1. General description

The 74AUP2G3407 is a single buffer and a single buffer with open-drain output. It features two input pins (nA), an output pin (1Y) and an open-drain output pin (2Y).

Schmitt trigger action at all inputs makes the circuit tolerant of slower input rise and fall times across the entire V\text{CC} range from 0.8 V to 3.6 V.

This device ensures a very low static and dynamic power consumption across the entire V\text{CC} range from 0.8 V to 3.6 V.

This device is fully specified for partial power-down applications using I\text{OFF}. The I\text{OFF} circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

2. Features and benefits

- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.2 V to 1.95 V)
  - JESD8-5 (1.8 V to 2.7 V)
  - JESD8-B (2.7 V to 3.6 V)
- ESD protection:
  - HBM JESD22-A114F Class 3A exceeds 5000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1000 V
- Low static power consumption; I\text{CC} = 0.9 \mu A (maximum)
-Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of V\text{CC}
- I\text{OFF} 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>74AUP2G3407GW</td>
<td>SC-88</td>
<td>−40 °C to +125 °C</td>
<td>plastic surface-mounted package; 6 leads</td>
<td>SOT363</td>
<td></td>
</tr>
<tr>
<td>74AUP2G3407GM</td>
<td>XSON6</td>
<td>−40 °C to +125 °C</td>
<td>plastic extremely thin outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm</td>
<td>SOT886</td>
<td></td>
</tr>
<tr>
<td>74AUP2G3407GF</td>
<td>XSON6</td>
<td>−40 °C to +125 °C</td>
<td>plastic extremely thin outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm</td>
<td>SOT891</td>
<td></td>
</tr>
<tr>
<td>74AUP2G3407GN</td>
<td>XSON6</td>
<td>−40 °C to +125 °C</td>
<td>extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm</td>
<td>SOT1115</td>
<td></td>
</tr>
<tr>
<td>74AUP2G3407GS</td>
<td>XSON6</td>
<td>−40 °C to +125 °C</td>
<td>extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm</td>
<td>SOT1202</td>
<td></td>
</tr>
</tbody>
</table>

4. Marking

Table 2. Marking

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>74AUP2G3407GW</td>
<td>aJ</td>
</tr>
<tr>
<td>74AUP2G3407GM</td>
<td>aJ</td>
</tr>
<tr>
<td>74AUP2G3407GF</td>
<td>aJ</td>
</tr>
<tr>
<td>74AUP2G3407GN</td>
<td>aJ</td>
</tr>
<tr>
<td>74AUP2G3407GS</td>
<td>aJ</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. IEC logic symbol

Fig 3. Logic diagram
6. Pinning information

6.1 Pinning

Fig 4. Pin configuration SOT363

74AUP2G3407

1A 1
GND 2
2A 3

1A 6
GND 5
2A 4

1Y
VCC

Transparent top view

aaa-009180

Fig 5. Pin configuration SOT886

74AUP2G3407

1A 1
GND 2
2A 3

1Y
VCC

Transparent top view

aaa-009181

Fig 6. Pin configuration SOT891, SOT1115 and SOT1202

74AUP2G3407

1A 1
GND 2
2A 3

1Y
VCC

Transparent top view

aaa-009182

6.2 Pin description

Table 3. Pin description

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>1</td>
<td>data input</td>
</tr>
<tr>
<td>GND</td>
<td>2</td>
<td>ground (0 V)</td>
</tr>
<tr>
<td>2A</td>
<td>3</td>
<td>data input</td>
</tr>
<tr>
<td>2Y</td>
<td>4</td>
<td>data output (open-drain)</td>
</tr>
<tr>
<td>VCC</td>
<td>5</td>
<td>supply voltage</td>
</tr>
<tr>
<td>1Y</td>
<td>6</td>
<td>data output</td>
</tr>
</tbody>
</table>

7. Functional description

Table 4. Function table[1]

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>1Y</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

[1] H = HIGH voltage level; L = LOW voltage level.

