

Appendix Report

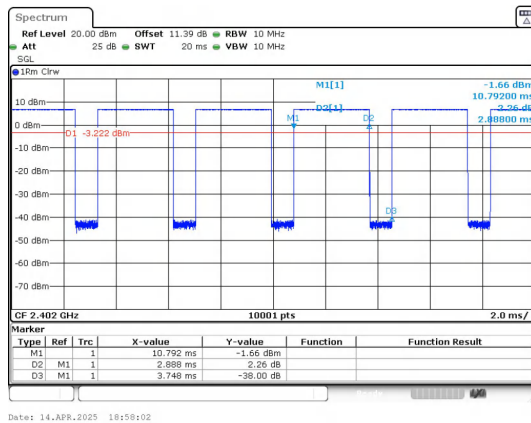
Project No.:	CISR250412112
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

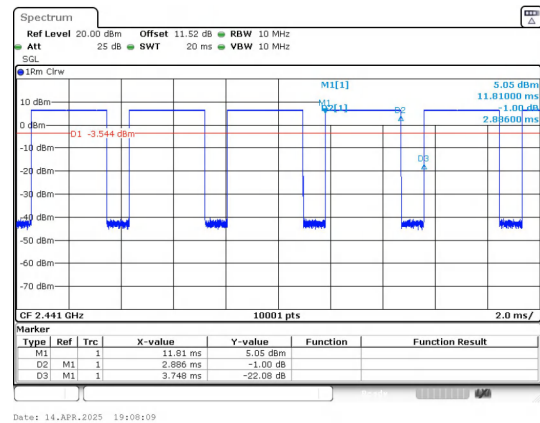
Test Result

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	3.746	77.15	0.7715	1.1266	0.3460
		39	2.890	3.748	77.11	0.7711	1.1289	0.3460
		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



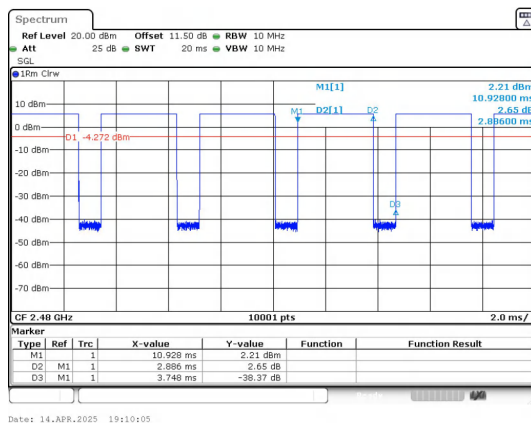
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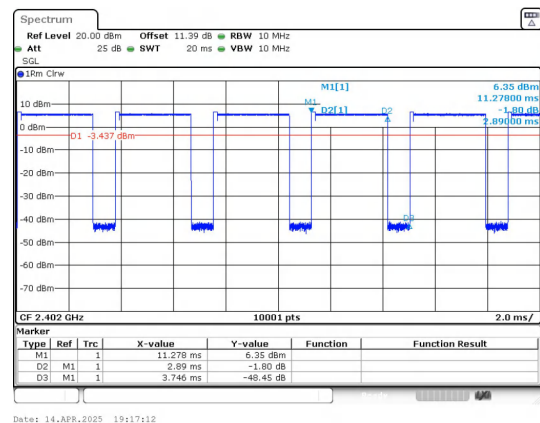
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GFSK(DH5)_Channel 0

GFSK(DH5)_Channel 39



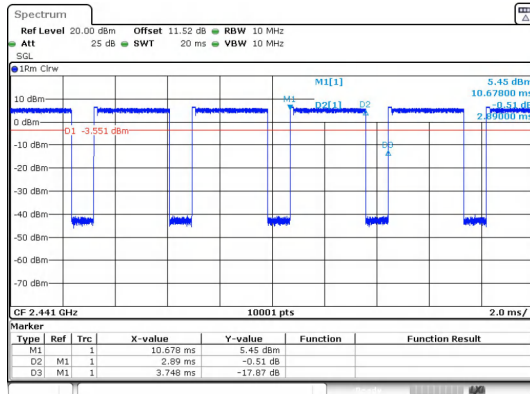
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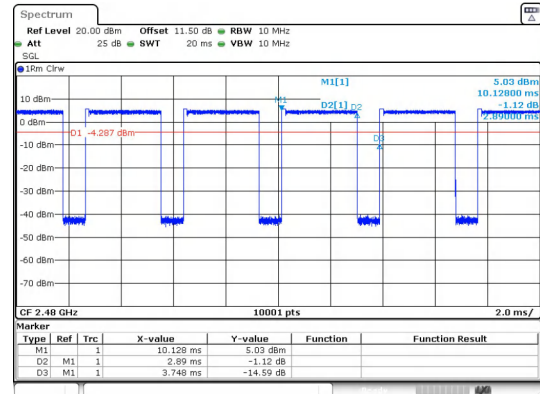
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GFSK(DH5)_Channel 78

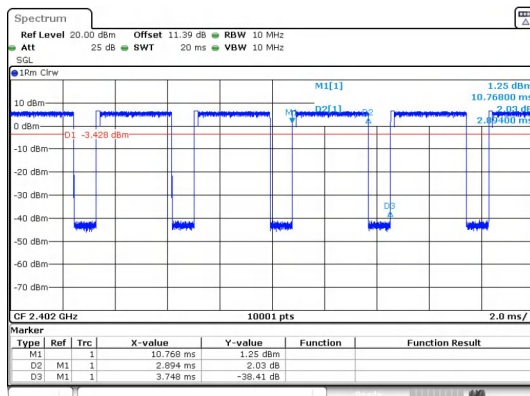
 $\pi/4$ DQPSK(2-DH5)_Channel 0



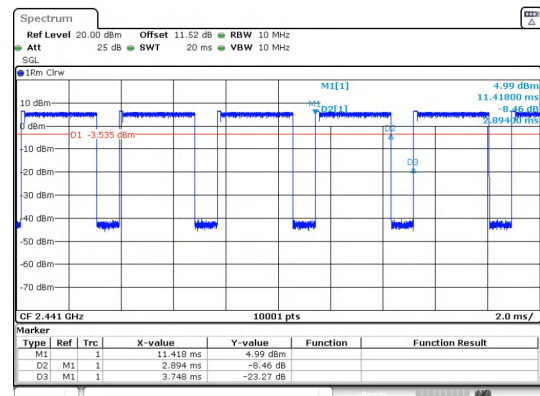
$\pi/4$ DQPSK(2-DH5)_Channel 39



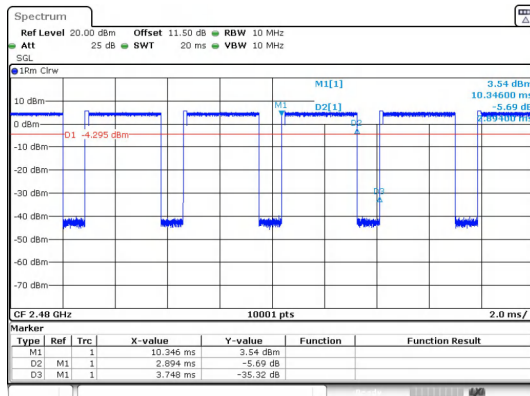
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



