SN74LV1T34 Single Power Supply Single Buffer GATE CMOS Logic Level Shifter

1 Features

- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Performance Tested Per JESD 22
  - 2000-V Human-Body Model (A114-B, Class II)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)
- Single-Supply Voltage Translator at 5-V, 3.3-V, 2.5-V, and 1.8-V V\textsubscript{CC}
- Operating Range of 1.65 V to 5.5 V
- Up Translation
  - 1.2 V\textsuperscript{(1)} to 1.8 V at 1.8-V V\textsubscript{CC}
  - 1.5 V\textsuperscript{(1)} to 2.5 V at 2.5-V V\textsubscript{CC}
  - 1.8 V\textsuperscript{(1)} to 3.3 V at 3.3-V V\textsubscript{CC}
  - 3.3 V to 5.0 V at 5.0-V V\textsubscript{CC}
- Down Translation
  - 3.3 V to 1.8 V at 1.8-V V\textsubscript{CC}
  - 3.3 V to 2.5 V at 2.5-V V\textsubscript{CC}
  - 5 V to 3.3 V at 3.3-V V\textsubscript{CC}
- Logic Output is Referenced to V\textsubscript{CC}
- Output Drive
  - 8 mA Output Drive at 5.0 V
  - 7 mA Output Drive at 3.3 V
  - 3 mA Output Drive at 1.8 V
- Characterized up to 50 MHz at 3.3 V V\textsubscript{CC}
- 5-V Tolerance on Input Pins
- −40°C to +125°C Operating Temperature Range
- Supports Standard Logic Pinouts
- CMOS Output Backward Compatible With AUP1G and LVC1G Families

2 Applications

- Industrial Controllers
- Telecom
- Portable Applications
- Servers
- PC and Notebooks

3 Description

The SN74LV1T34 device is a low voltage CMOS gate logic that operates at a wider voltage range for industrial, portable, and telecom applications. The output level is referenced to the supply voltage and is able to support 1.8-V, 2.5-V, 3.3-V, and 5-V CMOS levels.

The input is designed with a lower threshold circuit to match 1.8 V input logic at V\textsubscript{CC} = 3.3 V and can be used in 1.8 V to 3.3 V level up translation. In addition, the 5 V tolerant input pins enable down translation (that is, 3.3 V to 2.5 V output at V\textsubscript{CC} = 2.5 V). The wide V\textsubscript{CC} range of 1.8 V to 5.5 V allows generation of desired output levels to connect to controllers or processors.

The SN74LV1T34 device is designed with current-drive capability of 8 mA to reduce line reflections, overshoot, and undershoot caused by high-drive outputs.

Device Information\textsuperscript{(1)}

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>PACKAGE</th>
<th>BODY SIZE (NOM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN74LV1T34DBV</td>
<td>SOT-23 (5)</td>
<td>2.90 mm x 1.60 mm</td>
</tr>
<tr>
<td>SN74LV1T34DCK</td>
<td>SC70 (5)</td>
<td>2.00 mm x 1.25 mm</td>
</tr>
</tbody>
</table>

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

Refer to the V\textsubscript{IH}/V\textsubscript{IL} and output drive for lower V\textsubscript{CC} condition

Logic Diagram

- A
- Y
- 2
- 4
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## 4 Revision History

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

### Changes from Revision A (February 2014) to Revision B

<table>
<thead>
<tr>
<th>Page</th>
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<tr>
<td>Deleted DPW Package throughout data sheet ....................................................................................................................... 1</td>
</tr>
<tr>
<td>Added Pin Configuration and Functions section, ESD Ratings table, Thermal Information table, Feature Description section, Device Functional Modes, Device Support, Documentation Support, Receiving Notification of Documentation Updates, and Community Resources .......................................................................................................................... 1</td>
</tr>
<tr>
<td>Added Typical Characteristics ............................................................................................................................. 7</td>
</tr>
<tr>
<td>Deleted function table for the Supply Vcc = 3.3 V test case ......................................................................................... 9</td>
</tr>
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### Changes from Original (December 2013) to Revision A

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updated document formatting ............................................................................................................................. 1</td>
</tr>
</tbody>
</table>

Submit Documentation Feedback

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Product Folder Links: SN74LV1T34
5 Pin Configuration and Functions

DBV or DCK Package
5-Pin SOT-23 or SC70
Top View

N.C. 1 5 V_CCC
A 2
GND 3 4 Y

Pin Functions

<table>
<thead>
<tr>
<th>PIN</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>I</td>
<td>Input A</td>
</tr>
<tr>
<td>GND</td>
<td>—</td>
<td>Ground</td>
</tr>
<tr>
<td>N.C.</td>
<td>—</td>
<td>No Connect</td>
</tr>
<tr>
<td>V_CC</td>
<td>—</td>
<td>Power Supply</td>
</tr>
<tr>
<td>Y</td>
<td>O</td>
<td>Output Y</td>
</tr>
</tbody>
</table>

