

HD74HC1G14

Inverter with Schmitt-trigger Input

REJ03D0186-0600Z (Previous ADE-205-299D (Z)) Rev.6.00 Jan.27.2004

Description

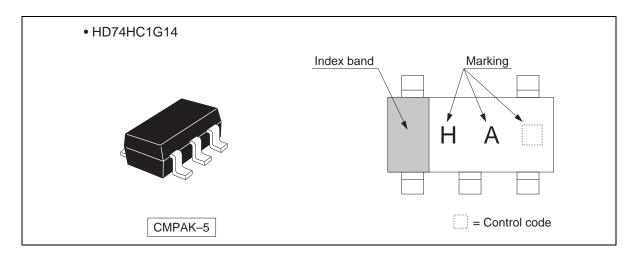
The HD74HC1G14 is high-speed CMOS Schmitt-trigger inverter using silicon gate CMOS process. With CMOS low power dissipation, it provides high-speed equivalent to LS-TTL series. The internal circuit of three stages construction with buffer provides wide noise margin and stable output.

Features

- 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 HD74HC14 Supply voltage range: 2 to 6 V
 Operating temperature range: -40 to +85°C
- $|I_{OH}| = I_{OL} = 2 \text{ mA (min)}$
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)	
HD74HC1G14CME	CMPAK-5 pin	CMPAK-5V	CM	E (3,000 pcs/reel)	

Outline and Article Indication

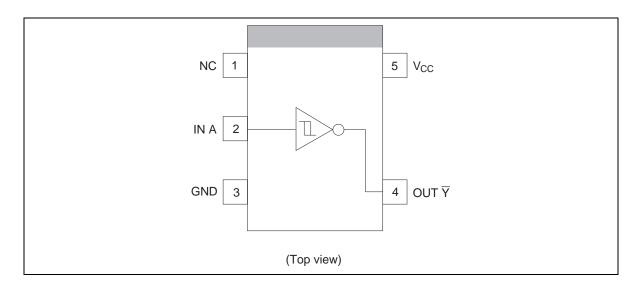


Function Table

Input A	Output \overline{Y}
Н	L
L	H

H : High level L : Low level

Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	V _{CC}	-0.5 to 7.0	V	
Input voltage range *1	Vı	-0.5 to V_{CC} + 0.5	V	
Output voltage range *1, 2	Vo	-0.5 to V_{CC} + 0.5	V	Output : H or L
Input clamp current	I _{IK}	±20	mA	$V_I < 0$ or $V_I > V_{CC}$
Output clamp current	I _{OK}	±20	mA	$V_O < 0$ or $V_O > V_{CC}$
Continuous output current	I _O	±25	mA	$V_0 = 0$ to V_{CC}
Continuous current through V _{CC} or GND	I _{CC} or I _{GND}	±25	mA	
Maximum power dissipation at Ta = 25°C (in still air) *3	P _T	200	mW	
Storage temperature	Tstg	-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	Test Conditions
Supply voltage range	V _{CC}	2	6	V	
Input voltage range	VI	0	V _{CC}	V	
Output voltage range	Vo	0	V _{CC}	V	
Output current	l _{OL}	_	2.0	mA	$V_{CC} = 4.5 \text{ V}$
		_	2.6		$V_{CC} = 6.0 \text{ V}$
	I _{OH}	_	-2.0	mA	V _{CC} = 4.5 V
		_	-2.6		$V_{CC} = 6.0 \text{ V}$
Operating temperature	Та	-40	85	°C	

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

HD74HC1G14

Electrical Characteristics

		\mathbf{V}_{CC}	T _a = 2	5°C		$T_a = -40 \text{ to } 85^{\circ}\text{C}$;		
Item	Symbol	(V)	Min	Тур	Max	Min	Max	Unit	Test Con	ditions
Threshold	V_T^+	2.0	1.0	1.29	1.5	1.0	1.5	V		
voltage		4.5	2.3	2.73	3.15	2.3	3.15	_		
		6.0	3.0	3.56	4.2	3.0	4.2	=		
	V _T	2.0	0.3	0.70	0.9	0.3	0.9	=		
		4.5	1.13	1.66	2.0	1.13	2.0	_		
		6.0	1.5	2.24	2.6	1.5	2.6	_		
	ΔV_T	2.0	0.3	0.59	1.0	0.3	1.0	_		
		4.5	0.6	1.08	1.4	0.6	1.4	_		
		6.0	8.0	1.31	1.7	8.0	1.7	_		
Output voltage	V _{OH}	2.0	1.9	2.0	_	1.9	_	V	$V_{\text{IN}} = V_{\text{IL}}$	$I_{OH} = -20 \mu A$
		4.5	4.4	4.5	_	4.4	_	_		
		6.0	5.9	6.0	_	5.9	_	_		
		4.5	4.18	4.31	_	4.13	_	_		$I_{OH} = -2 \text{ mA}$
		6.0	5.68	5.80	_	5.63	_			$I_{OH} = -2.6 \text{ mA}$
	V_{OL}	2.0	_	0.0	0.1	_	0.1	_	$V_{IN} = V_{IH}$	$I_{OL} = 20 \mu A$
		4.5	_	0.0	0.1	_	0.1	_		
		6.0	_	0.0	0.1	_	0.1	_		
		4.5	_	0.17	0.26	_	0.33			$I_{OL} = 2 \text{ mA}$
		6.0	_	0.18	0.26	_	0.33	_		$I_{OL} = 2.6 \text{ mA}$
Input current	I _{IN}	6.0	_		±0.1	_	±1.0	μΑ	$V_{IN} = V_{CC}$ or GND	
Operating current	I _{CC}	6.0	_	_	1.0	_	10.0	μΑ	$V_{\text{IN}} = V_{\text{CC}}$	or GND

