

Appendix Report

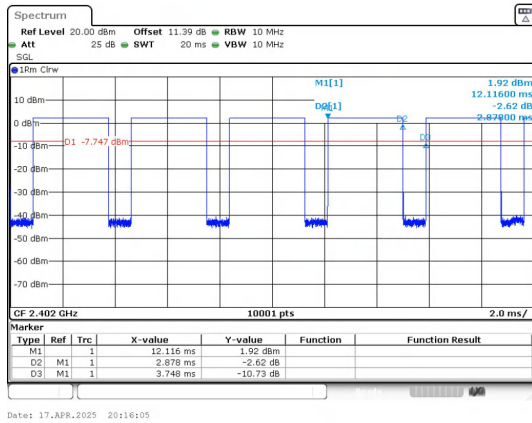
Project No.:	CISR250416150
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

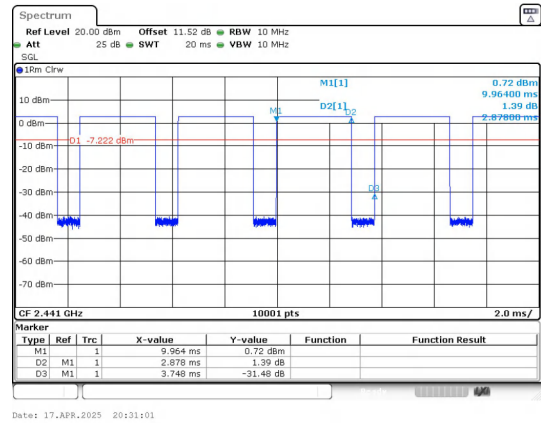
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.878	3.748	76.79	0.7679	1.147	0.3475
		39	2.878	3.748	76.79	0.7679	1.147	0.3475
		78	2.878	3.748	76.79	0.7679	1.147	0.3475
$\pi/4$ DQPSK	2-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	2.884	3.748	76.95	0.7695	1.1379	0.3467
8DPSK	3-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	2.888	3.748	77.05	0.7705	1.1323	0.3463

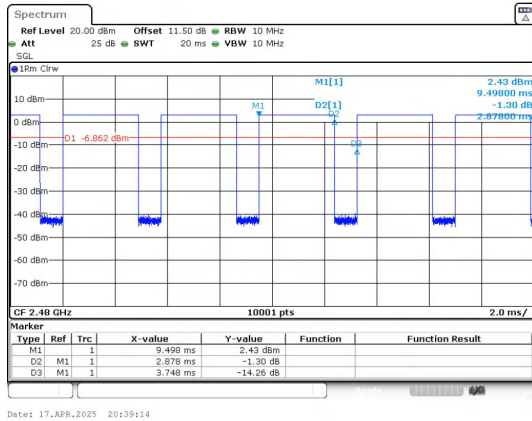
Test Graphs



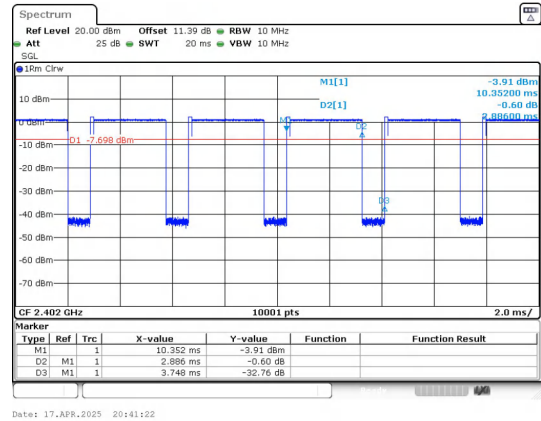
GFSK(DH5)_Channel 0

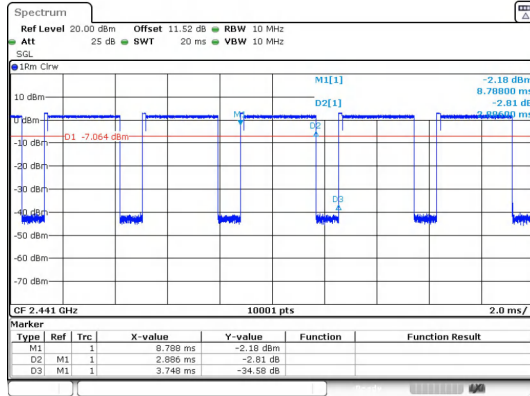


GFSK(DH5)_Channel 39

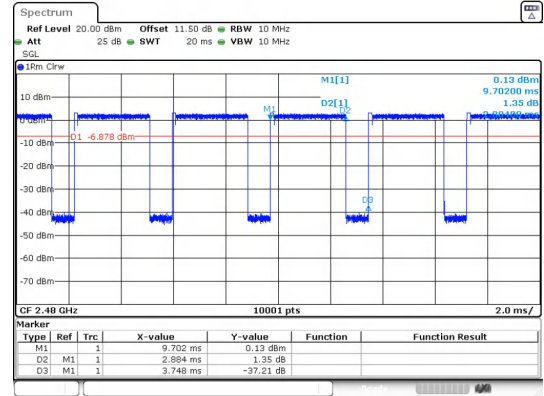


GFSK(DH5)_Channel 78

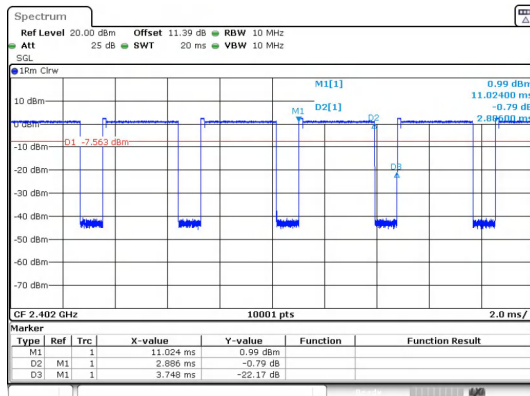

 $\pi/4$ DQPSK(2-DH5)_Channel 0



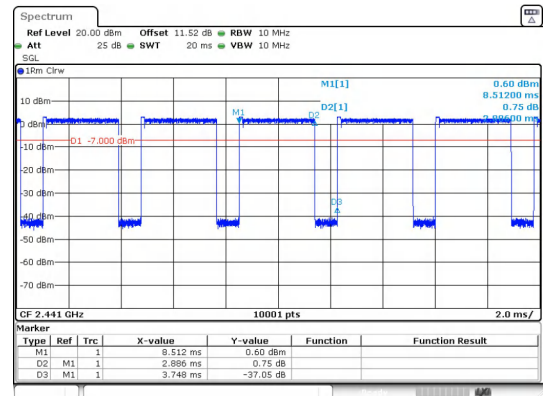
$\pi/4$ DQPSK(2-DH5)_Channel 39



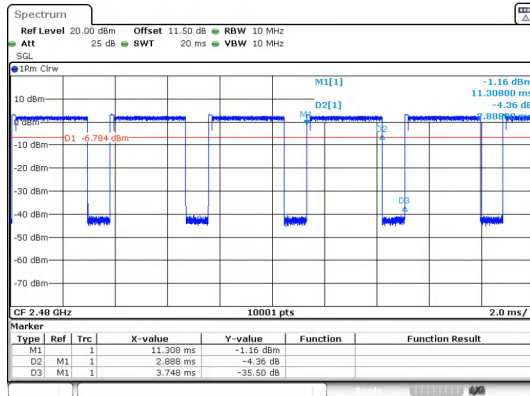
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



