HD74AC298/HD74ACT298

Quad 2-Input Multiplexer with Storage

HITACHI

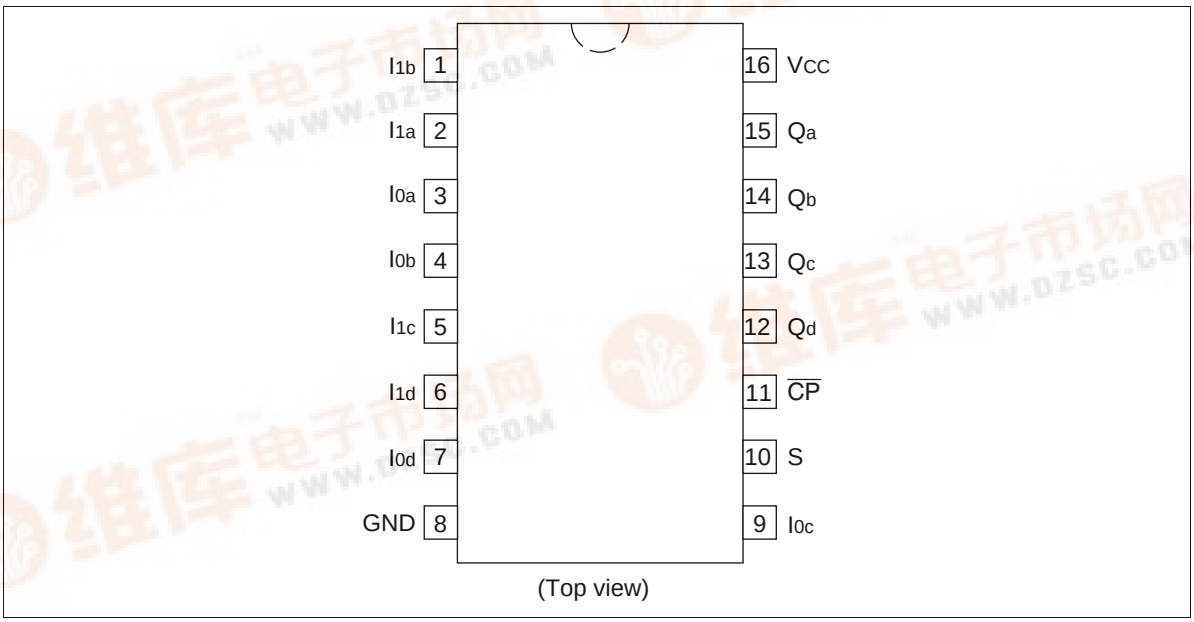
Description

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

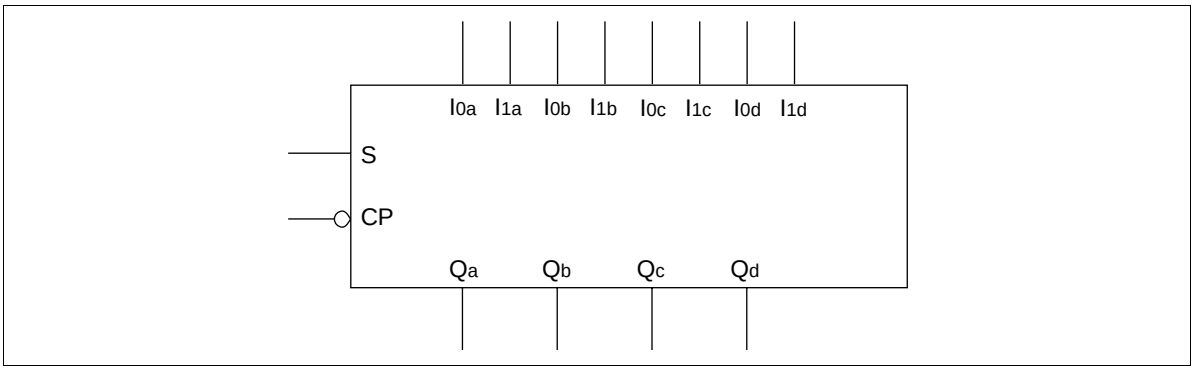
Pin Arrangement



(Top view)

