

Appendix

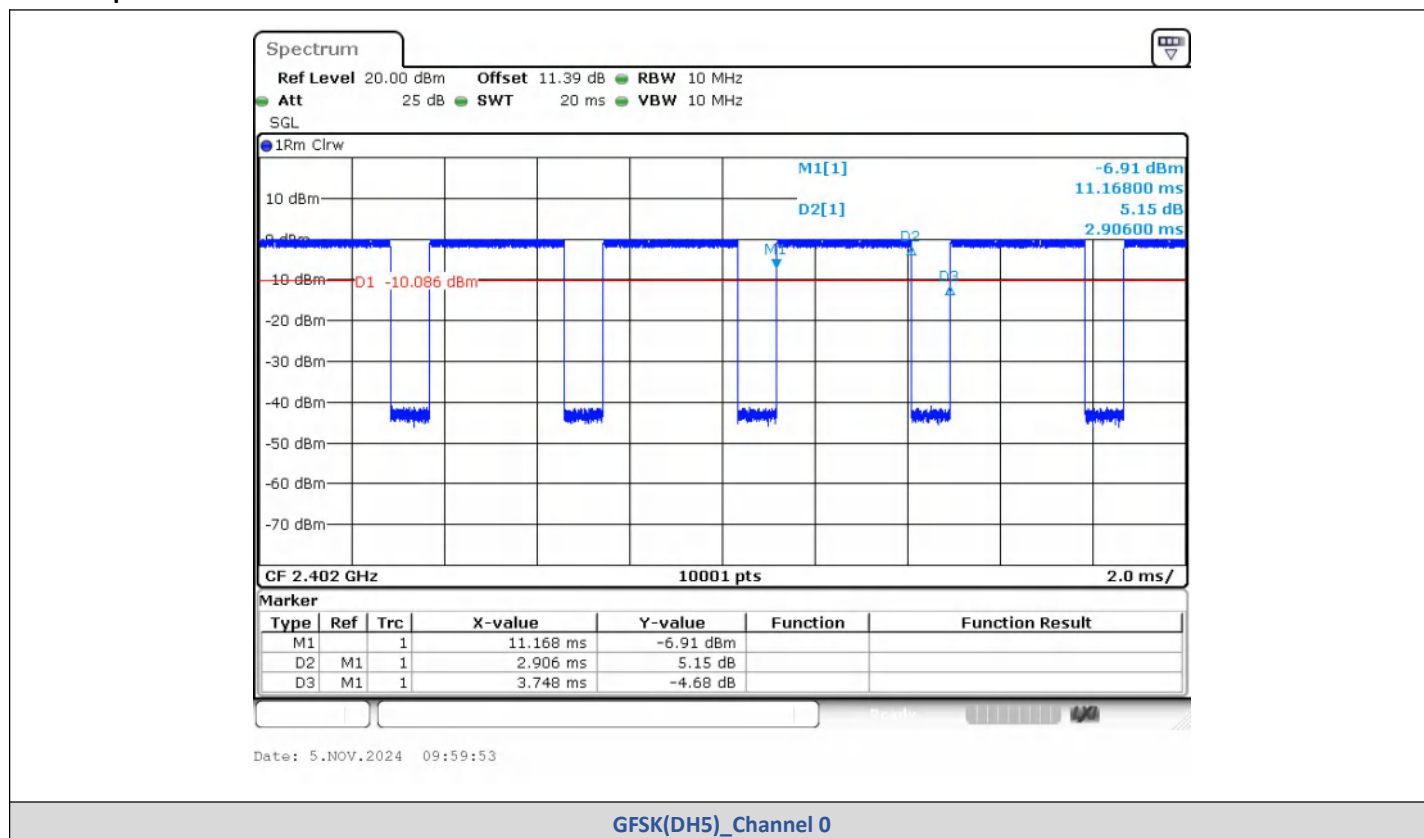
Report No.:	CISRR24110401704
FCC ID:	2BFNQ-M45
Product Name:	TWS wireless Bluetooth headset
Model No.:	M45
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

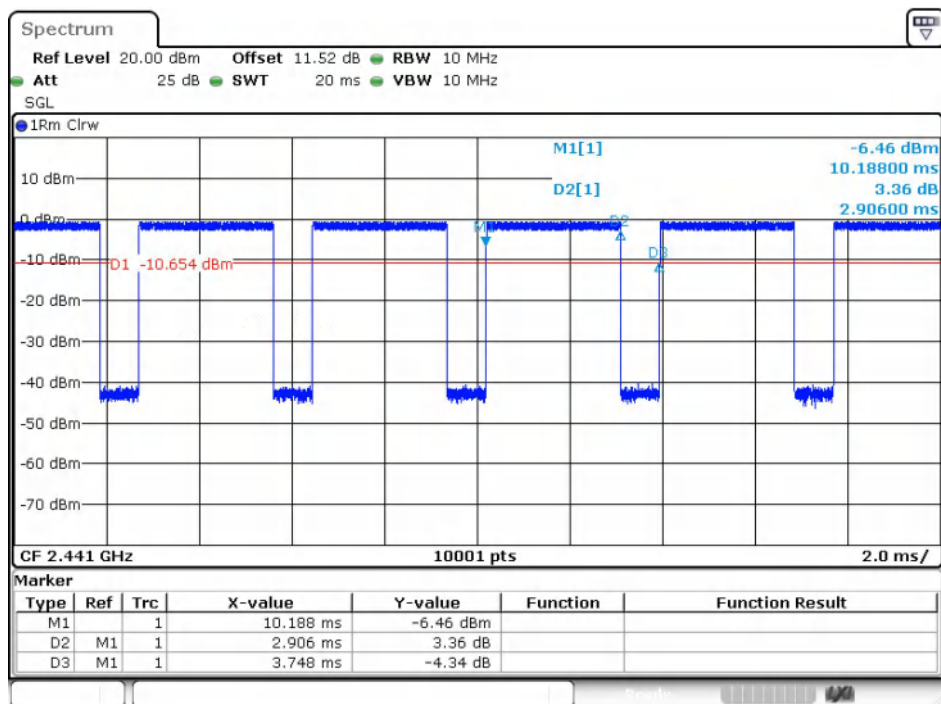
1) Duty Cycle

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	2.908	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	2.916	3.748	77.80	0.7780	1.0902	0.3429

