

Appendix A

Report No.:	CISRR24012915201
FCC ID:	2BEVZ-X5
Product Name:	soundbox with microphone
Model No.:	X5
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

Conducted Peak Output Power

Test Result

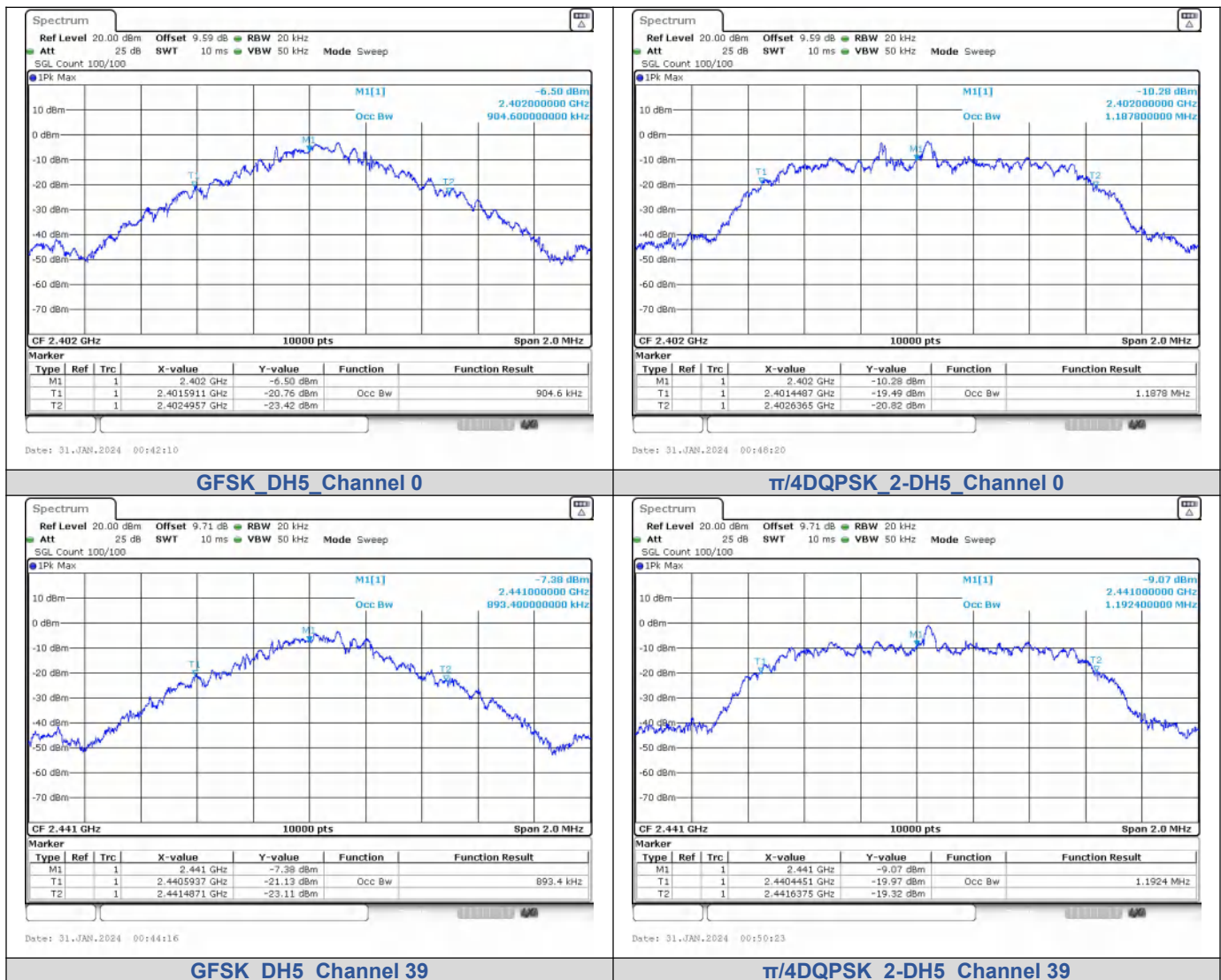
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	0.683	1.170	30	PASS
		39	0.255	1.060		PASS
		78	0.506	1.124		PASS
$\pi/4$ DQPSK	2-DH5	0	1.798	1.513	20.97	PASS
		39	3.263	2.120		PASS
		78	3.237	2.107		PASS
8DPSK	3-DH5	0	3.828	2.415		PASS
		39	3.692	2.340		PASS
		78	3.603	2.293		PASS

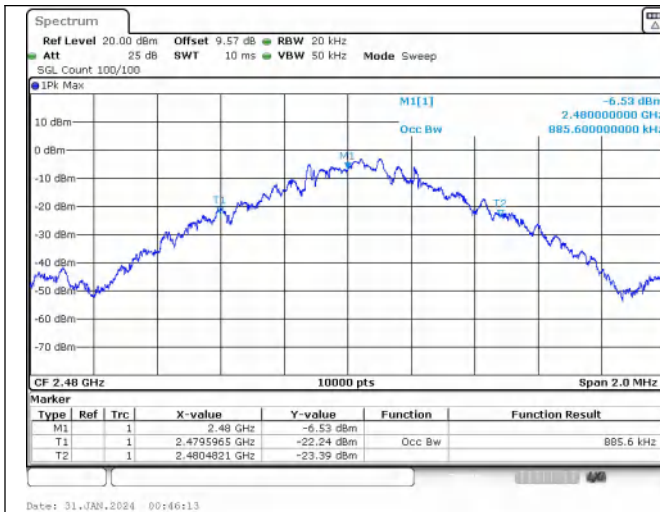
99% Bandwidth

Test Result

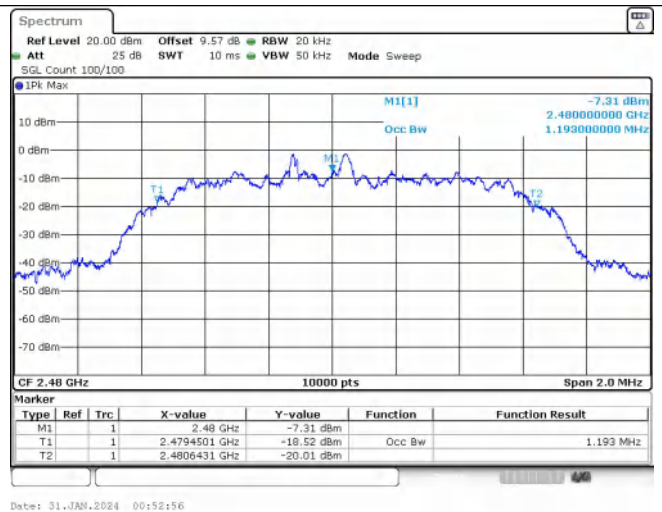
Modulation	Channel	99% BW (MHz)
GFSK	0	0.90460
	39	0.89340
	78	0.88560
$\pi/4$ DQPSK	0	1.1880
	39	1.1920
	78	1.1930
8DPSK	0	1.1960
	39	1.2070
	78	1.2190

Test Graphs

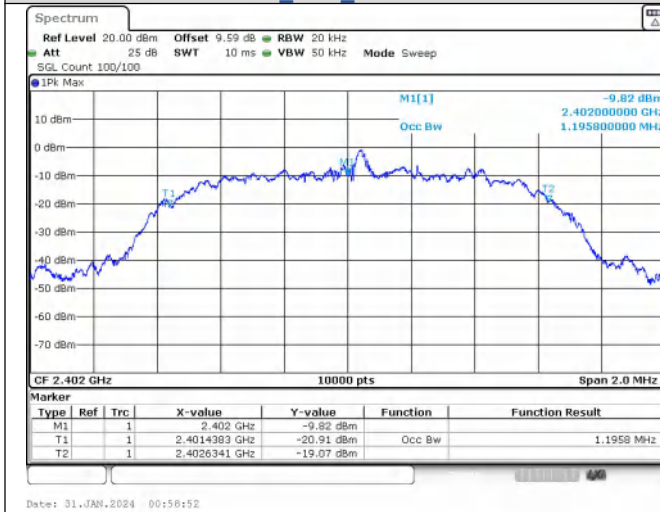




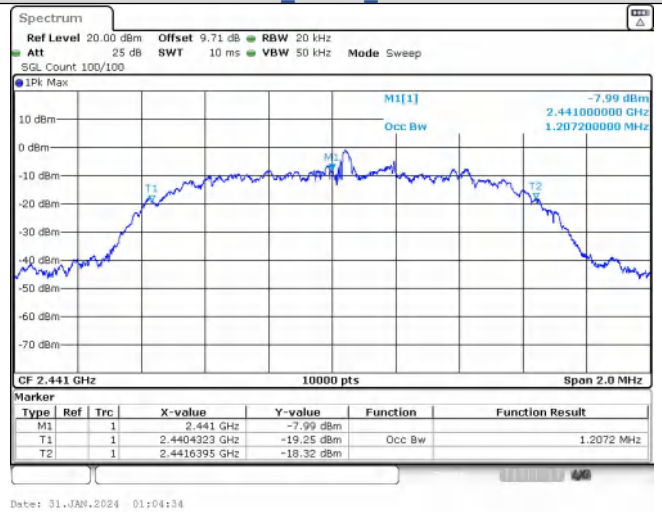
GFSK_DH5_Channel 78



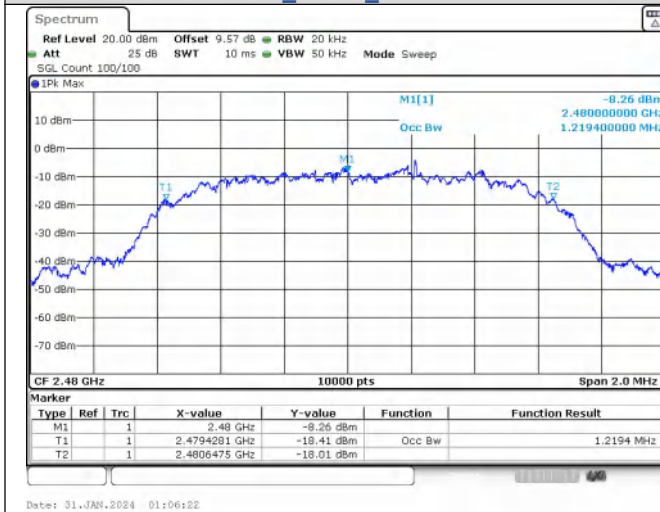
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



