Appendix A

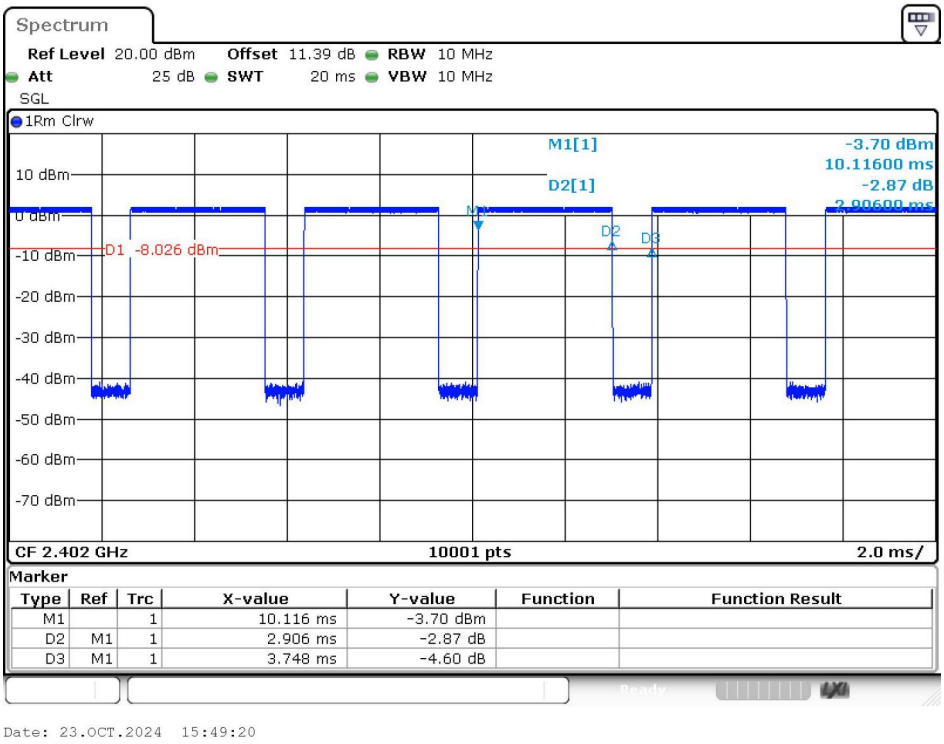
Report No.:	CISRR241018085
Product Name:	Multi-function Finger Ring Remote Control
Model No.:	J6
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Duty Cycle

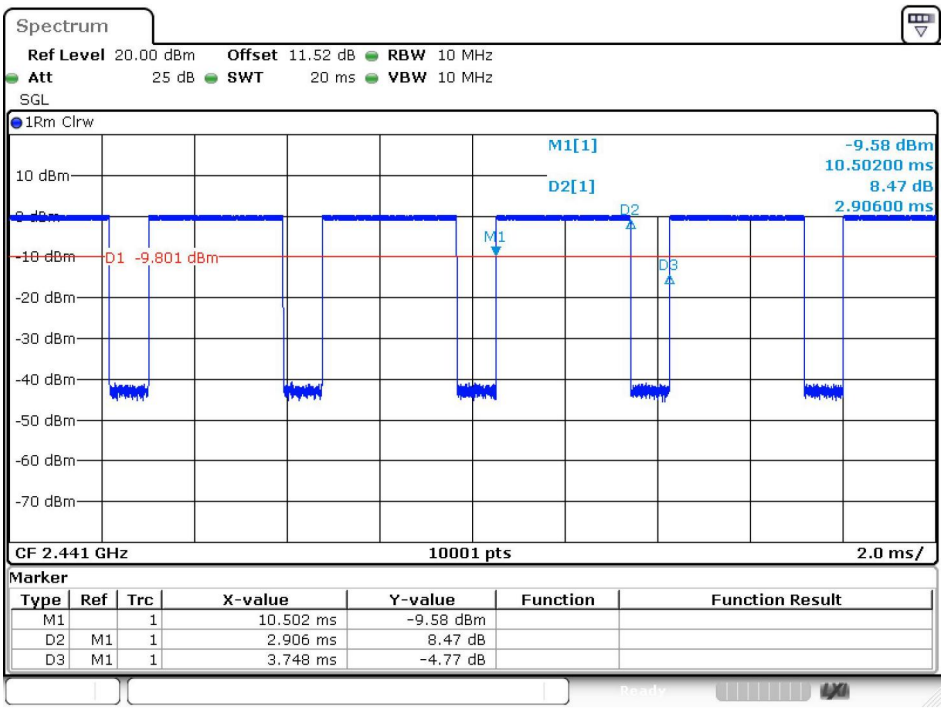
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.906	3.748	77.53	0.7753	1.1053	0.3441
		39	2.906	3.748	77.53	0.7753	1.1053	0.3441
		78	2.906	3.748	77.53	0.7753	1.1053	0.3441
π/4DQPSK	2-DH5	0	2.912	3.748	77.69	0.7769	1.0963	0.3434
		39	2.912	3.748	77.69	0.7769	1.0963	0.3434
		78	2.912	3.748	77.69	0.7769	1.0963	0.3434
8DPSK	3-DH5	0	2.914	3.748	77.75	0.7775	1.093	0.3432
		39	2.914	3.748	77.75	0.7775	1.093	0.3432
		78	2.914	3.748	77.75	0.7775	1.093	0.3432

