

# HD74UH4066

## Analog Switch

REJ03D0204-0400Z  
(Previous ADE-205-022B (Z))  
Rev.4.00  
Feb.02.2004

### Description

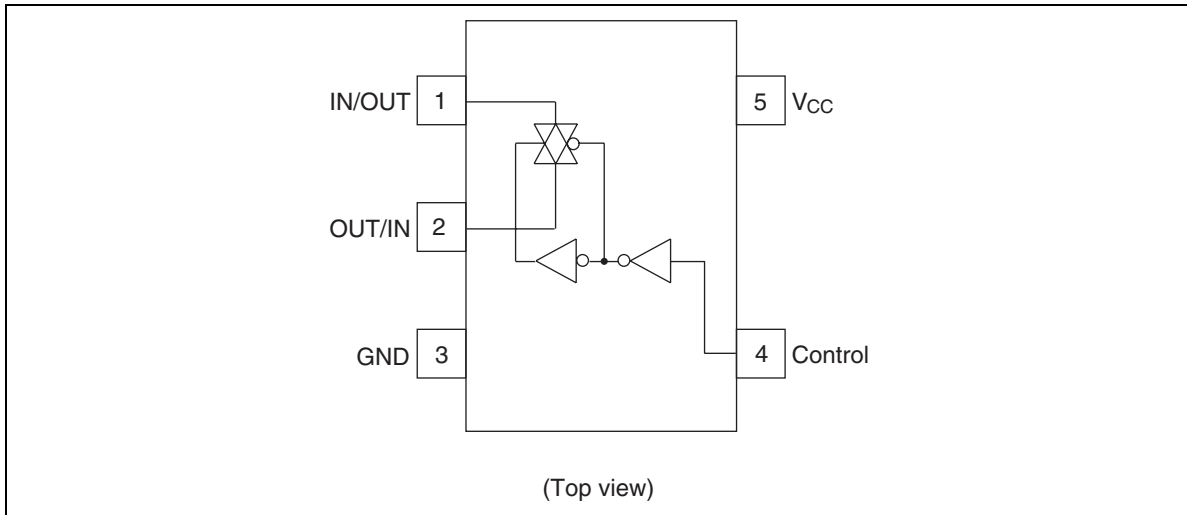
The HD74UH4066 is high-speed CMOS analog switch using silicon gate CMOS process. With CMOS low power dissipation, it provides high speed. The device has low ON resistance for good transfer characteristics and can take wide range of input voltage.

### Features

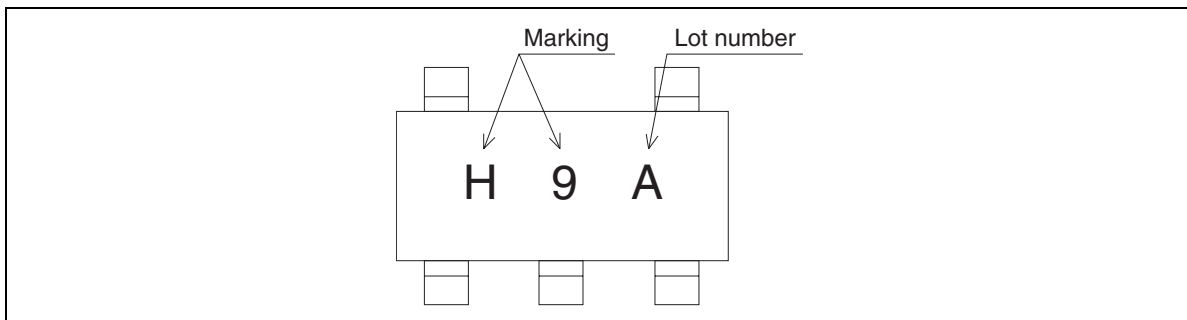
- Encapsulated in very small 5pins package of  $2.9 \times 1.6 \times 1.1$  mm, the efficiency to mount on substrate is significantly improved.
- The basic gate function is lined up as Renesas uni logic series.
- Supplied on emboss taping for high-speed automatic mounting.
- Electrical characteristics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

