

Appendix A

Report No.:	CISRR240109034
Product Name:	Wireless gamepad
Model No.:	JOY-02
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Conducted Peak Output Power

Test Result

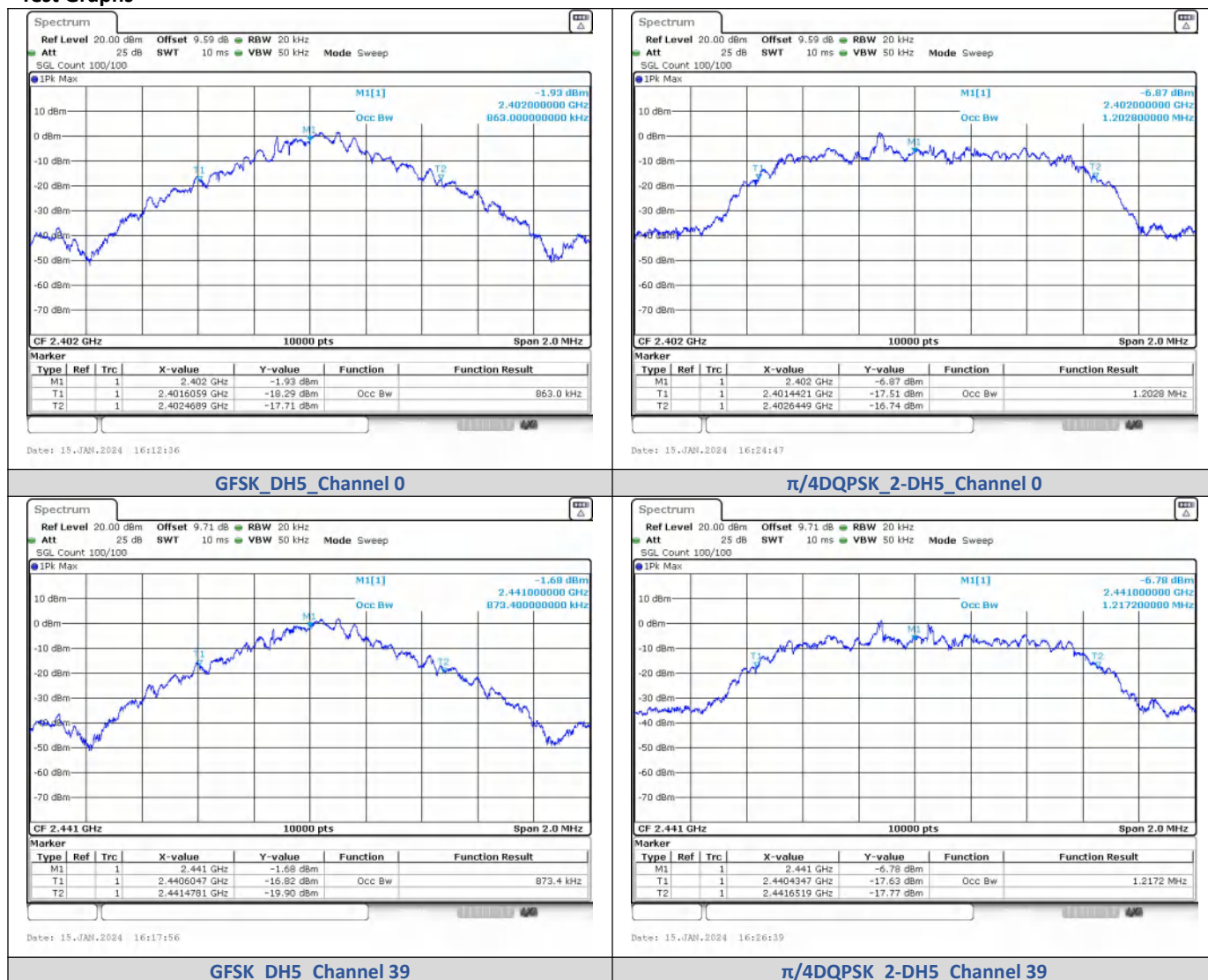
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	5.335	3.416	30	PASS
		39	5.462	3.517		PASS
		78	4.875	3.072		PASS
$\pi/4$ DQPSK	2-DH5	0	5.897	3.888	20.97	PASS
		39	5.879	3.872		PASS
		78	5.340	3.420		PASS
8DPSK	3-DH5	0	6.214	4.182		PASS
		39	6.117	4.090		PASS
		78	5.578	3.612		PASS

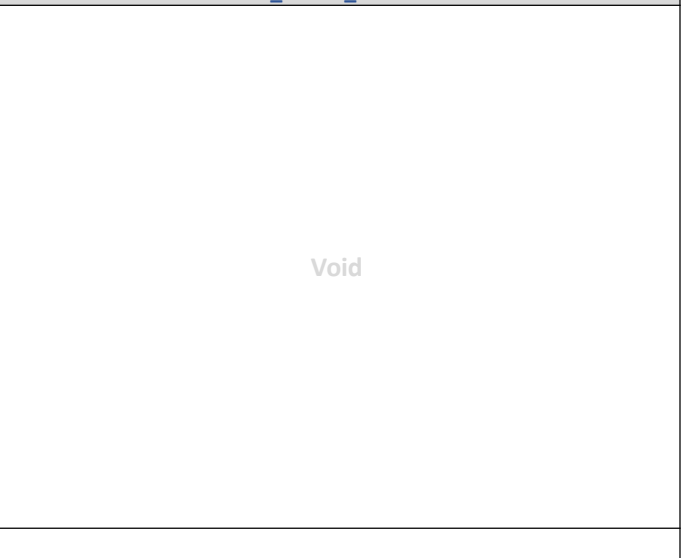
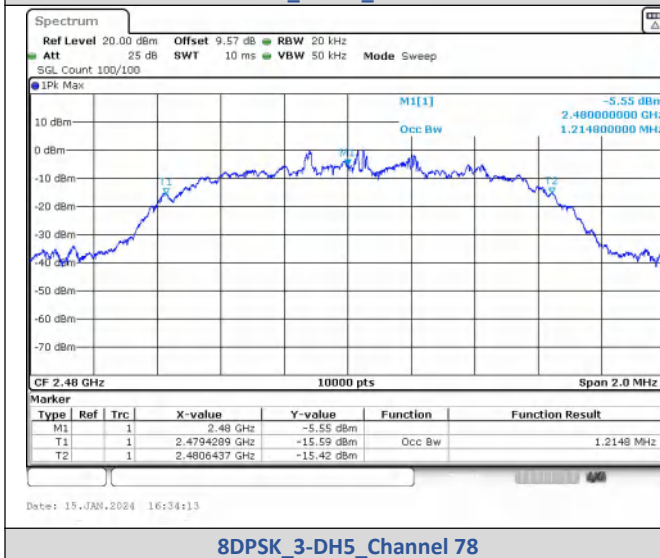
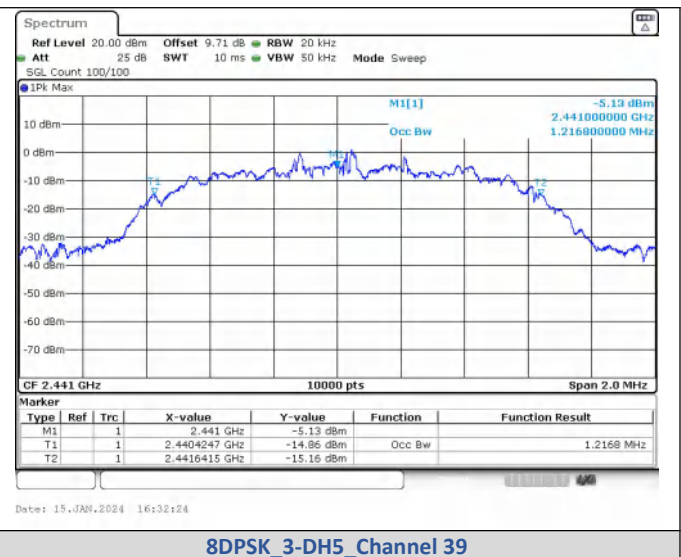
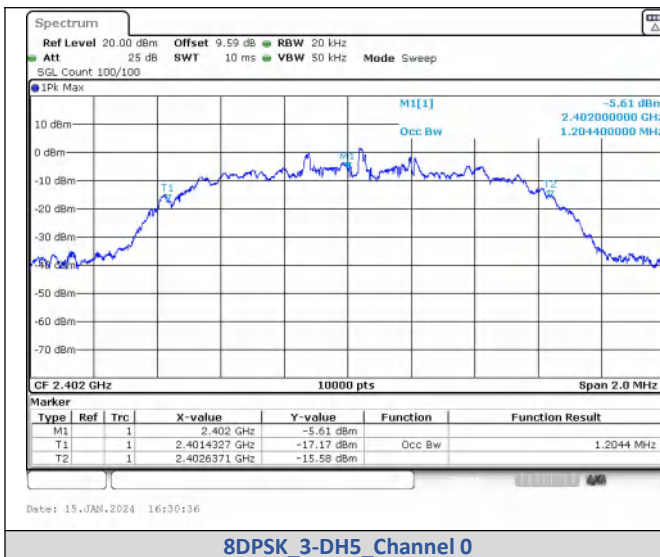
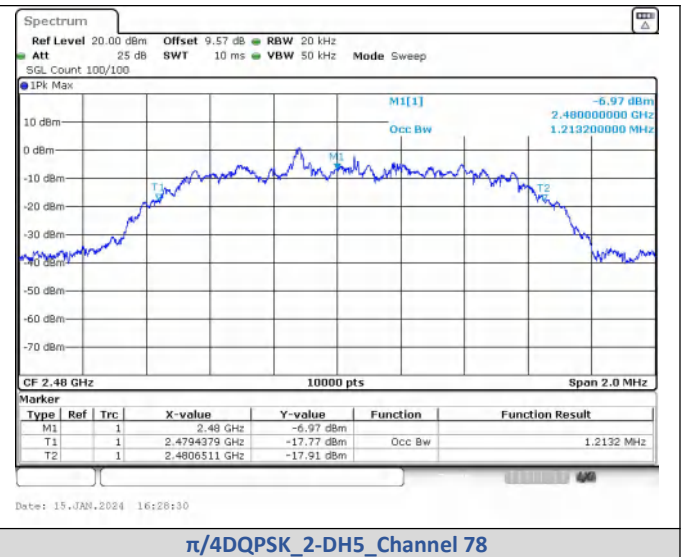
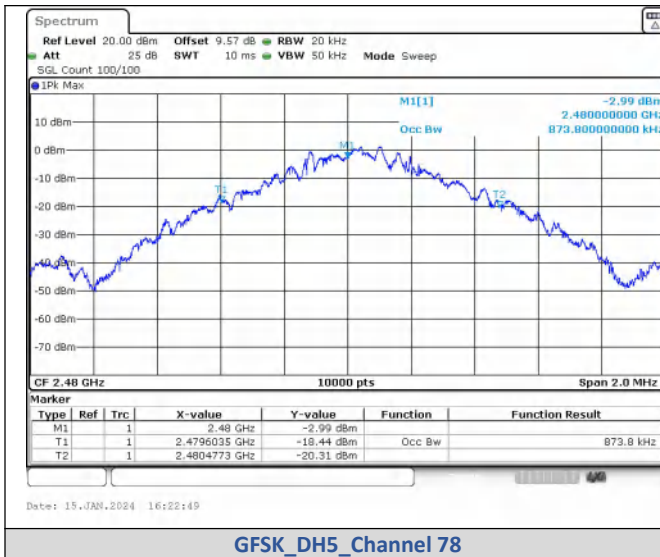
2) 99% Bandwidth

Test Result

Modulation	Channel	99% BW (MHz)
GFSK	0	0.86300
	39	0.87340
	78	0.87380
$\pi/4$ DQPSK	0	1.2030
	39	1.2170
	78	1.2130
	0	1.2040
8DPSK	0	1.2170
	39	1.2150
	78	1.2150