$\pi/4$ DQPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

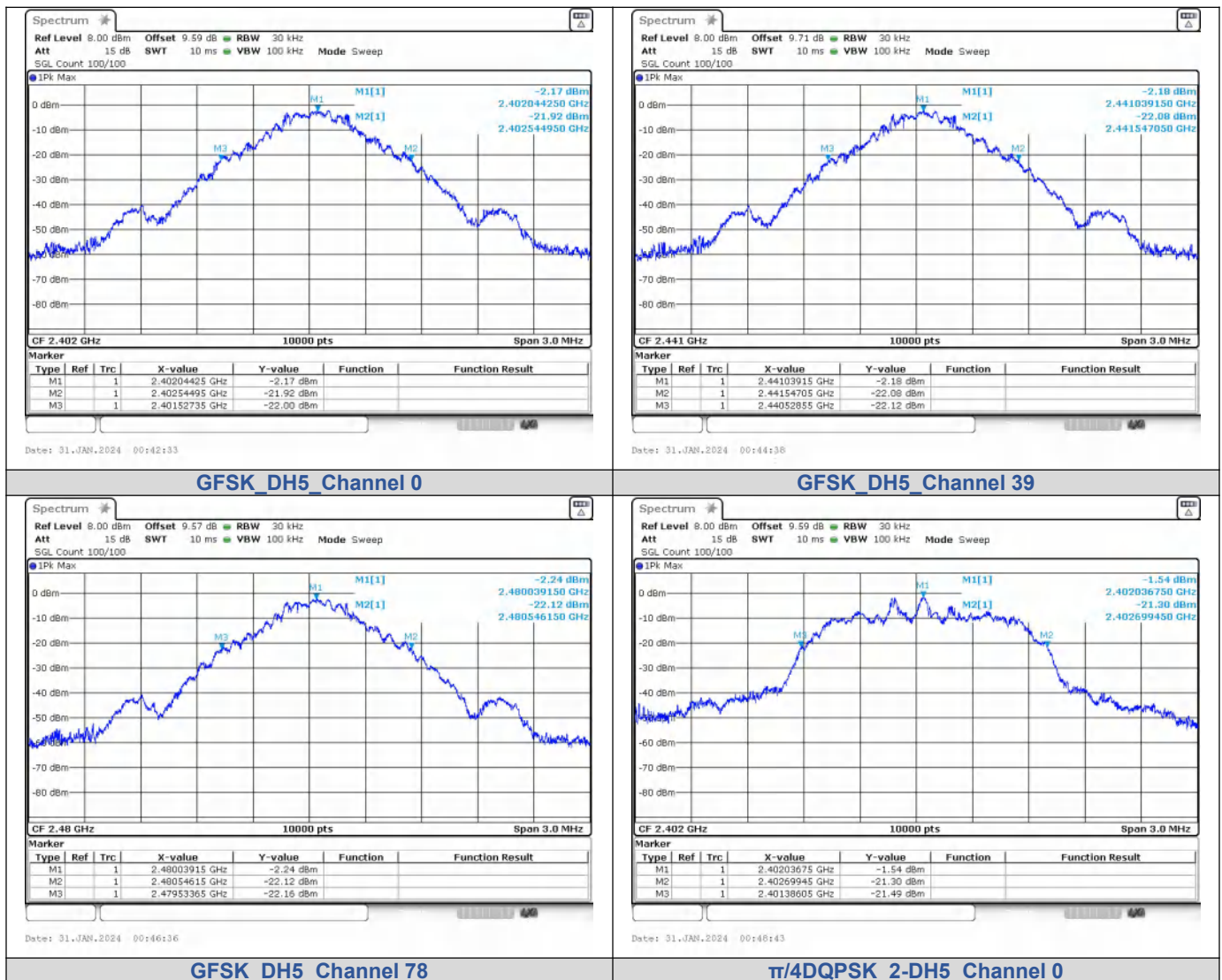
Void

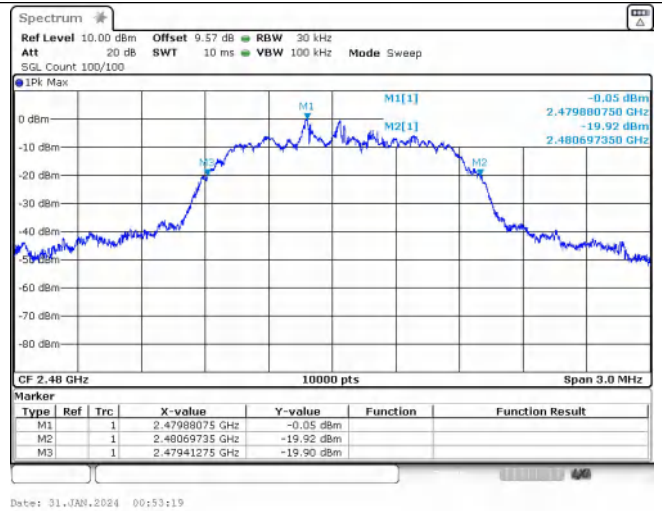
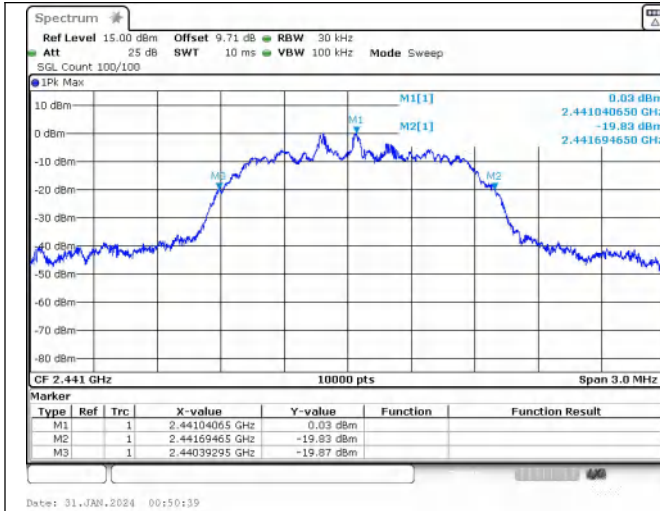
20dB Bandwidth

Test Result

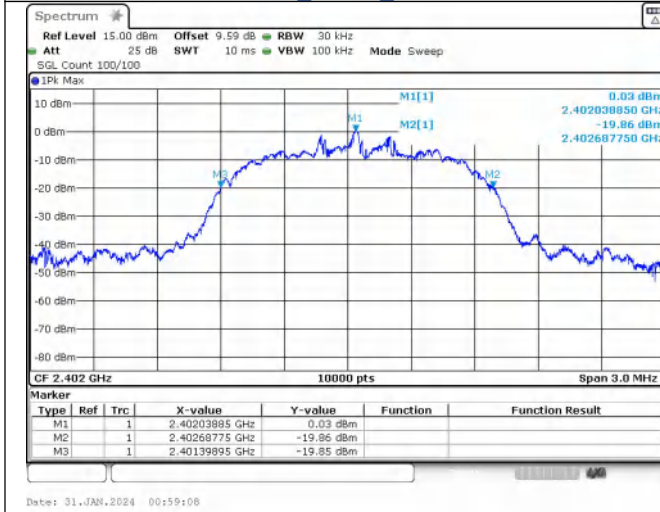
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.010
	39	2441 MHz	1.020
	78	2480 MHz	1.020
$\pi/4$ DQPSK	0	2402 MHz	1.310
	39	2441 MHz	1.300
	78	2480 MHz	1.290
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.300

Test Graphs

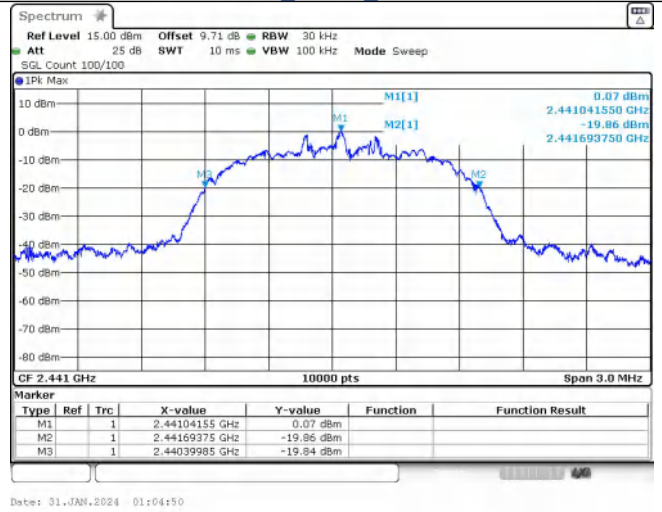




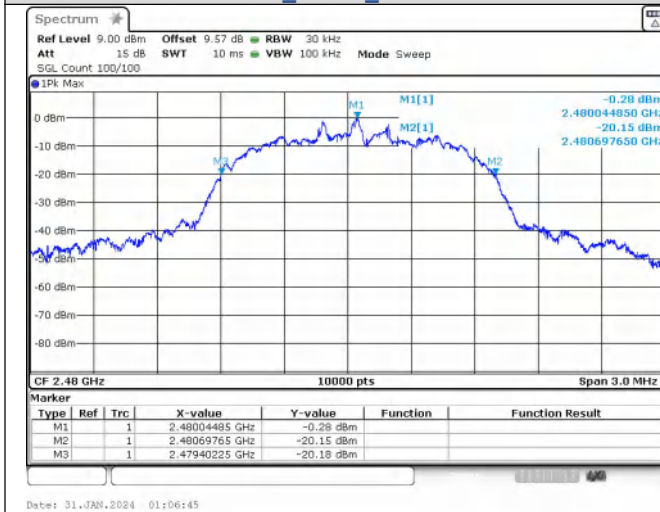
$\pi/4$ DQPSK_2-DH5_Channel 39



$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39

Void

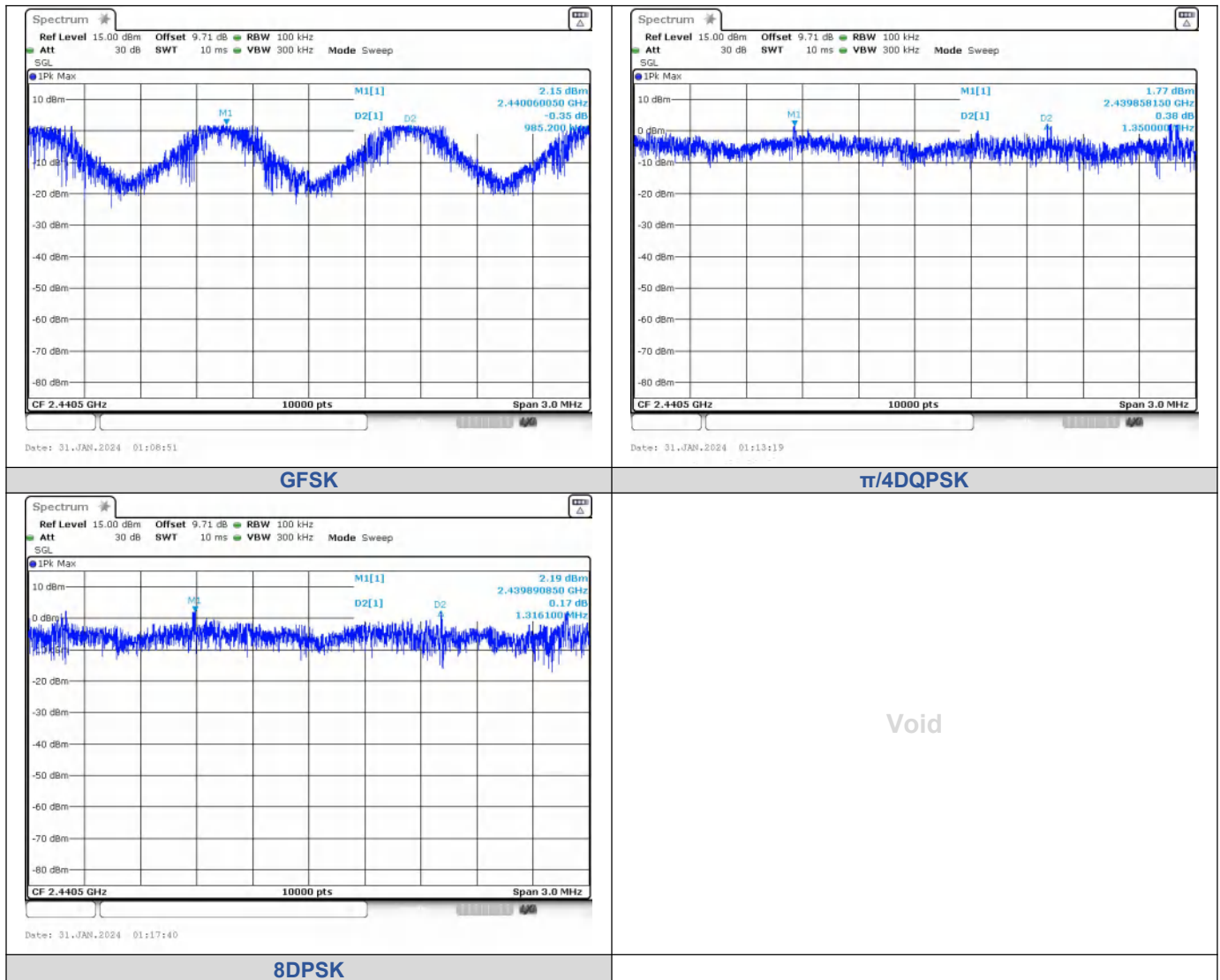
8DPSK_3-DH5_Channel 78

Carrier Frequencies Separation

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0601	2441.0453	0.9852	0.673	PASS
$\pi/4$ DQPSK	2-DH5	2439.8582	2441.2081	1.3500	0.873	PASS
8DPSK	3-DH5	2439.8908	2441.2069	1.3161	0.86	PASS

