

# Bus Buffer with 3-State Output

## NL17SG125

The NL17SG125 MiniGate™ is an advanced high-speed CMOS Bus Buffer with 3-State Output in ultra-small footprint.

The NL17SG125 input structures provides protection when voltages up to 3.6 V are applied.

### Features

- Wide Operating  $V_{CC}$  Range: 0.9 V to 3.6 V
- High Speed:  $t_{PD} = 2.4$  ns (Typ) at  $V_{CC} = 3.0$  V,  $C_L = 15$  pF
- Low Power Dissipation:  $I_{CC} = 0.5$   $\mu$ A (Max) at  $T_A = 25^\circ$ C
- 3.6 V Overvoltage Tolerant (OVT) Input Pins
- $I_{OFF}$  Supports Partial Power Down Protection
- Ultra-Small Packages
- -Q Suffix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

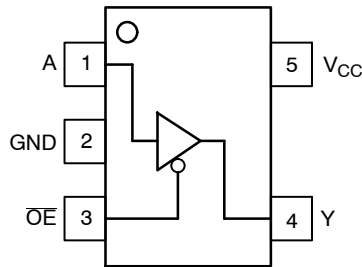


Figure 1. SOT-953  
(Top Thru View)

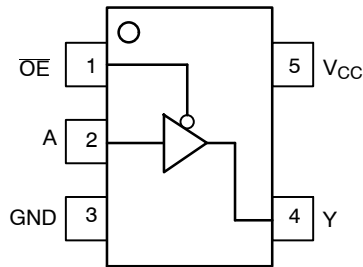


Figure 2. SC-88A  
(Top View)

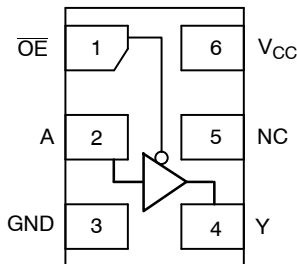


Figure 3. UDFN6  
(Top View)

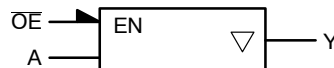


Figure 4. Logic Symbol

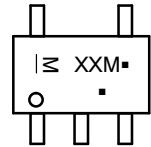
### PIN ASSIGNMENT

| Pin Number | SOT-953  | SC-88A   | UDFN6    |
|------------|----------|----------|----------|
| 1          | A        | OE       | OE       |
| 2          | GND      | A        | A        |
| 3          | OE       | GND      | GND      |
| 4          | Y        | Y        | Y        |
| 5          | $V_{CC}$ | $V_{CC}$ | NC       |
| 6          |          |          | $V_{CC}$ |

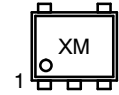
### MARKING DIAGRAMS



SC-88A  
DF SUFFIX  
CASE 419A



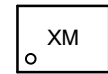
SOT-953  
CASE 527AE



UDFN6  
1.0 x 1.0  
CASE 517BX



UDFN6  
1.45 x 1.0  
CASE 517AQ



XX = Specific Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or position may vary depending upon manufacturing location.

### FUNCTION TABLE

| A Input | OE Input | Y Output |
|---------|----------|----------|
| L       | L        | L        |
| H       | L        | H        |
| X       | H        | Z        |

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

# NL17SG125

**Table 1. MAXIMUM RATINGS**

| Symbol                | Parameter  | Value  | Unit |
|-----------------------|--|--|------|
| $V_{CC}$              | DC Supply Voltage  | –0.5 to +4.3   | V    |
| $V_{IN}$              | DC Input Voltage   | –0.5 to +4.3   | V    |
| $V_{OUT}$             | DC Output Voltage<br>Active-Mode (High or Low State)<br>Tri-State Mode (Note 1)<br>Power-Down Mode ( $V_{CC} = 0$ V) | –0.5 to $V_{CC} + 0.5$<br>–0.5 to +4.3<br>–0.5 to +4.3 | V    |
| $I_{IK}$              | DC Input Diode Current<br>$V_{IN} < GND$   | –20  | mA   |
| $I_{OK}$              | DC Output Diode Current<br>$V_{OUT} < GND$   | –20  | mA   |
| $I_{OUT}$             | DC Output Source/Sink Current  | ±20  | mA   |
| $I_{CC}$ or $I_{GND}$ | DC Supply Current Per Supply Pin or Ground Pin   | ±20  | 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 (Note 2)<br>SC–88A<br>SOT–953<br>UDFN6  | 377<br>254<br>154                                      | °C/W |
| $P_D$                 | Power Dissipation in Still Air at 85°C<br>SC–88A<br>SOT–953<br>UDFN6   | 332<br>491<br>812                                      | mW   |
| MSL                   | Moisture Sensitivity   | Level 1  |      |
| $F_R$                 | Flammability Rating<br>Oxygen Index: 28 to 34  | UL 94 V–0 @ 0.125 in                                   |      |
| $V_{ESD}$             | ESD Withstand Voltage (Note 3)<br>Human Body Model<br>Charged Device Model   | 2000<br>1000   | V    |
| $I_{LATCHUP}$         | Latchup Performance (Note 4)   | ±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 EIA / JESD22–A114–A. CDM tested to JESD22–C101–A. JEDEC recommends that ESD qualification to EIA/JESD22–A115A (Machine Model) be discontinued.
4. Tested to EIA/JESD78 Class II.

