

Automotive High Performance Logic Gates

NLV18SZxx, NLV28WZxx

The NLV18SZxx are automotive-grade High Performance single CMOS logic gates. The NLV28WZxx are automotive-grade high Performance Dual CMOS logic gates.

Features

- High Speed: $t_{PD} = 3.7$ ns (Typ) at $V_{CC} = 3.0$ V
- Low Power Dissipation: $I_{CC} = 1$ μ A (Max) at $T_A = 25^\circ$ C
- High Noise Immunity
- Balanced Propagation Delays ($t_{PLH} = t_{PHL}$)
- Symmetrical Output Impedance ($I_{OH} = I_{OL} = 24$ mA @ $V_{CC} = 3.0$ V)
- Operating Temperature: -55° C to $+125^\circ$ C
AEC Grade 1-Compliant: -40° C to $+125^\circ$ C
- Tiny SC-88A and SC-88 Packages (other package offerings may be available upon request)
- AEC-Q100 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and RoHS Compliant

FUNCTION LIST

| xx | Function |
|-----|--------------------------|
| 00 | 2-Input NAND |
| 02 | 2-Input NOR |
| 04 | Inverter |
| 06 | Open-Drain Inverter |
| 07 | Open-Drain Buffer |
| 08 | 2-Input AND |
| 14 | Schmitt-Trigger Inverter |
| 17 | Schmitt-Trigger Buffer |
| 32 | 2-Input OR |
| 16 | Buffer |
| 86 | 2-Input XOR |
| 125 | Tri-State Buffer |
| 126 | Tri-State Buffer |
| U04 | Unbuffered Inverter |



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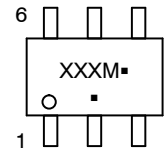
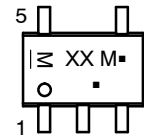


SC-88A
DF SUFFIX
CASE 419A



SC-88
CASE 419B

MARKING DIAGRAM



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

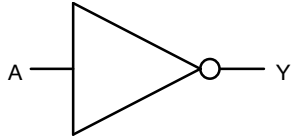
(Note: Microdot may be in either location)

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

ORDERING INFORMATION

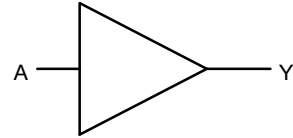
See detailed ordering and shipping information on page 9 of this data sheet.

Functions and Function Tables – Buffers and Inverters



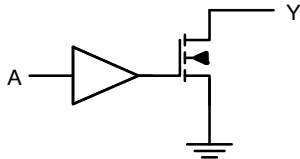
04 – Inverter
U04 – Unbuffered Inverter

| A | Y |
|---|---|
| 0 | 1 |
| 1 | 0 |



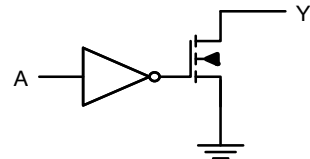
16 – Buffer

| A | Y |
|---|---|
| 0 | 0 |
| 1 | 1 |



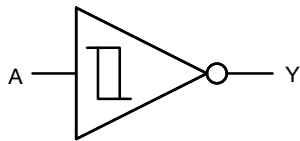
06 – Open-Drain Inverter

| A | Y |
|---|------|
| 0 | Hi-Z |
| 1 | 0 |



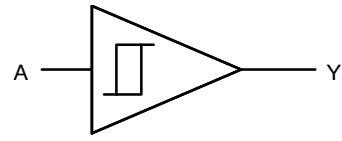
07 – Open-Drain Buffer

| A | Y |
|---|------|
| 0 | 0 |
| 1 | Hi-Z |



14 – Schmitt-Trigger Inverter

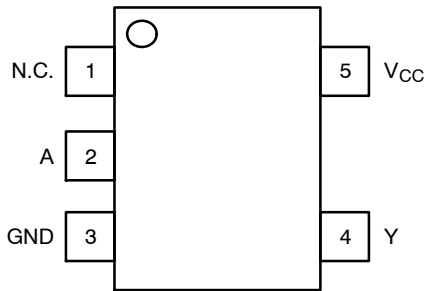
| A | Y |
|---|---|
| 0 | 1 |
| 1 | 0 |



17 – Schmitt-Trigger Buffer

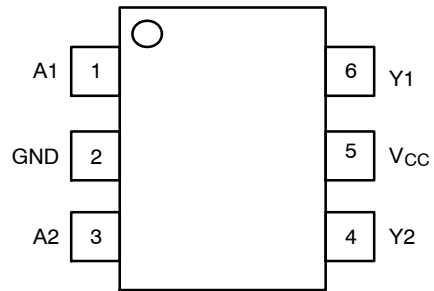
| A | Y |
|---|---|
| 0 | 0 |
| 1 | 1 |

Pin Assignment



Pinout (Buffers and Inverters)

| Pin | Name | Description |
|-----|-----------------|---------------|
| 1 | N.C. | No Connection |
| 2 | A | Input |
| 3 | GND | Ground |
| 4 | Y | Output |
| 5 | V _{CC} | Supply |

