

# 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

## **HEF4531B**

## **MSI**

## **13-input parity checker/generator**

Product specification  
File under Integrated Circuits, IC04

January 1995

# 13-input parity checker/generator

**HEF4531B**  
**MSI**

**DESCRIPTION**

The HEF4531B is a parity checker/generator with 13 parity inputs ( $I_0$  to  $I_{12}$ ) and a parity output (O). When the number of parity inputs that are HIGH is even, the output is LOW. When the number of parity inputs that are HIGH is odd, the output is HIGH. For words of 12 bits or less, the output can be used to generate either odd or even parity by appropriate termination of the unused parity input(s). For words of 14 or more bits, the devices can be cascaded by connecting the output of one device to any parity input of another device. When cascading devices, it is recommended that the output of one device be connected to the  $I_{12}$  input of the other device since there is less delay to the output from the  $I_{12}$  input than from any other input ( $I_0$  to  $I_{11}$ ).

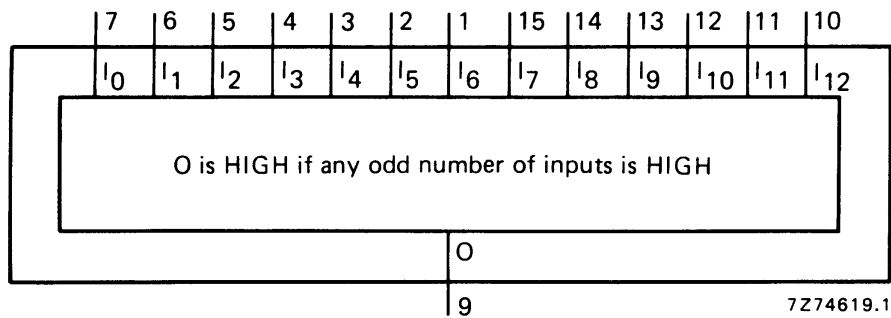


Fig.1 Functional diagram.

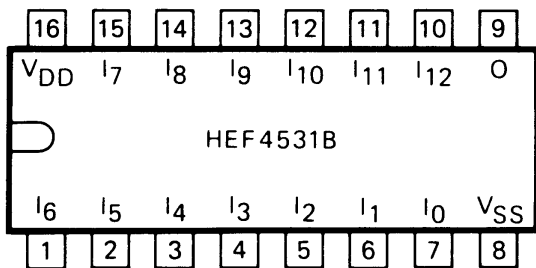


Fig.2 Pinning diagram.

- HEF4531BP(N): 16-lead DIL; plastic (SOT38-1)
- HEF4531BD(F): 16-lead DIL; ceramic (cerdip) (SOT74)
- HEF4531BT(D): 16-lead SO; plastic (SOT109-1)
- ( ): Package Designator North America

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

See Family Specifications

13-input parity checker/generator

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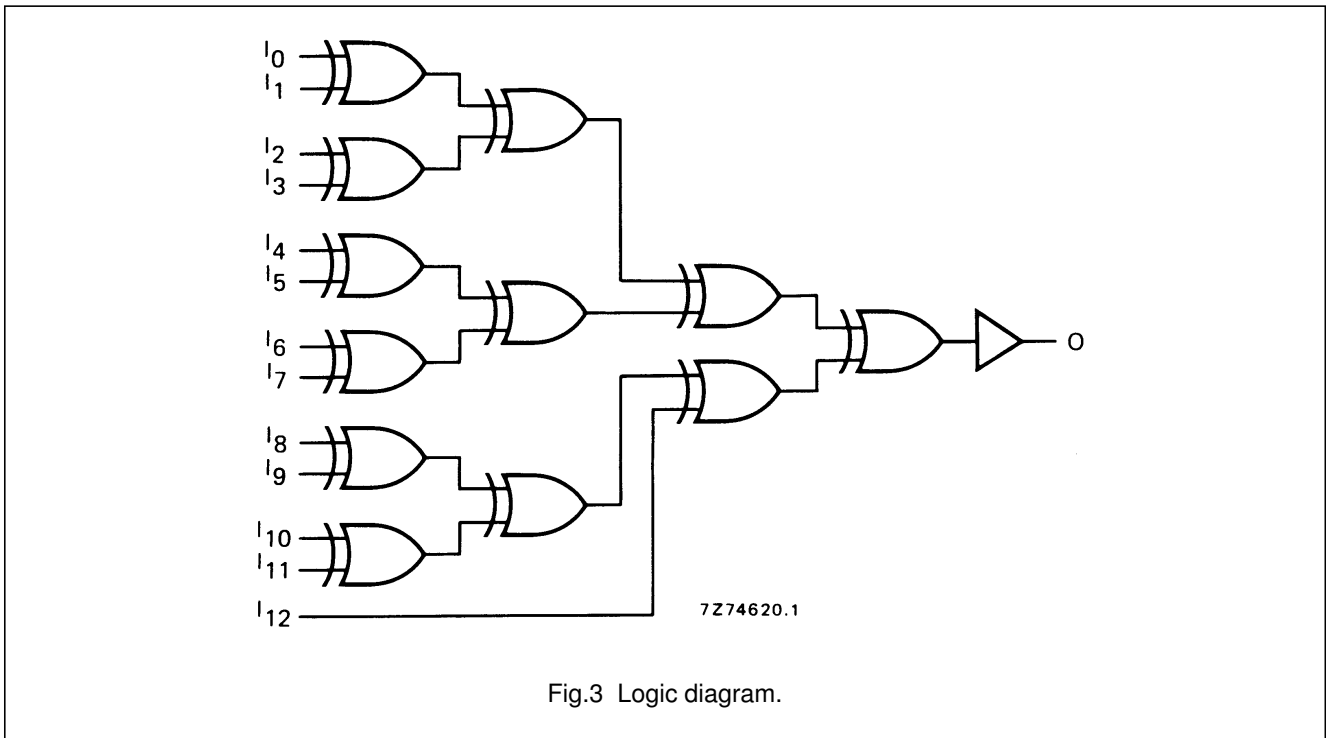


