

Appendix

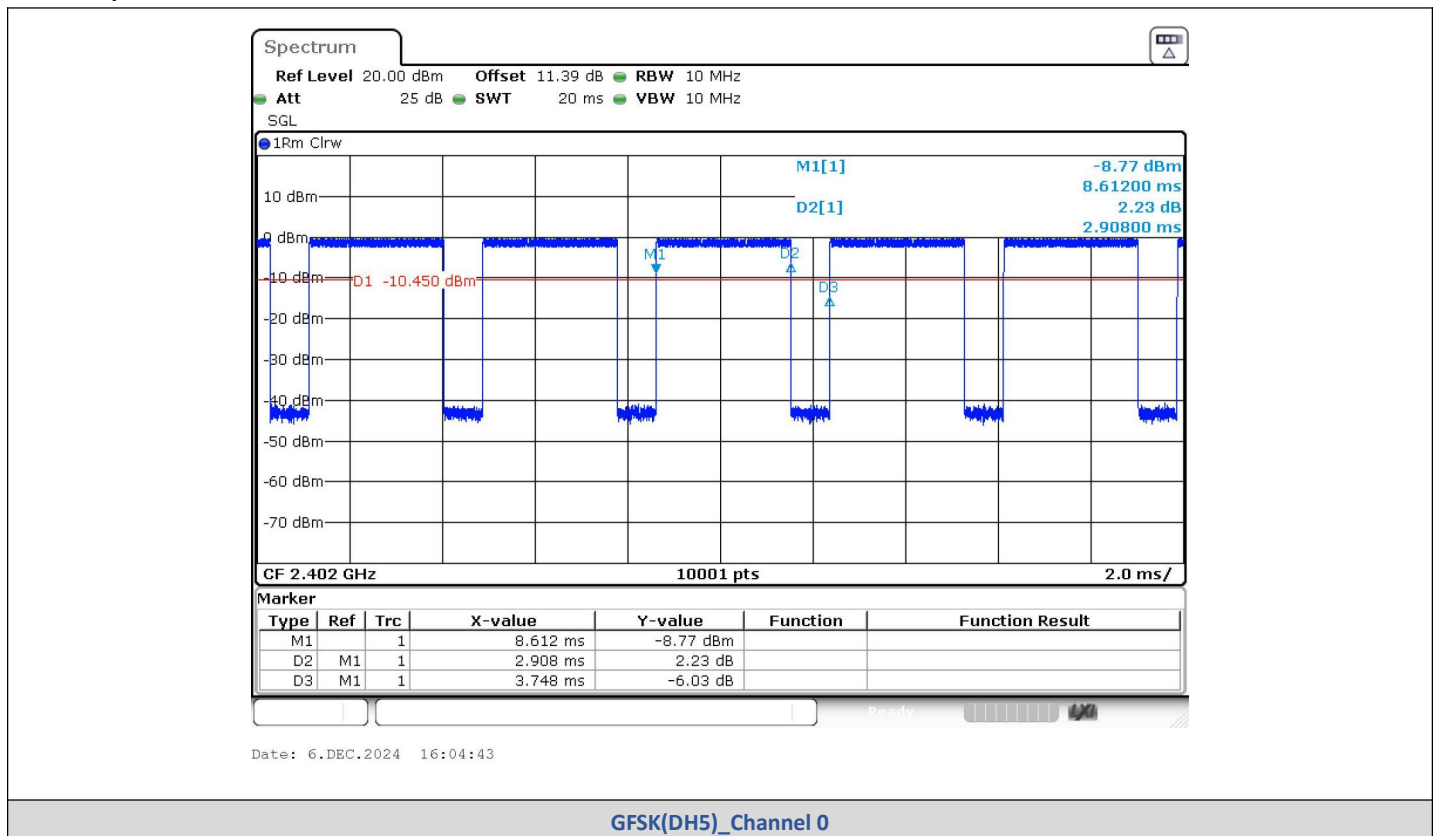
Report No.:	CISRR24112517604
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

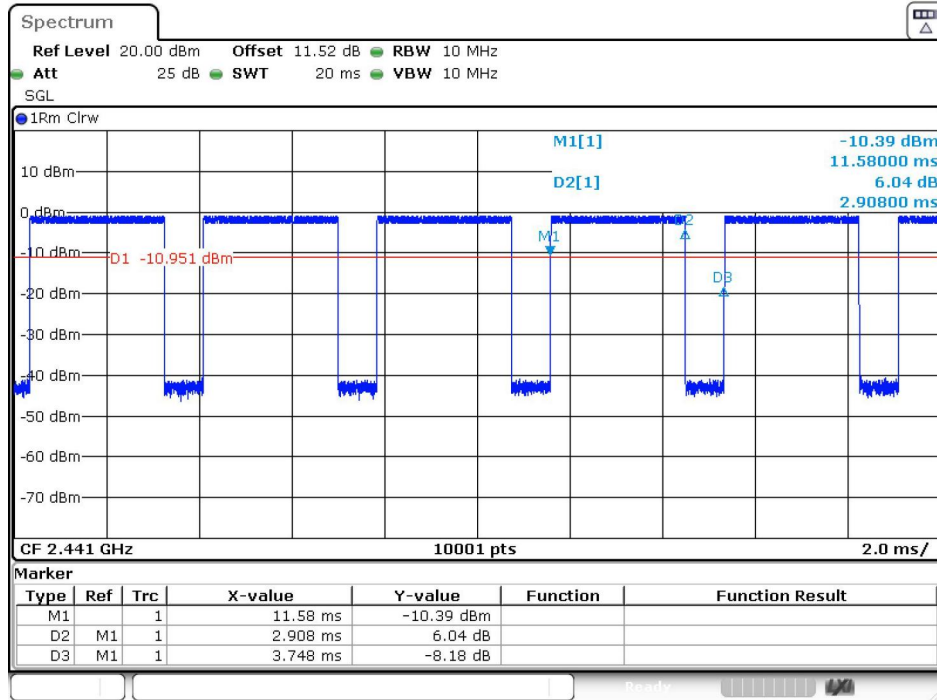
1) Duty Cycle

Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.908	3.748	77.59	0.7759	1.1019	0.3439
		39	2.908	3.748	77.59	0.7759	1.1019	0.3439
		78	2.908	3.748	77.59	0.7759	1.1019	0.3439
$\pi/4$ DQPSK	2-DH5	0	2.912	3.748	77.69	0.7769	1.0963	0.3434
		39	2.914	3.748	77.75	0.7775	1.093	0.3432
		78	2.912	3.748	77.69	0.7769	1.0963	0.3434
8DPSK	3-DH5	0	2.916	3.748	77.80	0.7780	1.0902	0.3429
		39	2.916	3.748	77.80	0.7780	1.0902	0.3429
		78	2.914	3.748	77.75	0.7775	1.093	0.3432

