

NLV18HC1Gxx, NLV18HC1GTxx

Automotive High Speed Logic Gates

The NLV18HC1Gxx and NLV18HC1GTxx are automotive-grade High-Speed CMOS logic gates.

The NLV18HC1Gxx devices have CMOS input voltage levels while the NLV18HC1GTxx devices have TTL input voltage levels.

Features

- High Speed: $t_{PD} = 7 \text{ ns}$ (Typ) at $V_{CC} = 6 \text{ V}$
- Low Power Dissipation: $I_{CC} = 1 \mu\text{A}$ (Max) at $T_A = 25^\circ\text{C}$
- High Noise Immunity
- Balanced Propagation Delays ($t_{PLH} = t_{PHL}$)
- Symmetrical Output Impedance ($I_{OH} = I_{OL} = 2 \text{ mA}$)
- Operating Temperature: -55°C to $+125^\circ\text{C}$
AEC Grade 1-Compliant: -40°C to $+125^\circ\text{C}$
- Tiny SC-88A Package (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 |
| 05 | Open-Drain Inverter |
| 07 | Open-Drain Buffer |
| 08 | 2-Input AND |
| 14 | Schmitt-Trigger Inverter |
| 17 | Schmitt-Trigger Buffer |
| 32 | 2-Input OR |
| 34 | Buffer |
| 86 | 2-Input XOR |
| 125 | Tri-State Buffer |
| 126 | Tri-State Buffer |
| U04 | Unbuffered Inverter |



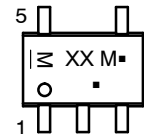
ON Semiconductor®

www.onsemi.com



**SC-88A
DF SUFFIX
CASE 419A**

MARKING DIAGRAM



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

(Note: Microdot may be in either location)

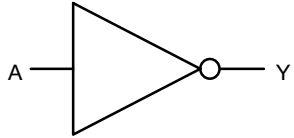
*Date Code orientation and/or position may vary depending upon manufacturing location.

ORDERING INFORMATION

See detailed ordering and shipping information on page 10 of this data sheet.

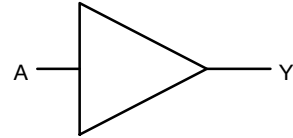
NLV18HC1Gxx, NLV18HC1GTxx

Functions and Function Tables – Buffers and Inverters



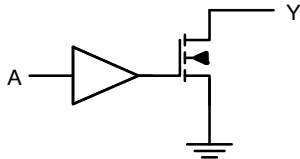
04 – Inverter
U04 – Unbuffered Inverter

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



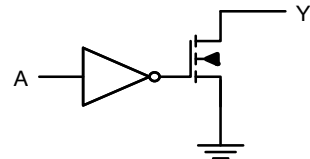
34 – Buffer

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



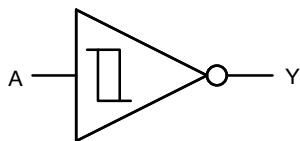
05 – Open-Drain Inverter

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



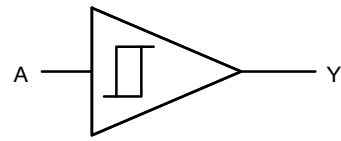
07 – Open-Drain Buffer

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



14 – Schmitt-Trigger Inverter

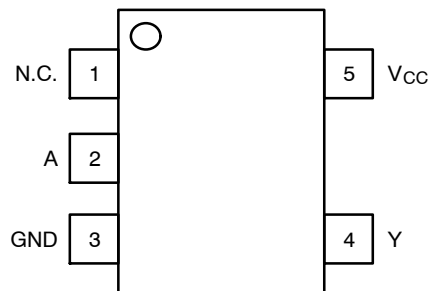
| A | Y |
|---|---|
| 0 | 1 |
| 1 | 0 |



17 – Schmitt-Trigger Buffer

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

Pin Assignment

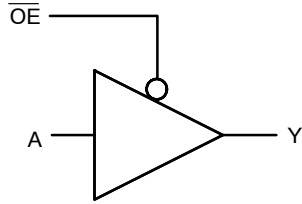


Pinout (Buffers and Inverters)

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

NLV18HC1Gxx, NLV18HC1GTxx

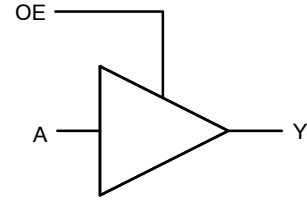
Functions and Function Tables – Tri-State Buffers and Bus Drivers



