



**THE DATASHEET OF  
SN74LVC1G132YZPR**



## SN74LVC1G132 Single 2-Input NAND Gate With Schmitt-Trigger Inputs

### 1 Features

- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)
- Available in Texas Instruments NanoStar™ and NanoFree™ Packages
- Supports 5-V  $V_{CC}$  Operation
- Inputs Accept Voltages to 5.5 V
- Max  $t_{pd}$  of 5.3 ns at 3.3 V
- Low Power Consumption, 10- $\mu$ A Maximum  $I_{CC}$
- $\pm 24$ -mA Output Drive at 3.3 V
- $I_{off}$  Supports Partial-Power-Down Mode Operation

### 2 Applications

- AV Receiver
- Audio Dock: Portable
- Blu-Ray Player and Home Theater
- Embedded PC
- MP3 Player/Recorder (Portable Audio)
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drive (SSD): Client and Enterprise
- TV: LCD/Digital and High-Definition (HDTV)
- Tablet: Enterprise
- Video Analytics: Server
- Wireless Headset, Keyboard, and Mouse

### 3 Description

The SN74LVC1G132 device contains one 2-input NAND gate with Schmitt-trigger inputs designed for 1.65-V to 5.5-V  $V_{CC}$  operation and performs the Boolean function  $Y = A \times B$  or  $Y = \overline{A + B}$  in positive logic.

Because of Schmitt action, this device has different input threshold levels for positive-going ( $V_{T+}$ ) and negative-going ( $V_{T-}$ ) signals.

This device can be triggered from the slowest of input ramps and still give clean jitter-free output signals.

This device is fully specified for partial-power-down applications using  $I_{off}$ . The  $I_{off}$  circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

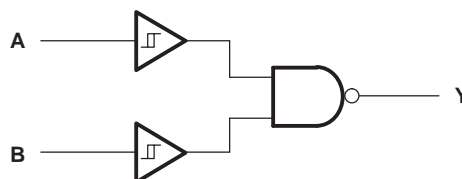
NanoStar™ and NanoFree™ package technology is a major breakthrough in IC packaging concepts, using the die as the package.

#### Device Information(1)

| ORDER NUMBER    | PACKAGE    | BODY SIZE         |
|-----------------|------------|-------------------|
| SN74LVC1G132DBV | SOT-23 (5) | 2.90 mm x 1.60 mm |
| SN74LVC1G132DCK | SC70 (5)   | 2.00 mm x 1.25 mm |

(1) For all available packages, see the orderable addendum at the end of the data sheet.

#### Logic Diagram (Positive Logic)



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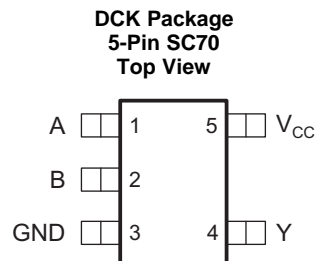
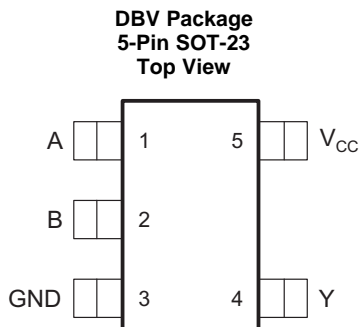
## 4 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

| <b>Changes from Revision C (December 2013) to Revision D</b>  | <b>Page</b> |
|---|-------------|
| • Added <i>Applications</i> , <i>Device Information</i> table, <i>Pin Configuration and Functions</i> section, <i>ESD Ratings</i> table, <i>Thermal Information</i> table, <i>Feature Description</i> section, <i>Device Functional Modes</i> , <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section..... | <b>1</b>    |
| • Deleted YEP, YZP packages throughout data sheet .....   | <b>1</b>    |

| <b>Changes from Revision B (September 2006) to Revision C</b> | <b>Page</b> |
|---|-------------|
| • Updated document to new TI data sheet format .....          | <b>1</b>    |
| • Removed <i>Ordering Information</i> table .....             | <b>1</b>    |
| • Updated operating temperature range. ....                   | <b>4</b>    |
| • Added ESD warning. ....                                     | <b>10</b>   |

## 5 Pin Configuration and Functions



See mechanical drawings for dimensions.