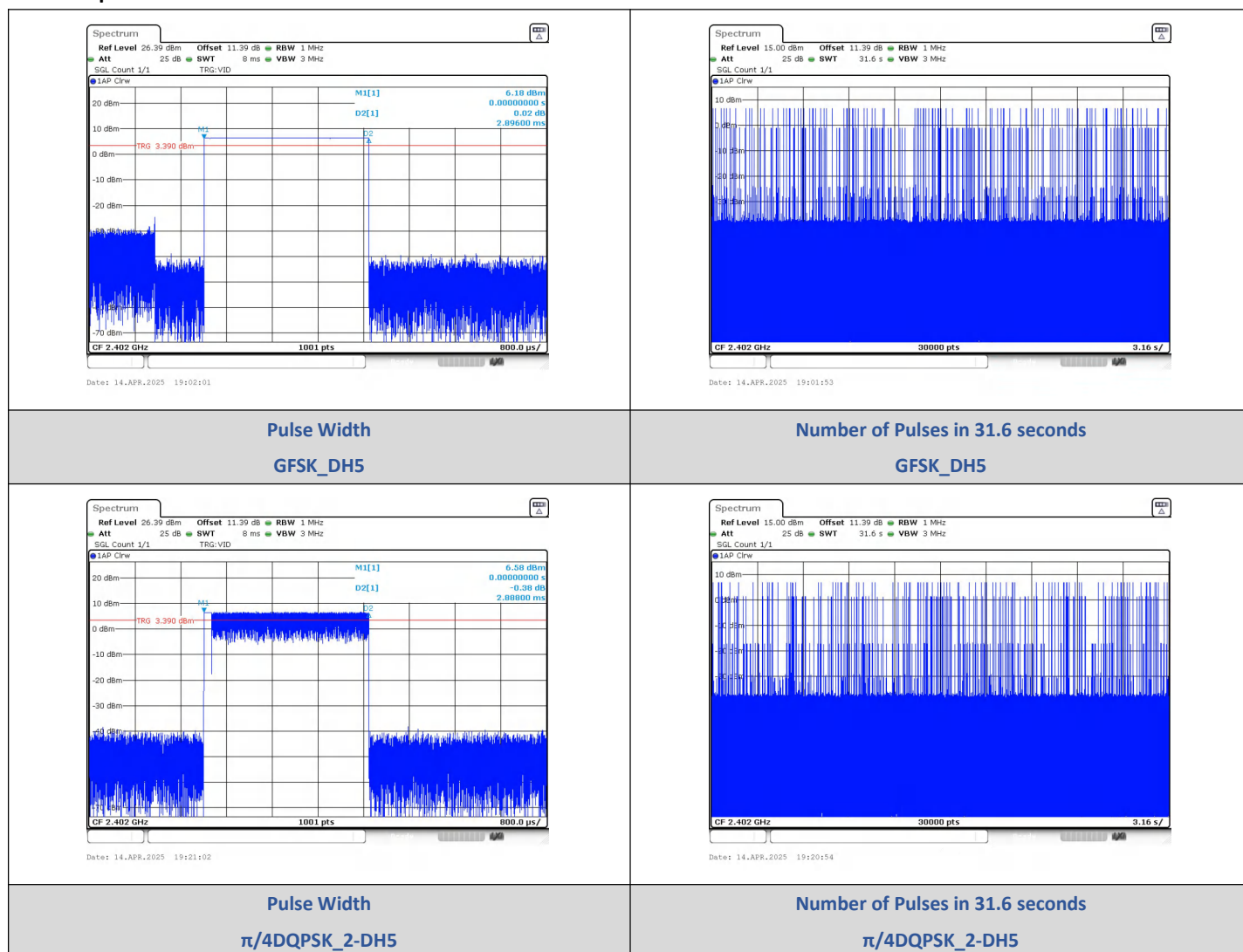
8DPSK(3-DH5)_Channel 78

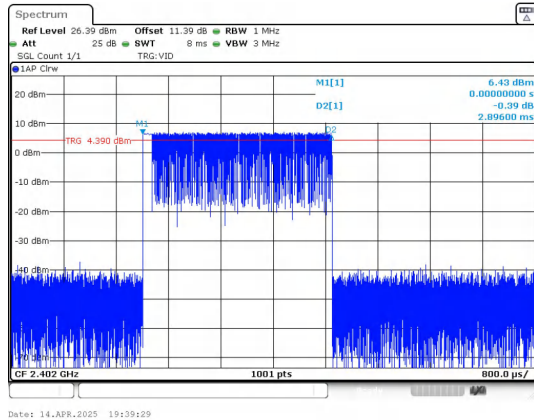
2) Dwell Time

Test Result

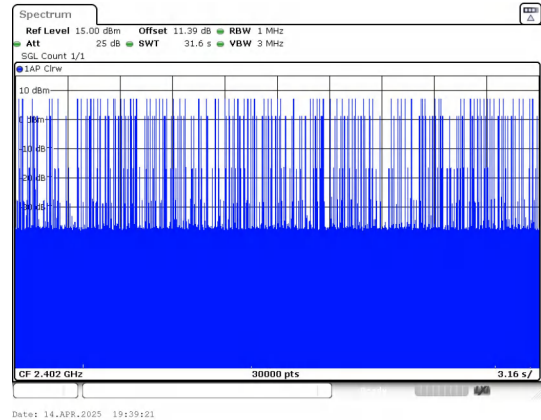
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.896	105	304.08	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	97	280.14		PASS
8DPSK	3-DH5		2.896	101	292.5		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