Table 5. Function table[1]

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A</td>
<td>2Y</td>
</tr>
<tr>
<td>L</td>
<td>L</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 6. 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>VCC</td>
<td>supply voltage</td>
<td>−0.5 to +4.6 V</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>IIK</td>
<td>input clamping current</td>
<td>V I &lt; 0 V</td>
<td>−50</td>
<td>−</td>
<td>mA</td>
</tr>
<tr>
<td>VI</td>
<td>input voltage</td>
<td>[1] −0.5 to +4.6 V</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>IOK</td>
<td>output clamping current</td>
<td>V O &lt; 0 V</td>
<td>−50</td>
<td>−</td>
<td>mA</td>
</tr>
<tr>
<td>VO</td>
<td>output voltage</td>
<td>[1] −0.5 to +4.6 V</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>IO</td>
<td>output current</td>
<td>V O = 0 V to VCC</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>IICC</td>
<td>supply current</td>
<td>−50 to 50 mA</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>IGND</td>
<td>ground current</td>
<td>−50 to 50 mA</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Tstg</td>
<td>storage temperature</td>
<td>−65 to +150 °C</td>
<td></td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Ptot</td>
<td>total power dissipation</td>
<td>T amb = −40 °C to +125 °C</td>
<td>250</td>
<td></td>
<td>mW</td>
</tr>
</tbody>
</table>

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SC-88 packages: above 87.5 °C the value of Ptot derates linearly with 4.0 mW/K.

For XSON6 packages: above 118 °C the value of Ptot derates linearly with 7.8 mW/K.

9. Recommended operating conditions

Table 7. 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>VCC</td>
<td>supply voltage</td>
<td>0.8 to 3.6 V</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>VI</td>
<td>input voltage</td>
<td>0 to 3.6 V</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>VO</td>
<td>output voltage</td>
<td>Active mode VCC = 0 V</td>
<td>0</td>
<td>VCC</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>Power-down mode: VCC = 0 V</td>
<td>0</td>
<td>3.6</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Tamb</td>
<td>ambient temperature</td>
<td>−40 to +125 °C</td>
<td></td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Δt/ΔV</td>
<td>input transition rise and fall rate</td>
<td>VCC = 0.8 V to 3.6 V</td>
<td>0</td>
<td>200</td>
<td>ns/V</td>
</tr>
</tbody>
</table>
### 10. Static characteristics