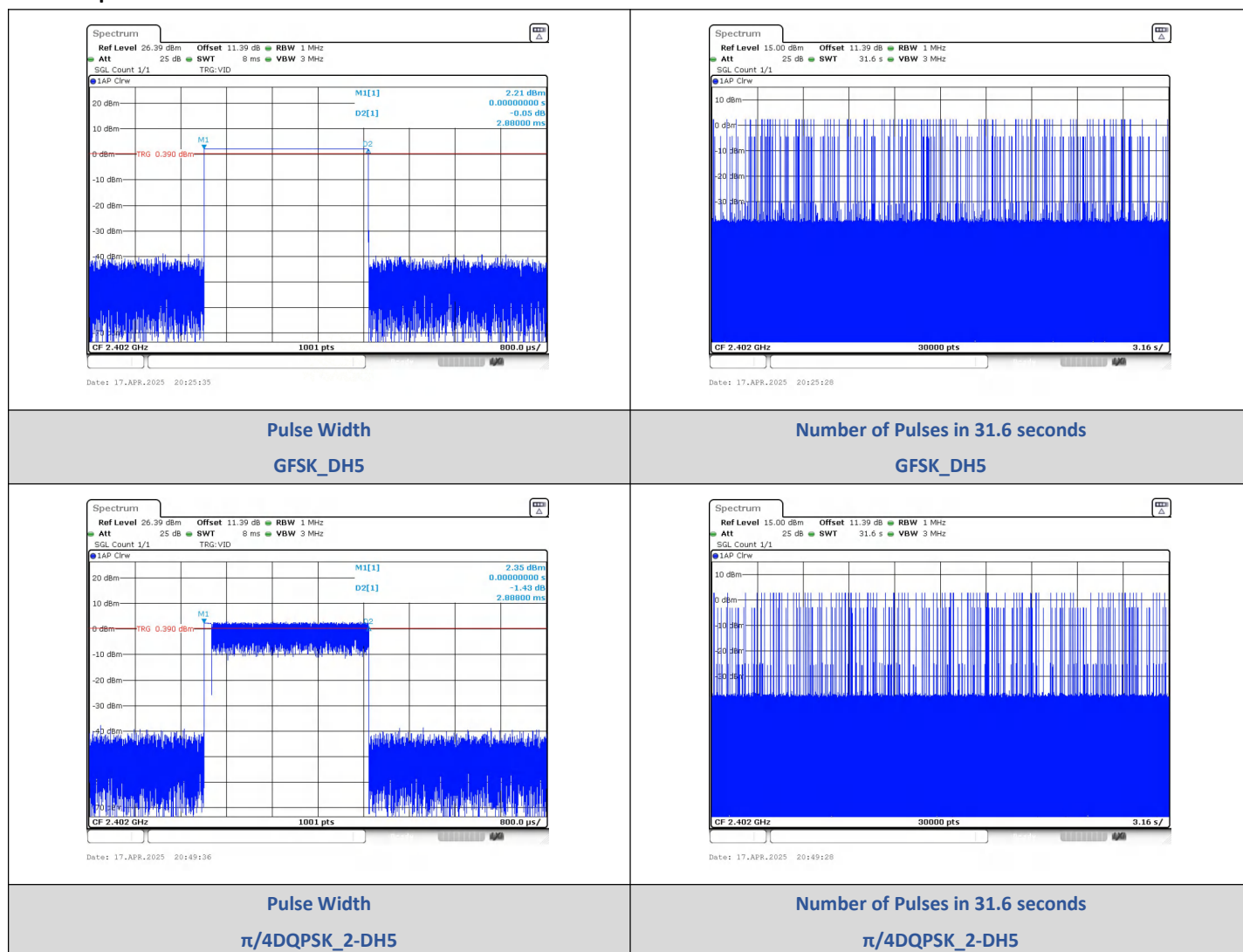
8DPSK(3-DH5)_Channel 78

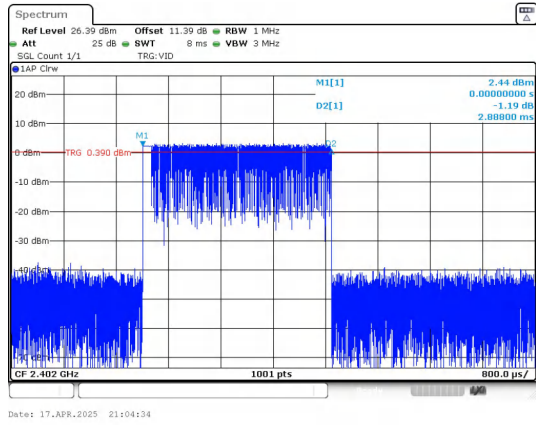
2) Dwell Time

Test Result

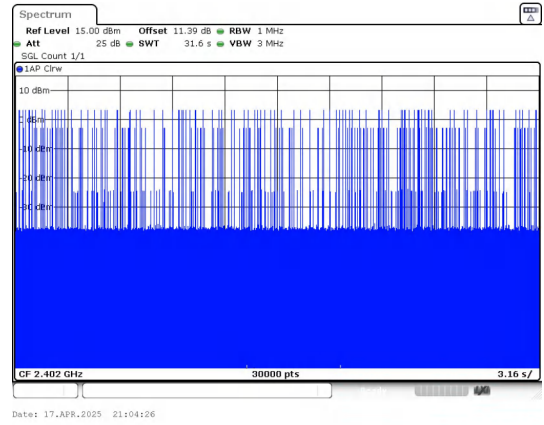
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.880	110	316.8	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	100	288.8		PASS
8DPSK	3-DH5		2.888	102	294.58		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



