

## FEATURES

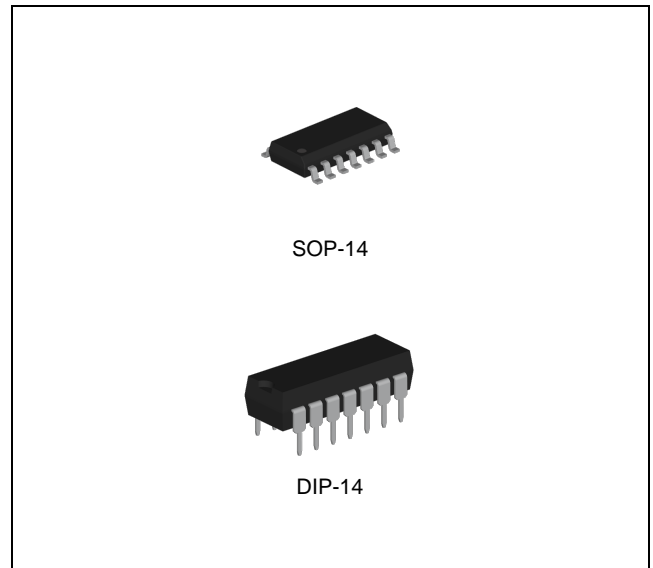
- Wide Operating Voltage Range of 2.0V to 6.0V
- Outputs Can Drive up to 10 LSTTL Loads
- Low Power Consumption, 20 $\mu$ A Maximum  $I_{CC}$
- Typical  $t_{pd}$ : 8ns
- $\pm$ 4mA Output Drive at 5.0V
- Low Input Current of 1 $\mu$ A Maximum

## APPLICATIONS

- AV Receivers
- Portable Audio Docks
- Blu-ray Players and Home Theater
- Wireless Devices

## DESCRIPTION

The 74HC00 contain four independent, 2-input NAND gates. They perform the Boolean function  $Y = \bar{A} \times \bar{B}$  or  $Y = \bar{A} + \bar{B}$  in positive logic. Inputs include clamp diodes.



## ORDERING INFORMATION

Device	Package
74HC00D	SOP-14
74HC00N	DIP-14

## ABSOLUTE MAXIMUM RATINGS (Note 1)

CHARACTERISTIC		SYMBOL	MIN.	MAX.	UNIT
DC Supply Voltage		$V_{CC}$	-0.5	7	V
Input Clamp Current <small>(Note 2)</small>	$V_I < 0$ or $V_I > V_{CC}$	$I_{IK}$	-	$\pm$ 20	mA
Output Clamp Current <small>(Note 2)</small>	$V_O < 0$	$I_{OK}$	-	$\pm$ 20	mA
Continuous Output Current	$V_O = 0$ to $V_{CC}$	$I_{IN}$	-	$\pm$ 25	mA
Continuous Current through $V_{CC}$ or GND			-	$\pm$ 50	mA
Maximum Junction Temperature		$T_J$	-	150	$^{\circ}$ C
Storage Temperature		$T_{STG}$	-65	150	$^{\circ}$ C

Note 1. Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Note 2. The input and output negative-voltage ratings may be exceeded if the input and output clamp current ratings are observed.

**RECOMMENDED OPERATING CONDITIONS** (Note 3)

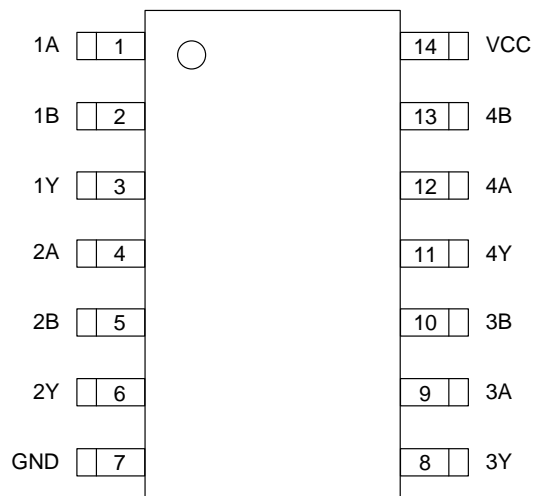
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	$V_{CC}$	2	6	V
DC Input Voltage	$V_{IN}$	0	$V_{CC}$	V
DC Output Voltage	$V_{OUT}$	0	$V_{CC}$	V
Operating Free-Air Temperature Range	$T_A$	-40	85	°C

Note 3. The device is not guaranteed to function outside its operating ratings.

