

Appendix A

Report No.:	CISRR240125144
FCC ID:	2BET4-L1
Product Name:	Wireless Karaoke Speakers
Model No.:	L1
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Conducted Peak Output Power

Test Result

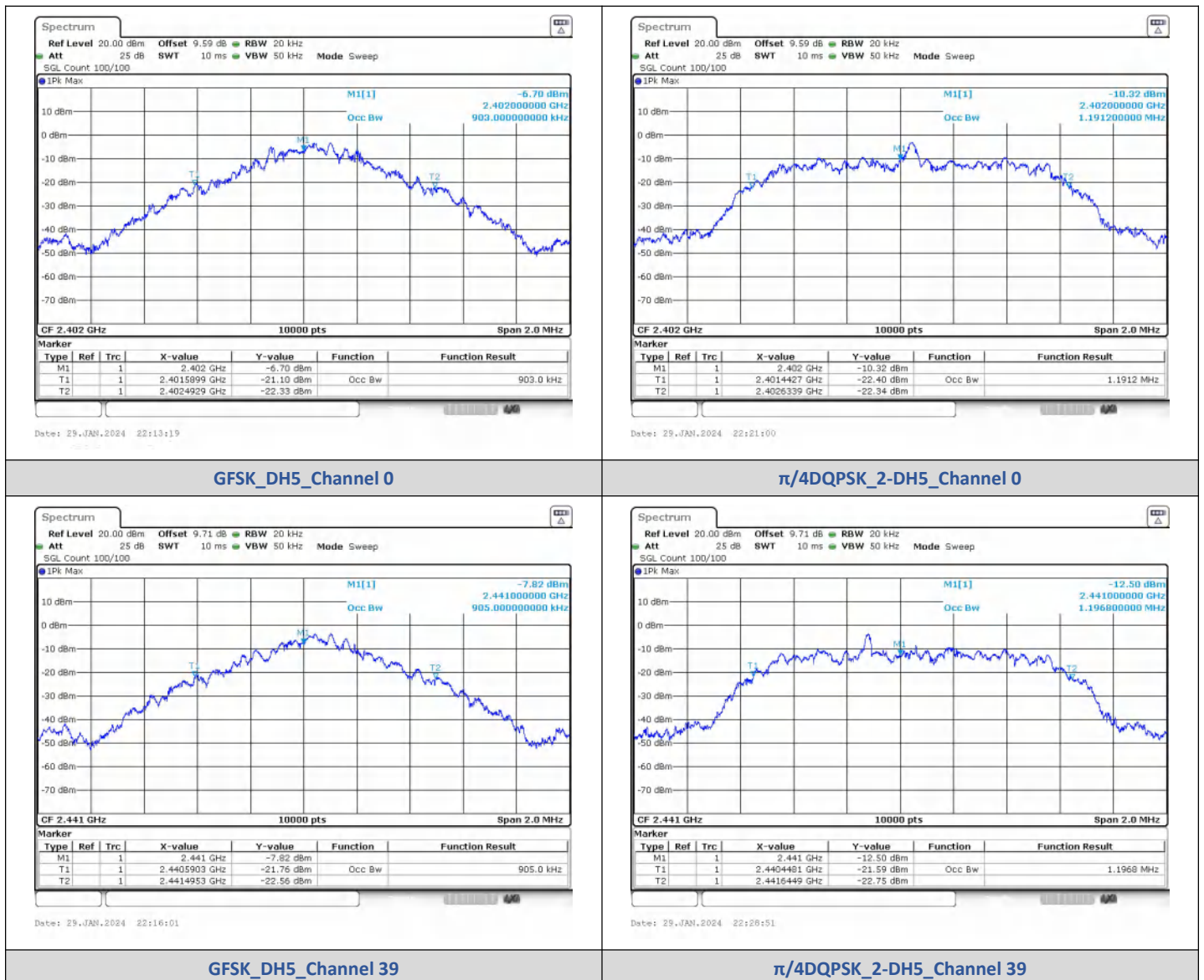
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	0.356	1.086	30	PASS
		39	0.044	1.010		PASS
		78	0.479	1.117		PASS
$\pi/4$ DQPSK	2-DH5	0	1.262	1.337	20.97	PASS
		39	0.952	1.245		PASS
		78	1.307	1.351		PASS
8DPSK	3-DH5	0	1.662	1.466		PASS
		39	1.360	1.368		PASS
		78	1.772	1.504		PASS

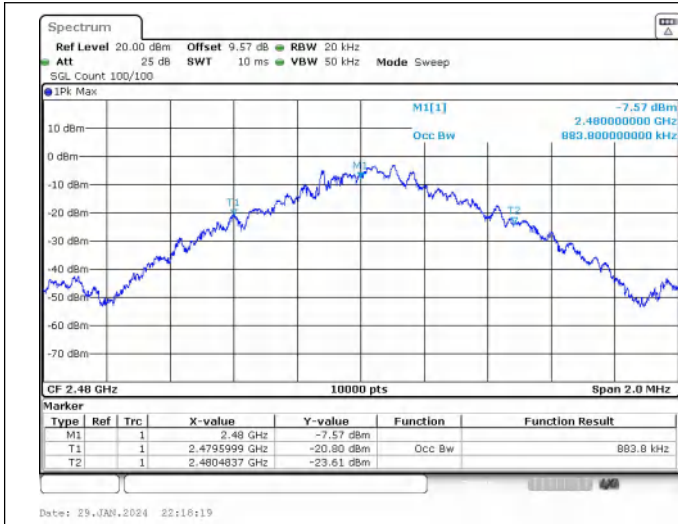
2) 99% Bandwidth

Test Result

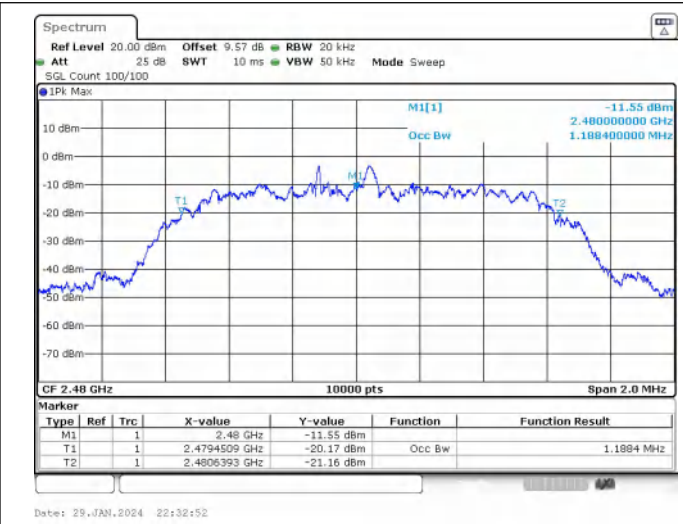
Modulation	Channel	99% BW (MHz)
GFSK	0	0.90300
	39	0.90500
	78	0.88380
$\pi/4$ DQPSK	0	1.1910
	39	1.1970
	78	1.1880
8DPSK	0	1.2030
	39	1.2090
	78	1.2030

Test Graphs

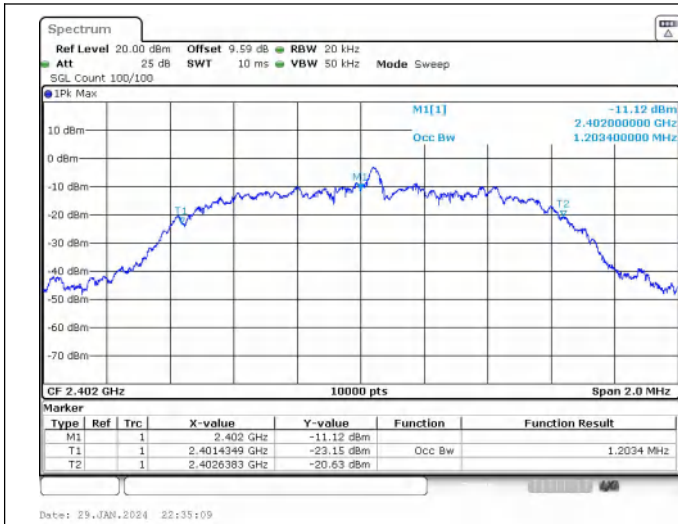




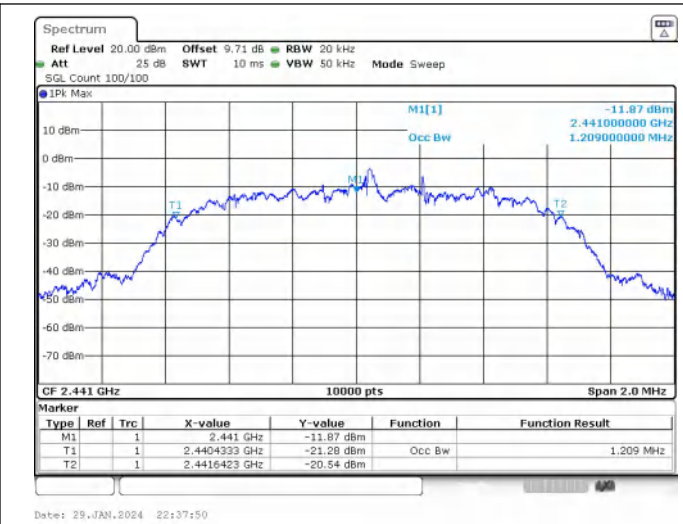
GFSK_DH5_Channel 78



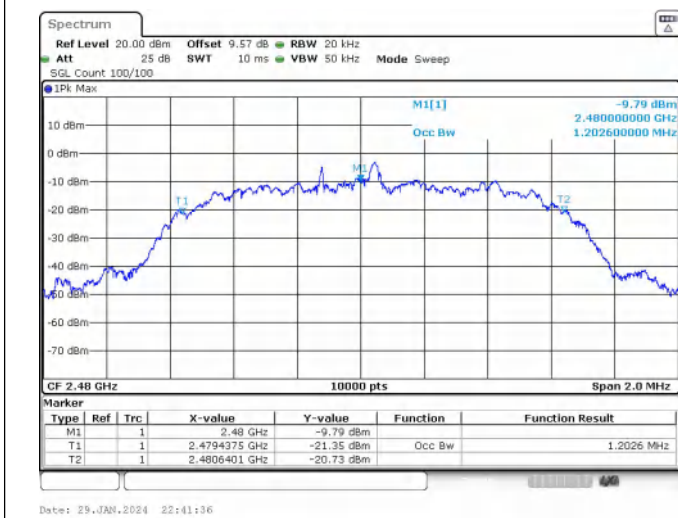
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

Void

3) 20dB Bandwidth

Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.030
	39	2441 MHz	1.020
	78	2480 MHz	1.010
$\pi/4$ DQPSK	0	2402 MHz	1.310
	39	2441 MHz	1.280
	78	2480 MHz	1.290
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.290
	78	2480 MHz	1.290