#### Table 8. 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>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{IH}$</td>
<td>HIGH-level input voltage</td>
<td>$V_{CC} = 0.8$ V</td>
<td>$0.70 \times V_{CC}$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CC} = 0.9$ V to $1.95$ V</td>
<td>$0.65 \times V_{CC}$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CC} = 2.3$ V to $2.7$ V</td>
<td>$1.6$</td>
<td>-</td>
<td>-</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>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>$V_{IL}$</td>
<td>LOW-level input voltage</td>
<td>$V_{CC} = 0.8$ V</td>
<td>-</td>
<td>-</td>
<td>$0.30 \times V_{CC}$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CC} = 0.9$ V to $1.95$ V</td>
<td>-</td>
<td>-</td>
<td>$0.35 \times V_{CC}$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CC} = 2.3$ V to $2.7$ V</td>
<td>-</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>-</td>
<td>$0.9$</td>
<td>V</td>
</tr>
<tr>
<td>$V_{OH}$</td>
<td>HIGH-level output voltage</td>
<td>$1Y; V_i = V_{IH}$ or $V_{IL}$</td>
<td>$V_{CC} - 0.1$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = -20$ μA; $V_{CC} = 0.8$ V to $3.6$ V</td>
<td>$0.75 \times V_{CC}$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = -1.1$ mA; $V_{CC} = 1.1$ V</td>
<td>$1.11$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = -1.7$ mA; $V_{CC} = 1.4$ V</td>
<td>$1.32$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = -1.9$ mA; $V_{CC} = 1.65$ V</td>
<td>$2.05$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = -3.1$ mA; $V_{CC} = 2.3$ V</td>
<td>$1.9$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = -2.7$ mA; $V_{CC} = 3.0$ V</td>
<td>$2.72$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = -4.0$ mA; $V_{CC} = 3.0$ V</td>
<td>$2.6$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>$V_{OL}$</td>
<td>LOW-level output voltage</td>
<td>$1Y, 2Y; V_i = V_{IH}$ or $V_{IL}$</td>
<td>-</td>
<td>-</td>
<td>$0.1$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 20$ μA; $V_{CC} = 0.8$ V to $3.6$ V</td>
<td>-</td>
<td>-</td>
<td>$0.3 \times V_{CC}$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 1.1$ mA; $V_{CC} = 1.1$ V</td>
<td>-</td>
<td>-</td>
<td>$0.31$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 1.7$ mA; $V_{CC} = 1.4$ V</td>
<td>-</td>
<td>-</td>
<td>$0.31$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 1.9$ mA; $V_{CC} = 1.65$ V</td>
<td>-</td>
<td>-</td>
<td>$0.31$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 2.3$ mA; $V_{CC} = 2.3$ V</td>
<td>-</td>
<td>-</td>
<td>$0.44$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 3.1$ mA; $V_{CC} = 2.3$ V</td>
<td>-</td>
<td>-</td>
<td>$0.31$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 2.7$ mA; $V_{CC} = 3.0$ V</td>
<td>-</td>
<td>-</td>
<td>$0.44$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_O = 4.0$ mA; $V_{CC} = 3.0$ V</td>
<td>-</td>
<td>-</td>
<td>$0.44$</td>
<td>V</td>
</tr>
<tr>
<td>$I_I$</td>
<td>input leakage current</td>
<td>$V_i = GND$ to $3.6$ V; $V_{CC} = 0$ V to $3.6$ V</td>
<td>-</td>
<td>-</td>
<td>$\pm 0.1$</td>
<td>μA</td>
</tr>
<tr>
<td>$I_{OFF}$</td>
<td>power-off leakage current</td>
<td>$V_i$ or $V_O = 0$ V to $3.6$ V; $V_{CC} = 0$ V</td>
<td>-</td>
<td>-</td>
<td>$\pm 0.2$</td>
<td>μA</td>
</tr>
<tr>
<td>$\Delta I_{OFF}$</td>
<td>additional power-off leakage current</td>
<td>$V_i$ or $V_O = 0$ V to $3.6$ V; $V_{CC} = 0$ V to $0.2$ V</td>
<td>-</td>
<td>-</td>
<td>$\pm 0.2$</td>
<td>μA</td>
</tr>
<tr>
<td>$I_{CC}$</td>
<td>supply current</td>
<td>$V_i = GND$ or $V_{CC}; I_O = 0$ A; $V_{CC} = 0.8$ V to $3.6$ V</td>
<td>-</td>
<td>-</td>
<td>$0.5$</td>
<td>μA</td>
</tr>
<tr>
<td>$\Delta I_{CC}$</td>
<td>additional supply current</td>
<td>$V_i = V_{CC} = 0$ V; $I_O = 0$ A; $V_{CC} = 3.3$ V</td>
<td>-</td>
<td>-</td>
<td>$40$</td>
<td>μA</td>
</tr>
<tr>
<td>$C_I$</td>
<td>input capacitance</td>
<td>$V_{CC} = 0$ V to $3.6$ V; $V_i = GND$ or $V_{CC}$</td>
<td>-</td>
<td>0.8</td>
<td>-</td>
<td>pF</td>
</tr>
</tbody>
</table>
### Table 8. 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>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>output capacitance</td>
<td>V_O = GND; V_CC = 0 V</td>
<td>2Y output; enabled</td>
<td>-</td>
<td>1.7</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2Y output; disabled</td>
<td>-</td>
<td>1.1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1Y output</td>
<td>-</td>
<td>1.7</td>
<td>-</td>
</tr>
<tr>
<td>Tamb</td>
<td></td>
<td></td>
<td>VCC = 0.8 V</td>
<td>0.70 × V_CC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VCC = 0.9 V to 1.95 V</td>
<td>0.65 × V_CC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VCC = 2.3 V to 2.7 V</td>
<td>1.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VCC = 3.0 V to 3.6 V</td>
<td>2.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>VIL</td>
<td>LOW-level input voltage</td>
<td>VCC = 0.8 V</td>
<td>-</td>
<td>-</td>
<td>0.30 × V_CC</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VCC = 0.9 V to 1.95 V</td>
<td>-</td>
<td>-</td>
<td>0.35 × V_CC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VCC = 2.3 V to 2.7 V</td>
<td>-</td>
<td>-</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VCC = 3.0 V to 3.6 V</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
</tr>
<tr>
<td>VOH</td>
<td>HIGH-level output voltage</td>
<td>1Y; V_I = VIH or VIL</td>
<td>IO = −20 μA; V_CC = 0.8 V to 3.6 V</td>
<td>V_CC = 0.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IO = −1.1 mA; V_CC = 1.1 V</td>
<td>0.7 × V_CC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>IO = −2.3 mA; V_CC = 2.3 V</td>
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<td>IO = −2.7 mA; V_CC = 3.0 V</td>
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<td>-</td>
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<tr>
<td>VOL</td>
<td>LOW-level output voltage</td>
<td>1Y, 2Y; V_I = VIH or VIL</td>
<td>IO = 20 μA; V_CC = 0.8 V to 3.6 V</td>
<td>-</td>
<td>-</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IO = 1.1 mA; V_CC = 1.1 V</td>
<td>-</td>
<td>-</td>
<td>0.3 × V_CC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IO = 1.7 mA; V_CC = 1.4 V</td>
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<td>-</td>
<td>0.37</td>
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<td>IO = 2.3 mA; V_CC = 2.3 V</td>
