Appendix A

Report No.:	CISRR23121804601
FCC ID:	2BD7G-JNE-23
Product Name:	TWS Bluetooth earphones
Model No.:	JNE-23
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

1) Conducted Peak Output Power

Test Result

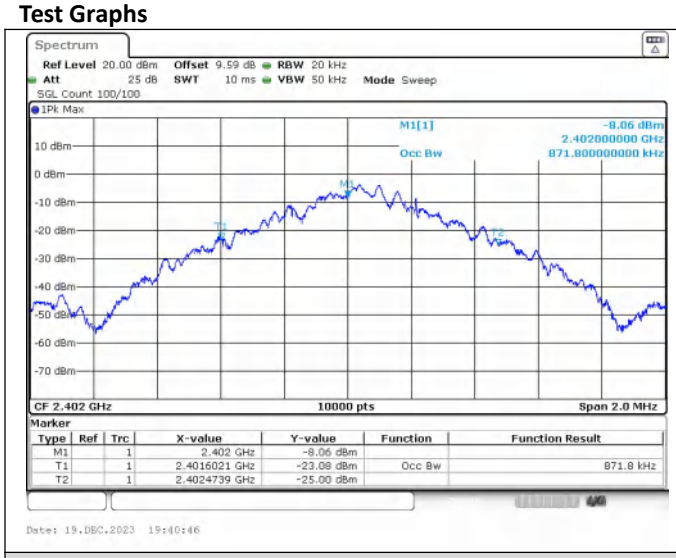
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	4.905	3.094	30	PASS
		39	5.175	3.292		PASS
		78	4.715	2.962		PASS
π/4DQPSK	2-DH5	0	5.556	3.595	20.97	PASS
		39	5.718	3.731		PASS
		78	5.298	3.387		PASS
8DPSK	3-DH5	0	6.005	3.985		PASS
		39	6.070	4.046		PASS
		78	5.604	3.634		PASS

2) 99% Bandwidth

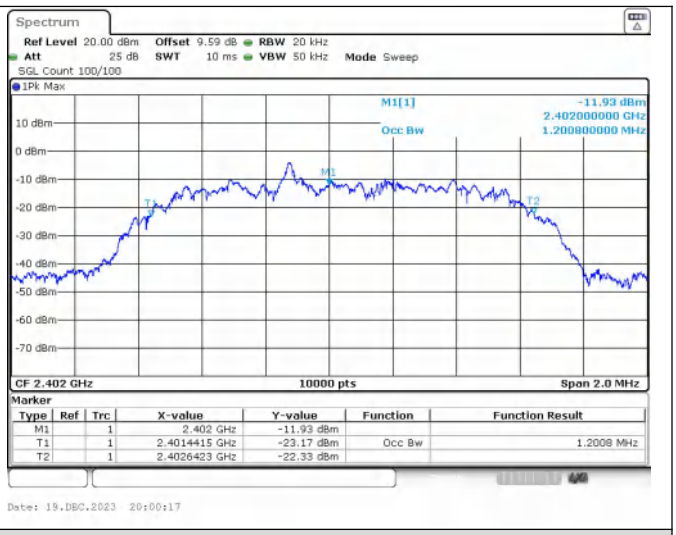
Test Result

Modulation	Channel	99% BW (MHz)
GFSK	0	0.87180
	39	0.86080
	78	0.88200
π/4DQPSK	0	1.2010
	39	1.2020
	78	1.2060
8DPSK	0	1.2040
	39	1.2070
	78	1.2130

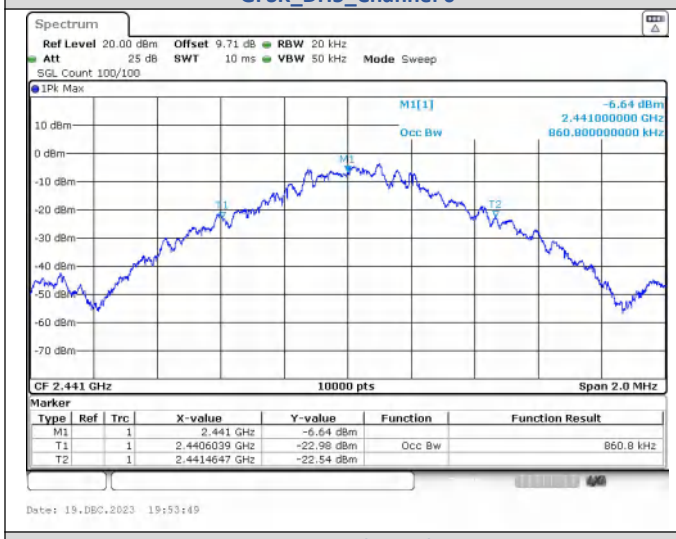
Test Graphs



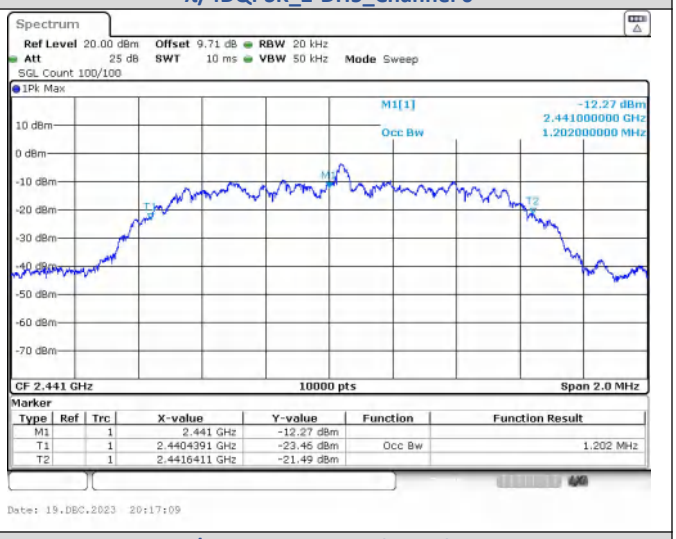
GFSK_DH5_Channel 0



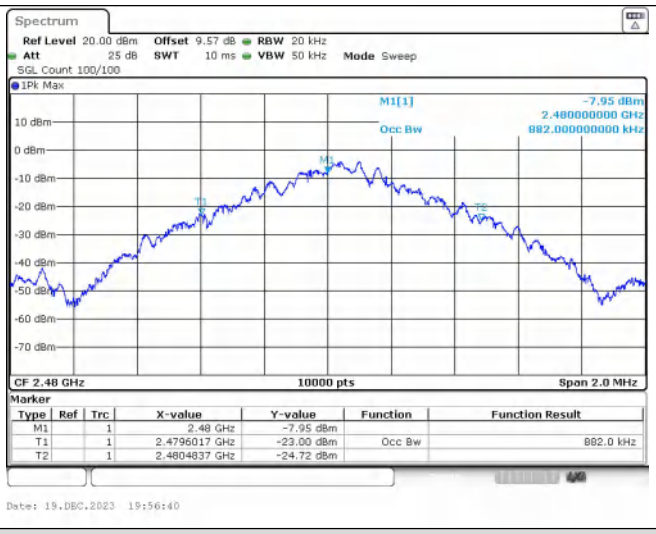
π/4DQPSK_2-DH5_Channel 0



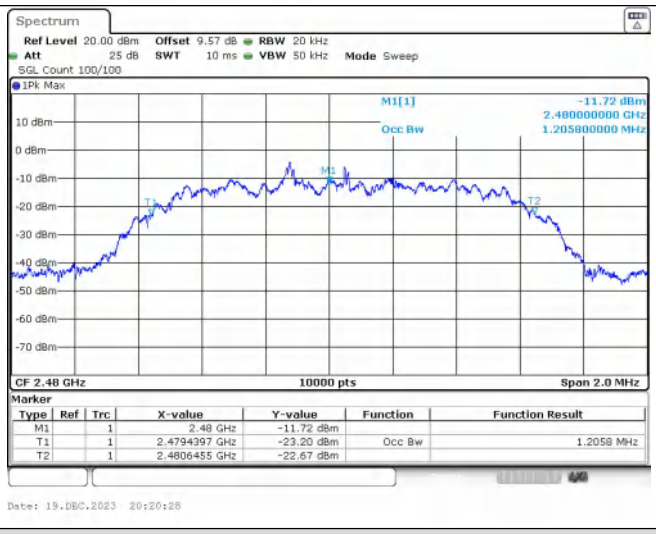
GFSK_DH5_Channel 39



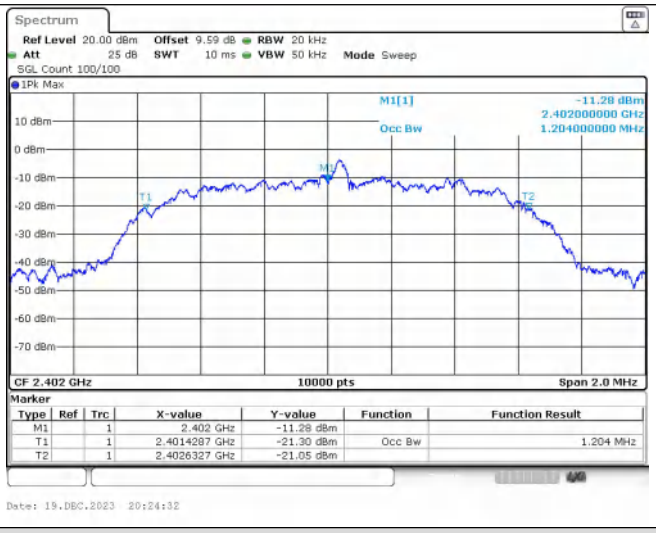
π/4DQPSK_2-DH5_Channel 39



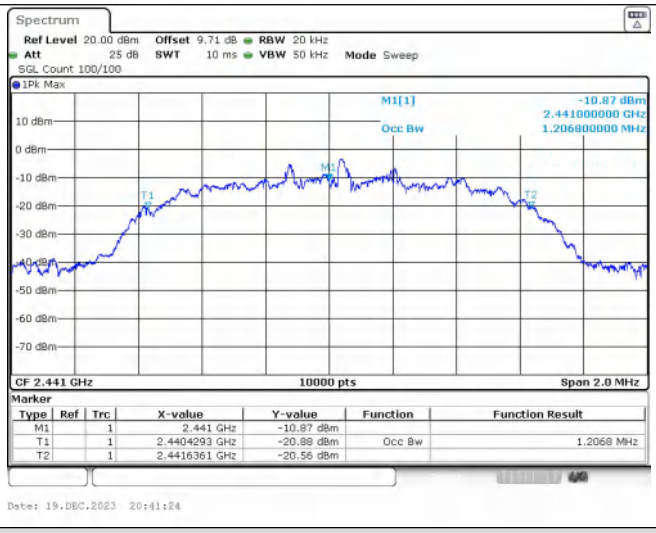
GFSK_DH5_Channel 78



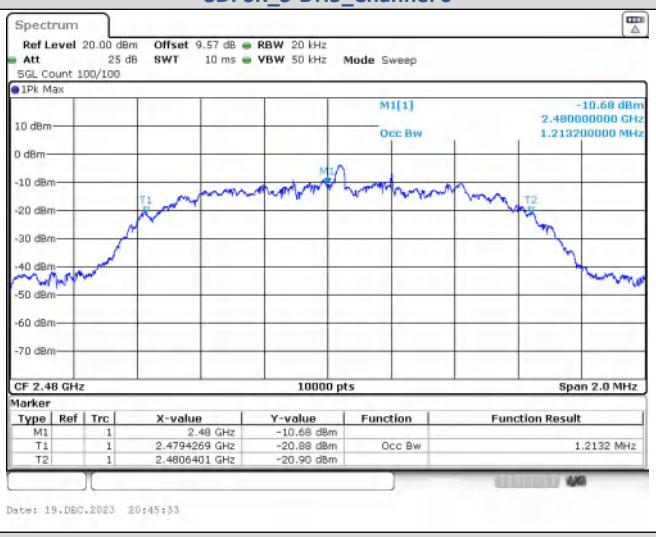
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

