

## 54ABT241

### Octal Buffer/Line Driver with TRI-STATE® Outputs

#### General Description

The ABT241 is an octal buffer and line driver with 3-STATE outputs designed to be employed as a memory and address driver, clock driver, or bus-oriented transmitter/receiver.

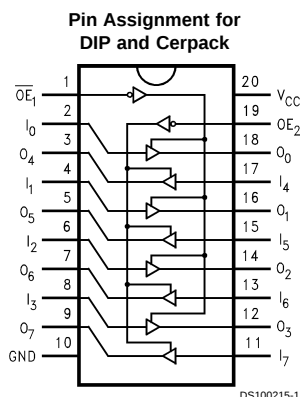
#### Features

- Non-inverting buffers
- Output sink capability of 48 mA, source capability of 24 mA
- Guaranteed latchup protection
- High impedance glitch free bus loading during entire power up and power down cycle
- Nondestructive hot insertion capability
- Standard Microcircuit Drawing (SMD) 5962-9322701

#### Ordering Code

| Military      | Package Number | Package Description                           |
|---------------|----------------|-----------------------------------------------|
| 54ABT241J-QML | J20A           | 20-Lead Ceramic Dual-In-Line                  |
| 54ABT241W-QML | W20A           | 20-Lead Cerpack                               |
| 54ABT241E-QML | E20A           | 20-Lead Ceramic Leadless Chip Carrier, Type C |

#### Connection Diagram

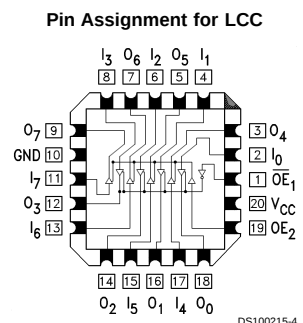


| Pin Names         | Description                       |
|-------------------|-----------------------------------|
| $\overline{OE}_1$ | Output Enable Input (Active Low)  |
| $OE_2$            | Output Enable Input (Active High) |
| $I_0-I_7$         | Inputs                            |
| $O_0-O_7$         | Outputs                           |

#### Truth Table

| $\overline{OE}_1$ | $I_{0-3}$ | $O_{0-3}$ | $\overline{OE}_2$ | $I_{4-7}$ | $O_{4-7}$ |
|-------------------|-----------|-----------|-------------------|-----------|-----------|
| H                 | X         | Z         | L                 | X         | Z         |
| L                 | H         | H         | H                 | H         | H         |
| L                 | L         | L         | H                 | L         | L         |

H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial  
Z = High Impedance



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## Absolute Maximum Ratings (Note 1)

|                                                                  |                                      |
|------------------------------------------------------------------|--------------------------------------|
| Storage Temperature                                              | -65°C to +150°C                      |
| Ambient Temperature under Bias                                   | -55°C to +125°C                      |
| Junction Temperature under Bias                                  |                                      |
| Ceramic                                                          | -55°C to +175°C                      |
| V <sub>CC</sub> Pin Potential to Ground Pin                      | -0.5V to +7.0V                       |
| Input Voltage (Note 2)                                           | -0.5V to +7.0V                       |
| Input Current (Note 2)                                           | -30 mA to +5.0 mA                    |
| Voltage Applied to Any Output in the Disabled or Power-Off State | -0.5V to 5.5V                        |
| in the HIGH State                                                | -0.5V to V <sub>CC</sub>             |
| Current Applied to Output in LOW State (Max)                     | twice the rated I <sub>OL</sub> (mA) |

|                                                       |         |
|-------------------------------------------------------|---------|
| DC Latchup Source Current (Over Comm Operating Range) | -500 mA |
| Over Voltage Latchup (I/O)                            | 10V     |

## Recommended Operating Conditions

|                              |                 |
|------------------------------|-----------------|
| Free Air Ambient Temperature |                 |
| Military                     | -55°C to +125°C |
| Supply Voltage               |                 |
| Military                     | +4.5V to +5.5V  |
| Minimum Input Edge Rate      | (ΔV/Δt)         |
| Data Input                   | 50 mV/ns        |
| Enable Input                 | 20 mV/ns        |

