



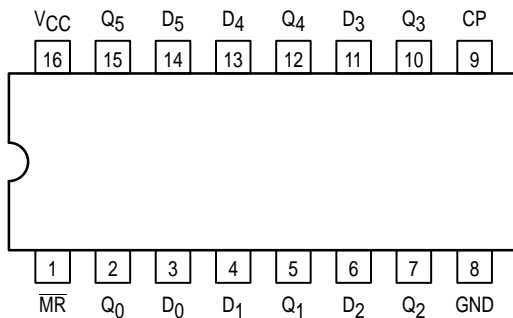
# HEX D FLIP-FLOP WITH MASTER RESET

The MC54/74F174 is a high-speed hex D flip-flop. The device is used primarily as a 6-bit edge-triggered storage register. The device has a Master Reset to simultaneously clear all flip-flops.

The F174 consists of six edge-triggered D flip-flops with individual D inputs and Q outputs. The Clock (CP) and Master Reset ( $\overline{MR}$ ) are common to all flip-flops. The state of each D input, one setup time before low-to-high clock transition, is transferred to the corresponding flip-flop's Q output. A LOW input to the Master Reset ( $\overline{MR}$ ) will force all outputs LOW independent of Clock or Data inputs. The F174 is useful for applications where only the true output is required and the Clock and Master Reset are common to all storage elements.

- Six Edge-triggered D-type Inputs
- Buffered Positive Edge-triggered Common Clock
- Buffered, Asynchronous Common Reset

## CONNECTION DIAGRAM DIP (TOP VIEW)



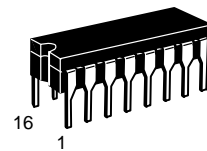
## FUNCTION TABLE

Inputs	Outputs
@ $t_n$ , $\overline{MR} = H$	@ $t_n + 1$
$D_n$	$Q_n$
H	H
L	L

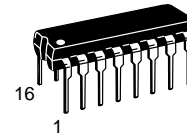
$t_n$  = Bit time before clock pulse  
 $t_n + 1$  = Bit time after clock pulse  
 H = HIGH Voltage Level  
 L = LOW Voltage Level

# MC54/74F174

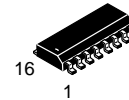
**HEX D FLIP-FLOP WITH MASTER RESET**  
**FAST™ SCHOTTKY TTL**



**J SUFFIX**  
 CERAMIC  
 CASE 620-09



**N SUFFIX**  
 PLASTIC  
 CASE 648-08

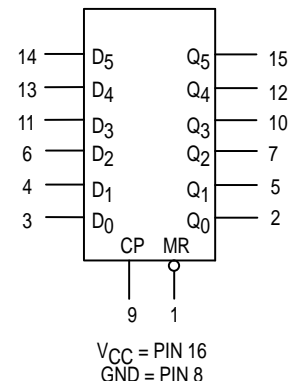


**D SUFFIX**  
 SOIC  
 CASE 751B-03

## ORDERING INFORMATION

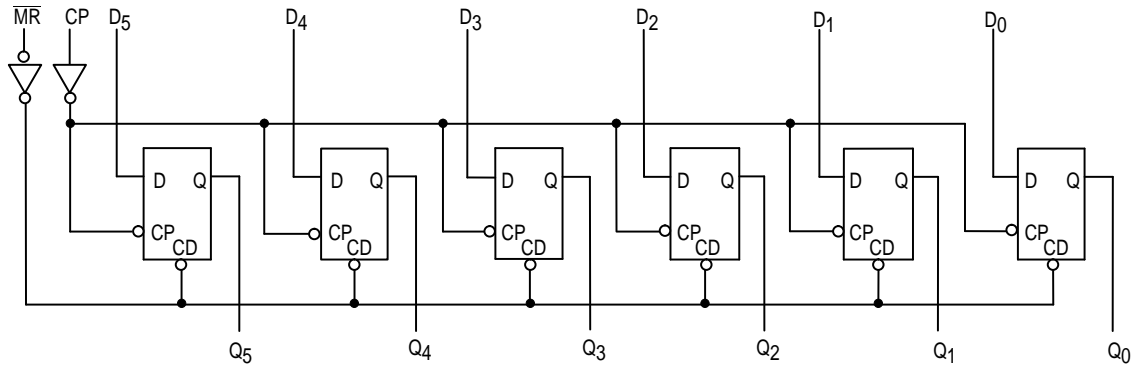
MC54FXXXJ Ceramic  
 MC74FXXXN Plastic  
 MC74FXXXD SOIC

