Appendix A

Report No.:	CISRR24052414401
FCC ID:	2BGIM-S11
Product Name:	S11 Bluetooth earphones
Model No.:	S11
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

Conducted Peak Output Power

Test Result

Left

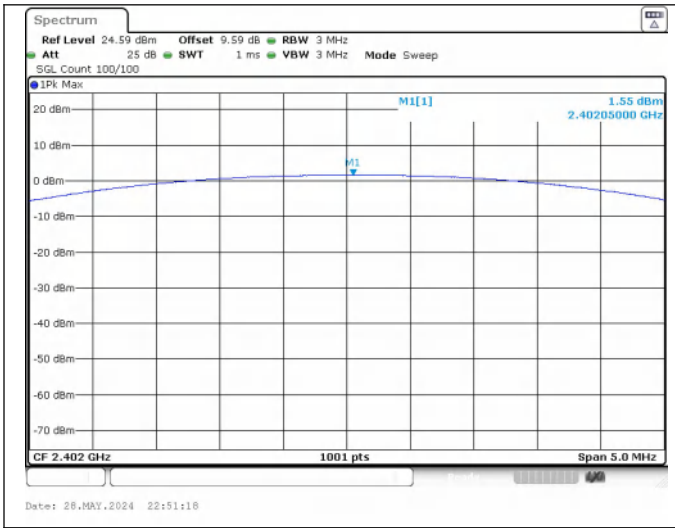
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.55	1.43	30	PASS
		39	0.91	1.23		PASS
		78	0.94	1.24		PASS
π/4DQPSK	2-DH5	0	1.96	1.57	20.97	PASS
		39	1.45	1.40		PASS
		78	1.52	1.42		PASS
8DPSK	3-DH5	0	2.19	1.66		PASS
		39	1.65	1.46		PASS
		78	1.71	1.48		PASS

Right

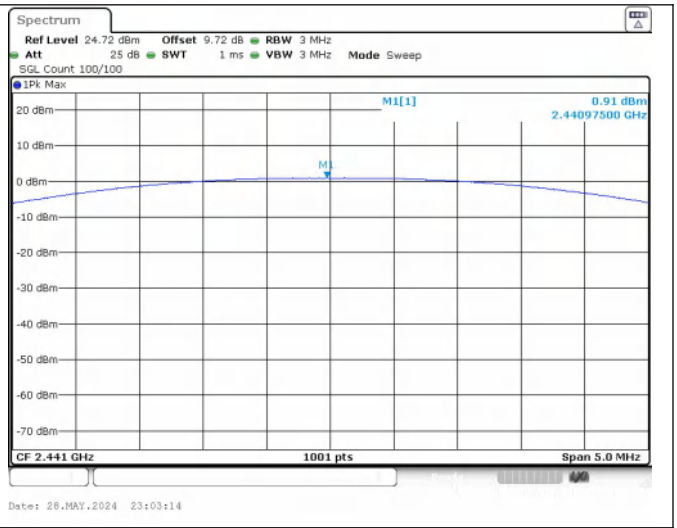
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.59	1.44	30	PASS
		39	0.78	1.20		PASS
		78	0.63	1.16		PASS
π/4DQPSK	2-DH5	0	2.14	1.63	20.97	PASS
		39	1.44	1.39		PASS
		78	1.31	1.35		PASS
8DPSK	3-DH5	0	2.24	1.68		PASS
		39	1.55	1.43		PASS
		78	1.45	1.40		PASS

Test Graphs

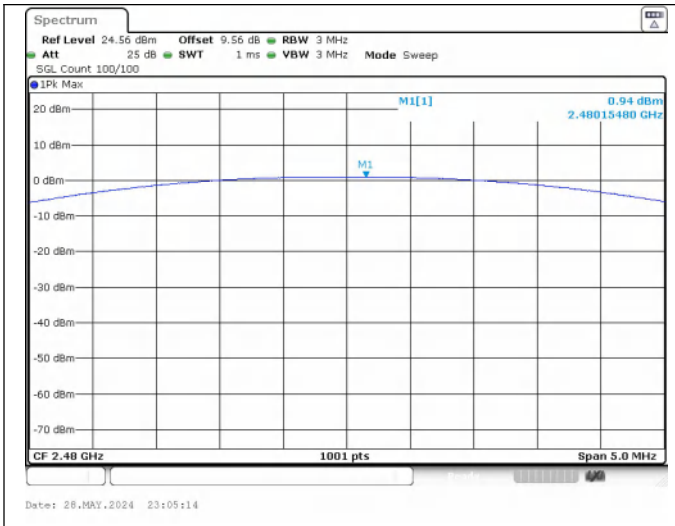
Left



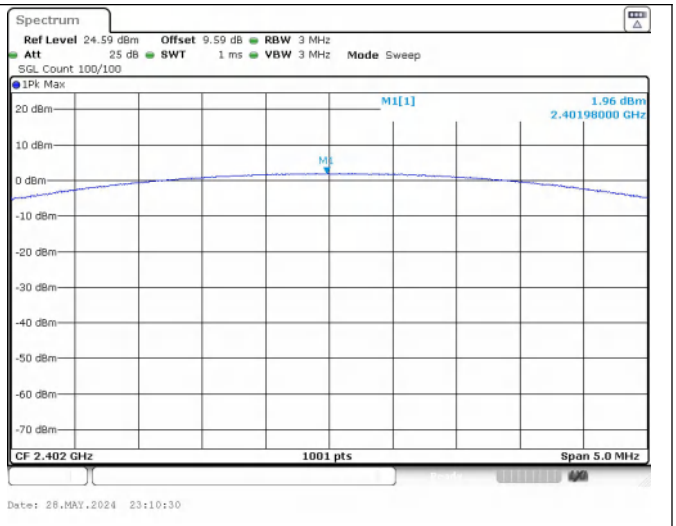
Peak Output Power
GFSK_Channel 0



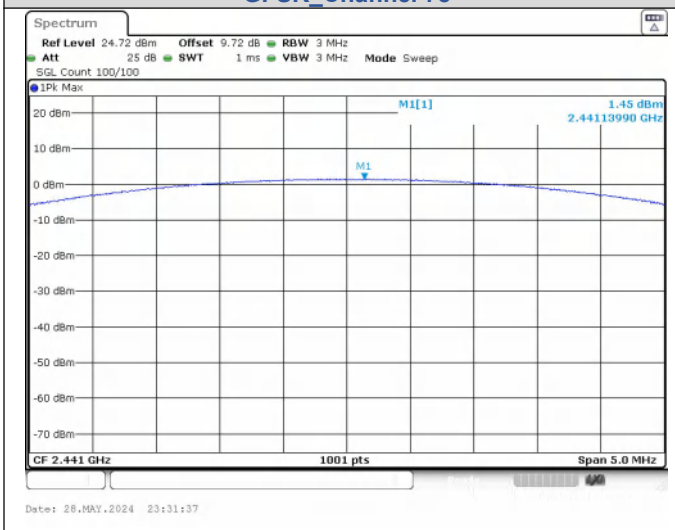
Peak Output Power
GFSK_Channel 39



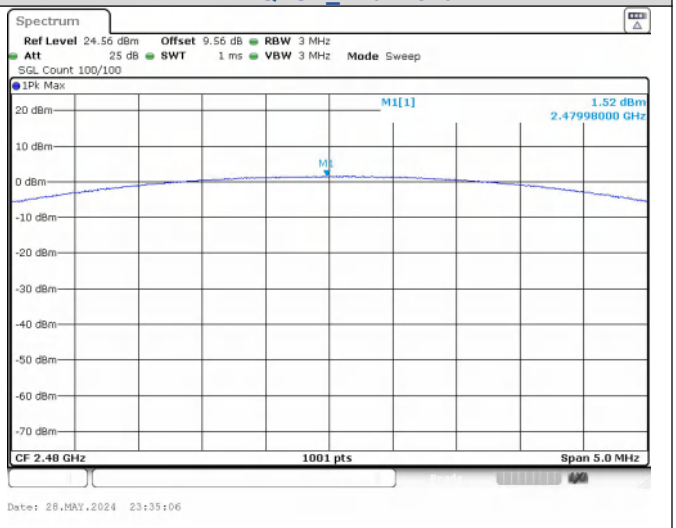
Peak Output Power
GFSK_Channel 78



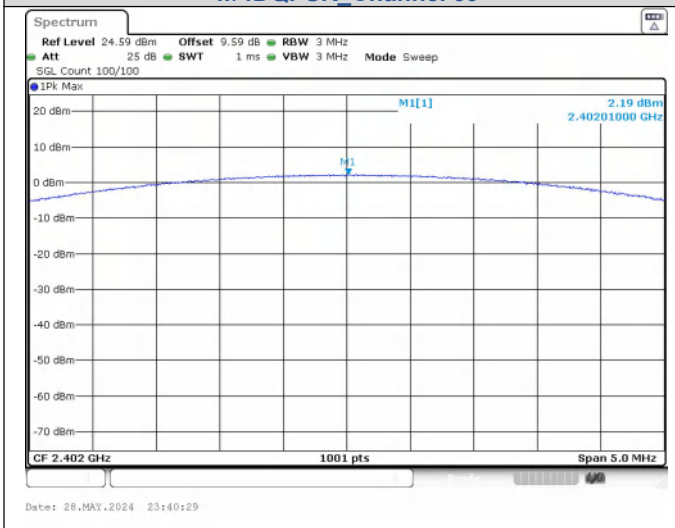
Peak Output Power
π/4DQPSK_Channel 0



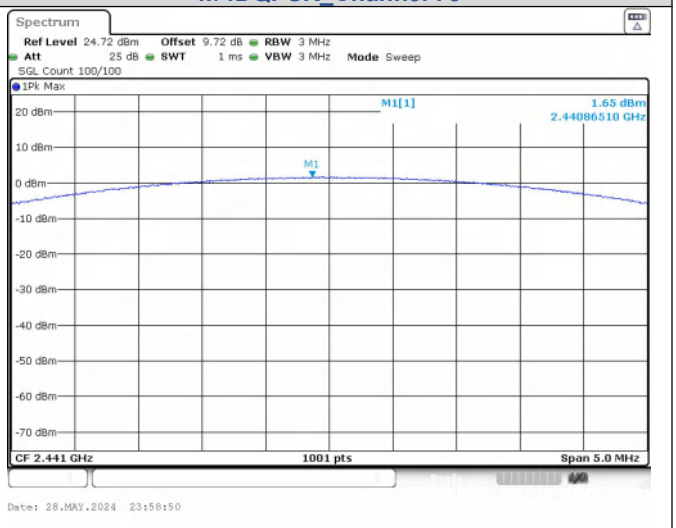
Peak Output Power
π/4DQPSK_Channel 39



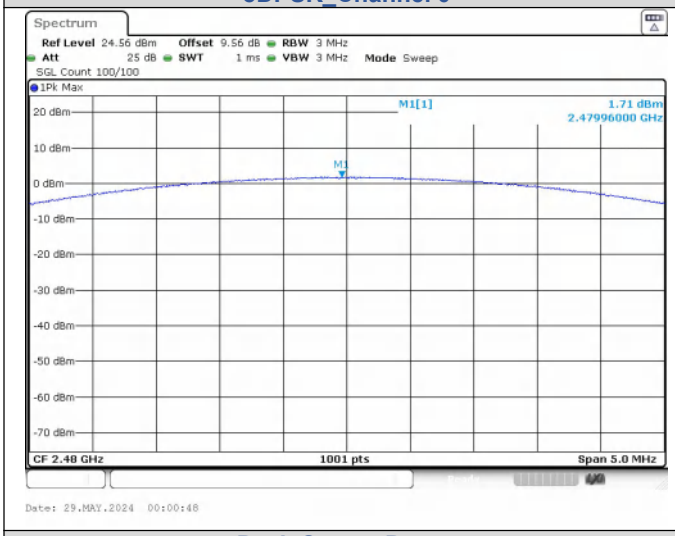
Peak Output Power
π/4DQPSK_Channel 78



Peak Output Power

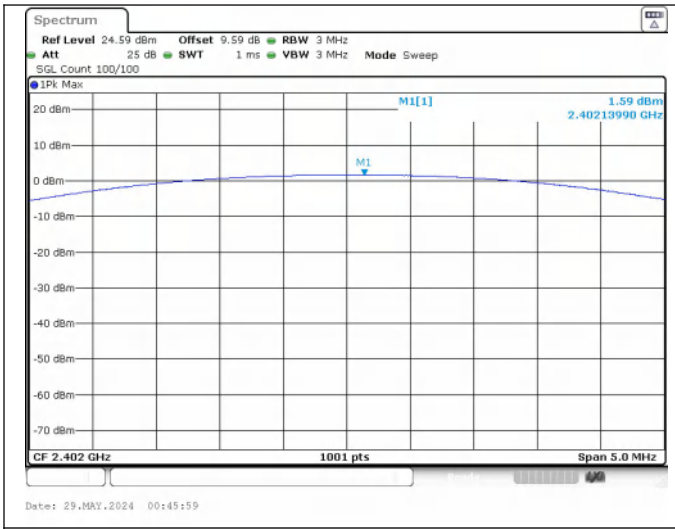


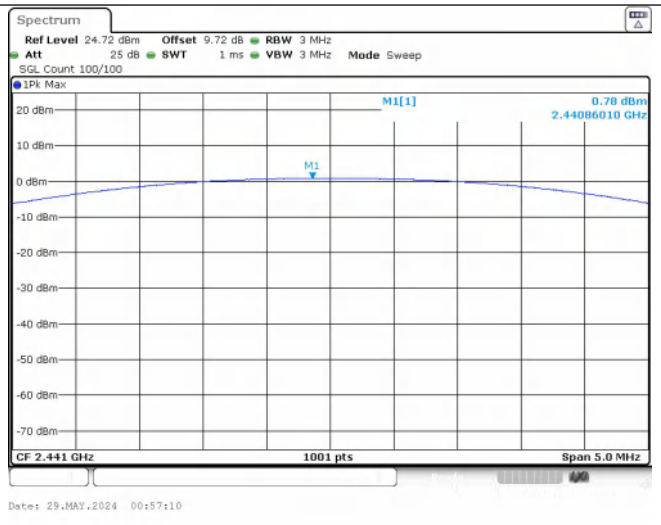
Peak Output Power

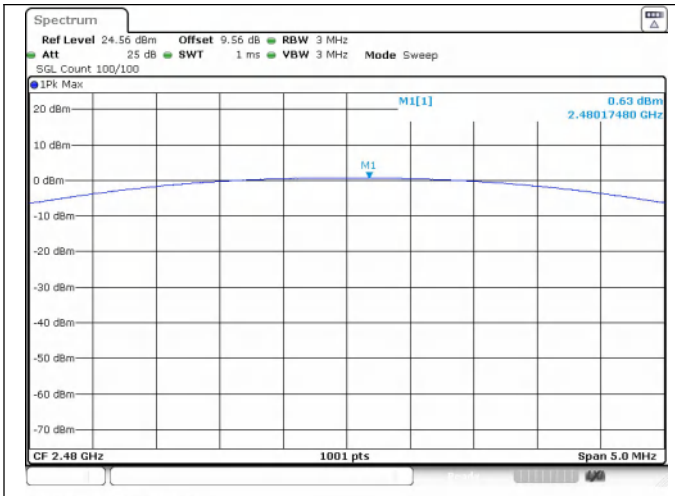
8DPSK_Channel 0	8DPSK_Channel 39
	
Peak Output Power 8DPSK_Channel 78	

Right

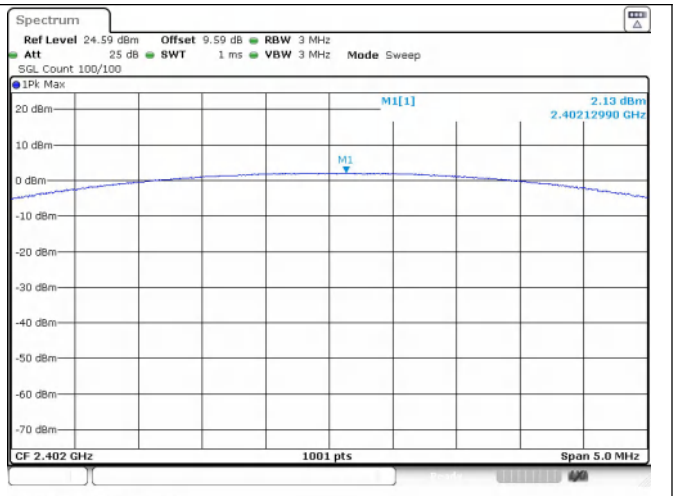
Peak Output Power GFSK_Channel 0	Peak Output Power GFSK_Channel 39



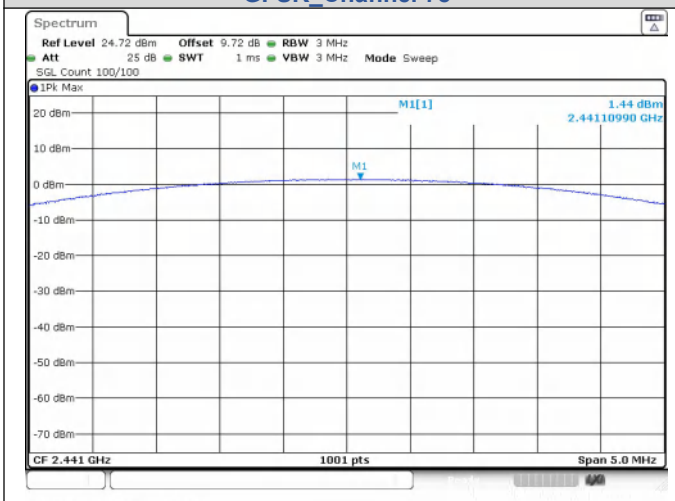




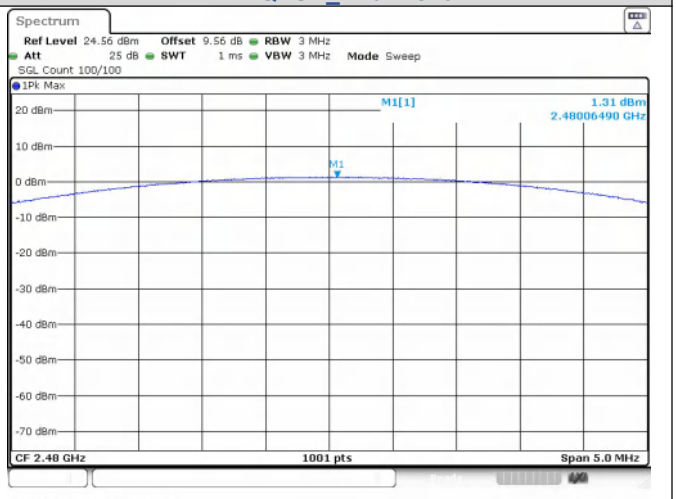
Peak Output Power
GFSK_Channel 78



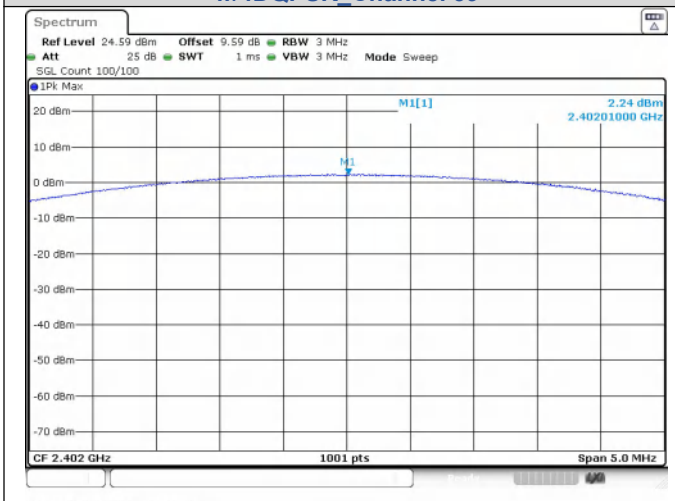
Peak Output Power
π/4DQPSK_Channel 0



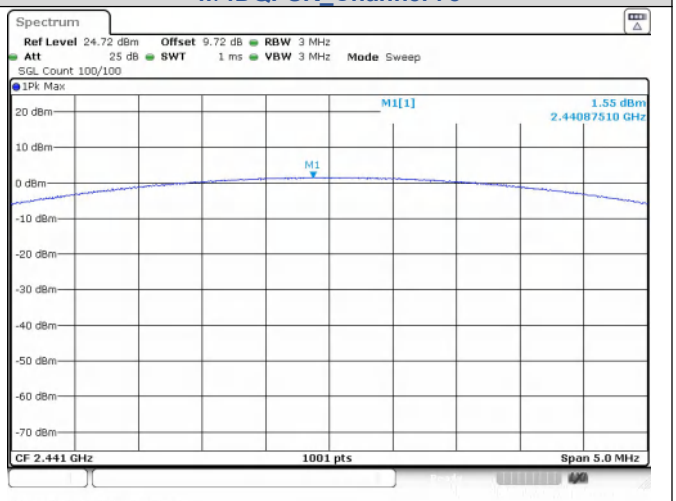
Peak Output Power
π/4DQPSK_Channel 39



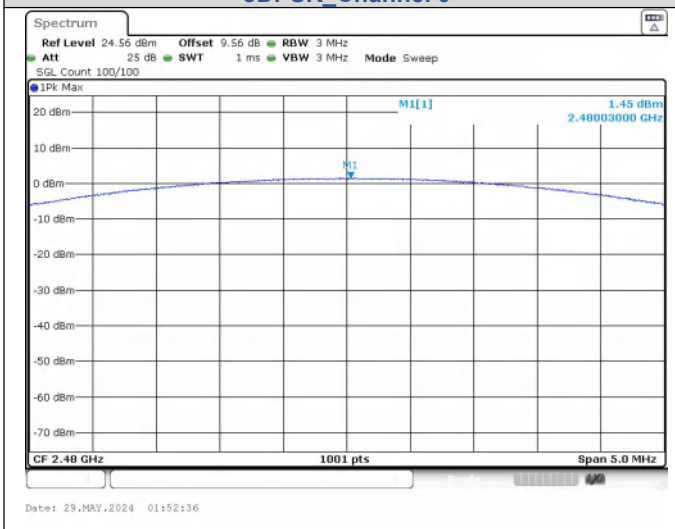
Peak Output Power
π/4DQPSK_Channel 78



Peak Output Power



Peak Output Power

8DPSK_Channel 0	8DPSK_Channel 39
	
Peak Output Power 8DPSK_Channel 78	

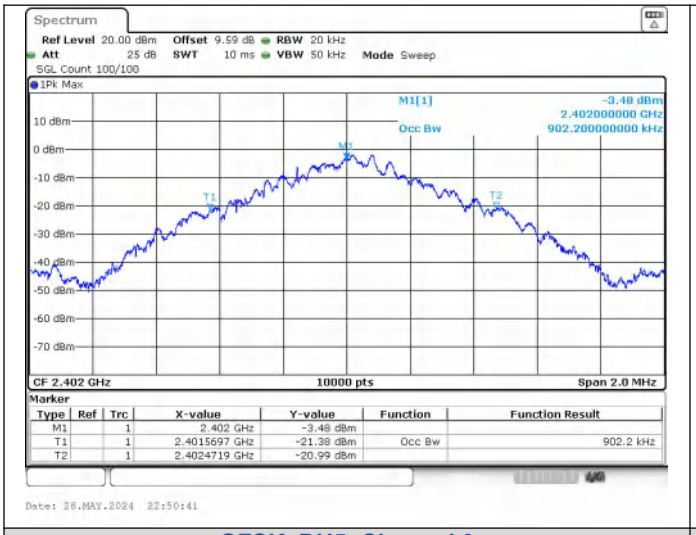
99% Bandwidth

Test Result

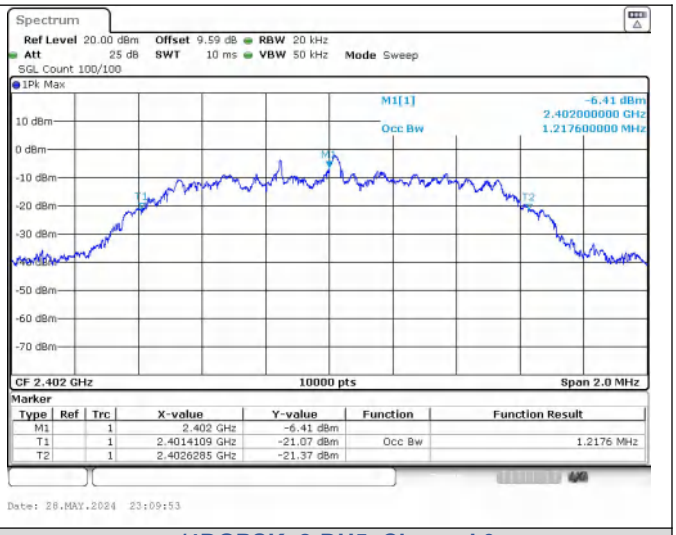
Left

Modulation	Channel	99% BW (MHz)
GFSK	0	0.90220
	39	0.89960
	78	0.88720
π/4DQPSK	0	1.2180
	39	1.2130
	78	1.1980
8DPSK	0	1.2210
	39	1.2170
	78	1.2150

