

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

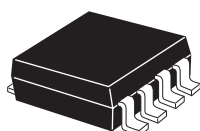
- The basic gate function is lined up as Renesas uni logic series.
- Supplied on emboss taping for high-speed automatic mounting.
- Supply voltage range : 1.2 to 3.6 V
- Operating temperature range: -40 to +85°C
- All inputs V_{IH} (Max.) = 3.6 V (@ V_{CC} = 0 V to 3.6 V)
- All outputs V_O (Max.) = 3.6 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

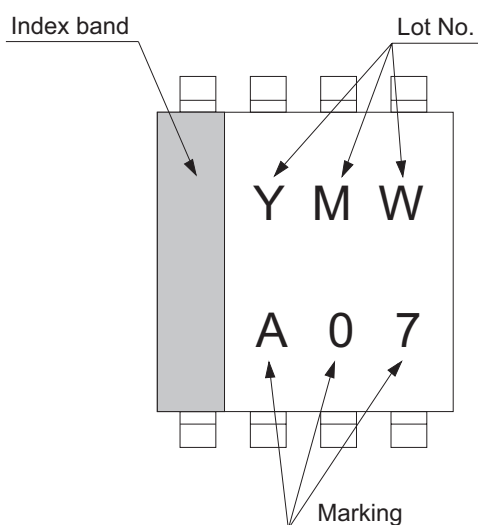
Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74ALVC2G07USE	SSOP-8 pin	PVSP0008KA-A (TTP-8DBV)	US	E (3,000 pcs/reel)

Outline and Article Indication

- HD74ALVC2G07



SSOP-8



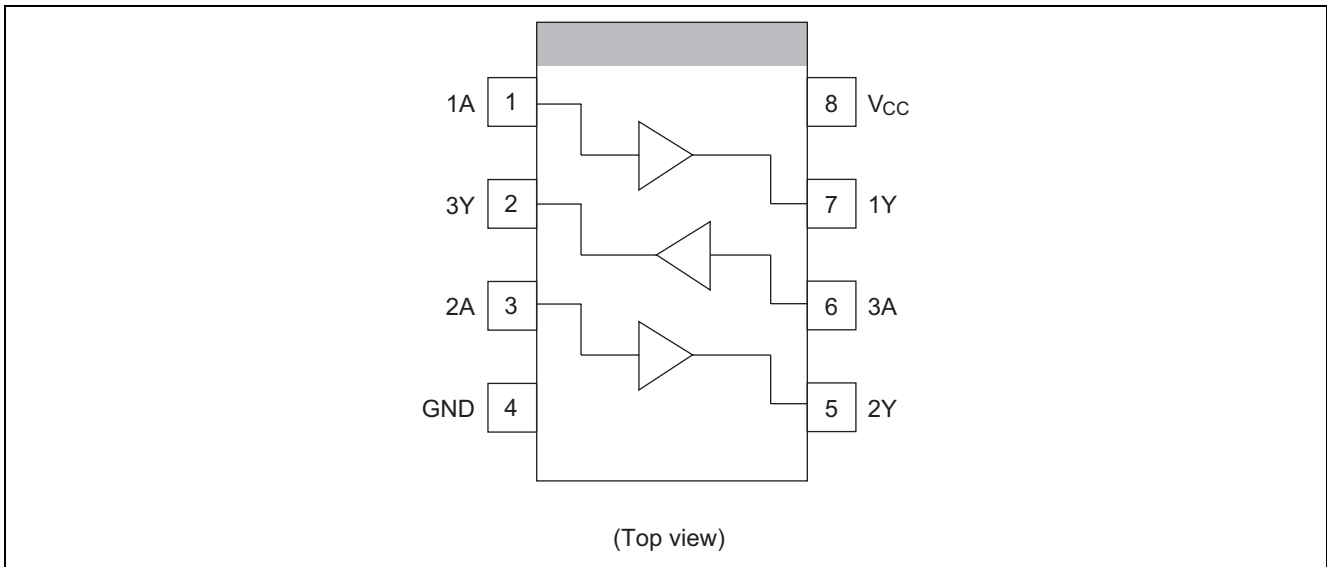
Y : Year code
(the last digit of year)
M : Month code
W : Week code

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	$T_a = -40\text{ to }85^\circ\text{C}$			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	t_{LZ}	—	5.5	—	ns	$C_L = 15\text{ pF}$	A	Y
	t_{ZL}							

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

Item	Symbol	$T_a = -40\text{ to }85^\circ\text{C}$			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	t_{LZ}	1.0	—	7.0	ns	$C_L = 15\text{ pF}$	A	Y
	t_{ZL}							

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

Item	Symbol	$T_a = -40\text{ to }85^\circ\text{C}$			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	t_{LZ}	1.0	—	5.0	ns	$C_L = 30\text{ pF}$	A	Y
	t_{ZL}							

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

Item	Symbol	$T_a = -40\text{ to }85^\circ\text{C}$			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	t_{LZ}	0.5	—	3.5	ns	$C_L = 30\text{ pF}$	A	Y
	t_{ZL}							

