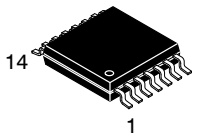
# Quad 2-Input NAND Schmitt Trigger

# 74VHC132




**TSSOP−14 WB**
**CASE 948G**

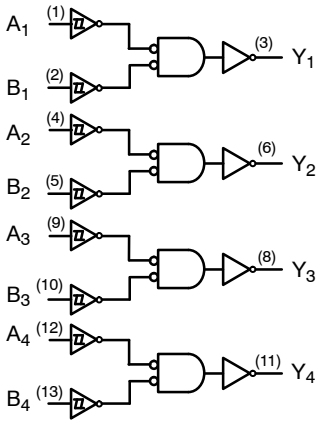
## General Description

The VHC132 is an advanced high speed CMOS 2−input NAND Schmitt Trigger Gate fabricated with silicon gate CMOS technology. It achieves the high−speed operation similar to Bipolar Schottky TTL while maintaining the CMOS low power dissipation. Pin configuration and function are the same as the VHC00 but the inputs have hysteresis between the positive−going and negative−going input thresholds, which are capable of transforming slowly changing input signals into sharply defined, jitter−free output signals. Thus greater noise margin then conventional gates is provided. An input protection circuit ensures that 0 V to 5.5 V can be applied to the input pins without regard to the supply voltage. This device can be used to interface 5 V to 3 V systems and two supply systems such as battery backup. This circuit prevents device destruction due to mismatched supply and input voltages.

## Features

- High Speed: $t_{PD}$ = 3.9 ns (typ.) at $V_{CC}$ = 5 V
- Power Down Protection is Provided on All Inputs
- Low Power Dissipation: $I_{CC}$ = 2 μA (max.) at $T_A$ = 25°C
- Low Noise: $V_{OLP}$ = 0.8 V (max.)
- Pin and Function Compatible with 74HC132
- Pb−Free, Halogen Free/BFR Free and RoHS Compliant

## Logic Diagram

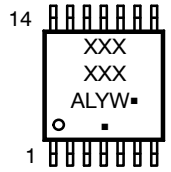



$Y = \overline{AB}$

**TRUTH TABLE**

| A | B | Y |
|---|---|---|
| L | L | H |
| L | H | H |
| H | L | H |
| H | H | L |

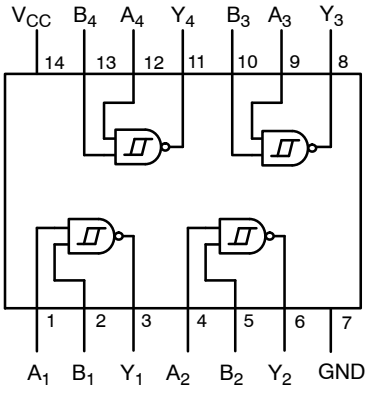
## MARKING DIAGRAM




XXXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb−Free Package

(Note: Microdot may be in either location)

## CONNECTION DIAGRAM




## PIN DESCRIPTION

| Pin Names | Description |
|---|---|
| $A_n$, $B_n$ | Inputs |
| $Y_n$ | Outputs |

## ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

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## MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | −0.5 to +6.5 | V |
| $V_{IN}$ | DC Input Voltage | −0.5 to +6.5 | V |
| $V_{OUT}$ | DC Output Voltage | −0.5 to $V_{CC}$ +0.5 | V |
| $I_{IN}$ | DC Input Current, per Pin | ±20 | mA |
| $I_{OUT}$ | DC Output Current, Per Pin | ±25 | mA |
| $I_{CC}$ | DC Supply Current, $V_{CC}$ and GND Pins | ±50 | mA |
| $I_{IK}$ | Input Clamp Current | −20 | mA |
| $I_{OK}$ | Output Clamp Current | ±20 | mA |
| $T_{STG}$ | Storage Temperature Range | −65 to +150 | °C |
| $T_L$ | Lead Temperature, 1 mm from Case for 10 seconds | 260 | °C |
| $T_J$ | Junction Temperature Under Bias | +150 | °C |
| $\theta_{JA}$ | Thermal Resistance (Note 1) | 150 | °C/W |
| $P_D$ | Power Dissipation in Still Air at 25°C | 833 | mW |
| $V_{ESD}$ | ESD Withstand Voltage (Note 2)<br>Human Body Model<br>Charged Device Model | <br>> 2000<br>N/A | V |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Measured with minimum pad spacing on an FR4 board, using 76mm−by−114mm, 2−ounce copper trace no air flow per JESD51−7.
2. HBM tested to EIA / JESD22−A114−A. CDM tested to JESD22−C101−A. JEDEC recommends that ESD qualification to EIA/JESD22−A115A (Machine Model) be discontinued.

## RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Max | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | 2.0 | 5.5 | V |
| $V_{IN}$ | DC Input Voltage (Note 3) | 0 | 5.5 | V |
| $V_{OUT}$ | DC Output Voltage (Note 3) | 0 | $V_{CC}$ | V |
| $T_A$ | Operating Temperature | −40 | +85 | °C |
| $t_r$, $t_f$ | Input Rise or Fall Rate | 0 | No Limit | ns/V |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

3. Unused inputs must be held HIGH or LOW. They may not float.



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## DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | $V_{CC}$ (V) | Conditions | | $T_A$ = 25°C | | | $T_A$ = −40°C to +85°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Typ | Max | Min | Max | |
| $V_P$ | Positive Threshold Voltage | 3.0 | | | – | – | 2.20 | – | 2.20 | V |
| | | 4.5 | | | – | – | 3.15 | – | 3.15 | |
| | | 5.5 | | | – | – | 3.85 | – | 3.85 | |
| $V_N$ | Negative Threshold Voltage | 3.0 | | | 0.90 | – | – | 0.90 | – | V |
| | | 4.5 | | | 1.35 | – | – | 1.35 | – | |
| | | 5.5 | | | 1.65 | – | – | 1.65 | – | |
| $V_H$ | Hysteresis Output Voltage | 3.0 | | | 0.30 | – | 1.20 | 0.30 | 1.20 | V |
| | | 4.5 | | | 0.40 | – | 1.40 | 0.40 | 1.40 | |
| | | 5.5 | | | 0.50 | – | 1.60 | 0.50 | 1.60 | |
| $V_{OH}$ | HIGH Level Output Voltage | 2.0 | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OH}$ = −50 μA | 1.9 | 2.0 | – | 1.9 | – | V |
| | | 3.0 | | | 2.9 | 3.0 | – | 2.9 | – | |
| | | 4.5 | | | 4.4 | 4.5 | – | 4.4 | – | |
| | | 3.0 | | $I_{OH}$ = −4 mA | 2.58 | – | – | 2.48 | – | |
| | | 4.5 | | $I_{OH}$ = −8 mA | 3.94 | – | – | 3.80 | – | |
| $V_{OL}$ | LOW Level Output Voltage | 2.0 | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OL}$ = 50 μA | – | 0.0 | 0.1 | – | 0.1 | V |
| | | 3.0 | | | – | 0.0 | 0.1 | – | 0.1 | |
| | | 4.5 | | | – | 0.0 | 0.1 | – | 0.1 | |
| | | 3.0 | | $I_{OL}$ = 4 mA | – | – | 0.36 | – | 0.44 | |
| | | 4.5 | | $I_{OL}$ = 8 mA | – | – | 0.36 | – | 0.44 | |
| $I_{IN}$ | Input Leakage Current | 0–5.5 | $V_{IN}$ = 5.5 V or GND | | – | – | ±0.1 | – | ±1.0 | μA |
| $I_{CC}$ | Quiescent Supply Current | 5.5 | $V_{IN}$ = $V_{CC}$ or GND | | – | – | 2.0 | – | 20.0 | μA |

## NOISE CHARACTERISTICS

| Symbol | Parameter | $V_{CC}$ (V) | Conditions | $T_A$ = 25°C | | Unit |
|---|---|---|---|---|---|---|
| | | | | Typ | Limits | |
| $V_{OLP}$ | Quiet Output Maximum Dynamic $V_{OL}$ (Note 4) | 5.0 | $C_L$ = 50 pF | 0.3 | 0.8 | V |
| $V_{OLV}$ | Quiet Output Minimum Dynamic $V_{OL}$ (Note 4) | 5.0 | $C_L$ = 50 pF | −0.3 | −0.8 | V |
| $V_{IHD}$ | Minimum HIGH Level Dynamic Input Voltage (Note 4) | 5.0 | $C_L$ = 50 pF | – | 3.5 | V |
| $V_{ILD}$ | Maximum LOW Level Dynamic Input Voltage (Note 4) | 5.0 | $C_L$ = 50 pF | – | 1.5 | V |

4. Parameter guaranteed by design.

## AC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | $V_{CC}$ (V) | Conditions | $T_A$ = 25°C | | | $T_A$ = −40°C to +85°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay | 3.3 ±0.3 | $C_L$ = 15 pF | – | 6.1 | 11.9 | 1.0 | 14.0 | ns |
| | | | $C_L$ = 50 pF | – | 8.0 | 15.4 | 1.0 | 17.5 | |
| | | 5.0 ±0.5 | $C_L$ = 15 pF | – | 3.9 | 7.7 | 1.0 | 9.0 | ns |
| | | | $C_L$ = 50 pF | – | 5.9 | 9.7 | 1.0 | 11.0 | |
| $C_{IN}$ | Input Capacitance | | $V_{CC}$ = Open | – | 4 | 10 | – | 10 | pF |
| $C_{PD}$ | Power Dissipation Capacitance | | (Note 5) | – | 16 | – | – | – | pF |

5. CPD is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation:
$I_{CC}$ (opr.) = $C_{PD} \times V_{CC} \times f_{IN} + I_{CC} / 4$ (per gate).