**ORDERING INFORMATION**

Package	Order No.	Description	Supplied As	Status
SOP-14	74HC00D	Quad 2-Input NAND Gates	Tape & Reel	Active
DIP-14	74HC00N	Quad 2-Input NAND Gates	Tube	Active

### PIN CONFIGURATION

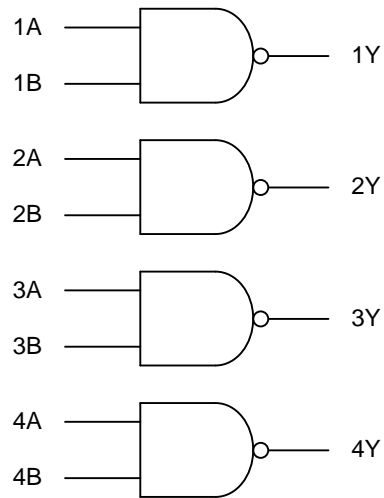


SOP-14 / DIP-14

### PIN DESCRIPTION

Pin No.		Pin Name	Pin Function
SOP-14	DIP-14		
1	1	1A	Input 1A
2	2	1B	Input 1B
3	3	1Y	Output 1
4	4	2A	Input 2A
5	5	2B	Input 2B
6	6	2Y	Output 2
7	7	GND	Ground
8	8	3Y	Output 3
9	9	3A	Input 3A
10	10	3B	Input 3B
11	11	4Y	Output 4
12	12	4A	Input 4A
13	13	4B	Input 4B
14	14	VCC	Power Supply

### BLOCK DIAGRAM



**DC ELECTRICAL CHARACTERISTICS**

Over operating free-air temperature range (unless otherwise noted); Voltages referenced to GND

SYMBOL	PARAMETER	TEST CONDITION	V <sub>CC</sub>	MIN	TYP	MAX	UNIT	
V <sub>IH</sub>	High-Level Input Voltage		2.0 V	1.5	1.2	-	V	
			4.5 V	3.15	2.4	-		
			6.0 V	4.2	3.2	-		
V <sub>IL</sub>	Low-Level Input Voltage		2.0 V	-	0.8	0.5	V	
			4.5 V	-	2.1	1.35		
			6.0 V	-	2.8	1.8		
V <sub>OH</sub>	High-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -20μA	2.0 V	1.9	2.0	-	V
				4.5 V	4.4	4.5	-	
				6.0 V	5.9	6.0	-	
			I <sub>OH</sub> = -4mA	4.5 V	3.84	4.32	-	
				6.0 V	5.34	5.81	-	
V <sub>OL</sub>	Low-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = 20μA	2.0 V	-	0	0.1	V
				4.5 V	-	0	0.1	
				6.0 V	-	0	0.1	
			I <sub>OH</sub> = 4mA	4.5 V	-	0.15	0.33	
				6.0 V	-	0.16	0.33	
I <sub>IN</sub>	Input Leakage Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	6.0 V	-	-	±1.0	μA	
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IN</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0A	6.0 V	-	-	2.0	μA	

**AC ELECTRICAL CHARACTERISTICS**

 Over operating free-air temperature range (unless otherwise noted); C<sub>L</sub> = 50 pF, Z<sub>O</sub> = 50Ω, Input t<sub>r</sub> = t<sub>f</sub> = 6 ns

SYMBOL	PARAMETER	V <sub>CC</sub>	MIN	TYP	MAX	UNIT
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay, Input A or B to Output Y (Figure 2)	2.0 V	-	25	115	ns
		4.5 V	-	9	23	
		6.0 V	-	7	20	
t <sub>TLH</sub> , t <sub>THL</sub>	Transition Time, Any Output (Figure 2)	2.0 V	-	19	95	ns
		4.5 V	-	7	19	
		6.0 V	-	6	16	

### FUNCTION TABLE

Input (A)	Input (B)	Output (Y)
L	L	H
L	H	H
H	L	H
H	H	L

### SWITCHING CHARACTERISTICS



Fig. 1. Test Circuit

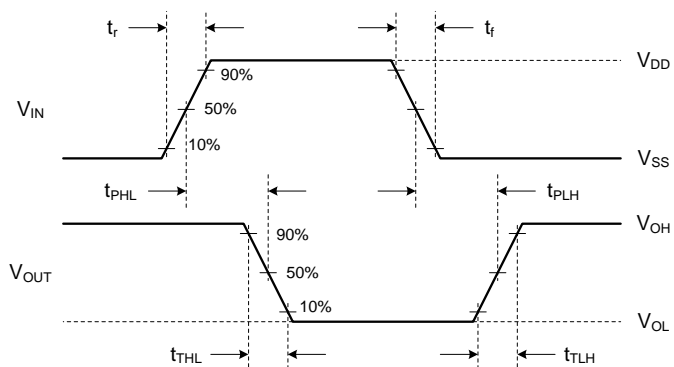


Fig 2. Switching Time Waveforms