
HD74AC273

Octal D-Type Flip-Flop

HITACHI

ADE-205-386 (Z)

1st. Edition

Sep. 2000

Description

The HD74AC273 has eight edge-triggered D-type flip-flops with individual D inputs and Q outputs. The common buffered Clock (CP) and Master Reset ($\overline{\text{MR}}$) inputs load and reset (clear) all flip-flops simultaneously.

The register is fully edge-triggered. The state of each D input, one setup time before the Low-to-High clock transition, is transferred to the corresponding flip-flops's Q output

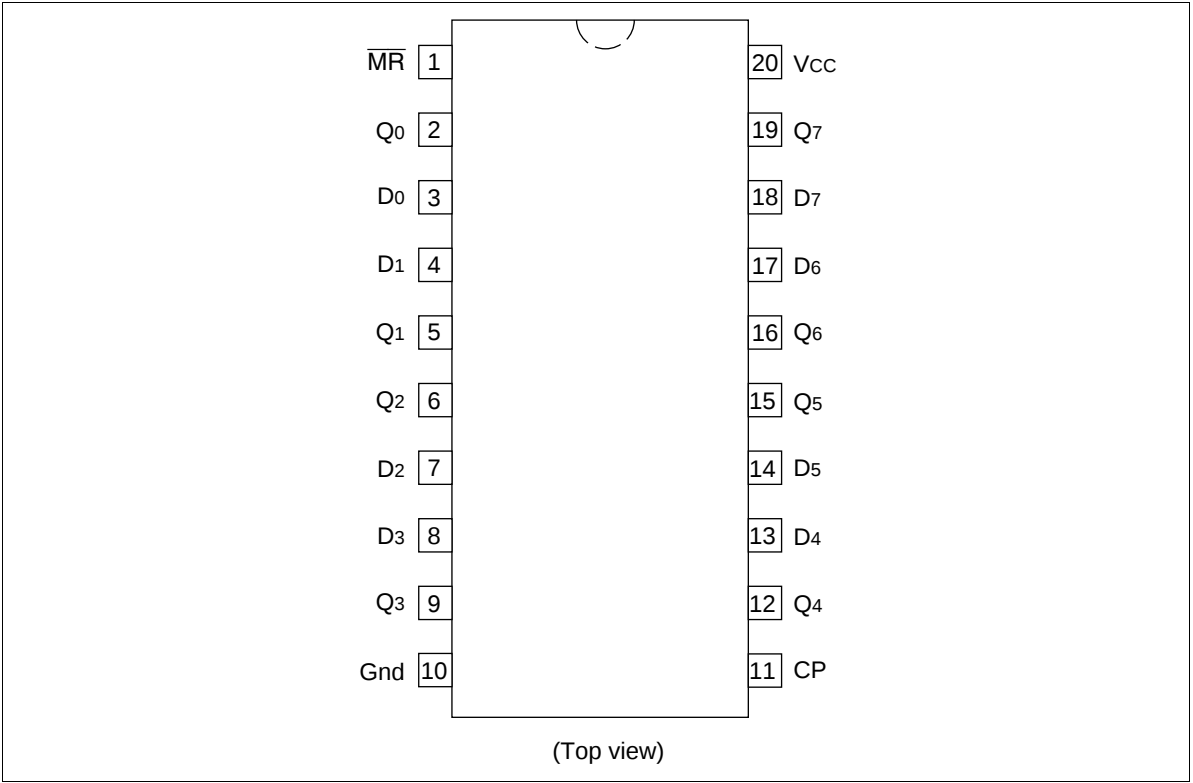
All outputs will be forced Low independently of Clock or Data inputs by a Low voltage level on the $\overline{\text{MR}}$ input. The device is useful for applications where the true output only is required and the Clock and Master Reset are common to all storage elements.

