HD74AC158

Quad 2-Input Multiplexer

HITACHI

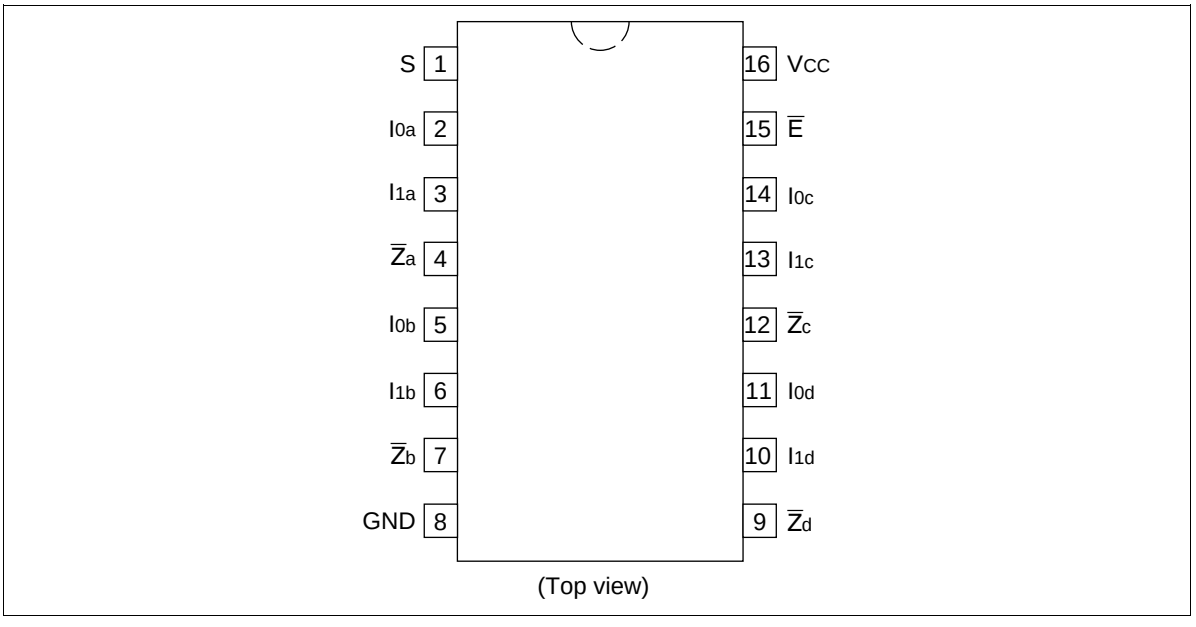
Description

The HD74AC158 is a high-speed quad 2-input multiplexer. It selects four bits of data from two source using the common Select and Enable inputs. The four buffered outputs present the selected data in the inverted form. The HD74AC158 can also be used as a function generator.

Feature

- Outputs Source/Sink 24 mA

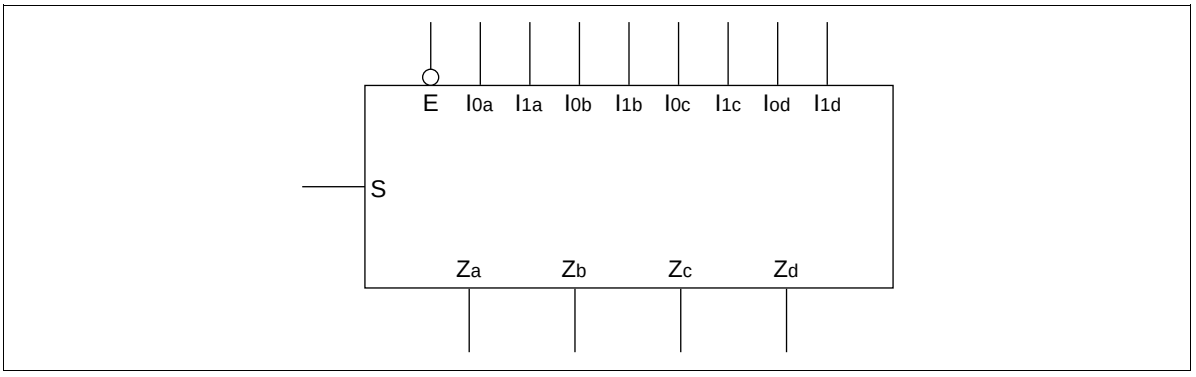
Pin Arrangement



(Top view)

