

Appendix A

Report No.:	CISRR241014063
FCC ID:	2BLRB-FY25
Product Name:	TWS earphone
Model No.:	FY25 KHC EARBUDS
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

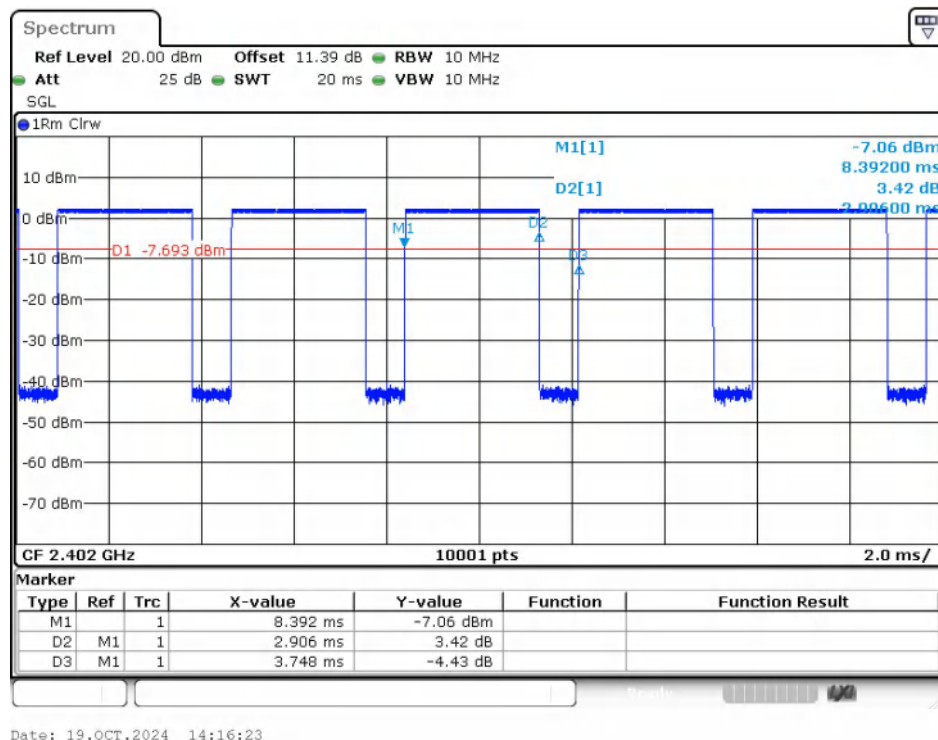
1) Duty Cycle

RIGHT:

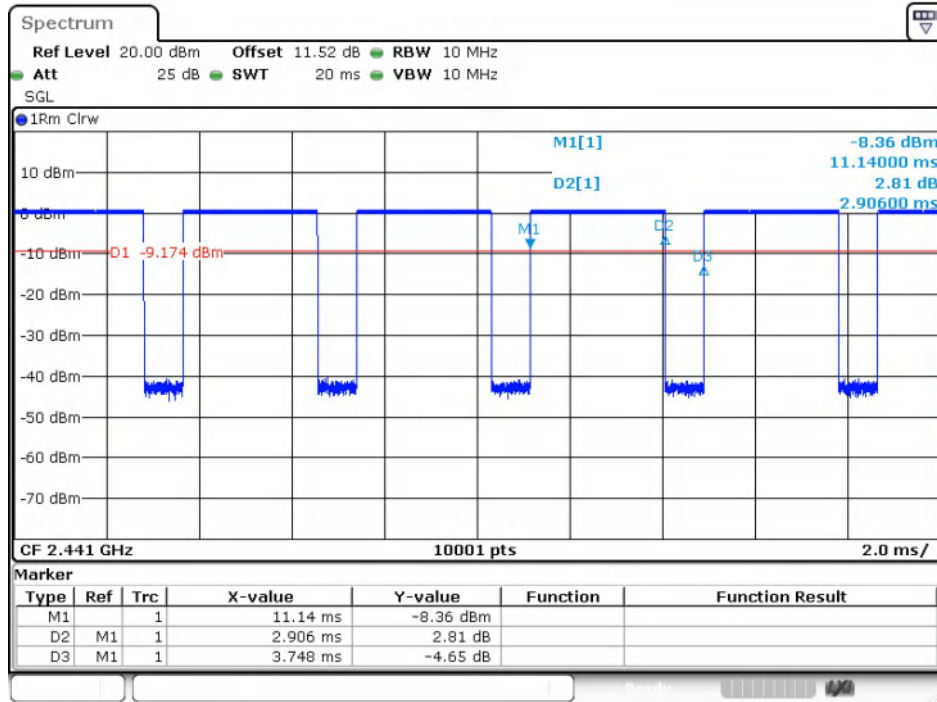
Test Result

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	0.34
		39	2.906	3.748	77.53	0.7753	1.1053	0.34
		78	2.906	3.748	77.53	0.7753	1.1053	0.34
$\pi/4$ DQPSK	2-DH5	0	2.912	3.748	77.69	0.7769	1.0963	0.34
		39	2.910	3.748	77.64	0.7764	1.0991	0.34
		78	2.910	3.748	77.64	0.7764	1.0991	0.34
8DPSK	3-DH5	0	2.914	3.748	77.75	0.7775	1.093	0.34
		39	2.914	3.748	77.75	0.7775	1.093	0.34
		78	2.912	3.746	77.74	0.7774	1.0936	0.34

Test Graphs

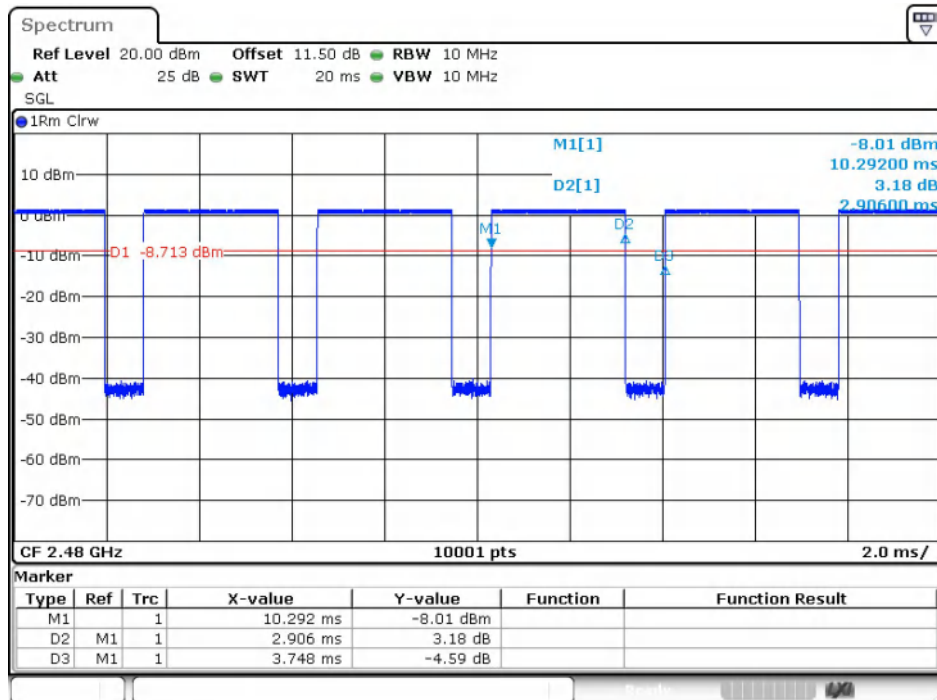


GFSK(DH5)_Channel 0



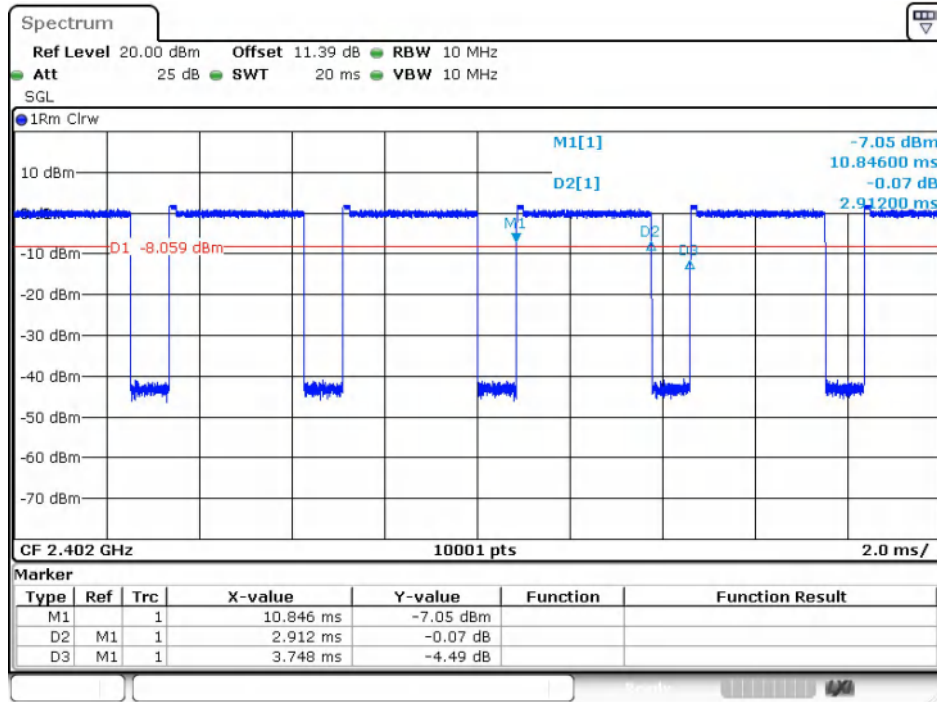
Date: 19.OCT.2024 14:21:43

GFSK(DH5)_Channel 39



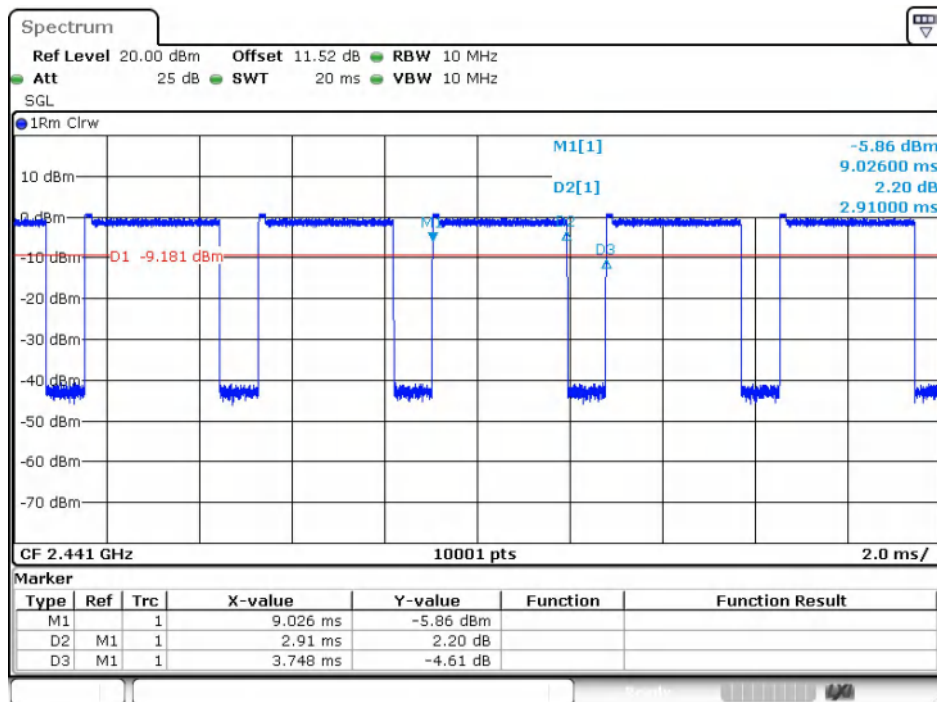
Date: 19.OCT.2024 14:24:13

GFSK(DH5)_Channel 78



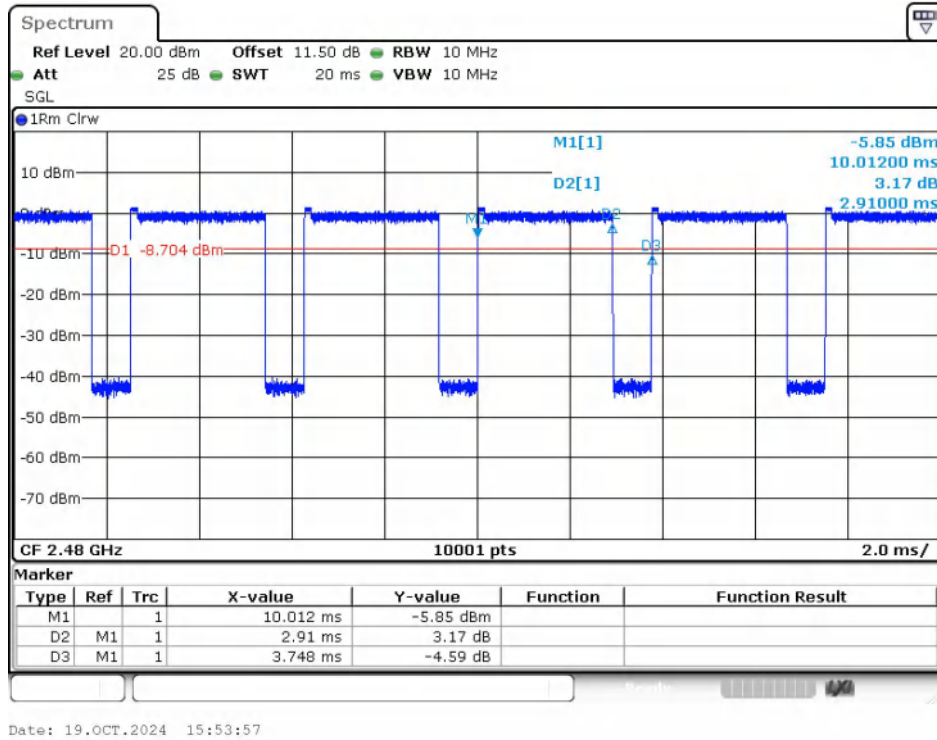
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$\pi/4$ DQPSK(2-DH5)_Channel 0

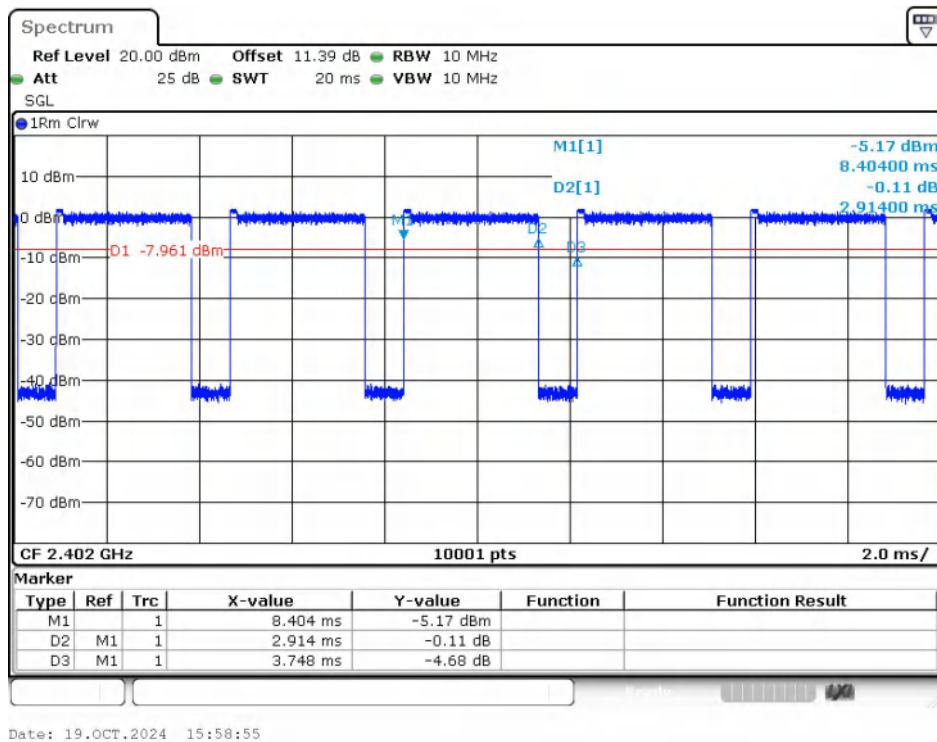


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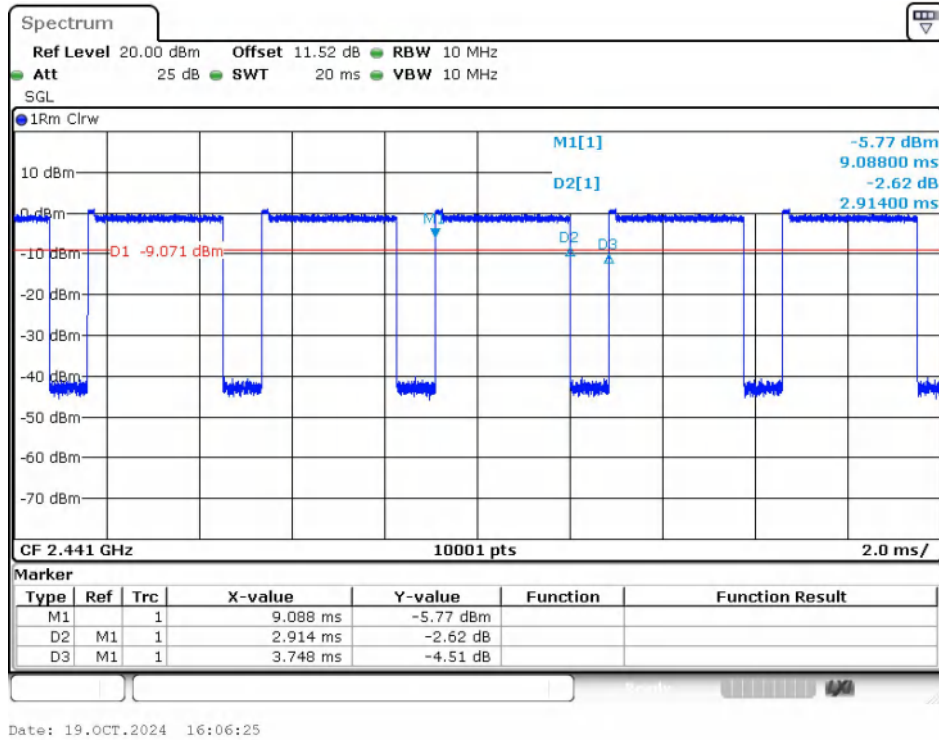
$\pi/4$ DQPSK(2-DH5)_Channel 39



