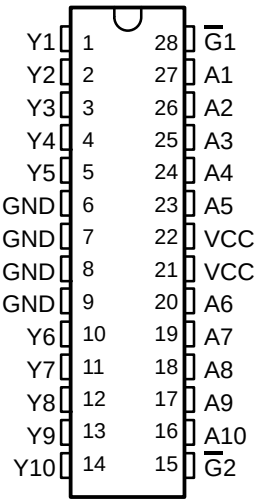
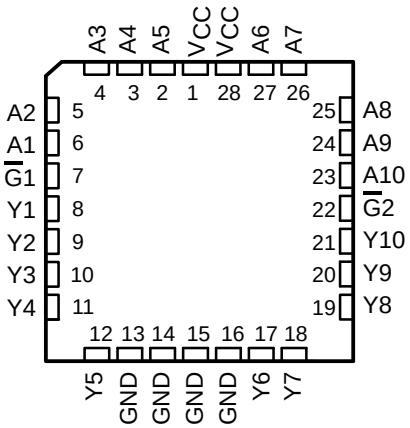
- **Inputs Are TTL-Voltage Compatible**
- **3-State Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **Flow-Through Architecture to Optimize PCB Layout**
- **Center-Pin $V_{CC}$ and GND Configurations Minimize High-Speed Switching Noise**
- ***EPIC***™ **(Enhanced-Performance Implanted CMOS) 1-μm Process**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Ceramic 300-mil DIPs**

**54ACT11827 . . . JT PACKAGE**
**74ACT11827 . . . DW PACKAGE**
**(TOP VIEW)**




**54ACT11827 . . . FK PACKAGE**
**(TOP VIEW)**




## description

These 10-bit buffers/bus drivers provide high-performance bus interface for wide data paths or buses carrying parity.

The 3-state control gate is a 2-input NOR such that if either $\overline{G}1$ or $\overline{G}2$ is high, all ten outputs are in the high-impedance state.

The ′ACT11827 provides inverted data.

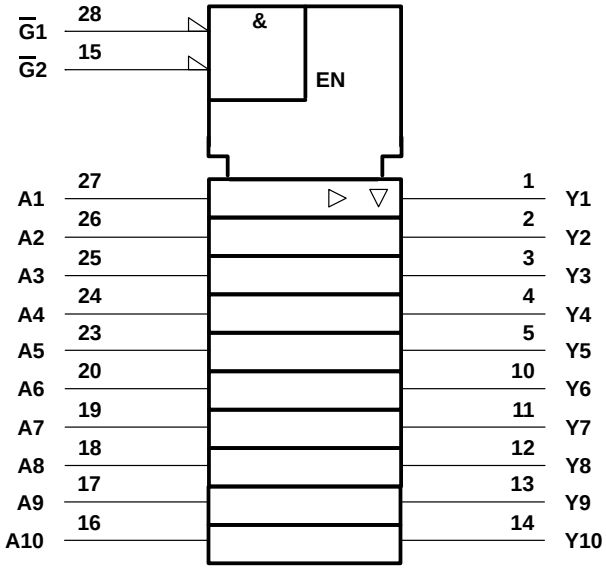
The 54ACT11827 is characterized for operation over the full military temperature range of – 55°C to 125°C. The 74ACT11827 is characterized for operation from – 40°C to 85°C.

**FUNCTION TABLE**

| INPUTS | | | OUTPUT |
|---|---|---|---|
| $\overline{G}1$ | $\overline{G}2$ | A | Y |
| L | L | H | H |
| L | L | L | L |
| X | H | X | Z |
| H | X | X | Z |

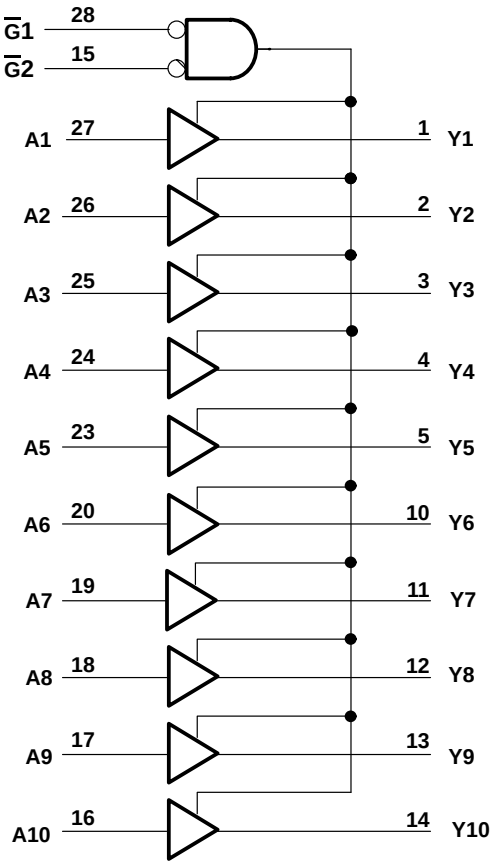
EPIC is a trademark of Texas Instruments Incorporated.

## logic symbol†




† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

## logic diagram (positive logic)




Pin numbers shown are for the DW, JT, and NT packages.

## absolute maximum ratings over operating free-air temperature range (unless otherwise noted)‡

Supply voltage range, $V_{CC}$ . . . . . −0.5 V to 7 V
Input voltage range, $V_I$ (see Note 1) . . . . . −0.5 V to $V_{CC}$ + 0.5 V
Output voltage range, $V_O$ (see Note 1) . . . . . −0.5 V to $V_{CC}$ + 0.5 V
Input clamp current, $I_{IK}$ ($V_I$ < 0 or $V_I$ > $V_{CC}$) . . . . . ± 20 mA
Output clamp current, $I_{OK}$ ($V_O$ < 0 or $V_O$ > $V_{CC}$) . . . . . ± 50 mA
Continuous output current, $I_O$ ($V_O$ = 0 to $V_{CC}$) . . . . . ± 50 mA
Continuous current through $V_{CC}$ or GND . . . . . ± 250 mA
Storage temperature range . . . . . −65°C to 150°C

‡ Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

## recommended operating conditions

| | | 54ACT11827 | | 74ACT11827 | | UNIT |
|---|---|---|---|---|---|---|
| | | MIN | MAX | MIN | MAX | |
| $V_{CC}$ | Supply voltage | 4.5 | 5.5 | 4.5 | 5.5 | V |
| $V_{IH}$ | High-level input voltage | 2 | | 2 | | V |
| $V_{IL}$ | Low-level input voltage | | 0.8 | | 0.8 | V |
| $V_I$ | Input voltage | 0 | $V_{CC}$ | 0 | $V_{CC}$ | V |
| $V_O$ | Output voltage | 0 | $V_{CC}$ | 0 | $V_{CC}$ | V |
| $I_{OH}$ | High-level output current | | –24 | | –24 | mA |
| $I_{OL}$ | Low-level output current | | 24 | | 24 | mA |
| $\Delta t/\Delta v$ | Input transition rise or fall rate | 0 | 10 | 0 | 10 | ns/V |
| $T_A$ | Operating free-air temperature | –55 | 125 | – 40 | 85 | °C |



## electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | $V_{CC}$ | $T_A$ = 25°C | | | 54ACT11827 | | 74ACT11827 | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| $V_{OH}$ | $I_{OH}$ = – 50 μA | 4.5 V | 4.4 | | | 4.4 | | 4.4 | | V |
| | | 5.5 V | 5.4 | | | 5.4 | | 5.4 | | |
| | $I_{OH}$ = – 24 mA | 4.5 V | 3.94 | | | 3.7 | | 3.8 | | |
| | | 5.5 V | 4.94 | | | 4.7 | | 4.8 | | |
| | $I_{OH}$ = – 50 mA† | 5.5 V | | | | 3.85 | | | | |
| | $I_{OH}$ = – 75 mA† | 5.5 V | | | | | | 3.85 | | |
| $V_{OL}$ | $I_{OL}$ = 50 μA | 4.5 V | | | 0.1 | | 0.1 | | 0.1 | V |
| | | 5.5 V | | | 0.1 | | 0.1 | | 0.1 | |
| | $I_{OL}$ = 24 mA | 4.5 V | | | 0.36 | | 0.5 | | 0.44 | |
| | | 5.5 V | | | 0.36 | | 0.5 | | 0.44 | |
| | $I_{OL}$ = 50 mA† | 5.5 V | | | | | 1.65 | | | |
| | $I_{OL}$ = 75 mA† | 5.5 V | | | | | | | 1.65 | |
| $I_{OZ}$ | $V_O = V_{CC}$ or GND | 5.5 V | | | ± 0.5 | | ± 10 | | ±5 | μA |
| $I_I$ | $V_I = V_{CC}$ or GND | 5.5 V | | | ± 0.1 | | ± 1 | | ±1 | μA |
| $I_{CC}$ | $V_I = V_{CC}$ or GND, $I_O$ = 0 | 5.5 V | | | 8 | | 160 | | 80 | μA |
| $\Delta I_{CC}$‡ | One input at 3.4 V, Other inputs at GND or $V_{CC}$ | 5.5 V | | | 0.9 | | 1 | | 1 | mA |
| $C_i$ | $V_I = V_{CC}$ or GND | 5 V | | 4 | | | | | | pF |
| $C_o$ | $V_O = V_{CC}$ or GND | 5 V | | 10 | | | | | | pF |

† Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.
‡ This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V to $V_{CC}$.

**switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)**

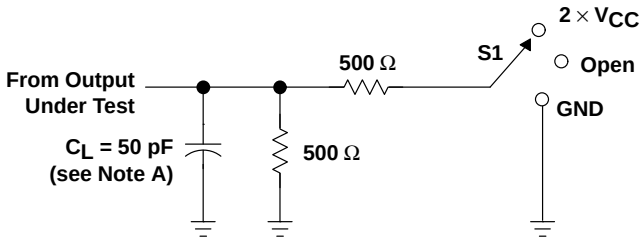
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $T_A$ = 25°C | | | 54ACT11827 | | 74ACT11827 | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| $t_{PLH}$ | A | Y | 3.8 | 6.3 | 8 | 3.8 | 9.9 | 3.8 | 9.2 | ns |
| $t_{PHL}$ | | | 2.7 | 6.9 | 9.5 | 2.7 | 11.9 | 2.7 | 11.2 | |
| $t_{PZH}$ | $\overline{G}$ | Y | 2.6 | 6.4 | 9.2 | 2.6 | 12.2 | 2.6 | 11.3 | ns |
| $t_{PZL}$ | | | 3.2 | 8 | 11.2 | 3.2 | 15.1 | 3.2 | 14 | |
| $t_{PHZ}$ | $\overline{G}$ | Y | 6.1 | 8.8 | 11.1 | 6.1 | 12.9 | 6.1 | 12 | ns |
| $t_{PLZ}$ | | | 5.8 | 8.3 | 10.6 | 5.8 | 12.4 | 5.8 | 11.6 | |



**operating characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C**

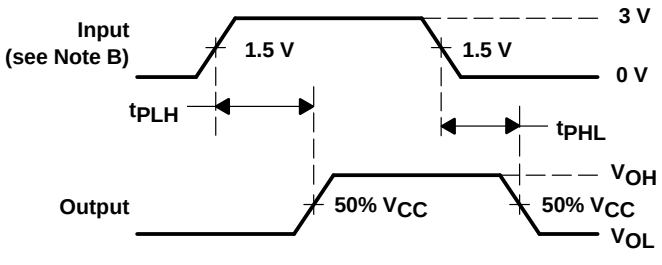
| PARAMETER | | | TEST CONDITIONS | TYP | UNIT |
|---|---|---|---|---|---|
| $C_{pd}$ | Power dissipation capacitance | Outputs enabled | $C_L$ = 50 pF, f = 1 MHz | 35 | pF |
| | | Outputs disabled | | 10 | |

## PARAMETER MEASUREMENT INFORMATION

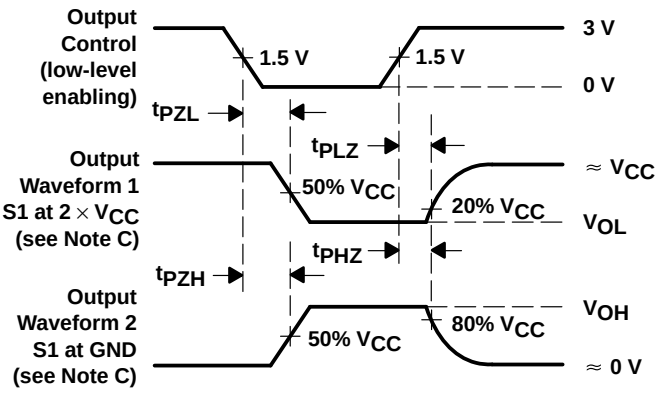



| TEST | S1 |
|---|---|
| $t_{PLH}/t_{PHL}$ | Open |
| $t_{PLZ}/t_{PZL}$ | 2 × $V_{CC}$ |
| $t_{PHZ}/t_{PZH}$ | GND |

LOAD CIRCUIT




VOLTAGE WAVEFORMS




VOLTAGE WAVEFORMS

NOTES: A. $C_L$ includes probe and jig capacitance.
B. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, $Z_O$ = 50 Ω, $t_r$ = 3 ns, $t_f$ = 3 ns.
C. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
D. The outputs are measured one at a time with one input transition per measurement.

**Figure 1. Load Circuit and Voltage Waveforms**

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