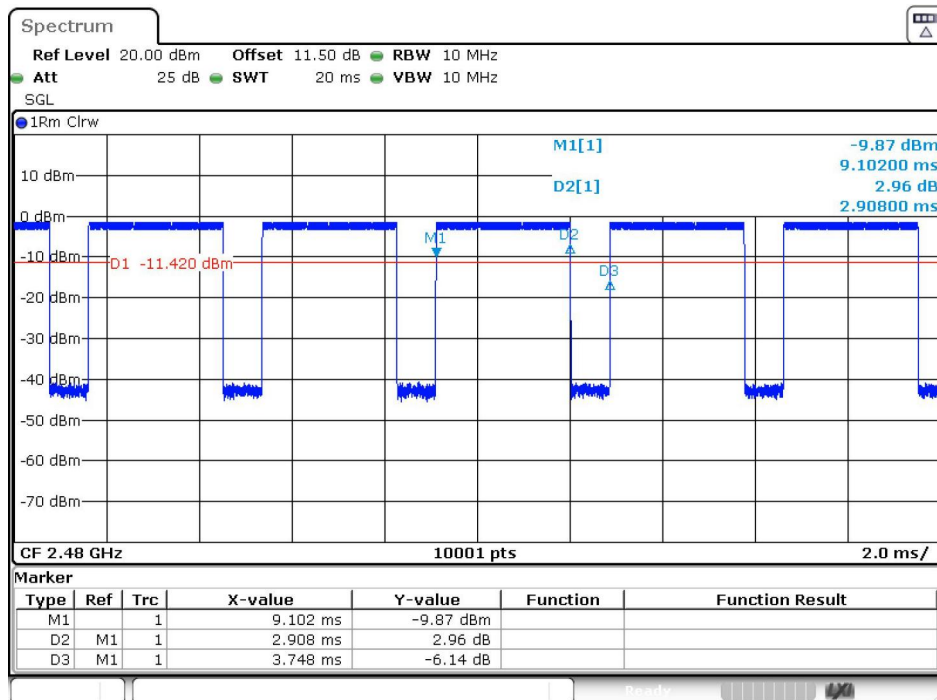
Test Graphs





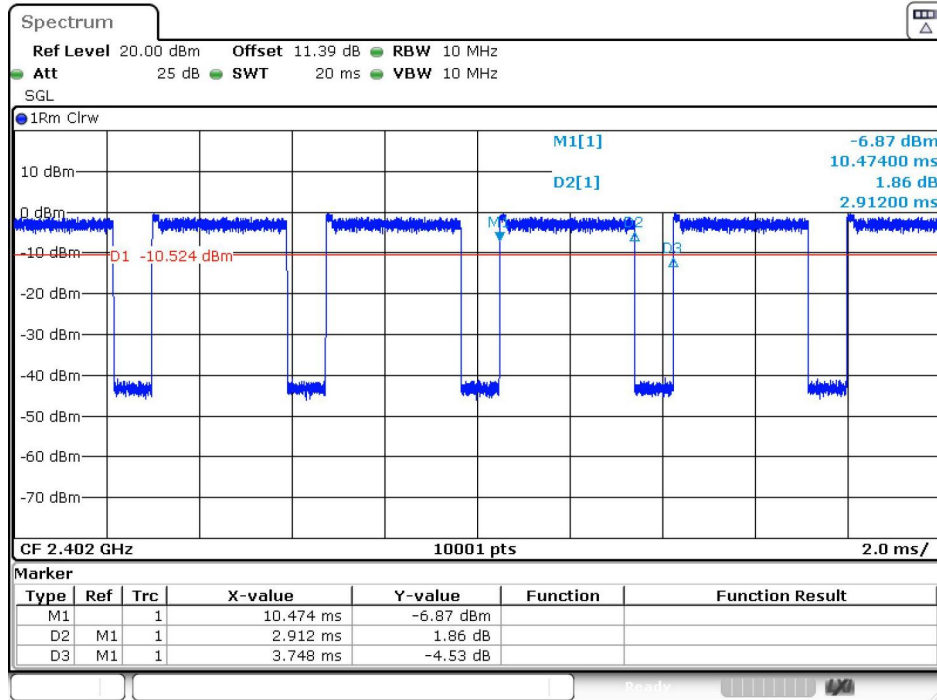
Date: 6.DEC.2024 16:10:55

GFSK(DH5)_Channel 39



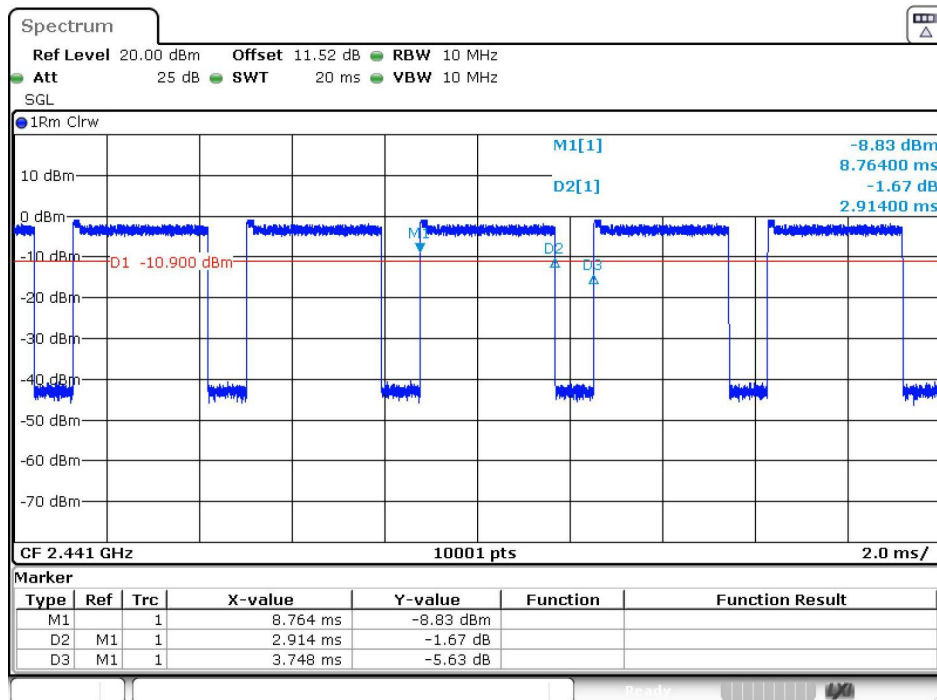
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GFSK(DH5)_Channel 78



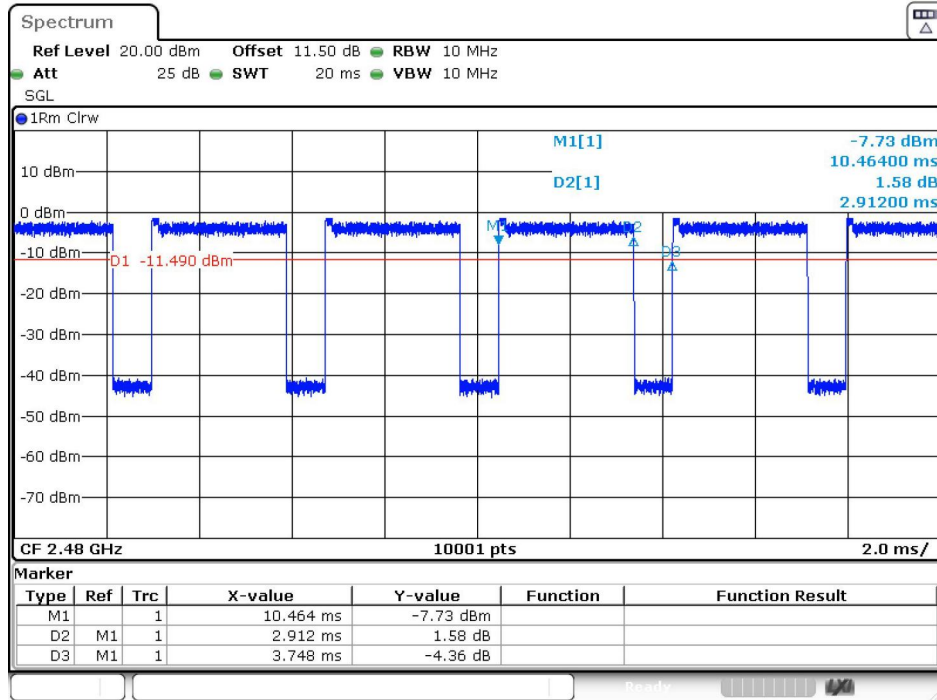
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$\pi/4$ DQPSK(2-DH5)_Channel 0



