

Appendix Report

Project No.:	CISR250408081
Test Engineer:	James Wang
Supervised by:	Rory Huang

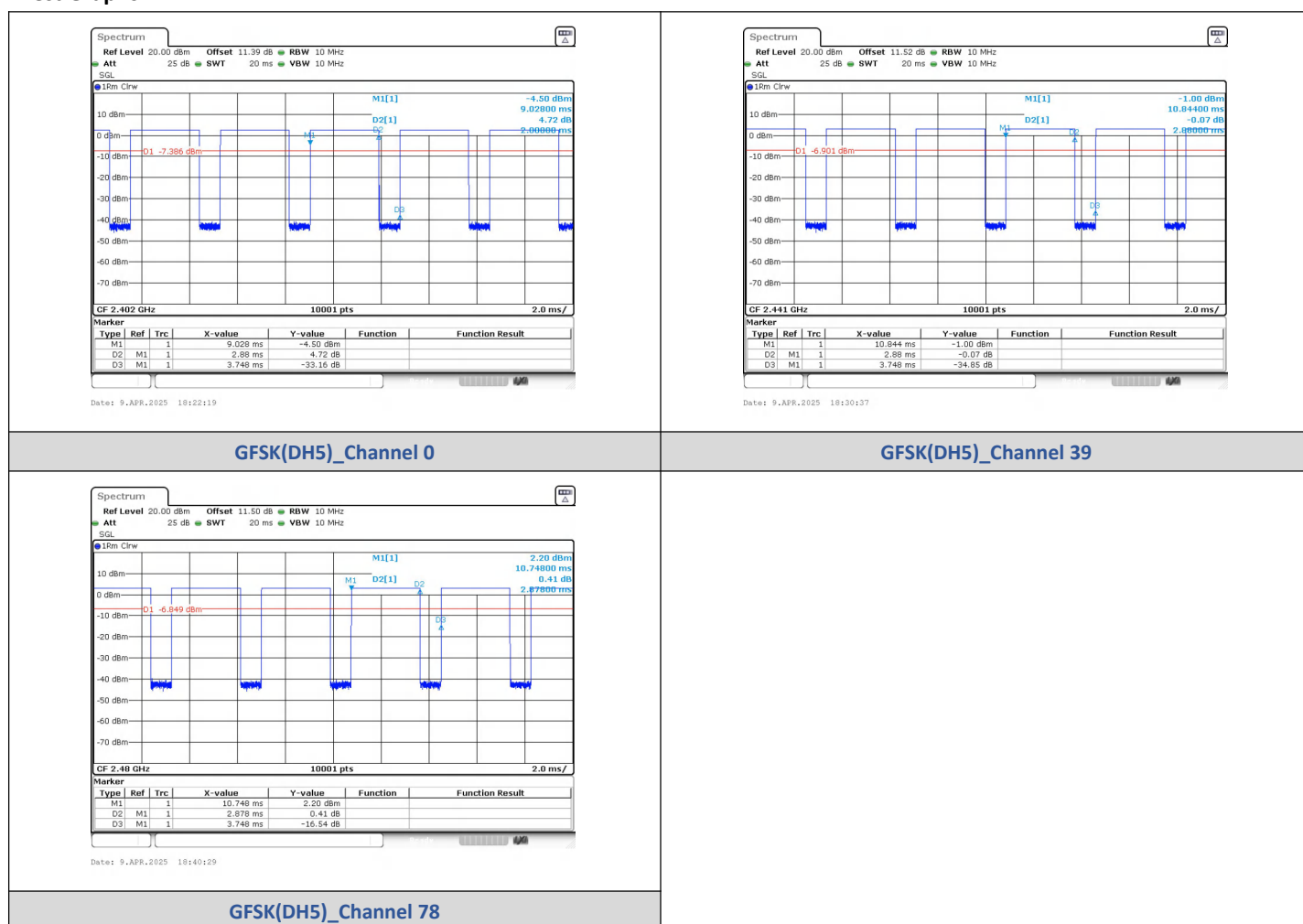
1) Duty Cycle

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	2.880	3.748	76.84	0.7684	1.1441	0.3472
		39	2.880	3.748	76.84	0.7684	1.1441	0.3472
		78	2.878	3.748	76.79	0.7679	1.147	0.3475

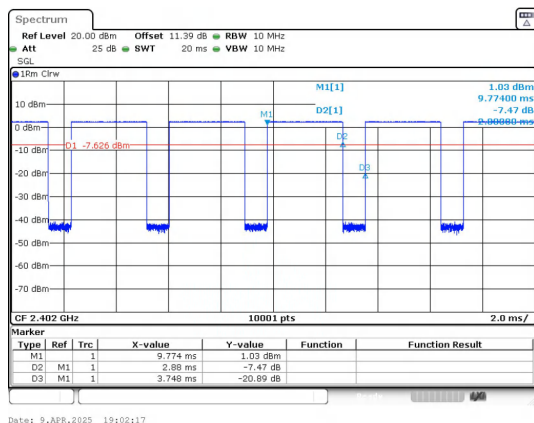
Test Graphs



Right:

