

74AUP2G14

Low-power dual Schmitt trigger inverter

Rev. 9 — 26 July 2023

Product data sheet

1. General description

The 74AUP2G14 is a dual inverter with Schmitt-trigger inputs. 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
- CMOS low power dissipation
- High noise immunity
- 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
- Latch-up performance exceeds 100 mA per JESD 78B Class II
- Low static power consumption; $I_{CC} = 0.9 \mu A$ (maximum)
- 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: ANSI/ESDA/JEDEC JS-001 class 3A exceeds 5000 V
 - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

3. Applications

- Wave and pulse shaper
- Astable multivibrator
- Monostable multivibrator

4. Ordering information

Table 1. Ordering information

| Type number | Package | | | |
|-----------------------------|-------------------|--------|--|---------------------------|
| | Temperature range | Name | Description | Version |
| 74AUP2G14GW | -40 °C to +125 °C | TSSOP6 | plastic thin shrink small outline package; 6 leads; body width 1.25 mm | SOT363-2 |
| 74AUP2G14GM | -40 °C to +125 °C | XSON6 | plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm | SOT886 |
| 74AUP2G14GN | -40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm | SOT1115 |
| 74AUP2G14GS | -40 °C to +125 °C | XSON6 | extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm | SOT1202 |
| 74AUP2G14GX | -40 °C to +125 °C | X2SON6 | plastic thermal enhanced extremely thin small outline package; no leads; 6 terminals; body 1.0 × 0.8 × 0.32 mm | SOT1255-2 |

5. Marking

Table 2. Marking

| Type number | Marking code[1] |
|-------------|-----------------|
| 74AUP2G14GW | pK |
| 74AUP2G14GM | pK |
| 74AUP2G14GN | pK |
| 74AUP2G14GS | pK |
| 74AUP2G14GX | pK |

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

6. Functional diagram

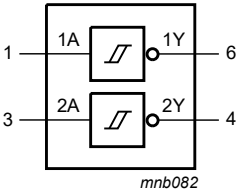


Fig. 1. Logic symbol

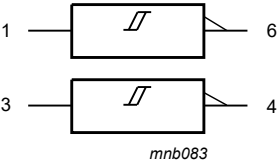


Fig. 2. IEC logic symbol

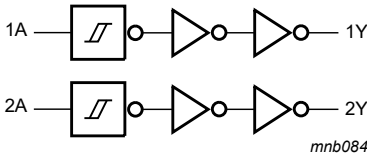


Fig. 3. Logic diagram

7. Pinning information

7.1. Pinning

74AUP2G14

1A 1 6 1Y

GND 2 5 V_{CC}

2A 3 4 2Y

001aad704

74AUP2G14

1A 1 6 1Y

GND 2 5 V_{CC}

2A 3 4 2Y

001aad705

Transparent top view

74AUP2G14

1A 1 6 1Y

GND 2 5 V_{CC}

2A 3 4 2Y

001aad663

Transparent top view

74AUP2G14

1A 1 6 1Y

GND 2 5 V_{CC}

2A 3 4 2Y

aaa-019830

Transparent top view

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

Fig. 5. Pin configuration SOT886 (XSON6)

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

Fig. 7. Pin configuration SOT1255-2 (X2SON6)

7.2. 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 |

8. Functional description

Table 4. Function table

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

| Input | Output |
|-------|--------|
| nA | nY |
| L | H |
| H | L |

9. 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 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.
For SOT1255-2 (X2SON6) package: P_{tot} derates linearly with 3.3 mW/K above 75 °C.

10. 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 |

11. 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 _{OH} | HIGH-level output voltage | V _I = V _{T+} or V _{T-} | | | | |
| | | 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 | V _I = V _{T+} or V _{T-} | | | | |
| | | 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 |
| ΔI _{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 |
| ΔI _{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 _I = GND or V _{CC} ; V _{CC} = 0 V to 3.6 V | - | 1.1 | - | pF |
| C _O | output capacitance | V _O = GND; V _{CC} = 0 V | - | 1.7 | - | pF |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--------------------------------------|---|-----------------------|-----|-----------------------|------|
| T_{amb} = -40 °C to +85 °C | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{T+} or V _{T-} | | | | |
| | | 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 | V _I = V _{T+} or V _{T-} | | | | |
| | | 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 |
| ΔI _{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 |
| ΔI _{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 _{OH} | HIGH-level output voltage | V _I = V _{T+} or V _{T-} | | | | |
| | | 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 | V _I = V _{T+} or V _{T-} | | | | |
| | | 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 |
| ΔI _{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 |
| ΔI _{CC} | additional supply current | V _I = V _{CC} - 0.6 V; I _O = 0 A; V _{CC} = 3.3 V | - | - | 75 | µA |

12. Dynamic characteristics

Table 8. Dynamic characteristics

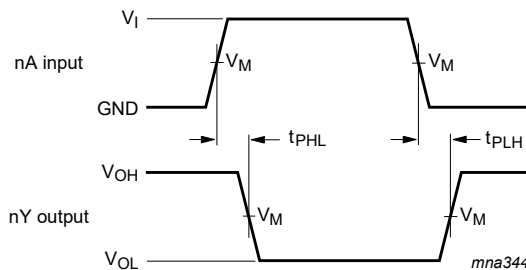
Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 9.

