

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

General Description

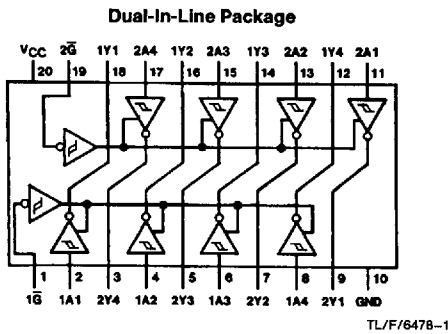
These buffers/line drivers are designed to improve both the performance and PC board density of TRI-STATE buffers/drivers employed as memory-address drivers, clock drivers, and bus-oriented transmitters/receivers. Featuring 400 mV of hysteresis at each low current PNP data line input, they provide improved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

- 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

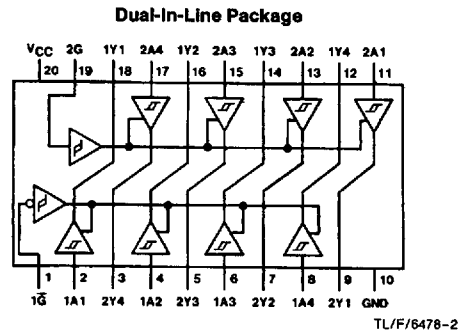
Features

- TRI-STATE outputs drive bus lines directly
- PNP inputs reduce DC loading on bus lines
- Hysteresis at data inputs improves noise margins

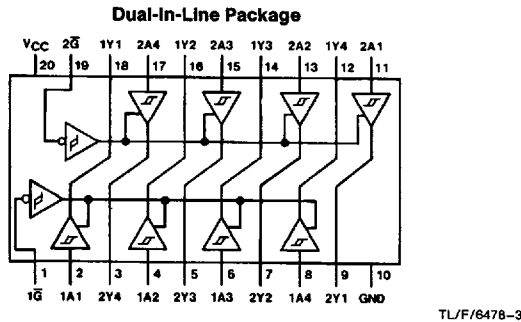
Connection Diagrams



Order Number DM74S240N
See NS Package Number N20A



Order Number DM74S241N
See NS Package Number N20A



Order Number DM74S244N
See NS Package Number N20A

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Absolute Maximum Ratings (Note)

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range DM74S	0°C to +70°C
Storage Temperature Range	-65°C to +150°C

Note: 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.

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

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

Symbol	Parameter	Conditions	Min	Typ (Note 1)	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	Any A		-400	μA
			Any G		-2	mA

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
I_{OS}	Short Circuit Output Current	$V_{CC} = \text{Max (Note 2)}$	-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	

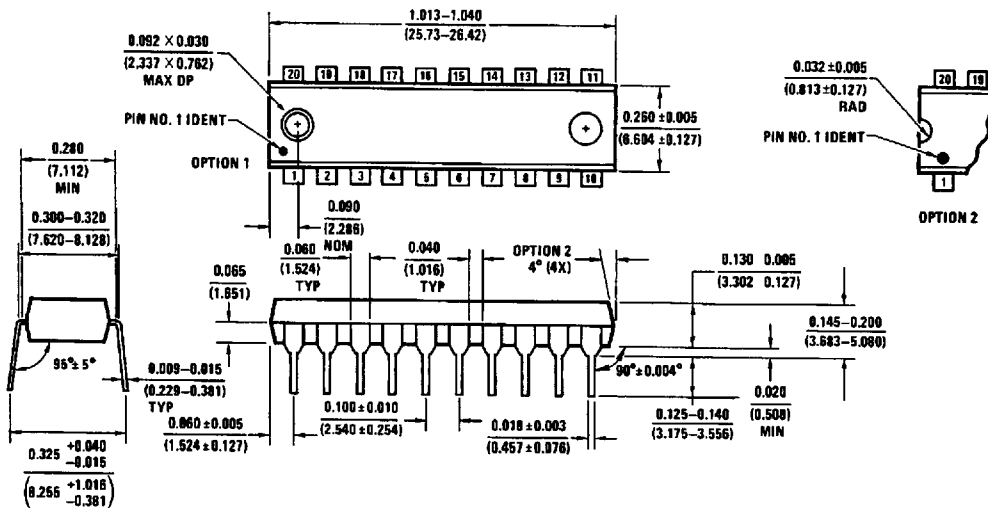
Note 1: All typical values are at $V_{CC} = 5V$, $T_A = 25^\circ C$.

Note 2: Not more than one output should be shorted at a time and duration should not exceed one second.

Switching Characteristics:

Symbol	Parameter	Conditions	Min	Max	Units	
t_{PLH}	Propagation Delay Time Low to High Level Output	$C_L = 45 \text{ pF}$ $R_L = 90\Omega$	S240	2	7	ns
			S241, 244	2	9	
t_{PHL}	Propagation Delay Time High to Low Level Output	$C_L = 45 \text{ pF}$ $R_L = 90\Omega$	S240	2	7	ns
			S241, 244	2	9	
t_{PZL}	Output Enable Time to Low Level	$C_L = 45 \text{ pF}$ $R_L = 90\Omega$	S240	3	15	ns
			S241, 244	3	15	
t_{PZH}	Output Enable Time to High Level	$C_L = 45 \text{ pF}$ $R_L = 90\Omega$	S240	2	10	ns
			S241, 244	3	12	
t_{PLZ}	Output Disable Time from Low Level	$C_L = 5 \text{ pF}$ $R_L = 90\Omega$	S240	4	15	ns
			S241, 244	2	15	
t_{PHZ}	Output Disable Time from High Level	$C_L = 5 \text{ pF}$ $R_L = 90\Omega$	S240	2	9	ns
			S241, 244	2	9	
t_{PLH}	Propagation Delay Time Low to High Level Output	$C_L = 150 \text{ pF}$ $R_L = 90\Omega$	S240	3	10	ns
			S241, 244	4	12	
t_{PHL}	Propagation Delay Time High to Low Level Output	$C_L = 150 \text{ pF}$ $R_L = 90\Omega$	S240	3	10	ns
			S241, 244	4	12	
t_{PZL}	Output Enable Time to Low Level	$C_L = 150 \text{ pF}$ $R_L = 90\Omega$	S240	6	21	ns
			S241, 244	6	21	
t_{PZH}	Output Enable Time to High Level	$C_L = 150 \text{ pF}$ $R_L = 90\Omega$	S240	4	12	ns
			S241, 244	4	15	

Physical Dimensions inches (millimeters)



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

N20A (REV Q)

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National Semiconductor Corporation
 1111 West Bardin Road
 Arlington, TX 76017
 Tel: 1(800) 272-9959
 Fax: 1(800) 737-7018

National Semiconductor Europe
 Fax: (+49) 0-180-530 85 86
 Email: crjwge@tevm2.nsc.com
 Deutsch Tel: (+49) 0-180-530 85 85
 English Tel: (+49) 0-180-532 78 32
 Français Tel: (+49) 0-180-532 83 58
 Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
 13th Floor, Straight Block,
 Ocean Centre, 5 Canton Rd.
 Tsimshatsui, Kowloon
 Hong Kong
 Tel: (852) 2737-1800
 Fax: (852) 2736-9960

National Semiconductor Japan Ltd.
 Tel: 81-043-299-2309
 Fax: 81-043-299-2408

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