

Appendix

Report No.:	CISRR241121127
FCC ID:	2BGU9-YW12
Product Name:	wireless headphone
Model No.:	YW12
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

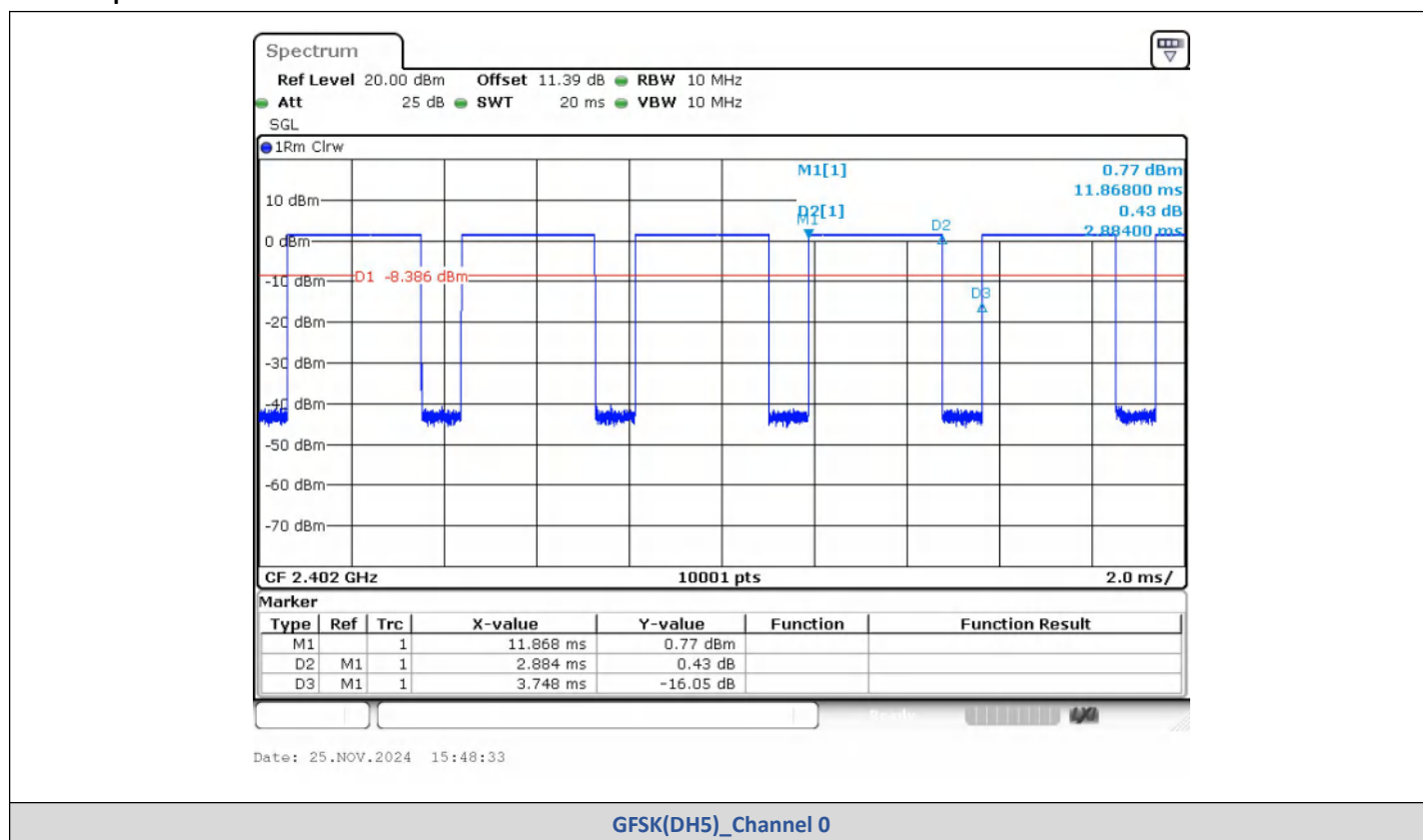
1) Duty Cycle

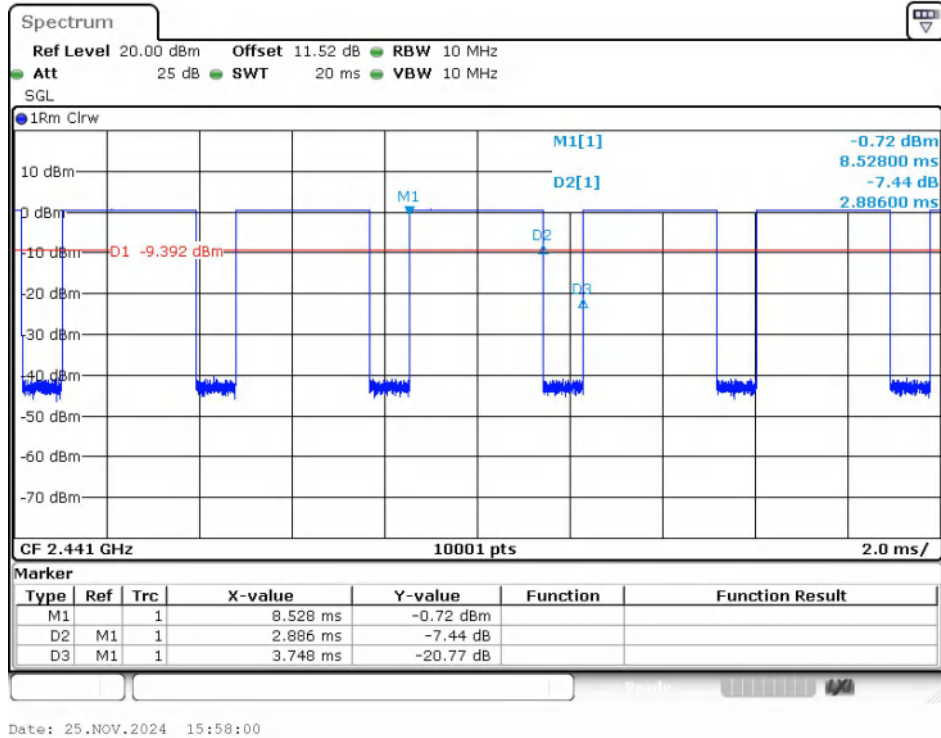
Test Result

Left:

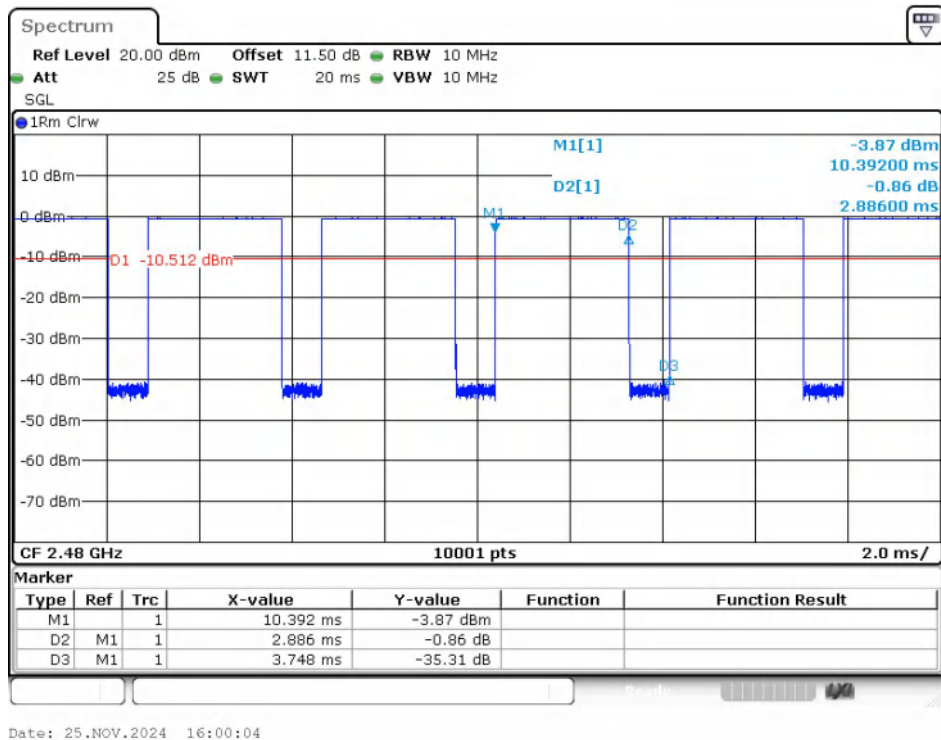
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.884	3.748	76.95	0.7695	1.1379	0.3467
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465
		78	2.886	3.748	77.00	0.7700	1.1351	0.3465
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.3460
		39	2.890	3.748	77.11	0.7711	1.1289	0.3460
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.894	3.748	77.21	0.7721	1.1233	0.3455
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458

Test Graphs

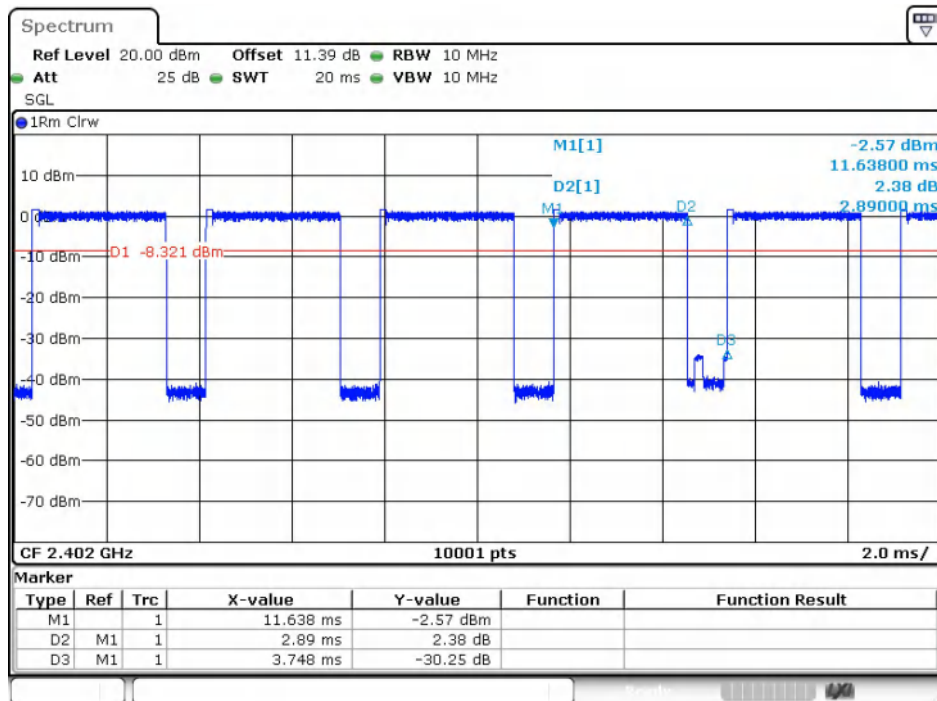




GFSK(DH5)_Channel 39

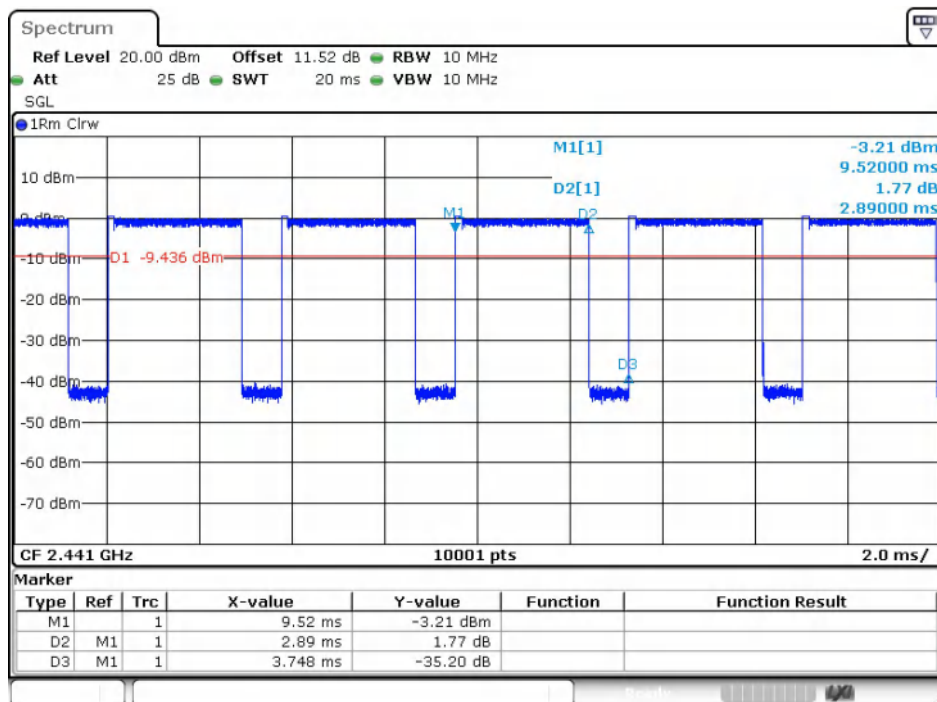


GFSK(DH5)_Channel 78



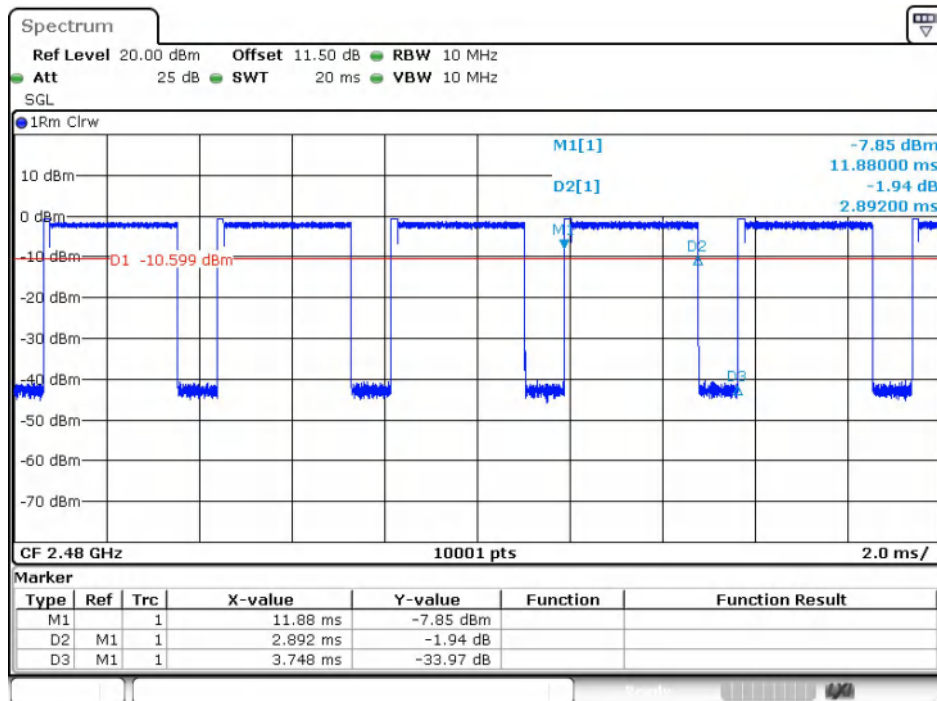
Date: 25.NOV.2024 16:02:19

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



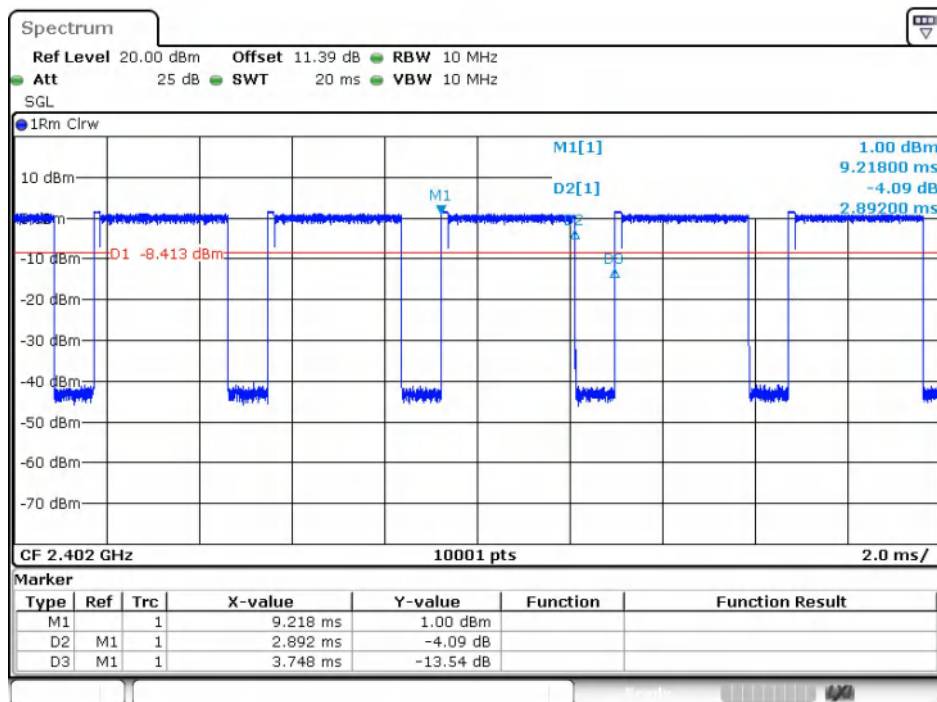
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$\pi/4$ DQPSK(2-DH5)_Channel 39