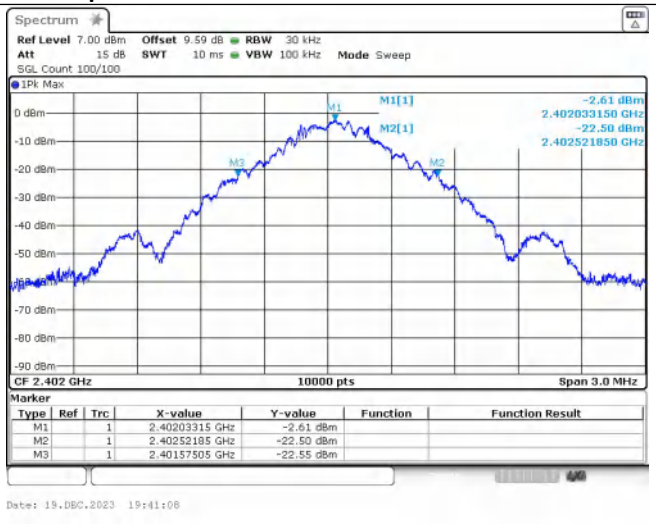
Void

3) 20dB Bandwidth

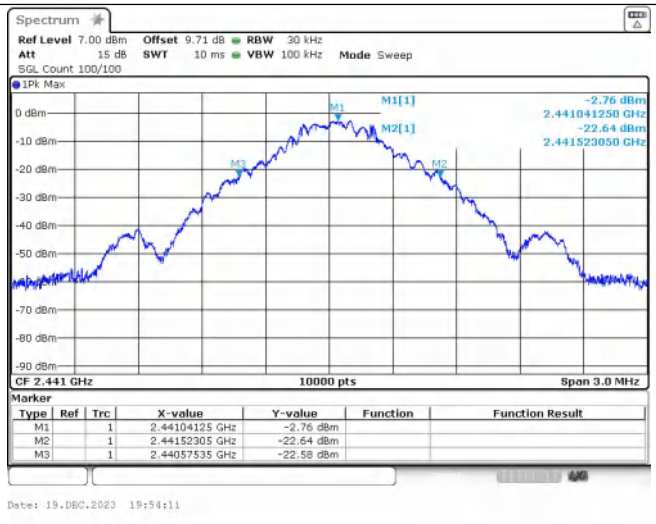
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9400
	39	2441 MHz	0.9400
	78	2480 MHz	0.9400
π/4DQPSK	0	2402 MHz	1.280
	39	2441 MHz	1.300
	78	2480 MHz	1.300
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.300
	78	2480 MHz	1.290

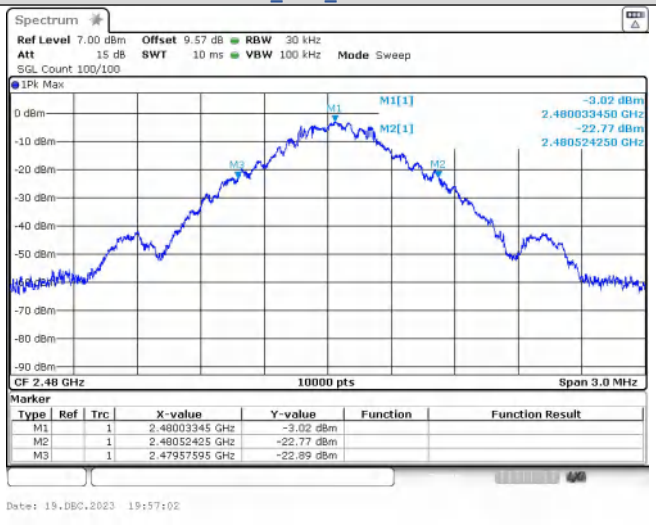
Test Graphs



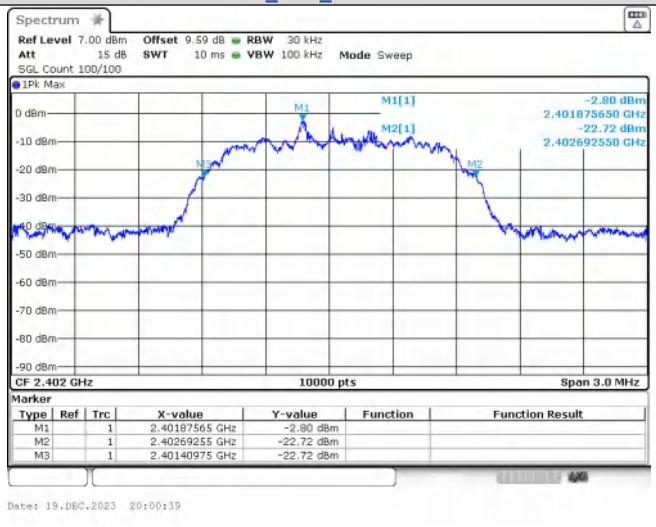
GFSK_DH5_Channel 0



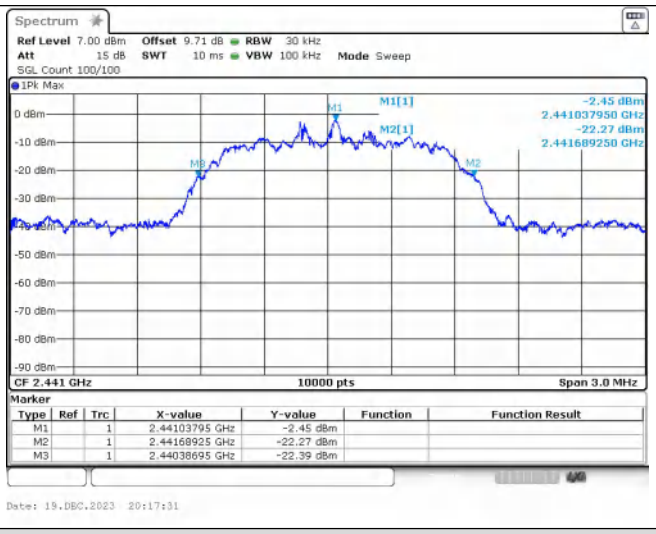
GFSK_DH5_Channel 39



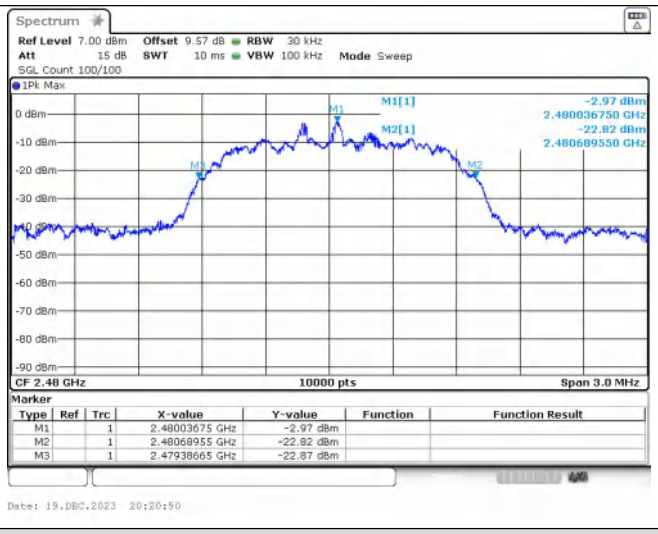
GFSK_DH5_Channel 78



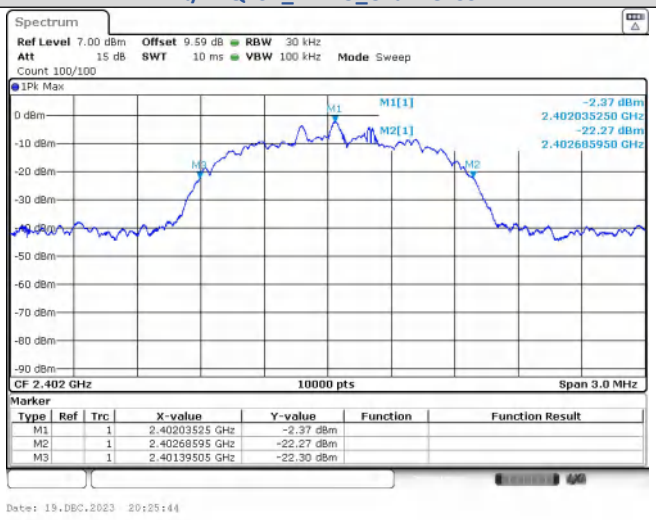
π/4DQPSK_2-DH5_Channel 0



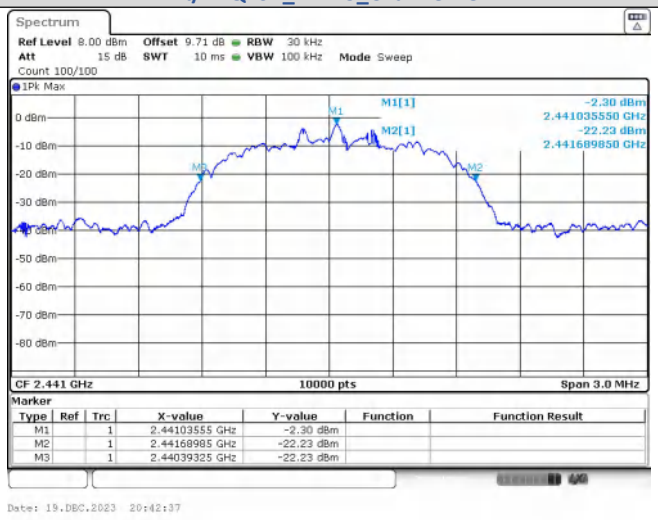
π/4DQPSK_2-DH5_Channel 39



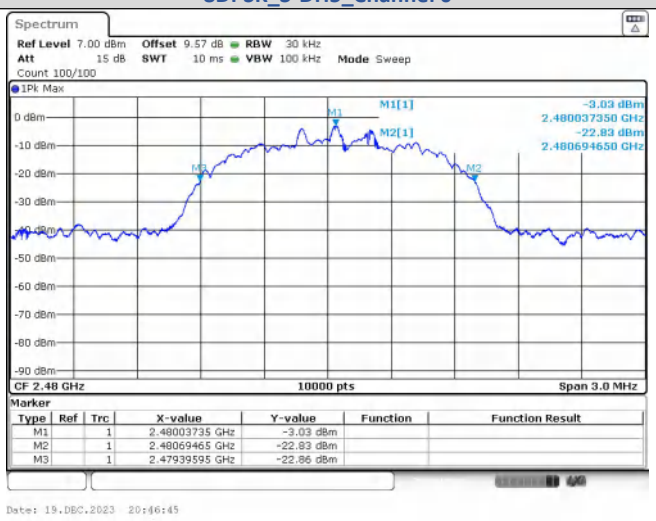
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

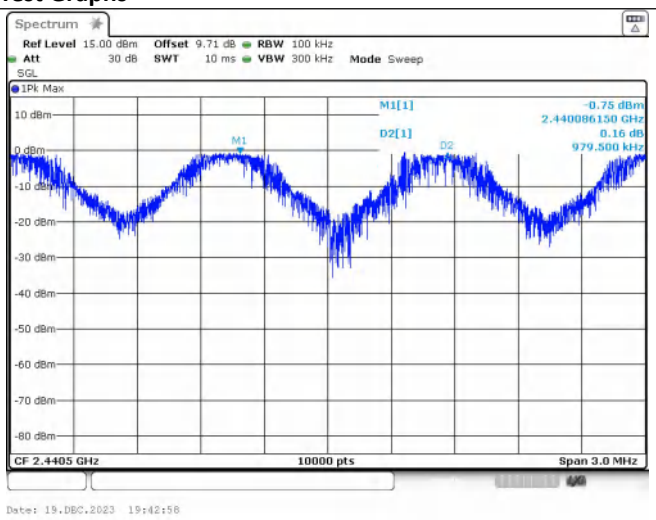
Void

4) Carrier Frequencies Separation

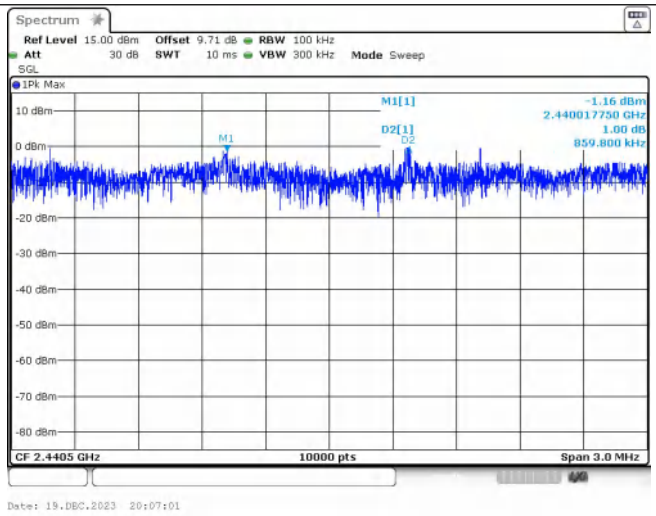
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0862	2441.0657	0.9795	0.627	PASS
π/4DQPSK	2-DH5	2440.0177	2440.8776	0.8598	0.853	PASS
8DPSK	3-DH5	2440.0561	2441.0314	0.9753	0.86	PASS

