ON Semiconductor

Is Now

# onsemi 

To learn more about onsemi ${ }^{T M}$, please visit our website at www.onsemi.com

[^0]
## Single Unbuffered Inverter

## NL17SZU04

The NL17SZU04 is a single unbuffered inverter in tiny footprint packages.

## Features

- Designed for 1.65 V to $5.5 \mathrm{~V}_{\mathrm{CC}}$ Operation
- 2.1 ns tpD at $\mathrm{V}_{\mathrm{CC}}=5 \mathrm{~V}$ (typ)
- Input Overvoltage Tolerant up to 5.5 V
- I IOFF Supports Partial Power Down Protection
- Source/Sink 24 mA at 3.0 V
- Available in SC-88A, SC-74A, SOT-553, SOT-953 and UDFN6 Packages
- Chip Complexity < 100 FETs
- NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are $\mathrm{Pb}-$ Free, Halogen Free/BFR Free and are RoHS Compliant


Figure 1. Logic Symbol


ON Semiconductor ${ }^{\circledR}$
www.onsemi.com


X, XX, XXX = Specific Device Code
M = Date Code*

- $\quad=\mathrm{Pb}-$ Free Package
(Note: Microdot may be in either location)
*Date Code orientation and/or position may vary depending upon manufacturing location.

ORDERING INFORMATION
See detailed ordering, marking and shipping information in the package dimensions section on page 6 of this data sheet.

## NL17SZU04



Figure 2. Pinout (Top View)
PIN ASSIGNMENT
(SC-88A/SOT-553/ TSOP-5/SC-74A)

| Pin | Function |
| :---: | :---: |
| 1 | NC |
| 2 | A |
| 3 | GND |
| 4 | Y |
| 5 | $\mathrm{~V}_{\mathrm{CC}}$ |

PIN ASSIGNMENT (SOT-953)

| Pin | Function |
| :---: | :---: |
| 1 | A |
| 2 | GND |
| 3 | NC |
| 4 | Y |
| 5 | $\mathrm{~V}_{\mathrm{CC}}$ |

PIN ASSIGNMENT (UDFN)

| Pin | Function |
| :---: | :---: |
| 1 | NC |
| 2 | A |
| 3 | GND |
| 4 | Y |
| 5 | NC |
| 6 | $\mathrm{~V}_{\mathrm{CC}}$ |

FUNCTION TABLE

| Input | Output <br> $\mathbf{Y}=\overline{\mathbf{A}}$ |
| :---: | :---: |
| $\mathbf{A}$ | $\mathbf{Y}$ |
| L | H |
| H | L |

MAXIMUM RATINGS

| Symbol | Characteristics | Value | Unit |
| :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | $\begin{array}{ll}\text { DC Supply Voltage } & \text { SC-88A (NLV) } \\ & \text { SC-74A, SC-88A, SOT-953, SOT-553, UDFN6 }\end{array}$ | $\begin{aligned} & -0.5 \text { to }+7.0 \\ & -0.5 \text { to }+6.5 \end{aligned}$ | V |
| $\mathrm{V}_{\text {IN }}$ | $\begin{array}{ll}\text { DC Input Voltage } & \text { SC-88A (NLV) } \\ & \text { SC-74A, SC-88A, SOT-953, SOT-553, UDFN6 }\end{array}$ | $\begin{aligned} & -0.5 \text { to }+7.0 \\ & -0.5 \text { to }+6.5 \end{aligned}$ | V |
| $\mathrm{V}_{\text {OUT }}$ | DC Output Voltage | -0.5 to $\mathrm{V}_{\mathrm{CC}}+0.5$ | V |
| $\mathrm{I}_{\text {K }}$ | DC Input Diode Current $\quad \mathrm{V}_{\text {IN }}<$ GND | -50 | mA |
| IOK | DC Output Diode Current | $\pm 50$ | mA |
| Iout | DC Output Source/Sink Current | $\pm 50$ | mA |
| $\mathrm{I}_{\text {CC }}$ or $\mathrm{I}_{\text {GND }}$ | DC Supply Current per Supply Pin or Ground Pin | $\pm 100$ | mA |
| $\mathrm{T}_{\text {STG }}$ | Storage Temperature Range | -65 to +150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{L}}$ | Lead Temperature, 1 mm from Case for 10 secs | 260 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{J}}$ | Junction Temperature Under Bias | +150 | ${ }^{\circ} \mathrm{C}$ |
| $\theta_{\text {JA }}$ | Thermal Resistance (Note 2) SC-88A <br> SC-74A  <br> SOT-553  <br> SOT-953  <br> UDFN6  | $\begin{aligned} & 377 \\ & 320 \\ & 324 \\ & 254 \\ & 154 \end{aligned}$ | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| $\mathrm{P}_{\mathrm{D}}$ | Power Dissipation in Still Air SC-88A <br> SC-74A  <br> SOT-553  <br> SOT-953  <br>  UDFN6 | $\begin{aligned} & 332 \\ & 390 \\ & 386 \\ & 491 \\ & 812 \end{aligned}$ | mW |
| MSL | Moisture Sensitivity | Level 1 | - |
| $\mathrm{F}_{\mathrm{R}}$ | Flammability Rating Oxygen Index: 28 to 34 | UL 94 V-0 @ 0.125 in | - |
| $\mathrm{V}_{\text {ESD }}$ | ESD Withstand Voltage (Note 3) $\begin{gathered}\text { Human Body Model } \\ \text { Charged Device Model }\end{gathered}$ | $\begin{aligned} & 2000 \\ & 1000 \end{aligned}$ | V |
| ILatchup | Latchup Performance (Note 4) | $\pm 100$ | mA |

