
HD74HC4066

Quad Analog Switches/Quad Multiplexers

HITACHI

Description

This switch has low “on” resistance and low “off” leakage. It is a bidirectional switch, thus any analog input may be used as an output and vice-versa. Also the HD74HC4066 switch contains linearization circuitry which lowers the “on” resistance and increases switch linearity. The HD74HC4066 device allows control of up to 12 V (peak) analog signals with digital control signals of the same range. Each switch has its own control input which disables each switch when low.

Features

- High Speed Operation
- Wide Operating Voltage
- Low Quiescent Supply Current

Function Table

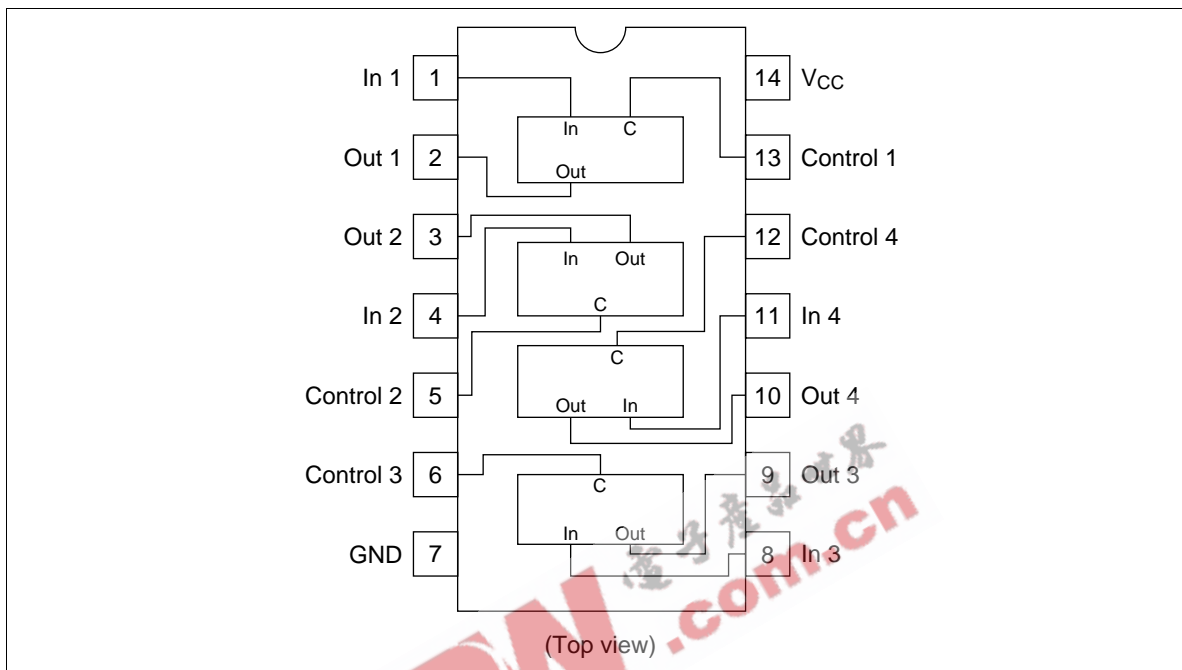
Control	Switch
L	OFF
H	ON

$GND \leq V_{in} \leq V_{CC}$

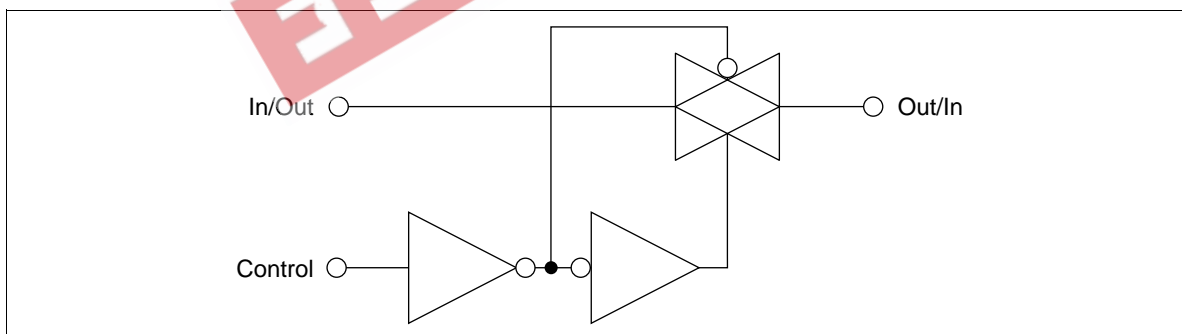
$GND \leq V_{out} \leq V_{CC}$

HD74HC4066

Pin Arrangement



Logic Diagram (1/4)



