

Appendix A

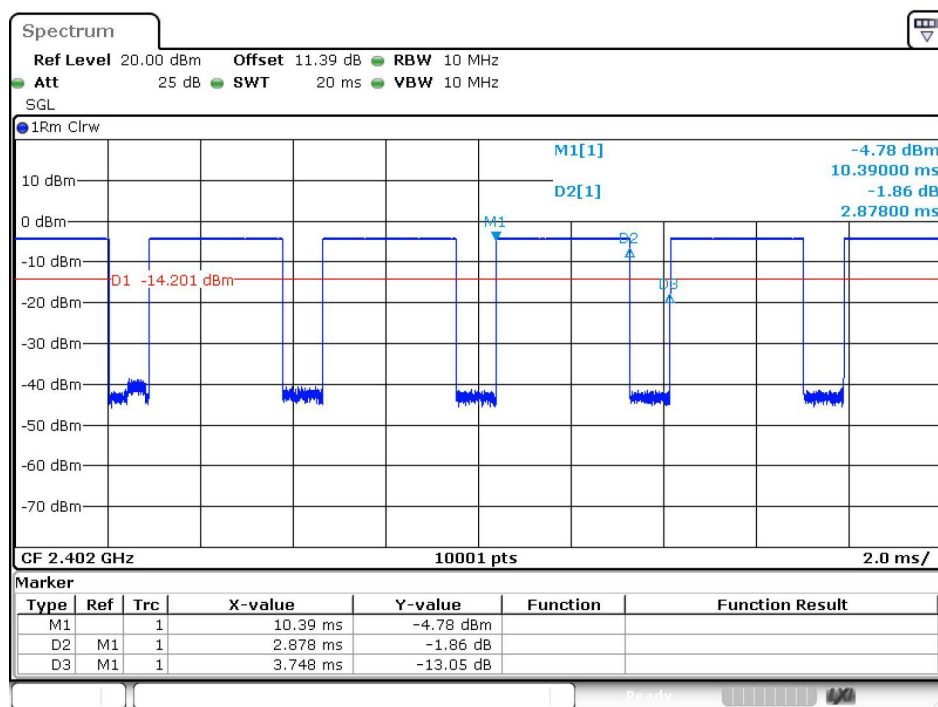
Report No.:	CISRR241012051
FCC ID:	2BLOE-TYD-HCYL-001
Product Name:	Colorful Moon Projection Lamp
Model No.:	TYD-HCYL-001
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Duty Cycle

Test Result

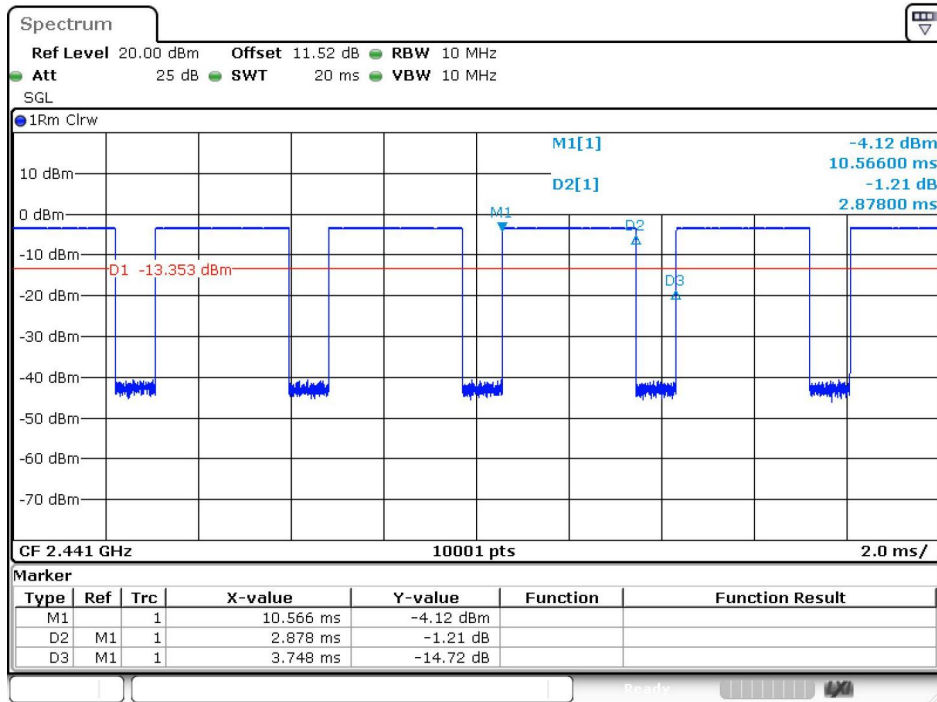
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.878	3.748	76.79	0.7679	1.147	0.35
		39	2.878	3.748	76.79	0.7679	1.147	0.35
		78	2.878	3.748	76.79	0.7679	1.147	0.35
$\pi/4$ DQPSK	2-DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.35
		39	2.884	3.748	76.95	0.7695	1.1379	0.35
		78	2.884	3.748	76.95	0.7695	1.1379	0.35
8DPSK	3-DH5	0	2.888	3.748	77.05	0.7705	1.1323	0.35
		39	2.888	3.748	77.05	0.7705	1.1323	0.35
		78	2.888	3.748	77.05	0.7705	1.1323	0.35

Test Graphs



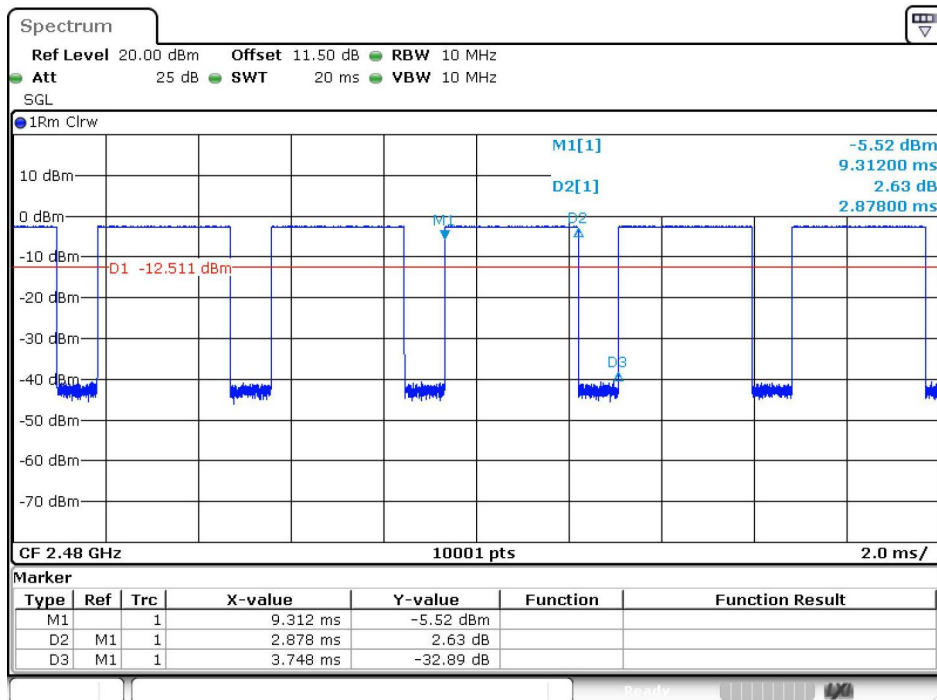
Date: 15.OCT.2024 09:35:32

GFSK(DH5)_Channel 0



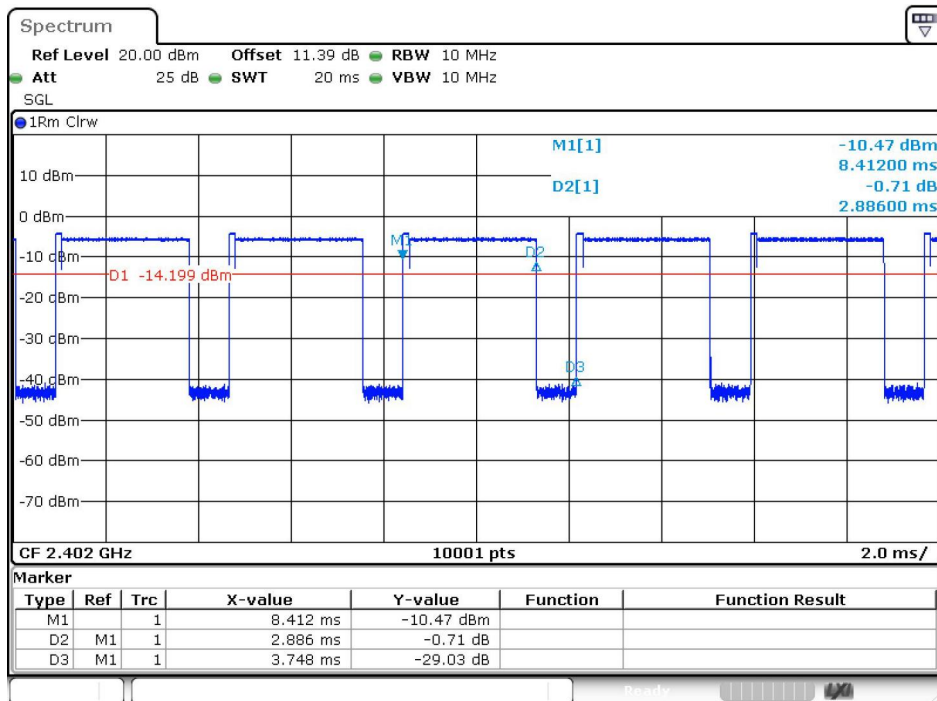
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GFSK(DH5)_Channel 39



