

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

HEF4049B **buffers** **HEX inverting buffers**

Product specification
File under Integrated Circuits, IC04

January 1995

HEX inverting buffers

HEF4049B
buffers

DESCRIPTION

The HEF4049B provides six inverting buffers with high current output capability suitable for driving TTL or high capacitive loads. Since input voltages in excess of the buffers' supply voltage are permitted, the buffers may also be used to convert logic levels of up to 15 V to standard TTL levels. Their guaranteed fan-out into common bipolar logic elements is shown in the table below.

HEF4049BP(N): 16-lead DIL; plastic (SOT38-1)
 HEF4049BD(F): 16-lead DIL; ceramic (cerdip) (SOT74)
 HEF4049BT(D): 16-lead SO; plastic (SOT109-1)
 (): Package Designator North America

Guaranteed fan-out in common logic families

DRIVEN ELEMENT	GUARANTEED FAN-OUT
standard TTL	2
74 LS	9
74 L	16

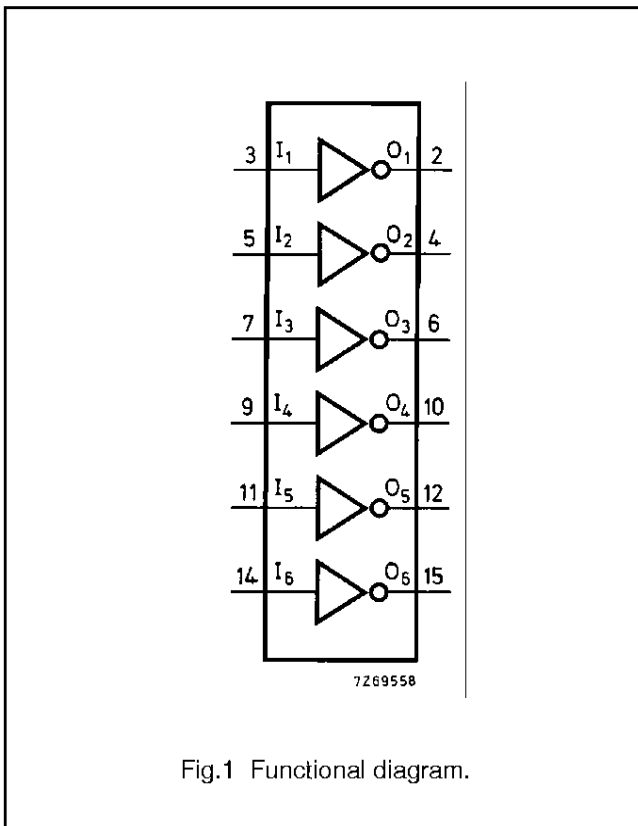


Fig.1 Functional diagram.

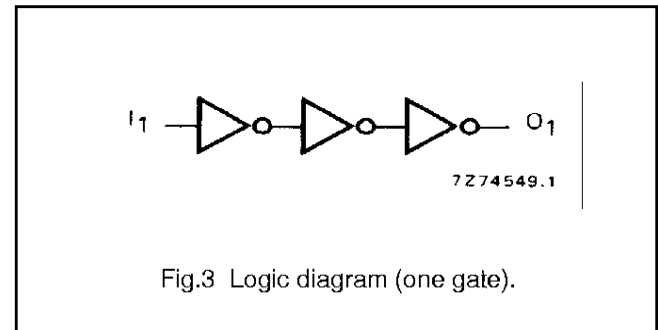


Fig.3 Logic diagram (one gate).

APPLICATION INFORMATION

Some examples of applications for the HEF4049B are:

- LOC MOS to DTL/TTL converter
- HIGH sink current for driving 2 TTL loads
- HIGH-to-LOW level logic conversion

Input protection

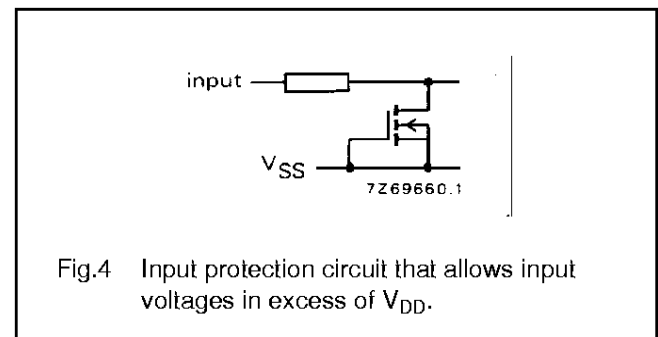


Fig.4 Input protection circuit that allows input voltages in excess of V_{DD}.

