

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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HD74ALVC2G07

Triple Buffers / Drivers with Open Drain

REJ03D0163-0500

Rev.5.00

Sep 08, 2006

Description

The HD74ALVC2G07 has triple buffers / drivers with open drain outputs in an 8 pin package. Low voltage and high-speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

Features

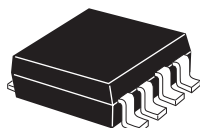
- The basic gate function is lined up as Renesas uni logic series.
- Supplied on emboss taping for high-speed automatic mounting.
- Supply voltage range : 1.2 to 3.6 V
- Operating temperature range: -40 to +85°C
- All inputs V_{IH} (Max.) = 3.6 V (@ V_{CC} = 0 V to 3.6 V)
- All outputs V_O (Max.) = 3.6 V (@ V_{CC} = 0 V, Output: Z)
- Output current
 - 2 mA (@ V_{CC} = 1.2 V)
 - 4 mA (@ V_{CC} = 1.4 V to 1.6 V)
 - 6 mA (@ V_{CC} = 1.65 V to 1.95 V)
 - 18 mA (@ V_{CC} = 2.3 V to 2.7 V)
 - 24 mA (@ V_{CC} = 3.0 V to 3.6 V)

- Ordering Information

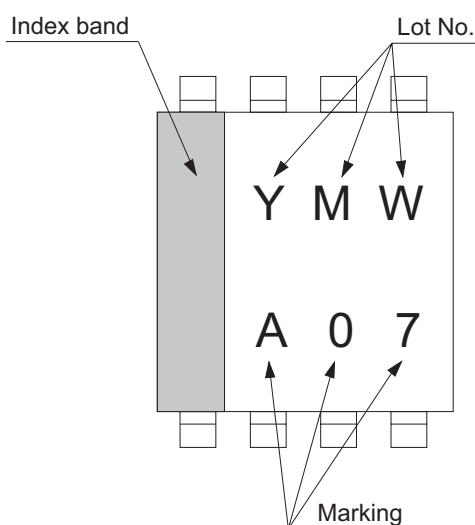
| Part Name | Package Type | Package Code (Previous Code) | Package Abbreviation | Taping Abbreviation (Quantity) |
|-----------------|--------------|------------------------------|----------------------|--------------------------------|
| HD74ALVC2G07USE | SSOP-8 pin | PVSP0008KA-A (TTP-8DBV) | US | E (3,000 pcs/reel) |

Outline and Article Indication

- HD74ALVC2G07



SSOP-8



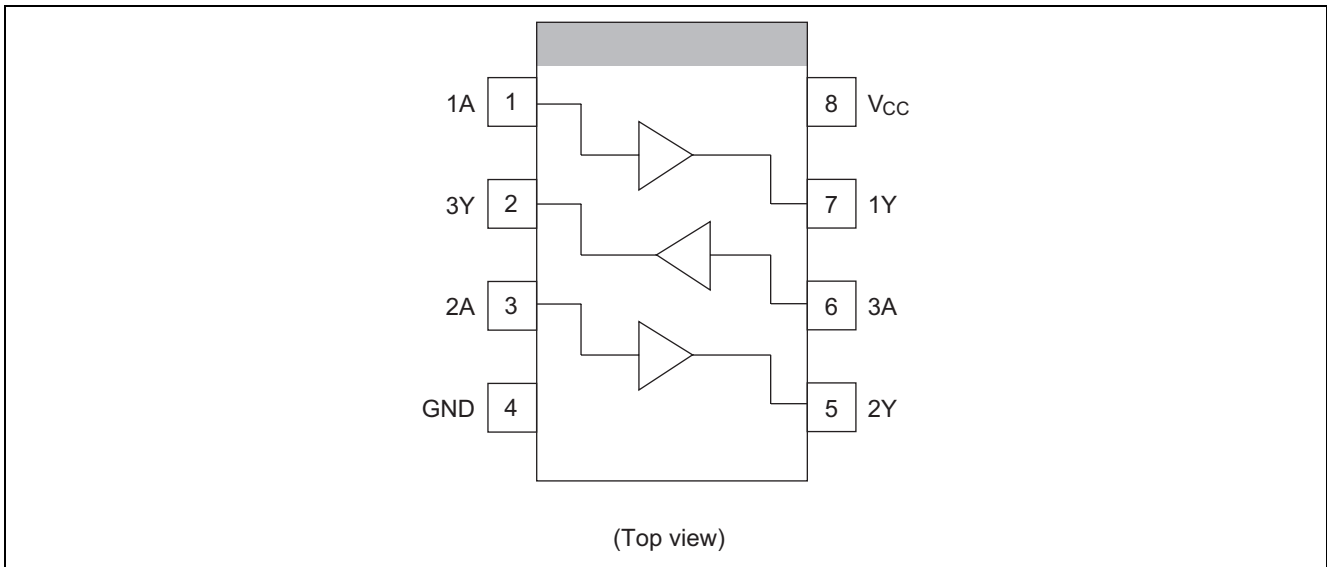
Y : Year code
(the last digit of year)
M : Month code
W : Week code