Test Graphs





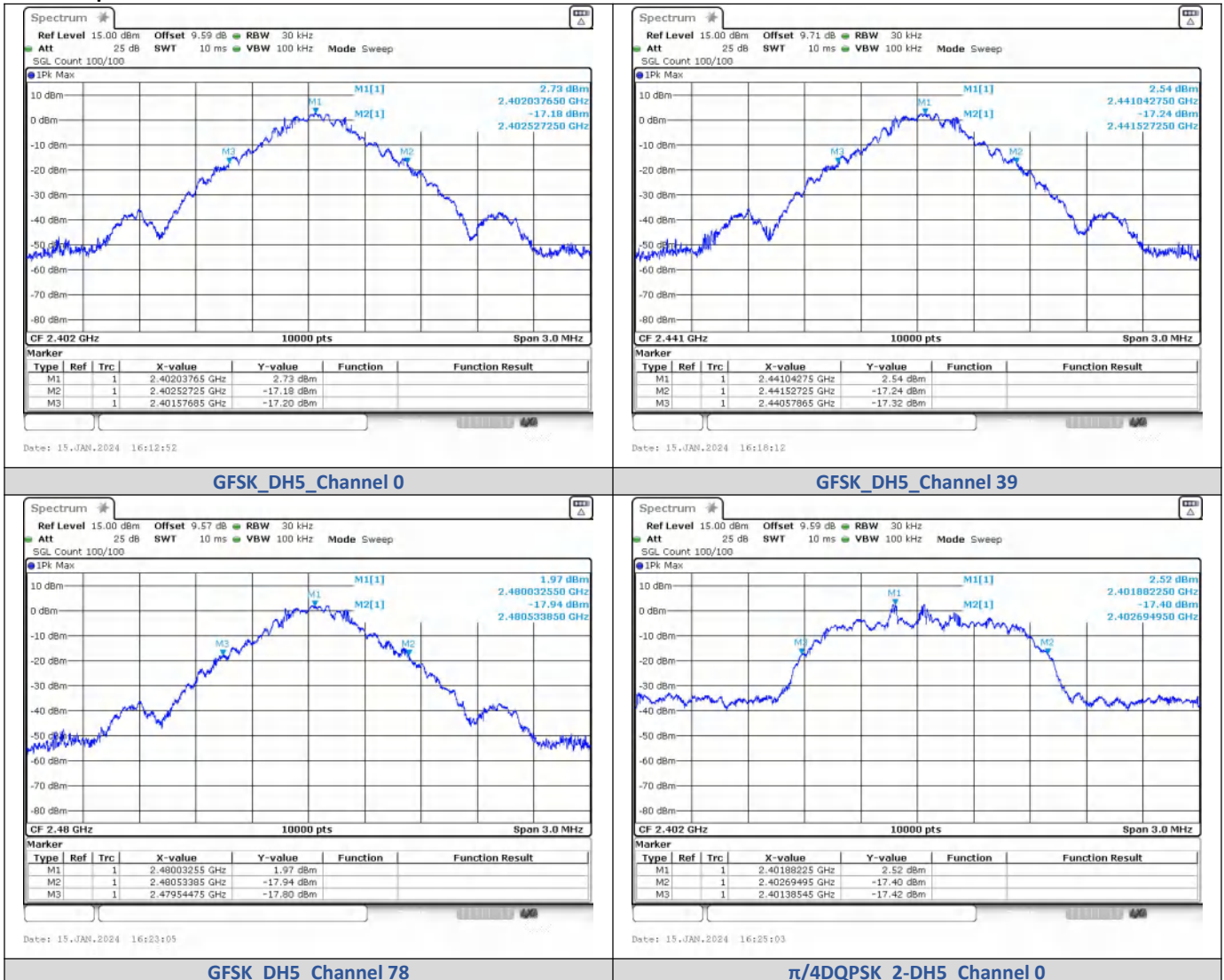
Void

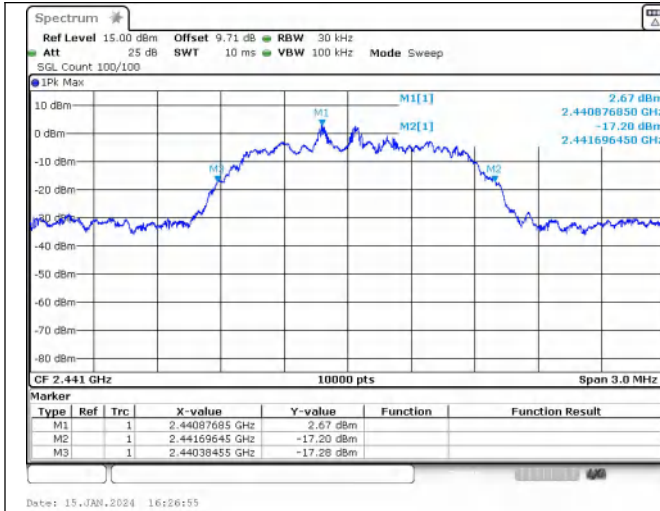
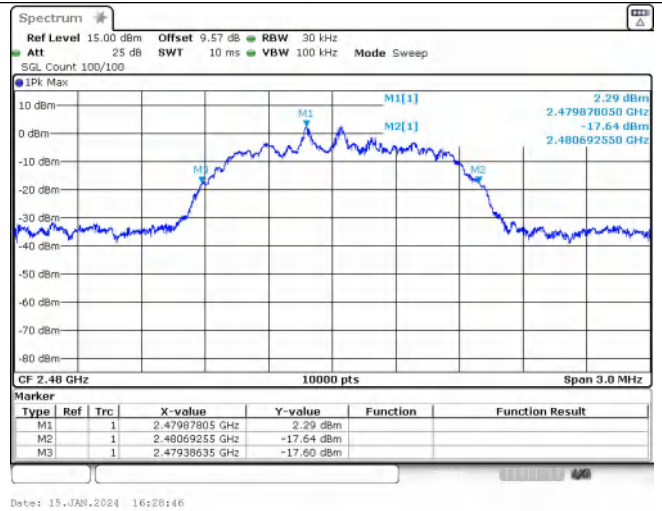
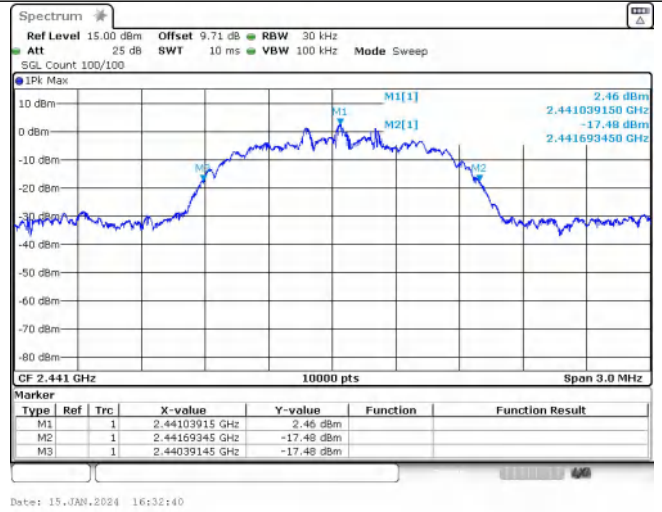
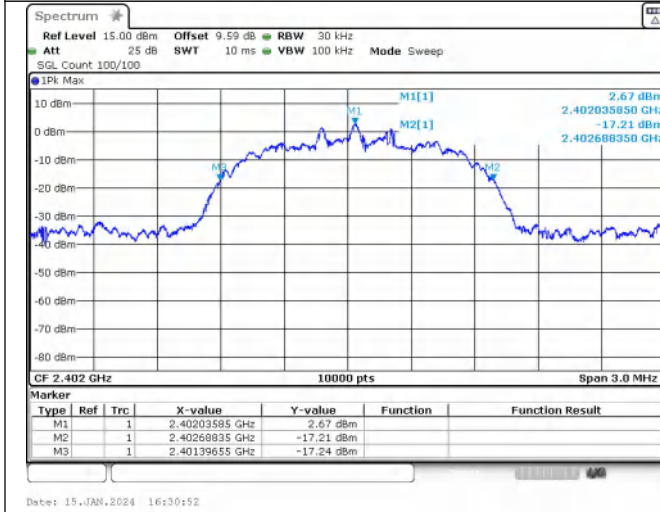
3) 20dB Bandwidth

Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9500
	39	2441 MHz	0.9500
	78	2480 MHz	0.9900
$\pi/4$ DQPSK	0	2402 MHz	1.300
	39	2441 MHz	1.320
	78	2480 MHz	1.300
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.300
	78	2480 MHz	1.300

