

Appendix A

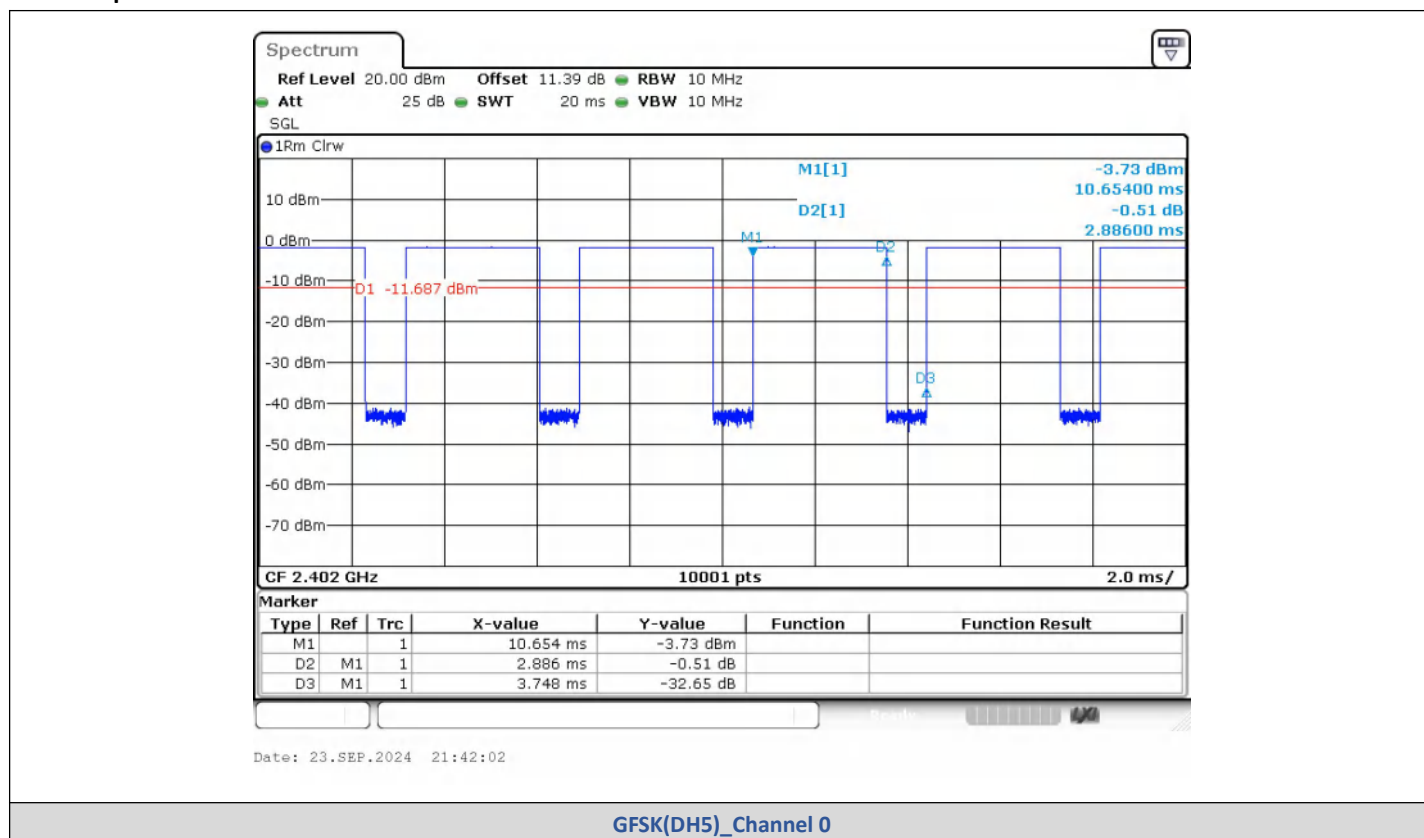
Report No.:	CISRR240918168
FCC ID:	2BET4-K100
Product Name:	Wireless Karaoke Speakers
Model No.:	K100
Test Engineer:	Mark Fu
Supervised by:	Rory Huang

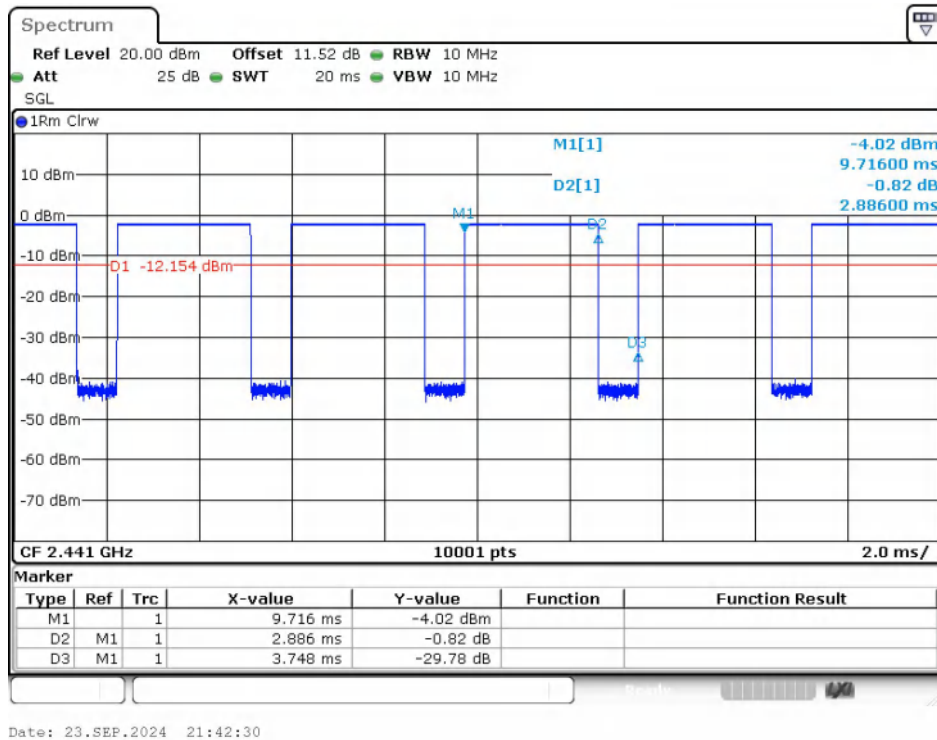
1) Duty Cycle

Test Result

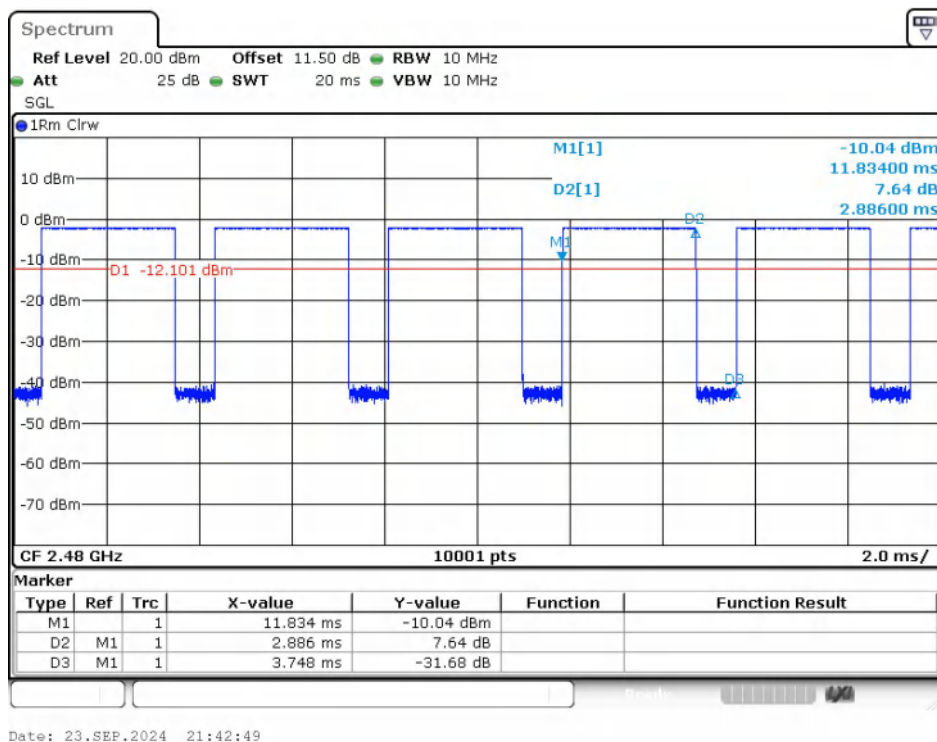
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.886	3.748	77.00	0.7700	1.1351	0.35
		39	2.886	3.748	77.00	0.7700	1.1351	0.35
		78	2.886	3.748	77.00	0.7700	1.1351	0.35
$\pi/4$ DQPSK	2-DH5	0	2.890	3.748	77.11	0.7711	1.1289	0.35
		39	2.892	3.748	77.16	0.7716	1.1261	0.35
		78	2.892	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	3.748	77.16	0.7716	1.1261	0.35
		78	2.892	3.748	77.16	0.7716	1.1261	0.35

