

# 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

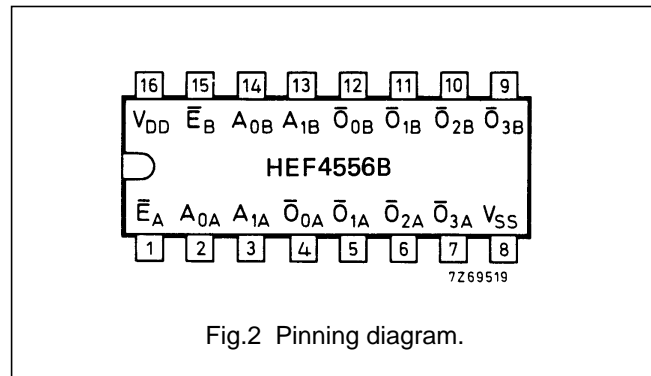
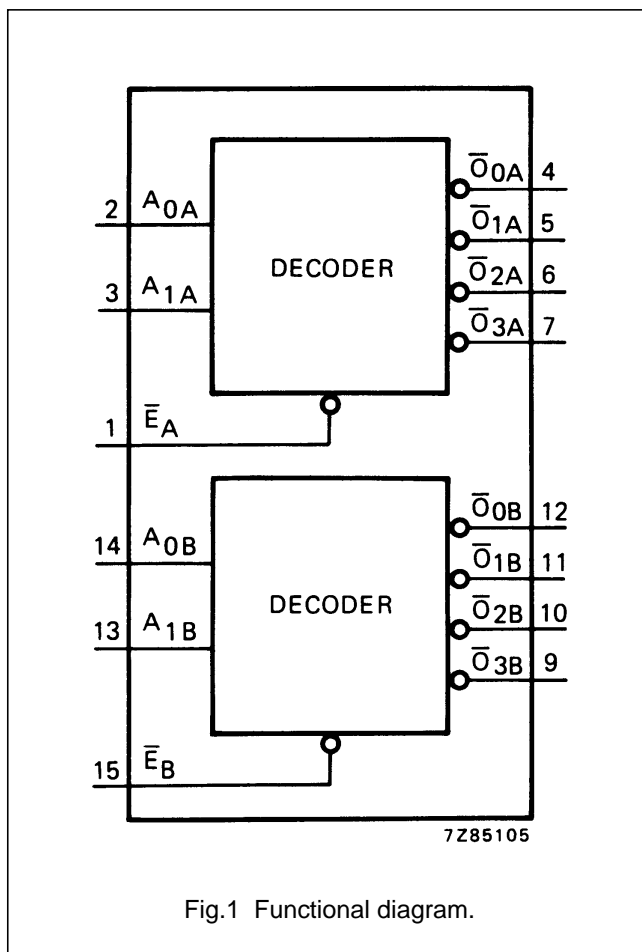
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# Dual 1-of-4 decoder/demultiplexer

# 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 ( $\bar{E}$ ) and four mutually exclusive outputs which are active LOW ( $\bar{O}_0$  to  $\bar{O}_3$ ). When used as a decoder,  $\bar{E}$  when HIGH, forces  $\bar{O}_0$  to  $\bar{O}_3$  HIGH. 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 HIGH.



- 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

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

### FAMILY DATA, I<sub>DD</sub> LIMITS category MSI

See Family Specifications

Dual 1-of-4 decoder/demultiplexer

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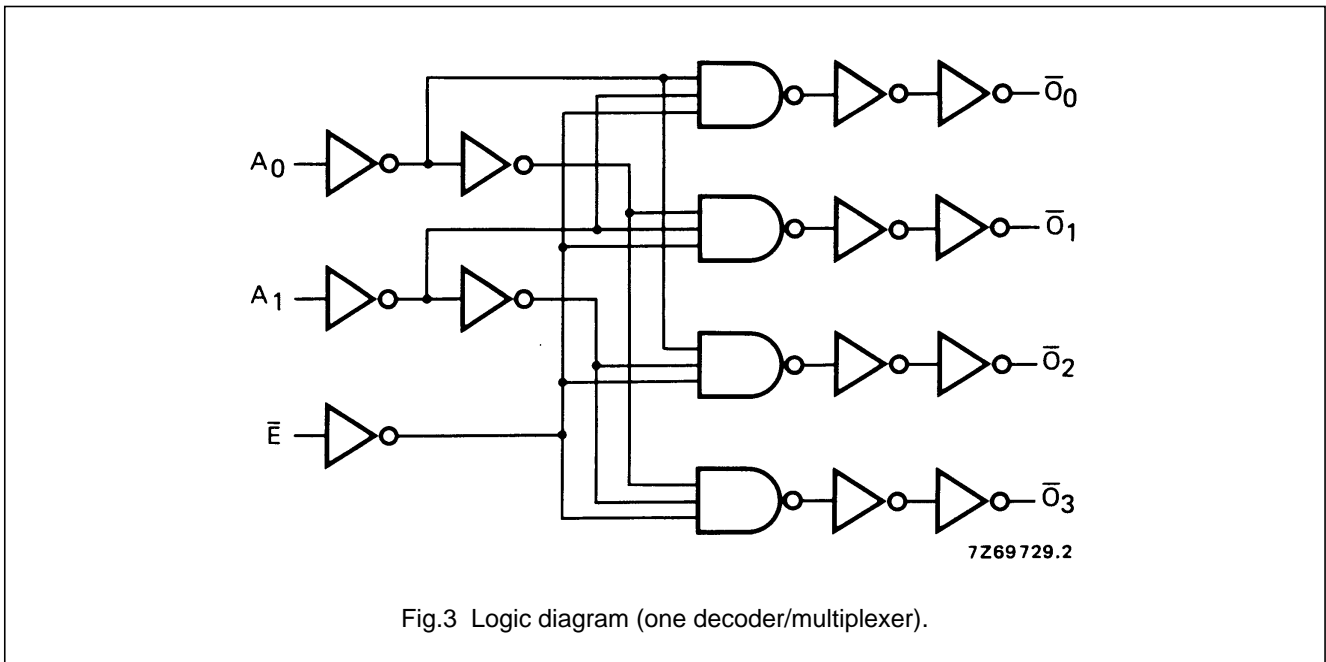


Fig.3 Logic diagram (one decoder/multiplexer).

TRUTH TABLE

INPUTS			OUTPUTS			
$\bar{E}$	$A_0$	$A_1$	$\bar{O}_0$	$\bar{O}_1$	$\bar{O}_2$	$\bar{O}_3$
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

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## AC CHARACTERISTICS

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

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

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

## APPLICATION INFORMATION

Some examples of applications for the HEF4556B are:

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