

Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[STMicroelectronics](#)
[M74HC132B1R](#)

For any questions, you can email us directly:

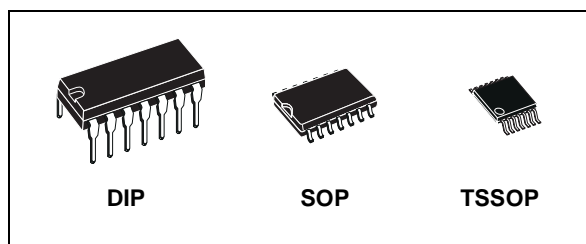
sales@integrated-circuit.com



M74HC132

QUAD 2-INPUT SCHMITT NAND GATE

- **HIGH SPEED:**
 $t_{PD} = 11\text{ns}$ (TYP.) at $V_{CC} = 6\text{V}$
- **LOW POWER DISSIPATION:**
 $I_{CC} = 1\mu\text{A}$ (MAX.) at $T_A=25^\circ\text{C}$
- **HIGH NOISE IMMUNITY:**
 V_H (TYP.) = 0.9 V AT $V_{CC} = 5\text{V}$
- **SYMMETRICAL OUTPUT IMPEDANCE:**
 $|I_{OH}| = I_{OL} = 4\text{mA}$ (MIN)
- **BALANCED PROPAGATION DELAYS:**
 $t_{PLH} \cong t_{PHL}$
- **WIDE OPERATING VOLTAGE RANGE:**
 V_{CC} (OPR) = 2V to 6V
- **PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 132**



ORDER CODES

| PACKAGE | TUBE | T & R |
|---------|-------------|----------------|
| DIP | M74HC132B1R | |
| SOP | M74HC132M1R | M74HC132RM13TR |
| TSSOP | | M74HC132TTR |

DESCRIPTION

The M74HC132 is an high speed CMOS QUAD 2-INPUT SCHMITT NAND GATE fabricated with silicon gate C²MOS technology.

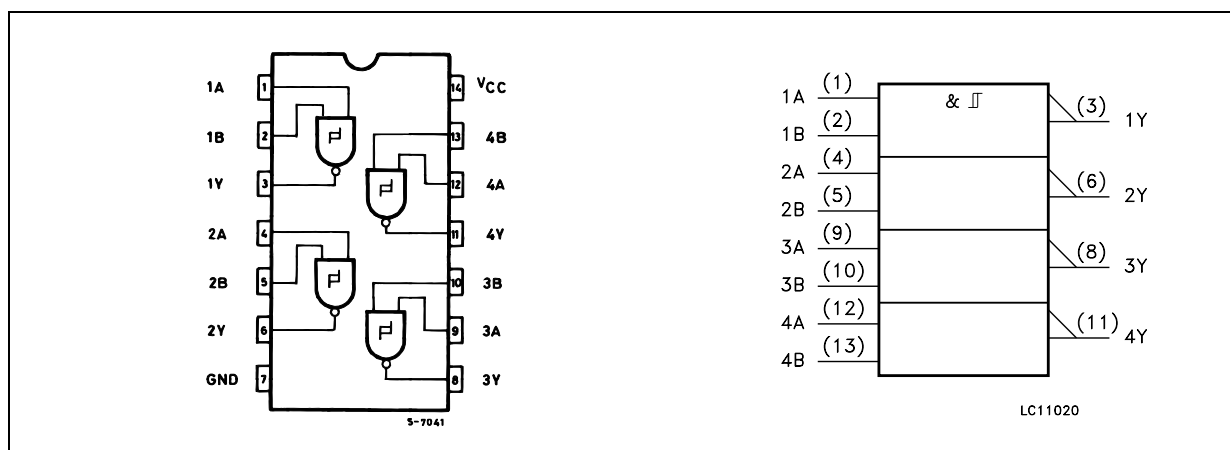
Pin configuration and function are identical to those of the M74HC00.

The hysteresis characteristics (around 20% V_{CC}) of all inputs allow slowly changing input signals to

be transformed into sharply defined jitter-free output signals.