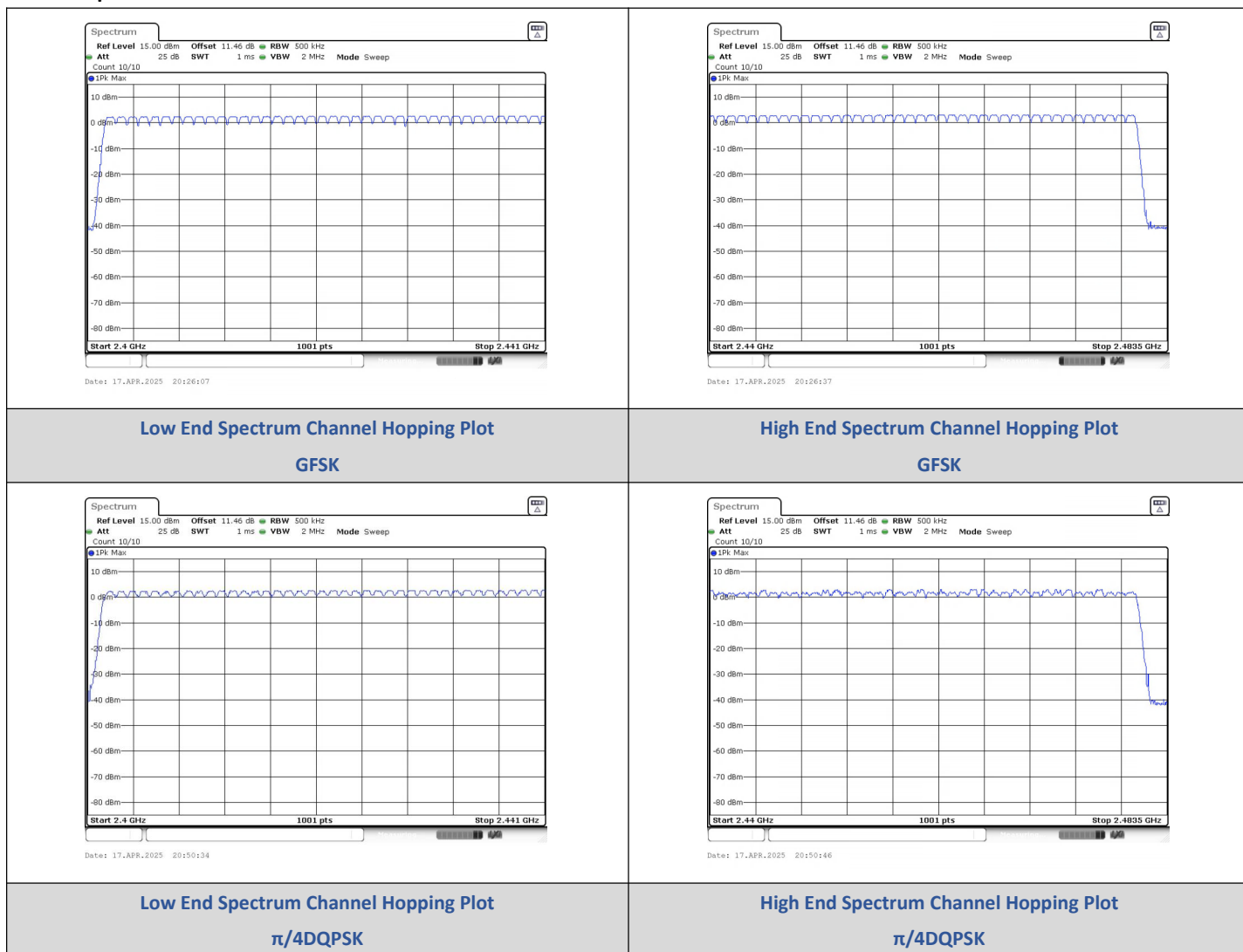
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

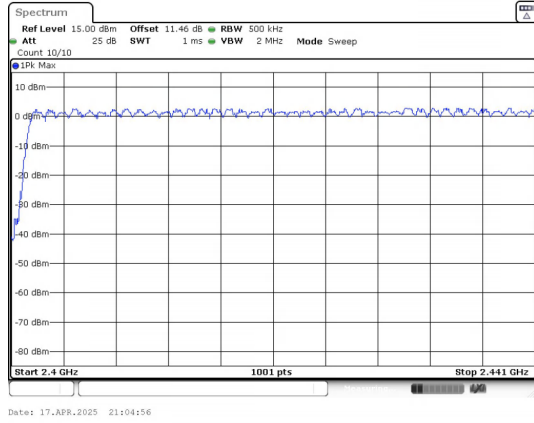
3) Number Of Hopping Channel

Test Result

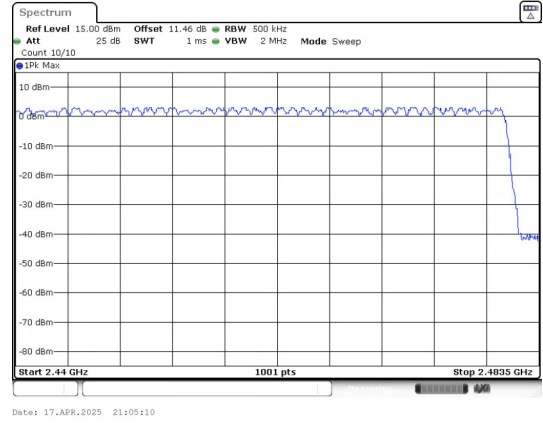
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



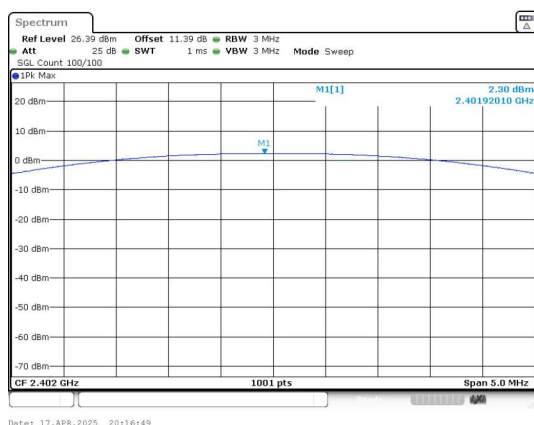
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

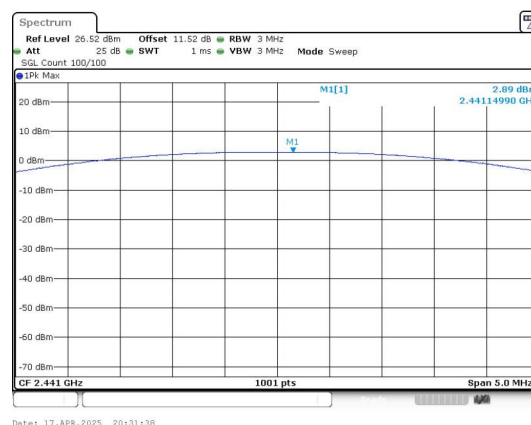
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	2.30	1.70	≤30	PASS
		39	2.89	1.95		PASS
		78	3.15	2.07		PASS
$\pi/4$ DQPSK	2-DH5	0	3.20	2.09	≤20.97	PASS
		39	3.83	2.42		PASS
		78	4.07	2.55		PASS
8DPSK	3-DH5	0	3.72	2.36		PASS
		39	4.32	2.70		PASS
		78	4.47	2.80		PASS