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<td>0.33</td>
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<tr>
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<td>IO = 3.1 mA; V_CC = 2.3 V</td>
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<td>0.45</td>
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<td>IO = 2.7 mA; V_CC = 3.0 V</td>
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<td>IO = 4.0 mA; V_CC = 3.0 V</td>
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<td>0.45</td>
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<tr>
<td>Ii</td>
<td>input leakage current</td>
<td>V_I = GND to 3.6 V; V_CC = 0 V to 3.6 V</td>
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<td>-</td>
<td>±0.5</td>
<td>μA</td>
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<td>IOFF</td>
<td>power-off leakage current</td>
<td>V_I or V_O = 0 V to 3.6 V; V_CC = 0 V</td>
<td>-</td>
<td>-</td>
<td>±0.5</td>
<td>μA</td>
</tr>
<tr>
<td>ΔIOFF</td>
<td>additional power-off leakage current</td>
<td>V_I or V_O = 0 V to 3.6 V; V_CC = 0 V to 0.2 V</td>
<td>-</td>
<td>-</td>
<td>±0.6</td>
<td>μA</td>
</tr>
<tr>
<td>ICC</td>
<td>supply current</td>
<td>V_I = GND or V_CC; IO = 0 A; V_CC = 0.8 V to 3.6 V</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
<td>μA</td>
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<tr>
<td>ΔICC</td>
<td>additional supply current</td>
<td>V_I = V_CC − 0.6 V; IO = 0 A; V_CC = 3.3 V</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>μA</td>
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</table>
### Table 8. 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>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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</thead>
<tbody>
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<td>Tamb</td>
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<td>-40°C to +125°C</td>
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<tr>
<td>$V_{IH}$</td>
<td>HIGH-level input voltage</td>
<td>$V_{CC} = 0.8$ V</td>
<td>$0.75 \times V_{CC}$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CC} = 0.9$ V to 1.95 V</td>
<td>$0.70 \times V_{CC}$</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CC} = 2.3$ V to 2.7 V</td>
<td>1.6</td>
<td>-</td>
<td>-</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>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>$V_{IL}$</td>
<td>LOW-level input voltage</td>
<td>$V_{CC} = 0.8$ V</td>
<td>-</td>
<td>-</td>
<td>$0.25 \times V_{CC}$</td>
<td>V</td>
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<tr>
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<td></td>
<td>$V_{CC} = 0.9$ V to 1.95 V</td>
<td>-</td>
<td>-</td>
<td>$0.30 \times V_{CC}$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CC} = 2.3$ V to 2.7 V</td>
<td>-</td>
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<td>0.7</td>
<td>V</td>
</tr>
<tr>
<td></td>
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<td>$V_{CC} = 3.0$ V to 3.6 V</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
<td>V</td>
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<tr>
<td>$V_{OH}$</td>
<td>HIGH-level output voltage</td>
<td>1Y; $V_{I} = V_{IH}$ or $V_{IL}$</td>
<td>$I_{O} = -20 \mu A; V_{CC} = 0.8$ V to 3.6 V</td>
<td>$V_{CC} - 0.11$</td>
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<td></td>
<td>$I_{O} = -1.1$ mA; $V_{CC} = 1.1$ V</td>
<td>0.6 $\times V_{CC}$</td>
<td>-</td>
<td>-</td>
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<td>$I_{O} = -1.7$ mA; $V_{CC} = 1.4$ V</td>
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<td>$I_{O} = -1.9$ mA; $V_{CC} = 1.65$ V</td>
<td>1.17</td>
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<td>1.77</td>
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<td>$I_{O} = -3.1$ mA; $V_{CC} = 2.3$ V</td>
<td>1.67</td>
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<td>-</td>
</tr>
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<td>$I_{O} = -4.0$ mA; $V_{CC} = 3.0$ V</td>
<td>2.30</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$V_{OL}$</td>
<td>LOW-level output voltage</td>
<td>1Y; 2Y; $V_{I} = V_{IH}$ or $V_{IL}$</td>
<td>$I_{O} = 20 \mu A; V_{CC} = 0.8$ V to 3.6 V</td>
<td>-</td>
<td>-</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$I_{O} = 1.1$ mA; $V_{CC} = 1.1$ V</td>
<td>-</td>
<td>-</td>
<td>$0.33 \times V_{CC}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$I_{O} = 1.7$ mA; $V_{CC} = 1.4$ V</td>
<td>-</td>
<td>-</td>
<td>0.41</td>
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<tr>
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<td>$I_{O} = 1.9$ mA; $V_{CC} = 1.65$ V</td>
<td>-</td>
<td>-</td>
<td>0.39</td>
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<td>$I_{O} = 2.3$ mA; $V_{CC} = 2.3$ V</td>
<td>-</td>
<td>-</td>
<td>0.36</td>
</tr>
<tr>
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<td></td>
<td>$I_{O} = 3.1$ mA; $V_{CC} = 2.3$ V</td>
<td>-</td>
<td>-</td>
<td>0.50</td>
</tr>
<tr>
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<td></td>
<td>$I_{O} = 2.7$ mA; $V_{CC} = 3.0$ V</td>
<td>-</td>
<td>-</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$I_{O} = 4.0$ mA; $V_{CC} = 3.0$ V</td>
<td>-</td>
<td>-</td>
<td>0.50</td>
</tr>
<tr>
<td>$I_{I}$</td>
<td>input leakage current</td>
<td>$V_{I} = GND$ to 3.6 V; $V_{CC} = 0$ V to 3.6 V</td>
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<td>-</td>
<td>$\pm 0.75$</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>$I_{OFF}$</td>
<td>power-off leakage current</td>
<td>$V_{I} = V_{O} = 0$ V to 3.6 V; $V_{CC} = 0$ V</td>
<td>-</td>
<td>-</td>
<td>$\pm 0.75$</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>$\Delta I_{OFF}$</td>
<td>additional power-off leakage current</td>
<td>$V_{I} = V_{O} = 0$ V to 3.6 V; $V_{CC} = 0$ V to 0.2 V</td>
<td>-</td>
<td>-</td>
<td>$\pm 0.75$</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>$I_{CC}$</td>
<td>supply current</td>
<td>$V_{I} = GND$ or $V_{CC}$; $I_{O} = 0$ A; $V_{CC} = 0.8$ V to 3.6 V</td>
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<td>-</td>
<td>1.4</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>$\Delta I_{CC}$</td>
<td>additional supply current</td>
<td>$V_{I} = V_{CC} = 0.6$ V; $I_{O} = 0$ A; $V_{CC} = 3.3$ V</td>
<td>-</td>
<td>-</td>
<td>75</td>
<td>$\mu A$</td>
</tr>
</tbody>
</table>
# 11. Dynamic characteristics

