

Appendix A

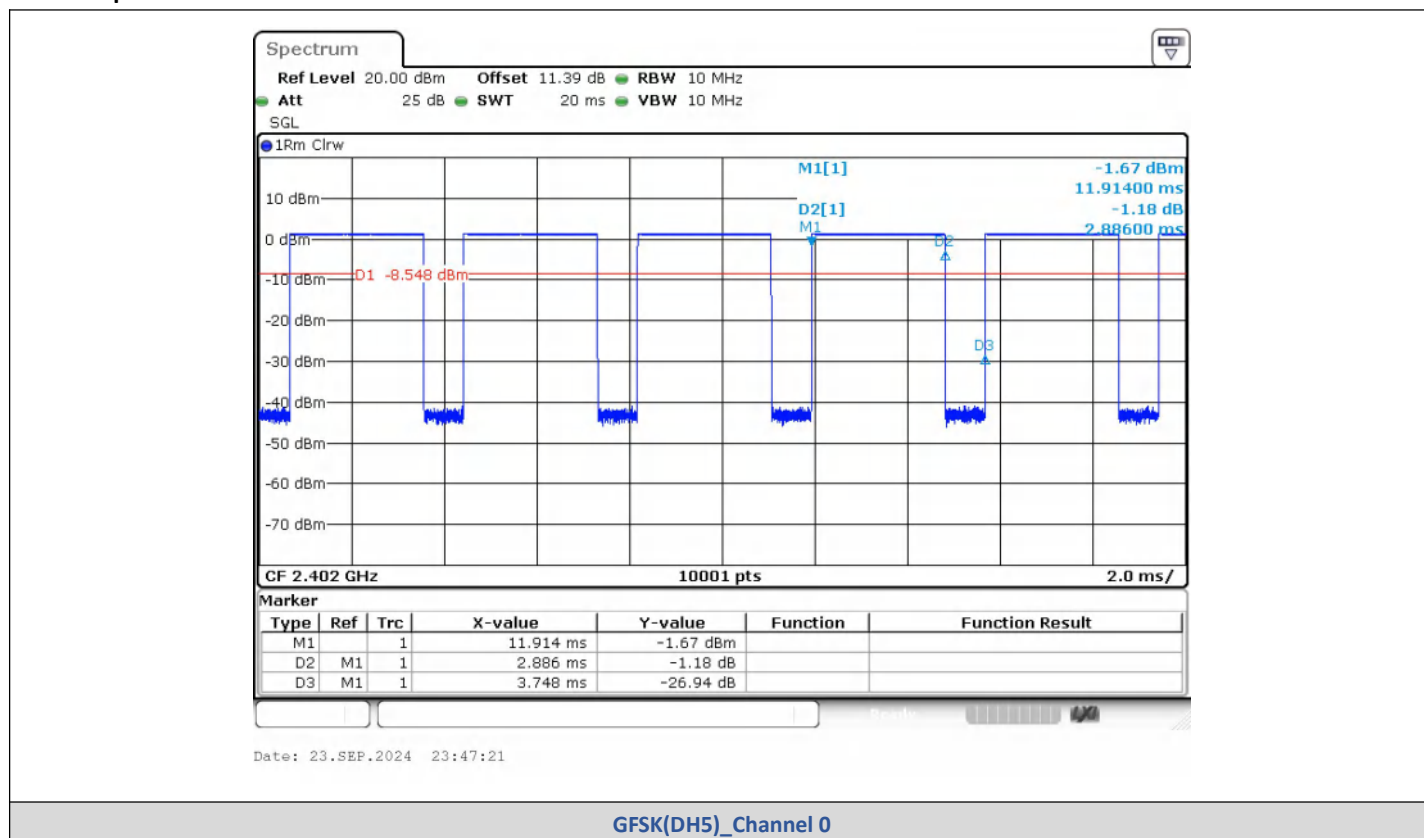
Report No.:	CISRR240919182
FCC ID:	2BK9M-SUPERTALK
Product Name:	Helmet Headphones
Model No.:	SUPERTALK
Test Engineer:	Mark Fu
Supervised by:	Rory Huang

