## MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +7.0 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +7.0 | V |
| $V_{OUT}$ | DC Output Voltage | | −0.5 to $V_{CC}$ +0.5 | V |
| $I_{IK}$ | DC Input Diode Current | | −50 | mA |
| $I_{OK}$ | DC Output Diode Current | | −50 | mA |
| $I_{OUT}$ | DC Output Sink Current | | ±50 | mA |
| $I_{CC}$ | DC Supply Current per Supply Pin | | ±100 | mA |
| $T_{STG}$ | Storage Temperature Range | | −65 to +150 | °C |
| $T_L$ | Lead Temperature, 1 mm from Case for 10 Seconds | | 260 | °C |
| $T_J$ | Junction Temperature Under Bias | | +150 | °C |
| $\theta_{JA}$ | Thermal Resistance | SOT−353 (Note 1)<br>SOT−553 | 350<br>496 | °C/W |
| $P_D$ | Power Dissipation in Still Air at 85°C | SOT−353<br>SOT−553 | 186<br>135 | mW |
| MSL | Moisture Sensitivity | | Level 1 | |
| $F_R$ | Flammability Rating | Oxygen Index: 28 to 34 | UL 94 V−0 @ 0.125 in | |
| ESD | ESD Classification | Human Body Model (Note 2)<br>Machine Model (Note 3) | 4000<br>400 | V |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Measured with minimum pad spacing on an FR4 board, using 10 mm−by−1 inch, 2−ounce copper trace with no air flow.
2. Tested to EIA/JESD22−A114−A, rated to EIA/JESD22−A114−B.
3. Tested to EIA/JESD22−A115−A, rated to EIA/JESD22−A115−A.

## RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | 1.65 | 5.5 | V |
| $V_{IN}$ | DC Input Voltage | | 0 | 5.5 | V |
| $V_{OUT}$ | DC Output Voltage | | 0 | $V_{CC}$ + 0.5 | V |
| $T_A$ | Operating Temperature Range | | −55 | +125 | °C |
| $t_r$, $t_f$ | Input Rise and Fall Time | $V_{CC}$ = 3.0 V ±0.3 V<br>$V_{CC}$ = 5.0 V ±0.5 V | 0<br>0 | 100<br>20 | ns/V |

## DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | $V_{CC}$ (V) | $T_A$ = 25°C | | | −55°C ≤ $T_A$ ≤ 125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $V_{IH}$ | High−Level Input Voltage | | 1.65 to 1.95<br>2.3 to 5.5 | 0.75 $V_{CC}$<br>0.7 $V_{CC}$ | | | 0.75 $V_{CC}$<br>0.7 $V_{CC}$ | | V |
| $V_{IL}$ | Low−Level Input Voltage | | 1.65 to 1.95<br>2.3 to 5.5 | | | 0.25 $V_{CC}$<br>0.3 $V_{CC}$ | | 0.25 $V_{CC}$<br>0.3 $V_{CC}$ | V |
| $V_{OH}$ | High−Level Output Voltage | $I_{OH}$ = 100 μA | 1.65 to 5.5 | $V_{CC}$ − 0.1 | $V_{CC}$ | | $V_{CC}$ − 0.1 | | V |
| | $V_{IN}$ = $V_{IL}$ or $V_{IH}$ | $I_{OH}$ = −3 mA | 1.65 | 1.29 | 1.52 | | 1.29 | | |
| | | $I_{OH}$ = −8 mA | 2.3 | 1.9 | 2.1 | | 1.9 | | |
| | | $I_{OH}$ = −12 mA | 2.7 | 2.2 | 2.4 | | 2.2 | | |
| | | $I_{OH}$ = −16 mA | 3.0 | 2.4 | 2.7 | | 2.4 | | |
| | | $I_{OH}$ = −24 mA | 3.0 | 2.3 | 2.5 | | 2.3 | | |
| | | $I_{OH}$ = −32 mA | 4.5 | 3.8 | 4.0 | | 3.8 | | |
| $V_{OL}$ | Low−Level Output Voltage | $I_{OL}$ = 100 μA | 1.65 to 5.5 | | | 0.1 | | 0.1 | V |
| | $V_{IN}$ = $V_{IH}$ or $V_{OH}$ | $I_{OL}$ = 3 mA | 1.65 | | 0.08 | 0.24 | | 0.24 | |
| | | $I_{OL}$ = 8 mA | 2.3 | | 0.20 | 0.3 | | 0.3 | |
| | | $I_{OL}$ = 12 mA | 2.7 | | 0.22 | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 16 mA | 3.0 | | 0.28 | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 24 mA | 3.0 | | 0.38 | 0.55 | | 0.55 | |
| | | $I_{OL}$ = 32 mA | 4.5 | | 0.42 | 0.55 | | 0.55 | |
| $I_{IN}$ | Input Leakage Current | $V_{IN}$ = $V_{CC}$ or GND | 0 to 5.5 | | | ±0.1 | | ±1.0 | μA |
| $I_{CC}$ | Quiescent Supply Current | $V_{IN}$ = $V_{CC}$ or GND | 5.5 | | | 1 | | 10 | μA |

