

MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|------------------|---|------------------------|------|
| V _{CC} | DC Supply Voltage | − 0.5 to + 7.0 | V |
| V _I | DC Input Voltage | − 0.5 to + 7.0 | V |
| V _O | DC Output Voltage | − 0.5 to + 7.0 | V |
| I _{IK} | DC Input Diode Current V _I < GND | − 50 | mA |
| I _{OK} | DC Output Diode Current V _O < GND | − 50 | mA |
| I _O | DC Output Sink Current | ± 50 | mA |
| I _{CC} | DC Supply Current per Supply Pin | ± 100 | mA |
| I _{GND} | DC Ground Current per 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 1) | 250 | °C/W |
| P _D | Power Dissipation in Still Air at 85°C | 250 | 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 Human Body Model (Note 2) Machine Model (Note 3) Charged Device Model (Note 4) | > 2000 > 200 N/A | V |

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

1. Measured with minimum pad spacing on an FR4 board, using 10 mm-by-1 inch, 2-ounce copper trace with no air flow.
2. Tested to EIA/JESD22-A114-A.
3. Tested to EIA/JESD22-A115-A.
4. Tested to JESD22-C101-A.

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Max | Unit |
|-----------------|---|-------------|----------------------------------|------|
| V _{CC} | Supply Voltage Operating Data Retention Only | 2.3 1.5 | 5.5 5.5 | V |
| V _I | Input Voltage (Note 5) | 0 | 5.5 | V |
| V _O | Output Voltage (HIGH or LOW State) | 0 | 5.5 | V |
| T _A | Operating Free-Air Temperature | − 55 | + 125 | °C |
| Δt/ΔV | Input Transition Rise or Fall Rate V _{CC} = 2.5 V ± 0.2 V V _{CC} = 3.0 V ± 0.3 V V _{CC} = 5.0 V ± 0.5 V | 0 0 0 | No Limit No Limit No Limit | ns/V |

5. Unused inputs may not be left open. All inputs must be tied to a high- or low-logic input voltage level.

DEVICE ORDERING INFORMATION

| Device Order Number | Package Type | Tape and Reel Size |
|---------------------------------|------------------|----------------------------------|
| NL37WZ14US | US8 | 178 mm, 3000 Units / Tape & Reel |
| NL37WZ14USG | US8 (Pb-Free) | 178 mm, 3000 Units / Tape & Reel |
| NLV37WZ14USG (AEC Qualified) | US8 (Pb-Free) | 178 mm, 3000 Units / 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.