## Table 9. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit, see Figure 8.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>25 °C</th>
<th>-40 °C to +125 °C</th>
<th>Unit</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
<td>Typ[1]</td>
<td>Max</td>
</tr>
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<td></td>
<td></td>
<td>Min</td>
<td>Max (85 °C)</td>
<td>Max (125 °C)</td>
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<tr>
<td>CL = 5 pF</td>
<td>propagation delay</td>
<td>1A to 1Y or 2A to 2Y; see Figure 7</td>
<td>2</td>
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<tr>
<td>tδp</td>
<td>V\textsubscript{CC} = 0.8 V</td>
<td>13.3</td>
<td>-</td>
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<td>V\textsubscript{CC} = 1.1 V to 1.3 V</td>
<td>2.1</td>
<td>4.4</td>
<td>9.2</td>
<td>1.7</td>
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<td>V\textsubscript{CC} = 1.4 V to 1.6 V</td>
<td>1.6</td>
<td>3.2</td>
<td>5.7</td>
<td>1.3</td>
</tr>
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<td>V\textsubscript{CC} = 1.65 V to 1.95 V</td>
<td>1.6</td>
<td>2.8</td>
<td>4.5</td>
<td>1.2</td>
</tr>
<tr>
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<td>V\textsubscript{CC} = 2.3 V to 2.7 V</td>
<td>1.1</td>
<td>2.2</td>
<td>3.5</td>
<td>0.9</td>
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<td>V\textsubscript{CC} = 3.0 V to 3.6 V</td>
<td>1.4</td>
<td>2.1</td>
<td>3.2</td>
<td>1.0</td>
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<td>CL = 10 pF</td>
<td>propagation delay</td>
<td>1A to 1Y or 2A to 2Y; see Figure 7</td>
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<td>tδp</td>
<td>V\textsubscript{CC} = 0.8 V</td>
<td>16.6</td>
<td>-</td>
<td>-</td>
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<td>V\textsubscript{CC} = 1.1 V to 1.3 V</td>
<td>3.0</td>
<td>5.4</td>
<td>10.9</td>
<td>2.3</td>
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<td>V\textsubscript{CC} = 1.4 V to 1.6 V</td>
<td>2.3</td>
<td>3.9</td>
<td>6.7</td>
<td>1.9</td>
</tr>
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<td>V\textsubscript{CC} = 1.65 V to 1.95 V</td>
<td>2.3</td>
<td>3.5</td>
<td>5.3</td>
<td>1.7</td>
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<tr>
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<td>V\textsubscript{CC} = 2.3 V to 2.7 V</td>
<td>1.7</td>
<td>2.8</td>
<td>4.2</td>
<td>1.3</td>
</tr>
<tr>
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<td>V\textsubscript{CC} = 3.0 V to 3.6 V</td>
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<td>2.9</td>
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<td>1.4</td>
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<td>CL = 15 pF</td>
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<td>1A to 1Y or 2A to 2Y; see Figure 7</td>
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<tr>
<td>tδp</td>
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<td>V\textsubscript{CC} = 1.1 V to 1.3 V</td>
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<td>V\textsubscript{CC} = 1.4 V to 1.6 V</td>
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<td>4.6</td>
<td>7.6</td>
<td>2.2</td>
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<tr>
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<td>V\textsubscript{CC} = 1.65 V to 1.95 V</td>
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<td>4.1</td>
<td>6.7</td>
<td>2.0</td>
</tr>
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<td>V\textsubscript{CC} = 2.3 V to 2.7 V</td>
<td>2.3</td>
<td>3.4</td>
<td>4.8</td>
<td>1.8</td>
</tr>
<tr>
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<td>V\textsubscript{CC} = 3.0 V to 3.6 V</td>
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<td>3.5</td>
<td>5.7</td>
<td>1.6</td>
</tr>
<tr>
<td>CL = 30 pF</td>
<td>propagation delay</td>
<td>1A to 1Y or 2A to 2Y; see Figure 7</td>
<td>2</td>
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<tr>
<td>tδp</td>
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<td>4.8</td>
<td>8.9</td>
<td>16.3</td>
<td>3.6</td>
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<td>6.4</td>
<td>10.3</td>
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<td></td>
<td>V\textsubscript{CC} = 1.65 V to 1.95 V</td>
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<td>6.0</td>
<td>9.7</td>
<td>3.2</td>
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<td>2.9</td>
<td>5.3</td>
<td>9.7</td>
<td>2.5</td>
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</table>
Low-power single buffer; single buffer with open-drain