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

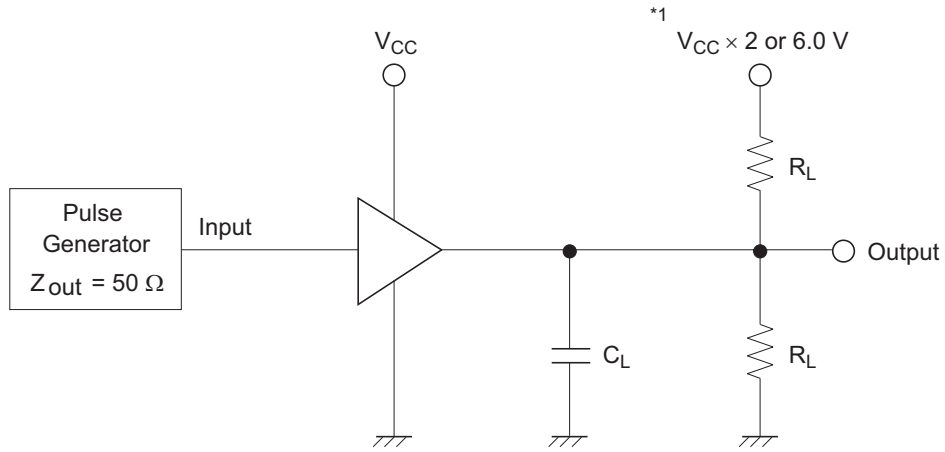
Item	Symbol	$T_a = -40\text{ to }85^\circ\text{C}$			Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max				
Propagation delay time	t_{LZ}	0.5	—	2.5	ns	$C_L = 30\text{ pF}$	A	Y
	t_{ZL}							

Operating Characteristics

$(T_a = 25^\circ\text{C})$

Item	Symbol	$V_{CC}\text{ (V)}$	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	—		

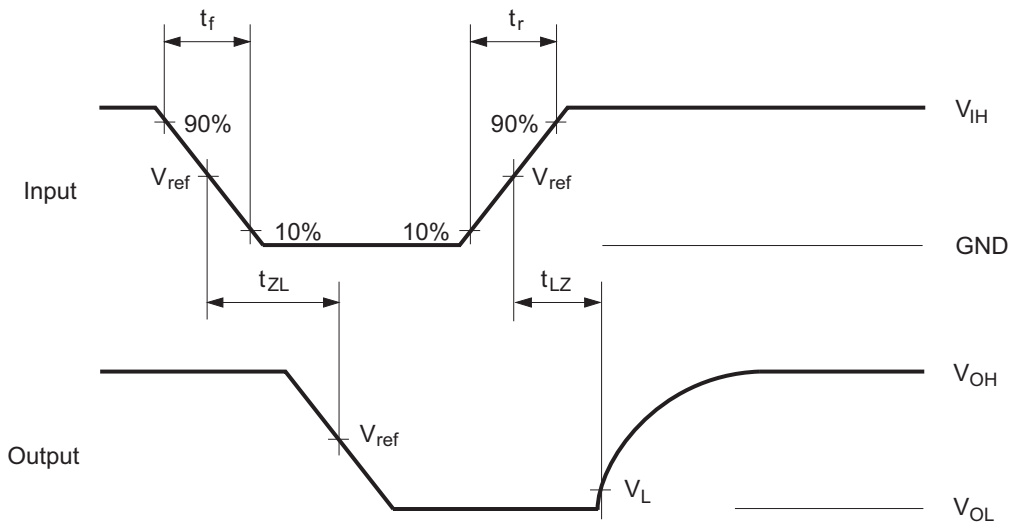
Test Circuit



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 k Ω	1.0 k Ω	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

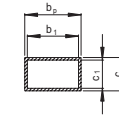
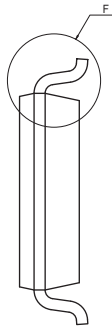
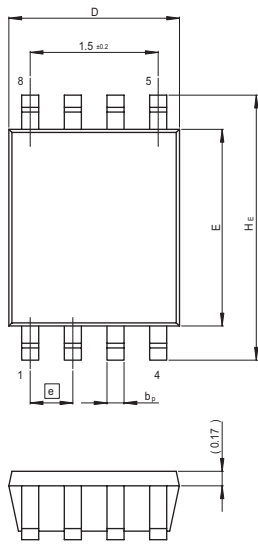


Symbol	$V_{CC} = 1.2\text{ V},$ $1.5 \pm 0.1\text{ V}$	$V_{CC} = 1.8 \pm 0.15\text{ V}$	$V_{CC} = 2.5 \pm 0.2\text{ V}$	$V_{CC} = 3.3 \pm 0.3\text{ V}$
t_r / t_f	2.0 ns	2.0 ns	2.5 ns	2.5 ns
V_{IH}	V_{CC}	V_{CC}	V_{CC}	2.7 V
V_{ref}	50%	50%	50%	1.5 V
V_L	$V_L = V_{OL} + 0.1\text{ V}$	$V_L = V_{OL} + 0.15\text{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

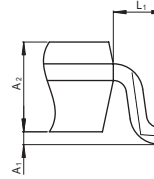
Note: Input waveform : PRR = 10 MHz, duty cycle 50%

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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