

# BC807; BC807W; BC327

45 V, 500 mA PNP general-purpose transistors

Rev. 06 — 17 November 2009

Product data sheet

## 1. Product profile

### 1.1 General description

PNP general-purpose transistors.

Table 1. Product overview

| Type number          | Package       |        | NPN complement |
|----------------------|---------------|--------|----------------|
|                      | NXP           | JEITA  |                |
| BC807                | SOT23         | -      | BC817          |
| BC807W               | SOT323        | SC-70  | BC817W         |
| BC327 <sup>[1]</sup> | SOT54 (TO-92) | SC-43A | BC337          |

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

### 1.2 Features

- High current
- Low voltage

### 1.3 Applications

- General-purpose switching and amplification

### 1.4 Quick reference data

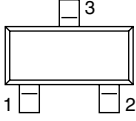
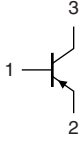
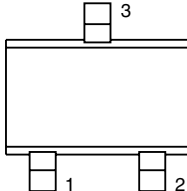
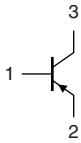
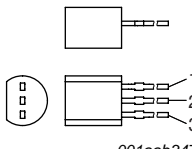
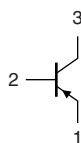
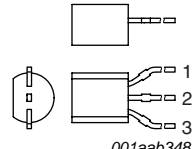
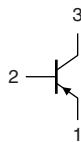
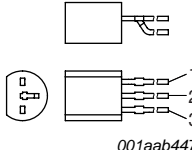
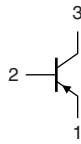
Table 2. Quick reference data

| Symbol    | Parameter                     | Conditions  | Min | Typ | Max  | Unit |
|-----------|-------------------------------|---|-----|-----|------|------|
| $V_{CEO}$ | collector-emitter voltage     | open base;<br>$I_C = 10 \text{ mA}$                                 | -   | -   | -45  | V    |
| $I_C$     | collector current (DC)        |   | -   | -   | -500 | mA   |
| $I_{CM}$  | peak collector current        |   | -   | -   | -1   | A    |
| $h_{FE}$  | DC current gain               | $I_C = -100 \text{ mA}$ ; <sup>[1]</sup><br>$V_{CE} = -1 \text{ V}$ |     |     |      |      |
|           | BC807; BC807W; BC327          |   | 100 | -   | 600  |      |
|           | BC807-16; BC807-16W; BC327-16 |   | 100 | -   | 250  |      |
|           | BC807-25; BC807-25W; BC327-25 |   | 160 | -   | 400  |      |
|           | BC807-40; BC807-40W; BC327-40 |   | 250 | -   | 600  |      |

[1] Pulse test:  $t_p \leq 300 \mu\text{s}$ ;  $\delta \leq 0.02$ .

## 2. Pinning information

**Table 3. Pinning**

| Pin                  | Description | Simplified outline   | Symbol   |
|----------------------|-------------|--|--|
| <b>SOT23</b>         |             |  |  |
| 1                    | base        |   | <br>sym013      |
| 2                    | emitter     |  |  |
| 3                    | collector   |  |  |
| <b>SOT323</b>        |             |  |  |
| 1                    | base        |   | <br>sym013      |
| 2                    | emitter     |  |  |
| 3                    | collector   |  |  |
| <b>SOT54</b>         |             |  |  |
| 1                    | emitter     |  | <br>006aaa149 |
| 2                    | base        |  |  |
| 3                    | collector   |  |  |
| <b>SOT54A</b>        |             |  |  |
| 1                    | emitter     |  | <br>006aaa149 |
| 2                    | base        |  |  |
| 3                    | collector   |  |  |
| <b>SOT54 variant</b> |             |  |  |
| 1                    | emitter     |  | <br>006aaa149 |
| 2                    | base        |  |  |
| 3                    | collector   |  |  |

### 3. Ordering information

**Table 4. Ordering information**

| Type number <sup>[1]</sup> | Package |   | Version |
|----------------------------|---------|---|---------|
|                            | Name    | Description   |         |
| BC807                      | -       | plastic surface mounted package; 3 leads                    | SOT23   |
| BC807W                     | SC-70   | plastic surface mounted package; 3 leads                    | SOT323  |
| BC327 <sup>[2]</sup>       | SC-43A  | plastic single-ended leaded (through hole) package; 3 leads | SOT54   |

[1] Valid for all available selection groups.