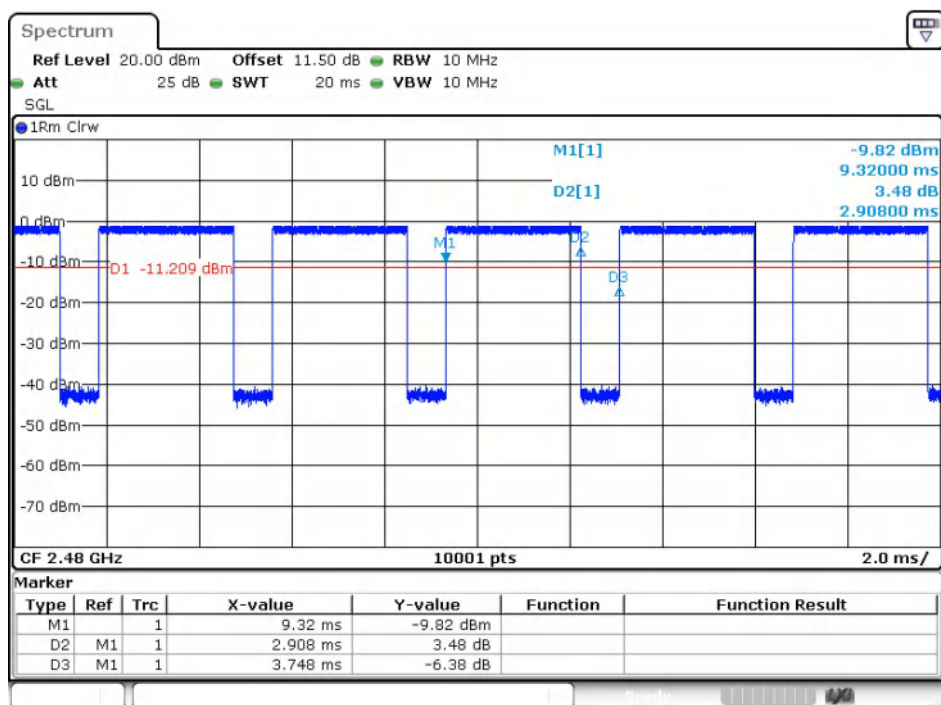
Test Graphs





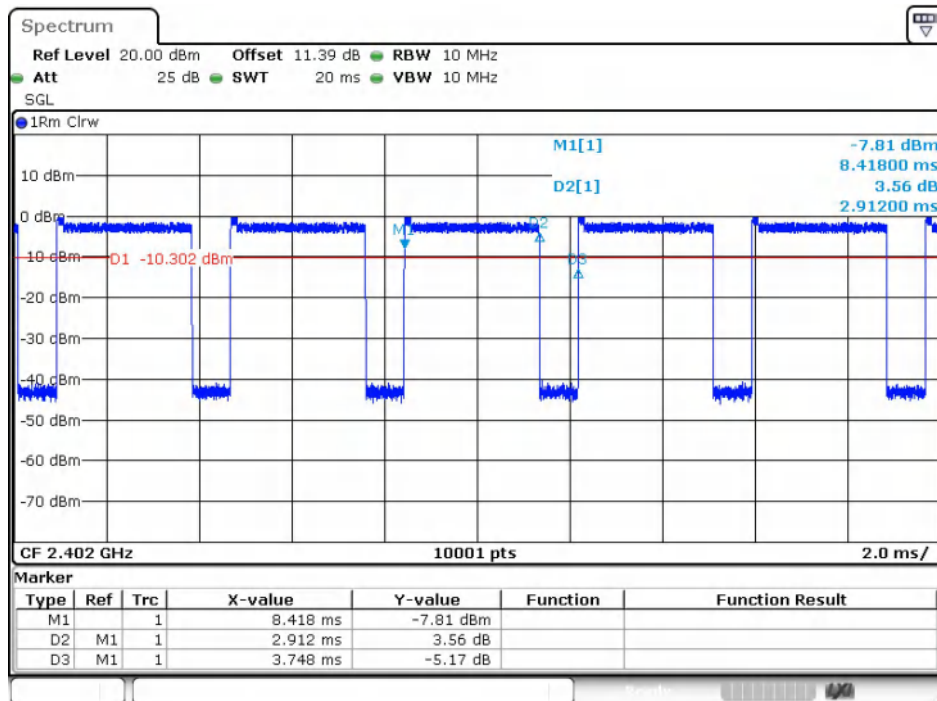
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GFSK(DH5)_Channel 39



