

Appendix

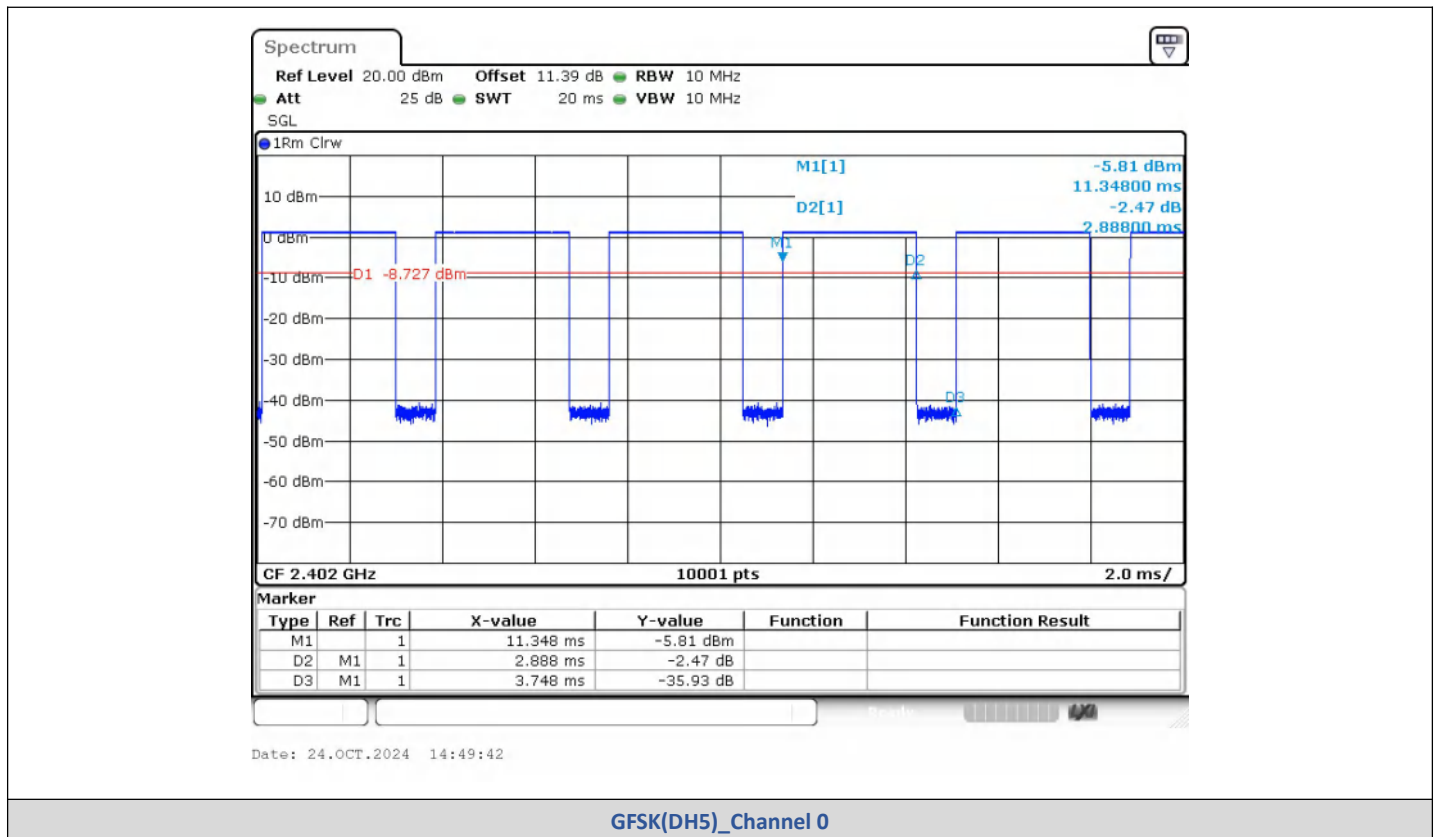
Report No.:	CISRR241019108
FCC ID:	2BHBO-SLEEPBUDS01
Product Name:	Bluetooth headphones
Model No.:	SleepBuds01
Test Engineer:	Mark Fu
Supervised by:	Rory Huang

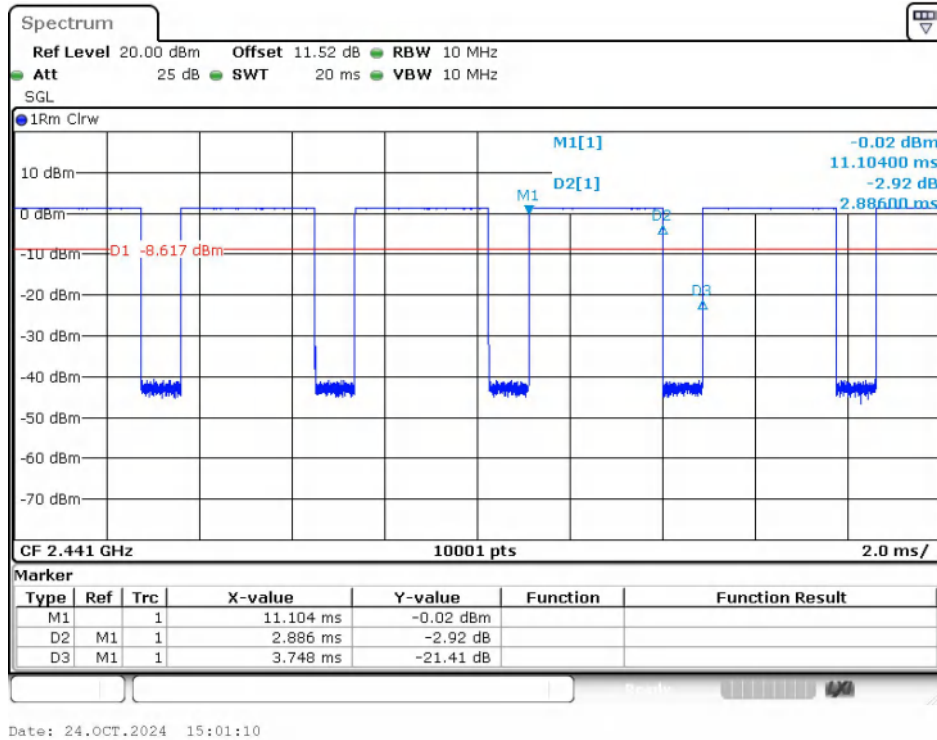
1) Duty Cycle

Test Result

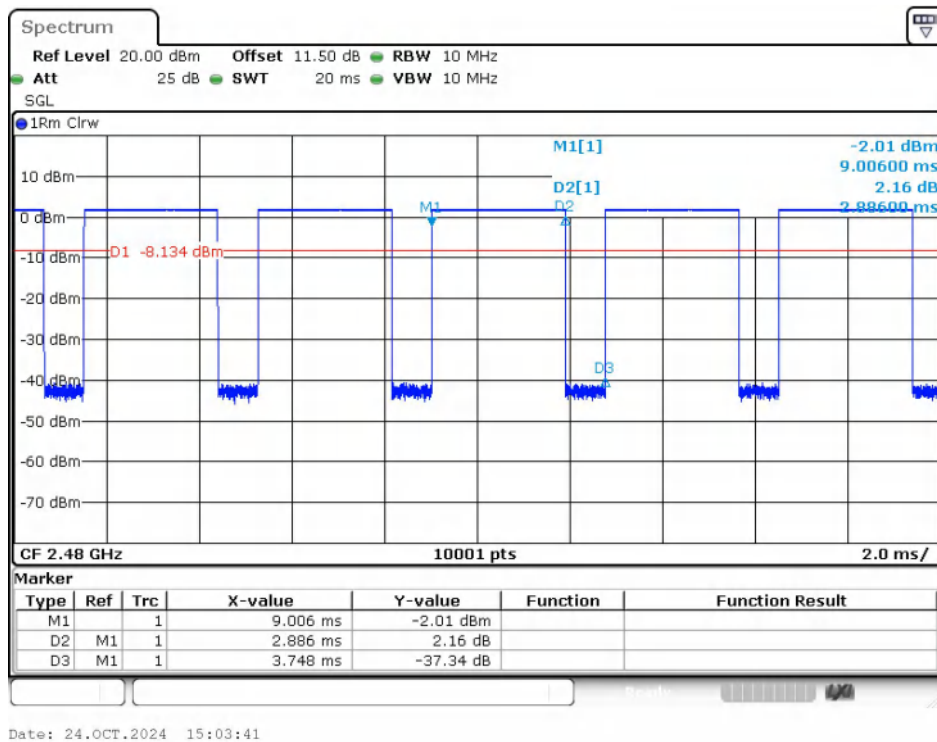
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.888	3.748	77.05	0.7705	1.1323	0.3463
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.3460
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.890	3.748	77.11	0.7711	1.1289	0.3460
8DPSK	3-DH5	0	2.894	3.748	77.21	0.7721	1.1233	0.3455
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458

