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Kind regards,

Team Nexperia

# PDTA115T series

PNP resistor-equipped transistors; R1 = 100 k $\Omega$ , 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 <sup>[1]</sup> | 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 $\Omega$ |

## 2. Pinning information

**Table 3. Pinning**

| Pin                                  | Description        | Simplified outline | Symbol |
|--------------------------------------|--------------------|--------------------|--------|
| <b>SOT54</b>                         |                    |                    |        |
| 1                                    | input (base)       |                    |        |
| 2                                    | output (collector) |                    |        |
| 3                                    | GND (emitter)      |                    |        |
| <b>SOT54A</b>                        |                    |                    |        |
| 1                                    | input (base)       |                    |        |
| 2                                    | output (collector) |                    |        |
| 3                                    | GND (emitter)      |                    |        |
| <b>SOT54 variant</b>                 |                    |                    |        |
| 1                                    | input (base)       |                    |        |
| 2                                    | output (collector) |                    |        |
| 3                                    | GND (emitter)      |                    |        |
| <b>SOT23, SOT323, SOT346, SOT416</b> |                    |                    |        |
| 1                                    | input (base)       |                    |        |
| 2                                    | GND (emitter)      |                    |        |
| 3                                    | output (collector) |                    |        |
| <b>SOT883</b>                        |                    |                    |        |
| 1                                    | input (base)       |                    |        |
| 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 <sup>[1]</sup> | 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 <sup>[1]</sup> |
|-------------|-----------------------------|
| 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 <sub>CBO</sub> | collector-base voltage    | open emitter             | -        | -50  | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open base                | -        | -50  | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector           | -        | -5   | V    |
| I <sub>O</sub>   | output current (DC)       |                          | -        | -100 | mA   |
| I <sub>CM</sub>  | peak collector current    |                          | -        | -100 | mA   |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 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 <sub>stg</sub> | storage temperature       |                          | -65      | +150 | °C   |
| T <sub>j</sub>   | junction temperature      |                          | -        | 150  | °C   |
| T <sub>amb</sub> | 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 μm copper strip line.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

| Symbol               | Parameter                                   | Conditions  | Min      | Typ | Max | Unit |
|----------------------|---|-------------|----------|-----|-----|------|
| R <sub>th(j-a)</sub> | 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.

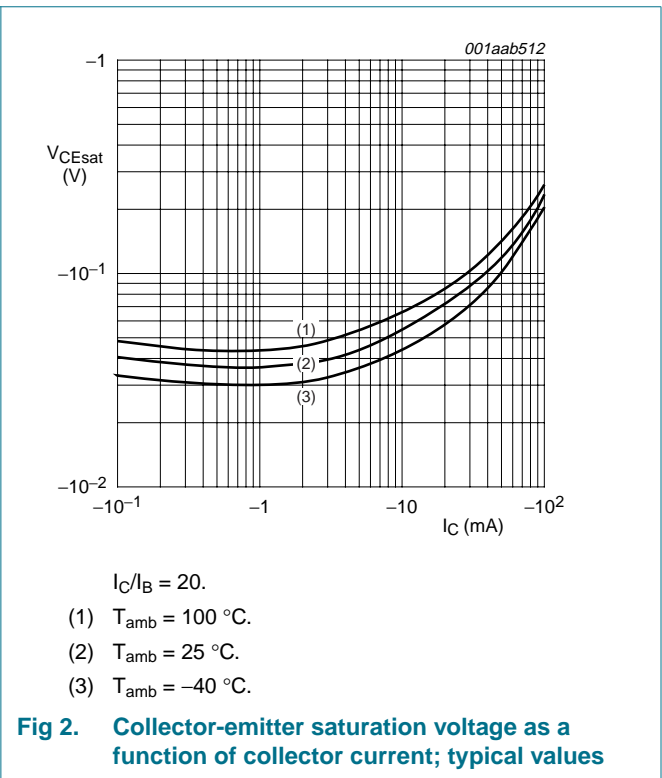
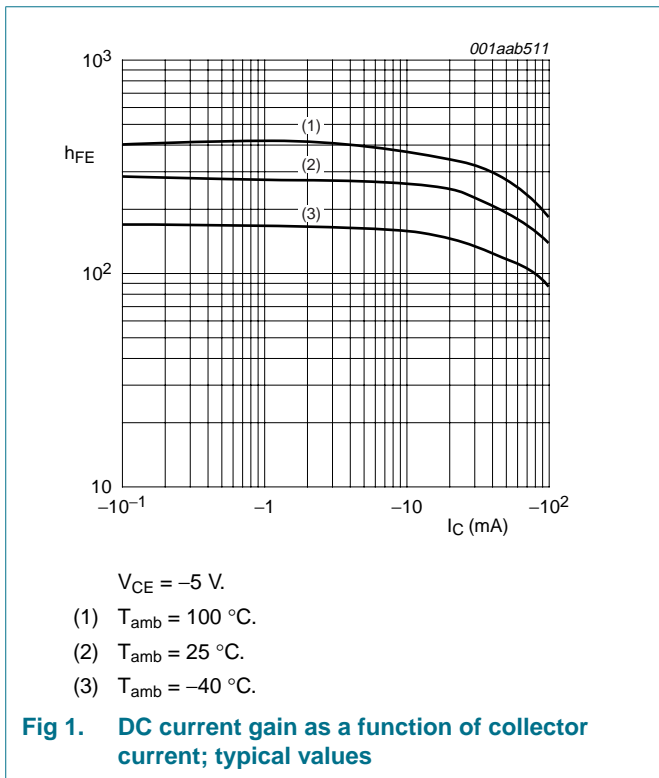
[3] Refer to SOT883 standard mounting conditions; FR4 printed-circuit board with 60 μm copper strip line.