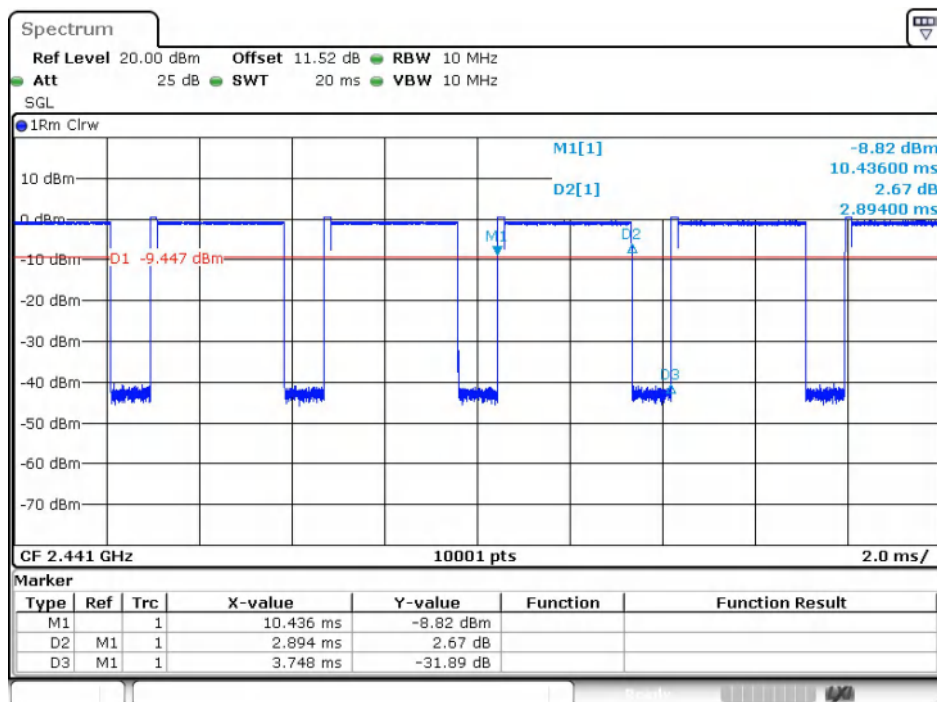
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$\pi/4$ DQPSK(2-DH5)_Channel 78



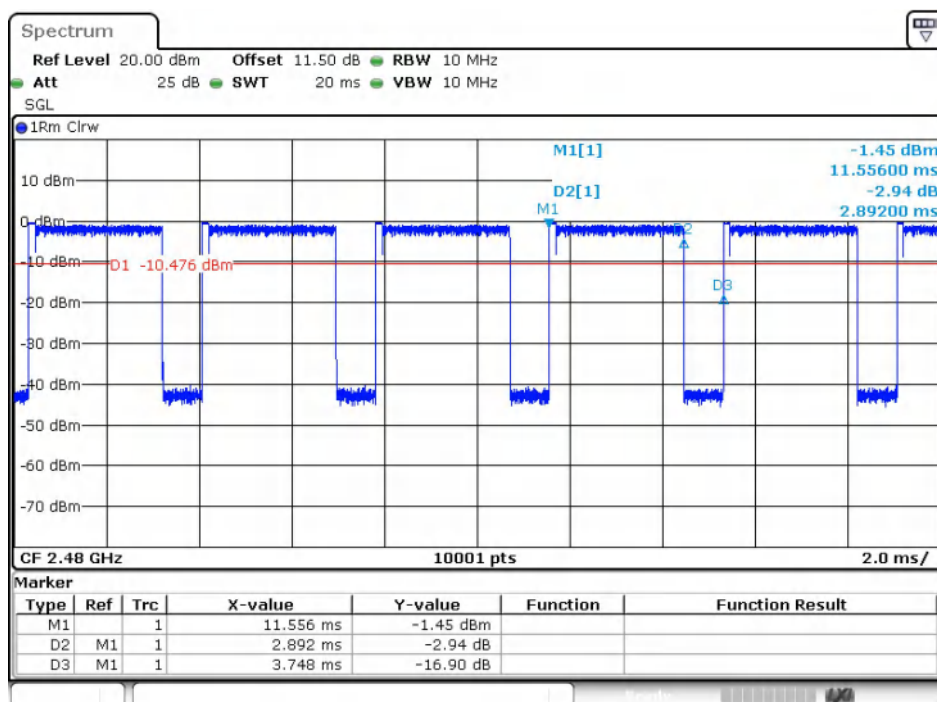
Date: 25.NOV.2024 16:13:59

8DPSK(3-DH5)_Channel 0



Date: 25.NOV.2024 16:21:12

8DPSK(3-DH5)_Channel 39



Date: 25.NOV.2024 16:23:34

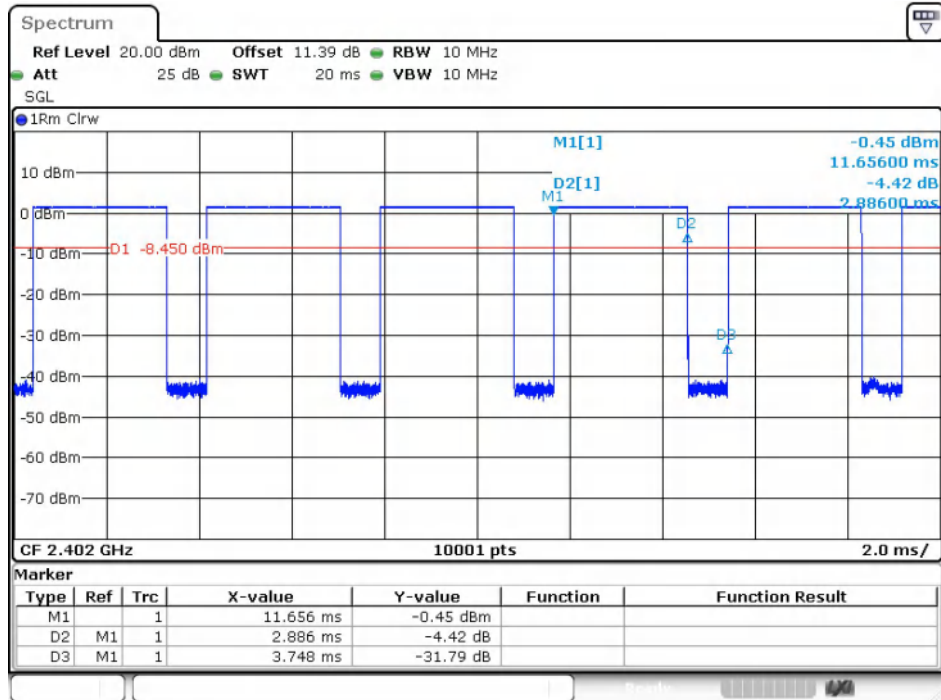
8DPSK(3-DH5)_Channel 78

Right:

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	0.3465
		39	2.886	3.748	77.00	0.7700	1.1351	0.3465

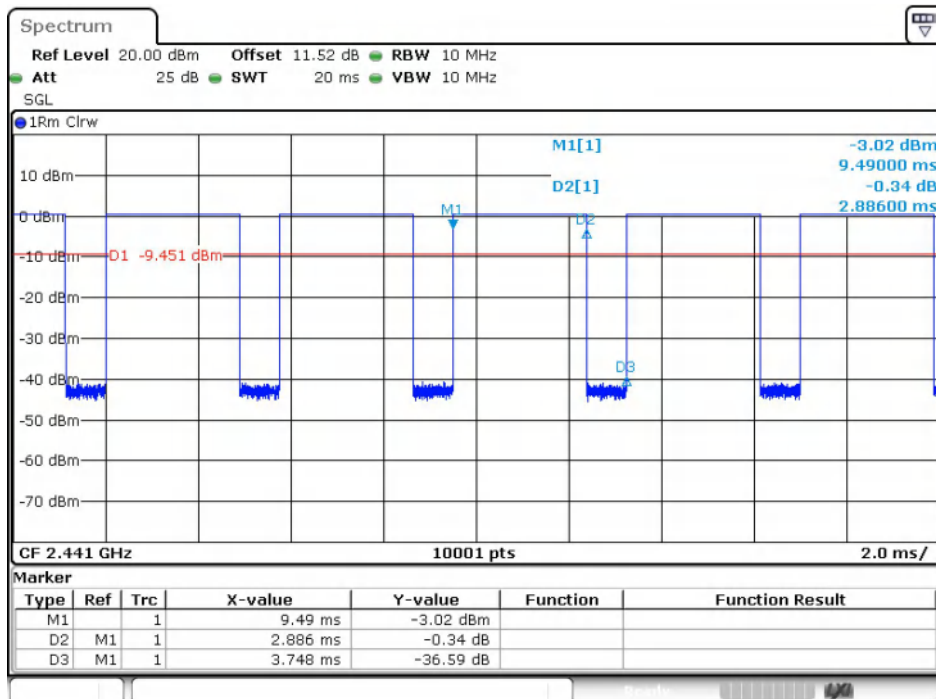
		78	2.884	3.748	76.95	0.7695	1.1379	0.3467
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.3460
		39	2.890	3.746	77.15	0.7715	1.1266	0.3460
		78	2.890	3.748	77.11	0.7711	1.1289	0.3460
8DPSK	3-DH5	0	2.892	3.748	77.16	0.7716	1.1261	0.3458
		39	2.892	3.748	77.16	0.7716	1.1261	0.3458
		78	2.892	3.748	77.16	0.7716	1.1261	0.3458

Test Graphs



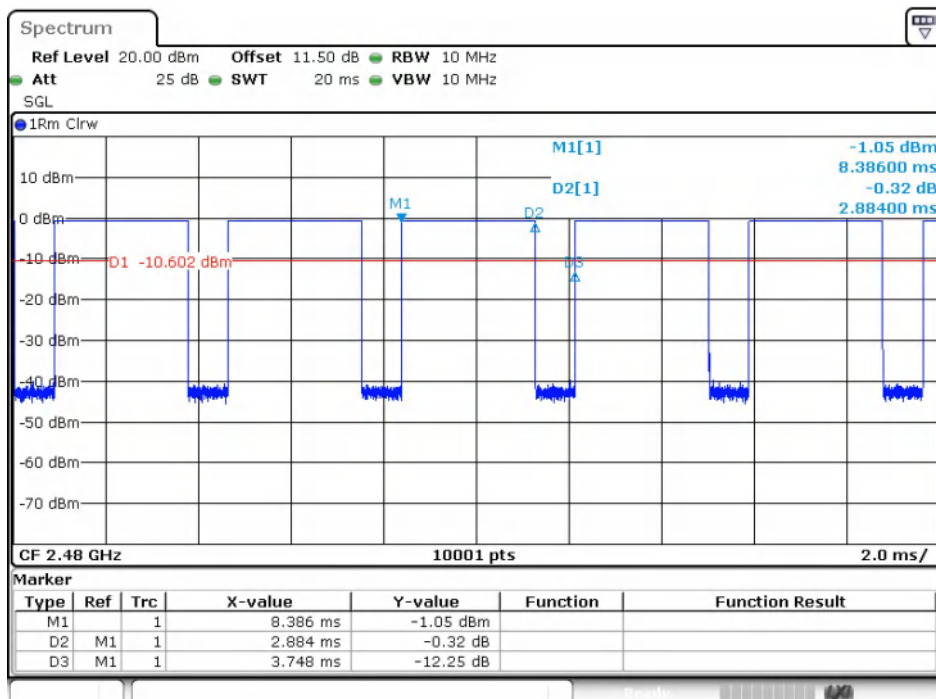
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GFSK(DH5)_Channel 0



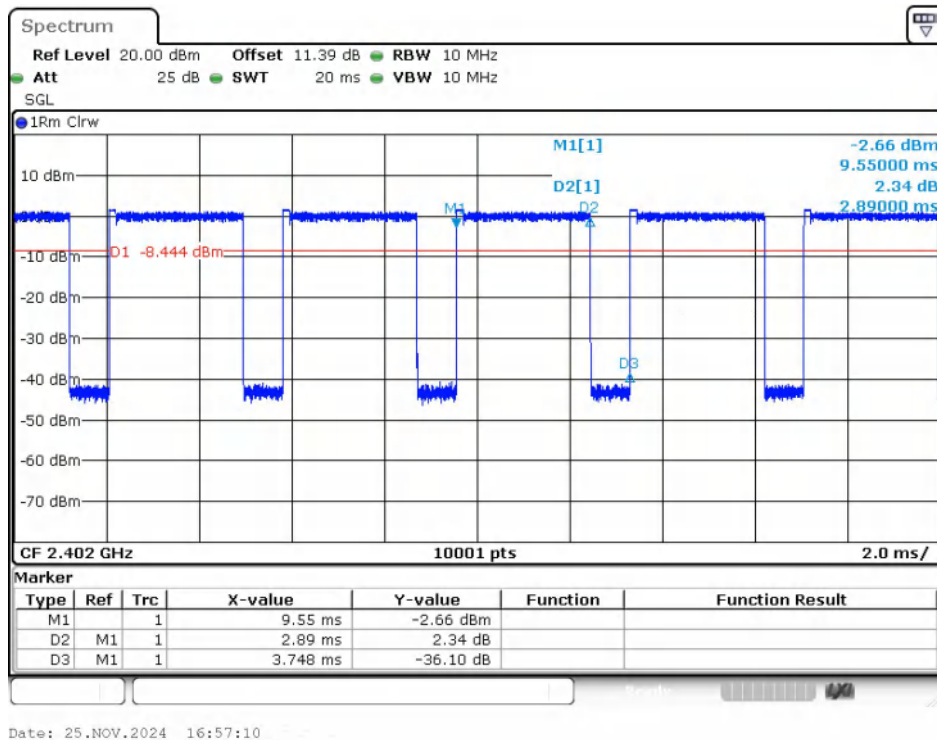
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GFSK(DH5)_Channel 39