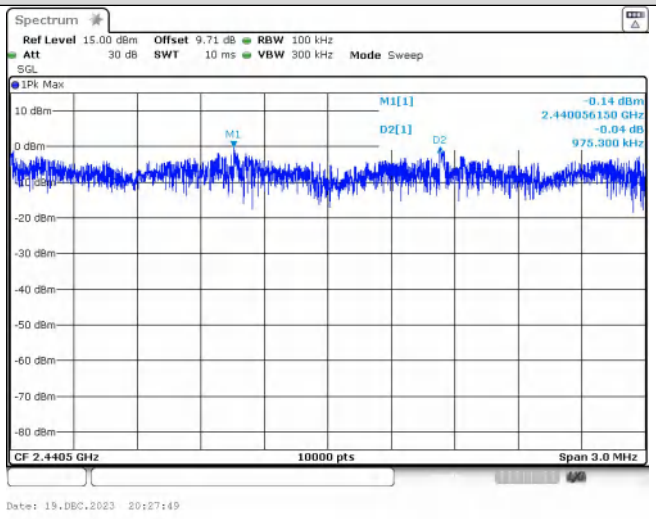
Test Graphs



GFSK



π/4DQPSK



8DPSK

Void

5) Conducted Out Of Band Emission

Test Result

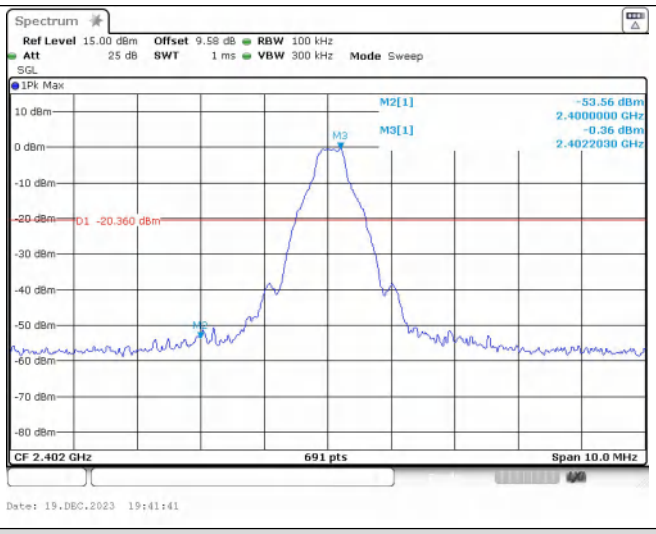
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-53.565	-20.36	-33.205	PASS
			7206.79	-44.387	-20.36	-24.027	PASS
		39	9764.55	-44.841	-20.3	-24.541	PASS
		78	2483.50	-57.404	-20.58	-36.824	PASS
			7439.85	-46.762	-20.58	-26.182	PASS
π/4DQPSK	2-DH5	0	2400.00	-50.670	-20.41	-30.260	PASS
			7205.96	-44.685	-20.41	-24.275	PASS
		39	9764.55	-44.841	-20.34	-24.501	PASS
		78	2483.50	-55.984	-20.56	-35.424	PASS
			9920.20	-47.201	-20.56	-26.641	PASS
8DPSK	3-DH5	0	2400.00	-50.400	-20.19	-30.210	PASS
			9608.08	-48.651	-20.19	-28.461	PASS
		39	9764.55	-44.446	-19.93	-24.516	PASS
		78	2483.50	-55.983	-20.42	-35.562	PASS
			9920.20	-47.464	-20.42	-27.044	PASS

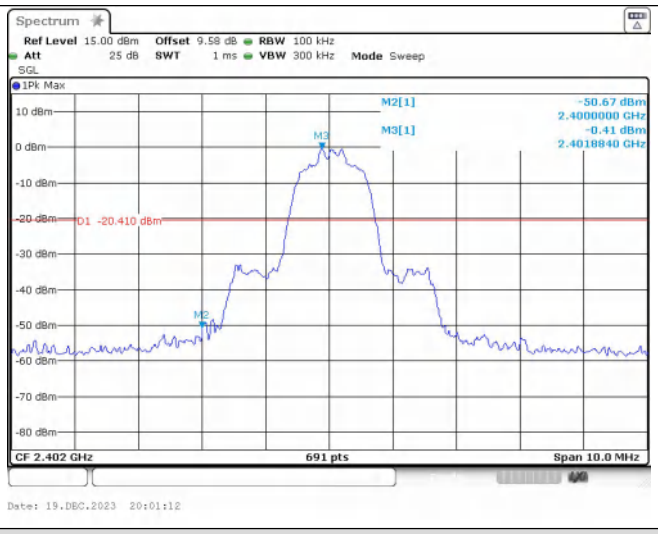
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.21	-55.291	-20.87	-34.421	PASS
			2400.00	-58.441	-20.87	-37.571	PASS
			2483.50	-56.701	-20.86	-35.841	PASS
			2398.44	-54.721	-20.64	-34.081	PASS
			2400.00	-57.535	-20.64	-36.895	PASS
			2483.50	-55.330	-20.69	-34.640	PASS
π/4DQPSK	2-DH5		2395.35	-54.846	-20.35	-34.496	PASS
			2400.00	-54.914	-20.35	-34.564	PASS
			2483.50	-56.685	-21.44	-35.245	PASS
			2400.00	-51.858	-20.29	-31.568	PASS
			2483.50	-57.460	-20.98	-36.480	PASS
8DPSK	3-DH5		2400.00	-50.880	-20.22	-30.660	PASS
			2483.50	-56.054	-20.47	-35.584	PASS
			2397.50	-53.735	-20.2	-33.535	PASS
			2400.00	-55.982	-20.2	-35.782	PASS
			2483.50	-56.047	-20.85	-35.197	PASS

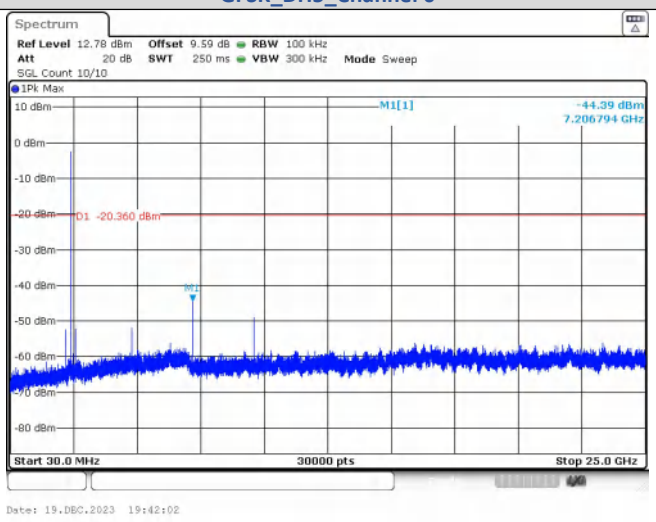
Test Graphs



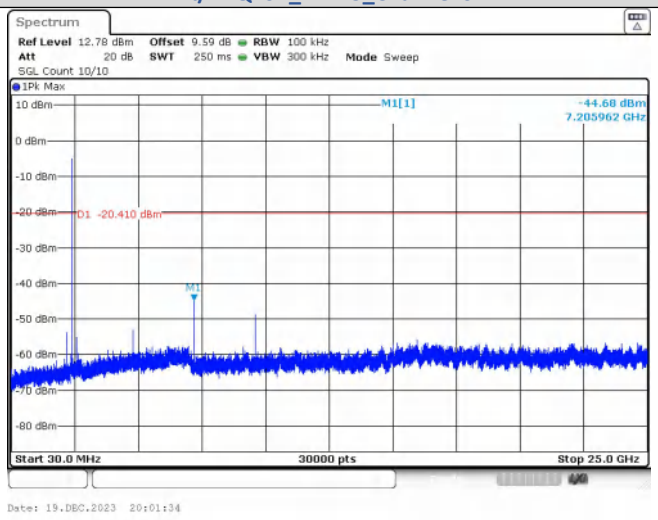
Out Of Band Emission
GFSK_DH5_Channel 0



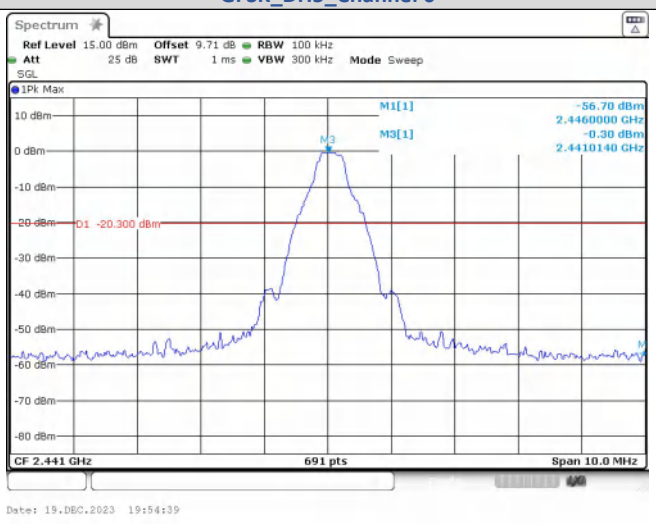
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 0



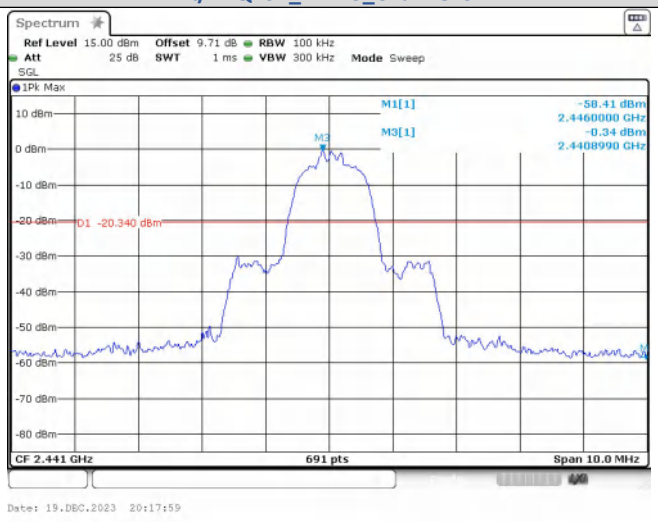
Spurious Emission
GFSK_DH5_Channel 0



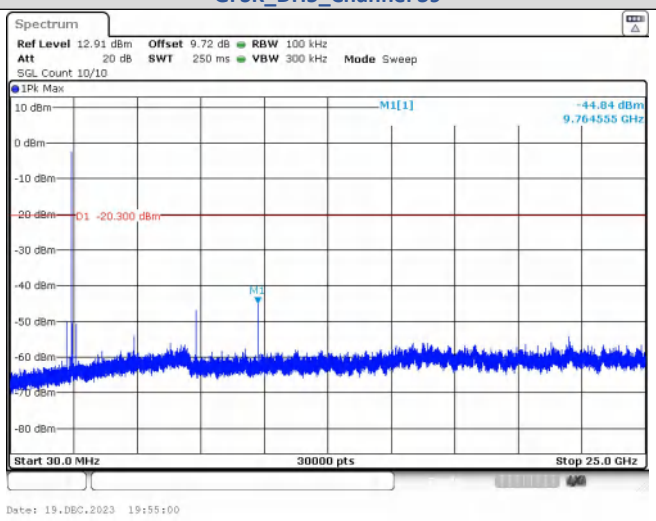
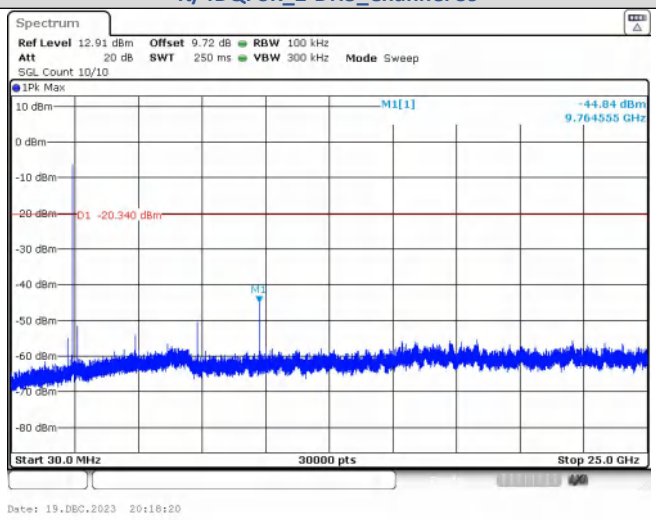
Spurious Emission
π/4DQPSK_2-DH5_Channel 0

