

HD74UH4066

Analog Switch

HITACHI

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

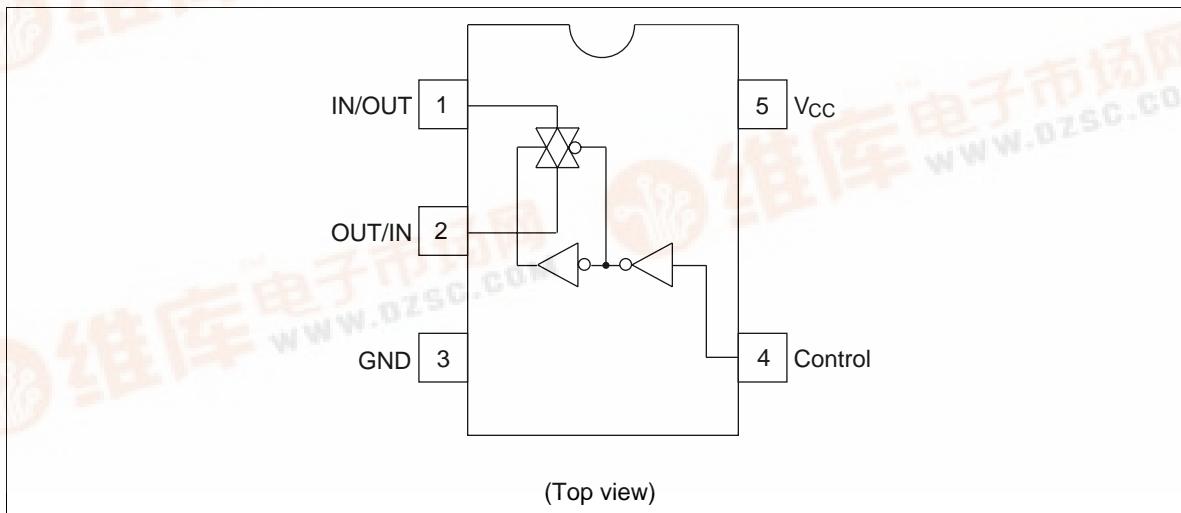
Description

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

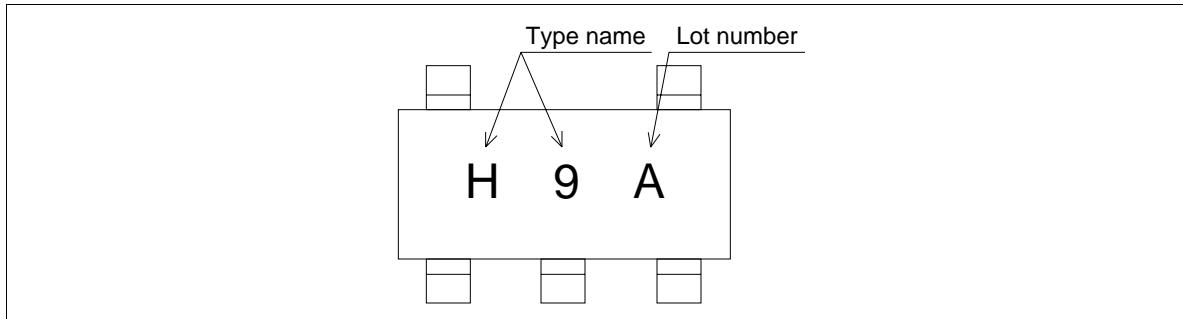
- Encapsulated in very small 5pins package of $2.9 \times 1.6 \times 1.1$ mm, the efficiency to mount on substrate is significantly improved.
- The basic gate function is lined up as hitachi uni logic series.
- Supplied on embos taping for high speed automatic mounting.
- Electrical characteristics equivalent 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



HD74UH4066

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 |
| Storage temperature | T_{STG} | −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) 0 to 500 ($V_{CC} = 4.5$ V) 0 to 400 ($V_{CC} = 6.0$ V) | ns |

