

DM74ALS244A/74ALS244B-1 Octal 3-STATE Bus Driver

General Description

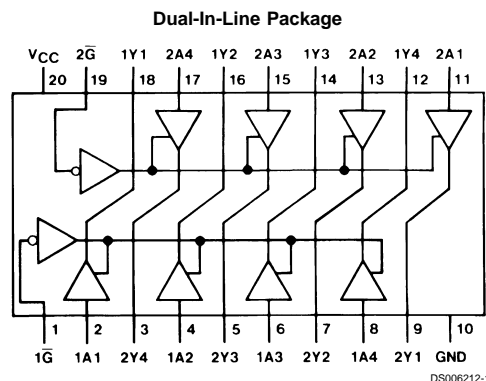
This octal 3-STATE bus driver is designed to provide the designer with flexibility in implementing a bus interface with memory, microprocessor, or communication systems. This device offers 64-extended temperature Grade product guaranteeing performance from -40°C to $+85^{\circ}\text{C}$. The output 3-STATE gating control is organized into two separate groups of four buffers, and both control inputs enable the respective outputs when set logic low. The 3-STATE circuitry contains a feature that maintains the buffer outputs in 3-STATE (high impedance state) during power supply ramp-up or ramp-down. This eliminates bus glitching problems that arise during power-up and power-down.

The "ALS244B-1 version features the same performance as the standard version with the addition of increased current drive capability to meet the current requirements of various bus architectures. For all ALS-1 products, the recommended maximum I_{OL} is increased to 48 mA.

Features

- Advanced low power oxide-isolated ion-implanted Schottky TTL process
- Functional and pin compatible with the 74LS counterpart
- Improved switching performance with less power dissipation compared with the 74LS counterpart
- Switching response specified into 500Ω and 50 pF load
- Switching response specifications guaranteed over full temperature and V_{CC} supply range
- PNP input design reduces input loading
- Guaranteed performance over extended Temperature Range (-40°C to $+85^{\circ}\text{C}$) in 64-grade products
- Maximum I_{OL} increased to 48 mA for 'ALS244B-1 product

Connection Diagram



Order Number DM74ALS244AWM, DM74ALS244AN or
DM74ALS244ASJ, 74ALS244B-1N, 74ALS244B-1WM
See Package Number M20B, M20D or N20A

Function Table

Input		Output
\bar{G}	A	Y
L	L	L
L	H	H
H	X	Z

H = High Level Logic State

L = Low Level Logic State

X = Don't Care (Either Low or High Level Logic State)

Z = High Impedance (Off) State

Absolute Maximum Ratings (Note 1)

Supply Voltage, V_{CC}	7V	DM74ALS	0°C to +70°C
Input Voltage	7V	Storage Temperature Range	-65°C to +150°C
Voltage Applied to Disabled Output	5.5V	Typical θ_{JA}	
Operating Free Air Temperature Range		N Package	60.5°C/W
		M Package	79.8°C/W

Recommended Operating Conditions

Symbol	Parameter	DM74ALS244A, 244B-1			Units
		Min	Typ	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	ALS244B,		24	mA
		ALS244B-1		48	
T_A	Operating Free-Air 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 operating free air temperature (unless otherwise specified)

Symbol	Parameter	Conditions	DM74ALS244A, 244B-1			Units
			Min	Typ	Max	
V_{IK}	Input Clamp Voltage	$V_{CC} = 4.5V, I_I = -18\text{ mA}$			-1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = 4.5V\text{ to }5.5V$	$I_{OH} = -0.4\text{ mA}$	$V_{CC}-2$		V
		$V_{CC} = 4.5V$	$I_{OH} = -3\text{ mA}$	2.4		V
			$I_{OH} = \text{Max}$	2		V
V_{OL}	Low Level Output Voltage	$V_{CC} = 4.5V$				V
		$I_{OL} = 64\text{ALS}/74\text{ALS (Max)}$ $I_{OL} = 74\text{ALS}-1\text{ (Max)}$		0.35 0.4	0.5 0.5	
I_I	Input Current at Max Input Voltage	$V_{CC} = 5.5V, V_I = 7V$			0.1	mA
I_{IH}	High Level Input Current	$V_{CC} = 5.5V, V_I = 2.7V$			20	μA
I_{IL}	Low Level Input Current	$V_{CC} = 5.5V, V_{IL} = 0.4V$			-0.1	mA
I_O	Output Drive Current	$V_{CC} = 5.5V, V_O = 2.25V$	-30		-112	mA
I_{OZH}	High Level 3-STATE Output Current	$V_{CC} = 5.5V, V_O = 2.7V$			20	μA
I_{OZL}	Low Level 3-STATE Output Current	$V_{CC} = 5.5V, V_O = 0.4V$			-20	μA
I_{CC}	Supply Current	$V_{CC} = 5.5V$				mA
		Outputs High		9	15	
		Outputs Low		15	24	
	Outputs 3-STATE		17	27		mA