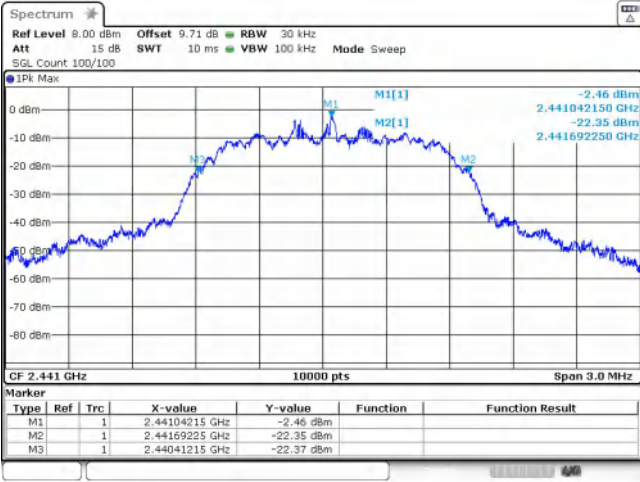
Test Graphs

GFSK_DH5_Channel 0

GFSK_DH5_Channel 39

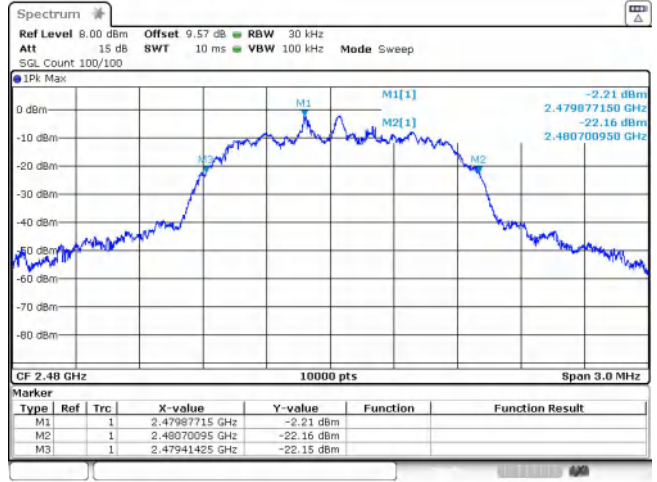
GFSK_DH5_Channel 78

$\pi/4$ DQPSK_2-DH5_Channel 0



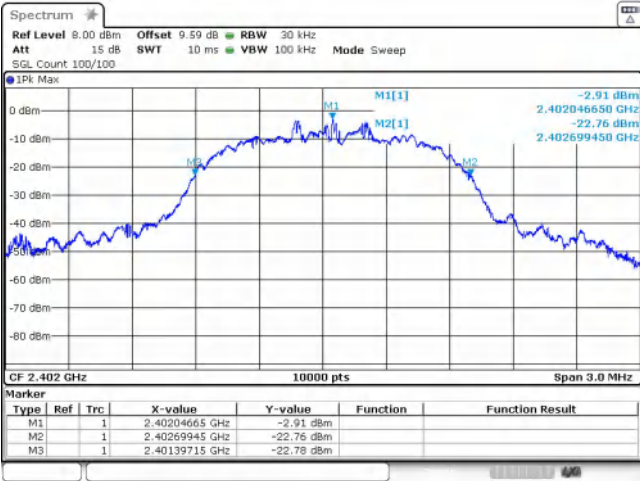
Date: 29.JAN.2024 22:29:13

π /4DQPSK_2-DH5_Channel 39



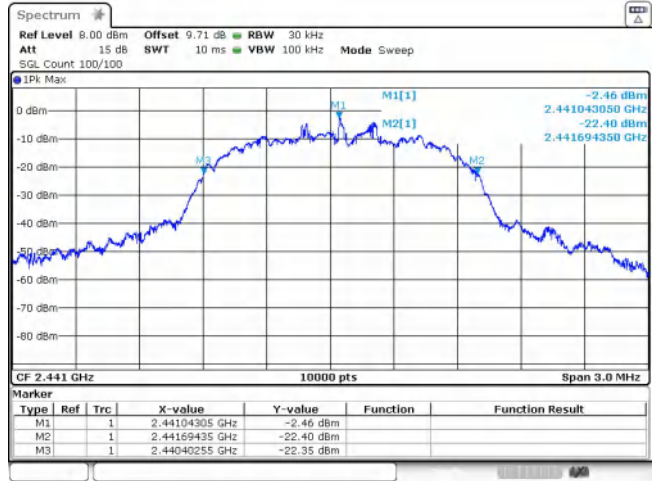
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π /4DQPSK_2-DH5_Channel 78



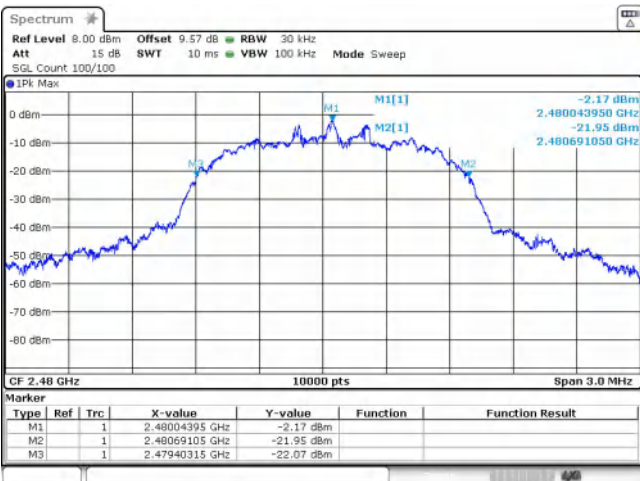
Date: 29.JAN.2024 22:35:32

8DPSK_3-DH5_Channel 0



Date: 29.JAN.2024 22:36:12

8DPSK_3-DH5_Channel 39



Date: 29.JAN.2024 22:41:56

8DPSK_3-DH5_Channel 78

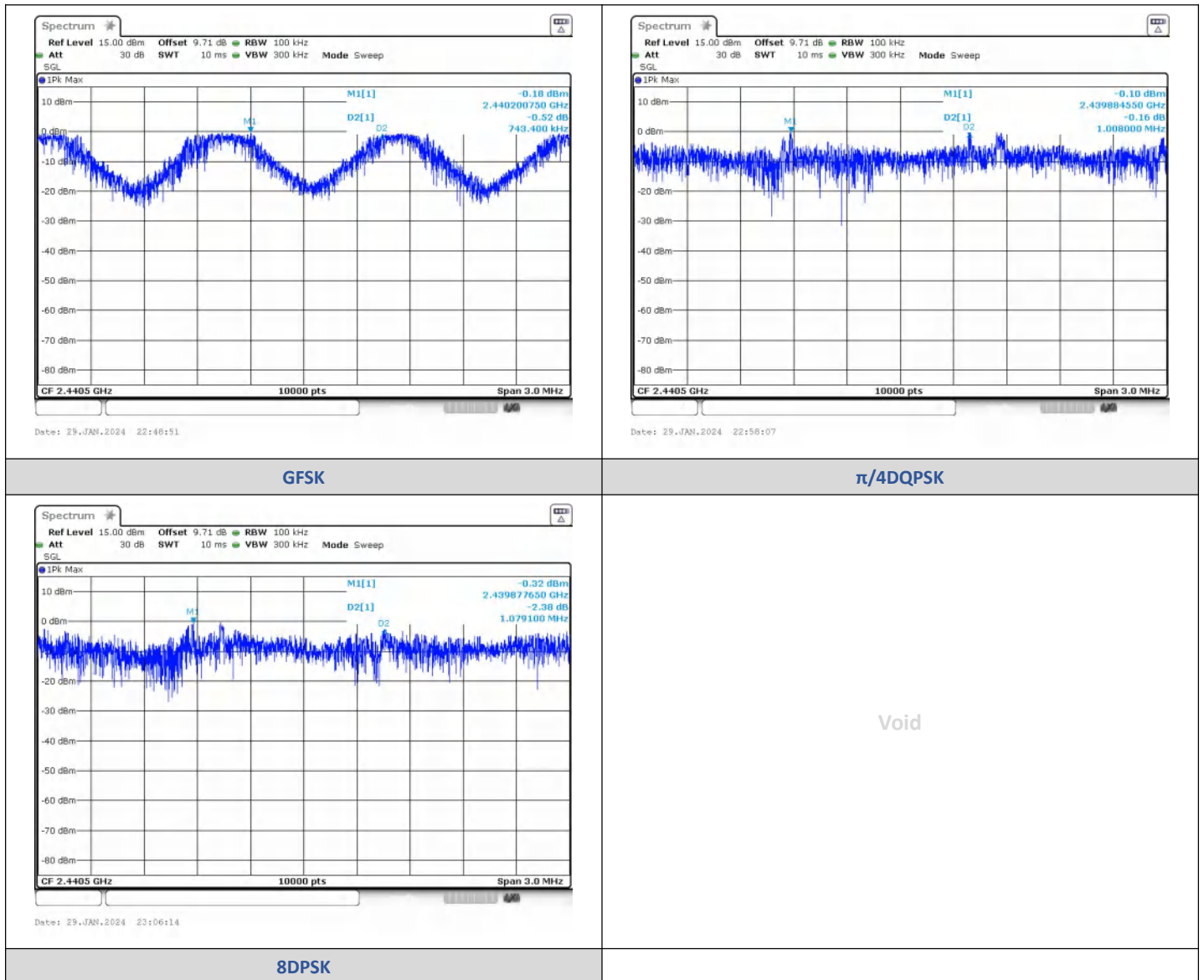
Void

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	2440.2007	2440.9441	0.7434	0.687	PASS
$\pi/4$ DQPSK	2-DH5	2439.8846	2440.8926	1.0080	0.873	PASS
8DPSK	3-DH5	2439.8776	2440.9567	1.0791	0.867	PASS

Test Graphs



5) Conducted Out Of Band Emission

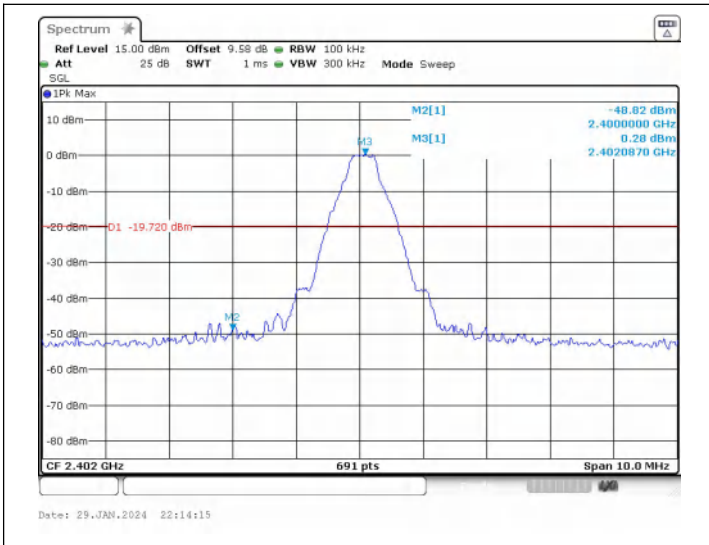
Test Result

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.822	-19.72	-29.102	PASS
			4803.85	-44.266	-19.72	-24.546	PASS
		39	9764.55	-40.842	-20.14	-20.702	PASS
		78	2483.50	-52.136	-19.65	-32.486	PASS
			9920.20	-44.582	-19.65	-24.932	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-49.853	-19.75	-30.103	PASS
			2398.71	-49.805	-19.75	-30.055	PASS
			9608.10	-44.882	-19.75	-25.132	PASS
		39	9764.55	-40.880	-20.19	-20.690	PASS
		78	2483.50	-53.114	-19.82	-33.294	PASS
			9920.20	-43.622	-19.82	-23.802	PASS
8DPSK	3-DH5	0	2400.00	-50.434	-19.74	-30.694	PASS
			9608.08	-46.711	-19.74	-26.971	PASS
		39	9764.55	-40.710	-20.25	-20.460	PASS
		78	2483.50	-52.724	-19.78	-32.944	PASS
			9920.20	-43.431	-19.78	-23.651	PASS