### Pin Functions

| PIN             |          | I/O | DESCRIPTION         |
|-----------------|----------|-----|---------------------|
| NAME            | DBV, DCK |     |                     |
| A               | 1        | I   | A logic input       |
| B               | 2        | I   | B logic input       |
| GND             | 3        | —   | Ground              |
| V <sub>CC</sub> | 5        | —   | Positive supply     |
| Y               | 4        | O   | Y NAND logic output |

## 6 Specifications

### 6.1 Absolute Maximum Ratings

 over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

|                  |   | MIN                | MAX                   | UNIT |    |
|------------------|---|--------------------|-----------------------|------|----|
| V <sub>CC</sub>  | Supply voltage  | –0.5               | 6.5                   | V    |    |
| V <sub>I</sub>   | Input voltage <sup>(2)</sup>  | –0.5               | 6.5                   | V    |    |
| V <sub>O</sub>   | Voltage range applied to any output in the high-impedance or power-off state <sup>(2)</sup> | –0.5               | 6.5                   | V    |    |
| V <sub>O</sub>   | Voltage range applied to any output in the high or low state <sup>(2)(3)</sup>              | –0.5               | V <sub>CC</sub> + 0.5 | V    |    |
| I <sub>IK</sub>  | Input clamp current   | V <sub>I</sub> < 0 |                       | –50  | mA |
| I <sub>OK</sub>  | Output clamp current  | V <sub>O</sub> < 0 |                       | –50  | mA |
| I <sub>O</sub>   | Continuous output current   |                    |                       | ±50  | mA |
|                  | Continuous current through V <sub>CC</sub> or GND   |                    |                       | ±100 | mA |
| T <sub>stg</sub> | Storage temperature   | –65                | 150                   | °C   |    |

- (1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The value of V<sub>CC</sub> is provided in the *Recommended Operating Conditions* table.

## 6.2 ESD Ratings

|             |                         | VALUE  | UNIT |
|-------------|-------------------------|--|------|
| $V_{(ESD)}$ | Electrostatic discharge | Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 <sup>(1)</sup>              | 2000 |
|             |                         | Charged-device model (CDM), per JEDEC specification JESD22-C101 <sup>(2)</sup> | 1000 |
|             |                         | Machine Model (A115-A)   | 200  |

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

## 6.3 Recommended Operating Conditions

|          |                                | MIN                      | MAX      | UNIT |    |
|----------|--------------------------------|--------------------------|----------|------|----|
| $V_{CC}$ | Supply voltage                 | Operating                | 1.65     | 5.5  | V  |
|          |                                | Data retention only      | 1.5      |      |    |
| $V_I$    | Input voltage                  | 0                        | 5.5      | V    |    |
| $V_O$    | Output voltage                 | 0                        | $V_{CC}$ | V    |    |
| $I_{OH}$ | High-level output current      | $V_{CC} = 1.65\text{ V}$ |          | –4   | mA |
|          |                                | $V_{CC} = 2.3\text{ V}$  |          | –8   |    |
|          |                                | $V_{CC} = 3\text{ V}$    |          | –16  |    |
|          |                                |                          |          | –24  |    |
|          |                                | $V_{CC} = 4.5\text{ V}$  |          | –32  |    |
| $I_{OL}$ | Low-level output current       | $V_{CC} = 1.65\text{ V}$ |          | 4    | mA |
|          |                                | $V_{CC} = 2.3\text{ V}$  |          | 8    |    |
|          |                                | $V_{CC} = 3\text{ V}$    |          | 16   |    |
|          |                                |                          |          | 24   |    |
|          |                                | $V_{CC} = 4.5\text{ V}$  |          | 32   |    |
| $T_A$    | Operating free-air temperature | –40                      | 125      | °C   |    |

(1) All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation. See [Implications of Slow or Floating CMOS Inputs](#), SCBA004.

## 6.4 Thermal Information

| THERMAL METRIC <sup>(1)</sup> | SN74LVC1G132                           |            | UNIT |      |
|-------------------------------|--|------------|------|------|
|                               | DBV (SOT-23)                           | DCK (SC70) |      |      |
|                               | 5 PINS                                 | 5 PINS     |      |      |
| $R_{\theta JA}$               | Junction-to-ambient thermal resistance | 206        | 252  | °C/W |

(1) For more information about traditional and new thermal metrics, see the [Semiconductor and IC Package Thermal Metrics](#) application report.