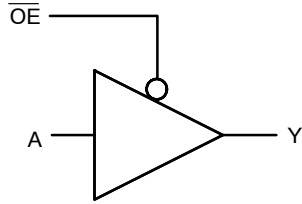


Pinout (Buffers and Inverters)

| Pin | Name | Description |
|-----|-----------------|-------------|
| 1 | A1 | Input 1 |
| 2 | GND | Ground |
| 3 | A2 | Input 2 |
| 4 | Y | Output 2 |
| 5 | V _{CC} | Supply |
| 6 | Y1 | Output 1 |

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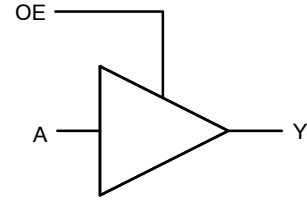
Functions and Function Tables – Tri-State Buffers and Bus Drivers



125 - Tri-State Buffer

| OE | A | Y |
|----|---|------|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | X | Hi-Z |

X = Don't Care

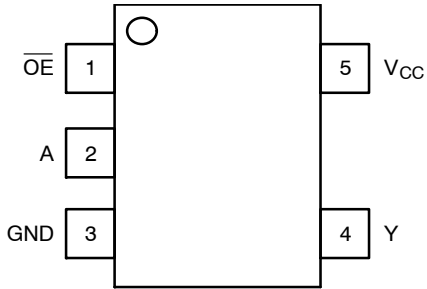


126 - Tri-State Buffer

| OE | A | Y |
|----|---|------|
| 0 | X | Hi-Z |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

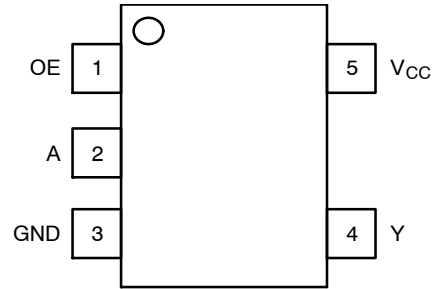
X = Don't Care

Pin Assignments



Pinout (125)

| Pin | Name | Description |
|-----|-----------------|---------------------|
| 1 | OE | Enable (Active-Low) |
| 2 | A | Input |
| 3 | GND | Ground |
| 4 | Y | Output |
| 5 | V _{CC} | Supply |

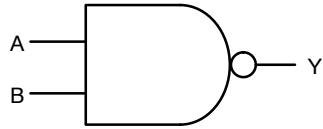


Pinout (126)

| Pin | Name | Description |
|-----|-----------------|----------------------|
| 1 | OE | Enable (Active-High) |
| 2 | A | Input |
| 3 | GND | Ground |
| 4 | Y | Output |
| 5 | V _{CC} | Supply |

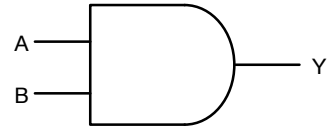
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Functions and Function Tables – Gates



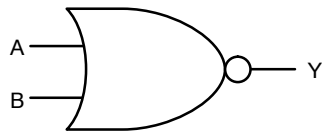
00 - NAND

| A | B | Y |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |



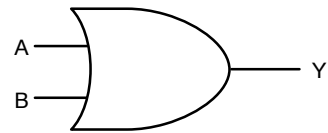
08 - AND

| A | B | Y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |



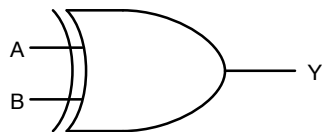
02 - NOR

| A | B | Y |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |



32 - OR

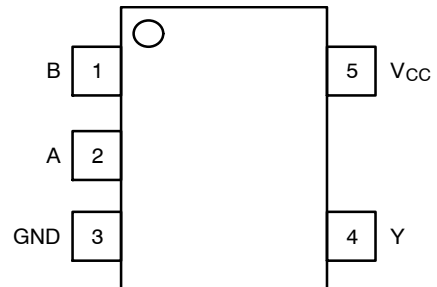
| A | B | Y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |



86 - XOR

| A | B | Y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

Pin Assignment



Pinout (Gates)

| Pin | Name | Description |
|-----|-----------------|-------------|
| 1 | B | Input |
| 2 | A | Input |
| 3 | GND | Ground |
| 4 | Y | Output |
| 5 | V _{CC} | Supply |

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Table 1. MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-------------------------------------|--|--|------|
| V _{CC} | DC Supply Voltage | -0.5 to +6.5 | V |
| V _{IN} | DC Input Voltage | -0.5 to +6.5 | V |
| V _{OUT} | DC Output Voltage (U04) | -0.5 to V _{CC} +0.5 | V |
| | DC Output Voltage (Other functions) Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode (V _{CC} = 0 V) | -0.5 to V _{CC} +0.5 -0.5 to +6.5 -0.5 to +6.5 | |
| I _{IK} | DC Input Diode Current | -50 | mA |
| I _{OK} | DC Output Diode Current | -50 | mA |
| I _{OUT} | DC Output Source/Sink Current | ±50 | mA |
| I _{CC} or I _{GND} | DC Supply Current Per Supply Pin or Ground 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 |
| θ _{JA} | Thermal Resistance (Note 2) | 659 | °C/W |
| P _D | Power Dissipation in Still Air at 85°C | 190 | mW |
| MSL | Moisture Sensitivity | Level 1 | |
| F _R | Flammability Rating Oxygen Index: 28 to 34 | UL 94 V-0 @ 0.125 in | |
| V _{ESD} | ESD Withstand Voltage (Note 3) Human Body Model Charged Device Model | 2000 | V |
| | | 1000 | |
| 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, 20 ounce copper trace with no air flow.
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 | 1.65 | 5.5 | V | |
| V _{IN} | Digital Input Voltage | 0 | 5.5 | V | |
| V _{OUT} | DC Output Voltage (U04) | 0 | V _{CC} | V | |
| | DC Output Voltage (Other functions) Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode (V _{CC} = 0 V) | 0 0 0 | V _{CC} 5.5 5.5 | | |
| T _A | Operating Free-Air Temperature | -55 | +125 | °C | |
| t _r , t _f | Input Transition Rise or Fall Rate | | | ns/V | |
| | Functions 14 and 17 | 0 | No Limit | | |
| | All Other Functions | V _{CC} = 1.65 V to 1.95 V | 0 | | 20 |
| | | V _{CC} = 2.3 V to 2.7 V | 0 | | 20 |
| | | V _{CC} = 3.0 V to 3.6 V | 0 | | 10 |
| V _{CC} = 4.5 V to 5.5 V | | 0 | 5 | | |

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.

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Table 3. DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | V _{CC} (V) | T _A = 25°C | | | -55°C ≤ T _A ≤ 125°C | | Units |
|----------------------------|----------------------------------|-----------|------------------------|-----------------------|------|------|--------------------------------|------|-------|
| | | | | Min | Typ | Max | Min | Max | |
| Functions 14 and 17 | | | | | | | | | |
| V _{T+} | Positive Input Threshold Voltage | | 1.65 | - | 1.0 | 1.4 | - | 1.4 | V |
| | | | 2.3 | - | 1.5 | 1.8 | - | 1.8 | |
| | | | 2.7 | - | 1.7 | 2.0 | - | 2.0 | |
| | | | 3.0 | - | 1.9 | 2.2 | - | 2.2 | |
| | | | 4.5 | - | 2.7 | 3.1 | - | 3.1 | |
| | | | 5.5 | - | 3.3 | 3.6 | - | 3.6 | |
| V _{T-} | Negative Input Threshold Voltage | | 1.65 | 0.2 | 0.5 | - | 0.2 | - | V |
| | | | 2.3 | 0.4 | 0.75 | - | 0.4 | - | |
| | | | 2.7 | 0.5 | 0.87 | - | 0.5 | - | |
| | | | 3.0 | 0.6 | 1.0 | - | 0.6 | - | |
| | | | 4.5 | 1.0 | 1.5 | - | 1.0 | - | |
| | | | 5.5 | 1.2 | 1.9 | - | 1.2 | - | |
| V _H | Input Hysteresis Voltage | | 1.65 | 0.1 | 0.48 | 0.9 | 0.1 | 0.9 | V |
| | | | 2.3 | 0.25 | 0.75 | 1.1 | 0.25 | 1.1 | |
| | | | 2.7 | 0.3 | 0.83 | 1.15 | 0.3 | 1.15 | |
| | | | 3.0 | 0.4 | 0.93 | 1.2 | 0.4 | 1.2 | |
| | | | 4.5 | 0.6 | 1.2 | 1.5 | 0.6 | 1.5 | |
| | | | 5.5 | 0.7 | 1.4 | 1.7 | 0.7 | 1.7 | |