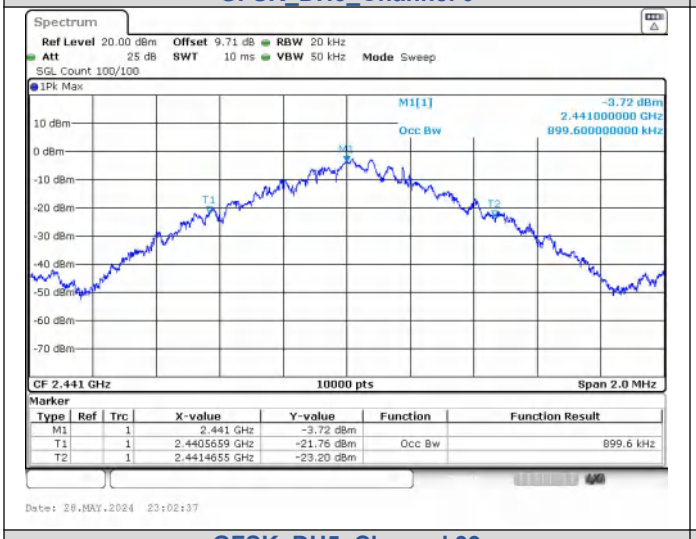
Test Graphs



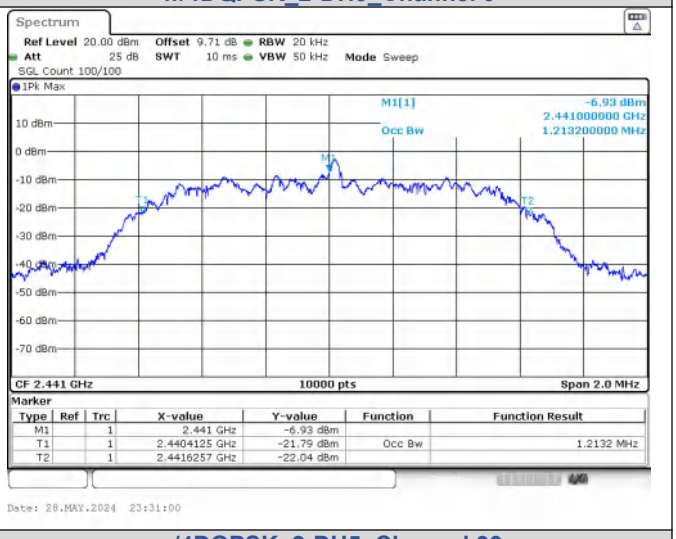
GFSK_DH5_Channel 0



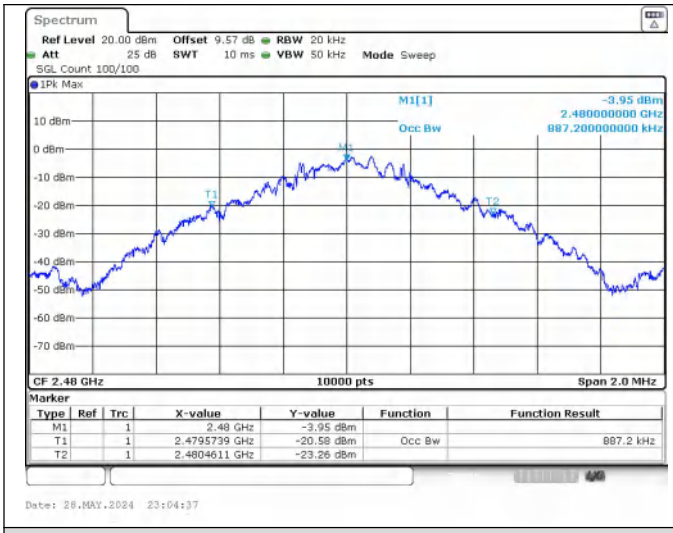
π/4DQPSK_2-DH5_Channel 0



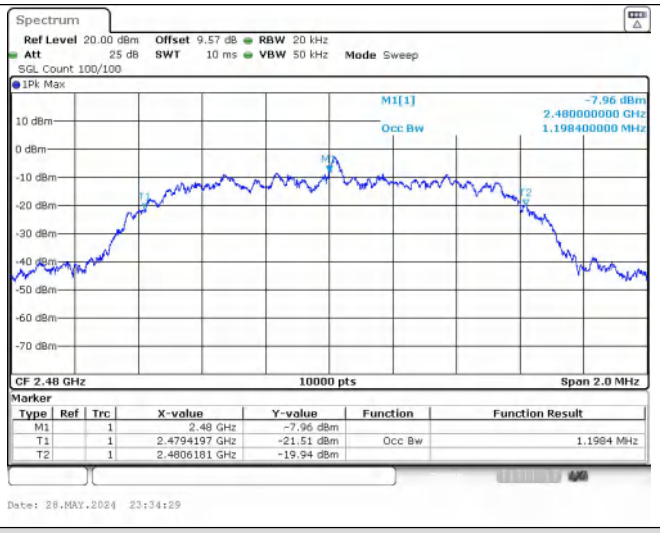
GFSK_DH5_Channel 39



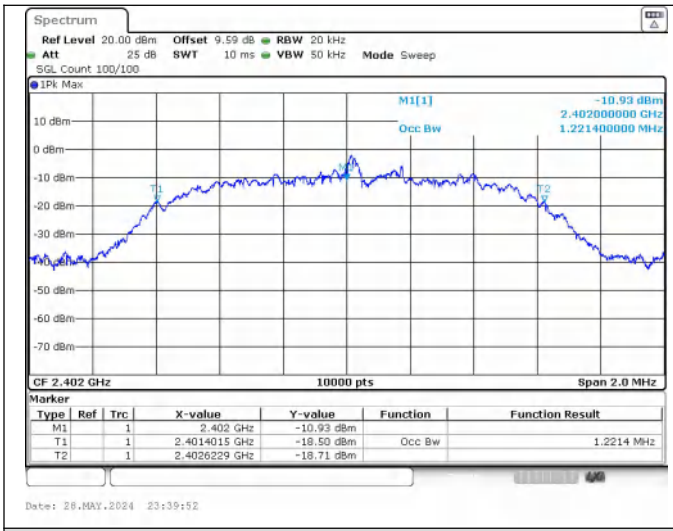
π/4DQPSK_2-DH5_Channel 39



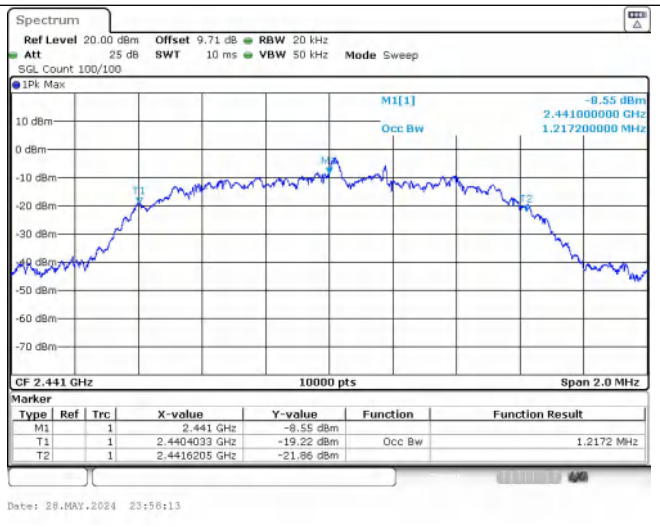
GFSK_DH5_Channel 78



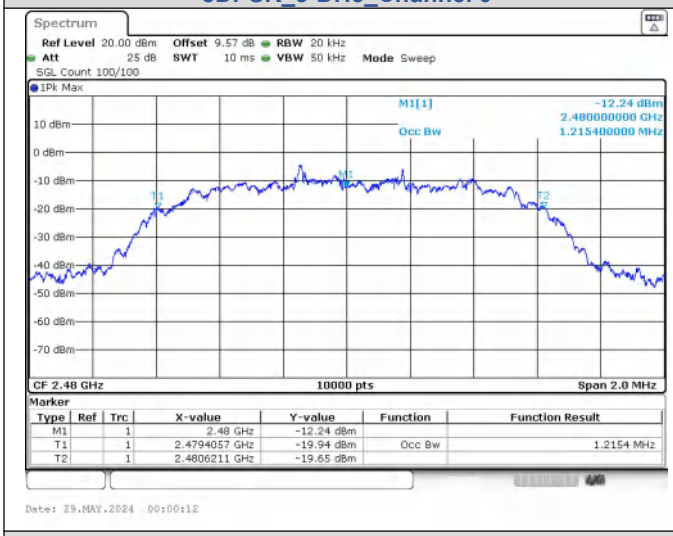
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



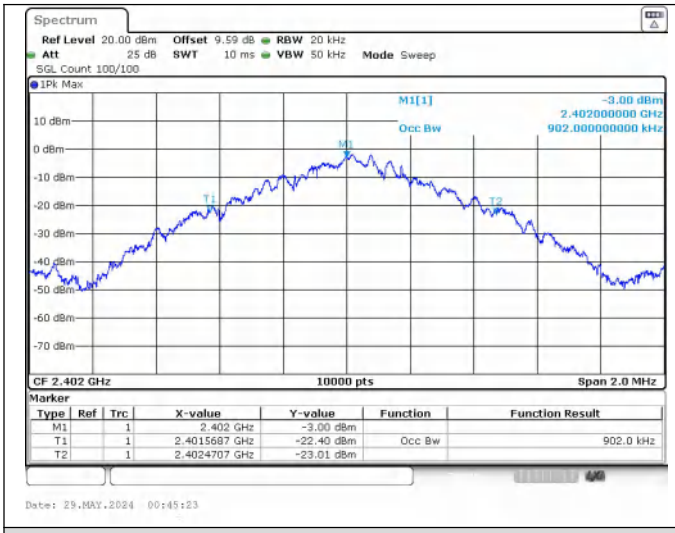
8DPSK_3-DH5_Channel 78

Right

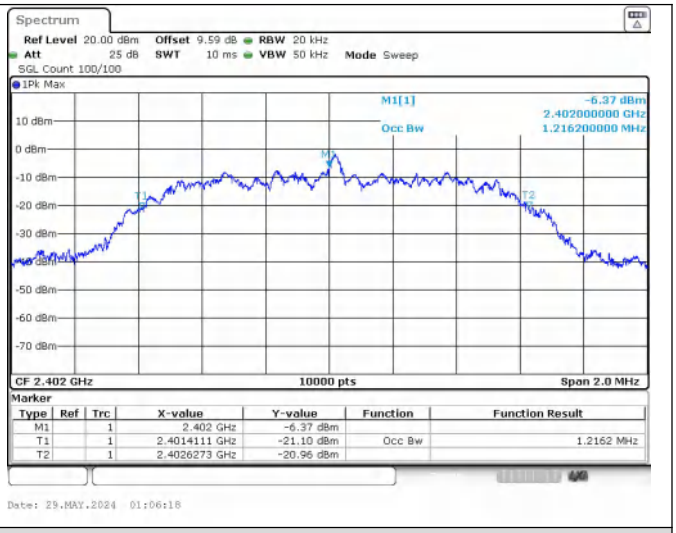
Test Result

Modulation	Channel	99% BW (MHz)
GFSK	0	0.90200
	39	0.90140
	78	0.88000
π/4DQPSK	0	1.2160
	39	1.2090
	78	1.2100
8DPSK	0	1.2180
	39	1.2170
	78	1.2130

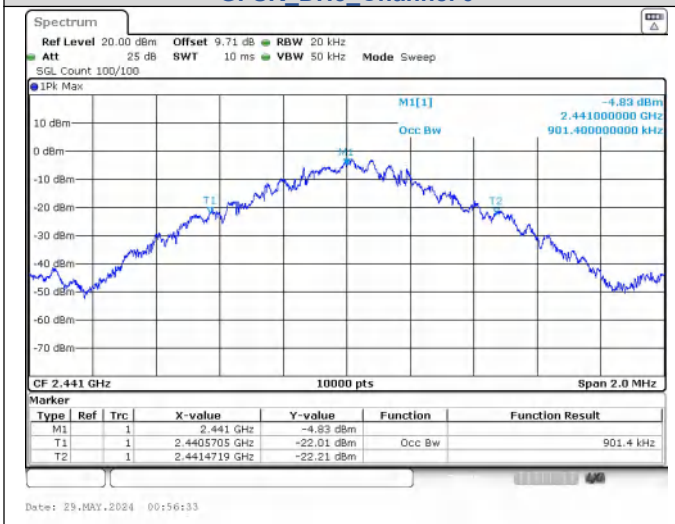
Test Graphs



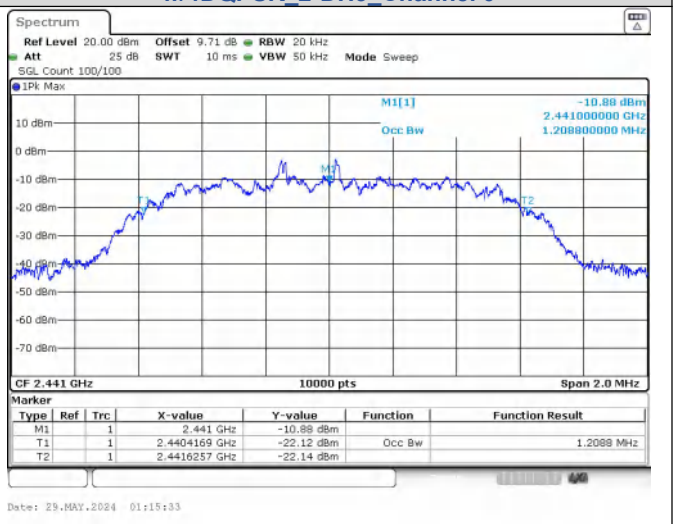
GFSK_DH5_Channel 0



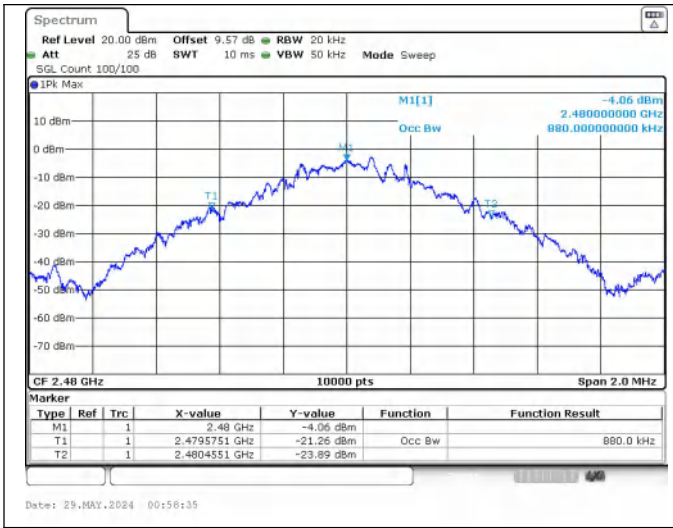
π/4DQPSK_2-DH5_Channel 0



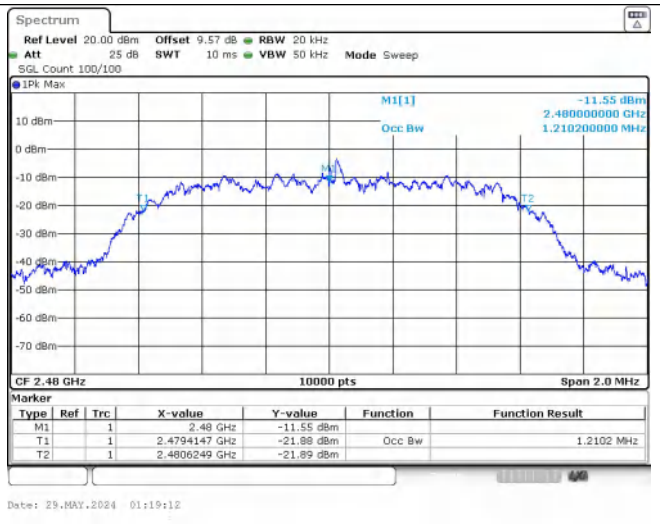
GFSK_DH5_Channel 39



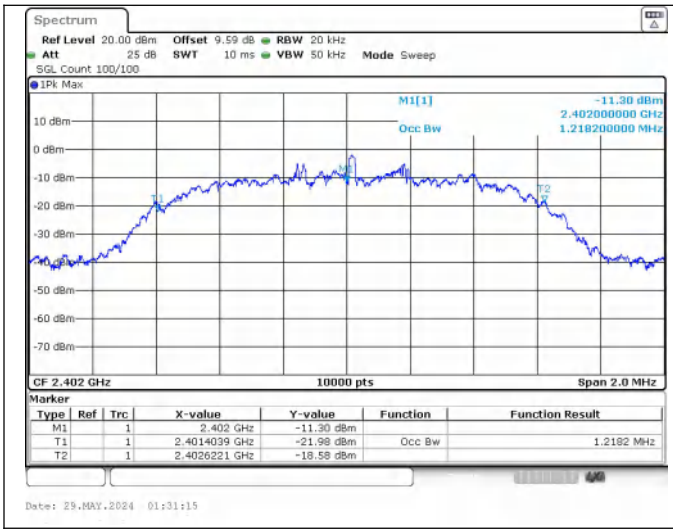
π/4DQPSK_2-DH5_Channel 39



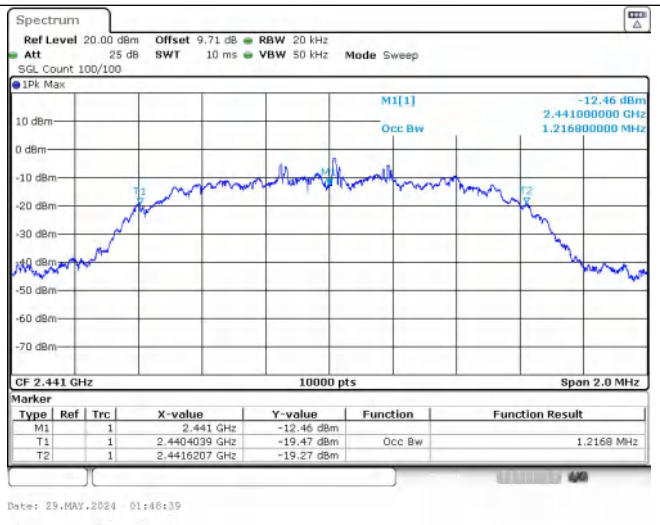
GFSK_DH5_Channel 78



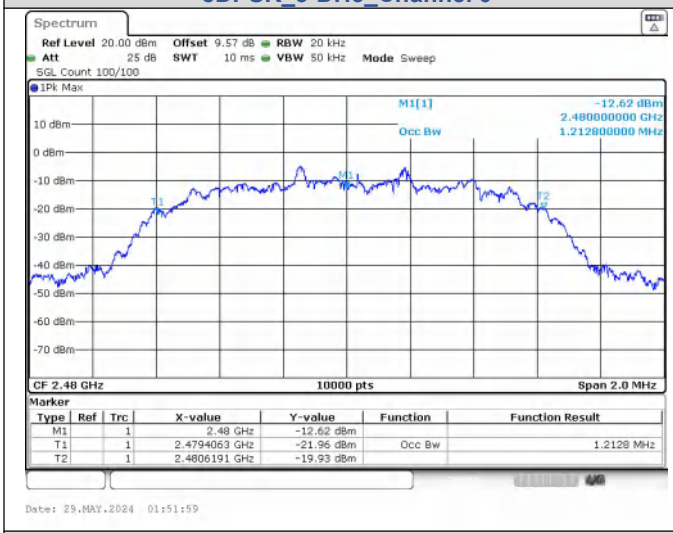
π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

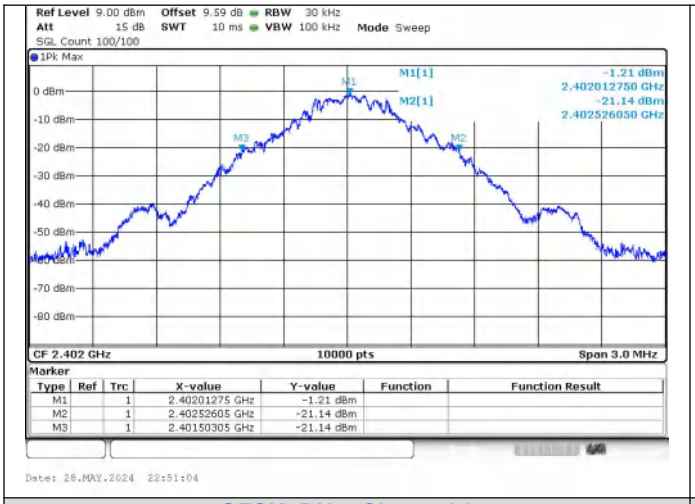
20dB Bandwidth

Test Result

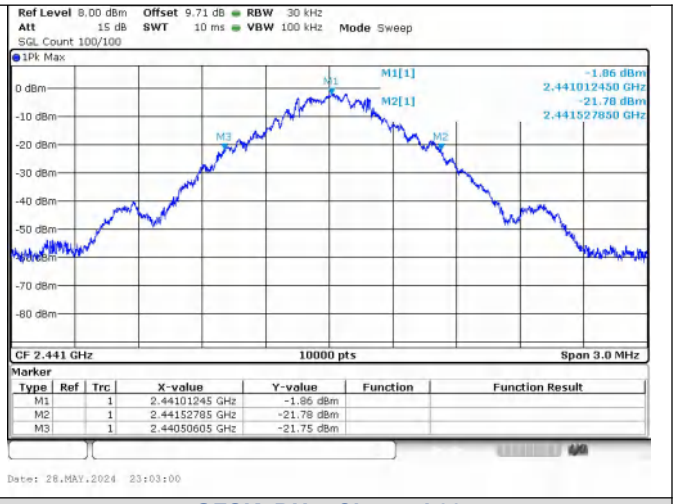
Left

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.030
	39	2441 MHz	1.020
	78	2480 MHz	1.030
π/4DQPSK	0	2402 MHz	1.320
	39	2441 MHz	1.310
	78	2480 MHz	1.310
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.310
	78	2480 MHz	1.290

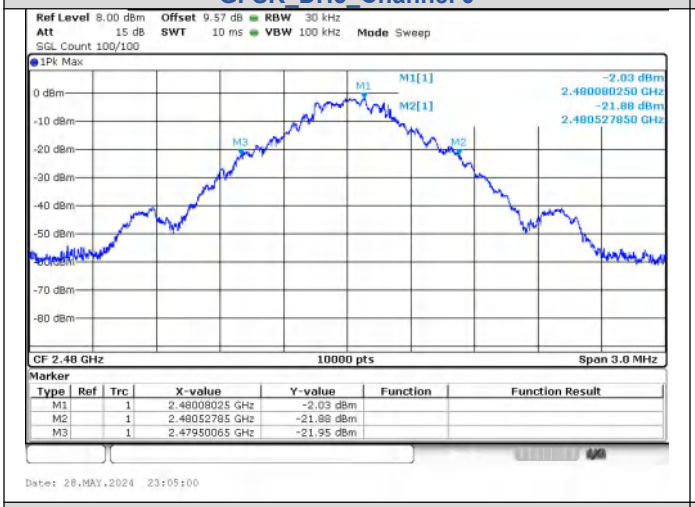
Test Graphs



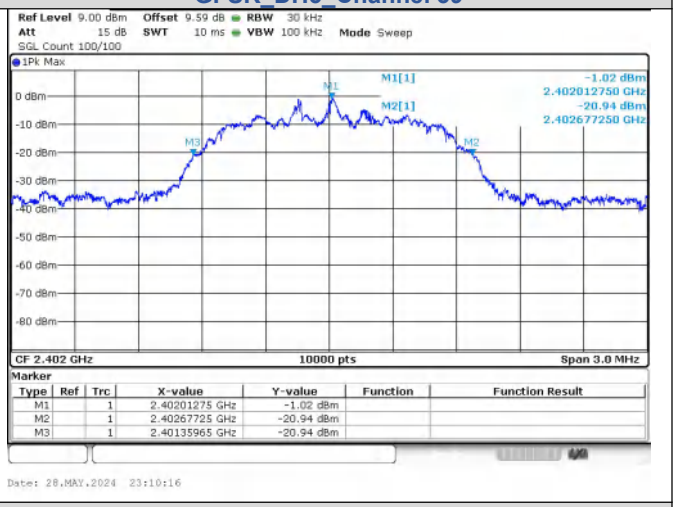
GFSK_DH5_Channel 0



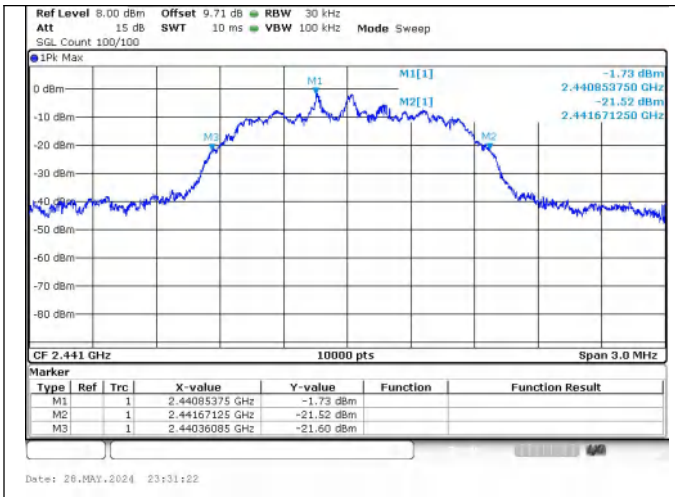
GFSK_DH5_Channel 39



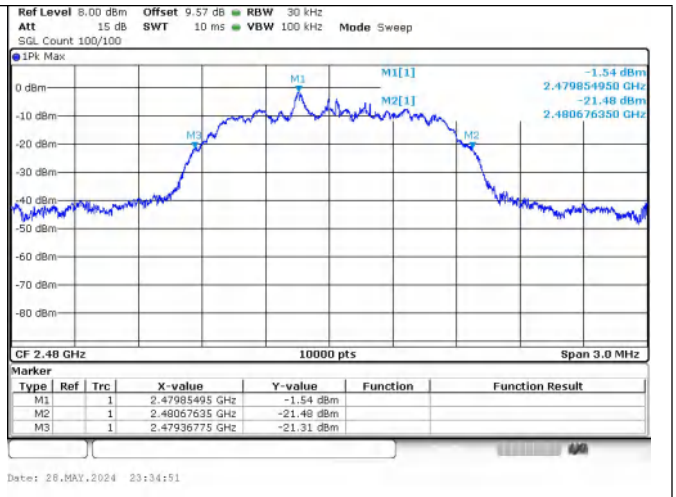
GFSK_DH5_Channel 78



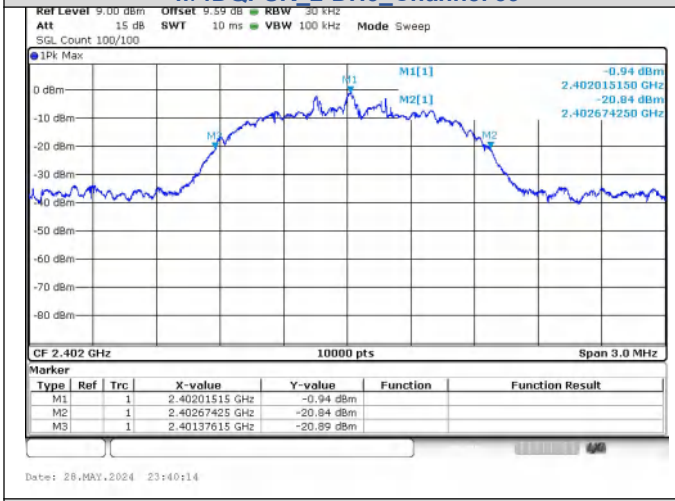
π/4DQPSK_2-DH5_Channel 0



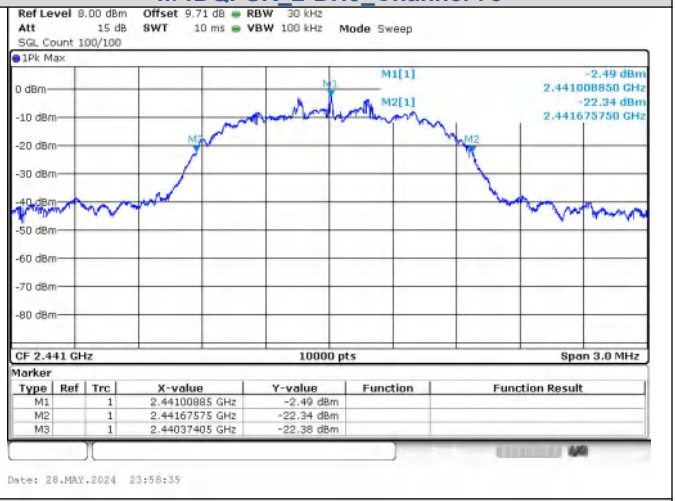
π/4DQPSK_2-DH5_Channel 39



π/4DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39

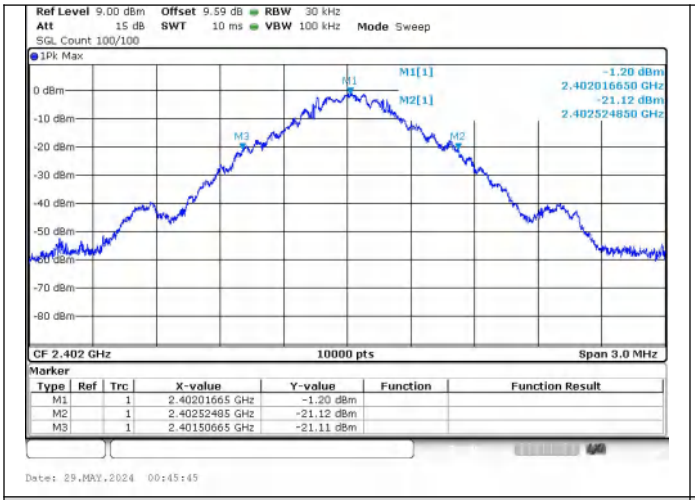
8DPSK_3-DH5_Channel 78

Right

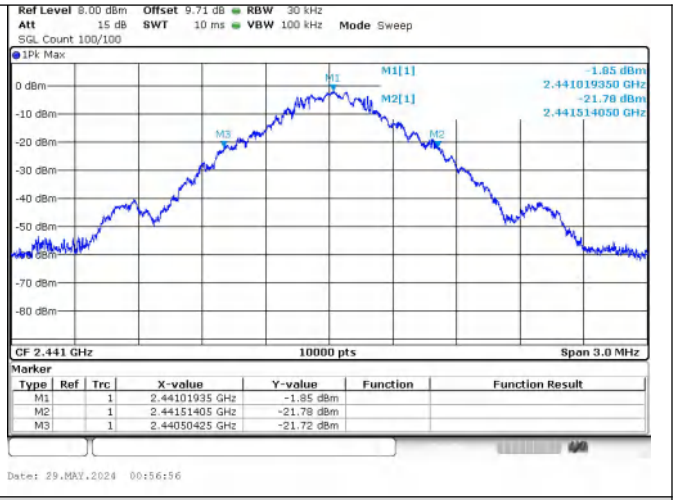
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.010
	39	2441 MHz	1.010
	78	2480 MHz	1.010
π/4DQPSK	0	2402 MHz	1.310
	39	2441 MHz	1.320
	78	2480 MHz	1.280
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.290

