FAIRCHILD SEMICONDUCTOR™

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DM74ALS541
Octal Buffer and Line Driver with 3-STATE Outputs

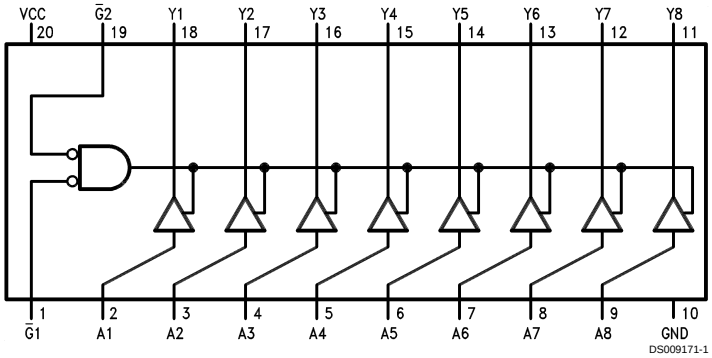
General Description

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.

Features

- Advanced oxide-isolated ion-implanted Schottky TTL process
- 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

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
Input Voltage: Control Inputs	7V
Voltage Applied to a Disabled 3-STATE Output	5.5V
Operating Free-Air Temperature Range	
DM74ALS	0˚C to +70˚C
Storage Temperature Range	−65˚C to +150˚C
Typical θ_{JA}	
N Package	58.5˚C/W
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} = Min, I_I = −18 mA				−1.2	V
V_{OH}	High Level Output Voltage	V_{CC} = 4.5V to 5.5V	I_{OH} = −0.4 mA	V_{CC} − 2			V
		V_{CC} = Min	I_{OH} = −3 mA	2.4	3.2		
			I_{OH} = Max	2			
V_{OL}	Low Level Output Voltage	V_{CC} = Min	I_{OL} = 12 mA		0.25	0.4	mA
			I_{OL} = 24 mA		0.35	0.5	
I_I	Input Current at Max Input Voltage	V_{CC} = Max, V_I = 7V				100	µA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.7V				20	µA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V				−100	µA
I_{OZH}	High Level 3-STATE Output Current	V_{CC} = Max, V_O = 2.7V				20	µA
I_{OZL}	Low Level 3-STATE Output Current	V_{CC} = Max, V_O = 0.4V				−20	µA
I_O	Output Drive Current	V_{CC} = Max, V_O = 2.25V		−30		−112	mA
I_{CC}	Supply Current	V_{CC} = Max	Outputs High		6	14	mA
			Outputs Low		15	25	
			Outputs Disabled		13.5	22	

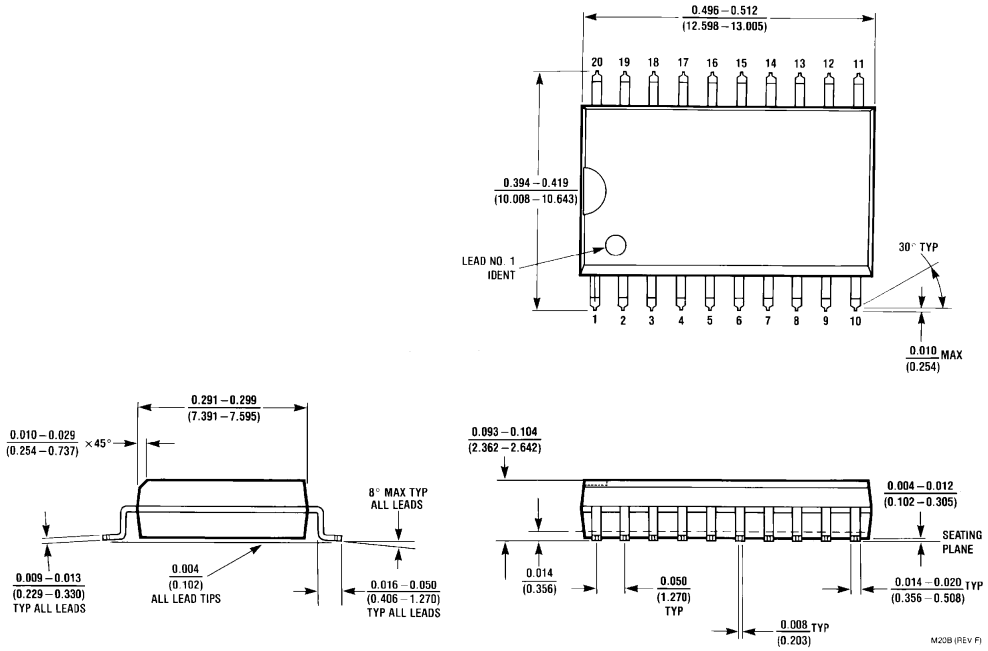
Switching Characteristics

over recommended operating free air temperature range (Note 2)

