

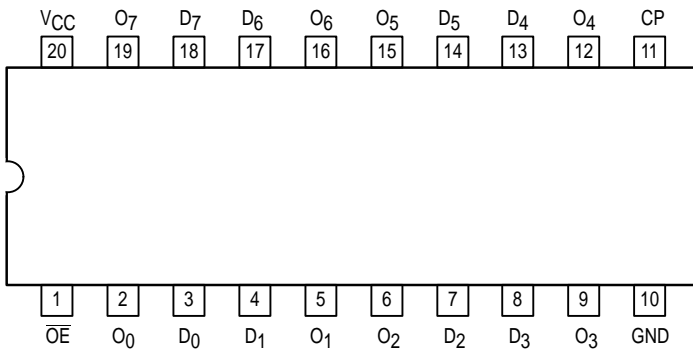


OCTAL D-TYPE FLIP-FLOP WITH 3-STATE OUTPUTS

The MC54/74F374 is a high-speed, low-power octal D-type flip-flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus oriented applications. A buffered Clock (CP) and Output Enable (\overline{OE}) are common to all flip-flops.

- Edge-triggered D-Type Inputs
- Buffered Positive Edge-triggered Clock
- 3-State Outputs for Bus-Oriented Applications
- ESD > 4000 Volts

CONNECTION DIAGRAM (TOP VIEW)



FUNCTION TABLE

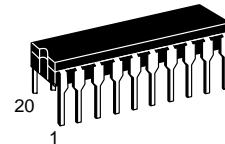
Inputs		Outputs	
D_n	CP	\overline{OE}	O_n
H		L	H
L		L	L
X	X	H	Z

H = HIGH Voltage Level
 L = LOW Voltage Level
 X = Don't Care
 Z = High Impedance

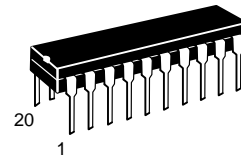
MC54/74F374

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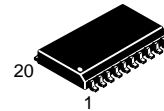
FAST™ SCHOTTKY TTL



J SUFFIX
 CERAMIC
 CASE 732-03



N SUFFIX
 PLASTIC
 CASE 738-03

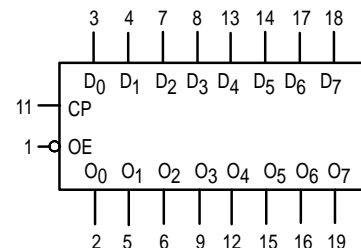


DW SUFFIX
 SOIC
 CASE 751D-03

ORDERING INFORMATION

MC54FXXXJ Ceramic
 MC74FXXXN Plastic
 MC74FXXXDW SOIC

LOGIC SYMBOL



V_{CC} = PIN 20
 GND = PIN 10

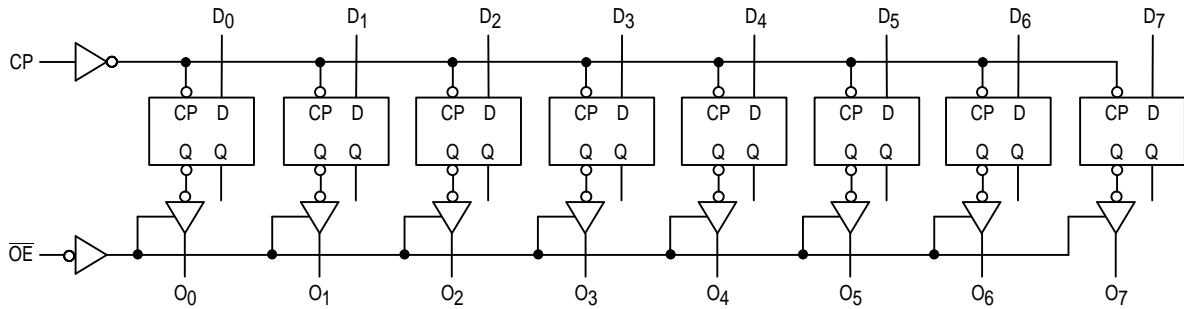
MC54/74F374

FUNCTIONAL DESCRIPTION

The F374 consists of eight edge-triggered flip-flops with individual D-type inputs and 3-state true outputs. The buffered clock and buffered Output Enable are common to all flip-flops. The eight flip-flops will store the state of their individual D inputs that meet the setup and hold time requirements on the

LOW-to-HIGH Clock (CP) transition. With the Output Enable (\overline{OE}) LOW, the contents of the eight flip-flops are available at the outputs. When the \overline{OE} is HIGH, the outputs go to the high impedance state. Operation of the \overline{OE} input does not affect the state of the flip-flops.

