

# DATA SHEET

## **74F260** Dual 5-input NOR gate

Product specification

1988 Nov 29

IC15 Data Handbook

# Dual 5-input NOR gate

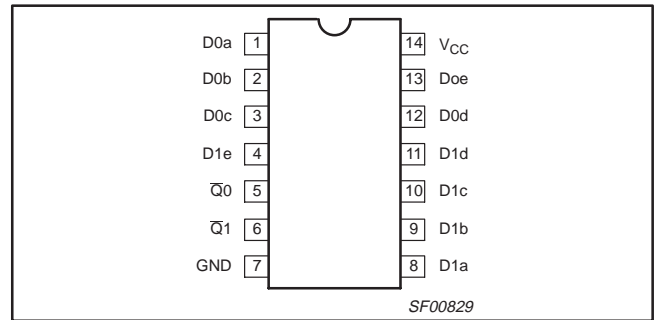
# 74F260

| TYPE   | TYPICAL PROPAGATION DELAY | TYPICAL SUPPLY CURRENT (TOTAL) |
|--------|---------------------------|--------------------------------|
| 74F260 | 3.5ns                     | 6mA                            |

### ORDERING INFORMATION

| DESCRIPTION        | COMMERCIAL RANGE<br>$V_{CC} = 5V \pm 10\%$ ,<br>$T_{amb} = 0^{\circ}C$ to $+70^{\circ}C$ | PKG DWG # |
|--------------------|--|-----------|
| 14-pin plastic DIP | N74F260N   | SOT27-1   |
| 14-pin plastic SO  | N74F260D   | SOT108-1  |

### PIN CONFIGURATION

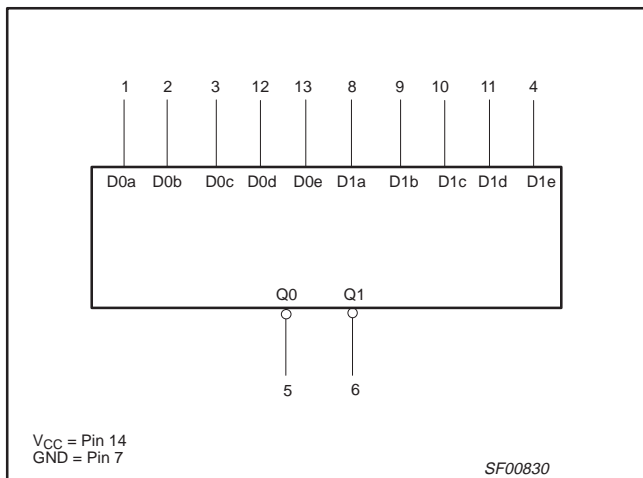


### INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

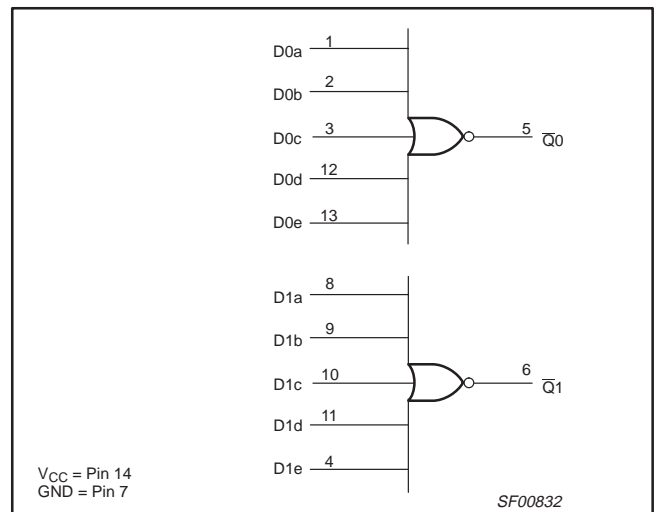
| PINS                    | DESCRIPTION  | 74F (U.L.) HIGH/LOW | LOAD VALUE HIGH/LOW |
|-------------------------|--------------|---------------------|---------------------|
| Dna, Dnb, Dnc, Dnd, Dne | Data inputs  | 1.0/1.0             | 20µA/0.6mA          |
| $\bar{Q}0, \bar{Q}1$    | Data outputs | 50/33               | 1.0mA/20mA          |

NOTE: One (1.0) FAST unit load is defined as: 20µA in the High state and 0.6mA in the Low state.