| 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 | nA to nY; see Fig. 8 [2] | | | | | | | | |
| | | V _{CC} = 0.8 V | - | 19.9 | - | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 2.7 | 5.9 | 11.0 | 2.4 | 11.1 | 2.4 | 11.2 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 2.6 | 4.3 | 6.6 | 2.4 | 7.1 | 2.4 | 7.4 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.1 | 3.7 | 5.4 | 2.0 | 6.0 | 2.0 | 6.2 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.0 | 3.0 | 4.1 | 1.7 | 4.5 | 1.7 | 4.7 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 1.9 | 2.8 | 3.6 | 1.5 | 3.9 | 1.5 | 4.0 | ns |
| C _L = 10 pF | | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Fig. 8 [2] | | | | | | | | |
| | | V _{CC} = 0.8 V | - | 23.4 | - | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 2.9 | 6.8 | 12.7 | 2.8 | 12.8 | 2.8 | 12.9 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 2.8 | 5.0 | 7.7 | 2.6 | 8.2 | 2.6 | 8.6 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.7 | 4.2 | 6.2 | 2.5 | 6.7 | 2.5 | 7.1 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.3 | 3.6 | 4.8 | 2.1 | 5.2 | 2.1 | 5.5 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 2.1 | 3.3 | 4.3 | 2.0 | 4.5 | 2.0 | 4.7 | ns |
| C _L = 15 pF | | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Fig. 8 [2] | | | | | | | | |
| | | V _{CC} = 0.8 V | - | 26.9 | - | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 3.3 | 7.6 | 14.3 | 3.0 | 14.5 | 3.0 | 14.7 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.3 | 5.5 | 8.6 | 2.9 | 9.4 | 2.9 | 9.8 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 2.8 | 4.7 | 7.0 | 2.8 | 7.7 | 2.8 | 8.1 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 2.7 | 4.0 | 5.5 | 2.4 | 5.9 | 2.4 | 6.2 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 2.6 | 3.8 | 4.8 | 2.2 | 5.2 | 2.2 | 5.4 | ns |
| C _L = 30 pF | | | | | | | | | | |
| t _{pd} | propagation delay | nA to nY; see Fig. 8 [2] | | | | | | | | |
| | | V _{CC} = 0.8 V | - | 37.3 | - | - | - | - | - | ns |
| | | V _{CC} = 1.1 V to 1.3 V | 4.0 | 9.8 | 18.7 | 3.9 | 19.6 | 3.9 | 20.0 | ns |
| | | V _{CC} = 1.4 V to 1.6 V | 3.7 | 7.1 | 11.2 | 3.8 | 12.3 | 3.8 | 12.9 | ns |
| | | V _{CC} = 1.65 V to 1.95 V | 3.6 | 6.0 | 9.1 | 3.6 | 10.0 | 3.6 | 10.6 | ns |
| | | V _{CC} = 2.3 V to 2.7 V | 3.5 | 5.2 | 6.9 | 3.2 | 7.5 | 3.2 | 7.9 | ns |
| | | V _{CC} = 3.0 V to 3.6 V | 3.3 | 4.8 | 6.1 | 3.1 | 7.1 | 3.1 | 7.4 | 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 | f _i = 1 MHz; V _I = GND to V _{CC} [3][4] | | | | | | | | |
| | | V _{CC} = 0.8 V | - | 2.6 | - | - | - | - | - | pF |
| | | V _{CC} = 1.1 V to 1.3 V | - | 2.7 | - | - | - | - | - | pF |
| | | V _{CC} = 1.4 V to 1.6 V | - | 2.9 | - | - | - | - | - | pF |
| | | V _{CC} = 1.65 V to 1.95 V | - | 3.1 | - | - | - | - | - | pF |
| | | V _{CC} = 2.3 V to 2.7 V | - | 3.7 | - | - | - | - | - | pF |
| | | V _{CC} = 3.0 V to 3.6 V | - | 4.3 | - | - | - | - | - | pF |

- [1] All typical values are measured at nominal V_{CC}.
 [2] t_{pd} is the same as t_{PLH} and t_{PHL}.
 [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).
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ 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.

12.1. Waveform and test circuit



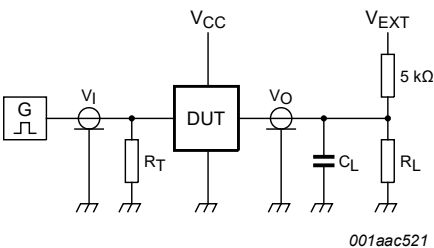
Measurement points are given in [Table 9](#).

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 8. The data input (nA) to output (nY) propagation delays

Table 9. Measurement points

| Supply voltage | Output | Input | | |
|-----------------|-----------------------|-----------------------|-----------------|---------------------------------|
| V _{CC} | V _M | V _M | V _I | t _r = t _f |
| 0.8 V to 3.6 V | 0.5 × V _{CC} | 0.5 × V _{CC} | V _{CC} | ≤ 3.0 ns |



