

Appendix Report

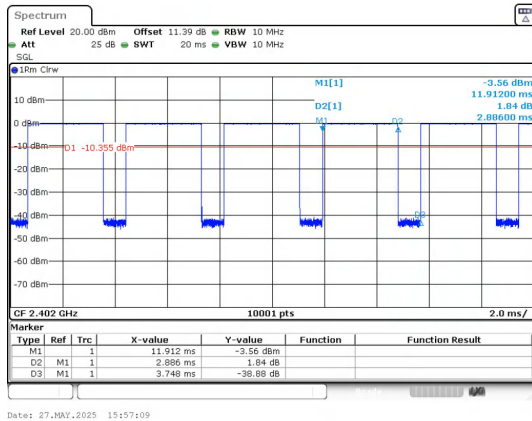
Project No.:	CISR250522135
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

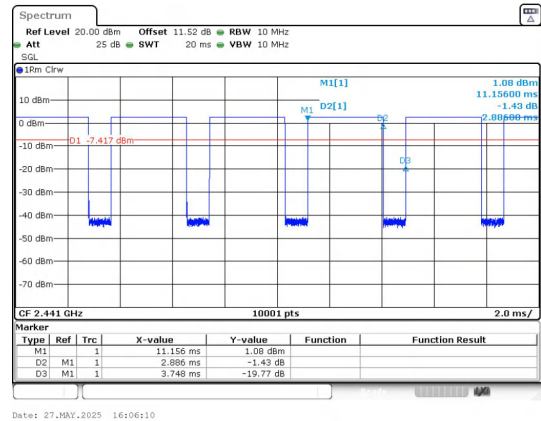
Test Result

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	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458
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

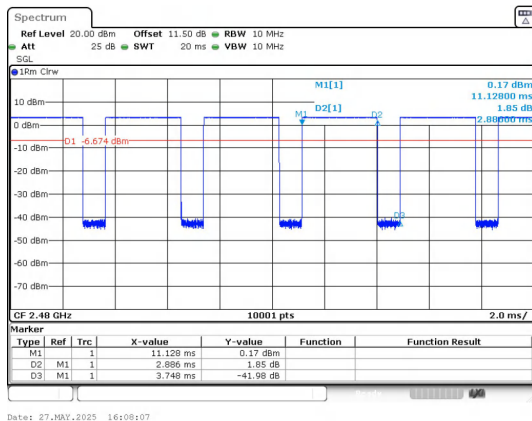
Test Graphs



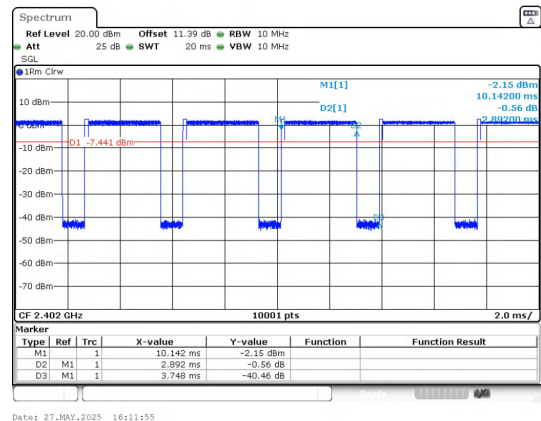
GFSK(DH5)_Channel 0

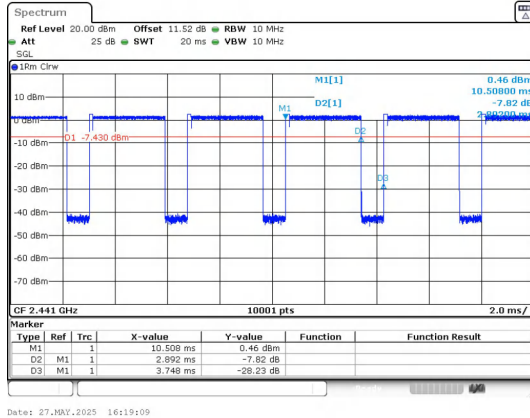


GFSK(DH5)_Channel 39

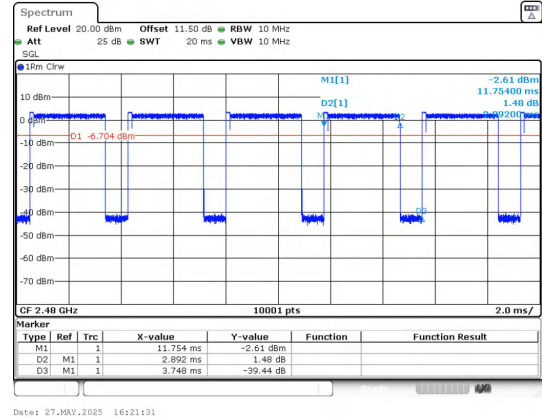


GFSK(DH5)_Channel 78

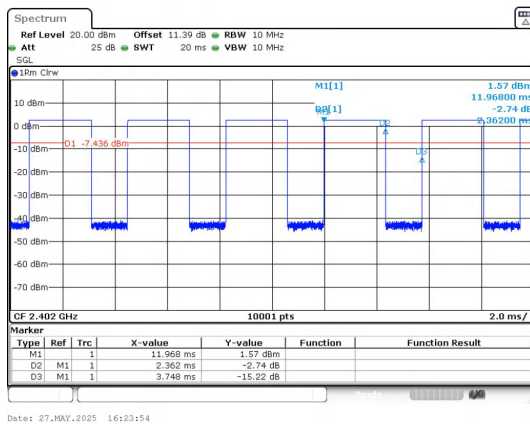

 $\pi/4$ DQPSK(2-DH5)_Channel 0



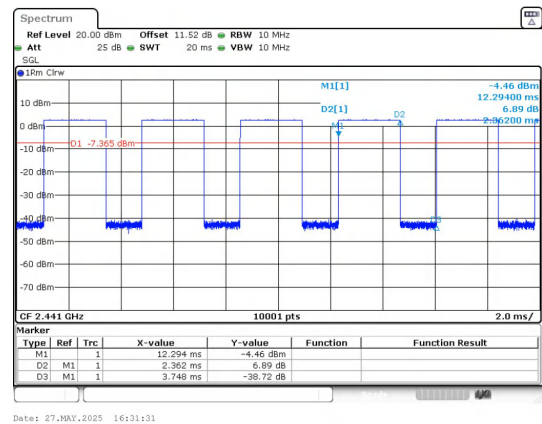
$\pi/4$ DQPSK(2-DH5)_Channel 39



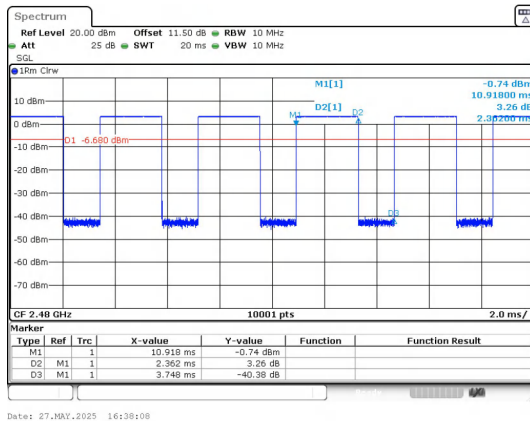
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