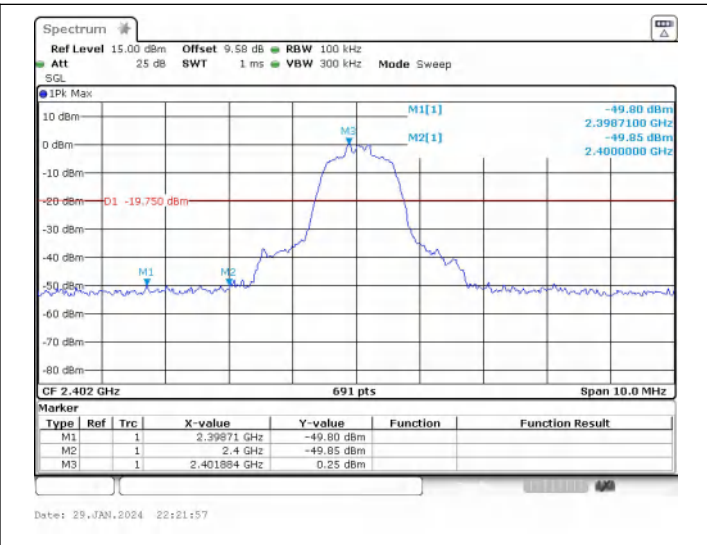
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.83	-50.464	-20.07	-30.394	PASS
			2400.00	-52.736	-20.07	-32.666	PASS
			2483.50	-51.095	-19.85	-31.245	PASS
			2397.44	-49.811	-19.77	-30.041	PASS
			2400.00	-51.597	-19.77	-31.827	PASS
			2483.50	-51.382	-19.84	-31.542	PASS
$\pi/4$ DQPSK	2-DH5		2396.98	-50.060	-23.86	-26.200	PASS
			2400.00	-52.293	-23.86	-28.433	PASS
			2483.50	-51.988	-22.88	-29.108	PASS
			2395.96	-49.800	-20.66	-29.140	PASS
			2400.00	-51.745	-20.66	-31.085	PASS
			2483.50	-50.297	-20.25	-30.047	PASS
8DPSK	3-DH5	2398.65	-50.319	-20.96	-29.359	PASS	
		2400.00	-52.616	-20.96	-31.656	PASS	
		2483.50	-50.763	-20.71	-30.053	PASS	
		2397.45	-50.212	-21.44	-28.772	PASS	
		2400.00	-52.005	-21.44	-30.565	PASS	
		2483.50	-51.451	-21.58	-29.871	PASS	

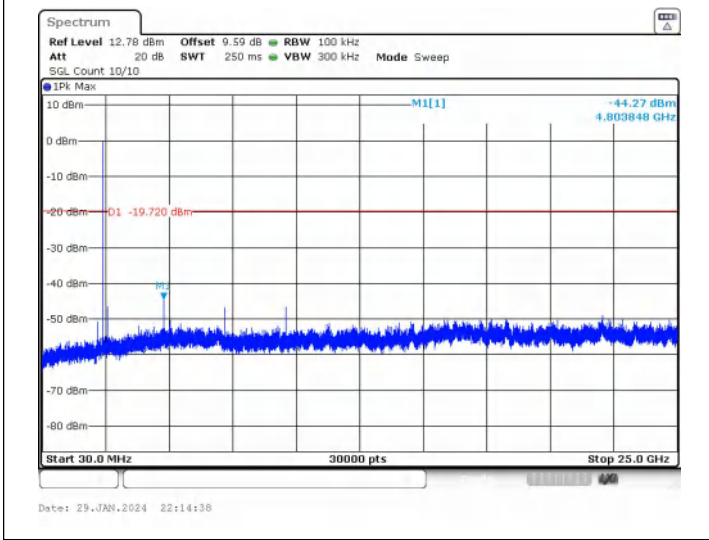
Test Graphs



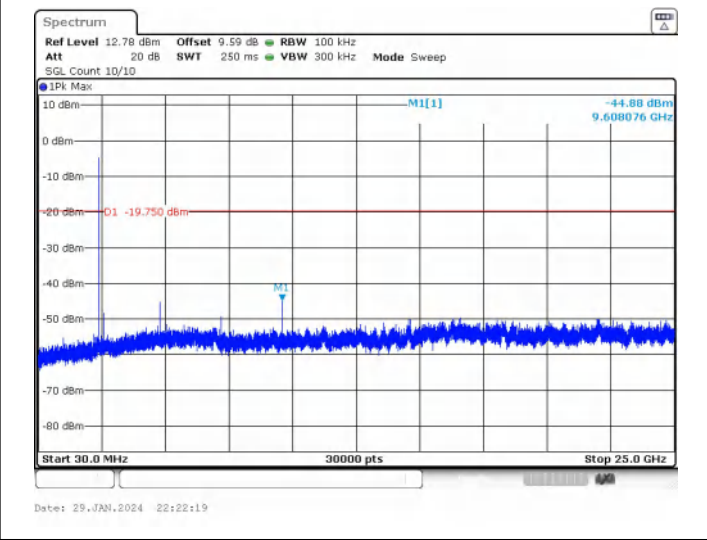
Out Of Band Emission
GFSK_DH5_Channel 0



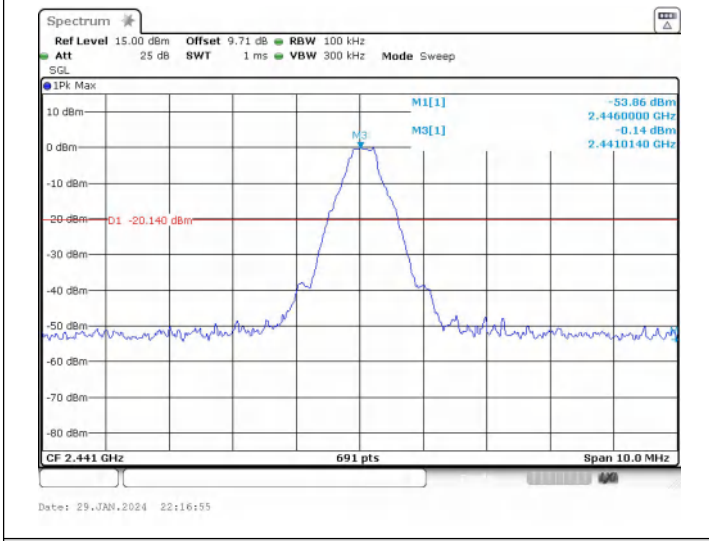
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



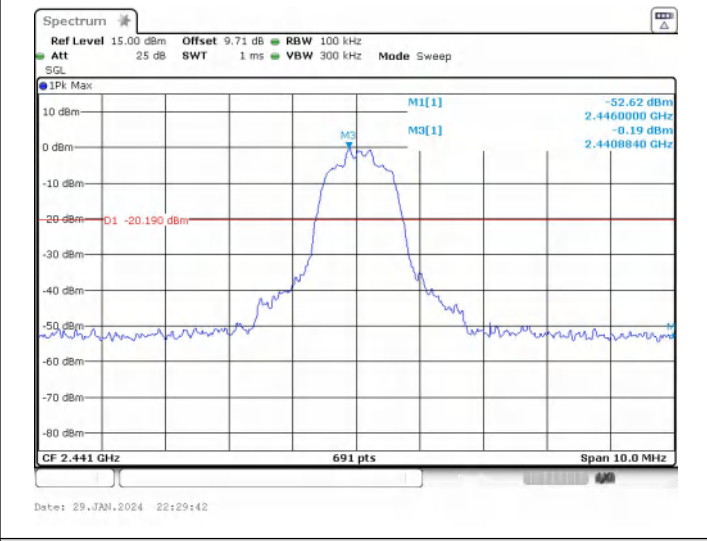
Spurious Emission
GFSK_DH5_Channel 0



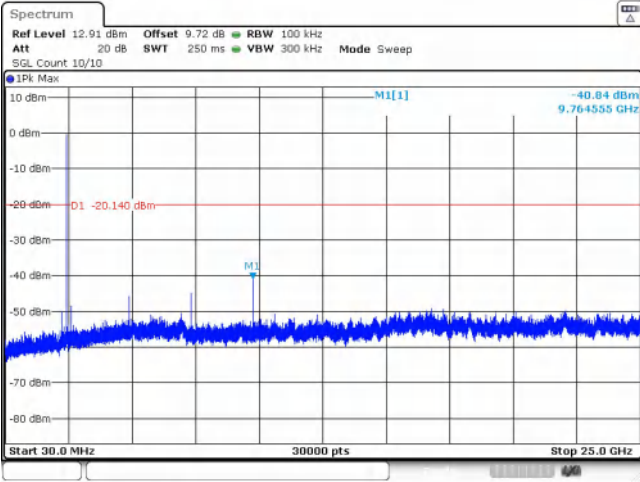
Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