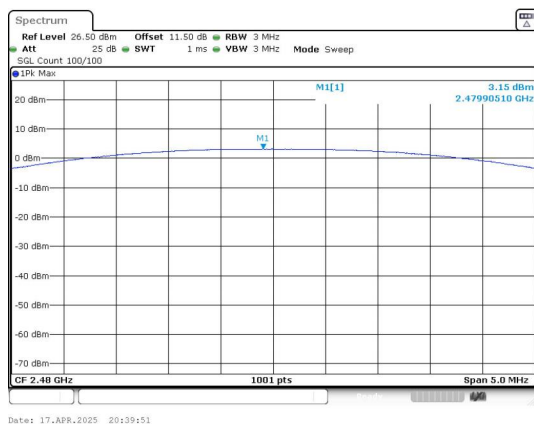
Test Graphs



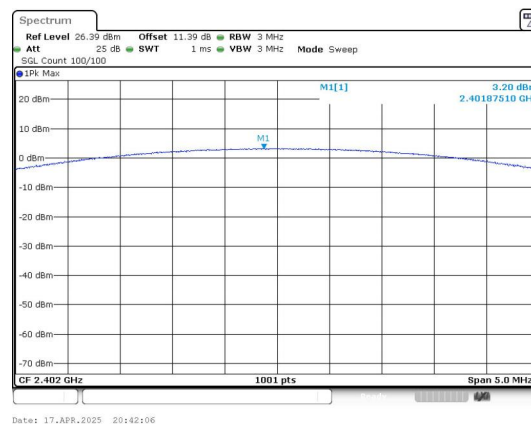
Peak Output Power
GFSK_Channel 0



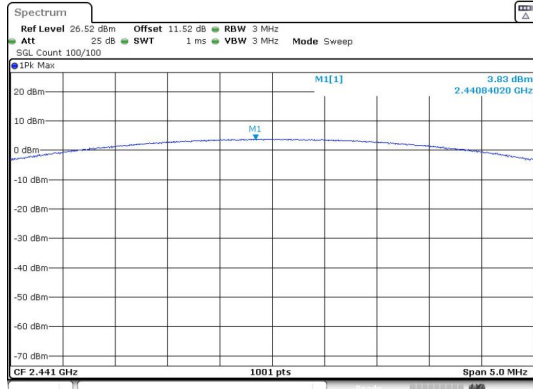
Peak Output Power
GFSK_Channel 39



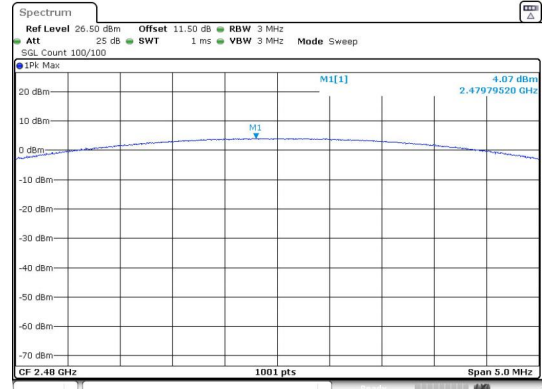
Peak Output Power
GFSK_Channel 78



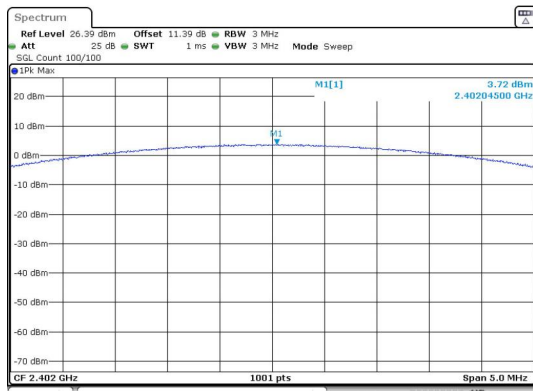
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



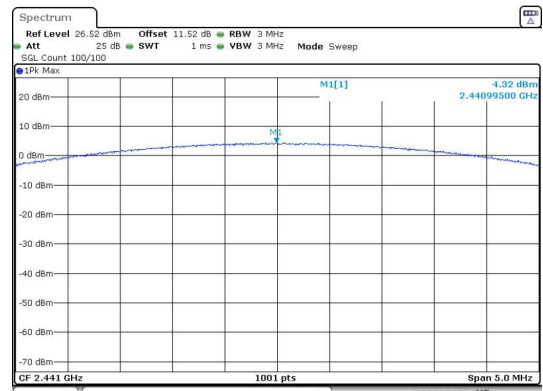
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



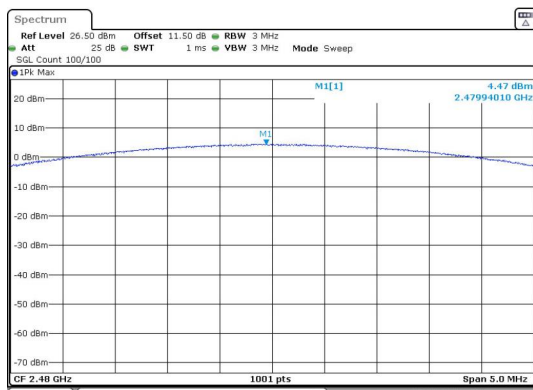
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



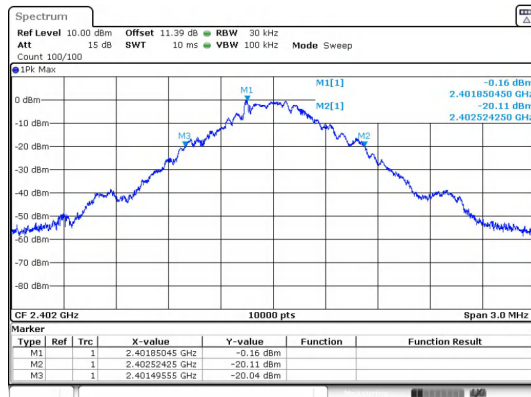
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

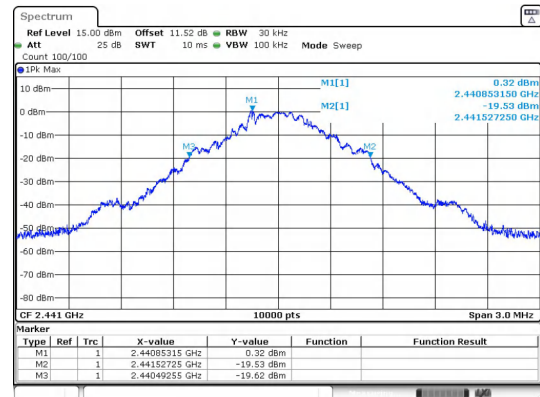
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.02
	39	2441 MHz	1.02
	78	2480 MHz	1.02
$\pi/4$ DQPSK	0	2402 MHz	1.320
	39	2441 MHz	1.330
	78	2480 MHz	1.330
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.290
	78	2480 MHz	1.280

Test Graphs



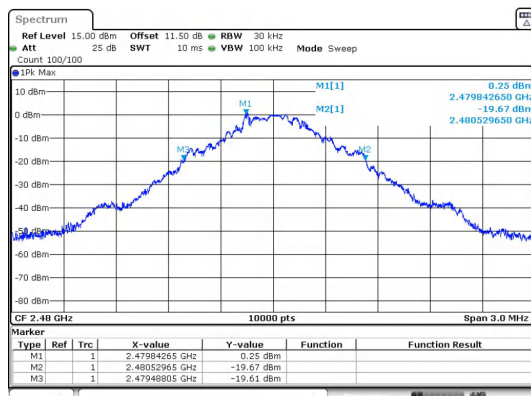
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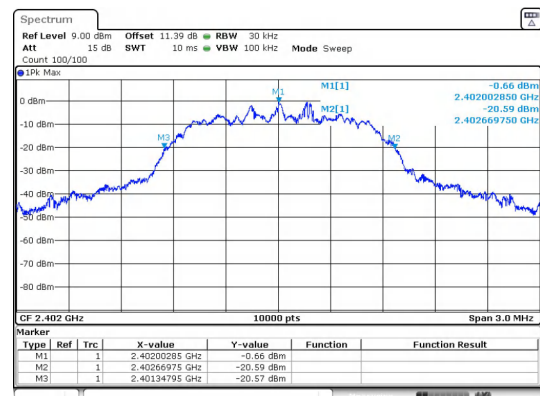
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GFSK_DH5_Channel 0

