# 74AUP2G0604

## Low-power inverting buffer with open-drain and inverter

Rev. 3 — 31 January 2022 Product data sheet

## 1. General description

The 74AUP2G0604 is a single inverting buffer with open-drain output and a single inverter. It features two input pins (nA), an output pin (2Y) and an open-drain output pin (1Y).

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

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

This device is fully specified for partial power-down applications using $I_{OFF}$. The $I_{OFF}$ 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; $I_{CC}$ = 0.9 µA (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 $V_{CC}$
- $I_{OFF}$ circuitry provides partial power-down mode operation
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

nexperia

# 3. Ordering information

**Table 1. Ordering information**

| Type number | Package | | | |
|---|---|---|---|---|
| | Temperature range | Name | Description | Version |
| 74AUP2G0604GW | -40 °C to +125 °C | TSSOP6 | plastic thin shrink small outline package; 6 leads; body width 1.25 mm | SOT363-2 |
| 74AUP2G0604GM | -40 °C to +125 °C | XSON6 | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm | SOT886 |
| 74AUP2G0604GN | -40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm | SOT1115 |
| 74AUP2G0604GS | -40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm | SOT1202 |

# 4. Marking

**Table 2. Marking**

| Type number | Marking code [1] |
|---|---|
| 74AUP2G0604GW | a6 |
| 74AUP2G0604GM | a6 |
| 74AUP2G0604GN | a6 |
| 74AUP2G0604GS | a6 |

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

# 5. Functional diagram

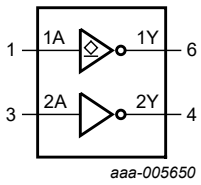



Fig. 1. Logic symbol

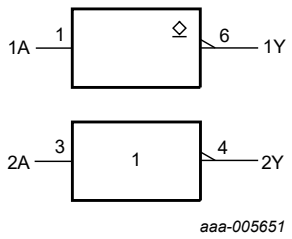



Fig. 2. IEC logic symbol

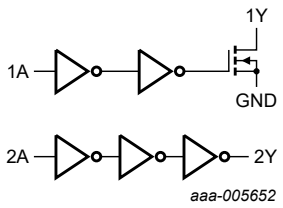



Fig. 3. Logic diagram

# 6. Pinning information

## 6.1. Pinning

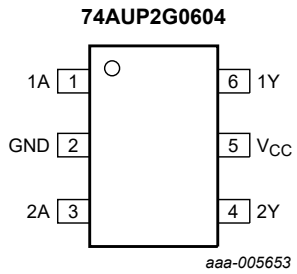
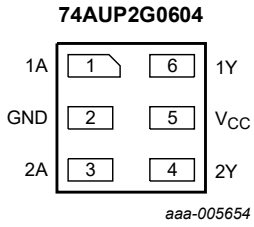
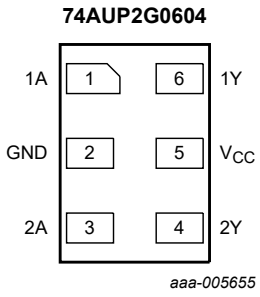



Fig. 4. Pin configuration SOT363-2 (TSSOP6)




Transparent top view

Fig. 5. Pin configuration SOT886 (XSON6)




Transparent top view

Fig. 6. Pin configuration SOT1115 and SOT1202 (XSON6)

## 6.2. Pin description

**Table 3. Pin description**

| Symbol | Pin | Description |
|---|---|---|
| 1A | 1 | data input |
| GND | 2 | ground (0 V) |
| 2A | 3 | data input |
| 2Y | 4 | data output |
| $V_{CC}$ | 5 | supply voltage |
| 1Y | 6 | data output |

# 7. Functional description

**Table 4. Function table**

*H = HIGH voltage level; L = LOW voltage level.*

| Input | Output |
|---|---|
| **1A** | **1Y** |
| L | Z |
| H | L |

**Table 5. Function table**

*H = HIGH voltage level; L = LOW voltage level.*

| Input | Output |
|---|---|
| **2A** | **2Y** |
| L | H |
| H | L |

# 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).*

| Symbol | Parameter | Conditions | | Min | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | | | -0.5 | +4.6 | V |
| $I_{IK}$ | input clamping current | $V_I$ < 0 V | | -50 | - | mA |
| $V_I$ | input voltage | | [1] | -0.5 | +4.6 | V |
| $I_{OK}$ | output clamping current | $V_O$ < 0 V | | -50 | - | mA |
| $V_O$ | output voltage | Active mode and Power-down mode | [1] | -0.5 | +4.6 | V |
| $I_O$ | output current | $V_O$ = 0 V to $V_{CC}$ | | | | |
| | | 1Y | | - | +20 | mA |
| | | 2Y | | - | ±20 | mA |
| $I_{CC}$ | supply current | | | - | 50 | mA |
| $I_{GND}$ | ground current | | | -50 | - | mA |
| $T_{stg}$ | storage temperature | | | -65 | +150 | °C |
| $P_{tot}$ | total power dissipation | $T_{amb}$ = -40 °C to +125 °C | [2] | - | 250 | mW |

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

[2] For SOT363-2 (TSSOP6) package: $P_{tot}$ derates linearly with 3.7 mW/K above 83 °C.
For SOT886 (XSON6) package: $P_{tot}$ derates linearly with 3.3 mW/K above 74 °C.
For SOT1115 (XSON6) package: $P_{tot}$ derates linearly with 3.2 mW/K above 71 °C.
For SOT1202 (XSON6) package: $P_{tot}$ derates linearly with 3.3 mW/K above 74 °C.