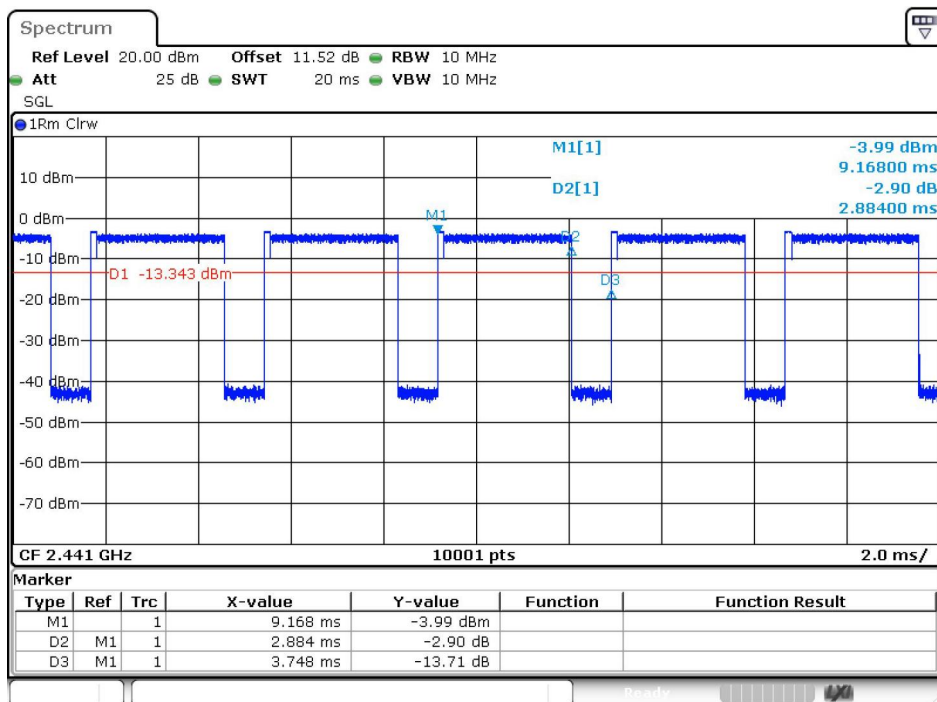
Date: 15.OCT.2024 09:50:06

GFSK(DH5)_Channel 78



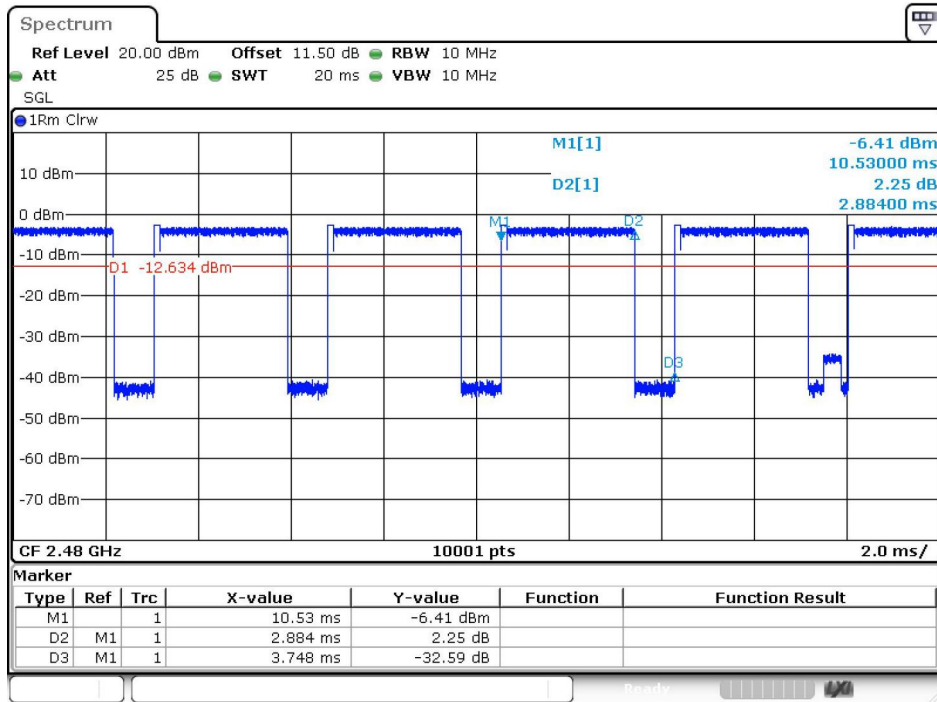
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$\pi/4$ DQPSK(2-DH5)_Channel 0



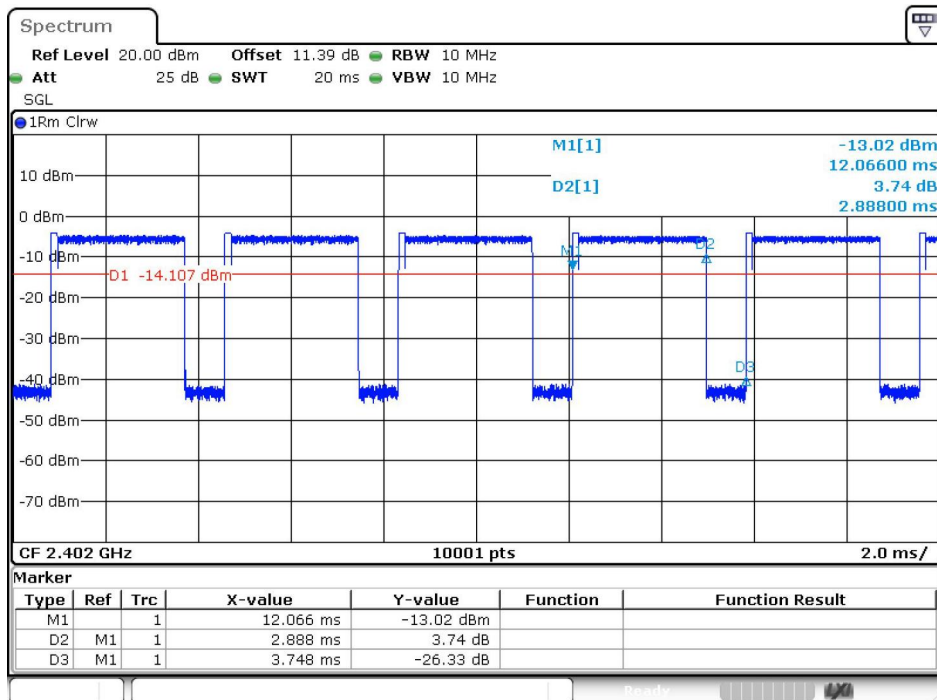
Date: 15.OCT.2024 10:04:58

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



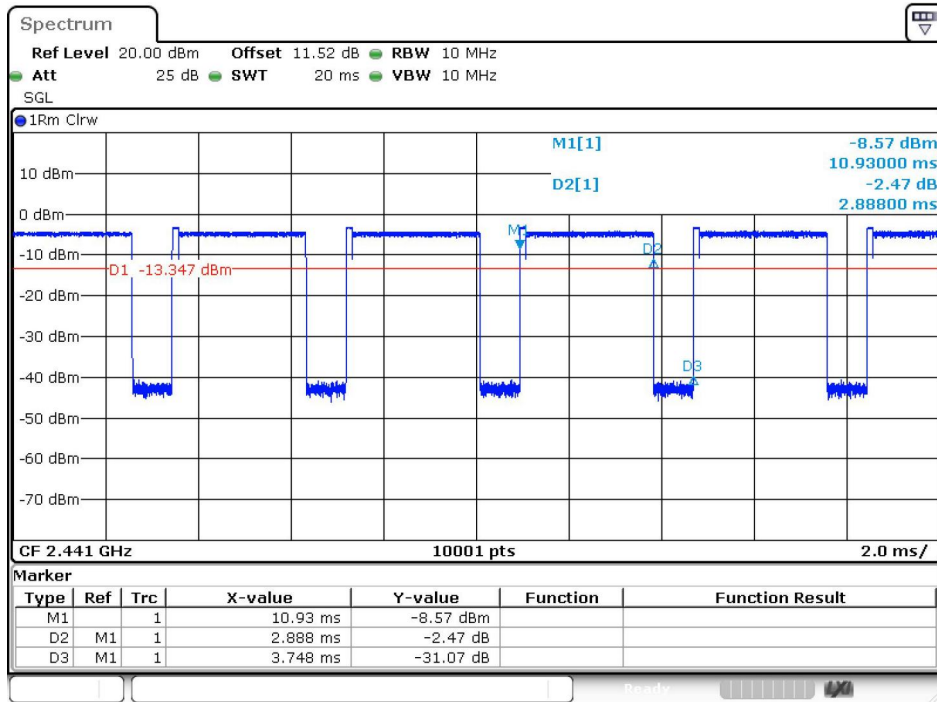
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$\pi/4$ DQPSK(2-DH5)_Channel 78