Test Graphs

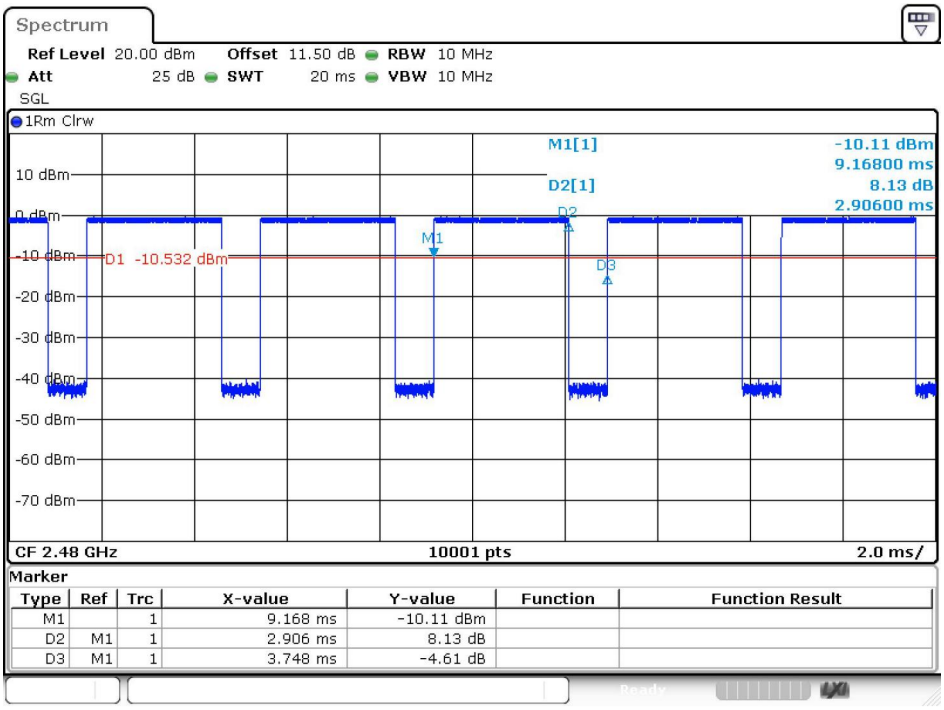


GFSK(DH5)_Channel 0



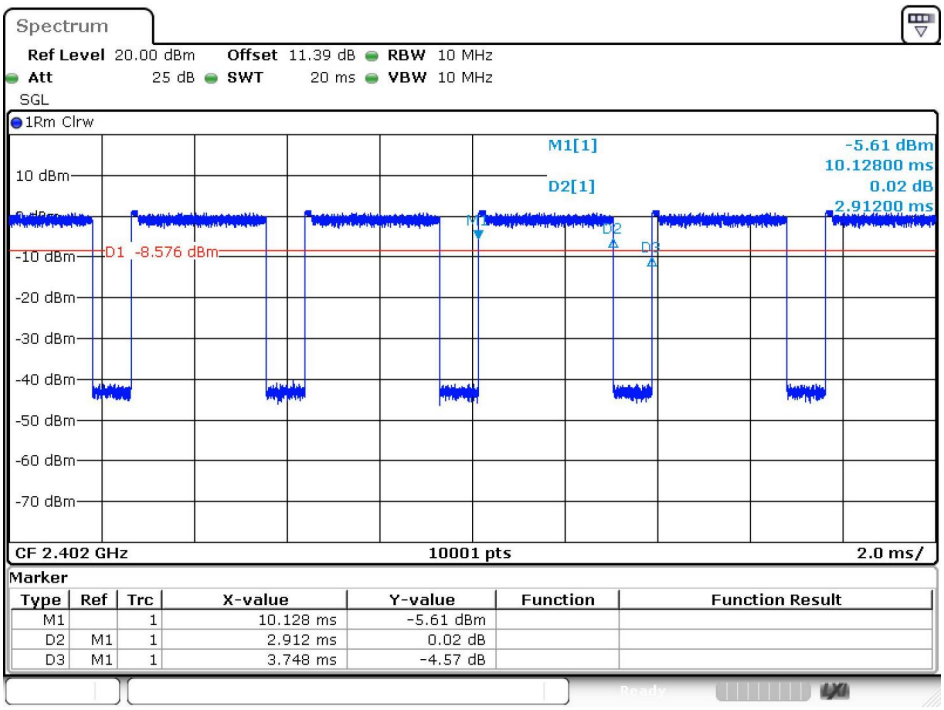
Date: 23.OCT.2024 15:59:54

GFSK(DH5)_Channel 39

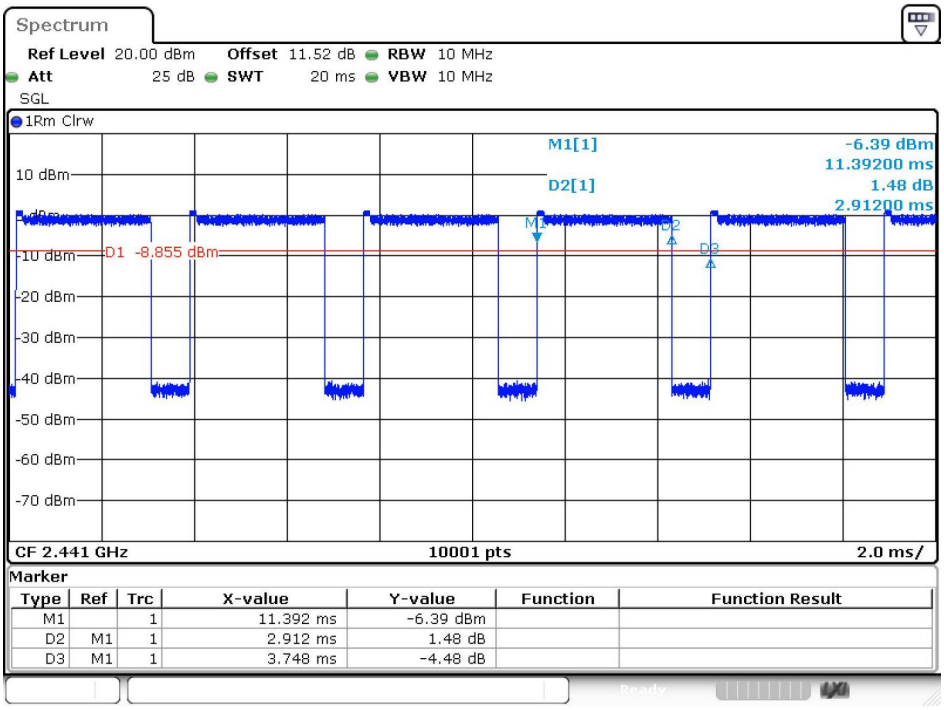


Date: 23.OCT.2024 16:01:57

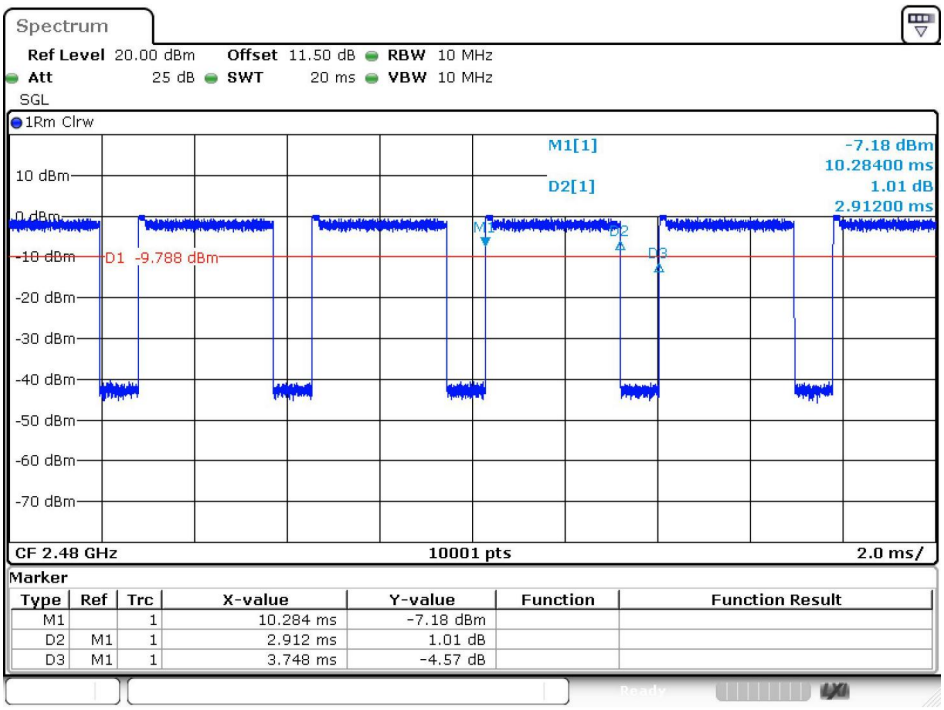
GFSK(DH5)_Channel 78



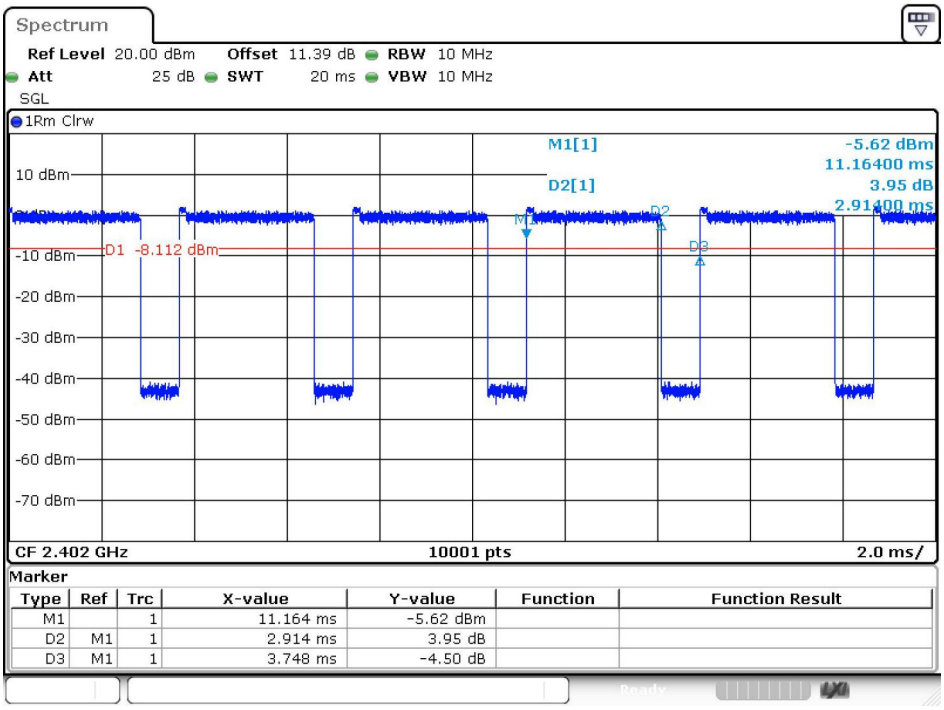
π/4DQPSK(2-DH5)_Channel 0



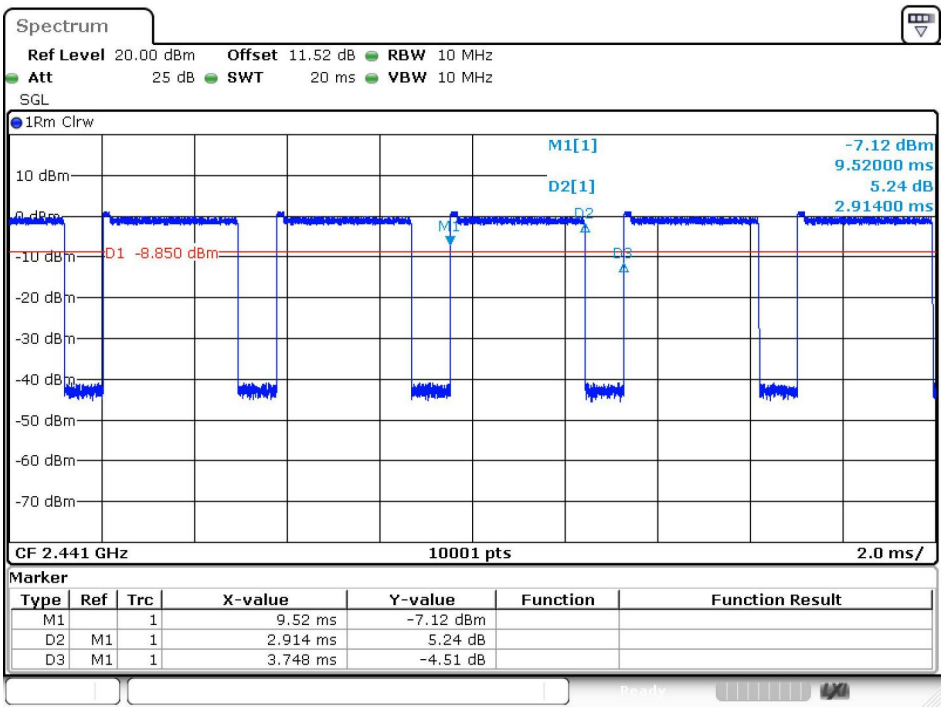
π/4DQPSK(2-DH5)_Channel 39



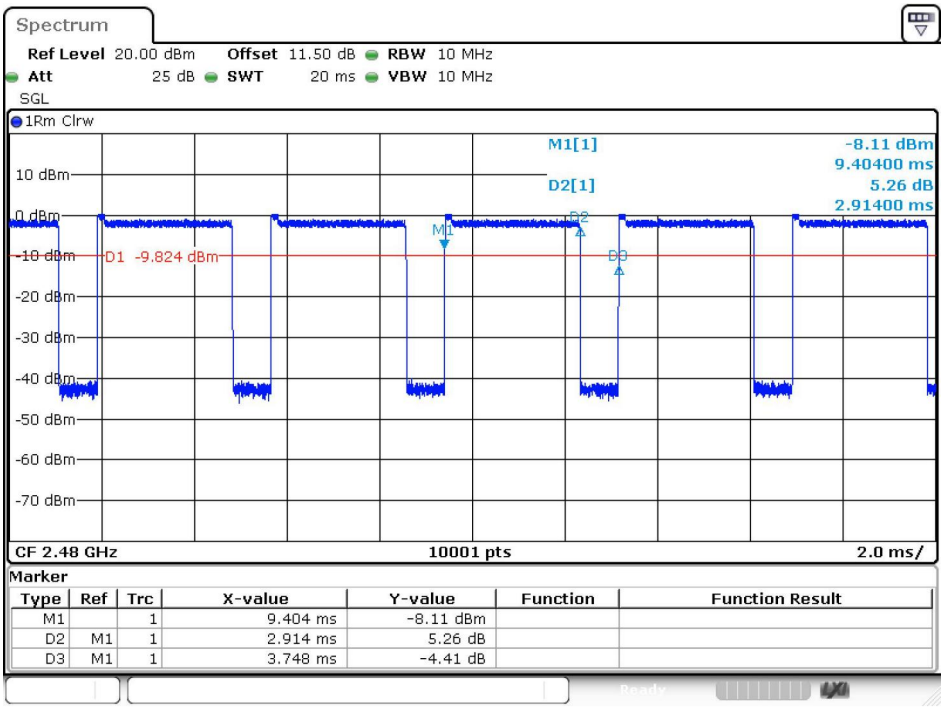
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