Features

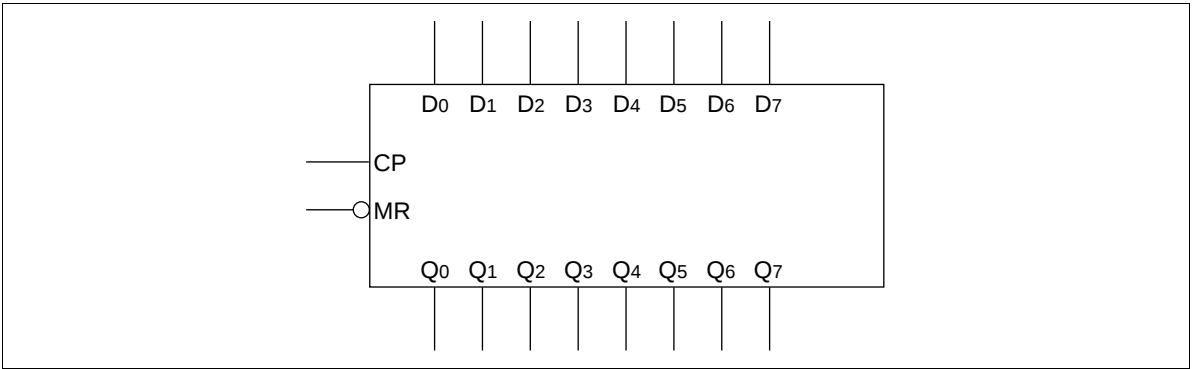
- Ideal Buffer for MOS Microprocessor or Memory
- Eight Edge-Triggered D Flip-Flops
- Buffered Common Clock
- Buffered, Asynchronous Master Reset
- See HD74AC373 for Transparent Latch Version
- See HD74AC374 for 3-State Version
- Outputs Source/Sink 24 mA

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Pin Arrangement



Logic Symbol

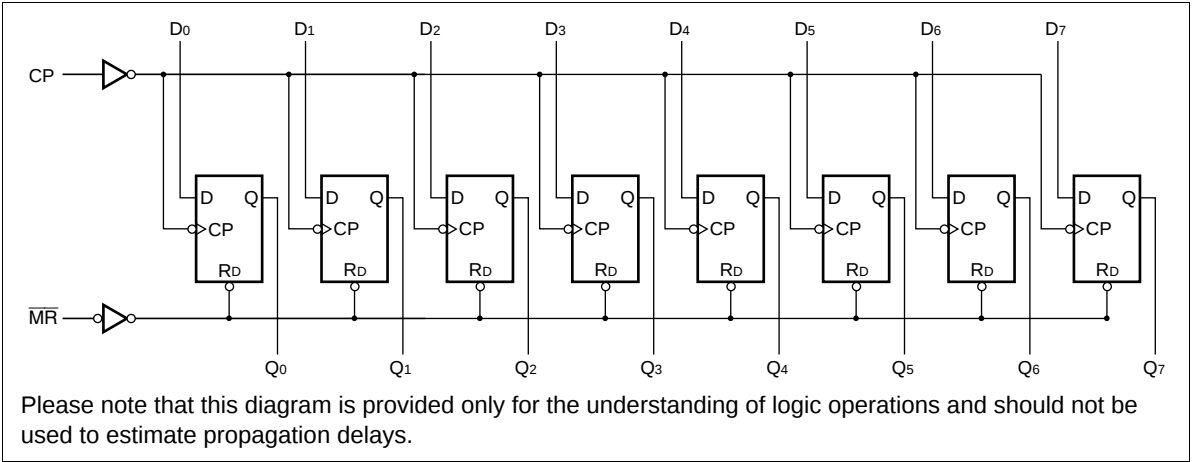


Pin Names

- D₀ – D₇ Data Inputs
- $\overline{MR}$ Master Reset
- CP Clock Pulse Input
- Q₀ – Q₇ Data Outputs

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Logic Diagram



Mode Select-Truth Table

Operating Mode	Inputs			Outputs
	MR	CP	D _n	Q _n
Reset (Clear)	L	X	X	L
Load "1"	H		H	H
Load "0"	H		L	L

