

Appendix Report

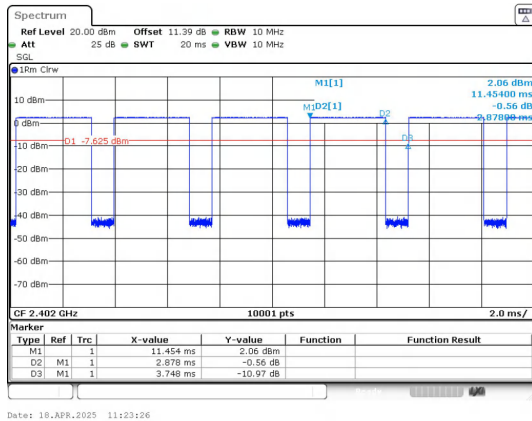
Project No.:	CISR250416162
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

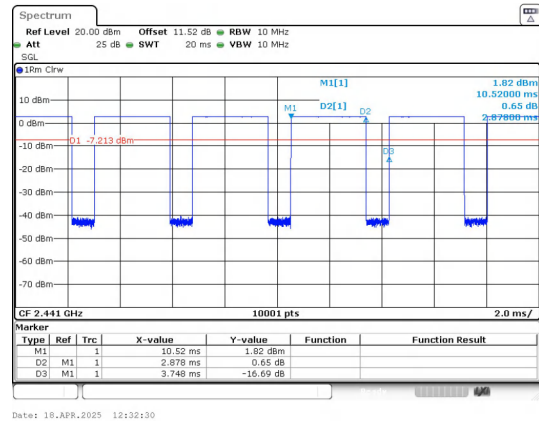
Test Result

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	2.880	3.748	76.84	0.7684	1.1441	0.3472
$\pi/4$ 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	2.886	3.748	77.00	0.7700	1.1351	0.3465
8DPSK	3-DH5	0	2.888	3.748	77.05	0.7705	1.1323	0.3463
		39	2.888	3.748	77.05	0.7705	1.1323	0.3463
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465

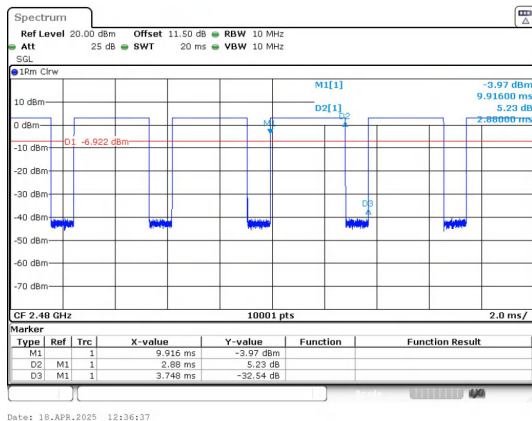
Test Graphs



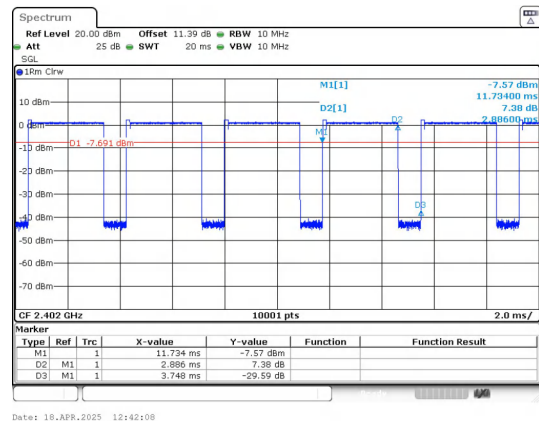
GFSK(DH5)_Channel 0

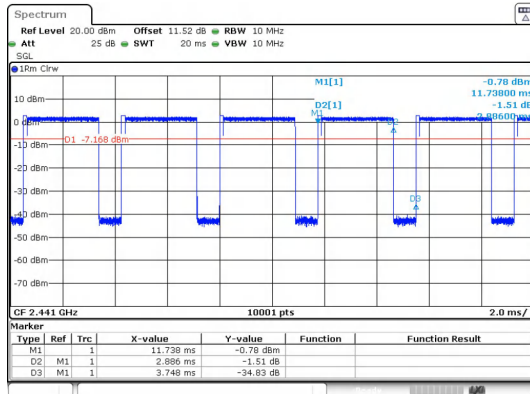


GFSK(DH5)_Channel 39

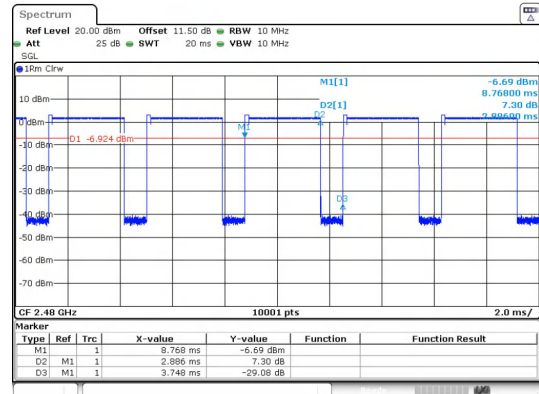


GFSK(DH5)_Channel 78

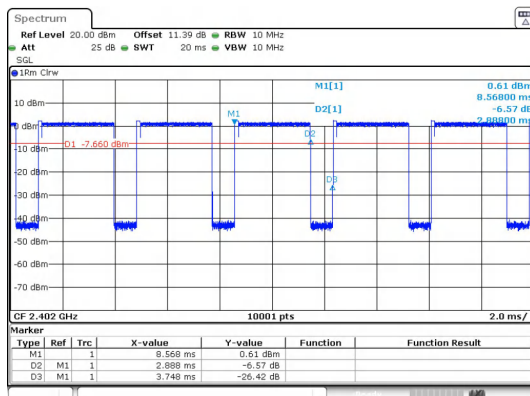

 $\pi/4$ DQPSK(2-DH5)_Channel 0



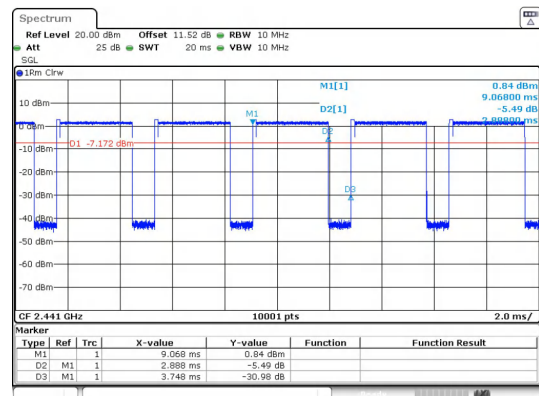
$\pi/4$ DQPSK(2-DH5)_Channel 39



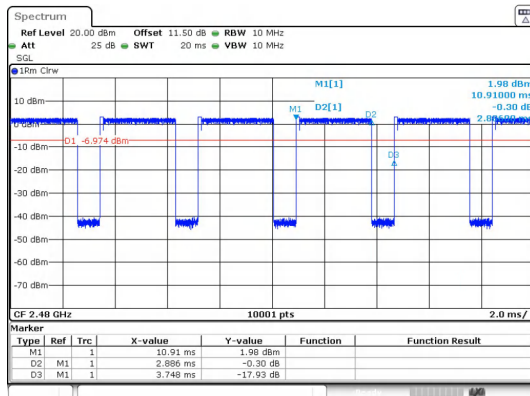
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