# 9. Recommended operating conditions

**Table 7. Recommended operating conditions**

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | | 0.8 | 3.6 | V |
| $V_I$ | input voltage | | 0 | 3.6 | V |
| $V_O$ | output voltage | Active mode | 0 | $V_{CC}$ | V |
| | | Power-down mode; $V_{CC}$ = 0 V | 0 | 3.6 | V |
| $T_{amb}$ | ambient temperature | | -40 | +125 | °C |
| Δt/ΔV | input transition rise and fall rate | $V_{CC}$ = 0.8 V to 3.6 V | 0 | 200 | ns/V |

# 10. Static characteristics

**Table 8. Static characteristics**

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **$T_{amb}$ = 25 °C** | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 0.8 V | 0.70 × $V_{CC}$ | - | - | V |
| | | $V_{CC}$ = 0.9 V to 1.95 V | 0.65 × $V_{CC}$ | - | - | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.6 | - | - | V |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.0 | - | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 0.8 V | - | - | 0.30 × $V_{CC}$ | V |
| | | $V_{CC}$ = 0.9 V to 1.95 V | - | - | 0.35 × $V_{CC}$ | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | - | 0.7 | V |
| | | $V_{CC}$ = 3.0 V to 3.6 V | - | - | 0.9 | V |
| $V_{OH}$ | HIGH-level output voltage | 2Y; $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = -20 µA; $V_{CC}$ = 0.8 V to 3.6 V | $V_{CC}$ - 0.1 | - | - | V |
| | | $I_O$ = -1.1 mA; $V_{CC}$ = 1.1 V | 0.75 × $V_{CC}$ | - | - | V |
| | | $I_O$ = -1.7 mA; $V_{CC}$ = 1.4 V | 1.11 | - | - | V |
| | | $I_O$ = -1.9 mA; $V_{CC}$ = 1.65 V | 1.32 | - | - | V |
| | | $I_O$ = -2.3 mA; $V_{CC}$ = 2.3 V | 2.05 | - | - | V |
| | | $I_O$ = -3.1 mA; $V_{CC}$ = 2.3 V | 1.9 | - | - | V |
| | | $I_O$ = -2.7 mA; $V_{CC}$ = 3.0 V | 2.72 | - | - | V |
| | | $I_O$ = -4.0 mA; $V_{CC}$ = 3.0 V | 2.6 | - | - | V |
| $V_{OL}$ | LOW-level output voltage | 1Y, 2Y; $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = 20 µA; $V_{CC}$ = 0.8 V to 3.6 V | - | - | 0.1 | V |
| | | $I_O$ = 1.1 mA; $V_{CC}$ = 1.1 V | - | - | 0.3 × $V_{CC}$ | V |
| | | $I_O$ = 1.7 mA; $V_{CC}$ = 1.4 V | - | - | 0.31 | V |
| | | $I_O$ = 1.9 mA; $V_{CC}$ = 1.65 V | - | - | 0.31 | V |
| | | $I_O$ = 2.3 mA; $V_{CC}$ = 2.3 V | - | - | 0.31 | V |
| | | $I_O$ = 3.1 mA; $V_{CC}$ = 2.3 V | - | - | 0.44 | V |
| | | $I_O$ = 2.7 mA; $V_{CC}$ = 3.0 V | - | - | 0.31 | V |
| | | $I_O$ = 4.0 mA; $V_{CC}$ = 3.0 V | - | - | 0.44 | V |
| $I_I$ | input leakage current | $V_I$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V | - | - | ±0.1 | µA |
| $I_{OFF}$ | power-off leakage current | $V_I$ or $V_O$ = 0 V to 3.6 V; $V_{CC}$ = 0 V | - | - | ±0.2 | µA |
| $\Delta I_{OFF}$ | additional power-off leakage current | $V_I$ or $V_O$ = 0 V to 3.6 V; $V_{CC}$ = 0 V to 0.2 V | - | - | ±0.2 | µA |
| $I_{CC}$ | supply current | $V_I$ = GND or $V_{CC}$; $I_O$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V | - | - | 0.5 | µA |
| $\Delta I_{CC}$ | additional supply current | $V_I$ = $V_{CC}$ - 0.6 V; $I_O$ = 0 A; $V_{CC}$ = 3.3 V | - | - | 40 | µA |
| $C_I$ | input capacitance | $V_{CC}$ = 0 V to 3.6 V; $V_I$ = GND or $V_{CC}$ | - | 0.8 | - | pF |
| $C_O$ | output capacitance | $V_O$ = GND; $V_{CC}$ = 0 V | | | | |
| | | 1Y output; enabled | - | 1.7 | - | pF |
| | | 1Y output; disabled | - | 1.1 | - | pF |
| | | 2Y output | - | 1.7 | - | pF |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **$T_{amb}$ = -40 °C to +85 °C** | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 0.8 V | 0.70 × $V_{CC}$ | - | - | V |
| | | $V_{CC}$ = 0.9 V to 1.95 V | 0.65 × $V_{CC}$ | - | - | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.6 | - | - | V |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.0 | - | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 0.8 V | - | - | 0.30 × $V_{CC}$ | V |
| | | $V_{CC}$ = 0.9 V to 1.95 V | - | - | 0.35 × $V_{CC}$ | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | - | 0.7 | V |
| | | $V_{CC}$ = 3.0 V to 3.6 V | - | - | 0.9 | V |
| $V_{OH}$ | HIGH-level output voltage | 2Y; $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = -20 µA; $V_{CC}$ = 0.8 V to 3.6 V | $V_{CC}$ - 0.1 | - | - | V |