GFSK_DH5_Channel 39



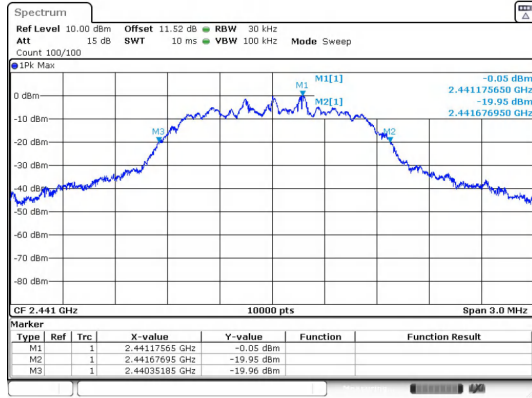
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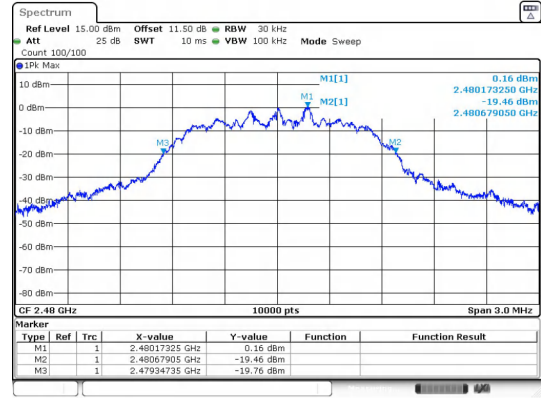
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GFSK_DH5_Channel 78

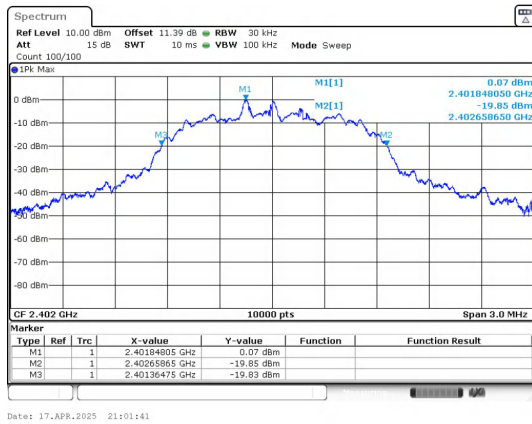
 $\pi/4$ DQPSK_2-DH5_Channel 0



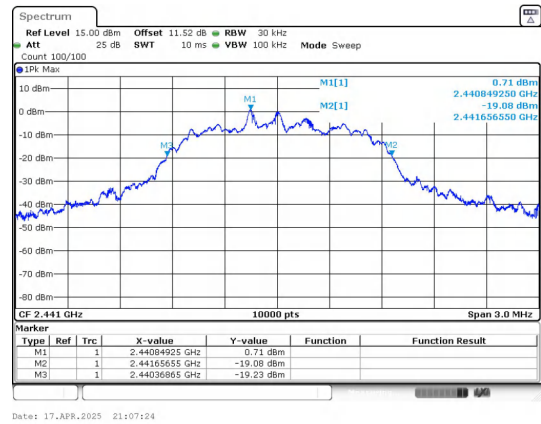
$\pi/4$ DQPSK_2-DH5_Channel 39



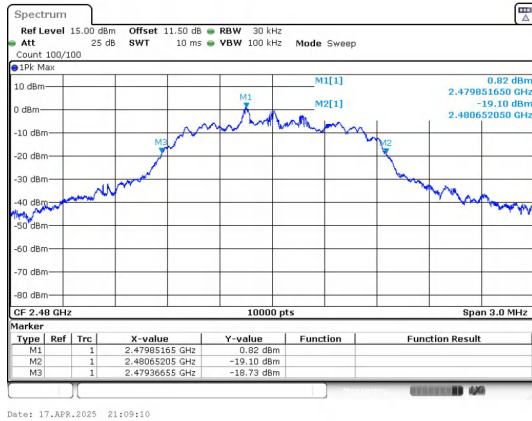
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