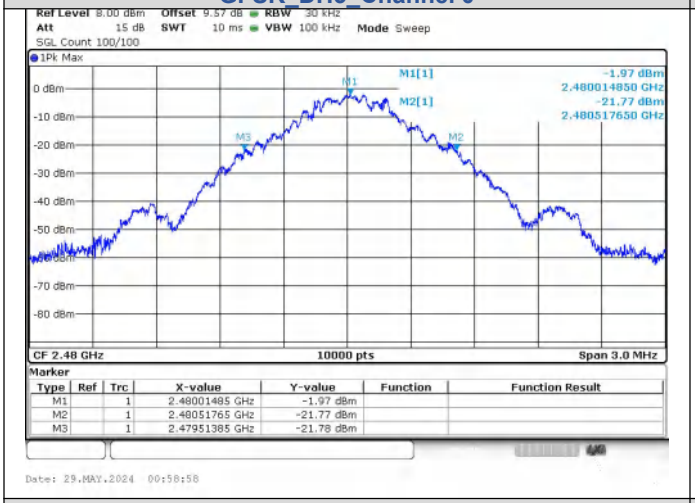
Test Graphs



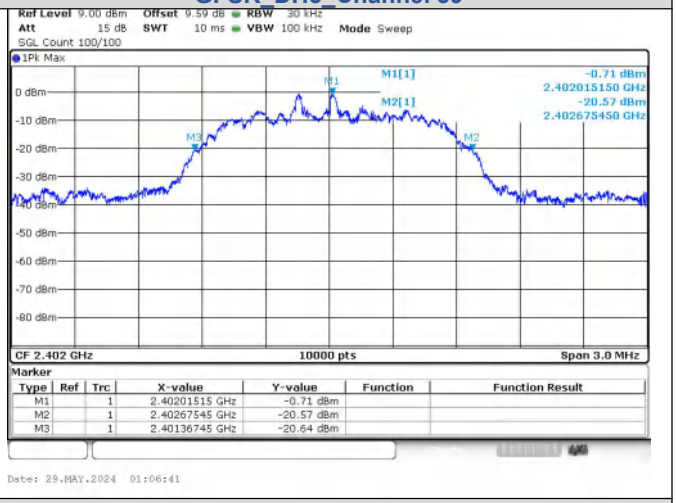
GFSK_DH5_Channel 0



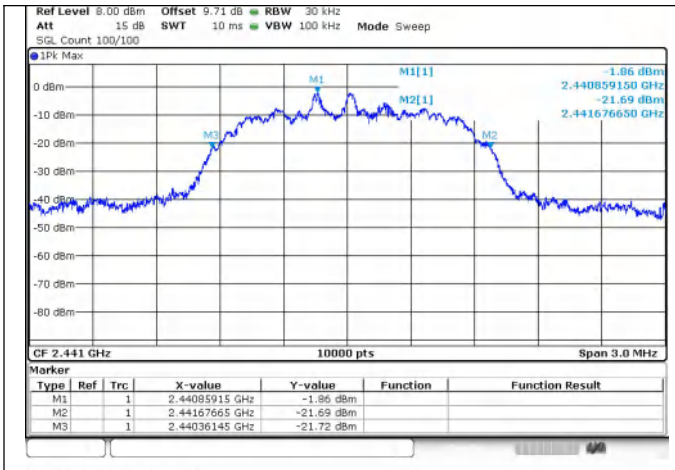
GFSK_DH5_Channel 39



GFSK_DH5_Channel 78



π/4DQPSK_2-DH5_Channel 0



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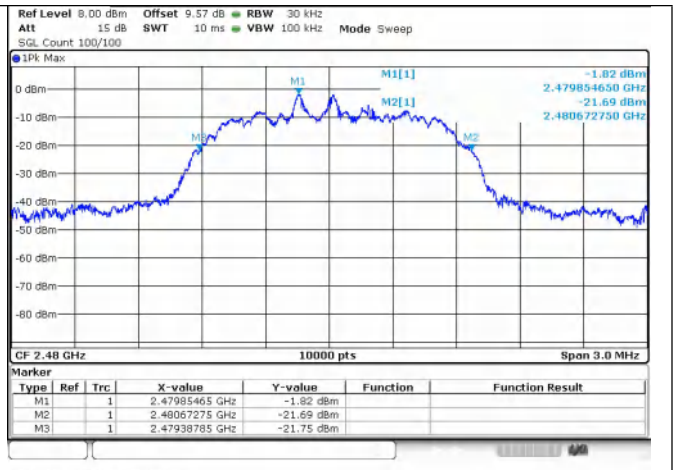

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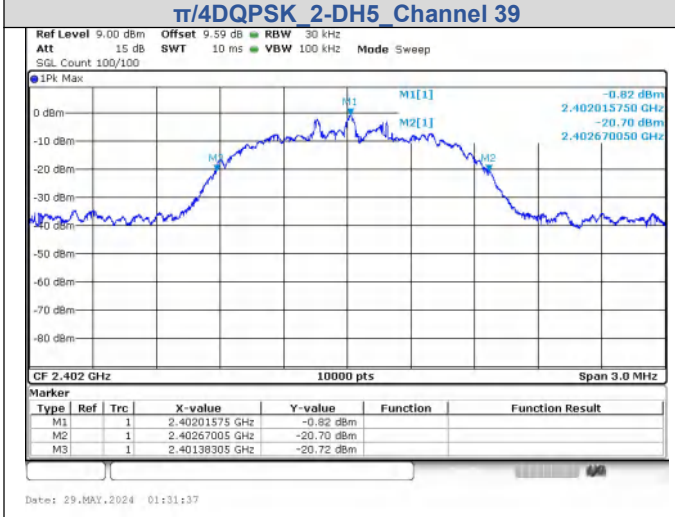
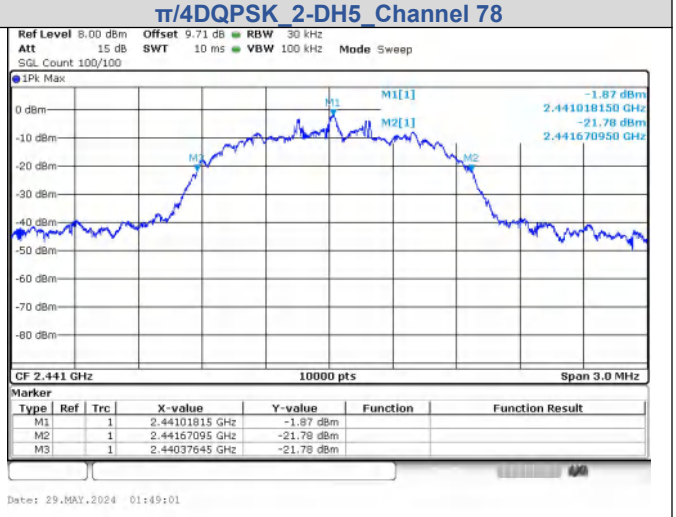
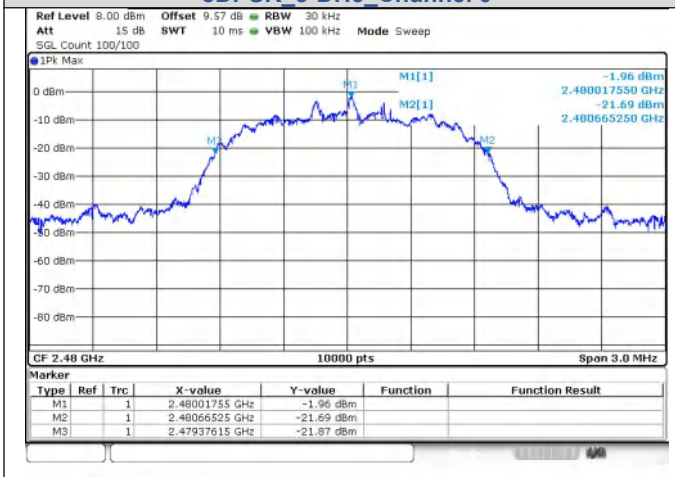


8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

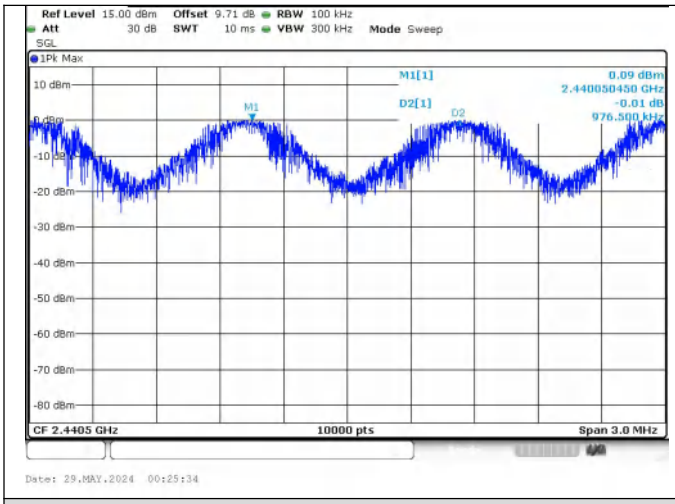
Carrier Frequencies Separation

Test Result

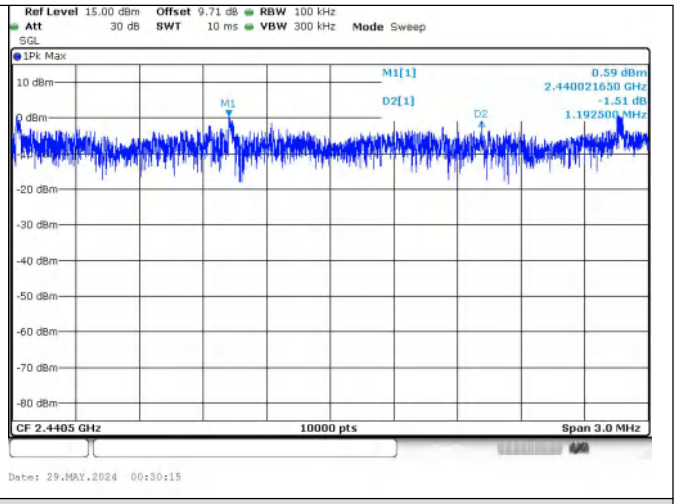
Left

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0505	2441.0269	0.9765	0.687	PASS
π/4DQPSK	2-DH5	2440.0217	2441.2141	1.1925	0.88	PASS
8DPSK	3-DH5	2440.2121	2441.1757	0.9636	0.86	PASS

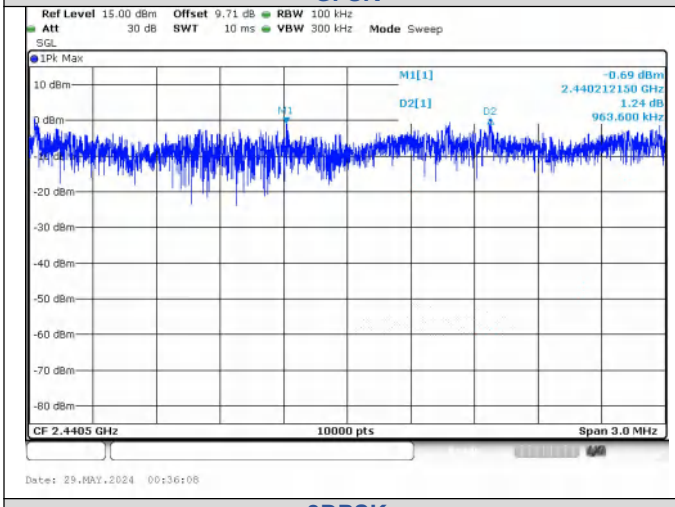
Test Graphs



GFSK



π/4DQPSK



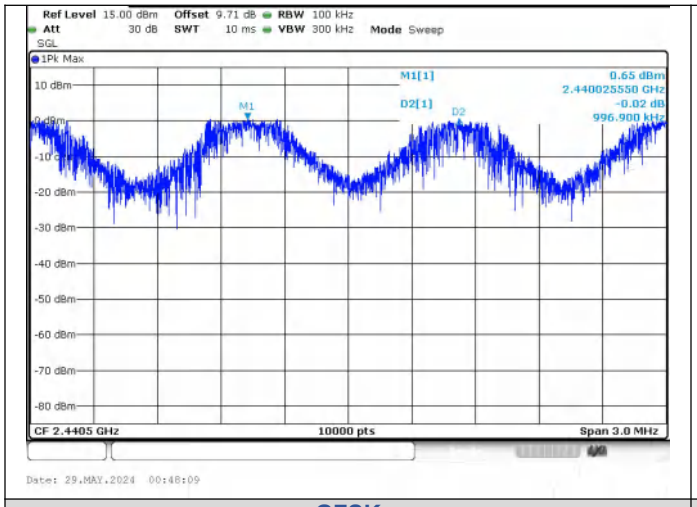
8DPSK

Right

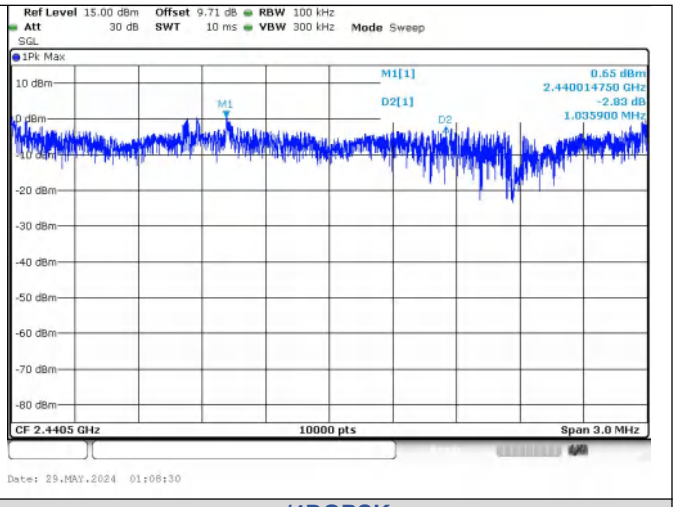
Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0255	2441.0224	0.9969	0.673	PASS
π/4DQPSK	2-DH5	2440.0147	2441.0507	1.0359	0.873	PASS
8DPSK	3-DH5	2439.9824	2441.0141	1.0317	0.86	PASS

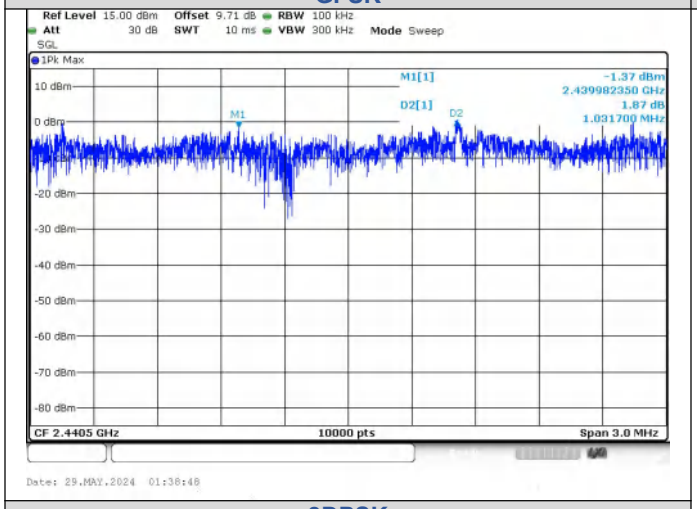
Test Graphs



GFSK



π/4DQPSK



8DPSK

Conducted Out Of Band Emission

Test Result

Left

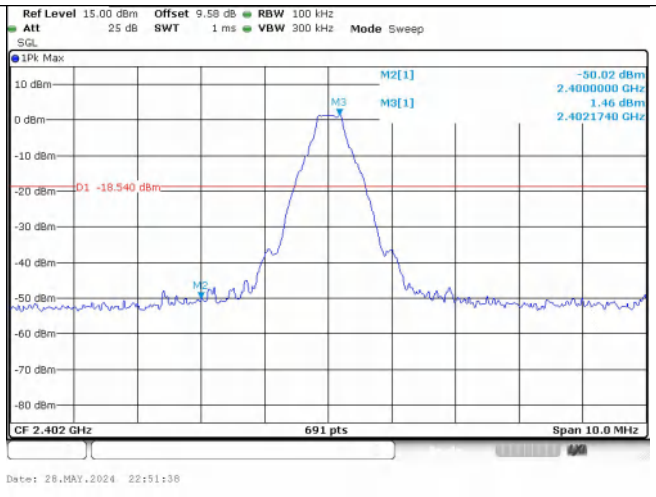
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-50.017	-18.54	-31.477	PASS
			7206.79	-39.679	-18.54	-21.139	PASS
		39	9763.72	-42.628	-19.3	-23.328	PASS
		78	2483.50	-51.599	-19.19	-32.409	PASS
			9920.20	-40.614	-19.19	-21.424	PASS
π/4DQPSK	2-DH5	0	2400.00	-48.449	-18.69	-29.759	PASS
			7205.96	-45.045	-18.69	-26.355	PASS
		39	9763.72	-42.533	-19.87	-22.663	PASS
		78	2483.50	-52.295	-19.31	-32.985	PASS
			9920.20	-40.284	-19.31	-20.974	PASS
8DPSK	3-DH5	0	2400.00	-49.560	-18.97	-30.590	PASS
			7206.79	-39.476	-18.97	-20.506	PASS
		39	9763.72	-42.303	-19.49	-22.813	PASS
		78	2483.50	-52.171	-19.44	-32.731	PASS
			9920.20	-40.440	-19.44	-21.000	PASS

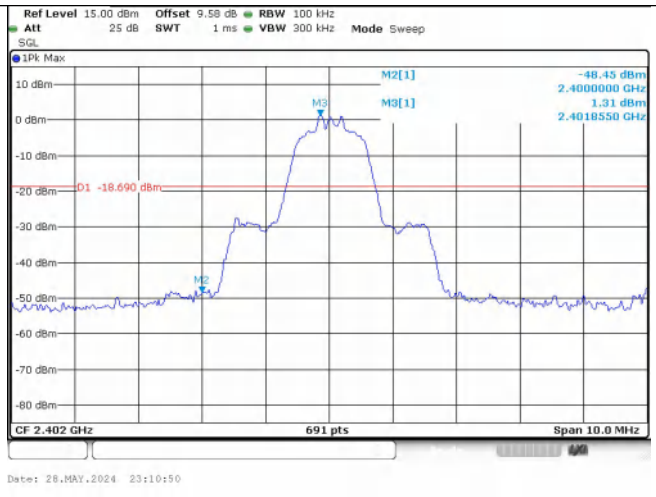
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.93	-50.034	-18.86	-31.174	PASS
			2400.00	-52.292	-18.86	-33.432	PASS
			2483.50	-51.317	-19.69	-31.627	PASS
			2397.15	-49.733	-18.54	-31.193	PASS
			2400.00	-52.075	-18.54	-33.535	PASS
			2483.50	-52.004	-19.18	-32.824	PASS
π/4DQPSK	2-DH5		2397.22	-50.403	-18.76	-31.643	PASS
			2400.00	-51.541	-18.76	-32.781	PASS
			2483.50	-51.848	-22.15	-29.698	PASS
			2398.36	-49.510	-18.55	-30.960	PASS
			2400.00	-49.739	-18.55	-31.189	PASS
			2483.50	-51.149	-19.46	-31.689	PASS
8DPSK	3-DH5		2398.68	-50.072	-18.92	-31.152	PASS
			2400.00	-50.812	-18.92	-31.892	PASS
			2483.50	-52.141	-19.49	-32.651	PASS
			2398.26	-49.869	-18.93	-30.939	PASS
			2400.00	-50.470	-18.93	-31.540	PASS
			2483.50	-51.254	-19.48	-31.774	PASS

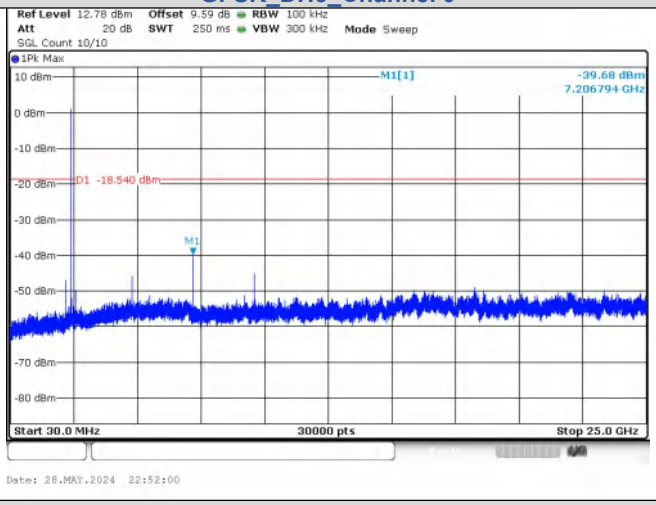
Test Graphs



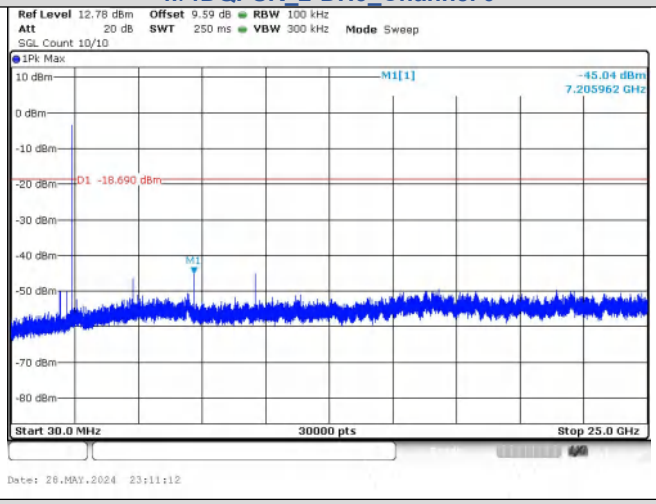
Out Of Band Emission
GFSK_DH5_Channel 0



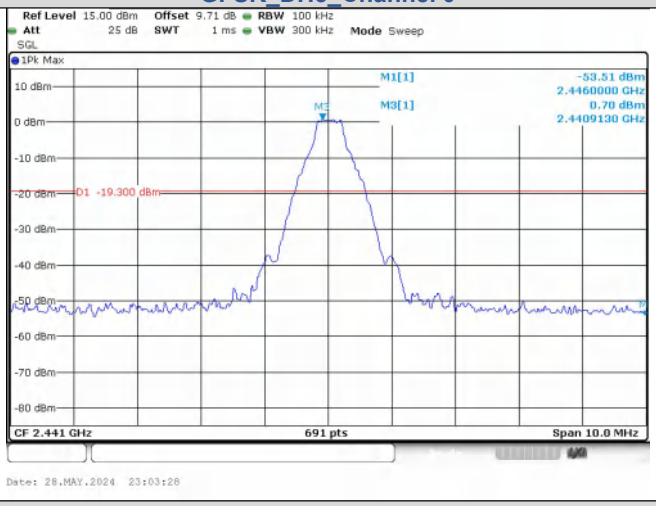
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 0



