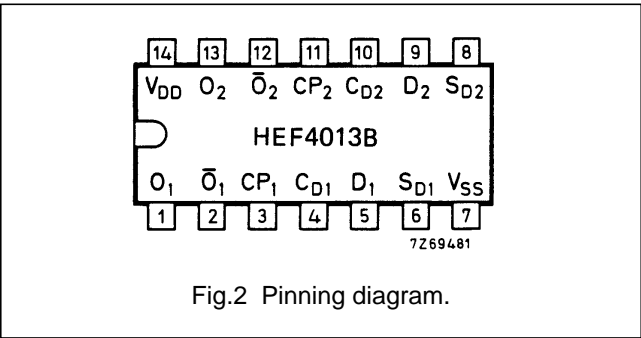
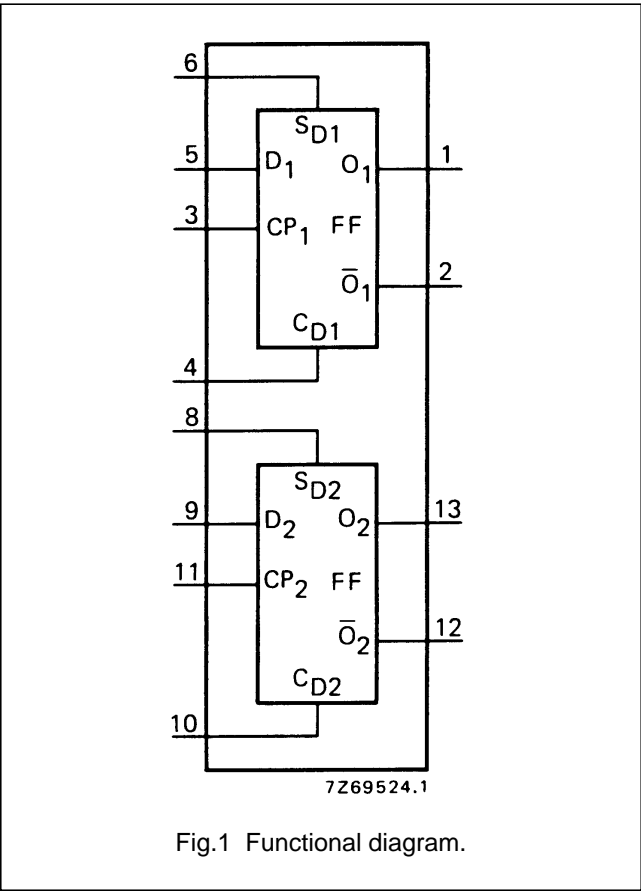


Dual D-type flip-flop

HEF4013B
flip-flops

DESCRIPTION

The HEF4013B is a dual D-type flip-flop which features independent set direct (S_D), clear direct (C_D), clock inputs (CP) and outputs (O, \overline{O}). Data is accepted when CP is LOW and transferred to the output on the positive-going edge of the clock. The active HIGH asynchronous clear-direct (C_D) and set-direct (S_D) are independent and override the D or CP inputs. The outputs are buffered for best system performance. Schmitt-trigger action in the clock input makes the circuit highly tolerant to slower clock rise and fall times.



FUNCTION TABLES

INPUTS				OUTPUTS	
S_D	C_D	CP	D	O	\overline{O}
H	L	X	X	H	L
L	H	X	X	L	H
H	H	X	X	H	H

INPUTS				OUTPUTS	
S_D	C_D	CP	D	$O_n + 1$	$\overline{O_n} + 1$
L	L		L	L	H
L	L		H	H	L

Notes

1. H = HIGH state (the more positive voltage)
L = LOW state (the less positive voltage)
X = state is immaterial
- = positive-going transition
 $O_n + 1$ = state after clock positive transition

PINNING

- D data inputs
- CP clock input (L to H edge-triggered)
- S_D asynchronous set-direct input (active HIGH)
- C_D asynchronous clear-direct input (active HIGH)
- O true output
- \overline{O} complement output