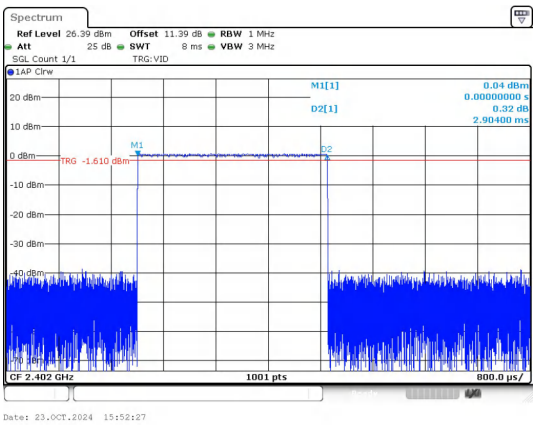
8DPSK(3-DH5)_Channel 78

2) Dwell Time

Test Result

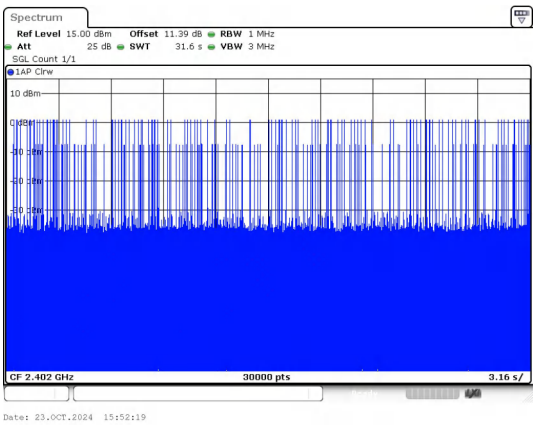
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.904	117	339.77	< 400	PASS
π/4DQPSK	2-DH5		2.912	105	305.76		PASS
8DPSK	3-DH5		2.912	104	302.85		PASS

Test Graphs



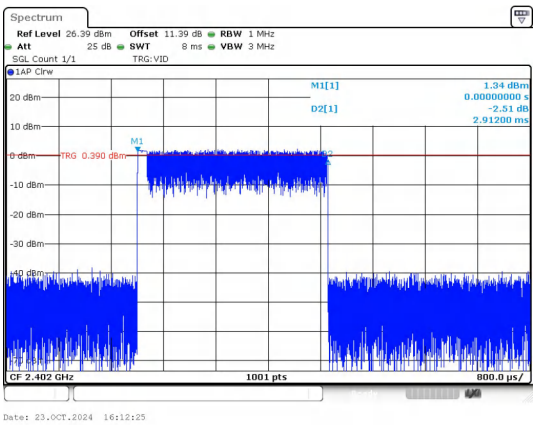
Pulse Width

GFSK_DH5



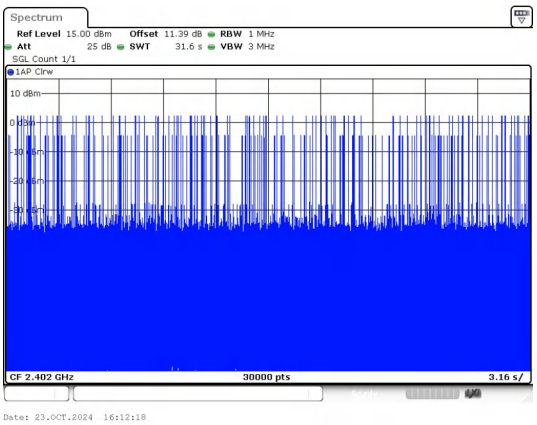
Number of Pulses in 31.6 seconds

GFSK_DH5



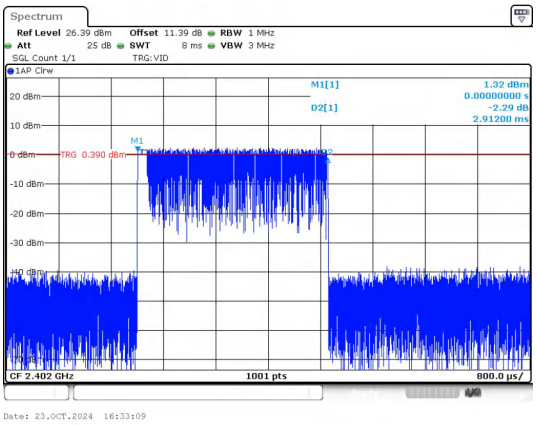
Pulse Width

π/4DQPSK_2-DH5



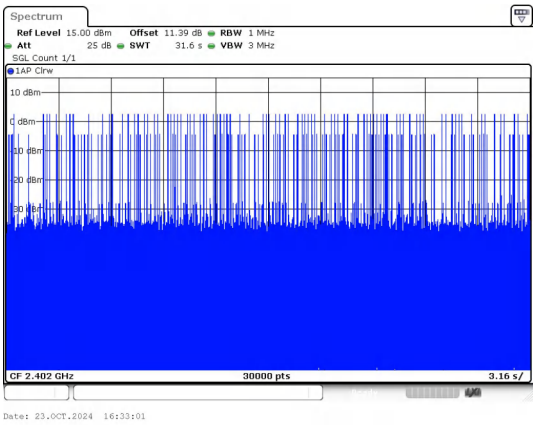
Number of Pulses in 31.6 seconds

π/4DQPSK_2-DH5



Pulse Width

8DPSK_3-DH5



Number of Pulses in 31.6 seconds

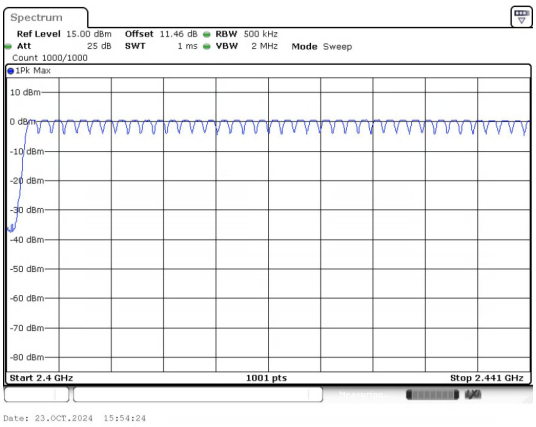
8DPSK_3-DH5

3) Number Of Hopping Channel

Test Result

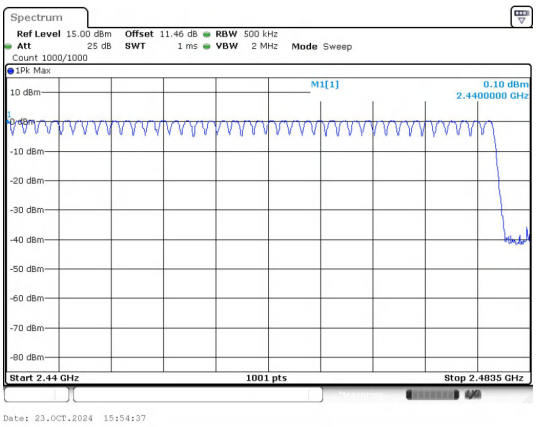
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
π/4DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs



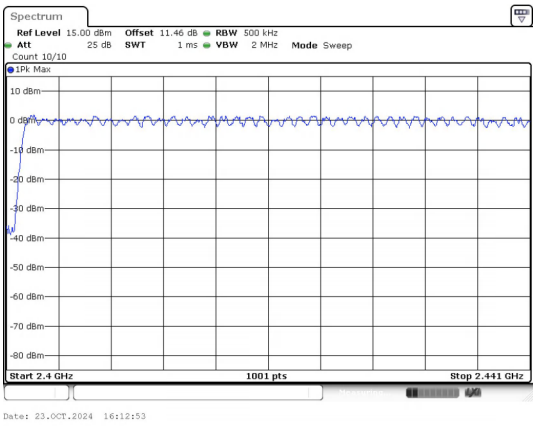
Low End Spectrum Channel Hopping Plot

GFSK



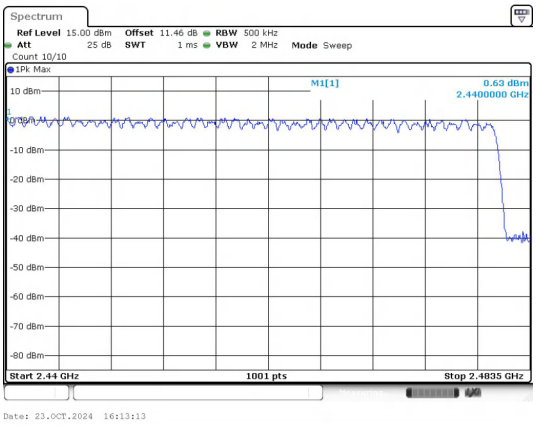
High End Spectrum Channel Hopping Plot

GFSK



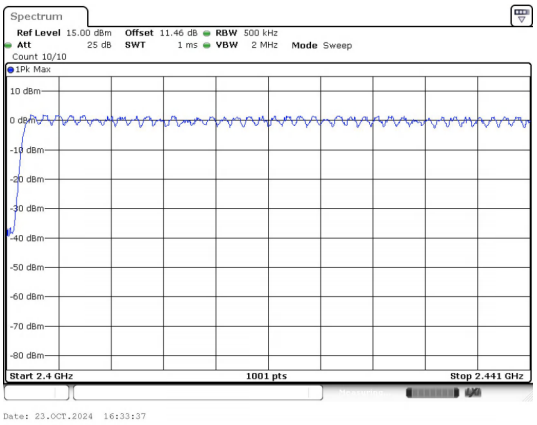
Low End Spectrum Channel Hopping Plot

π/4DQPSK



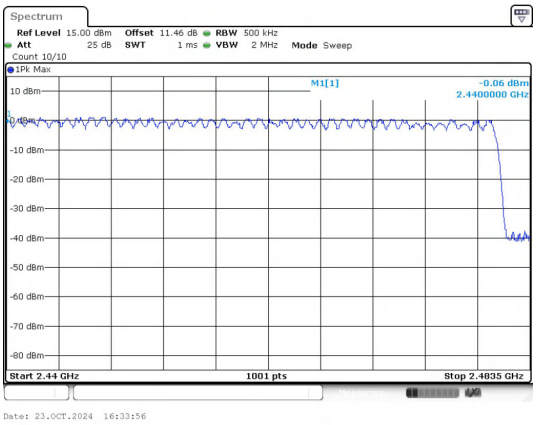
High End Spectrum Channel Hopping Plot

π/4DQPSK



Low End Spectrum Channel Hopping Plot

8DPSK



High End Spectrum Channel Hopping Plot

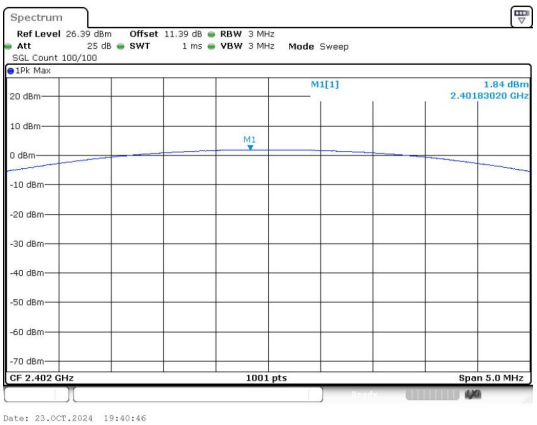
8DPSK

4) Conducted Peak Output Power

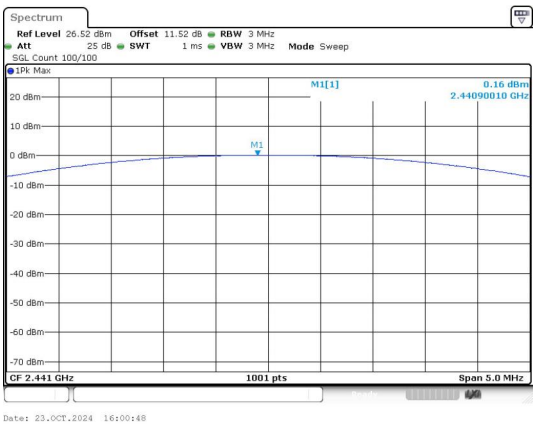
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.84	1.53	≤30	PASS
		39	0.16	1.04		PASS
		78	-0.32	0.93		PASS
π/4DQPSK	2-DH5	0	2.50	1.78	≤20.97	PASS
		39	2.04	1.60		PASS
		78	1.11	1.29		PASS
8DPSK	3-DH5	0	2.99	1.99		PASS
		39	2.19	1.65		PASS
		78	1.22	1.33		PASS

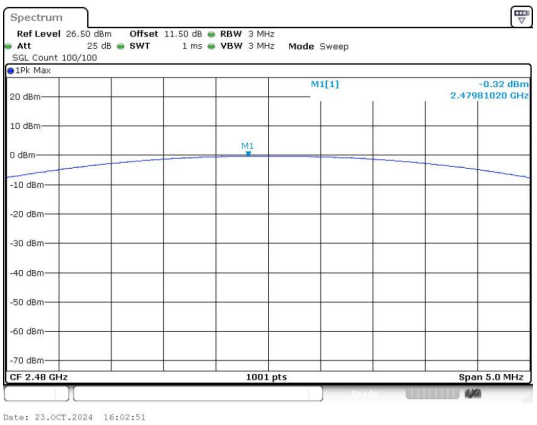
Test Graphs



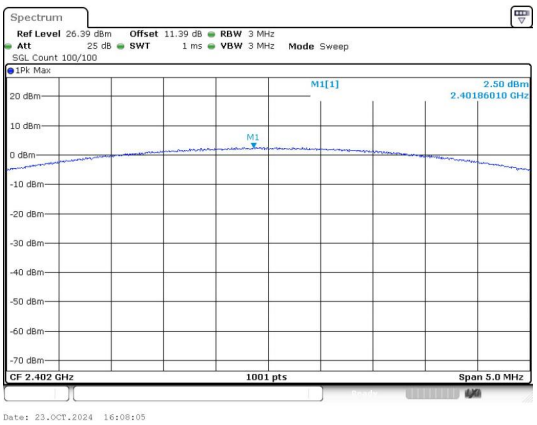
Peak Output Power
GFSK_Channel 0



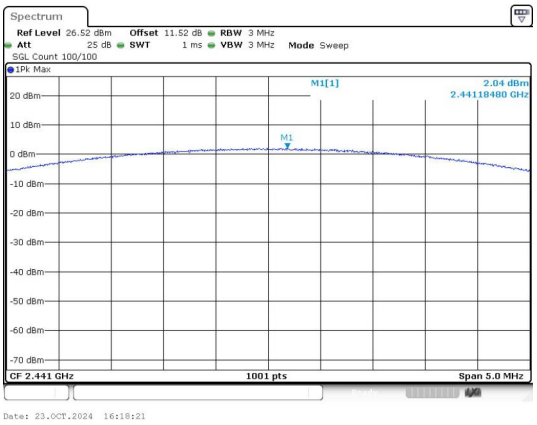
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78

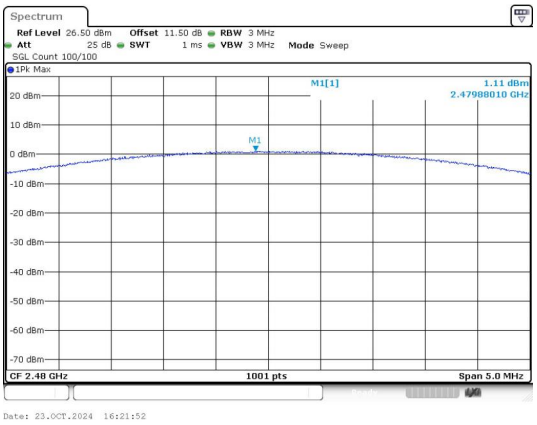


Peak Output Power
π/4DQPSK_Channel 0



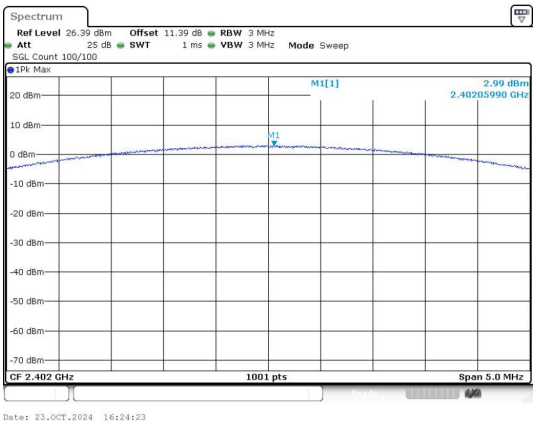
Peak Output Power

π/4DQPSK_Channel 39



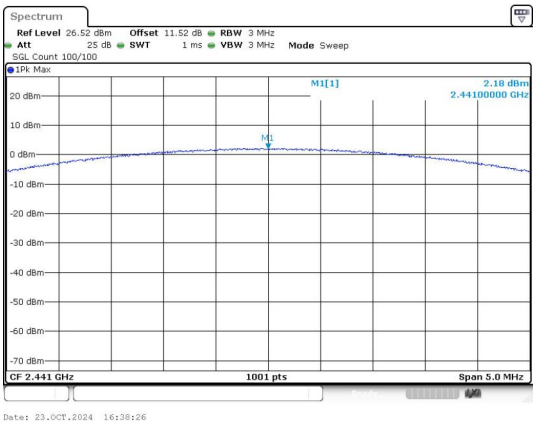
Peak Output Power

π/4DQPSK_Channel 78



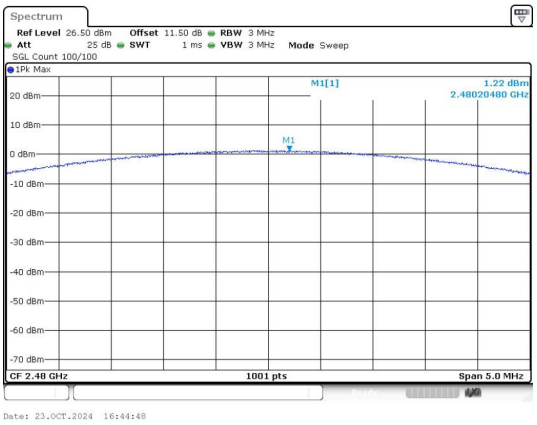
Peak Output Power

8DPSK_Channel 0



Peak Output Power

8DPSK_Channel 39



Peak Output Power

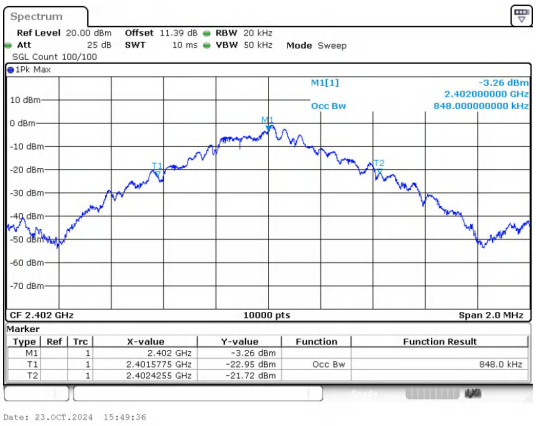
8DPSK_Channel 78

5) 99% Bandwidth

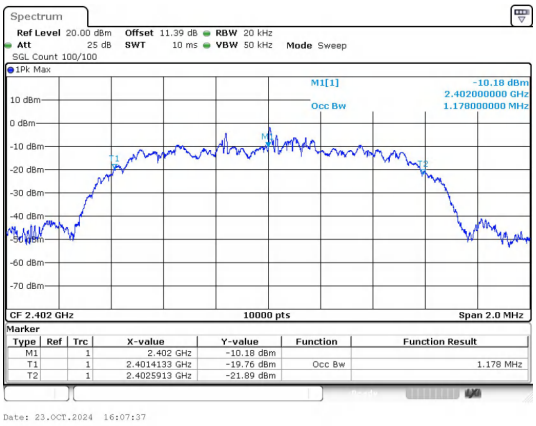
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.84800
	39	2441	0.86500
	78	2480	0.85300
π/4DQPSK	0	2402	1.1780
	39	2441	1.1746
	78	2480	1.1722
8DPSK	0	2402	1.1760
	39	2441	1.1770
	78	2480	1.1810