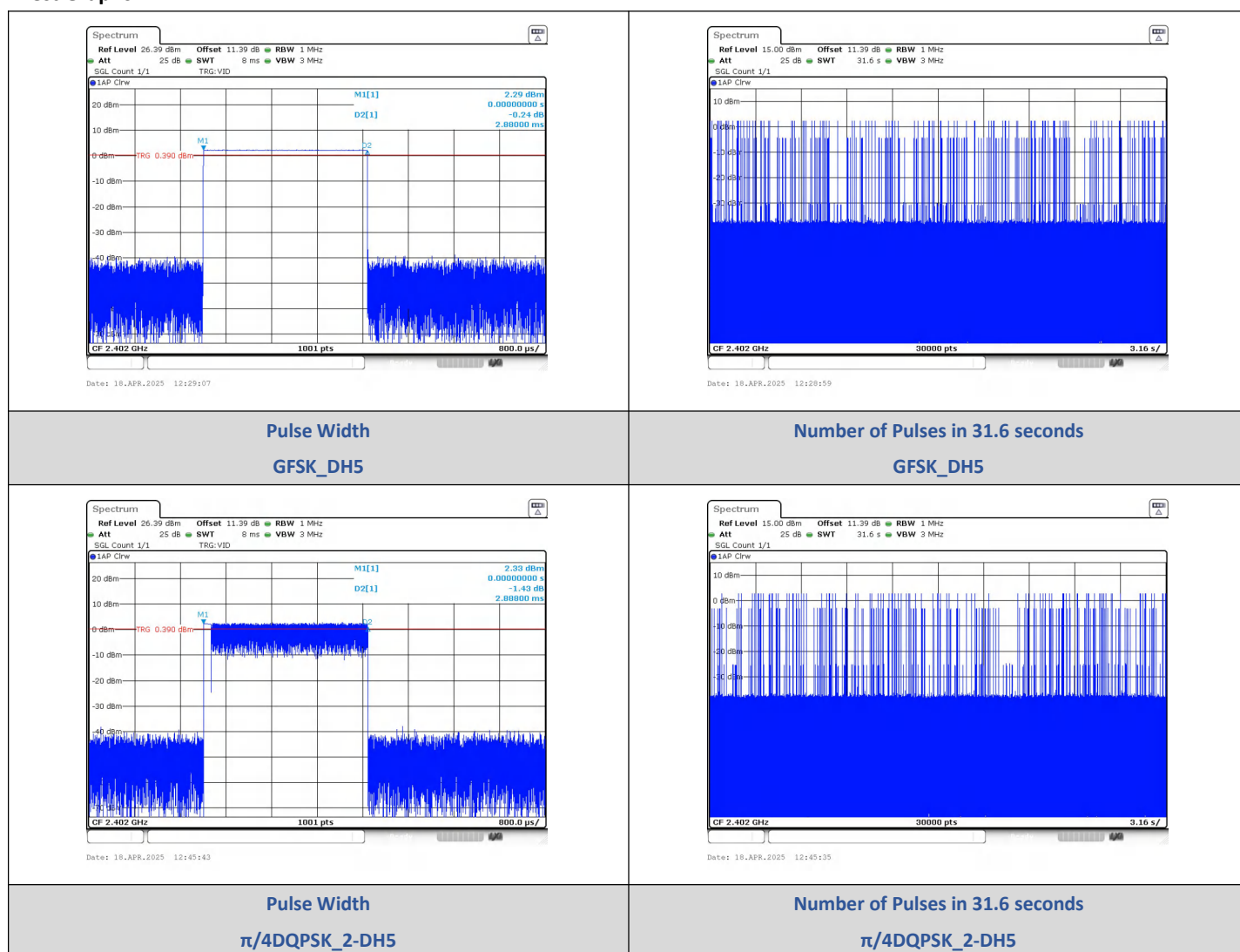
8DPSK(3-DH5)_Channel 78

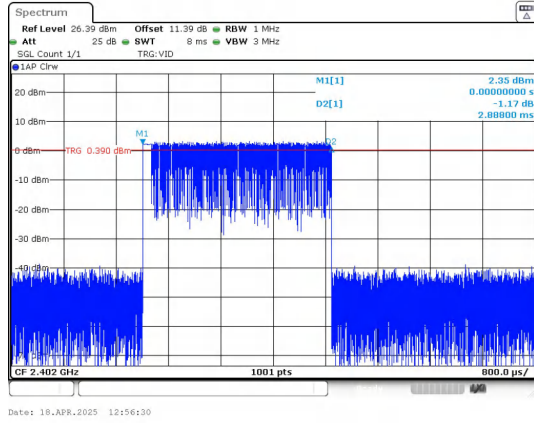
2) Dwell Time

Test Result

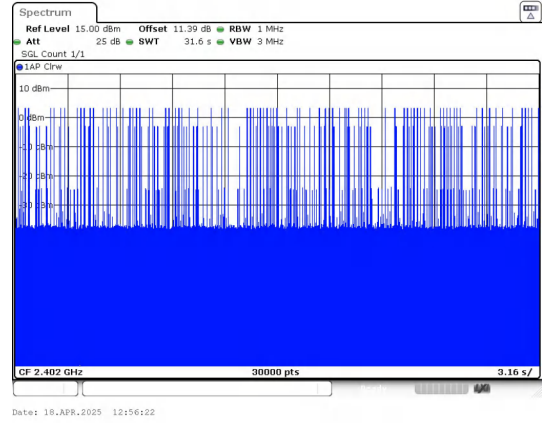
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.880	109	313.92	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	95	274.36		PASS
8DPSK	3-DH5		2.888	112	323.46		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