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74UH4066EL	MPAK-5 pin	MPAK-5V	–	EL (3,000 pcs/reel)

**Pin Arrangement**



**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	$I_{IK}$	$\pm 20$	mA
Output diode current	$I_{OK}$	$\pm 20$	mA
Output current	$I_{OUT}$	$\pm 25$	mA
$V_{CC}/GND$ current	$I_{CC}, I_{GND}$	$\pm 25$	mA
Power dissipation	$P_T$	200	mW
Storage temperature	$T_{stg}$	-65 to +150	$^{\circ}C$

**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	$T_{opr}$	-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**

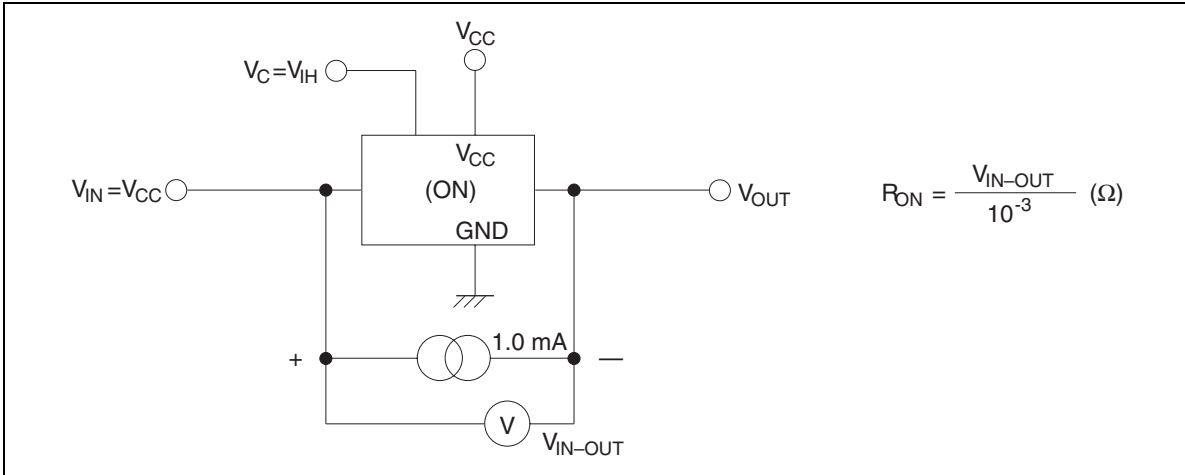
Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } 85^\circ\text{C}$		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Input voltage	$V_{IH}$	2.0	1.5	—	—	1.5	—	V	
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	$V_{IL}$	2.0	—	—	0.5	—	0.5	V	
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—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

