

Appendix Report

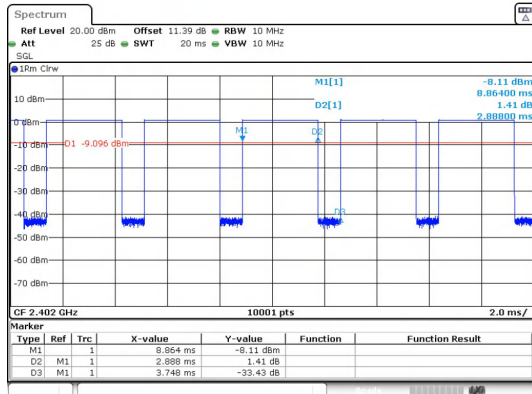
Project No.:	CISR250321179
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

Test Result

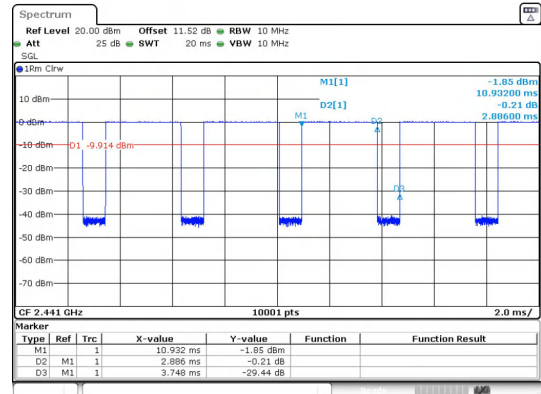
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.888	3.748	77.05	0.7705	1.1323	0.3463
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.3460
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.892	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	2.894	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



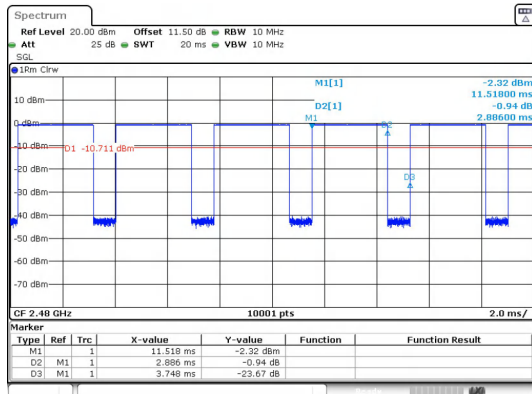
Date: 26.MAR.2025 09:18:53

GFSK(DH5)_Channel 0



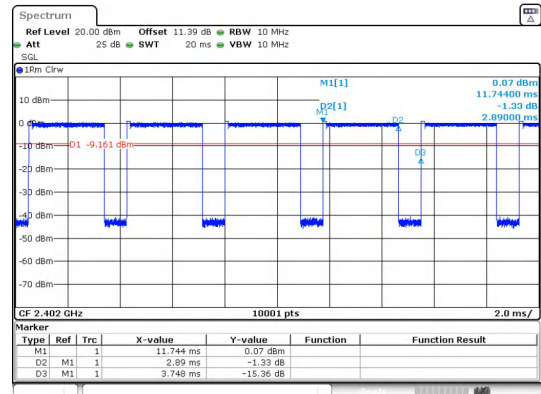
Date: 26.MAR.2025 09:30:21

GFSK(DH5)_Channel 39



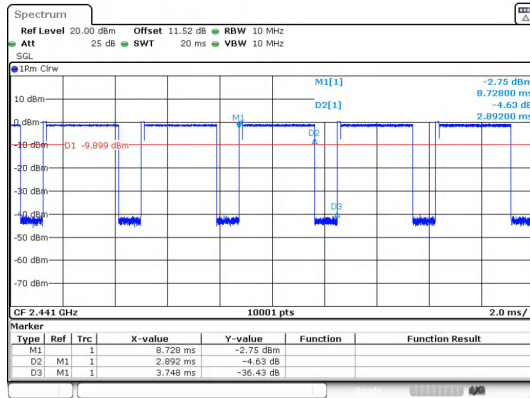
Date: 26.MAR.2025 09:13:03

GFSK(DH5)_Channel 78

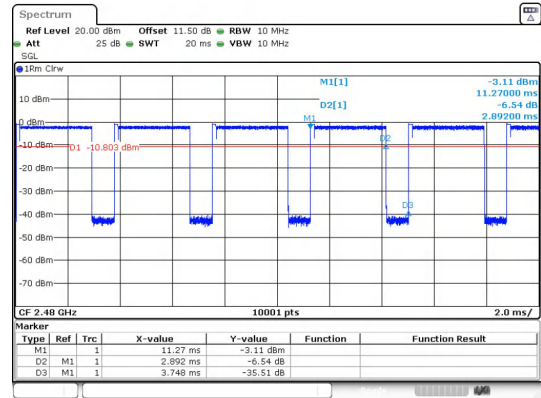


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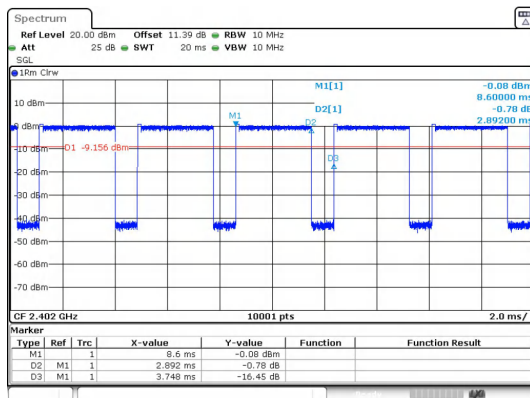
 $\pi/4$ DQPSK(2-DH5)_Channel 0



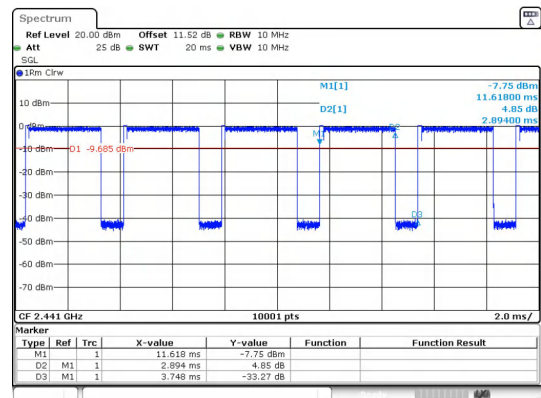
$\pi/4$ DQPSK(2-DH5)_Channel 39



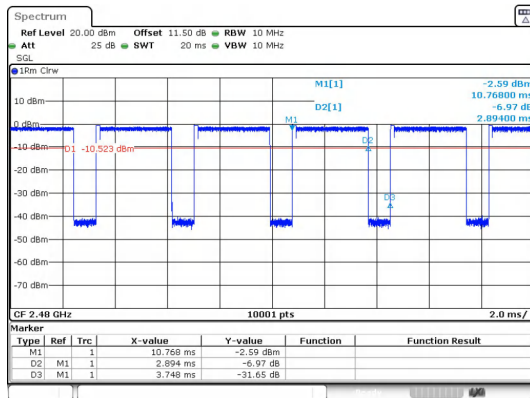
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