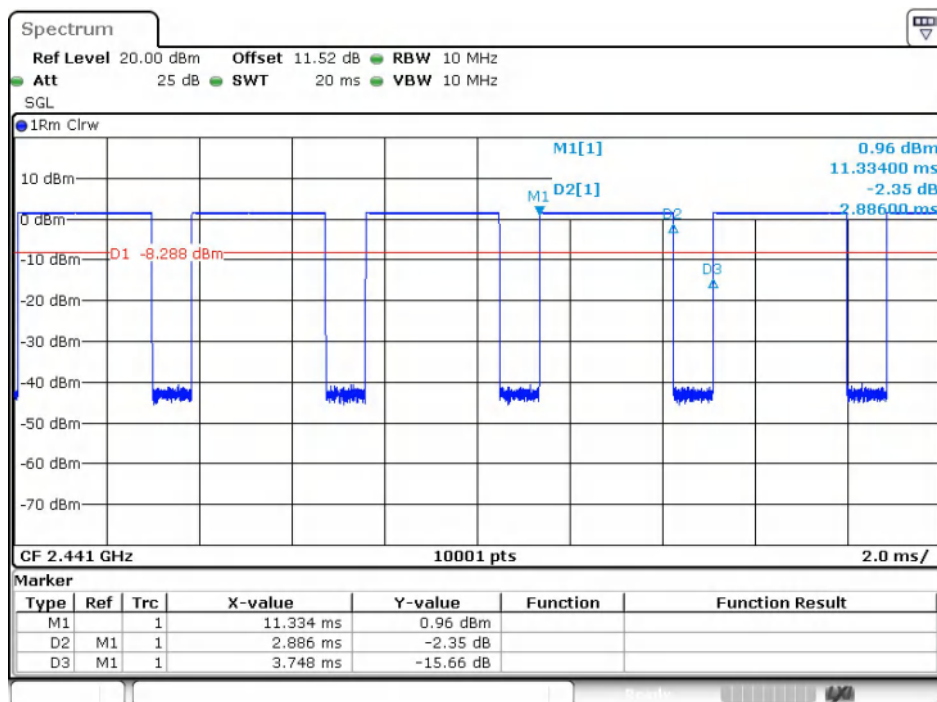
1) Duty Cycle

Test Result

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

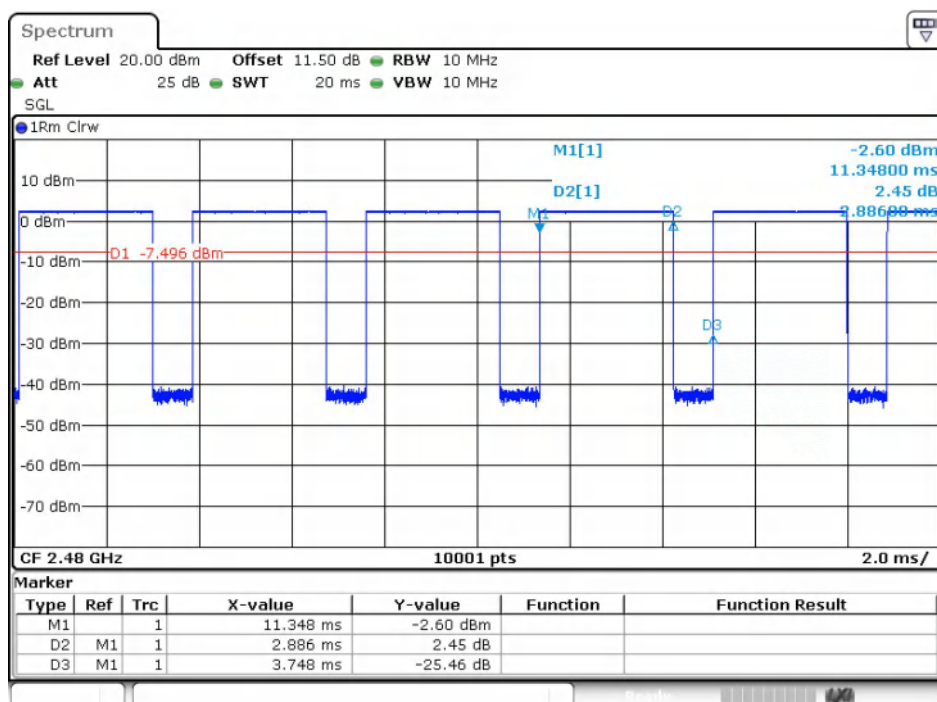
Test Graphs





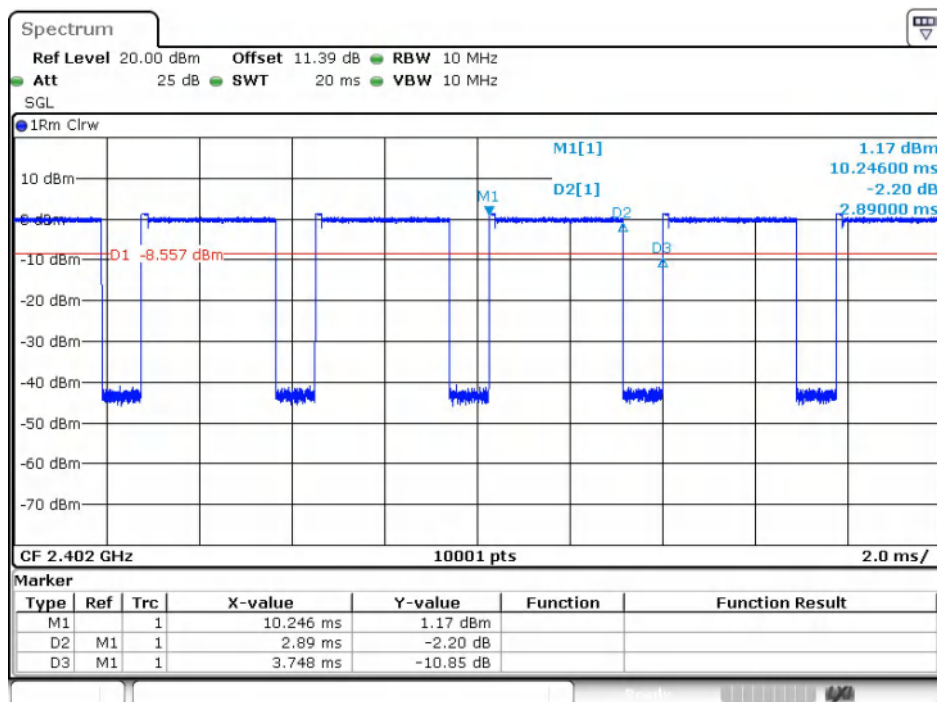
Date: 24.SEP.2024 00:02:56

GFSK(DH5)_Channel 39



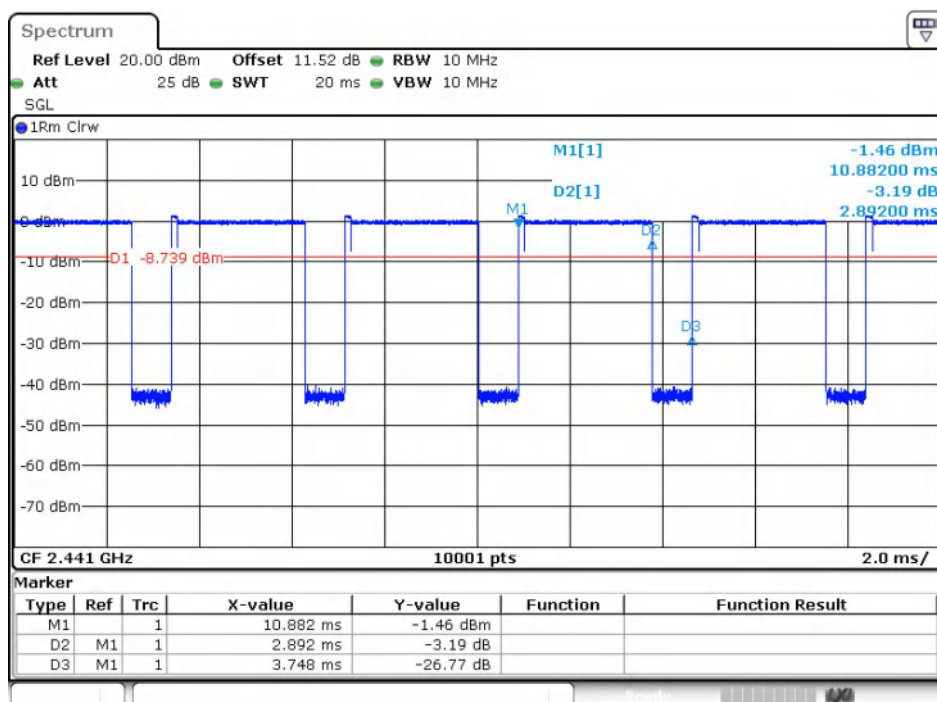
Date: 24.SEP.2024 00:05:18

GFSK(DH5)_Channel 78



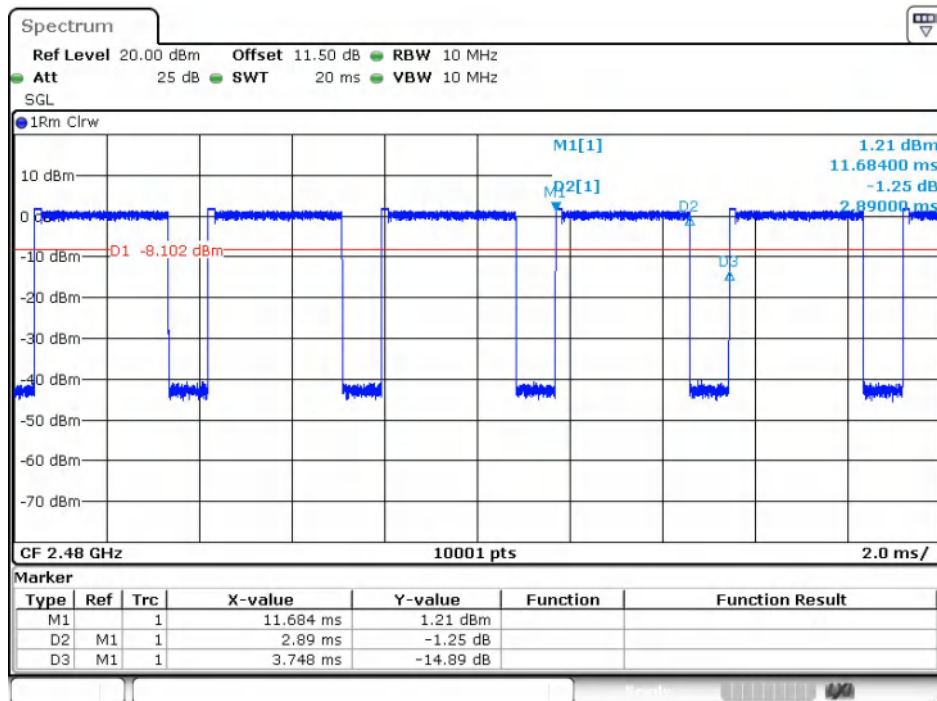
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$\pi/4$ QPSK(2-DH5)_Channel 0



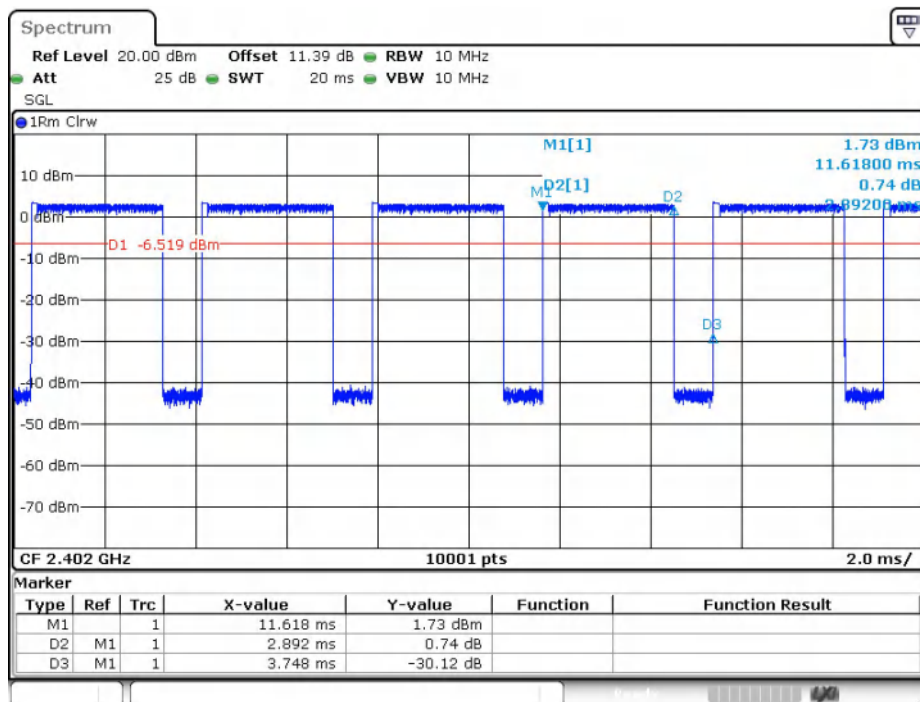
Date: 24.SEP.2024 00:14:45

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



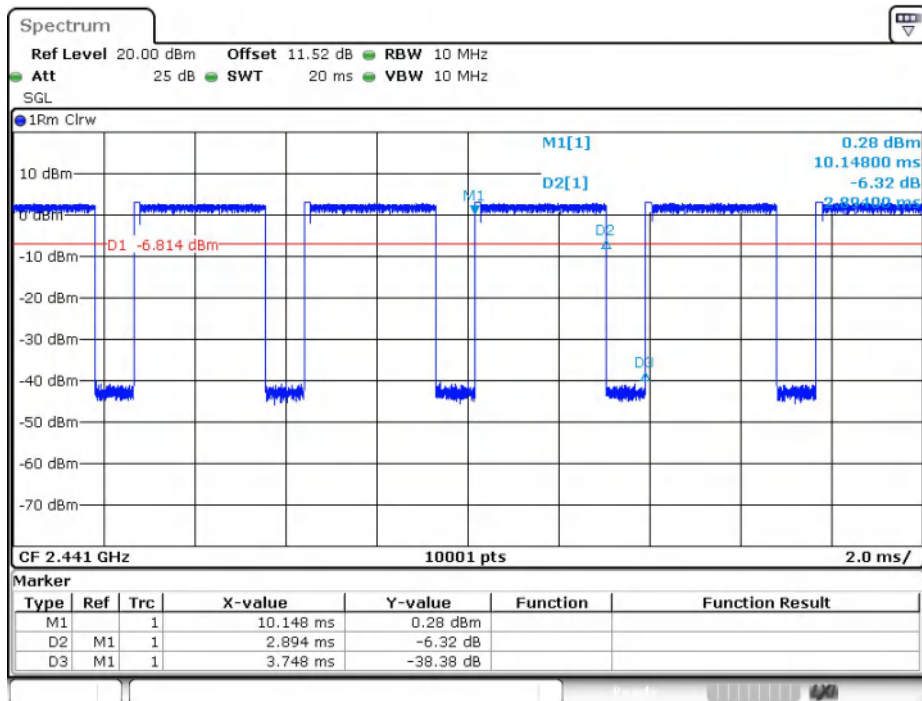
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$\pi/4$ DQPSK(2-DH5)_Channel 78