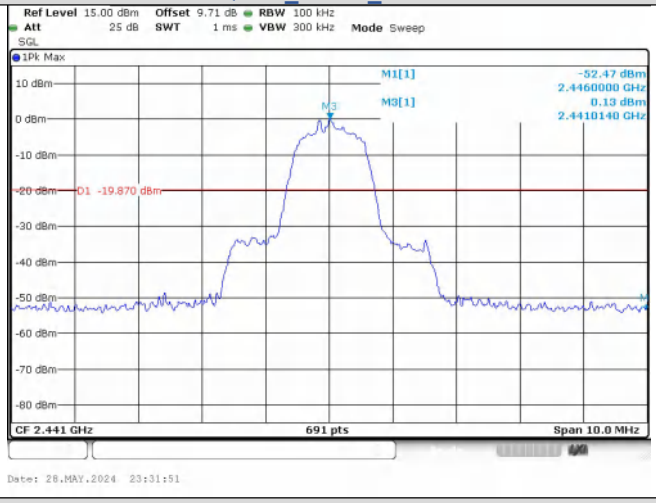
Spurious Emission
GFSK_DH5_Channel 0



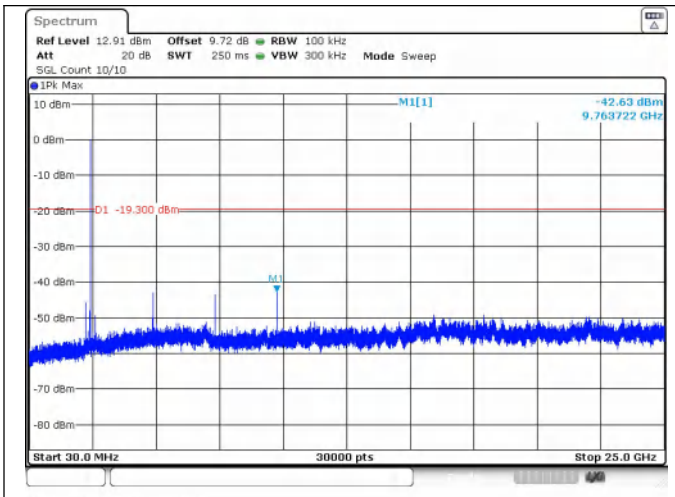
Spurious Emission
π/4DQPSK_2-DH5_Channel 0



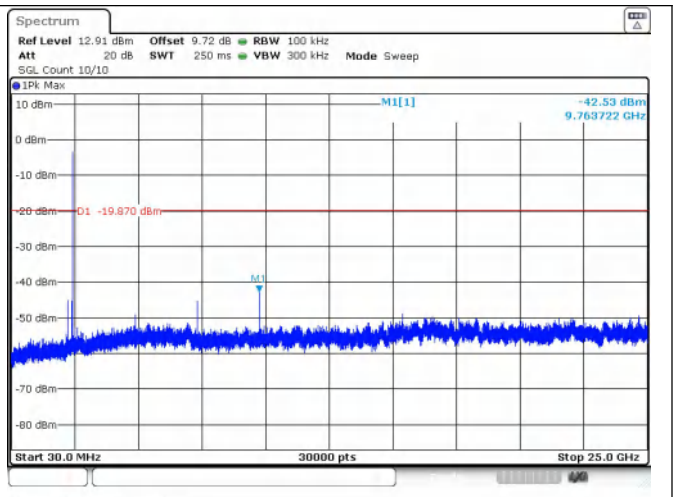
Out Of Band Emission
GFSK_DH5_Channel 39



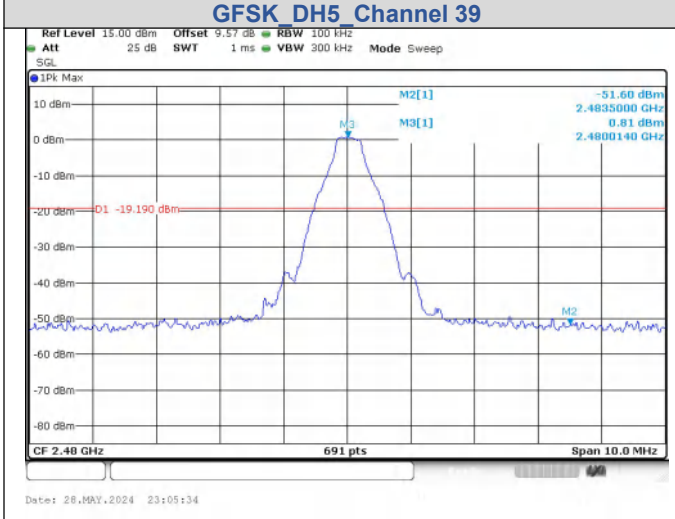
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 39



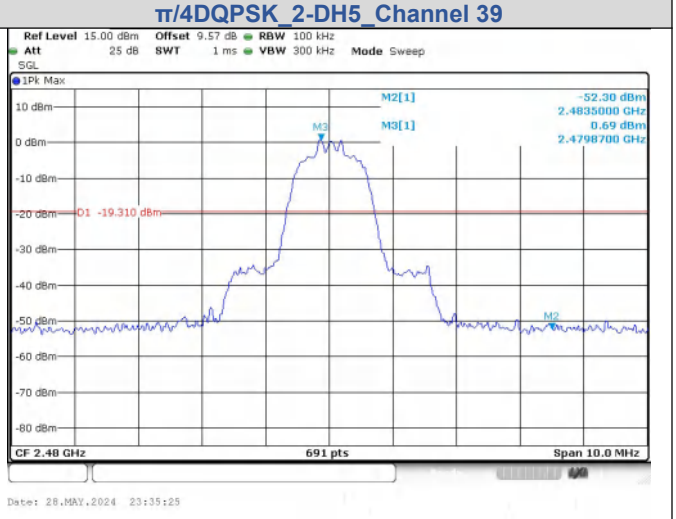
Spurious Emissions
GFSK_DH5_Channel 39



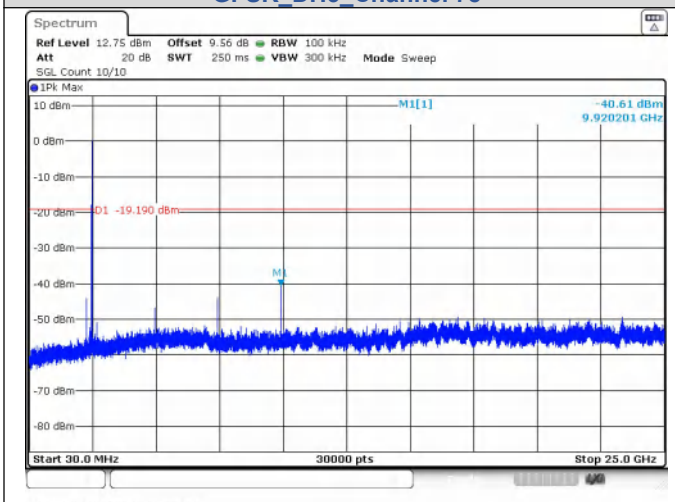
Spurious Emissions
π/4DQPSK_2-DH5_Channel 39



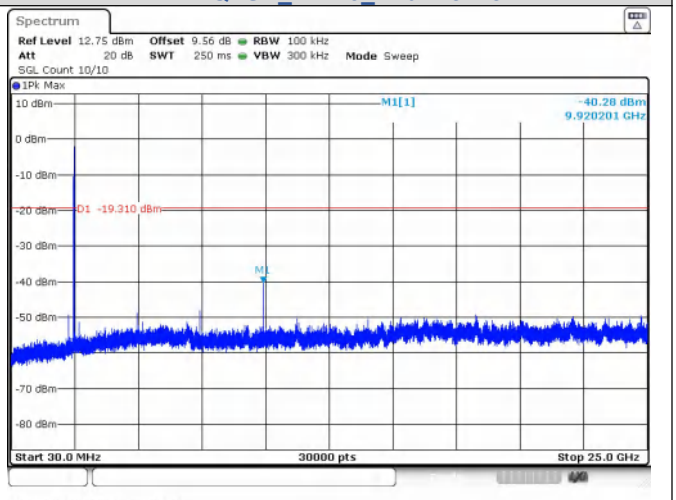
Out Of Band Emission
GFSK_DH5_Channel 78



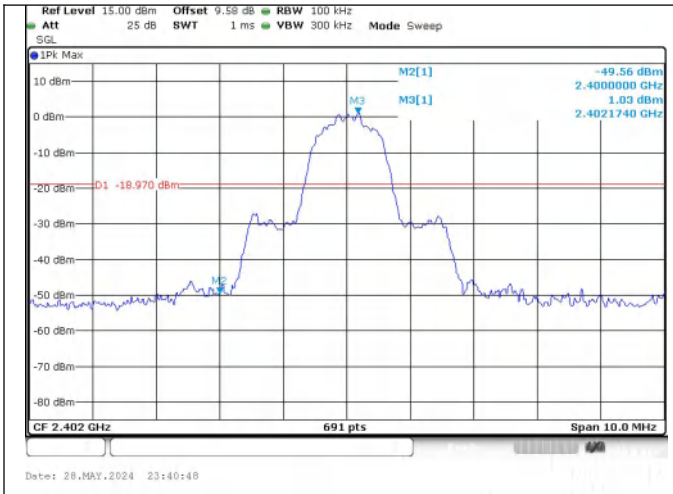
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 78



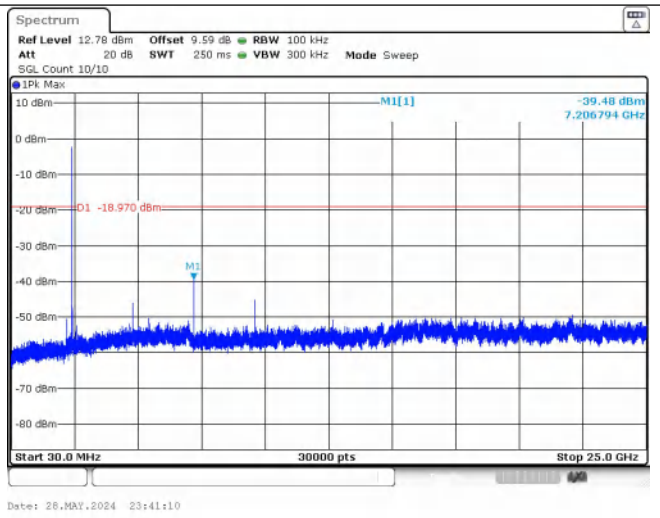
Spurious Emission
GFSK_DH5_Channel 78



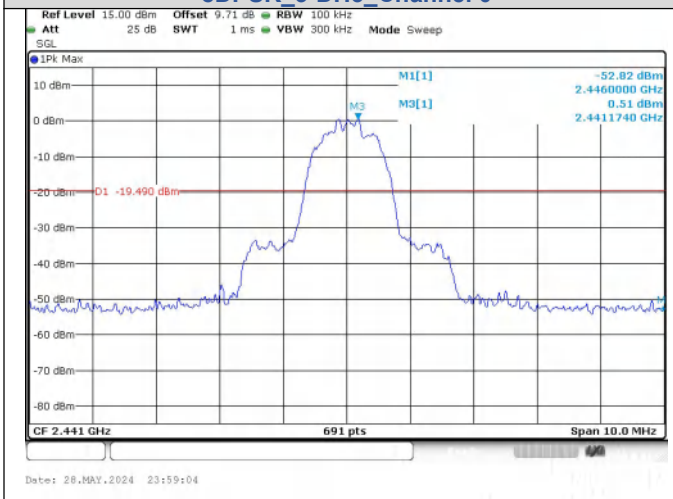
Spurious Emission
π/4DQPSK_2-DH5_Channel 78



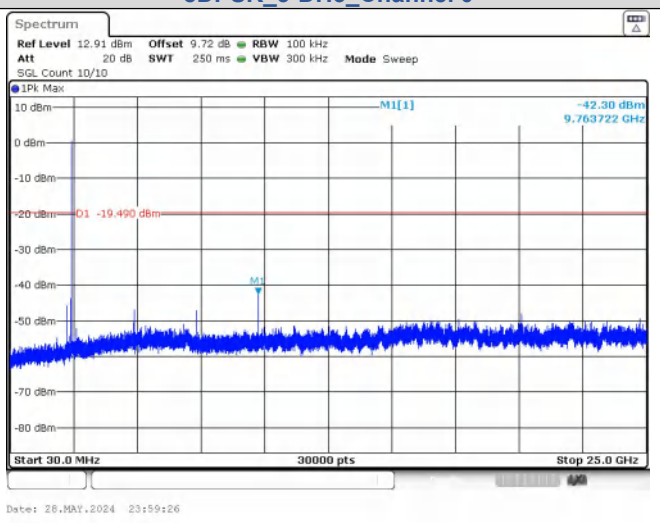
Out Of Band Emission
8DPSK_3-DH5_Channel 0



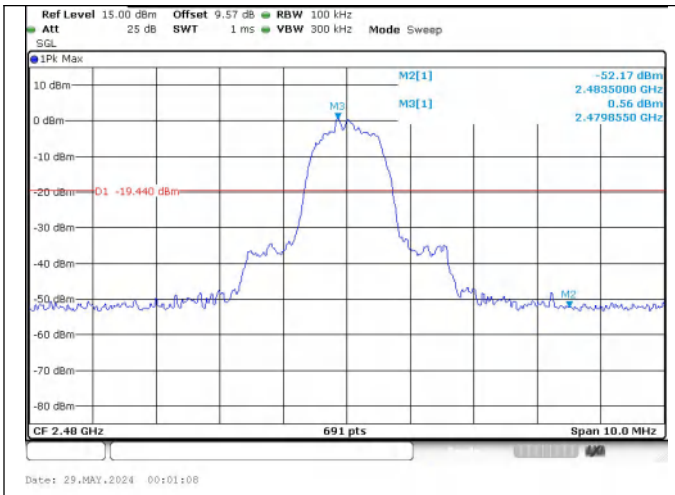
Spurious Emission
8DPSK_3-DH5_Channel 0



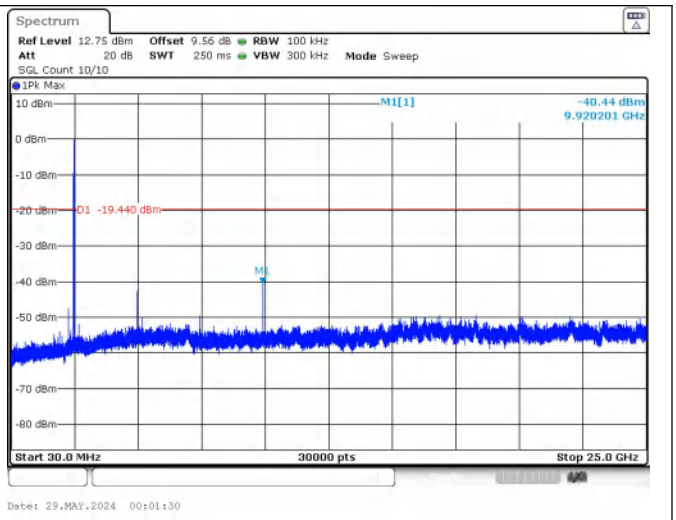
Out Of Band Emission
8DPSK_3-DH5_Channel 39



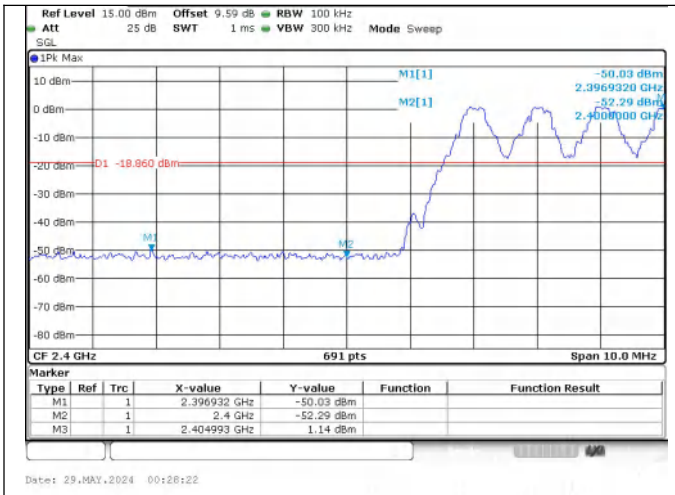
Spurious Emissions
8DPSK_3-DH5_Channel 39



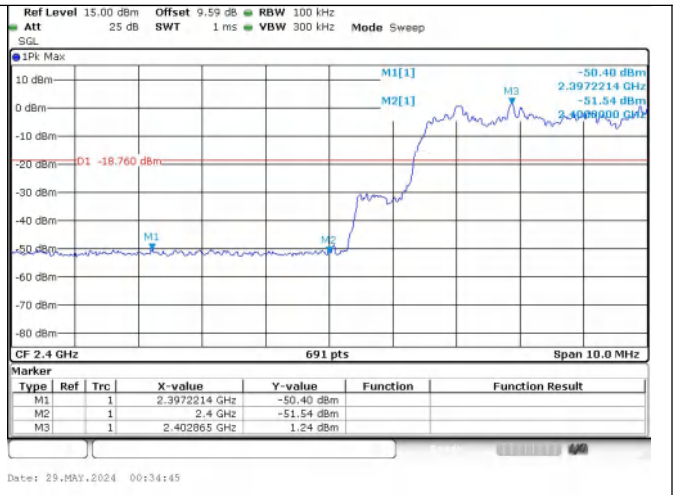
Out Of Band Emission
8DPSK_3-DH5_Channel 78



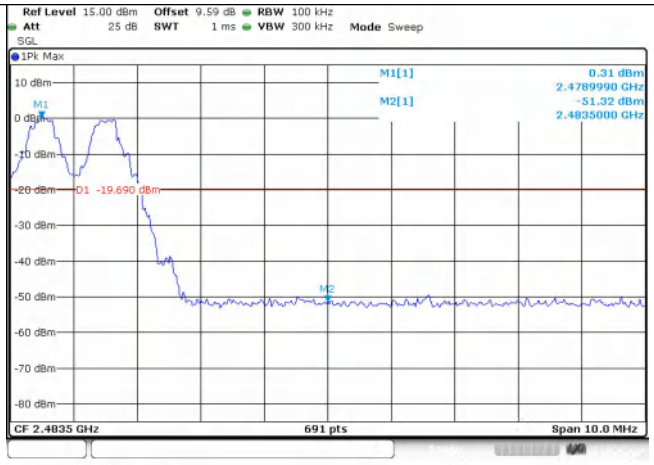
Spurious Emission
8DPSK_3-DH5_Channel 78



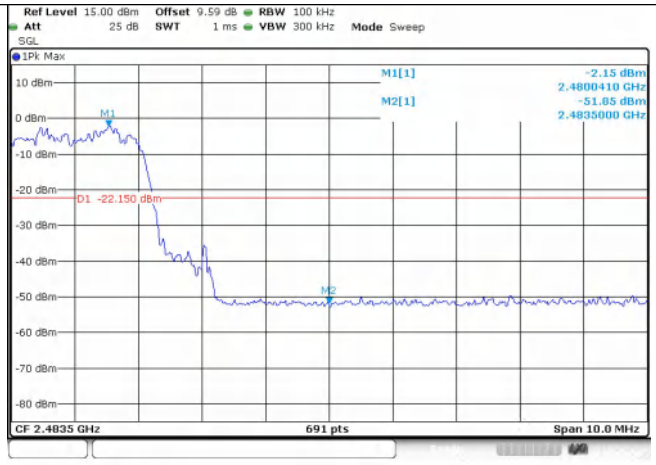
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



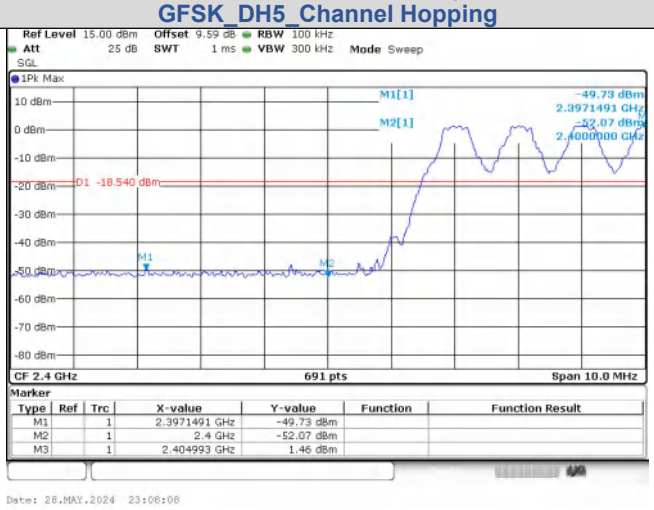
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



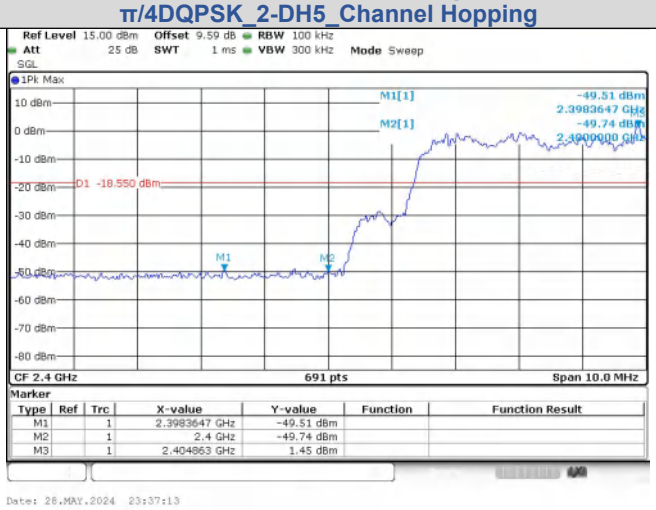
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



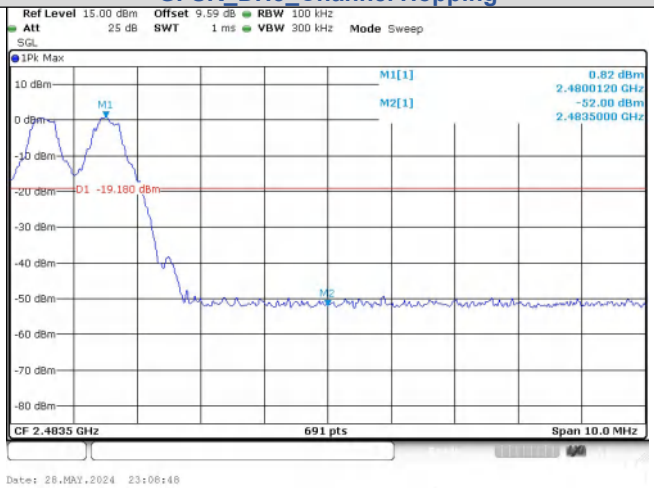
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



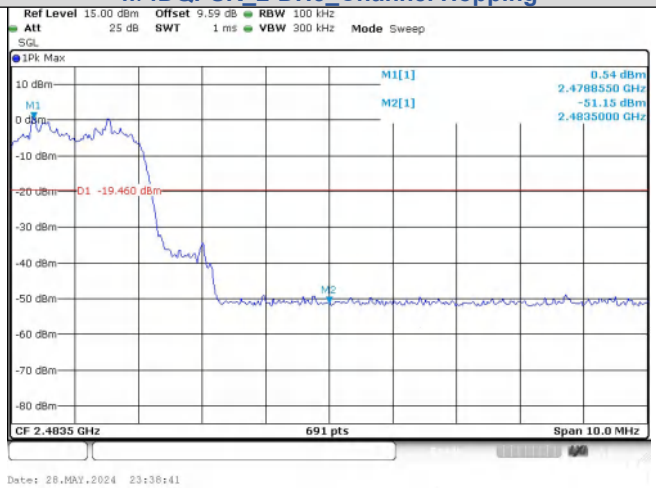
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



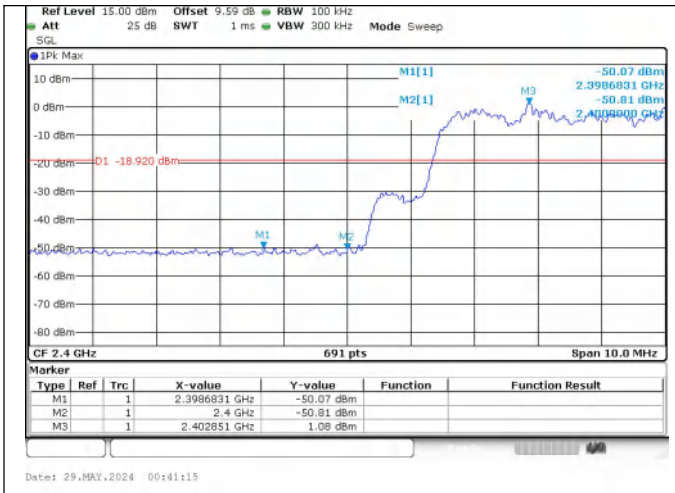
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



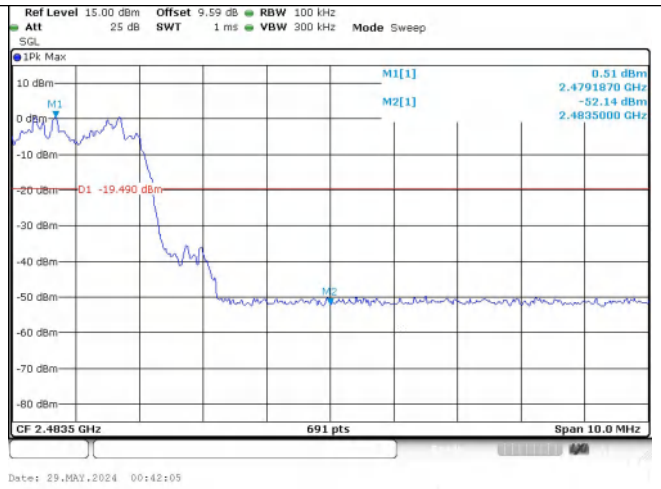
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



