

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

HEF4731B; HEF4731V **LSI**

Quadruple 64-bit static shift register

Product specification
File under Integrated Circuits, IC04

January 1995

Quadruple 64-bit static shift register

HEF4731B; HEF4731V

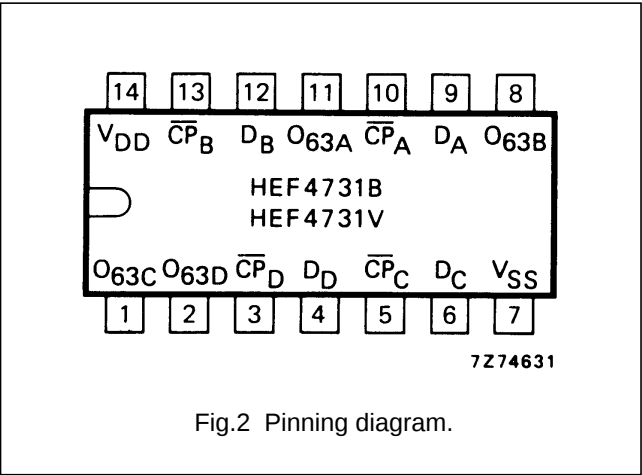
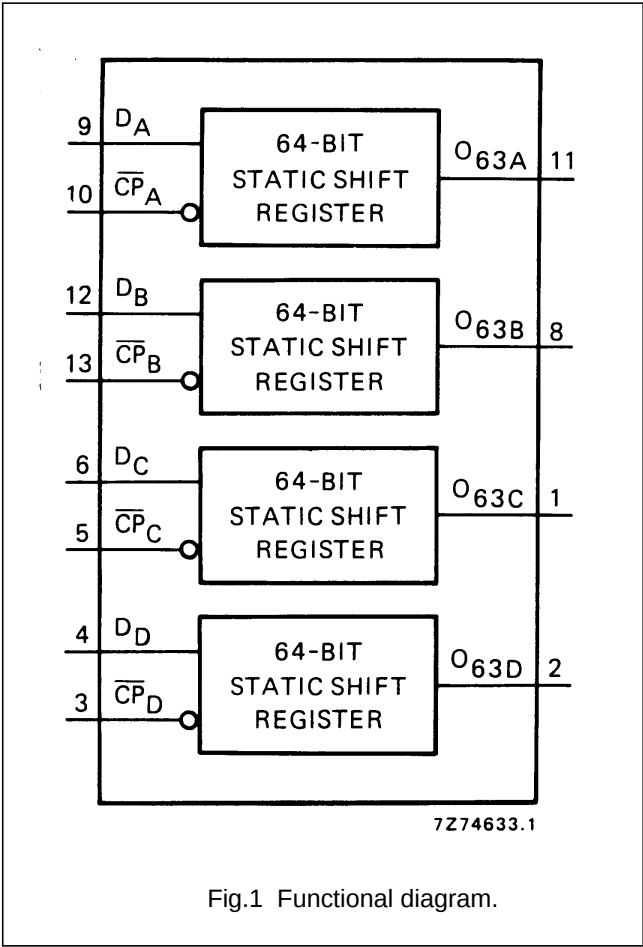
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DESCRIPTION

The HEF4731B and HEF4731V are quadruple 64-bit static shift registers each with separate serial data inputs (D_A to D_D), clock inputs ($\overline{CP}_A$ to $\overline{CP}_D$) and data outputs (O_{63A} to O_{63D}) from the 64th register position.

Recommended supply voltage range for HEF4731B is 3 to 15 V and for HEF4731V is 4,5 to 12,5 V.

Data are shifted to the next stage on the negative-going transitions of the clock. Low impedance outputs are provided for direct interface to TTL.



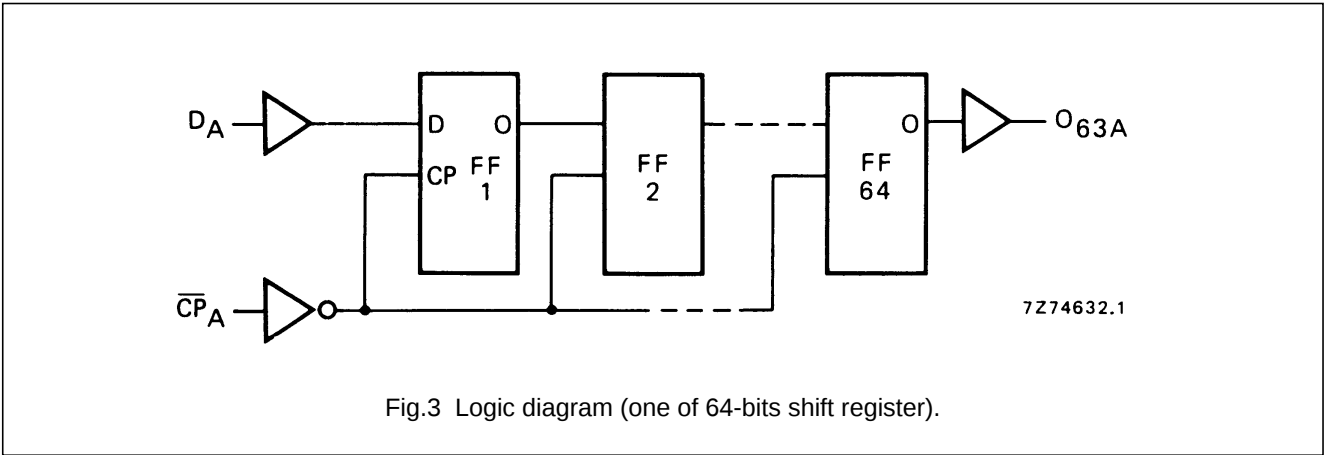
- HEF4731BP; 14-lead DIL; plastic
- HEF4731VP(N): (SOT27-1)
- HEF4731BD; 14-lead DIL; ceramic (cerdip)
- HEF4731VD(F): (SOT73)
- (): Package Designator North America

FAMILY DATA, I_{DD} LIMITS category LSI

See Family Specifications

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The values given at $V_{DD} = 15\text{ V}$ in the following DC and AC characteristics, are not applicable to the HEF4731V, because of its reduced supply voltage range.