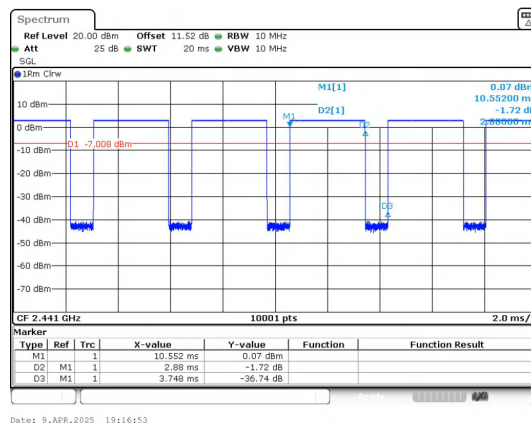
Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
GFSK	DH5	0	2.880	3.748	76.84	0.7684	1.1441	0.3472
		39	2.880	3.748	76.84	0.7684	1.1441	0.3472
		78	2.880	3.748	76.84	0.7684	1.1441	0.3472

Test Graphs



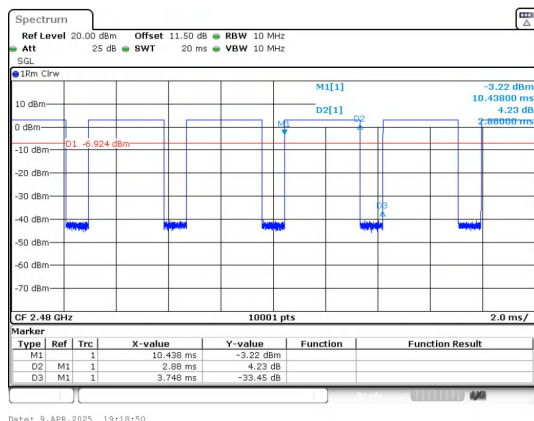
Date: 9.APR.2025 19:02:17

GFSK(DH5)_Channel 0



Date: 9.APR.2025 19:16:53

GFSK(DH5)_Channel 39



Date: 9.APR.2025 19:18:50

GFSK(DH5)_Channel 78

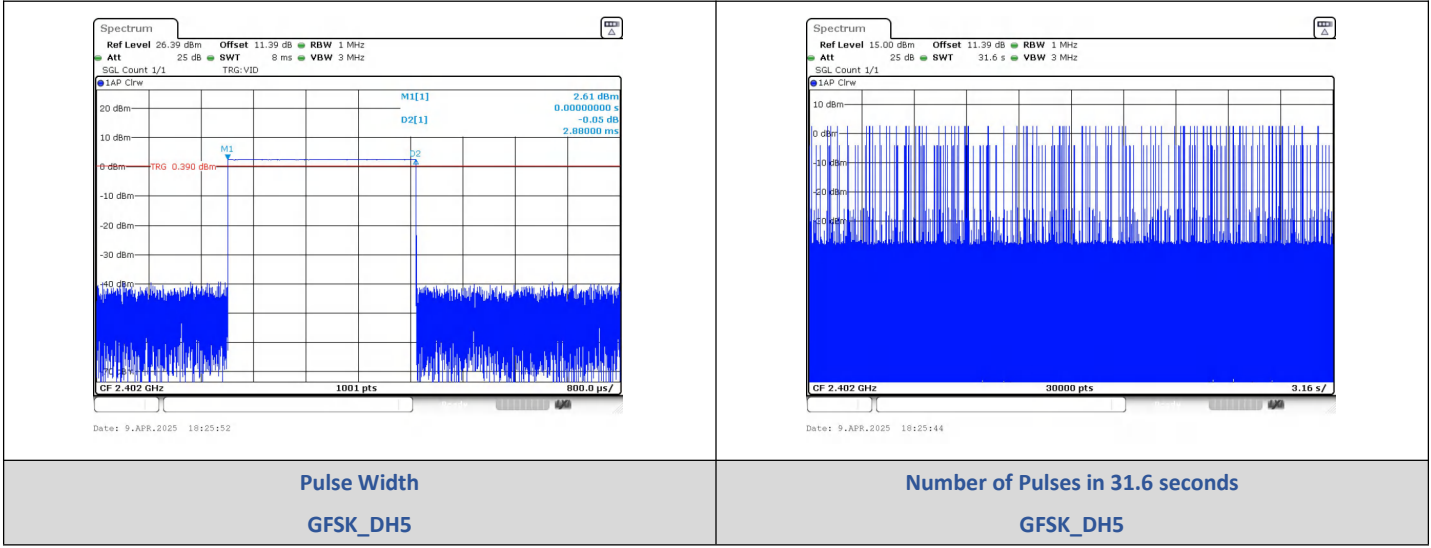
2) Dwell Time

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)	2.880	95	273.6	< 400	PASS

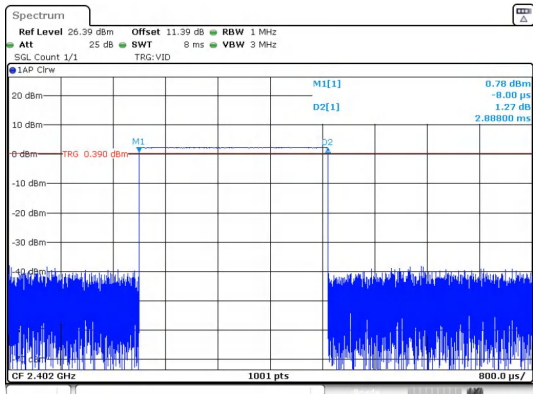
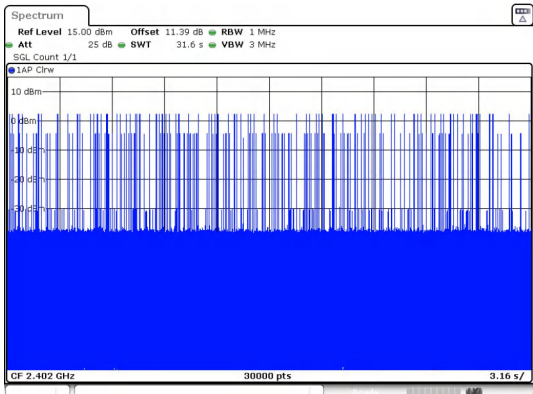
Test Graphs



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	106	306.13	< 400	PASS

Test Graphs

 Date: 9.APR.2025 19:14:03	 Date: 9.APR.2025 19:13:55
Pulse Width GFSK_DH5	Number of Pulses in 31.6 seconds GFSK_DH5