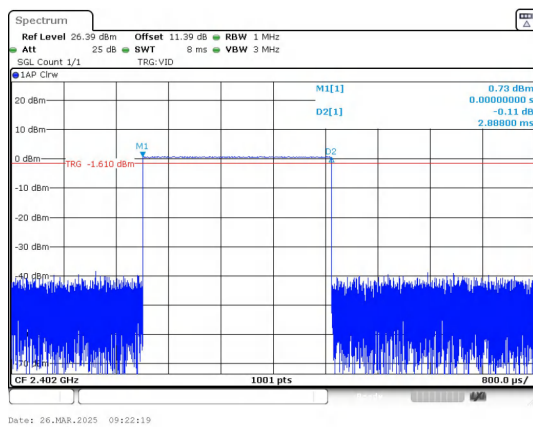
8DPSK(3-DH5)_Channel 78

2) Dwell Time

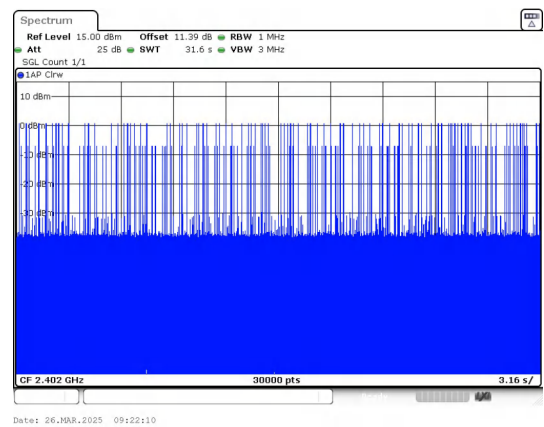
Test Result

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	114	329.23	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	98	283.02		PASS
8DPSK	3-DH5		2.896	94	272.22		PASS

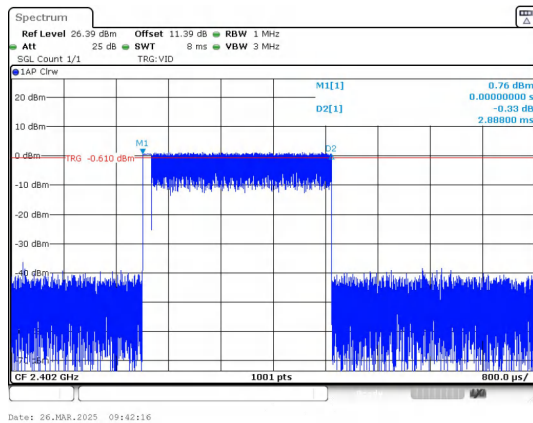
Test Graphs



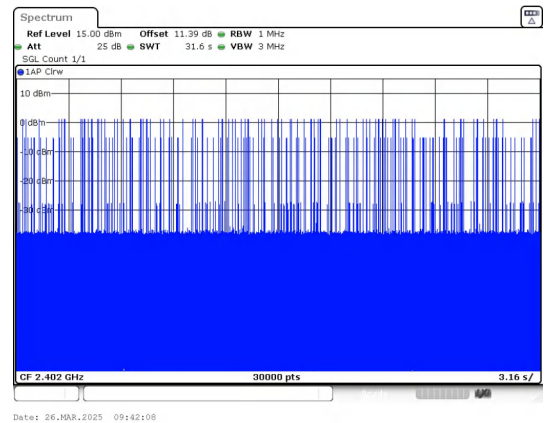
Pulse Width
GFSK_DH5



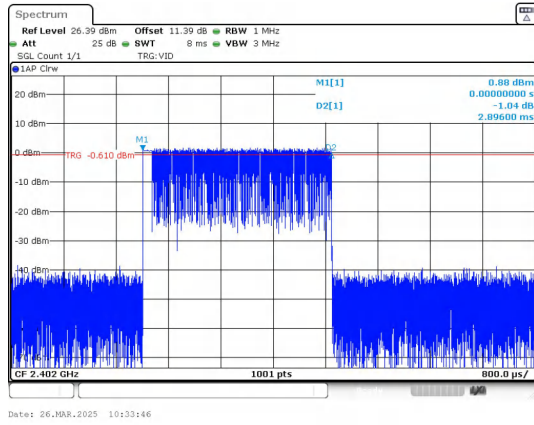
Number of Pulses in 31.6 seconds
GFSK_DH5