H : High Voltage Level
L : Low Voltage Level
X : Immaterial
: Low-to-High Clock Transition

DC Characteristics (unless otherwise specified)

Item	Symbol	Max	Unit	Condition
Maximum quiescent supply current	I _{cc}	80	μA	V _{IN} = V _{CC} or ground, V _{CC} = 5.5 V, Ta = Worst case
Maximum quiescent supply current	I _{cc}	8.0	μA	V _{IN} = V _{CC} or ground, V _{CC} = 5.5 V, Ta = 25°C

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AC Characteristics: HD74AC273

Item	Symbol	V _{CC} (V)*1	Ta = +25°C C _L = 50 pF			Ta = −40°C to +85°C C _L = 50 pF		Unit
			Min	Typ	Max	Min	Max	
Maximum clock frequency	f _{max}	3.3	90	125	—	75	—	MHz
		5.0	140	175	—	125	—	
Propagation delay	t _{PLH}	3.3	1.0	7.0	12.5	1.0	14.0	ns
Clock to output		5.0	1.0	5.5	9.0	1.0	10.0	
Propagation delay	t _{PHL}	3.3	1.0	7.0	13.0	1.0	14.5	ns
Clock to output		5.0	1.0	5.0	10.0	1.0	11.0	
Propagation delay	t _{PHL}	3.3	1.0	7.0	13.0	1.0	14.0	ns
$\overline{\text{MR}}$ to output		5.0	1.0	5.0	10.0	1.0	10.5	

Note: 1. Voltage Range 3.3 is 3.3 V ± 0.3 V
Voltage Range 5.0 is 5.0 V ± 0.5 V

AC Operating Requirements: HD74AC273

Item	Symbol	V _{CC} (V)*1	Ta = +25°C C _L = 50 pF		Ta = −40°C to +85°C C _L = 50 pF		Unit
			Typ	Guaranteed Minimum			
Setup time, HIGH or LOW	t _{su}	3.3	3.5	5.5	6.0		ns
Data to CP		5.0	2.5	4.0	4.5		
Hold time, HIGH or LOW	t _h	3.3	−2.0	0.0	0.0		ns
Data to CP		5.0	−1.0	1.0	1.0		
Clock pulse width	t _w	3.3	3.5	5.5	6.0		ns
HIGH or LOW		5.0	2.5	4.0	4.5		
$\overline{\text{MR}}$ Pulse width	t _w	3.3	2.0	5.5	6.0		ns
HIGH or LOW		5.0	1.5	4.0	4.5		
Recovery time	t _{rec}	3.3	1.5	3.5	4.5		ns
$\overline{\text{MR}}$ to CP		5.0	1.0	2.0	3.0		

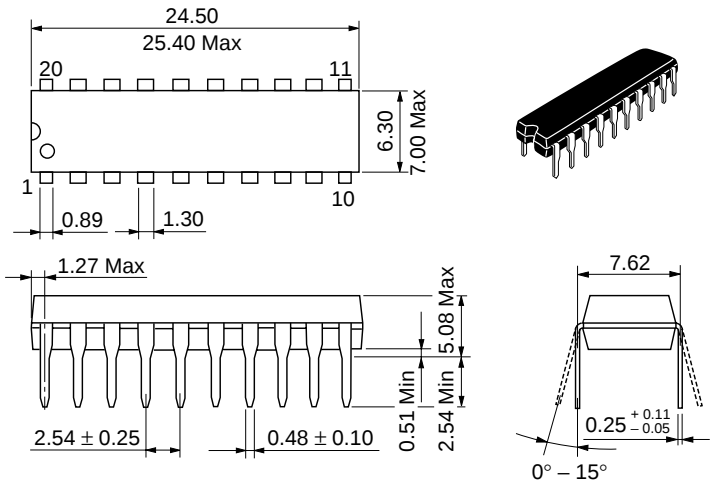
Note: 1. Voltage Range 3.3 is 3.3 V ± 0.3 V
Voltage Range 5.0 is 5.0 V ± 0.5 V

