

HD74HCT374/HD74HCT534

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

HITACHI

ADE-205-556 (Z)
1st. Edition
Sep. 2000

Description

These device are positive edge triggered flip-flops. The difference between HD74HCT374 and HD74HCT534 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

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation: t_{pd} (Clock to Q) = 15 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 4.5$ to 5.5 V
- Low Input Current: 1 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)

Function Table

Output Control	Clock	D	HD74HCT374 Q	HD74HCT534 $\bar{Q}$
L		H	H	L
L		L	L	H
L	L	X	No change	No change
H	X	X	Z	Z

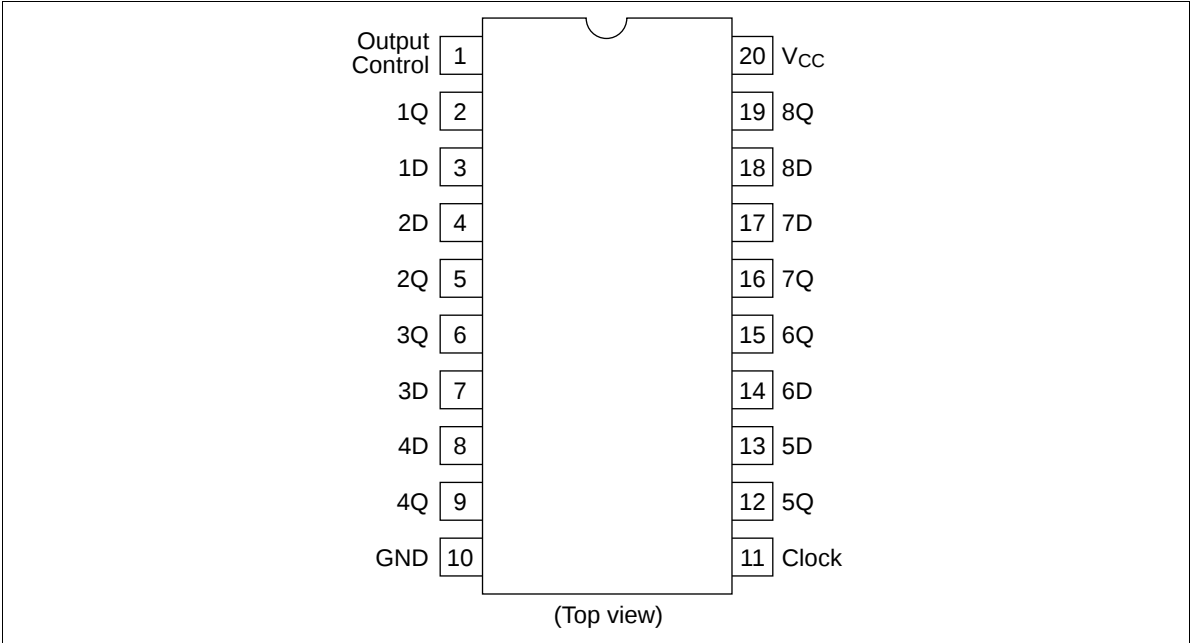
X : Irrelevant

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

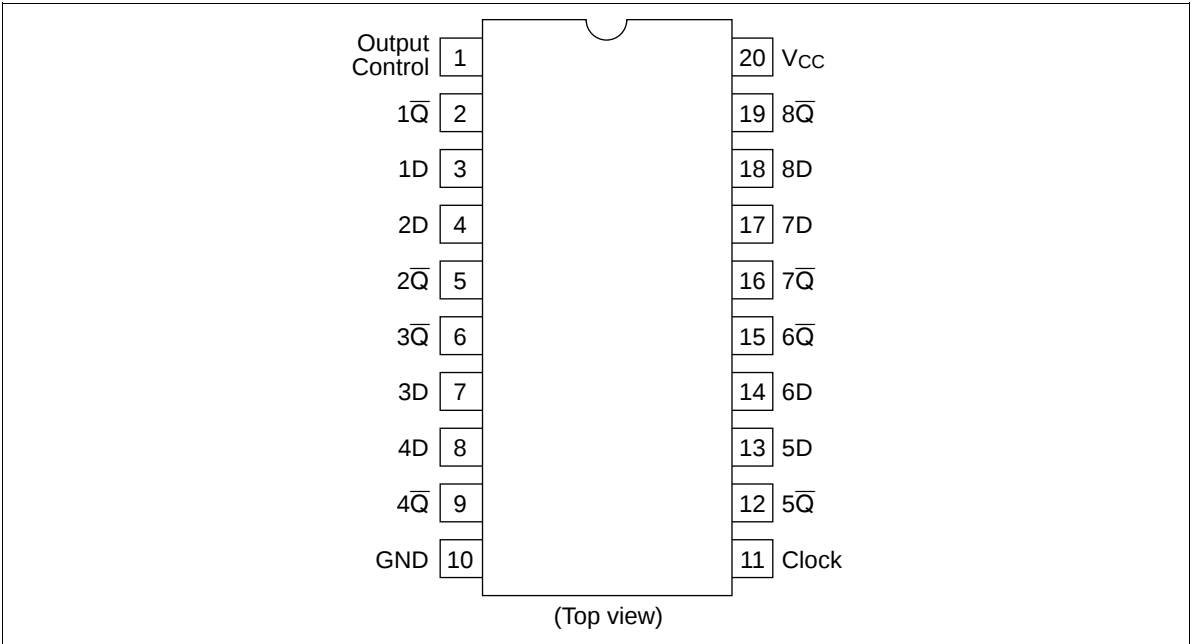
HD74HCT374/HD74HCT534

Pin Arrangement

HD74HCT374

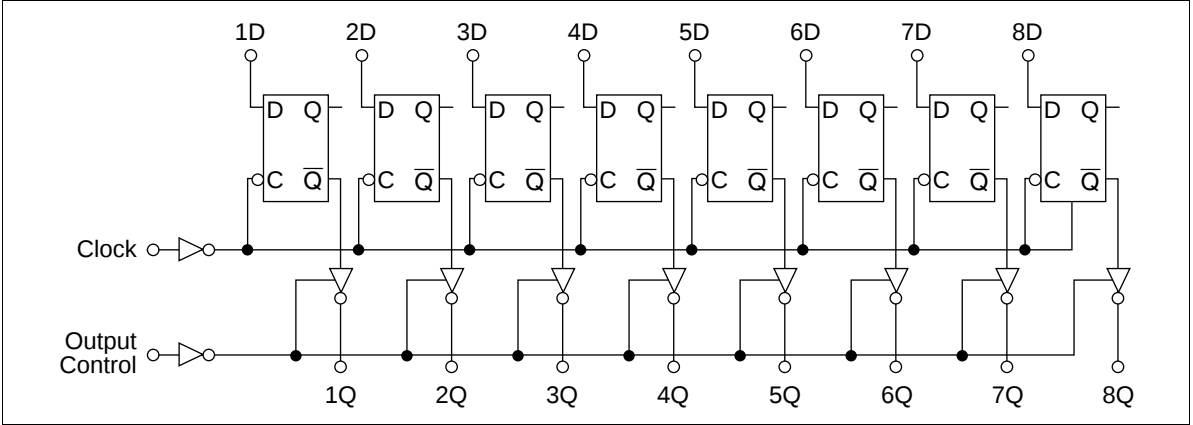


HD74HCT534

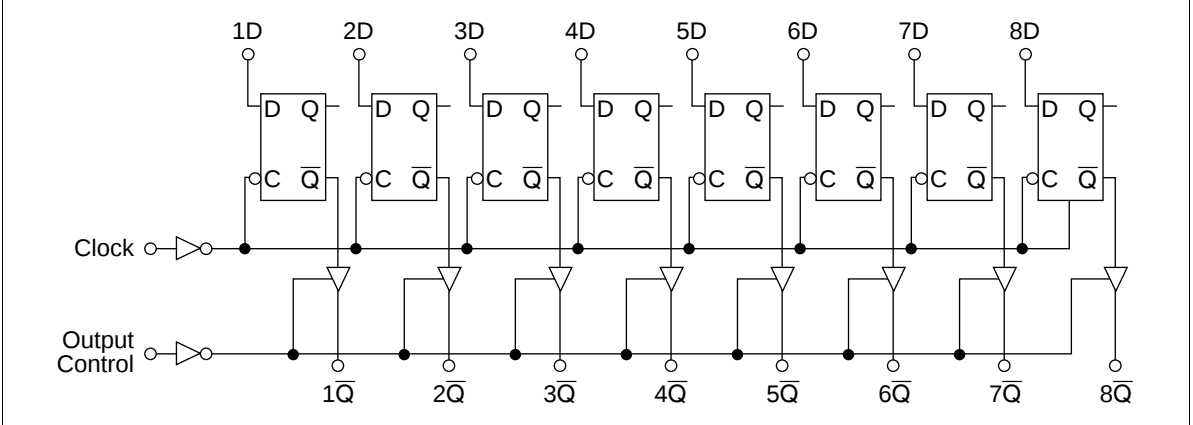


Block Diagram

HD74HCT374



HD74HCT534



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}	±35	mA
DC current drain per V _{CC} , GND	I _{CC} , I _{GND}	±75	mA
DC input diode current	I _{IK}	±20	mA
DC output diode current	I _{OK}	±20	mA
Power dissipation per package	P _T	500	mW
Storage temperature	T _{stg}	−65 to +150	°C

DC Characteristics

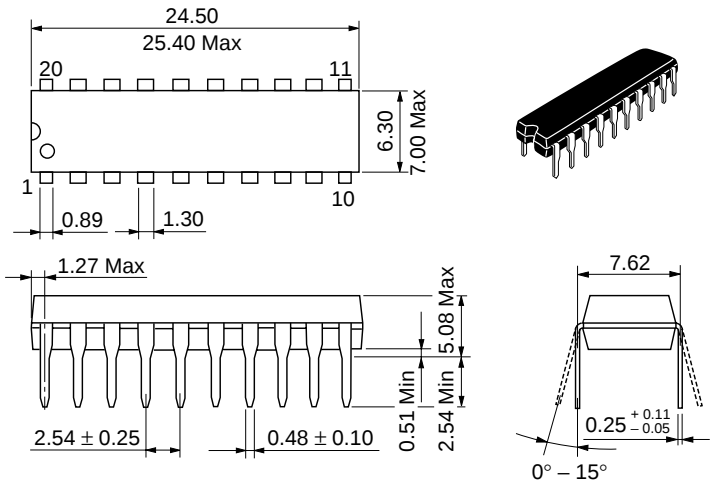
Item	Symbol	Ta = 25°C		Ta = −40 to +85°C		Unit	Test Conditions	
		Min	Typ	Max	Min	Max	V _{CC} (V)	
Input voltage	V _{IH}	2.0	—	—	2.0	—	V	4.5 to 5.5
	V _{IL}	—	—	0.8	—	0.8	V	4.5 to 5.5
Output voltage	V _{OH}	4.4	—	—	4.4	—	V	Vin = V _{IH} or V _{IL} I _{OH} = −20 μA
		4.18	—	—	4.13	—		I _{OH} = −6 mA
	V _{OL}	—	—	0.1	—	0.1	V	Vin = V _{IH} or V _{IL} I _{OL} = 20 μA
		—	—	0.26	—	0.33		I _{OL} = 6 mA
Off-state output current	I _{OZ}	—	—	±0.5	—	±5.0	μA	5.5 Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND
Input current	I _{in}	—	—	±0.1	—	±1.0	μA	5.5 Vin = V _{CC} or GND
Quiescent current	I _{CC}	—	—	4.0	—	40	μA	5.5 Vin = V _{CC} or GND, Iout = 0 μA

AC Characteristics ($C_L = 50 \text{ pF}$, Input $t_r = t_f = 6 \text{ ns}$)

Item	Symbol	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
		Min	Typ	Max	Min	Max		V _{CC} (V)	
Maximum clock frequency	f _{max}	—	—	30	—	24	MHz	4.5	
Propagation delay time	t _{PLH}	—	12	28	—	35	ns	4.5	
	t _{PHL}	—	15	28	—	35		4.5	
Output enable time	t _{ZL}	—	16	30	—	38	ns	4.5	
	t _{ZH}	—	15	30	—	38		4.5	
Output disable time	t _{LZ}	—	13	30	—	38	ns	4.5	
	t _{HZ}	—	16	30	—	38		4.5	
Setup time	t _{su}	20	2	—	25	—	ns	4.5	Data to clock
Hold time	t _h	5	0	—	6	—	ns	4.5	Clock to data
Pulse width	t _w	16	5	—	20	—	ns	4.5	Clock, output control
Output rise/fall time	t _{TLH}	—	4	12	—	15	ns	4.5	
	t _{THL}	—	4	12	—	15		4.5	
Input capacitance	C _{in}	—	5	10	—	10	pF	—	

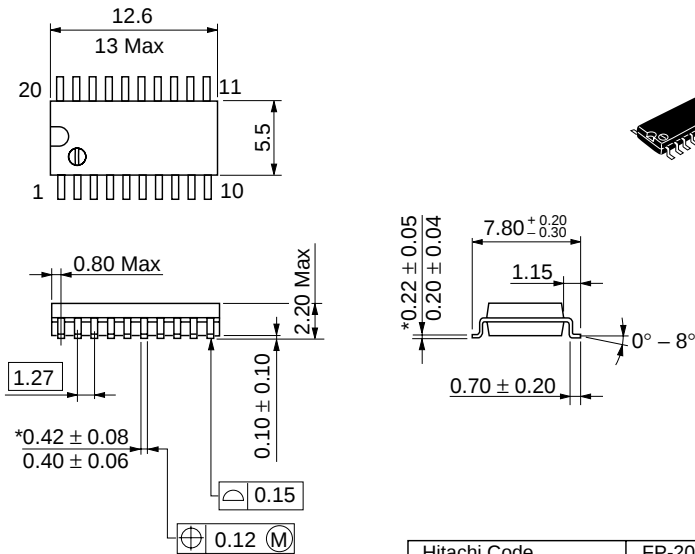
Package Dimensions

Unit: mm



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

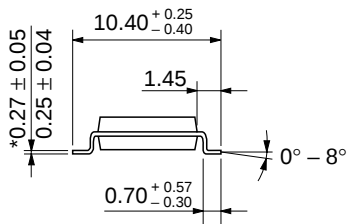
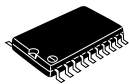
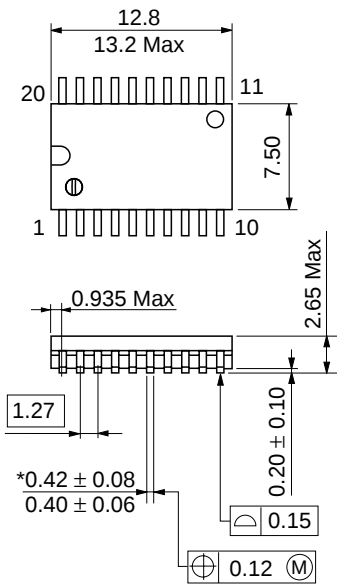
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

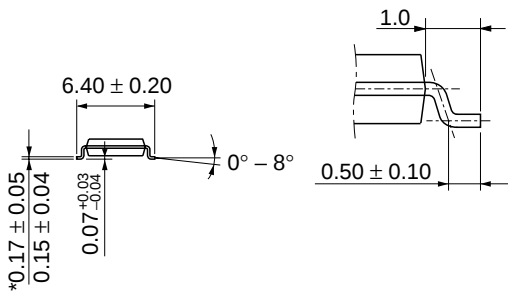
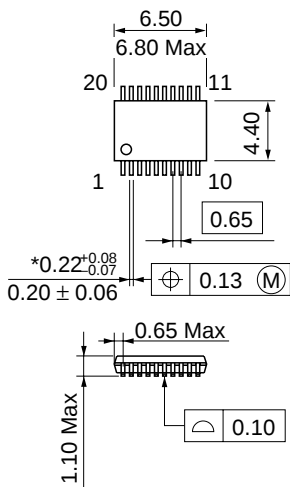
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

Unit: mm



*Dimension including the plating thickness
Base material dimension

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

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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

Hitachi Semiconductor (America) Inc. 179 East Tasman Drive, San Jose, CA 95134 Tel: <1> (408) 433-1990 Fax: <1> (408) 433-0223	Hitachi Europe GmbH Electronic Components Group Dornacher Straße 3 D-85622 Feldkirchen, Munich Germany Tel: <49> (89) 9 9180-0 Fax: <49> (89) 9 29 30 00 Hitachi Europe Ltd. Electronic Components Group. Whitebrook Park Lower Cookham Road Maidenhead Berkshire SL6 8YA, United Kingdom Tel: <44> (1628) 585000 Fax: <44> (1628) 585160
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Hitachi Asia Ltd. Hitachi Tower 16 Collyer Quay #20-00, Singapore 049318 Tel: <65>-538-6533/538-8577 Fax: <65>-538-6933/538-3877 URL: http://www.hitachi.com.sg Hitachi Asia Ltd. (Taipei Branch Office) 4/F, No. 167, Tun Hwa North Road, Hung-Kuo Building, Taipei (105), Taiwan Tel: <886>-(2)-2718-3666 Fax: <886>-(2)-2718-8180 Telex: 23222 HAS-TP URL: http://www.hitachi.com.tw
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Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon,
Hong Kong
Tel: <852>-(2)-735-9218
Fax: <852>-(2)-730-0281
URL: <http://www.hitachi.com.hk>

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