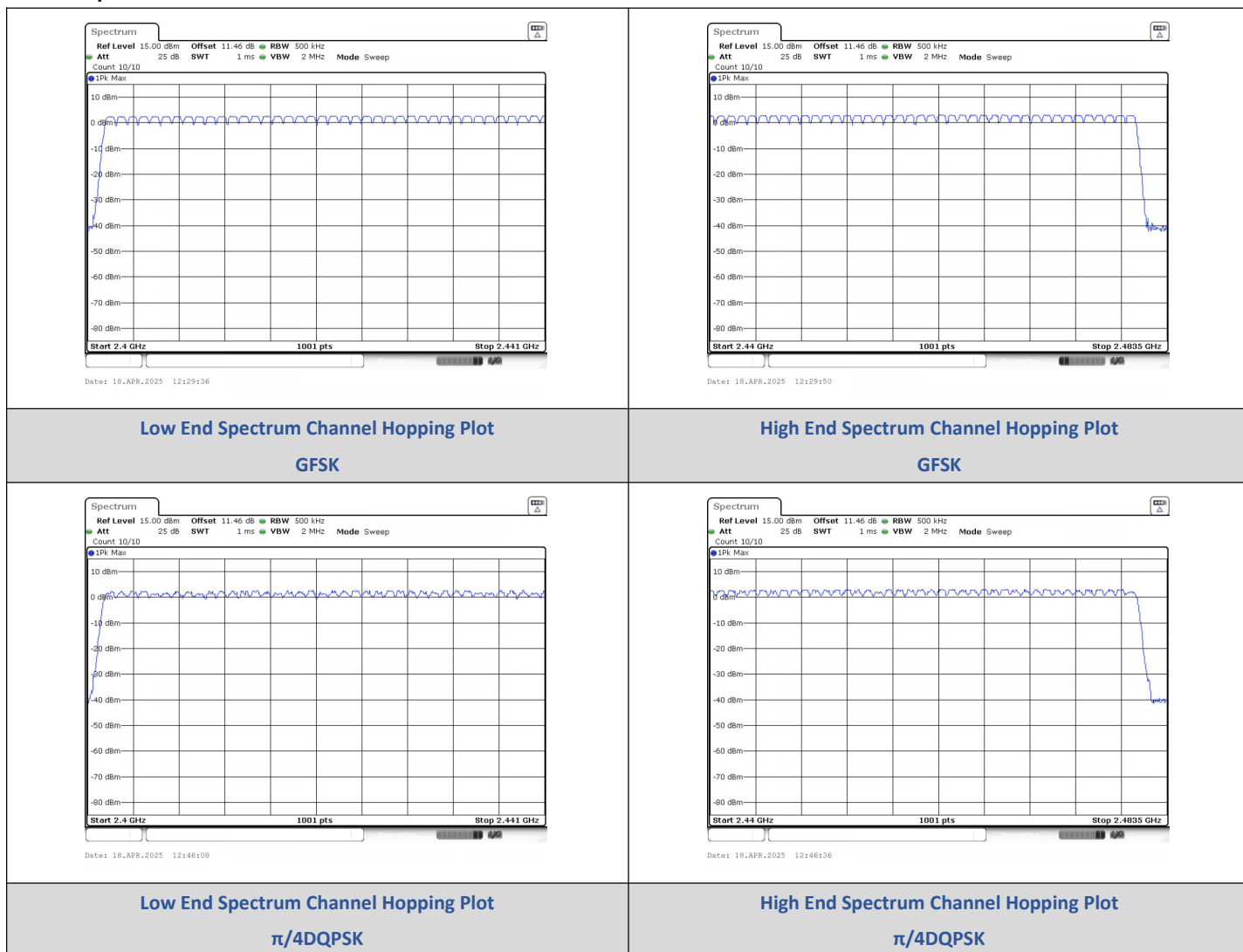
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

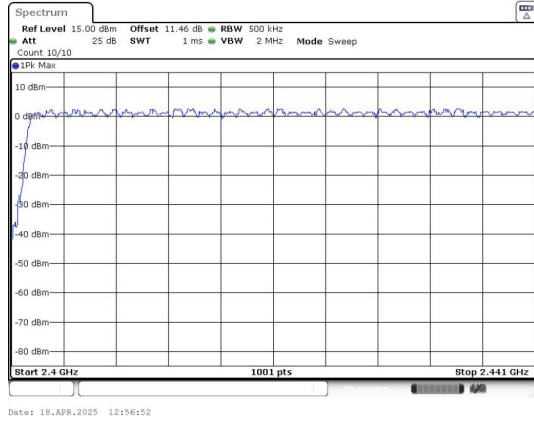
3) Number Of Hopping Channel

Test Result

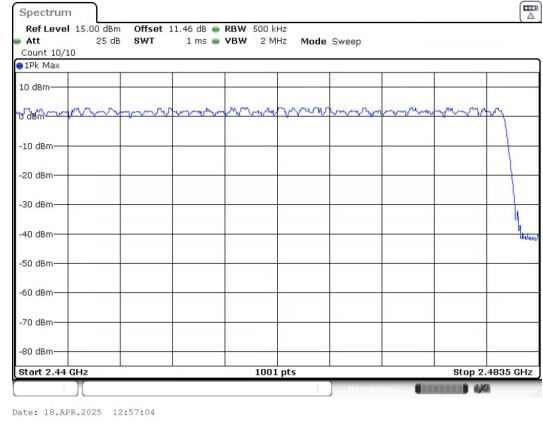
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



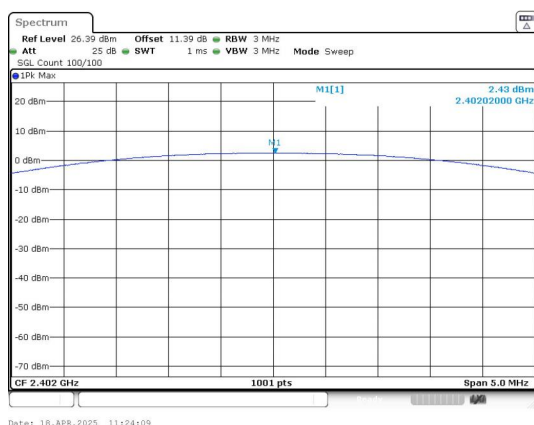
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

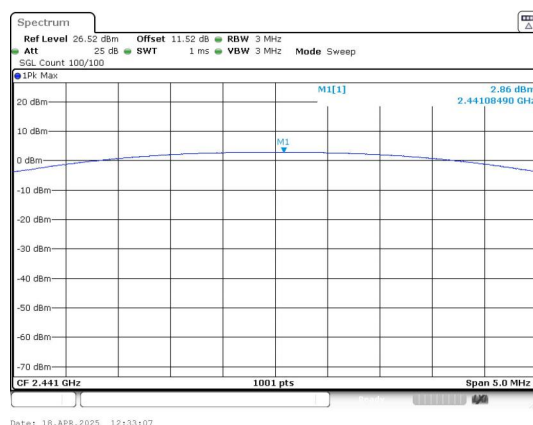
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	2.43	1.75	≤30	PASS
		39	2.86	1.93		PASS
		78	3.14	2.06		PASS
$\pi/4$ DQPSK	2-DH5	0	3.19	2.08	≤20.97	PASS
		39	3.70	2.34		PASS
		78	3.90	2.45		PASS
8DPSK	3-DH5	0	3.68	2.33		PASS
		39	4.13	2.59		PASS
		78	4.34	2.72		PASS