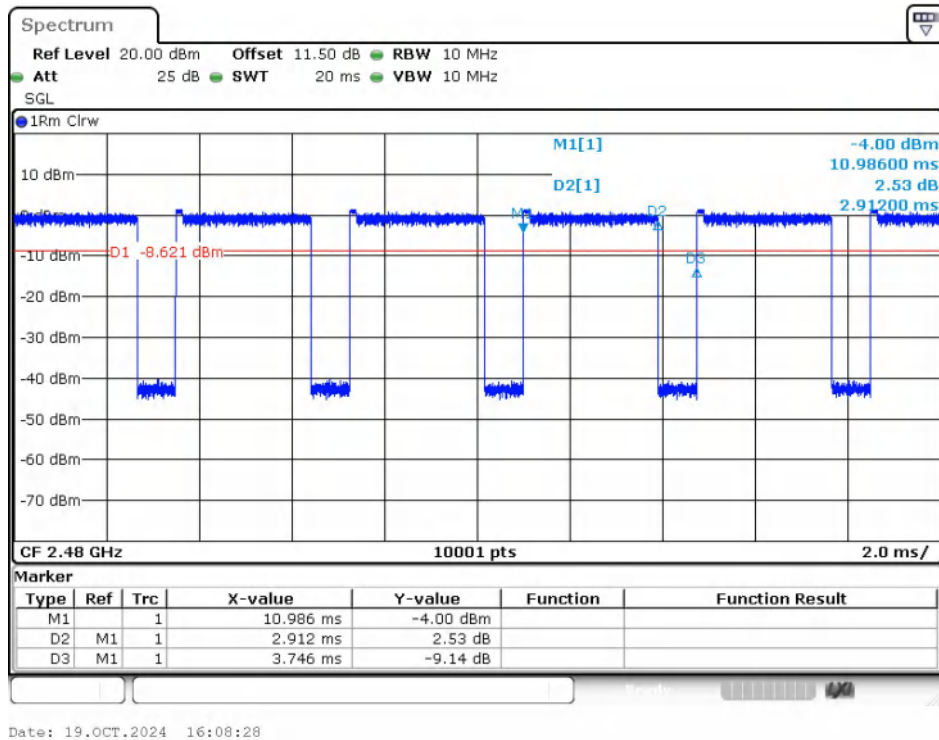
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



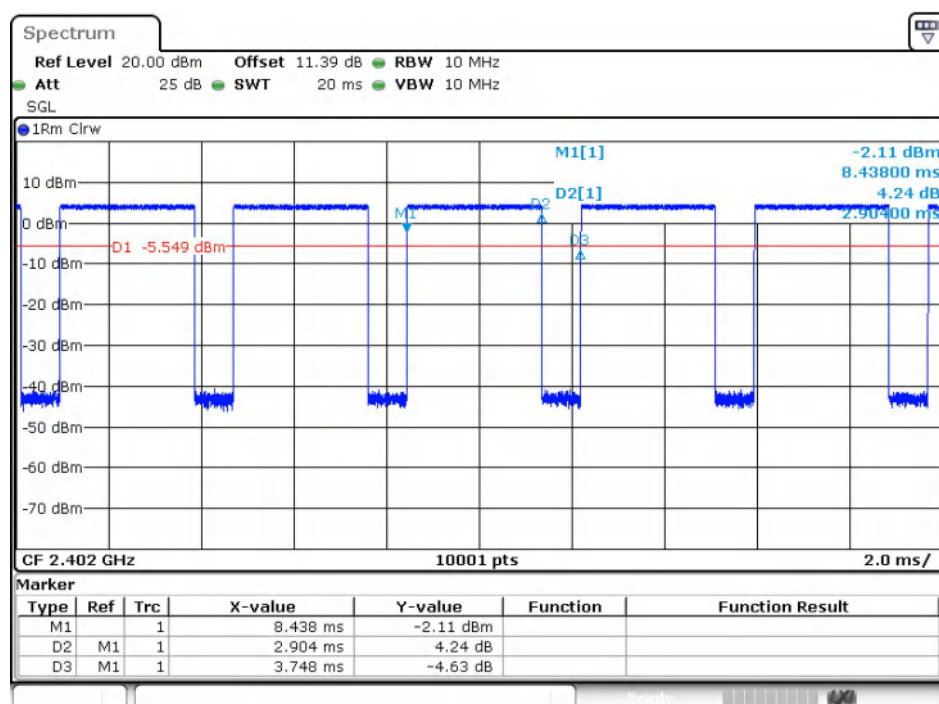
8DPSK(3-DH5)_Channel 78

LEFT:

Test Result

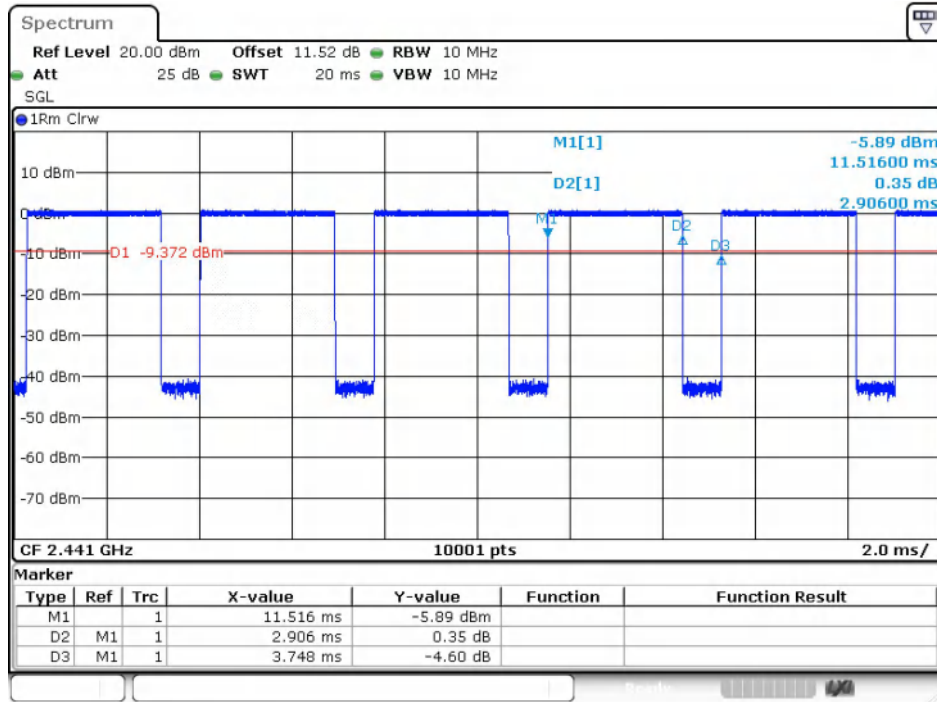
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.904	3.748	77.48	0.7748	1.1081	0.34
		39	2.906	3.748	77.53	0.7753	1.1053	0.34
		78	2.906	3.748	77.53	0.7753	1.1053	0.34
$\pi/4$ DQPSK	2-DH5	0	2.912	3.748	77.69	0.7769	1.0963	0.34
		39	2.912	3.748	77.69	0.7769	1.0963	0.34
		78	2.912	3.748	77.69	0.7769	1.0963	0.34
8DPSK	3-DH5	0	2.914	3.748	77.75	0.7775	1.093	0.34
		39	2.916	3.748	77.80	0.7780	1.0902	0.34
		78	2.916	3.748	77.80	0.7780	1.0902	0.34

Test Graphs



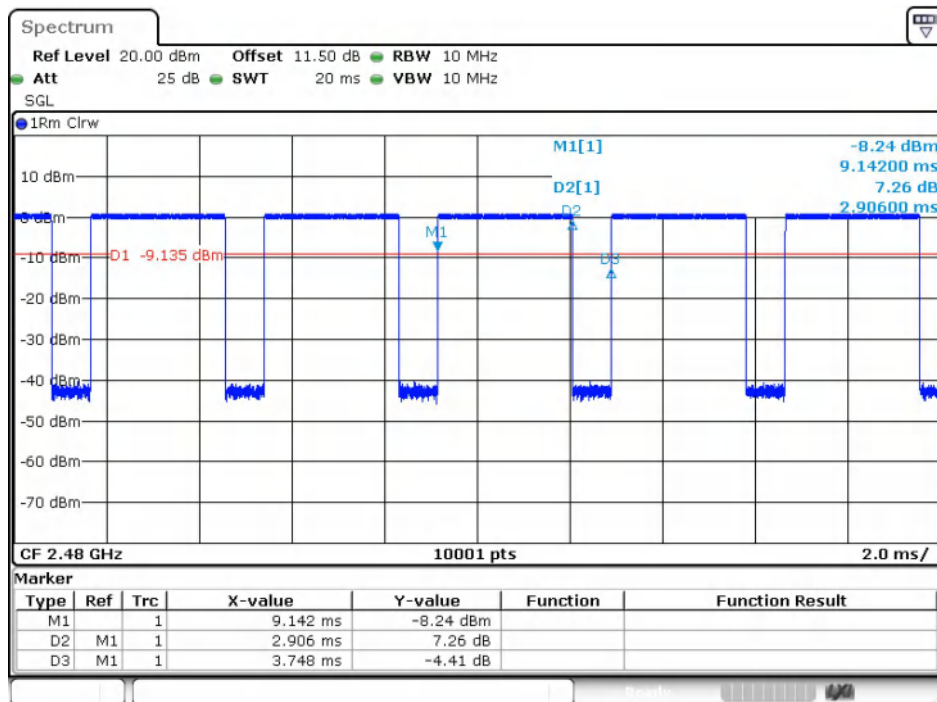
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GFSK(DH5)_Channel 0



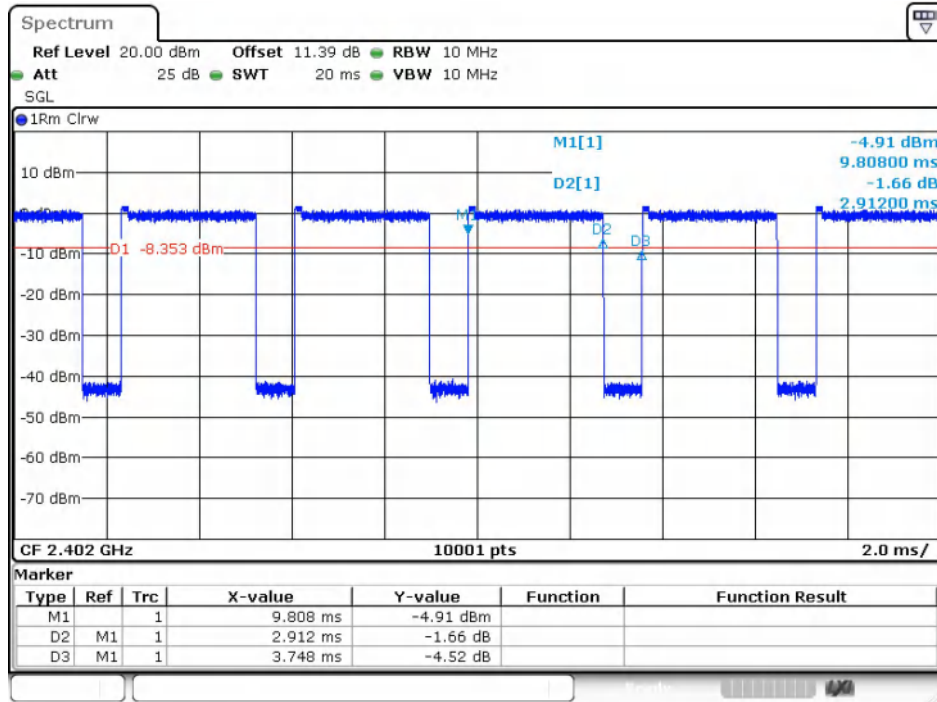
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GFSK(DH5)_Channel 39



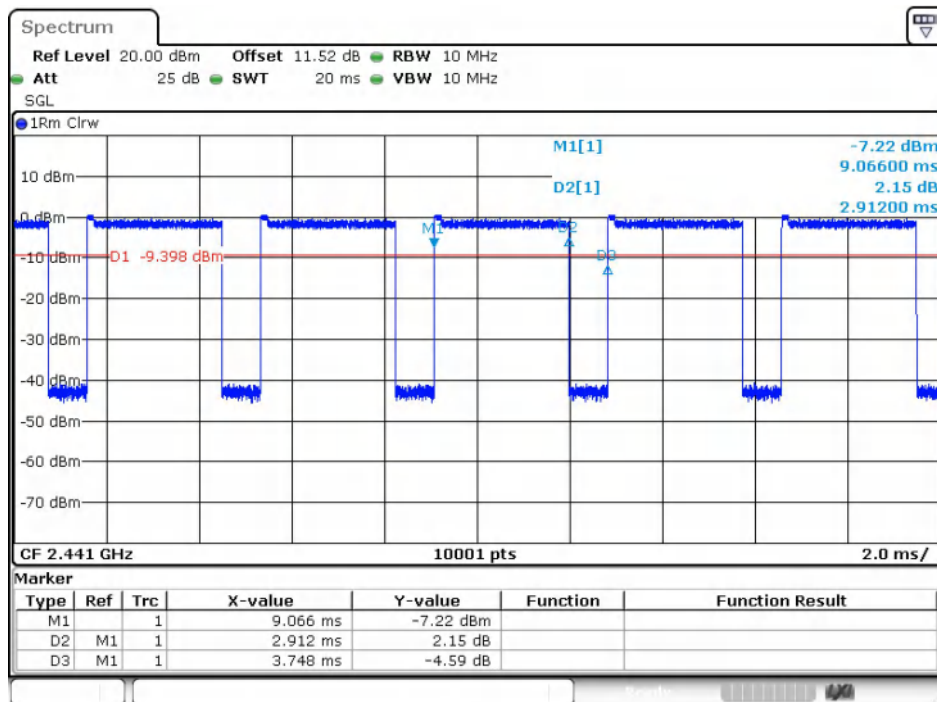
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GFSK(DH5)_Channel 78



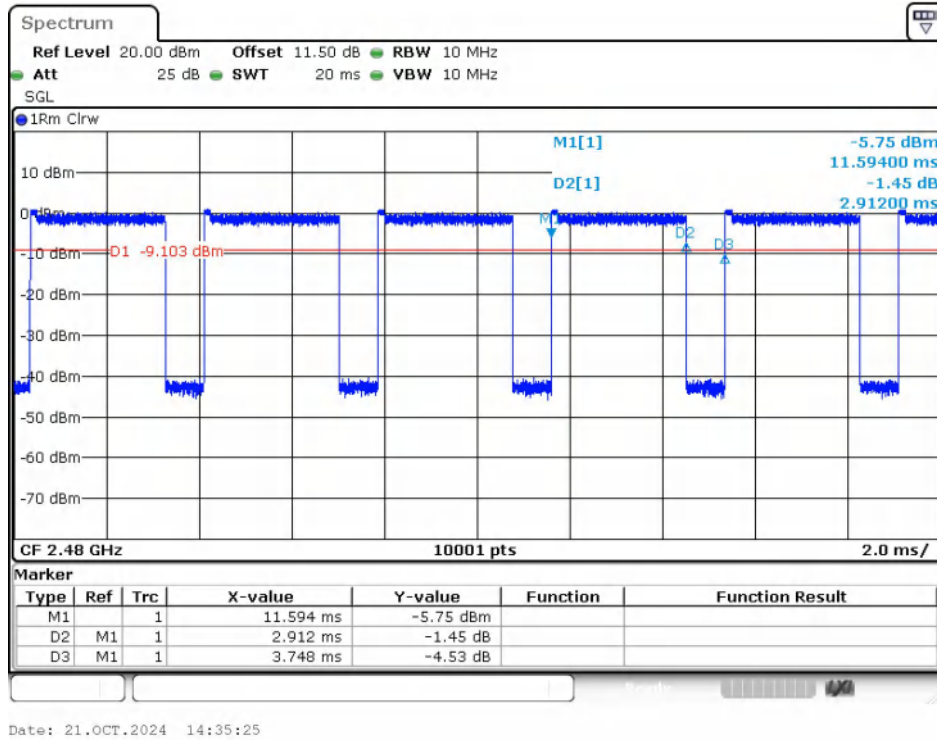
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$\pi/4$ DQPSK(2-DH5)_Channel 0