Switching Characteristics

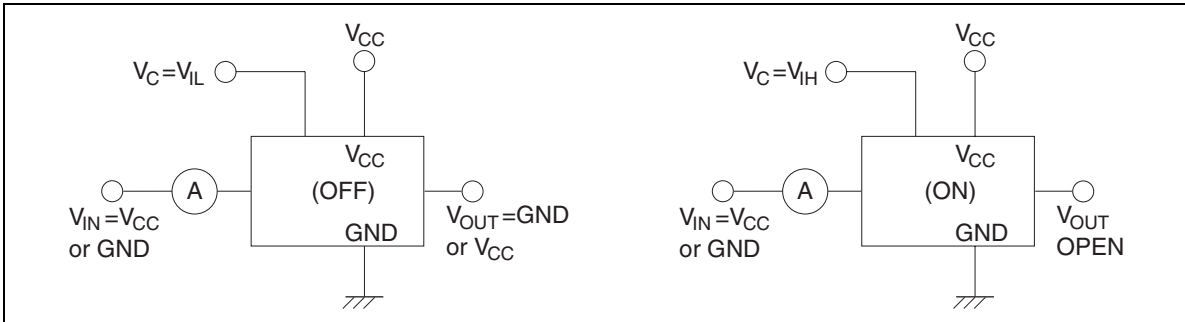
Item	Symbol	V <sub>CC</sub>	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t <sub>PLH</sub>	2.0	—	—	50	—	65	ns	R <sub>L</sub> = 10 KΩ
	t <sub>PHL</sub>	4.5	—	4	10	—	13		
		6.0	—	—	9	—	11		
Output enable time	t <sub>PZL</sub>	2.0	—	—	115	—	145	ns	R <sub>L</sub> = 1 KΩ
	t <sub>PZH</sub>	4.5	—	10	23	—	29		
		6.0	—	—	20	—	25		
Output disable time	t <sub>LZ</sub>	2.0	—	—	115	—	145	ns	R <sub>L</sub> = 1 KΩ
	t <sub>HZ</sub>	4.5	—	14	23	—	29		
		6.0	—	—	20	—	25		
Maximum control frequency	t <sub>max</sub>	2.0	—	20	—	—	—	MHz	
		4.5	—	30	—	—	—		
		6.0	—	30	—	—	—		
Control input capacitance	C <sub>IN</sub>	—	—	5	10	—	10	pF	
Switch I/O capacitance	C <sub>IN/OUT</sub>	—	—	6	—	—	—	pF	
Feed through capacitance	C <sub>IN-OUT</sub>	—	—	0.5	—	—	—	pF	
Power dissipation capacitance	C <sub>PD</sub>	—	—	13	—	—	—	pF	

Test Circuit

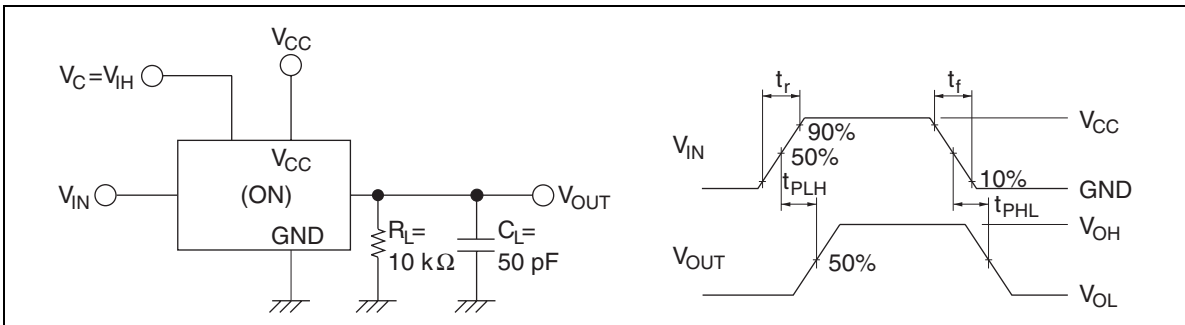
RON



I<sub>S</sub> (OFF), I<sub>S</sub> (ON)

