

Appendix Report

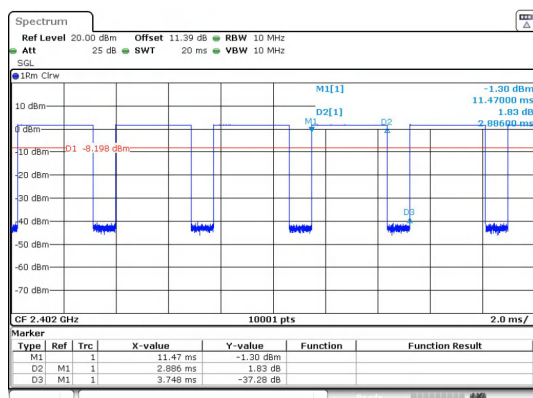
Project No.:	CISR250321178
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Duty Cycle

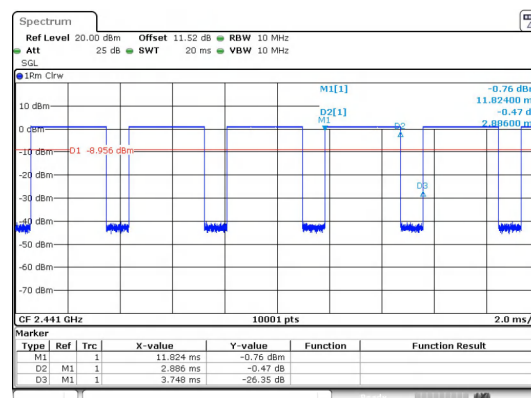
Test Result

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	2.888	3.748	77.05	0.7705	1.1323	0.3463
$\pi/4$ 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	2.892	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	2.892	3.748	77.16	0.7716	1.1261	0.3458

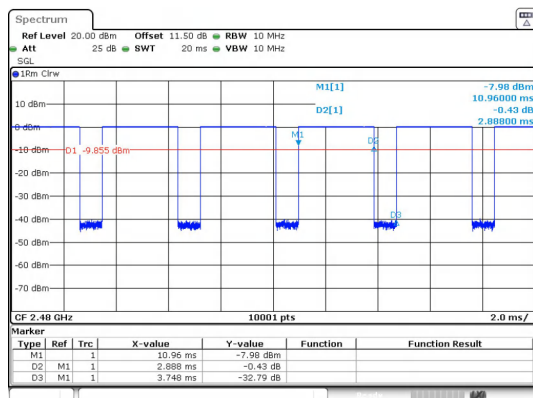
Test Graphs



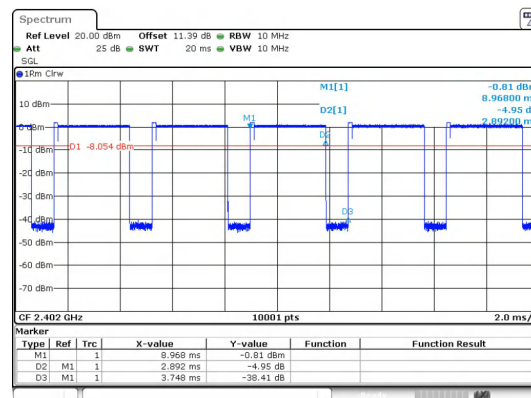
GFSK(DH5)_Channel 0

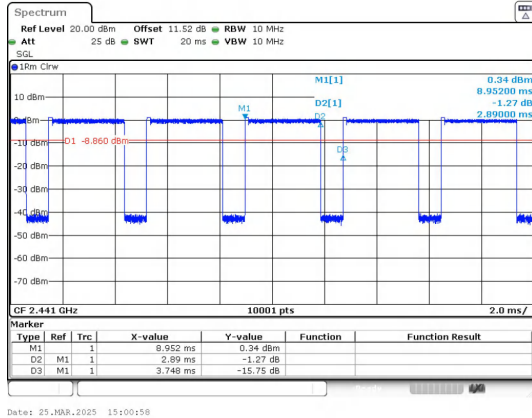


GFSK(DH5)_Channel 39

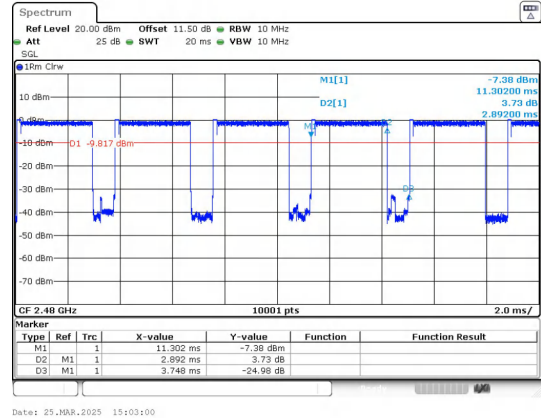


GFSK(DH5)_Channel 78

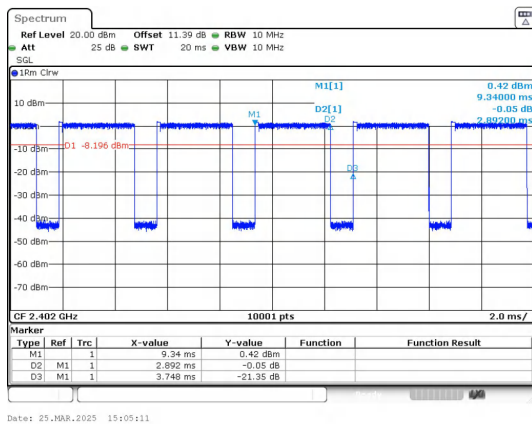

 $\pi/4$ DQPSK(2-DH5)_Channel 0



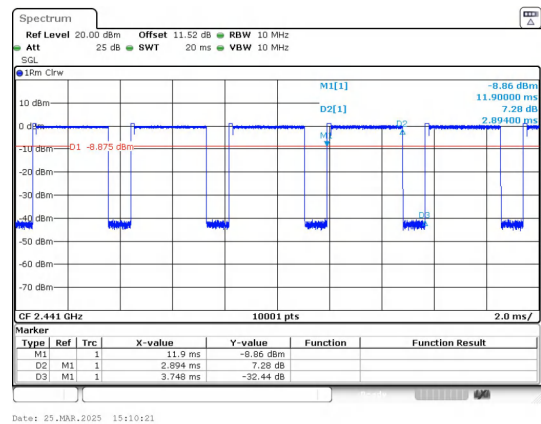
$\pi/4$ DQPSK(2-DH5)_Channel 39



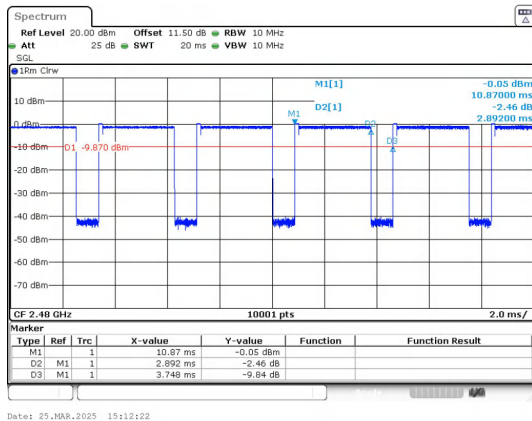
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