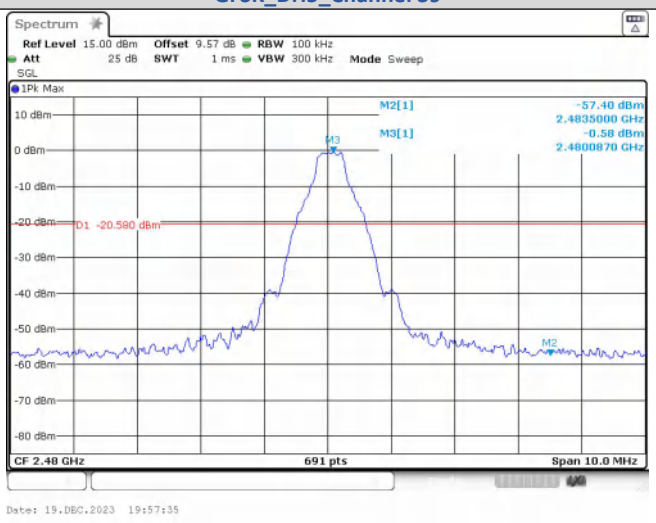
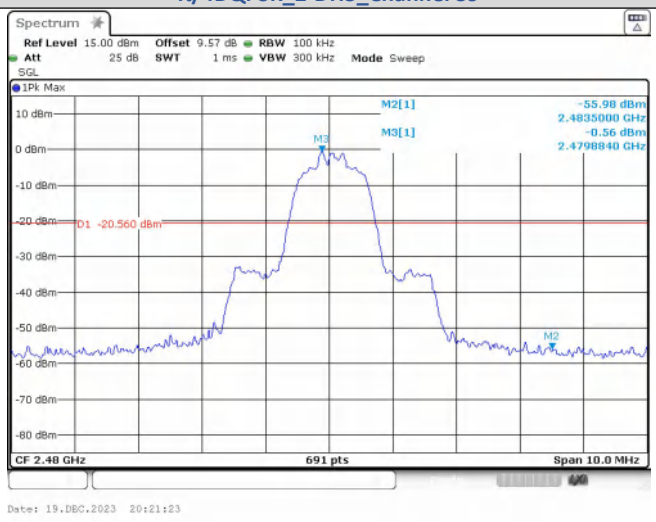


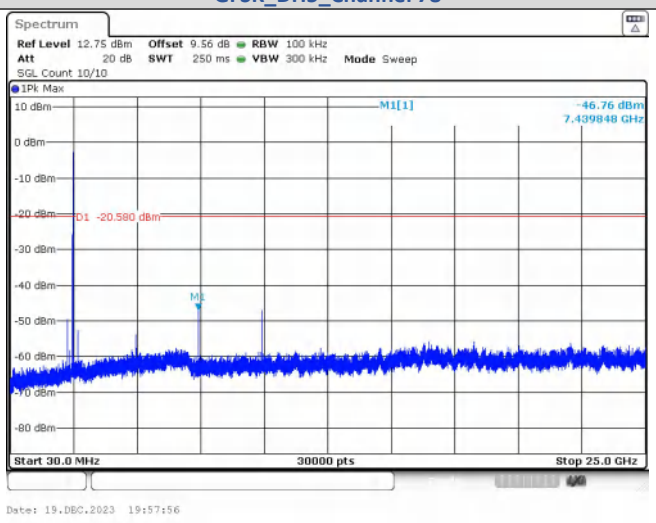
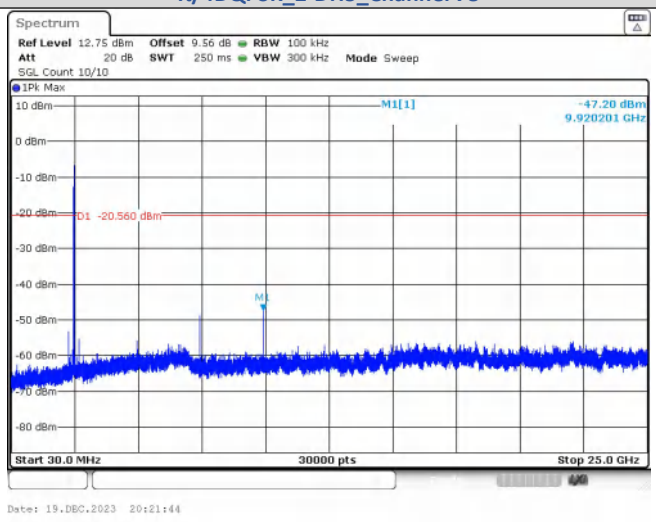
Out Of Band Emission

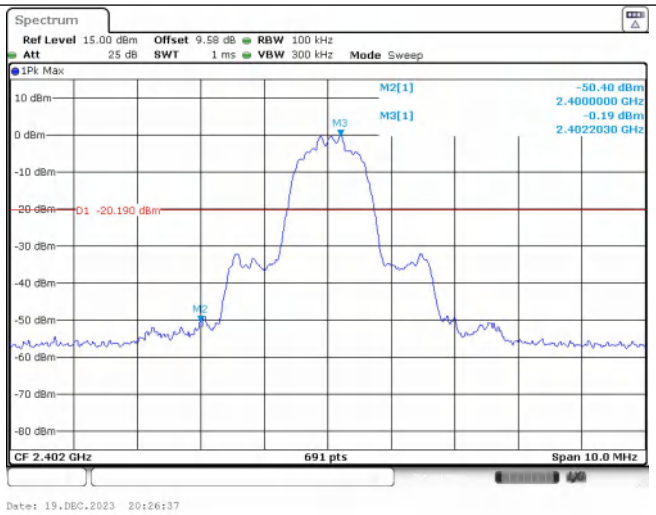
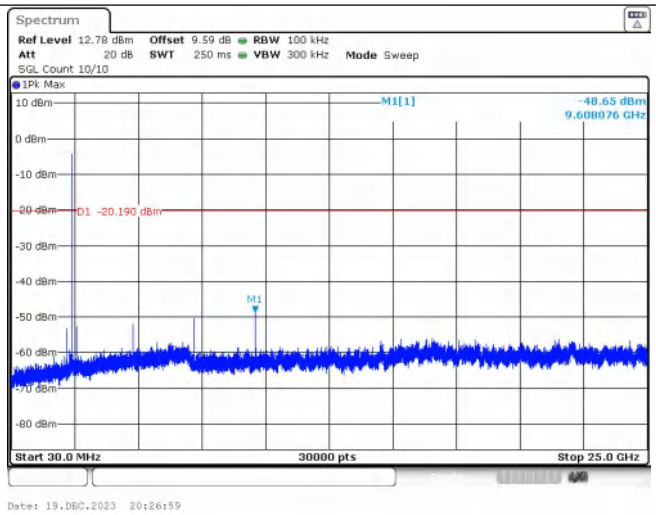
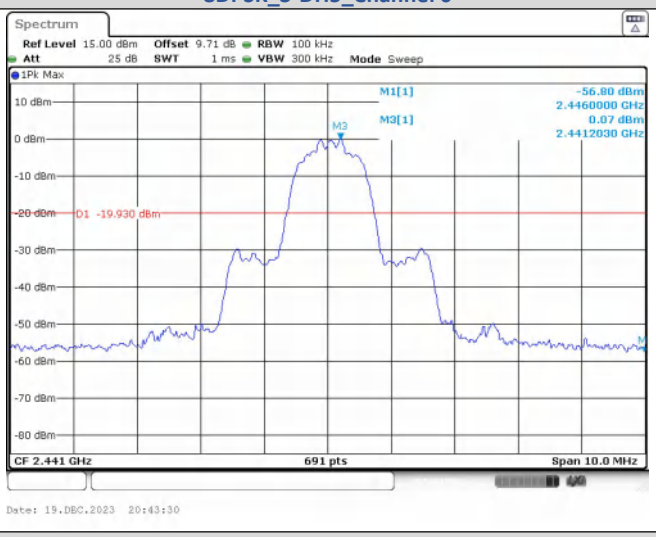
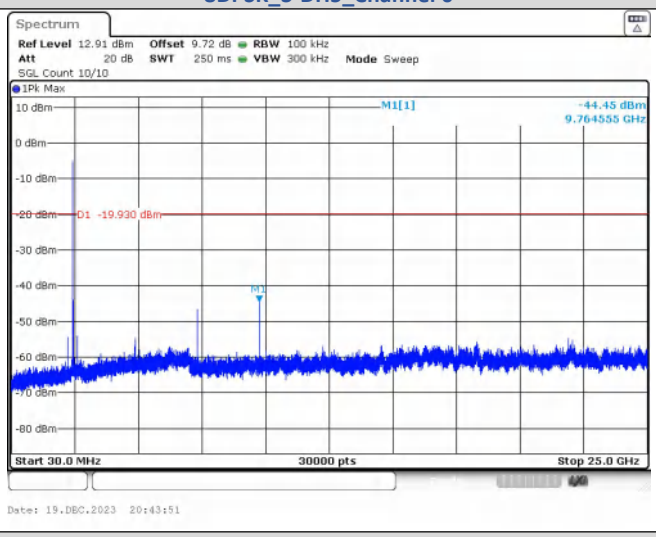


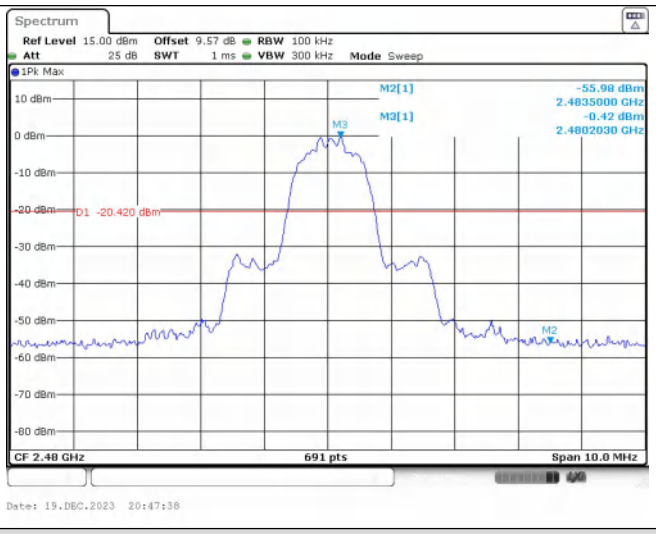
Out Of Band Emission

GFSK_DH5_Channel 39	π/4DQPSK_2-DH5_Channel 39
	

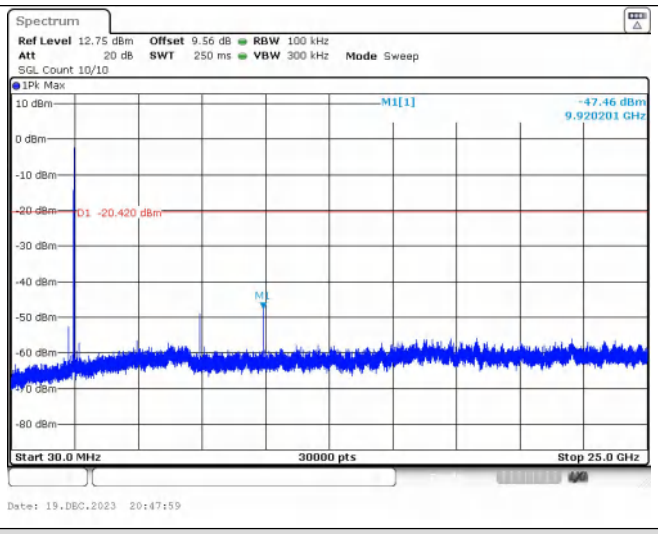
Spurious Emissions GFSK_DH5_Channel 39	Spurious Emissions π/4DQPSK_2-DH5_Channel 39
	

Out Of Band Emission GFSK_DH5_Channel 78	Out Of Band Emission π/4DQPSK_2-DH5_Channel 78
	

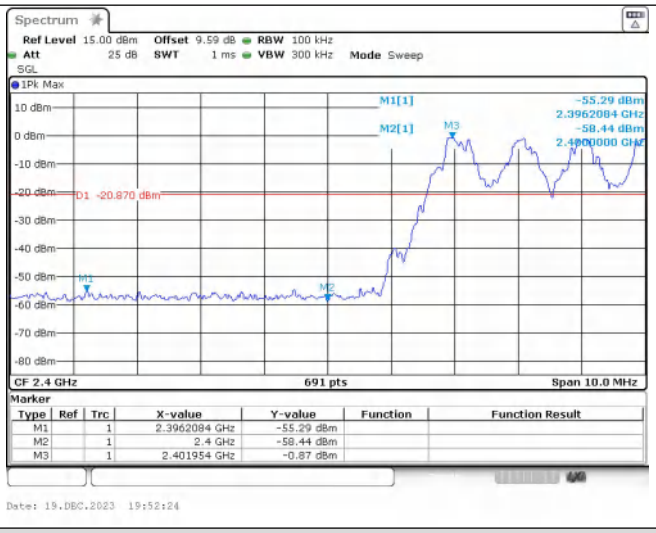
Spurious Emission GFSK_DH5_Channel 78	Spurious Emission π/4DQPSK_2-DH5_Channel 78
	