## 6.5 Electrical Characteristics

over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER   | TEST CONDITIONS           | V <sub>CC</sub>   | –40°C to +85°C        |                    |                       | –40°C to +125°C |                    |      | UNIT |
|---|---------------------------|---|-----------------------|--------------------|-----------------------|-----------------|--------------------|------|------|
|   |                           |   | MIN                   | TYP <sup>(1)</sup> | MAX                   | MIN             | TYP <sup>(1)</sup> | MAX  |      |
| V <sub>T+</sub><br>Positive-going<br>input threshold<br>voltage       |                           | 1.65 V  | 0.79                  |                    | 1.16                  | 0.79            |                    | 1.16 | V    |
|   |                           | 2.3 V   | 1.11                  |                    | 1.56                  | 1.11            |                    | 1.56 |      |
|   |                           | 3 V   | 1.5                   |                    | 1.87                  | 1.5             |                    | 1.87 |      |
|   |                           | 4.5 V   | 2.16                  |                    | 2.74                  | 2.16            |                    | 2.74 |      |
|   |                           | 5.5 V   | 2.61                  |                    | 3.33                  | 2.61            |                    | 3.33 |      |
| V <sub>T–</sub><br>Negative-going<br>input threshold<br>voltage       |                           | 1.65 V  | 0.39                  |                    | 0.62                  | 0.39            |                    | 0.62 | V    |
|   |                           | 2.3 V   | 0.58                  |                    | 0.87                  | 0.58            |                    | 0.87 |      |
|   |                           | 3 V   | 0.84                  |                    | 1.14                  | 0.84            |                    | 1.16 |      |
|   |                           | 4.5 V   | 1.41                  |                    | 1.79                  | 1.41            |                    | 1.84 |      |
|   |                           | 5.5 V   | 1.87                  |                    | 2.29                  | 1.87            |                    | 2.33 |      |
| ΔV <sub>T</sub><br>Hysteresis<br>(V <sub>T+</sub> – V <sub>T–</sub> ) |                           | 1.65 V  | 0.37                  |                    | 0.62                  | 0.37            |                    | 0.62 | V    |
|   |                           | 2.3 V   | 0.48                  |                    | 0.77                  | 0.48            |                    | 0.77 |      |
|   |                           | 3 V   | 0.56                  |                    | 0.87                  | 0.54            |                    | 0.87 |      |
|   |                           | 4.5 V   | 0.71                  |                    | 1.04                  | 0.66            |                    | 1.04 |      |
|   |                           | 5.5 V   | 0.71                  |                    | 1.11                  | 0.67            |                    | 1.11 |      |
| V <sub>OH</sub>   | I <sub>OH</sub> = –100 μA | 1.65 V to 5.5 V   | V <sub>CC</sub> – 0.1 |                    | V <sub>CC</sub> – 0.1 |                 |                    |      | V    |
|   | I <sub>OH</sub> = –4 mA   | 1.65 V  | 1.2                   |                    | 1.2                   |                 |                    |      |      |
|   | I <sub>OH</sub> = –8 mA   | 2.3 V   | 1.9                   |                    | 1.9                   |                 |                    |      |      |
|   | I <sub>OH</sub> = –16 mA  | 3 V   | 2.4                   |                    | 2.4                   |                 |                    |      |      |
|   | I <sub>OH</sub> = –24 mA  |   | 2.3                   |                    | 2.3                   |                 |                    |      |      |
|   | I <sub>OH</sub> = –32 mA  | 4.5 V   | 3.8                   |                    | 3.8                   |                 |                    |      |      |
| V <sub>OL</sub>   | I <sub>OL</sub> = 100 μA  | 1.65 V to 5.5 V   |                       |                    | 0.1                   |                 | 0.1                |      | V    |
|   | I <sub>OL</sub> = 4 mA    | 1.65 V  |                       |                    | 0.45                  |                 | 0.45               |      |      |
|   | I <sub>OL</sub> = 8 mA    | 2.3 V   |                       |                    | 0.3                   |                 | 0.3                |      |      |
|   | I <sub>OL</sub> = 16 mA   | 3 V   |                       |                    | 0.4                   |                 | 0.4                |      |      |
|   | I <sub>OL</sub> = 24 mA   |   |                       |                    | 0.55                  |                 | 0.55               |      |      |
|   | I <sub>OL</sub> = 32 mA   | 4.5 V   |                       |                    | 0.55                  |                 | 0.55               |      |      |
| I <sub>i</sub>  | A or B inputs             | V <sub>I</sub> = 5.5 V or GND   | 1.65 V to 5.5 V       |                    | ±1                    |                 | ±1                 |      | μA   |
| I <sub>off</sub>  |                           | V <sub>I</sub> or V <sub>O</sub> = 5.5 V  | 0                     |                    | ±10                   |                 | ±10                |      | μA   |
| I <sub>CC</sub>   |                           | V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0                     | 1.65 V to 5.5 V       |                    | 10                    |                 | 10                 |      | μA   |
| ΔI <sub>CC</sub>  |                           | One input at V <sub>CC</sub> – 0.6 V,<br>Other inputs at V <sub>CC</sub> or GND | 3 V to 5.5 V          |                    | 500                   |                 | 500                |      | μA   |
| C <sub>i</sub>  |                           | V <sub>I</sub> = V <sub>CC</sub> or GND   | 3.3 V                 |                    | 3.5                   |                 |                    |      | pF   |

(1) All typical values are at V<sub>CC</sub> = 3.3 V, T<sub>A</sub> = 25°C.

