

Appendix

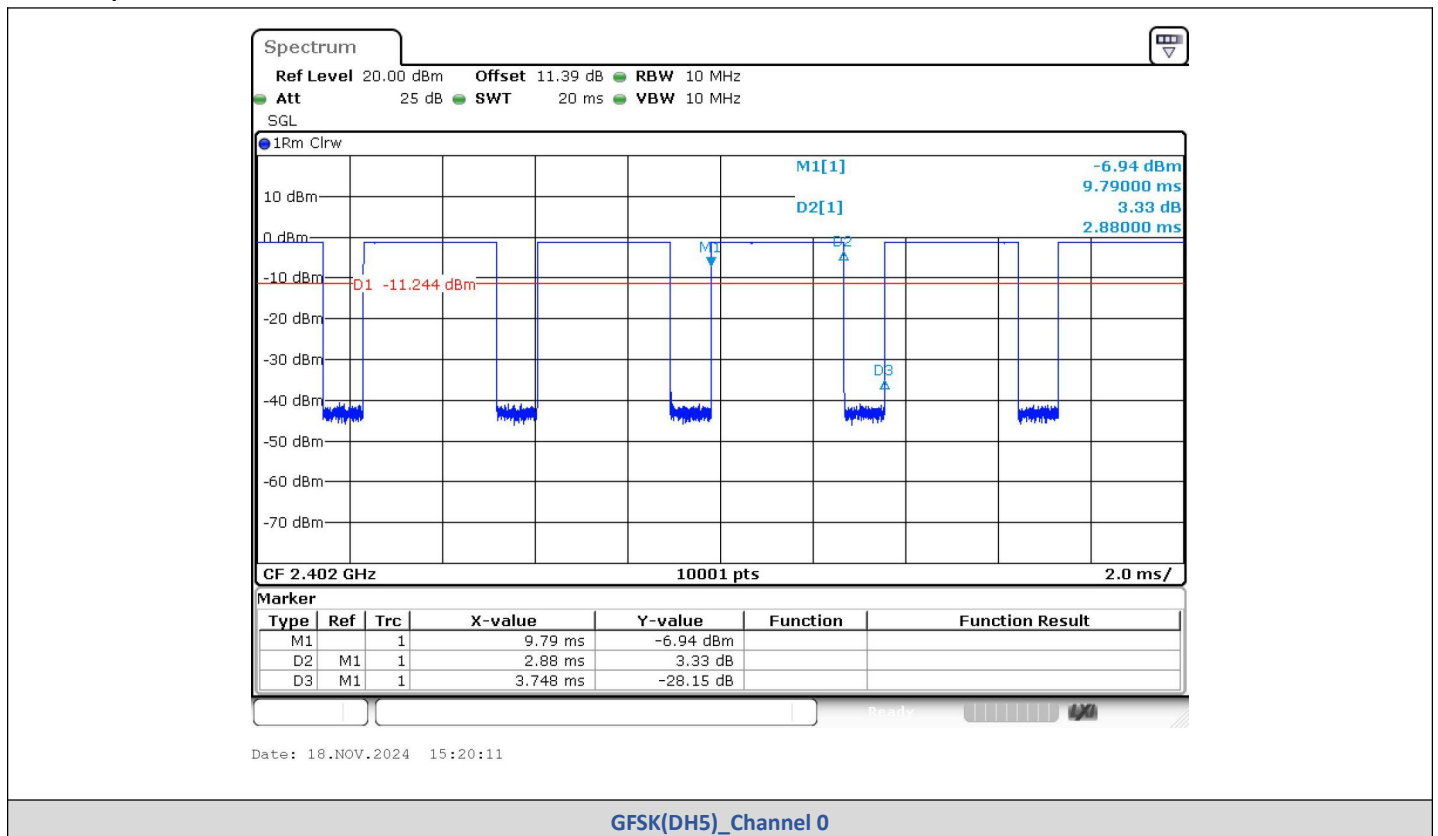
Report No.:	CISRR24111610304
FCC ID:	2AQN2-CIEL-T10S
Product Name:	Multifunctional Bluetooth Helmet Intercom
Model No.:	CIEL T10S
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

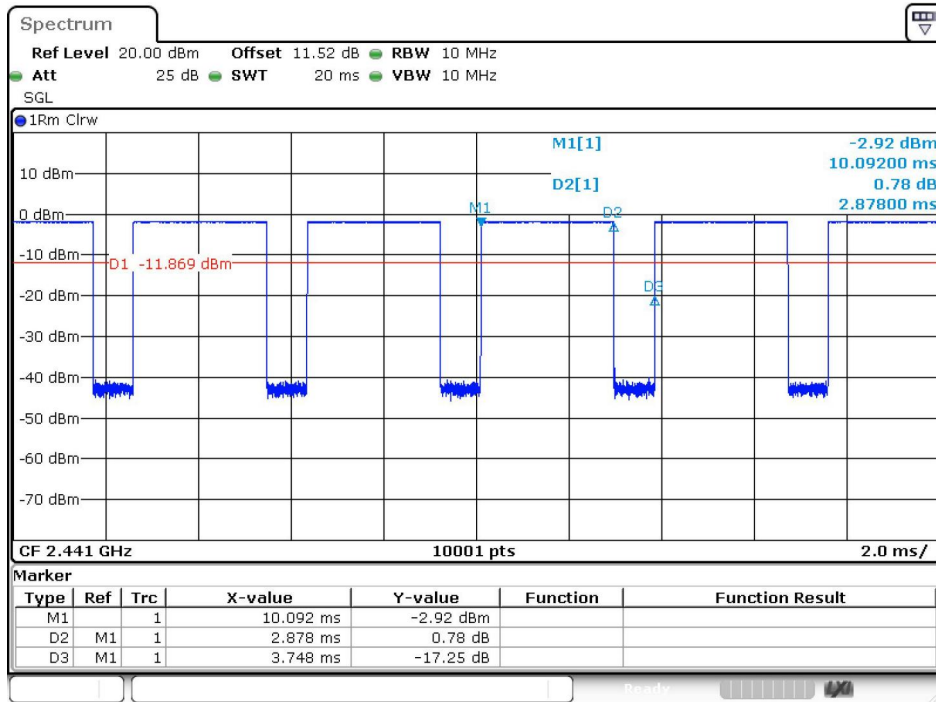
1) Duty Cycle

Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.880	3.748	76.84	0.7684	1.1441	0.3472
		39	2.878	3.748	76.79	0.7679	1.147	0.3475
		78	2.880	3.748	76.84	0.7684	1.1441	0.3472
$\pi/4$ DQPSK	2-DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.3465
		39	2.884	3.748	76.95	0.7695	1.1379	0.3467
		78	2.884	3.748	76.95	0.7695	1.1379	0.3467
8DPSK	3-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	2.888	3.748	77.05	0.7705	1.1323	0.3463