6 Specifications

6.1 Absolute Maximum Ratings
over operating free-air temperature range (unless otherwise noted)\(^{(1)}\)

<table>
<thead>
<tr>
<th></th>
<th>(\text{MIN})</th>
<th>(\text{MAX})</th>
<th>(\text{UNIT})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(V_{\text{CC}})</td>
<td>(-0.5)</td>
<td>7</td>
<td>V</td>
</tr>
<tr>
<td>(V_{\text{I}})</td>
<td>(-0.5)</td>
<td>7</td>
<td>V</td>
</tr>
<tr>
<td>(V_{\text{O}})</td>
<td>(-0.5)</td>
<td>(V_{\text{CC}} + 0.5)</td>
<td>V</td>
</tr>
<tr>
<td>(I_{\text{IK}})</td>
<td></td>
<td>(-20)</td>
<td>mA</td>
</tr>
<tr>
<td>(I_{\text{OK}})</td>
<td></td>
<td>(\pm 20)</td>
<td>mA</td>
</tr>
<tr>
<td>(I_{\text{O}})</td>
<td></td>
<td>(\pm 25)</td>
<td>mA</td>
</tr>
<tr>
<td>(T_{\text{stg}})</td>
<td>(-65)</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>(T_{\text{J}})</td>
<td></td>
<td>150</td>
<td>°C</td>
</tr>
</tbody>
</table>

(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 negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

6.2 ESD Ratings

<table>
<thead>
<tr>
<th></th>
<th>(\text{VALUE})</th>
<th>(\text{UNIT})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(V_{\text{ESD}})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrostatic discharge</td>
<td>Human body model (HBM), per ANSI/ESDA/JEDEC JS-001(^{(1)})</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>Charged device model (CDM), per JEDEC specification JESD22-C101(^{(2)})</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>Machine Model (A115-A)</td>
<td>200</td>
</tr>
</tbody>
</table>

(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

over operating free-air temperature range (unless otherwise noted)\(^{(1)}\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>(V_{CC})</th>
<th>(V_{IL})</th>
<th>(V_{IH})</th>
<th>(I_{OH})</th>
<th>(I_{OL})</th>
<th>(\Delta t/\Delta v)</th>
<th>(T_{A})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>(V_{CC} = 1.8) V</td>
<td>1.6</td>
<td>-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 2.5) V</td>
<td>1.8</td>
<td>-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 3.3) V</td>
<td>2.0</td>
<td>-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 5) V</td>
<td>2.5</td>
<td>-8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input voltage</td>
<td>(V_{VCC} = 1.8) V</td>
<td>0</td>
<td>-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{VCC} = 2.5) V</td>
<td>0</td>
<td>-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{VCC} = 3.3) V</td>
<td>0</td>
<td>-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{VCC} = 5) V</td>
<td>0</td>
<td>-8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output voltage</td>
<td>(V_{VCC} = 1.8) V</td>
<td>0</td>
<td>-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{VCC} = 2.5) V</td>
<td>0</td>
<td>-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{VCC} = 3.3) V</td>
<td>0</td>
<td>-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{VCC} = 5) V</td>
<td>0</td>
<td>-8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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

<table>
<thead>
<tr>
<th>Thermal Metric(^{(1)})</th>
<th>DBV</th>
<th>DCK</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junction-to-ambient thermal resistance</td>
<td>206</td>
<td>252</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>(V_{CC})</th>
<th>(T_{A} = 25°C)</th>
<th>(T_{A} = -40°C) to (+125°C)</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-level input voltage</td>
<td>(V_{CC} = 1.65) V to 1.8 V</td>
<td>1.0</td>
<td>1</td>
<td>(V)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 2) V</td>
<td>0.95</td>
<td>0.99</td>
<td>1.03</td>
<td>(V)</td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 2.25) V to 2.5 V</td>
<td>1.15</td>
<td>1.22</td>
<td>1.25</td>
<td>(V)</td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 2.75) V</td>
<td>1.25</td>
<td>1.37</td>
<td>1.39</td>
<td>(V)</td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 3) V to 3.3 V</td>
<td>1.47</td>
<td>1.47</td>
<td>1.48</td>
<td>(V)</td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 3.6) V</td>
<td>2.02</td>
<td>2.02</td>
<td>2.03</td>
<td>(V)</td>
</tr>
<tr>
<td></td>
<td>(V_{CC} = 5) V</td>
<td>2.11</td>
<td>2.11</td>
<td>2.11</td>
<td>(V)</td>
</tr>
</tbody>
</table>