Out Of Band Emission
GFSK_DH5_Channel 39

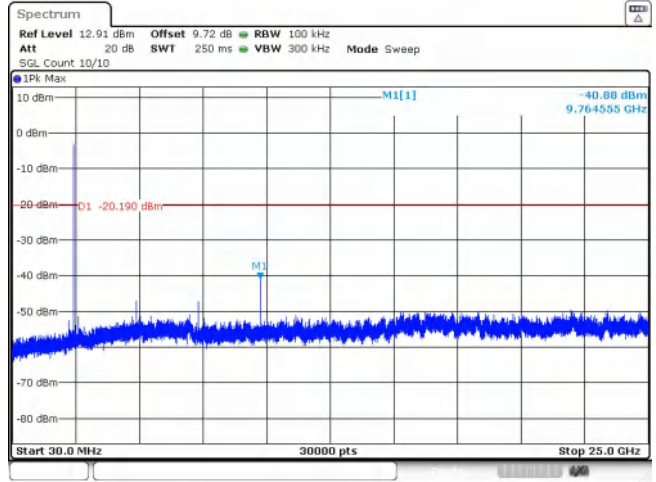


Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



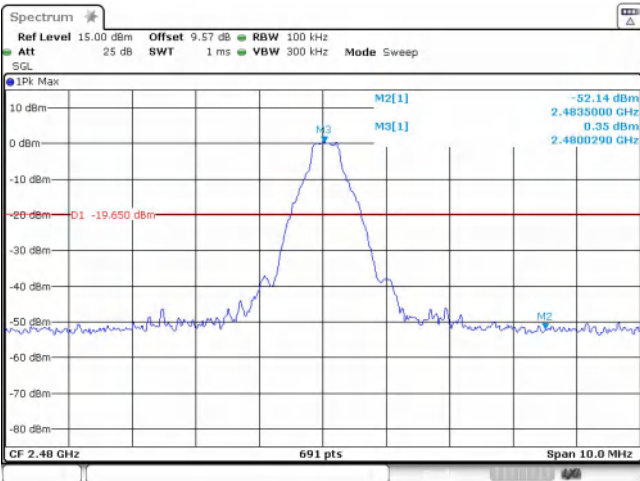
Date: 29.JAN.2024 22:17:17

Spurious Emissions
GFSK_DH5_Channel 39



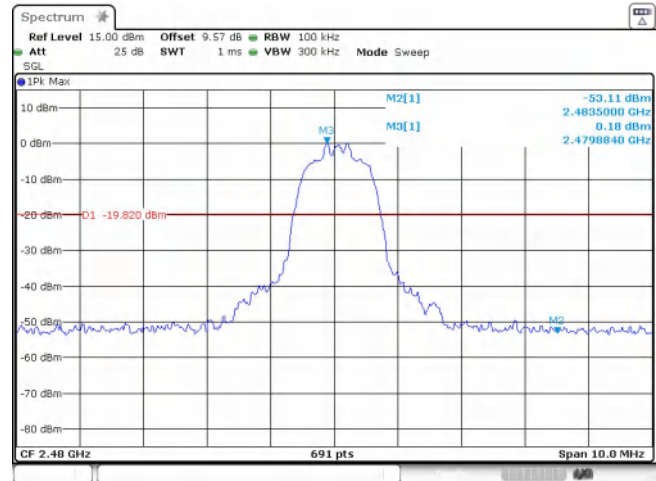
Date: 29.JAN.2024 22:30:05

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



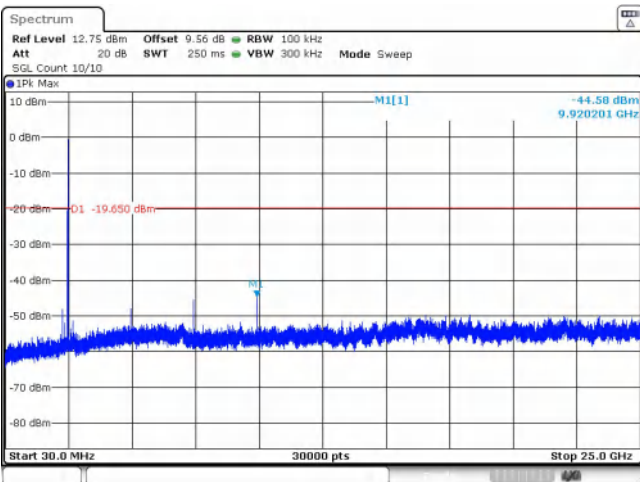
Date: 29.JAN.2024 22:19:16

Out Of Band Emission
GFSK_DH5_Channel 78



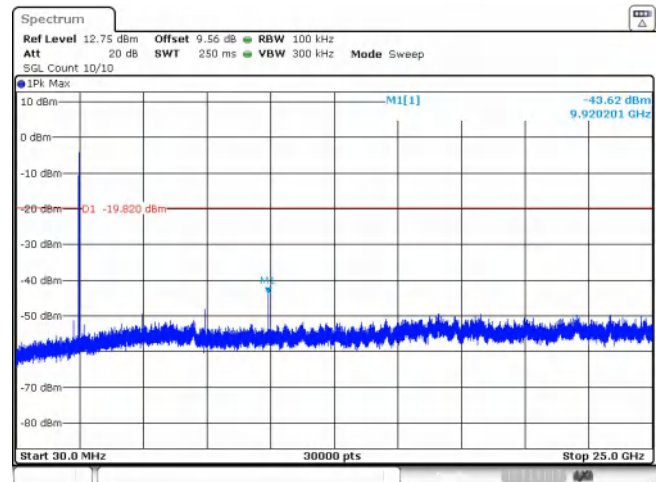
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Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 78



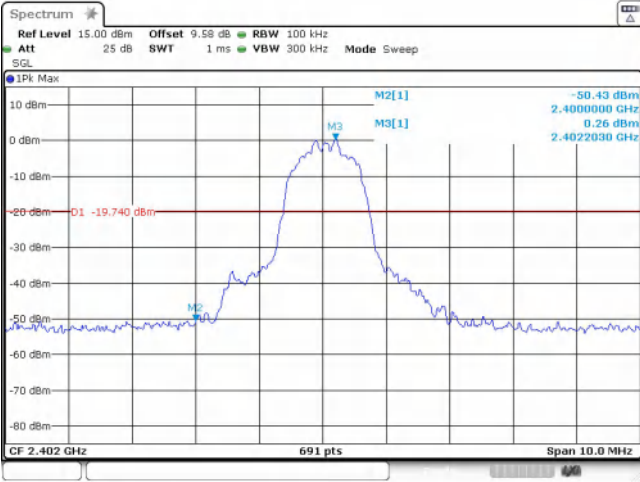
Date: 29.JAN.2024 22:19:38

Spurious Emission
GFSK_DH5_Channel 78



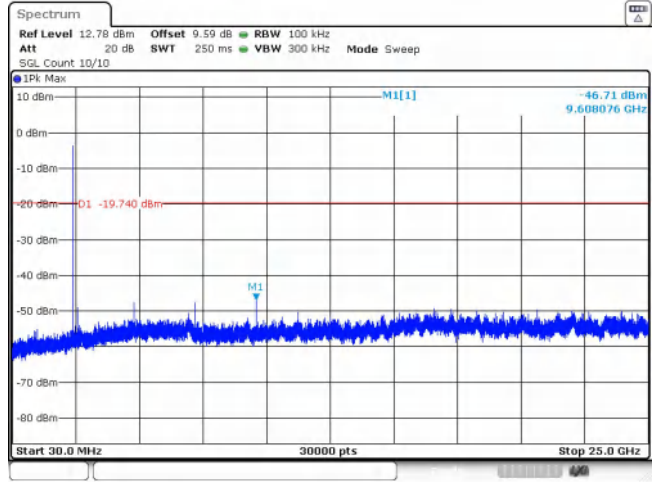
Date: 29.JAN.2024 22:34:11

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



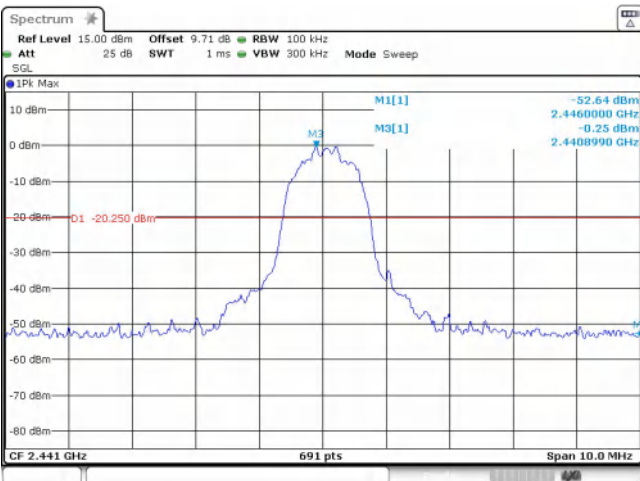
Date: 29.JAN.2024 22:36:06

Out Of Band Emission
8DPSK_3-DH5_Channel 0



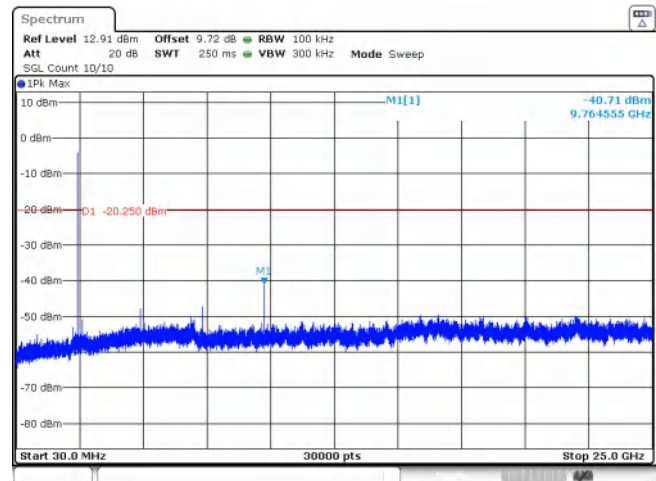
Date: 29.JAN.2024 22:36:28

Spurious Emission
8DPSK_3-DH5_Channel 0



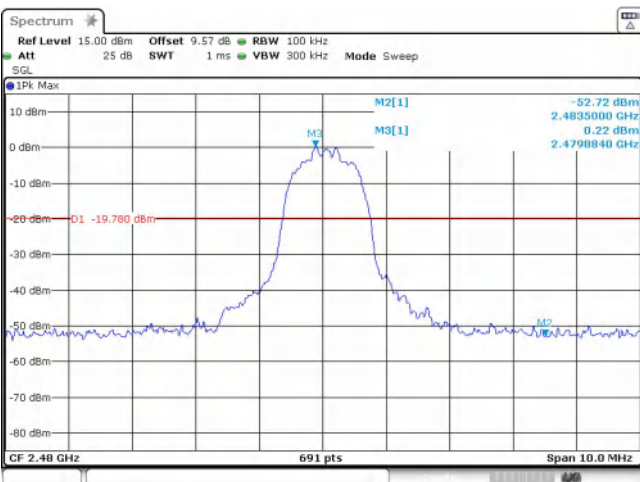
Date: 29.JAN.2024 22:36:41

Out Of Band Emission
8DPSK_3-DH5_Channel 39



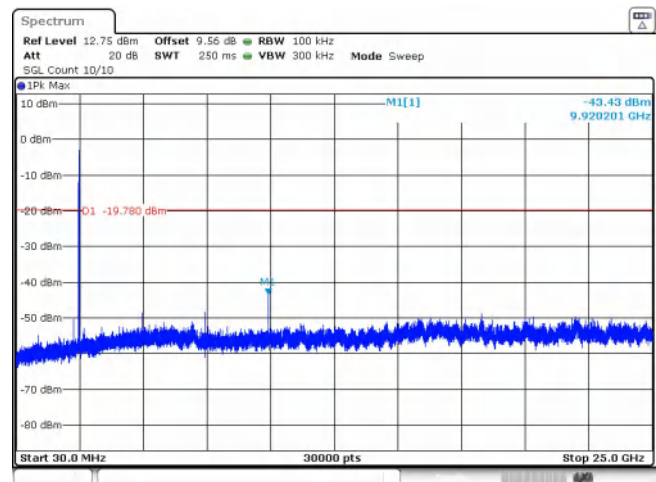
Date: 29.JAN.2024 22:39:04

Spurious Emissions
8DPSK_3-DH5_Channel 39



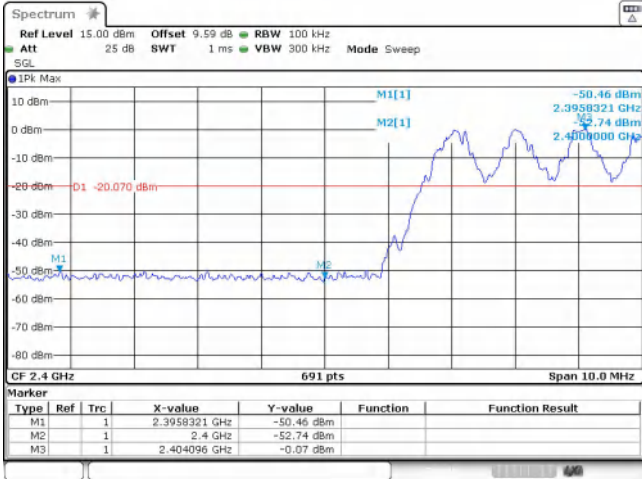
Date: 29.JAN.2024 22:42:32

Out Of Band Emission
8DPSK_3-DH5_Channel 78



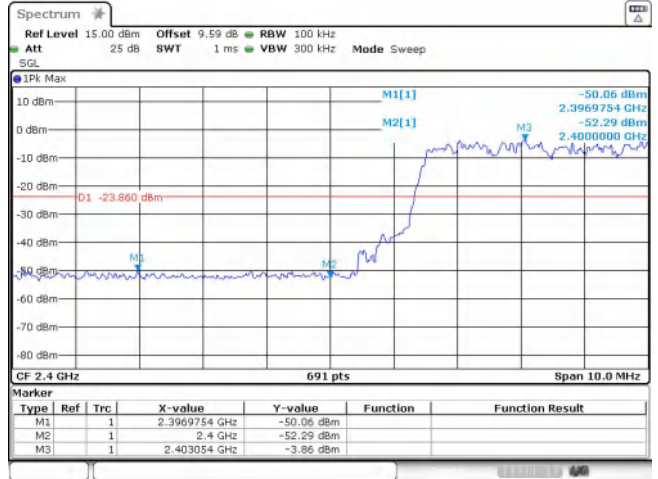
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Spurious Emission
8DPSK_3-DH5_Channel 78



