

Appendix Report

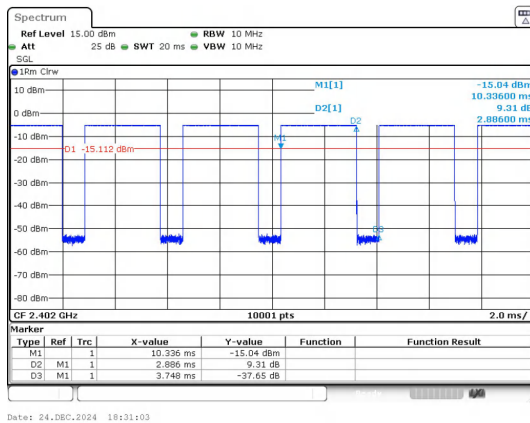
Report No.:	CISRR24122419704
Test Engineer:	Mark Fu
Supervised by:	Rory Huang

1) Duty Cycle

Test Result

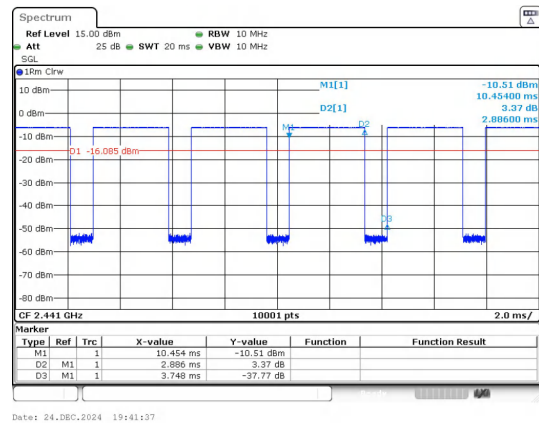
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.892	3.748	77.16	0.7716	1.1261	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	2.894	3.748	77.21	0.7721	1.1233	0.3455
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458

Test Graphs



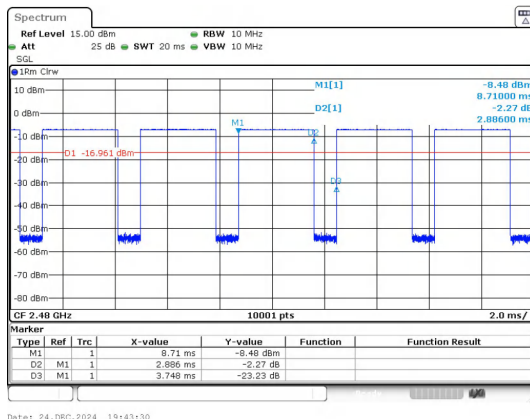
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GFSK(DH5)_Channel 0



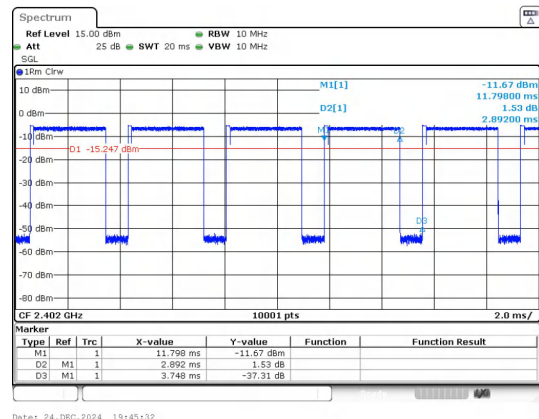
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GFSK(DH5)_Channel 39



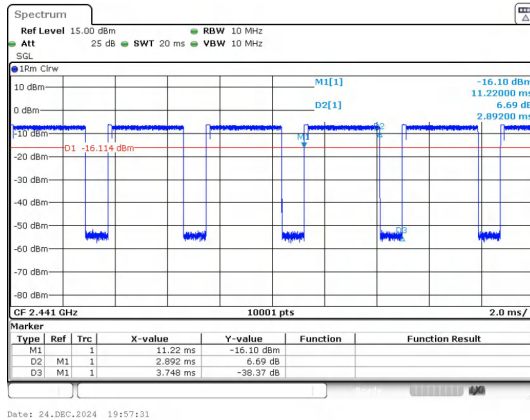
Date: 24.DEC.2024 19:43:130

GFSK(DH5)_Channel 78

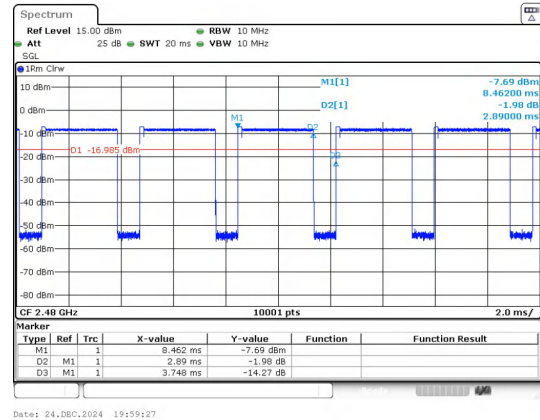


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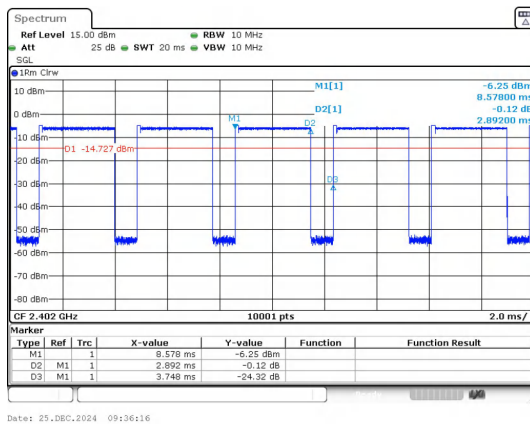
 $\pi/4$ DQPSK(2-DH5)_Channel 0



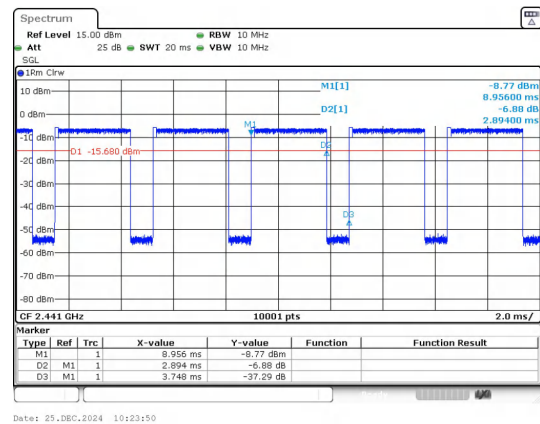
$\pi/4$ DQPSK(2-DH5)_Channel 39



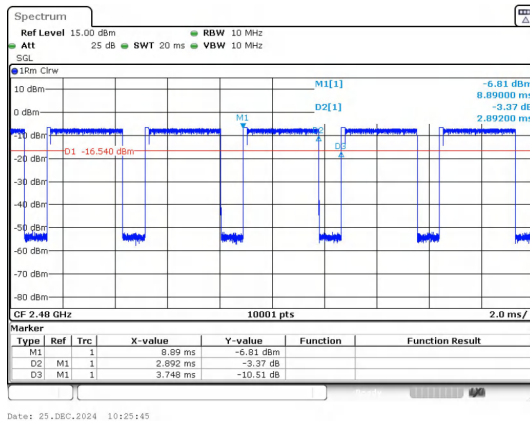
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