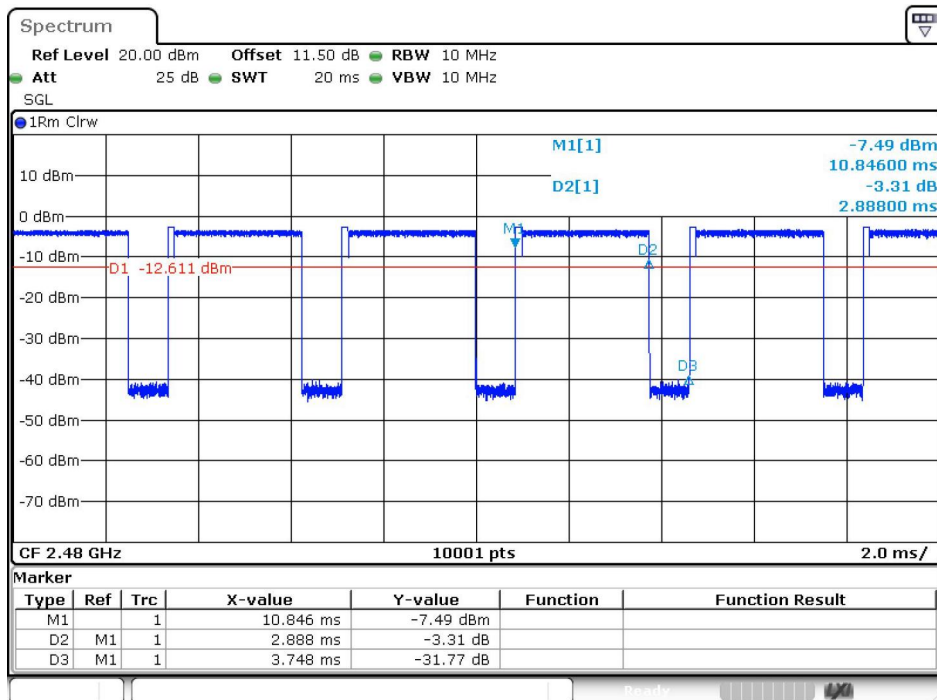
Date: 15.OCT.2024 10:25:26

8DPSK(3-DH5)_Channel 0



Date: 15.OCT.2024 10:34:24

8DPSK(3-DH5)_Channel 39



Date: 15.OCT.2024 10:36:43

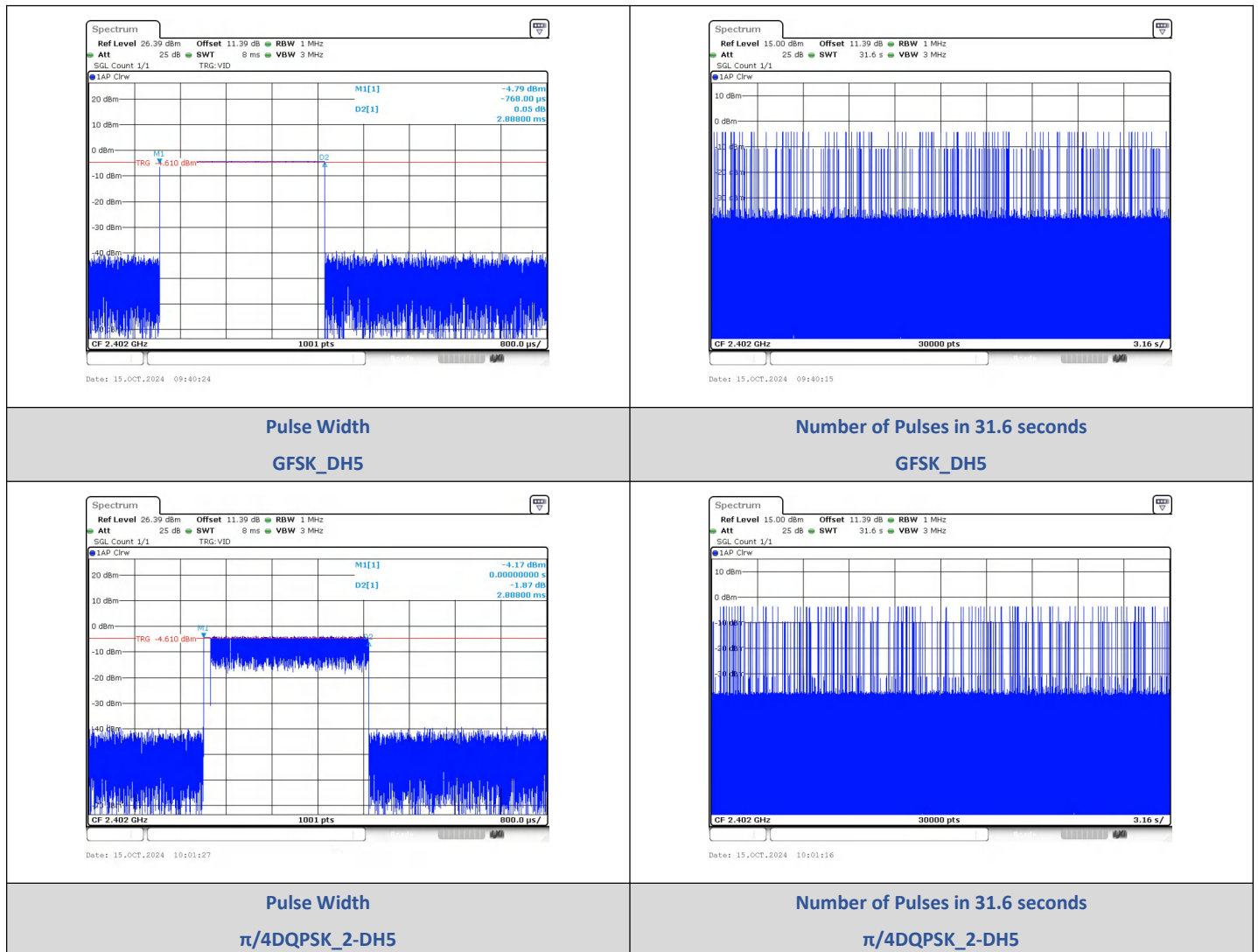
8DPSK(3-DH5)_Channel 78

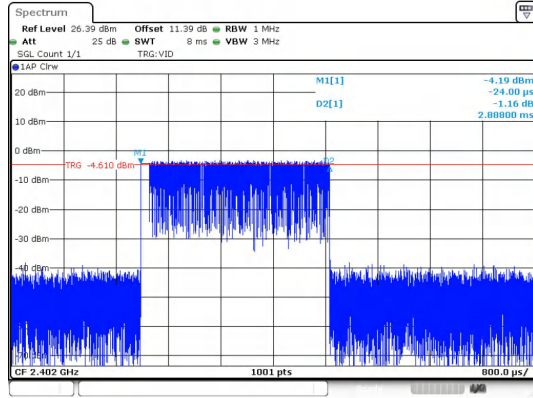
2) Dwell Time

Test Result

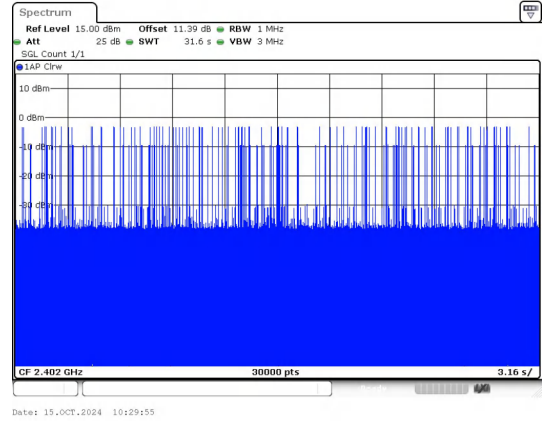
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	100	288.8	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	112	323.46		PASS
8DPSK	3-DH5		2.888	104	300.35		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



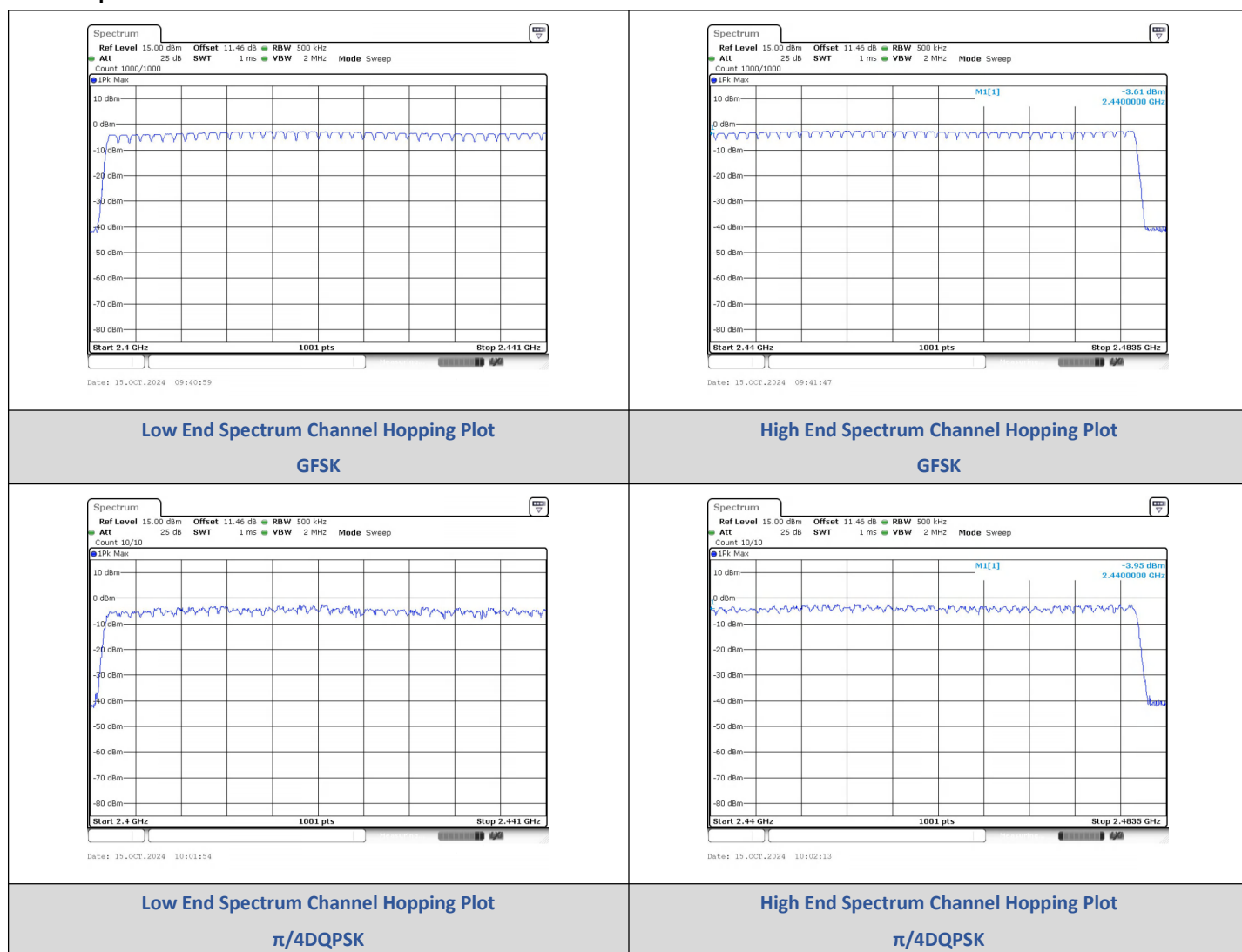
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