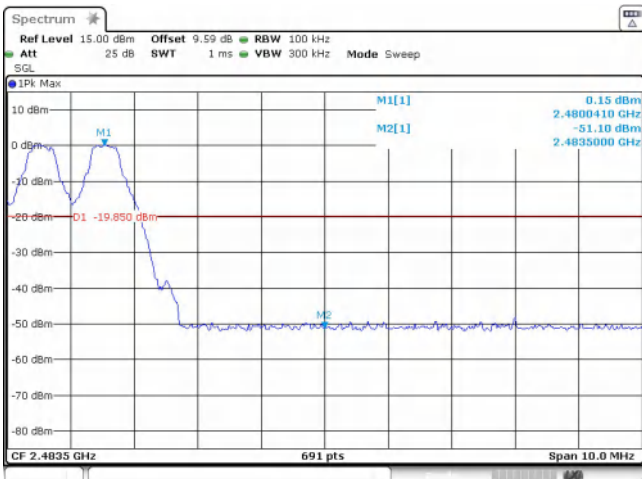
Date: 29.JAN.2024 22:53:12

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



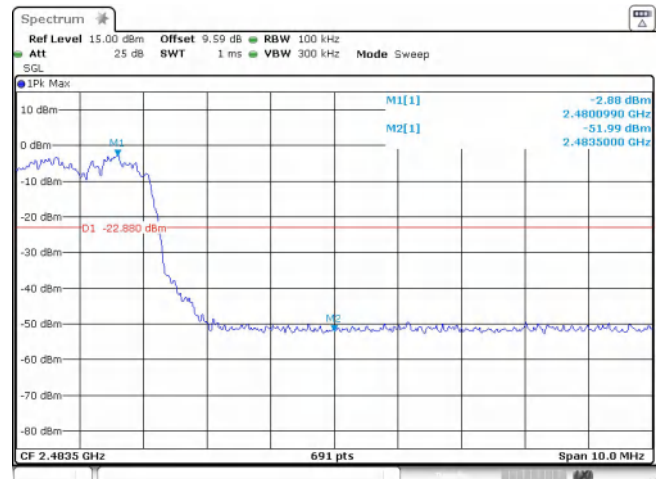
Date: 29.JAN.2024 23:00:27

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



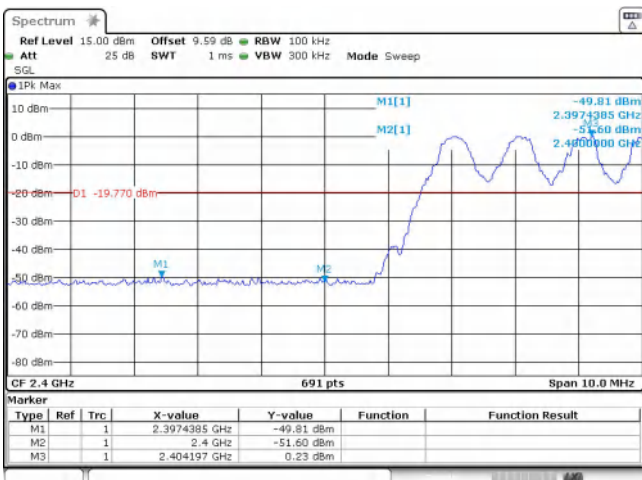
Date: 29.JAN.2024 22:55:00

Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



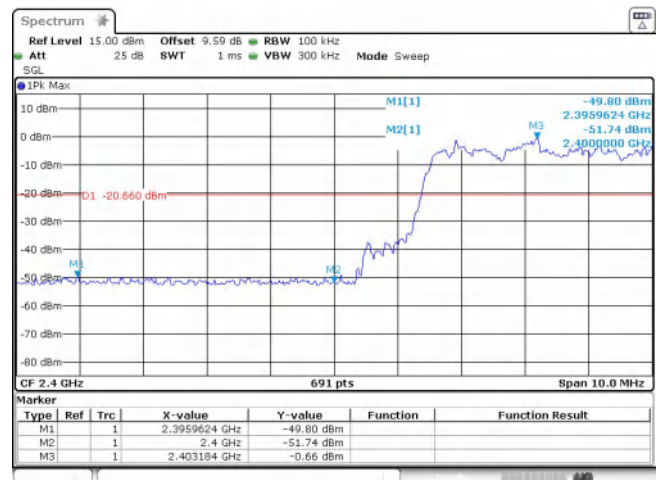
Date: 29.JAN.2024 23:01:03

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



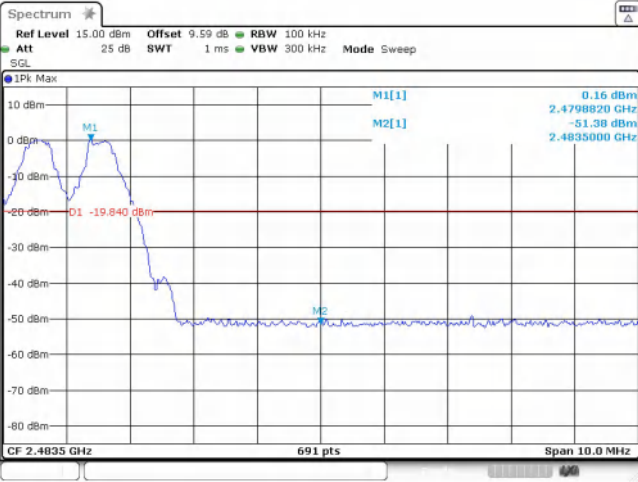
Date: 29.JAN.2024 22:56:07

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



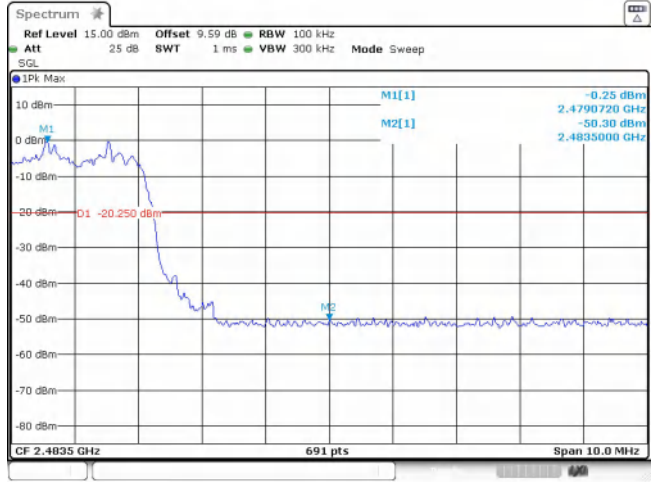
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Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



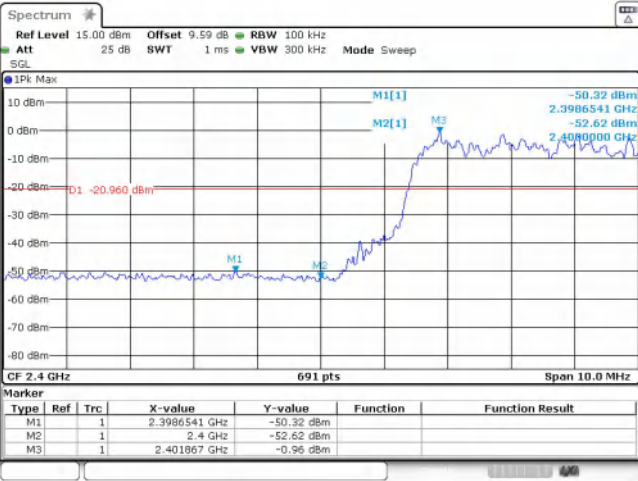
Date: 29.JAN.2024 22:57:11

Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



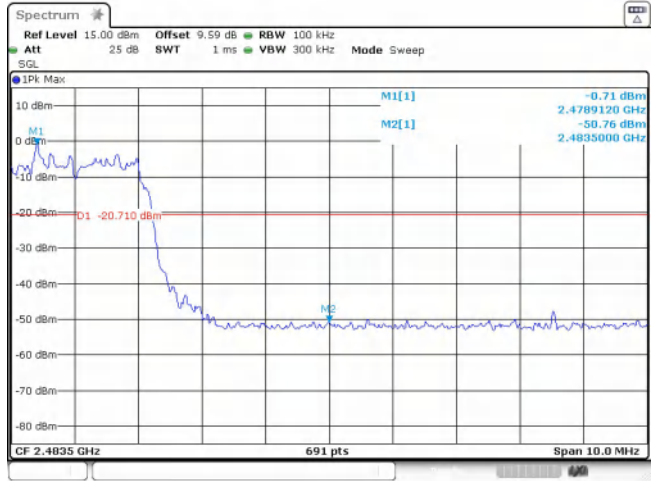
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Out Of Band Emission(Right)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



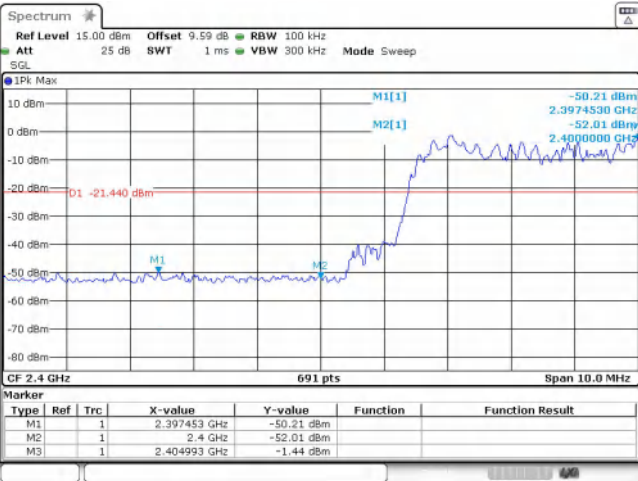
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Out Of Band Emission(Left)
8DPSK_3-DH5_Channel Hopping