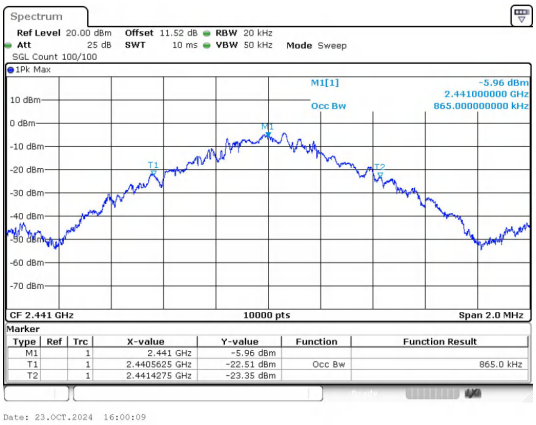
Test Graphs



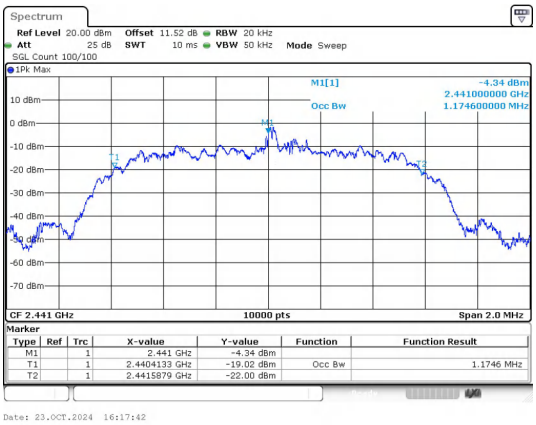
GFSK_DH5_Channel 0



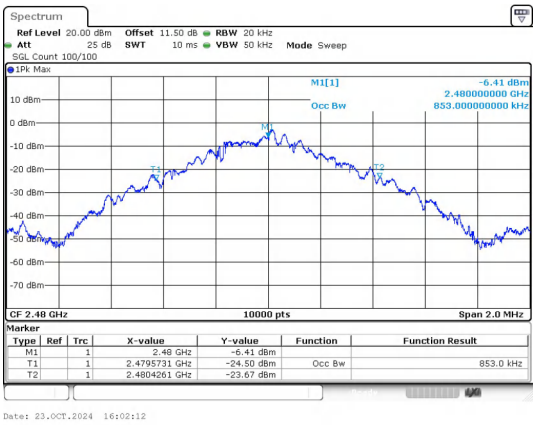
π/4DQPSK_2-DH5_Channel 0



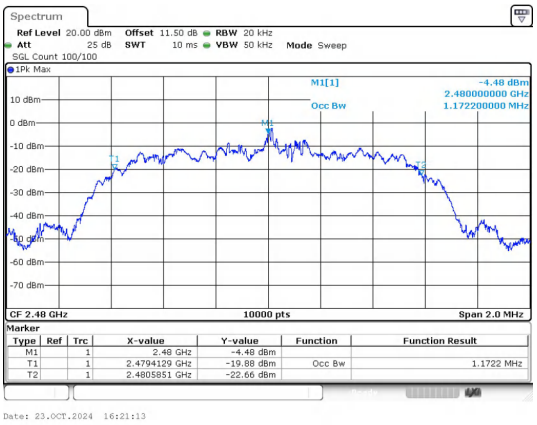
GFSK_DH5_Channel 39



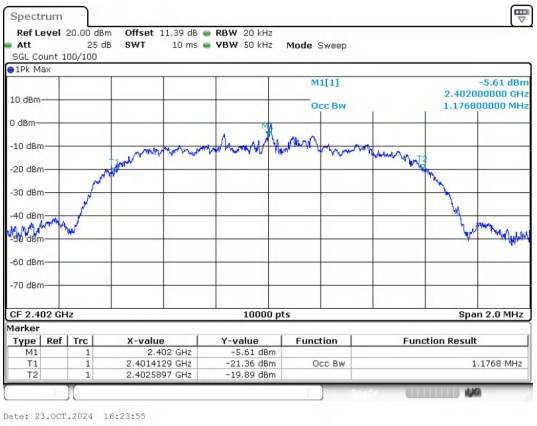
π/4DQPSK_2-DH5_Channel 39



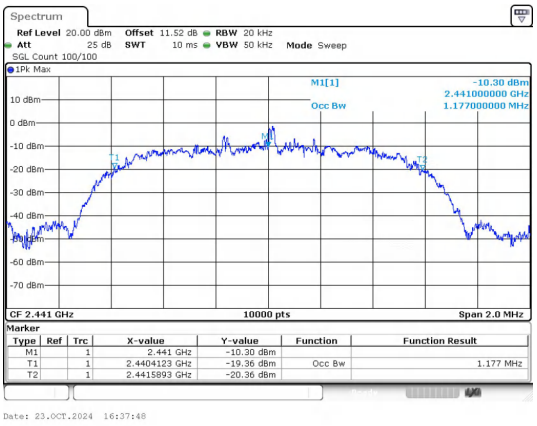
GFSK_DH5_Channel 78



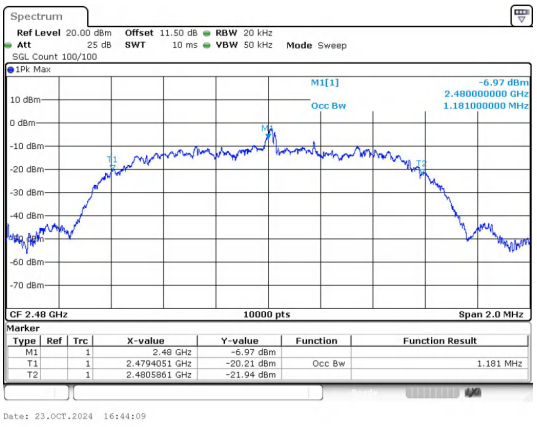
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



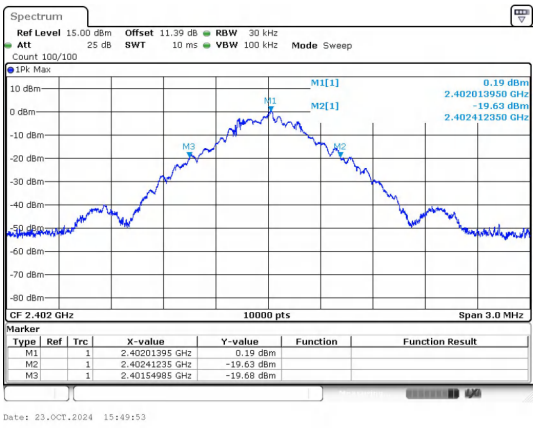
8DPSK_3-DH5_Channel 78

6) 20dB Bandwidth

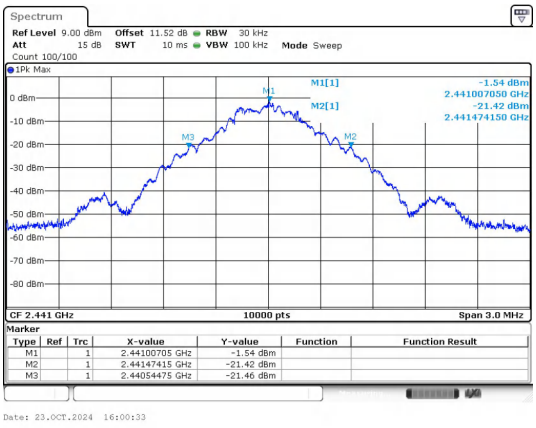
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.8600
	39	2441 MHz	0.9300
	78	2480 MHz	0.9200
π/4DQPSK	0	2402 MHz	1.220
	39	2441 MHz	1.220
	78	2480 MHz	1.220
8DPSK	0	2402 MHz	1.240
	39	2441 MHz	1.250
	78	2480 MHz	1.240