| | | $I_O$ = -1.1 mA; $V_{CC}$ = 1.1 V | 0.7 × $V_{CC}$ | - | - | V |
| | | $I_O$ = -1.7 mA; $V_{CC}$ = 1.4 V | 1.03 | - | - | V |
| | | $I_O$ = -1.9 mA; $V_{CC}$ = 1.65 V | 1.30 | - | - | V |
| | | $I_O$ = -2.3 mA; $V_{CC}$ = 2.3 V | 1.97 | - | - | V |
| | | $I_O$ = -3.1 mA; $V_{CC}$ = 2.3 V | 1.85 | - | - | V |
| | | $I_O$ = -2.7 mA; $V_{CC}$ = 3.0 V | 2.67 | - | - | V |
| | | $I_O$ = -4.0 mA; $V_{CC}$ = 3.0 V | 2.55 | - | - | V |
| $V_{OL}$ | LOW-level output voltage | 1Y, 2Y; $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = 20 µA; $V_{CC}$ = 0.8 V to 3.6 V | - | - | 0.1 | V |
| | | $I_O$ = 1.1 mA; $V_{CC}$ = 1.1 V | - | - | 0.3 × $V_{CC}$ | V |
| | | $I_O$ = 1.7 mA; $V_{CC}$ = 1.4 V | - | - | 0.37 | V |
| | | $I_O$ = 1.9 mA; $V_{CC}$ = 1.65 V | - | - | 0.35 | V |
| | | $I_O$ = 2.3 mA; $V_{CC}$ = 2.3 V | - | - | 0.33 | V |
| | | $I_O$ = 3.1 mA; $V_{CC}$ = 2.3 V | - | - | 0.45 | V |
| | | $I_O$ = 2.7 mA; $V_{CC}$ = 3.0 V | - | - | 0.33 | V |
| | | $I_O$ = 4.0 mA; $V_{CC}$ = 3.0 V | - | - | 0.45 | V |
| $I_I$ | input leakage current | $V_I$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V | - | - | ±0.5 | µA |
| $I_{OFF}$ | power-off leakage current | $V_I$ or $V_O$ = 0 V to 3.6 V; $V_{CC}$ = 0 V | - | - | ±0.5 | µA |
| $\Delta I_{OFF}$ | additional power-off leakage current | $V_I$ or $V_O$ = 0 V to 3.6 V; $V_{CC}$ = 0 V to 0.2 V | - | - | ±0.6 | µA |
| $I_{CC}$ | supply current | $V_I$ = GND or $V_{CC}$; $I_O$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V | - | - | 0.9 | µA |
| $\Delta I_{CC}$ | additional supply current | $V_I$ = $V_{CC}$ - 0.6 V; $I_O$ = 0 A; $V_{CC}$ = 3.3 V | - | - | 50 | µA |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **$T_{amb}$ = -40 °C to +125 °C** | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 0.8 V | 0.75 × $V_{CC}$ | - | - | V |
| | | $V_{CC}$ = 0.9 V to 1.95 V | 0.70 × $V_{CC}$ | - | - | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.6 | - | - | V |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.0 | - | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 0.8 V | - | - | 0.25 × $V_{CC}$ | V |
| | | $V_{CC}$ = 0.9 V to 1.95 V | - | - | 0.30 × $V_{CC}$ | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | - | 0.7 | V |
| | | $V_{CC}$ = 3.0 V to 3.6 V | - | - | 0.9 | V |
| $V_{OH}$ | HIGH-level output voltage | 2Y; $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = -20 µA; $V_{CC}$ = 0.8 V to 3.6 V | $V_{CC}$ - 0.11 | - | - | V |
| | | $I_O$ = -1.1 mA; $V_{CC}$ = 1.1 V | 0.6 × $V_{CC}$ | - | - | V |
| | | $I_O$ = -1.7 mA; $V_{CC}$ = 1.4 V | 0.93 | - | - | V |
| | | $I_O$ = -1.9 mA; $V_{CC}$ = 1.65 V | 1.17 | - | - | V |
| | | $I_O$ = -2.3 mA; $V_{CC}$ = 2.3 V | 1.77 | - | - | V |
| | | $I_O$ = -3.1 mA; $V_{CC}$ = 2.3 V | 1.67 | - | - | V |
| | | $I_O$ = -2.7 mA; $V_{CC}$ = 3.0 V | 2.40 | - | - | V |
| | | $I_O$ = -4.0 mA; $V_{CC}$ = 3.0 V | 2.30 | - | - | V |
| $V_{OL}$ | LOW-level output voltage | 1Y, 2Y; $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | |
| | | $I_O$ = 20 µA; $V_{CC}$ = 0.8 V to 3.6 V | - | - | 0.11 | V |
| | | $I_O$ = 1.1 mA; $V_{CC}$ = 1.1 V | - | - | 0.33 × $V_{CC}$ | V |
| | | $I_O$ = 1.7 mA; $V_{CC}$ = 1.4 V | - | - | 0.41 | V |
| | | $I_O$ = 1.9 mA; $V_{CC}$ = 1.65 V | - | - | 0.39 | V |
| | | $I_O$ = 2.3 mA; $V_{CC}$ = 2.3 V | - | - | 0.36 | V |
| | | $I_O$ = 3.1 mA; $V_{CC}$ = 2.3 V | - | - | 0.50 | V |
| | | $I_O$ = 2.7 mA; $V_{CC}$ = 3.0 V | - | - | 0.36 | V |
| | | $I_O$ = 4.0 mA; $V_{CC}$ = 3.0 V | - | - | 0.50 | V |
| $I_I$ | input leakage current | $V_I$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V | - | - | ±0.75 | µA |
| $I_{OFF}$ | power-off leakage current | $V_I$ or $V_O$ = 0 V to 3.6 V; $V_{CC}$ = 0 V | - | - | ±0.75 | µA |
| $\Delta I_{OFF}$ | additional power-off leakage current | $V_I$ or $V_O$ = 0 V to 3.6 V; $V_{CC}$ = 0 V to 0.2 V | - | - | ±0.75 | µA |
| $I_{CC}$ | supply current | $V_I$ = GND or $V_{CC}$; $I_O$ = 0 A; $V_{CC}$ = 0.8 V to 3.6 V | - | - | 1.4 | µA |
| $\Delta I_{CC}$ | additional supply current | $V_I$ = $V_{CC}$ - 0.6 V; $I_O$ = 0 A; $V_{CC}$ = 3.3 V | - | - | 75 | µA |

