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Kind regards,

Team Nexperia

PDTA115T series

PNP resistor-equipped transistors; R1 = 100 k Ω , R2 = open

Rev. 05 — 2 September 2009

Product data sheet

1. Product profile

1.1 General description

PNP resistor-equipped transistors.

Table 1. Product overview

| Type number | Package | | NPN complement |
|--------------------------|---------------|--------|----------------|
| | NXP | JEITA | |
| PDTA115TE | SOT416 | SC-75 | PDTC115TE |
| PDTA115TK | SOT346 | SC-59 | PDTC115TK |
| PDTA115TM | SOT883 | SC-101 | PDTC115TM |
| PDTA115TS ^[1] | SOT54 (TO-92) | SC-43A | PDTC115TS |
| PDTA115TT | SOT23 | - | PDTC115TT |
| PDTA115TU | SOT323 | SC-70 | PDTC115TU |

[1] Also available in SOT54A and SOT54 variant packages (see [Section 2](#))

1.2 Features

- Built-in bias resistors
- Reduces component count
- Simplifies circuit design
- Reduces pick and place costs

1.3 Applications

- General purpose switching and amplification
- Circuit drivers
- Inverter and interface circuits

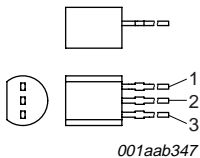
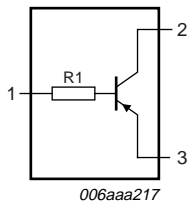
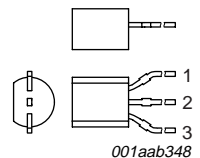
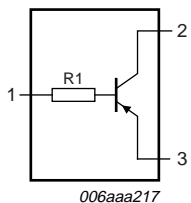
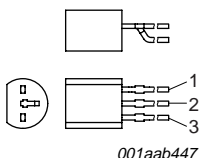
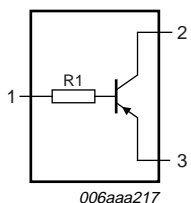
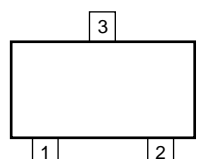
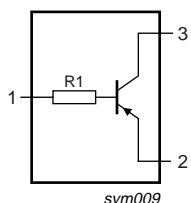
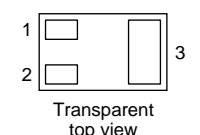
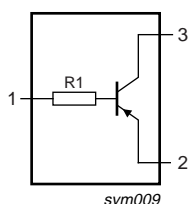
1.4 Quick reference data

Table 2. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------|---------------------------|------------|-----|-----|------|------------|
| V_{CE0} | collector-emitter voltage | open base | - | - | -50 | V |
| I_O | output current (DC) | | - | - | -100 | mA |
| R1 | bias resistor 1 (input) | | 70 | 100 | 130 | k Ω |

2. Pinning information

Table 3. Pinning

| Pin | Description | Simplified outline | Symbol |
|--------------------------------------|--------------------|--|--|
| SOT54 | | | |
| 1 | input (base) |  <p>001aab347</p> |  <p>006aaa217</p> |
| 2 | output (collector) | | |
| 3 | GND (emitter) | | |
| SOT54A | | | |
| 1 | input (base) |  <p>001aab348</p> |  <p>006aaa217</p> |
| 2 | output (collector) | | |
| 3 | GND (emitter) | | |
| SOT54 variant | | | |
| 1 | input (base) |  <p>001aab447</p> |  <p>006aaa217</p> |
| 2 | output (collector) | | |
| 3 | GND (emitter) | | |
| SOT23, SOT323, SOT346, SOT416 | | | |
| 1 | input (base) |  <p>006aaa144</p> |  <p>sym009</p> |
| 2 | GND (emitter) | | |
| 3 | output (collector) | | |
| SOT883 | | | |
| 1 | input (base) |  <p>Transparent top view</p> |  <p>sym009</p> |
| 2 | GND (emitter) | | |
| 3 | output (collector) | | |

3. Ordering information

Table 4. Ordering information

| Type number | Package | | Version |
|--------------------------|---------|---|---------|
| | Name | Description | |
| PDTA115TE | SC-75 | plastic surface mounted package; 3 leads | SOT416 |
| PDTA115TK | SC-59 | plastic surface mounted package; 3 leads | SOT346 |
| PDTA115TM | SC-101 | leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.5 mm | SOT883 |
| PDTA115TS ^[1] | SC-43A | plastic single-ended leaded (through hole) package; 3 leads | SOT54 |
| PDTA115TT | - | plastic surface mounted package; 3 leads | SOT23 |
| PDTA115TU | SC-70 | plastic surface mounted package; 3 leads | SOT323 |

[1] Also available in SOT54A and SOT54 variant packages (see [Section 2](#) and [Section 9](#)).

4. Marking

Table 5. Marking codes

| Type number | Marking code ^[1] |
|-------------|-----------------------------|
| PDTA115TE | 12 |
| PDTA115TK | 11 |
| PDTA115TM | E8 |
| PDTA115TS | TA115T |
| PDTA115TT | *AC |
| PDTA115TU | *11 |

[1] * = -: made in Hong Kong
 * = p: made in Hong Kong
 * = t: made in Malaysia
 * = W: made in China

5. Limiting values

Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------|---------------------------|--------------------------|----------|------|------|
| V _{CBO} | collector-base voltage | open emitter | - | -50 | V |
| V _{CEO} | collector-emitter voltage | open base | - | -50 | V |
| V _{EBO} | emitter-base voltage | open collector | - | -5 | V |
| I _O | output current (DC) | | - | -100 | mA |
| I _{CM} | peak collector current | | - | -100 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | | | |
| | SOT416 | | [1] - | 150 | mW |
| | SOT346 | | [1] - | 250 | mW |
| | SOT883 | | [2][3] - | 250 | mW |
| | SOT54 | | [1] - | 500 | mW |
| | SOT23 | | [1] - | 250 | mW |
| | SOT323 | | [1] - | 200 | mW |
| T _{stg} | storage temperature | | -65 | +150 | °C |
| T _j | junction temperature | | - | 150 | °C |
| T _{amb} | ambient temperature | | -65 | +150 | °C |

[1] Refer to standard mounting conditions.

