# 74AUP1G06

## Low-power inverter with open-drain output

Rev. 10 — 13 January 2022 Product data sheet

## 1. General description

The 74AUP1G06 is a single inverter with open-drain output. Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times.

This device ensures 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 potentially 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
- CMOS low power dissipation
- Low static power consumption; $I_{CC}$ = 0.9 µA (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Overvoltage tolerant inputs to 3.6 V
- Low noise overshoot and undershoot < 10 % of $V_{CC}$
- $I_{OFF}$ circuitry provides partial Power-down mode operation
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.65 V to 1.95 V)
  - JESD8-5 (2.3 V to 2.7 V)
  - JESD8C (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
- Multiple package options
- Specified from −40 °C to +85 °C and −40 °C to +125 °C

## 3. Ordering information

**Table 1. Ordering information**

| Type number | Package | | | |
|---|---|---|---|---|
| | Temperature range | Name | Description | Version |
| 74AUP1G06GW | -40 °C to +125 °C | TSSOP5 | plastic thin shrink small outline package; 5 leads; body width 1.25 mm | SOT353-1 |
| 74AUP1G06GM | -40 °C to +125 °C | XSON6 | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm | SOT886 |
| 74AUP1G06GN | -40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm | SOT1115 |
| 74AUP1G06GS | -40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm | SOT1202 |
| 74AUP1G06GX | -40 °C to +125 °C | X2SON5 | plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 × 0.8 × 0.32 mm | SOT1226-3 |

## 4. Marking

**Table 2. Marking**

| Type number | Marking code [1] |
|---|---|
| 74AUP1G06GW | pR |
| 74AUP1G06GM | pR |
| 74AUP1G06GN | pR |
| 74AUP1G06GS | pR |
| 74AUP1G06GX | pR |

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

## 5. Functional diagram

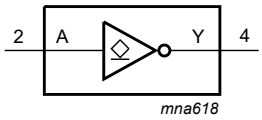



Fig. 1. Logic symbol

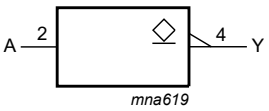



Fig. 2. IEC logic symbol

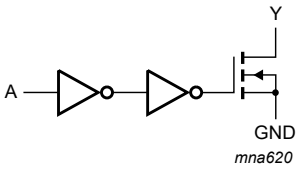



Fig. 3. Logic diagram

# 6. Pinning information

## 6.1. Pinning

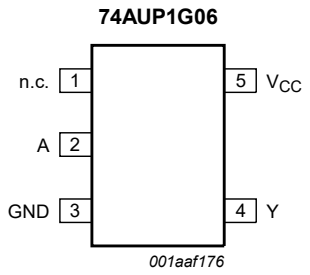
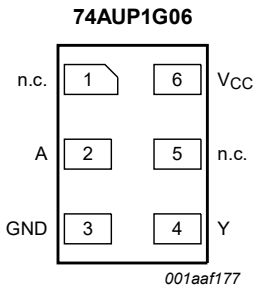
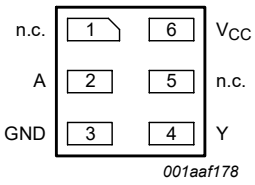



Fig. 4. Pin configuration SOT353-1 (TSSOP5)



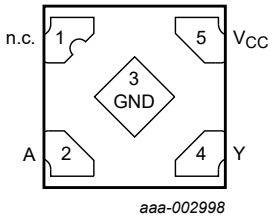

Transparent top view

Fig. 5. Pin configuration SOT886 (XSON6)




Transparent top view

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




Transparent top view

Fig. 7. Pin configuration SOT1226-3 (X2SON5)

## 6.2. Pin description

Table 3. Pin description

| Symbol | Pin | | Description |
|---|---|---|---|
| | TSSOP5 and X2SON5 | XSON6 | |
| n.c. | 1 | 1 | not connected |
| A | 2 | 2 | data input |
| GND | 3 | 3 | ground (0 V) |
| Y | 4 | 4 | data output |
| n.c. | - | 5 | not connected |
| $V_{CC}$ | 5 | 6 | supply voltage |

# 7. Functional description

**Table 4. Function table**

*H = HIGH voltage level; L = LOW voltage level; Z = high-impedance OFF state.*

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

# 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).*

| 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 $V_{CC}$ | - | +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 SOT353-1 (TSSOP5) package: $P_{tot}$ derates linearly with 3.3 mW/K above 74 °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.
For SOT1226-3 (X2SON5) package: $P_{tot}$ derates linearly with 3.0 mW/K above 67 °C.

