

## DM74ALS541 Octal Buffer and Line Driver with 3-STATE Outputs

### General Description

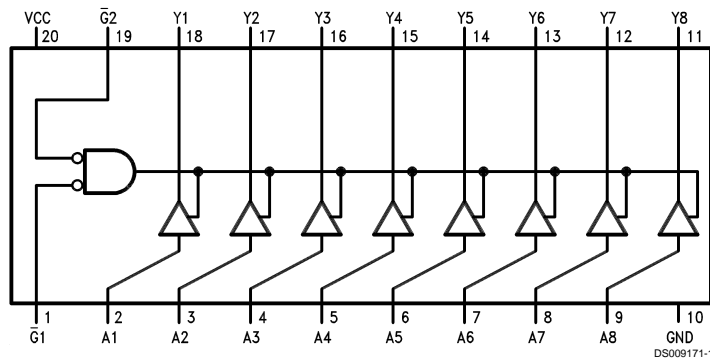
This octal buffer and line driver is designed to have the performance of the 'ALS240 series and, at the same time, offer a pinout with inputs and outputs on opposite sides of the package. This arrangement greatly enhances circuit board layout. The 3-STATE control gate is a 2-input NOR such that if either G1 or G2 is high, all eight outputs are in the high impedance state.

- Switching performance is guaranteed over full temperature and  $V_{CC}$  supply range
- Data flow-thru pinout (all inputs on opposite side from outputs)
- P-N-P Inputs reduce DC loading

### Features

- Advanced oxide-isolated ion-implanted Schottky TTL process

### Connection Diagram



Order Number DM74ALS541WM, DM74ALS541SJ or DM74ALS541N  
See Package Number M20B, M20D or N20A

### Function Table

Input			Output
$\bar{G}1$	$\bar{G}2$	A	Y
H	X	X	Hi-Z
X	H	X	Hi-Z
L	L	L	L
L	L	H	H

H = High Logic Level, L = Low Logic Level  
X = Don't Care (Either Low or High Logic Level)  
Hi-Z = High Impedance (Off) State

### Absolute Maximum Ratings (Note 1)

Supply Voltage	7V	Range	DM74ALS	0°C to +70°C
Input Voltage: Control Inputs	7V	Storage Temperature Range		-65°C to +150°C
Voltage Applied to a Disabled 3-STATE Output	5.5V	Typical $\theta_{JA}$	N Package	58.5°C/W
Operating Free-Air Temperature			M Package	77.5°C/W

### Recommended Operating Conditions

Symbol	Parameter	DM74ALS541			Units
		Min	Nom	Max	
$V_{CC}$	Supply Voltage	4.5	5	5.5	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			24	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 free air temperature range

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units	
$V_{IK}$	Input Clamp Voltage	$V_{CC} = \text{Min}, I_I = -18 \text{ mA}$			-1.2	V	
$V_{OH}$	High Level Output Voltage	$V_{CC} = 4.5\text{V to } 5.5\text{V}$	$I_{OH} = -0.4 \text{ mA}$	$V_{CC} - 2$		V	
		$V_{CC} = \text{Min}$	$I_{OH} = -3 \text{ mA}$	2.4	3.2		
			$I_{OH} = \text{Max}$	2			
$V_{OL}$	Low Level Output Voltage	$V_{CC} = \text{Min}$	$I_{OL} = 12 \text{ mA}$		0.25	0.4	mA
			$I_{OL} = 24 \text{ mA}$		0.35	0.5	
$I_I$	Input Current at Max Input Voltage	$V_{CC} = \text{Max}, V_I = 7\text{V}$			100	$\mu\text{A}$	
$I_{IH}$	High Level Input Current	$V_{CC} = \text{Max}, V_I = 2.7\text{V}$			20	$\mu\text{A}$	
$I_{IL}$	Low Level Input Current	$V_{CC} = \text{Max}, V_I = 0.4\text{V}$			-100	$\mu\text{A}$	
$I_{OZH}$	High Level 3-STATE Output Current	$V_{CC} = \text{Max}, V_O = 2.7\text{V}$			20	$\mu\text{A}$	
$I_{OZL}$	Low Level 3-STATE Output Current	$V_{CC} = \text{Max}, V_O = 0.4\text{V}$			-20	$\mu\text{A}$	
$I_O$	Output Drive Current	$V_{CC} = \text{Max}, V_O = 2.25\text{V}$	-30		-112	mA	
$I_{CC}$	Supply Current	$V_{CC} = \text{Max}$	Outputs High		6	14	mA
			Outputs Low		15	25	
			Outputs Disabled		13.5	22	

