

74HC00

DATASHEET

Specification Revision History:

Version	Date	Description
V1.0	2019/07	New
V1.1	2021/10	Modify Ordering Information
V1.2	2025/02	Modify Ordering Information
V1.3	2025/03	Add application precautions and overall typesetting.

DESCRIPTION

The 74HC00 is a Quadruple 2-input positive-NAND gate with provides the function $Y = \overline{\overline{A} \times \overline{B}}$ or $Y = \overline{A+B}$.

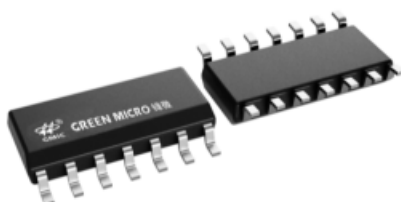
FEATURES

- Operation voltage range: 2.0V ~ 6.0V
- Low Quiescent Current: $I_{CC} = 2\mu A$ (Max.)

The appearance of the product



DIP-14



SOP-14

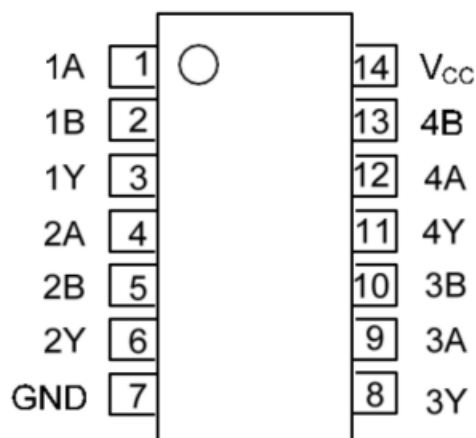


TSSOP-14

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
SN74HC00DS	SOP-14	74HC00 322	REEL	4000PCS/REEL
SN74HC00NCD	DIP-14	74HC00 322	TUBE	1000PCS/BOX
SN74HC00PJS	TSSOP-14	74HC00 322	REEL	2500PCS/REEL

PIN CONFIGURATION



FUNCTION TABLE

INPUT		OUTPUT
A	B	Y
H	H	L
L	X	H
X	L	H

LOGIC DIAGRAM (positive logic)



ABSOLUTE MAXIMUM RATINGS (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7.0	V
Input Clamp Current	I_{IK}	± 20	mA
Output Clamp Current	I_{OK}	± 20	mA
Output Current	I_{OUT}	± 25	mA
VCC or GND Current	I_{CC}	± 50	mA
Storage Temperature	T_{STG}	-65 ~ +150	°C

Notes:

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	θ_{JA}	90	°C/W
	SOP-14U		95	°C/W
	TSSOP-14U		120	°C/W

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		6	V
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	t_R, t_F	$V_{CC} = 2V$			1000	ns
		$V_{CC} = 4.5V$			500	ns
		$V_{CC} = 6V$			400	ns
Operating Temperature	T_A		-40		+125	°C

Note: All unused inputs of the device must be held at VCC or GND to ensure proper device operation.

STATIC CHARACTERISTICS (TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=2V$	1.5			V
		$V_{CC}=4.5V$	3.15			V
		$V_{CC}=6V$	4.2			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2V$			0.5	V
		$V_{CC}=4.5V$			1.35	V
		$V_{CC}=6V$			1.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OH}=-20\mu A$	1.9	1.998		V
		$V_{CC}=4.5V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OH}=-20\mu A$	4.4	4.499		V
		$V_{CC}=6V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OH}=-20\mu A$	5.9	5.999		V
		$V_{CC}=4.5V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OH}=-4mA$	3.98	4.3		V
		$V_{CC}=6V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OH}=-5.2mA$	5.48	5.8		V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OL}=20\mu A$		0.002	0.1	V
		$V_{CC}=4.5V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OL}=20\mu A$		0.001	0.1	V
		$V_{CC}=6V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OL}=20\mu A$		0.001	0.1	V
		$V_{CC}=4.5V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OL}=4mA$		0.17	0.26	V
		$V_{CC}=6V, V_{IN}=V_{IH} \text{ or } V_{IL}, I_{OL}=5.2mA$		0.15	0.26	V