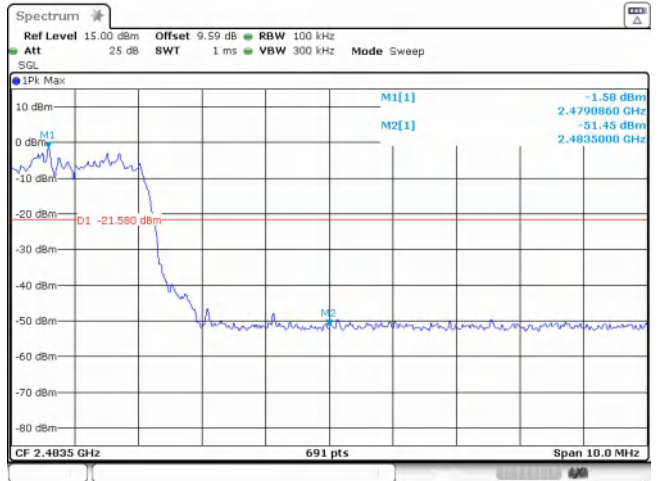
Date: 29.JAN.2024 23:09:01

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



Date: 29.JAN.2024 23:10:09

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



Date: 29.JAN.2024 23:10:38

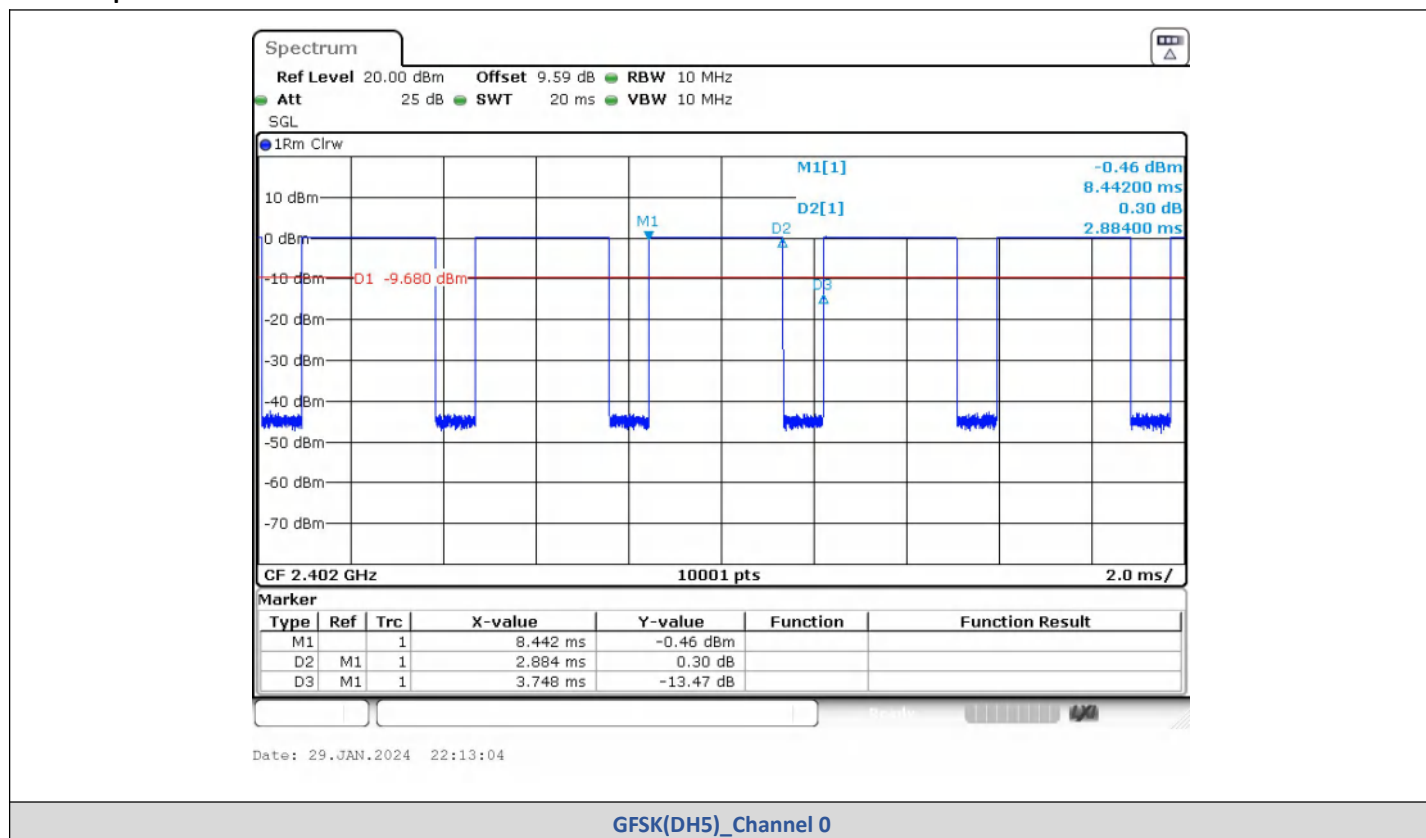
Out Of Band Emission(Right)
8DPSK_3-DH5_Channel Hopping

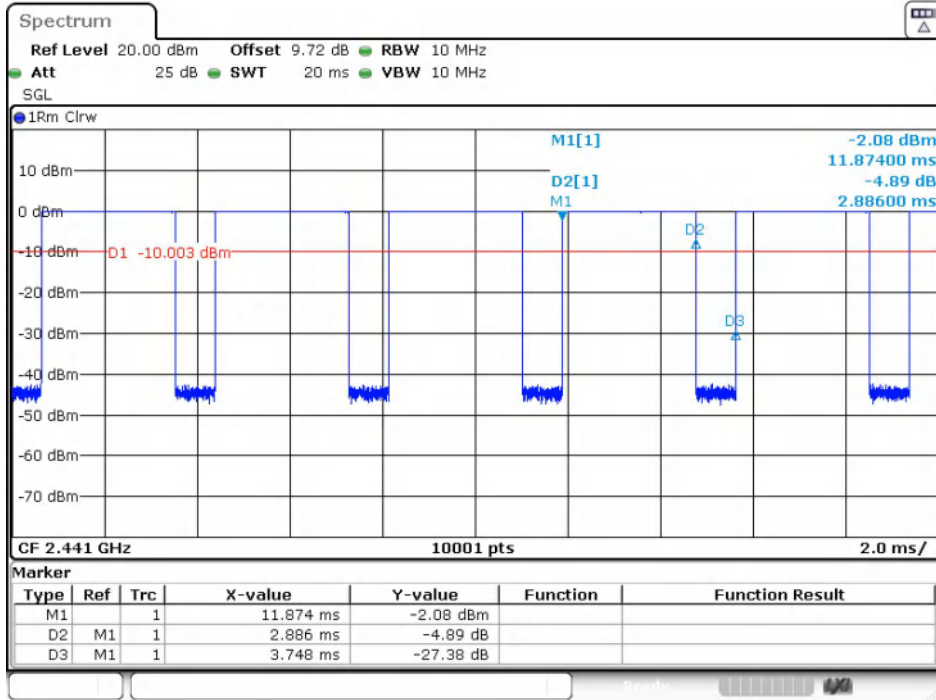
6) Duty Cycle

Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.884	3.748	76.95	0.7695	1.1379	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	2.890	3.748	77.11	0.7711	1.1289	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	2.892	3.748	77.16	0.7716	1.1261	0.35
		78	2.894	3.748	77.21	0.7721	1.1233	0.35

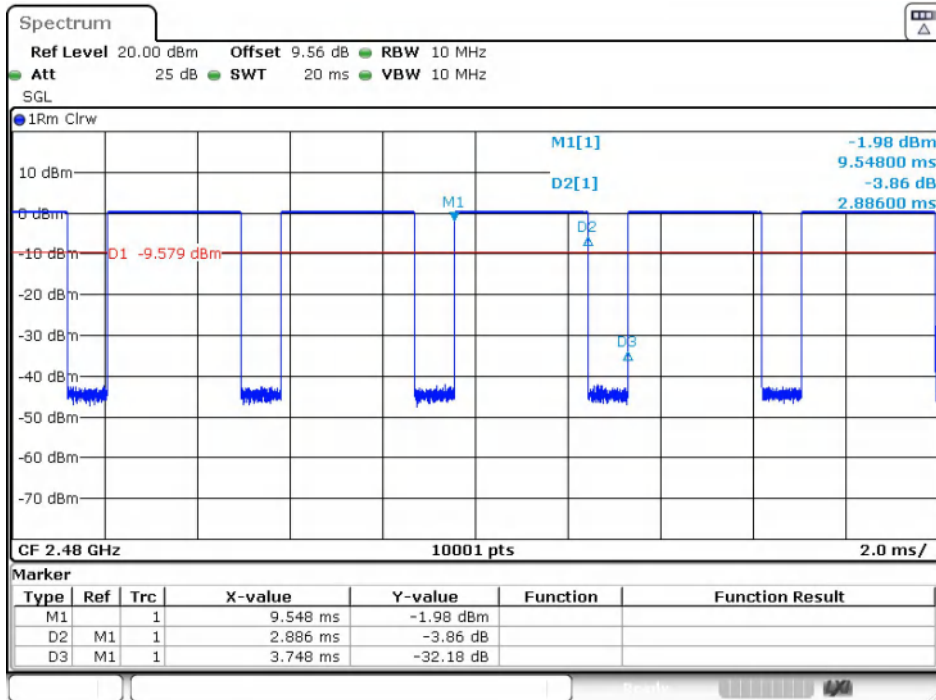
Test Graphs





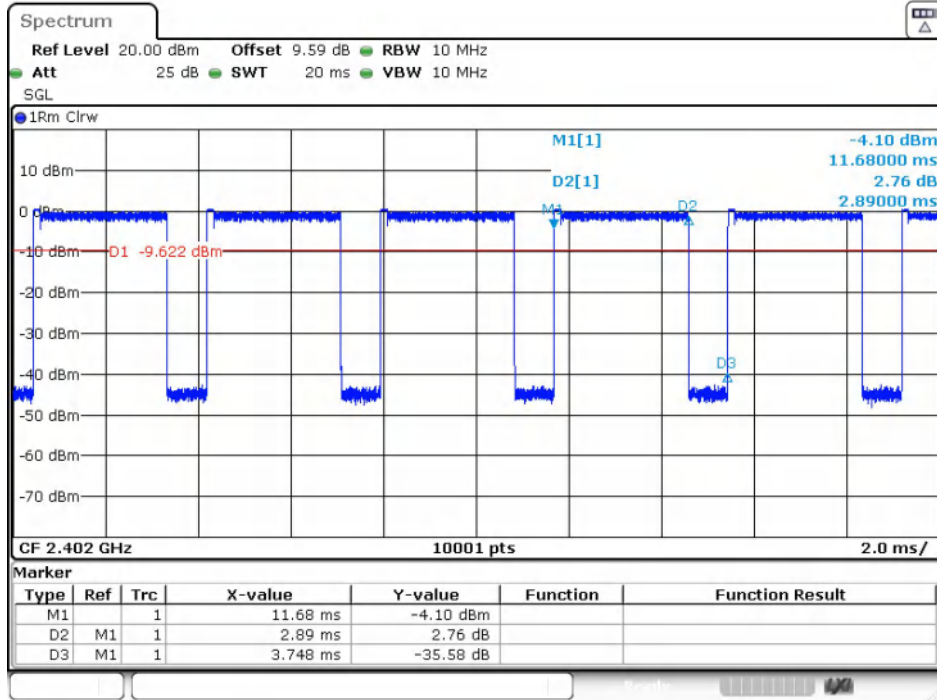
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GFSK(DH5)_Channel 39