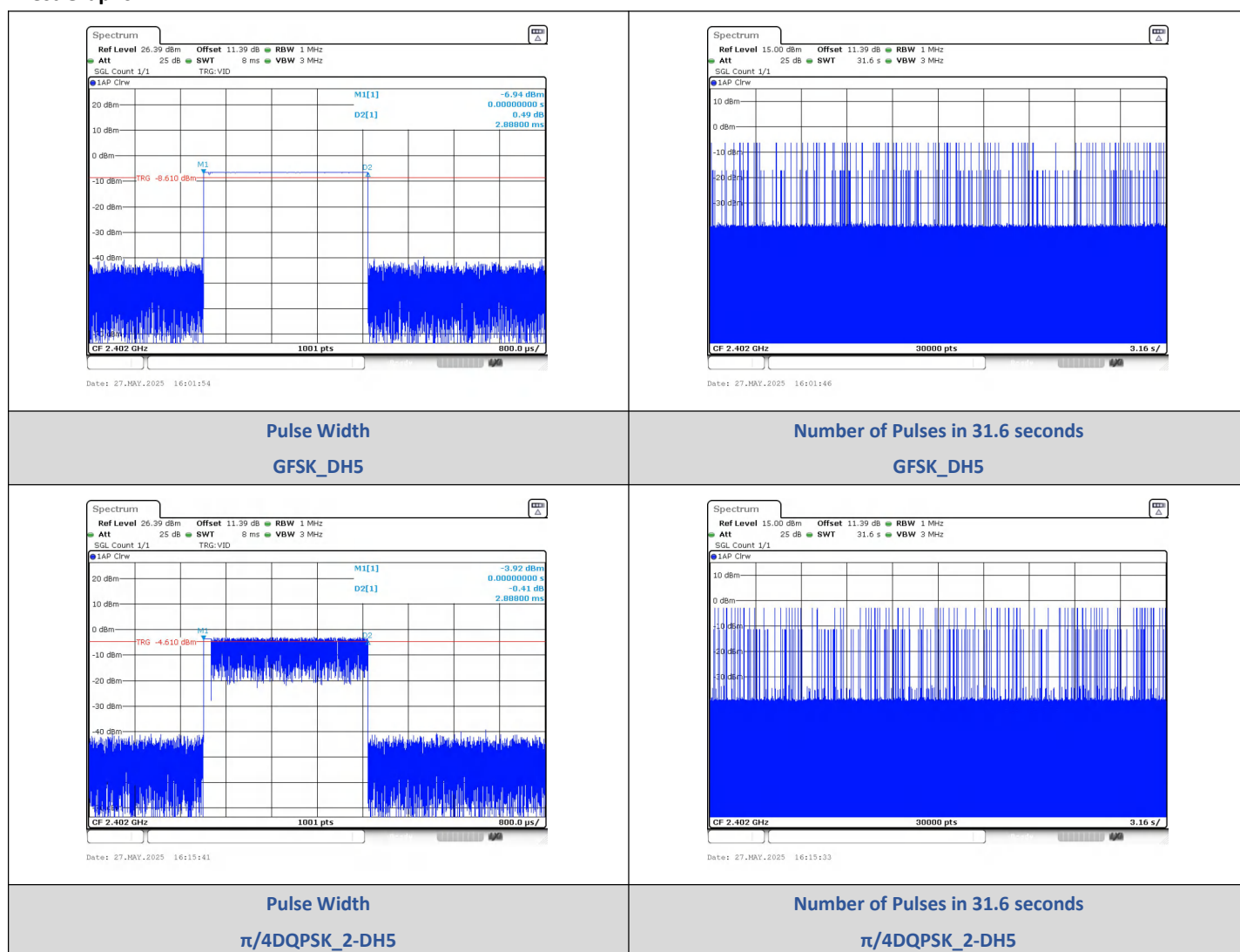
8DPSK(3-DH5)_Channel 78

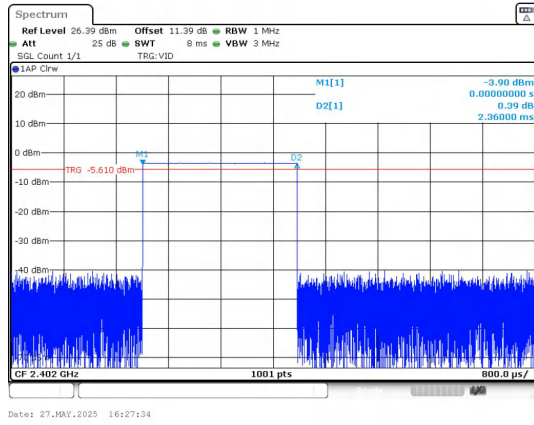
2) Dwell Time

Test Result

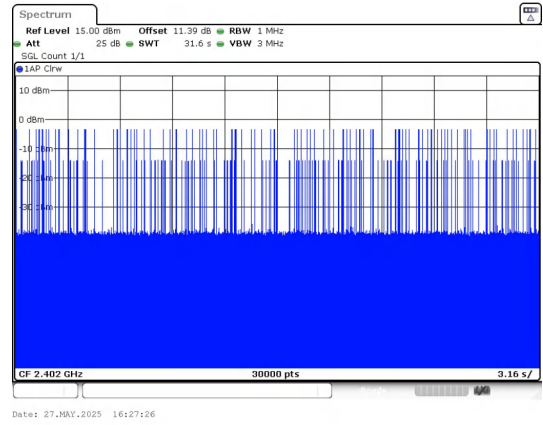
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	103	297.46	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	100	288.8		PASS
8DPSK	3-DH5		2.360	106	250.16		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



