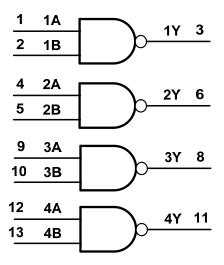


## **Pin Descriptions**

Pin Number	Pin Name	Function
1	1A	Data Input
2	1B	Data Input
3	1Y	Data Output
4	2A	Data Input
5	2B	Data Input
6	2Y	Data Output
7	GND	Ground
8	3Y	Data Output
9	3A	Data Input
10	3B	Data Input
11	4Y	Data Output
12	4A	Data Input
13	4B	Data Input
14	$V_{CC}$	Supply Voltage

## **Logic Diagram**



#### **Function Table**

Inp	Output	
Α	В	Υ
L	L	Н
L	Н	Н
Н	L	Н
Н	Н	L



## Absolute Maximum Ratings (Note 4) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	KV
ESD CDM	Charged Device Model ESD Protection	1	KV
ESD MM	Machine Model ESD Protection	200	V
$V_{CC}$	Supply Voltage Range	-0.5 to +7.0	V
VI	Input Voltage Range (Note 5)	-0.5 to +7.0	V
I <sub>IK</sub>	Input Clamp Current V <sub>I</sub> < -0.5V or Vi > V <sub>CC</sub> +0.5V	±20	mA
lok	Output Clamp Current $V_O < -0.5V$ or $V_O > V_{CC} +0.5V$	±20	mA
I <sub>O</sub>	Continuous output current $-0.5V < V_O V_{CC} +0.5V$	+/- 25	mA
Icc	Continuous current through Vcc	50	mA
I <sub>GND</sub>	Continuous current through GND	-50	mA
TJ	Operating Junction Temperature	-40 to +150	°C
T <sub>STG</sub>	T <sub>STG</sub> Storage Temperature		°C
P <sub>TOT</sub>	Total Power Dissipation	500	mW

#### Recommended Operating Conditions (Note 6) (@TA = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
Vcc	Supply Voltage		2.0	6.0	V
VI	Input Voltage		0	$V_{CC}$	V
Vo	Output Voltage		0	V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.0V		625	
Δt/ΔV	Input transition rise or fall rate	V <sub>CC</sub> = 4.5V		140	ns/V
		V <sub>CC</sub> = 6.0V		85	
T <sub>A</sub>	Operating Free-Air Temperature		-40	+125	°C

Note: 6. Unused inputs should be held at  $V_{\text{CC}}$  or Ground.

<sup>4.</sup> Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values. V<sub>CC</sub> to the extent the maximum clamp current is exceeded.

5. Input Voltage cannot exceed Vcc to the extent the Maximum clamp current is exceeded.



#### **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Courselle ed	Damamatan	Took Conditions		T <sub>A</sub> = -40°	°C to 85°C	T <sub>A</sub> = -40°	C to 125°C	l l m i t
Symbol	Parameter	Test Conditions	Vcc	Min	Max	Min	Max	Unit
			2.0V	1.5		1.5		
$V_{IH}$	High-level Input Voltage		4.5V	3.15		3.15		V
	Voltage		6.0V	4.2		4.2		
	L and land lines 4		2.0V		0.5		0.5	
$V_{IL}$	Low-level input voltage		4.5V		1.35		1.35	V
	voltage		6.0V		1.8		1.8	
		$I_{OH} = -20 \mu A$	2.0V	1.9		1.9		<b>&gt;</b>
	l	I <sub>OH</sub> = -20μA	4.5V	4.4		4.4		
V <sub>OH</sub>	High-level Output Voltage	I <sub>OH</sub> = -20μA	6.0V	5.9		5.9		
	Voltage	I <sub>OH</sub> = -4.0mA	4.5V	3.84		3.7		
		I <sub>OH</sub> = -5.2mA	6.0V	5.34		5.2		
		I <sub>OL</sub> = 20μA	2.0V		0.1		0.1	
		I <sub>OL</sub> = 20μA	4.5V		0.1		0.1	
$V_{OL}$	Low-level Output Voltage	I <sub>OL</sub> = 20μA	6.0V		0.1		0.1	V
	voltage	I <sub>OL</sub> = 4mA	4.5V		0.33		0.44	
		I <sub>OL</sub> = 5.2mA	6.0V		0.33		0.44	
lı	Input Current	V <sub>I</sub> =GND to 5.5V	6.0V		± 1		± 1	μΑ
Icc	Supply Current	$V_I = GND \text{ or } V_{CC}, I_O = 0$	6.0V		20		40	μΑ