Input Leakage Current	$I_{(LEAK)}$	$V_{CC}=6V, V_{IN}=V_{CC}$ or 0	± 0.1	± 100	nA
Quiescent Supply Current	I_Q	$V_{CC}=6V, V_{IN}=V_{CC}$ or 0, $I_{OUT}=0$		2	μA
Input Capacitance	C_{IN}	$V_{CC}=2V \sim 6V$	3	10	pF

DYNAMIC CHARACTERISTICS

($T_A=25^{\circ}C$, Input: $t_R=t_F=6ns$; PRR $\leq 1MHz$, unless otherwise specified)

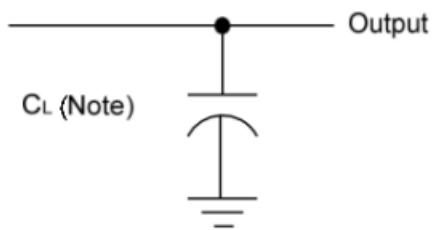
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay, (A) or (B) to (Y)	t_{PLH}, t_{PHL}	$V_{CC}=2V, C_L=50pF$		45	90	ns
		$V_{CC}=4.5V, C_L=50pF$		9	18	ns
		$V_{CC}=6V, C_L=50pF$		8	15	ns
Output Transition Times	t_{TLH}, t_{THL}	$V_{CC}=2V, C_L=50pF$		38	75	ns
		$V_{CC}=4.5V, C_L=50pF$		8	15	ns
		$V_{CC}=6V, C_L=50pF$		6	13	ns

OPERATING CHARACTERISTICS ($T_A=25^{\circ}C$, unless otherwise specified)

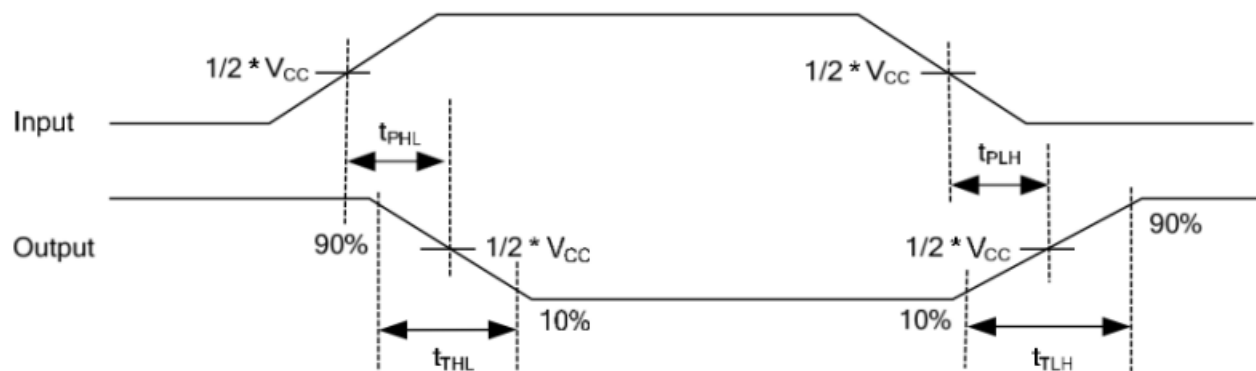
PARAMETER	SYMBOL	TEST CONDITION	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No Load	20	pF

Note: All unused inputs of the device must be held at VCC or GND to ensure proper device operation.

