

DM64ALS244B/DM74ALS244A/74ALS244B-1 Octal TRI-STATE® Bus Driver

General Description

This octal TRI-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 TRI-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 TRI-STATE circuitry contains a feature that maintains the buffer outputs in TRI-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.

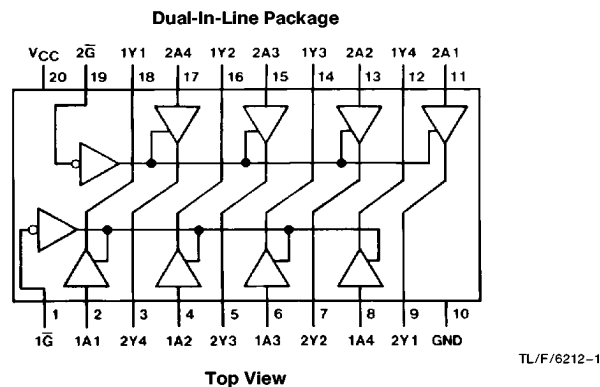
The 'ALS244B-1 version features the same performance as the standard version with the addition of increased current drive capability to meet the current requirements of various bus architectures. For all ALS-1 products, the recommended maximum I_{OL} is increased to 48 mA.

The DM64ALS244B version features the same performance as the standard version DM74ALS244A with a guarantee over an extended temperature range (-40°C to $+85^{\circ}\text{C}$).

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
- Low level drive current:
64ALS/74ALS = 24 mA
- 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 **DM64ALS244BWM, DM64ALS244BN, DM74ALS244AWM, DM74ALS244AN** or **DM74ALS244ASJ, 74ALS244B-1N, 74ALS244B-1WM**
See NS Package Number **M20B, M20D** or **N20A**

Function Table

| Input | | Output Y |
|-----------|---|-------------|
| \bar{G} | A | |
| 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

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Absolute Maximum Ratings

| | | | |
|--------------------------------------|-----------------|---|----------|
| Supply Voltage, V_{CC} | 7V | Typical θ_{JA} | |
| Input Voltage | 7V | N Package | 60.5°C/W |
| Voltage Applied to Disabled Output | 5.5V | M Package | 79.8°C/W |
| Operating Free Air Temperature Range | | 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. | |
| DM64ALS | -40°C to +85°C | | |
| DM74ALS | 0°C to +70°C | | |
| Storage Temperature Range | -65°C to +150°C | | |

Recommended Operating Conditions

| Symbol | Parameter | DM64ALS244B | | | DM74ALS244A, 244B-1 | | | Units |
|----------|--------------------------------|-------------|-----|-----|---------------------|-----|-----|-------|
| | | Min | Typ | Max | Min | Typ | Max | |
| V_{CC} | Supply Voltage | 4.5 | 5 | 5.5 | 4.5 | 5 | 5.5 | V |
| V_{IH} | High Level Input Voltage | 2 | | | 2 | | | V |
| V_{IL} | Low Level Input Voltage | | | 0.8 | | | 0.8 | V |
| I_{OH} | High Level Output Current | | | -15 | | | -15 | mA |
| I_{OL} | Low Level Output Current | ALS244B, | | 24 | | | 24 | mA |
| | | ALS244B-1 | | | | | 48 | |
| T_A | Operating Free-Air Temperature | -40 | | 85 | 0 | | 70 | °C |

Electrical Characteristics over recommended operating free air temperature (unless otherwise specified)