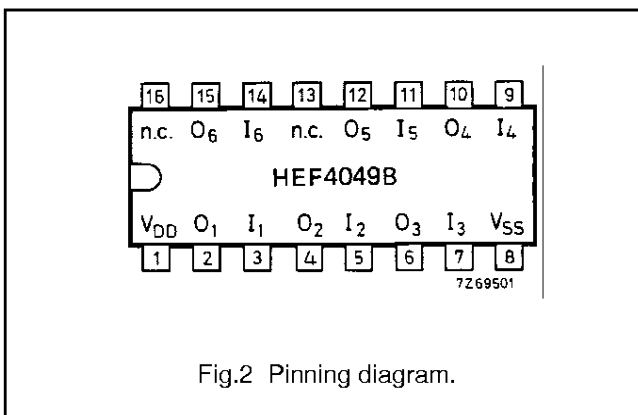


Fig.2 Pinning diagram.

FAMILY DATA, I_{DD} LIMITS category BUFFERS

See Family Specifications

HEX inverting buffers

HEF4049B
buffers**DC CHARACTERISTICS** $V_{SS} = 0\text{ V}$; $V_I = V_{SS}$ or V_{DD}

HEF	V_{DD} V	V_O V	SYMBOL	T_{amb} (°C)						
				-40		+25		+85		
				MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
Output (sink) current LOW	4,75	0,4	I_{OL}	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
Output (source) current HIGH	5	4,6	$-I_{OH}$	0,52	-	0,44	-	0,36	-	mA
	10	9,5		1,3	-	1,1	-	0,9	-	mA
	15	13,5		3,6	-	3,0	-	2,4	-	mA
Output (source) current HIGH	5	2,5	$-I_{OH}$	1,7	-	1,4	-	1,1	-	mA

HEC	V_{DD} V	V_O V	SYMBOL	T_{amb} (°C)						
				-55		+25		+125		
				MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
Output (sink) current LOW	4,75	0,4	I_{OL}	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
Output (source) current HIGH	5	4,6	$-I_{OH}$	0,52	-	0,44	-	0,36	-	mA
	10	9,5		1,3	-	1,1	-	0,9	-	mA
	15	13,5		3,6	-	3,0	-	2,4	-	mA

	V_{DD} V	SYMBOL	TYP.	MAX.		TYPICAL EXTRAPOLATION				
						FORMULA				
Propagation delays $I_n \rightarrow O_n$ HIGH to LOW LOW to HIGH	5	t_{PHL}	35	70	ns	26 ns + (0,18 ns/pF) C_L				
						10	15	30	ns	11 ns + (0,08 ns/pF) C_L
						15	12	25	ns	9 ns + (0,05 ns/pF) C_L
	5	t_{PLH}	50	100	ns	23 ns + (0,55 ns/pF) C_L				
						10	25	50	ns	14 ns + (0,23 ns/pF) C_L
						15	20	40	ns	12 ns + (0,16 ns/pF) C_L
Output transition times HIGH to LOW LOW to HIGH	5	t_{THL}	20	40	ns	3 ns + (0,35 ns/pF) C_L				
						10	10	20	ns	3 ns + (0,14 ns/pF) C_L
						15	7	14	ns	2 ns + (0,09 ns/pF) C_L
	5	t_{TLH}	60	120	ns	10 ns + (1,0 ns/pF) C_L				
						10	30	60	ns	9 ns + (0,42 ns/pF) C_L
						15	20	40	ns	6 ns + (0,28 ns/pF) C_L

HEX inverting buffers

HEF4049B
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	V_{DD} V	TYPICAL FORMULA FOR P (μ W)	
Dynamic power dissipation per package (P)	5 10 15	$2\,500 f_i + \sum (f_o C_L) \times V_{DD}^2$ $11\,000 f_i + \sum (f_o C_L) \times V_{DD}^2$ $35\,000 f_i + \sum (f_o C_L) \times V_{DD}^2$	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)