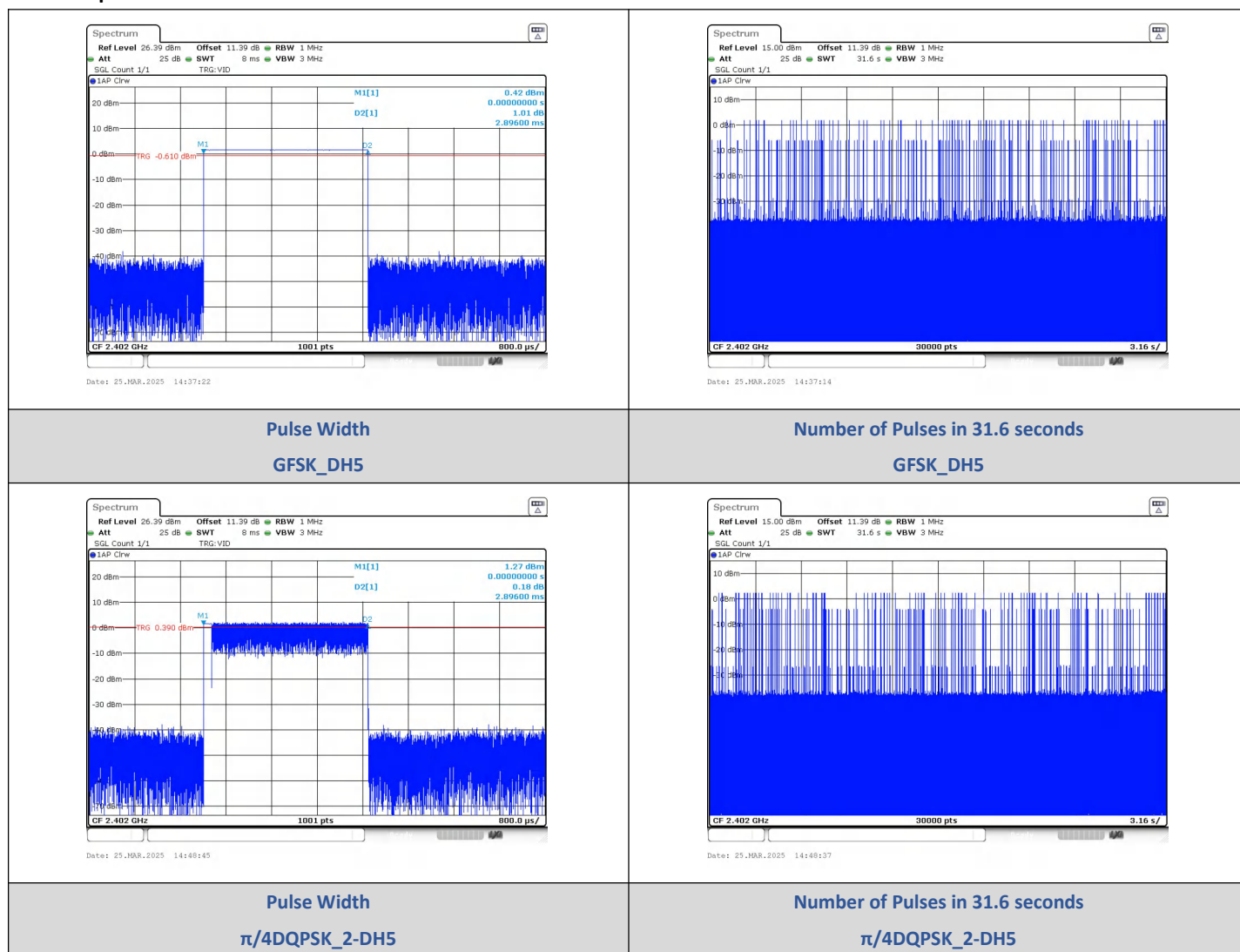
8DPSK(3-DH5)_Channel 78

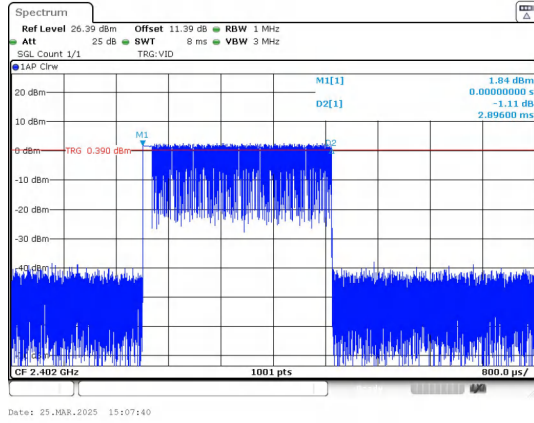
2) Dwell Time

Test Result

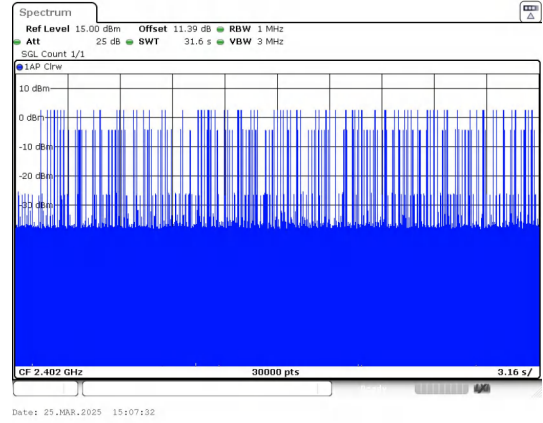
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.896	97	280.91	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	104	301.18		PASS
8DPSK	3-DH5		2.896	96	278.02		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



