

## 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.

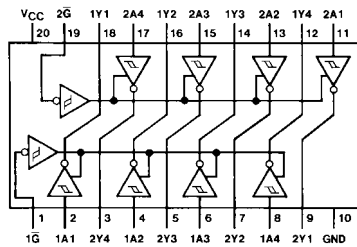
#### Features

- 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) 64 mA
- Typical  $I_{OH}$  (source current) -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

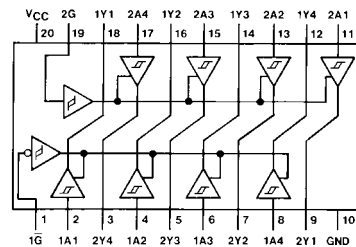
#### Ordering Code:

Order Number	Package Number	Package Description
DM74S240N	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
DM74S241N	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
DM74S244N	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

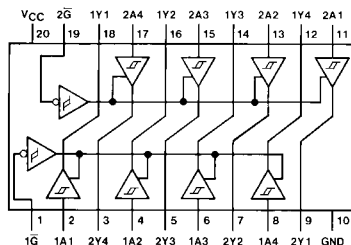
#### Connection Diagrams



DM74S240N



DM74S241N



DM74S244N

**Absolute Maximum Ratings**(Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	0°C to +70°C
Storage Temperature Range	-65°C to +150°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 tables 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 <sub>CC</sub>	Supply Voltage	4.75	5	5.25	V
V <sub>IH</sub>	HIGH Level Input Voltage	2			V
V <sub>IL</sub>	LOW Level Input Voltage			0.8	V
I <sub>OH</sub>	HIGH Level Output Current			-15	mA
I <sub>OL</sub>	LOW Level Output Current			64	mA
T <sub>A</sub>	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 2)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA			-1.2	V
H <sub>ys</sub>	Hysteresis (V <sub>T+</sub> - V <sub>T-</sub> ) (Data Inputs Only)	V <sub>CC</sub> = Min	0.2	0.4		V
V <sub>OH</sub>	HIGH Level Output Voltage	V <sub>CC</sub> = 4.75V, V <sub>IH</sub> = 2V V <sub>IL</sub> = 0.8V, I <sub>OH</sub> = -1 mA	2.7			V
		V <sub>CC</sub> = Min, V <sub>IH</sub> = 2V V <sub>IL</sub> = 0.8V, I <sub>OH</sub> = -3 mA	2.4	3.4		
		V <sub>CC</sub> = Min, V <sub>IH</sub> = 2V V <sub>IL</sub> = 0.5V, I <sub>OH</sub> = Max	2			
V <sub>OL</sub>	LOW Level Output Voltage	V <sub>CC</sub> = Min I <sub>OL</sub> = Max V <sub>IL</sub> = 0.8V, V <sub>IH</sub> = 2V			0.55	V
I <sub>OZH</sub>	Off-State Output Current, HIGH Level Voltage Applied	V <sub>CC</sub> = Max V <sub>O</sub> = 2.4V V <sub>IL</sub> = 0.8V			50	μA
I <sub>OZL</sub>	Off-State Output Current, LOW Level Voltage Applied	V <sub>IH</sub> = 2V V <sub>O</sub> = 0.5V			-50	μA
I <sub>I</sub>	Input Current at Maximum Input Voltage	V <sub>CC</sub> = Max V <sub>I</sub> = 5.5V			1	mA
I <sub>IH</sub>	HIGH Level Input Current	V <sub>CC</sub> = Max V <sub>I</sub> = 2.7V			50	μA
I <sub>IL</sub>	LOW Level Input Current	V <sub>CC</sub> = Max V <sub>I</sub> = 0.5V	Any A		-400	μA
			Any G		-2	mA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 3)	-50		-225	mA
I <sub>CC</sub>	Supply Current	Outputs HIGH	DM74S240	80	135	mA
			DM74S241, DM74244	95	160	
		Outputs LOW	DM74S240	100	150	
			DM74S241, DM74244	120	180	
		Outputs Disabled	DM74S240	100	150	
			DM74S241, DM74S244	120	180	