Capacitance

Item	Symbol	Typ	Unit	Condition
Input capacitance	C _{IN}	4.5	pF	V _{CC} = 5.5 V
Power dissipation capacitance	C _{PD}	50.0	pF	V _{CC} = 5.0 V

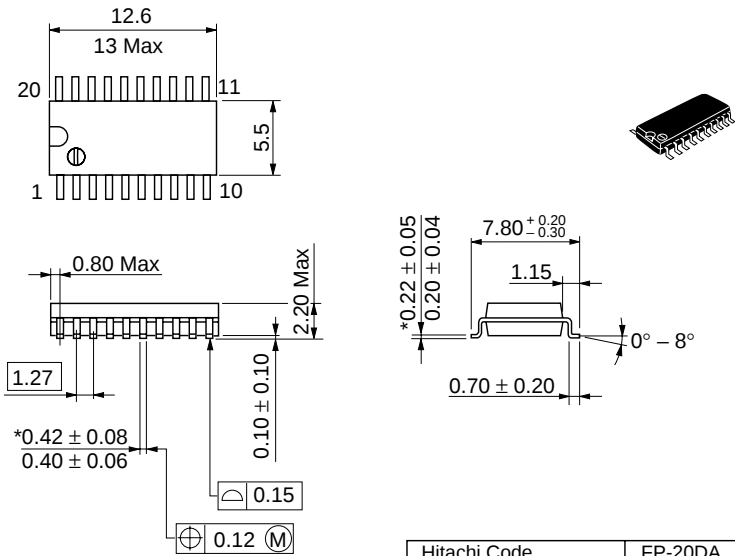
Package Dimensions

Unit: mm



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

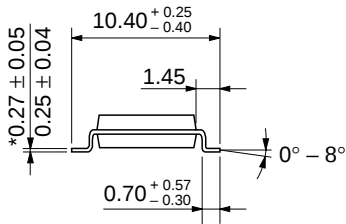
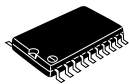
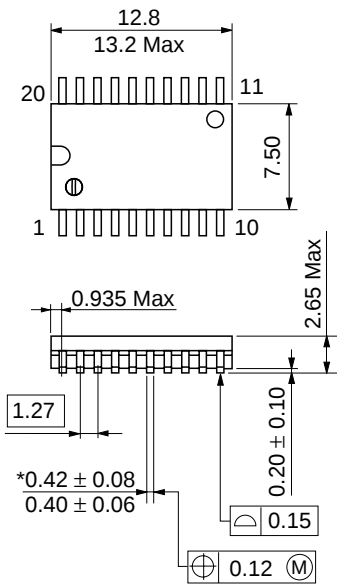
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

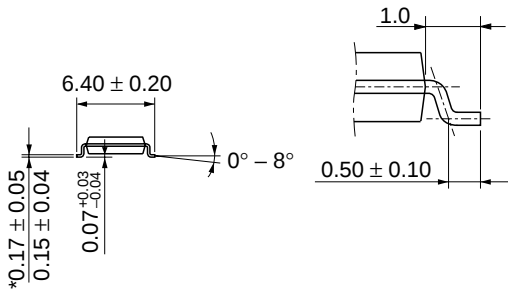
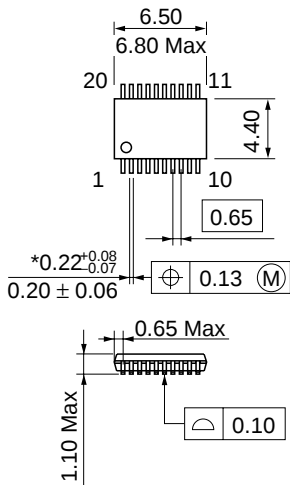
Unit: mm



*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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