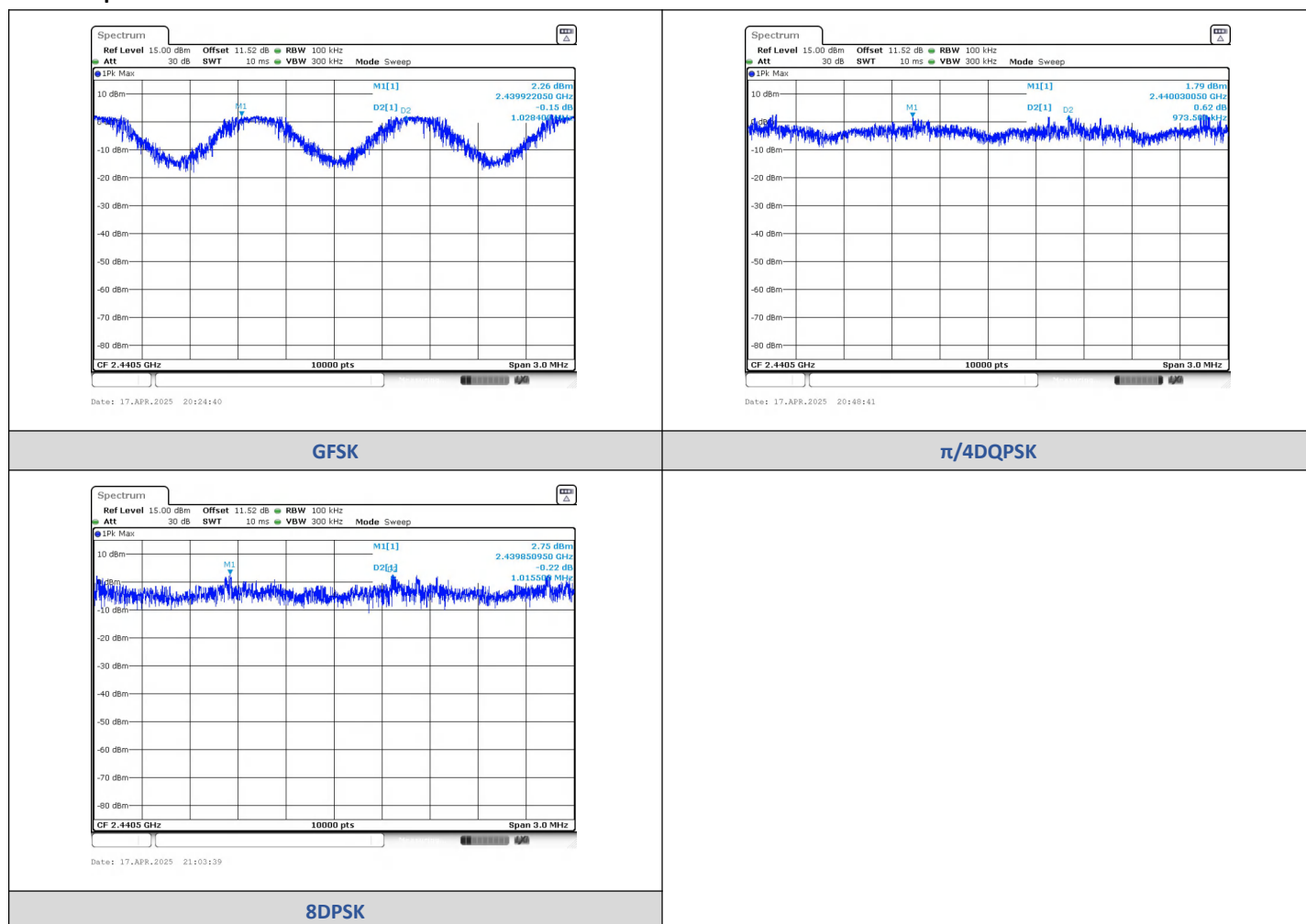
8DPSK_3-DH5_Channel 78

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	2439.9221	2440.9504	1.0284	1.02	PASS
$\pi/4$ DQPSK	2-DH5	2440.03	2441.0035	0.9735	0.88	PASS
8DPSK	3-DH5	2439.851	2440.8664	1.0155	0.867	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

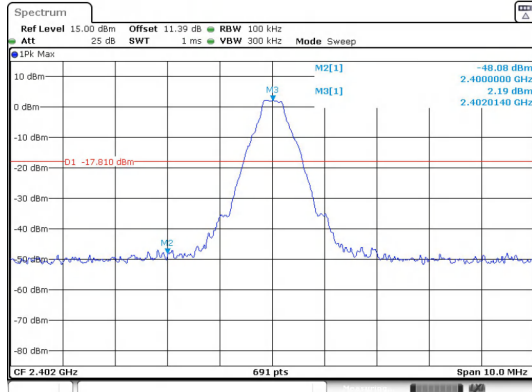
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.080	-17.81	-30.270	PASS
			9608.08	-41.536	-17.81	-23.726	PASS
		39	7323.32	-43.494	-17.17	-26.324	PASS
		78	2483.50	-50.310	-17.02	-33.290	PASS
			4960.33	-45.334	-17.02	-28.314	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-47.790	-17.79	-30.000	PASS
			9608.08	-41.940	-17.79	-24.150	PASS
		39	9763.72	-44.587	-17.27	-27.317	PASS
		78	2483.50	-49.920	-17.03	-32.890	PASS
			9920.20	-44.121	-17.03	-27.091	PASS
8DPSK	3-DH5	0	2397.90	-48.960	-17.71	-31.250	PASS
			2400.00	-49.370	-17.71	-31.660	PASS
			9608.10	-41.772	-17.71	-24.062	PASS
		39	9763.72	-43.584	-17.63	-25.954	PASS
		78	2483.50	-49.840	-17.12	-32.720	PASS
			9920.20	-43.494	-17.12	-26.374	PASS

Hopping

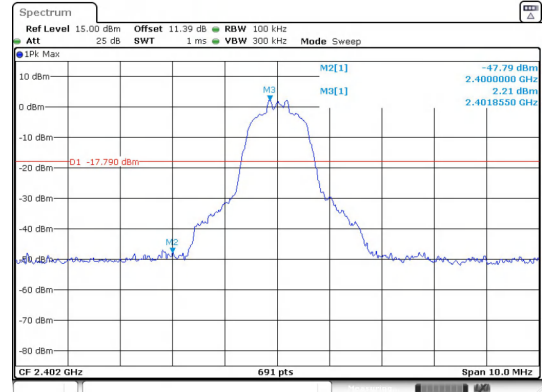
Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.48	-48.106	-17.61	-30.496	PASS
			2400.00	-49.580	-17.61	-31.970	PASS
			2483.50	-49.170	-17.0	-32.170	PASS
$\pi/4$ DQPSK	2-DH5		2396.64	-47.393	-17.69	-29.703	PASS
			2400.00	-49.050	-17.69	-31.360	PASS
			2483.50	-48.420	-18.26	-30.160	PASS
8DPSK	3-DH5		2398.25	-48.022	-17.98	-30.042	PASS
			2400.00	-50.460	-17.98	-32.480	PASS
			2483.50	-48.920	-17.36	-31.560	PASS

Test Graphs



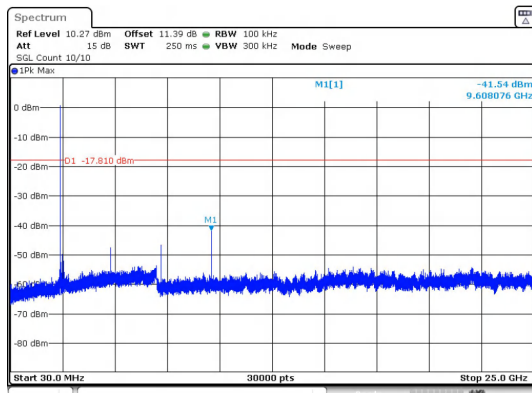
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Out Of Band Emission
GFSK_DH5_Channel 0



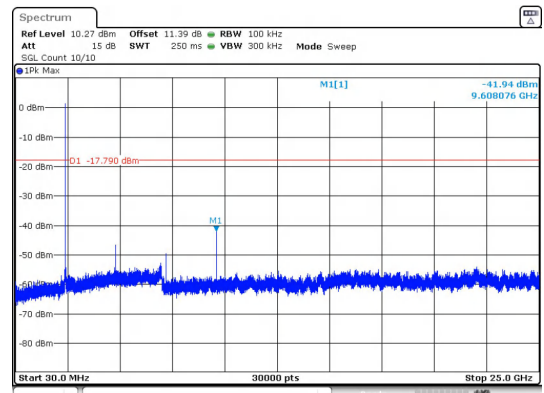
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



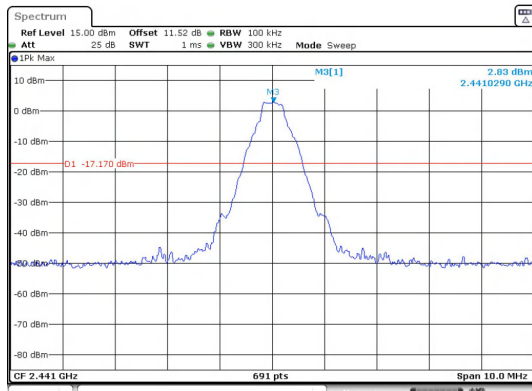
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30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



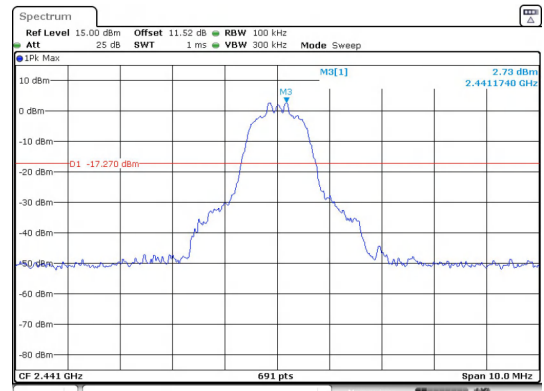
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30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



