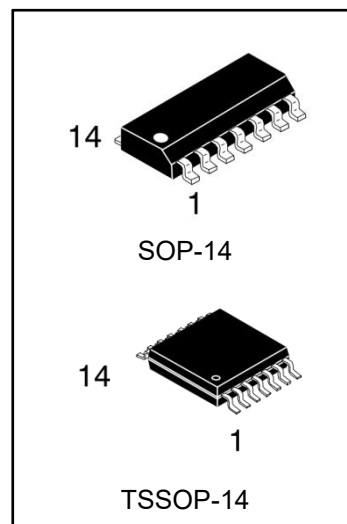


Quad 2-Input NAND Gate with Schmitt-Trigger Inputs

High-Performance Silicon-Gate CMOS

FEATURES

- Output Drive Capability: 10 LSTTL Loads
- Outputs Directly Interface to CMOS, NMOS, and TTL
- Operating Voltage Range: 2.0 to 6.0 V
- Low Input Current: 1.0 μ A
- High Noise Immunity Characteristic of CMOS Devices
- In Compliance with the Requirements as Defined by JEDEC Standard No. 7A
- ESD Performance:
 - HBM > 2000 V;
 - Machine Model > 200 V
- Chip Complexity: 72 FETs or 18 Equivalent Gates
- These are Pb-Free Device



ORDERING INFORMATION

DEVICE	Package Type	MARKING	Packing	Packing Qty
74HC132DRG	SOP-14	74HC132	REEL	2500pcs/reel
74HC132PWRG	TSSOP-14	HC132	REEL	2500pcs/reel

GENERAL DESCRIPTION

The 74HC132 is identical in pinout to the LS132. The device inputs are compatible with standard CMOS outputs; with pull-up resistors, they are compatible with LSTTL outputs. The HC132 can be used to enhance noise immunity or to square up slowly changing waveforms.

PIN CONFIGURATION

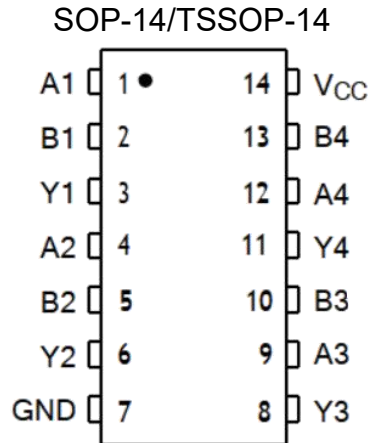
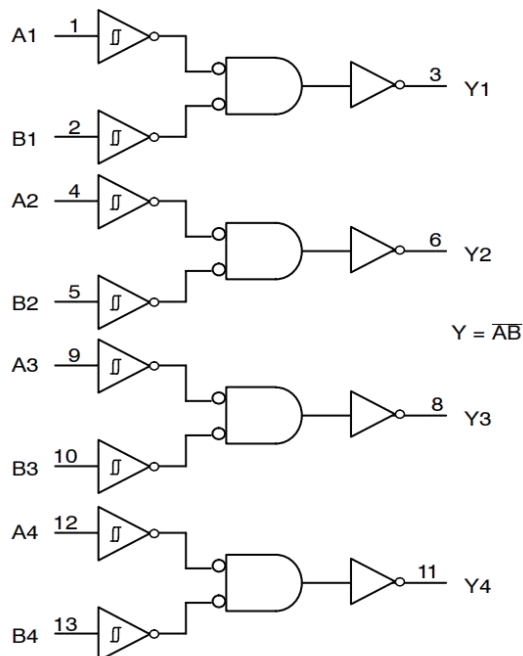


Figure 1. Pin Assignment



PIN 14 = V_{CC};

PIN 7 = GND

Figure 2. Logic Diagram

FUNCTION TABLE

Inputs		Output
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit	
V_{CC}	Positive DC Supply Voltage	-0.5 to +7.0	V	
V_{IN}	Digital Input Voltage	-0.5 to +7.0	V	
V_{OUT}	DC Output Voltage	Output in 3-State High or Low State	-0.5 to +7.0 -0.5 to $V_{CC} + 0.5$	
I_{IK}	Input Diode Current	-20	mA	
I_{OK}	Output Diode Current	± 20	mA	
I_{OUT}	DC Output Current, per Pin	± 25	mA	
I_{CC}	DC Supply Current, VCC and GND Pins	± 75	mA	
I_{GND}	DC Ground Current per Ground Pin	± 75	mA	
T_{STG}	Storage Temperature Range	-65 to +150	$^{\circ}C$	
T_L	Lead Temperature, 1 mm from Case for 10 Seconds	245	$^{\circ}C$	
T_J	Junction Temperature Under Bias	+125	$^{\circ}C$	
θ_{JA}	Thermal Resistance	14-SOP 14-TSSOP	125 170	$^{\circ}C/W$
P_D	Power Dissipation in Still Air at 85 $^{\circ}C$	SOP TSSOP	500 450	mW
M_{SL}	Moisture Sensitivity	Level 1		
F_R	Flammability Rating	Oxygen Index: 30% - 35%	UL 94 V-0 @ 0.125 in	
V_{ESD}	ESD Withstand Voltage	Human Body Model (Note 1) Machine Model (Note 2)	>2000 >200	V
$I_{Latchup}$	Latchup Performance	Above VCC and Below GND at 85 $^{\circ}C$ (Note 3)	± 300	mA