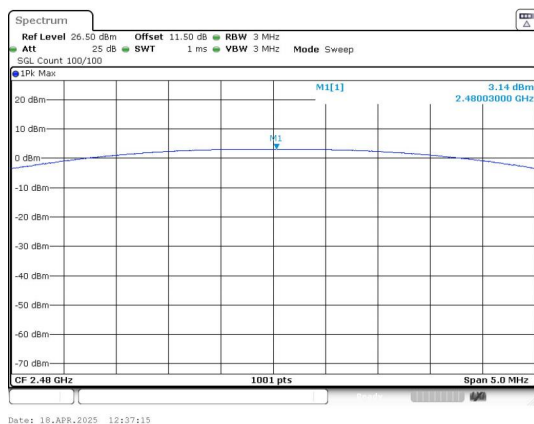
Test Graphs



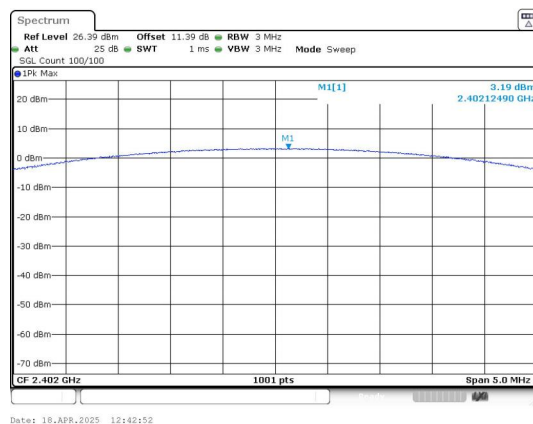
Peak Output Power
GFSK_Channel 0



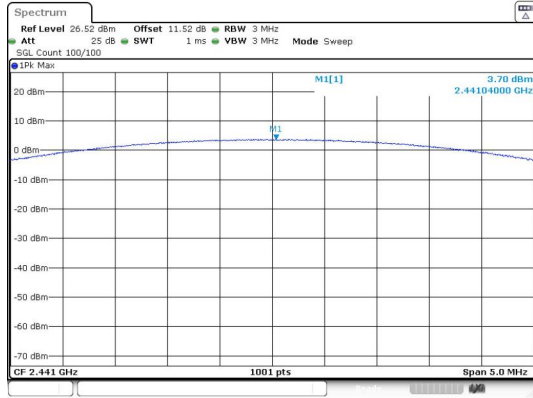
Peak Output Power
GFSK_Channel 39



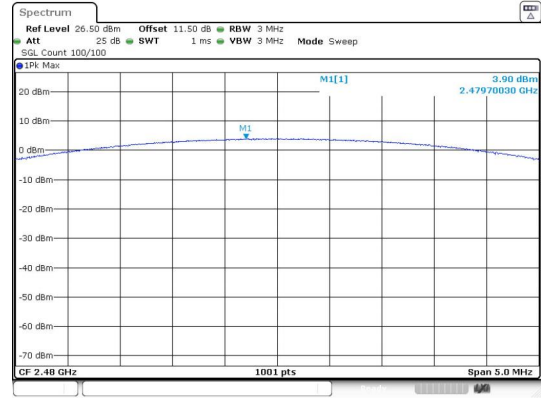
Peak Output Power
GFSK_Channel 78



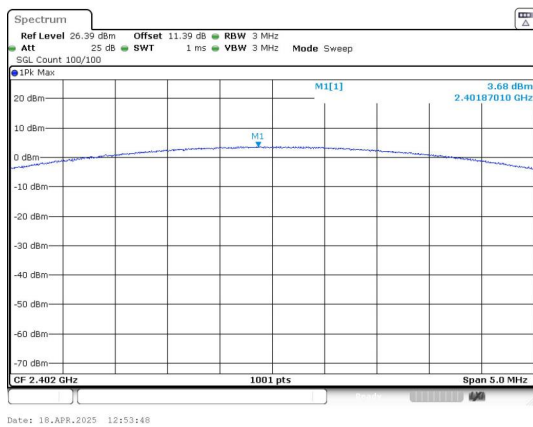
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



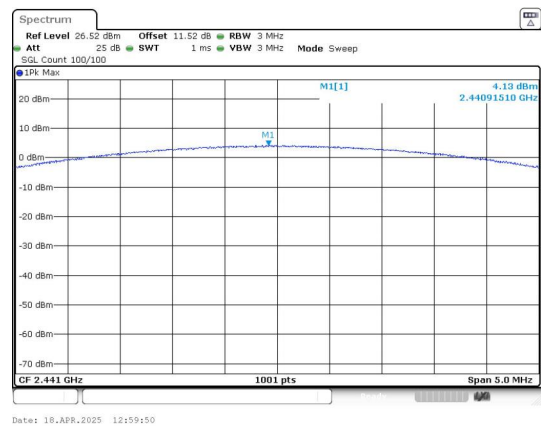
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



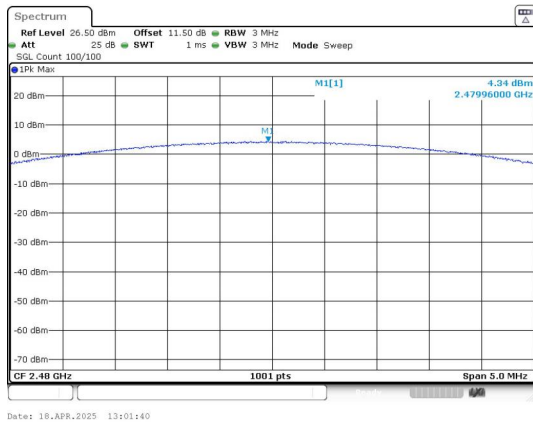
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



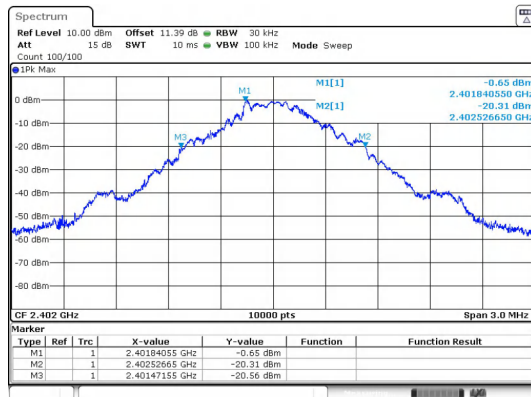
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

Test Result

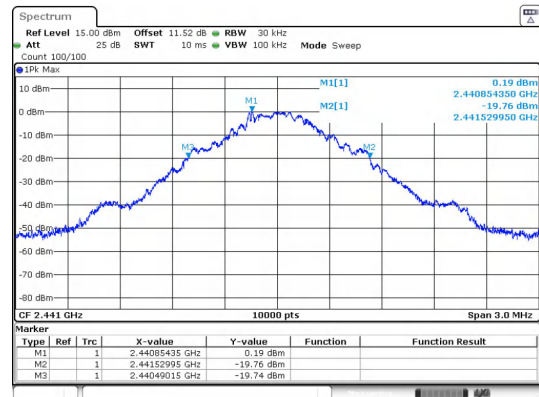
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.06
	39	2441 MHz	1.06
	78	2480 MHz	1.06
$\pi/4$ DQPSK	0	2402 MHz	1.320
	39	2441 MHz	1.330
	78	2480 MHz	1.340
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.280
	78	2480 MHz	1.280

Test Graphs



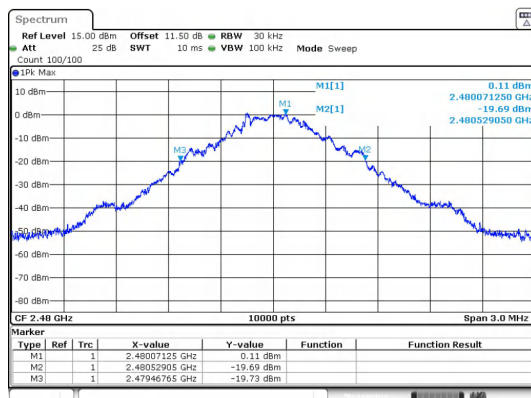
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GFSK_DH5_Channel 0



