

Appendix Report

Report No.:	CISRR25010803604
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

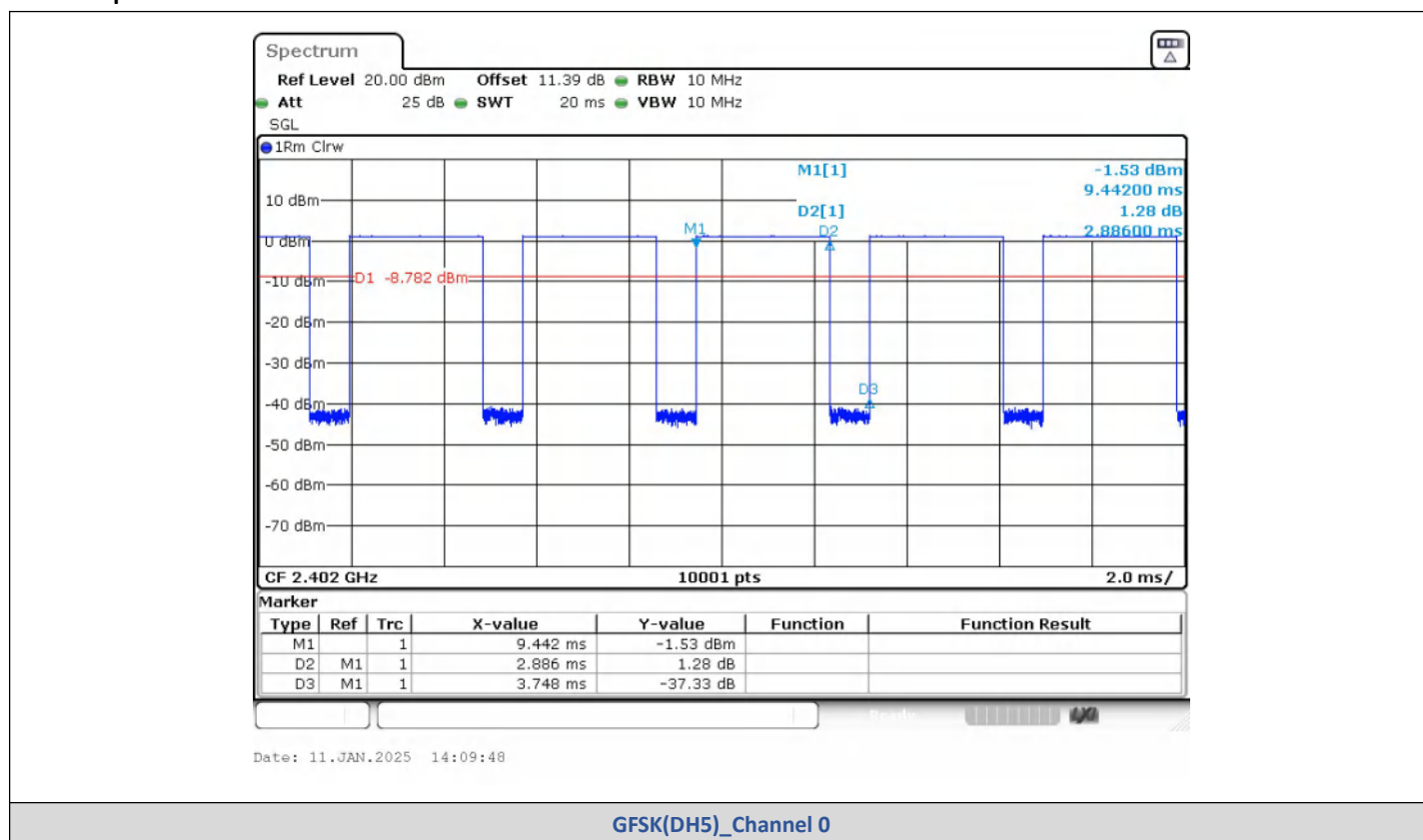
1) Duty Cycle

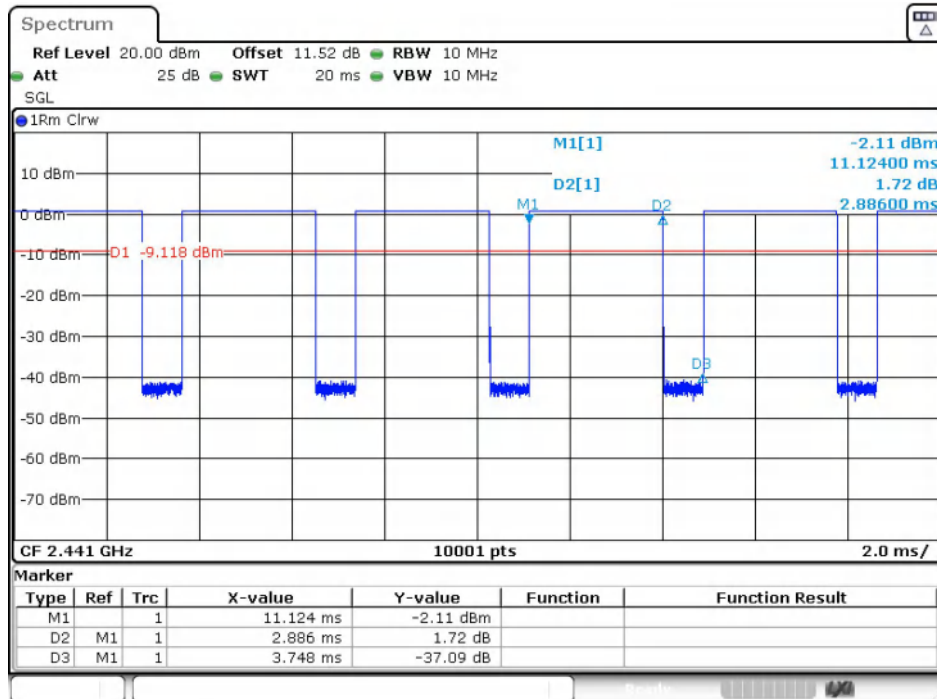
Test Result

Left:

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	2.892	3.748	77.16	0.7716	1.1261	0.3458
		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	2.894	3.748	77.21	0.7721	1.1233	0.3455

