

DM74S240, DM74S241, DM74S244 Octal 3-STATE Buffer/Line Driver/Line Receiver

General Description

These buffers/line drivers are designed to improve both the performance and PC board density of 3-STATE buffers/drivers employed as memory-address drivers, clock drivers, and bus-oriented transmitters/receivers. Featuring 400 mV of hysteresis at each low current PNP data line input, they provide improved noise rejection and high fanout outputs, and can be used to drive terminated lines down to 133Ω.

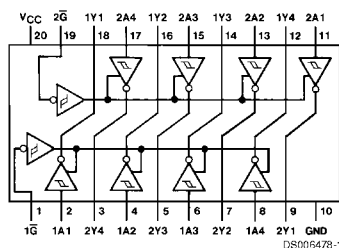
Features

- 3-STATE outputs drive bus lines directly
- PNP inputs reduce DC loading on bus lines

- Hysteresis at data inputs improves noise margins
- Typical I_{OL} (sink current)
74S 64 mA
- Typical I_{OH} (source current)
74S -15 mA
- Typical propagation delay times
Inverting 4.5 ns
Noninverting 6 ns
- Typical enable/disable times 9 ns
- Typical power dissipation (enabled)
Inverting 450 mW
Noninverting 538 mW

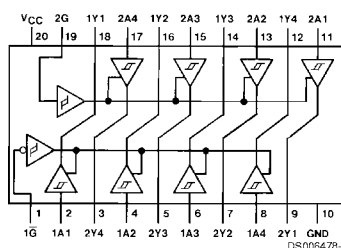
Connection Diagrams

Dual-In-Line Package



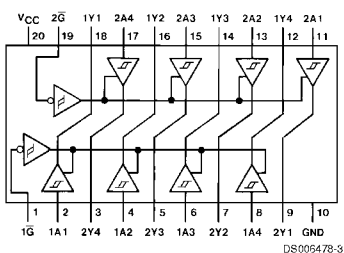
Order Number DM74S240N
See Package Number N20A
Dual-In-Line Package

Dual-In-Line Package



Order Number DM74S241N
See Package Number N20A

Dual-In-Line Package



Order Number DM74S244N
See Package Number N20A

DM74S240, DM74S241, DM74S244 Octal 3-STATE Buffer/Line Driver/Line Receiver

Absolute Maximum Ratings (Note 1)

Supply Voltage
Input Voltage

7V
5.5V

Operating Free Air Temperature Range

DM74S
Storage Temperature Range

0°C to +70°C
-65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Units
V _{CC}	Supply Voltage	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			V
V _{IL}	Low Level Input Voltage			0.8	V
I _{OH}	High Level Output Current			-15	mA
I _{OL}	Low Level Output Current			64	mA
T _A	Free Air Operating Temperature	0		70	°C

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Electrical Characteristics

over recommended operating free-air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V _I	Input Clamp Voltage	V _{CC} = Min, I _I = -18 mA			-1.2	V
H _{ys}	Hysteresis (V _{T+} - V _{T-}) (Data Inputs Only)	V _{CC} = Min	0.2	0.4		V
V _{OH}	High Level Output Voltage	V _{CC} = 4.75V, V _{IH} = 2V V _{IL} = 0.8V, I _{OH} = -1 mA	2.7			V
		V _{CC} = Min, V _{IH} = 2V V _{IL} = 0.8V, I _{OH} = -3 mA	2.4	3.4		
		V _{CC} = Min, V _{IH} = 2V V _{IL} = 0.5V, I _{OH} = Max	2			
V _{OL}	Low Level Output Voltage	V _{CC} = Min I _{OL} = Max V _{IL} = 0.8V, V _{IH} = 2V			0.55	V
I _{OZH}	Off-State Output Current, High Level Voltage Applied	V _{CC} = Max V _{IL} = 0.8V			50	μA
I _{OZL}	Off-State Output Current, Low Level Voltage Applied	V _{IH} = 2V			-50	μA
I _I	Input Current at Maximum Input Voltage	V _{CC} = Max V _I = 5.5V			1	mA
I _{IH}	High Level Input Current	V _{CC} = Max V _I = 2.7V			50	μA
I _{IL}	Low Level Input Current	V _{CC} = Max V _I = 0.5V			-400	μA
		Any A			-2	mA
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 3)	-50		-225	mA
I _{CC}	Supply Current	Outputs High	S240	80	135	mA
			S241, 244	95	160	
		Outputs Low	S240	100	150	
			S241, 244	120	180	
		Outputs Disabled	S240	100	150	
			S241, 244	120	180	

Note 2: All typical values are at V_{CC} = 5V, T_A = 25°C.