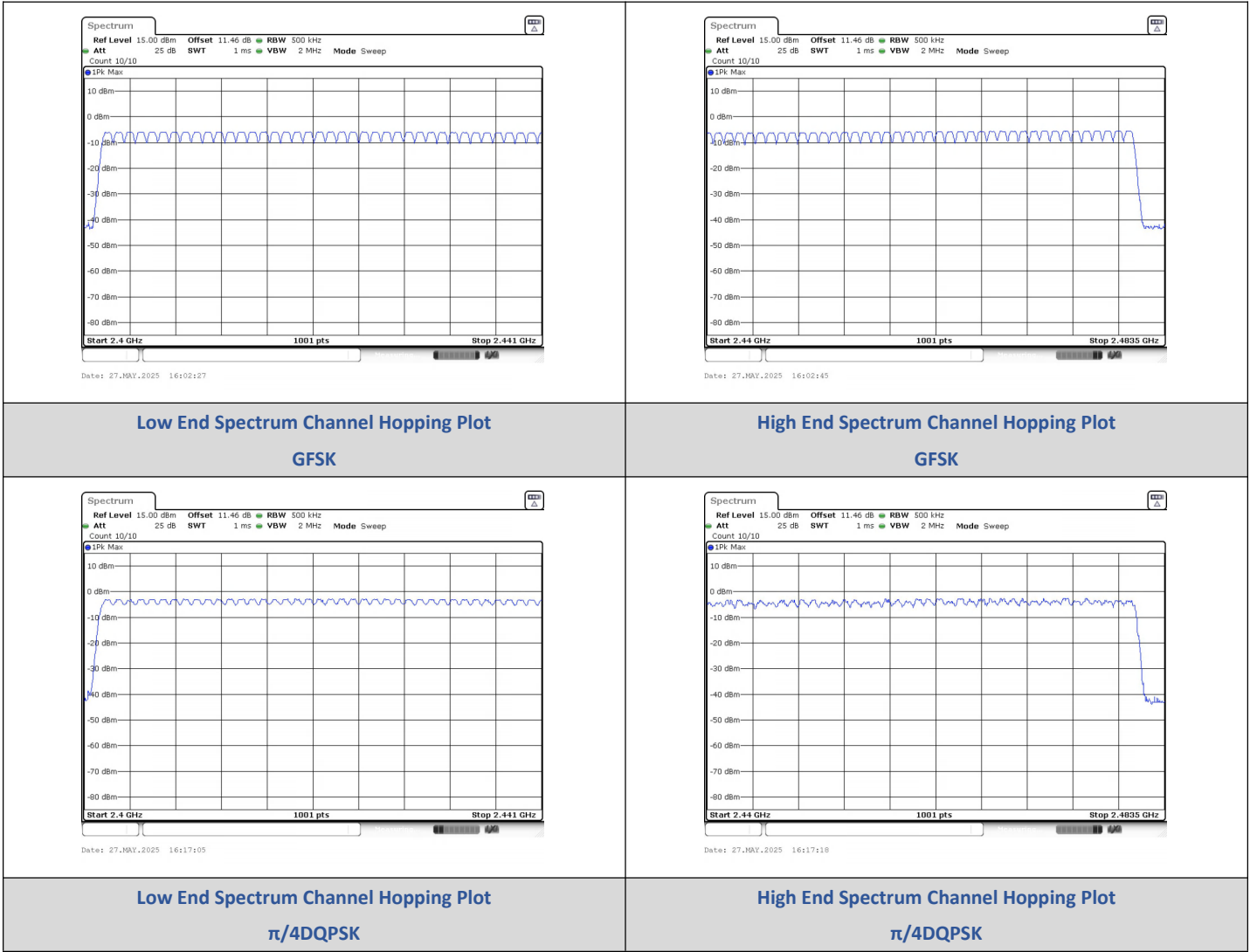
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

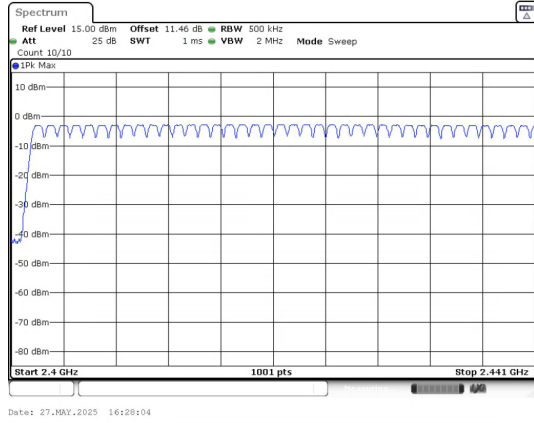
3) Number Of Hopping Channel

Test Result

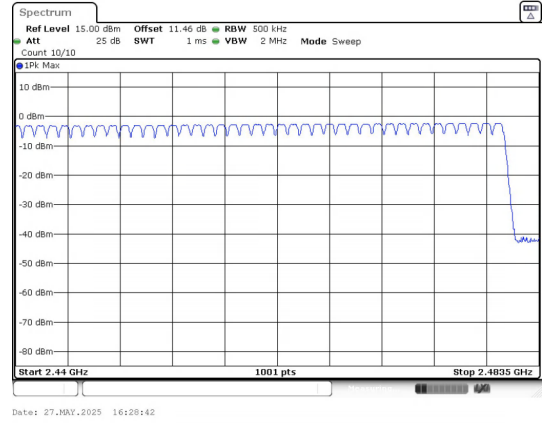
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



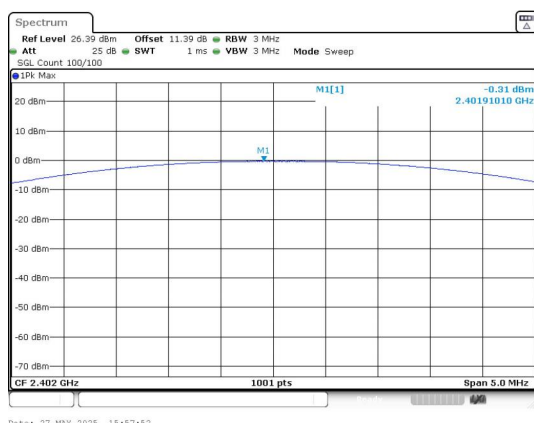
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

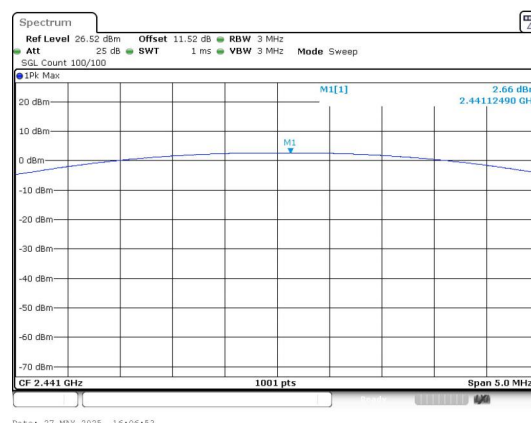
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-0.31	0.93	≤30	PASS
		39	2.66	1.85		PASS
		78	3.31	2.14		PASS
$\pi/4$ DQPSK	2-DH5	0	3.52	2.25	≤20.97	PASS
		39	3.49	2.23		PASS
		78	4.22	2.64		PASS
8DPSK	3-DH5	0	2.59	1.82		PASS
		39	2.69	1.86		PASS
		78	3.35	2.16		PASS