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 | $2 \times V_{CC}$ | |

[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. Transfer characteristics

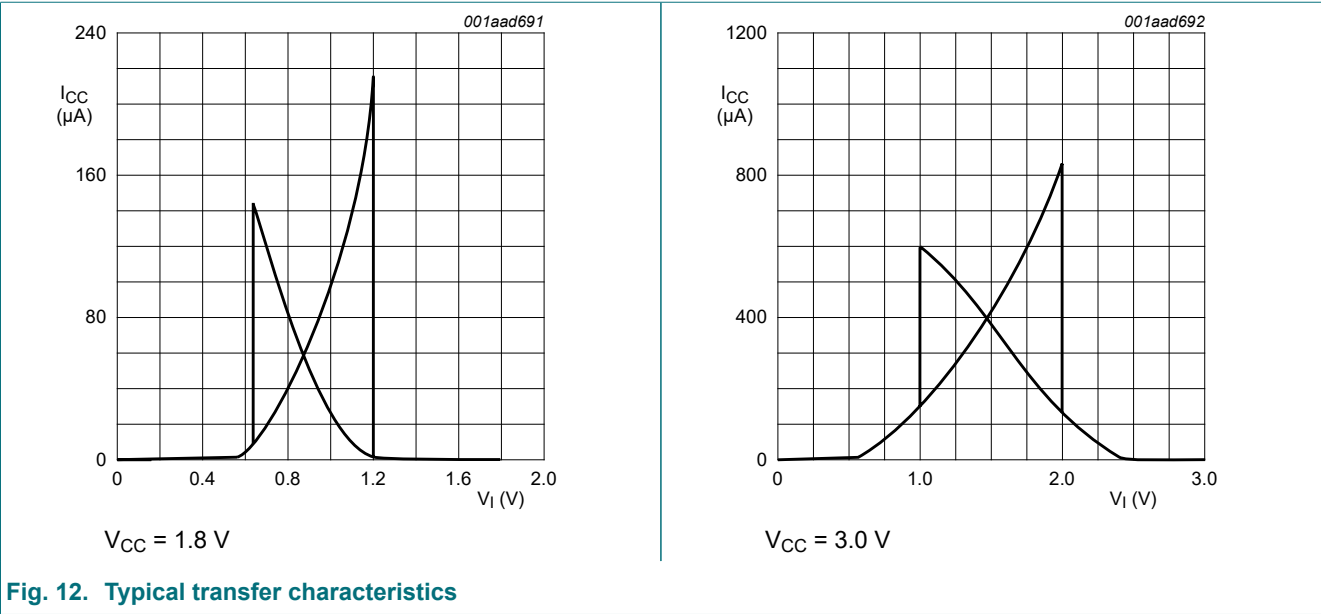
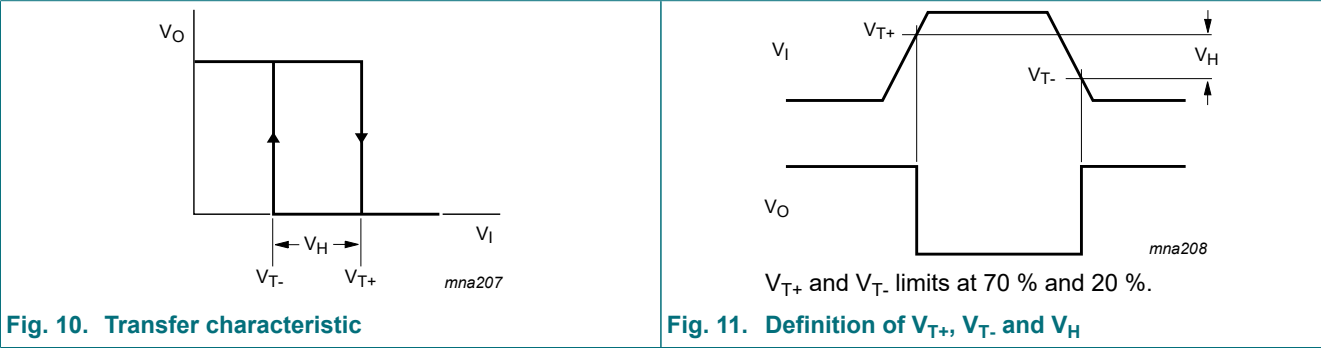
Table 11. Transfer characteristics

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

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|----------|----------------------------------|---|-------|-----|------|------------------|------|-------------------|------|------|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| V_{T+} | positive-going threshold voltage | see Fig. 10 and Fig. 11 | | | | | | | | |
| | | $V_{CC} = 0.8 \text{ V}$ | 0.30 | - | 0.60 | 0.30 | 0.60 | 0.30 | 0.62 | V |
| | | $V_{CC} = 1.1 \text{ V}$ | 0.53 | - | 0.90 | 0.53 | 0.90 | 0.53 | 0.92 | V |
| | | $V_{CC} = 1.4 \text{ V}$ | 0.74 | - | 1.11 | 0.74 | 1.11 | 0.74 | 1.13 | V |
| | | $V_{CC} = 1.65 \text{ V}$ | 0.91 | - | 1.29 | 0.91 | 1.29 | 0.91 | 1.31 | V |
| | | $V_{CC} = 2.3 \text{ V}$ | 1.37 | - | 1.77 | 1.37 | 1.77 | 1.37 | 1.80 | V |
| | | $V_{CC} = 3.0 \text{ V}$ | 1.88 | - | 2.29 | 1.88 | 2.29 | 1.88 | 2.32 | V |
| V_{T-} | negative-going threshold voltage | see Fig. 10 and Fig. 11 | | | | | | | | |
| | | $V_{CC} = 0.8 \text{ V}$ | 0.10 | - | 0.60 | 0.10 | 0.60 | 0.10 | 0.60 | V |
| | | $V_{CC} = 1.1 \text{ V}$ | 0.26 | - | 0.65 | 0.26 | 0.65 | 0.26 | 0.65 | V |
| | | $V_{CC} = 1.4 \text{ V}$ | 0.39 | - | 0.75 | 0.39 | 0.75 | 0.39 | 0.75 | V |
| | | $V_{CC} = 1.65 \text{ V}$ | 0.47 | - | 0.84 | 0.47 | 0.84 | 0.47 | 0.84 | V |
| | | $V_{CC} = 2.3 \text{ V}$ | 0.69 | - | 1.04 | 0.69 | 1.04 | 0.69 | 1.04 | V |
| | | $V_{CC} = 3.0 \text{ V}$ | 0.88 | - | 1.24 | 0.88 | 1.24 | 0.88 | 1.24 | V |