**Note 1:** Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

**Note 2:** Either voltage limit or current limit is sufficient to protect inputs.

## DC Electrical Characteristics

| Symbol           | Parameter                         | Min             | Typ  | Max  | Units      | V <sub>CC</sub> | Conditions                                                                                    |
|------------------|-----------------------------------|-----------------|------|------|------------|-----------------|-----------------------------------------------------------------------------------------------|
| V <sub>IH</sub>  | Input HIGH Voltage                | 2.0             |      |      | V          |                 | Recognized HIGH Signal                                                                        |
| V <sub>IL</sub>  | Input LOW Voltage                 |                 |      | 0.8  | V          |                 | Recognized LOW Signal                                                                         |
| V <sub>CD</sub>  | Input Clamp Diode Voltage         |                 |      | -1.2 | V          | Min             | I <sub>IN</sub> = -18 mA                                                                      |
| V <sub>OH</sub>  | Output HIGH Voltage               | 54ABT           | 2.5  |      | V          | Min             | I <sub>OH</sub> = -3 mA                                                                       |
|                  |                                   |                 | 2.0  |      | V          | Min             | I <sub>OH</sub> = -24 mA                                                                      |
| V <sub>OL</sub>  | Output LOW Voltage                | 54ABT           |      | 0.55 | V          | Min             | I <sub>OL</sub> = 48 mA                                                                       |
| I <sub>IH</sub>  | Input HIGH Current                |                 |      | 5    | μA         | Max             | V <sub>IN</sub> = 2.7V (Note 4)                                                               |
|                  |                                   |                 |      | 5    |            |                 | V <sub>IN</sub> = V <sub>CC</sub>                                                             |
| I <sub>BVI</sub> | Input HIGH Current Breakdown Test |                 |      | 7    | μA         | Max             | V <sub>IN</sub> = 7.0V                                                                        |
| I <sub>IL</sub>  | Input LOW Current                 |                 |      | -5   | μA         | Max             | V <sub>IN</sub> = 0.5V (Note 4)                                                               |
|                  |                                   |                 |      | -5   |            |                 | V <sub>IN</sub> = 0.0V                                                                        |
| V <sub>ID</sub>  | Input Leakage Test                | 4.75            |      |      | V          | 0.0             | I <sub>ID</sub> = 1.9 μA<br>All Other Pins Grounded                                           |
| I <sub>OZH</sub> | Output Leakage Current            |                 |      | 50   | μA         | 0 - 5.5V        | V <sub>OUT</sub> = 2.7V; $\overline{OE}_n$ = 2.0V                                             |
| I <sub>OZL</sub> | Output Leakage Current            |                 |      | -50  | μA         | 0 - 5.5V        | V <sub>OUT</sub> = 0.5V; $\overline{OE}_n$ = 2.0V                                             |
| I <sub>OS</sub>  | Output Short-Circuit Current      | -100            | -275 |      | mA         | Max             | V <sub>OUT</sub> = 0.0V                                                                       |
| I <sub>CEX</sub> | Output High Leakage Current       |                 |      | 50   | μA         | Max             | V <sub>OUT</sub> = V <sub>CC</sub>                                                            |
| I <sub>ZZ</sub>  | Bus Drainage Test                 |                 |      | 100  | μA         | 0.0             | V <sub>OUT</sub> = 5.5V; All Others GND                                                       |
| I <sub>CCH</sub> | Power Supply Current              |                 |      | 50   | μA         | Max             | All Outputs HIGH                                                                              |
| I <sub>CCL</sub> | Power Supply Current              |                 |      | 30   | mA         | Max             | All Outputs LOW                                                                               |
| I <sub>CCZ</sub> | Power Supply Current              |                 |      | 50   | μA         | Max             | $\overline{OE}_n$ = V <sub>CC</sub> ;<br>All Others at V <sub>CC</sub> or Ground              |
| I <sub>CCT</sub> | Additional I <sub>CC</sub> /Input | Outputs Enabled |      | 2.5  | mA         | Max             | V <sub>I</sub> = V <sub>CC</sub> - 2.1V                                                       |
|                  |                                   | Outputs 3-STATE |      | 2.5  | mA         |                 | Enable Input V <sub>I</sub> = V <sub>CC</sub> - 2.1V                                          |
|                  |                                   | Outputs 3-STATE |      | 50   | μA         |                 | Data Input V <sub>I</sub> = V <sub>CC</sub> - 2.1V<br>All Others at V <sub>CC</sub> or Ground |
| I <sub>CCD</sub> | Dynamic I <sub>CC</sub> (Note 4)  | No Load         |      | 0.1  | mA/<br>MHz | Max             | Outputs Open<br>$\overline{OE}_n$ = GND, (Note 3)<br>One Bit Toggling, 50%<br>Duty Cycle      |