**Note 2:** All typical values are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

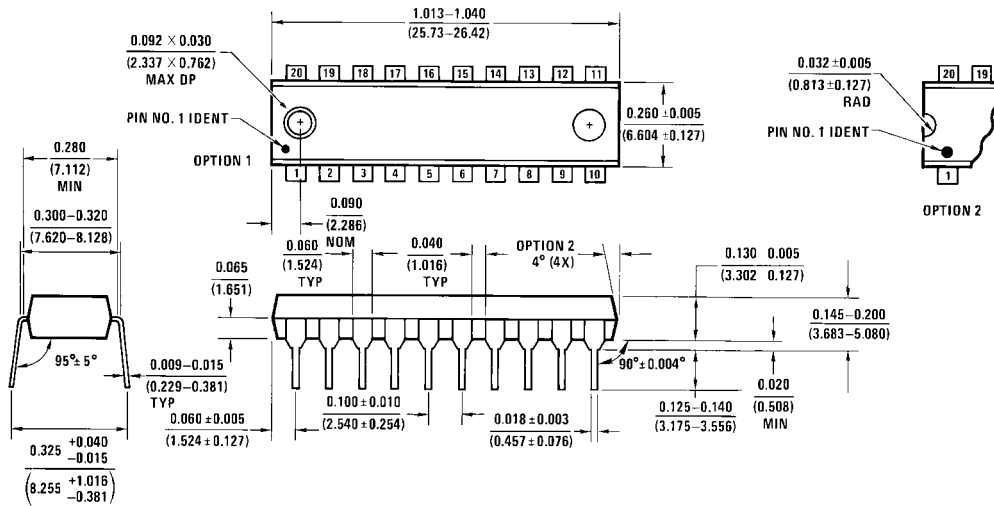
**Note 3:** Not more than one output should be shorted at a time and duration should not exceed one second.

## Switching Characteristics

 $V_{CC} = 5V, T_A = 25^\circ C$ 

Symbol	Parameter	Conditions	Min	Max	Units
$t_{PLH}$	Propagation Delay Time LOW-to-HIGH Level Output	$C_L = 45 \text{ pF}$ DM74S240	2	7	ns
		$R_L = 90\Omega$ DM74S241, DM74244	2	9	
$t_{PHL}$	Propagation Delay Time HIGH-to-LOW Level Output	$C_L = 45 \text{ pF}$ DM74S240	2	7	ns
		$R_L = 90\Omega$ DM74S241, DM74244	2	9	
$t_{PZL}$	Output Enable Time to LOW Level	$C_L = 45 \text{ pF}$ DM74S240	3	15	ns
		$R_L = 90\Omega$ DM74S241, DM74244	3	15	
$t_{PZH}$	Output Enable Time to HIGH Level	$C_L = 45 \text{ pF}$ DM74S240	2	10	ns
		$R_L = 90\Omega$ DM74S241, DM74244	3	12	
$t_{PLZ}$	Output Disable Time from Low Level	$C_L = 5 \text{ pF}$ DM74S240	4	15	ns
		$R_L = 90\Omega$ DM74S241, DM74244	2	15	
$t_{PHZ}$	Output Disable Time from High Level	$C_L = 5 \text{ pF}$ DM74S240	2	9	ns
		$R_L = 90\Omega$ DM74S241, DM74244	2	9	
$t_{PLH}$	Propagation Delay Time LOW-to-HIGH Level Output	$C_L = 150 \text{ pF}$ DM74S240	3	10	ns
		$R_L = 90\Omega$ DM74S241, DM74244	4	12	
$t_{PHL}$	Propagation Delay Time HIGH-to-LOW Level Output	$C_L = 150 \text{ pF}$ DM74S240	3	10	ns
		$R_L = 90\Omega$ DM74S241, DM74244	4	12	
$t_{PZL}$	Output Enable Time to LOW Level	$C_L = 150 \text{ pF}$ DM74S240	6	21	ns
		$R_L = 90\Omega$ DM74S241, DM74244	6	21	
$t_{PZH}$	Output Enable Time to HIGH Level	$C_L = 150 \text{ pF}$ DM74S240	4	12	ns
		$R_L = 90\Omega$ DM74S241, DM74244	4	15	

**Physical Dimensions** inches (millimeters) unless otherwise noted



N20A (REV G)

**20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N20A**

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