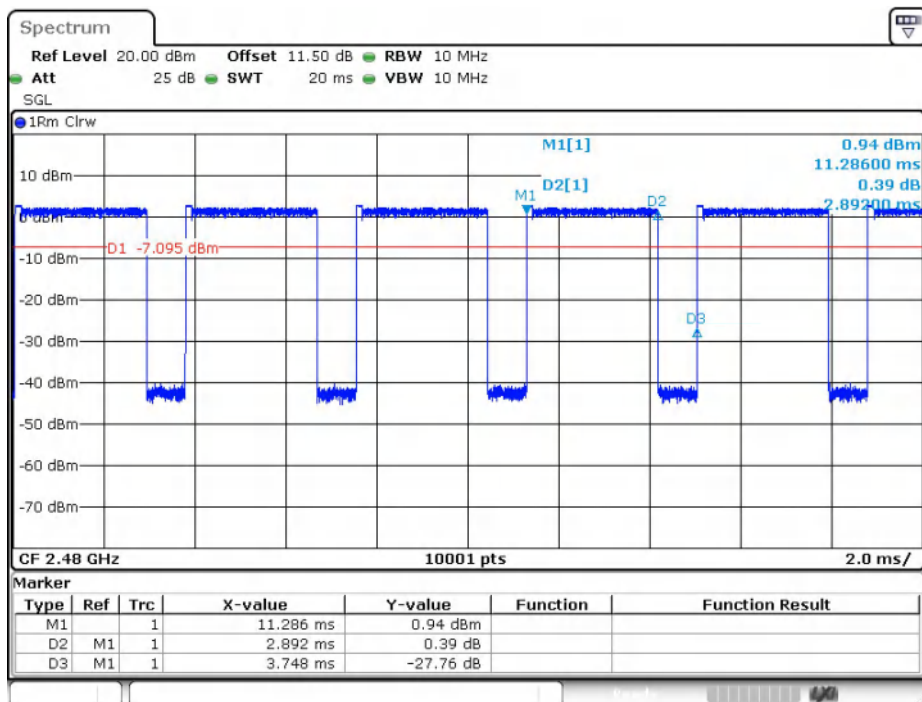
Date: 24.SEP.2024 16:15:39

8DPSK(3-DH5)_Channel 0



Date: 24.SEP.2024 16:17:15

8DPSK(3-DH5)_Channel 39



Date: 24.SEP.2024 16:16:17

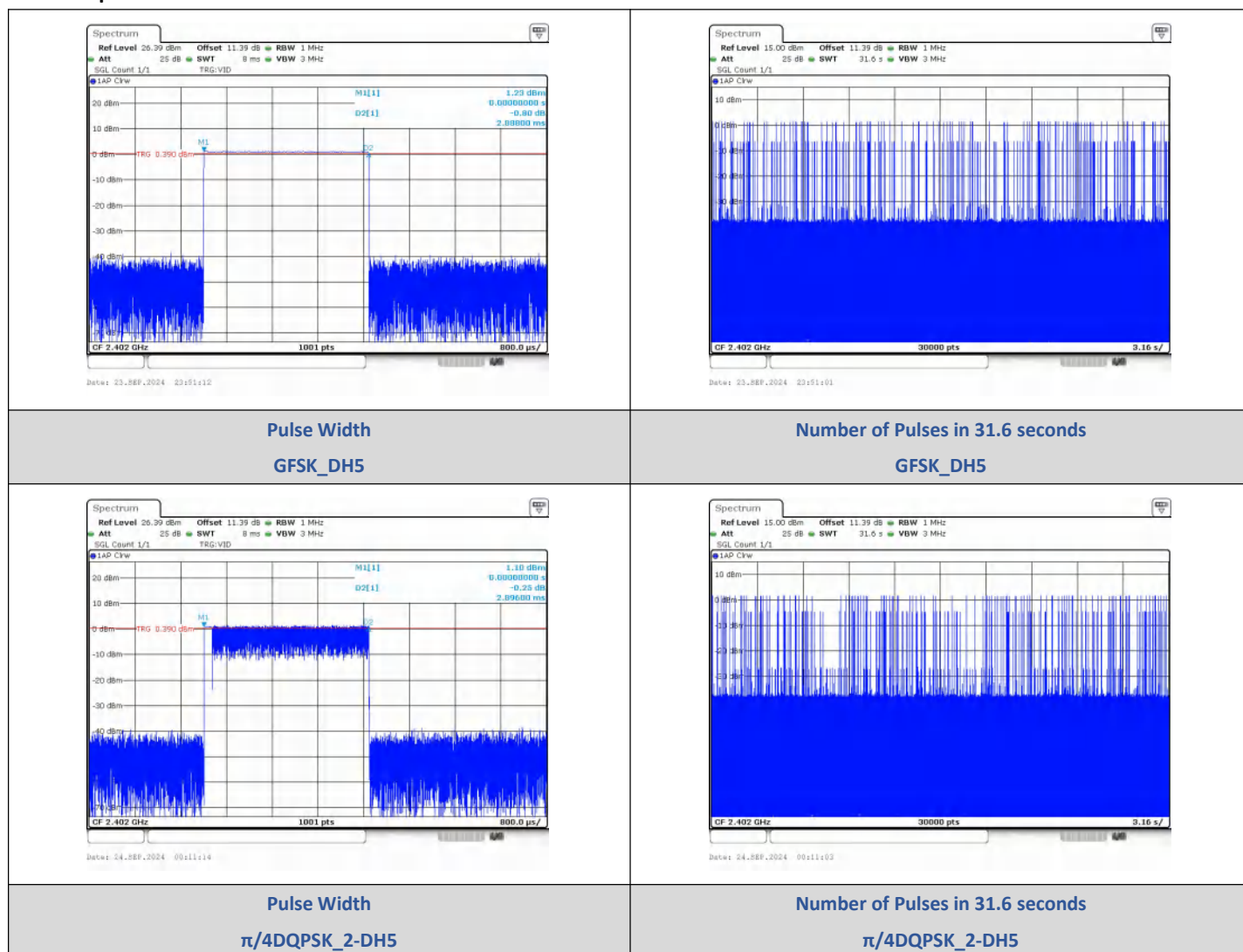
8DPSK(3-DH5)_Channel 78

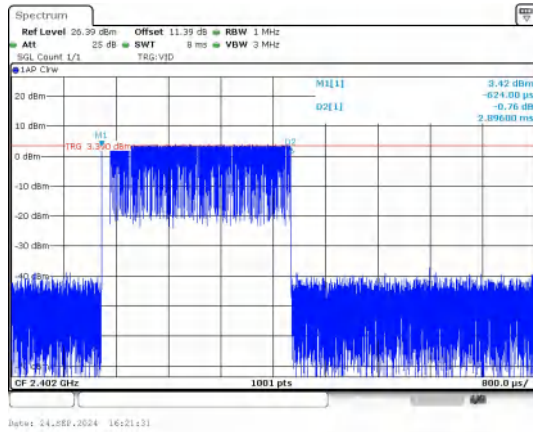
2) Dwell Time

Test Result

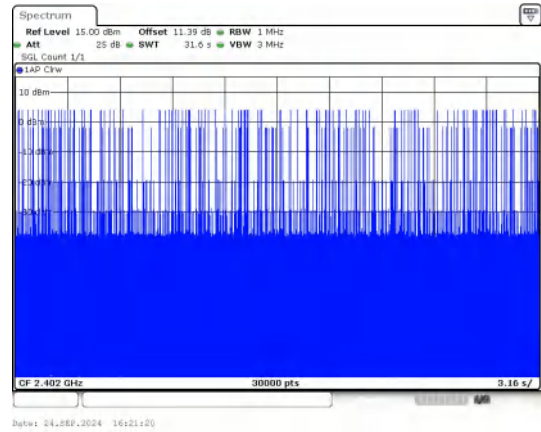
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.888	106	306.13	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	110	318.56		PASS
8DPSK	3-DH5		2.896	117	338.83		PASS