- HEF4013BP(N): 14-lead DIL; plastic
(SOT27-1)
- HEF4013BD(F): 14-lead DIL; ceramic (cerdip)
(SOT73)
- HEF4013BT(D): 14-lead SO; plastic
(SOT108-1)
- (): Package Designator North America

FAMILY DATA, I_{DD} LIMITS category FLIP-FLOPS

See Family Specifications

Dual D-type flip-flop

HEF4013B
flip-flops

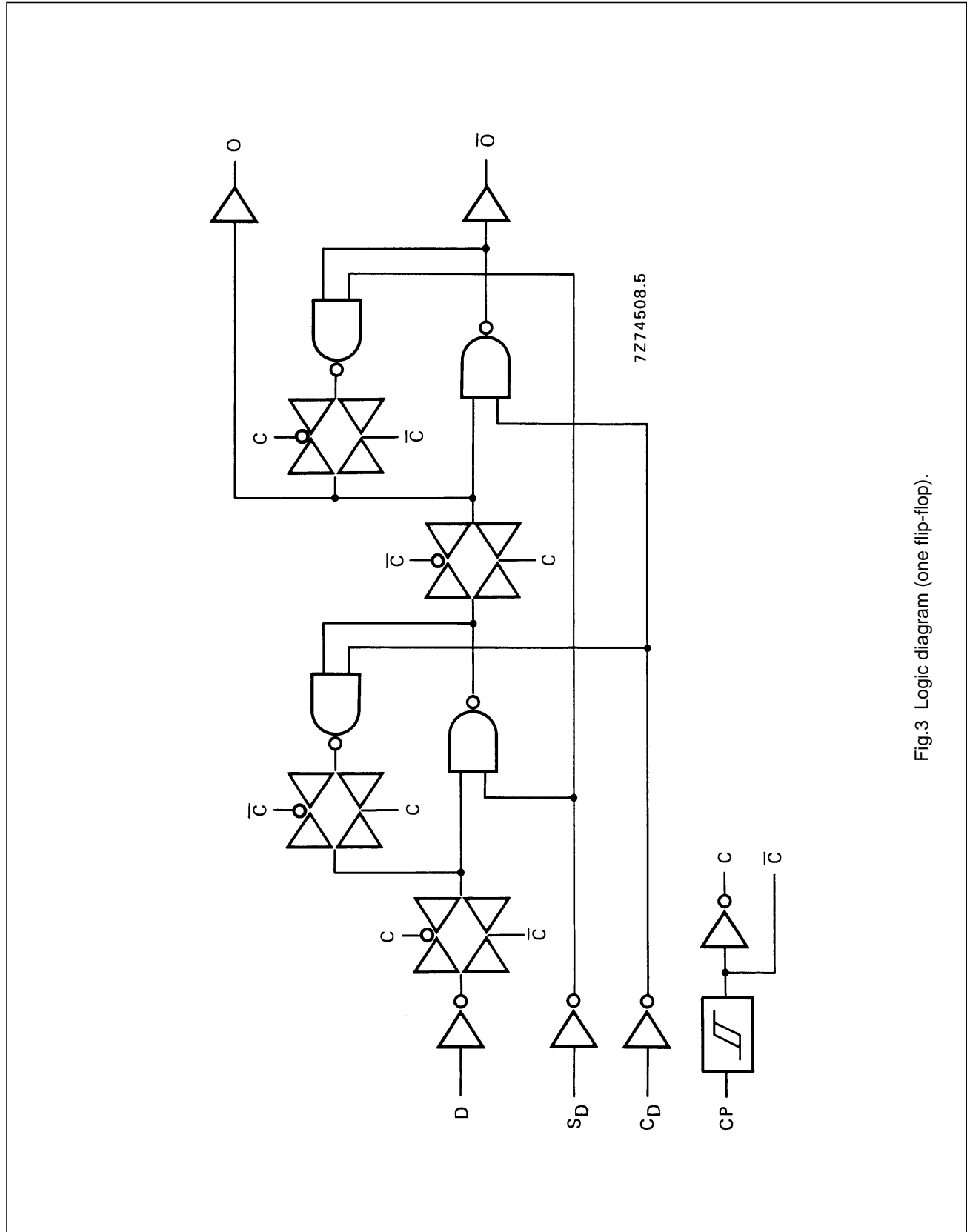


Fig.3 Logic diagram (one flip-flop).