Function Table

| Input A | Output Y |
|---------|----------|
| L | L |
| H | Z |

H: High level
 L: Low level
 Z: High impedance

Pin Arrangement



Absolute Maximum Ratings

| Item | Symbol | Ratings | Unit | Conditions |
|--|-----------------------|----------------------|------------------|------------------------------|
| Supply voltage range | V_{CC} | -0.5 to 4.6 | V | |
| Input voltage range ^{*1} | V_I | -0.5 to 4.6 | V | |
| Output voltage range ^{*1, 2} | V_O | -0.5 to $V_{CC}+0.5$ | V | Output : L |
| | | -0.5 to 4.6 | | V_{CC} : OFF or Output : Z |
| Input clamp current | I_{IK} | -50 | mA | $V_I < 0$ |
| Output clamp current | I_{OK} | -50 | mA | $V_O < 0$ |
| Continuous output current | I_O | ± 50 | mA | $V_O = 0$ to V_{CC} |
| Continuous current through V_{CC} or GND | I_{CC} or I_{GND} | ± 100 | mA | |
| Maximum power dissipation at $T_a = 25^\circ\text{C}$ (in still air) ^{*3} | P_T | 200 | mW | |
| Storage temperature | T_{stg} | -65 to 150 | $^\circ\text{C}$ | |

Notes: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

- 3. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
- 3. This value is limited to 4.6 V maximum.
- 3. The maximum package power dissipation was calculated using a junction temperature of 150°C.

Recommended Operating Conditions

| Item | Symbol | Min | Max | Unit | Conditions |
|------------------------------------|-----------------------|-----|----------|--------|---------------------------------------|
| Supply voltage range | V_{CC} | 1.2 | 3.6 | V | |
| Input voltage range | V_I | 0 | 3.6 | V | |
| Output voltage range | V_O | 0 | V_{CC} | V | |
| Output current | I_{OL} | — | 2 | mA | $V_{CC} = 1.2\text{ V}$ |
| | | — | 4 | | $V_{CC} = 1.4\text{ V}$ |
| | | — | 6 | | $V_{CC} = 1.65\text{ V}$ |
| | | — | 18 | | $V_{CC} = 2.3\text{ V}$ |
| | | — | 24 | | $V_{CC} = 3.0\text{ V}$ |
| Input transition rise or fall rate | $\Delta t / \Delta v$ | 0 | 20 | ns / V | $V_{CC} = 1.2\text{ to }2.7\text{ V}$ |
| | | 0 | 10 | | $V_{CC} = 3.3\pm 0.3\text{ V}$ |
| Operating free-air temperature | T_a | -40 | 85 | °C | |

Note: Unused or floating inputs must be held high or low.