Function U04 (Under Development)

| | | | | | | | | | |
|-----------------|--------------------------|--|--------------|----------------------|---|----------------------|----------------------|----------------------|---|
| V _{IH} | High-Level Input Voltage | | 1.65 to 1.95 | 0.85 V _{CC} | - | - | 0.85 V _{CC} | - | V |
| | | | 2.3 to 5.5 | 0.80 V _{CC} | - | - | 0.80 V _{CC} | - | |
| V _{IL} | Low-Level Input Voltage | | 1.65 to 1.95 | - | - | 0.15 V _{CC} | - | 0.15 V _{CC} | V |
| | | | 2.3 to 5.5 | - | - | 0.20 V _{CC} | - | 0.20 V _{CC} | |

ALL OTHER FUNCTIONS

| | | | | | | | | | |
|-----------------|--------------------------|--|--------------|----------------------|---|----------------------|----------------------|----------------------|---|
| V _{IH} | High-Level Input Voltage | | 1.65 to 1.95 | 0.65 V _{CC} | - | - | 0.65 V _{CC} | - | V |
| | | | 2.3 to 5.5 | 0.70 V _{CC} | - | - | 0.70 V _{CC} | - | |
| V _{IL} | Low-Level Input Voltage | | 1.65 to 1.95 | - | - | 0.35 V _{CC} | - | 0.35 V _{CC} | V |
| | | | 2.3 to 5.5 | - | - | 0.30 V _{CC} | - | 0.30 V _{CC} | |

ALL FUNCTIONS (Unless otherwise indicated)

| | | | | | | | | | |
|-----------------|--------------------------------|---|-------------|-----------------------|-----------------|------|-----------------------|------|----|
| V _{OH} | High-Level Output Voltage | V _{IN} = V _{IH} or V _{IL} I _{OH} = -100 μA I _{OH} = -4 mA I _{OH} = -8 mA I _{OH} = -12 mA I _{OH} = -16 mA I _{OH} = -24 mA I _{OH} = -32 mA | 1.65 to 5.5 | V _{CC} - 0.1 | V _{CC} | - | V _{CC} - 0.1 | - | V |
| | | | 1.65 | 1.29 | 1.4 | - | 1.29 | - | |
| | | | 2.3 | 1.9 | 2.1 | - | 1.9 | - | |
| | | | 2.7 | 2.2 | 2.4 | - | 2.2 | - | |
| | | | 3.0 | 2.4 | 2.7 | - | 2.4 | - | |
| | | | 3.0 | 2.3 | 2.5 | - | 2.3 | - | |
| | | | 4.5 | 3.8 | 4.0 | - | 3.8 | - | |
| V _{OL} | Low-Level Output Voltage | V _{IN} = V _{IH} or V _{IL} I _{OL} = 100 μA I _{OL} = 4 mA I _{OL} = 8 mA I _{OL} = 12 mA I _{OL} = 16 mA I _{OL} = 24 mA I _{OL} = 32 mA | 1.65 to 5.5 | - | - | 0.1 | - | 0.1 | V |
| | | | 1.65 | - | 0.08 | 0.24 | - | 0.24 | |
| | | | 2.3 | - | 0.2 | 0.3 | - | 0.3 | |
| | | | 2.7 | - | 0.22 | 0.4 | - | 0.4 | |
| | | | 3.0 | - | 0.28 | 0.4 | - | 0.4 | |
| | | | 3.0 | - | 0.38 | 0.55 | - | 0.55 | |
| | | | 4.5 | - | 0.42 | 0.55 | - | 0.55 | |
| I _{IN} | Input Leakage Current | V _{IN} = 5.5 V or GND | 1.65 to 5.5 | - | - | ±0.1 | - | ±1.0 | μA |
| I _{OZ} | 3-State Output Leakage Current | V _{OUT} = 0 V to 5.5 V | 1.65 to 5.5 | - | - | ±0.5 | - | ±5.0 | μA |