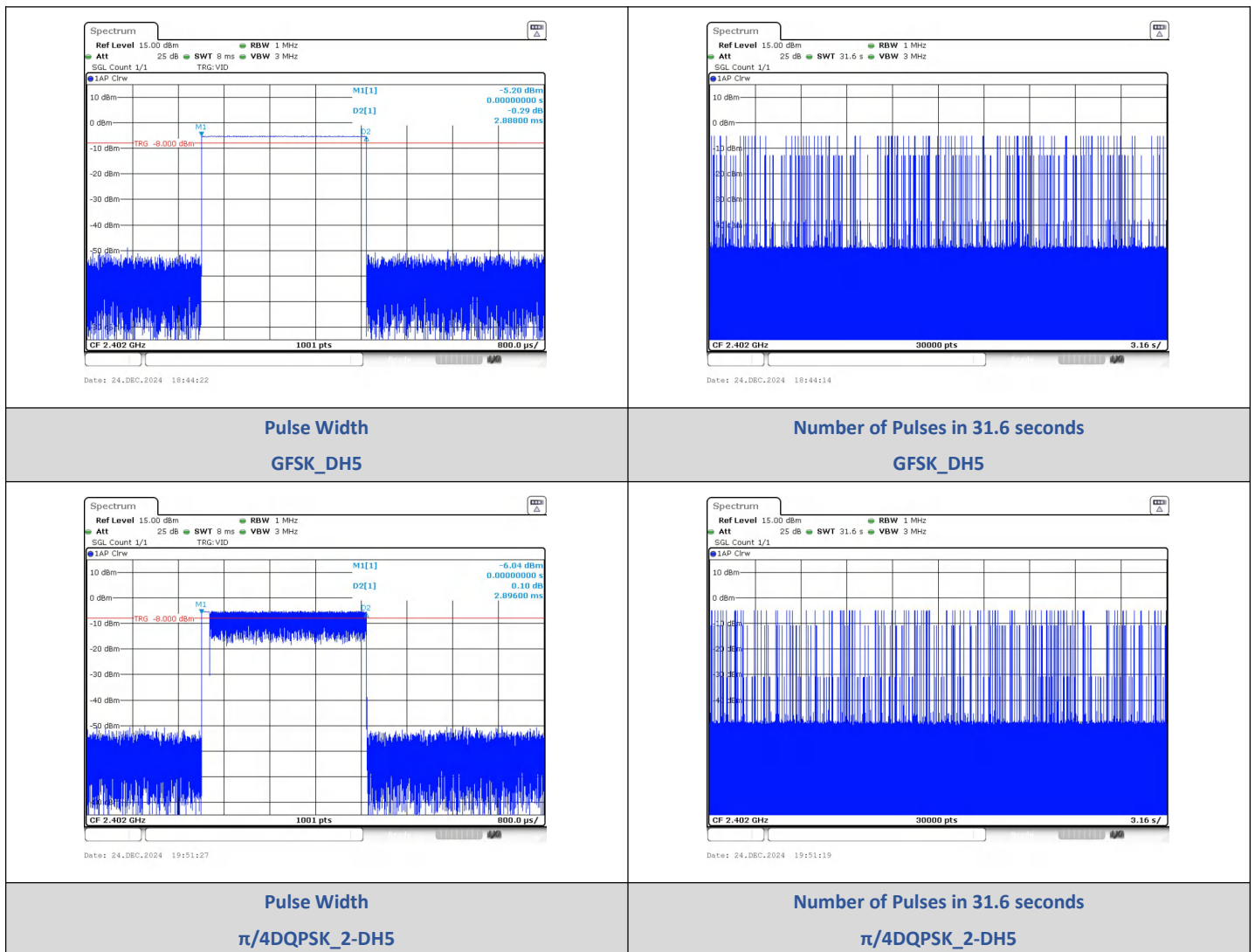
8DPSK(3-DH5)_Channel 78

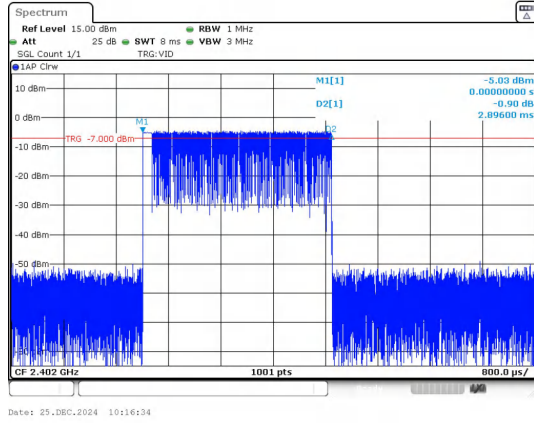
2) Dwell Time

Test Result

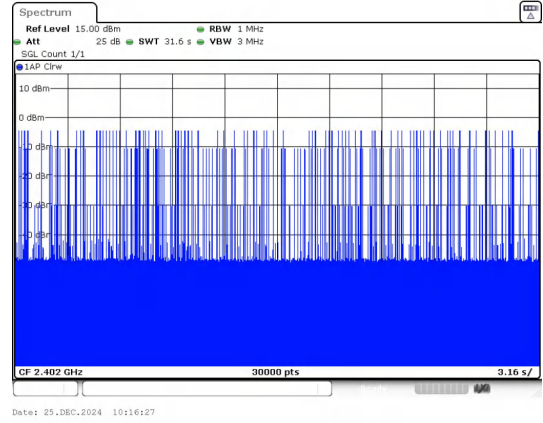
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	99	285.91	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	114	330.14		PASS
8DPSK	3-DH5		2.896	109	315.66		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