[2] Reflow soldering is the only recommended soldering method.

[3] Refer to SOT883 standard mounting conditions; FR4 printed-circuit board with 60 μ m copper strip line.

6. Thermal characteristics

Table 7. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------------|---|-------------|----------|-----|-----|------|
| R _{th(j-a)} | thermal resistance from junction to ambient | in free air | | | | |
| | SOT416 | | [1] - | - | 833 | K/W |
| | SOT346 | | [1] - | - | 500 | K/W |
| | SOT883 | | [2][3] - | - | 500 | K/W |
| | SOT54 | | [1] - | - | 250 | K/W |
| | SOT23 | | [1] - | - | 500 | K/W |
| | SOT323 | | [1] - | - | 625 | K/W |

[1] Refer to standard mounting conditions.

[2] Reflow soldering is the only recommended soldering method.

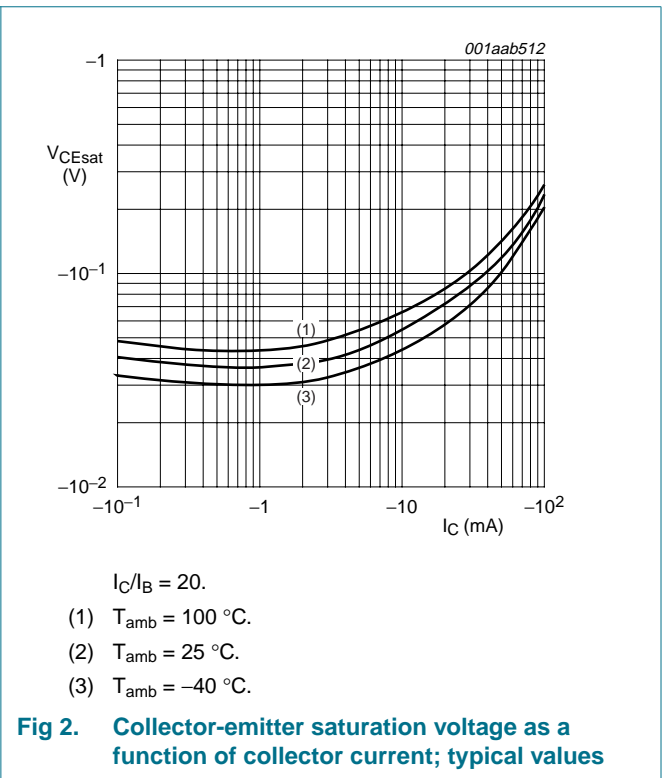
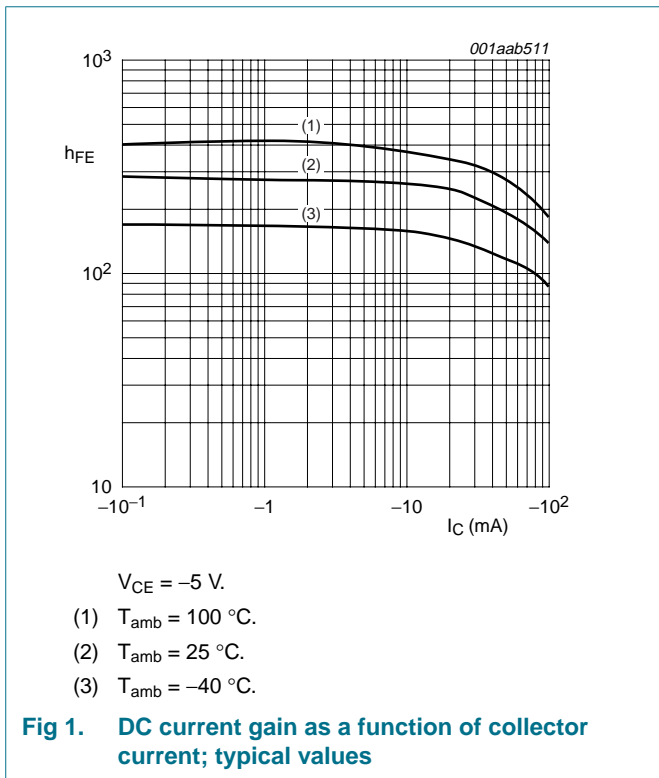
[3] Refer to SOT883 standard mounting conditions; FR4 printed-circuit board with 60 μ m copper strip line.