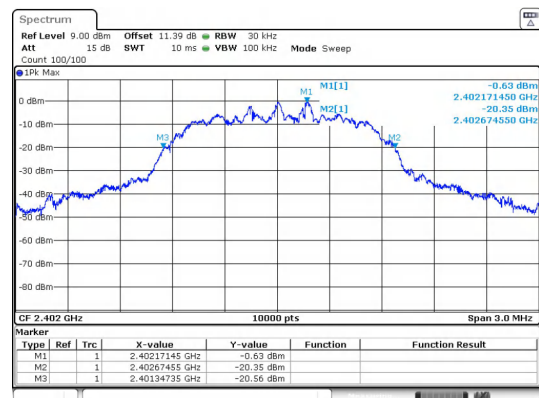
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GFSK_DH5_Channel 39



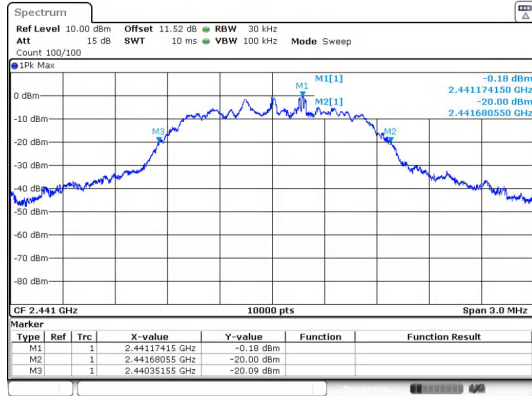
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GFSK_DH5_Channel 78

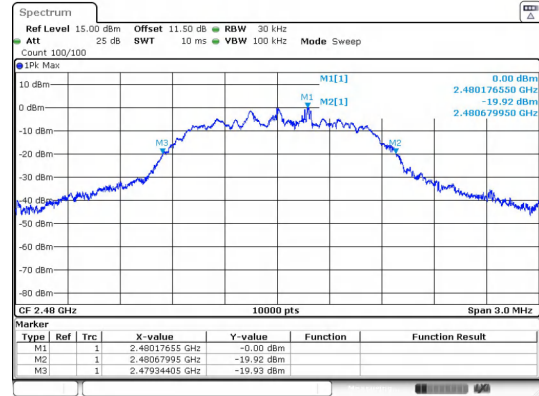


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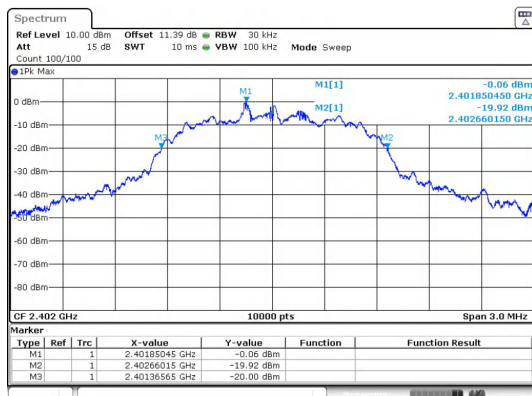
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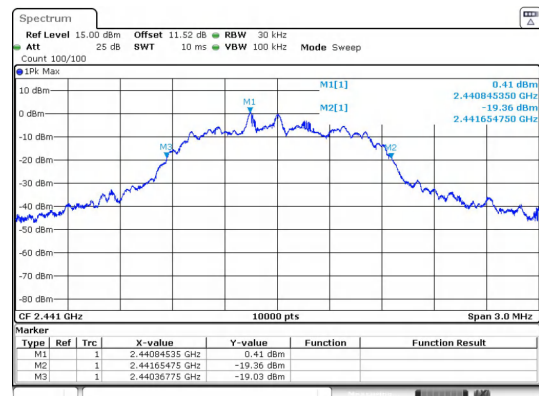
$\pi/4$ DQPSK_2-DH5_Channel 39



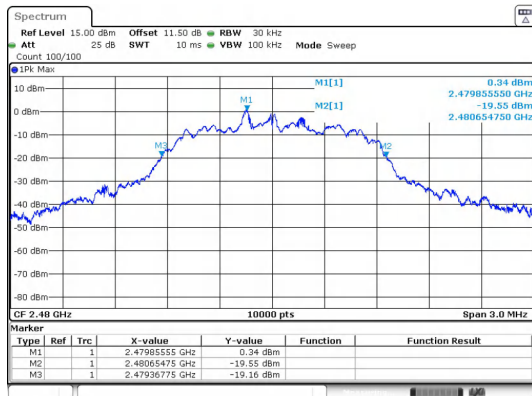
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