Test Graphs

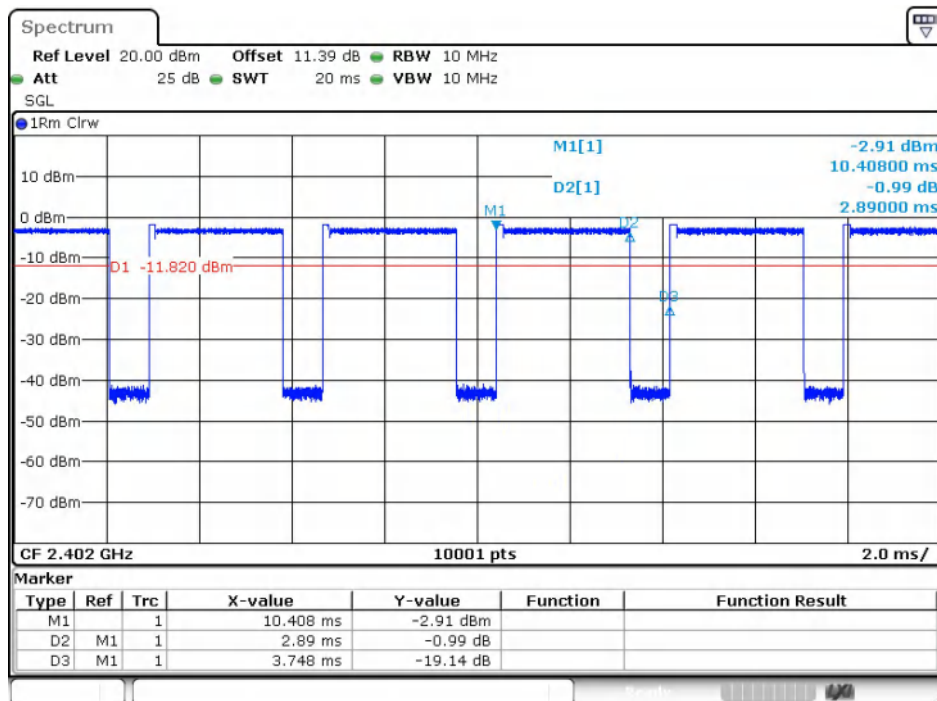




GFSK(DH5)_Channel 39

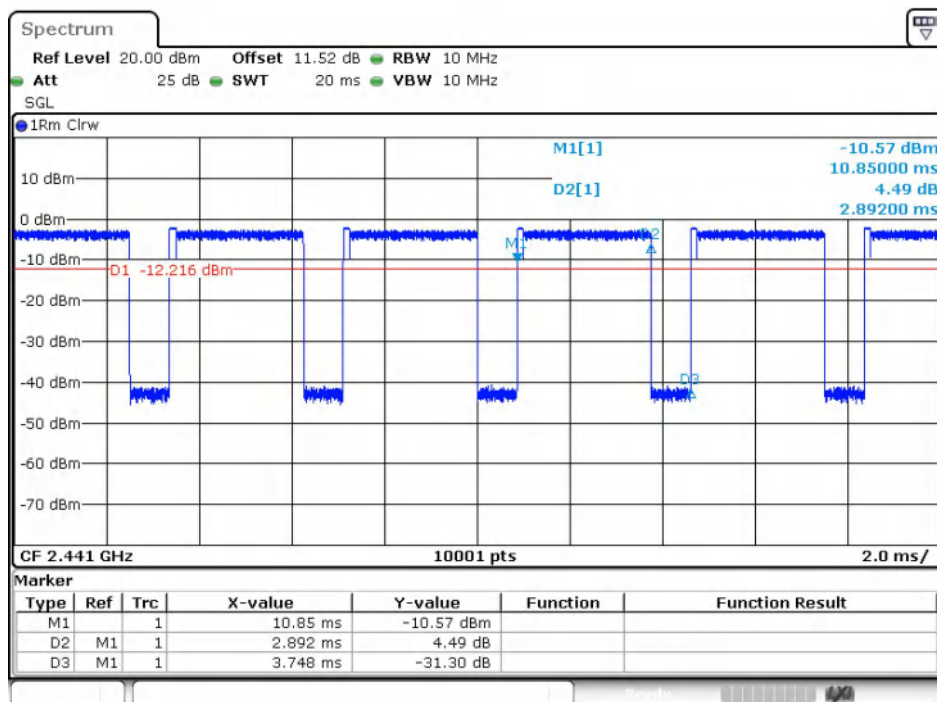


GFSK(DH5)_Channel 78



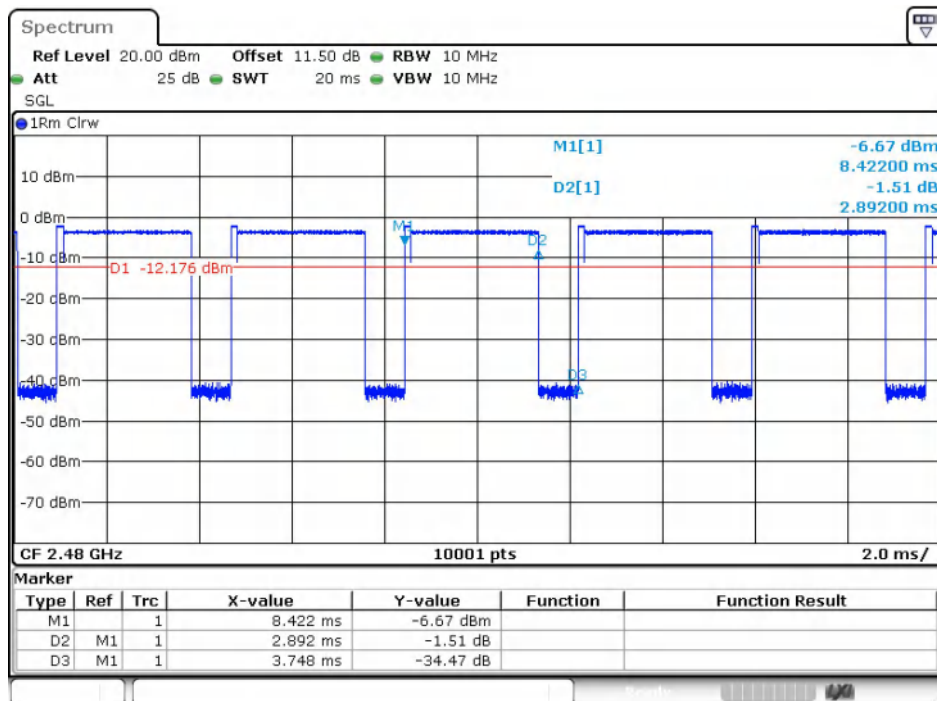
Date: 23.SEP.2024 21:43:18

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



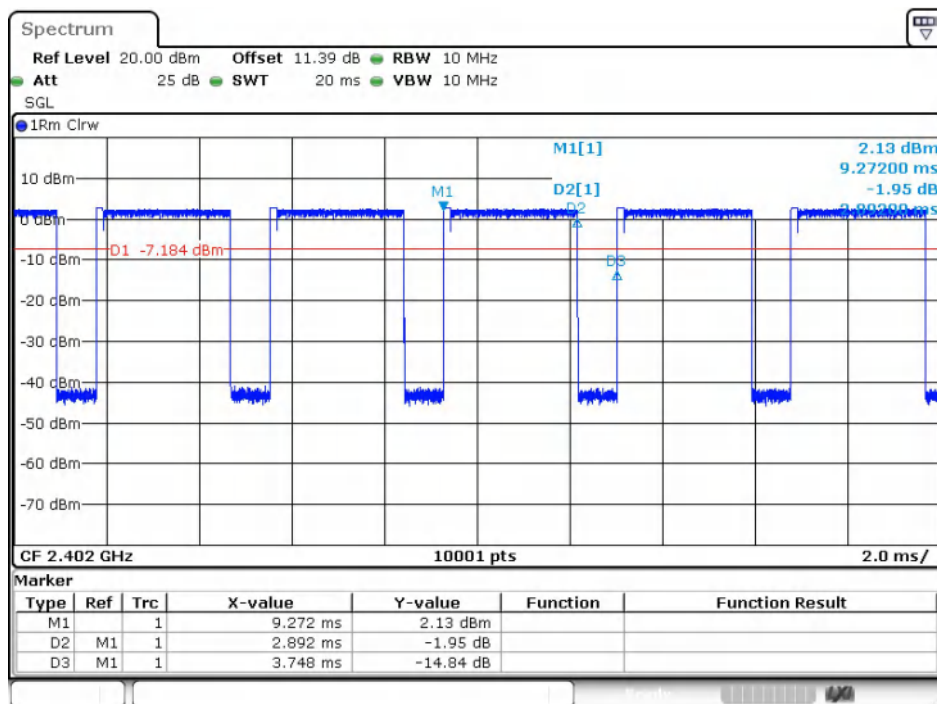
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$\pi/4$ QPSK(2-DH5)_Channel 39



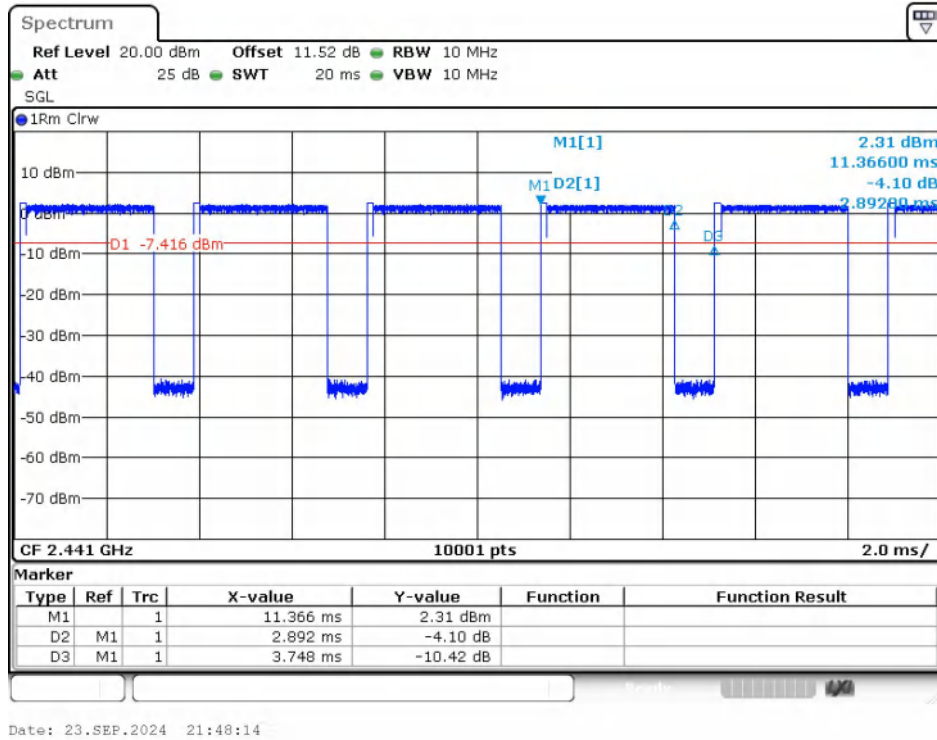
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$\pi/4$ DQPSK(2-DH5)_Channel 78