Out Of Band Emission 8DPSK_3-DH5_Channel 0	Spurious Emission 8DPSK_3-DH5_Channel 0
	
Out Of Band Emission 8DPSK_3-DH5_Channel 39	Spurious Emissions 8DPSK_3-DH5_Channel 39



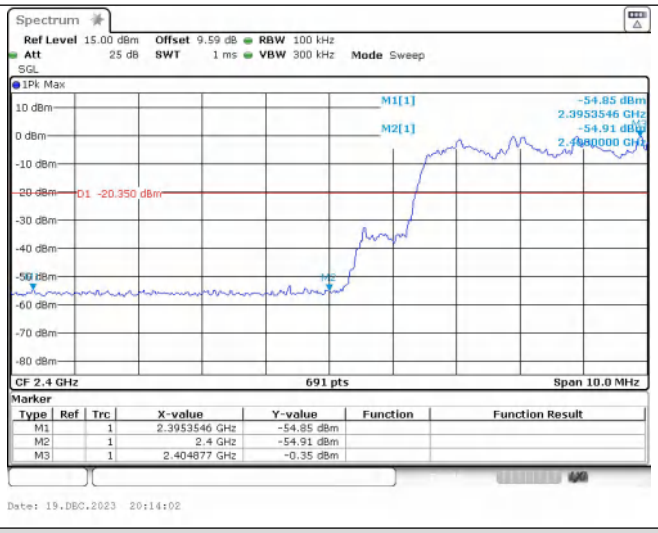
Out Of Band Emission
8DPSK_3-DH5_Channel 78



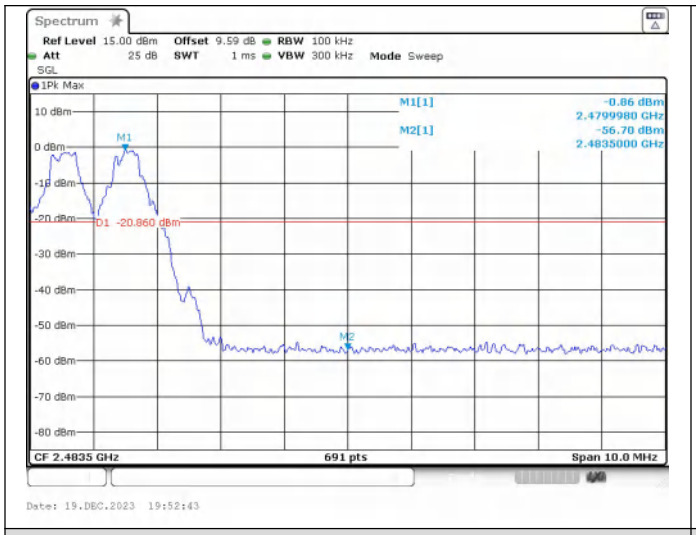
Spurious Emission
8DPSK_3-DH5_Channel 78



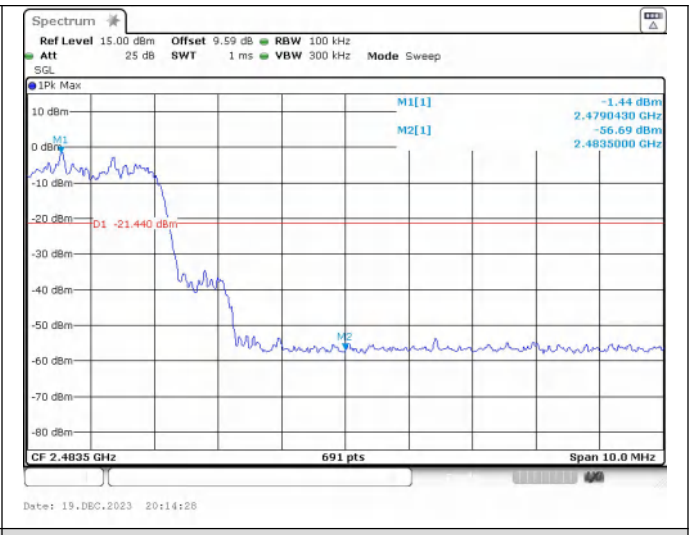
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



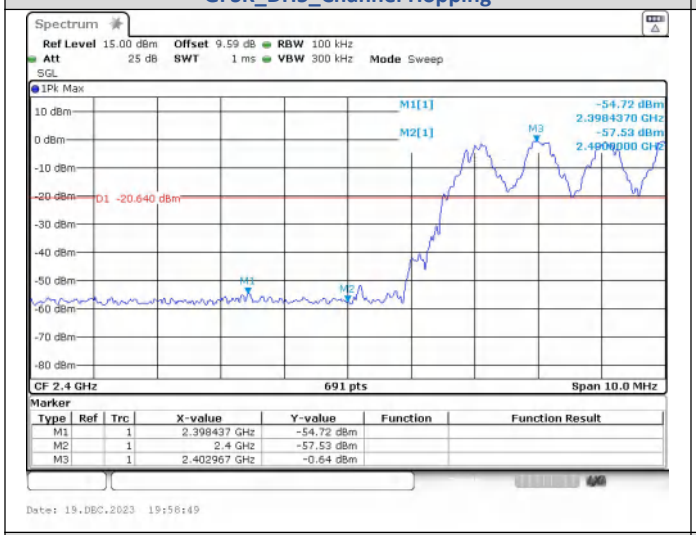
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



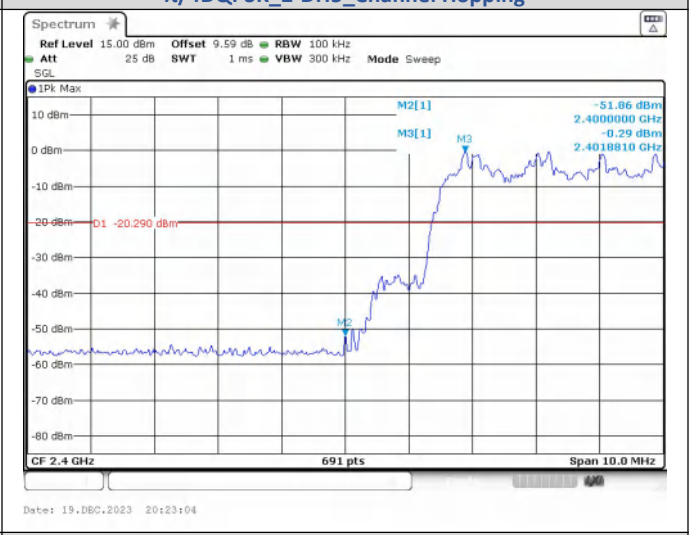
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



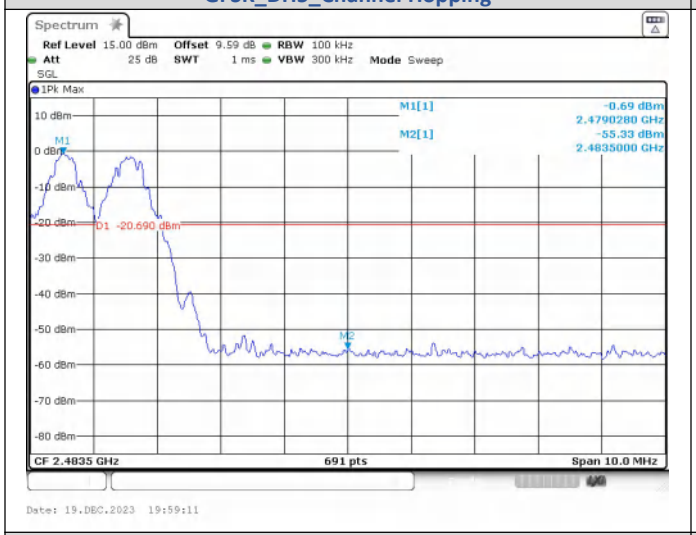
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



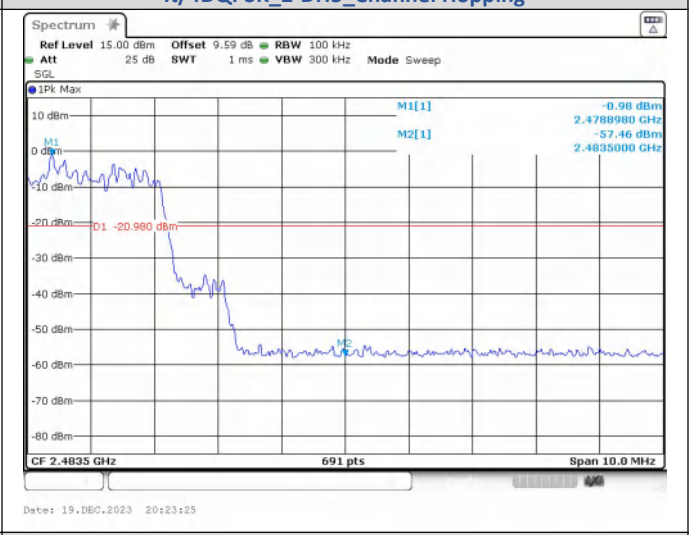
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



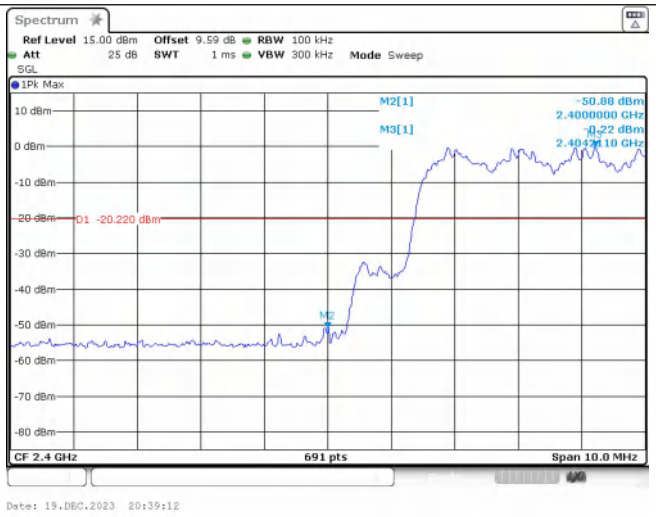
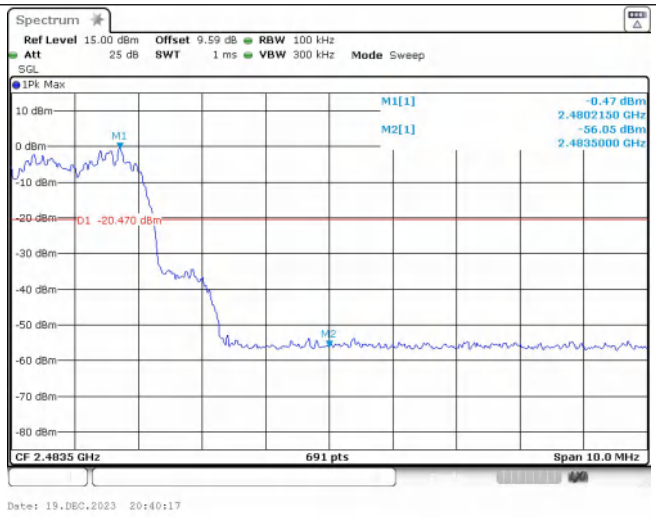
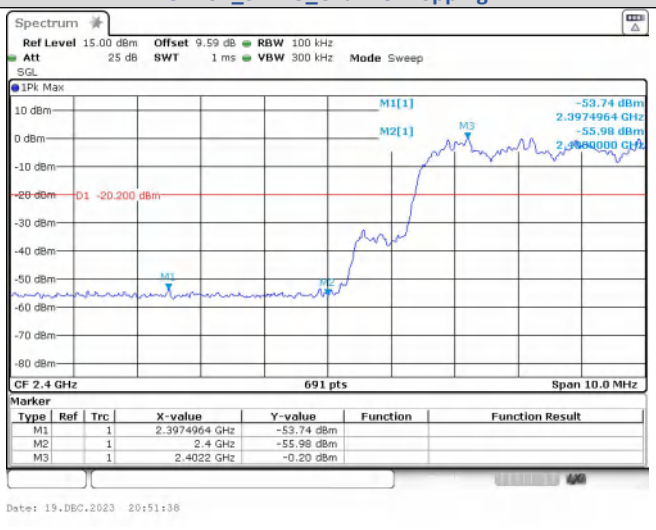
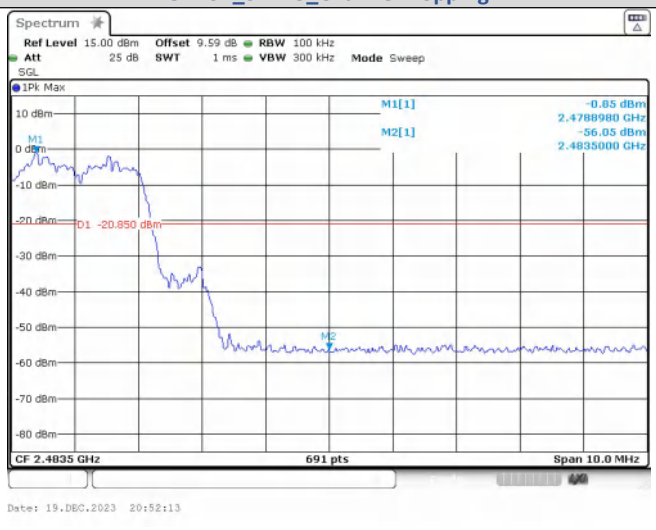
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