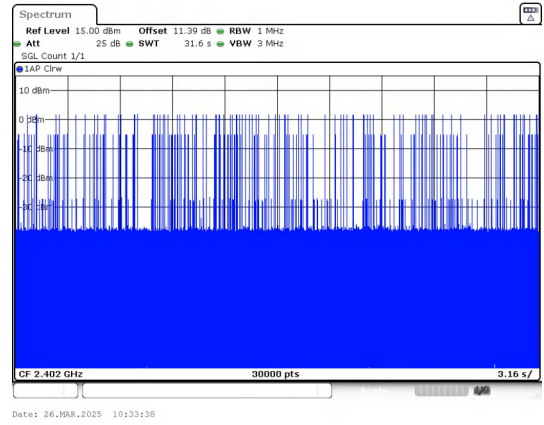
Pulse Width
 $\pi/4$ DQPSK_2-DH5



Number of Pulses in 31.6 seconds
 $\pi/4$ DQPSK_2-DH5



Pulse Width
8DPSK_3-DH5



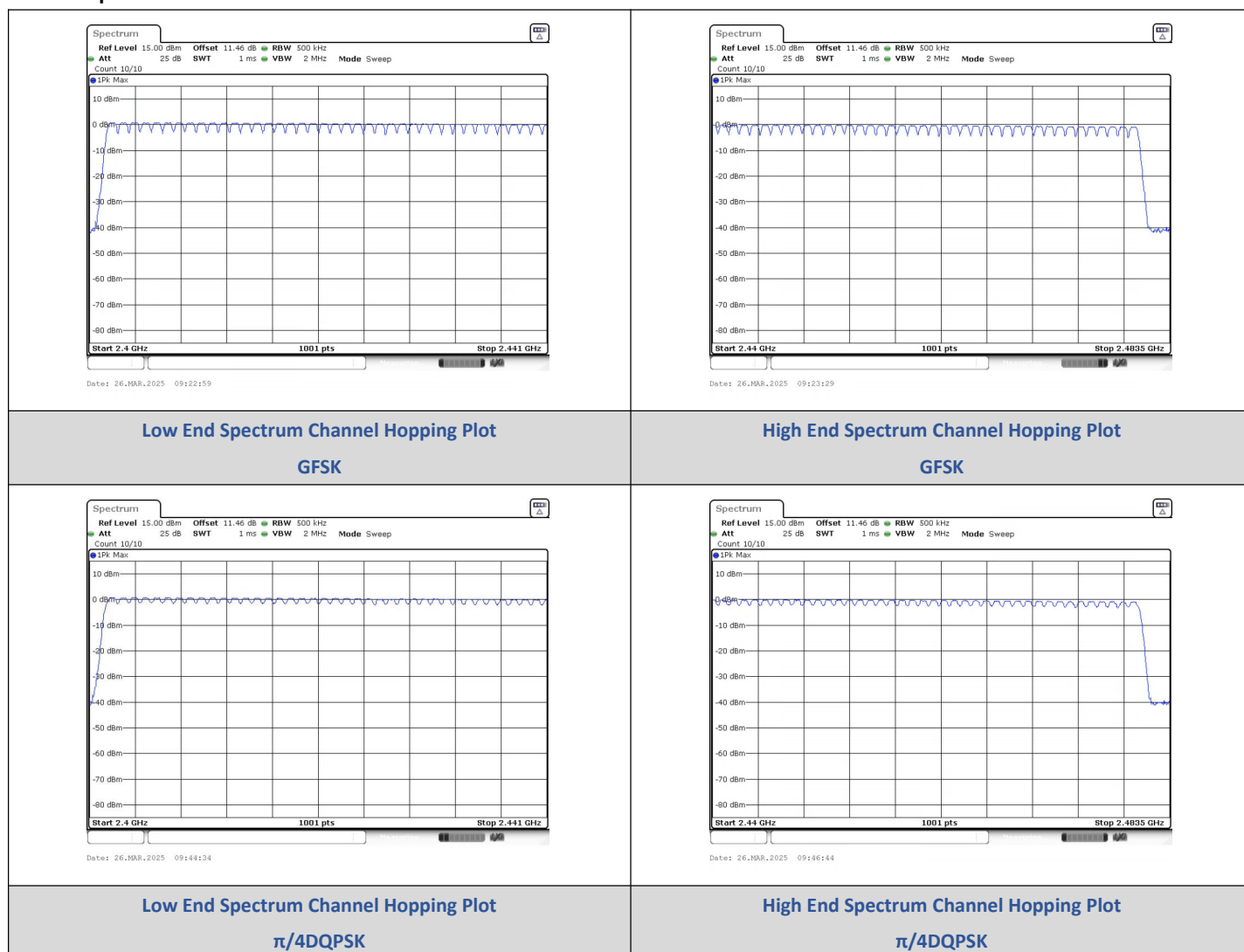
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

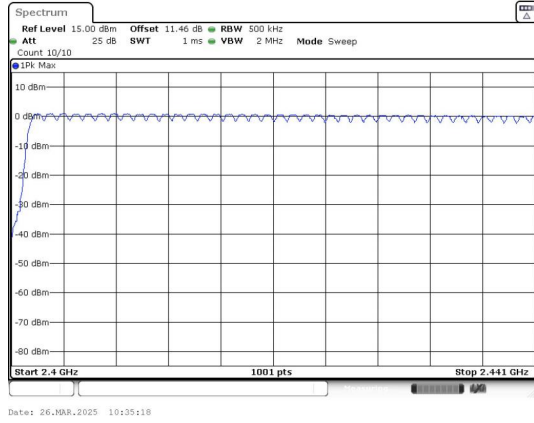
3) Number Of Hopping Channel

Test Result

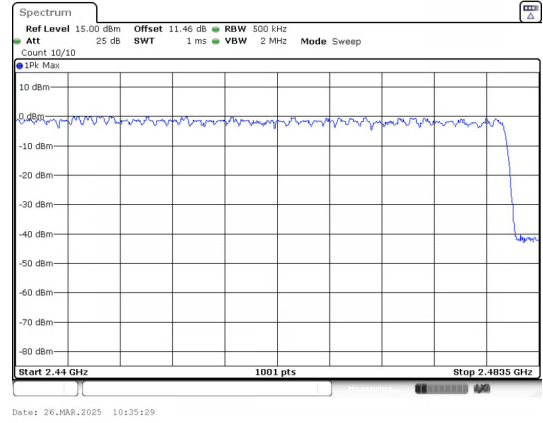
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



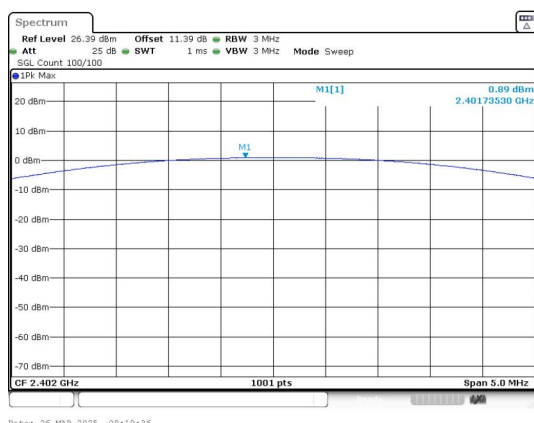
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

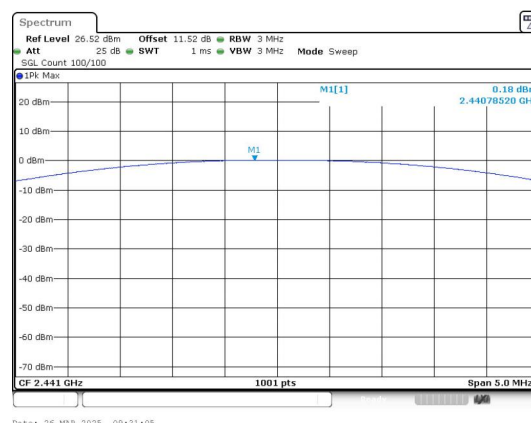
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	0.89	1.23	≤30	PASS
		39	0.18	1.04		PASS
		78	-0.68	0.86		PASS
$\pi/4$ DQPSK	2-DH5	0	1.73	1.49	≤20.97	PASS
		39	1.01	1.26		PASS
		78	0.14	1.03		PASS
8DPSK	3-DH5	0	2.15	1.64		PASS
		39	1.59	1.44		PASS
		78	0.75	1.19		PASS