125 – Tri-State Buffer

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

X = Don't Care

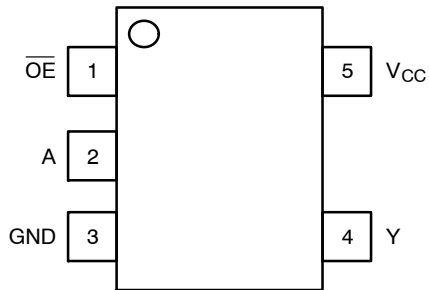


126 – Tri-State Buffer

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

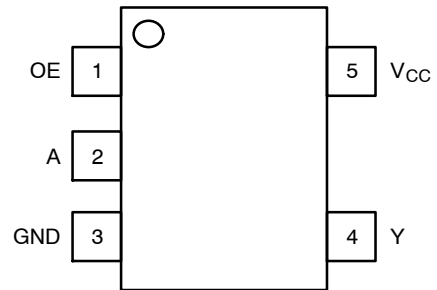
X = Don't Care

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 |

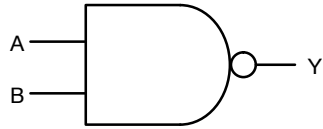


Pinout (126)

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

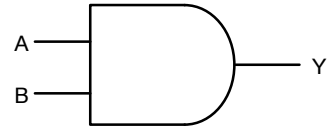
NLV18HC1Gxx, NLV18HC1GTxx

Functions and Function Tables – Gates



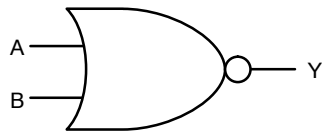
00 - NAND

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



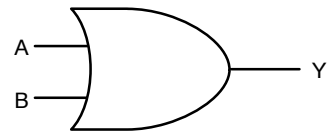
08 - AND

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



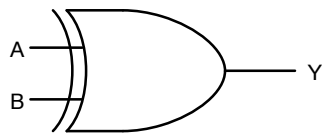
02 - NOR

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



32 - OR

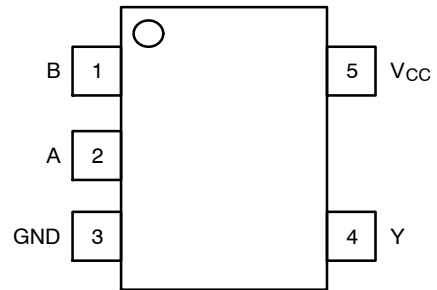
| A | B | Y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |



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 |

NLV18HC1Gxx, NLV18HC1GTxx

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 V _{CC} +0.5 | V | |
| V _{OUT} | DC Output Voltage | -0.5 to V _{CC} +0.5 | V | |
| I _{IK} | DC Input Diode Current | ±20 | mA | |
| I _{OK} | DC Output Diode Current | ±20 | mA | |
| I _{OUT} | DC Output Source/Sink Current | ±12.5 | mA | |
| I _{CC} or I _{GND} | DC Supply Current Per Supply Pin or Ground Pin | ±25 | 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 1) | 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 2) | Human Body Model Charged Device Model | 2000 1000 | V |
| I _{LATCHUP} | Latchup Performance (Note 3) | ±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. Measured with minimum pad spacing on an FR4 board, using 10 mm-by-1 inch, 20 ounce copper trace with no air flow.
2. 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.
3. Tested to EIA/JESD78 Class II.

Table 2. RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Max | Unit | |
|----------------------------------|------------------------------------|------------------------------------|-----------------|------|----|
| V _{CC} | Positive DC Supply Voltage | NLV18HC1Gxx | 2.0 | 6.0 | V |
| | | NLV18HC1GTxx | 4.5 | 5.5 | |
| V _{IN} | Digital Input Voltage | 0 | V _{CC} | V | |
| V _{OUT} | Output Voltage | 0 | V _{CC} | V | |
| 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.