Hitachi semiconductor

Logic Symbol



Pin Names

I_{0a} to I_{0d}	Source 0 Data Inputs
I_{1a} to I_{1d}	Source 1 Data Inputs
$\overline{E}$	Enable Input
S	Select Input
$\overline{Z}_a$ to $\overline{Z}_d$	Outputs

Functional Description

The HD74AC158 quad 2-input multiplexer selects four bits of data from two sources under the control of a common Select input (S) and presents the data in inverted form at the four outputs. The Enable Input ($\overline{E}$) is active-LOW. When $\overline{E}$ is HIGH, all of the outputs ($\overline{Z}$) are forced HIGH regardless of all other inputs. The HD74AC158 is the logic implementation of a 4-pole, 2-position switch where the position of the switch is determined by the logic levels supplied to the Select input.

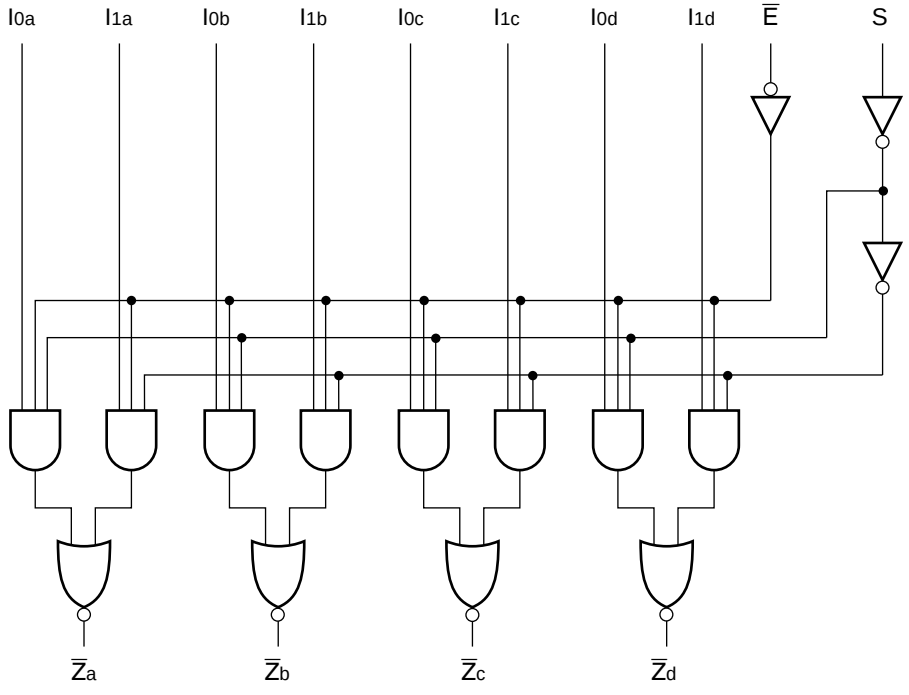
A common use of the HD74AC158 is the moving of data from two groups of registers to four common output busses. The particular register from which the data comes is determined by the state of the Select input. A less obvious use is as a function generator. The HD74AC158 can generate four functions of two variables with one variable common. This is useful for implementing gating functions.

Truth Table

Inputs				Output
$\overline{E}$	S	I_0	I_1	Z
H	X	X	X	H
L	L	L	X	H
L	L	H	X	L
L	H	X	L	H
L	H	X	H	L