Out Of Band Emission(Right)



Out Of Band Emission(Right)

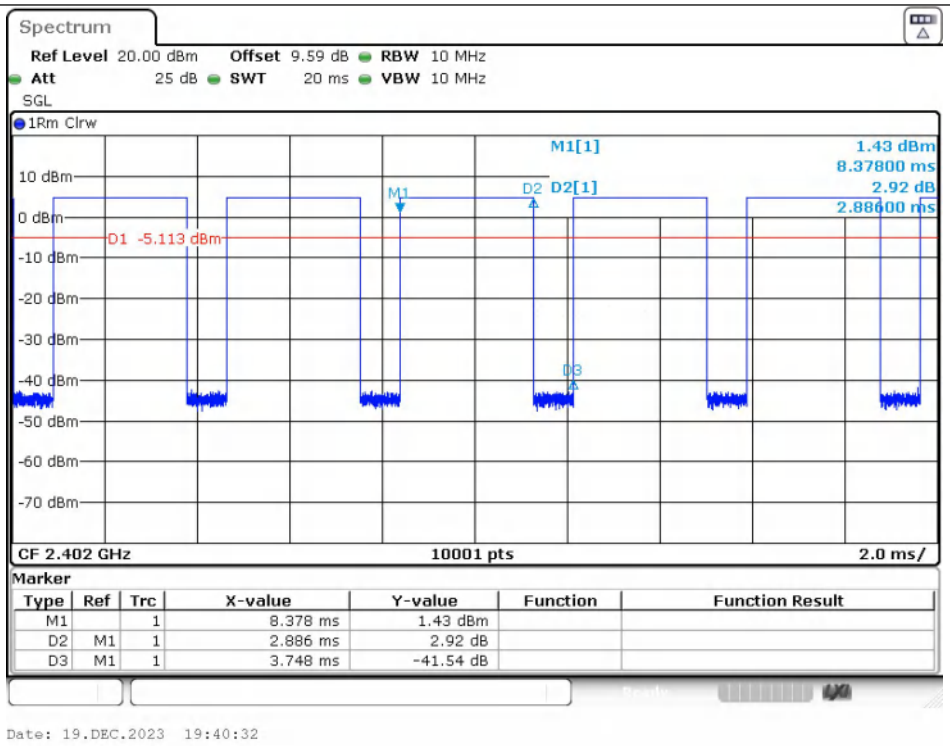
GFSK_DH5_Channel Hopping	π/4DQPSK_2-DH5_Channel Hopping
	
Out Of Band Emission(Left) 8DPSK_3-DH5_Channel Hopping	Out Of Band Emission(Right) 8DPSK_3-DH5_Channel Hopping
	
Out Of Band Emission(Left) 8DPSK_3-DH5_Channel Hopping	Out Of Band Emission(Right) 8DPSK_3-DH5_Channel Hopping

6) Duty Cycle

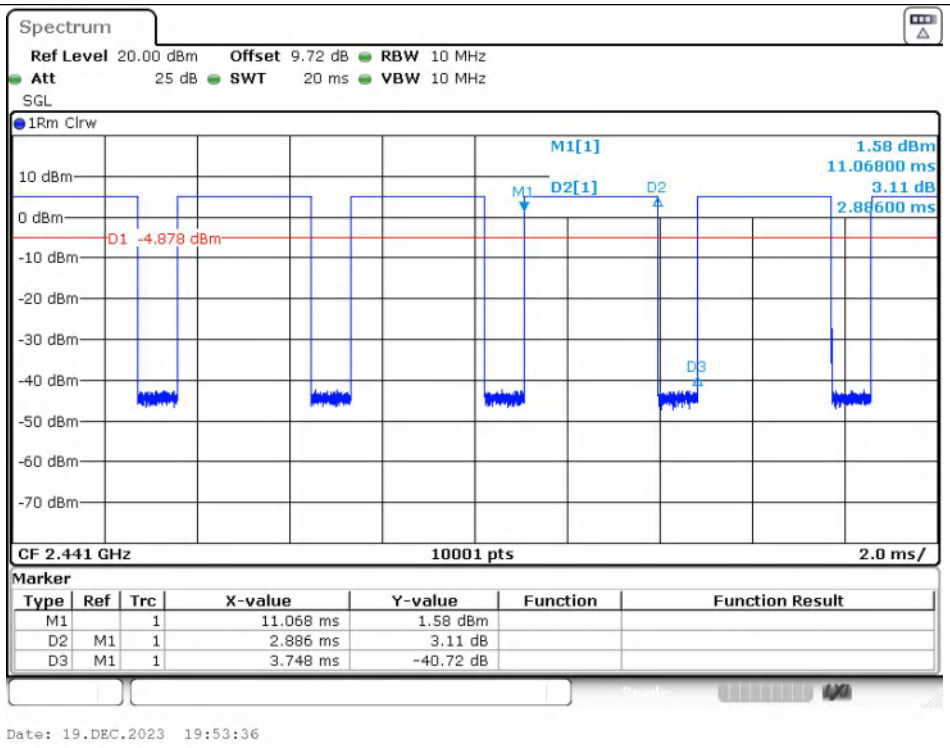
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.35
		39	2.886	3.748	77.00	0.7700	1.1351	0.35
		78	2.886	3.748	77.00	0.7700	1.1351	0.35
π/4DQPSK	2-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.35
		39	2.892	3.748	77.16	0.7716	1.1261	0.35
		78	2.892	3.748	77.16	0.7716	1.1261	0.35
8DPSK	3-DH5	0	2.894	3.748	77.21	0.7721	1.1233	0.35
		39	2.894	3.748	77.21	0.7721	1.1233	0.35
		78	2.892	3.748	77.16	0.7716	1.1261	0.35