Test Graphs

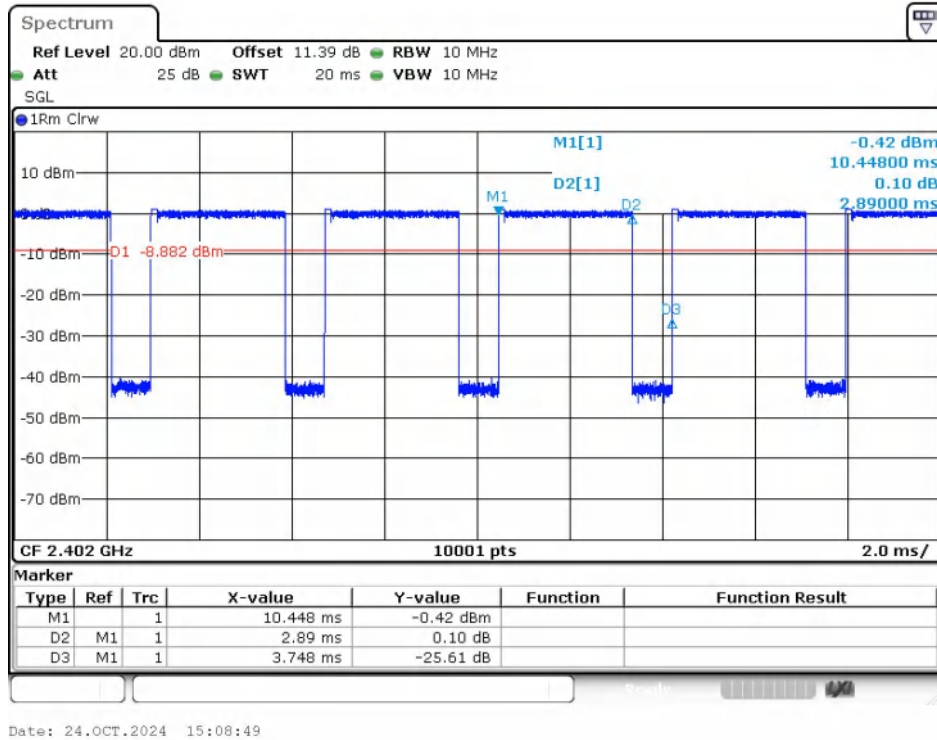




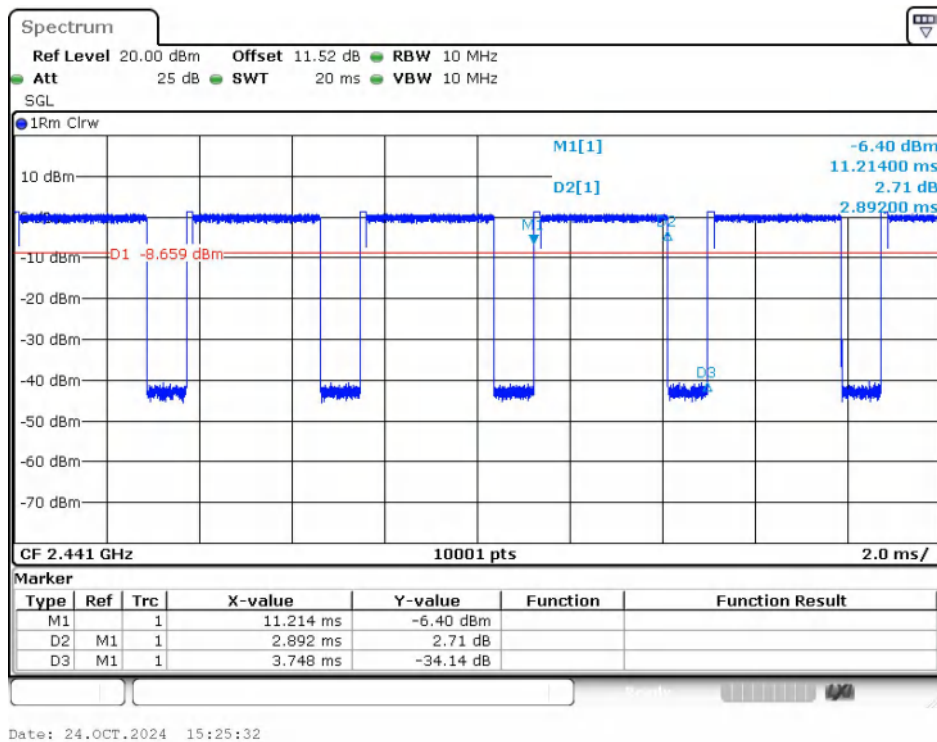
GFSK(DH5)_Channel 39



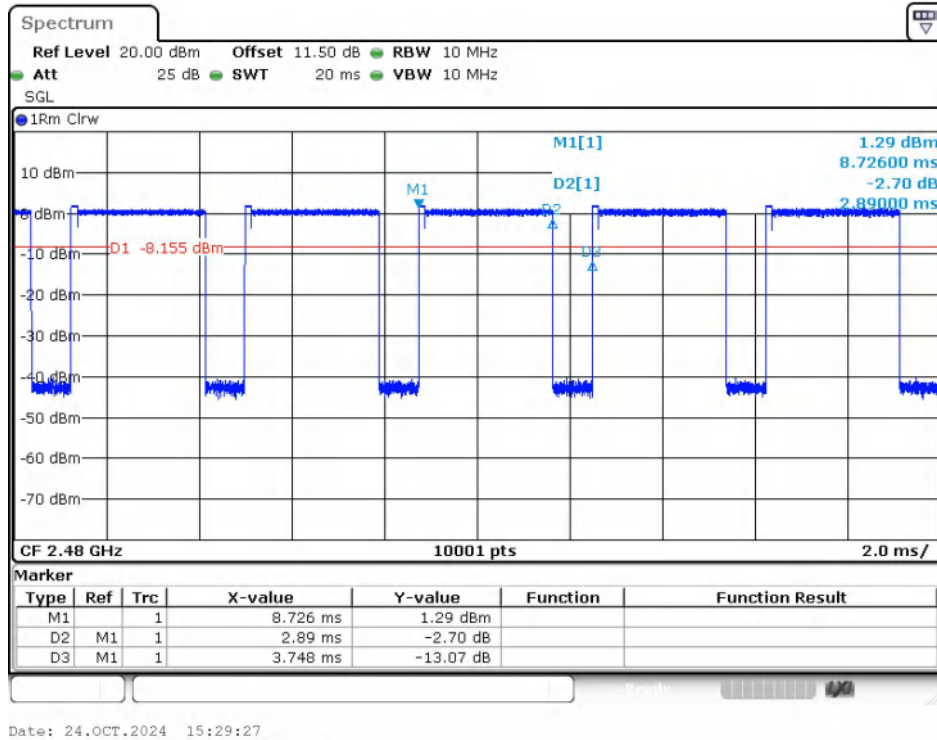
GFSK(DH5)_Channel 78



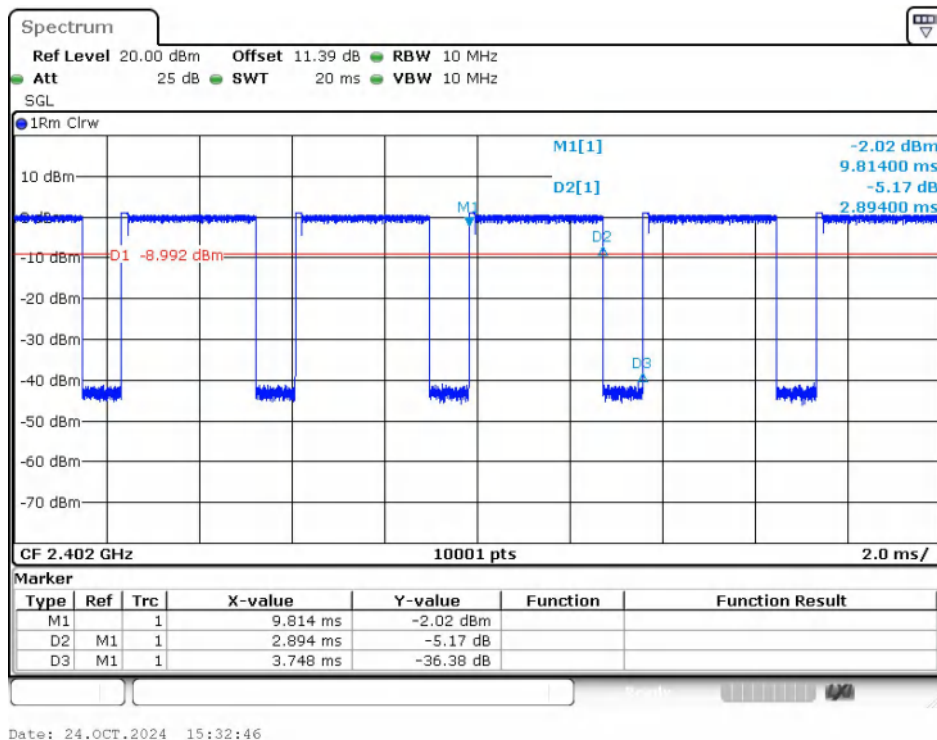
$\pi/4$ DQPSK(2-DH5)_Channel 0



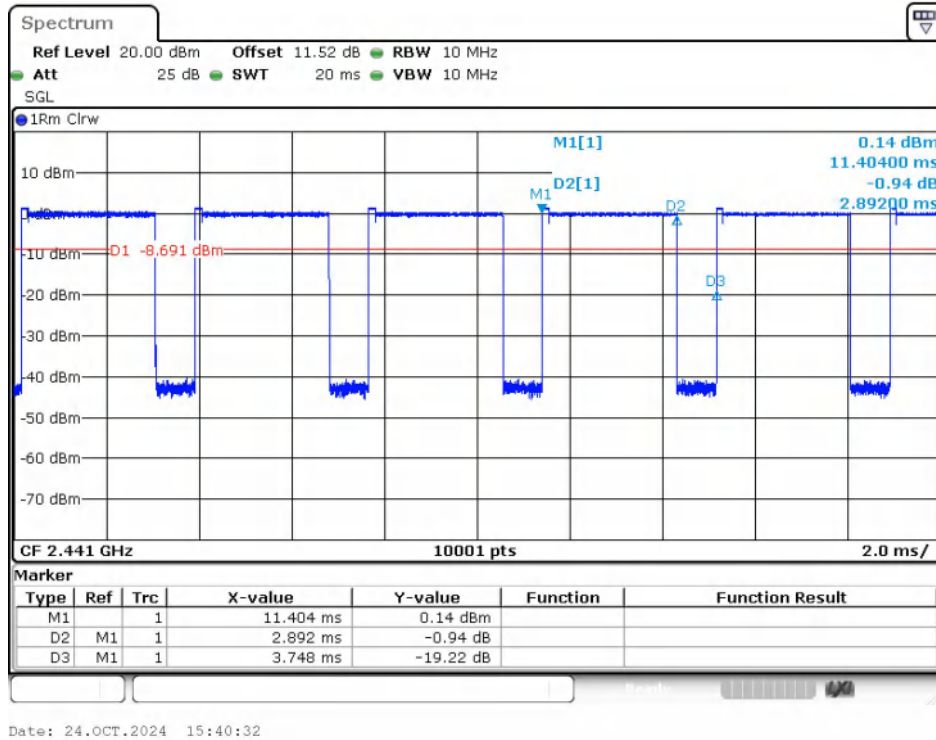
$\pi/4$ DQPSK(2-DH5)_Channel 39



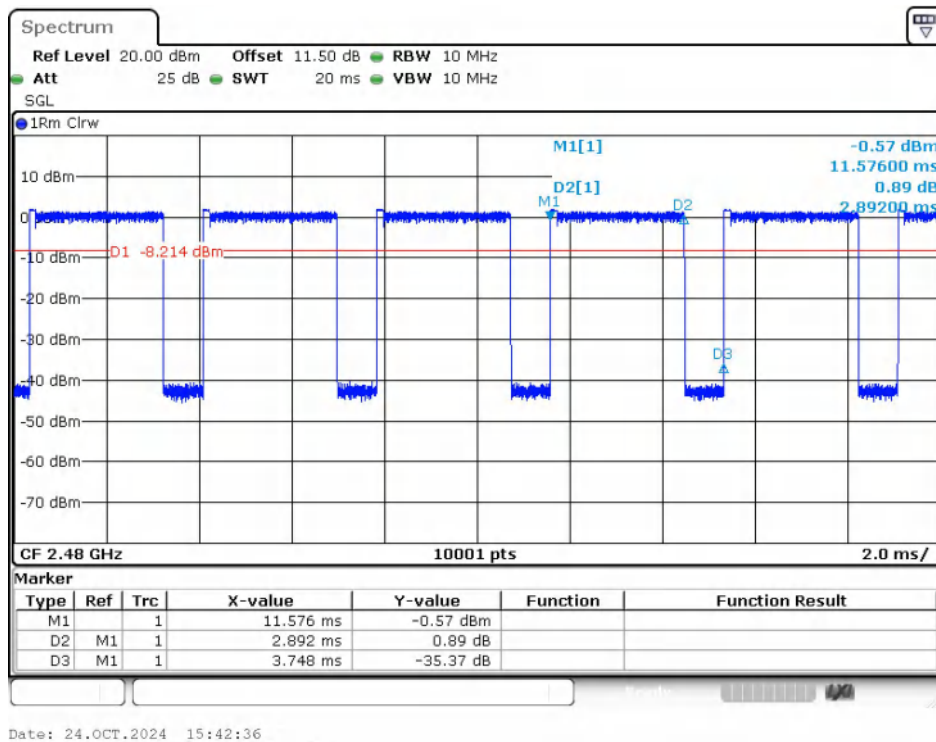
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



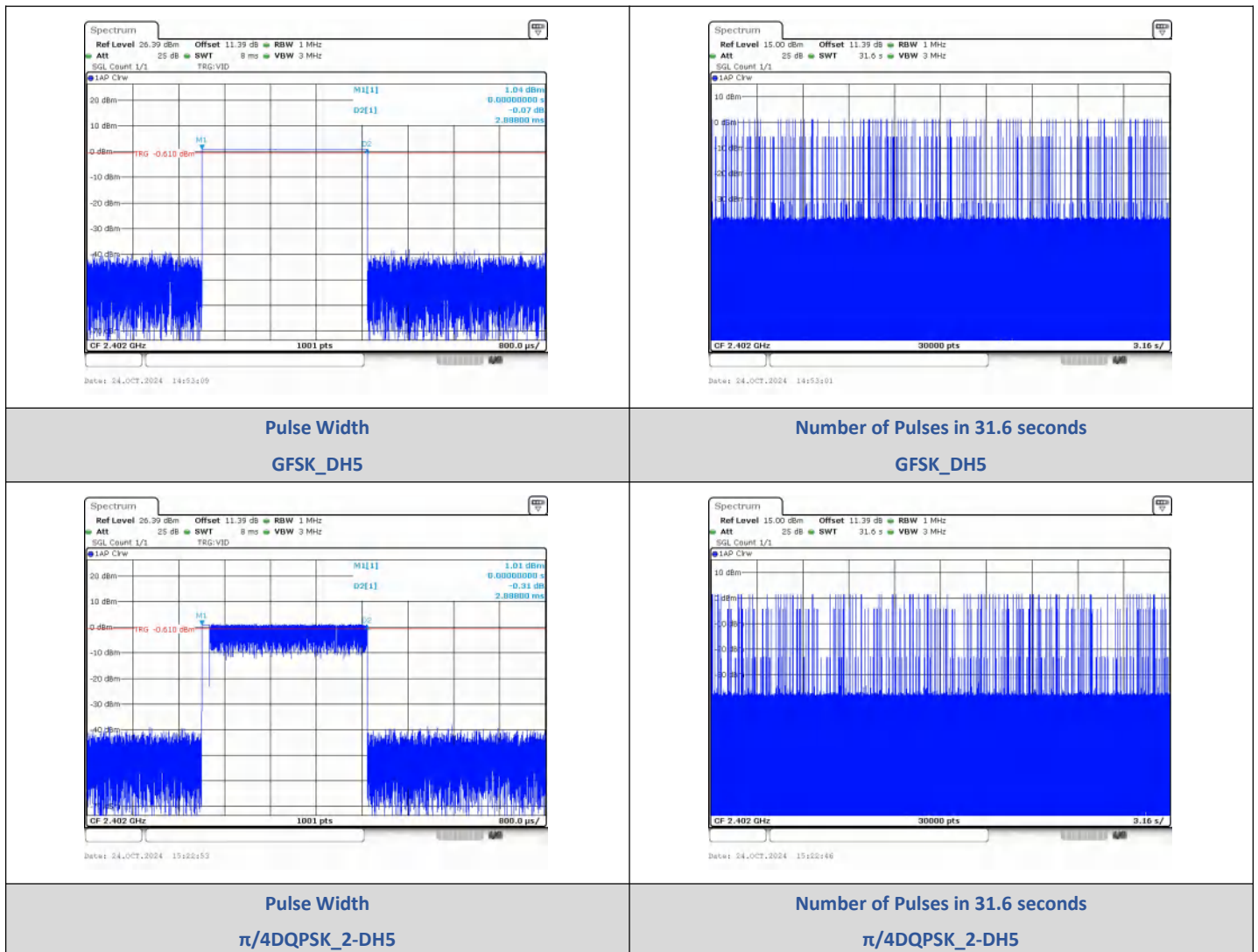