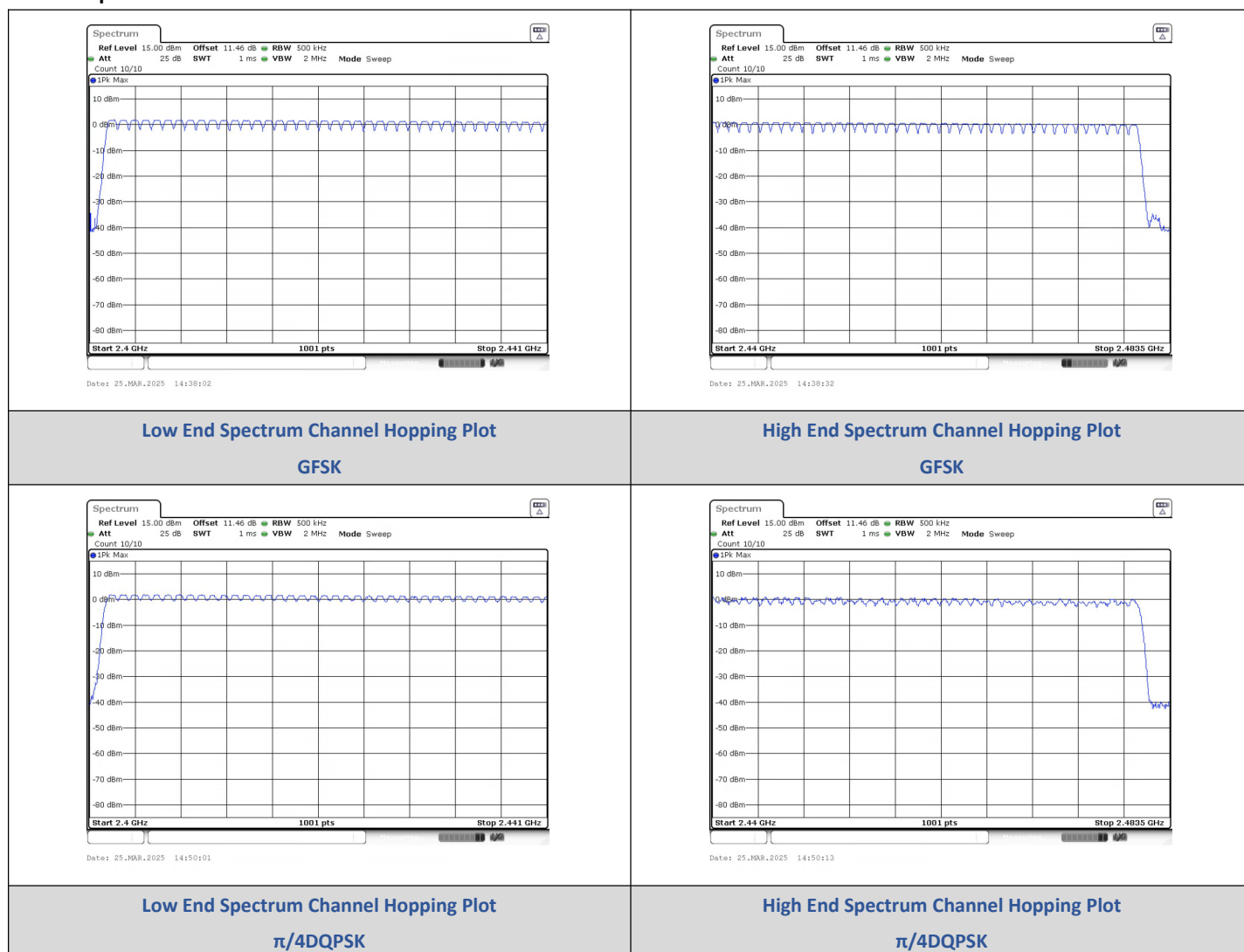
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

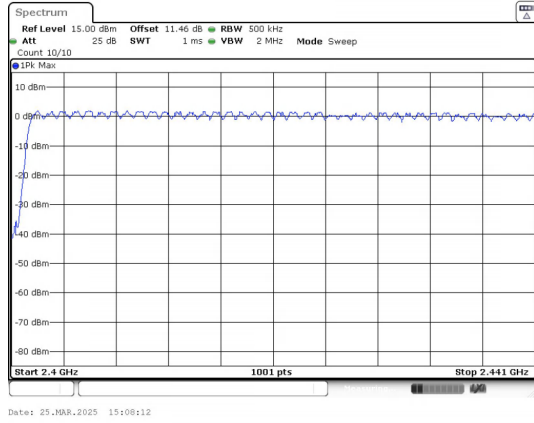
3) Number Of Hopping Channel

Test Result

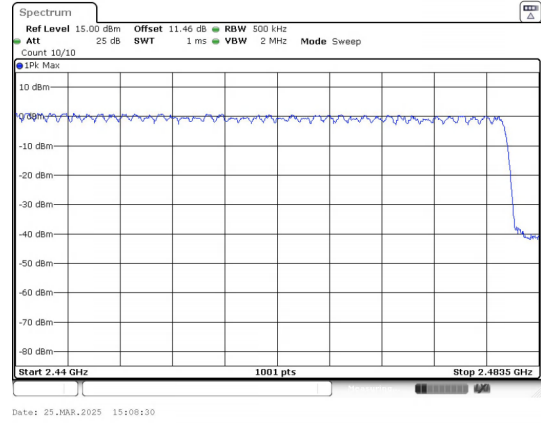
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



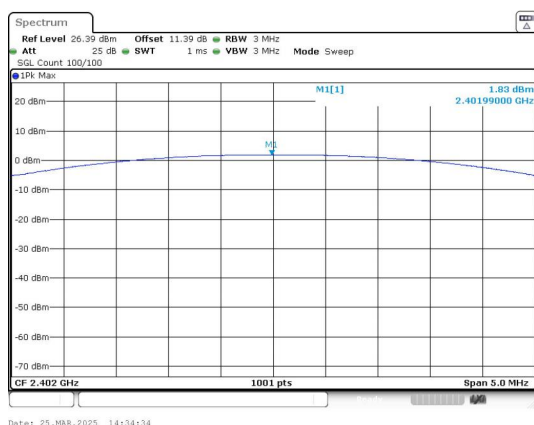
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Output Power

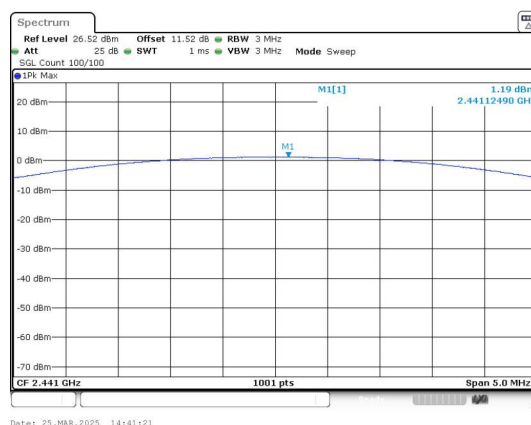
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.83	1.52	≤30	PASS
		39	1.19	1.32		PASS
		78	0.27	1.06		PASS
$\pi/4$ DQPSK	2-DH5	0	2.76	1.89	≤20.97	PASS
		39	2.07	1.61		PASS
		78	1.02	1.26		PASS
8DPSK	3-DH5	0	3.07	2.03		PASS
		39	2.32	1.71		PASS
		78	1.39	1.38		PASS

