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April 1st, 2010
Renesas Electronics Corporation

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HD74LV1GW06A

Dual Inverter Open Drain

REJ03D0075-0300
Rev.3.00
Sep 08, 2006

Description

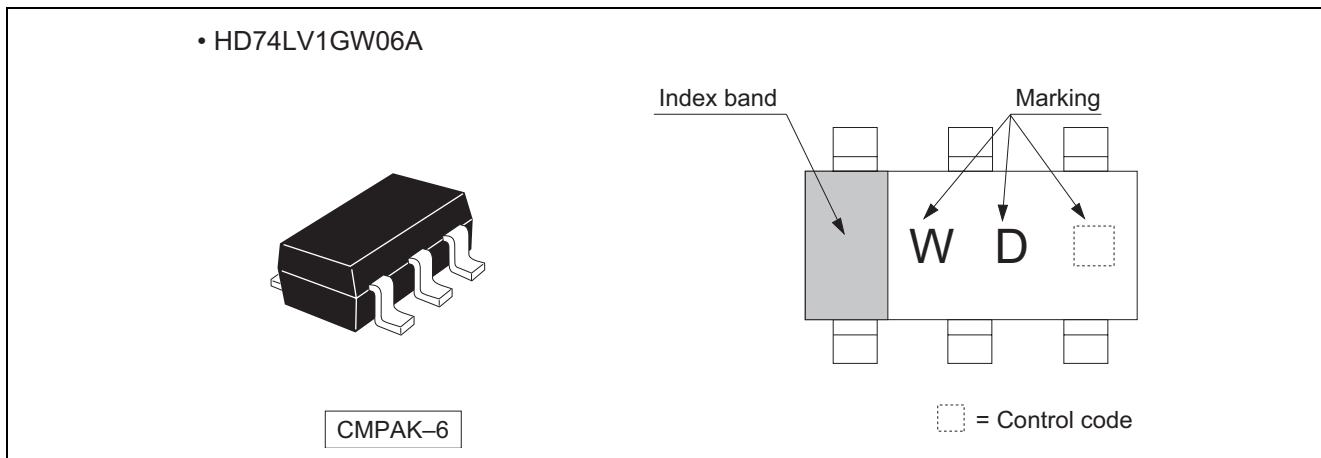
The HD74LV1GW06A has dual inverter open drain in a 6 pin package. Low voltage and high-speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

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 : 1.65 to 5.5 V
- Operating temperature range : -40 to +85°C
- All inputs V_{IH} (Max.) = 5.5 V (@ V_{CC} = 0 V to 5.5 V)
- All outputs V_O (Max.) = 5.5 V (@ V_{CC} = 0 V, Output: Z)
- Output current 6 mA (@ V_{CC} = 3.0 V to 3.6 V), 12 mA (@ V_{CC} = 4.5 V to 5.5 V)
- All the logical input has hysteresis voltage for the slow transition.
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LV1GW06ACME	CMPAK-6 pin	PTSP0006JA-A (CMPAK-6V)	CM	E (3,000 pcs / Reel)

Outline and Article Indication



Function Table

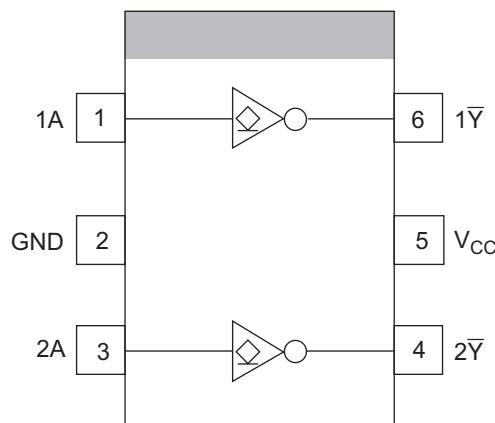
Input A	Output \bar{Y}
H	L
L	Z

H : High level

L : Low level

Z : High impedance

Pin Arrangement



(Top view)

