

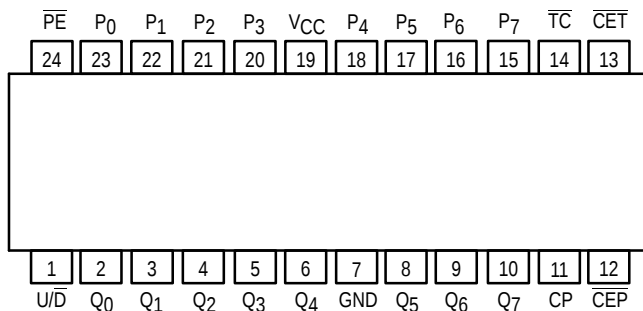


8-BIT BIDIRECTIONAL BINARY COUNTER

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

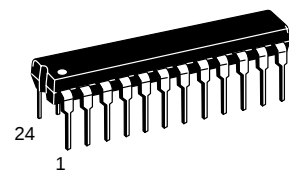
PIN ASSIGNMENT



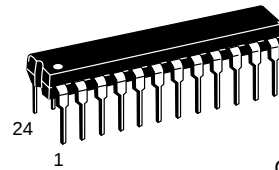
MC74F269

**8-BIT BIDIRECTIONAL
BINARY COUNTER**

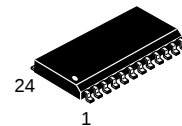
FAST™ SCHOTTKY TTL



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		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	$\uparrow$ $\uparrow$	X X	X X	X X	l l	l h	L H	(a) (a)
Count Up	$\uparrow$	h	l	l	h	X	Count Up	(a)
Count Down	$\uparrow$	l	l	l	h	X	Count Down	(a)
Hold Do Nothing	$\uparrow$ $\uparrow$	X X	h X	X h	h h	X X	q_n q_n	(a) 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

$\uparrow$ = 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)

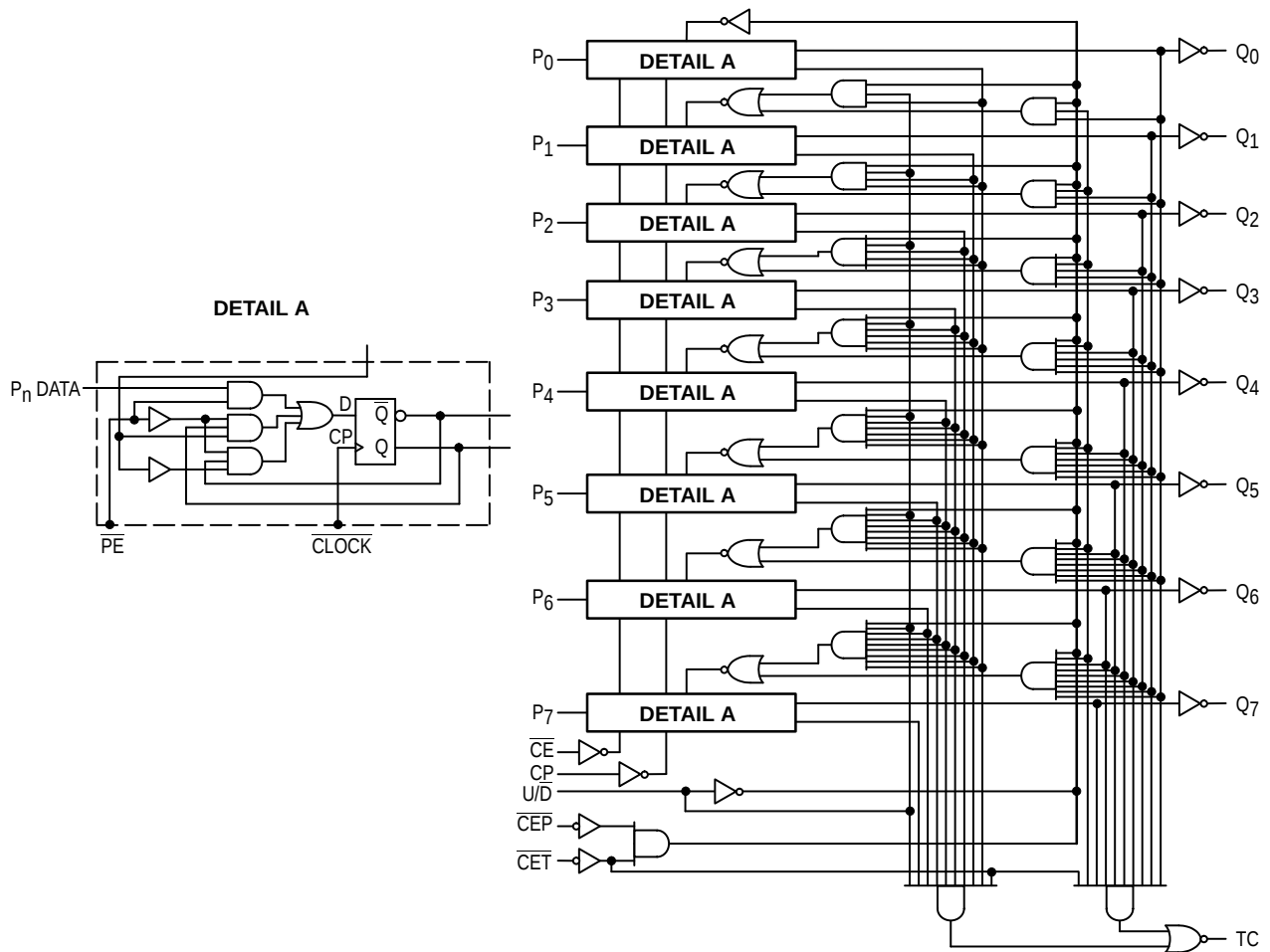
Symbol	Parameter		Limits			Unit	Test Conditions	
			Min	Typ	Max			
V _{OH}	Output HIGH Voltage	74	2.5			V	I _{OH} = −1.0 mA	V _{CC} = 4.5 V
			2.7	3.4				V _{CC} = 4.75 V
V _{OL}	Output LOW Voltage	74		0.35	0.5	V	I _{OL} = 20 mA, V _{CC} = 4.5 V	
V _{IK}	Input Clamp Diode Voltage				−1.2	V	V _{CC} = MIN, I _{IN} = −18 mA	
I _{IH}	Input HIGH Current				100	μA	V _{CC} = MAX	V _{IN} = 7.0 V
					20			V _{IN} = 2.7 V
I _{IL}	Input LOW Current				−0.6	mA	V _{CC} = MAX, V _{IN} = 0.5 V	
I _{OS}	Output Short Circuit Current (Note 2)		−60		−150	mA	V _{CC} = MAX, V _{OUT} = 0 V	
I _{CC}	Total Supply Current (total)	I _{CCH}		93	120	mA	V _{CC} = 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.
- $\text{PE} = \text{CET} = \text{CEP} = \text{U/D} = \text{GND}; \text{P}_n = 4.5 \text{ V}; \text{CP} = \uparrow$
- $\text{PE} = \text{CET} = \text{CEP} = \text{U/D} = \text{GND}; \text{CP} = \uparrow$