7. Characteristics

Table 8. Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------|--------------------------------------|--|-----|-----|------|---------------|
| I_{CBO} | collector-base cut-off current | $V_{CB} = -50\text{ V}; I_E = 0\text{ A}$ | - | - | -100 | nA |
| I_{CEO} | collector-emitter cut-off current | $V_{CE} = -30\text{ V}; I_B = 0\text{ A}$ | - | - | -1 | μA |
| | | $V_{CE} = -30\text{ V}; I_B = 0\text{ A}; T_j = 150\text{ }^{\circ}\text{C}$ | - | - | -50 | μA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = -5\text{ V}; I_C = 0\text{ A}$ | - | - | -100 | nA |
| h_{FE} | DC current gain | $V_{CE} = -5\text{ V}; I_C = -1\text{ mA}$ | 100 | - | - | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -5\text{ mA}; I_B = -0.25\text{ mA}$ | - | - | -150 | mV |
| R1 | bias resistor 1 (input) | | 70 | 100 | 130 | kΩ |
| C_c | collector capacitance | $V_{CB} = -10\text{ V}; I_E = i_e = 0\text{ A}; f = 1\text{ MHz}$ | - | - | 3 | pF |



8. Package outline

Plastic surface-mounted package; 3 leads

SOT416

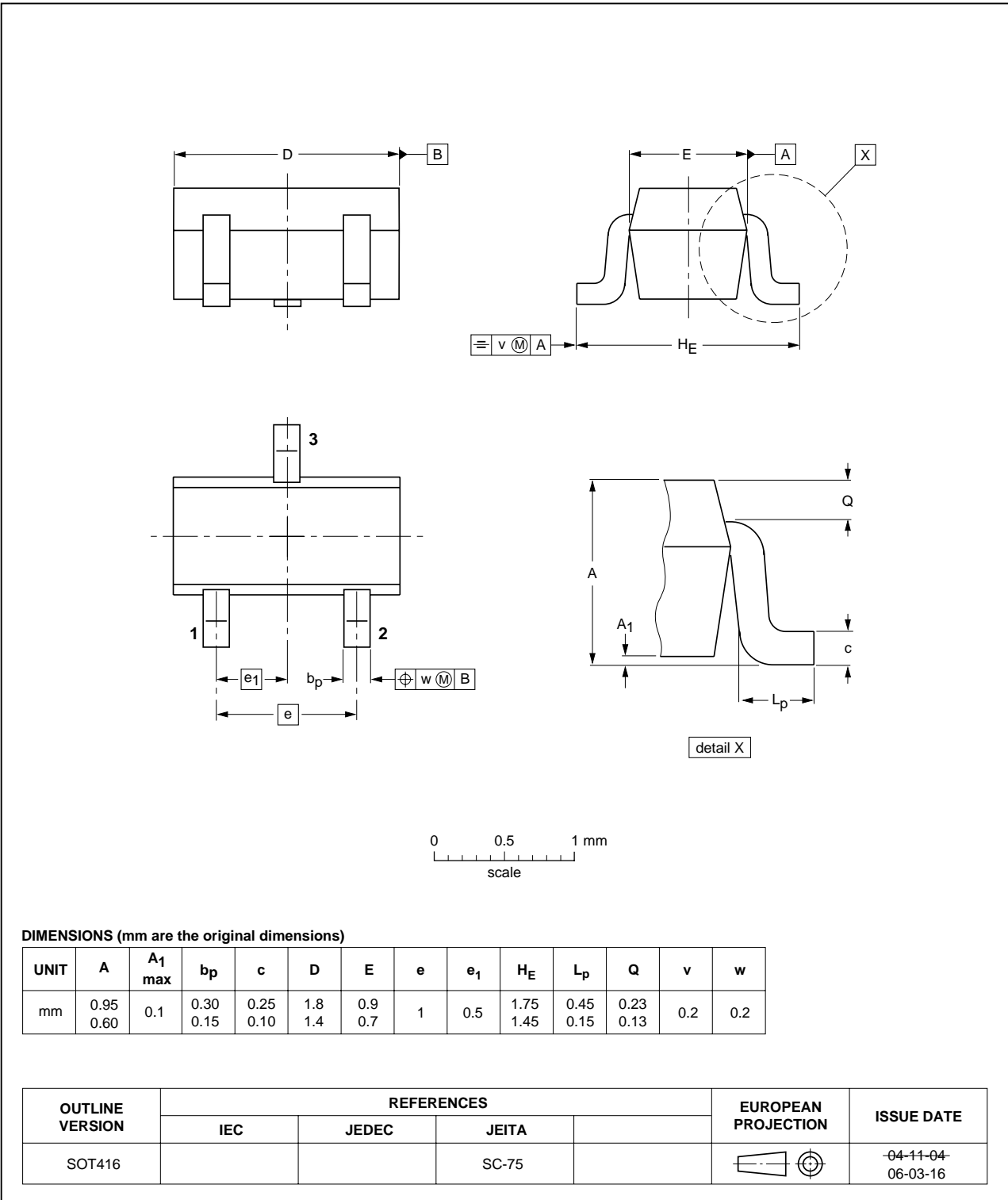


Fig 3. Package outline SOT416 (SC-75)