**7. Characteristics**

**Table 8. Characteristics**

*T<sub>amb</sub> = 25 °C unless otherwise specified*

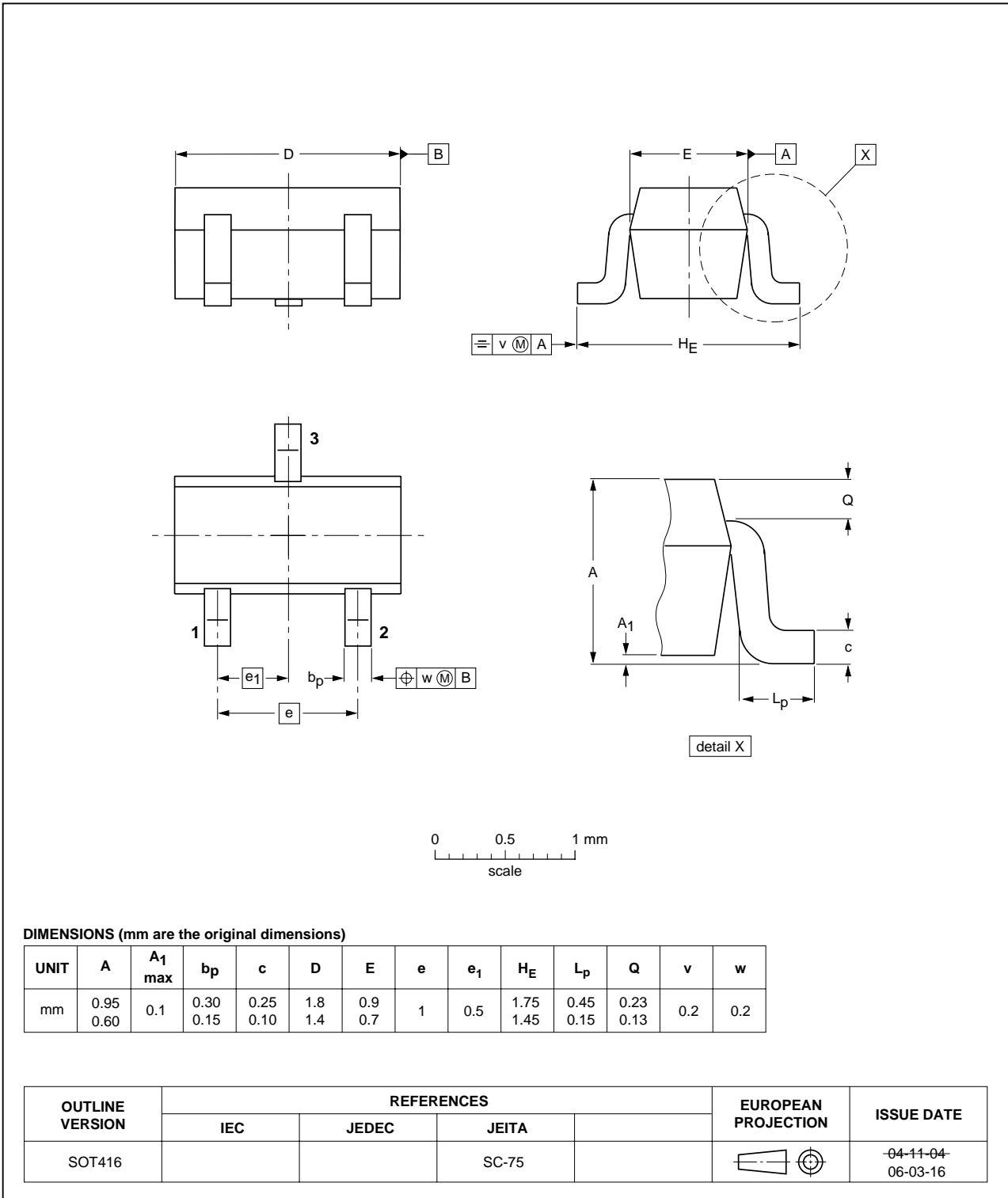
| Symbol             | Parameter                            | Conditions   | Min | Typ | Max  | Unit |
|--------------------|--------------------------------------|--|-----|-----|------|------|
| I <sub>CBO</sub>   | collector-base cut-off current       | V <sub>CB</sub> = -50 V; I <sub>E</sub> = 0 A                                | -   | -   | -100 | nA   |
| I <sub>CEO</sub>   | collector-emitter cut-off current    | V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A                                | -   | -   | -1   | μA   |
|                    |                                      | V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A;<br>T <sub>j</sub> = 150 °C    | -   | -   | -50  | μA   |
| I <sub>EBO</sub>   | emitter-base cut-off current         | V <sub>EB</sub> = -5 V; I <sub>C</sub> = 0 A                                 | -   | -   | -100 | nA   |
| h <sub>FE</sub>    | DC current gain                      | V <sub>CE</sub> = -5 V; I <sub>C</sub> = -1 mA                               | 100 | -   | -    |      |
| V <sub>CEsat</sub> | collector-emitter saturation voltage | I <sub>C</sub> = -5 mA; I <sub>B</sub> = -0.25 mA                            | -   | -   | -150 | mV   |
| R1                 | bias resistor 1 (input)              |  | 70  | 100 | 130  | kΩ   |
| C <sub>c</sub>     | collector capacitance                | V <sub>CB</sub> = -10 V; I <sub>E</sub> = i <sub>e</sub> = 0 A;<br>f = 1 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