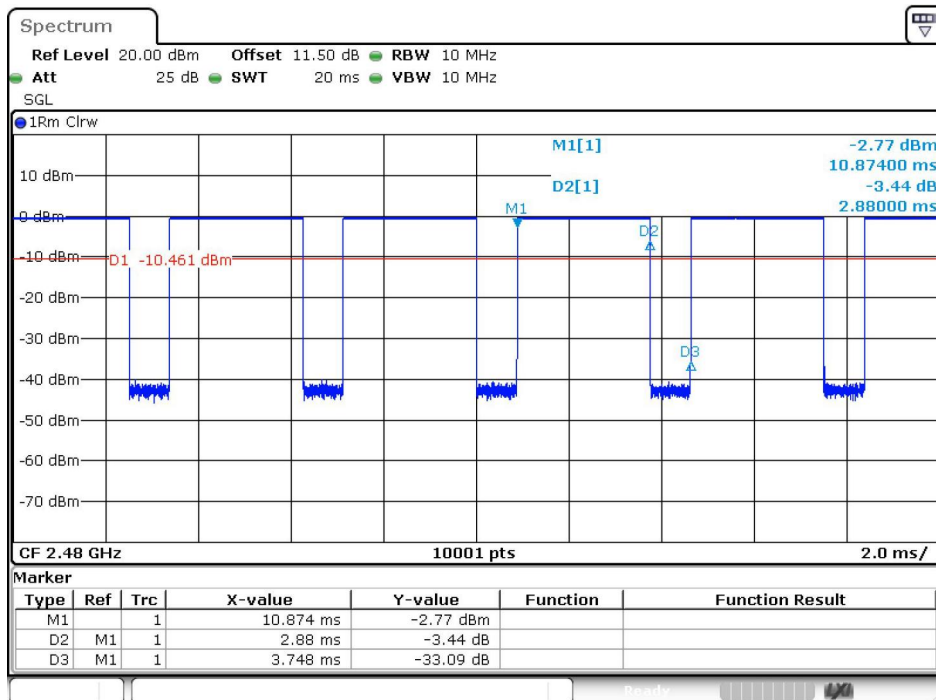
Test Graphs





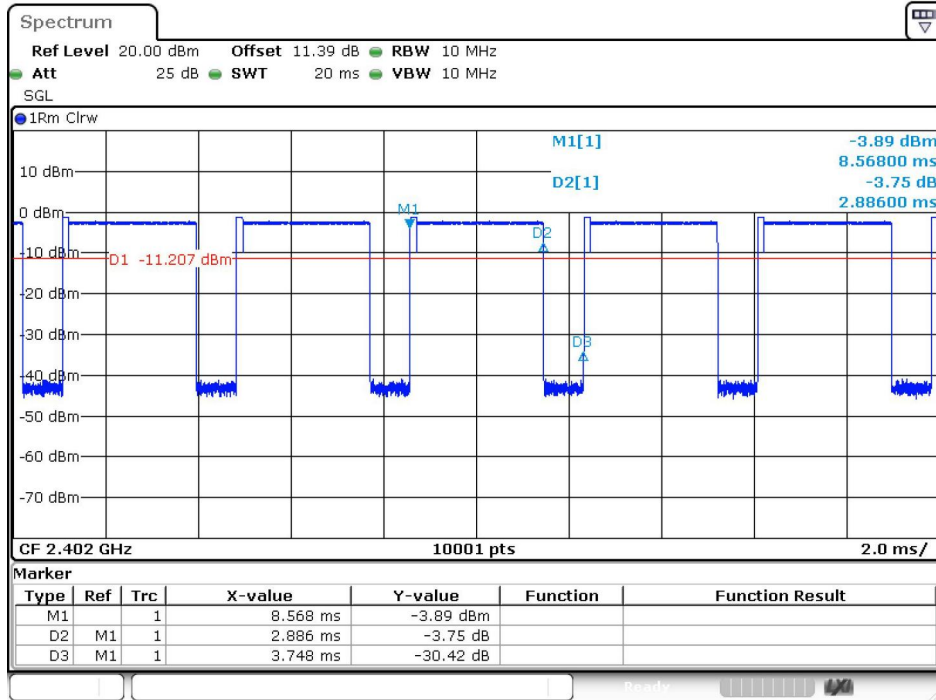
Date: 18.NOV.2024 15:27:45

GFSK(DH5)_Channel 39



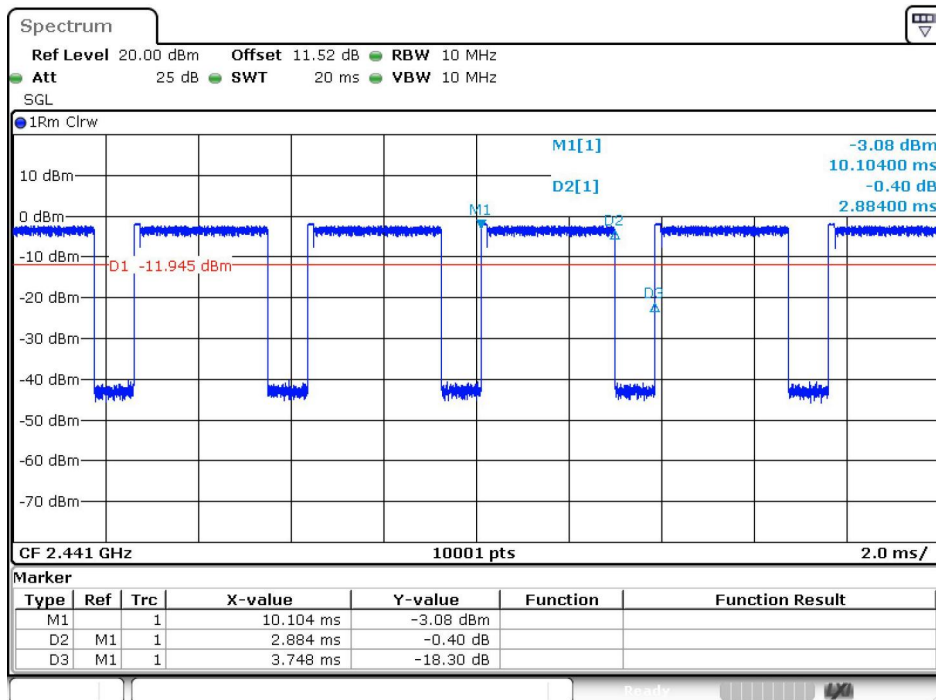
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GFSK(DH5)_Channel 78



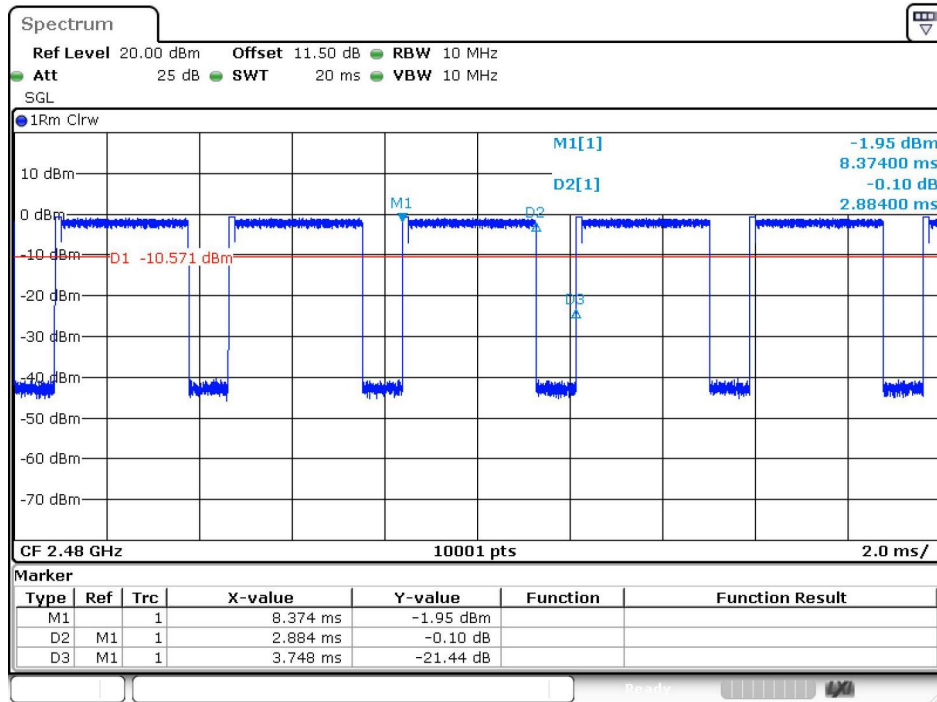
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$\pi/4$ QPSK(2-DH5)_Channel 0



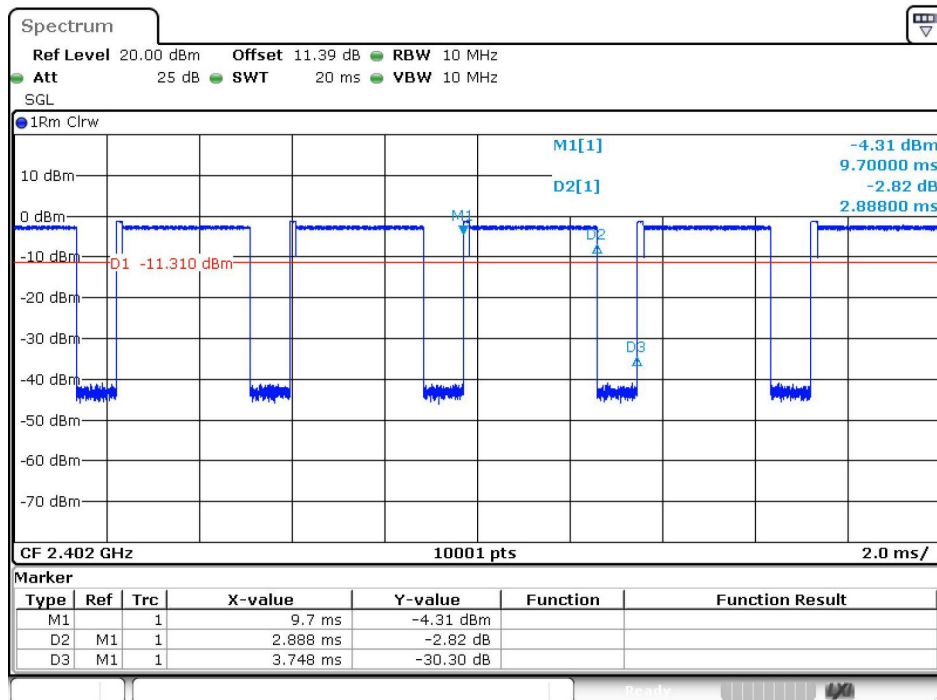
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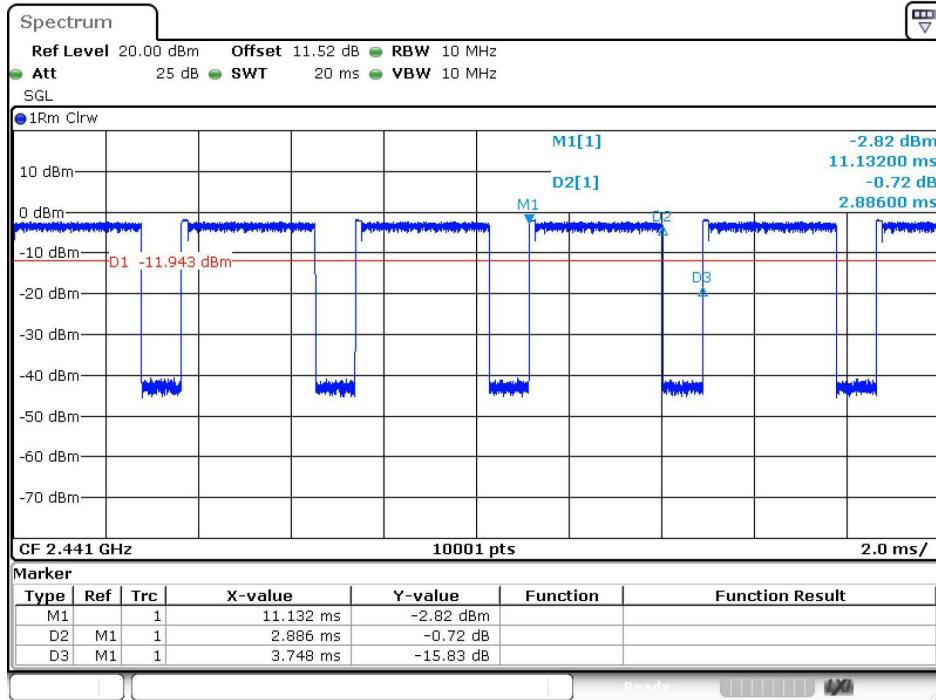
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$\pi/4$ DQPSK(2-DH5)_Channel 78