8DPSK(3-DH5)_Channel 78

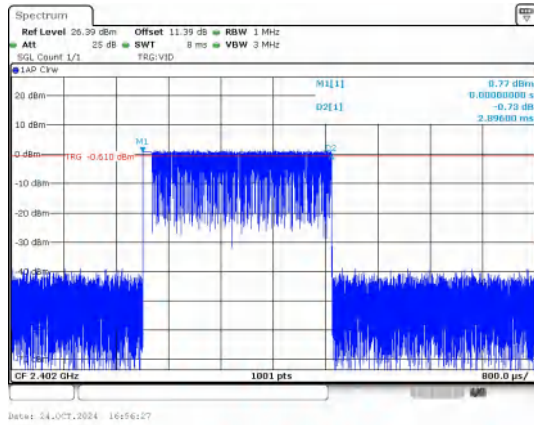
2) Dwell Time

Test Result

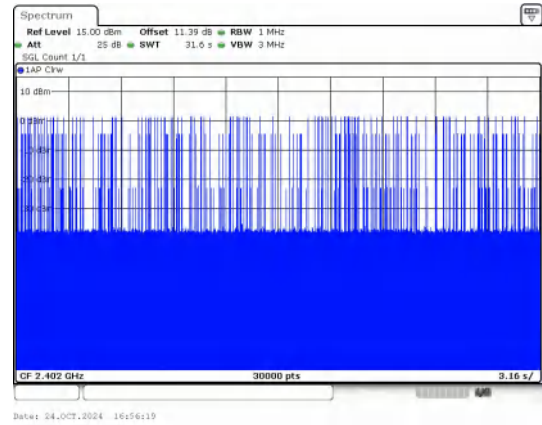
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	99	285.91	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	102	294.58		PASS
8DPSK	3-DH5		2.896	109	315.66		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



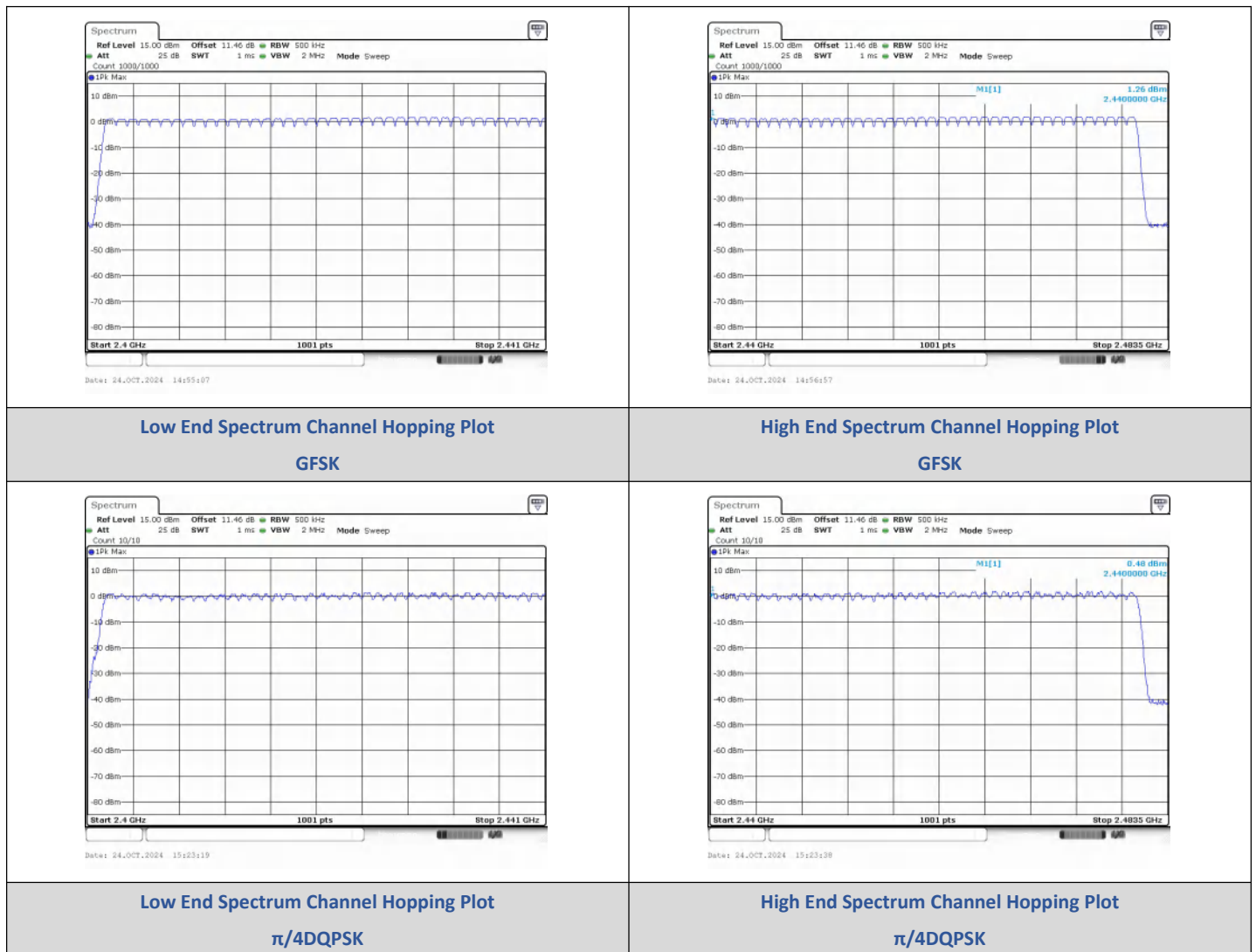
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