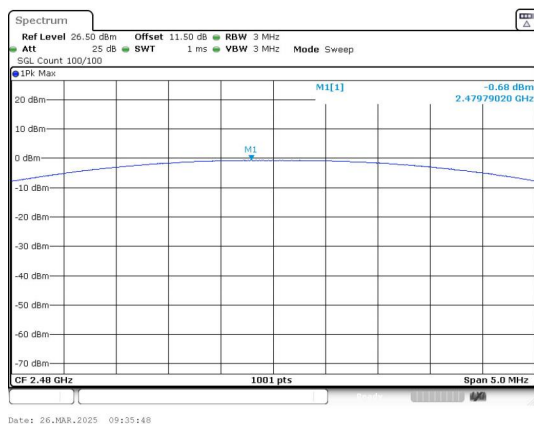
Test Graphs



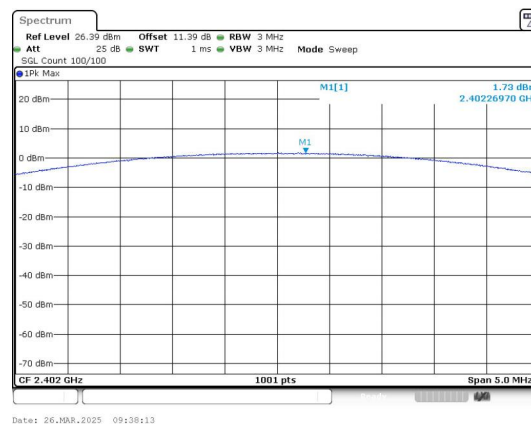
Peak Output Power
GFSK_Channel 0



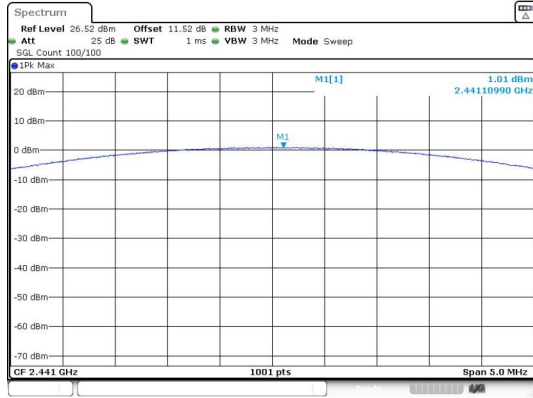
Peak Output Power
GFSK_Channel 39



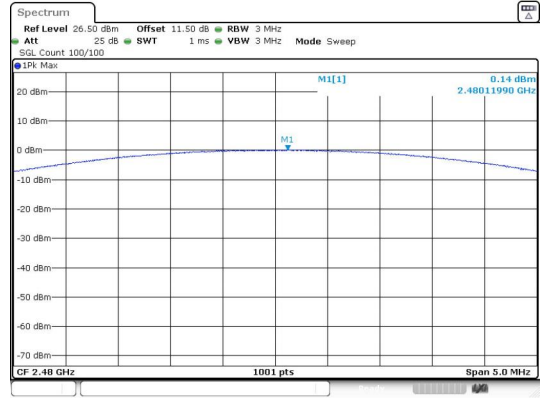
Peak Output Power
GFSK_Channel 78



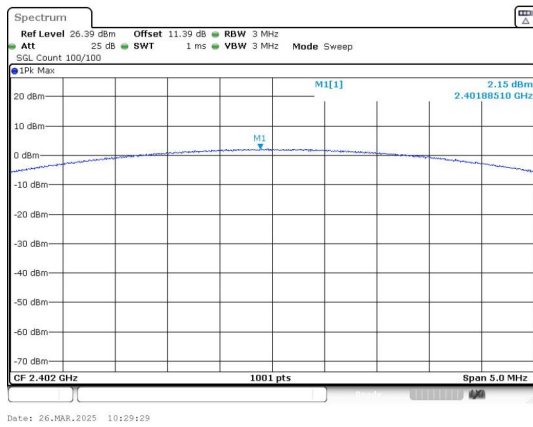
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



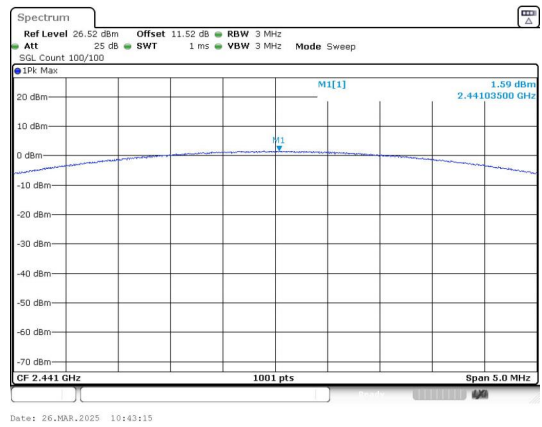
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



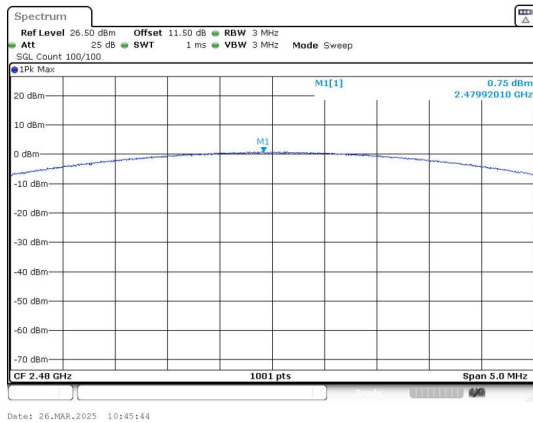
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



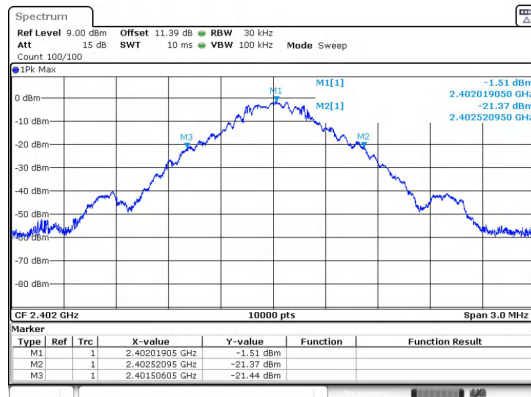
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

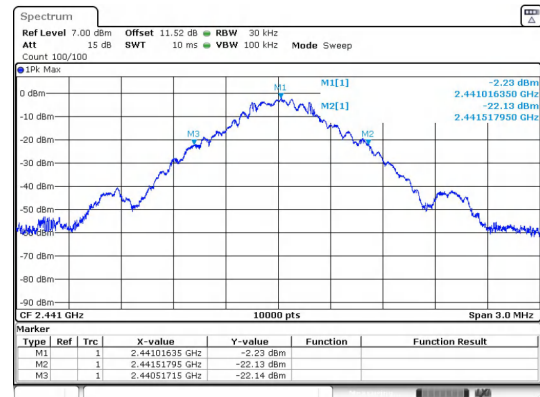
Test Result

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	1.280
8DPSK	0	2402 MHz	1.280
	39	2441 MHz	1.290
	78	2480 MHz	1.290

Test Graphs



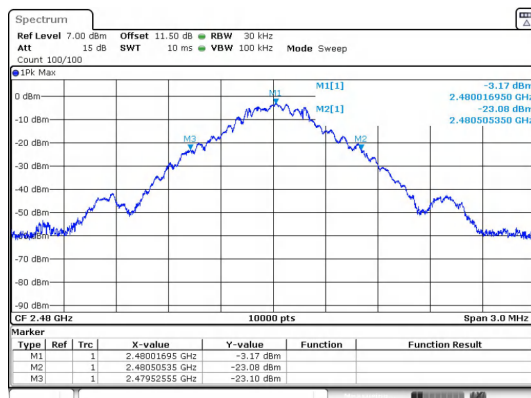
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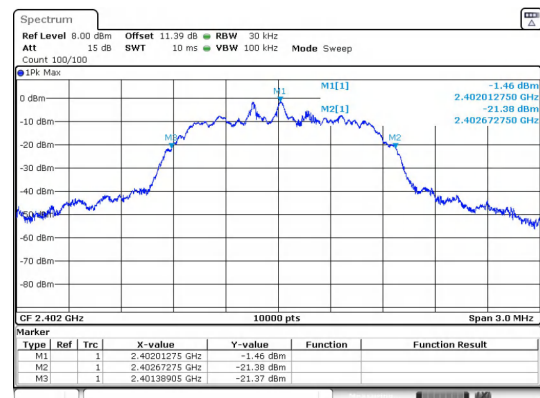
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GFSK_DH5_Channel 0