Hitachi semiconductor

Logic Symbol



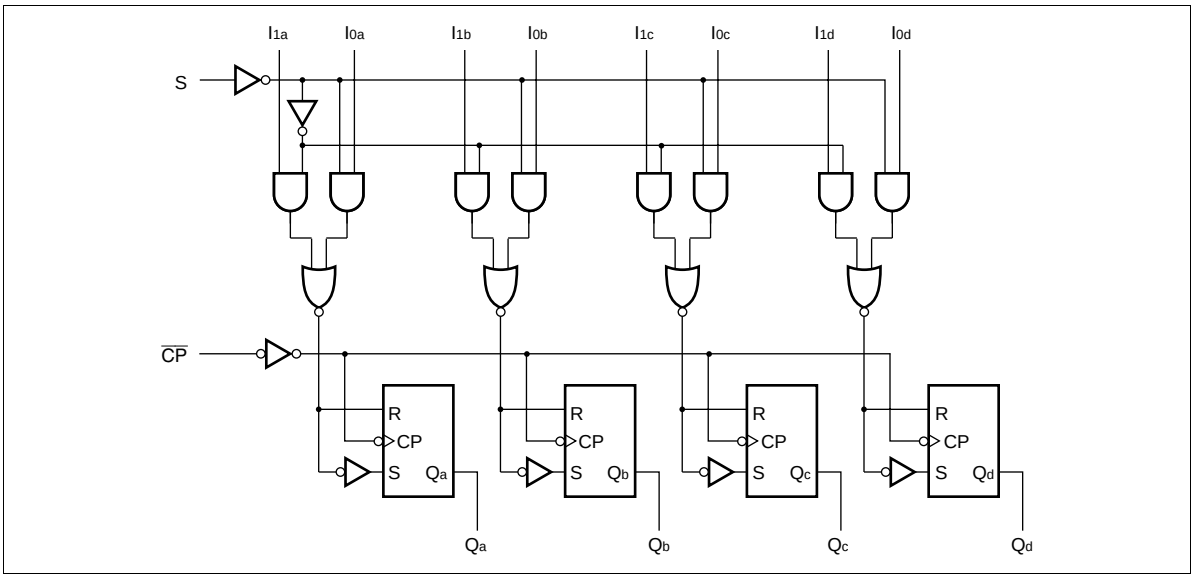
Pin Names

$I_{1a} – I_{1d}$	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	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
Maximum I_{CC}/input (HD74ACT298)	I_{CCT}	1.5	mA	V_{IN} = V_{CC} – 2.1 V, V_{CC} = 5.5 V, Ta = Worst case

AC Characteristics: HD74AC298

			Ta = +25°C C_L = 50 pF			Ta = –40°C to +85°C C_L = 50 pF		
Item	**Symbol**	**V_{CC} (V)*[1]**	**Min**	**Typ**	**Max**	**Min**	**Max**	**Unit**
Maximum count	f_{max}	3.3	90	—	—	70	—	MHz
frequency		5.0	110	—	—	100	—	
Propagation delay	t_{PLH}	3.3	1.0	7.0	10.0	1.0	11.5	ns
CP to Q		5.0	1.0	5.0	7.5	1.0	8.5	
Propagation delay	t_{PHL}	3.3	1.0	7.5	10.0	1.0	11.5	
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 ± 0.3 V
Voltage Range 5.0 is 5.0 V ± 0.5 V

AC Operating Requirements: HD74AC298

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	4.5	5.5	7.0	ns
D or S to CP		5.0	2.5	4.5	5.5	
Hold time, HIGH or LOW	t_h	3.3	–2.0	0.0	0.0	ns
D_n to CP_n		5.0	–1.0	0.0	0.0	
Hold time, HIGH or LOW	t_h	3.3	–3.0	0.5	0.5	ns
S to CP		5.0	–1.5	0.5	0.5	
Pulse with	t_w	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_{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 count frequency	f_{max}	5.0	70	—	—	60	—	MHz
Propagation delay CP to Q	t_{PLH}	5.0	1.0	6.0	10.0	1.0	11.0	ns
Propagation delay CP to Q	t_{PHL}	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