Test Graphs



Conducted Out Of Band Emission

Test Result

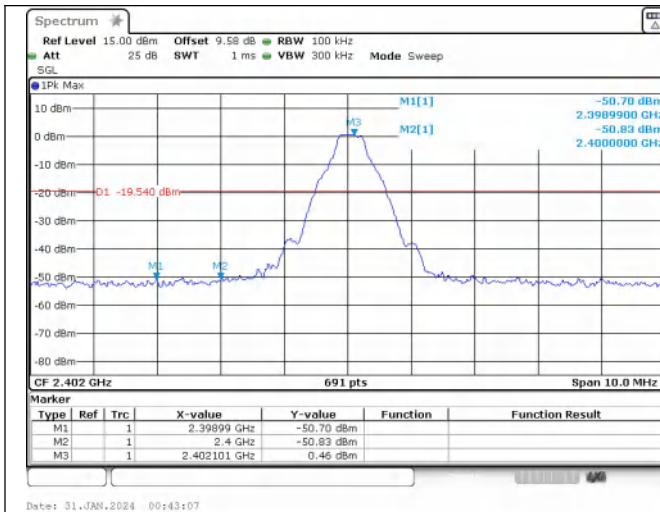
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-50.832	-19.54	-31.292	PASS
			2398.99	-50.695	-19.54	-31.155	PASS
			7206.00	-44.594	-19.54	-25.054	PASS
		39	9764.55	-41.401	-19.93	-21.471	PASS
		78	2483.50	-52.404	-19.74	-32.664	PASS
			7439.85	-43.564	-19.74	-23.824	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-51.208	-19.23	-31.978	PASS
			2398.30	-50.341	-19.23	-31.111	PASS
			9608.10	-45.122	-19.23	-25.892	PASS
		39	9764.55	-40.659	-17.59	-23.069	PASS
		78	2483.50	-52.393	-17.76	-34.633	PASS
			9920.20	-43.113	-17.76	-25.353	PASS
8DPSK	3-DH5	0	2400.00	-50.757	-17.45	-33.307	PASS
			2398.86	-50.178	-17.45	-32.728	PASS
			9608.10	-44.312	-17.45	-26.862	PASS
		39	9764.55	-40.272	-17.94	-22.332	PASS
		78	2483.50	-52.703	-17.75	-34.953	PASS
			9920.20	-42.495	-17.75	-24.745	PASS

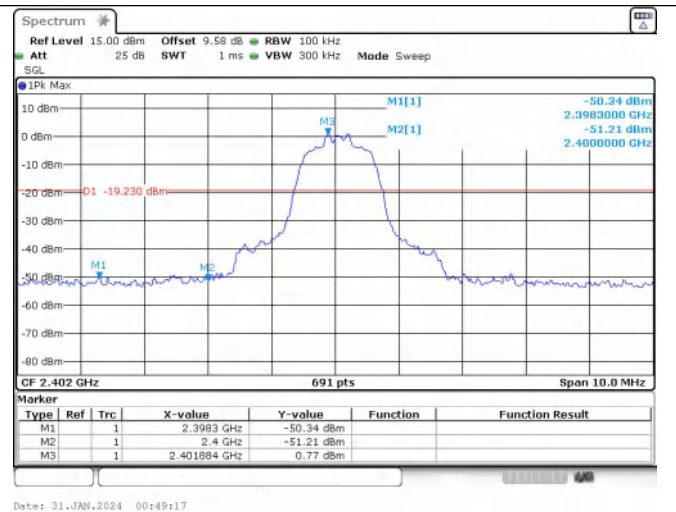
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.76	-49.855	-18.04	-31.815	PASS
			2400.00	-51.047	-18.04	-33.007	PASS
			2483.50	-50.659	-18.04	-32.619	PASS
			2395.31	-50.328	-17.69	-32.638	PASS
			2400.00	-51.170	-17.69	-33.480	PASS
			2483.50	-52.064	-18.31	-33.754	PASS
π/4DQPSK	2-DH5		2397.38	-49.980	-18.05	-31.930	PASS
			2400.00	-51.618	-18.05	-33.569	PASS
			2483.50	-51.548	-17.78	-33.768	PASS
			2396.25	-50.002	-17.61	-32.392	PASS
			2400.00	-52.481	-17.61	-34.871	PASS
			2483.50	-52.559	-17.85	-34.709	PASS
8DPSK	3-DH5		2398.13	-50.162	-17.49	-32.672	PASS
			2400.00	-52.077	-17.49	-34.587	PASS
			2483.50	-52.739	-20.99	-31.749	PASS
			2396.40	-50.127	-19.65	-30.477	PASS
			2400.00	-50.548	-19.65	-30.898	PASS
			2483.50	-51.827	-17.79	-34.037	PASS

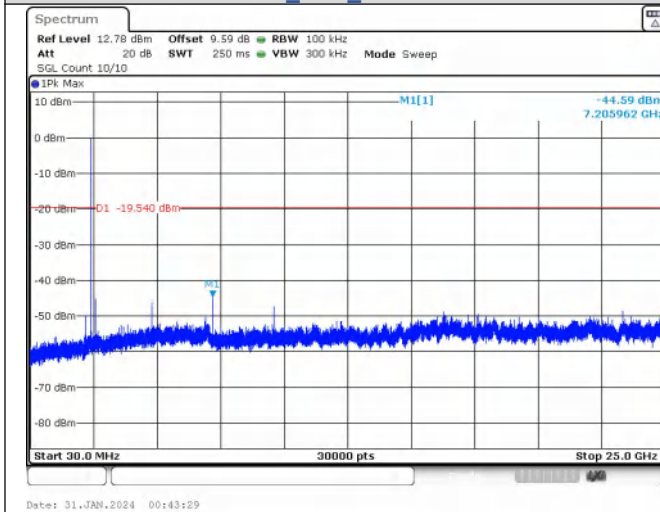
Test Graphs



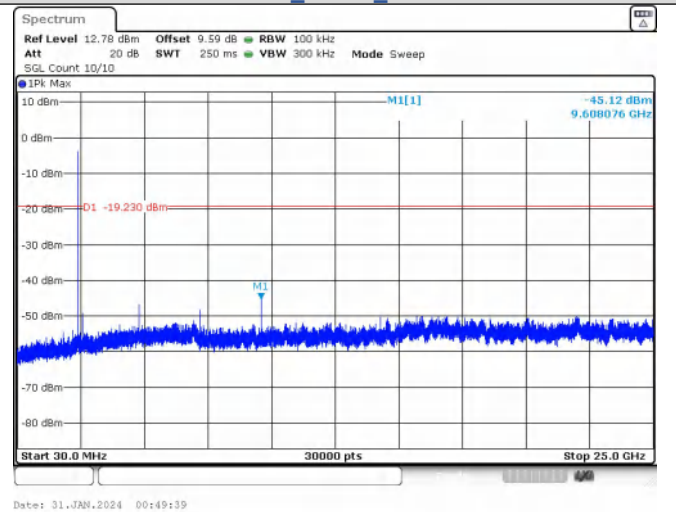
**Out Of Band Emission
GFSK_DH5_Channel 0**



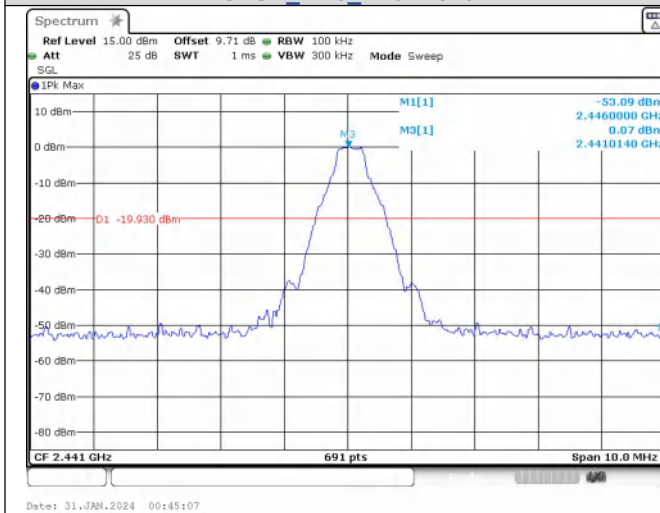
**Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0**



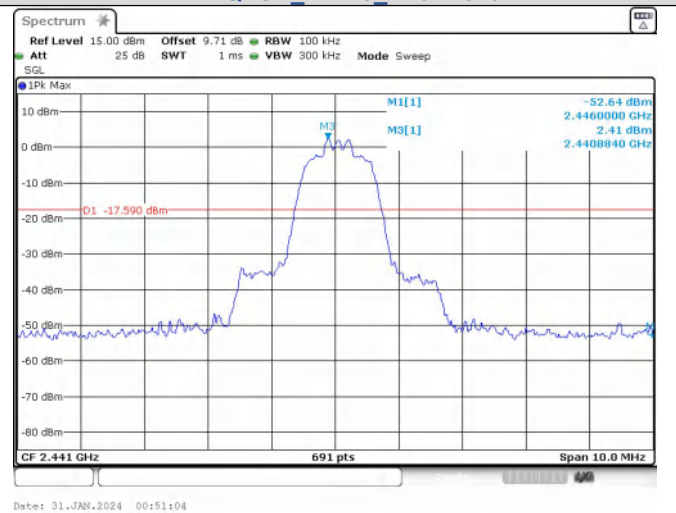
**Spurious Emission
GFSK_DH5_Channel 0**