[2] 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> |
|-------------|-----------------------------|
| BC807       | 5D*                         |
| BC807-16    | 5A*                         |
| BC807-25    | 5B*                         |
| BC807-40    | 5C*                         |
| BC807W      | 5D*                         |
| BC807-16W   | 5A*                         |
| BC807-25W   | 5B*                         |
| BC807-40W   | 5C*                         |
| BC327       | C327                        |
| BC327-16    | C32716                      |
| BC327-25    | C32725                      |
| BC327-40    | C32740                      |

[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;<br>$I_C = 10\text{ mA}$ | -      | -45  | V    |    |
| $V_{EBO}$ | emitter-base voltage      | open collector                     | -      | -5   | V    |    |
| $I_C$     | collector current (DC)    |                                    | -      | -500 | mA   |    |
| $I_{CM}$  | peak collector current    |                                    | -      | -1   | A    |    |
| $I_{BM}$  | peak base current         |                                    | -      | -200 | mA   |    |
| $P_{tot}$ | total power dissipation   |                                    |        |      |      |    |
|           | BC807                     | $T_{amb} \leq 25\text{ °C}$        | [1][2] | -    | 250  | mW |
|           | BC807W                    | $T_{amb} \leq 25\text{ °C}$        | [1][2] | -    | 200  | mW |
|           | BC327                     | $T_{amb} \leq 25\text{ °C}$        | [1][2] | -    | 625  | mW |
| $T_{stg}$ | storage temperature       |                                    | -65    | +150 | °C   |    |
| $T_j$     | junction temperature      |                                    | -      | 150  | °C   |    |
| $T_{amb}$ | ambient temperature       |                                    | -65    | +150 | °C   |    |

[1] Transistor mounted on an FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

[2] Valid for all available selection groups.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

| Symbol        | Parameter                                   | Conditions                  | Min    | Typ | Max | Unit |     |
|---------------|---|-----------------------------|--------|-----|-----|------|-----|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient |                             |        |     |     |      |     |
|               | BC807                                       | $T_{amb} \leq 25\text{ °C}$ | [1][2] | -   | -   | 500  | K/W |
|               | BC807W                                      | $T_{amb} \leq 25\text{ °C}$ | [1][2] | -   | -   | 625  | K/W |
|               | BC327                                       | $T_{amb} \leq 25\text{ °C}$ | [1][2] | -   | -   | 200  | K/W |

[1] Transistor mounted on an FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

[2] Valid for all available selection groups.

## 7. Characteristics

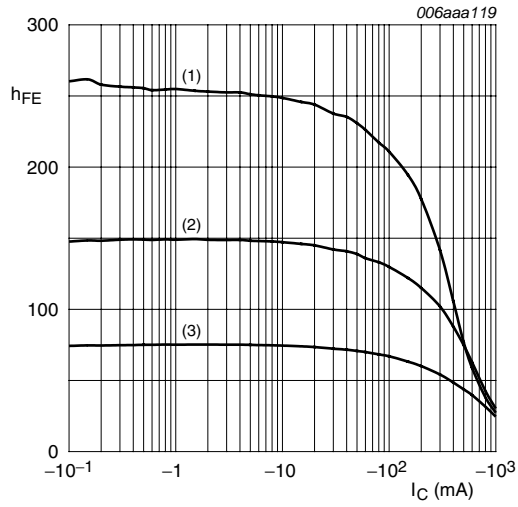
**Table 8. Characteristics**

$T_{amb} = 25\text{ °C}$  unless otherwise specified.

