

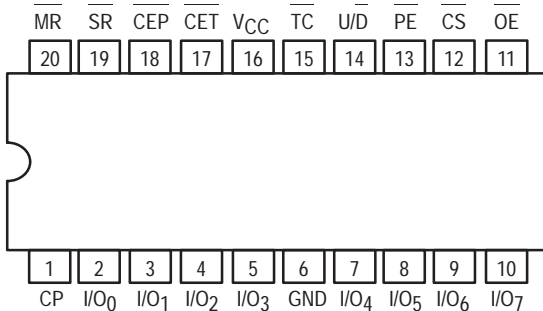


# 8-BIT BIDIRECTIONAL BINARY COUNTER (3-STATE)

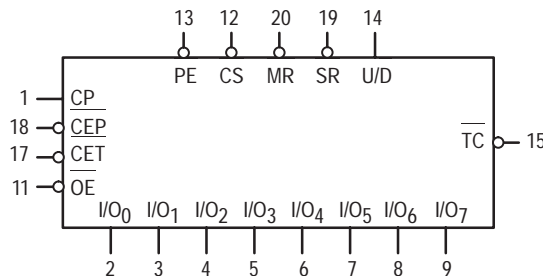
The MC74F579 is a fully synchronous 8-stage up/down counter with multiplexed 3-state I/O ports for bus-oriented applications. It features a preset capability for programmable operation, carry look-ahead for easy cascading and a U/D input to control the direction of counting. All state changes, except for the case of asynchronous reset, are initiated by the rising edge of the clock. TC output is not recommended for use as a clock or asynchronous reset due to the possibility of decoding spikes.

- Multiplexed 3-State I/O Ports For Bus-oriented Applications
- Built-In Cascading Carry Capability
- Count Frequency 115 MHz Typ
- Supply Current 100 mA Typ
- Fully Synchronous Operation
- U/D Pin to Control Direction of Counting
- Separate Pins for Master Reset and Synchronous Reset
- Center Power Pins to Reduce Effects of Package Inductance
- See F269 for 24-Pin Separate I/O Port Version
- See F779 for 16-Pin Version
- ESD Protection > 4000 Volts

### PIN ASSIGNMENT



### LOGIC SYMBOL

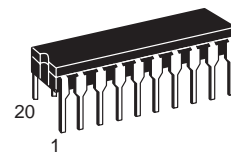


### GUARANTEED OPERATING RANGES

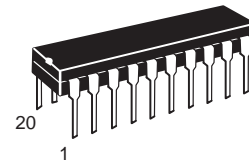
Symbol	Parameter	Min	Typ	Max	Unit
V <sub>CC</sub>	Supply Voltage	4.5	5.0	5.5	V
T <sub>A</sub>	Operating Ambient Temperature Range	0	25	70	°C
I <sub>OH</sub>	Output Current — High	TC		-1.0	mA
		I/O <sub>n</sub>		-3.0	
I <sub>OL</sub>	Output Current — Low	TC		20	mA
		I/O <sub>n</sub>		24	

MC74F579

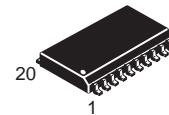
8-BIT BIDIRECTIONAL BINARY COUNTER (3-STATE)  
FAST™ SCHOTTKY TTL



J SUFFIX  
CERAMIC  
CASE 732-03



N SUFFIX  
PLASTIC  
CASE 738-03



DW SUFFIX  
SOIC  
CASE 751D-03

### ORDERING INFORMATION

MC74FXXXJ Ceramic  
MC74FXXXN Plastic  
MC74FXXXDW SOIC

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# MC74F579

## FUNCTION TABLE

MR	SR	CS	PE	CEP	CET	U/D	OE	CP	Function
X	X	H	X	X	X	X	X	X	I/O <sub>0</sub> to I/O <sub>7</sub> in Hi-Z (PE disabled)
X	X	L	H	X	X	X	H	X	I/O <sub>0</sub> to I/O <sub>7</sub> in Hi-Z
X	X	L	H	X	X	X	L	X	Flip-Flop outputs appear on I/O lines
L	X	X	X	X	X	X	X	X	Asynchronous reset for all flip-flops
H	L	X	X	X	X	X	X	↑	Synchronous reset for all flip-flops
H	H	L	L	X	X	X	X	↑	Parallel load all flip-flops
H	H	(not LL)		H	X	X	X	↑	Hold
H	H	(not LL)		X	H	X	X	↑	Hold (TC held high)
H	H	(not LL)		L	L	H	X	↑	Count up
H	H	(not LL)		L	L	L	X	↑	Count down

H = High voltage level  
 X = Don't care  
 (not LL) = CS and PE should never both be low voltage at the same time  
 L = Low voltage level  
 ↑ = Low-to-High clock transition