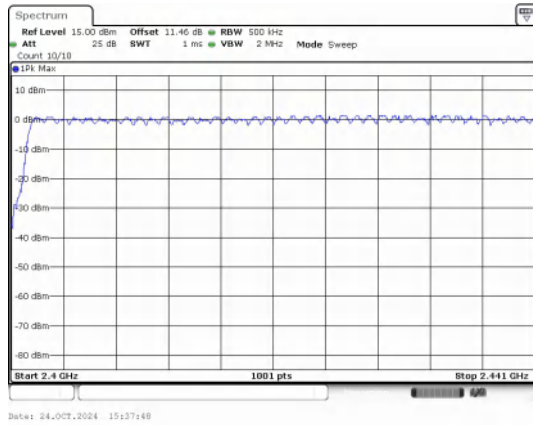
3) Number Of Hopping Channel

Test Result

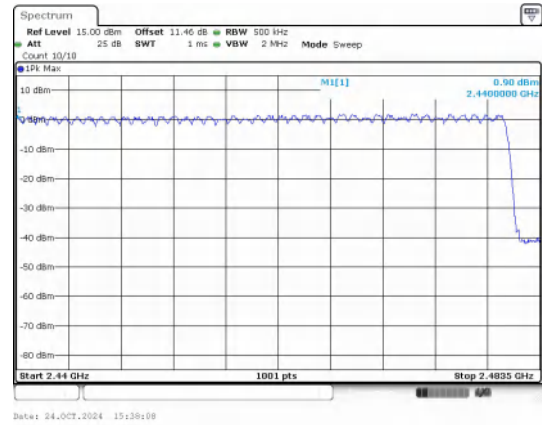
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



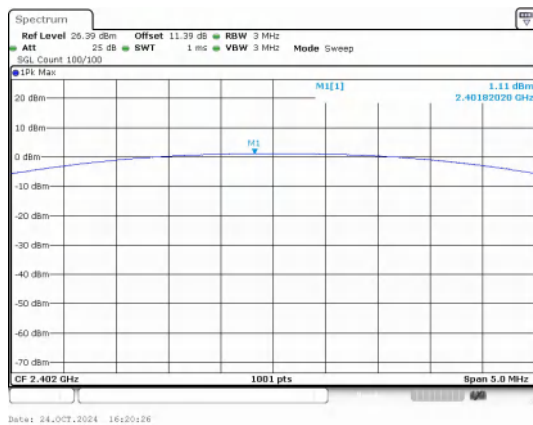
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Peak Output Power

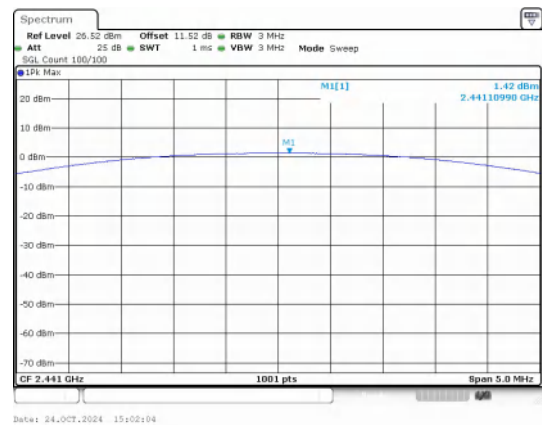
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.11	1.29	≤30	PASS
		39	1.42	1.39		PASS
		78	1.95	1.57		PASS
$\pi/4$ DQPSK	2-DH5	0	1.70	1.48	≤20.97	PASS
		39	2.27	1.69		PASS
		78	2.78	1.90		PASS
8DPSK	3-DH5	0	1.79	1.51		PASS
		39	2.53	1.79		PASS
		78	3.06	2.02		PASS

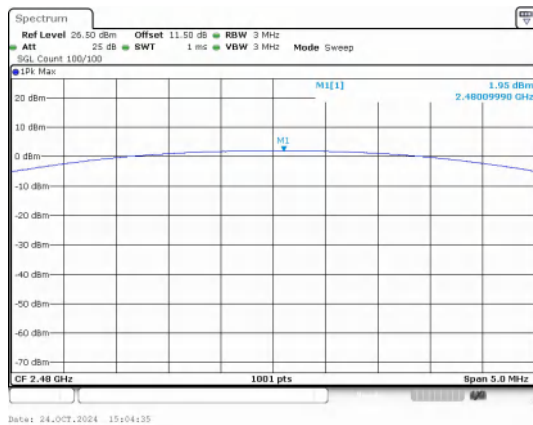
Test Graphs



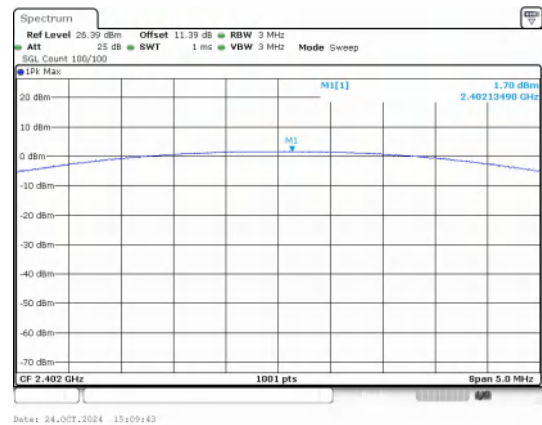
Peak Output Power
GFSK_Channel 0



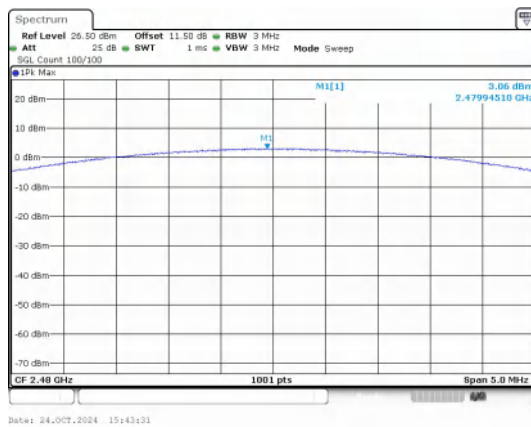
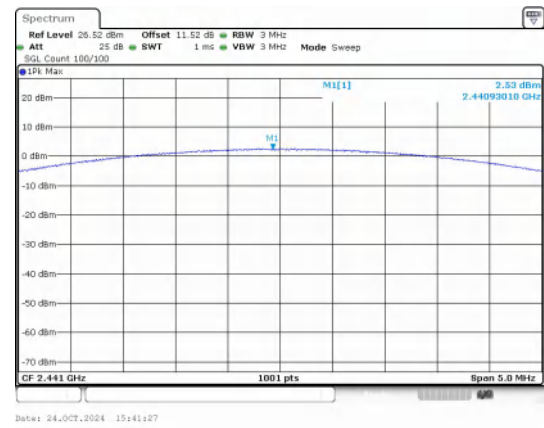
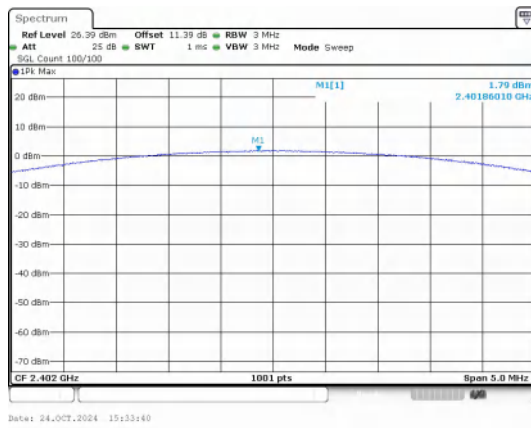
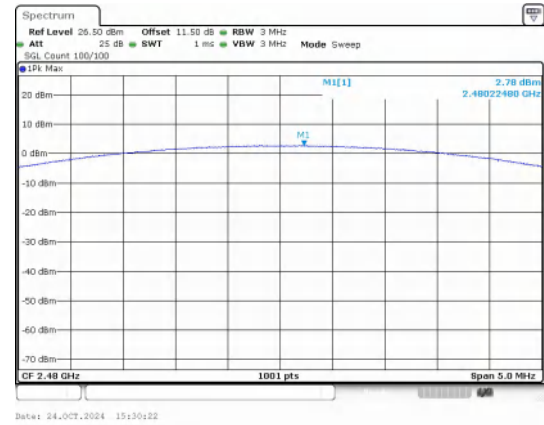
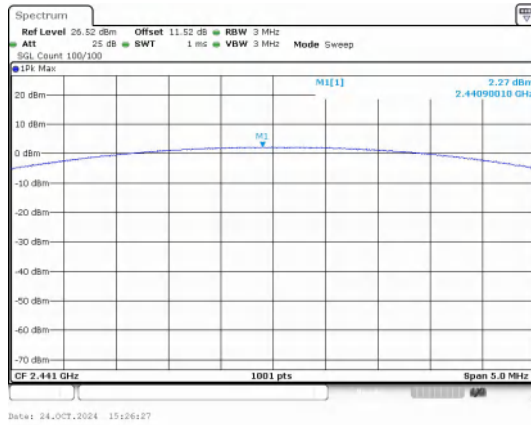
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78