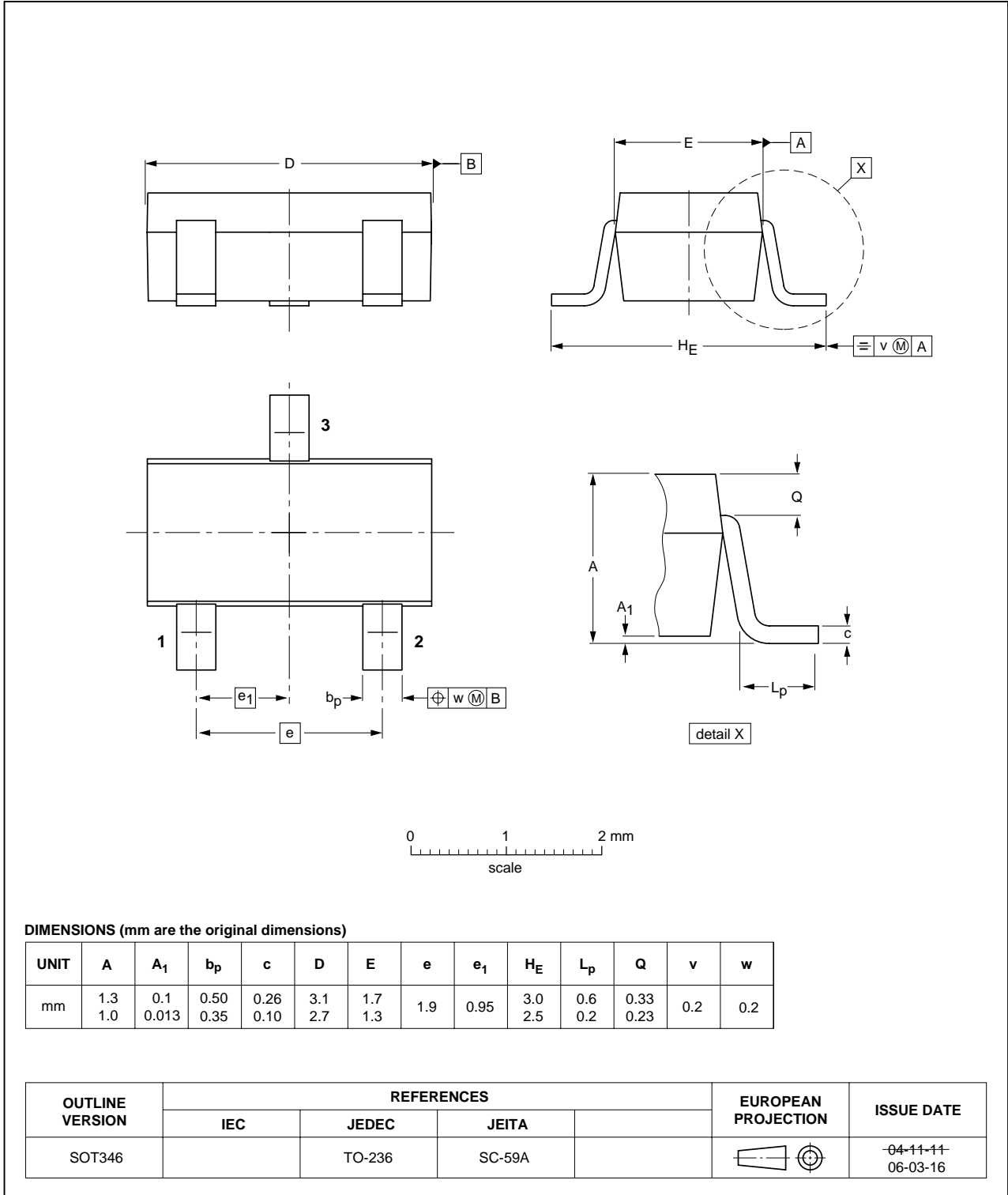


Fig 4. Package outline SOT346 (SC-59/TO-236)