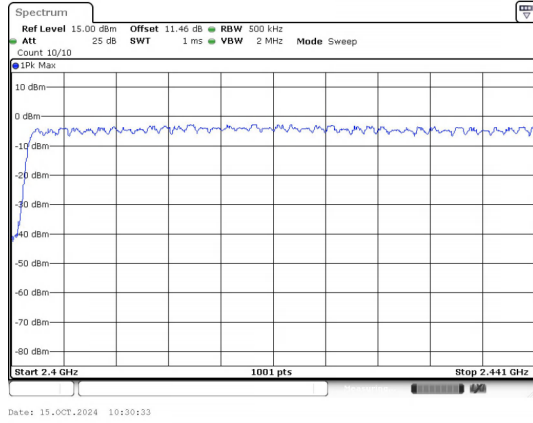
3) Number Of Hopping Channel

Test Result

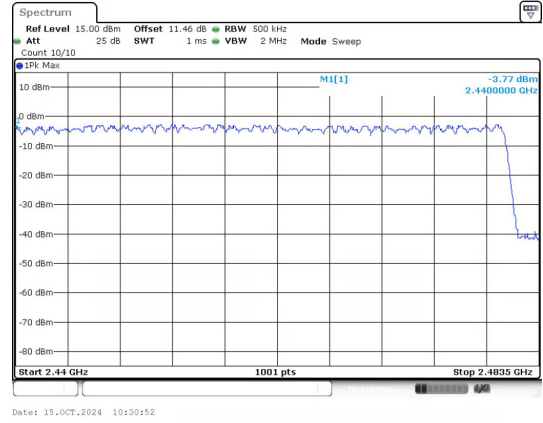
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



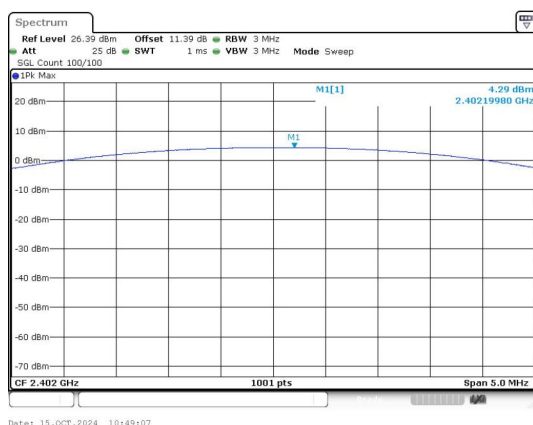
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Peak Output Power

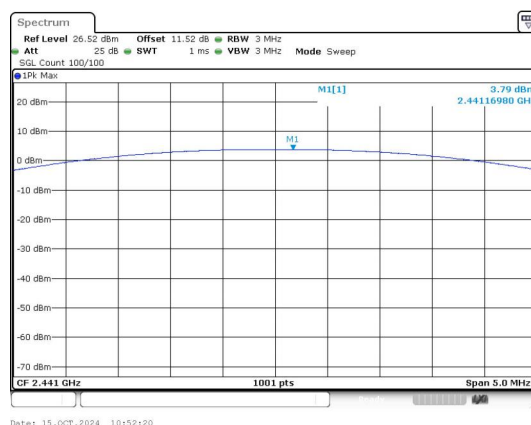
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	4.29	2.69	≤30	PASS
		39	3.79	2.39		PASS
		78	3.26	2.12		PASS
$\pi/4$ DQPSK	2-DH5	0	4.65	2.92	≤20.97	PASS
		39	4.45	2.79		PASS
		78	3.95	2.48		PASS
8DPSK	3-DH5	0	4.86	3.06		PASS
		39	4.66	2.92		PASS
		78	4.15	2.60		PASS

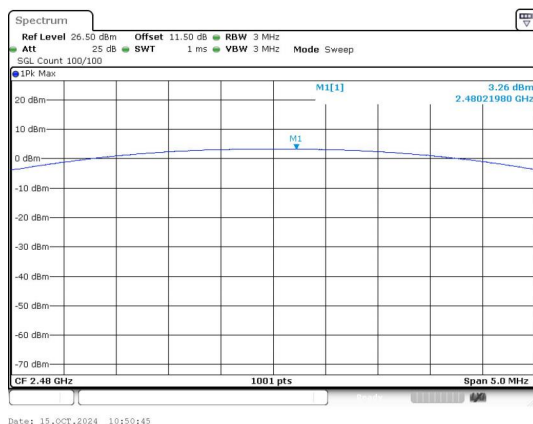
Test Graphs



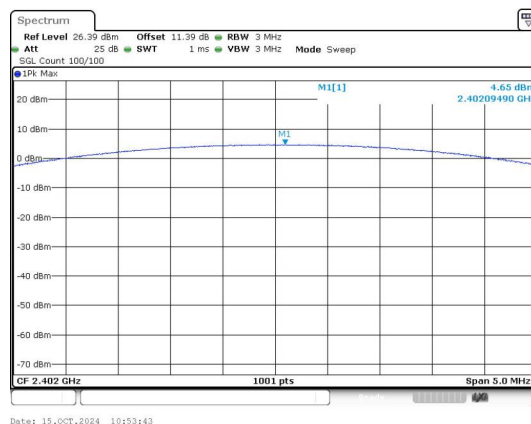
Peak Output Power
GFSK_Channel 0



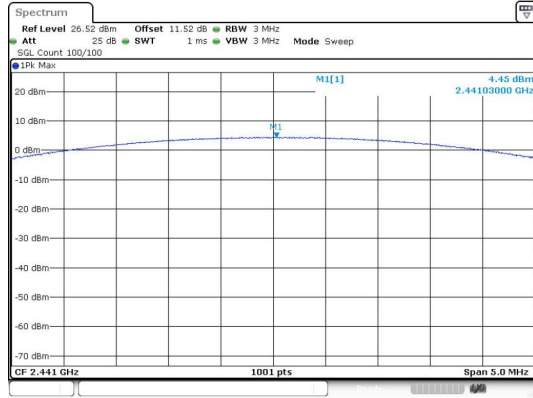
Peak Output Power
GFSK_Channel 39



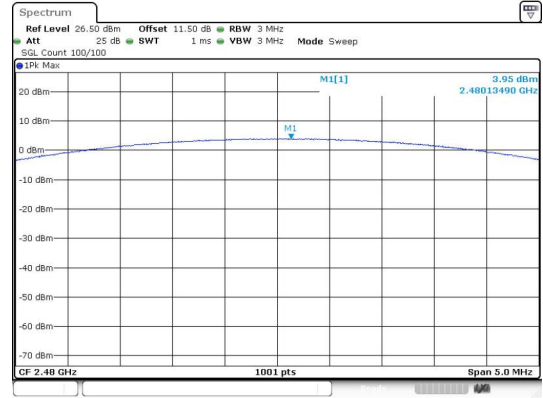
Peak Output Power
GFSK_Channel 78



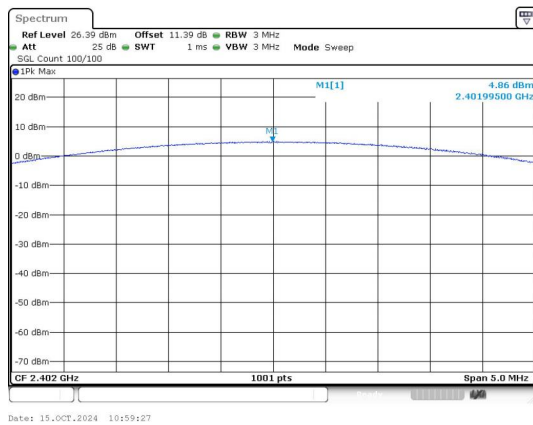
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



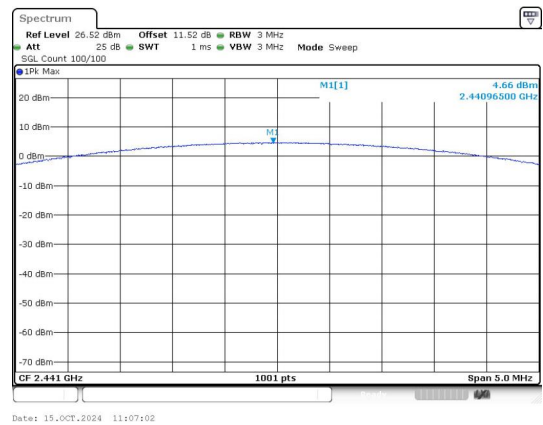
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



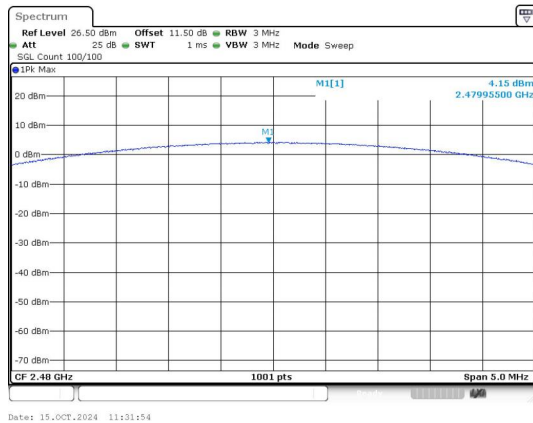
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