NLV18HC1Gxx, NLV18HC1GTxx

Table 3. DC ELECTRICAL CHARACTERISTICS (NLV18HC1Gxx)

| Symbol | Parameter | Conditions | V _{CC} (V) | T _A = 25°C | | | T _A = -40°C to 85°C | | T _A = -55°C to +125°C | | Unit |
|---|----------------------------|--|---------------------|-----------------------|------|------|--------------------------------|------|----------------------------------|------|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| NLV18HC1G14 and NLV18HC1G17 | | | | | | | | | | | |
| V _{T+} | Positive-Going Threshold | | 2.0 | - | 1.29 | 1.5 | - | 1.5 | - | 1.5 | V |
| | | | 3.0 | - | 1.91 | 2.20 | - | 2.20 | - | 2.20 | |
| | | | 4.5 | - | 2.77 | 3.15 | - | 3.15 | - | 3.15 | |
| | | | 5.5 | - | 3.37 | 3.85 | - | 3.85 | - | 3.85 | |
| V _{T-} | Negative-Going Threshold | | 2.0 | 0.5 | 0.75 | - | 0.5 | - | 0.5 | - | V |
| | | | 3.0 | 0.9 | 1.2 | - | 0.9 | - | 0.9 | - | |
| | | | 4.5 | 1.35 | 1.91 | - | 1.35 | - | 1.35 | - | |
| | | | 5.5 | 1.65 | 2.38 | - | 1.65 | - | 1.65 | - | |
| V _H | Hysteresis Voltage | | 2.0 | 0.2 | 0.55 | 1.0 | 0.2 | 1.0 | 0.2 | 1.0 | V |
| | | | 3.0 | 0.3 | 0.7 | 1.2 | 0.3 | 1.2 | 0.3 | 1.2 | |
| | | | 4.5 | 0.4 | 0.86 | 1.4 | 0.4 | 1.4 | 0.4 | 1.4 | |
| | | | 5.5 | 0.5 | 0.98 | 1.6 | 0.5 | 1.6 | 0.5 | 1.6 | |
| NLV18HC1GU04 (Under Development) | | | | | | | | | | | |
| V _{IH} | High- Level Input Voltage | | 2.0 | TBD | - | - | TBD | - | TBD | - | V |
| | | | 3.0 | TBD | - | - | TBD | - | TBD | - | |
| | | | 4.5 | TBD | - | - | TBD | - | TBD | - | |
| | | | 6.0 | TBD | - | - | TBD | - | TBD | - | |
| V _{IL} | Low- Level Input Voltage | | 2.0 | - | - | TBD | - | TBD | - | TBD | V |
| | | | 3.0 | - | - | TBD | - | TBD | - | TBD | |
| | | | 4.5 | - | - | TBD | - | TBD | - | TBD | |
| | | | 6.0 | - | - | TBD | - | TBD | - | TBD | |
| ALL OTHER PARTS | | | | | | | | | | | |
| V _{IH} | High- Level Input Voltage | | 2.0 | 1.5 | - | - | 1.5 | - | 1.5 | - | V |
| | | | 3.0 | 2.1 | - | - | 2.1 | - | 2.1 | - | |
| | | | 4.5 | 3.15 | - | - | 3.15 | - | 3.15 | - | |
| | | | 6.0 | 4.20 | - | - | 4.20 | - | 4.20 | - | |
| V _{IL} | Low- Level Input Voltage | | 2.0 | - | - | 0.5 | - | 0.5 | - | 0.5 | V |
| | | | 3.0 | - | - | 0.9 | - | 0.9 | - | 0.9 | |
| | | | 4.5 | - | - | 1.35 | - | 1.35 | - | 1.35 | |
| | | | 6.0 | - | - | 1.80 | - | 1.80 | - | 1.80 | |
| ALL PARTS | | | | | | | | | | | |
| V _{OH} (Note 4) | High- Level Output Voltage | V _{IN} = V _{IH} (V _{T+}) or V _{IL} (V _{T-}) I _{OH} = -20 μA | 2.0 | 1.9 | 2.0 | - | 1.9 | - | 1.9 | - | V |
| | | | 3.0 | 2.9 | 3.0 | - | 2.9 | - | 2.9 | - | |
| | | | 4.5 | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | |
| | | | 6.0 | 5.9 | 6.0 | - | 5.9 | - | 5.9 | - | |
| | | V _{IN} = V _{IH} (V _{T+}) or V _{IL} (V _{T-}) I _{OH} = -2 mA I _{OH} = -2.6 mA | 4.5 | 4.18 | 4.31 | - | 4.13 | - | 4.08 | - | |
| | | | 6.0 | 5.68 | 5.80 | - | 5.63 | - | 5.58 | - | |