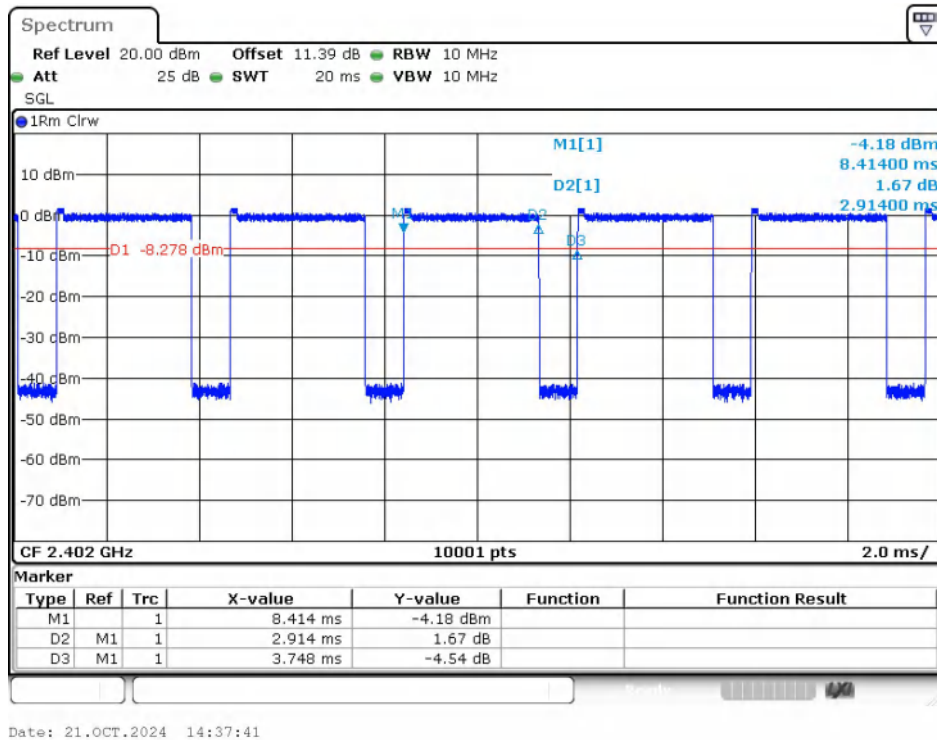


Date: 21.OCT.2024 14:33:23

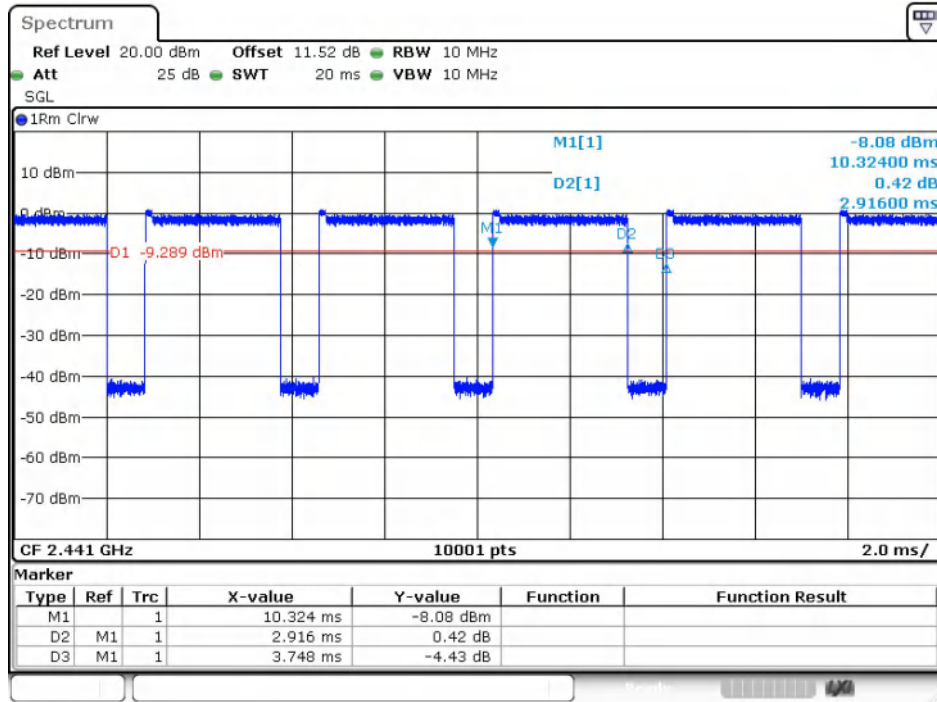
$\pi/4$ DQPSK(2-DH5)_Channel 39



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

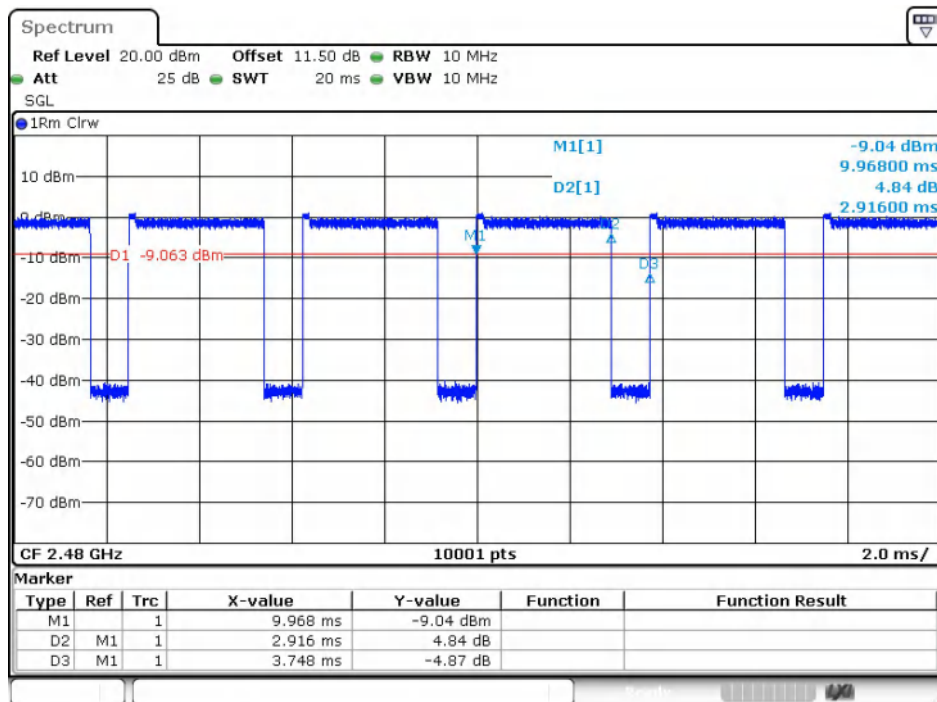


8DPSK(3-DH5)_Channel 0



Date: 21.OCT.2024 14:43:03

8DPSK(3-DH5)_Channel 39



Date: 21.OCT.2024 14:44:56

8DPSK(3-DH5)_Channel 78

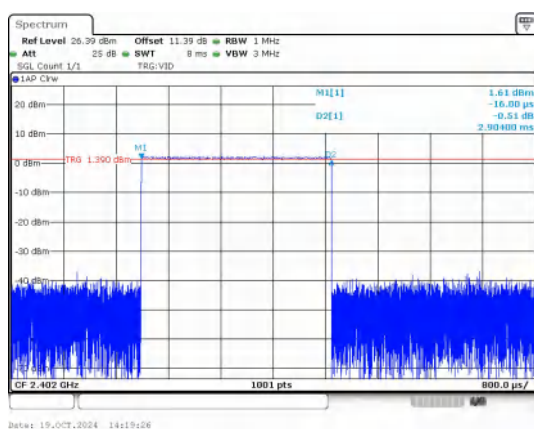
2) Dwell Time

RIGHT:

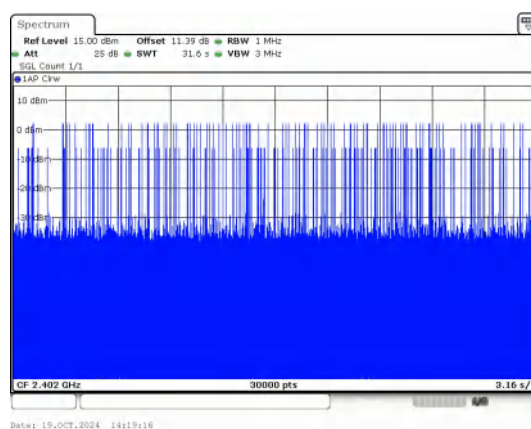
Test Result

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	102	296.21	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.912	103	299.94		PASS
8DPSK	3-DH5		2.920	102	297.84		PASS

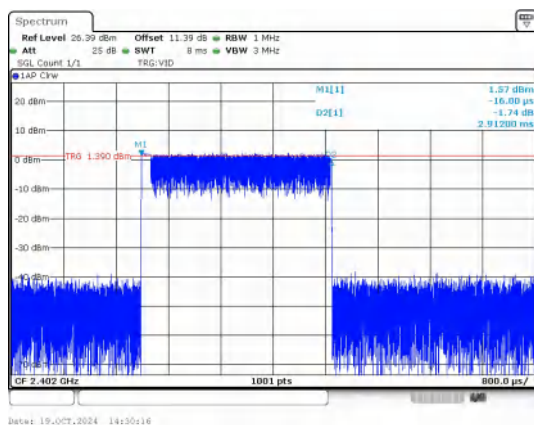
Test Graphs



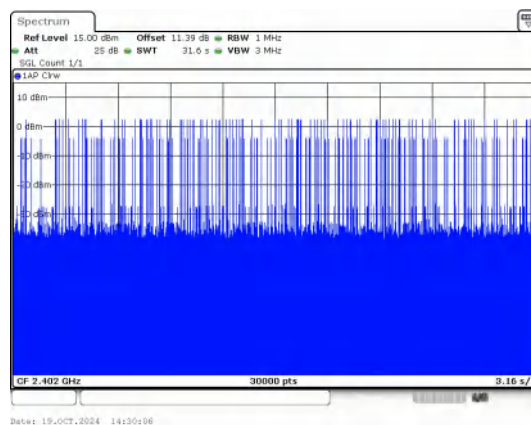
Pulse Width
GFSK_DH5



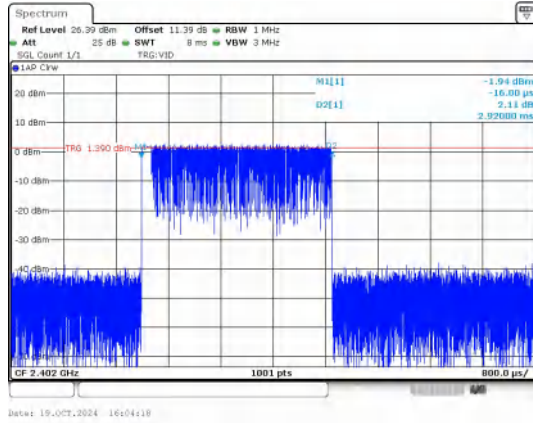
Number of Pulses in 31.6 seconds
GFSK_DH5



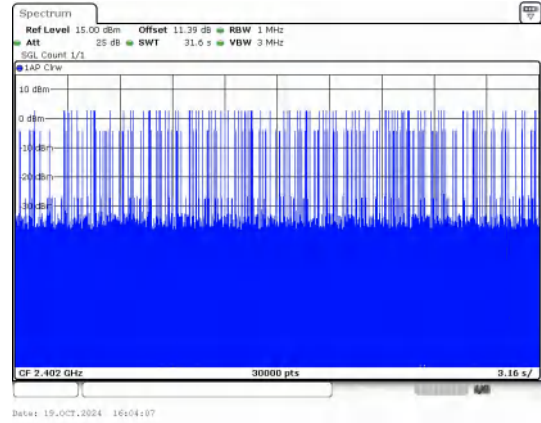
Pulse Width
 $\pi/4$ DQPSK_2-DH5



Number of Pulses in 31.6 seconds
 $\pi/4$ DQPSK_2-DH5



Pulse Width
8DPSK_3-DH5



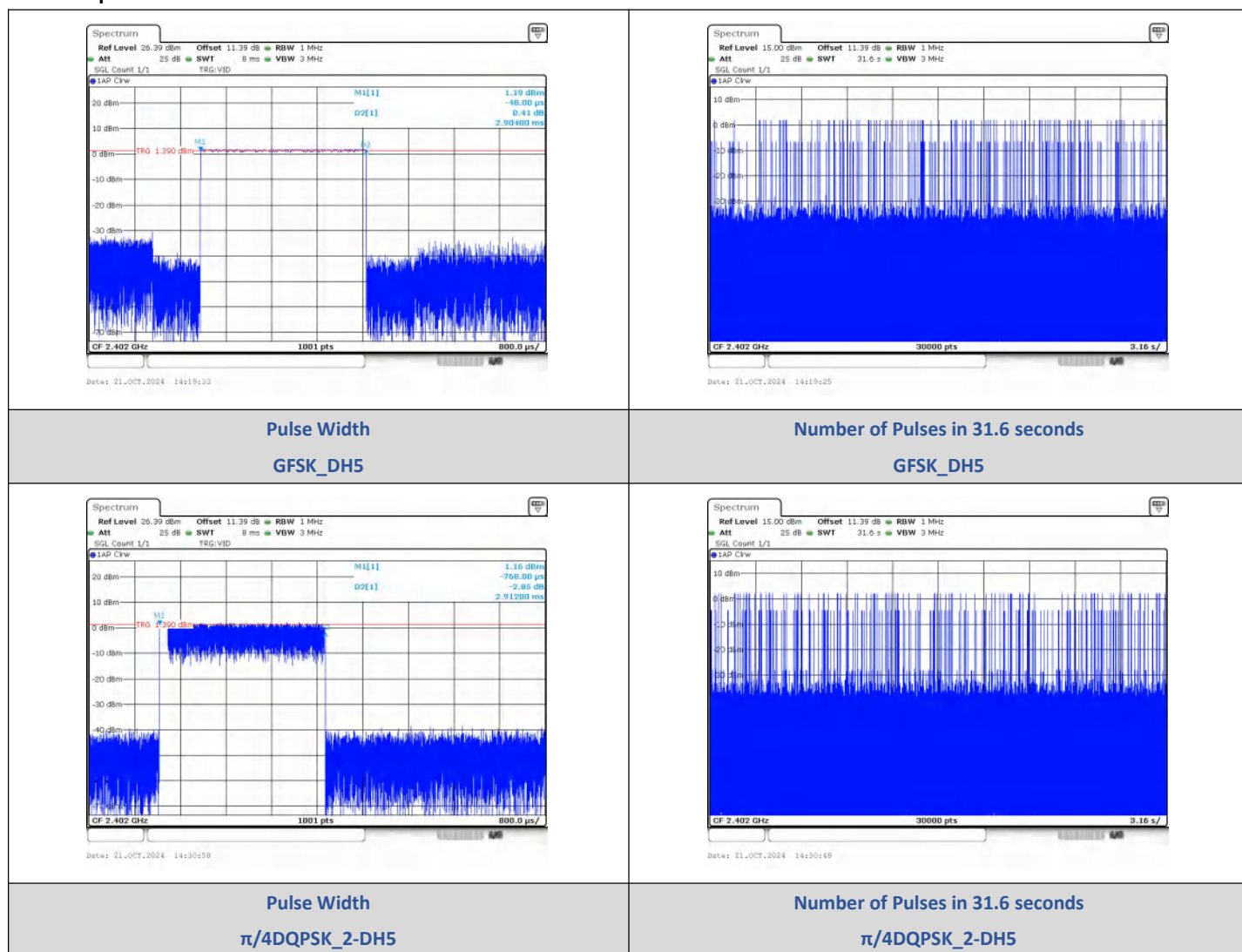
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

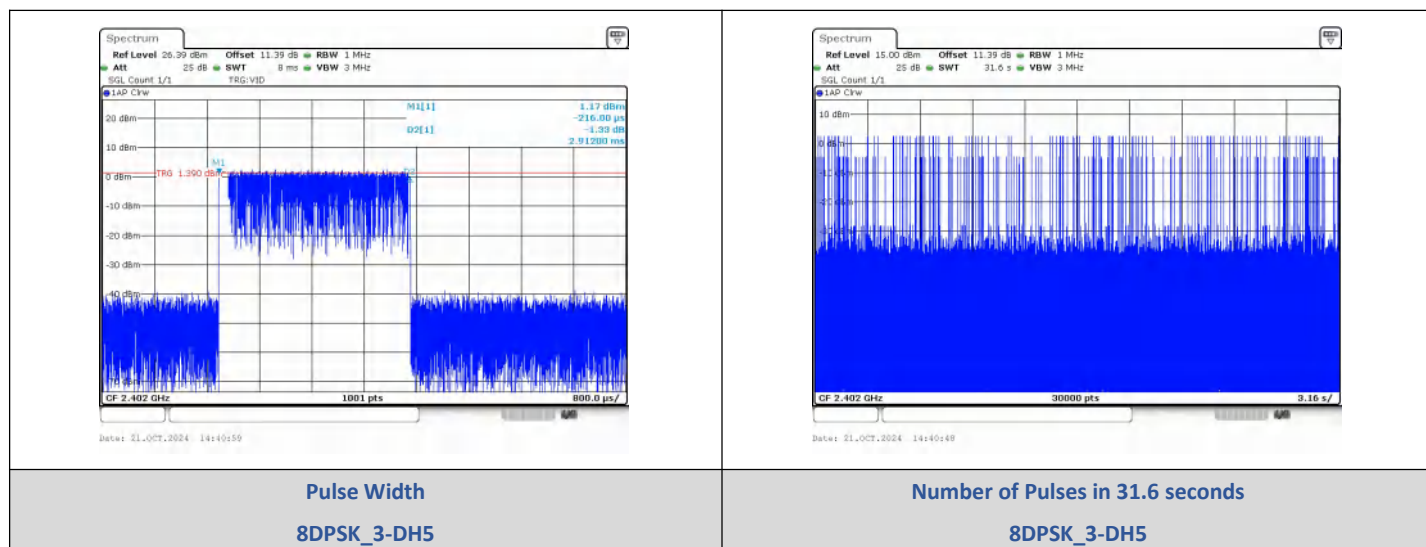
LEFT:

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	101	293.3	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.912	102	297.02		PASS
8DPSK	3-DH5		2.912	111	323.23		PASS

Test Graphs





3) Number Of Hopping Channel

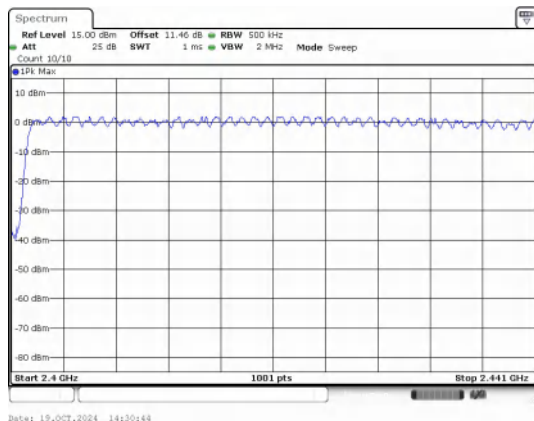
RIGHT:

Test Result

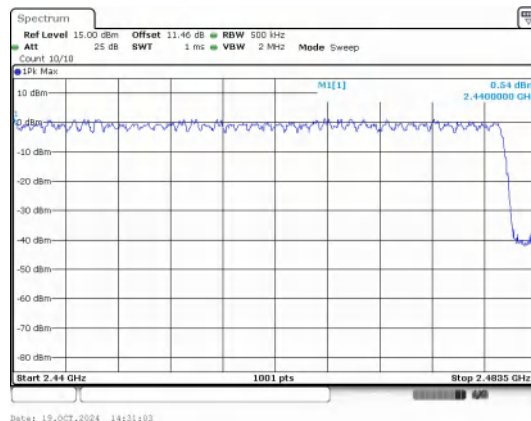
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs

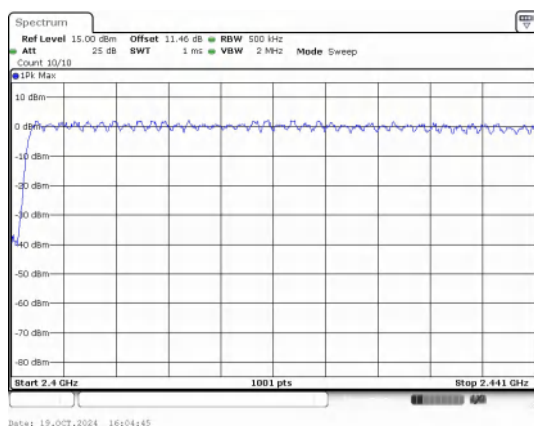




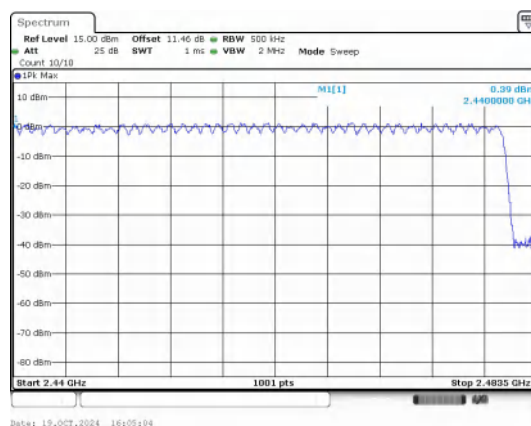
Low End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK



High End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



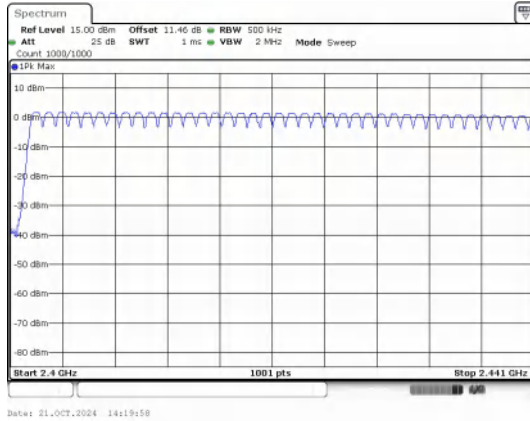
High End Spectrum Channel Hopping Plot
8DPSK

LEFT:

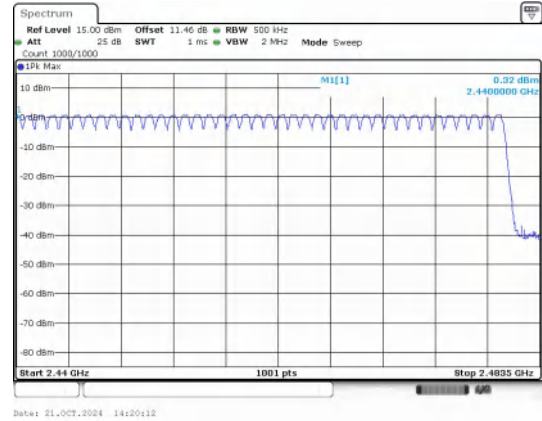
Test Result

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

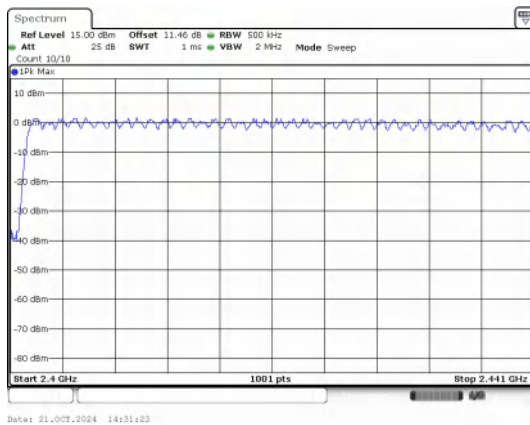
Test Graphs



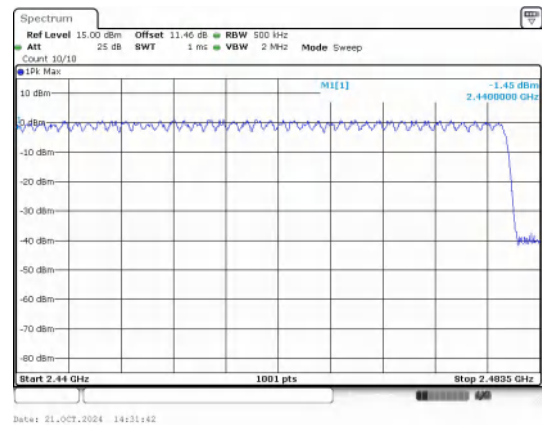
Low End Spectrum Channel Hopping Plot
GFSK



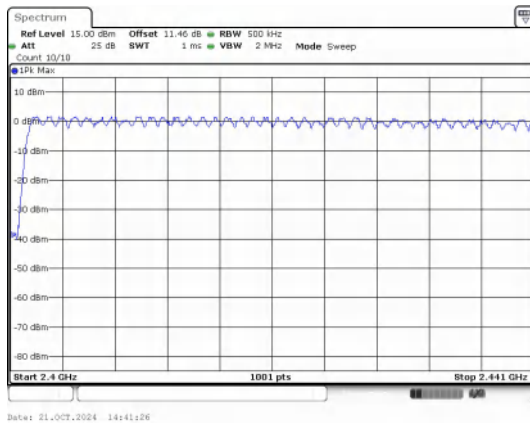
High End Spectrum Channel Hopping Plot
GFSK



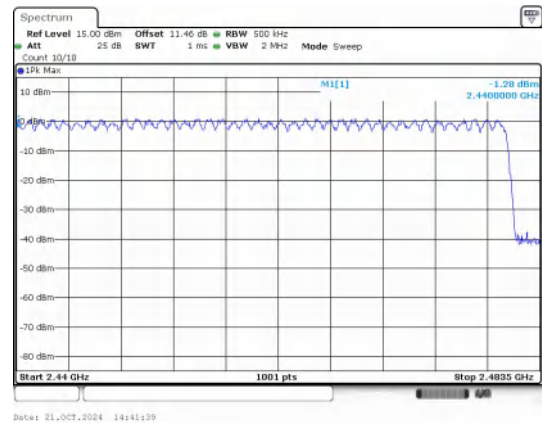
Low End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK



High End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK

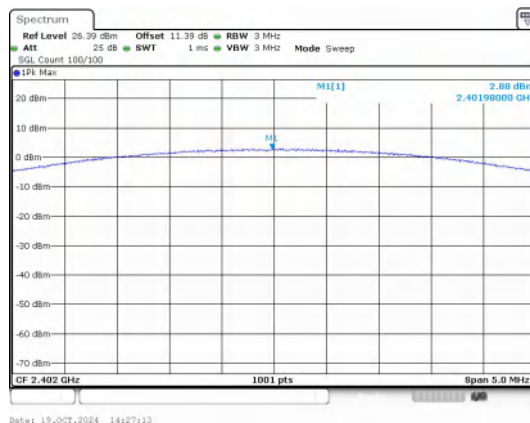
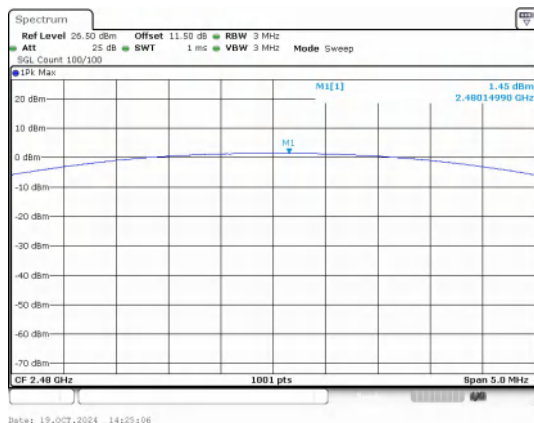
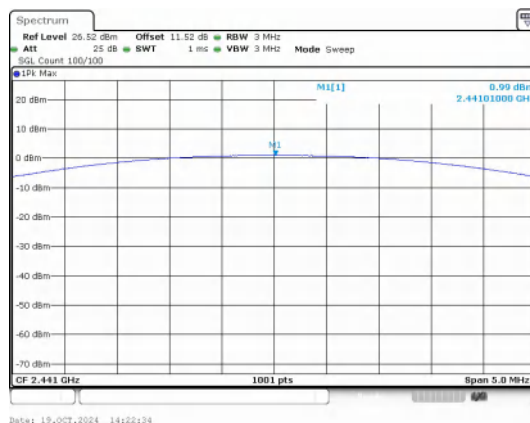
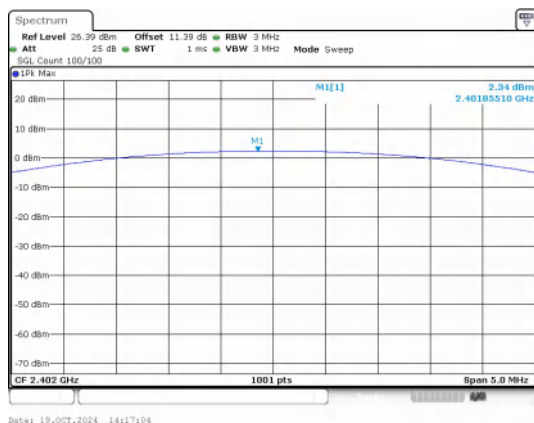
4) Conducted Peak Output Power

RIGHT:

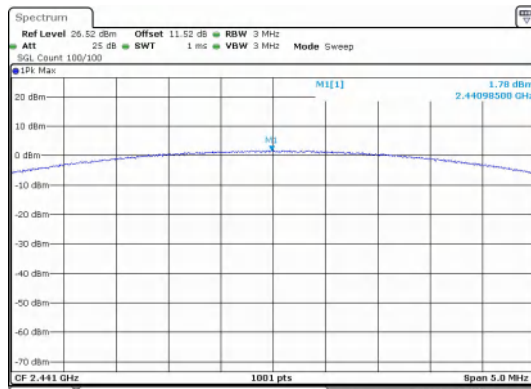
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	2.34	1.72	≤30	PASS
		39	0.99	1.26		PASS
		78	1.45	1.40		PASS
$\pi/4$ DQPSK	2-DH5	0	2.88	1.94	≤20.97	PASS
		39	1.78	1.51		PASS
		78	2.27	1.69		PASS
8DPSK	3-DH5	0	3.20	2.09		PASS
		39	1.96	1.57		PASS
		78	2.39	1.74		PASS

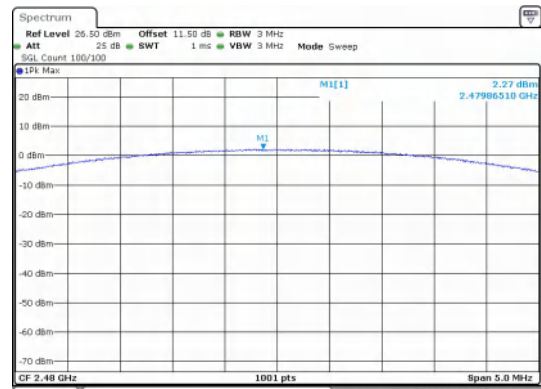
Test Graphs



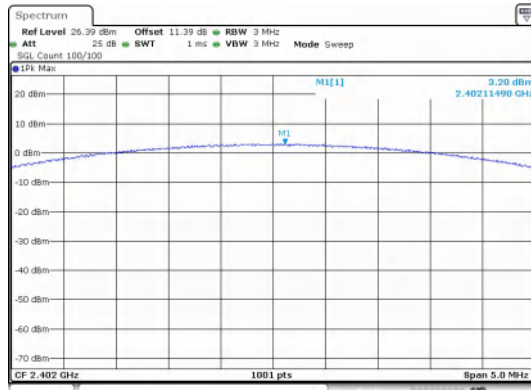
GFSK_Channel 78



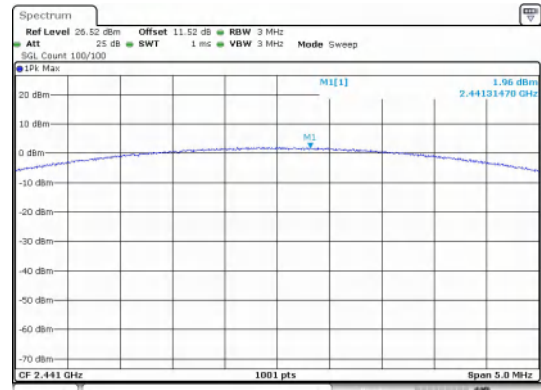
$\pi/4$ DQPSK_Channel 0



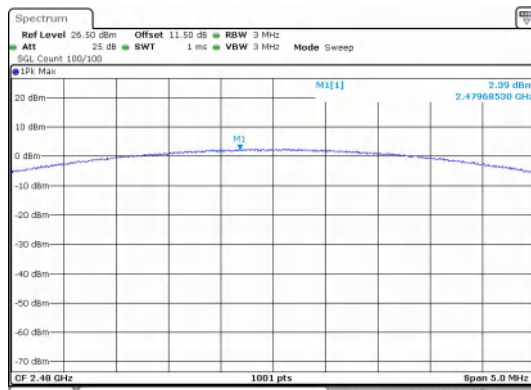
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39

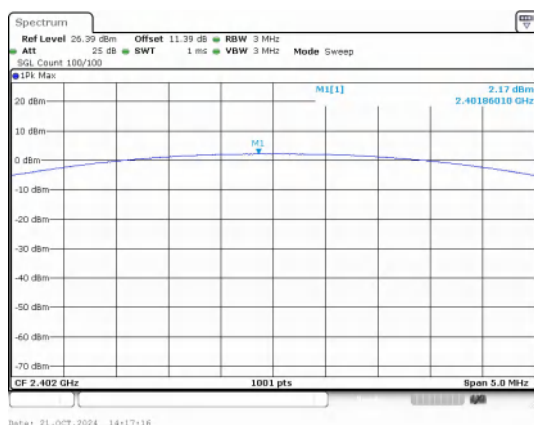
Peak Output Power
8DPSK_Channel 78

LEFT:

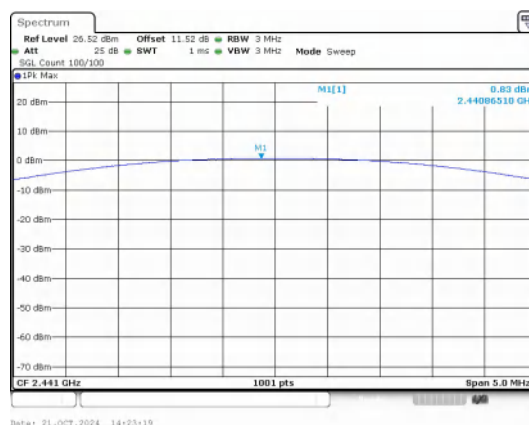
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	2.17	1.65	≤30	PASS
		39	0.83	1.21		PASS
		78	1.02	1.26		PASS
$\pi/4$ DQPSK	2-DH5	0	2.56	1.80	≤20.97	PASS
		39	1.50	1.41		PASS
		78	1.78	1.51		PASS
8DPSK	3-DH5	0	2.97	1.98		PASS
		39	1.92	1.56		PASS
		78	2.20	1.66		PASS

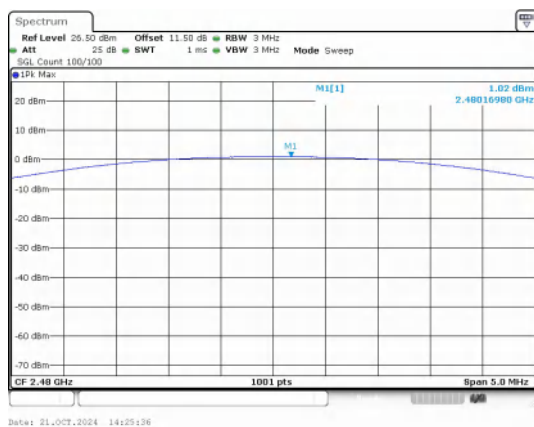
Test Graphs



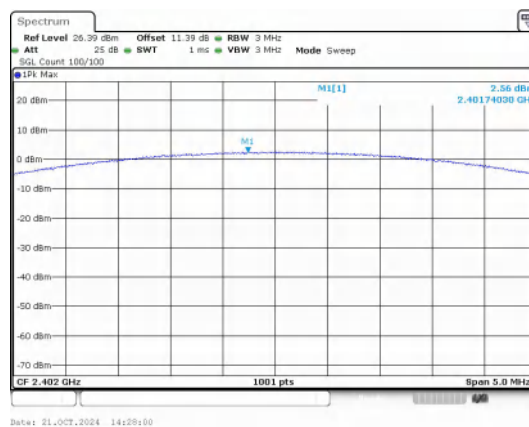
Peak Output Power
GFSK_Channel 0



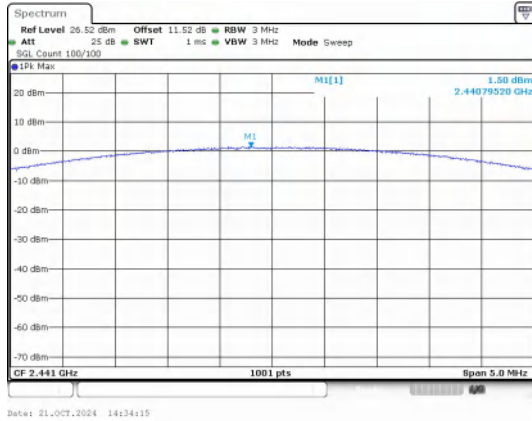
Peak Output Power
GFSK_Channel 39



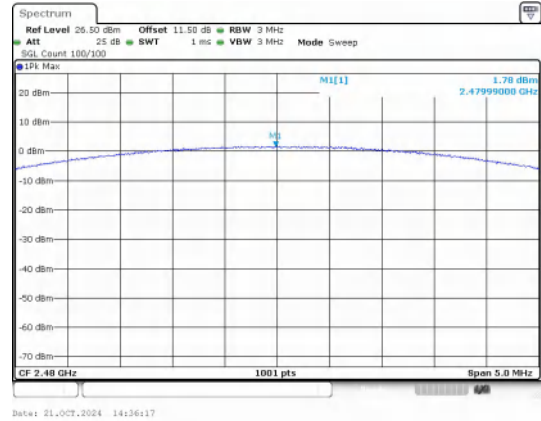
Peak Output Power
GFSK_Channel 78



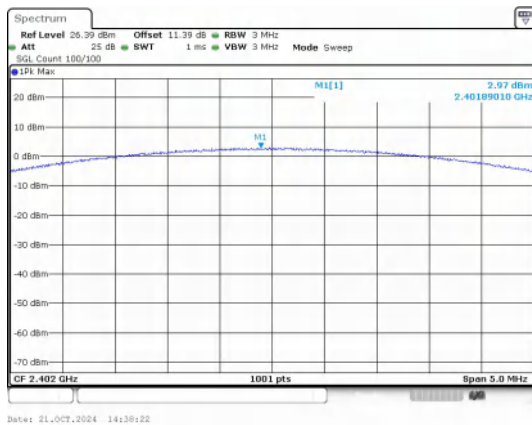
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



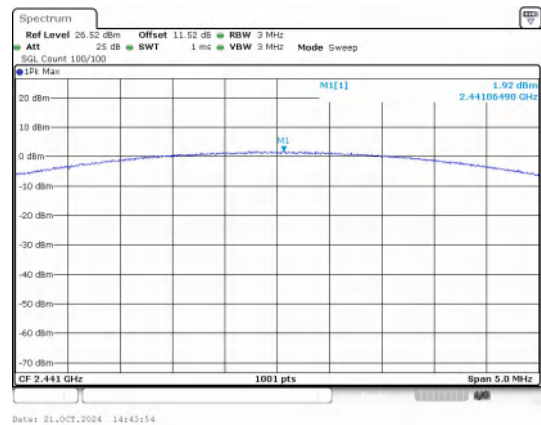
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



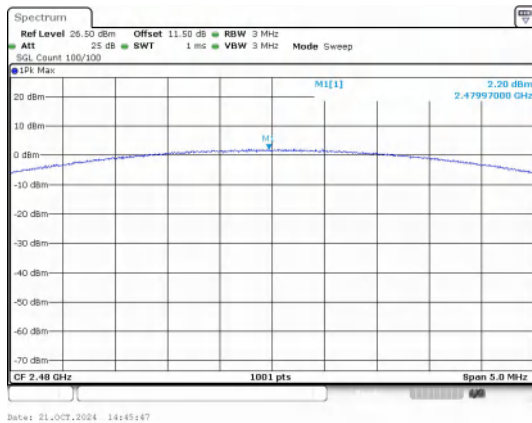
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