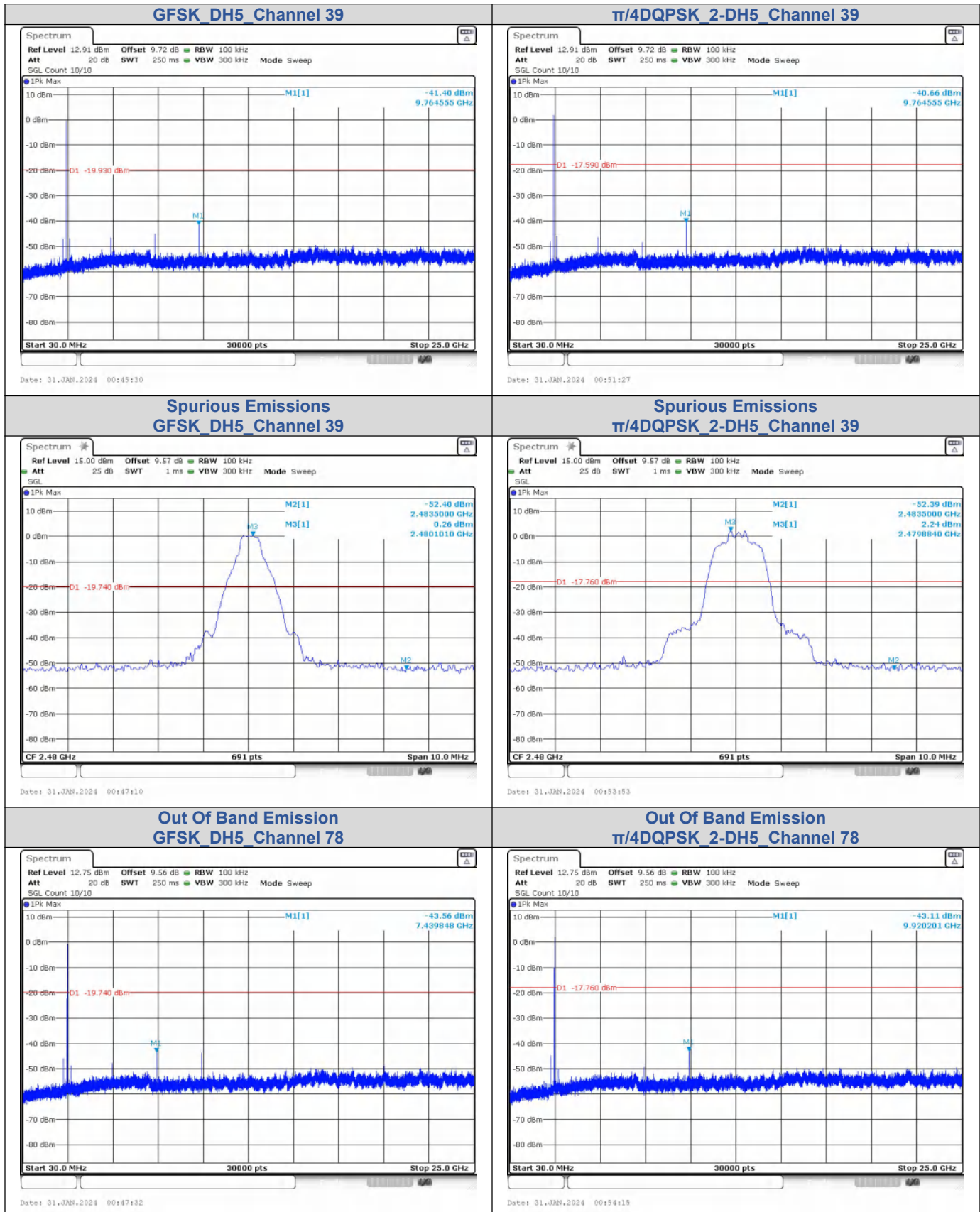
**Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0**



Out Of Band Emission

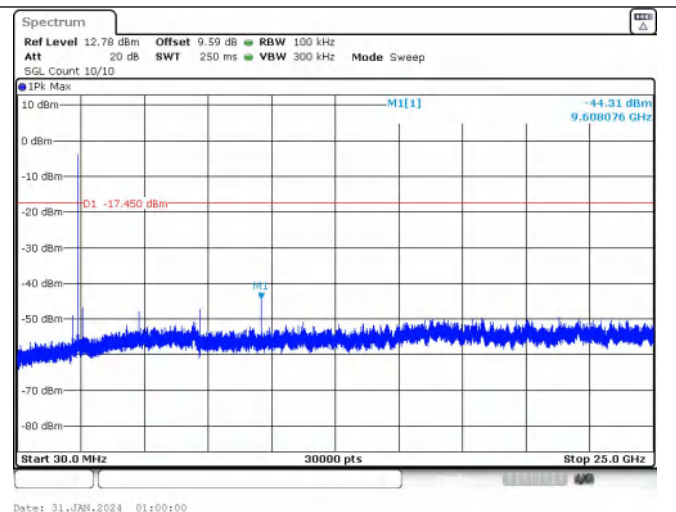
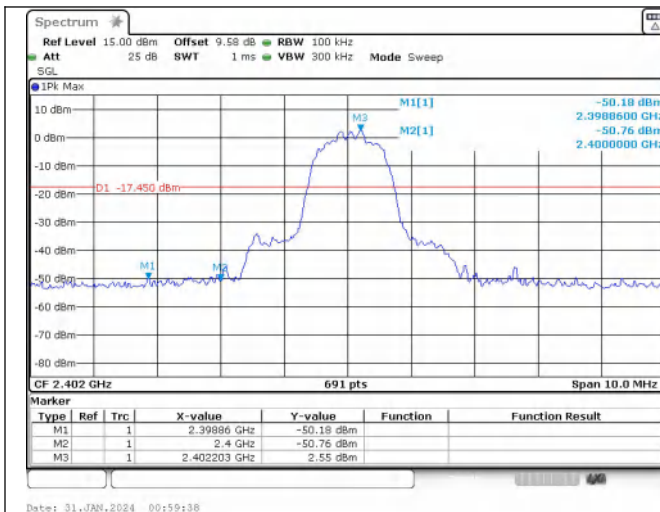


Out Of Band Emission



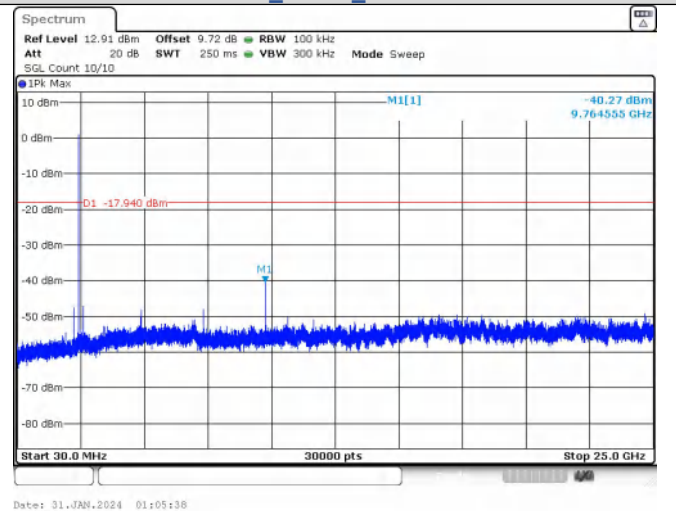
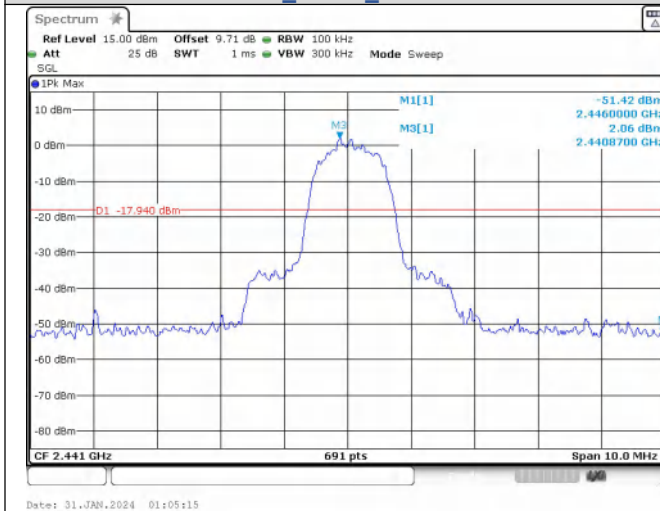
Spurious Emission GFSK_DH5_Channel 78

Spurious Emission $\pi/4$ DQPSK_2-DH5_Channel 78



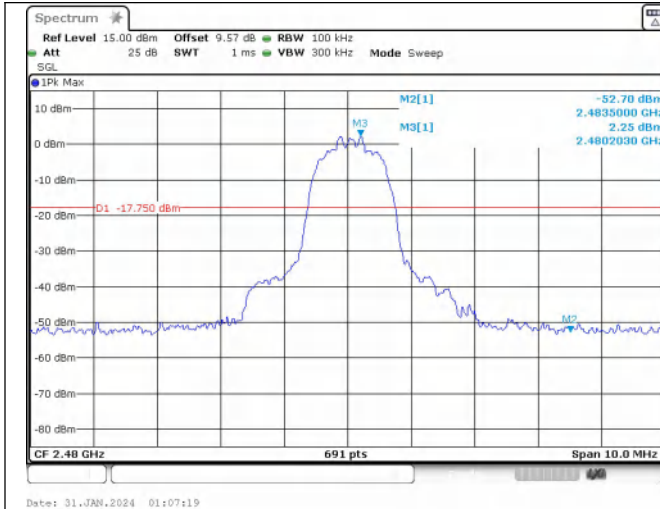
Out Of Band Emission 8DPSK_3-DH5_Channel 0

Spurious Emission 8DPSK_3-DH5_Channel 0

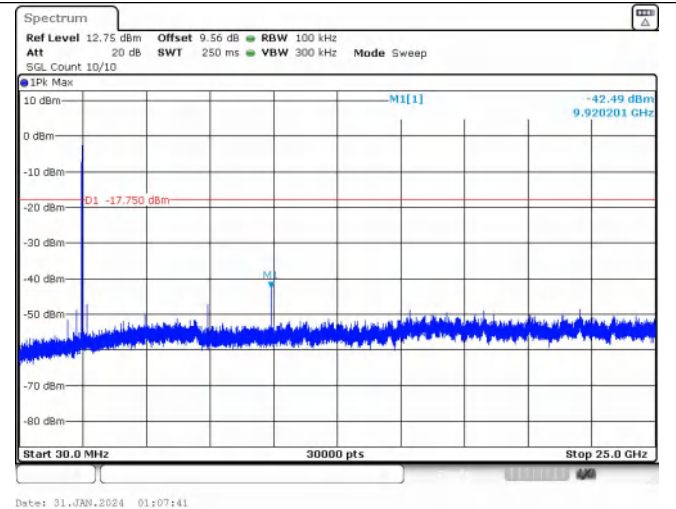


Out Of Band Emission 8DPSK_3-DH5_Channel 39

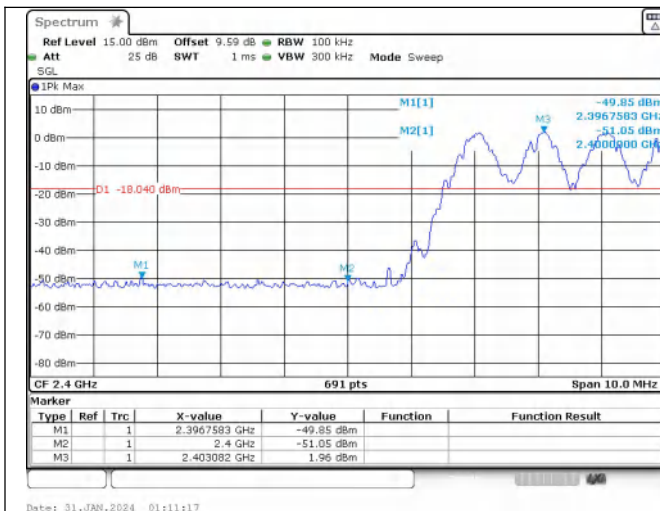
Spurious Emissions 8DPSK_3-DH5_Channel 39



