

HD74AC269/HD74ACT269

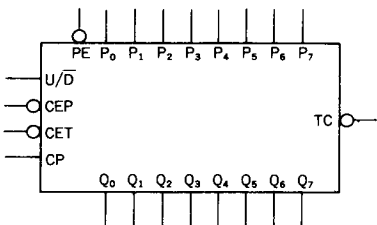
•8-Bit Bidirectional Binary Counter

Description

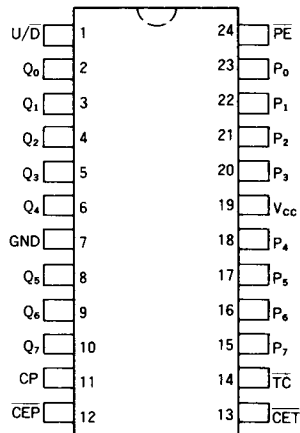
The AC269 is a fully synchronous 8-stage up/down counter featuring a preset capability for programmable operation, carry lookahead for easy cascading and a U/D input to control the direction of counting. All state changes, whether in counting or parallel loading, are initiated by the rising edge of the clock.

- Synchronous Counting and Loading
- Built-in Lookahead Carry Capability
- Output Source/Sink 24mA
- HD74ACT269 has TTL Compatible Inputs

Logic Symbol



Pin Assignment



(Top View)

Pin Names

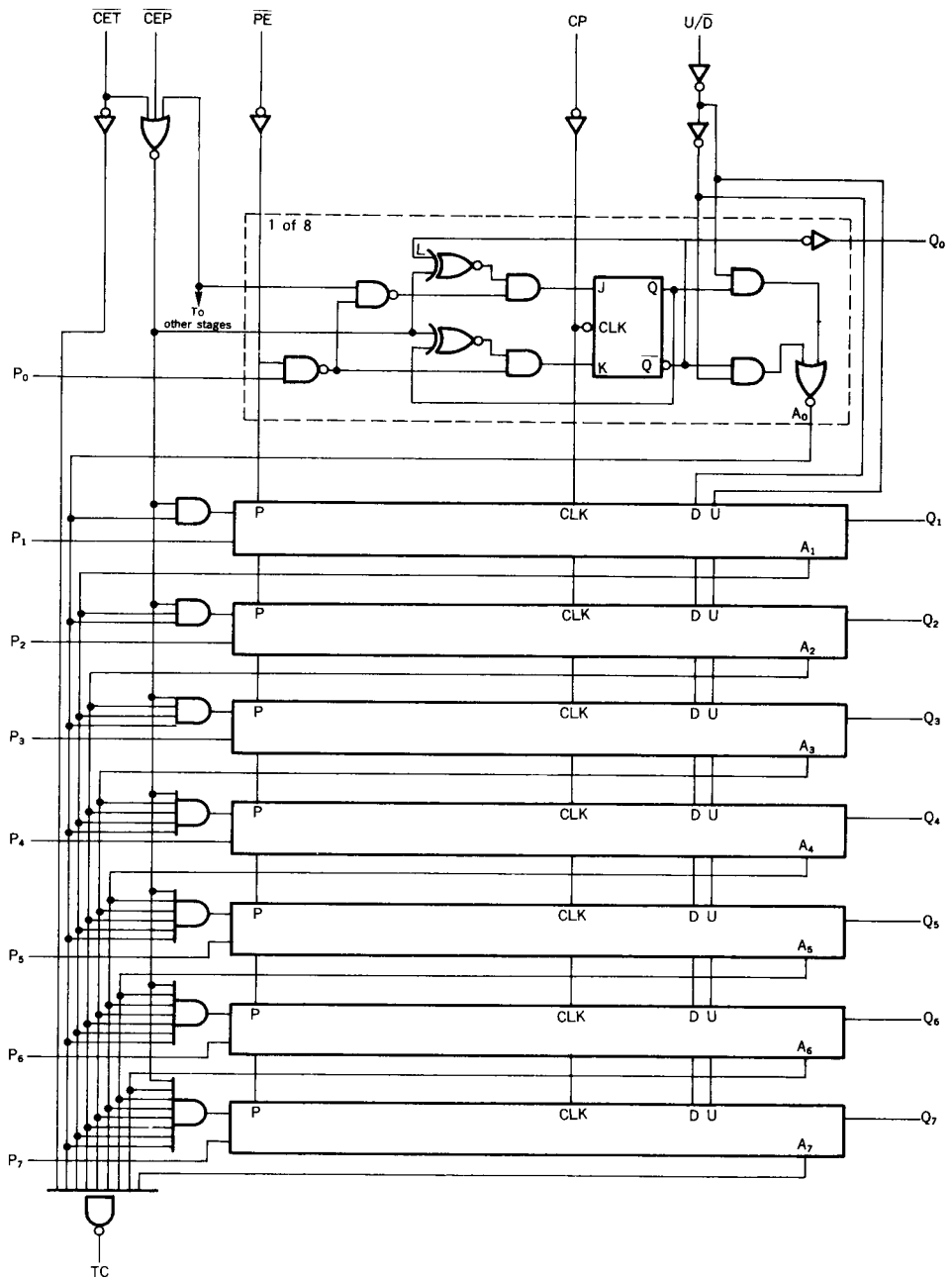
- P₀-P₇ Parallel Data Inputs
- PE Parallel Enable Input (Active LOW)
- U/D Up-Down Count Control Input
- CEP Count Enable Parallel Inupt (Active LOW)
- CET Count Enable Trickle Input (Active LOW)
- CP Clock Input
- TC Terminal Count Output (Active LOW)
- Q₀-Q₇ Flip-Flop Outputs

