

# 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

## HEF40097B

### buffers

### 3-state hex non-inverting buffer

Product specification  
File under Integrated Circuits, IC04

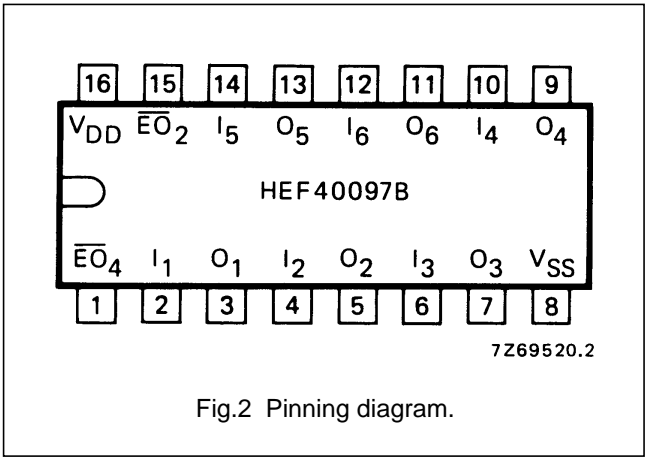
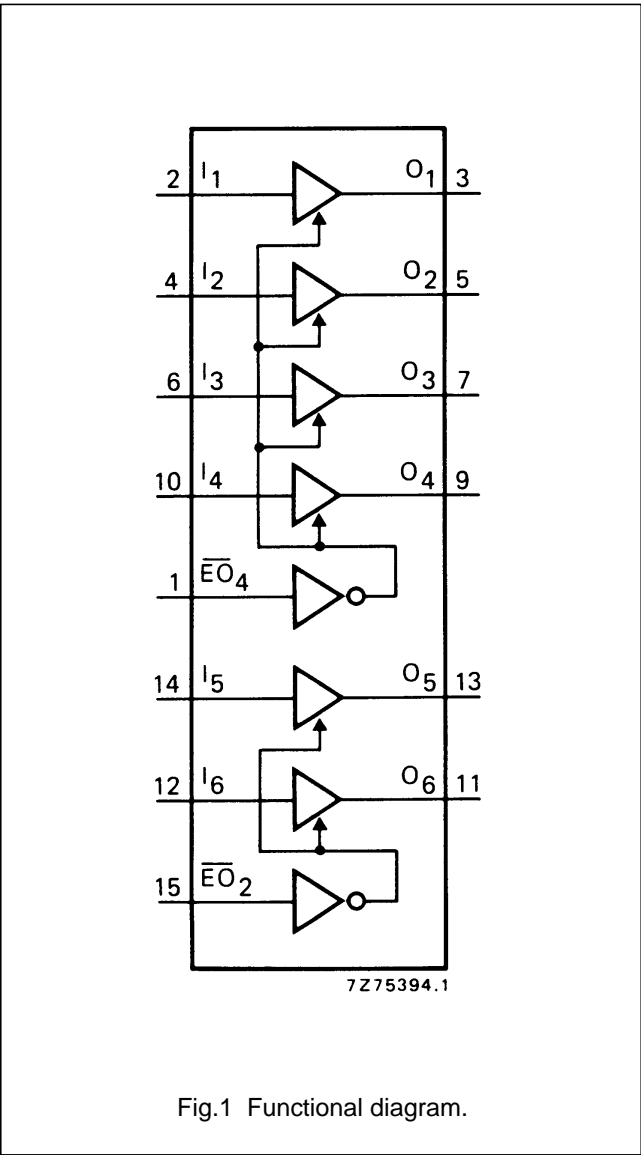
January 1995

3-state hex non-inverting buffer

HEF40097B  
buffers

DESCRIPTION

The HEF40097B is a hex non-inverting buffer with 3-state outputs. The 3-state outputs are controlled by two enable inputs ( $\overline{EO}_4$  and  $\overline{EO}_2$ ). A HIGH on  $\overline{EO}_4$  causes four of the six buffer elements to assume a high impedance or OFF-state, regardless of the other input conditions and a HIGH on  $\overline{EO}_2$  causes the outputs of the remaining two buffer elements to assume a high impedance or OFF-state, regardless of the other input conditions.



- HEF40097BP(N): 16-lead DIL; plastic (SOT38-1)
- HEF40097BD(F): 16-lead DIL; ceramic (cerdip) (SOT74)
- HEF40097BT(D): 16-lead SO; plastic (SOT109-1)
- ( ): Package Designator North America