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

SOT883

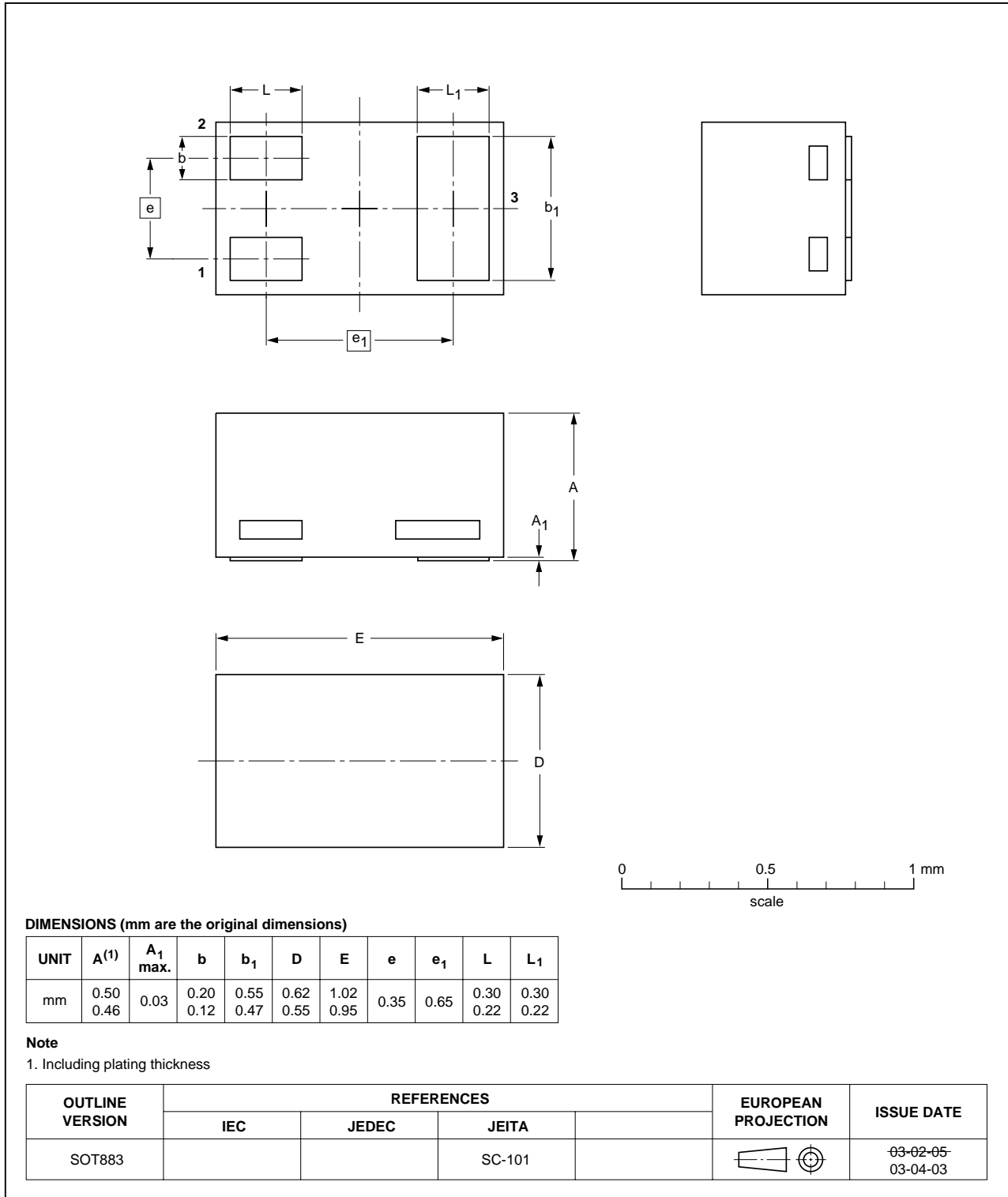


Fig 5. Package outline SOT883 (SC-101)