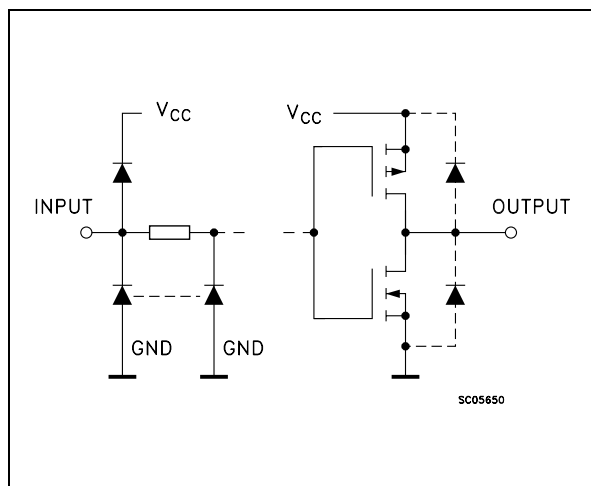
All inputs are equipped with protection circuits against static discharge and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS



M74HC132

INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

| PIN No | SYMBOL | NAME AND FUNCTION |
|--------------|-----------------|-------------------------|
| 1, 4, 9, 12 | 1A to 4A | Data Inputs |
| 2, 5, 10, 13 | 1B to 4B | Data Inputs |
| 3, 6, 8, 11 | 1Y to 4Y | Data Outputs |
| 7 | GND | Ground (0V) |
| 14 | V _{CC} | Positive Supply Voltage |

TRUTH TABLE

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

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit | |
|-------------------------------------|--------------------------------------|-------------------------------|--------|----|
| V _{CC} | Supply Voltage | -0.5 to +7 | V | |
| V _I | DC Input Voltage | -0.5 to V _{CC} + 0.5 | V | |
| V _O | DC Output Voltage | -0.5 to V _{CC} + 0.5 | V | |
| I _{IK} | DC Input Diode Current | ± 20 | mA | |
| I _{OK} | DC Output Diode Current | ± 20 | mA | |
| I _O | DC Output Current | ± 25 | mA | |
| I _{CC} or I _{GND} | DC V _{CC} or Ground Current | ± 50 | mA | |
| P _D | Power Dissipation | DIP | 750(*) | mW |
| | | SOP | 500(*) | mW |
| | | TSSOP | 450(*) | mW |
| T _{stg} | Storage Temperature | -65 to +150 | °C | |
| T _L | Lead Temperature (10 sec) | 300 | °C | |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied

(*) Power dissipation at 65 °C. Derating from 65 °C to 125 °C: DIP Package -10mW/°C; SO Package -7mW/°C; TSSOP Package -6.1mW/°C

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Value | Unit |
|-----------------|-----------------------|----------------------|------|
| V _{CC} | Supply Voltage | 2 to 6 | V |
| V _I | Input Voltage | 0 to V _{CC} | V |
| V _O | Output Voltage | 0 to V _{CC} | V |
| T _{op} | Operating Temperature | -55 to 125 | °C |