Plastic surface-mounted package; 3 leads

SOT346

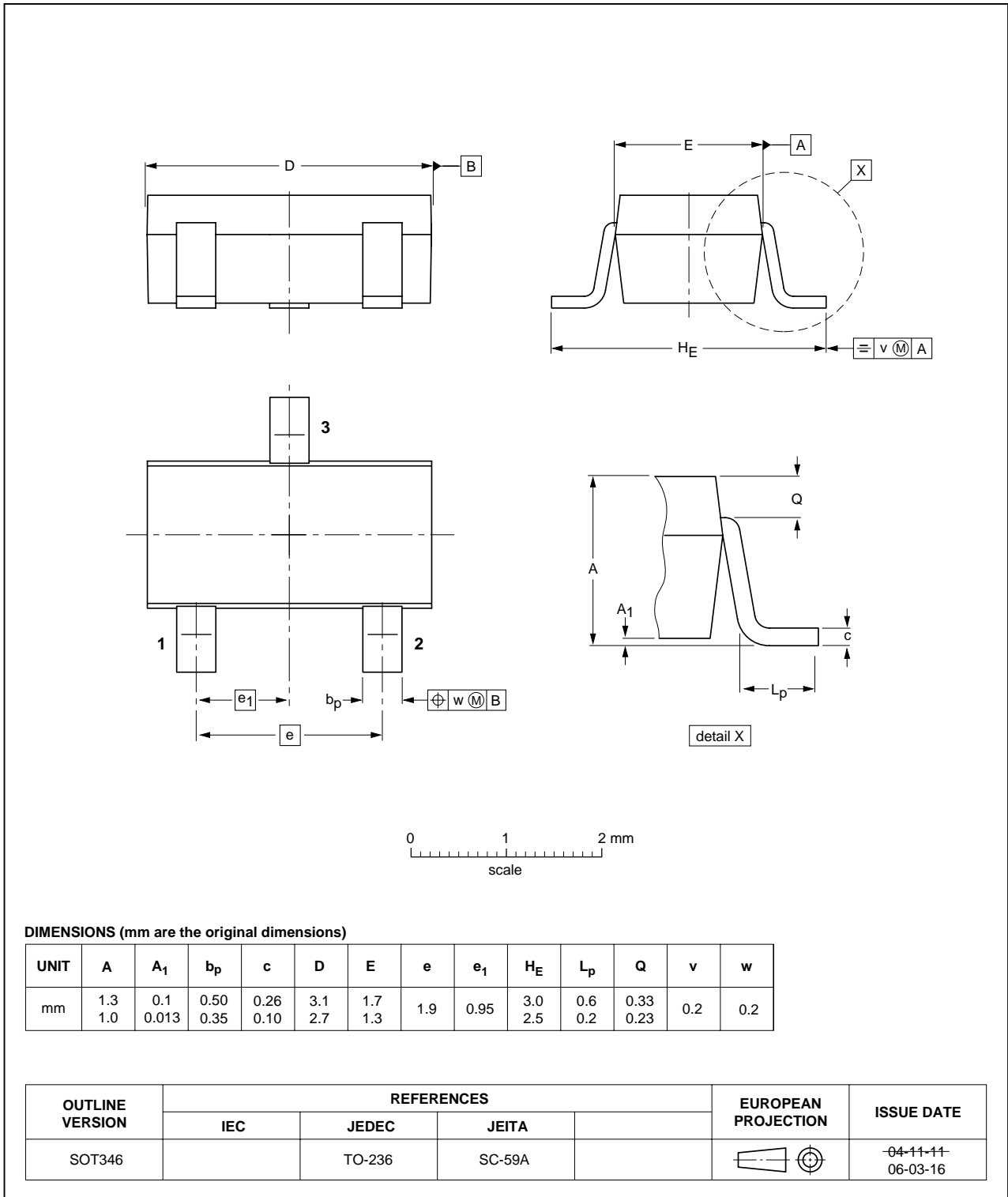


Fig 4. Package outline SOT346 (SC-59/TO-236)