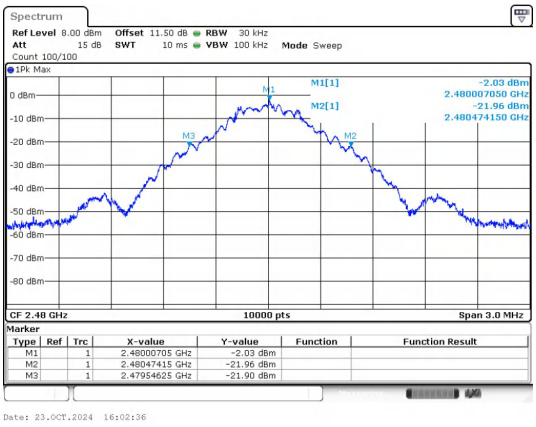
Test Graphs



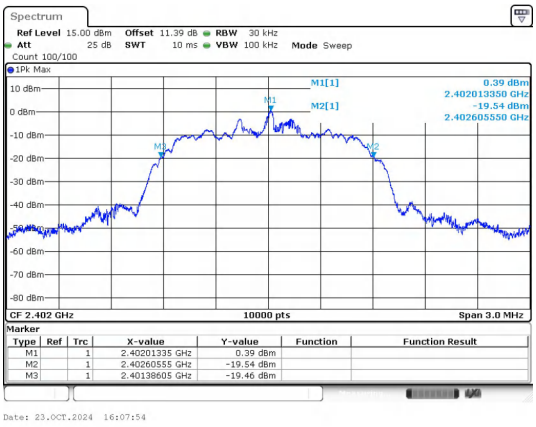
GFSK_DH5_Channel 0



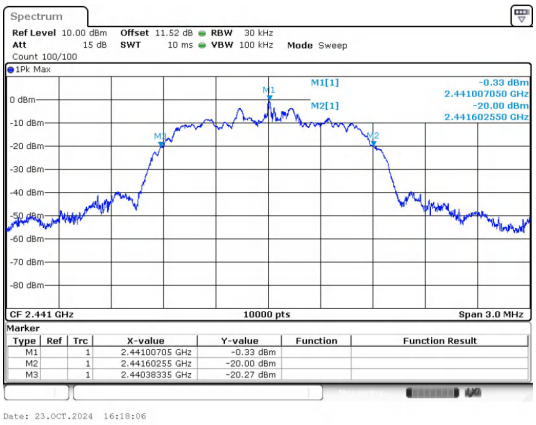
GFSK_DH5_Channel 39



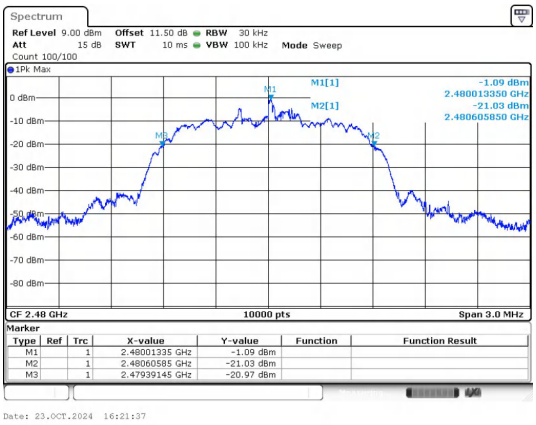
GFSK_DH5_Channel 78



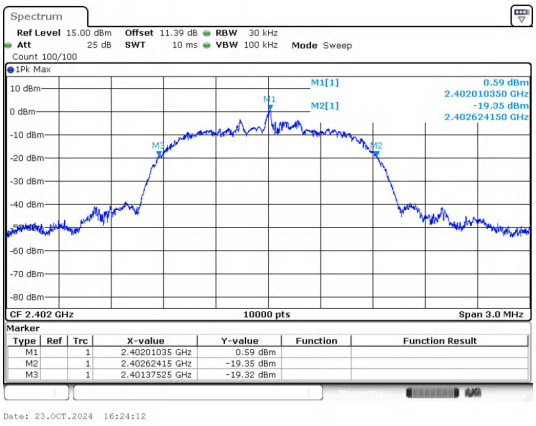
π/4DQPSK_2-DH5_Channel 0



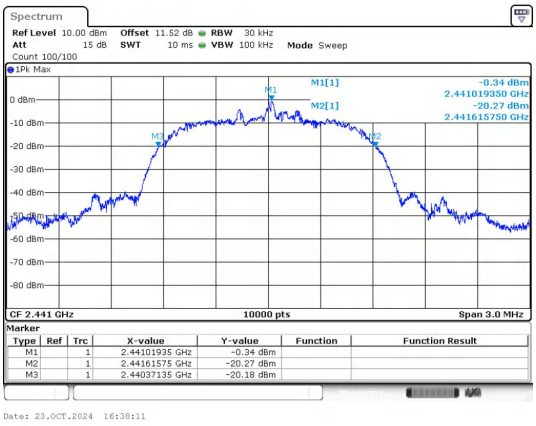
π/4DQPSK_2-DH5_Channel 39



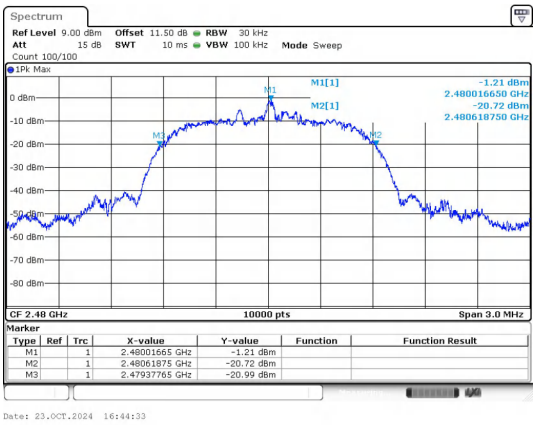
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



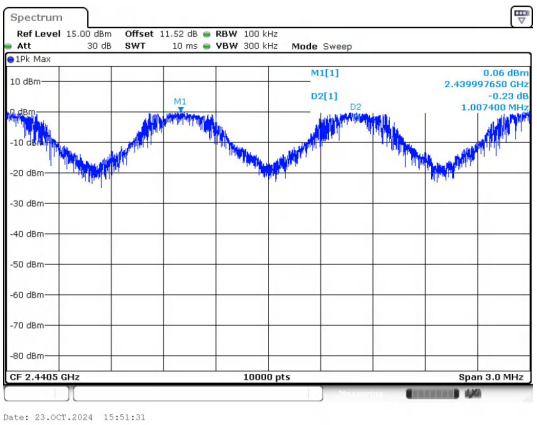
8DPSK_3-DH5_Channel 78

7) Carrier Frequencies Separation

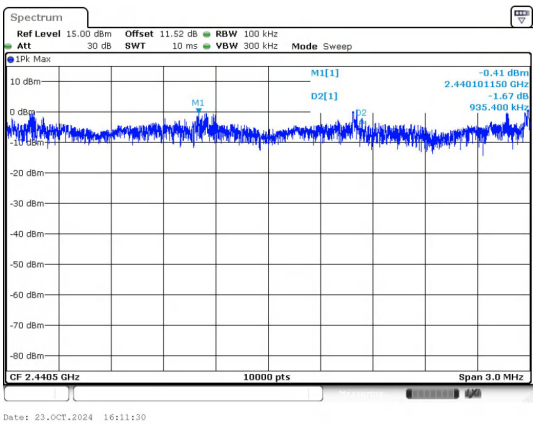
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.9976	2441.0051	1.0074	0.93	PASS
π/4DQPSK	2-DH5	2440.1011	2441.0365	0.9354	0.813	PASS
8DPSK	3-DH5	2440.0237	2440.9994	0.9756	0.83	PASS

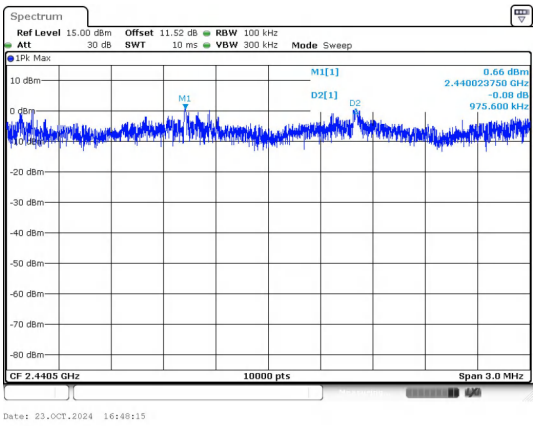
Test Graphs



GFSK



π/4DQPSK



8DPSK

8) Conducted Out Of Band Emission

Test Result

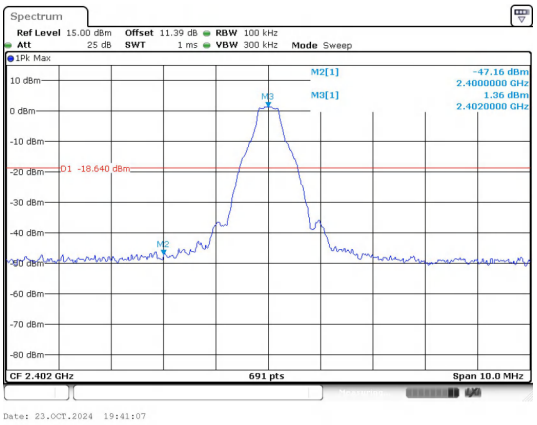
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-47.162	-18.64	-28.522	PASS
			4803.85	-39.949	-18.64	-21.309	PASS
		39	4882.09	-43.589	-20.2	-23.389	PASS
		78	2483.50	-50.144	-20.81	-29.334	PASS
			4960.33	-45.720	-20.81	-24.910	PASS
π/4DQPSK	2-DH5	0	2400.00	-44.378	-18.82	-25.558	PASS
			4804.68	-46.041	-18.82	-27.221	PASS
		39	2363.45	-49.505	-19.33	-30.175	PASS
		78	2483.50	-49.745	-20.12	-29.625	PASS
			4959.49	-45.740	-20.12	-25.620	PASS
8DPSK	3-DH5	0	2400.00	-47.446	-18.36	-29.086	PASS
			4803.85	-43.786	-18.36	-25.426	PASS
		39	2575.69	-46.720	-19.43	-27.290	PASS
		78	2483.50	-50.164	-20.14	-30.024	PASS
			4959.49	-49.046	-20.14	-28.906	PASS