**Table 2. RECOMMENDED OPERATING CONDITIONS**

| Symbol     | Parameter   | Min         | Max                    | Unit |
|------------|---|-------------|------------------------|------|
| $V_{CC}$   | Positive DC Supply Voltage  | 0.9         | 3.6                    | V    |
| $V_{IN}$   | Digital Input Voltage   | 0           | 3.6                    | V    |
| $V_{OUT}$  | Output Voltage<br>Active Mode (High or Low State)<br>Tri-State Mode (Note 1)<br>Power Down Mode ( $V_{CC} = 0$ V) | 0<br>0<br>0 | $V_{CC}$<br>3.6<br>3.6 | V    |
| $T_A$      | Operating Free-Air Temperature  | –55         | +125                   | °C   |
| $t_r, t_f$ | Input Transition Rise or Fall Rate<br>$V_{CC} = 3.3$ V ± 0.3 V  | 0           | 10                     | nS/V |

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.

Table 3. DC ELECTRICAL CHARACTERISTICS

| Symbol           | Parameter                      | Conditions   | V <sub>CC</sub> (V) | T <sub>A</sub> = 25°C  |                 |                        | T <sub>A</sub> = -55°C to +125°C |                        | Unit |
|------------------|--------------------------------|--|---------------------|------------------------|-----------------|------------------------|----------------------------------|------------------------|------|
|                  |                                |  |                     | Min                    | Typ             | Max                    | Min                              | Max                    |      |
| V <sub>IH</sub>  | High-Level Input Voltage       |  | 0.9                 | –                      | V <sub>CC</sub> | –                      | –                                | –                      | V    |
|                  |                                |  | 1.1 to 1.3          | 0.7 × V <sub>CC</sub>  | –               | –                      | 0.7 × V <sub>CC</sub>            | –                      |      |
|                  |                                |  | 1.4 to 1.6          | 0.65 × V <sub>CC</sub> | –               | –                      | 0.65 × V <sub>CC</sub>           | –                      |      |
|                  |                                |  | 1.65 to 1.95        | 0.65 × V <sub>CC</sub> | –               | –                      | 0.65 × V <sub>CC</sub>           | –                      |      |
|                  |                                |  | 2.3 to 2.7          | 1.7                    | –               | –                      | 1.7                              | –                      |      |
|                  |                                |  | 3.0 to 3.6          | 2.0                    | –               | –                      | 2.0                              | –                      |      |
| V <sub>IL</sub>  | Low-Level Input Voltage        |  | 0.9                 | –                      | GND             | –                      | –                                | –                      | V    |
|                  |                                |  | 1.1 to 1.3          | –                      | –               | 0.3 × V <sub>CC</sub>  | –                                | 0.3 × V <sub>CC</sub>  |      |
|                  |                                |  | 1.4 to 1.6          | –                      | –               | 0.35 × V <sub>CC</sub> | –                                | 0.35 × V <sub>CC</sub> |      |
|                  |                                |  | 1.65 to 1.95        | –                      | –               | 0.35 × V <sub>CC</sub> | –                                | 0.35 × V <sub>CC</sub> |      |
|                  |                                |  | 2.3 to 2.7          | –                      | –               | 0.7                    | –                                | 0.7                    |      |
|                  |                                |  | 3.0 to 3.6          | –                      | –               | 0.8                    | –                                | 0.8                    |      |
| V <sub>OH</sub>  | High-Level Output Voltage      | V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                 |                     |                        |                 |                        |                                  |                        | V    |