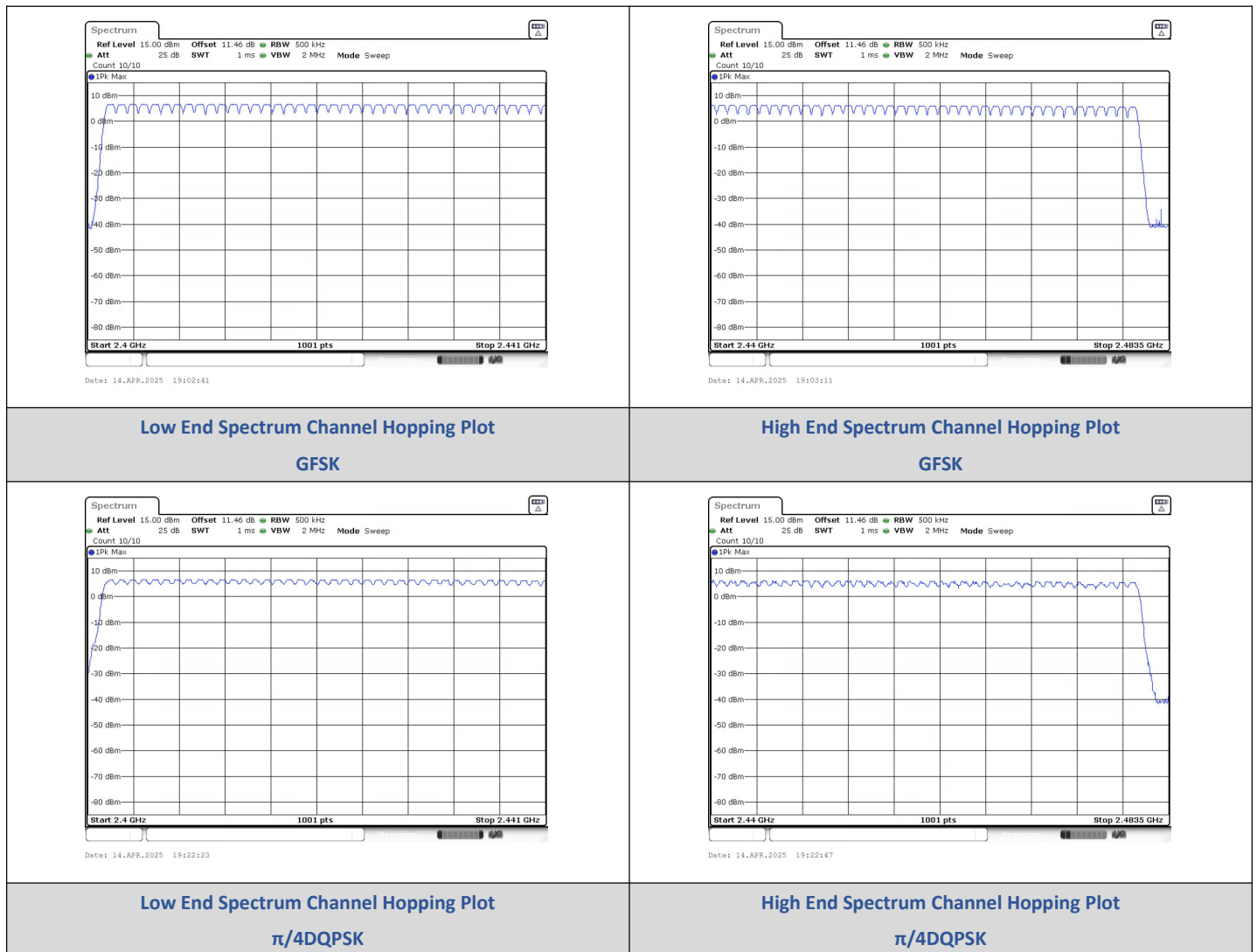
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

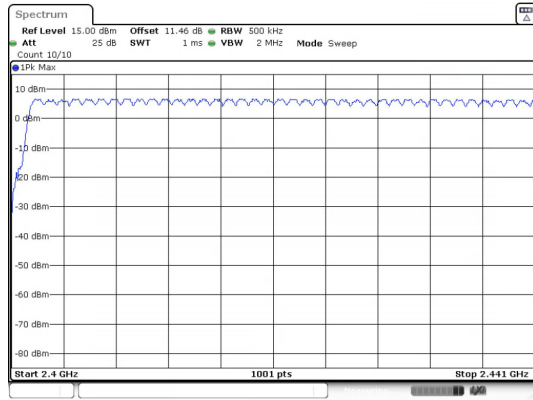
3) Number Of Hopping Channel

Test Result

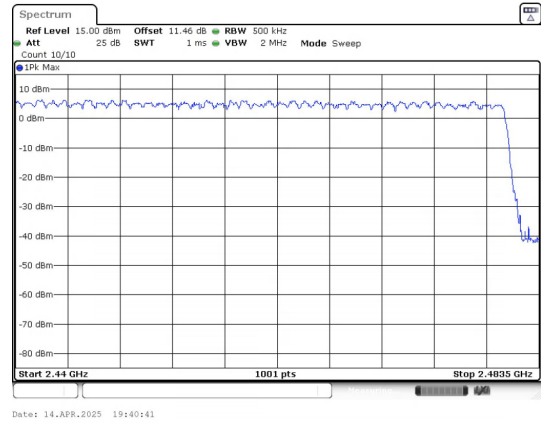
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



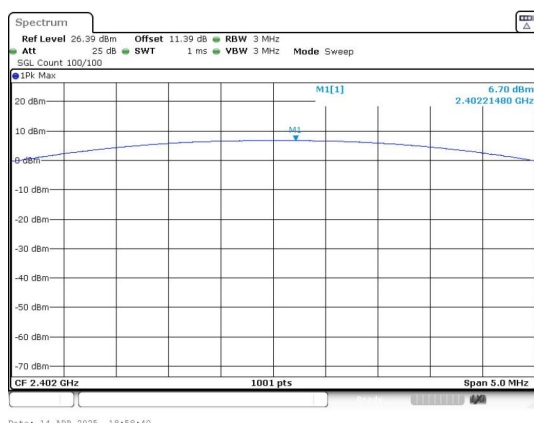
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

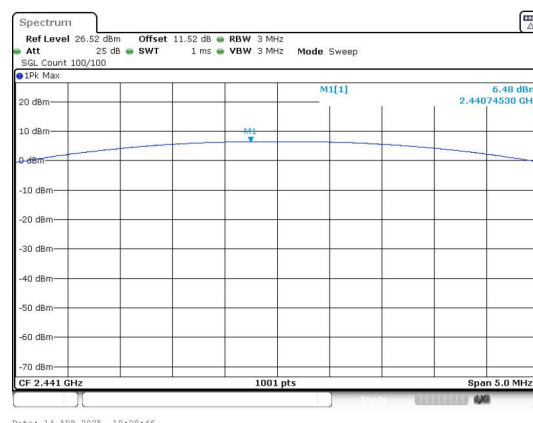
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	6.70	4.68	≤30	PASS
		39	6.48	4.45		PASS
		78	5.80	3.80		PASS
$\pi/4$ DQPSK	2-DH5	0	7.14	5.18	≤20.97	PASS
		39	7.12	5.15		PASS
		78	6.39	4.36		PASS
8DPSK	3-DH5	0	7.36	5.45		PASS
		39	7.35	5.43		PASS
		78	6.67	4.65		PASS