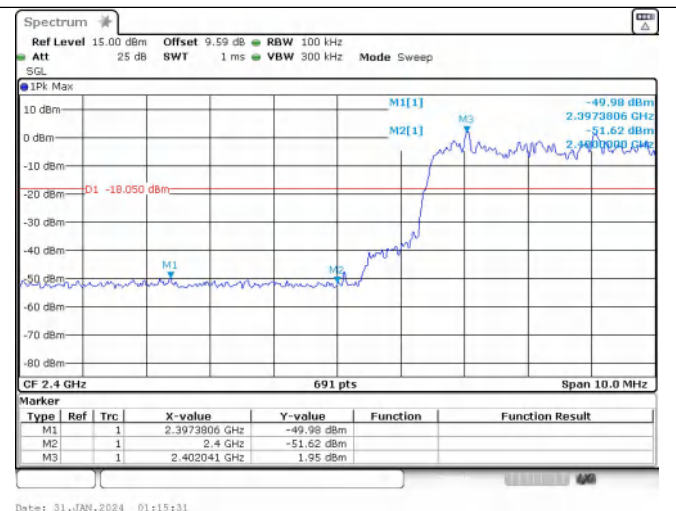
**Out Of Band Emission
8DPSK_3-DH5_Channel 78**



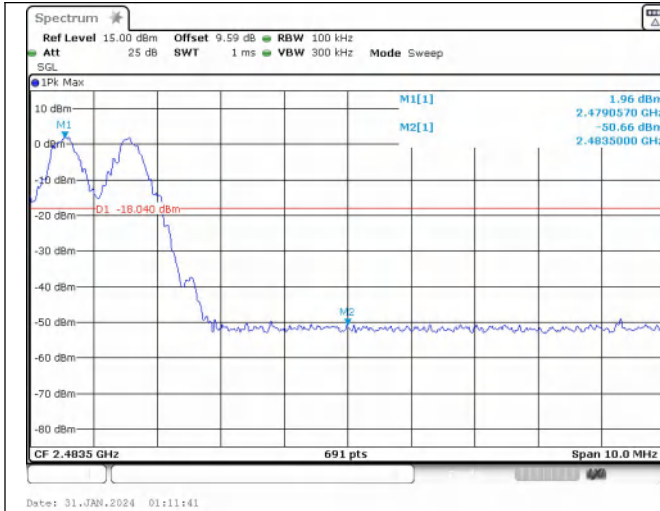
**Spurious Emission
8DPSK_3-DH5_Channel 78**



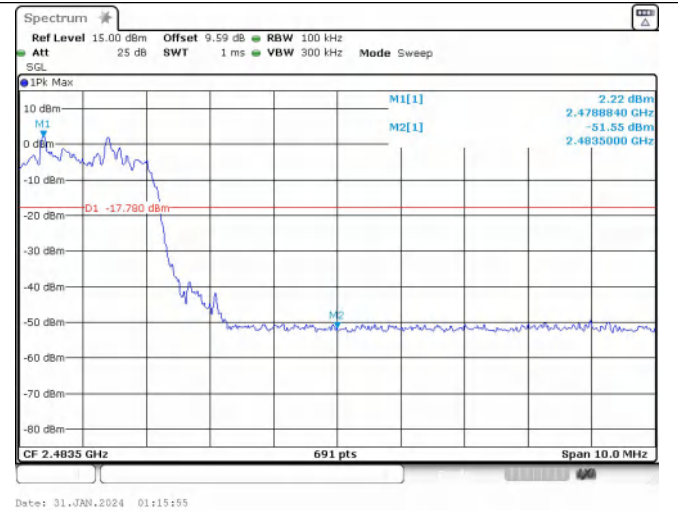
**Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping**



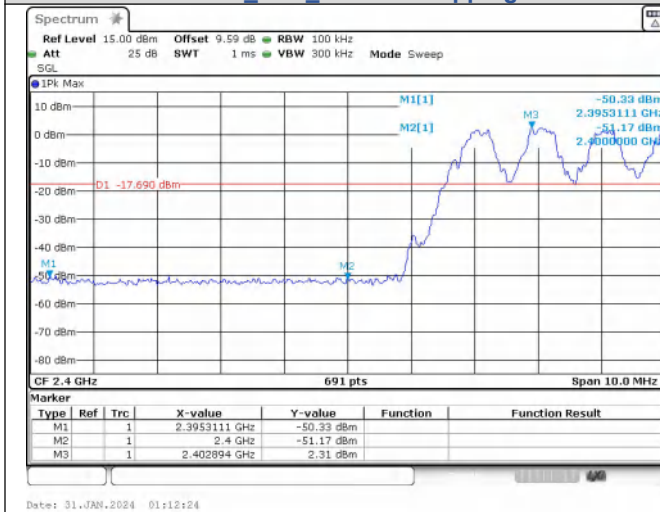
**Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping**



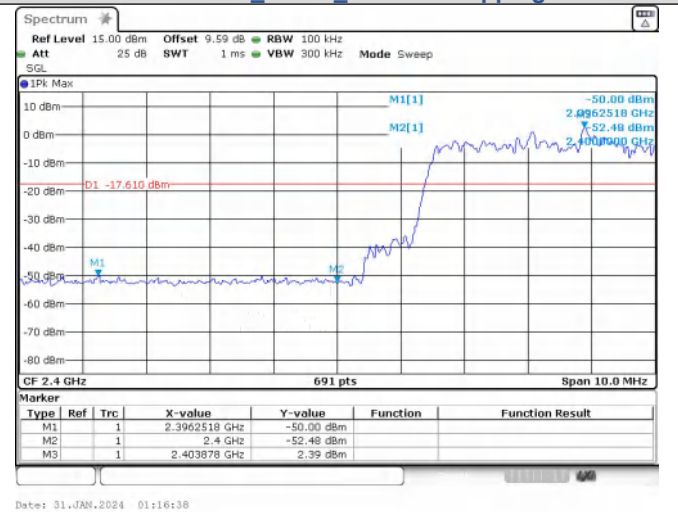
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



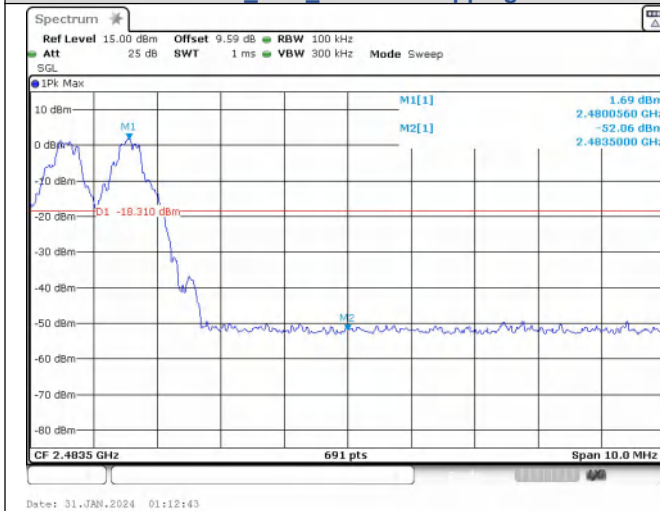
Out Of Band Emission(Right)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



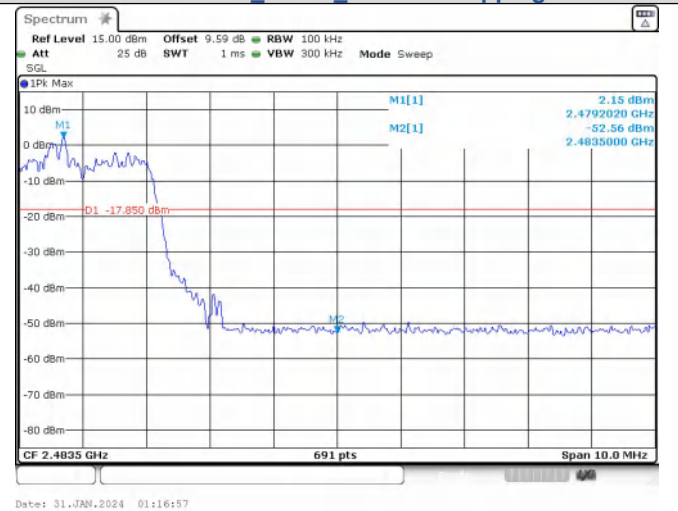
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



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



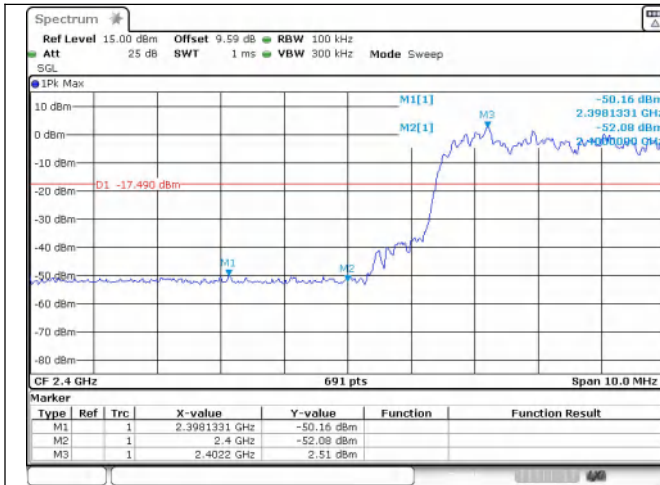
Out Of Band Emission(Right)



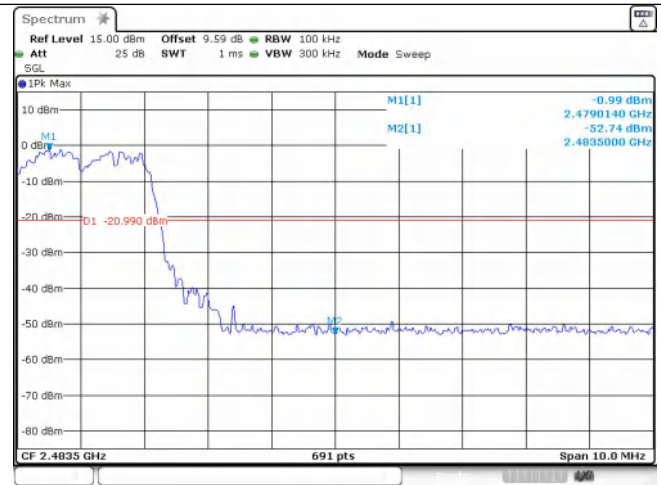
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping

π /4DQPSK_2-DH5_Channel Hopping



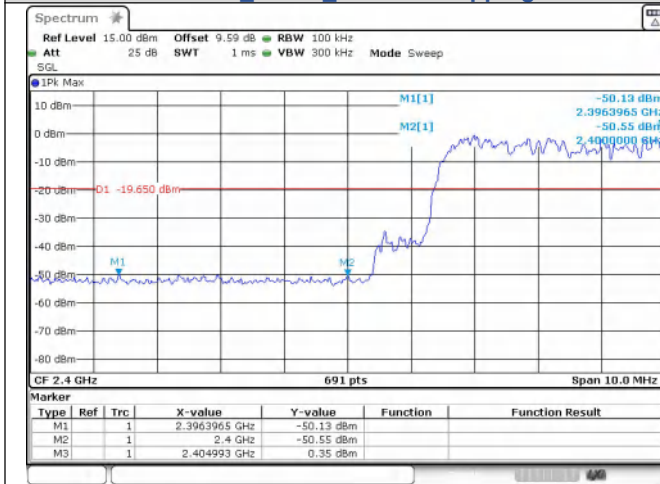
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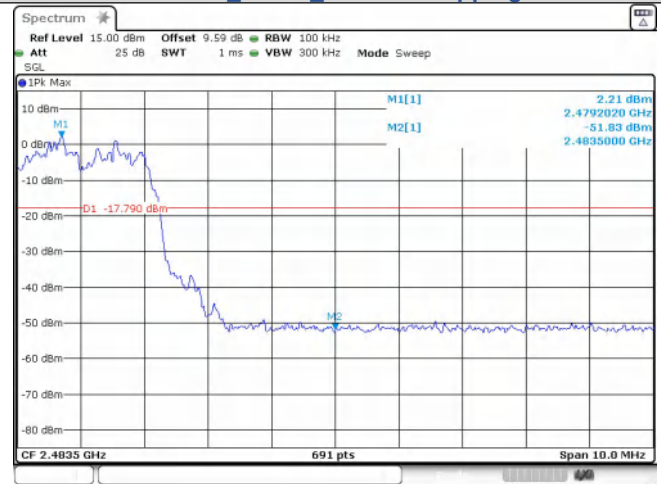
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Out Of Band Emission(Left) 8DPSK_3-DH5_Channel Hopping