## 6.6 Switching Characteristics: –40°C to +85°C, C<sub>L</sub> = 15 pF

over recommended operating free-air temperature range, C<sub>L</sub> = 15 pF (unless otherwise noted) (see Figure 1)

| PARAMETER       | FROM<br>(INPUT) | TO<br>(OUTPUT) | –40°C to +85°C                     |     |                                   |     |                                   |     |                                 |     | UNIT |
|-----------------|-----------------|----------------|------------------------------------|-----|-----------------------------------|-----|-----------------------------------|-----|---------------------------------|-----|------|
|                 |                 |                | V <sub>CC</sub> = 1.8 V<br>±0.15 V |     | V <sub>CC</sub> = 2.5 V<br>±0.2 V |     | V <sub>CC</sub> = 3.3 V<br>±0.3 V |     | V <sub>CC</sub> = 5 V<br>±0.5 V |     |      |
|                 |                 |                | MIN                                | MAX | MIN                               | MAX | MIN                               | MAX | MIN                             | MAX |      |
| t <sub>pd</sub> | A or B          | Y              | 4                                  | 16  | 2.5                               | 7   | 2                                 | 5.3 | 1.5                             | 4.4 | ns   |

### 6.7 Switching Characteristics: –40°C to +85°C

over recommended operating free-air temperature range,  $C_L = 30$  pF or 50 pF (unless otherwise noted) (see [Figure 2](#))

| PARAMETER | FROM<br>(INPUT) | TO<br>(OUTPUT) | –40°C to +85°C                                 |     |   |     |   |     |   |     | UNIT |
|-----------|-----------------|----------------|--|-----|---|-----|---|-----|---|-----|------|
|           |                 |                | $V_{CC} = 1.8\text{ V}$<br>$\pm 0.15\text{ V}$ |     | $V_{CC} = 2.5\text{ V}$<br>$\pm 0.2\text{ V}$ |     | $V_{CC} = 3.3\text{ V}$<br>$\pm 0.3\text{ V}$ |     | $V_{CC} = 5\text{ V}$<br>$\pm 0.5\text{ V}$ |     |      |
|           |                 |                | MIN  | MAX | MIN   | MAX | MIN   | MAX | MIN   | MAX |      |
| $t_{pd}$  | A or B          | Y              | 4  | 16  | 3   | 7.5 | 2   | 6   | 2   | 5   | ns   |

### 6.8 Switching Characteristics: –40°C to +125°C

over recommended operating free-air temperature range,  $C_L = 30$  pF or 50 pF (unless otherwise noted) (see [Figure 2](#))

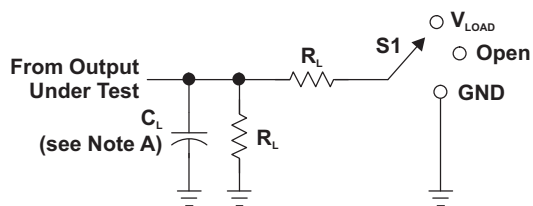
| PARAMETER | FROM<br>(INPUT) | TO<br>(OUTPUT) | –40°C to +125°C                                |      |   |     |   |     |   |     | UNIT |
|-----------|-----------------|----------------|--|------|---|-----|---|-----|---|-----|------|
|           |                 |                | $V_{CC} = 1.8\text{ V}$<br>$\pm 0.15\text{ V}$ |      | $V_{CC} = 2.5\text{ V}$<br>$\pm 0.2\text{ V}$ |     | $V_{CC} = 3.3\text{ V}$<br>$\pm 0.3\text{ V}$ |     | $V_{CC} = 5\text{ V}$<br>$\pm 0.5\text{ V}$ |     |      |
|           |                 |                | MIN  | MAX  | MIN   | MAX | MIN   | MAX | MIN   | MAX |      |
| $t_{pd}$  | A or B          | Y              | 4  | 16.5 | 3   | 8   | 2   | 6.5 | 2   | 5.5 | ns   |