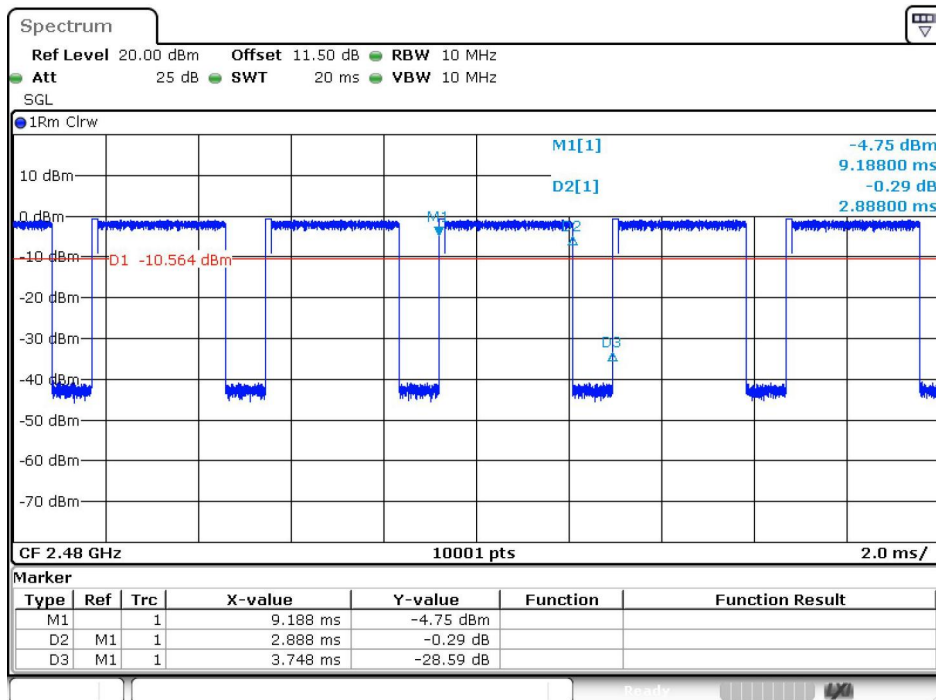
Date: 18.NOV.2024 15:46:23

8DPSK(3-DH5)_Channel 0



Date: 18.NOV.2024 15:53:11

8DPSK(3-DH5)_Channel 39



Date: 18.NOV.2024 15:55:18

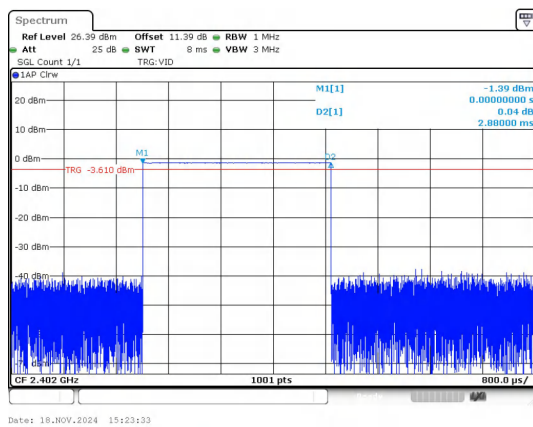
8DPSK(3-DH5)_Channel 78

2) Dwell Time

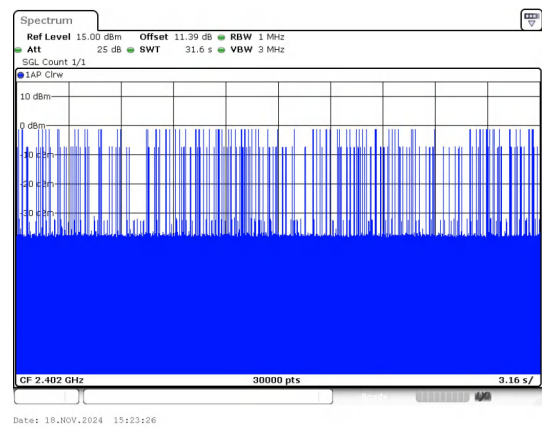
Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.880	96	276.48	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.888	101	291.69		PASS
8DPSK	3-DH5		2.888	111	320.57		PASS

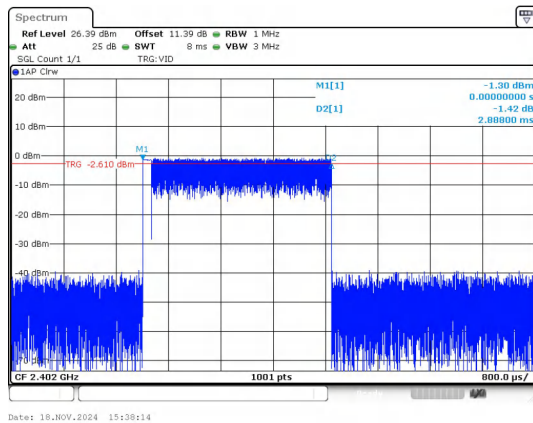
Test Graphs



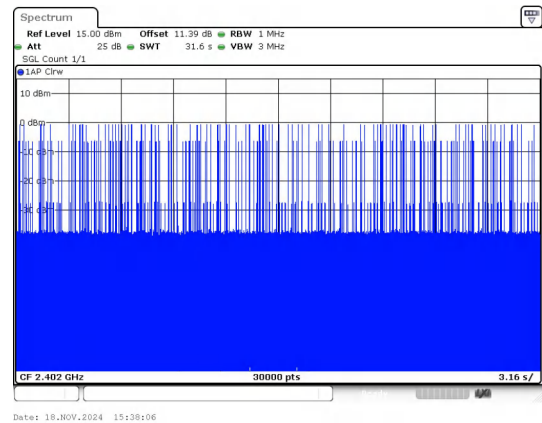
Pulse Width
GFSK_DH5



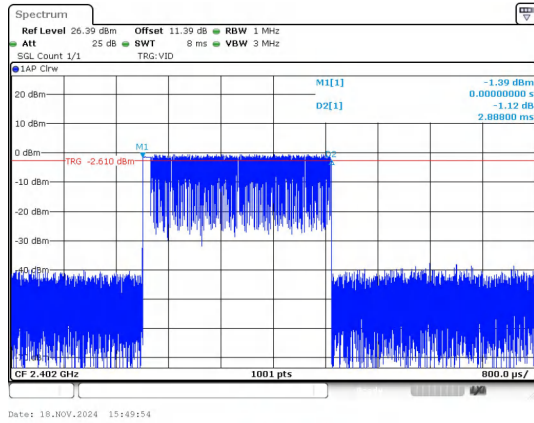
Number of Pulses in 31.6 seconds
GFSK_DH5



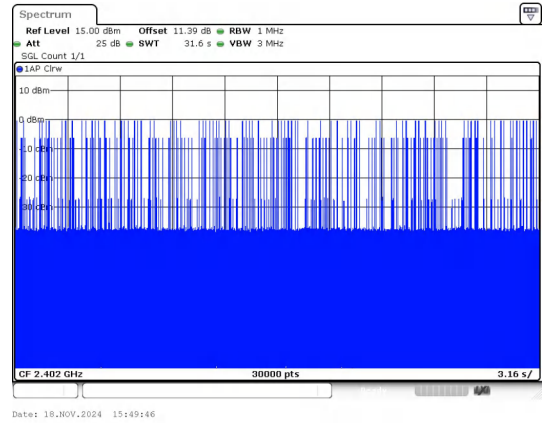
Pulse Width
 $\pi/4$ DQPSK_2-DH5



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



Pulse Width
8DPSK_3-DH5



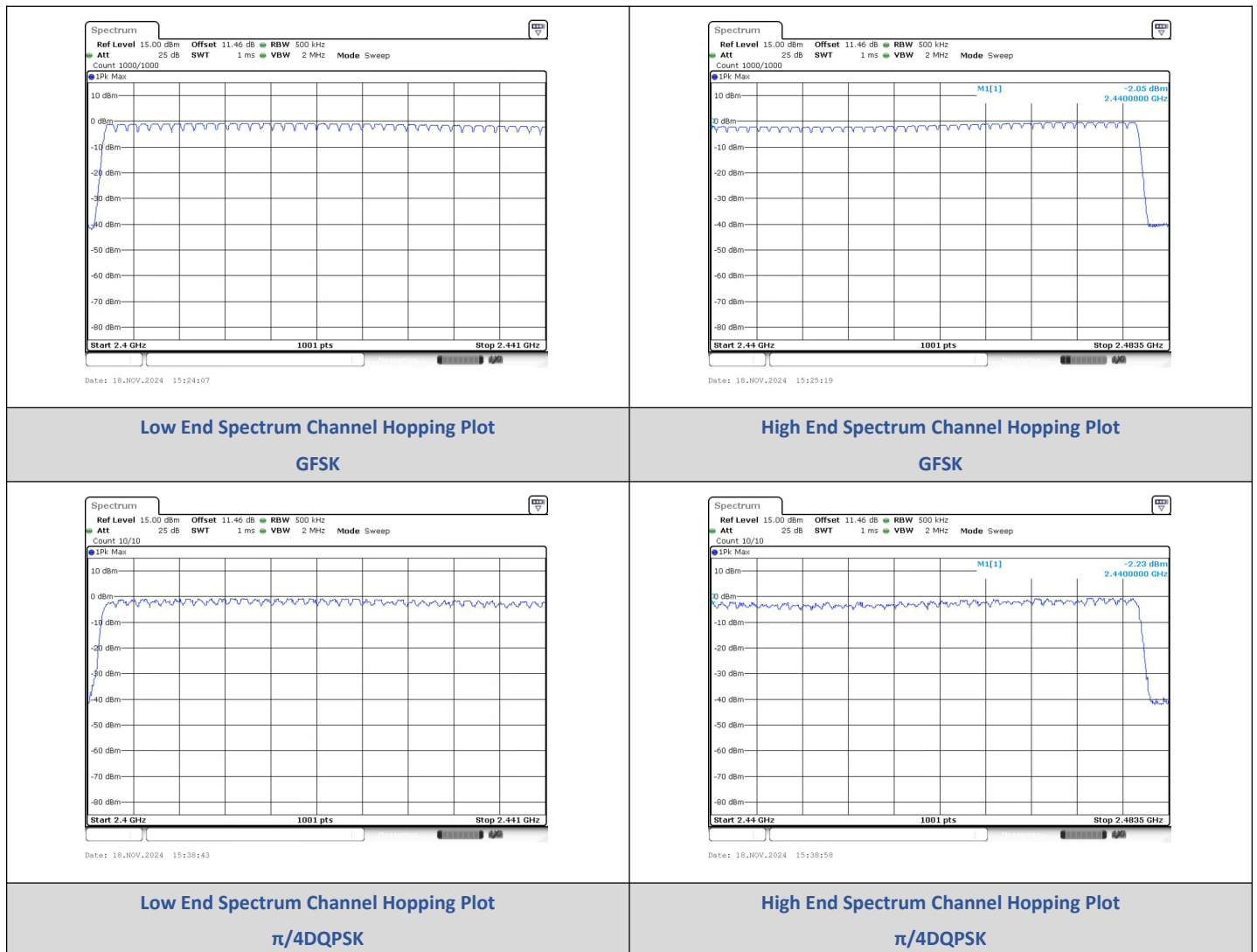
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