GFSK_DH5_Channel 39



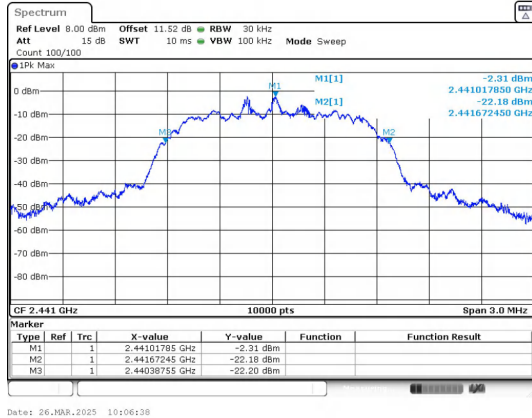
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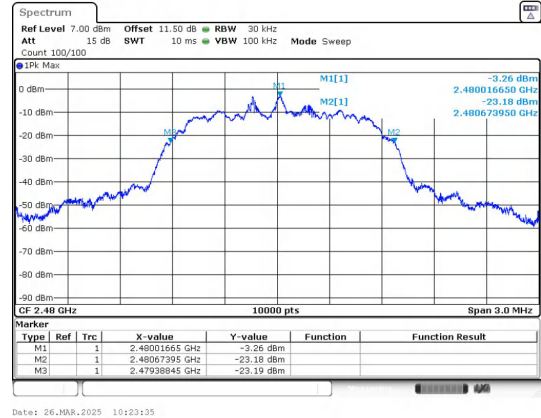
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GFSK_DH5_Channel 78

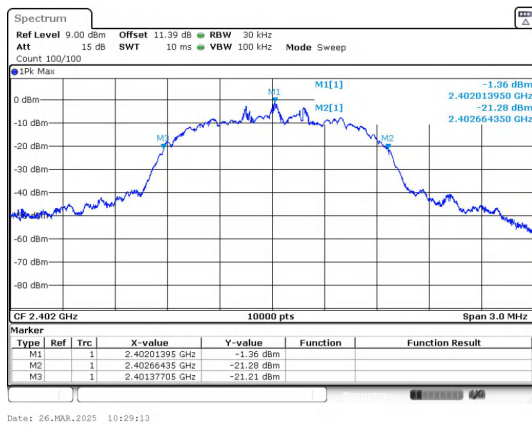
 $\pi/4$ DQPSK_2-DH5_Channel 0



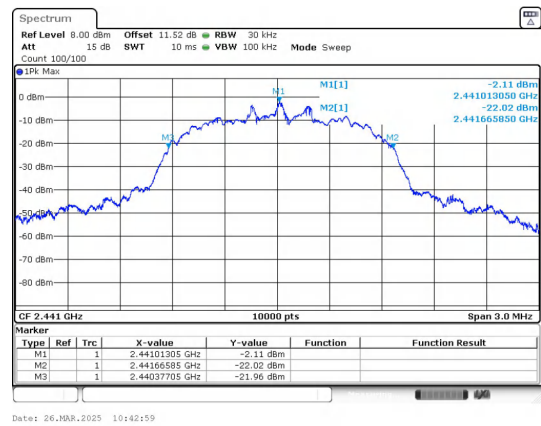
$\pi/4$ DQPSK_2-DH5_Channel 39



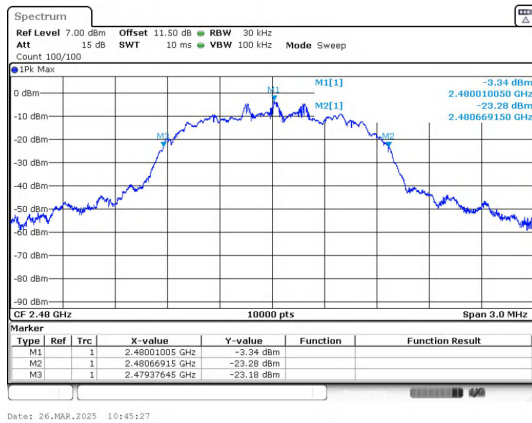
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