# 11. Dynamic characteristics

**Table 9. Dynamic characteristics**

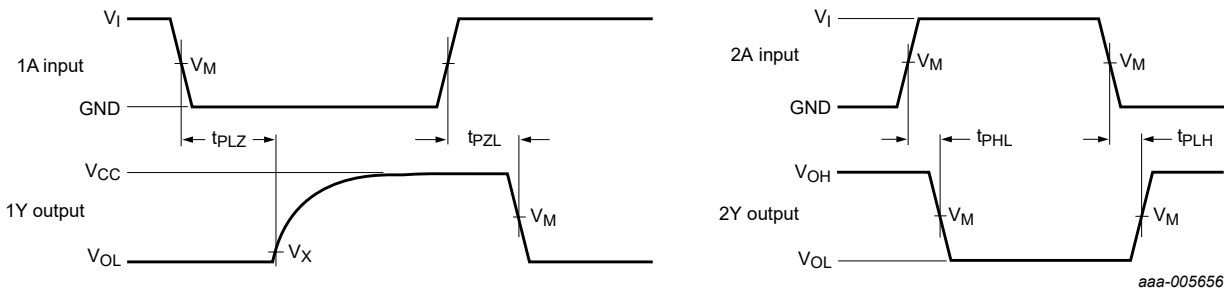
*Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 8.*

