

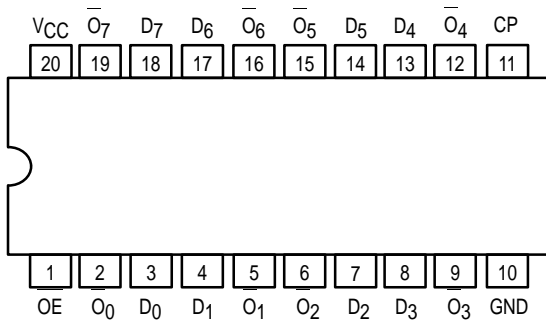


# OCTAL D-TYPE FLIP-FLOP WITH 3-STATE OUTPUTS

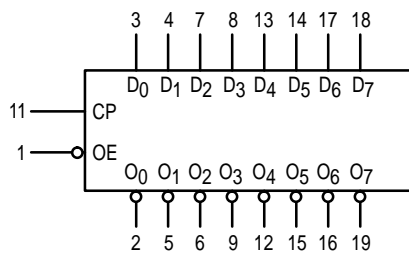
The MC54/74F534 is a high-speed, low-power octal D-type flip-flop featuring separate D-type inputs for each flip-flop and 3-state outputs for bus oriented applications. A buffered Clock (CP) and Output Enable (OE) are common to all flip-flops. The F534 is the same as the F374 except that the outputs are inverted.

- Edge-Triggered D-Type Inputs
- Buffered Positive Edge-Triggered Clock
- 3-State Outputs for Bus Oriented Applications

### CONNECTION DIAGRAM



### LOGIC SYMBOL

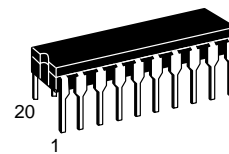


VCC = PIN 20  
GND = PIN 10

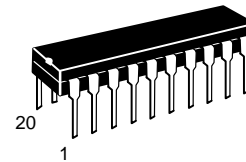
## MC54/74F534

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

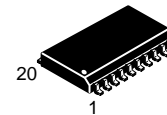
FAST™ SCHOTTKY TTL



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

### GUARANTEED OPERATING RANGES

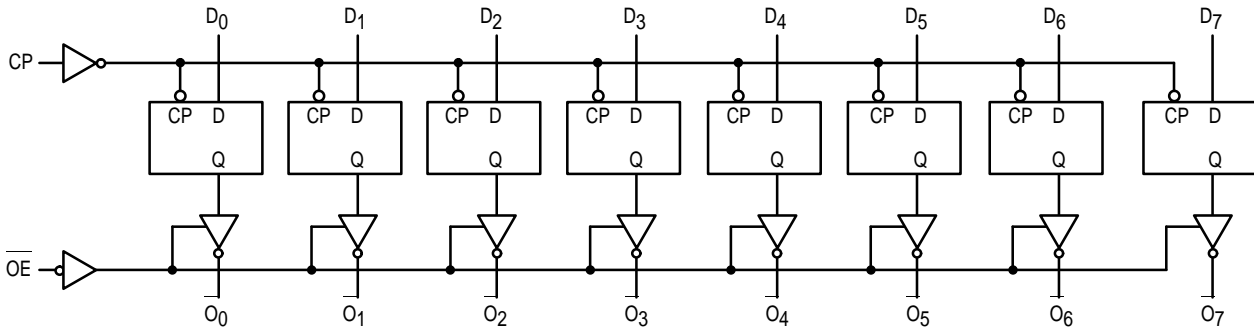
Symbol	Parameter	Min	Typ	Max	Unit	
VCC	Supply Voltage	54, 74	4.5	5.0	5.5	V
TA	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
IOH	Output Current — High	54, 74			-3.0	mA
IOL	Output Current — Low	54, 74			24	mA

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# MC54/74F534

## LOGIC DIAGRAM



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

## FUNCTIONAL DESCRIPTION

The F534 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 times requirements on the

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

## 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	$\mu\text{A}$	$V_{OUT} = 2.7 \text{ V}$	$V_{CC} = \text{MAX}$
$I_{OZL}$	Output OFF Current — LOW			-50	$\mu\text{A}$	$V_{OUT} = 0.5 \text{ V}$	$V_{CC} = \text{MAX}$
$I_{IH}$	Input HIGH Current			20	$\mu\text{A}$	$V_{IN} = 2.7 \text{ V}$	$V_{CC} = \text{MAX}$
				100		$V_{IN} = 7.0 \text{ V}$	
$I_{IL}$	Input LOW Current			-0.6	$\text{mA}$	$V_{IN} = 0.5 \text{ V}$	$V_{CC} = \text{MAX}$
$I_{OS}$	Output Short Circuit Current (Note 2)	-60		-150	$\text{mA}$	$V_{OUT} = 0 \text{ V}$	$V_{CC} = \text{MAX}$
$I_{CCZ}$	Power Supply Current		55	86	$\text{mA}$	$D_n = \text{Gnd}$ $\text{OE} = 4.5 \text{ V}$	$V_{CC} = \text{MAX}$

### NOTES:

1. For conditions such as MIN or MAX, use the appropriate value specified under guaranteed operating ranges.
2. Not more than one output should be shorted at a time, nor for more than 1 second.

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# MC54/74F534

## 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 to +125°C V <sub>CC</sub> = 5.0 V ±10% C <sub>L</sub> = 50 pF		T <sub>A</sub> = 0 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			60		70		MHz
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CP to O <sub>n</sub>	4.0	6.5	8.5	4.0	10.5	4.0	10	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time	2.0	9.0	11.5	2.0	14	2.0	12.5	ns
t <sub>PHZ</sub> t <sub>PLZ</sub>	Output Disable Time	2.0	5.3	7.0	2.0	8.0	2.0	8.0	
		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 <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0 V			T <sub>A</sub> = -55 to +125°C V <sub>CC</sub> = 5.0 V ±10%		T <sub>A</sub> = 0 to +70°C V <sub>CC</sub> = 5.0 V ±10%		
		Min	Typ	Max	Min	Max	Min	Max	
t <sub>S</sub> (H) t <sub>S</sub> (L)	Setup Time, HIGH or LOW D <sub>n</sub> to CP	2.0			2.5		2.0		ns
t <sub>H</sub> (H) t <sub>H</sub> (L)	Hold Time, HIGH or LOW D <sub>n</sub> to CP	2.0			2.0		2.0		
t <sub>w</sub> (H) t <sub>w</sub> (L)	CP Pulse Width HIGH or LOW	7.0			7.0		7.0		ns
		6.0			6.0		6.0		


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