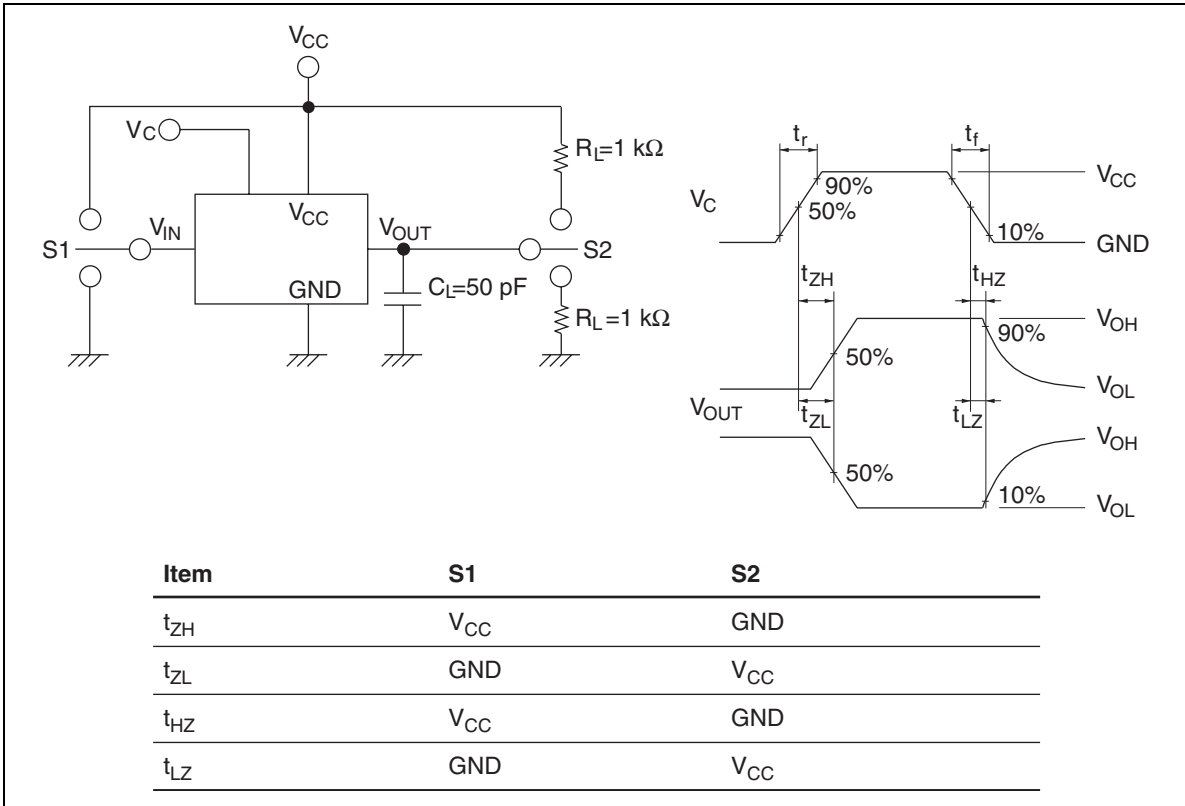


t<sub>PLH</sub>, t<sub>PHL</sub>

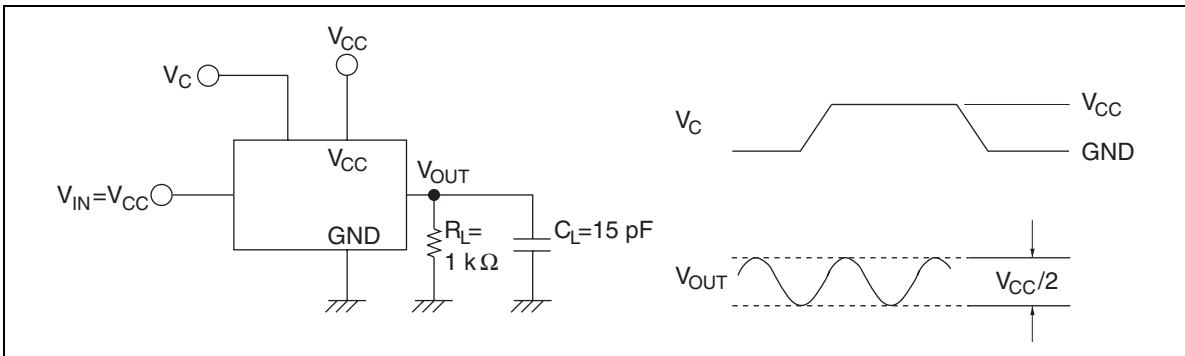


## HD74UH4066

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



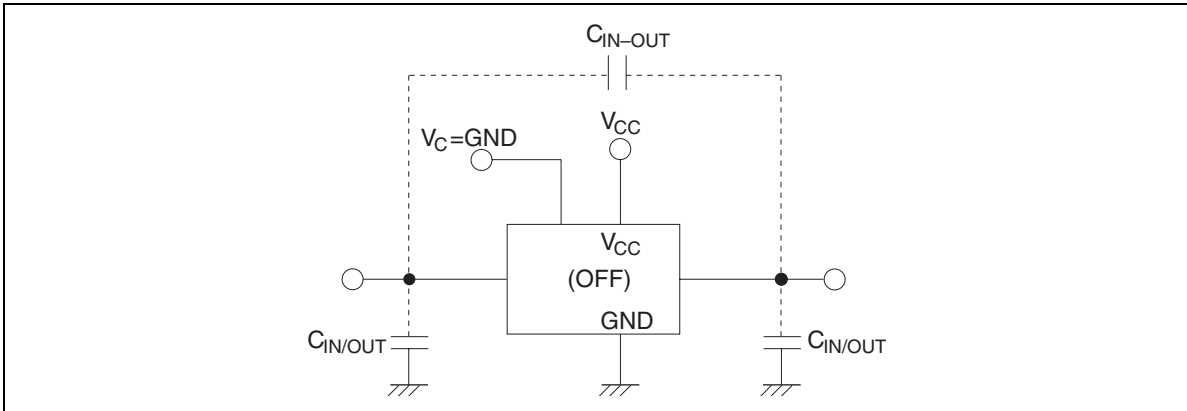