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ[1] | Max | Min | Max | Min | Max | |
| **$C_L$ = 5 pF** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | 1A to 1Y or 2A to 2Y; see Fig. 7 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 14.4 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 2.3 | 4.7 | 10.3 | 2.0 | 11.4 | 2.0 | 12.6 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 1.8 | 3.4 | 6.4 | 1.5 | 7.4 | 1.5 | 8.2 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 1.5 | 2.9 | 5.0 | 1.2 | 5.9 | 1.2 | 6.5 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.2 | 2.3 | 3.9 | 1.0 | 4.5 | 1.0 | 5.0 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.1 | 2.2 | 3.3 | 0.8 | 3.9 | 0.8 | 4.3 | ns |
| **$C_L$ = 10 pF** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | 1A to 1Y or 2A to 2Y; see Fig. 7 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 17.7 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 2.7 | 5.7 | 12.2 | 2.5 | 13.7 | 2.5 | 15.1 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 2.2 | 4.1 | 7.5 | 2.0 | 8.7 | 2.0 | 9.6 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 1.9 | 3.6 | 5.9 | 1.7 | 7.0 | 1.7 | 7.7 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.7 | 2.9 | 4.6 | 1.4 | 5.4 | 1.4 | 6.0 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.6 | 3.0 | 4.6 | 1.2 | 4.9 | 1.2 | 5.4 | ns |
| **$C_L$ = 15 pF** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | 1A to 1Y or 2A to 2Y; see Fig. 7 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 21.1 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 3.2 | 6.6 | 13.0 | 2.9 | 15.8 | 2.9 | 17.4 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 2.6 | 4.7 | 8.6 | 2.3 | 10.0 | 2.3 | 11.0 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 2.3 | 4.3 | 6.7 | 2.1 | 8.0 | 2.1 | 8.8 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 2.1 | 3.4 | 5.1 | 1.7 | 6.1 | 1.7 | 6.8 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.0 | 3.6 | 6.0 | 1.5 | 6.5 | 1.5 | 7.2 | ns |
| **$C_L$ = 30 pF** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | 1A to 1Y or 2A to 2Y; see Fig. 7 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 30.7 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 4.4 | 9.1 | 16.5 | 3.9 | 19.3 | 3.9 | 21.3 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 3.6 | 6.6 | 10.8 | 3.2 | 12.9 | 3.2 | 14.2 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 3.2 | 6.1 | 10.7 | 2.9 | 11.0 | 2.9 | 12.1 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 2.9 | 4.9 | 7.2 | 2.6 | 7.8 | 2.6 | 8.6 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.9 | 5.4 | 10.5 | 2.5 | 10.8 | 2.5 | 11.9 | ns |

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ[1] | Max | Min | Max | Min | Max | |
| **$C_L$ = 5 pF, 10 pF, 15 pF and 30 pF** | | | | | | | | | | |
| $C_{PD}$ | power dissipation capacitance | 1A to 1Y; $f_i$ = 1 MHz; $V_I$ = GND to $V_{CC}$ [3][4] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 0.5 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 1.1 V to 1.3 V | - | 0.6 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 1.4 V to 1.6 V | - | 0.7 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 1.65 V to 1.95 V | - | 0.7 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | 1.0 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 3.0 V to 3.6 V | - | 1.2 | - | - | - | - | - | pF |
| | | 2A to 2Y; $f_i$ = 1 MHz; $V_I$ = GND to $V_{CC}$ [3][5] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 2.5 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 1.1 V to 1.3 V | - | 2.7 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 1.4 V to 1.6 V | - | 2.8 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 1.65 V to 1.95 V | - | 3.0 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | 3.5 | - | - | - | - | - | pF |
| | | $V_{CC}$ = 3.0 V to 3.6 V | - | 4.0 | - | - | - | - | - | pF |

[1] All typical values are measured at nominal $V_{CC}$.
[2] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$(2A to 2Y) and $t_{PLZ}$ and $t_{PZL}$(1A to 1Y).
[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:
$f_i$ = input frequency in MHz;
$C_L$ = 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:
$f_i$ = input frequency in MHz;
$f_o$ = output frequency in MHz;
$C_L$ = 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.

## 11.1. Waveforms and test circuit



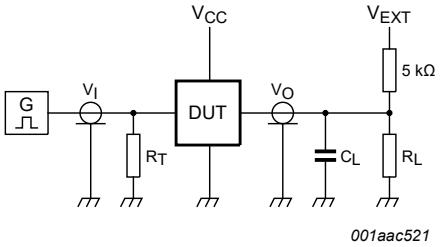

Measurement points are given in Table 10.

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 10. Measurement points**

| Supply voltage | Output | | Input | | |
|---|---|---|---|---|---|
| $V_{CC}$ | $V_M$ | $V_X$ | $V_M$ | $V_I$ | $t_r = t_f$ |
| 0.8 V to 1.6 V | 0.5 × $V_{CC}$ | $V_{OL}$ + 0.1 V | 0.5 × $V_{CC}$ | $V_{CC}$ | ≤ 3.0 ns |
| 1.65 V to 2.7 V | 0.5 × $V_{CC}$ | $V_{OL}$ + 0.15 V | 0.5 × $V_{CC}$ | $V_{CC}$ | ≤ 3.0 ns |
| 3.0 V to 3.6 V | 0.5 × $V_{CC}$ | $V_{OL}$ + 0.3 V | 0.5 × $V_{CC}$ | $V_{CC}$ | ≤ 3.0 ns |