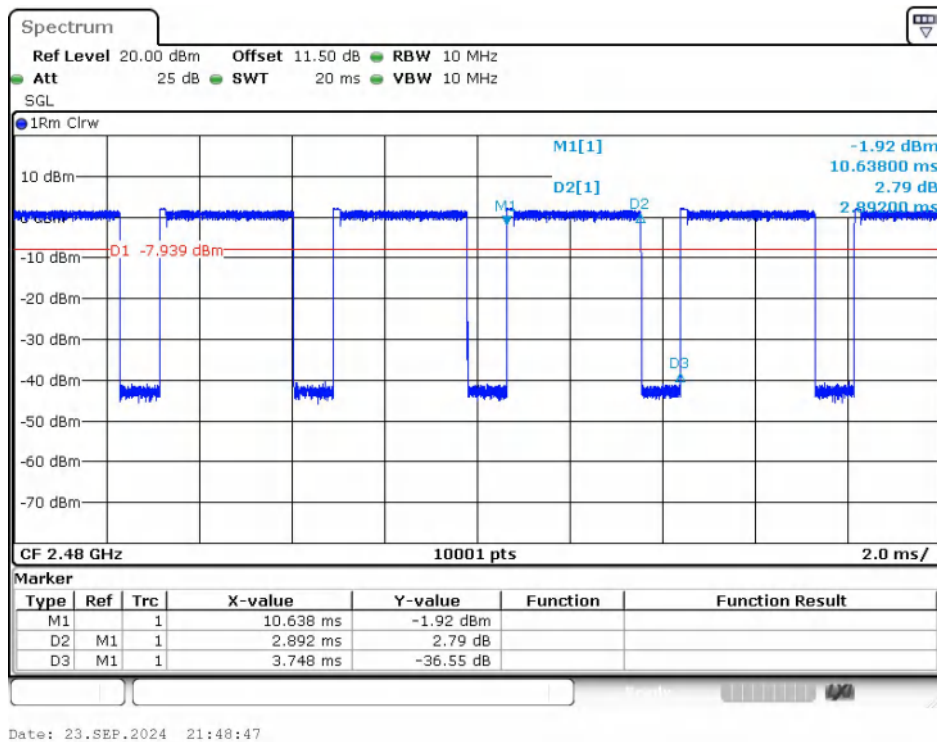


Date: 23.SEP.2024 21:47:48

8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



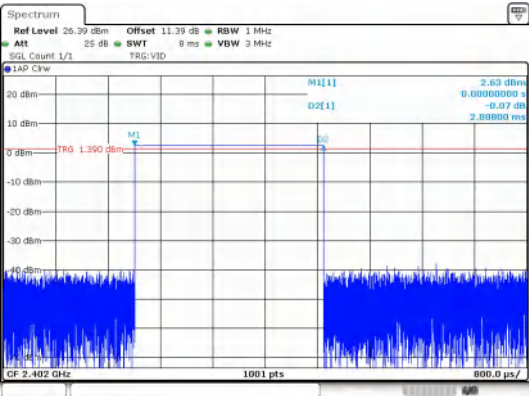
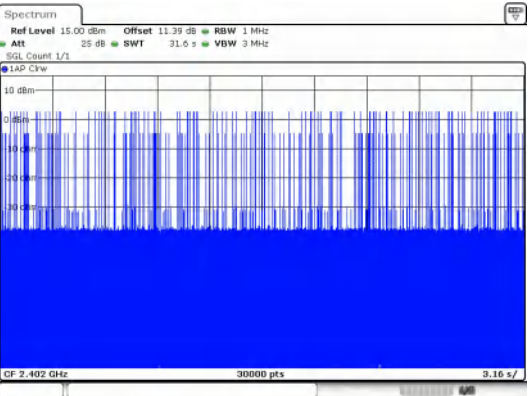
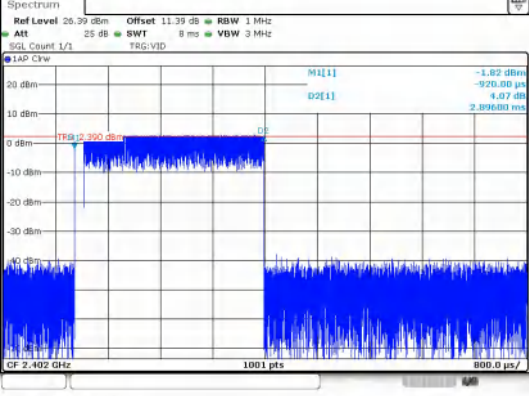
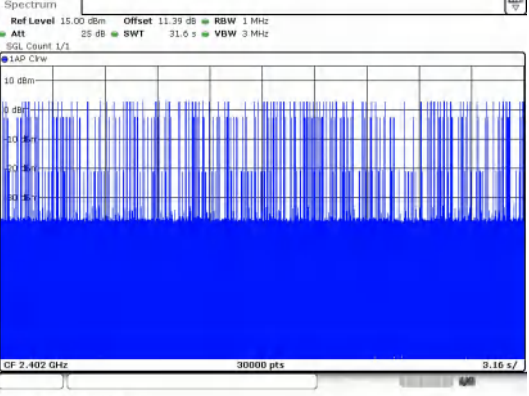
8DPSK(3-DH5)_Channel 78

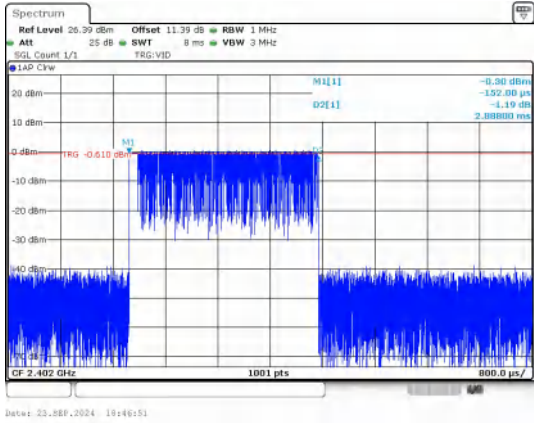
2) Dwell Time

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	114	329.23	< 400	PASS
$\pi/4$ DQPSK	2-DH5		2.896	118	341.73		PASS
8DPSK	3-DH5		2.888	87	251.26		PASS

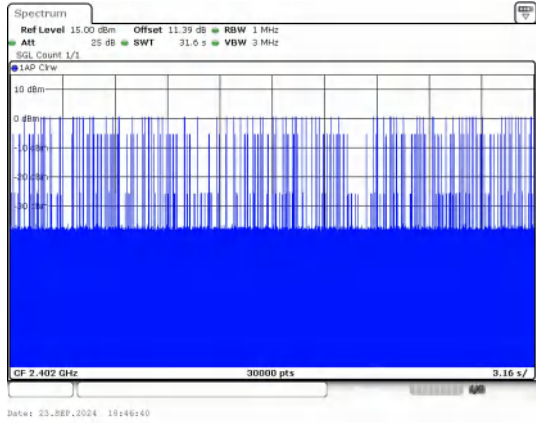
Test Graphs

 Ref Level 26.39 dBm Offset 11.39 dB RBW 1 MHz Att 25 dB SWT 8 ms VBW 3 MHz SQL Count 1/1 TRG:VID M1: 2.63 dBm D2: 0.000000 s D2: -0.07 dB 2.88800 ms CF 2.402 GHz 1001 pts 800.0 μs Date: 23.SEP.2024 21:51:54	 Ref Level 15.00 dBm Offset 11.39 dB RBW 1 MHz Att 25 dB SWT 31.6 s VBW 3 MHz SQL Count 1/1 CF 2.402 GHz 30000 pts 3.16 s Date: 23.SEP.2024 21:51:44
Pulse Width GFSK_DH5	Number of Pulses in 31.6 seconds GFSK_DH5
 Ref Level 26.39 dBm Offset 11.39 dB RBW 1 MHz Att 25 dB SWT 8 ms VBW 3 MHz SQL Count 1/1 TRG:VID M1: -1.82 dBm D2: -9.70 dB D2: 4.07 dB 2.89600 ms CF 2.402 GHz 1001 pts 800.0 μs Date: 23.SEP.2024 21:53:47	 Ref Level 15.00 dBm Offset 11.39 dB RBW 1 MHz Att 25 dB SWT 31.6 s VBW 3 MHz SQL Count 1/1 CF 2.402 GHz 30000 pts 3.16 s Date: 23.SEP.2024 21:53:27
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