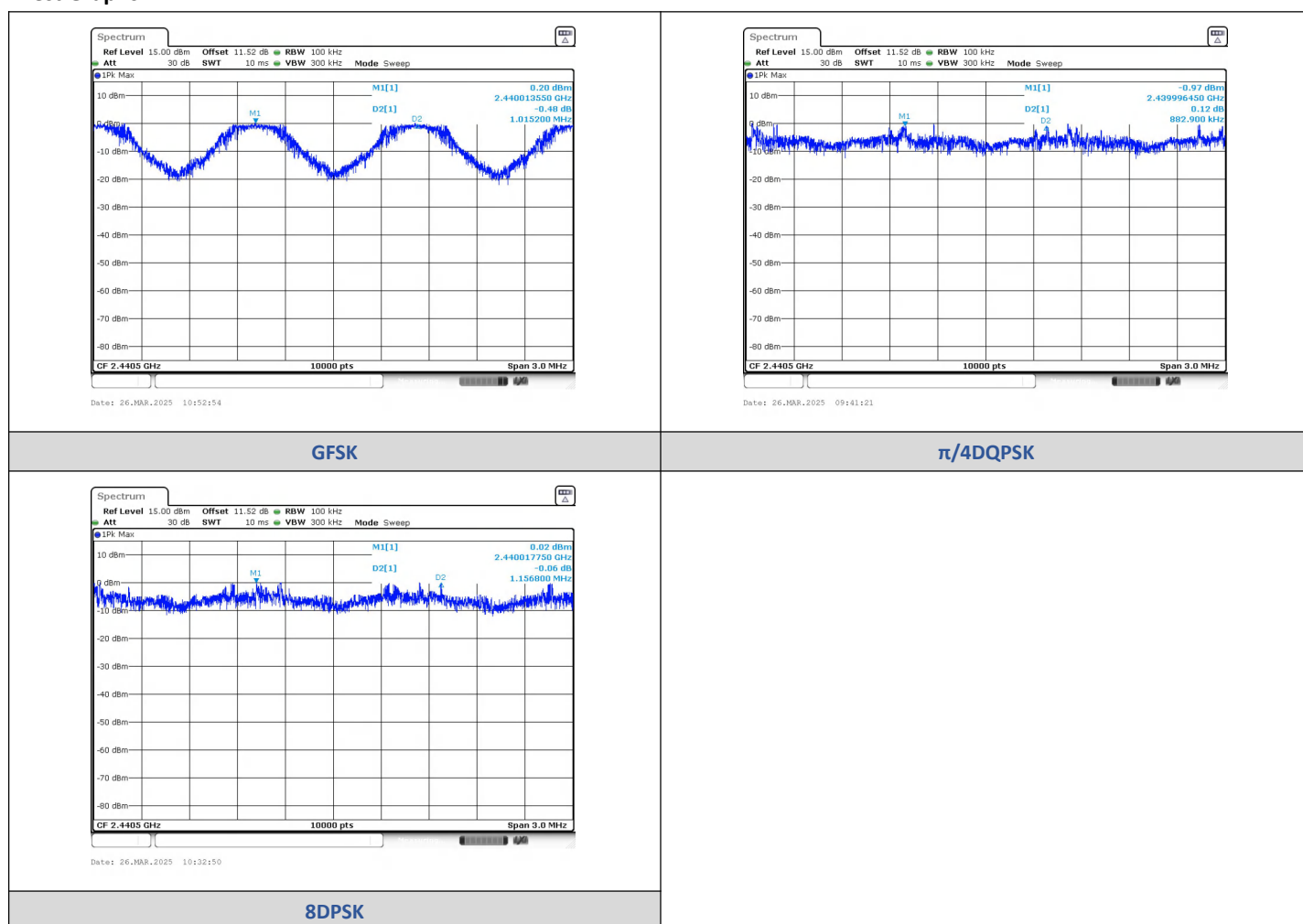
8DPSK_3-DH5_Channel 78

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	2440.0136	2441.0287	1.0152	1.01	PASS
$\pi/4$ DQPSK	2-DH5	2439.9965	2440.8794	0.8829	0.853	PASS
8DPSK	3-DH5	2440.0177	2441.1746	1.1568	0.853	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

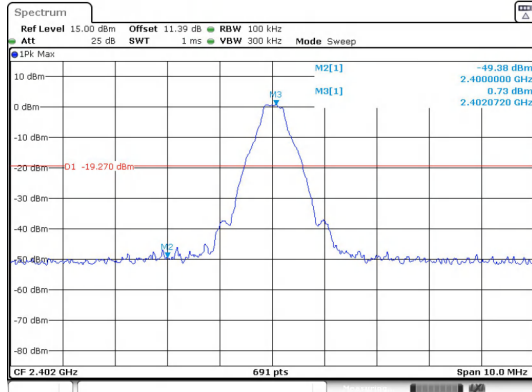
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-49.380	-19.27	-30.110	PASS
			9608.08	-44.373	-19.27	-25.103	PASS
		39	9764.55	-42.502	-20.04	-22.462	PASS
		78	2483.50	-50.500	-20.88	-29.620	PASS
			9920.20	-39.621	-20.88	-18.741	PASS
$\pi/4$ DQPSK	2-DH5	0	2397.82	-49.157	-19.24	-29.917	PASS
			2400.00	-49.730	-19.24	-30.490	PASS
			9608.10	-43.780	-19.24	-24.540	PASS
		39	9763.72	-42.765	-20.01	-22.755	PASS
		78	2483.50	-51.200	-20.92	-30.280	PASS
			9920.20	-39.173	-20.92	-18.253	PASS
8DPSK	3-DH5	0	2398.11	-48.918	-19.23	-29.688	PASS
			2400.00	-49.330	-19.23	-30.100	PASS
			9608.10	-43.942	-19.23	-24.712	PASS
		39	9763.72	-42.790	-19.85	-22.940	PASS
		78	2483.50	-51.090	-20.77	-30.320	PASS
			9920.20	-39.139	-20.77	-18.369	PASS

Hopping

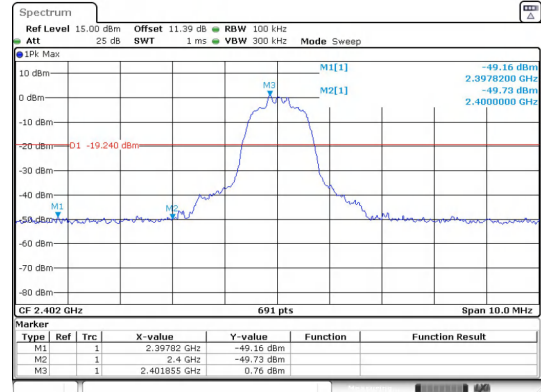
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.56	-48.235	-19.51	-28.725	PASS
			2400.00	-48.980	-19.51	-29.470	PASS
			2483.50	-49.010	-20.88	-28.130	PASS
π/4DQPSK	2-DH5		2398.70	-47.752	-19.24	-28.512	PASS
			2400.00	-48.640	-19.24	-29.400	PASS
			2483.50	-47.850	-20.79	-27.060	PASS
8DPSK	3-DH5		2395.40	-48.149	-19.51	-28.639	PASS
			2400.00	-49.380	-19.51	-29.870	PASS
			2483.50	-49.570	-20.72	-28.850	PASS

Test Graphs



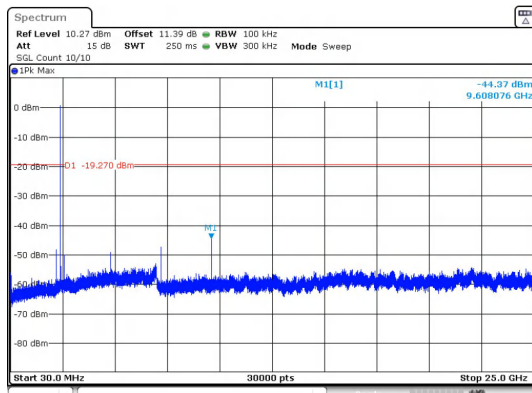
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Out Of Band Emission
GFSK_DH5_Channel 0



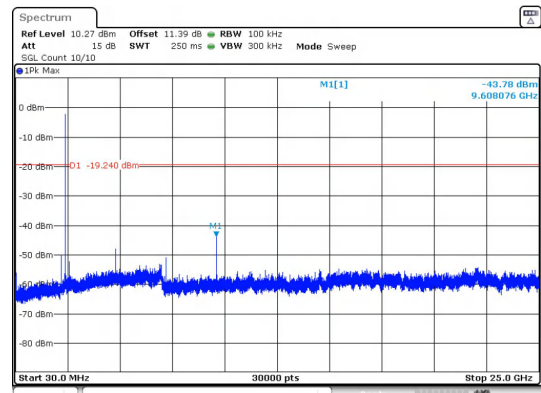
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



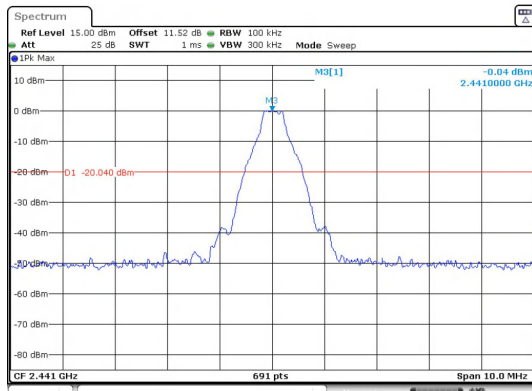
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30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



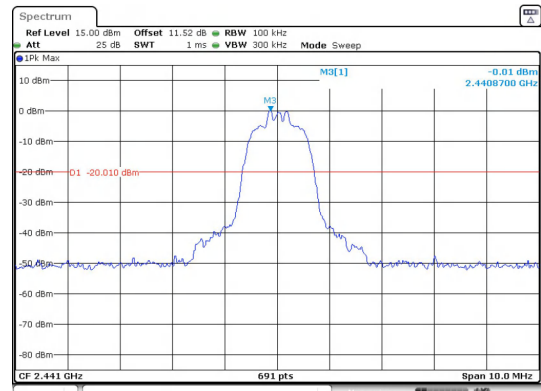
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30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



