

Appendix Report

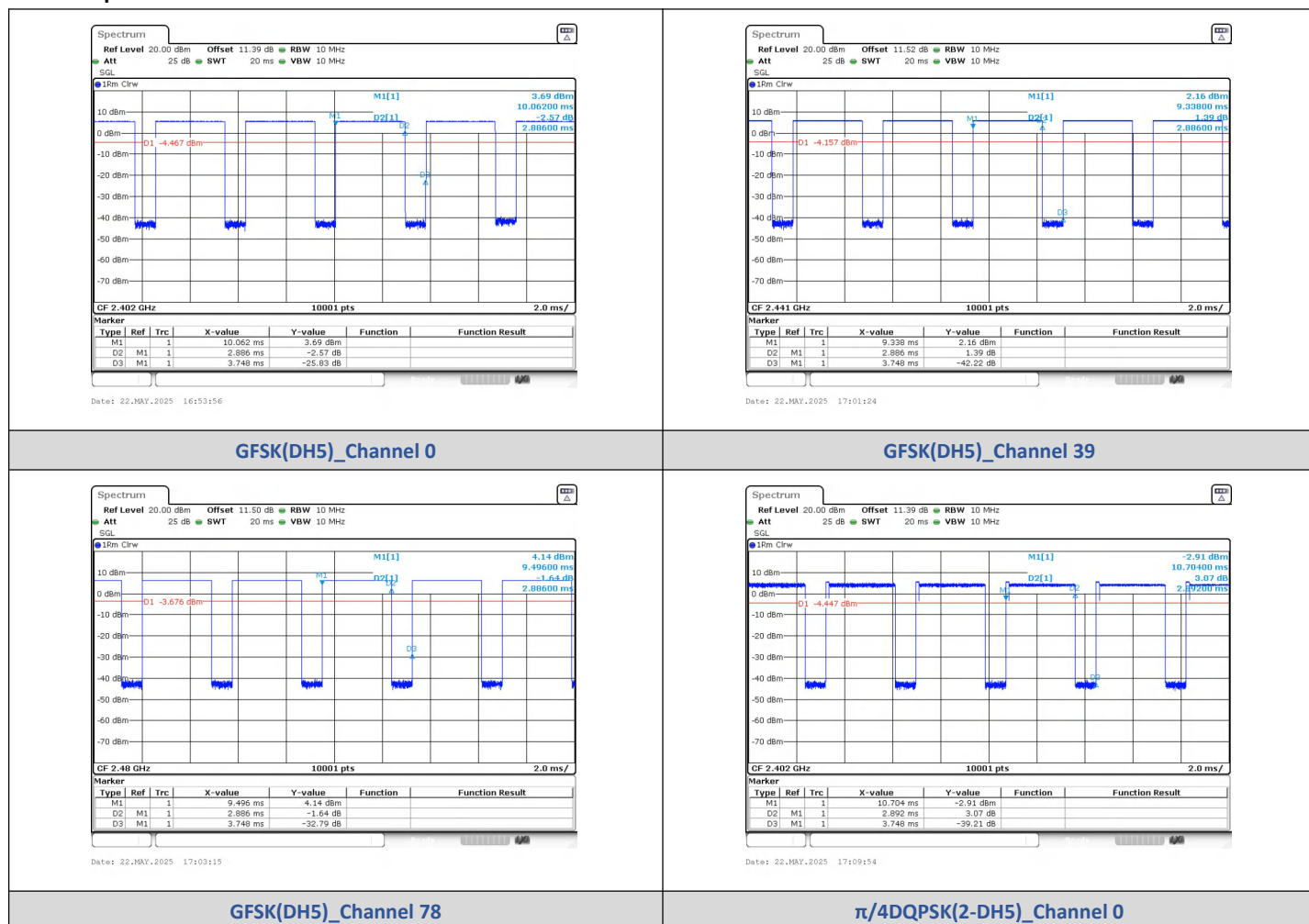
Project No.:	CISR250520117
Test Engineer:	James Wang
Supervised by:	Rory Huang

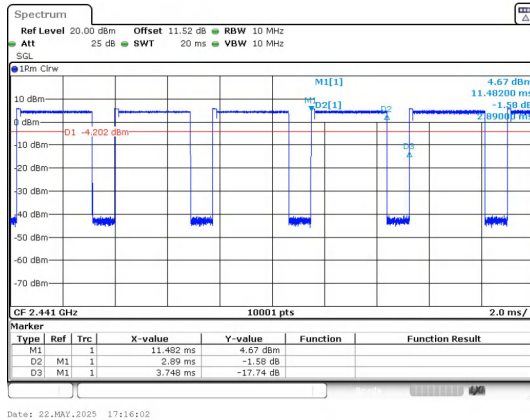
1) Duty Cycle

Test Result

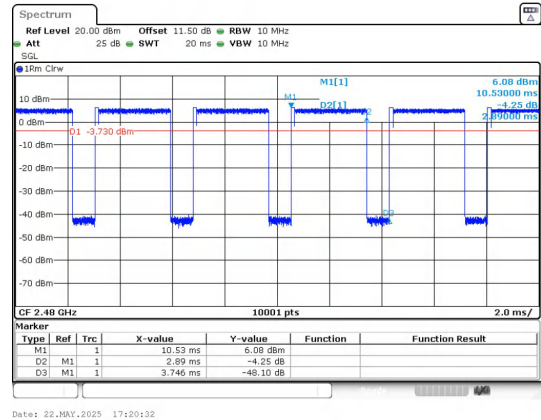
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.890	3.748	77.11	0.7711	1.1289	0.3460
		78	2.890	3.746	77.15	0.7715	1.1266	0.3460
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	2.360	3.748	62.97	0.6297	2.0087	0.4237

Test Graphs

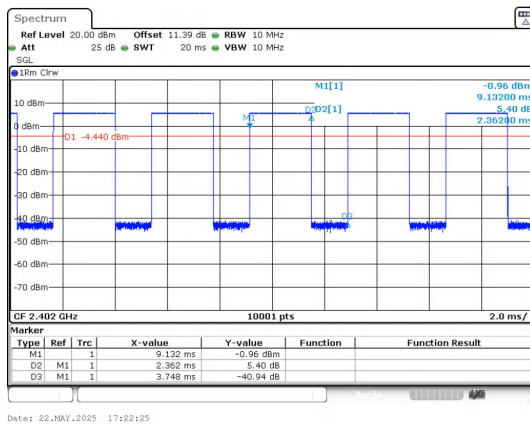




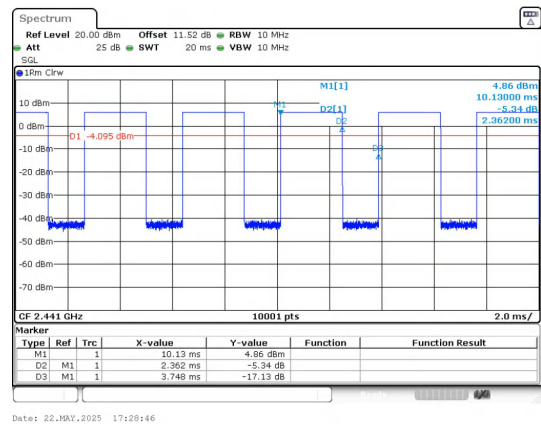
$\pi/4$ DQPSK(2-DH5)_Channel 39



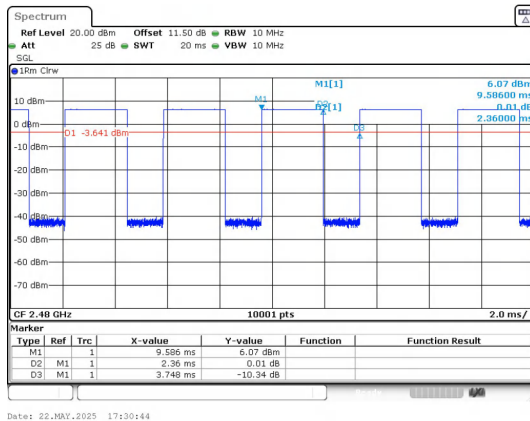
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 39