NLV18HC1Gxx, NLV18HC1GTxx

Table 3. DC ELECTRICAL CHARACTERISTICS (NLV18HC1Gxx)

| Symbol | Parameter | Conditions | V _{CC} (V) | T _A = 25°C | | | T _A = -40°C to 85°C | | T _A = -55°C to +125°C | | Unit |
|------------------|---------------------------|--|---------------------|-----------------------|------|------|--------------------------------|------|----------------------------------|------|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| ALL PARTS | | | | | | | | | | | |
| V _{OL} | Low- Level Output Voltage | V _{IN} = V _{IH} (V _{T+}) or V _{IL} (V _{T-}) I _{OL} = 20 μA | 2.0 | - | 0.0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | | 3.0 | - | 0.0 | 0.1 | - | 0.1 | - | 0.1 | |
| | | | 4.5 | - | 0.0 | 0.1 | - | 0.1 | - | 0.1 | |
| | | | 6.0 | - | 0.0 | 0.1 | - | 0.1 | - | 0.1 | |
| | | V _{IN} = V _{IH} (V _{T+}) or V _{IL} (V _{T-}) I _{OL} = 2 mA I _{OL} = 2.6 mA | 4.5 | - | 0.17 | 0.26 | - | 0.33 | - | 0.40 | |
| | | | 6.0 | - | 0.18 | 0.26 | - | 0.33 | - | 0.40 | |
| I _{IN} | Input Leakage Current | V _{IN} = 6.0 V or GND | 6.0 | - | - | ±0.1 | - | ±1.0 | - | ±1.0 | μA |
| I _{CC} | Quiescent Supply Current | V _{IN} = V _{CC} or GND | 6.0 | - | - | 1.0 | - | 10 | - | 40 | 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.

4. The V_{OH} parameter does not apply to devices with open-drain output, NLV18HC1G05, NLV18HC1G07, NLV18HC1GT05 and NLV18HC1GT07.

Table 4. DC ELECTRICAL CHARACTERISTICS (NLV18HC1GTxx)

| Symbol | Parameter | Conditions | V _{CC} (V) | T _A = 25 °C | | | T _A = -40°C to 85°C | | T _A = -55°C to +125°C | | Unit |
|--------------------------------------|-------------------------------------|---|---------------------|------------------------|------|------|--------------------------------|------|----------------------------------|------|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| NLV18HC1GT14 and NLV18HC1GT17 | | | | | | | | | | | |
| V _{T+} | Positive-Going Threshold | | 4.5 | - | 1.64 | 2.0 | - | 2.0 | - | 2.0 | V |
| | | | 5.5 | - | 1.85 | 2.1 | - | 2.1 | - | 2.1 | |
| V _{T-} | Negative-Going Threshold | | 4.5 | 0.5 | 1.0 | - | 0.5 | - | 0.5 | - | V |
| | | | 5.5 | 0.6 | 1.14 | - | 0.6 | - | 0.6 | - | |
| V _H | Hysteresis Voltage | | 4.5 | 0.4 | 0.64 | 1.4 | 0.4 | 1.4 | 0.4 | 1.4 | V |
| | | | 5.5 | 0.5 | 0.71 | 1.6 | 0.5 | 1.6 | 0.5 | 1.6 | |
| ALL OTHER PARTS | | | | | | | | | | | |
| V _{IH} | High- Level Input Voltage | | 4.5 – 5.5 | 2.0 | - | - | 2.0 | - | 2.0 | - | V |
| V _{IL} | Low- Level Input Voltage | | 4.5 – 5.5 | - | - | 0.8 | - | 0.8 | - | 0.8 | V |
| ALL PARTS | | | | | | | | | | | |
| V _{OH} (Note 4) | High- Level Output Voltage | V _{IN} = V _{IH} (V _{T+}) or V _{IL} (V _{T-}) I _{OH} = -20 μA I _{OH} = -2 mA | | | | | | | | | V |
| | | | 4.5 | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | |
| | | | 4.5 | 4.18 | 4.32 | - | 4.13 | - | 4.08 | - | |
| V _{OL} | Low- Level Output Voltage | V _{IN} = V _{IH} (V _{T+}) or V _{IL} (V _{T-}) I _{OL} = 20 μA I _{OL} = 2 mA | | | | | | | | | V |
| | | | 4.5 | - | 0.0 | 0.1 | - | 0.1 | - | 0.1 | |
| | | | 4.5 | - | 0.17 | 0.26 | - | 0.33 | - | 0.40 | |
| I _{IN} | Input Leakage Current | V _{IN} = V _{CC} or GND | 5.5 | - | - | ±0.1 | - | ±1.0 | - | ±1.0 | μA |
| I _{CC} | Quiescent Supply Current | V _{IN} = V _{CC} or GND; I _O = 0 A | 5.5 | - | - | 1.0 | - | 10 | - | 40 | μA |
| ΔI _{CC} | Additional Supply Current per Input | V _{IN} = V _{CC} - 2.1 V; I _O = 0 A; Other input at V _{CC} or GND | 4.5 – 5.5 | - | - | 1.0 | - | 1.5 | - | 1.65 | mA |