H : High Voltage Level
L : Low Voltage Level
X : Immaterial

Logic Diagram



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

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

AC Characteristics: HD74AC158

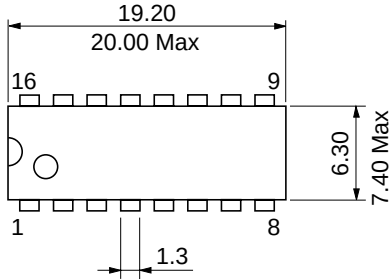
			Ta = +25°C, C_L = 50 pF			Ta = –40°C to +85°C, C_L = 50 pF		
Item	**Symbol**	**V_{CC} (V)*[1]**	**Min**	**Typ**	**Max**	**Min**	**Max**	**Unit**
Propagation delay	t_{PLH}	3.3	1.0	7.0	11.5	1.0	12.5	ns
S to $\overline{Z}_n$		5.0	1.0	5.5	9.0	1.0	9.5	
Propagation delay	t_{PHL}	3.3	1.0	7.0	11.5	1.0	12.5	ns
S to $\overline{Z}_n$		5.0	1.0	5.5	9.0	1.0	10.0	
Propagation delay	t_{PLH}	3.3	1.0	7.5	12.0	1.0	13.0	ns
$\overline{E}$ to $\overline{Z}_n$		5.0	1.0	6.0	9.5	1.0	10.5	
Propagation delay	t_{PHL}	3.3	1.0	7.0	11.0	1.0	12.0	ns
$\overline{E}$ to $\overline{Z}_n$		5.0	1.0	5.5	8.5	1.0	9.5	
Propagation delay	t_{PLH}	3.3	1.0	5.5	9.0	1.0	10.0	ns
I_n to $\overline{Z}_n$		5.0	1.0	4.0	7.0	1.0	7.5	
Propagation delay	t_{PHL}	3.3	1.0	5.0	8.0	1.0	8.5	ns
I_n to $\overline{Z}_n$		5.0	1.0	4.0	6.5	1.0	6.5	

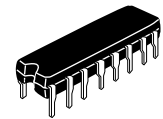
Note: 1. Voltage Range 3.3 is 3.3 V ± 0.3 V
Voltage Range 5.0 is 5.0 V ± 0.5 V

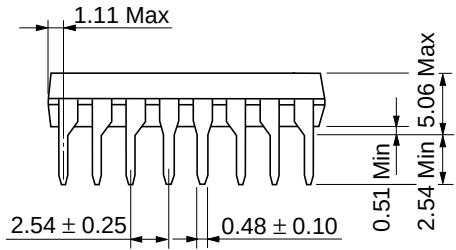
Capacitance

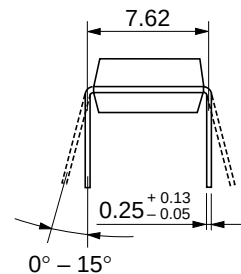
Item	Symbol	Typ	Unit	Condition
Input capacitance	C_{IN}	4.5	pF	V_{CC} = 5.5 V
Power dissipation capacitance	C_{PD}	45.0	pF	V_{CC} = 5.0 V

Unit: mm



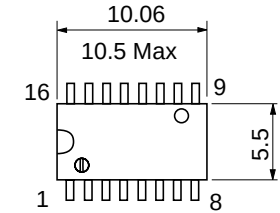


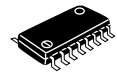


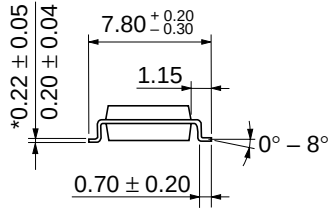


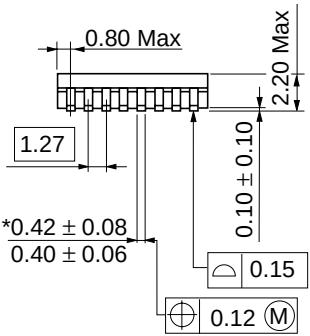
Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g