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

SOT54

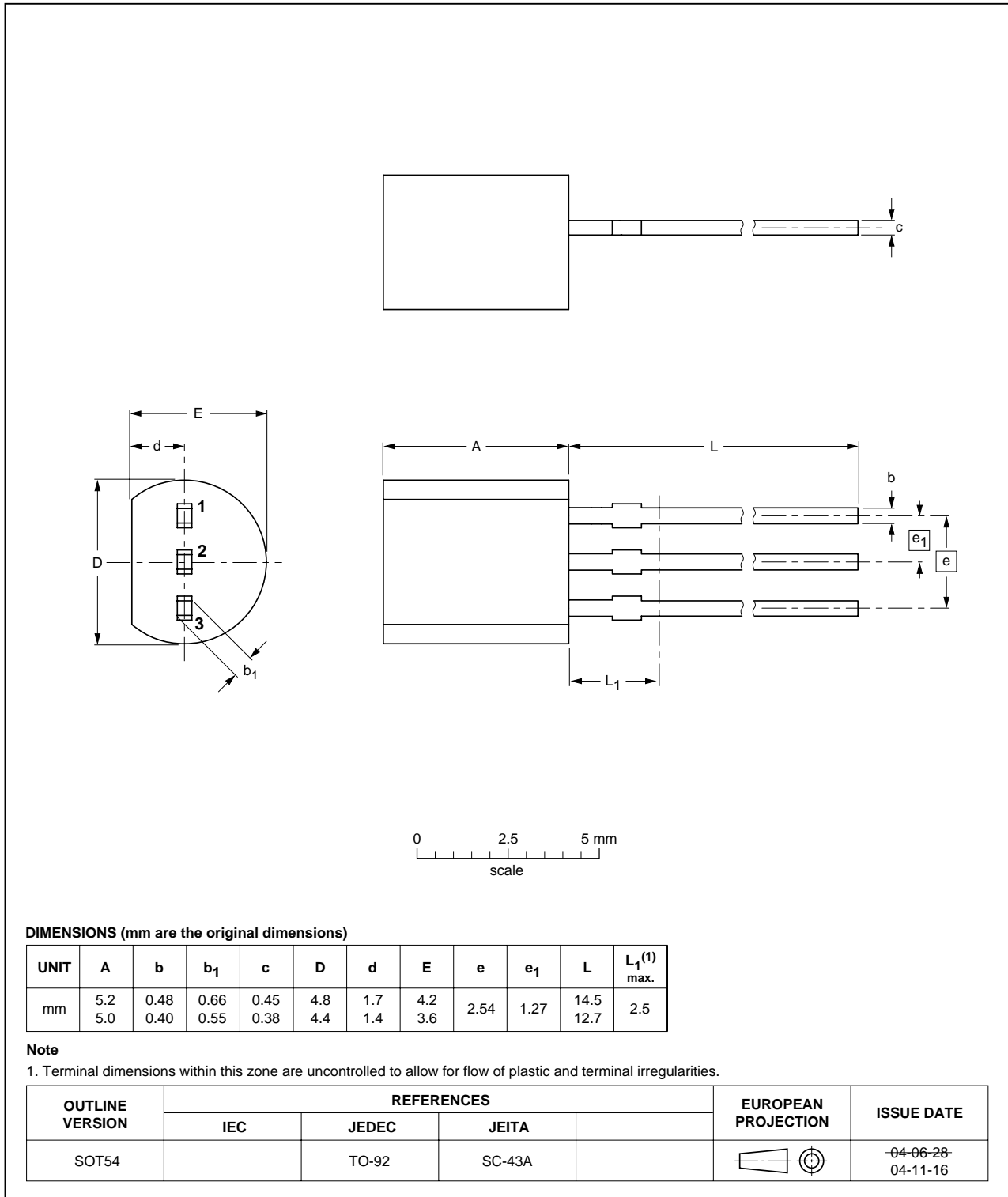


Fig 6. Package outline SOT54 (SC-43A/TO-92)