# 9. Recommended operating conditions

**Table 6. 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 7. 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 |
| $V_{OL}$ | LOW-level output voltage | $V_I$ = $V_{IH}$ 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 |
| $I_{OZ}$ | OFF-state output current | $V_I$ = $V_{IL}$; $V_O$ = 0 V 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 | output enabled; $V_O$ = GND; $V_{CC}$ = 0 V | - | 1.7 | - | pF |
| | | output disabled; $V_O$ = GND; $V_{CC}$ = 0 V | - | 1.1 | - | pF |
| **$T_{amb}$ = -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 |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{IH}$ 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 |
| $I_{OZ}$ | OFF-state output current | $V_I = V_{IL}$; $V_O$ = 0 V 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 |
| **$T_{amb}$ = -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 |
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{IH}$ 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 |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $I_I$ | input leakage current | $V_I$ = GND to 3.6 V; $V_{CC}$ = 0 V to 3.6 V | - | - | ±0.75 | µA |
| $I_{OZ}$ | OFF-state output current | $V_I = V_{IL}$; $V_O$ = 0 V 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 8. Dynamic characteristics**

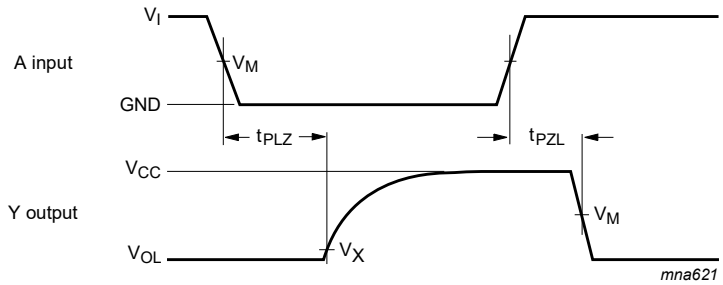
*Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 9.*

| 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 | A to Y; see Fig. 8 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 12.8 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 2.3 | 4.3 | 9.9 | 2.0 | 10.9 | 2.0 | 12.0 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 1.8 | 3.1 | 6.1 | 1.5 | 7.1 | 1.5 | 7.8 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 1.5 | 2.8 | 4.7 | 1.2 | 5.7 | 1.2 | 6.3 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.2 | 2.2 | 3.2 | 1.0 | 3.9 | 1.0 | 4.3 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.1 | 2.2 | 3.3 | 0.8 | 3.6 | 0.8 | 4.0 | ns |
| **$C_L$ = 10 pF** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | A to Y; see Fig. 8 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 15.8 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 2.7 | 5.4 | 11.2 | 2.5 | 13.2 | 2.5 | 15.0 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 2.2 | 3.9 | 7.0 | 2.0 | 8.5 | 2.0 | 9.4 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 1.9 | 3.6 | 5.4 | 1.7 | 6.7 | 1.7 | 7.4 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.7 | 2.9 | 3.8 | 1.4 | 4.5 | 1.4 | 5.0 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.6 | 3.2 | 4.6 | 1.2 | 4.9 | 1.2 | 5.4 | ns |
| **$C_L$ = 15 pF** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | A to Y; see Fig. 8 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 18.8 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 3.2 | 6.4 | 12.2 | 2.9 | 15.2 | 2.9 | 17.0 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 2.6 | 4.6 | 7.7 | 2.3 | 9.4 | 2.3 | 10.0 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 2.3 | 4.5 | 6.6 | 2.1 | 7.3 | 2.1 | 8.1 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 2.1 | 3.5 | 4.6 | 1.7 | 5.1 | 1.7 | 5.7 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.0 | 4.0 | 6.0 | 1.5 | 6.5 | 1.5 | 7.2 | 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 | |
| **$C_L$ = 30 pF** | | | | | | | | | | |
| $t_{pd}$ | propagation delay | A to Y; see Fig. 8 [2] | | | | | | | | |
| | | $V_{CC}$ = 0.8 V | - | 27.8 | - | - | - | - | - | ns |
| | | $V_{CC}$ = 1.1 V to 1.3 V | 4.4 | 9.3 | 16.5 | 3.9 | 19.3 | 3.9 | 21.3 | ns |
| | | $V_{CC}$ = 1.4 V to 1.6 V | 3.6 | 6.8 | 10.1 | 3.2 | 12.0 | 3.2 | 13.2 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 3.2 | 6.8 | 10.7 | 2.9 | 11.0 | 2.9 | 12.1 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 2.9 | 5.3 | 7.2 | 2.6 | 7.8 | 2.6 | 8.6 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 2.9 | 6.5 | 10.5 | 2.5 | 10.8 | 2.5 | 11.9 | ns |
| **$C_L$ = 5 pF, 10 pF, 15 pF and 30 pF** | | | | | | | | | | |
| $C_{PD}$ | power dissipation capacitance | $f_i$ = 1 MHz; $V_I$ = GND to $V_{CC}$ [3] | | | | | | | | |
| | | $V_{CC}$ = 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 |