Hopping

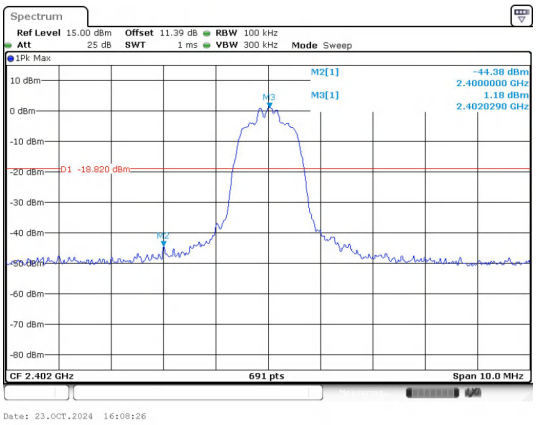
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.97	-36.872	-20.26	-16.612	PASS
			2400.00	-48.694	-20.26	-28.434	PASS
			2483.50	-50.114	-20.83	-29.284	PASS
π/4DQPSK	2-DH5		2397.12	-44.903	-18.43	-26.473	PASS
			2400.00	-46.156	-18.43	-27.726	PASS
			2483.50	-49.492	-21.25	-28.242	PASS
8DPSK	3-DH5		2395.01	-45.549	-18.91	-26.639	PASS
			2400.00	-47.117	-18.91	-28.207	PASS
			2483.50	-49.075	-21.71	-27.365	PASS

Test Graphs



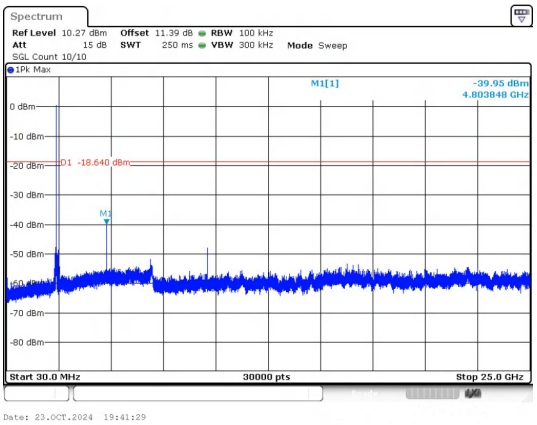
Out Of Band Emission

GFSK_DH5_Channel 0



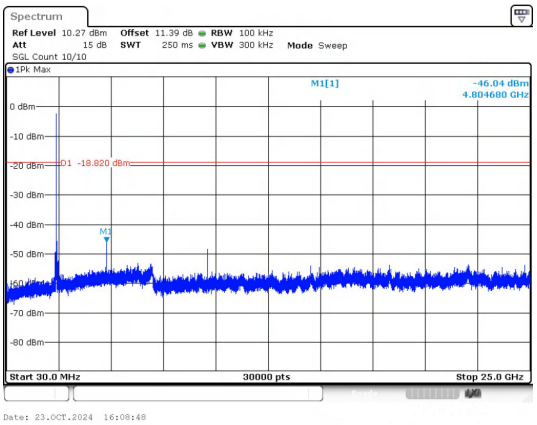
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 0



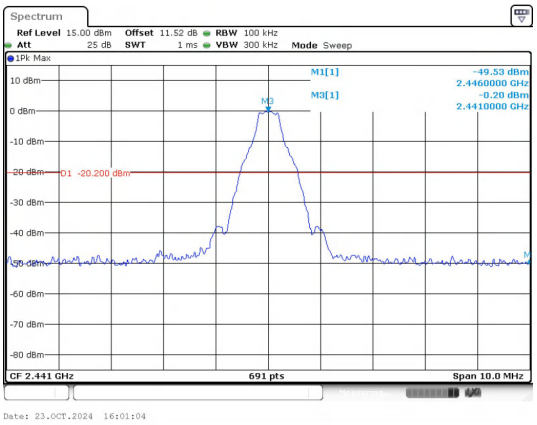
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 0



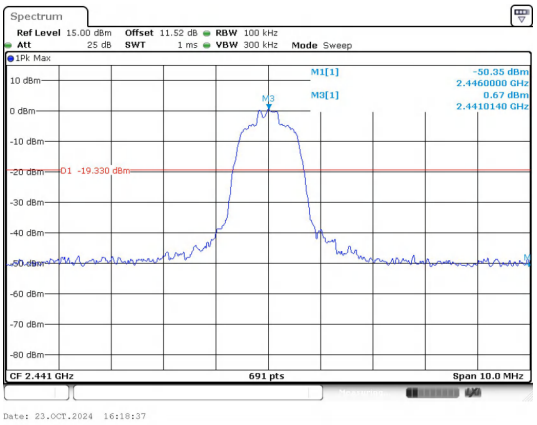
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 0



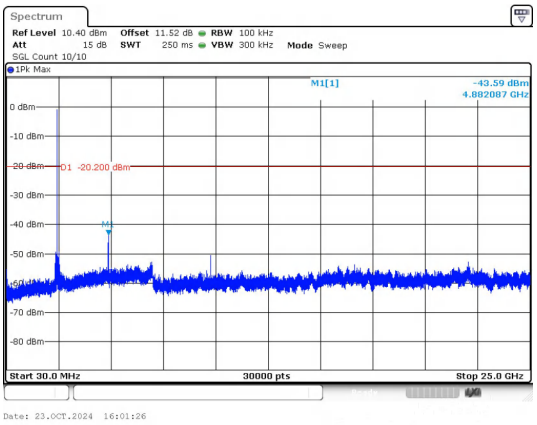
Out Of Band Emission

GFSK_DH5_Channel 39



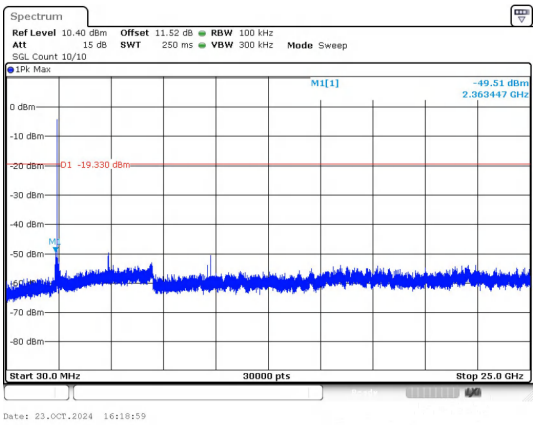
Out Of Band Emission

π/4DQPSK_2-DH5_Channel 39



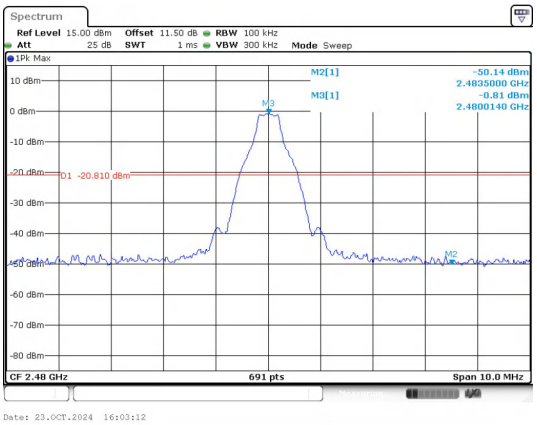
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 39



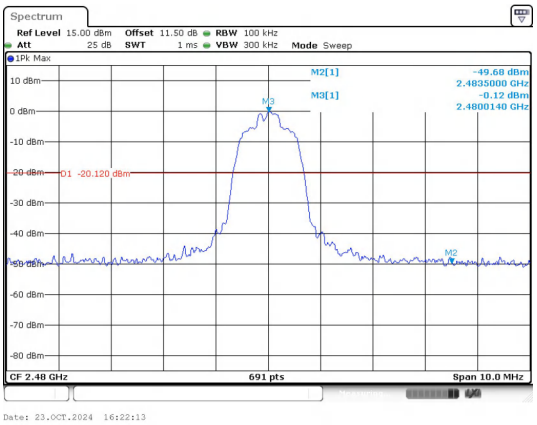
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 39



Out Of Band Emission

GFSK_DH5_Channel 78



Out Of Band Emission

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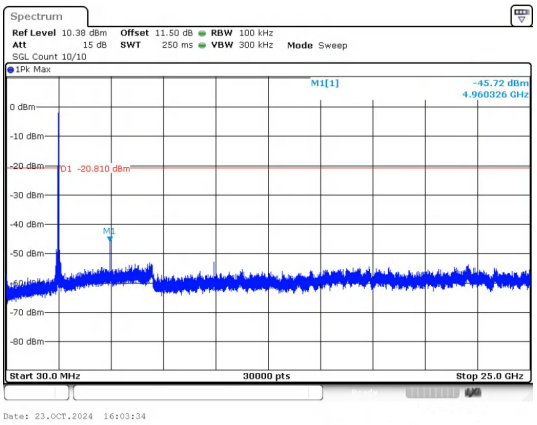
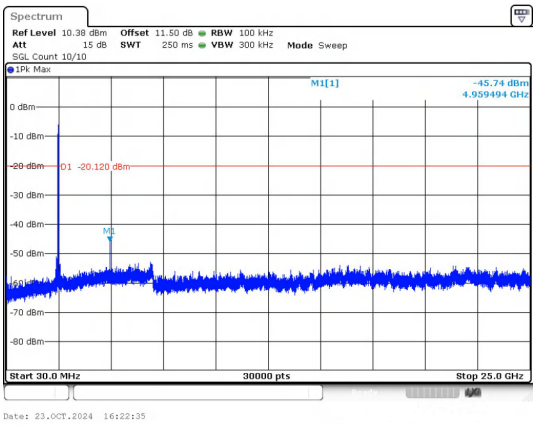