| Symbol | Parameter | Conditions | DM64ALS244B | | | DM74ALS244A, 244B-1 | | | Units |
|-----------|-------------------------------------|--|-------------|-----|------|---------------------|-------------|------------|---------------|
| | | | Min | Typ | Max | Min | Typ | Max | |
| V_{IK} | Input Clamp Voltage | $V_{CC} = 4.5V, I_I = -18\text{ mA}$ | | | -1.5 | | | -1.5 | V |
| V_{OH} | High Level Output Voltage | $V_{CC} = 4.5V\text{ to }5.5V, I_{OH} = -0.4\text{ mA}$ | $V_{CC}-2$ | | | $V_{CC}-2$ | | | V |
| | | $V_{CC} = 4.5V, I_{OH} = -3\text{ mA}$ | 2.4 | | | 2.4 | | | V |
| | | $I_{OH} = \text{Max}$ | 2 | | | 2 | | | V |
| V_{OL} | Low Level Output Voltage | $V_{CC} = 4.5V$ $I_{OL} = 64\text{ALS}/74\text{ALS (Max)}$ $I_{OL} = 74\text{ALS-1 (Max)}$ | | | 0.5 | | 0.35 0.4 | 0.5 0.5 | V |
| I_I | Input Current at Max Input Voltage | $V_{CC} = 5.5V, V_I = 7V$ | | | 0.1 | | | 0.1 | mA |
| I_{IH} | High Level Input Current | $V_{CC} = 5.5V, V_I = 2.7V$ | | | 20 | | | 20 | μA |
| I_{IL} | Low Level Input Current | $V_{CC} = 5.5V, V_{IL} = 0.4V$ | | | -0.1 | | | -0.1 | mA |
| I_O | Output Drive Current | $V_{CC} = 5.5V, V_O = 2.25V$ | -30 | | -112 | -30 | | -112 | mA |
| I_{OZH} | High Level TRI-STATE Output Current | $V_{CC} = 5.5V, V_O = 2.7V$ | | | 20 | | | 20 | μA |
| I_{OZL} | Low Level TRI-STATE Output Current | $V_{CC} = 5.5V, V_O = 0.4V$ | | | -20 | | | -20 | μA |
| I_{CC} | Supply Current | $V_{CC} = 5.5V$ Outputs High | | 9 | 15 | | 9 | 15 | mA |
| | | Outputs Low | | 15 | 24 | | 15 | 24 | mA |
| | | Outputs TRI-STATE | | 17 | 27 | | 17 | 27 | mA |

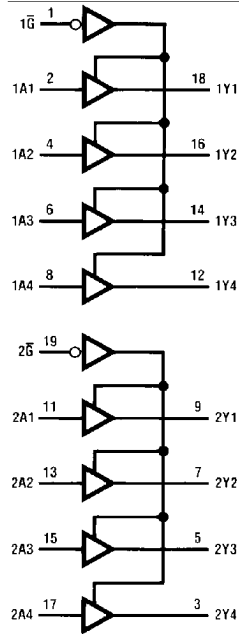
Switching Characteristics over recommended operating free-air temperature range (Note 1)

| Symbol | Parameter | From (Input) | To (Output) | Conditions | 64ALS244B | | 74ALS244A, 244B-1 | | Units |
|------------------|---|----------------|-------------|---|-----------|-----|-------------------|-----|-------|
| | | | | | Min | Max | 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 = 500Ω, R2 = 500Ω, T _A = Min to Max | 3 | 10 | 3 | 10 | ns |
| t _{PHL} | Propagation Delay Time High to Low Level Output | A | Y | | 3 | 10 | 3 | 10 | ns |
| t _{PZH} | Output Enable Time to High Level Output | \overline{G} | Y | | 3 | 20 | 3 | 20 | ns |
| t _{PZL} | Output Enable Time to Low Level Output | \overline{G} | Y | | 3 | 20 | 3 | 20 | ns |
| t _{PHZ} | Output Disable Time from High Level Output | \overline{G} | Y | | 2 | 10 | 2 | 10 | ns |
| t _{PLZ} | Output Disable Time from Low Level Output | \overline{G} | Y | | 1 | 13 | 1 | 13 | ns |

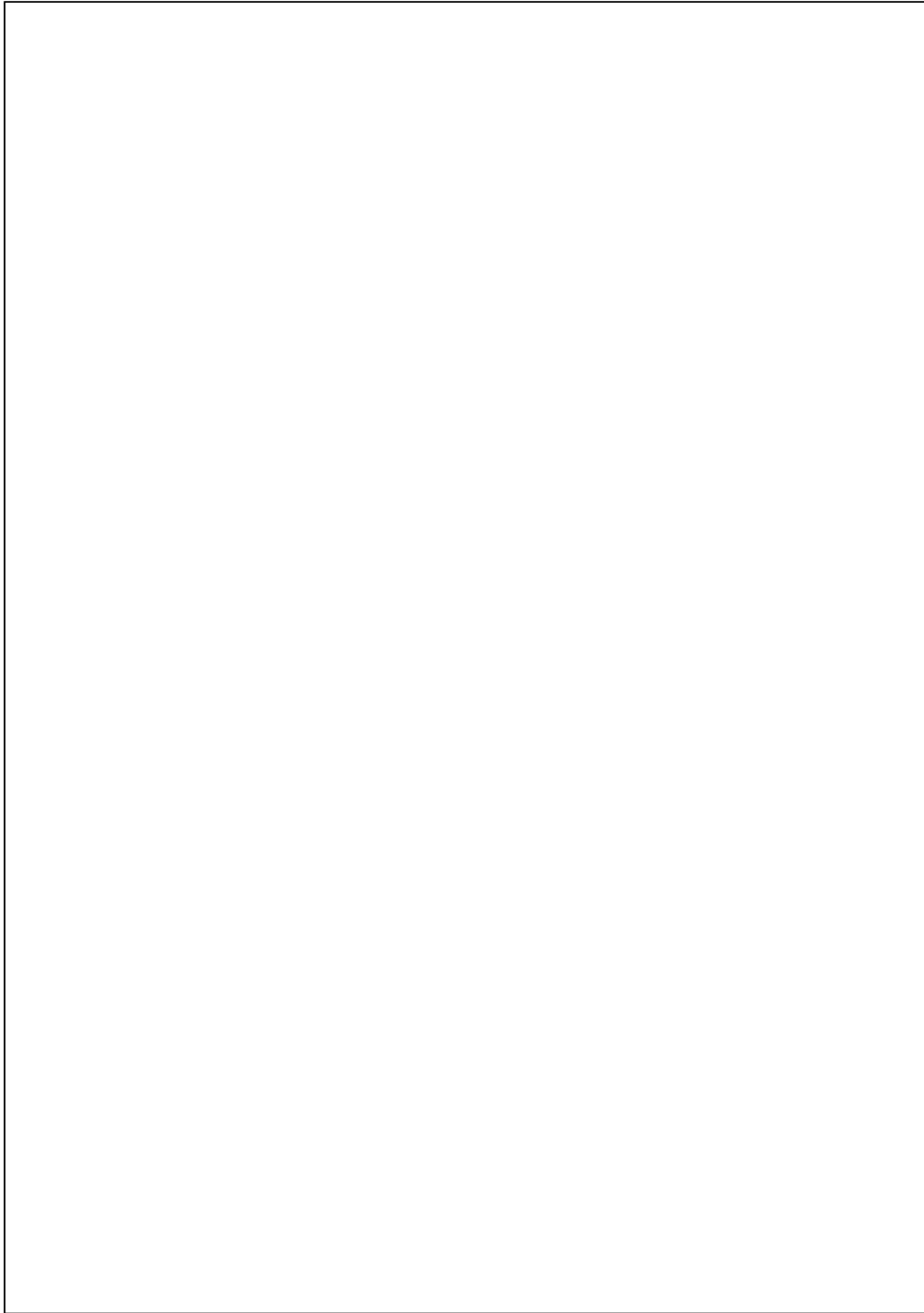
Note 1: See Section 5 for test waveforms and output load.

Logic Diagram

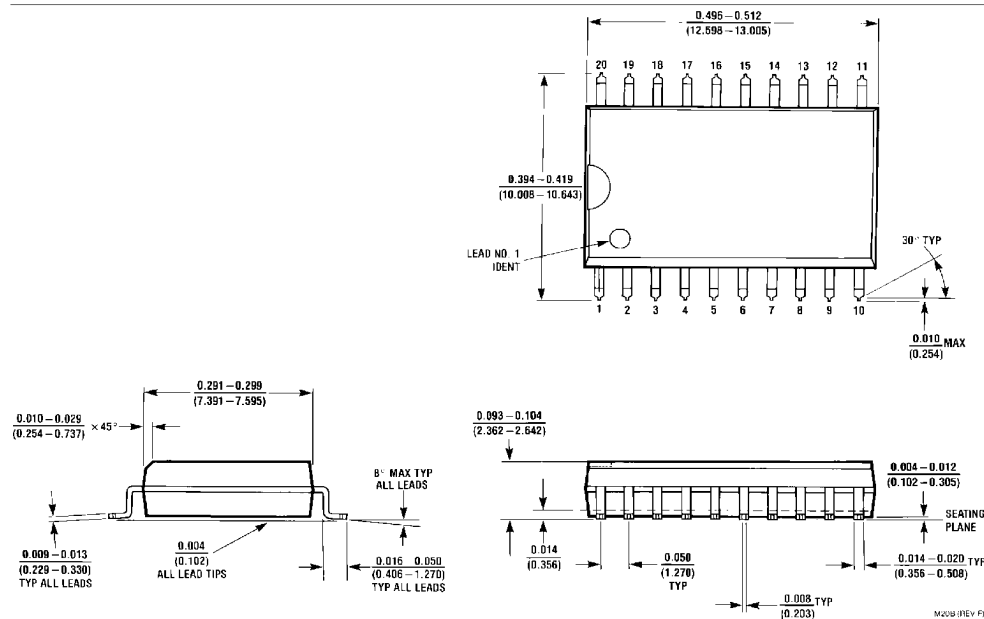
74ALS244A/74ALS244B-1/64ALS244B



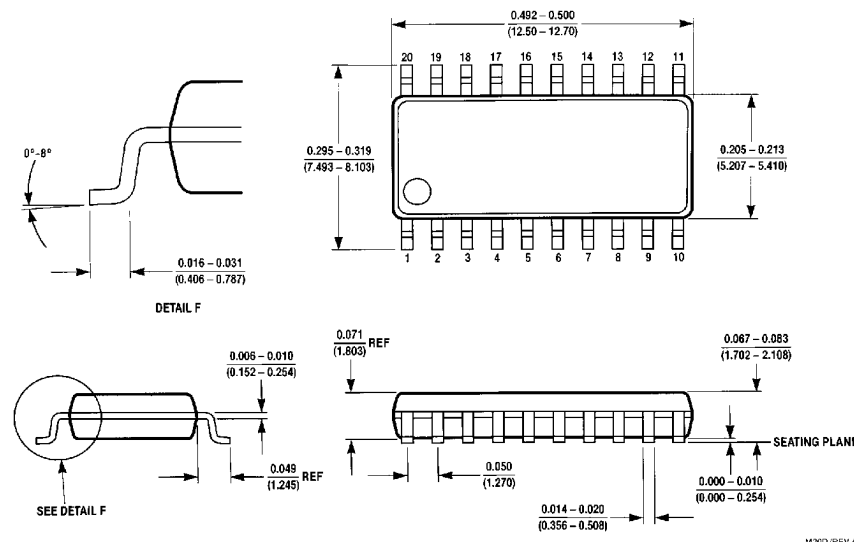
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Physical Dimensions inches (millimeters)

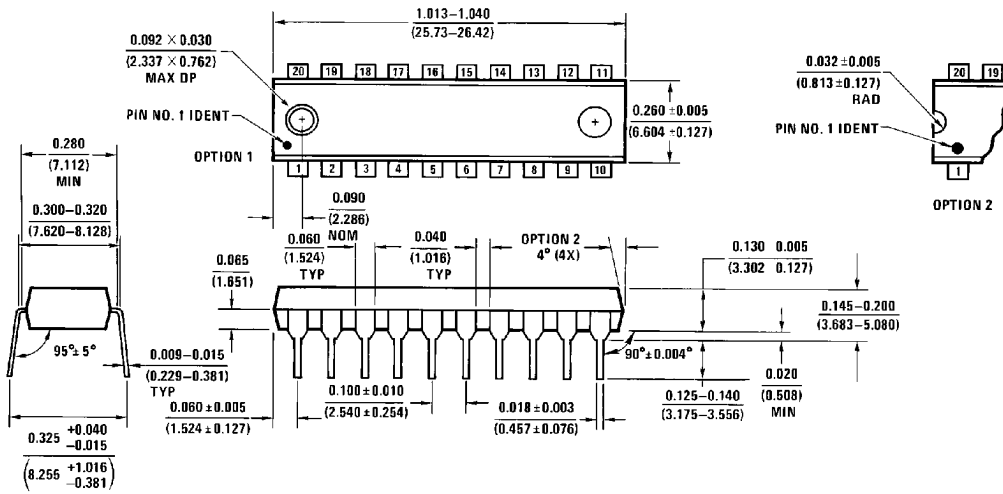


S.O. Package (M)
Order Number DM64ALS244BWM, DM74ALS244AWM or 74ALS244B-1WM
NS Package Number M20B



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

Physical Dimensions inches (millimeters) (Continued)



Molded Dual-In-Line Package (N)
Order Number DM64ALS244BN, DM74ALS244AN or 74ALS244B-1N
NS Package Number N20A

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|--|---|---|--|--|

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