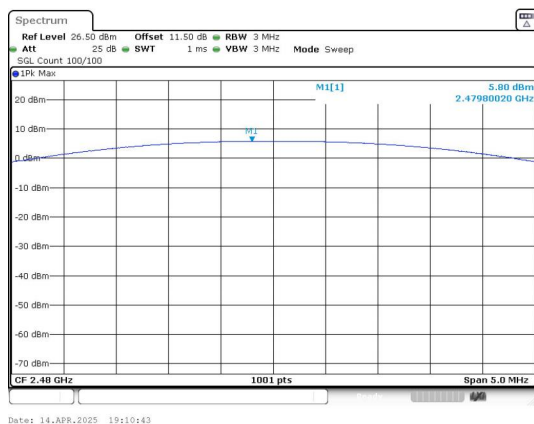
Test Graphs



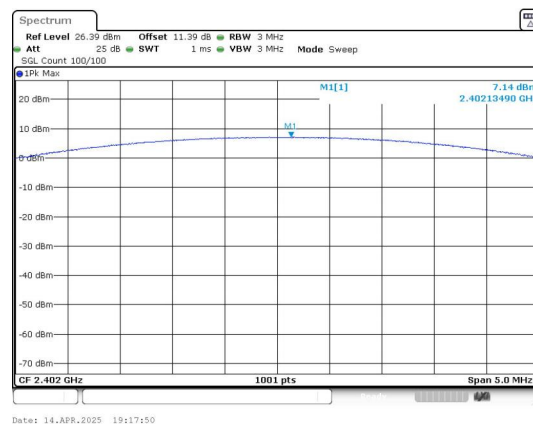
Peak Output Power
GFSK_Channel 0



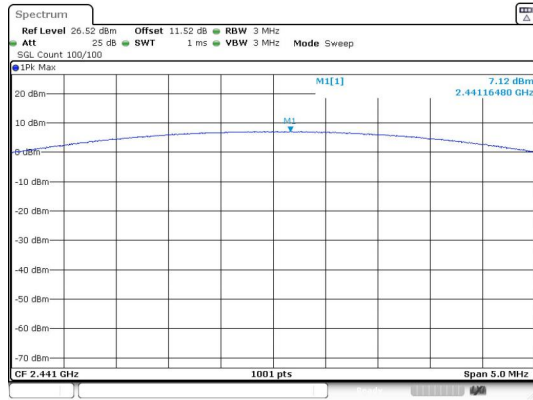
Peak Output Power
GFSK_Channel 39



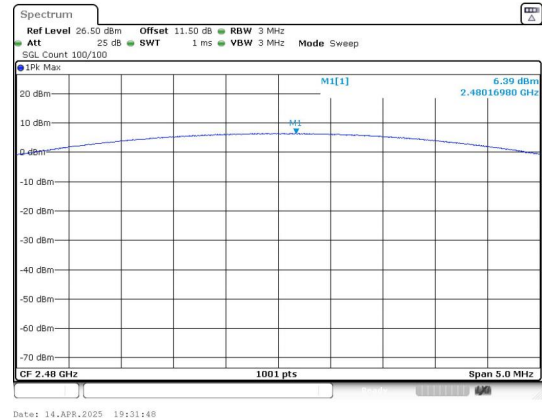
Peak Output Power
GFSK_Channel 78



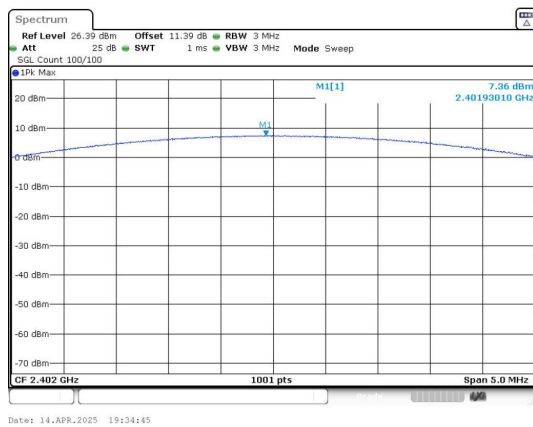
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



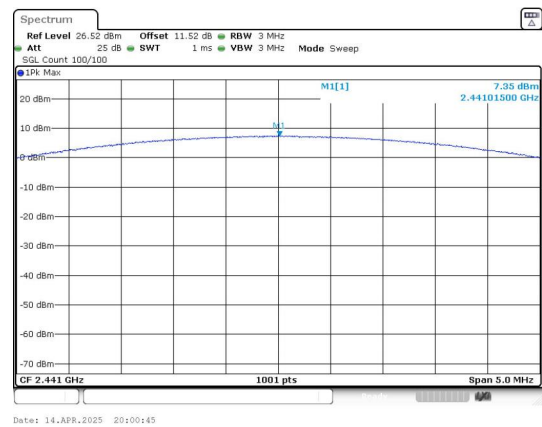
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



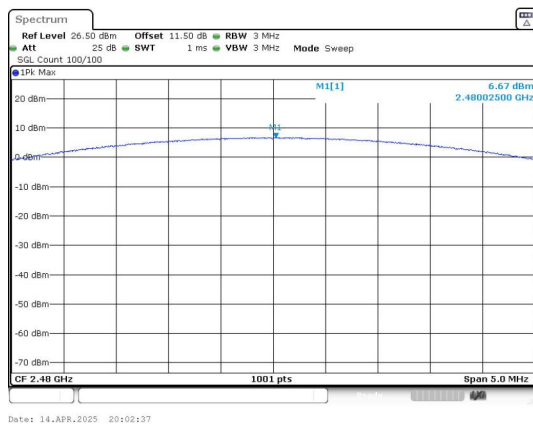
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



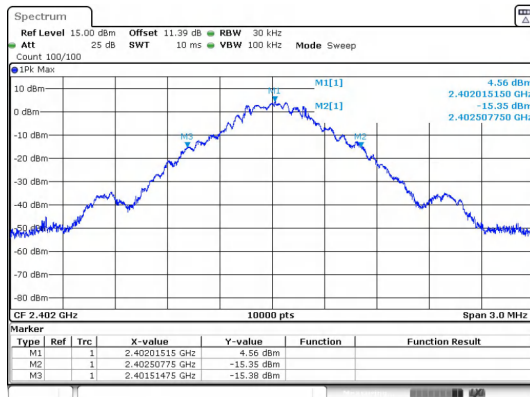
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

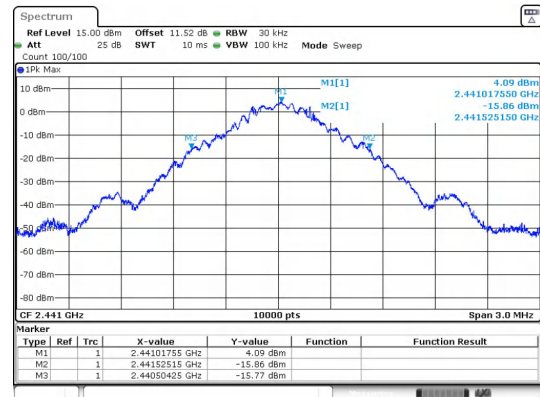
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.03
	39	2441 MHz	1.03
	78	2480 MHz	1.03
$\pi/4$ DQPSK	0	2402 MHz	1.300
	39	2441 MHz	1.310
	78	2480 MHz	1.320
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.300
	78	2480 MHz	1.300

