

DM74ALS244A

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.

Features

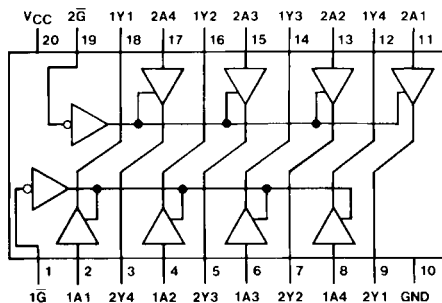
- Advanced low power oxide-isolated ion-implanted Schottky TTL process
- Functional and pin compatible with the 74LS counterpart
- Improved switching performance with less power dissipation compared with the 74LS counterpart
- Switching response specified into 500Ω and 50 pF load
- Switching response specifications guaranteed over full temperature and V_{CC} supply range
- PNP input design reduces input loading

Ordering Code:

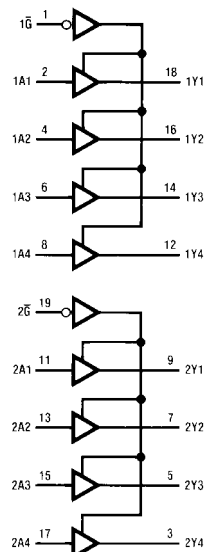
| Order Number | Package Number | Package Description |
|----------------|----------------|---|
| DM74ALS244AWM | M20B | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide |
| DM74ALS244ASJ | M20D | 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide |
| DM74ALS244AMSA | MSA20 | 20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide |
| DM74ALS244AN | N20A | 20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



Logic Diagram



Function Table

| Input | | Output |
|-----------------------|---|--------|
| $\overline{\text{G}}$ | 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

DM74ALS244A Octal 3-STATE Bus Driver

Absolute Maximum Ratings(Note 1)

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

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 tables 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 | Min | Typ | Max | Units |
|----------|--------------------------------|-----|-----|-----|-------|
| 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 | Operating Free-Air Temperature | 0 | | 70 | °C |

Electrical Characteristics

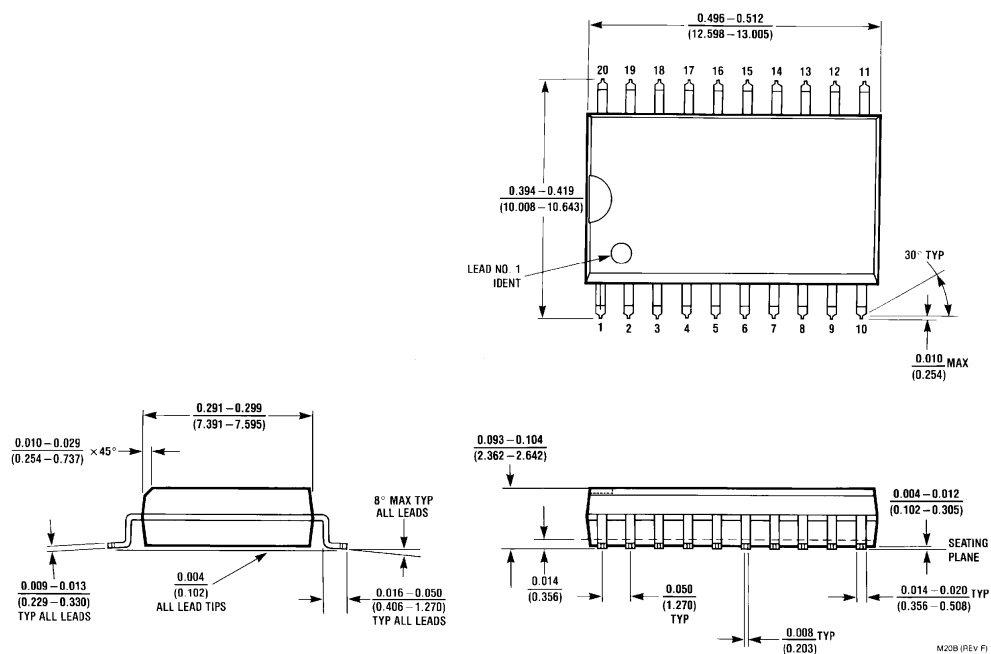
over recommended operating free air temperature (unless otherwise specified)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|-----------|--|---|----------------------------|------------|------|---------|
| 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 | $V_{CC} = 4.5V$ $I_{OL} = 24 \text{ mA}$ | | 0.35 | 0.5 | V |
| I_I | Input Current at Maximum 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 | $V_{CC} = 5.5V$ | | | | |
| | | Outputs HIGH | | 9 | 15 | mA |
| | | Outputs LOW | | 15 | 24 | mA |
| | | Outputs 3-STATE | | 17 | 27 | mA |

Switching Characteristics

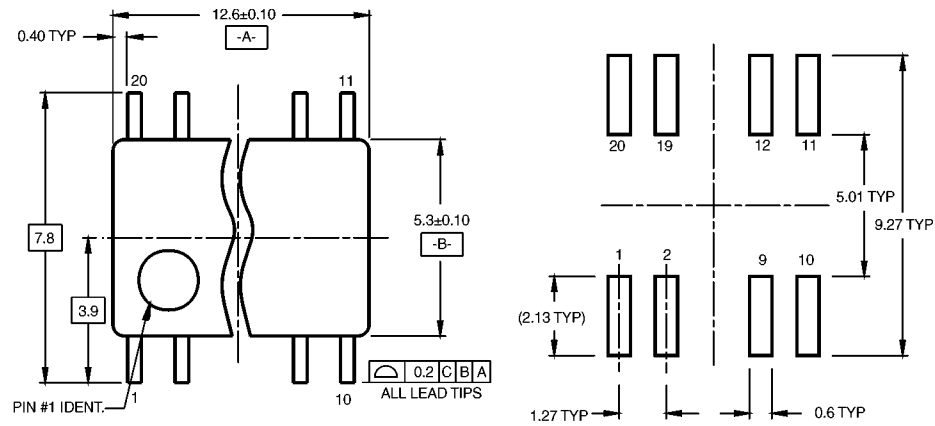
over recommended operating free-air temperature range

| Symbol | Parameter | Conditions | From (Input) | To (Output) | Min | Max | Units |
|-----------|---|--|----------------|-------------|-----|-----|-------|
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | $V_{CC} = 4.5V \text{ to } 5.5V$, $C_L = 50 \text{ pF}$, $R_1 = 500\Omega$, $R_2 = 500\Omega$, $T_A = \text{Min to Max}$ | A | Y | 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 | | \overline{G} | Y | 3 | 20 | ns |
| t_{PZL} | Output Enable Time to LOW Level Output | | \overline{G} | Y | 3 | 20 | ns |
| t_{PHZ} | Output Disable Time from HIGH Level Output | | \overline{G} | Y | 2 | 10 | ns |
| t_{PLZ} | Output Disable Time from LOW Level Output | | \overline{G} | Y | 1 | 13 | ns |
| | | | | | | | |

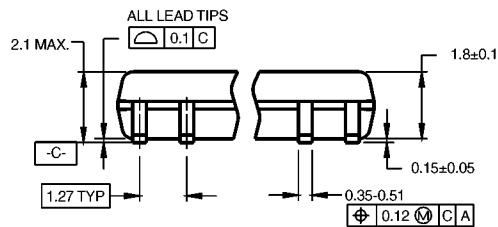
Physical Dimensions inches (millimeters) unless otherwise noted

**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
Package Number M20B**

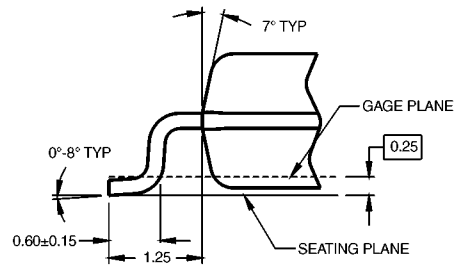
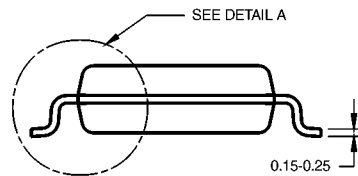
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS



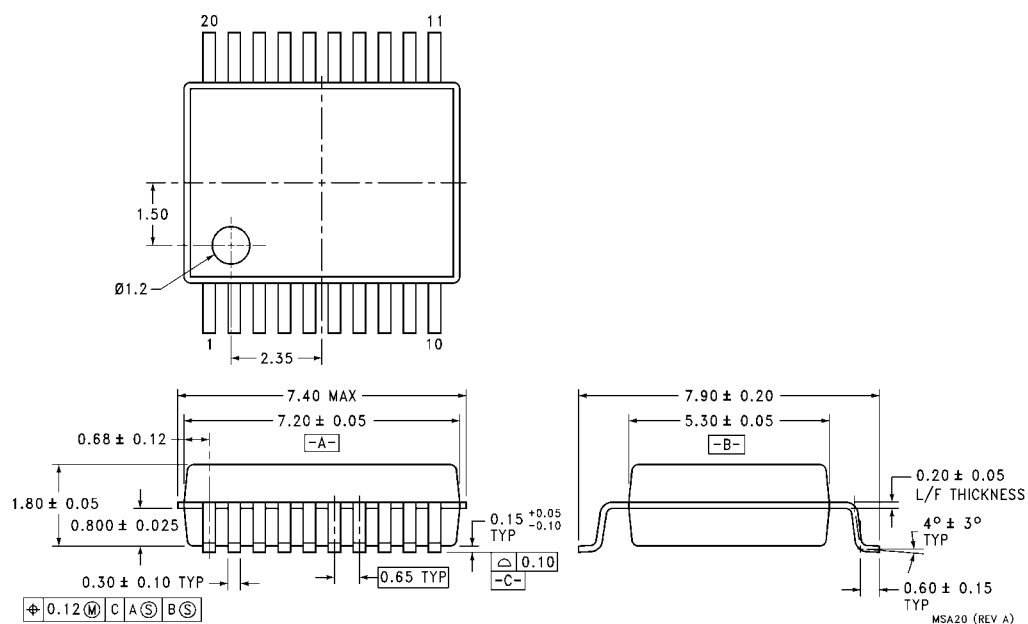
DETAIL A

NOTES:

- CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
- DIMENSIONS ARE IN MILLIMETERS.
- DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

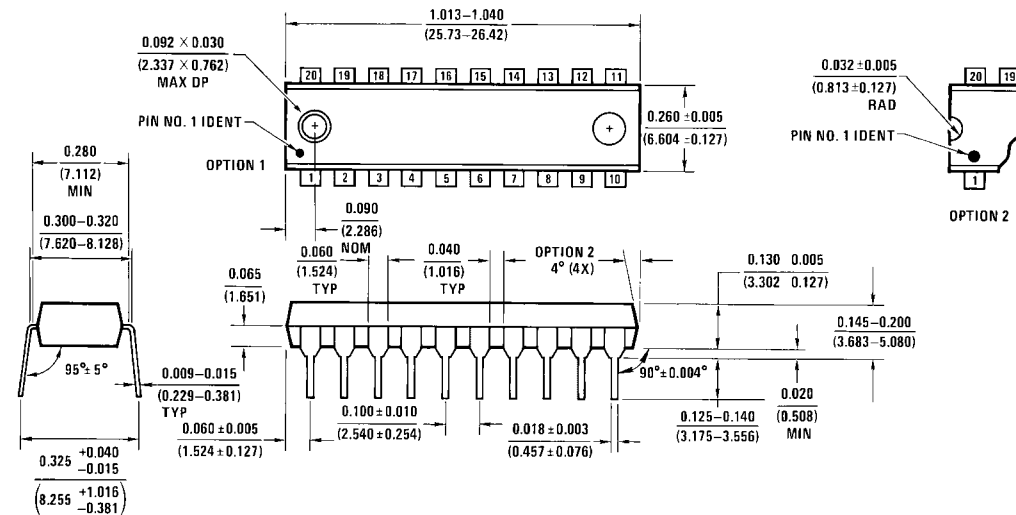
M20DRevB1

20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
Package Number M20D



**20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
Package Number MSA20**

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



N20A (REV G)

**20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
Package Number N20A**

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