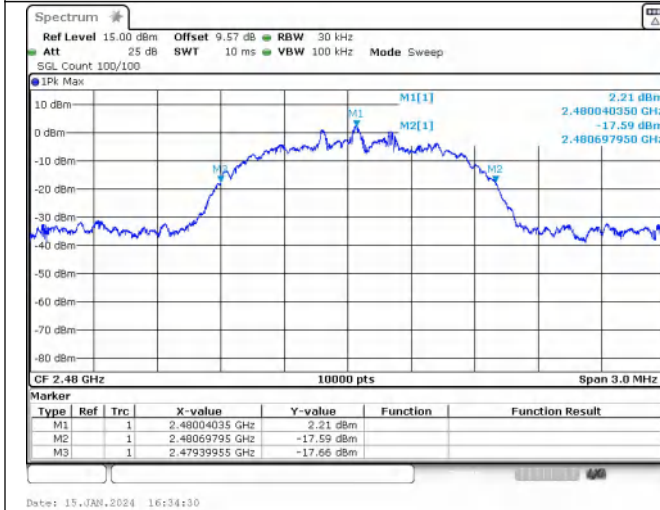
Test Graphs




 $\pi/4$ DQPSK_2-DH5_Channel 39

 $\pi/4$ DQPSK_2-DH5_Channel 78


8DPSK_3-DH5_Channel 0

8DPSK_3-DH5_Channel 39



Void

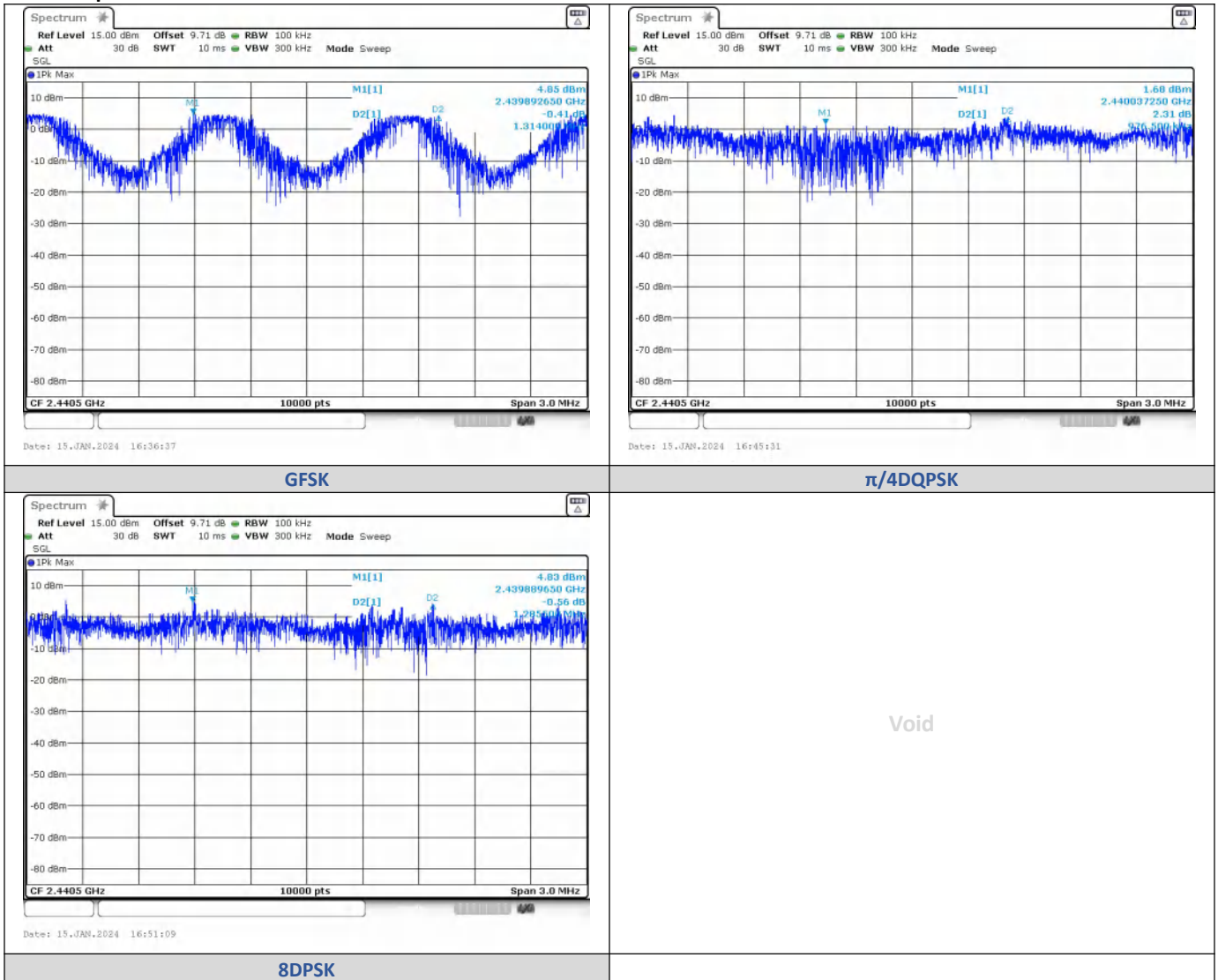
8DPSK_3-DH5_Channel 78

4) Carrier Frequencies Separation

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8926	2441.2067	1.3140	0.633	PASS
$\pi/4$ DQPSK	2-DH5	2440.0372	2441.0138	0.9765	0.867	PASS
8DPSK	3-DH5	2439.8897	2441.1752	1.2855	0.86	PASS

Test Graphs



5) Conducted Out Of Band Emission

Test Result

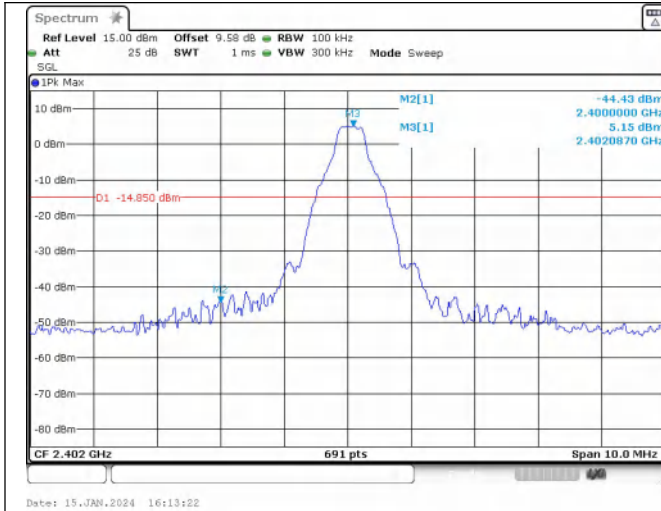
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-44.425	-14.85	-29.575	PASS
			7205.96	-39.085	-14.85	-24.235	PASS
		39	7322.49	-36.160	-14.59	-21.570	PASS
			2483.50	-50.959	-15.15	-35.809	PASS
			7440.68	-38.184	-15.15	-23.034	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-49.094	-14.75	-34.344	PASS
			9608.08	-40.728	-14.75	-25.978	PASS
		39	9764.55	-38.340	-14.75	-23.590	PASS
			2483.50	-51.792	-15.44	-36.352	PASS
			9920.20	-40.297	-15.44	-24.857	PASS
8DPSK	3-DH5	0	2400.00	-48.161	-14.8	-33.361	PASS
			9608.08	-41.642	-14.8	-26.842	PASS
		39	7323.32	-36.158	-14.72	-21.438	PASS
			2483.50	-50.499	-15.18	-35.319	PASS
			9920.20	-40.312	-15.18	-25.132	PASS

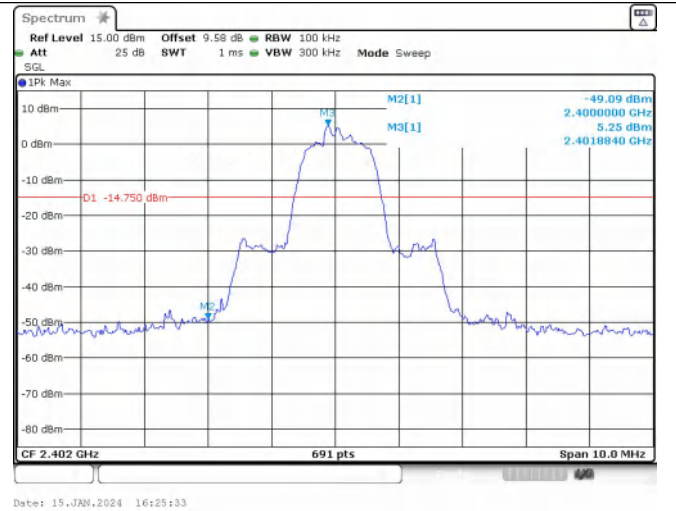
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2400.00	-50.126	-14.96	-35.166	PASS
			2483.50	-50.681	-15.16	-35.521	PASS
			2400.00	-50.085	-14.99	-35.095	PASS
			2483.50	-50.915	-15.77	-35.145	PASS
$\pi/4$ DQPSK	2-DH5		2397.18	-50.056	-18.54	-31.516	PASS
			2400.00	-51.026	-18.54	-32.486	PASS
			2483.50	-51.725	-16.51	-35.215	PASS
			2397.37	-49.161	-14.97	-34.191	PASS
			2400.00	-52.010	-14.97	-37.040	PASS
			2483.50	-51.874	-17.86	-34.014	PASS
			2398.60	-49.761	-16.11	-33.651	PASS
			2400.00	-52.158	-16.11	-36.048	PASS
8DPSK	3-DH5		2483.50	-52.066	-16.3	-35.766	PASS
			2398.06	-50.082	-15.05	-35.032	PASS
			2400.00	-52.160	-15.05	-37.110	PASS
			2483.50	-52.034	-18.95	-33.084	PASS

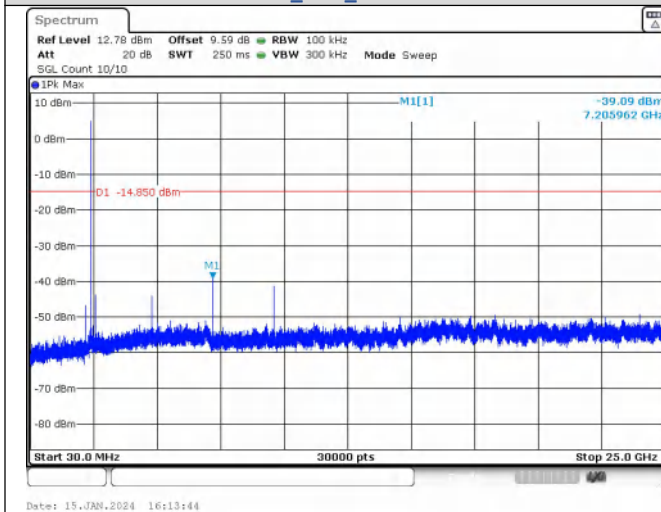
Test Graphs



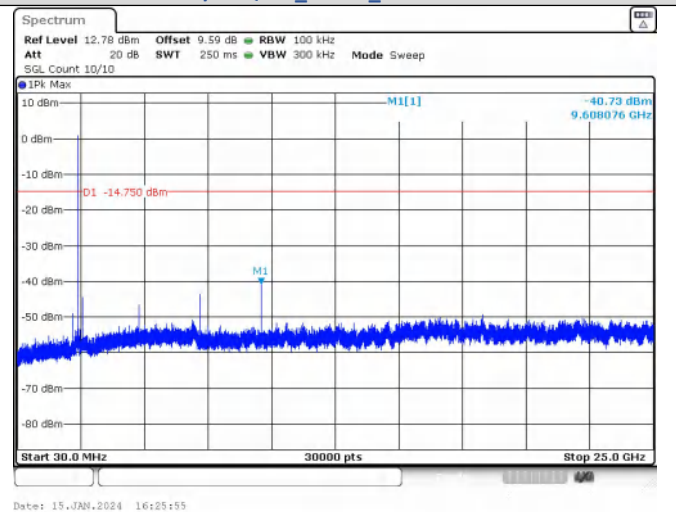
Out Of Band Emission
GFSK_DH5_Channel 0



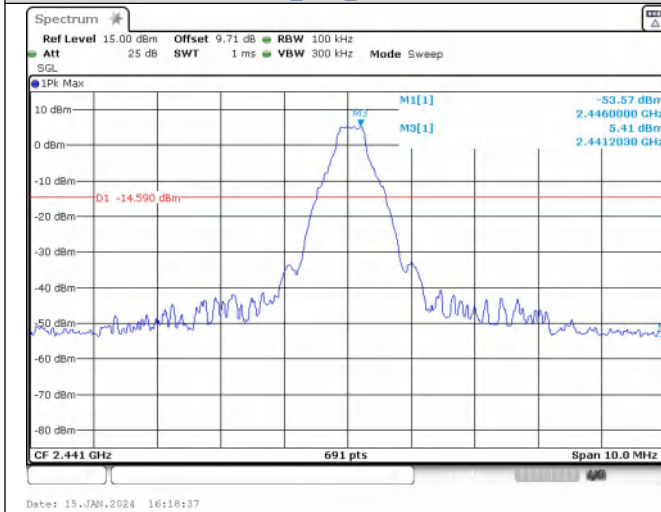
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