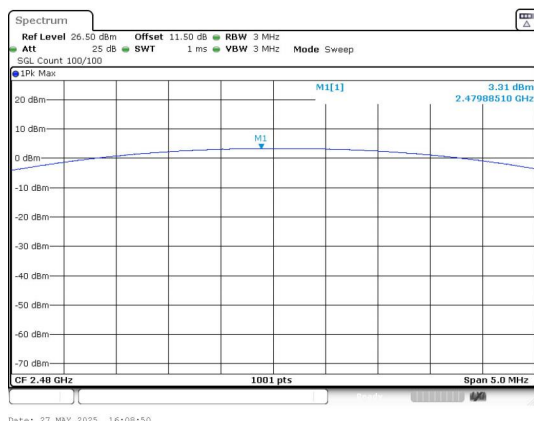
Test Graphs



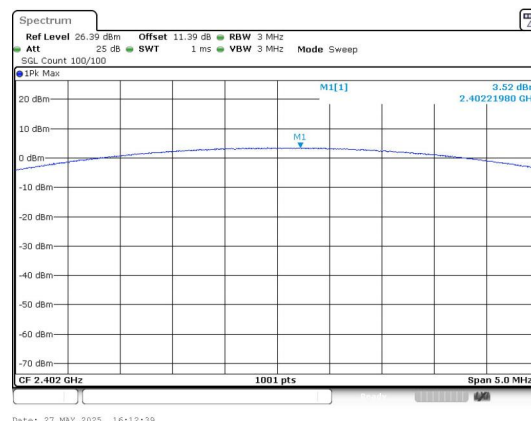
Peak Output Power
GFSK_Channel 0



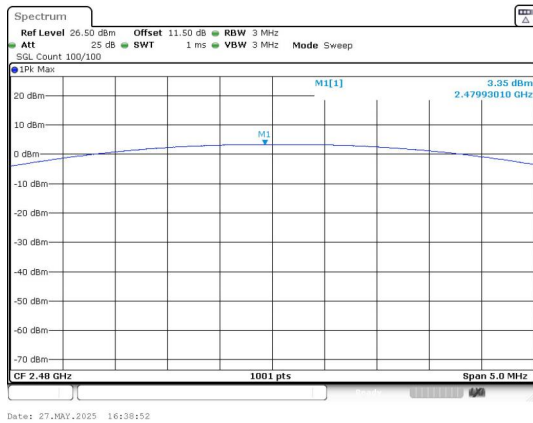
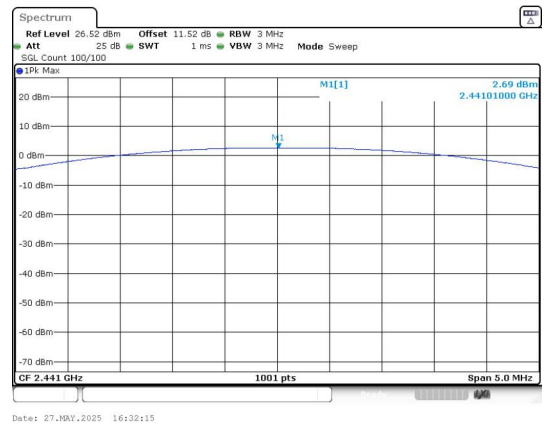
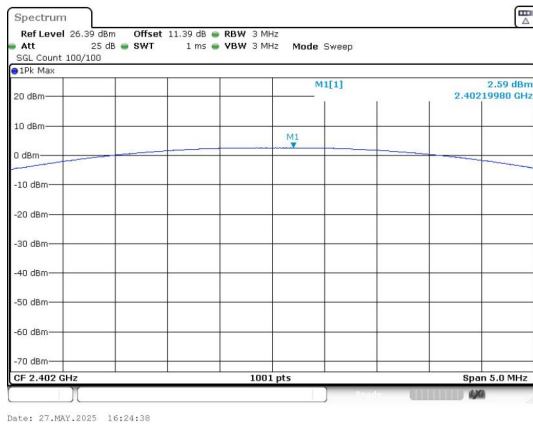
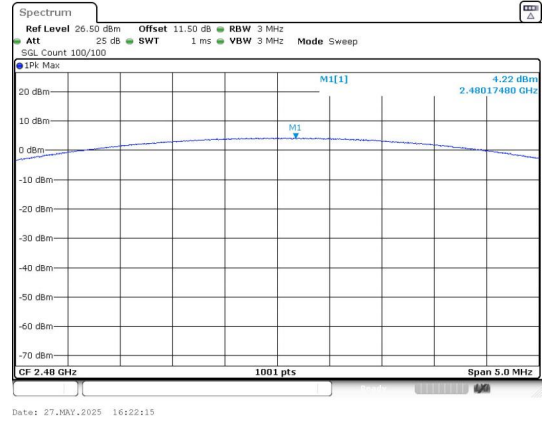
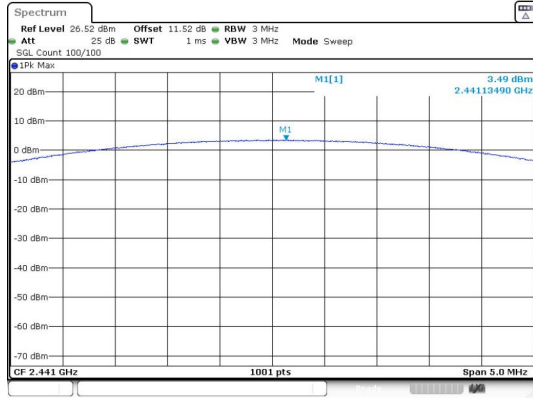
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78



Peak Output Power
 $\pi/4$ DQPSK_Channel 0

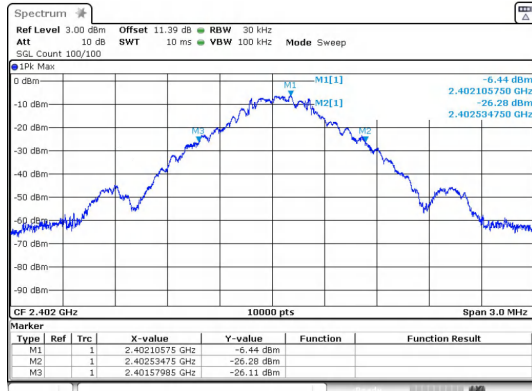


5) 20dB Bandwidth

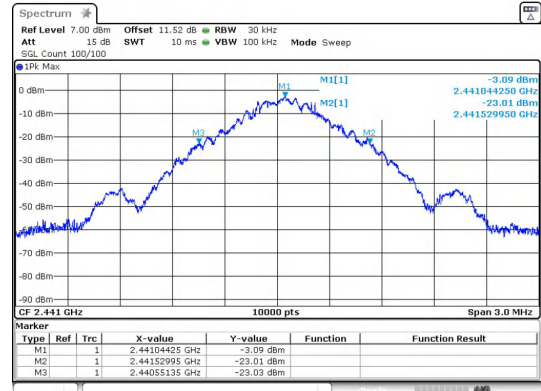
Test Result

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	1.280
	39	2441 MHz	1.310
	78	2480 MHz	1.280
8DPSK	0	2402 MHz	1.000
	39	2441 MHz	0.9900
	78	2480 MHz	0.9800

Test Graphs



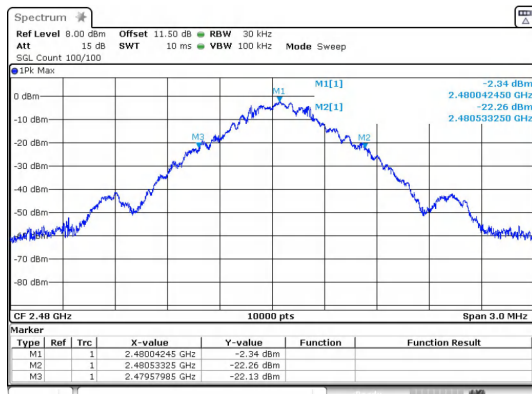
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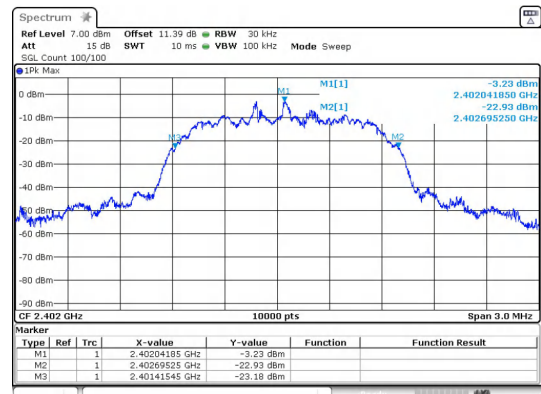
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GFSK_DH5_Channel 0