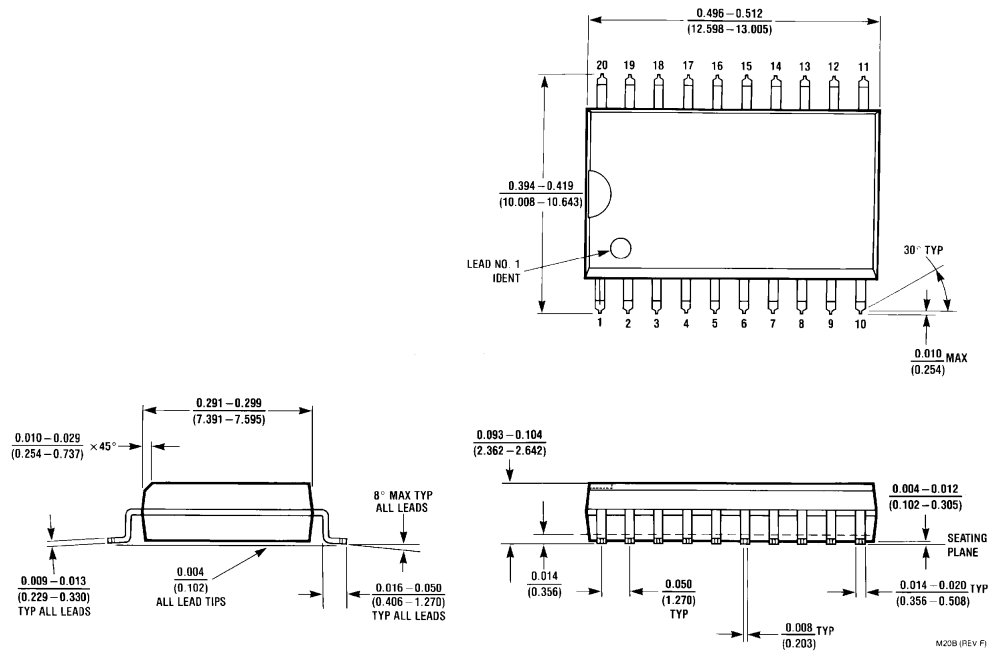
## Switching Characteristics

over recommended operating free air temperature range (Note 2)

Symbol	Parameter	Conditions	From (Input) To (Output)	DM74ALS541		Units
				Min	Max	
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output	V <sub>CC</sub> = 4.5V to 5.5V, R <sub>1</sub> = R <sub>2</sub> = 500Ω, C <sub>L</sub> = 50 pF	A to Y	4	14	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output		A to Y	2	10	ns
t <sub>PZH</sub>	Output Enable Time to High Level Output		$\bar{G}$ to Y	5	15	ns
t <sub>PZL</sub>	Output Enable Time to Low Level Output		$\bar{G}$ to Y	8	20	ns
t <sub>PHZ</sub>	Output Disable Time from High Level Output		$\bar{G}$ to Y	1	10	ns
t <sub>PLZ</sub>	Output Disable Time from Low Level Output		$\bar{G}$ to Y	2	12	ns

