

HD74HC592

8-bit Register/Binary Counter

HITACHI

Description





The HD74HC592 consists of a parallel input, 8-bit storage register feeding an 8-bit binary counter. Both the register and the counter have individual positive edge-triggered clocks. In addition, the counter has direct load and clear functions. Expansion is easily accomplished by connecting $\overline{\text{RCO}}$ of the first stage to the count enable of the second stage, etc.

Features

- High Speed Operation: t_{pd} (CCK to $\overline{\text{RCO}}$) = 24 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 2$ to 6 V
- Low Input Current: 1 μA max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μA max ($T_a = 25^\circ\text{C}$)

Function Table

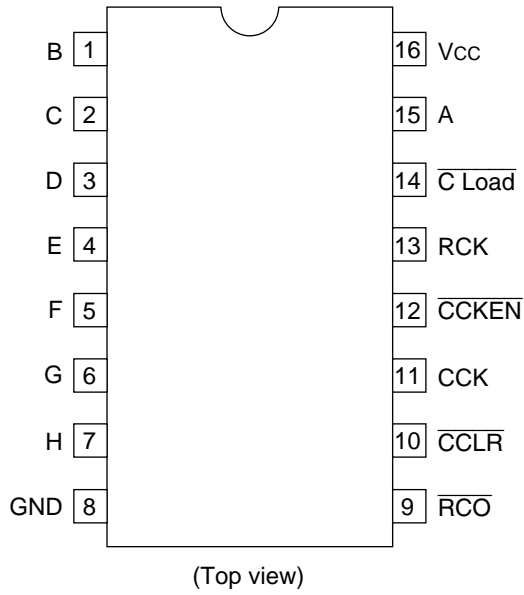
Inputs

RCK	CLoad	CCLR	CCKEN	CCK	Function
X	L	H	X	X	Register data loaded into counter
X	H	L	X	X	Counter clear
	H	H	X	X	Input data A to H stored into register
	H	H	X	X	No change in register
X	H	H	L		Count up
X	H	H	L		No count
X	H	H	H	X	No count

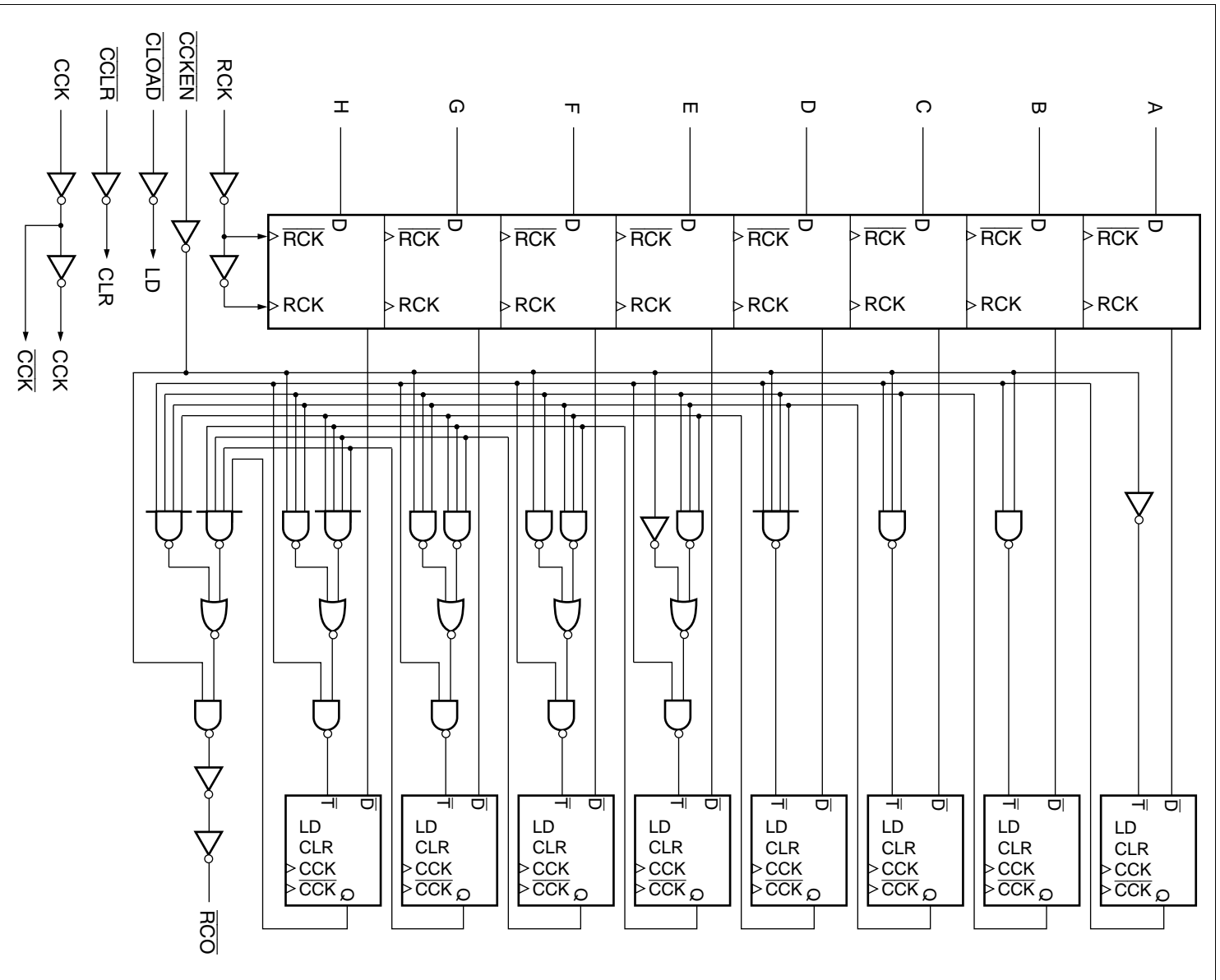
$\overline{\text{RCO}} = \overline{\text{QA}} \cdot \overline{\text{QB}} \cdot \overline{\text{QC}} \cdot \overline{\text{QD}} \cdot \overline{\text{QE}} \cdot \overline{\text{QF}} \cdot \overline{\text{QG}} \cdot \overline{\text{QH}} \cdot (\overline{\text{CCKEN}})$ (QA' to QH': Output of Internal Counter)

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Pin Arrangement



Logic Diagram



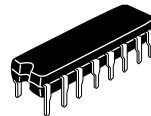
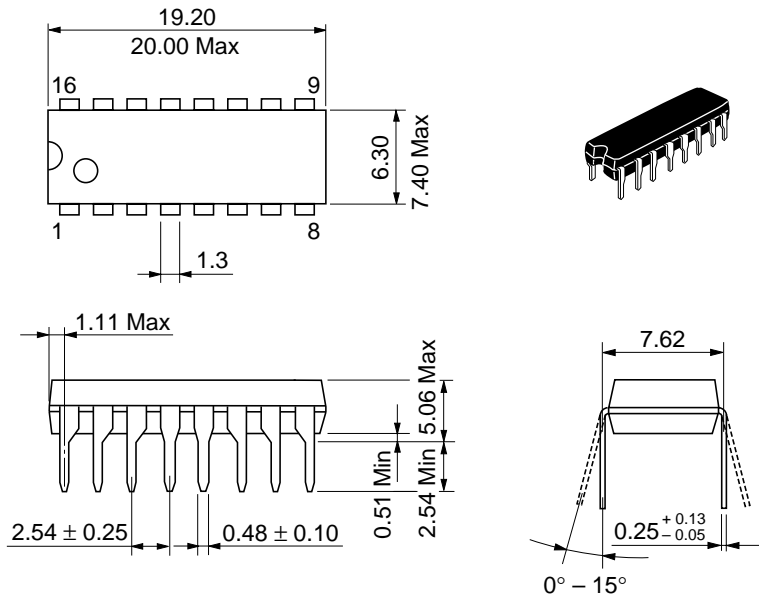
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DC Characteristics

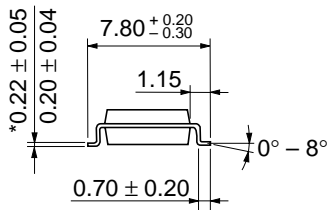
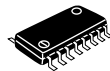
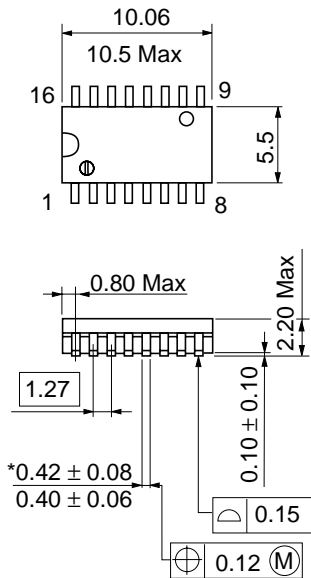
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V _{IL}	2.0	—	—	0.5	—	0.5			V
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V _{OH}	2.0	1.9	2.0	—	1.9	—	V	Vin = V _{IH} or V _{IL} I _{OH} = -20 μA	
		4.5	4.4	4.5	—	4.4	—			
		6.0	5.9	6.0	—	5.9	—			
		4.5	4.18	—	—	4.13	—			I _{OH} = -4 mA
		6.0	5.68	—	—	5.63	—			I _{OH} = -5.2 mA
	V _{OL}	2.0	—	0.0	0.1	—	0.1	V	Vin = V _{IH} or V _{IL} I _{OL} = 20 μA	
		4.5	—	0.0	0.1	—	0.1			
		6.0	—	0.0	0.1	—	0.1			
		4.5	—	—	0.26	—	0.33			I _{OL} = 4 mA
		6.0	—	—	0.26	—	0.33			I _{OL} = 5.2 mA
Input current	I _{in}	6.0	—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND	
Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, I _{out} = 0 μA	

AC Characteristics ($C_L = 50$ pF, Input $t_r = t_f = 6$ ns)

Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$		$T_a = -40$ to $+85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min			Max
Maximum clock frequency	f_{max}	2.0	—	—	5	—	4	MHz	
		4.5	—	—	25	—	20		
		6.0	—	—	29	—	24		
Propagation delay time	t_{PLH}	2.0	—	—	200	—	250	ns	$\overline{\text{CCK}}$ to $\overline{\text{RCO}}$
		4.5	—	24	40	—	50		
		6.0	—	—	34	—	43		
	t_{PHL}	2.0	—	—	200	—	250	ns	$\overline{\text{C}}$ Load to $\overline{\text{RCO}}$
		4.5	—	27	40	—	50		
		6.0	—	—	34	—	43		
	t_{PLH}	2.0	—	—	200	—	250	ns	$\overline{\text{CCLR}}$ to $\overline{\text{RCO}}$
		4.5	—	26	40	—	50		
		6.0	—	—	34	—	43		
	t_{PHL}	2.0	—	—	300	—	375	ns	$\overline{\text{RCK}}$ to $\overline{\text{RCO}}$
		4.5	—	29	60	—	75		
		6.0	—	—	51	—	64		
Pulse width	t_w	2.0	80	—	—	100	—	ns	
		4.5	16	8	—	20	—		
		6.0	14	—	—	17	—		
Removal time	t_{rem}	2.0	100	—	—	125	—	ns	$\overline{\text{CCLR}}$ to CCK
		4.5	20	12	—	25	—		
		6.0	17	—	—	21	—		
Setup time	t_{su}	2.0	100	—	—	125	—	ns	$\overline{\text{CCKEN}}$ to CCK
		4.5	20	0	—	25	—		
		6.0	17	—	—	21	—		
	t_{TLH}	2.0	200	—	—	250	—	ns	CCK to RCK
		4.5	40	14	—	50	—		
		6.0	34	—	—	43	—		
Output rise/fall time	t_{THL}	2.0	—	—	75	—	95	ns	
		4.5	—	5	15	—	19		
		6.0	—	—	13	—	16		
Input capacitance	C_{in}	—	—	5	10	—	10	pF	

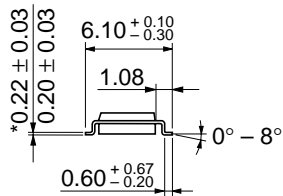
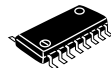
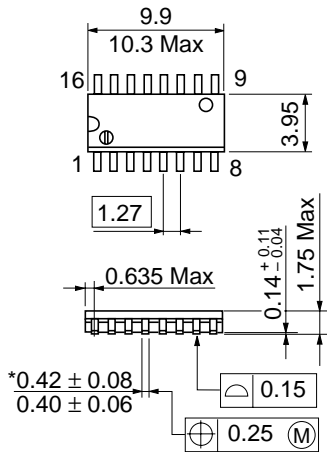


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

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