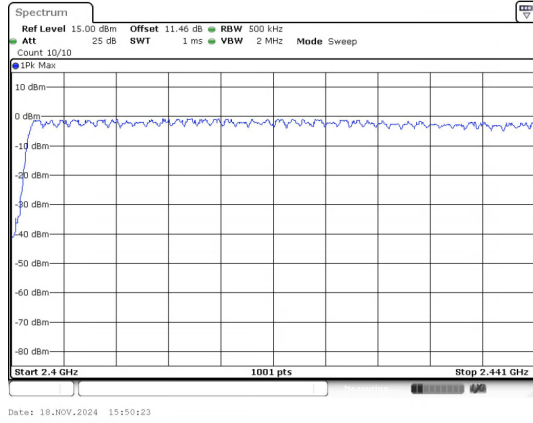
3) Number Of Hopping Channel

Test Result

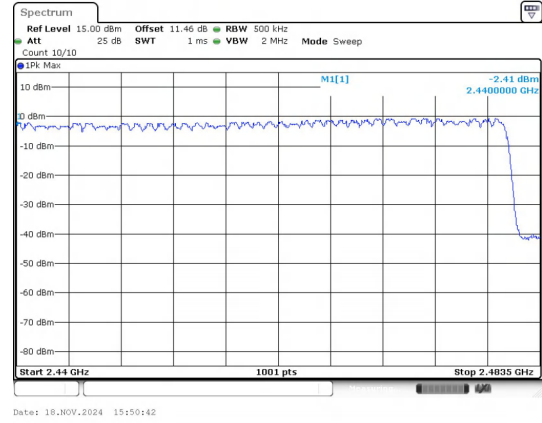
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



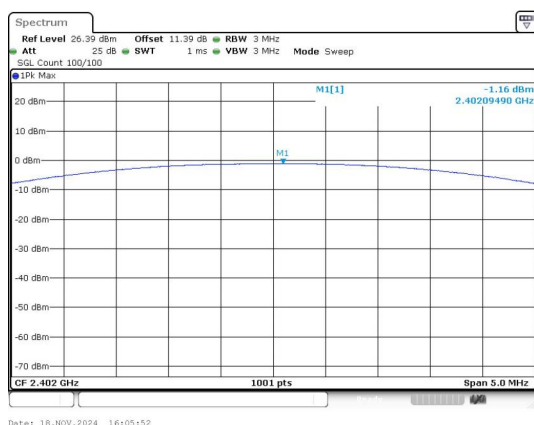
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Peak Output Power

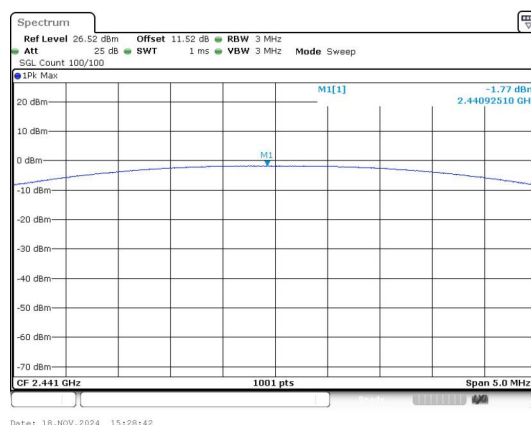
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-1.16	0.77	≤30	PASS
		39	-1.77	0.67		PASS
		78	-0.39	0.91		PASS
$\pi/4$ DQPSK	2-DH5	0	-0.29	0.94	≤20.97	PASS
		39	-1.03	0.79		PASS
		78	0.40	1.10		PASS
8DPSK	3-DH5	0	0.05	1.01		PASS
		39	-0.62	0.87		PASS
		78	0.80	1.20		PASS

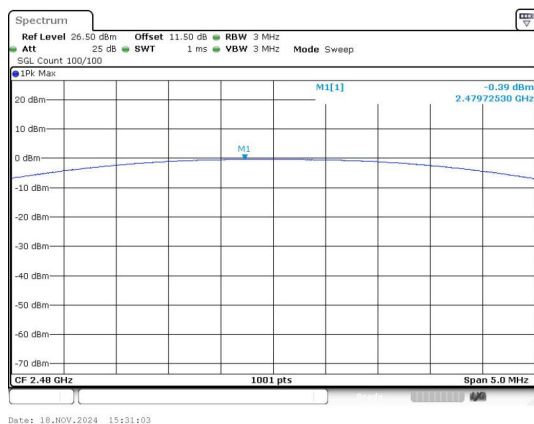
Test Graphs



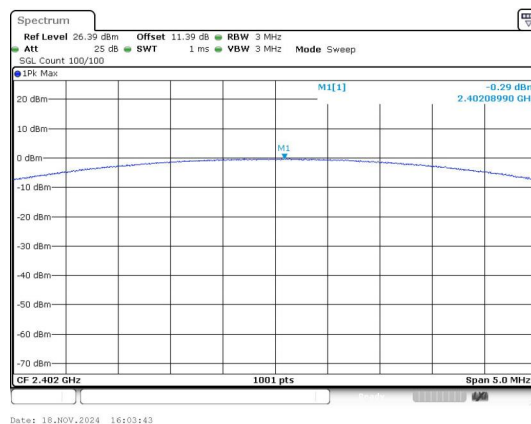
Peak Output Power
GFSK_Channel 0



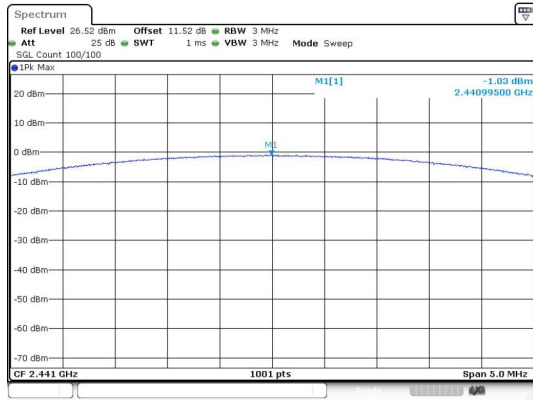
Peak Output Power
GFSK_Channel 39



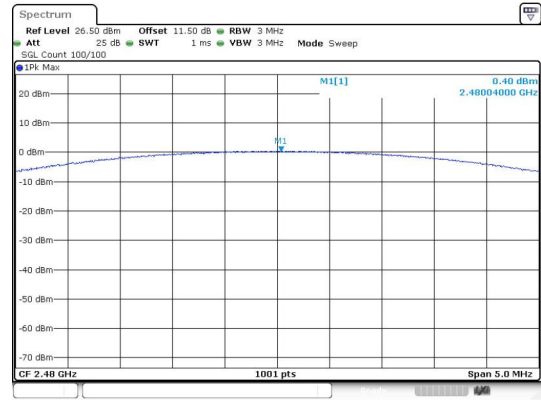
Peak Output Power
GFSK_Channel 78



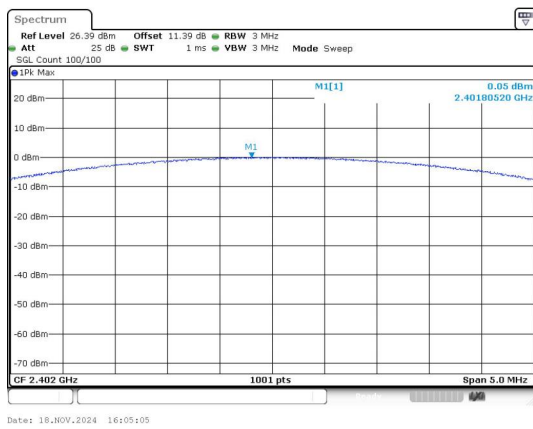
Peak Output Power
 $\pi/4$ DQPSK_Channel 0



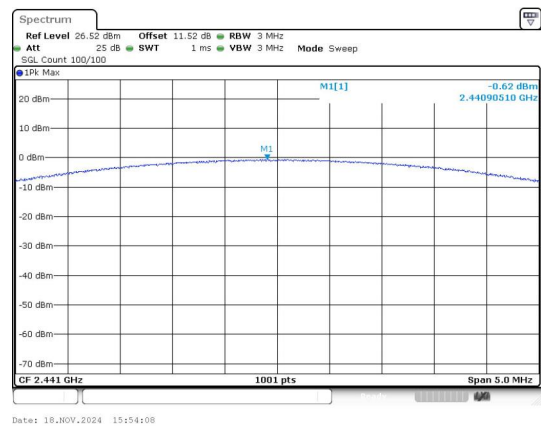
Peak Output Power
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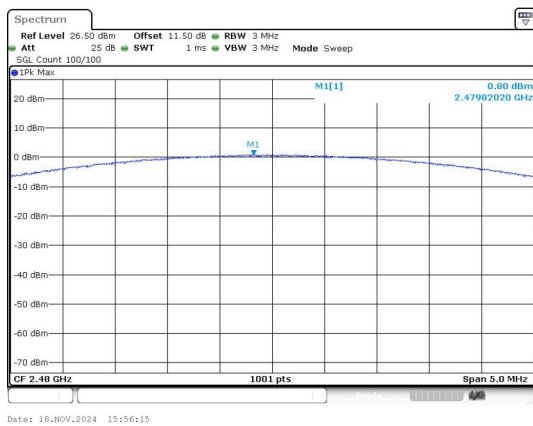
Peak Output Power
 $\pi/4$ DQPSK_Channel 78