3) Number Of Hopping Channel

Test Result

Left:

Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS

Test Graphs



Right:

Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS

Test Graphs



4) Conducted Output Power

Test Result

Left:

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	2.66	1.85	≤30	PASS
		39	3.11	2.05		PASS
		78	3.22	2.10		PASS

Test Graphs

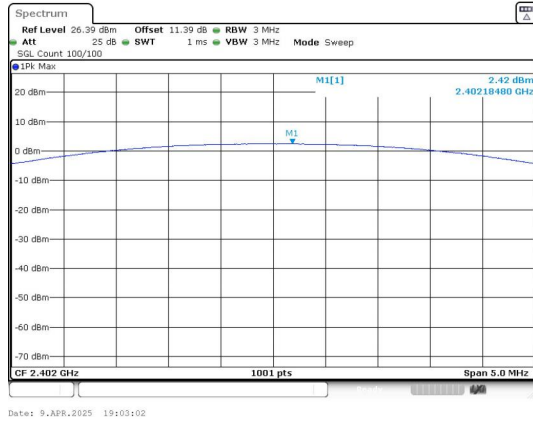


Right:

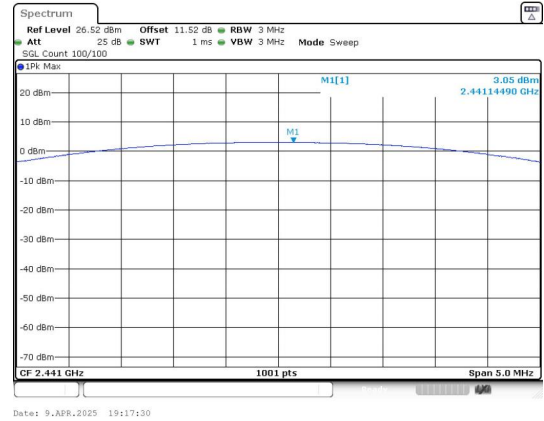
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
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GFSK	DH5	0	2.42	1.75	≤30	PASS
		39	3.05	2.02		PASS
		78	3.19	2.08		PASS

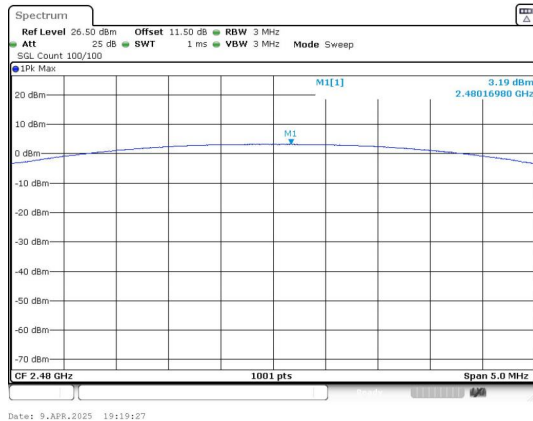
Test Graphs



Peak Output Power
GFSK_Channel 0



Peak Output Power
GFSK_Channel 39



Peak Output Power
GFSK_Channel 78

5) 20dB Bandwidth

Test Result

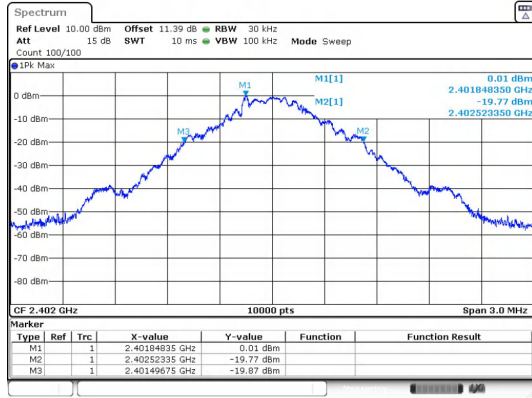
Left:

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.03
	39	2441 MHz	1.03
	78	2480 MHz	1.03

Test Graphs

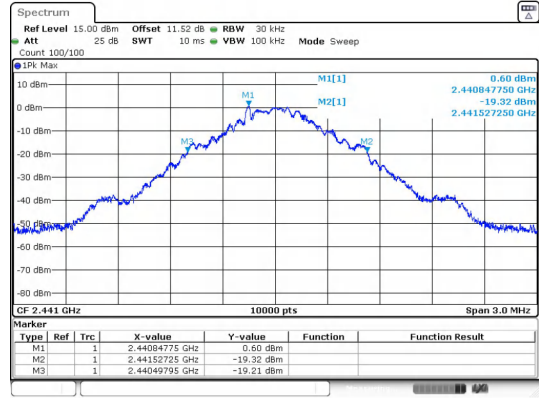
Spectrum Ref Level 15.00 dBm Offset 11.99 dB RBW 30 kHz Att 25 dB SWT 10 ms VBW 100 kHz Mode Sweep Count 100/100 1PK Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm -80 dBm CF 2.402 GHz 10000 pts Span 3.0 MHz Marker <table><thead><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-value</th><th>Y-value</th><th>Function</th><th>Function Result</th></tr></thead><tbody><tr><td>M1</td><td>1</td><td></td><td>2.40185045 GHz</td><td>0.16 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.40252575 GHz</td><td>-19.75 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.40149645 GHz</td><td>-19.77 dBm</td><td></td><td></td></tr></tbody></table> Date: 9.APR.2025 18:22:40	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.40185045 GHz	0.16 dBm			M2	1		2.40252575 GHz	-19.75 dBm			M3	1		2.40149645 GHz	-19.77 dBm			Spectrum Ref Level 15.00 dBm Offset 11.52 dB RBW 30 kHz Att 25 dB SWT 10 ms VBW 100 kHz Mode Sweep Count 100/100 1PK Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm -80 dBm CF 2.441 GHz 10000 pts Span 3.0 MHz Marker <table><thead><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-value</th><th>Y-value</th><th>Function</th><th>Function Result</th></tr></thead><tbody><tr><td>M1</td><td>1</td><td></td><td>2.44085585 GHz</td><td>0.28 dBm</td><td></td><td></td></tr><tr><td>M2</td><td>1</td><td></td><td>2.44152815 GHz</td><td>-19.67 dBm</td><td></td><td></td></tr><tr><td>M3</td><td>1</td><td></td><td>2.44049285 GHz</td><td>-19.59 dBm</td><td></td><td></td></tr></tbody></table> Date: 9.APR.2025 18:30:59	Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1	1		2.44085585 GHz	0.28 dBm			M2	1		2.44152815 GHz	-19.67 dBm			M3	1		2.44049285 GHz	-19.59 dBm		
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GFSK_DH5_Channel 78																																																									
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	39	2441 MHz	1.07																																																						
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Test Graphs



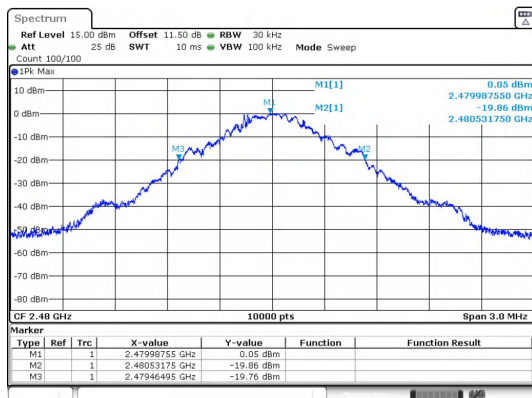
Date: 9.APR.2025 19:02:45

GFSK_DH5_Channel 0



Date: 9.APR.2025 19:17:14

GFSK_DH5_Channel 39



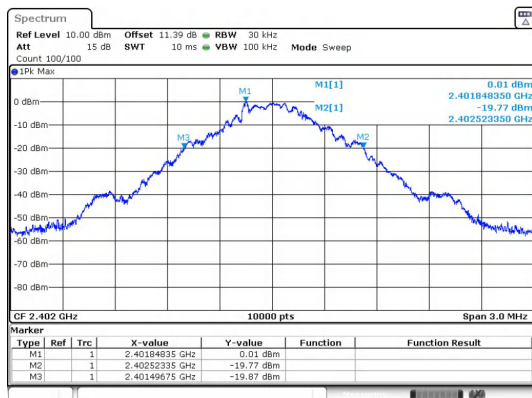
Date: 9.APR.2025 19:19:11

GFSK_DH5_Channel 78

Right:

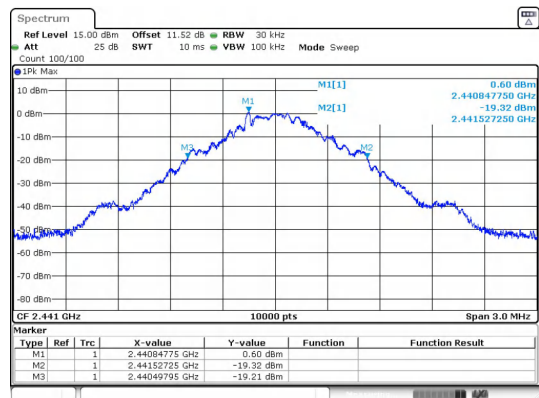
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	1.07
	39	2441 MHz	1.07
	78	2480 MHz	1.07

Test Graphs



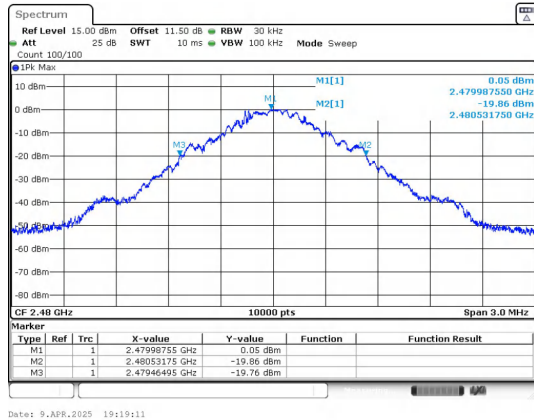
Date: 9.APR.2025 19:02:45

GFSK_DH5_Channel 0



Date: 9.APR.2025 19:17:14

GFSK_DH5_Channel 39



GFSK_DH5_Channel 78

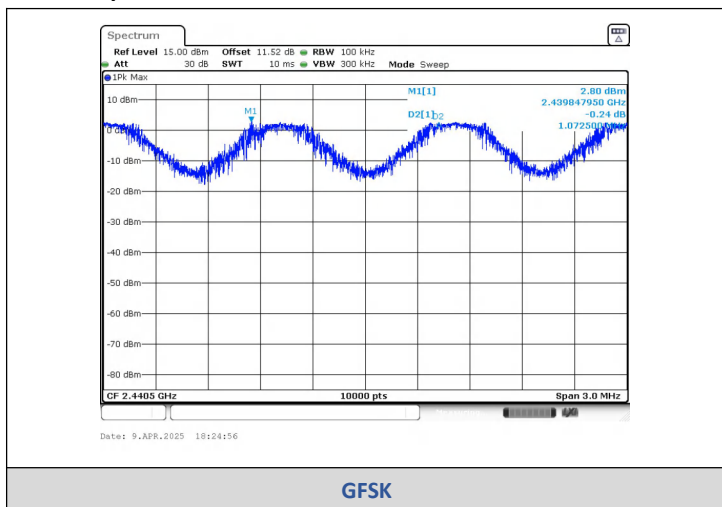
6) Carrier Frequencies Separation

Test Result

Left:

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8479	2440.9205	1.0725	1.03	PASS

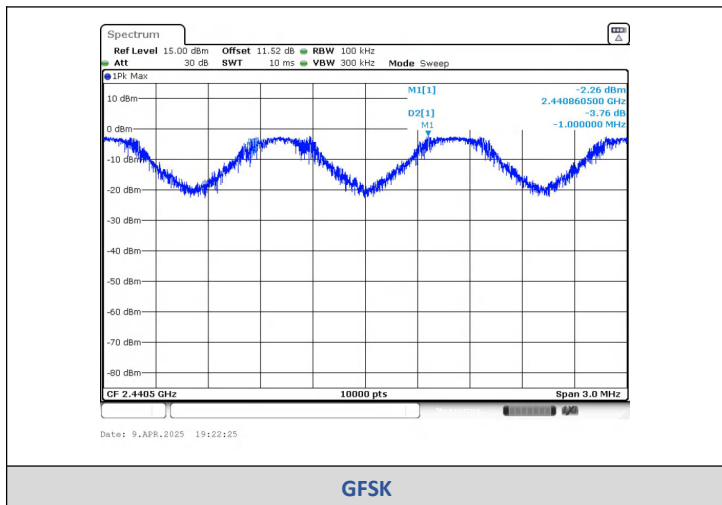
Test Graphs



Right:

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.184	2440.861	1	1.07	PASS

Test Graphs



7) Conducted Out Of Band Emission

Test Result

Left:

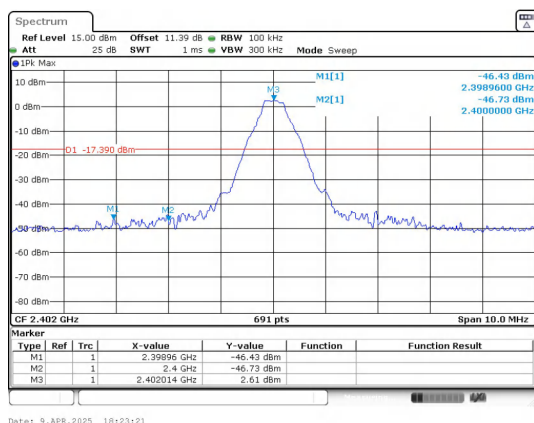
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2398.96	-46.433	-17.39	-29.043	PASS
			2400.00	-46.730	-17.39	-29.340	PASS
			9608.10	-42.776	-17.39	-25.386	PASS
		39	9763.72	-43.993	-16.96	-27.033	PASS
		78	2483.50	-49.110	-16.85	-32.260	PASS
			9920.20	-43.514	-16.85	-26.664	PASS

