

# 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

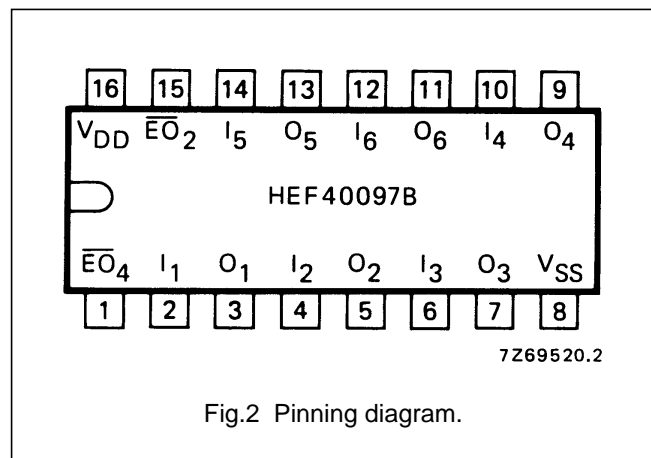
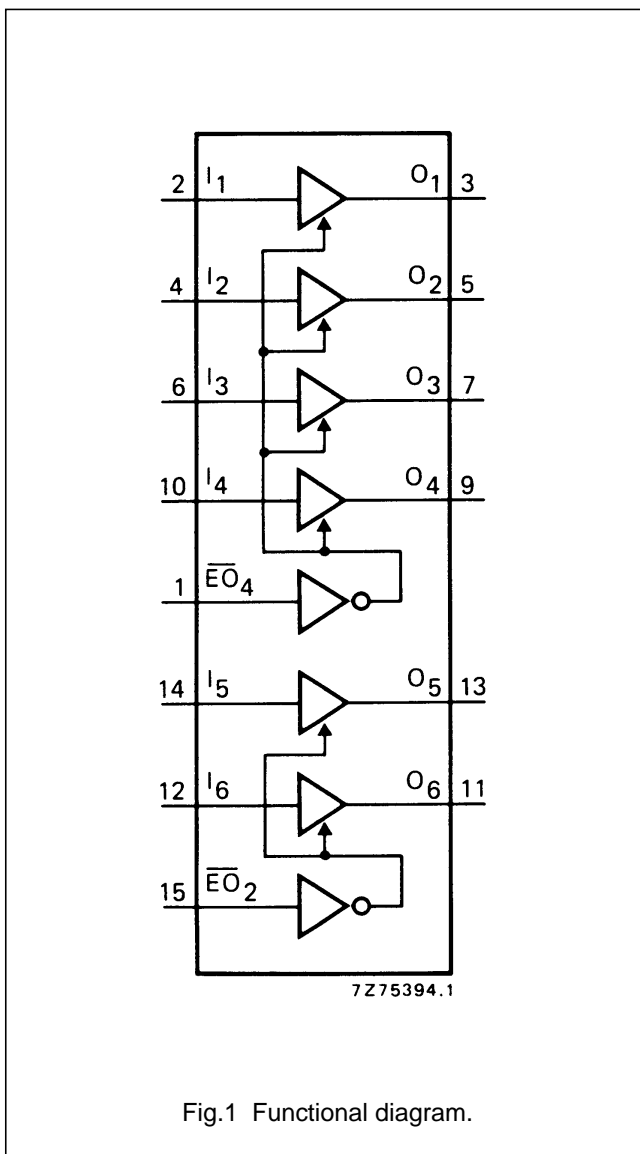
January 1995

### 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**

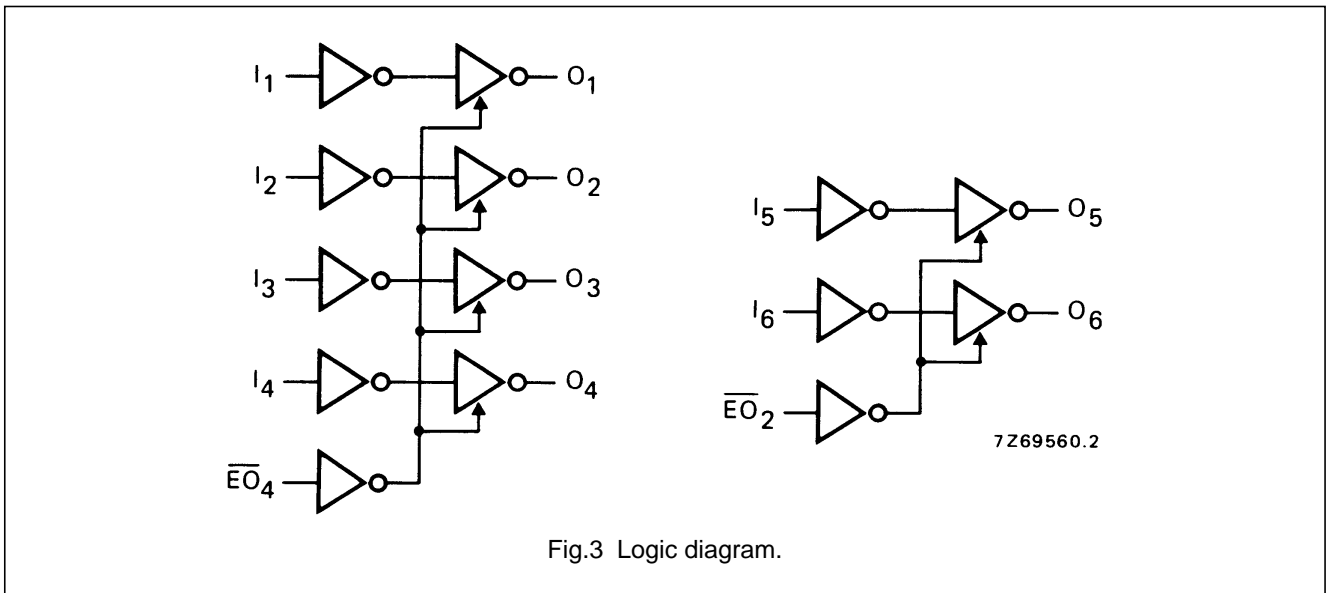
- $I_1$  to  $I_6$  buffer inputs
- $\overline{EO}_4$ ,  $\overline{EO}_2$  enable inputs (active LOW)
- $O_1$  to  $O_6$  buffer outputs (active HIGH)

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

See Family Specifications

3-state hex non-inverting buffer

HEF40097B  
buffers



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

	$V_{DD}$ V	TYPICAL FORMULA FOR P ( $\mu$ W)	
Dynamic power dissipation per package (P)	5	$5\,400 f_i + \sum (f_o C_L) \times V_{DD}^2$	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)
	10	$25\,200 f_i + \sum (f_o C_L) \times V_{DD}^2$	
	15	$96\,500 f_i + \sum (f_o C_L) \times V_{DD}^2$	