Table 9. Dynamic characteristics …continued

Voltages are referenced to GND (ground = 0 V); for test circuit, see Figure 8.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>25 °C</th>
<th>−40 °C to +125 °C</th>
<th>Unit</th>
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<tbody>
<tr>
<td></td>
<td>C PD</td>
<td>power dissipation capacitance</td>
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<td>1A to 1Y; f i = 1 MHz; V i = GND to V CC</td>
<td>VC C = 0.8 V</td>
<td>VC C = 0.8 V</td>
<td>-</td>
<td>2.5</td>
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<td>VC C = 1.1 V to 1.3 V</td>
<td>-</td>
<td>2.6</td>
<td>-</td>
</tr>
<tr>
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<td>VC C = 1.4 V to 1.6 V</td>
<td>VC C = 1.4 V to 1.6 V</td>
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<td>VC C = 1.65 V to 1.95 V</td>
<td>VC C = 1.65 V to 1.95 V</td>
<td>-</td>
<td>2.9</td>
<td>-</td>
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<td>VC C = 3.0 V to 3.6 V</td>
<td>-</td>
<td>4.0</td>
<td>-</td>
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<td>2A to 2Y; f i = 1 MHz; V i = GND to V CC</td>
<td>VC C = 0.8 V</td>
<td>VC C = 0.8 V</td>
<td>-</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>VC C = 1.1 V to 1.3 V</td>
<td>VC C = 1.1 V to 1.3 V</td>
<td>-</td>
<td>0.6</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>VC C = 1.4 V to 1.6 V</td>
<td>VC C = 1.4 V to 1.6 V</td>
<td>-</td>
<td>0.6</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>VC C = 1.65 V to 1.95 V</td>
<td>VC C = 1.65 V to 1.95 V</td>
<td>-</td>
<td>0.7</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>VC C = 2.3 V to 2.7 V</td>
<td>VC C = 2.3 V to 2.7 V</td>
<td>-</td>
<td>0.9</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>VC C = 3.0 V to 3.6 V</td>
<td>VC C = 3.0 V to 3.6 V</td>
<td>-</td>
<td>1.2</td>
<td>-</td>
</tr>
</tbody>
</table>