Switching Characteristics

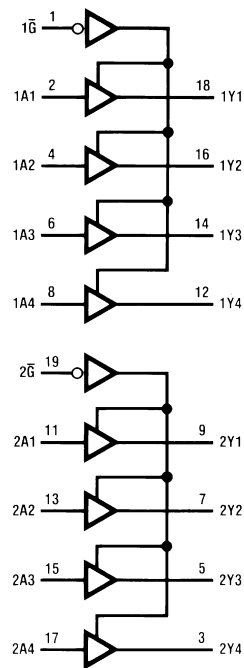
over recommended operating free-air temperature range (Note 2)

Symbol	Parameter	From (Input)	To (Output)	Conditions	74ALS244A, 244B-1		Units
					Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	A	Y	$V_{CC} = 4.5V$ to $5.5V$, $C_L = 50$ pF, $R1 = 500\Omega$, $R2 = 500\Omega$, $T_A = \text{Min to Max}$	3	10	ns
t_{PHL}	Propagation Delay Time High to Low Level Output	A	Y		3	10	ns
t_{PZH}	Output Enable Time to High Level Output	\bar{G}	Y		3	20	ns
t_{PZL}	Output Enable Time to Low Level Output	\bar{G}	Y		3	20	ns
t_{PHZ}	Output Disable Time from High Level Output	\bar{G}	Y		2	10	ns
t_{PLZ}	Output Disable Time from Low Level Output	\bar{G}	Y		1	13	ns

Note 2: See Section 5 for test waveforms and output load.