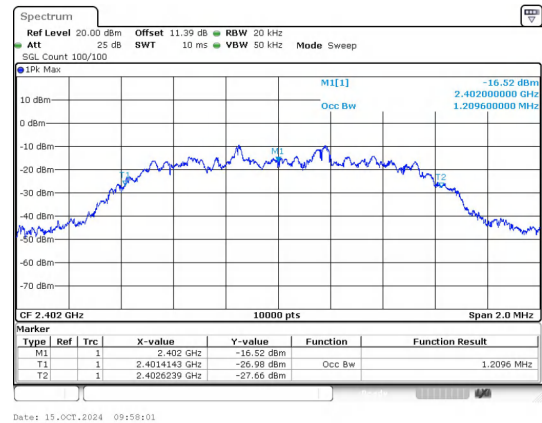
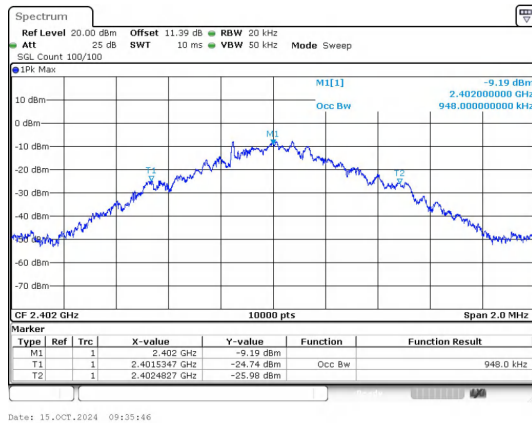
Peak Output Power
8DPSK_Channel 78

5) 99% Bandwidth

Test Result

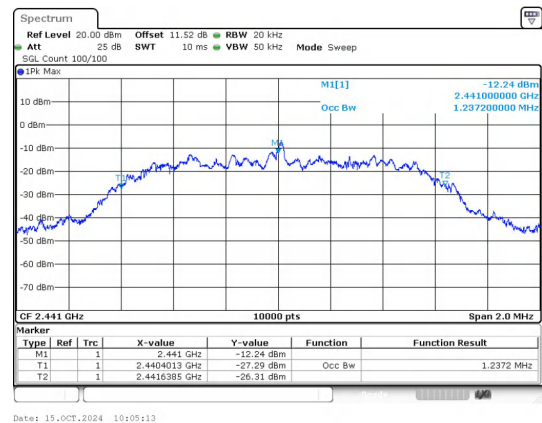
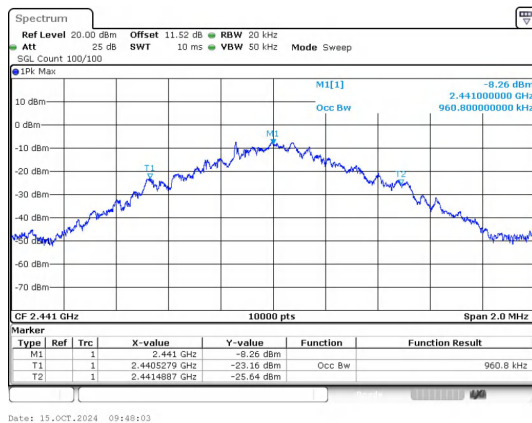
Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.9480
	39	2441	0.9608
	78	2480	0.9522
$\pi/4$ DQPSK	0	2402	1.2096
	39	2441	1.2372
	78	2480	1.2258
8DPSK	0	2402	1.2200
	39	2441	1.2214
	78	2480	1.2156

Test Graphs



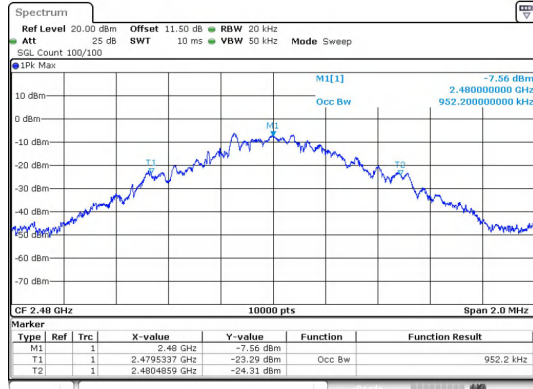
GFSK_DH5_Channel 0

$\pi/4$ DQPSK_2-DH5_Channel 0

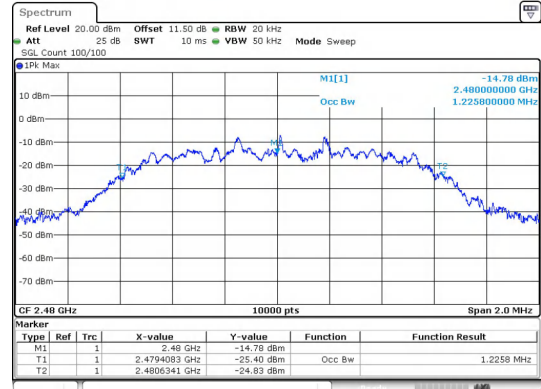


GFSK_DH5_Channel 39

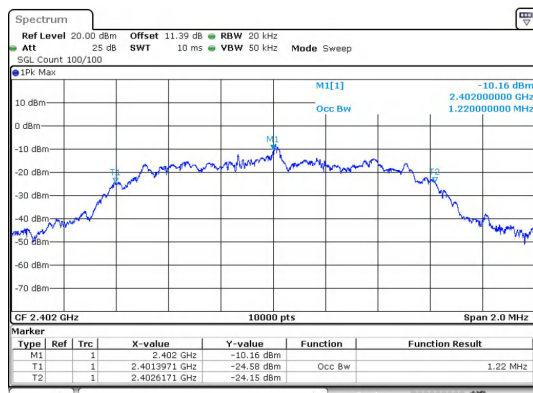
$\pi/4$ DQPSK_2-DH5_Channel 39



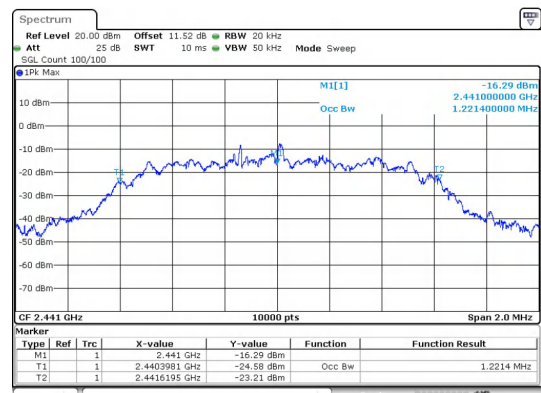
GFSK_DH5_Channel 78



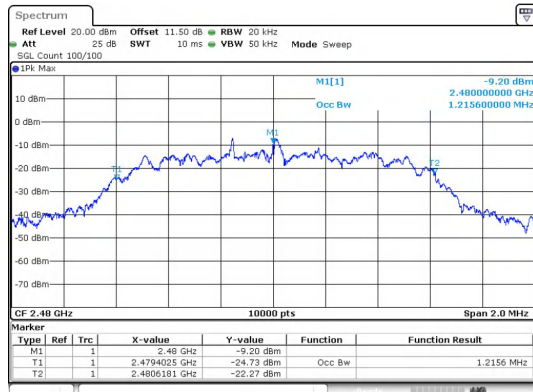
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



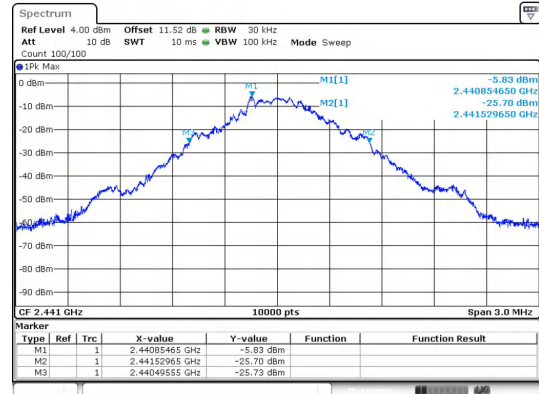
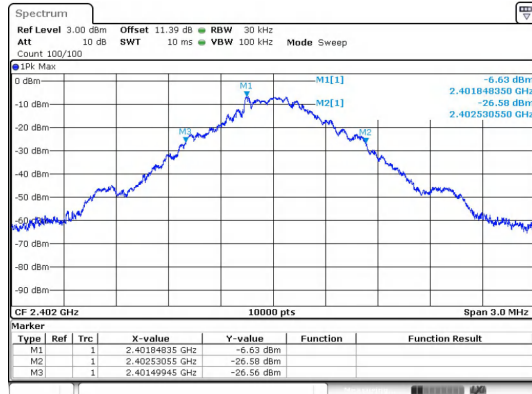
8DPSK_3-DH5_Channel 78