8DPSK(3-DH5)_Channel 78



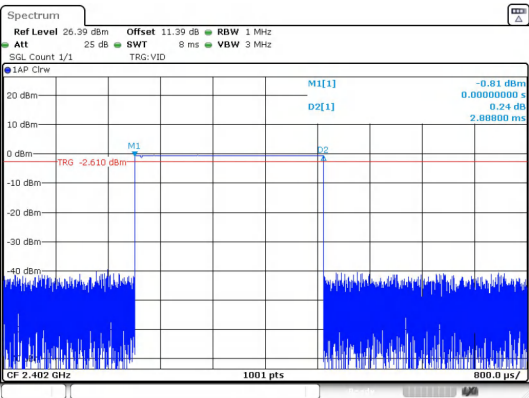
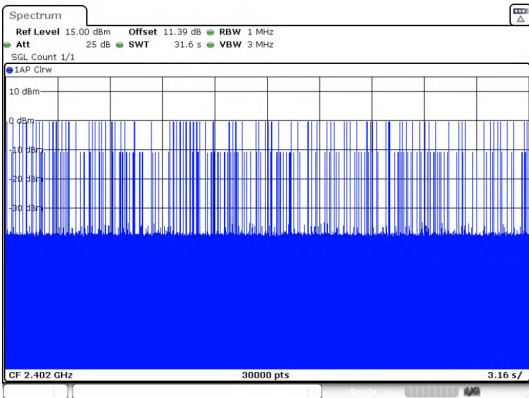
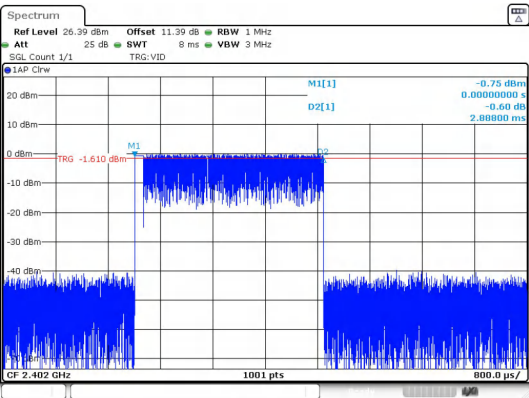
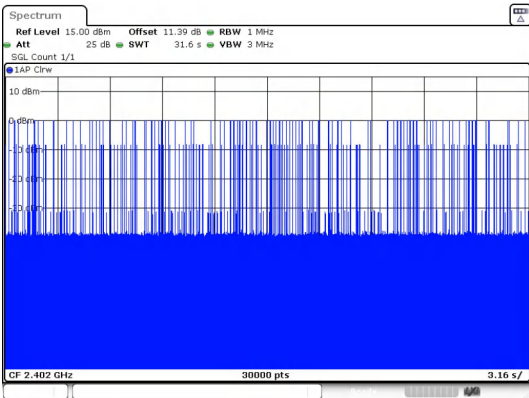
8DPSK(3-DH5)_Channel 78

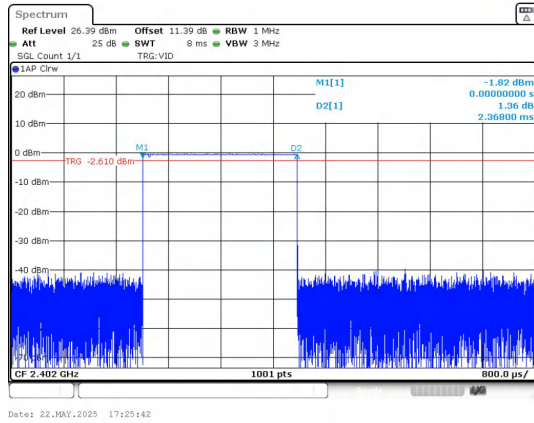
2) Dwell Time

Test Result

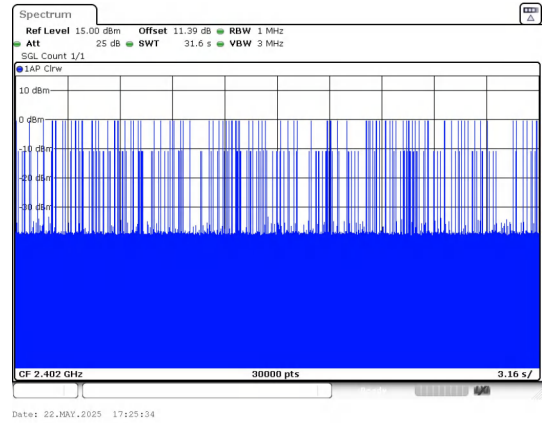
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	104	300.35	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	119	343.67		PASS
8DPSK	3-DH5		2.368	105	248.64		PASS

Test Graphs

 Date: 22.MAY.2025 16:57:49	 Date: 22.MAY.2025 16:57:41
Pulse Width GFSK_DH5	Number of Pulses in 31.6 seconds GFSK_DH5
 Date: 22.MAY.2025 17:13:14	 Date: 22.MAY.2025 17:13:06
Pulse Width $\pi/4$DQPSK_2-DH5	Number of Pulses in 31.6 seconds $\pi/4$DQPSK_2-DH5