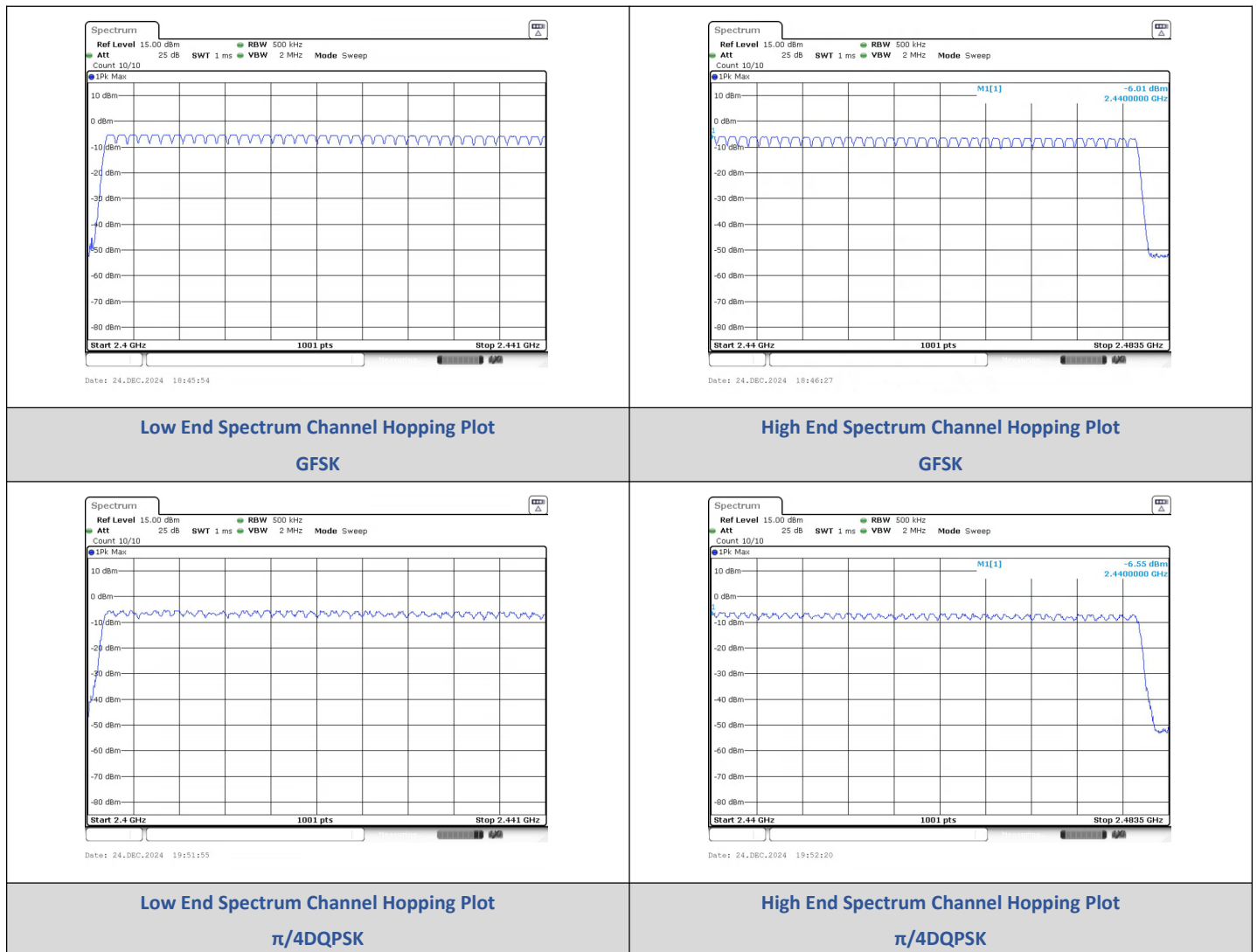
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

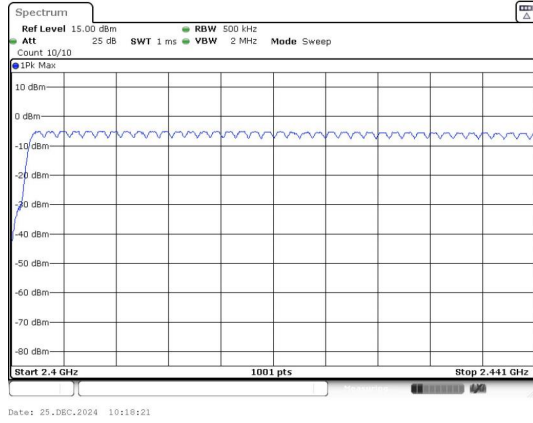
3) Number Of Hopping Channel

Test Result

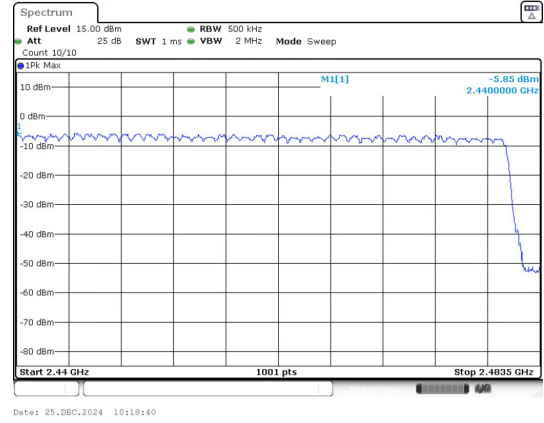
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



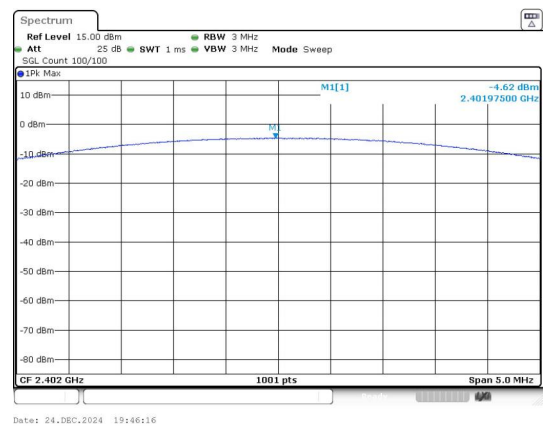
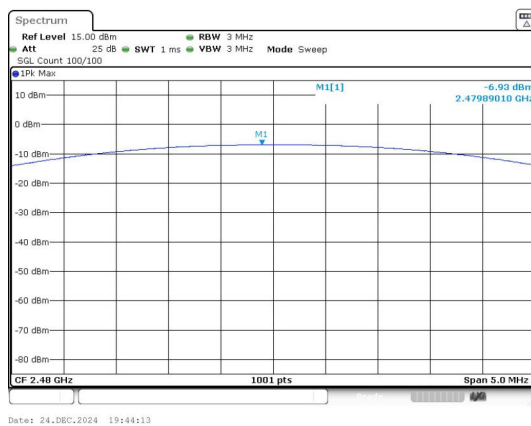
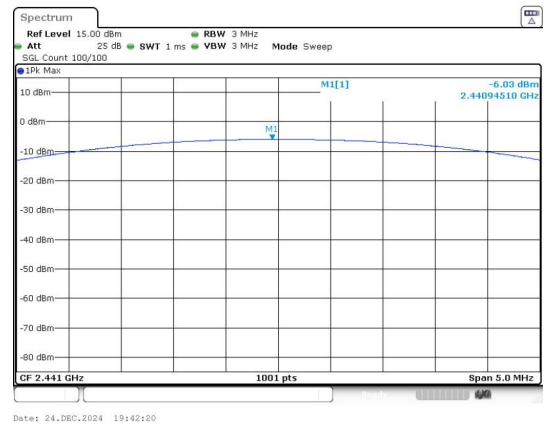
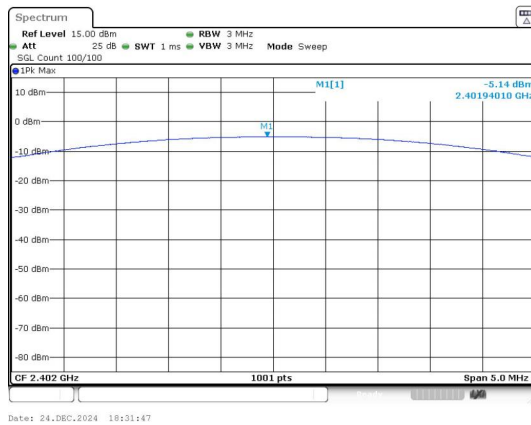
High End Spectrum Channel Hopping Plot
8DPSK