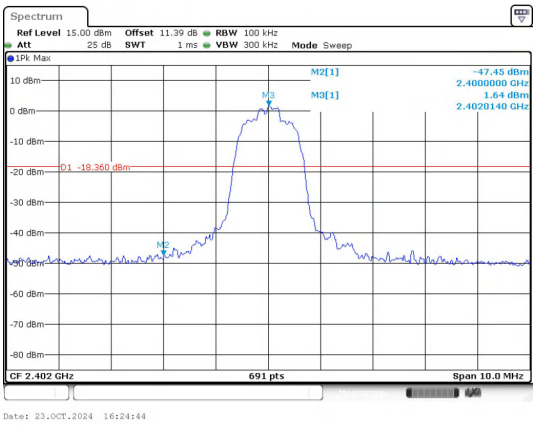
30.0 MHz - 25000.0 MHz

GFSK_DH5_Channel 78



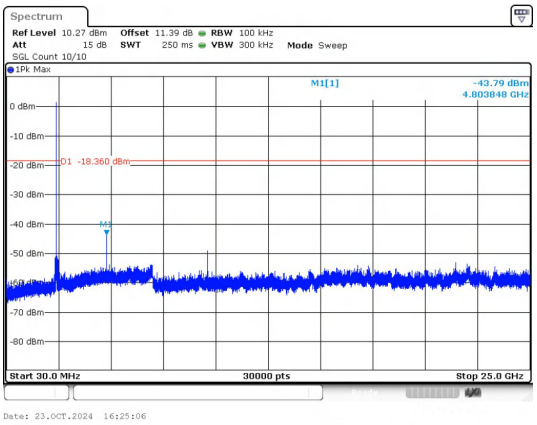
30.0 MHz - 25000.0 MHz

π/4DQPSK_2-DH5_Channel 78



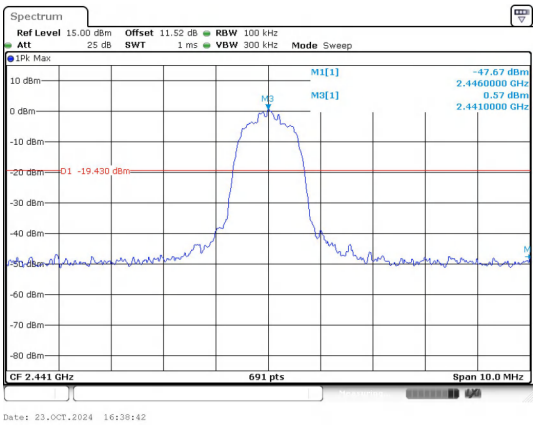
Out Of Band Emission

8DPSK_3-DH5_Channel 0



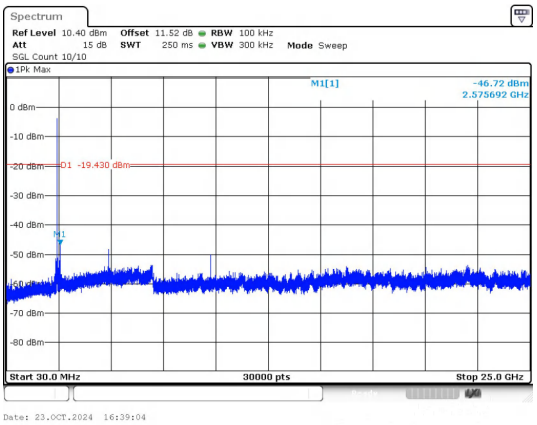
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 0



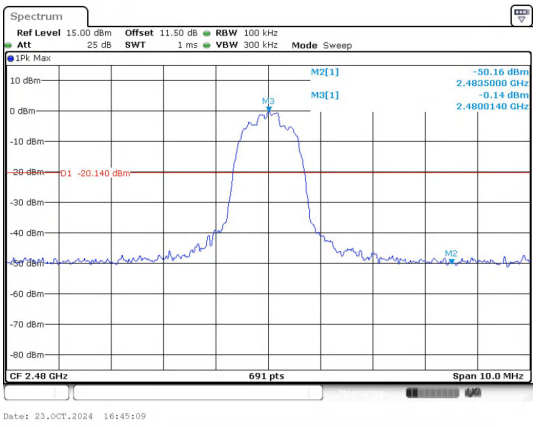
Out Of Band Emission

8DPSK_3-DH5_Channel 39



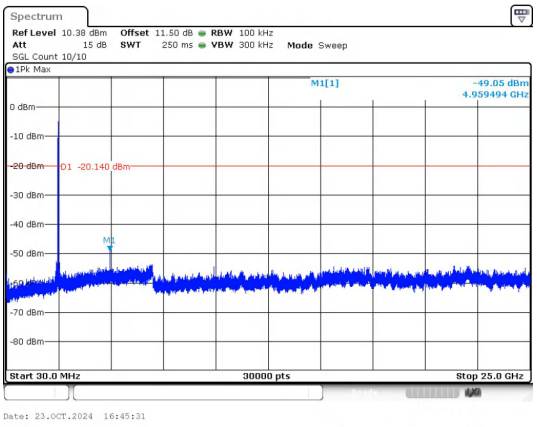
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 39



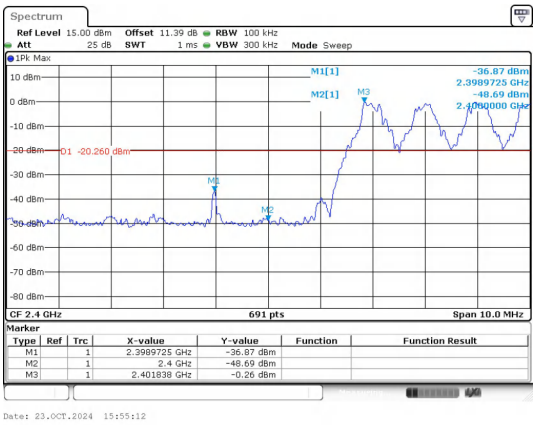
Out Of Band Emission

8DPSK_3-DH5_Channel 78



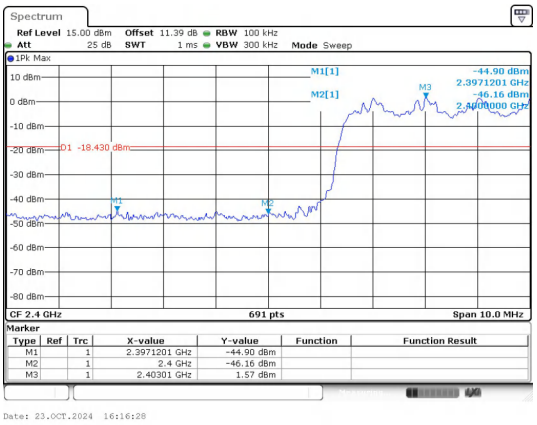
30.0 MHz - 25000.0 MHz

8DPSK_3-DH5_Channel 78



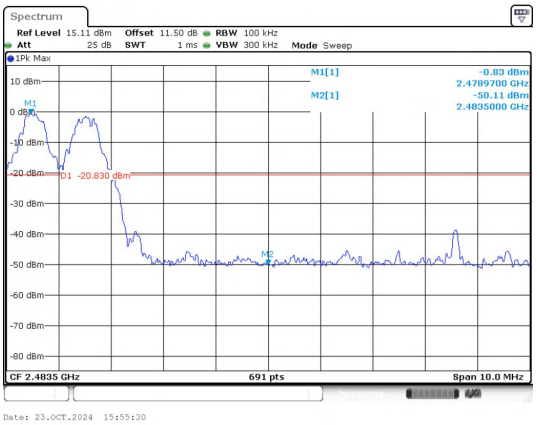
Out Of Band Emission(Left)

GFSK_DH5_Channel Hopping



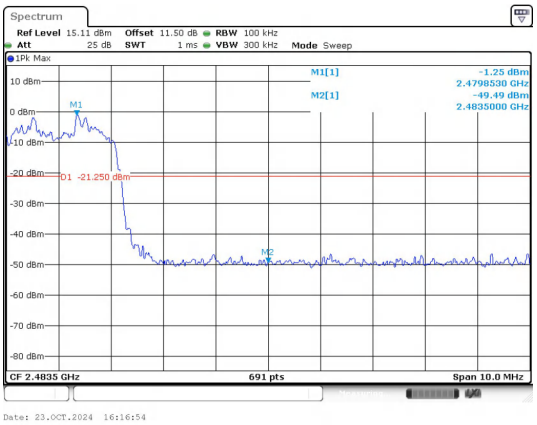
Out Of Band Emission(Left)

π/4DQPSK_2-DH5_Channel Hopping



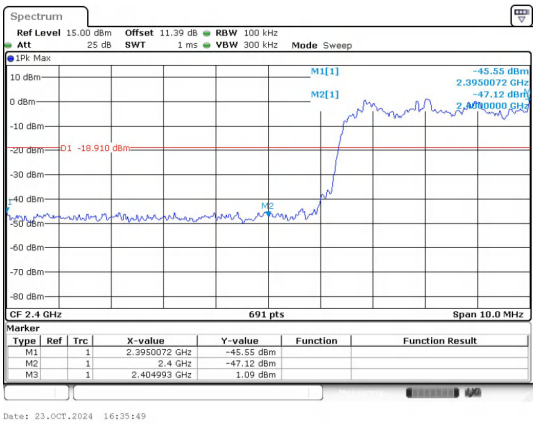
Out Of Band Emission(Right)

GFSK_DH5_Channel Hopping



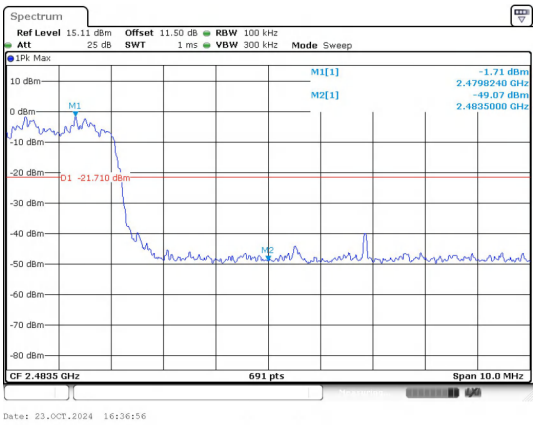
Out Of Band Emission(Right)

π/4DQPSK_2-DH5_Channel Hopping



Out Of Band Emission(Left)

8DPSK_3-DH5_Channel Hopping



Out Of Band Emission(Right)

8DPSK_3-DH5_Channel Hopping