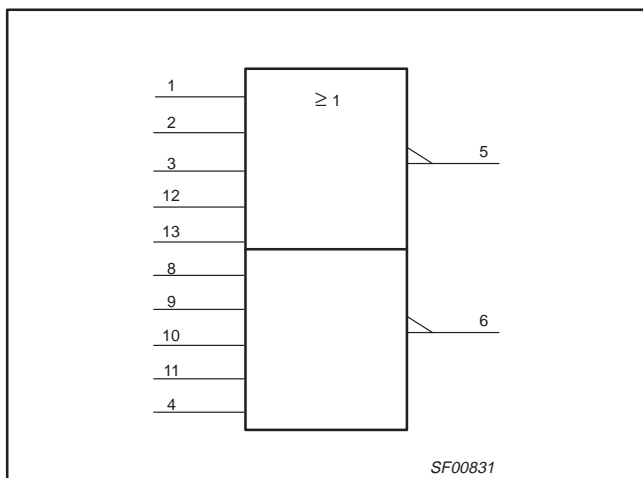
### LOGIC SYMBOL



### LOGIC DIAGRAM



### IEC/IEEE SYMBOL



### FUNCTION TABLE

| INPUTS |     |     |     |     | OUTPUT     |
|--------|-----|-----|-----|-----|------------|
| Dna    | Dnb | Dnc | Dnd | Dne | $\bar{Q}n$ |
| H      | X   | X   | X   | X   | L          |
| X      | H   | X   | X   | X   | L          |
| X      | X   | H   | X   | X   | L          |
| X      | X   | X   | H   | X   | L          |
| X      | X   | X   | X   | H   | L          |
| L      | L   | L   | L   | L   | H          |

H = High voltage level  
L = Low voltage level  
X = Don't care

## Dual 5-input NOR gate

74F260

**ABSOLUTE MAXIMUM RATINGS**

(Operation beyond the limits set forth in this table may impair the useful life of the device.  
Unless otherwise noted these limits are over the operating free-air temperature range.)

| SYMBOL           | PARAMETER                                      | RATING                  | UNIT |
|------------------|--|-------------------------|------|
| V <sub>CC</sub>  | Supply voltage                                 | -0.5 to +7.0            | V    |
| V <sub>IN</sub>  | Input voltage                                  | -0.5 to +7.0            | V    |
| I <sub>IN</sub>  | Input current                                  | -30 to +5               | mA   |
| V <sub>OUT</sub> | Voltage applied to output in High output state | -0.5 to V <sub>CC</sub> | V    |
| I <sub>OUT</sub> | Current applied to output in Low output state  | 40                      | mA   |
| T <sub>amb</sub> | Operating free-air temperature range           | 0 to +70                | °C   |
| T <sub>stg</sub> | Storage temperature range                      | -65 to +150             | °C   |

**RECOMMENDED OPERATING CONDITIONS**

| SYMBOL           | PARAMETER                            | LIMITS |     |     | UNIT |
|------------------|--------------------------------------|--------|-----|-----|------|
|                  |                                      | MIN    | NOM | MAX |      |
| V <sub>CC</sub>  | Supply voltage                       | 4.5    | 5.0 | 5.5 | V    |
| V <sub>IH</sub>  | High-level input voltage             | 2.0    |     |     | V    |
| V <sub>IL</sub>  | Low-level input voltage              |        |     | 0.8 | V    |
| I <sub>IK</sub>  | Input clamp current                  |        |     | -18 | mA   |
| I <sub>OH</sub>  | High-level output current            |        |     | -1  | mA   |
| I <sub>OL</sub>  | Low-level output current             |        |     | 20  | mA   |
| T <sub>amb</sub> | Operating free-air temperature range | 0      |     | +70 | °C   |

**DC ELECTRICAL CHARACTERISTICS**

(Over recommended operating free-air temperature range unless otherwise noted.)