[1] All typical values are measured at nominal $V_{CC}$.
[2] $t_{pd}$ is the same as $t_{PZL}$ and $t_{PLZ}$.
[3] $C_{PD}$ 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;
$V_{CC}$ = supply voltage in V;
N = number of inputs switching.

## 11.1. Waveforms and test circuit

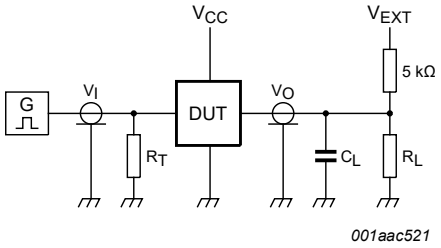



Measurement points are given in Table 9.
Logic level: $V_{OL}$ is the typical output voltage level that occurs at the output load.

**Fig. 8. The data input (A) to output (Y) propagation delays**

**Table 9. Measurement points**

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




Test data is given in Table 10.

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. 9. Test circuit for measuring switching times**

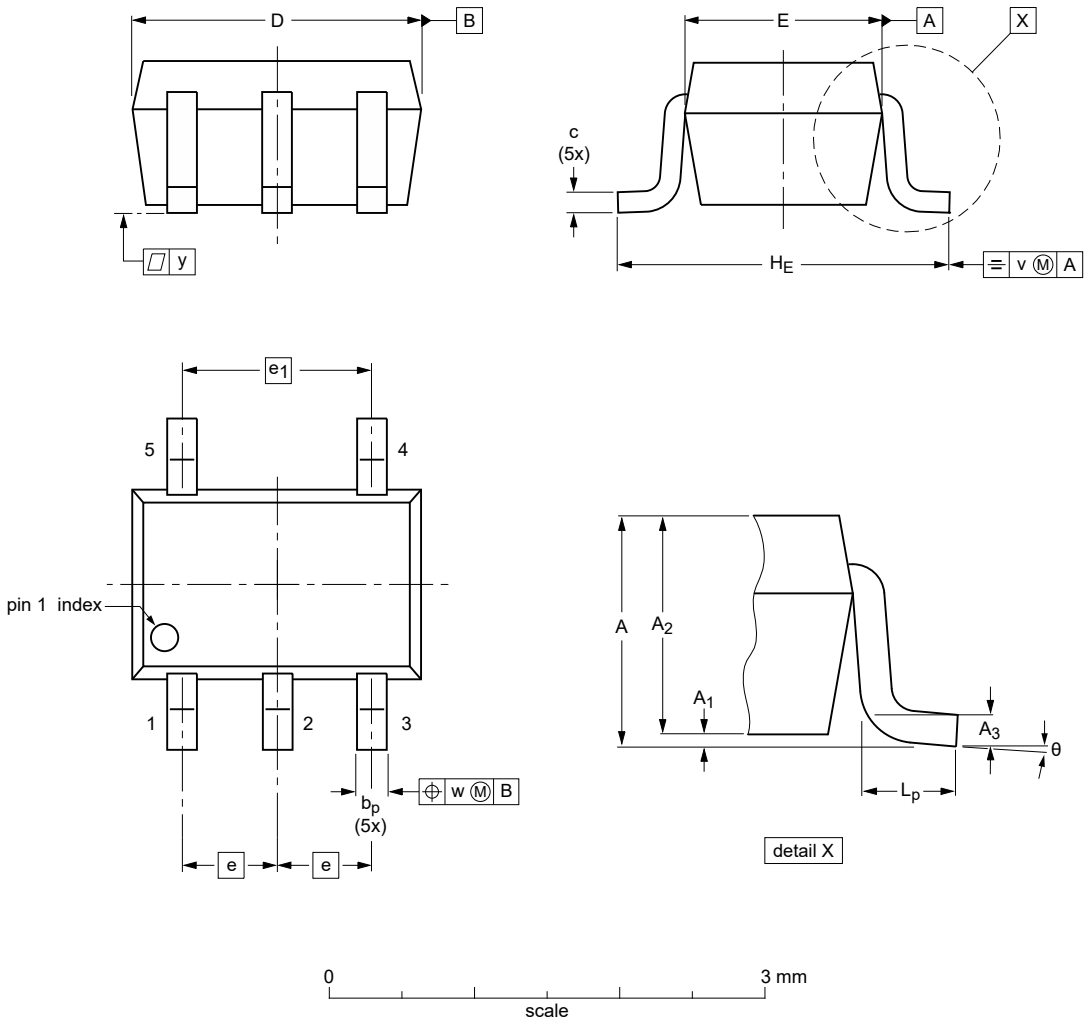
**Table 10. Test data**

| 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, setup and hold times and pulse width $R_L$ = 1 MΩ.

## 12. Package outline

**TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm** **SOT353-1**




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

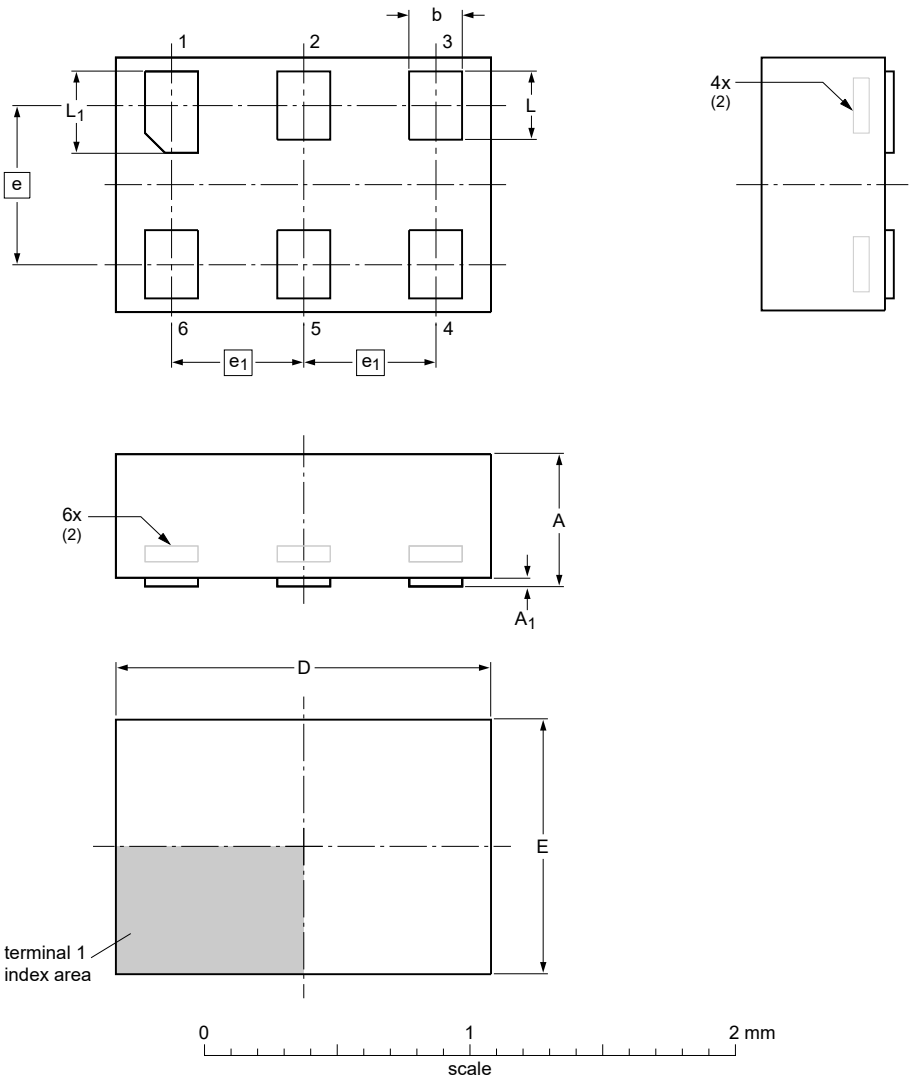
1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

