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

HEF4556B
MSI
Dual 1-of-4 decoder/demultiplexer

Product specification
File under Integrated Circuits, IC04

January 1995

Philips Semiconductors

PHILIPS

Dual 1-of-4 decoder/demultiplexer

HEF4556B
MSI

DESCRIPTION

The HEF4556B is a dual 1-of-4 decoder/demultiplexer. Each has two address inputs (A_0 and A_1), an active LOW enable input ($\overline{E}$) and four mutually exclusive outputs which are active LOW ($\overline{O}_0$ to $\overline{O}_3$). When used as a decoder, $\overline{E}$ when HIGH, forces $\overline{O}_0$ to $\overline{O}_3$ HIGH. When used as a demultiplexer, the appropriate output is selected by the information on A_0 and A_1 with $\overline{E}$ as data input. All unselected outputs are HIGH.

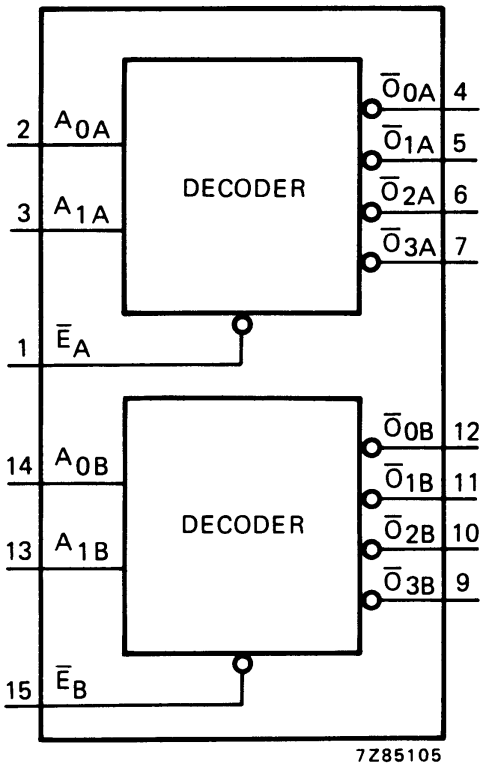

Fig.1 Functional diagram.

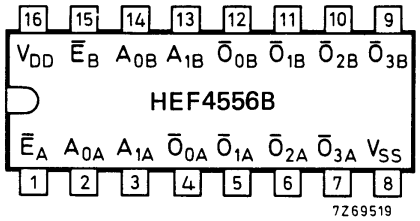

Fig.2 Pinning diagram.

HEF4556BP(N): 16-lead DIL; plastic (SOT38-1)
HEF4556BD(F): 16-lead DIL; ceramic (cerdip) (SOT74)
HEF4556BT(D): 16-lead SO; plastic (SOT109-1)
( ): Package Designator North America

PINNING

$\overline{E}$	enable inputs (active LOW)
A_0 and A_1	address inputs
$\overline{O}_0$ to $\overline{O}_3$	outputs (active LOW)

FAMILY DATA, I_{DD} LIMITS category MSI

See Family Specifications

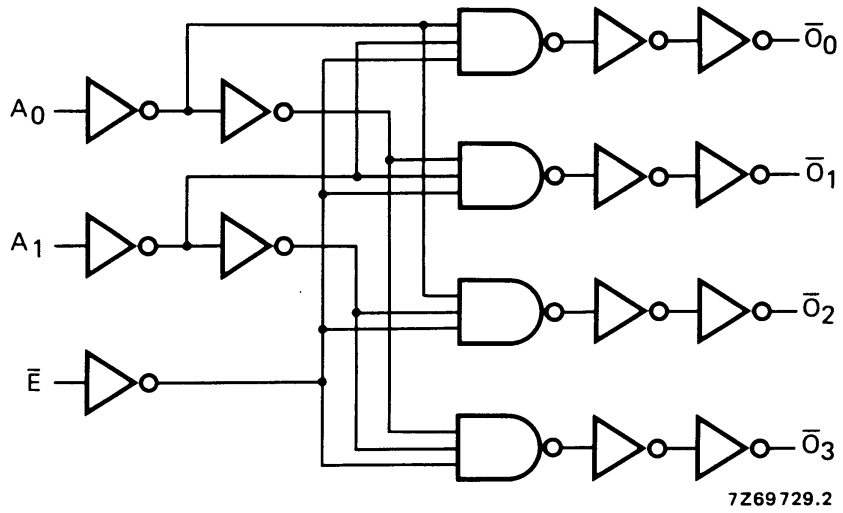

Fig.3 Logic diagram (one decoder/multiplexer).

TRUTH TABLE

INPUTS			OUTPUTS			
$\overline{E}$	A_0	A_1	$\overline{O}_0$	$\overline{O}_1$	$\overline{O}_2$	$\overline{O}_3$
L	L	L	L	H	H	H
L	H	L	H	L	H	H
L	L	H	H	H	L	H
L	H	H	H	H	H	L
H	X	X	H	H	H	H

Notes

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

AC CHARACTERISTICS

V_{SS} = 0 V; T_{amb} = 25 °C; C_L = 50 pF; input transition times ≤ 20 ns

	V_{DD} V	SYMBOL	MIN.	TYP.	MAX.		TYPICAL EXTRAPOLATION FORMULA
Propagation delays							
$A_n \rightarrow \overline{O}_n$	5			130	255	ns	103 ns + (0,55 ns/pF) C_L
HIGH to LOW	10	t_{PHL}		50	100	ns	39 ns + (0,23 ns/pF) C_L
	15			35	65	ns	27 ns + (0,16 ns/pF) C_L
	5			105	210	ns	78 ns + (0,55 ns/pF) C_L
LOW to HIGH	10	t_{PLH}		40	85	ns	29 ns + (0,23 ns/pF) C_L
	15			30	60	ns	22 ns + (0,16 ns/pF) C_L
$\overline{E}_n \rightarrow \overline{O}_n$	5			120	240	ns	93 ns + (0,55 ns/pF) C_L
HIGH to LOW	10	t_{PHL}		45	90	ns	34 ns + (0,23 ns/pF) C_L
	15			30	60	ns	22 ns + (0,16 ns/pF) C_L
	5			105	205	ns	78 ns + (0,55 ns/pF) C_L
LOW to HIGH	10	t_{PLH}		40	80	ns	29 ns + (0,23 ns/pF) C_L
	15			30	60	ns	22 ns + (0,16 ns/pF) C_L
Output transition times	5			60	120	ns	10 ns + (1,0 ns/pF) C_L
HIGH to LOW	10	t_{THL}		30	60	ns	9 ns + (0,42 ns/pF) C_L
	15			20	40	ns	6 ns + (0,28 ns/pF) C_L
	5			60	120	ns	10 ns + (1,0 ns/pF) C_L
LOW to HIGH	10	t_{TLH}		30	60	ns	9 ns + (0,42 ns/pF) C_L
	15			20	40	ns	6 ns + (0,28 ns/pF) C_L

	V_{DD} V	TYPICAL FORMULA FOR P (μW)	
Dynamic power	5	$4400\ f_i + \sum (f_o C_L) \times V_{DD}^2$	where
dissipation per	10	$18\ 000\ f_i + \sum (f_o C_L) \times V_{DD}^2$	f_i = input freq. (MHz)
package (P)	15	$43\ 300\ f_i + \sum (f_o C_L) \times V_{DD}^2$	f_o = output freq. (MHz)
			C_L = load capacitance (pF)
			$\sum (f_o C_L)$ = sum of outputs
			V_{DD} = supply voltage (V)

APPLICATION INFORMATION

Some examples of applications for the HEF4556B are:

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