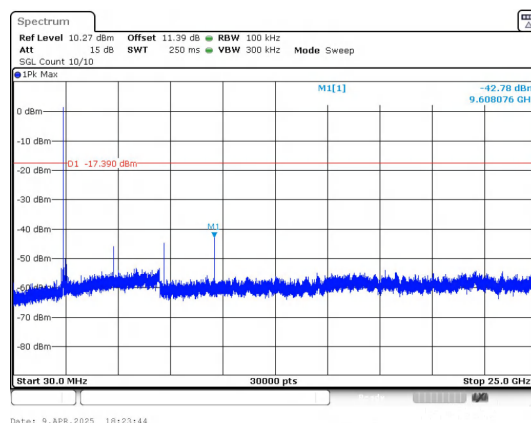
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2397.48	-47.629	-17.42	-30.209	PASS
			2400.00	-48.460	-17.42	-31.040	PASS
			2483.50	-49.050	-16.86	-32.190	PASS

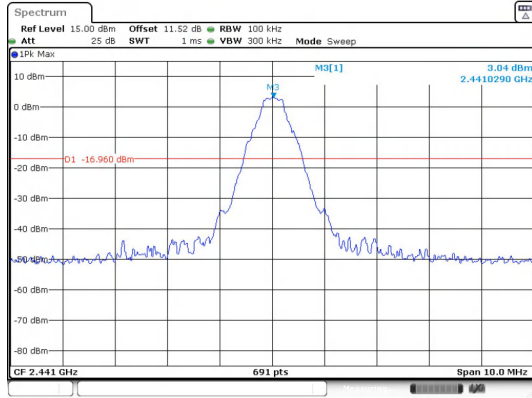
Test Graphs



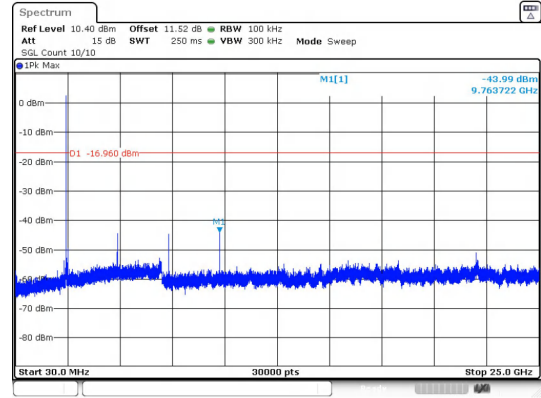
Out Of Band Emission
GFSK_DH5_Channel 0



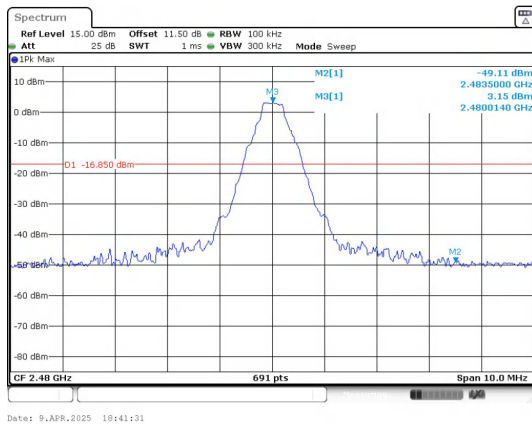
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0



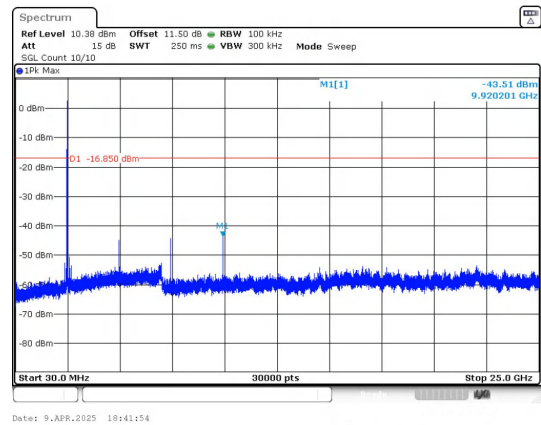
**Out Of Band Emission
GFSK_DH5_Channel 39**



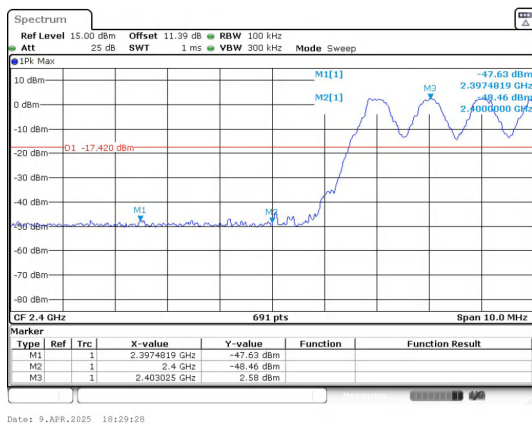
**30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39**