Peak Output Power
 $\pi/4$ DQPSK_Channel 0

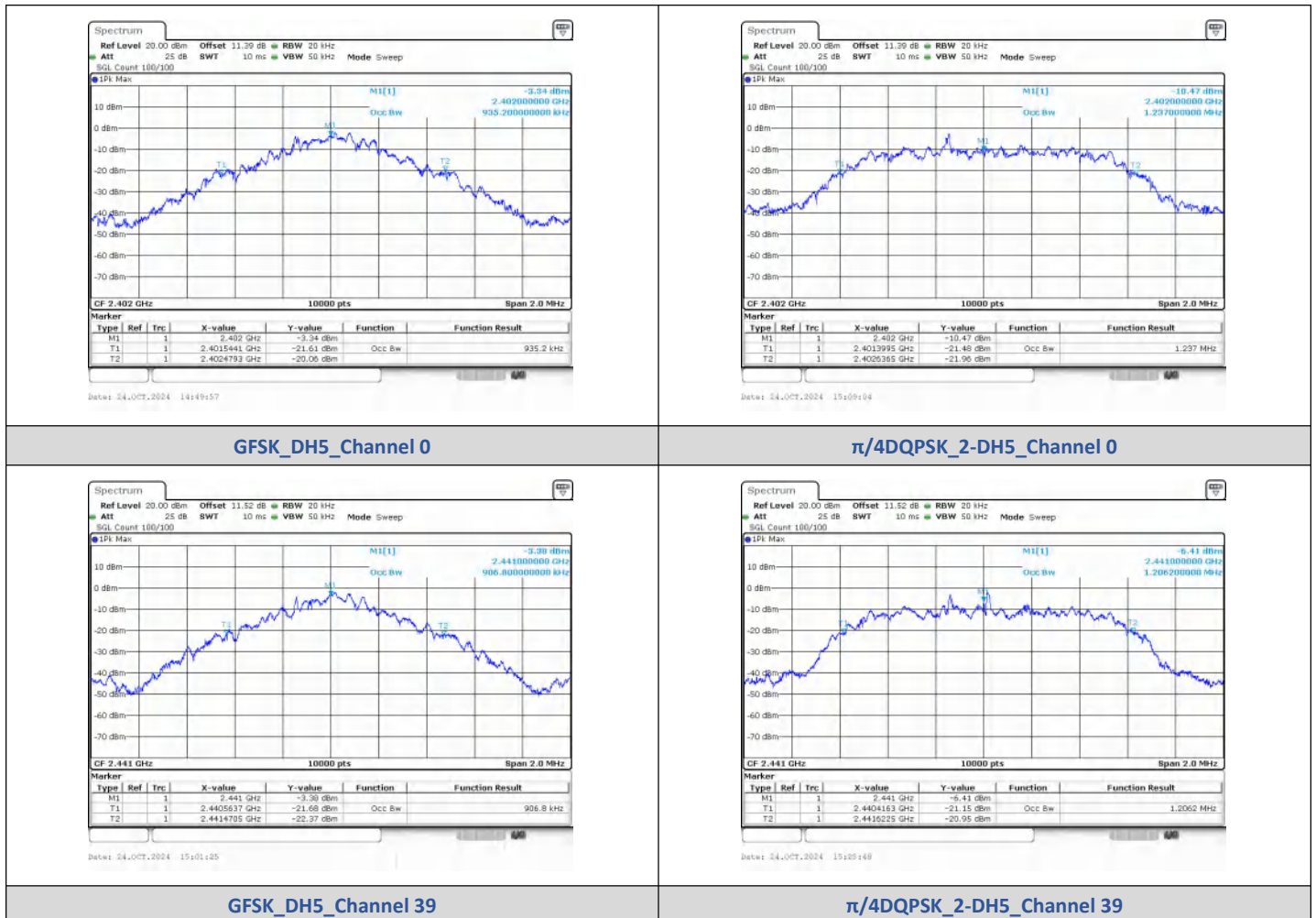


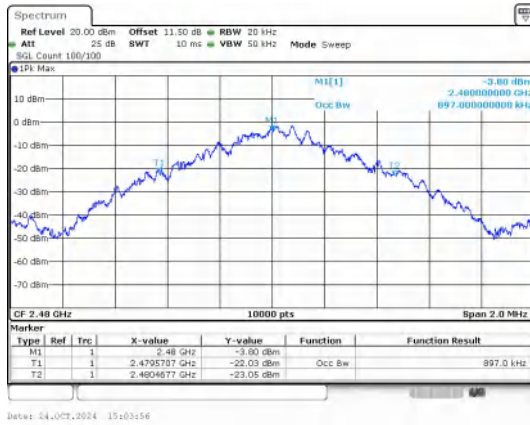
5) 99% Bandwidth

Test Result

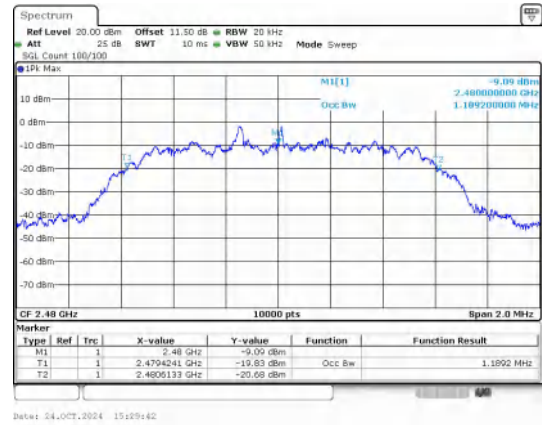
Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.93520
	39	2441	0.90680
	78	2480	0.89700
$\pi/4$ QPSK	0	2402	1.2370
	39	2441	1.2062
	78	2480	1.1892
8DPSK	0	2402	1.2272
	39	2441	1.2126
	78	2480	1.2076

Test Graphs

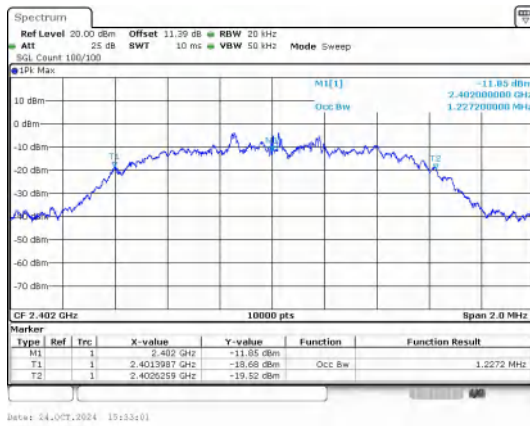




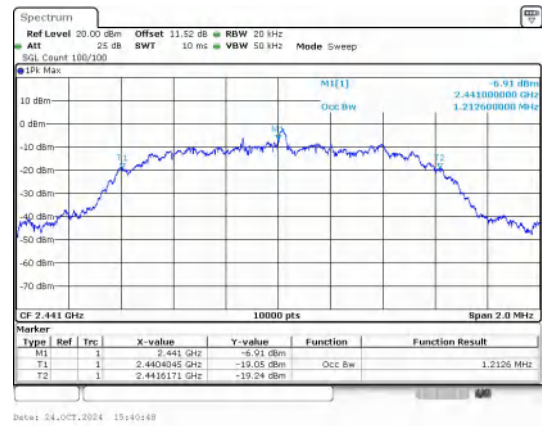
GFSK_DH5_Channel 78



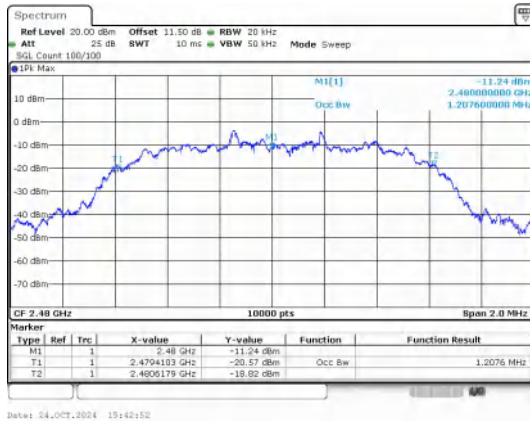
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