GFSK_DH5_Channel 39



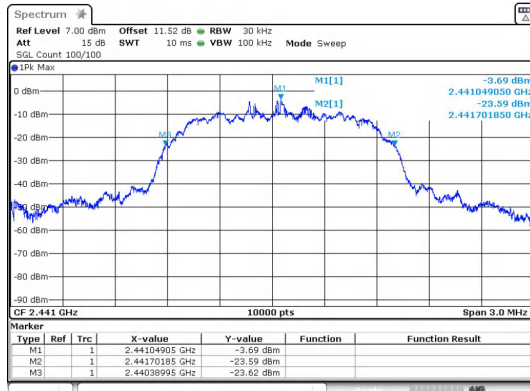
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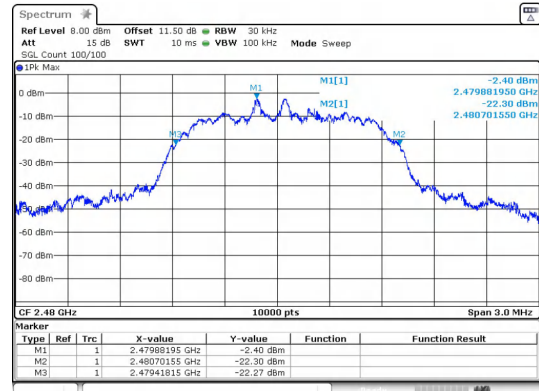
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GFSK_DH5_Channel 78

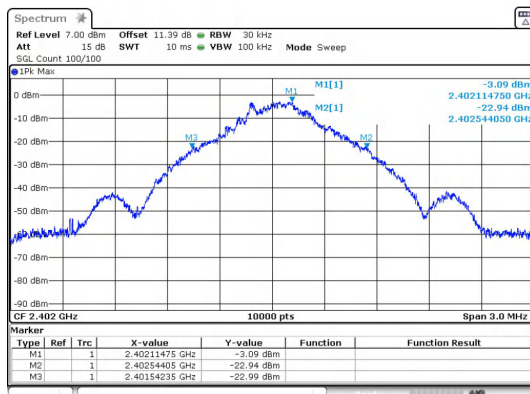
 $\pi/4$ DQPSK_2-DH5_Channel 0



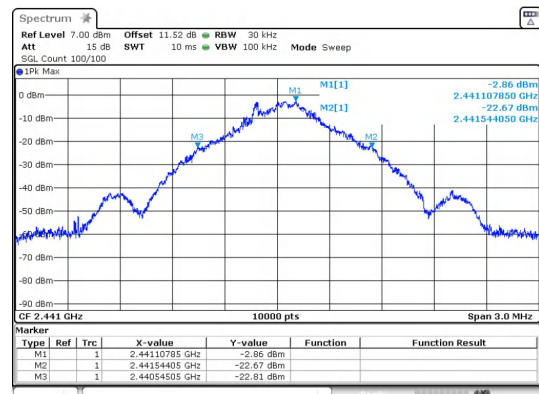
$\pi/4$ DQPSK_2-DH5_Channel 39



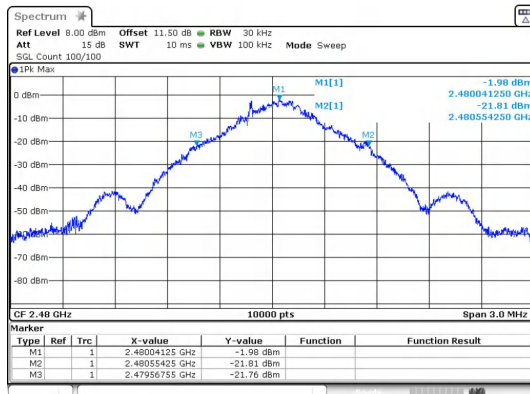
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