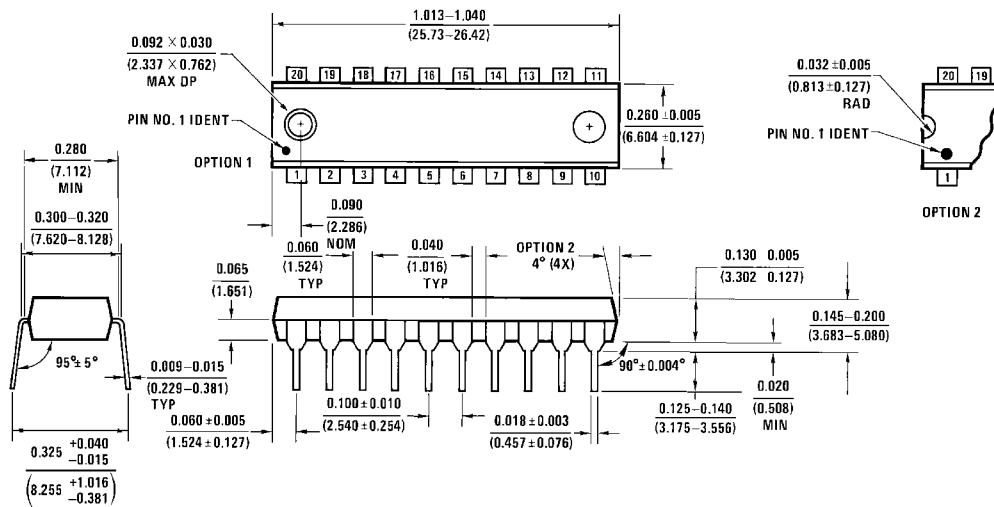
Note 3: Not more than one output should be shorted at a time and duration should not exceed one second.

Switching Characteristics:

for test waveforms and output load. $V_{CC} = 5V$, $T_A = 25^\circ C$

Symbol	Parameter	Conditions	Min	Max	Units	
t _{PLH}	Propagation Delay Time Low to High Level Output	C _L = 45 pF R _L = 90Ω	S240	2	7	ns
			S241, 244	2	9	
t _{PHL}	Propagation Delay Time High to Low Level Output	C _L = 45 pF R _L = 90Ω	S240	2	7	ns
			S241, 244	2	9	
t _{PZL}	Output Enable Time to Low Level	C _L = 45 pF R _L = 90Ω	S240	3	15	ns
			S241, 244	3	15	
t _{PZH}	Output Enable Time to High Level	C _L = 45 pF R _L = 90Ω	S240	2	10	ns
			S241, 244	3	12	
t _{PLZ}	Output Disable Time from Low Level	C _L = 5 pF R _L = 90Ω	S240	4	15	ns
			S241, 244	2	15	
t _{PHZ}	Output Disable Time from High Level	C _L = 5 pF R _L = 90Ω	S240	2	9	ns
			S241, 244	2	9	
t _{PLH}	Propagation Delay Time Low to High Level Output	C _L = 150 pF R _L = 90Ω	S240	3	10	ns
			S241, 244	4	12	
t _{PHL}	Propagation Delay Time High to Low Level Output	C _L = 150 pF R _L = 90Ω	S240	3	10	ns
			S241, 244	4	12	
t _{PZL}	Output Enable Time to Low Level	C _L = 150 pF R _L = 90Ω	S240	6	21	ns
			S241, 244	6	21	
t _{PZH}	Output Enable Time to High Level	C _L = 150 pF R _L = 90Ω	S240	4	12	ns
			S241, 244	4	15	

Physical Dimensions inches (millimeters) unless otherwise noted



20-Lead Molded Dual-In-Line Package (N)
Order Numbers DM74S240N, DM74S241N or DM74S244N
Package Number N20A

N20A (REV G)

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Fairchild Semiconductor Corporation
Americas
 Customer Response Center
 Tel: 1-888-522-5372

Fairchild Semiconductor Europe
 Fax: +49 (0) 1 80-530 85 86
 Email: europe.support@nsc.com
 Deutsch Tel: +49 (0) 8 141-35-0
 English Tel: +44 (0) 1 793-85-68-56
 Italy Tel: +39 (0) 2 57 5631

Fairchild Semiconductor Hong Kong Ltd.
 13th Floor, Straight Block,
 Ocean Centre, 5 Canton Rd.
 Tsimshatsui, Kowloon
 Hong Kong
 Tel: +852 2737-7200
 Fax: +852 2314-0061

National Semiconductor Japan Ltd.
 Tel: 81-3-5620-6175
 Fax: 81-3-5620-6179

www.fairchildsemi.com