

(1)

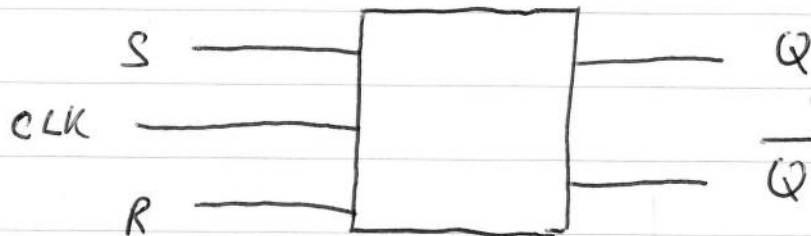
RECALL CLOCKED SR FLIP FLOP TRUTH TABLE

CLK	S	R	S*	R*	Q	\bar{Q}
0	X	X	1	1	NO CHANGE MEMORY (LATCHED)	
1	0	0	1	1	NO CHANGE MEMORY (LATCHED)	
1	0	1	1	0	0	1
1	1	0	0	1	1	0
1	1	1	0	0	INVALID	

D FLIP FLOP

FIRST OF ALL :

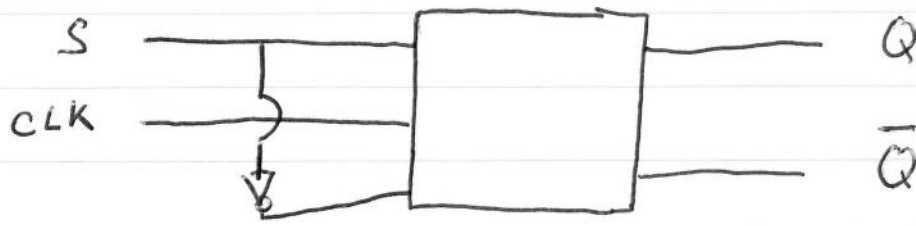
CLOCKED S-R FLIP FLOP



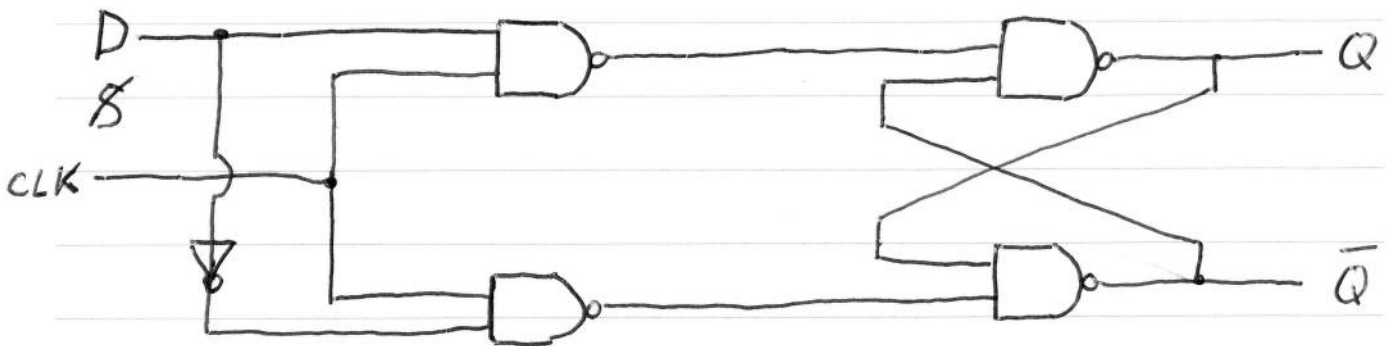
ABOVE IS BLOCK DIAGRAM OF CLOCKED S-R FLIP FLOP

THE D FLIP-FLOP AVOIDS THE INVALID STATE IN THE CLOCKED SR FLIP FLOP BY INVERTING THE S LINE BEFORE IT FEEDS INTO THE R LINE.

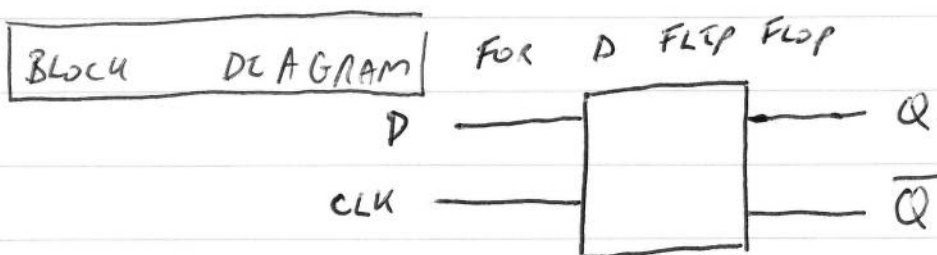
(2)



So the "R" line will always be the opposite of the S line, so you avoid the invalid state — the S line and the "R" line cannot ^{BOTH} be 1 at the same time. (see gate level diagram below).



GATE LEVEL DIAGRAM FOR D FLIP FLOP



(3)

D FLIP FLOP CONSIDERATION

	\boxed{S}	\boxed{R}				
CLK	D	\bar{D}	S^*	R^*	Q	\bar{Q}
0	X	X	1	1	NO CHANGE MEMORY (LATCHED)	
1	0	1	1	0	0	1
1	1	0	0	1	1	0

D : PREVIOUSLY S } ON CLOCKED
 \bar{D} : PREVIOUSLY R } S-R FLIP FLOP

D FLIP FLOP TRUTH TABLE

CLK	D	Q	\bar{Q}
0	X	NO CHANGE	
1	0	0	1
1	1	1	0

← ~~RESET~~ RESET TO 0

← ~~RESET~~ SET TO 1