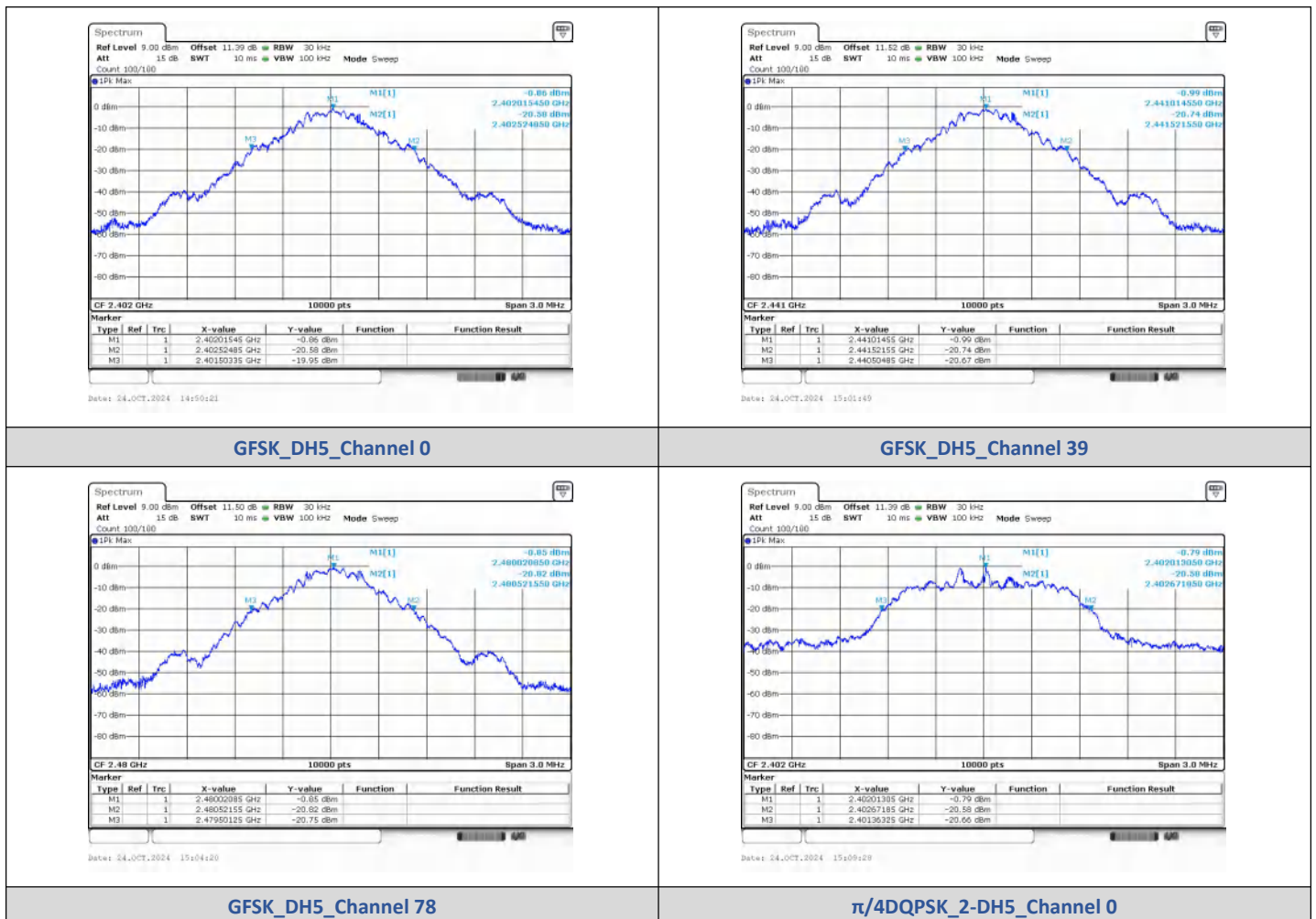
8DPSK_3-DH5_Channel 78

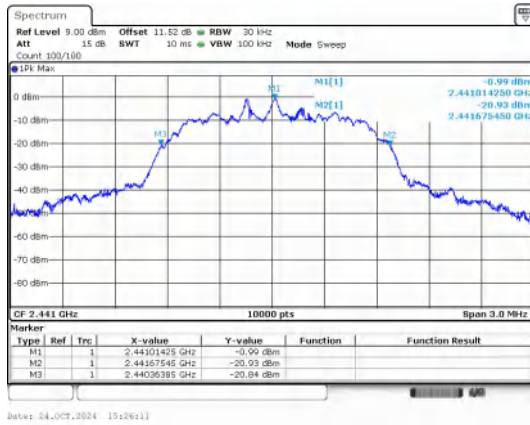
6) 20dB Bandwidth

Test Result

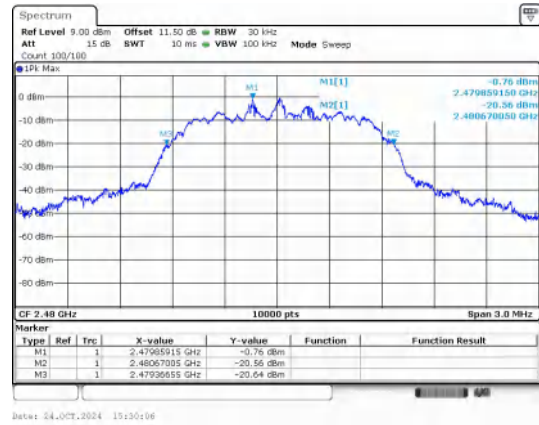
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.020
	39	2441 MHz	1.020
	78	2480 MHz	1.020
$\pi/4$ QPSK	0	2402 MHz	1.310
	39	2441 MHz	1.320
	78	2480 MHz	1.300
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.290
	78	2480 MHz	1.290

Test Graphs

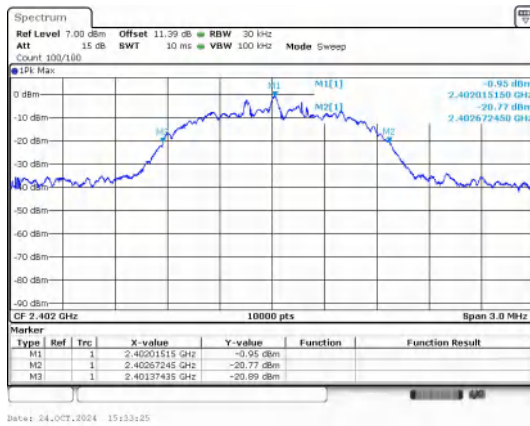




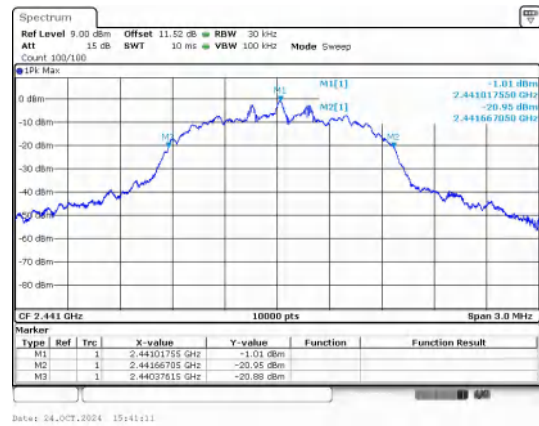
$\pi/4$ DQPSK_2-DH5_Channel 39



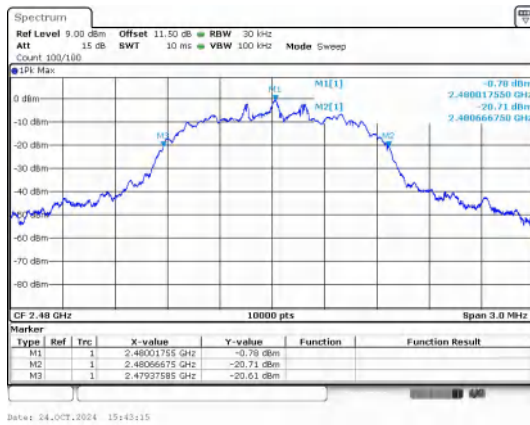
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



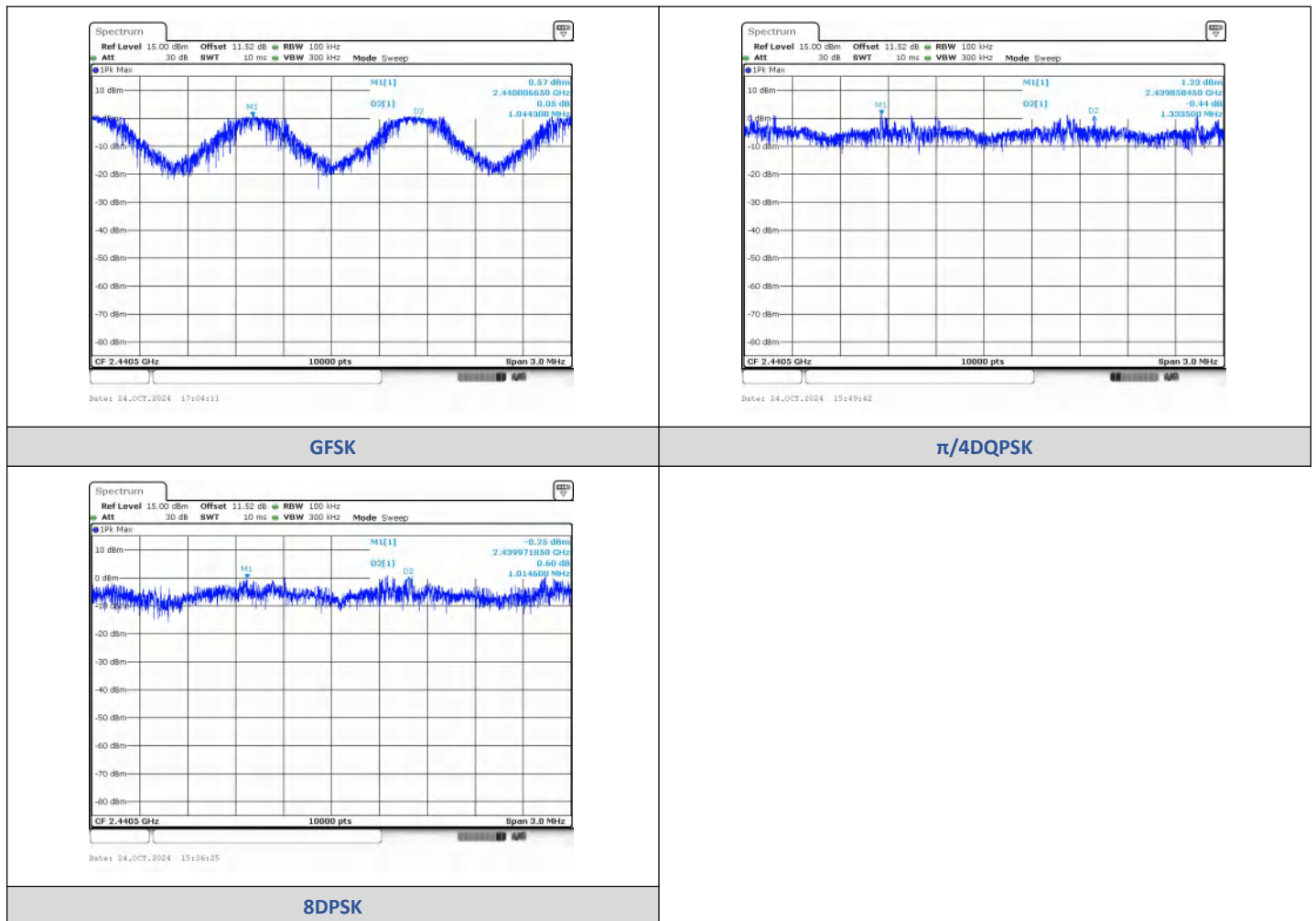
8DPSK_3-DH5_Channel 78

7) Carrier Frequencies Separation

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0066	2441.0509	1.0443	1.020	PASS
$\pi/4$ DQPSK	2-DH5	2439.8585	2441.1919	1.3335	0.873	PASS
8DPSK	3-DH5	2439.9718	2440.9864	1.0146	0.867	PASS