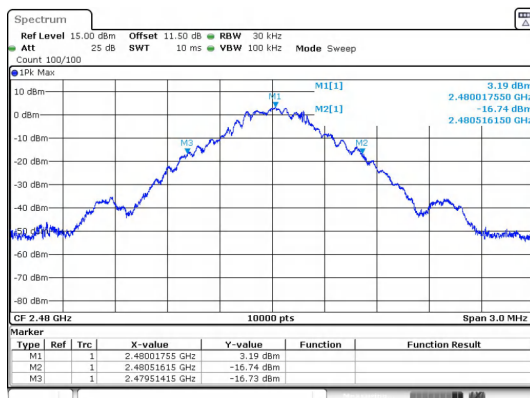
Test Graphs



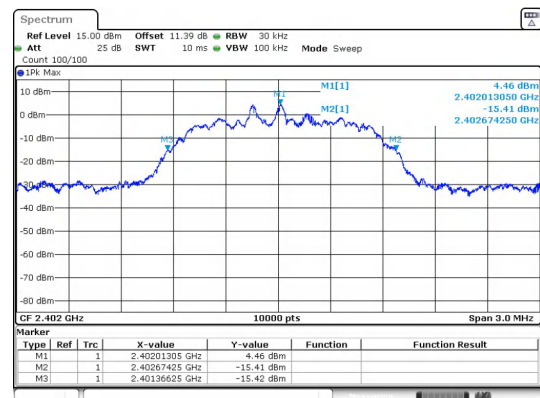
GFSK_DH5_Channel 0

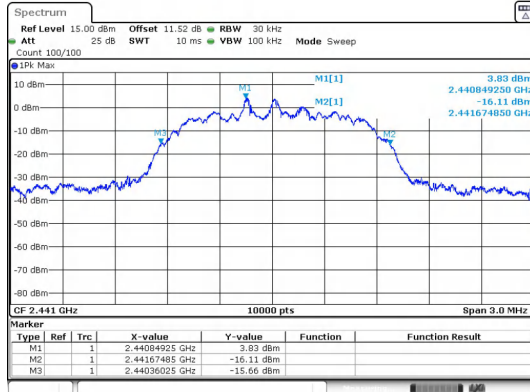


GFSK_DH5_Channel 39

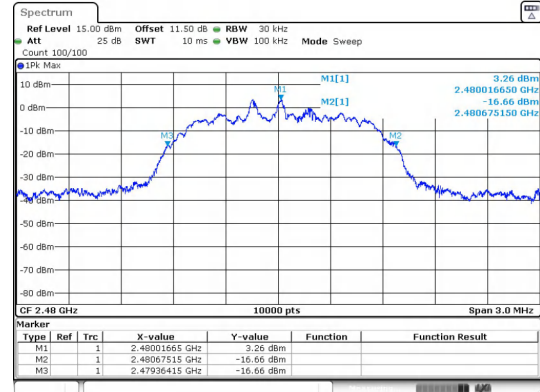


GFSK_DH5_Channel 78

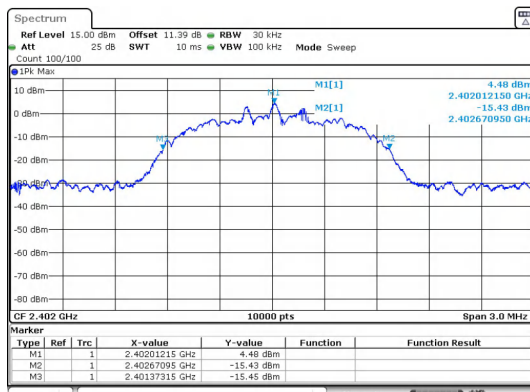

 $\pi/4$ DQPSK_2-DH5_Channel 0



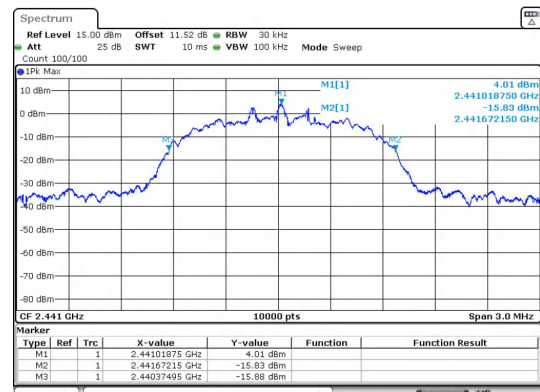
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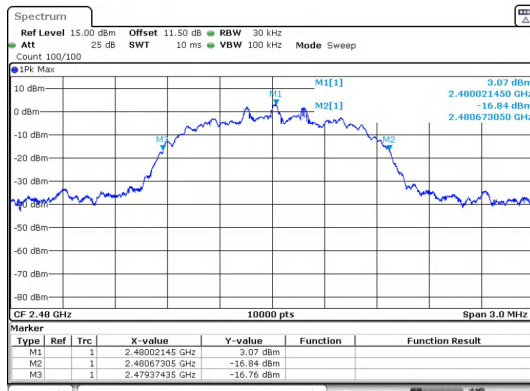
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



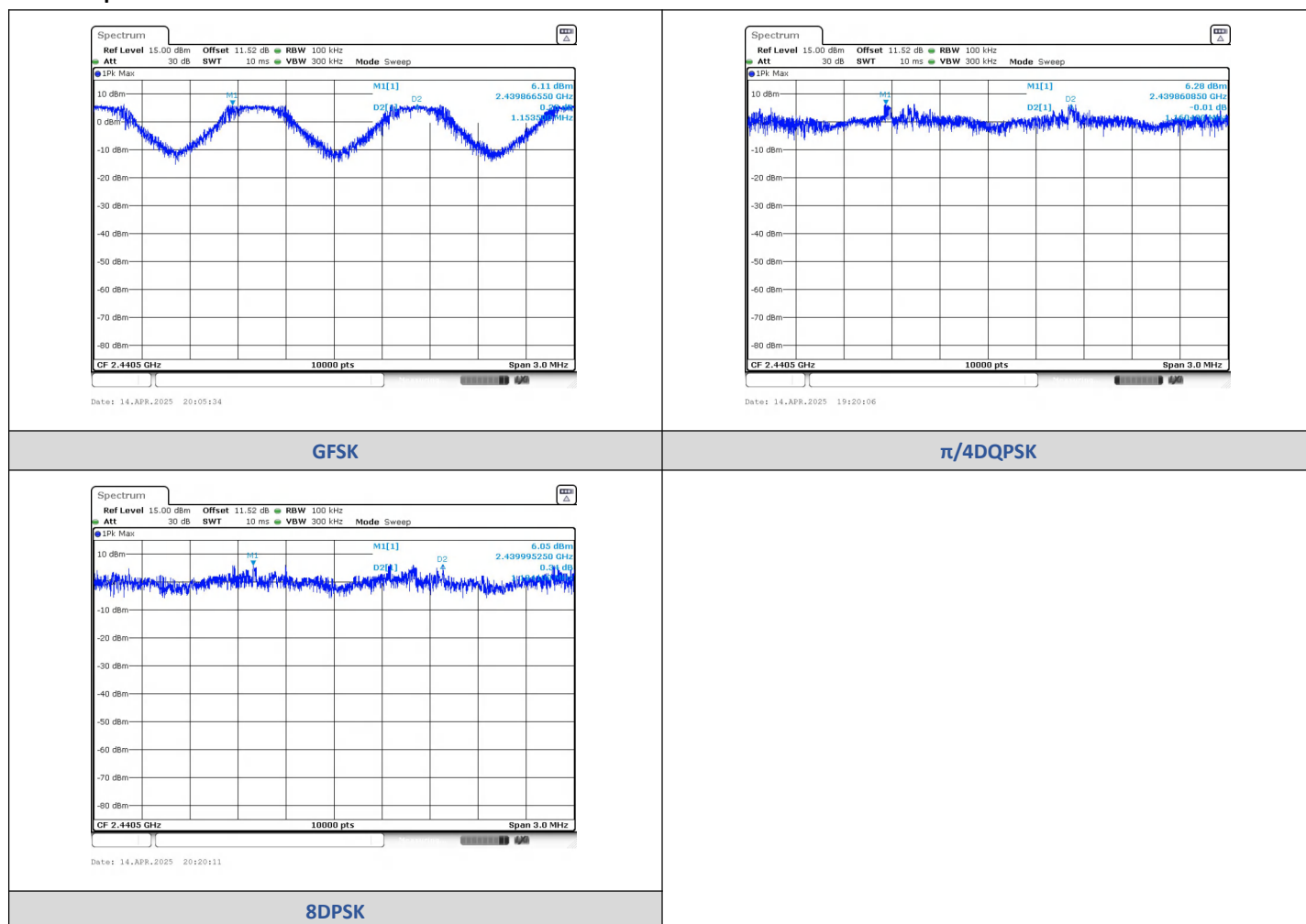
8DPSK_3-DH5_Channel 78

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	2439.8666	2441.0201	1.1535	1.03	PASS
$\pi/4$ DQPSK	2-DH5	2439.8609	2441.0212	1.1604	0.867	PASS
8DPSK	3-DH5	2439.9952	2441.1793	1.1841	0.867	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