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Table 3. DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | V _{CC} (V) | T _A = 25°C | | | -55°C ≤ T _A ≤ 125°C | | Units |
|---|---|---|------------------------|-----------------------|-----|-----|--------------------------------|-----|-------|
| | | | | Min | Typ | Max | Min | Max | |
| ALL FUNCTIONS (Unless otherwise indicated) | | | | | | | | | |
| I _{OFF} | Power Off Leakage Current (except function U04) | V _{IN} = 5.5 V or V _{OUT} = 5.5 V | 0 | - | - | 1.0 | - | 10 | μA |
| I _{OFF} | Power Off Leakage Current (Function U04 only) | V _{IN} = 5.5 V | 0 | - | - | 1.0 | - | 10 | μA |
| I _{CC} | Quiescent Supply Current | V _{IN} = V _{CC} or GND | 5.5 | - | - | 1.0 | - | 10 | 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.

5. The V_{OH} parameter does not apply to devices with open-drain output, NLV18SZ06, NLV18SZ07, NLV18SZT05 and NLV18SZT07.

Table 4. AC ELECTRICAL CHARACTERISTICS (t_R = t_F = 3.0 ns)

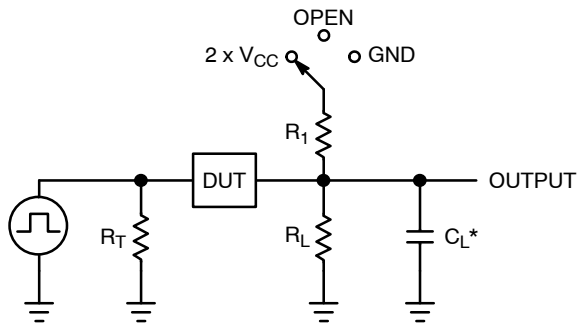
| Symbol | Parameter | Condition | V _{CC} (V) | T _A = 25°C | | | -55°C ≤ T _A ≤ 125°C | | Units |
|--------------------------------------|---|--|------------------------|-----------------------|-----|-----|--------------------------------|------|-------|
| | | | | Min | Typ | Max | Min | Max | |
| t _{PLH} t _{PHL} | Propagation Delay, (A or B) to Y (Figures 1 and 2) | R _L = 1 MΩ, C _L = 15 pF | 1.65 to 1.95 | - | 9.1 | 15 | - | 15.6 | ns |
| | | R _L = 1 MΩ, C _L = 15 pF | 2.3 to 2.7 | - | 5.0 | 9.0 | - | 9.5 | |
| | | R _L = 1 MΩ, C _L = 15 pF | 3.0 to 3.6 | - | 3.7 | 6.3 | - | 6.5 | |
| | | R _L = 500 Ω, C _L = 50 pF | | - | 4.4 | 7.2 | - | 7.5 | |
| | | R _L = 1 MΩ, C _L = 15 pF | 4.5 to 5.5 | - | 3.1 | 5.2 | - | 5.5 | |
| | | R _L = 500 Ω, C _L = 50 pF | | - | 3.7 | 5.9 | - | 6.2 | |
| t _{PZH} t _{PZL} | Output Enable Time, (A or OE or OE) to Y (Figures 1 and 2) | | 1.65 to 1.95 | - | 6.5 | 9.5 | - | 10 | ns |
| | | | 2.3 to 2.7 | - | 3.6 | 8.5 | - | 9.0 | |
| | | | 3.0 to 3.6 | - | 2.8 | 6.2 | - | 6.5 | |
| | | | 4.5 to 5.5 | - | 2.0 | 5.5 | - | 5.8 | |
| t _{PHZ} t _{PLZ} | Output Disable Time, (A or OE or OE) to Y (Figures 1 and 2) | | 1.65 to 1.95 | - | 5.0 | 10 | - | 10.5 | ns |
| | | | 2.3 to 2.7 | - | 3.3 | 8.0 | - | 8.5 | |
| | | | 3.0 to 3.6 | - | 2.7 | 5.7 | - | 6.0 | |
| | | | 4.5 to 5.5 | | 2.6 | 4.7 | - | 5.0 | |