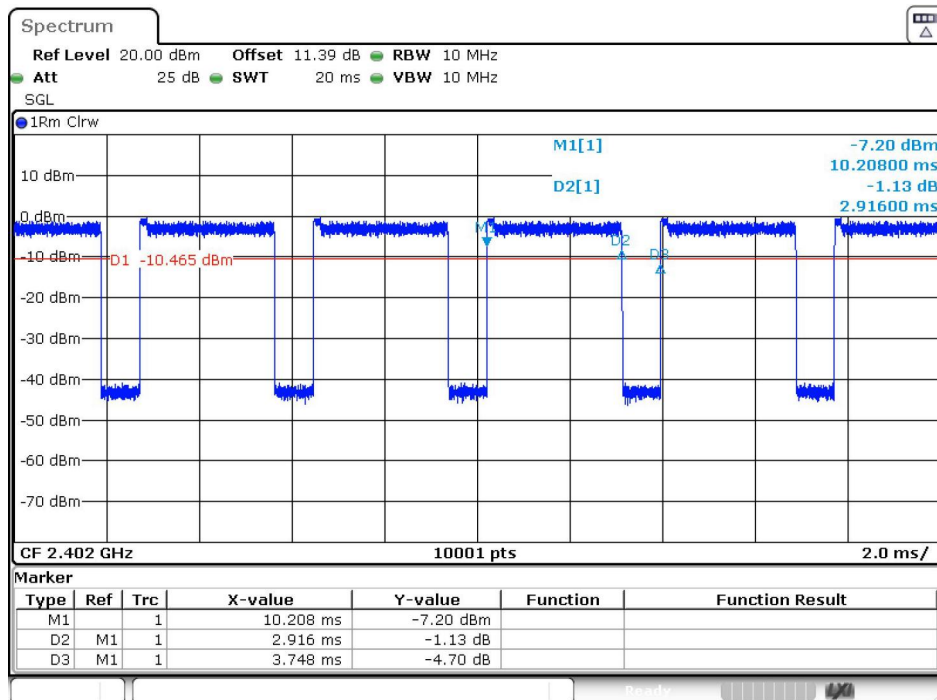
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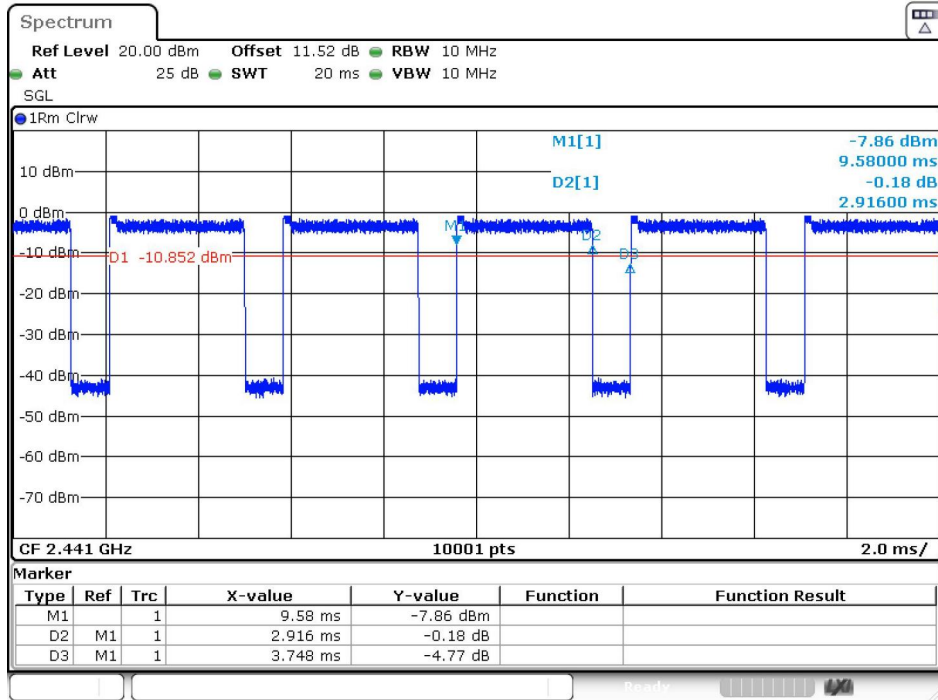
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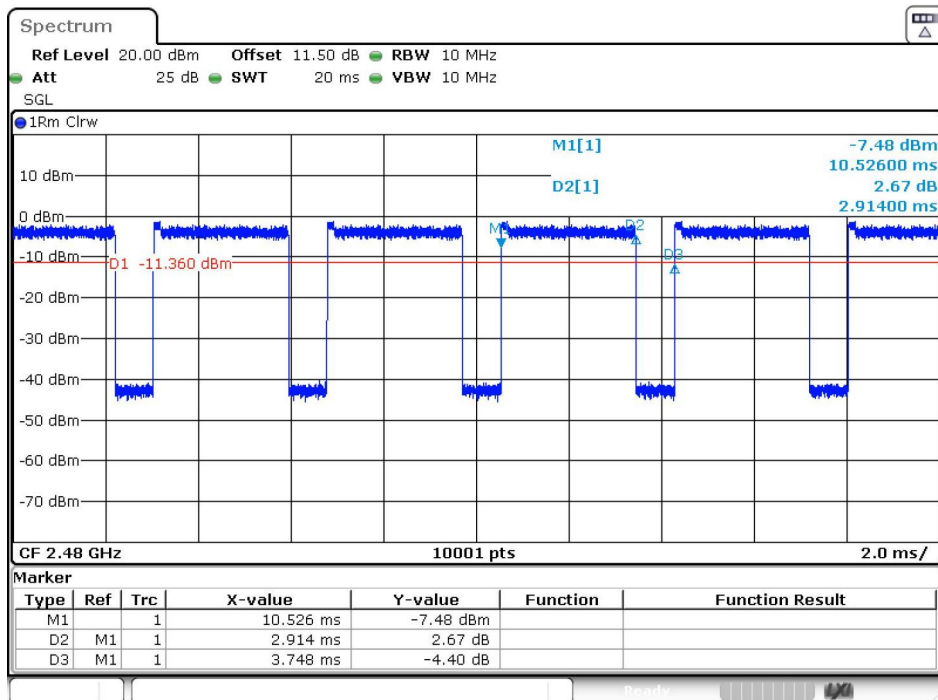
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8DPSK(3-DH5)_Channel 0



Date: 6.DEC.2024 16:32:17

8DPSK(3-DH5)_Channel 39



Date: 6.DEC.2024 16:34:41

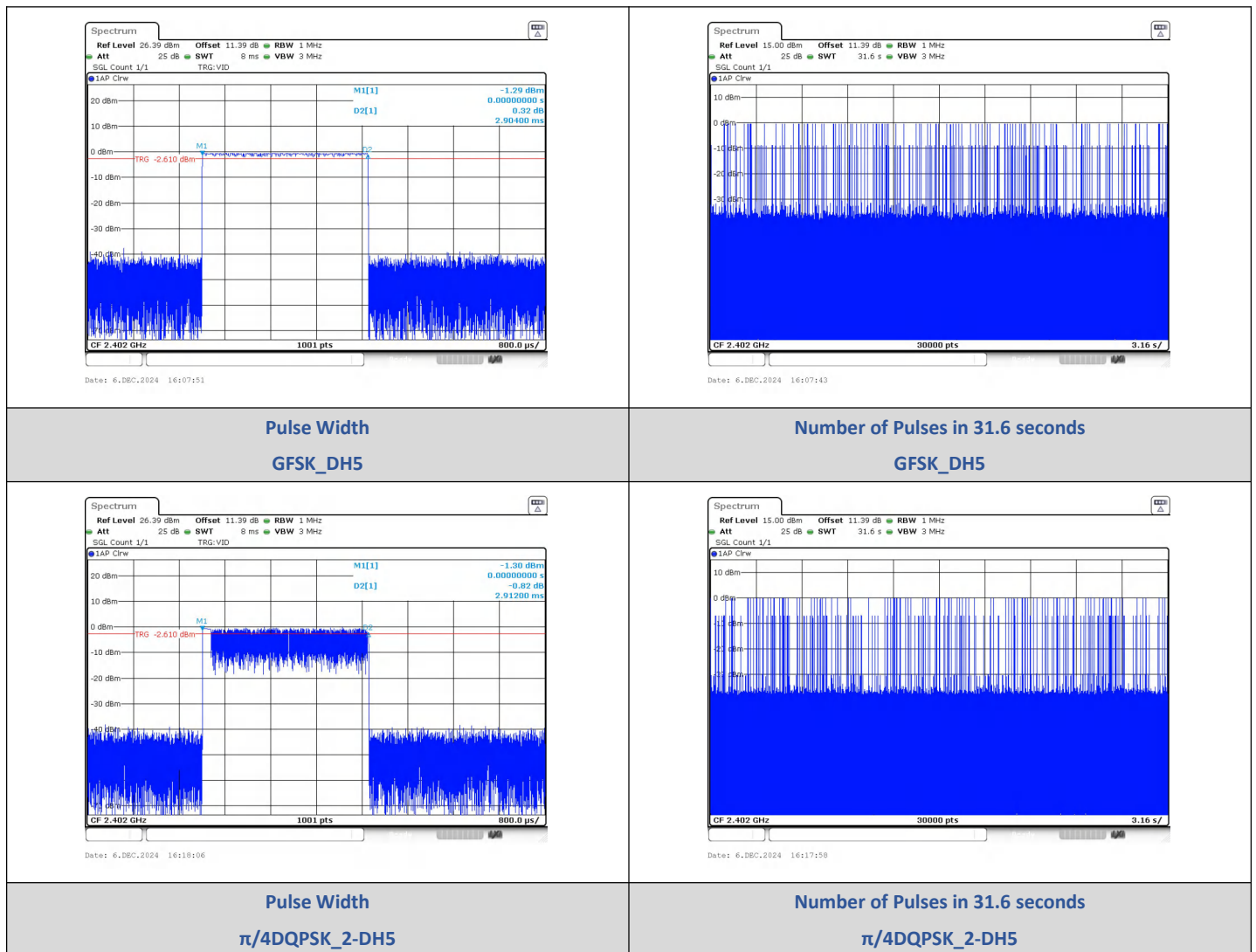
8DPSK(3-DH5)_Channel 78

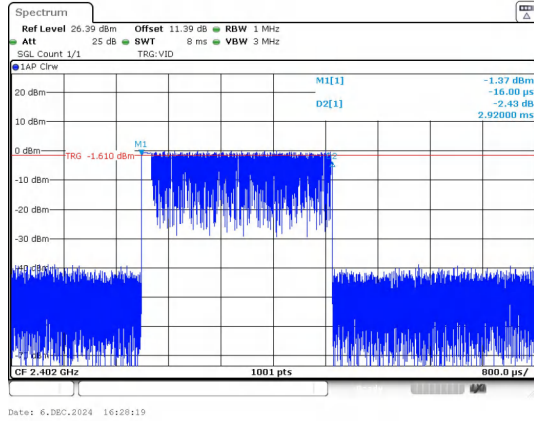
2) Dwell Time

Test Result

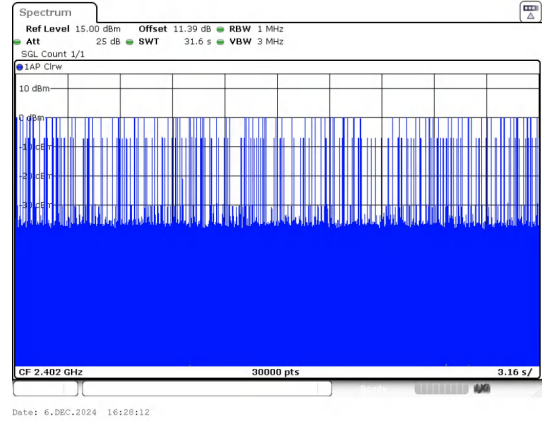
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.904	107	310.73	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.912	104	302.85		PASS
8DPSK	3-DH5		2.920	108	315.36		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