### 6.9 Operating Characteristics

$T_A = 25^\circ\text{C}$

| PARAMETER                              | TEST<br>CONDITIONS  | $V_{CC} = 1.8\text{ V}$ | $V_{CC} = 2.5\text{ V}$ | $V_{CC} = 3.3\text{ V}$ | $V_{CC} = 5\text{ V}$ | UNIT |
|--|---------------------|-------------------------|-------------------------|-------------------------|-----------------------|------|
|  |                     | TYP                     | TYP                     | TYP                     | TYP                   |      |
| $C_{pd}$ Power dissipation capacitance | $f = 10\text{ MHz}$ | 17                      | 18                      | 18                      | 20                    | pF   |

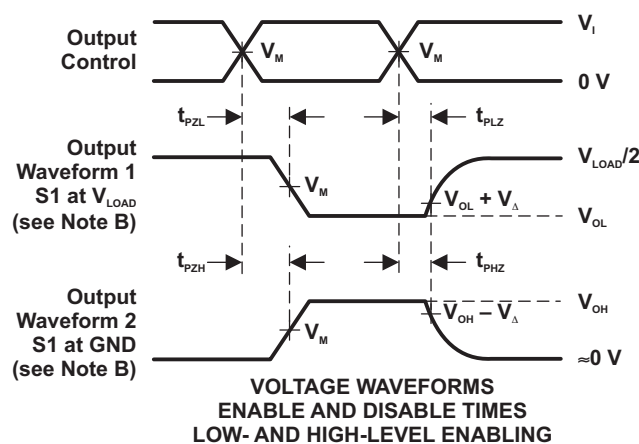
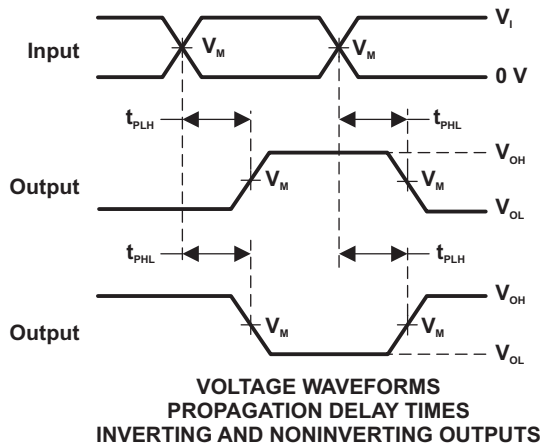
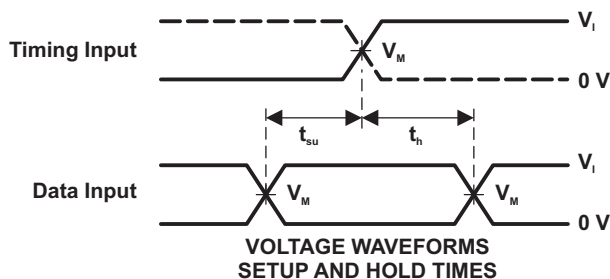
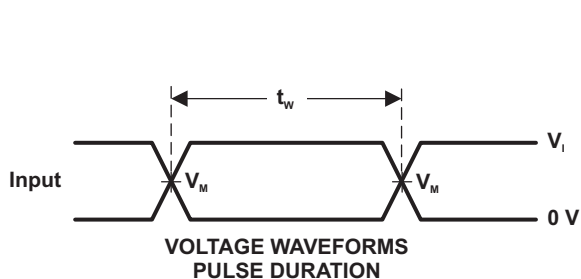
## 7 Parameter Measurement Information



LOAD CIRCUIT

| TEST              | S1         |
|-------------------|------------|
| $t_{PLH}/t_{PHL}$ | Open       |
| $t_{PLZ}/t_{PZL}$ | $V_{LOAD}$ |
| $t_{PHZ}/t_{PZH}$ | GND        |