Peak Output Power
8DPSK_Channel 0



Peak Output Power
8DPSK_Channel 39



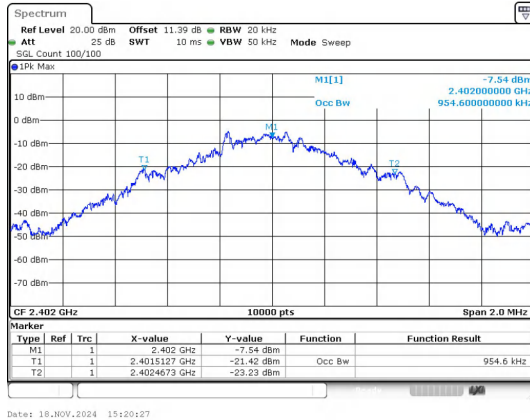
Peak Output Power
8DPSK_Channel 78

5) 99% Bandwidth

Test Result

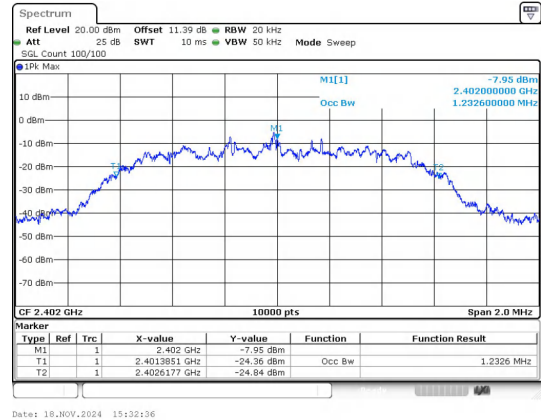
Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.95460
	39	2441	0.97780
	78	2480	0.97820
$\pi/4$ DQPSK	0	2402	1.2326
	39	2441	1.2250
	78	2480	1.2444
8DPSK	0	2402	1.2180
	39	2441	1.2280
	78	2480	1.2166

Test Graphs

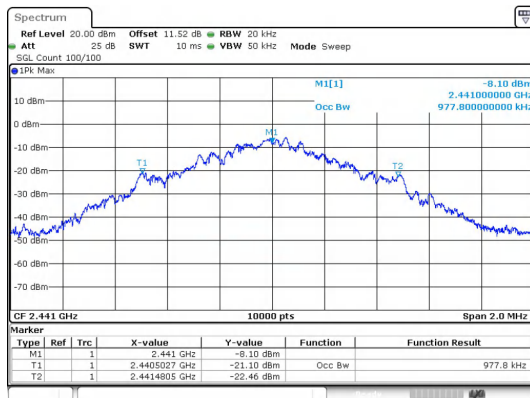


Date: 18.NOV.2024 15:12:27

GFSK_DH5_Channel 0

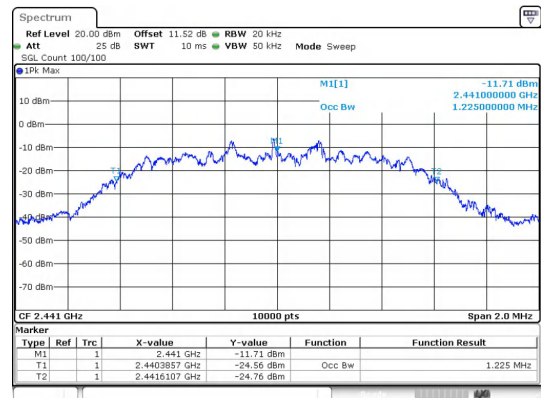


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 $\pi/4$ DQPSK_2-DH5_Channel 0


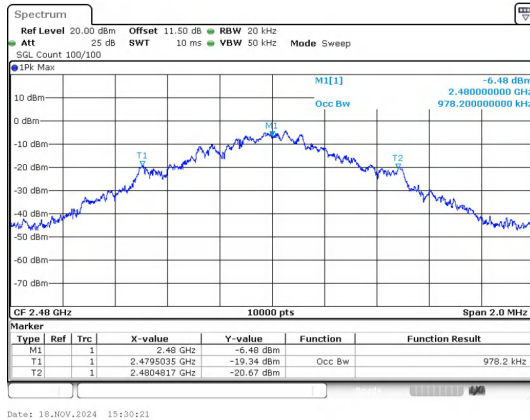
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GFSK_DH5_Channel 39

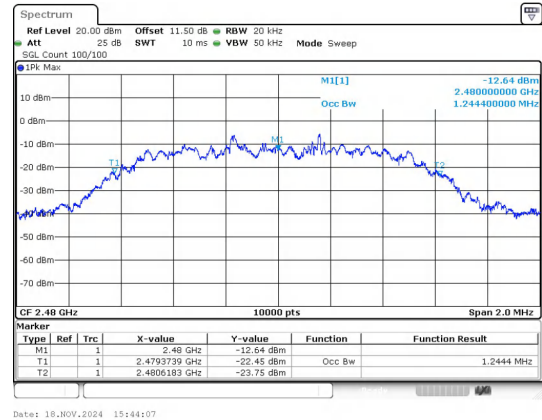


Date: 18.NOV.2024 15:41:59

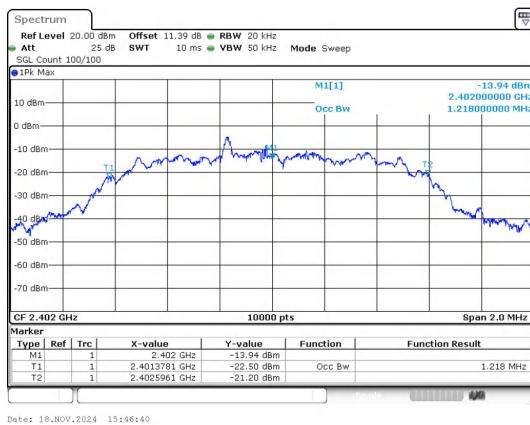
 $\pi/4$ DQPSK_2-DH5_Channel 39



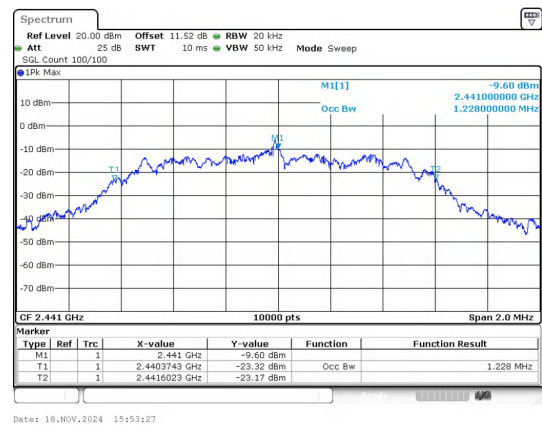
GFSK_DH5_Channel 78



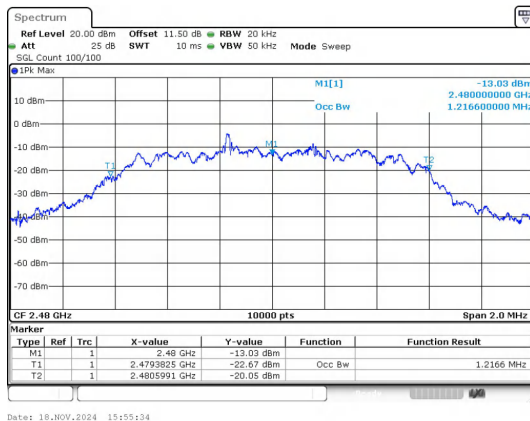
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



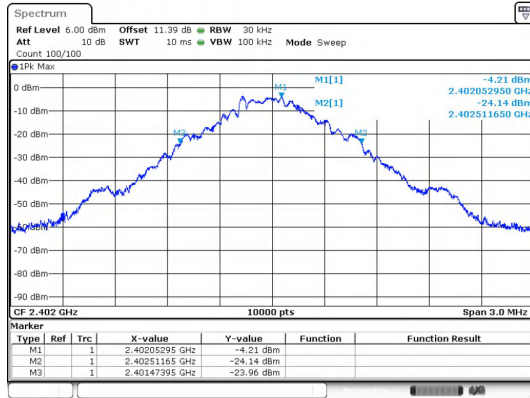
8DPSK_3-DH5_Channel 78

6) 20dB Bandwidth

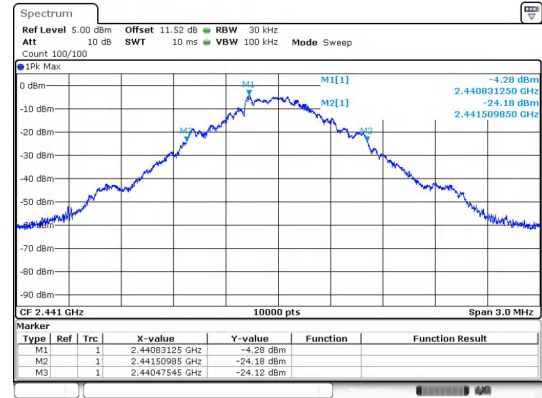
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.040
	39	2441 MHz	1.030
	78	2480 MHz	1.040
π /4DQPSK	0	2402 MHz	1.330
	39	2441 MHz	1.330
	78	2480 MHz	1.340
8DPSK	0	2402 MHz	1.290
	39	2441 MHz	1.300
	78	2480 MHz	1.290