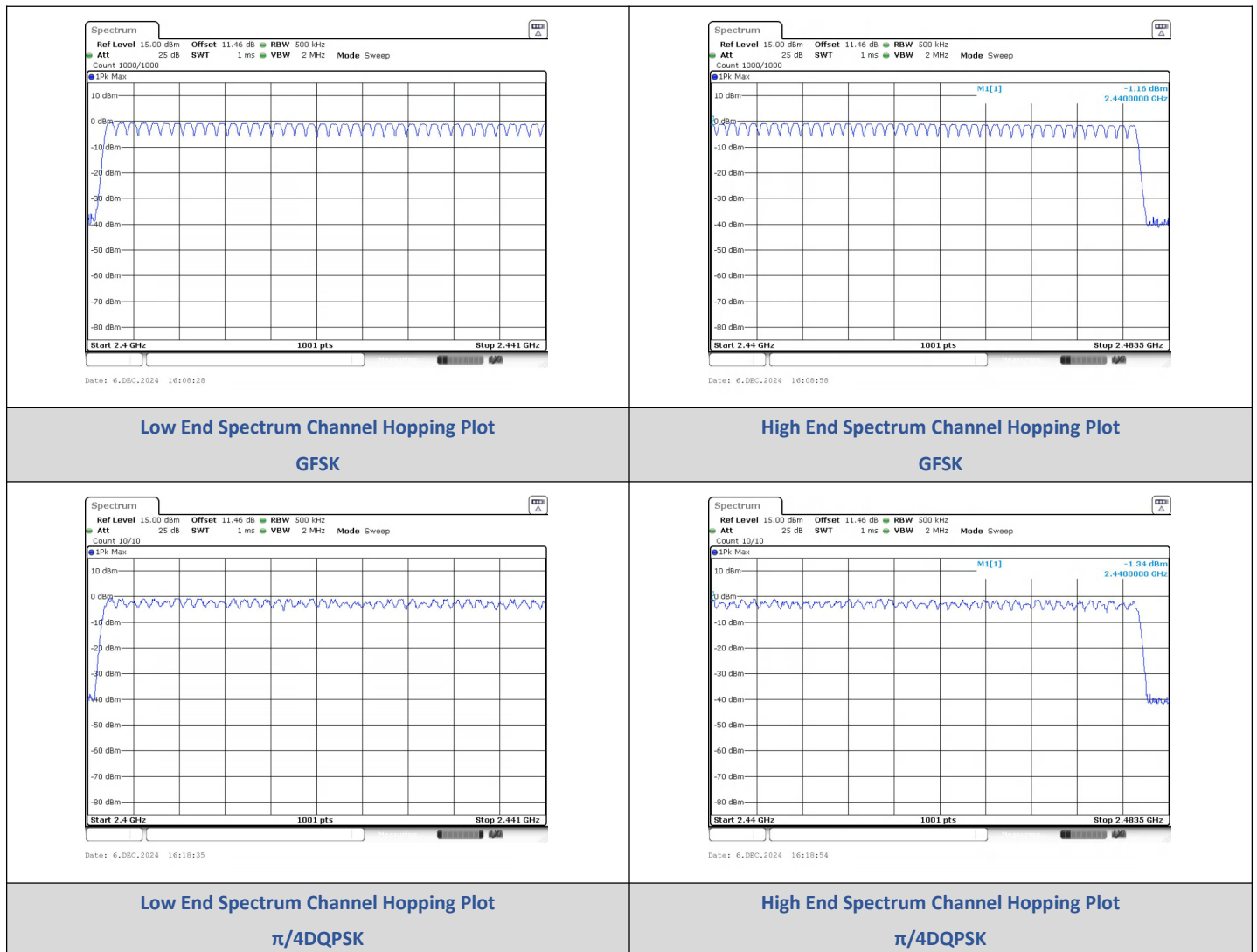
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

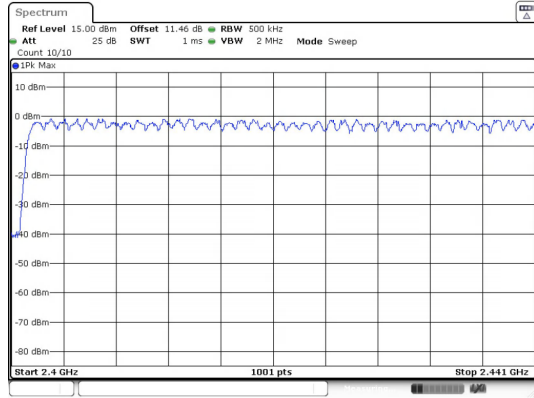
3) Number Of Hopping Channel

Test Result

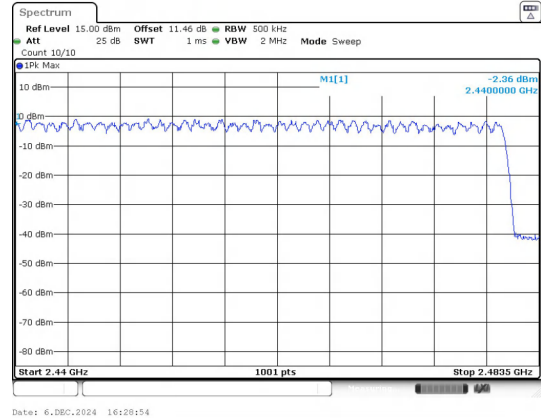
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



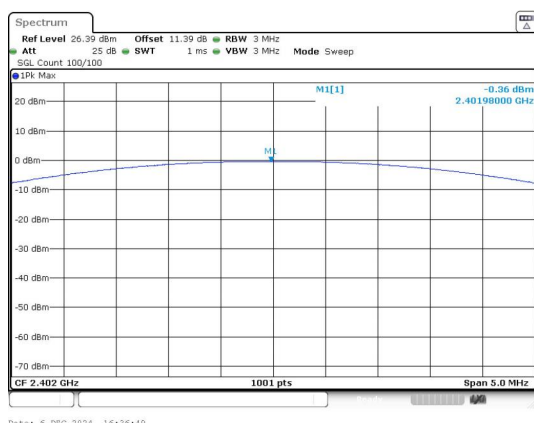
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Peak Output Power

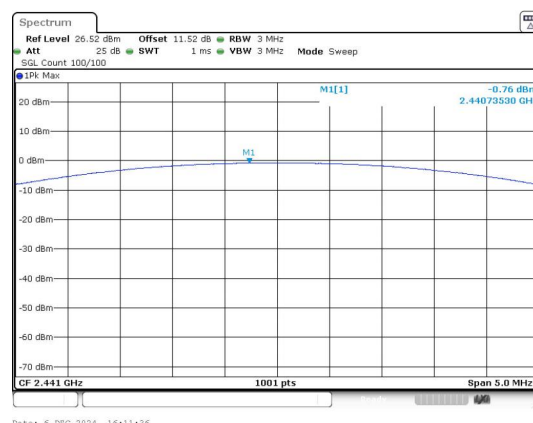
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-0.36	0.92	≤30	PASS
		39	-0.76	0.84		PASS
		78	-1.24	0.75		PASS
$\pi/4$ DQPSK	2-DH5	0	0.34	1.08	≤20.97	PASS
		39	-0.02	1.00		PASS
		78	-0.62	0.87		PASS
8DPSK	3-DH5	0	0.75	1.19		PASS
		39	0.23	1.05		PASS
		78	-0.21	0.95		PASS