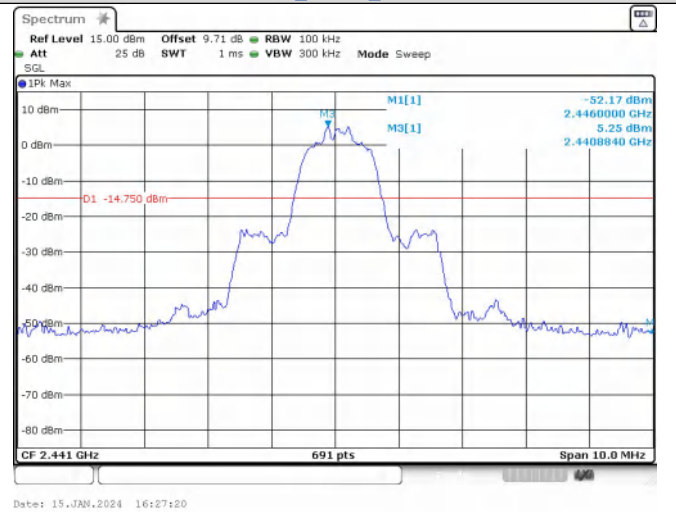
Spurious Emission
GFSK_DH5_Channel 0



Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0

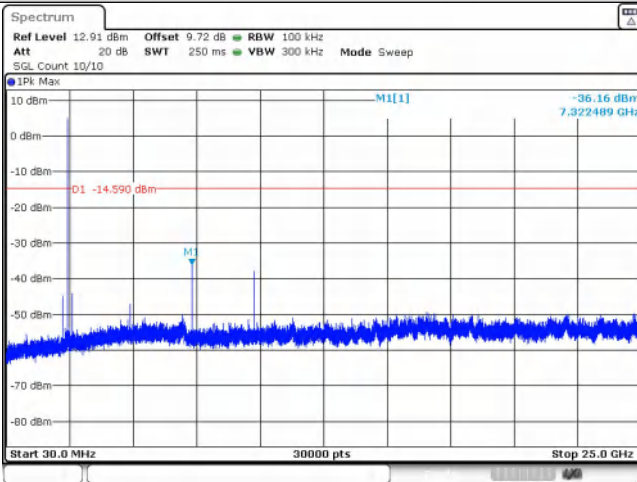


Out Of Band Emission



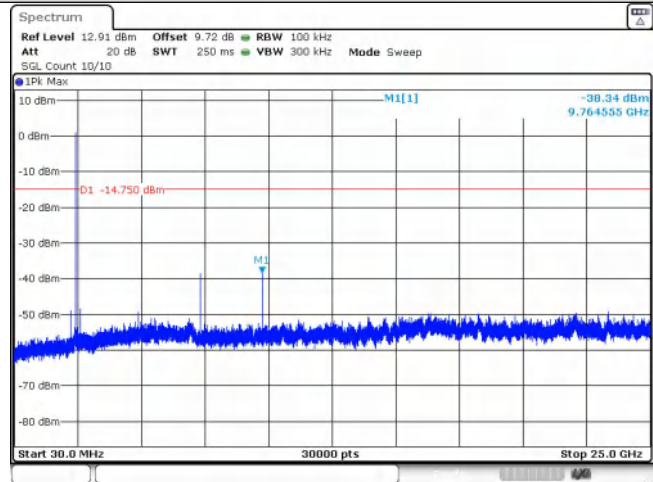
Out Of Band Emission

GFSK_DH5_Channel 39



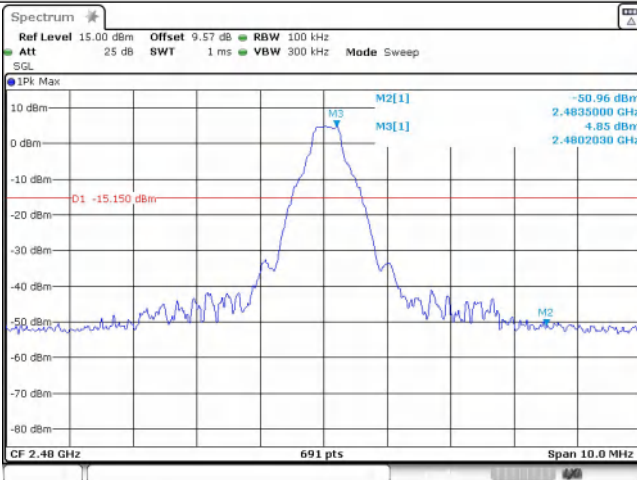
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$\pi/4$ QPSK_2-DH5_Channel 39



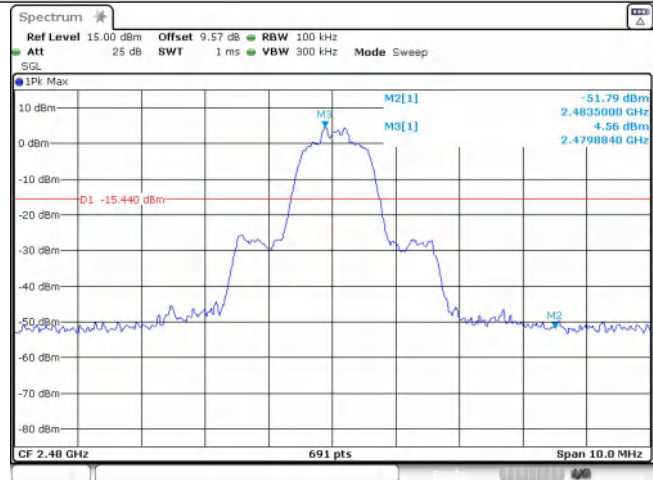
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Spurious Emissions GFSK_DH5_Channel 39



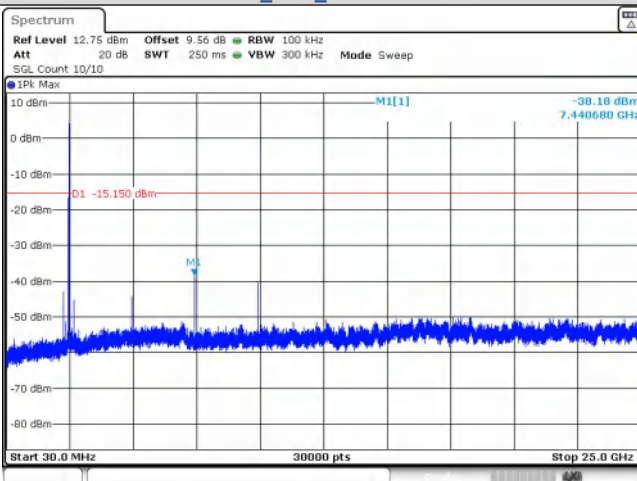
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Spurious Emissions $\pi/4$ QPSK_2-DH5_Channel 39



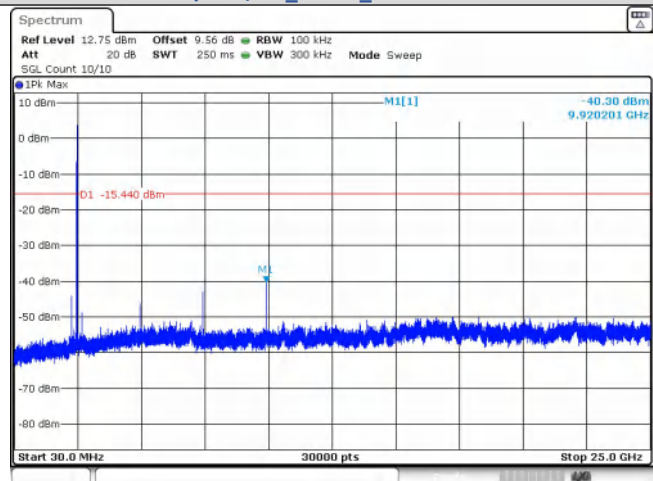
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Out Of Band Emission GFSK_DH5_Channel 78



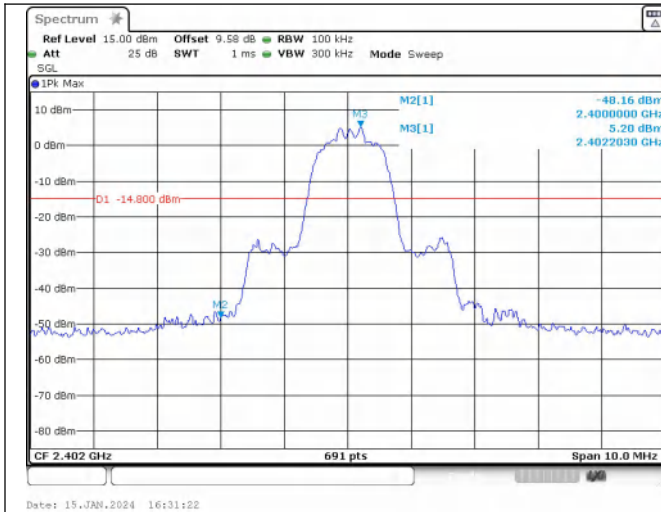
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Out Of Band Emission $\pi/4$ QPSK_2-DH5_Channel 78

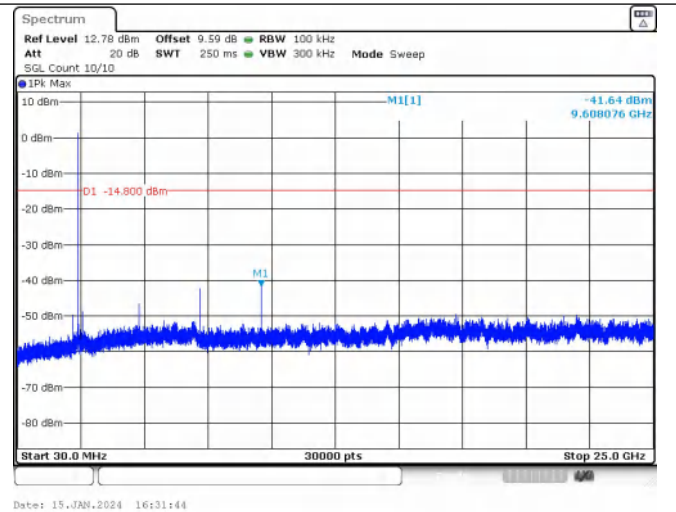


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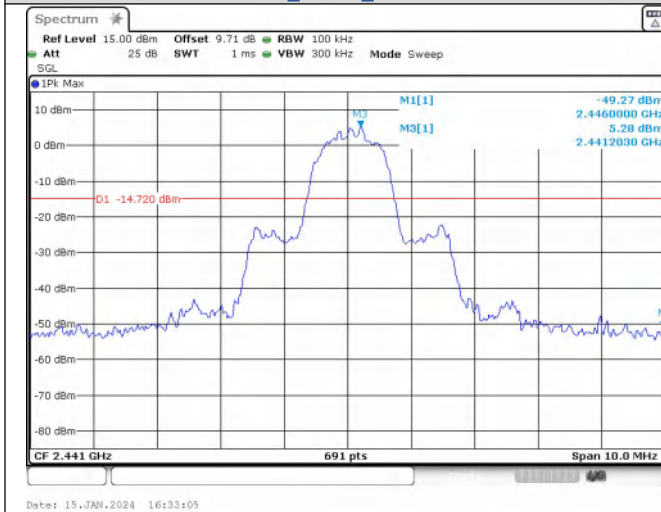
Spurious Emission
GFSK_DH5_Channel 78



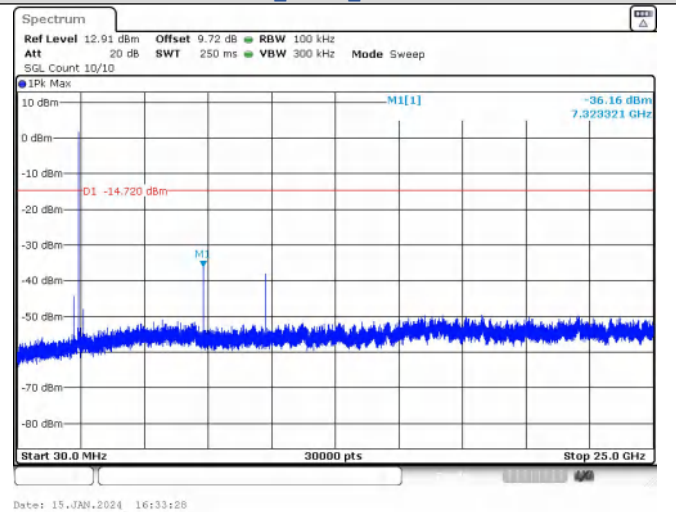
Spurious Emission
 $\pi/4$ QPSK_2-DH5_Channel 78