Test Graphs





Pulse Width
8DPSK_3-DH5



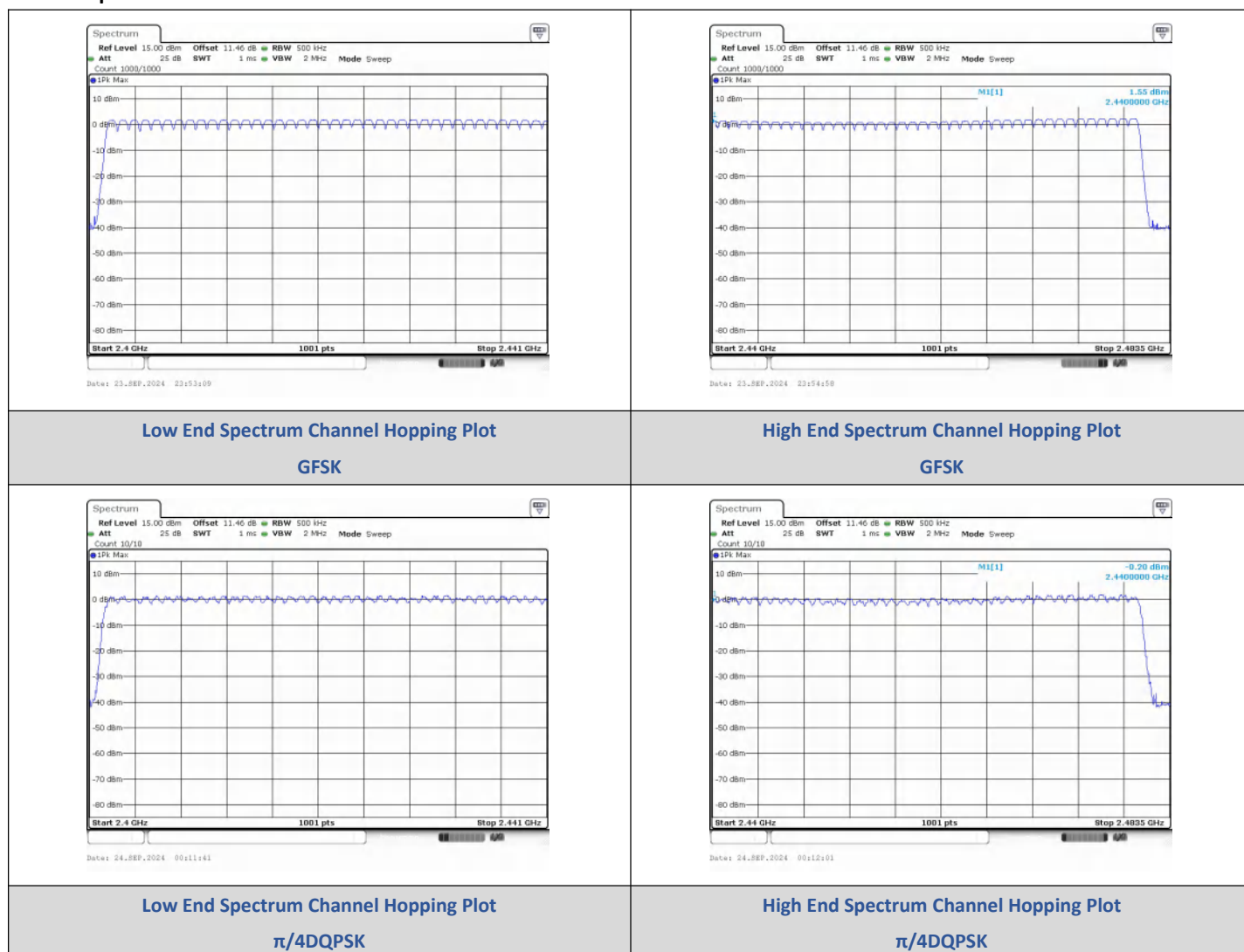
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

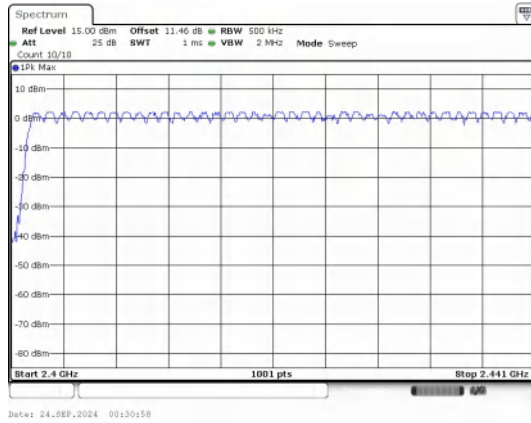
3) Number Of Hopping Channel

Test Result

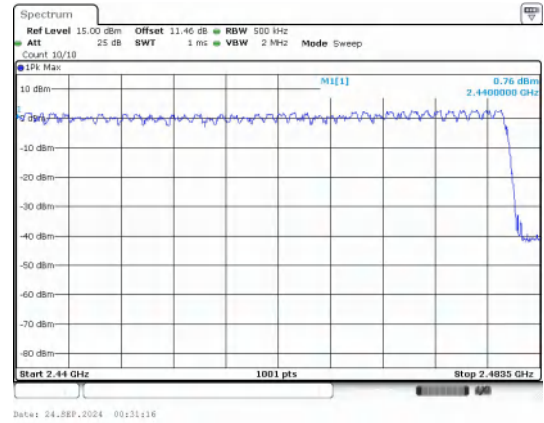
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



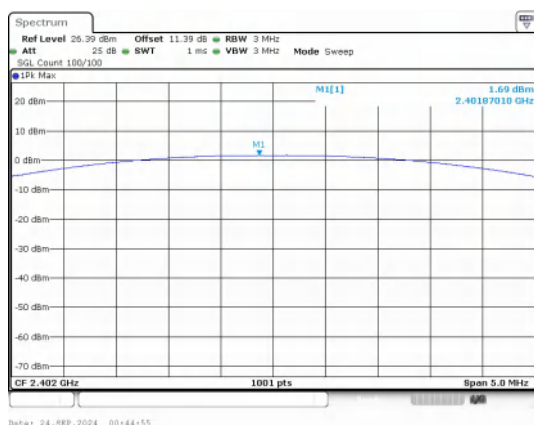
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Peak Output Power

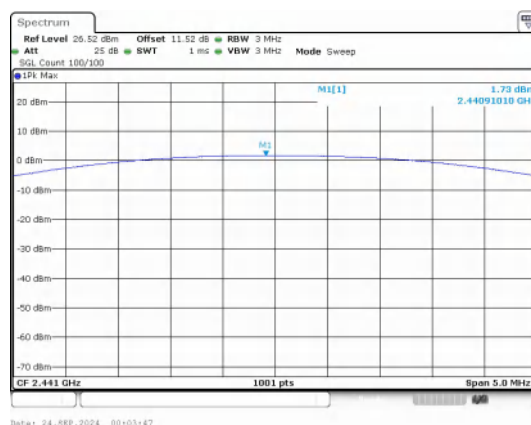
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	1.69	1.48	≤30	PASS
		39	1.73	1.49		PASS
		78	2.34	1.71		PASS
$\pi/4$ DQPSK	2-DH5	0	2.16	1.64	≤20.97	PASS
		39	1.98	1.58		PASS
		78	2.66	1.85		PASS
8DPSK	3-DH5	0	2.77	1.89		PASS
		39	2.76	1.89		PASS
		78	3.70	2.34		PASS

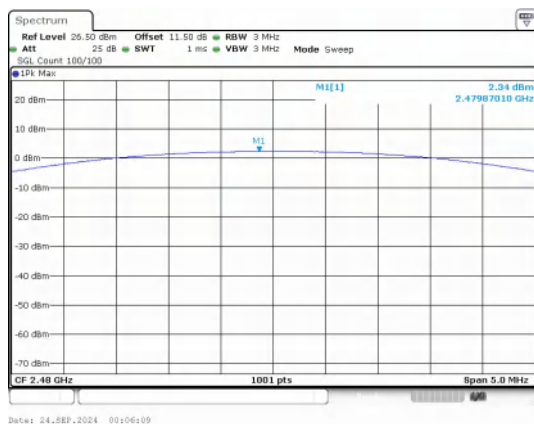
Test Graphs



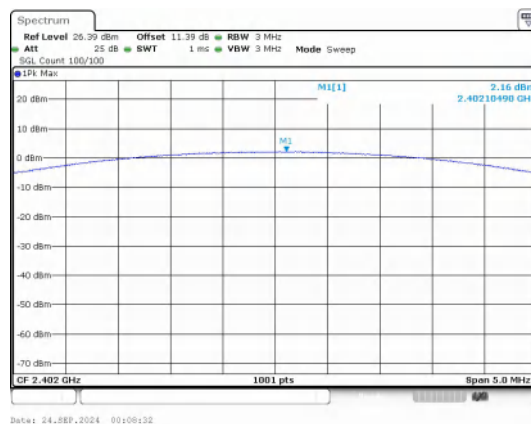
Peak Output Power
GFSK_Channel 0



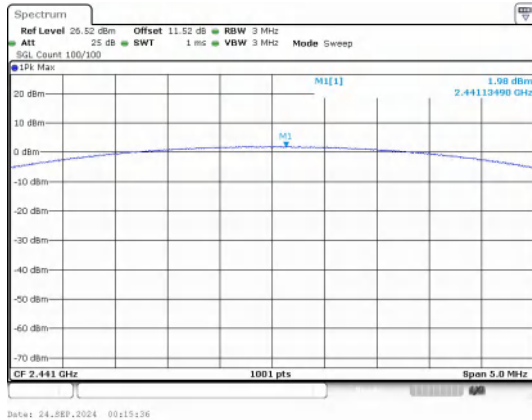
Peak Output Power
GFSK_Channel 39



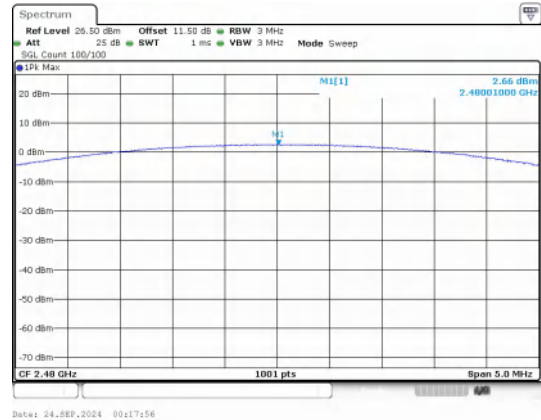
Peak Output Power
GFSK_Channel 78



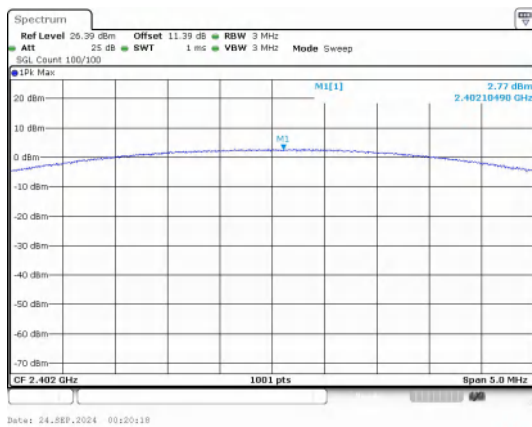
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