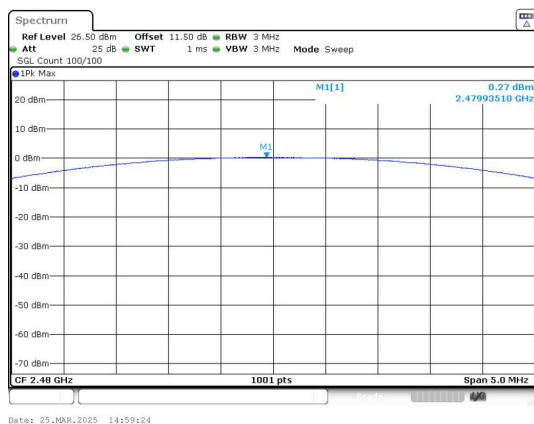
Test Graphs



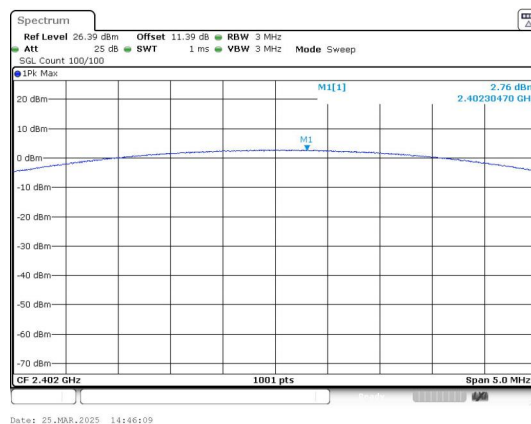
Peak Output Power
GFSK_Channel 0



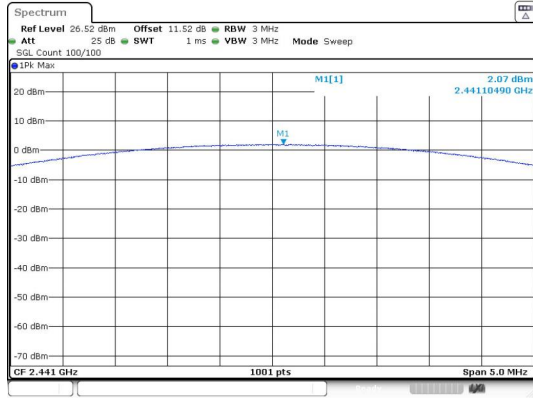
Peak Output Power
GFSK_Channel 39



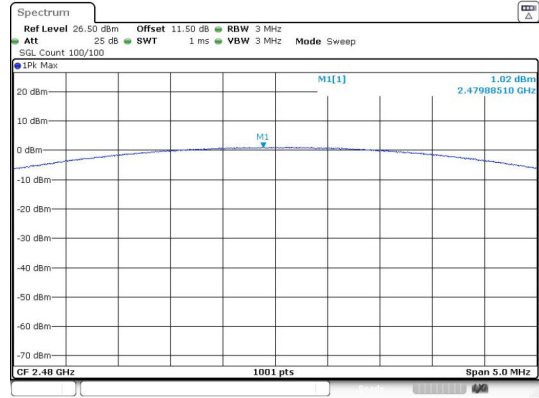
Peak Output Power
GFSK_Channel 78



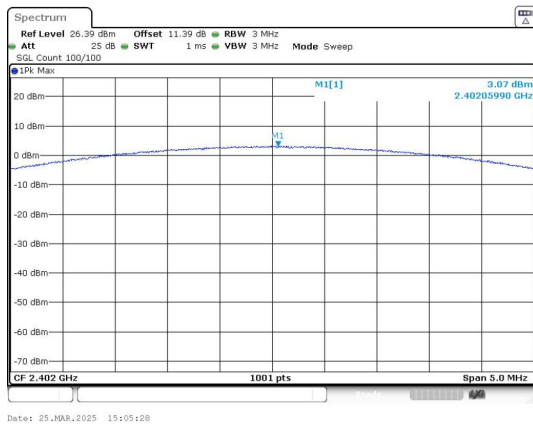
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



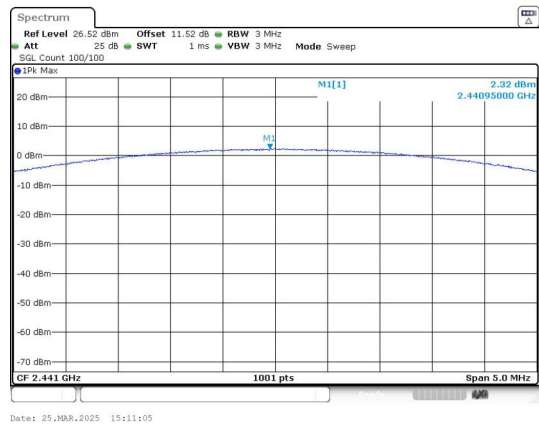
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



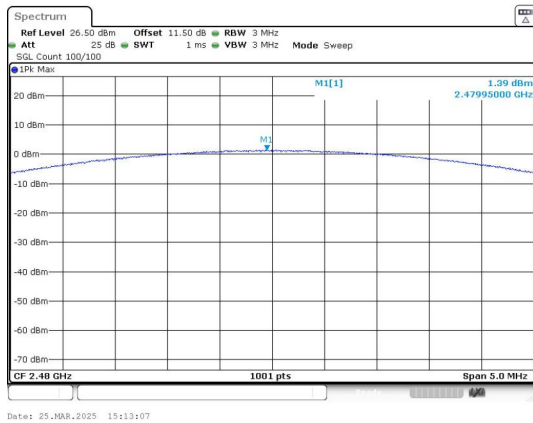
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