Unit: mm





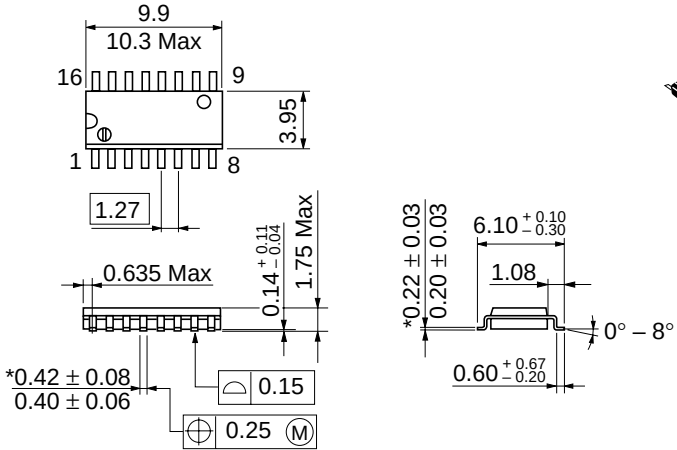


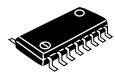


*Dimension including the plating thickness
Base material dimension

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

Unit: mm

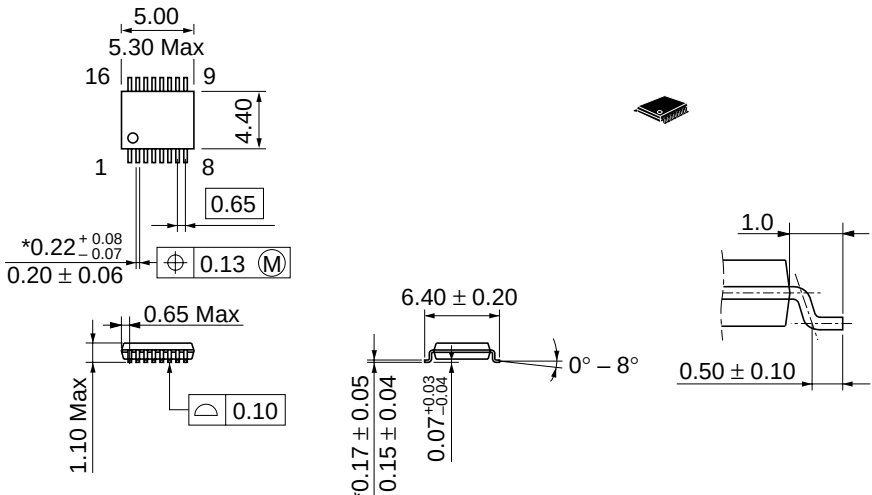




Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

*Dimension including the plating thickness
Base material dimension

Unit: mm



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

*Dimension including the plating thickness
Base material dimension

Cautions

1. Hitachi neither warrants nor grants licenses of any rights of Hitachi's or any third party's patent, copyright, trademark, or other intellectual property rights for information contained in this document. Hitachi bears no responsibility for problems that may arise with third party's rights, including intellectual property rights, in connection with use of the information contained in this document.
2. Products and product specifications may be subject to change without notice. Confirm that you have received the latest product standards or specifications before final design, purchase or use.
3. Hitachi makes every attempt to ensure that its products are of high quality and reliability. However, contact Hitachi's sales office before using the product in an application that demands especially high quality and reliability or where its failure or malfunction may directly threaten human life or cause risk of bodily injury, such as aerospace, aeronautics, nuclear power, combustion control, transportation, traffic, safety equipment or medical equipment for life support.
4. Design your application so that the product is used within the ranges guaranteed by Hitachi particularly for maximum rating, operating supply voltage range, heat radiation characteristics, installation conditions and other characteristics. Hitachi bears no responsibility for failure or damage when used beyond the guaranteed ranges. Even within the guaranteed ranges, consider normally foreseeable failure rates or failure modes in semiconductor devices and employ systemic measures such as fail-safes, so that the equipment incorporating Hitachi product does not cause bodily injury, fire or other consequential damage due to operation of the Hitachi product.
5. This product is not designed to be radiation resistant.
6. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without written approval from Hitachi.
7. Contact Hitachi's sales office for any questions regarding this document or Hitachi semiconductor products.

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

URL
NorthAmerica : http:semiconductor.hitachi.com/
Europe : http://www.hitachi-eu.com/hel/ecg
Asia (Singapore) : http://www.has.hitachi.com.sg/grp3/sicd/index.htm
Asia (Taiwan) : http://www.hitachi.com.tw/E/Product/SICD_Frame.htm
Asia (HongKong) : http://www.hitachi.com.hk/eng/bo/grp3/index.htm
Japan : http://www.hitachi.co.jp/Sicd/indx.htm

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