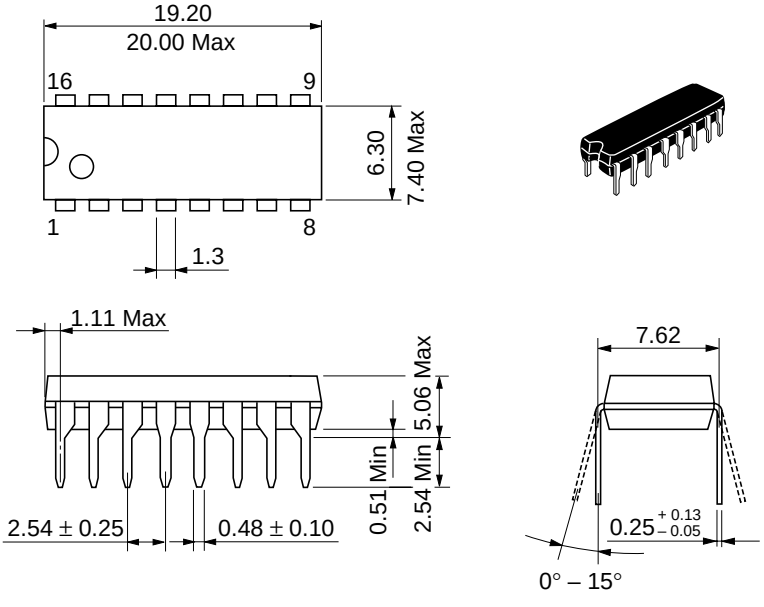
Item	Symbol	V_{CC} (V)*[1]	Ta = +25°C C_L = 50 pF Typ	Ta = –40°C to +85°C C_L = 50 pF Guaranteed Minimum		Unit
Setup time, HIGH or LOW $\overline{D}_n$ or S to CP	t_{su}	5.0	3.5	5.5	6.5	ns
Hold time, HIGH or LOW D_n to CP	t_h	5.0	–5.0	1.0	1.0	ns
Hold time, HIGH or LOW S to CP	t_h	5.0	–0.5	1.0	1.0	ns
Pulse with	t_w	5.0	3.0	7.0	8.0	ns

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

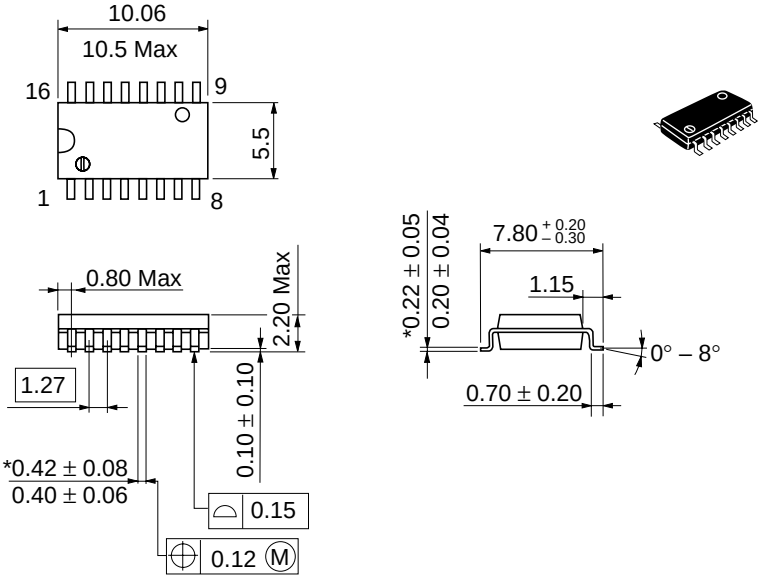
Capacitance

Item	Symbol	Typ	Unit	Condition
Input capacitance	C_{IN}	4.5	pF	V_{CC} = 5.5 V
Power dissipation capacitance	C_{PD}	30	pF	V_{CC} = 5.0 V