Pulse Width
8DPSK_3-DH5



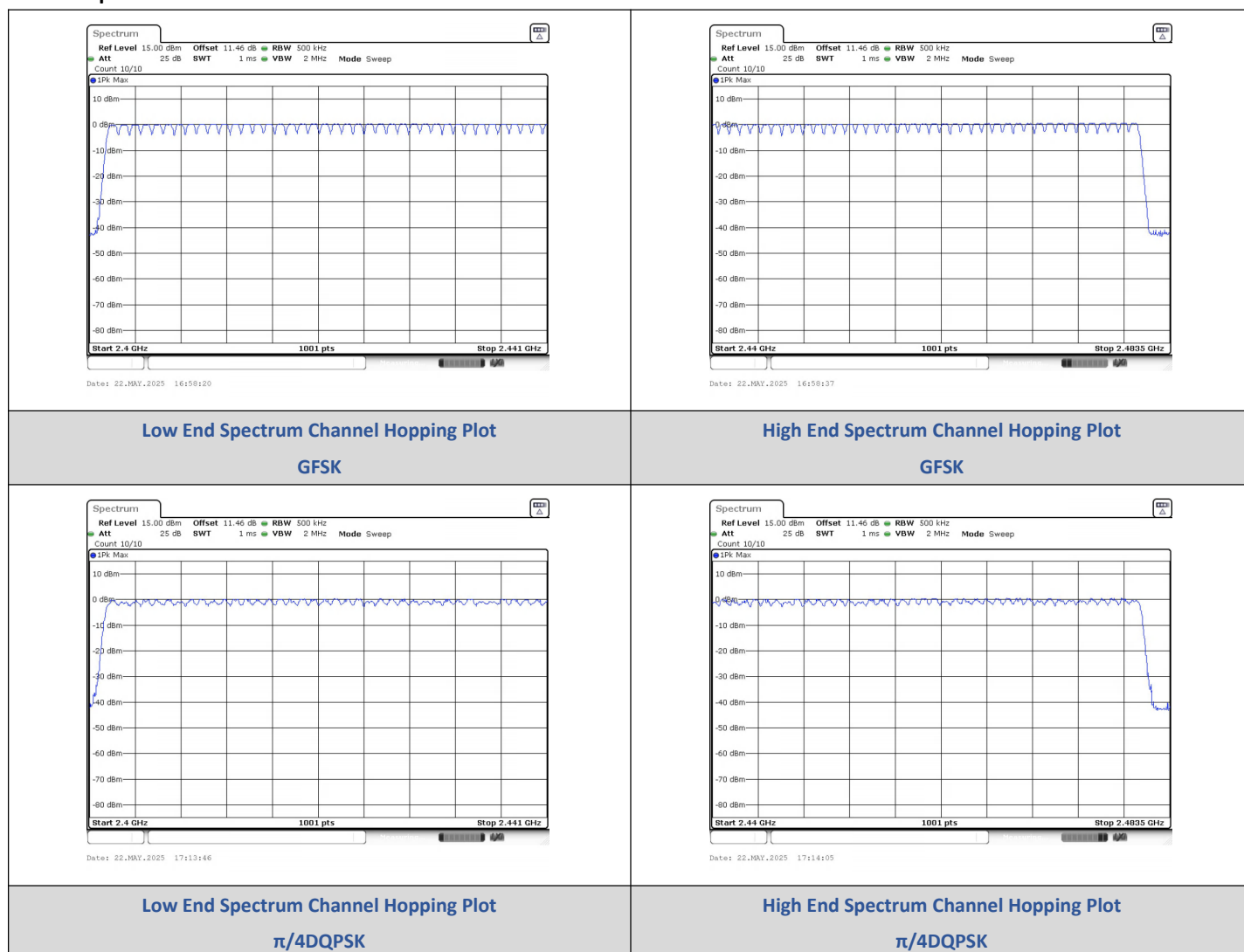
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

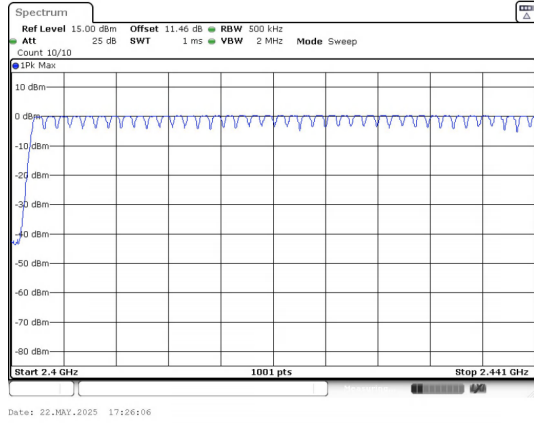
3) Number Of Hopping Channel

Test Result

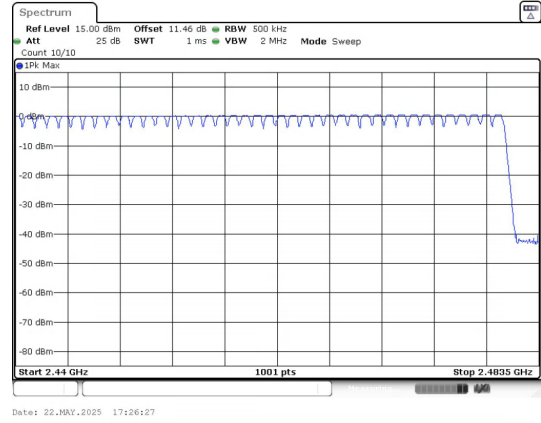
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



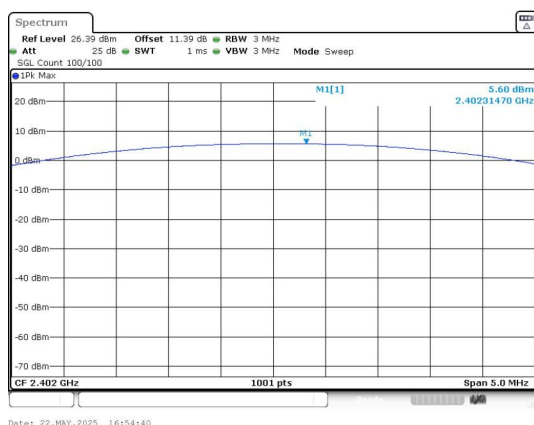
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

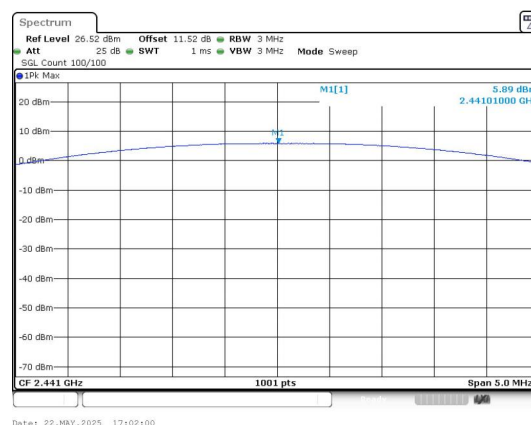
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	5.60	3.63	≤30	PASS
		39	5.89	3.88		PASS
		78	6.34	4.31		PASS
$\pi/4$ DQPSK	2-DH5	0	6.37	4.34	≤20.97	PASS
		39	6.68	4.66		PASS
		78	7.07	5.09		PASS
8DPSK	3-DH5	0	5.60	3.63		PASS
		39	5.93	3.92		PASS
		78	6.41	4.38		PASS