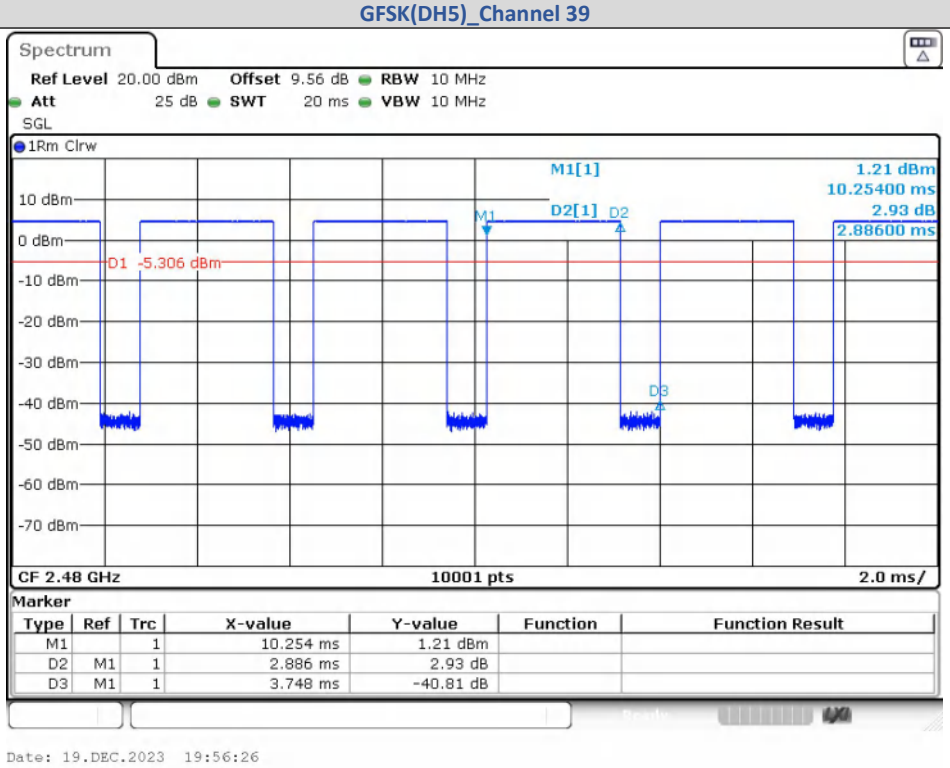
Test Graphs



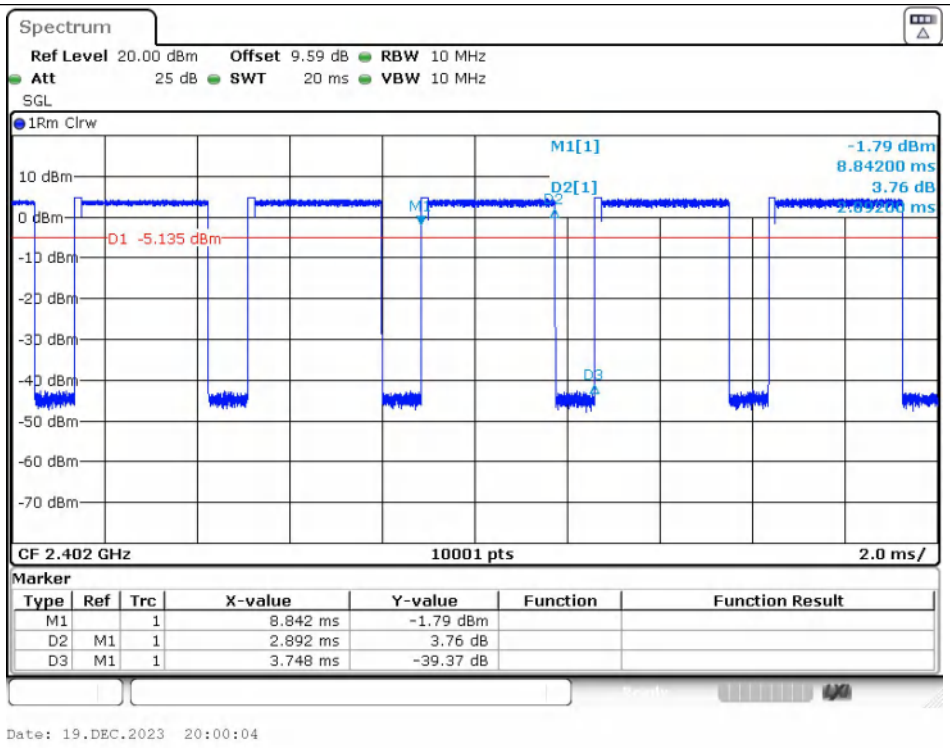
GFSK(DH5)_Channel 0



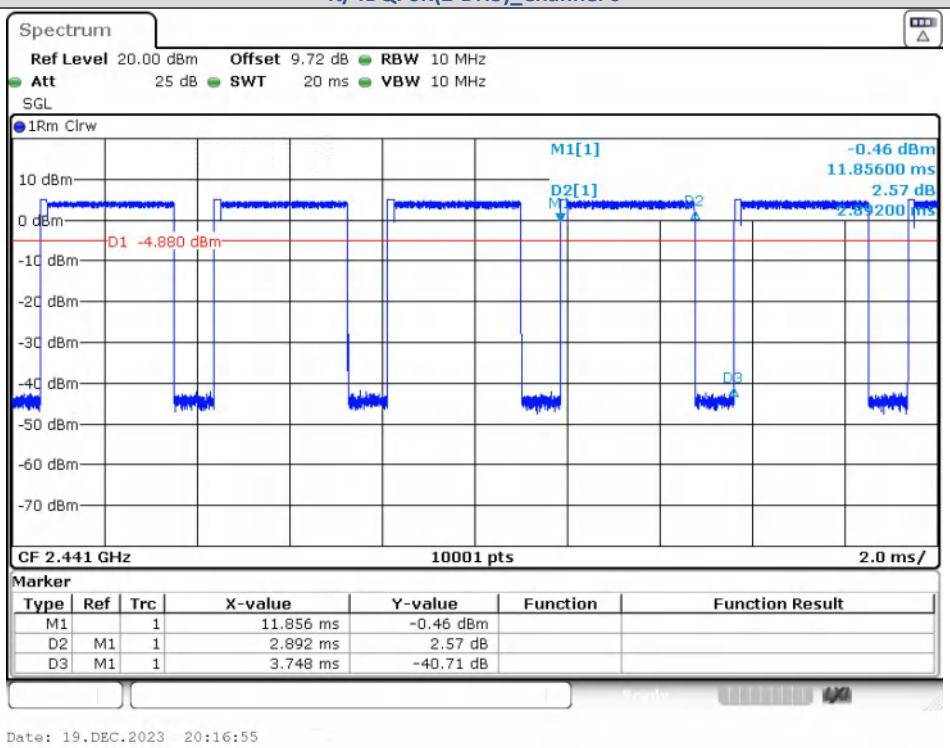
GFSK(DH5)_Channel 39



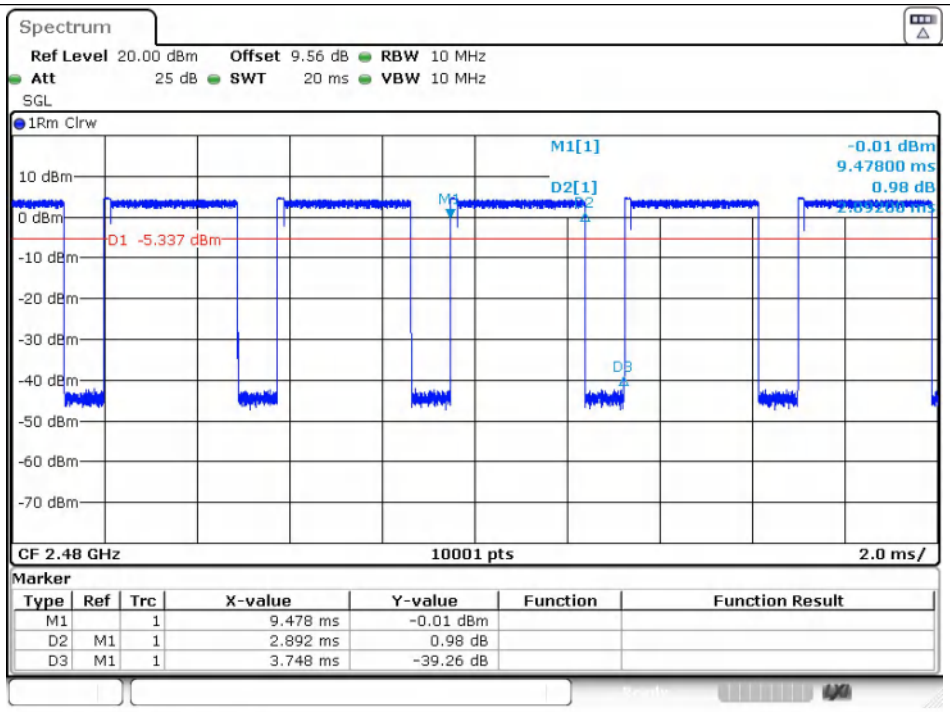
GFSK(DH5)_Channel 78



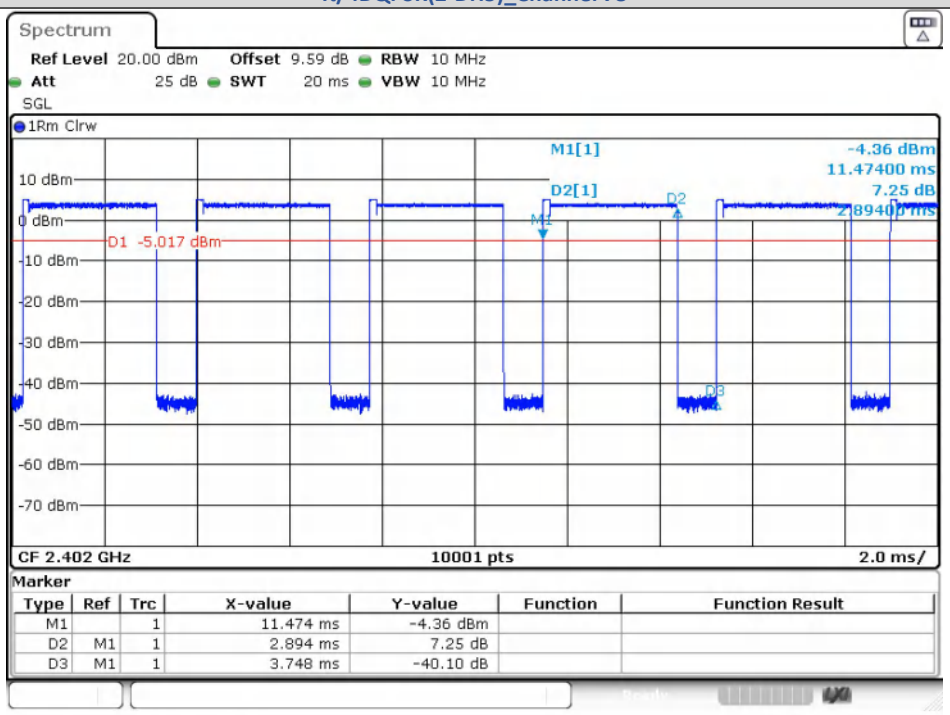
π/4DQPSK(2-DH5)_Channel 0



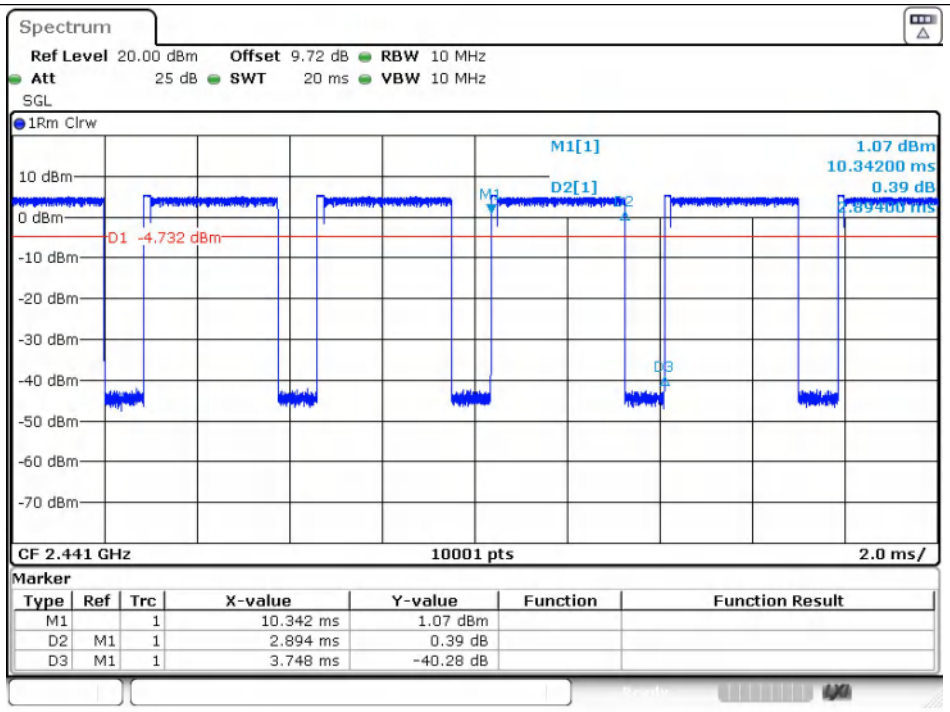
π/4DQPSK(2-DH5)_Channel 39



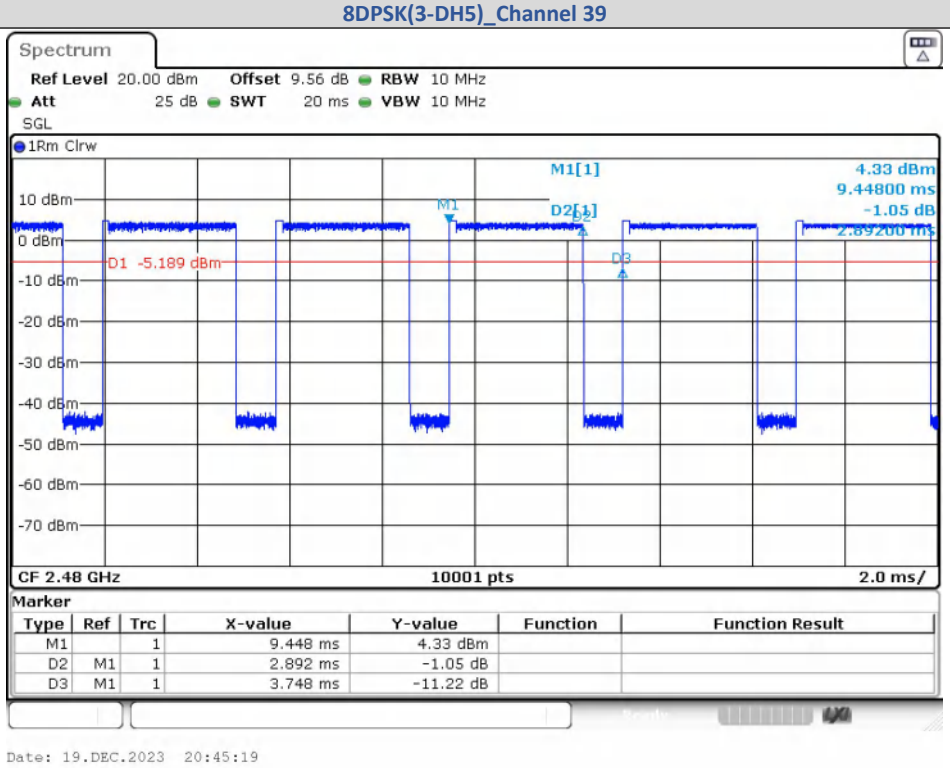
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



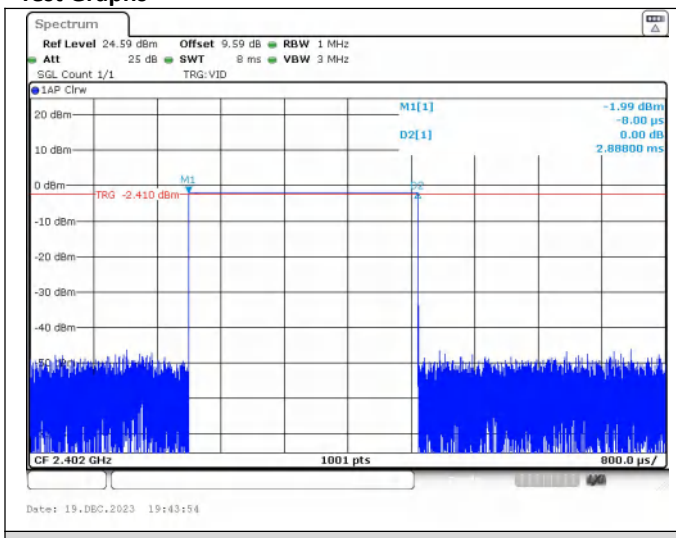
8DPSK(3-DH5)_Channel 78

7) Dwell Time

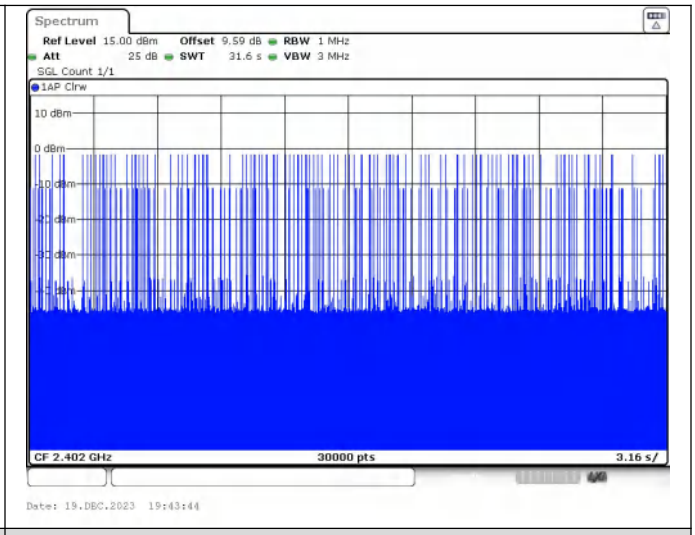
Test Result

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	116	335.01	< 400	PASS
π/4DQPSK	2-DH5		2.896	113	327.25		PASS
8DPSK	3-DH5		2.896	107	309.87		PASS

