

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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# HD74AC298/HD74ACT298

## Quad 2-Input Multiplexer with Storage



ADE-205-389 (Z)

1st. Edition

Sep. 2000

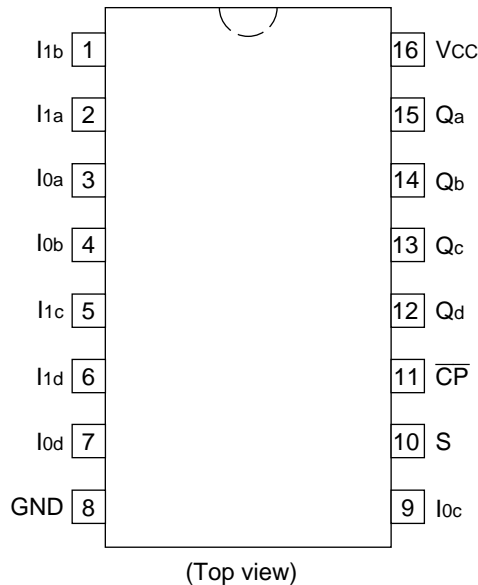
### Description

This device is a high-speed multiplexer with storage. It selects four bits of data from two sources (Ports) under the control of a common Select input (S). The selected data is transferred to the 4-bit output register synchronous with the HIGH-to-LOW transition of the Clock input ( $\overline{CP}$ ). The 4-bit register is fully edge triggered. The Data inputs ( $I_0$  and  $I_1$ ) and Select input (S) must be stable only one setup time prior to the HIGH-to-LOW transition of the clock for predictable operation.

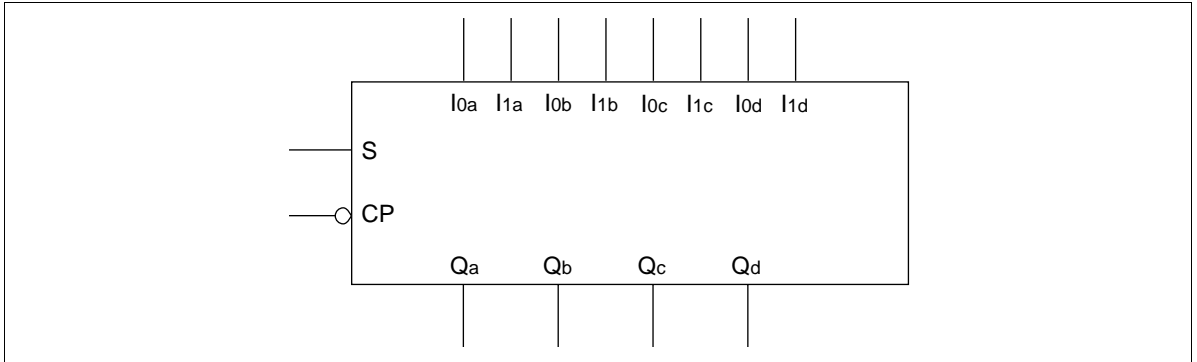
### Features

- Outputs Source/Sink 24 mA
- HD74ACT298 has TTL-Compatible Inputs

### Pin Arrangement





## Logic Symbol



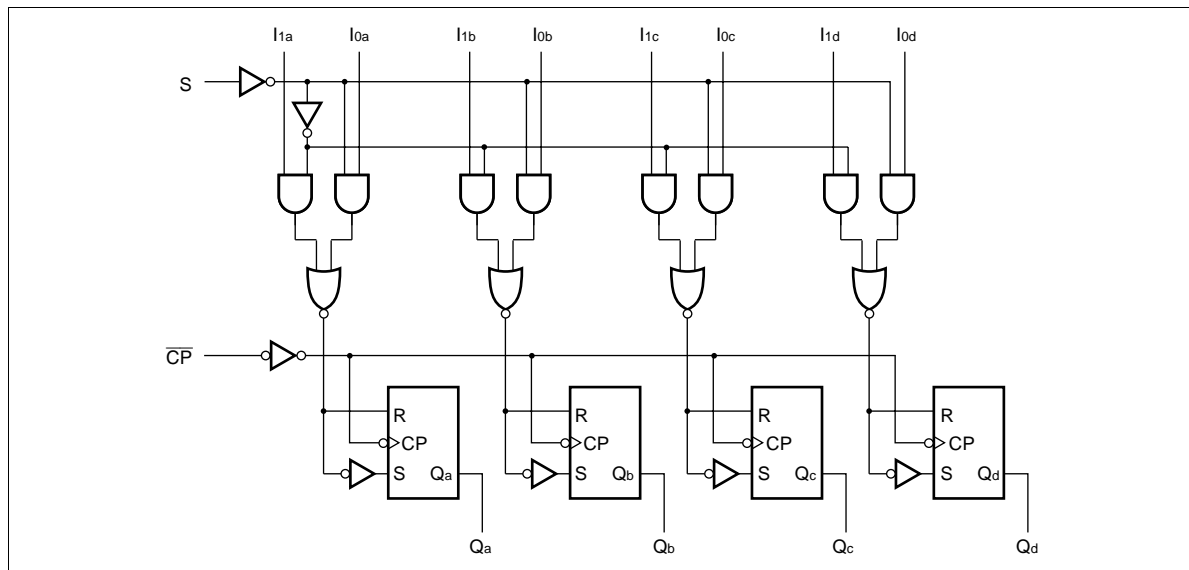
## Pin Names

- $I_{1a} - I_{1d}$  Source 1 Data Inputs
- $I_{0a} - I_{0d}$  Source 0 Data Inputs
- S Select Input
- $\overline{CP}$  Clock Pulse Input (Active Falling Edge)
- $Q_a - Q_d$  Outputs