M74HC132

DC SPECIFICATIONS

| Symbol | Parameter | Test Condition | | Value | | | | | | Unit | |
|-----------------|------------------------------|---------------------|---|-----------------------|------|-------|-------------|------|--------------|------|------|
| | | V _{CC} (V) | | T _A = 25°C | | | -40 to 85°C | | -55 to 125°C | | |
| | | | | Min. | Typ. | Max. | Min. | Max. | Min. | | Max. |
| V _P | High Level Threshold Voltage | 2.0 | | 1.0 | 1.25 | 1.5 | 1.0 | 1.5 | 1.0 | 1.5 | V |
| | | 4.5 | | 2.3 | 2.7 | 3.15 | 2.3 | 3.15 | 2.3 | 3.15 | |
| | | 6.0 | | 3.0 | 3.5 | 4.2 | 3.0 | 4.2 | 3.0 | 4.2 | |
| V _N | Low Level Threshold Voltage | 2.0 | | 0.3 | 0.65 | 0.9 | 0.3 | 0.9 | 0.3 | 0.9 | V |
| | | 4.5 | | 1.13 | 1.6 | 2.0 | 1.13 | 2.0 | 1.13 | 2.0 | |
| | | 6.0 | | 1.5 | 2.3 | 2.6 | 1.5 | 2.6 | 1.5 | 2.6 | |
| V _H | Hysteresis Voltage | 2.0 | | 0.3 | 0.6 | 1.0 | 0.3 | 1.0 | 0.3 | 1.0 | V |
| | | 4.5 | | 0.6 | 1.1 | 1.4 | 0.6 | 1.4 | 0.6 | 1.4 | |
| | | 6.0 | | 0.8 | 1.2 | 1.4 | 0.8 | 1.7 | 0.8 | 1.7 | |
| V _{OH} | High Level Output Voltage | 2.0 | I _O = -20 μA | 1.9 | 2.0 | | 1.9 | | 1.9 | | V |
| | | 4.5 | I _O = -20 μA | 4.4 | 4.5 | | 4.4 | | 4.4 | | |
| | | 6.0 | I _O = -20 μA | 5.9 | 6.0 | | 5.9 | | 5.9 | | |
| | | 4.5 | I _O = -4.0 mA | 4.18 | 4.31 | | 4.13 | | 4.10 | | |
| | | 6.0 | I _O = -5.2 mA | 5.68 | 5.8 | | 5.63 | | 5.60 | | |
| V _{OL} | Low Level Output Voltage | 2.0 | I _O = -20 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | V |
| | | 4.5 | I _O = -20 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | |
| | | 6.0 | I _O = -20 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | |
| | | 4.5 | I _O = -4.0 mA | | 0.17 | 0.26 | | 0.33 | | 0.40 | |
| | | 6.0 | I _O = -5.2 mA | | 0.18 | 0.26 | | 0.33 | | 0.40 | |
| I _I | Input Leakage Current | 6.0 | V _I = V _{CC} or GND | | | ± 0.1 | | ± 1 | | ± 1 | μA |
| I _{CC} | Quiescent Supply Current | 6.0 | V _I = V _{CC} or GND | | | 1 | | 10 | | 20 | μA |

AC ELECTRICAL CHARACTERISTICS (C_L = 50 pF, Input t_r = t_f = 6ns)

| Symbol | Parameter | Test Condition | | Value | | | | | | Unit | |
|-----------------------------------|------------------------|---------------------|--|-----------------------|------|------|-------------|------|--------------|------|------|
| | | V _{CC} (V) | | T _A = 25°C | | | -40 to 85°C | | -55 to 125°C | | |
| | | | | Min. | Typ. | Max. | Min. | Max. | Min. | | Max. |
| t _{TLH} t _{THL} | Output Transition Time | 2.0 | | | 30 | 75 | | 95 | | 110 | ns |
| | | 4.5 | | | 8 | 15 | | 19 | | 22 | |
| | | 6.0 | | | 7 | 13 | | 16 | | 19 | |
| t _{PLH} t _{PHL} | Propagation Delay Time | 2.0 | | | 52 | 105 | | 130 | | 160 | ns |
| | | 4.5 | | | 13 | 21 | | 26 | | 32 | |
| | | 6.0 | | | 11 | 18 | | 22 | | 27 | |

