

DM74ALS541 Octal Buffer and Line Driver with TRI-STATE® Outputs

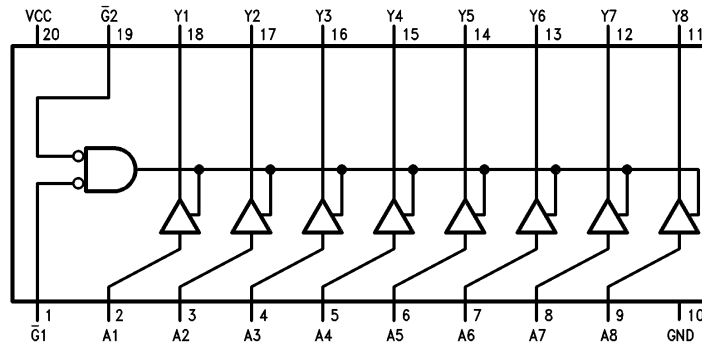
General Description

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 TRI-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



TL/F/9171-1

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

Function Table

Input			Output Y
G1	G2	A	
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

TRI-STATE® is a registered trademark of National Semiconductor Corporation.

Absolute Maximum Ratings

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

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	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

Electrical Characteristics over recommended free air temperature range

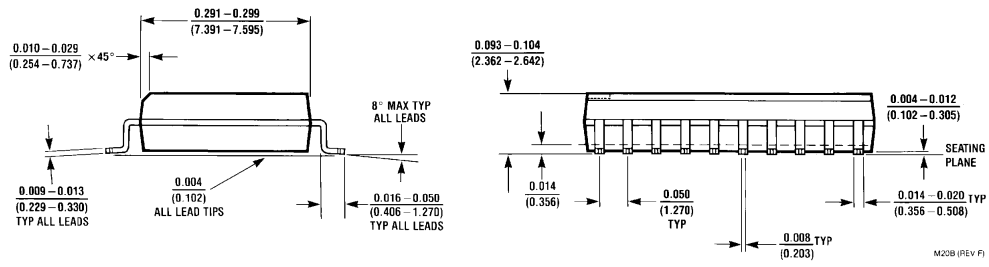
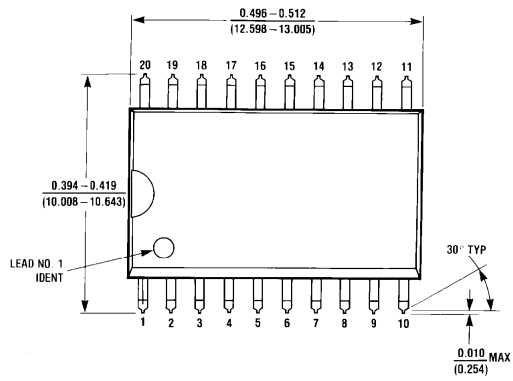
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units	
V _{IK}	Input Clamp Voltage	V _{CC} = Min, I _I = –18 mA			–1.2	V	
V _{OH}	High Level Output Voltage	V _{CC} = 4.5V to 5.5V	I _{OH} = –0.4 mA	V _{CC} – 2		V	
		V _{CC} = Min	I _{OH} = –3 mA	2.4	3.2		
			I _{OH} = Max	2			
V _{OL}	Low Level Output Voltage	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 TRI-STATE Output Current	V _{CC} = Max, V _O = 2.7V			20	μA	
I _{OZL}	Low Level TRI-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 1)

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		\bar{G} to Y	5	15	ns
t _{PZL}	Output Enable Time to Low Level Output		\bar{G} to Y	8	20	ns
t _{PHZ}	Output Disable Time from High Level Output		\bar{G} to Y	1	10	ns
t _{PLZ}	Output Disable Time from Low Level Output		\bar{G} to Y	2	12	ns

Note 1: See Section 5 for test waveforms and output load.