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



Date: 31.JAN.2024 01:21:15



Date: 31.JAN.2024 01:21:43

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

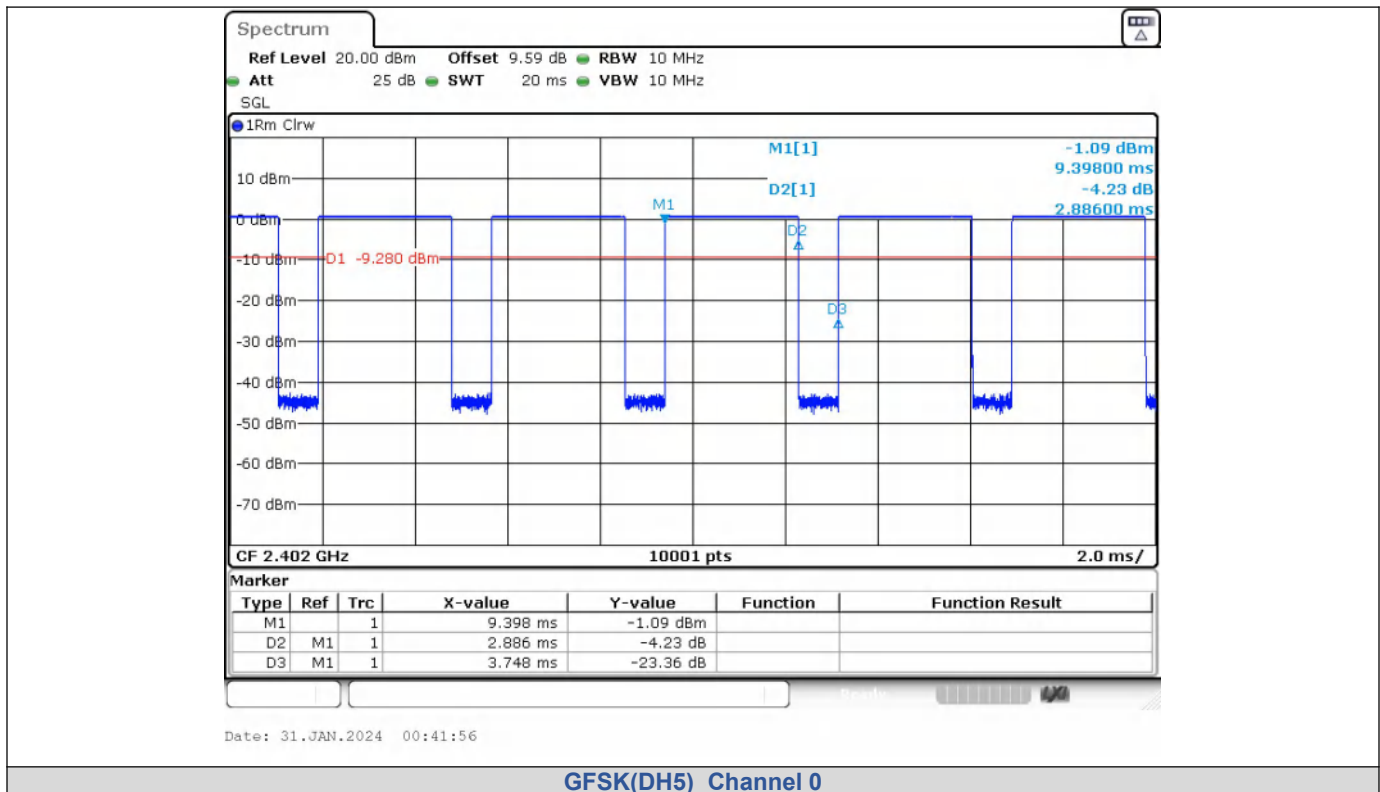
Out Of Band Emission(Right) 8DPSK_3-DH5_Channel Hopping

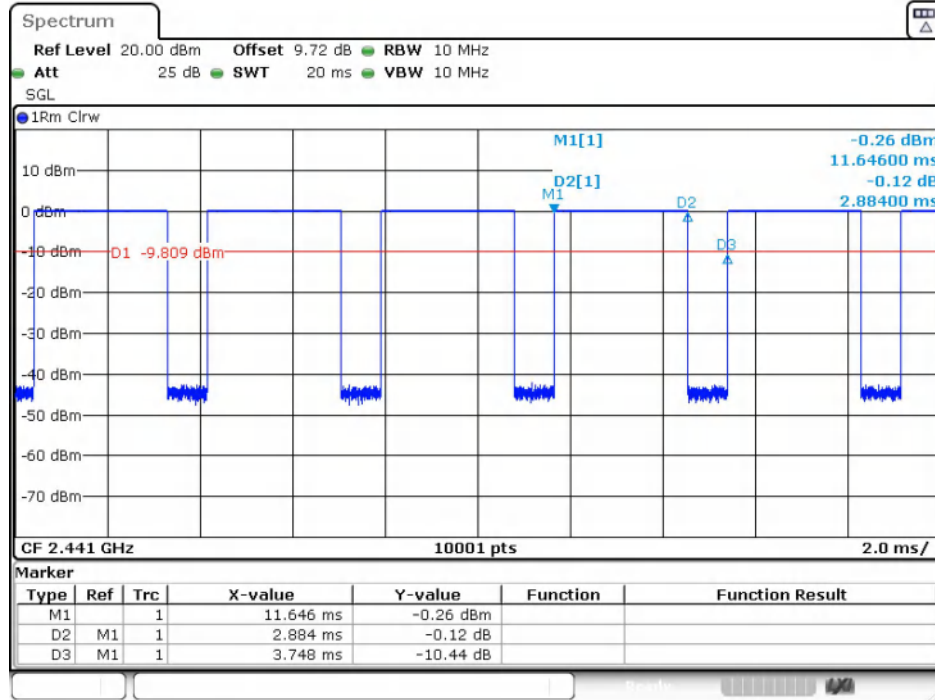
Duty Cycle

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	2.884	3.748	76.95	0.7695	1.1379	0.35
		78	2.886	3.748	77.00	0.7700	1.1351	0.35
$\pi/4$ DQPSK	2-DH5	0	2.892	3.748	77.16	0.7716	1.1261	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	2.892	3.748	77.16	0.7716	1.1261	0.35

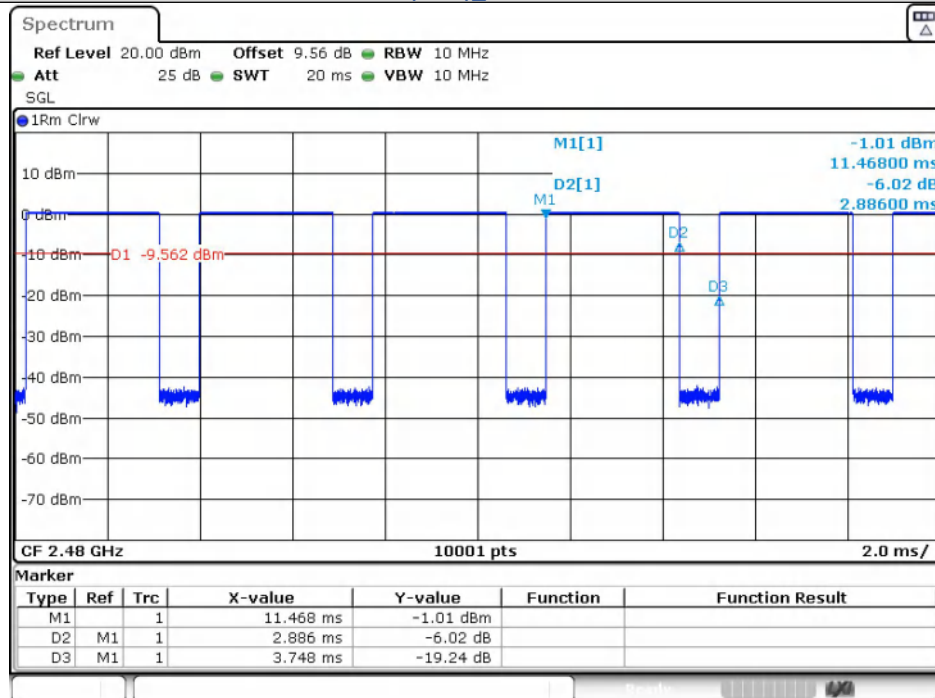
Test Graphs





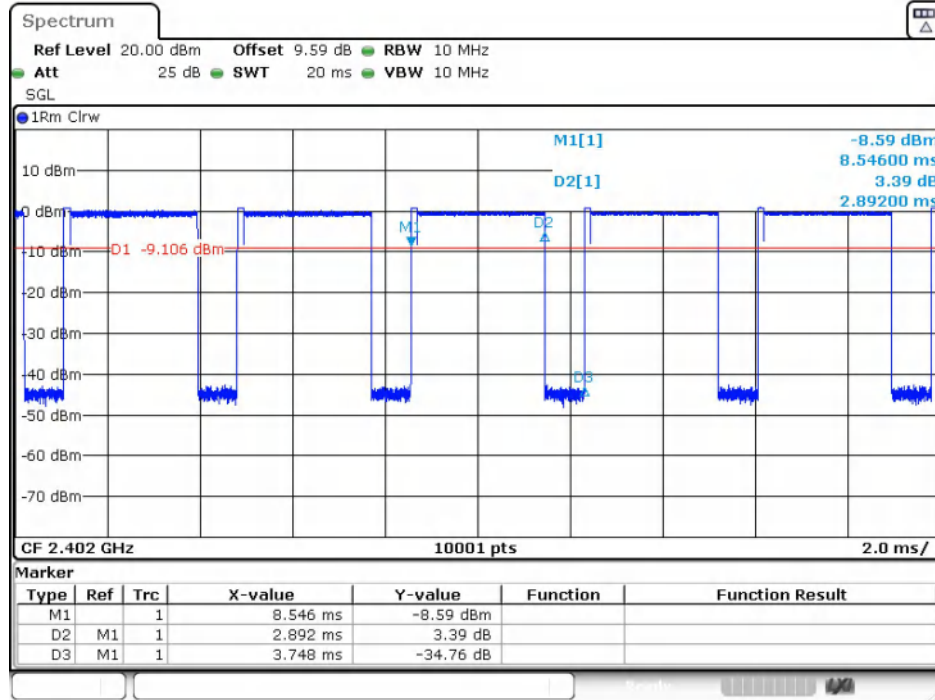
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GFSK(DH5)_Channel 39