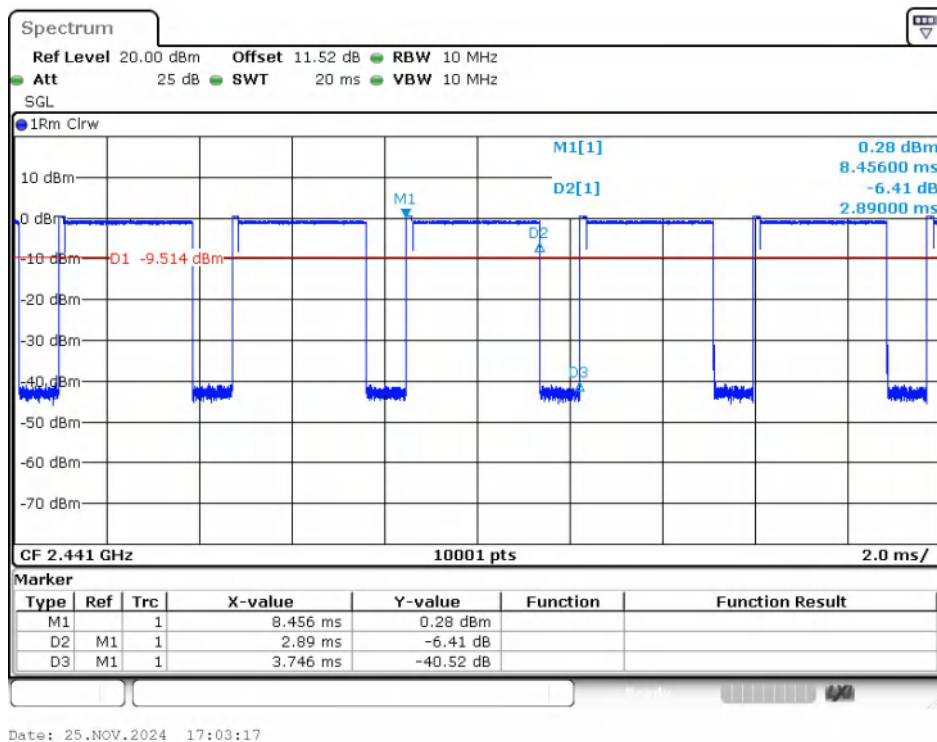


Date: 25.NOV.2024 16:54:48

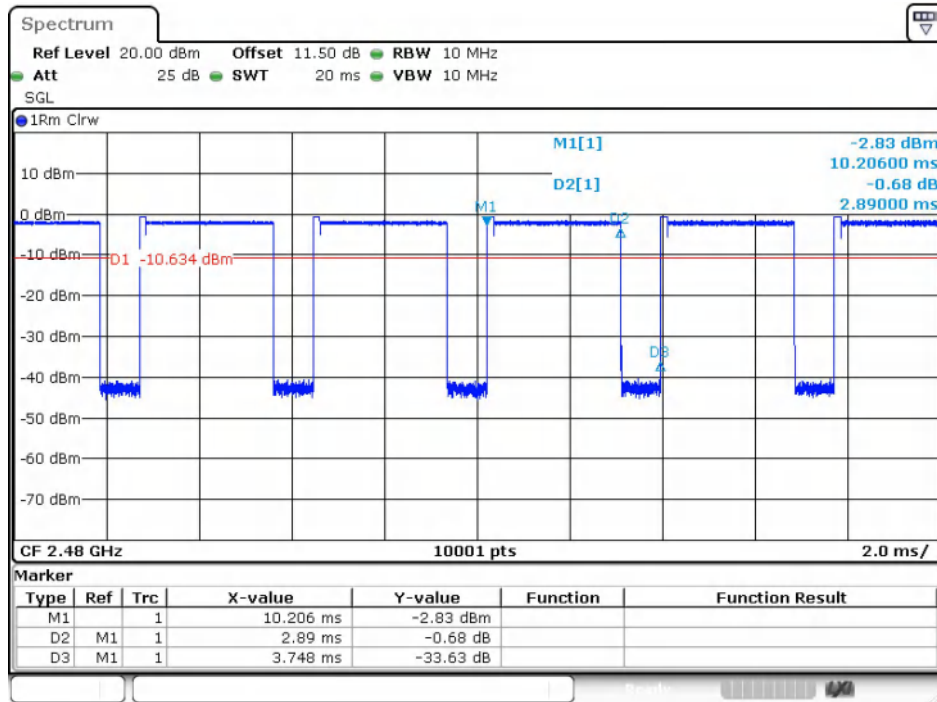
GFSK(DH5)_Channel 78



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

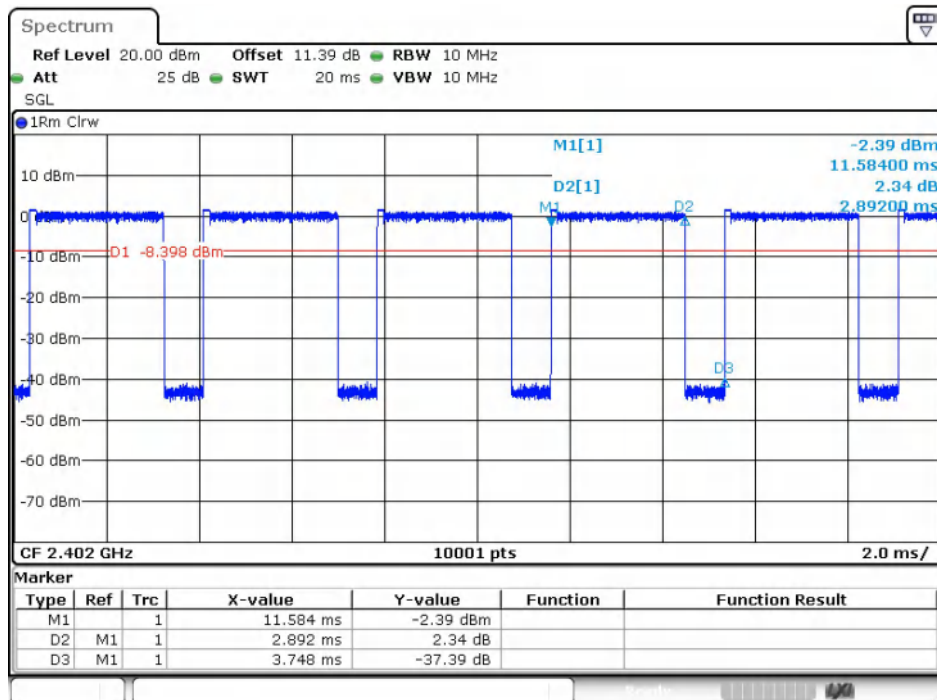


$\pi/4$ QPSK(2-DH5)_Channel 39



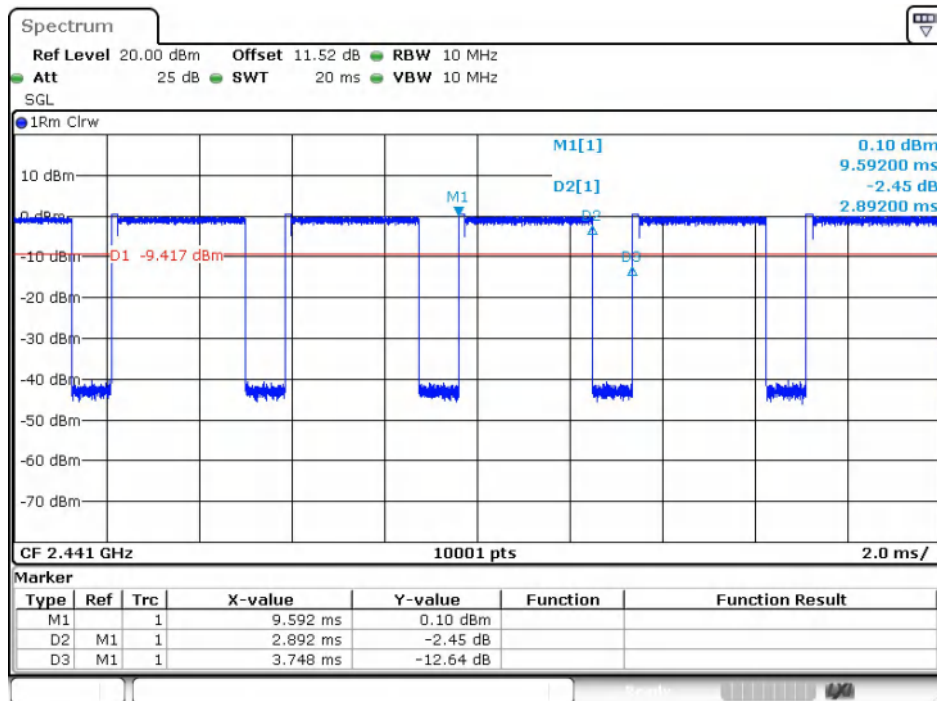
Date: 25.NOV.2024 17:05:22

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



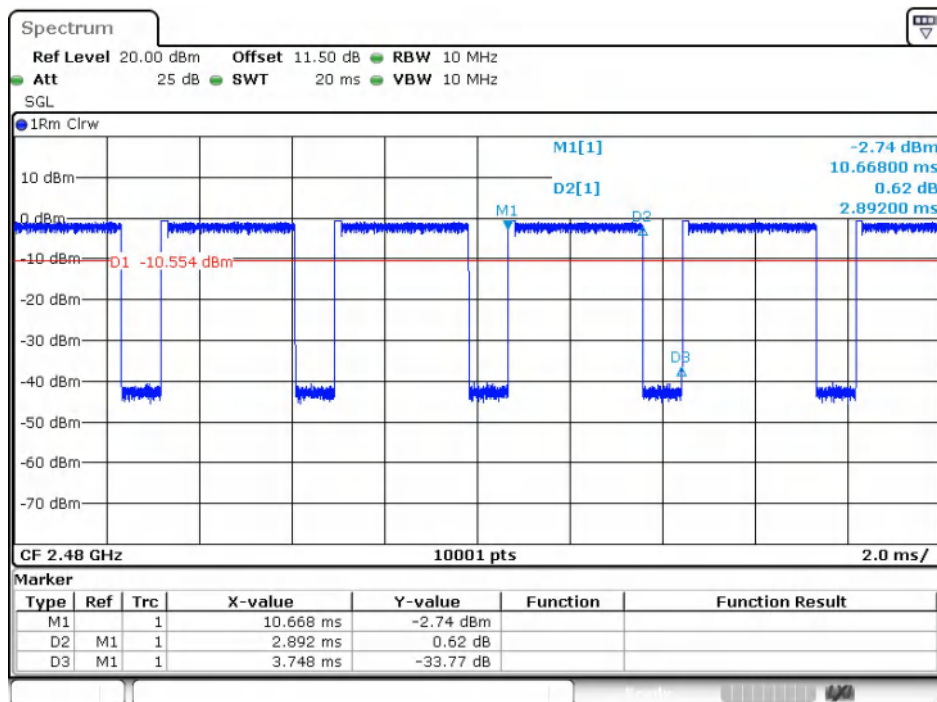
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8DPSK(3-DH5)_Channel 0



Date: 25.NOV.2024 17:13:30

8DPSK(3-DH5)_Channel 39



Date: 25.NOV.2024 17:16:11

8DPSK(3-DH5)_Channel 78

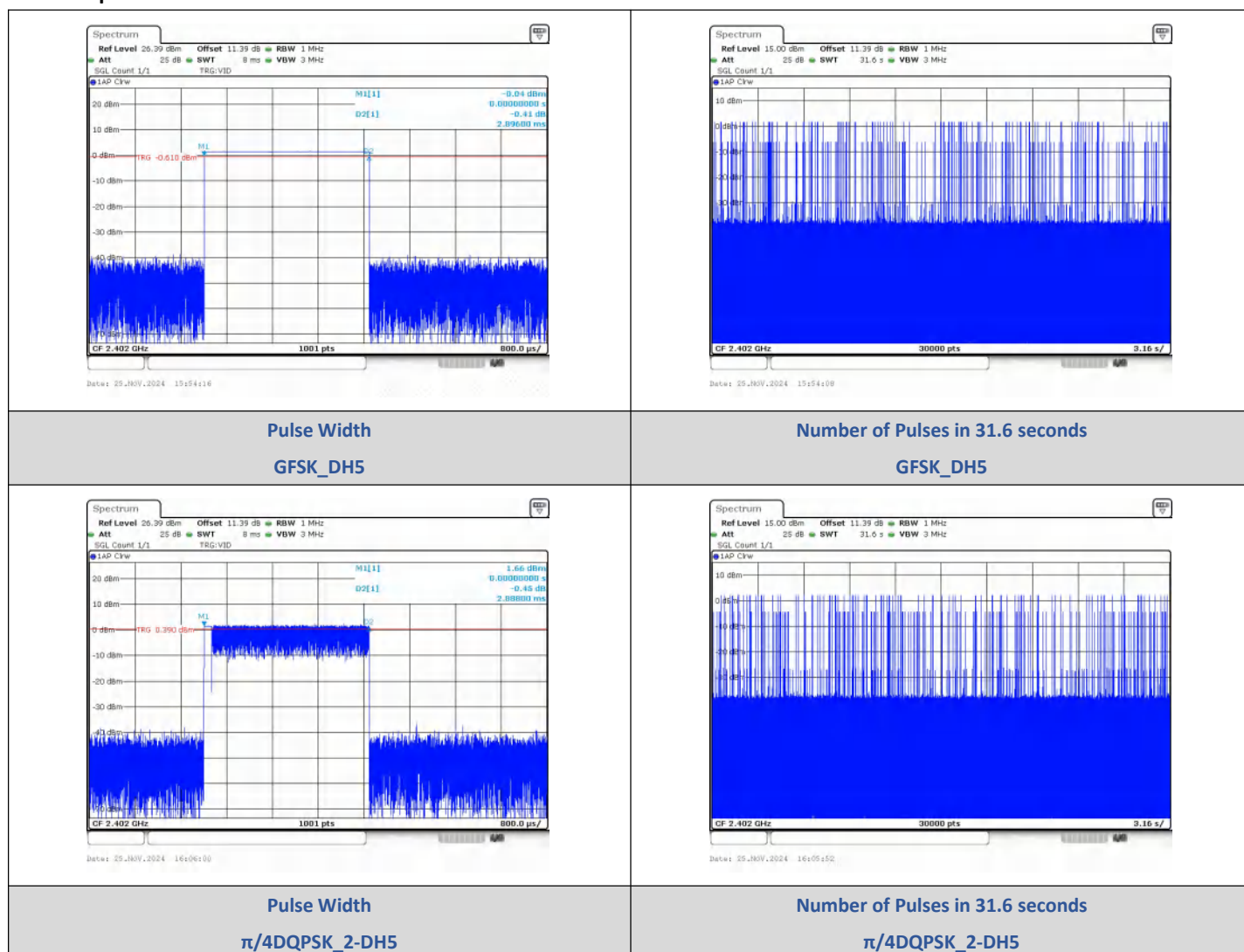
2) Dwell Time

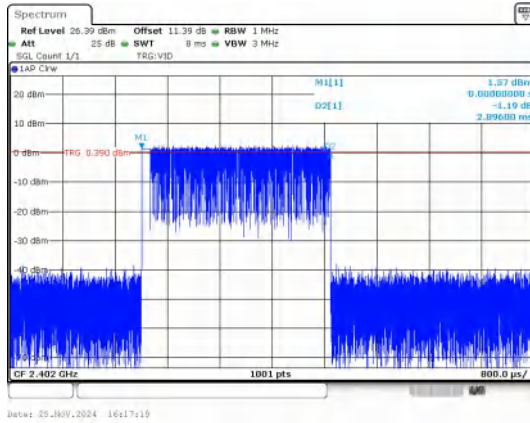
Test Result

Left:

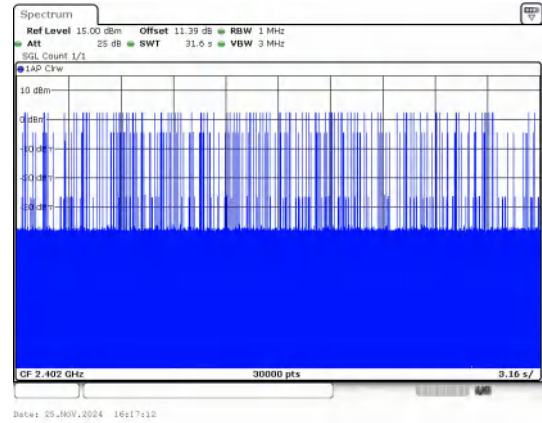
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.896	111	321.46	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	102	294.58		PASS
8DPSK	3-DH5		2.896	106	306.98		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5

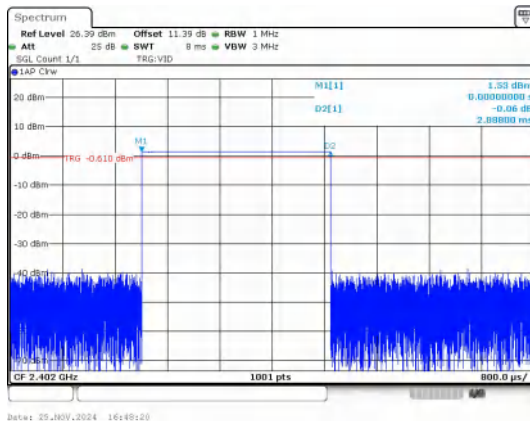


Number of Pulses in 31.6 seconds
8DPSK_3-DH5

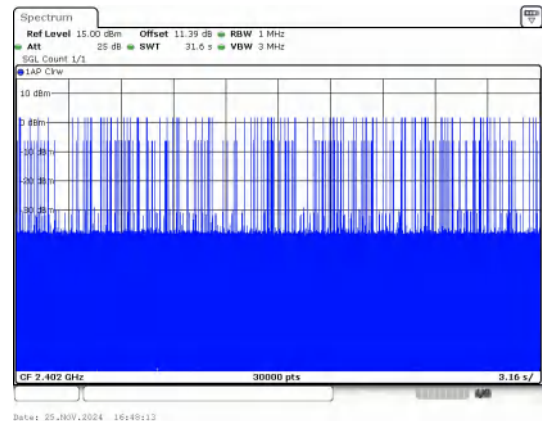
Right:

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	104	300.35	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	99	285.91		PASS
8DPSK	3-DH5		2.896	120	347.52		PASS

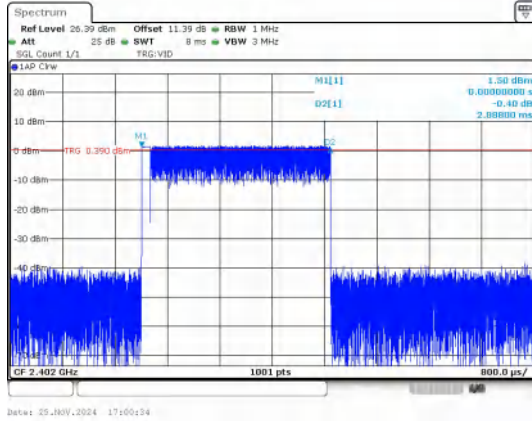
Test Graphs



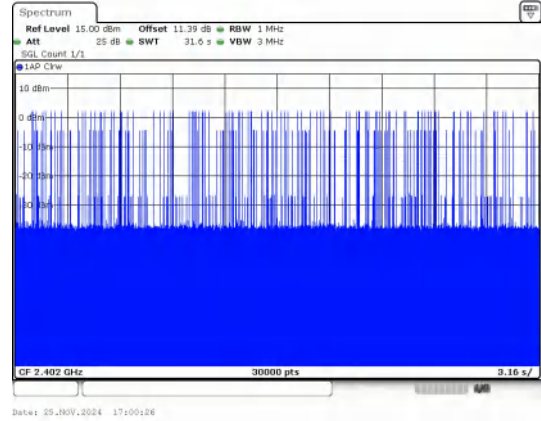
Pulse Width
GFSK_DH5



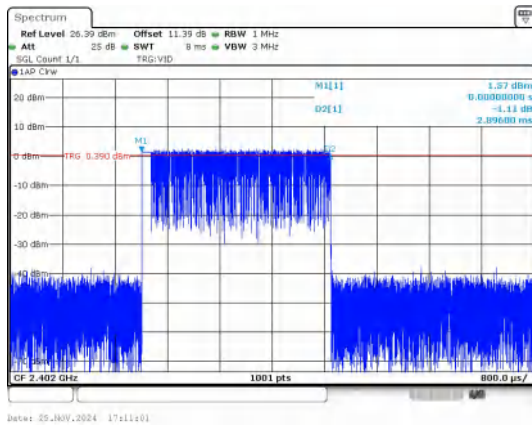
Number of Pulses in 31.6 seconds
GFSK_DH5



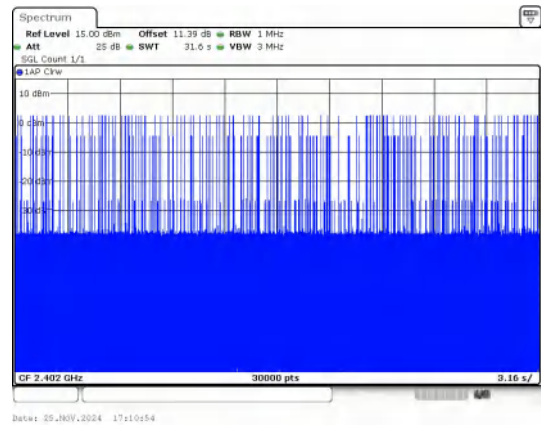
Pulse Width
 $\pi/4$ DQPSK_2-DH5



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



Pulse Width
8DPSK_3-DH5



Number of Pulses in 31.6 seconds
8DPSK_3-DH5

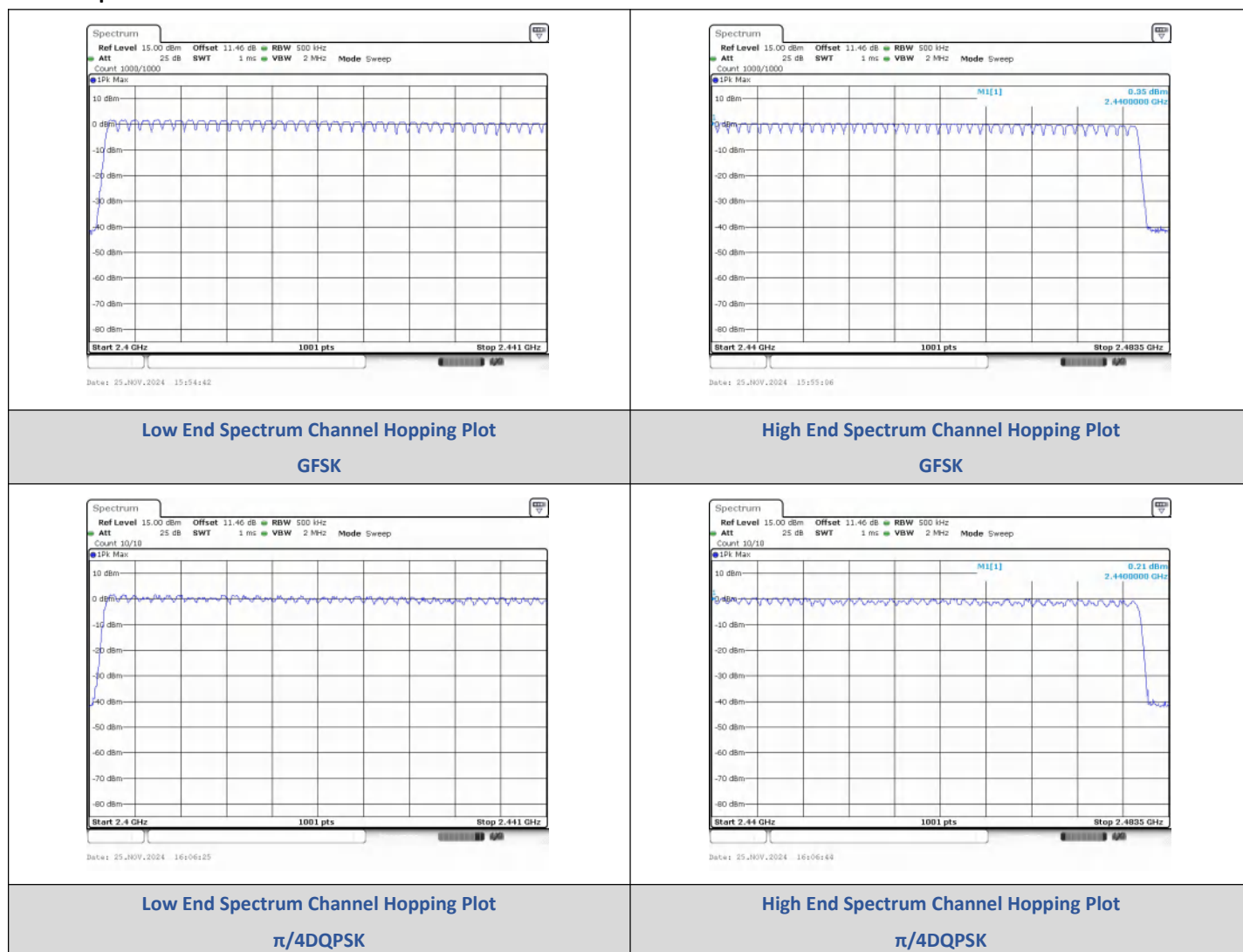
3) Number Of Hopping Channel

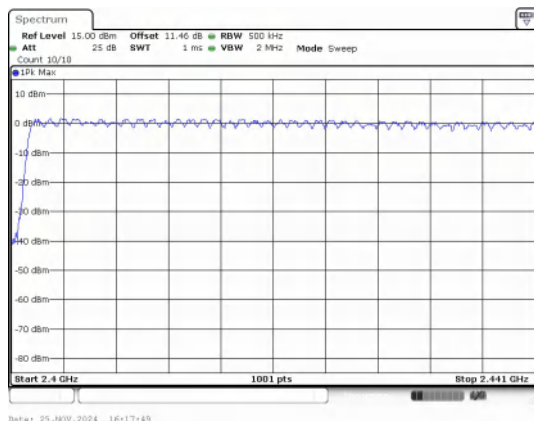
Test Result

Left:

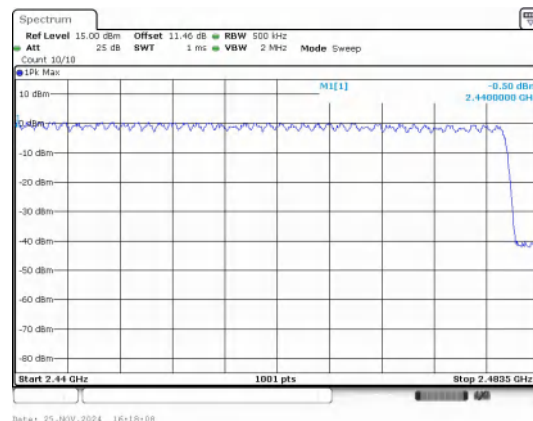
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK

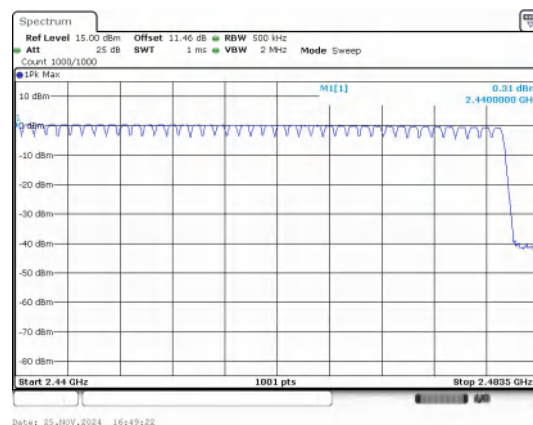
Right:

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

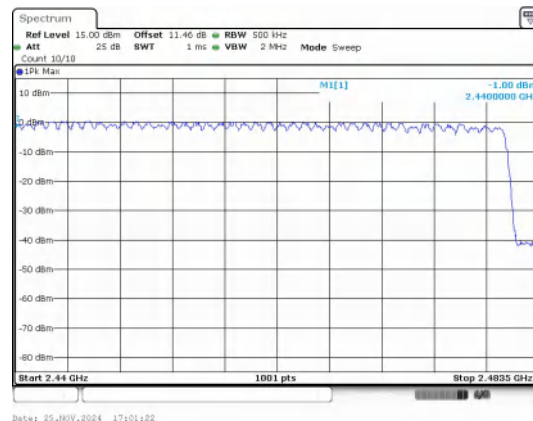
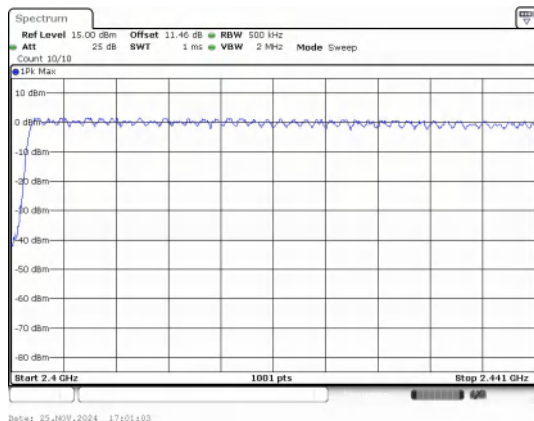
Test Graphs



Low End Spectrum Channel Hopping Plot
GFSK

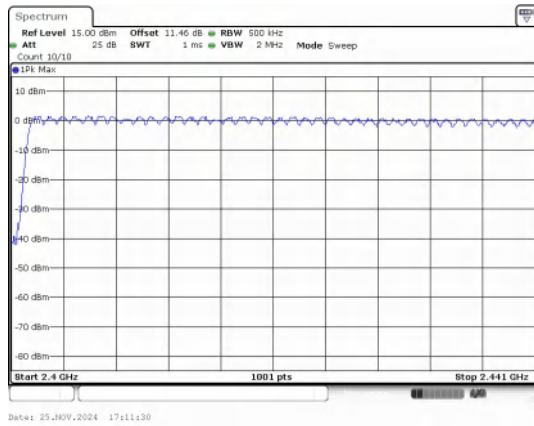


High End Spectrum Channel Hopping Plot
GFSK



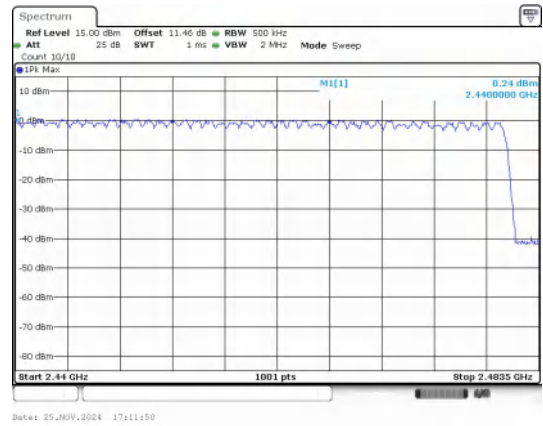
Low End Spectrum Channel Hopping Plot

$\pi/4$ DQPSK



High End Spectrum Channel Hopping Plot

$\pi/4$ DQPSK



Low End Spectrum Channel Hopping Plot

8DPSK

High End Spectrum Channel Hopping Plot

8DPSK

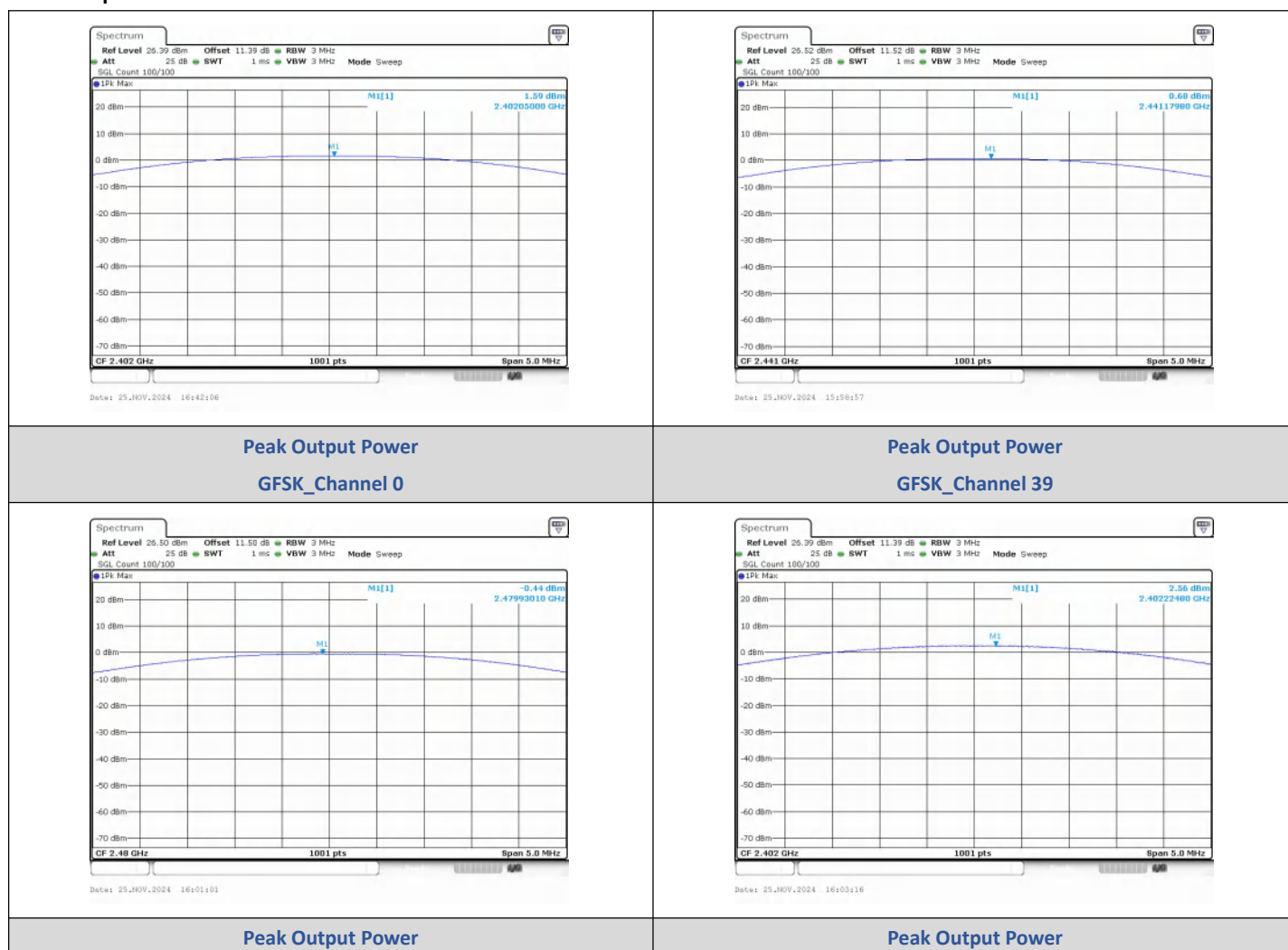
4) Conducted Peak Output Power

Test Result

Left:

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	0.68	1.17		PASS
		78	-0.44	0.90		PASS
$\pi/4$ DQPSK	2-DH5	0	2.56	1.80	≤20.97	PASS
		39	1.48	1.41		PASS
		78	0.32	1.08		PASS
8DPSK	3-DH5	0	2.84	1.92		PASS
		39	1.94	1.56		PASS
		78	0.77	1.19		PASS

Test Graphs



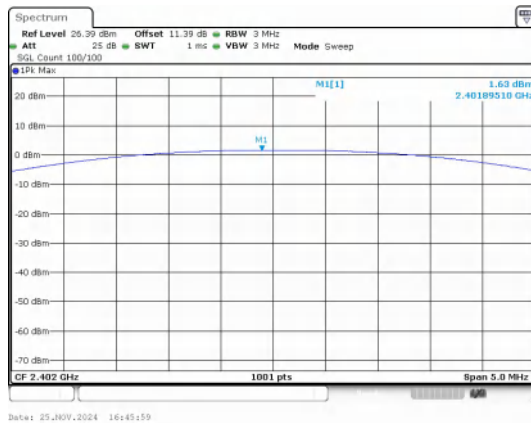


Right:

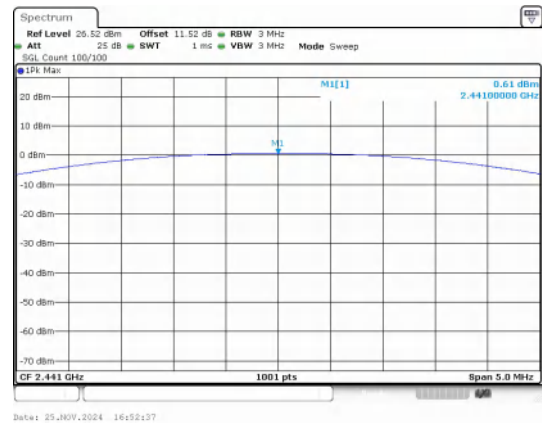
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.63	1.46	≤30	PASS

$\pi/4$ DQPSK	2-DH5	39	0.61	1.15	≤ 20.97	PASS
		78	-0.52	0.89		PASS
		0	2.45	1.76		PASS
		39	1.41	1.38		PASS
		78	0.31	1.07		PASS
		0	2.85	1.93		PASS
8DPSK	3-DH5	39	1.82	1.52	≤ 20.97	PASS
		78	0.69	1.17		PASS
						PASS

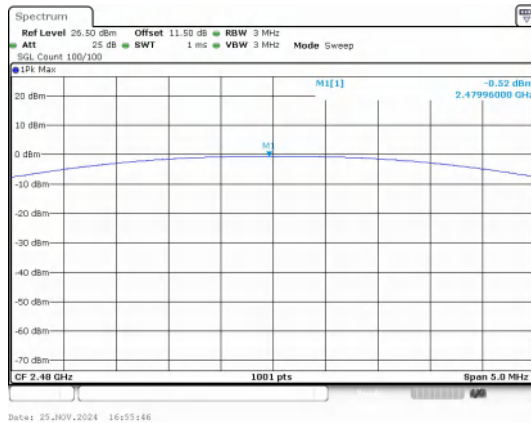
Test Graphs



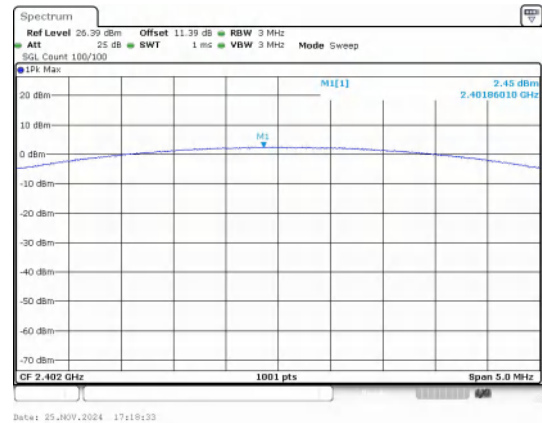
Peak Output Power
GFSK_Channel 0



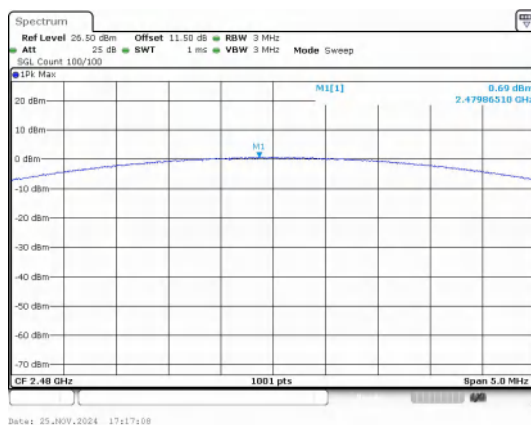
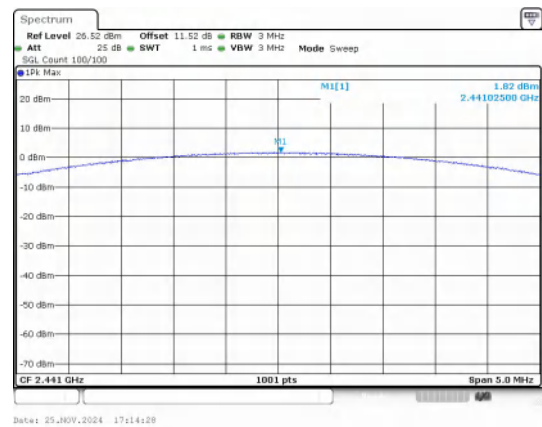
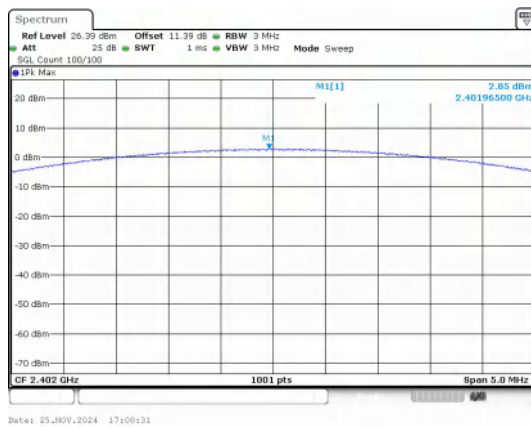
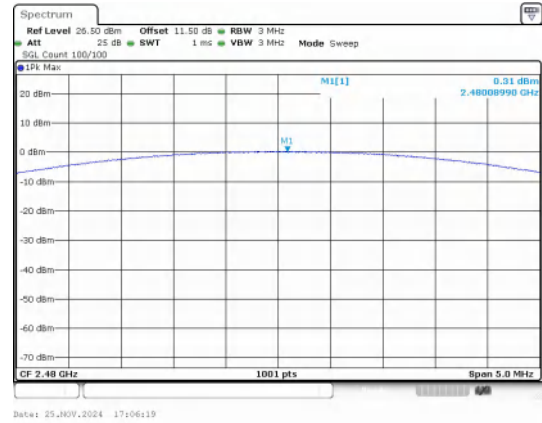
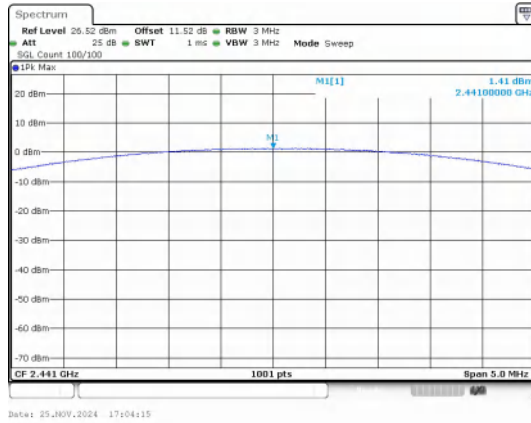
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78