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

Symbol	Parameter	74F			Unit	Test Conditions (Note 1)		
		Min	Typ (2)	Max				
V <sub>OH</sub>	Output HIGH Voltage	TC	2.5			V	I <sub>OH</sub> = -1.0 mA V <sub>IL</sub> = MAX V <sub>IH</sub> = MIN	V <sub>CC</sub> = 4.5 V
			2.7	3.4			V <sub>CC</sub> = 4.75 V	
		I/O <sub>n</sub>	2.4	3.3		V	I <sub>OH</sub> = -3.0 mA V <sub>IL</sub> = MAX V <sub>IH</sub> = MIN	V <sub>CC</sub> = 4.5 V
			2.7	3.3				V <sub>CC</sub> = 4.75 V
V <sub>OL</sub>	Output LOW Voltage	TC		0.35	V	I <sub>OL</sub> = 20 mA I <sub>OL</sub> = 24 mA	V <sub>CC</sub> = 4.5 V V <sub>IL</sub> = MAX V <sub>IH</sub> = MIN	
		I/O <sub>n</sub>		0.5				
V <sub>IK</sub>	Input Clamp Diode Voltage		-0.73	-1.2	V	V <sub>CC</sub> = 4.5 V, I <sub>IN</sub> = -18 mA		
I <sub>IH</sub>	Input HIGH Current	I/O <sub>n</sub>		1.0	mA	V <sub>CC</sub> = 5.5 V	V <sub>IN</sub> = 5.5 V	
		others		100			V <sub>IN</sub> = 7.0 V	
		I/O <sub>n</sub>		70	μA	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 2.7 V		
		others		20				
I <sub>IL</sub>	Input LOW Current	Except I/O <sub>n</sub>		-0.6	mA	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0.5 V		
I <sub>OZH</sub>	OFF-State Current High-Level Voltage Applied	I/O <sub>n</sub>		70	μA	V <sub>CC</sub> = 5.5 V	V <sub>OUT</sub> = 2.7 V	
I <sub>OZL</sub>	OFF-State Current Low-Level Voltage Applied			-600			V <sub>OUT</sub> = 0.5 V	
I <sub>OS</sub>	Output Short Circuit Current (Note 3)		-60	-80	-150	mA	V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 0 V	
I <sub>CC</sub>	Total Supply Current (total)	I <sub>CC</sub> H		95	135	mA	V <sub>CC</sub> = MAX	
		I <sub>CC</sub> L		105	145			
		I <sub>CC</sub> Z		105	150			

### NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under guaranteed operating conditions for the applicable device type.
- All typical values are at V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25°C.
- Not more than one output should be shorted at a time. For I<sub>OS</sub> testing, the use of high-speed test apparatus and/or sample-and-hold techniques are preferable in order to minimize internal heating and more accurately reflect operational values. Otherwise, prolonged shorting of a HIGH output may raise the chip temperature well above normal and thereby cause invalid readings in other parameter tests. In any sequence of parameter tests, I<sub>OS</sub> tests should be performed last.

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## AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	74F			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> = 0°C to +70°C V <sub>CC</sub> = +5.0 V ±10% C <sub>L</sub> = 50 pF		
		Min	Typ	Max	Min	Max	
f <sub>MAX</sub>	Maximum Clock Frequency	100			80		MHz
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CP to I/O <sub>n</sub>	5.0 5.0		10.5 10.5	5.0 5.0	11.5 11.5	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CP to TC	4.5 5.5		10 10	4.5 5.0	11 11	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay U/D to TC	3.5 4.5		8.0 8.0	3.5 4.5	9.0 9.0	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay CET to TC	3.5 3.5		7.0 8.0	3.5 3.5	8.5 8.5	ns
t <sub>PHL</sub>	Propagation Delay MR to I/O <sub>n</sub>	5.0		10	5.0	11	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time to HIGH or LOW Level CS, PE to I/O <sub>n</sub>	4.5 6.5		10.5 10.5	4.5 6.0	11.5 11.5	ns
t <sub>PHZ</sub> t <sub>PLZ</sub>	Output Disable Time to HIGH or LOW Level CS, PE to I/O <sub>n</sub>	3.0 4.0		7.5 9.5	3.0 4.0	9.0 11	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time to HIGH or LOW Level OE to I/O <sub>n</sub>	4.0 6.0		8.5 9.5	4.0 5.0	9.5 10.5	ns
t <sub>PHZ</sub> t <sub>PLZ</sub>	Output Disable Time to HIGH or LOW Level OE to I/O <sub>n</sub>	1.0 2.5		6.0 7.0	1.0 2.5	6.5 8.0	ns