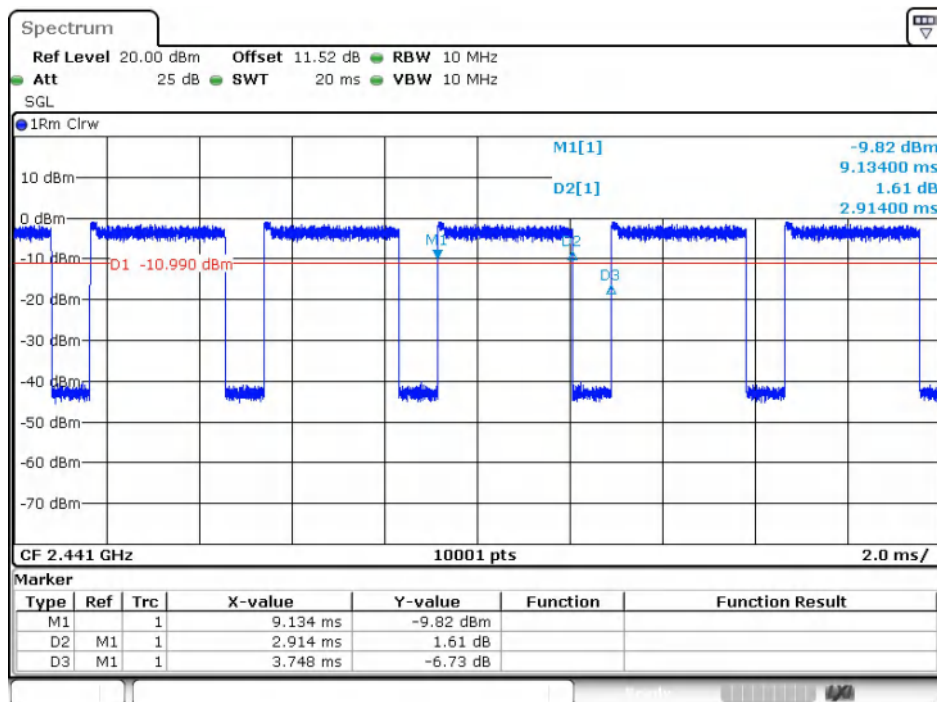
Date: 5.NOV.2024 10:12:59

GFSK(DH5)_Channel 78



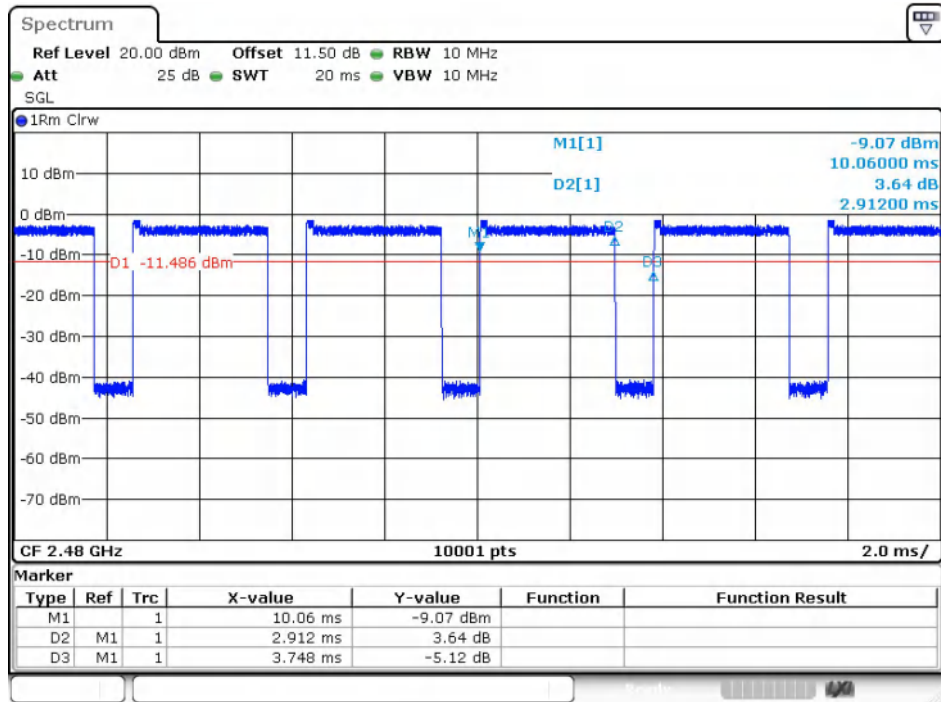
Date: 5.NOV.2024 10:15:35

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



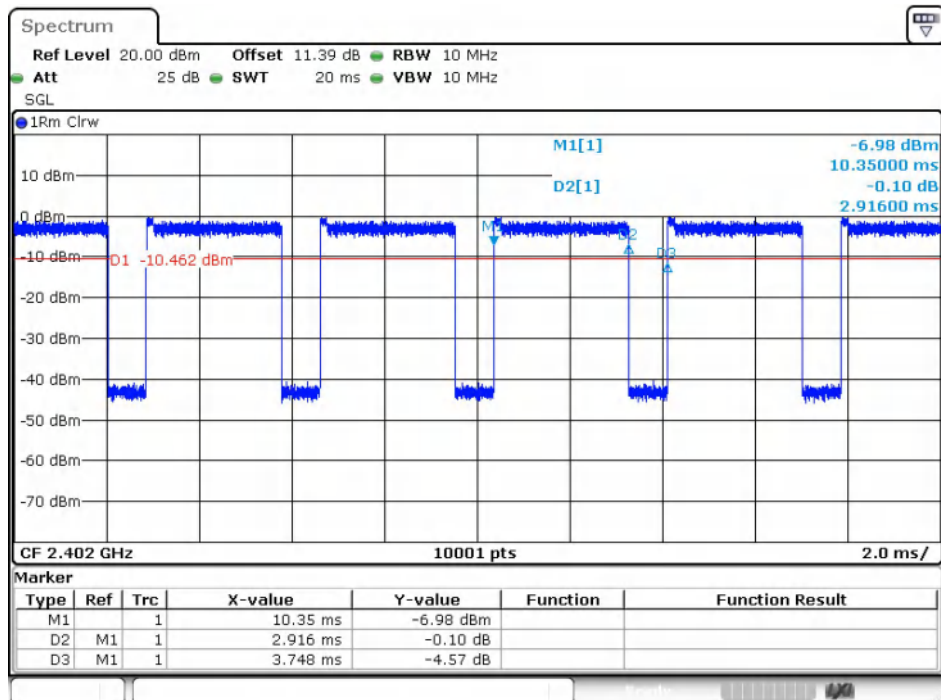
Date: 5.NOV.2024 10:26:03

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



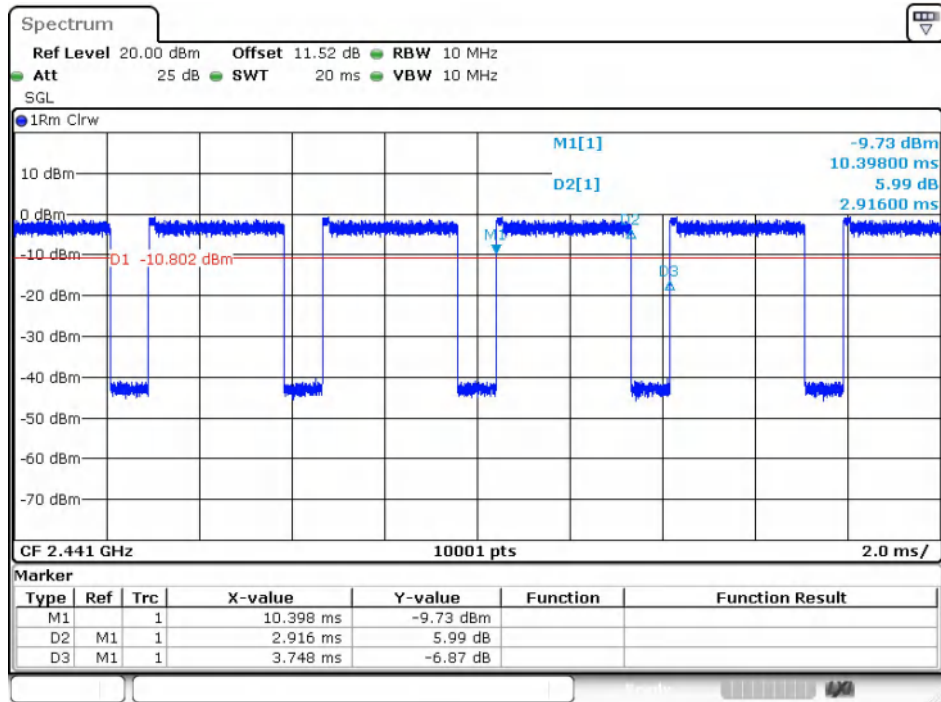
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$\pi/4$ DQPSK(2-DH5)_Channel 78



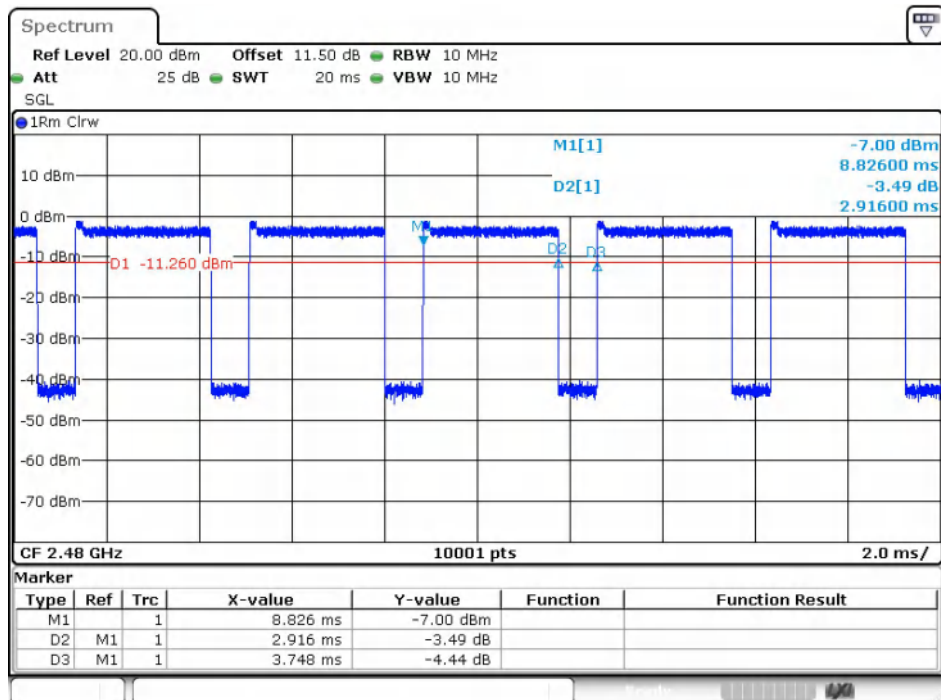
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8DPSK(3-DH5)_Channel 0



Date: 5.NOV.2024 10:39:19

8DPSK(3-DH5)_Channel 39



Date: 5.NOV.2024 10:41:32

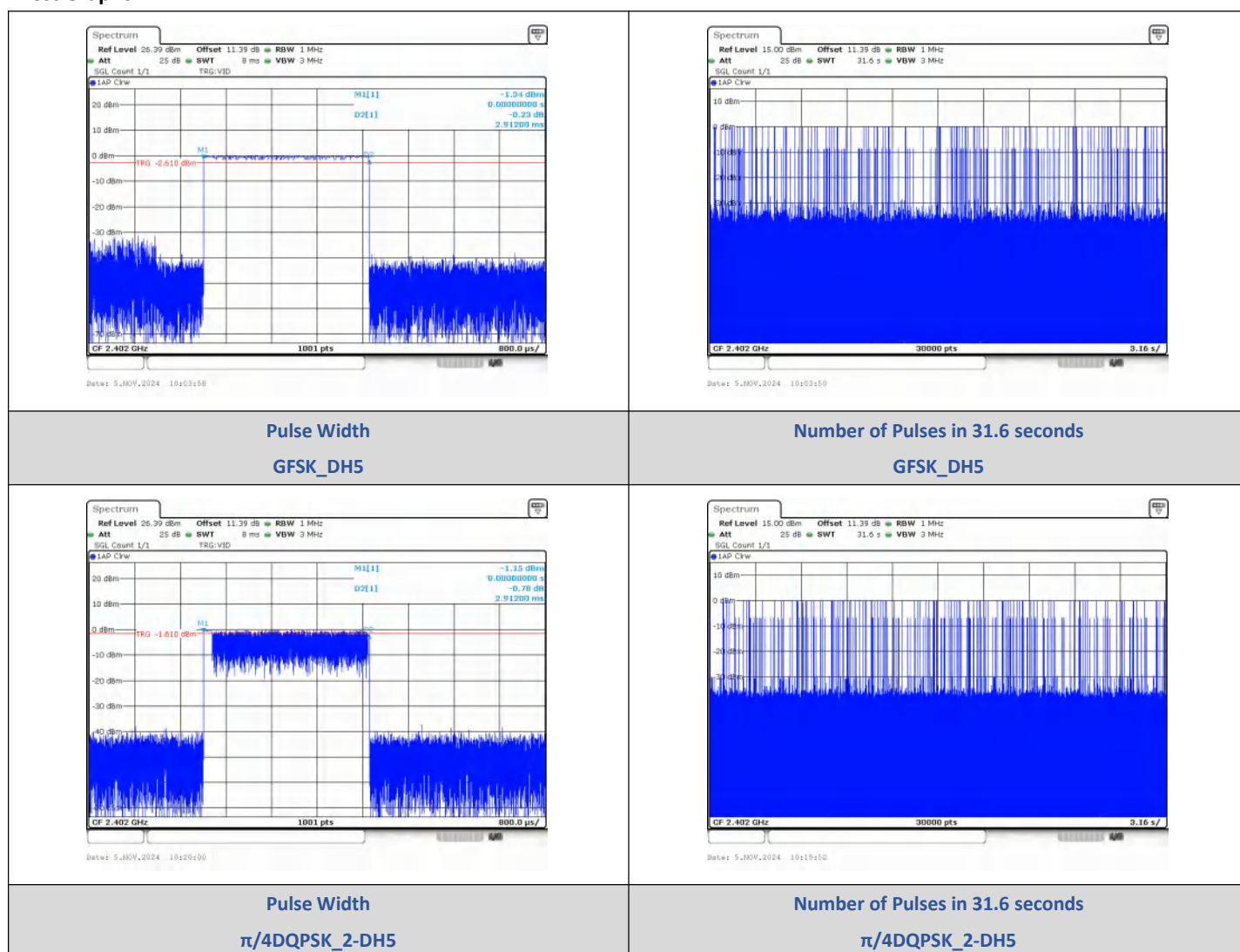
8DPSK(3-DH5)_Channel 78

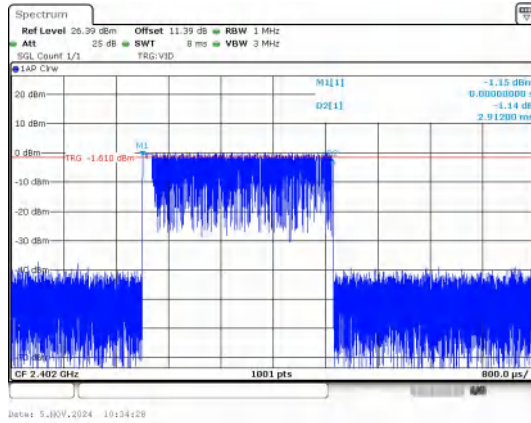
2) Dwell Time

Test Result

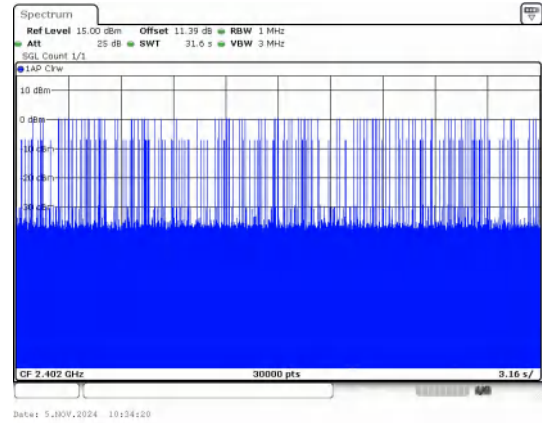
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.912	106	308.67	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.912	107	311.58		PASS
8DPSK	3-DH5		2.912	103	299.94		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