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883

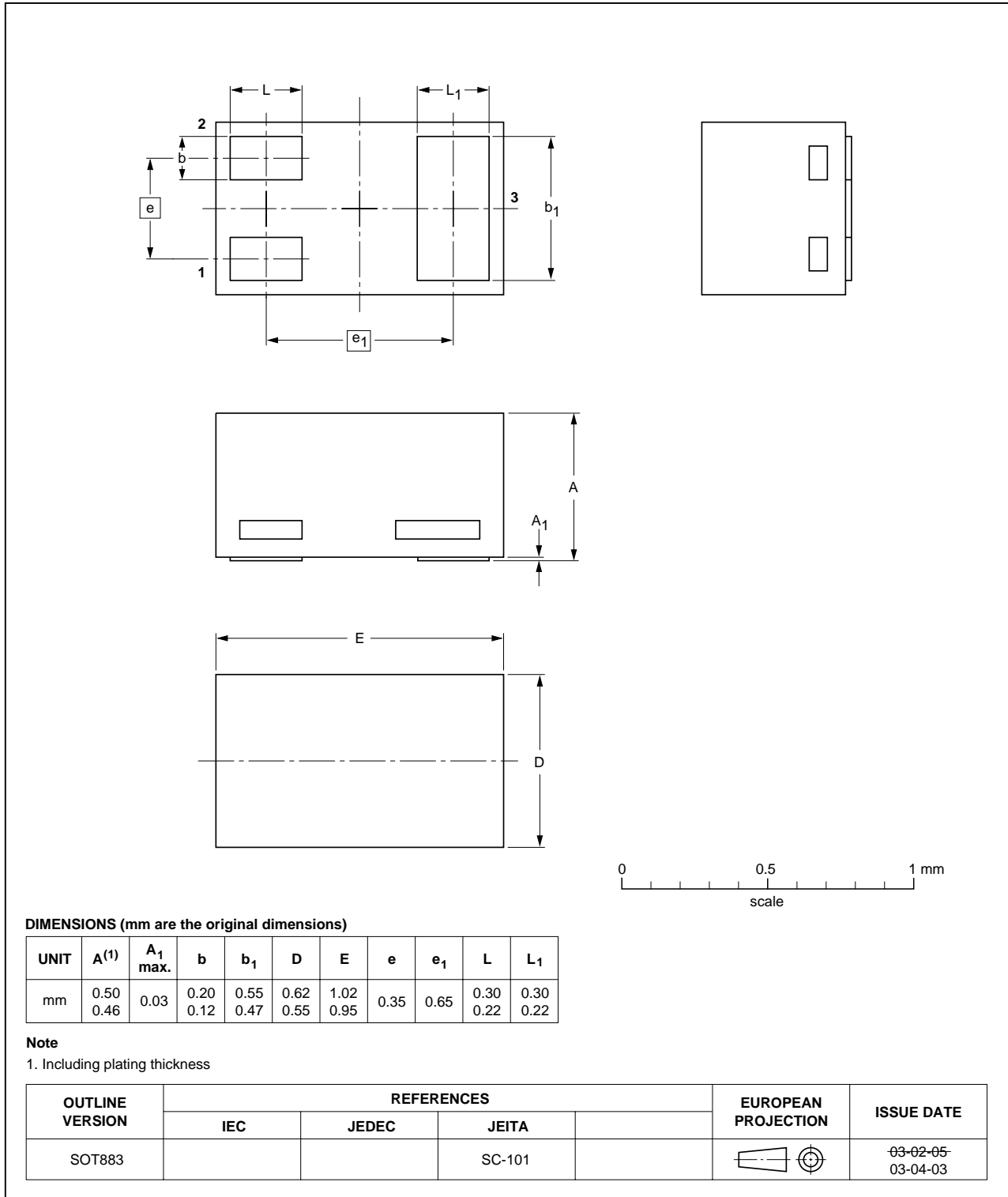


Fig 5. Package outline SOT883 (SC-101)

Plastic single-ended leaded (through hole) package; 3 leads

SOT54

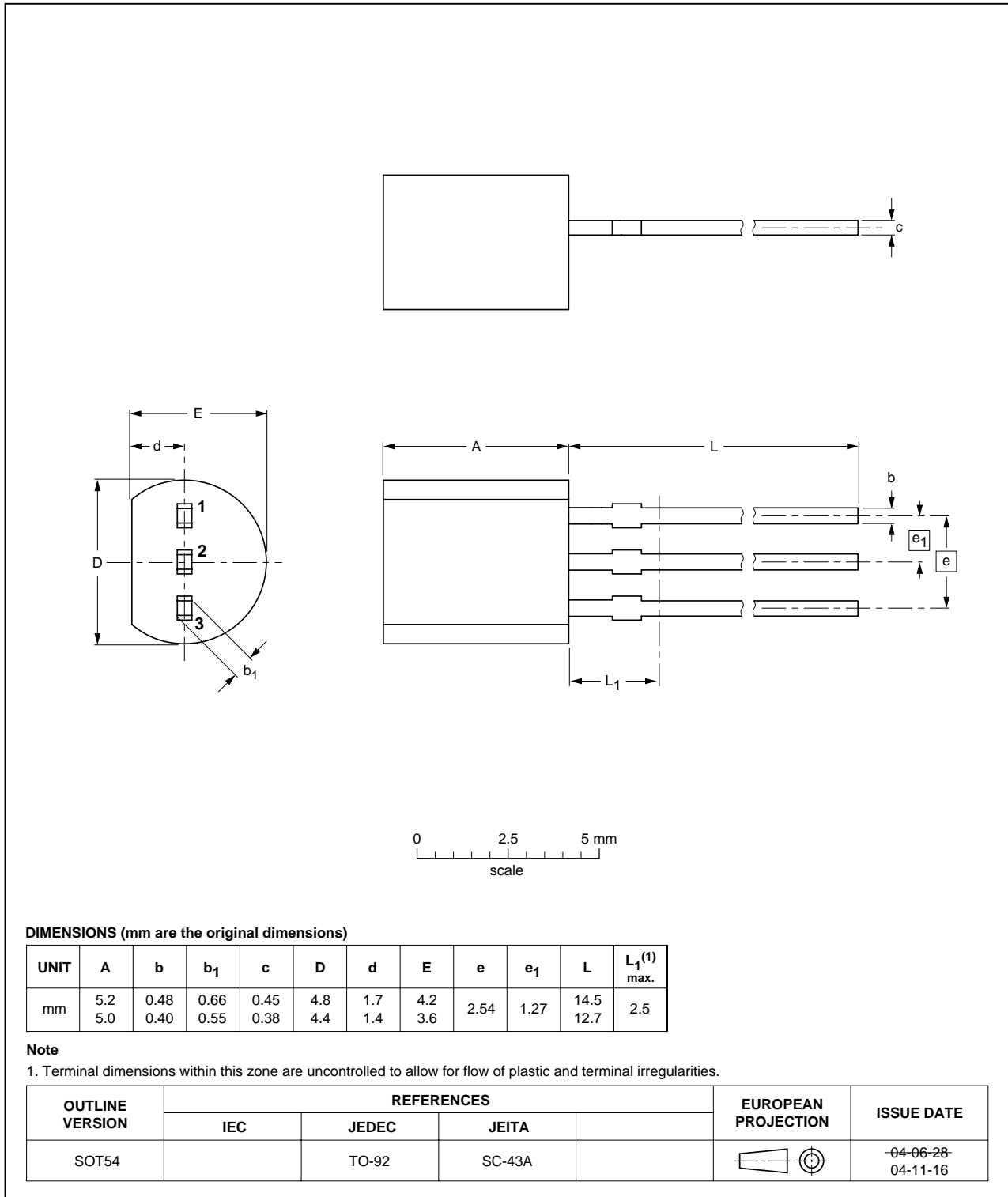
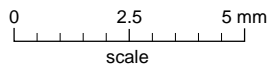
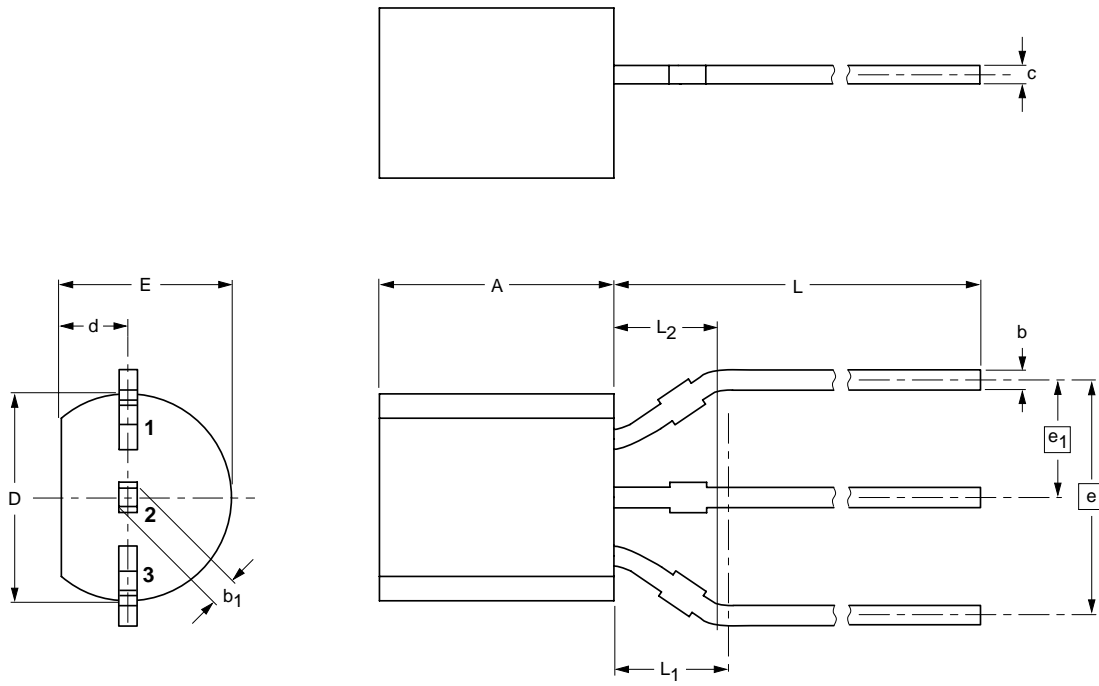