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**

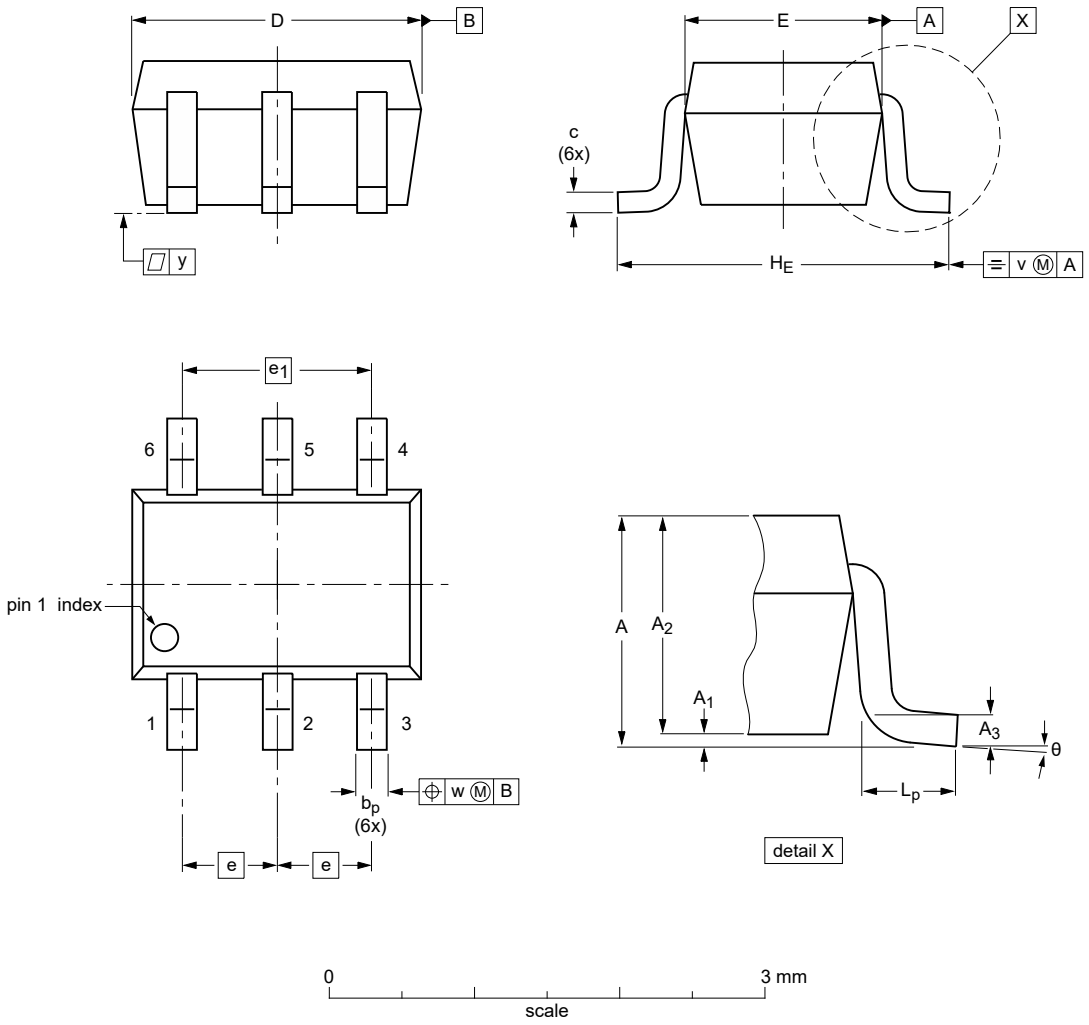
**Table 11. Test data**

| Supply voltage | Load | | $V_{EXT}$ | | |
|---|---|---|---|---|---|
| $V_{CC}$ | $C_L$ | $R_L$ [1] | $t_{PLH}$, $t_{PHL}$ | $t_{PZH}$, $t_{PHZ}$ | $t_{PZL}$, $t_{PLZ}$ |
| 0.8 V to 3.6 V | 5 pF, 10 pF, 15 pF and 30 pF | 5 kΩ or 1 MΩ | open | GND | 2 × $V_{CC}$ |

[1] For measuring enable and disable times, $R_L$ = 5 kΩ.
For measuring propagation delays, set-up and hold times, and pulse width, $R_L$ = 1 MΩ.

## 12. Package outline

**TSSOP6: plastic thin shrink small outline package; 6 leads; body width 1.25 mm** **SOT363-2**




Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | $D^{(1)}$ | $E^{(1)}$ | e | $e_1$ | $H_E$ | $L_p$ | v | w | y | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 1.1 | 0.1 | 1.0 | 0.15 | 0.30 | 0.25 | 2.2 | 1.35 | 0.65 | 1.3 | 2.4 | 0.46 | 0.3 | 0.1 | 0.1 | 8° |
| | min | 0.8 | 0 | 0.8 | | 0.15 | 0.08 | 1.8 | 1.15 | | | 1.8 | 0.26 | | | | 0° |