Switching Characteristics

Ta = 25°C

Item	Symbol	Min	Тур	Max	Unit	Test Conditions
Output rise / fall time	t _{TLH} t _{THL}	_	5	8	ns	Test circuit
Propagation delay time	t _{PLH} t _{PHL}	_	10	21	ns	Test circuit

 $(C_L = 15 \text{ pF}, t_r = t_f = 6 \text{ ns}, V_{CC} = 5 \text{ V})$

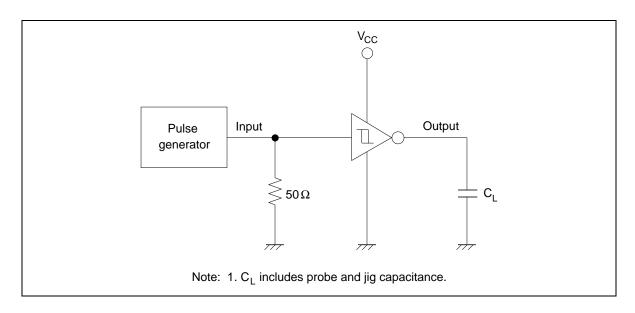
		\mathbf{V}_{CC}	Ta = 25°C		Ta = -40 to 85°C				
Item	Symbol	(V)	Min	Тур	Max	Min	Max	Unit	Test Conditions
Output rise / fall time	t _{TLH}	2.0	_	50	125	_	145	ns	Test circuit
	t_{THL}	4.5	_	14	25	_	30		
		6.0	_	12	21	_	24	_	
Propagation delay time	t _{PLH}	2.0	_	48	100	_	125	ns	Test circuit
	t_{PHL}	4.5	_	12	20	_	25	_	
		6.0	_	9	17	_	21	=	
Input capacitance	C _{IN}	_	_	2.5	5	_	5	pF	
Equivalent capacitance	C_{PD}	_	_	10	_	_	_	pF	

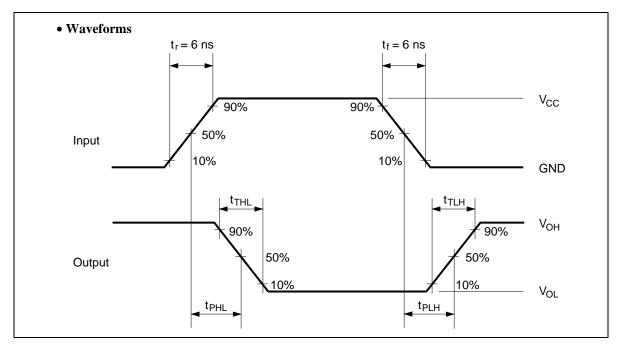
 $(C_L = 50 \text{ pF}, t_r = t_f = 6 \text{ ns})$

Note: C_{PD} is equivalent capacitance inside of the IC calculated from the operating current without load (see test circuit). The average operating current without load is calculated according to the expression below.

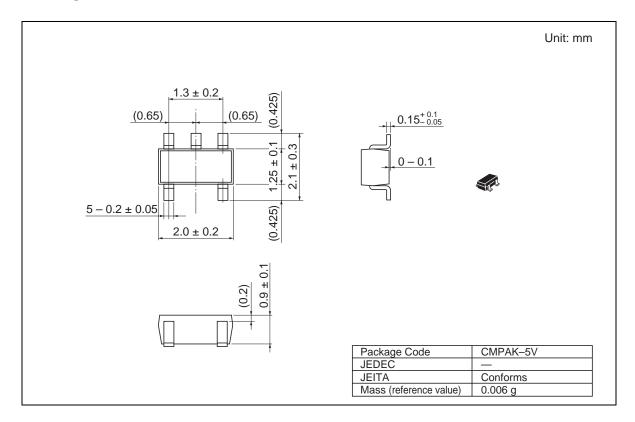
 I_{CC} (opr) = $C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$

Test Circuit





Package Dimensions



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Renesas Technology Europe GmbHDornacher Str. 3, D-85622 Feldkirchen, Germany
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Renesas Technology Singapore Pte. Ltd.
1, Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632 Tel: <65> 6213-0200, Fax: <65> 6278-8001