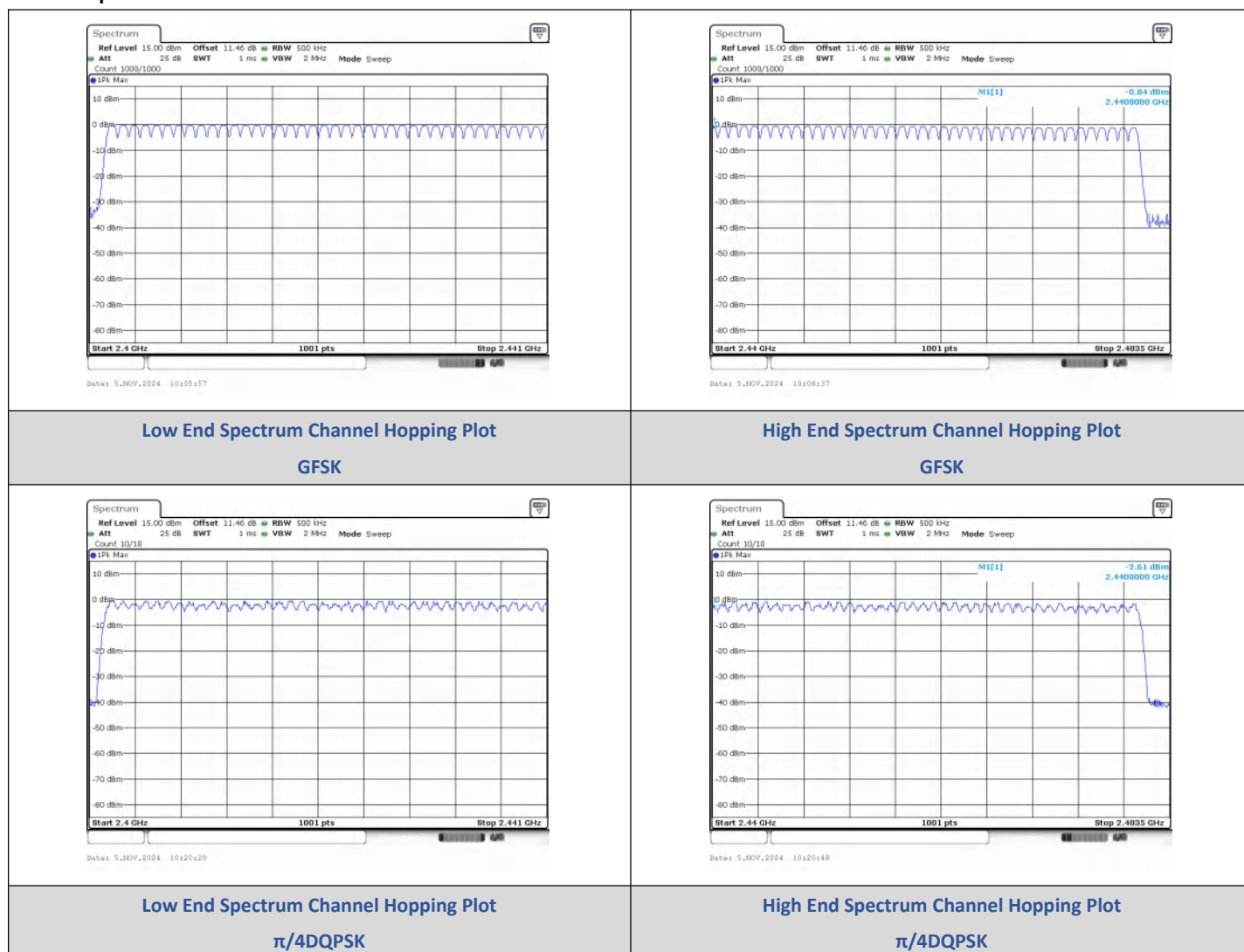
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

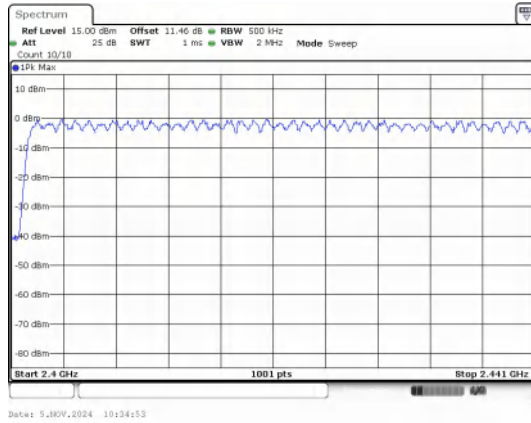
3) Number Of Hopping Channel

Test Result

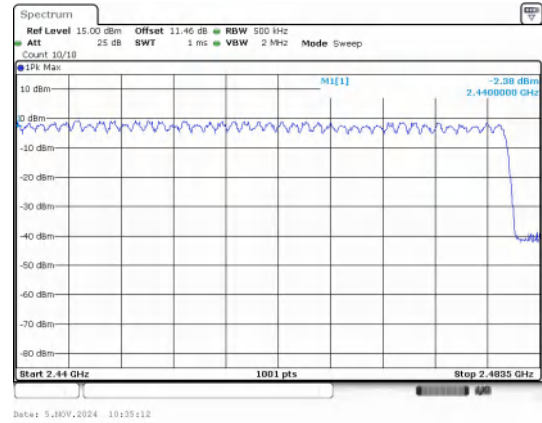
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



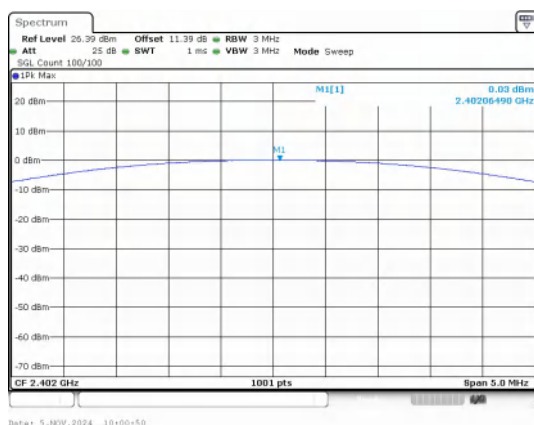
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Peak Output Power

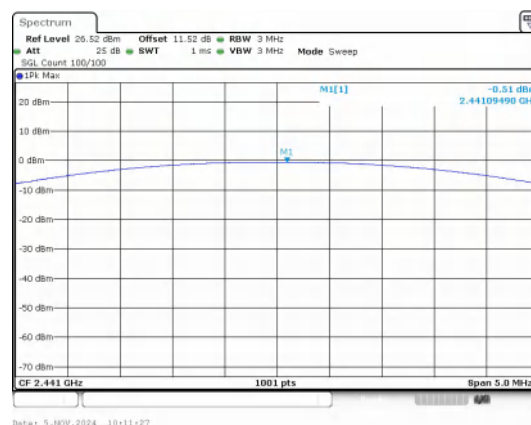
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	0.03	1.01	≤30	PASS
		39	-0.51	0.89		PASS
		78	-1.04	0.79		PASS
$\pi/4$ DQPSK	2-DH5	0	0.55	1.14	≤20.97	PASS
		39	-0.11	0.98		PASS
		78	-0.57	0.88		PASS
8DPSK	3-DH5	0	0.65	1.16		PASS
		39	0.26	1.06		PASS
		78	-0.20	0.96		PASS