| Low-level input voltage | \(V_{CC} = 1.65\) V to 2 V | 0.57 | 0.55 | \(V\) |
| | \(V_{CC} = 2.25\) V to 2.75 V | 0.75 | 0.71 | \(V\) |
| | \(V_{CC} = 3\) V to 3.6 V | 0.8 | 0.8 | \(V\) |
| | \(V_{CC} = 4.5\) V to 5.5 V | 0.8 | 0.8 | \(V\) |
### Electrical Characteristics (continued)

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

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS</th>
<th>$V_{CC}$</th>
<th>$T_A = 25^\circ C$</th>
<th>$T_A = -40^\circ C$ to $+125^\circ C$</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{OH}$</td>
<td>$I_{OH} = -20 \mu A$</td>
<td>1.65 V to 5.5 V</td>
<td>$V_{CC} - 0.1$</td>
<td>$V_{CC} - 0.1$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -2.0 \ mA$</td>
<td>1.65 V</td>
<td>1.28</td>
<td>1.21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -3.0 \ mA$</td>
<td>1.8 V</td>
<td>1.5</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -3.0 \ mA$</td>
<td>2.3 V</td>
<td>2</td>
<td>1.93</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -3.0 \ mA$</td>
<td>2.5 V</td>
<td>2.25</td>
<td>2.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -3.0 \ mA$</td>
<td>3 V</td>
<td>2.78</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -5.5 \ mA$</td>
<td>2.6</td>
<td>2.6</td>
<td>2.49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -5.5 \ mA$</td>
<td>3.3 V</td>
<td>2.9</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -4.0 \ mA$</td>
<td>4.5 V</td>
<td>4.2</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -8.0 \ mA$</td>
<td>4.5 V</td>
<td>4.1</td>
<td>3.95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OH} = -8.0 \ mA$</td>
<td>5 V</td>
<td>4.6</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>$V_{OL}$</td>
<td>$I_{OL} = 20 \mu A$</td>
<td>1.65 V to 5.5 V</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OL} = 2.0 \ mA$</td>
<td>1.65 V</td>
<td>0.2</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OL} = 3.0 \ mA$</td>
<td>2.3 V</td>
<td>0.15</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OL} = 3.0 \ mA$</td>
<td>3 V</td>
<td>0.11</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OL} = 5.5 \ mA$</td>
<td>4.5 V</td>
<td>0.21</td>
<td>0.252</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OL} = 4.0 \ mA$</td>
<td>4.5 V</td>
<td>0.15</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_{OL} = 8.0 \ mA$</td>
<td>5 V</td>
<td>0.3</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>$I_{i}$</td>
<td>$V_i = 0 \ V$ or $V_{CC}$</td>
<td>0 V, 1.8 V, 2.5 V, 3.3 V, 5.5 V</td>
<td>0.1</td>
<td>±1</td>
<td>µA</td>
</tr>
<tr>
<td>$I_{CC}$</td>
<td>$V_i = 0 \ V$ or $V_{CC}$; $I_o = 0$; Open on loading</td>
<td>5 V</td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.3 V</td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5 V</td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.8 V</td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>$\Delta I_{CC}$</td>
<td>One input at 0.3 V or 3.4 V</td>
<td>5.5 V</td>
<td>1.35</td>
<td>1.5</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>Other inputs at 0 or $V_{CC}$; $I_o = 0$</td>
<td>5.5 V</td>
<td>1.35</td>
<td>1.5</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>One input at 0.3 V or 1.1 V</td>
<td>1.8 V</td>
<td>10</td>
<td>10</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td>Other inputs at 0 or $V_{CC}$; $I_o = 0$</td>
<td>1.8 V</td>
<td>10</td>
<td>10</td>
<td>µA</td>
</tr>
<tr>
<td>$C_i$</td>
<td>$V_i = V_{CC}$ or GND</td>
<td>10 V</td>
<td>2</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>$C_o$</td>
<td>$V_o = V_{CC}$ or GND</td>
<td>3.3 V</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
</tbody>
</table>