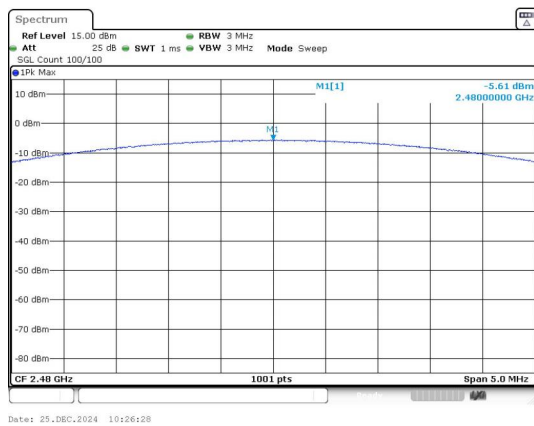
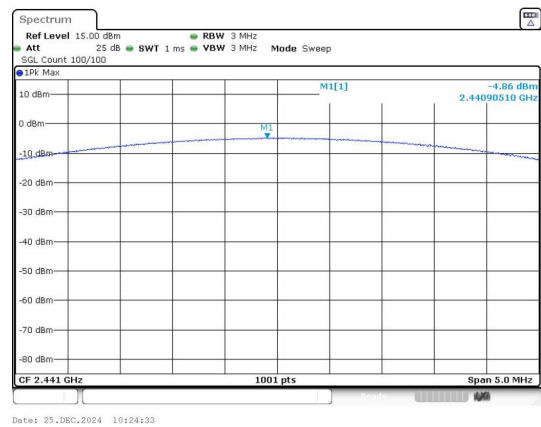
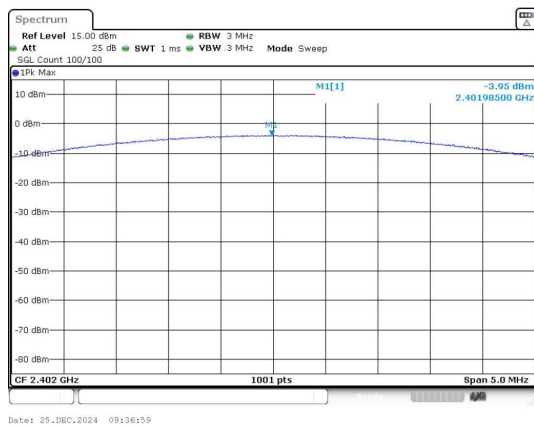
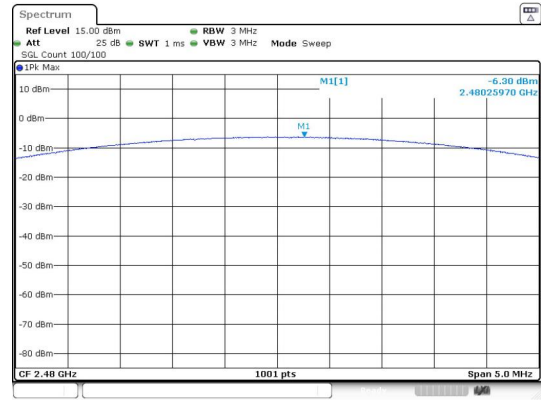
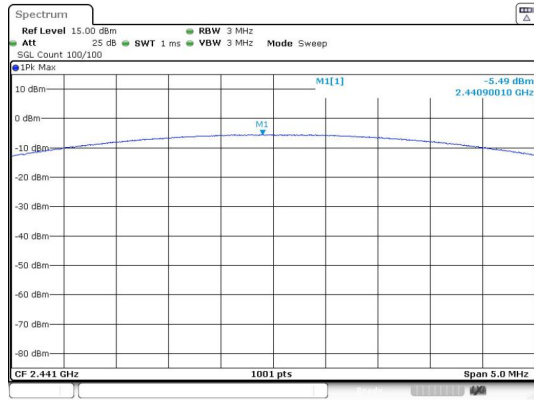
4) Conducted Output Power

Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-5.14	0.31	≤30	PASS
		39	-6.03	0.25		PASS
		78	-6.93	0.20		PASS
$\pi/4$ DQPSK	2-DH5	0	-4.62	0.35	≤20.97	PASS
		39	-5.49	0.28		PASS
		78	-6.30	0.23		PASS
8DPSK	3-DH5	0	-3.95	0.40		PASS
		39	-4.86	0.33		PASS
		78	-5.61	0.27		PASS

Test Graphs



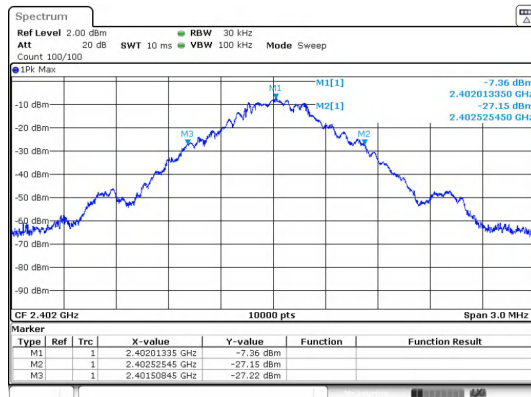


5) 20dB Bandwidth

Test Result

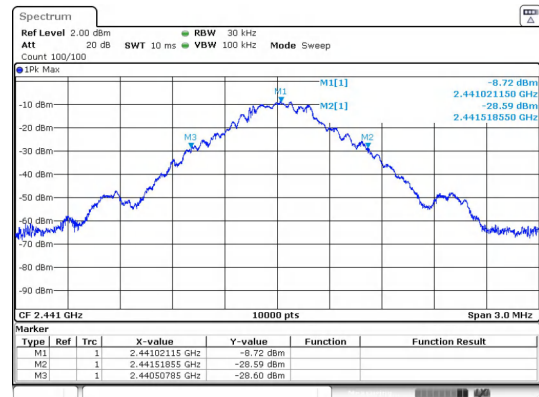
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.020
	39	2441 MHz	1.010
	78	2480 MHz	1.000
$\pi/4$ DQPSK	0	2402 MHz	1.290
	39	2441 MHz	1.310
	78	2480 MHz	1.320
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.300
	78	2480 MHz	1.300

Test Graphs



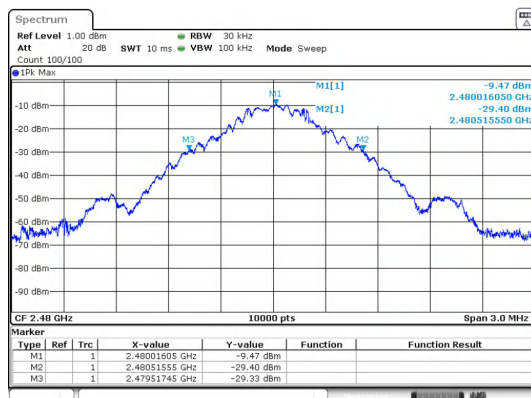
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GFSK_DH5_Channel 0