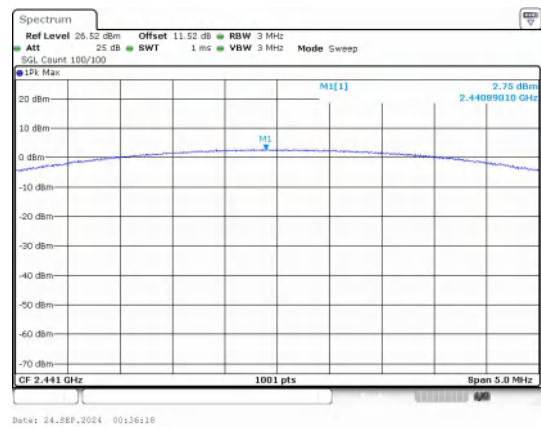
Peak Output Power
 $\pi/4$ DQPSK_Channel 39



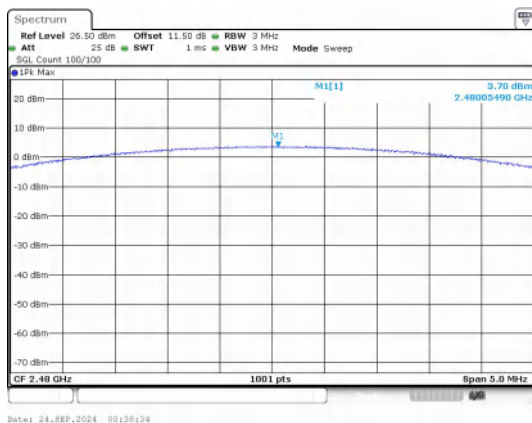
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



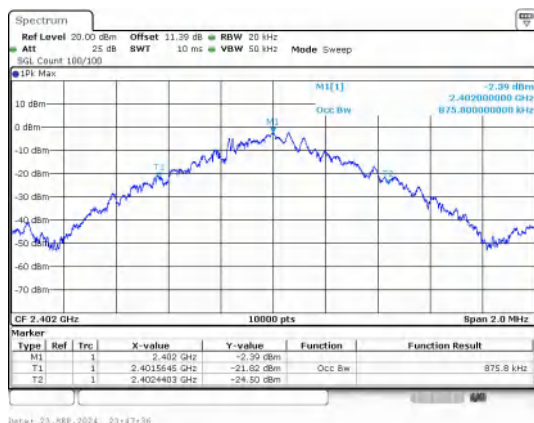
Peak Output Power
8DPSK_Channel 78

5) 99% Bandwidth

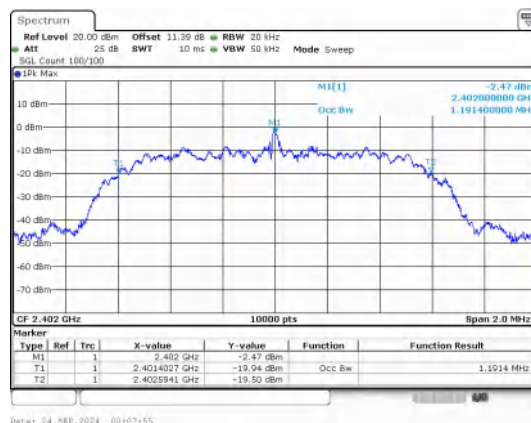
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.87580
	39	2441	0.91480
	78	2480	0.91940
$\pi/4$ DQPSK	0	2402	1.1914
	39	2441	1.2132
	78	2480	1.2144
8DPSK	0	2402	1.1846
	39	2441	1.1900
	78	2480	1.1870

Test Graphs

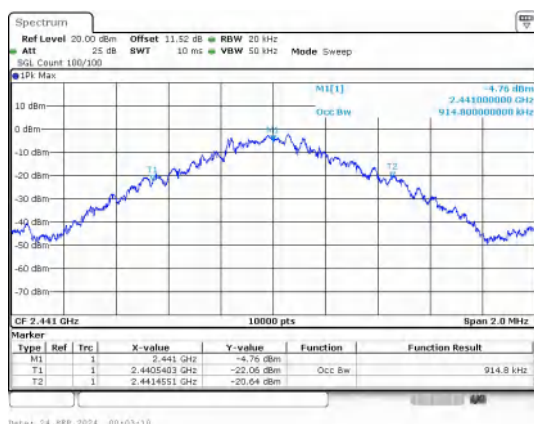


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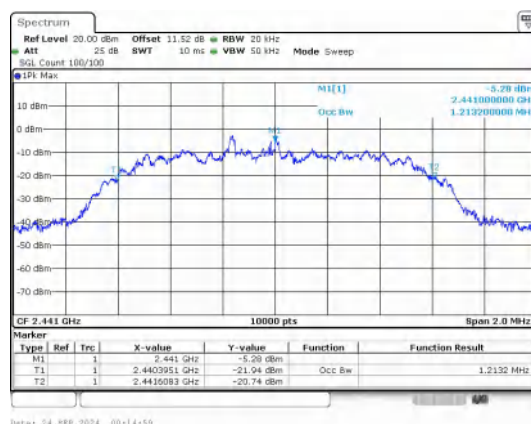


Date: 24.SEP.2024 09:10:55

GFSK_DH5_Channel 0

 $\pi/4$ DQPSK_2-DH5_Channel 0


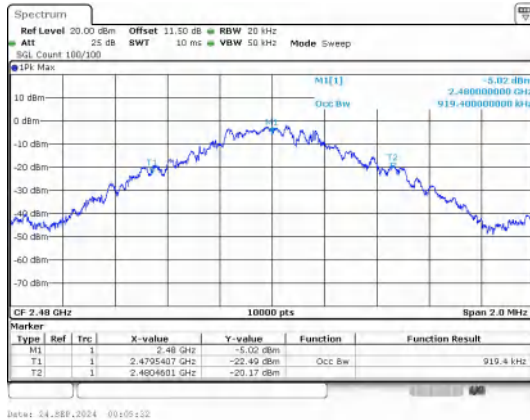
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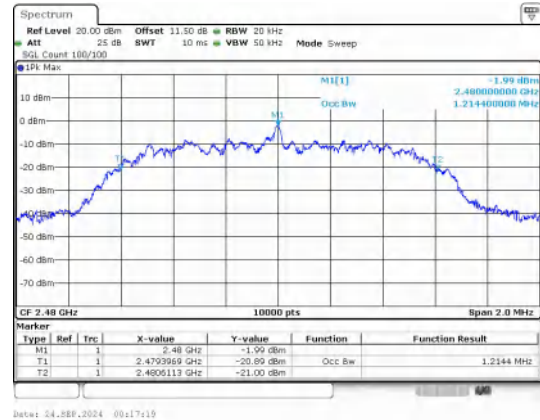
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GFSK_DH5_Channel 39

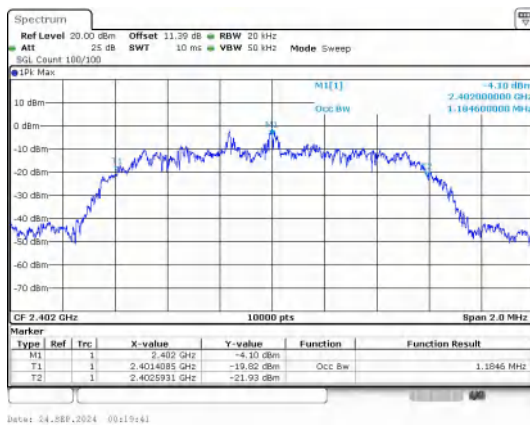
 $\pi/4$ DQPSK_2-DH5_Channel 39



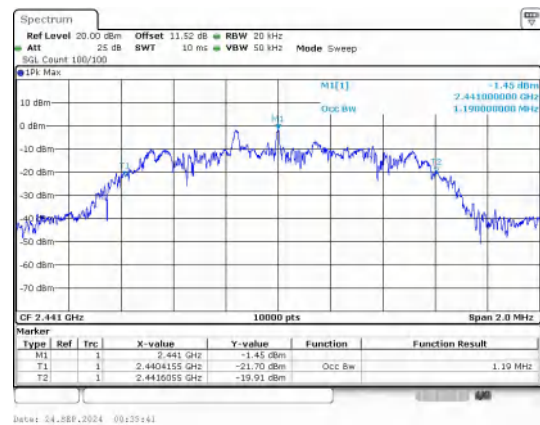
GFSK_DH5_Channel 78



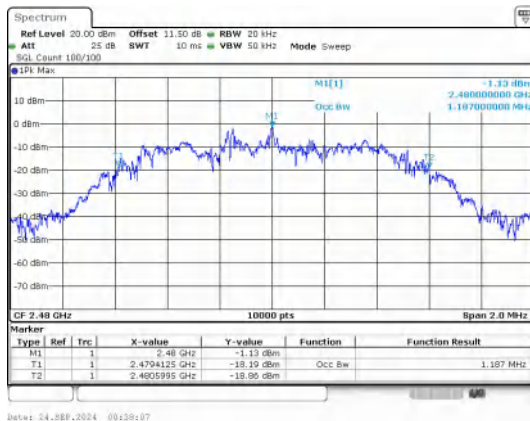
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