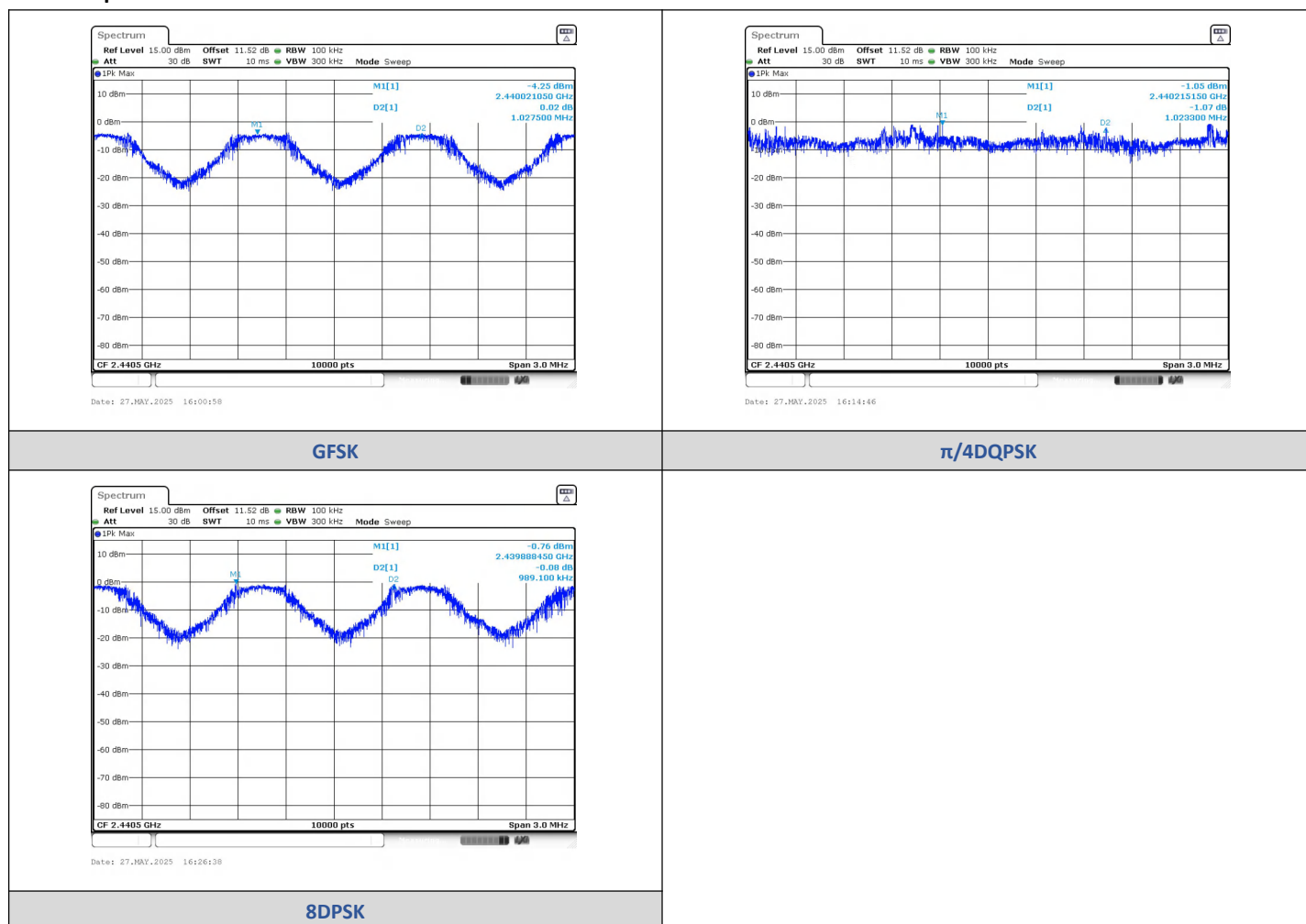
8DPSK_3-DH5_Channel 78

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	2440.021	2441.0485	1.0275	0.95	PASS
$\pi/4$ DQPSK	2-DH5	2440.2151	2441.2384	1.0233	0.853	PASS
8DPSK	3-DH5	2439.8884	2440.8776	0.9891	0.667	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

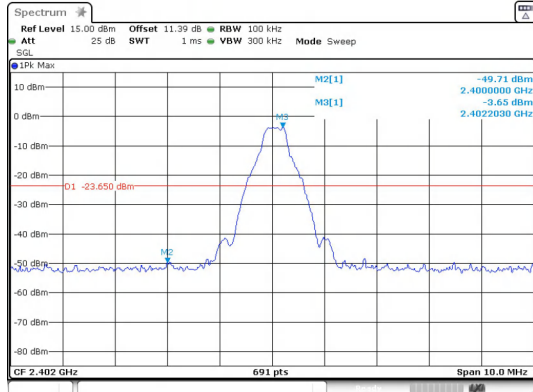
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-49.710	-23.65	-26.060	PASS
			5738.56	-47.844	-23.65	-24.194	PASS
		39	2633.12	-48.799	-20.72	-28.079	PASS
		78	2483.50	-52.320	-20.01	-32.310	PASS
			2672.24	-49.764	-20.01	-29.754	PASS
$\pi/4$ DQPSK	2-DH5	0	2397.67	-50.063	-20.83	-29.233	PASS
			2400.00	-50.950	-20.83	-30.120	PASS
			2594.00	-50.703	-20.83	-29.873	PASS
		39	5740.22	-49.600	-20.7	-28.900	PASS
		78	2483.50	-51.330	-20.05	-31.280	PASS
			5740.22	-49.774	-20.05	-29.724	PASS
8DPSK	3-DH5	0	2398.98	-50.632	-20.75	-29.882	PASS
			2400.00	-52.100	-20.75	-31.350	PASS
			2594.00	-48.730	-20.75	-27.980	PASS
		39	2633.12	-51.446	-20.64	-30.806	PASS
		78	2483.50	-50.790	-19.76	-31.030	PASS
			2672.24	-48.869	-19.76	-29.109	PASS

Hopping

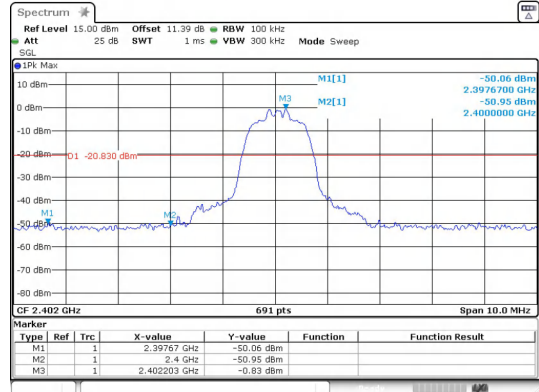
Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.57	-49.815	-24.27	-25.545	PASS
			2400.00	-50.590	-24.27	-26.320	PASS
			2483.50	-50.580	-23.23	-27.350	PASS
$\pi/4$ DQPSK	2-DH5		2396.96	-49.338	-23.97	-25.368	PASS
			2400.00	-51.800	-23.97	-27.830	PASS
			2483.50	-51.500	-20.99	-30.510	PASS
8DPSK	3-DH5		2395.05	-49.329	-20.55	-28.779	PASS
			2400.00	-51.310	-20.55	-30.760	PASS
			2483.50	-50.800	-20.04	-30.760	PASS

Test Graphs



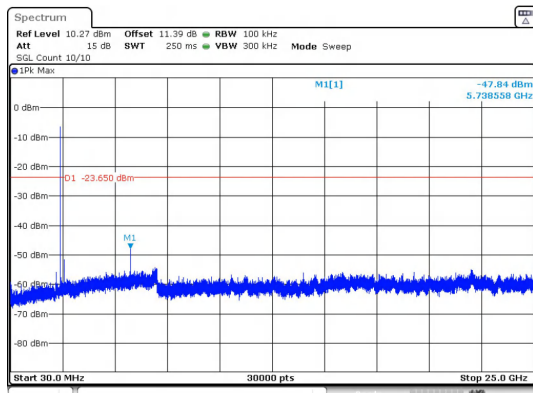
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Out Of Band Emission
GFSK_DH5_Channel 0



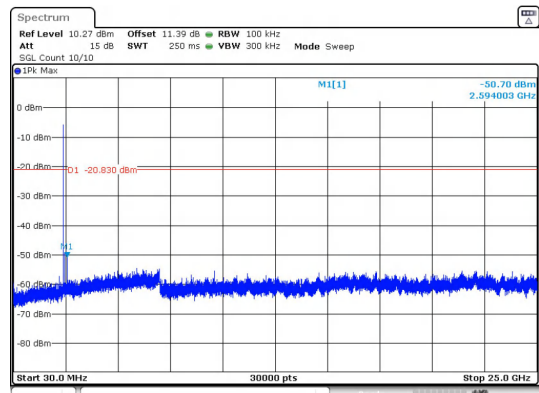
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Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 0



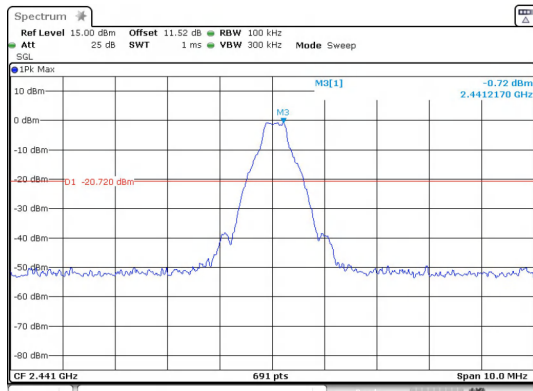
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30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



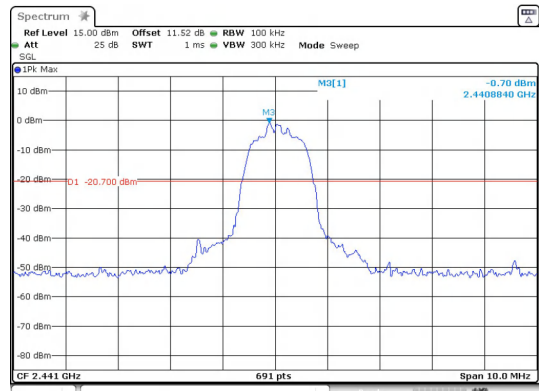
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30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 0



