HD74UH4066

Analog Switch

HITACHI

ADE-205-022A (Z)
2nd. Edition
Aug. 1993

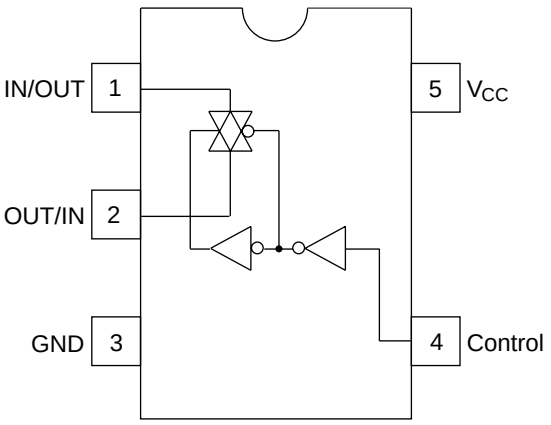
Description

The HD74UH4066 is high speed CMOS analog switch using silicon gate CMOS process. With CMOS low power dissipation, it provides high speed. The device has low ON resistance for good transfer characteristics and can take wide range of input voltage.

Features

- Encapsulated in very small 5pins package of 2.9 × 1.6 × 1.1 mm, the efficiency to mount on substrate is significantly improved.
- The basic gate function is lined up as hitachi uni logic series.
- Supplied on embos taping for high speed automatic mounting.
- Electrical characteristics equivalent to the HD74HC4066
  Supply voltage range: 2 to 6 V
  Operating temperature range: –40 to +85°C
- $| I_{OH} | = I_{OL} = 2$ mA (min)

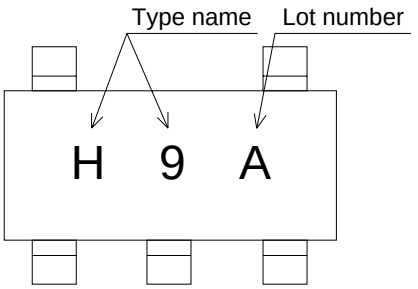
Pin Arrangement



(Top view)

Hitachi semiconductor

Article Indication



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	–0.5 to +7.0	V
Input voltage	V_{IN}	–0.5 to V_{CC} +0.5	V
Output voltage	V_{OUT}	–0.5 to V_{CC} +0.5	V
Input diode current	I_{IK}	±20	mA
Output diode current	I_{OK}	±20	mA
Output current	I_{OUT}	±25	mA
V_{CC}/GND current	I_{CC}, I_{GND}	±25	mA
Power dissipation	P_T	200	mW
Strage temperature	Tstg	–65 to +150	°C

Recommended Operating Conditions

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	2 to 6	V
Input voltage	V_{IN}	0 to V_{CC}	V
Output voltage	V_{OUT}	0 to V_{CC}	V
Operating temperature	Topr	–40 to +85	°C
Input rise/fall time	t_r, t_f	0 to 1000 (V_{CC} = 2.0 V)	ns
		0 to 500 (V_{CC} = 4.5 V)	
		0 to 400 (V_{CC} = 6.0 V)	

Electrical Characteristics

		Ta = 25°C			Ta = –40 to 85°C			Test Conditions	
Item	**Symbol**	**Min**	**Typ**	**Max**	**Min**	**Max**	**Unit**	**V_{CC}**	
Input voltage	V_{IH}	1.5	—	—	1.5	—	V	2.0	
		3.15	—	—	3.15	—		4.5	
		4.2	—	—	4.2	—		6.0	
	V_{IL}	—	—	0.5	—	0.5	V	2.0	
		—	—	1.35	—	1.35		4.5	
		—	—	1.8	—	1.8		6.0	
On resistance	R_{ON}	—	2000	5000	—	6250	Ω	2.0	$V_C = V_{IH}$
		—	100	200	—	250		4.5	V_{IN} = 0 to V_{CC}
		—	60	170	—	210		6.0	$I_{IN/OUT}$ = 1 mA
Leak current	I_S (off)	—	—	±0.1	—	±1.0	µA	6.0	$V_C = V_{IL}$ $V_{IN} = V_{CC}$, V_{OUT} = GND or V_{IN} = GND, $V_{OUT} = V_{CC}$
	I_S (on)	—	—	±0.1	—	±1.0	µA	6.0	$V_C = V_{IH}$ $V_{IN} = V_{CC}$ or GND
Input current	I_{IN}	—	—	±0.1	—	±1.0	µA	6.0	$V_{IN} = V_{CC}$ or GND
Operating current	I_{CC}	—	—	1.0	—	10.0	µA	6.0	$V_{IN} = V_{CC}$ or GND