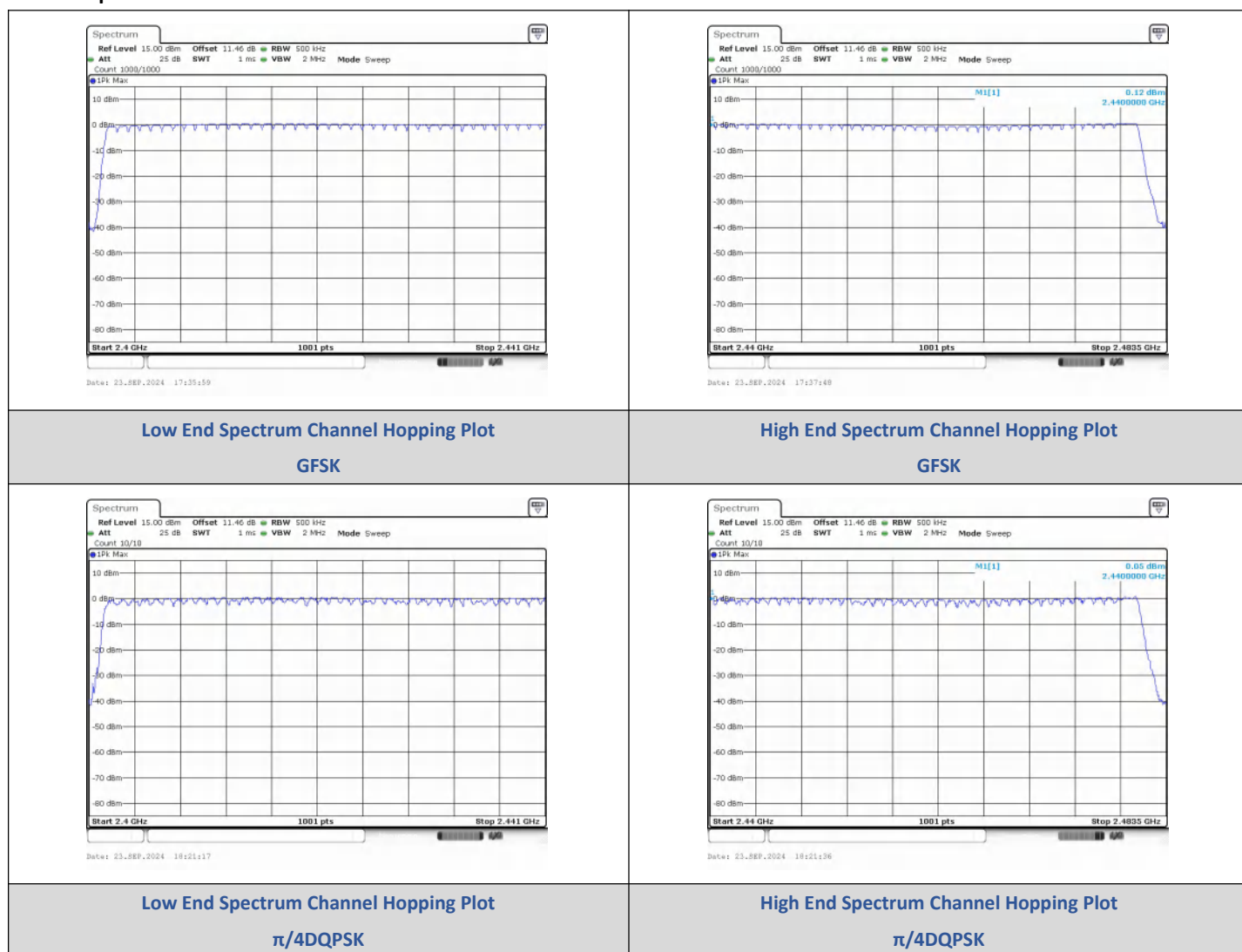
8DPSK_3-DH5

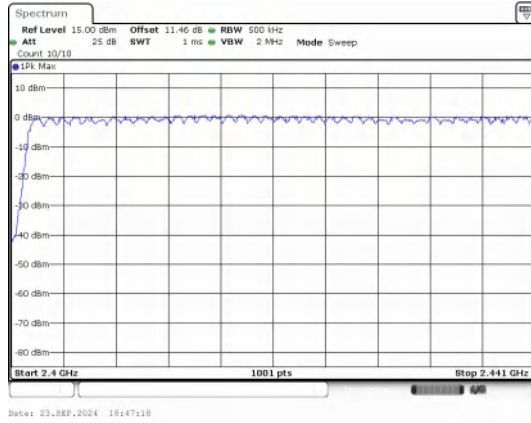
3) Number Of Hopping Channel

Test Result

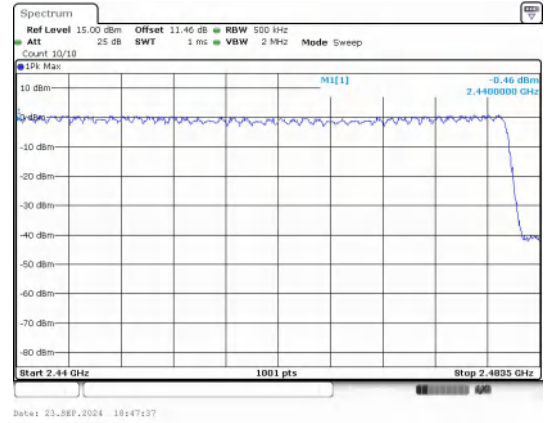
Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



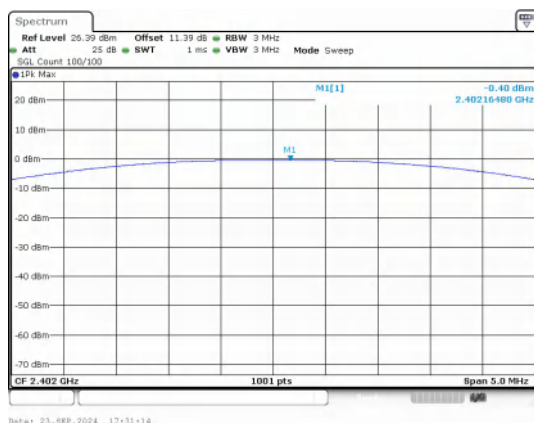
High End Spectrum Channel Hopping Plot
8DPSK

4) Conducted Peak Output Power

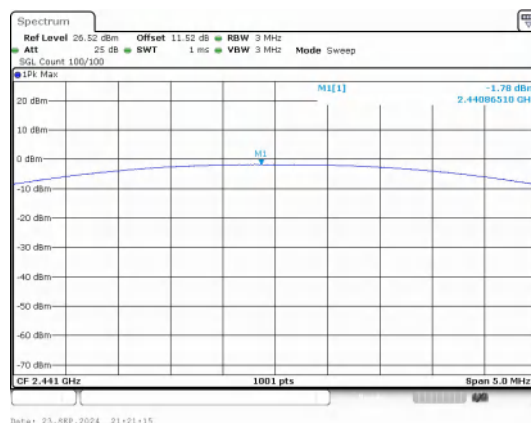
Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	-0.40	0.91	≤30	PASS
		39	-1.78	0.66		PASS
		78	0.94	1.24		PASS
$\pi/4$ DQPSK	2-DH5	0	-1.05	0.79	≤20.97	PASS
		39	-1.38	0.73		PASS
		78	-1.35	0.73		PASS
8DPSK	3-DH5	0	-0.82	0.83		PASS
		39	1.85	1.53		PASS
		78	2.23	1.67		PASS

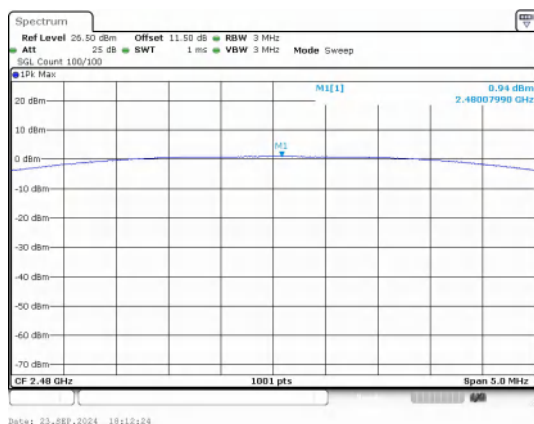
Test Graphs



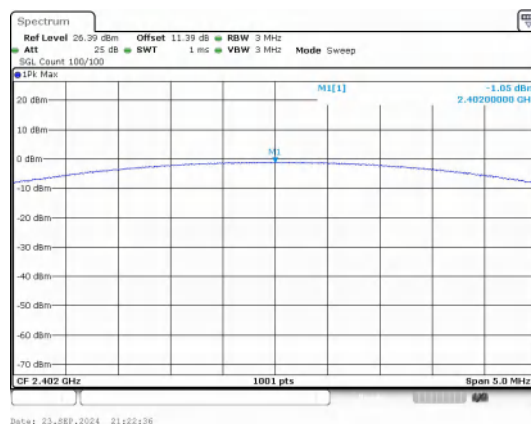
Peak Output Power
GFSK_Channel 0



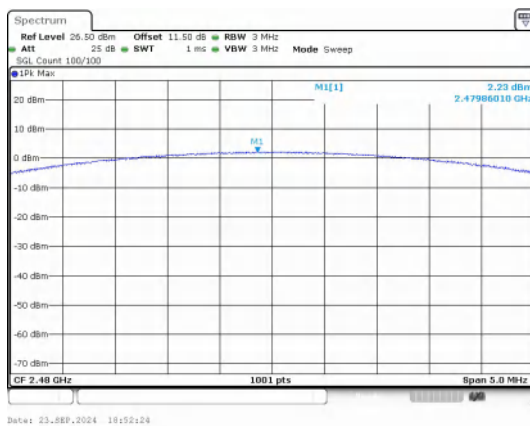
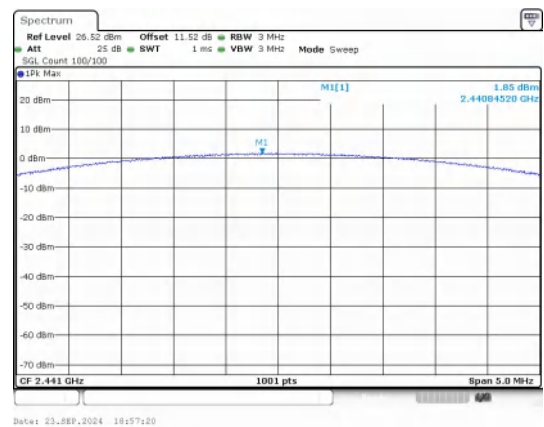
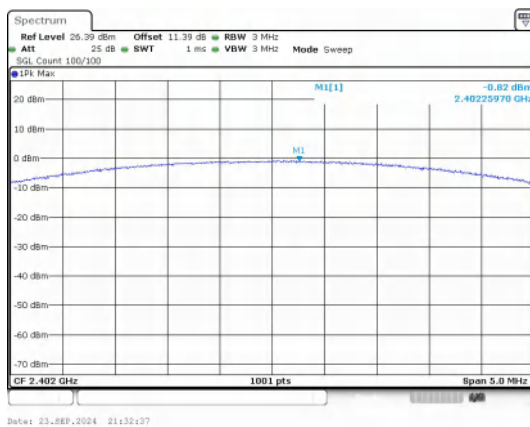
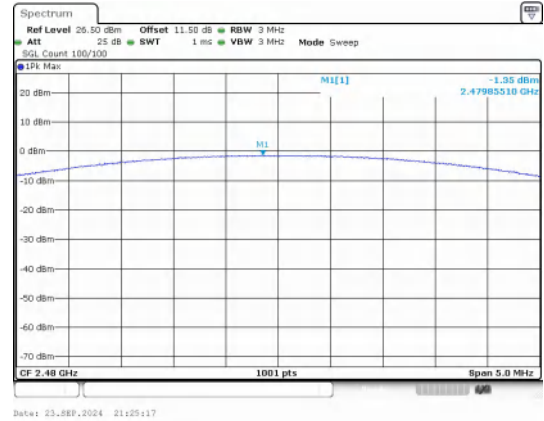
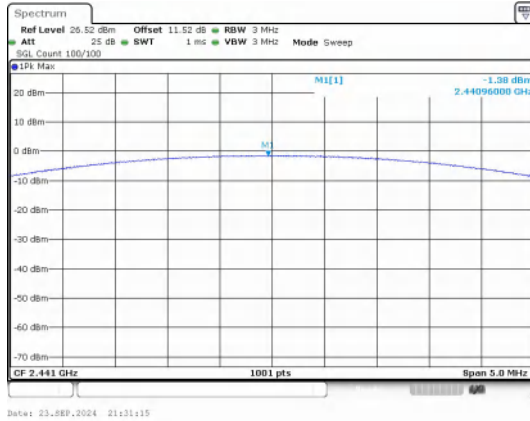
Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78