LOGIC DIAGRAM



DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter	Limits			Unit	Test Conditions	
		Min	Typ	Max			
V_{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage	
V_{IL}	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage	
V_{IK}	Input Clamp Diode Voltage			-1.2	V	$I_{IN} = -18 \text{ mA}$	$V_{CC} = \text{MIN}$
V_{OH}	Output HIGH Voltage	54, 74	2.4	3.3	V	$I_{OH} = -3.0 \text{ mA}$	$V_{CC} = 4.5 \text{ V}$
		74	2.7	3.3	V	$I_{OH} = -3.0 \text{ mA}$	$V_{CC} = 4.75 \text{ V}$
V_{OL}	Output LOW Voltage		0.35	0.5	V	$I_{OL} = 24 \text{ mA}$	$V_{CC} = \text{MIN}$
I_{OZH}	Output OFF Current — HIGH			50	μA	$V_{OUT} = 2.7 \text{ V}$	$V_{CC} = \text{MAX}$
I_{OZL}	Output OFF Current — LOW			-50	μA	$V_{OUT} = 0.5 \text{ V}$	$V_{CC} = \text{MAX}$
I_{IH}	Input HIGH Current			20	μA	$V_{IN} = 2.7 \text{ V}$	$V_{CC} = \text{MAX}$
				100	μA	$V_{IN} = 7.0 \text{ V}$	$V_{CC} = \text{MAX}$
I_{IL}	Input LOW Current			-0.6	mA	$V_{IN} = 0.5 \text{ V}$	$V_{CC} = \text{MAX}$
I_{OS}	Output Short Circuit Current (Note 2)	-60		-150	mA	$V_{OUT} = 0 \text{ V}$	$V_{CC} = \text{MAX}$
I_{CCZ}	Power Supply Current (All Outputs OFF)		55	86	mA	$D_n = \text{GND}$ $\overline{OE} = 4.5 \text{ V}$	$V_{CC} = \text{MAX}$

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.

MC54/74F374

GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V _{CC}	Supply Voltage	54, 74	4.5	5.0	5.5	V
T _A	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
I _{OH}	Output Current — HIGH	54, 74			-3.0	mA
I _{OL}	Output Current — LOW	54, 74			24	mA

AC CHARACTERISTICS

Symbol	Parameter	54/74F			54F		74F		Unit
		T _A = +25°C V _{CC} = +5.0 V C _L = 50 pF			T _A = -55°C to +125°C V _{CC} = 5.0 V ± 10% C _L = 50 pF		T _A = 0°C to +70°C V _{CC} = 5.0 V ± 10% C _L = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
f _{max}	Maximum Clock Frequency	100			60		70		MHz
t _{PLH}	Propagation Delay	4.0	6.5	8.5	4.0	10.5	4.0	10	ns
t _{PHL}	CP to O _n	4.0	6.5	8.5	4.0	11	4.0	10	
t _{PZH}	Output Enable Time	2.0	9.0	11.5	2.0	14	2.0	12.5	ns
t _{PZL}		2.0	5.8	7.5	2.0	10	2.0	8.5	
t _{PHZ}	Output Disable Time	2.0	5.3	7.0	2.0	8.0	2.0	8.0	ns
t _{PLZ}		2.0	4.3	5.5	2.0	7.5	2.0	6.5	

AC OPERATING REQUIREMENTS

Symbol	Parameter	54/74F			54F		74F		Unit
		T _A = +25°C V _{CC} = +5.0 V			T _A = -55°C to +125°C V _{CC} = 5.0 V ± 10%		T _A = 0°C to +70°C V _{CC} = 5.0 V ± 10%		
		Min	Typ	Max	Min	Max	Min	Max	
t _S (H)	Setup Time, HIGH or LOW	2.0			2.5		2.0		ns
t _S (L)	D _n to CP	2.0			2.0		2.0		
t _H (H)	Hold Time, HIGH or LOW	2.0			2.0		2.0		
t _H (L)	D _n to CP	2.0			2.5		2.0		
t _W (H)	CP Pulse Width, HIGH or LOW	7.0			7.0		7.0		ns
t _W (L)		6.0			6.0		6.0		