TEST CIRCUIT AND WAVEFORMS



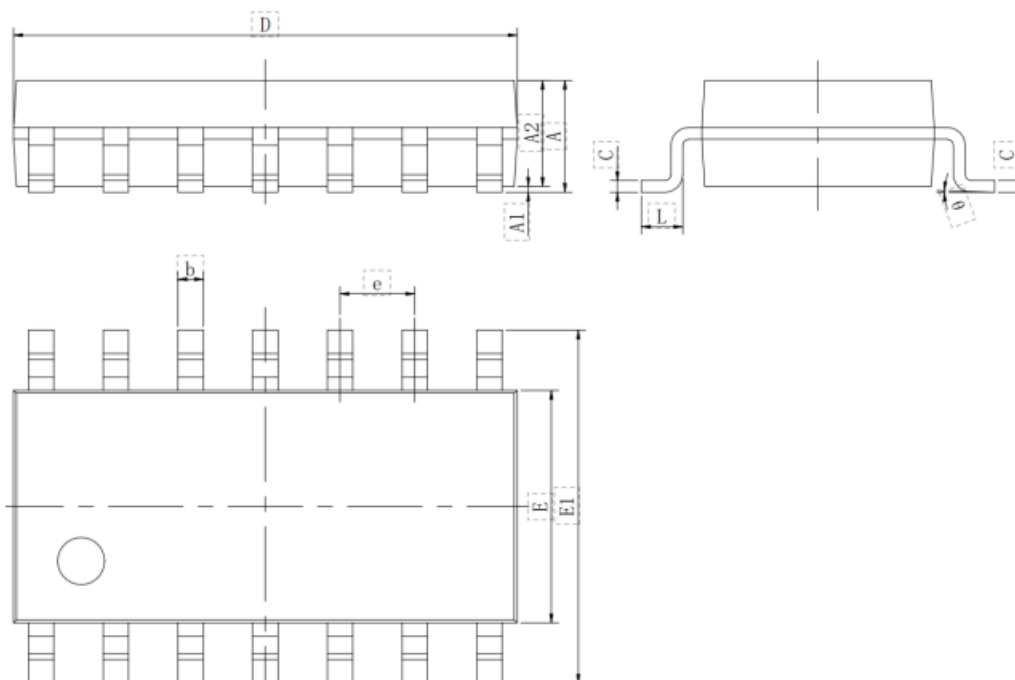
Note: C_L includes probe and jig capacitance.