[1] All typical values are measured at nominal V CC.
[2] t pd is the same as t PLH and t PHL(1A to 1Y) and t PLZ and t PZL(2A to 2Y).
[3] All specified values are the average typical values over all stated loads.
[4] C PD is used to determine the dynamic power dissipation (P D in μW).
\[
P D = C PD \times V CC^2 \times f i \times N
\]
where:
- fi = input frequency in MHz;
- CL = load capacitance in pF;
- N = number of inputs switching;

[5] C PD is used to determine the dynamic power dissipation (P D in μW).
\[
P D = C PD \times V CC^2 \times f i \times N + \Sigma(C L \times V CC^2 \times f o)
\]
where:
- fi = input frequency in MHz;
- fo = output frequency in MHz;
- CL = load capacitance in pF;
- V CC = supply voltage in V;
- N = number of inputs switching;
- \(\Sigma(C L \times V CC^2 \times f o)\) = sum of the outputs.
12. Waveforms

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 7.** The data input 1A to output 1Y and input 2A to output 2Y propagation delays

<table>
<thead>
<tr>
<th>Table 10. Measurement points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage (V_{CC})</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>(0.8 \text{ V to } 1.6 \text{ V})</td>
</tr>
<tr>
<td>(1.65 \text{ V to } 2.7 \text{ V})</td>
</tr>
<tr>
<td>(3.0 \text{ V to } 3.6 \text{ V})</td>
</tr>
</tbody>
</table>

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.
\(V_{EXT}\) = External voltage for measuring switching times.

**Fig 8.** Test circuit for measuring switching times

<table>
<thead>
<tr>
<th>Table 11. Test data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage (V_{CC})</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>(0.8 \text{ V to } 3.6 \text{ V})</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

[1] For measuring enable and disable times, \(R_L = 5 \text{ k}\Omega\). For measuring propagation delays, set-up and hold times, and pulse width, \(R_L = 1 \text{ M}\Omega\).
13. Package outline

Plastic surface-mounted package; 6 leads

SOT363

Fig 9. Package outline SOT363 (SC-88)

<table>
<thead>
<tr>
<th>UNIT</th>
<th>A</th>
<th>A1 max</th>
<th>bp</th>
<th>c</th>
<th>D</th>
<th>E</th>
<th>e</th>
<th>e1</th>
<th>HE</th>
<th>Lp</th>
<th>Q</th>
<th>v</th>
<th>w</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>1.1</td>
<td>0.1</td>
<td>0.30</td>
<td>0.20</td>
<td>0.25</td>
<td>1.8</td>
<td>1.35</td>
<td>1.35</td>
<td>0.65</td>
<td>2.2</td>
<td>0.45</td>
<td>0.15</td>
<td>0.25</td>
<td>0.2</td>
</tr>
</tbody>
</table>

DIMENSIONS (mm are the original dimensions)

OUTLINE VERSION

<table>
<thead>
<tr>
<th>OUTLINE</th>
<th>REFERENCES</th>
<th>EUROPEAN PROJECTION</th>
<th>ISSUE DATE</th>
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<tr>
<td>IEC</td>
<td>JEDEC</td>
<td>JEITA</td>
<td>04-11-08</td>
</tr>
<tr>
<td>SOT363</td>
<td>SC-88</td>
<td>06-03-16</td>
<td></td>
</tr>
</tbody>
</table>

Fig 9. Package outline SOT363 (SC-88)
**Fig 10. Package outline SOT886 (XSON6)**

Dimensions (mm are the original dimensions)

<table>
<thead>
<tr>
<th>Unit</th>
<th>A(1)</th>
<th>A₁</th>
<th>b</th>
<th>D</th>
<th>E</th>
<th>e₁</th>
<th>L</th>
<th>L₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>max</td>
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<td>0.04</td>
<td>0.25</td>
<td>1.50</td>
<td>1.05</td>
<td>0.35</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>0.20</td>
<td>1.45</td>
<td>1.00</td>
<td>0.6</td>
<td>0.5</td>
<td>0.30</td>
<td>0.35</td>
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<tr>
<td>min</td>
<td>0.17</td>
<td>1.40</td>
<td>0.95</td>
<td>0.6</td>
<td>0.5</td>
<td>0.27</td>
<td>0.32</td>
<td></td>
</tr>
</tbody>
</table>

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

Outline version | References | European projection | Issue date
---|---|---|---
SOT886 | IEC | JEITA | 04-07-22

---

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm

SOT886
XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm

Fig 11. Package outline SOT891 (XSON6)

<table>
<thead>
<tr>
<th>UNIT</th>
<th>A₁</th>
<th>A₁₁</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>0.20</td>
<td>1.05</td>
<td>1.05</td>
<td>0.55</td>
<td>0.35</td>
<td>0.35</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Note
1. Can be visible in some manufacturing processes.

