1. General description

The 74CBTLV3306 is a 2-bit high-speed bus switch with separate output enable inputs (nOE). Each switch is disabled when the associated output enable (nOE) input is HIGH.

To ensure the high-impedance OFF-state during power-up or power-down, nOE should be tied to the VCC through a pull-up resistor. The minimum value of the resistor is determined by the current-sinking capability of the driver.

Schmitt trigger action at control input makes the circuit tolerant to slower input rise and fall times across the entire VCC range from 2.3 V to 3.6 V.

This device is fully specified for partial power-down applications using IOFF. The IOFF circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

2. Features and benefits

- Supply voltage range from 2.3 V to 3.6 V
- High noise immunity
- Complies with JEDEC standard:
  - JESD8-5 (2.3 V to 2.7 V)
  - JESD8-B/JESD36 (2.7 V to 3.6 V)
- ESD protection:
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM AEC-Q100-011 revision B exceeds 1000 V
- 4 \( \Omega \) switch connection between two ports
- Rail to rail switching on data I/O ports
- CMOS low power consumption
- Latch-up performance exceeds 250 mA per JESD78B Class I level A
- IOFF circuitry provides partial Power-down mode operation
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C
3. Ordering information

Table 1. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Temperature range</th>
<th>Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>74CBTLV3306DC</td>
<td>VSSOP8</td>
<td>–40 °C to +125 °C</td>
<td></td>
<td>plastic very thin shrink small outline package; 8 leads; body width 2.3 mm</td>
<td>SOT765-1</td>
</tr>
<tr>
<td>74CBTLV3306GT</td>
<td>XSON8</td>
<td>–40 °C to +125 °C</td>
<td></td>
<td>plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm</td>
<td>SOT833-1</td>
</tr>
</tbody>
</table>

4. Marking

Table 2. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>74CBTLV3306DC</td>
<td>b6</td>
</tr>
<tr>
<td>74CBTLV3306GT</td>
<td>b6</td>
</tr>
</tbody>
</table>

[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram

Fig 1. Logic symbol

Fig 2. Logic diagram (one switch)
6. Pinning information

6.1 Pinning

6.2 Pin description

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1OE, 2OE</td>
<td>1, 7</td>
<td>output enable input</td>
</tr>
<tr>
<td>1A, 2A</td>
<td>2, 5</td>
<td>data input/output (A port)</td>
</tr>
<tr>
<td>1B, 2B</td>
<td>3, 6</td>
<td>data input/output (B port)</td>
</tr>
<tr>
<td>GND</td>
<td>4</td>
<td>ground (0 V)</td>
</tr>
<tr>
<td>VCC</td>
<td>8</td>
<td>positive supply voltage</td>
</tr>
</tbody>
</table>

7. Functional description

<table>
<thead>
<tr>
<th>Input</th>
<th>Input/output</th>
</tr>
</thead>
<tbody>
<tr>
<td>nOE</td>
<td>nA, nB</td>
</tr>
<tr>
<td>L</td>
<td>nA = nB</td>
</tr>
<tr>
<td>H</td>
<td>Z</td>
</tr>
</tbody>
</table>

[1] H = HIGH voltage level; L = LOW voltage level; Z = high-impedance OFF-state.
8. Limiting values

Table 5. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{CC}</td>
<td>supply voltage</td>
<td></td>
<td>−0.5</td>
<td>+4.6</td>
<td>V</td>
</tr>
<tr>
<td>V_{I}</td>
<td>input voltage control inputs</td>
<td></td>
<td>−0.5</td>
<td>+4.6</td>
<td>V</td>
</tr>
<tr>
<td>V_{SW}</td>
<td>switch voltage enable and disable mode</td>
<td></td>
<td>−0.5</td>
<td>V_{CC} + 0.5</td>
<td>V</td>
</tr>
<tr>
<td>I_{IK}</td>
<td>input clamping current V_{I} &lt; −0.5 V</td>
<td></td>
<td>−50</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>I_{SK}</td>
<td>switch clamping current V_{I} &lt; −0.5 V</td>
<td></td>
<td>−50</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>I_{SW}</td>
<td>switch current V_{SW} = 0 V to V_{CC}</td>
<td></td>
<td>−128</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>I_{CC}</td>
<td>supply current</td>
<td></td>
<td></td>
<td>+100</td>
<td>mA</td>
</tr>
<tr>
<td>I_{GND}</td>
<td>ground current</td>
<td></td>
<td>−100</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>T_{stellar}</td>
<td>storage temperature</td>
<td></td>
<td>−65</td>
<td>+150</td>
<td>°C</td>
</tr>
<tr>
<td>P_{tot}</td>
<td>total power dissipation T_{amb} = −40 °C to +125 °C</td>
<td></td>
<td></td>
<td>500</td>
<td>mW</td>
</tr>
</tbody>
</table>

[1] The minimum input voltage rating may be exceeded if the input clamping current ratings are observed.

[2] The switch voltage ratings may be exceeded if switch clamping current ratings are observed.

[3] For VSSOP8 packages: above 110 °C, the value of P_{tot} derates linearly with 8.0 mW/K.
For XSON8 packages: above 118 °C the value of P_{tot} derates linearly with 7.8 mW/K.

9. Recommended operating conditions

Table 6. Recommended operating conditions

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{CC}</td>
<td>supply voltage</td>
<td></td>
<td>2.3</td>
<td>3.6</td>
<td>V</td>
</tr>
<tr>
<td>V_{I}</td>
<td>input voltage control inputs</td>
<td></td>
<td>0</td>
<td>3.6</td>
<td>V</td>
</tr>
<tr>
<td>V_{SW}</td>
<td>switch voltage enable and disable mode</td>
<td></td>
<td>0</td>
<td>V_{CC}</td>
<td>V</td>
</tr>
<tr>
<td>T_{ambient}</td>
<td>ambient temperature</td>
<td></td>
<td>−40</td>
<td>+125</td>
<td>°C</td>
</tr>
<tr>
<td>ΔV/ΔV</td>
<td>input transition rise and fall rate pin nOE; V_{CC} = 2.3 V to 3.6 V</td>
<td></td>
<td>0</td>
<td>200</td>
<td>ns/V</td>
</tr>
</tbody>
</table>

10. Static characteristics

Table 7. Static characteristics
At recommended operating conditions voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>T_{amb} = −40 °C to +85 °C</th>
<th>T_{amb} = −40 °C to +125 °C</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{IH}</td>
<td>HIGH-level input voltage</td>
<td>V_{CC} = 2.3 V to 2.7 V</td>
<td>1.7</td>
<td>1.7</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_{CC} = 3.0 V to 3.6 V</td>
<td>2.0</td>
<td>2.0</td>
<td>V</td>
</tr>
<tr>
<td>V_{IL}</td>
<td>LOW-level input voltage</td>
<td>V_{CC} = 2.3 V to 2.7 V</td>
<td>−</td>
<td>0.7</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_{CC} = 3.0 V to 3.6 V</td>
<td>−</td>
<td>0.9</td>
<td>V</td>
</tr>
<tr>
<td>I_{f}</td>
<td>input leakage current</td>
<td>pin nOE; V_{I} = GND to V_{CC}; V_{CC} = 3.6 V</td>
<td>−</td>
<td>±1.0</td>
<td>μA</td>
</tr>
<tr>
<td>I_{OFF}</td>
<td>OFF-state leakage current</td>
<td>V_{CC} = 3.6 V; see Figure 5</td>
<td>−</td>
<td>−</td>
<td>μA</td>
</tr>
</tbody>
</table>
74CBTLV3306
2-bit bus switch

Table 7. Static characteristics …continued
At recommended operating conditions voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>( T_{\text{amb}} = -40 , ^\circ \text{C} ) to (+85 , ^\circ \text{C})</th>
<th>( T_{\text{amb}} = -40 , ^\circ \text{C} ) to (+125 , ^\circ \text{C})</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_{\text{ON}} )</td>
<td>ON-state leakage current</td>
<td>( V_{\text{CC}} = 3.6 , \text{V}; ) see Figure 6</td>
<td>-</td>
<td>-</td>
<td>( \pm 1 )</td>
</tr>
<tr>
<td>( I_{\text{OFF}} )</td>
<td>power-off leakage current</td>
<td>( V_{\text{I}} ) or ( V_{\text{O}} = 0 , \text{V} ) to ( 3.6 , \text{V} ); ( V_{\text{CC}} = 0 , \text{V} )</td>
<td>-</td>
<td>-</td>
<td>( \pm 10 )</td>
</tr>
<tr>
<td>( I_{\text{CC}} )</td>
<td>supply current</td>
<td>( V_{\text{I}} = \text{GND or V}<em>{\text{CC}}; , I</em>{\text{O}} = 0 , \text{A} ); ( V_{\text{SW}} = \text{GND or V}<em>{\text{CC}}; , V</em>{\text{CC}} = 3.6 , \text{V} )</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>( \Delta I_{\text{CC}} )</td>
<td>additional supply current</td>
<td>pin nOE; ( V_{\text{I}} = V_{\text{CC}} - 0.6 , \text{V} ); ( V_{\text{SW}} = \text{GND or V}<em>{\text{CC}}; , V</em>{\text{CC}} = 3.6 , \text{V} )</td>
<td>-</td>
<td>-</td>
<td>300</td>
</tr>
<tr>
<td>( C_{\text{I}} )</td>
<td>input capacitance</td>
<td>pin nOE; ( V_{\text{CC}} = 3.3 , \text{V}; , V_{\text{I}} = 0 , \text{V} ) to ( 3.3 , \text{V} )</td>
<td>-</td>
<td>0.9</td>
<td>-</td>
</tr>
<tr>
<td>( C_{\text{S(OFF)}} )</td>
<td>OFF-state capacitance</td>
<td>( V_{\text{CC}} = 3.3 , \text{V}; , V_{\text{I}} = 0 , \text{V} ) to ( 3.3 , \text{V} )</td>
<td>-</td>
<td>3.0</td>
<td>-</td>
</tr>
<tr>
<td>( C_{\text{S(ON)}} )</td>
<td>ON-state capacitance</td>
<td>( V_{\text{CC}} = 3.3 , \text{V}; , V_{\text{I}} = 0 , \text{V} ) to ( 3.3 , \text{V} )</td>
<td>-</td>
<td>10.6</td>
<td>-</td>
</tr>
</tbody>
</table>

[1] All typical values are measured at \( T_{\text{amb}} = 25 \, ^\circ \text{C} \).

[2] One input at 3 V, other inputs at \( V_{\text{CC}} \) or GND.

10.1 Test circuits

![Fig 5. Test circuit for measuring OFF-state leakage current (one switch)](image)

![Fig 6. Test circuit for measuring ON-state leakage current (one switch)](image)
10.2 ON resistance

Table 8. Resistance $R_{\text{ON}}$

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see Figure 7.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>$T_{\text{amb}} = -40 , ^\circ\text{C}$ to $+85 , ^\circ\text{C}$</th>
<th>$T_{\text{amb}} = -40 , ^\circ\text{C}$ to $+125 , ^\circ\text{C}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{\text{ON}}$</td>
<td>ON resistance</td>
<td>$V_{\text{CC}} = 2.3 , \text{V}$ to $2.7 , \text{V}$; see Figure 8 to Figure 10</td>
<td>$V_{\text{CC}} = 3.0 , \text{V}$ to $3.6 , \text{V}$; see Figure 11 to Figure 13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_{\text{SW}} = 64 , \text{mA} , ; , V_{\text{i}} = 0 , \text{V}$</td>
<td>$I_{\text{SW}} = 64 , \text{mA} , ; , V_{\text{i}} = 0 , \text{V}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_{\text{SW}} = 24 , \text{mA} , ; , V_{\text{i}} = 0 , \text{V}$</td>
<td>$I_{\text{SW}} = 24 , \text{mA} , ; , V_{\text{i}} = 0 , \text{V}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_{\text{SW}} = 15 , \text{mA} , ; , V_{\text{i}} = 1.7 , \text{V}$</td>
<td>$I_{\text{SW}} = 15 , \text{mA} , ; , V_{\text{i}} = 1.7 , \text{V}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{\text{CC}} = 3.0 , \text{V}$ to $3.6 , \text{V}$; see Figure 11 to Figure 13</td>
<td>$V_{\text{CC}} = 3.0 , \text{V}$ to $3.6 , \text{V}$; see Figure 11 to Figure 13</td>
<td></td>
</tr>
<tr>
<td>$I_{\text{SW}} = 64 , \text{mA} , ; , V_{\text{i}} = 0 , \text{V}$</td>
<td>$- , 3.6 , 8.0 , -$</td>
<td>$- , 3.5 , 7.0 , -$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{\text{SW}} = 24 , \text{mA} , ; , V_{\text{i}} = 0 , \text{V}$</td>
<td>$- , 3.6 , 8.0 , -$</td>
<td>$- , 3.5 , 7.0 , -$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{\text{SW}} = 15 , \text{mA} , ; , V_{\text{i}} = 1.7 , \text{V}$</td>
<td>$- , 6.6 , 40.0 , -$</td>
<td>$- , 4.6 , 15.0 , -$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[1] Typical values are measured at $T_{\text{amb}} = 25 \, ^\circ\text{C}$ and nominal $V_{\text{CC}}$.

[2] Measured by the voltage drop between the A and B terminals at the indicated current through the switch. ON-state resistance is determined by the lower of the voltages of the two (A or B) terminals.

10.3 ON resistance test circuit and graphs

$R_{\text{ON}} = \frac{V_{\text{SW}}}{I_{\text{SW}}}$. 

Fig 7. Test circuit for measuring ON resistance (one switch)

Fig 8. ON resistance as a function of input voltage; $V_{\text{CC}} = 2.5 \, \text{V} \, ; \, I_{\text{SW}} = 15 \, \text{mA}$

(1) $T_{\text{amb}} = 125 \, ^\circ\text{C}$.
(2) $T_{\text{amb}} = 85 \, ^\circ\text{C}$.
(3) $T_{\text{amb}} = 25 \, ^\circ\text{C}$.
(4) $T_{\text{amb}} = -40 \, ^\circ\text{C}$. 
Fig 9. ON resistance as a function of input voltage; 
\( V_{CC} = 2.5 \, \text{V}; \, I_{SW} = 24 \, \text{mA} \)

(1) \( T_{\text{amb}} = 125 \, ^\circ\text{C} \).
(2) \( T_{\text{amb}} = 85 \, ^\circ\text{C} \).
(3) \( T_{\text{amb}} = 25 \, ^\circ\text{C} \).
(4) \( T_{\text{amb}} = -40 \, ^\circ\text{C} \).

Fig 10. ON resistance as a function of input voltage; 
\( V_{CC} = 2.5 \, \text{V}; \, I_{SW} = 64 \, \text{mA} \)

(1) \( T_{\text{amb}} = 125 \, ^\circ\text{C} \).
(2) \( T_{\text{amb}} = 85 \, ^\circ\text{C} \).
(3) \( T_{\text{amb}} = 25 \, ^\circ\text{C} \).
(4) \( T_{\text{amb}} = -40 \, ^\circ\text{C} \).

Fig 11. ON resistance as a function of input voltage; 
\( V_{CC} = 3.3 \, \text{V}; \, I_{SW} = 15 \, \text{mA} \)

(1) \( T_{\text{amb}} = 125 \, ^\circ\text{C} \).
(2) \( T_{\text{amb}} = 85 \, ^\circ\text{C} \).
(3) \( T_{\text{amb}} = 25 \, ^\circ\text{C} \).
(4) \( T_{\text{amb}} = -40 \, ^\circ\text{C} \).

Fig 12. ON resistance as a function of input voltage; 
\( V_{CC} = 3.3 \, \text{V}; \, I_{SW} = 24 \, \text{mA} \)

(1) \( T_{\text{amb}} = 125 \, ^\circ\text{C} \).
(2) \( T_{\text{amb}} = 85 \, ^\circ\text{C} \).
(3) \( T_{\text{amb}} = 25 \, ^\circ\text{C} \).
(4) \( T_{\text{amb}} = -40 \, ^\circ\text{C} \).
11. Dynamic characteristics

Table 9. Dynamic characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>( T_{\text{amb}} = -40 , ^\circ\text{C} ) to +85 , ^\circ\text{C}</th>
<th>( T_{\text{amb}} = -40 , ^\circ\text{C} ) to +125 , ^\circ\text{C}</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t_{\text{pd}} )</td>
<td>propagation delay</td>
<td>nA to nB or nB to nA; see Figure 14</td>
<td>Min</td>
<td>Typ (^{[1]})</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 2.3 , \text{V to 2.7 , V} )</td>
<td>-</td>
<td>-</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 3.0 , \text{V to 3.6 , V} )</td>
<td>-</td>
<td>-</td>
<td>0.20</td>
</tr>
<tr>
<td>( t_{\text{en}} )</td>
<td>enable time</td>
<td>nOE to nA or nB; see Figure 15</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 2.3 , \text{V to 2.7 , V} )</td>
<td>1.0</td>
<td>2.7</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 3.0 , \text{V to 3.6 , V} )</td>
<td>1.0</td>
<td>2.4</td>
<td>4.4</td>
</tr>
<tr>
<td>( t_{\text{dis}} )</td>
<td>disable time</td>
<td>nOE to nA or nB; see Figure 15</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 2.3 , \text{V to 2.7 , V} )</td>
<td>1.0</td>
<td>2.2</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 3.0 , \text{V to 3.6 , V} )</td>
<td>1.0</td>
<td>2.9</td>
<td>4.2</td>
</tr>
</tbody>
</table>

\(^{[1]}\) All typical values are measured at \( T_{\text{amb}} = 25 \, ^\circ\text{C} \) and at nominal \( V_{\text{CC}} \).

\(^{[2]}\) The propagation delay is the calculated RC time constant of the typical ON resistance of the switch and the load capacitance, when driven by an ideal voltage source (zero output impedance).

\(^{[3]}\) \( t_{\text{pd}} \) is the same as \( t_{\text{pLH}} \) and \( t_{\text{pHL}} \).

\(^{[4]}\) \( t_{\text{en}} \) is the same as \( t_{\text{pZH}} \) and \( t_{\text{pHL}} \).

\(^{[5]}\) \( t_{\text{dis}} \) is the same as \( t_{\text{pHZ}} \) and \( t_{\text{pLZ}} \).
12. Waveforms

Table 10. Measurement points

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>Input</th>
<th>( V_i )</th>
<th>( t_i = t_f )</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3 V to 2.7 V</td>
<td>0.5( V_{CC} )</td>
<td>( V_{CC} )</td>
<td>( \leq 2.0 ) ns</td>
<td>0.5( V_{CC} )</td>
</tr>
<tr>
<td>3.0 V to 3.6 V</td>
<td>0.5( V_{CC} )</td>
<td>( V_{CC} )</td>
<td>( \leq 2.0 ) ns</td>
<td>0.5( V_{CC} )</td>
</tr>
</tbody>
</table>

Measurement points are given in Table 10.
Logic levels: \( V_{OL} \) and \( V_{OH} \) are typical output voltage levels that occur with the output load.

Fig 14. The data input (nA or nB) to output (nB or nA) propagation delays

Measurement points are given in Table 10.
Logic levels: \( V_{OL} \) and \( V_{OH} \) are typical output voltage levels that occur with the output load.

Fig 15. Enable and disable times
Test data is given in Table 11.
Definitions for test circuit:
\( R_L \) = Load resistance.
\( C_L \) = Load capacitance including jig and probe capacitance.
\( R_T \) = Termination resistance should be equal to the output impedance \( Z_o \) of the pulse generator.
\( V_{E_XT} \) = External voltage for measuring switching times.

**Fig 16. Test circuit for measuring switching times**

Table 11. Test data

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>Load</th>
<th>( R_L )</th>
<th>( V_{E_XT} )</th>
<th>( t_{PZH}, t_{PHZ} )</th>
<th>( t_{PZL}, t_{PHL} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3 V to 2.7 V</td>
<td>( C_L )</td>
<td>500 ( \Omega )</td>
<td>open</td>
<td>GND</td>
<td>2( V_{C_C} )</td>
</tr>
<tr>
<td>3.0 V to 3.6 V</td>
<td>50 pF</td>
<td>500 ( \Omega )</td>
<td>open</td>
<td>GND</td>
<td>2( V_{C_C} )</td>
</tr>
</tbody>
</table>
12.1 Additional dynamic characteristics

Table 12. Additional dynamic characteristics
At recommended operating conditions; voltages are referenced to GND (ground = 0 V); Vᵢ = GND or VᵢCC (unless otherwise specified); tᵣ = tᵣ ≤ 2.5 ns.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Tₘᵦₜ = 25 °C</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>fᵢ(–3dB)</td>
<td>–3 dB frequency response</td>
<td>VᵢCC = 3.3 V; R_L = 50 Ω; see Figure 17 [1]</td>
<td>-</td>
<td>423</td>
</tr>
</tbody>
</table>

[1] fᵢ is biased at 0.5VᵢCC.

12.2 Test circuits

Fig 17. Test circuit for measuring the frequency response when channel is in ON-state

nOE connected to GND; Adjust fᵢ voltage to obtain 0 dBm level at output. Increase fᵢ frequency until dB meter reads –3 dB.
13. Package outline

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm

---

**Dimensions (mm are the original dimensions)**

<table>
<thead>
<tr>
<th>Unit</th>
<th>A</th>
<th>A_1</th>
<th>A_2</th>
<th>A_3</th>
<th>b_p</th>
<th>c</th>
<th>D^{(1)}</th>
<th>E^{(2)}</th>
<th>e</th>
<th>H_E</th>
<th>L</th>
<th>L_p</th>
<th>Q</th>
<th>v</th>
<th>w</th>
<th>y</th>
<th>Z^{(1)}</th>
<th>( \theta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>max</td>
<td>0.15</td>
<td>0.85</td>
<td>0.27</td>
<td>0.23</td>
<td>2.1</td>
<td>2.4</td>
<td>3.2</td>
<td>0.40</td>
<td>0.21</td>
<td>0.4</td>
<td>0.5</td>
<td>0.40</td>
<td>0.21</td>
<td>0.1</td>
<td>0.1</td>
<td>0.4</td>
<td>8°</td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>0.00</td>
<td>0.60</td>
<td>0.17</td>
<td>0.08</td>
<td>1.9</td>
<td>2.2</td>
<td>3.0</td>
<td>0.15</td>
<td>0.19</td>
<td>0.1</td>
<td>0.1</td>
<td>0.15</td>
<td>0.19</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0°</td>
<td></td>
</tr>
</tbody>
</table>

**Note**
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

---

**Fig 18. Package outline SOT765-1 (VSSOP8)**
XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm

DIMENSIONS (mm are the original dimensions)

<table>
<thead>
<tr>
<th>UNIT</th>
<th>A₁ (1) max</th>
<th>A₂ max</th>
<th>b</th>
<th>D</th>
<th>E</th>
<th>e</th>
<th>e₁</th>
<th>L</th>
<th>L₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>0.5</td>
<td>0.04</td>
<td>0.25</td>
<td>0.17</td>
<td>2.0</td>
<td>1.95</td>
<td>0.6</td>
<td>0.5</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

<table>
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<th>REFERENCES</th>
<th>EUROPEAN PROJECTION</th>
<th>ISSUE DATE</th>
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<tr>
<td>SOT833-1</td>
<td>IEC - JEDEC - JEITA</td>
<td>- -</td>
<td>MO-252 - -</td>
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</table>

07-11-14
07-12-07

Fig 19. Package outline SOT833-1 (XSON8)
14. Abbreviations

Table 13. Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>CDM</td>
<td>Charged Device Model</td>
</tr>
<tr>
<td>CMOS</td>
<td>Complementary Metal-Oxide Semiconductor</td>
</tr>
<tr>
<td>DUT</td>
<td>Device Under Test</td>
</tr>
<tr>
<td>ESD</td>
<td>ElectroStatic Discharge</td>
</tr>
<tr>
<td>FET</td>
<td>Field Effect Transistor</td>
</tr>
<tr>
<td>HBM</td>
<td>Human Body Model</td>
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<tr>
<td>MM</td>
<td>Machine Model</td>
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15. Revision history

Table 14. Revision history

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<th>Supersedes</th>
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16. Legal information

16.1 Data sheet status

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<td>Objective [short] data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary [short] data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product [short] data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

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[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on request via the local Nexperia sales office. In case of any inconsistency or conflict with the short data sheet, the Product data sheet Rev. 1 — 7 December 2016 shall prevail.

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Product data sheet

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