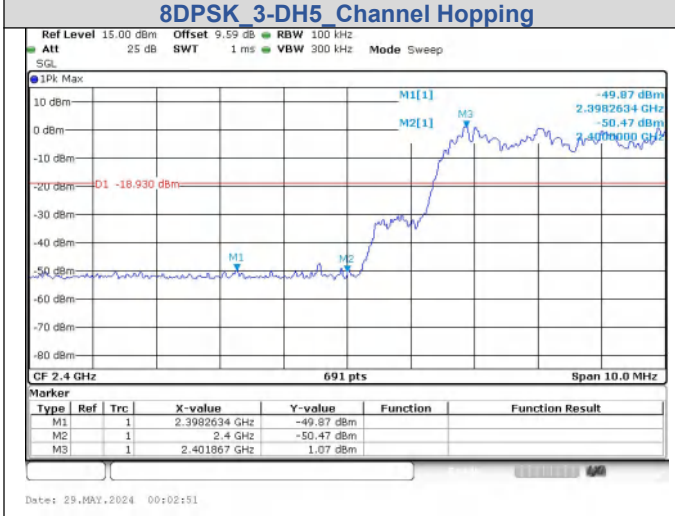
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



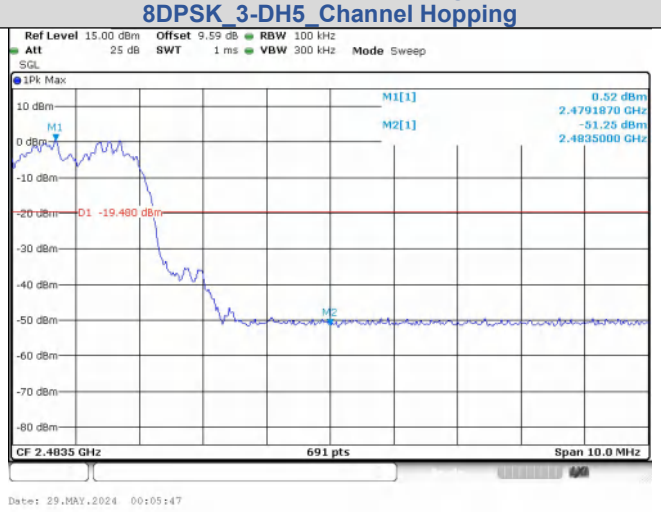
Out Of Band Emission(Left)
8DPSK_3-DH5_Channel Hopping



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



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



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

Right

Test Result

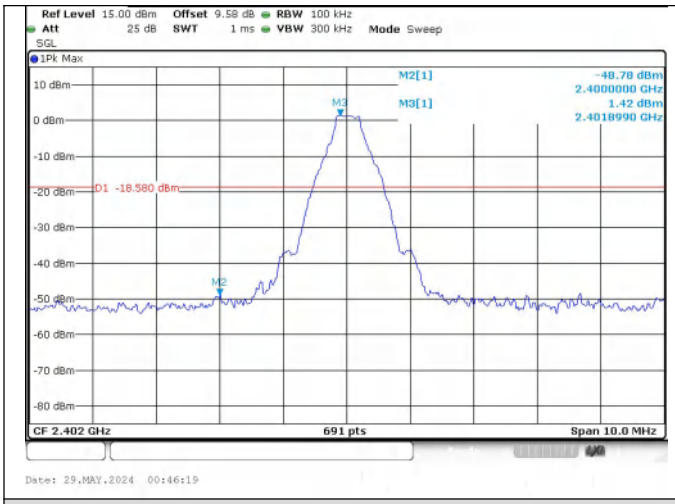
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.778	-18.58	-30.198	PASS
			7205.96	-39.601	-18.58	-21.021	PASS
		39	9764.55	-42.327	-19.39	-22.937	PASS
		78	2483.50	-52.424	-19.48	-32.944	PASS
			9920.20	-39.877	-19.48	-20.397	PASS
π/4DQPSK	2-DH5	0	2400.00	-48.968	-18.54	-30.428	PASS
			7205.96	-45.798	-18.54	-27.258	PASS
		39	9763.72	-42.441	-19.36	-23.081	PASS
		78	2483.50	-52.548	-19.83	-32.718	PASS
			9920.20	-40.026	-19.83	-20.196	PASS
8DPSK	3-DH5	0	2400.00	-48.671	-18.6	-30.071	PASS
			9608.08	-45.356	-18.6	-26.756	PASS
		39	9763.72	-42.373	-19.51	-22.863	PASS
		78	2483.50	-52.092	-19.69	-32.402	PASS
			9920.20	-39.494	-19.69	-19.804	PASS

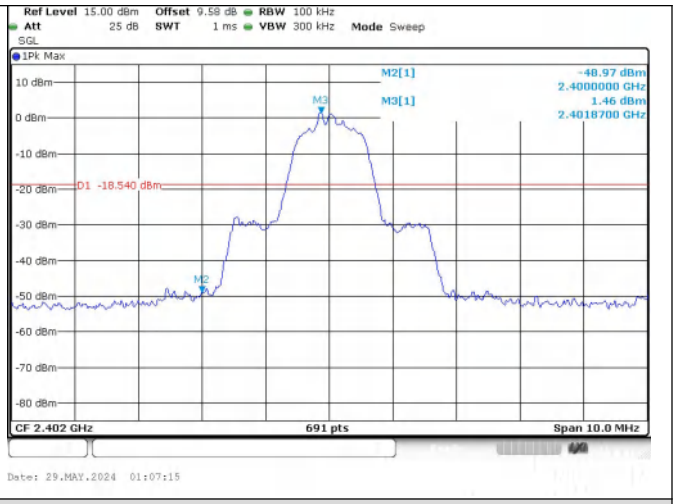
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.38	-50.323	-18.51	-31.813	PASS
			2400.00	-52.010	-18.51	-33.500	PASS
			2483.50	-51.160	-19.63	-31.530	PASS
			2395.70	-50.054	-18.79	-31.264	PASS
			2400.00	-52.397	-18.79	-33.607	PASS
			2483.50	-50.832	-19.49	-31.342	PASS
π/4DQPSK	2-DH5		2395.27	-49.907	-18.63	-31.277	PASS
			2400.00	-52.250	-18.63	-33.620	PASS
			2483.50	-51.779	-19.87	-31.909	PASS
			2396.96	-50.269	-19.24	-31.029	PASS
			2400.00	-52.102	-19.24	-32.862	PASS
			2483.50	-51.069	-19.57	-31.499	PASS
8DPSK	3-DH5		2397.66	-49.791	-18.78	-31.011	PASS
			2400.00	-49.981	-18.78	-31.201	PASS
			2483.50	-51.240	-20.09	-31.150	PASS
			2400.00	-48.963	-18.5	-30.463	PASS
			2483.50	-50.273	-19.6	-30.673	PASS

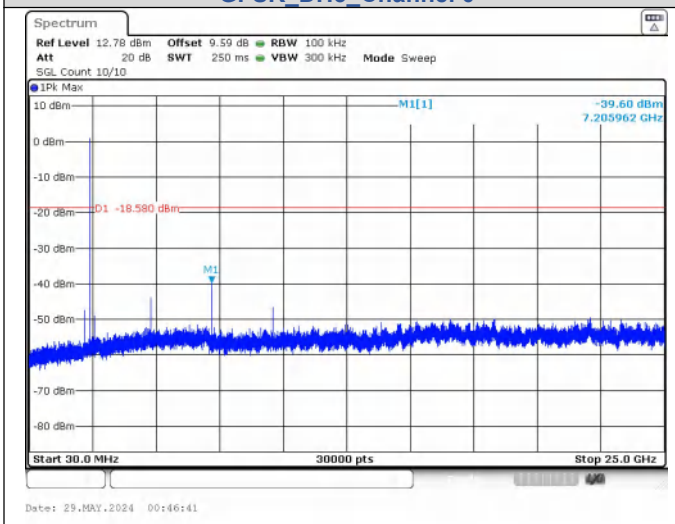
Test Graphs



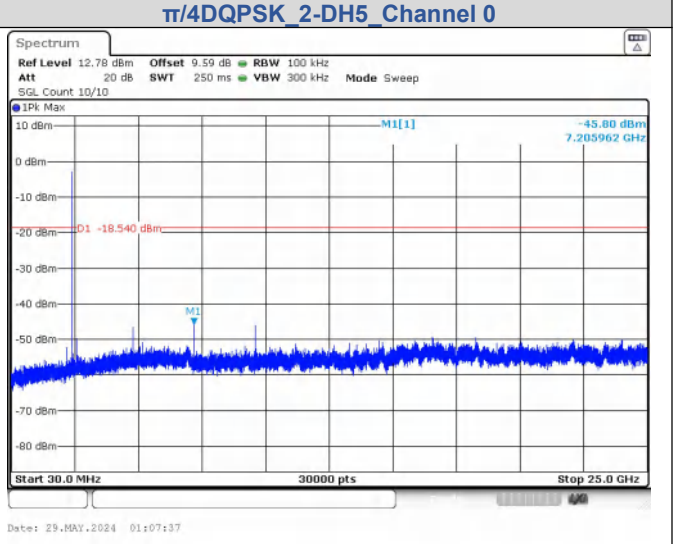
Out Of Band Emission
GFSK_DH5_Channel 0



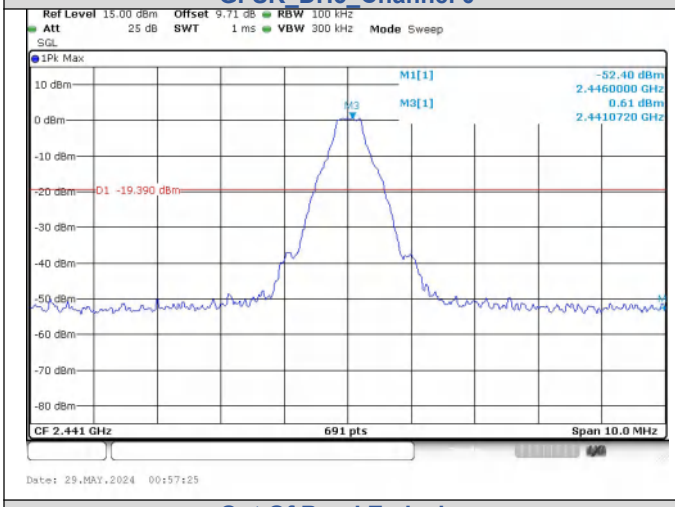
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 0



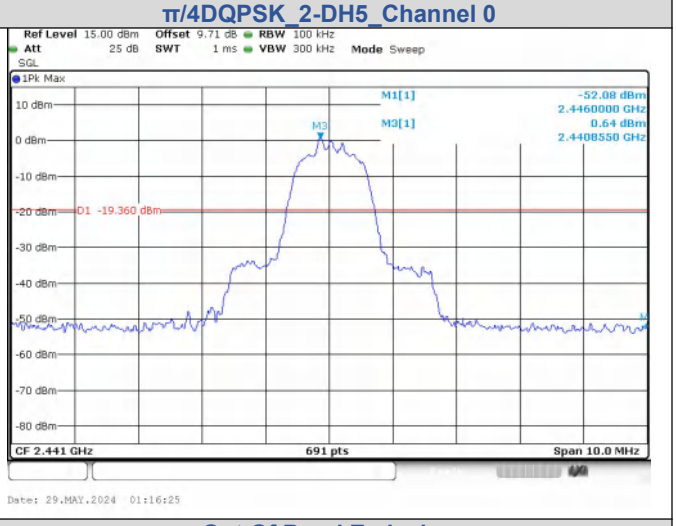
Spurious Emission
GFSK_DH5_Channel 0



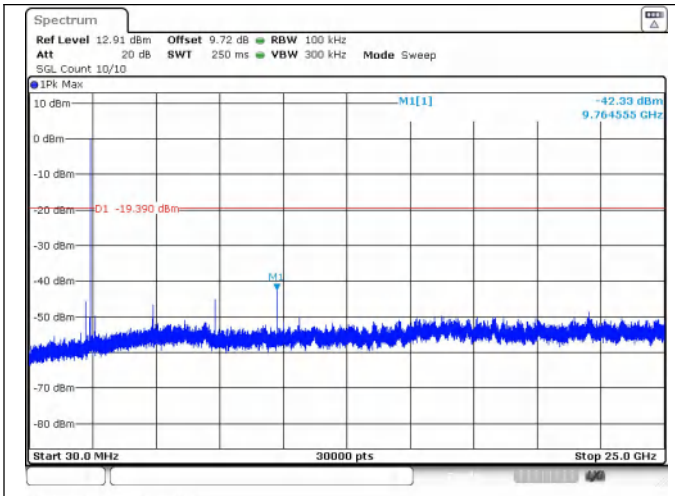
Spurious Emission
π/4DQPSK_2-DH5_Channel 0



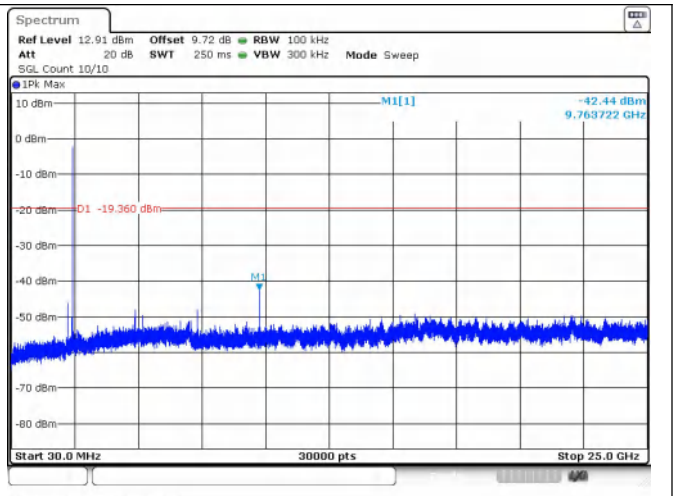
Out Of Band Emission
GFSK_DH5_Channel 39



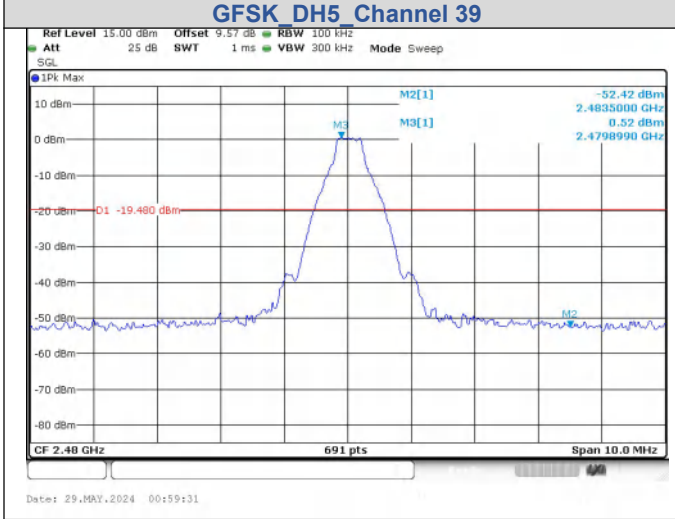
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 39



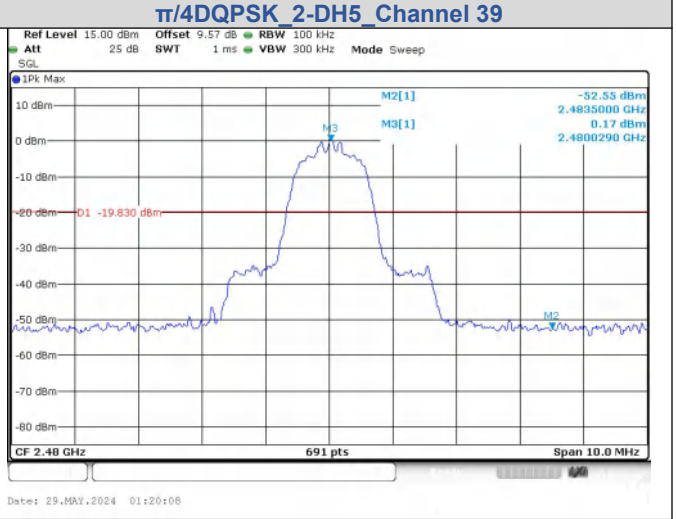
Spurious Emissions
GFSK_DH5_Channel 39



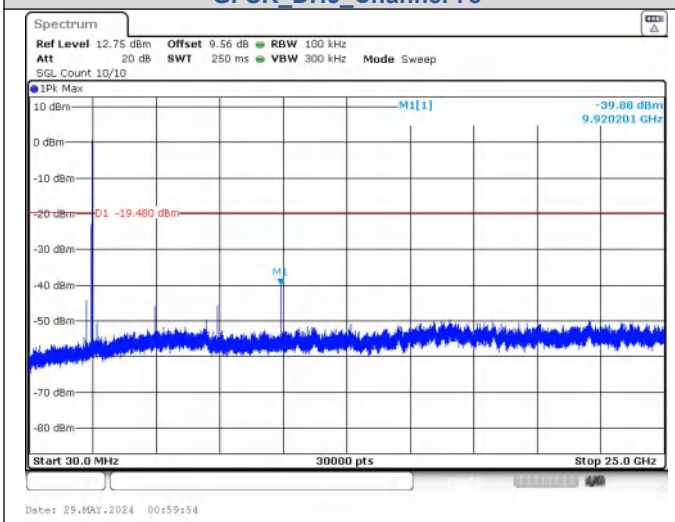
Spurious Emissions
π/4DQPSK_2-DH5_Channel 39



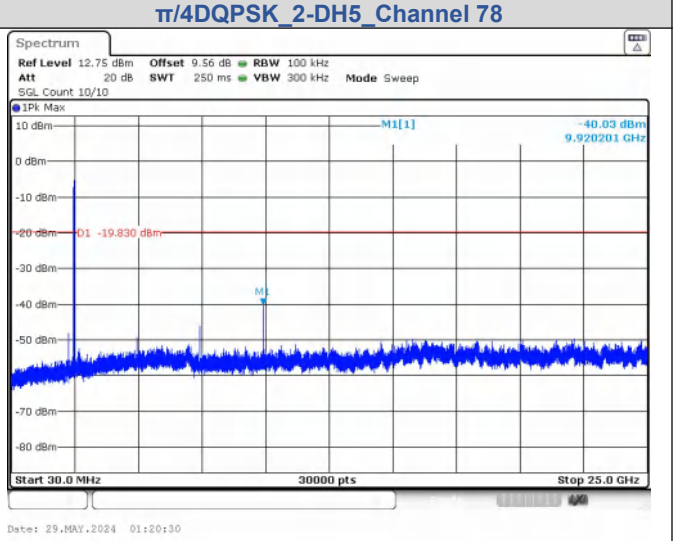
Out Of Band Emission
GFSK_DH5_Channel 78



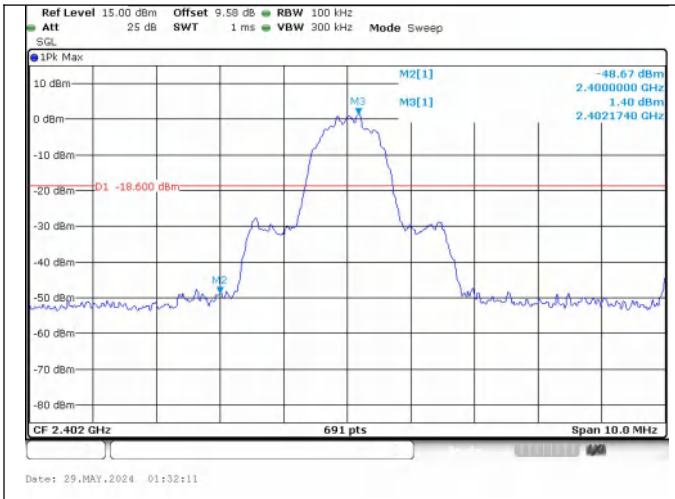
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 78



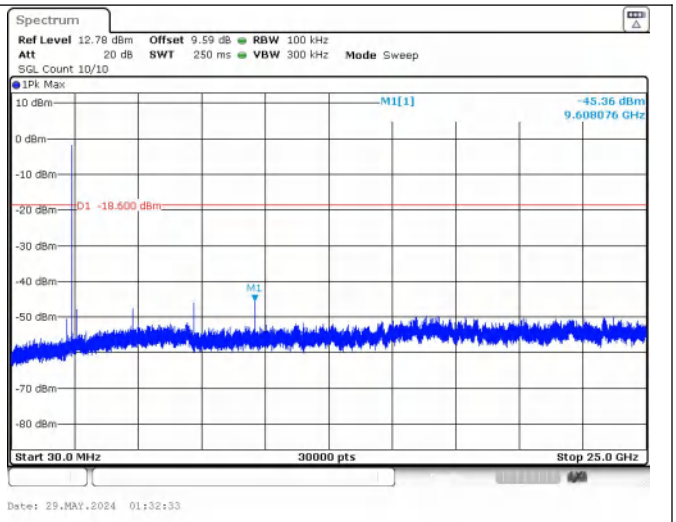
Spurious Emission
GFSK_DH5_Channel 78



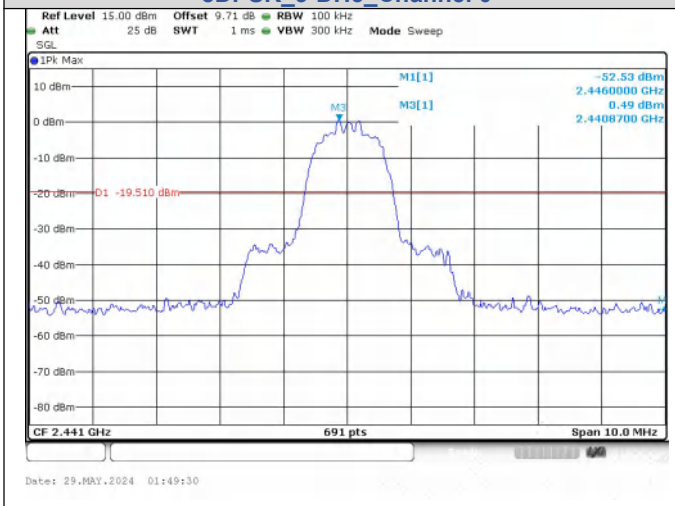
Spurious Emission
π/4DQPSK_2-DH5_Channel 78



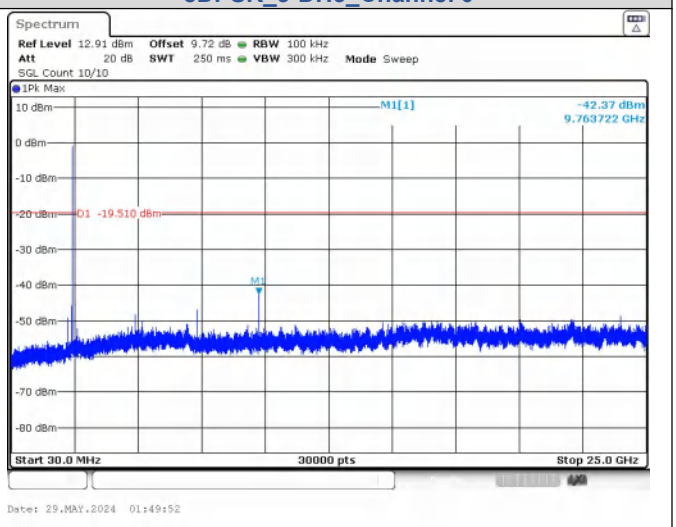
Out Of Band Emission
8DPSK_3-DH5_Channel 0



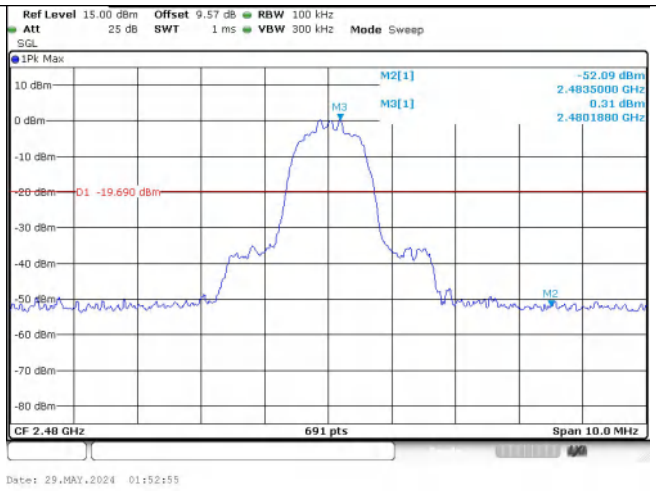
Spurious Emission
8DPSK_3-DH5_Channel 0



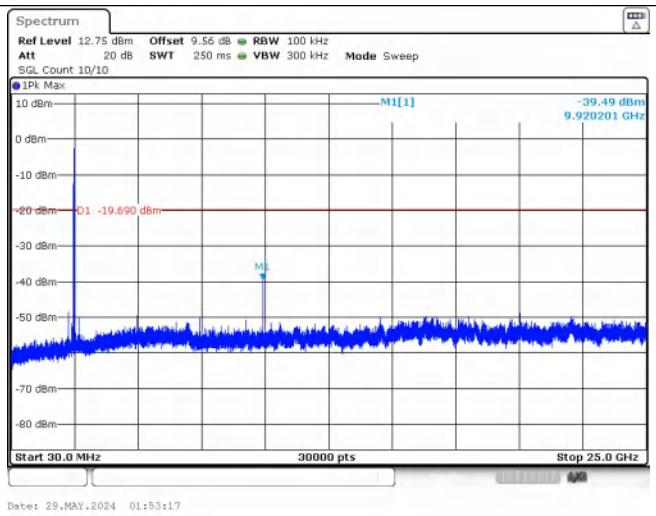
Out Of Band Emission
8DPSK_3-DH5_Channel 39