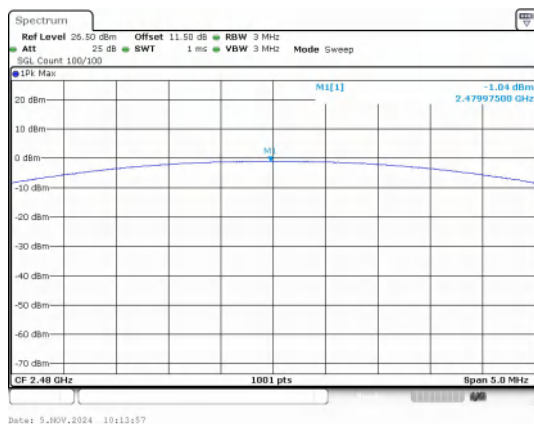
Test Graphs



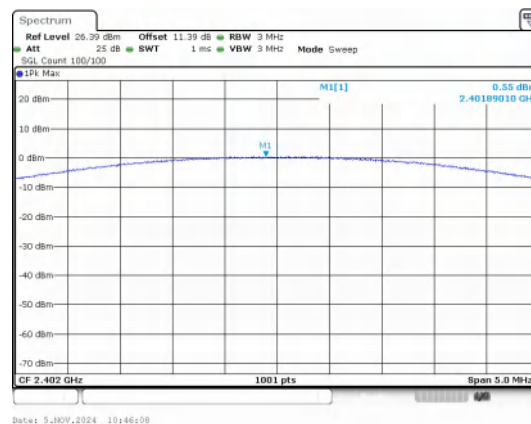
Peak Output Power
GFSK_Channel 0



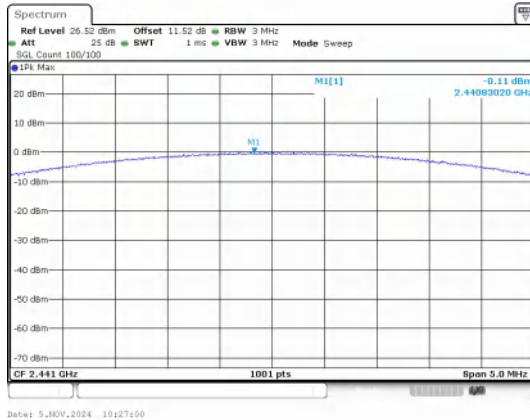
Peak Output Power
GFSK_Channel 39



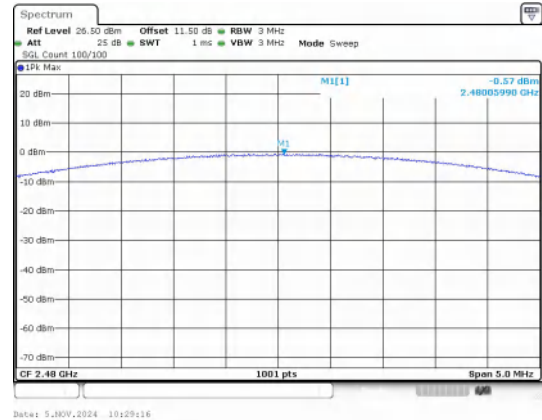
Peak Output Power
GFSK_Channel 78



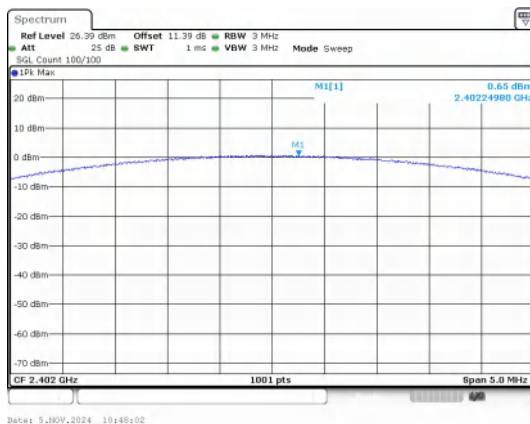
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



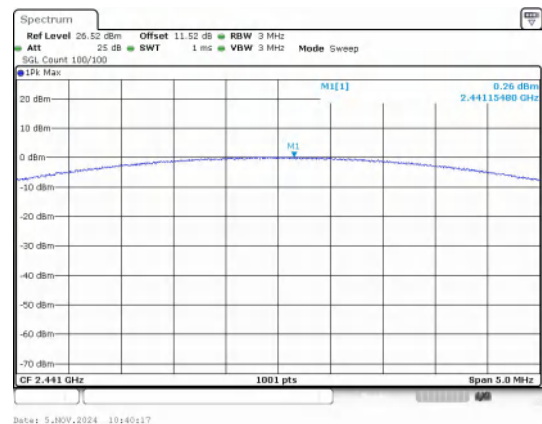
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



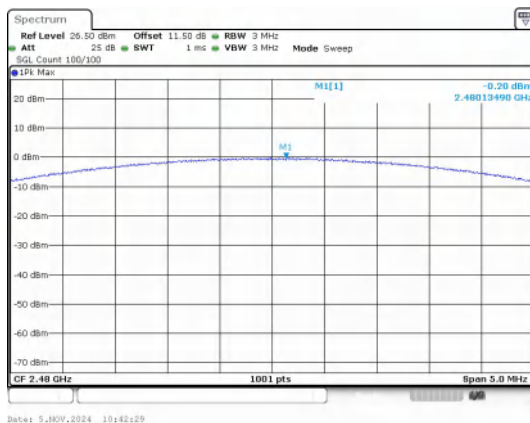
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



Peak Output Power
8DPSK_Channel 78

5) 99% Bandwidth

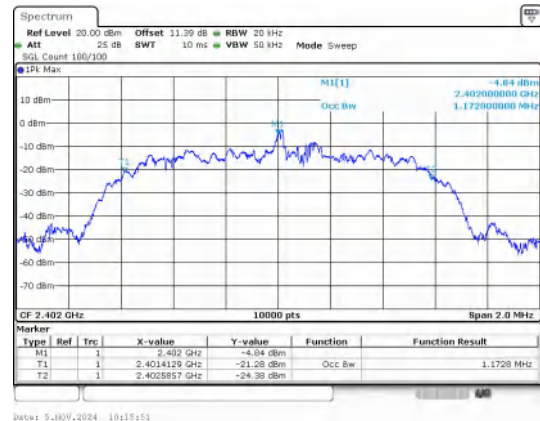
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.86760
	39	2441	0.86020
	78	2480	0.84960
$\pi/4$ DQPSK	0	2402	1.1728
	39	2441	1.1810
	78	2480	1.1800
8DPSK	0	2402	1.1768
	39	2441	1.1740
	78	2480	1.1788