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LOGIC DIAGRAM



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AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	74F			74F		Unit
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V}$ $C_L = 50\text{ pF}$			$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V } \pm 10\%$ $C_L = 50\text{ pF}$		
		Min	Typ	Max	Min	Max	
f _{MAX}	Maximum Clock Frequency	100			85		MHz
t _{PLH} t _{PHL}	Propagation Delay CP to Q _n (Load) $\overline{PE} = \text{LOW}$	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) $\overline{PE} = \text{HIGH}$	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 CET to 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
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V}$ $C_L = 50\text{ pF}$			$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V } \pm 10\%$ $C_L = 50\text{ pF}$			
		Min	Typ	Max	Min	Typ	Max	
$t_S(\text{H})$ $t_S(\text{L})$	Set-up Time, HIGH or LOW P to CP	2.0 2.0			2.5 2.5			ns
$t_H(\text{H})$ $t_H(\text{L})$	Hold Time, HIGH or LOW P to CP	1.0 1.0			1.0 1.0			ns
$t_S(\text{H})$ $t_S(\text{L})$	Set-up Time, HIGH or LOW $\overline{PE}$ to CP	5.0 5.5			5.5 6.5			ns
$t_H(\text{H})$ $t_H(\text{L})$	Hold Time, HIGH or LOW $\overline{PE}$ to CP	0 0			0 0			ns
$t_S(\text{H})$ $t_S(\text{L})$	Set-up Time, HIGH or LOW $\overline{CET}$, $\overline{CEP}$ to CP	4.5 4.5			5.5 5.5			ns
$t_H(\text{H})$ $t_H(\text{L})$	Hold Time, HIGH or LOW $\overline{CET}$, $\overline{CEP}$ to CP	0 0			0 0			ns
$t_S(\text{H})$ $t_S(\text{L})$	Set-up Time, HIGH or LOW $U/\overline{D}$ to CP	6.0 7.0			7.0 8.0			ns
$t_H(\text{H})$ $t_H(\text{L})$	Hold Time, HIGH or LOW $U/\overline{D}$ to CP	0 0			0 0			ns
$t_W(\text{H})$ $t_W(\text{L})$	Clock Pulse Width CP	4.0 4.5			4.0 5.0			ns

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TIMING DIAGRAM