Peak Output Power
 $\pi/4$ DQPSK_Channel 0



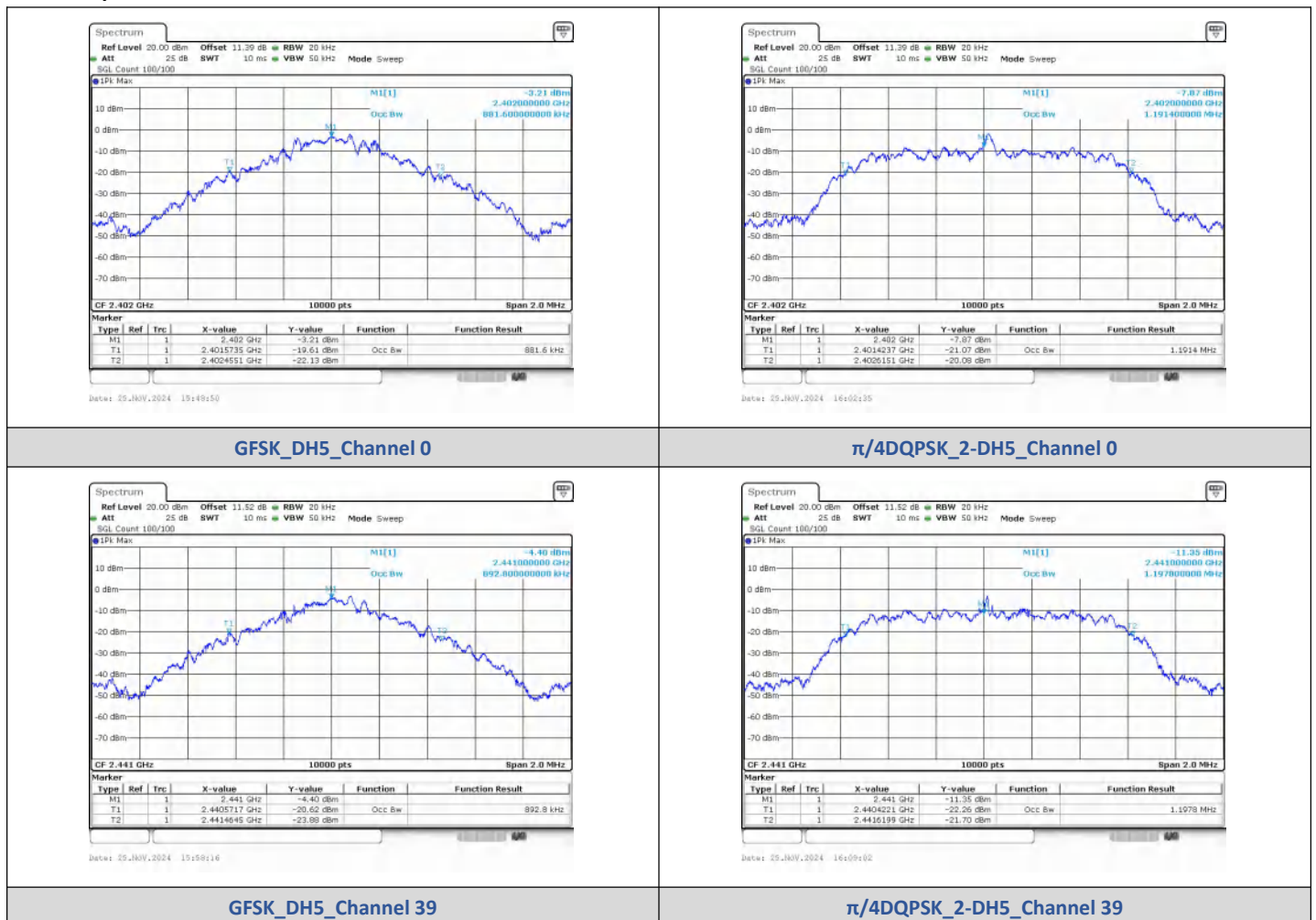
5) 99% Bandwidth

Test Result

Left:

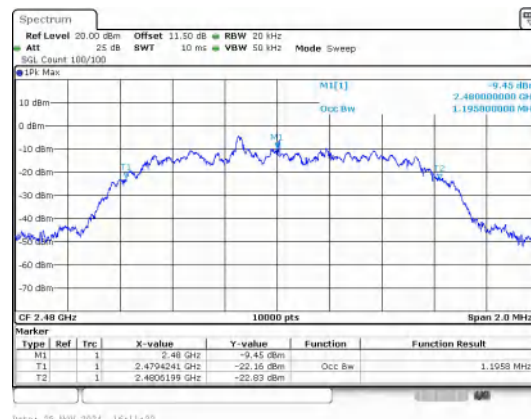
Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.88160
	39	2441	0.89280
	78	2480	0.89240
$\pi/4$ DQPSK	0	2402	1.1914
	39	2441	1.1978
	78	2480	1.1958
8DPSK	0	2402	1.2040
	39	2441	1.2096
	78	2480	1.2046

Test Graphs

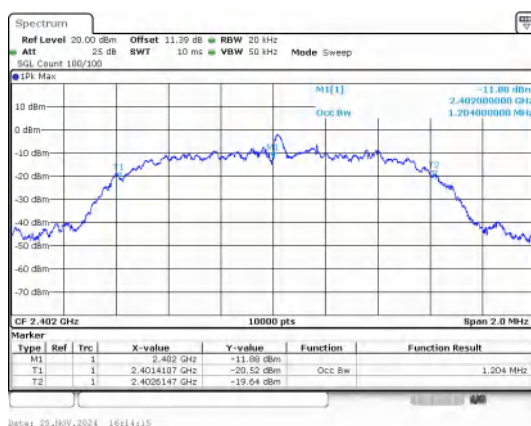




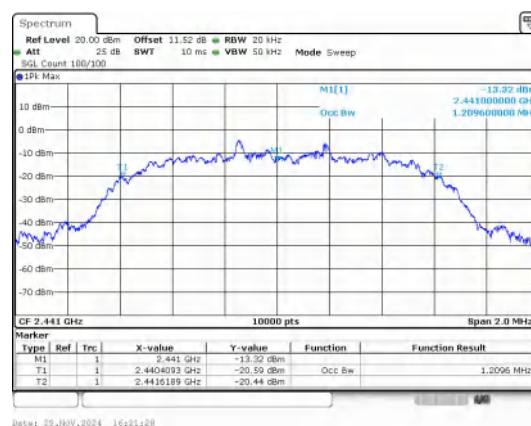
GFSK_DH5_Channel 78



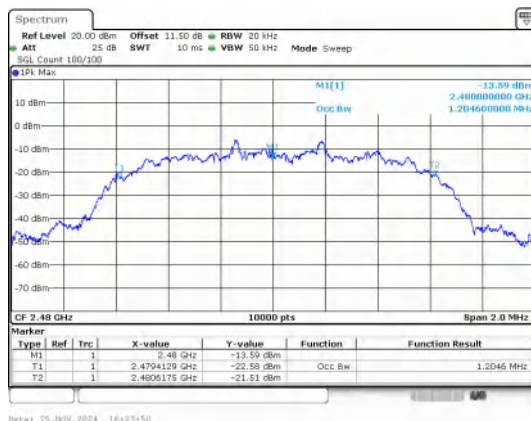
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



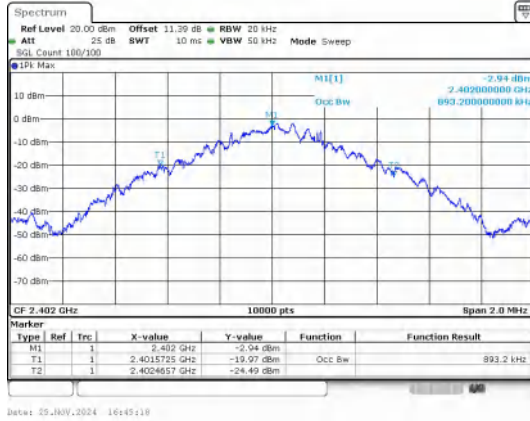
8DPSK_3-DH5_Channel 78

Right:

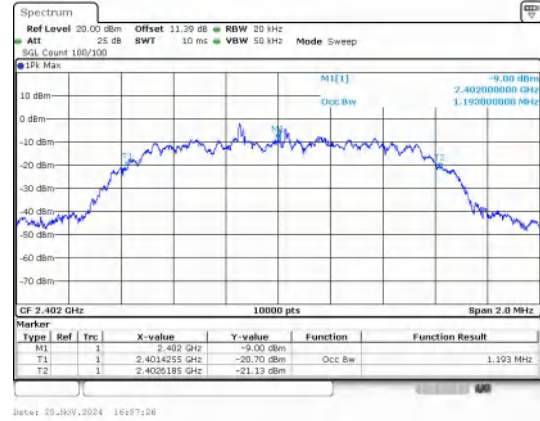
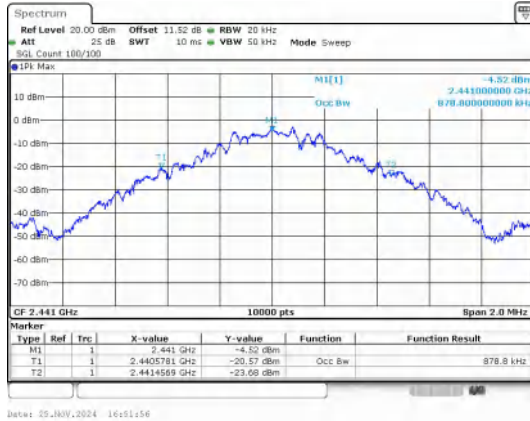
Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.89320
	39	2441	0.87880
	78	2480	0.88860
$\pi/4$ DQPSK	0	2402	1.1930
	39	2441	1.1898

	78	2480	1.1978
8DPSK	0	2402	1.2056
	39	2441	1.2060
	78	2480	1.2092

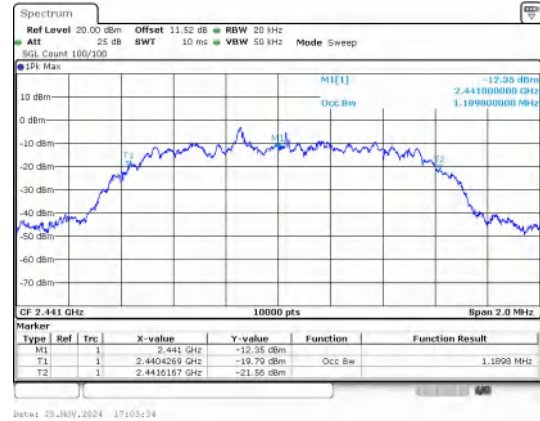
Test Graphs



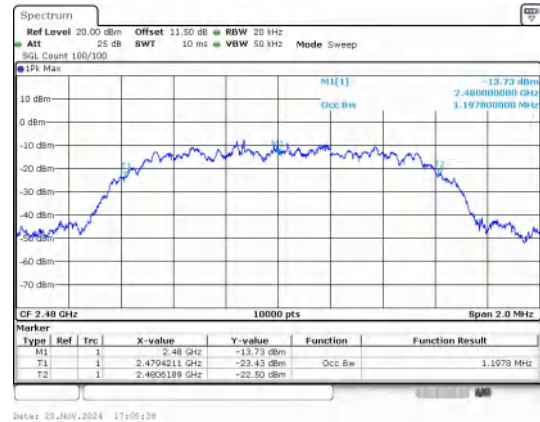
GFSK_DH5_Channel 0

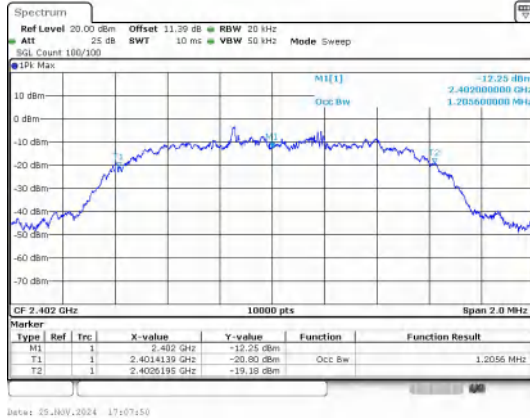

 $\pi/4$ DQPSK_2-DH5_Channel 0


GFSK_DH5_Channel 39

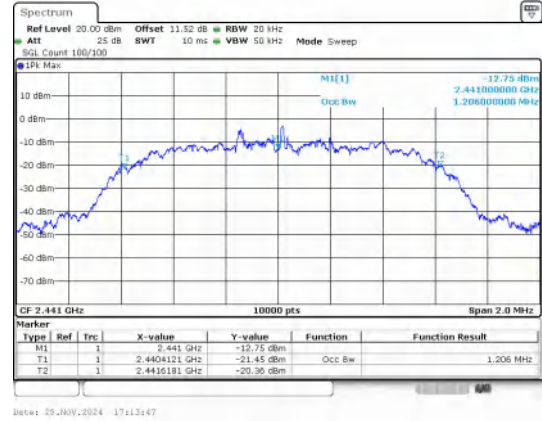

 $\pi/4$ DQPSK_2-DH5_Channel 39


GFSK_DH5_Channel 78

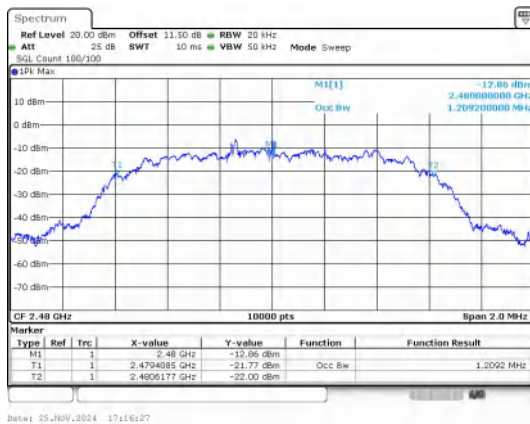

 $\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

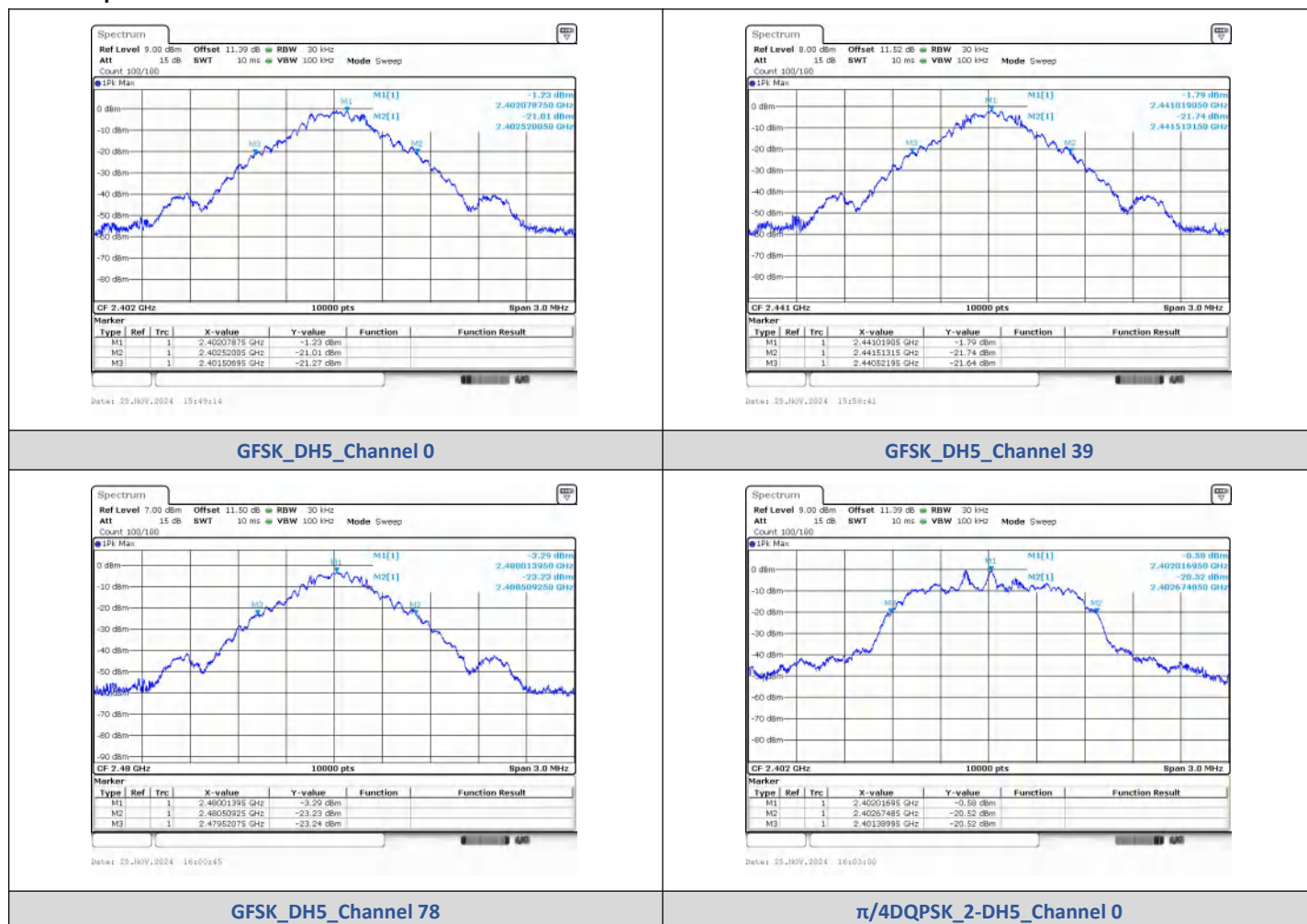
6) 20dB Bandwidth

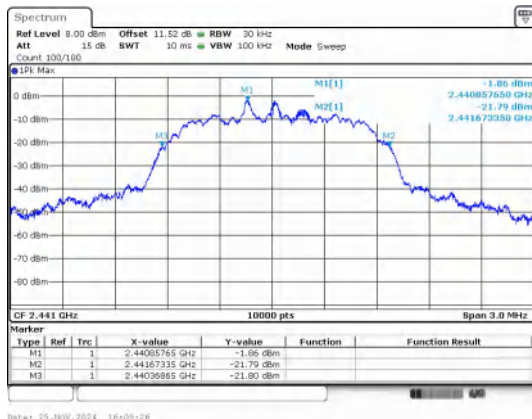
Test Result

Left:

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.010
	39	2441 MHz	0.9900
	78	2480 MHz	0.9900
$\pi/4$ QPSK	0	2402 MHz	1.280
	39	2441 MHz	1.300
	78	2480 MHz	1.280
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.290

Test Graphs

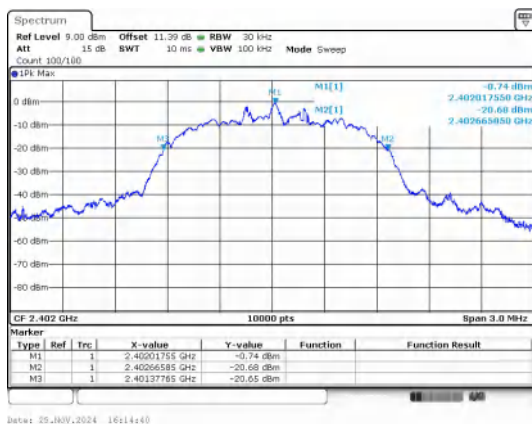




$\pi/4$ DQPSK_2-DH5_Channel 39



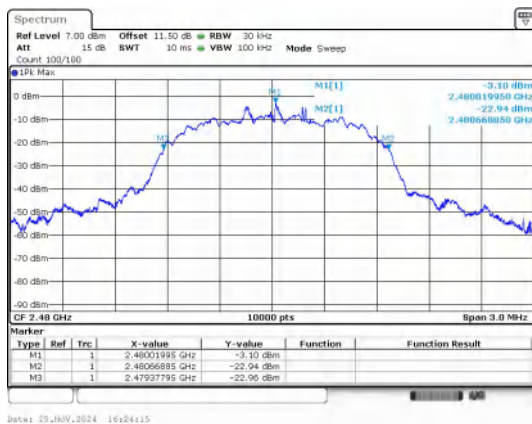
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



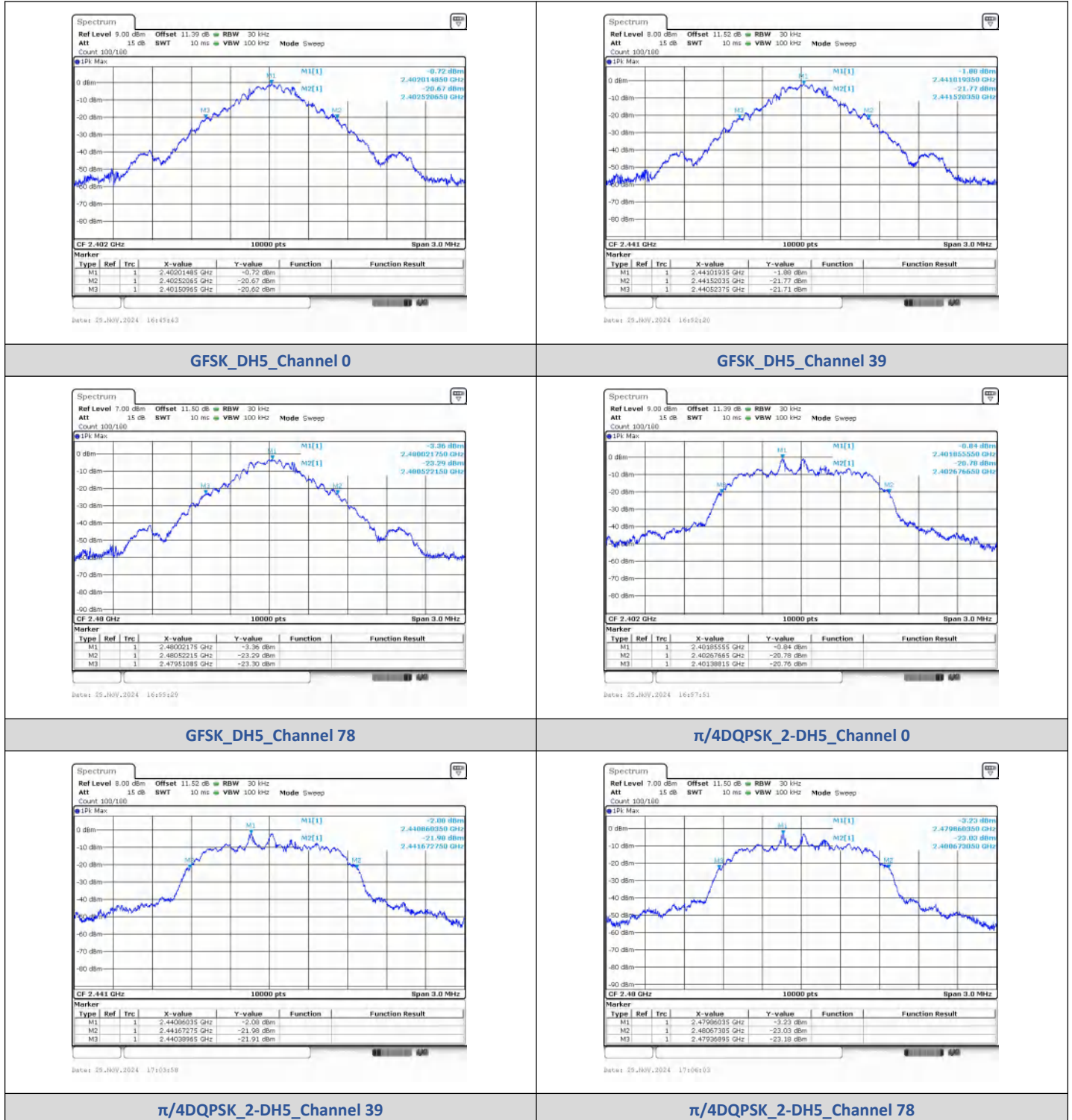
8DPSK_3-DH5_Channel 78

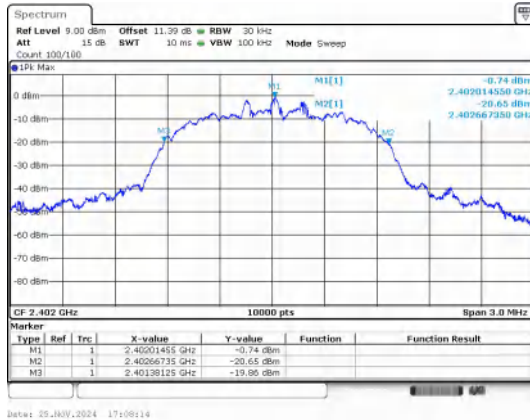
Right:

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.010
	39	2441 MHz	1.000
	78	2480 MHz	1.010
$\pi/4$ DQPSK	0	2402 MHz	1.290
	39	2441 MHz	1.280
	78	2480 MHz	1.300

8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.290
	78	2480 MHz	1.290

Test Graphs





8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

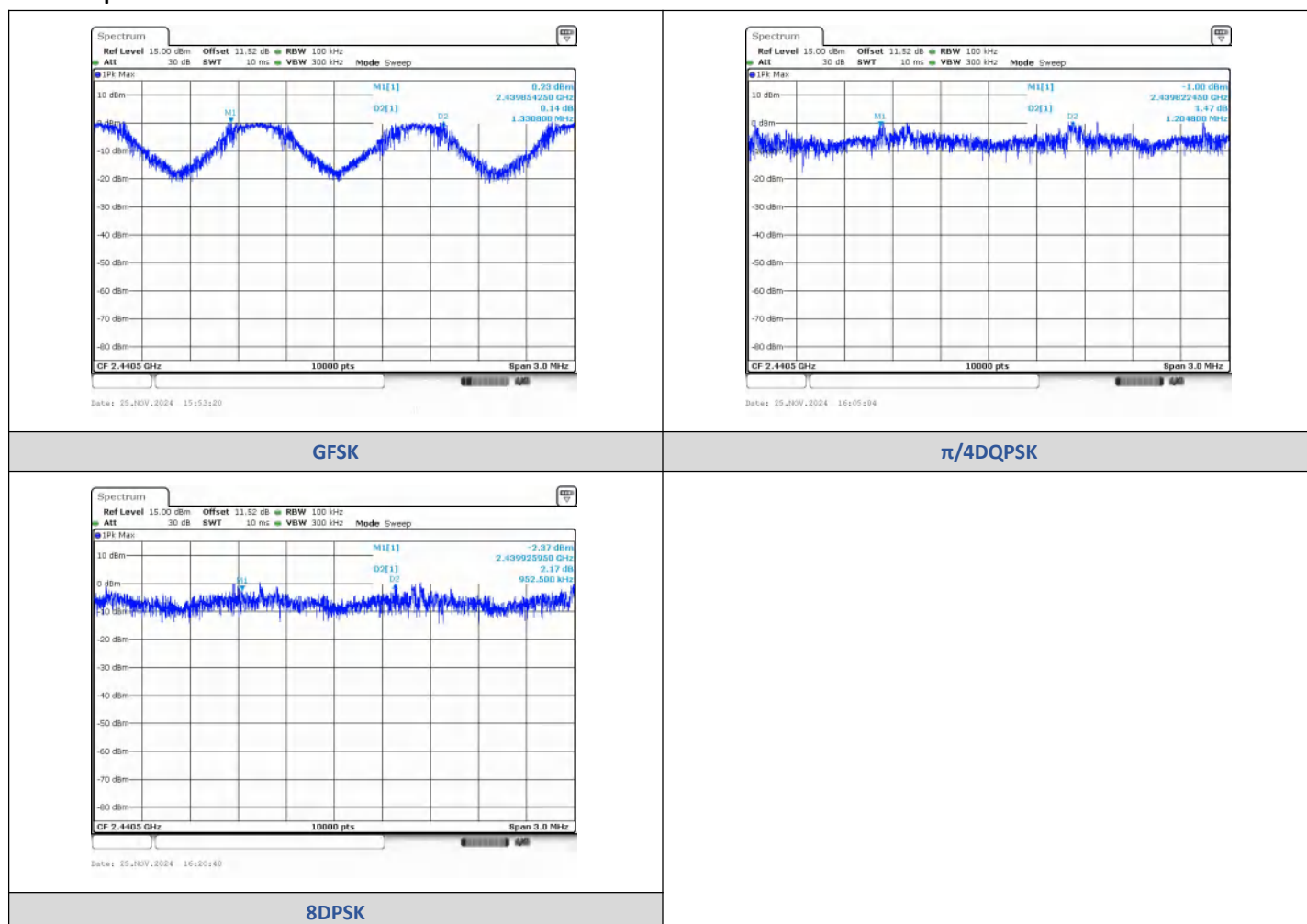
7) Carrier Frequencies Separation

Test Result

Left:

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8542	2441.1851	1.3308	1.01	PASS
$\pi/4$ DQPSK	2-DH5	2439.8225	2441.0273	1.2048	0.88	PASS
8DPSK	3-DH5	2439.9259	2440.8785	0.9525	0.867	PASS

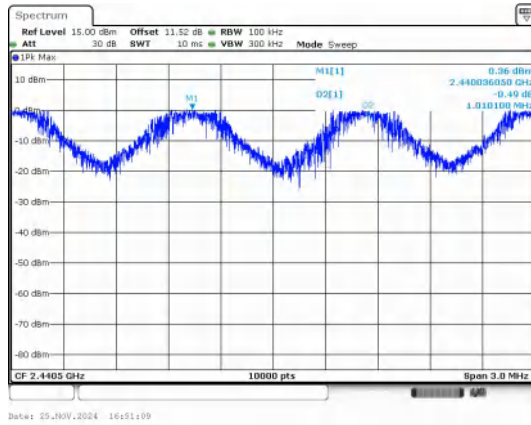
Test Graphs



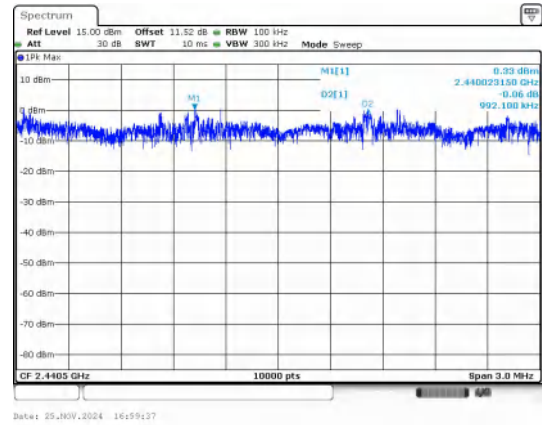
Right:

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0361	2441.0462	1.0101	1.01	PASS
$\pi/4$ DQPSK	2-DH5	2440.0231	2441.0152	0.9921	0.88	PASS
8DPSK	3-DH5	2439.8486	2440.8553	1.0068	0.86	PASS

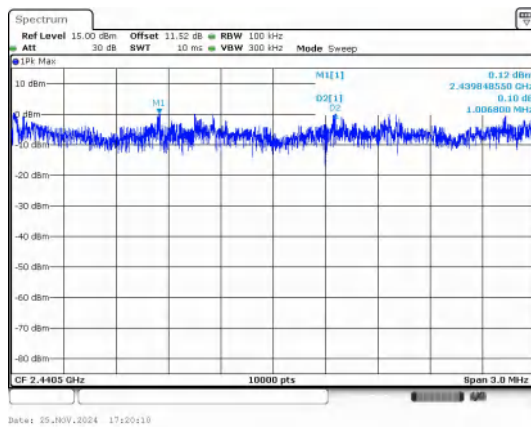
Test Graphs



GFSK



$\pi/4$ DQPSK



8DPSK

8) Conducted Out Of Band Emission

Test Result

Left:

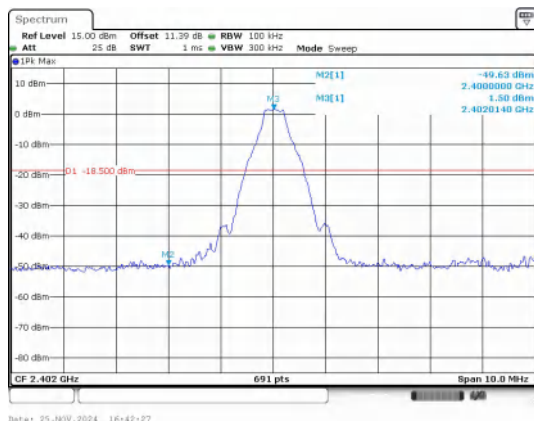
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-49.630	-18.5	-31.130	PASS
			4803.85	-45.285	-18.5	-26.785	PASS
		39	9763.72	-41.990	-19.48	-22.510	PASS
		78	2483.50	-51.100	-20.66	-30.440	PASS
			9920.20	-41.291	-20.66	-20.631	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-47.640	-18.43	-29.210	PASS
			9608.08	-45.943	-18.43	-27.513	PASS
		39	9763.72	-41.224	-19.63	-21.594	PASS
		78	2483.50	-50.150	-20.82	-29.330	PASS
			9920.20	-41.219	-20.82	-20.399	PASS
8DPSK	3-DH5	0	2400.00	-47.890	-18.52	-29.370	PASS
			9608.08	-46.232	-18.52	-27.712	PASS
		39	9763.72	-41.700	-19.47	-22.230	PASS
		78	2483.50	-51.570	-20.63	-30.940	PASS
			9920.20	-41.185	-20.63	-20.555	PASS

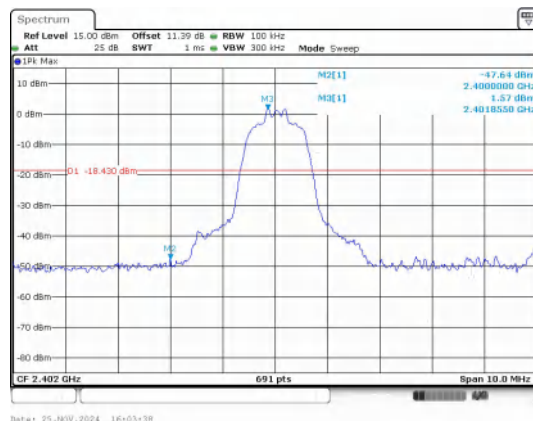
Hopping

Hopping							
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.21	-47.872	-18.47	-29.402	PASS
			2400.00	-49.740	-18.47	-31.270	PASS
			2483.50	-49.850	-21.08	-28.770	PASS
$\pi/4$ DQPSK	2-DH5		2397.15	-48.838	-18.56	-30.278	PASS
			2400.00	-50.210	-18.56	-31.650	PASS
			2483.50	-48.710	-20.58	-28.130	PASS
8DPSK	3-DH5		2398.31	-48.417	-18.55	-29.867	PASS
			2400.00	-50.540	-18.55	-31.990	PASS
			2483.50	-50.400	-21.27	-29.130	PASS