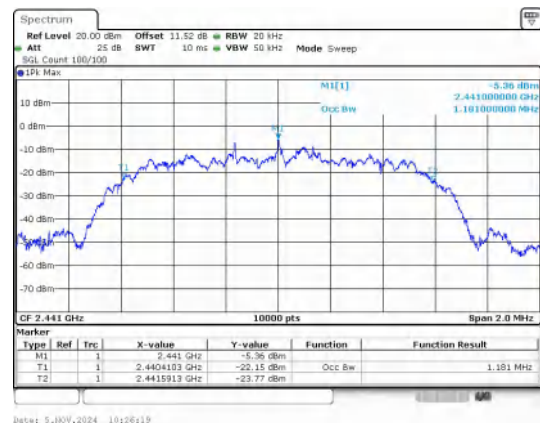
Test Graphs

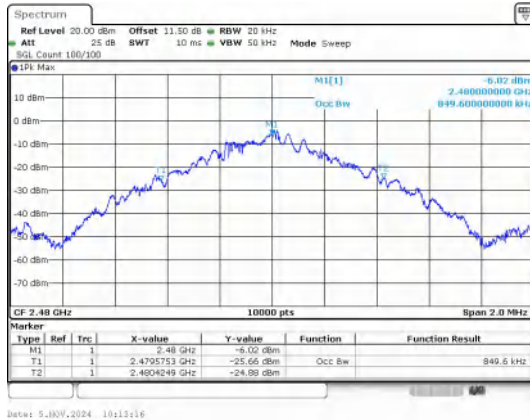


GFSK_DH5_Channel 0

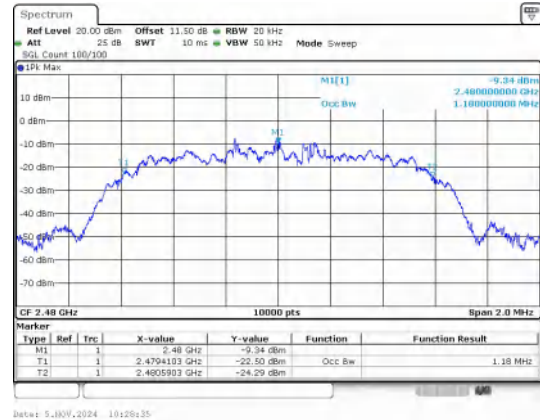

 $\pi/4$ DQPSK_2-DH5_Channel 0


GFSK_DH5_Channel 39

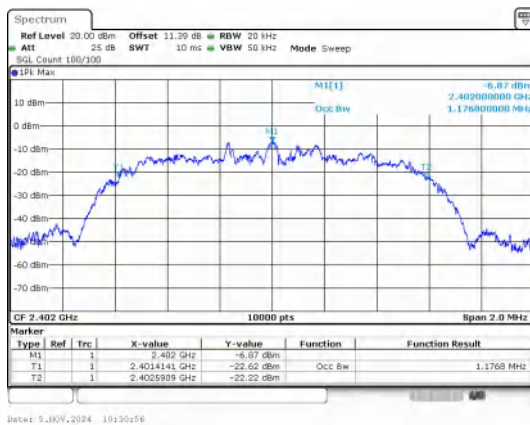

 $\pi/4$ DQPSK_2-DH5_Channel 39



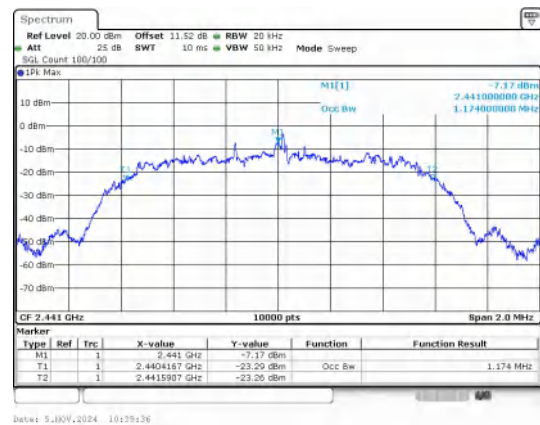
GFSK_DH5_Channel 78



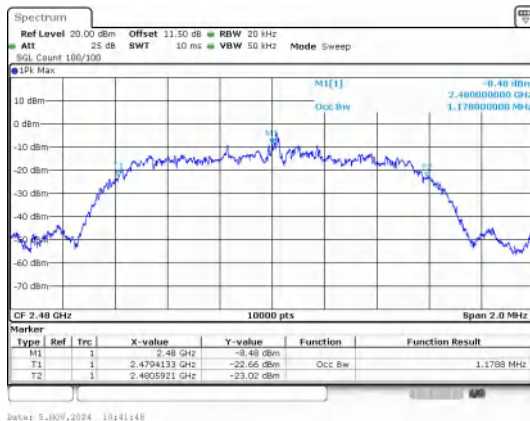
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



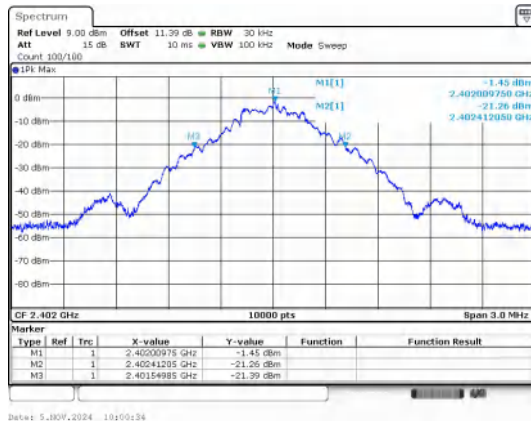
8DPSK_3-DH5_Channel 78

6) 20dB Bandwidth

Test Result

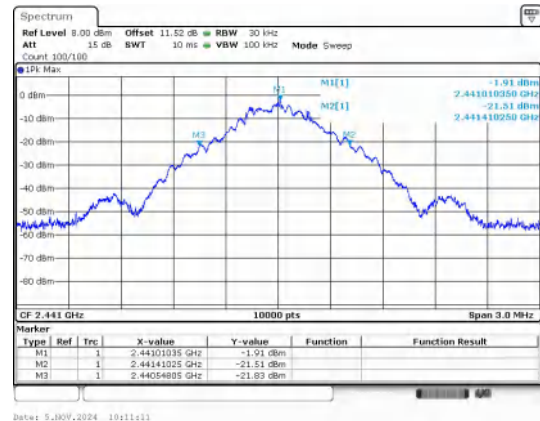
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.8600
	39	2441 MHz	0.8600
	78	2480 MHz	0.8600
$\pi/4$ DQPSK	0	2402 MHz	1.200
	39	2441 MHz	1.200
	78	2480 MHz	1.200
8DPSK	0	2402 MHz	1.240
	39	2441 MHz	1.240
	78	2480 MHz	1.250

Test Graphs



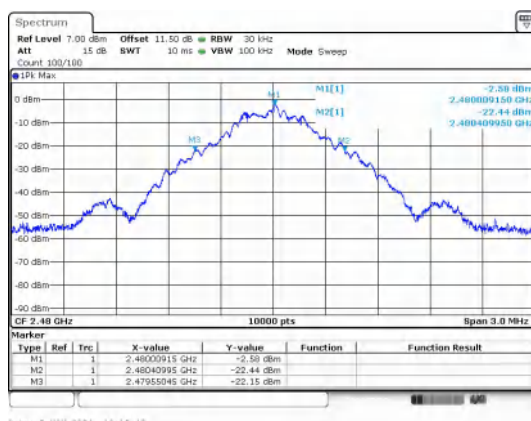
Date: 5.NOV.2024 10:00:34

GFSK_DH5_Channel 0



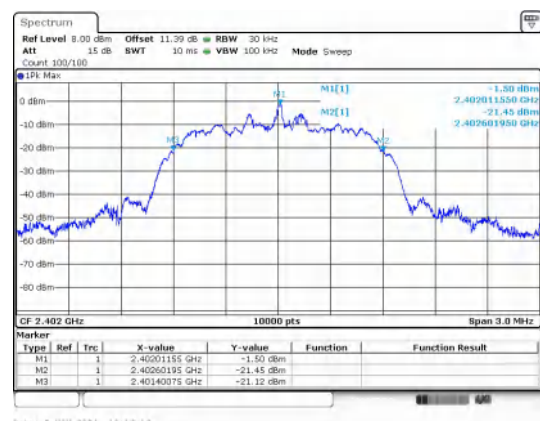
Date: 5.NOV.2024 10:11:11

GFSK_DH5_Channel 39



Date: 5.NOV.2024 10:12:40

GFSK_DH5_Channel 78



Date: 5.NOV.2024 10:16:16

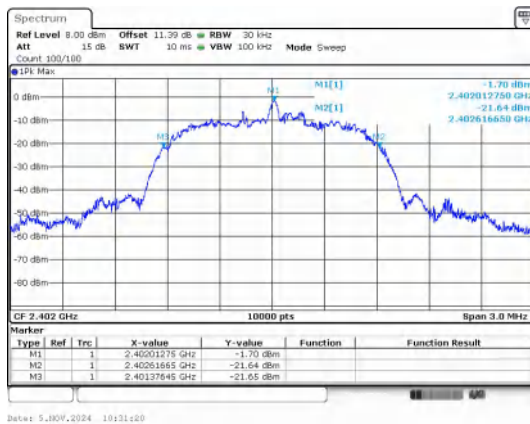
 $\pi/4$ DQPSK_2-DH5_Channel 0



$\pi/4$ DQPSK_2-DH5_Channel 39



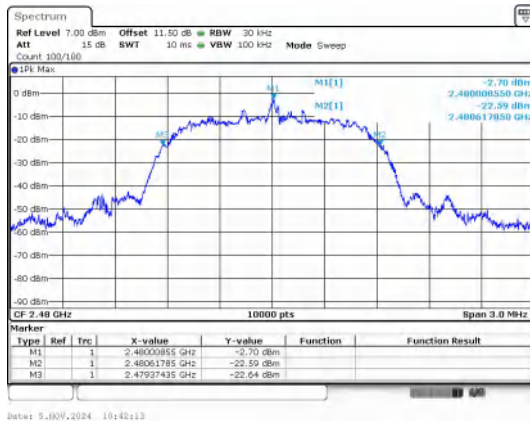
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