DC CHARACTERISTICS

$V_{SS} = 0\text{ V}$; $V_I = V_{SS}$ or V_{DD}

	V_{DD} V	V_{OL} V	V_{OH} V	SYMBOL	$T_{amb}\text{ (}^{\circ}\text{C)}$					
					-40		+ 25		+ 85	
					MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Output (source) current HIGH	5		2,5	$-I_{OH}$	3		2,5		2,0	mA
	5		4,6		1		0,85		0,65	mA
	10		9,5		3		2,5		2,0	mA
	15		13,5		10		8,5		6,5	mA
Output (sink) current LOW	4,75	0,4		I_{OL}	2,3		2,0		1,6	mA
	10	0,5			6,0		5,0		4,0	mA
	15	1,5			20,0		18,0		14,0	mA

AC CHARACTERISTICS

$V_{SS} = 0\text{ V}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$; input transition times $\leq 20\text{ ns}$

	V_{DD} V	TYPICAL FORMULA FOR P (μW)	
Dynamic power dissipation per package (P)	5	$13\,000\,f_i + \sum (f_o C_L) \times V_{DD}^2$	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)
	10	$55\,000\,f_i + \sum (f_o C_L) \times V_{DD}^2$	
	15	$140\,000\,f_i + \sum (f_o C_L) \times V_{DD}^2$	

Quadruple 64-bit static shift register

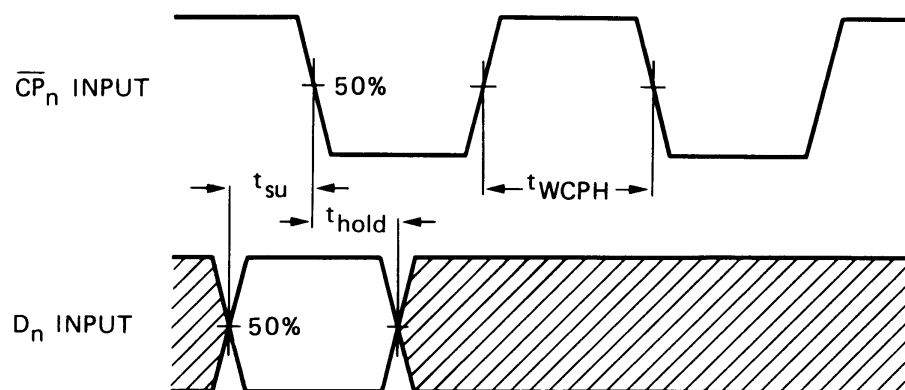
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AC CHARACTERISTICS

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

	V_{DD} V	SYMBOL	MIN.	TYP.	MAX.	TYPICAL EXTRAPOLATION FORMULA
Propagation delays $\overline{CP} \rightarrow O_{63}$ HIGH to LOW	5	t_{PHL}		115	230 ns	$132\text{ ns} + (0,26\text{ ns/pF}) C_L$
	10			55	110 ns	$47\text{ ns} + (0,16\text{ ns/pF}) C_L$
	15			40	80 ns	$34\text{ ns} + (0,11\text{ ns/pF}) C_L$
	5	t_{PLH}		130	260 ns	$138\text{ ns} + (0,45\text{ ns/pF}) C_L$
	10			65	130 ns	$56\text{ ns} + (0,19\text{ ns/pF}) C_L$
	15			45	90 ns	$39\text{ ns} + (0,13\text{ ns/pF}) C_L$
Transition times O_{63} HIGH to LOW	5	t_{THL}		30	60 ns	$10\text{ ns} + (0,40\text{ ns/pF}) C_L$
	10			12	24 ns	$3\text{ ns} + (0,18\text{ ns/pF}) C_L$
	15			10	20 ns	$3\text{ ns} + (0,13\text{ ns/pF}) C_L$
	5	t_{TLH}		40	80 ns	$8\text{ ns} + (0,65\text{ ns/pF}) C_L$
	10			20	40 ns	$5\text{ ns} + (0,30\text{ ns/pF}) C_L$
	15			15	30 ns	$5\text{ ns} + (0,20\text{ ns/pF}) C_L$
Minimum clock pulse width; HIGH	5	t_{WCPH}	200	80	ns	see also waveforms Fig.4
	10		75	30	ns	
	15		50	20	ns	
Set-up time $D \rightarrow \overline{CP}$	5	t_{su}	25	-5	ns	
	10		15	-5	ns	
	15		15	-5	ns	
Hold time $D \rightarrow \overline{CP}$	5	t_{hold}	50	20	ns	
	10		30	10	ns	
	15		20	5	ns	
Maximum clock pulse frequency	5	f_{max}	2.25	6	MHz	Note: the maximum power dissipation has to be observed
	10		6	16	MHz	
	15		9	25	MHz	

Fig.4 Waveforms showing minimum clock pulse width, set-up and hold times for D to $\overline{CP}$. Set-up and hold times are shown as positive values but may be specified as negative values.



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