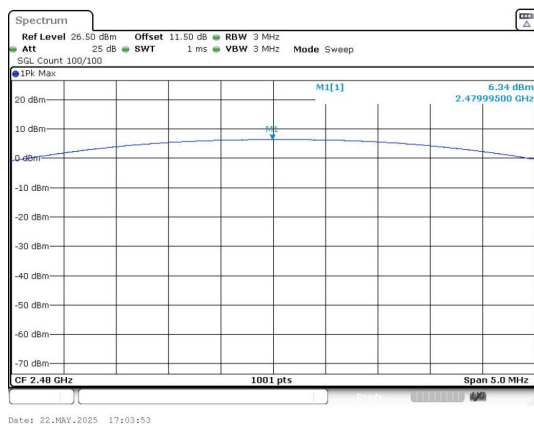
Test Graphs



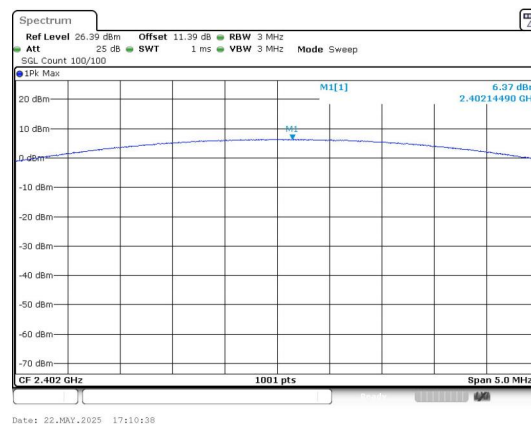
Peak Output Power
GFSK_Channel 0



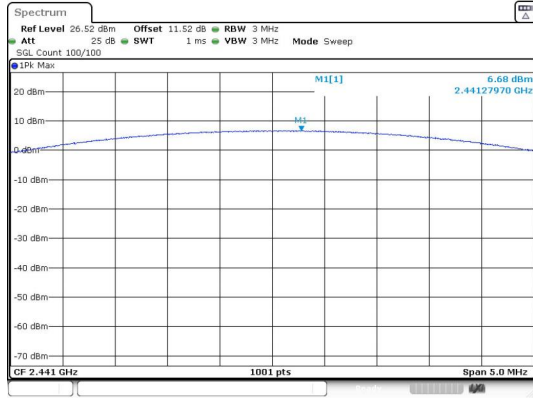
Peak Output Power
GFSK_Channel 39



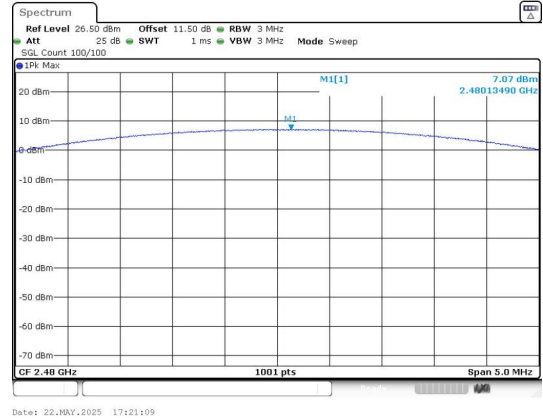
Peak Output Power
GFSK_Channel 78



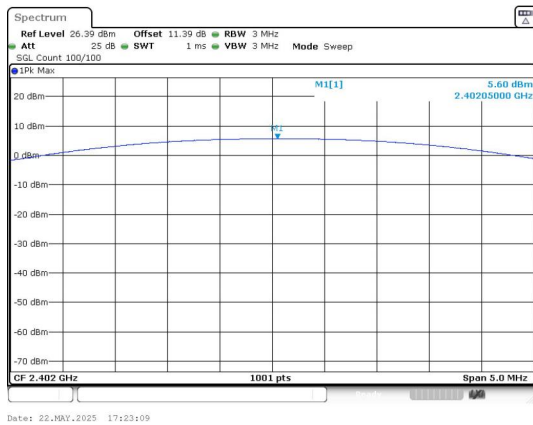
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



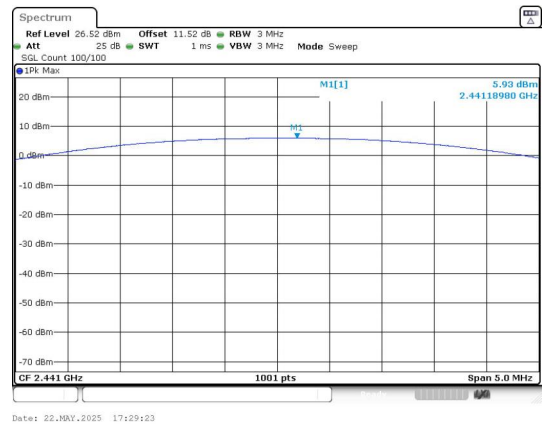
Peak Output Power
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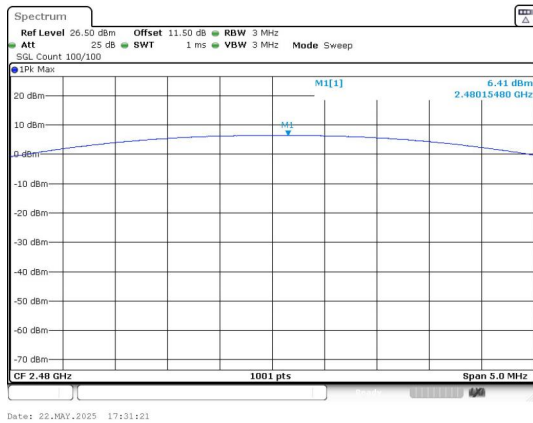
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



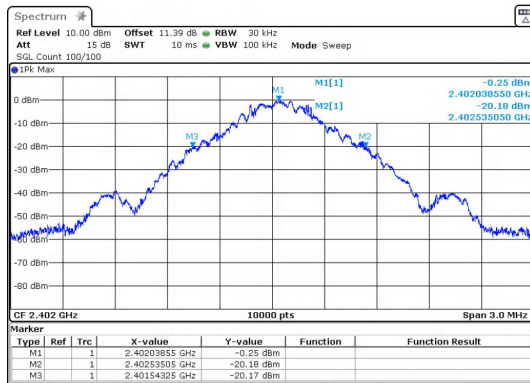
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

Test Result

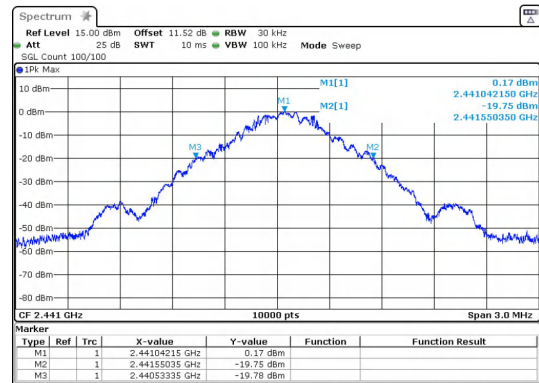
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.0
	39	2441 MHz	1.0
	78	2480 MHz	1.0
$\pi/4$ DQPSK	0	2402 MHz	1.300
	39	2441 MHz	1.310
	78	2480 MHz	1.310
8DPSK	0	2402 MHz	1.010
	39	2441 MHz	1.020
	78	2480 MHz	1.020

Test Graphs



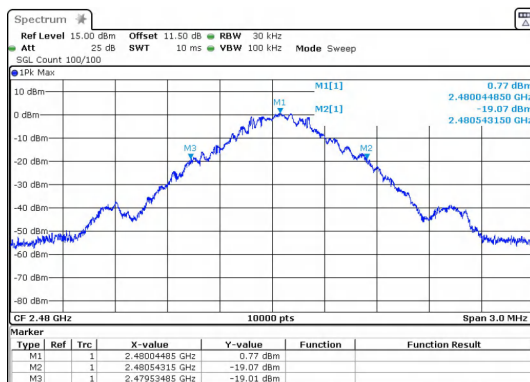
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GFSK_DH5_Channel 0



