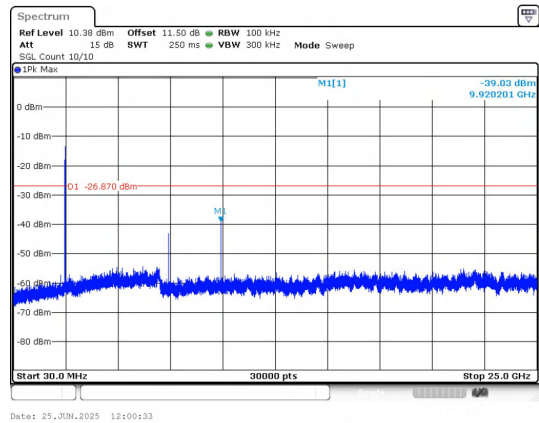
Out Of Band Emission
GFSK_DH5_Channel 78



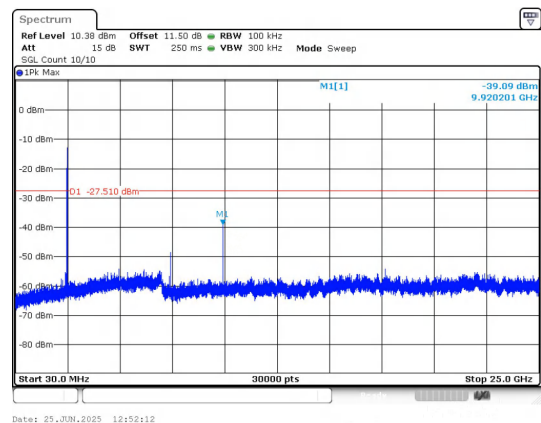
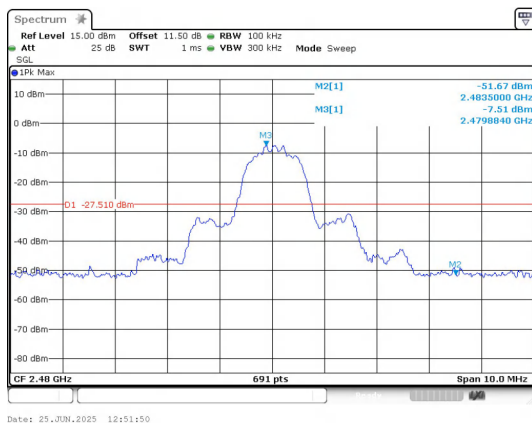
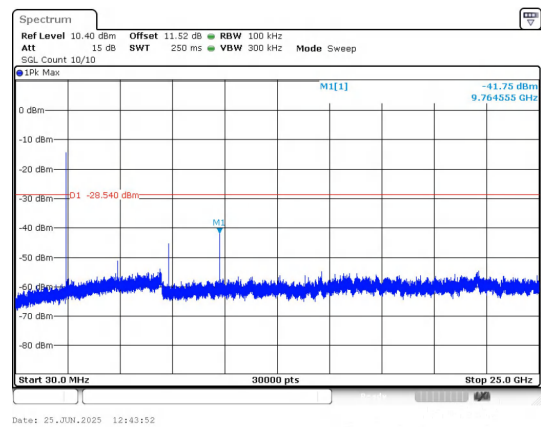
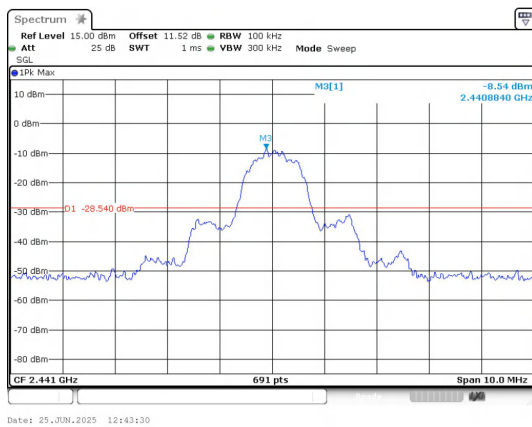
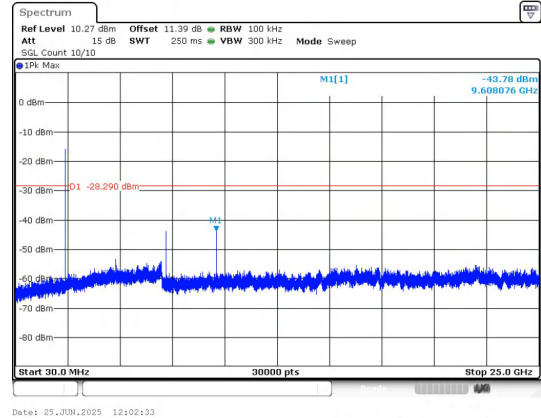
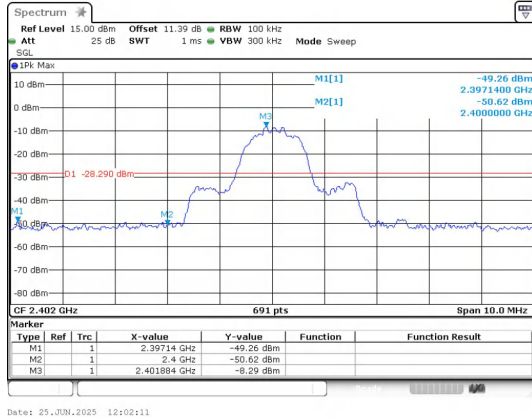
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78