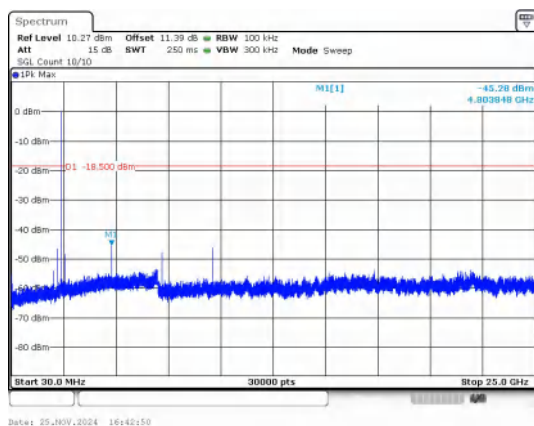
Test Graphs



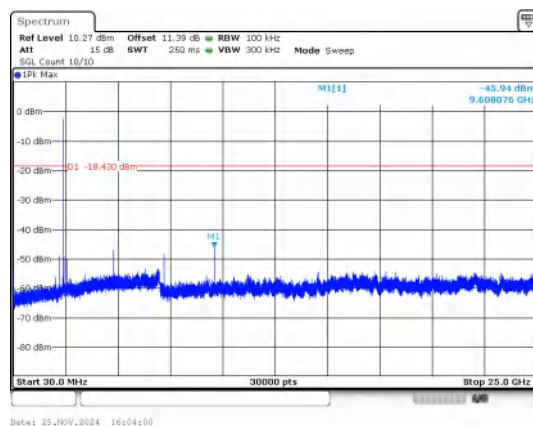
Out Of Band Emission
GFSK_DH5_Channel 0



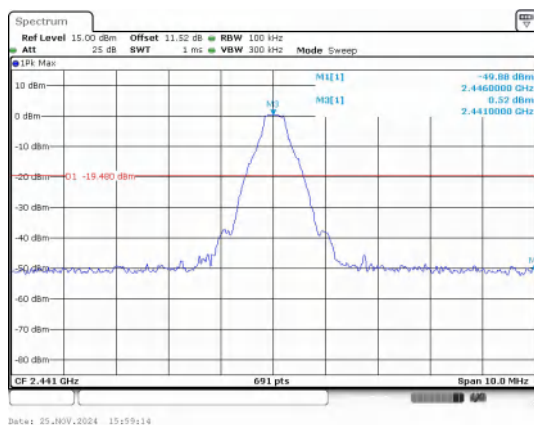
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



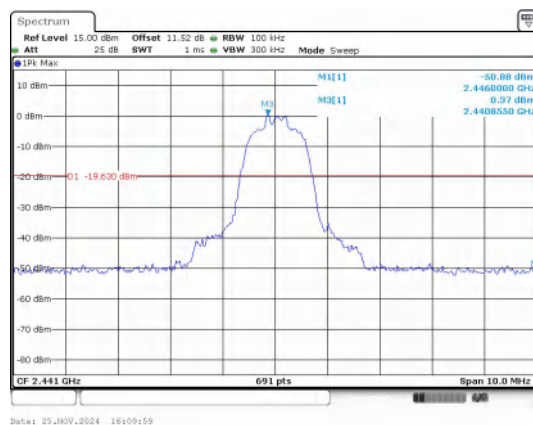
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



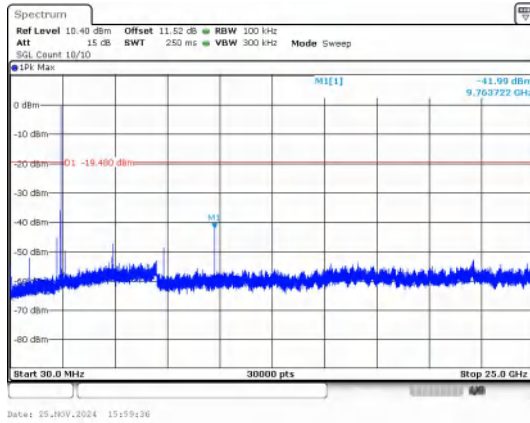
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



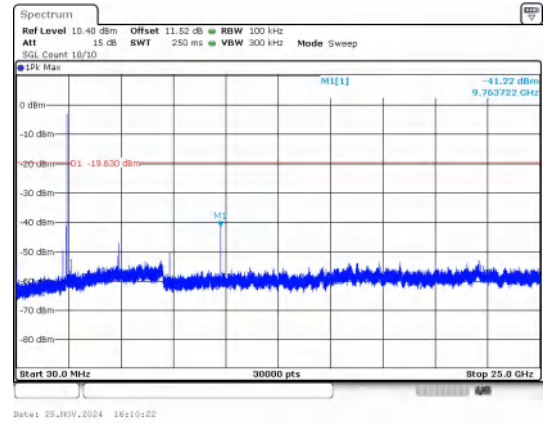
Out Of Band Emission
GFSK_DH5_Channel 39



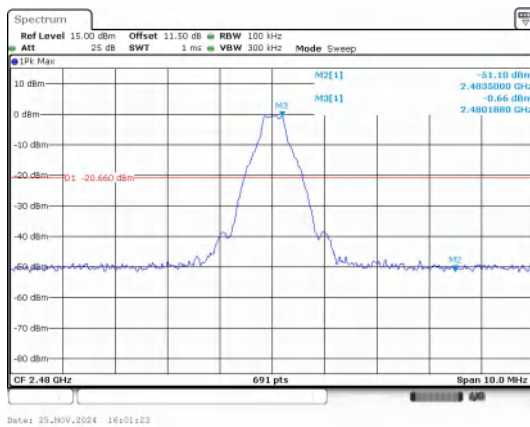
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



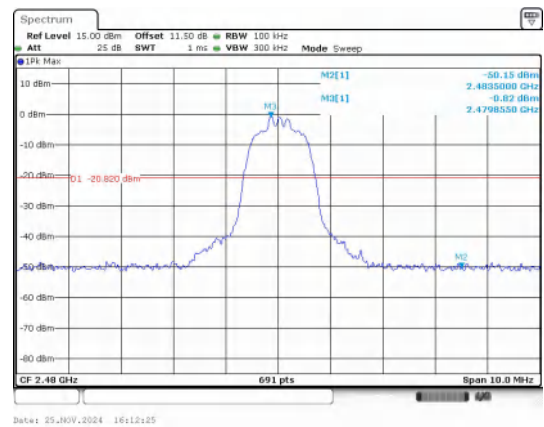
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



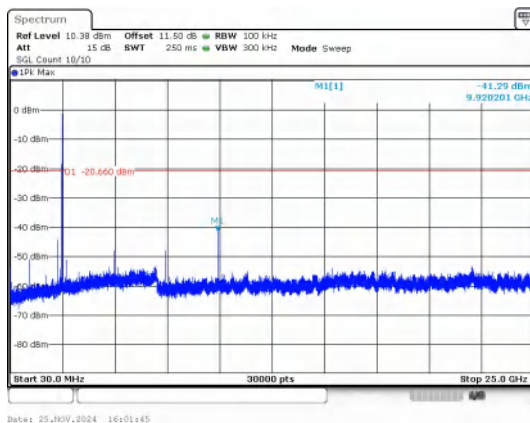
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



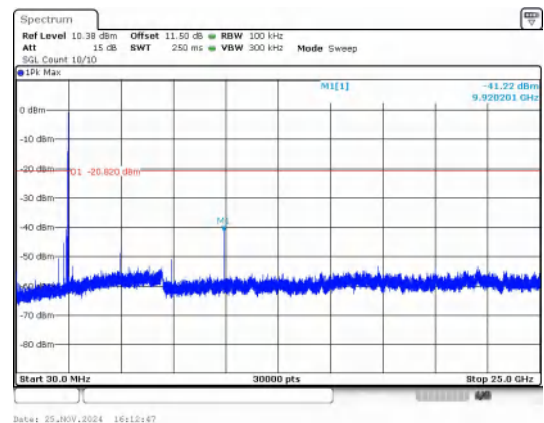
Out Of Band Emission
GFSK_DH5_Channel 78



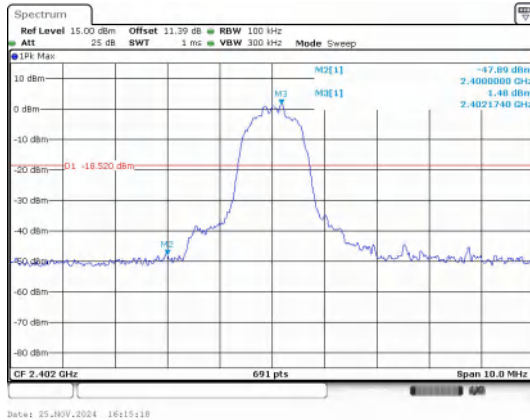
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



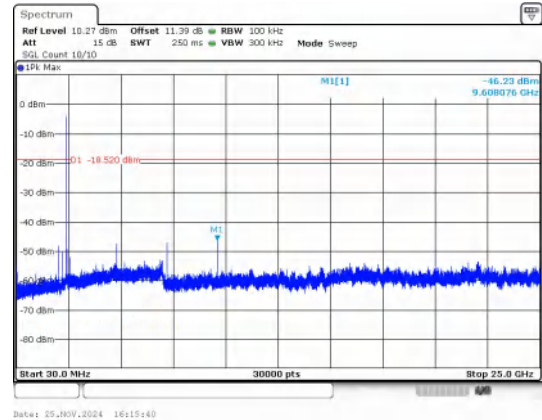
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



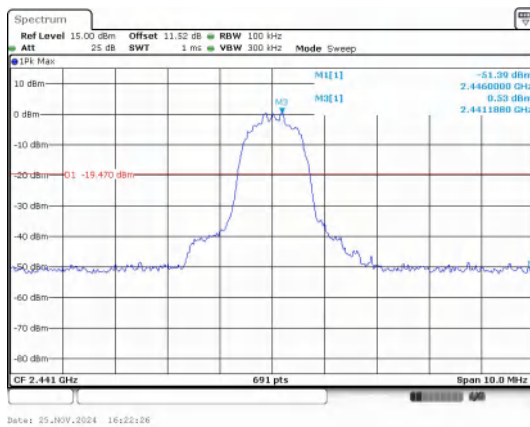
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



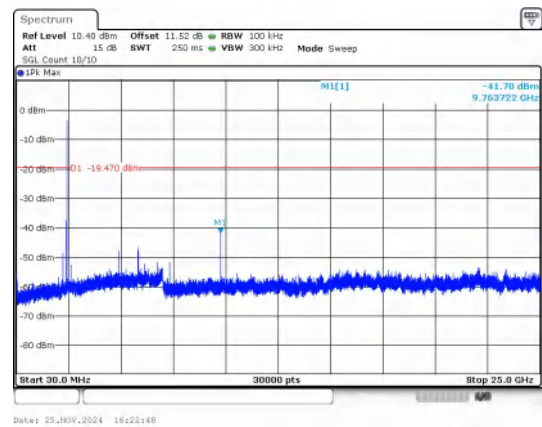
Out Of Band Emission
8DPSK_3-DH5_Channel 0



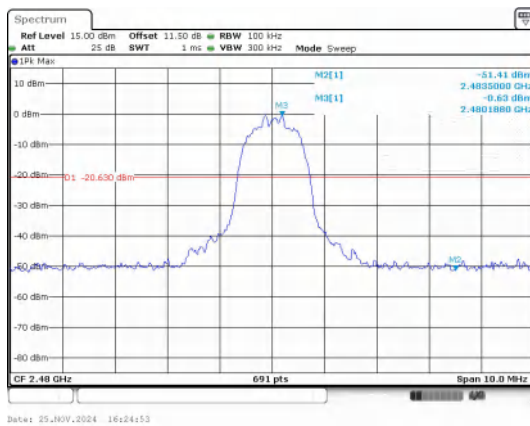
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



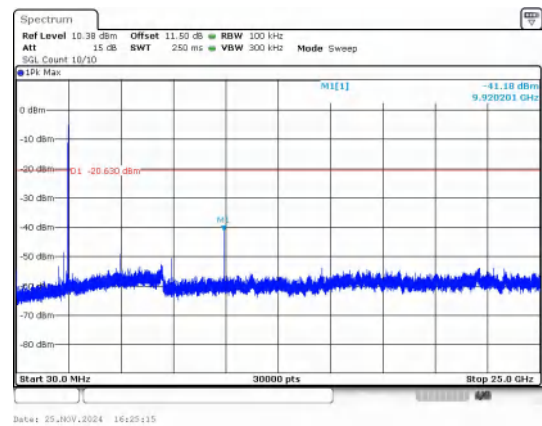
Out Of Band Emission
8DPSK_3-DH5_Channel 39



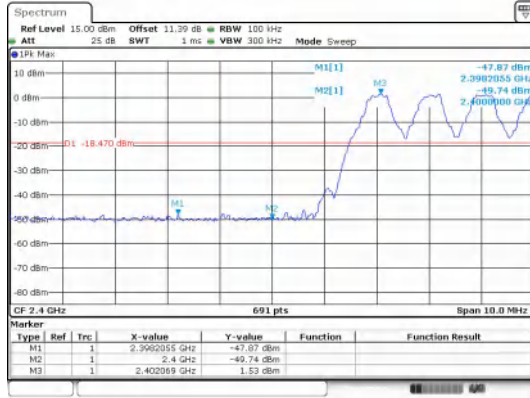
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



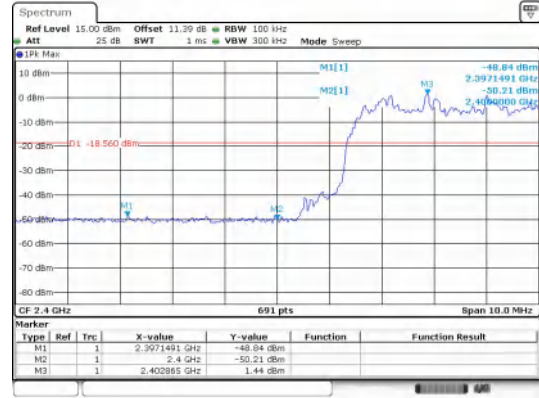
Out Of Band Emission
8DPSK_3-DH5_Channel 78



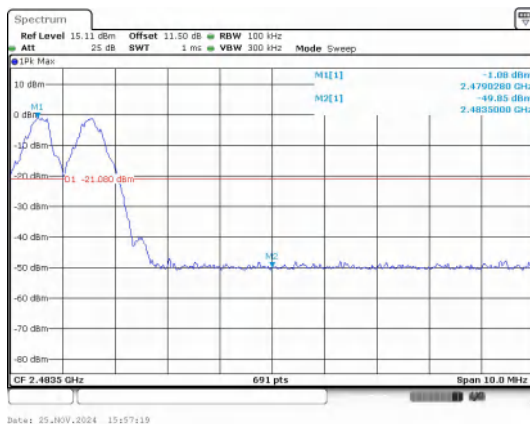
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



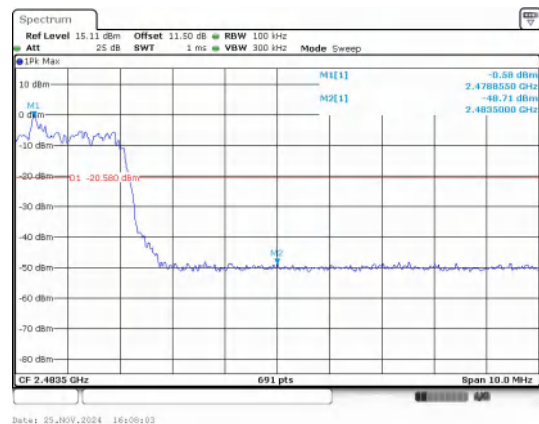
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



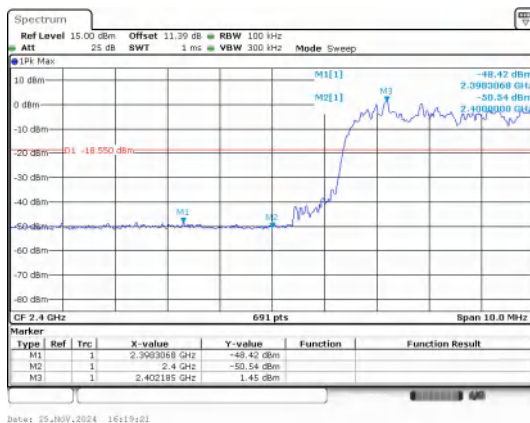
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



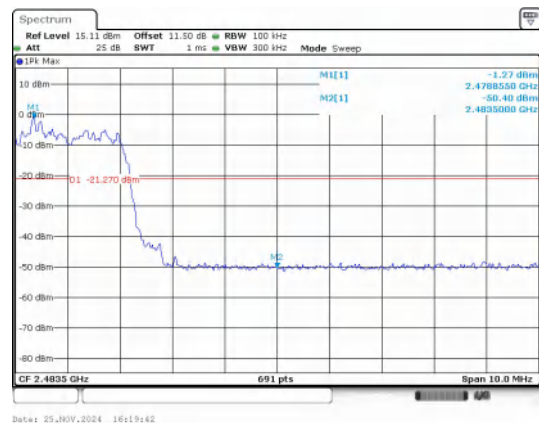
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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

Right:
Non-Hopping

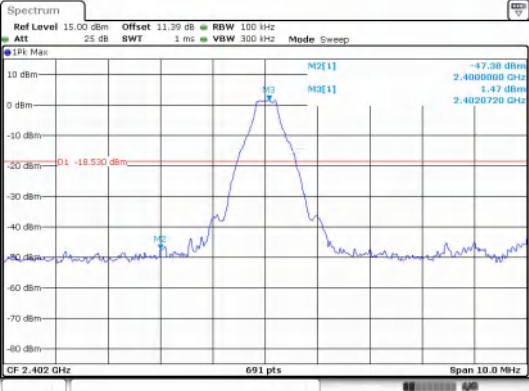
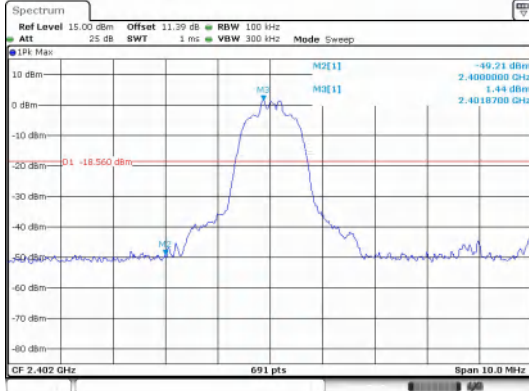
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
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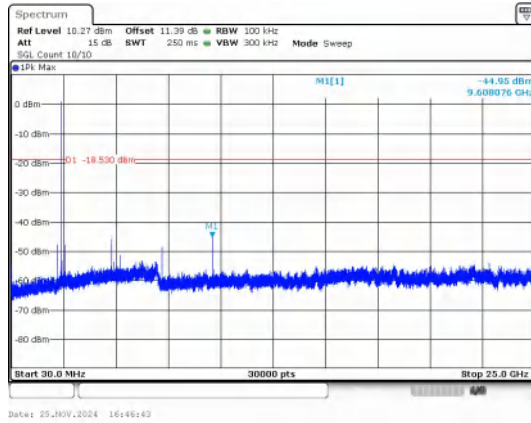
GFSK	DH5	0	2400.00	-47.380	-18.53	-28.850	PASS
			9608.08	-44.952	-18.53	-26.422	PASS
		39	5830.11	-41.874	-19.58	-22.294	PASS
		78	2483.50	-51.030	-20.78	-30.250	PASS
			9920.20	-42.045	-20.78	-21.265	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-49.210	-18.56	-30.650	PASS
			9608.08	-45.827	-18.56	-27.267	PASS
		39	9763.72	-41.719	-19.61	-22.109	PASS
		78	2483.50	-49.640	-20.75	-28.890	PASS
			9920.20	-40.990	-20.75	-20.240	PASS
8DPSK	3-DH5	0	2400.00	-46.260	-18.52	-27.740	PASS
			7205.96	-35.454	-18.52	-16.934	PASS
		39	9763.72	-40.889	-19.56	-21.329	PASS
		78	2483.50	-50.440	-20.71	-29.730	PASS
			9920.20	-41.129	-20.71	-20.419	PASS