Peak Output Power
8DPSK_Channel 78

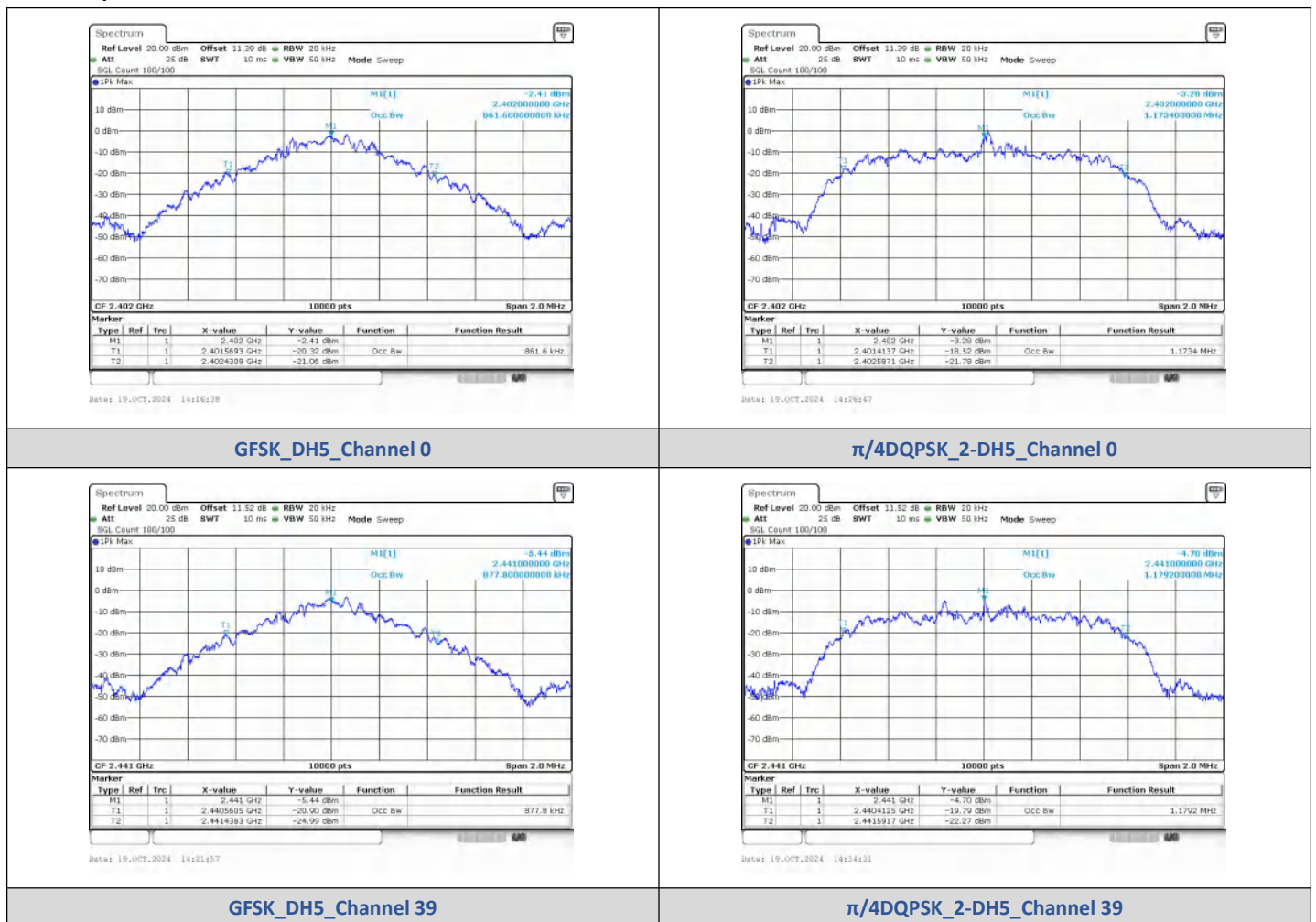
5) 99% Bandwidth

RIGHT:

Test Result

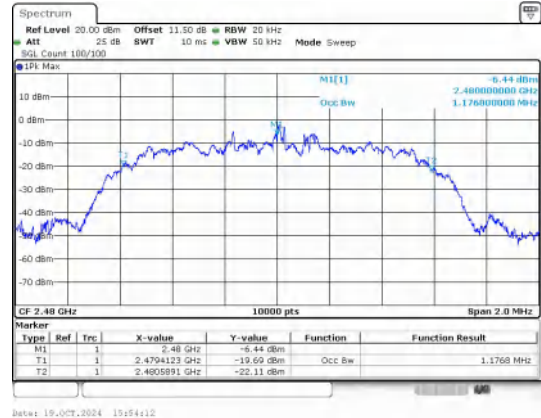
Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.86160
	39	2441	0.87780
	78	2480	0.85880
$\pi/4$ DQPSK	0	2402	1.1734
	39	2441	1.1792
	78	2480	1.1768
8DPSK	0	2402	1.1720
	39	2441	1.1806
	78	2480	1.1748

Test Graphs

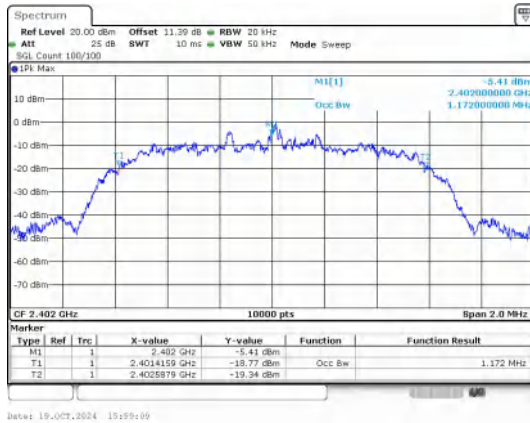




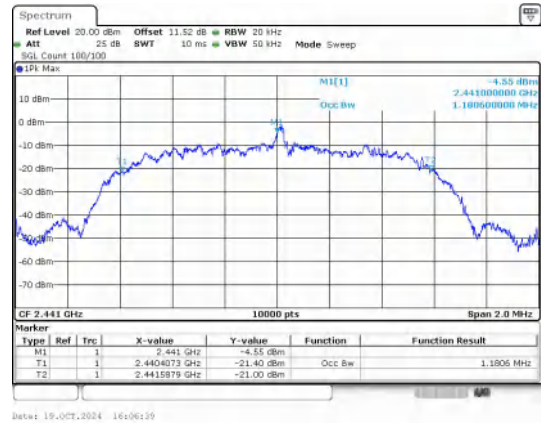
GFSK_DH5_Channel 78



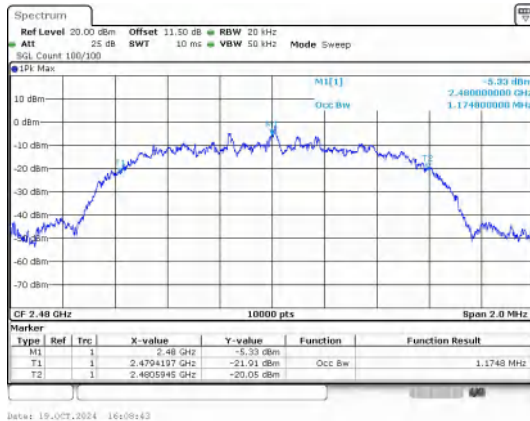
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



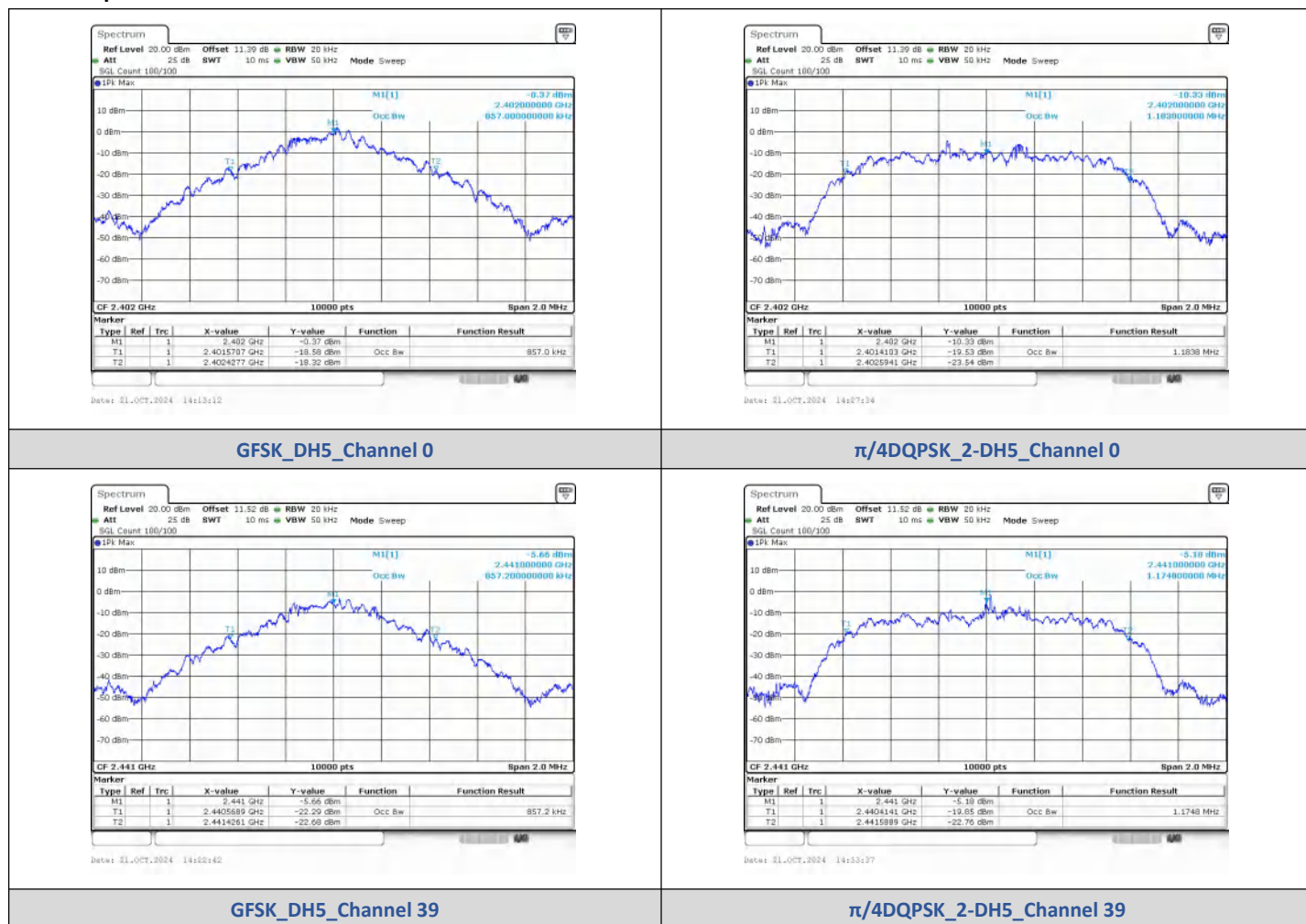
8DPSK_3-DH5_Channel 78

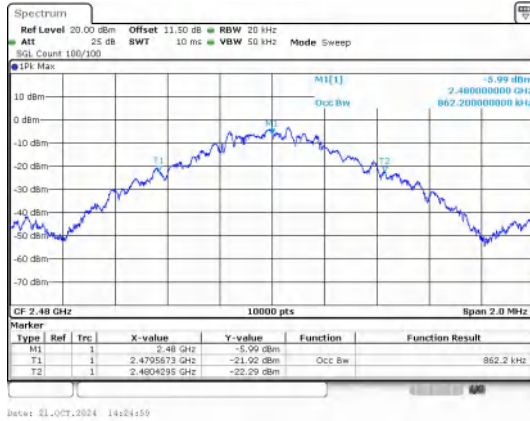
LEFT:

Test Result

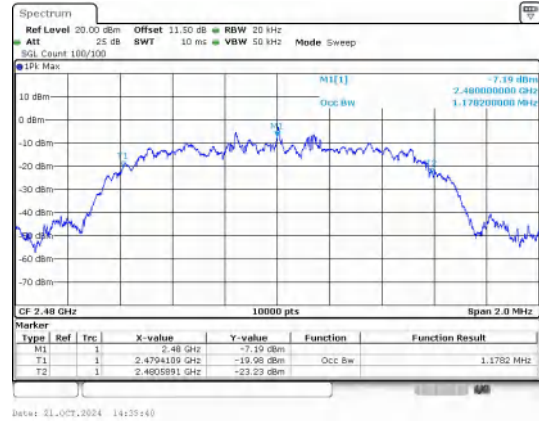
Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.85700
	39	2441	0.85720
	78	2480	0.86220
$\pi/4$ DQPSK	0	2402	1.1838
	39	2441	1.1748
	78	2480	1.1782
8DPSK	0	2402	1.1792
	39	2441	1.1774
	78	2480	1.1884

Test Graphs

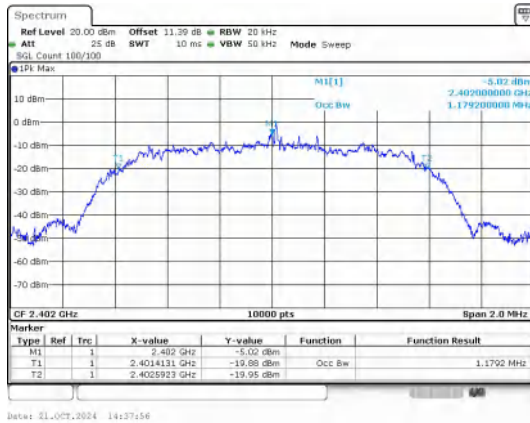




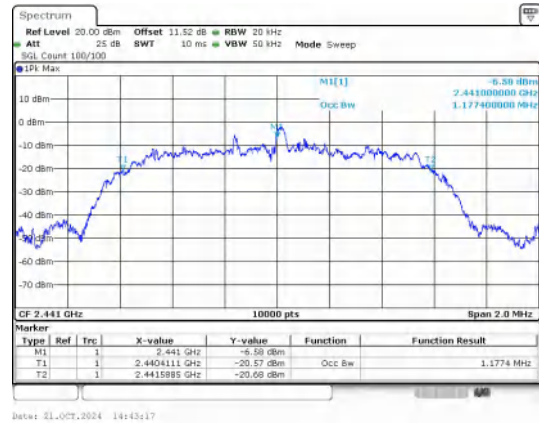
GFSK_DH5_Channel 78



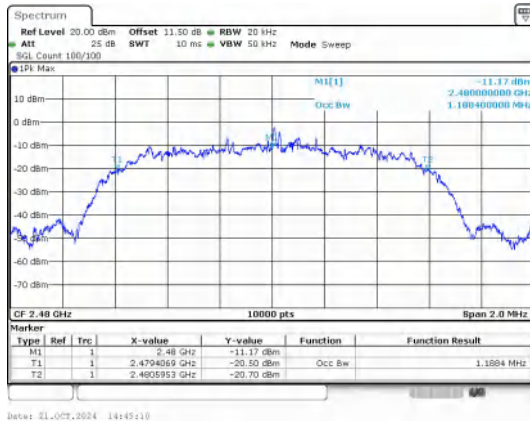
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

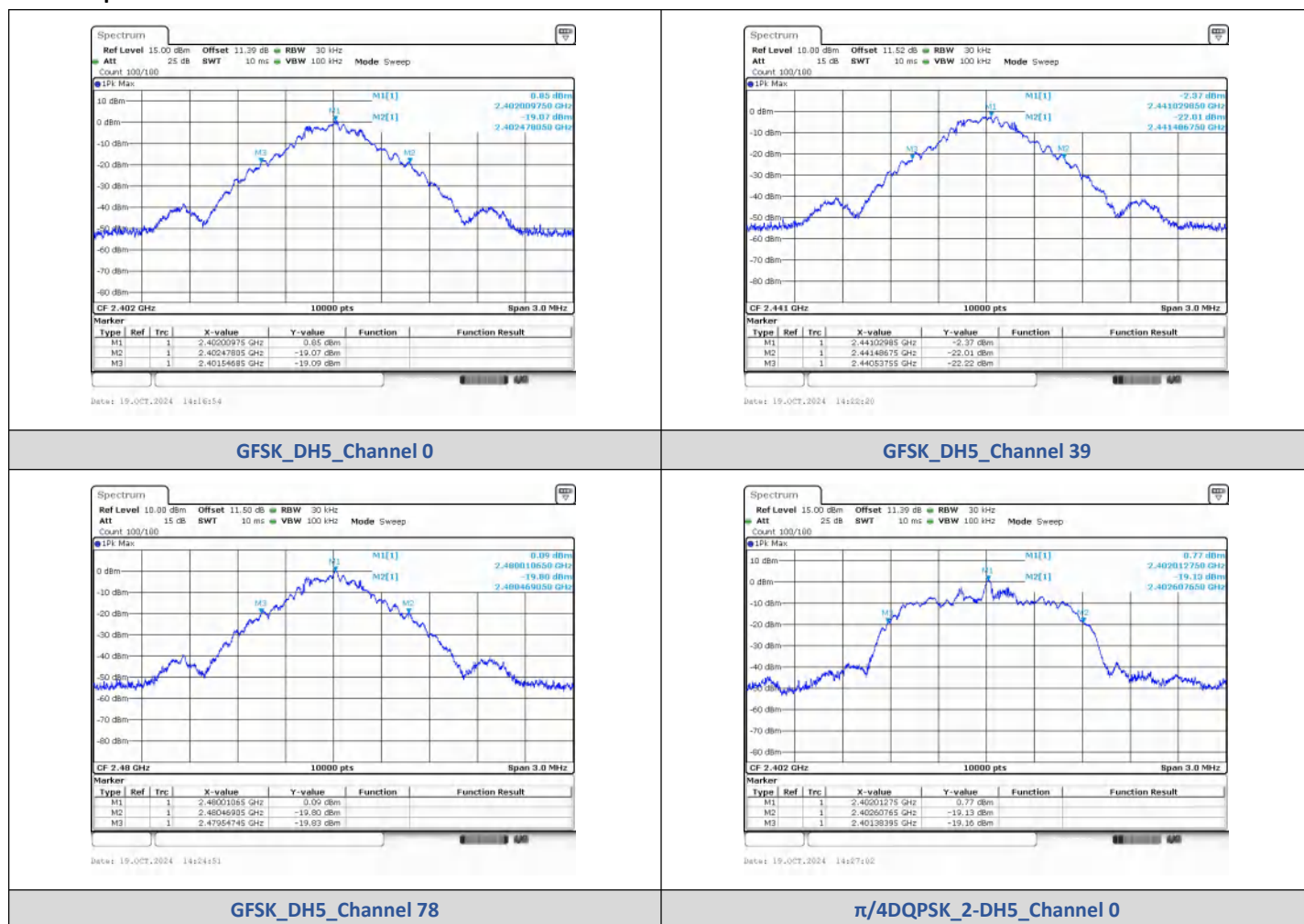
6) 20dB Bandwidth

RIGHT:

Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9300
	39	2441 MHz	0.9500
	78	2480 MHz	0.9200
π /4QPSK	0	2402 MHz	1.230
	39	2441 MHz	1.220
	78	2480 MHz	1.230
8DPSK	0	2402 MHz	1.270
	39	2441 MHz	1.250
	78	2480 MHz	1.240

Test Graphs

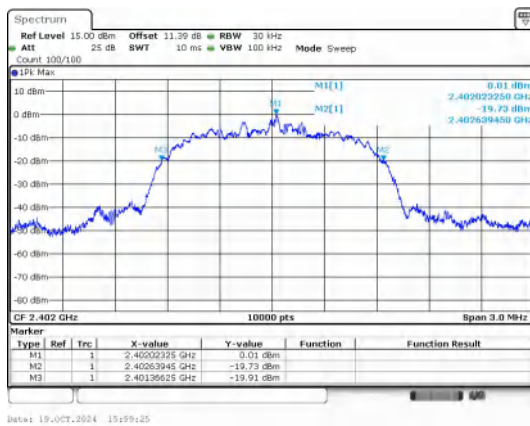




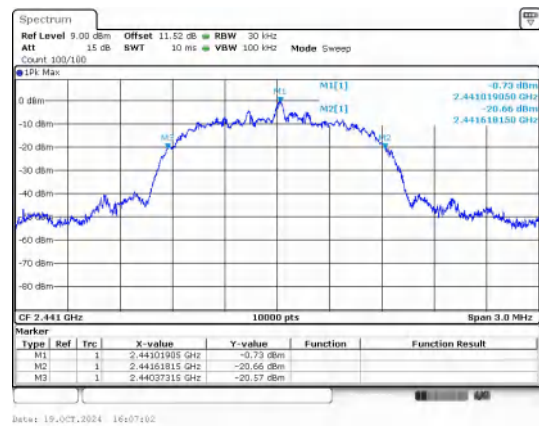
$\pi/4$ DQPSK_2-DH5_Channel 39



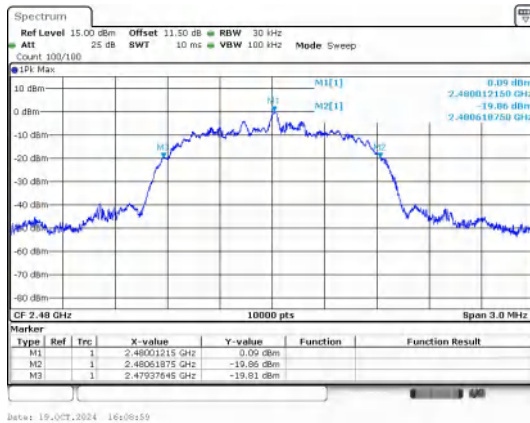
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



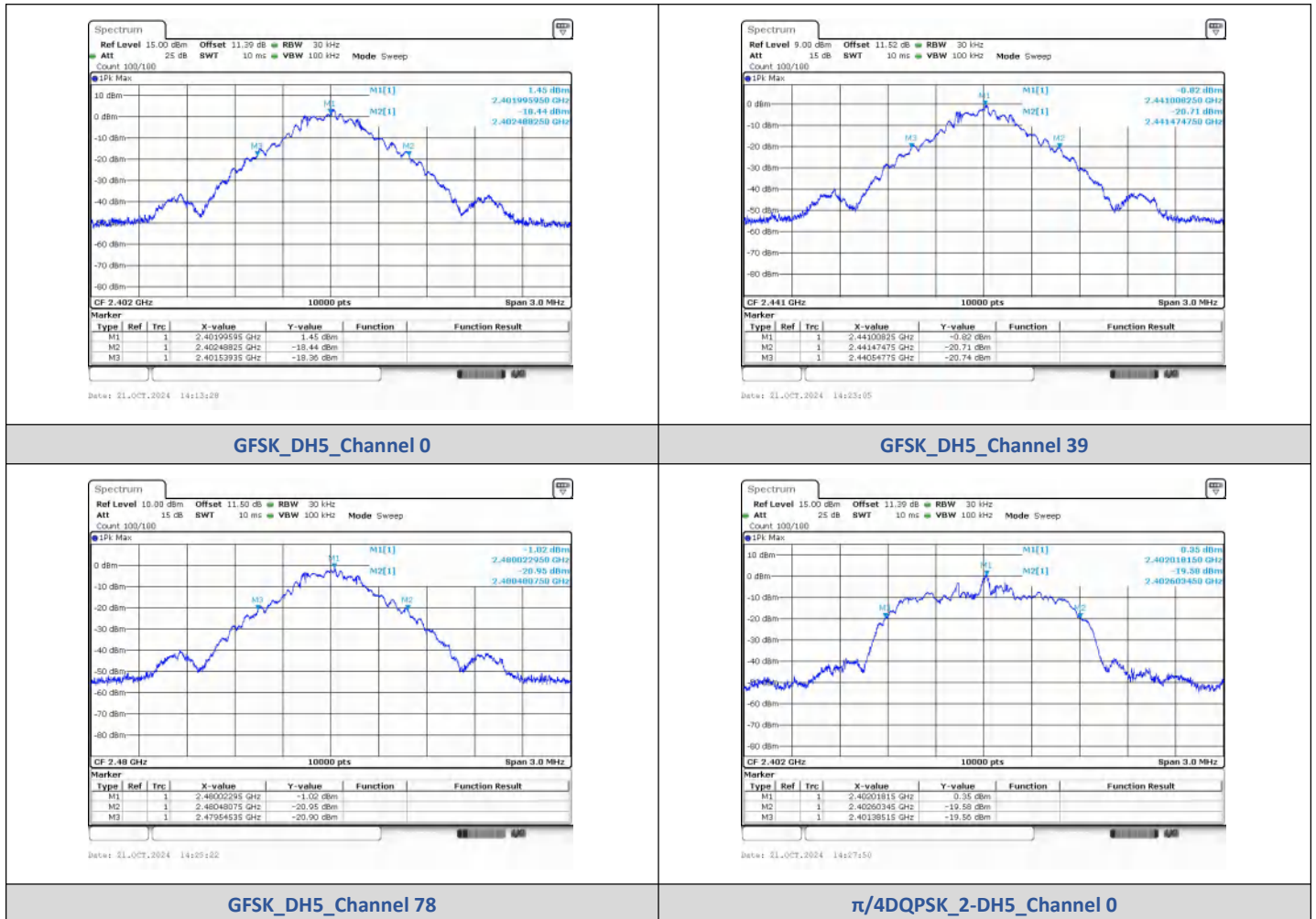
8DPSK_3-DH5_Channel 78

LEFT:

Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9500
	39	2441 MHz	0.9200
	78	2480 MHz	0.9300
$\pi/4$ DQPSK	0	2402 MHz	1.210
	39	2441 MHz	1.210
	78	2480 MHz	1.200
8DPSK	0	2402 MHz	1.270
	39	2441 MHz	1.270
	78	2480 MHz	1.270

Test Graphs

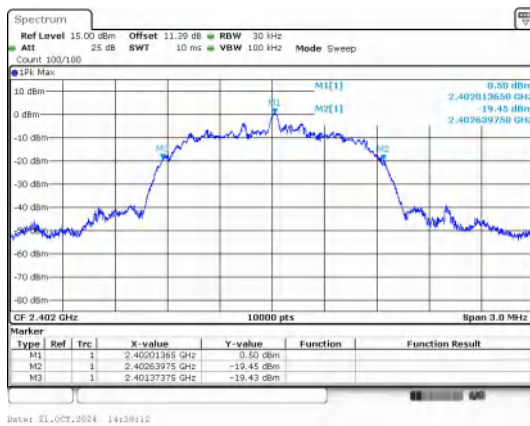




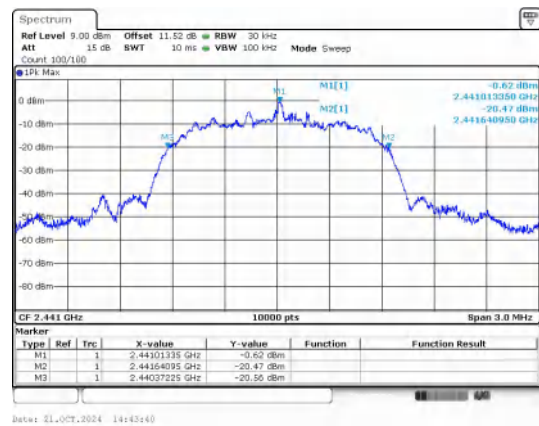
$\pi/4$ DQPSK_2-DH5_Channel 39



$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

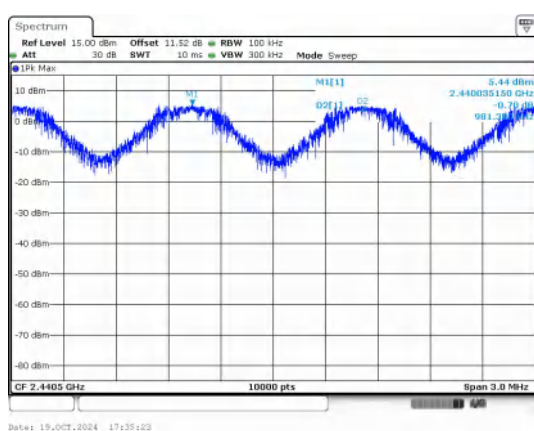
7) Carrier Frequencies Separation

RIGHT:

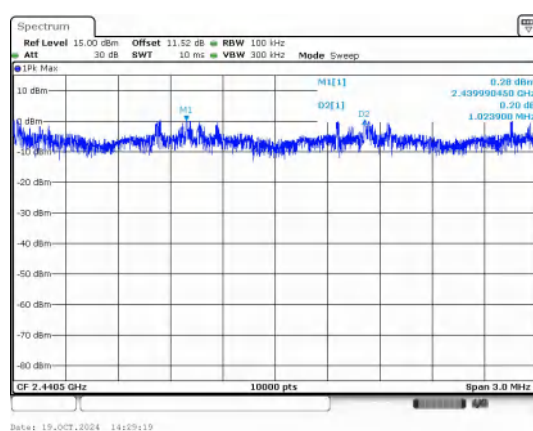
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0352	2441.0165	0.9813	0.9500	PASS
$\pi/4$ DQPSK	2-DH5	2439.9904	2441.0143	1.0239	0.82	PASS
8DPSK	3-DH5	2439.9592	2441.032	1.0728	0.847	PASS

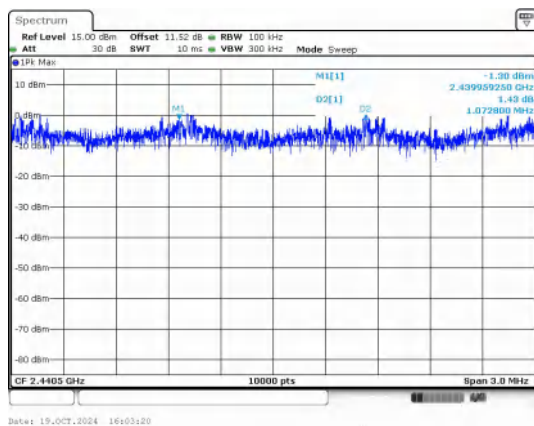
Test Graphs



GFSK



$\pi/4$ DQPSK



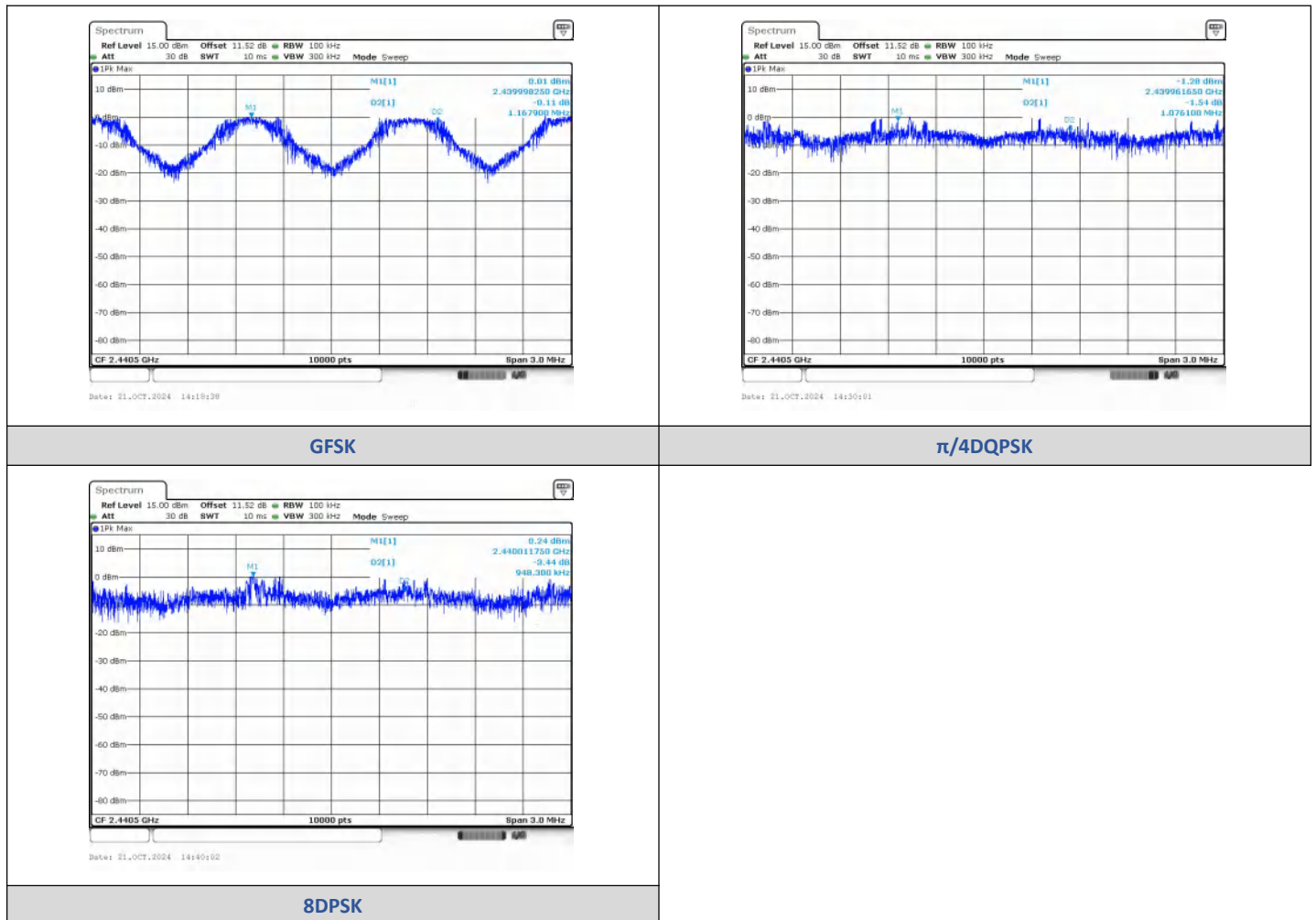
8DPSK

LEFT:

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.9983	2441.1662	1.1679	0.9500	PASS
$\pi/4$ DQPSK	2-DH5	2439.9617	2441.0377	1.0761	0.807	PASS
8DPSK	3-DH5	2440.0118	2440.9601	0.9483	0.847	PASS

Test Graphs



8) Conducted Out Of Band Emission

RIGHT:

Test Result

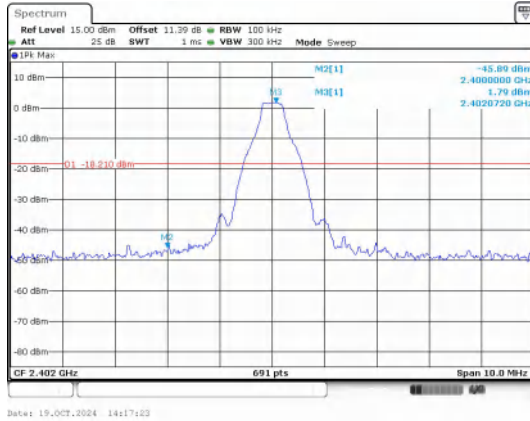
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-45.893	-18.21	-27.683	PASS
			4803.85	-38.744	-18.21	-20.534	PASS
		39	4882.09	-41.130	-19.47	-21.660	PASS
		78	2483.50	-49.195	-18.88	-30.315	PASS
			4960.33	-42.887	-18.88	-24.007	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-45.903	-18.33	-27.573	PASS
			4803.85	-42.069	-18.33	-23.739	PASS
		39	4882.09	-46.830	-19.35	-27.480	PASS
		78	2483.50	-46.600	-18.91	-27.690	PASS
			4960.33	-44.257	-18.91	-25.347	PASS
8DPSK	3-DH5	0	2400.00	-47.434	-18.21	-29.224	PASS
			4803.85	-40.891	-18.21	-22.681	PASS
		39	4882.09	-45.308	-19.52	-25.788	PASS
		78	2483.50	-48.533	-19.03	-29.503	PASS
			4960.33	-46.420	-19.03	-27.390	PASS

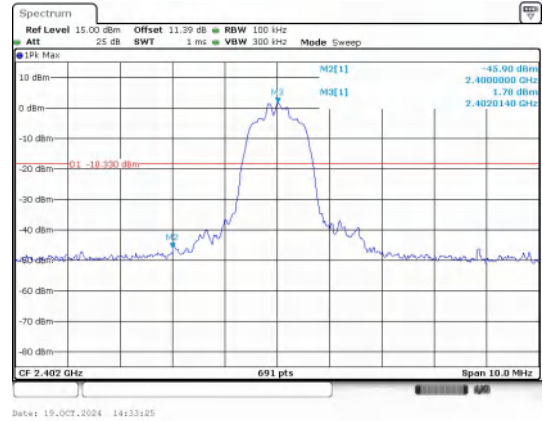
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.02	-44.875	-18.59	-26.285	PASS
			2400.00	-45.920	-18.59	-27.330	PASS
			2483.50	-48.893	-18.97	-29.923	PASS
$\pi/4$ DQPSK	2-DH5		2395.83	-45.768	-18.69	-27.078	PASS
			2400.00	-49.018	-18.69	-30.328	PASS
			2483.50	-49.765	-21.85	-27.915	PASS
8DPSK	3-DH5		2395.01	-46.225	-18.52	-27.705	PASS
			2400.00	-48.373	-18.52	-29.853	PASS
			2483.50	-50.411	-19.29	-31.121	PASS