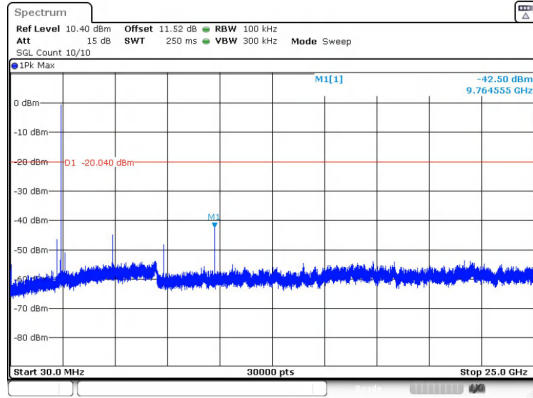
Date: 26.MAR.2025 09:13:125

Out Of Band Emission
GFSK_DH5_Channel 39



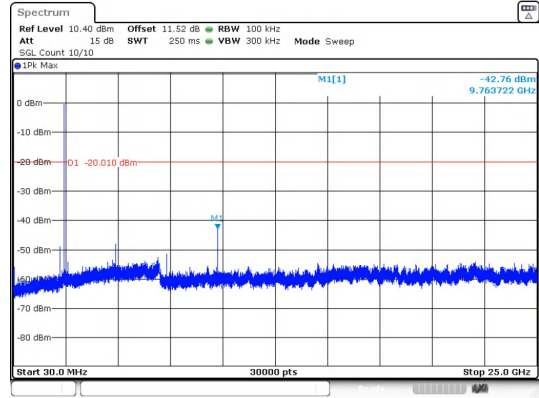
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



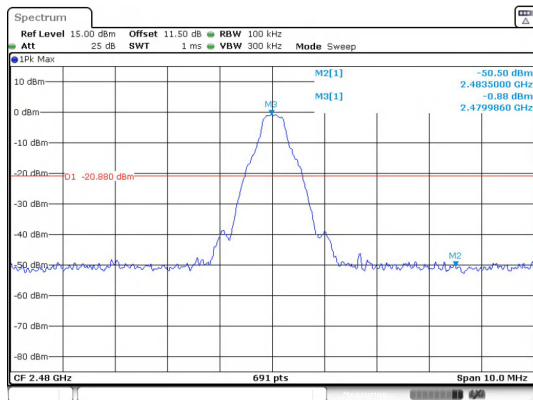
Date: 26.MAR.2025 09:13:147

30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



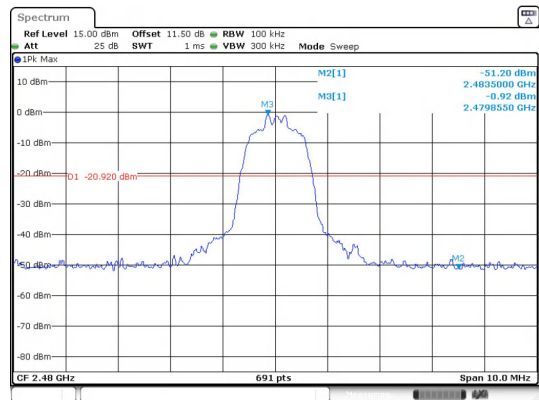
Date: 26.MAR.2025 10:07:136

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



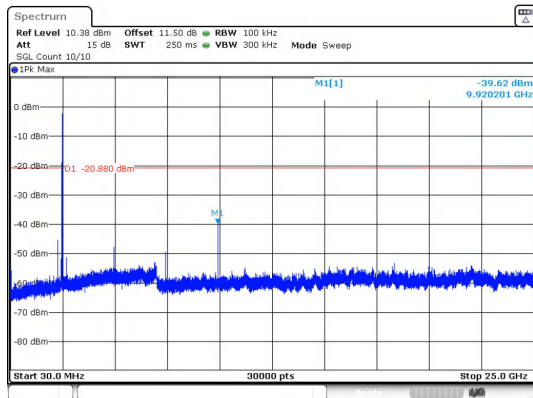
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Out Of Band Emission
GFSK_DH5_Channel 78



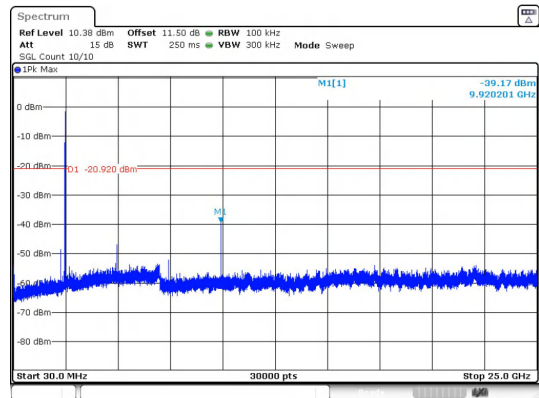
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



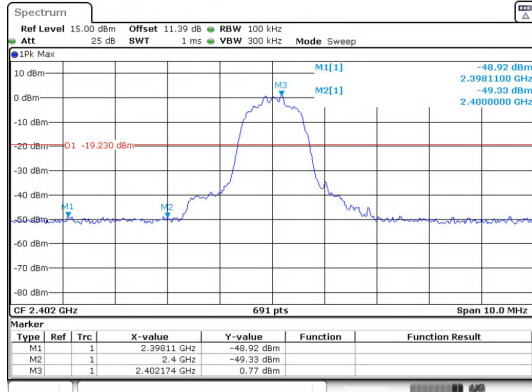
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30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78

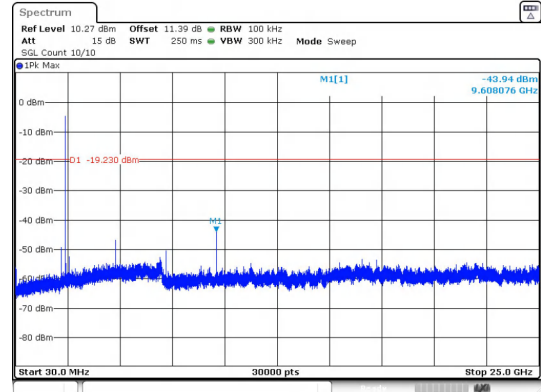


Date: 26.MAR.2025 10:24:139

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



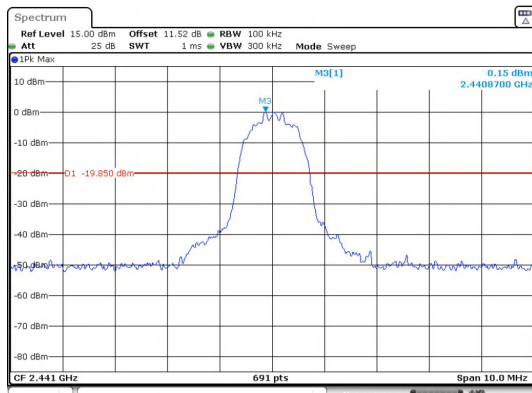
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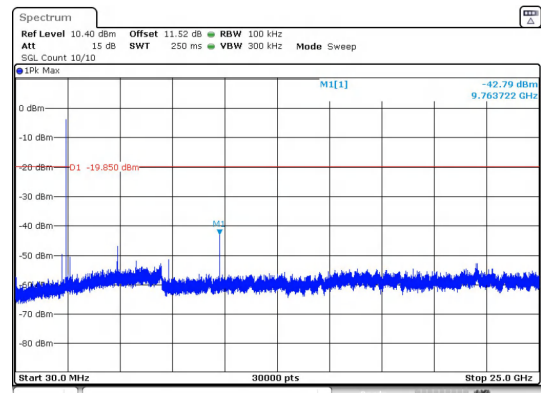
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Out Of Band Emission
8DPSK_3-DH5_Channel 0