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

SOT54A

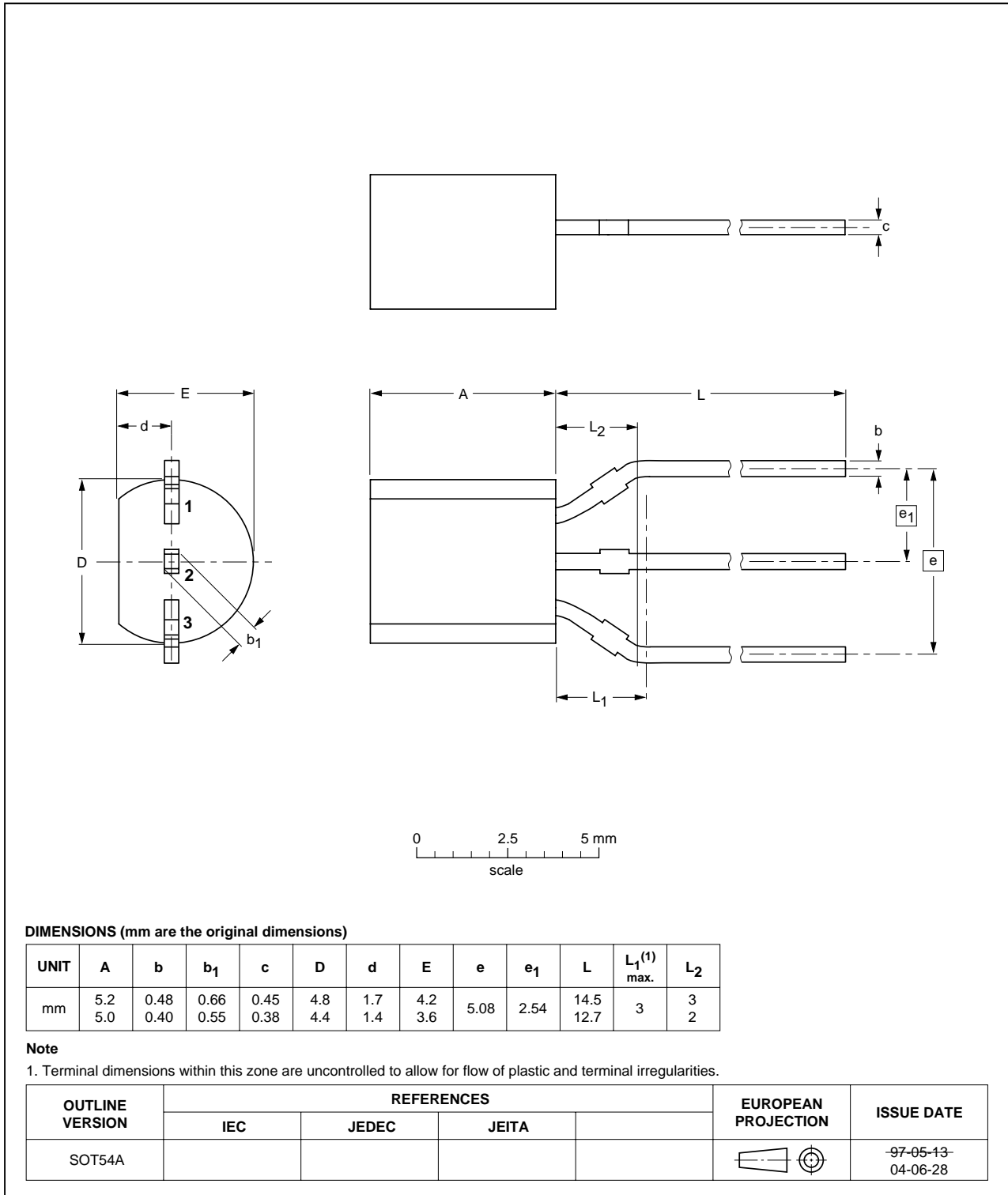


Fig 7. Package outline SOT54A

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

SOT54 variant

