
HD74HC4066

Quad Analog Switches/Quad Multiplexers

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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

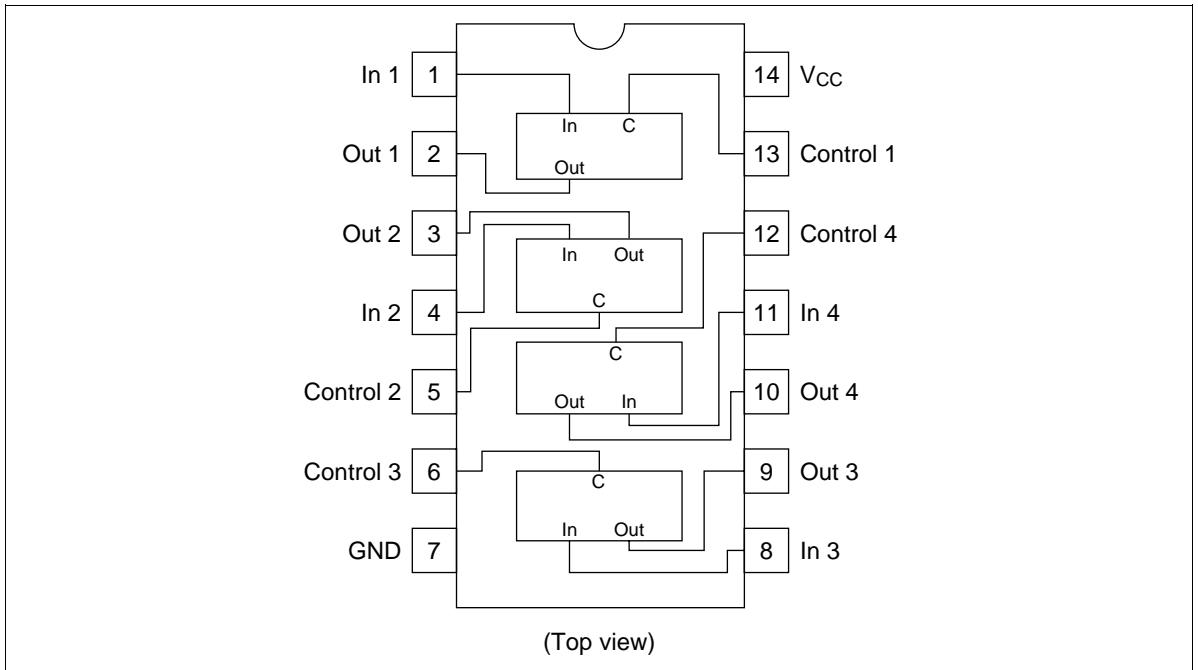
Control	Switch
L	OFF
H	ON

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

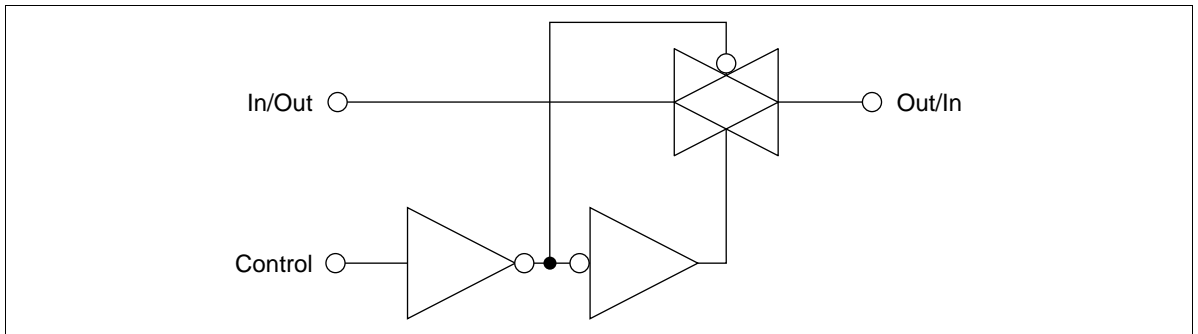
$GND \leq V_{out} \leq V_{CC}$

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Pin Arrangement



Logic Diagram (1/4)