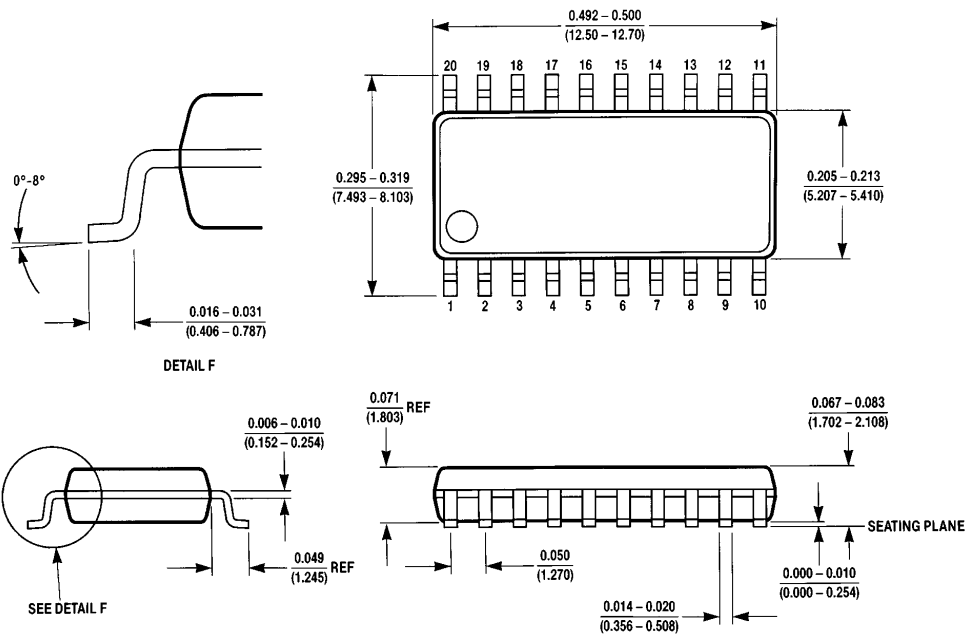
Physical Dimensions inches (millimeters)



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

M20B (REV F)

Physical Dimensions inches (millimeters) (Continued)

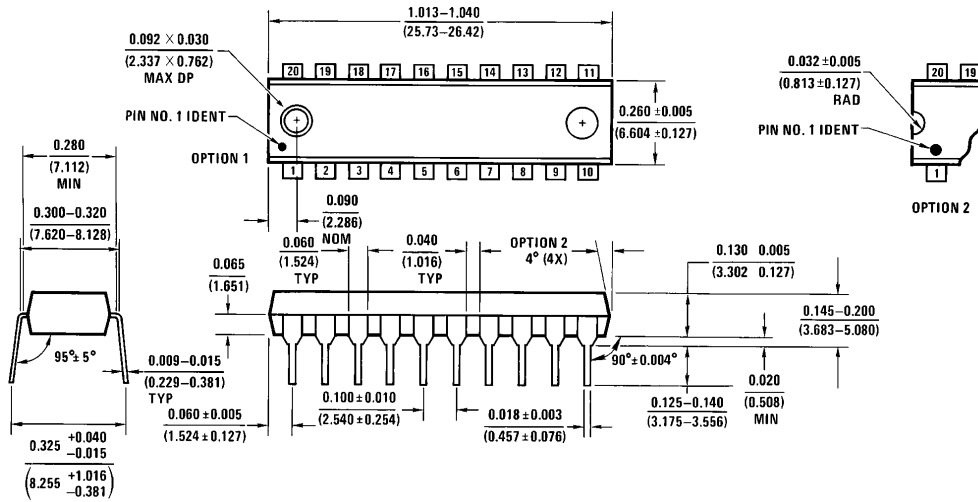


M20D (REV A)

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

DM74ALS541 Octal Buffer and Line Driver with TRI-STATE Outputs

Physical Dimensions inches (millimeters) (Continued)



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

N20A (REV G)

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