*sot353-1_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT353-1 | | MO-203 | SC-88A | | | ~~21-12-15~~ 21-12-16 |

**Fig. 10. Package outline SOT353-1 (TSSOP5)**

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 |

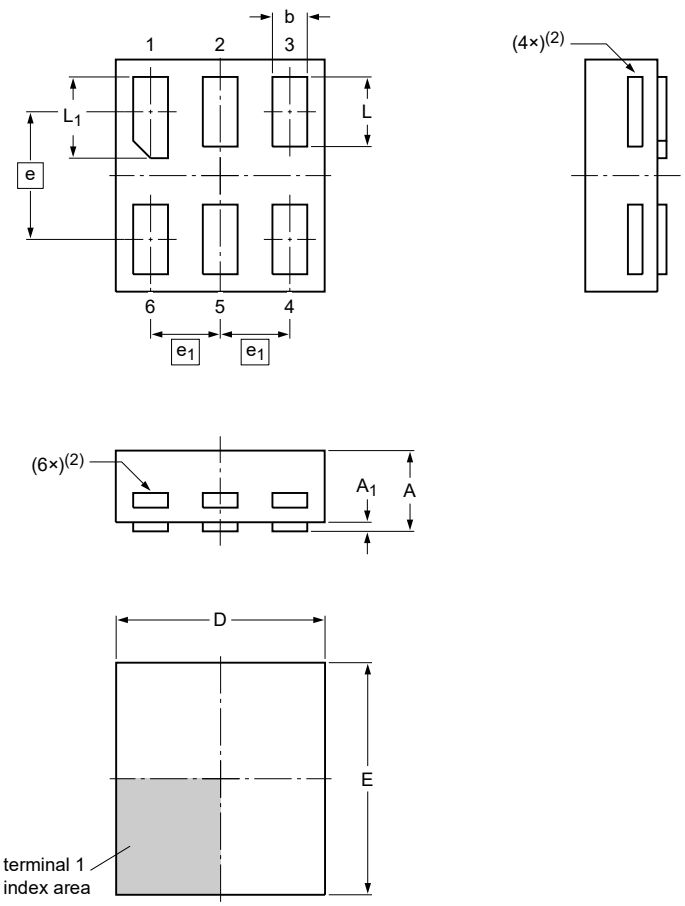
Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