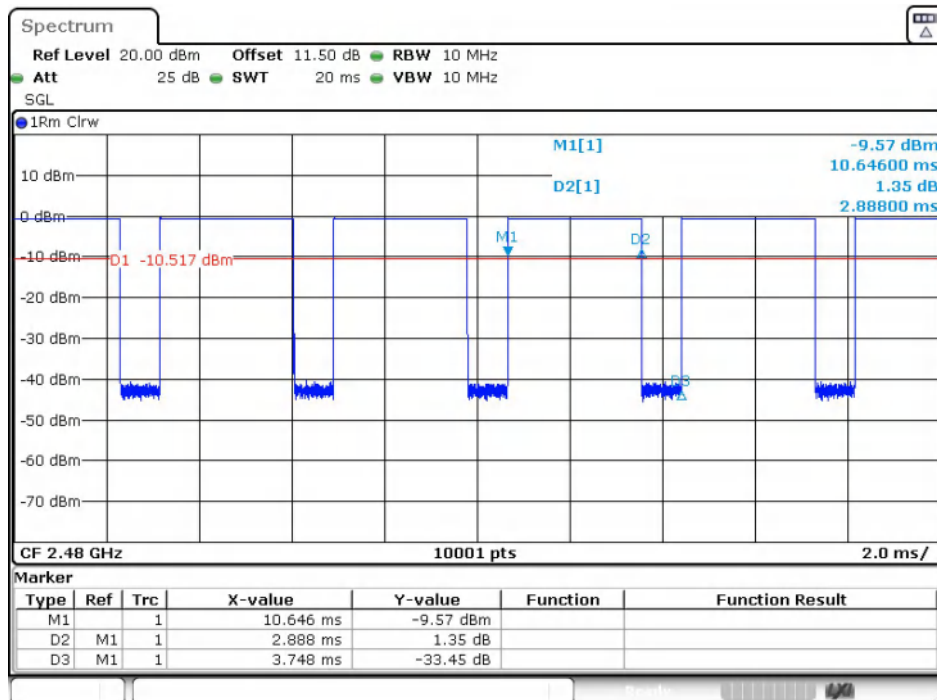
Test Graphs





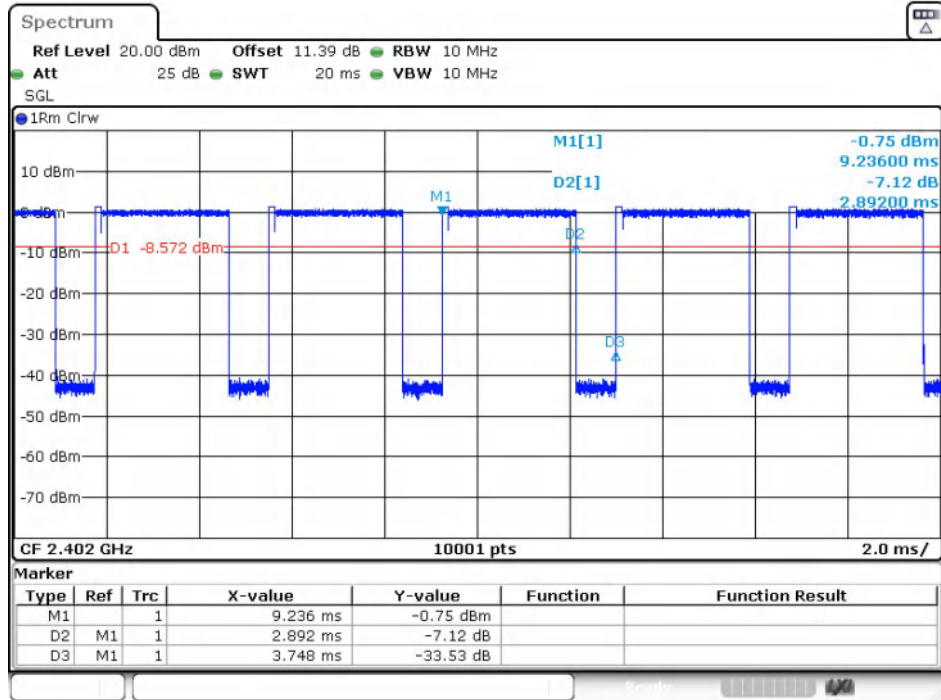
Date: 11.JAN.2025 14:16:46

GFSK(DH5)_Channel 39



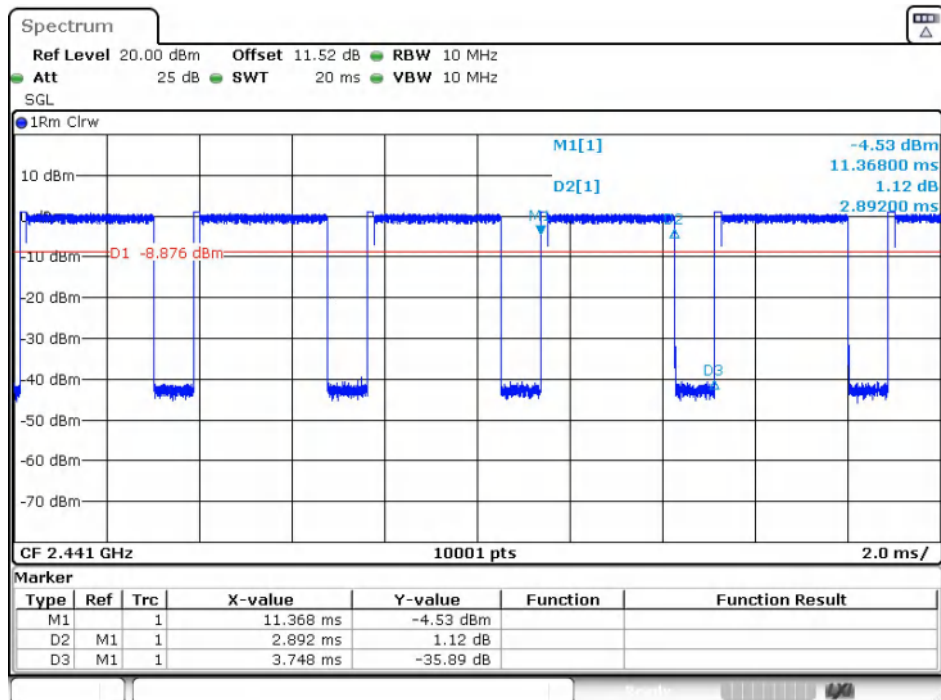
Date: 11.JAN.2025 14:18:48

GFSK(DH5)_Channel 78



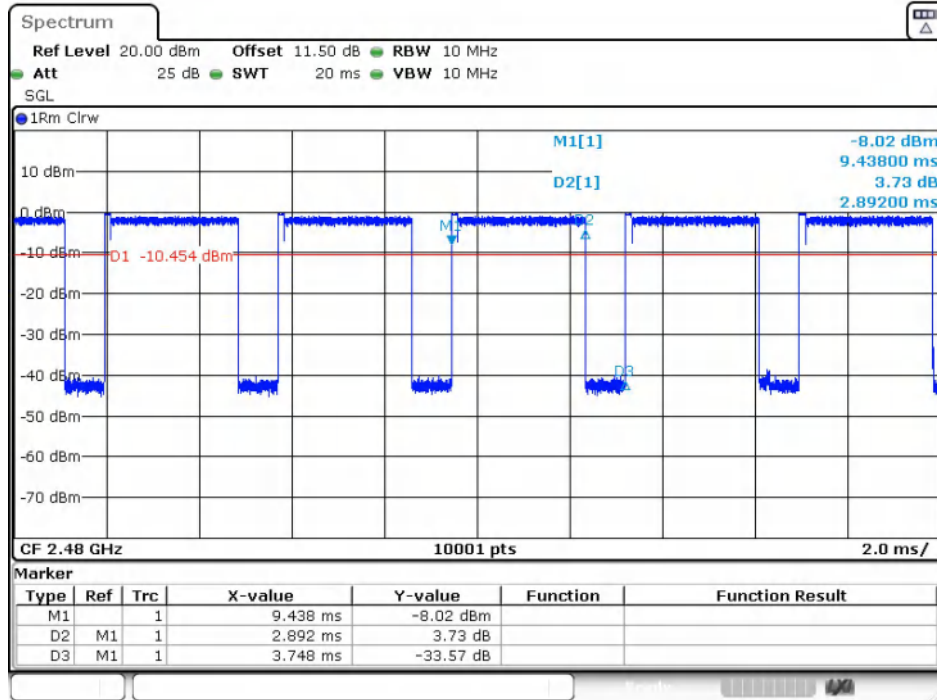
Date: 11, JAN, 2025 14:21:42

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



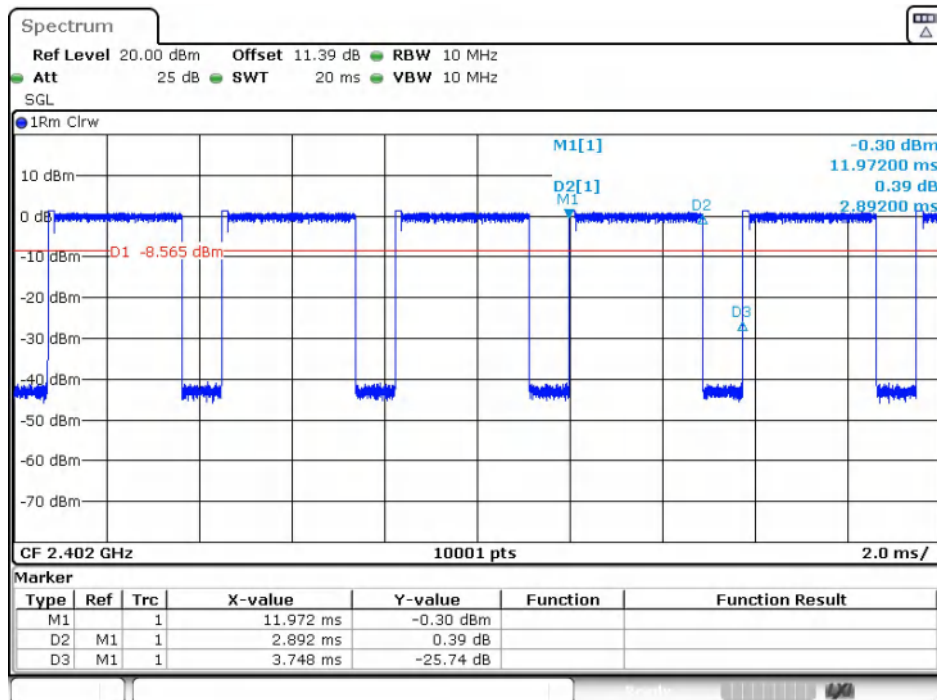
Date: 11, JAN, 2025 14:37:24

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



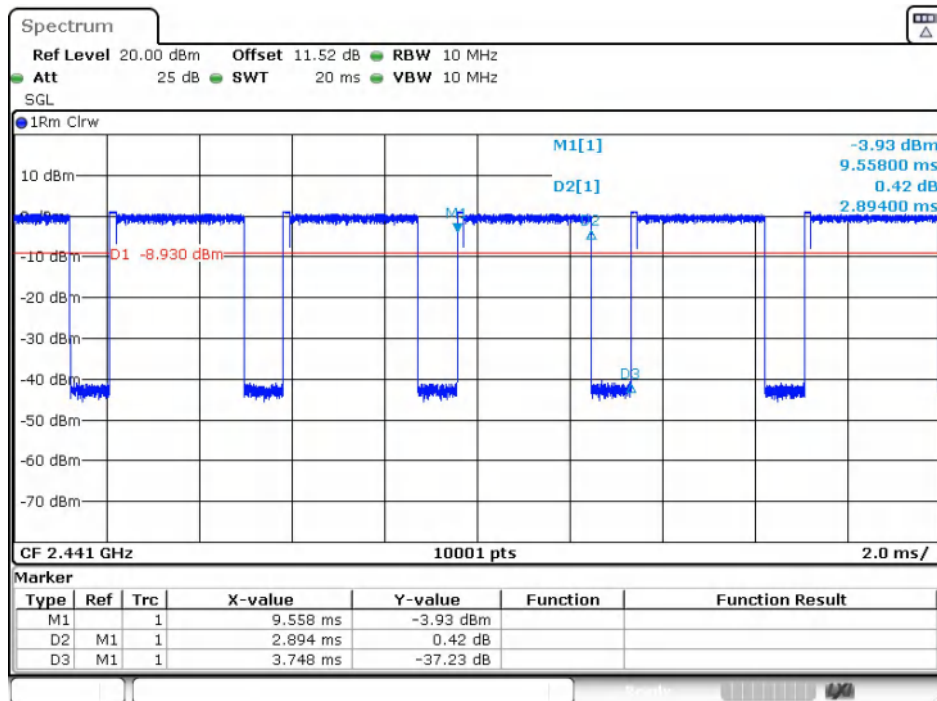
Date: 11, JAN, 2025 14:40:57

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



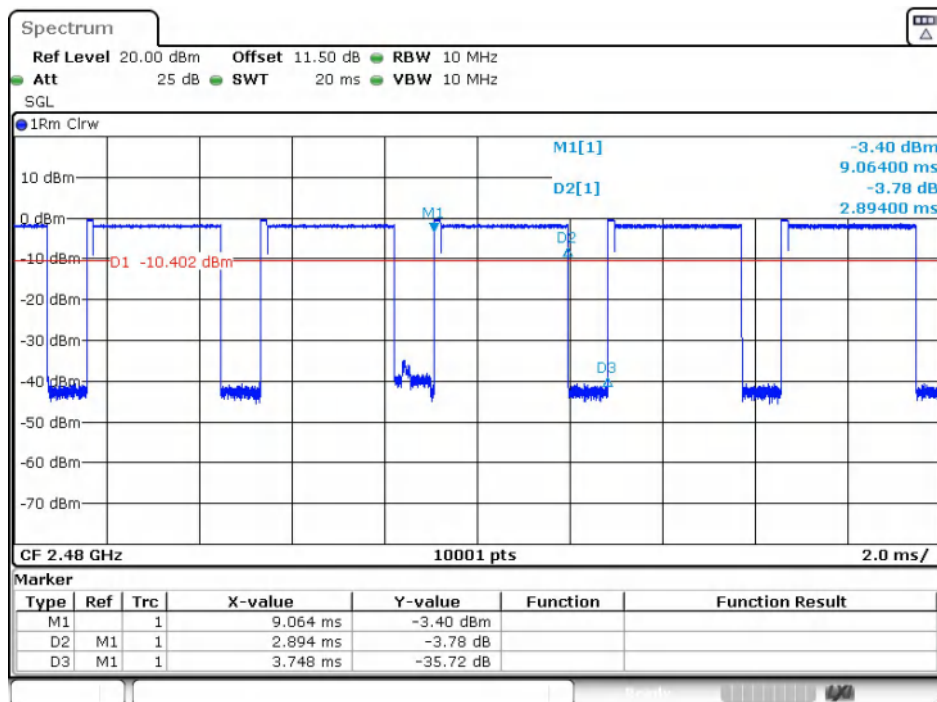
Date: 11, JAN, 2025 14:42:56

8DPSK(3-DH5)_Channel 0



Date: 11.JAN.2025 15:18:54

8DPSK(3-DH5)_Channel 39



Date: 11.JAN.2025 15:23:12

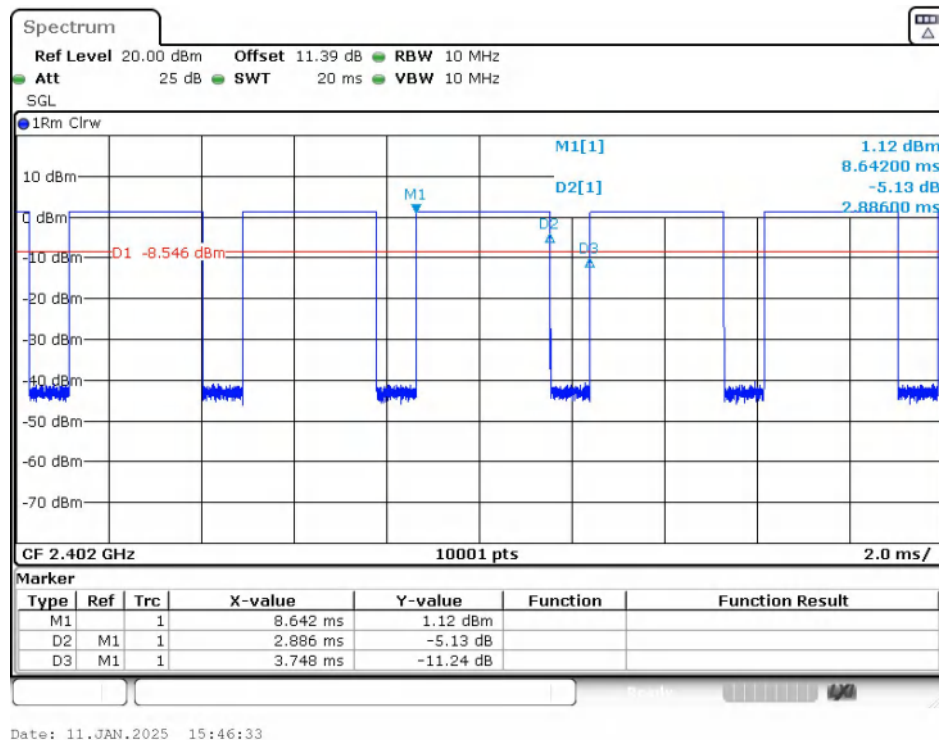
8DPSK(3-DH5)_Channel 78

Right:

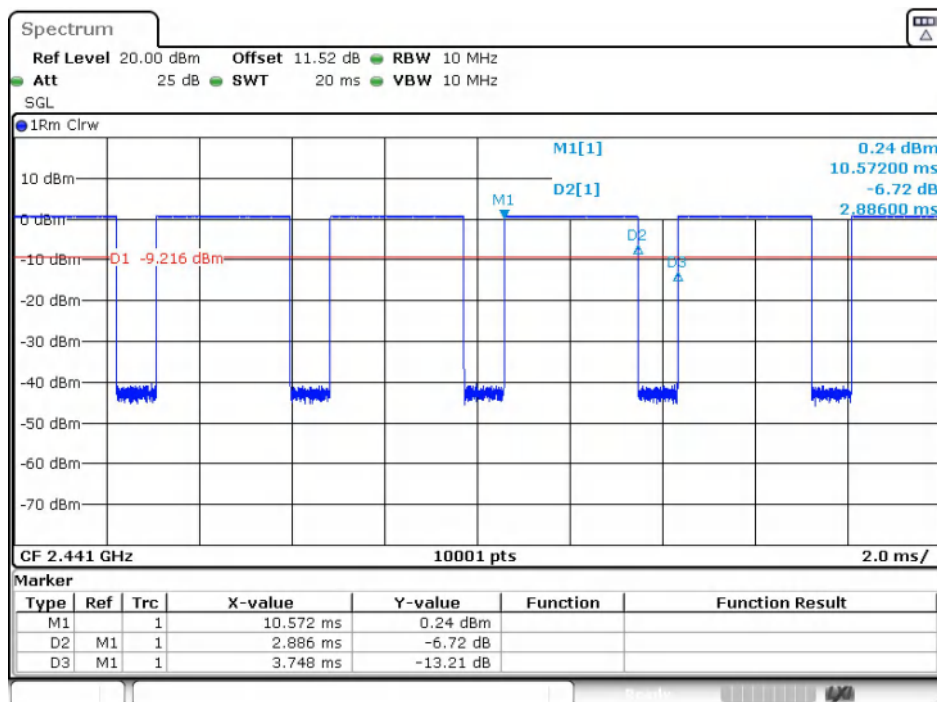
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465

		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	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.890	3.748	77.11	0.7711	1.1289	0.3460
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.894	3.748	77.21	0.7721	1.1233	0.3455