Fig 6. Package outline SOT54 (SC-43A/TO-92)

Plastic single-ended leaded (through hole) package; 3 leads (wide pitch)

SOT54A



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b | b ₁ | c | D | d | E | e | e ₁ | L | L ₁ ⁽¹⁾ max. | L ₂ |
|------|-----|------|----------------|------|-----|-----|-----|------|----------------|------|---------------------------------------|----------------|
| mm | 5.2 | 0.48 | 0.66 | 0.45 | 4.8 | 1.7 | 4.2 | 5.08 | 2.54 | 14.5 | 3 | 3 |
| | 5.0 | 0.40 | 0.55 | 0.38 | 4.4 | 1.4 | 3.6 | | | 12.7 | | 2 |

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|------------------------|-----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT54A | | | | | 97-05-13- 04-06-28 |

Fig 7. Package outline SOT54A

Plastic single-ended leaded (through hole) package; 3 leads (on-circle)

SOT54 variant

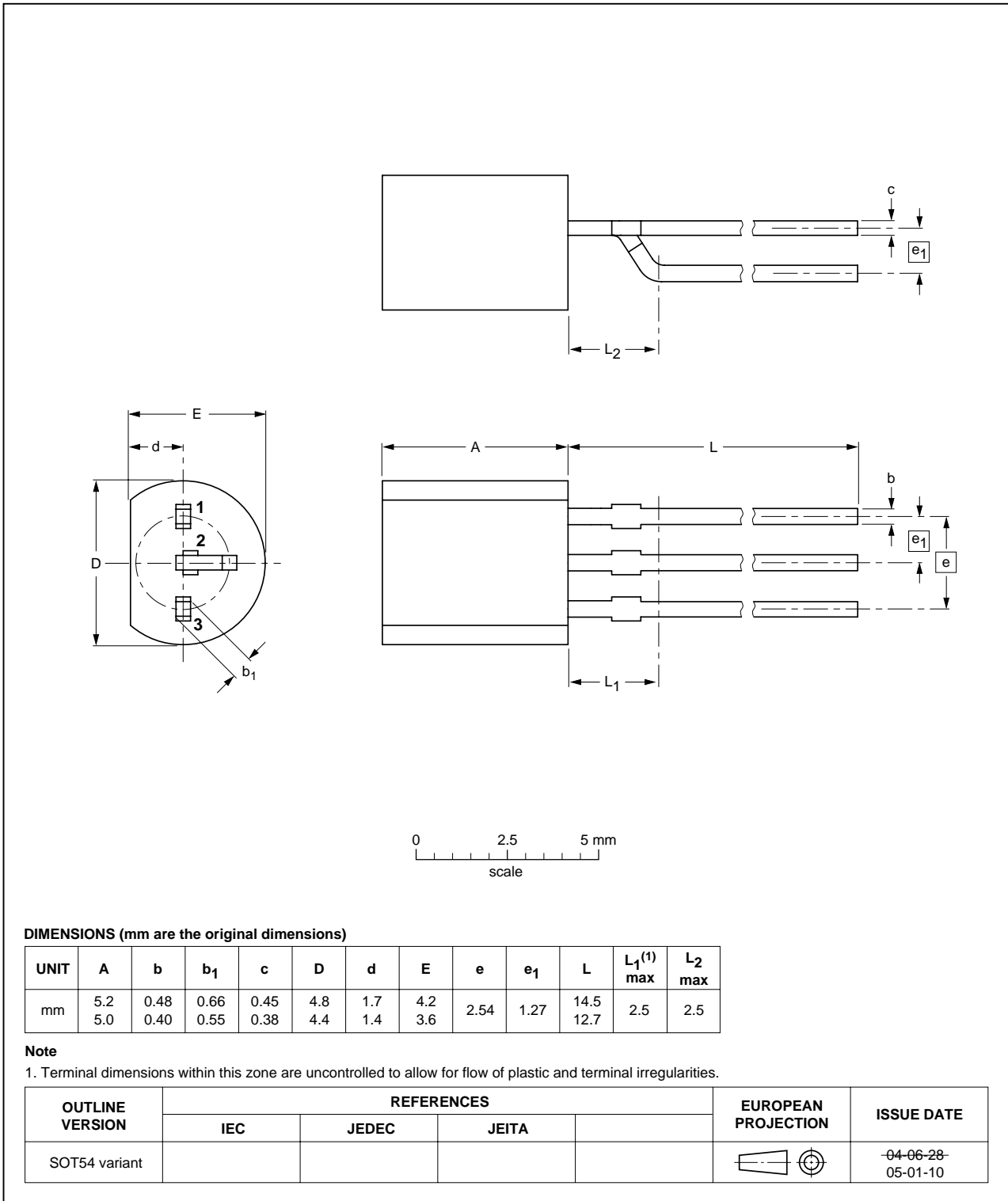


Fig 8. Package outline SOT54 variant

Plastic surface-mounted package; 3 leads

SOT23

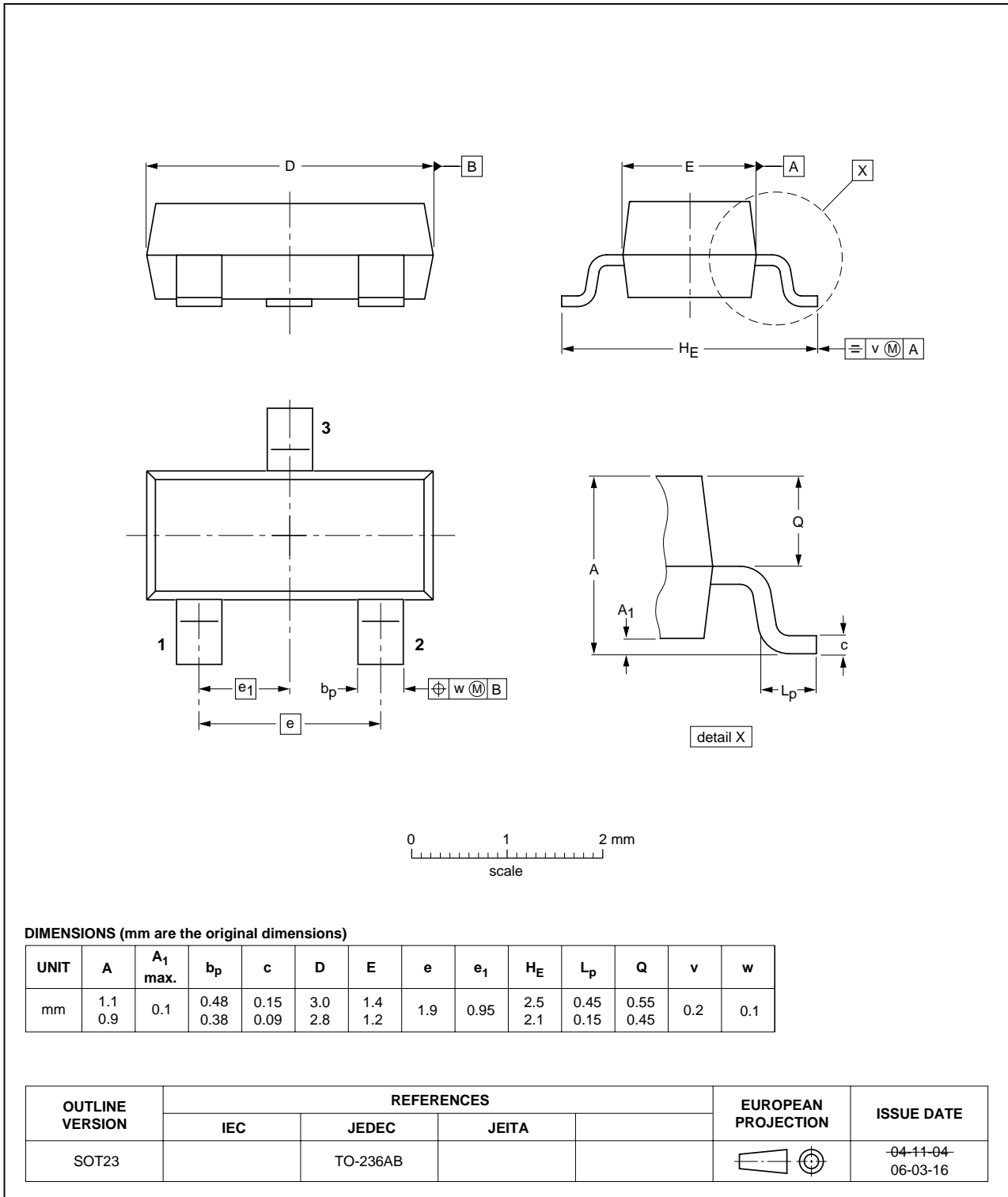


Fig 9. Package outline SOT23 (TO-236AB)