REFERENCES
- IEC
- JEDEC
- JEITA

EUROPEAN PROJECTION
- 05-04-05
- 07-05-15

ISSUE DATE
XSON6: extremely thin small outline package; no leads; 6 terminals; body 0.9 x 1.0 x 0.35 mm

**Fig 12. Package outline SOT1115 (XSON6)**

<table>
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<tr>
<th>Dimensions</th>
<th>A(1)</th>
<th>A1</th>
<th>b</th>
<th>D</th>
<th>E</th>
<th>e</th>
<th>e1</th>
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<th>L1</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm max</td>
<td>0.35</td>
<td>0.04</td>
<td>0.20</td>
<td>0.95</td>
<td>1.05</td>
<td>0.35</td>
<td>0.40</td>
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<td></td>
</tr>
<tr>
<td>mm nom</td>
<td>0.15</td>
<td>0.90</td>
<td>1.00</td>
<td>0.55</td>
<td>0.3</td>
<td>0.30</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm min</td>
<td>0.12</td>
<td>0.85</td>
<td>0.95</td>
<td>0.27</td>
<td>0.32</td>
<td></td>
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</tr>
</tbody>
</table>

**Note**
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

**Outline**
- **version**: SOT1115
- **References**: IEC, JEDEC, JEITA
- **European projection**: sot1115_po
- **Issue date**: 10-04-02
**XSON6:** extremely thin small outline package; no leads; 6 terminals; body 1.0 x 1.0 x 0.35 mm

**SOT1202**

---

### Dimensions

<table>
<thead>
<tr>
<th>Unit</th>
<th>A&lt;sup&gt;(1)&lt;/sup&gt;</th>
<th>A&lt;sub&gt;1&lt;/sub&gt;</th>
<th>b</th>
<th>D</th>
<th>E</th>
<th>e</th>
<th>e&lt;sub&gt;1&lt;/sub&gt;</th>
<th>L</th>
<th>L&lt;sub&gt;1&lt;/sub&gt;</th>
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</thead>
<tbody>
<tr>
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<td>0.04</td>
<td>0.20</td>
<td>1.05</td>
<td>1.05</td>
<td>0.35</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom</td>
<td>0.15</td>
<td>1.00</td>
<td>1.00</td>
<td>0.55</td>
<td>0.35</td>
<td>0.30</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>min</td>
<td>0.12</td>
<td>0.95</td>
<td>0.95</td>
<td>0.27</td>
<td>0.32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

---

**Fig 13. Package outline SOT1202 (XSON6)**
14. Abbreviations

Table 12. Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>CDM</td>
<td>Charged Device Model</td>
</tr>
<tr>
<td>DUT</td>
<td>Device Under Test</td>
</tr>
<tr>
<td>ESD</td>
<td>ElectroStatic Discharge</td>
</tr>
<tr>
<td>HBM</td>
<td>Human Body Model</td>
</tr>
<tr>
<td>MM</td>
<td>Machine Model</td>
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</table>

15. Revision history

Table 13. Revision history

<table>
<thead>
<tr>
<th>Document ID</th>
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<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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<td>74AUP2G3407 v.1</td>
<td>20131018</td>
<td>Product data sheet</td>
<td>-</td>
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16. Legal information

16.1 Data sheet status

<table>
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<tbody>
<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>

[1] Please consult the most recently issued document before initiating or completing a design.
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Product data sheet

Rev. 1 — 18 October 2013

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18. Contents

1 General description ......................... 1
2 Features and benefits ........................ 1
3 Ordering information ....................... 2
4 Marking ...................................... 2
5 Functional diagram .......................... 2
6 Pinning information ......................... 3
6.1 Pinning .................................... 3
6.2 Pin description ............................ 3
7 Functional description ...................... 3
8 Limiting values .............................. 4
9 Recommended operating conditions ...... 4
10 Static characteristics ...................... 5
11 Dynamic characteristics .................. 8
12 Waveforms ................................. 10
13 Package outline ............................. 11
14 Abbreviations .............................. 16
15 Revision history ............................ 16
16 Legal information ......................... 17
16.1 Data sheet status ........................ 17
16.2 Definitions ............................... 17
16.3 Disclaimers .............................. 17
16.4 Trademarks ............................... 18
17 Contact information ....................... 18
18 Contents ................................. 19