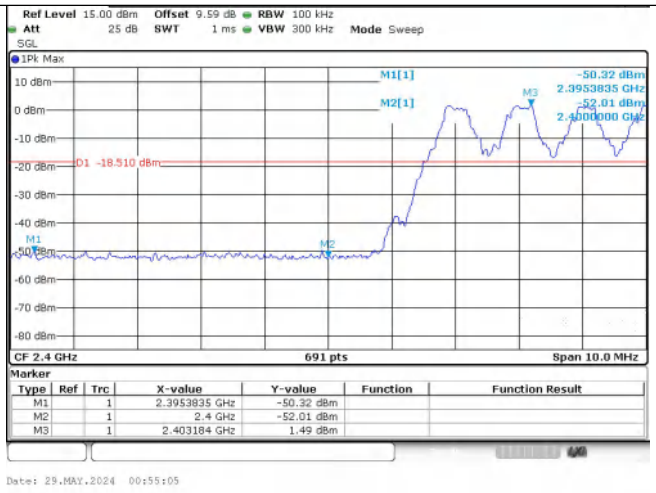
Spurious Emissions
8DPSK_3-DH5_Channel 39



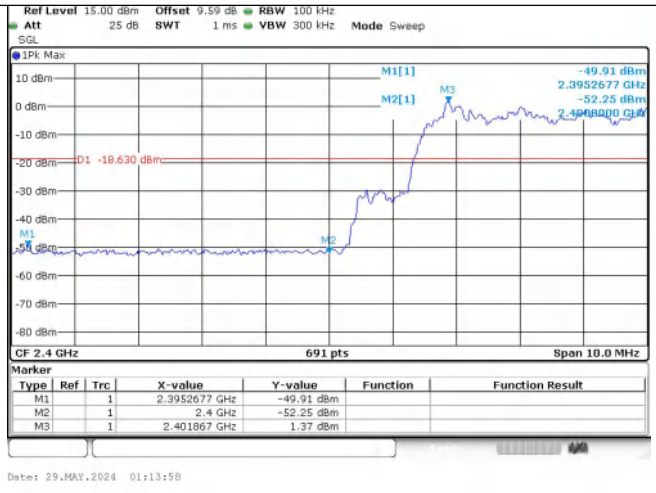
Out Of Band Emission
8DPSK_3-DH5_Channel 78



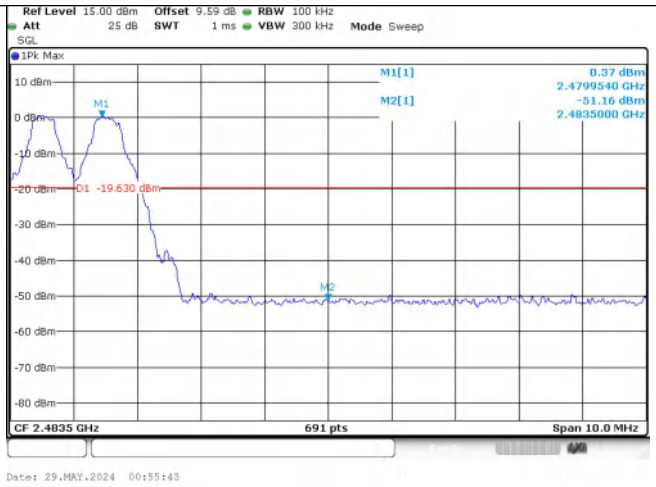
Spurious Emission
8DPSK_3-DH5_Channel 78



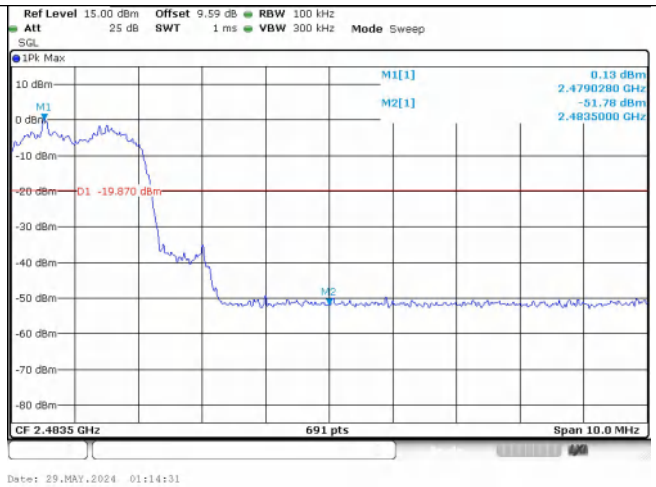
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



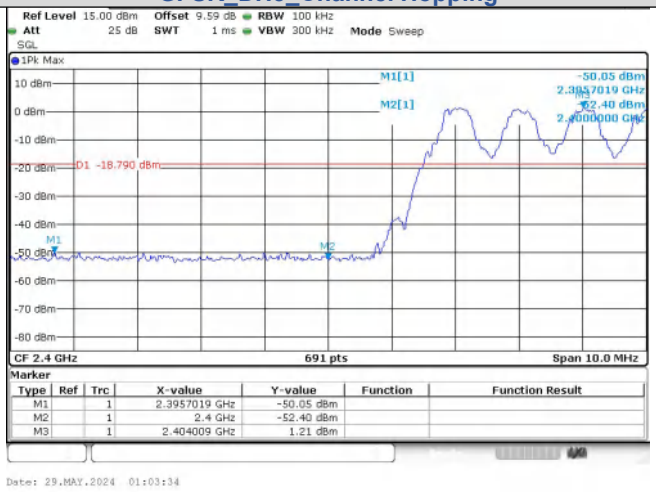
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



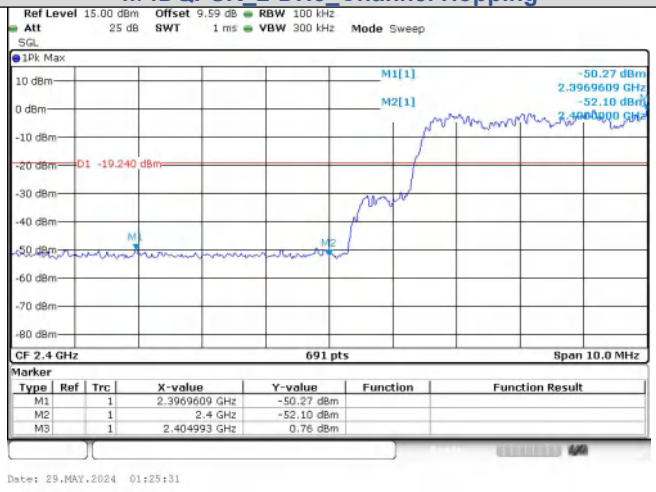
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



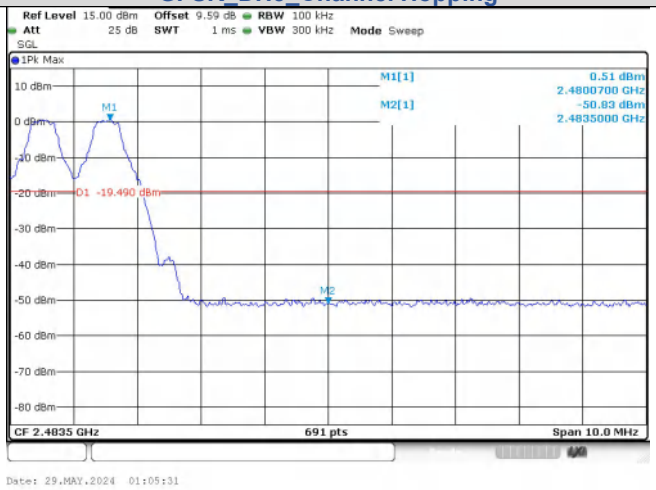
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



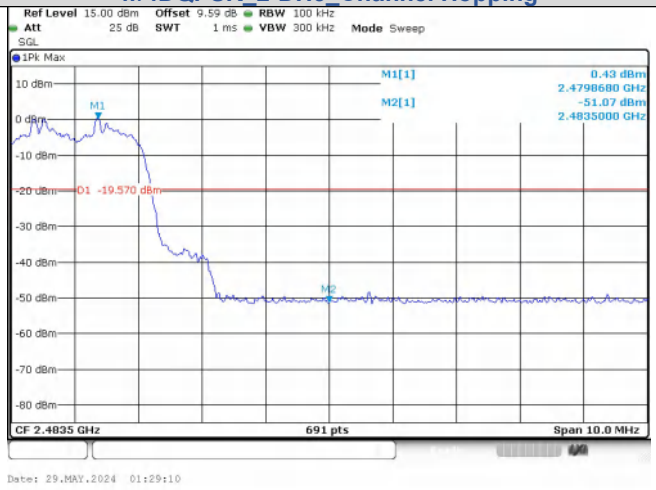
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



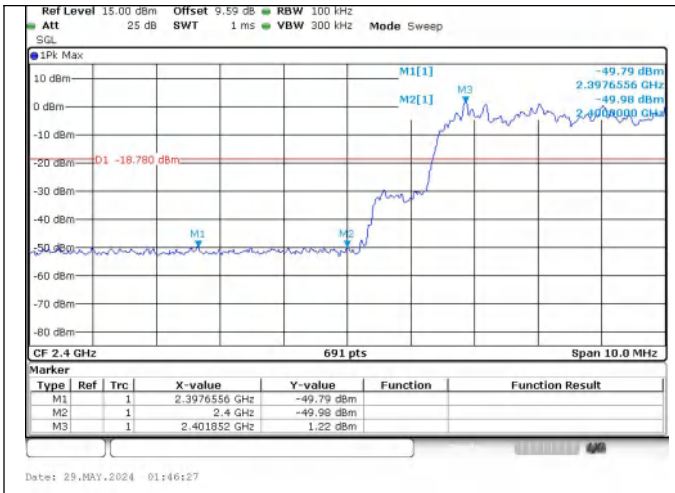
Out Of Band Emission(Left)
π/4DQPSK_2-DH5_Channel Hopping



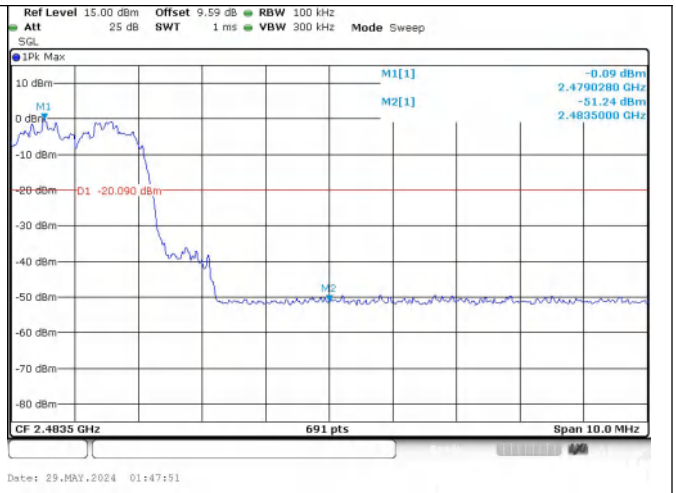
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



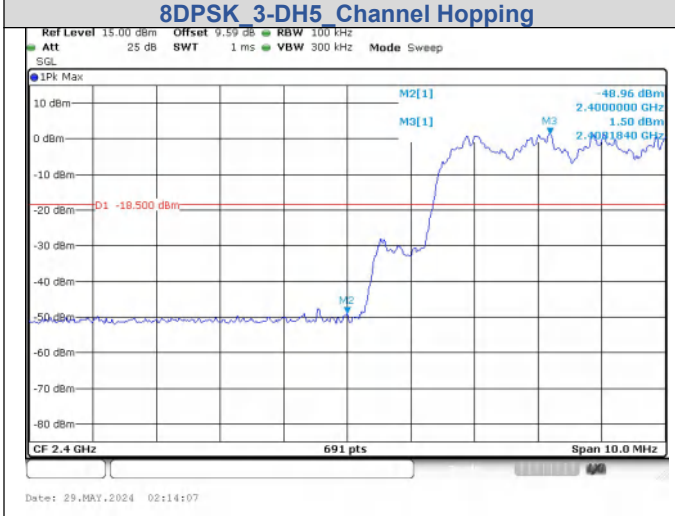
Out Of Band Emission(Right)
π/4DQPSK_2-DH5_Channel Hopping



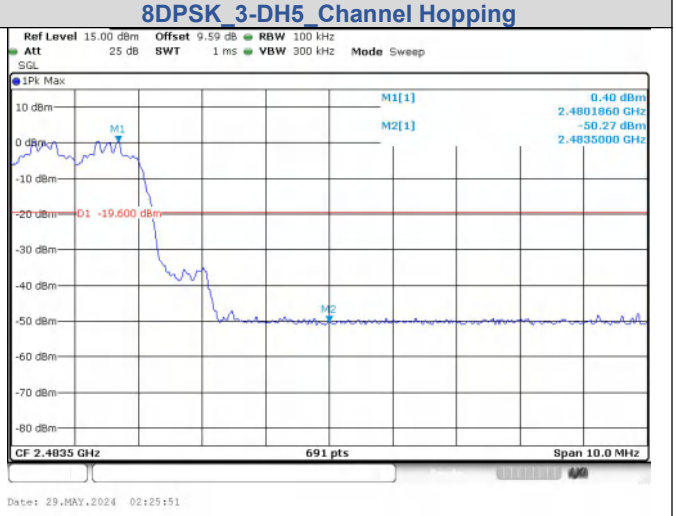
Out Of Band Emission(Left)
8DPSK_3-DH5_Channel Hopping



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



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



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

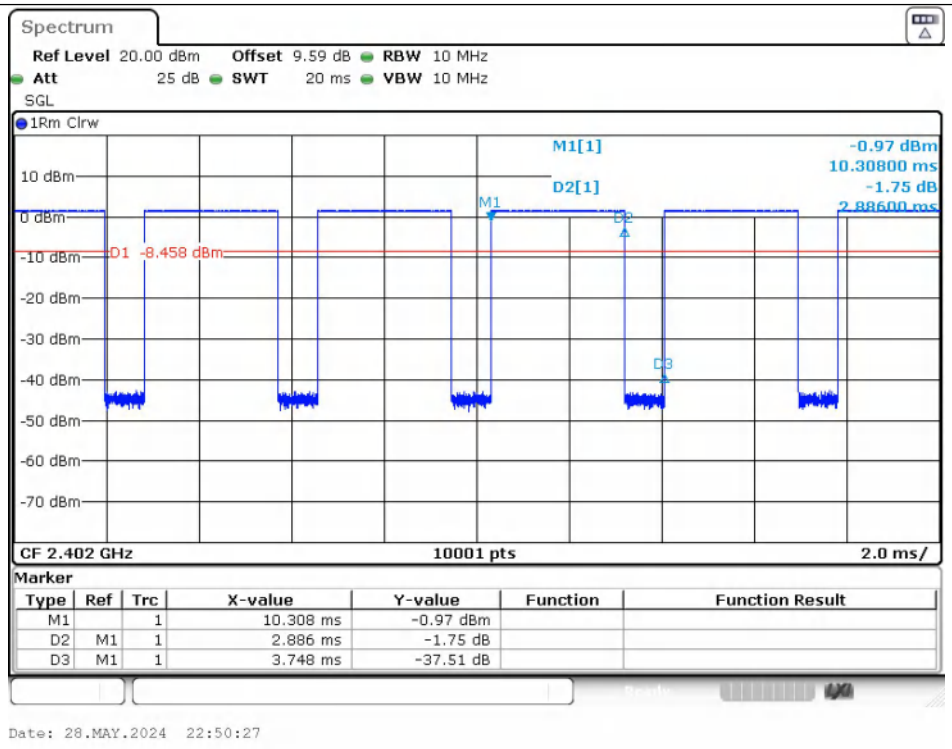
Duty Cycle

Left

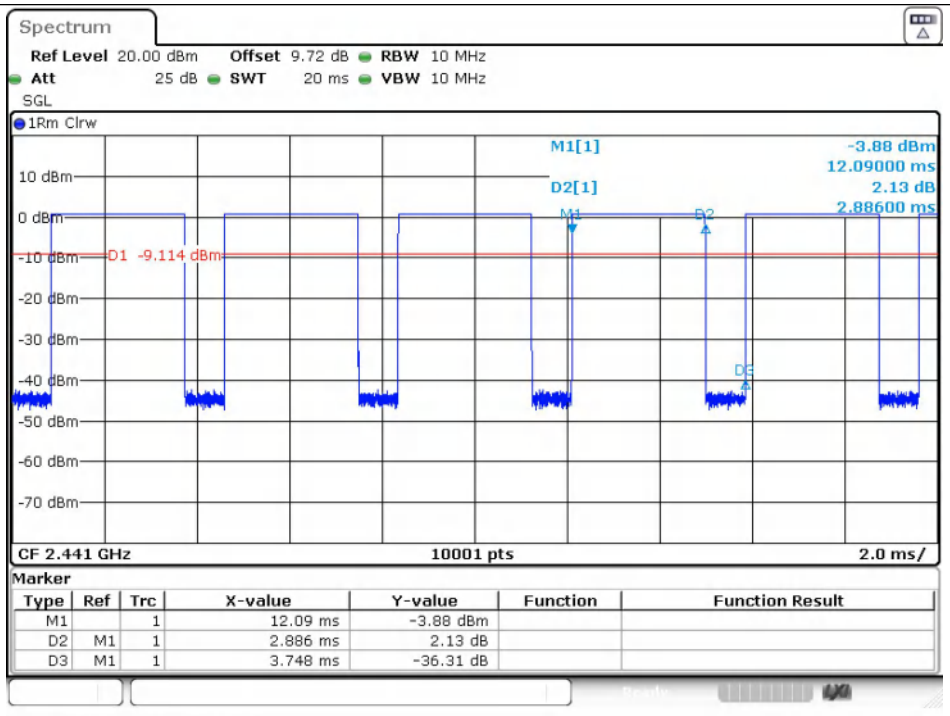
Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	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	2.890	3.748	77.11	0.7711	1.1289	0.35
		39	2.890	3.748	77.11	0.7711	1.1289	0.35
		78	2.890	3.748	77.11	0.7711	1.1289	0.35
8DPSK	3-DH5	0	2.894	3.748	77.21	0.7721	1.1233	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