## Function Table

Inputs		Outputs			
S	Cp	$Q_a$	$Q_b$	$Q_c$	$Q_d$
L		$a_1$	$b_1$	$c_1$	$d_1$
H		$a_2$	$b_2$	$c_2$	$d_2$
X	H	$Q_{A0}$	$Q_{B0}$	$Q_{C0}$	$Q_{D0}$

Logic Diagram



DC Characteristics (unless otherwise specified)

Item	Symbol	Max	Unit	Condition
Maximum quiescent supply current	$I_{CC}$	80	$\mu A$	$V_{IN} = V_{CC}$ or ground, $V_{CC} = 5.5 V$ , $T_a = \text{Worst case}$
Maximum quiescent supply current	$I_{CC}$	8.0	$\mu A$	$V_{IN} = V_{CC}$ or ground, $V_{CC} = 5.5 V$ , $T_a = 25^\circ C$
Maximum $I_{CC}/\text{input}$ (HD74ACT298)	$I_{CCT}$	1.5	mA	$V_{IN} = V_{CC} - 2.1 V$ , $V_{CC} = 5.5 V$ , $T_a = \text{Worst case}$

AC Characteristics: HD74AC298

Item	Symbol	$V_{CC} (V)^{*1}$	$T_a = +25^\circ C$ $C_L = 50 pF$			$T_a = -40^\circ C \text{ to } +85^\circ C$ $C_L = 50 pF$		Unit
			Min	Typ	Max	Min	Max	
Maximum count frequency	$f_{max}$	3.3	90	—	—	70	—	MHz
Propagation delay CP to Q	$t_{PLH}$	3.3	1.0	7.0	10.0	1.0	11.5	ns
Propagation delay CP to Q	$t_{PHL}$	5.0	1.0	5.0	7.5	1.0	8.5	
Propagation delay CP to Q		3.3	1.0	7.5	10.0	1.0	11.5	
Propagation delay CP to Q		5.0	1.0	5.5	7.5	1.0	8.5	

Note: 1. Voltage Range 3.3 is  $3.3 V \pm 0.3 V$   
Voltage Range 5.0 is  $5.0 V \pm 0.5 V$

# HD74AC298/HD74ACT298

## AC Operating Requirements: HD74AC298

Item	Symbol	V <sub>CC</sub> (V)*1	Ta = +25°C C <sub>L</sub> = 50 pF		Ta = -40°C to +85°C C <sub>L</sub> = 50 pF		Unit
			Typ	Guaranteed Minimum	Guaranteed Minimum	Guaranteed Minimum	
Setup time, HIGH or LOW D or S to CP	t <sub>su</sub>	3.3	4.5	5.5	7.0	ns	
		5.0	2.5	4.5	5.5		
Hold time, HIGH or LOW D <sub>n</sub> to CP <sub>n</sub>	t <sub>h</sub>	3.3	-2.0	0.0	0.0	ns	
		5.0	-1.0	0.0	0.0		
Hold time, HIGH or LOW S to CP	t <sub>h</sub>	3.3	-3.0	0.5	0.5	ns	
		5.0	-1.5	0.5	0.5		
Pulse width	t <sub>w</sub>	3.3	3.0	5.5	7.0	ns	
		5.0	3.0	4.5	5.0		

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

## AC Characteristics: HD74ACT298

Item	Symbol	V <sub>CC</sub> (V)*1	Ta = +25°C C <sub>L</sub> = 50 pF			Ta = -40°C to +85°C C <sub>L</sub> = 50 pF		Unit
			Min	Typ	Max	Min	Max	
Maximum count frequency	f <sub>max</sub>	5.0	70	—	—	60	—	MHz
Propagation delay CP to Q	t <sub>PLH</sub>	5.0	1.0	6.0	10.0	1.0	11.0	ns
Propagation delay CP to Q	t <sub>PHL</sub>	5.0	1.0	6.5	10.0	1.0	11.0	

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

AC Operating Requirements: HD74ACT298

Item	Symbol	V <sub>CC</sub> (V)*1	Ta = +25°C	Ta = -40°C		Unit
			Typ	to +85°C		
			C <sub>L</sub> = 50 pF	C <sub>L</sub> = 50 pF		
Guaranteed Minimum						
Setup time, HIGH or LOW D <sub>n</sub> or S to CP	t <sub>su</sub>	5.0	3.5	5.5	6.5	ns
Hold time, HIGH or LOW D <sub>n</sub> to CP	t <sub>h</sub>	5.0	-5.0	1.0	1.0	ns
Hold time, HIGH or LOW S to CP	t <sub>h</sub>	5.0	-0.5	1.0	1.0	ns
Pulse width	t <sub>w</sub>	5.0	3.0	7.0	8.0	ns