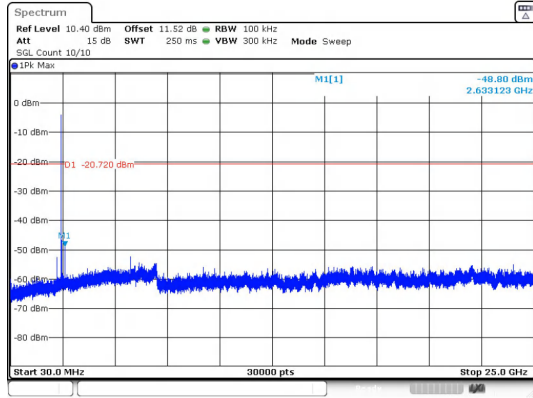
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Out Of Band Emission
GFSK_DH5_Channel 39

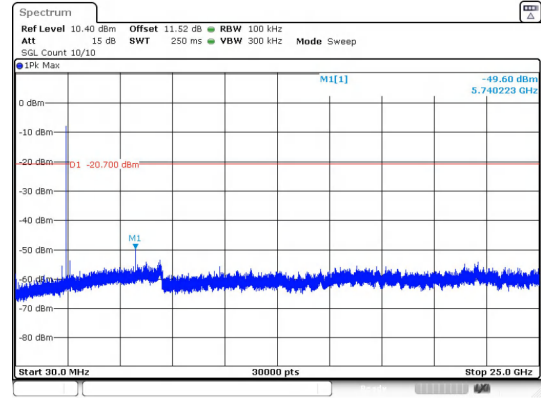


Date: 27.MAY.2025 16:20:13

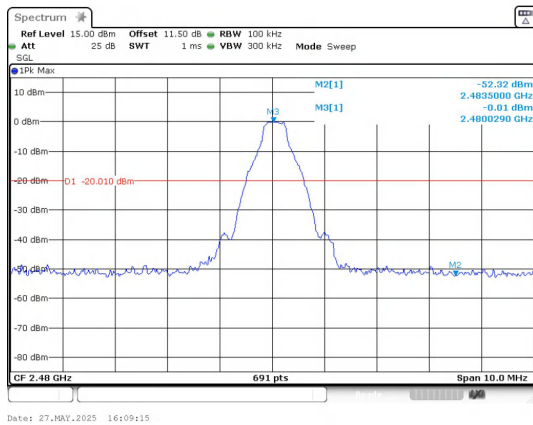
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



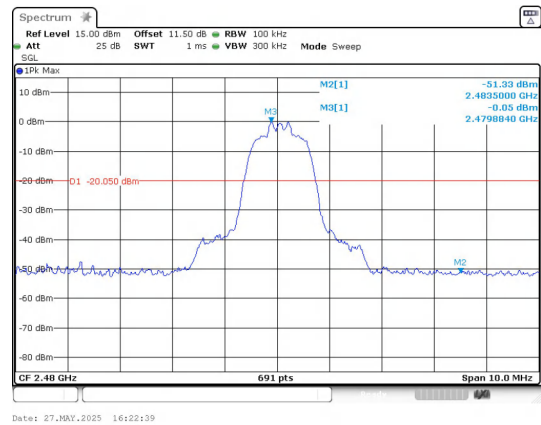
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



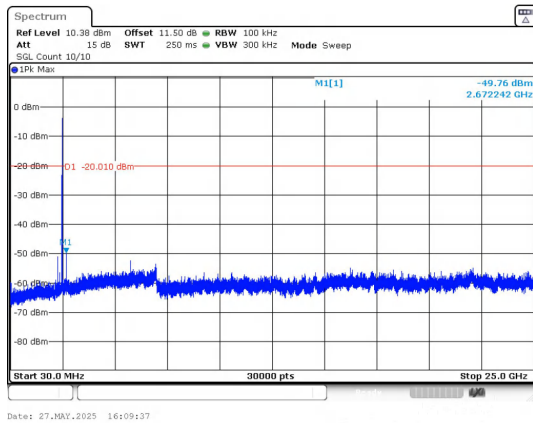
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



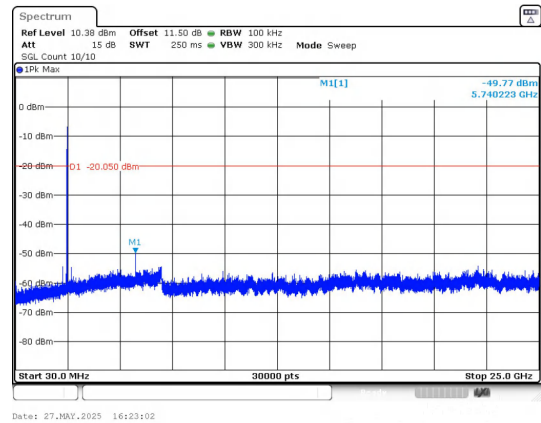
Out Of Band Emission
GFSK_DH5_Channel 78



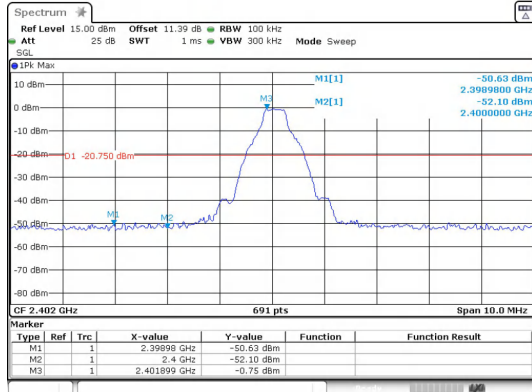
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



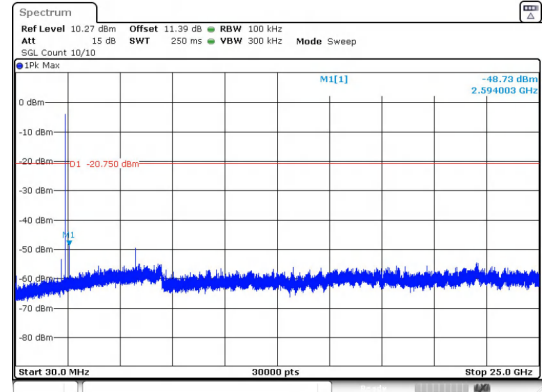
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