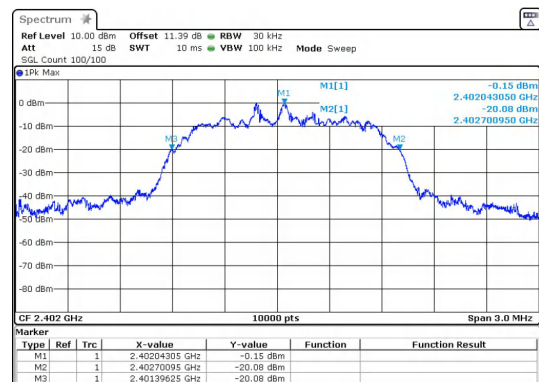
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GFSK_DH5_Channel 39



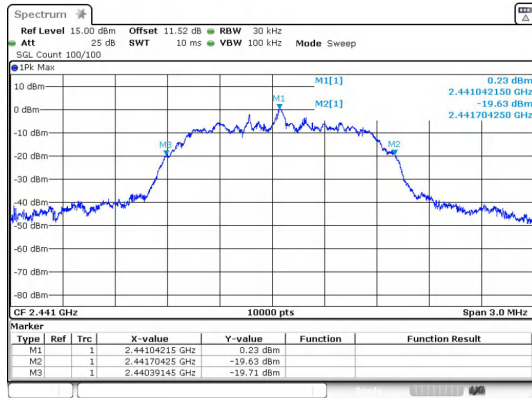
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GFSK_DH5_Channel 78

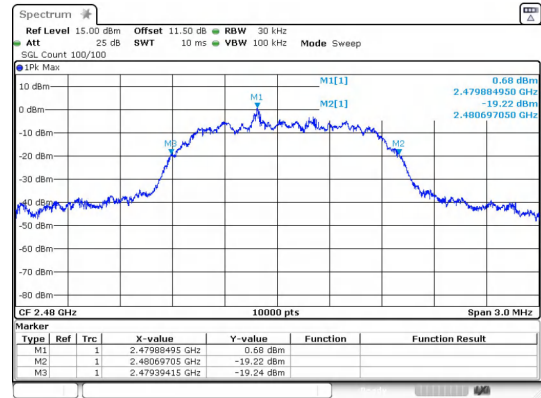


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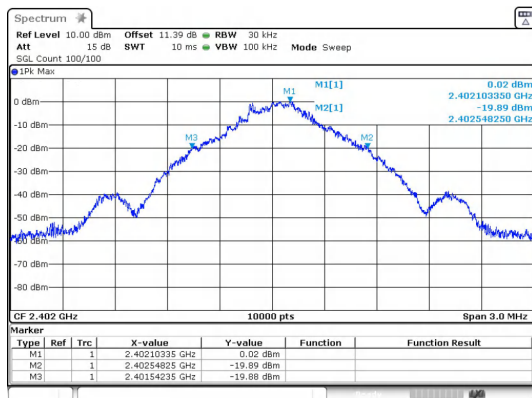
 $\pi/4$ DQPSK_2-DH5_Channel 0



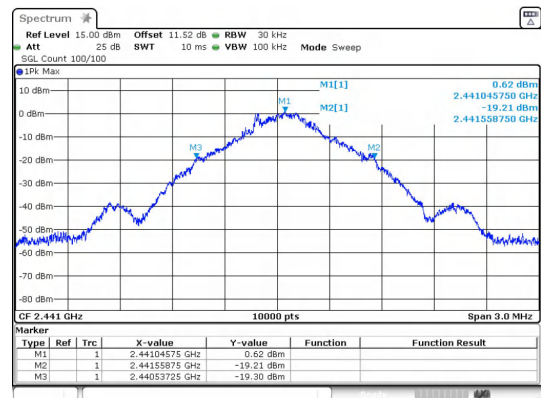
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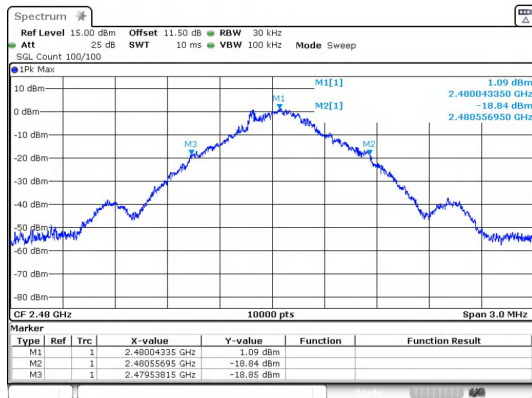
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