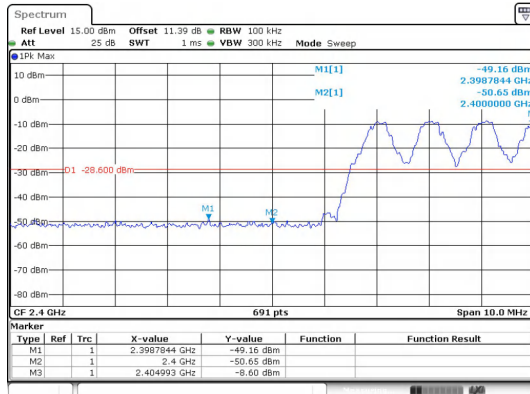


30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



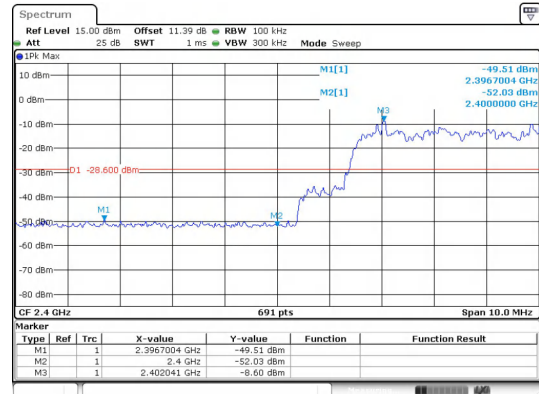
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78





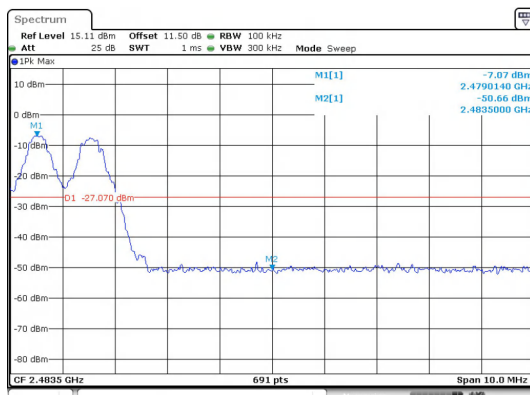
Date: 25.JUN.2025 11:45:42

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



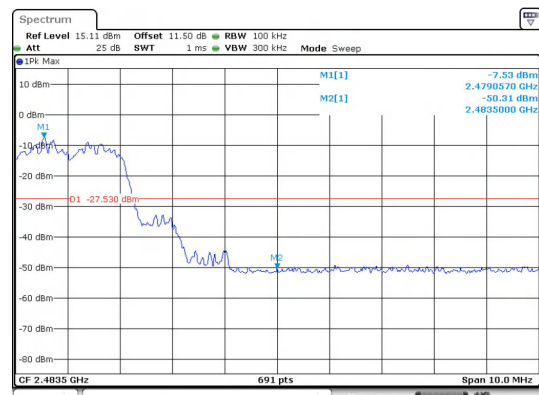
Date: 25.JUN.2025 11:56:08

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



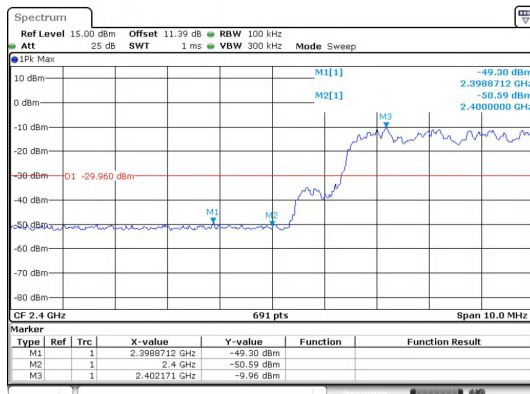
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Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



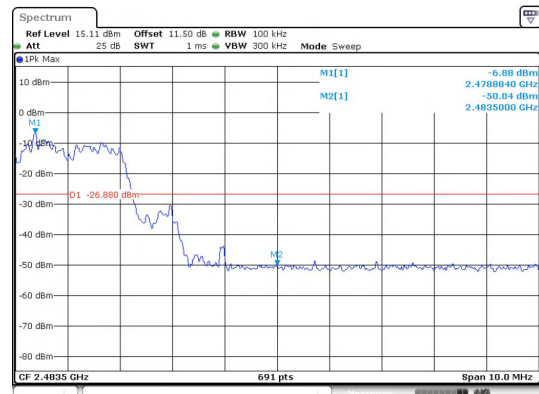
Date: 25.JUN.2025 11:56:37

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



Date: 25.JUN.2025 12:41:15

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



Date: 25.JUN.2025 12:41:44

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

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