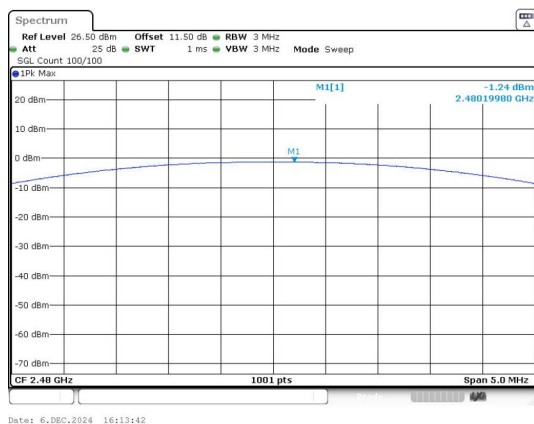
Test Graphs



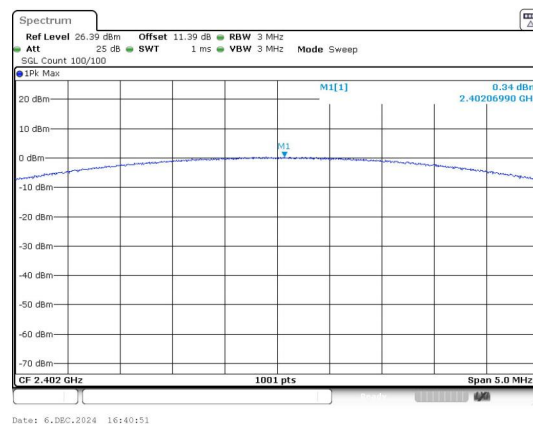
Peak Output Power
GFSK_Channel 0



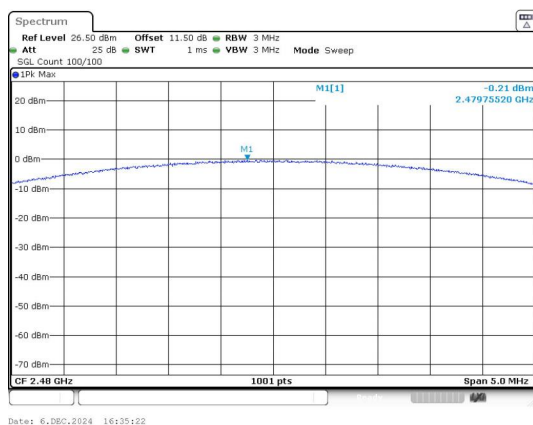
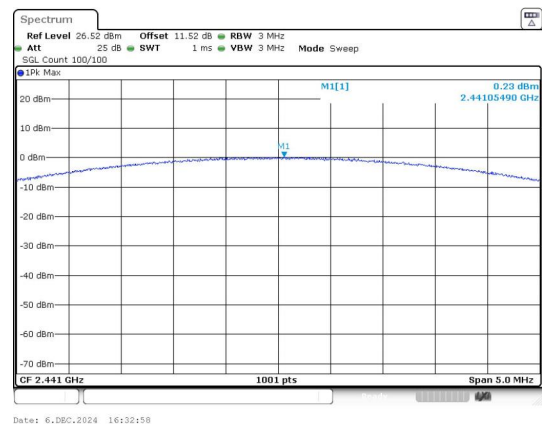
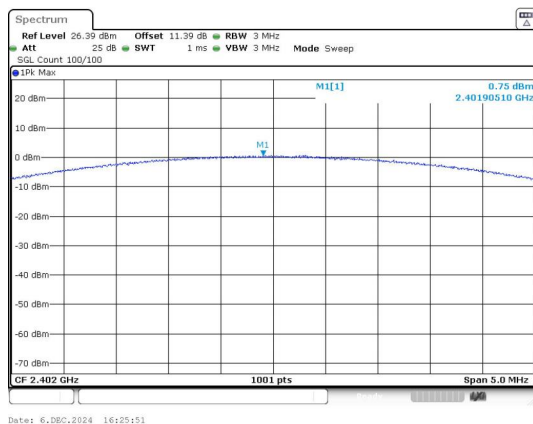
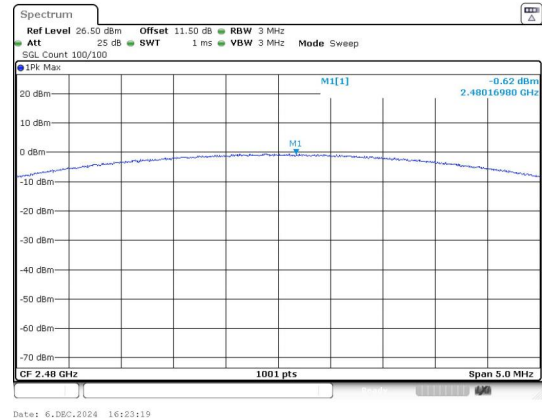
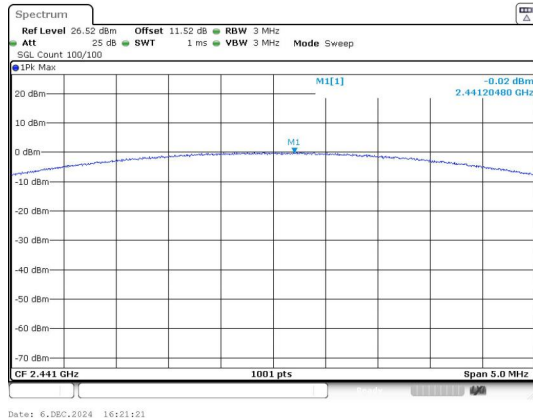
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78



Peak Output Power
 $\pi/4$ DQPSK_Channel 0

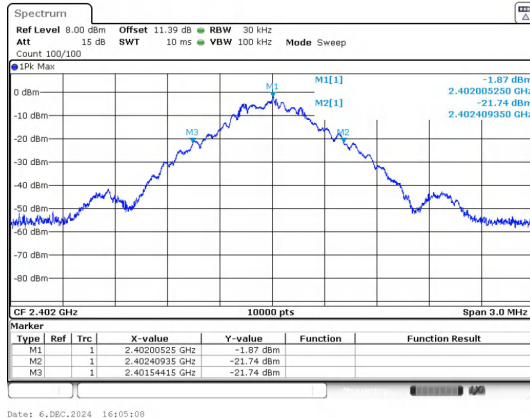


5) 20dB Bandwidth

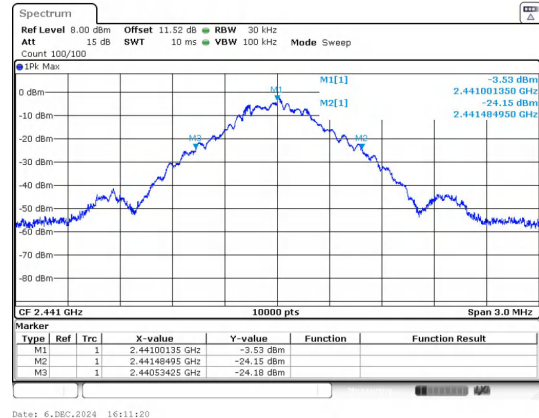
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.8700
	39	2441 MHz	0.9500
	78	2480 MHz	0.9400
$\pi/4$ DQPSK	0	2402 MHz	1.200
	39	2441 MHz	1.200
	78	2480 MHz	1.270
8DPSK	0	2402 MHz	1.240
	39	2441 MHz	1.260
	78	2480 MHz	1.240