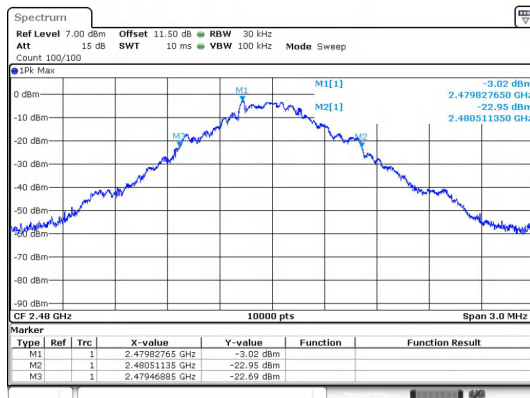
Test Graphs



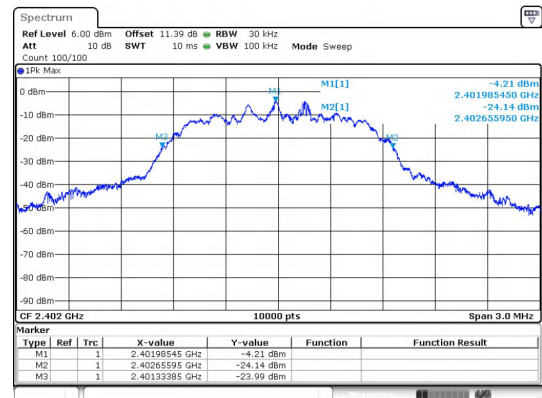
GFSK_DH5_Channel 0

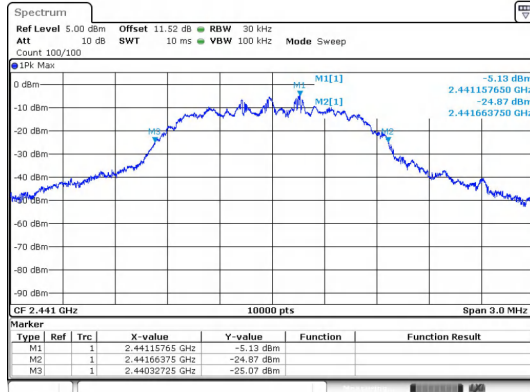


GFSK_DH5_Channel 39

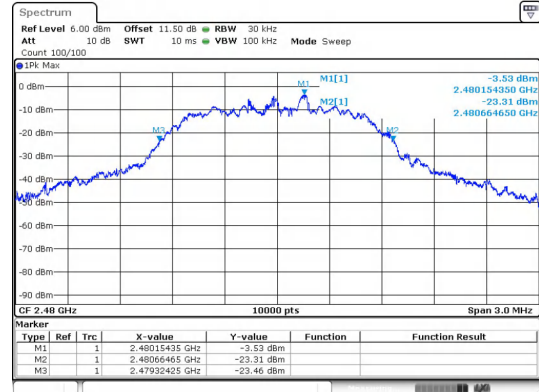


GFSK_DH5_Channel 78

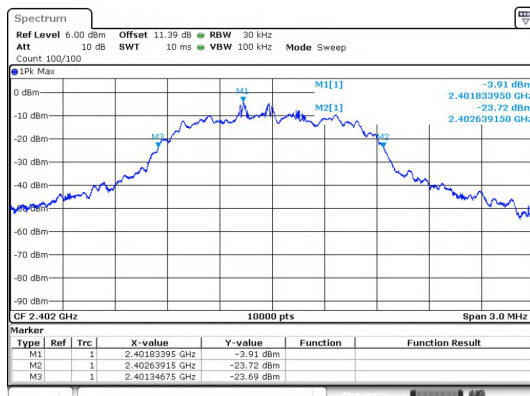

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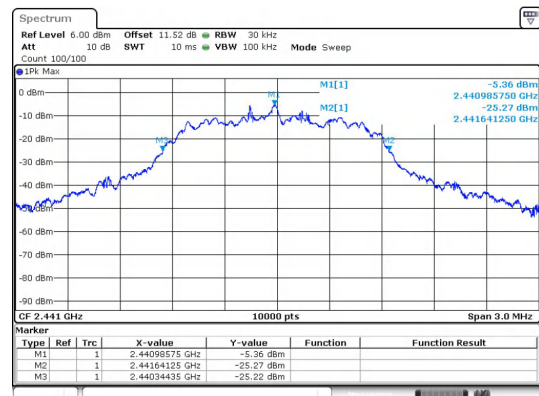
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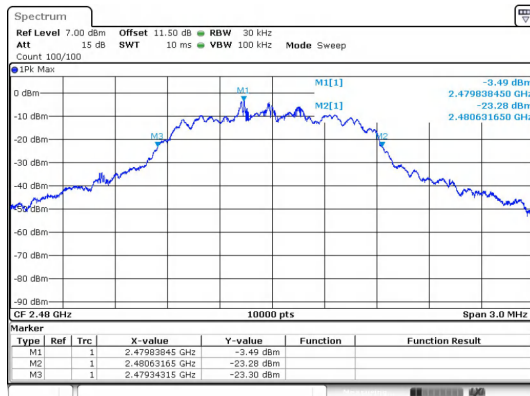
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



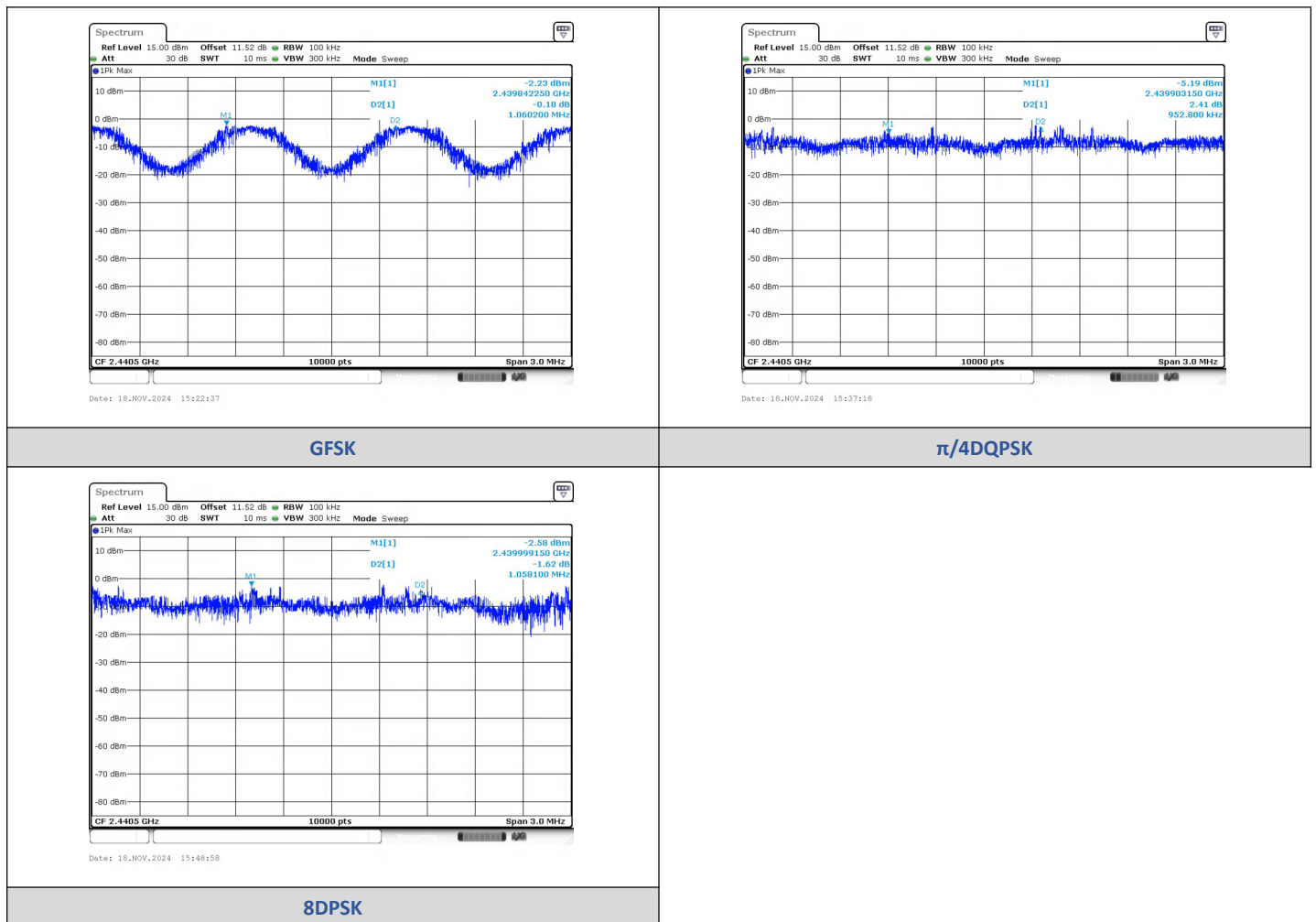
8DPSK_3-DH5_Channel 78

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	2439.8423	2440.9025	1.0602	1.04	PASS
$\pi/4$ QPSK	2-DH5	2439.9032	2440.856	0.9528	0.887	PASS
8DPSK	3-DH5	2439.9992	2441.0572	1.0581	0.86	PASS

