

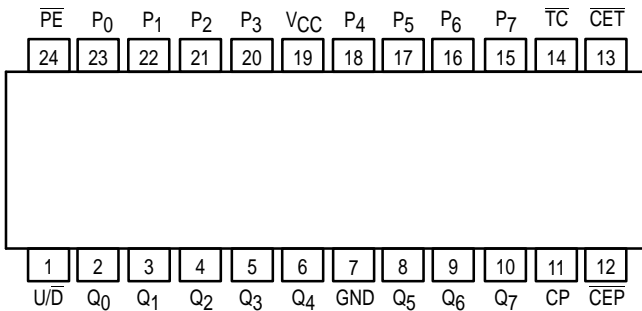


8-BIT BIDIRECTIONAL BINARY COUNTER

The MC74F269 is a fully synchronous 8-stage up/down counter featuring a preset capability for programmable operation, carry look-ahead for easy cascading and a U/\bar{D} input to control the direction of counting. All state changes, whether in counting or parallel loading, are initiated by the rising edge of the clock.

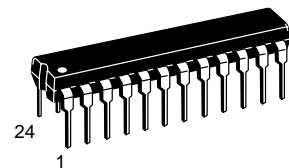
- Synchronous Counting and Loading
- Built-In Lookahead Carry Capability
- Count Frequency 115 MHz Typical
- Supply Current 95 mA Typical

PIN ASSIGNMENT

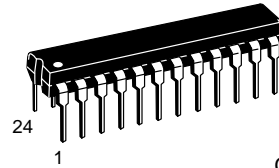


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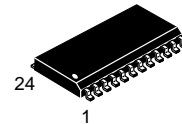
8-BIT BIDIRECTIONAL BINARY COUNTER
FAST™ SCHOTTKY TTL



J SUFFIX
 CERAMIC
 CASE 758-01



N SUFFIX
 PLASTIC
 CASE 724-03



DW SUFFIX
 SOIC
 CASE 751E-03

ORDERING INFORMATION

MC74FXXXJ Ceramic
 MC74FXXXN Plastic
 MC74FXXXDW SOIC

GUARANTEED OPERATING RANGES

Symbol	Parameter	74	Min	Typ	Max	Unit
V _{CC}	Supply Voltage	74	4.5	5.0	5.5	V
T _A	Operating Ambient Temperature Range	74	0	25	70	°C
I _{OH}	Output Current — High	74			-1.0	mA
I _{OL}	Output Current — Low	74			20	mA

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FUNCTION TABLE

Operating Mode	Inputs						Outputs	
	CP	U/D	$\overline{\text{CEP}}$	$\overline{\text{CET}}$	$\overline{\text{PE}}$	P_n	Q_n	$\overline{\text{TC}}$
Parallel Load	↑	X	X	X	l	l	L	(a)
	↑	X	X	X	l	h	H	(a)
Count Up	↑	h	l	l	h	X	Count Up	(a)
Count Down	↑	l	l	l	h	X	Count Down	(a)
Hold Do Nothing	↑	X	h	X	h	X	q_n	(a)
	↑	X	X	h	h	X	q_n	H

H = HIGH voltage level steady state

h = HIGH voltage level one set-up time prior to the LOW-to-HIGH clock transition

L = LOW voltage level steady state

l = LOW voltage level one set-up time prior to the LOW-to-HIGH clock transition

X = Don't care

q = Lower case letters indicate the state of the referenced output prior to the LOW-to-HIGH clock transition

↑ = LOW-to-HIGH clock transition

(a) = The TC is LOW when CET is LOW and the counter is at Terminal Count. Terminal Count Up is with all Q_n outputs HIGH and Terminal Count Down is with all Q_n outputs LOW.