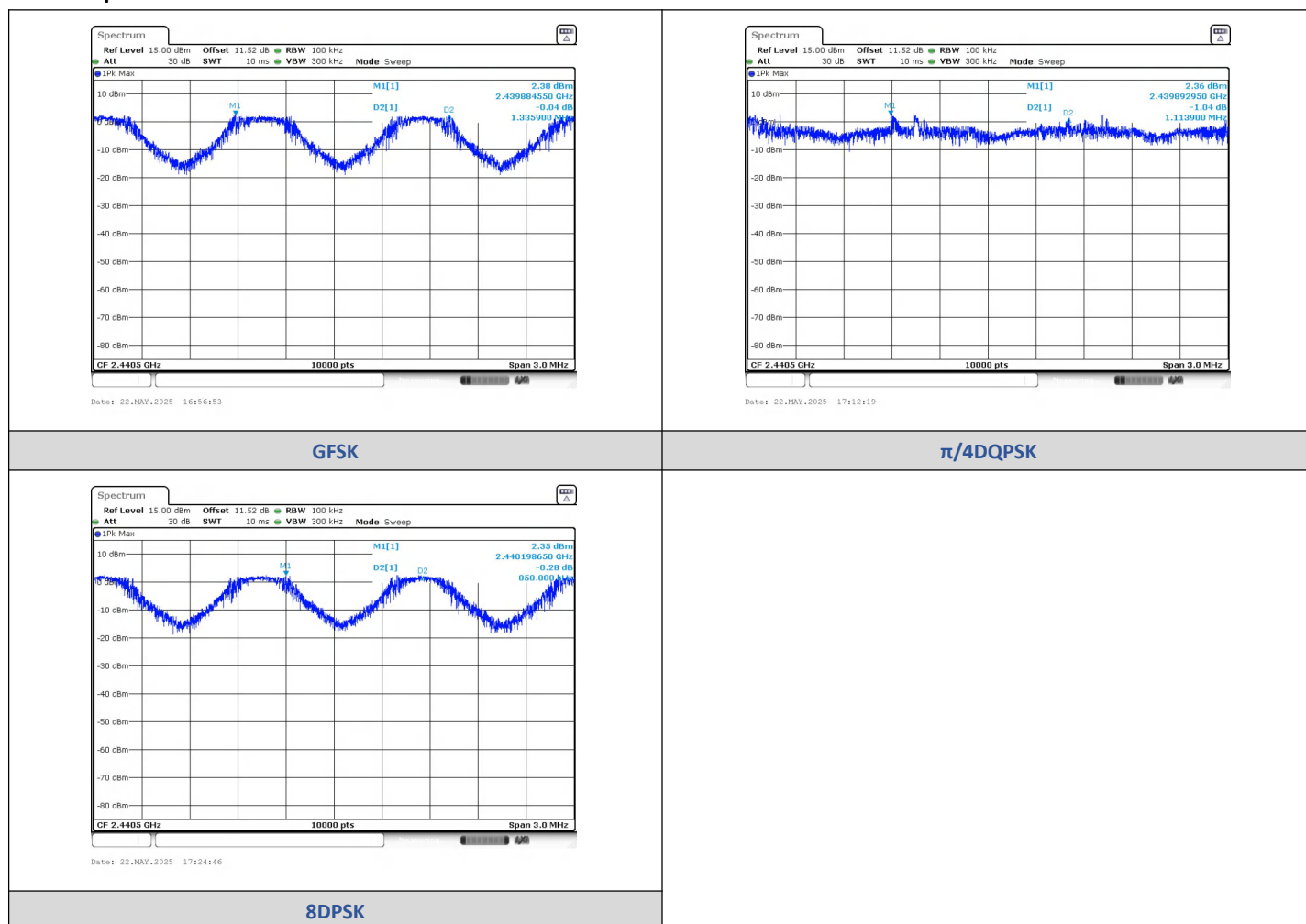
8DPSK_3-DH5_Channel 78

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	2439.8846	2441.2204	1.3359	1.0	PASS
$\pi/4$ QPSK	2-DH5	2439.8929	2441.0069	1.1139	0.867	PASS
8DPSK	3-DH5	2440.1986	2441.0566	0.8580	0.673	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

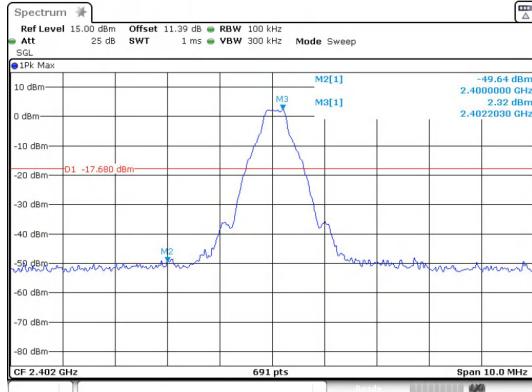
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-49.640	-17.68	-31.960	PASS
			2594.00	-45.855	-17.68	-28.175	PASS
		39	2633.12	-47.295	-17.38	-29.915	PASS
		78	2287.70	-47.648	-17.0	-30.648	PASS
			2483.50	-51.440	-17.0	-34.440	PASS
$\pi/4$ DQPSK	2-DH5	0	2397.73	-50.344	-17.71	-32.634	PASS
			2400.00	-50.500	-17.71	-32.790	PASS
			2594.80	-48.556	-17.71	-30.846	PASS
		39	2633.12	-49.786	-17.53	-32.256	PASS
		78	2288.54	-50.473	-16.98	-33.493	PASS
			2483.50	-50.110	-16.98	-33.130	PASS
8DPSK	3-DH5	0	2400.00	-49.570	-17.75	-31.820	PASS
			2594.00	-45.567	-17.75	-27.817	PASS
		39	2633.12	-47.252	-17.22	-30.032	PASS
		78	2287.70	-48.007	-16.71	-31.297	PASS
			2483.50	-51.440	-16.71	-34.730	PASS

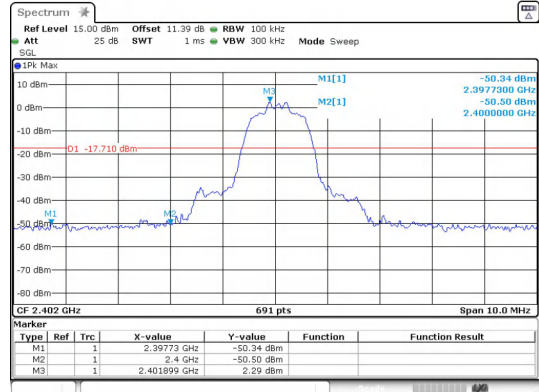
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.95	-49.345	-17.98	-31.365	PASS
			2400.00	-50.660	-17.98	-32.680	PASS
			2483.50	-50.800	-16.99	-33.810	PASS
$\pi/4$ DQPSK	2-DH5		2398.12	-49.063	-17.74	-31.323	PASS
			2400.00	-51.240	-17.74	-33.500	PASS
			2483.50	-49.730	-16.99	-32.740	PASS
8DPSK	3-DH5		2397.40	-49.208	-17.8	-31.408	PASS
			2400.00	-51.050	-17.8	-33.250	PASS
			2483.50	-50.970	-17.17	-33.800	PASS

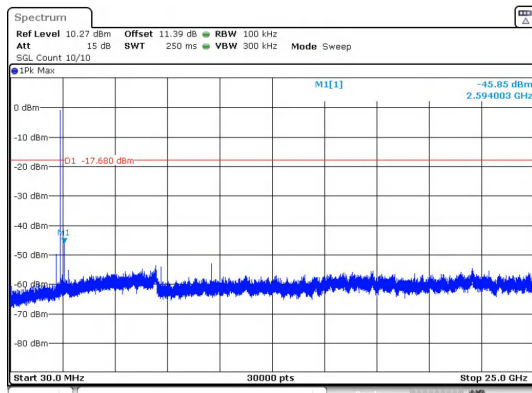
Test Graphs



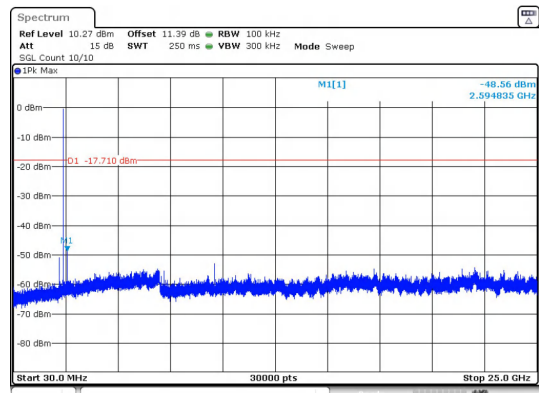
Out Of Band Emission
GFSK_DH5_Channel 0



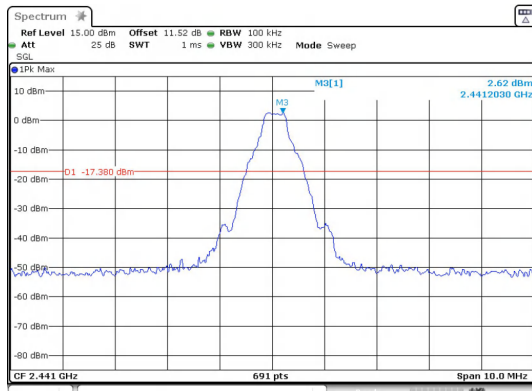
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



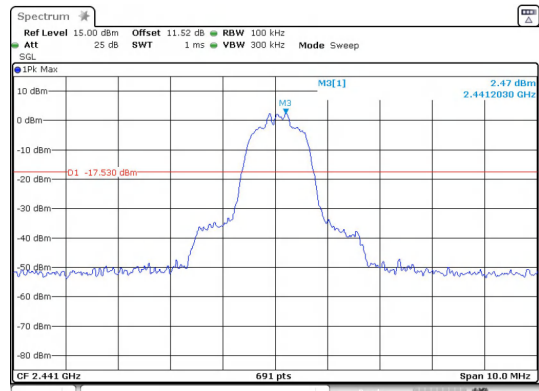
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



