

HD74HCT1G00

2-input NAND Gate

REJ03D0191-0500Z (Previous ADE-205-301C (Z)) Rev.5.00 Jan.28.2004

Description

The HD74HCT1G00 is high-speed CMOS two input NAND gate 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.
- TTL compatible input level.

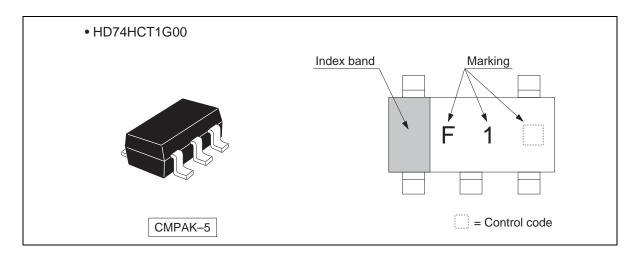
Supply voltage range: 4.5 to 5.5 V

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)
HD74HCT1G00CME	CMPAK-5 pin	CMPAK-5V	CM	E (3,000 pcs/reel)

Outline and Article Indication



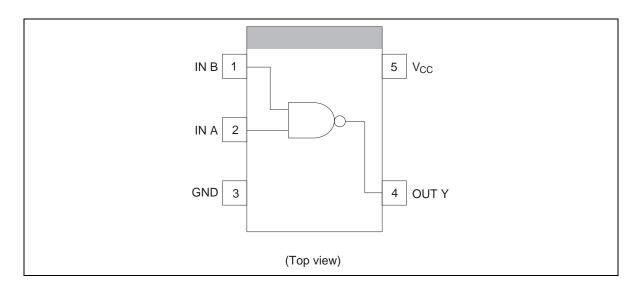
Function Table

Inputs

A	В	Output Y
L	L	Н
L	Н	Н
Н	L	Н
Н	Н	L

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	VI	-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	$V_O = 0$ 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}	4.5	5.5	V	
Input voltage range	Vı	0	5.5	V	
Output voltage range	Vo	0	V _{CC}	V	
Output current	I _{OL}	_	2	mA	$V_{CC} = 4.5 \text{ to } 5.5 \text{ V}$
	I _{OH}	_	-2		$V_{CC} = 4.5 \text{ to } 5.5 \text{ V}$
Input rise / fall time (0.3 V to 2.7 V)	t _r , t _f	0	500	ns	$V_{CC} = 4.5 \text{ to } 5.5 \text{ V}$
Operating temperature	Та	-40	85	°C	

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

HD74HCT1G00

Electrical Characteristics

		$\mathbf{V}_{\mathbf{CC}}$	$T_a = 2$	5°C		$T_a = -40 \text{ to } 85^{\circ}\text{C}$				
Item	Symbol	(V)	Min	Тур	Max	Min	Max	Unit	Test Conditions	
Input voltage	V _{IH}	4.5 to 5.5	2.0	_	_	2.0	_	V		
	V _{IL}	4.5 to 5.5	_	_	8.0	_	0.8	-		
Output voltage	V _{OH}	4.5	4.4	4.5	_	4.4	_	V	V _{IN} =	$I_{OH} = -20 \mu A$
		4.5	4.18	4.31	_	4.13	_	=	V_{IH} or V_{IL}	$I_{OH} = -2 \text{ mA}$
	V _{OL}	4.5	_	0.0	0.1	_	0.1	=		I _{OL} = 20 μA
		4.5	_	0.17	0.26	_	0.33	=		I _{OL} = 2 mA
Input current	I _{IN}	5.5	_	_	±0.1	_	±1.0	μΑ	$V_{\text{IN}} = V_{\text{CC}}$	or GND
Operating current	I _{CC}	5.5	_	_	1.0	_	10.0	μΑ	$V_{IN} = V_{CC}$ or GND	
Quiescent supply current	I _{CCT}	5.5	_	_	2.0	_	2.9	mA	One input $V_{IN} = 2.4 \text{ V}$, other input V_{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	10	ns	Test circuit
Propagation delay time	t _{PLH}	_	6.9	12	ns	Test circuit
	t _{PHL}	_	9.8	17		

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

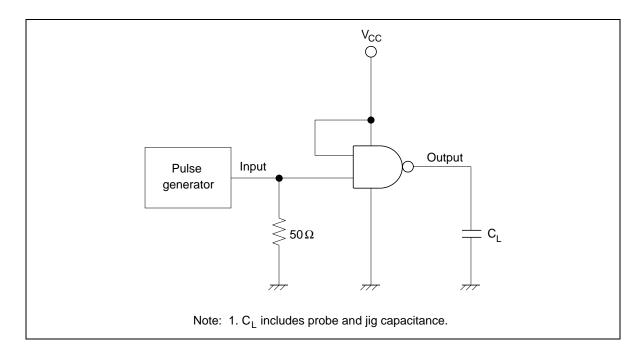
		\mathbf{V}_{CC}	Ta = 25°C		Ta = -4	40 to 85°C			
Item	Symbol	(V)	Min	Тур	Max	Min	Max	Unit	Test Conditions
Output rise / fall time	t _{TLH} t _{THL}	4.5	_	14	25	_	31	ns	Test circuit
Propagation delay time	t _{PLH}	4.5	_	10.5	16	_	20	ns	Test circuit
	t _{PHL}	4.5	_	16.0	27	_	31	=	
Input capacitance	C _{IN}	_	_	2.5	5	_	5	pF	
Equivalent capacitance	C _{PD}		_	10		_	_	pF	

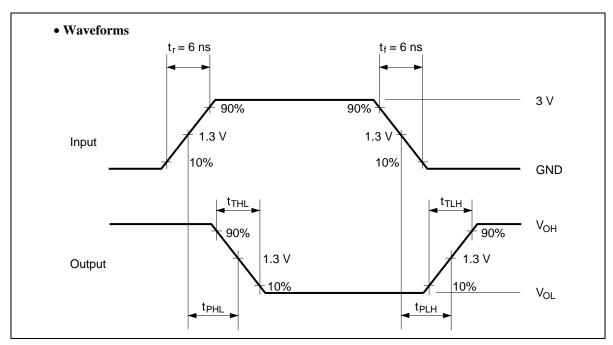
 $⁽C_L = 50 \text{ pF}, t_r = t_f = 6 \text{ ns})$

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.

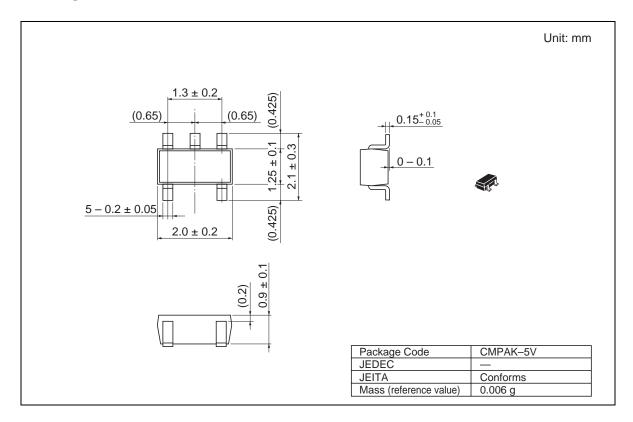
 I_{CC} (opr) = $C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$

Test Circuit





Package Dimensions



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