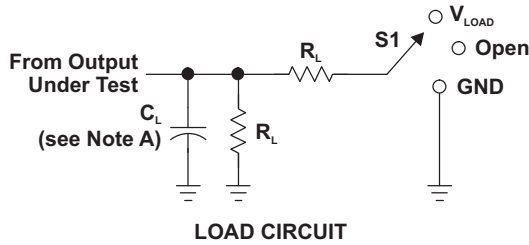
| $V_{CC}$                         | INPUTS   |                      | $V_M$      | $V_{LOAD}$        | $C_L$ | $R_L$        | $V_{\Delta}$ |
|----------------------------------|----------|----------------------|------------|-------------------|-------|--------------|--------------|
|                                  | $V_i$    | $t_r/t_f$            |            |                   |       |              |              |
| $1.8\text{ V} \pm 0.15\text{ V}$ | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 15 pF | 1 M $\Omega$ | 0.15 V       |
| $2.5\text{ V} \pm 0.2\text{ V}$  | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 15 pF | 1 M $\Omega$ | 0.15 V       |
| $3.3\text{ V} \pm 0.3\text{ V}$  | 3 V      | $\leq 2.5\text{ ns}$ | 1.5 V      | 6 V               | 15 pF | 1 M $\Omega$ | 0.3 V        |
| $5\text{ V} \pm 0.5\text{ V}$    | $V_{CC}$ | $\leq 2.5\text{ ns}$ | $V_{CC}/2$ | $2 \times V_{CC}$ | 15 pF | 1 M $\Omega$ | 0.3 V        |



- NOTES:
- A.  $C_L$  includes probe and jig capacitance.
  - B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
  - C. All input pulses are supplied by generators having the following characteristics: PRR  $\leq$  10 MHz,  $Z_o = 50\ \Omega$ .
  - D. The outputs are measured one at a time, with one transition per measurement.
  - E.  $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .
  - F.  $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{en}$ .
  - G.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .
  - H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

Parameter Measurement Information (continued)



| TEST              | S1         |
|-------------------|------------|
| $t_{PLH}/t_{PHL}$ | Open       |
| $t_{PLZ}/t_{PZL}$ | $V_{LOAD}$ |
| $t_{PHZ}/t_{PZH}$ | GND        |

| $V_{CC}$                         | INPUTS   |                      | $V_M$      | $V_{LOAD}$        | $C_L$ | $R_L$        | $V_{\Delta}$ |
|----------------------------------|----------|----------------------|------------|-------------------|-------|--------------|--------------|
|                                  | $V_I$    | $t_r/t_f$            |            |                   |       |              |              |
| $1.8\text{ V} \pm 0.15\text{ V}$ | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 30 pF | 1 k $\Omega$ | 0.15 V       |
| $2.5\text{ V} \pm 0.2\text{ V}$  | $V_{CC}$ | $\leq 2\text{ ns}$   | $V_{CC}/2$ | $2 \times V_{CC}$ | 30 pF | 500 $\Omega$ | 0.15 V       |
| $3.3\text{ V} \pm 0.3\text{ V}$  | 3 V      | $\leq 2.5\text{ ns}$ | 1.5 V      | 6 V               | 50 pF | 500 $\Omega$ | 0.3 V        |
| $5\text{ V} \pm 0.5\text{ V}$    | $V_{CC}$ | $\leq 2.5\text{ ns}$ | $V_{CC}/2$ | $2 \times V_{CC}$ | 50 pF | 500 $\Omega$ | 0.3 V        |



- NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.  
 C. All input pulses are supplied by generators having the following characteristics: PRR  $\leq$  10 MHz,  $Z_o = 50\ \Omega$ .  
 D. The outputs are measured one at a time, with one transition per measurement.  
 E.  $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .  
 F.  $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{on}$ .  
 G.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .  
 H. All parameters and waveforms are not applicable to all devices.

Figure 2. Load Circuit and Voltage Waveforms

## 8 Detailed Description

### 8.1 Functional Block Diagram

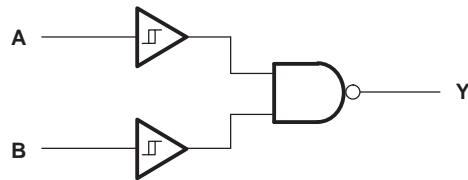


Figure 3. Logic Diagram (Positive Logic)

### 8.2 Device Functional Modes

Table 1 lists the functional modes of the SN74LVC1G132.

Table 1. Function Table

| INPUTS |   | OUTPUT |
|--------|---|--------|
| A      | B | Y      |
| L      | L | H      |
| L      | H | H      |
| H      | L | H      |
| H      | H | L      |

## 9 Device and Documentation Support

### 9.1 Documentation Support

#### 9.1.1 Related Documentation

For related documentation see the following:

[Implications of Slow or Floating CMOS Inputs](#), SCBA004

### 9.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. In the upper right corner, click on *Alert me* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

### 9.3 Community Resources

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

**TI E2E™ Online Community** *TI's Engineer-to-Engineer (E2E) Community*. Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

**Design Support** *TI's Design Support* Quickly find helpful E2E forums along with design support tools and contact information for technical support.

### 9.4 Trademarks

NanoStar, NanoFree, E2E are trademarks of Texas Instruments. All other trademarks are the property of their respective owners.