Test Graphs

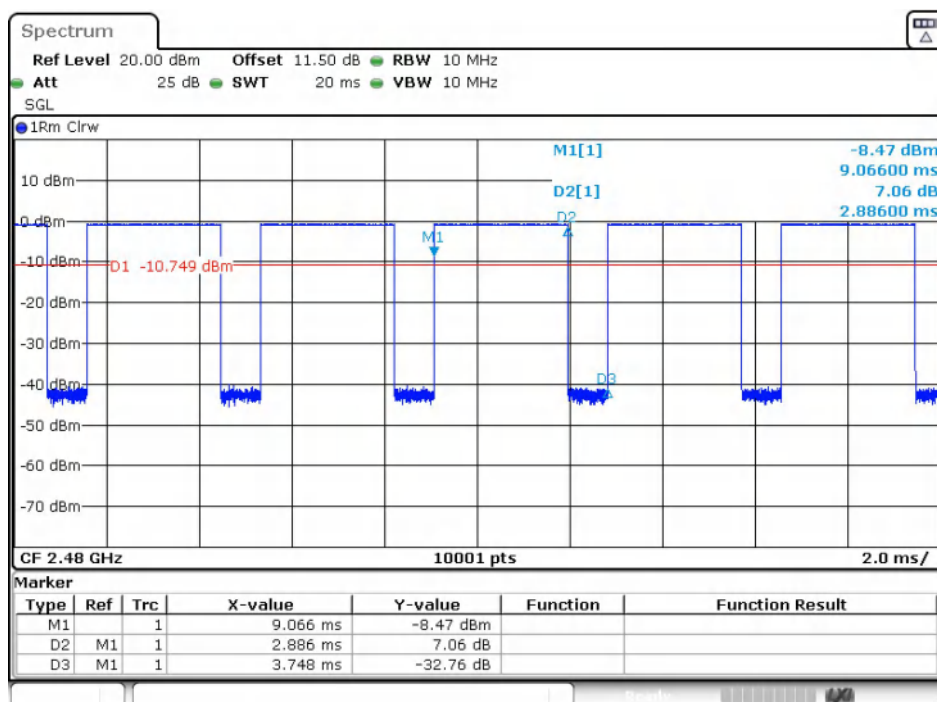


GFSK(DH5)_Channel 0



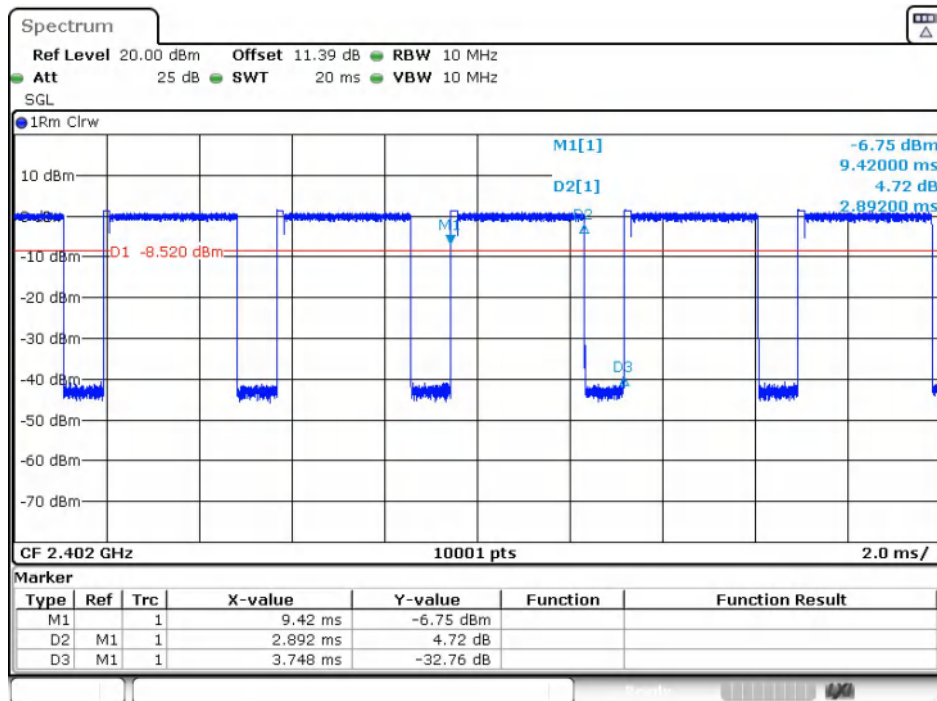
Date: 14, JAN, 2025 10:05:52

GFSK(DH5)_Channel 39



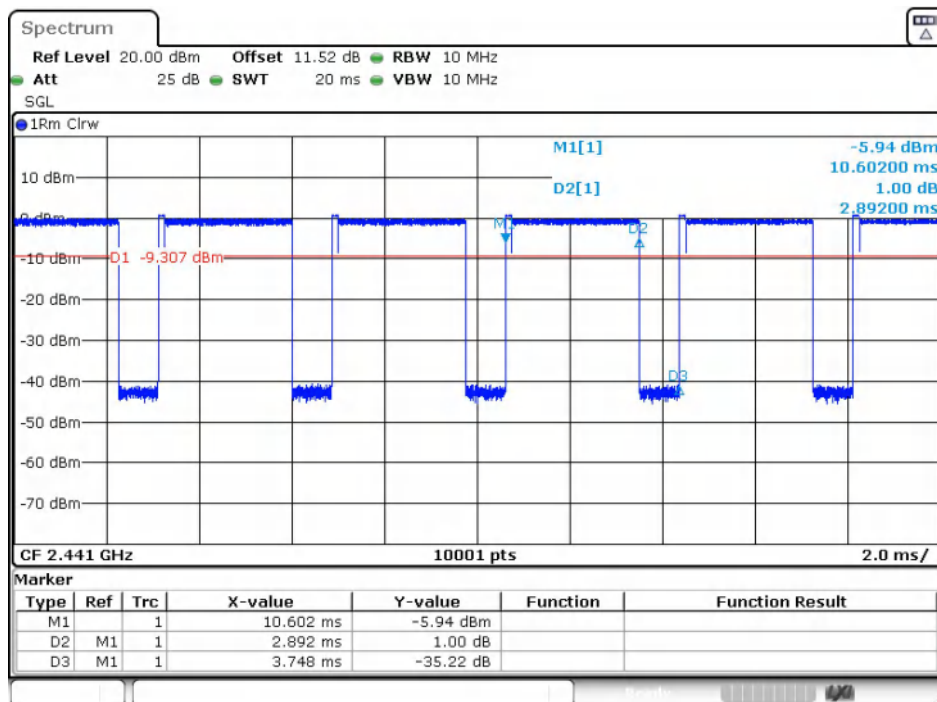
Date: 14, JAN, 2025 10:09:53

GFSK(DH5)_Channel 78



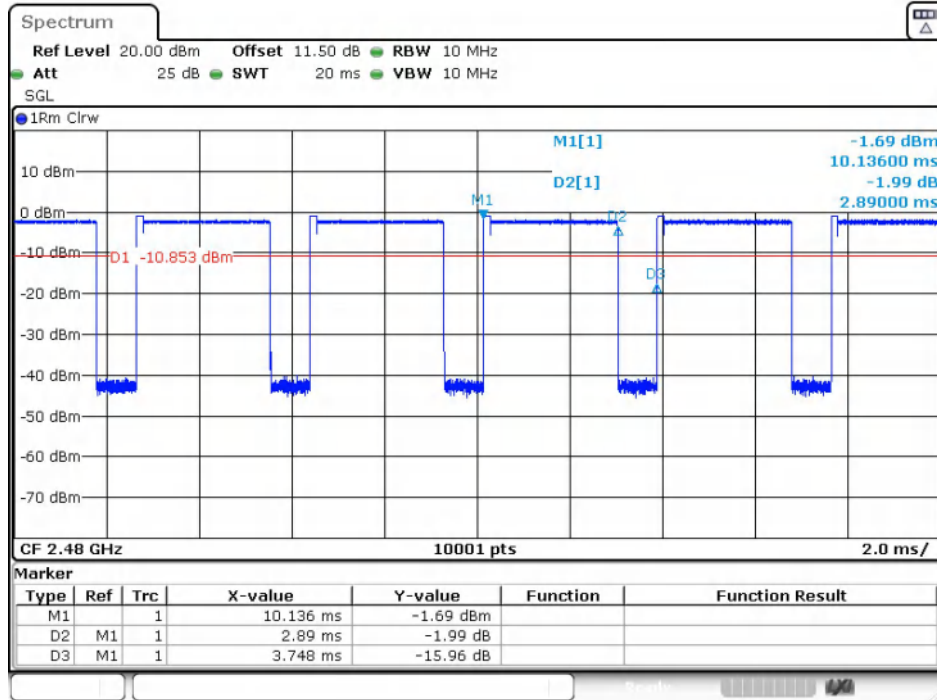
Date: 11, JAN, 2025 15:48:27

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



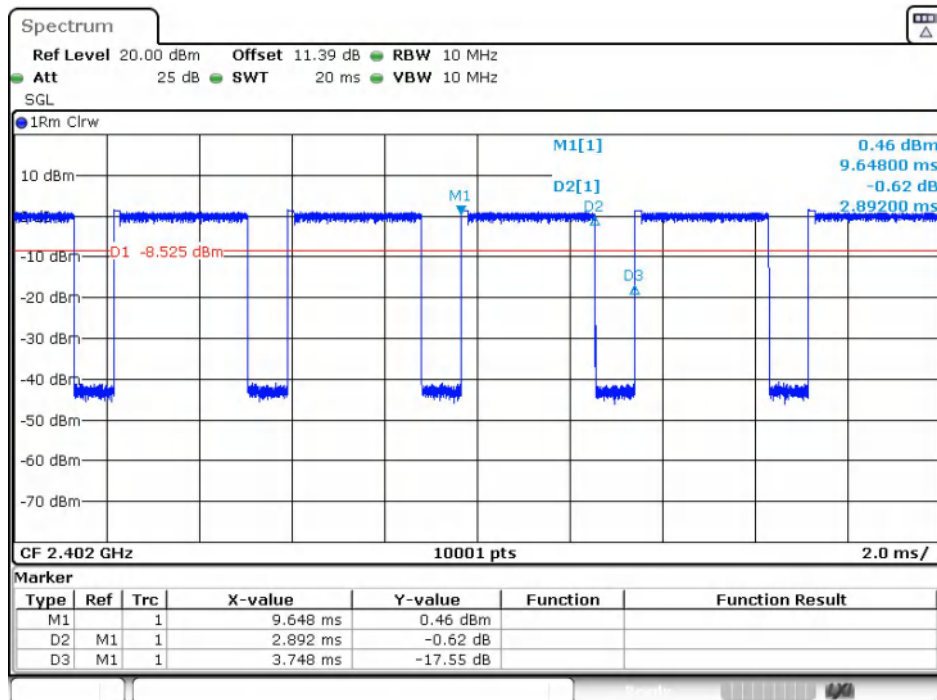
Date: 14, JAN, 2025 10:16:36

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



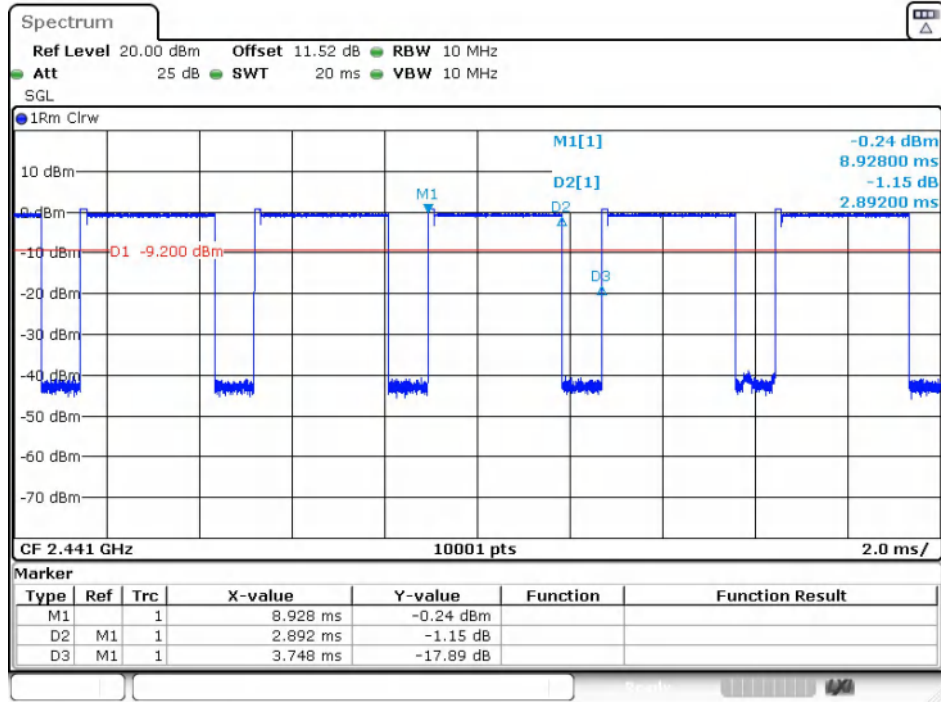
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$\pi/4$ DQPSK(2-DH5)_Channel 78



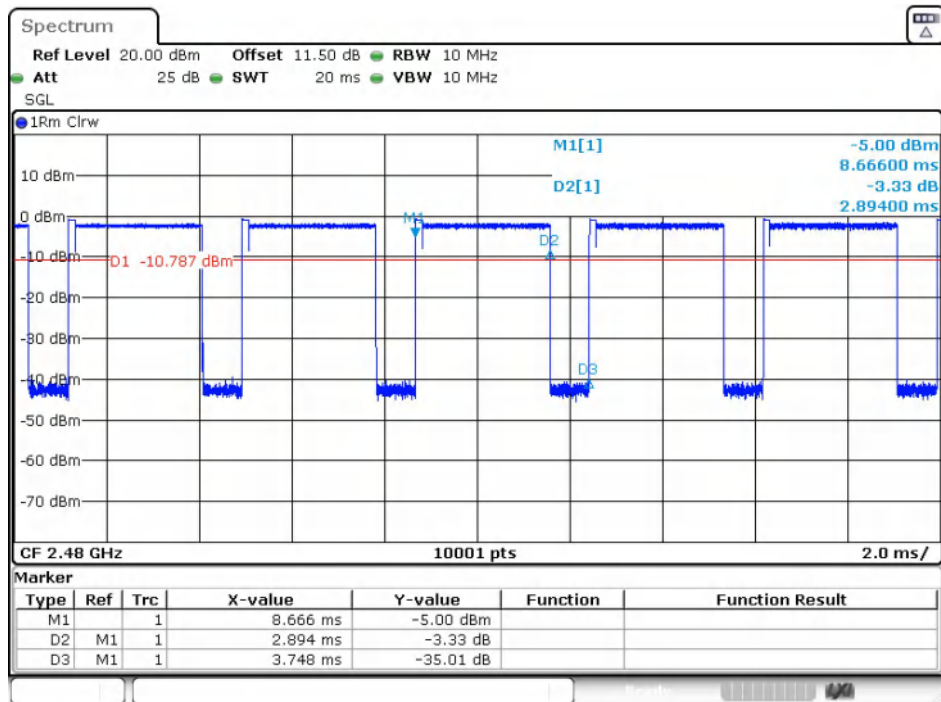
Date: 11, JAN, 2025 15:50:51

8DPSK(3-DH5)_Channel 0



Date: 14, JAN, 2025 10:24:41

8DPSK(3-DH5)_Channel 39



Date: 14, JAN, 2025 10:27:35

8DPSK(3-DH5)_Channel 78

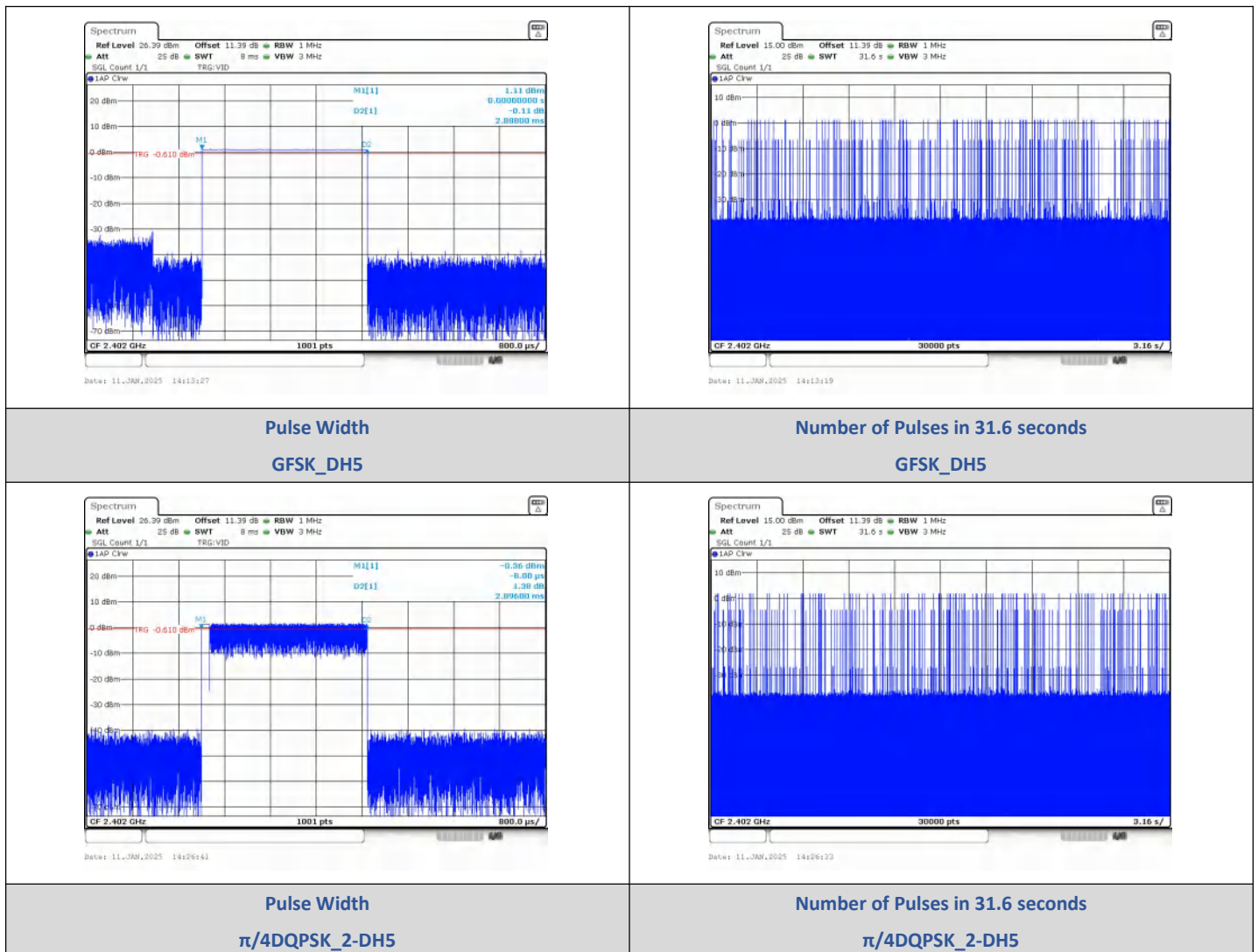
2) Dwell Time

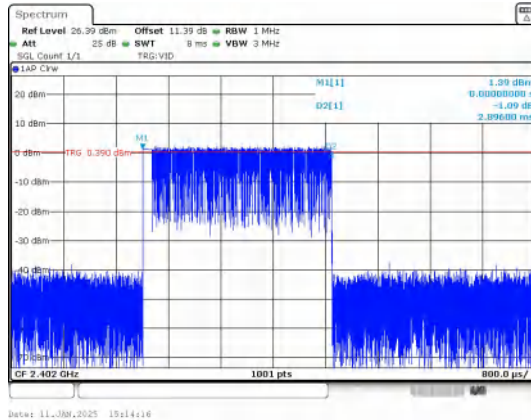
Test Result

Left:

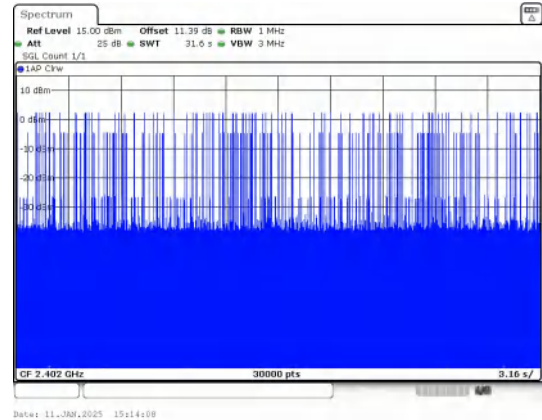
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	101	291.69	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	106	306.98		PASS
8DPSK	3-DH5		2.896	97	280.91		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5

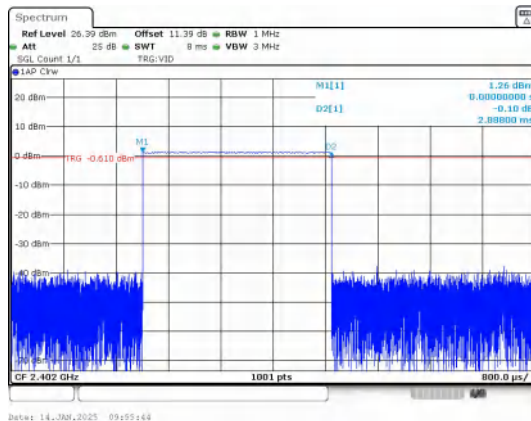


Number of Pulses in 31.6 seconds
8DPSK_3-DH5

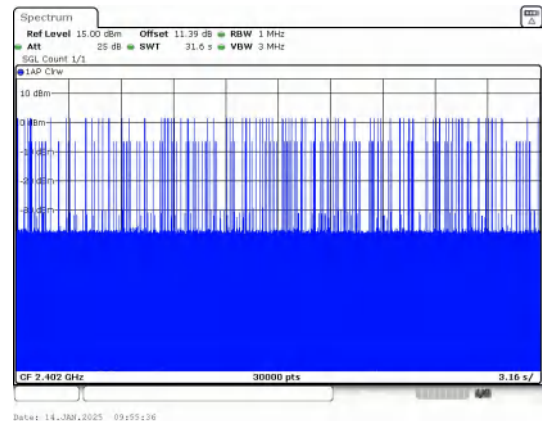
Right:

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	98	283.02	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	110	318.56		PASS
8DPSK	3-DH5		2.896	99	286.7		PASS

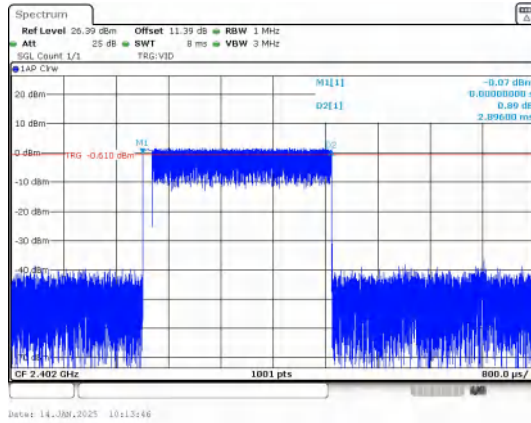
Test Graphs



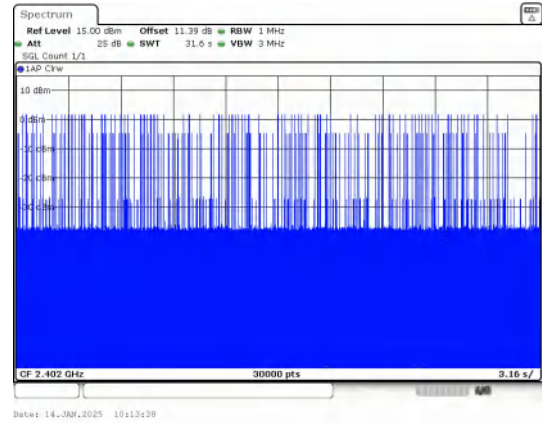
Pulse Width
GFSK_DH5



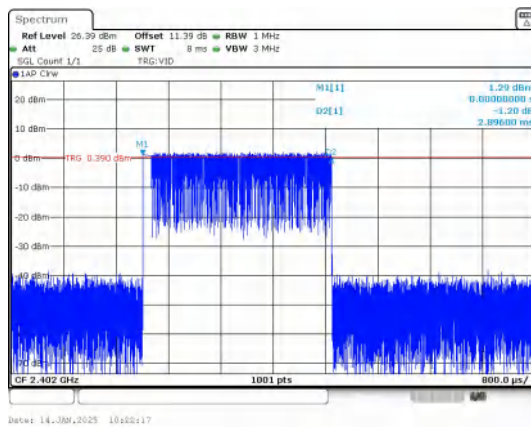
Number of Pulses in 31.6 seconds
GFSK_DH5