Peak Output Power
 $\pi/4$ DQPSK_Channel 0



5) 99% Bandwidth

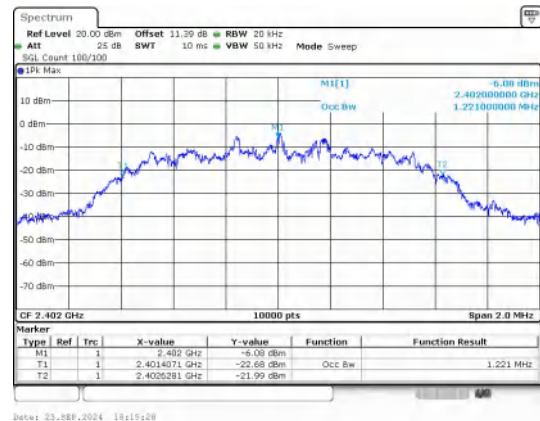
Test Result

Modulation	Channel	Center Frequency (MHz)	99% BW (MHz)
GFSK	0	2402	0.97540
	39	2441	0.98780
	78	2480	0.89140
$\pi/4$ DQPSK	0	2402	1.2210
	39	2441	1.2290
	78	2480	1.2090
8DPSK	0	2402	1.2282
	39	2441	1.2408
	78	2480	1.2464

Test Graphs

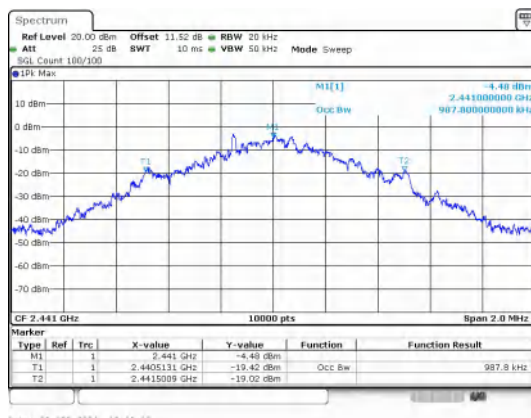


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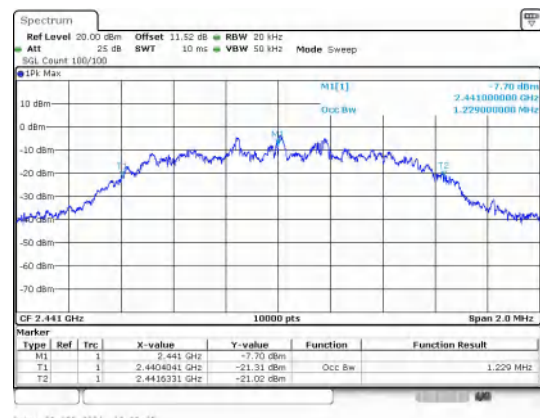


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GFSK_DH5_Channel 0

 $\pi/4$ DQPSK_2-DH5_Channel 0


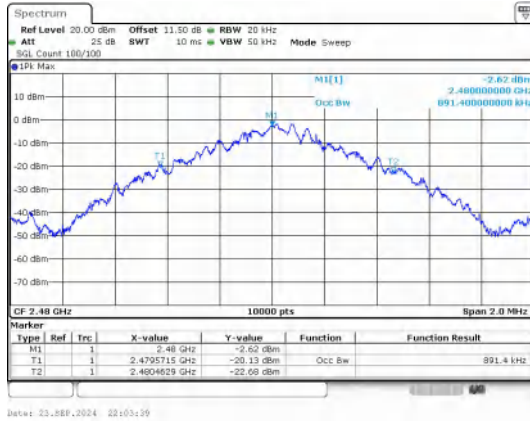
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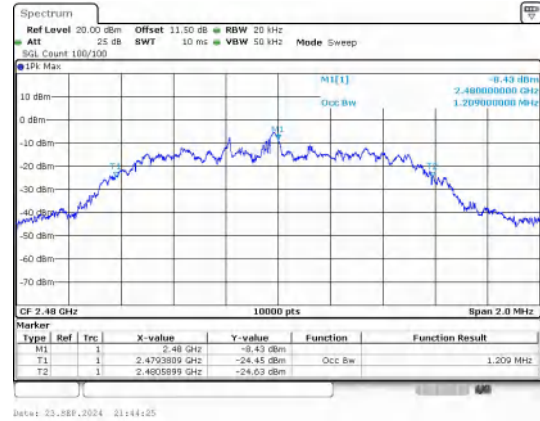
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GFSK_DH5_Channel 39

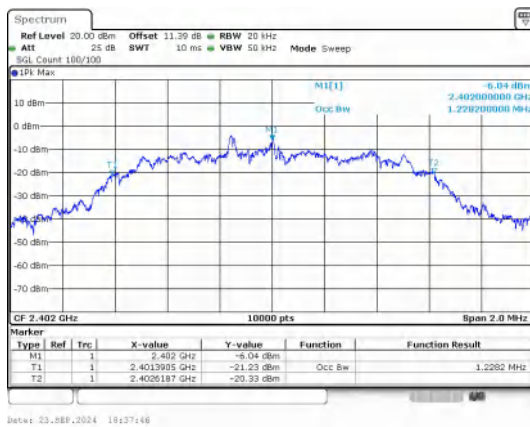
 $\pi/4$ DQPSK_2-DH5_Channel 39



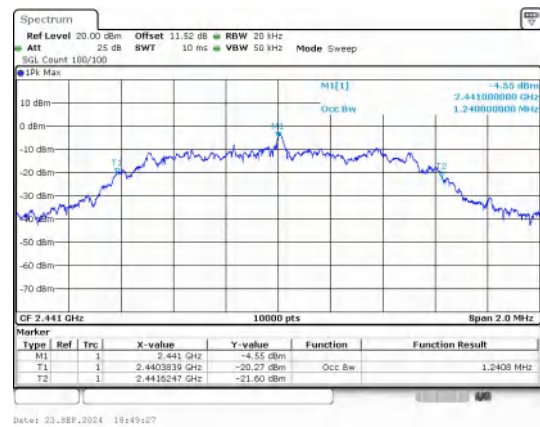
GFSK_DH5_Channel 78



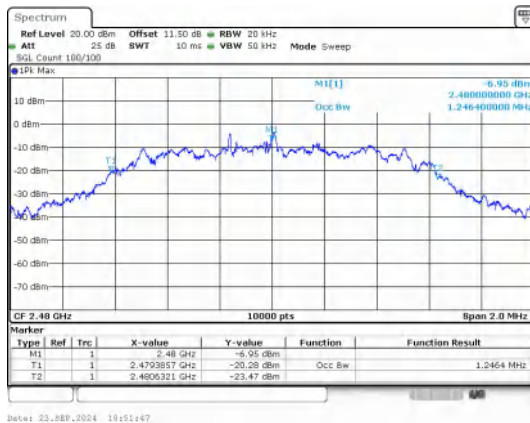
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



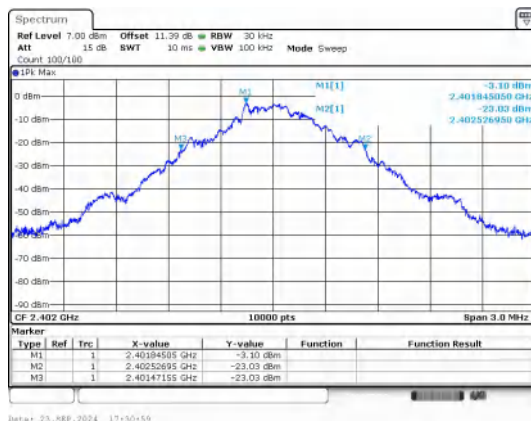
8DPSK_3-DH5_Channel 78

6) 20dB Bandwidth

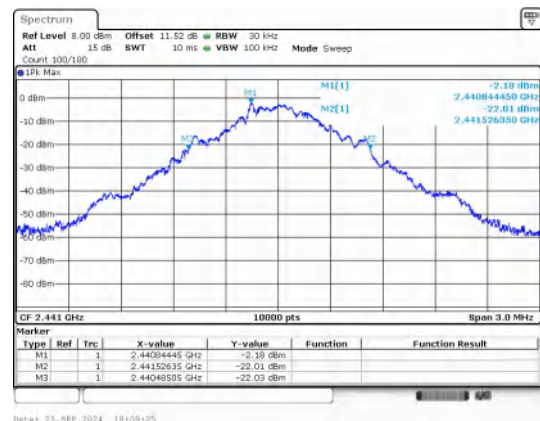
Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.060
	39	2441 MHz	1.040
	78	2480 MHz	1.000
π /4DQPSK	0	2402 MHz	1.340
	39	2441 MHz	1.340
	78	2480 MHz	1.330
8DPSK	0	2402 MHz	1.300
	39	2441 MHz	1.300
	78	2480 MHz	1.300