DC CHARACTERISTICS

| Symbol | Parameter | Condition | V _{CC} (V) | T _A = 25°C | | | -55°C ≤ T _A ≤ 125°C | | Unit |
|------------------|---|--|------------------------|-----------------------|-----------------|-------|--------------------------------|-------|------|
| | | | | Min | Typ | Max | Min | Max | |
| V _{T+} | Positive Input Threshold Voltage | | 2.3 | 1.0 | 1.5 | 1.8 | 1.0 | 1.8 | V |
| | | | 2.7 | 1.2 | 1.7 | 2.0 | 1.2 | 2.0 | |
| | | | 3.0 | 1.3 | 1.9 | 2.2 | 1.3 | 2.2 | |
| | | | 4.5 | 1.9 | 2.7 | 3.1 | 1.9 | 3.1 | |
| | | | 5.5 | 2.2 | 3.3 | 3.6 | 2.2 | 3.6 | |
| V _{T-} | Negative Input Threshold Voltage | | 2.3 | 0.4 | 0.75 | 1.15 | 0.4 | 1.15 | V |
| | | | 2.7 | 0.5 | 0.87 | 1.4 | 0.5 | 1.4 | |
| | | | 3.0 | 0.6 | 1.0 | 1.5 | 0.6 | 1.5 | |
| | | | 4.5 | 1.0 | 1.5 | 2.0 | 1.0 | 2.0 | |
| | | | 5.5 | 1.2 | 1.9 | 2.3 | 1.2 | 2.3 | |
| V _H | Input Hysteresis Voltage | | 2.3 | 0.25 | 0.75 | 1.1 | 1.25 | 1.1 | V |
| | | | 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 | |
| V _{OH} | High-Level Output Voltage V _{IN} = V _{IH} or V _{IL} | I _{OH} = -100 μA | 1.65 to 5.5 | V _{CC} - 0.1 | V _{CC} | | V _{CC} - 0.1 | | V |
| | | I _{OH} = -3 mA | 1.65 | 1.29 | 1.52 | | 1.29 | | |
| | | I _{OH} = -8 mA | 2.3 | 1.9 | 2.1 | | 1.9 | | |
| | | I _{OH} = -12 mA | 2.7 | 2.2 | 2.4 | | 2.2 | | |
| | | I _{OH} = -16 mA | 3.0 | 2.4 | 2.7 | | 2.4 | | |
| | | I _{OH} = -24 mA | 3.0 | 2.3 | 2.5 | | 2.3 | | |
| | | I _{OH} = -32 mA | 4.5 | 3.8 | 4.0 | | 3.8 | | |
| V _{OL} | Low-Level Output Voltage V _{IN} = V _{IH} or V _{IL} | I _{OL} = 100 μA | 1.65 to 5.5 | | | 0.1 | | 0.1 | V |
| | | I _{OL} = 4 mA | 1.65 | | 0.08 | 0.24 | | 0.24 | |
| | | I _{OL} = 8 mA | 2.3 | | 0.2 | 0.3 | | 0.3 | |
| | | I _{OL} = 12 mA | 2.7 | | 0.22 | 0.4 | | 0.4 | |
| | | I _{OL} = 16 mA | 3.0 | | 0.28 | 0.4 | | 0.4 | |
| | | I _{OL} = 24 mA | 3.0 | | 0.38 | 0.55 | | 0.55 | |
| | | I _{OL} = 32 mA | 4.5 | | 0.42 | 0.55 | | 0.55 | |
| I _{IN} | Input Leakage Current | V _{IN} = V _{CC} or GND | 0 to 5.5 | | | ± 0.1 | | ± 1.0 | μA |
| I _{OFF} | Power Off-Output Leakage Current | V _{OUT} = 5.5 V | 0 | | | 1 | | 10 | μA |
| I _{CC} | Quiescent Supply Current | V _{IN} = V _{CC} or GND | 5.5 | | | 1 | | 10 | μA |

AC ELECTRICAL CHARACTERISTICS (Input t_r = t_f = 3.0 ns)

| Symbol | Parameter | Condition | V _{CC} (V) | T _A = 25°C | | | -55°C ≤ T _A ≤ 125°C | | Unit |
|--------------------------------------|---|--|------------------------|-----------------------|-----|-----|--------------------------------|-----|------|
| | | | | Min | Typ | Max | Min | Max | |
| t _{PLH} t _{PHL} | Propagation Delay Input A to Y (Figure 3 and 4) | R _L = 1 MΩ, C _L = 15 pF | 2.5 ± 0.2 | 1.8 | 4.3 | 7.4 | 1.8 | 8.1 | ns |
| | | R _L = 1 MΩ, C _L = 15 pF | 3.3 ± 0.3 | 1.5 | 3.3 | 5.0 | 1.5 | 5.5 | |
| | | R _L = 500 Ω, C _L = 50 pF | | 1.8 | 4.0 | 6.0 | 1.8 | 6.6 | |
| | | R _L = 1 MΩ, C _L = 15 pF | 5.0 ± 0.5 | 1.0 | 2.7 | 4.1 | 1.0 | 4.5 | |
| | | R _L = 500 Ω, C _L = 50 pF | | 1.2 | 3.2 | 4.9 | 1.2 | 5.4 | |

CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Condition | Typical | Unit |
|-----------------|---|--|---------|------|
| C _{IN} | Input Capacitance | V _{CC} = 5.5 V, V _I = 0 V or V _{CC} | 2.5 | pF |
| C _{PD} | Power Dissipation Capacitance (Note 6) | 10 MHz, V _{CC} = 3.3 V, V _I = 0 V or V _{CC} | 11 | pF |
| | | 10 MHz, V _{CC} = 5.0 V, V _I = 0 V or V _{CC} | 12.5 | |

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}.