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



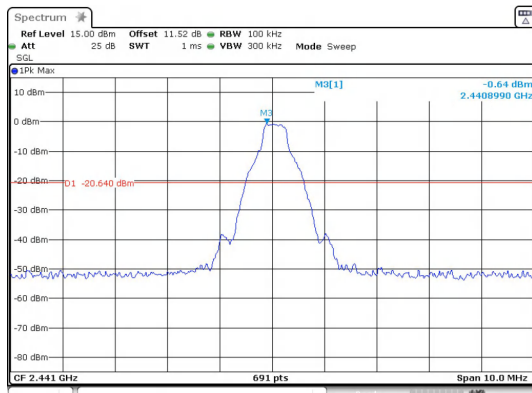
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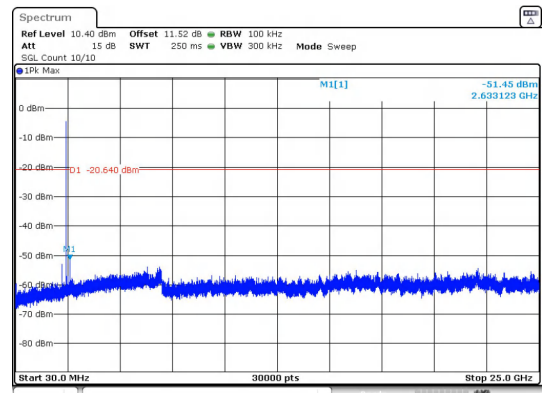
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Out Of Band Emission
8DPSK_3-DH5_Channel 0

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



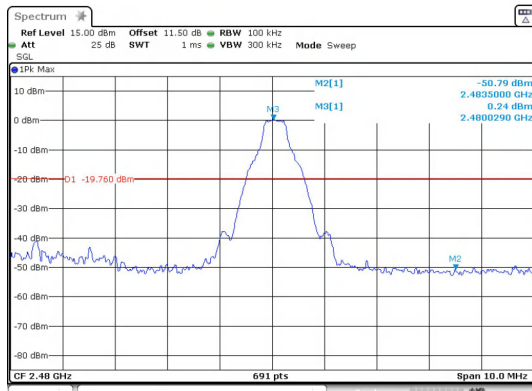
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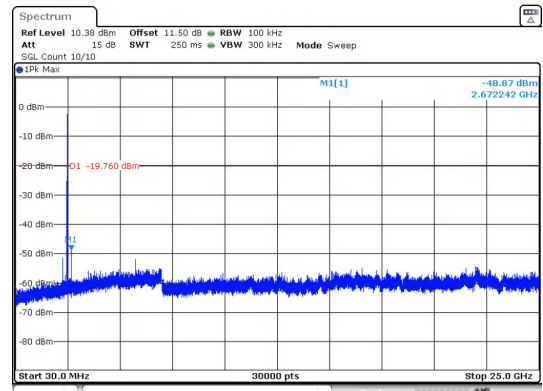
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Out Of Band Emission
8DPSK_3-DH5_Channel 39

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



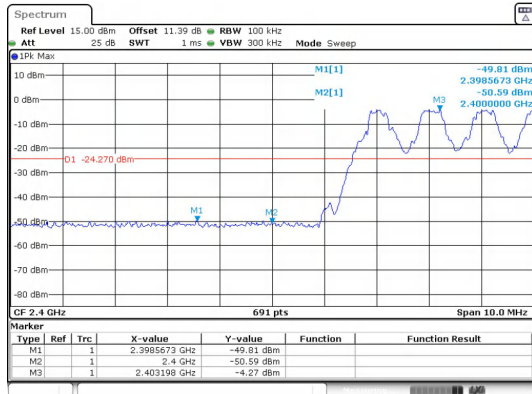
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Date: 27.MAY.2025 16:39:39

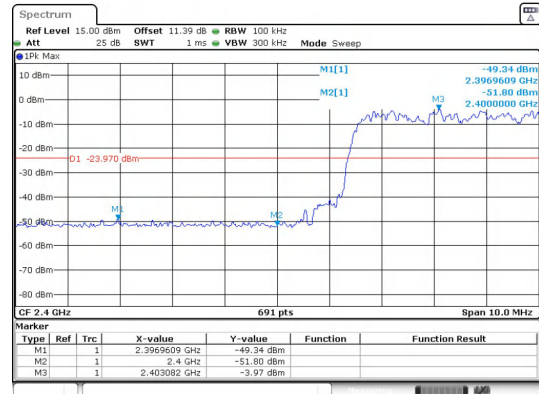
Out Of Band Emission
8DPSK_3-DH5_Channel 78

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



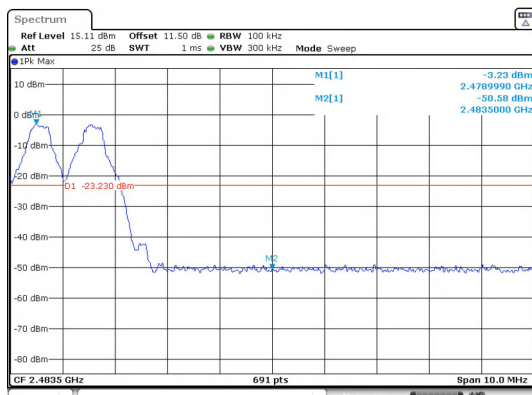
Date: 27.MAY.2025 16:03:14

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



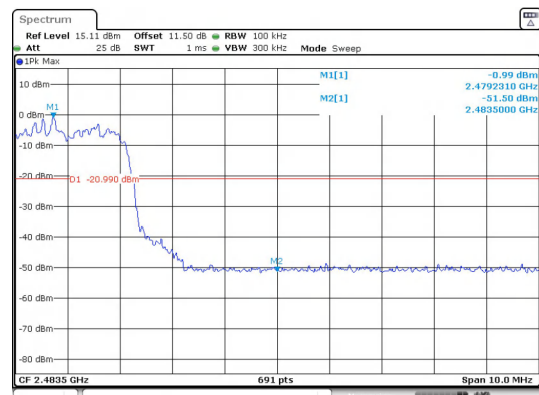
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Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



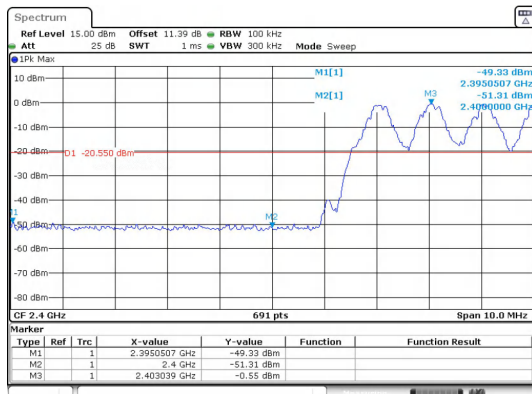
Date: 27.MAY.2025 16:04:13

Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



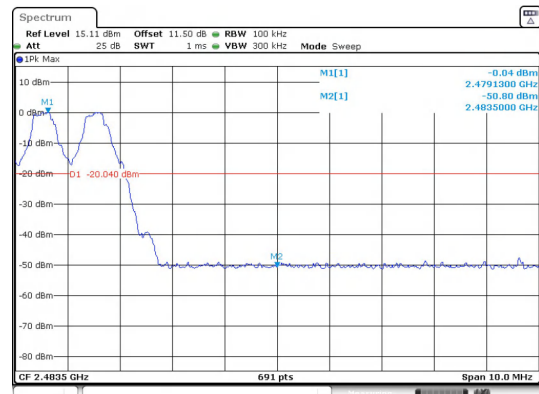
Date: 27.MAY.2025 16:18:34

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



Date: 27.MAY.2025 16:29:54

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



Date: 27.MAY.2025 16:30:58

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

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