Note

1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

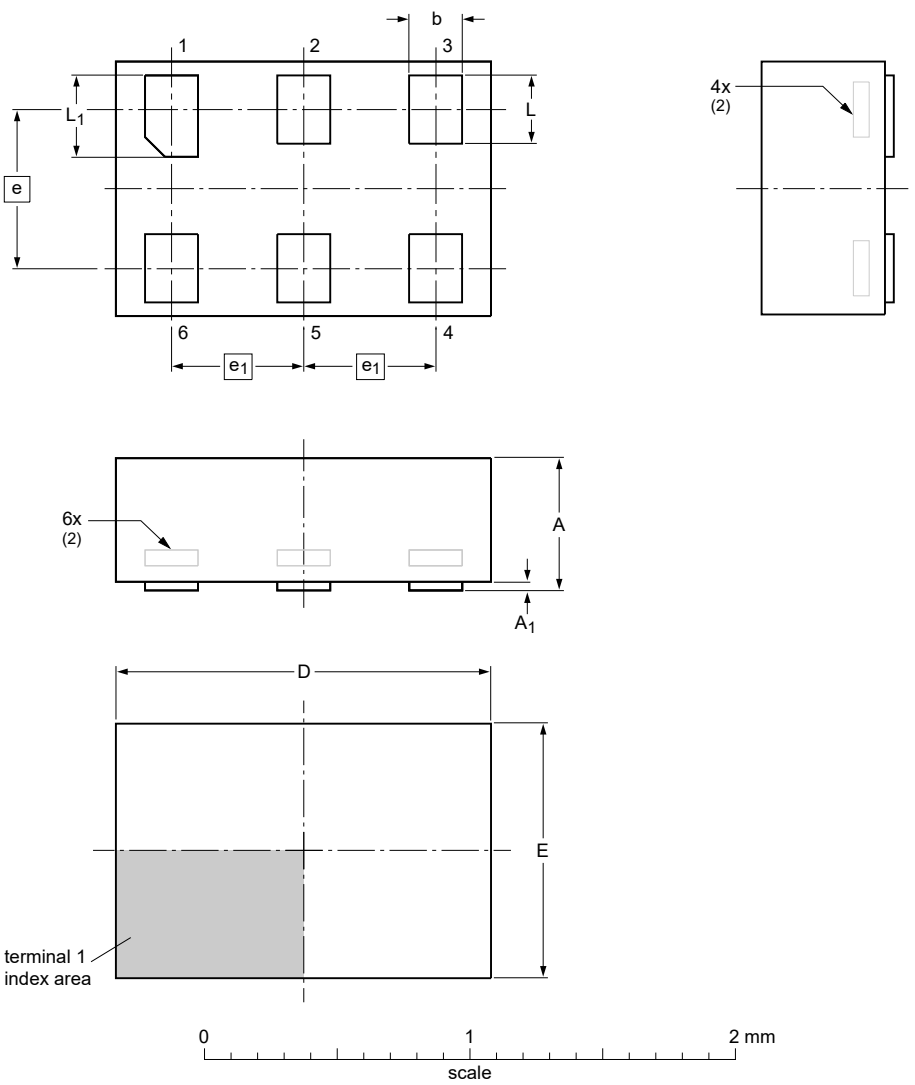
*sot363-2_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT363-2 | | MO-203 | SC-88A | | | ~~21-12-15~~ 21-12-16 |

**Fig. 9. Package outline SOT363-2 (TSSOP6)**

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

SOT886




Dimensions (mm are the original dimensions)

| Unit | | A(1) | $A_1$ | b | D | E | e | $e_1$ | L | $L_1$ |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 0.5 | 0.04 | 0.25 | 1.50 | 1.05 | | | 0.35 | 0.40 |
| | nom | | | 0.20 | 1.45 | 1.00 | 0.6 | 0.5 | 0.30 | 0.35 |
| | min | | | 0.17 | 1.40 | 0.95 | | | 0.27 | 0.32 |

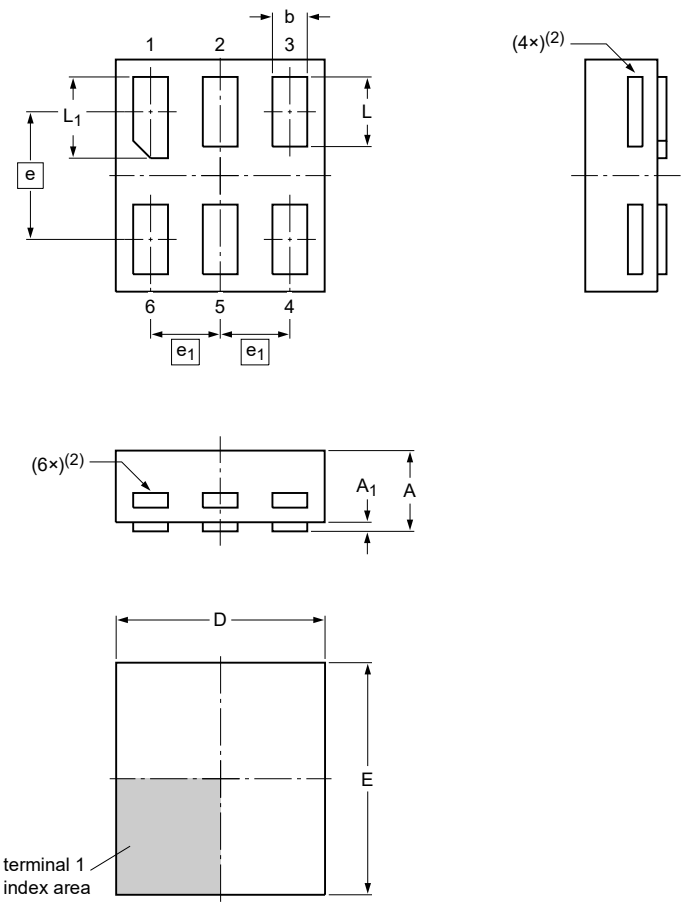
Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

sot886_po

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT886 | | MO-252 | | | | ~~04-07-22~~ 12-01-05 |