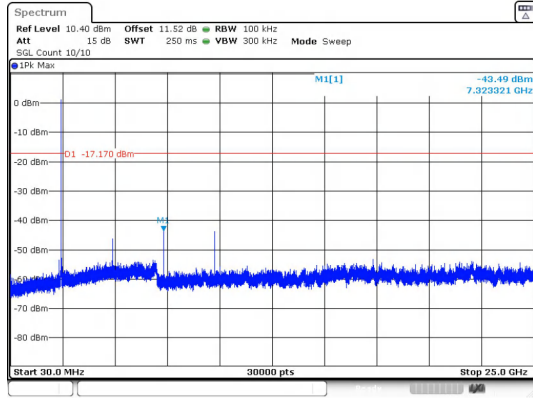
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Out Of Band Emission
GFSK_DH5_Channel 39

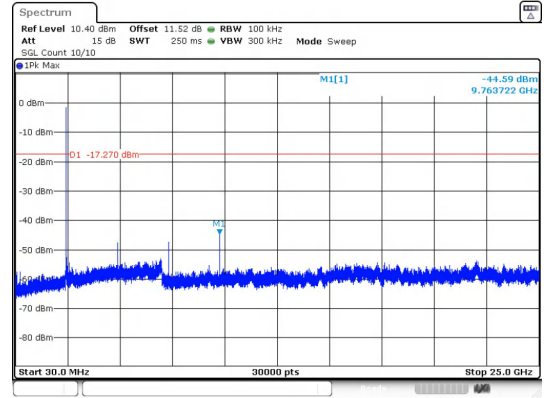


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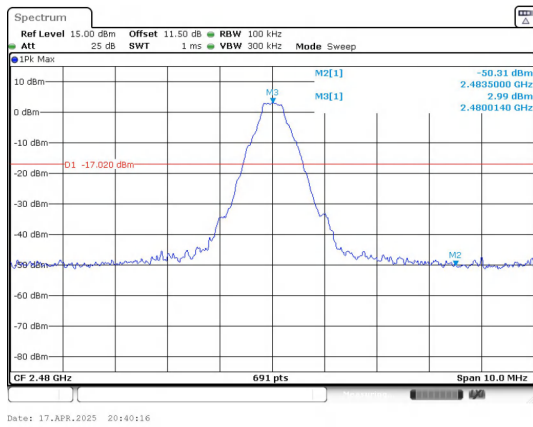
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



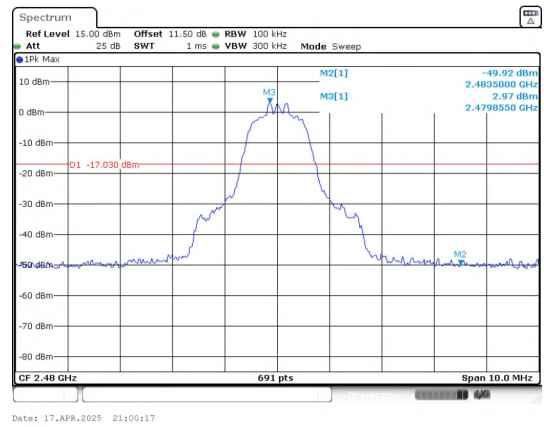
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



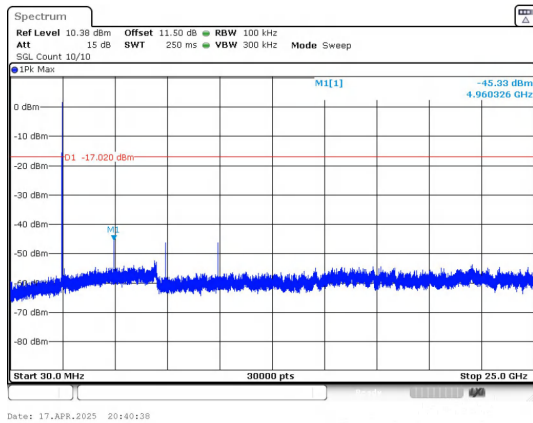
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



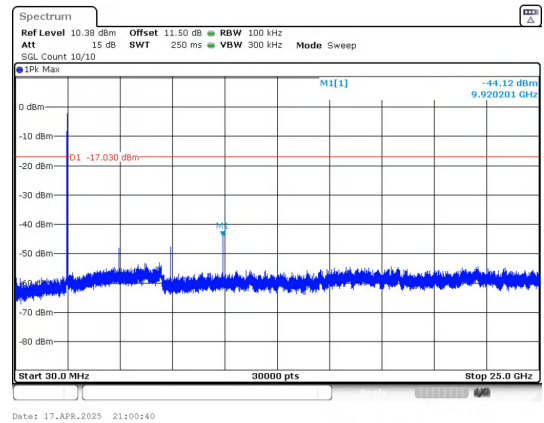
Out Of Band Emission
GFSK_DH5_Channel 78



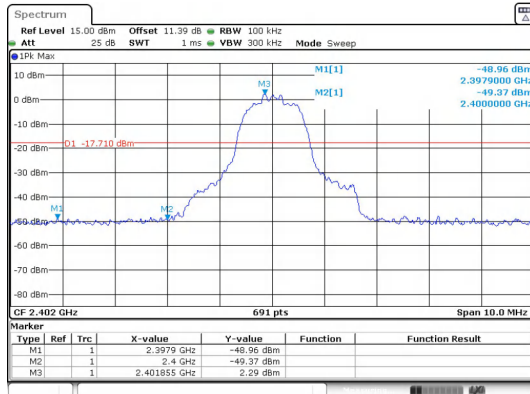
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



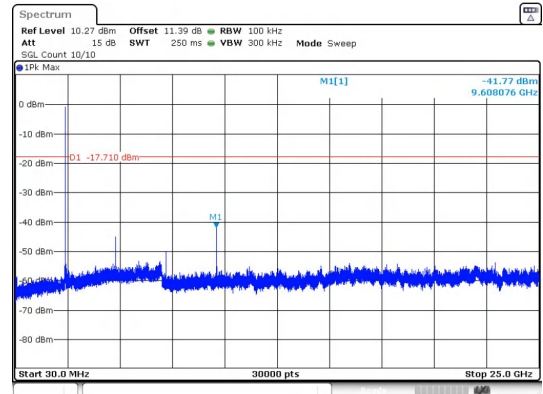
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