| SYMBOL          | PARAMETER                                      | TEST CONDITIONS <sup>NO TAG</sup>                       | LIMITS               |                       |       | UNIT |     |
|-----------------|--|---|----------------------|-----------------------|-------|------|-----|
|                 |  |   | MIN                  | TYP<br>NO TAG         | MAX   |      |     |
| V <sub>OH</sub> | High-level output voltage                      | V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX            | ±10%V <sub>CC</sub>  | 2.5                   |       | V    |     |
|                 |  | V <sub>IH</sub> = MIN, I <sub>OH</sub> = MAX            | ±5%V <sub>CC</sub>   | 2.7                   | 3.4   |      |     |
| V <sub>OL</sub> | Low-level output voltage                       | V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX            | ±10%V <sub>CC</sub>  |                       | 0.30  | V    |     |
|                 |  | V <sub>IH</sub> = MIN, I <sub>OL</sub> = MAX            | ±5%V <sub>CC</sub>   |                       | 0.30  |      |     |
| V <sub>IK</sub> | Input clamp voltage                            | V <sub>CC</sub> = MIN, I <sub>I</sub> = I <sub>IK</sub> |                      |                       | -0.73 | V    |     |
| I <sub>I</sub>  | Input current at maximum input voltage         | V <sub>CC</sub> = MAX, V <sub>I</sub> = 7.0V            |                      |                       | 100   | μA   |     |
| I <sub>IH</sub> | High-level input current                       | V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7V            |                      |                       | 20    | μA   |     |
| I <sub>IL</sub> | Low-level input current                        | V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.5V            |                      |                       | -0.6  | mA   |     |
| I <sub>OS</sub> | Short-circuit output current <sup>NO TAG</sup> | V <sub>CC</sub> = MAX                                   |                      | -60                   | -150  | mA   |     |
| I <sub>CC</sub> | Supply current (total)                         | V <sub>CC</sub> = MAX                                   | V <sub>IN</sub> =GND |                       | 4.6   | 6.5  | mA  |
|                 |  |   |                      | V <sub>IN</sub> =4.5V |       | 7.3  | 9.5 |

**NOTES:**

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at V<sub>CC</sub> = 5V, T<sub>amb</sub> = 25°C.
- Not more than one output should be shorted at a time. For testing I<sub>OS</sub>, the use of high-speed test apparatus and/or sample-and-hold techniques are preferable in order to minimize internal heating and more accurately reflect operational values. Otherwise, prolonged shorting of a High output may raise the chip temperature well above normal and thereby cause invalid readings in other parameter tests. In any sequence of parameter tests, I<sub>OS</sub> tests should be performed last.

# Dual 5-input NOR gate

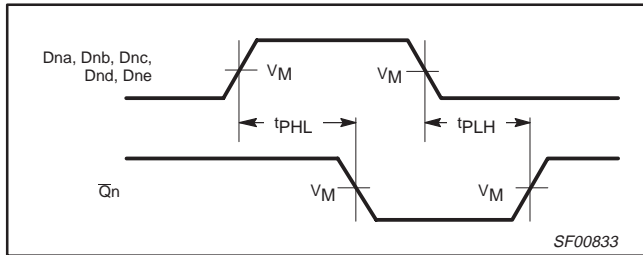
74F260

## AC ELECTRICAL CHARACTERISTICS

| SYMBOL                 | PARAMETER   | TEST CONDITION     | LIMITS   |            |            |  |            | UNIT |
|------------------------|---|--------------------|--|------------|------------|--|------------|------|
|                        |   |                    | $V_{CC} = +5.V$<br>$T_{amb} = +25^{\circ}C$<br>$C_L = 50pF, R_L = 500\Omega$ |            |            | $V_{CC} = +5.V \pm 10\%$<br>$T_{amb} = 0^{\circ}C \text{ to } +70^{\circ}C$<br>$C_L = 50pF, R_L = 500\Omega$ |            |      |
|                        |   |                    | MIN  | TYP        | MAX        | MIN  | MAX        |      |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation delay<br>Dna, Dnb, Dnc, Dnd, Dne to $\bar{Q}_n$ | Waveform<br>NO TAG | 2.5<br>1.5   | 4.0<br>2.5 | 5.5<br>4.0 | 2.0<br>1.0   | 6.5<br>4.5 | ns   |

## AC WAVEFORM

For all waveforms,  $V_M = 1.5V$ .



Waveform 1. For Inverting Outputs

## TEST CIRCUIT AND WAVEFORMS

**Test Circuit for Totem-Pole Outputs**

**DEFINITIONS:**

- $R_L$  = Load resistor; see AC ELECTRICAL CHARACTERISTICS for value.
- $C_L$  = Load capacitance includes jig and probe capacitance; see AC ELECTRICAL CHARACTERISTICS for value.
- $R_T$  = Termination resistance should be equal to  $Z_{OUT}$  of pulse generators.

**Input Pulse Definition**

| family | INPUT PULSE REQUIREMENTS |       |           |       |           |           |
|--------|--------------------------|-------|-----------|-------|-----------|-----------|
|        | amplitude                | $V_M$ | rep. rate | $t_w$ | $t_{TLH}$ | $t_{THL}$ |
| 74F    | 3.0V                     | 1.5V  | 1MHz      | 500ns | 2.5ns     | 2.5ns     |

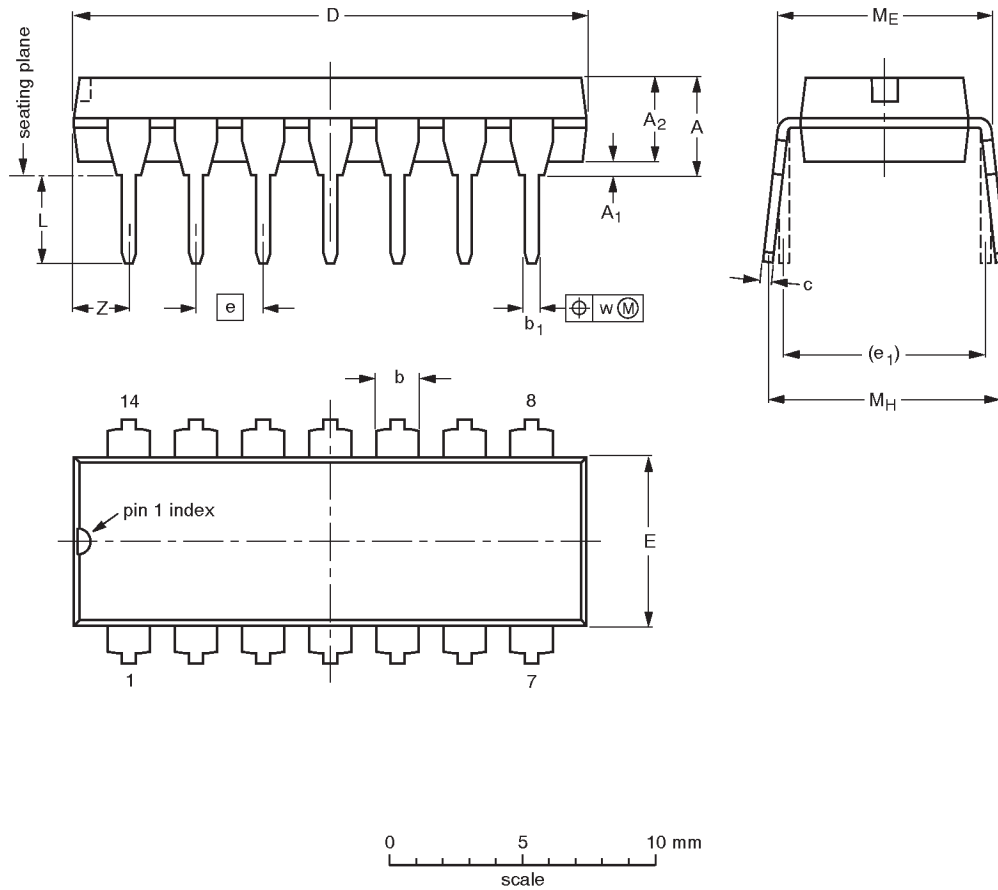
SF00006

# Dual 5-input NOR gate

74F260

DIP14: plastic dual in-line package; 14 leads (300 mil)

SOT27-1



**DIMENSIONS (inch dimensions are derived from the original mm dimensions)**

| UNIT   | A max. | A <sub>1</sub> min. | A <sub>2</sub> max. | b              | b <sub>1</sub> | c              | D <sup>(1)</sup> | E <sup>(1)</sup> | e    | e <sub>1</sub> | L            | M <sub>E</sub> | M <sub>H</sub> | w     | Z <sup>(1)</sup> max. |
|--------|--------|---------------------|---------------------|----------------|----------------|----------------|------------------|------------------|------|----------------|--------------|----------------|----------------|-------|-----------------------|
| mm     | 4.2    | 0.51                | 3.2                 | 1.73<br>1.13   | 0.53<br>0.38   | 0.36<br>0.23   | 19.50<br>18.55   | 6.48<br>6.20     | 2.54 | 7.62           | 3.60<br>3.05 | 8.25<br>7.80   | 10.0<br>8.3    | 0.254 | 2.2                   |
| inches | 0.17   | 0.020               | 0.13                | 0.068<br>0.044 | 0.021<br>0.015 | 0.014<br>0.009 | 0.77<br>0.73     | 0.26<br>0.24     | 0.10 | 0.30           | 0.14<br>0.12 | 0.32<br>0.31   | 0.39<br>0.33   | 0.01  | 0.087                 |

**Note**

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES |          |      | EUROPEAN PROJECTION | ISSUE DATE           |
|-----------------|------------|----------|------|---------------------|----------------------|
|                 | IEC        | JEDEC    | EIAJ |                     |                      |
| SOT27-1         | 050G04     | MO-001AA |      |                     | 92-11-17<br>95-03-11 |

# Dual 5-input NOR gate

# 74F260

**SO14: plastic small outline package; 14 leads; body width 3.9 mm**

**SOT108-1**



**DIMENSIONS (inch dimensions are derived from the original mm dimensions)**

| UNIT   | A max. | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | b <sub>p</sub> | c                | D <sup>(1)</sup> | E <sup>(1)</sup> | e     | H <sub>E</sub> | L     | L <sub>p</sub> | Q              | v    | w    | y     | Z <sup>(1)</sup> | θ        |
|--------|--------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|-------|----------------|-------|----------------|----------------|------|------|-------|------------------|----------|
| mm     | 1.75   | 0.25<br>0.10   | 1.45<br>1.25   | 0.25           | 0.49<br>0.36   | 0.25<br>0.19     | 8.75<br>8.55     | 4.0<br>3.8       | 1.27  | 6.2<br>5.8     | 1.05  | 1.0<br>0.4     | 0.7<br>0.6     | 0.25 | 0.25 | 0.1   | 0.7<br>0.3       | 8°<br>0° |
| inches | 0.069  | 0.010<br>0.004 | 0.057<br>0.049 | 0.01           | 0.019<br>0.014 | 0.0100<br>0.0075 | 0.35<br>0.34     | 0.16<br>0.15     | 0.050 | 0.244<br>0.228 | 0.041 | 0.039<br>0.016 | 0.028<br>0.024 | 0.01 | 0.01 | 0.004 | 0.028<br>0.012   |          |

**Note**

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES |          |      |  | EUROPEAN PROJECTION | ISSUE DATE           |
|-----------------|------------|----------|------|--|---------------------|----------------------|
|                 | IEC        | JEDEC    | EIAJ |  |                     |                      |
| SOT108-1        | 076E06S    | MS-012AB |      |  |                     | 95-01-29<br>97-05-22 |

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Dual 5-input NOR gate

74F260

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**NOTES**

## Dual 5-input NOR gate

74F260

## Data sheet status

| Data sheet status         | Product status | Definition [1]   |
|---------------------------|----------------|--|
| Objective specification   | Development    | This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.  |
| Preliminary specification | Qualification  | This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product. |
| Product specification     | Production     | This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.   |

[1] Please consult the most recently issued datasheet before initiating or completing a design.

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