|                  |                                | I <sub>OH</sub> = -20 μA   | 0.9                 | –                      | 0.75            | –                      | –                                | –                      |      |
|                  |                                | I <sub>OH</sub> = -0.3 mA  | 1.1 to 1.3          | 0.75 × V <sub>CC</sub> | –               | –                      | 0.75 × V <sub>CC</sub>           | –                      |      |
|                  |                                | I <sub>OH</sub> = -1.7 mA  | 1.4 to 1.6          | 0.75 × V <sub>CC</sub> | –               | –                      | 0.75 × V <sub>CC</sub>           | –                      |      |
|                  |                                | I <sub>OH</sub> = -3.0 mA  | 1.65 to 1.95        | V <sub>CC</sub> - 0.45 | –               | –                      | V <sub>CC</sub> - 0.45           | –                      |      |
|                  |                                | I <sub>OH</sub> = -4.0 mA  | 2.3 to 2.7          | 2.0                    | –               | –                      | 2.0                              | –                      |      |
|                  |                                | I <sub>OH</sub> = -8.0 mA  | 3.0 to 3.6          | 2.48                   | –               | –                      | 2.48                             | –                      |      |
| V <sub>OL</sub>  | Low-Level Output Voltage       | V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                 |                     |                        |                 |                        |                                  |                        | V    |
|                  |                                | I <sub>OL</sub> = 20 μA  | 0.9                 | –                      | 0.1             | –                      | –                                | –                      |      |
|                  |                                | I <sub>OL</sub> = 0.3 mA   | 1.1 to 1.3          | –                      | –               | 0.25 × V <sub>CC</sub> | –                                | 0.25 × V <sub>CC</sub> |      |
|                  |                                | I <sub>OL</sub> = 1.7 mA   | 1.4 to 1.6          | –                      | –               | 0.25 × V <sub>CC</sub> | –                                | 0.25 × V <sub>CC</sub> |      |
|                  |                                | I <sub>OL</sub> = 3.0 mA   | 1.65 to 1.95        | –                      | –               | 0.45                   | –                                | 0.45                   |      |
|                  |                                | I <sub>OL</sub> = 4.0 mA   | 2.3 to 2.7          | –                      | –               | 0.4                    | –                                | 0.4                    |      |
|                  |                                | I <sub>OL</sub> = 8.0 mA   | 2.7 to 3.6          | –                      | –               | 0.4                    | –                                | 0.4                    |      |
| I <sub>IN</sub>  | Input Leakage Current          | V <sub>IN</sub> = 0 V to 3.6 V   | 0.9 to 3.6          | –                      | –               | ±0.1                   | –                                | ±1.0                   | μA   |
| I <sub>OFF</sub> | Power Off Leakage Current      | V <sub>IN</sub> = 0 V to 3.6 V;<br>V <sub>OUT</sub> = 0 V to 3.6 V                   | 0                   | –                      | –               | 1.0                    | –                                | 10.0                   | μA   |
| I <sub>CC</sub>  | Quiescent Supply Current       | V <sub>IN</sub> = V <sub>CC</sub> or GND   | 0.9 to 3.6          | –                      | –               | 1.0                    | –                                | 10.0                   | μA   |
| I <sub>OZ</sub>  | 3-State Output Leakage Current | V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>V <sub>OUT</sub> = 0 to 3.6V | 0.9 to 3.6          | –                      | –               | 1.0                    | –                                | 10.0                   | μA   |

