

**54/7476  
54H/74H76  
54LS/74LS76**

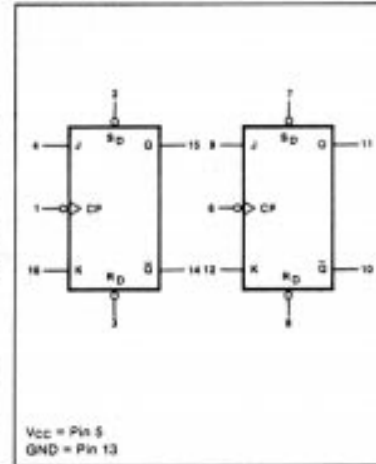
**DESCRIPTION**

The "76" is a Dual JK Flip-Flop with individual J, K, Clock, Set and Reset inputs. The 7476 and 74H76 are positive pulse triggered flip-flops. JK information is loaded into the master while the Clock is HIGH and transferred to the slave on the HIGH-to-LOW Clock transition. The J and K inputs must be stable while the Clock is HIGH for conventional operation.

The 74LS76 is a negative edge triggered flip-flop. The J and K inputs must be stable only one setup time prior to the HIGH-to-LOW Clock transition.

The Set ( $\bar{S}_D$ ) and Reset ( $\bar{R}_D$ ) are asynchronous active LOW inputs. When LOW, they override the Clock and data inputs forcing the outputs to the steady state levels as shown in the Truth Table.

**LOGIC SYMBOL**



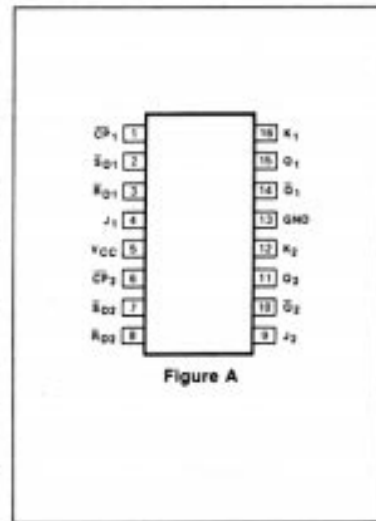
**ORDERING CODE** (See Section 9 for further Package and Ordering Information)

PACKAGES	PIN CONF.	COMMERCIAL RANGES		MILITARY RANGES	
		V <sub>CC</sub> = 5V ± 5%; T <sub>A</sub> = 0°C to +75°C		V <sub>CC</sub> = 5V ± 10%; T <sub>A</sub> = -55°C to +125°C	
Plastic DIP	Fig A Fig A	N7476N	• N74H76N N74LS76N		
Ceramic DIP	Fig A Fig A	N7476F	• N74H76F N74LS76F	S5476F	• S54H76F S54LS76F
Flatpak	Fig A Fig A			S5476W	• S54H76W S54LS76W

**INPUT AND OUTPUT LOADING AND FAN-OUT TABLE (a)**

PINS		54/74	54H/74H	54S/74S	54LS/74LS
$\bar{C}P$ Clock input	I <sub>H</sub> (μA)	80	50		80
	I <sub>L</sub> (mA)	-3.2	-2.0		-0.8
$\bar{R}_D$ Reset input	I <sub>H</sub> (μA)	80	100		60
	I <sub>L</sub> (mA)	-3.2	-4.0		-0.8
$\bar{S}_D$ Set input	I <sub>H</sub> (μA)	80	100		60
	I <sub>L</sub> (mA)	-3.2	-4.0		-0.8
JK Data inputs	I <sub>H</sub> (μA)	40	50		20
	I <sub>L</sub> (mA)	-1.6	-2.0		-0.4
Q & $\bar{Q}$ Outputs	I <sub>OH</sub> (μA)	-400	-500		-400
	I <sub>OL</sub> (mA)	16	20		4/8 (a)

**PIN CONFIGURATION**



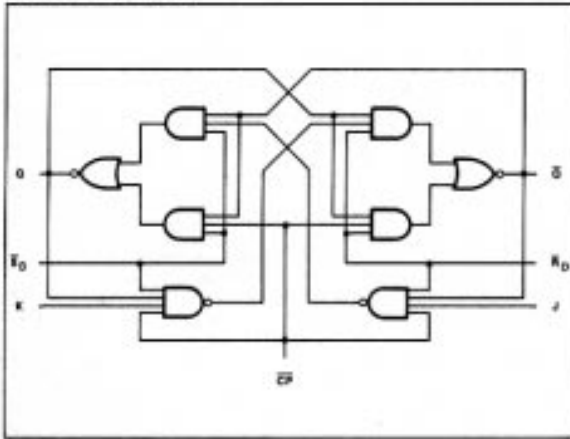
**DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (b)**