Fig.3 Logic diagram.

FUNCTION TABLE

INPUTS												OUTPUT	
I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	I <sub>5</sub>	I <sub>6</sub>	I <sub>7</sub>	I <sub>8</sub>	I <sub>9</sub>	I <sub>10</sub>	I <sub>11</sub>	I <sub>12</sub>	O
L	L	L	L	L	L	L	L	L	L	L	L	L	L
any odd number of inputs HIGH												H	
any even number of inputs HIGH												L	
H	H	H	H	H	H	H	H	H	H	H	H	H	H

Notes

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

AC CHARACTERISTICS

V<sub>SS</sub> = 0 V; T<sub>amb</sub> = 25 °C; input transition times ≤ 20 ns

	V <sub>DD</sub> V	TYPICAL FORMULA FOR P (μW)	
Dynamic power dissipation per package (P)	5 10 15	425 f <sub>i</sub> + ∑ (f <sub>o</sub> C <sub>L</sub> ) × V <sub>DD</sub> <sup>2</sup> 2 400 f <sub>i</sub> + ∑ (f <sub>o</sub> C <sub>L</sub> ) × V <sub>DD</sub> <sup>2</sup> 7 700 f <sub>i</sub> + ∑ (f <sub>o</sub> C <sub>L</sub> ) × V <sub>DD</sub> <sup>2</sup>	where f <sub>i</sub> = input freq. (MHz) f <sub>o</sub> = output freq. (MHz) C <sub>L</sub> = load capacitance (pF) ∑ (f <sub>o</sub> C <sub>L</sub> ) = sum of outputs V <sub>DD</sub> = supply voltage (V)

## 13-input parity checker/generator

HEF4531B  
MSI**AC CHARACTERISTICS** $V_{SS} = 0\text{ V}$ ;  $T_{amb} = 25\text{ °C}$ ;  $C_L = 50\text{ pF}$ ; input transition times  $\leq 20\text{ ns}$ 

	$V_{DD}$ V	SYMBOL	TYP.	MAX.		TYPICAL EXTRAPOLATION FORMULA	
Propagation delays	$I_0$ to $I_{11} \rightarrow O$ HIGH to LOW	$t_{PHL}$	145	290	ns	$118\text{ ns} + (0,55\text{ ns/pF}) C_L$	
			60	120	ns	$49\text{ ns} + (0,23\text{ ns/pF}) C_L$	
			45	90	ns	$37\text{ ns} + (0,16\text{ ns/pF}) C_L$	
	LOW to HIGH	$t_{PLH}$	135	270	ns	$108\text{ ns} + (0,55\text{ ns/pF}) C_L$	
			55	110	ns	$44\text{ ns} + (0,23\text{ ns/pF}) C_L$	
			45	90	ns	$37\text{ ns} + (0,16\text{ ns/pF}) C_L$	
	$I_{12} \rightarrow 0$	HIGH to LOW	$t_{PHL}$	105	210	ns	$78\text{ ns} + (0,55\text{ ns/pF}) C_L$
				45	90	ns	$34\text{ ns} + (0,23\text{ ns/pF}) C_L$
				35	70	ns	$27\text{ ns} + (0,16\text{ ns/pF}) C_L$
		LOW to HIGH	$t_{PLH}$	85	170	ns	$58\text{ ns} + (0,55\text{ ns/pF}) C_L$
				35	70	ns	$24\text{ ns} + (0,23\text{ ns/pF}) C_L$
				25	50	ns	$17\text{ ns} + (0,16\text{ ns/pF}) C_L$
Output transition times	HIGH to LOW	$t_{THL}$	60	120	ns	$10\text{ ns} + (1,0\text{ ns/pF}) C_L$	
			30	60	ns	$9\text{ ns} + (0,42\text{ ns/pF}) C_L$	
			20	40	ns	$6\text{ ns} + (0,28\text{ ns/pF}) C_L$	
	LOW to HIGH	$t_{TLH}$	60	120	ns	$10\text{ ns} + (1,0\text{ ns/pF}) C_L$	
			30	60	ns	$9\text{ ns} + (0,42\text{ ns/pF}) C_L$	
			20	40	ns	$6\text{ ns} + (0,28\text{ ns/pF}) C_L$	