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.

# NL17SG125

**Table 4. AC ELECTRICAL CHARACTERISTICS**

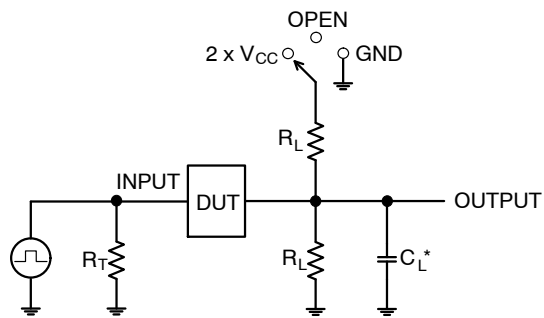
| Symbol                                 | Parameter                      | Test Condition   | V <sub>CC</sub> (V) | T <sub>A</sub> = 25 °C |      |      | T <sub>A</sub> = -55°C to +125°C |      | Unit |
|--|--------------------------------|--|---------------------|------------------------|------|------|----------------------------------|------|------|
|  |                                |  |                     | Min                    | Typ  | Max  | Min                              | Max  |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Propagation Delay,<br>A to Y   | C <sub>L</sub> = 10 pF,<br>R <sub>L</sub> = 1 MΩ   | 0.9                 | -                      | 44.4 | -    | -                                | -    | ns   |
|  |                                |  | 1.1 to 1.3          | -                      | 10.8 | 29.2 | -                                | 33.9 |      |
|  |                                |  | 1.4 to 1.6          | -                      | 5.0  | 8.5  | -                                | 10.0 |      |
|  |                                |  | 1.65 to 1.95        | -                      | 4.0  | 6.2  | -                                | 6.7  |      |
|  |                                |  | 2.3 to 2.7          | -                      | 2.6  | 3.9  | -                                | 4.4  |      |
|  |                                |  | 3.0 to 3.6          | -                      | 2.1  | 3.1  | -                                | 3.7  |      |
|  |                                | C <sub>L</sub> = 15 pF,<br>R <sub>L</sub> = 1 MΩ   | 0.9                 | -                      | 44.9 | -    | -                                | -    | ns   |
|  |                                |  | 1.1 to 1.3          | -                      | 11.0 | 29.9 | -                                | 34.7 |      |
|  |                                |  | 1.4 to 1.6          | -                      | 5.6  | 9.3  | -                                | 11.2 |      |
|  |                                |  | 1.65 to 1.95        | -                      | 4.5  | 6.9  | -                                | 7.1  |      |
|  |                                |  | 2.3 to 2.7          | -                      | 2.9  | 4.4  | -                                | 5.0  |      |
|  |                                |  | 3.0 to 3.6          | -                      | 2.4  | 3.4  | -                                | 3.9  |      |
|  |                                | C <sub>L</sub> = 30 pF,<br>R <sub>L</sub> = 1 MΩ   | 0.9                 | -                      | 46.2 | -    | -                                | -    | ns   |
|  |                                |  | 1.1 to 1.3          | -                      | 11.6 | 32.0 | -                                | 37.1 |      |
|  |                                |  | 1.4 to 1.6          | -                      | 8.2  | 13.1 | -                                | 15.9 |      |
|  |                                |  | 1.65 to 1.95        | -                      | 6    | 9.2  | -                                | 9.6  |      |
|  |                                |  | 2.3 to 2.7          | -                      | 4    | 5.7  | -                                | 6.1  |      |
|  |                                |  | 3.0 to 3.6          | -                      | 3.3  | 4.4  | -                                | 4.8  |      |
| t <sub>PZH</sub> ,<br>t <sub>PZL</sub> | Output Enable Time,<br>OE to Y | C <sub>L</sub> = 10 pF;<br>R <sub>L</sub> = 100 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ |                     |                        |      |      |                                  |      | ns   |
|  |                                |  | 0.9                 | -                      | 43.3 | -    | -                                | -    |      |
|  |                                |  | 1.1 to 1.3          | -                      | 10.5 | 29.0 | -                                | 33.7 |      |
|  |                                |  | 1.4 to 1.6          | -                      | 5.3  | 7.8  | -                                | 8.3  |      |
|  |                                |  | 1.65 to 1.95        | -                      | 3.9  | 5.5  | -                                | 5.9  |      |
|  |                                |  | 2.3 to 2.7          | -                      | 2.5  | 3.5  | -                                | 3.8  |      |
|  |                                |  | 3.0 to 3.6          | -                      | 2.1  | 2.7  | -                                | 3    |      |
|  |                                | C <sub>L</sub> = 15 pF;<br>R <sub>L</sub> = 100 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ |                     |                        |      |      |                                  |      | ns   |
|  |                                |  | 0.9                 | -                      | 43.8 | -    | -                                | -    |      |
|  |                                |  | 1.1 to 1.3          | -                      | 10.7 | 29.7 | -                                | 34.5 |      |
|  |                                |  | 1.4 to 1.6          | -                      | 5.9  | 8.9  | -                                | 11   |      |
|  |                                |  | 1.65 to 1.95        | -                      | 4.4  | 6.3  | -                                | 6.5  |      |
|  |                                |  | 2.3 to 2.7          | -                      | 2.9  | 3.9  | -                                | 4.2  |      |
|  |                                |  | 3.0 to 3.6          | -                      | 2.3  | 3    | -                                | 3.3  |      |
|  |                                | C <sub>L</sub> = 30 pF;<br>R <sub>L</sub> = 100 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ |                     |                        |      |      |                                  |      | ns   |
|  |                                |  | 0.9                 | -                      | 45.1 | -    | -                                | -    |      |
|  |                                |  | 1.1 to 1.3          | -                      | 11.2 | 31.8 | -                                | 36.9 |      |
|  |                                |  | 1.4 to 1.6          | -                      | 8.3  | 12.2 | -                                | 13.7 |      |
|  |                                |  | 1.65 to 1.95        | -                      | 6.1  | 8.6  | -                                | 9.7  |      |
|  |                                |  | 2.3 to 2.7          | -                      | 3.8  | 5    | -                                | 5.5  |      |
|  |                                |  | 3.0 to 3.6          | -                      | 2.9  | 3.8  | -                                | 4.2  |      |