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Electrical Characteristics

| Item | Symbol | Ta = 25°C | | | | | Ta = -40 to 85°C | | Test Conditions |
|-------------------|-------------------------|-----------|------|------|------|------|------------------|-----------------|--|
| | | Min | Typ | Max | Min | Max | Unit | V _{cc} | |
| Input voltage | V _{IH} | 1.5 | — | — | 1.5 | — | V | 2.0 | V _C = V _{IH} |
| | | 3.15 | — | — | 3.15 | — | | 4.5 | |
| | | 4.2 | — | — | 4.2 | — | | 6.0 | |
| | V _{IL} | — | — | 0.5 | — | 0.5 | V | 2.0 | V _{IN} = 0 to V _{cc} |
| | | — | — | 1.35 | — | 1.35 | | 4.5 | |
| | | — | — | 1.8 | — | 1.8 | | 6.0 | |
| On resistance | R _{ON} | — | 2000 | 5000 | — | 6250 | Ω | 2.0 | I _{IN/OUT} = 1 mA |
| | | — | 100 | 200 | — | 250 | | 4.5 | |
| | | — | 60 | 170 | — | 210 | | 6.0 | |
| 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 | |
| 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 |

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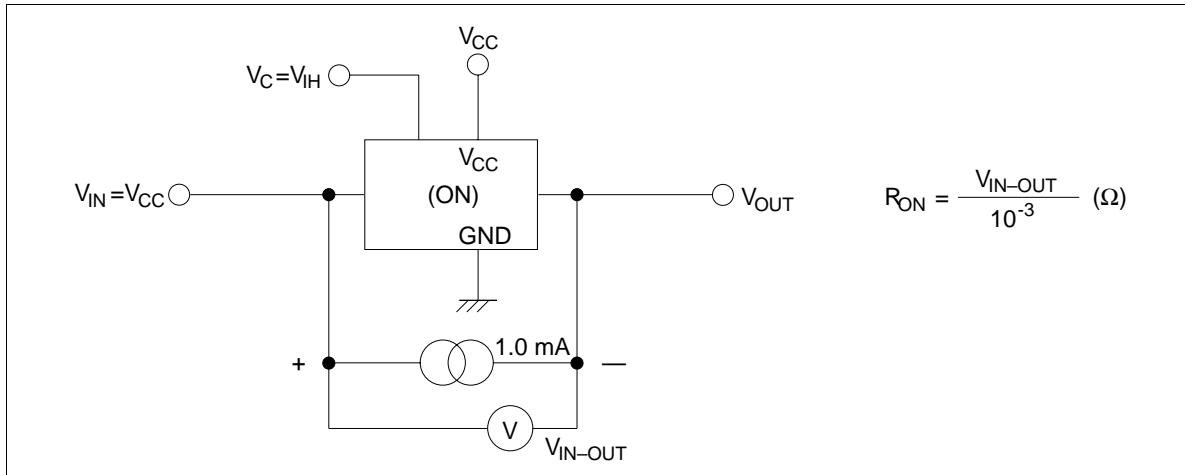
Switching Characteristics

| Item | Symbol | Ta = 25°C | | | Ta = -40 to 85°C | | Test Conditions | |
|-------------------------------|---------------------|-----------|-----|-----|------------------|-----|-----------------|-----------------|
| | | Min | Typ | Max | Min | Max | Unit | V _{cc} |
| Propagation delay time | t _{PLH} | — | — | 50 | — | 65 | ns | 2.0 |
| | t _{PHL} | — | 4 | 10 | — | 13 | | 4.5 |
| | | — | — | 9 | — | 11 | | 6.0 |
| Output enable time | t _{PZL} | — | — | 115 | — | 145 | ns | 2.0 |
| | t _{PZH} | — | 10 | 23 | — | 29 | | 4.5 |
| | | — | — | 20 | — | 25 | | 6.0 |
| Output disable time | t _{LZ} | — | — | 115 | — | 145 | ns | 2.0 |
| | 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 | |