## AC ELECTRICAL CHARACTERISTICS $t_R = t_F$ = 3.0 ns

| Symbol | Parameter | Condition | $V_{CC}$ (V) | $T_A$ = 25°C | | | −55°C ≤ $T_A$ ≤ 125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay<br>(Figure 3 and 4) | $R_L$ = 1 MΩ, $C_L$ = 15 pF | 1.65 | 2.0 | 5.5 | 12.0 | 2.0 | 12.7 | ns |
| | | $R_L$ = 1 MΩ, $C_L$ = 15 pF | 1.8 | 2.0 | 4.6 | 10 | 2.0 | 10.5 | |
| | | $R_L$ = 1 MΩ, $C_L$ = 15 pF | 2.5 ± 0.2 | 0.8 | 3.0 | 7 | 0.8 | 7.5 | |
| | | $R_L$ = 1 MΩ, $C_L$ = 15 pF | 3.3 ± 0.3 | 0.5 | 2.6 | 4.7 | 0.5 | 5.0 | |
| | | $R_L$ = 500 Ω, $C_L$ = 50 pF | | 1.5 | 3.0 | 5.2 | 1.5 | 5.5 | |
| | | $R_L$ = 1 MΩ, $C_L$ = 15 pF | 5.0 ± 0.5 | 0.5 | 2.2 | 4.1 | 0.5 | 4.4 | |
| | | $R_L$ = 500 Ω, $C_L$ = 50 pF | | 0.8 | 2.4 | 4.5 | 0.8 | 4.8 | |

## CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Condition | Typical | Unit |
|---|---|---|---|---|
| $C_{IN}$ | Input Capacitance | $V_{CC}$ = 5.5 V, $V_I$ = 0 V or $V_{CC}$ | >4 | pF |
| $C_{PD}$ | Power Dissipation Capacitance<br>(Note 4) | 10 MHz, $V_{CC}$ = 3.3 V, $V_I$ = 0 V or $V_{CC}$ | 25 | pF |
| | | 10 MHz, $V_{CC}$ = 5.5 V, $V_I$ = 0 V or $V_{CC}$ | 30 | |

4. $C_{PD}$ is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation: $I_{CC(OPR)} = C_{PD} \bullet V_{CC} \bullet f_{in} + I_{CC}$. $C_{PD}$ is used to determine the no−load dynamic power consumption; $P_D = C_{PD} \bullet V_{CC}^2 \bullet f_{in} + I_{CC} \bullet V_{CC}$.

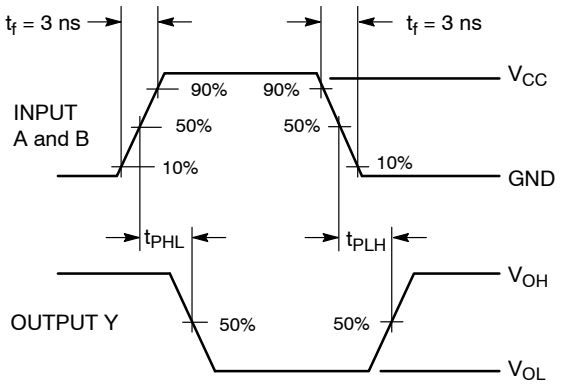
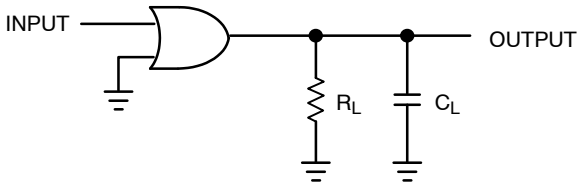



**Figure 3. Switching Waveform**




A 1 MHz square input wave is recommended for propagation delay tests.