# **Switching Characteristics**

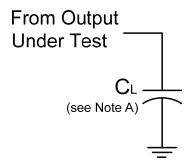
Symbol	Parameter	Test Conditions	Vcc	•	Γ <sub>A</sub> = +25°0		-40°C to +85°C	-40°C to +125°C	Unit
Symbol	Symbol Parameter		<b>V</b> CC	Min	Тур.	Max	Max	Max	Oilit
	$\begin{array}{ccc} & & \text{Propagation} & \text{Figure 1} \\ \text{Delay A}_{\text{N}} \text{ to Y}_{\text{N}} & \text{C}_{\text{L}} = 50 \text{pF} \end{array}$	Figure 1	2.0V		25	90	115	135	
t <sub>PD</sub>		. 5	4.5V		9	18	23	27	ns
			6.0V		7	15	20	23	
		Figure 1	2.0V		19	75	95	110	
t <sub>t</sub> Transition Time	Time Figure 1 $C_{L} = 50pF$	4.5V		7	15	19	22	ns	
		CL = 30pi	6.0V	_	6	13	16	19	

## Operating Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

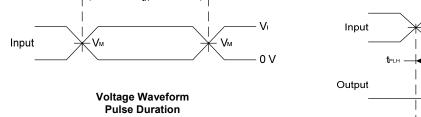
Parameter		Test Conditions	V <sub>CC</sub> = 6V Typ	Unit
C <sub>pd</sub>	Power Dissipation Capacitance per Gate	f = 1 MHz	22	pF
Cı	Input Capacitance	$V_1 = V_{CC} - \text{or GND}$	4	pF

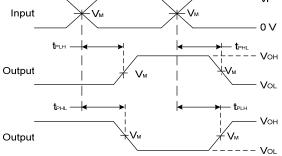


#### **Parameter Measurement Information**



Vcc	Inputs		V <sub>M</sub>	CL
	VI	t <sub>r</sub> /t <sub>f</sub>		
2.0V to 6.0V	V <sub>CC</sub>	6ns	V <sub>CC</sub> /2	15pF,50pF





Voltage Waveform **Propagation Delay Times** Inverting and Non Inverting Outputs

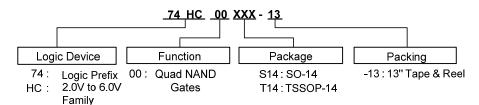
- Notes: A . Includes test lead and test apparatus capacitance.

  - B. All pulses are supplied at pulse repetition rate ≤ 1 MHz
    C. Inputs are measured separately one transition per measurement
  - D.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$

Figure 1 Load Circuit and Voltage Waveforms



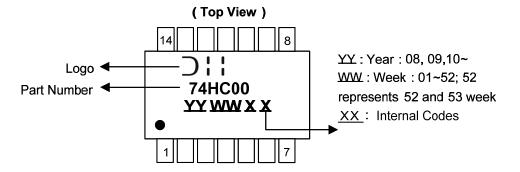
## **Ordering Information**



	Device	Package Code Packaging		7" Tape and Reel	
		rackage code	Packaging	Quantity	Part Number Suffix
Lead-free Green	74HC00S14-13	S14	SO-14	2500/Tape & Reel	-13
Pby Lead-free Green	74HC00T14-13	T14	TSSOP-14	2500/Tape & Reel	-13

## **Marking Information**

(1) SO-14, TSSOP-14



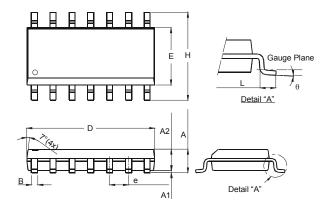
Part Number	Package
74HC00S14	SO-14
74HC00T14	TSSOP-14



#### Package Outline Dimensions (All dimensions in mm.)

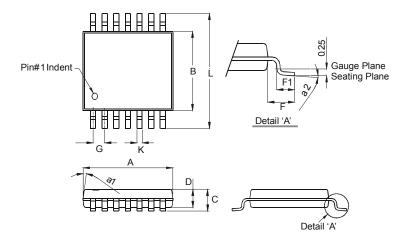
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.

#### Package Type: SO-14



	SO-14				
Dim	Min	Max			
Α	1.47	1.73			
A1	0.10	0.25			
A2	1.45	Тур			
В	0.33	0.51			
D	8.53	8.74			
Е	3.80	3.99			
е	1.27	Тур			
Н	5.80	6.20			
L	0.38	1.27			
θ	0°	8°			
All Di	All Dimensions in mm				

#### Package Type: TSSOP-14

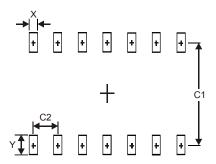


	TSSOP-14				
Dim	Min	Max			
a1	7° (4X)				
a2	0°	8°			
Α	4.9	5.10			
В	4.30	4.50			
С	_	1.2			
D	0.8	1.05			
F	1.00	Тур			
F1	0.45	0.75			
G	0.65 Typ				
K	0.19	0.30			
L	6.40 Typ				
All Dir					

# **Suggested Pad Layout**

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for latest version.

#### Package Type: SO-14

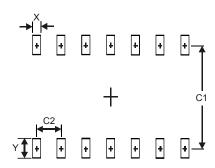


<b>Dimensions</b>	Value (in mm)
Х	0.60
Y	1.50
C1	5.4
C2	1.27



#### Suggested Pad Layout (cont.)

Package Type: TSSOP-14



Dimensions	Value (in mm)
Х	0.45
Υ	1.45
C1	5.9
C2	0.65

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