Rochester Electronics

# Datasheet

## Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

## Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

- Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

D2915, JANUARY 1986—REVISED MAY 1986

- **Functionally Equivalent to AM29863 and AM29864**
- **Choice of True or Inverting Logic**
- **Power-Up High-Impedance State**
- **Package Options Include Plastic "Small Outline" Packages, Plastic Chip Carriers, and Standard Plastic DIPs**
- **Dependable Texas Instruments Quality and Reliability**

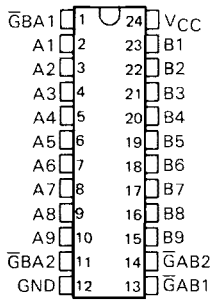
## description

These 9-bit bus transceivers are designed for asynchronous two-way communication between data buses. The control function implementation allows for maximum flexibility in timing.

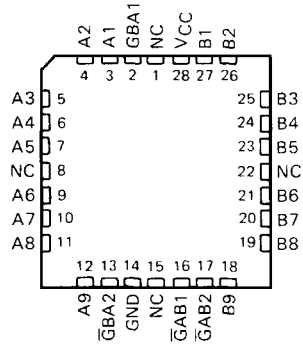
These devices allow data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic levels at the enable inputs ($\overline{G}$BA1, $\overline{G}$BA2, $\overline{G}$AB1, and $\overline{G}$AB2).

The SN74' family is characterized for operation from 0°C to 70°C.

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




**FN PACKAGE**
**(TOP VIEW)**



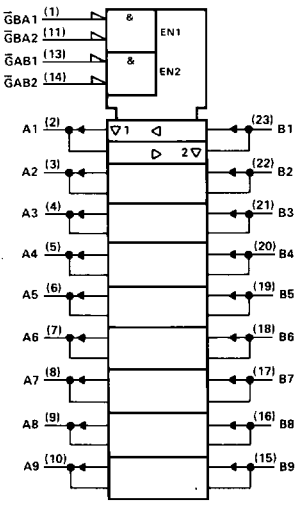

NC No internal connection

**FUNCTION TABLE**

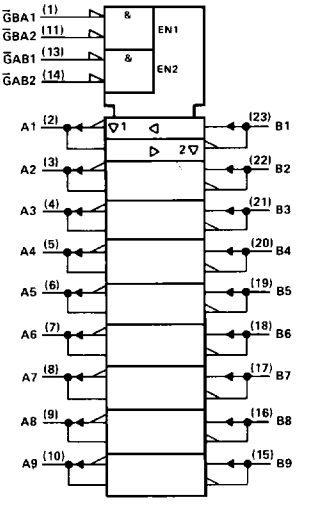
| ENABLE INPUTS | | | | OPERATION | |
|---|---|---|---|---|---|
| $\overline{G}$AB1 | $\overline{G}$AB2 | $\overline{G}$BA1 | $\overline{G}$BA2 | 'ALS29863 | 'ALS29864 |
| L | L | L | L | Latch A and B | Latch A and B |
| L | L | H | X | A to B | A to $\overline{B}$ |
| L | L | X | H | | |
| H | X | L | L | B to A | B to $\overline{A}$ |
| X | H | L | L | | |
| H | X | H | X | Isolation | Isolation |
| H | X | X | H | | |
| X | H | X | H | | |
| X | H | H | X | | |

## logic symbols†

'ALS29863



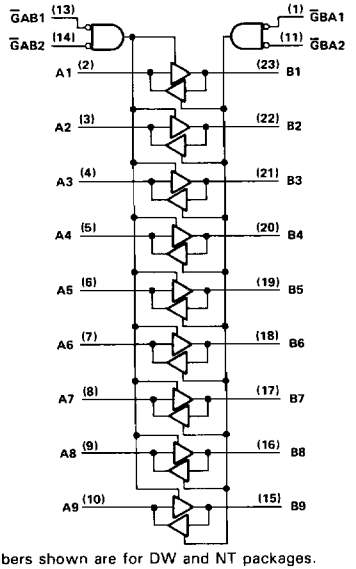

'ALS29864



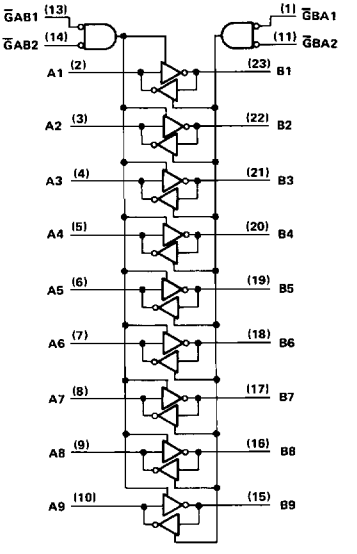

†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

## logic diagrams

'ALS29863




'ALS29864




Pin numbers shown are for DW and NT packages.