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Absolute Maximum Ratings

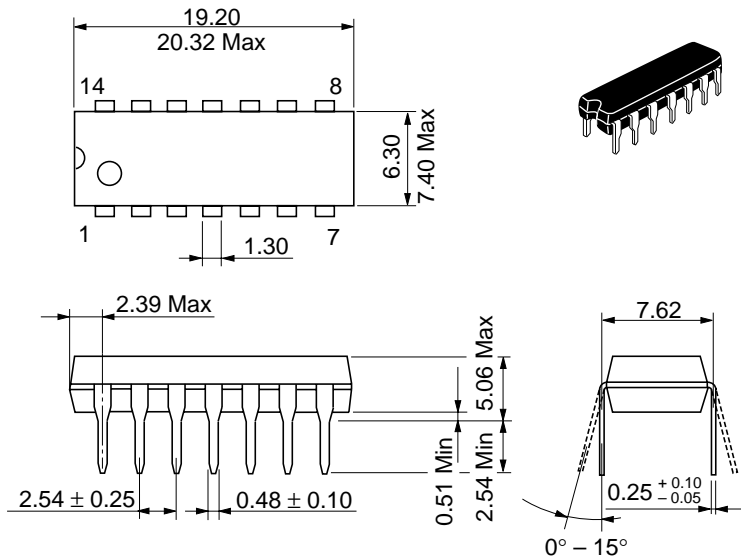
Item	Symbol	Rating	Unit	
Supply voltage	V_{CC}	-0.5 to +7.0	V	
Control input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V	
Switch I/O voltage	$V_{I/O}$	-0.5 to $V_{CC} + 0.5$	V	
Supply current	(V_{CC})	I_{CC}	+50	mA
	(GND)	I_{GND}	-50	mA
Switch I/O current (per pin)	$I_{I/O}$	± 25	mA	
Control input diode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

DC Characteristics

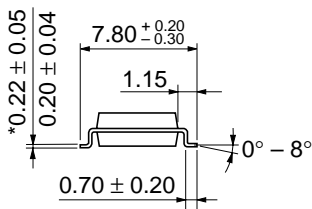
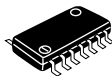
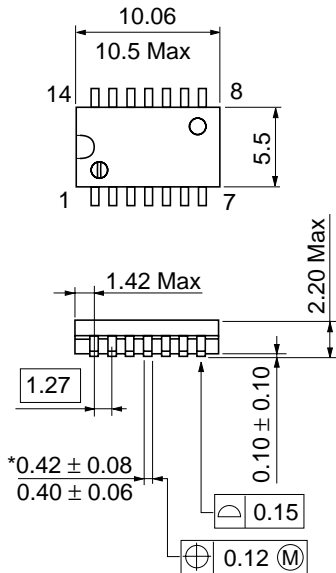
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Control input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V	
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	V _{IL}	2.0	—	—	0.5	—	0.5	V	
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—	1.8		
“ON” resistance	R _{ON}	2.0	—	2000	5000	—	6250	Ω	V _C = V _{IH}
		4.5	—	100	200	—	250		V _{in} = 0 to V _{CC}
		6.0	—	60	170	—	210		lin/out = 1 mA
ΔON resistance between any two channels	ΔR _{ON}	2.0	—	50	—	—	—	Ω	V _C = V _{IH} , lin/out = 1 mA
		4.5	—	3	—	—	—		between any two
		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)	$T_a = 25^\circ\text{C}$			$T_a = -40$ to $+85^\circ\text{C}$		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	

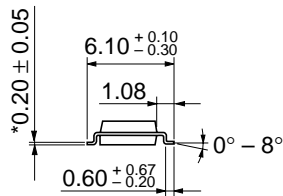
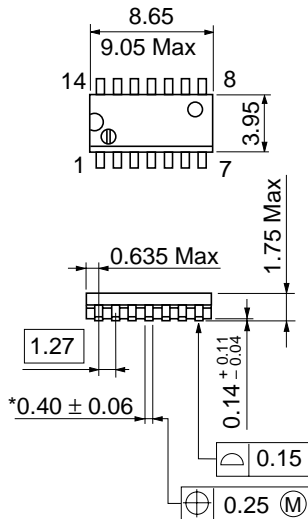


Hitachi Code	DP-14
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.97 g

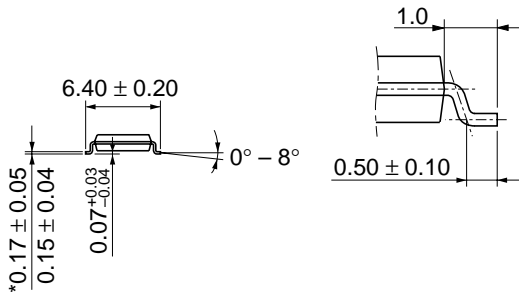
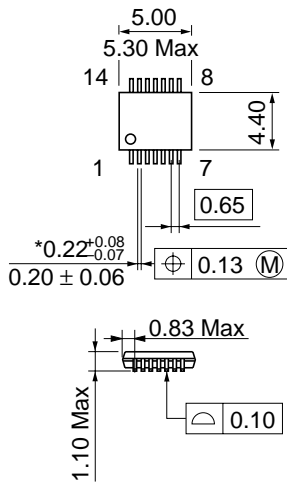


Hitachi Code	FP-14DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.23 g

*Dimension including the plating thickness
Base material dimension



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



*Dimension including the plating thickness
 Base material dimension

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

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