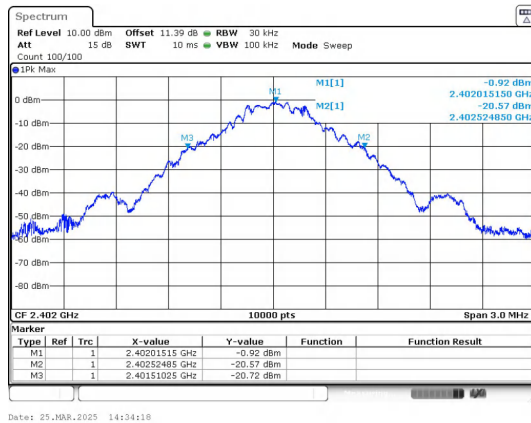
Peak Output Power
8DPSK_Channel 78

5) 20dB Bandwidth

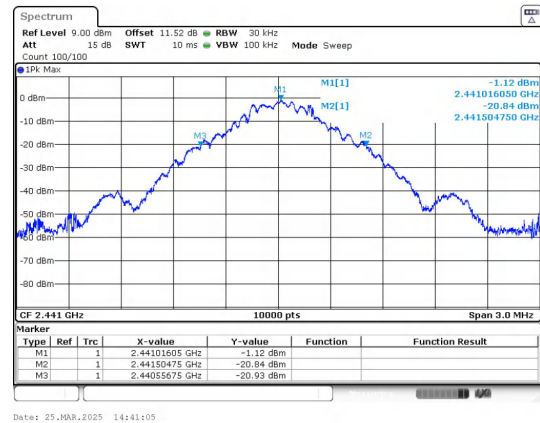
Test Result

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

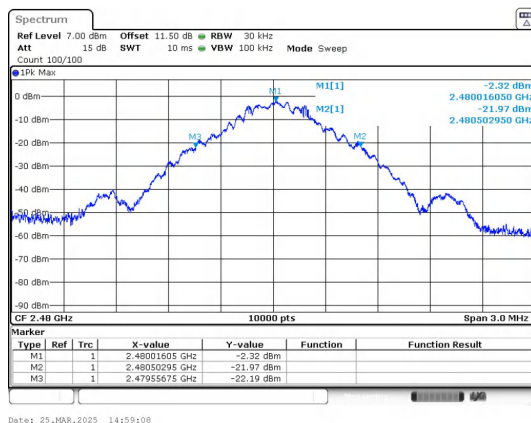
Test Graphs



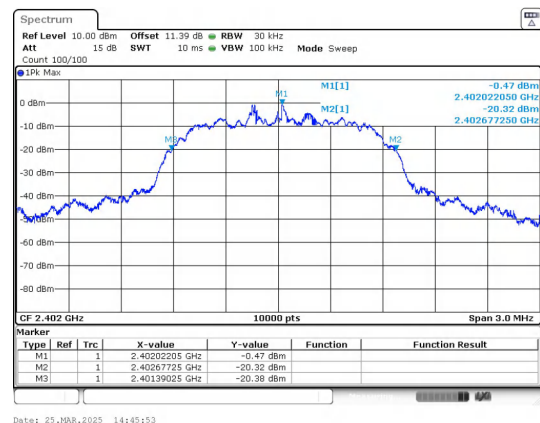
GFSK_DH5_Channel 0

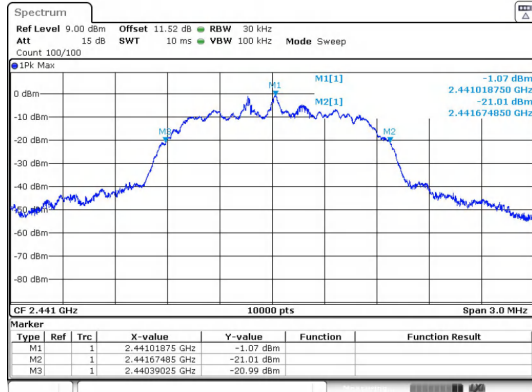


GFSK_DH5_Channel 39

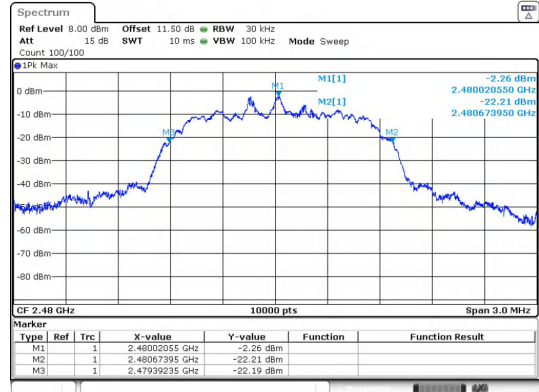


GFSK_DH5_Channel 78

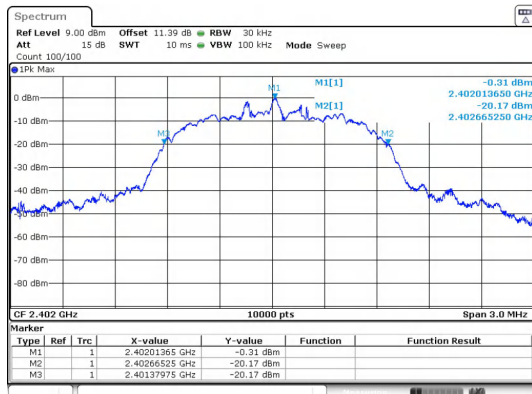

 $\pi/4$ DQPSK_2-DH5_Channel 0



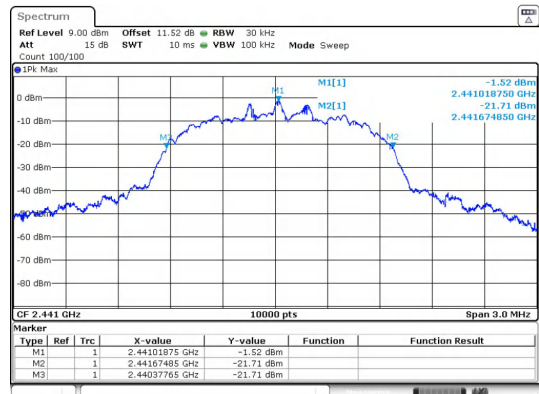
$\pi/4$ DQPSK_2-DH5_Channel 39



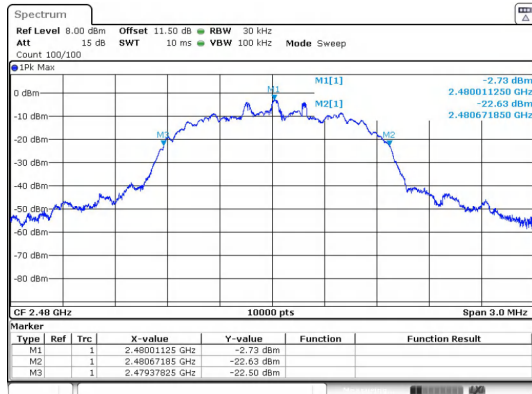
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



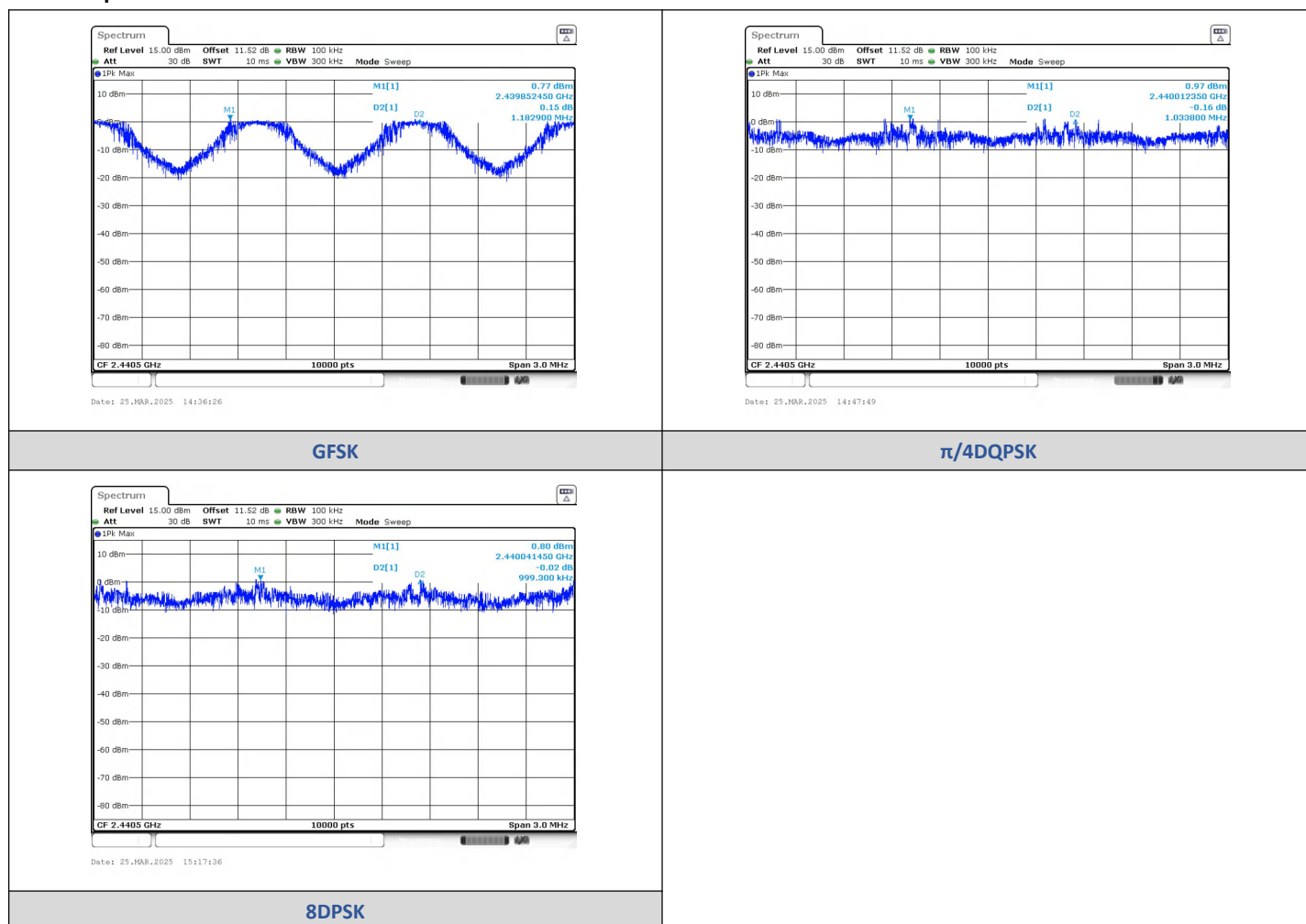
8DPSK_3-DH5_Channel 78

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	2439.8524	2441.0354	1.1829	1.01	PASS
$\pi/4$ DQPSK	2-DH5	2440.0123	2441.0462	1.0338	0.86	PASS
8DPSK	3-DH5	2440.0415	2441.0408	0.9993	0.86	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