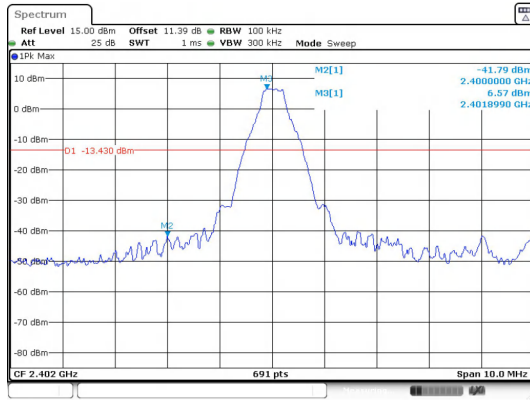
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-41.790	-13.43	-28.360	PASS
			7205.96	-38.255	-13.43	-24.825	PASS
		39	7323.32	-37.755	-13.61	-24.145	PASS
		78	2483.50	-49.610	-14.41	-35.200	PASS
			9920.20	-37.207	-14.41	-22.797	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-42.130	-13.56	-28.570	PASS
			7206.79	-41.057	-13.56	-27.497	PASS
		39	9763.72	-39.771	-13.74	-26.031	PASS
		78	2483.50	-50.220	-14.3	-35.920	PASS
			9920.20	-36.812	-14.3	-22.512	PASS
8DPSK	3-DH5	0	2400.00	-44.180	-13.4	-30.780	PASS
			7205.96	-41.403	-13.4	-28.003	PASS
		39	9763.72	-39.957	-13.99	-25.967	PASS
		78	2483.50	-49.830	-14.33	-35.500	PASS
			9920.20	-36.913	-14.33	-22.583	PASS

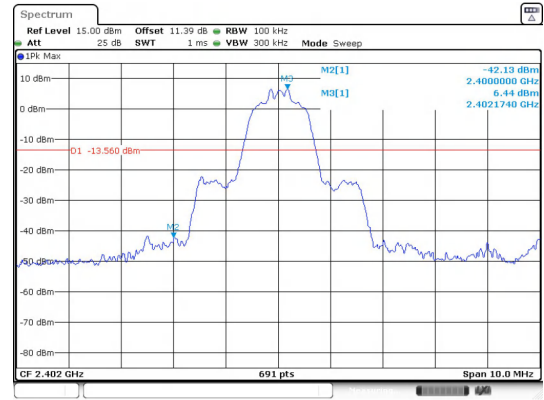
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.34	-47.654	-13.55	-34.104	PASS
			2400.00	-48.780	-13.55	-35.230	PASS
			2483.50	-49.310	-14.31	-35.000	PASS
$\pi/4$ DQPSK	2-DH5		2400.00	-46.020	-13.54	-32.480	PASS
			2483.50	-48.930	-16.31	-32.620	PASS
8DPSK	3-DH5		2400.00	-44.050	-13.34	-30.710	PASS
			2483.50	-48.260	-14.27	-33.990	PASS

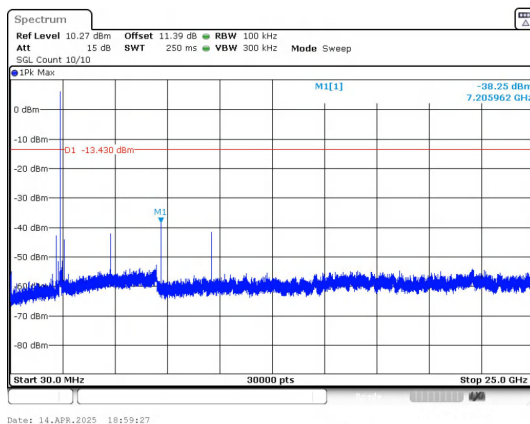
Test Graphs



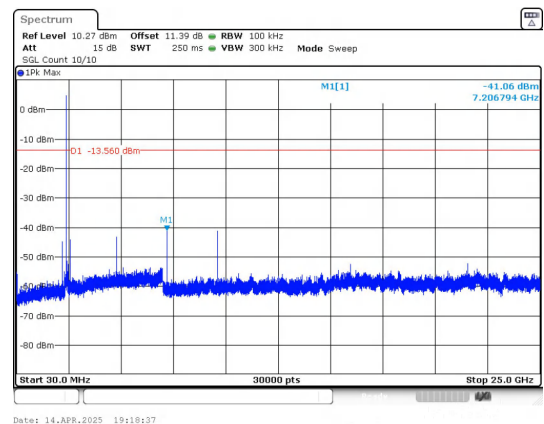
Out Of Band Emission
GFSK_DH5_Channel 0



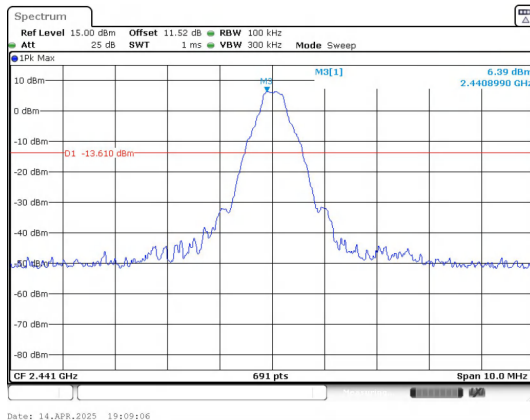
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 0



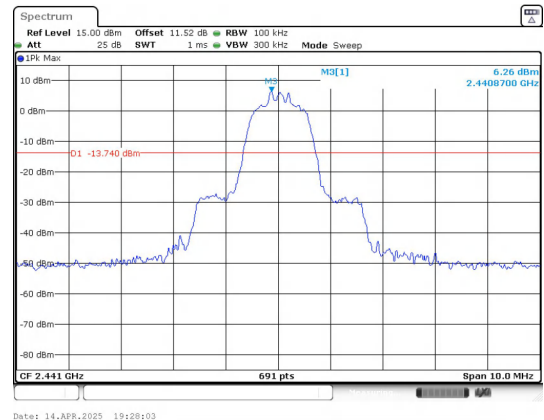
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