Table 4. AC ELECTRICAL CHARACTERISTICS

| Symbol                                 | Parameter                              | Test Condition  | V <sub>CC</sub> (V) | T <sub>A</sub> = 25 °C |       |      | T <sub>A</sub> = -55°C to +125°C |      | Unit |
|--|--|---|---------------------|------------------------|-------|------|----------------------------------|------|------|
|  |  |   |                     | Min                    | Typ   | Max  | Min                              | Max  |      |
| t <sub>PHZ</sub> ,<br>t <sub>PLZ</sub> | Output Disable Time,<br>OE to Y        | C <sub>L</sub> = 10 pF;<br>R <sub>L</sub> = 100 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ |                     |                        |       |      |                                  |      | ns   |
|  |  |   | 0.9                 | -                      | 89.6  | -    | -                                | -    |      |
|  |  |   | 1.1 to 1.3          | -                      | 9.1   | 16.5 | -                                | 22.4 |      |
|  |  |   | 1.4 to 1.6          | -                      | 7.1   | 9.1  | -                                | 10.4 |      |
|  |  |   | 1.65 to 1.95        | -                      | 6.5   | 8.3  | -                                | 9    |      |
|  |  |   | 2.3 to 2.7          | -                      | 5.8   | 7.3  | -                                | 8.8  |      |
|  |  |   | 3.0 to 3.6          | -                      | 5.4   | 10.1 | -                                | 10.3 |      |
|  |  | C <sub>L</sub> = 15 pF;<br>R <sub>L</sub> = 100 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ |                     |                        |       |      |                                  |      | ns   |
|  |  |   | 0.9                 | -                      | 117.8 | -    | -                                | -    |      |
|  |  |   | 1.1 to 1.3          | -                      | 9.8   | 18.4 | -                                | 25.1 |      |
|  |  |   | 1.4 to 1.6          | -                      | 7.8   | 9.8  | -                                | 11.3 |      |
|  |  |   | 1.65 to 1.95        | -                      | 7.2   | 9.2  | -                                | 10.6 |      |
|  |  |   | 2.3 to 2.7          | -                      | 7     | 8.2  | -                                | 10.3 |      |
|  |  |   | 3.0 to 3.6          | -                      | 6.6   | 11.1 | -                                | 11.3 |      |
|  |  | C <sub>L</sub> = 30 pF;<br>R <sub>L</sub> = 100 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ<br>R <sub>L</sub> = 5 kΩ |                     |                        |       |      |                                  |      | ns   |
|  |  |   | 0.9                 | -                      | 202.1 | -    | -                                | -    |      |
|  |  |   | 1.1 to 1.3          | -                      | 13.2  | 24.3 | -                                | 31.9 |      |
|  |  |   | 1.4 to 1.6          | -                      | 12.2  | 13.5 | -                                | 14.9 |      |
|  |  |   | 1.65 to 1.95        | -                      | 11.4  | 12.7 | -                                | 13.9 |      |
|  |  |   | 2.3 to 2.7          | -                      | 11.3  | 12.2 | -                                | 13.5 |      |
|  |  |   | 3.0 to 3.6          | -                      | 10.2  | 14.8 | -                                | 15.1 |      |
| C <sub>IN</sub>                        | Input Capacitance                      |   | 0 to 3.6            |                        | 3     | -    | -                                | -    | pF   |
| C <sub>O</sub>                         | Output Capacitance                     | V <sub>O</sub> = GND  | 0                   |                        | 3     | -    | -                                | -    | pF   |
| C <sub>PD</sub>                        | Power Dissipation Capacitance (Note 5) | f = 10 MHz  | 0.9 to 3.6          | -                      | 4     | -    | -                                | -    | pF   |

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.

5. C<sub>PD</sub> 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<sub>CC(OPR)</sub> = C<sub>PD</sub> • V<sub>CC</sub> • f<sub>in</sub> + I<sub>CC</sub>. C<sub>PD</sub> is used to determine the no-load dynamic power consumption; P<sub>D</sub> = C<sub>PD</sub> • V<sub>CC</sub><sup>2</sup> • f<sub>in</sub> + I<sub>CC</sub> • V<sub>CC</sub>.



$C_L$  includes probe and jig capacitance  
 $R_T$  is  $Z_{OUT}$  of pulse generator (typically 50  $\Omega$ )  
 $f = 1$  MHz