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	V _{CC}	−0.5 to 7.0	V	
Input voltage range ^{*1}	V _I	−0.5 to 7.0	V	
Output voltage range ^{*1, 2}	V _O	−0.5 to V _{CC} + 0.5	V	Output : L
		−0.5 to 7.0		V _{CC} : OFF or Output : Z
Input clamp current	I _{IK}	−20	mA	V _I < 0
Output clamp current	I _{OK}	−50	mA	V _O < 0
Continuous output current	I _O	±25	mA	V _O = 0 to V _{CC}
Continuous current through V _{CC} or GND	I _{CC} or I _{GND}	±50	mA	
Maximum power dissipation at Ta = 25°C (in still air) ^{*3}	P _T	200	mW	
Storage temperature	T _{STG}	−65 to 150	°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.

1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
2. This value is limited to 5.5 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}	1.65	5.5	V	
Input voltage range	V_I	0	5.5	V	
Output voltage range	V_O	0	V_{CC}	V	
Output current	I_{OL}	—	1	mA	$V_{CC} = 1.65$ to 1.95 V
		—	2		$V_{CC} = 2.3$ to 2.7 V
		—	6		$V_{CC} = 3.0$ to 3.6 V
		—	12		$V_{CC} = 4.5$ to 5.5 V
Input transition rise or fall rate	$\Delta t / \Delta V$	0	300	ns / V	$V_{CC} = 1.65$ to 1.95 V
		0	200		$V_{CC} = 2.3$ to 2.7 V
		0	100		$V_{CC} = 3.0$ to 3.6 V
		0	20		$V_{CC} = 4.5$ to 5.5 V
Operating free-air temperature	T_a	-40	85	°C	

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

Electrical Characteristic

$T_a = -40$ to 85 °C

Item	Symbol	V_{CC} (V) * ¹	Min	Typ	Max	Unit	Test Condition
Input voltage	V_{IH}	1.65 to 1.95	$V_{CC} \times 0.75$	—	—	V	
		2.3 to 2.7	$V_{CC} \times 0.7$	—	—		
		3.0 to 3.6	$V_{CC} \times 0.7$	—	—		
		4.5 to 5.5	$V_{CC} \times 0.7$	—	—		
	V_{IL}	1.65 to 1.95	—	—	$V_{CC} \times 0.25$		
		2.3 to 2.7	—	—	$V_{CC} \times 0.3$		
		3.0 to 3.6	—	—	$V_{CC} \times 0.3$		
		4.5 to 5.5	—	—	$V_{CC} \times 0.3$		
Hysteresis voltage	V_H	1.8	—	0.25	—	V	$V_T^+ - V_T^-$
		2.5	—	0.30	—		
		3.3	—	0.35	—		
		5.0	—	0.45	—		
Output voltage	V_{OL}	Min to Max	—	—	0.1	V	$I_{OL} = 50$ μ A
		1.65	—	—	0.3		$I_{OL} = 1$ mA
		2.3	—	—	0.4		$I_{OL} = 2$ mA
		3.0	—	—	0.44		$I_{OL} = 6$ mA
		4.5	—	—	0.55		$I_{OL} = 12$ mA
Input current	I_{IN}	0 to 5.5	—	—	± 1	μ A	$V_{IN} = 5.5$ V or GND
Off state output current	I_{OZ}	Min to Max	—	—	± 5	μ A	$V_O = 5.5$ V or GND
Quiescent supply current	I_{CC}	5.5	—	—	10	μ A	$V_{IN} = V_{CC}$ or GND, $I_O = 0$
Output leakage current	I_{OFF}	0	—	—	5	μ A	V_{IN} or $V_O = 0$ to 5.5 V
Input capacitance	C_{IN}	3.3	—	3.0	—	pF	$V_{IN} = V_{CC}$ or GND

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

Switching Characteristics

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

Item	Symbol	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{ZL}	—	12.6	22.0	1.0	24.0	ns	C _L = 15 pF	A	Y
	t _{LZ}	—	19.7	33.0	1.0	36.0		C _L = 50 pF		