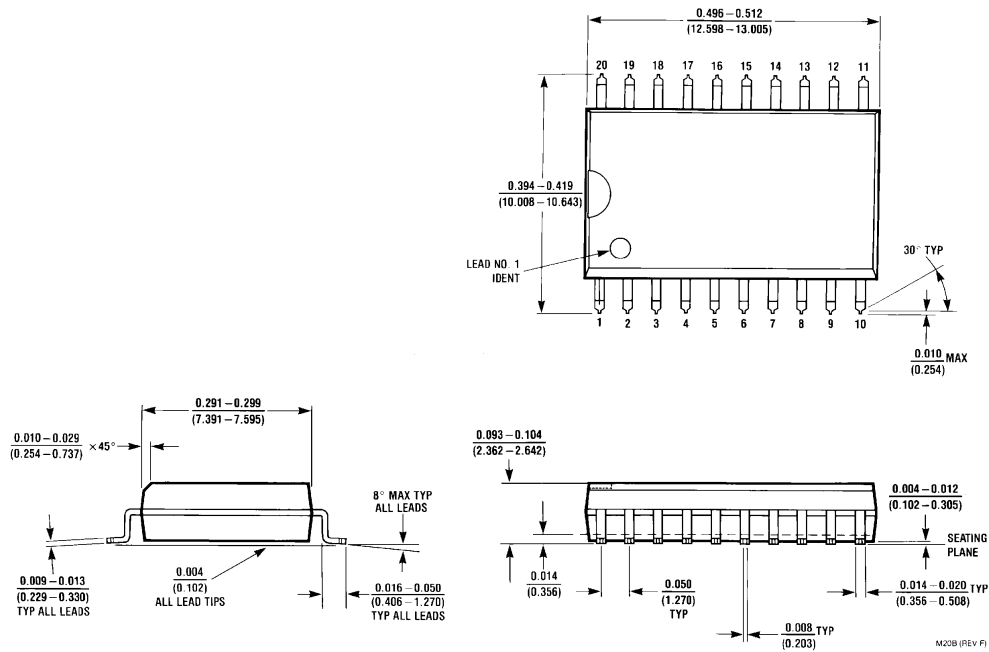
Logic Diagram

74ALS244A/74ALS244B

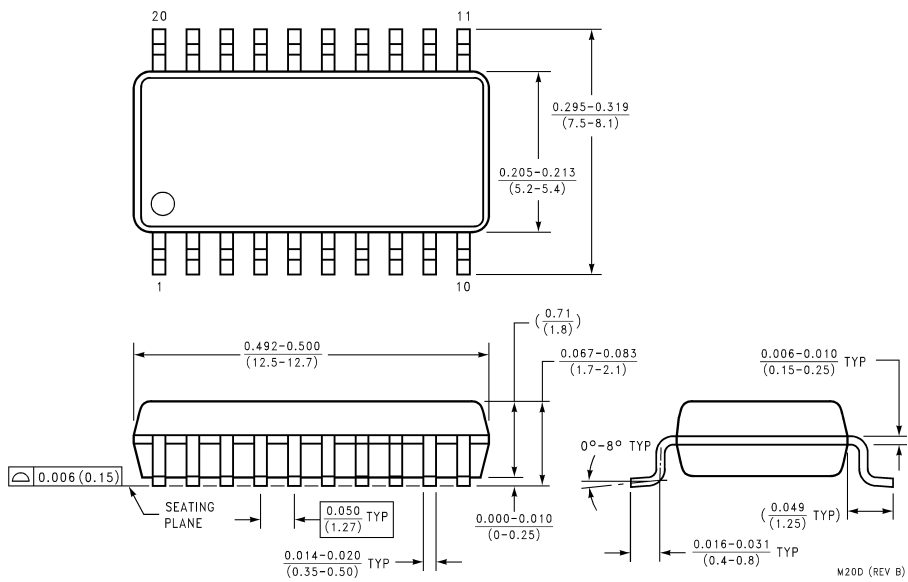


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Physical Dimensions inches (millimeters) unless otherwise noted

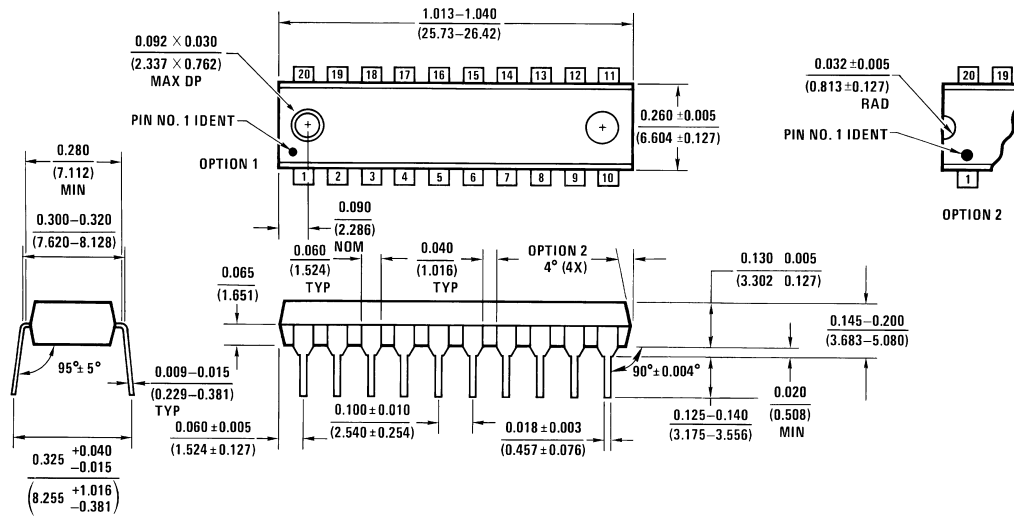


S.O. Package (M)
Order Number DM74ALS244AWM or 74ALS244B-1WM
Package Number M20B



S.O. Package (SJ)
Order Number DM74ALS244BSJ
Package Number M20D

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



N20A (REV G)

Molded Dual-In-Line Package (N)
Order Number DM74ALS244AN or 74ALS244B-1N
Package Number N20A

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