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. Applicable to devices with outputs that may be tri-stated.
2. Measured with minimum pad spacing on an FR4 board, using 10 mm -by-1 inch, 2 ounce copper trace no air flow per JESD51-7.
3. HBM tested to ANSI/ESDA/JEDEC JS-001-2017. CDM tested to EIA/JESD22-C101-F. JEDEC recommends that ESD qualification to EIA/JESD22-A115-A (Machine Model) be discontinued per JEDEC/JEP172A.
4. Tested to EIA/JESD78 Class II.

## RECOMMENDED OPERATING CONDITIONS

| Symbol | Characteristics |  | Min | Max | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\text {CC }}$ | Positive DC Supply Voltage |  | 1.65 | 5.5 | V |
| $\mathrm{V}_{\text {IN }}$ | DC Input Voltage |  | 0 | 5.5 | V |
| $\mathrm{V}_{\text {OUT }}$ | DC Output Voltage |  | 0 | $\mathrm{V}_{\mathrm{CC}}$ |  |
| $\mathrm{T}_{\mathrm{A}}$ | Operating Temperature Range |  | -55 | +125 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{t}_{\mathrm{r}}, \mathrm{t}_{\mathrm{f}}$ | Input Rise and Fall Time (SC-88A (NLV)) | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V} \text { to } 3.6 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=4.5 \mathrm{~V} \text { to } 5.5 \mathrm{~V} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 100 \\ & 20 \end{aligned}$ | ns/V |
|  | Input Rise and Fall Time (SC-74A, SC-88A, SOT-953, SOT-553, UDFN6) | $\begin{gathered} \mathrm{V}_{\mathrm{CC}}=1.65 \mathrm{~V} \text { to } 1.95 \mathrm{~V} \\ \mathrm{~V}_{\mathrm{CC}}=2.3 \mathrm{~V} \text { to } 2.7 \mathrm{~V} \\ \mathrm{~V}_{\mathrm{CC}}=3.0 \mathrm{~V} \text { to } 3.6 \mathrm{~V} \text { to } 5.5 \mathrm{~V} \end{gathered}$ | $\begin{aligned} & \hline 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{gathered} 20 \\ 20 \\ 10 \\ 5 \end{gathered}$ |  |

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.

DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | $\mathrm{V}_{\mathrm{cc}}$ <br> (V) | $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ |  |  | $-55^{\circ} \mathrm{C} \leq \mathrm{T}_{\mathrm{A}} \leq 125^{\circ} \mathrm{C}$ |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Min | Typ | Max | Min | Max |  |
| $\mathrm{V}_{\mathrm{IH}}$ | High-Level Input Voltage |  | 1.65 to 1.95 | $0.85 \mathrm{~V}_{\mathrm{CC}}$ | - | - | $0.85 \mathrm{~V}_{\mathrm{CC}}$ | - | V |
|  |  |  | 2.3 to 5.5 | $0.80 \mathrm{~V}_{\mathrm{CC}}$ | - | - | $0.80 \mathrm{~V}_{\mathrm{CC}}$ | - |  |
| $\mathrm{V}_{\text {IL }}$ | Low-Level Input Voltage |  | 1.65 to 1.95 | - | - | $0.15 \mathrm{~V}_{\mathrm{CC}}$ | - | $0.15 \mathrm{~V}_{\mathrm{CC}}$ | V |
|  |  |  | 2.3 to 5.5 | - | - | $0.20 \mathrm{~V}_{\mathrm{CC}}$ | - | $0.20 \mathrm{~V}_{\mathrm{CC}}$ |  |
| $\mathrm{V}_{\mathrm{OH}}$ | High-Level Output Voltage | $\begin{array}{\|l} \hline \mathrm{V}_{\mathrm{IN}}=\mathrm{GND} \\ \mathrm{I}_{\mathrm{OH}}=-100 \mu \mathrm{~A} \\ \mathrm{O}_{\mathrm{OH}}=-4 \mathrm{~mA} \\ \mathrm{I}_{\mathrm{OH}}=-8 \mathrm{~mA} \\ \mathrm{I}_{\mathrm{OH}}=-12 \mathrm{~mA} \\ \mathrm{I}_{\mathrm{OH}}=-16 \mathrm{~mA} \\ \mathrm{O}_{\mathrm{H}}=-24 \mathrm{~mA} \\ \mathrm{I}_{\mathrm{OH}}=-32 \mathrm{~mA} \\ \hline \end{array}$ | 1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5 | $\mathrm{V}_{\mathrm{CC}}-0.1$ 1.29 1.9 2.2 2.4 2.3 3.8 | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}} \\ & 1.4 \\ & 2.1 \\ & 2.4 \\ & 2.7 \\ & 2.5 \\ & 4.0 \end{aligned}$ |  | $\begin{gathered} \mathrm{V}_{\mathrm{CC}}-0.1 \\ 1.29 \\ 1.9 \\ 2.2 \\ 2.4 \\ 2.3 \\ 3.8 \end{gathered}$ |  | V |
| V OL | Low-Level Output Voltage | $\begin{aligned} & \mathrm{V}_{\mathrm{IN}}=\mathrm{V} \mathrm{CC} \\ & \mathrm{I}_{\mathrm{OL}}=100 \mu \mathrm{~A} \\ & \mathrm{I}_{\mathrm{OL}}=4 \mathrm{~mA} \\ & \mathrm{I}_{\mathrm{OL}}=81 \mathrm{~mA} \\ & \mathrm{I}_{\mathrm{OL}}=12 \mathrm{~mA} \\ & \mathrm{I}_{\mathrm{OL}}=16 \mathrm{~mA} \\ & \mathrm{I}_{\mathrm{OL}}=24 \mathrm{~mA} \\ & \mathrm{I}_{\mathrm{OL}}=32 \mathrm{~mA} \\ & \hline \end{aligned}$ | 1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5 |  | $\begin{gathered} - \\ 0.08 \\ 0.2 \\ 0.22 \\ 0.28 \\ 0.38 \\ 0.42 \end{gathered}$ | $\begin{gathered} 0.1 \\ 0.24 \\ 0.3 \\ 0.4 \\ 0.4 \\ 0.55 \\ 0.55 \end{gathered}$ |  | $\begin{gathered} 0.1 \\ 0.24 \\ 0.3 \\ 0.4 \\ 0.4 \\ 0.55 \\ 0.55 \end{gathered}$ | V |
| 1 N | Input Leakage Current | $\mathrm{V}_{\mathrm{IN}}=5.5 \mathrm{~V}$ or GND | 1.65 to 5.5 | - | - | $\pm 0.1$ | - | $\pm 1.0$ | $\mu \mathrm{A}$ |
| IofF | Power Off Leakage Current | $\mathrm{V}_{\text {IN }}=5.5 \mathrm{~V}$ | 0 | - | - | 1.0 | - | 10 | $\mu \mathrm{A}$ |
| Icc | Quiescent Supply Current | $\mathrm{V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{CC}}$ or GND | 5.5 | - | - | 1.0 | - | 10 | $\mu \mathrm{A}$ |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