### 6.6 Switching Characteristics

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

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>FROM (INPUT)</th>
<th>TO (OUTPUT)</th>
<th>FREQUENCY (TYP)</th>
<th>$V_{CC}$</th>
<th>$C_L$</th>
<th>$T_A = 25^\circ C$</th>
<th>$T_A = -65^\circ C$ to 125°C</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t_{pd}$</td>
<td>Any In</td>
<td>Y</td>
<td>DC to 50 MHz</td>
<td>5.0 V</td>
<td>15 pF</td>
<td>2.7</td>
<td>5.5</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.3 V</td>
<td>15 pF</td>
<td>4</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DC to 25 MHz</td>
<td>2.5 V</td>
<td>15 pF</td>
<td>5.8</td>
<td>8.5</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DC to 15 MHz</td>
<td>1.8 V</td>
<td>15 pF</td>
<td>10.5</td>
<td>13</td>
<td>11.8</td>
</tr>
</tbody>
</table>

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6.7 Operating Characteristics

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

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS</th>
<th>$V_{CC}$</th>
<th>TYP</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_{pd}$</td>
<td>Power dissipation capacitance</td>
<td>$f = 1$ MHz and $10$ MHz</td>
<td>1.8 V ± 0.15 V</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5 V ± 0.2 V</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.3 V ± 0.3 V</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 V ± 0.5 V</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of switching thresholds for 1.8-V to 3.3-V translation](image)

Figure 1. Switching Thresholds For 1.8-V to 3.3-V Translation
6.8 Typical Characteristics

Figure 2. Switching Characteristics at 50 MHz
Excellent Signal Integrity

Figure 3. Switching Characteristics at 50 MHz
Excellent Signal Integrity

Figure 4. Switching Characteristics at 15 MHz
Excellent Signal Integrity
7 Parameter Measurement Information

From Output Under Test
Test Point

From Output Under Test

LOAD CIRCUIT FOR TOTEM-POLE OUTPUTS
LOAD CIRCUIT FOR 3-STATE AND OPEN-DRAIN OUTPUTS

VOLTAGE WAVEFORMS
PULSE DURATION

VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES

VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING

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 ≤ 1 MHz, Z_0 = 50 Ω, t_r ≤ 3 ns, t_f ≤ 3 ns.
D. The outputs are measured one at a time, with one input transition per measurement.
E. All parameters and waveforms are not applicable to all devices.

Figure 5. Load Circuit and Voltage Waveforms
8 Detailed Description

8.1 Functional Block Diagram

![Figure 6. Logic Diagram](image)

8.2 Device Functional Modes

Table 1 is the function table for the SN74LV1T34.

<table>
<thead>
<tr>
<th>INPUT (LOWER LEVEL INPUT)</th>
<th>OUTPUT (Vcc CMOS)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Y</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
</tr>
</tbody>
</table>
9 Device and Documentation Support

9.1 Device Support

Table 2. Additional Product Selection

<table>
<thead>
<tr>
<th>DEVICE</th>
<th>PACKAGE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN74LV1T00</td>
<td>DCK, DBV</td>
<td>2-Input Positive-NAND Gate</td>
</tr>
<tr>
<td>SN74LV1T02</td>
<td>DCK, DBV</td>
<td>2-Input Positive-NOR Gate</td>
</tr>
<tr>
<td>SN74LV1T04</td>
<td>DCK, DBV</td>
<td>Inverter Gate</td>
</tr>
<tr>
<td>SN74LV1T08</td>
<td>DCK, DBV</td>
<td>2-Input Positive-AND Gate</td>
</tr>
<tr>
<td>SN74LV1T34</td>
<td>DCK, DBV</td>
<td>Single Buffer Gate</td>
</tr>
<tr>
<td>SN74LV1T14</td>
<td>DCK, DBV</td>
<td>Single Schmitt-Trigger Inverter Gate</td>
</tr>
<tr>
<td>SN74LV1T32</td>
<td>DCK, DBV</td>
<td>2-Input Positive-OR Gate</td>
</tr>
<tr>
<td>SN74LV1T86</td>
<td>DCK, DBV</td>
<td>Single 2-Input Exclusive-Or Gate</td>
</tr>
<tr>
<td>SN74LV1T125</td>
<td>DCK, DBV</td>
<td>Single Buffer Gate with 3-State Output</td>
</tr>
<tr>
<td>SN74LV1T126</td>
<td>DCK, DBV</td>
<td>Single Buffer Gate with 3-State Output</td>
</tr>
<tr>
<td>SN74LV4T125</td>
<td>RGY, PW</td>
<td>Quadruple Bus Buffer Gate With 3-State Outputs</td>
</tr>
</tbody>
</table>

9.2 Documentation Support

9.2.1 Related Documentation

For related documentation see the following:

*Implications of Slow or Floating CMOS Inputs*, SCBA004.

9.3 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.

9.4 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.

9.5 Trademarks

E2E is a trademark of Texas Instruments.