Table 5. CAPACITIVE CHARACTERISTICS (t_R = t_F = 3.0 ns)

| Symbol | Parameter | Condition | Typical | Units |
|------------------|--|---|---------|-------|
| C _{IN} | Input Capacitance | V _{CC} = 5.5 V, V _{IN} = 0 V or V _{CC} | 2.5 | pF |
| C _{OUT} | Output Capacitance | V _{CC} = 5.5 V, V _{IN} = 0 V or V _{CC} | 2.5 | pF |
| C _{PD} | Power Dissipation Capacitance (Note 6) | 10 MHz, V _{CC} = 3.3 V, V _{IN} = 0 V or V _{CC} | 9 | pF |
| | | 10 MHz, V _{CC} = 5.5 V, V _{IN} = 0 V or V _{CC} | 11 | |

6. 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} • V_{CC} • f_{in} + I_{CC}. C_{PD} is used to determine the no-load dynamic power consumption; P_D = C_{PD} • V_{CC}² • f_{in} + I_{CC} • V_{CC}.

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

Figure 1. Test Circuit

| Test | Switch Position | C_L , pF | R_L , Ω | R_1 , Ω |
|---------------------|-------------------|------------------------------|------------------|------------------|
| t_{PLH} / t_{PHL} | Open | See AC Characteristics Table | | |
| t_{PLZ} / t_{PZL} | $2 \times V_{CC}$ | 50 | 500 | 500 |
| t_{PHZ} / t_{PZH} | GND | 50 | 500 | 500 |

X = Don't Care

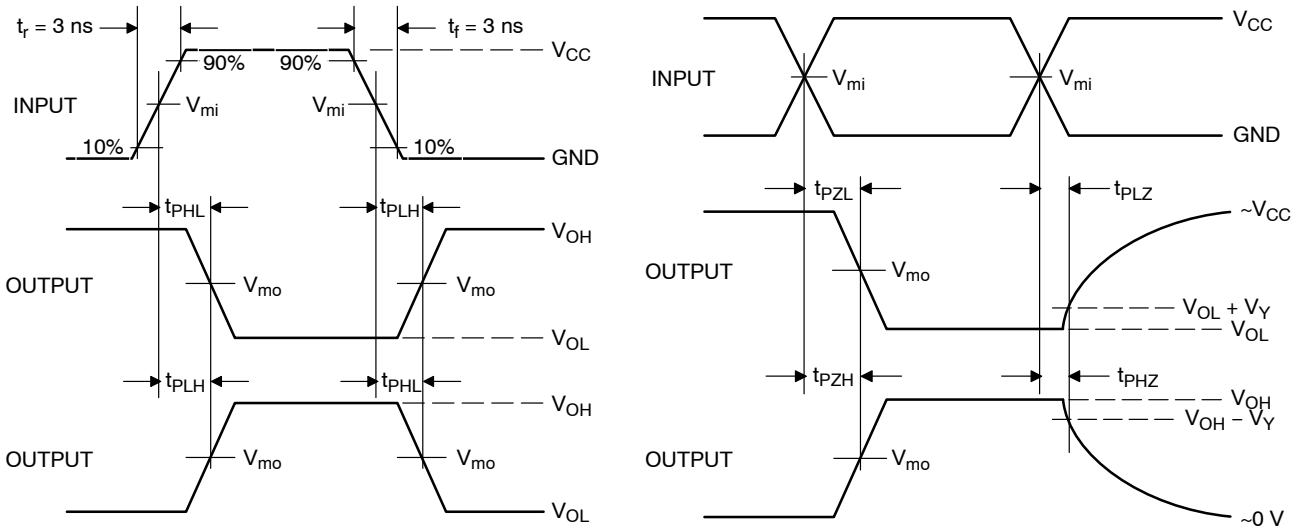


Figure 2. Switching Waveforms

| V_{CC} , V | V_{mi} , V | V_{mo} , V | | V_Y , V |
|--------------|--------------|-----------------------|---|-----------|
| | | t_{PLH} , t_{PHL} | t_{PZL} , t_{PLZ} , t_{PZH} , t_{PHZ} | |
| 1.65 to 1.95 | $V_{CC}/2$ | $(V_{OH} - V_{OL})/2$ | $V_{CC}/2$ | 0.15 |
| 2.3 to 2.7 | $V_{CC}/2$ | $(V_{OH} - V_{OL})/2$ | $V_{CC}/2$ | 0.15 |
| 3.0 to 3.6 | $V_{CC}/2$ | $(V_{OH} - V_{OL})/2$ | $V_{CC}/2$ | 0.3 |
| 4.5 to 5.5 | $V_{CC}/2$ | $(V_{OH} - V_{OL})/2$ | $V_{CC}/2$ | 0.3 |

