

# 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

## **HEF4555B**

## **MSI**

## **Dual 1-of-4 decoder/demultiplexer**

Product specification  
File under Integrated Circuits, IC04

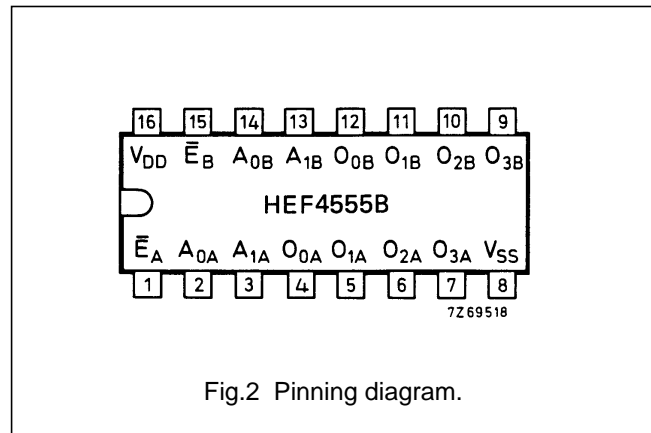
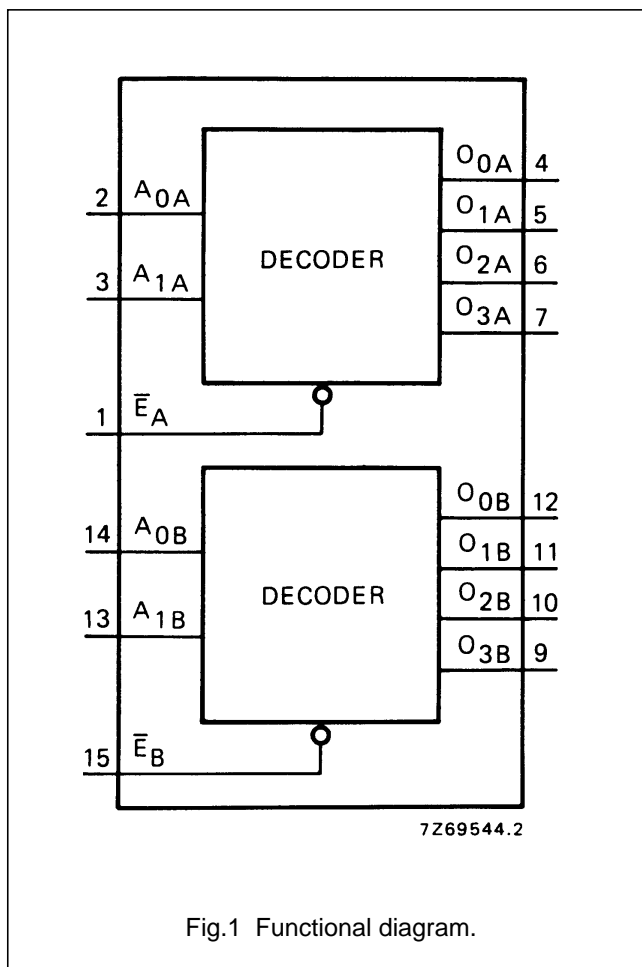
January 1995

# Dual 1-of-4 decoder/demultiplexer

**HEF4555B**  
**MSI**

**DESCRIPTION**

The HEF4555B is a dual 1-of-4 decoder/demultiplexer. Each has two address inputs ( $A_0$  and  $A_1$ ), an active LOW enable input ( $\bar{E}$ ) and four mutually exclusive outputs which are active HIGH ( $O_0$  to  $O_3$ ). When used as a decoder,  $\bar{E}$  when HIGH, forces  $O_0$  to  $O_3$  LOW. When used as a demultiplexer, the appropriate output is selected by the information on  $A_0$  and  $A_1$  with  $\bar{E}$  as data input. All unselected outputs are LOW.



- HEF4555BP(N): 16-lead DIL; plastic (SOT38-1)
- HEF4555BD(F): 16-lead DIL; ceramic (cerdip) (SOT74)
- HEF4555BT(D): 16-lead SO; plastic (SOT109-1)
- ( ): Package Designator North America

**PINNING**

- $\bar{E}$  enable inputs (active LOW)
- $A_0$  and  $A_1$  address inputs
- $O_0$  to  $O_3$  outputs (active HIGH)

**FAMILY DATA,  $I_{DD}$  LIMITS category MSI**

See Family Specifications

Dual 1-of-4 decoder/demultiplexer

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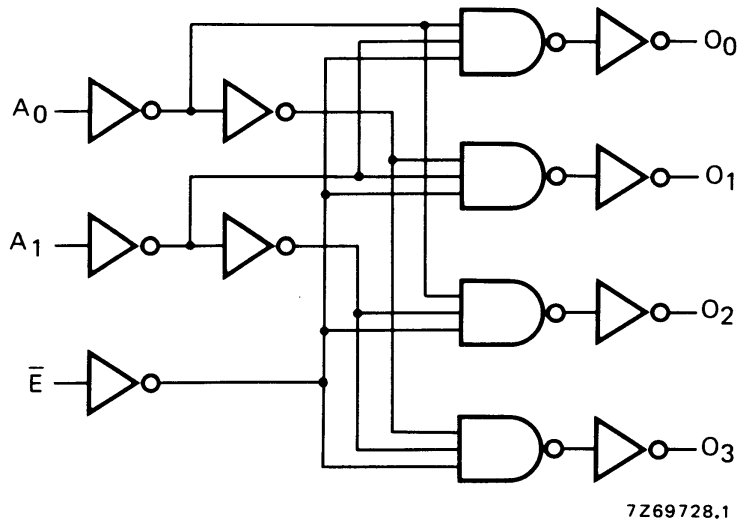


Fig.3 Logic diagram (one decoder/multiplexer).