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Tested to EIA/JESD22-A114-A.
2. Tested to EIA/JESD22-A115-A.
3. Tested to EIA/JESD78.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	2.0	6.0	V
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage (Referenced to GND)	0	V _{CC}	V
T _A	Operating Temperature, All Package Types	-40	+85	°C
t _r , t _f	Input Rise and Fall Time (Figure 3)	-	NoLimit (Note5)	ns

4. When $V_{IN} \sim 0.5 V_{CC}$, $I_{CC} \gg$ quiescent current.

5. Unused inputs may not be left open. All inputs must be tied to a high-logic voltage level or a low-logic input voltage level.

DC ELECTRICAL CHARACTERISTICS (Voltages Referenced to GND)

Symbol	Parameter	Test Conditions	V _{CC} (V)	Guaranteed Limit		Unit
				-40°C to 25°C	≤85°C	
VT+max	Maximum Positive Going Input Threshold Voltage (Figure 5)	V _{OUT} = 0.1 V I _{OUT} ≤ 20 μA	2.0	1.5	1.5	V
			4.5	3.15	3.15	
			6.0	4.2	4.2	
VT+min	Minimum Positive-Going Input Threshold Voltage (Figure 5)	V _{OUT} = 0.1 V I _{OUT} ≤ 20 μA	2.0	1.0	0.95	V
			4.5	2.3	2.25	
			6.0	3.0	2.95	
VT-max	Maximum Negative-Going Input Threshold Voltage (Figure 5)	V _{OUT} = V _{CC} - 0.1 V I _{OUT} ≤ 20 μA	2.0	0.9	0.95	V
			4.5	2.0	2.05	
			6.0	2.6	2.65	
VT-min	Minimum Negative-Going Input Threshold Voltage (Figure 5)	V _{OUT} = V _{CC} - 0.1 V I _{OUT} ≤ 20 μA	2.0	0.3	0.3	V
			4.5	0.9	0.9	
			6.0	1.2	1.2	
VHmax (Note 7)	Maximum Hysteresis Voltage (Figure 5)	V _{OUT} = 0.1 V or V _{CC} - 0.1 V I _{OUT} ≤ 20 μA	2.0	1.2	1.2	V
			4.5	2.25	2.25	
			6.0	3.0	3.0	
VHmin (Note 7)	Minimum Hysteresis Voltage (Figure 5)	V _{OUT} = 0.1 V or V _{CC} - 0.1 V I _{OUT} ≤ 20 μA	2.0	0.2	0.2	V
			4.5	0.4	0.4	
			6.0	0.5	0.5	
V _{OH}	Minimum High-Level Output Voltage	V _{IN} ≤ VT-min or VT+max I _{OUT} ≤ 20 μA	2.0	1.9	1.9	V
			4.5	4.4	4.4	
		6.0	5.9	5.9		
		V _{IN} ≤ -VT-min or VT+max I _{OUT} ≤ 4.0 mA I _{OUT} ≤ 5.2 mA	4.5	3.98	3.84	
6.0	5.48		5.34			

V _{OL}	Maximum Low-Level Output Voltage	V _{IN} ≥ V _{T+max} I _{OUT} ≤ 20 μA	2.0	0.1	0.1	V
		V _{IN} ≥ V _{T+max} I _{OUT} ≤ 4.0 mA I _{OUT} ≤ 5.2 mA	4.5	0.1	0.1	
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} or GND	6.0	±0.1	±1.0	μA
I _{CC}	Maximum Quiescent Supply Current (per Package)	V _{IN} = V _{CC} or GND I _{OUT} = 0 μA	6.0	2.0	20	μA

6. V_{Hmin} > (V_{T+min}) - (V_{T-max}); V_{Hmax} = (V_{T+max}) + (V_{T-min}).

AC ELECTRICAL CHARACTERISTICS (C_L = 50 pF, Input t_r = t_f = 6.0 ns)