**Figure 4. Test Circuit**

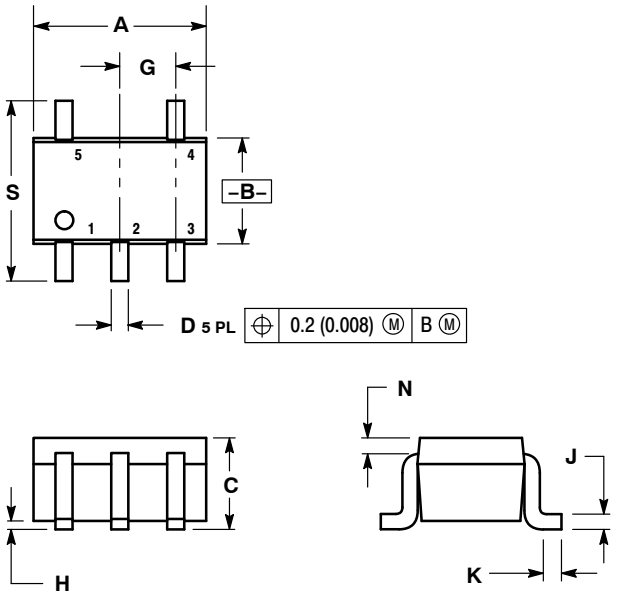
## ORDERING INFORMATION

| Device Order Number | Package Type | Tape and Reel Size† |
|---|---|---|
| NL17SZ32DFT2 | SC70−5/SC−88A/SOT−353 | 3000 / Tape & Reel |
| NL17SZ32DFT2G | SC70−5/SC−88A/SOT−353 (Pb−Free) | 3000 / Tape & Reel |
| NL17SZ32XV5T2 | SOT−553* | 4000 / Tape & Reel |
| NL17SZ32XV5T2G | SOT−553* | 4000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.
*All Devices in Package SOT553 are Inherently Pb−Free.

## PACKAGE DIMENSIONS

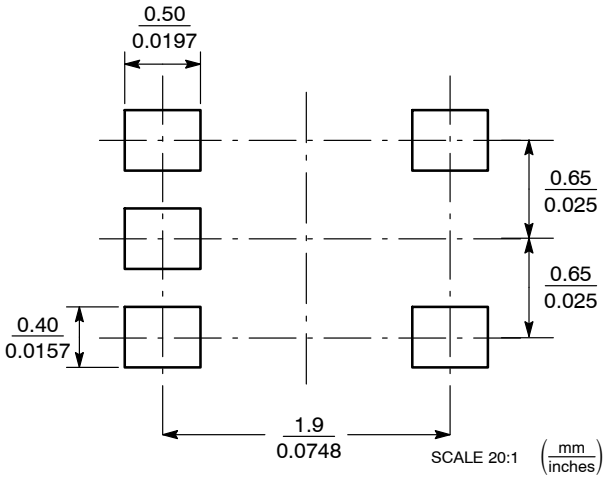
**SOT−353**
**(SC−88A, SC−70)**
**DF SUFFIX**
CASE 419A−02
ISSUE J




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A−01 OBSOLETE. NEW STANDARD 419A−02.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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 | |
| S | 0.079 | 0.087 | 2.00 | 2.20 |

## SOLDERING FOOTPRINT*

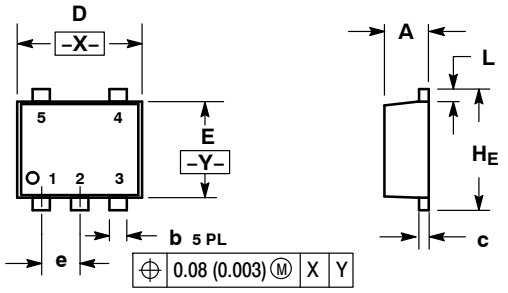



*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# NL17SZ32

## PACKAGE DIMENSIONS

**SOT−553**
**XV5 SUFFIX**
CASE 463B−01
ISSUE B



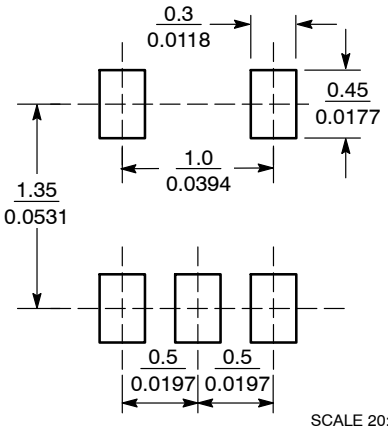

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

| | MILLIMETERS | | | 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 | 1.50 | 1.60 | 1.70 | 0.059 | 0.063 | 0.067 |
| E | 1.10 | 1.20 | 1.30 | 0.043 | 0.047 | 0.051 |
| e | 0.50 BSC | | | 0.020 BSC | | |
| L | 0.10 | 0.20 | 0.30 | 0.004 | 0.008 | 0.012 |
| $H_E$ | 1.50 | 1.60 | 1.70 | 0.059 | 0.063 | 0.067 |

STYLE 1:
PIN 1. BASE 1
2. EMITTER 1/2
3. BASE 2
4. COLLECTOR 2
5. COLLECTOR 1

STYLE 2:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. CATHODE

## SOLDERING FOOTPRINT*

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