Plastic surface-mounted package; 3 leads

SOT323

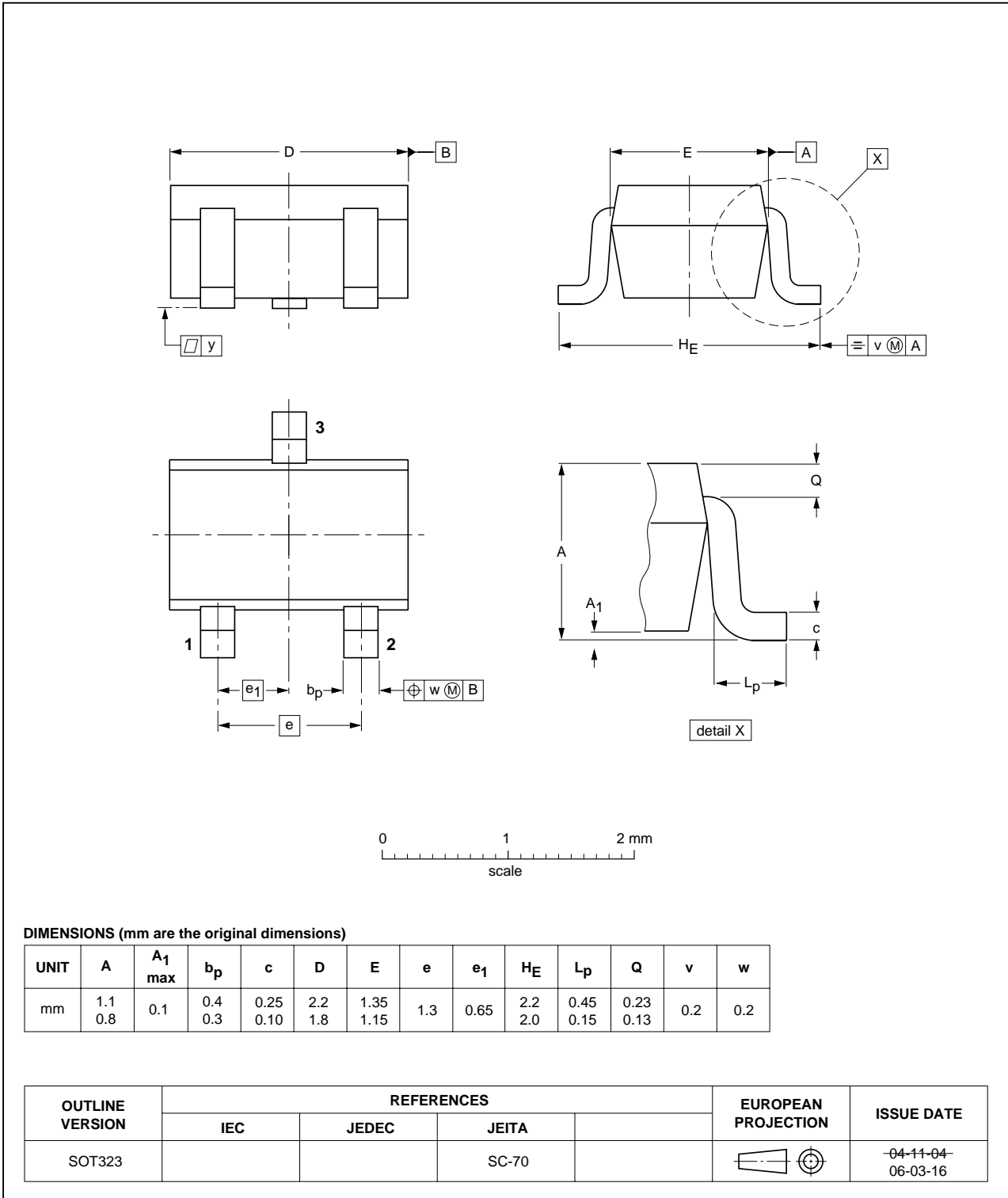


Fig 10. Package outline SOT323 (SC-70)

9. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code. [1]

| Type number | Package | Description | Packing quantity | | |
|-------------|---------------|--------------------------------|------------------|------|-------|
| | | | 3000 | 5000 | 10000 |
| PDTA115TE | SOT416 | 4 mm pitch, 8 mm tape and reel | -115 | - | -135 |
| PDTA115TK | SOT346 | 4 mm pitch, 8 mm tape and reel | -115 | - | -135 |
| PDTA115TM | SOT883 | 2 mm pitch, 8 mm tape and reel | - | - | -315 |
| PDTA115TS | SOT54 | bulk, straight leads | - | -412 | - |
| | SOT54A | tape and reel, wide pitch | - | - | -116 |
| | SOT54A | tape ammopack, wide patch | - | - | -126 |
| | SOT54 variant | bulk, delta pinning | - | -112 | - |
| PDTA115TT | SOT23 | 4 mm pitch, 8 mm tape and reel | -215 | - | -235 |
| PDTA115TU | SOT323 | 4 mm pitch, 8 mm tape and reel | -115 | - | -135 |

[1] For further information and the availability of packing methods, see [Section 12](#).

10. Revision history

Table 10. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--------------|---|---------------|----------------|
| PDTA115T_SER_5 | 20090902 | Product data sheet | - | PDTA115T_SER_4 |
| Modifications: | | <ul style="list-style-type: none"> This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content. Figure 3 "Package outline SOT416 (SC-75)": updated Figure 4 "Package outline SOT346 (SC-59/TO-236)": updated Figure 9 "Package outline SOT23 (TO-236AB)": updated Figure 10 "Package outline SOT323 (SC-70)": updated | | |
| PDTA115T_SER_4 | 20050405 | Product data sheet | - | PDTA115TT_3 |
| PDTA115TT_3 | 20040907 | Objective data sheet | - | PDTA115TT_2 |
| PDTA115TT_2 | 20040518 | Objective data sheet | - | PDTA115TT_1 |
| PDTA115TT_1 | 20040323 | Objective data sheet | - | - |

11. Legal information

11.1 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. |
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[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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