TRUTH TABLE

| INPUTS    |       |       | OUTPUTS |       |       |       |
|-----------|-------|-------|---------|-------|-------|-------|
| $\bar{E}$ | $A_0$ | $A_1$ | $O_0$   | $O_1$ | $O_2$ | $O_3$ |
| L         | L     | L     | H       | L     | L     | L     |
| L         | H     | L     | L       | H     | L     | L     |
| L         | L     | H     | L       | L     | H     | L     |
| L         | H     | H     | L       | L     | L     | H     |
| H         | X     | X     | L       | L     | L     | L     |

Notes

1. H = HIGH state (the more positive voltage)
2. L = LOW state (the less positive voltage)
3. X = state is immaterial

## Dual 1-of-4 decoder/demultiplexer

HEF4555B  
MSI**AC CHARACTERISTICS** $V_{SS} = 0\text{ V}$ ;  $T_{amb} = 25\text{ °C}$ ;  $C_L = 50\text{ pF}$ ; input transition times  $\leq 20\text{ ns}$ 

|                         | $V_{DD}$<br>V               | SYMBOL    | MIN.      | TYP.        | MAX.        | TYPICAL EXTRAPOLATION<br>FORMULA |                             |                             |                            |
|-------------------------|-----------------------------|-----------|-----------|-------------|-------------|----------------------------------|-----------------------------|-----------------------------|----------------------------|
| Propagation delays      | 5                           | $t_{PHL}$ |           | 115         | 230         | ns                               | 88 ns + (0,55 ns/pF) $C_L$  |                             |                            |
|                         |                             |           |           | HIGH to LOW | 45          | 90                               | ns                          | 34 ns + (0,23 ns/pF) $C_L$  |                            |
|                         |                             |           |           |             | 30          | 65                               | ns                          | 22 ns + (0,16 ns/pF) $C_L$  |                            |
|                         | 5                           | $t_{PLH}$ |           | 140         | 280         | ns                               | 113 ns + (0,55 ns/pF) $C_L$ |                             |                            |
|                         |                             |           |           | LOW to HIGH | 55          | 105                              | ns                          | 44 ns + (0,23 ns/pF) $C_L$  |                            |
|                         |                             |           |           |             | 40          | 75                               | ns                          | 32 ns + (0,16 ns/pF) $C_L$  |                            |
|                         | $\bar{E}_n \rightarrow O_n$ | 5         | $t_{PHL}$ |             | 125         | 250                              | ns                          | 98 ns + (0,55 ns/pF) $C_L$  |                            |
|                         |                             |           |           |             | HIGH to LOW | 50                               | 95                          | ns                          | 39 ns + (0,23 ns/pF) $C_L$ |
|                         |                             |           |           |             |             | 30                               | 65                          | ns                          | 22 ns + (0,16 ns/pF) $C_L$ |
|                         |                             | 5         | $t_{PLH}$ |             | 150         | 295                              | ns                          | 123 ns + (0,55 ns/pF) $C_L$ |                            |
|                         |                             |           |           |             | LOW to HIGH | 55                               | 110                         | ns                          | 44 ns + (0,23 ns/pF) $C_L$ |
|                         |                             |           |           |             |             | 40                               | 75                          | ns                          | 32 ns + (0,16 ns/pF) $C_L$ |
| Output transition times | 5                           | $t_{THL}$ |           | 60          | 120         | ns                               | 10 ns + ((1,0 ns/pF) $C_L$  |                             |                            |
|                         |                             |           |           | HIGH to LOW | 30          | 60                               | ns                          | 9 ns + (0,42 ns/pF) $C_L$   |                            |
|                         |                             |           |           |             | 20          | 40                               | ns                          | 6 ns + (0,28 ns/pF) $C_L$   |                            |
|                         | 5                           | $t_{TLH}$ |           | 60          | 120         | ns                               | 10 ns + (1,0 ns/pF) $C_L$   |                             |                            |
|                         |                             |           |           | LOW to HIGH | 30          | 60                               | ns                          | 9 ns + (0,42 ns/pF) $C_L$   |                            |
|                         |                             |           |           |             | 20          | 40                               | ns                          | 6 ns + (0,28 ns/pF) $C_L$   |                            |

|   | $V_{DD}$<br>V | TYPICAL FORMULA FOR P ( $\mu\text{W}$ )        |   |
|---|---------------|--|---|
| Dynamic power<br>dissipation per<br>package (P) | 5             | $4500 f_i + \sum (f_o C_L) \times V_{DD}^2$    | 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            | $18\,800 f_i + \sum (f_o C_L) \times V_{DD}^2$ |   |
|   | 15            | $45\,700 f_i + \sum (f_o C_L) \times V_{DD}^2$ |   |

**APPLICATION INFORMATION**

Some examples of applications for the HEF4555B are:

- Code conversion.
- Address decoding.
- Demultiplexing: when using the enable input as data input.