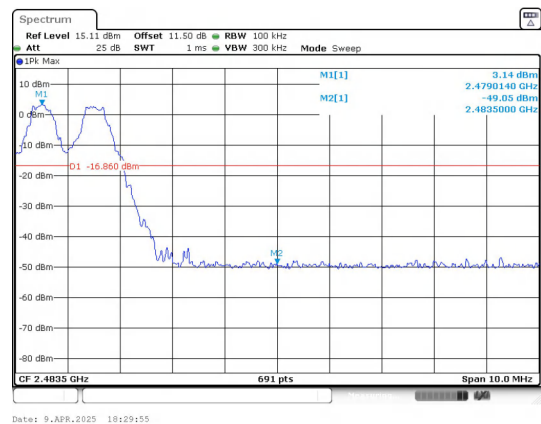
**Out Of Band Emission
GFSK_DH5_Channel 78**



**30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78**



**Out Of Band Emission (Left)
GFSK_DH5_Channel Hopping**



**Out Of Band Emission (Right)
GFSK_DH5_Channel Hopping**

Right:
Non-Hopping

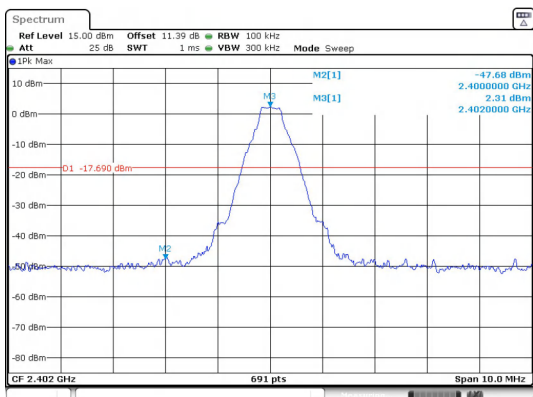
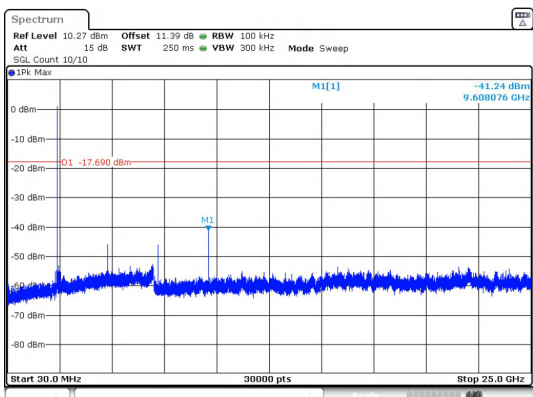
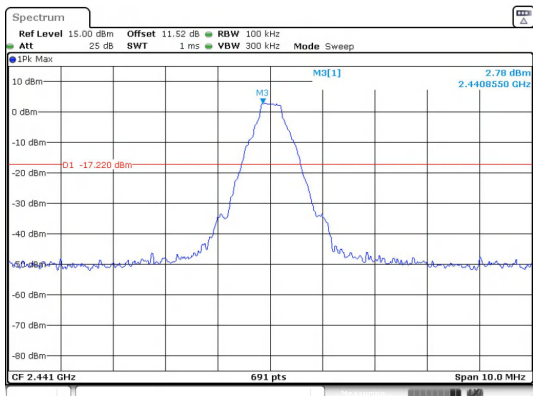
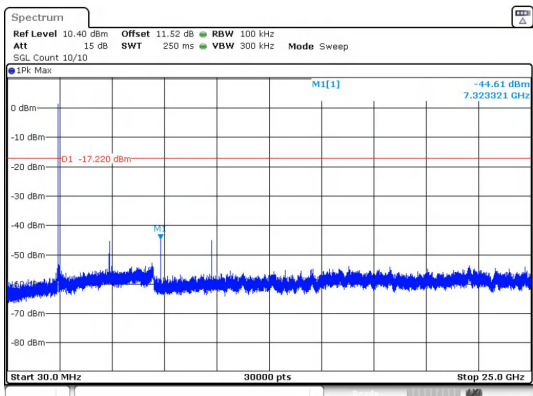
Modulation	Packet	Channel	OOB Emission	OOB Emission	Limit	Over Limit	Result
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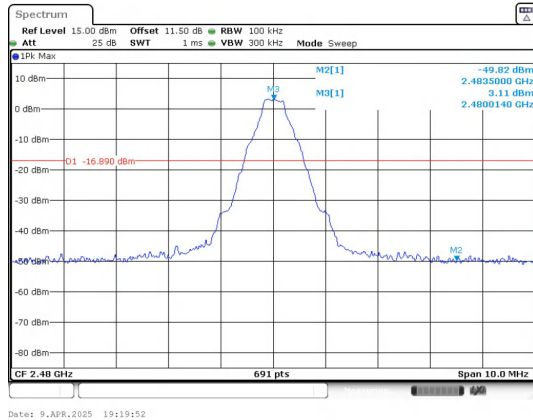
			Frequency (MHz)	Level (dBm)	(dBm)	(dB)	
GFSK	DH5	0	2400.00	-47.680	-17.69	-29.990	PASS
			9608.08	-41.238	-17.69	-23.548	PASS
		39	7323.32	-44.613	-17.22	-27.393	PASS
		78	2483.50	-49.820	-16.89	-32.930	PASS
			4960.33	-43.127	-16.89	-26.237	PASS