AC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | $V_{c c}$ <br> (V) | $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ |  |  | $-55^{\circ} \mathrm{C} \leq \mathrm{T}_{\mathrm{A}} \leq 125^{\circ} \mathrm{C}$ |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Min | Typ | Max | Min | Max |  |
| tpli, ${ }^{\text {tpHL }}$ | Propagation Delay, A to Y (Figures 3 and 4) | $\mathrm{R}_{\mathrm{L}}=1 \mathrm{M} \Omega, \mathrm{C}_{\mathrm{L}}=15 \mathrm{pF}$ | 1.65 to 1.95 | - | 3.0 | 11.7 | - | 12.1 | ns |
|  |  | $\mathrm{R}_{\mathrm{L}}=1 \mathrm{M} \Omega, \mathrm{C}_{\mathrm{L}}=15 \mathrm{pF}$ | 2.3 to 2.7 | - | 2.2 | 6.2 | - | 6.5 |  |
|  |  | $\mathrm{R}_{\mathrm{L}}=1 \mathrm{M} \Omega, \mathrm{C}_{\mathrm{L}}=15 \mathrm{pF}$ | 3.0 to 3.6 | - | 2.0 | 4.5 | - | 4.8 |  |
|  |  | $\mathrm{R}_{\mathrm{L}}=500 \Omega, \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  | - | 2.5 | 6.0 | - | 6.6 |  |
|  |  | $\mathrm{R}_{\mathrm{L}}=1 \mathrm{M} \Omega, \mathrm{C}_{\mathrm{L}}=15 \mathrm{pF}$ | 4.5 to 5.5 | - | 1.8 | 3.9 | - | 4.1 |  |
|  |  | $\mathrm{R}_{\mathrm{L}}=500 \Omega, \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  | - | 2.1 | 5.0 | - | 5.5 |  |

CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Condition | Typical | Units |
| :---: | :--- | :--- | :---: | :---: |
| $\mathrm{C}_{\mathrm{IN}}$ | Input Capacitance | $\mathrm{V}_{\mathrm{CC}}=5.5 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 2.5 | pF |
| $\mathrm{C}_{\mathrm{OUT}}$ | Output Capacitance | $\mathrm{V}_{\mathrm{CC}}=5.5 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 2.5 | pF |
| $\mathrm{C}_{\mathrm{PD}}$ | Power Dissipation Capacitance <br> (Note 5) | $10 \mathrm{MHz}, \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ <br> $10 \mathrm{MHz}, \mathrm{V}_{\mathrm{CC}}=5.5 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 9 | pF |

5. $\mathrm{C}_{P \mathrm{D}}$ 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: $\mathrm{I}_{\mathrm{CC}(\mathrm{OPR})}=\mathrm{C}_{\mathrm{PD}} \bullet \mathrm{V}_{\mathrm{CC}} \bullet \mathrm{f}_{\mathrm{in}}+\mathrm{I}_{\mathrm{CC}}$. $\mathrm{C}_{\mathrm{PD}}$ is used to determine the no-load dynamic power consumption; $\mathrm{P}_{\mathrm{D}}=\mathrm{C}_{\mathrm{PD}} \bullet \mathrm{V}_{\mathrm{CC}}{ }^{2} \bullet \mathrm{f}_{\text {in }}+\mathrm{I}_{\mathrm{CC}} \bullet \mathrm{V}_{\mathrm{CC}}$.

## NL17SZU04



| Test | Switch <br> Position | $\mathbf{C}_{\mathrm{L}}, \mathbf{p F}$ | $\mathbf{R}_{\mathrm{L}}, \boldsymbol{\Omega}$ | $\mathbf{R}_{\mathbf{1}}, \boldsymbol{\Omega}$ |
| :---: | :---: | :---: | :---: | :---: |
| $\mathrm{t}_{\mathrm{PLH}} / \mathrm{t}_{\mathrm{PHL}}$ | Open | See AC Characteristics Table |  |  |
| $\mathrm{t}_{\mathrm{PLZ}} / \mathrm{t}_{\mathrm{PZL}}$ | $2 \times \mathrm{V}_{\mathrm{CC}}$ | 50 | 500 | 500 |
| $\mathrm{t}_{\mathrm{PHZ}} / \mathrm{t}_{\mathrm{PZH}}$ | GND | 50 | 500 | 500 |