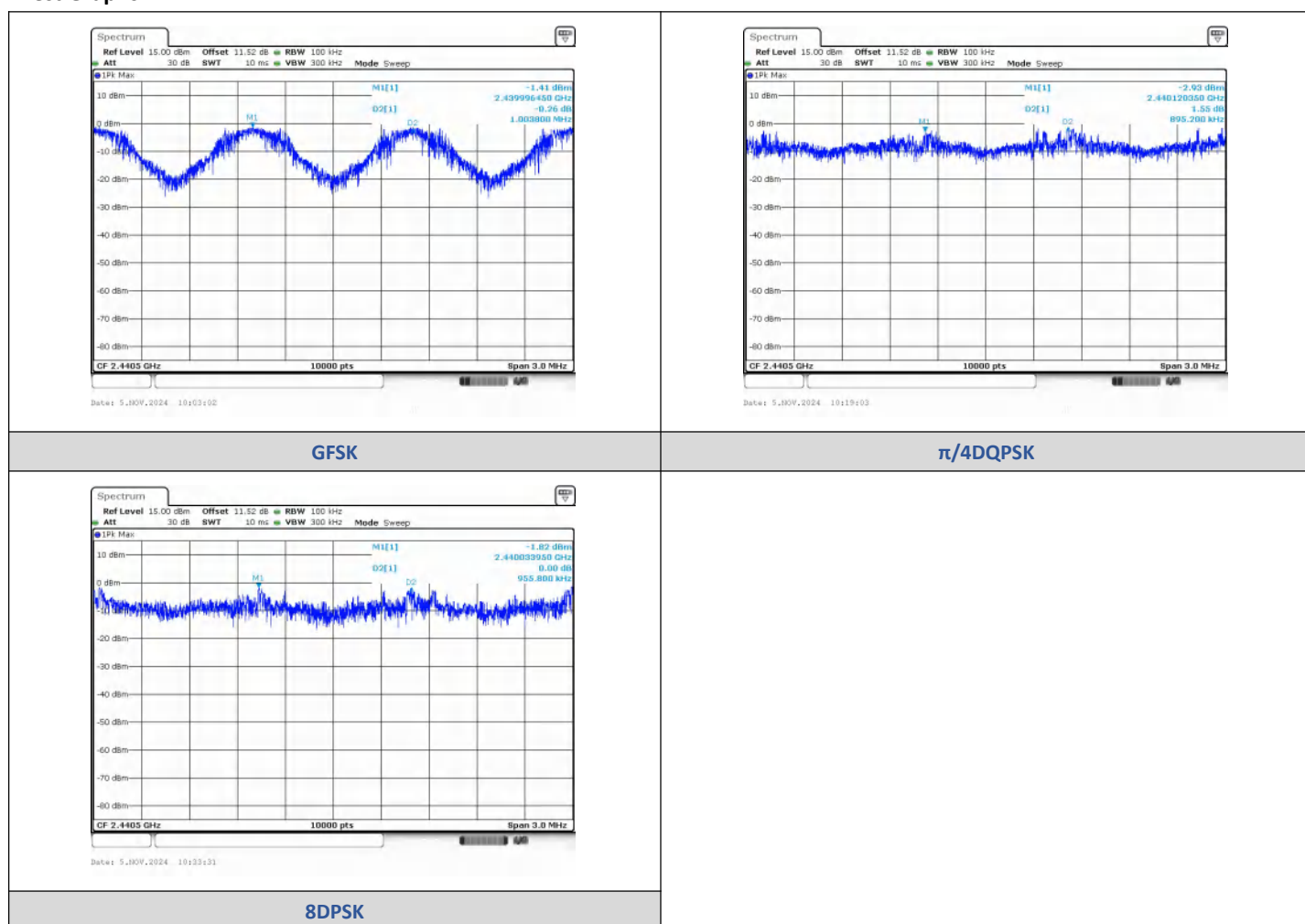
8DPSK_3-DH5_Channel 78

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	2439.9965	2441.0003	1.0038	0.86	PASS
$\pi/4$ QPSK	2-DH5	2440.1204	2441.0156	0.8952	0.8	PASS
8DPSK	3-DH5	2440.034	2440.9898	0.9558	0.827	PASS

Test Graphs



8) Conducted Out Of Band Emission

Test Result

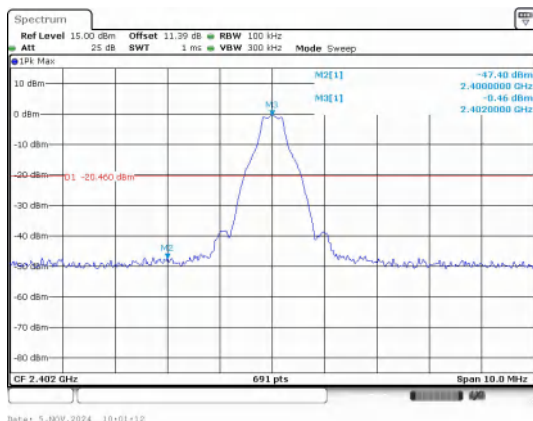
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2394.24	-45.722	-20.46	-25.262	PASS
			2400.00	-47.400	-20.46	-26.940	PASS
		39	2519.09	-49.672	-21.02	-28.652	PASS
		78	2483.50	-49.550	-21.61	-27.940	PASS
			2558.21	-51.097	-21.61	-29.487	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-47.820	-20.88	-26.940	PASS
			4803.85	-47.167	-20.88	-26.287	PASS
		39	9763.72	-50.836	-21.41	-29.426	PASS
		78	1958.93	-39.924	-21.92	-18.004	PASS
			2483.50	-49.570	-21.92	-27.650	PASS
8DPSK	3-DH5	0	2400.00	-48.220	-20.81	-27.410	PASS
			4803.85	-47.601	-20.81	-26.791	PASS
		39	9763.72	-50.721	-21.38	-29.341	PASS
		78	2483.50	-49.020	-21.87	-27.150	PASS
			2532.41	-53.266	-21.87	-31.396	PASS

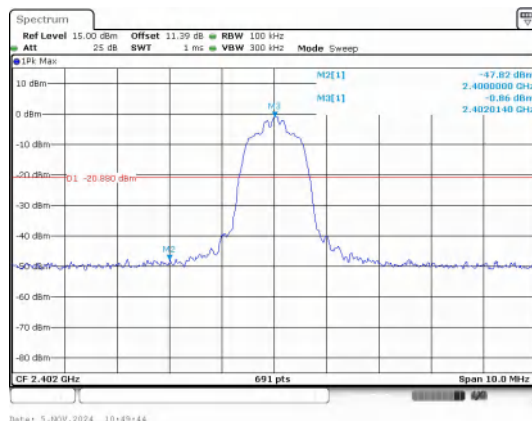
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.64	-43.296	-20.61	-22.686	PASS
			2400.00	-46.270	-20.61	-25.660	PASS
			2483.50	-48.880	-21.72	-27.160	PASS
$\pi/4$ DQPSK	2-DH5		2397.13	-47.188	-21.01	-26.178	PASS
			2400.00	-48.340	-21.01	-27.330	PASS
			2483.50	-49.740	-22.05	-27.690	PASS
8DPSK	3-DH5		2398.31	-48.608	-21.57	-27.038	PASS
			2400.00	-50.570	-21.57	-29.000	PASS
			2483.50	-49.790	-21.9	-27.890	PASS

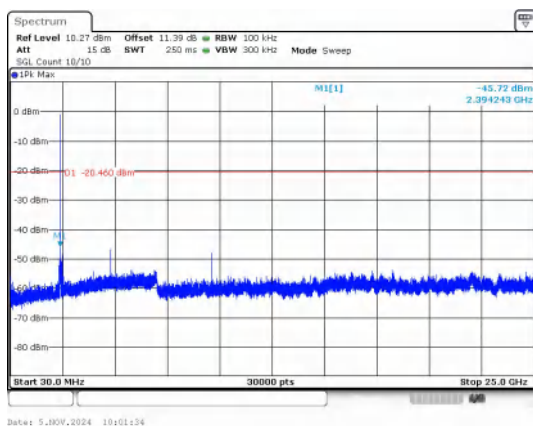
Test Graphs



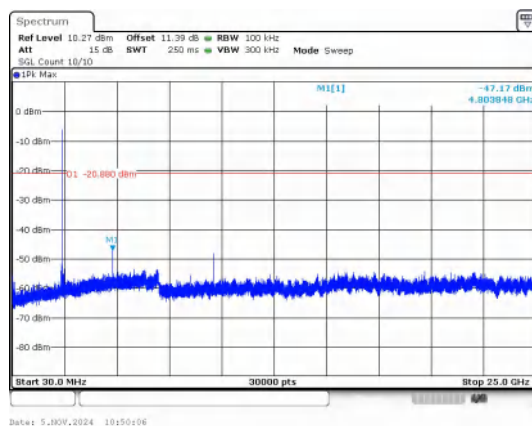
Out Of Band Emission
GFSK_DH5_Channel 0



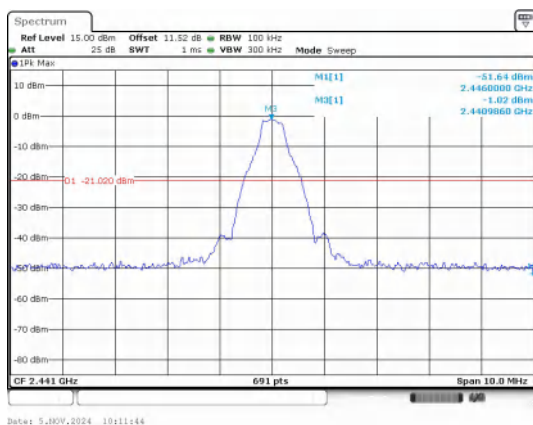
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 0



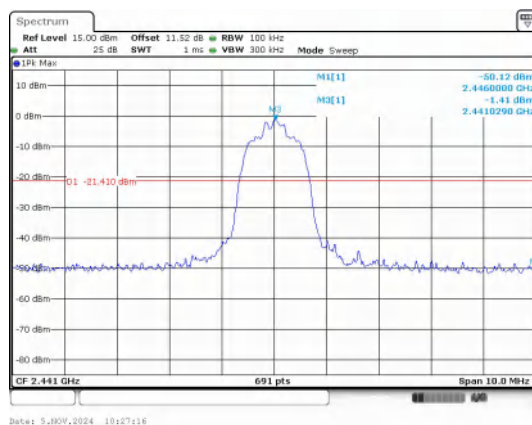
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



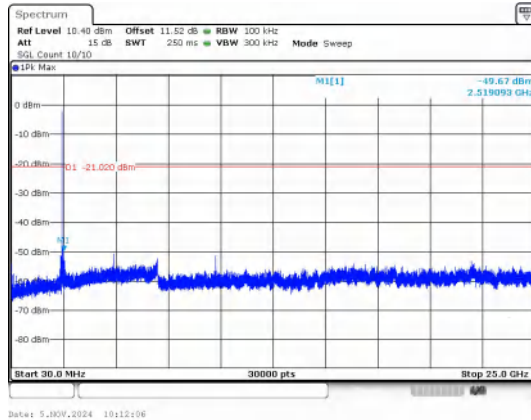
30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 0