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

Item	Symbol	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{ZL}	—	7.0	11.7	1.0	14.0	ns	C _L = 15 pF	A	Y
	t _{LZ}	—	10.5	15.5	1.0	18.0		C _L = 50 pF		

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

Item	Symbol	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{ZL}	—	5.0	7.1	1.0	8.5	ns	C _L = 15 pF	A	Y
	t _{LZ}	—	7.5	10.6	1.0	12.0		C _L = 50 pF		

 $V_{CC} = 5.0 \pm 0.5$ V

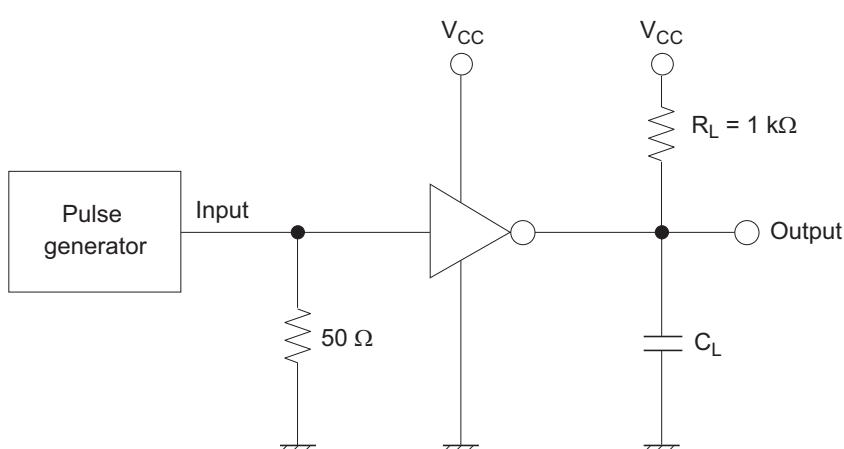
Item	Symbol	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{ZL}	—	3.8	5.5	1.0	6.5	ns	C _L = 15 pF	A	Y
	t _{LZ}	—	5.3	7.5	1.0	8.5		C _L = 50 pF		

Operating Characteristics

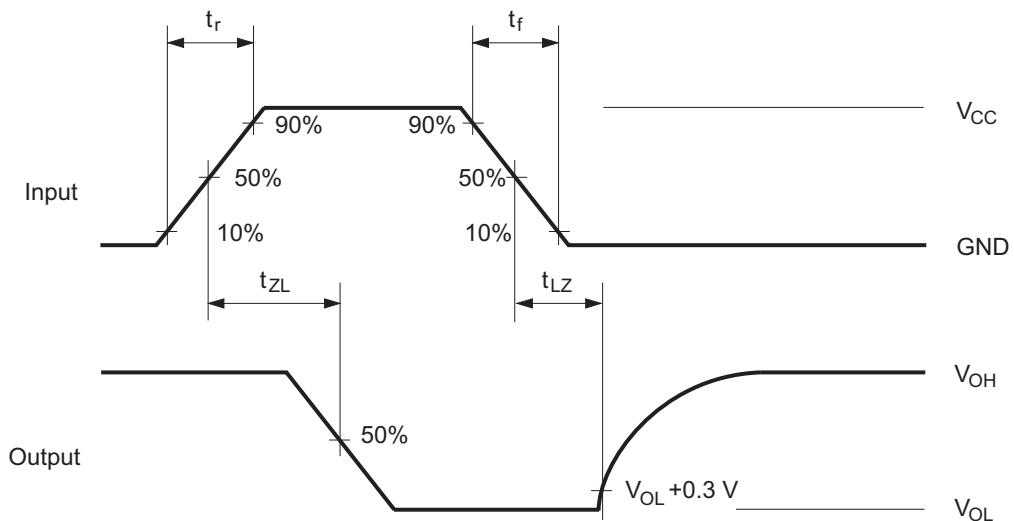
 $C_L = 50$ pF

Item	Symbol	V _{CC} (V)	Ta = 25°C			Unit	Test Conditions		
			Min	Typ	Max				
Power dissipation capacitance	C _{PD}	3.3	—	8.5	—	pF	f = 10 MHz		
		5.0	—	10.0	—				

