

STROBED HEX INVERTER/BUFFER

The HEF4502B consists of six inverter/buffers with 3-state outputs. When the output enable input ( $\overline{EO}$ ) is HIGH all six outputs ( $O_1$  to  $O_6$ ) are in the high impedance OFF-state. When the enable input ( $\overline{E}$ ) is HIGH all six outputs are switched to LOW. The outputs have a 2-TTL load drive capability.

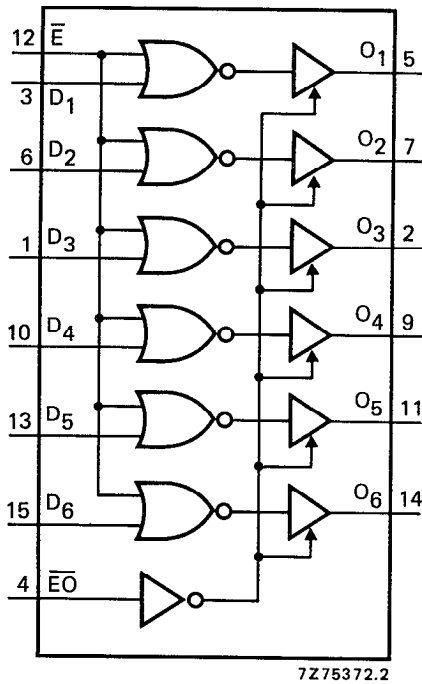


Fig. 1 Functional diagram.

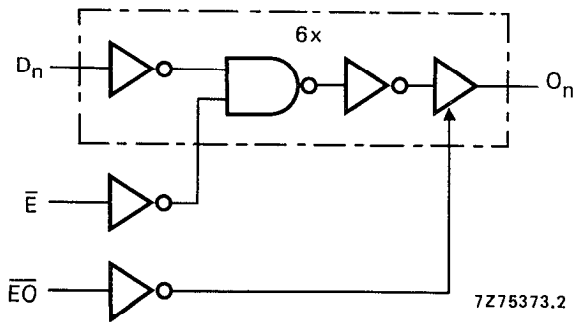


Fig. 3 Logic diagram.

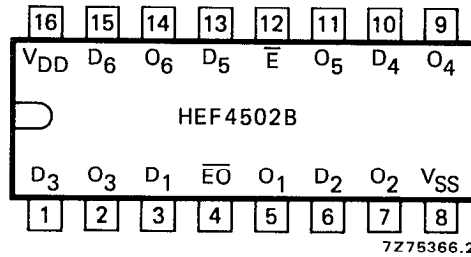


Fig. 2 Pinning diagram.

HEF4502BP(N): 16-lead DIL; plastic (SOT38-1)  
 HEF4502BD(F): 16-lead DIL; ceramic (cerdip) (SOT74)  
 HEF4502BT(D): 16-lead SO; plastic (SOT109-1)  
 ( ): Package Designator North America

PINNING

- $D_1$  to  $D_6$  data inputs
- $\overline{E}$  enable input
- $\overline{EO}$  output enable input
- $O_1$  to  $O_6$  3-state outputs

TRUTH TABLE

inputs			output
$D_n$	$\overline{E}$	$\overline{EO}$	$O_n$
L	L	L	H
H	L	L	L
X	H	L	L
X	X	H	Z

H = HIGH state (the more pos. voltage)  
 L = LOW state (the less pos. voltage)  
 X = state is immaterial  
 Z = high impedance off state

FAMILY DATA

$I_{DD}$  LIMITS category BUFFERS

Family Specifications

see

D.C. CHARACTERISTICS

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

	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		
Output current 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		

A.C. 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)	where f <sub>i</sub> = output freq. (MHz) f <sub>o</sub> = output freq. (MHz) C <sub>L</sub> = load capacitance (pF) Σ(f <sub>o</sub> C <sub>L</sub> ) = sum of outputs V <sub>DD</sub> = supply voltage (V)
Dynamic power dissipation per package (P)	5	5 000 f <sub>i</sub> + Σ(f <sub>o</sub> C <sub>L</sub> ) × V <sub>DD</sub> <sup>2</sup>	
	10	25 000 f <sub>i</sub> + Σ(f <sub>o</sub> C <sub>L</sub> ) × V <sub>DD</sub> <sup>2</sup>	
	15	85 000 f <sub>i</sub> + Σ(f <sub>o</sub> C <sub>L</sub> ) × V <sub>DD</sub> <sup>2</sup>	

## A.C. 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	typ.	max.	typical extrapolation formula
Propagation delays					
$\overline{D_n}, \overline{E} \rightarrow O_n$ HIGH to LOW	5	t <sub>PHL</sub>	85	170 ns	77 ns + (0,17 ns/pF) C <sub>L</sub>
	10		40	80 ns	37 ns + (0,06 ns/pF) C <sub>L</sub>
	15		35	70 ns	33 ns + (0,04 ns/pF) C <sub>L</sub>
LOW to HIGH	5	t <sub>PLH</sub>	80	160 ns	66 ns + (0,28 ns/pF) C <sub>L</sub>
	10		35	70 ns	28 ns + (0,13 ns/pF) C <sub>L</sub>
	15		30	60 ns	25 ns + (0,10 ns/pF) C <sub>L</sub>
Output transition times					
HIGH to LOW	5	t <sub>THL</sub>	25	50 ns	10 ns + (0,30 ns/pF) C <sub>L</sub>
	10		12	24 ns	7 ns + (0,11 ns/pF) C <sub>L</sub>
	15		8	15 ns	5 ns + (0,07 ns/pF) C <sub>L</sub>
LOW to HIGH	5	t <sub>TLH</sub>	30	60 ns	5 ns + (0,50 ns/pF) C <sub>L</sub>
	10		15	30 ns	3 ns + (0,24 ns/pF) C <sub>L</sub>
	15		12	24 ns	3 ns + (0,18 ns/pF) C <sub>L</sub>
3-state propagation delays					
Output disable times					
$\overline{EO} \rightarrow O_n$ HIGH	5	t <sub>PHZ</sub>	60	160 ns	
	10		55	140 ns	
	15		55	140 ns	
LOW	5	t <sub>PLZ</sub>	50	100 ns	
	10		35	70 ns	
	15		30	60 ns	
Output enable times					
$\overline{EO} \rightarrow O_n$ HIGH	5	t <sub>PZH</sub>	60	120 ns	
	10		35	70 ns	
	15		30	60 ns	
LOW	5	t <sub>PZL</sub>	55	110 ns	
	10		25	50 ns	
	15		20	40 ns	