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



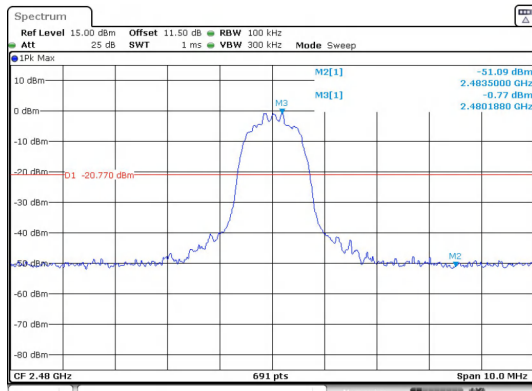
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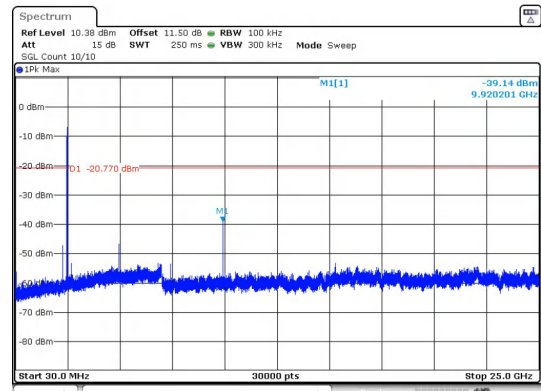
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Out Of Band Emission
8DPSK_3-DH5_Channel 39

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



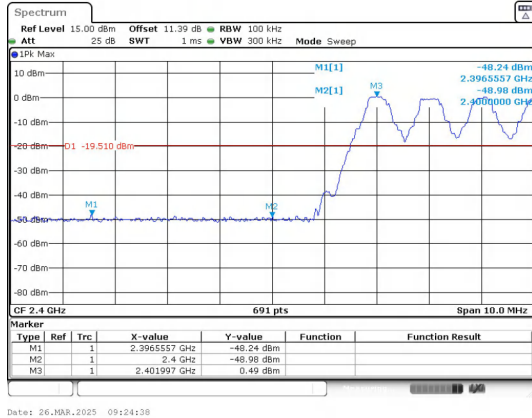
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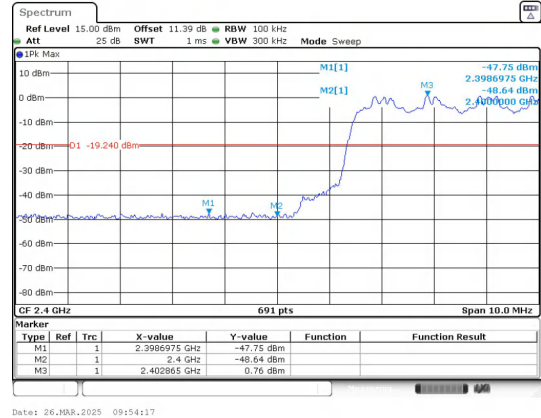
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Out Of Band Emission
8DPSK_3-DH5_Channel 78

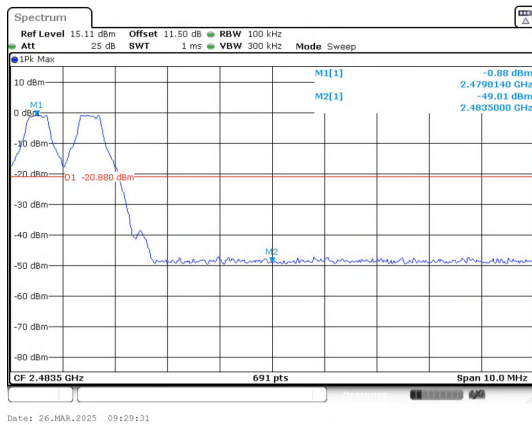
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



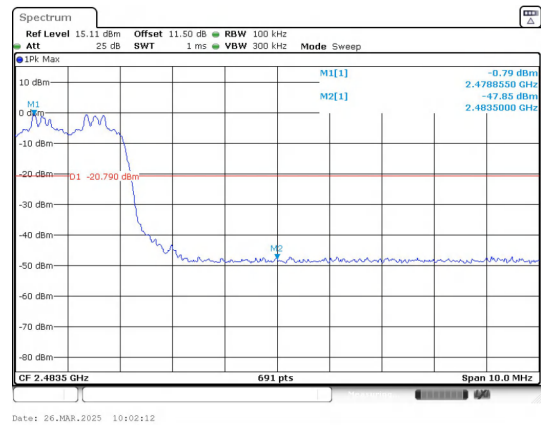
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



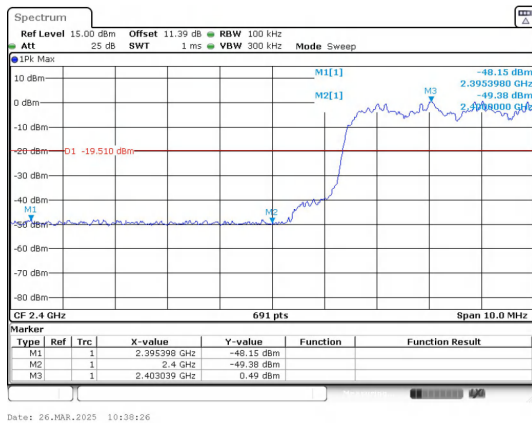
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



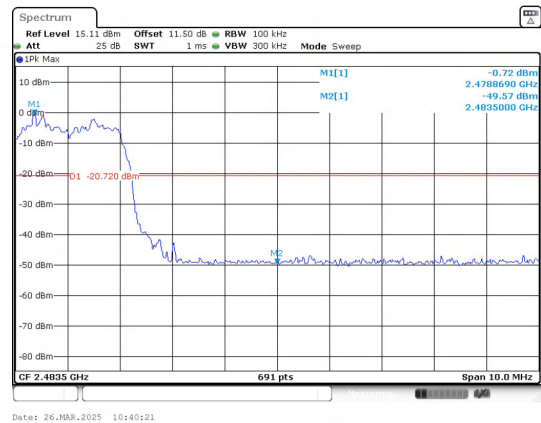
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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-----