PARAMETER	TEST CONDITIONS	54/74		54H/74H		54S/74S		54LS/74LS		UNIT
		Min	Max	Min	Max	Min	Max	Min	Max	
I <sub>CC</sub> Supply current	V <sub>CC</sub> = Max, V <sub>CP</sub> = 0V		40		50				8.0	mA

NOTES

- a. The slashed numbers indicate different parametric values for Military/Commercial temperature ranges respectively.
- b. For family dc characteristics, see inside front cover for 54/74 and 54H/74H and see inside back cover for 54S/74S and 54LS/74LS specification.

LOGIC DIAGRAM



MODE SELECT—TRUTH TABLE

OPERATING MODE	INPUTS					OUTPUTS	
	$\bar{S}_D$	$\bar{R}_D$	$\overline{CP}$ (d)	J	K	Q	$\bar{Q}$
Asynchronous Set	L	H	X	X	X	H	L
Asynchronous Reset (Clear)	H	L	X	X	X	L	H
Undetermined (c)	L	L	X	X	X	H	H
Toggle	H	H	$\downarrow$	h	h	$\bar{q}$	q
Load "0" (Reset)	H	H	$\downarrow$	l	h	L	H
Load "1" (Set)	H	H	$\downarrow$	h	l	H	L
Hold "no change"	H	H	$\downarrow$	l	l	q	$\bar{q}$

H = HIGH voltage level steady state.  
 L = LOW voltage level steady state.  
 h = HIGH voltage level one setup time prior to the HIGH-to-LOW Clock transition.<sup>(a)</sup>  
 l = LOW voltage level one setup time prior to the HIGH-to-LOW Clock transition.<sup>(a)</sup>  
 X = Don't care.  
 c = Lower case letters indicate the state of the referenced output prior to the HIGH to LOW Clock transition.  
 $\downarrow$  = Positive Clock pulse.

AC CHARACTERISTICS  $T_A = 25^\circ\text{C}$  (See Section 4 for Waveforms and Conditions)

PARAMETER	TEST CONDITIONS	54/74		54H/74H		54S/74S		54LS/74LS		UNIT
		$C_L = 15\text{ pF}$ $R_L = 400\ \Omega$		$C_L = 25\text{ pF}$ $R_L = 280\ \Omega$				$C_L = 15\text{ pF}$ $R_L = 2\text{ k}\Omega$		
		Min	Max	Min	Max	Min	Max	Min	Max	
$f_{MAX}$	Maximum Clock frequency	Waveform 4		15		25			30	MHz
$t_{PLH}$ $t_{PHL}$	Propagation delay Clock to Output	Waveform 4			25		21		20	ns
$t_{PLH}$ $t_{PHL}$	Propagation delay $\bar{S}_D$ or $\bar{R}_D$ to Output	Waveform 5			25		13		20	ns
					40		24		30	ns

AC SETUP REQUIREMENTS  $T_A = 25^\circ\text{C}$  (See Section 4 for Waveforms and Conditions)

PARAMETER	TEST CONDITIONS	54/74		54H/74H		54S/74S		54LS/74LS		UNIT
		Min	Max	Min	Max	Min	Max	Min	Max	
$t_{w(H)}$	Clock pulse width (HIGH)	Waveform 4		20				20		ns
$t_{w(L)}$	Clock pulse width (LOW)	Waveform 4		47				13		ns
$t_{w(L)}$	Set or Reset pulse width (LOW)	Waveform 5		25				25		ns
$t_s$	Setup time J or K to Clock	Waveform 4		(e)				20		ns
$t_h$	Hold time J or K to Clock	Waveform 4		0				0		ns

NOTES

- c. Both outputs will be HIGH while both  $\bar{S}_D$  and  $\bar{R}_D$  are LOW, but the output states are unpredictable if  $\bar{S}_D$  and  $\bar{R}_D$  go HIGH simultaneously.
- d. The 74LS76 is edge triggered. Data must be stable one setup time prior to the negative edge of the Clock for predictable operation.
- e. The J and K inputs of the 7476 and 74H76 must be stable while the Clock is HIGH for conventional operation.