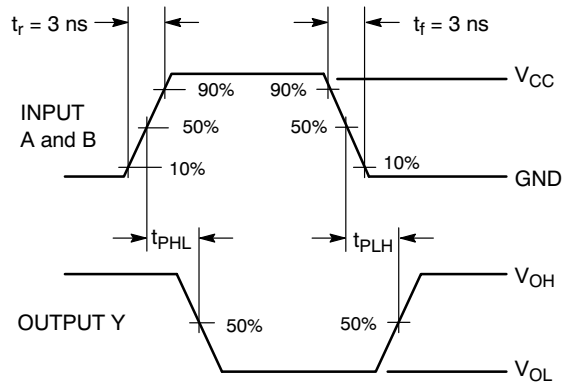
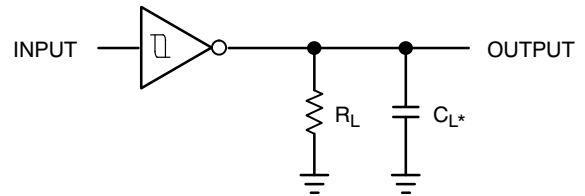


Figure 3. Switching Waveforms



*CL includes all probe and jig capacitances.
A 1-MHz square input wave is recommended for propagation delay tests.

Figure 4. Test Circuit

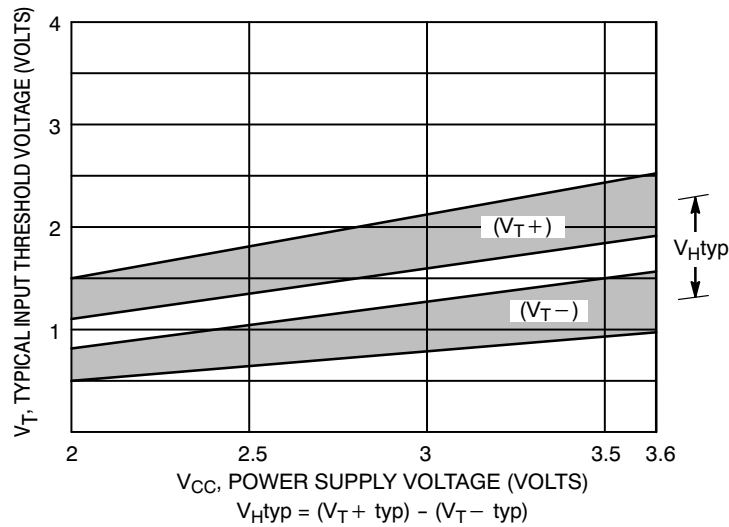
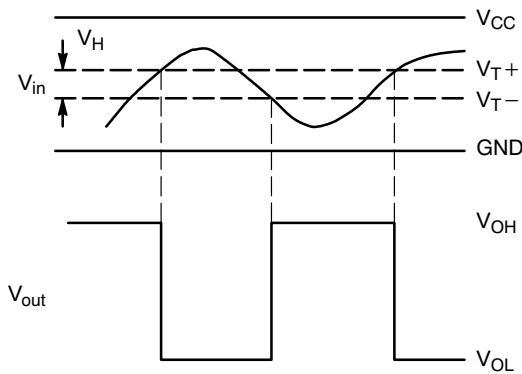
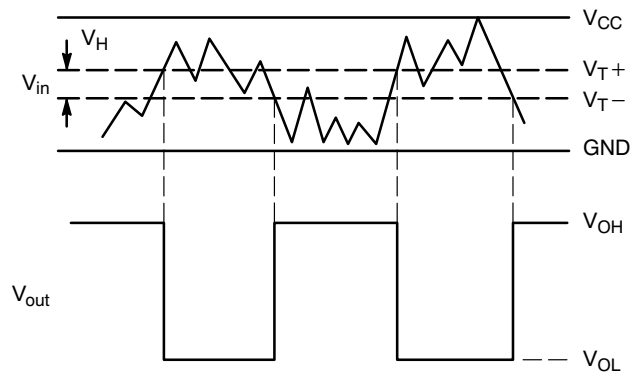


Figure 5. Typical Input Threshold, V_{T+} , V_{T-} versus Power Supply Voltage



(a) A Schmitt-Trigger Squares Up Inputs With Slow Rise and Fall Times



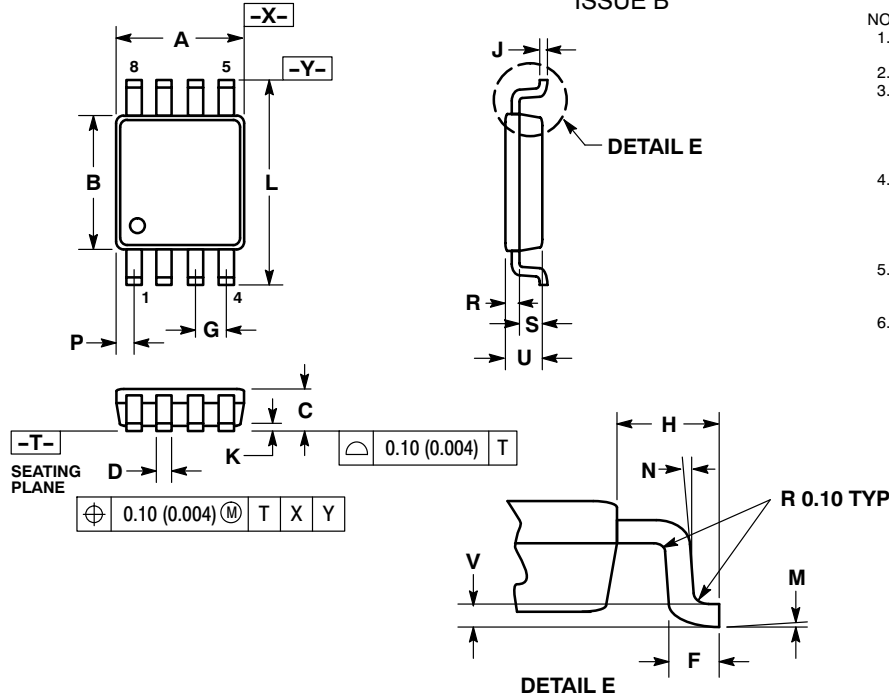
(b) A Schmitt-Trigger Offers Maximum Noise Immunity

Figure 6. Typical Schmitt-Trigger Applications

NL37WZ14

PACKAGE DIMENSIONS

US8
US SUFFIX
CASE 493-02
ISSUE B

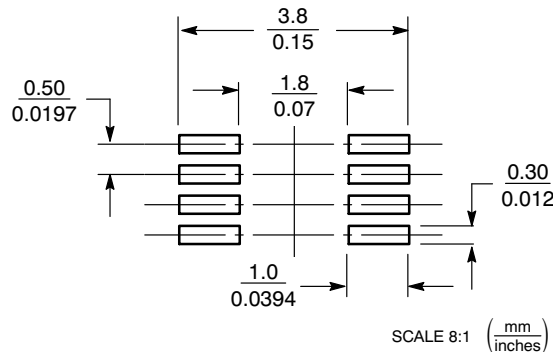


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION "A" DOES NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURR. MOLD FLASH, PROTRUSION AND GATE BURR SHALL NOT EXCEED 0.140 MM (0.0055") PER SIDE.
4. DIMENSION "B" DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSION. INTER-LEAD FLASH AND PROTRUSION SHALL NOT EXCEED 0.140 (0.0055") PER SIDE.
5. LEAD FINISH IS SOLDER PLATING WITH THICKNESS OF 0.0076-0.0203 MM. (300-800 °).
6. ALL TOLERANCE UNLESS OTHERWISE SPECIFIED ±0.0508 (0.0002 °).

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.90 | 2.10 | 0.075 | 0.083 |
| B | 2.20 | 2.40 | 0.087 | 0.094 |
| C | 0.60 | 0.90 | 0.024 | 0.035 |
| D | 0.17 | 0.25 | 0.007 | 0.010 |
| F | 0.20 | 0.35 | 0.008 | 0.014 |
| G | 0.50 BSC | | 0.020 BSC | |
| H | 0.40 REF | | 0.016 REF | |
| J | 0.10 | 0.18 | 0.004 | 0.007 |
| K | 0.00 | 0.10 | 0.000 | 0.004 |
| L | 3.00 | 3.20 | 0.118 | 0.126 |
| M | 0° | 6° | 0° | 6° |
| N | 5° | 10° | 5° | 10° |
| P | 0.23 | 0.34 | 0.010 | 0.013 |
| R | 0.23 | 0.33 | 0.009 | 0.013 |
| S | 0.37 | 0.47 | 0.015 | 0.019 |
| U | 0.60 | 0.80 | 0.024 | 0.031 |
| V | 0.12 BSC | | 0.005 BSC | |

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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