X = Don't Care
$\mathrm{C}_{\mathrm{L}}$ includes probe and jig capacitance
$R_{T}$ is $Z_{\text {OUT }}$ of pulse generator (typically $50 \Omega$ )
$\mathrm{f}=1 \mathrm{MHz}$
Figure 3. Test Circuit


Figure 4. Switching Waveforms

| $\mathbf{v}_{\mathbf{C C}}, \mathbf{v}$ | $\mathbf{V}_{\mathbf{m o}}, \mathbf{V}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathbf{t}_{\mathbf{P Z L}}, \mathbf{t}_{\mathbf{P L Z}}, \mathbf{t}_{\mathbf{P Z H}}, \mathbf{t}_{\mathbf{P H Z}}$ | $\mathbf{v}_{\mathbf{Y},} \mathbf{v}$ |
|  | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.15 |
| 2.3 to 2.7 | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.15 |
| 3.0 to 3.6 | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.3 |
| 4.5 to 5.5 | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.3 |

DEVICE ORDERING INFORMATION

| Device | Packages | Marking | Pin 1 Orientation <br> (See below) | Shipping ${ }^{\dagger}$ |
| :--- | :---: | :---: | :---: | :---: |

$\dagger$ 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.
*NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable.

Pin 1 Orientation in Tape and Reel
Direction of Feed


## NL17SZU04

## PACKAGE DIMENSIONS

## SC-88A (SC-70-5/SOT-353) <br> CASE 419A-02

ISSUE L


NOTES:

1. DIMENSIONING AND TOLERANCING

PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A-01 OBSOLETE. NEW STANDARD
$419 \mathrm{~A}-02$.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE MOLD FL
BURRS.

| DIM | INCHES |  | MILLIMETERS |  |
| :---: | :---: | :---: | :---: | :---: |
|  | MIN | MAX | MIN | MAX |
| A | 0.071 | 0.087 | 1.80 | 2.20 |
| B | 0.045 | 0.053 | 1.15 | 1.35 |
| C | 0.031 | 0.043 | 0.80 | 1.10 |
| D | 0.004 | 0.012 | 0.10 | 0.30 |
| G | 0.026 BSC |  | 0.65 BSC |  |
| H | --- | 0.004 | --- | 0.10 |
| J | 0.004 | 0.010 | 0.10 | 0.25 |
| K | 0.004 | 0.012 | 0.10 | 0.30 |
| N | 0.008 REF |  | 0.20 REF |  |
| 5 | 0.079 | 0.087 | 2.00 | 2.20 |

SOLDER FOOTPRINT*

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

## NL17SZU04

## PACKAGE DIMENSIONS

SC-74A
CASE 318BQ
ISSUE B


RECOMMENDED SOLDERING FOOTPRINT*

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

## NL17SZU04

## PACKAGE DIMENSIONS

## SOT-553, 5 LEAD

CASE 463B
ISSUE C


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS. MINIMUM LEAD THIC
THICKNESS OF BASE MATERIAL.

|  | MILIMETERS |  |  | INCHES |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DIM | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.50 | 0.55 | 0.60 | 0.020 | 0.022 | 0.024 |
| b | 0.17 | 0.22 | 0.27 | 0.007 | 0.009 | 0.011 |
| c | 0.08 | 0.13 | 0.18 | 0.003 | 0.005 | 0.007 |
| D | 1.55 | 1.60 | 1.65 | 0.061 | 0.063 | 0.065 |
| E | 1.15 | 1.20 | 1.25 | 0.045 | 0.047 | 0.049 |
| e | 0.50 BSC |  |  | 0.020 BSC |  |  |
| L | 0.10 | 0.20 | 0.30 | 0.004 | 0.008 | 0.012 |
| $H_{\text {E }}$ | 1.55 | 1.60 | 1.65 | 0.061 | 0.063 | 0.065 |

## SOLDERING FOOTPRINT*


*For additional information on our $\mathrm{Pb}-$ Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## NL17SZU04