Out Of Band Emission
8DPSK_3-DH5_Channel 0

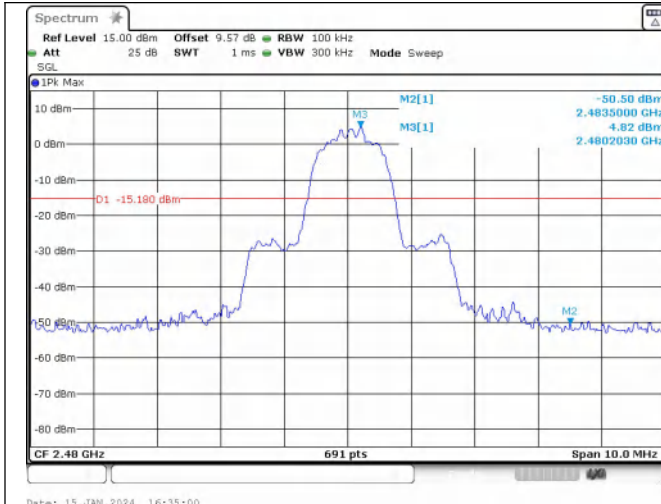


Spurious Emission
8DPSK_3-DH5_Channel 0

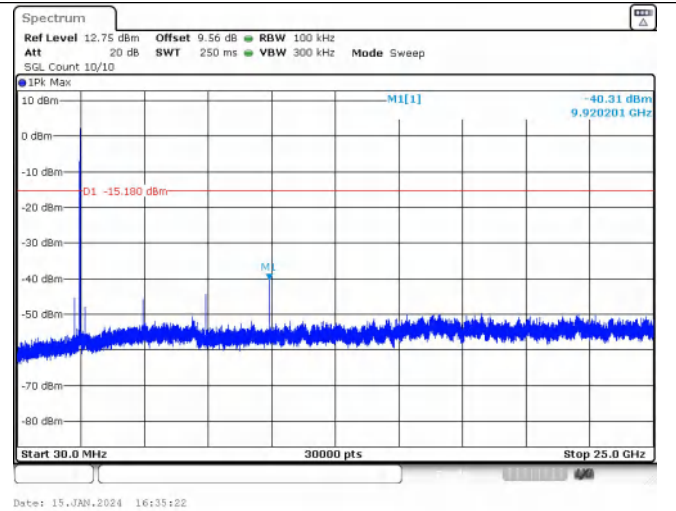


Out Of Band Emission
8DPSK_3-DH5_Channel 39

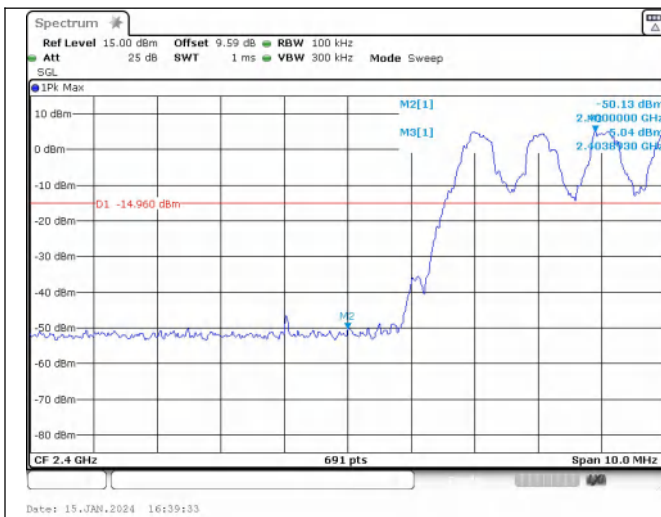
Spurious Emissions
8DPSK_3-DH5_Channel 39



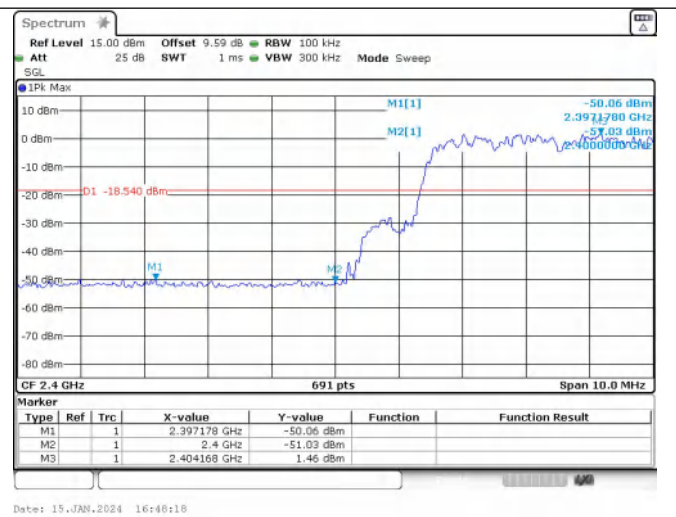
Out Of Band Emission
8DPSK_3-DH5_Channel 78



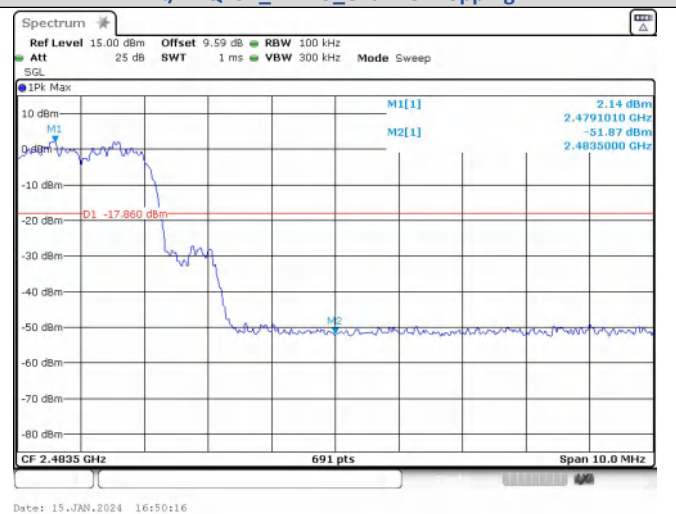
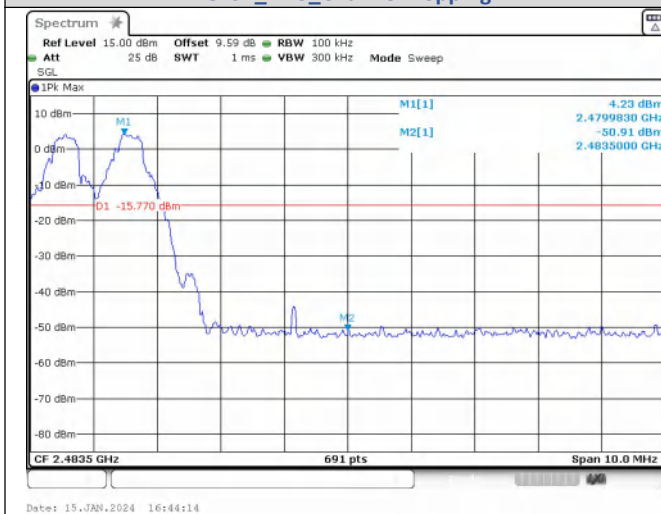
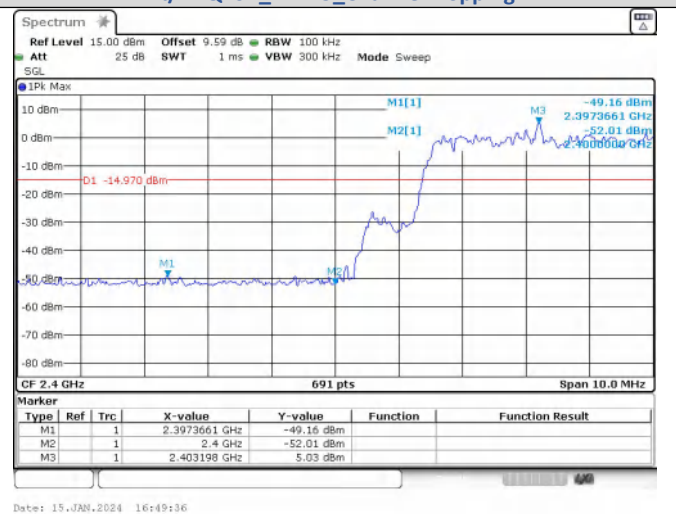
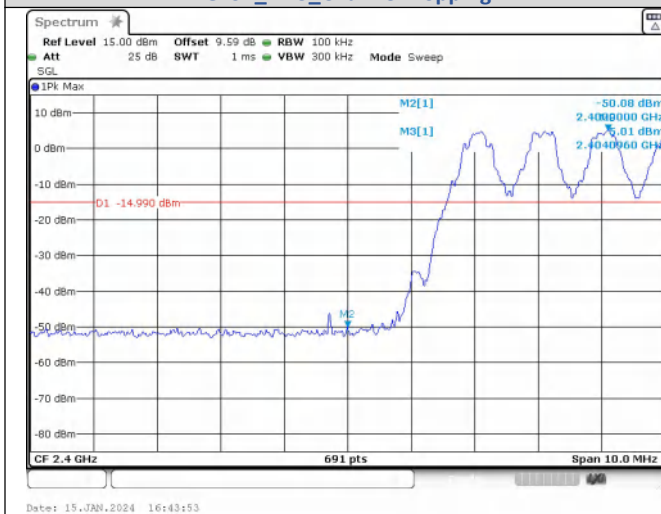
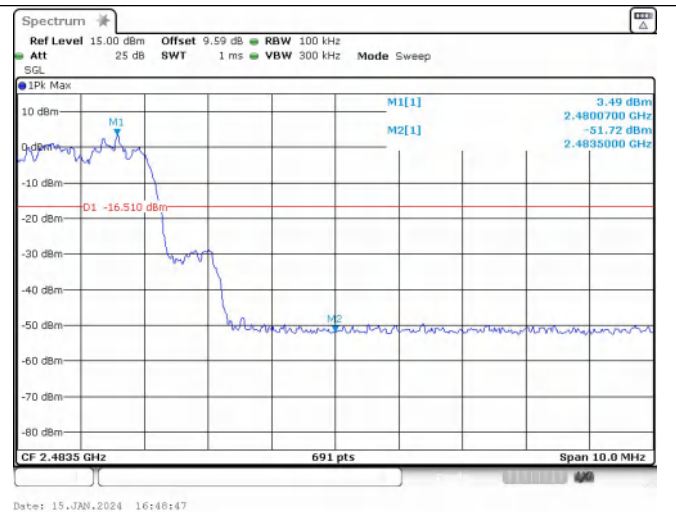
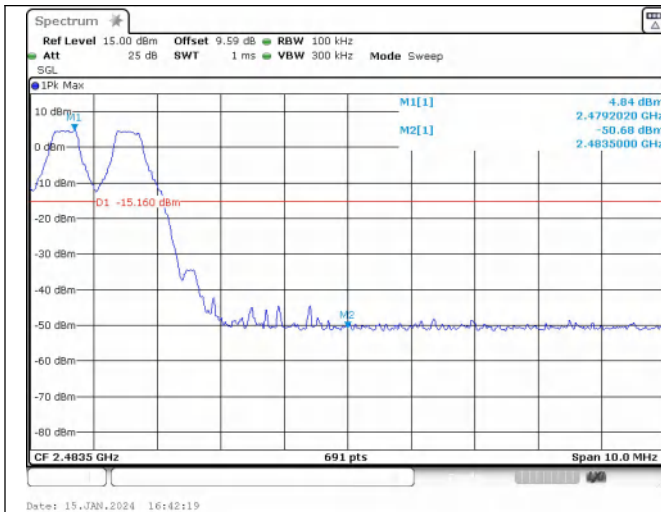
Spurious Emission
8DPSK_3-DH5_Channel 78



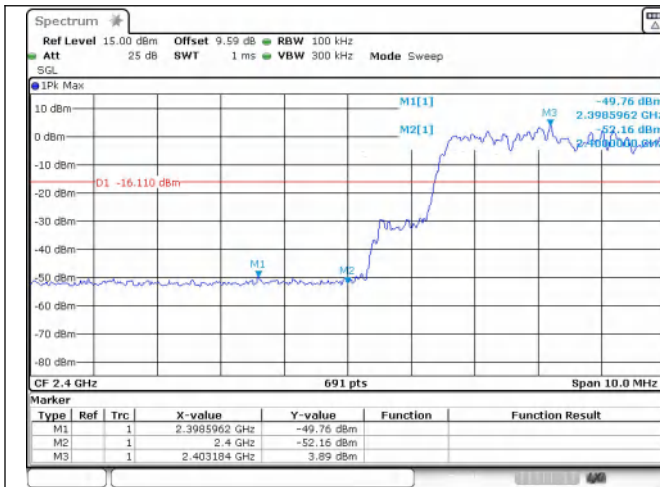
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



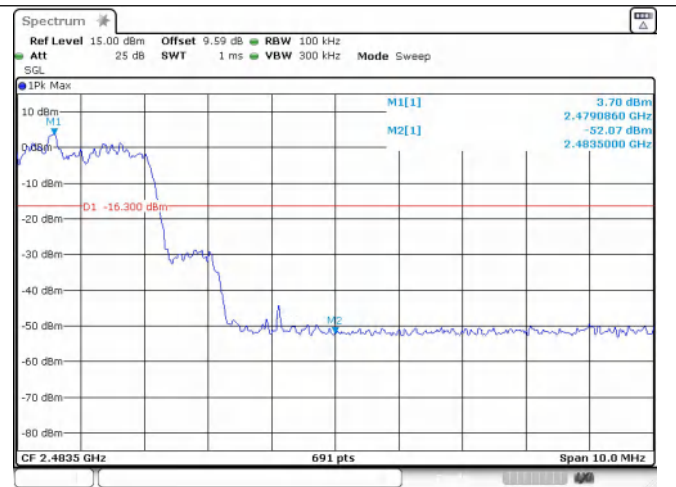
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