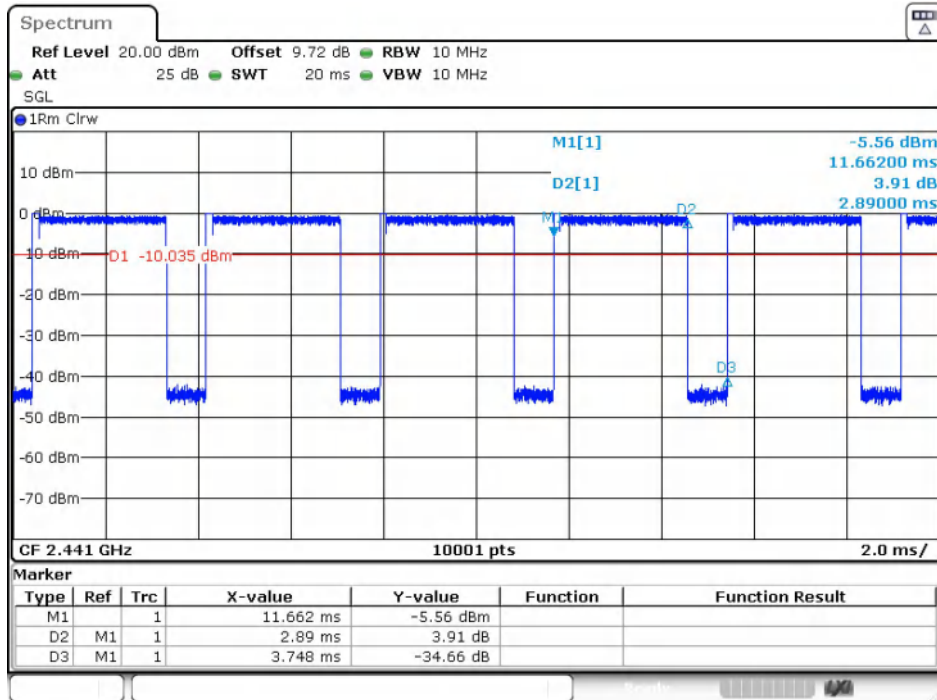
Date: 29.JAN.2024 22:18:05

GFSK(DH5)_Channel 78



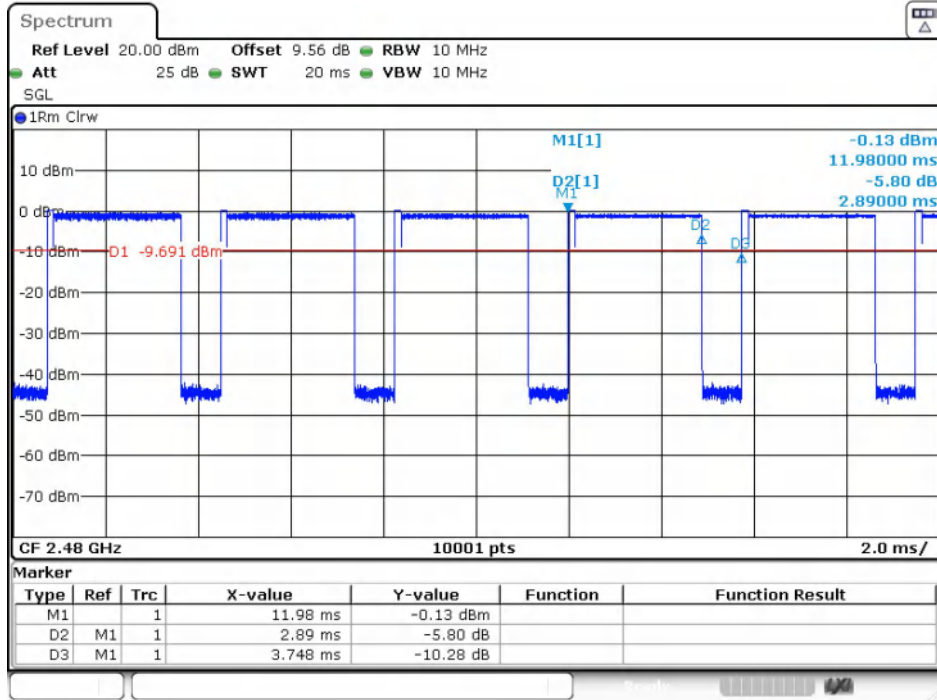
Date: 29.JAN.2024 22:20:46

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



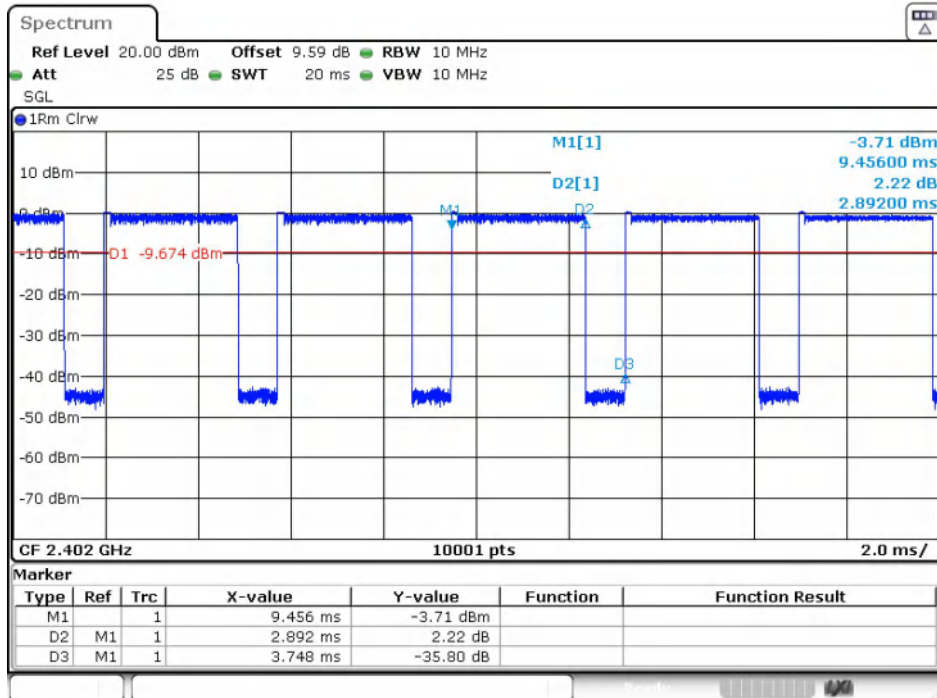
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$\pi/4$ DQPSK(2-DH5)_Channel 39