Dual D-type flip-flop

HEF4013B
flip-flops

APPLICATION INFORMATION

Some examples of applications for the HEF4013B are:

- Counters/dividers
- Registers
- Toggle flip-flops

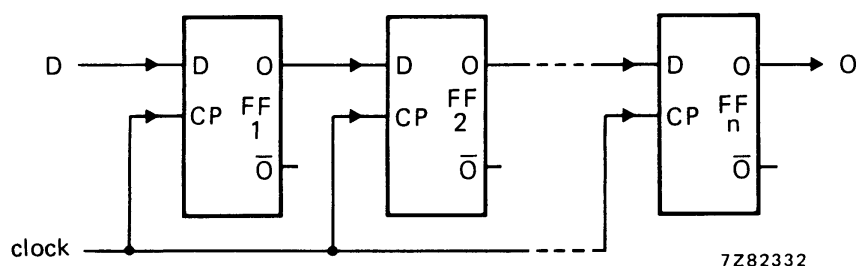


Fig.6 Typical application of the HEF4013B in an n-stage shift register.

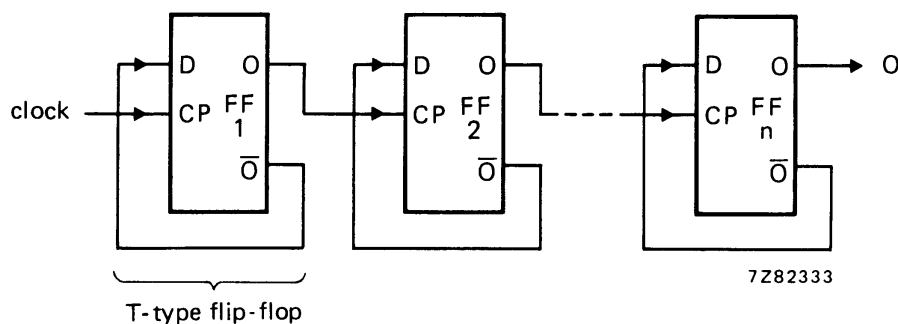


Fig.7 Typical application of the HEF4013B in a binary ripple up-counter; divide-by- 2^n .

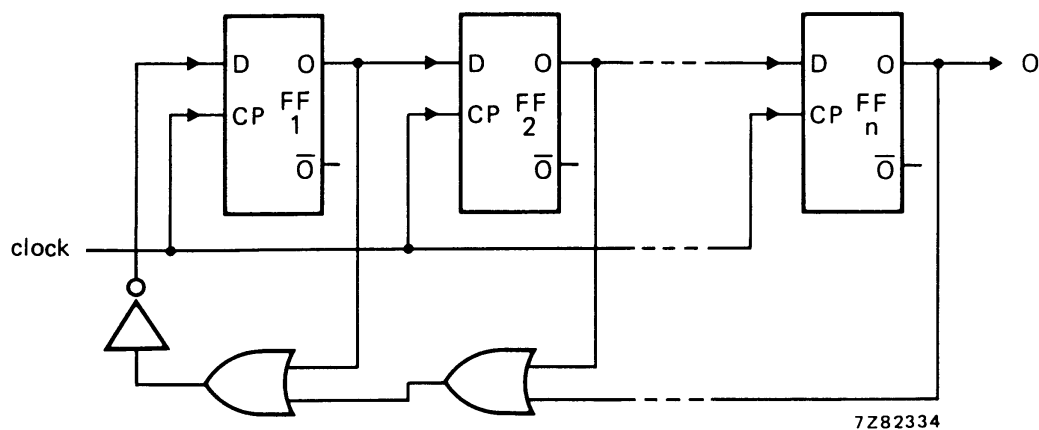


Fig.8 Typical application of the HEF4013B in a modified ring counter; divide-by-($n + 1$).