Test Graphs



8) Conducted Out Of Band Emission

Test Result

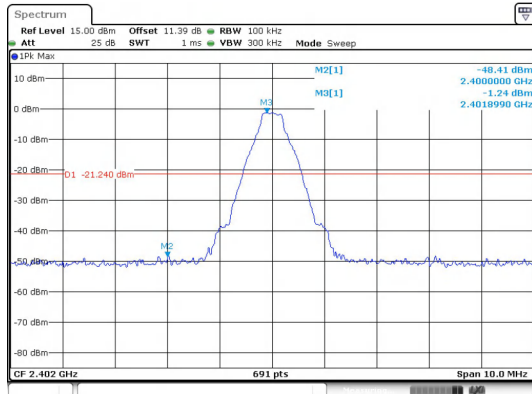
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.410	-21.24	-27.170	PASS
			4803.85	-43.353	-21.24	-22.113	PASS
		39	4882.09	-43.170	-21.98	-21.190	PASS
		78	2483.50	-50.750	-20.56	-30.190	PASS
			4960.33	-41.558	-20.56	-20.998	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-47.680	-21.49	-26.190	PASS
			4803.85	-44.650	-21.49	-23.160	PASS
		39	4882.09	-42.083	-22.41	-19.673	PASS
		78	2483.50	-49.320	-20.86	-28.460	PASS
			4960.33	-44.745	-20.86	-23.885	PASS
8DPSK	3-DH5	0	2400.00	-48.920	-21.46	-27.460	PASS
			4803.85	-45.006	-21.46	-23.546	PASS
		39	4882.09	-41.621	-22.17	-19.451	PASS
		78	2483.50	-50.700	-20.79	-29.910	PASS
			4960.33	-46.059	-20.79	-25.269	PASS

Hopping

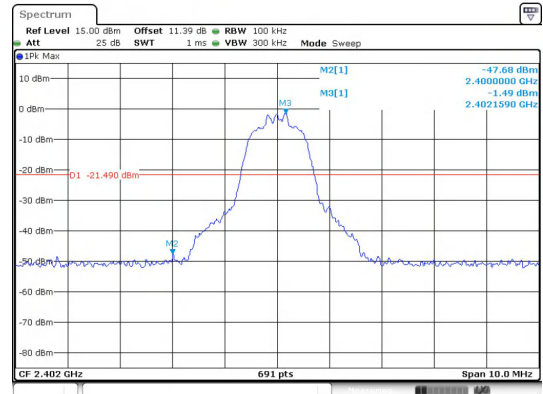
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2396.02	-47.425	-21.39	-26.035	PASS
			2400.00	-48.520	-21.39	-27.130	PASS
			2483.50	-48.870	-20.86	-28.010	PASS
$\pi/4$ DQPSK	2-DH5		2395.28	-48.665	-22.4	-26.265	PASS
			2400.00	-49.410	-22.4	-27.010	PASS
			2483.50	-49.140	-22.48	-26.660	PASS
8DPSK	3-DH5		2398.99	-48.124	-22.36	-25.764	PASS
			2400.00	-48.470	-22.36	-26.110	PASS
			2483.50	-50.790	-21.1	-29.690	PASS

Test Graphs



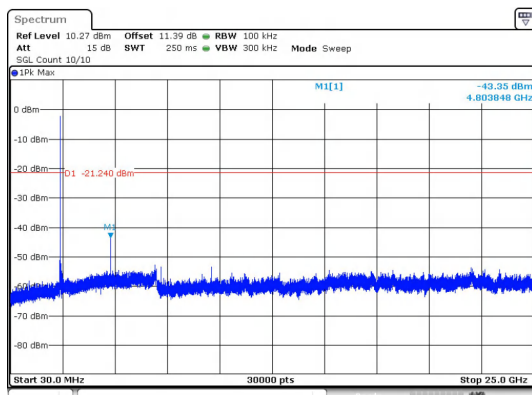
Date: 18.NOV.2024 16:06:14

Out Of Band Emission
GFSK_DH5_Channel 0



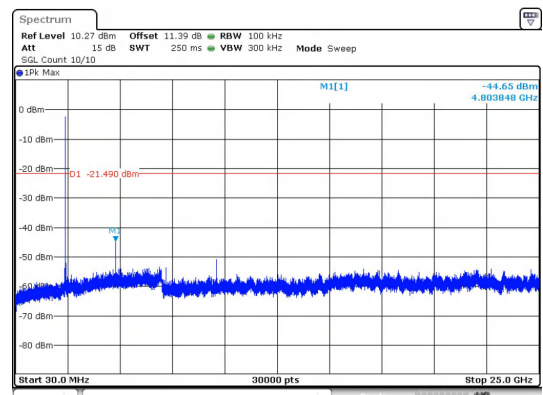
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Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



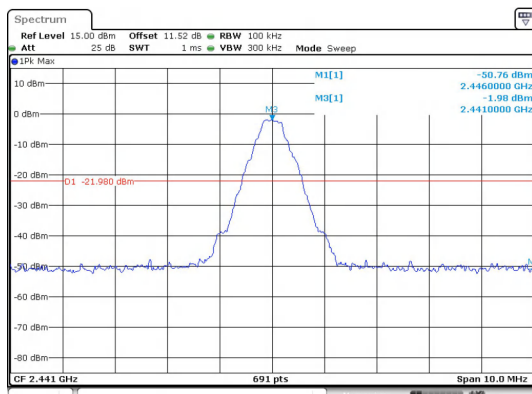
Date: 18.NOV.2024 16:06:36

30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



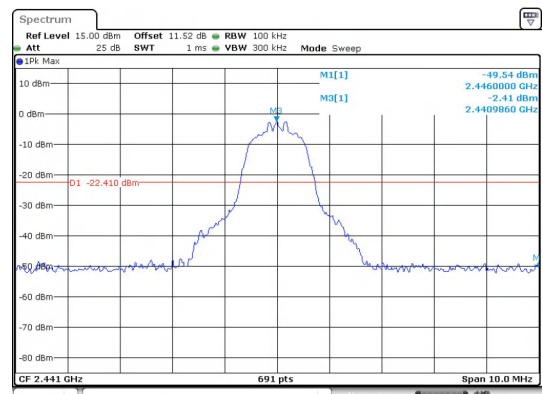
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30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0



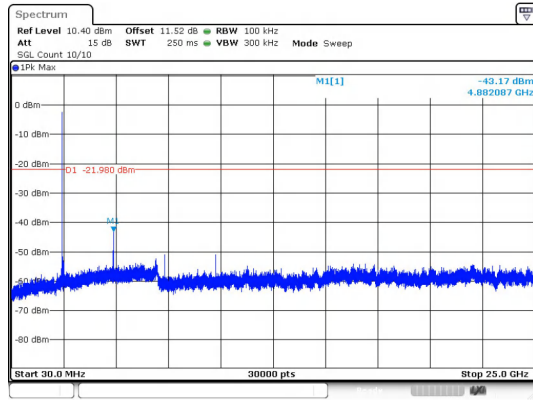
Date: 18.NOV.2024 15:28:59

Out Of Band Emission
GFSK_DH5_Channel 39

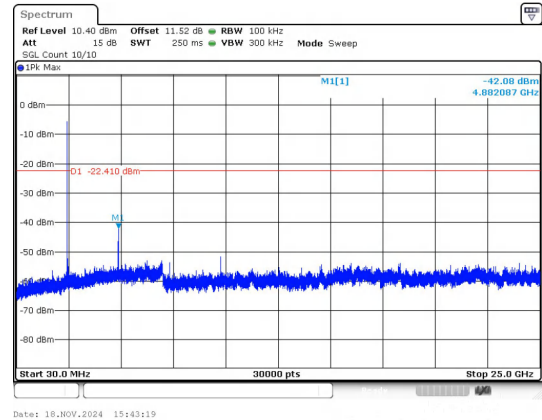


Date: 18.NOV.2024 15:42:57

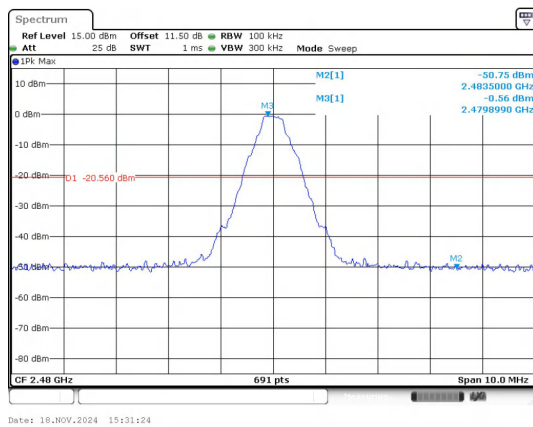
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



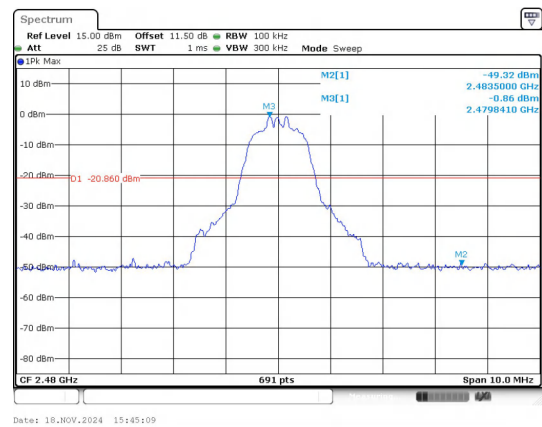
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



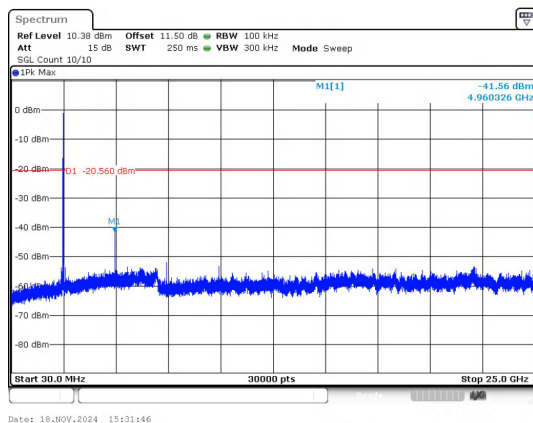
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