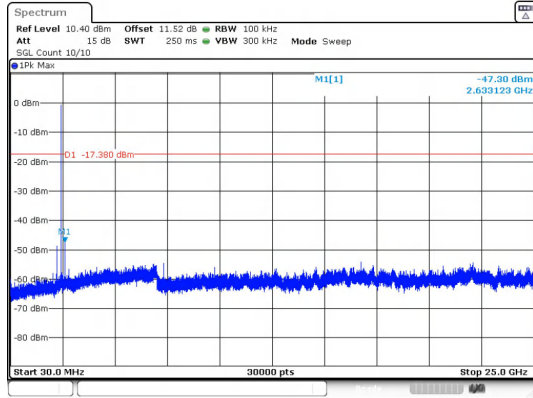
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



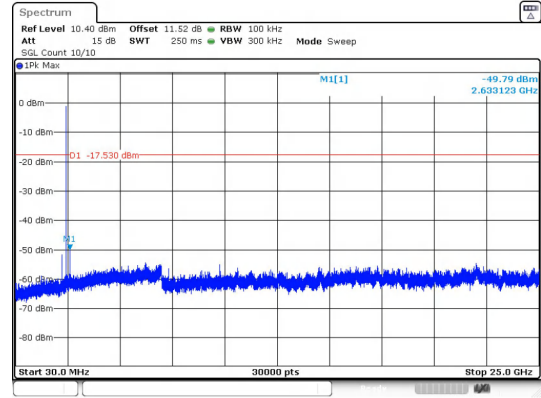
Out Of Band Emission
GFSK_DH5_Channel 39



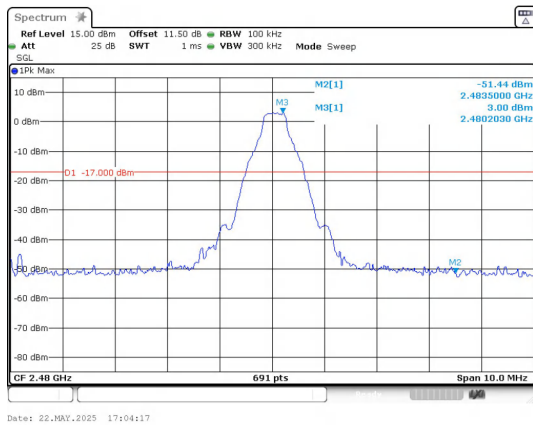
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



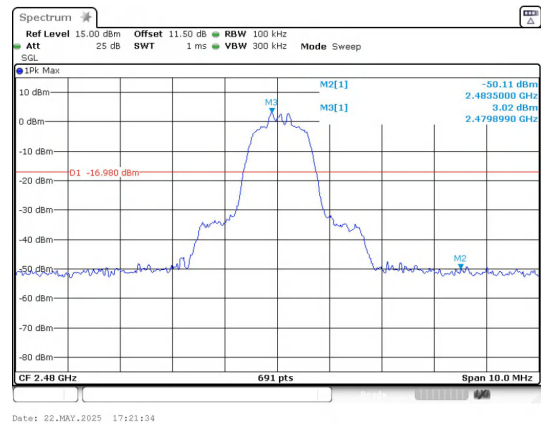
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



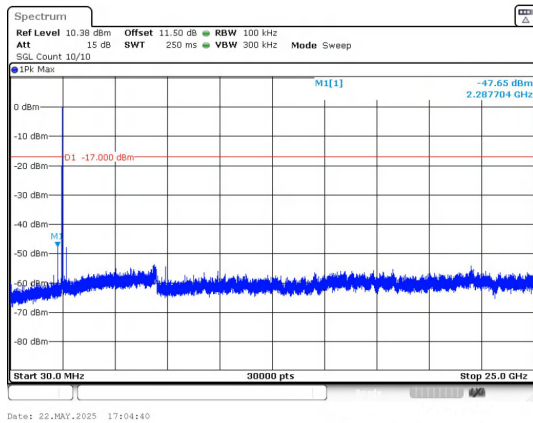
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



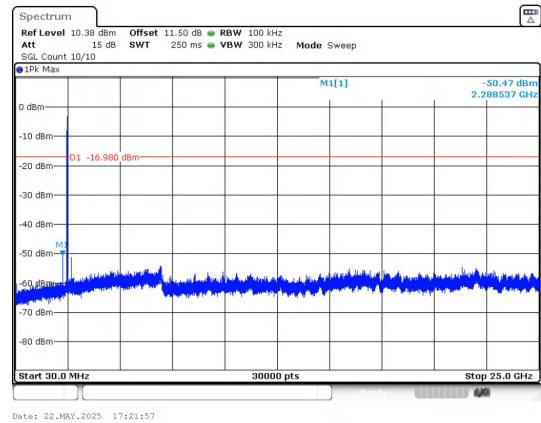
Out Of Band Emission
GFSK_DH5_Channel 78



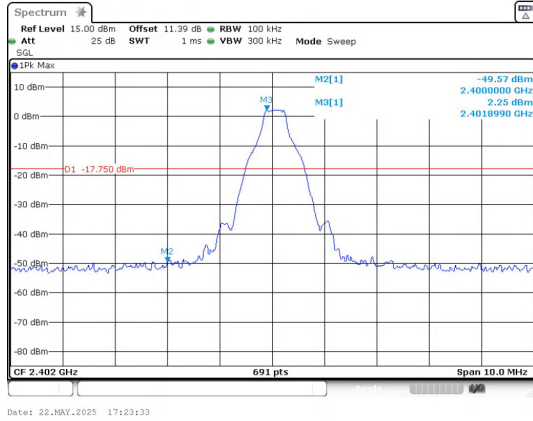
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



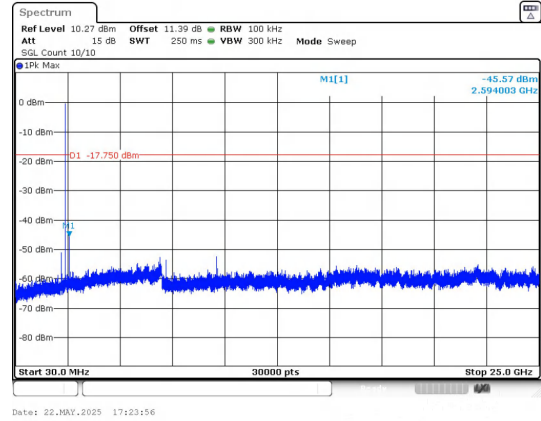
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



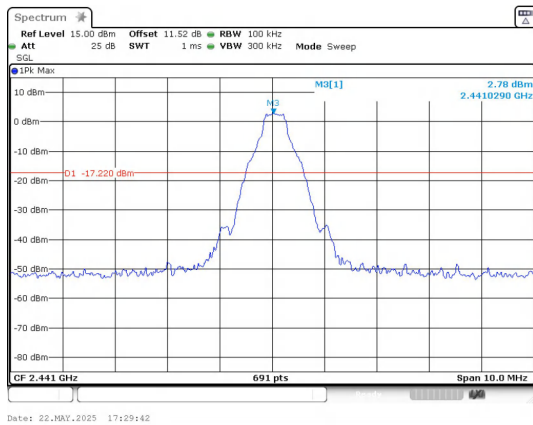
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