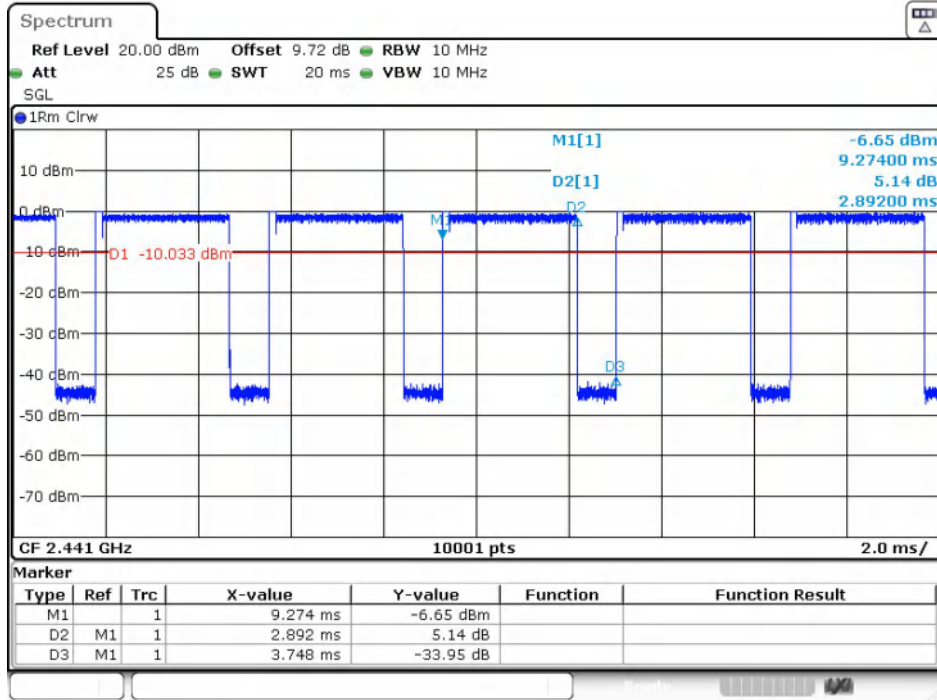
Date: 29.JAN.2024 22:32:38

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



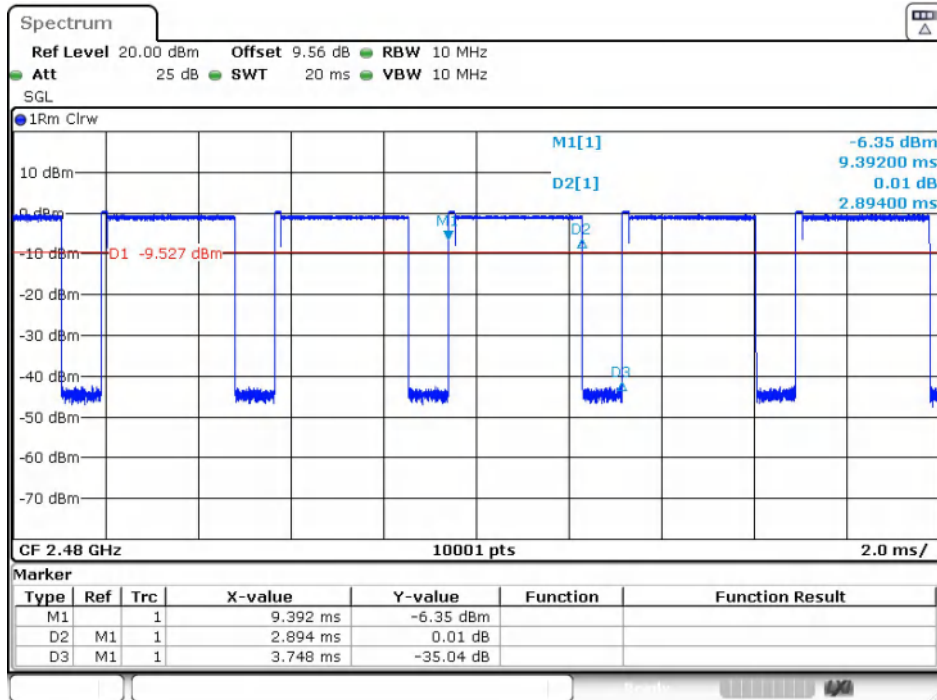
Date: 29.JAN.2024 22:34:55

8DPSK(3-DH5)_Channel 0



Date: 29.JAN.2024 22:37:35

8DPSK(3-DH5)_Channel 39



Date: 29.JAN.2024 22:41:21

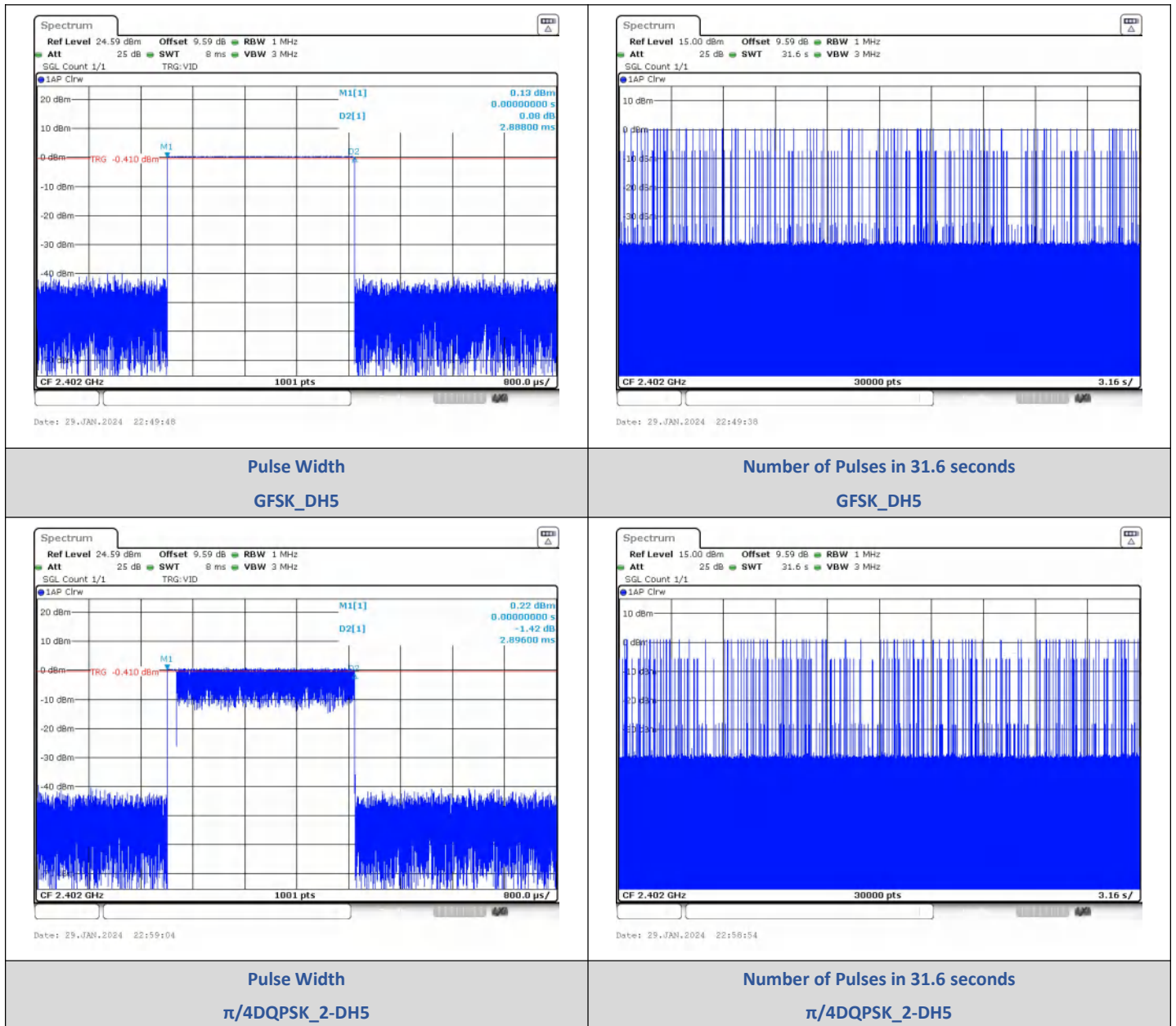
8DPSK(3-DH5)_Channel 78

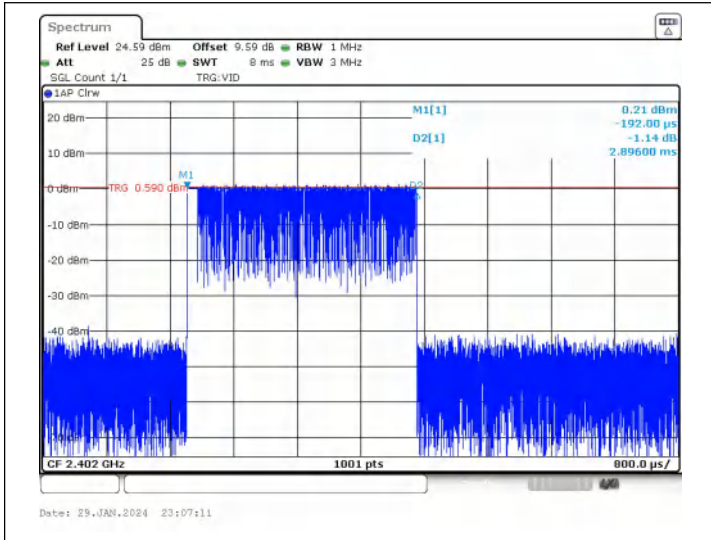
7) Dwell Time

Test Result

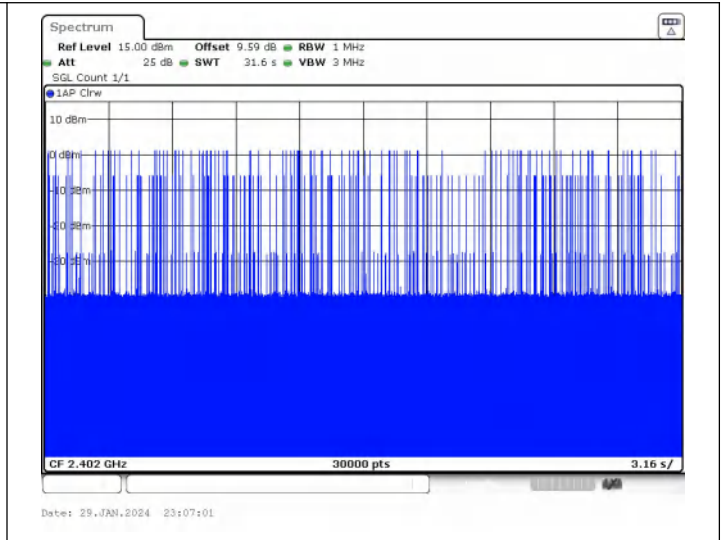
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CHO (2402MHz)	2.888	101	291.69	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	107	309.87		PASS
8DPSK	3-DH5		2.896	98	283.81		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



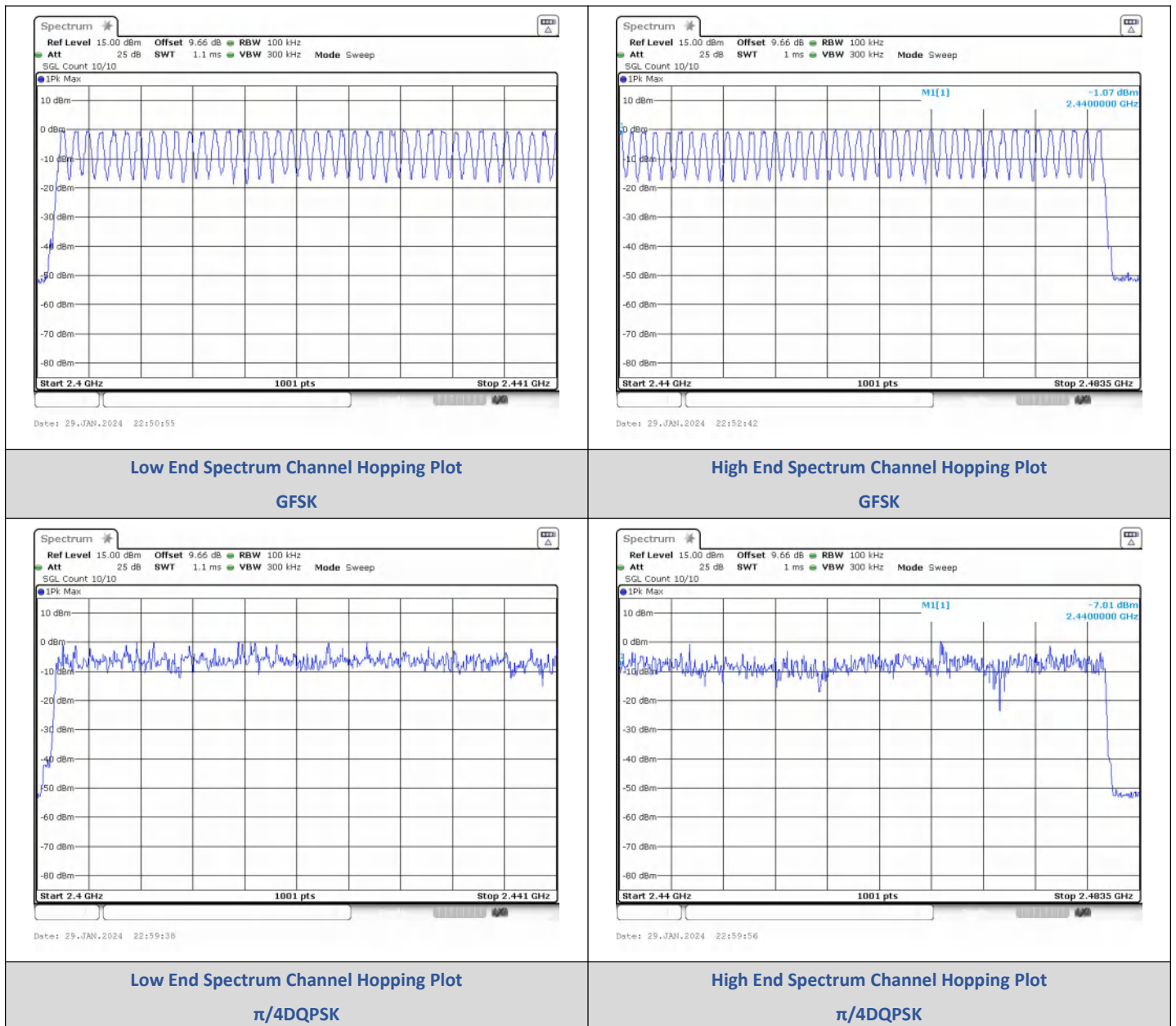
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

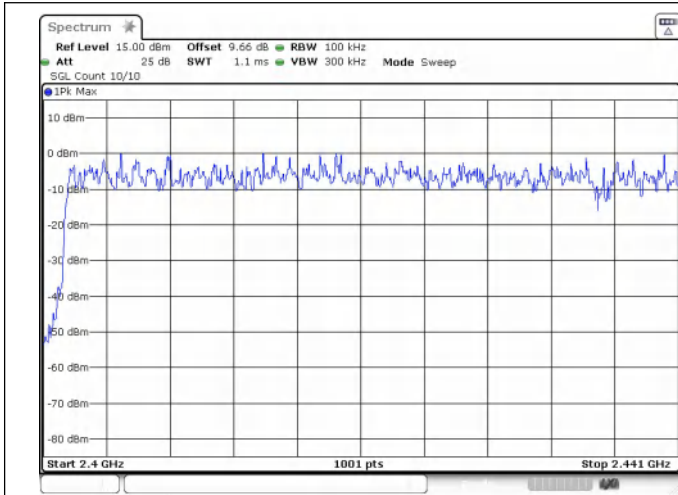
8) Number Of Hopping Channel

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

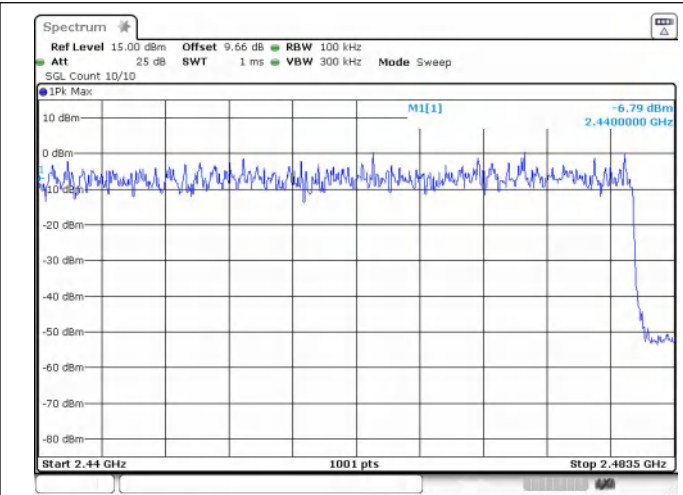




Date: 29.JAN.2024 23:07:46

Low End Spectrum Channel Hopping Plot

8DPSK



Date: 29.JAN.2024 23:08:11

High End Spectrum Channel Hopping Plot

8DPSK