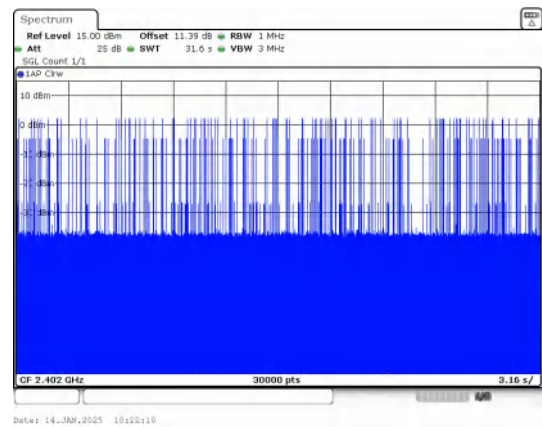
Pulse Width
 $\pi/4$ DQPSK_2-DH5



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

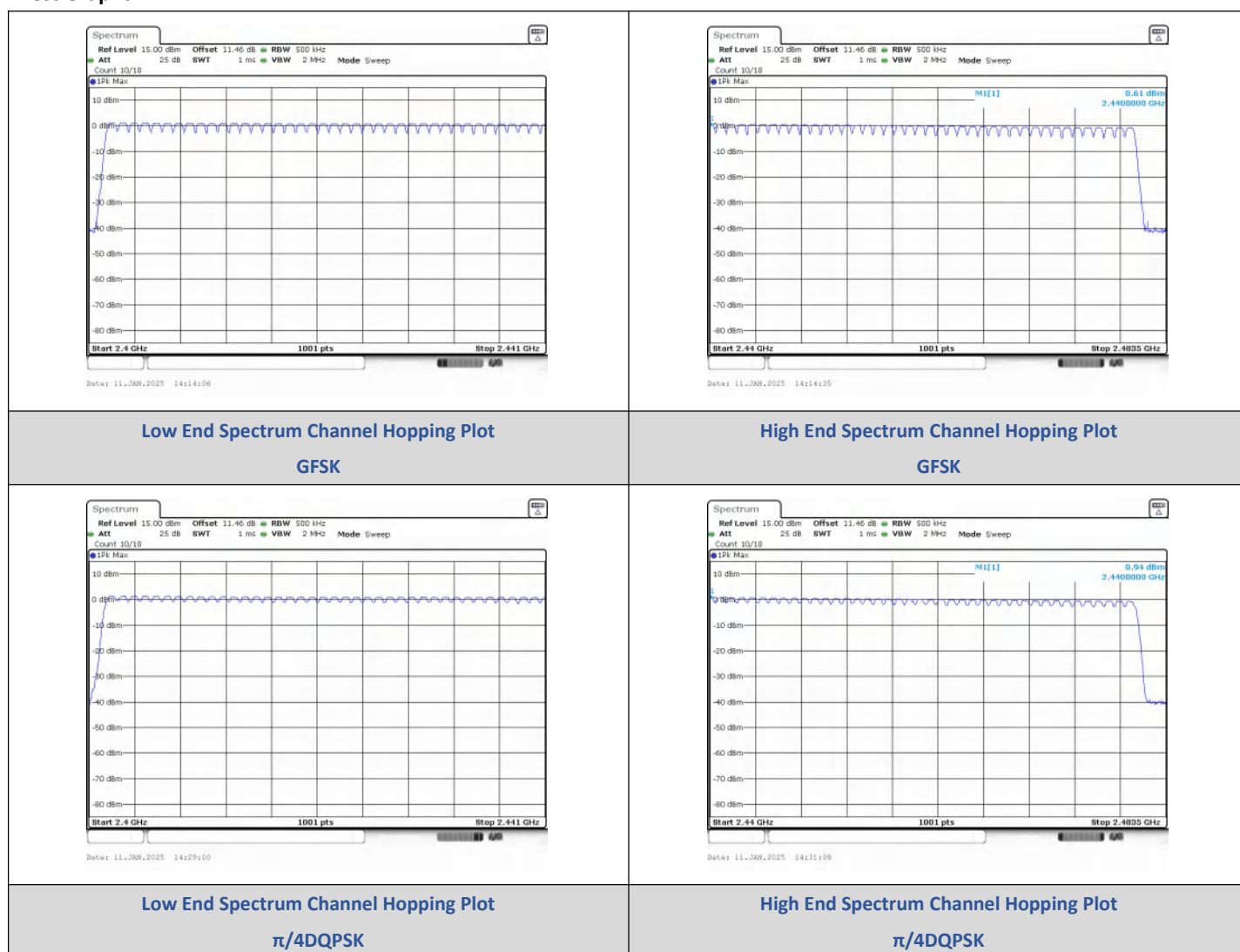
3) Number Of Hopping Channel

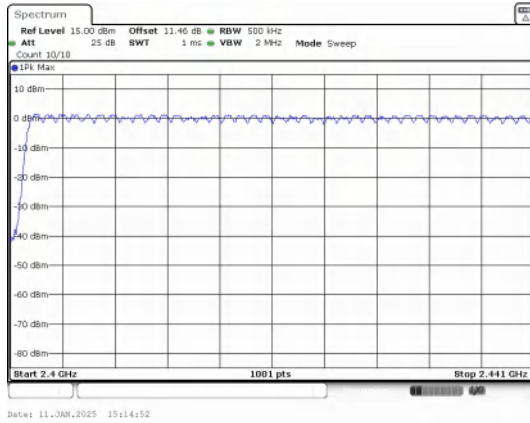
Test Result

Left:

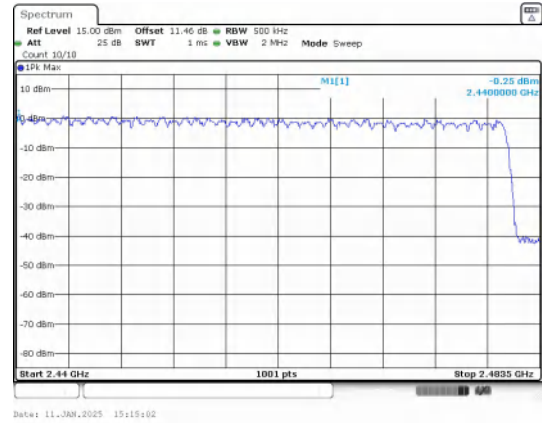
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK

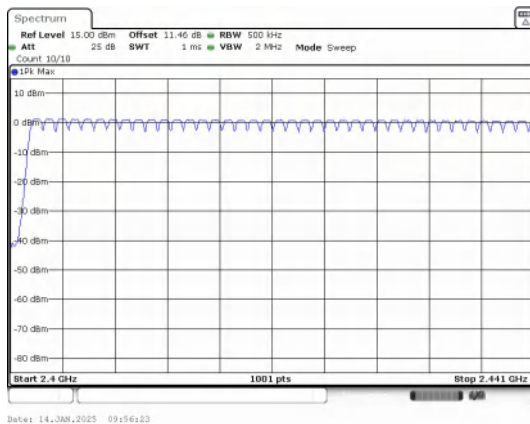


High End Spectrum Channel Hopping Plot
8DPSK

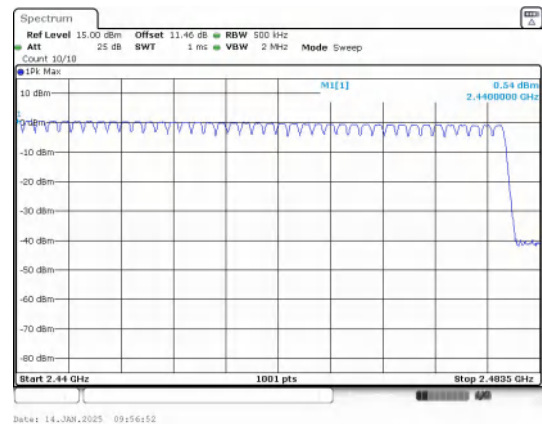
Right:

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

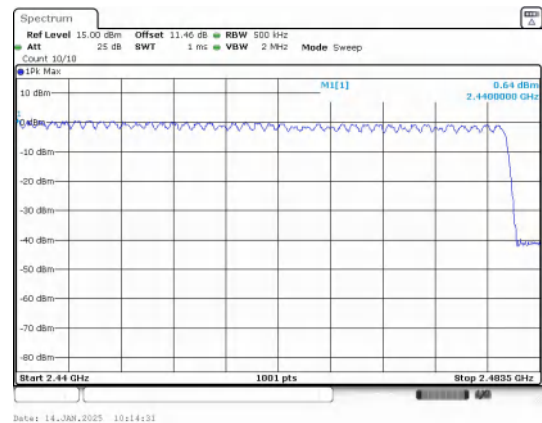
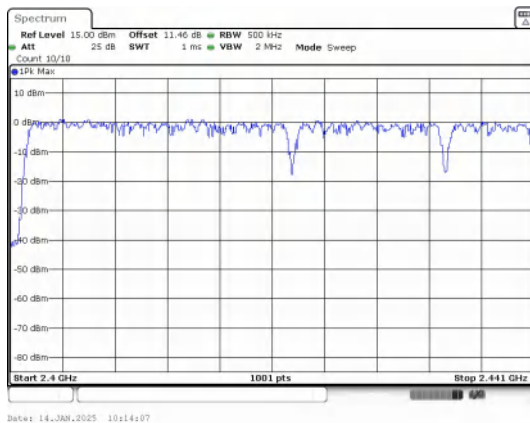
Test Graphs

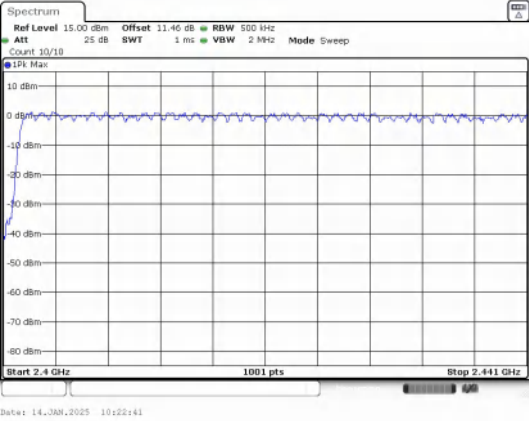
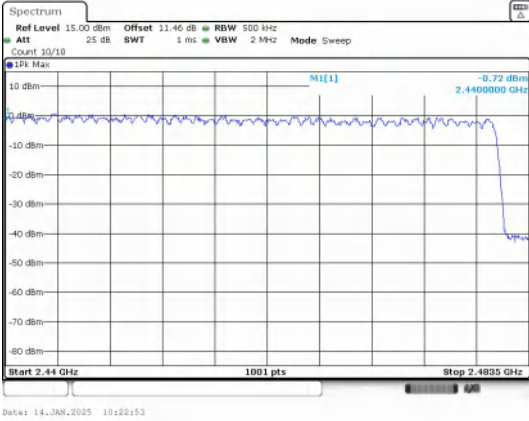


Low End Spectrum Channel Hopping Plot
GFSK



High End Spectrum Channel Hopping Plot
GFSK



Low End Spectrum Channel Hopping Plot $\pi/4$DQPSK 	High End Spectrum Channel Hopping Plot $\pi/4$DQPSK 
Low End Spectrum Channel Hopping Plot 8DPSK	High End Spectrum Channel Hopping Plot 8DPSK

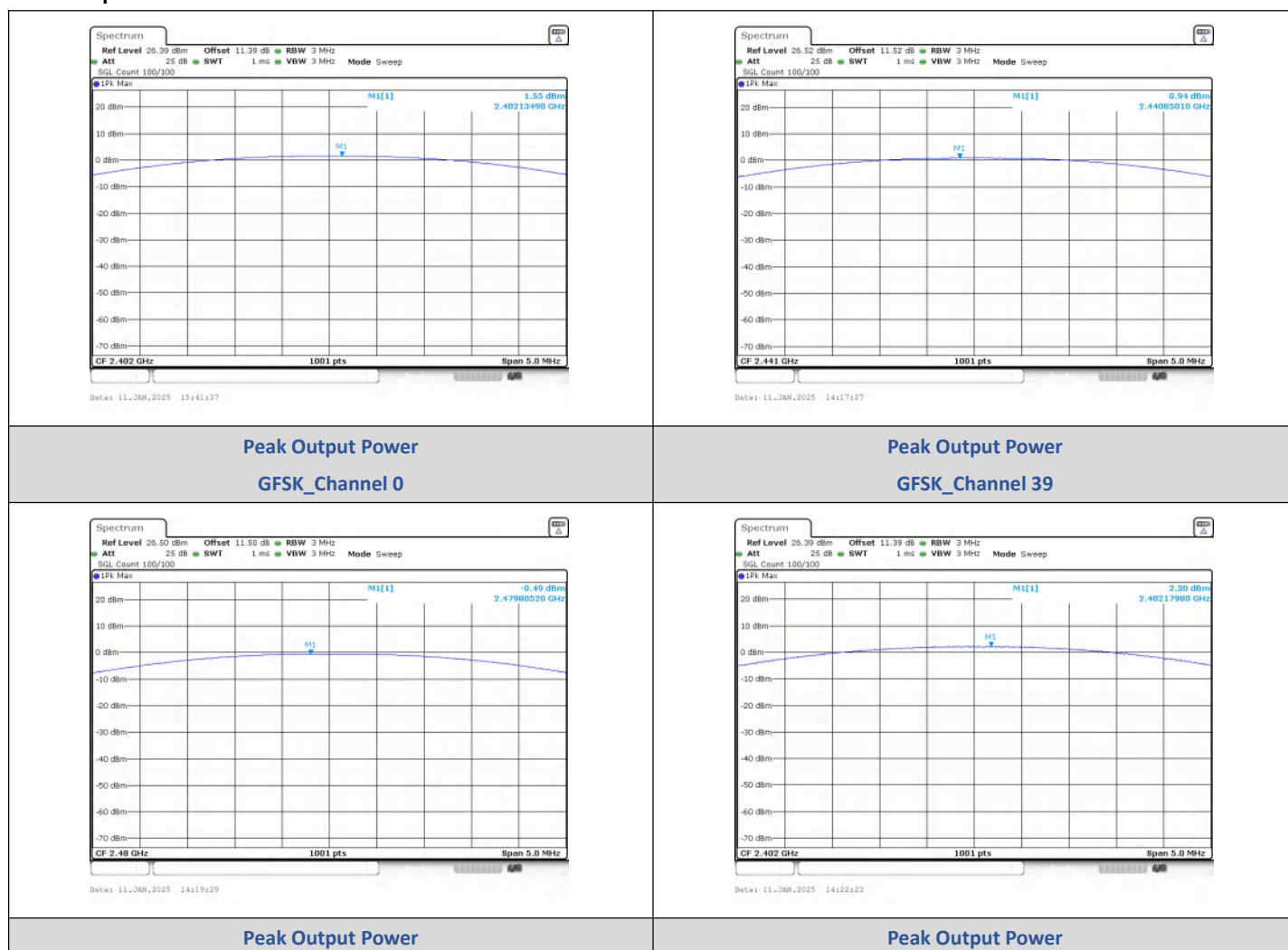
4) Conducted Peak Output Power

Test Result

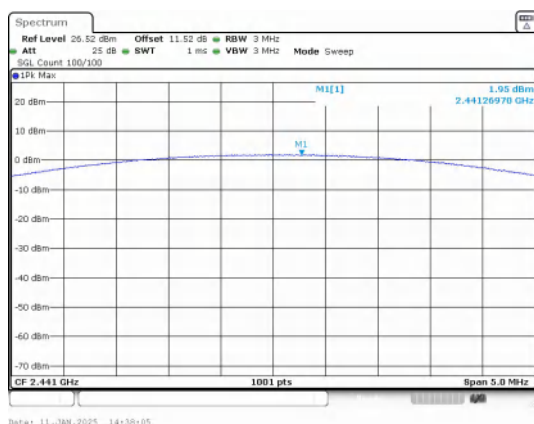
Left:

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.55	1.43	≤30	PASS
		39	0.94	1.24		PASS
		78	-0.49	0.89		PASS
$\pi/4$ DQPSK	2-DH5	0	2.30	1.70	≤20.97	PASS
		39	1.95	1.57		PASS
		78	0.47	1.11		PASS
8DPSK	3-DH5	0	2.70	1.86		PASS
		39	2.32	1.71		PASS
		78	0.83	1.21		PASS

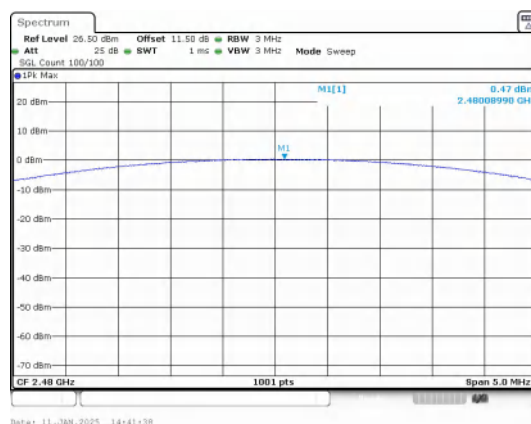
Test Graphs



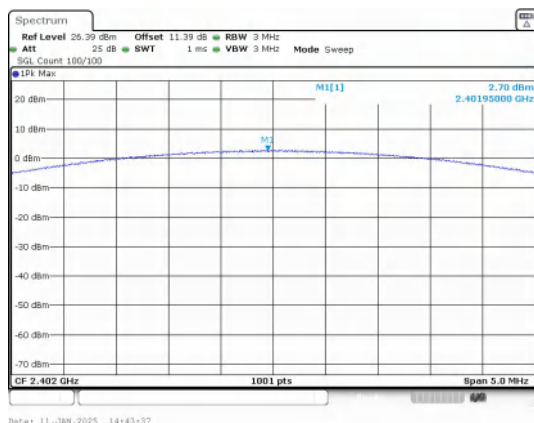
GFSK_Channel 78



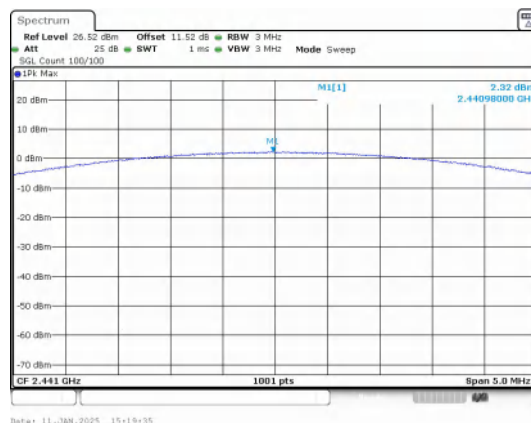
$\pi/4$ DQPSK_Channel 0



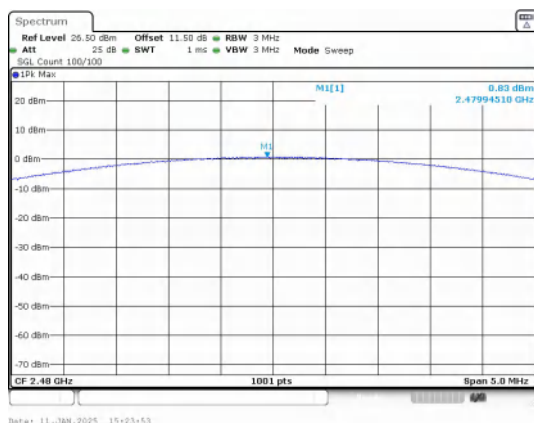
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39