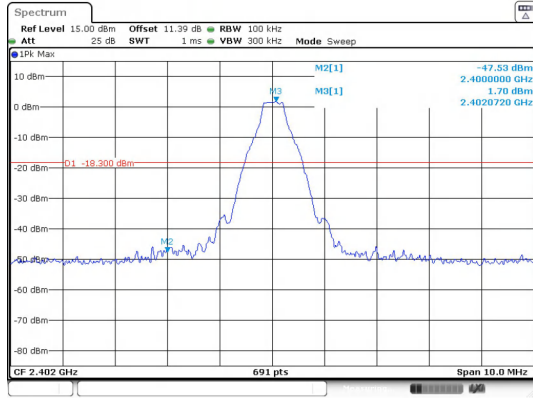
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-47.530	-18.3	-29.230	PASS
			9608.08	-44.251	-18.3	-25.951	PASS
		39	9763.72	-41.769	-19.02	-22.749	PASS
		78	2483.50	-50.340	-19.94	-30.400	PASS
			9920.20	-39.439	-19.94	-19.499	PASS
$\pi/4$ DQPSK	2-DH5	0	2398.35	-48.432	-18.29	-30.142	PASS
			2400.00	-49.580	-18.29	-31.290	PASS
			9608.10	-43.721	-18.29	-25.431	PASS
		39	9764.55	-42.438	-18.94	-23.498	PASS
		78	2483.50	-50.900	-19.9	-31.000	PASS
			9920.20	-39.131	-19.9	-19.231	PASS
8DPSK	3-DH5	0	2400.00	-47.610	-18.31	-29.300	PASS
			9608.08	-43.426	-18.31	-25.116	PASS
		39	9763.72	-41.808	-19.28	-22.528	PASS
		78	825.29	-38.331	-20.13	-18.201	PASS
			2483.50	-50.140	-20.13	-30.010	PASS

Hopping

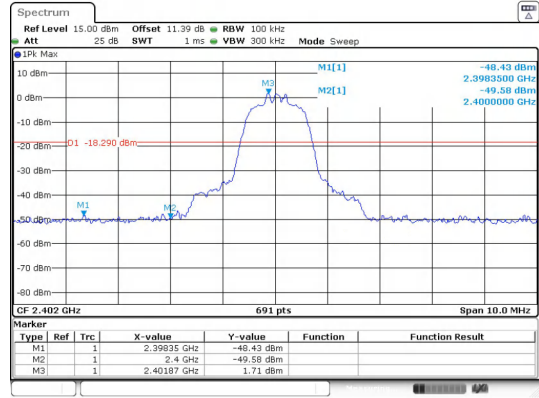
Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.59	-48.978	-18.3	-30.678	PASS
			2400.00	-50.410	-18.3	-32.110	PASS
			2483.50	-48.390	-20.38	-28.010	PASS
$\pi/4$ DQPSK	2-DH5		2398.00	-47.884	-18.27	-29.614	PASS
			2400.00	-49.930	-18.27	-31.660	PASS
			2483.50	-50.020	-21.89	-28.130	PASS
8DPSK	3-DH5		2395.85	-48.437	-20.61	-27.827	PASS
			2400.00	-50.870	-20.61	-30.260	PASS
			2483.50	-48.930	-20.17	-28.760	PASS