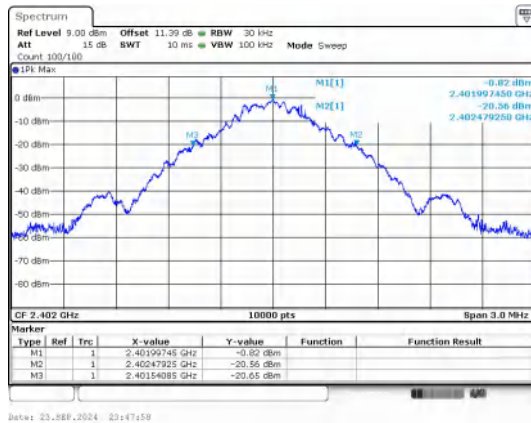
8DPSK_3-DH5_Channel 78

6) 20dB Bandwidth

Test Result

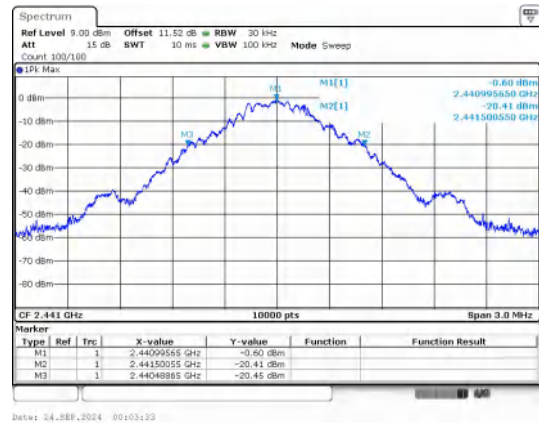
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9400
	39	2441 MHz	1.010
	78	2480 MHz	1.030
$\pi/4$ DQPSK	0	2402 MHz	1.280
	39	2441 MHz	1.270
	78	2480 MHz	1.320
8DPSK	0	2402 MHz	1.270
	39	2441 MHz	1.310
	78	2480 MHz	1.290

Test Graphs



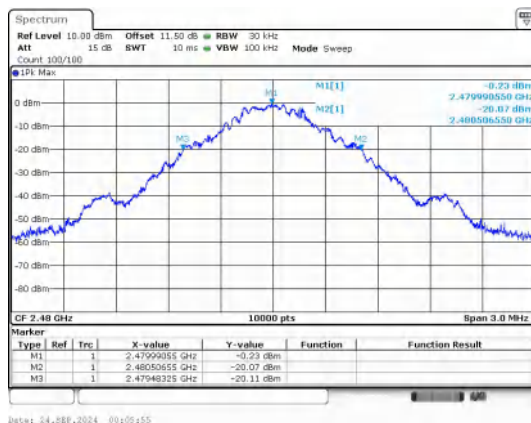
Date: 23.SEP.2024 23:47:59

GFSK_DH5_Channel 0



Date: 24.SEP.2024 00:03:23

GFSK_DH5_Channel 39



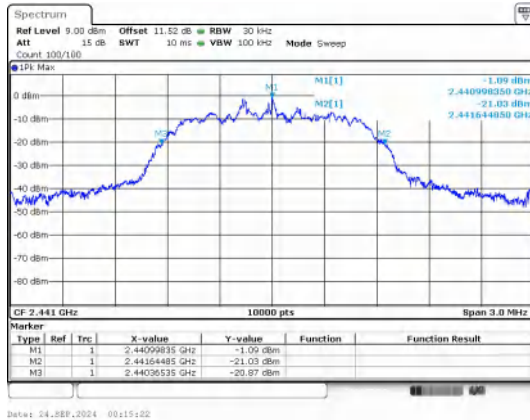
Date: 24.SEP.2024 00:05:55

GFSK_DH5_Channel 78



Date: 24.SEP.2024 00:06:18

 $\pi/4$ DQPSK_2-DH5_Channel 0



$\pi/4$ DQPSK_2-DH5_Channel 39



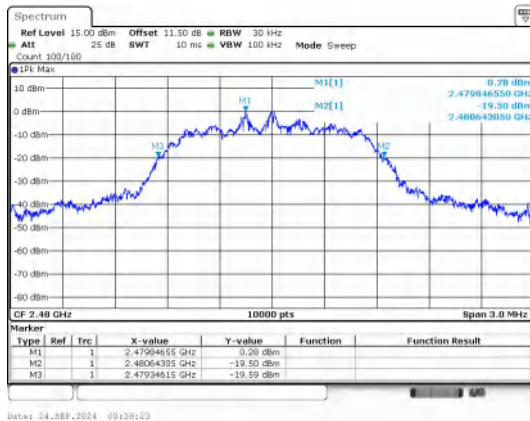
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



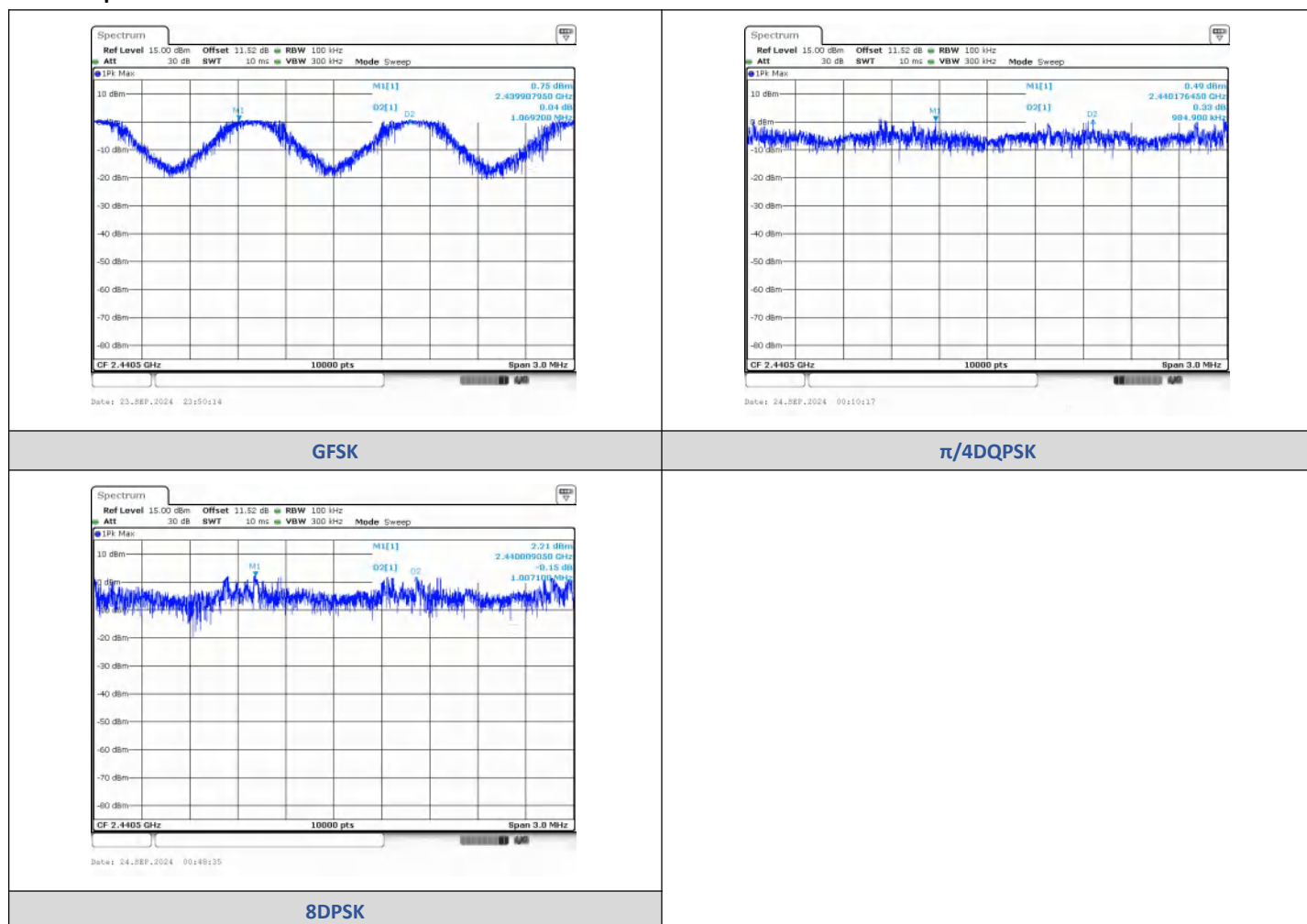
8DPSK_3-DH5_Channel 78

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	2439.9079	2440.9772	1.0692	1.030	PASS
$\pi/4$ QPSK	2-DH5	2440.1764	2441.1613	0.9849	0.853	PASS
8DPSK	3-DH5	2440.0091	2441.0161	1.0071	0.847	PASS

Test Graphs



8) Conducted Out Of Band Emission

Test Result

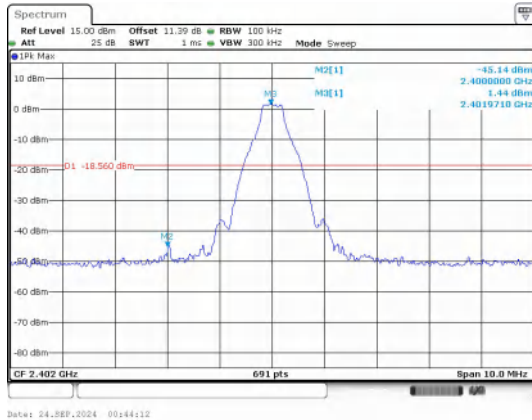
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-45.137	-18.56	-26.577	PASS
			9608.08	-45.373	-18.56	-26.813	PASS
		39	9763.72	-42.198	-18.49	-23.708	PASS
		78	2483.50	-50.261	-17.76	-32.501	PASS
			9920.20	-43.101	-17.76	-25.341	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-46.301	-18.52	-27.781	PASS
			9608.08	-45.406	-18.52	-26.886	PASS
		39	9763.72	-42.592	-18.94	-23.652	PASS
		78	2483.50	-50.313	-18.19	-32.123	PASS
			9920.20	-42.503	-18.19	-24.313	PASS
8DPSK	3-DH5	0	2400.00	-47.910	-18.03	-29.880	PASS
			9608.08	-46.034	-18.03	-28.004	PASS
		39	9763.72	-43.951	-18.02	-25.931	PASS
		78	2483.50	-50.394	-17.09	-33.304	PASS
			9920.20	-42.685	-17.09	-25.595	PASS