Switching Characteristics

		Ta = 25°C			Ta = –40 to 85°C			Test Conditions	
Item	**Symbol**	**Min**	**Typ**	**Max**	**Min**	**Max**	**Unit**	**V_{cc}**	
Propagation delay time	t_{PLH}	—	—	50	—	65	ns	2.0	R_L = 10 KΩ
	t_{PHL}	—	4	10	—	13		4.5	
		—	—	9	—	11		6.0	
Output enable time	t_{PZL}	—	—	115	—	145	ns	2.0	R_L = 1 KΩ
	t_{PZH}	—	10	23	—	29		4.5	
		—	—	20	—	25		6.0	
Output disable time	t_{LZ}	—	—	115	—	145	ns	2.0	R_L = 1 KΩ
	t_{HZ}	—	14	23	—	29		4.5	
		—	—	20	—	25		6.0	
Maximum control frequency	t_{max}	—	20	—	—	—	MHz	2.0	
		—	30	—	—	—		4.5	
		—	30	—	—	—		6.0	
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		

Test Circuit

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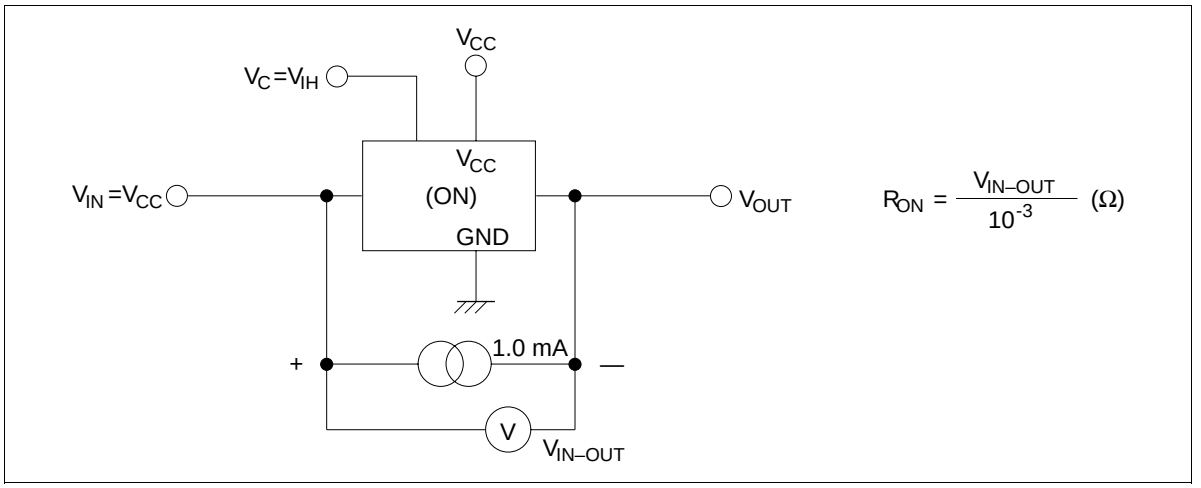
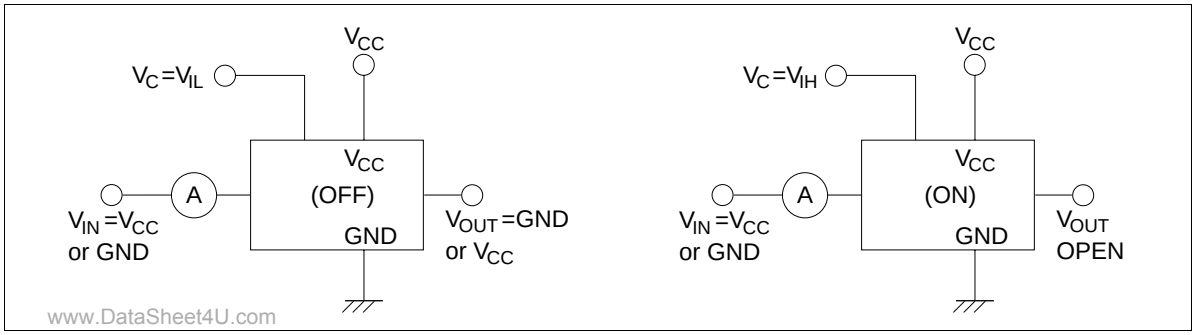
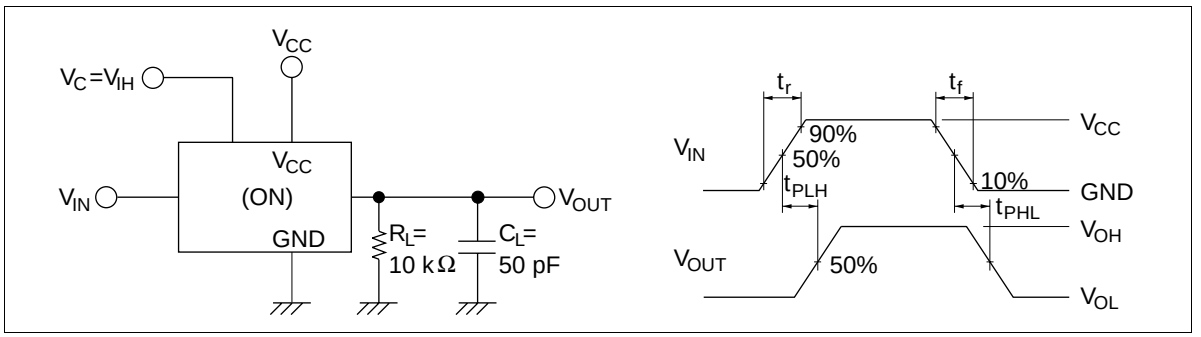