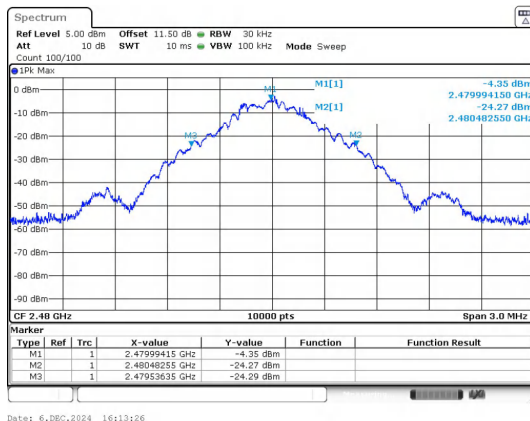
Test Graphs



GFSK_DH5_Channel 0



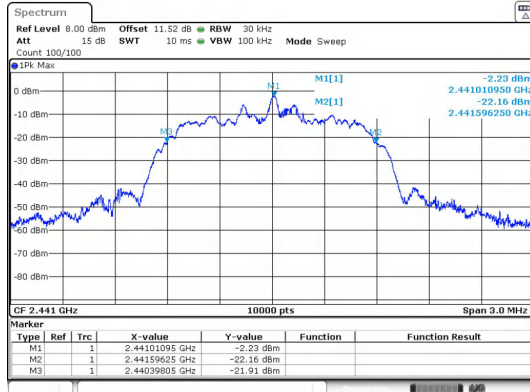
GFSK_DH5_Channel 39



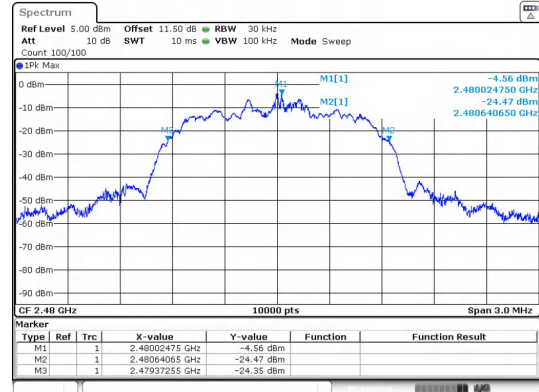
GFSK_DH5_Channel 78



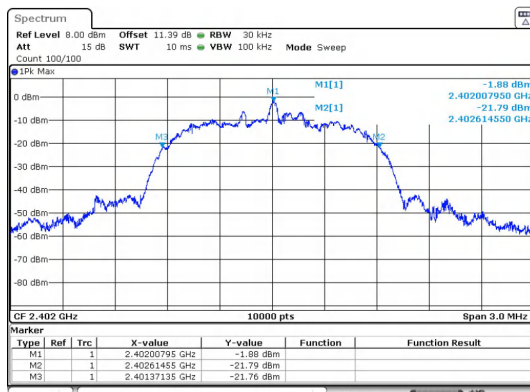
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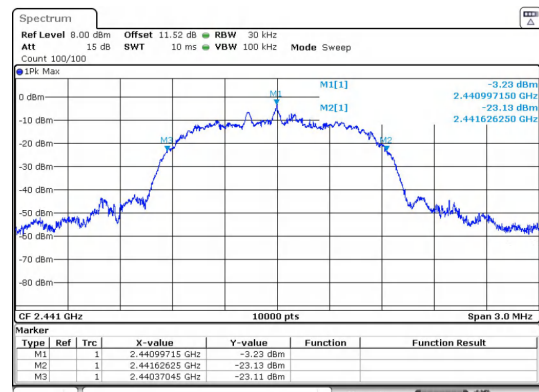
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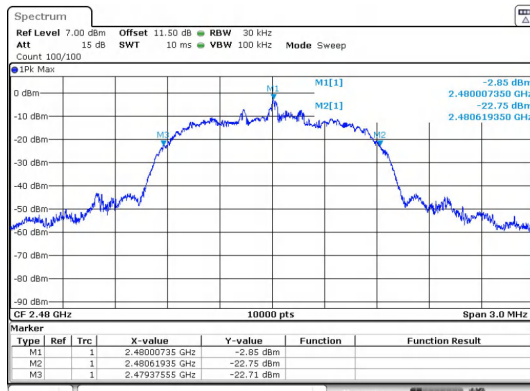
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



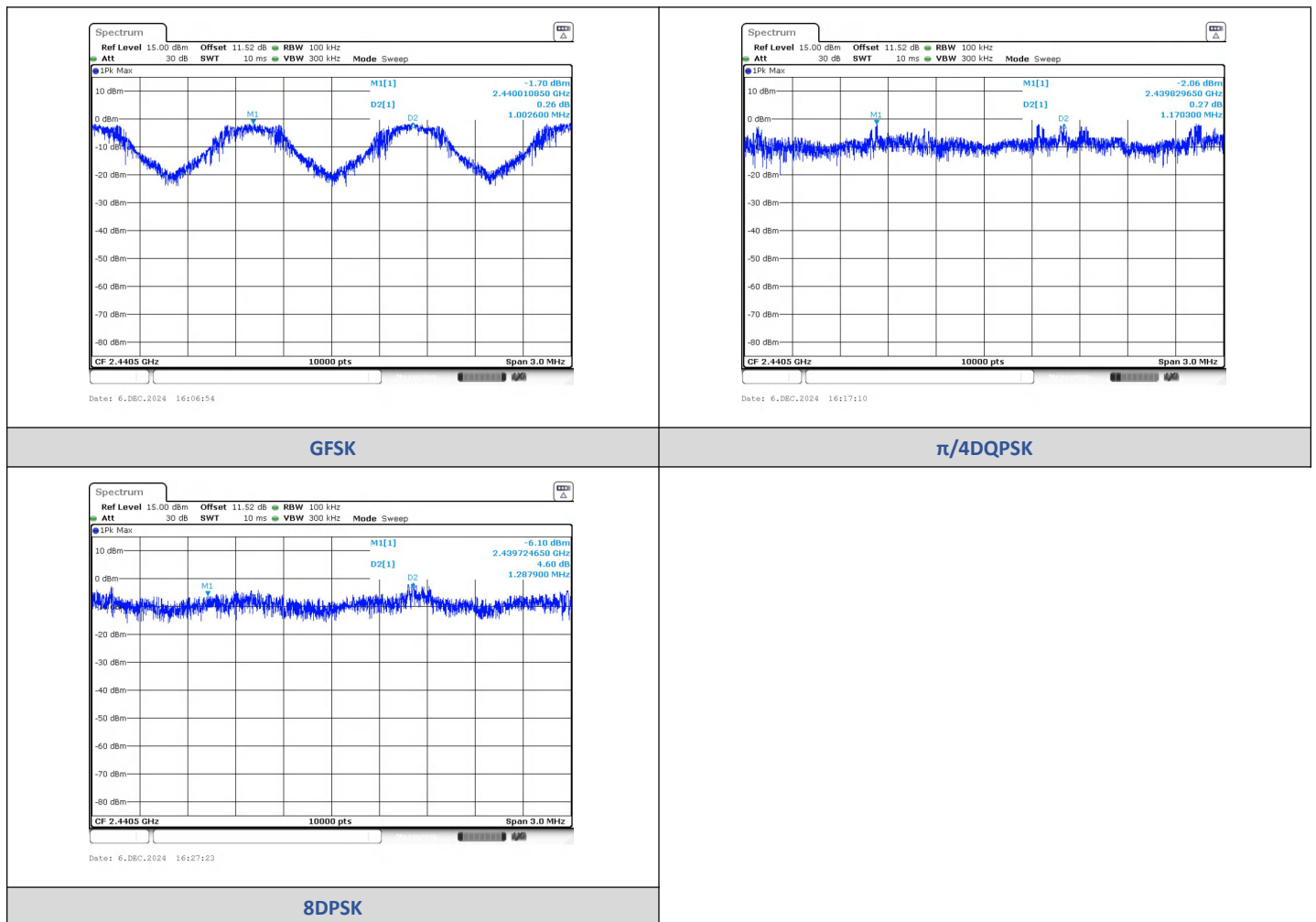
8DPSK_3-DH5_Channel 78

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	2440.0109	2441.0134	1.0026	0.87	PASS
$\pi/4$ QPSK	2-DH5	2439.8297	2440.9999	1.1703	0.8	PASS
8DPSK	3-DH5	2439.7247	2441.0125	1.2879	0.827	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

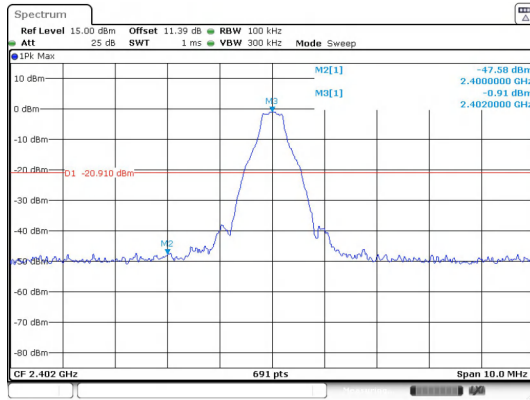
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-47.580	-20.91	-26.670	PASS
			4803.85	-45.856	-20.91	-24.946	PASS
		39	2362.61	-49.376	-21.43	-27.946	PASS
		78	2483.50	-49.920	-21.76	-28.160	PASS
			2558.21	-51.322	-21.76	-29.562	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-48.240	-20.91	-27.330	PASS
			9608.08	-47.721	-20.91	-26.811	PASS
		39	9763.72	-51.170	-21.2	-29.970	PASS
		78	2483.50	-49.820	-21.95	-27.870	PASS
			4960.33	-51.856	-21.95	-29.906	PASS
8DPSK	3-DH5	0	2400.00	-46.160	-21.12	-25.040	PASS
			9608.08	-47.957	-21.12	-26.837	PASS
		39	9763.72	-50.657	-21.48	-29.177	PASS
		78	2483.50	-49.820	-21.84	-27.980	PASS
			9920.20	-52.555	-21.84	-30.715	PASS

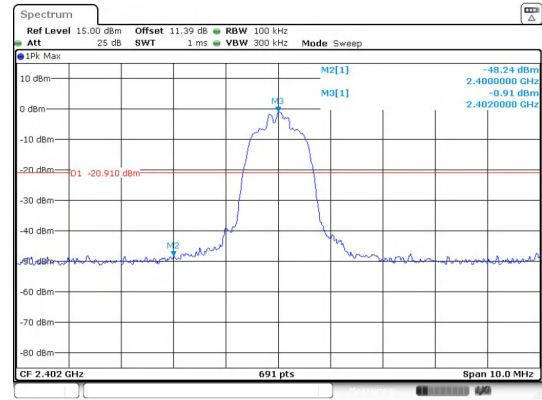
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.19	-47.130	-21.1	-26.030	PASS
			2400.00	-48.660	-21.1	-27.560	PASS
			2483.50	-49.980	-22.43	-27.550	PASS
$\pi/4$ DQPSK	2-DH5		2395.44	-47.503	-21.71	-25.793	PASS
			2400.00	-50.890	-21.71	-29.180	PASS
			2483.50	-50.770	-24.92	-25.850	PASS
8DPSK	3-DH5		2396.90	-41.172	-21.07	-20.102	PASS
			2400.00	-48.100	-21.07	-27.030	PASS
			2483.50	-49.430	-22.05	-27.380	PASS