TEXAS INSTRUMENTS
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

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

Supply voltage, $V_{CC}$ . . . . . 7 V
Input voltage: All inputs and I/O ports . . . . . 5.5 V
Operating free-air temperature range . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

### recommended operating conditions

| | | MIN | NOM | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage | 4.75 | 5 | 5.25 | V |
| $V_{IH}$ | High-level input voltage | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | 0.8 | V |
| $I_{OH}$ | High-level output current | | | −24 | mA |
| $I_{OL}$ | Low-level output current | | | 48 | mA |
| $T_A$ | Operating free-air temperature | 0 | | 70 | °C |

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

| PARAMETER | | TEST CONDITIONS | MIN | TYP† | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{IK}$ | | $V_{CC}$ = 4.75 V, $I_I$ = −18 mA | | | −1.2 | V |
| $V_{OH}$ | | $V_{CC}$ = 4.75 V, $I_{OH}$ = −15 mA | 2.4 | | | V |
| | | $V_{CC}$ = 4.75 V, $I_{OH}$ = −24 mA | 2 | | | |
| $V_{OL}$ | | $V_{CC}$ = 4.75 V, $I_{OL}$ = 48 mA | | 0.35 | 0.5 | V |
| $I_I$ | | $V_{CC}$ = 5.25 V, $V_I$ = 5.5 V | | | 0.1 | mA |
| $I_{IH}$ | Control inputs | $V_{CC}$ = 5.25 V, $V_I$ = 2.7 V | | | 20 | μA |
| | A or B ports‡ | | | | 20 | |
| $I_{IL}$ | Control inputs | $V_{CC}$ = 5.25 V, $V_I$ = 0.4 V | | | −0.1 | mA |
| | A or B ports‡ | | | | −0.1 | |
| $I_{OS}$§ | | $V_{CC}$ = 5.25 V, $V_O$ = 0 V | −75 | | −250 | mA |
| $I_{CC}$ | 'ALS29863 | $V_{CC}$ = 5.25 V | | 40 | 65 | mA |
| | 'ALS29864 | | | 40 | 65 | |

† All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
‡ For I/O ports, the parameters $I_{IH}$ and $I_{IL}$ include the off-state output current.
§ Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.

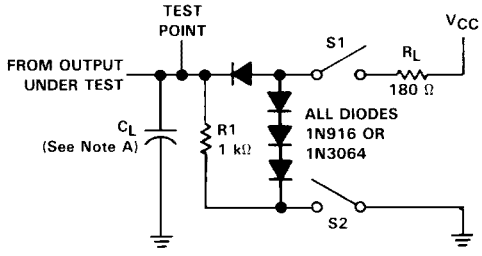
### SN74ALS29863 switching characteristics

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS See Figure 1 | $V_{CC}$ = 5 V, $T_A$ = 25°C | | | $V_{CC}$ = 4.75 V to 5.25 V, $T_A$ = 0°C to 70°C | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | MAX | |
| $t_{PLH}$ | A or B | B or A | $C_L$ = 300 pF | | 7.5 | 11 | | 15 | ns |
| $t_{PHL}$ | | | | | 11 | 16 | | 18 | |
| $t_{PLH}$ | | | $C_L$ = 50 pF | | 3.5 | 6 | | 8 | |
| $t_{PHL}$ | | | | | 6.5 | 8 | | 10 | |
| $t_{PZH}$ | $\overline{G}AB$ or $\overline{G}BA$ | A or B | $C_L$ = 300 pF | | 13 | 17 | | 20 | ns |
| $t_{PZL}$ | | | | | 16 | 21 | | 23 | |
| $t_{PZH}$ | | | $C_L$ = 50 pF | | 6.5 | 12 | | 15 | |
| $t_{PZL}$ | | | | | 9.5 | 12 | | 15 | |
| $t_{PHZ}$ | $\overline{G}AB$ or $\overline{G}BA$ | A or B | $C_L$ = 50 pF | | 10 | 16 | | 17 | ns |
| $t_{PLZ}$ | | | | | 4 | 9 | | 12 | |
| $t_{PHZ}$ | | | $C_L$ = 5 pF | | 4.5 | 8 | | 9 | |
| $t_{PLZ}$ | | | | | 4.5 | 8 | | 9 | |

### SN74ALS29864 switching characteristics

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS See Figure 1 | $V_{CC}$ = 5 V, $T_A$ = 25°C | | | $V_{CC}$ = 4.75 V to 5.25 V, $T_A$ = 0°C to 70°C | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | MIN | MAX | |
| $t_{PLH}$ | A or B | B or A | $C_L$ = 300 pF | | 8 | 11 | | 14 | ns |
| $t_{PHL}$ | | | | | 10 | 12.9 | | 14 | |
| $t_{PLH}$ | | | $C_L$ = 50 pF | | 5 | 7 | | 8 | |
| $t_{PHL}$ | | | | | 3 | 5.9 | | 7.5 | |
| $t_{PZH}$ | $\overline{G}AB$ or $\overline{G}BA$ | A or B | $C_L$ = 300 pF | | 11 | 17 | | 20 | ns |
| $t_{PZL}$ | | | | | 19 | 23 | | 24 | |
| $t_{PZH}$ | | | $C_L$ = 50 pF | | 6.5 | 12 | | 15 | |
| $t_{PZL}$ | | | | | 9.5 | 12 | | 15 | |
| $t_{PHZ}$ | $\overline{G}AB$ or $\overline{G}BA$ | A or B | $C_L$ = 50 pF | | 10 | 16 | | 17 | ns |
| $t_{PLZ}$ | | | | | 4 | 9 | | 12 | |
| $t_{PHZ}$ | | | $C_L$ = 5 pF | | 6 | 8 | | 9 | |
| $t_{PLZ}$ | | | | | 3.5 | 8 | | 9 | |

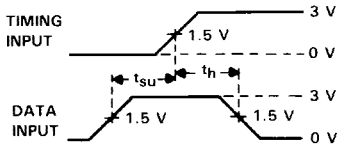
## PARAMETER MEASUREMENT INFORMATION



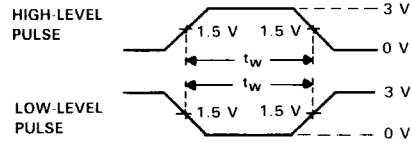

LOAD CIRCUIT

SWITCH POSITION TABLE

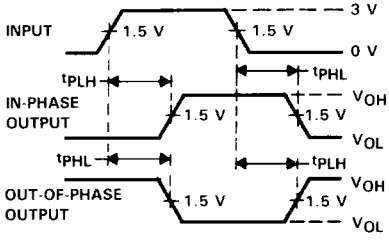
| TEST | S1 | S2 |
|---|---|---|
| $t_{PLH}$ | Closed | Closed |
| $t_{PHL}$ | Closed | Closed |
| $t_{PZH}$ | Open | Closed |
| $t_{PZL}$ | Closed | Open |
| $t_{PHZ}$ | Closed | Closed |
| $t_{PLZ}$ | Closed | Closed |



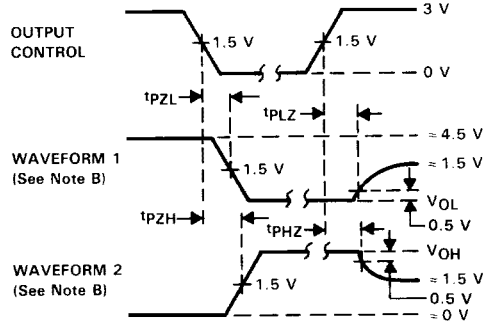

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES




VOLTAGE WAVEFORMS
PULSE DURATIONS




VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES




VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES, THREE-STATE OUTPUTS

NOTES: A. $C_L$ includes probe and jig capacitance.
B. 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.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, $Z_O$ = 50 Ω, $t_r$ ≤ 2.5 ns, $t_f$ ≤ 2.5 ns.

FIGURE 1