Symbol	Parameter	VCC (V)	Guaranteed Limit		Unit
			-40°C to 25°C	≤85°C	
t _{PLH} , t _{PHL}	Maximum Propagation Delay, Input A or B to Output Y (Figures 3 and 4)	2.0	125	155	ns
		4.5	25	31	
		6.0	21	26	
t _{TLH} , t _{THL}	Maximum Output Transition Time, Any Output (Figures 3 and 4)	2.0	75	95	ns
		4.5	15	19	
		6.0	13	16	
C _{in}	Maximum Input Capacitance	—	10	10	pF
C _{PD}	Power Dissipation Capacitance(per Gate)(Note 10)	Typical@25°C,VCC=5.0V		24	pF

Used to determine the no-load dynamic power consumption: P_D = C_{PD} V_{CC}²f + I_{CC} V_{CC}

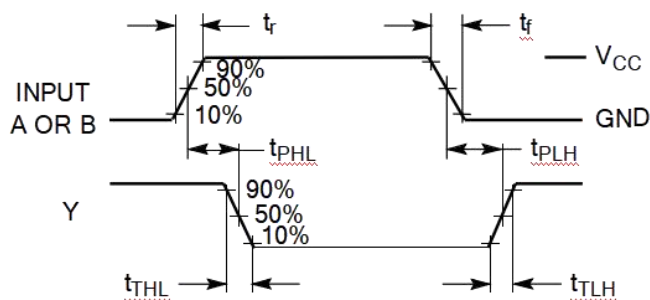
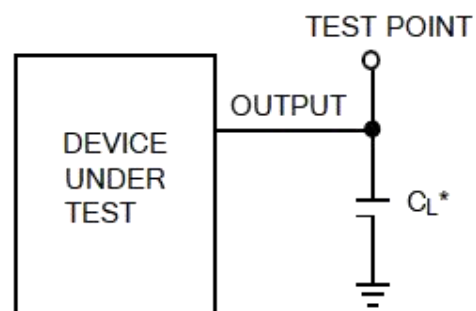
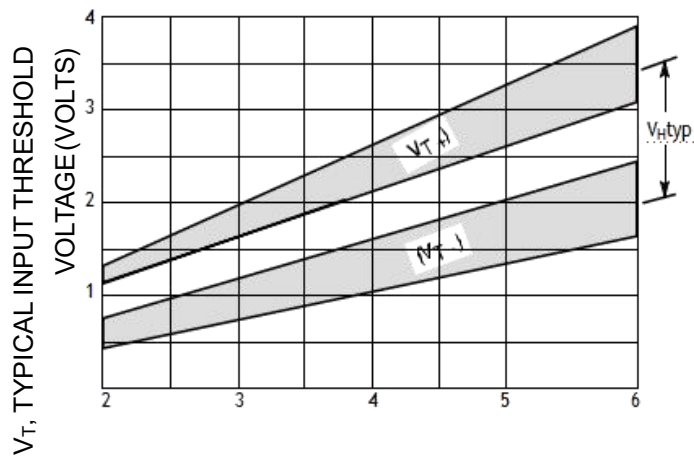


Figure 3. Switching Waveforms



*Includes all probe and jig capacitance

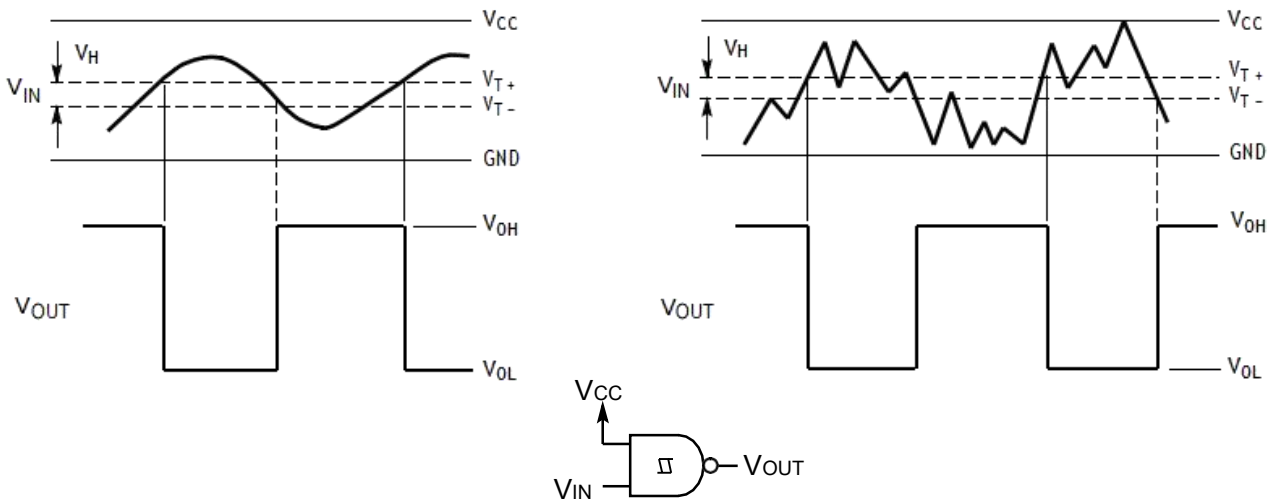
Figure 4. Test Circuit



V_{CC} , POWER SUPPLY VOLTAGE (VOLTS)

