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# HD74HCT373/HD74HCT533

Octal D-type Transparent Latches (with 3-state outputs)/  
Octal D-type Transparent Latches (with inverted 3-state outputs)

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## Description

When the latch enable input is high, the Q outputs of HD74HCT373 will follow the D inputs and the Q outputs of HD74HCT533 will follow the inversion of the D inputs. When the latch enable goes low, data at the D inputs will be retained at the outputs until latch enable returns high again. When a high logic level is applied to the output control input, all outputs go to a high impedance state, regardless of what signals 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:  $t_{pd}$  (Data to Q) = 14 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  $\mu$ A max
- Low Quiescent Supply Current:  $I_{CC}$  (static) = 4  $\mu$ A max ( $T_a = 25^\circ\text{C}$ )

## Function Table

Output Control	Enable G	D	HD74HCT373 Q	HD74HCT533 $\overline{Q}$
L	H	H	H	L
L	H	L	L	H
L	L	X	No change	No change
H	X	X	Z	Z

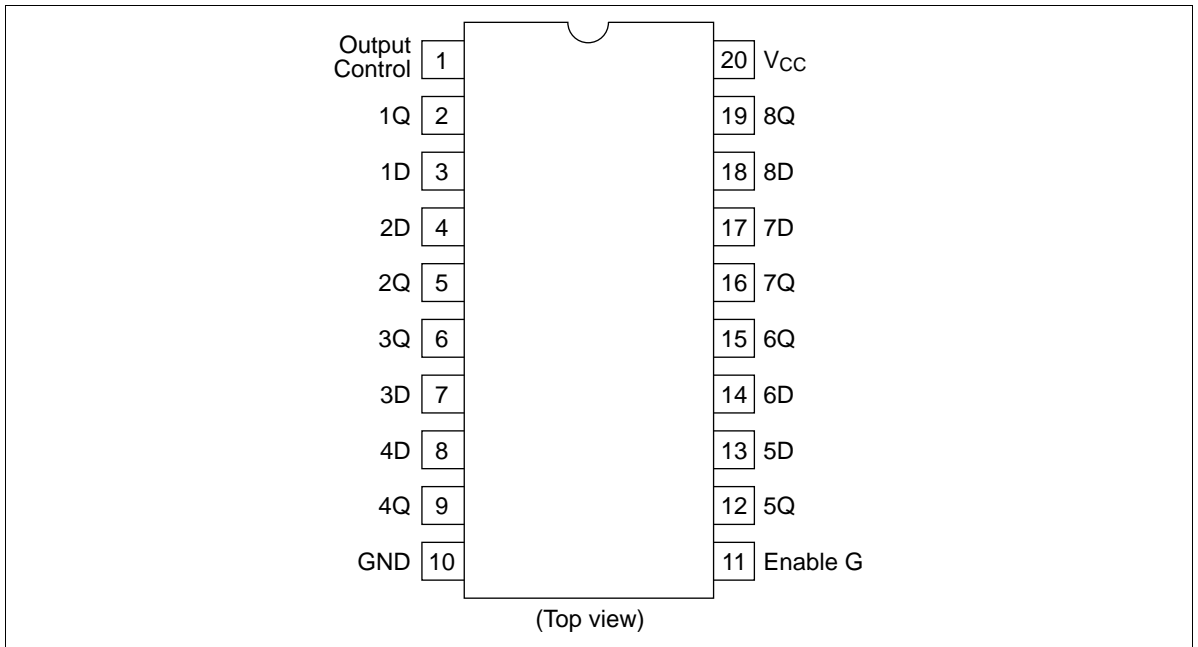
X : Irrelevant

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

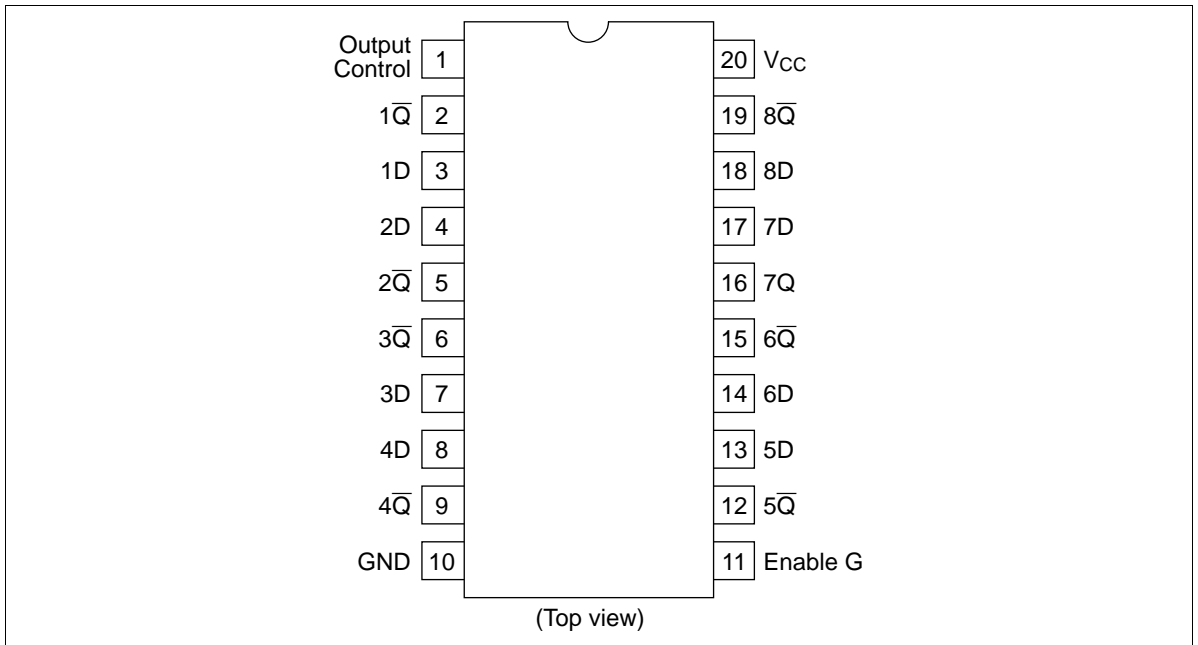
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## Pin Arrangement

### HD74HCT373



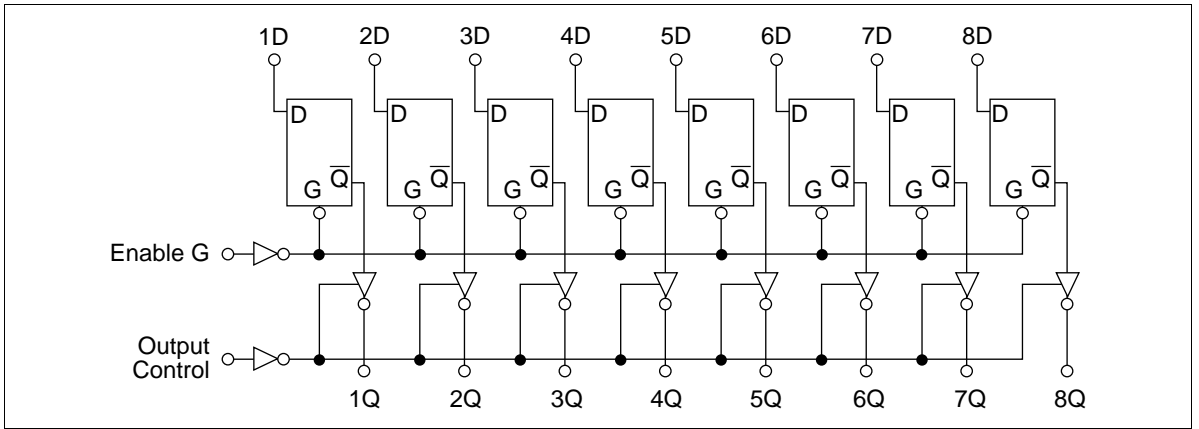
### HD74HCT533



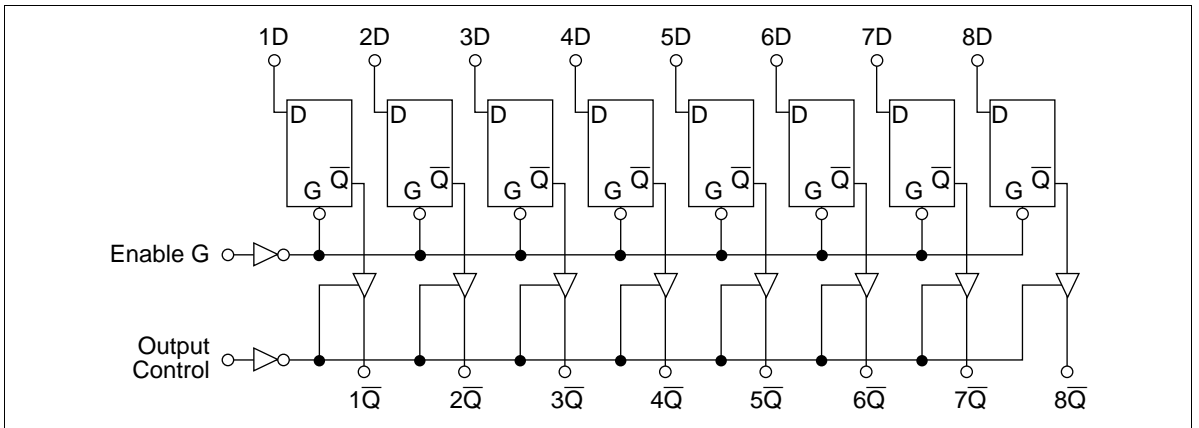
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Block Diagram

HD74HCT373



HD74HCT533



## Absolute Maximum Ratings

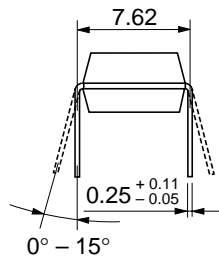
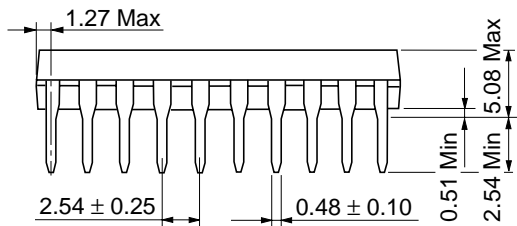
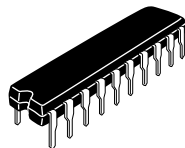
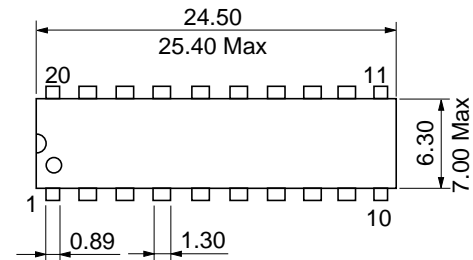
Item	Symbol	Rating	Unit
Supply voltage range	$V_{CC}$	-0.5 to +7.0	V
Input voltage	$V_{IN}$	-0.5 to $V_{CC} + 0.5$	V
Output voltage	$V_{OUT}$	-0.5 to $V_{CC} + 0.5$	V
DC current drain per pin	$I_{OUT}$	$\pm 35$	mA
DC current drain per $V_{CC}$ , GND	$I_{CC}$ , $I_{GND}$	$\pm 75$	mA
DC input diode current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

## DC Characteristics

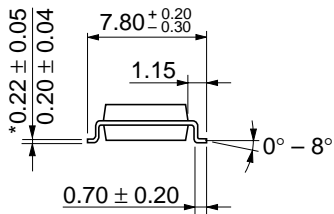
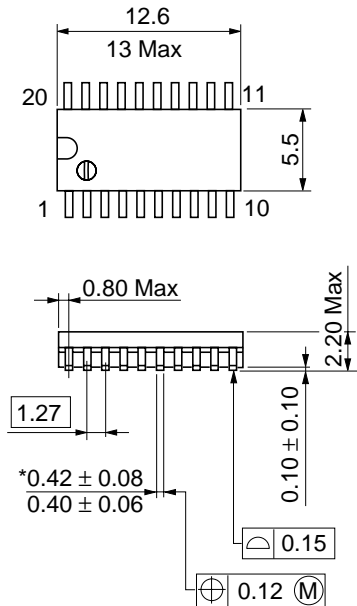
Item	Symbol	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions		
		Min	Typ	Max	Min		Max	$V_{CC}$ (V)	
Input voltage	$V_{IH}$	2.0	—	—	2.0	—	V	4.5 to 5.5	
	$V_{IL}$	—	—	0.8	—	0.8	V	4.5 to 5.5	
Output voltage	$V_{OH}$	4.4	—	—	4.4	—	V	4.5	$V_{in} = V_{IH}$ or $V_{IL}$ , $I_{OH} = -20 \mu A$
		4.18	—	—	4.13	—		4.5	$I_{OH} = -6 \text{ mA}$
	$V_{OL}$	—	—	0.1	—	0.1	V	4.5	$V_{in} = V_{IH}$ or $V_{IL}$ , $I_{OL} = 20 \mu A$
		—	—	0.26	—	0.33		4.5	$I_{OL} = 6 \text{ mA}$
Off-state output current	$I_{OZ}$	—	—	$\pm 0.5$	—	$\pm 5.0$	$\mu A$	5.5	$V_{in} = V_{IH}$ or $V_{IL}$ , $V_{out} = V_{CC}$ or GND
Input current	$I_{in}$	—	—	$\pm 0.1$	—	$\pm 1.0$	$\mu A$	5.5	$V_{in} = V_{CC}$ or GND
Quiescent current	$I_{CC}$	—	—	4.0	—	40	$\mu A$	5.5	$V_{in} = V_{CC}$ or GND, $I_{out} = 0 \mu A$

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

Item	Symbol	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions		
		Min	Typ	Max	Min		Max	V <sub>cc</sub> (V)	
Propagation delay time	t <sub>PLH</sub>	—	13	30	—	38	ns	4.5	Latch control to Q
	t <sub>PHL</sub>	—	16	30	—	38		4.5	
	t <sub>PLH</sub>	—	14	25	—	31	ns	4.5	Data to Q
	t <sub>PHL</sub>	—	12	25	—	31		4.5	
Output enable time	t <sub>ZL</sub>	—	16	30	—	38	ns	4.5	
	t <sub>ZH</sub>	—	15	30	—	38		4.5	
Output disable time	t <sub>LZ</sub>	—	14	30	—	38	ns	4.5	
	t <sub>HZ</sub>	—	16	30	—	38		4.5	
Setup time	t <sub>su</sub>	20	—	—	25	—	ns	4.5	Data to latch control
Hold time	t <sub>h</sub>	10	—	—	13	—	ns	4.5	Latch control to data
Pulse width	t <sub>w</sub>	16	—	—	20	—	ns	4.5	Latch control, output control
Output rise/fall time	t <sub>TLH</sub>	—	4	12	—	15	ns	4.5	
	t <sub>THL</sub>								
Input capacitance	C <sub>in</sub>	—	5	10	—	10	pF	—	

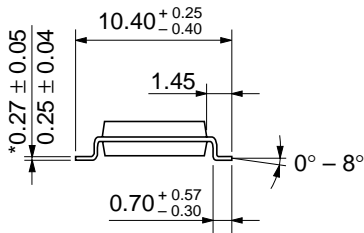
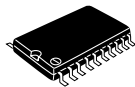
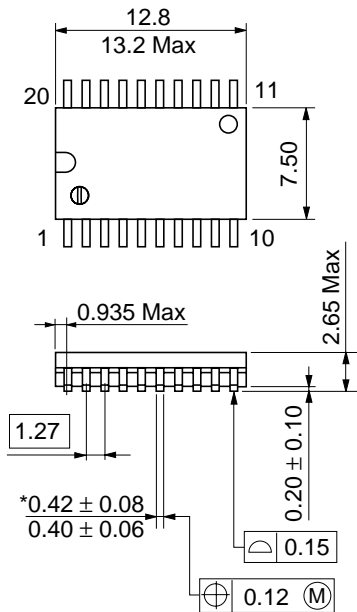


Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g



\*Dimension including the plating thickness  
Base material dimension

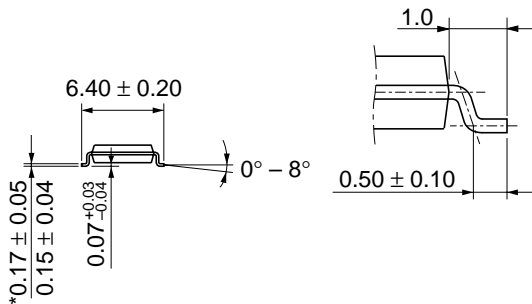
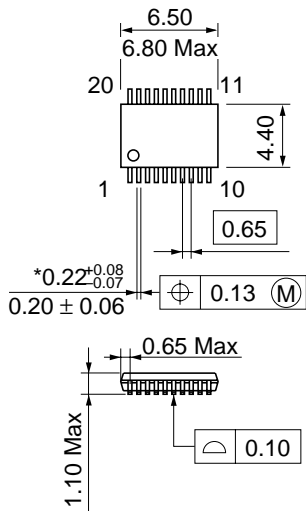
Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.31 g



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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