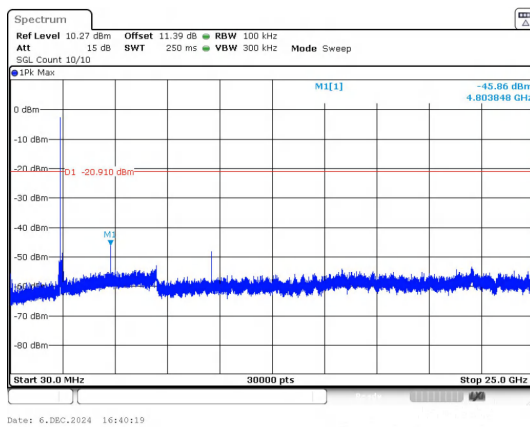
Test Graphs



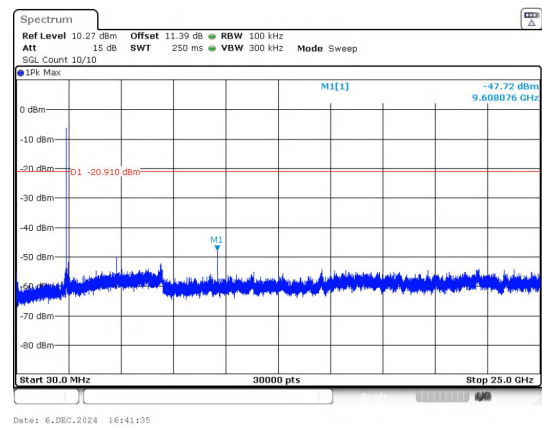
Out Of Band Emission
GFSK_DH5_Channel 0



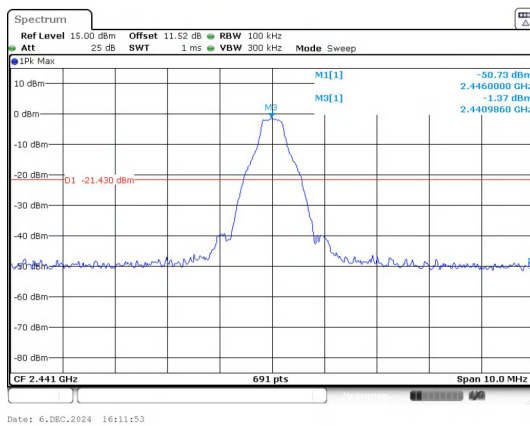
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



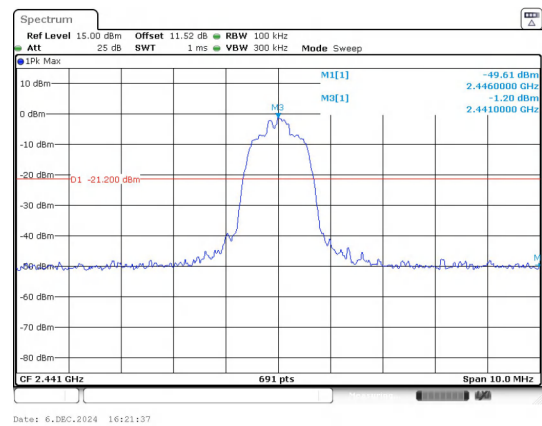
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



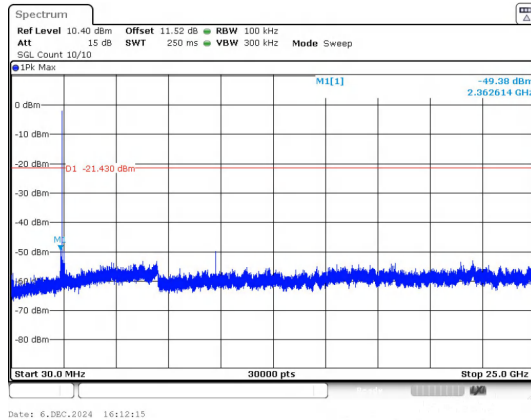
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 $\pi/4$ DQPSK_2-DH5_Channel 0



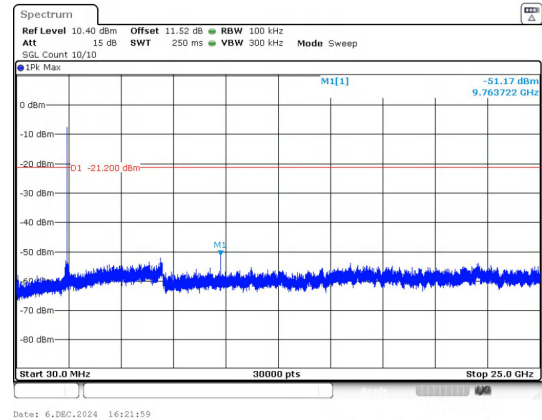
Out Of Band Emission
GFSK_DH5_Channel 39



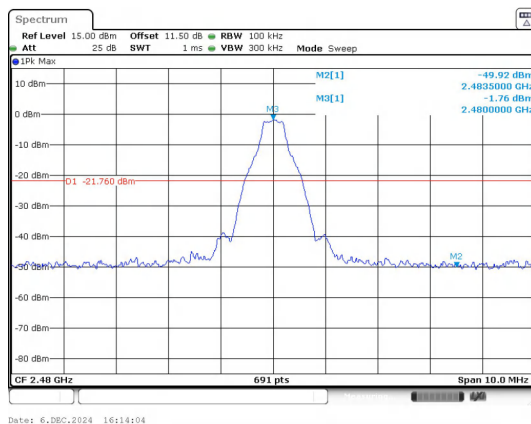
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



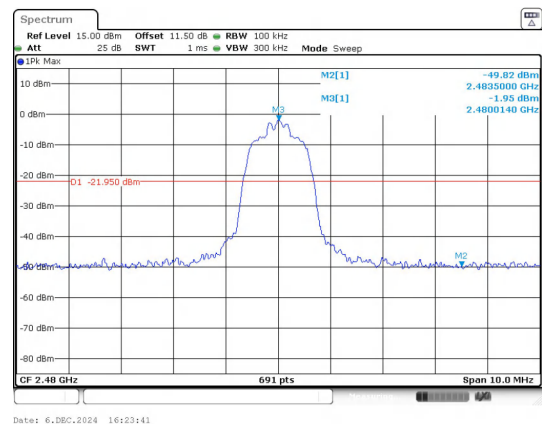
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



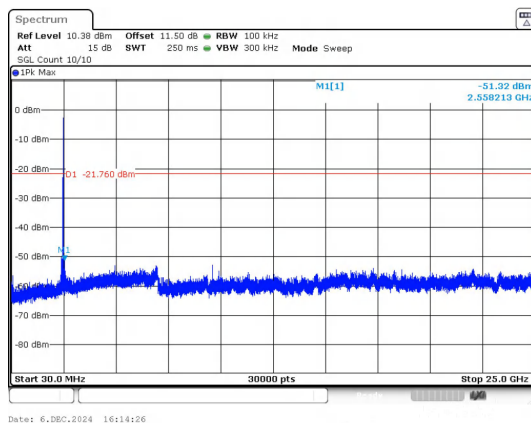
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 $\pi/4$ DQPSK_2-DH5_Channel 39



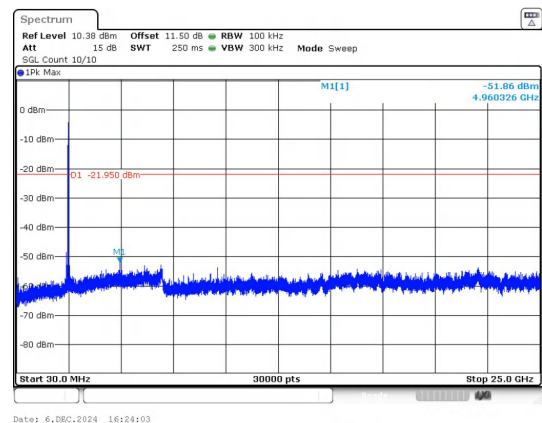
Out Of Band Emission
GFSK_DH5_Channel 78



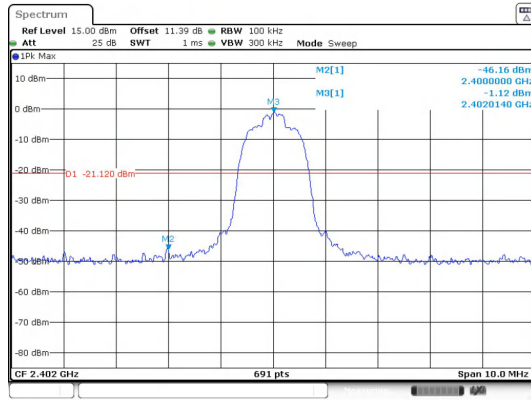
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