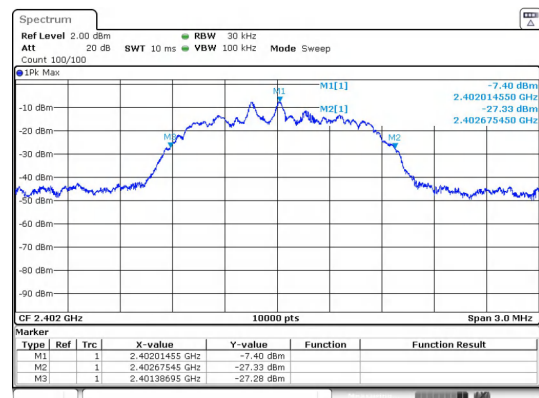
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GFSK_DH5_Channel 39



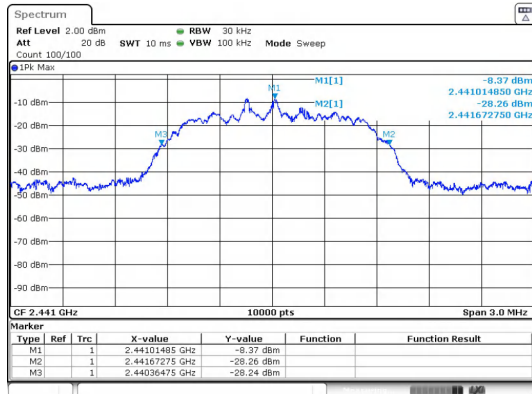
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GFSK_DH5_Channel 78

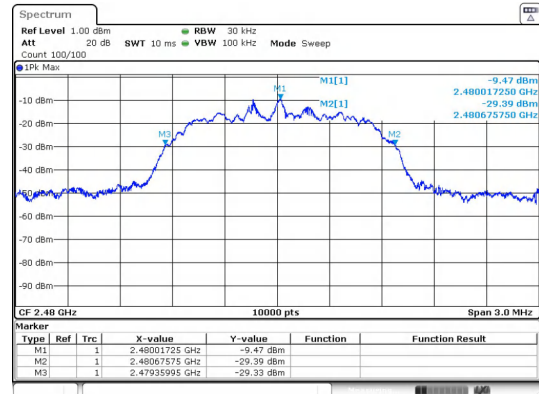


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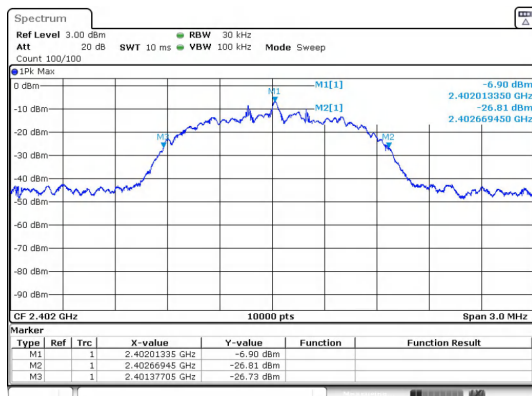
 $\pi/4$ DQPSK_2-DH5_Channel 0



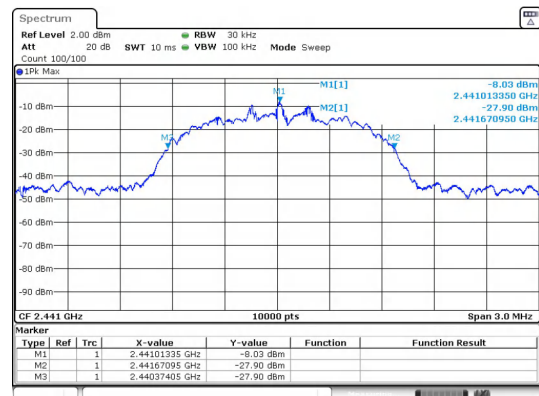
$\pi/4$ DQPSK_2-DH5_Channel 39



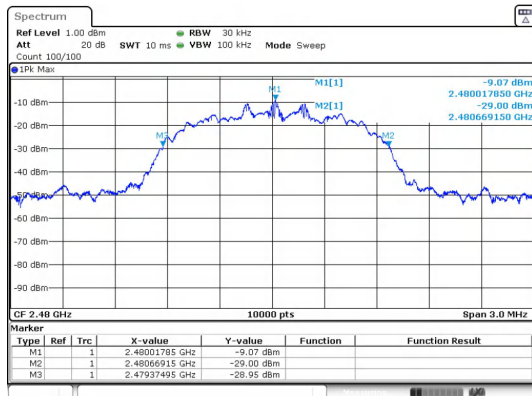
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



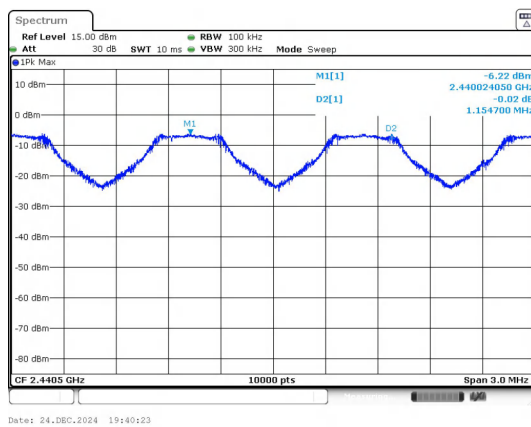
8DPSK_3-DH5_Channel 78

6) Carrier Frequencies Separation

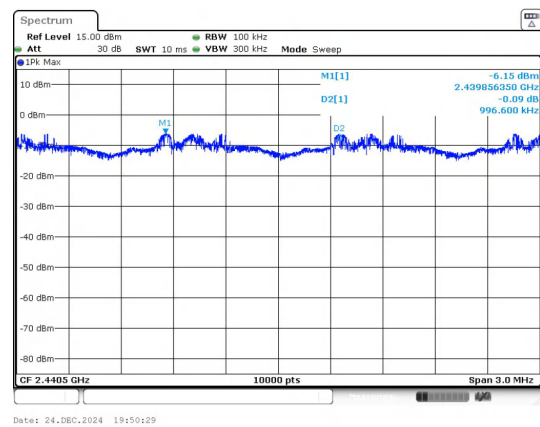
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.024	2441.1788	1.1547	1.02	PASS
$\pi/4$ QPSK	2-DH5	2439.8564	2440.8529	0.9966	0.86	PASS
8DPSK	3-DH5	2440.0264	2441.0305	1.0041	0.86	PASS