HITACHI

Absolute Maximum Ratings

Item	Symbol	Rating	Unit	
Supply voltage	V_{CC}	-0.5 to +7.0	V	
Control input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V	
Switch I/O voltage	$V_{I/O}$	-0.5 to $V_{CC} + 0.5$	V	
Supply current	(V_{CC})	I_{CC}	+50	mA
	(GND)	I_{GND}	-50	mA
Switch I/O current (per pin)	$I_{I/O}$	± 25	mA	
Control input diode current	I_{IK}	± 20	mA	
Switch I/O diode current	I_{IOK}	± 20	mA	
Power dissipation	P_T	500	mW	
Storage temperature range	Tstg	-65 to +150	$^{\circ}\text{C}$	

EEPW.com.cn 电子产品世界

HD74HC4066

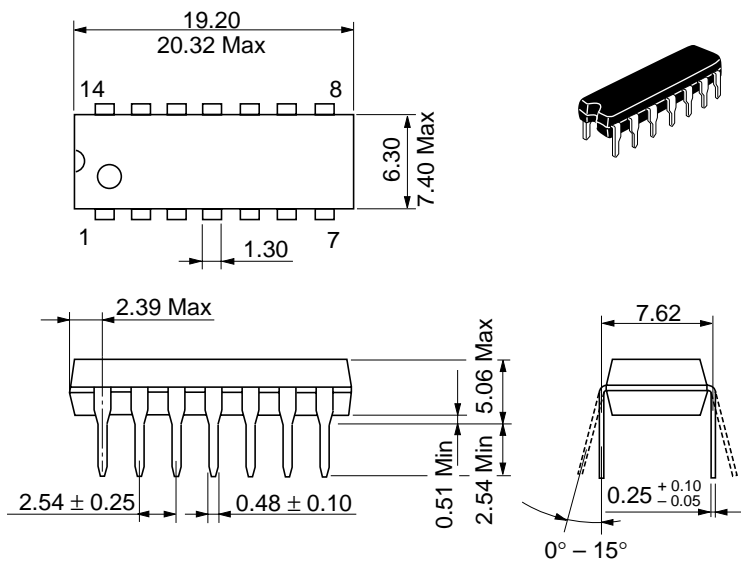
DC Characteristics

Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Control input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V	
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	V _{IL}	2.0	—	—	0.5	—	0.5	V	
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—	1.8		
“ON” resistance	R _{ON}	2.0	—	2000	5000	—	6250	Ω	V _C = V _{IH}
		4.5	—	100	200	—	250		V _{in} = 0 to V _{CC}
		6.0	—	60	170	—	210		I _{in/out} = 1 mA
ΔON resistance between any two channels	ΔR _{ON}	2.0	—	50	—	—	—	Ω	V _C = V _{IH} , I _{in/out} = 1 mA
		4.5	—	3	—	—	—		between any two channels
		6.0	—	2	—	—	—		channels
OFF channel leakage current (switch off)	I _{S(OFF)}	6.0	—	—	±0.1	—	±1.0	μA	V _C = V _{IL} V _{IN} = V _{CC} , V _{out} = GND or, V _{in} = GND, V _{out} = V _{CC}
OFF channel leakage current (switch on)	I _{S(ON)}	6.0	—	—	±0.1	—	±1.0	μA	V _C = V _{IH} V _{in} = V _{CC} or GND
Control input current	I _{in}	6.0	—	—	±0.1	—	±1.0	μA	V _{in} = V _{CC} or GND
Quiescent supply current	I _{CC}	6.0	—	—	1.0	—	10.0	μA	V _{in} = V _{CC} or GND