**Note 3:** For 8 bits toggling, I<sub>CCD</sub> < 0.8 mA/MHz.

**Note 4:** Guaranteed, but not tested.

## DC Electrical Characteristics

| Symbol           | Parameter                                    | Min | Max   | Units | V <sub>CC</sub> | Conditions<br>C <sub>L</sub> = 50 pF,<br>R <sub>L</sub> = 500Ω |
|------------------|----------------------------------------------|-----|-------|-------|-----------------|----------------------------------------------------------------|
| V <sub>OLP</sub> | Quiet Output Maximum Dynamic V <sub>OL</sub> |     | 0.67  | V     | 5.0             | T <sub>A</sub> = 25°C (Note 5)                                 |
| V <sub>OLV</sub> | Quiet Output Minimum Dynamic V <sub>OL</sub> |     | -1.35 | V     | 5.0             | T <sub>A</sub> = 25°C (Note 5)                                 |

**Note 5:** Max number of outputs defined as (n). n - 1 data inputs are driven 0V to 3V. One output at LOW. Guaranteed, but not tested.

## AC Electrical Characteristics

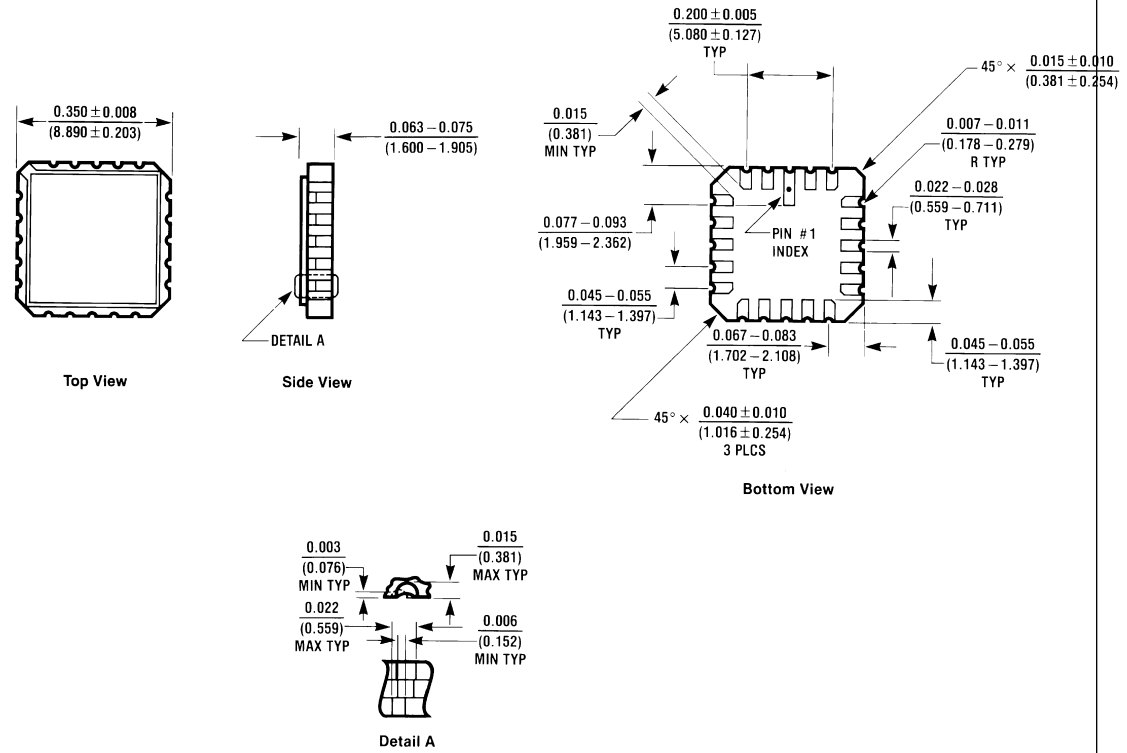
| Symbol           | Parameter         | T <sub>A</sub> = -55°C to +125°C<br>V <sub>CC</sub> = 4.5V-5.5V<br>C <sub>L</sub> = 50 pF |     | Units | Fig.<br>No. |
|------------------|-------------------|-------------------------------------------------------------------------------------------|-----|-------|-------------|
|                  |                   | Min                                                                                       | Max |       |             |
| t <sub>PLH</sub> | Propagation Delay | 0.8                                                                                       | 5.3 | ns    |             |
| t <sub>PHL</sub> | Data to Outputs   | 0.8                                                                                       | 5.0 |       |             |
| t <sub>PZH</sub> | Output Enable     | 1.0                                                                                       | 7.0 | ns    |             |
| t <sub>PZL</sub> | Time              | 1.0                                                                                       | 7.0 |       |             |
| t <sub>PHZ</sub> | Output Disable    | 0.8                                                                                       | 7.9 | ns    |             |
| t <sub>PLZ</sub> | Time              | 0.8                                                                                       | 6.2 |       |             |

## Capacitance

| Symbol                    | Parameter          | Typ | Units | Conditions<br>T <sub>A</sub> = 25°C |
|---------------------------|--------------------|-----|-------|-------------------------------------|
| C <sub>IN</sub>           | Input Capacitance  | 5.0 | pF    | V <sub>CC</sub> = 0V                |
| C <sub>OUT</sub> (Note 6) | Output Capacitance | 9.0 | pF    | V <sub>CC</sub> = 5.0V              |

**Note 6:** C<sub>OUT</sub> is measured at frequency f = 1 MHz, per MIL-STD-883B, Method 3012.

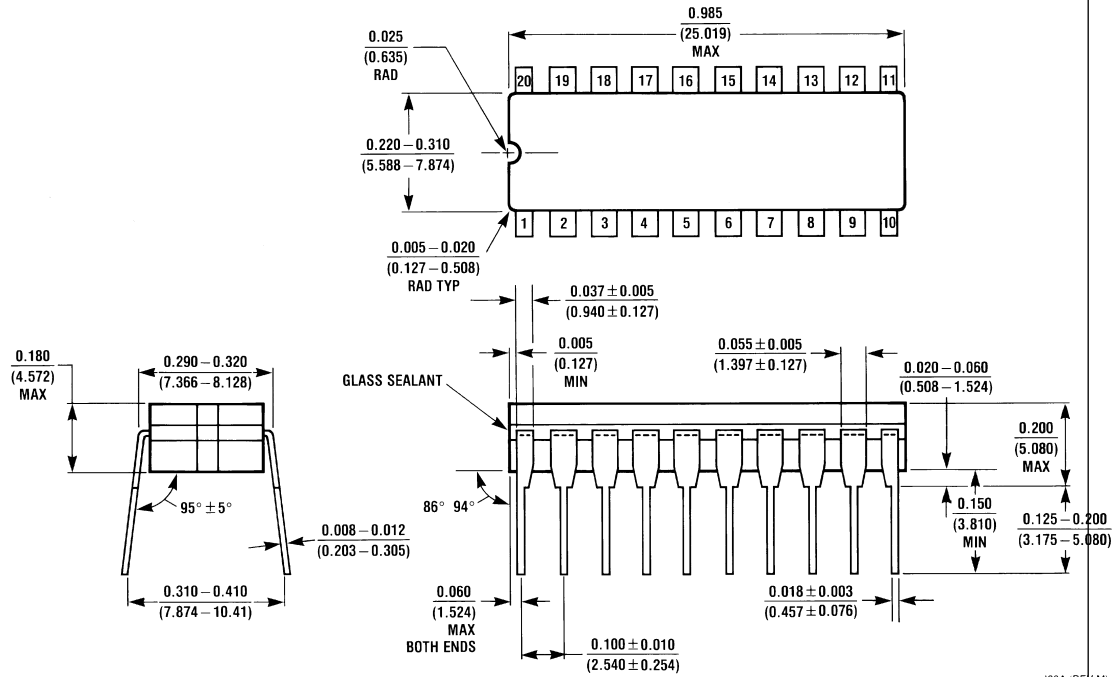
# Physical Dimensions inches (millimeters) unless otherwise noted



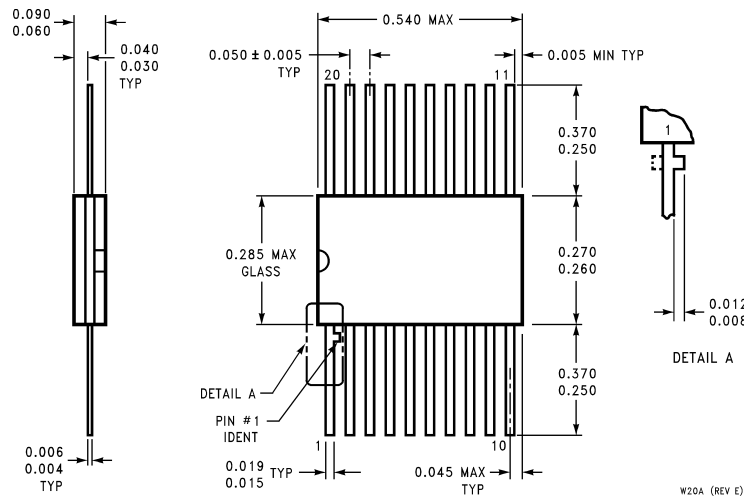
20-Lead Ceramic Leadless Chip Carrier  
Package Number E20A

E20A (REV D)

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



**20-Lead Ceramic Dual-In-Line  
Package Number J20A**



**20-Lead Ceramic Flatpack  
Package Number W20A**

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