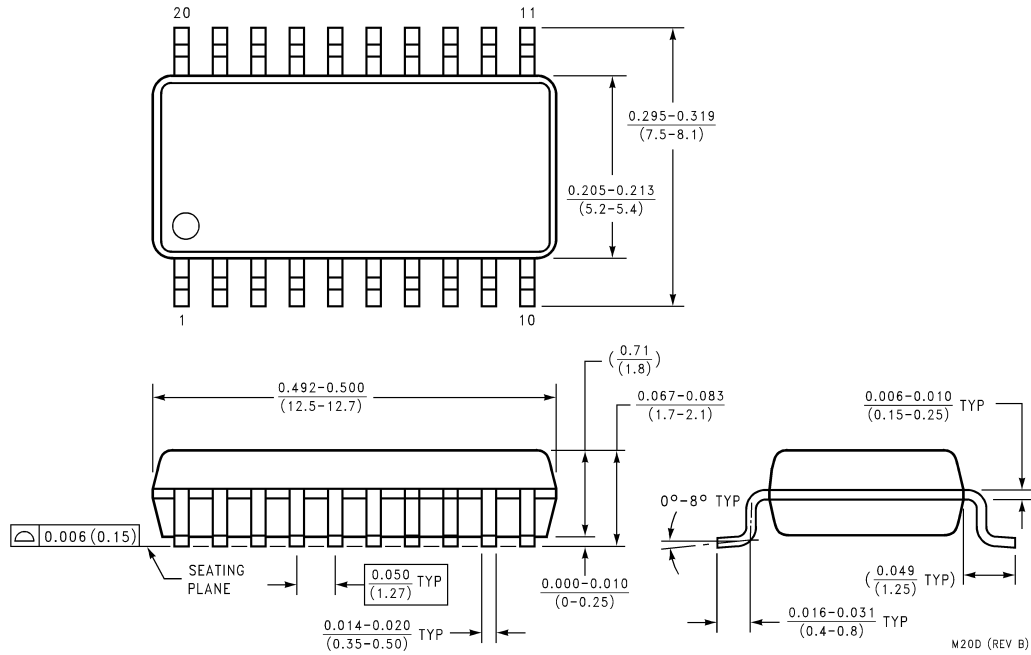
**Note 2:** See Section 1 for test waveforms and output load.

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

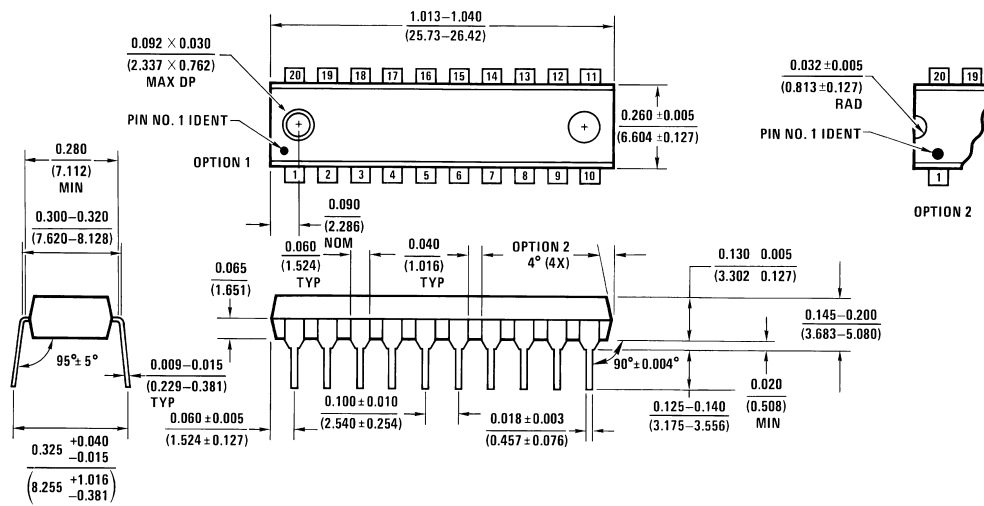


**S.O. Package (M)**  
**Order Number DM74ALS541WM**  
**Package Number M20B**

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



**S.O. Package (SJ)**  
**Order Number DM74ALS541SJ**  
**Package Number M20D**



**Molded Dual-In-Line Package (N)**  
**Order Number DM74ALS541N**  
**Package Number N20A**

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