GFSK_DH5_Channel Hopping

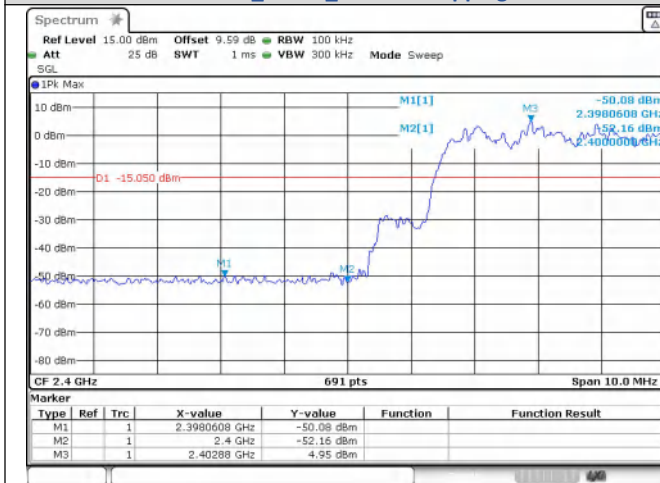
 $\pi/4$ QPSK_2-DH5_Channel Hopping


Date: 15.JAN.2024 16:54:15

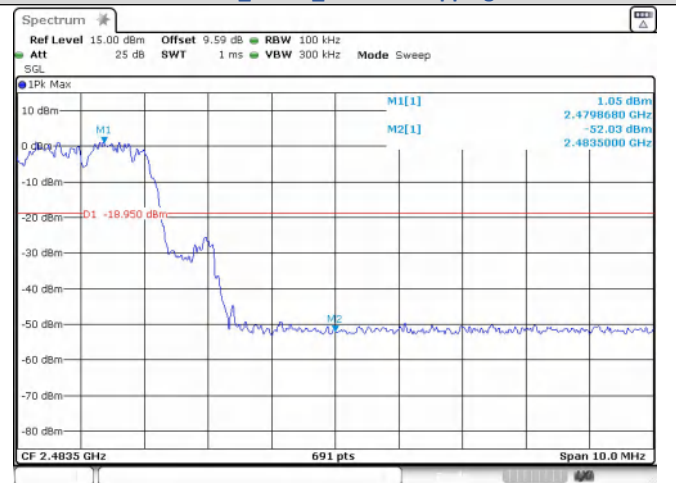


Date: 15.JAN.2024 16:54:39

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

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


Date: 15.JAN.2024 16:55:32



Date: 15.JAN.2024 16:55:54

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

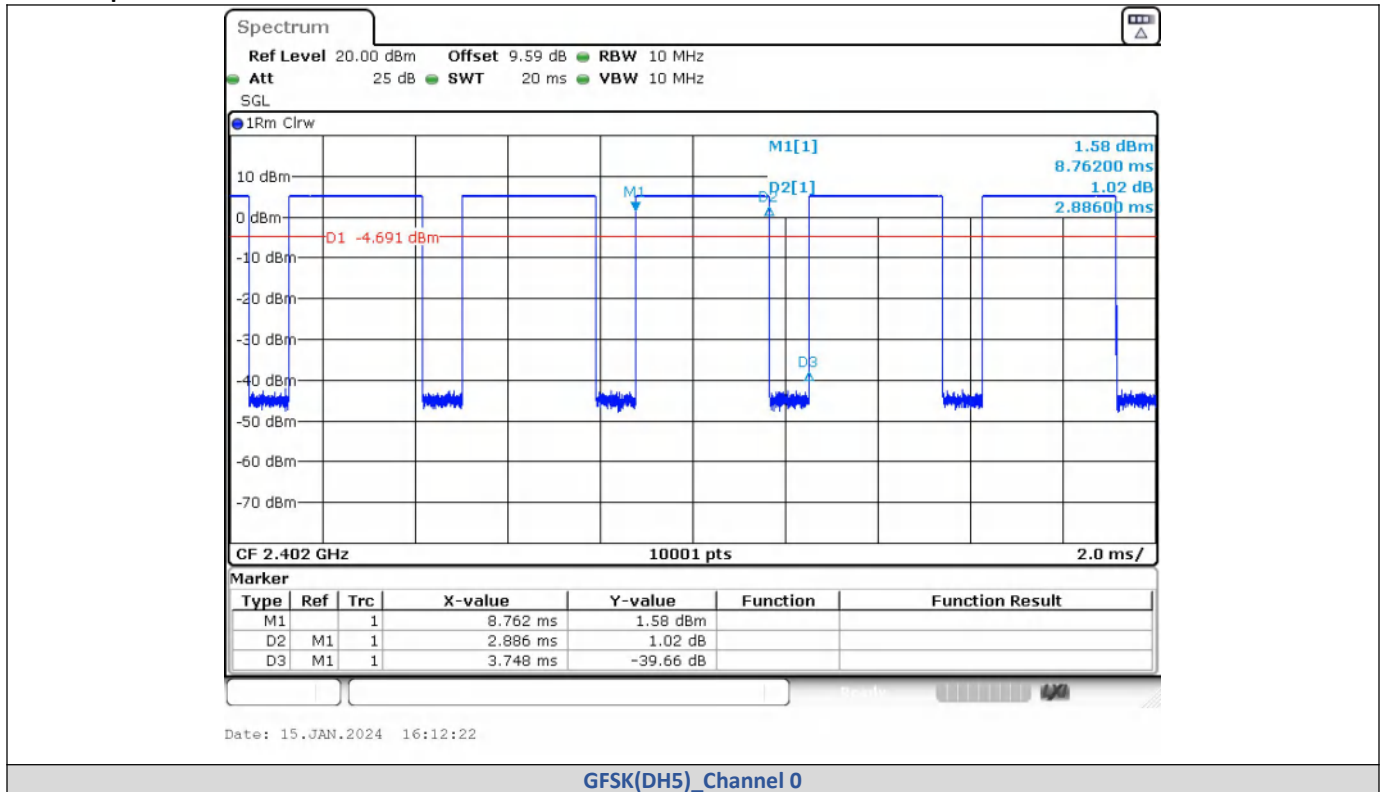
Out Of Band Emission(Right)
8DPSK_3-DH5_Channel Hopping

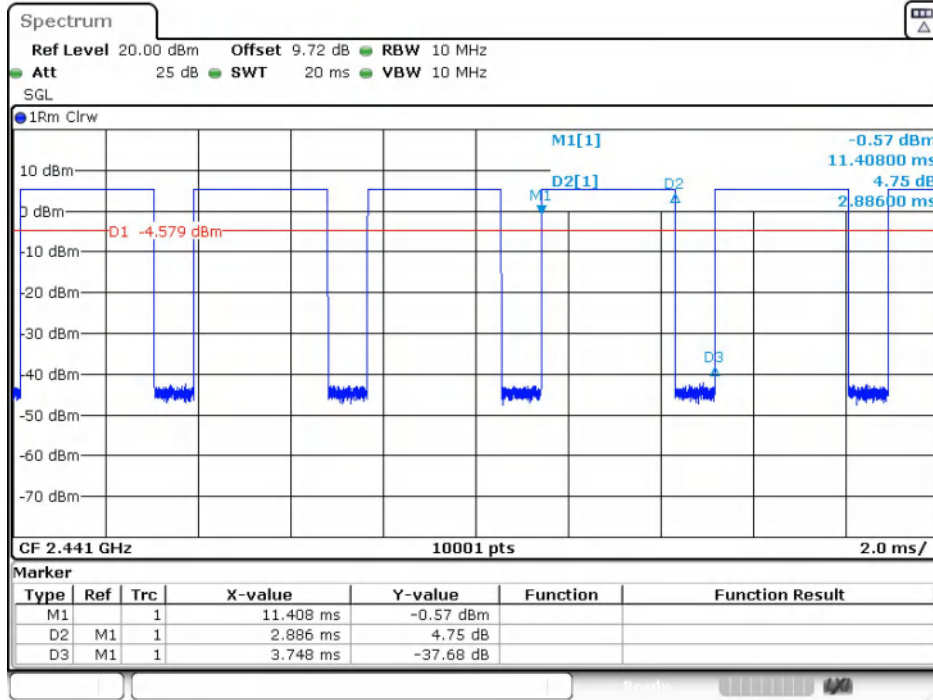
6) Duty Cycle

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	0.35
		39	2.886	3.748	77.00	0.7700	1.1351	0.35
		78	2.886	3.748	77.00	0.7700	1.1351	0.35
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.35
		39	2.892	3.748	77.16	0.7716	1.1261	0.35
		78	2.890	3.748	77.11	0.7711	1.1289	0.35
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.35
		39	2.894	3.748	77.21	0.7721	1.1233	0.35
		78	2.894	3.748	77.21	0.7721	1.1233	0.35

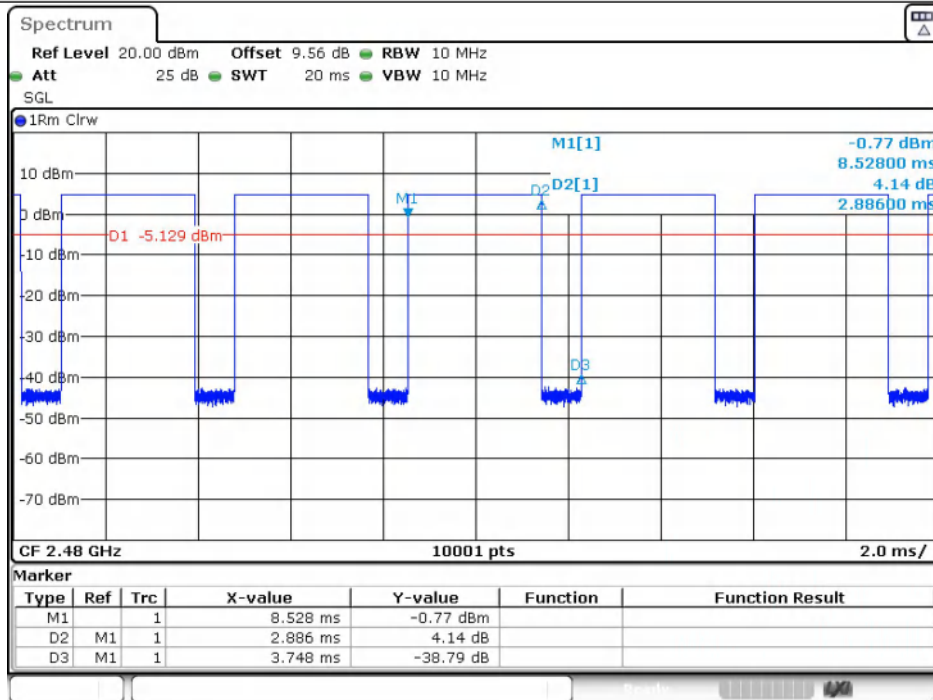
Test Graphs





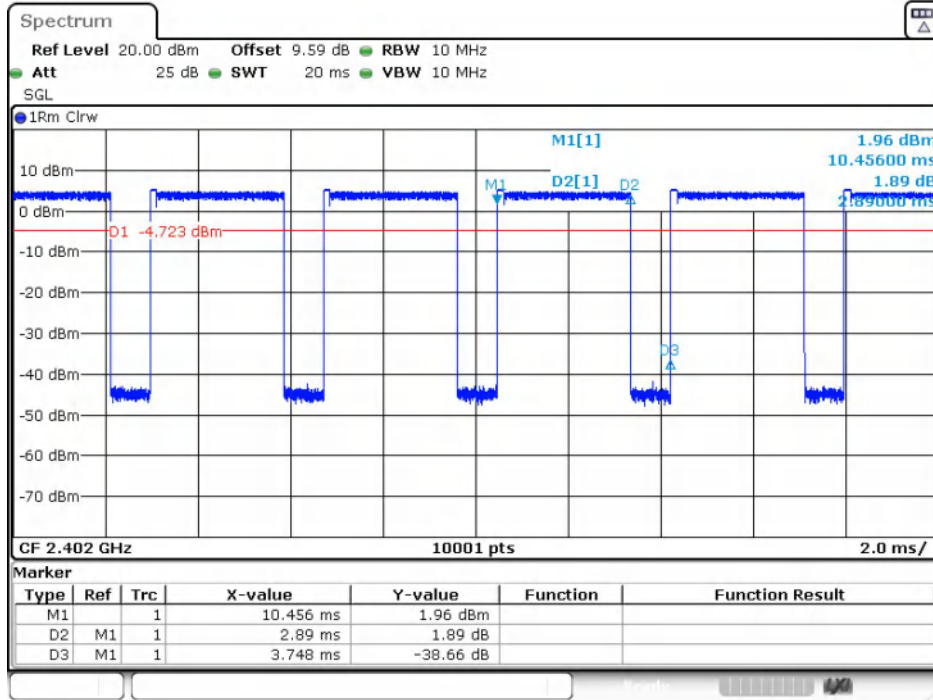
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GFSK(DH5)_Channel 39