Test Graphs



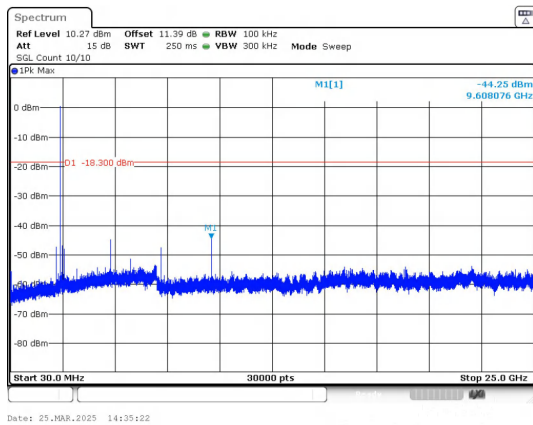
Date: 25.MAR.2025 14:13:159

Out Of Band Emission
GFSK_DH5_Channel 0



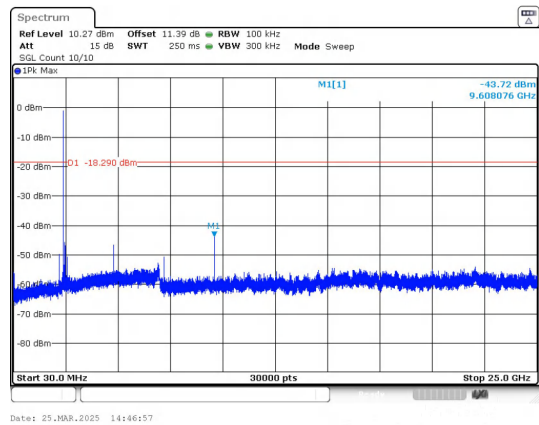
Date: 25.MAR.2025 14:14:134

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



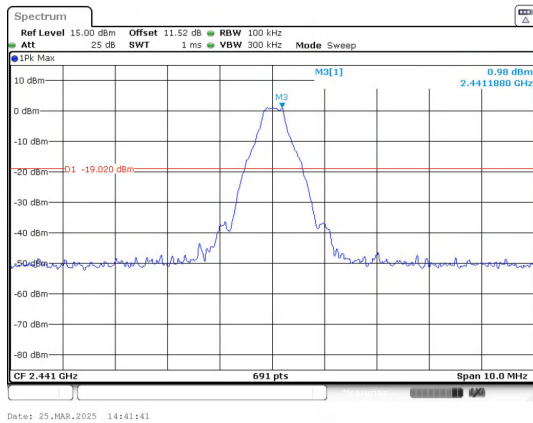
Date: 25.MAR.2025 14:13:122

30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



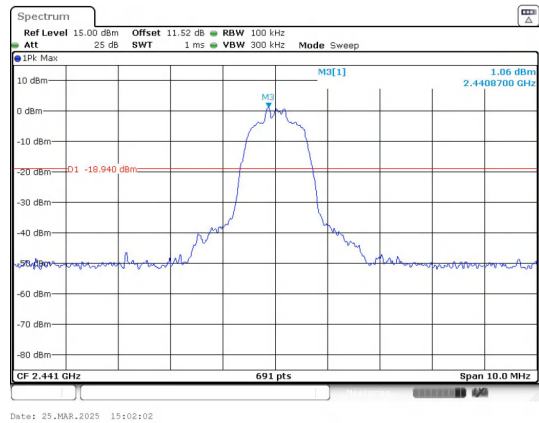
Date: 25.MAR.2025 14:14:157

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



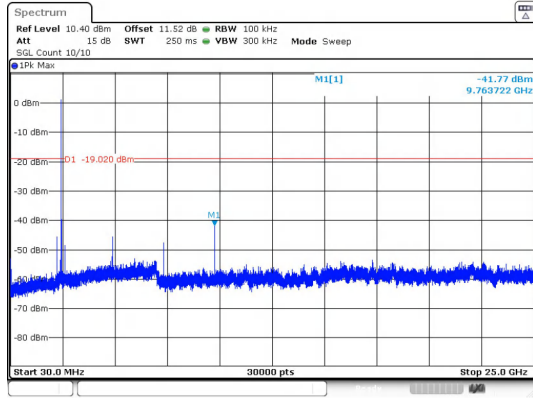
Date: 25.MAR.2025 14:41:141

Out Of Band Emission
GFSK_DH5_Channel 39

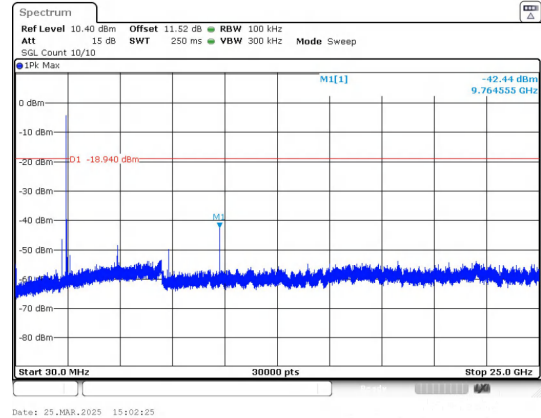


Date: 25.MAR.2025 15:02:102

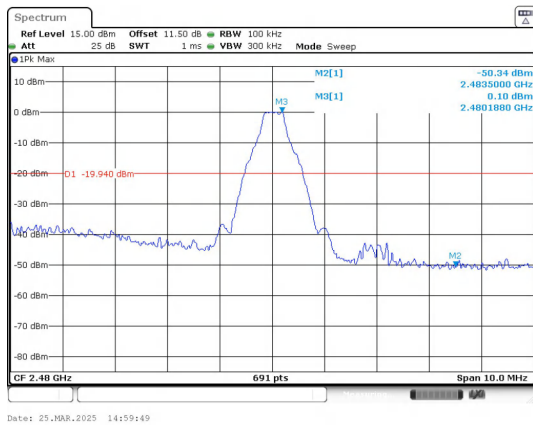
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



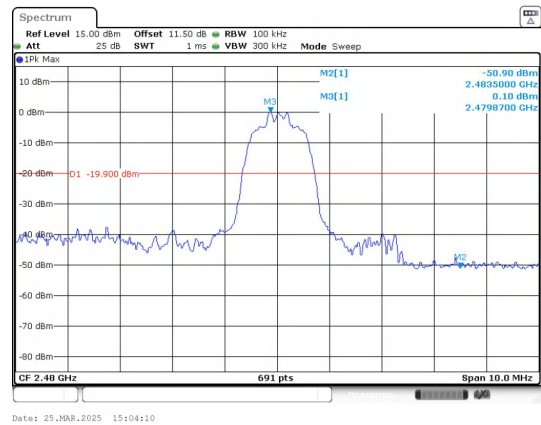
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



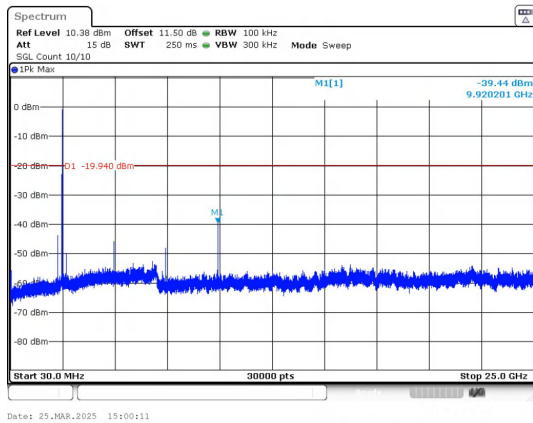
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



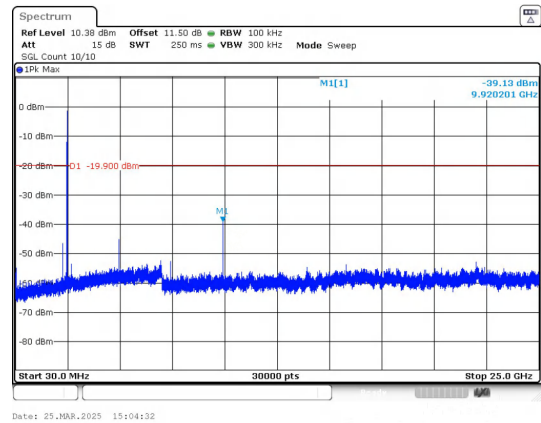
Out Of Band Emission
GFSK_DH5_Channel 78



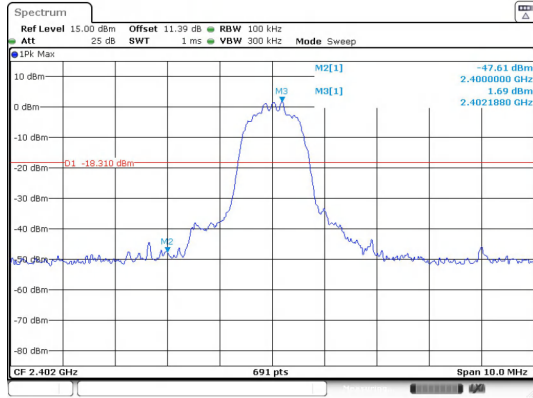
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



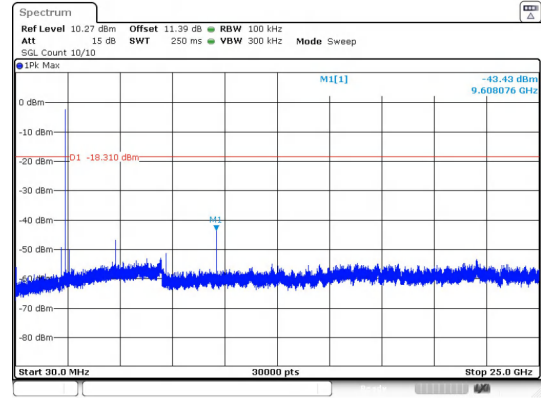
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



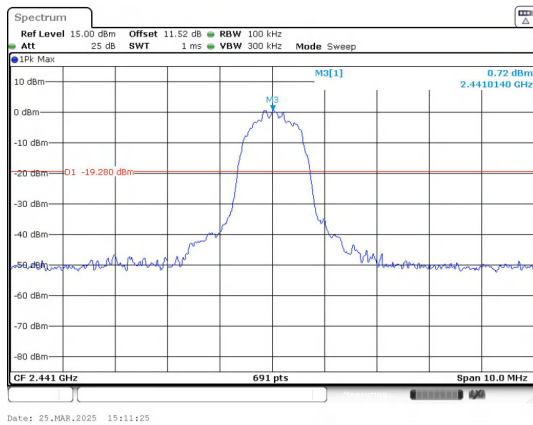
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