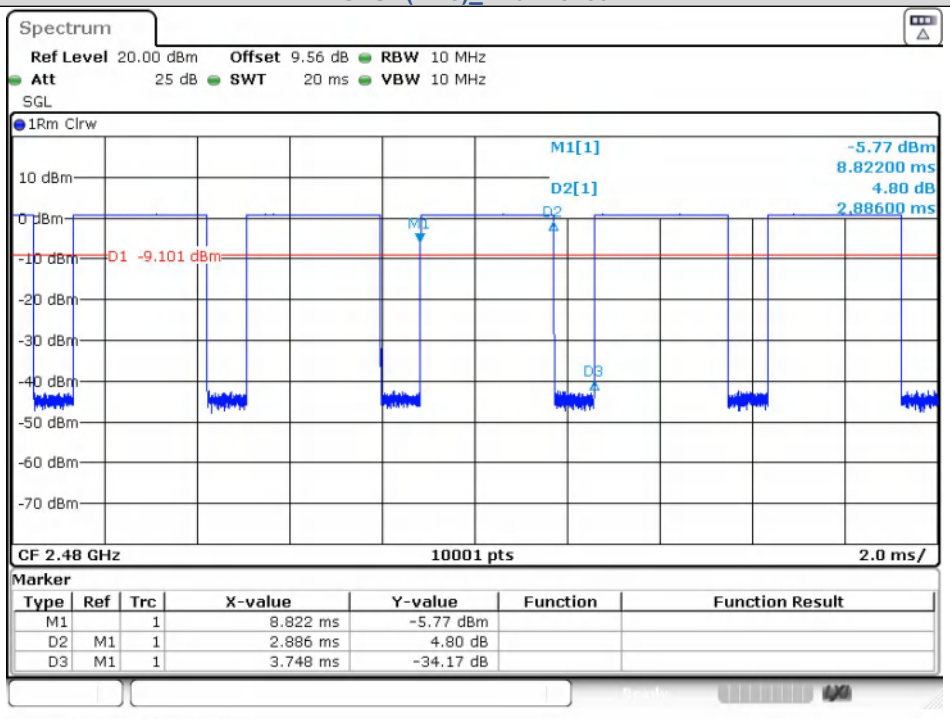
Test Graphs



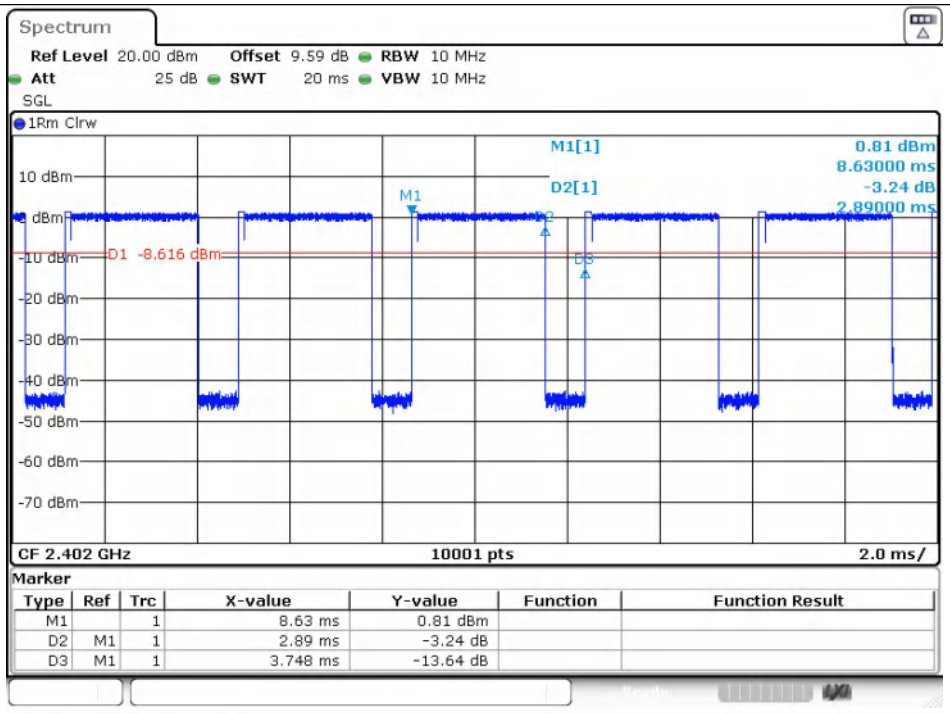
GFSK(DH5)_Channel 0



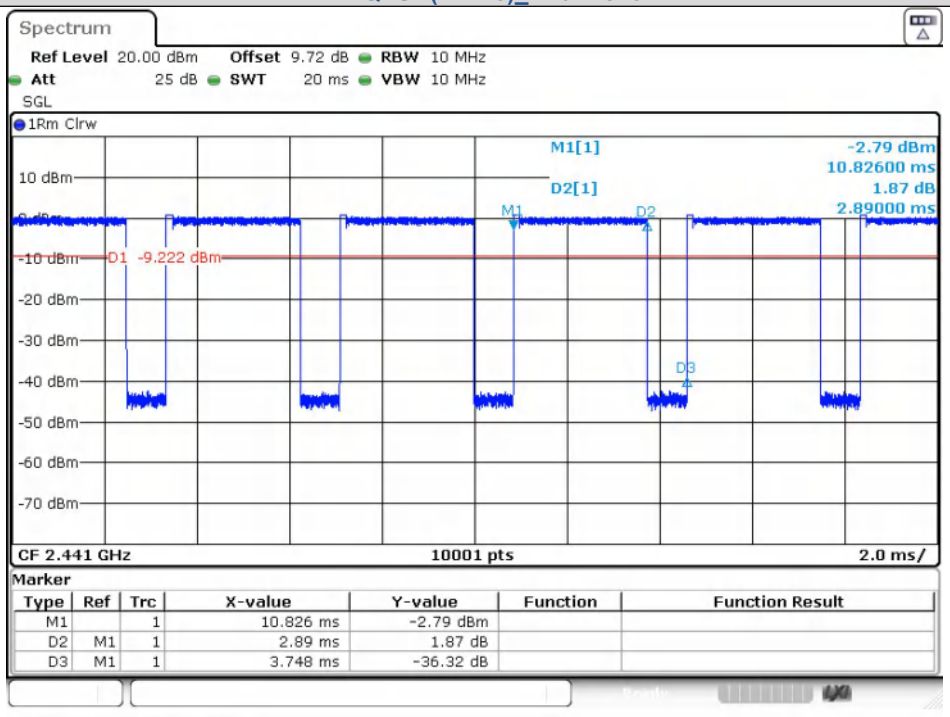
GFSK(DH5)_Channel 39



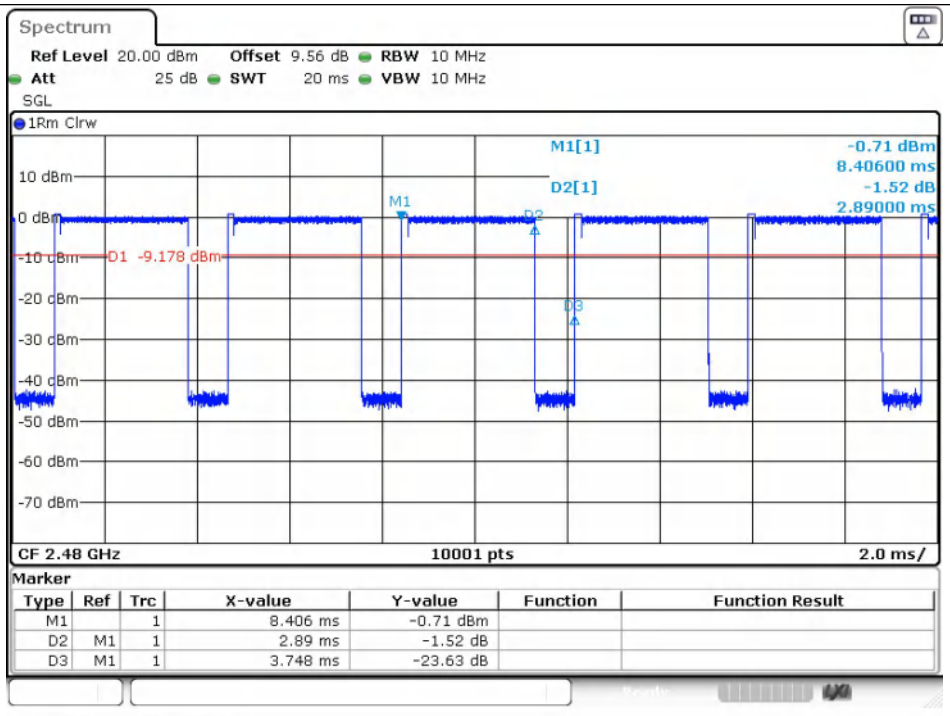
GFSK(DH5)_Channel 78



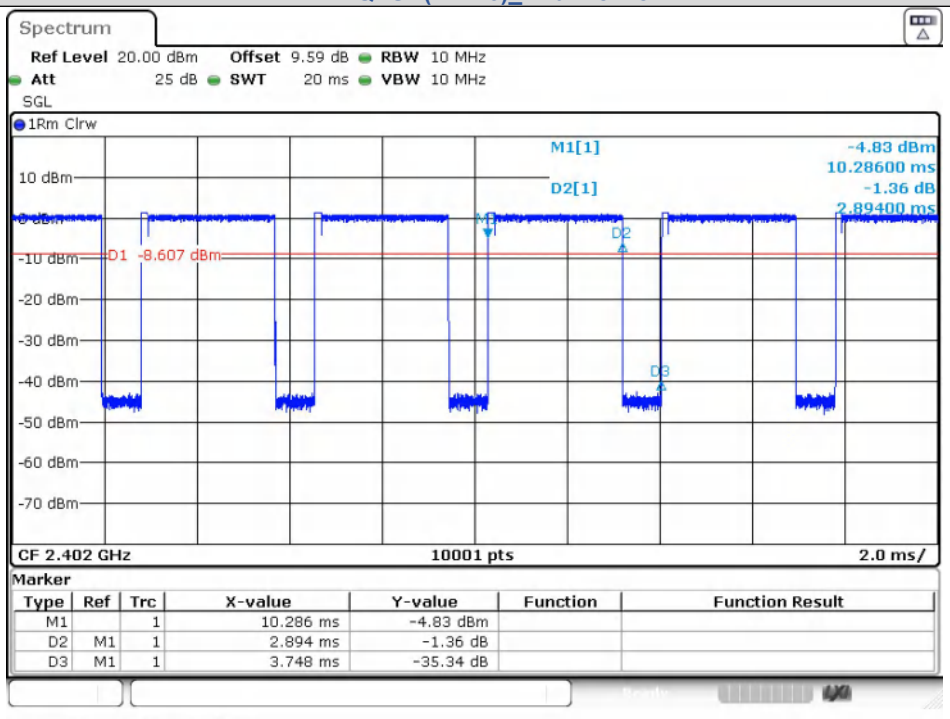
π/4DQPSK(2-DH5)_Channel 0



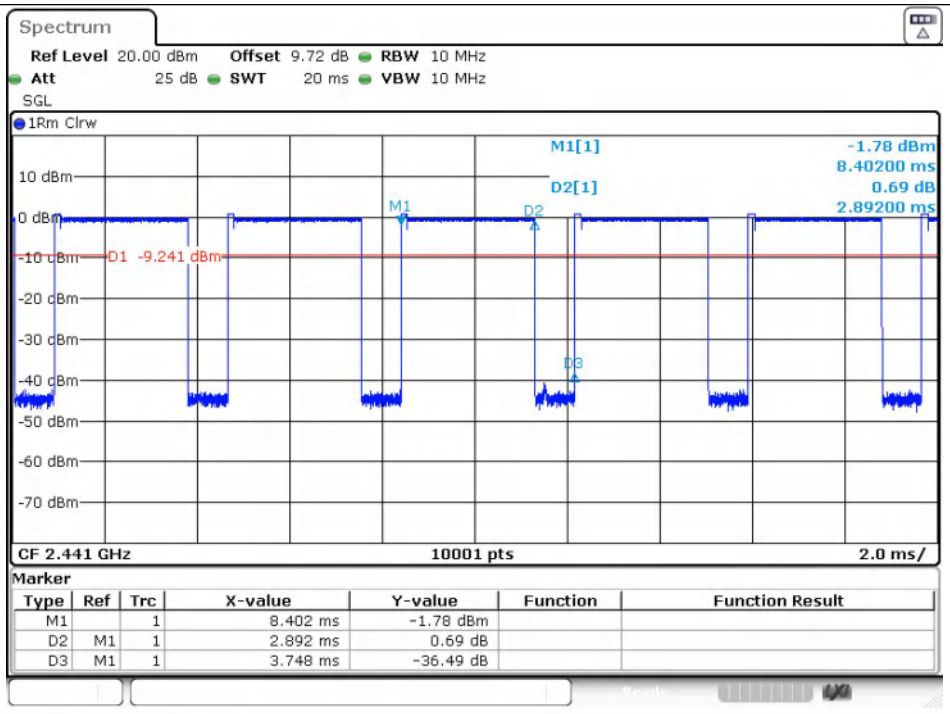
π/4DQPSK(2-DH5)_Channel 39



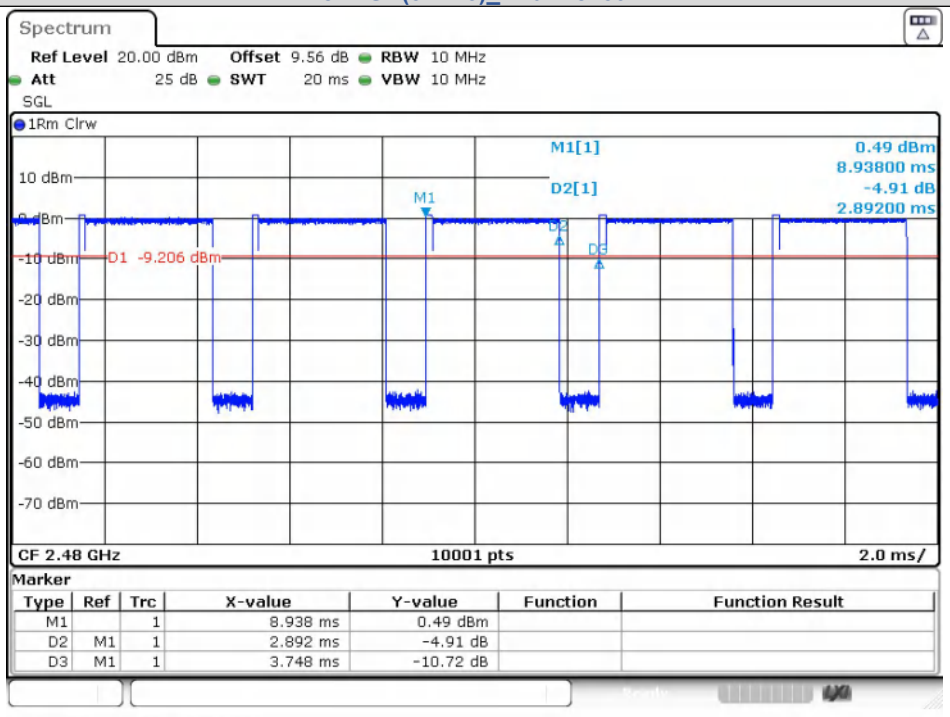
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



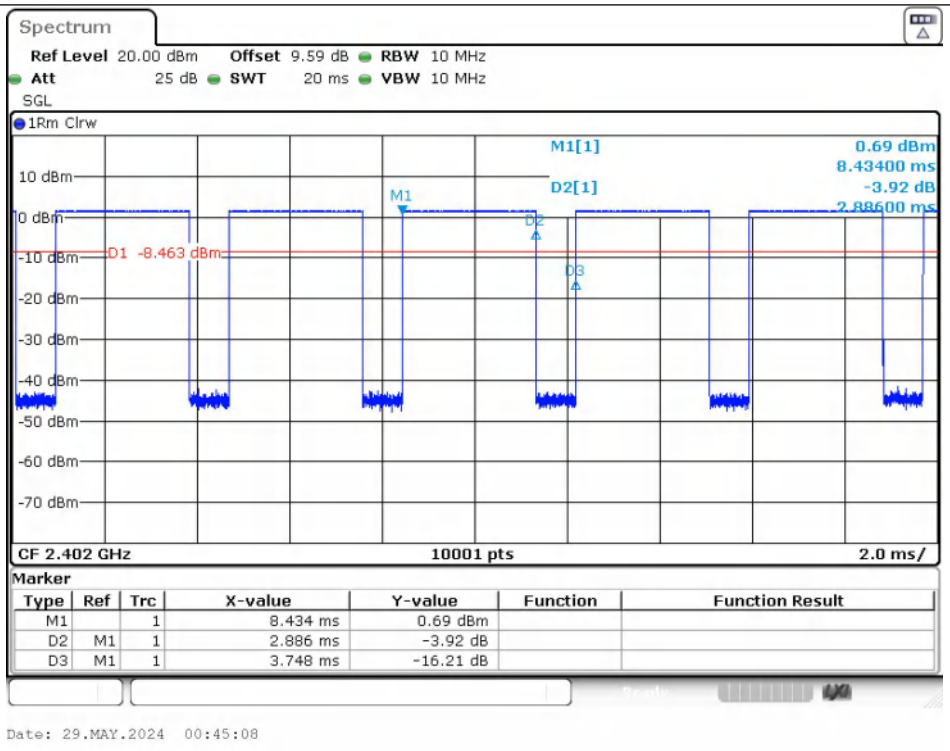
8DPSK(3-DH5)_Channel 78

Right

Test Result

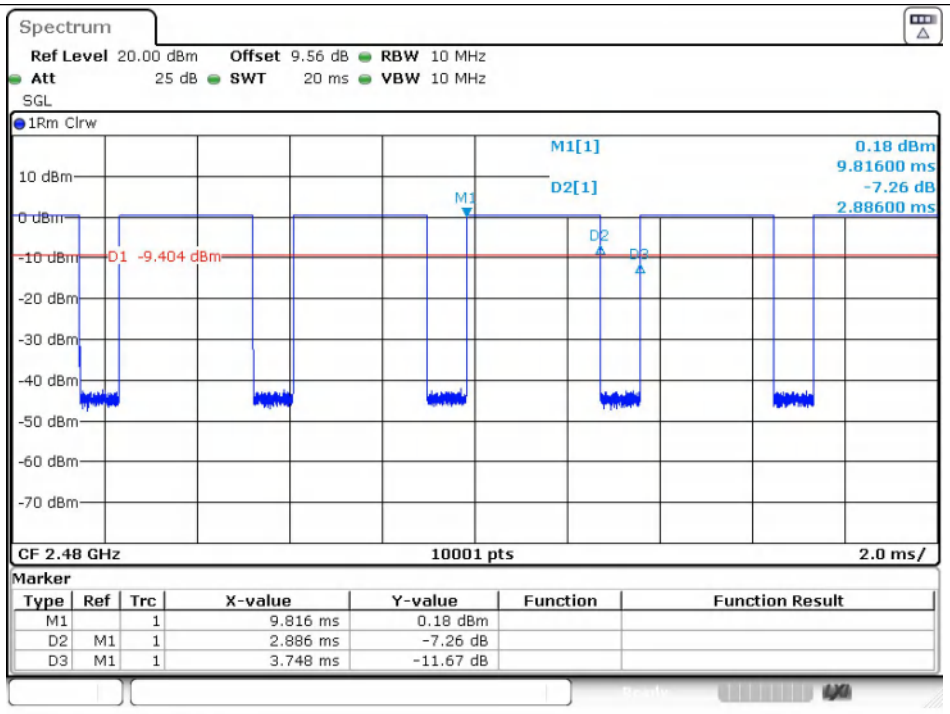
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.35
		39	2.886	3.748	77.00	0.7700	1.1351	0.35
		78	2.886	3.748	77.00	0.7700	1.1351	0.35
π/4DQPSK	2-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.35
		39	2.890	3.748	77.11	0.7711	1.1289	0.35
		78	2.892	3.748	77.16	0.7716	1.1261	0.35
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.35
		39	2.892	3.746	77.20	0.7720	1.1238	0.35
		78	2.894	3.748	77.21	0.7721	1.1233	0.35

Test Graphs

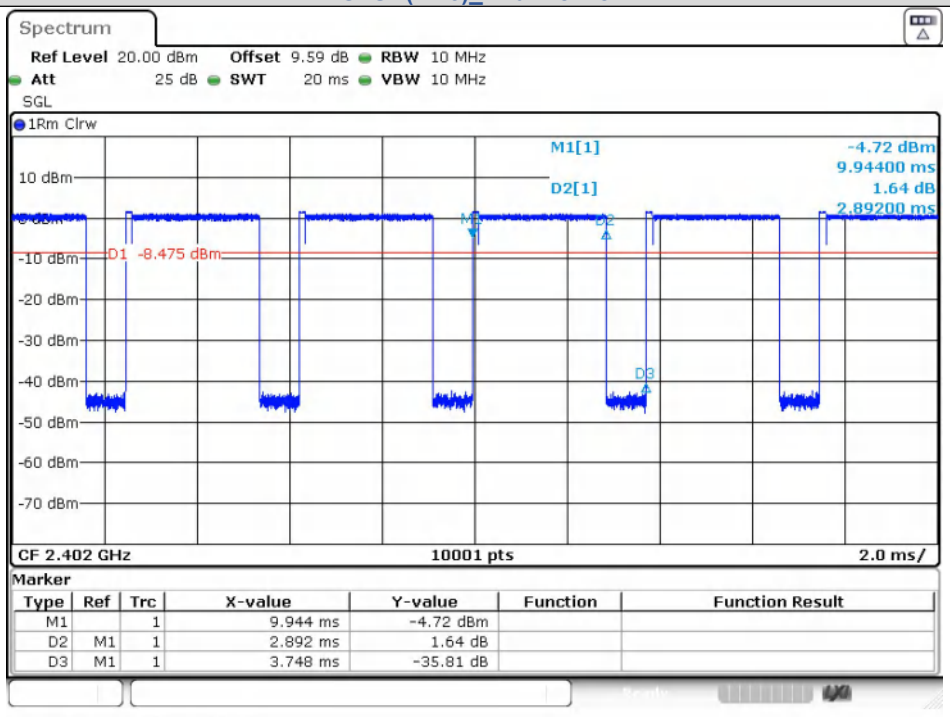


GFSK(DH5)_Channel 0

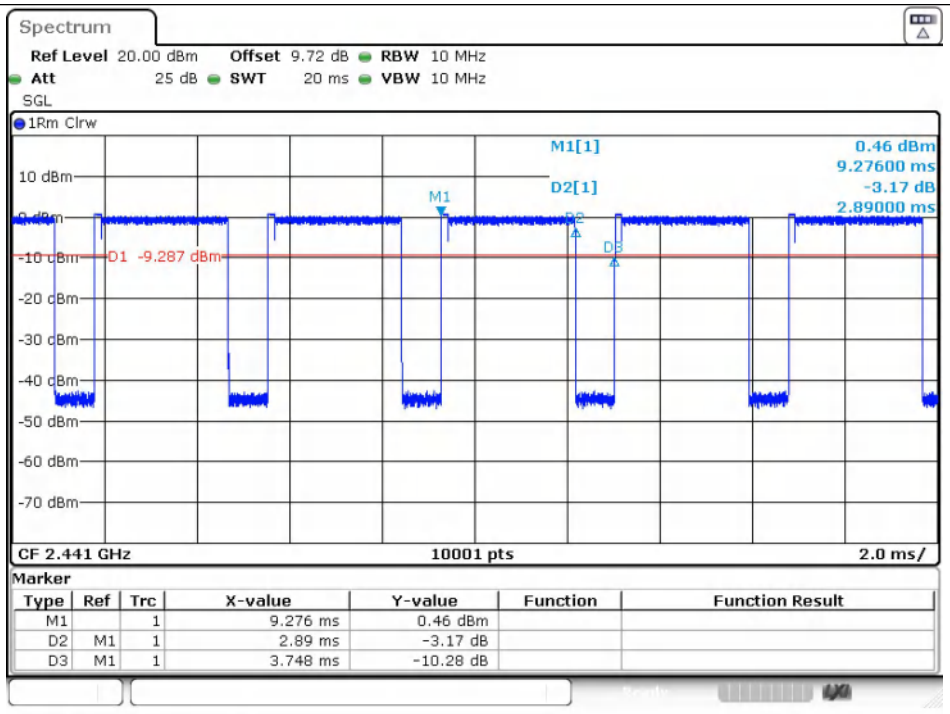
GFSK(DH5)_Channel 39



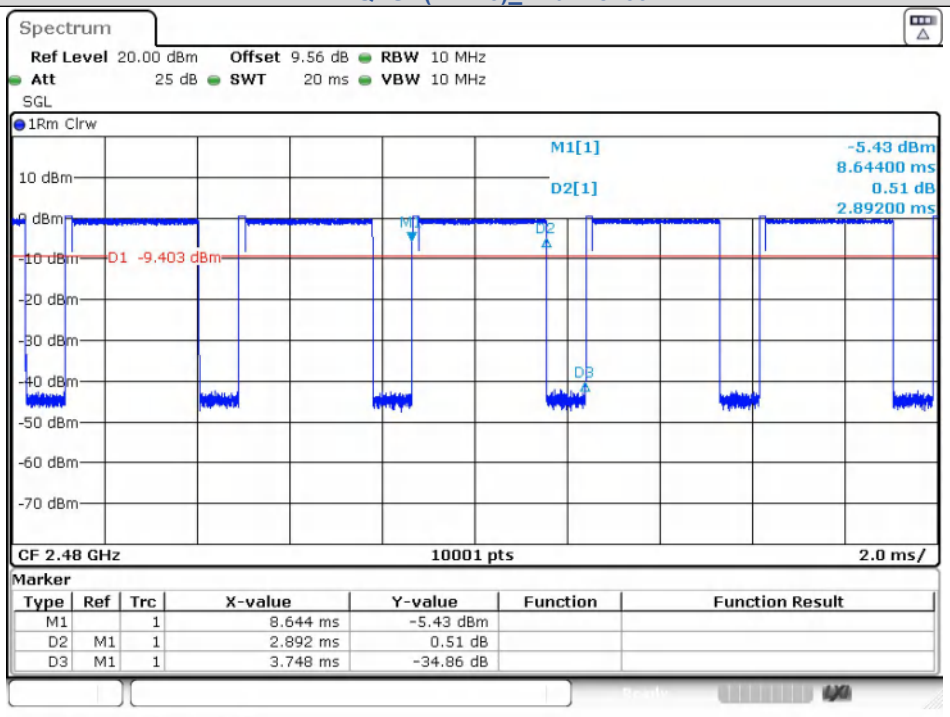
GFSK(DH5)_Channel 78



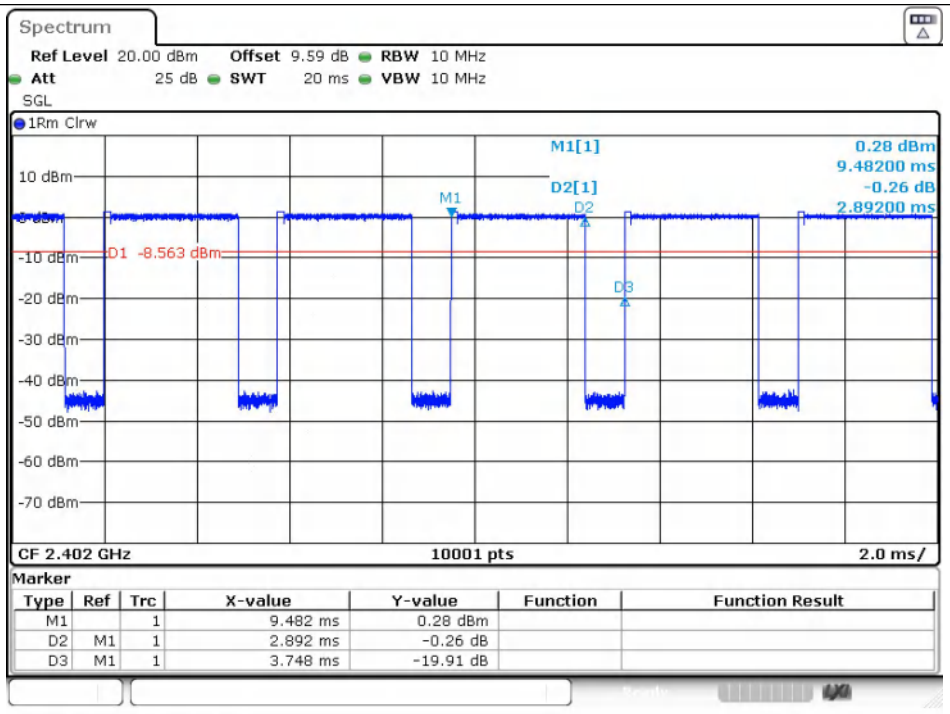
π/4DQPSK(2-DH5)_Channel 0



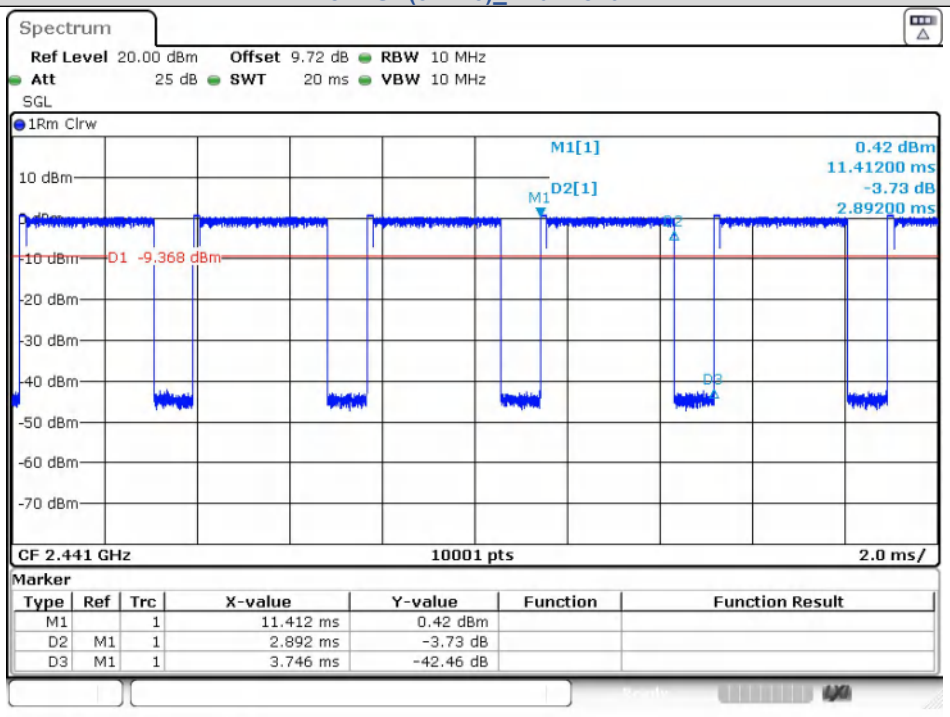
π/4DQPSK(2-DH5)_Channel 39



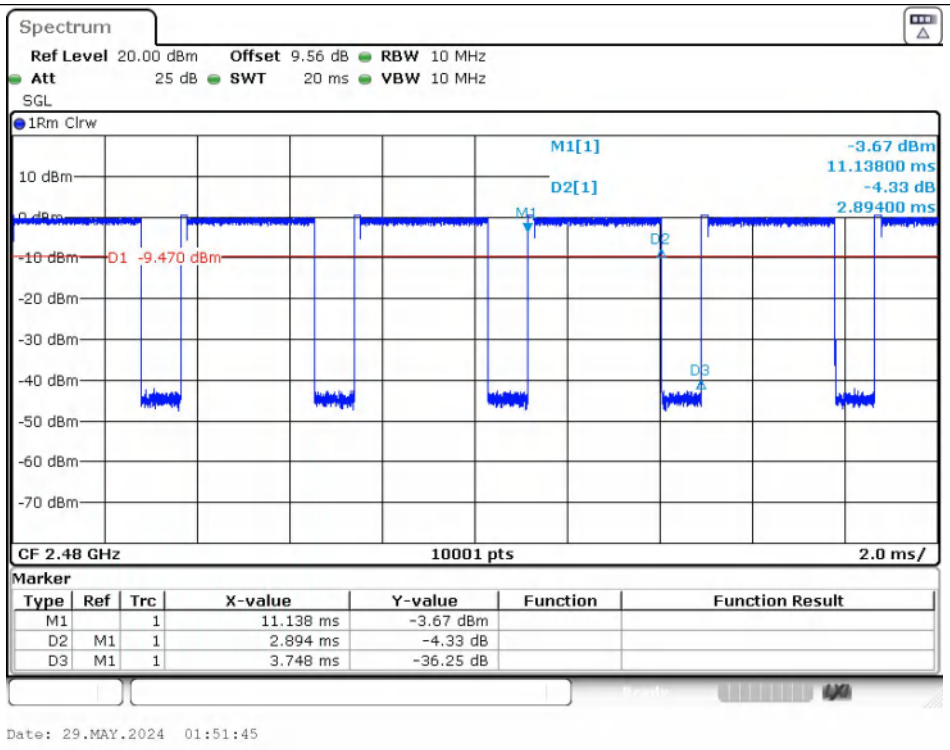
π/4DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



8DPSK(3-DH5)_Channel 78

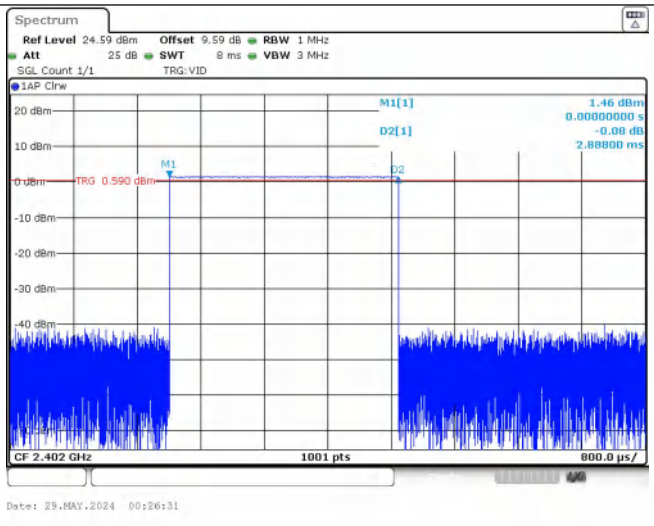
Dwell Time

Left

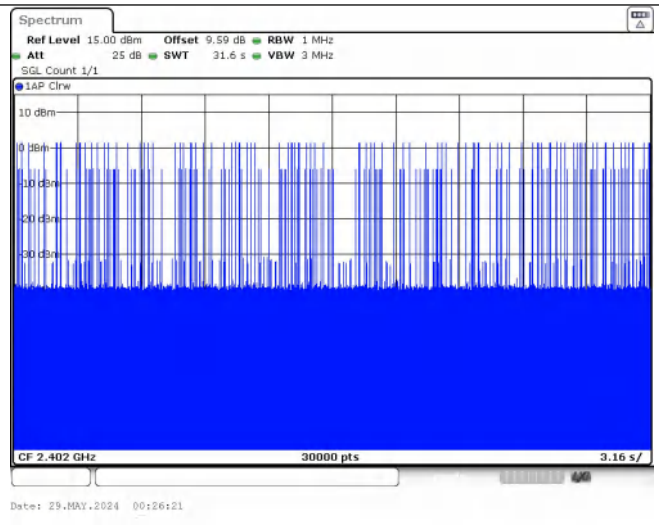
Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	94	271.47	< 400	PASS
π/4DQPSK	2-DH5		2.888	108	311.9		PASS
8DPSK	3-DH5		2.896	103	298.29		PASS