Test Graphs



8) Conducted Out Of Band Emission

Test Result

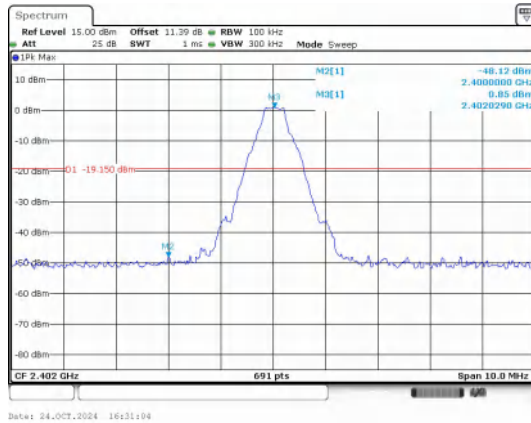
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.115	-19.15	-28.965	PASS
			4804.68	-41.050	-19.15	-21.900	PASS
		39	9763.72	-41.492	-18.66	-22.832	PASS
		78	2483.50	-48.887	-18.17	-30.717	PASS
			9920.20	-39.206	-18.17	-21.036	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-48.375	-19.15	-29.225	PASS
			4803.85	-41.799	-19.15	-22.649	PASS
		39	9763.72	-41.069	-18.75	-22.319	PASS
		78	2483.50	-49.078	-18.22	-30.858	PASS
			9920.20	-39.659	-18.22	-21.439	PASS
8DPSK	3-DH5	0	2400.00	-48.604	-19.14	-29.464	PASS
			4803.85	-42.381	-19.14	-23.241	PASS
		39	9763.72	-40.911	-19.1	-21.811	PASS
		78	2483.50	-50.499	-18.53	-31.969	PASS
			9920.20	-39.687	-18.53	-21.157	PASS

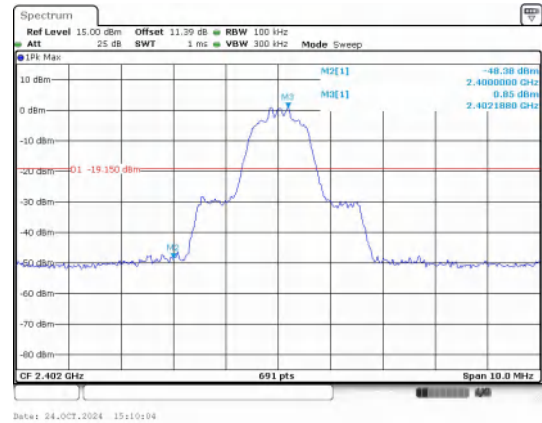
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.19	-48.623	-19.62	-29.003	PASS
			2400.00	-50.643	-19.62	-31.023	PASS
			2483.50	-50.101	-19.12	-30.981	PASS
$\pi/4$ DQPSK	2-DH5		2395.46	-48.569	-19.14	-29.429	PASS
			2400.00	-51.221	-19.14	-32.081	PASS
			2483.50	-50.504	-18.65	-31.854	PASS
8DPSK	3-DH5		2397.61	-48.439	-19.88	-28.559	PASS
			2400.00	-50.616	-19.88	-30.736	PASS
			2483.50	-48.548	-18.94	-29.608	PASS

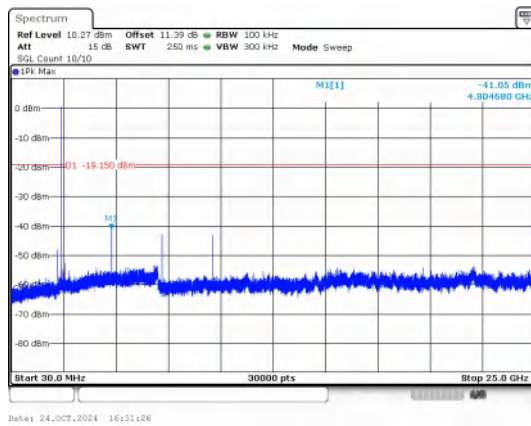
Test Graphs



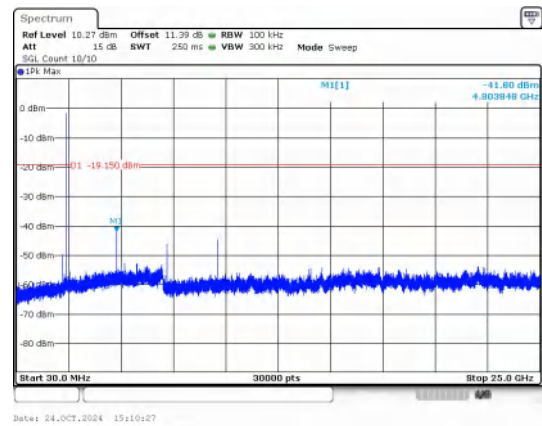
Out Of Band Emission
GFSK_DH5_Channel 0



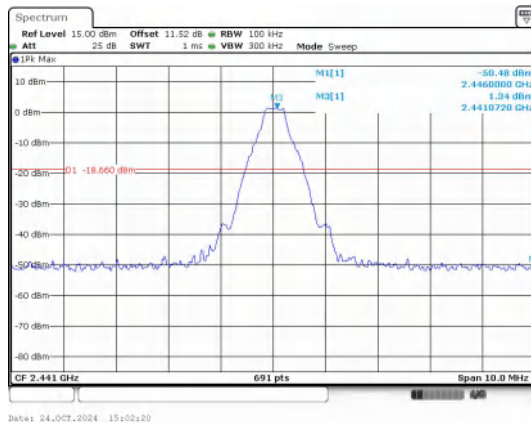
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



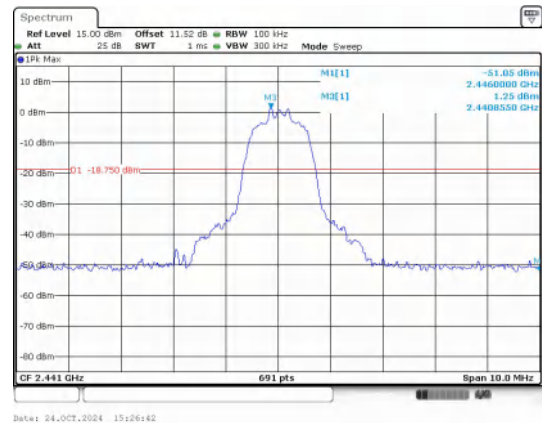
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



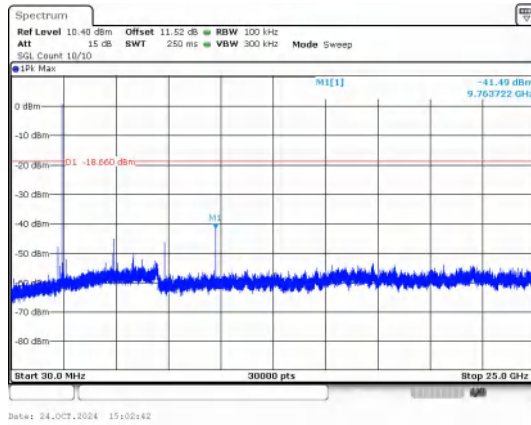
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



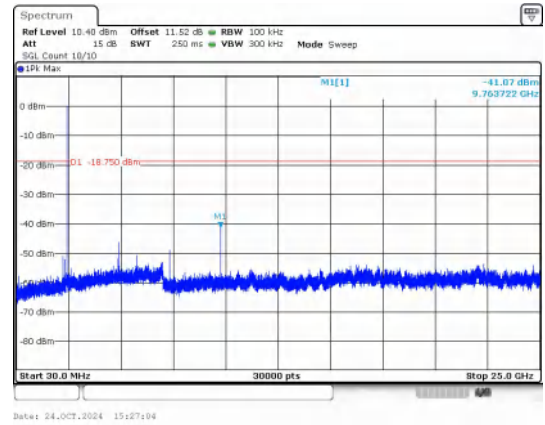
Out Of Band Emission
GFSK_DH5_Channel 39



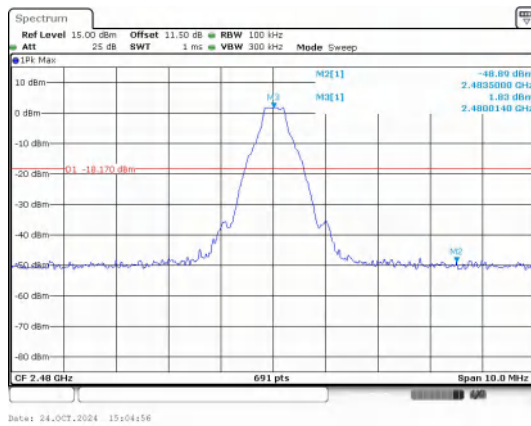
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



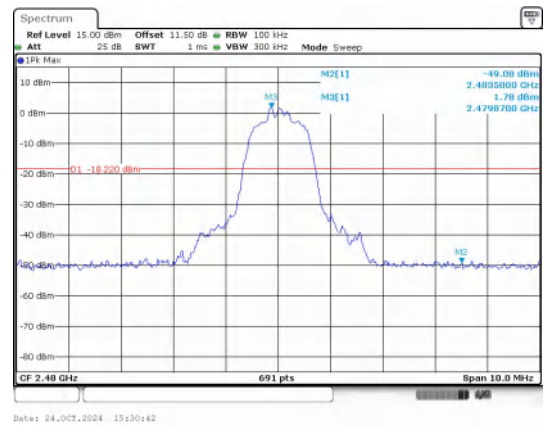
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



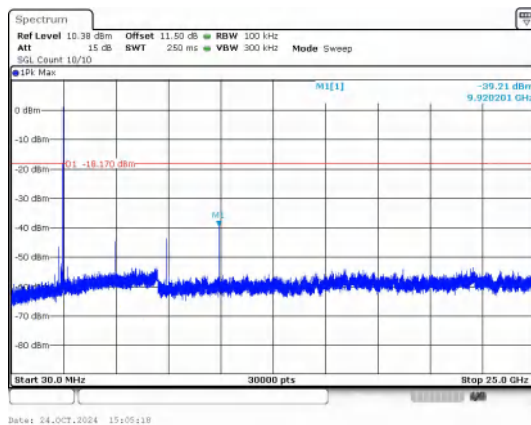
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