6) 20dB Bandwidth

Test Result

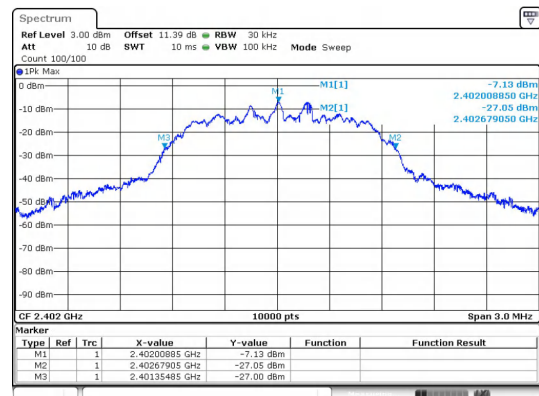
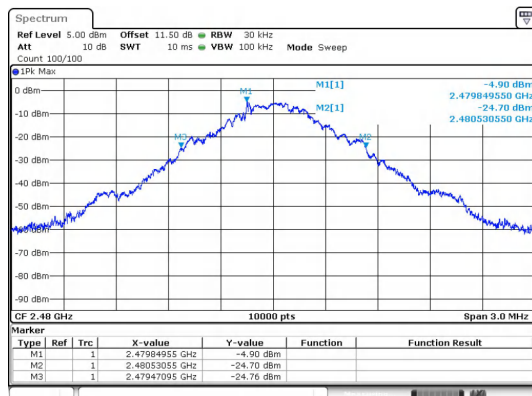
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.030
	39	2441 MHz	1.030
	78	2480 MHz	1.060
π /4DQPSK	0	2402 MHz	1.330
	39	2441 MHz	1.330
	78	2480 MHz	1.340
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.290

Test Graphs



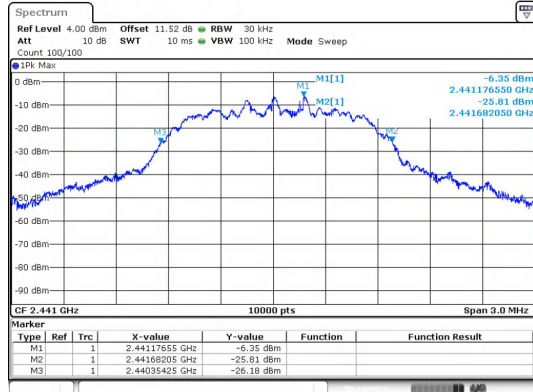
GFSK_DH5_Channel 0

GFSK_DH5_Channel 39

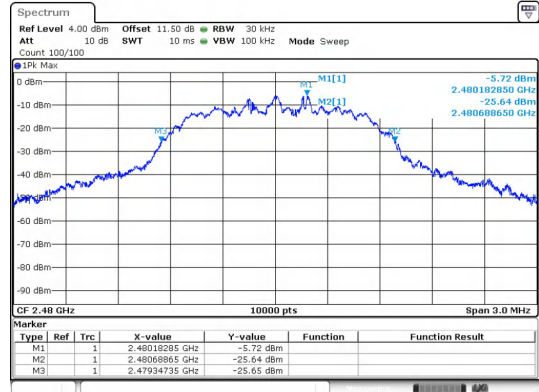


GFSK_DH5_Channel 78

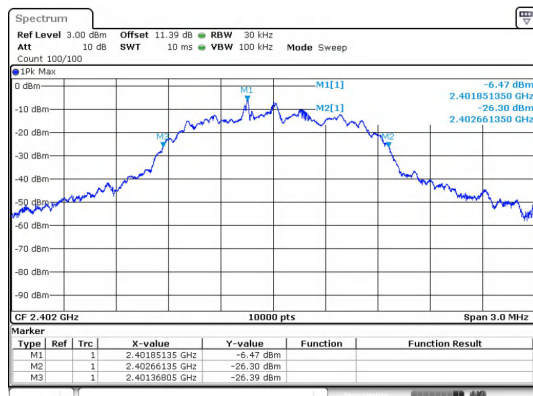
 π /4DQPSK_2-DH5_Channel 0



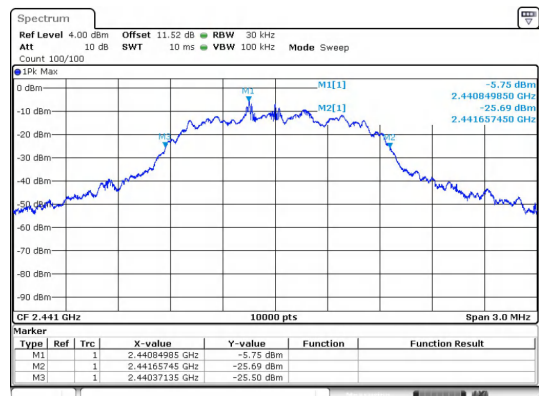
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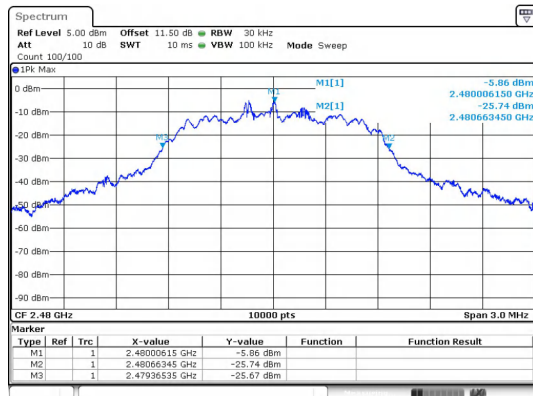
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



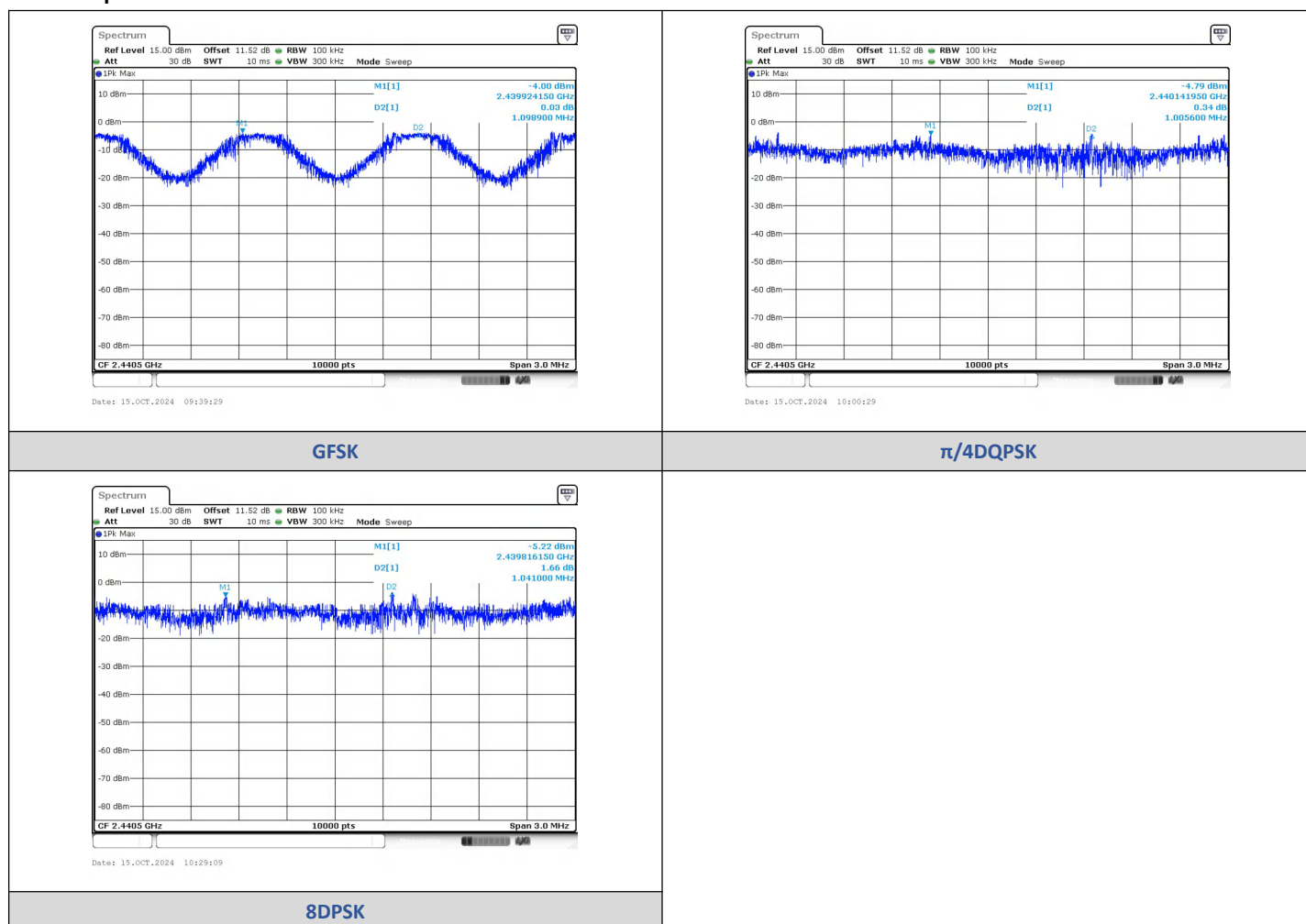
8DPSK_3-DH5_Channel 78

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	2439.9241	2441.023	1.0989	1.06	PASS
$\pi/4$ QPSK	2-DH5	2440.142	2441.1476	1.0056	0.887	PASS
8DPSK	3-DH5	2439.8162	2440.8571	1.0410	0.86	PASS