Figure 5. Test Circuit

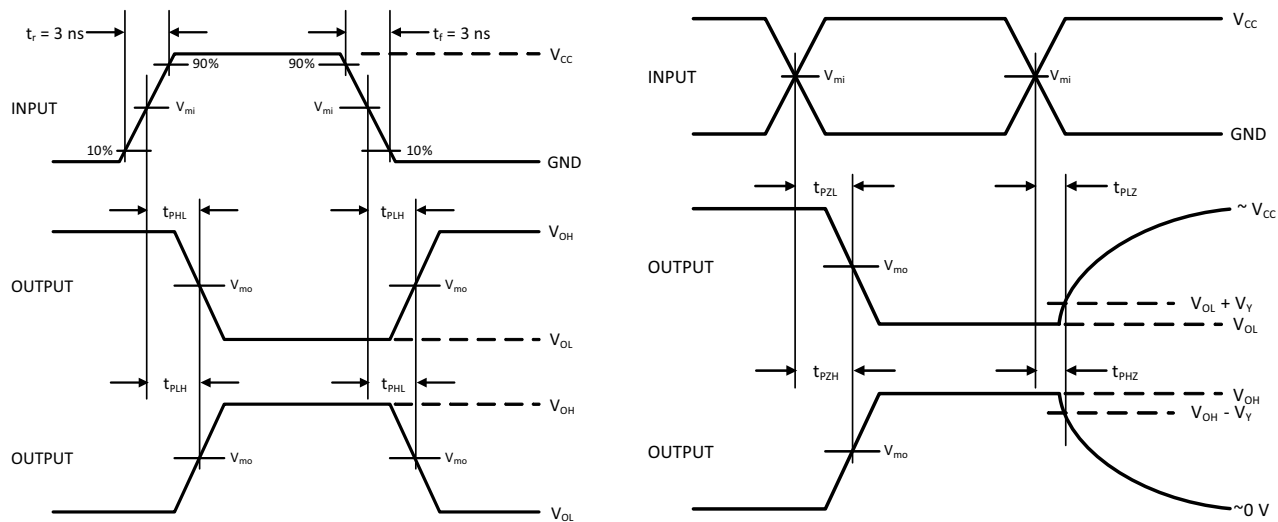


Figure 6. Switching Waveforms

| $V_{CC}, V$  | $V_{mi}, V$ | $V_{mo}, V$ | $V_Y, V$ |
|--------------|-------------|-------------|----------|
| 0.9          | $V_{CC}/2$  | $V_{CC}/2$  | 0.1      |
| 1.1 to 1.3   | $V_{CC}/2$  | $V_{CC}/2$  | 0.1      |
| 1.4 to 1.6   | $V_{CC}/2$  | $V_{CC}/2$  | 0.1      |
| 1.65 to 1.95 | $V_{CC}/2$  | $V_{CC}/2$  | 0.15     |
| 2.3 to 2.7   | $V_{CC}/2$  | $V_{CC}/2$  | 0.15     |
| 3.0 to 3.6   | 1.5         | 1.5         | 0.3      |

# NL17SG125

## ORDERING INFORMATION

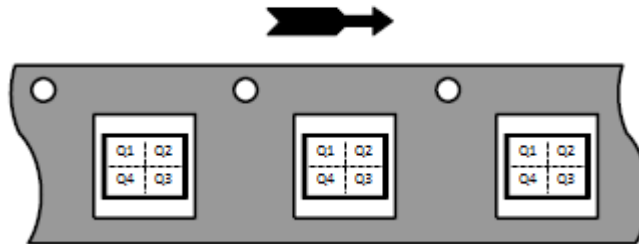
| Device                                      | Marking           | Pin 1 Orientation<br>(See below) | Package           | Shipping <sup>†</sup> |
|---|-------------------|----------------------------------|-------------------|-----------------------|
| NL17SG125DFT2G                              | A4                | Q4                               | SC-88A            | 3000 / Tape & Reel    |
| NL17SG125P5T5G                              | F (Rotated 90°CW) | Q2                               | SOT-953           | 8000 / Tape & Reel    |
| NL17SG125MU1TCG<br>(Contact <b>onsemi</b> ) | TBD               | Q4                               | UDFN6 1.45 x 1 mm | 3000 / Tape & Reel    |
| NL17SG125MU3TCG<br>(Contact <b>onsemi</b> ) | TBD               | Q4                               | UDFN6 1 x 1 mm    | 3000 / Tape & Reel    |

<sup>†</sup>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.

\*-Q Suffix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

## PIN 1 ORIENTATION IN TAPE AND REEL

Direction of Feed

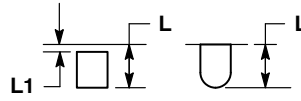
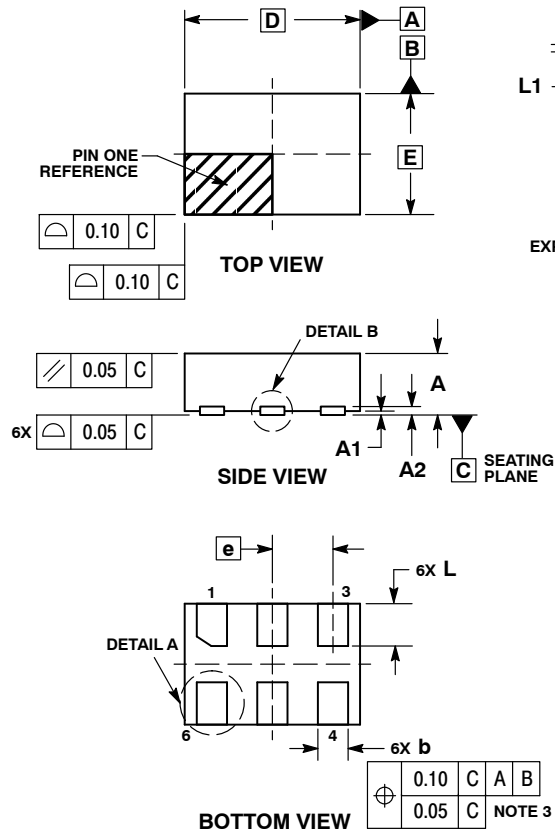


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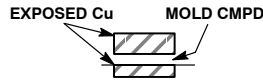
# NL17SG125

## PACKAGE DIMENSIONS

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



**DETAIL A**  
OPTIONAL  
CONSTRUCTIONS



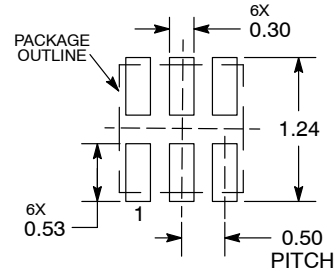
**DETAIL B**  
OPTIONAL  
CONSTRUCTIONS

### 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 0.30 mm FROM THE TERMINAL TIP.

| MILLIMETERS |          |      |
|-------------|----------|------|
| DIM         | MIN      | MAX  |
| A           | 0.45     | 0.55 |
| A1          | 0.00     | 0.05 |
| A2          | 0.07 REF |      |
| b           | 0.20     | 0.30 |
| D           | 1.45 BSC |      |
| E           | 1.00 BSC |      |
| e           | 0.50 BSC |      |
| L           | 0.30     | 0.40 |
| L1          | ---      | 0.15 |

### MOUNTING FOOTPRINT



DIMENSIONS: MILLIMETERS

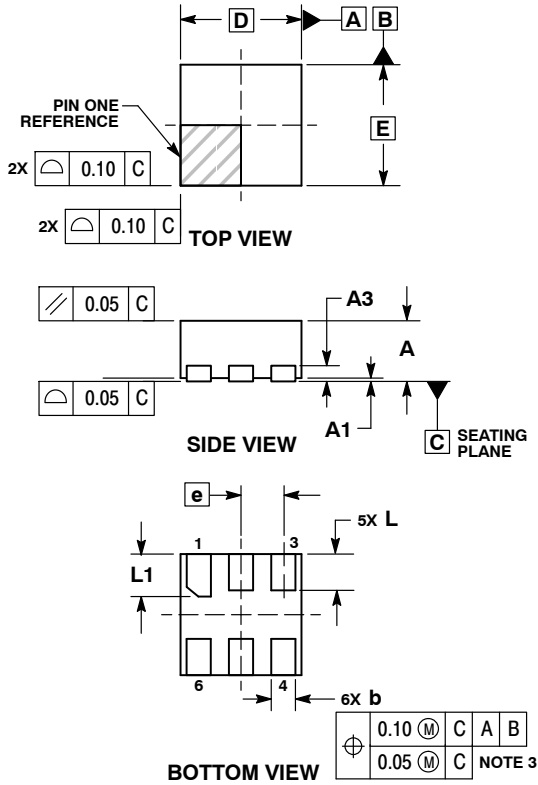
\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



# NL17SG125

## PACKAGE DIMENSIONS

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

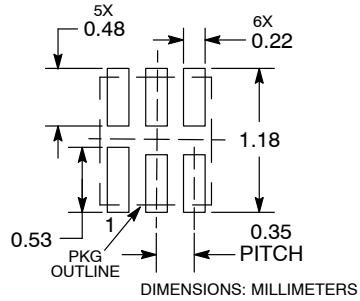


### NOTES:

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 0.20 MM FROM TERMINAL TIP.
4. PACKAGE DIMENSIONS EXCLUSIVE OF BURRS AND MOLD FLASH.

| MILLIMETERS |          |      |
|-------------|----------|------|
| DIM         | MIN      | MAX  |
| A           | 0.45     | 0.55 |
| A1          | 0.00     | 0.05 |
| A3          | 0.13 REF |      |
| b           | 0.12     | 0.22 |
| D           | 1.00 BSC |      |
| E           | 1.00 BSC |      |
| e           | 0.35 BSC |      |
| L           | 0.25     | 0.35 |
| L1          | 0.30     | 0.40 |

### RECOMMENDED SOLDERING FOOTPRINT\*



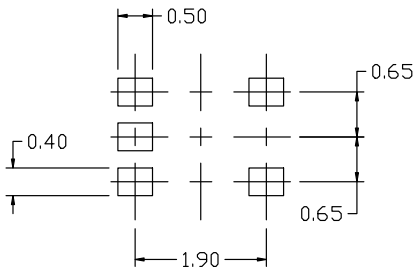
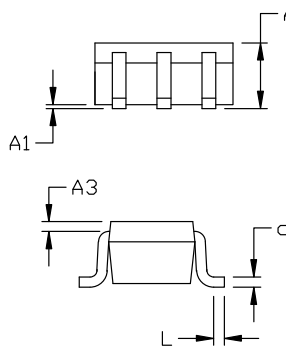
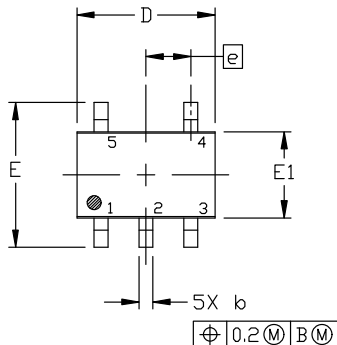
\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



SCALE 2:1

SC-88A (SC-70-5/SOT-353)  
CASE 419A-02  
ISSUE M

DATE 11 APR 2023



RECOMMENDED  
MOUNTING FOOTPRINT

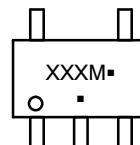
\* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. 419A-01 OBSOLETE. NEW STANDARD 419A-02
4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.1016MM PER SIDE.