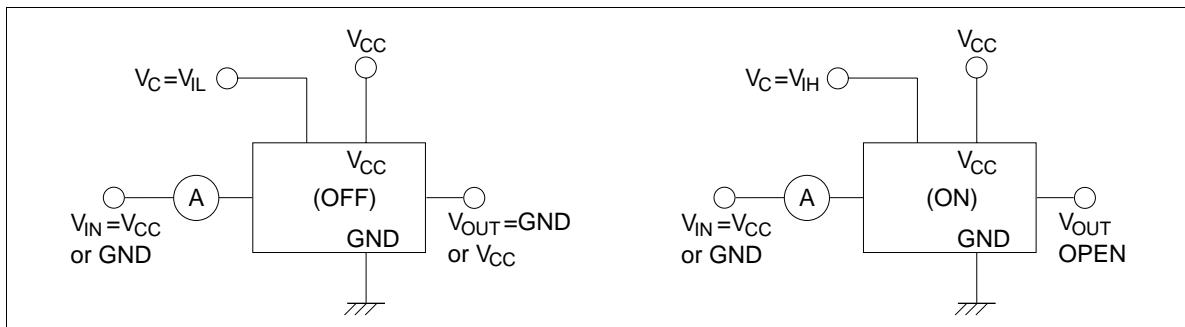
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Test Circuit