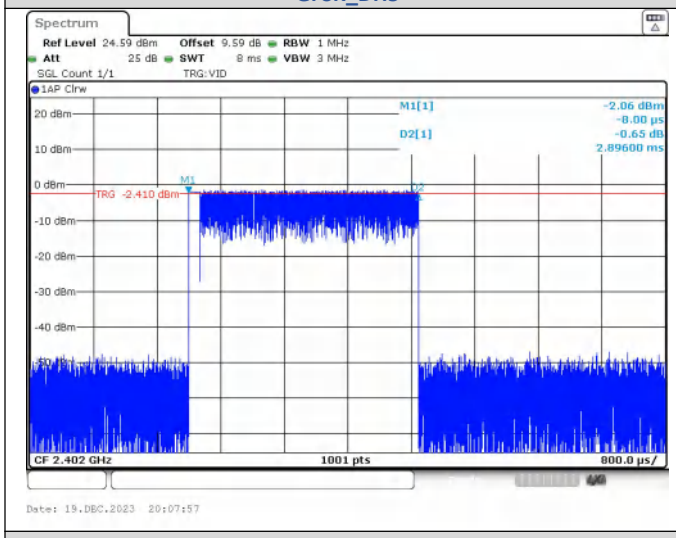
Test Graphs



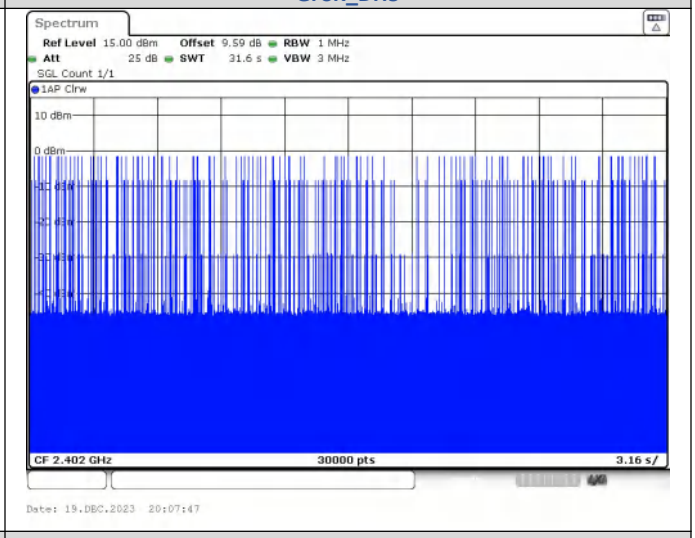
Pulse Width
GFSK_DH5



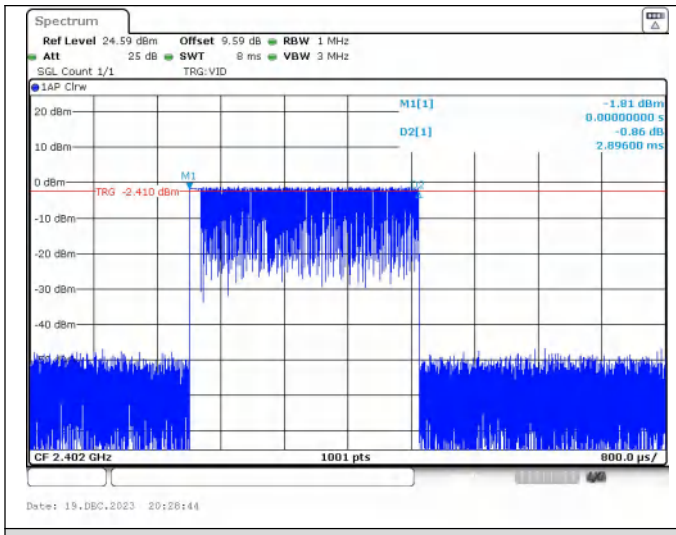
Number of Pulses in 31.6 seconds
GFSK_DH5



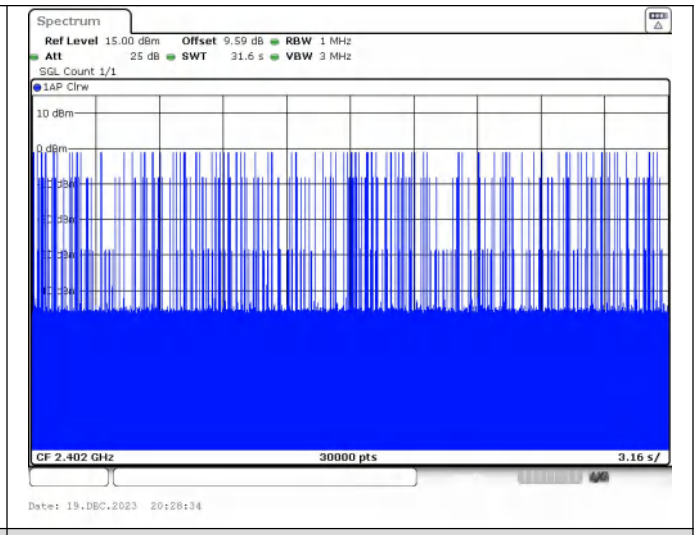
Pulse Width
π/4DQPSK_2-DH5



Number of Pulses in 31.6 seconds
π/4DQPSK_2-DH5



Pulse Width
8DPSK_3-DH5



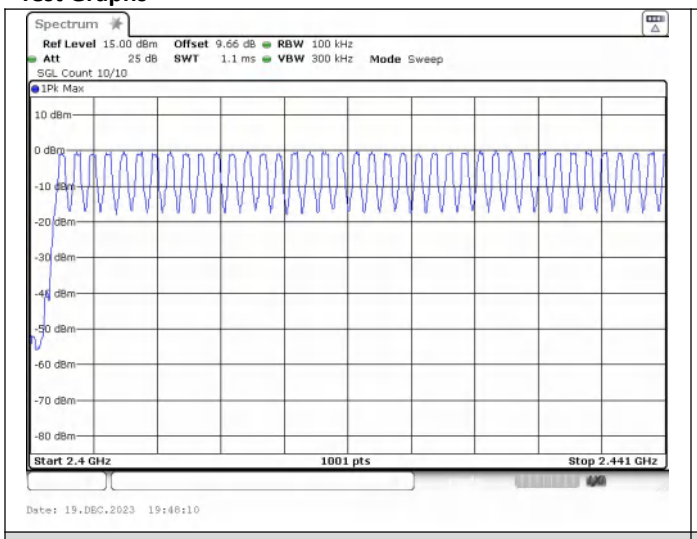
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

8) Number Of Hopping Channel

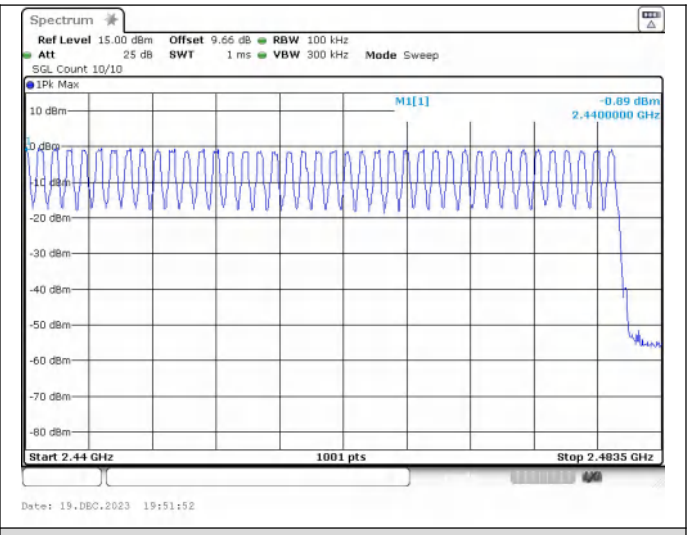
Test Result

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

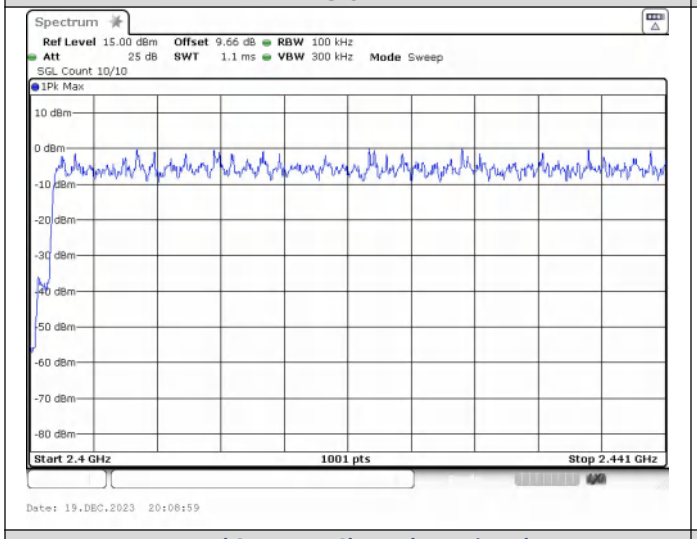
Test Graphs



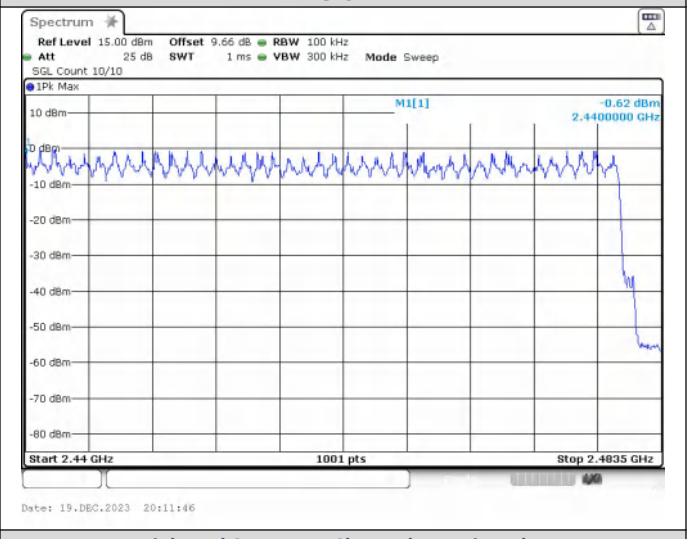
Low End Spectrum Channel Hopping Plot
GFSK



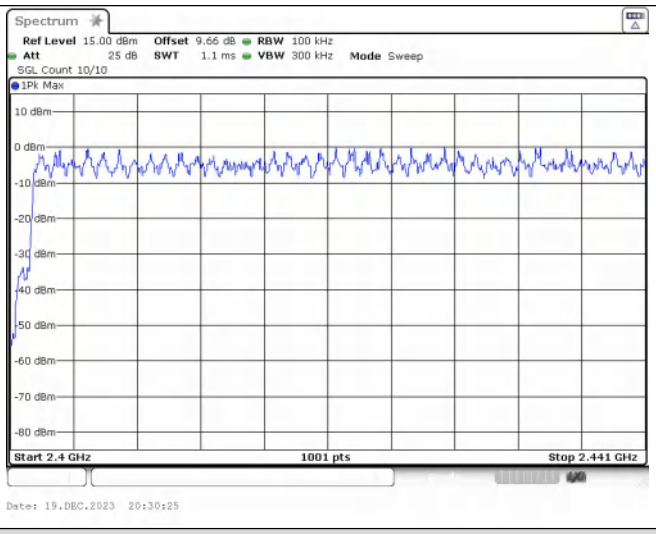
High End Spectrum Channel Hopping Plot
GFSK



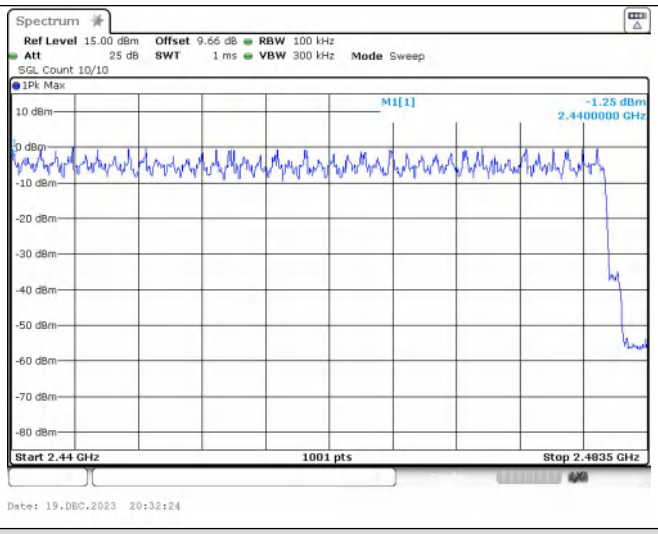
Low End Spectrum Channel Hopping Plot
π/4DQPSK



High End Spectrum Channel Hopping Plot
π/4DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK