

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

HEF4043B

MSI

Quadruple R/S latch with 3-state outputs

Product specification
File under Integrated Circuits, IC04

January 1995

Quadruple R/S latch with 3-state outputs

HEF4043B

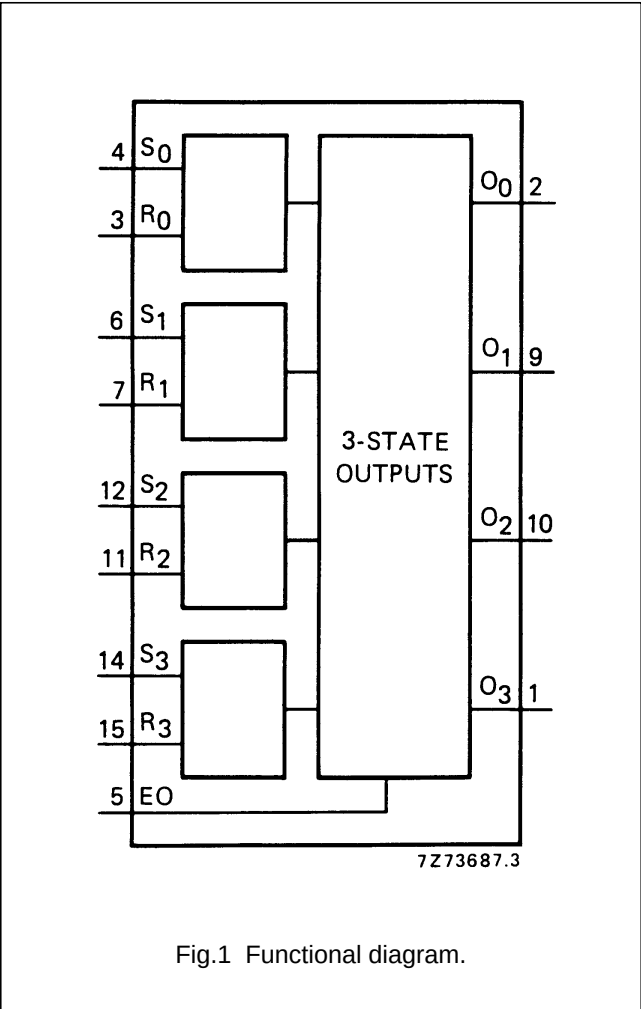
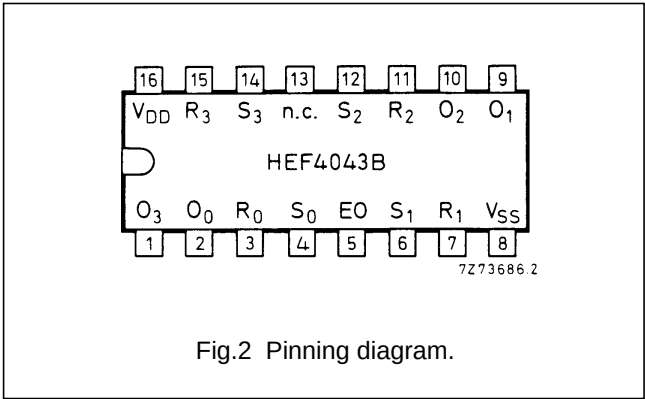
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DESCRIPTION

The HEF4043B is a quadruple R/S latch with 3-state outputs with a common output enable input (EO). Each latch has an active HIGH set input (S_0 to S_3), an active HIGH reset input (R_0 to R_3) and an active HIGH 3-state output (O_0 to O_3).

When EO is HIGH, the state of the latch output (O_n) can be determined from the function table below. When EO is LOW, the latch outputs are in the high impedance OFF-state. EO does not affect the state of the latch.

The high impedance off-state feature allows common busing of the outputs.



HEF4043BP(N): 16-lead DIL; plastic (SOT38-1)
HEF4043BD(F): 16-lead DIL; ceramic (cerdip) (SOT74)
HEF4043BT(D): 16-lead SO; plastic (SOT109-1)
() : Package Designator North America

PINNING

EO common output enable input
 S_0 to S_3 set inputs (active HIGH)
 R_0 to R_3 reset inputs (active HIGH)
 O_0 to O_3 3-state buffered latch outputs

FUNCTION TABLE

INPUTS			OUTPUT O_n
EO	S_n	R_n	
L	X	X	Z
H	L	H	L
H	H	X	H
H	L	L	latched

Notes

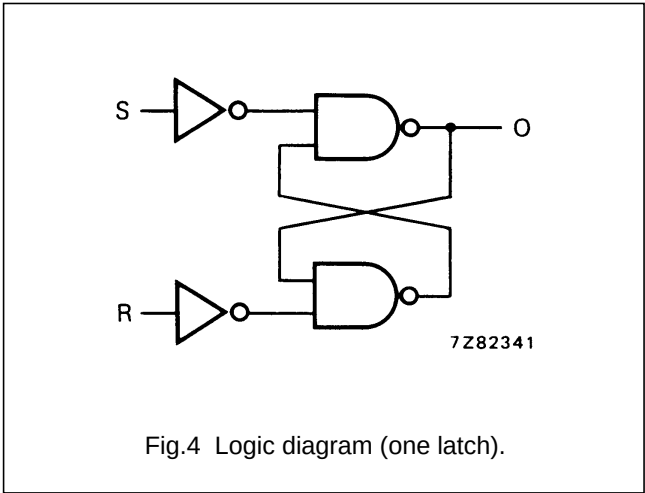
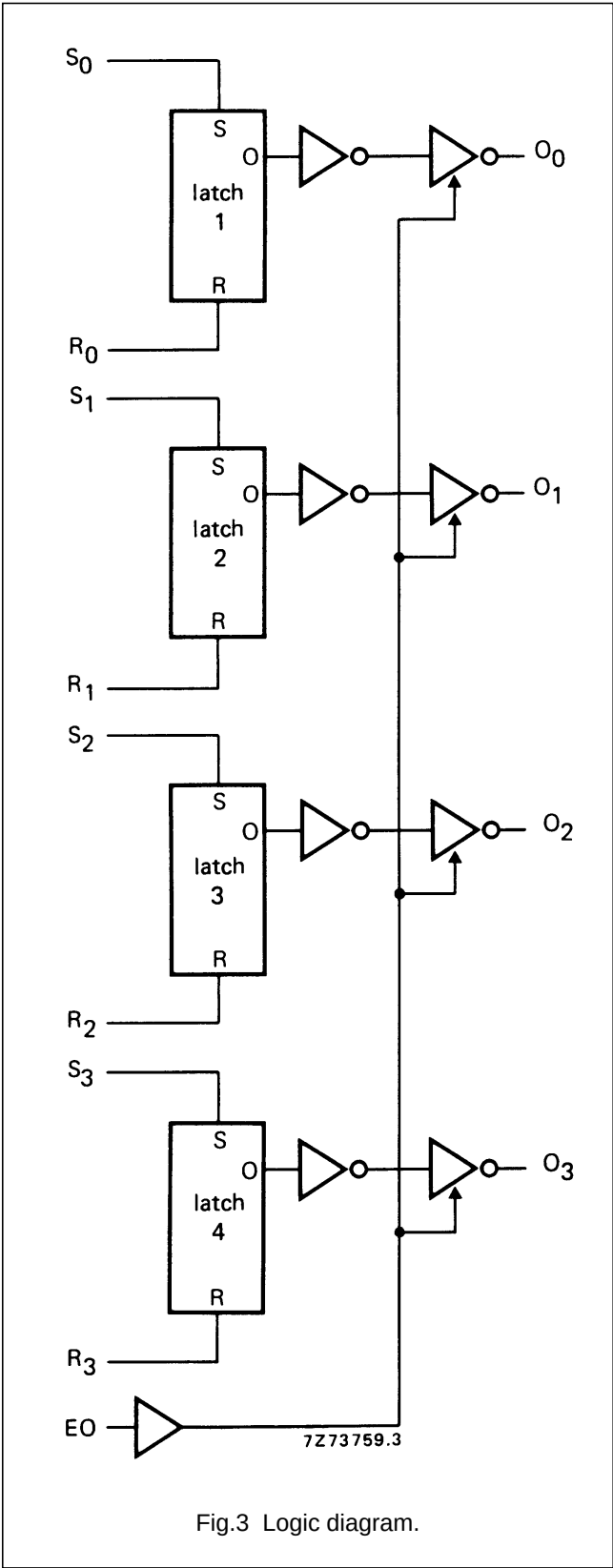
- H = HIGH state (the more positive voltage)
L = LOW state (the less positive voltage)
X = state immaterial
Z = high impedance state

FAMILY DATA, I_{DD} LIMITS category MSI

See Family Specifications

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AC CHARACTERISTICS

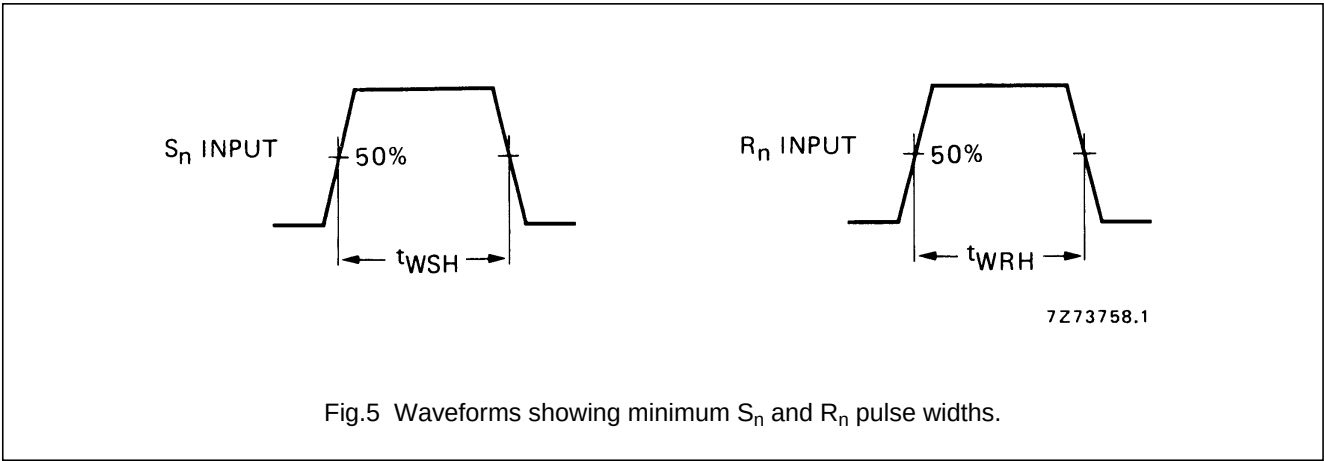
 $V_{SS} = 0\text{ V}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$; $C_L = 50\text{ pF}$; input transition times $\leq 20\text{ ns}$

	V _{DD} V	SYMBOL	MIN.	TYP.	MAX.	TYPICAL EXTRAPOLATION FORMULA	
Propagation delays							
R _n → O _n	5			90	180	ns	63 ns + (0,55 ns/pF) C _L
HIGH to LOW	10	t _{PHL}		35	70	ns	24 ns + (0,23 ns/pF) C _L
	15			25	50	ns	17 ns + (0,16 ns/pF) C _L
S _n → O _n	5			65	135	ns	38 ns + (0,55 ns/pF) C _L
LOW to HIGH	10	t _{PLH}		25	50	ns	14 ns + (0,23 ns/pF) C _L
	15			15	35	ns	7 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
LOW to HIGH	5			60	120	ns	10 ns + (1,0 ns/pF) C _L
	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
3-state propagation delays							
Output disable times							
EO → O _n	5			45	90	ns	
HIGH	10	t _{PHZ}		20	35	ns	
	15			10	25	ns	
LOW	5			50	100	ns	
	10	t _{PLZ}		20	40	ns	
	15			10	25	ns	
Output enable times							
EO → O _n	5			25	50	ns	
HIGH	10	t _{PZH}		15	30	ns	
	15			10	25	ns	
LOW	5			40	80	ns	
	10	t _{PZL}		20	45	ns	
	15			15	35	ns	
Minimum S _n	5		30	15		ns	see also waveforms Fig.5
pulse width; HIGH	10	t _{WSH}	20	10		ns	
	15		16	8		ns	
Minimum R _n	5		30	15		ns	
pulse width; HIGH	10	t _{WRH}	20	10		ns	
	15		16	8		ns	

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	V_{DD} V	TYPICAL FORMULA FOR P (μW)	
Dynamic power dissipation per package (P)	5	$1100 f_i + \sum(f_o C_L) \times V_{DD}^2$	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	$4400 f_i + \sum(f_o C_L) \times V_{DD}^2$	
	15	$11\,400 f_i + \sum(f_o C_L) \times V_{DD}^2$	



APPLICATION INFORMATION

An example of application for the HEF4043B is:

- Four-bit storage with output enable