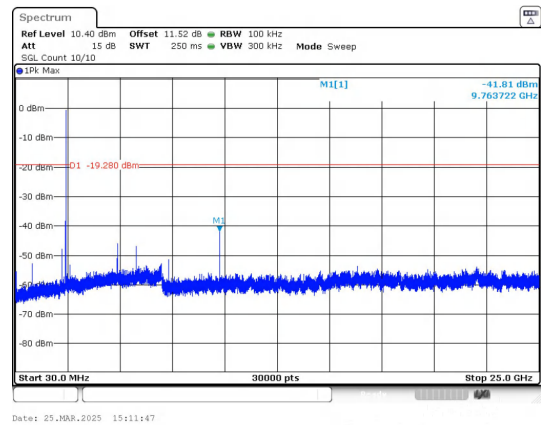
Out Of Band Emission
8DPSK_3-DH5_Channel 0



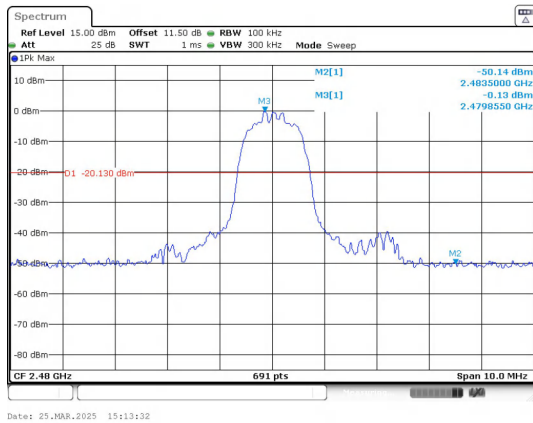
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



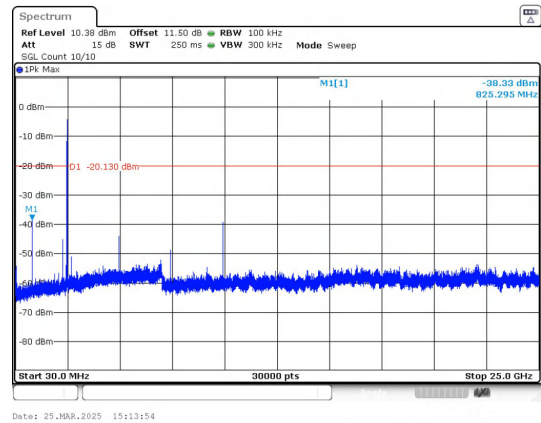
Out Of Band Emission
8DPSK_3-DH5_Channel 39



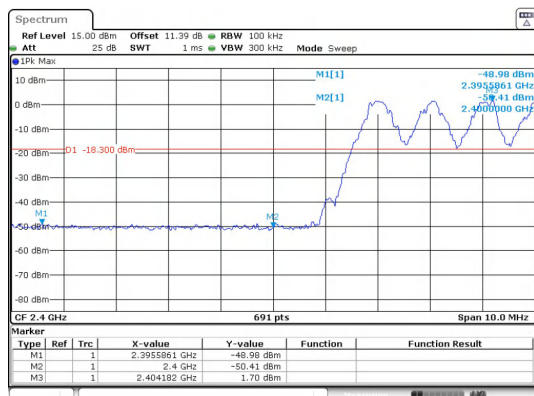
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



Out Of Band Emission
8DPSK_3-DH5_Channel 78

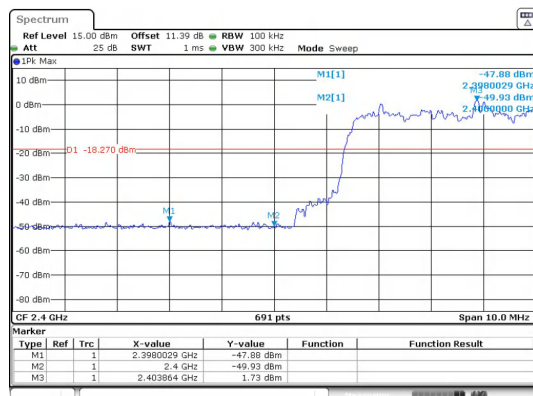


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



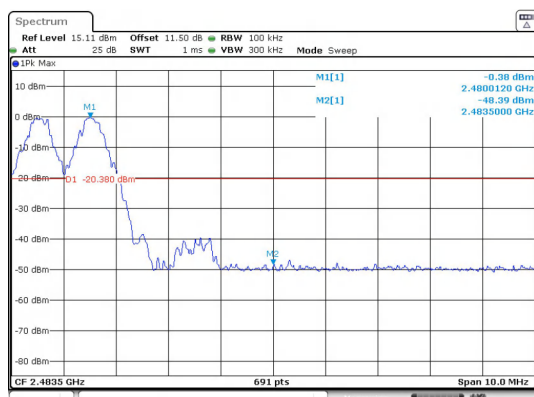
Date: 25.MAR.2025 14:39:19

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



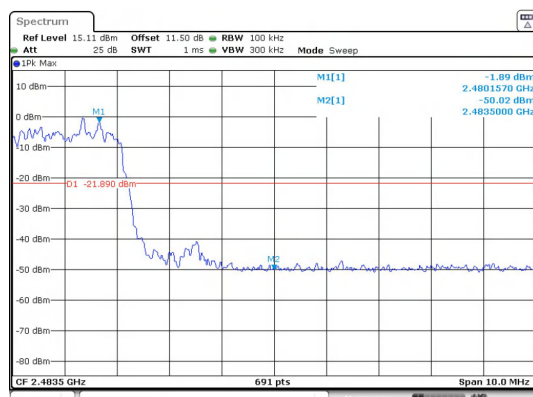
Date: 25.MAR.2025 14:51:06

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



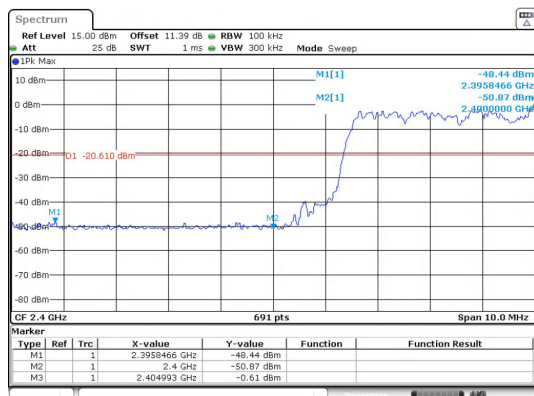
Date: 25.MAR.2025 14:39:51

Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



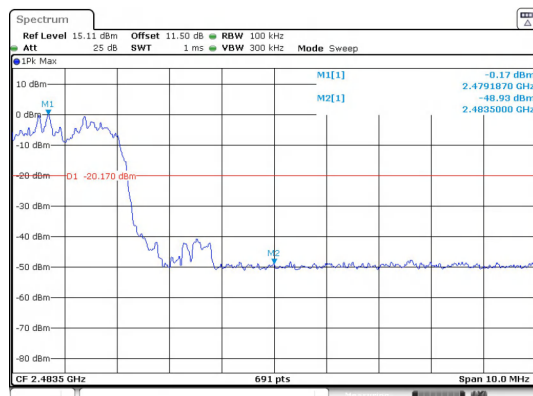
Date: 25.MAR.2025 14:51:39

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



Date: 25.MAR.2025 15:09:12

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



Date: 25.MAR.2025 15:09:42

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

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