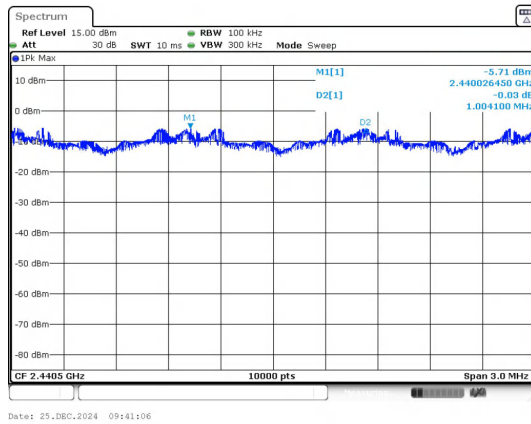
Test Graphs



GFSK



$\pi/4$ QPSK



8DPSK

7) Conducted Out Of Band Emission

Test Result

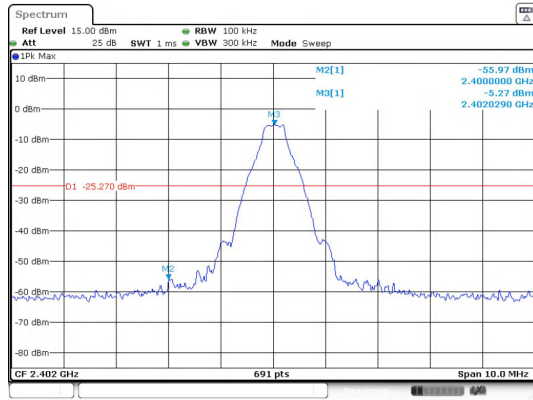
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-55.970	-25.27	-30.700	PASS
			6924.63	-43.093	-25.27	-17.823	PASS
		39	6942.11	-44.602	-26.21	-18.392	PASS
		78	2483.50	-61.870	-27.11	-34.760	PASS
			22078.1	-45.077	-27.11	-17.967	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-54.620	-25.46	-29.160	PASS
			22049.8	-44.802	-25.46	-19.342	PASS
		39	6087.31	-44.397	-26.29	-18.107	PASS
		78	2483.50	-62.240	-27.09	-35.150	PASS
			6949.60	-45.127	-27.09	-18.037	PASS
8DPSK	3-DH5	0	2400.00	-57.190	-24.88	-32.310	PASS
			6885.51	-44.662	-24.88	-19.782	PASS
		39	906.86	-42.132	-26.06	-16.072	PASS
		78	913.52	-40.623	-26.64	-13.983	PASS
			2483.50	-62.120	-26.64	-35.480	PASS

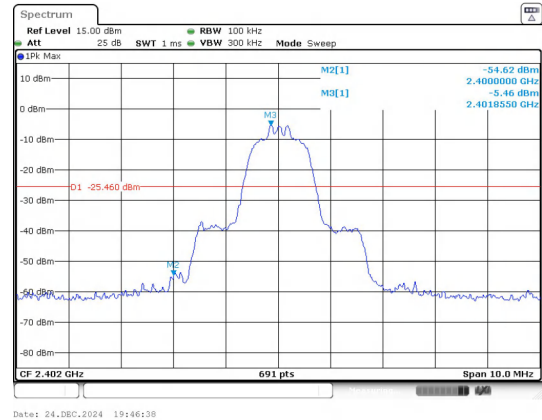
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.32	-58.550	-25.29	-33.260	PASS
			2400.00	-59.860	-25.29	-34.570	PASS
			2483.50	-59.840	-26.76	-33.080	PASS
$\pi/4$ DQPSK	2-DH5		2395.47	-59.057	-25.43	-33.627	PASS
			2400.00	-60.600	-25.43	-35.170	PASS
			2483.50	-60.820	-27.24	-33.580	PASS
8DPSK	3-DH5		2400.00	-57.510	-25.1	-32.410	PASS
			2483.50	-60.820	-26.82	-34.000	PASS

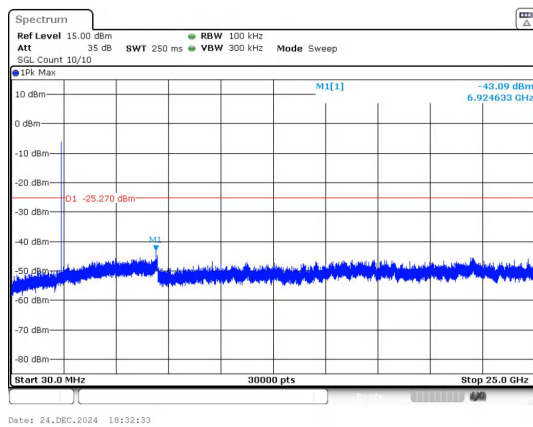
Test Graphs



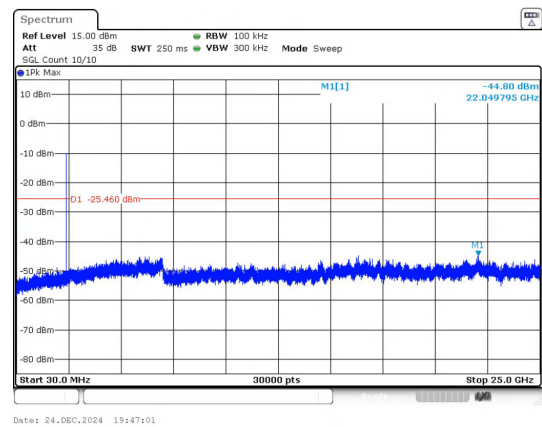
Out Of Band Emission
GFSK_DH5_Channel 0



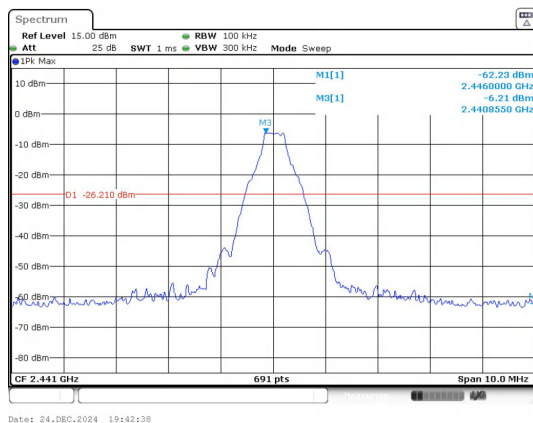
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 0



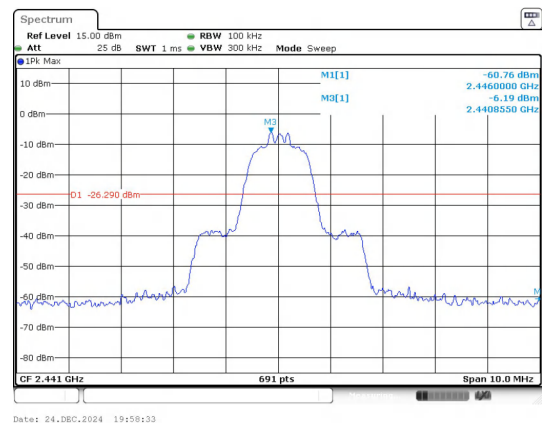
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