Symbol	Parameter	Conditions	From (Input) To (Output)	DM74ALS541		Units
				Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	V_{CC} = 4.5V to 5.5V, $R_1 = R_2$ = 500Ω, C_L = 50 pF	A to Y	4	14	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		A to Y	2	10	ns
t_{PZH}	Output Enable Time to High Level Output		$\overline{G}$ to Y	5	15	ns
t_{PZL}	Output Enable Time to Low Level Output		$\overline{G}$ to Y	8	20	ns
t_{PHZ}	Output Disable Time from High Level Output		$\overline{G}$ to Y	1	10	ns
t_{PLZ}	Output DisableTime from Low Level Output		$\overline{G}$ to Y	2	12	ns

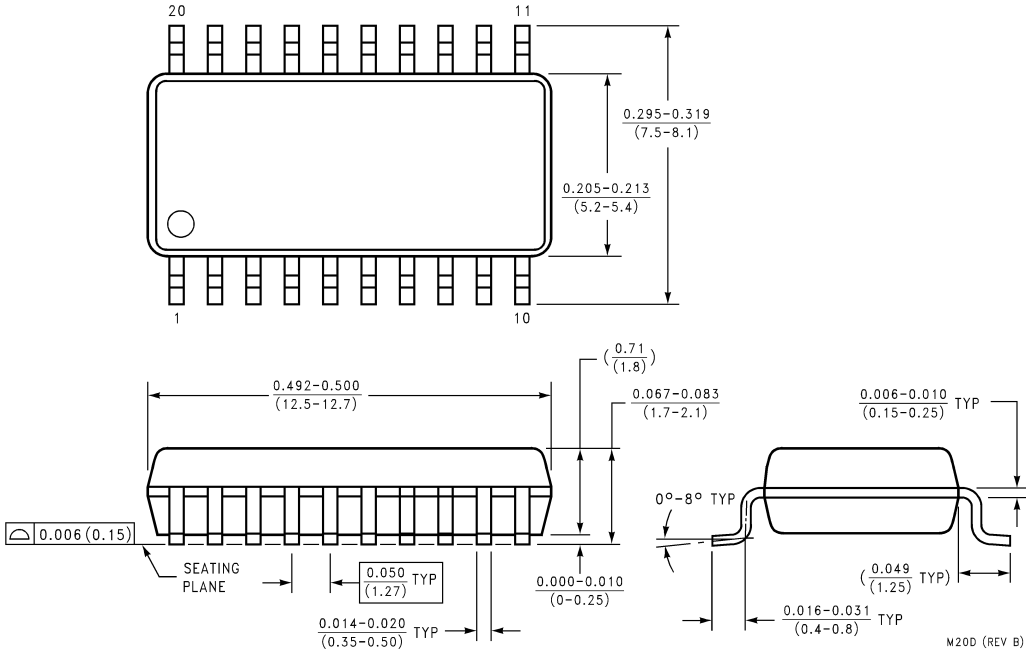
Note 2: See Section 1 for test waveforms and output load.

Physical Dimensions inches (millimeters) unless otherwise noted

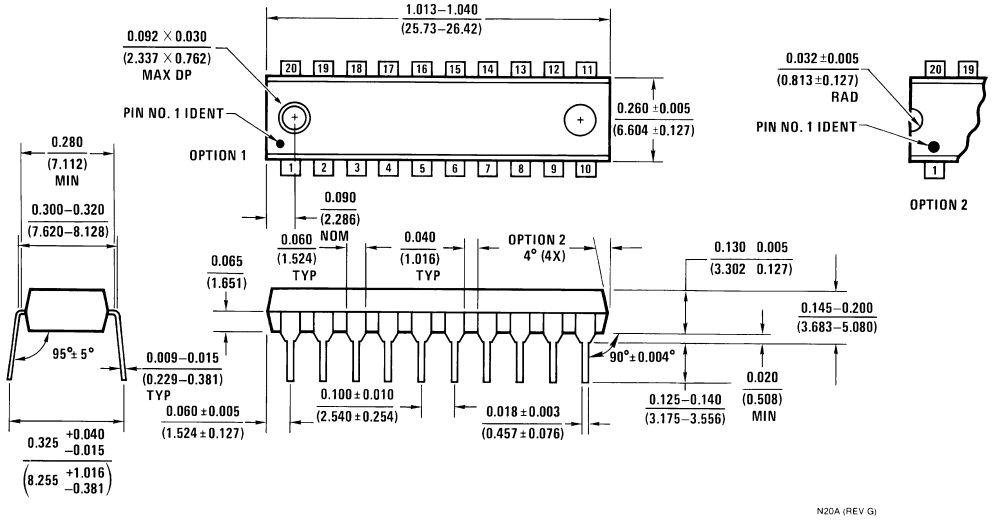


S.O. Package (M)
Order Number DM74ALS541WM
Package Number M20B

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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