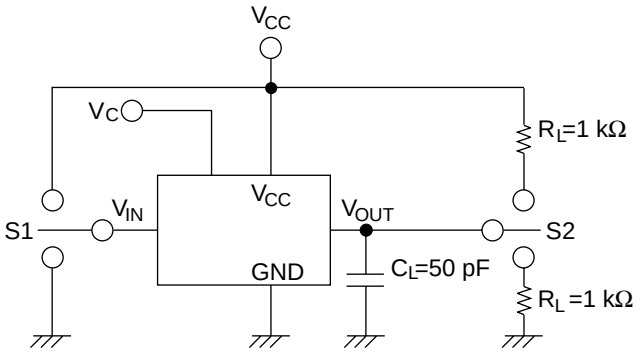
$I_{S\,(OFF)}$, $I_{S\,(ON)}$

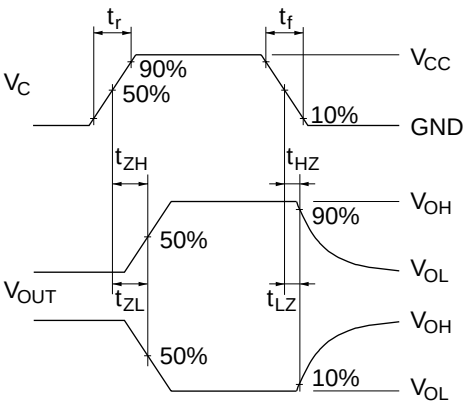


t_{PLH}, t_{PHL}



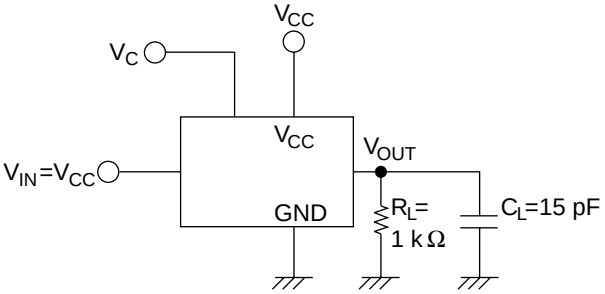
t_{ZH}, t_{ZL} / t_{HZ}, t_{LZ}

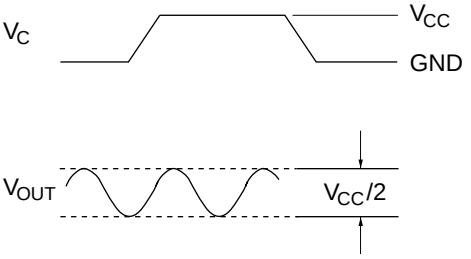




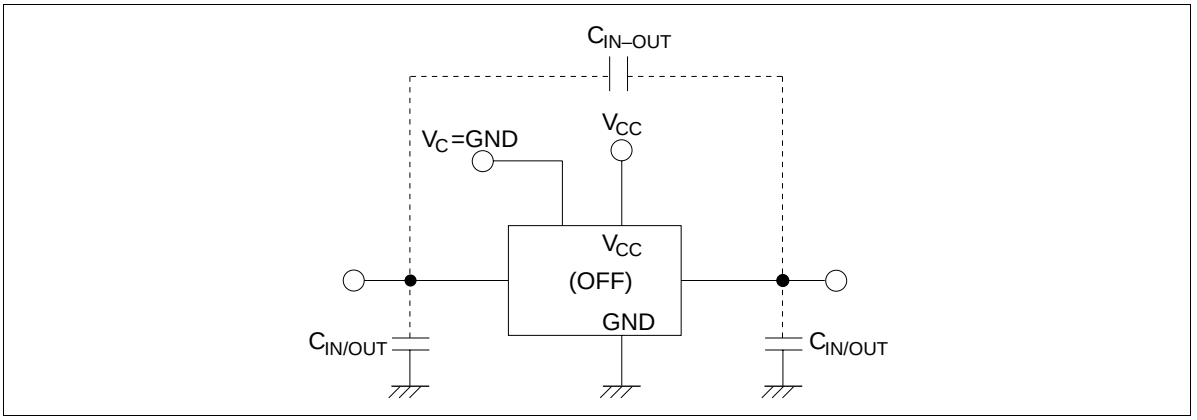
Item	S1	S2
t_{ZH}	V_{CC}	GND
t_{ZL}	GND	V_{CC}