NLV18SZxx, NLV28WZxx

ORDERING INFORMATION

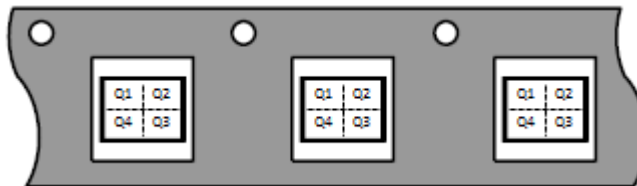
| Device | Package | Marking | Pin 1 Orientation (See below) | Shipping† |
|----------------------------------|---------|---------|----------------------------------|--------------------|
| NLV18SZ00DFT2G | SC-88A | L1 | Q4 | 3000 / Tape & Reel |
| NLV18SZ02DFT2G | SC-88A | L3 | Q4 | 3000 / Tape & Reel |
| NLV18SZ04DFT2G | SC-88A | L5 | Q4 | 3000 / Tape & Reel |
| NLV18SZ06DFT2G (in development) | SC-88A | LF | Q4 | 3000 / Tape & Reel |
| NLV18SZ07DFT2G | SC-88A | L7 | Q4 | 3000 / Tape & Reel |
| NLV18SZ08DFT2G | SC-88A | L2 | Q4 | 3000 / Tape & Reel |
| NLV18SZ14DFT2G | SC-88A | LA | Q4 | 3000 / Tape & Reel |
| NLV18SZ17DFT2G | SC-88A | LX | Q4 | 3000 / Tape & Reel |
| NLV18SZ32DFT2G | SC-88A | L4 | Q4 | 3000 / Tape & Reel |
| NLV18SZ16DFT2G (in development) | SC-88A | LR | Q4 | 3000 / Tape & Reel |
| NLV18SZ86DFT2G (in development) | SC-88A | L8 | Q4 | 3000 / Tape & Reel |
| NLV18SZ125DFT2G | SC-88A | M0 | Q4 | 3000 / Tape & Reel |
| NLV18SZ126DFT2G (in development) | SC-88A | M2 | Q4 | 3000 / Tape & Reel |
| NLV18SZU04DFT2G (in development) | SC-88A | L6 | Q4 | 3000 / Tape & Reel |
| NLV28WZ16DFT2G | SC-88 | MR | Q4 | 3000 / Tape & Reel |
| NLV28WZU04DFT2G | SC-88 | M6 | Q4 | 3000 / 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.

*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

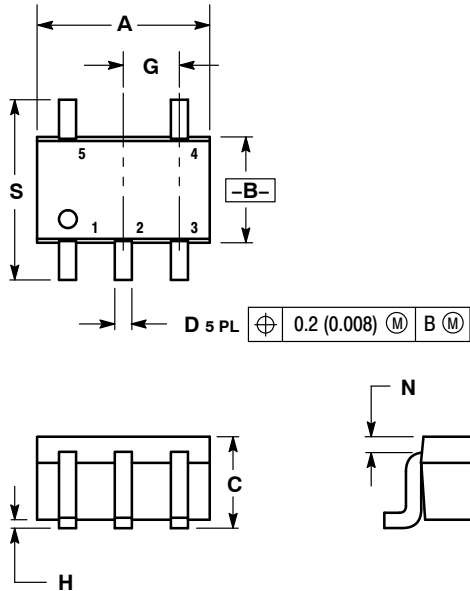
Direction of Feed



NLV18SZxx, NLV28WZxx

PACKAGE DIMENSIONS

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

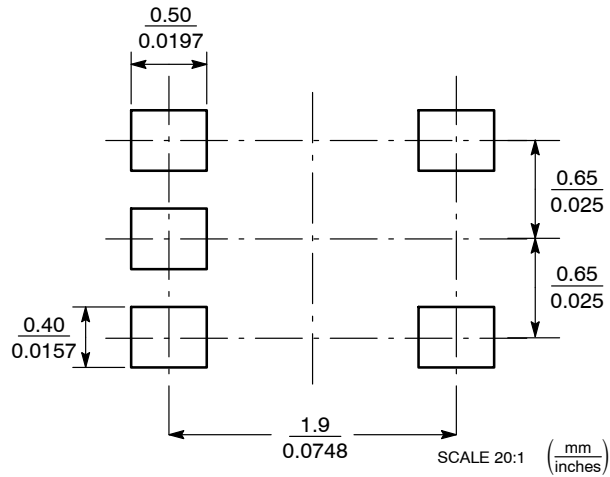


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A-01 OBSOLETE. NEW STANDARD 419A-02.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE 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 | |
| S | 0.079 | 0.087 | 2.00 | 2.20 |

SOLDER FOOTPRINT




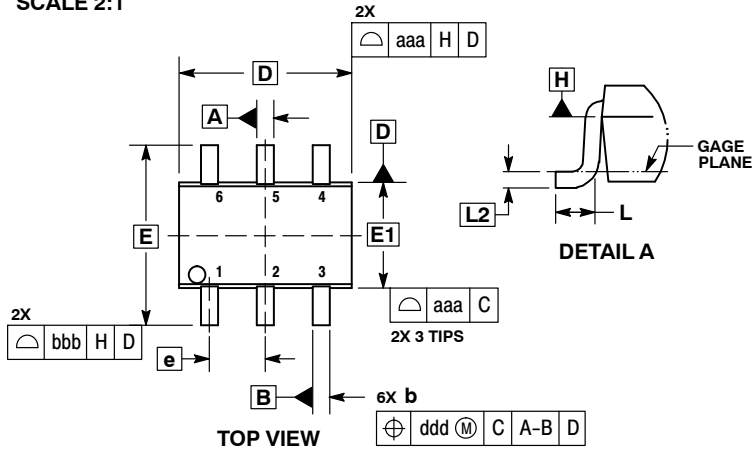
NLV18SZxx, NLV28WZxx

PACKAGE DIMENSIONS

SC-88/SC70-6/SOT-363
CASE 419B-02
ISSUE Y

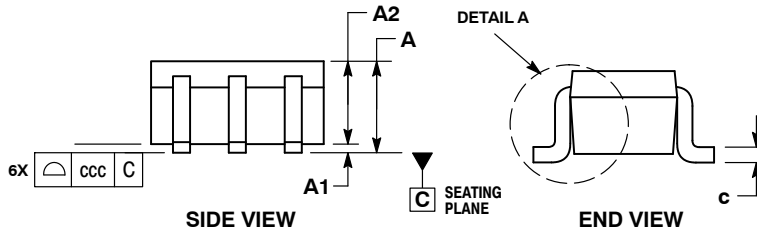
DATE 11 DEC 2012


1
SCALE 2:1

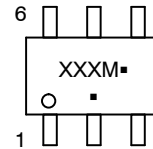


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 PER END.
 4. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AND DATUM H.
 5. DATUMS A AND B ARE DETERMINED AT DATUM H.
 6. DIMENSIONS b AND c APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP.
 7. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION b AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|-----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | --- | --- | 1.10 | --- | --- | 0.043 |
| A1 | 0.00 | --- | 0.10 | 0.000 | --- | 0.004 |
| A2 | 0.70 | 0.90 | 1.00 | 0.027 | 0.035 | 0.039 |
| b | 0.15 | 0.20 | 0.25 | 0.006 | 0.008 | 0.010 |
| C | 0.08 | 0.15 | 0.22 | 0.003 | 0.006 | 0.009 |
| D | 1.80 | 2.00 | 2.20 | 0.070 | 0.078 | 0.086 |
| E | 2.00 | 2.10 | 2.20 | 0.078 | 0.082 | 0.086 |
| E1 | 1.15 | 1.25 | 1.35 | 0.045 | 0.049 | 0.053 |
| e | 0.65 BSC | | | 0.026 BSC | | |
| L | 0.26 | 0.36 | 0.46 | 0.010 | 0.014 | 0.018 |
| L2 | 0.15 BSC | | | 0.006 BSC | | |
| aaa | 0.15 | | | 0.006 | | |
| bbb | 0.30 | | | 0.012 | | |
| ccc | 0.10 | | | 0.004 | | |
| ddd | 0.10 | | | 0.004 | | |



GENERIC MARKING DIAGRAM*



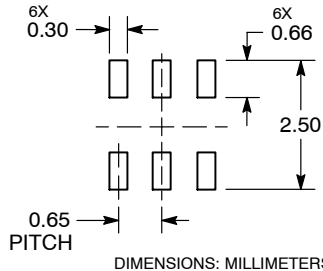
XXX = Specific Device Code
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)


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

*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.

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.

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