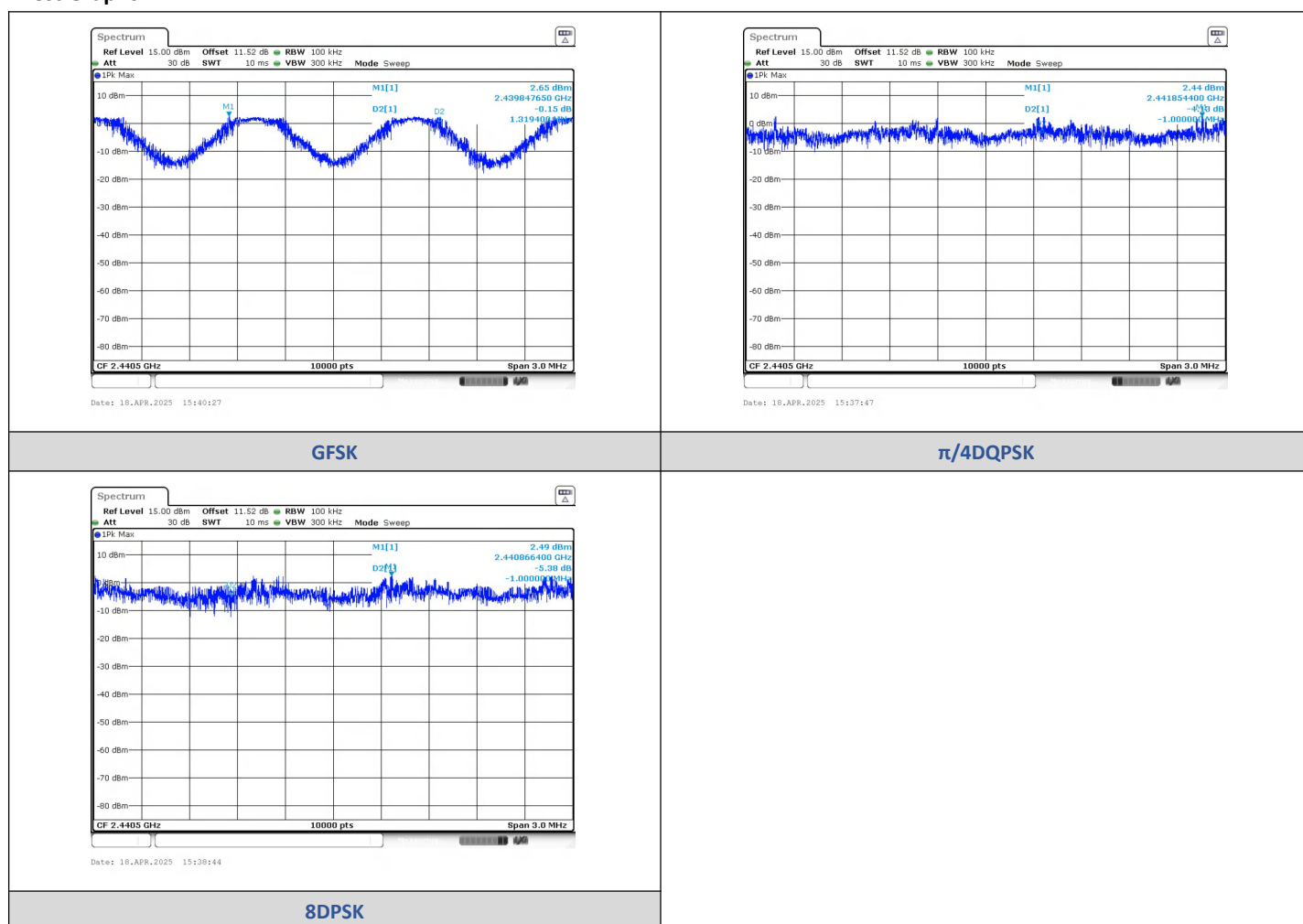
8DPSK_3-DH5_Channel 78

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	2439.8477	2441.1671	1.3194	1.06	PASS
$\pi/4$ QPSK	2-DH5	2440.1966	2440.8349	1	0.893	PASS
8DPSK	3-DH5	2439.9979	2440.8664	1	0.86	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

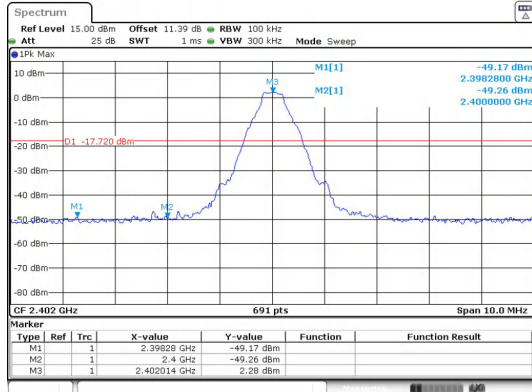
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2398.28	-49.168	-17.72	-31.448	PASS
			2400.00	-49.260	-17.72	-31.540	PASS
			9608.10	-41.256	-17.72	-23.536	PASS
		39	7323.32	-44.506	-17.13	-27.376	PASS
		78	1765.83	-44.107	-16.91	-27.197	PASS
			2483.50	-50.230	-16.91	-33.320	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-48.590	-17.81	-30.780	PASS
			9608.08	-41.644	-17.81	-23.834	PASS
		39	9763.72	-44.571	-17.31	-27.261	PASS
		78	2483.50	-51.150	-17.2	-33.950	PASS
			9920.20	-44.810	-17.2	-27.610	PASS
8DPSK	3-DH5	0	2397.07	-48.744	-17.76	-30.984	PASS
			2400.00	-48.800	-17.76	-31.040	PASS
			9608.10	-41.973	-17.76	-24.213	PASS
		39	9763.72	-42.727	-17.32	-25.407	PASS
		78	2483.50	-48.510	-17.26	-31.250	PASS
			9920.20	-43.299	-17.26	-26.039	PASS

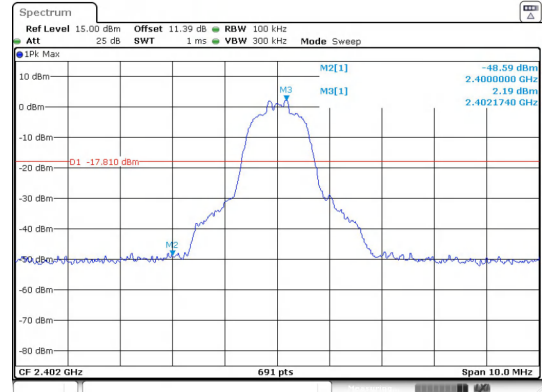
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.80	-47.542	-17.95	-29.592	PASS
			2400.00	-50.250	-17.95	-32.300	PASS
			2483.50	-50.090	-17.37	-32.720	PASS
$\pi/4$ DQPSK	2-DH5		2397.51	-48.528	-18.22	-30.308	PASS
			2400.00	-49.730	-18.22	-31.510	PASS
			2483.50	-48.980	-17.26	-31.720	PASS
8DPSK	3-DH5		2395.80	-48.041	-17.72	-30.321	PASS
			2400.00	-49.350	-17.72	-31.630	PASS
			2483.50	-48.400	-17.59	-30.810	PASS

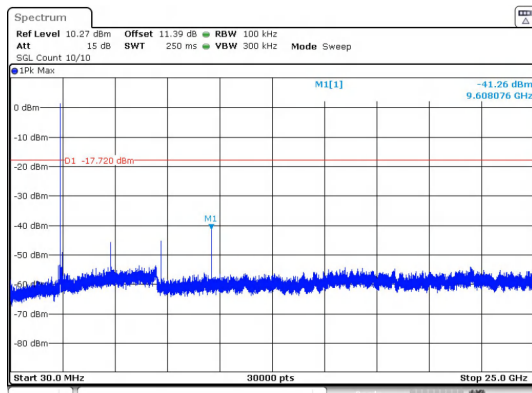
Test Graphs



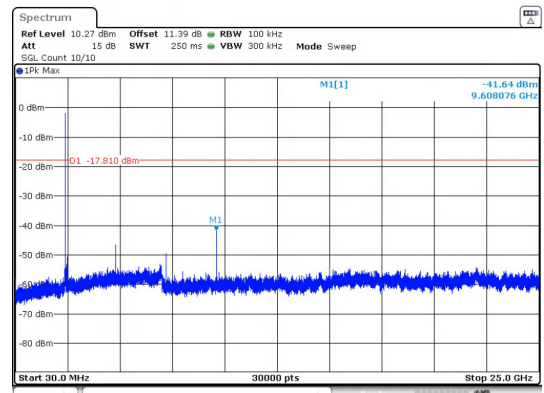
Out Of Band Emission
GFSK_DH5_Channel 0



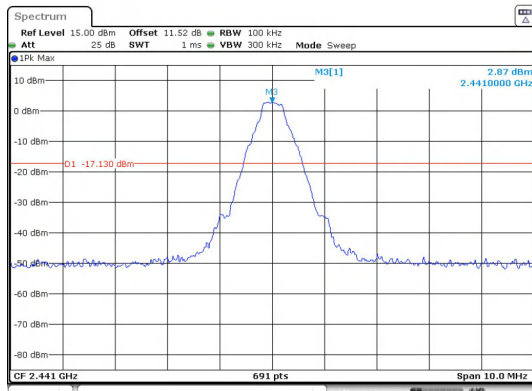
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



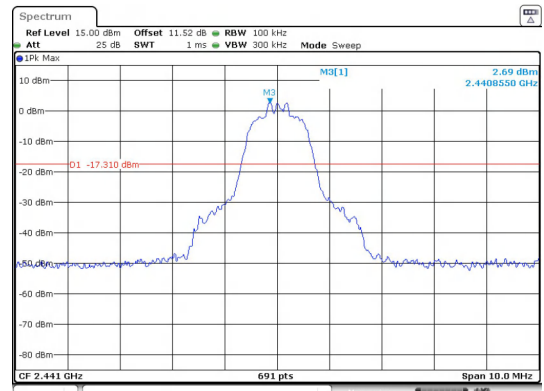
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