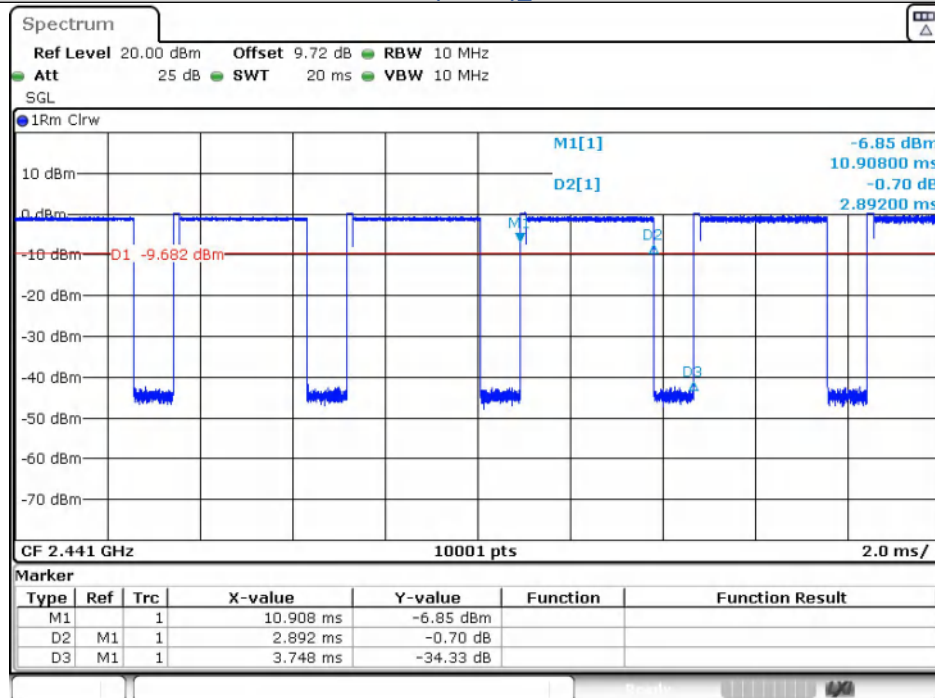
Date: 31.JAN.2024 00:45:59

GFSK(DH5)_Channel 78



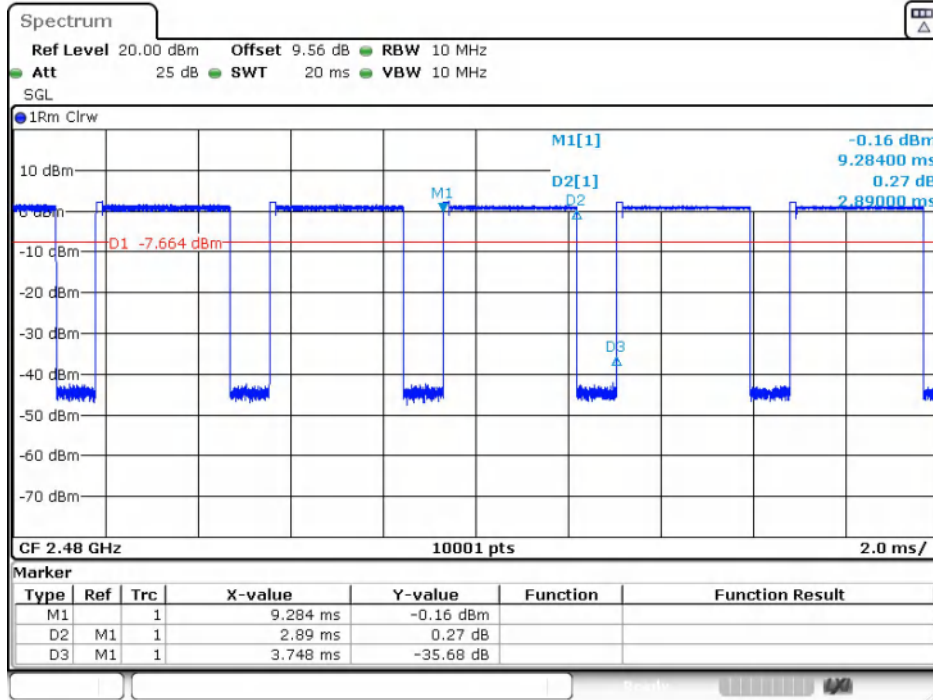
Date: 31.JAN.2024 00:48:06

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



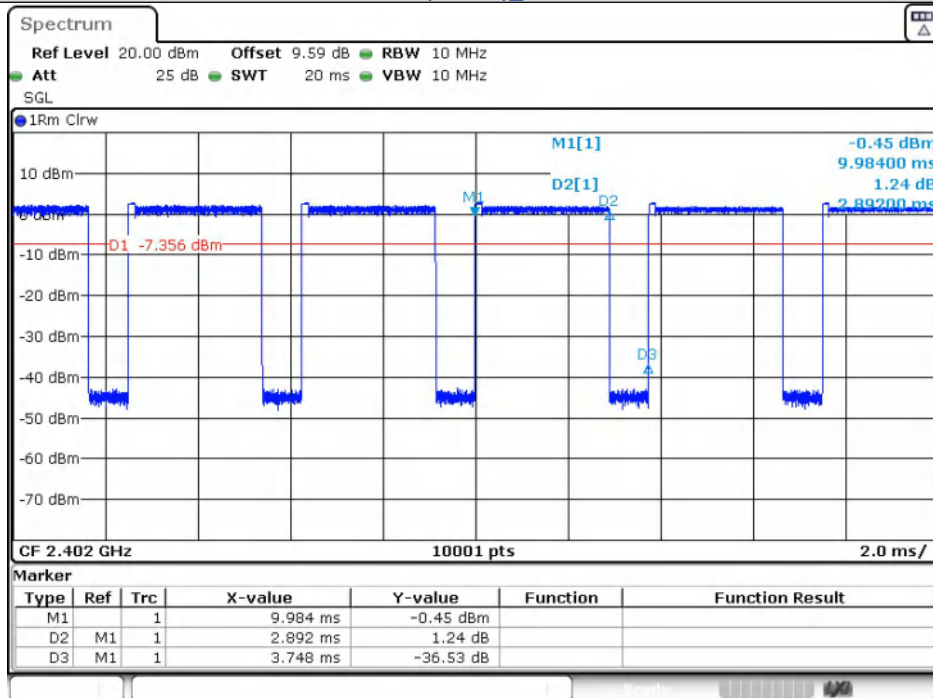
Date: 31.JAN.2024 00:50:09

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



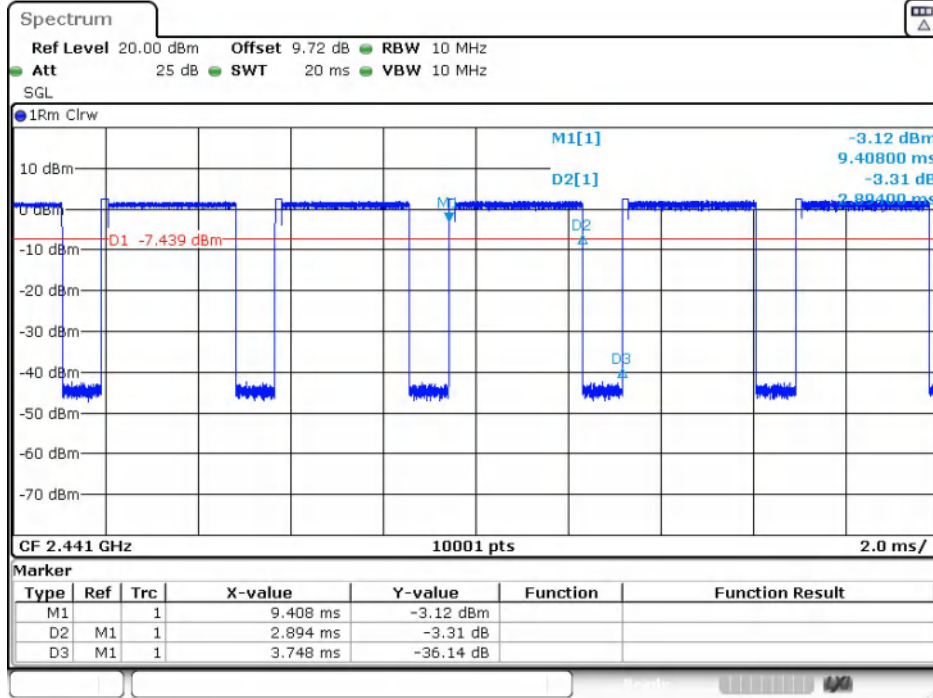
Date: 31.JAN.2024 00:52:42

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



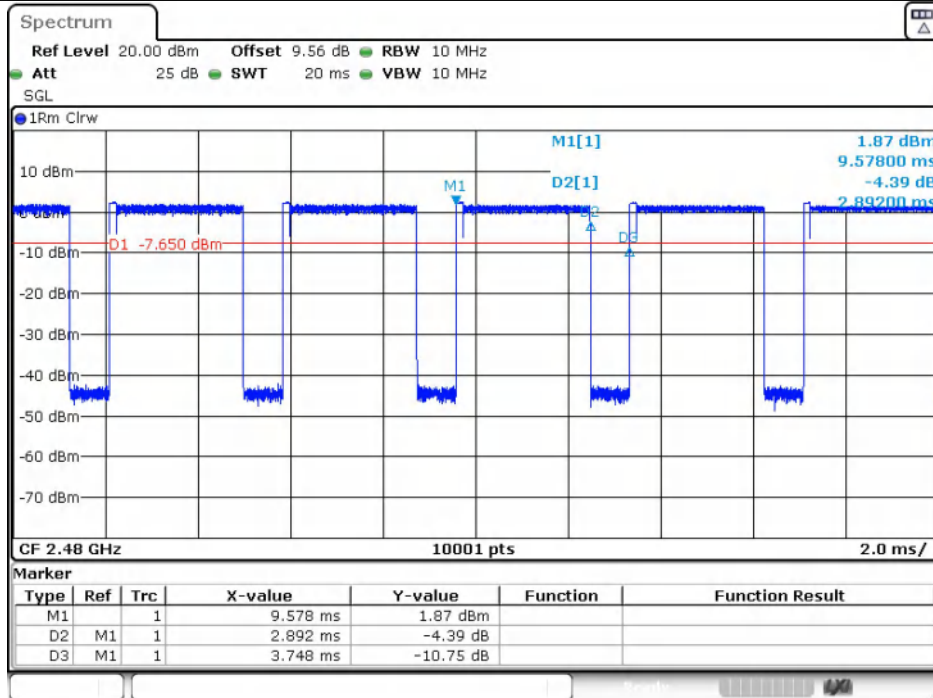
Date: 31.JAN.2024 00:58:37

8DPSK(3-DH5)_Channel 0



Date: 31.JAN.2024 01:04:20

8DPSK(3-DH5)_Channel 39



Date: 31.JAN.2024 01:06:08

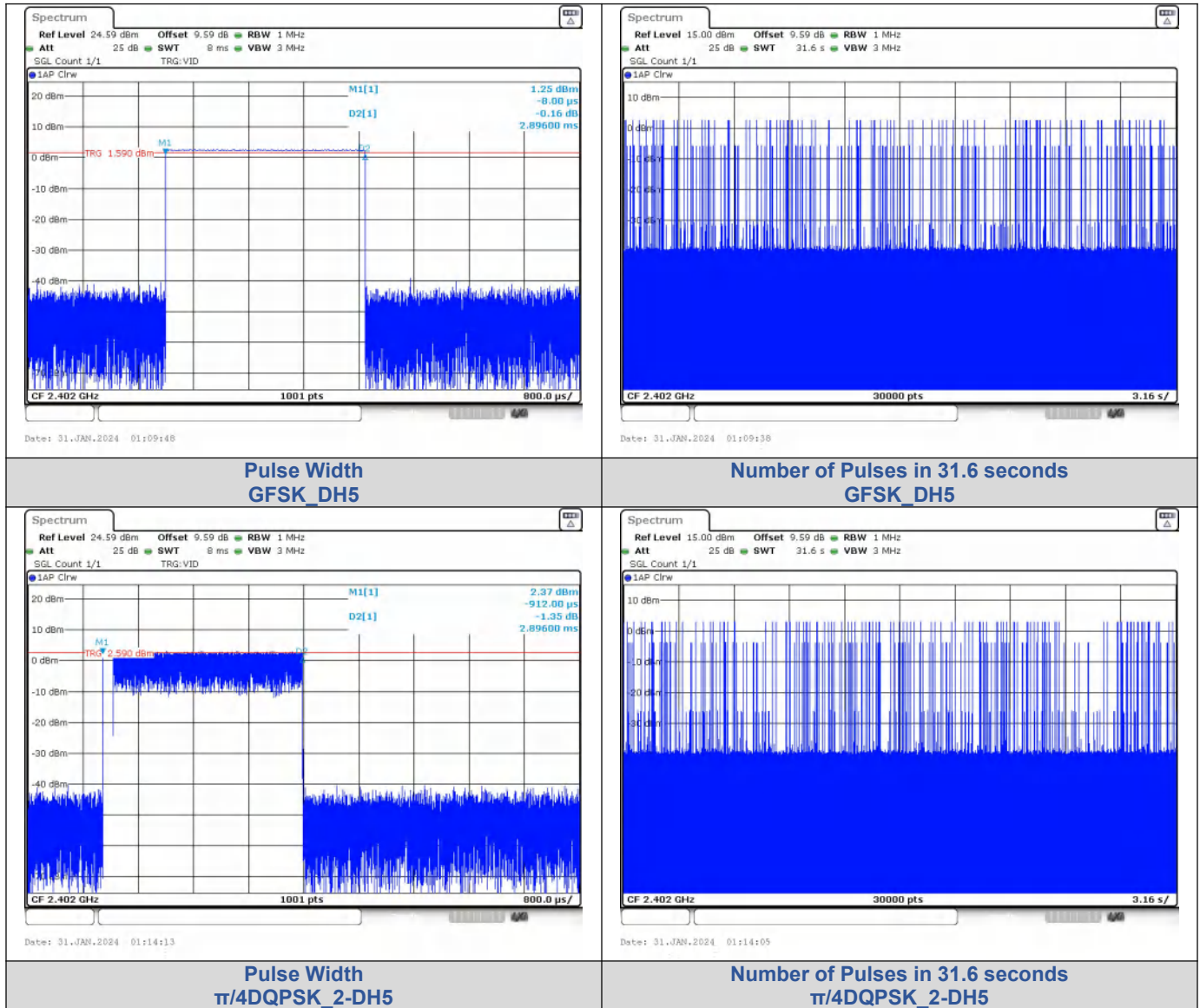
8DPSK(3-DH5)_Channel 78