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|----------------|--------------------|---|-------|-----|------|------------------|------|-------------------|------|------|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| V _H | hysteresis voltage | (V _{T+} - V _{T-}); see Fig. 10, Fig. 11 and Fig. 12. | | | | | | | | |
| | | V _{CC} = 0.8 V | 0.07 | - | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | V |
| | | V _{CC} = 1.1 V | 0.08 | - | 0.46 | 0.08 | 0.46 | 0.08 | 0.46 | V |
| | | V _{CC} = 1.4 V | 0.18 | - | 0.56 | 0.18 | 0.56 | 0.18 | 0.56 | V |
| | | V _{CC} = 1.65 V | 0.27 | - | 0.66 | 0.27 | 0.66 | 0.27 | 0.66 | V |
| | | V _{CC} = 2.3 V | 0.53 | - | 0.92 | 0.53 | 0.92 | 0.53 | 0.92 | V |
| | | V _{CC} = 3.0 V | 0.79 | - | 1.31 | 0.79 | 1.31 | 0.79 | 1.31 | V |

13.1. Waveforms transfer characteristics



14. Application information

The slow input rise and fall times cause additional power dissipation, this can be calculated using the following formula:

$P_{add} = f_i \times (t_r \times \Delta I_{CC(AV)} + t_f \times \Delta I_{CC(AV)}) \times V_{CC}$ where:

- P_{add} = additional power dissipation (μW);
- f_i = input frequency (MHz);
- t_r = rise time (ns); 10 % to 90 %;
- t_f = fall time (ns); 90 % to 10 %;
- $\Delta I_{CC(AV)}$ = average additional supply current (μA).

Average $\Delta I_{CC(AV)}$ differs with positive or negative input transitions, as shown in Fig. 13.

An example of a relaxation circuit using the 74AUP2G14 is shown in Fig. 14.

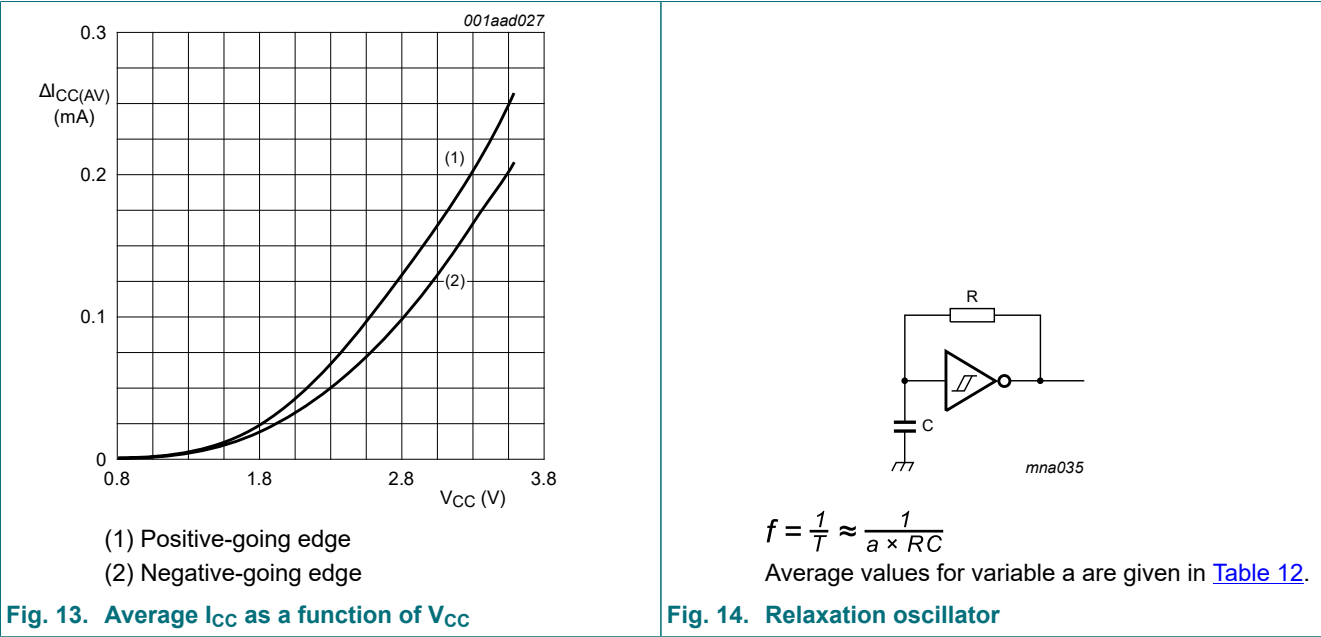


Table 12. Variable values

| Supply voltage | Variable a |
|----------------|------------|
| 1.1 V | 1.28 |
| 1.5 V | 1.22 |
| 1.8 V | 1.24 |
| 2.8 V | 1.34 |
| 3.3 V | 1.45 |