## AC SETUP REQUIREMENTS

Symbol	Parameter	74F			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> = 0°C to +70°C V <sub>CC</sub> = +5.0 V ±10% C <sub>L</sub> = 50 pF		
		Min	Typ	Max	Min	Typ	
t <sub>s(H)</sub> t <sub>s(L)</sub>	Setup Time, HIGH or LOW I/O <sub>n</sub> to CP	3.0 3.0			4.0 4.0		ns
t <sub>h(H)</sub> t <sub>h(L)</sub>	Hold Time, HIGH or LOW I/O <sub>n</sub> to CP	1.0 1.0			1.0 1.0		ns
t <sub>s(H)</sub> t <sub>s(L)</sub>	Setup Time, HIGH or LOW PE, SR or CS to CP	9.5 9.5			10 10		ns
t <sub>h(H)</sub> t <sub>h(L)</sub>	Hold Time, HIGH or LOW PE, SR or CS to CP	0 0			0 0		ns
t <sub>s(H)</sub> t <sub>s(L)</sub>	Setup Time, HIGH or LOW CET, CEP to CP	5.0 9.0			5.5 10.5		ns
t <sub>h(H)</sub> t <sub>h(L)</sub>	Hold Time, HIGH or LOW CET, CEP to CP	0 0			0 0		ns
t <sub>w</sub>	CP Pulse Width	4.5			6.0		ns
t <sub>w(L)</sub>	MR Pulse Width	3.5			4.5		ns
t <sub>rec</sub>	MR Recovery Time	4.0			4.5		ns

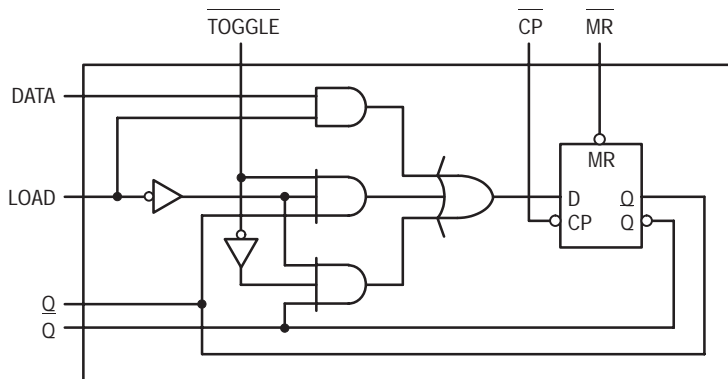
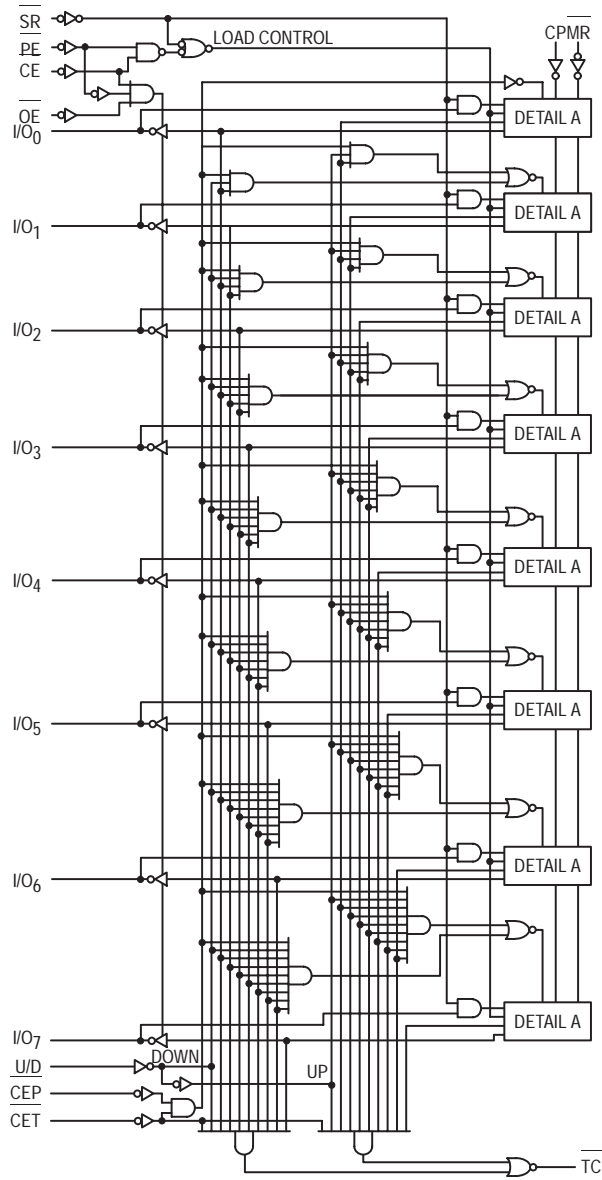
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## LOGIC DIAGRAM




Detail A

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