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (Unless otherwise specified)

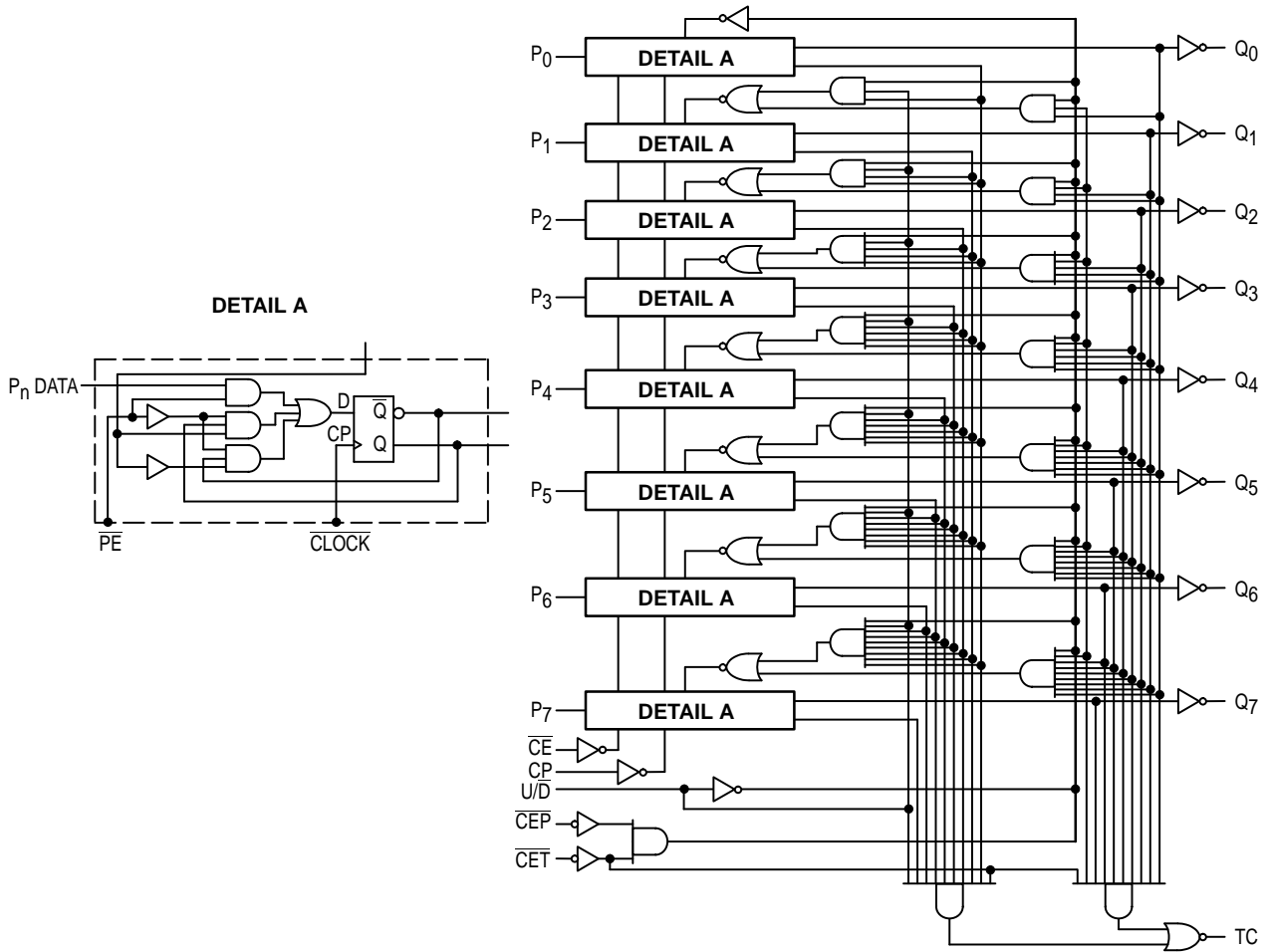
Symbol	Parameter		Limits			Unit	Test Conditions	
			Min	Typ	Max			
V_{OH}	Output HIGH Voltage	74	2.5			V	$I_{OH} = -1.0 \text{ mA}$	$V_{CC} = 4.5 \text{ V}$
			2.7	3.4				$V_{CC} = 4.75 \text{ V}$
V_{OL}	Output LOW Voltage	74		0.35	0.5	V	$I_{OL} = 20 \text{ mA}, V_{CC} = 4.5 \text{ V}$	
V_{IK}	Input Clamp Diode Voltage				-1.2	V	$V_{CC} = \text{MIN}, I_{IN} = -18 \text{ mA}$	
I_{IH}	Input HIGH Current				100	μA	$V_{CC} = \text{MAX}$	$V_{IN} = 7.0 \text{ V}$
					20			$V_{IN} = 2.7 \text{ V}$
I_{IL}	Input LOW Current				-0.6	mA	$V_{CC} = \text{MAX}, V_{IN} = 0.5 \text{ V}$	
I_{OS}	Output Short Circuit Current (Note 2)		-60		-150	mA	$V_{CC} = \text{MAX}, V_{OUT} = 0 \text{ V}$	
I_{CC}	Total Supply Current (total)		I_{CCH}	93	120	mA	$V_{CC} = \text{MAX}$	(Note 3)
			I_{CCL}	98	125			(Note 4)