Electrical Characteristics

($T_a = -40\text{ to }85^\circ\text{C}$)

| Item | Symbol | $V_{CC}\text{ (V)}^{-1}$ | Min | Typ | Max | Unit | Test Conditions |
|--------------------------|-----------|--------------------------|---------------------|-----|---------------------|---------------|---|
| Input voltage | V_{IH} | 1.2 | $V_{CC}\times 0.75$ | — | — | V | |
| | | 1.4 to 1.6 | $V_{CC}\times 0.7$ | — | — | | |
| | | 1.65 to 1.95 | $V_{CC}\times 0.7$ | — | — | | |
| | | 2.3 to 2.7 | 1.7 | — | — | | |
| | | 3.0 to 3.6 | 2.0 | — | — | | |
| | V_{IL} | 1.2 | — | — | $V_{CC}\times 0.25$ | | |
| | | 1.4 to 1.6 | — | — | $V_{CC}\times 0.3$ | | |
| | | 1.65 to 1.95 | — | — | $V_{CC}\times 0.3$ | | |
| | | 2.3 to 2.7 | — | — | 0.7 | | |
| | | 3.0 to 3.6 | — | — | 0.8 | | |
| Output voltage | V_{OL} | Min to Max | — | — | 0.2 | V | $I_{OL} = 100\ \mu\text{A}$ |
| | | 1.2 | — | — | 0.3 | | $I_{OL} = 2\ \text{mA}$ |
| | | 1.4 | — | — | 0.3 | | $I_{OL} = 4\ \text{mA}$ |
| | | 1.65 | — | — | 0.3 | | $I_{OL} = 6\ \text{mA}$ |
| | | 2.3 | — | — | 0.55 | | $I_{OL} = 18\ \text{mA}$ |
| | | 3.0 | — | — | 0.55 | | $I_{OL} = 24\ \text{mA}$ |
| Input current | I_{IN} | 3.6 | — | — | ± 5 | μA | $V_{IN} = 3.6\text{ V or GND}$ |
| Off state output current | I_{OZ} | 3.6 | — | — | ± 5 | μA | $V_{OUT} = V_{CC}\text{ or GND}$ |
| Quiescent supply current | I_{CC} | 3.6 | — | — | 10 | μA | $V_{IN} = V_{CC}\text{ or GND, } I_O = 0$ |
| Output leakage current | I_{OFF} | 0 | — | — | 5 | μA | $V_{IN}\text{ or }V_O = 0\text{ to }3.6\text{ V}$ |
| Input capacitance | C_{IN} | 3.3 | — | 5.0 | — | pF | $V_{IN} = V_{CC}\text{ or GND}$ |

Note: For conditions shown as Min or Max, use the appropriate values under recommended operating conditions.

Switching Characteristics

$V_{CC} = 1.2\text{ V}$

| Item | Symbol | Ta = -40 to 85°C | | | Unit | Test Conditions | FROM (Input) | TO (Output) |
|------------------------|-----------------|------------------|-----|-----|------|------------------------|--------------|-------------|
| | | Min | Typ | Max | | | | |
| Propagation delay time | t _{LZ} | — | 5.5 | — | ns | C _L = 15 pF | A | Y |
| | t _{ZL} | — | 5.5 | — | | | | |

$V_{CC} = 1.5 \pm 0.1\text{ V}$

| Item | Symbol | Ta = -40 to 85°C | | | Unit | Test Conditions | FROM (Input) | TO (Output) |
|------------------------|-----------------|------------------|-----|-----|------|------------------------|--------------|-------------|
| | | Min | Typ | Max | | | | |
| Propagation delay time | t _{LZ} | 1.0 | — | 7.0 | ns | C _L = 15 pF | A | Y |
| | t _{ZL} | 1.0 | — | 7.0 | | | | |

$V_{CC} = 1.8 \pm 0.15\text{ V}$

| Item | Symbol | Ta = -40 to 85°C | | | Unit | Test Conditions | FROM (Input) | TO (Output) |
|------------------------|-----------------|------------------|-----|-----|------|------------------------|--------------|-------------|
| | | Min | Typ | Max | | | | |
| Propagation delay time | t _{LZ} | 1.0 | — | 5.0 | ns | C _L = 30 pF | A | Y |
| | t _{ZL} | 1.0 | — | 5.0 | | | | |

$V_{CC} = 2.5 \pm 0.2\text{ V}$

| Item | Symbol | Ta = -40 to 85°C | | | Unit | Test Conditions | FROM (Input) | TO (Output) |
|------------------------|-----------------|------------------|-----|-----|------|------------------------|--------------|-------------|
| | | Min | Typ | Max | | | | |
| Propagation delay time | t _{LZ} | 0.5 | — | 3.5 | ns | C _L = 30 pF | A | Y |
| | t _{ZL} | 0.5 | — | 3.5 | | | | |