sot886_po

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

**Fig. 11. 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 |

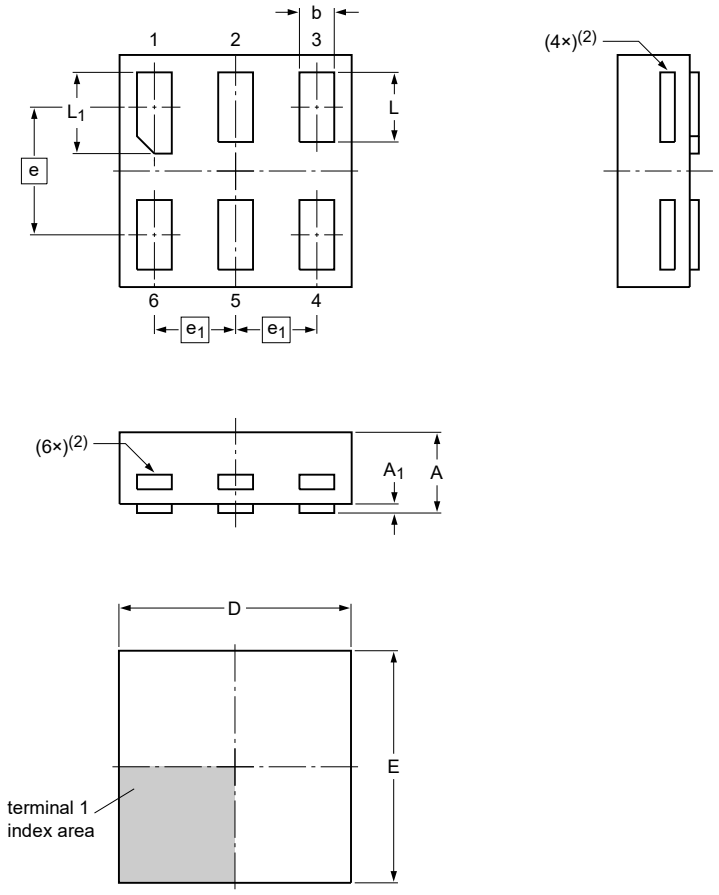
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

*sot1115_po*

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

**Fig. 12. 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 |

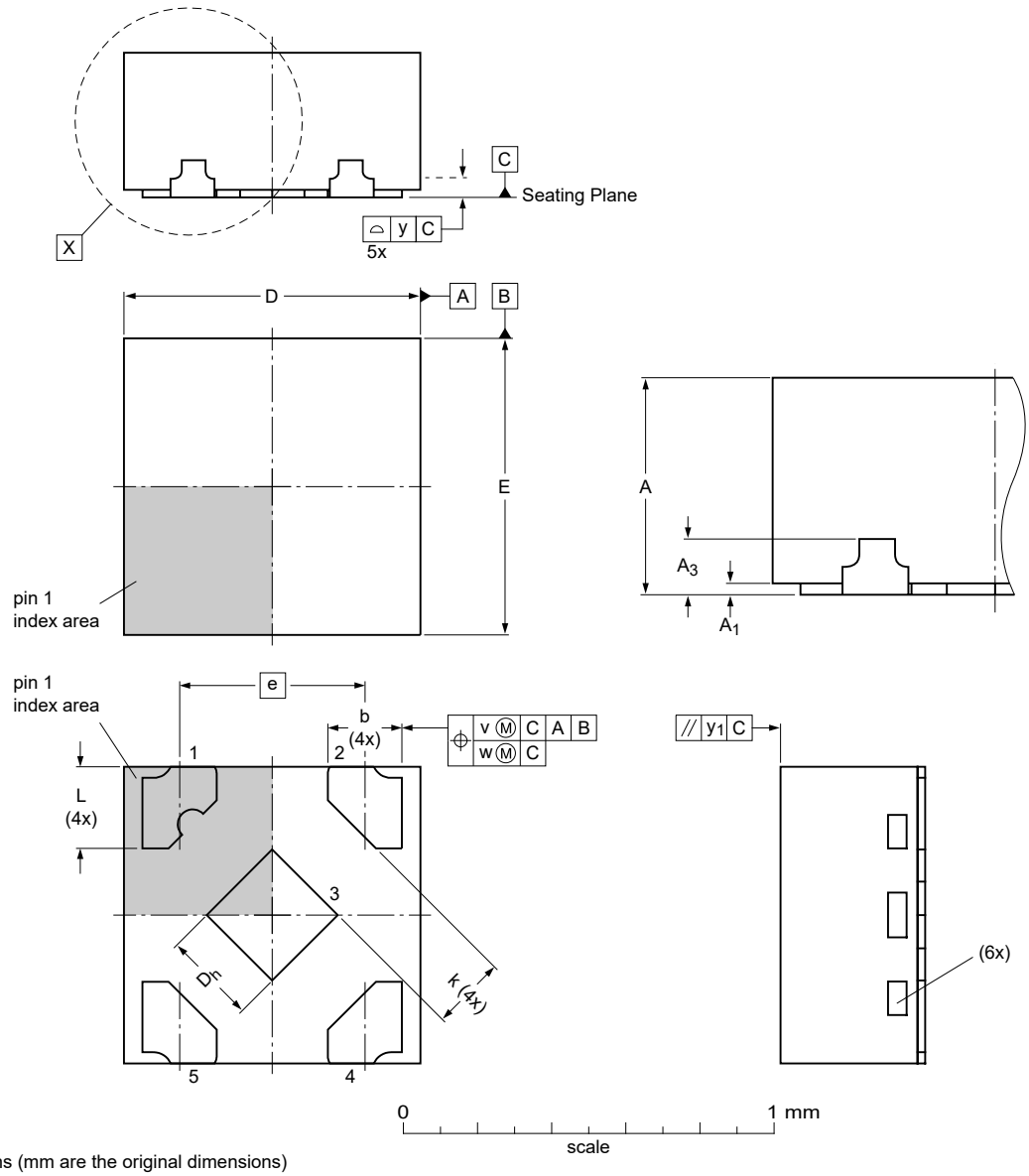
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