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



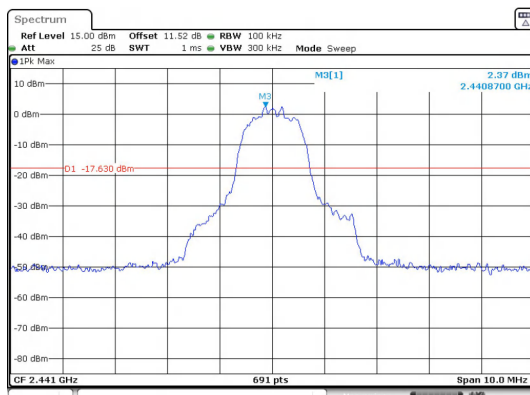
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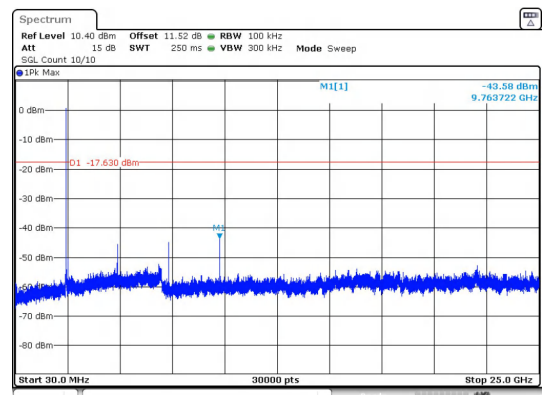
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Out Of Band Emission
8DPSK_3-DH5_Channel 0

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



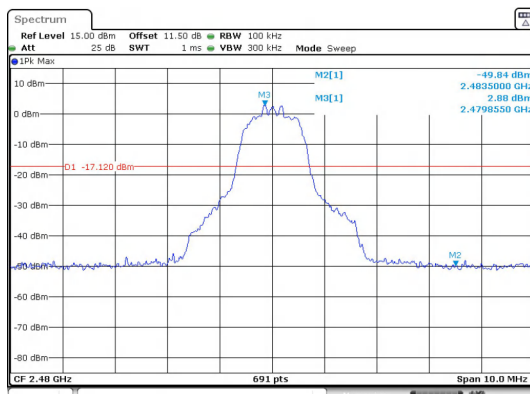
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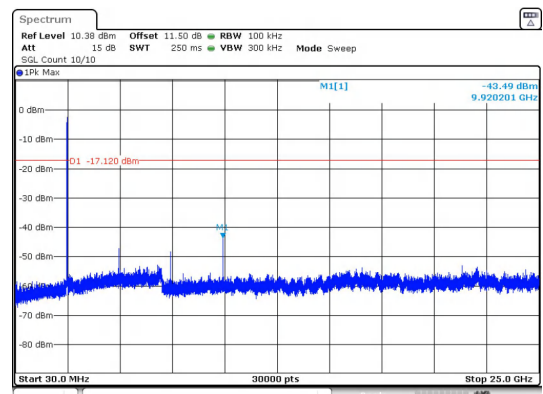
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Out Of Band Emission
8DPSK_3-DH5_Channel 39

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



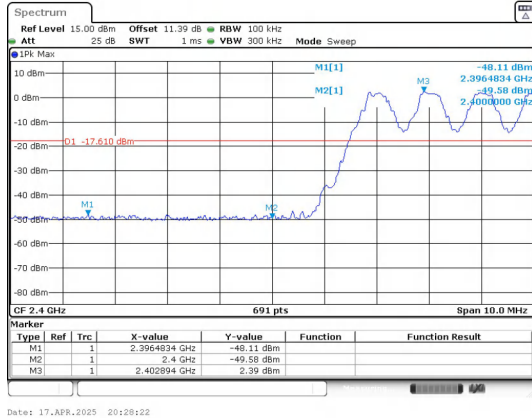
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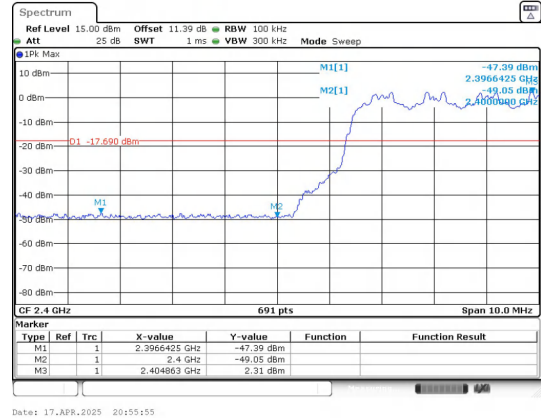
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Out Of Band Emission
8DPSK_3-DH5_Channel 78

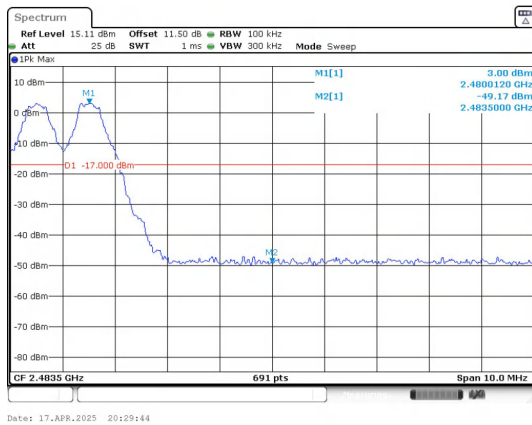
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



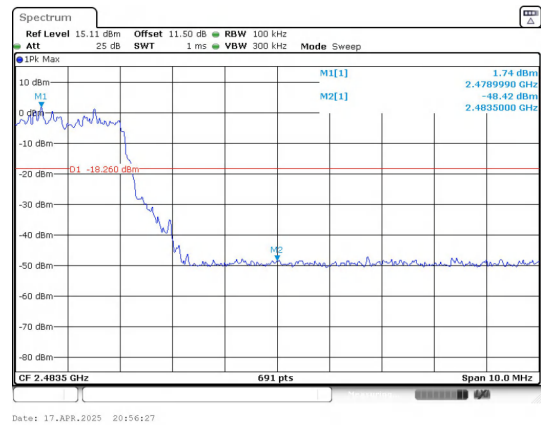
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



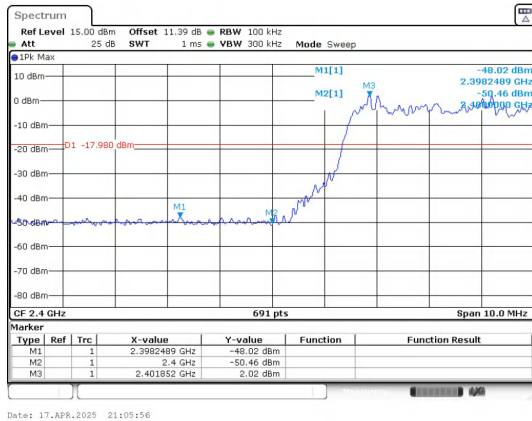
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



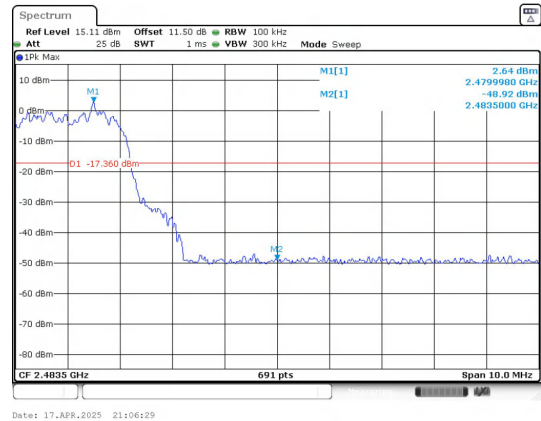
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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-----