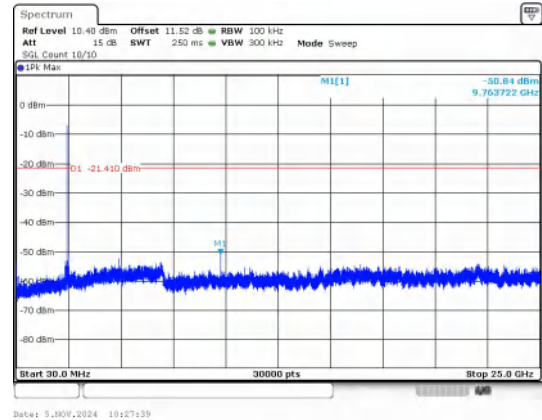
Out Of Band Emission
GFSK_DH5_Channel 39



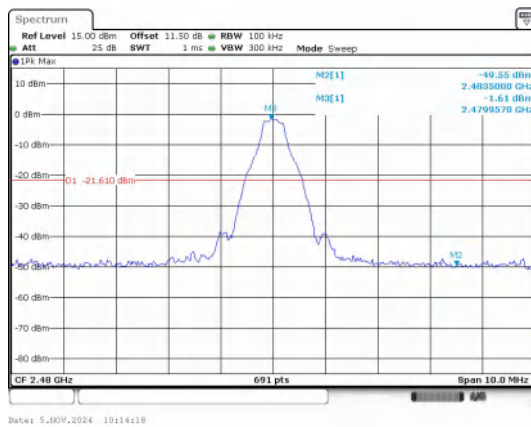
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



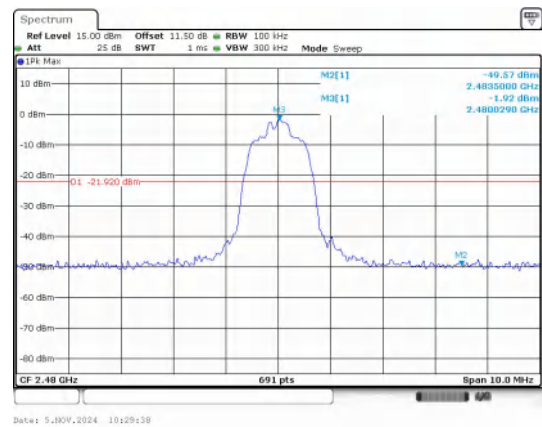
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



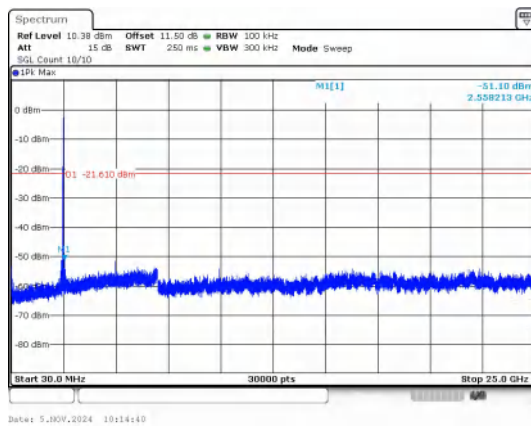
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



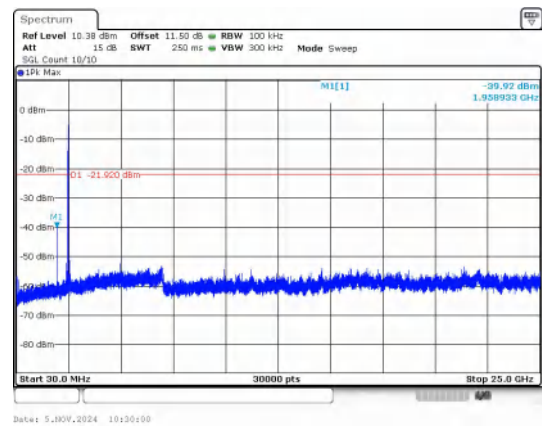
Out Of Band Emission
GFSK_DH5_Channel 78



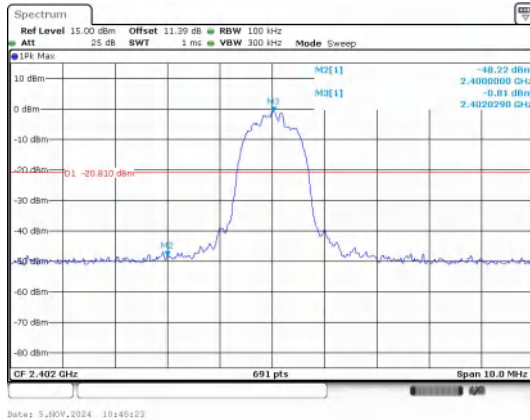
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



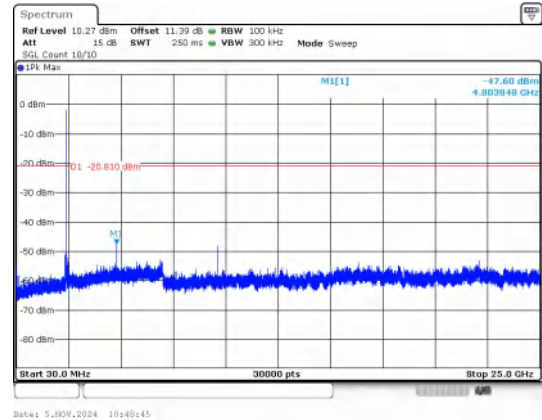
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



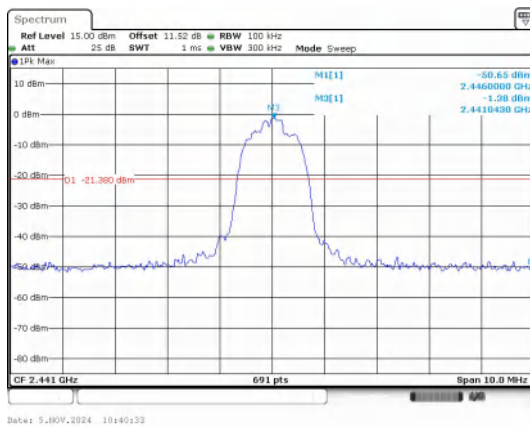
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



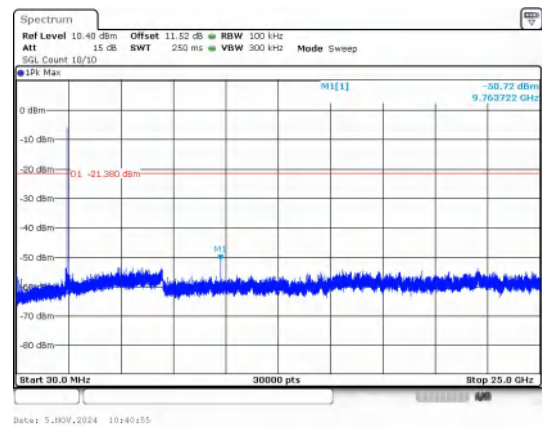
Out Of Band Emission
8DPSK_3-DH5_Channel 0



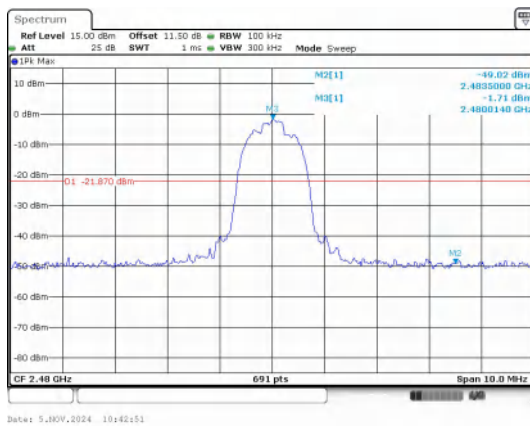
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



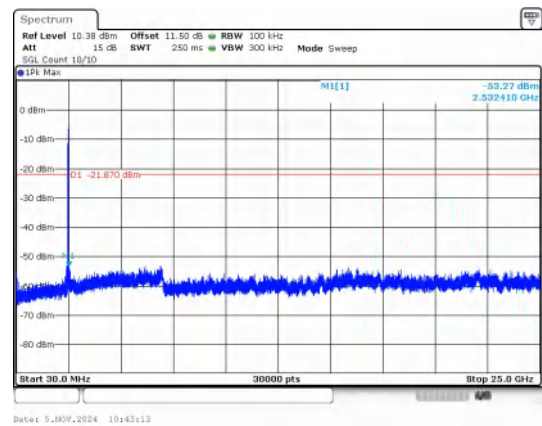
Out Of Band Emission
8DPSK_3-DH5_Channel 39



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



Out Of Band Emission(Left)
GFSK DH5 Channel Hopping



Out Of Band Emission(Left)



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