15. Package outline

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

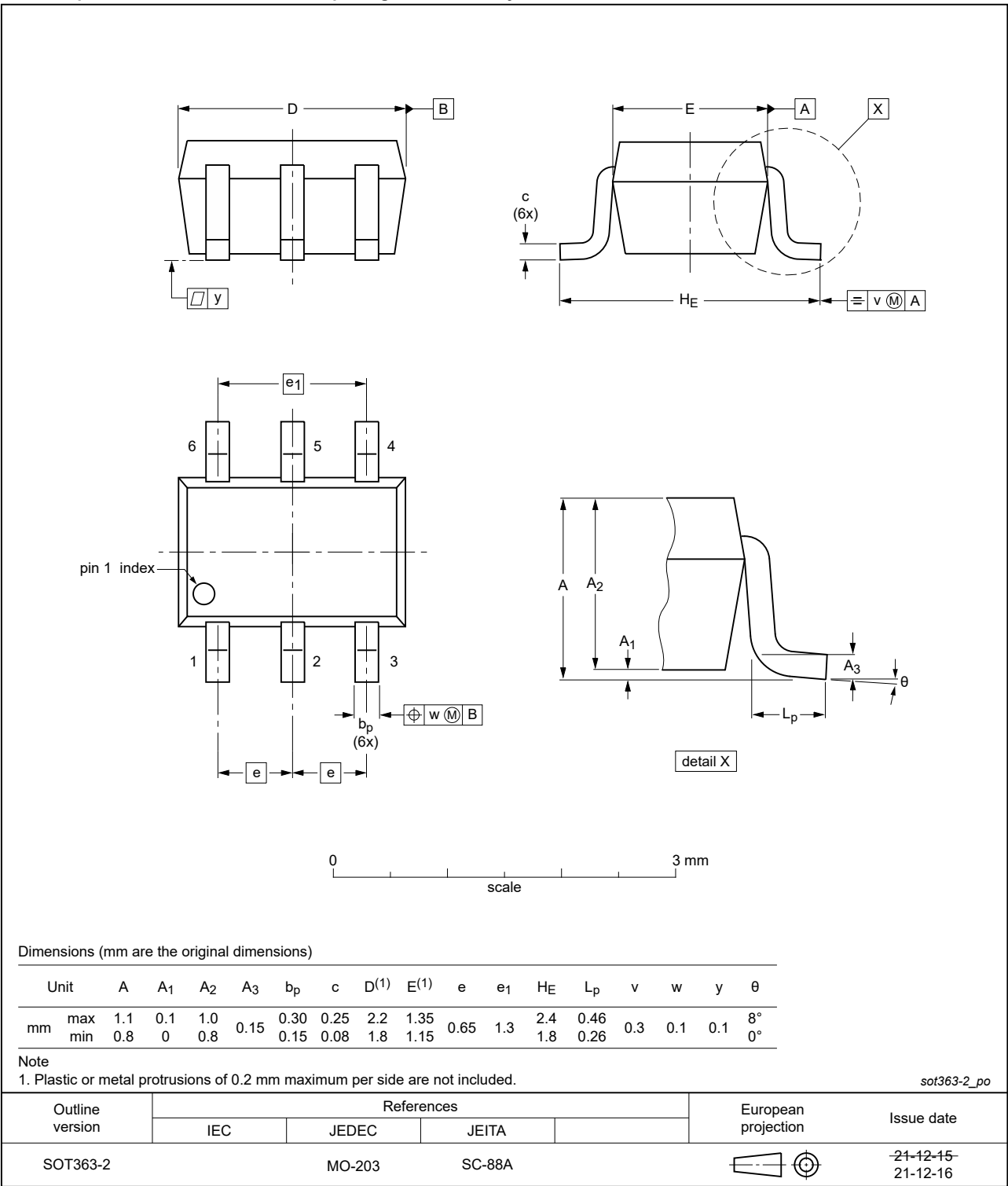


Fig. 15. Package outline SOT363-2 (TSSOP6)