Test Graphs



8) Conducted Out Of Band Emission

Test Result

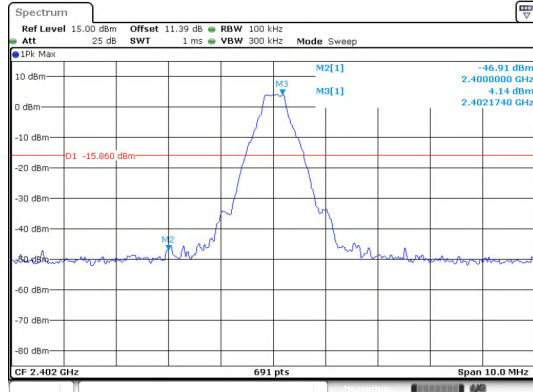
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-46.909	-15.86	-31.049	PASS
			7205.96	-35.767	-15.86	-19.907	PASS
		39	9763.72	-39.917	-16.32	-23.597	PASS
		78	2483.50	-50.214	-16.9	-33.314	PASS
			9920.20	-38.676	-16.9	-21.776	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-45.768	-16.04	-29.728	PASS
			7205.96	-41.228	-16.04	-25.188	PASS
		39	9763.72	-40.848	-16.49	-24.358	PASS
		78	2483.50	-50.078	-16.95	-33.128	PASS
			9920.20	-38.759	-16.95	-21.809	PASS
8DPSK	3-DH5	0	2400.00	-46.116	-16.02	-30.096	PASS
			7205.96	-42.256	-16.02	-26.236	PASS
		39	9763.72	-40.733	-16.01	-24.723	PASS
		78	2483.50	-50.505	-16.7	-33.805	PASS
			9920.20	-38.704	-16.7	-22.004	PASS

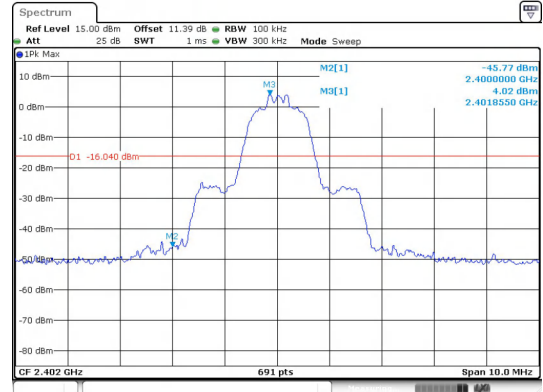
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.21	-47.816	-24.25	-23.566	PASS
			2400.00	-50.292	-24.25	-26.042	PASS
			2483.50	-48.815	-22.69	-26.125	PASS
$\pi/4$ DQPSK	2-DH5		2395.56	-47.477	-24.34	-23.137	PASS
			2400.00	-51.175	-24.34	-26.835	PASS
			2483.50	-49.197	-23.01	-26.187	PASS
8DPSK	3-DH5		2395.79	-48.044	-24.24	-23.804	PASS
			2400.00	-49.441	-24.24	-25.201	PASS
			2483.50	-50.005	-23.37	-26.635	PASS

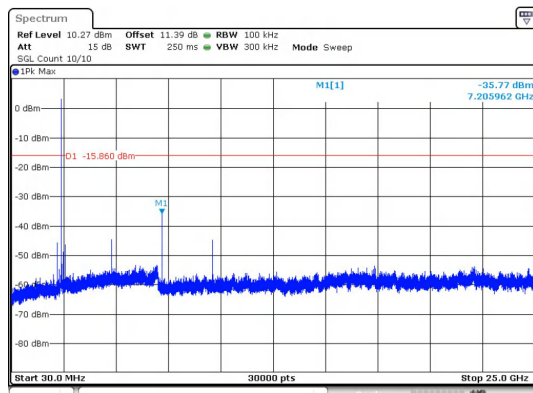
Test Graphs



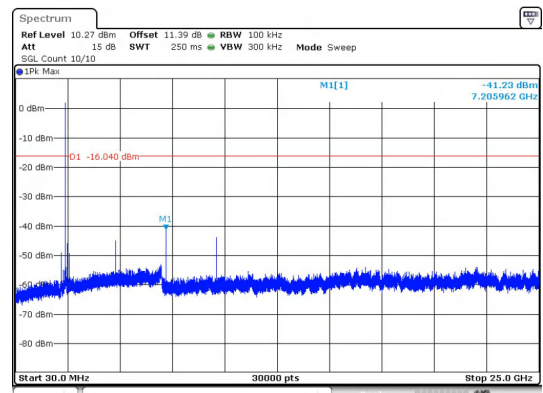
Out Of Band Emission
GFSK_DH5_Channel 0



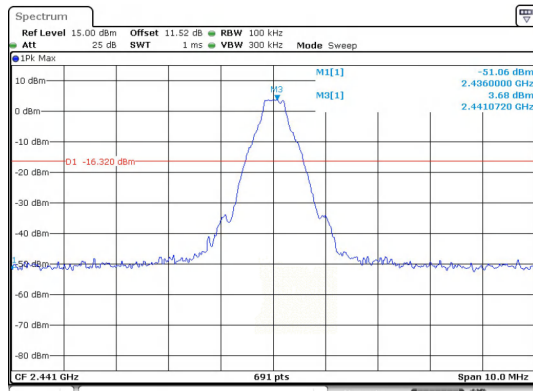
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



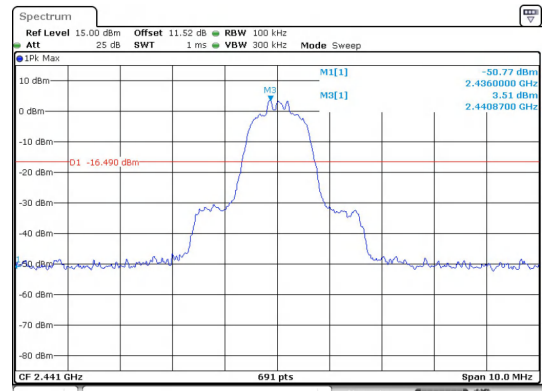
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



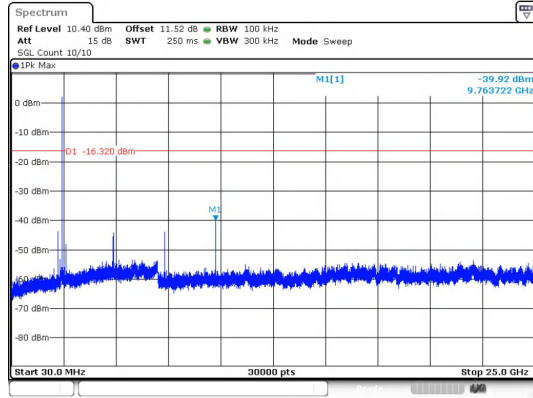
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



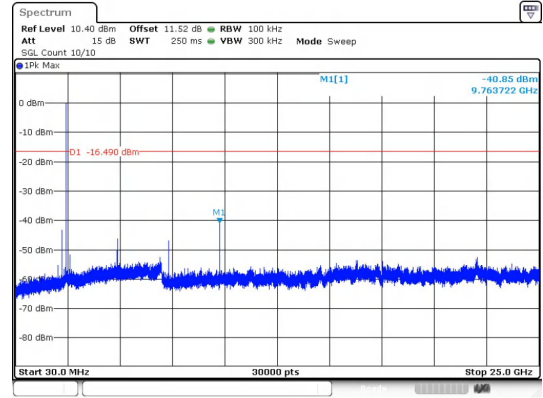
Out Of Band Emission
GFSK_DH5_Channel 39



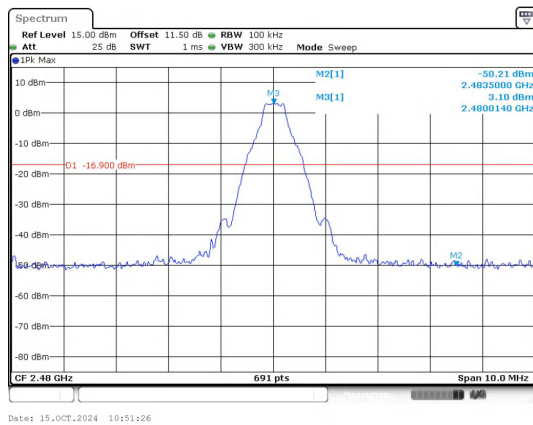
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



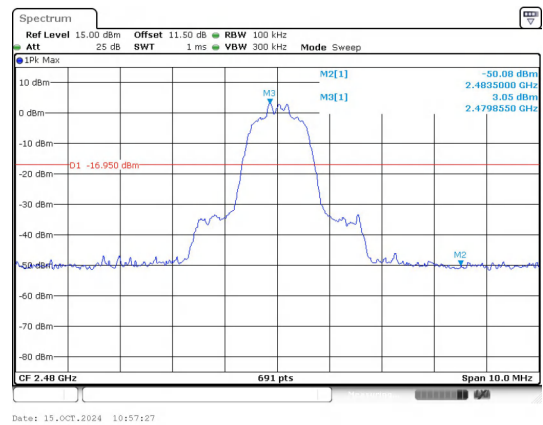
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



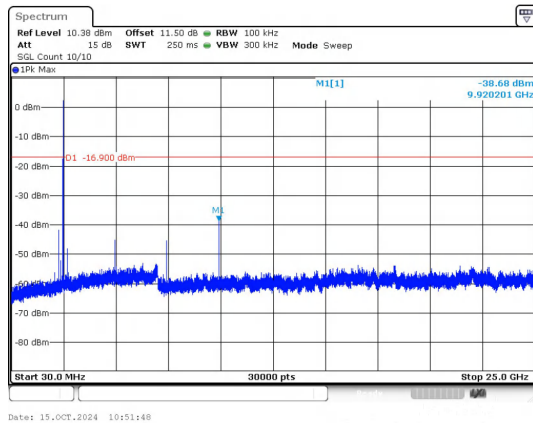
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



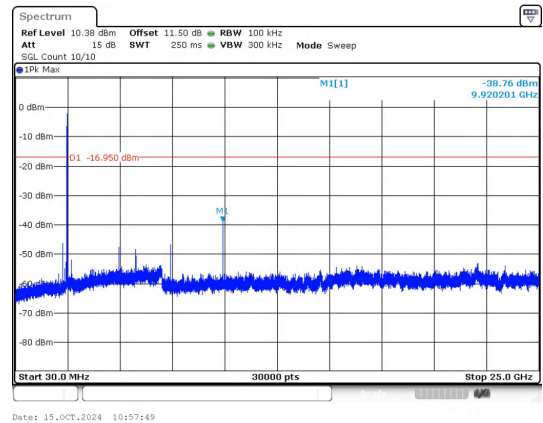
Out Of Band Emission
GFSK_DH5_Channel 78