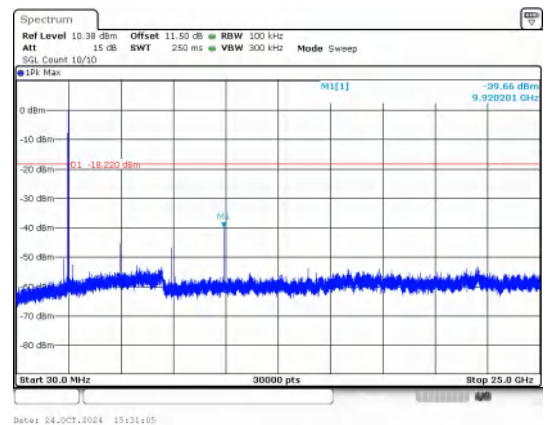
Out Of Band Emission
GFSK_DH5_Channel 78



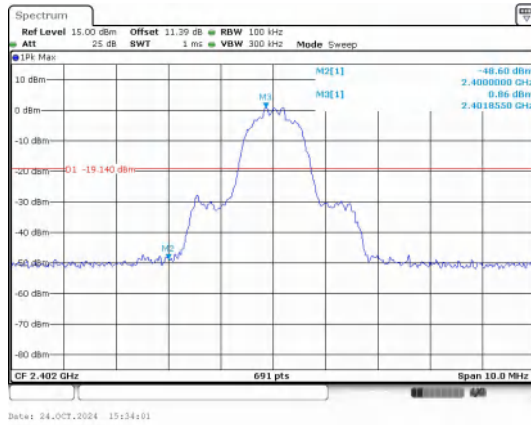
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



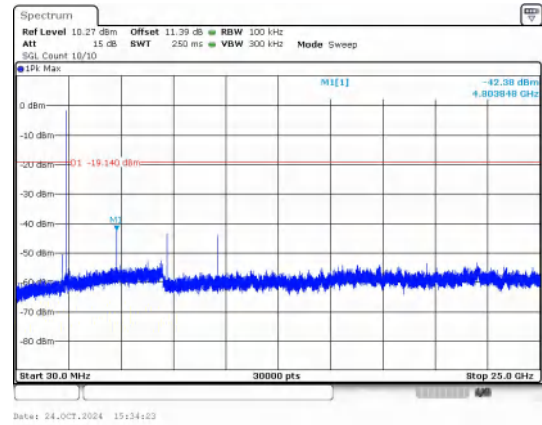
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



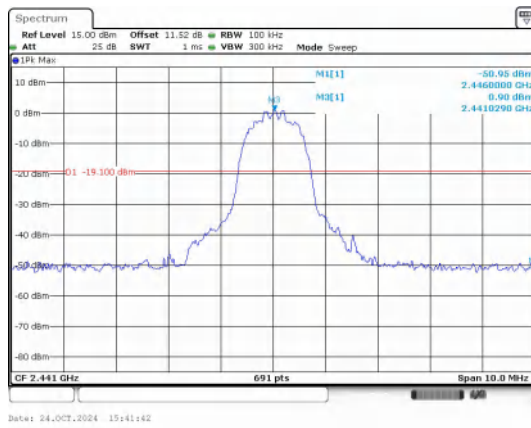
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



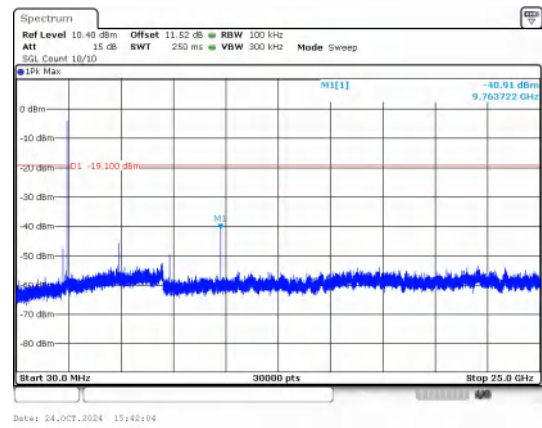
Out Of Band Emission
8DPSK_3-DH5_Channel 0



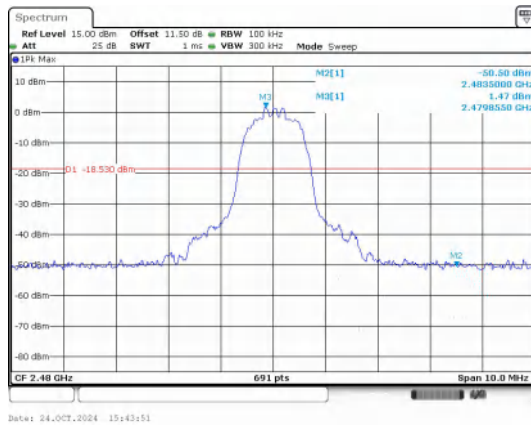
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



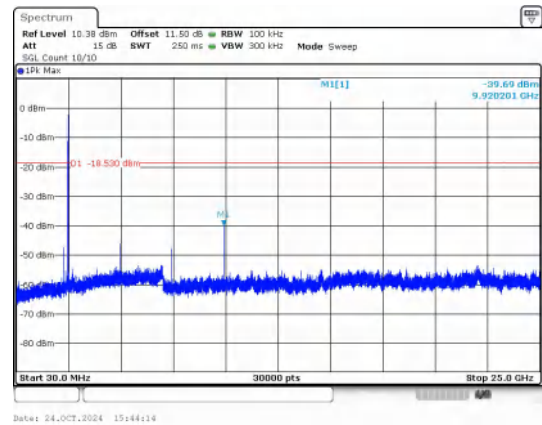
Out Of Band Emission
8DPSK_3-DH5_Channel 39



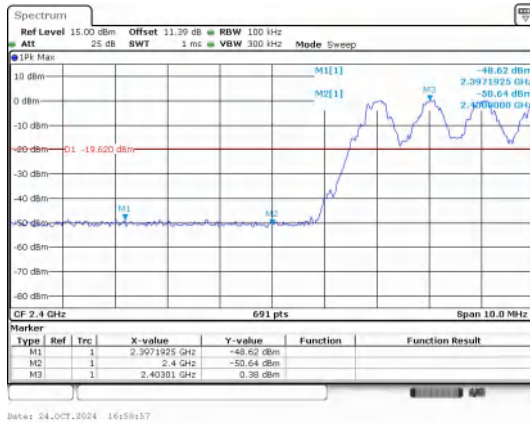
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



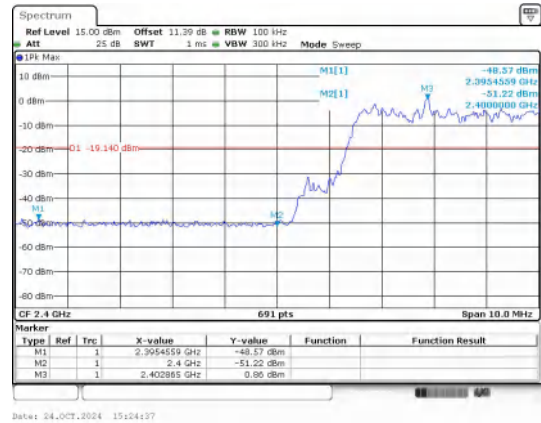
Out Of Band Emission
8DPSK_3-DH5_Channel 78



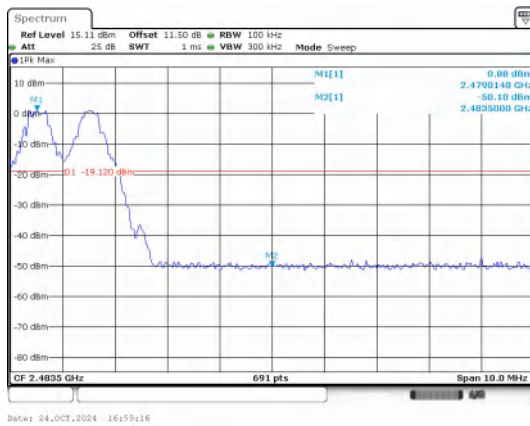
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



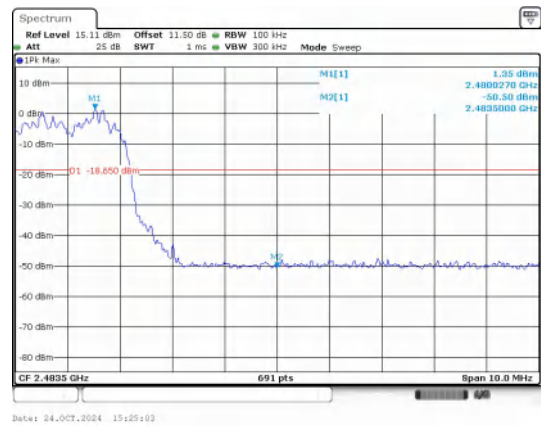
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



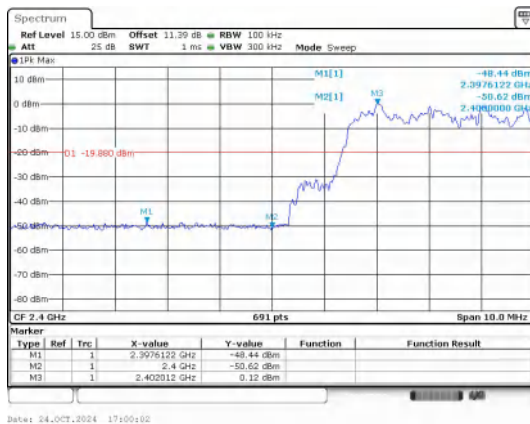
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



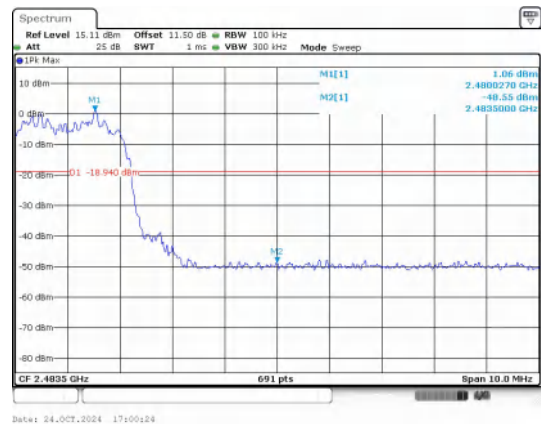
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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