$$V_{Htyp} = (V_{T+typ}) - (V_{T-typ})$$

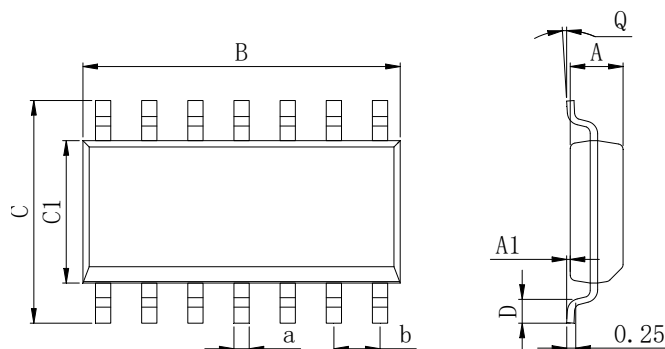
Figure 5. Typical Input Threshold, V_{T+} , V_{T-} Versus Power Supply Voltage



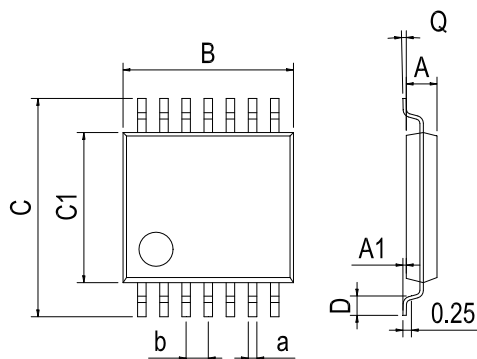
(A) A SCHMITT TRIGGER SQUARES UP INPUTS WITH SLOW RISE AND FALL TIMES

(B) A SCHMITT TRIGGER OFFERS MAXIMUM NOISE IMMUNITY

Figure 6. Typical Schmitt-Trigger Applications

PHYSICAL DIMENSIONS
SOP-14


Dimensions In Millimeters(SOP-14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	8.55	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	8.75	6.20	4.00	0.80	8°	0.45	

TSSOP-14


Dimensions In Millimeters(TSSOP-14)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.85	0.05	4.90	6.20	4.30	0.40	0°	0.20	0.65 BSC
Max:	0.95	0.20	5.10	6.60	4.50	0.80	8°	0.25	

REVISION HISTORY

DATE	REVISION	PAGE
2020-3-1	New	1-9
2023-7-21	Update Lead Temperature、 Update encapsulation type	3、 1

IMPORTANT STATEMENT:

Hanschip Semiconductor reserves the right to change its products and services without notice. Before ordering, the customer shall obtain the latest relevant information and verify whether the information is up to date and complete. Hanschip Semiconductor does not assume any responsibility or obligation for the altered documents.

Customers are responsible for complying with safety standards and taking safety measures when using Hanschip Semiconductor products for system design and machine manufacturing. You will bear all the following responsibilities: select the appropriate Hanschip Semiconductor products for your application; Design, validate and test your application; Ensure that your application meets the appropriate standards and any other safety, security or other requirements. To avoid the occurrence of potential risks that may lead to personal injury or property loss.

Hanschip Semiconductor products have not been approved for applications in life support, military, aerospace and other fields, and Hanschip Semiconductor will not bear the consequences caused by the application of products in these fields. All problems, responsibilities and losses arising from the user's use beyond the applicable area of the product shall be borne by the user and have nothing to do with Hanschip Semiconductor, and the user shall not claim any compensation liability against Hanschip Semiconductor by the terms of this Agreement.

The technical and reliability data (including data sheets), design resources (including reference designs), application or other design suggestions, network tools, safety information and other resources provided for the performance of semiconductor products produced by Hanschip Semiconductor are not guaranteed to be free from defects and no warranty, express or implied, is made. The use of testing and other quality control technologies is limited to the quality assurance scope of Hanschip Semiconductor. Not all parameters of each device need to be tested.

The documentation of Hanschip Semiconductor authorizes you to use these resources only for developing the application of the product described in this document. You have no right to use any other Hanschip Semiconductor intellectual property rights or any third party intellectual property rights. It is strictly forbidden to make other copies or displays of these resources. You should fully compensate Hanschip Semiconductor and its agents for any claims, damages, costs, losses and debts caused by the use of these resources. Hanschip Semiconductor accepts no liability for any loss or damage caused by infringement.

单击下面可查看定价，库存，交付和生命周期等信息

[>>HGC\(深圳汉芯\)](#)