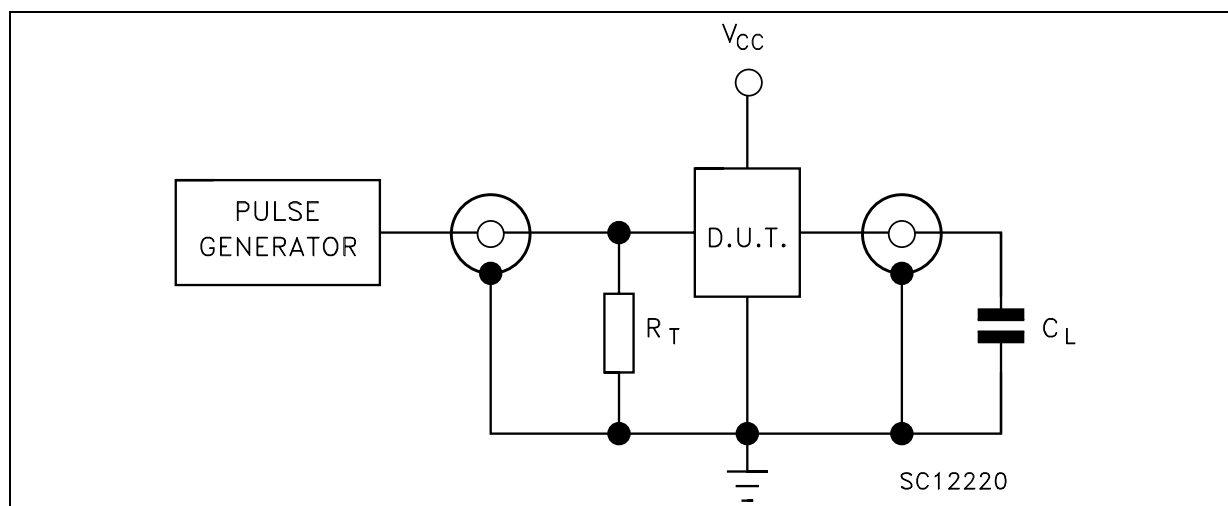
M74HC132

CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Test Condition | | Value | | | | | | Unit | |
|-----------------|--|---------------------|--|-----------------------|------|------|-------------|------|--------------|------|------|
| | | V _{CC} (V) | | T _A = 25°C | | | -40 to 85°C | | -55 to 125°C | | |
| | | | | Min. | Typ. | Max. | Min. | Max. | Min. | | Max. |
| C _{IN} | Input Capacitance | 5.0 | | | 5 | 10 | | 10 | | 10 | pF |
| C _{PD} | Power Dissipation Capacitance (note 1) | 5.0 | | | 29 | | | | | | pF |

1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. I_{CC(oper)} = C_{PD} × V_{CC} × f_{IN} + I_{CC}/4 (per gate)

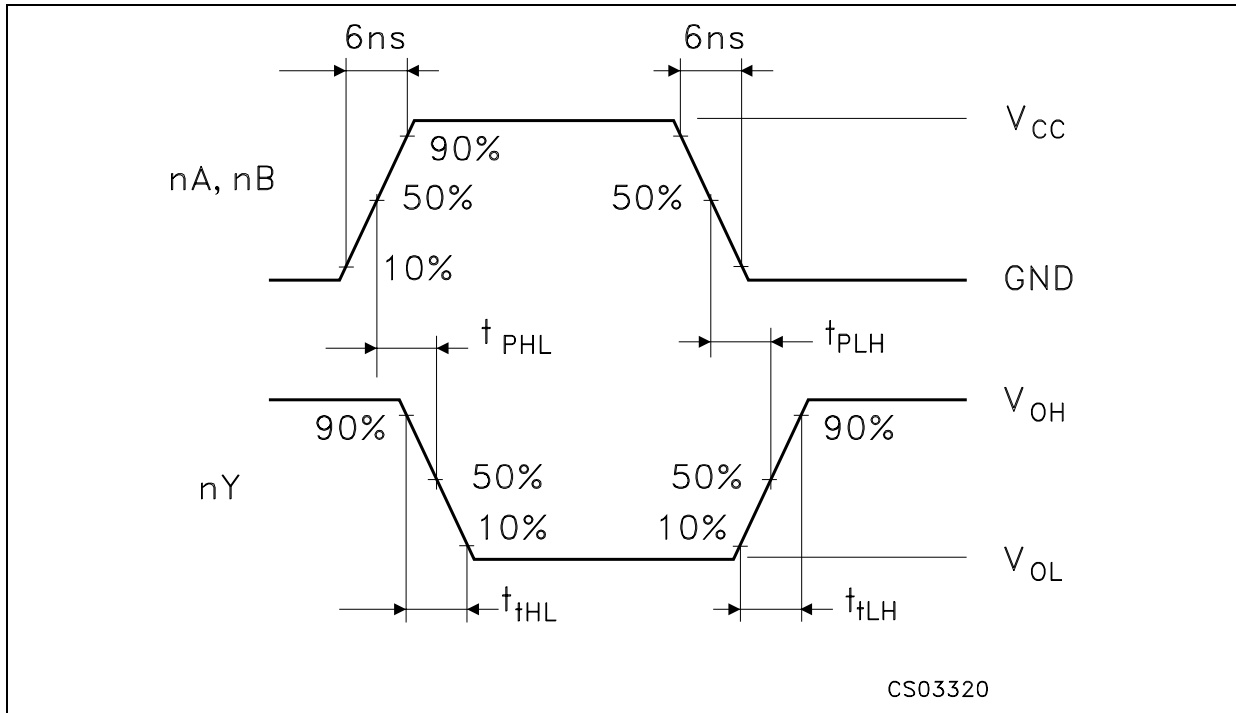
TEST CIRCUIT



C_L = 50pF or equivalent (includes jig and probe capacitance)
 R_T = Z_{OUT} of pulse generator (typically 50Ω)