$V_{CC} = 3.3 \pm 0.3\text{ V}$

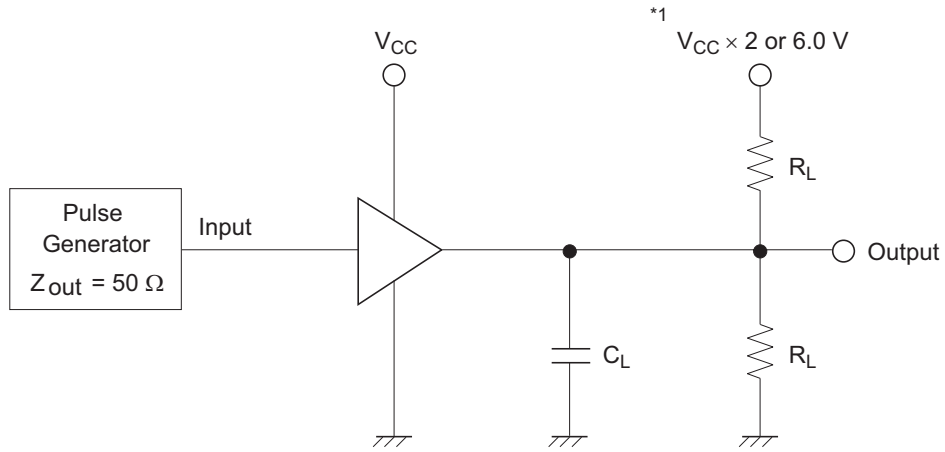
| Item | Symbol | Ta = -40 to 85°C | | | Unit | Test Conditions | FROM (Input) | TO (Output) |
|------------------------|-----------------|------------------|-----|-----|------|------------------------|--------------|-------------|
| | | Min | Typ | Max | | | | |
| Propagation delay time | t _{LZ} | 0.5 | — | 2.5 | ns | C _L = 30 pF | A | Y |
| | t _{ZL} | 0.5 | — | 2.5 | | | | |

Operating Characteristics

(Ta = 25°C)

| Item | Symbol | V _{CC} (V) | Min | Typ | Max | Unit | Test Conditions |
|-------------------------------|-----------------|---------------------|-----|-----|-----|------|-----------------|
| Power dissipation capacitance | C _{PD} | 1.5 | — | 2.0 | — | pF | f = 10 MHz |
| | | 1.8 | — | 2.0 | — | | |
| | | 2.5 | — | 2.5 | — | | |
| | | 3.3 | — | 3.5 | — | | |