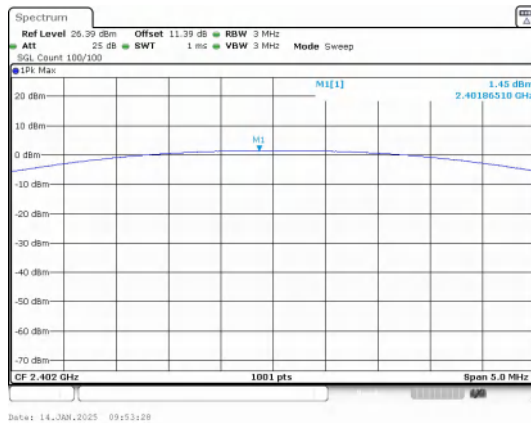
Peak Output Power
8DPSK_Channel 78

Right:

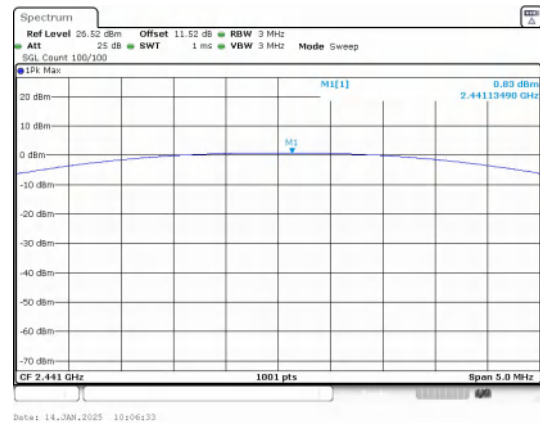
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.45	1.40	≤ 30	PASS

		39	0.83	1.21		PASS
		78	-0.71	0.85		PASS
		0	2.34	1.71		PASS
$\pi/4$ DQPSK	2-DH5	39	1.59	1.44	≤ 20.97	PASS
		78	0.07	1.02		PASS
		0	2.75	1.88		PASS
8DPSK	3-DH5	39	2.03	1.60		PASS
		78	0.50	1.12		PASS
						PASS

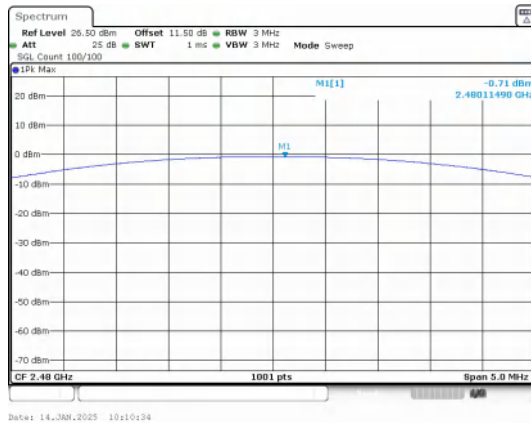
Test Graphs



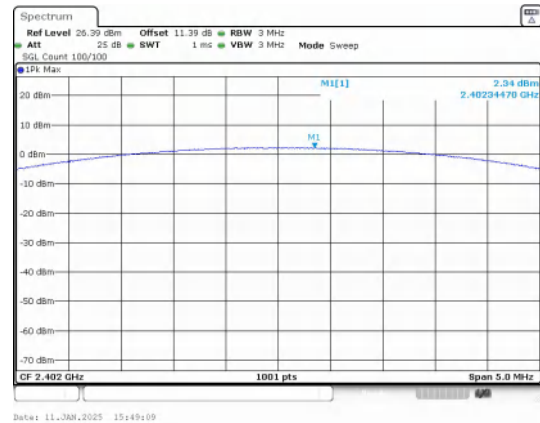
Peak Output Power
GFSK_Channel 0



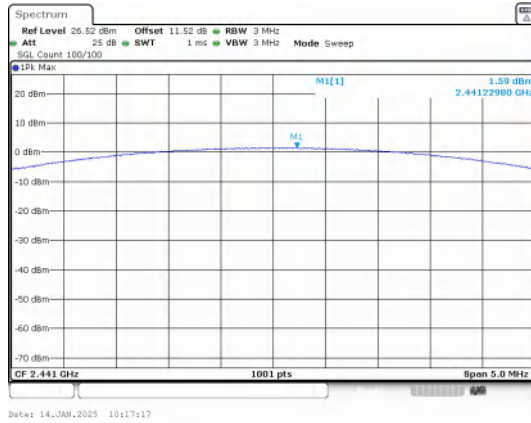
Peak Output Power
GFSK_Channel 39



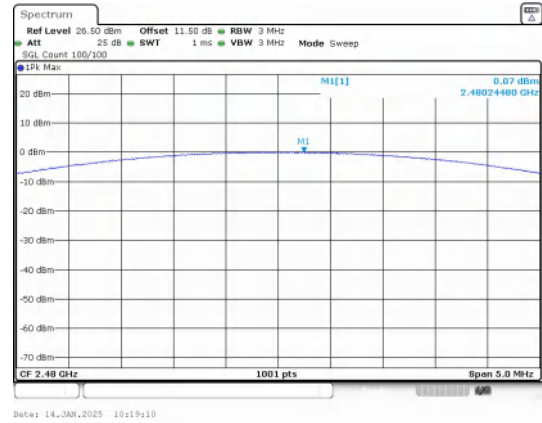
Peak Output Power
GFSK_Channel 78



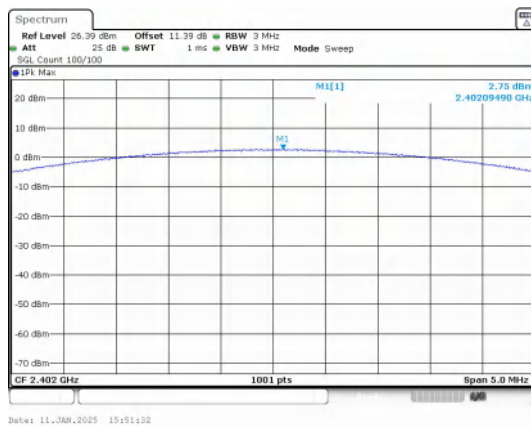
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



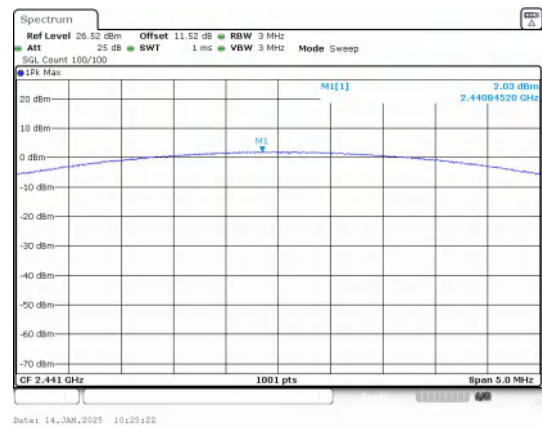
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



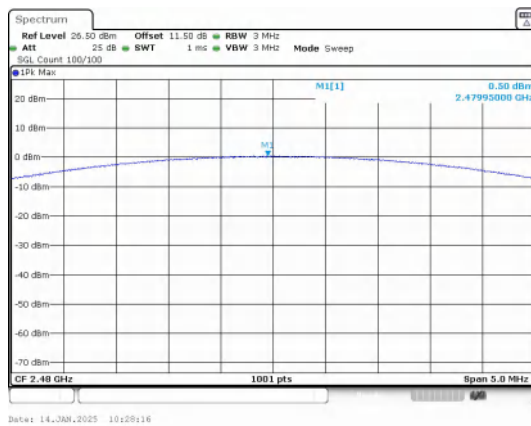
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



Peak Output Power
8DPSK_Channel 78

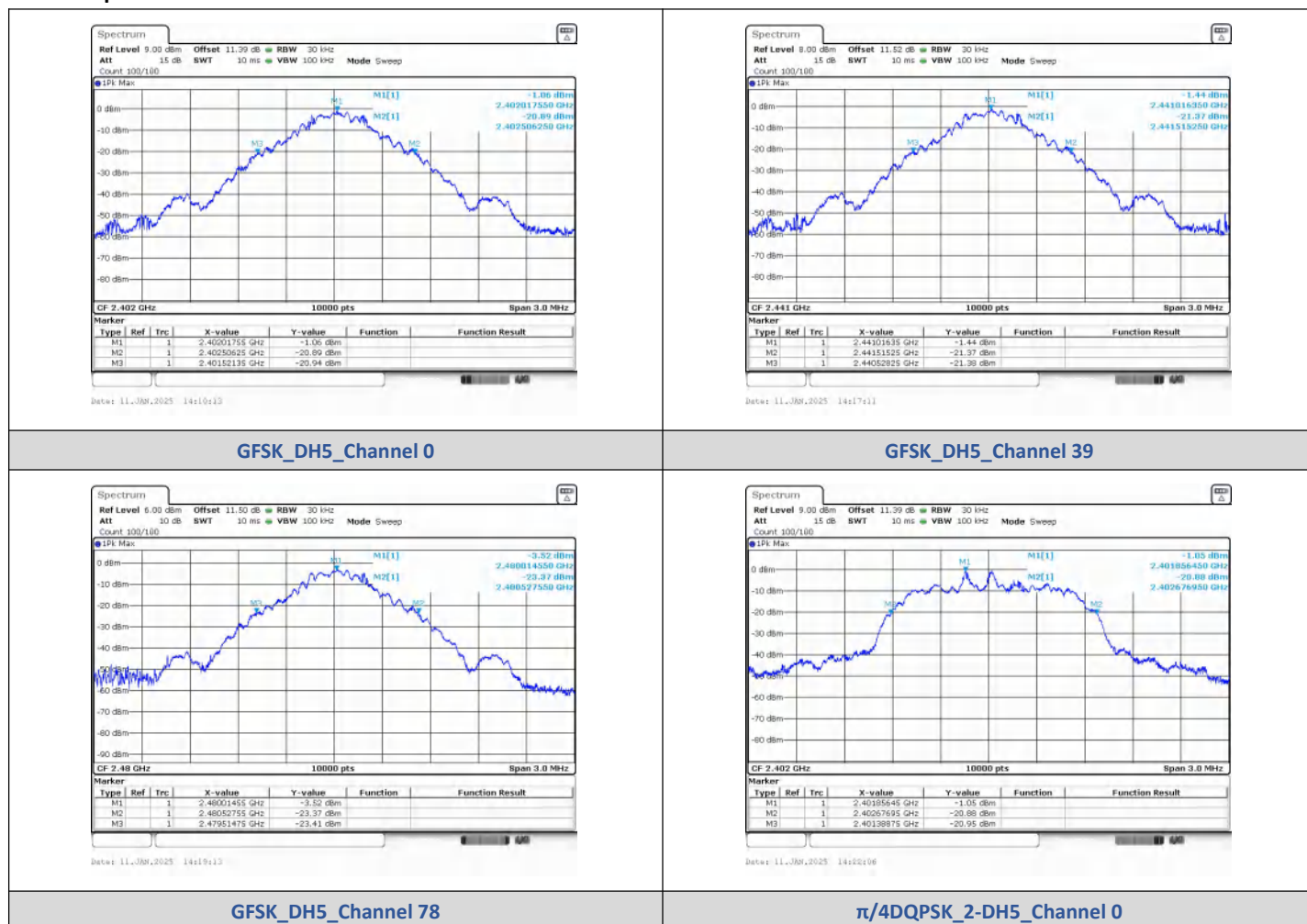
5) 20dB Bandwidth

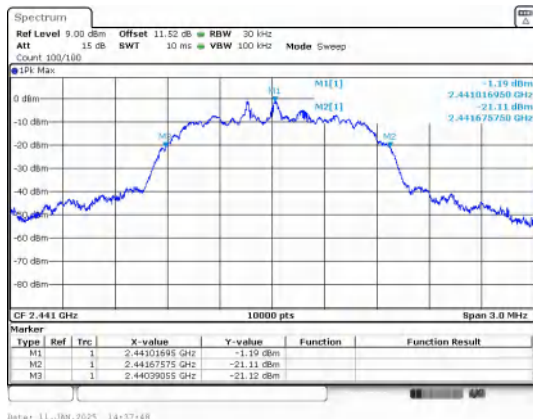
Test Result

Left:

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9900
	39	2441 MHz	0.9900
	78	2480 MHz	1.020
$\pi/4$ DQPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.280
8DPSK	0	2402 MHz	1.280
	39	2441 MHz	1.290
	78	2480 MHz	1.290

Test Graphs





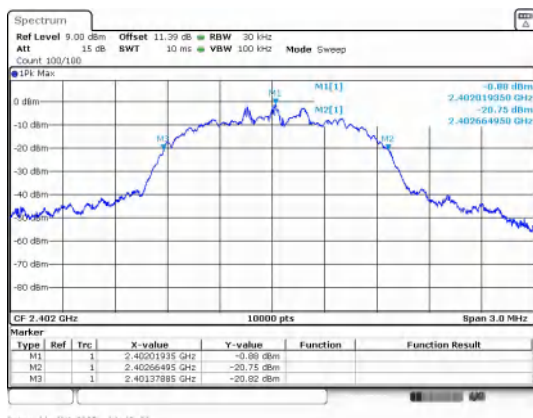
Date: 11/30/2025 14:37:48

$\pi/4$ DQPSK_2-DH5_Channel 39



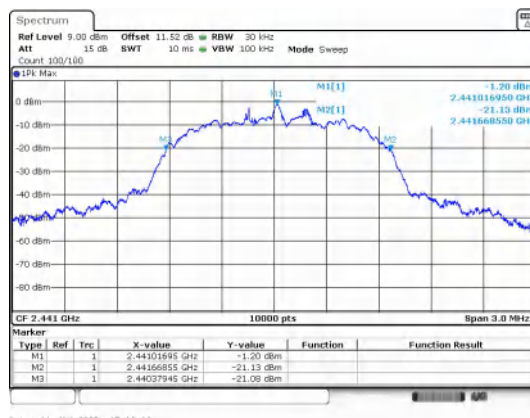
Date: 11/30/2025 14:41:22

$\pi/4$ DQPSK_2-DH5_Channel 78



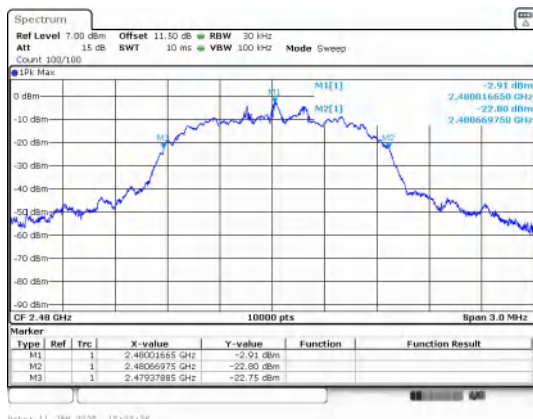
Date: 11/30/2025 14:43:28

8DPSK_3-DH5_Channel 0



Date: 11/30/2025 15:11:19

8DPSK_3-DH5_Channel 39



Date: 11/30/2025 15:43:36

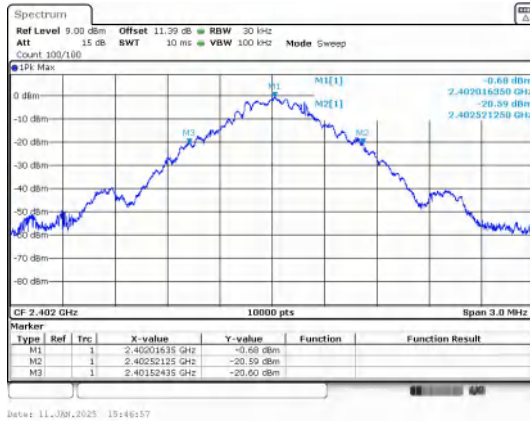
8DPSK_3-DH5_Channel 78

Right:

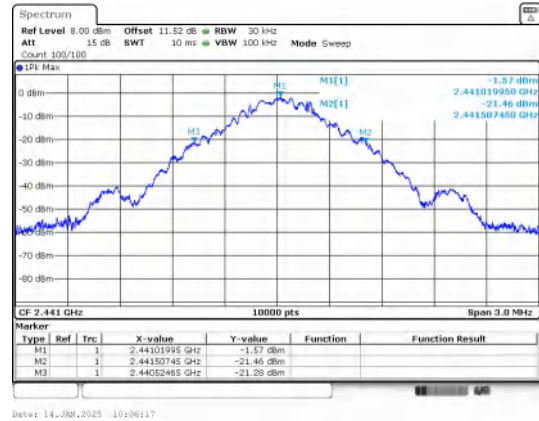
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.000
	39	2441 MHz	0.9900
	78	2480 MHz	0.9900
$\pi/4$ DQPSK	0	2402 MHz	1.310
	39	2441 MHz	1.300
	78	2480 MHz	1.280

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

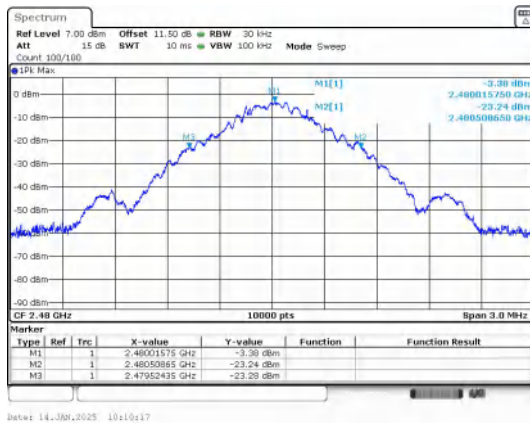
Test Graphs



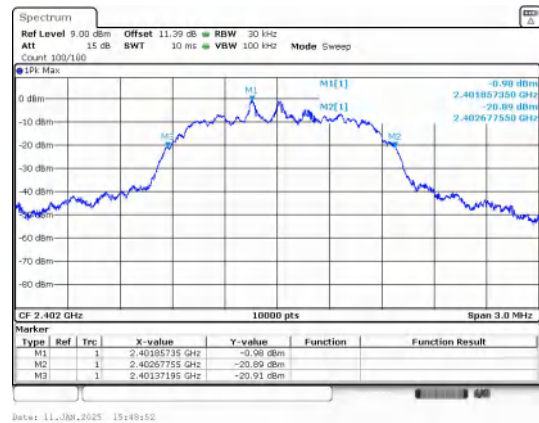
GFSK_DH5_Channel 0



GFSK_DH5_Channel 39

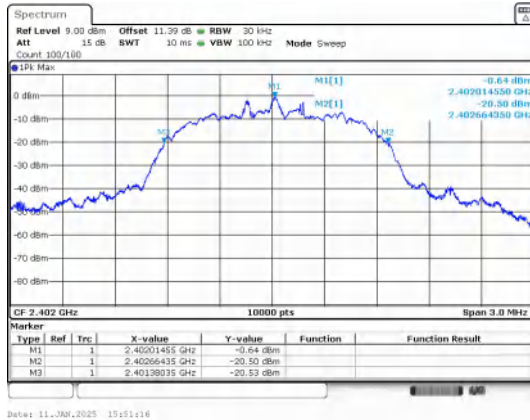


GFSK_DH5_Channel 78

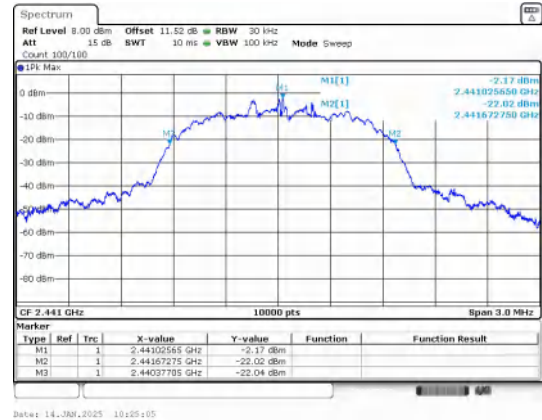

 $\pi/4$ DQPSK_2-DH5_Channel 0

 $\pi/4$ DQPSK_2-DH5_Channel 39

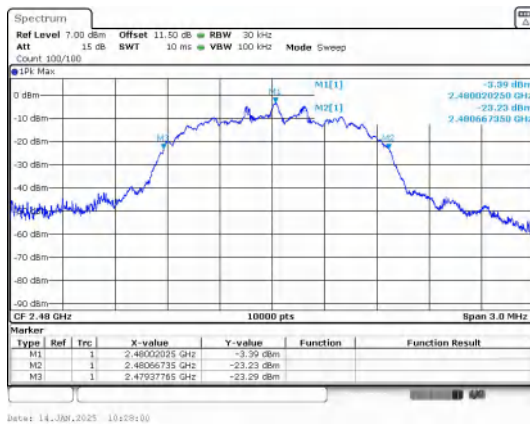
 $\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

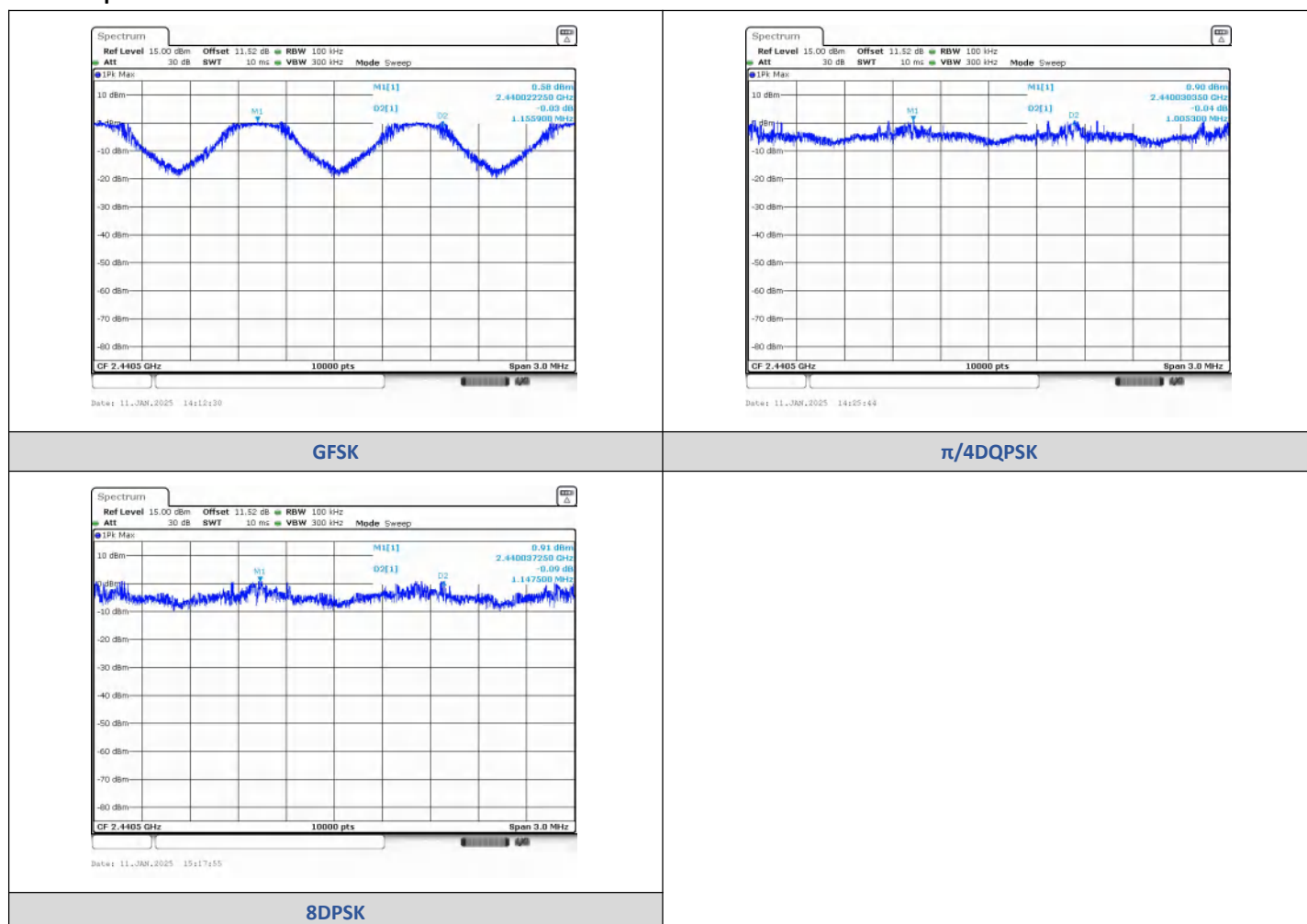
6) Carrier Frequencies Separation

Test Result

Left:

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0222	2441.1782	1.1559	0.99	PASS
$\pi/4$ DQPSK	2-DH5	2440.0303	2441.0356	1.0053	0.86	PASS
8DPSK	3-DH5	2440.0372	2441.1847	1.1475	0.853	PASS

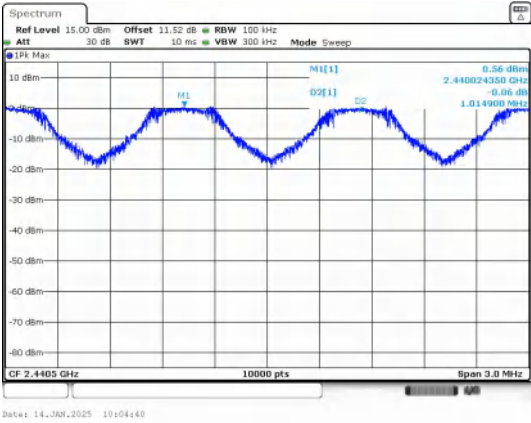
Test Graphs



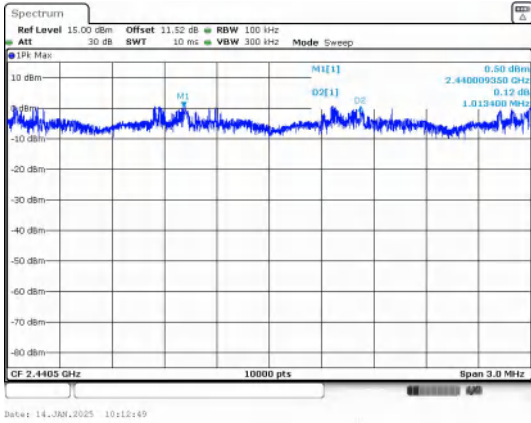
Right:

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0244	2441.0392	1.0149	1.0	PASS
$\pi/4$ DQPSK	2-DH5	2440.0093	2441.0228	1.0134	0.873	PASS
8DPSK	3-DH5	2440.0289	2441.0422	1.0134	0.853	PASS

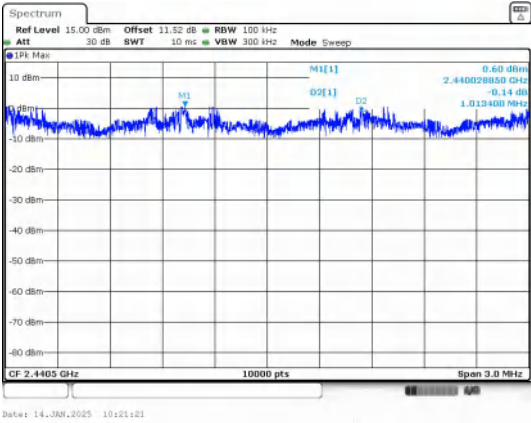
Test Graphs



GFSK



$\pi/4$ DQPSK



8DPSK

7) Conducted Out Of Band Emission

Test Result

Left:

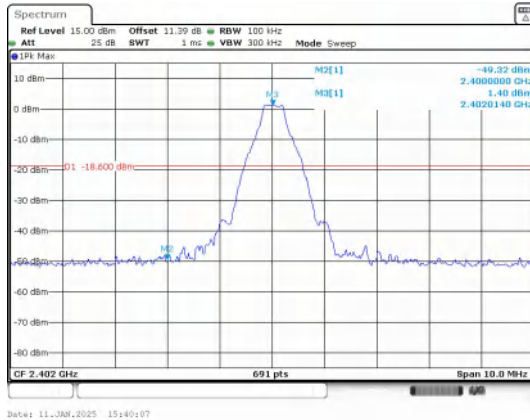
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2399.00	-49.112	-18.6	-30.512	PASS
			2400.00	-49.320	-18.6	-30.720	PASS
			4803.80	-44.396	-18.6	-25.796	PASS
		39	9763.72	-44.539	-19.28	-25.259	PASS
		78	2483.50	-51.100	-20.73	-30.370	PASS
			9920.20	-40.948	-20.73	-20.218	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-48.110	-18.66	-29.450	PASS
			9608.08	-44.529	-18.66	-25.869	PASS
		39	9763.72	-43.647	-19.05	-24.597	PASS
		78	2483.50	-48.940	-20.54	-28.400	PASS
			9920.20	-40.995	-20.54	-20.455	PASS
8DPSK	3-DH5	0	2400.00	-47.980	-18.55	-29.430	PASS
			9608.08	-44.769	-18.55	-26.219	PASS
		39	4882.09	-42.788	-19.13	-23.658	PASS
		78	2483.50	-50.180	-20.79	-29.390	PASS
			9920.20	-40.442	-20.79	-19.652	PASS

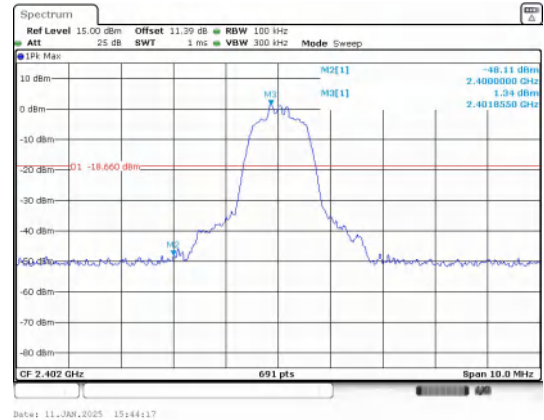
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.56	-48.582	-19.12	-29.462	PASS
			2400.00	-50.460	-19.12	-31.340	PASS
			2483.50	-50.040	-20.83	-29.210	PASS
$\pi/4$ DQPSK	2-DH5		2398.08	-47.459	-18.93	-28.529	PASS
			2400.00	-49.680	-18.93	-30.750	PASS
			2483.50	-49.570	-22.94	-26.630	PASS
8DPSK	3-DH5		2395.60	-47.859	-19.56	-28.299	PASS
			2400.00	-50.720	-19.56	-31.160	PASS
			2483.50	-49.440	-21.72	-27.720	PASS

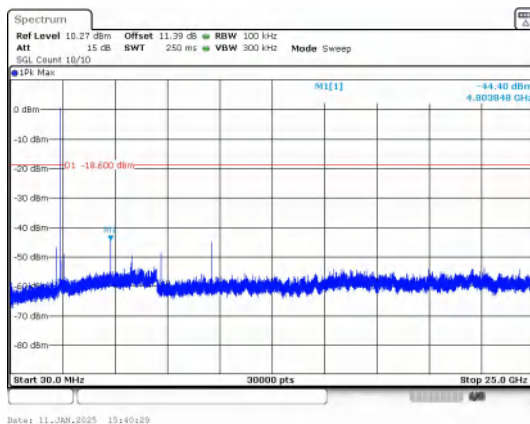
Test Graphs



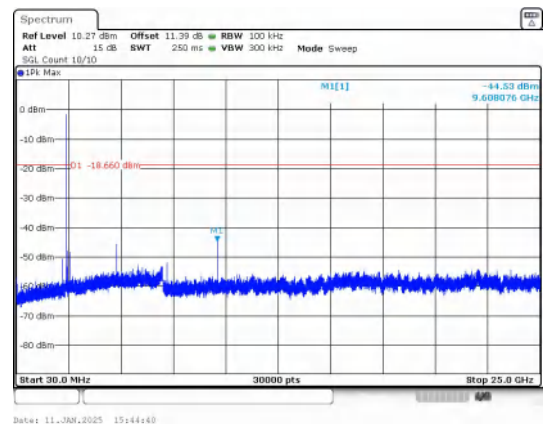
Out Of Band Emission
GFSK_DH5_Channel 0



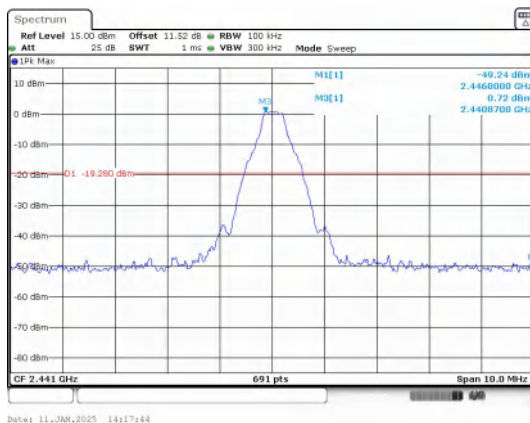
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