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

SOT886

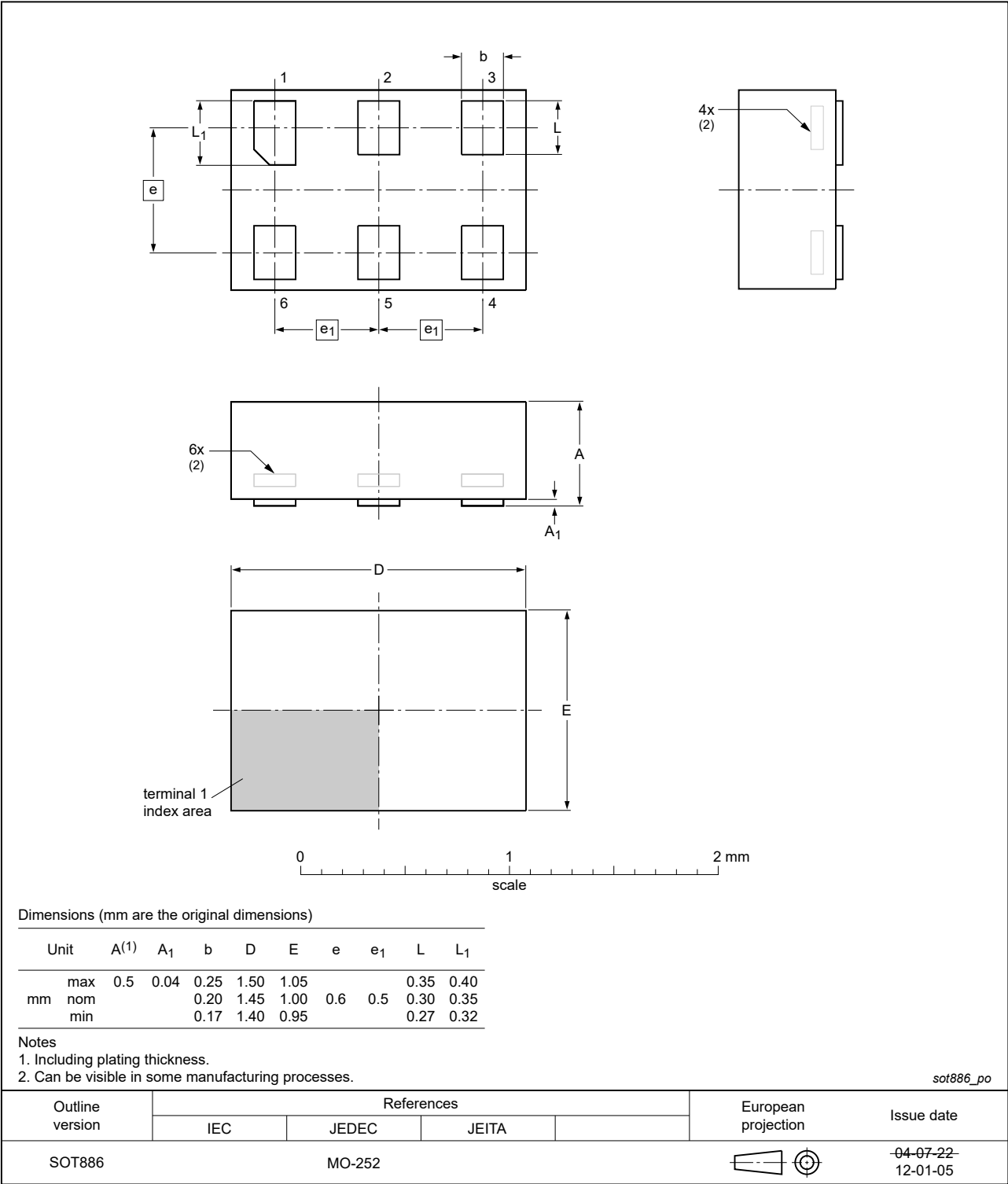


Fig. 16. Package outline SOT886 (XSON6)

