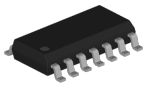
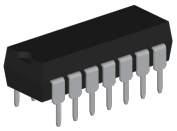
Quad 2-Input NAND Gates 74HC00

FEATURES

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



SOP-14



DIP-14

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 $Y=\overline{A} \times \overline{B}$ or $Y=\overline{A}+\overline{B}$ 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 (Note 2)	$V_I < 0$ or $V_I > V_{CC}$	I_{IK}	-	±20	mA
Output Clamp Current (Note 2)	$V_O < 0$	I_{OK}	-	±20	mA
Continuous Output Current	$V_O = 0$ to V_{CC}	I_{IN}	-	±25	mA
Continuous Current through V_{CC} or GND			-	±50	mA
Maximum Junction Temperature		T_J	-	150	°C
Storage Temperature		T_{STG}	−65	150	°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)

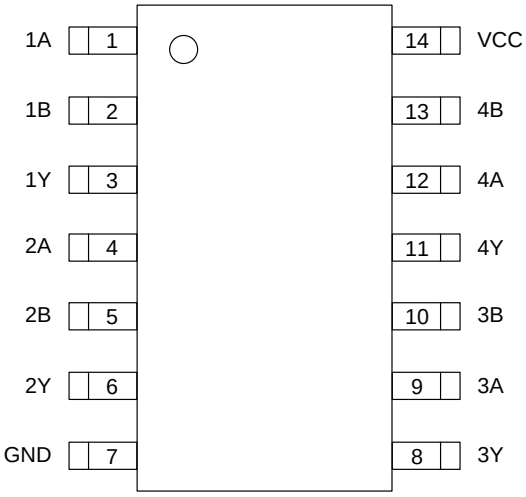
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V_{CC}	2	6	V
DC Input Voltage	V_{IN}	0	V_{CC}	V
DC Output Voltage	V_{OUT}	0	V_{CC}	V
Operating Free-Air Temperature Range	T_A	−40	85	°C

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	Contact Us

PIN CONFIGURATION

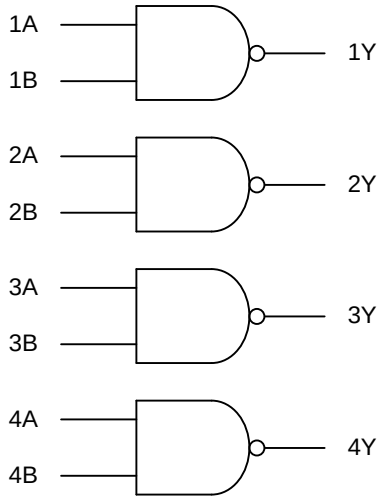


SOP-14 / DIP-14

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_{CC}	MIN	TYP	MAX	UNIT
V_{IH}	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_{IL}	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_{OH}	High-Level Output Voltage	V_{IN} = V_{IH} or V_{IL}	I_{OH} = −20μA	2.0 V	1.9	2.0	-	V
				4.5 V	4.4	4.5	-	
				6.0 V	5.9	6.0	-	
			I_{OH} = −4mA	4.5 V	3.84	4.32	-	
			I_{OH} = −5.2mA	6.0 V	5.34	5.81	-	
V_{OL}	Low-Level Output Voltage	V_{IN} = V_{IH} or V_{IL}	I_{OH} = 20μA	2.0 V	-	0	0.1	V
				4.5 V	-	0	0.1	
				6.0 V	-	0	0.1	
			I_{OH} = 4mA	4.5 V	-	0.15	0.33	
			I_{OH} = 5.2mA	6.0 V	-	0.16	0.33	
I_{IN}	Input Leakage Current	V_{IN} = V_{CC} or GND		6.0 V	-	-	±1.0	μA
I_{CC}	Quiescent Supply Current	V_{IN} = V_{CC} or GND, I_O = 0A		6.0 V	-	-	2.0	μA

AC ELECTRICAL CHARACTERISTICS

Over operating free-air temperature range (unless otherwise noted); C_L = 50 pF, Z_O = 50Ω, Input t_r = t_f = 6 ns

SYMBOL	PARAMETER	V_{CC}	MIN	TYP	MAX	UNIT
t_{PLH}, t_{PHL}	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_{TLH}, t_{THL}	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

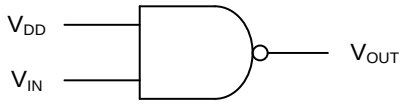


Fig. 1. Test Circuit

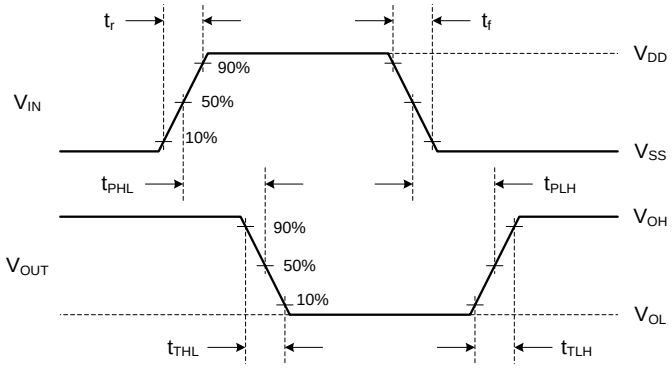


Fig 2. Switching Time Waveforms

TYPICAL OPERATING CHARACTERISTICS

T.B.D.

REVISION NOTICE

The description in this datasheet is subject to change without any notice to describe its electrical characteristics properly.