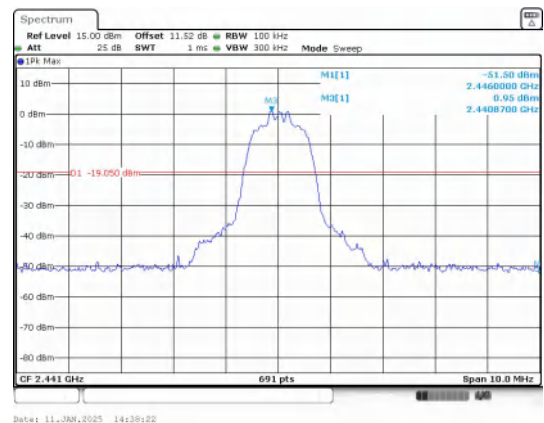
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



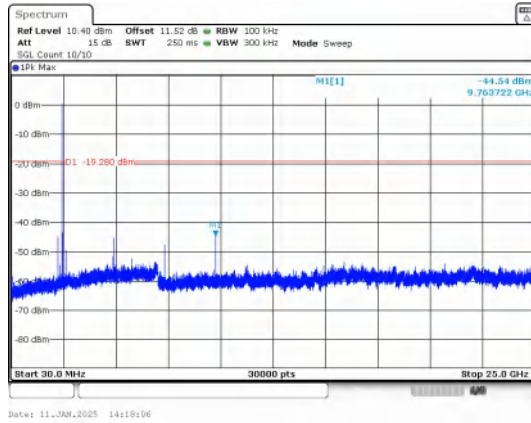
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



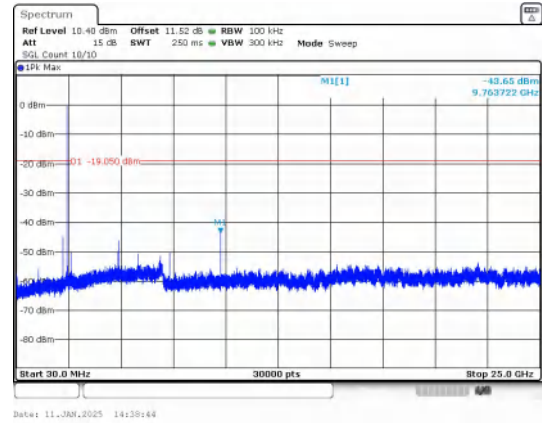
Out Of Band Emission
GFSK_DH5_Channel 39



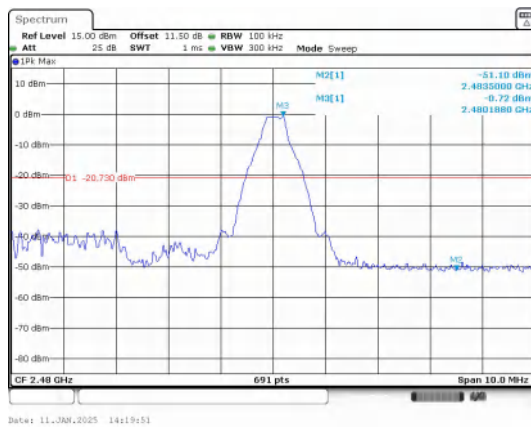
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



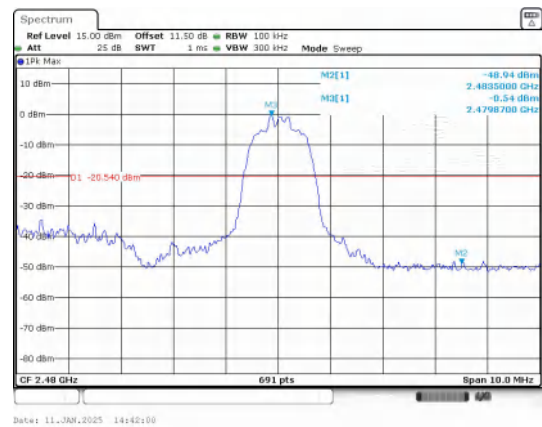
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



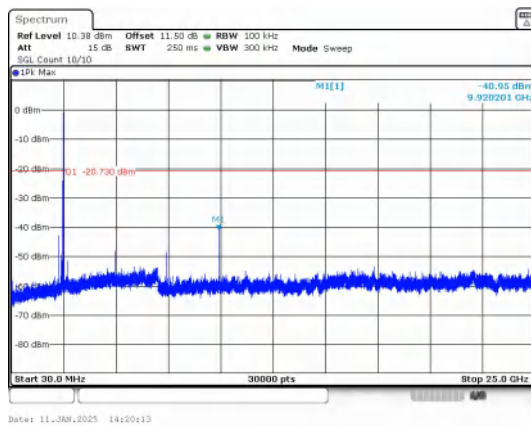
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



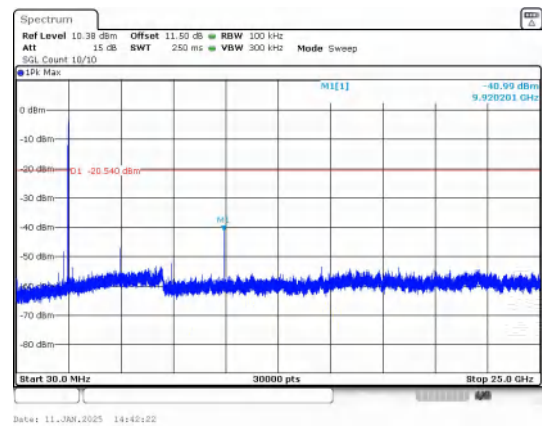
Out Of Band Emission
GFSK_DH5_Channel 78



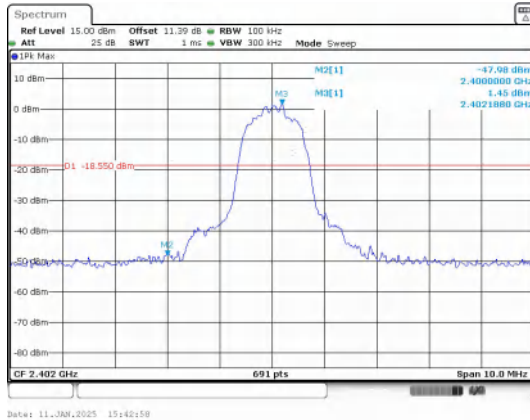
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



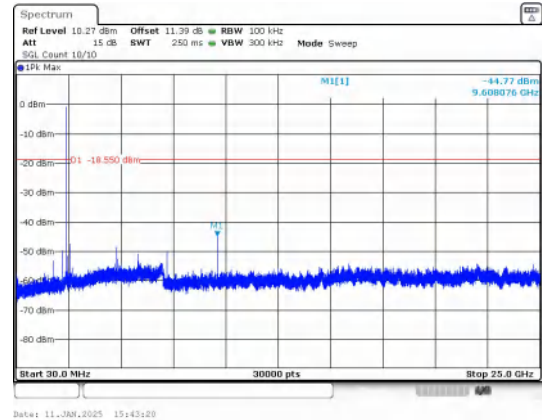
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



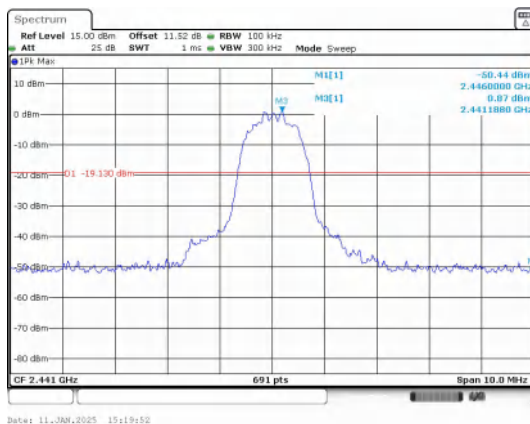
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



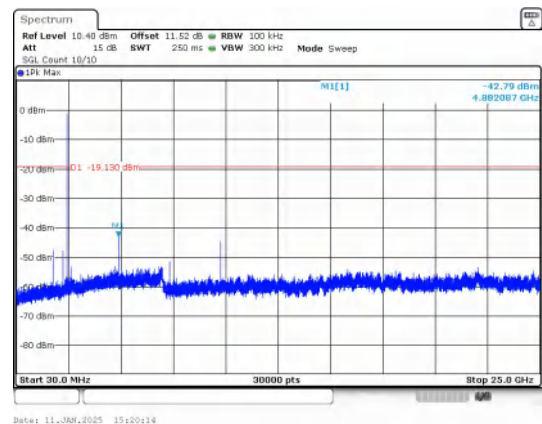
Out Of Band Emission
8DPSK_3-DH5_Channel 0



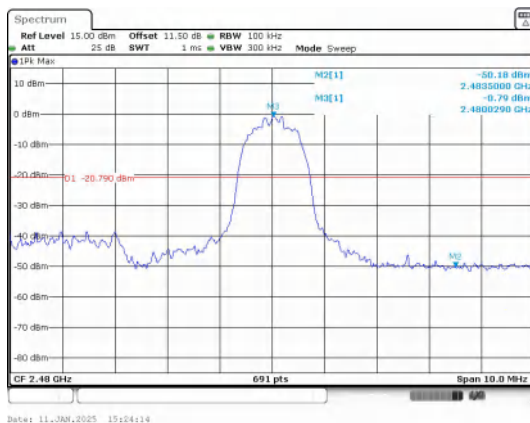
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



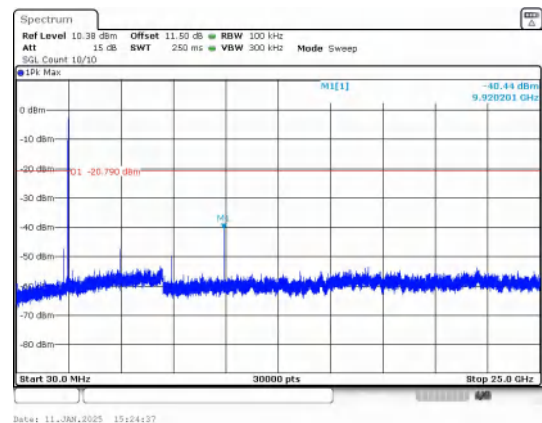
Out Of Band Emission
8DPSK_3-DH5_Channel 39



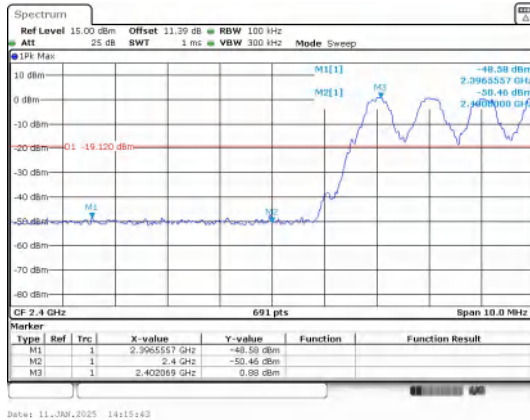
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



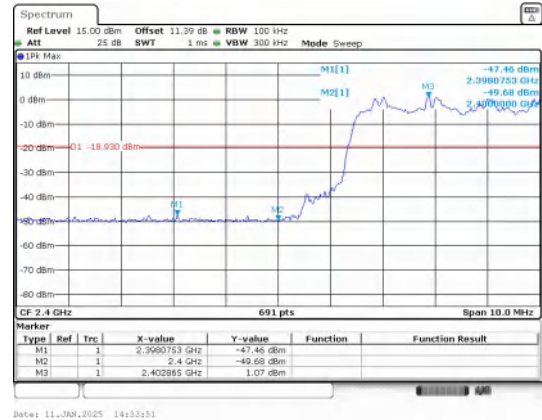
Out Of Band Emission
8DPSK_3-DH5_Channel 78



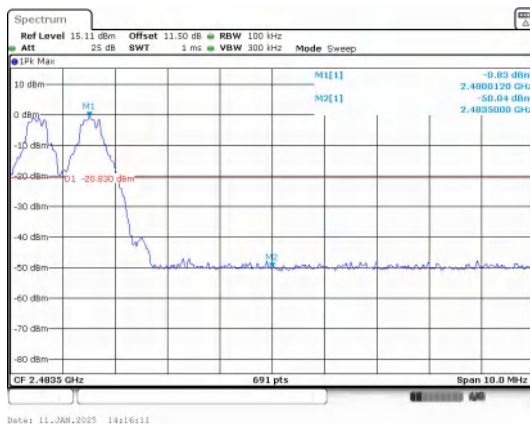
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



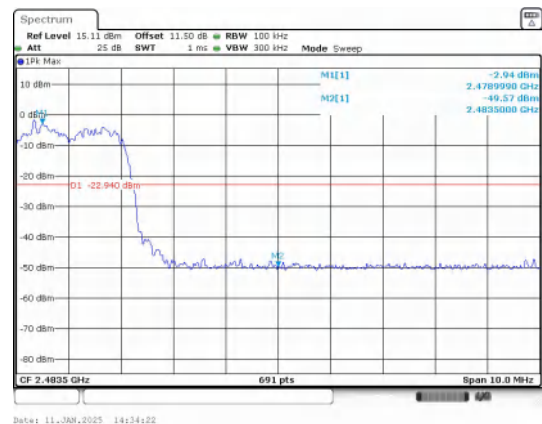
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



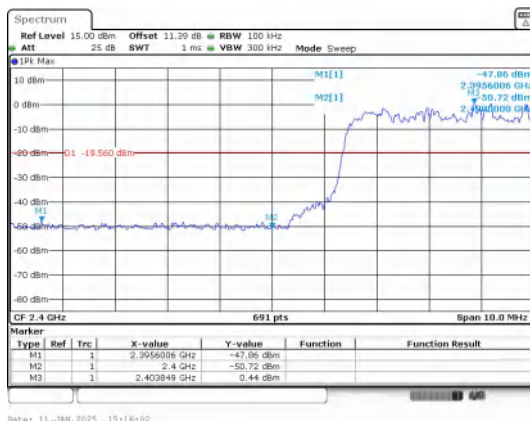
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



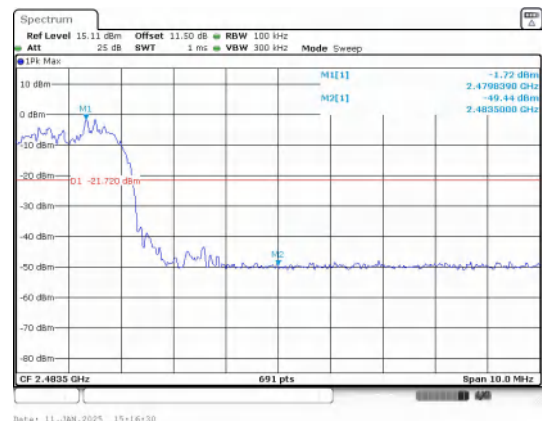
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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

Right:
Non-Hopping

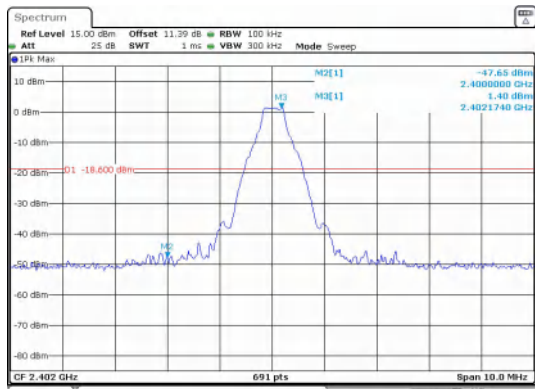
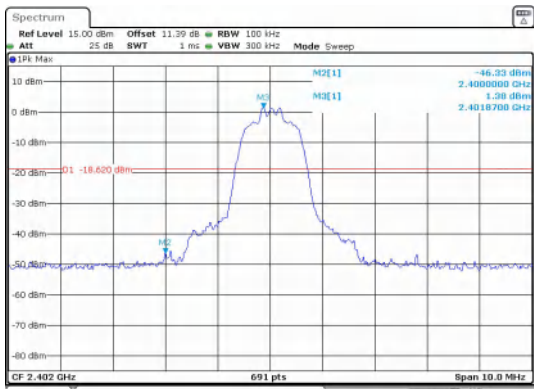
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
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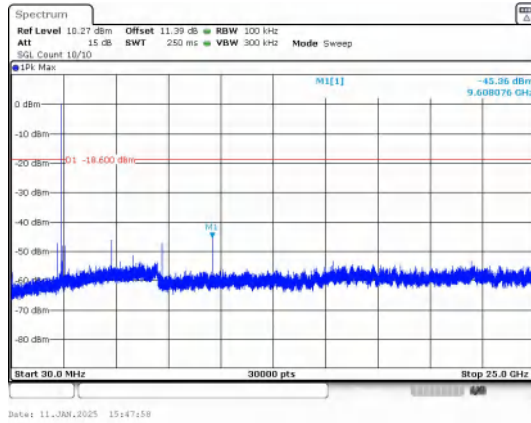
GFSK	DH5	0	2400.00	-47.650	-18.6	-29.050	PASS
			9608.08	-45.363	-18.6	-26.763	PASS
		39	9763.72	-42.878	-19.34	-23.538	PASS
		78	2483.50	-50.440	-20.91	-29.530	PASS
			9920.20	-40.334	-20.91	-19.424	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-46.330	-18.62	-27.710	PASS
			9608.08	-45.122	-18.62	-26.502	PASS
		39	9763.72	-42.726	-19.42	-23.306	PASS
		78	2483.50	-51.950	-20.99	-30.960	PASS
			9920.20	-39.801	-20.99	-18.811	PASS
8DPSK	3-DH5	0	2400.00	-48.240	-18.66	-29.580	PASS
			4803.85	-45.200	-18.66	-26.540	PASS
		39	9764.55	-42.645	-19.33	-23.315	PASS
		78	2483.50	-50.720	-21.01	-29.710	PASS
			9920.20	-39.790	-21.01	-18.780	PASS