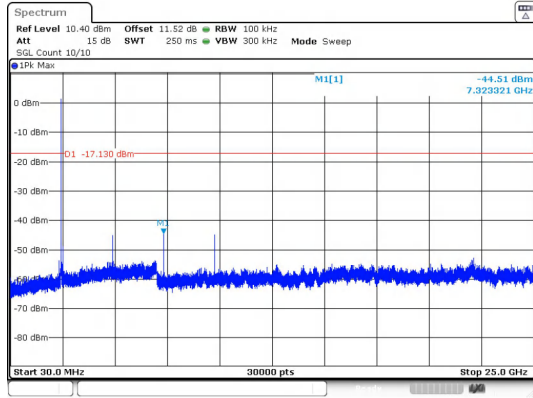
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



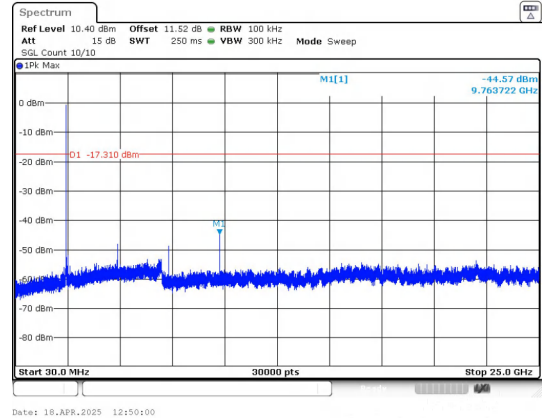
Out Of Band Emission
GFSK_DH5_Channel 39



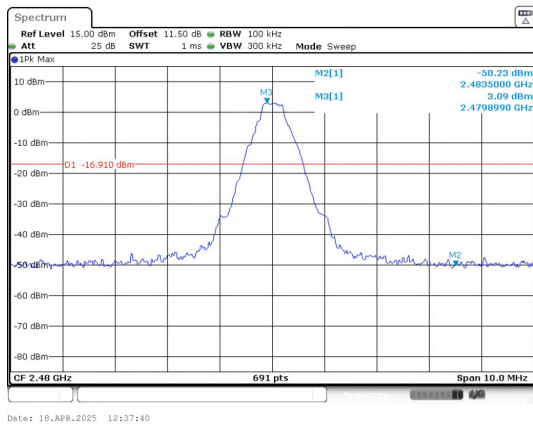
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



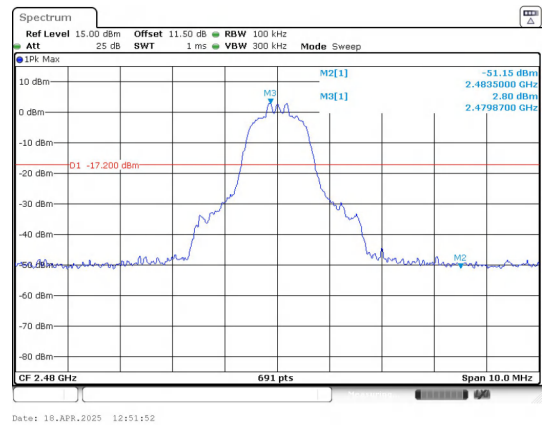
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



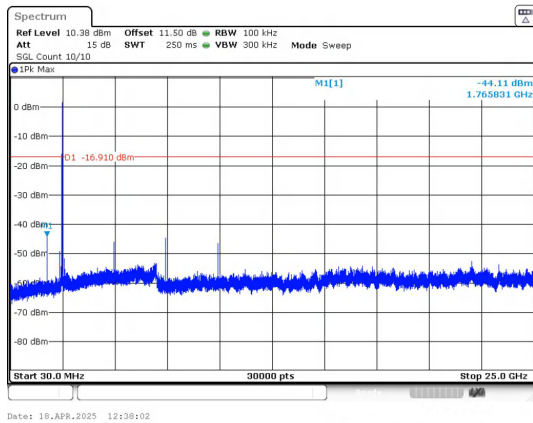
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



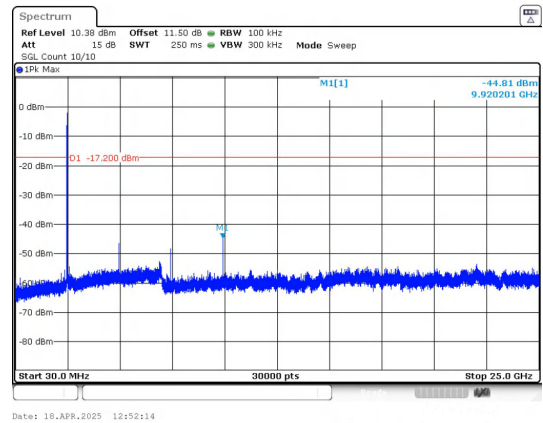
Out Of Band Emission
GFSK_DH5_Channel 78



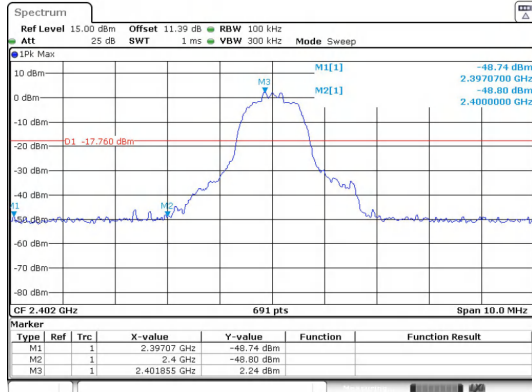
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



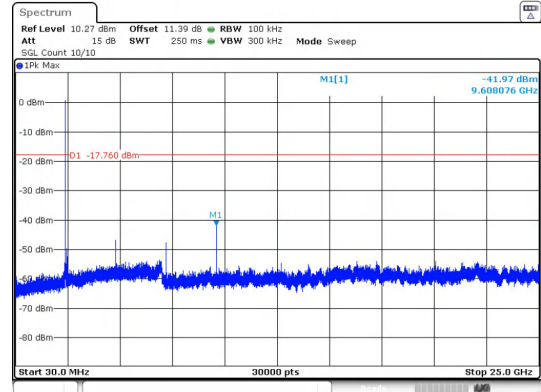
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