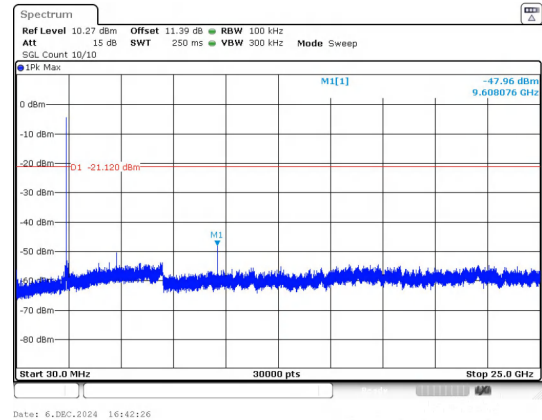
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



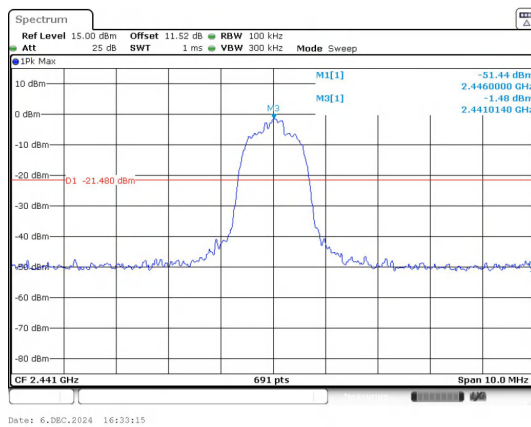
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 $\pi/4$ DQPSK_2-DH5_Channel 78



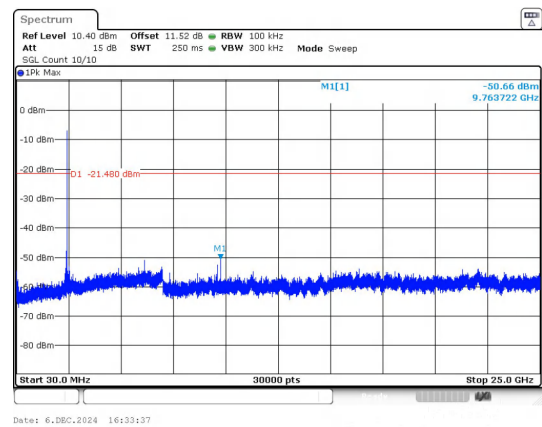
Out Of Band Emission
8DPSK_3-DH5_Channel 0



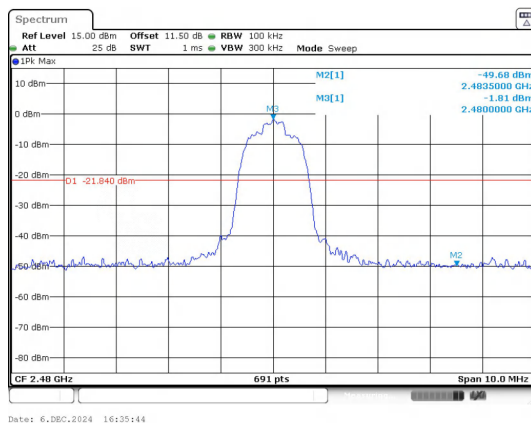
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



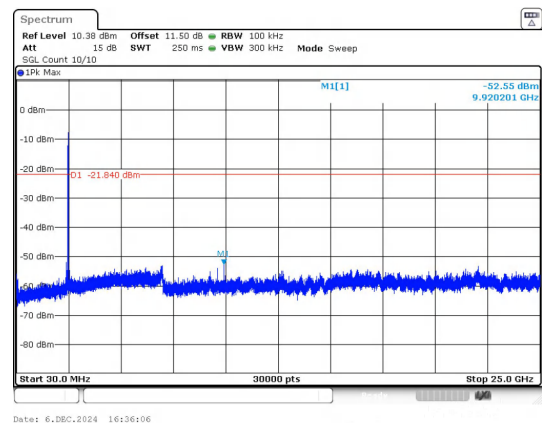
Out Of Band Emission
8DPSK_3-DH5_Channel 39



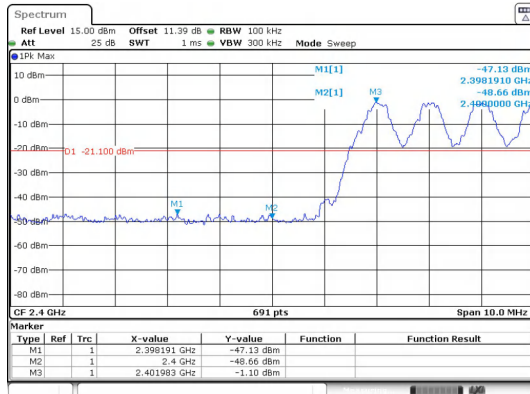
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



Out Of Band Emission
8DPSK_3-DH5_Channel 78

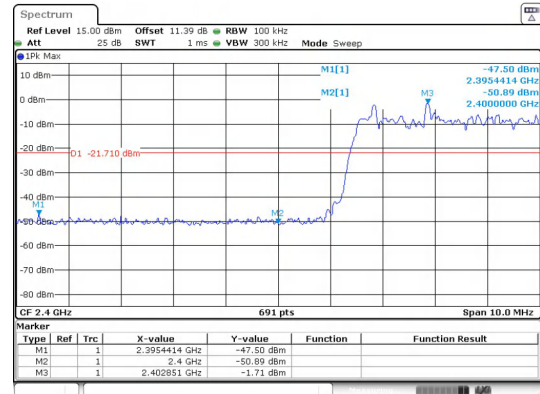


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



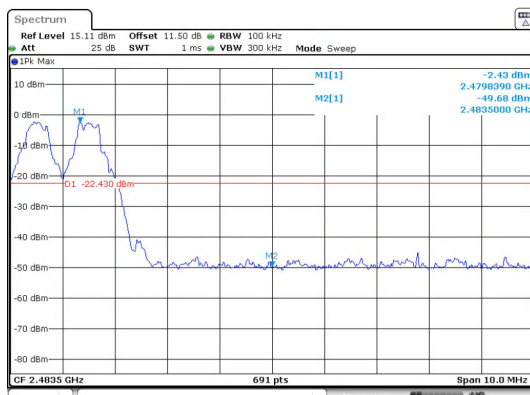
Date: 6.DEC.2024 16:09:54

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



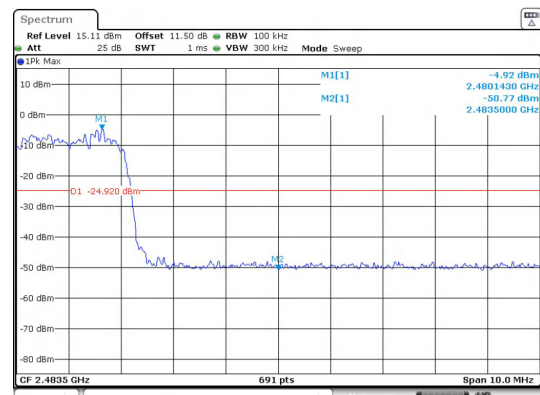
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Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



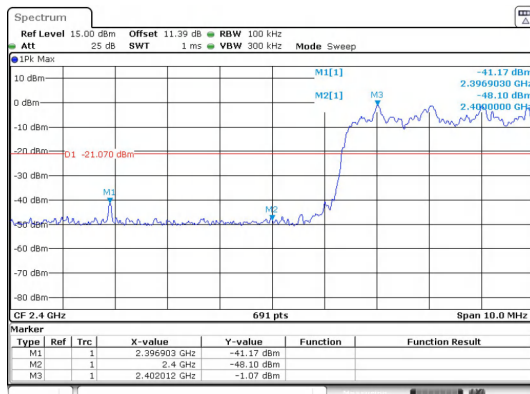
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Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



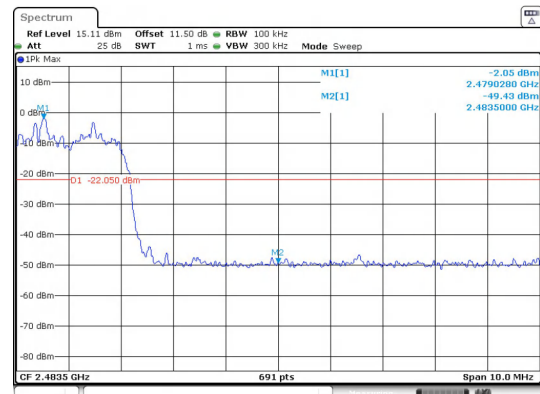
Date: 6.DEC.2024 16:20:09

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



Date: 6.DEC.2024 16:30:08

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



Date: 6.DEC.2024 16:30:31

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

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