

# DATA SHEET

For a complete data sheet, please also download:

- The IC04 LOCMOS HE4000B Logic Family Specifications HEF, HEC
- The IC04 LOCMOS HE4000B Logic Package Outlines/Information HEF, HEC

## **HEF4002B** **gates** Dual 4-input NOR gate

Product specification  
File under Integrated Circuits, IC04

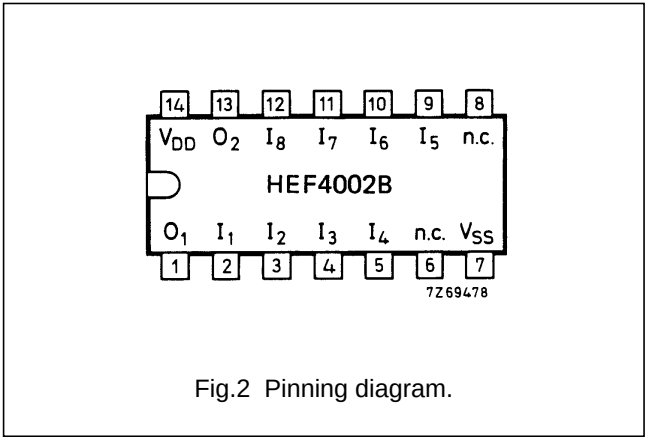
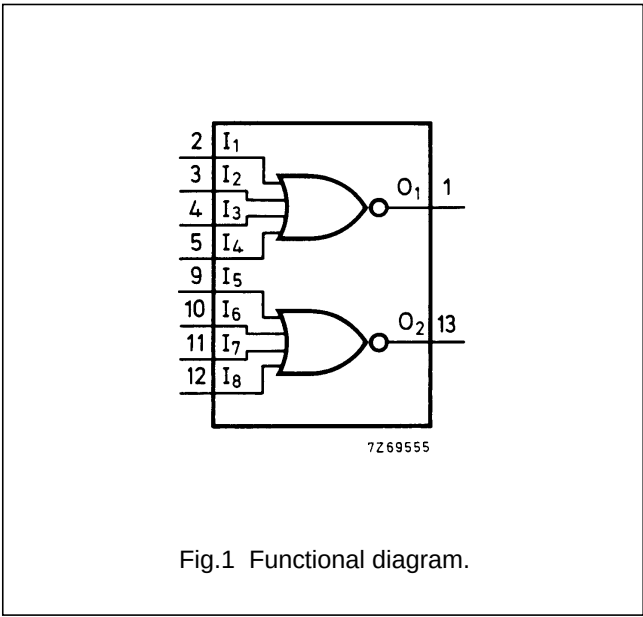
January 1995

Dual 4-input NOR gate

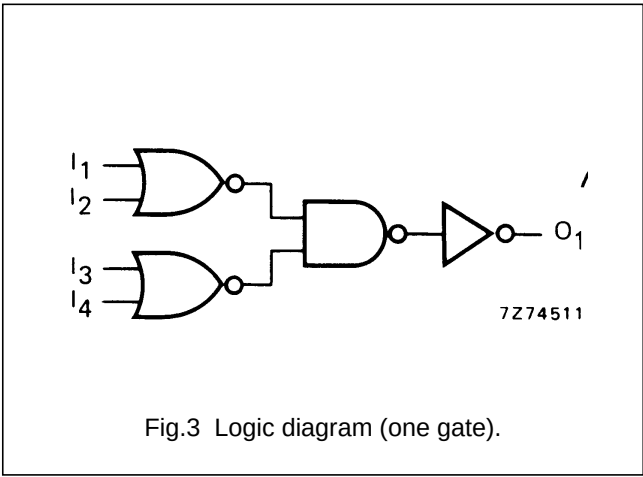
HEF4002B  
gates

DESCRIPTION

The HEF4002B provides the positive dual 4-input NOR function. The outputs are fully buffered for highest noise immunity and pattern insensitivity of output impedance.



- HEF4002BP(N): 14-lead DIL; plastic (SOT27-1)
- HEF4002BD(F): 14-lead DIL; ceramic (cerdip) (SOT73)
- HEF4002BT(D): 14-lead SO; plastic (SOT108-1)
- ( ): Package Designator North America



FAMILY DATA, I<sub>DD</sub> LIMITS category GATES

See Family Specifications

## Dual 4-input NOR gate

HEF4002B  
gates

## AC CHARACTERISTICS

$V_{SS} = 0 \text{ V}$ ;  $T_{amb} = 25 \text{ }^{\circ}\text{C}$ ;  $C_L = 50 \text{ pF}$ ; input transition times  $\leq 20 \text{ ns}$

|                                                       | V <sub>DD</sub><br>V | SYMBOL                              | TYP. | MAX. |    | TYPICAL EXTRAPOLATION<br>FORMULA    |
|-------------------------------------------------------|----------------------|-------------------------------------|------|------|----|-------------------------------------|
| Propagation delays<br>I <sub>n</sub> → O <sub>n</sub> | 5                    | t <sub>PHL</sub> ; t <sub>PLH</sub> | 60   | 120  | ns | 33 ns + (0,55 ns/pF) C <sub>L</sub> |
|                                                       | 10                   |                                     | 25   | 50   | ns | 14 ns + (0,23 ns/pF) C <sub>L</sub> |
|                                                       | 15                   |                                     | 20   | 40   | ns | 12 ns + (0,16 ns/pF) C <sub>L</sub> |
| Output transition times<br>HIGH to LOW                | 5                    | t <sub>THL</sub>                    | 60   | 120  | ns | 10 ns + (1,0 ns/pF) C <sub>L</sub>  |
|                                                       | 10                   |                                     | 30   | 60   | ns | 9 ns + (0,42 ns/pF) C <sub>L</sub>  |
|                                                       | 15                   |                                     | 20   | 40   | ns | 6 ns + (0,28 ns/pF) C <sub>L</sub>  |
| LOW to HIGH                                           | 5                    | t <sub>TLH</sub>                    | 60   | 120  | ns | 10 ns + (1,0 ns/pF) C <sub>L</sub>  |
|                                                       | 10                   |                                     | 30   | 60   | ns | 9 ns + (0,42 ns/pF) C <sub>L</sub>  |
|                                                       | 15                   |                                     | 20   | 40   | ns | 6 ns + (0,28 ns/pF) C <sub>L</sub>  |

|                                                 | $V_{DD}$<br>V | TYPICAL FORMULA FOR P ( $\mu\text{W}$ )        |                                                                                                                                                                         |
|-------------------------------------------------|---------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dynamic power<br>dissipation per<br>package (P) | 5             | $1050 f_i + \sum (f_o C_L) \times V_{DD}^2$    | where<br>$f_i$ = input freq. (MHz)<br>$f_o$ = output freq. (MHz)<br>$C_L$ = load capacitance (pF)<br>$\sum (f_o C_L)$ = sum of outputs<br>$V_{DD}$ = supply voltage (V) |
|                                                 | 10            | $4300 f_i + \sum (f_o C_L) \times V_{DD}^2$    |                                                                                                                                                                         |
|                                                 | 15            | $11\,700 f_i + \sum (f_o C_L) \times V_{DD}^2$ |                                                                                                                                                                         |