Test Graphs



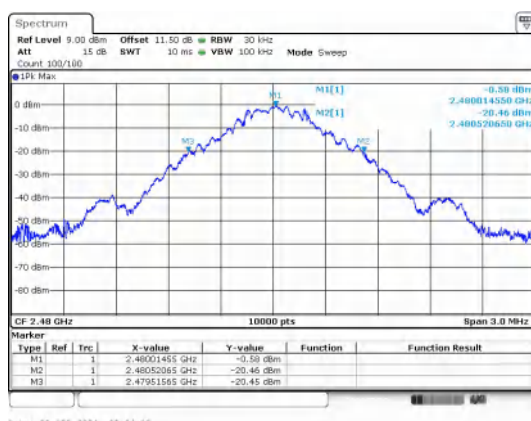
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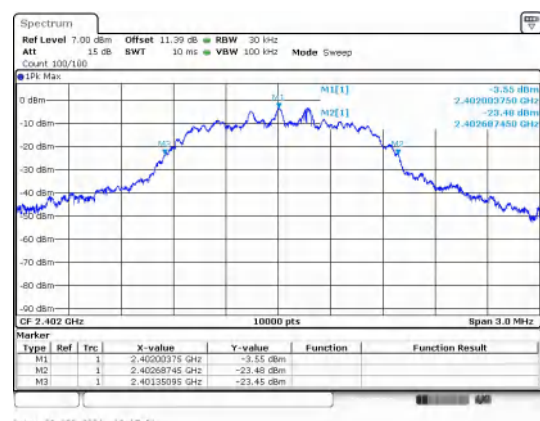
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GFSK_DH5_Channel 0

GFSK_DH5_Channel 39



Date: 23-SEP-2024 22:04:02



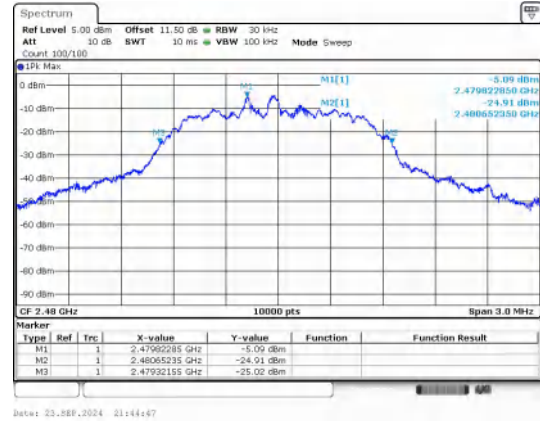
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GFSK_DH5_Channel 78

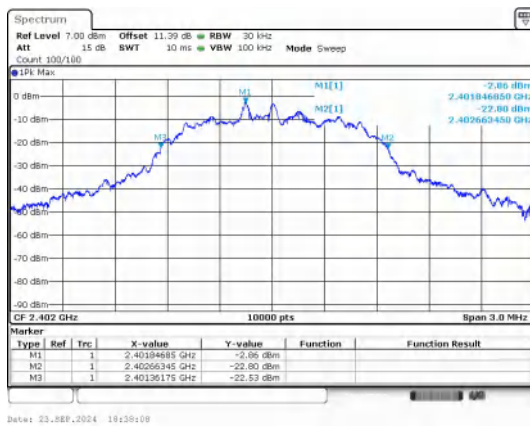
 π /4DQPSK_2-DH5_Channel 0



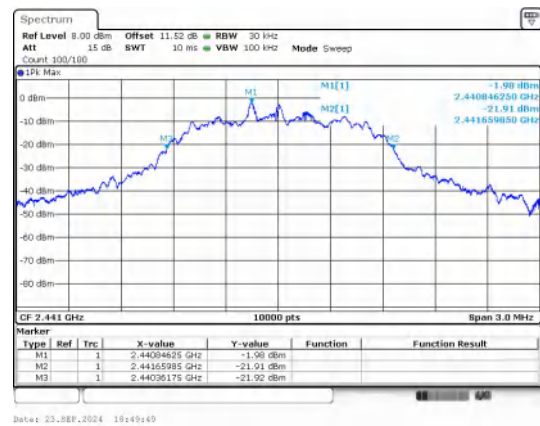
$\pi/4$ DQPSK_2-DH5_Channel 39



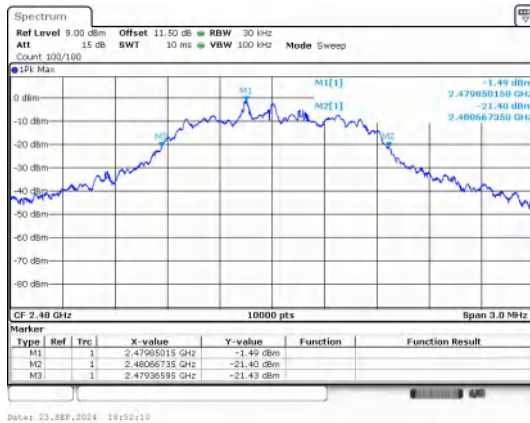
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



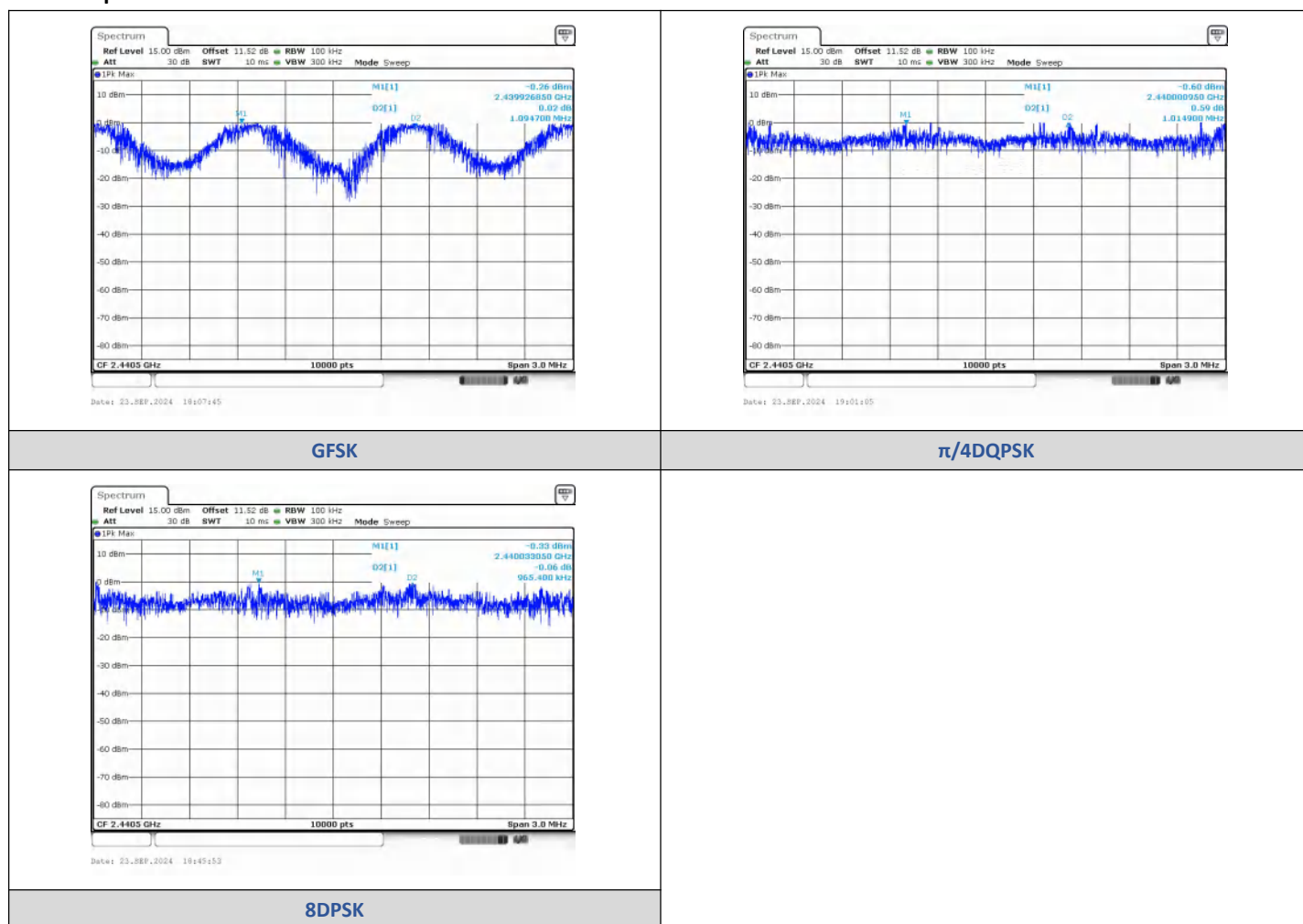
8DPSK_3-DH5_Channel 78

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	2439.9268	2441.0215	1.0947	1.060	PASS
$\pi/4$ QPSK	2-DH5	2440.001	2441.0158	1.0149	0.893	PASS
8DPSK	3-DH5	2440.0331	2440.9985	0.9654	0.867	PASS

