The NLAS2750 is a dual SPDT low on–resistance analog switch. It can operate from a single 1.8 V to 5.0 V power supply. It is a bi–directional switch that can switch a negative voltage swing audio signal without requiring a coupling capacitor. With a single power supply, the audio signal can swing over the range from −2.5 V to VCC.

Features
• Capable to Switch Negative Swing Audio Signals Without Requiring a DC Blocking Capacitor
• Low On–resistance (RON)
• Low Voltage Digital Control Logic: ($V_{\text{INH}} = 1.4 \text{ V @ } V_{\text{CC}} = 2.7 \text{ V to } 4.3 \text{ V}$)
• Low Power Consumption ($I_{\text{CC}} \leq 250 \text{ nA}$)
• Space Saving 1.4 mm x 1.8 mm Package UQFN Package
• This is a Pb–Free Device

Typical Applications
• Cellular Phones
• Portable Media Players

ORDERING INFORMATION
See detailed ordering and shipping information on page 7 of this data sheet.
Figure 1. Logic Equivalent Circuit

MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{CC}$</td>
<td>Positive DC Supply Voltage</td>
<td>−0.3 to +6.5</td>
<td>V</td>
</tr>
<tr>
<td>$V_{IS}$</td>
<td>Analog Input Voltage (COM, NO, NC) (Notes 1 and 2)</td>
<td>Min. $V_{IS} = V_{CC} - 6.5$ V or $V_{IS} = 2.5$ V (whichever is greater)</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. $V_{IS} = V_{CC} + 0.3$ V</td>
<td></td>
</tr>
<tr>
<td>$V_{IN}$</td>
<td>Digital (IN1, IN2)</td>
<td>−0.3 to +6.5</td>
<td>V</td>
</tr>
<tr>
<td>$I_{CC}$</td>
<td>Current (GND, $V_{CC}$)</td>
<td>50 mA</td>
<td></td>
</tr>
<tr>
<td>$I_{IS}$</td>
<td>Continuous Switch Current (COM, NO, NC) (Note 1)</td>
<td>±250 mA</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{ISP}$</td>
<td>Peak Switch Current (Pulsed at 1 ms, 10% Duty Cycle)</td>
<td>±500 mA</td>
<td>mA</td>
</tr>
<tr>
<td>$T_{STG}$</td>
<td>Storage Temperature</td>
<td>−65 to +150 °C</td>
<td>°C</td>
</tr>
<tr>
<td>$P_{D}$</td>
<td>Power Dissipation</td>
<td>200 mW</td>
<td></td>
</tr>
<tr>
<td>$V_{ESD}$</td>
<td>ESD (Human Body Model)</td>
<td>All pins I/O to GND</td>
<td>6 kV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I/O to GND</td>
<td>8 kV</td>
</tr>
<tr>
<td>$I_{LU}$</td>
<td>Latch-up (per JESD78)</td>
<td>300 mA</td>
<td>mA</td>
</tr>
</tbody>
</table>

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. Signals on COM, NO, NC, exceeding $V_{CC}$ will be clamped by internal diodes. Limit forward diode current to maximum current ratings.
2. The algebraic convention whereby the most negative value is a minimum and the most positive a maximum is used in this data sheet.

RECOMMENDED OPERATING CONDITIONS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{CC}$</td>
<td>Power Supply Range</td>
<td>1.8</td>
<td>5.5</td>
<td>V</td>
</tr>
<tr>
<td>$V_{IN}$</td>
<td>Digital Select Input Voltage Overvoltage Tolerance (OVT) (IN1, IN2)</td>
<td>GND</td>
<td>5.5</td>
<td>V</td>
</tr>
<tr>
<td>$V_{IS}$</td>
<td>Analog Input Voltage (NC, NO, COM) (Note 3)</td>
<td>−2.5</td>
<td>$V_{CC}$</td>
<td>V</td>
</tr>
<tr>
<td>$T_{A}$</td>
<td>Operating Temperature Range</td>
<td>−40</td>
<td>+85</td>
<td>°C</td>
</tr>
<tr>
<td>$t_{r}, t_{f}$</td>
<td>Input Rise or Fall Time (IN1, IN2)</td>
<td></td>
<td></td>
<td>ns/V</td>
</tr>
</tbody>
</table>

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.

3. The voltage across the switch should be ≤ 5.5 V.
# ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 2.7 V, ±10%) (Note 4)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Guaranteed Maximum Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>–40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
</tr>
</tbody>
</table>

## ANALOG SWITCH

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Guaranteed Maximum Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>–40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
</tr>
</tbody>
</table>

## DIGITAL CONTROL

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Guaranteed Maximum Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>–40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
</tr>
</tbody>
</table>

## POWER CONSUMPTION

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Guaranteed Maximum Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>–40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
</tr>
</tbody>
</table>

### Notes

6. Guaranteed by design, not subject to production testing.
7. VIS = input voltage to perform proper function.
8. Crosstalk Measured between channels.

---

www.onsemi.com
TYPICAL CHARACTERISTICS
(25°C, unless otherwise specified)

Figure 2. On Resistance ($R_{ON}$) vs. Analog Input Voltage ($V_{IS}$)
TYPICAL CHARACTERISTICS
(25°C, unless otherwise specified)

Figure 3. Bandwidth Measurement – Gain vs. Frequency

Figure 4. Off Isolation Measurement

Figure 5. Cross Talk Measurement
Figure 6. t_BBM (Time Break−Before−Make)

Figure 7. t_ON/t_OFF

Figure 8. t_ON/t_OFF
Channel switch control/s test socket is normalized. Off isolation is measured across an off channel. On loss is the bandwidth of an On switch. $V_{ISO}$, Bandwidth and $V_{ONL}$ are independent of the input signal direction.

$$V_{ISO} = \text{Off Channel Isolation} = 20 \log \left( \frac{V_{OUT}}{V_{IN}} \right) \text{ for } V_{IN} \text{ at } 100 \text{ kHz}$$

$$V_{ONL} = \text{On Channel Loss} = 20 \log \left( \frac{V_{OUT}}{V_{IN}} \right) \text{ for } V_{IN} \text{ at } 100 \text{ kHz to } 50 \text{ MHz}$$

Bandwidth (BW) = the frequency 3 dB below $V_{ONL}$

$V_{CT}$ = Use $V_{ISO}$ setup and test to all other switch analog input/outputs terminated with 50 Ω

**Figure 9. Off Channel Isolation/On Channel Loss (BW)/Crosstalk (On Channel to Off Channel)/$V_{ONL}$**

**Figure 10. Charge Injection: (Q)**

<table>
<thead>
<tr>
<th>Device</th>
<th>Package</th>
<th>Shipping†</th>
</tr>
</thead>
<tbody>
<tr>
<td>NLAS2750MUTAG</td>
<td>UQFN10 (Pb–Free)</td>
<td>3000 / Tape &amp; Reel</td>
</tr>
</tbody>
</table>

†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.
PACKAGE DIMENSIONS

UQFN10 1.4x1.8, 0.4P
CASE 488AT
ISSUE A

NOTES:
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO PLATED TERMINAL
   AND IS MEASURED BETWEEN 0.25 AND 0.30 MM
   FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD
   AS WELL AS THE TERMINALS.

<table>
<thead>
<tr>
<th>MILLIMETERS</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.40</td>
<td>1.45</td>
</tr>
<tr>
<td>A1</td>
<td>0.40</td>
<td>0.45</td>
</tr>
<tr>
<td>b</td>
<td>0.25</td>
<td>0.30</td>
</tr>
<tr>
<td>D</td>
<td>1.40</td>
<td>1.45</td>
</tr>
<tr>
<td>E</td>
<td>1.00</td>
<td>1.05</td>
</tr>
<tr>
<td>L</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>L1</td>
<td>0.00</td>
<td>0.15</td>
</tr>
<tr>
<td>L2</td>
<td>0.40</td>
<td>0.50</td>
</tr>
</tbody>
</table>

*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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