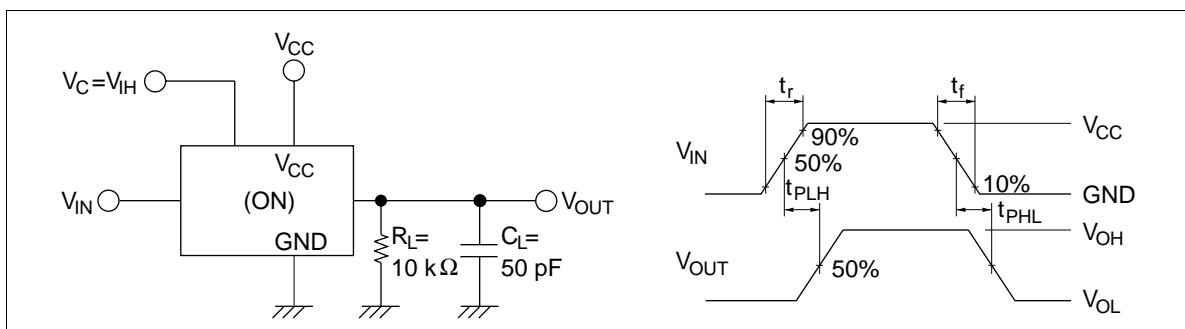
RON



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

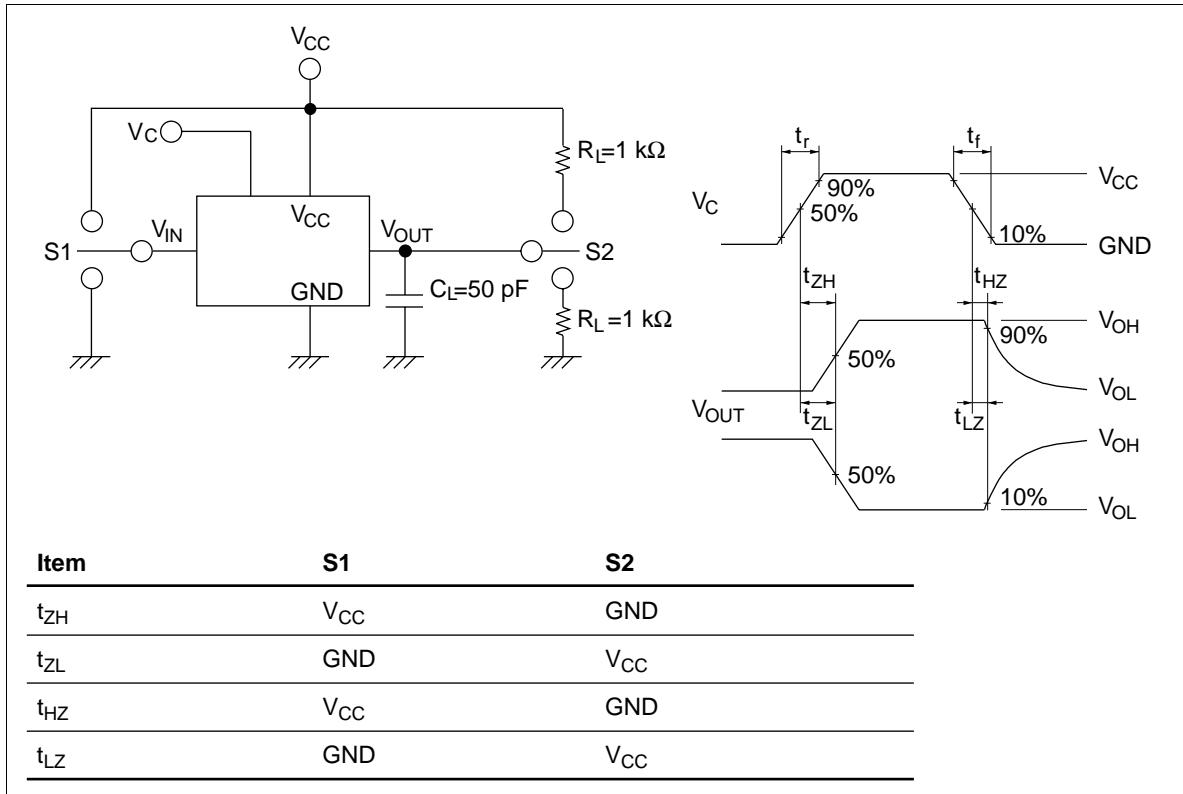


t_{PLH} , t_{PHL}

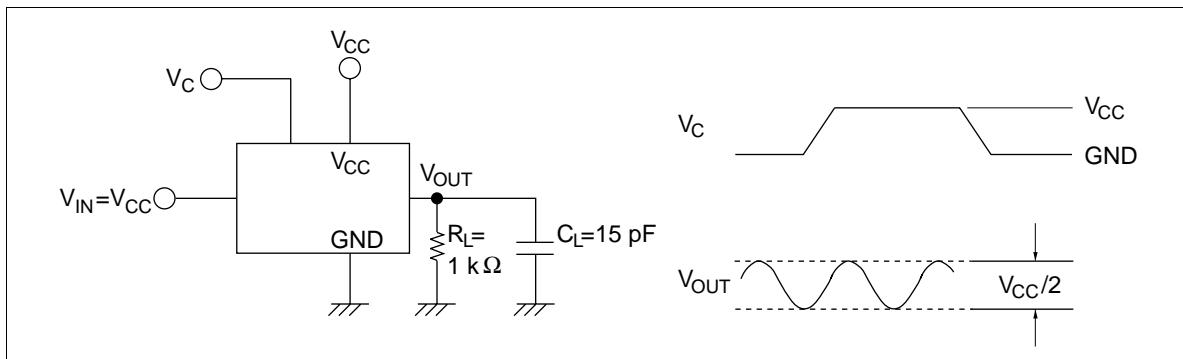


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$t_{ZH}, t_{ZL} / t_{HZ}, t_{LZ}$