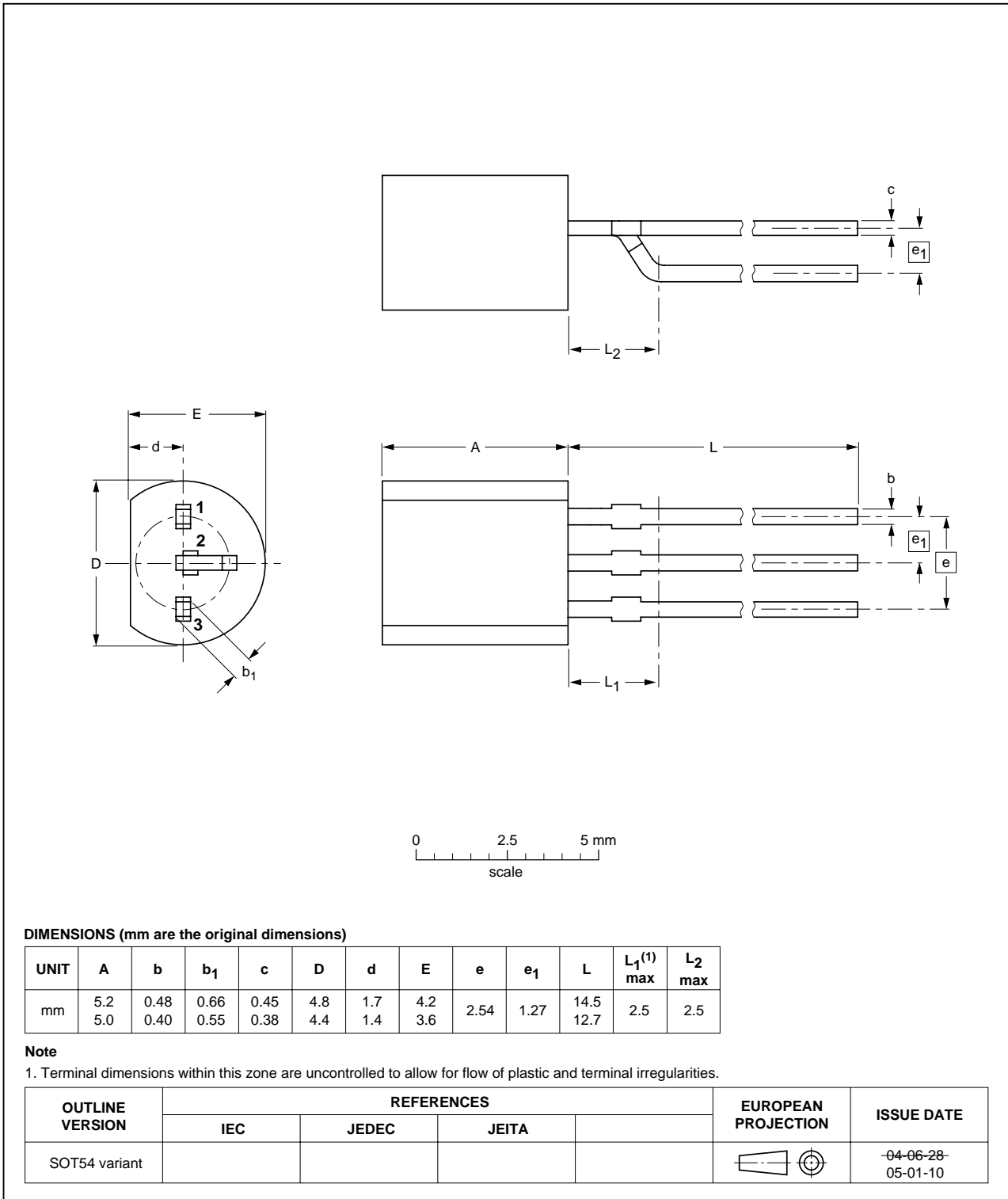


Fig 8. Package outline SOT54 variant

Plastic surface-mounted package; 3 leads

SOT23

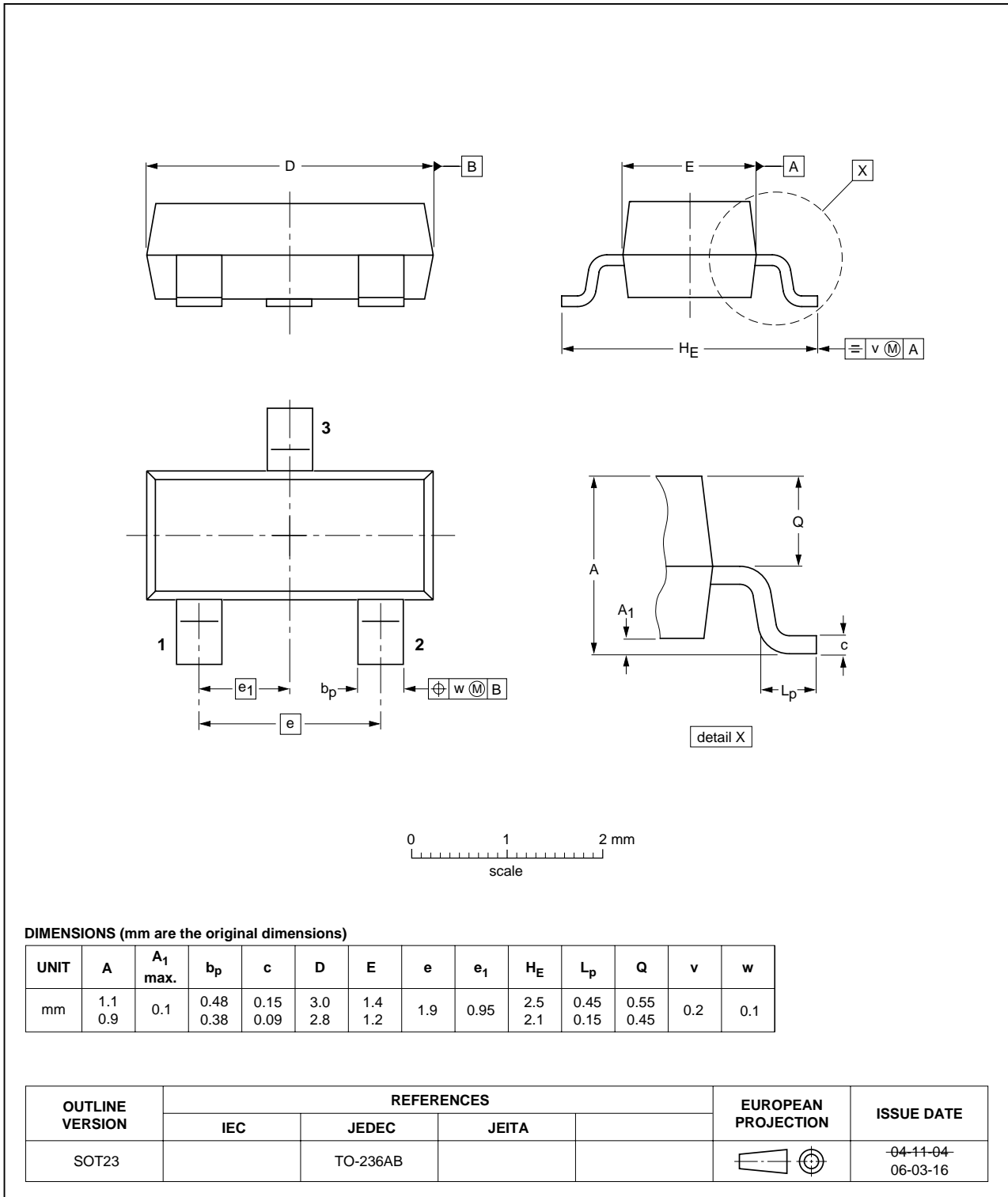


Fig 9. Package outline SOT23 (TO-236AB)