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



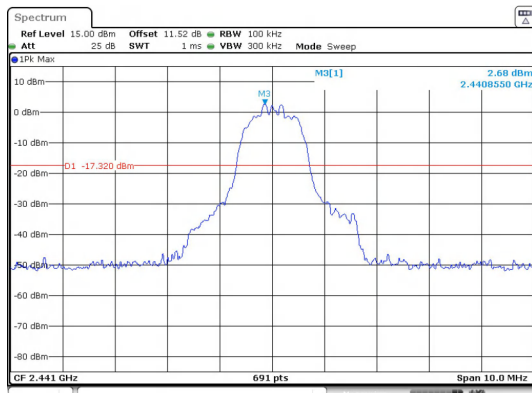
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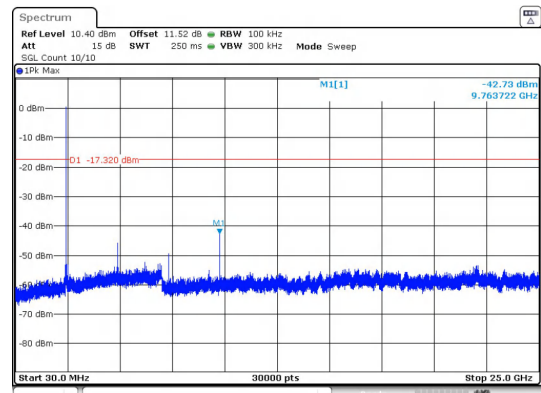
Date: 18.APR.2025 12:54:35

Out Of Band Emission
8DPSK_3-DH5_Channel 0

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



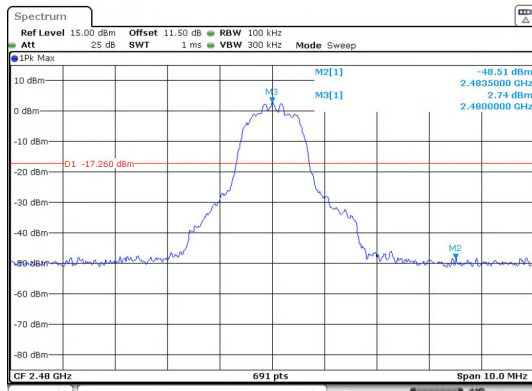
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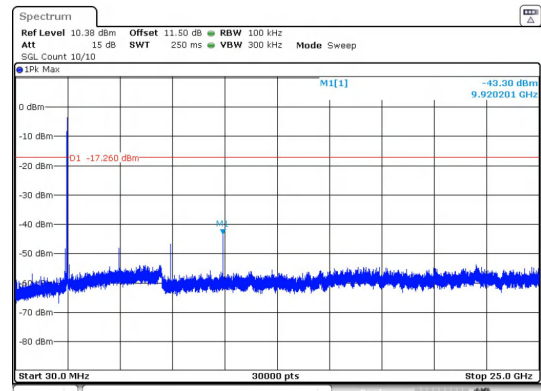
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Out Of Band Emission
8DPSK_3-DH5_Channel 39

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



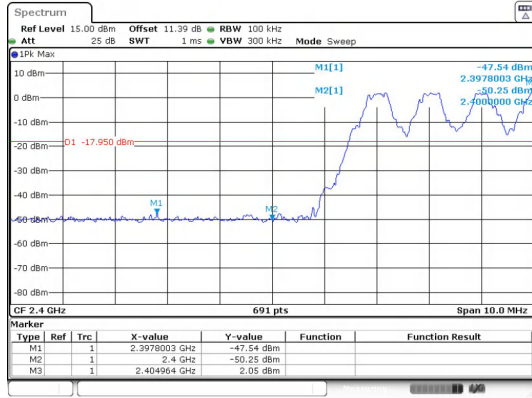
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Date: 18.APR.2025 13:02:27

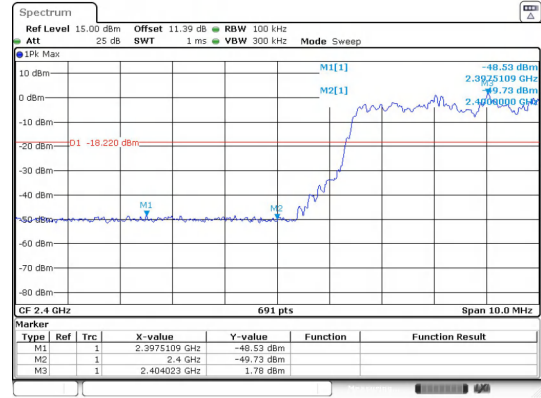
Out Of Band Emission
8DPSK_3-DH5_Channel 78

30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



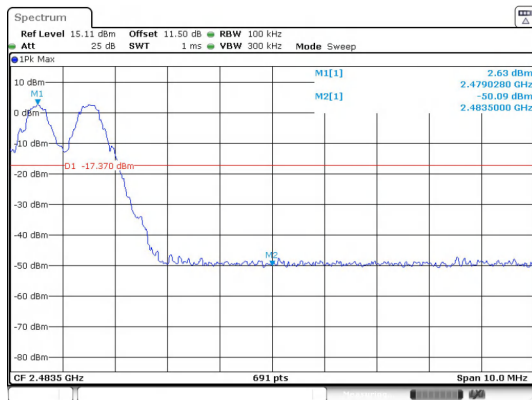
Date: 18.APR.2025 12:13:15

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



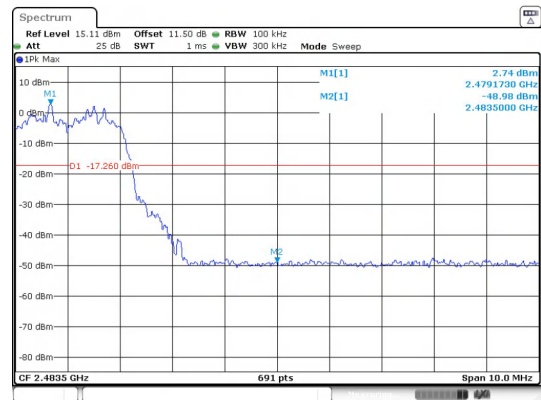
Date: 18.APR.2025 12:47:18

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



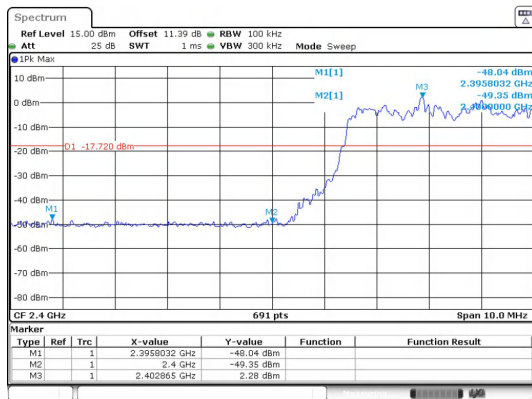
Date: 18.APR.2025 12:31:06

Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



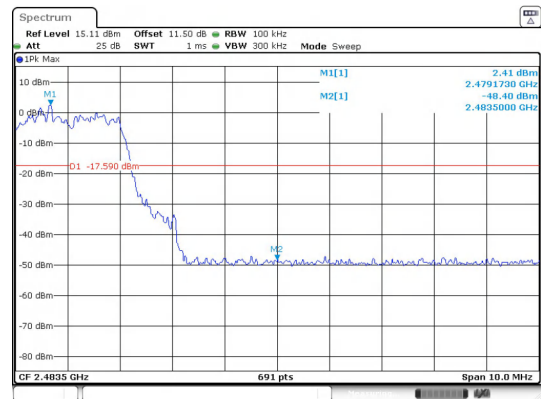
Date: 18.APR.2025 12:47:48

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



Date: 18.APR.2025 12:57:48

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



Date: 18.APR.2025 12:58:29

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

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