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台舟电子

SN74AHC1G00

Single 2-Input NAND Gate

www.sot23.com.tw

Features

- Operation Voltage Range: 2~5.5V
- Low Power Dissipation: I_{CC}=1.0μA (Max)
- High Speed: t_{PD}=4.3ns (Typ)
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 1000-V Charged-Device Model (C101)
- SOT23-5 Package Available
- SOT353 Package Available

Applications

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, Networking, Notebooks, Netbooks, PDAs
  - Tablet Computers, E-readers
  - Computer Peripherals, Hard Drives, CD/DVD ROM
  - TV, DVD, DVR, Set-Top Box
  - Cell Phones, Personal Navigation / GPS
  - MP3 Players, Cameras, Video Recorders

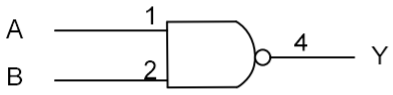
General Description

The SN74AHC1G00 is a 2-input NAND gate which provides the Function $Y=\overline{A\times B}$.

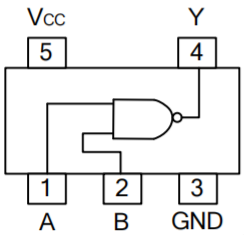
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
SN74AHC1G00DBVR	SOT23-5	Tape and Reel,3000
SN74AHC1G00DCKR	SOT353	Tape and Reel,3000

Logic Diagram



Pin Configuration



SOT23-5/ SOT353

Marking

SN74AHC1G00DBVR Marking:A00G

SN74AHC1G00DCKR Marking:AA3

Function Table

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

Absolute Maximum Ratings

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~7	V
Input Voltage	V_{IN}	-0.5~7	V
Output Voltage	V_{OUT}	-0.5~V_{CC}+0.5	V
Input Clamp Current	I_{IK}	-20	mA
Output Clamp Current	I_{OK}	±20	mA
Output Current	I_{OUT}	±25	mA
V_{CC} or GND Current	I_{CC}	±50	mA
Storage Temperature	T_{STG}	-65 ~ +150	°C

Notes: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. 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.

Recommended Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
High-Level Output Current	I_{OH}	V_{CC}=2V			-50	μA
		V_{CC}=3.3±0.3V			-4	mA
		V_{CC}=5±0.3V			-8	mA
Low-Level Output Current	I_{OL}	V_{CC}=2V			50	μA
		V_{CC}=3.3±0.3V			4	mA
		V_{CC}=5±0.5V			8	mA
Input Transition Rise or Fall Rate	Δt/Δv	V_{CC}=3.3+0.3V			100	ns/V
		V_{CC}=5.0+0.5V			20	
Operating Temperature	T_A		-40		+125	°C

Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V_{IH}	V_{CC}=2.0V	1.5			1.5			V
		V_{CC}=3.0V	2.1			2.1			
		V_{CC}=5.5V	3.85			3.85			
Low-Level Input Voltage	V_{IL}	V_{CC}=2.0V			0.5			0.5	V
		V_{CC}=3.0V			0.9			0.9	
		V_{CC}=5.5V			1.65			1.65	
High-Level Output Voltage	V_{OH}	V_{CC}=2.0V, I_{OH}=-50μA	1.9	2.0		1.9			V
		V_{CC}=3.0V, I_{OH}=-50μA	2.9	3.0		2.9			
		V_{CC}=4.5V, I_{OH}=-50μA	4.4	4.5		4.4			
		V_{CC}=3.0V, I_{OH}=-4mA	2.58			2.4			
		V_{CC}=4.5V, I_{OH}=-8mA	3.94			3.7			
Low-Level Output Voltage	V_{OL}	V_{CC}=2.0V, I_{OL}=50μA			0.1			0.1	V
		V_{CC}=3.0V, I_{OL}=50μA			0.1			0.1	
		V_{CC}=4.5V, I_{OL}=50μA			0.1			0.1	
		V_{CC}=3.0V, I_{OL}=4mA			0.36			0.55	
		V_{CC}=4.5V, I_{OL}=8mA			0.36			0.55	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0~5.5V, V_{IN}=V_{CC} or GND			±0.1			±2	μA
Quiescent Supply Current	I_{CC}	V_{CC}=5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0			1			40	μA

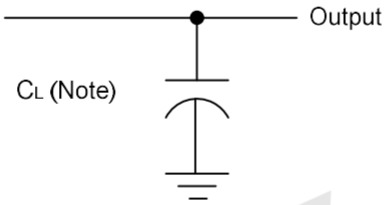
Dynamic Characteristics (Input: t_R, t_F≤3ns; P_{RR}≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay Time Input (A or B) to Output(Y)	t_{PLH}	V_{CC}=3.3±0.3V, C_L=15pF		5.5	7.9	1		10.5	ns
	t_{PHL}			5.5	7.9	1		10.5	ns
	t_{PLH}	V_{CC}=3.3±0.3V, C_L=50pF		8	11.4	1		14.5	ns
	t_{PHL}			8	11.4	1		14.5	ns
Propagation Delay Time Input (A or B) to Output(Y)	t_{PLH}	V_{CC}=5±0.5V, C_L=15pF		3.7	5.5	1		7	ns
	t_{PHL}			3.7	5.5	1		7	ns
	t_{PLH}	V_{CC}=5±0.5V, C_L=50pF		5.2	7.5	1		9.5	ns
	t_{PHL}			5.2	7.5	1		9.5	ns