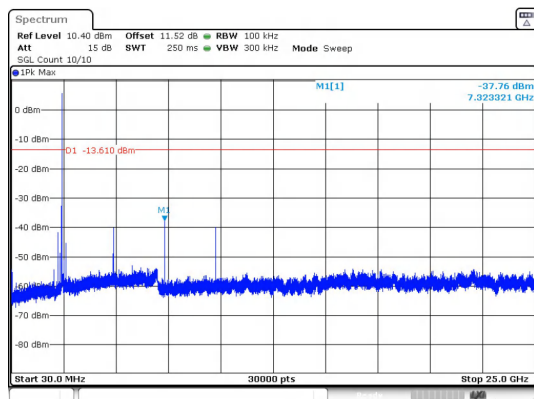
30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 0



Out Of Band Emission
GFSK_DH5_Channel 39



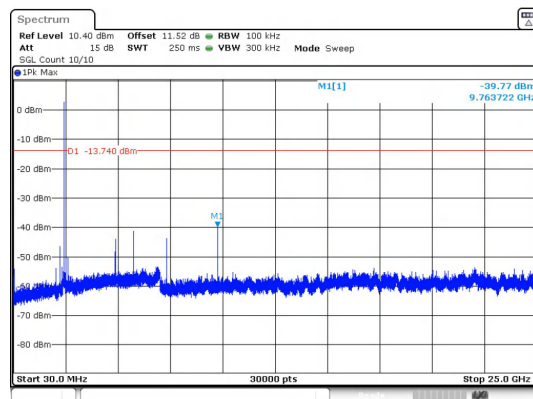
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



Date: 14.APR.2025 19:09:29

30.0 MHz - 25000.0 MHz

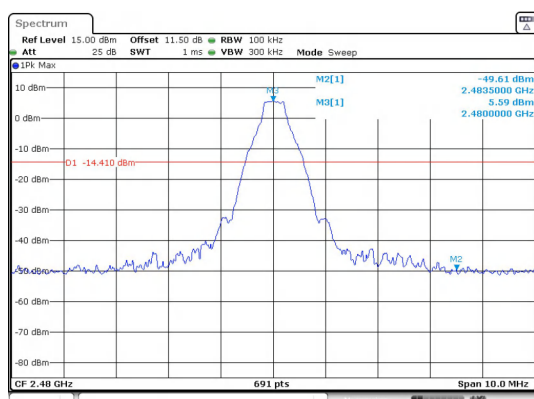
GFSK_DH5_Channel 39



Date: 14.APR.2025 19:28:25

30.0 MHz - 25000.0 MHz

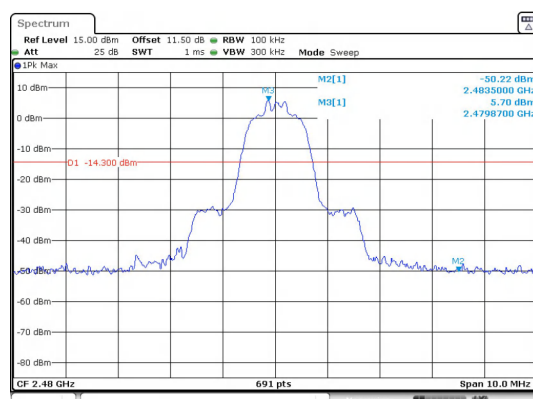
$\pi/4$ DQPSK_2-DH5_Channel 39



Date: 14.APR.2025 19:11:08

Out Of Band Emission

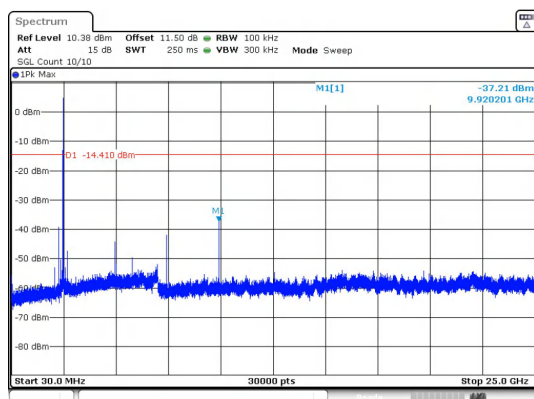
GFSK_DH5_Channel 78



Date: 14.APR.2025 19:32:13

Out Of Band Emission

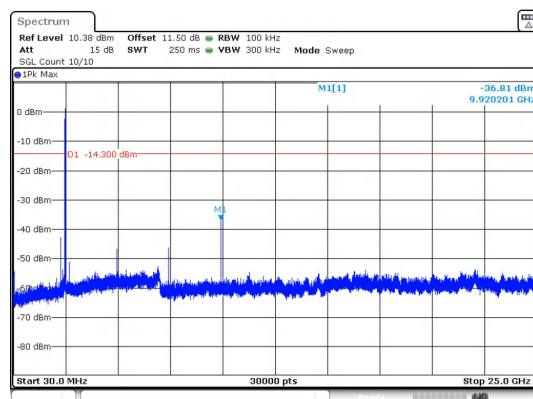
$\pi/4$ DQPSK_2-DH5_Channel 78



Date: 14.APR.2025 19:11:30

30.0 MHz - 25000.0 MHz

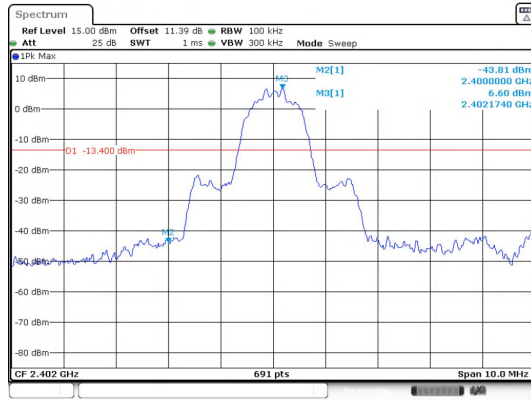
GFSK_DH5_Channel 78



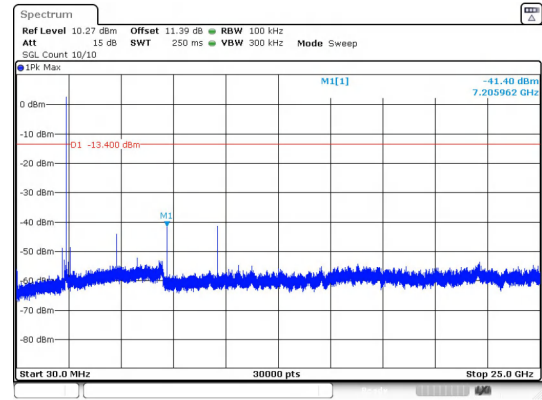
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30.0 MHz - 25000.0 MHz