All other trademarks are the property of their respective owners.

9.6 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.

9.7 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

<table>
<thead>
<tr>
<th>Orderable Device</th>
<th>Status</th>
<th>Package Type</th>
<th>Package Drawing</th>
<th>Pins</th>
<th>Package Qty</th>
<th>Eco Plan</th>
<th>Lead/Ball Finish</th>
<th>MSL Peak Temp</th>
<th>Op Temp (°C)</th>
<th>Device Marking</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN74LV1T34DBVR</td>
<td>ACTIVE</td>
<td>SOT-23</td>
<td>DBV</td>
<td>5</td>
<td>3000</td>
<td>Green (RoHS &amp; no Sb/Br)</td>
<td>CU NIPDAU</td>
<td>Level-1-260C-UNLIM</td>
<td>-40 to 125</td>
<td>(NEJ3, NEJJ, NEJS)</td>
<td></td>
</tr>
<tr>
<td>SN74LV1T34DBVRG4</td>
<td>ACTIVE</td>
<td>SOT-23</td>
<td>DBV</td>
<td>5</td>
<td>3000</td>
<td>Green (RoHS &amp; no Sb/Br)</td>
<td>CU NIPDAU</td>
<td>Level-1-260C-UNLIM</td>
<td>NEJ3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN74LV1T34DCKR</td>
<td>ACTIVE</td>
<td>SC70</td>
<td>DCK</td>
<td>5</td>
<td>3000</td>
<td>Green (RoHS &amp; no Sb/Br)</td>
<td>CU NIPDAU</td>
<td>Level-1-260C-UNLIM</td>
<td>-40 to 125</td>
<td>(WJ3, WJJ, WJS)</td>
<td></td>
</tr>
<tr>
<td>SN74LV1T34DCKRG4</td>
<td>ACTIVE</td>
<td>SC70</td>
<td>DCK</td>
<td>5</td>
<td>3000</td>
<td>Green (RoHS &amp; no Sb/Br)</td>
<td>CU NIPDAU</td>
<td>Level-1-260C-UNLIM</td>
<td>WJ3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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.  
**OBSELETE:** 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.

(6) 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

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<th>Package Type</th>
<th>Package Drawing</th>
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<th>SPQ</th>
<th>Reel Diameter (mm)</th>
<th>Reel Width W1 (mm)</th>
<th>A0 (mm)</th>
<th>B0 (mm)</th>
<th>K0 (mm)</th>
<th>P1 (mm)</th>
<th>W (mm)</th>
<th>Pin 1 Quadrant</th>
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</thead>
<tbody>
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<td>DBV</td>
<td>5</td>
<td>3000</td>
<td>178.0</td>
<td>9.2</td>
<td>3.3</td>
<td>3.23</td>
<td>1.55</td>
<td>4.0</td>
<td>8.0</td>
<td>Q3</td>
</tr>
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<td>DBV</td>
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<td>3000</td>
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<td>3.3</td>
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<td>4.0</td>
<td>8.0</td>
<td>Q3</td>
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<tr>
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<td>SC70</td>
<td>DCK</td>
<td>5</td>
<td>3000</td>
<td>178.0</td>
<td>9.2</td>
<td>2.4</td>
<td>2.4</td>
<td>1.22</td>
<td>4.0</td>
<td>8.0</td>
<td>Q3</td>
</tr>
</tbody>
</table>

*All dimensions are nominal.*
**PACKAGE MATERIALS INFORMATION**

**TAPE AND REEL BOX DIMENSIONS**

<table>
<thead>
<tr>
<th>Device</th>
<th>Package Type</th>
<th>Package Drawing</th>
<th>Pins</th>
<th>SPQ</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Height (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN74LV1T34DBVR</td>
<td>SOT-23</td>
<td>DBV</td>
<td>5</td>
<td>3000</td>
<td>180.0</td>
<td>180.0</td>
<td>18.0</td>
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<td>180.0</td>
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<td>18.0</td>
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<tr>
<td>SN74LV1T34DBVRG4</td>
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<td>DBV</td>
<td>5</td>
<td>3000</td>
<td>180.0</td>
<td>180.0</td>
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<td>180.0</td>
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<td>180.0</td>
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<tr>
<td>SN74LV1T34DCKRG4</td>
<td>SC70</td>
<td>DCK</td>
<td>5</td>
<td>3000</td>
<td>180.0</td>
<td>180.0</td>
<td>18.0</td>
</tr>
</tbody>
</table>

*All dimensions are nominal*
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.
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
D. Publication IPC-7351 is recommended for alternate designs.
E. 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.
NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
4. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
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.
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.
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