

## DM74LS540 Octal Buffer/Line Driver with TRI-STATE® Outputs

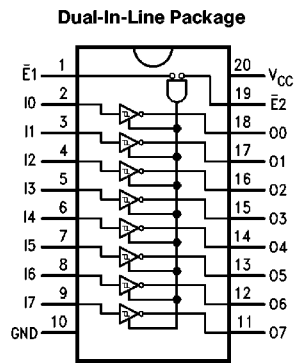
### General Description

The 'LS540 is similar in function to the 'LS240, except that the inputs and outputs are on opposite sides of the package (see Connection Diagram). This pinout arrangement makes this device especially useful as an output port for microprocessors, allowing ease of layout and greater PC board density.

### Features

- Hysteresis at inputs to improve noise margin
- PNP inputs reduce loading
- TRI-STATE outputs drive bus lines
- Inputs and outputs opposite side of package, allowing easier interface to microprocessors
- Fully TTL and CMOS compatible

### Connection Diagram



TL/F/9813-1

Order Number **DM74LS540WM** or **DM74LS540N**  
See NS Package Number **M20B** or **N20A**

Pin Name	Description
$\bar{E}1, \bar{E}2$	Output Enable (Active Low)
I0-7	Data Inputs
O0-7	Data Outputs

### Truth Table

Inputs			Outputs
E1	E2	D	
L	L	H	L
H	X	X	Z
X	H	X	Z
L	L	L	H

H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial  
Z = High Impedance

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## Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature	0°C to +70°C
DM74LS	
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	DM74LS540			Units
		Min	Nom	Max	
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			-3	mA
I <sub>OL</sub>	Low Level Output Current			24	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 1)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA			-1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max, V <sub>IL</sub> = Max	2.7	3.4		V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max, V <sub>IH</sub> = Min		0.35	0.5	V
		I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = Min		0.25	0.4	
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 7V			0.1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.7V			20	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V			-0.2	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	V <sub>CC</sub> = Max			50	mA
I <sub>OZH</sub>	TRI-STATE Output Off Current High	V <sub>CC</sub> = Max, V <sub>O</sub> = 2.7V			20	μA
I <sub>OZL</sub>	TRI-STATE Output Off Current Low	V <sub>CC</sub> = Max, V <sub>O</sub> = 0.4V			-20	μA

Note 1: All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

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

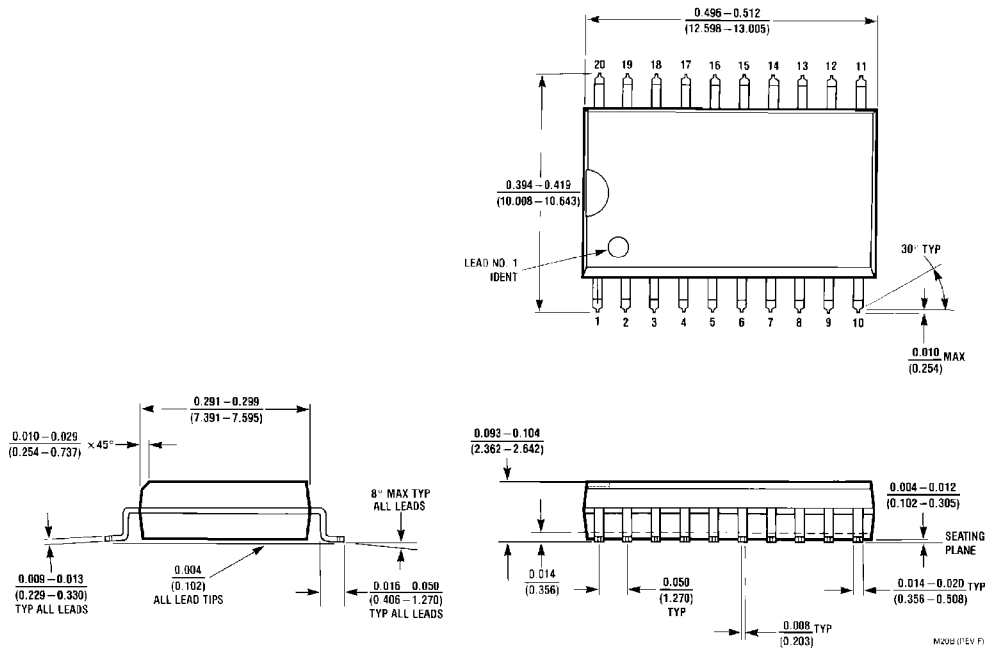
## Switching Characteristics

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

Symbol	Parameter	Conditions	Min	Max	Units
$t_{PLH}$ $t_{PHL}$	Propagation Delay Data to Output	$C_L = 50 \text{ pF}$		14 18	ns
$t_{PZH}$ $t_{PZL}$	Output Enable Time	$R_L = 667\Omega, C_L = 50 \text{ pF}$		23 30	ns
$t_{PLZ}$ $t_{PHZ}$	Output Disable Time	$R_L = 667\Omega, C_L = 50 \text{ pF}$		25 18	ns

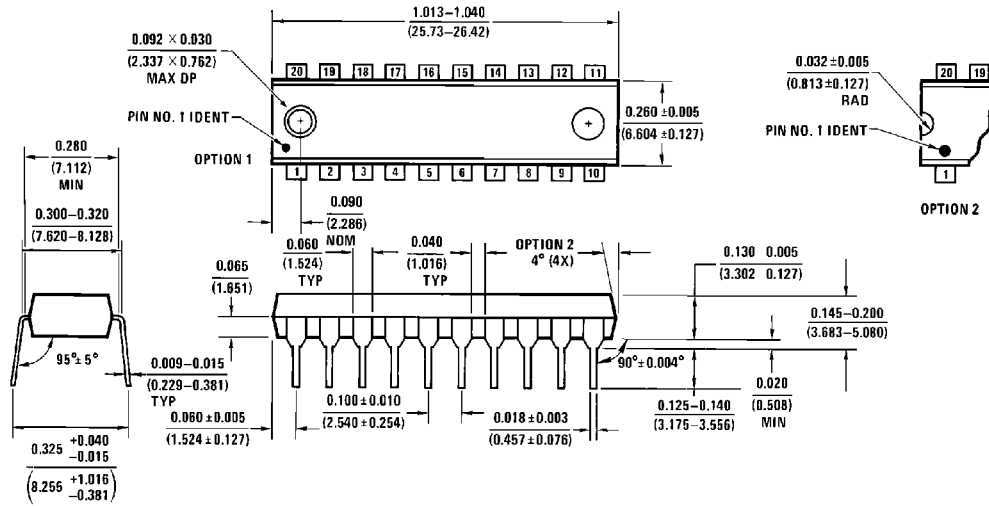
\*DC limits apply over operating temperature range; AC limits apply at  $T_A = +25^\circ$  and  $V_{CC} = +5.0V$ .

## Physical Dimensions inches (millimeters)



20-Lead Wide Small Outline Molded Package (M)  
Order Number DM74LS540WM  
NS Package Number M20B

**Physical Dimensions** inches (millimeters) (Continued)



**20-Lead Molded Dual-In-Line Package (N)**  
**Order Number DM74LS540N**  
**NS Package Number N20A**

N20A (REV G)

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