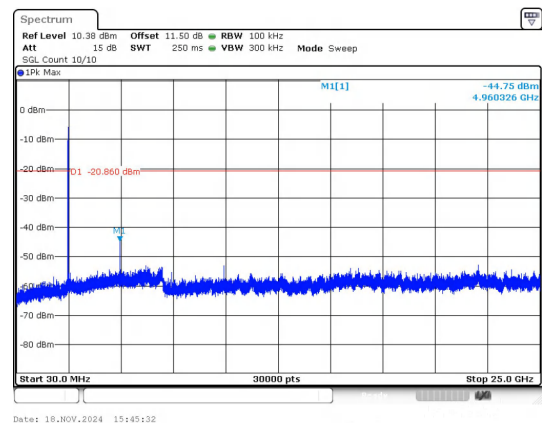
Out Of Band Emission
GFSK_DH5_Channel 78



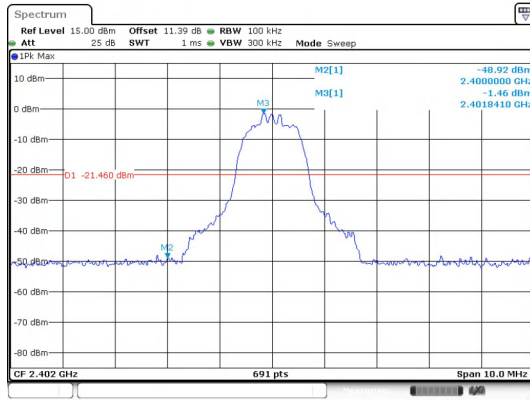
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



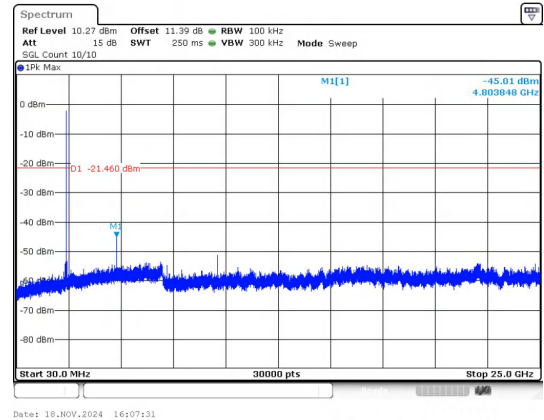
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



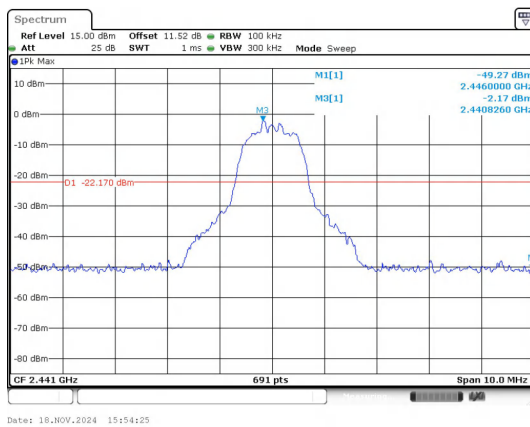
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



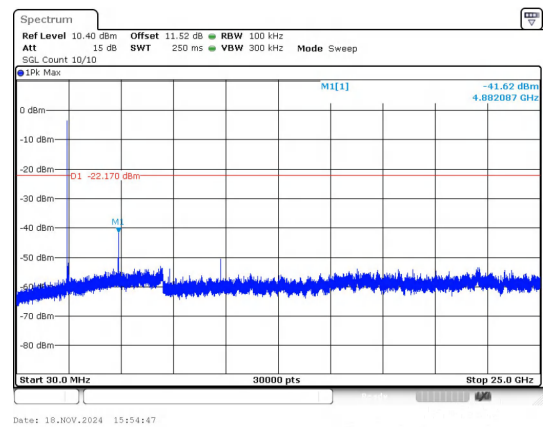
Out Of Band Emission
8DPSK_3-DH5_Channel 0



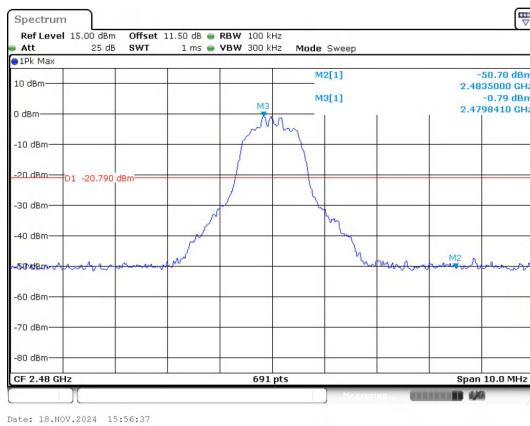
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



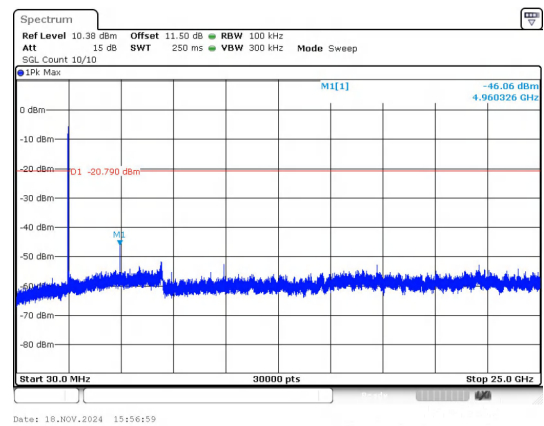
Out Of Band Emission
8DPSK_3-DH5_Channel 39



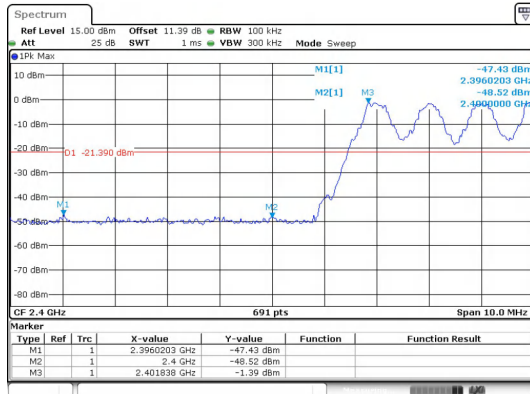
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



Out Of Band Emission
8DPSK_3-DH5_Channel 78

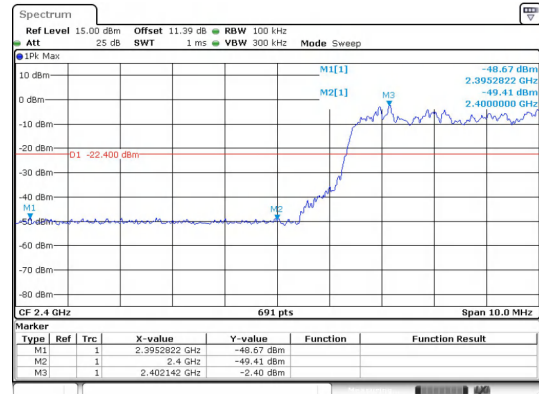


30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



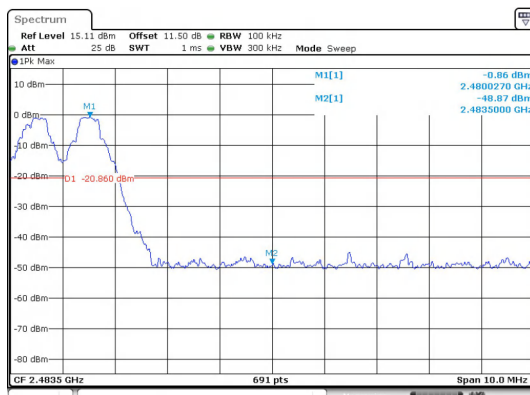
Date: 18.NOV.2024 15:26:20

Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



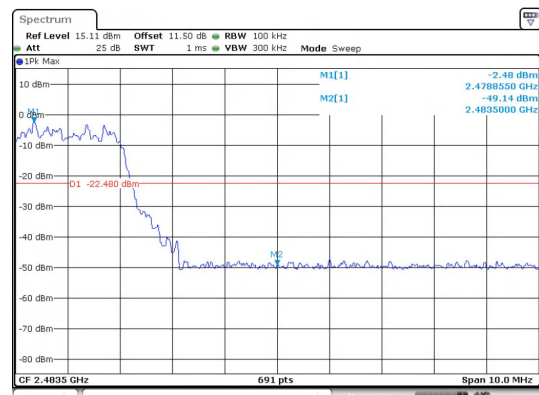
Date: 18.NOV.2024 15:39:43

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



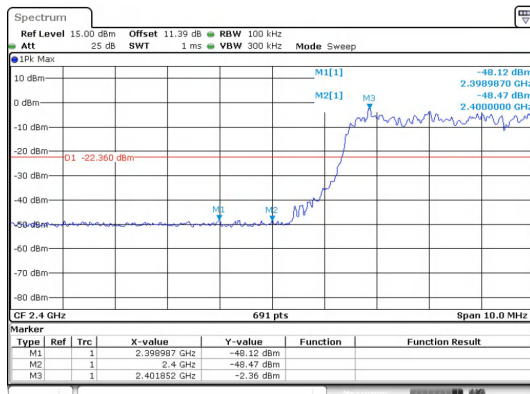
Date: 18.NOV.2024 15:27:14

Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



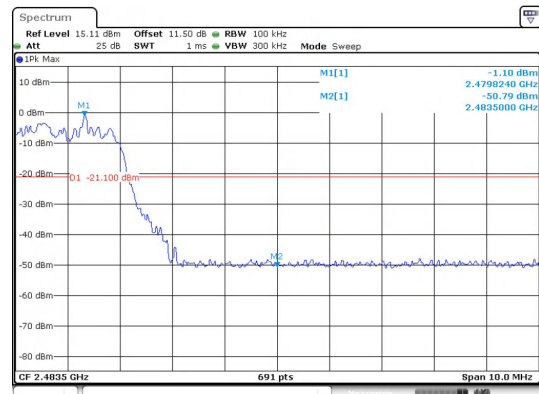
Date: 18.NOV.2024 15:40:12

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



Date: 18.NOV.2024 15:52:09

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



Date: 18.NOV.2024 15:52:31

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

-----The End-----