### Maximum control frequency



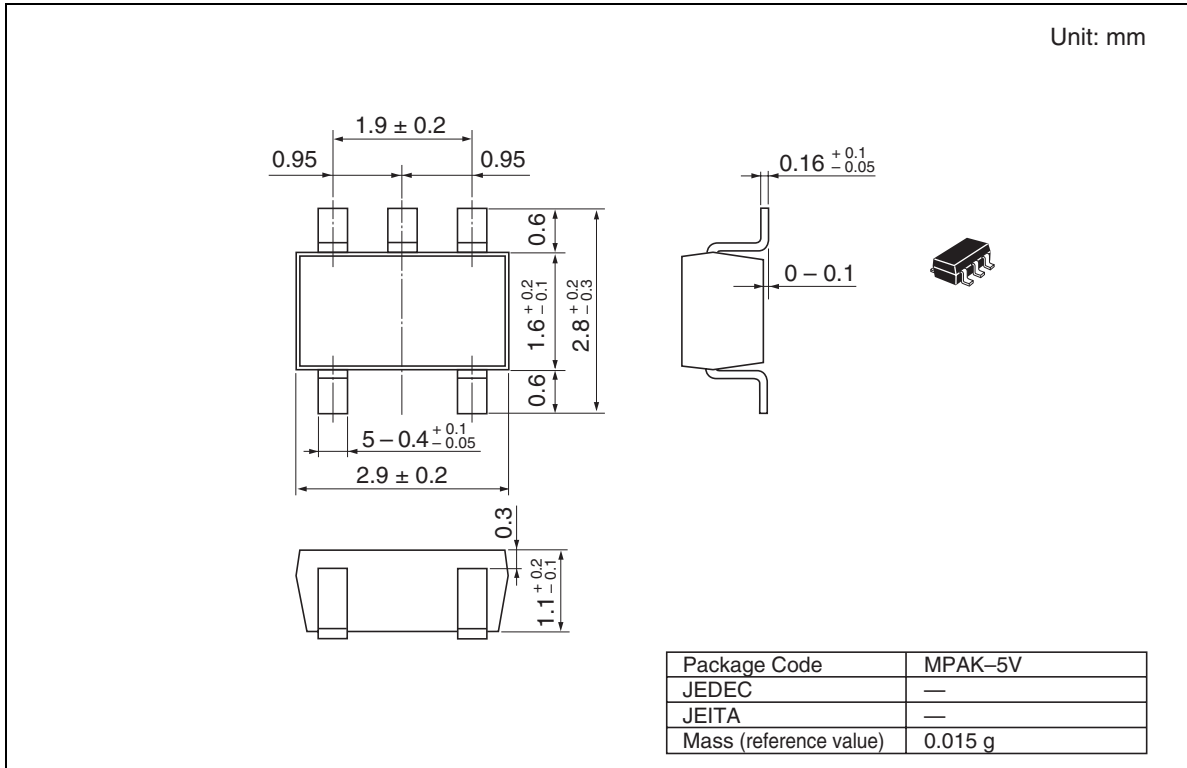
**HD74UH4066**

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



Package Dimensions





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