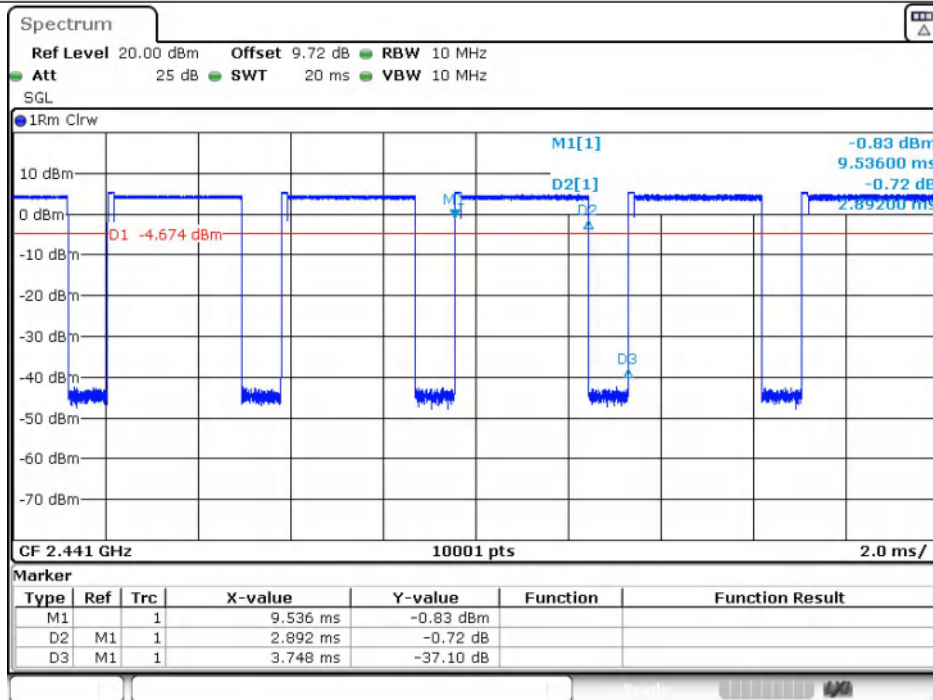
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GFSK(DH5)_Channel 78



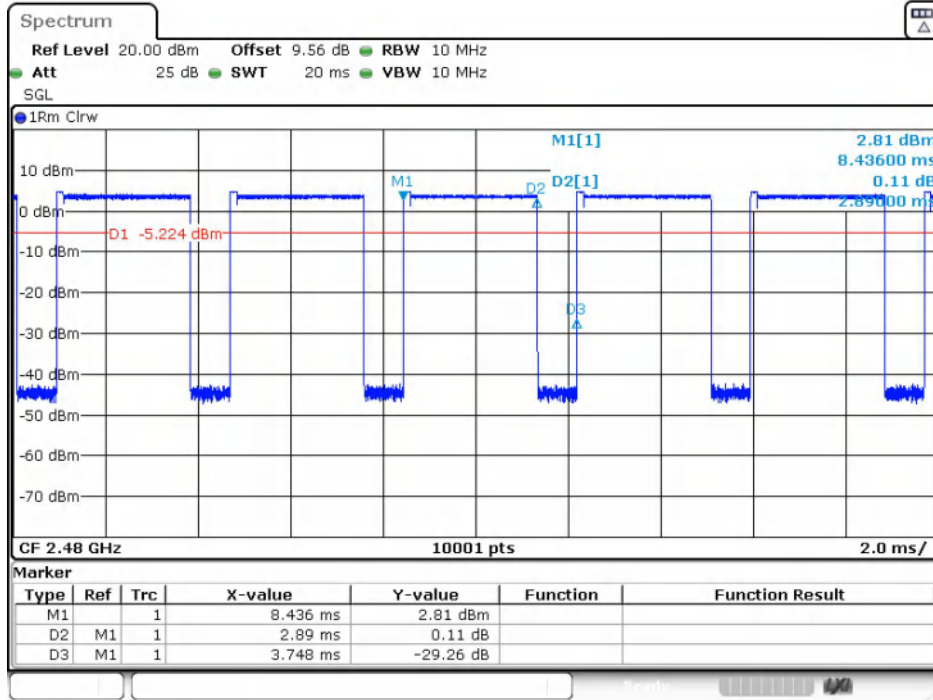
Date: 15.JAN.2024 16:24:33

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



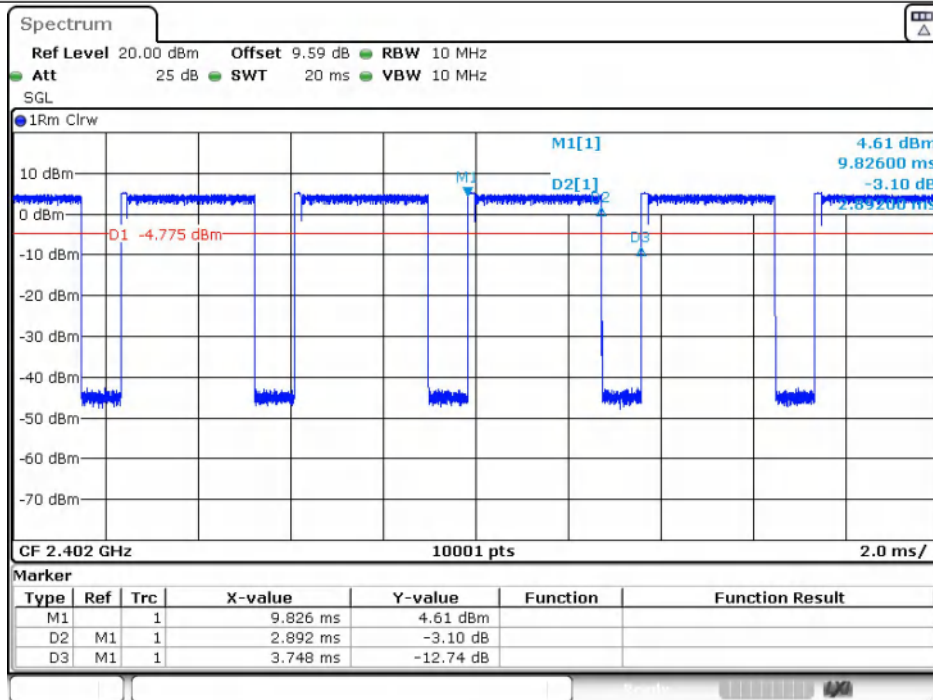
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$\pi/4$ DQPSK(2-DH5)_Channel 39



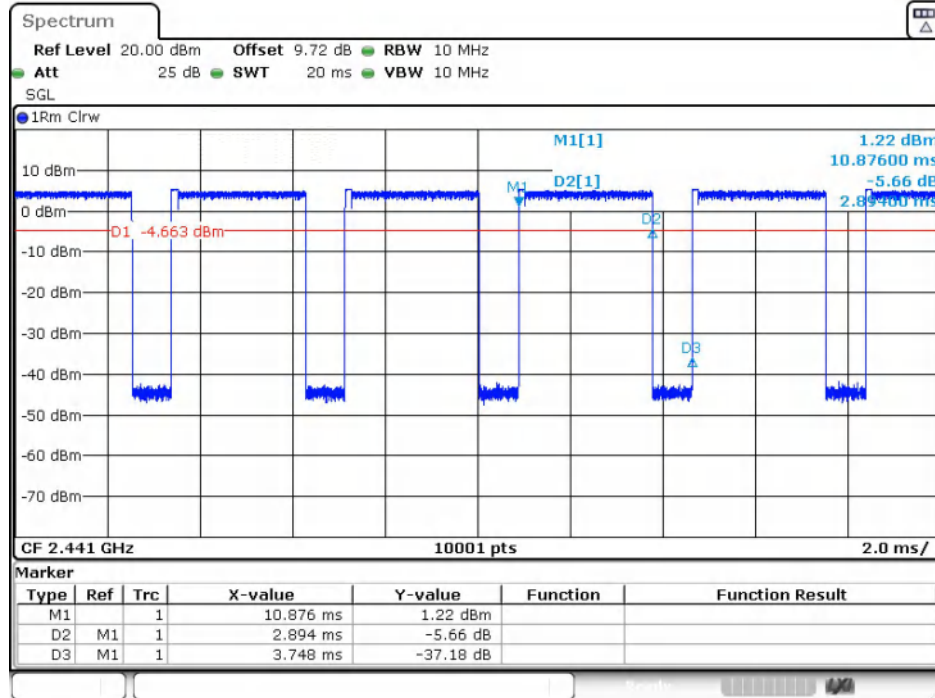
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$\pi/4$ DQPSK(2-DH5)_Channel 78



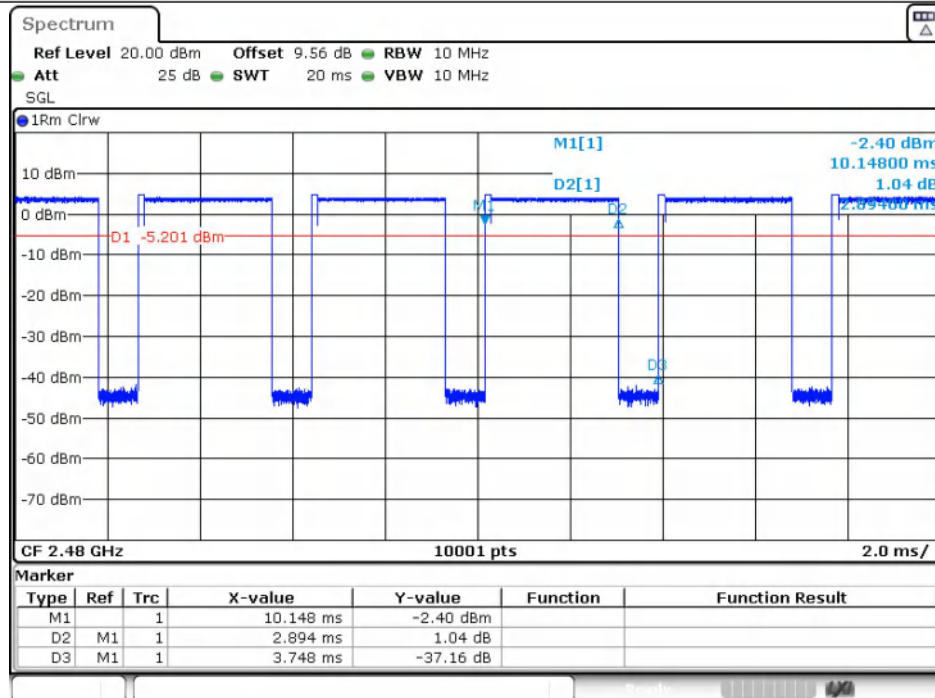
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8DPSK(3-DH5)_Channel 0