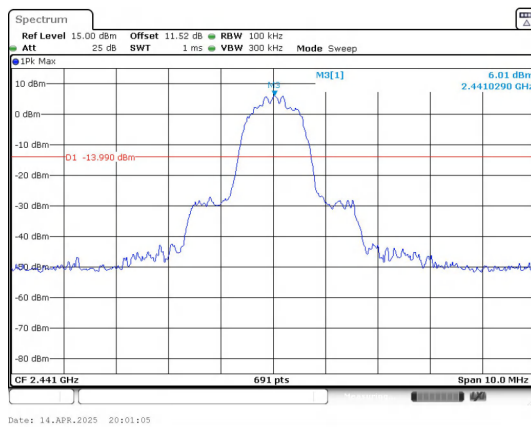
$\pi/4$ DQPSK_2-DH5_Channel 78



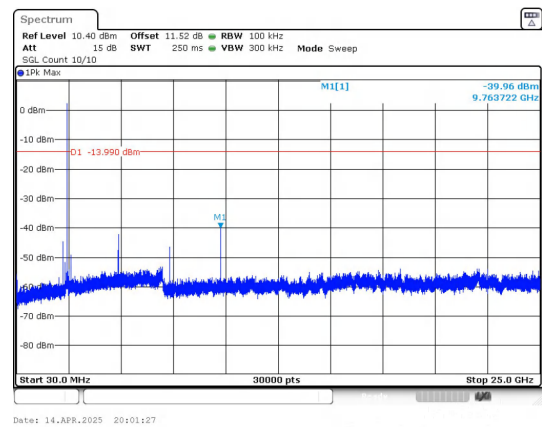
Out Of Band Emission
8DPSK_3-DH5_Channel 0



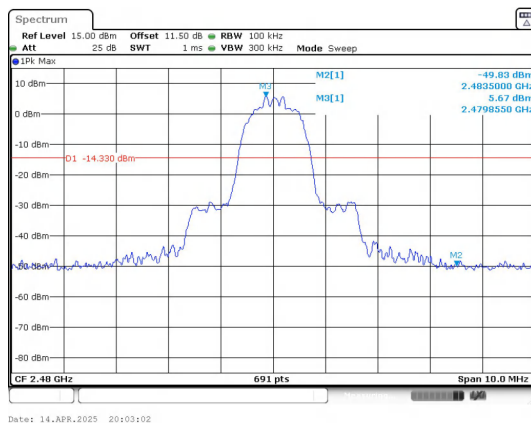
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



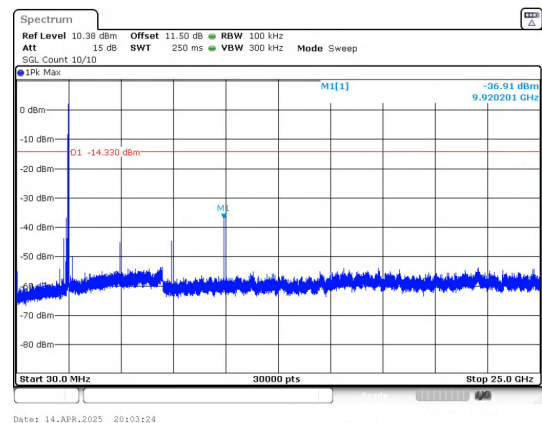
Out Of Band Emission
8DPSK_3-DH5_Channel 39



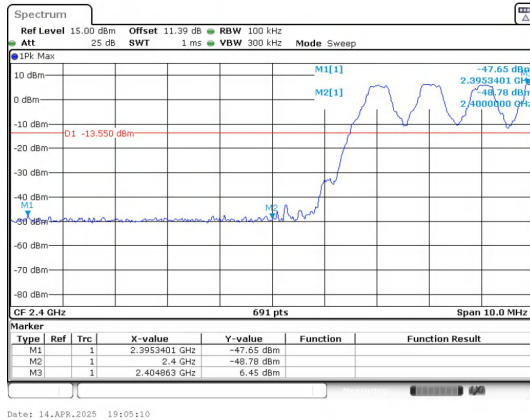
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



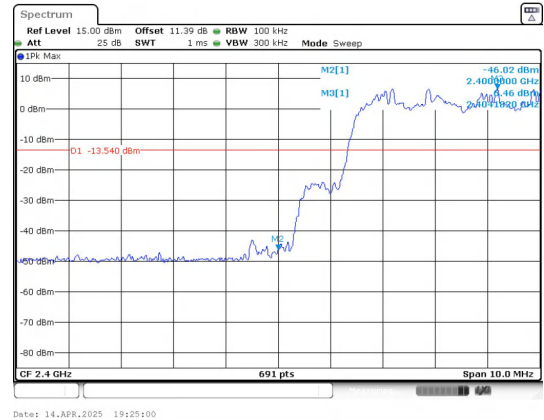
Out Of Band Emission
8DPSK_3-DH5_Channel 78



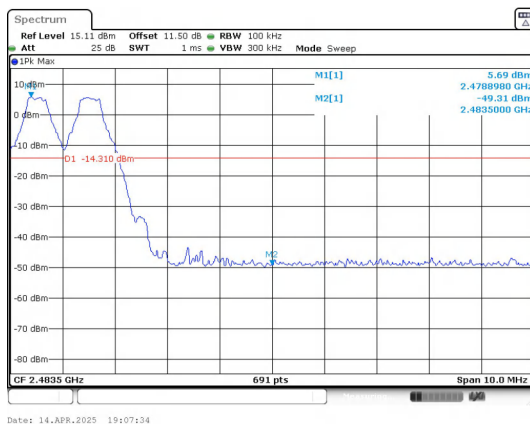
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



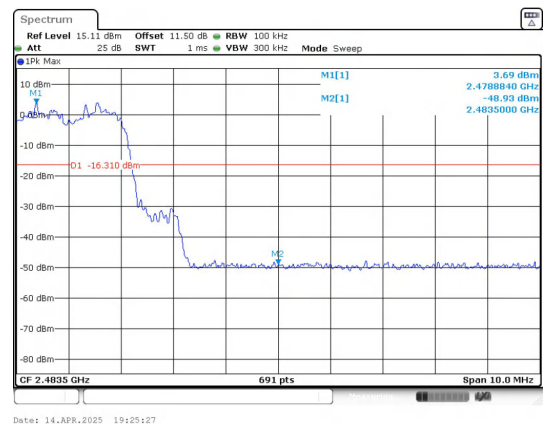
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



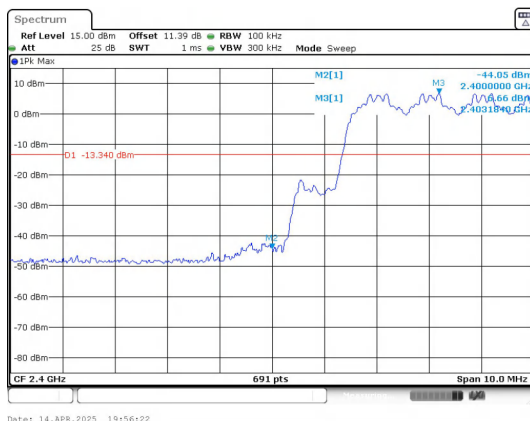
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



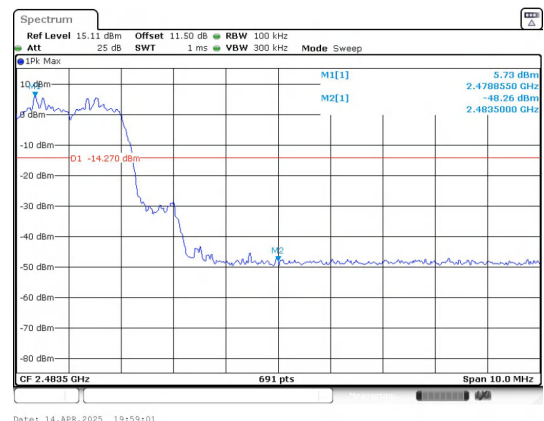
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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-----