M74HC132

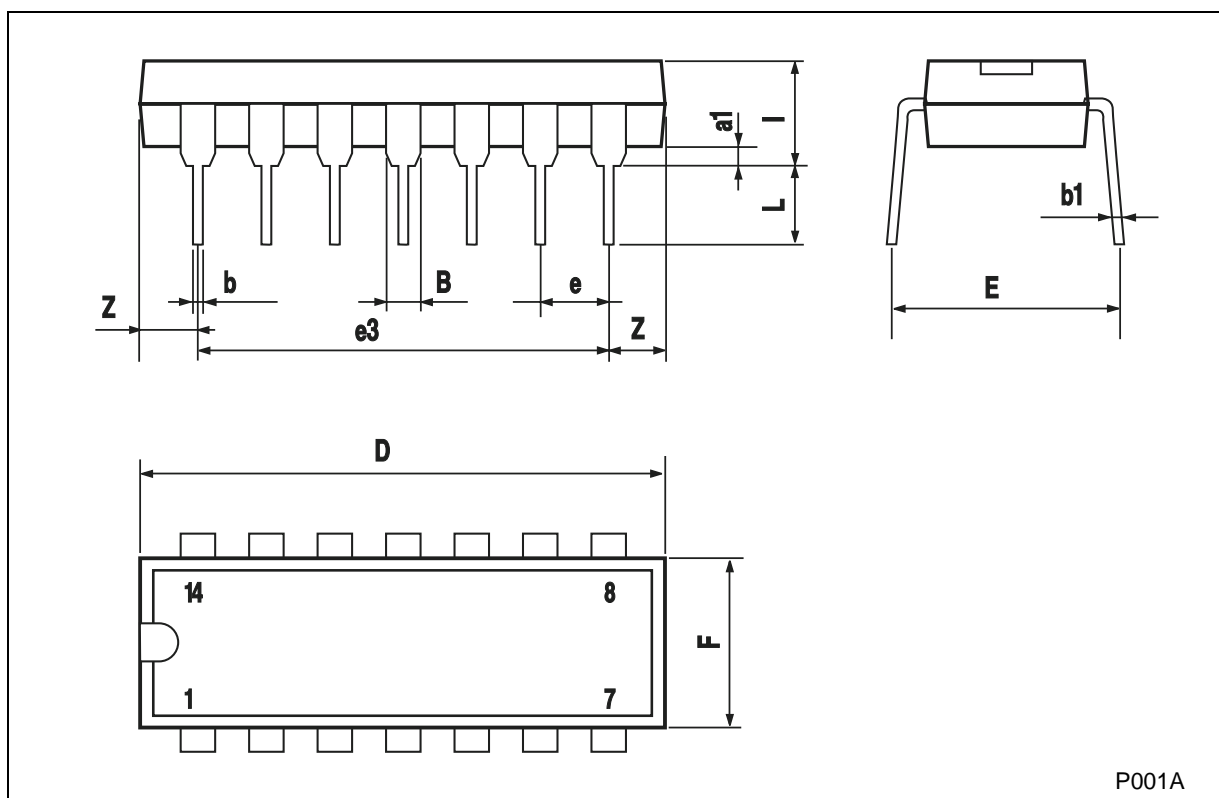
WAVEFORM : PROPAGATION DELAY TIMES (f=1MHz; 50% duty cycle)



M74HC132

Plastic DIP-14 MECHANICAL DATA

| DIM. | mm. | | | inch | | |
|------|------|-------|------|-------|-------|-------|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| a1 | 0.51 | | | 0.020 | | |
| B | 1.39 | | 1.65 | 0.055 | | 0.065 |
| b | | 0.5 | | | 0.020 | |
| b1 | | 0.25 | | | 0.010 | |
| D | | | 20 | | | 0.787 |
| E | | 8.5 | | | 0.335 | |
| e | | 2.54 | | | 0.100 | |
| e3 | | 15.24 | | | 0.600 | |
| F | | | 7.1 | | | 0.280 |
| l | | | 5.1 | | | 0.201 |
| L | | 3.3 | | | 0.130 | |
| Z | 1.27 | | 2.54 | 0.050 | | 0.100 |