Date: 15.JAN.2024 16:32:10

8DPSK(3-DH5)_Channel 39



Date: 15.JAN.2024 16:33:59

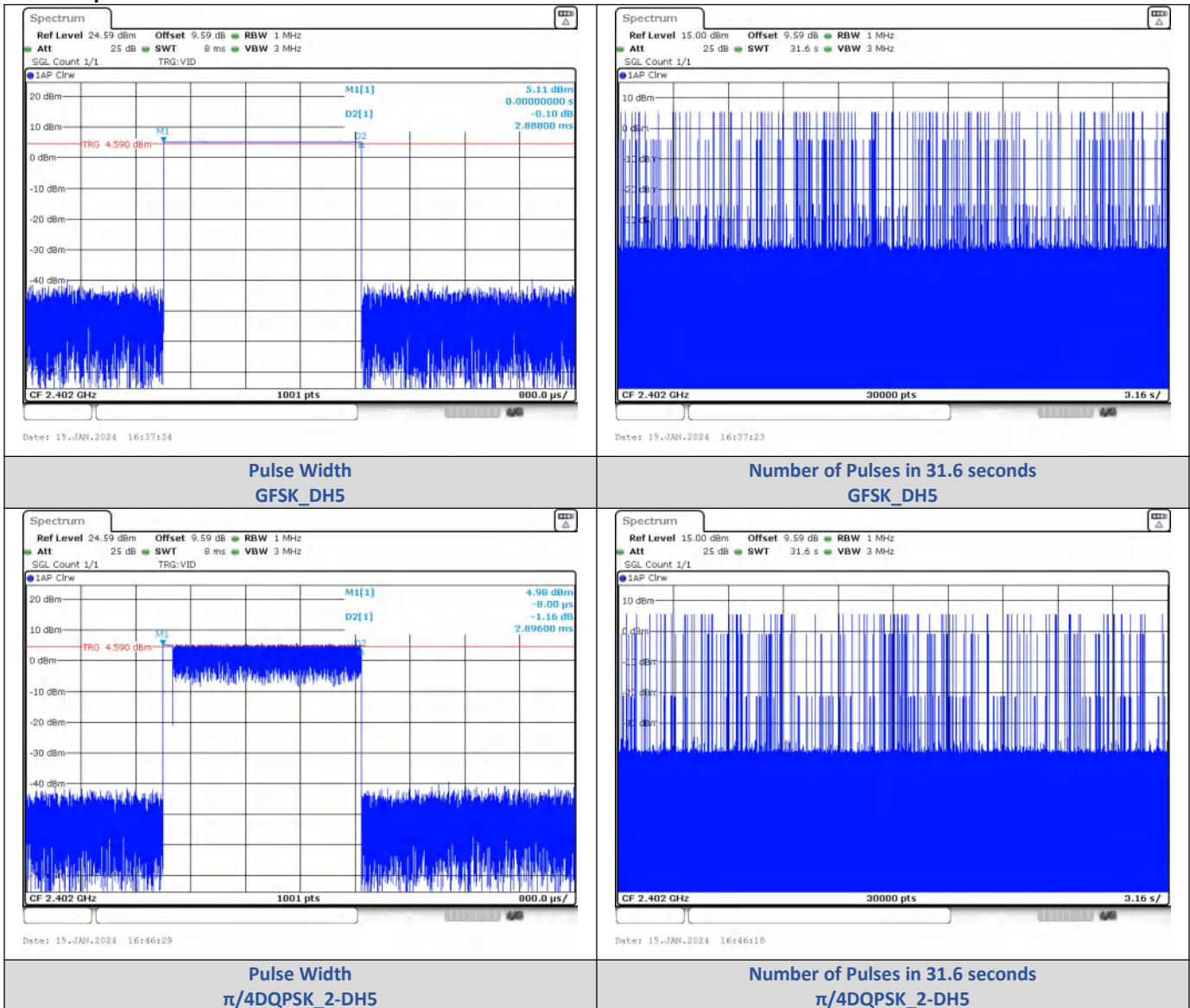
8DPSK(3-DH5)_Channel 78

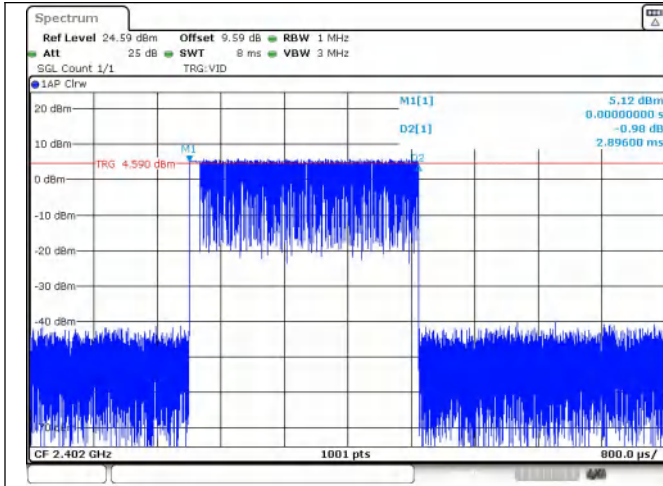
7) Dwell Time

Test Result

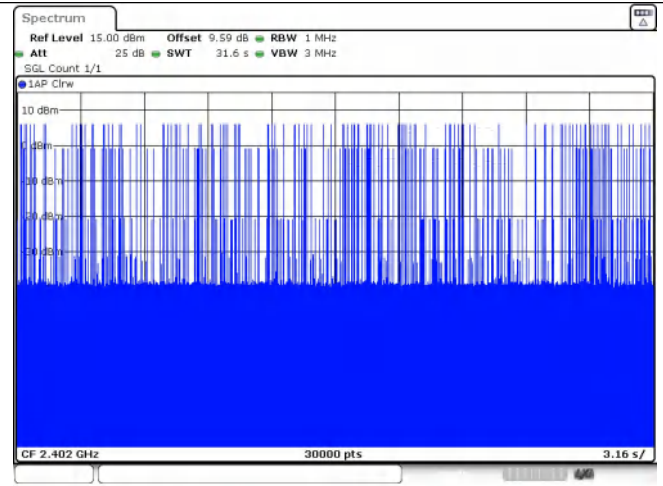
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	111	320.57	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	90	260.64		PASS
8DPSK	3-DH5		2.896	116	335.94		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



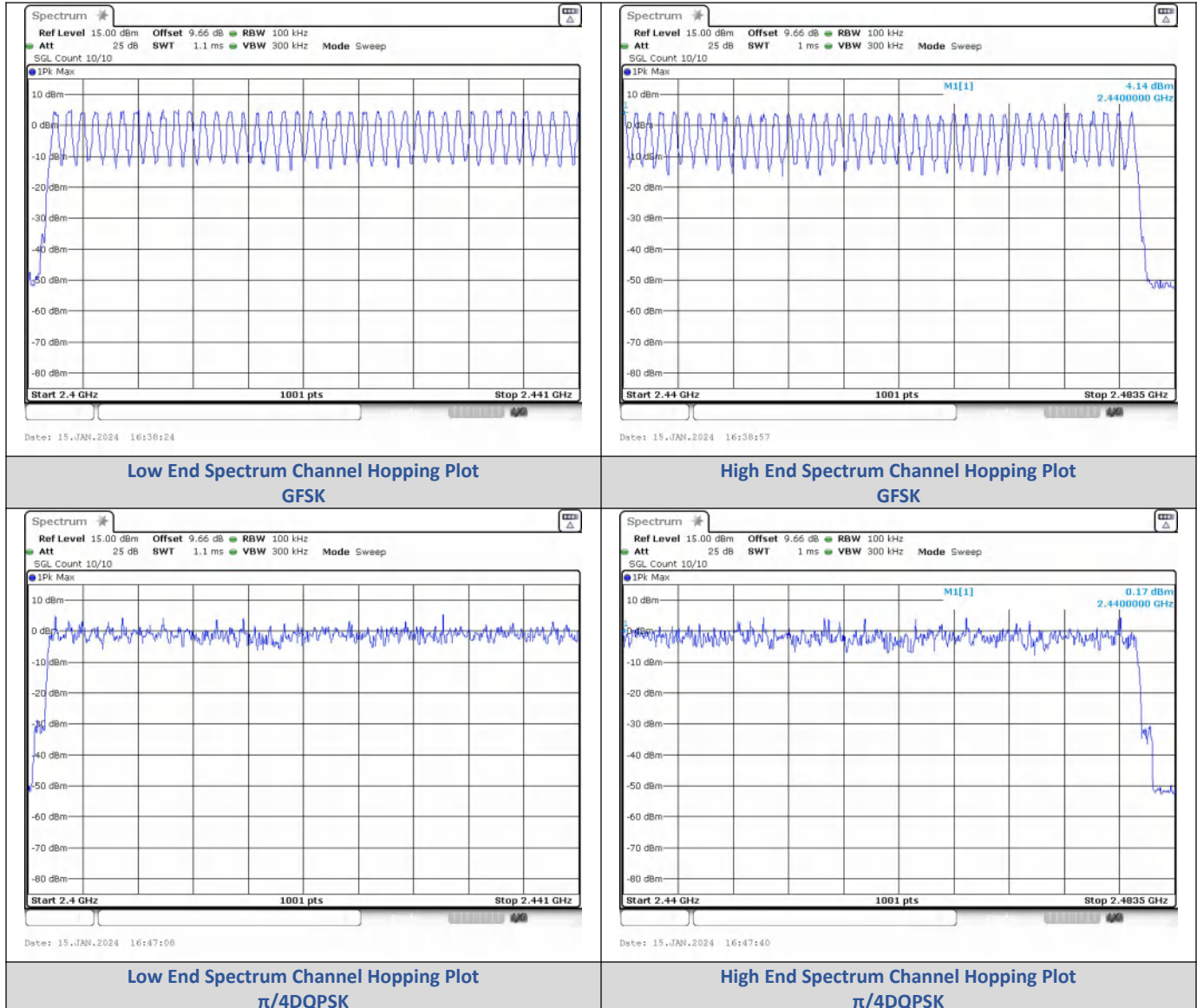
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

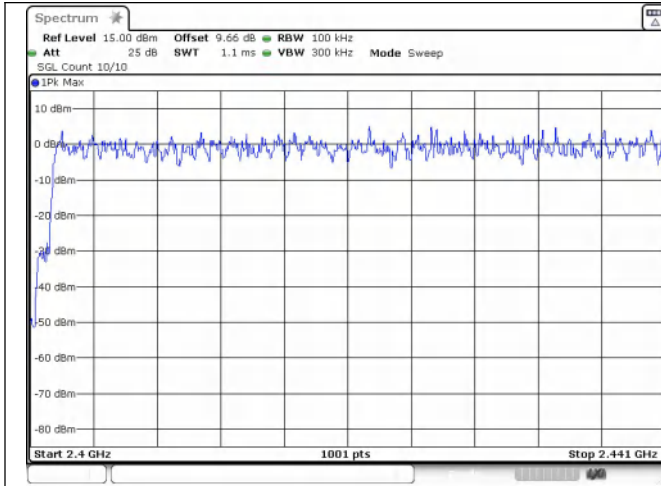
8) Number Of Hopping Channel

Test Result

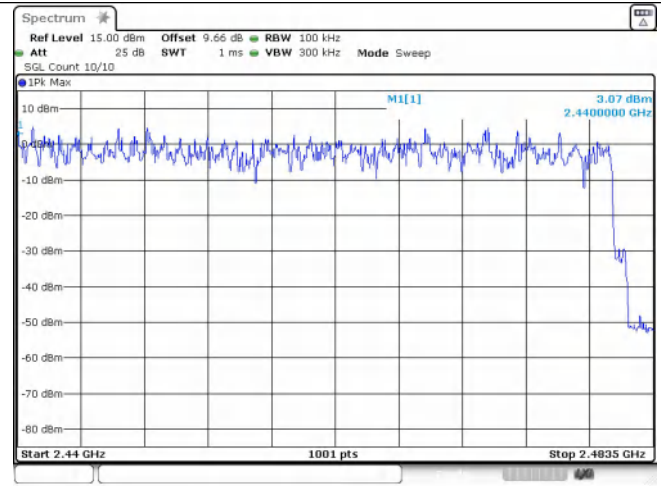
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK