

# HD74HC563/HD74HC573

Octal Transparent Latches (with 3-state outputs)

## HITACHI

ADE-205-509 (Z)  
1st. Edition  
Sep. 2000

### Description

When the latch enable (LE) input is high, the Q outputs of HD74HC563 will follow the inversion of the D inputs and the Q outputs of HD74HC573 will follow 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 are present at the other inputs and the state of the storage elements.

### Features

- High Speed Operation:  $t_{pd}$  (Data to Q,  $\overline{Q}$ ) = 11 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	Latch Enable	Data	Outputs	
			HD74HC563	HD74HD573
L	H	H	L	H
L	H	L	H	L
L	L	X	$\overline{Q_0}$	$Q_0$
H	X	X	Z	Z

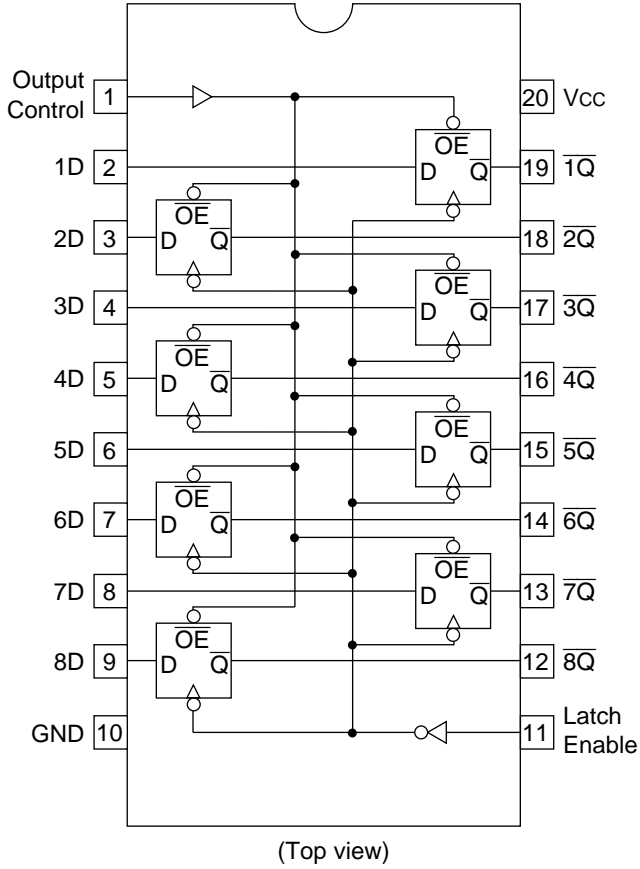
$Q_0$  : level of Q before the indicated Steady-state input conditions were established.

$\overline{Q_0}$  : complement of  $Q_0$  or level of  $\overline{Q}$  before the indicated Steady-state input conditions were established.

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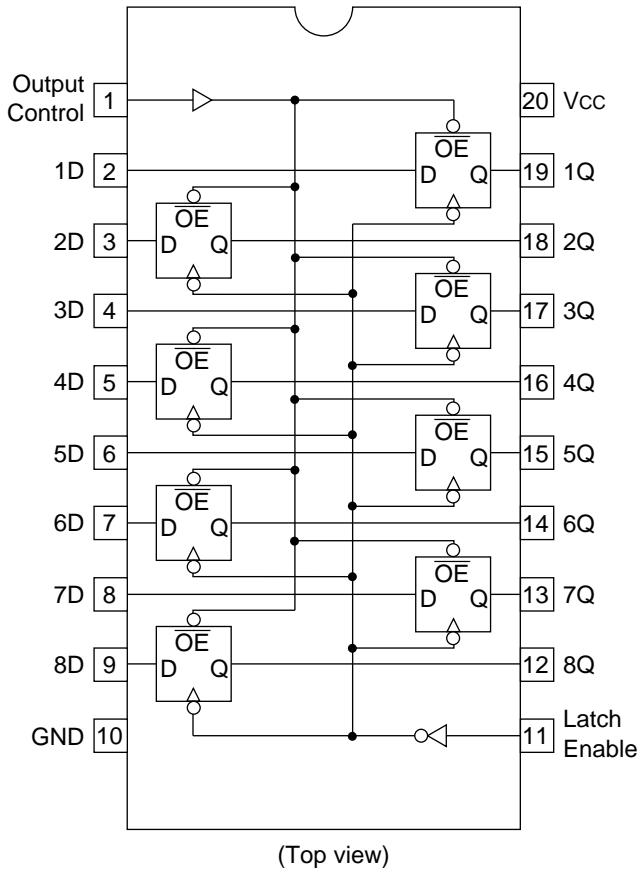
## Pin Arrangement

### HD74HC563



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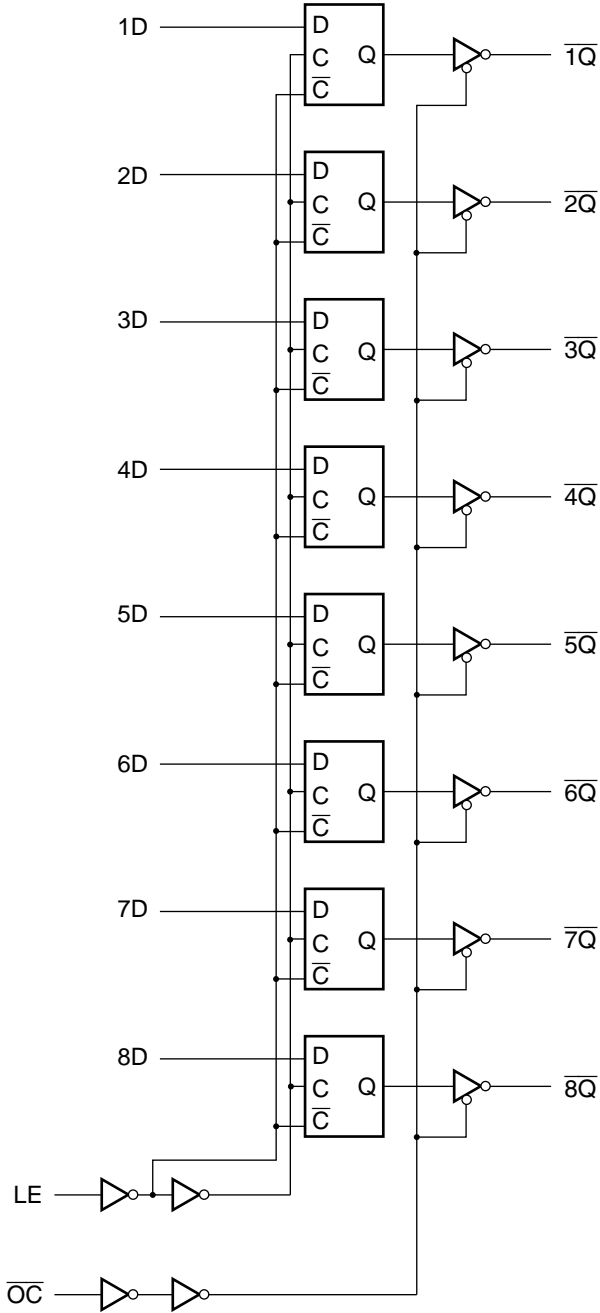
**Absolute Maximum Ratings**

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
Output current	$I_{OUT}$	$\pm 35$	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	$^{\circ}C$

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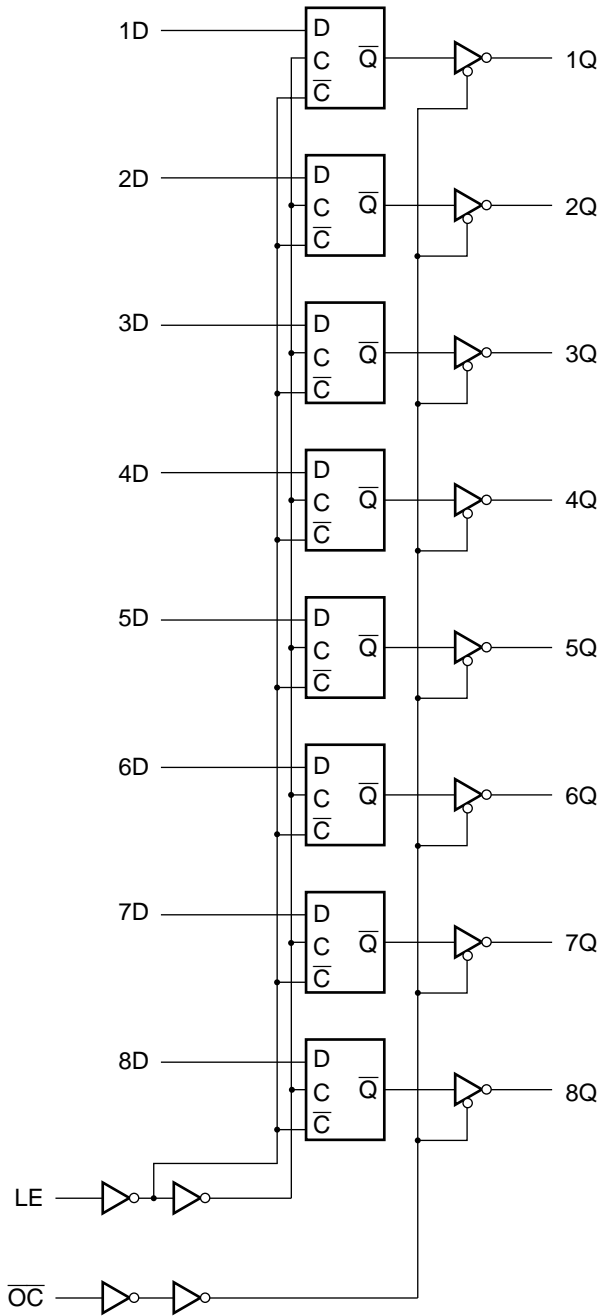
## Block Diagram

### HD74HC563



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## DC Characteristics

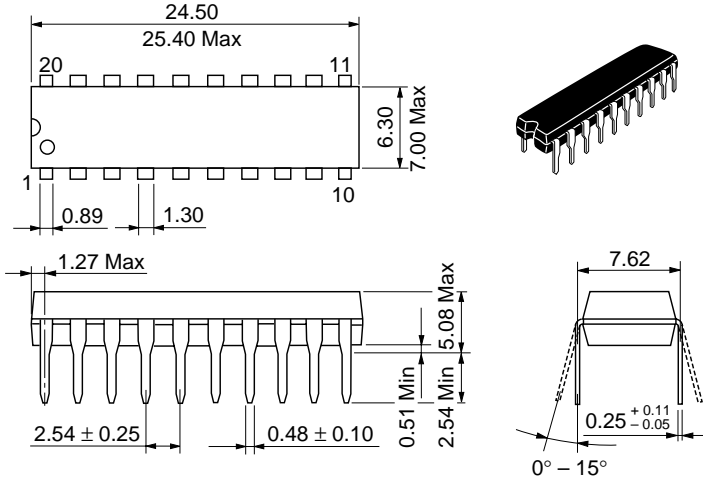
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5			V
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V <sub>OH</sub>	2.0	1.9	2.0	—	1.9	—	V	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	V	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, I <sub>out</sub> = 0 μA	

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

Item	Symbol	$V_{CC}$ (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min			Max
Propagation delay time	$t_{PLH}$	2.0	—	—	110	—	140	ns	Data to $\overline{Q}$
		4.5	—	11	22	—	28		
		6.0	—	—	19	—	24		
	$t_{PHL}$	2.0	—	—	115	—	145	ns	Clock to $\overline{Q}$
		4.5	—	13	23	—	29		
		6.0	—	—	20	—	25		
Output enable time	$t_{ZH}$	2.0	—	—	150	—	190	ns	
	$t_{ZL}$	4.5	—	14	30	—	38		
		6.0	—	—	26	—	33		
Output disable time	$t_{HZ}$	2.0	—	—	150	—	190	ns	
	$t_{LZ}$	4.5	—	15	30	—	38		
		6.0	—	—	26	—	33		
Setup time	$t_{su}$	2.0	75	—	—	90	—	ns	
		4.5	15	2	—	19	—		
		6.0	13	—	—	16	—		
Hold time	$t_h$	2.0	5	—	—	5	—	ns	
		4.5	5	-1	—	5	—		
		6.0	5	—	—	5	—		
Pulse width	$t_w$	2.0	80	—	—	100	—	ns	
		4.5	16	4	—	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	

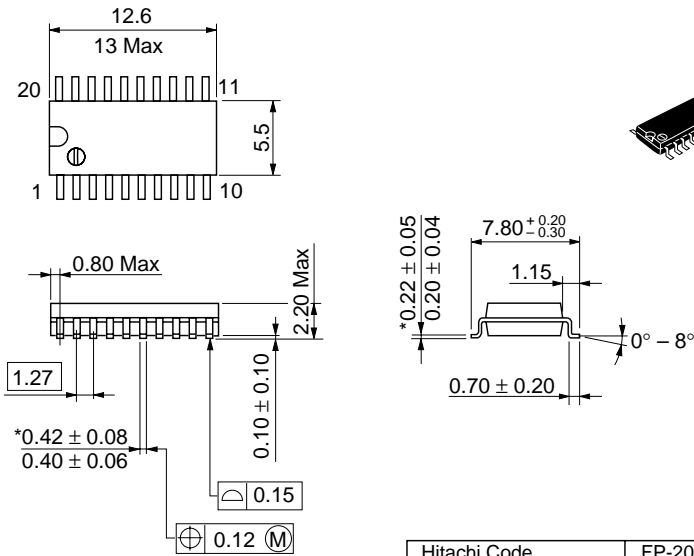
## Package Dimensions

Unit: mm



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

Unit: mm

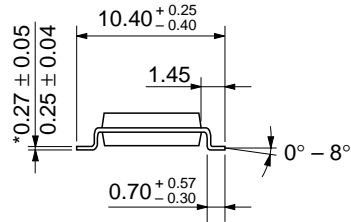
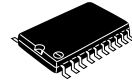
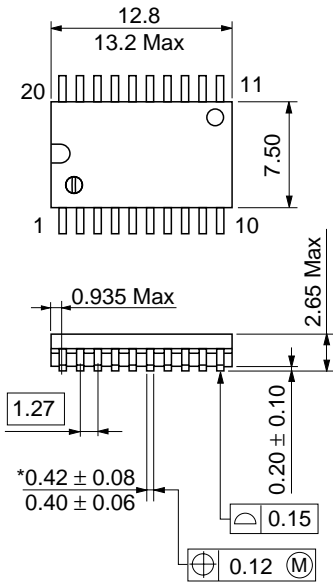


Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.31 g

\*Dimension including the plating thickness  
Base material dimension



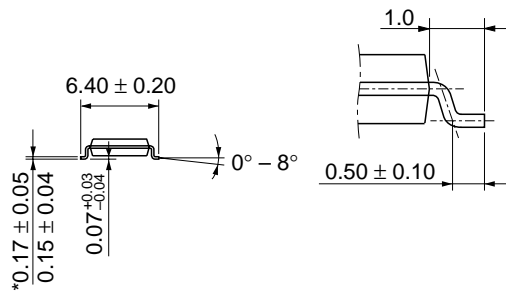
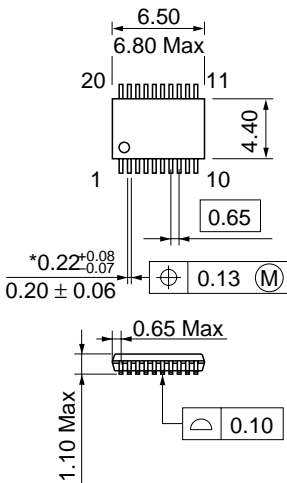
Unit: mm



\*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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