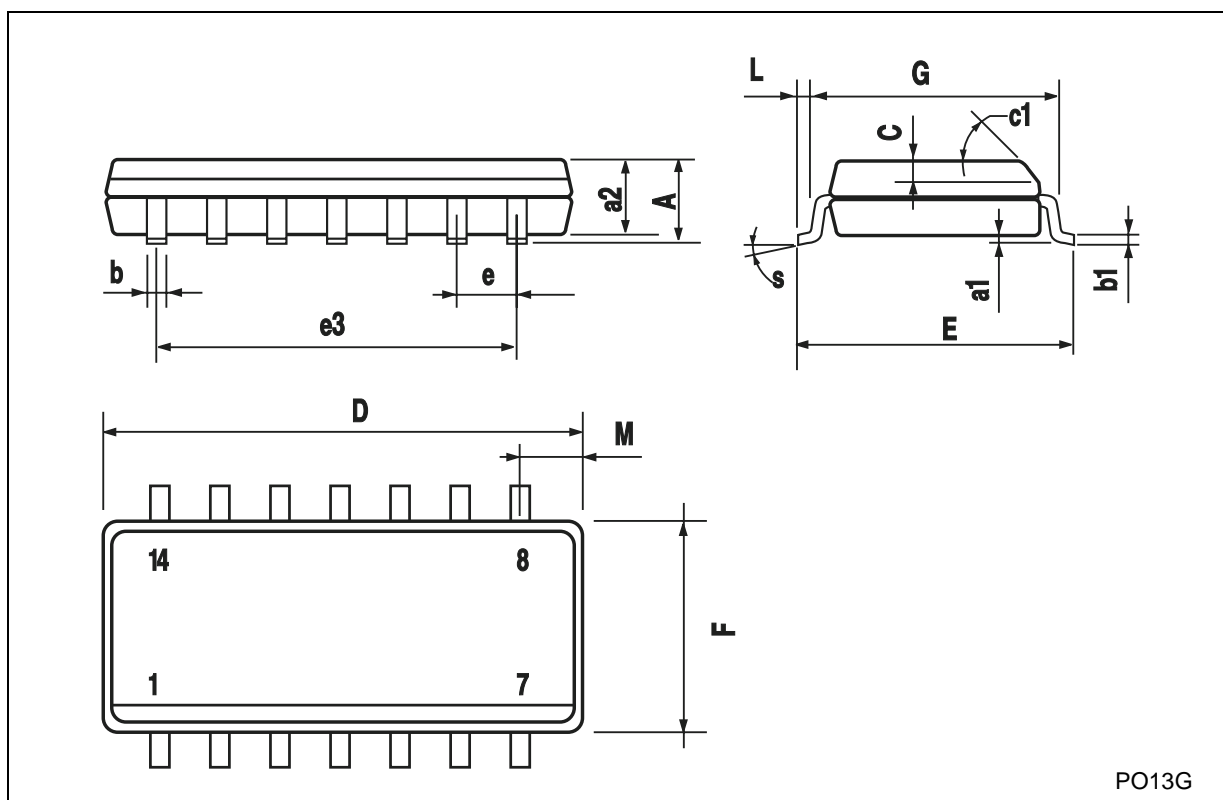


P001A

M74HC132

SO-14 MECHANICAL DATA

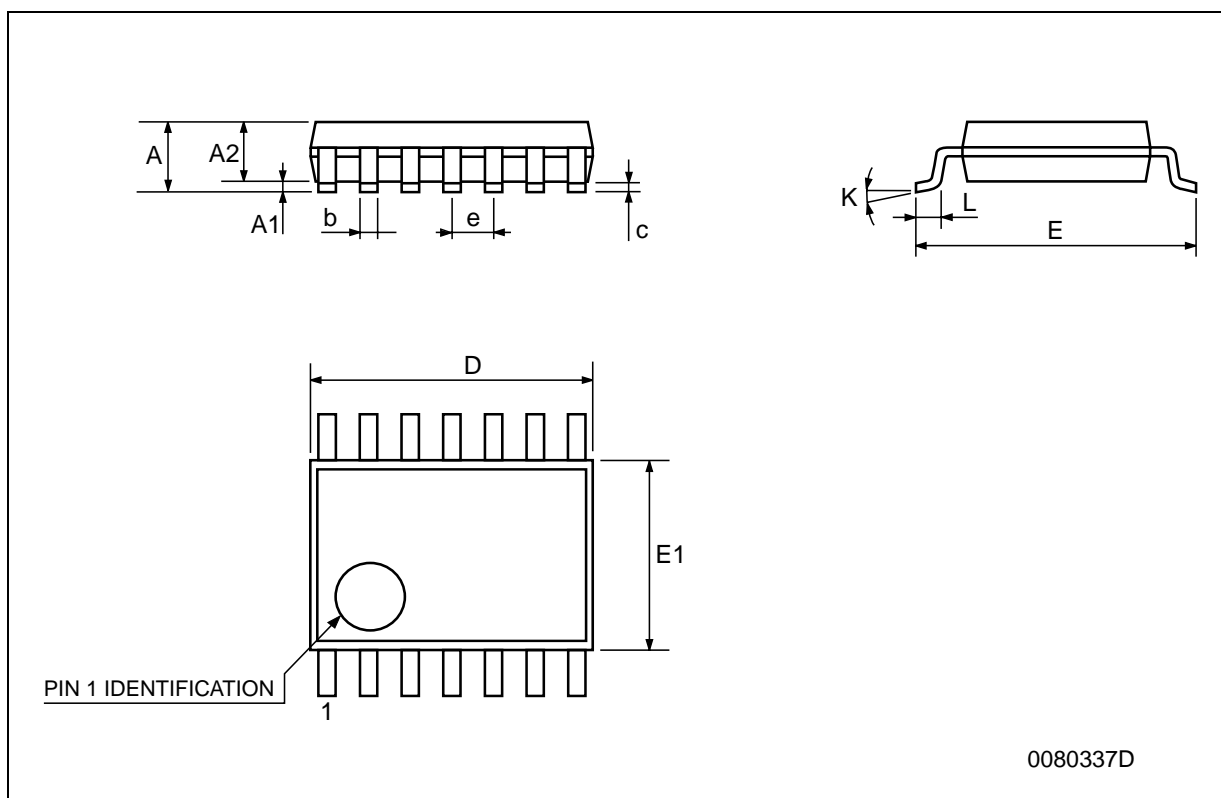
| DIM. | mm. | | | inch | | |
|------|------------|------|------|-------|-------|-------|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| A | | | 1.75 | | | 0.068 |
| a1 | 0.1 | | 0.2 | 0.003 | | 0.007 |
| a2 | | | 1.65 | | | 0.064 |
| b | 0.35 | | 0.46 | 0.013 | | 0.018 |
| b1 | 0.19 | | 0.25 | 0.007 | | 0.010 |
| C | | 0.5 | | | 0.019 | |
| c1 | 45° (typ.) | | | | | |
| D | 8.55 | | 8.75 | 0.336 | | 0.344 |
| E | 5.8 | | 6.2 | 0.228 | | 0.244 |
| e | | 1.27 | | | 0.050 | |
| e3 | | 7.62 | | | 0.300 | |
| F | 3.8 | | 4.0 | 0.149 | | 0.157 |
| G | 4.6 | | 5.3 | 0.181 | | 0.208 |
| L | 0.5 | | 1.27 | 0.019 | | 0.050 |
| M | | | 0.68 | | | 0.026 |
| S | 8° (max.) | | | | | |



M74HC132

TSSOP14 MECHANICAL DATA

| DIM. | mm. | | | inch | | |
|------|------|----------|------|-------|------------|--------|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| A | | | 1.2 | | | 0.047 |
| A1 | 0.05 | | 0.15 | 0.002 | 0.004 | 0.006 |
| A2 | 0.8 | 1 | 1.05 | 0.031 | 0.039 | 0.041 |
| b | 0.19 | | 0.30 | 0.007 | | 0.012 |
| c | 0.09 | | 0.20 | 0.004 | | 0.0089 |
| D | 4.9 | 5 | 5.1 | 0.193 | 0.197 | 0.201 |
| E | 6.2 | 6.4 | 6.6 | 0.244 | 0.252 | 0.260 |
| E1 | 4.3 | 4.4 | 4.48 | 0.169 | 0.173 | 0.176 |
| e | | 0.65 BSC | | | 0.0256 BSC | |
| K | 0° | | 8° | 0° | | 8° |
| L | 0.45 | 0.60 | 0.75 | 0.018 | 0.024 | 0.030 |



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

© The ST logo is a registered trademark of STMicroelectronics

© 2002 STMicroelectronics - Printed in Italy - All Rights Reserved
STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco
Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.

© <http://www.st.com>