## LOGIC SYMBOL



# MC54/74F174

## LOGIC DIAGRAM



### GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V <sub>CC</sub>	Supply Voltage	54, 74	4.5	5.0	5.5	V
T <sub>A</sub>	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
I <sub>OH</sub>	Output Current — High	54, 74			-1.0	mA
I <sub>OL</sub>	Output Current — Low	54, 74			20	mA

### DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter	Limits			Unit	Test Conditions
		Min	Typ	Max		
V <sub>IH</sub>	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage
V <sub>IL</sub>	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage
V <sub>IK</sub>	Input Clamp Diode Voltage			-1.2	V	V <sub>CC</sub> = MIN, I <sub>IN</sub> = -18 mA
V <sub>OH</sub>	Output HIGH Voltage	54, 74	2.5		V	I <sub>OL</sub> = -1.0 mA, V <sub>CC</sub> = 4.50 V
		74	2.7		V	I <sub>OL</sub> = -1.0 mA, V <sub>CC</sub> = 4.75 V
V <sub>OL</sub>	Output LOW Voltage			0.5	V	I <sub>OL</sub> = 20 mA, V <sub>CC</sub> = MIN
I <sub>IH</sub>	Input HIGH Current			20	μA	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2.7 V
				0.1	mA	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 7.0 V
I <sub>IL</sub>	Input LOW Current			-0.6	mA	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.5 V
I <sub>OS</sub>	Output Short Circuit Current (Note 2)	-60		-150	mA	V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 0 V
I <sub>CC</sub>	Power Supply Current		30	45	mA	V <sub>CC</sub> = MAX, D <sub>n</sub> = MR = 4.5 V, CP =

#### NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
- Not more than one output should be shorted at a time, nor for more than 1 second.

# MC54/74F174

## AC CHARACTERISTICS

Symbol	Parameter	54/74F			54F		74F		Unit
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0 V C <sub>L</sub> = 50 pF			T <sub>A</sub> = -55°C to +125°C V <sub>CC</sub> = 5.0 V ± 10% C <sub>L</sub> = 50 pF		T <sub>A</sub> = 0°C to +70°C V <sub>CC</sub> = 5.0 V ± 10% C <sub>L</sub> = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
f <sub>max</sub>	Maximum Clock Frequency	100	140		80		80		MHz
t <sub>PLH</sub>	Propagation Delay	3.5	5.5	8.0	3.5	10.0	3.5	9.0	ns
t <sub>PHL</sub>	CP to Q <sub>n</sub>	4.5	7.0	10	4.5	12.0	4.5	11.0	
t <sub>PHL</sub>	Propagation Delay MR to Q <sub>n</sub>	5.0	10	14	5.0	16.0	5.0	15.0	ns

## AC OPERATING REQUIREMENTS

Symbol	Parameter	54/74F			54F		74F		Unit
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0 V			T <sub>A</sub> = -55°C to +125°C V <sub>CC</sub> = 5.0 V ± 10%		T <sub>A</sub> = 0°C to +70°C V <sub>CC</sub> = 5.0 V ± 10%		
		Min	Typ	Max	Min	max	Min	Max	
t <sub>S</sub> (H)	Setup Time, HIGH or LOW	4.0			4.0		4.0		ns
t <sub>S</sub> (L)	D <sub>n</sub> to CP	4.0			4.0		4.0		
t <sub>H</sub> (H)	Hold Time, HIGH or LOW	0			1.0		0		
t <sub>H</sub> (L)	D <sub>n</sub> to CP	0			1.0		0		
t <sub>w</sub> (H)	CP Pulse Width, HIGH	4.0			4.0		4.0		ns
t <sub>w</sub> (L)	or LOW	6.0			6.0		6.0		
t <sub>w</sub> (L)	$\overline{\text{MR}}$ Pulse Width LOW	5.0			5.0		5.0		ns
t <sub>rec</sub>	Recovery Time $\overline{\text{MR}}$ to CP	5.0			5.0		5.0		ns