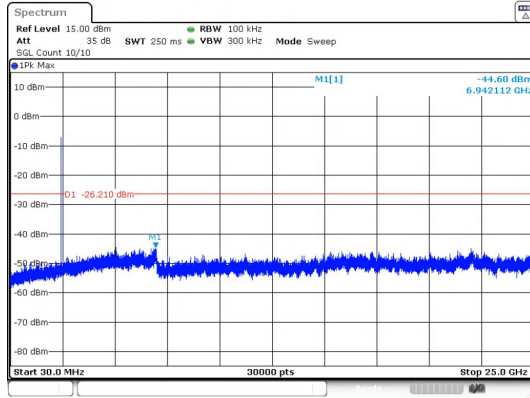
30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 0



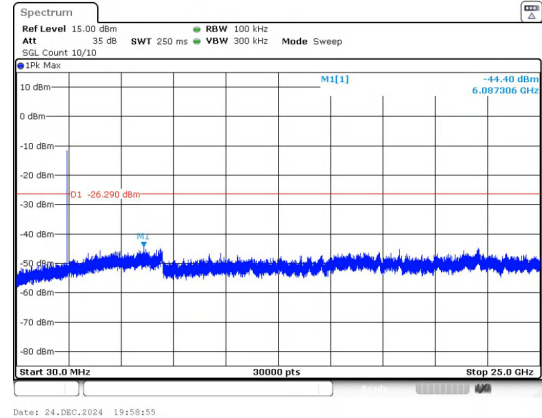
Out Of Band Emission
GFSK_DH5_Channel 39



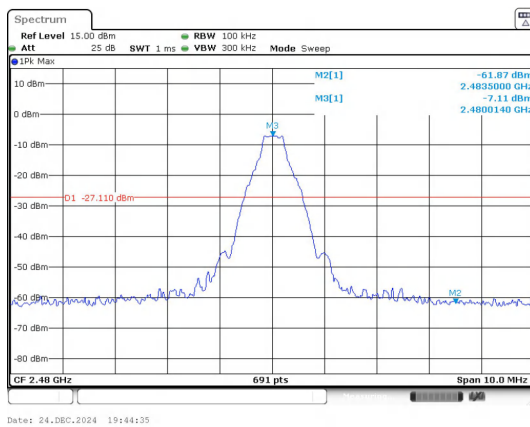
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



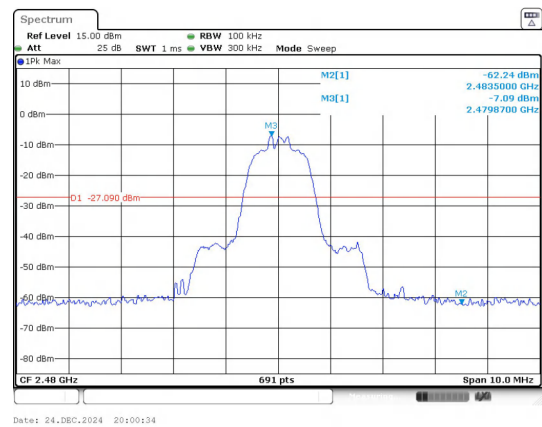
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



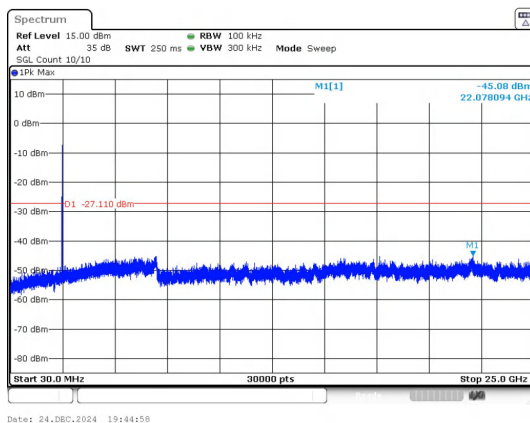
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



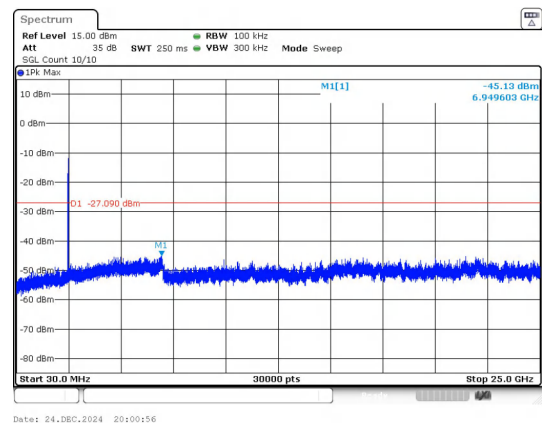
Out Of Band Emission
GFSK_DH5_Channel 78



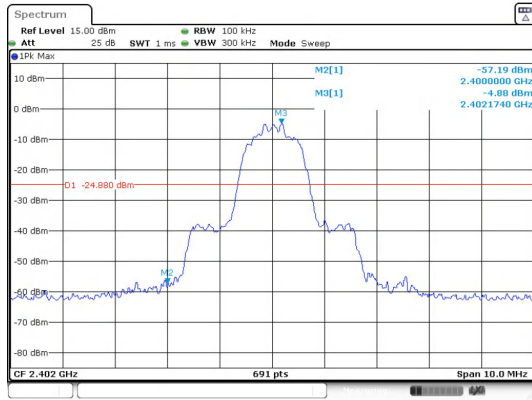
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



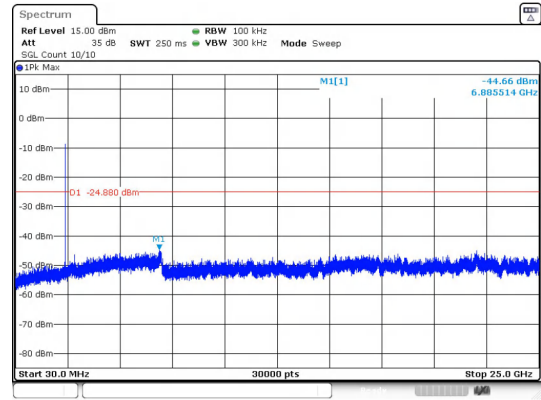
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



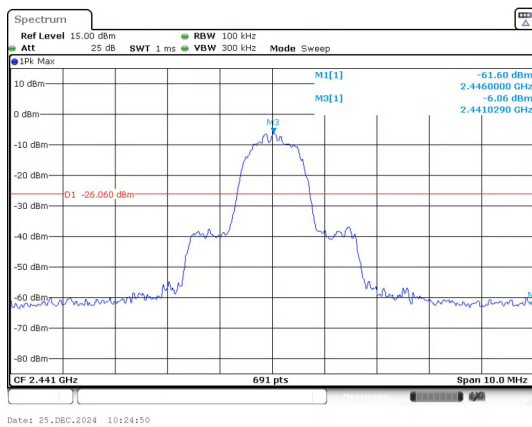
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 $\pi/4$ DQPSK_2-DH5_Channel 78