### 9.5 Electrostatic Discharge Caution



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

### 9.6 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

## 10 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

**PACKAGING INFORMATION**

| Orderable Device | Status<br>(1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan<br>(2)         | Lead/Ball Finish<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|-----------------|------|-------------|-------------------------|-------------------------|----------------------|--------------|-------------------------|-------------------------|
| 74LVC1G132DCKRG4 | ACTIVE        | SC70         | DCK             | 5    | 3000        | Green (RoHS & no Sb/Br) | CU NIPDAU               | Level-1-260C-UNLIM   | -40 to 125   | D5R                     | <a href="#">Samples</a> |
| 74LVC1G132DCKTG4 | ACTIVE        | SC70         | DCK             | 5    | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU               | Level-1-260C-UNLIM   | -40 to 125   | D5R                     | <a href="#">Samples</a> |
| SN74LVC1G132DBVR | ACTIVE        | SOT-23       | DBV             | 5    | 3000        | Green (RoHS & no Sb/Br) | CU NIPDAU   CU SN       | Level-1-260C-UNLIM   | -40 to 125   | (C3BJ, C3BR)            | <a href="#">Samples</a> |
| SN74LVC1G132DBVT | ACTIVE        | SOT-23       | DBV             | 5    | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU   CU SN       | Level-1-260C-UNLIM   | -40 to 125   | (C3BJ, C3BR)            | <a href="#">Samples</a> |
| SN74LVC1G132DCKR | ACTIVE        | SC70         | DCK             | 5    | 3000        | Green (RoHS & no Sb/Br) | CU NIPDAU   CU SN       | Level-1-260C-UNLIM   | -40 to 125   | (D55, D5J, D5R)         | <a href="#">Samples</a> |
| SN74LVC1G132DCKT | ACTIVE        | SC70         | DCK             | 5    | 250         | Green (RoHS & no Sb/Br) | CU NIPDAU   CU SN       | Level-1-260C-UNLIM   | -40 to 125   | (D55, D5J, D5R)         | <a href="#">Samples</a> |

(1) The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

<sup>(6)</sup> Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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## TAPE AND REEL INFORMATION



### QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



\*All dimensions are nominal

| Device           | Package Type | Package Drawing | Pins | SPQ  | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| 74LVC1G132DCKRG4 | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.47    | 2.3     | 1.25    | 4.0     | 8.0    | Q3            |
| 74LVC1G132DCKTG4 | SC70         | DCK             | 5    | 250  | 180.0              | 8.4                | 2.47    | 2.3     | 1.25    | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DBVR | SOT-23       | DBV             | 5    | 3000 | 180.0              | 8.4                | 3.23    | 3.17    | 1.37    | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DBVR | SOT-23       | DBV             | 5    | 3000 | 178.0              | 9.0                | 3.3     | 3.2     | 1.4     | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DBVT | SOT-23       | DBV             | 5    | 250  | 178.0              | 9.0                | 3.3     | 3.2     | 1.4     | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DBVT | SOT-23       | DBV             | 5    | 250  | 180.0              | 8.4                | 3.23    | 3.17    | 1.37    | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DCKR | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.47    | 2.3     | 1.25    | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.2                | 2.4     | 2.4     | 1.22    | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DCKT | SC70         | DCK             | 5    | 250  | 180.0              | 8.4                | 2.47    | 2.3     | 1.25    | 4.0     | 8.0    | Q3            |
| SN74LVC1G132DCKT | SC70         | DCK             | 5    | 250  | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

| Device           | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| 74LVC1G132DCKRG4 | SC70         | DCK             | 5    | 3000 | 183.0       | 183.0      | 20.0        |
| 74LVC1G132DCKTG4 | SC70         | DCK             | 5    | 250  | 183.0       | 183.0      | 20.0        |
| SN74LVC1G132DBVR | SOT-23       | DBV             | 5    | 3000 | 202.0       | 201.0      | 28.0        |
| SN74LVC1G132DBVR | SOT-23       | DBV             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74LVC1G132DBVT | SOT-23       | DBV             | 5    | 250  | 180.0       | 180.0      | 18.0        |
| SN74LVC1G132DBVT | SOT-23       | DBV             | 5    | 250  | 202.0       | 201.0      | 28.0        |
| SN74LVC1G132DCKR | SC70         | DCK             | 5    | 3000 | 202.0       | 201.0      | 28.0        |
| SN74LVC1G132DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74LVC1G132DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| SN74LVC1G132DCKT | SC70         | DCK             | 5    | 250  | 202.0       | 201.0      | 28.0        |
| SN74LVC1G132DCKT | SC70         | DCK             | 5    | 250  | 180.0       | 180.0      | 18.0        |