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

SOT1115

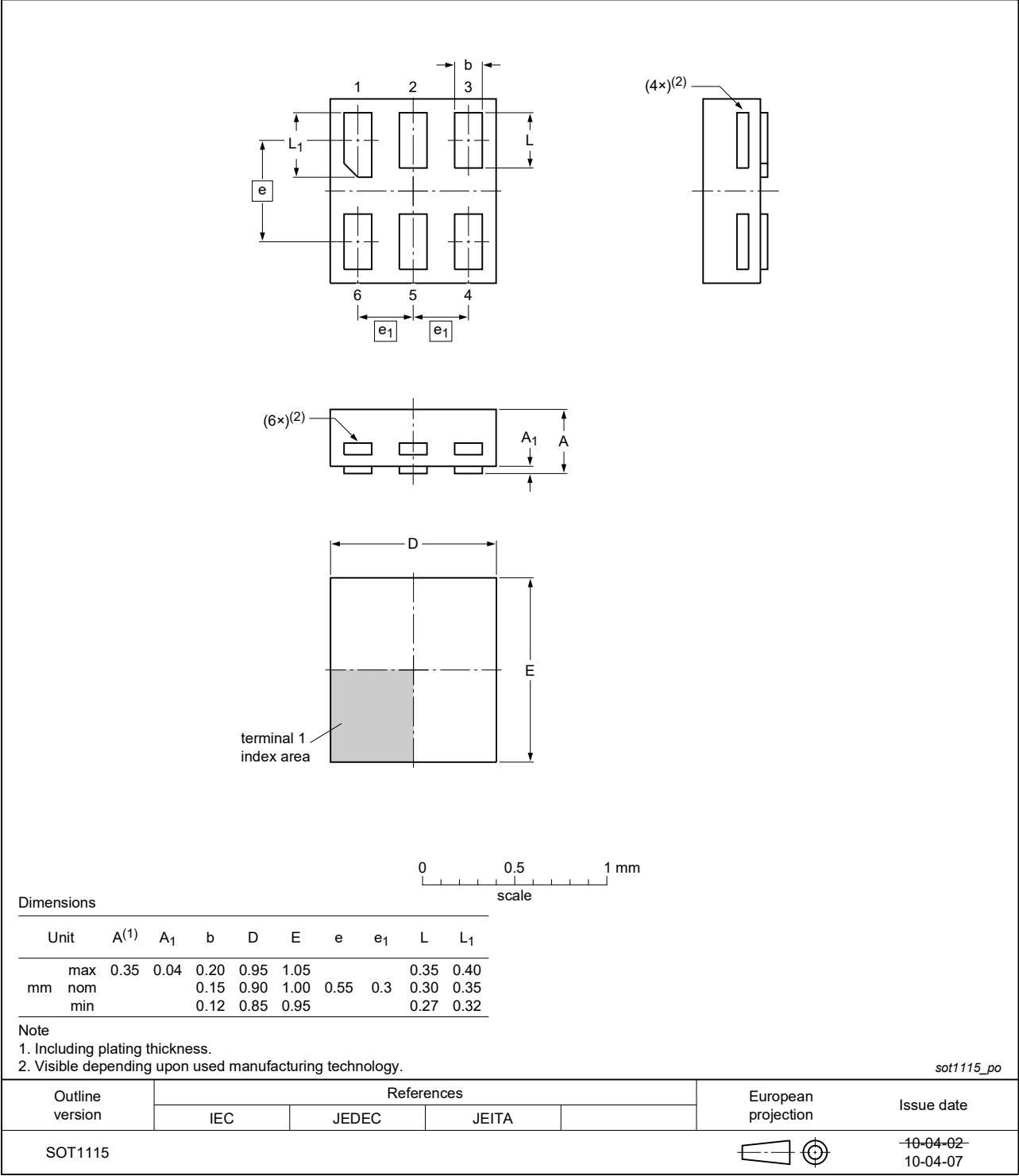


Fig. 17. Package outline SOT1115 (XSON6)

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

SOT1202

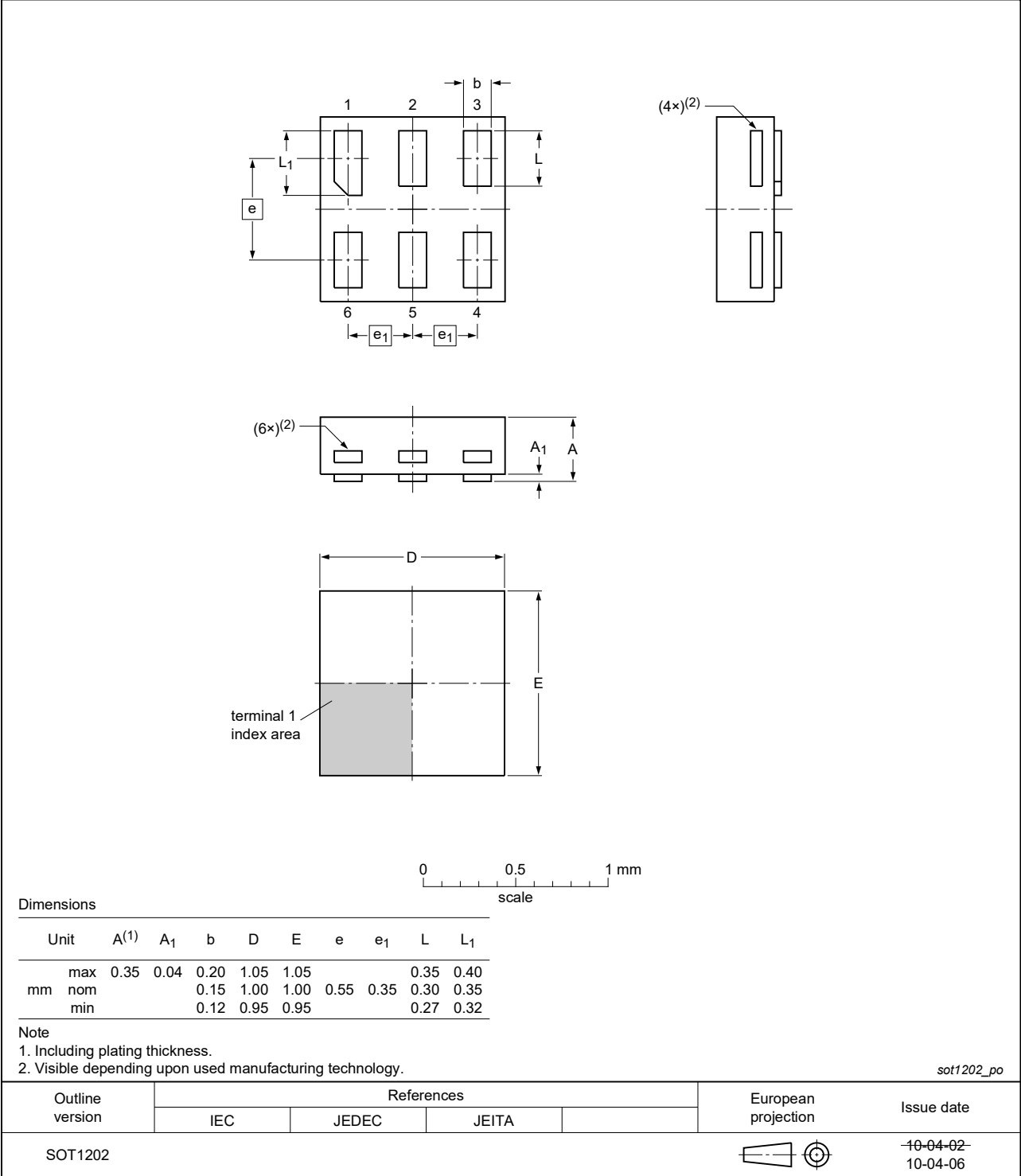


Fig. 18. Package outline SOT1202 (XSON6)

X2SON6: plastic thermal enhanced extremely thin small outline package; no leads;
6 terminals; body 1.0 x 0.8 x 0.32 mm