Function Table

PE	CEP	CET	U/D	CP	Function
L	X	X	X	↑	Parallel Load all Flip-Flops
H	H	X	X	↑	Hold
H	X	H	X	↑	Hold (TC held HIGH)
H	L	L	H	↑	Count Up
H	L	L	L	↑	Count Down

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
↑ = Transition LOW-to-HIGH

Logic Diagram



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DC Characteristics

Symbol	Parameter	Max	Unit	Condition
I _{cc}	Maximum Quiescent Supply Current	80	μA	V _{IN} =V _{CC} or Ground, V _{CC} =5.5V, Ta=Worst Case
I _{cc}	Maximum Quiescent Supply Current	8.0	μA	V _{IN} =V _{CC} or Ground, V _{CC} =5.5V, Ta=25°C
I _{CCT}	Maximum I _{cc} /Input (HD74ACT269)	1.5	mA	V _{IN} =V _{CC} -2.1V V _{CC} =5.5V, Ta=Worst Case

AC Characteristics: HD74AC269

Symbol	Parameter	V _{cc} * (V)	Ta = +25°C C _L = 50pF			Ta = -40°C to +85°C C _L = 50pF		Unit
			Min	Typ	Max	Min	Max	
f _{max}	Maximum Clock Frequency	3.3 5.0	65 85			55 75		MHz
t _{PLH}	Propagation Delay CP to Qn	3.3 5.0	1.0 1.0		15.0 11.5	1.0 1.0	18.0 13.0	ns
t _{PHL}	Propagation Delay CP to Qn	3.3 5.0	1.0 1.0		15.0 11.5	1.0 1.0	18.0 13.0	ns
t _{PLH}	Propagation Delay U/D to TC	3.3 5.0	1.0 1.0		23.0 16.0	1.0 1.0	26.0 19.0	ns
t _{PHL}	Propagation Delay CP to TC	3.3 5.0	1.0 1.0		24.0 18.0	1.0 1.0	28.0 21.0	ns
t _{PLH}	Propagation Delay CET to TC	3.3 5.0	1.0 1.0		12.0 9.5	1.0 1.0	14.0 11.0	ns

* Voltage Range 3.3 is 3.3V ± 0.3V
 Voltage Range 5.0 is 5.0V ± 0.5V

AC Operating Requirements: HD74AC269

Symbol	Parameter	Vcc* (V)	Ta = +25°C CL = 50pF		Ta = -40°C to +85°C CL = 50pF		Unit
			Typ	Guaranteed Minimum			
tSU	Setup Time, HIGH or LOW Data to CP	3.3 5.0		5.5 4.0	6.0 4.5	ns	
th	Hold Time, HIGH or LOW Data to CP	3.3 5.0		2.0 1.5	2.5 2.0	ns	
tSU	Setup Time, HIGH or LOW CET or CEP to CP	3.3 5.0		5.5 4.0	6.0 4.5	ns	
th	Hold Time, HIGH or LOW CET or CEP to CP	3.3 5.0		1.5 0.5	2.0 1.0	ns	
tSU	Setup Time, HIGH or LOW PE to CP	3.3 5.0		5.5 4.0	6.0 4.5	ns	
th	Hold Time, HIGH PE to CP	3.3 5.0		2.0 1.5	2.5 2.0	ns	
tW	Pulse Width	3.3 5.0		5.5 4.0	6.0 4.5	ns	

* Voltage Range 3.3 is 3.3V ± 0.3V
 Voltage Range 5.0 is 5.0V ± 0.5V

AC Characteristics:HD74ACT269

Symbol	Parameter	Vcc* (V)	Ta = +25°C CL = 50pF			Ta = -40°C to +85°C CL = 50pF		Unit
			Min	Typ	Max	Min	Max	
f _{max}	Maximum Clock Frequency	5.0	80			70		MHz
t _{PLH}	Propagation Delay CP to Qn	5.0	1.0		12.0	1.0	14.0	ns
t _{PHL}	Propagation Delay CP to Qn	5.0	1.0		12.0	1.0	14.0	ns
t _{PLH}	Propagation Delay U/D to TC	5.0	1.0		19.0	1.0	22.0	ns
t _{PHL}	Propagation Delay CP to TC	5.0	1.0		19.0	1.0	22.0	ns
t _{PLH}	Propagation Delay CET to TC	5.0	1.0		10.0	1.0	11.5	ns

* Voltage Range 5.0 is 5.0V ± 0.5V

AC Operating Requirements:HD74ACT269

Symol	Parameter	Vcc* (V)	Ta = +25°C CL = 50pF		Ta = -40°C to +85°C CL = 50pF	Unit
			Typ	Guaranteed Minimum		
t _{su}	Setup Time, HIGH or LOW Data to CP	5.0		7.0	8.0	ns
t _h	Hold Time, HIGH or LOW Data to CP	5.0		1.5	2.0	ns
t _{su}	Setup Time, HIGH or LOW CET or CEP to CP	5.0		7.0	8.0	ns
t _h	Hold Time, HIGH or LOW CET or CEP to CP	5.0		0.5	1.0	ns
t _{su}	Setup Time, HIGH or LOW PE to CP	5.0		7.0	8.0	ns
t _h	Hold Time, HIGH or LOW PE to CP	5.0		2.0	2.5	ns
t _w	Pulse Width	5.0		7.0	8.0	ns

* Voltage Range 5.0 is 5.0V ± 0.5V

Capacitance

Symbol	Parameter	Typ	Unit	Condition
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = 5.5V
C _{PD}	Power Dissipation Capacitance		pF	V _{CC} = 5.0V