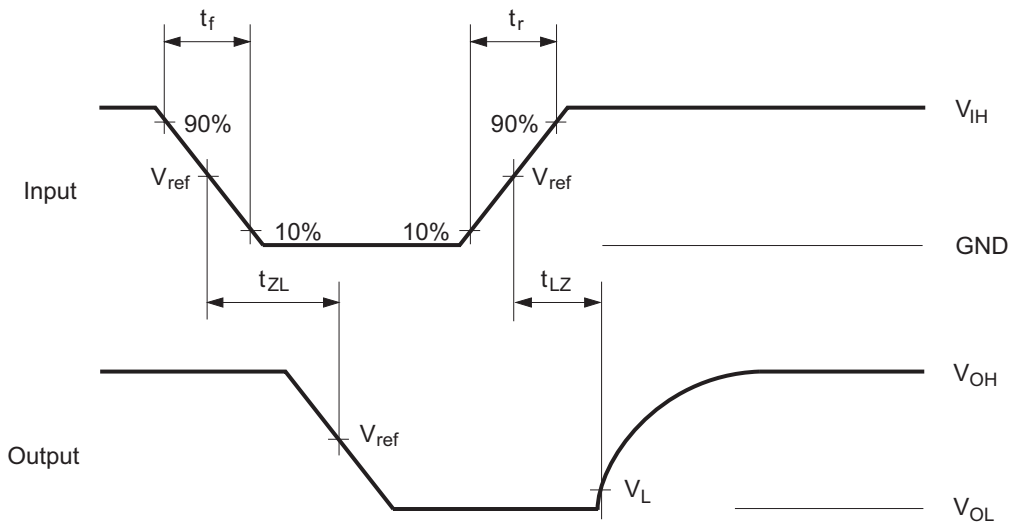
Test Circuit



| Symbol | $V_{CC} = 1.2\text{ V},$ $1.5 \pm 0.1\text{ V}$ | $V_{CC} = 1.8 \pm 0.15\text{ V}$ | $V_{CC} = 2.5 \pm 0.2\text{ V}$ | $V_{CC} = 3.3 \pm 0.3\text{ V}$ |
|--------|--|----------------------------------|---------------------------------|---------------------------------|
| R_L | 2.0 kΩ | 1.0 kΩ | 500 Ω | 500 Ω |
| C_L | 15 pF | 30 pF | 30 pF | 30 pF |
| *1 | $V_{CC} \times 2$ | $V_{CC} \times 2$ | $V_{CC} \times 2$ | 6.0 V |

Note: C_L includes probe and jig capacitance.

Waveforms

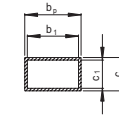
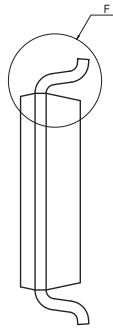
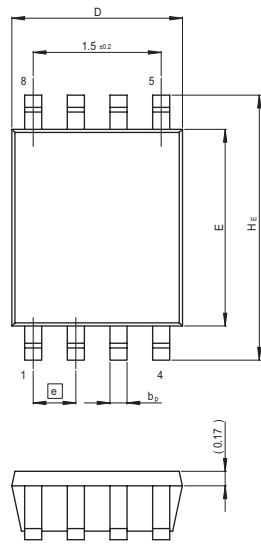


| Symbol | $V_{CC} = 1.2\text{ V},$ $1.5 \pm 0.1\text{ V}$ | $V_{CC} = 1.8 \pm 0.15\text{ V}$ | $V_{CC} = 2.5 \pm 0.2\text{ V}$ | $V_{CC} = 3.3 \pm 0.3\text{ V}$ |
|-------------|--|----------------------------------|---------------------------------|---------------------------------|
| t_r / t_f | 2.0 ns | 2.0 ns | 2.5 ns | 2.5 ns |
| V_{IH} | V_{CC} | V_{CC} | V_{CC} | 2.7 V |
| V_{ref} | 50% | 50% | 50% | 1.5 V |
| V_L | $V_L = V_{OL} + 0.1\text{ V}$ | $V_L = V_{OL} + 0.15\text{ V}$ | $V_L = V_{OL} + 0.15\text{ V}$ | $V_L = V_{OL} + 0.3\text{ V}$ |

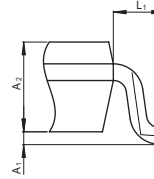
Note: Input waveform : PRR = 10 MHz, duty cycle 50%

Package Dimensions

| | | | |
|---------------------|--------------|------------------|------------|
| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
| P-VSSOP8-2.3x2-0.50 | PVSP0008KA-A | TTP-8DB/TTP-8DBV | 0.010g |



Terminal cross section



Detail F

| Reference Symbol | Dimension in Millimeters | | |
|------------------|--------------------------|-------|------|
| | Min | Nom | Max |
| D | 1.8 | 2.0 | 2.2 |
| E | 2.2 | 2.3 | 2.4 |
| A ₂ | 0.6 | 0.7 | 0.8 |
| A ₁ | 0 | — | 0.1 |
| A | — | — | — |
| b _p | 0.15 | 0.22 | 0.3 |
| b ₁ | — | 0.20 | — |
| c | 0.08 | 0.13 | 0.23 |
| c ₁ | — | 0.11 | — |
| θ | — | — | — |
| H _E | 2.8 | 3.1 | 3.4 |
| ⓐ | — | (0.5) | — |
| x | — | — | — |
| y | — | — | — |
| Z | — | — | — |
| L | — | — | — |
| L ₁ | — | (0.4) | — |

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Renesas Technology America, Inc.

450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology (Shanghai) Co., Ltd.

Unit 204, 205, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

Renesas Technology Hong Kong Ltd.

7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.

10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology Singapore Pte. Ltd.

1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.

Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510