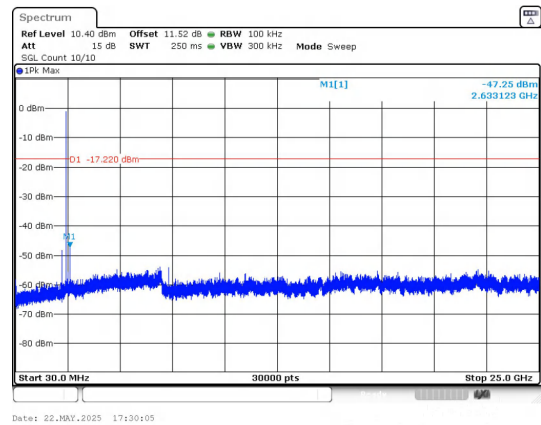
Out Of Band Emission
8DPSK_3-DH5_Channel 0



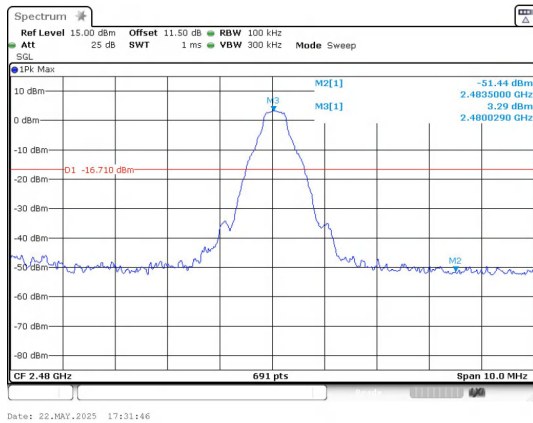
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



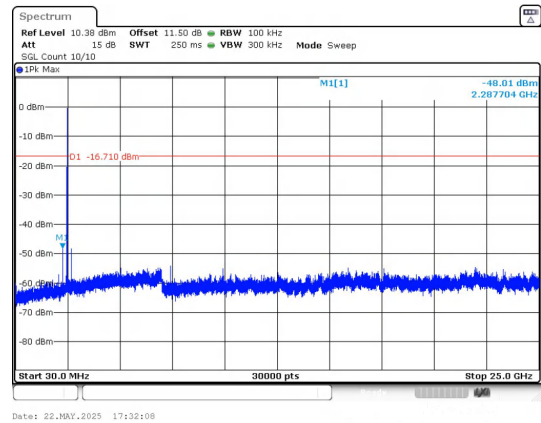
Out Of Band Emission
8DPSK_3-DH5_Channel 39



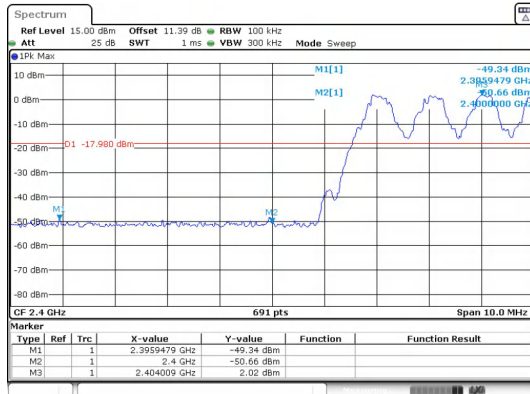
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



Out Of Band Emission
8DPSK_3-DH5_Channel 78

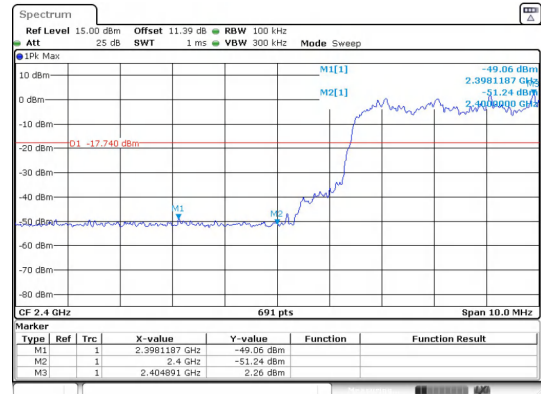


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



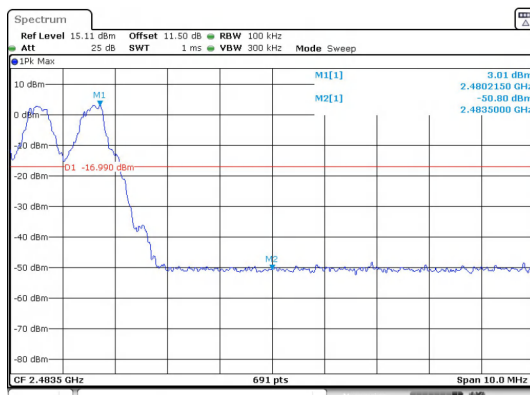
Date: 22.MAY.2025 16:59:49

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



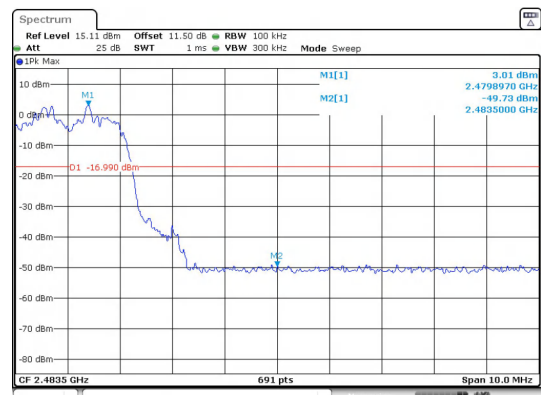
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Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



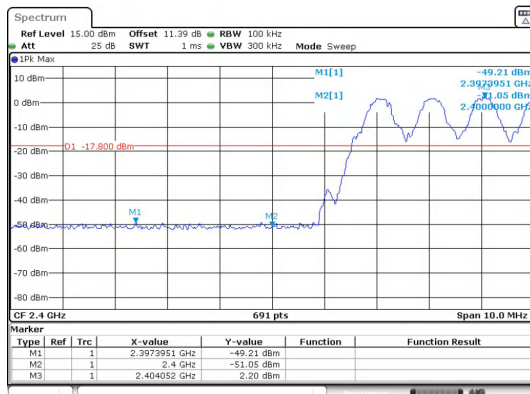
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Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



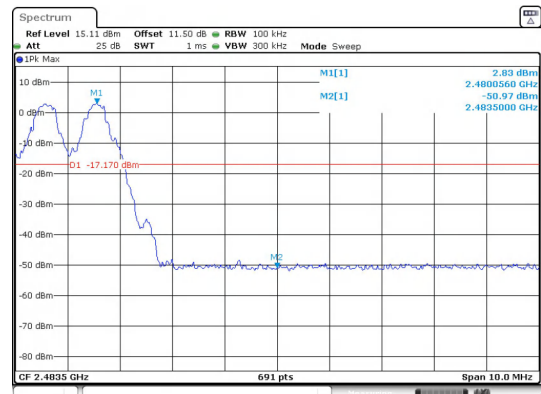
Date: 22.MAY.2025 17:15:34

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



Date: 22.MAY.2025 17:27:46

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



Date: 22.MAY.2025 17:28:16

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

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