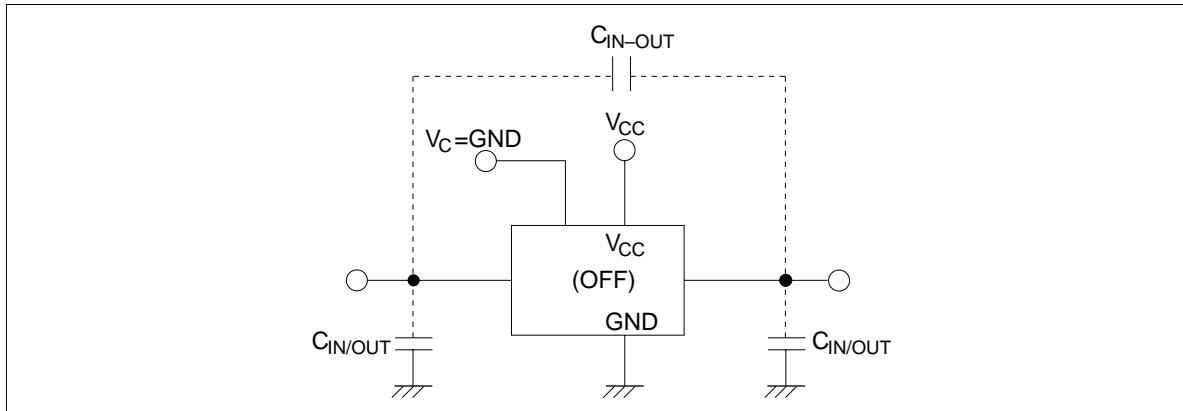


Maximum control frequency



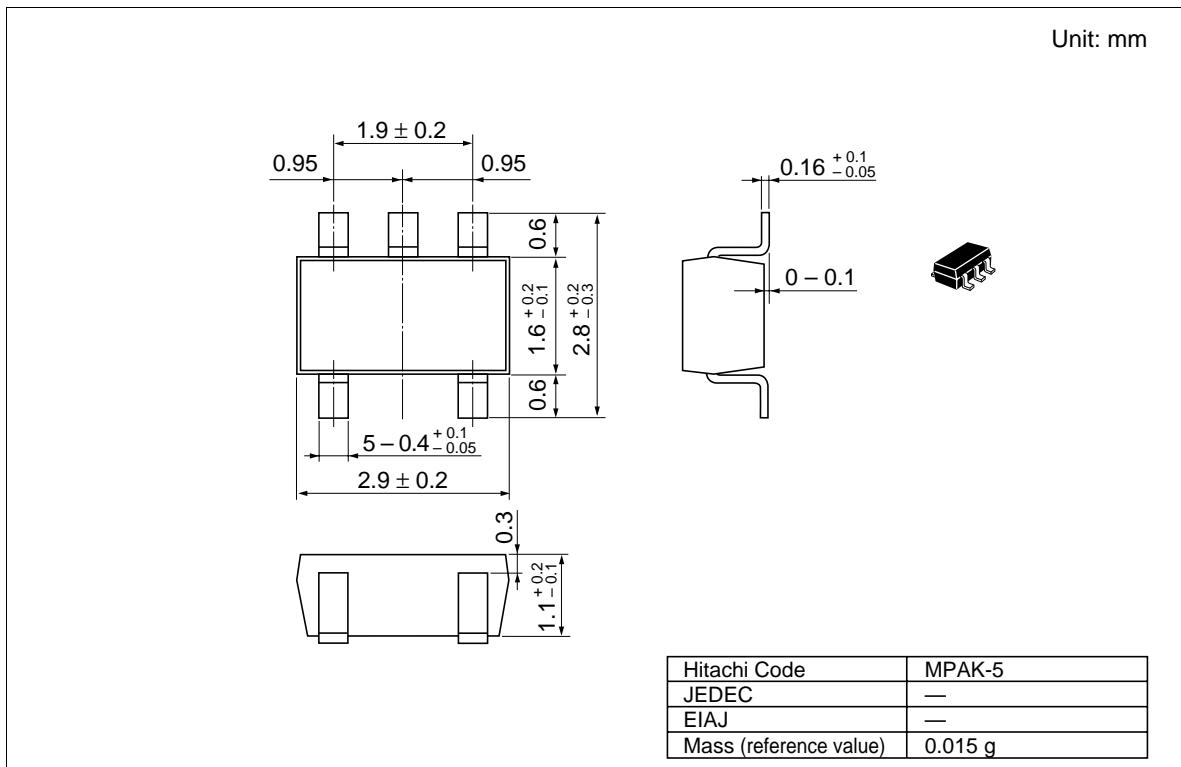
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$C_{IN/OUT}$, C_{IN-OUT}



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Package Dimensions



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Hitachi, Ltd.

Semiconductor & Integrated Circuits.

Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

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|---|---|---|---|
| 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 Asia Ltd. Hitachi Tower 16 Collyer Quay #20-00, Singapore 049318 Tel : <65>-538-6533/538-8577 Fax : <65>-538-6933/538-3877 URL : http://www.hitachi.com.sg | 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 URL : http://www.hitachi.com.hk |
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