**Fig. 10. Package outline SOT886 (XSON6)**

**XSON6: extremely thin small outline package; no leads; 6 terminals; body 0.9 x 1.0 x 0.35 mm** **SOT1115**




Dimensions

| Unit | | $A^{(1)}$ | $A_1$ | b | D | E | e | $e_1$ | L | $L_1$ |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 0.35 | 0.04 | 0.20 | 0.95 | 1.05 | | | 0.35 | 0.40 |
| | nom | | | 0.15 | 0.90 | 1.00 | 0.55 | 0.3 | 0.30 | 0.35 |
| | min | | | 0.12 | 0.85 | 0.95 | | | 0.27 | 0.32 |

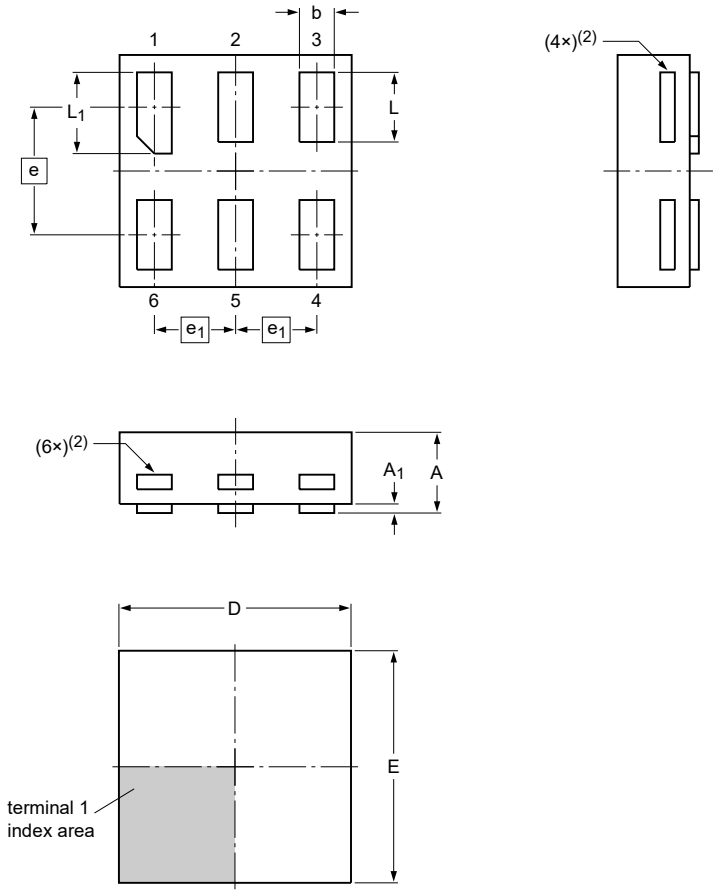
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

*sot1115_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT1115 | | | | | | ~~10-04-02~~ 10-04-07 |

**Fig. 11. Package outline SOT1115 (XSON6)**

**XSON6: extremely thin small outline package; no leads; 6 terminals; body 1.0 x 1.0 x 0.35 mm** **SOT1202**




Dimensions

| Unit | | $A^{(1)}$ | $A_1$ | b | D | E | e | $e_1$ | L | $L_1$ |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 0.35 | 0.04 | 0.20 | 1.05 | 1.05 | | | 0.35 | 0.40 |
| | nom | | | 0.15 | 1.00 | 1.00 | 0.55 | 0.35 | 0.30 | 0.35 |
| | min | | | 0.12 | 0.95 | 0.95 | | | 0.27 | 0.32 |

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

*sot1202_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT1202 | | | | | | ~~10-04-02~~ 10-04-06 |

**Fig. 12. Package outline SOT1202 (XSON6)**

## 13. Abbreviations

**Table 12. Abbreviations**

| Acronym | Description |
|---|---|
| CDM | Charged Device Model |
| DUT | Device Under Test |
| ESD | ElectroStatic Discharge |
| HBM | Human Body Model |
| MM | Machine Model |

## 14. Revision history

**Table 13. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74AUP2G0604 v.3 | 20220131 | Product data sheet | - | 74AUP2G0604 v.2 |
| Modifications: | • SOT363 (SC-88) package changed to SOT363-2 (TSSOP6) package. | | | |
| 74AUP2G0604 v.2 | 20201215 | Product data sheet | - | 74AUP2G0604 v.1 |
| Modifications: | • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.<br>• Legal texts have been adapted to the new company name where appropriate.<br>• Type number 74AUP2G0604GF (SOT891 / XSON6) removed.<br>• Table 6: Derating values for $P_{tot}$ total power dissipation updated. | | | |
| 74AUP2G0604 v.1 | 20121123 | Product data sheet | - | - |

# 15. Legal information

## Data sheet status

| Document status [1][2] | Product status [3] | Definition |
|---|---|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.
[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 the internet at https://www.nexperia.com.

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