NLV18HC1Gxx, NLV18HC1GTxx

Table 5. AC ELECTRICAL CHARACTERISTICS (NLV18HC1Gxx) (Input $t_r = t_f = 6.0$ nS)

| Symbol | Parameter | Test Conditions | V_{CC} (V) | $T_A = 25^\circ\text{C}$ | | | $T_A = -40^\circ\text{C}$ to 85°C | | $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$ | | Unit | |
|--------------------------------|------------------------------------|-----------------|---------------|--------------------------|-----|-----|---|-----|---|-----|------|-----|
| | | | | Min | Typ | Max | Min | Max | Min | Max | | |
| t_{PLH} , t_{PHL} | Propagation Delay, (A or B) to Y | $C_L = 15$ pF | 5.0 | – | 3.5 | 15 | – | 20 | – | 25 | ns | |
| | | | $C_L = 50$ pF | 2.0 | – | 20 | 100 | – | 125 | – | | 155 |
| | | | | 3.0 | – | 11 | 27 | – | 35 | – | | 90 |
| | | | | 4.5 | – | 8 | 20 | – | 25 | – | | 35 |
| | | | | 6.0 | – | 7 | 17 | – | 21 | – | | 26 |
| t_{TLH} , t_{THL} | Output Transition Time | $C_L = 15$ pF | 5.0 | – | 3 | 10 | – | 15 | – | 20 | ns | |
| | | | $C_L = 50$ pF | 2.0 | – | 25 | 125 | – | 155 | – | | 200 |
| | | | | 3.0 | – | 16 | 35 | – | 45 | – | | 60 |
| | | | | 4.5 | – | 11 | 25 | – | 31 | – | | 38 |
| | | | | 6.0 | – | 9 | 21 | – | 26 | – | | 32 |
| t_{PZH} , t_{PZL} (Note 5) | Enable Time, (A or OE or OE) to Y | $C_L = 50$ pF | 2.0 | – | 19 | TBD | – | 155 | – | 190 | ns | |
| | | | 3.0 | – | TBD | TBD | – | TBD | – | TBD | | |
| | | | 4.5 | – | 9 | TBD | – | 31 | – | 38 | | |
| | | | 6.0 | – | 7 | TBD | – | 26 | – | 32 | | |
| t_{PHZ} , t_{PLZ} (Note 5) | Disable Time, (A or OE or OE) to Y | $C_L = 50$ pF | 2.0 | – | 19 | TBD | – | 155 | – | 190 | ns | |
| | | | 3.0 | – | TBD | TBD | – | TBD | – | TBD | | |
| | | | 4.5 | – | 9 | TBD | – | 31 | – | 38 | | |
| | | | 6.0 | – | 7 | TBD | – | 26 | – | 32 | | |
| C_{IN} | Input Capacitance | | | – | 5 | 10 | – | 10 | – | 10 | pF | |

5. These parameters apply only to devices where the output may be tri-stated. These specifications are still under development.

Table 6. AC ELECTRICAL CHARACTERISTICS (NLV18HC1GTxx) (Input $t_r = t_f = 6.0$ nS)

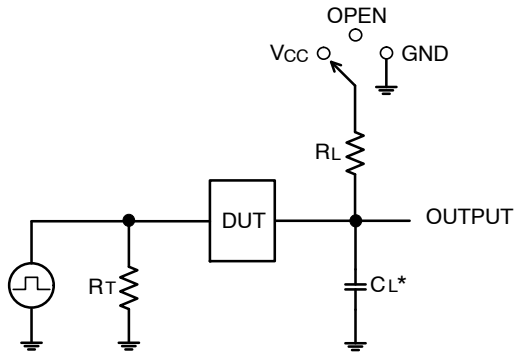
| Symbol | Parameter | Test Conditions | V_{CC} (V) | $T_A = 25^\circ\text{C}$ | | | $T_A = -40^\circ\text{C}$ to 85°C | | $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$ | | Unit |
|--------------------------------|------------------------------------|-----------------|--------------|--------------------------|-----|-----|---|-----|---|-----|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| t_{PLH} , t_{PHL} | Propagation Delay, (A or B) to Y | $C_L = 15$ pF | 5.0 | – | 3.5 | 15 | – | 20 | – | 25 | ns |
| | | $C_L = 50$ pF | 4.5 | – | 8 | 20 | – | 25 | – | 35 | |
| t_{TLH} , t_{THL} | Output Transition Time | $C_L = 15$ pF | 5.0 | – | 3 | 10 | – | 15 | – | 20 | ns |
| | | $C_L = 50$ pF | 4.5 | – | 11 | 25 | – | 31 | – | 38 | |
| t_{PZH} , t_{PZL} (Note 5) | Enable Time, (A or OE or OE) to Y | $C_L = 50$ pF | 4.5 | – | 9 | TBD | – | 31 | – | 38 | ns |
| t_{PHZ} , t_{PLZ} (Note 5) | Disable Time, (A or OE or OE) to Y | $C_L = 50$ pF | 4.5 | – | 9 | TBD | – | 31 | – | 38 | ns |

Table 7. CAPACITANCE

| Symbol | Parameter | Typical @ = 25°C , $V_{CC} = 5.0$ V | Unit |
|----------|--|---|------|
| C_{IN} | Input Capacitance | 5 | pF |
| C_{PD} | Power Dissipation Capacitance (Note 6) | 10 | pF |

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

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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

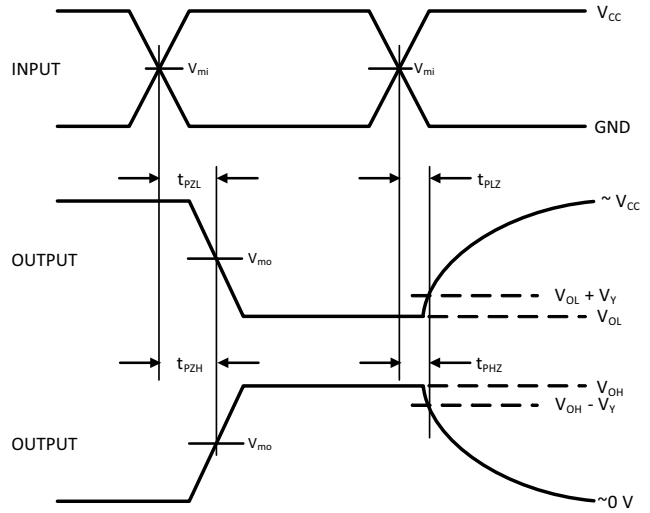
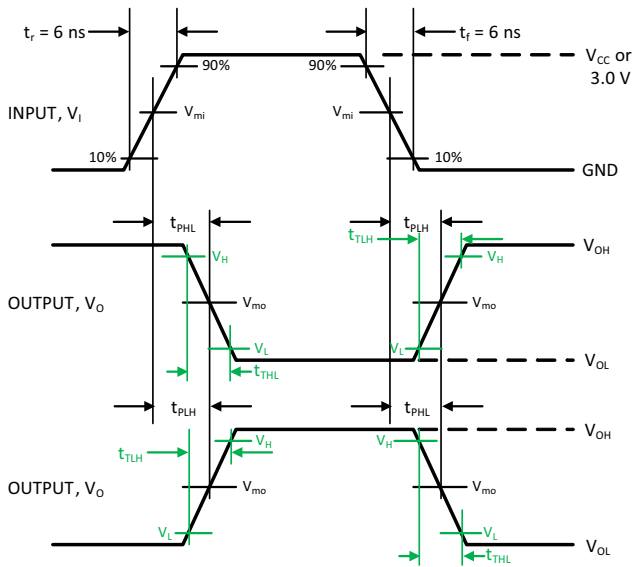


Figure 2. Switching Waveforms

| Device Type | Input | | | Output | | |
|--------------|-----------------|--------------|--------------|----------------------------------|----------------------------------|-----------|
| | V_I , V | V_{mi} , V | V_{mo} , V | V_L , V | V_H , V | V_Y , V |
| NLV18HC1Gxx | GND to V_{CC} | $V_{CC}/2$ | $V_{CC}/2$ | $V_{OL} + 0.1 (V_{OH} - V_{OL})$ | $V_{OL} + 0.9 (V_{OH} - V_{OL})$ | 0.3 |
| NLV18HC1GTxx | GND to 3.0 V | 1.3 V | 1.3 V | $V_{OL} + 0.1 (V_{OH} - V_{OL})$ | $V_{OL} + 0.9 (V_{OH} - V_{OL})$ | 0.3 |

7. t_{TLH} and t_{THL} are measured from 10% to 90% of $(V_{OH} - V_{OL})$, and 90% to 10% of $(V_{OH} - V_{OL})$, respectively.

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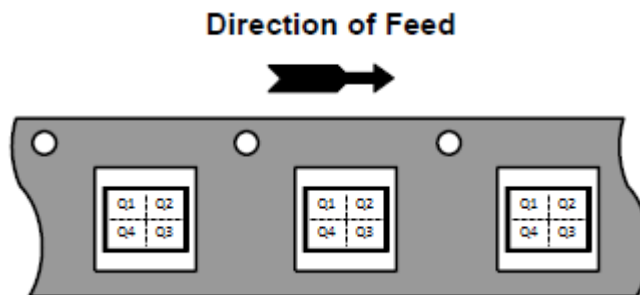
ORDERING INFORMATION

| Device | Package | Marking | Pin 1 Orientation (See below) | Shipping [†] |
|-------------------------------------|---------|---------|----------------------------------|-----------------------|
| NLV18HC1G00DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G02DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G04DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G05DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G07DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G08DFT2G | SC-88A | H2 | Q4 | 3000 / Tape & Reel |
| NLV18HC1G14DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G17DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G32DFT2G | SC-88A | H4 | Q4 | 3000 / Tape & Reel |
| NLV18HC1G34DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G86DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G125DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1G126DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GU04DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT00DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT02DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT04DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT05DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT07DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT08DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT14DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT17DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT32DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT34DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT86DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT125DFT2G (in development) | SC-88A | TBD | Q4 | 3000 / Tape & Reel |
| NLV18HC1GT126DFT2G (in development) | SC-88A | TBD | 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.

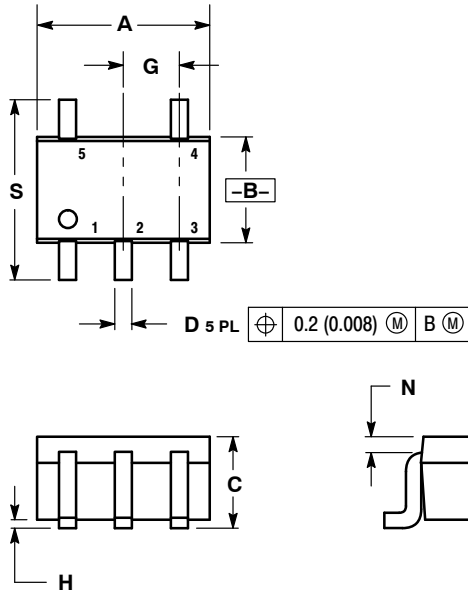
Pin 1 Orientation in Tape and Reel



NLV18HC1Gxx, NLV18HC1GTxx

PACKAGE DIMENSIONS

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

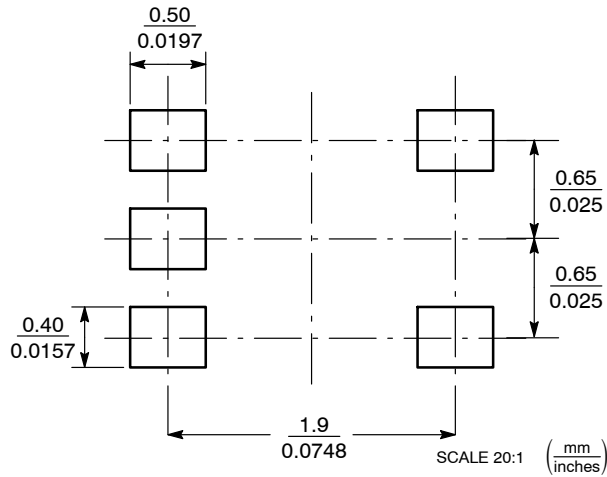


NOTES:

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



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