Outline Dimensions

SOP-14

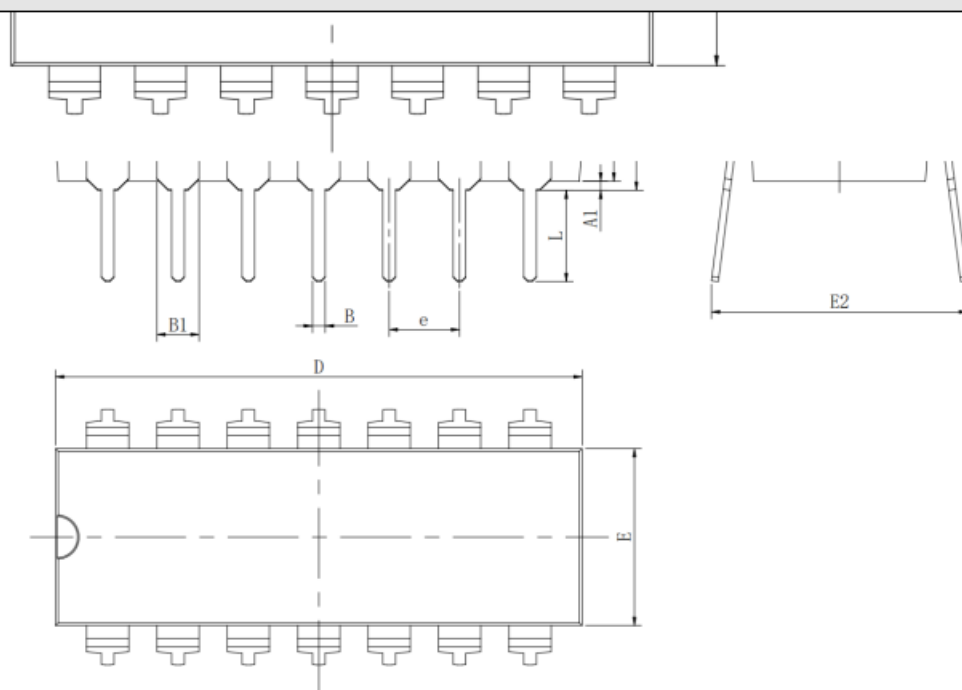
Unit : mm



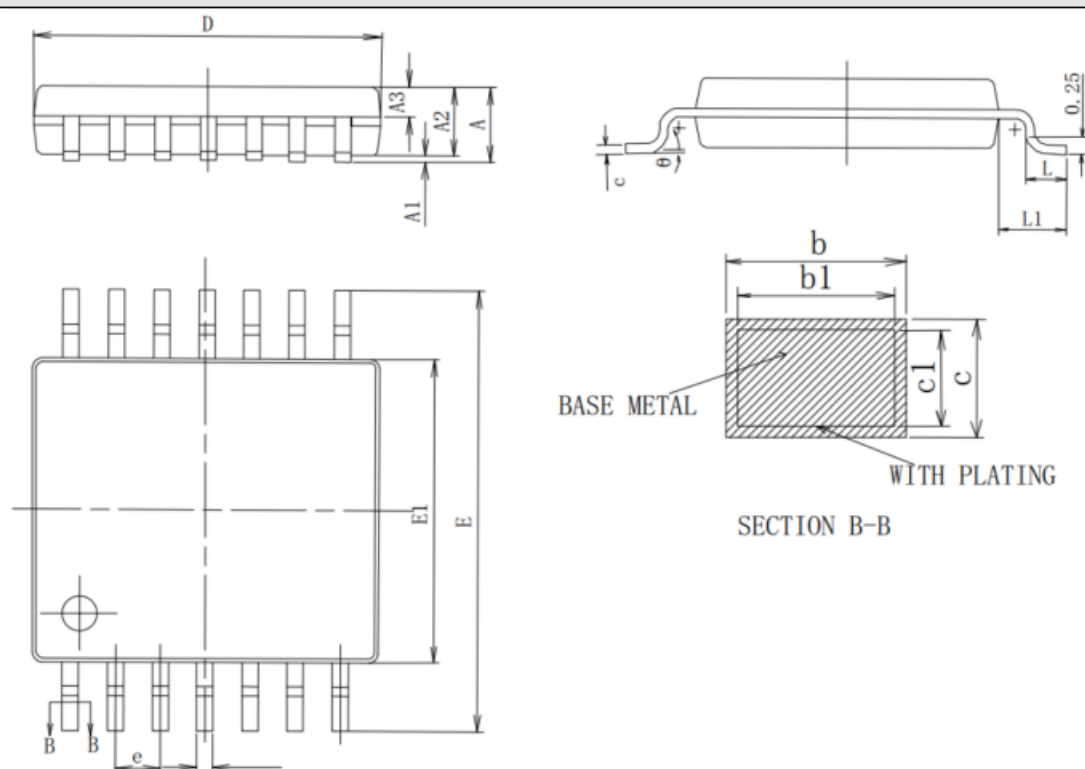
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	8.360	8.760	0.329	0.345
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0 °	8 °	0 °	8 °

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Unit:mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

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Unit:mm


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.20
A1	0.05	—	0.15
A2	0.90	1.00	1.05
A3	0.39	0.44	0.49
b	0.20	—	0.28
b1	0.19	0.22	0.25
c	0.13	—	0.17
cl	0.12	0.13	0.14
D	4.90	5.00	5.10
E1	4.30	4.40	4.50
E	6.20	6.40	6.60
e	0.65BSC		
L	0.45	0.60	0.75
L1	1.00BSC		
θ	0	—	8°

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