*sot1202_po*

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

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

**X2SON5: plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 x 0.8 x 0.32 mm** **SOT1226-3**




Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | $A_3$ | D | $D_h$ | E | b | e | K | L | v | w | y | $y_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 0.35 | 0.04 | 0.10 (Typ.) | 0.85 | 0.30 | 0.85 | 0.25 | 0.50 | | 0.27 | 0.1 | 0.05 | 0.05 | 0.05 |
| | nom | 0.32 | 0.02 | | 0.80 | 0.25 | 0.80 | 0.20 | | | 0.22 | | | | |
| | min | 0.30 | 0.00 | | 0.75 | 0.20 | 0.75 | 0.15 | | 0.20 | 0.17 | | | | |

sot1226-3_po

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT1226-3 | | --- | | | | ~~19-11-06~~ 19-11-07 |

**Fig. 14. Package outline SOT1226-3 (X2SON5)**

# 13. Abbreviations

**Table 11. Abbreviations**

| Acronym | Description |
|---|---|
| CDM | Charged Device Model |
| CMOS | Complementary Metal-Oxide Semiconductor |
| DUT | Device Under Test |
| ESD | ElectroStatic Discharge |
| HBM | Human Body Model |
| MM | Machine Model |

# 14. Revision history

**Table 12. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74AUP1G06 v.10 | 20220113 | Product data sheet | - | 74AUP1G06 v.9 |
| Modifications: | • Section 1 and Section 2 updated.<br>• Fig. 10: Package outline drawing for SOT353-1 (TSSOP5) has changed. | | | |
| 74AUP1G06 v.9 | 20210706 | Product data sheet | - | 74AUP1G06 v.8 |
| Modifications: | • Type number 74AUP1G06GF (SOT891 / XSON6) removed.<br>• SOT1226 (X2SON5) package changed to SOT1226-3 (X2SON5) package.<br>• Section 1 and Section 2 updated.<br>• Table 5: Derating values for $P_{tot}$ total power dissipation have been updated. | | | |
| 74AUP1G06 v.8 | 20180212 | Product data sheet | - | 74AUP1G06 v.7 |
| 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>• Pin configuration drawing of SOT1226 (X2SON5) updated. | | | |
| 74AUP1G06 v.7 | 20120628 | Product data sheet | - | 74AUP1G06 v.6 |
| Modifications: | • Added type number 74AUP1G06GX (SOT1226)<br>• Package outline drawing of SOT886 (Fig. 11) modified. | | | |
| 74AUP1G06 v.6 | 20111115 | Product data sheet | - | 74AUP1G06 v.5 |
| Modifications: | • Legal pages updated. | | | |
| 74AUP1G06 v.5 | 20101022 | Product data sheet | - | 74AUP1G06 v.4 |
| 74AUP1G06 v.4 | 20090610 | Product data sheet | - | 74AUP1G06 v.3 |
| 74AUP1G06 v.3 | 20070615 | Product data sheet | - | 74AUP1G06 v.2 |
| 74AUP1G06 v.2 | 20060824 | Product data sheet | - | 74AUP1G06 v.1 |
| 74AUP1G06 v.1 | 20050718 | 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".
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