



## DM74ALS465A/466A/467A/468A Octal TRI-STATE® Bidirectional Bus Driver

### General Description

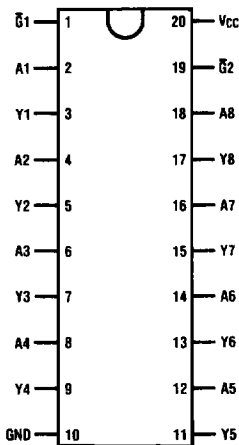
These octal TRI-STATE bus drivers are designed to provide the designer with flexibility in implementing a bus interface with memory, microprocessor, or communication systems. The output TRI-STATE gating control is organized into two separate groups of four buffers on the ALS467A and ALS468A, and one common gating control for all eight buffers on the ALS465A and ALS466A. All control inputs are active low enabling. The buffers on the ALS465A and ALS467A are non-inverting and the buffers on the ALS466A and ALS468A are inverting. 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.

### Features

- Advanced low power oxide-isolated ion-implanted Schottky TTL process
- Functional and pin compatible with the DM54/74LS counterpart and the DM71/81LS95, 96, 97, 98
- Improved switching performance with less power dissipation compared with the DM54/74LS counterpart
- Switching response specified into 500Ω and 50 pF load
- Switching response specifications guaranteed over full temperature and V<sub>CC</sub> supply range
- PNP input design reduces input loading

### Connection Diagrams

Dual-In-Line Package

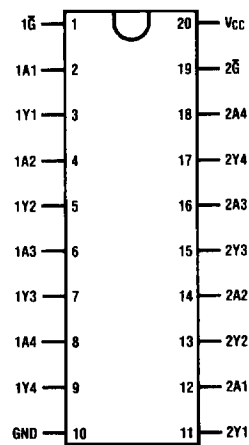


Top View

Order DM74ALS465AWM, DM74ALS466AWM,  
DM74ALS465AN or DM74ALS466AN  
See NS Package Number M20B or N20A

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Dual-In-Line Package



Top View

Order Number DM74ALS467AWM, DM74ALS468AWM,  
DM74ALS467AN or DM74ALS468AN  
See NS Package Number M20B or N20A

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## Absolute Maximum Ratings

|   |                 |
|---|-----------------|
| Supply Voltage, $V_{CC}$                        | 7V              |
| Input Voltage                                   | 7V              |
| Output Voltage (Disabled)                       | 5.5V            |
| Operating Free Air Temperature Range<br>DM74ALS | 0°C to +70°C    |
| Storage Temperature Range                       | -65°C to +150°C |
| Typical $\theta_{JA}$                           |                 |
| N Package                                       | 60.5°C/W        |
| M Package                                       | 79.8°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                      | 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 range (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                    | $I_{OL} = \text{Max}$                |                           | 0.35         | 0.5  | V             |
| $I_I$     | 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   | $\mu\text{A}$ |
| $I_{IL}$  | 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 TRI-STATE Output Current | $V_{CC} = 5.5V, V_O = 2.7V$          |                           |              | 20   | $\mu\text{A}$ |
| $I_{OZL}$ | Low Level TRI-STATE Output Current  | $V_{CC} = 5.5V, V_O = 0.4V$          |                           |              | -20  | $\mu\text{A}$ |

**Electrical Characteristics** (Continued)

over recommended operating free air temperature range (unless otherwise specified)

| Symbol   | Parameter      | Conditions  | Min | Typ            | Max            | Units |    |
|----------|----------------|---|-----|----------------|----------------|-------|----|
| $I_{CC}$ | Supply Current | $V_{CC} = 5.5V$ , ALS465A<br>Outputs High<br>Outputs Low<br>Outputs TRI-STATE |     | 11<br>19<br>23 | 16<br>28<br>33 | mA    |    |
|          |                | $V_{CC} = 5.5V$ , ALS466A<br>Outputs High<br>Outputs Low<br>Outputs TRI-STATE |     | 7<br>16<br>19  | 10<br>24<br>27 |       | mA |
|          |                | $V_{CC} = 5.5V$ , ALS467A<br>Outputs High<br>Outputs Low<br>Outputs TRI-STATE |     | 11<br>19<br>23 | 16<br>28<br>33 |       |    |
|          |                | $V_{CC} = 5.5V$ , ALS468A<br>Outputs High<br>Outputs Low<br>Outputs TRI-STATE |     | 7<br>16<br>19  | 10<br>24<br>27 |       | mA |

**'ALS465A and 'ALS467A Switching Characteristics**

over recommended operating free air temperature range (Note 1)

| Parameter | Conditions   | From (Input) | To (Output) | Min | Max | Units |
|-----------|--|--------------|-------------|-----|-----|-------|
| $t_{PLH}$ | $V_{CC} = 4.5V$ to $5.5V$ ,<br>$C_L = 50$ pF,<br>$R1 = 500\Omega$ ,<br>$R2 = 500\Omega$ ,<br>$T_A = \text{Min to Max}$ | A            | Y           | 2   | 13  | ns    |
| $t_{PHL}$ |  |              |             | 4   | 12  | ns    |
| $t_{PZH}$ |  | $\bar{G}$    | Any Y       | 4   | 23  | ns    |
| $t_{PZL}$ |  |              |             | 5   | 25  | ns    |
| $t_{PHZ}$ |  | $\bar{G}$    | Any Y       | 2   | 10  | ns    |
| $t_{PLZ}$ |  |              |             | 3   | 18  | ns    |

**'ALS466A and 'ALS468A Switching Characteristics**

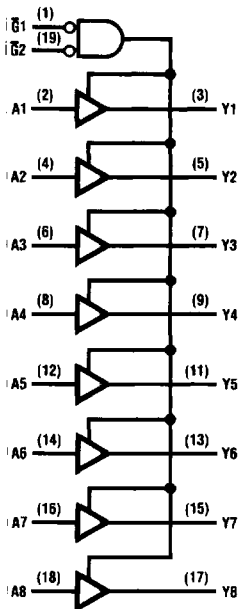
over recommended operating free air temperature range (Note 1)

| Parameter | Conditions   | From (Input) | To (Output) | Min | Max | Units |
|-----------|--|--------------|-------------|-----|-----|-------|
| $t_{PLH}$ | $V_{CC} = 4.5V$ to $5.5V$ ,<br>$C_L = 50$ pF,<br>$R1 = 500\Omega$ ,<br>$R2 = 500\Omega$ ,<br>$T_A = \text{Min to Max}$ | A            | Y           | 3   | 12  | ns    |
| $t_{PHL}$ |  |              |             | 2   | 9   | ns    |
| $t_{PZH}$ |  | $\bar{G}$    | Any Y       | 4   | 16  | ns    |
| $t_{PZL}$ |  |              |             | 7   | 23  | ns    |
| $t_{PHZ}$ |  | $\bar{G}$    | Any Y       | 2   | 10  | ns    |
| $t_{PLZ}$ |  |              |             | 2   | 17  | ns    |

**Note 1:** See Section 1 for test waveforms and output loads.

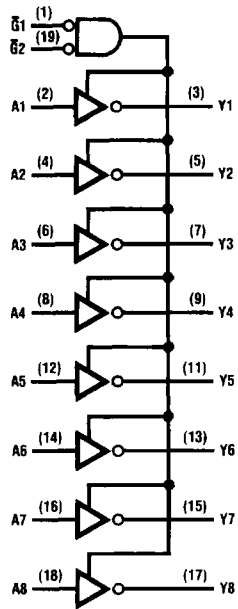
# Logic Diagrams

**ALS465A**



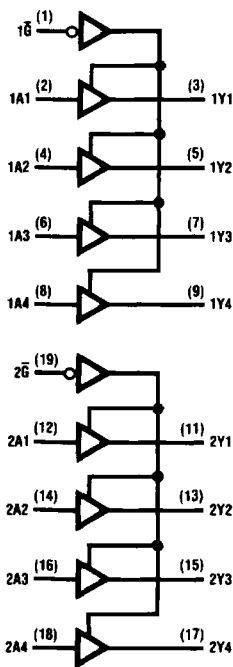
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**ALS466A**



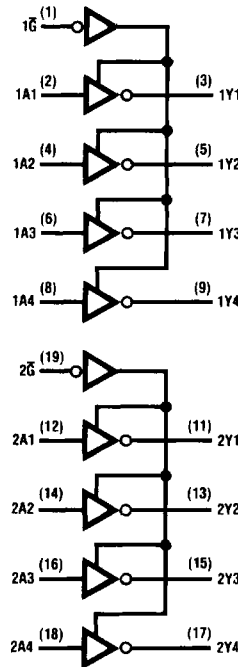
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**ALS467A**



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**ALS468A**



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