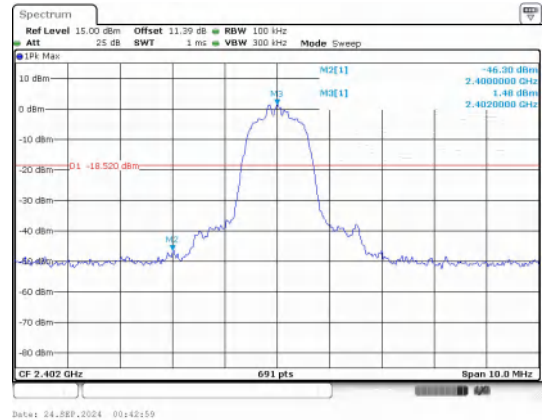
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2398.47	-46.941	-18.39	-28.551	PASS
			2400.00	-48.930	-18.39	-30.540	PASS
			2483.50	-49.075	-17.7	-31.375	PASS
$\pi/4$ DQPSK	2-DH5		2397.40	-47.326	-19.09	-28.236	PASS
			2400.00	-47.715	-19.09	-28.625	PASS
			2483.50	-48.995	-18.39	-30.605	PASS
8DPSK	3-DH5		2398.99	-47.883	-18.0	-29.883	PASS
			2400.00	-49.795	-18.0	-31.795	PASS
			2483.50	-48.500	-19.02	-29.480	PASS

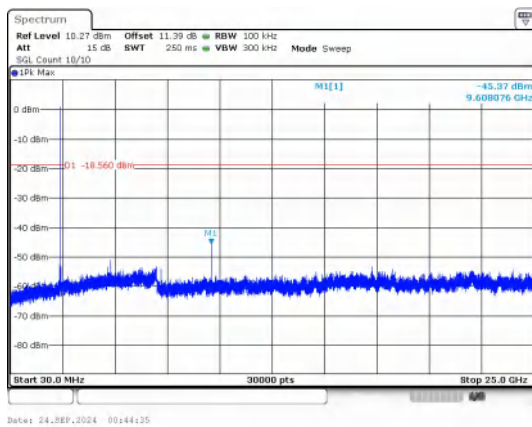
Test Graphs



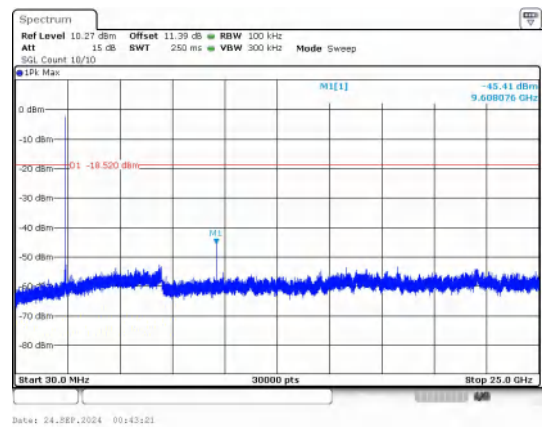
Out Of Band Emission
GFSK_DH5_Channel 0



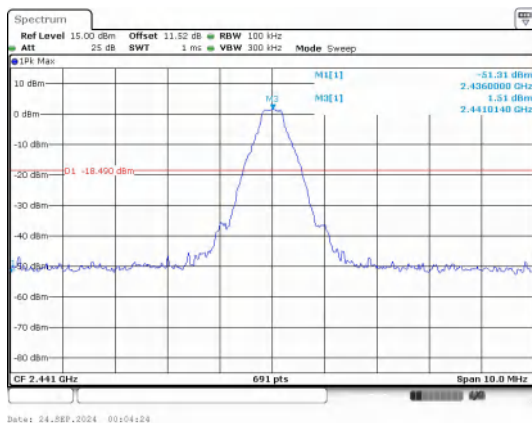
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



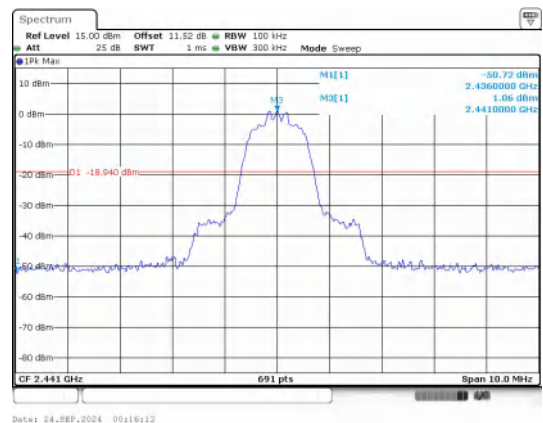
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



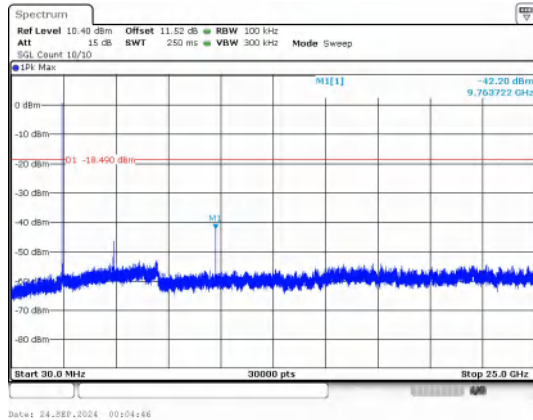
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



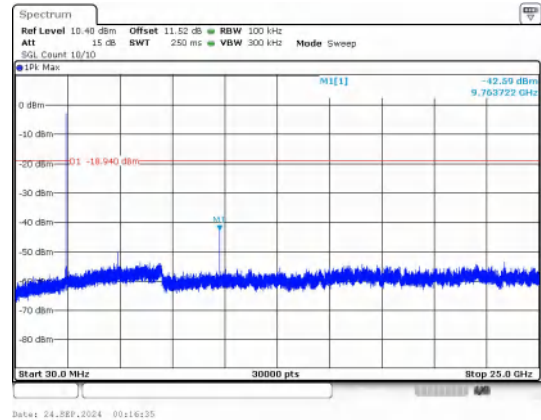
Out Of Band Emission
GFSK_DH5_Channel 39



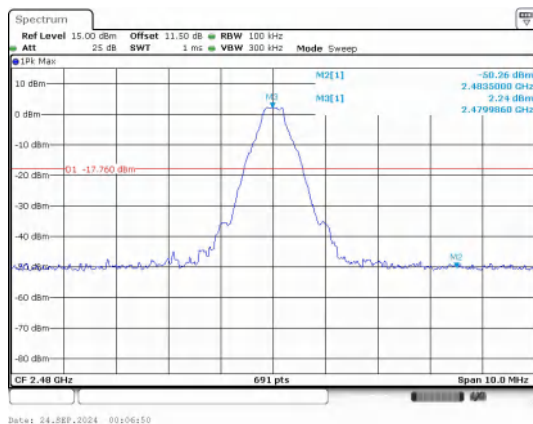
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



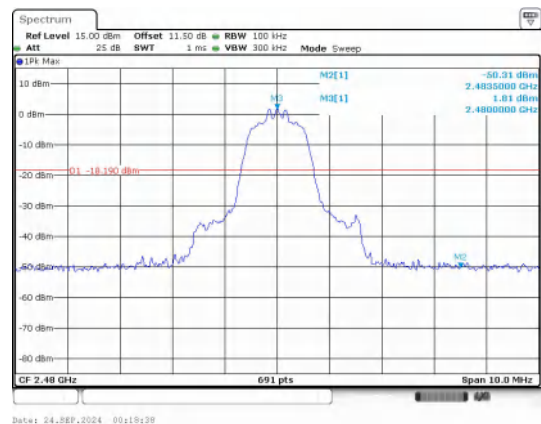
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



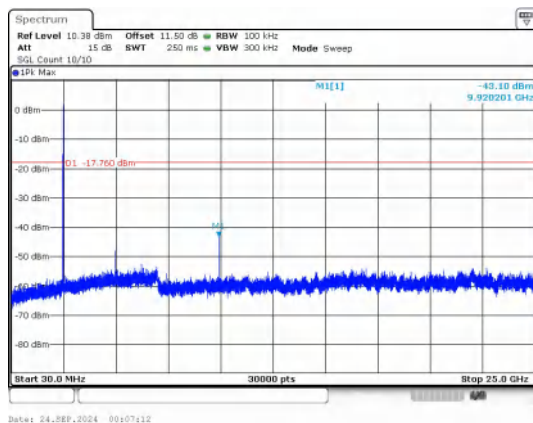
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 $\pi/4$ DQPSK_2-DH5_Channel 39



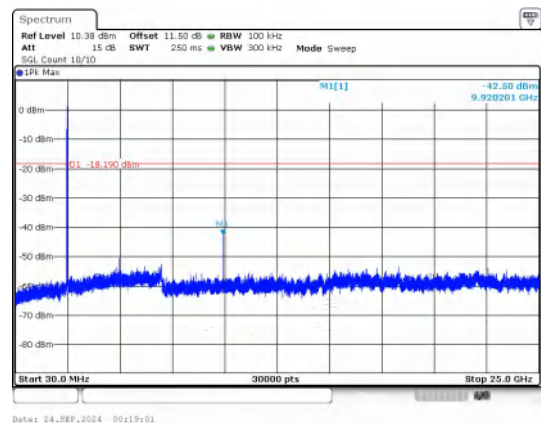
Out Of Band Emission
GFSK_DH5_Channel 78