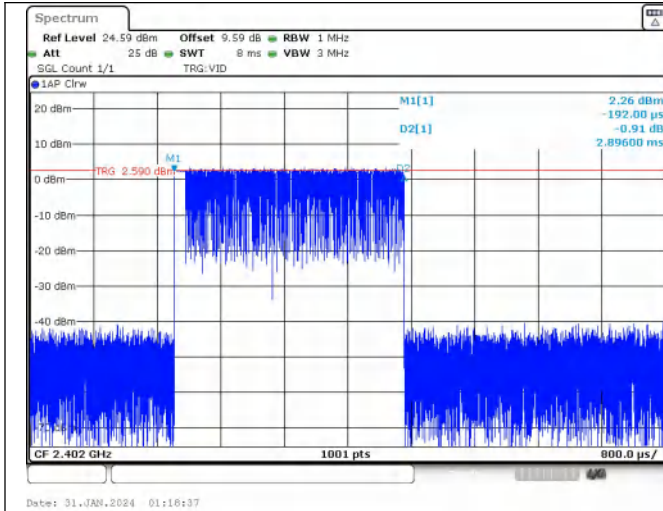
Dwell Time

Test Result

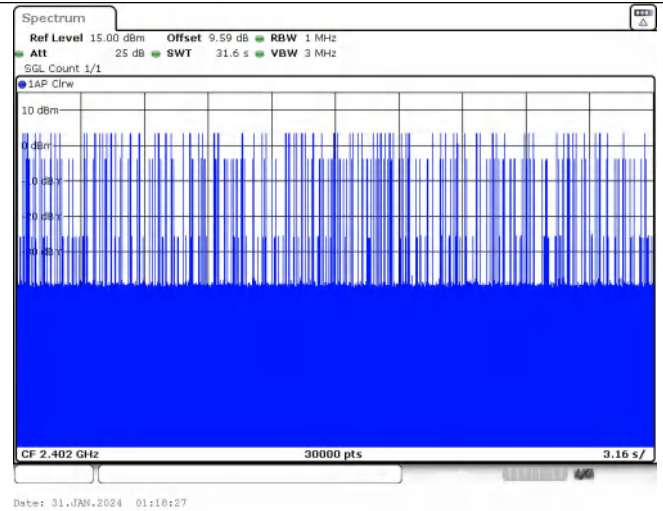
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.896	98	283.81	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	113	327.25		PASS
8DPSK	3-DH5		2.896	99	286.7		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



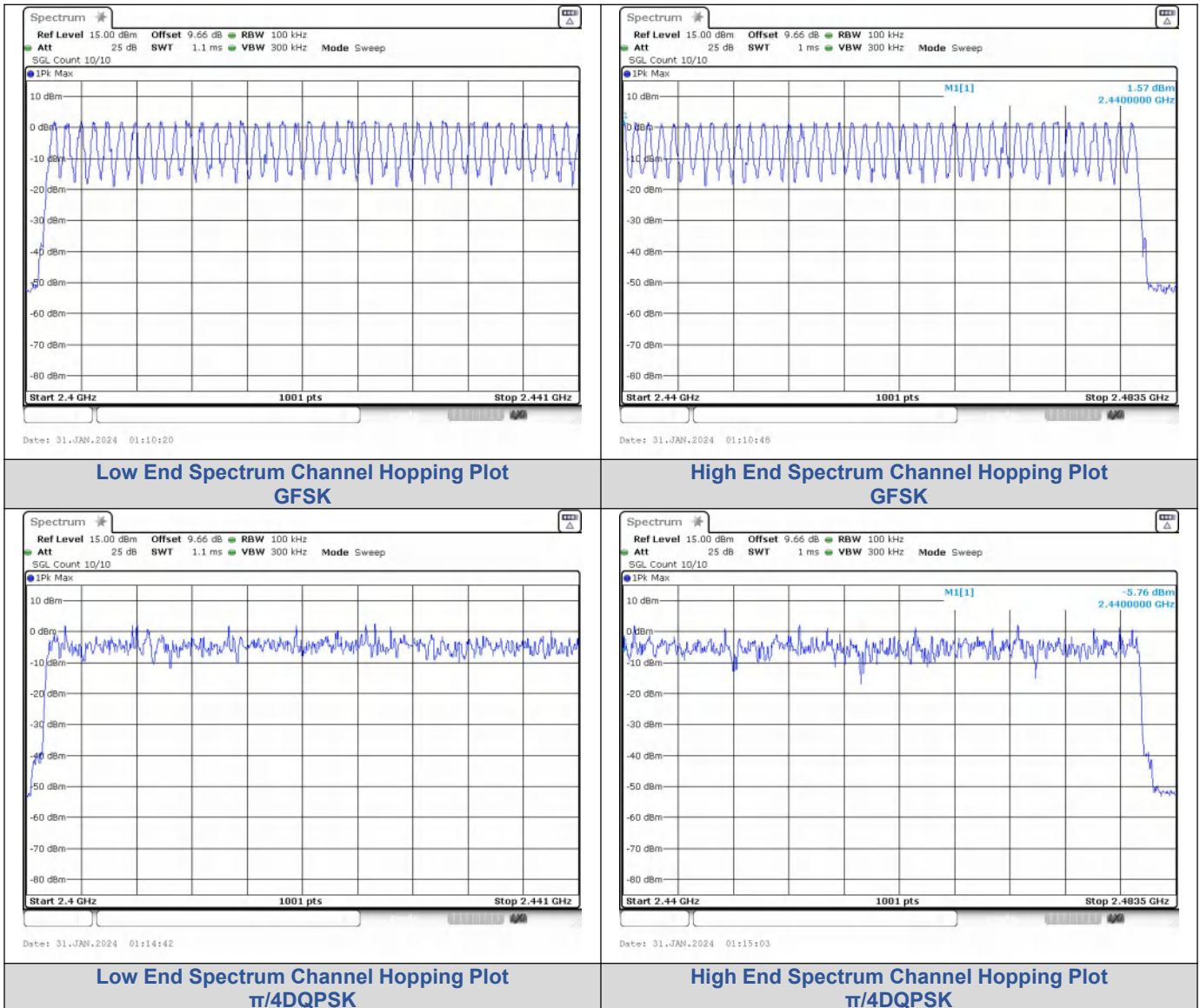
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

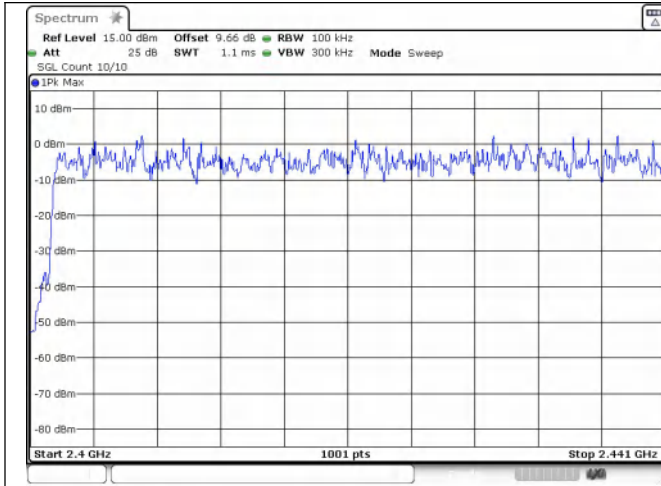
Number Of Hopping Channel

Test Result

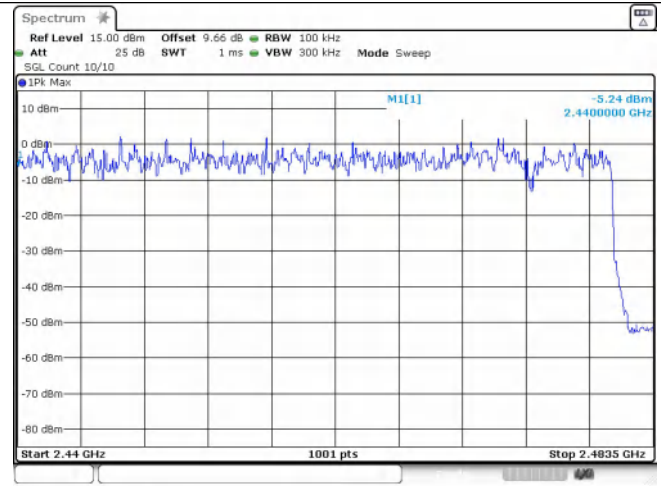
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





**Low End Spectrum Channel Hopping Plot
8DPSK**



**High End Spectrum Channel Hopping Plot
8DPSK**