Hopping

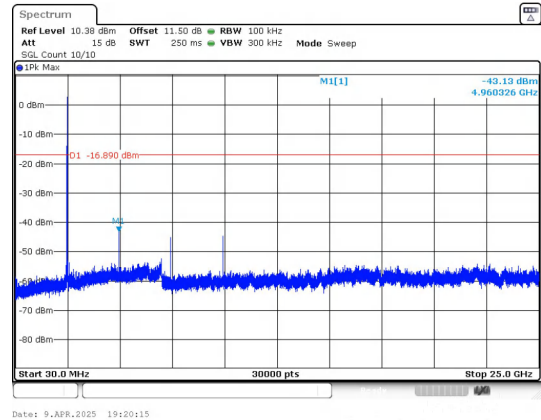
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2395.77	-48.597	-17.81	-30.787	PASS
			2400.00	-50.640	-17.81	-32.830	PASS
			2483.50	-50.060	-17.29	-32.770	PASS

Test Graphs

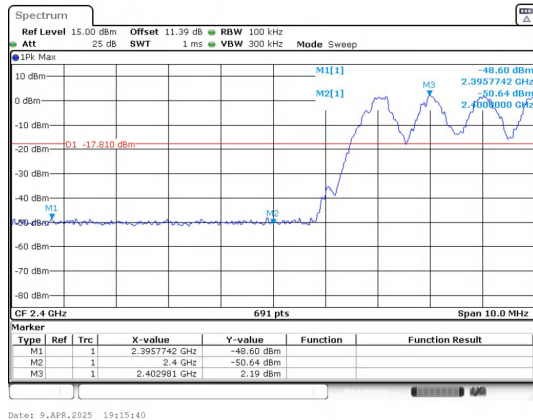
 Ref Level 15.00 dBm Offset 11.39 dB RBW 100 kHz Att 25 dB SWT 1 ms VBW 300 kHz Mode Sweep 1PK Max M2[1] -47.68 dBm 2.400000 GHz M3[1] 2.31 dBm 2.402000 GHz O1 -17.690 dBm CF 2.402 GHz 691 pts Span 10.0 MHz Date: 9.APR.2025 19:03:27	 Ref Level 10.27 dBm Offset 11.39 dB RBW 100 kHz Att 15 dB SWT 250 ms VBW 300 kHz Mode Sweep SGL Count 10/10 1PK Max M1[1] -41.24 dBm 9.608076 GHz O1 -17.690 dBm Start 30.0 MHz 30000 pts Stop 25.0 GHz Date: 9.APR.2025 19:03:49
Out Of Band Emission GFSK_DH5_Channel 0	30.0 MHz - 25000.0 MHz GFSK_DH5_Channel 0
 Ref Level 15.00 dBm Offset 11.52 dB RBW 100 kHz Att 25 dB SWT 1 ms VBW 300 kHz Mode Sweep 1PK Max M3[1] -44.61 dBm 2.4408550 GHz O1 -17.220 dBm CF 2.441 GHz 691 pts Span 10.0 MHz Date: 9.APR.2025 19:17:50	 Ref Level 10.40 dBm Offset 11.52 dB RBW 100 kHz Att 15 dB SWT 250 ms VBW 300 kHz Mode Sweep SGL Count 10/10 1PK Max M1[1] -44.61 dBm 7.323321 GHz O1 -17.220 dBm Start 30.0 MHz 30000 pts Stop 25.0 GHz Date: 9.APR.2025 19:18:13
Out Of Band Emission GFSK_DH5_Channel 39	30.0 MHz - 25000.0 MHz GFSK_DH5_Channel 39



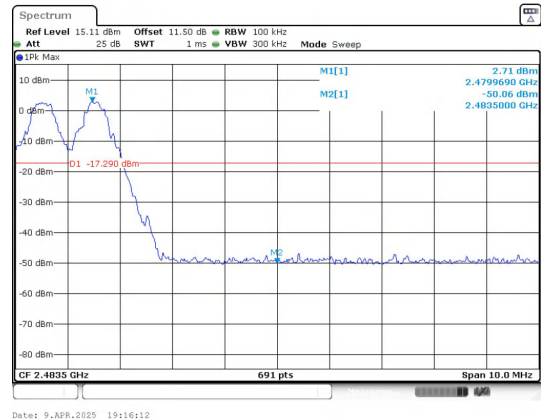
Out Of Band Emission
GFSK_DH5_Channel 78



30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 78



Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping

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