Test Circuit

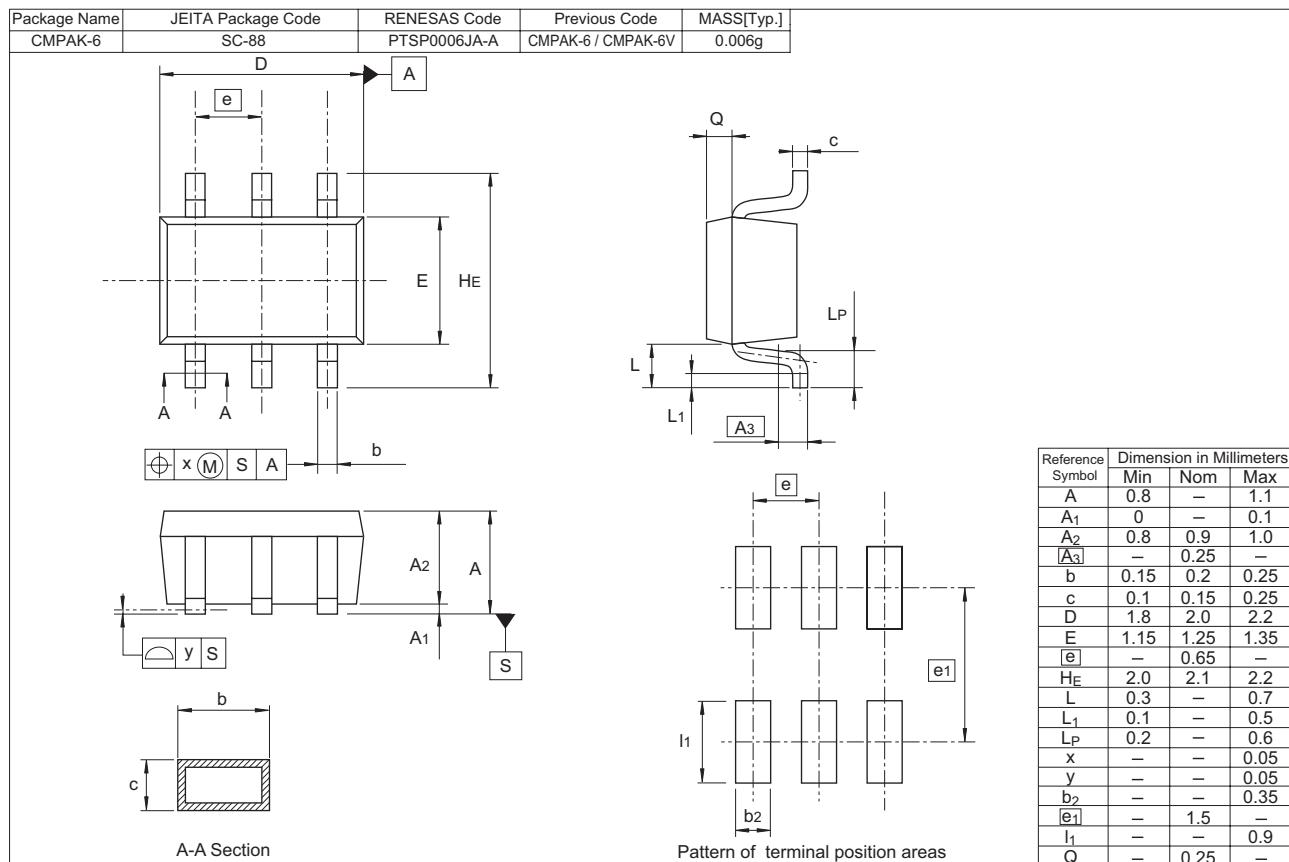


Waveform



Notes: 1. Input waveform : PRR \leq 1 MHz, $Z_0 = 50\ \Omega$, $t_r \leq 3\text{ ns}$, $t_f \leq 3\text{ ns}$.
 2. The output are measured one at a time with one transition per measurement.

Package Dimensions



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