| DIM | MILLIMETERS |      |      |
|-----|-------------|------|------|
|     | MIN.        | NOM. | MAX. |
| A   | 0.80        | 0.95 | 1.10 |
| A1  | ---         | ---  | 0.10 |
| A3  | 0.20 REF    |      |      |
| b   | 0.10        | 0.20 | 0.30 |
| c   | 0.10        | ---  | 0.25 |
| D   | 1.80        | 2.00 | 2.20 |
| E   | 2.00        | 2.10 | 2.20 |
| E1  | 1.15        | 1.25 | 1.35 |
| e   | 0.65 BSC    |      |      |
| L   | 0.10        | 0.15 | 0.30 |

GENERIC MARKING  
DIAGRAM\*



\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

XXX = Specific Device Code

M = Date Code

▪ = Pb-Free Package

(Note: Microdot may be in either location)

STYLE 1:

- PIN 1. BASE
2. EMITTER
3. BASE
4. COLLECTOR
5. COLLECTOR

STYLE 2:

- PIN 1. ANODE
2. EMITTER
3. BASE
4. COLLECTOR
5. CATHODE

STYLE 3:

- PIN 1. ANODE 1
2. N/C
3. ANODE 2
4. CATHODE 2
5. CATHODE 1

STYLE 4:

- PIN 1. SOURCE 1
2. DRAIN 1/2
3. SOURCE 1
4. GATE 1
5. GATE 2

STYLE 5:

- PIN 1. CATHODE
2. COMMON ANODE
3. CATHODE 2
4. CATHODE 3
5. CATHODE 4

STYLE 6:

- PIN 1. EMITTER 2
2. BASE 2
3. EMITTER 1
4. COLLECTOR
5. COLLECTOR 2/BASE 1

STYLE 7:

- PIN 1. BASE
2. EMITTER
3. BASE
4. COLLECTOR
5. COLLECTOR

STYLE 8:

- PIN 1. CATHODE
2. COLLECTOR
3. N/C
4. BASE
5. EMITTER

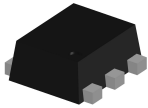
STYLE 9:

- PIN 1. ANODE
2. CATHODE
3. ANODE
4. ANODE
5. ANODE

Note: Please refer to datasheet for style callout. If style type is not called out in the datasheet refer to the device datasheet pinout or pin assignment.

|                  |                          |  |
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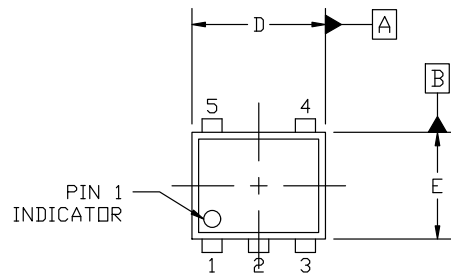
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**SOT-953 1.00x0.80x0.37, 0.35P**  
**CASE 527AE**  
**ISSUE F**

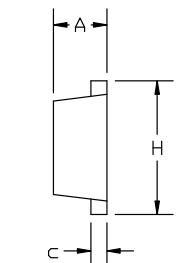
DATE 17 JAN 2024

## NOTES:

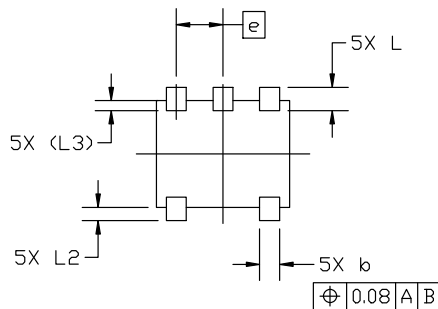
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.



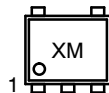
TOP VIEW



SIDE VIEW



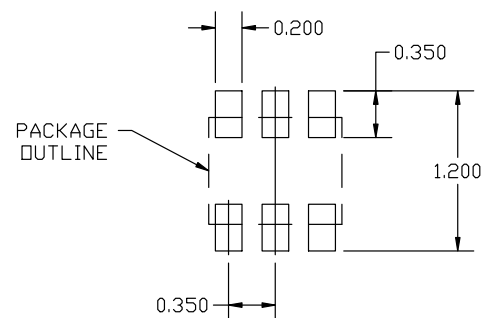
BOTTOM VIEW

**GENERIC**  
**MARKING DIAGRAM\***

X = Specific Device Code  
M = Month Code

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

## 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    |       |       |
| H   | 0.95        | 1.00  | 1.05  |
| L   | 0.125       | 0.175 | 0.225 |
| L2  | 0.05        | 0.10  | 0.15  |
| L3  | 0.075 (REF) |       |       |


**RECOMMENDED MOUNTING**  
**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.

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