Plastic surface-mounted package; 3 leads

SOT323

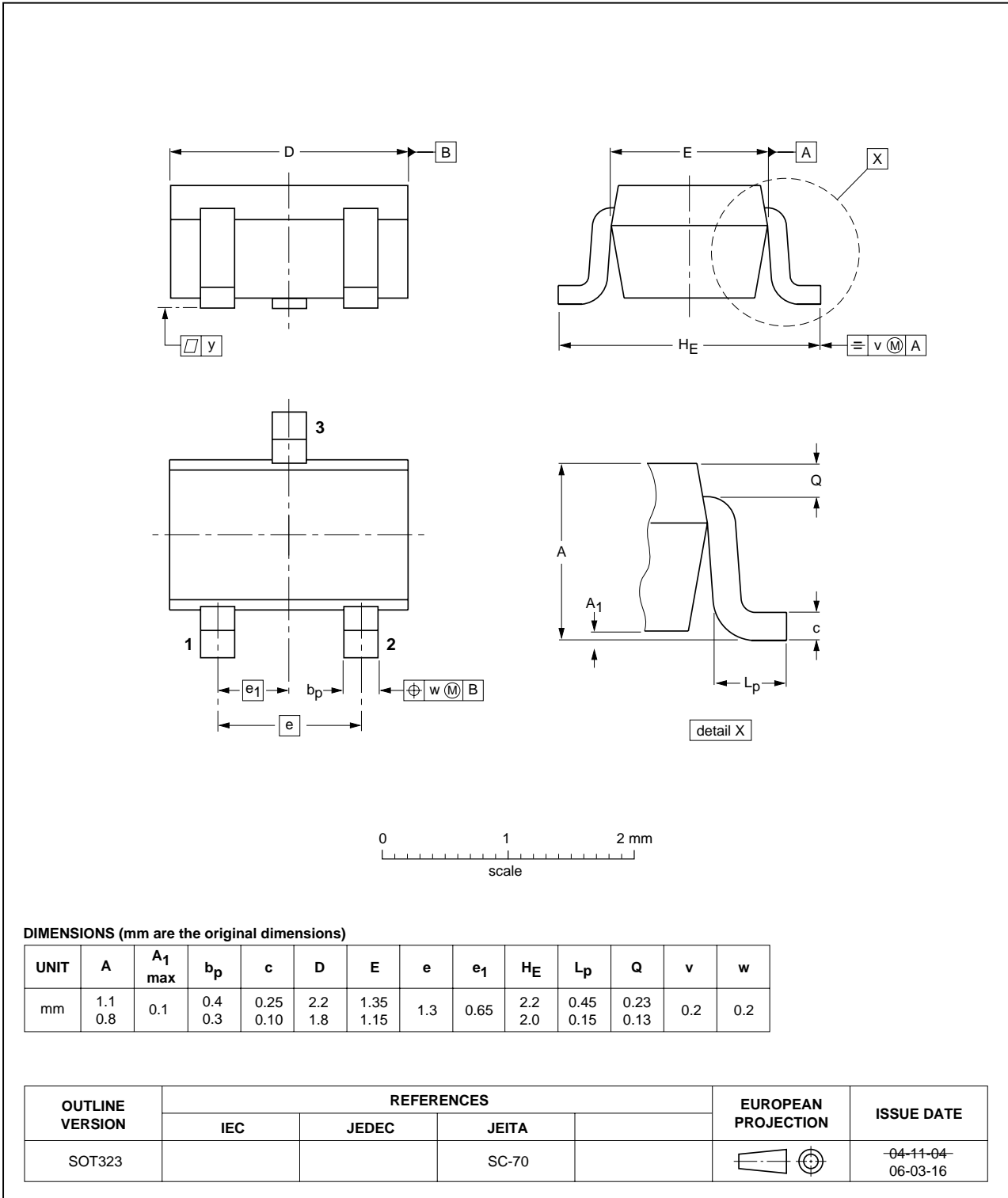


Fig 10. Package outline SOT323 (SC-70)

## 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"> <li>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.</li> <li><a href="#">Figure 3 "Package outline SOT416 (SC-75)": updated</a></li> <li><a href="#">Figure 4 "Package outline SOT346 (SC-59/TO-236)": updated</a></li> <li><a href="#">Figure 9 "Package outline SOT23 (TO-236AB)": updated</a></li> <li><a href="#">Figure 10 "Package outline SOT323 (SC-70)": updated</a></li> </ul> |               |                |
| 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 <sup>[1][2]</sup> | Product status <sup>[3]</sup> | 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.                                     |

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