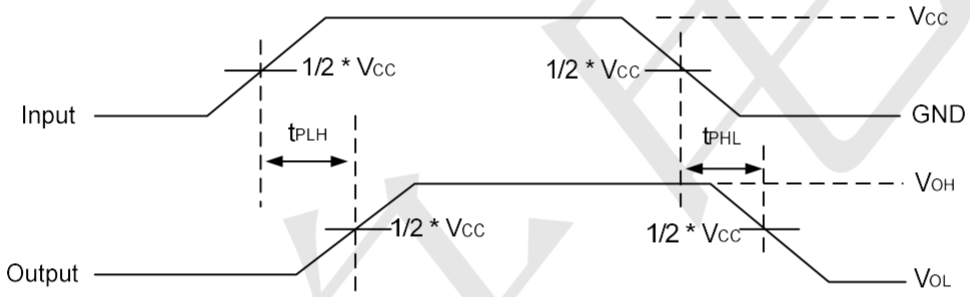
Operating Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	V_{CC}=5V, V_{IN}=V_{CC} or GND		4	10	pF
Power Dissipation Capacitance	C_{PD}	No load, f=1MHz, V_{CC}=5V		9.5		pF

Test Circuit And Waveforms

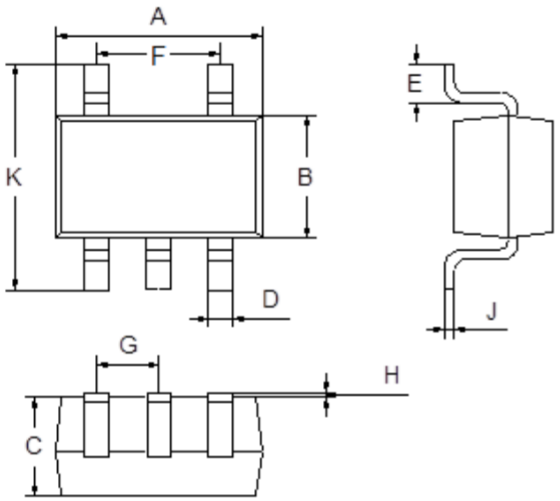


Note: C_L includes probe and jig capacitance.



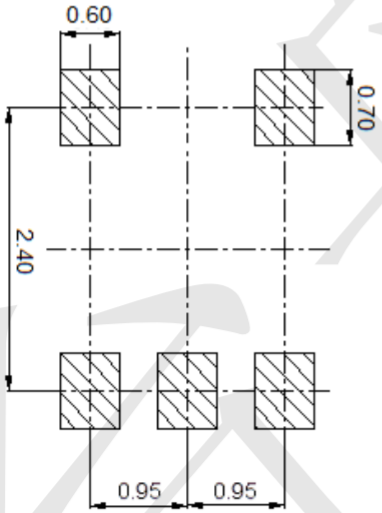
Package Outline Dimensions (Unit: mm)

SOT23-5



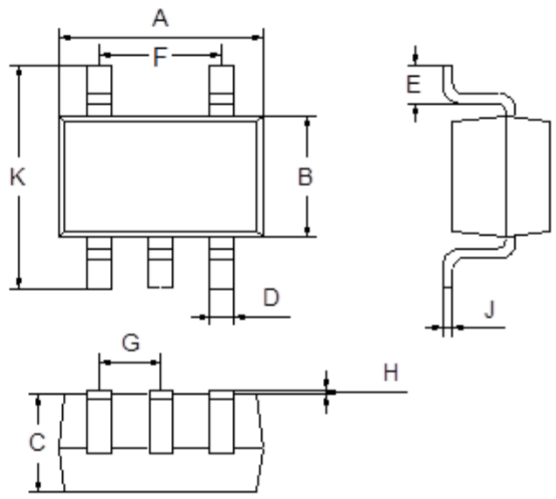
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)



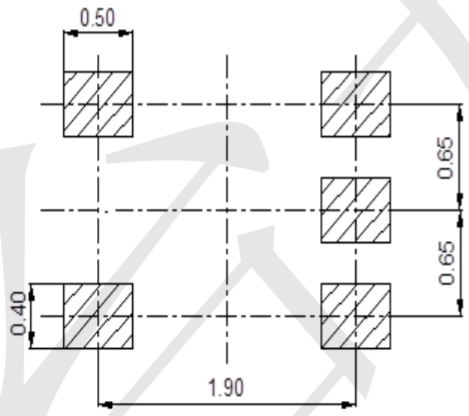
Package Outline Dimensions (Unit: mm)

SOT353



Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
F	1.20	1.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

Mounting Pad Layout (Unit: mm)



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