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## ORDERING INFORMATION

| Device Order Number | Top Marking | Package Type | Shipping† |
|---|---|---|---|
| 74VHC132MTCX | VHC<br>132 | TSSOP−14 WB<br>(Pb−Free) | 2,500 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.



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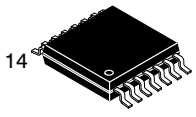
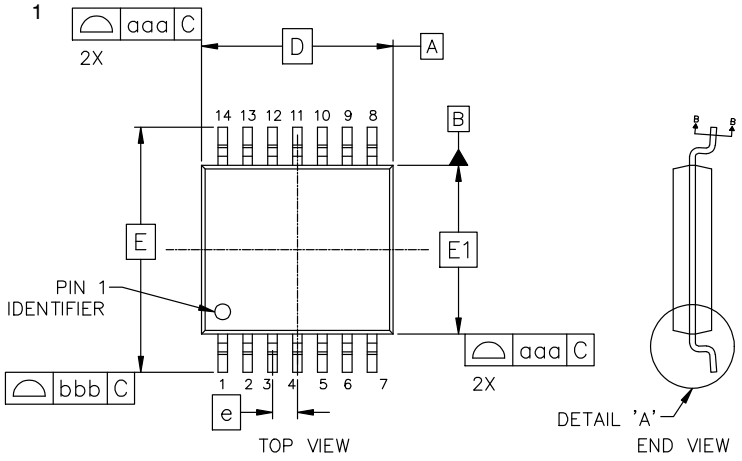
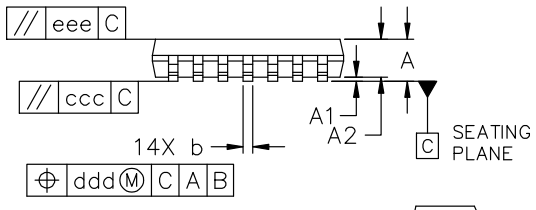
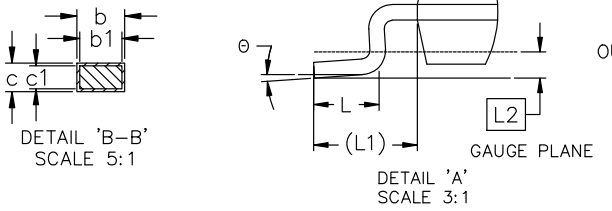


**TSSOP−14 5.00x4.40x0.95, 0.65P**
CASE 948G
ISSUE D

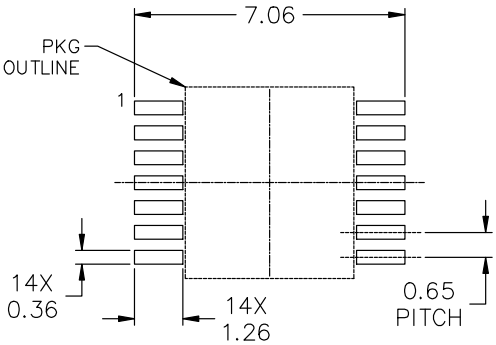
DATE 30 JUN 2026




| MILLIMETERS | | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| A | −−− | −−− | 1.20 |
| A1 | 0.05 | 0.10 | 0.15 |
| A2 | 0.85 | 0.95 | 1.05 |
| b | 0.19 | 0.25 | 0.30 |
| b1 | 0.19 | 0.22 | 0.25 |
| c | 0.09 | 0.15 | 0.20 |
| c1 | 0.09 | 0.12 | 0.16 |
| D | 5.00 BSC | | |
| E | 6.40 BSC | | |
| E1 | 4.40 BSC | | |
| e | 0.65 BSC | | |
| L | 0.50 | 0.63 | 0.75 |
| L1 | 1.00 REF | | |
| L2 | 0.25 BSC | | |
| θ | 0° | 4° | 8° |
| TOLERANCE FORM & POSITION | | | |
| aaa | 0.10 | | |
| bbb | 0.15 | | |
| ccc | 0.08 | | |
| ddd | 0.10 | | |
| eee | 0.10 | | |

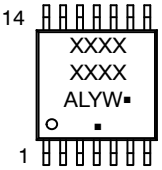



RECOMMENDED MOUNTING FOOTPRINT

*For additional information on our Pb−Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

NOTES:
1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION D DOES NOT INCLIDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 PER SIDE.
4. DIMENSION E1 DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 PER SIDE.
5. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF THE b DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.

**GENERIC MARKING DIAGRAM***




A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb−Free Package
(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

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|---|---|---|
| DESCRIPTION: | TSSOP−14 5.00x4.40x0.95, 0.65P | PAGE 1 OF 1 |

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