PINNING

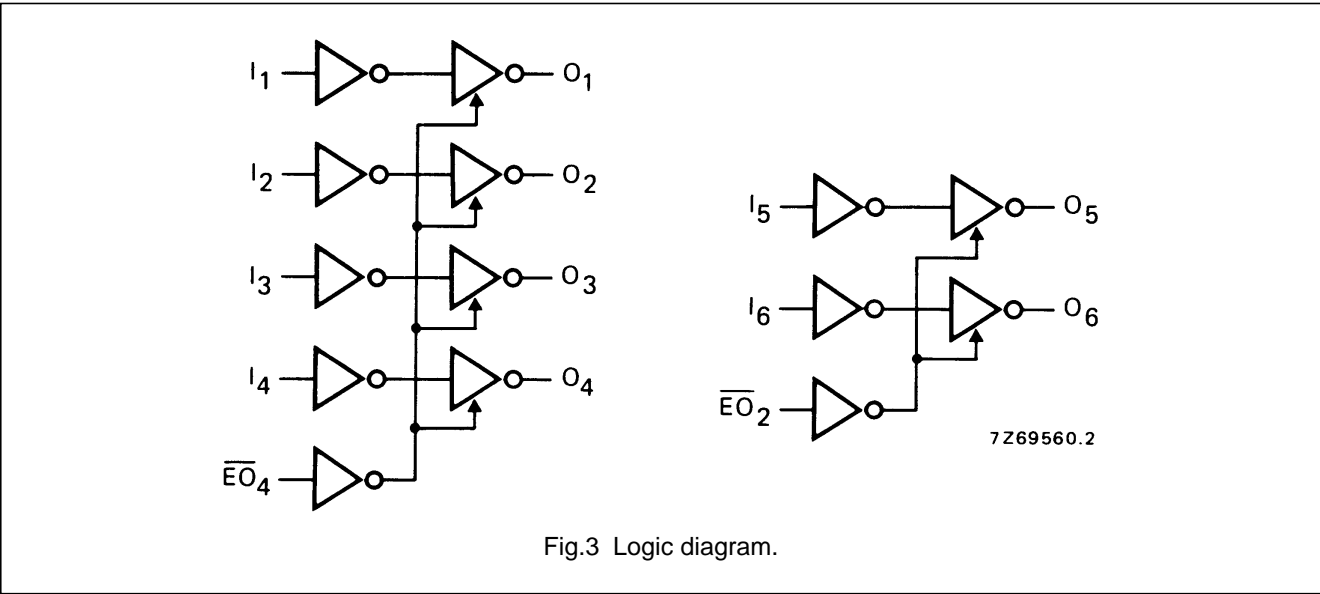
- $I_1$  to  $I_6$  buffer inputs
- $\overline{EO}_4$ ,  $\overline{EO}_2$  enable inputs (active LOW)
- $O_1$  to  $O_6$  buffer outputs (active HIGH)

FAMILY DATA,  $I_{DD}$  LIMITS category BUFFERS

See Family Specifications

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DC CHARACTERISTICS

V<sub>SS</sub> = 0 V

HEF	V <sub>DD</sub> V	V <sub>OH</sub> V	V <sub>OL</sub> V	SYMBOL	T <sub>amb</sub> (°C)					
					-40		+25		+85	
					MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Output current HIGH	5	4,6		-I <sub>OH</sub>	1,2	1,0			0,8	mA
	10	9,5			3,8	3,2			2,5	mA
	15	13,5			12,0	10,0			8,0	mA
HIGH	5	2,5		-I <sub>OH</sub>	3,8	3,2			2,5	mA
Output current LOW	4,75		0,4	I <sub>OL</sub>	3,5	2,9			2,3	mA
	10		0,5		12,0	10,0			8,0	mA
	15		1,5		24,0	20,0			16,0	mA

HEC	V <sub>DD</sub> V	V <sub>OH</sub> V	V <sub>OL</sub> V	SYMBOL	T <sub>amb</sub> (°C)					
					-55		+25		+125	
					MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Output current HIGH	5	4,6		-I <sub>OH</sub>	1,25	1,0			0,6	mA
	10	9,5			4,0	3,2			2,1	mA
	15	13,5			12,5	10,0			6,7	mA
HIGH	5	2,5		-I <sub>OH</sub>	4,0	3,2			2,1	mA
Output current LOW	4,75		0,4	I <sub>OL</sub>	3,6	2,9			1,9	mA
	10		0,5		12,5	10,0			6,7	mA
	15		1,5		25,0	20,0			13,0	mA

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## AC CHARACTERISTICS

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

	$V_{DD}$ V	SYMBOL	TYP.	MAX.		TYPICAL EXTRAPOLATION FORMULA
Propagation delays $I_n \rightarrow O_n$ HIGH to LOW	5 10 15	$t_{PHL}$	70 30 25	140 60 50	ns	60 ns + (0,20 ns/pF) $C_L$ 26 ns + (0,08 ns/pF) $C_L$ 22 ns + (0,06 ns/pF) $C_L$
LOW to HIGH	5 10 15	$t_{PLH}$	60 25 20	120 50 40	ns	45 ns + (0,30 ns/pF) $C_L$ 19 ns + (0,13 ns/pF) $C_L$ 16 ns + (0,09 ns/pF) $C_L$
Output transition times HIGH to LOW	5 10 15	$t_{THL}$	30 15 10	60 30 20	ns	15 ns + (0,30 ns/pF) $C_L$ 10 ns + (0,11 ns/pF) $C_L$ 7 ns + (0,07 ns/pF) $C_L$
LOW to HIGH	5 10 15	$t_{TLH}$	35 20 15	70 40 30	ns	10 ns + (0,50 ns/pF) $C_L$ 8 ns + (0,24 ns/pF) $C_L$ 6 ns + (0,18 ns/pF) $C_L$
3-state propagation delays Output disable times $\overline{EO}_2, \overline{EO}_4 \rightarrow O_n$ HIGH	5 10 15	$t_{PHZ}$	45 35 30	95 70 60	ns	
LOW	5 10 15	$t_{PLZ}$	60 35 25	120 70 55	ns	
Output enable times $\overline{EO}_2, \overline{EO}_4 \rightarrow O_n$ HIGH	5 10 15	$t_{PZH}$	75 35 30	150 70 60	ns	
LOW	5 10 15	$t_{PZL}$	95 40 30	190 80 65	ns	

	$V_{DD}$ V	TYPICAL FORMULA FOR P ( $\mu$ W)	
Dynamic power dissipation per package (P)	5 10 15	5 400 $f_i + \sum (f_o C_L) \times V_{DD}^2$ 25 200 $f_i + \sum (f_o C_L) \times V_{DD}^2$ 96 500 $f_i + \sum (f_o C_L) \times V_{DD}^2$	where $f_i$ = input freq. (MHz) $f_o$ = output freq. (MHz) $C_L$ = load cap. (pF) $\sum (f_o C_L)$ = sum of outputs $V_{DD}$ = supply voltage (V)