Test Graphs



8) Conducted Out Of Band Emission

Test Result

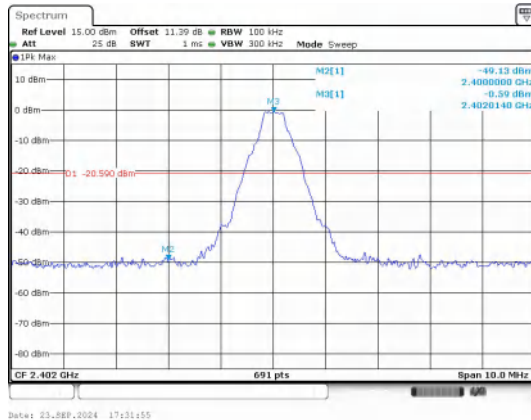
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-49.130	-20.59	-28.540	PASS
			4960.33	-40.158	-20.59	-19.568	PASS
		39	9763.72	-37.936	-22.14	-15.796	PASS
		78	2483.50	-49.283	-19.23	-30.053	PASS
			4960.33	-39.993	-19.23	-20.763	PASS
$\pi/4$ DQPSK	2-DH5	0	2399.00	-48.654	-21.82	-26.834	PASS
			2400.00	-50.245	-21.82	-28.425	PASS
			9608.10	-40.518	-21.82	-18.698	PASS
		39	9763.72	-35.718	-22.24	-13.478	PASS
		78	2483.50	-51.302	-22.21	-29.092	PASS
			9920.20	-39.485	-22.21	-17.275	PASS
8DPSK	3-DH5	0	2400.00	-48.214	-21.49	-26.724	PASS
			19215.7	-52.473	-21.49	-30.983	PASS
		39	9763.72	-43.149	-18.89	-24.259	PASS
		78	2483.50	-50.011	-17.79	-32.221	PASS
			9920.20	-42.335	-17.79	-24.545	PASS

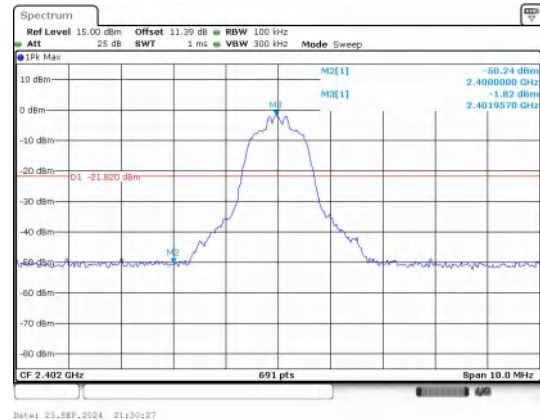
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2400.00	-45.838	-20.22	-25.618	PASS
			2483.50	-48.341	-19.54	-28.801	PASS
$\pi/4$ DQPSK	2-DH5		2395.24	-47.591	-20.66	-26.931	PASS
			2400.00	-49.977	-20.66	-29.317	PASS
			2483.50	-49.814	-19.73	-30.084	PASS
8DPSK	3-DH5		2398.32	-47.932	-21.7	-26.232	PASS
			2400.00	-49.898	-21.7	-28.198	PASS
			2483.50	-48.644	-21.06	-27.584	PASS

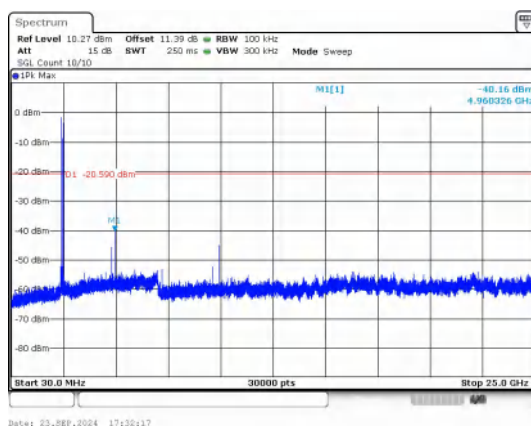
Test Graphs



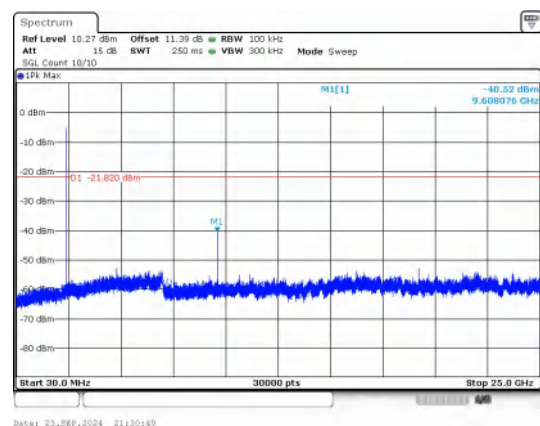
Out Of Band Emission
GFSK_DH5_Channel 0



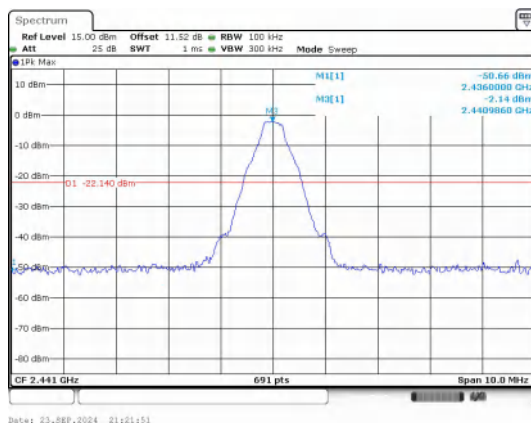
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 0



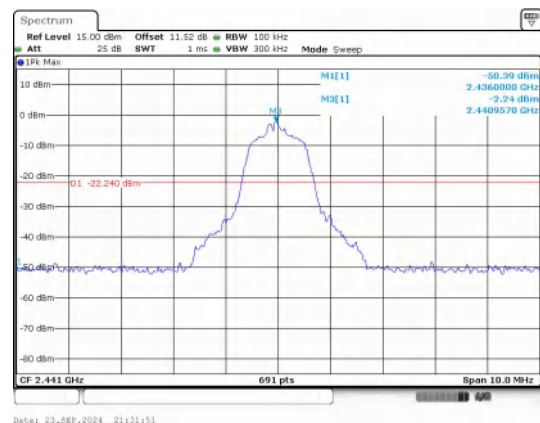
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



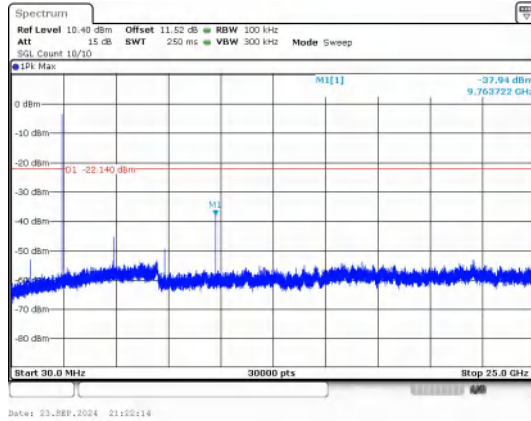
30.0 MHz - 25000.0 MHz
 $\pi/4$ QPSK_2-DH5_Channel 0



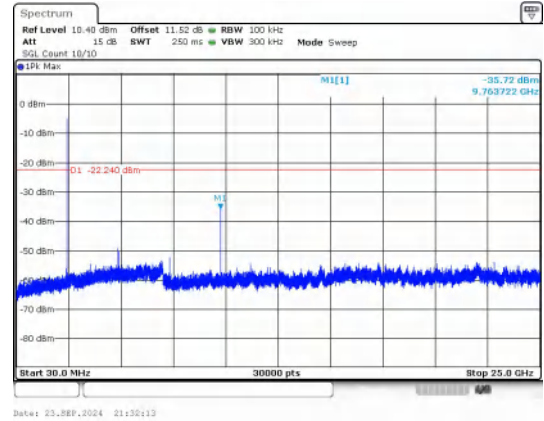
Out Of Band Emission
GFSK_DH5_Channel 39



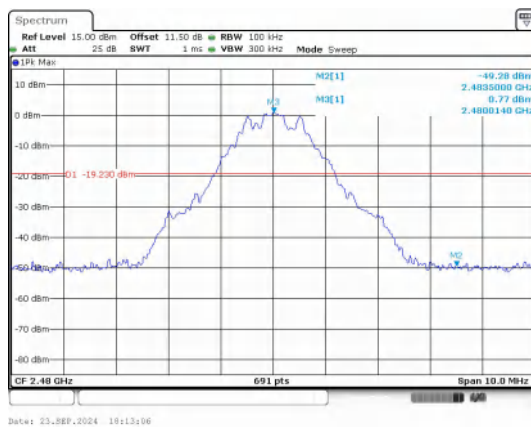
Out Of Band Emission
 $\pi/4$ QPSK_2-DH5_Channel 39



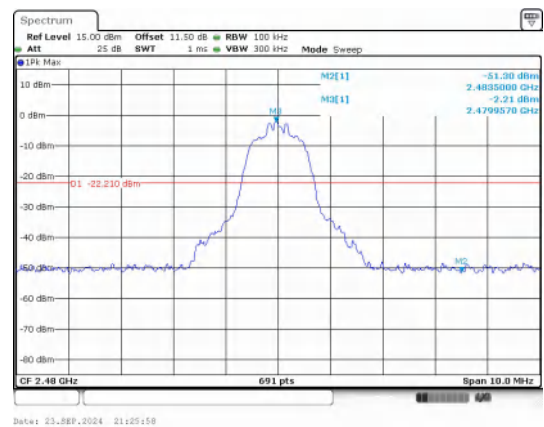
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



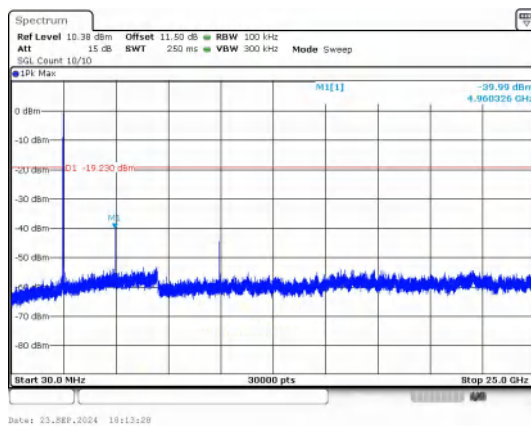
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