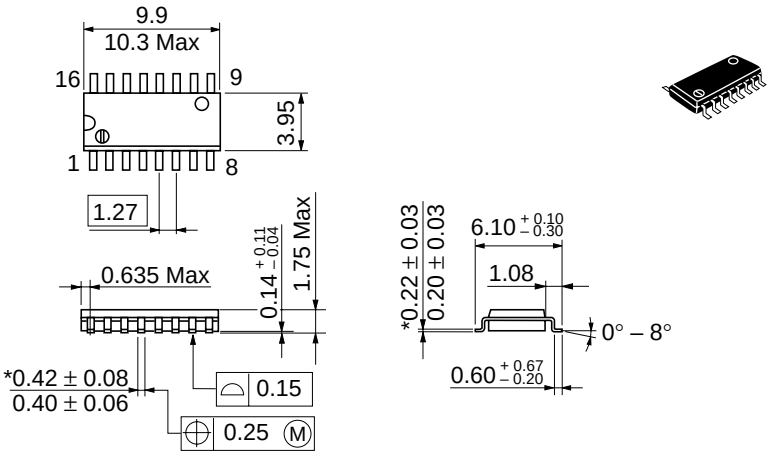
Unit: mm


19.20
20.00 Max
16
9
6.30
7.40 Max
1
8
1.3
1.11 Max
5.06 Max
2.54 Min
0.51 Min
2.54 ± 0.25
0.48 ± 0.10
7.62
0.25 + 0.13 − 0.05
0° – 15°

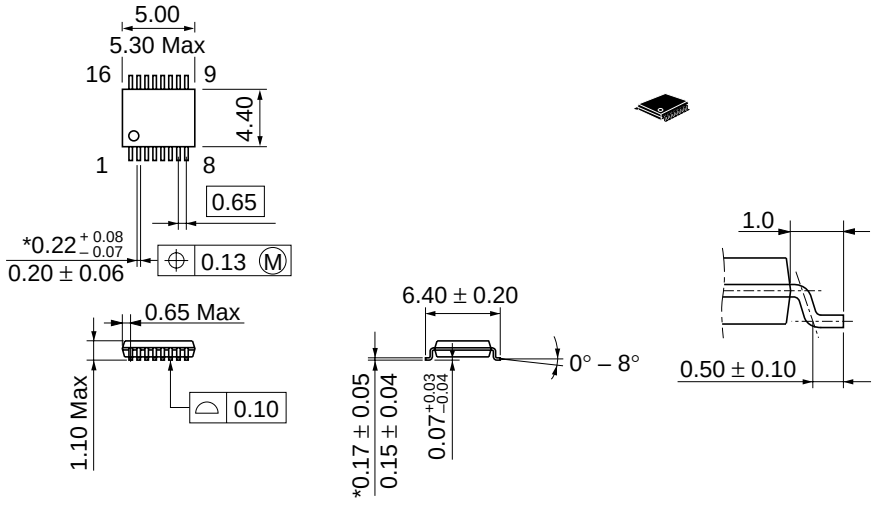
Unit: mm


10.06
10.5 Max
16
9
1
8
5.5
0.80 Max
2.20 Max
1.27
*0.42 ± 0.08
0.40 ± 0.06
0.10 ± 0.10
0.15
0.12 M
*0.22 ± 0.05
0.20 ± 0.04
7.80 +0.20 −0.30
1.15
0° – 8°
0.70 ± 0.20

Unit: mm


9.9
10.3 Max
16
9
1
8
3.95
1.27
0.635 Max
0.14 +0.11 −0.04
1.75 Max
*0.42 ± 0.08
0.40 ± 0.06
0.15
0.25 M
*0.22 ± 0.03
0.20 ± 0.03
6.10 +0.10 −0.30
1.08
0° – 8°
0.60 +0.67 −0.20

Unit: mm


5.00
5.30 Max
16
9
4.40
1
8
0.65
*0.22 +0.08 −0.07
0.20 ± 0.06
0.13 M
0.65 Max
1.10 Max
0.10
6.40 ± 0.20
0° – 8°
*0.17 ± 0.05
0.15 ± 0.04
0.07 +0.03 −0.04
1.0
0.50 ± 0.10

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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) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building. No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

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
Telex: 40815 HITEC HX