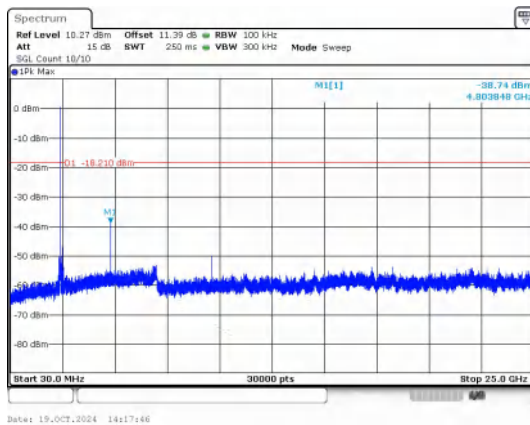
Test Graphs



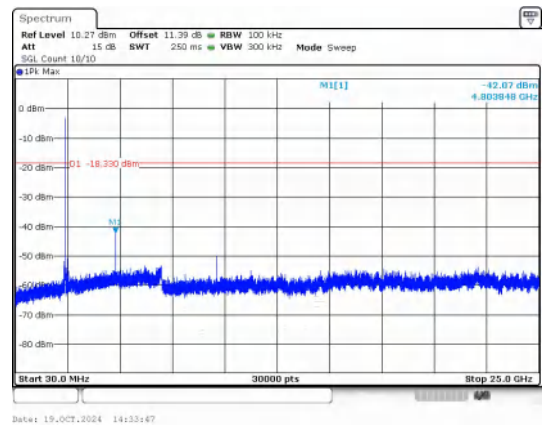
Out Of Band Emission
GFSK_DH5_Channel 0



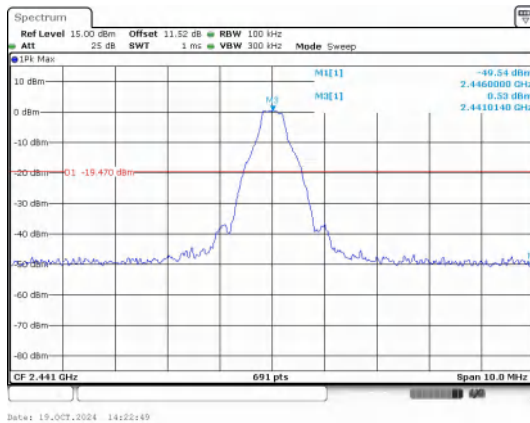
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 0



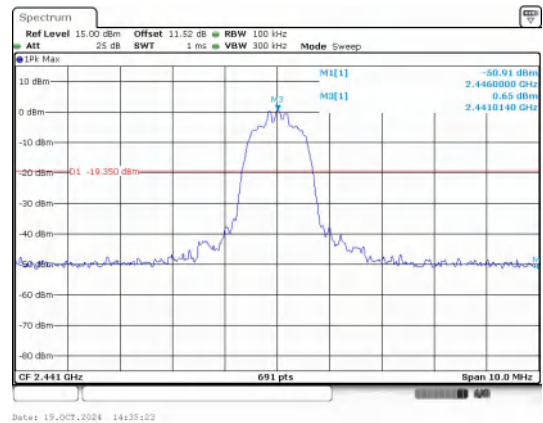
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



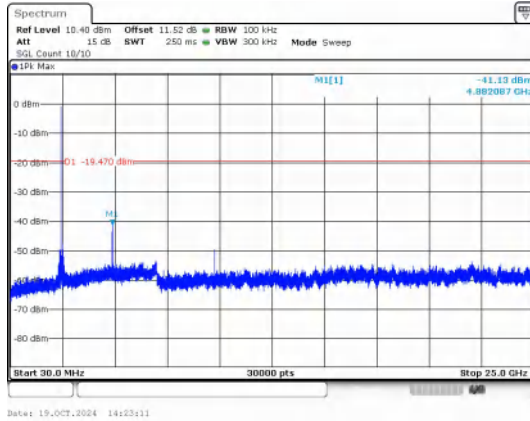
30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 0



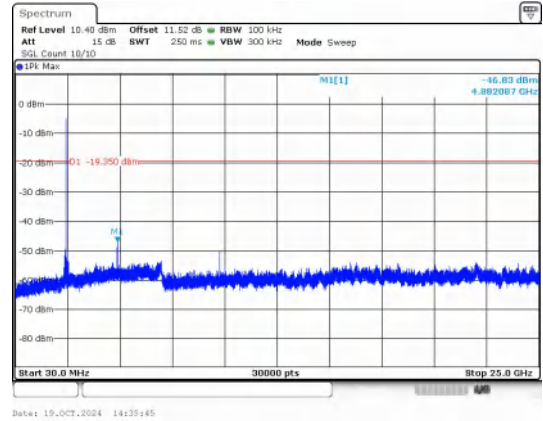
Out Of Band Emission
GFSK_DH5_Channel 39



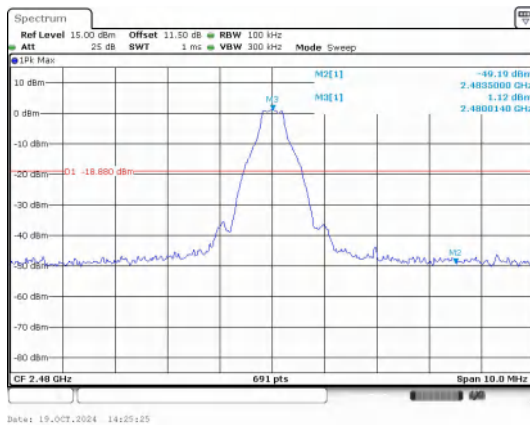
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



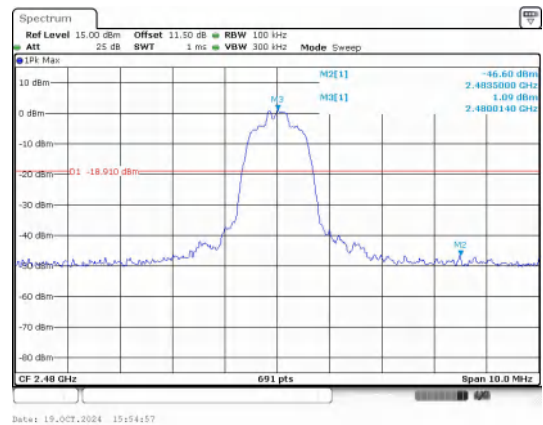
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



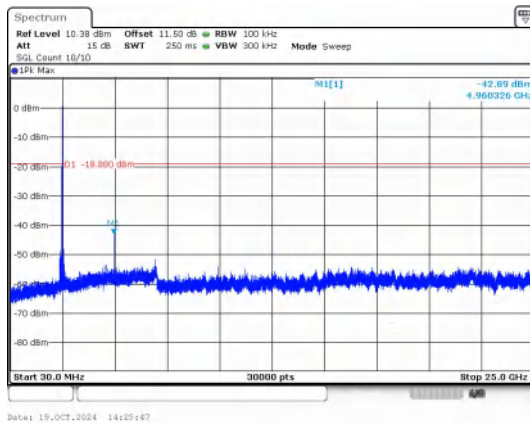
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



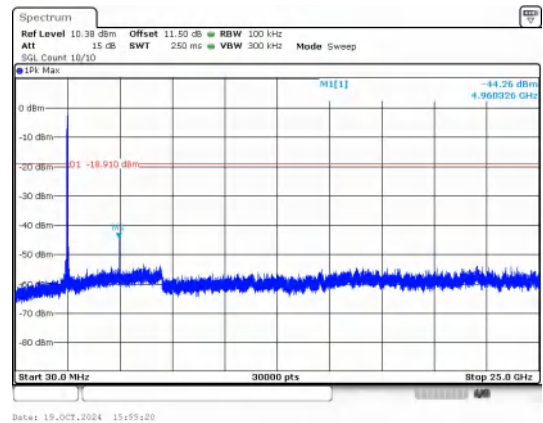
Out Of Band Emission
GFSK_DH5_Channel 78



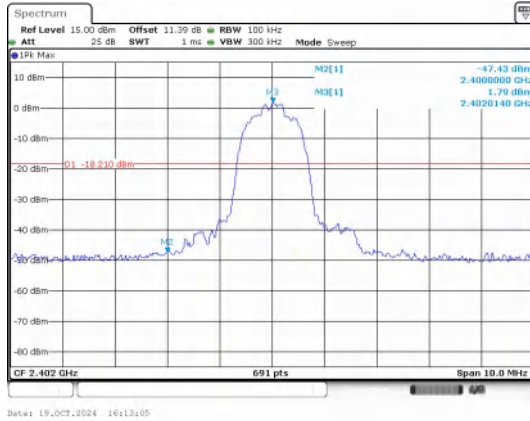
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



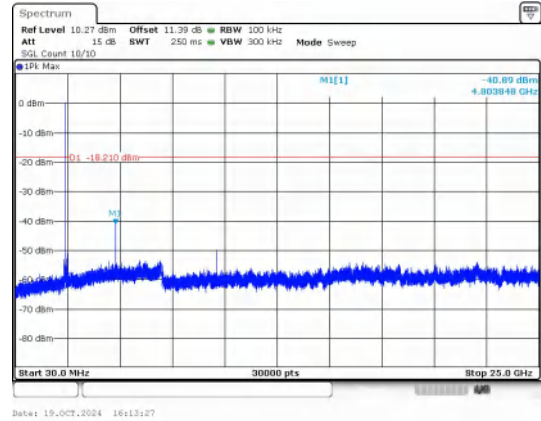
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



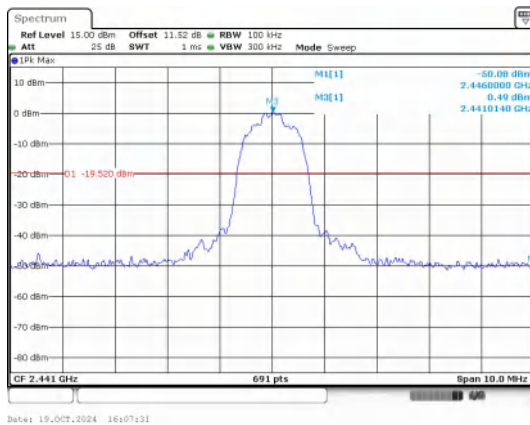
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



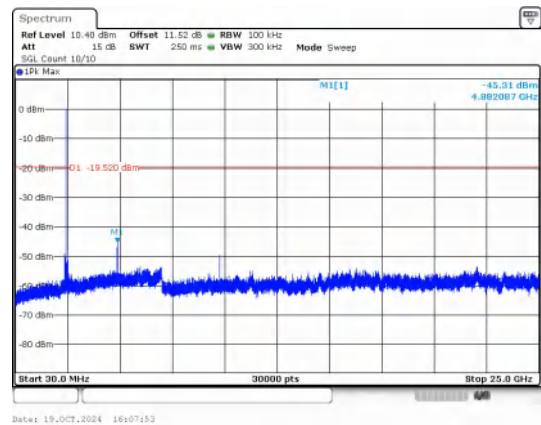
Out Of Band Emission
8DPSK_3-DH5_Channel 0



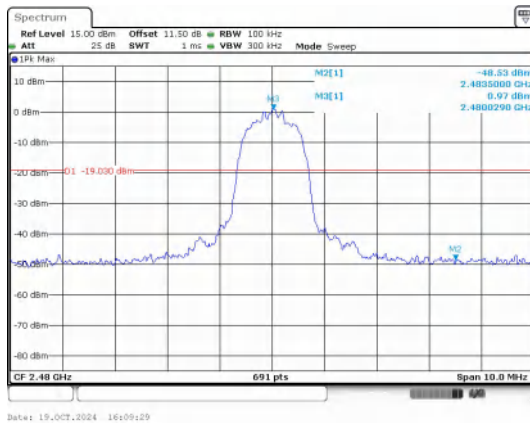
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



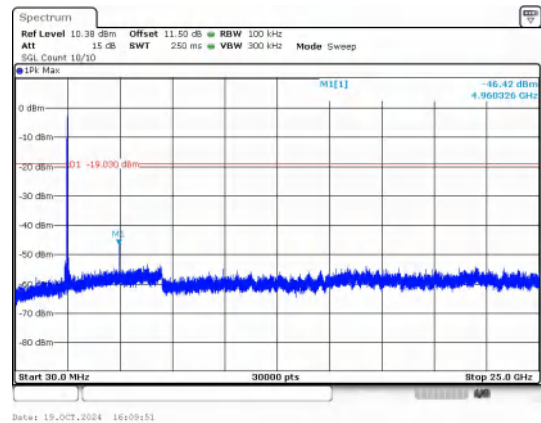
Out Of Band Emission
8DPSK_3-DH5_Channel 39



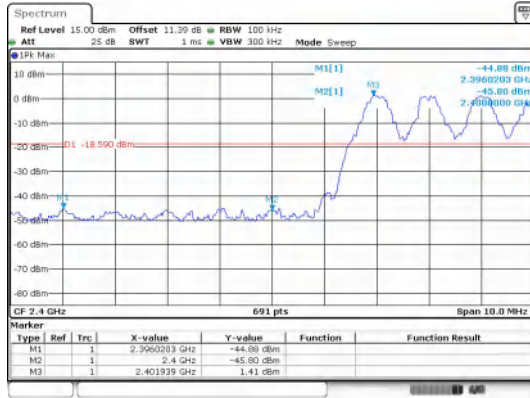
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



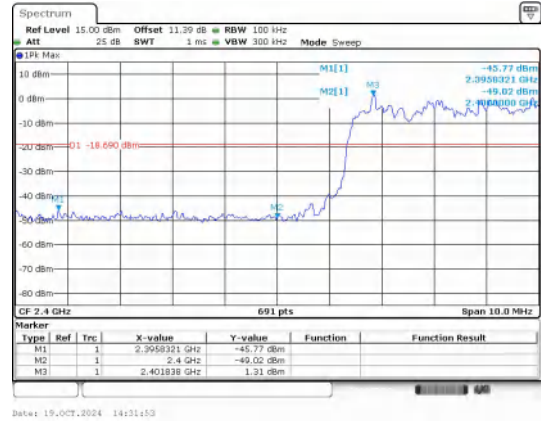
Out Of Band Emission
8DPSK_3-DH5_Channel 78



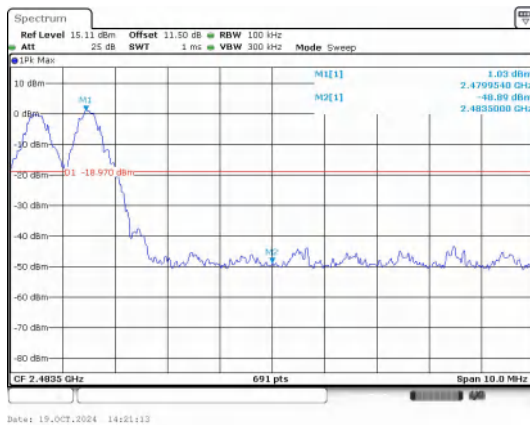
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



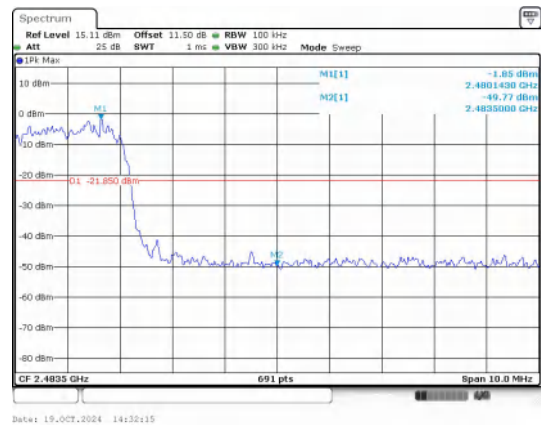
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



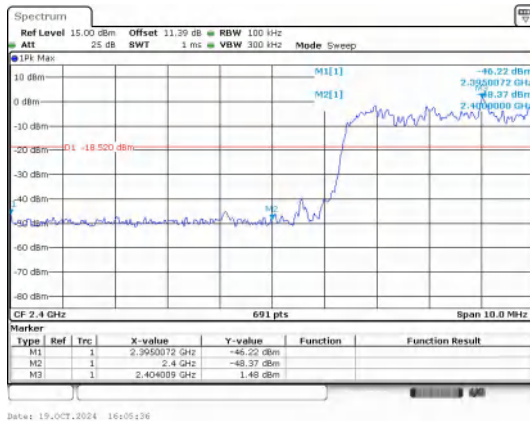
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



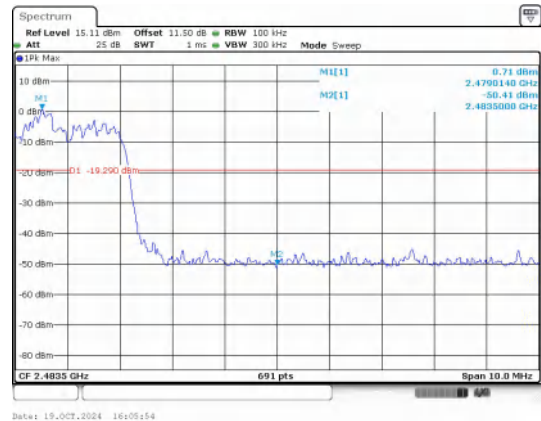
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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

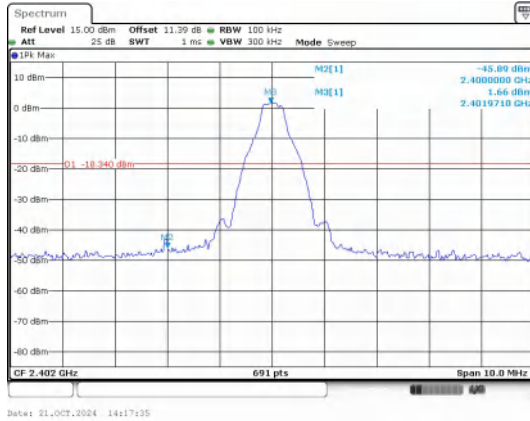
LEFT:
Test Result
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-45.893	-18.34	-27.553	PASS
			4803.85	-39.061	-18.34	-20.721	PASS
		39	4882.09	-45.447	-19.73	-25.717	PASS
		78	2483.50	-48.638	-19.48	-29.158	PASS
			4960.33	-47.425	-19.48	-27.945	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-46.190	-18.6	-27.590	PASS
			4803.85	-46.679	-18.6	-28.079	PASS
		39	4882.09	-49.137	-19.7	-29.437	PASS
		78	2483.50	-48.971	-19.35	-29.621	PASS
			4960.33	-47.839	-19.35	-28.489	PASS
8DPSK	3-DH5	0	2400.00	-46.396	-18.57	-27.826	PASS
			4803.85	-43.912	-18.57	-25.342	PASS
		39	4882.09	-47.932	-19.86	-28.072	PASS
		78	2483.50	-49.020	-19.49	-29.530	PASS
			2558.21	-49.324	-19.49	-29.834	PASS