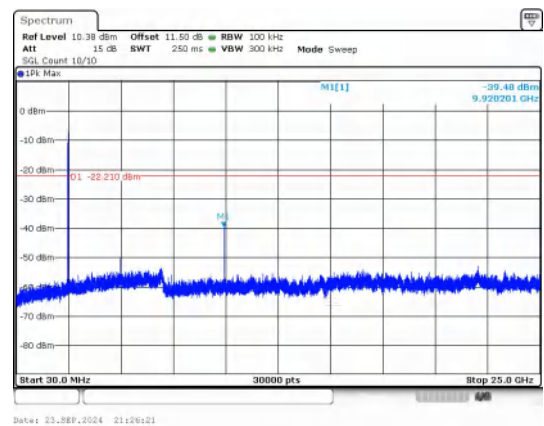
Out Of Band Emission
GFSK_DH5_Channel 78



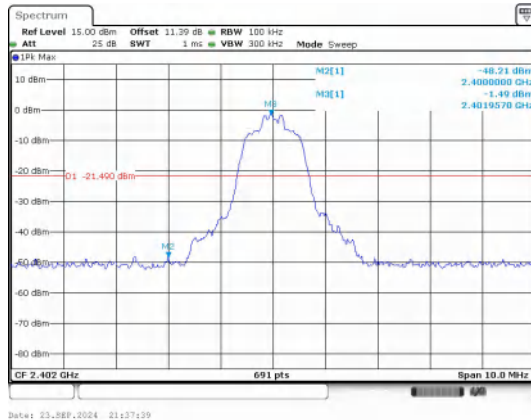
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78



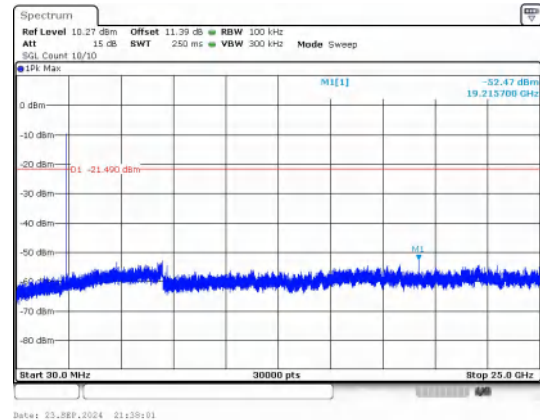
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



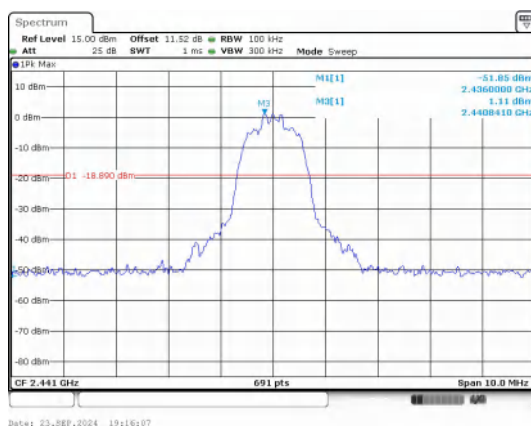
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 78



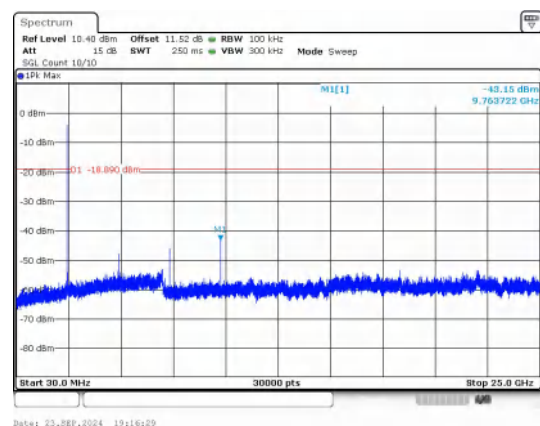
Out Of Band Emission
8DPSK_3-DH5_Channel 0



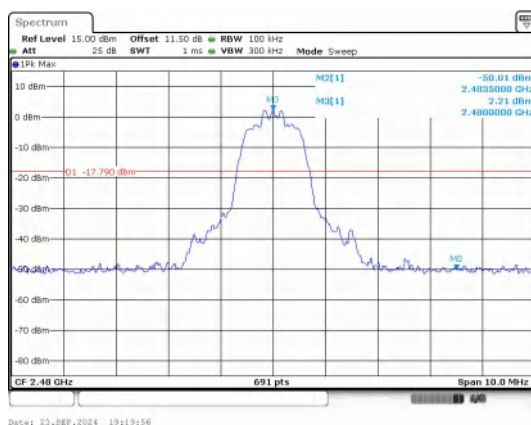
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



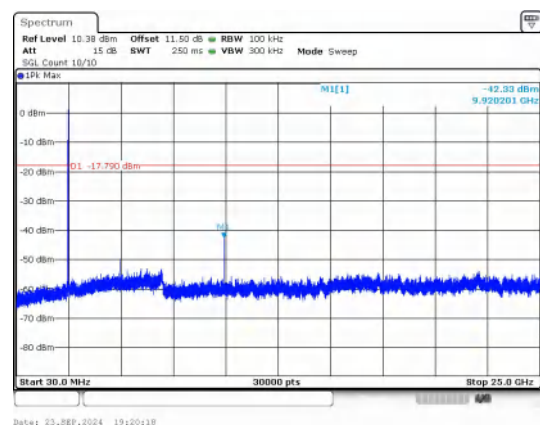
Out Of Band Emission
8DPSK_3-DH5_Channel 39



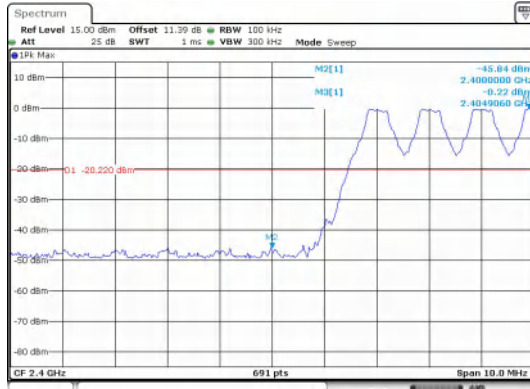
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



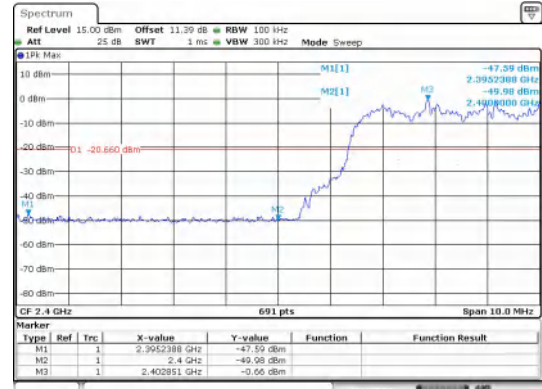
Out Of Band Emission
8DPSK_3-DH5_Channel 78



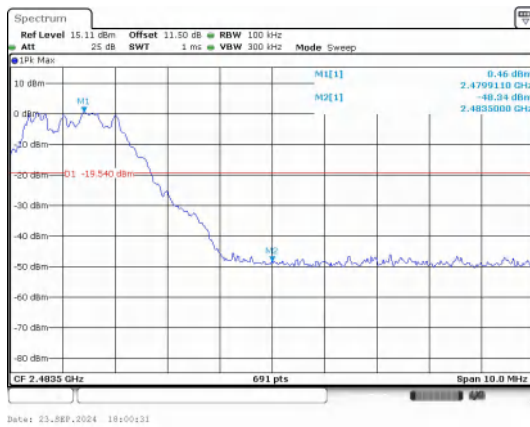
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 78



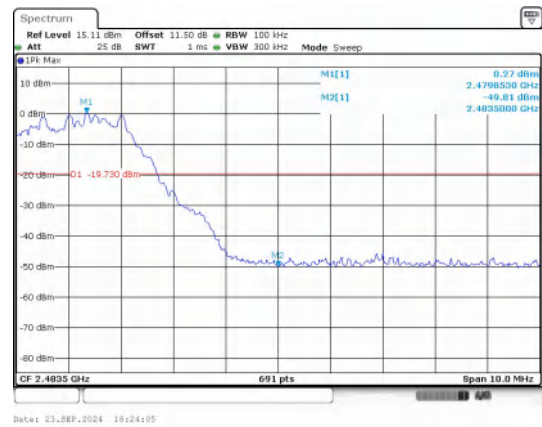
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



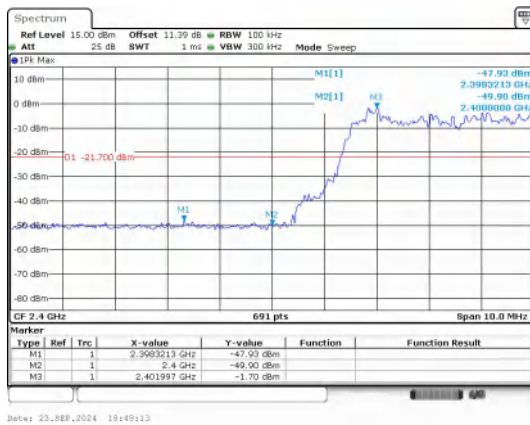
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



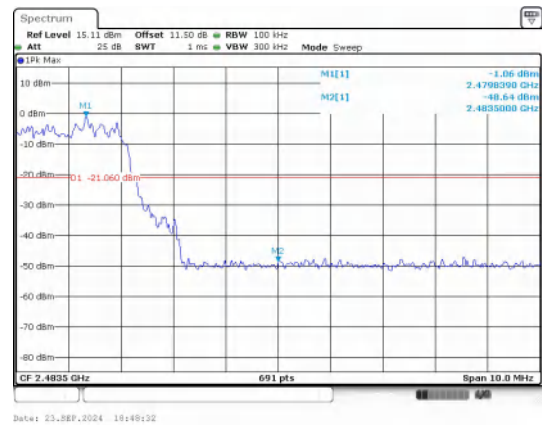
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



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