# EXAMPLE BOARD LAYOUT

DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:15X



SOLDER MASK DETAILS

4214839/D 11/2018

NOTES: (continued)

- 5. Publication IPC-7351 may have alternate designs.
- 6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:15X

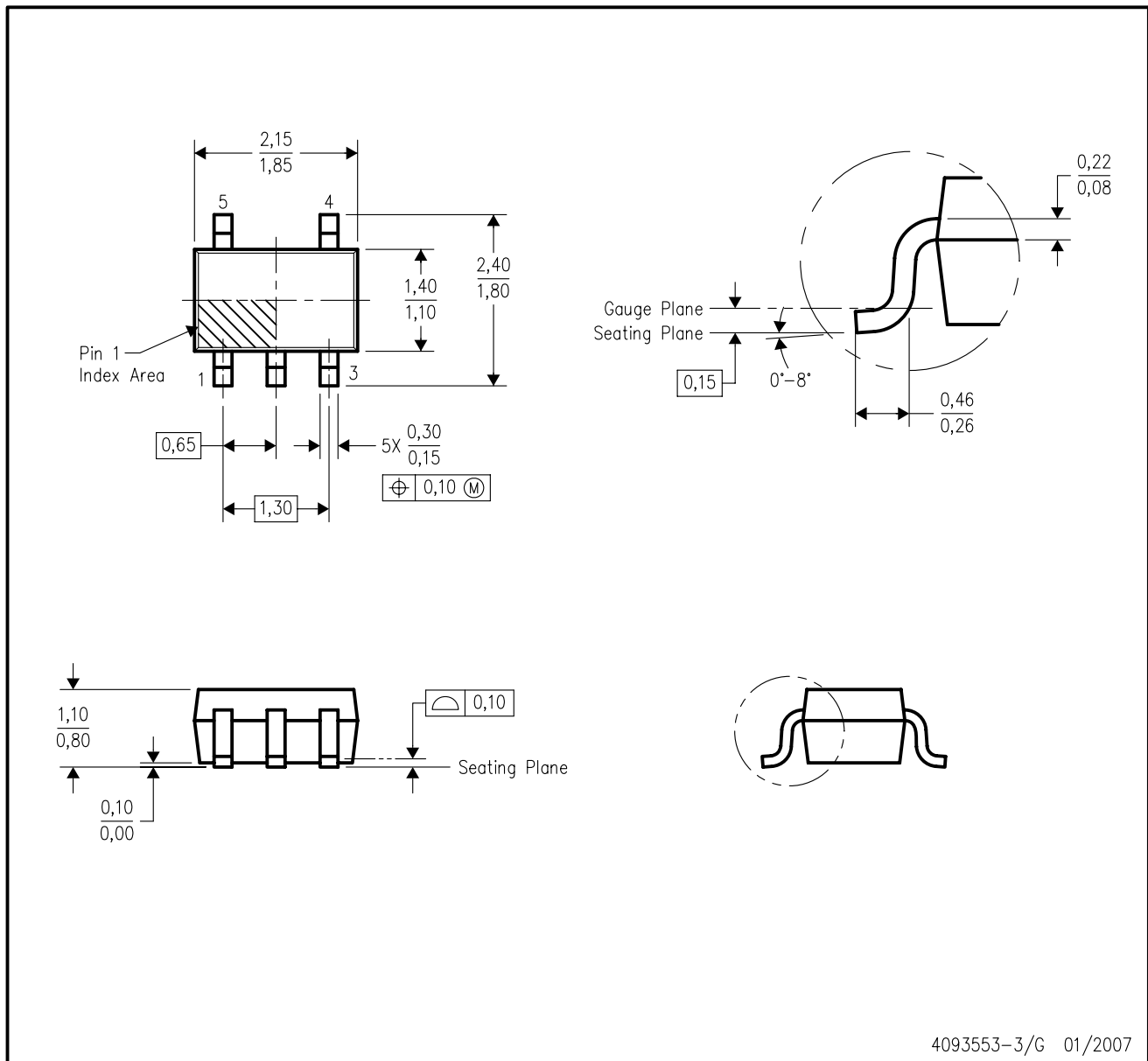
4214839/D 11/2018

NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

DCK (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
  - D. Falls within JEDEC MO-203 variation AA.

DCK (R-PDSO-G5)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
  - Publication IPC-7351 is recommended for alternate designs.
  - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.

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