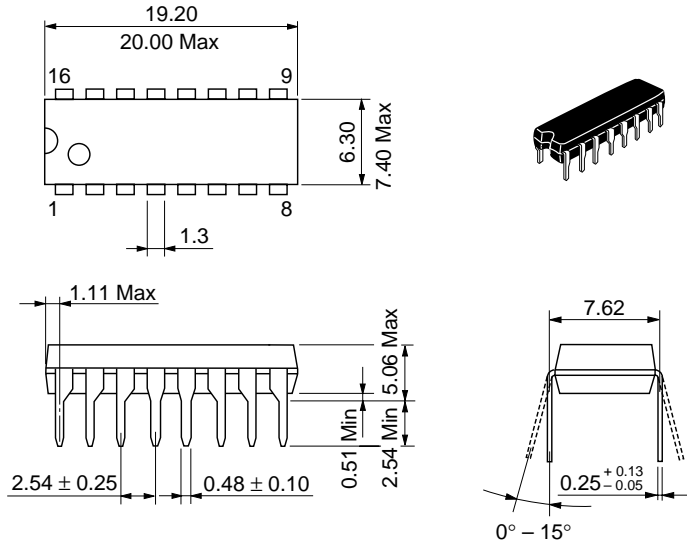
Note: 1. Voltage Range 5.0 is 5.0 V ± 0.5 V

Capacitance

Item	Symbol	Typ	Unit	Condition
Input capacitance	C <sub>IN</sub>	4.5	pF	V <sub>CC</sub> = 5.5 V
Power dissipation capacitance	C <sub>PD</sub>	30	pF	V <sub>CC</sub> = 5.0 V

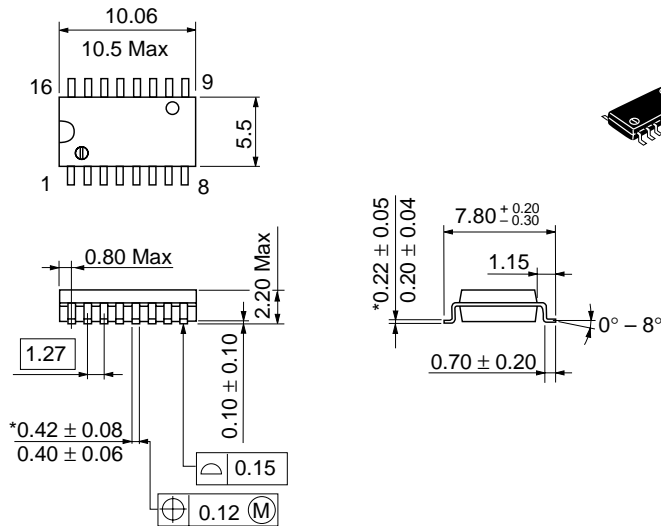
## Package Dimensions

Unit: mm



Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	1.07 g

Unit: mm

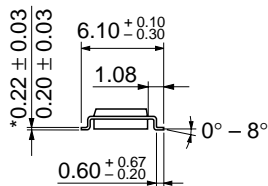
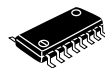
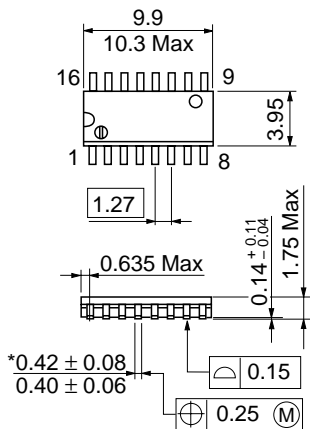


\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.24 g



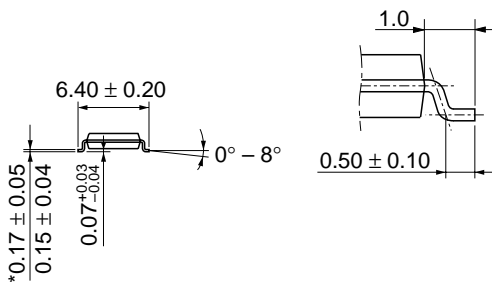
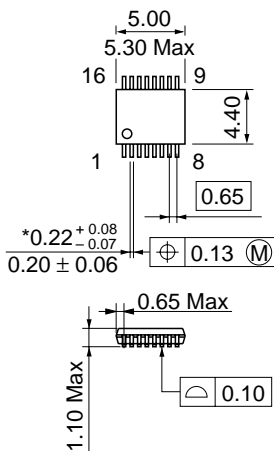
Unit: mm



\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.15 g

Unit: mm



\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	TTP-16DA
JEDEC	—
EIAJ	—
Mass (reference value)	0.05 g

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