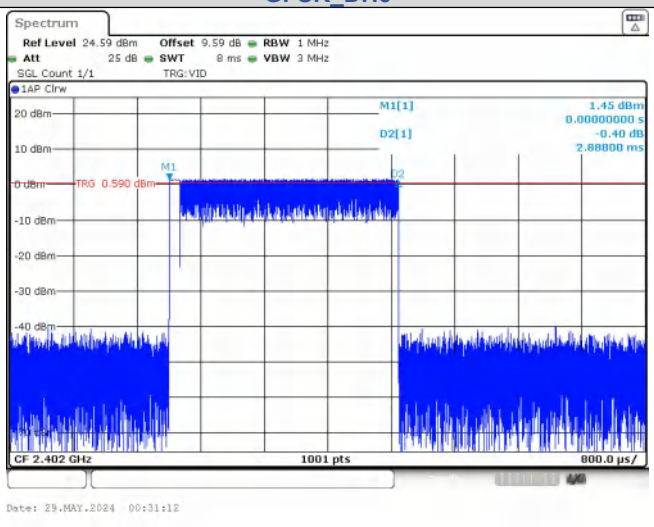
Test Graphs



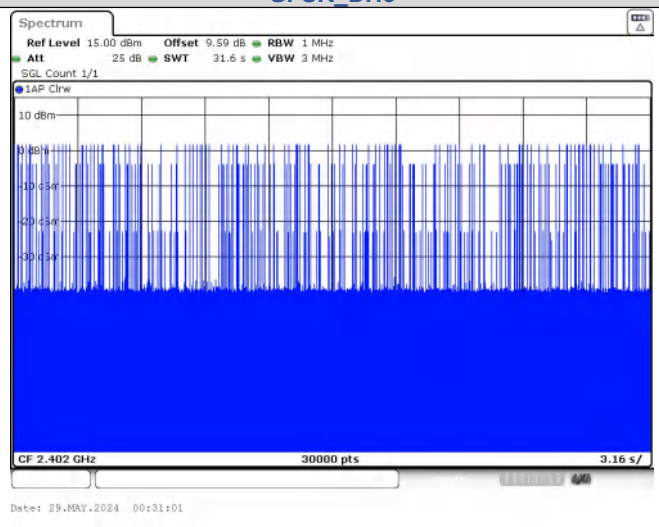
Pulse Width
GFSK_DH5



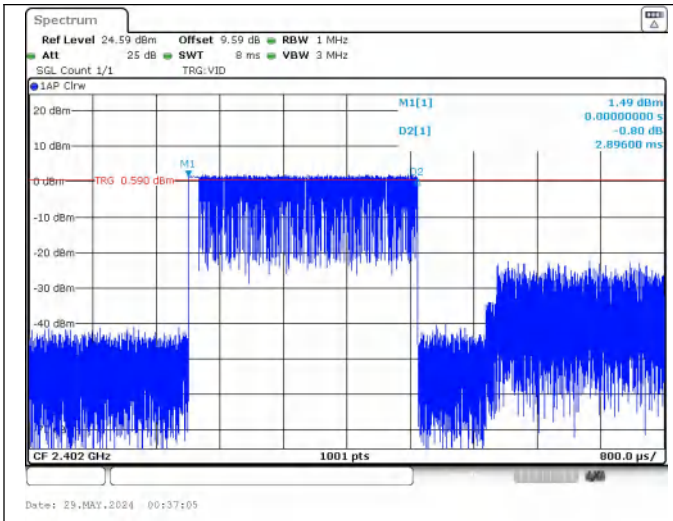
Number of Pulses in 31.6 seconds
GFSK_DH5



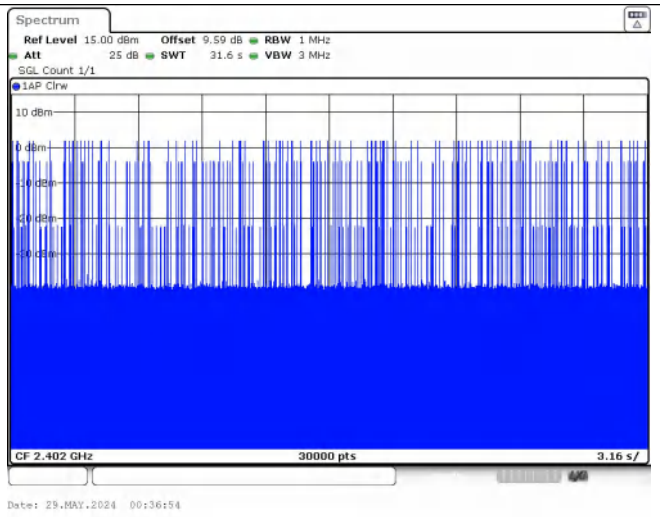
Pulse Width
π/4DQPSK_2-DH5



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



Pulse Width
8DPSK_3-DH5



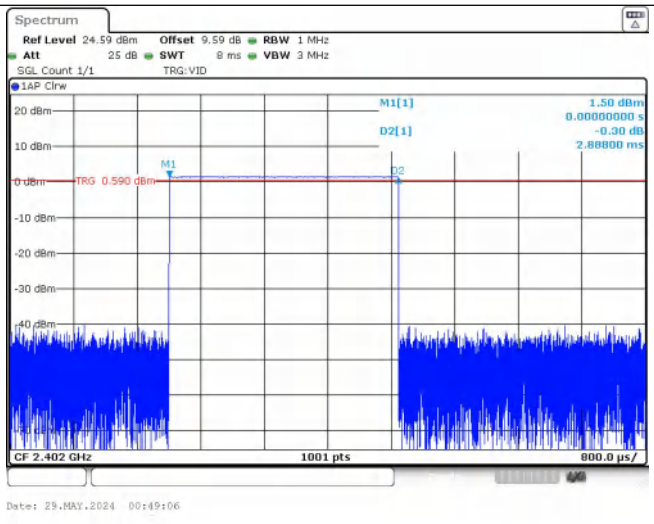
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

Right

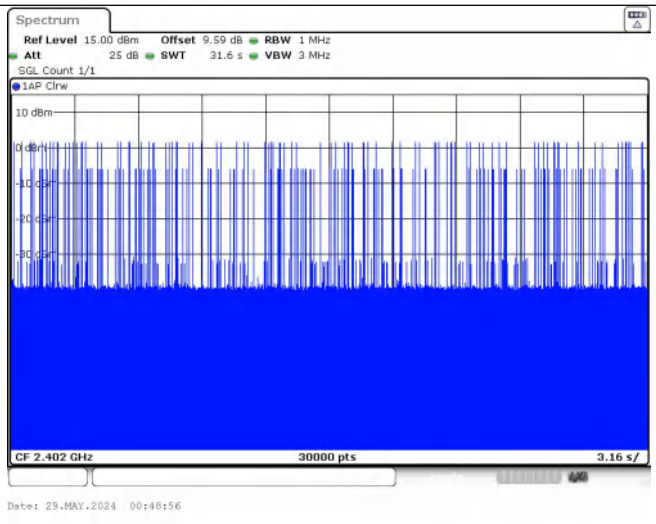
Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	98	283.02	< 400	PASS
π/4DQPSK	2-DH5		2.896	108	312.77		PASS
8DPSK	3-DH5		2.896	93	269.33		PASS

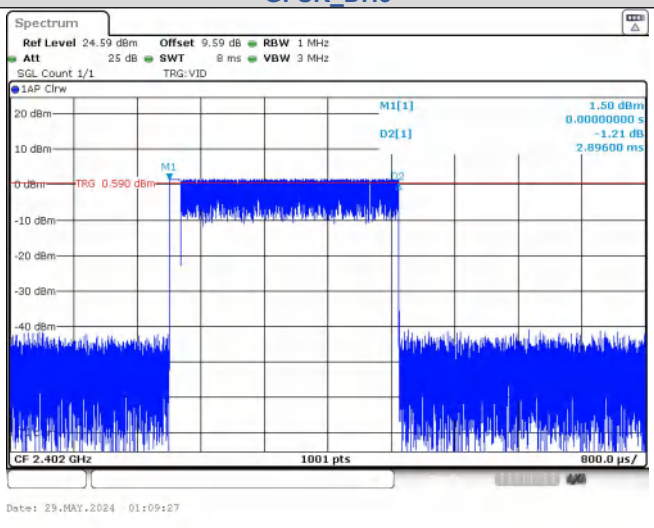
Test Graphs



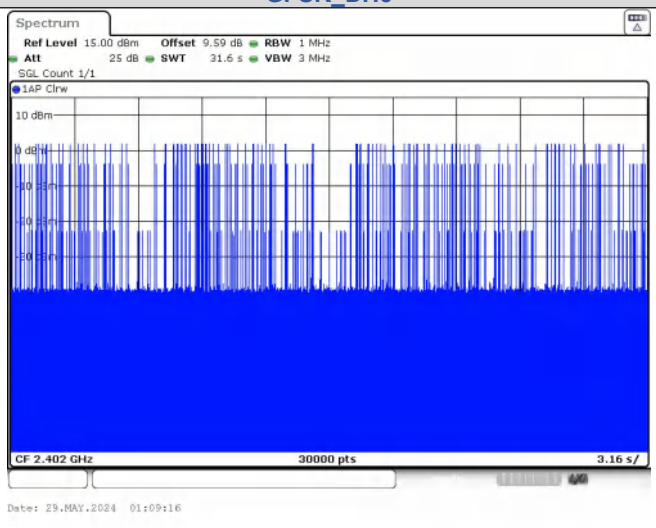
Pulse Width
GFSK_DH5



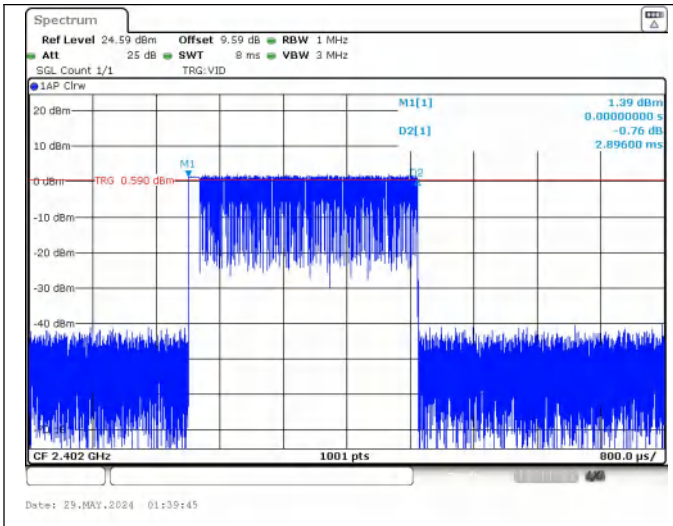
Number of Pulses in 31.6 seconds
GFSK_DH5



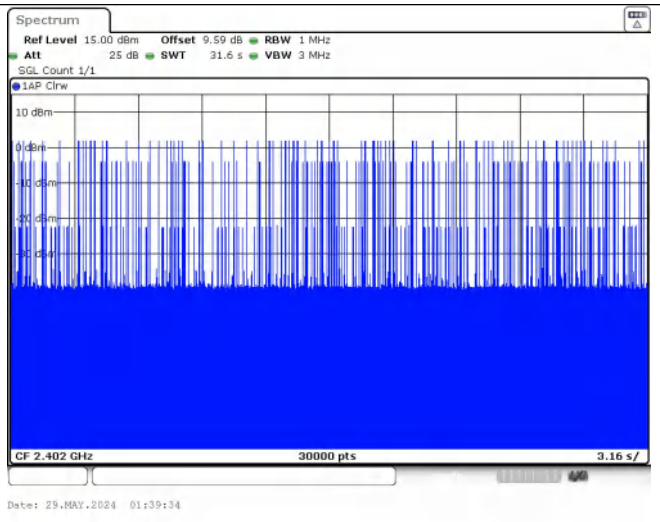
Pulse Width
π/4DQPSK_2-DH5



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

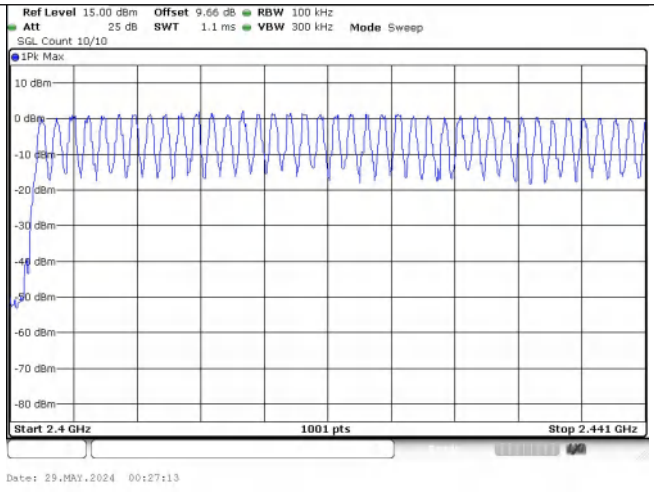
Number Of Hopping Channel

Left

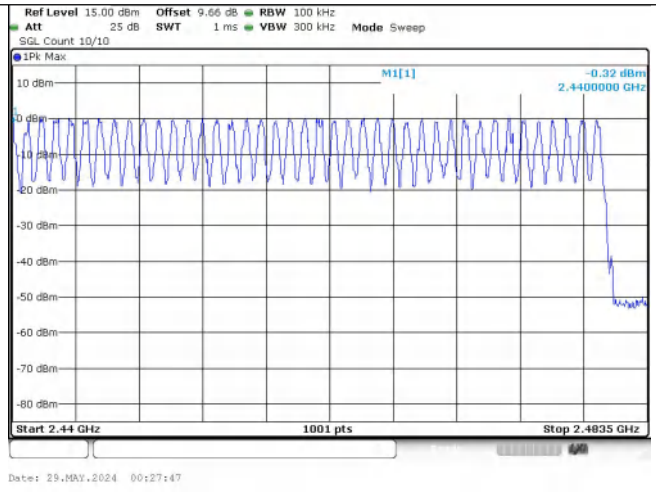
Test Result

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

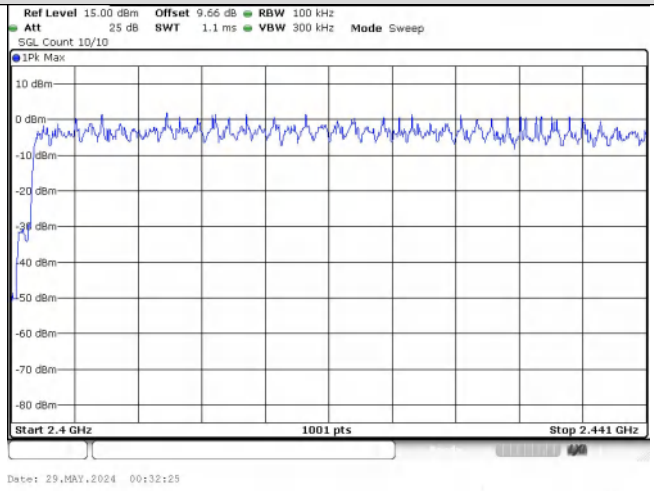
Test Graphs



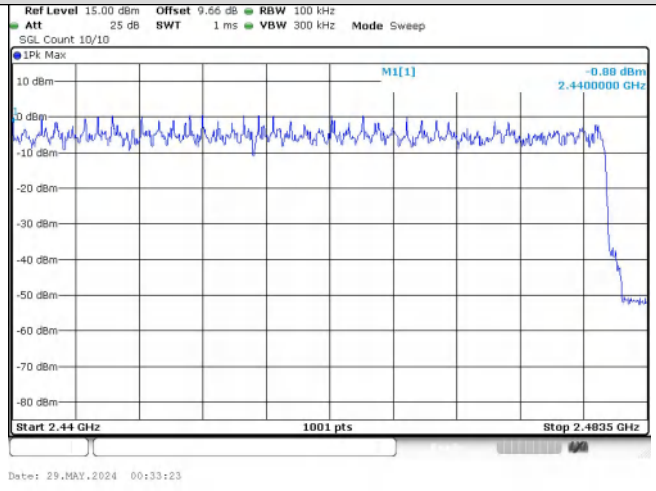
Low End Spectrum Channel Hopping Plot
GFSK



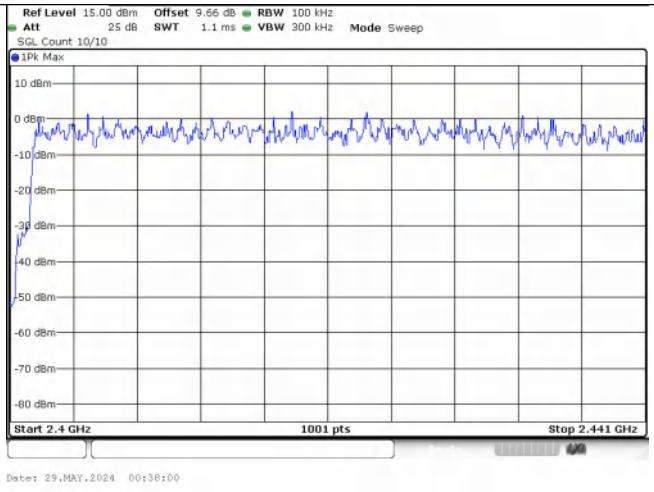
High End Spectrum Channel Hopping Plot
GFSK



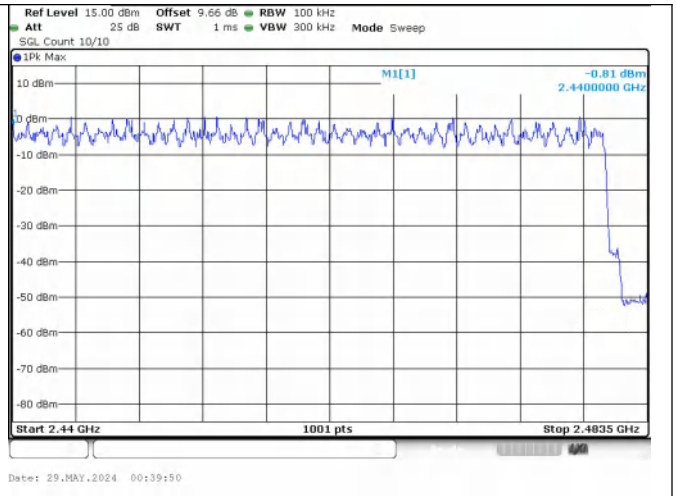
Low End Spectrum Channel Hopping Plot
π/4DQPSK



High End Spectrum Channel Hopping Plot
π/4DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



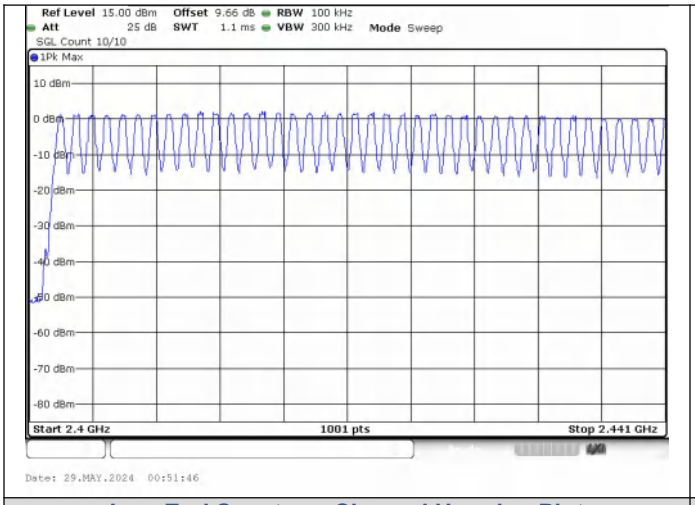
High End Spectrum Channel Hopping Plot
8DPSK

Right

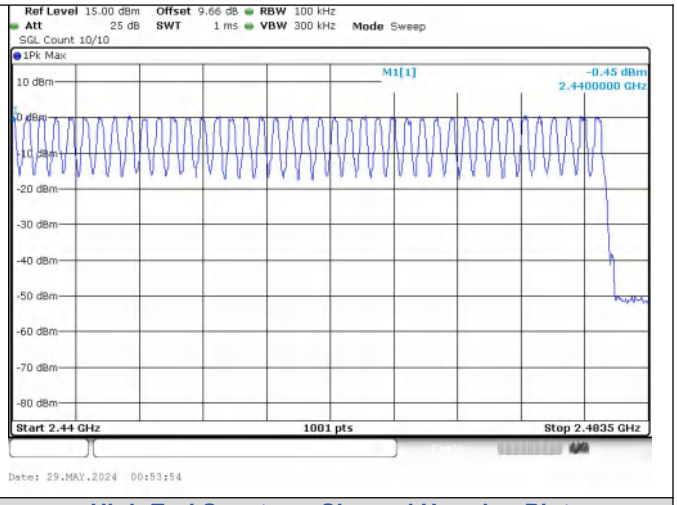
Test Result

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

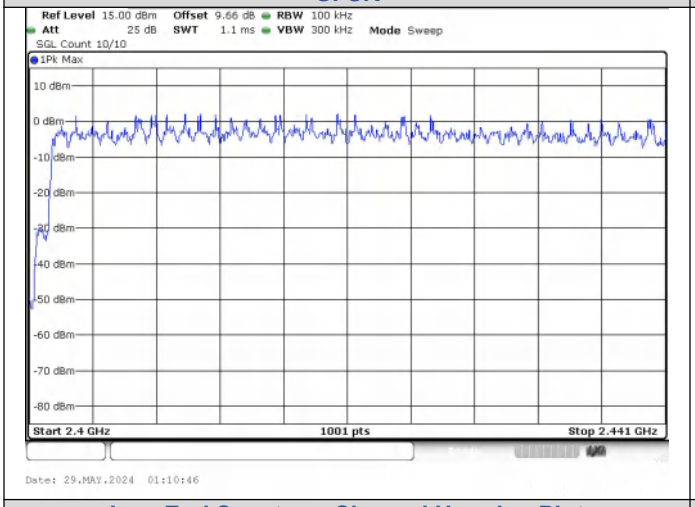
Test Graphs



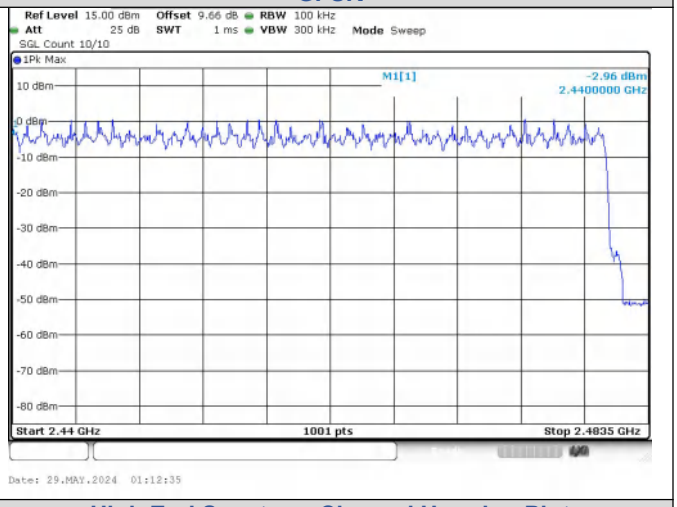
Low End Spectrum Channel Hopping Plot
GFSK



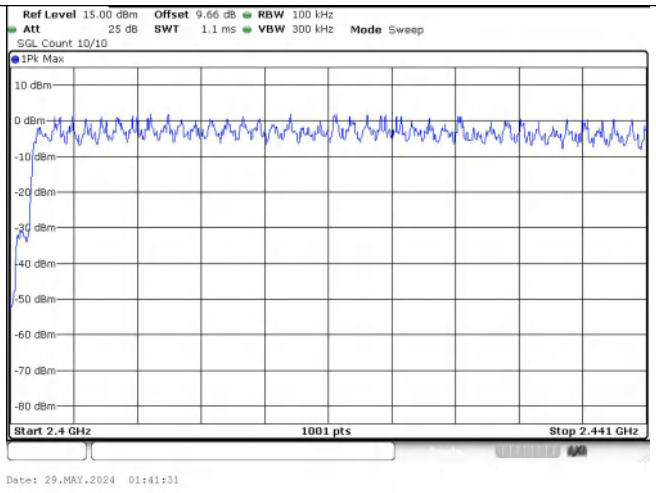
High End Spectrum Channel Hopping Plot
GFSK



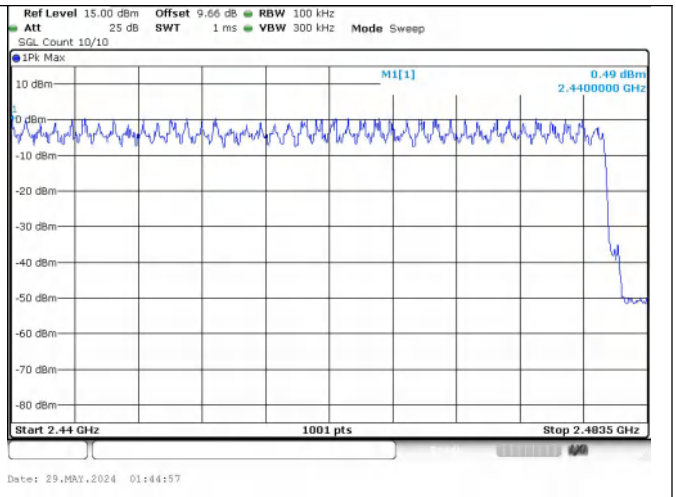
Low End Spectrum Channel Hopping Plot
π/4DQPSK



High End Spectrum Channel Hopping Plot
π/4DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK