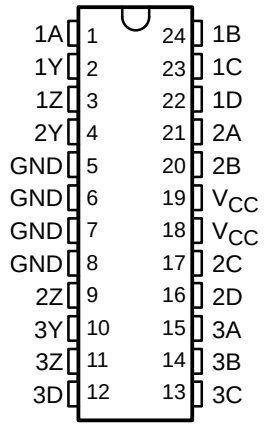
- **Inputs Are TTL-Voltage Compatible**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Center-Pin $V_{CC}$ and GND Configurations Minimize High-Speed Switching Noise**
- ***EPIC*™ (Enhanced-Performance Implanted CMOS) 1-μm Process**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **Package Options Include Plastic Small-Outline Packages and Standard Plastic 300-mil DIPs**

**DW OR NT PACKAGE**
**(TOP VIEW)**




## description

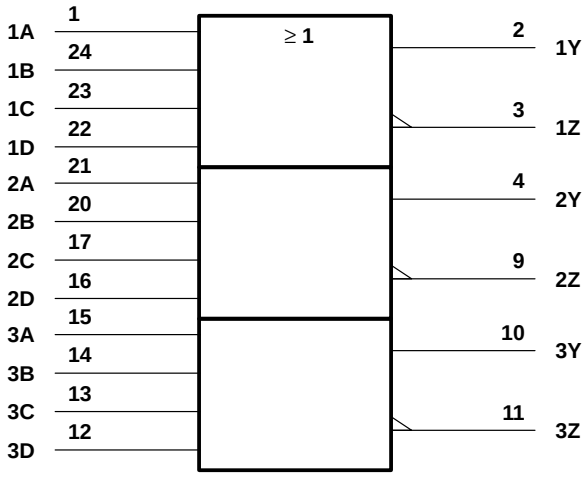
The 74ACT11802 contains three independent 4-input OR/NOR gates. They perform the Boolean functions in positive logic $Y = A + B + C + D$ and $Z = \overline{A + B + C + D}$.

The 74ACT11802 is characterized for operation from –40°C to 85°C.

**FUNCTION TABLE**
**(each 4-input gate)**

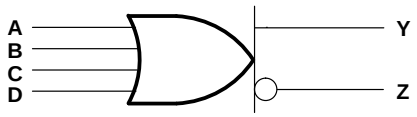
| INPUTS | | | | OUTPUTS | |
|---|---|---|---|---|---|
| A | B | C | D | Y | Z |
| H | X | X | X | H | L |
| X | H | X | X | H | L |
| X | X | H | X | H | L |
| X | X | X | H | H | L |
| L | L | L | L | L | H |

## logic symbol†




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

## logic diagram, each section (positive logic)

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## 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 . . . . . ±150 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 clamp-current ratings are observed.

## recommended operating conditions (see Note 2)

| | | MIN | NOM | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | 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 |
| $V_I$ | Input voltage | 0 | | $V_{CC}$ | V |
| $V_O$ | Output voltage | 0 | | $V_{CC}$ | V |
| $I_{OH}$ | High-level output current | | | –24 | mA |
| $I_{OL}$ | Low-level output current | | | 24 | mA |
| $\Delta t/\Delta v$ | Input transition rise or fall rate | 0 | | 10 | ns/V |
| $T_A$ | Operating free-air temperature | –40 | | 85 | °C |

NOTE 2: Unused or floating inputs must be held high or low.

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

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

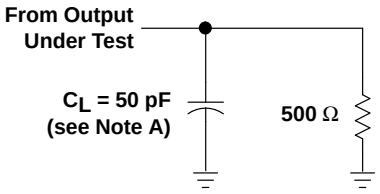
### switching characteristics over recommended operating free-air temperature range, $V_{CC}$ = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | | | |
| $t_{PLH}$ | A, B, C, or D | Y | 1.3 | 6.1 | 8.4 | 1.3 | 9.5 | ns |
| $t_{PHL}$ | | | 1.3 | 4.8 | 7.4 | 1.3 | 8.1 | |
| $t_{PLH}$ | A, B, C, or D | Z | 1.3 | 4.6 | 7.5 | 1.3 | 8.3 | ns |
| $t_{PHL}$ | | | 1 | 4.6 | 7.3 | 1 | 8.1 | |

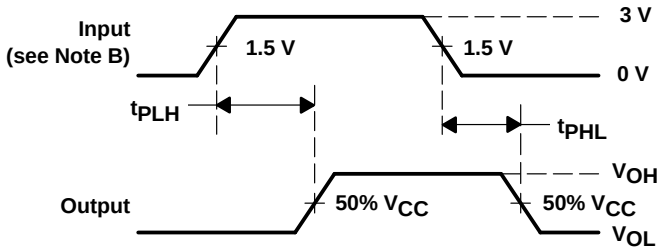
### operating characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C

| PARAMETER | | TEST CONDITIONS | TYP | UNIT |
|---|---|---|---|---|
| $C_{pd}$ | Power dissipation capacitance per gate | $C_L$ = 50 pF, f = 1 MHz | 59 | pF |

## PARAMETER MEASUREMENT INFORMATION




LOAD CIRCUIT




VOLTAGE WAVEFORMS

NOTES: A. $C_L$ includes probe and jig capacitance.
B. 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. 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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