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under guaranteed operating conditions for the applicable device type.
- Not more than one output should be shorted at a time, nor for more than 1 second.
- $\overline{\text{PE}} = \overline{\text{CET}} = \overline{\text{CEP}} = \text{U/D} = \text{GND}; \text{P}_n = 4.5 \text{ V}; \text{CP} = \uparrow$
- $\overline{\text{PE}} = \overline{\text{CET}} = \overline{\text{CEP}} = \text{U/D} = \text{GND}; \text{CP} = \uparrow$

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LOGIC DIAGRAM



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AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	74F			74F		Unit
		T _A = +25°C V _{CC} = +5.0 V 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	
f _{MAX}	Maximum Clock Frequency	100			85		MHz
t _{PLH} t _{PHL}	Propagation Delay CP to Q _n (Load) \overline{PE} = LOW	3.0 4.0	5.5 5.0	9.0 9.0	3.0 4.0	9.5 9.5	ns
t _{PLH} t _{PHL}	Propagation Delay CP to Q _n (Count) \overline{PE} = HIGH	3.0 4.5	6.0 7.0	9.0 10	2.5 4.5	10 10.5	ns
t _{PLH} t _{PHL}	Propagation Delay CP to \overline{TC}	4.5 5.0	7.5 7.5	10 10	4.5 5.0	10.5 11	ns
t _{PLH} t _{PHL}	Propagation Delay \overline{CET} to \overline{TC}	3.5 3.5	5.0 5.5	9.0 9.0	3.5 3.5	10 10	ns
t _{PLH} t _{PHL}	Propagation Delay U/ \overline{D} to \overline{TC}	4.0 4.5	6.0 5.5	9.0 9.5	4.0 4.5	10 10	ns

AC SETUP REQUIREMENTS

Symbol	Parameter	74F			74F			Unit
		T _A = +25°C V _{CC} = +5.0 V 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	Typ	Max	
t _S (H) t _S (L)	Set-up Time, HIGH or LOW P to CP	2.0 2.0			2.5 2.5			ns
t _H (H) t _H (L)	Hold Time, HIGH or LOW P to CP	1.0 1.0			1.0 1.0			ns
t _S (H) t _S (L)	Set-up Time, HIGH or LOW \overline{PE} to CP	5.0 5.5			5.5 6.5			ns
t _H (H) t _H (L)	Hold Time, HIGH or LOW \overline{PE} to CP	0 0			0 0			ns
t _S (H) t _S (L)	Set-up Time, HIGH or LOW \overline{CET} , \overline{CEP} to CP	4.5 4.5			5.5 5.5			ns
t _H (H) t _H (L)	Hold Time, HIGH or LOW \overline{CET} , \overline{CEP} to CP	0 0			0 0			ns
t _S (H) t _S (L)	Set-up Time, HIGH or LOW U/ \overline{D} to CP	6.0 7.0			7.0 8.0			ns
t _H (H) t _H (L)	Hold Time, HIGH or LOW U/ \overline{D} to CP	0 0			0 0			ns
t _W (H) t _W (L)	Clock Pulse Width CP	4.0 4.5			4.0 5.0			ns

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TIMING DIAGRAM