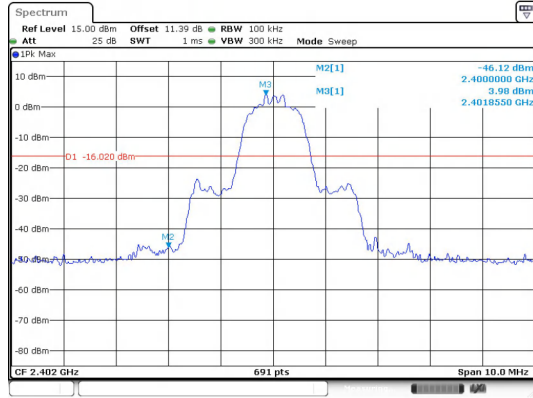
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



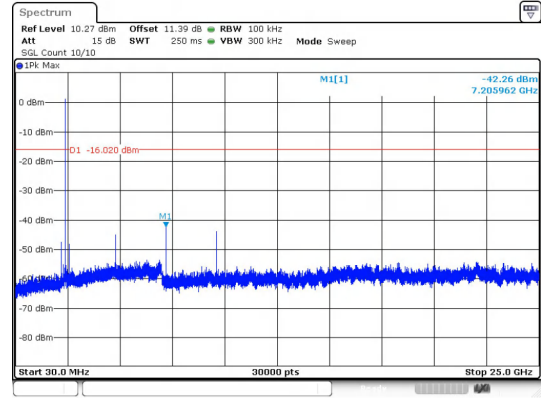
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



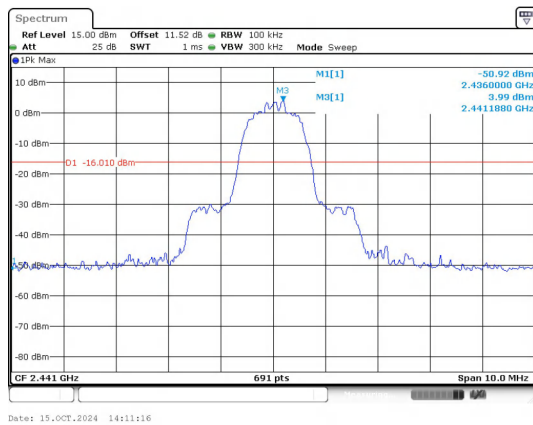
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



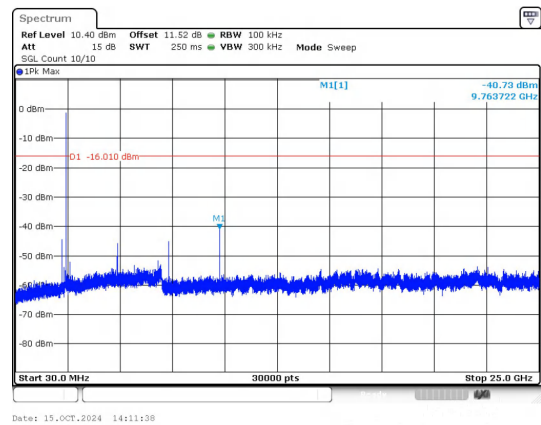
Out Of Band Emission
8DPSK_3-DH5_Channel 0



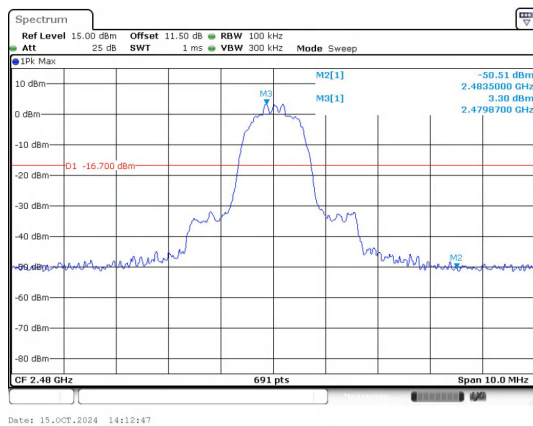
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



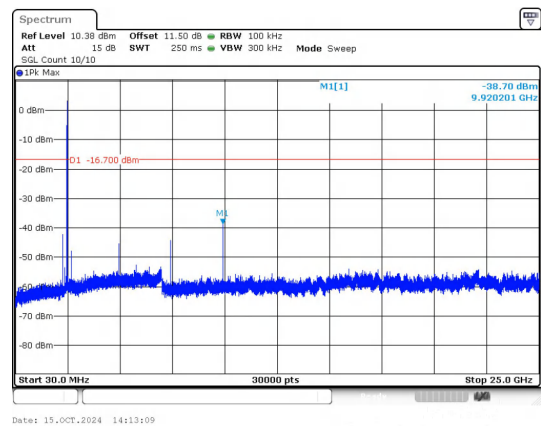
Out Of Band Emission
8DPSK_3-DH5_Channel 39



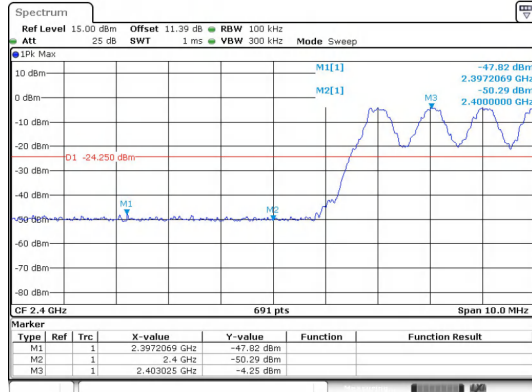
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



Out Of Band Emission
8DPSK_3-DH5_Channel 78

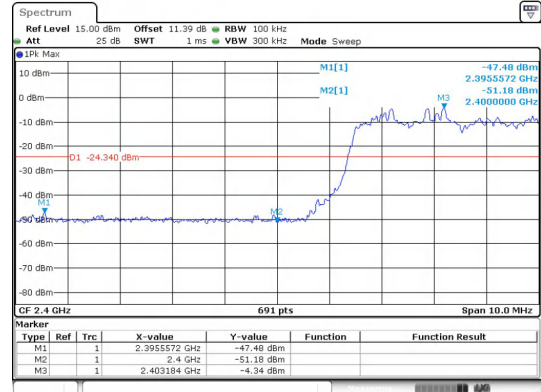


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



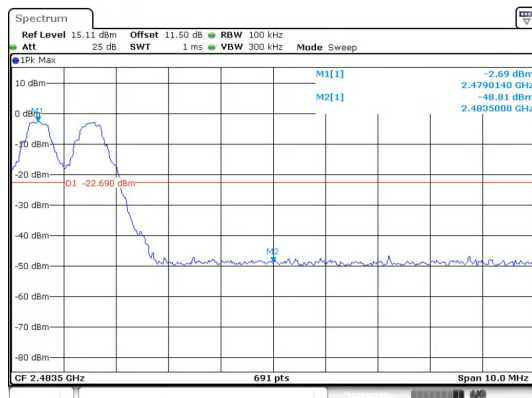
Date: 15.OCT.2024 09:43:14

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



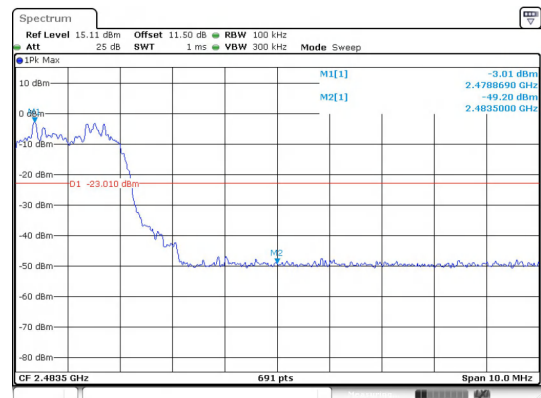
Date: 15.OCT.2024 10:03:28

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



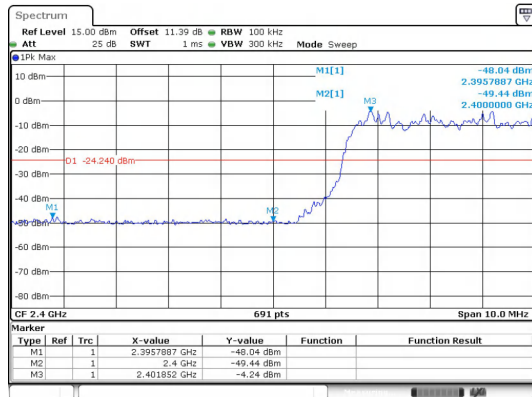
Date: 15.OCT.2024 09:45:14

Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



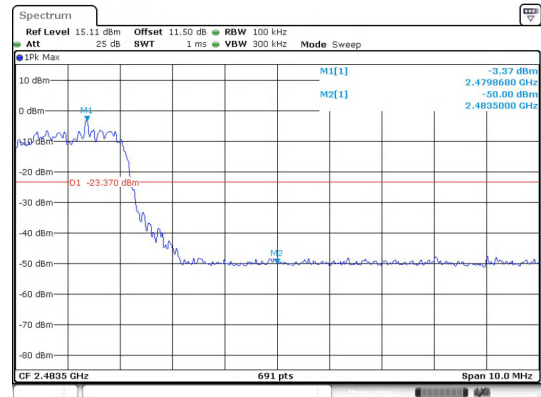
Date: 15.OCT.2024 10:04:24

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



Date: 15.OCT.2024 10:33:09

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



Date: 15.OCT.2024 10:33:39

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