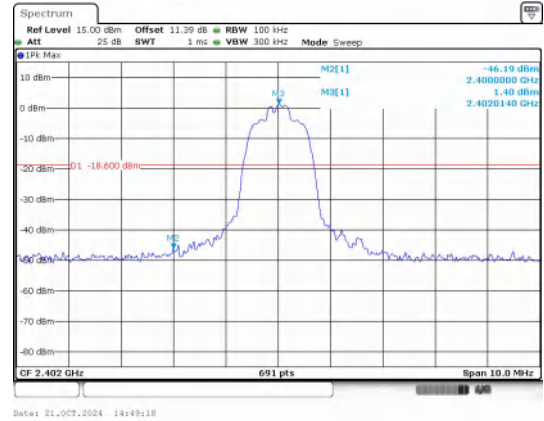
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.43	-44.939	-19.23	-25.709	PASS
			2400.00	-47.541	-19.23	-28.311	PASS
			2483.50	-48.243	-19.45	-28.793	PASS
$\pi/4$ DQPSK	2-DH5		2397.73	-46.668	-21.18	-25.488	PASS
			2400.00	-49.745	-21.18	-28.565	PASS
			2483.50	-49.400	-19.65	-29.750	PASS
8DPSK	3-DH5		2395.31	-45.999	-19.69	-26.309	PASS
			2400.00	-49.300	-19.69	-29.610	PASS
			2483.50	-50.264	-20.49	-29.774	PASS

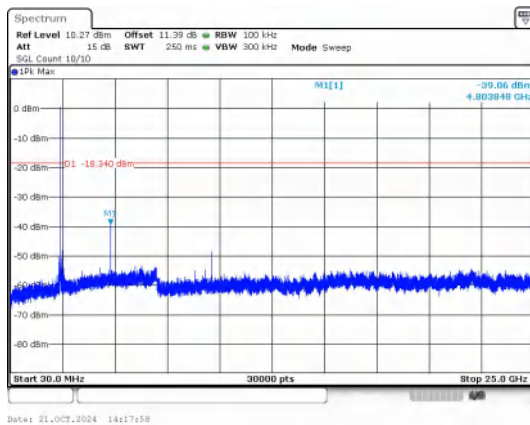
Test Graphs



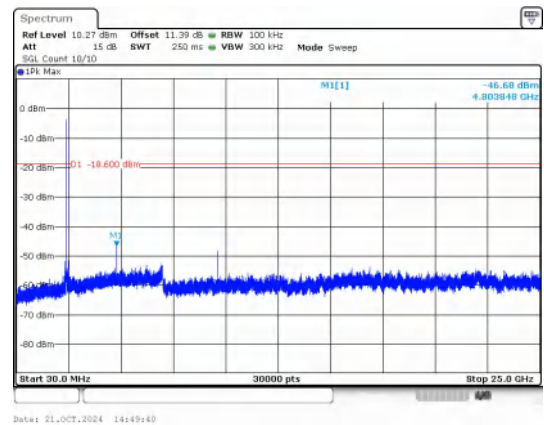
Out Of Band Emission
GFSK_DH5_Channel 0



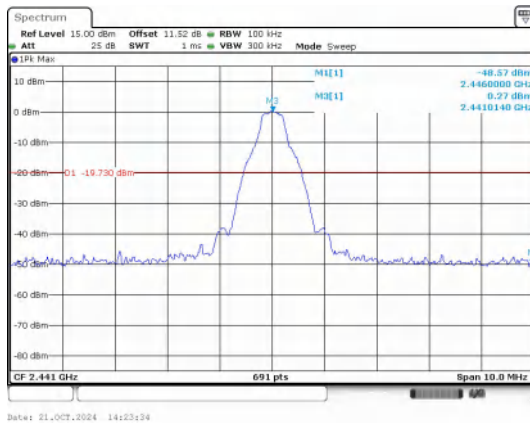
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



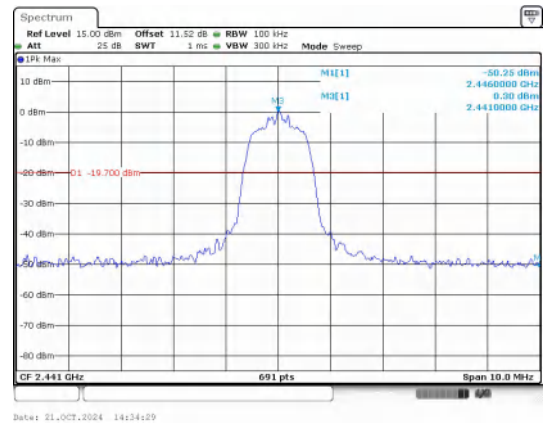
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



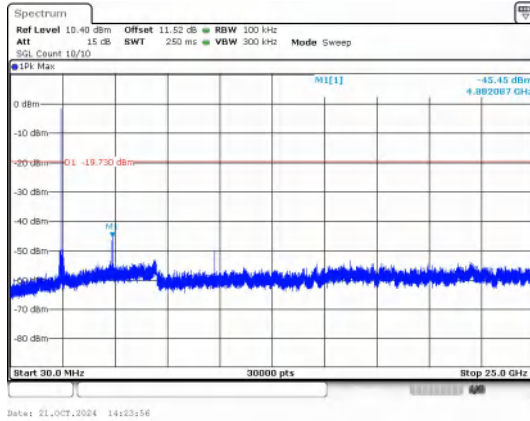
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



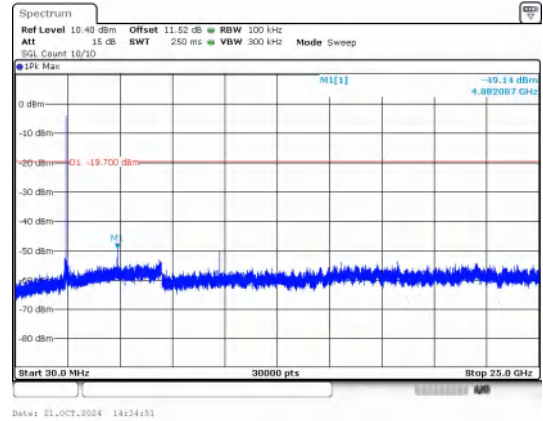
Out Of Band Emission
GFSK_DH5_Channel 39



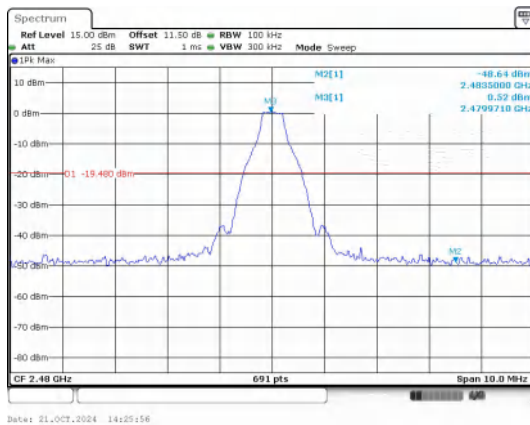
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



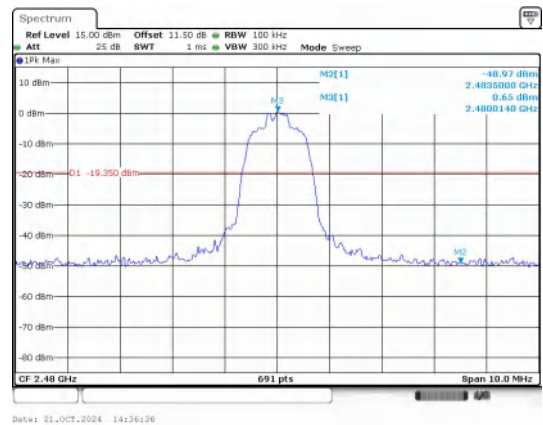
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



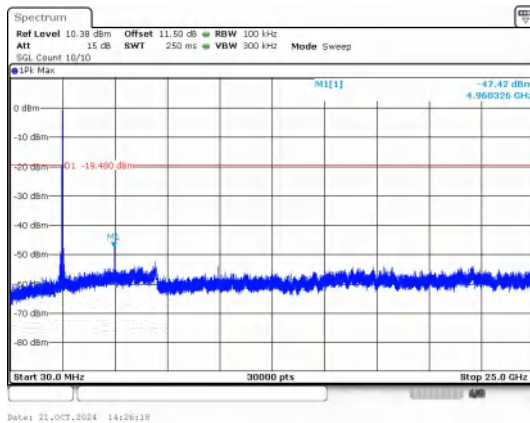
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



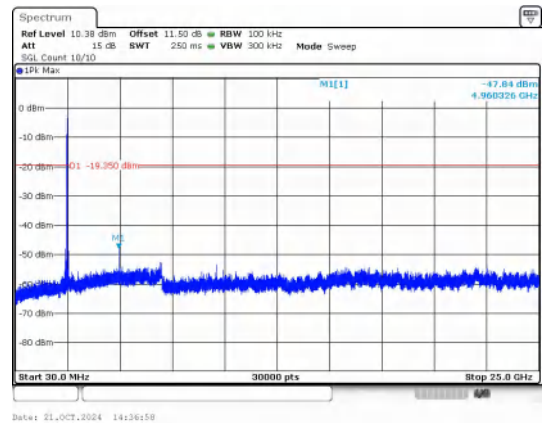
Out Of Band Emission
GFSK_DH5_Channel 78



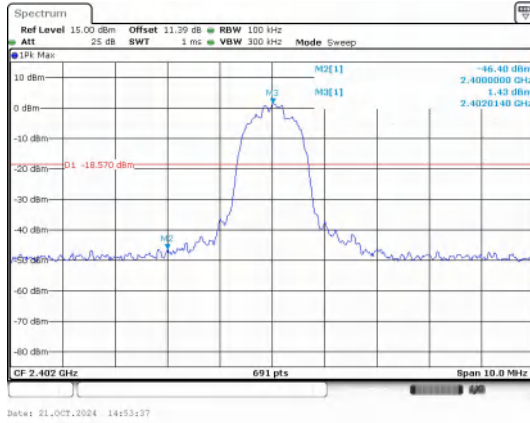
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



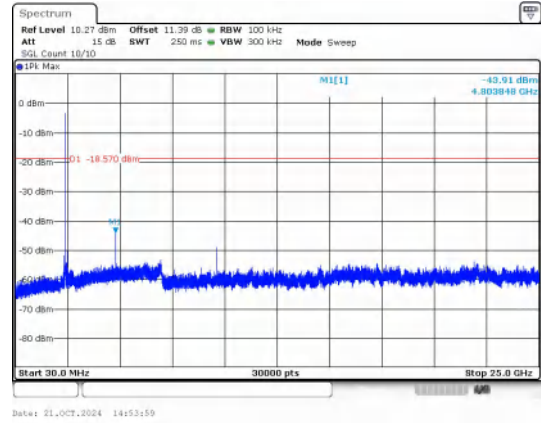
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



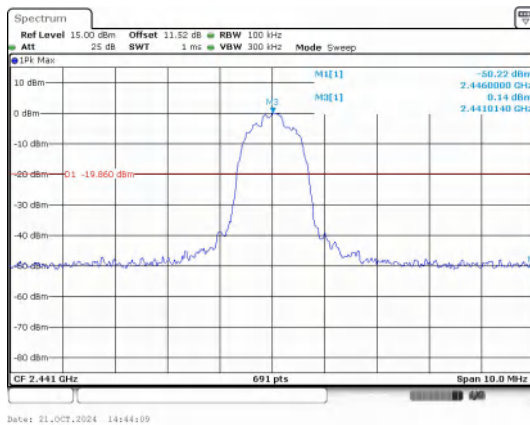
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



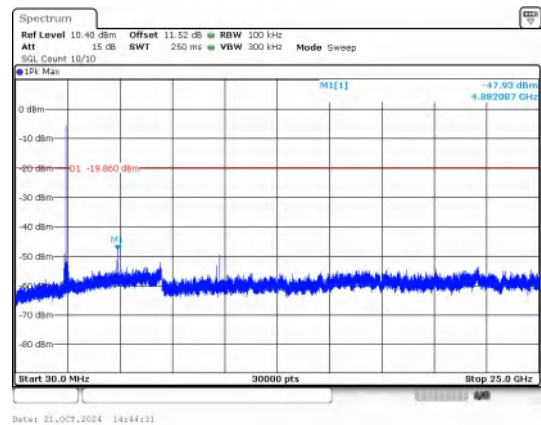
Out Of Band Emission
8DPSK_3-DH5_Channel 0



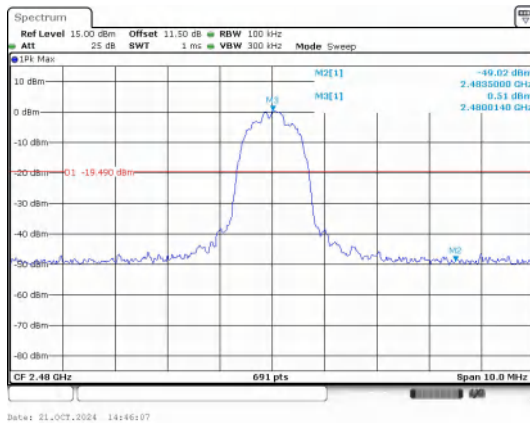
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



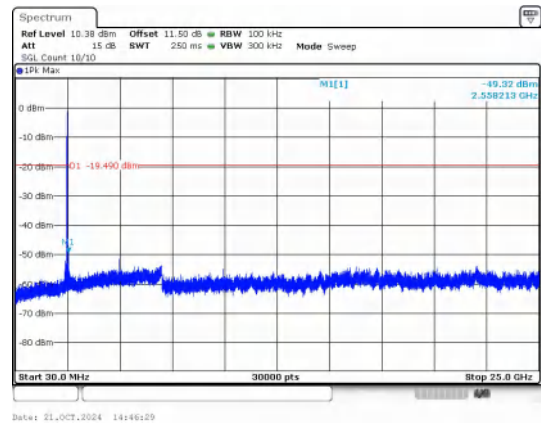
Out Of Band Emission
8DPSK_3-DH5_Channel 39



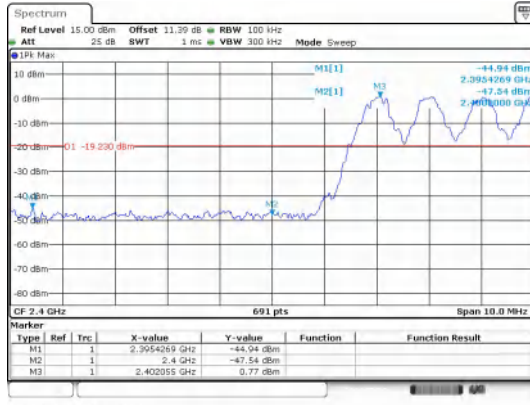
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



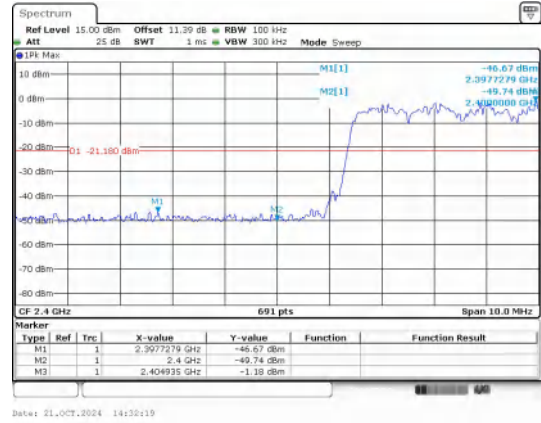
Out Of Band Emission
8DPSK_3-DH5_Channel 78



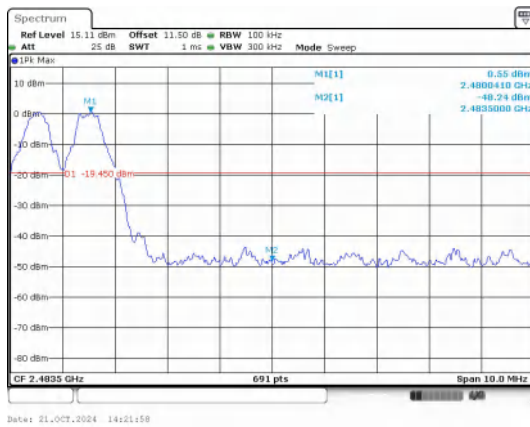
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



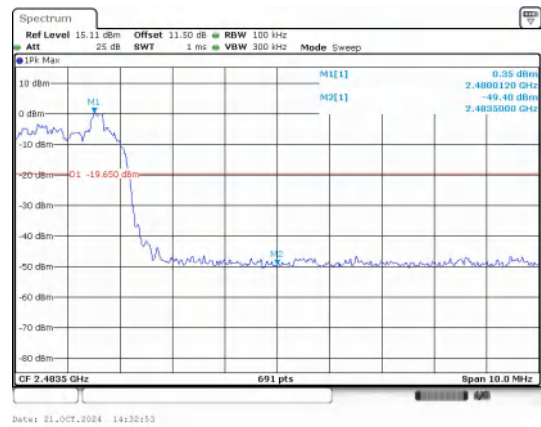
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



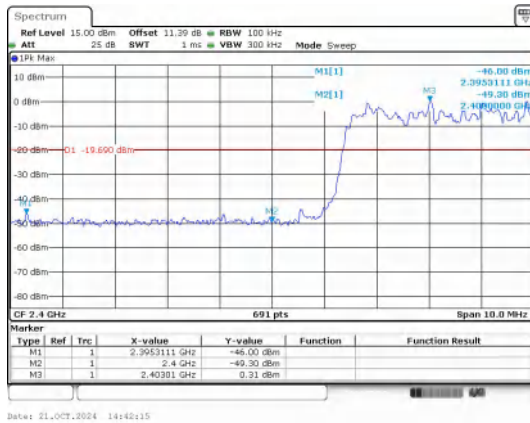
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



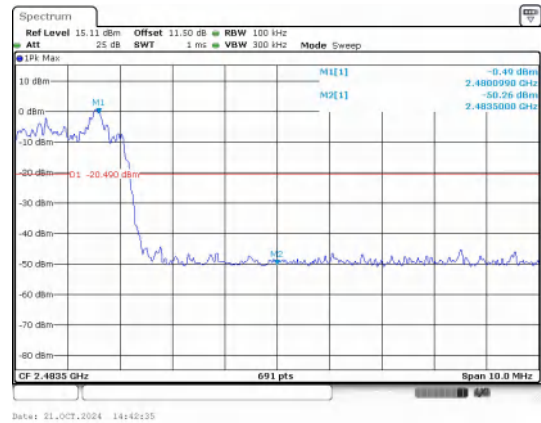
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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