Hopping

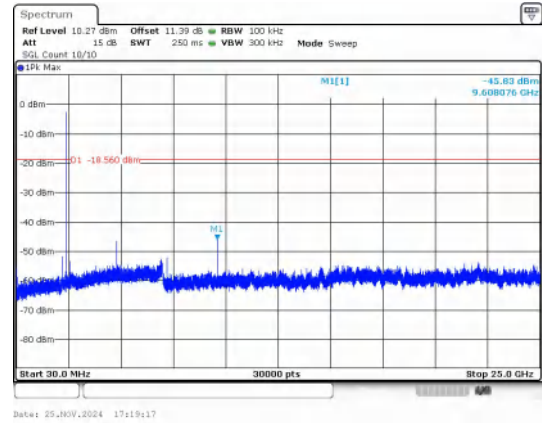
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.95	-48.667	-18.78	-29.887	PASS
			2400.00	-50.580	-18.78	-31.800	PASS
			2483.50	-49.570	-20.66	-28.910	PASS
$\pi/4$ DQPSK	2-DH5		2397.03	-48.604	-18.69	-29.914	PASS
			2400.00	-50.570	-18.69	-31.880	PASS
			2483.50	-50.300	-21.11	-29.190	PASS
8DPSK	3-DH5		2395.15	-48.442	-18.84	-29.602	PASS
			2400.00	-50.900	-18.84	-32.060	PASS
			2483.50	-50.310	-22.17	-28.140	PASS

Test Graphs

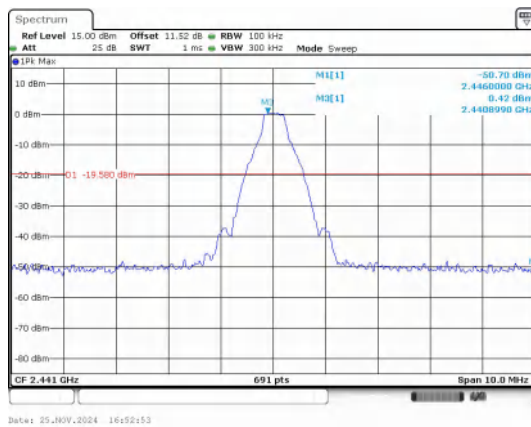
 Out Of Band Emission GFSK_DH5_Channel 0	 Out Of Band Emission $\pi/4$DQPSK_2-DH5_Channel 0
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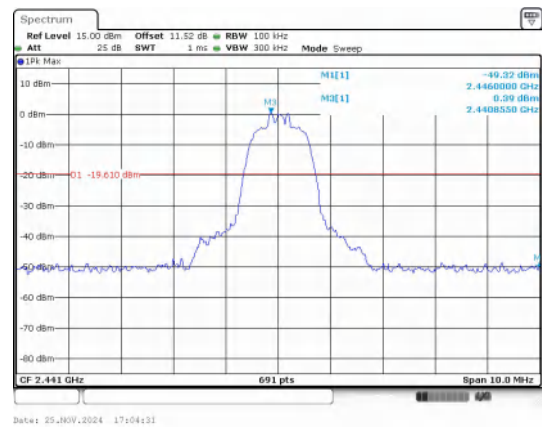
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



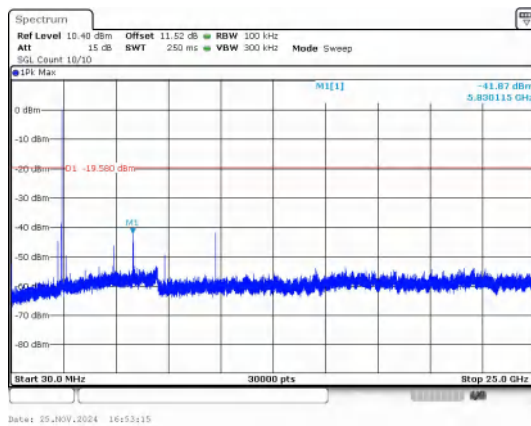
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



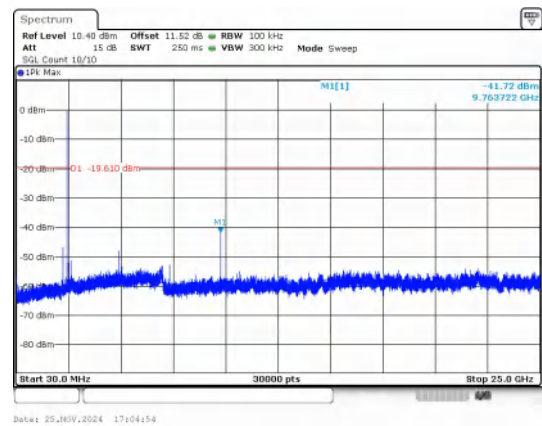
Out Of Band Emission
GFSK_DH5_Channel 39



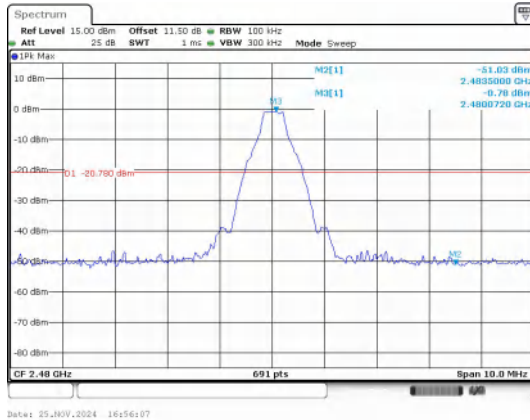
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



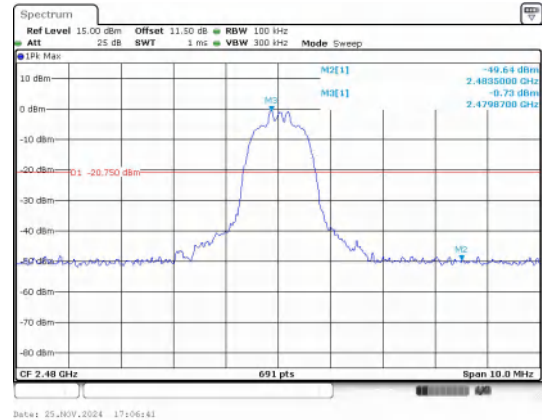
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



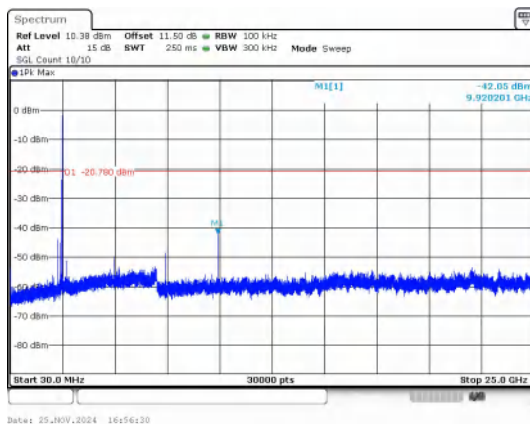
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



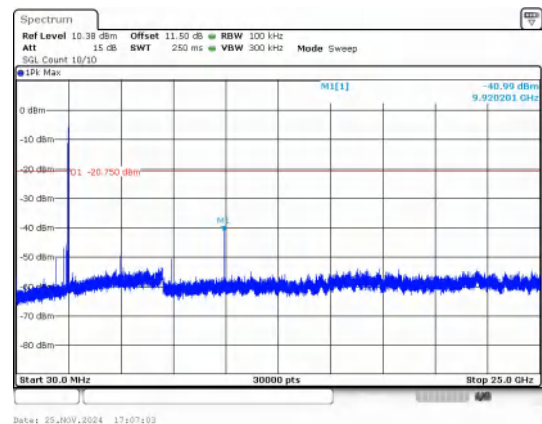
Out Of Band Emission
GFSK_DH5_Channel 78



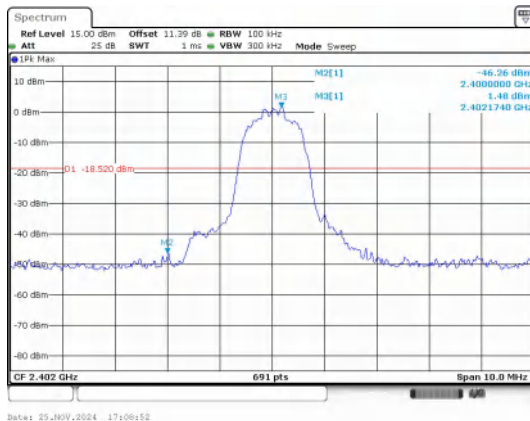
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 78



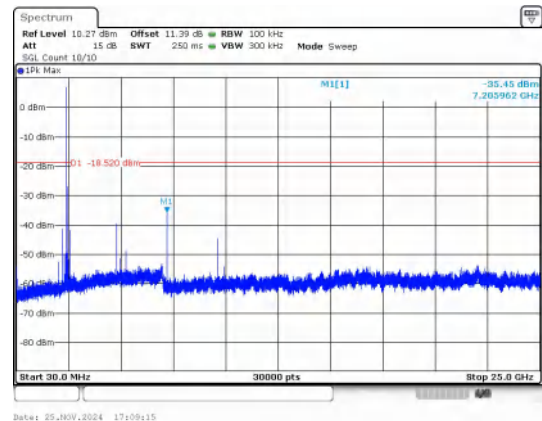
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



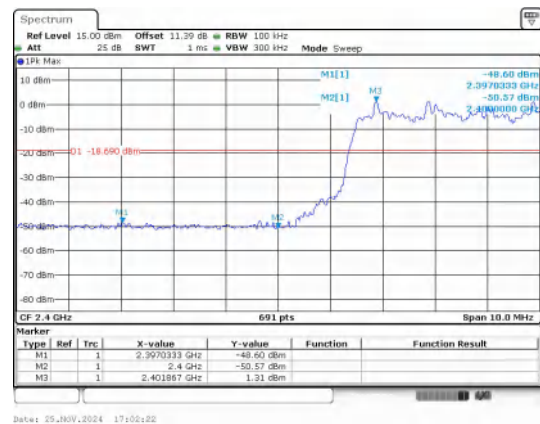
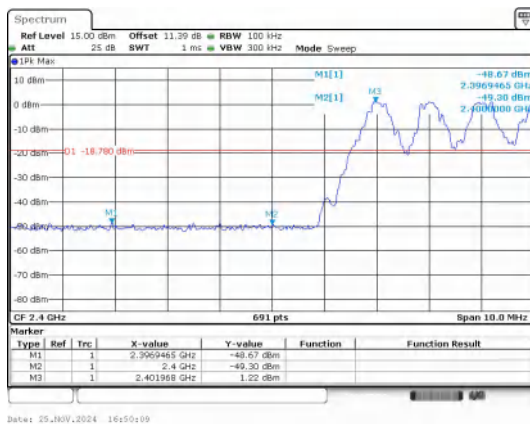
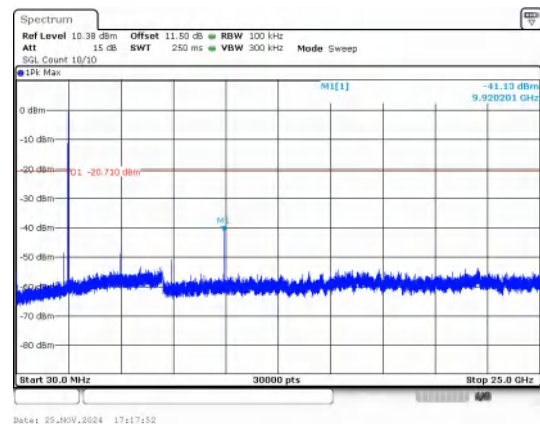
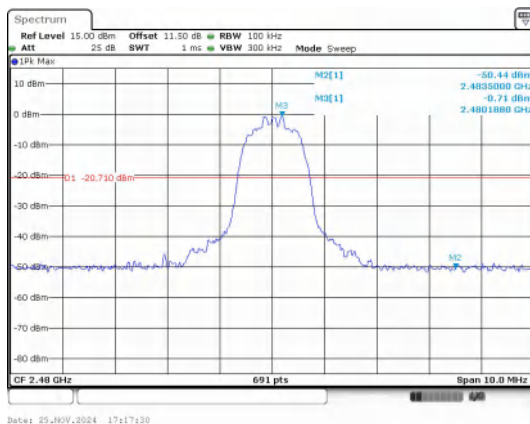
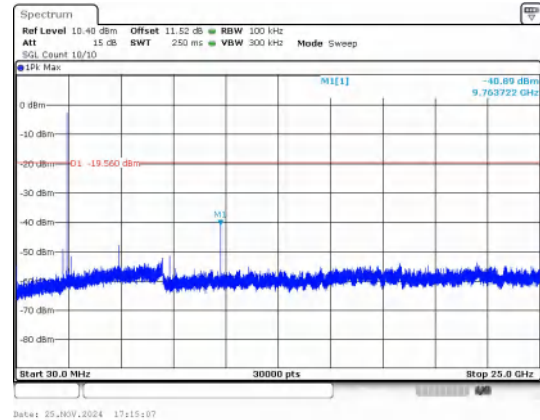
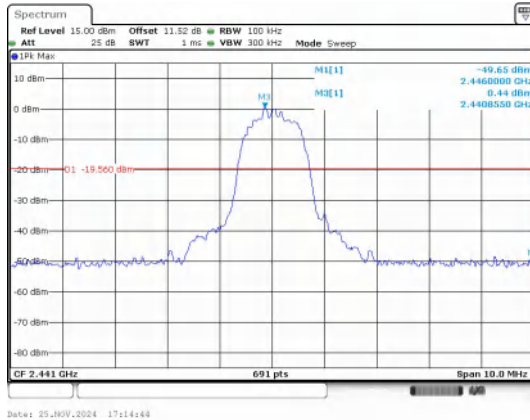
30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 78

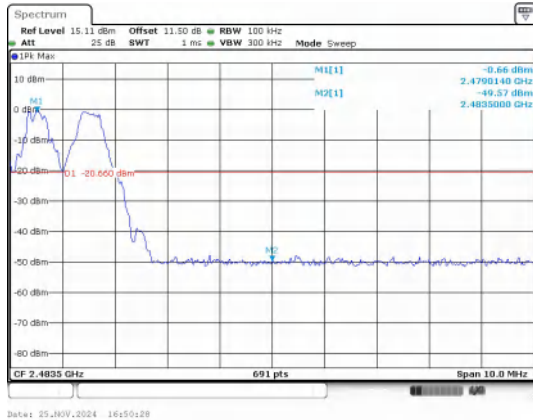


Out Of Band Emission
8DPSK_3-DH5_Channel 0

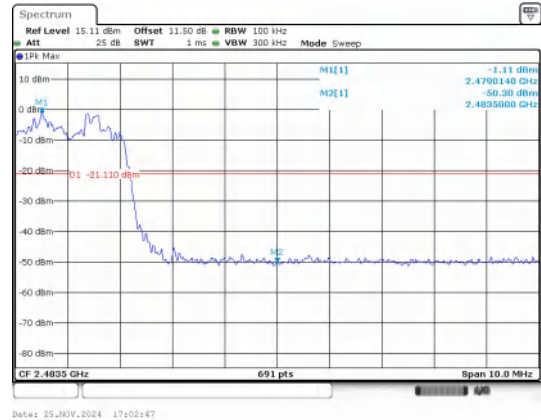


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0

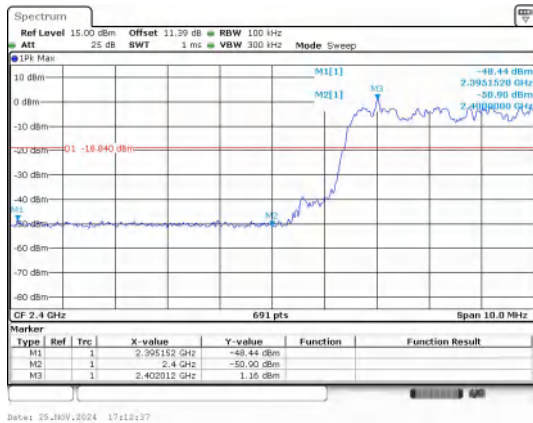




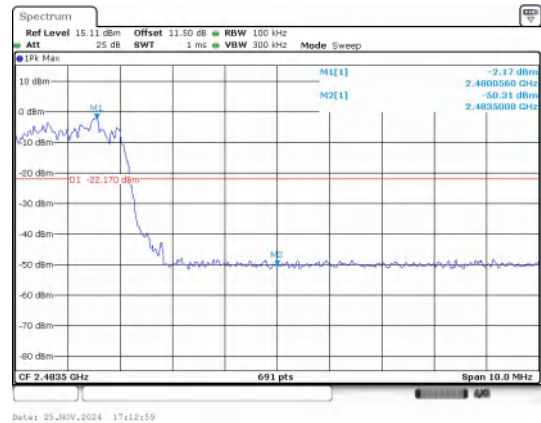
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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

-----End of the report-----