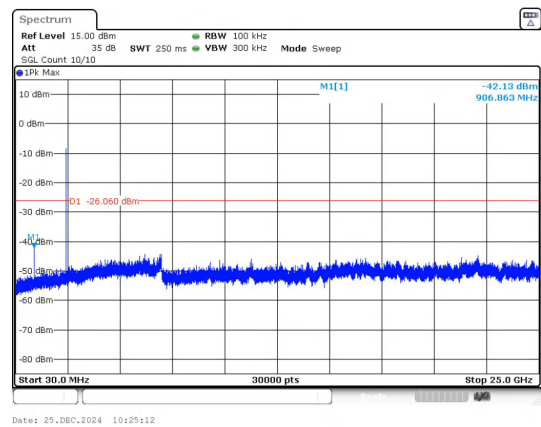
Out Of Band Emission
8DPSK_3-DH5_Channel 0



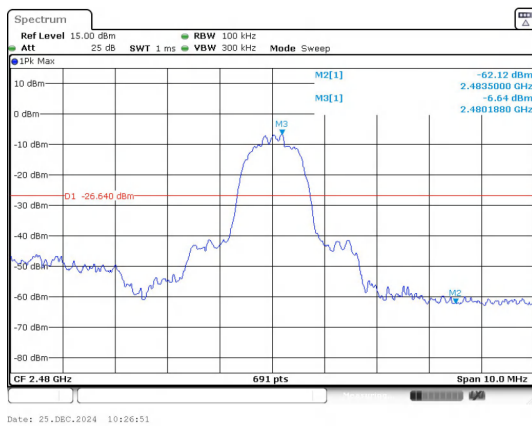
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8DPSK_3-DH5_Channel 0



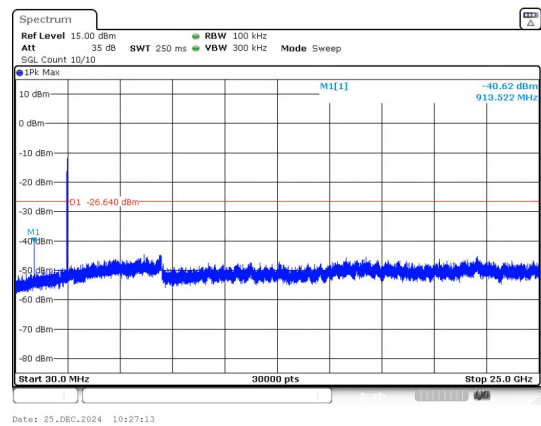
Out Of Band Emission
8DPSK_3-DH5_Channel 39



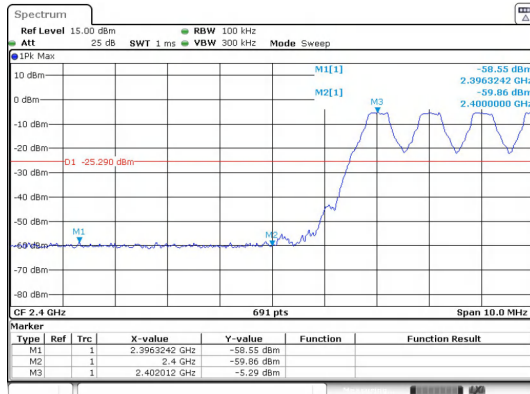
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



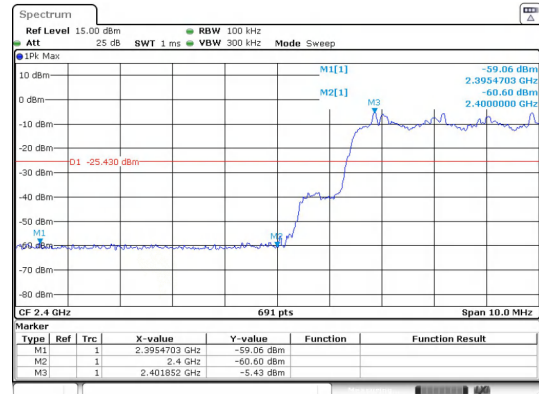
Out Of Band Emission
8DPSK_3-DH5_Channel 78



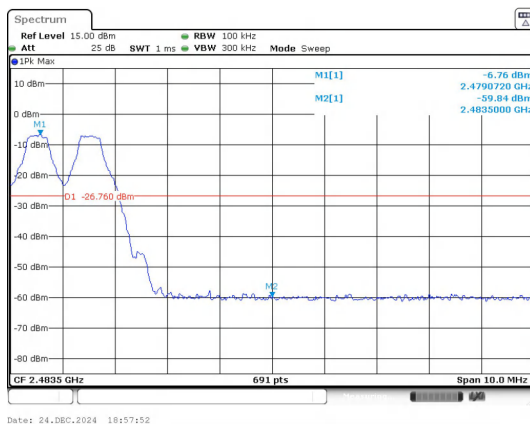
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



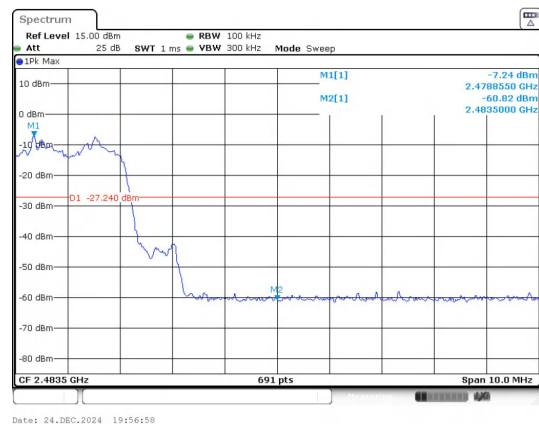
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



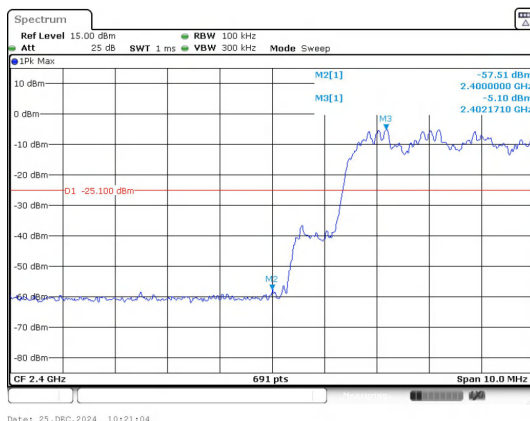
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



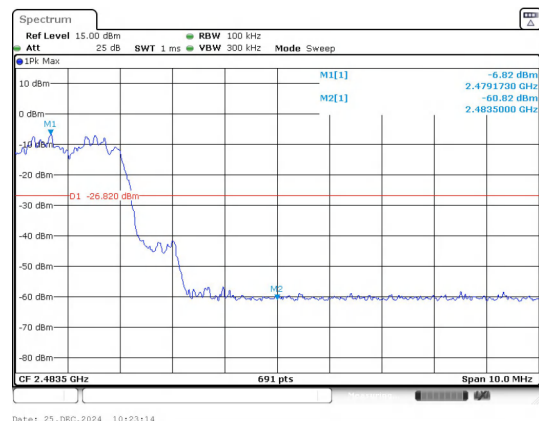
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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

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