(Separate preset, common clock and clear)

SPEED/PACKAGE AVAILABILITY

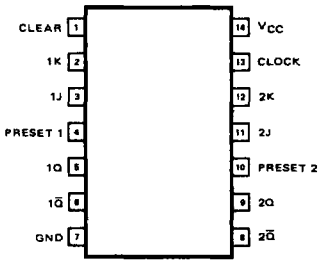
54LS F,W	74LS A,F
54S A,F,W	74S A,F

DESCRIPTION

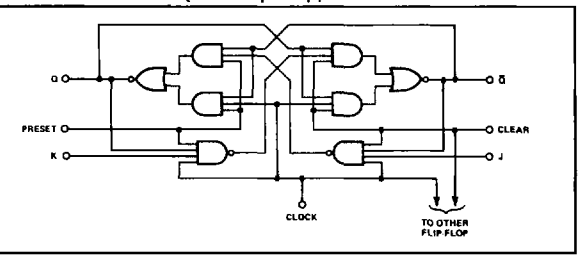
The preset or clear inputs, when low, set or reset the outputs regardless of the levels at the other inputs. When preset and clear inputs are inactive (high), a high level at the clock input enables the J and K inputs and data will be accepted. The logic levels at the J and K inputs may be allowed to change when the clock pulse is high and the bistable will perform according to the function table as long as minimum setup and hold times are observed. Input data is transferred to the outputs on the negative-going edge of the clock pulse.

PIN CONFIGURATION

A,F,W PACKAGE



BLOCK DIAGRAM (Each Flip-Flop)



SWITCHING CHARACTERISTICS V_{CC} = 5V, T_A = 25°C

TEST CONDITIONS			54/74LS C_L=15pF R_L=2kΩ			54/74S C_L=15pF R_L=280Ω			
PARAMETER	FROM INPUT	TO OUTPUT	MIN	TYP	MAX	MIN	TYP	MAX	UNIT
f_{Clock} Clock frequency			30	45		80	125		MHz
$t_{w(Clock)}$ Width of clock pulse			20						ns
Clock high						6			
Clock low						6.5			
$t_{w(Preset)}$ Width of preset pulse			25			8			ns
$t_{w(Clear)}$ Width of clear pulse			25			8			ns
t_{Setup} Input setup time			20↓			3↓			ns
t_{Hold} Input hold time			0↓			0↓			ns
Propagation delay time									
t_{PLH} Low-to-high	CLR, PRE or CLK (as appropriate)			11	20	2	4	7	ns
t_{PHL} High-to-low				15	30	2	5	7	

Load circuit and typical waveforms are shown at the front of section.

TRUTH TABLE (Each Flip-Flop)

Inputs					Outputs	
Preset	Clear	Clock	J	K	Q	Q̄
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	↓	L	L	Q_0	$\bar{Q}_0$
H	H	↓	H	L	H	L
H	H	↓	L	H	L	H
H	H	↓	H	H	Toggle	
H	H	H	X	X	Q_0	$\bar{Q}_0$

H = high level (steady state)
L = low level (steady state)
X = irrelevant
↓ = transition from high to low level
Q_0 = the level of Q before the indicated steady-state input conditions were established
TOGGLE: = Each output changes to the complement of its previous level on each clock transition.
*This configuration is nonstable; that is, it will not persist when preset and clear inputs return to their inactive (high) level.