## PACKAGE DIMENSIONS

SOT-953
CASE 527AE
ISSUE E


1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994
CONTROLLING DIMENSION: MILLIMETERS
2. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

|  | MILLIMETERS |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| DIM | MIN | NOM | MAX |  |
| A | 0.34 | 0.37 | 0.40 |  |
| b | 0.10 | 0.15 | 0.20 |  |
| C | 0.07 | 0.12 | 0.17 |  |
| D | 0.95 | 1.00 | 1.05 |  |
| E | 0.75 | 0.80 | 0.85 |  |
| e | 0.35 BSC |  |  |  |
| HE | 0.95 | 1.00 | 1.05 |  |
| L | 0.175 REF |  |  |  |
| L2 | 0.05 | 0.10 | 0.15 |  |
| L3 | --- | --- | 0.15 |  |

## SOLDERING FOOTPRINT*


*For additional information on our $\mathrm{Pb}-$ Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## NL17SZU04

## PACKAGE DIMENSIONS

UDFN6, 1.45x1.0, 0.5P
CASE 517AQ
ISSUE O


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND AND IS MEASURED BETWEEN 0.15
0.30 mm FROM THE TERMINAL TIP.
0.30 mm FROM THE TERMINAL TIP


DETAIL B OPTIONAL CONSTRUCTIONS

## MOUNTING FOOTPRINT



DIMENSIONS: MILLIMETERS
*For additional information on our $\mathrm{Pb}-$ Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## PACKAGE DIMENSIONS

UDFN6, 1x1, 0.35P
CASE 517BX
ISSUE O



DETAIL A alternate terminal CONSTRUCTION EXPOSED Cu MOLD CMPD


DETAIL B ALTERNATE CONSTRUCTION

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED

TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.20 MM FROM TERMINAL TIP.
4. PACKAGE DIMENSIONS EXCLUSIVE OF BURRS AND MOLD FLASH.

|  | MILLIMETERS |  |
| :---: | :---: | :---: |
| DIM | MIN | MAX |
| A | 0.50 | 0.65 |
| A1 | 0.00 | 0.05 |
| A3 | 0.13 REF |  |
| b | 0.17 |  |
| D | 0.23 |  |
| E | 1.00 BSC |  |
| e | 0.35 |  |
| L | 0.20 |  |
| L1 | -2. | 0.40 |
| L3 | 0.15 |  |

元

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

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

## LITERATURE FULFILLMENT

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com
N. American Technical Support: 800-282-9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support: Phone: 421337902910

ON Semiconductor Website: www.onsemi.com Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local For additional information
Sales Representative

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components
Click to view similar products for Inverters category:
Click to view products by ON Semiconductor manufacturer:
Other Similar products are found below :
E5-652Z NL17SGU04P5T5G NLX2G04BMX1TCG CD4009UBE TC4584BFN 022413E NL17SG14AMUTCG NLU2G04AMUTCG NLU2GU04BMX1TCG NLU2G04CMX1TCG NLV17SZ06DFT2G NCV1729SN35T1G TC74VHC04FK(EL,K) NLV74HC04ADTR2G NLU1G04AMUTCG NLX2G04CMUTCG NLU1GU04CMUTCG NLU1GT14AMUTCG NLU1G04CMUTCG NL17SZU04P5T5G NL17SG14DFT2G 74LVC06ADTR2G 74LVC04ADR2G NLV37WZ04USG NLX3G14FMUTCG NL17SZ04P5T5G NLV17SG14DFT2G 74ACT14SC BU4069UBF-E2 EMPP008Z NC7WZ14P6X NLV14106BDTR2G NLV74AC14DTR2G SN74HCT04DE4 ODE-3-1200231F12 74VHCT04AM SV004IE5-1C TC74HC04APF TC7SH04F,LJ(CT TC7W14FK,LF 74VHC14MTCX 74LCX14MTC

SN74LVC1GU04DBVR NL27WZ14DFT2G NLU1G14BMX1TCG NLU2G04AMX1TCG NLU2G14AMX1TCG NLU3G14AMX1TCG
NLVVHC1G04DFT2G NLX2G04CMX1TCG


[^0]:    
    
    
    
    
    
    
    
    
    
    
    
     Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner. Other names and brands may be claimed as the property of others.