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

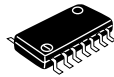
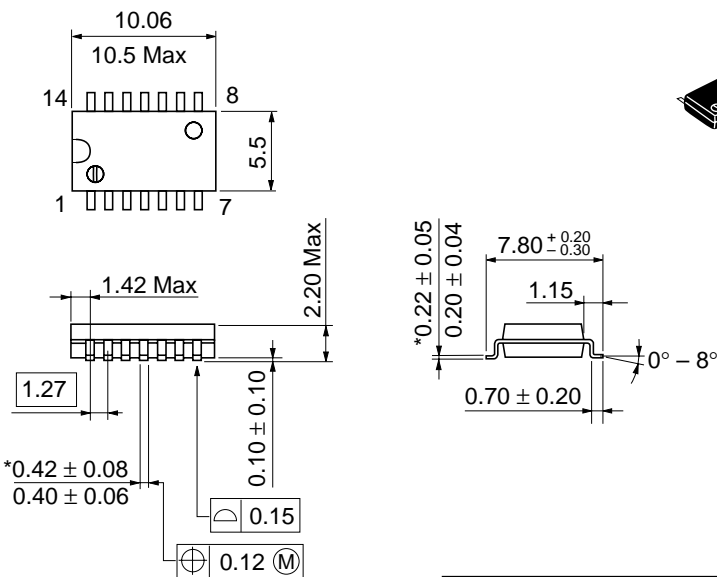
Item	Symbol	V_{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t_{PLH}	2.0	—	—	50	—	65	ns	$R_L = 10$ k Ω
	t_{PHT}	4.5	—	4	10	—	13		
		6.0	—	—	9	—	11		
Output enable time	t_{ZH}	2.0	—	—	115	—	145	ns	$R_L = 1$ k Ω
		4.5	—	10	23	—	29		
		6.0	—	—	20	—	25		
Output disable time	t_{LZ}	2.0	—	—	115	—	145	ns	$R_L = 1$ k Ω
	t_{HZ}	4.5	—	14	23	—	29		
		6.0	—	—	20	—	25		
Sine wave distortion		4.5	—	0.05	—	—	—	%	$R_L = 10$ k Ω , $C_L = 50$ pF, $f_{IN} = 1$ kHz
Band width (-3 dB)		4.5	—	30	—	—	—	MHz	$R_L = 600$ Ω , $C_L = 50$ pF, $20 \log_{10} V_{out}/V_{in} = -3$ dB
Feedthrough attenuation		4.5	—	-50	—	—	—	dB	$R_L = 600$ Ω , $C_L = 50$ pF, $f_{IN} = 1$ MHz
Cross talk between control input to signal I/O		2.0	—	25	—	—	—	mA	$R_L = 600$ Ω , $C_L = 50$ pF, $f_{IN} = 1$ MHz
		4.5	—	60	—	—	—		
		6.0	—	75	—	—	—		
Cross talk between any two switches		4.5	—	-50	—	—	—	dB	$R_L = 600$ Ω , $C_L = 50$ pF, $f_{IN} = 1$ MHz
Maximum control frequency		2.0	—	20	—	—	—	MHz	$R_L = 1$ k Ω , $C_L = 15$ pF, $V_{out} = 1/2 (V_{CC})$
		4.5	—	30	—	—	—		
		6.0	—	30	—	—	—		
Control input capacitance	C_{in}		—	5	10	—	10	pF	
Switch I/O capacitance	$C_{in/out}$		—	6	—	—	—	pF	
Feed through capacitance	$C_{in/out}$		—	0.5	—	—	—	pF	
Power dissipation capacitance	C_{PD}		—	13	—	—	—	pF	

Unit: mm



Hitachi Code	DP-14
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.97 g

Unit: mm

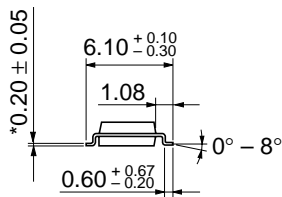
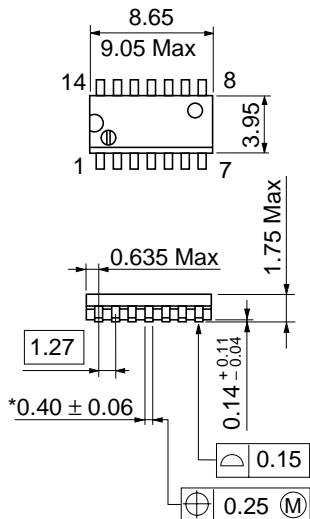


Hitachi Code	FP-14DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.23 g

*Dimension including the plating thickness
Base material dimension

EEPW 电子产品世界 .com.cn

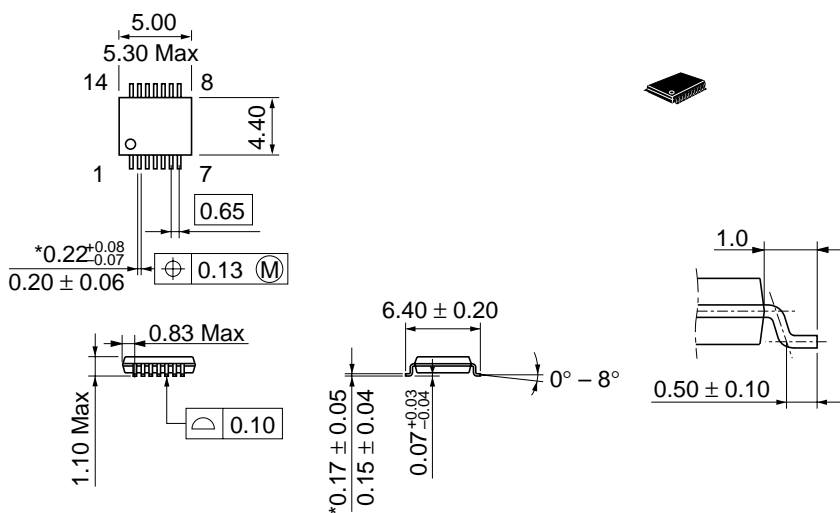
Unit: mm



Hitachi Code	FP-14DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.13 g

*Pd plating

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	TTP-14D
JEDEC	—
EIAJ	—
Weight (reference value)	0.05 g

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 North America : <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 StraÙe 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

Copyright ' Hitachi, Ltd., 1999. All rights reserved. Printed in Japan.

HITACHI