SOT1255-2

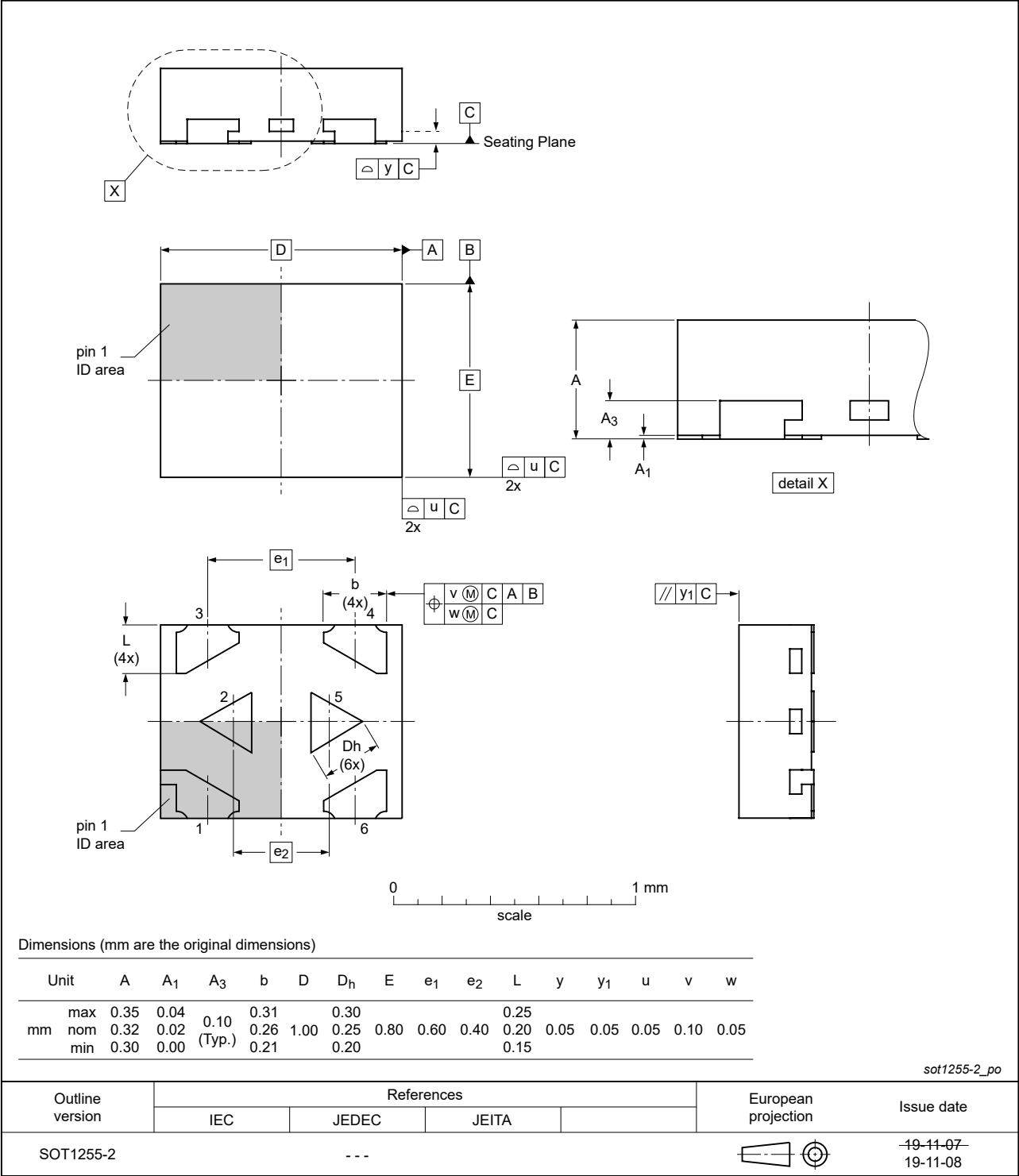


Fig. 19. Package outline SOT1255-2 (X2SON6)

16. Abbreviations

Table 13. Abbreviations

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

17. Revision history

Table 14. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--|--------------------|---------------|---------------|
| 74AUP2G14 v.9 | 20230726 | Product data sheet | - | 74AUP2G14 v.8 |
| Modifications: | <ul style="list-style-type: none">Section 2: ESD specification updated according to the latest JEDEC standard. | | | |
| 74AUP2G14 v.8 | 20220131 | Product data sheet | - | 74AUP2G14 v.7 |
| Modifications: | <ul style="list-style-type: none">Package SOT363 (SC-88) changed to SOT363-2 (TSSOP6). | | | |
| 74AUP2G14 v.7 | 20210705 | Product data sheet | - | 74AUP2G14 v.6 |
| Modifications: | <ul style="list-style-type: none">Section 1 and Section 2 updated.SOT1255 (X2SON6) package changed to SOT1255-2 (X2SON6) package.Type number 74AUP2G14GF (SOT891/XSON6) removed.Table 5: Derating values for P_{tot} total power dissipation updated. | | | |
| 74AUP2G14 v.6 | 20150917 | Product data sheet | - | 74AUP2G14 v.5 |
| Modifications: | <ul style="list-style-type: none">Added type number 74AUP2G14GX (SOT1255/X2SON6). | | | |
| 74AUP2G14 v.5 | 20121204 | Product data sheet | - | 74AUP2G14 v.4 |
| Modifications: | <ul style="list-style-type: none">Package outline drawing of SOT886 (Fig. 16) modified. | | | |
| 74AUP2G14 v.4 | 20111201 | Product data sheet | - | 74AUP2G14 v.3 |
| 74AUP2G14 v.3 | 20100722 | Product data sheet | - | 74AUP2G14 v.2 |
| 74AUP2G14 v.2 | 20090703 | Product data sheet | - | 74AUP2G14 v.1 |
| 74AUP2G14 v.1 | 20061219 | Product data sheet | - | - |

18. 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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