

# HD74HC374/HD74HC534

Octal D-type Flip-Flops (with 3-state outputs)  
Octal D-type Flip-flops (with inverted 3-state outputs)

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## Description

These devices are positive edge triggered flip-flops. The difference between HD74HC374 and HD74HC534 is only that the former is a true outputs and the latter is a false outputs. Data at the D inputs, meeting the setup and hold time requirements, are transferred to the Q outputs on positive going transitions of the clock (CK) input. When a high logic level is applied to the output control (OC) input, all outputs go to a high impedance state, regardless of what signals are present at the other inputs and the state of the storage elements.

## Features

- High Speed Operation:  $t_{pd}$  (Clock to Q) = 18 ns typ ( $C_L = 50$  pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage:  $V_{CC} = 2$  to 6 V
- Low Input Current: 1  $\mu$ A max
- Low Quiescent Supply Current:  $I_{CC}$  (static) = 4  $\mu$ A max ( $T_a = 25^\circ\text{C}$ )

## Function Table

Output Control	Clock	D	HD74HC374 Q	HD74HC534 $\bar{Q}$
L		H	H	L
L		L	L	H
L	L	X	No change	No change
H	X	X	Z	Z

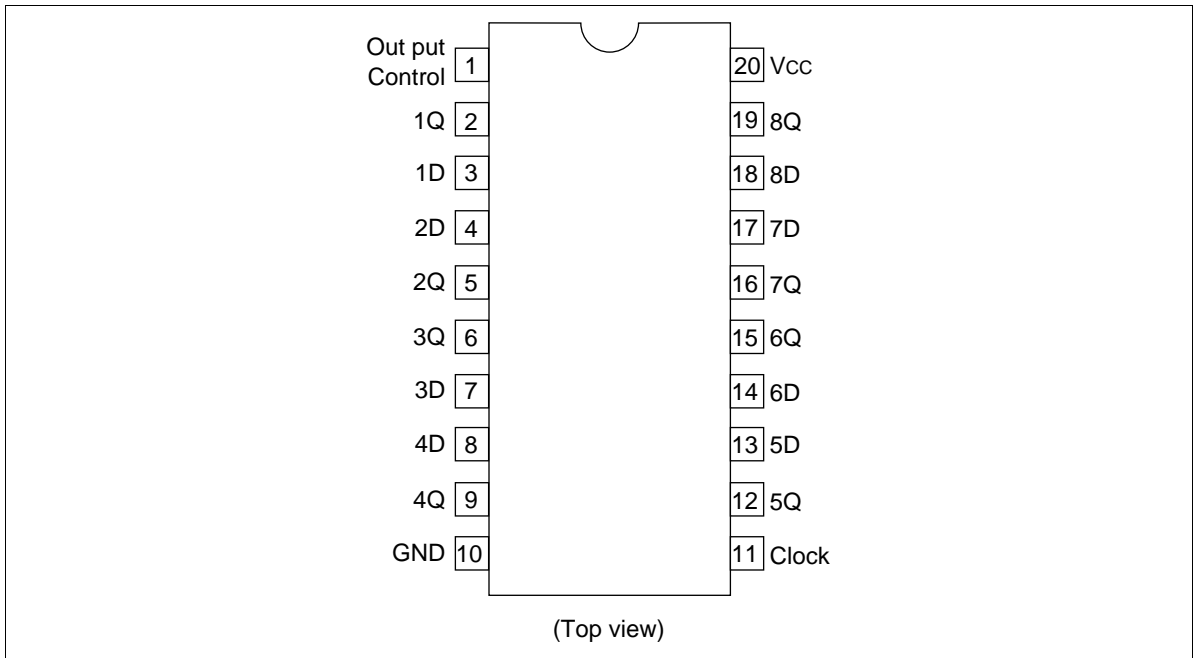
X : irrelevant

Z : off (high-impedance) state of a 3-state output.

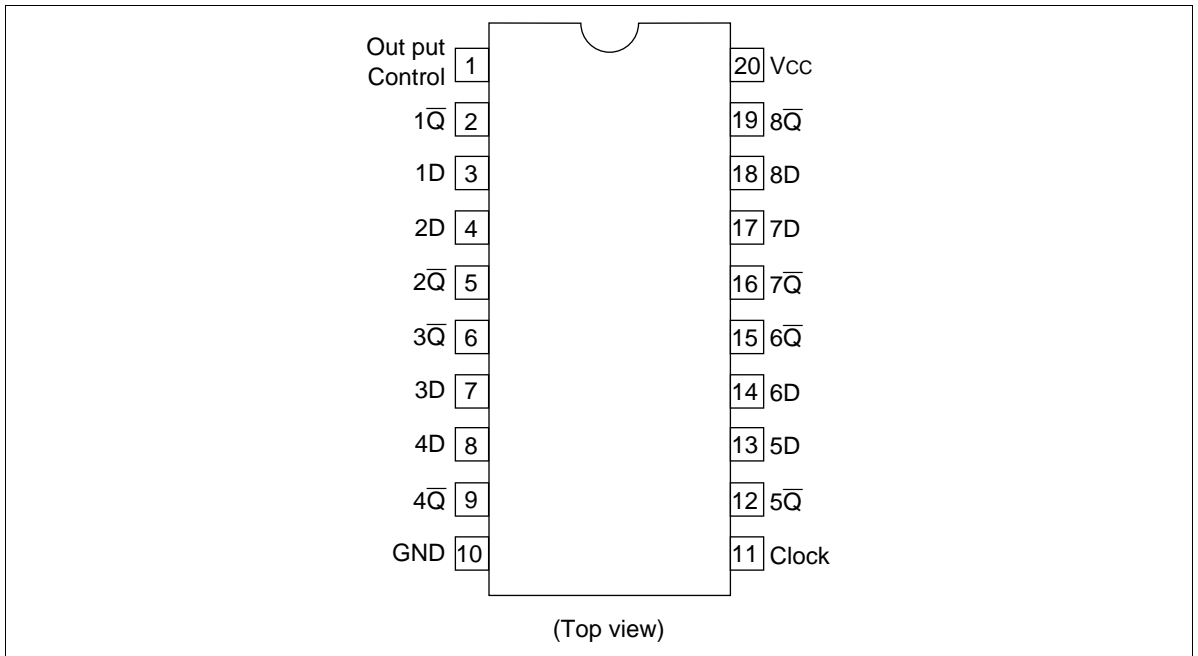
# HD74HC374/HD74HC534

## Pin Arrangement

### HD74HC374



### HD74HC534



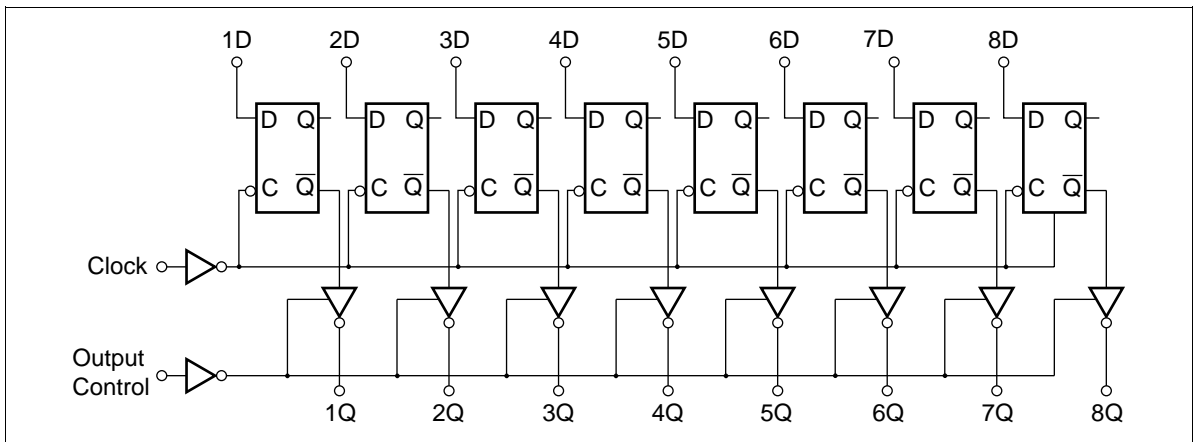
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**Absolute Maximum Ratings**

Item	Symbol	Rating	Unit
Supply voltage range	$V_{CC}$	-0.5 to +7.0	V
Input voltage	$V_{IN}$	-0.5 to $V_{CC} + 0.5$	V
Output voltage	$V_{OUT}$	-0.5 to $V_{CC} + 0.5$	V
DC current drain per pin	$I_{OUT}$	$\pm 35$	mA
DC current drain per $V_{CC}$ , GND	$I_{CC}$ , $I_{GND}$	$\pm 75$	mA
DC input diode current	$I_{IK}$	$\pm 20$	mA
DC output diode current	$I_{OK}$	$\pm 20$	mA
Power Dissipation per package	$P_T$	500	mW
Storage temperature	Tstg	-65 to +150	$^{\circ}C$

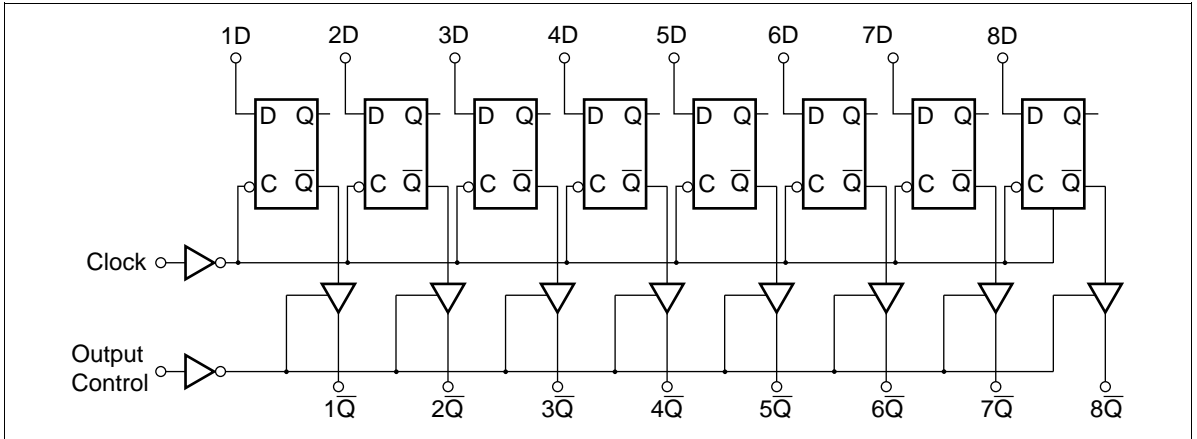
**Block Diagram**

**HD74HC374**



# HD74HC374/HD74HC534

## HD74HC534



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DC Characteristics

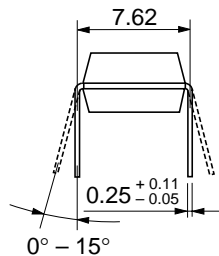
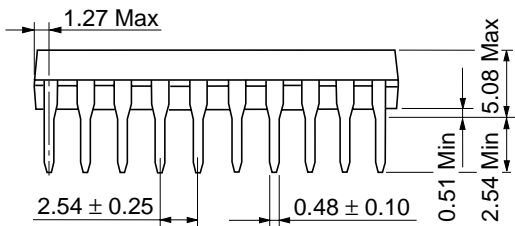
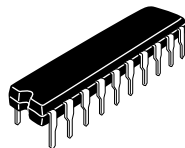
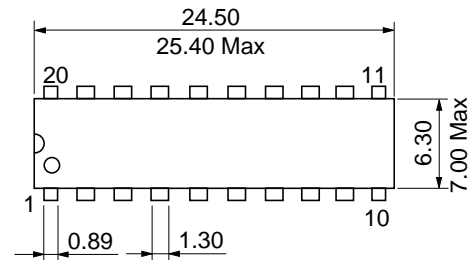
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min			Max
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V	
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5		V
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—	1.8		
Output voltage	V <sub>OH</sub>	2.0	1.9	2.0	—	1.9	—	Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OH</sub> = -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 <sub>OH</sub> = -6 mA
		6.0	5.68	—	—	5.63	—		I <sub>OH</sub> = -7.8 mA
	V <sub>OL</sub>	2.0	—	0.0	0.1	—	0.1	Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OL</sub> = 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 <sub>OL</sub> = 6 mA
		6.0	—	—	0.26	—	0.33		I <sub>OL</sub> = 7.8 mA
Off-state output current	I <sub>OZ</sub>	6.0	—	—	±0.5	—	±5.0	μA	Vin = V <sub>IH</sub> or V <sub>IL</sub> , Vout = V <sub>CC</sub> or GND
Input current	I <sub>in</sub>	6.0	—	—	±0.1	—	±1.0	μA	Vin = V <sub>CC</sub> or GND
Quiescent supply current	I <sub>CC</sub>	6.0	—	—	4.0	—	40	μA	Vin = V <sub>CC</sub> or GND, Iout = 0 μA

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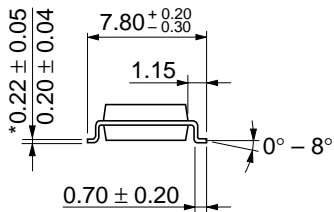
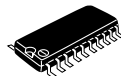
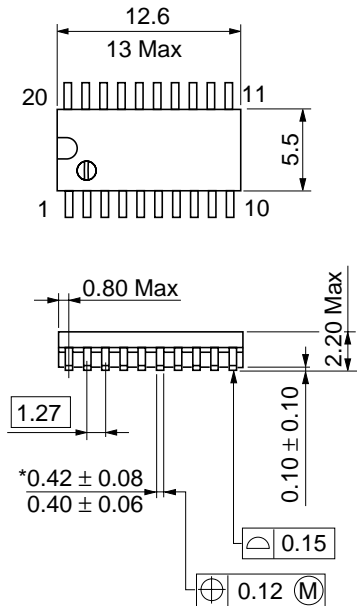
AC Characteristics ( $C_L = 50$  pF, Input  $t_r = t_f = 6$  ns)

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	—	—	6	—	5	MHz	
		4.5	—	—	30	—	24		
		6.0	—	—	35	—	28		
Propagation delay time	$t_{PHL}$	2.0	—	—	140	—	175	ns	
	$t_{PLH}$	4.5	—	18	28	—	35		
		6.0	—	—	24	—	30		
Output enable time	$t_{ZL}$	2.0	—	—	150	—	190	ns	
		4.5	—	11	30	—	38		
		6.0	—	—	26	—	33		
	$t_{ZH}$	2.0	—	—	150	—	190	ns	
		4.5	—	14	30	—	38		
		6.0	—	—	26	—	33		
Output disable time	$t_{LZ}$	2.0	—	—	150	—	190	ns	
		4.5	—	13	30	—	38		
		6.0	—	—	26	—	33		
	$t_{HZ}$	2.0	—	—	150	—	190	ns	
		4.5	—	16	30	—	38		
		6.0	—	—	26	—	33		
Setup time	$t_{su}$	2.0	100	—	—	125	—	ns	Data to Clock
		4.5	20	1	—	25	—		
		6.0	17	—	—	21	—		
Hold time	$t_h$	2.0	25	—	—	31	—	ns	Clock to Data
		4.5	5	1	—	6	—		
		6.0	5	—	—	6	—		
Pulse width	$t_w$	2.0	80	—	—	100	—	ns	Clock or Output control
		4.5	16	6	—	20	—		
		6.0	14	—	—	17	—		
Output rise/fall time	$t_{TLH}$	2.0	—	—	60	—	75	ns	
	$t_{THL}$	4.5	—	4	12	—	15		
		6.0	—	—	10	—	13		
Input capacitance	$C_{in}$	—	—	5	10	—	10	pF	

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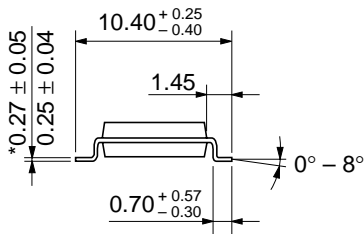
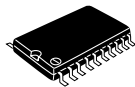
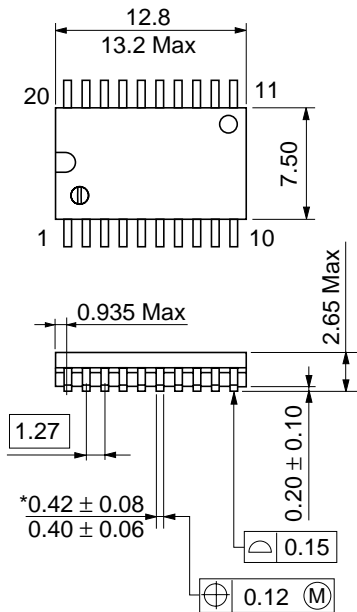
Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g



Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.31 g

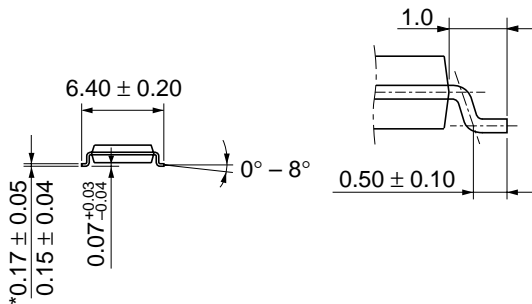
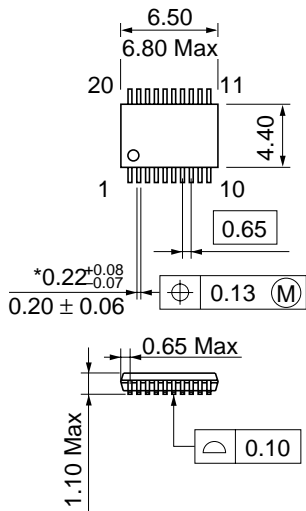
\*Dimension including the plating thickness  
Base material dimension





Hitachi Code	FP-20DB
JEDEC	Conforms
EIAJ	—
Weight (reference value)	0.52 g

\*Dimension including the plating thickness  
 Base material dimension



\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	TTP-20DA
JEDEC	—
EIAJ	—
Weight (reference value)	0.07 g

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