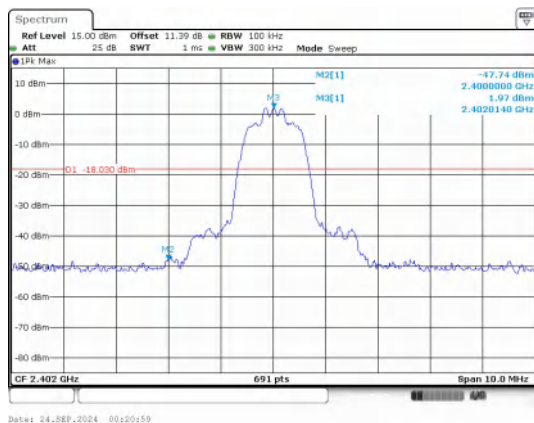
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



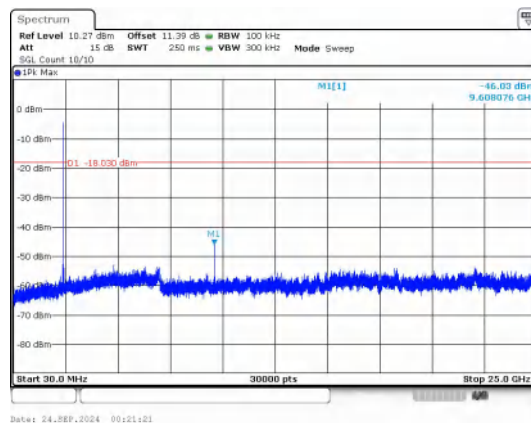
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



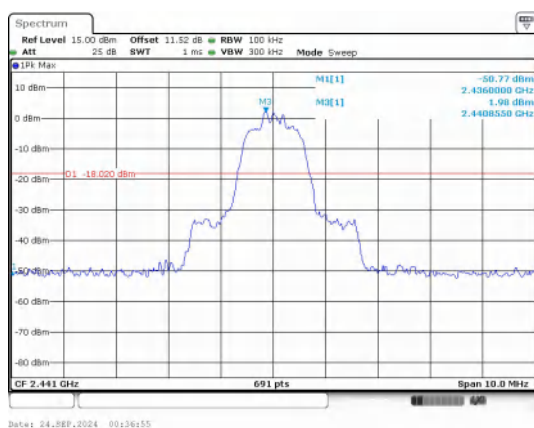
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



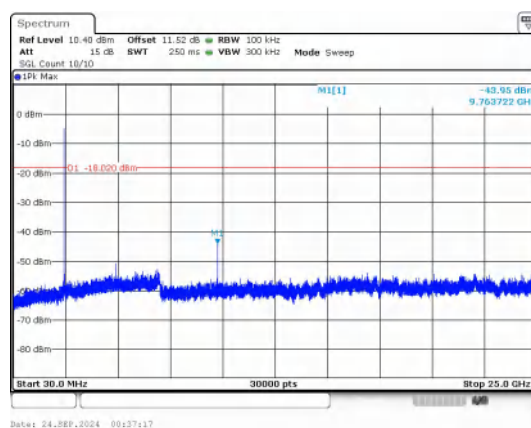
Out Of Band Emission
8DPSK_3-DH5_Channel 0



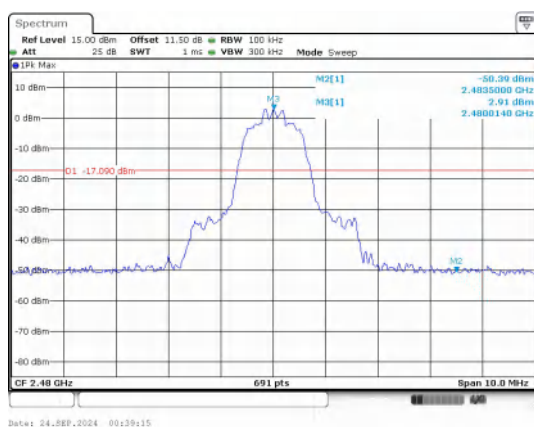
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



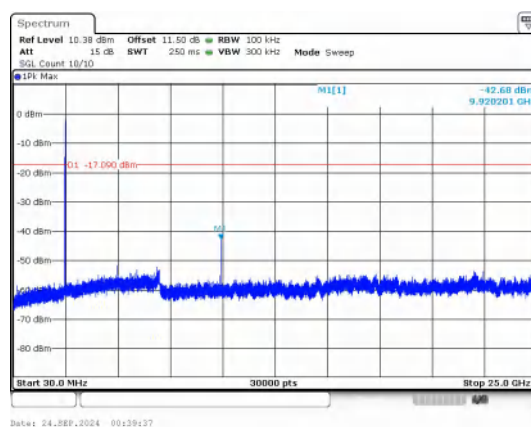
Out Of Band Emission
8DPSK_3-DH5_Channel 39



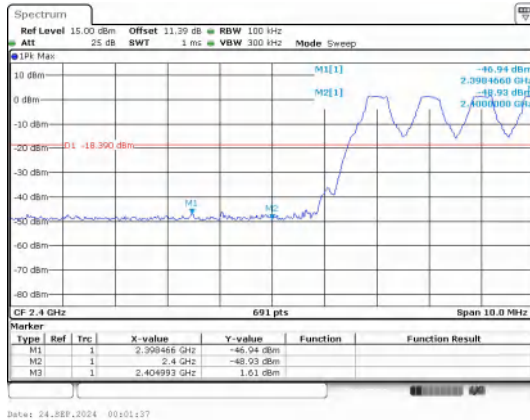
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



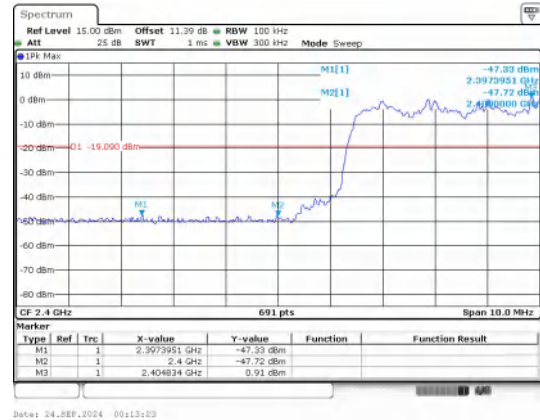
Out Of Band Emission
8DPSK_3-DH5_Channel 78



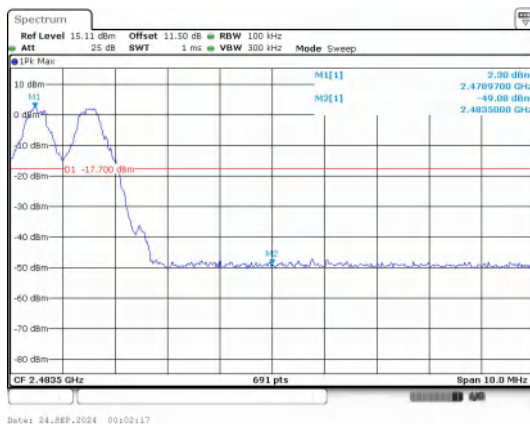
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



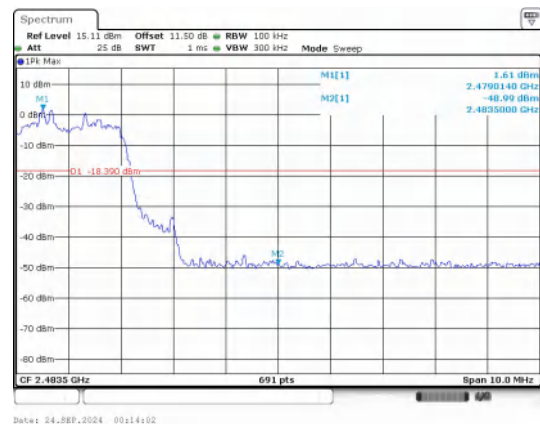
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



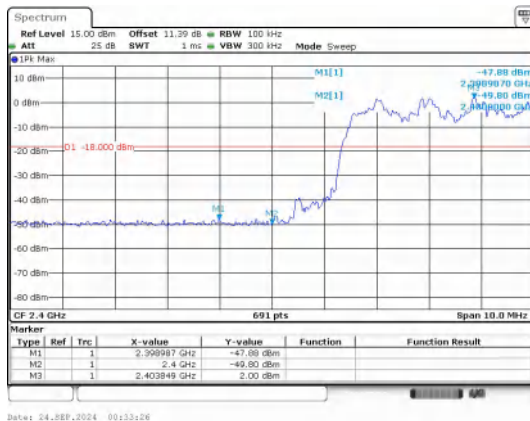
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



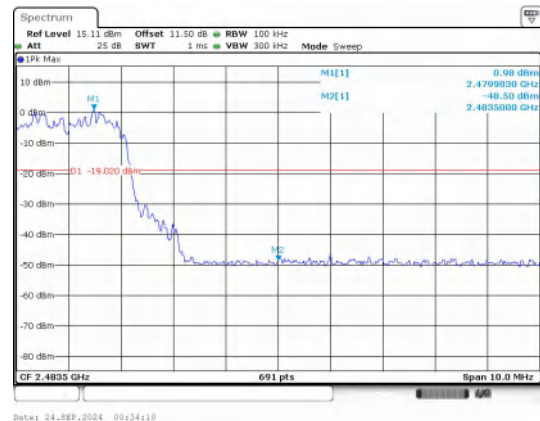
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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