Hopping

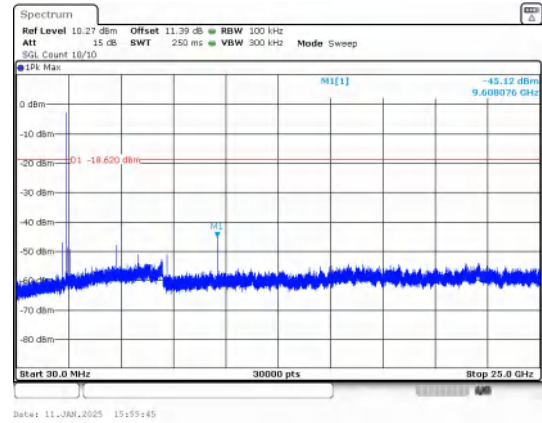
Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.18	-48.681	-18.93	-29.751	PASS
			2400.00	-49.320	-18.93	-30.390	PASS
			2483.50	-49.910	-21.18	-28.730	PASS
$\pi/4$ DQPSK	2-DH5		2397.15	-48.453	-18.99	-29.463	PASS
			2400.00	-49.960	-18.99	-30.970	PASS
			2483.50	-50.060	-21.9	-28.160	PASS
8DPSK	3-DH5		2398.12	-47.641	-19.3	-28.341	PASS
			2400.00	-51.000	-19.3	-31.700	PASS
			2483.50	-49.820	-21.18	-28.640	PASS

Test Graphs

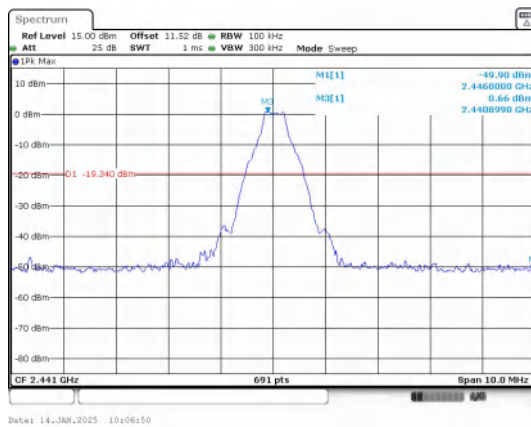
 Out Of Band Emission GFSK_DH5_Channel 0	 Out Of Band Emission $\pi/4$DQPSK_2-DH5_Channel 0
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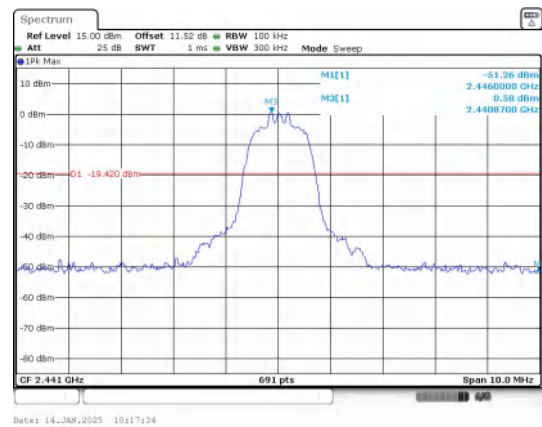
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



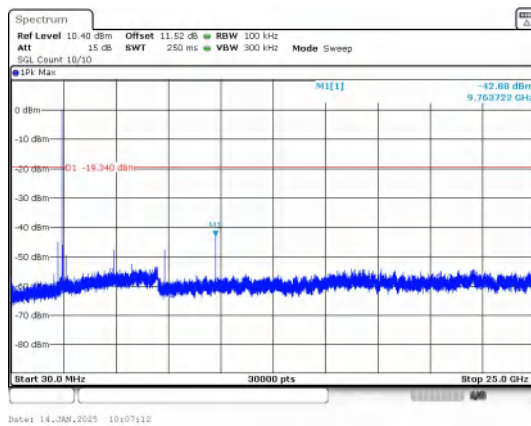
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



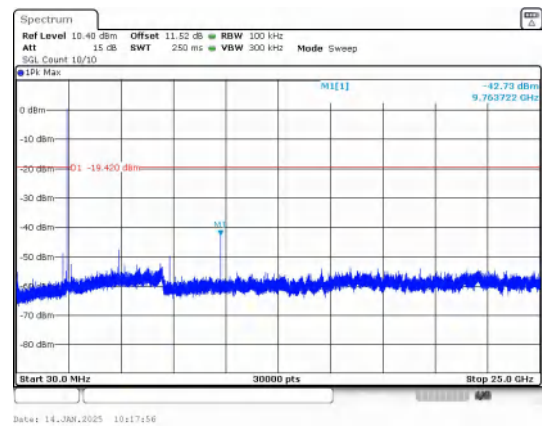
Out Of Band Emission
GFSK_DH5_Channel 39



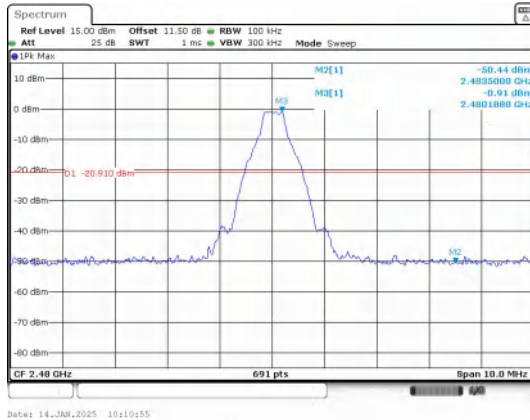
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



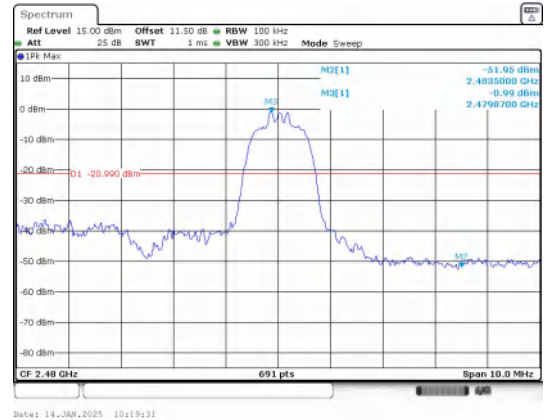
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



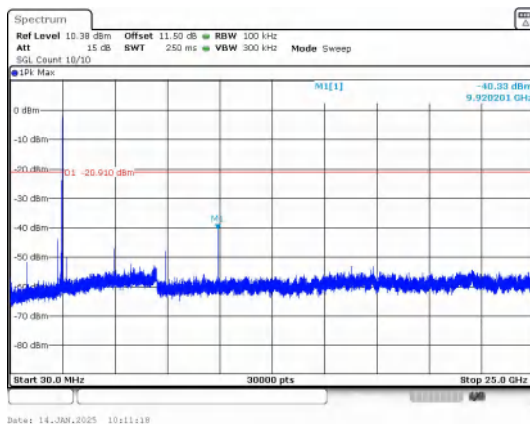
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



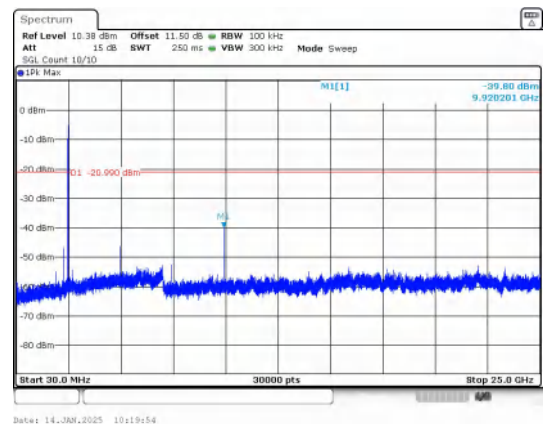
Out Of Band Emission
GFSK_DH5_Channel 78



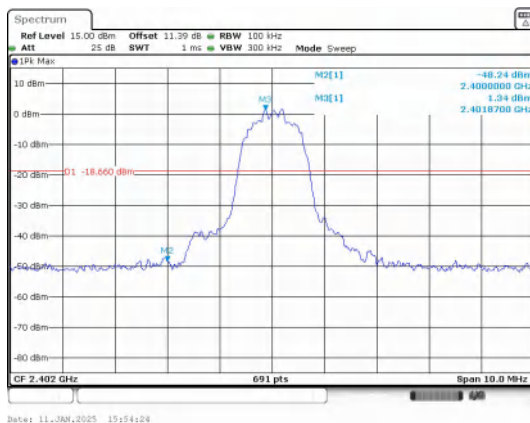
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



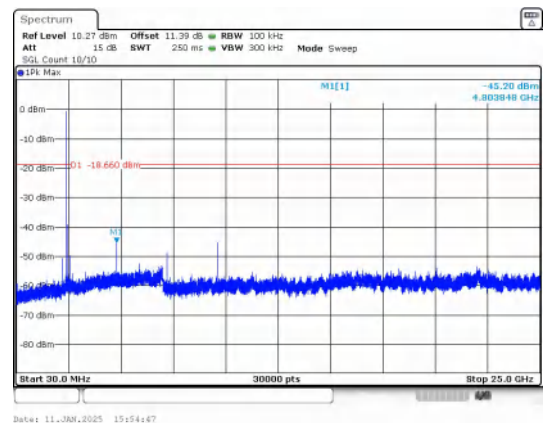
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



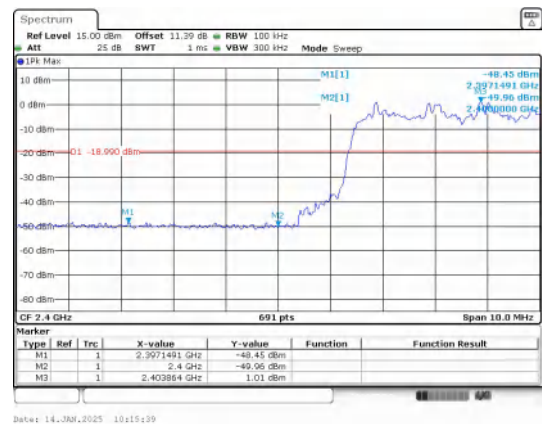
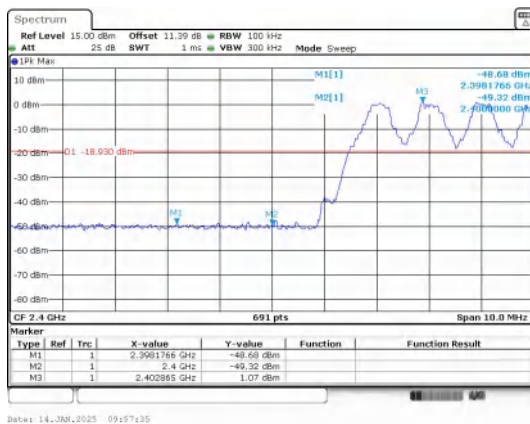
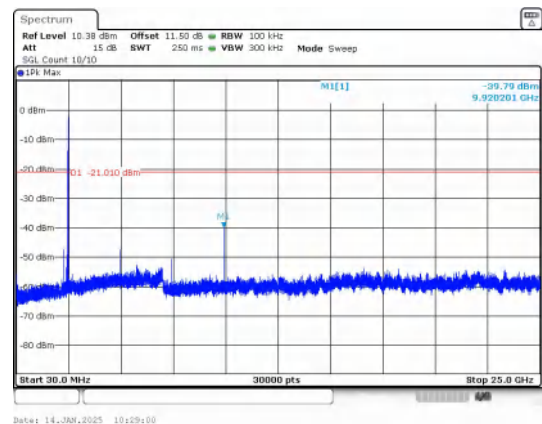
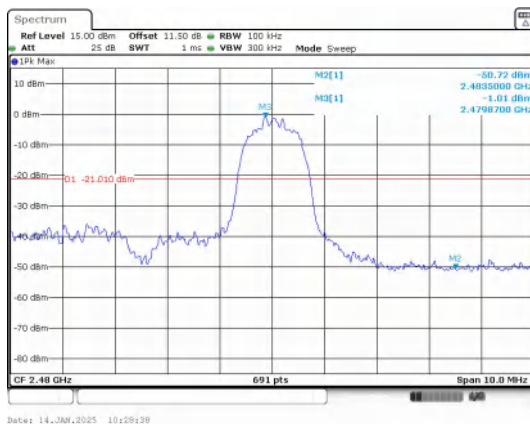
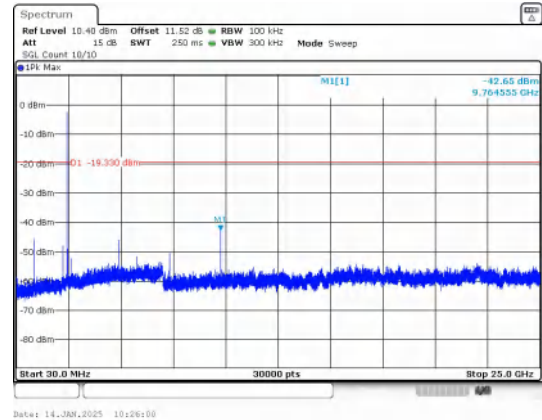
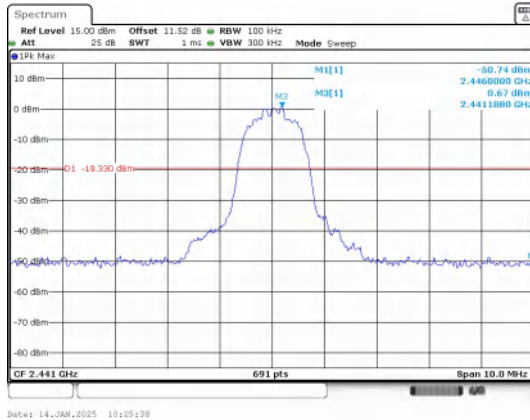
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78

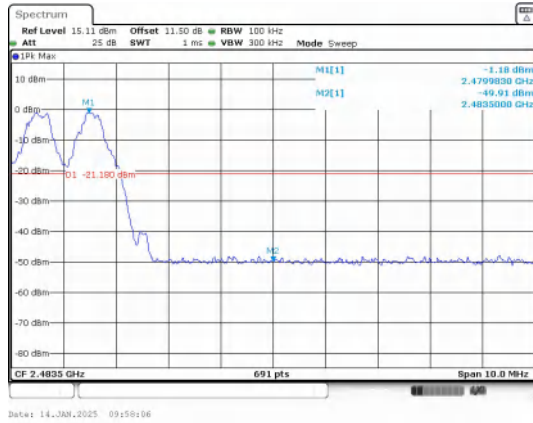


Out Of Band Emission
8DPSK_3-DH5_Channel 0

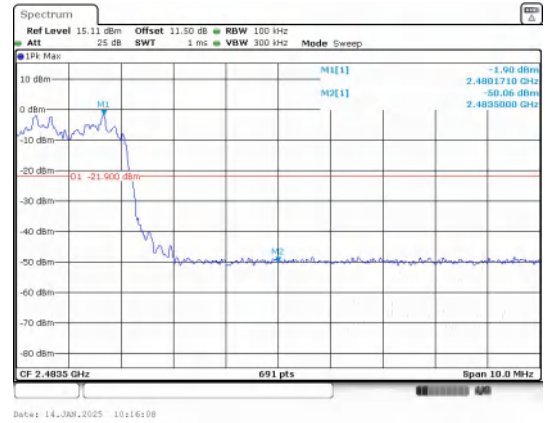


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0

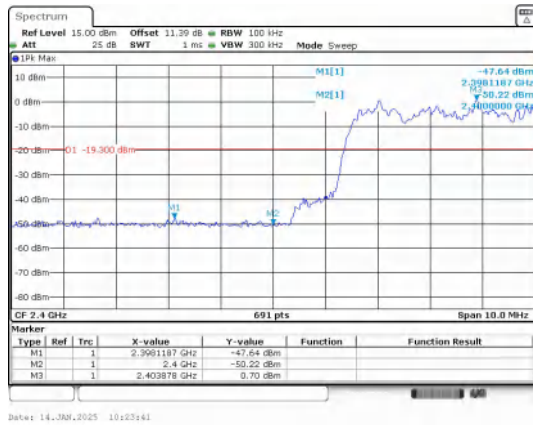




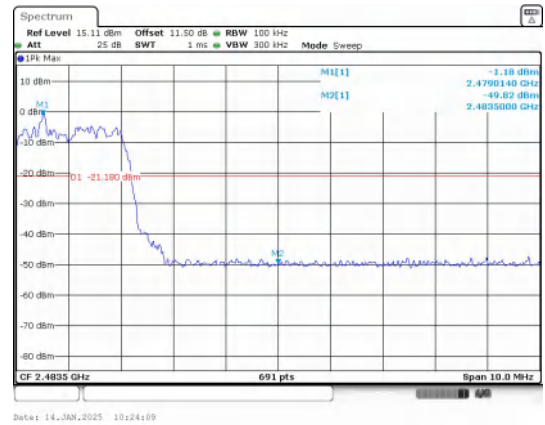
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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-----