t_{HZ}	V_{CC}	GND
t_{LZ}	GND	V_{CC}

Maximum control frequency



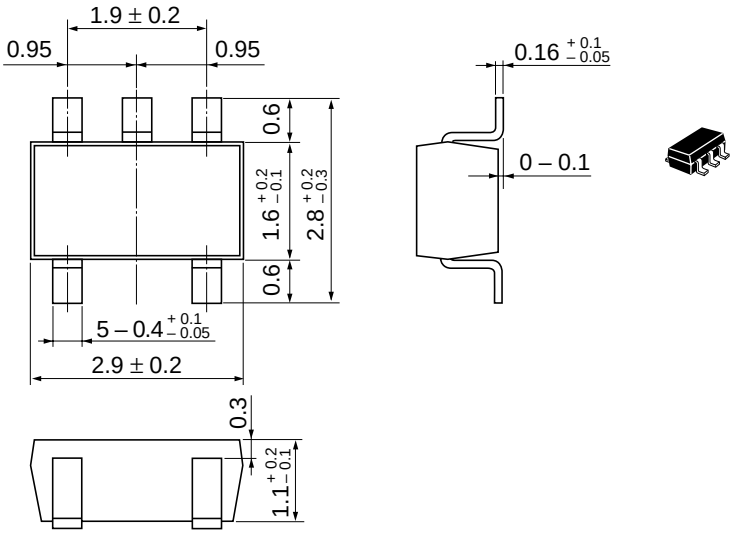


$C_{IN/OUT}$, C_{IN-OUT}



Package Dimensions

Unit: mm



Hitachi Code	MPAK-5
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Mass (reference value)	0.015 g

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