| Symbol      | Parameter                            | Conditions  | Min    | Typ | Max  | Unit          |
|-------------|--------------------------------------|---|--------|-----|------|---------------|
| $I_{CBO}$   | collector-base cut-off current       | $I_E = 0\text{ A}; V_{CB} = -20\text{ V}$                         | -      | -   | -100 | nA            |
|             |                                      | $I_E = 0\text{ A}; V_{CB} = -20\text{ V}; T_j = 150\text{ °C}$    | -      | -   | -5   | $\mu\text{A}$ |
| $I_{EBO}$   | emitter-base cut-off current         | $I_C = 0\text{ A}; V_{EB} = -5\text{ V}$                          | -      | -   | -100 | nA            |
| $h_{FE}$    | DC current gain                      | $I_C = -100\text{ mA}; V_{CE} = -1\text{ V}$                      | [1]    |     |      |               |
|             |                                      | BC807; BC807W; BC327  | 100    | -   | 600  |               |
|             |                                      | BC807-16; BC807-16W; BC327-16                                     | 100    | -   | 250  |               |
|             |                                      | BC807-25; BC807-25W; BC327-25                                     | 160    | -   | 400  |               |
|             | BC807-40; BC807-40W; BC327-40        | 250   | -      | 600 |      |               |
| $h_{FE}$    | DC current gain                      | $I_C = -500\text{ mA}; V_{CE} = -1\text{ V}$                      | [1] 40 | -   | -    |               |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = -500\text{ mA}; I_B = -50\text{ mA}$                       | [1] -  | -   | -700 | mV            |
| $V_{BE}$    | base-emitter voltage                 | $I_C = -500\text{ mA}; V_{CE} = -1\text{ V}$                      | [2] -  | -   | -1.2 | V             |
| $C_c$       | collector capacitance                | $I_E = i_e = 0\text{ A}; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$ | -      | 5   | -    | pF            |
| $f_T$       | transition frequency                 | $I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$   | 80     | -   | -    | MHz           |

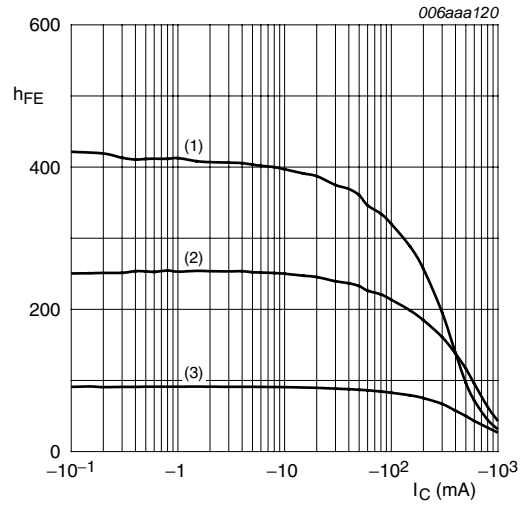
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

[2]  $V_{BE}$  decreases by approximately 2 mV/K with increasing temperature.



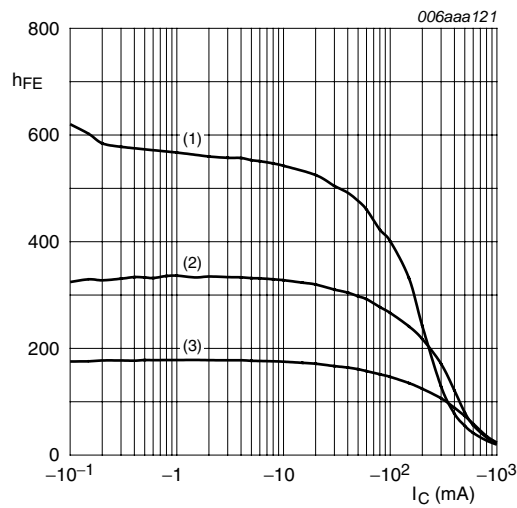
- $V_{CE} = -1\text{ V}$
- (1)  $T_{amb} = 150\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = -55\text{ °C}$

**Fig 1. Selection -16: DC current gain as a function of collector current; typical values**



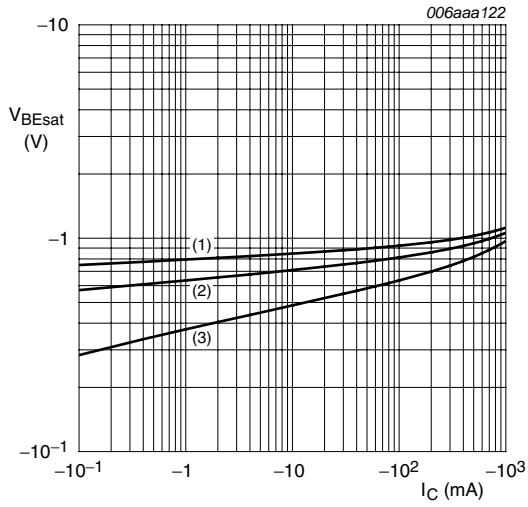
- $V_{CE} = -1\text{ V}$
- (1)  $T_{amb} = 150\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = -55\text{ °C}$

**Fig 2. Selection -25: DC current gain as a function of collector current; typical values**



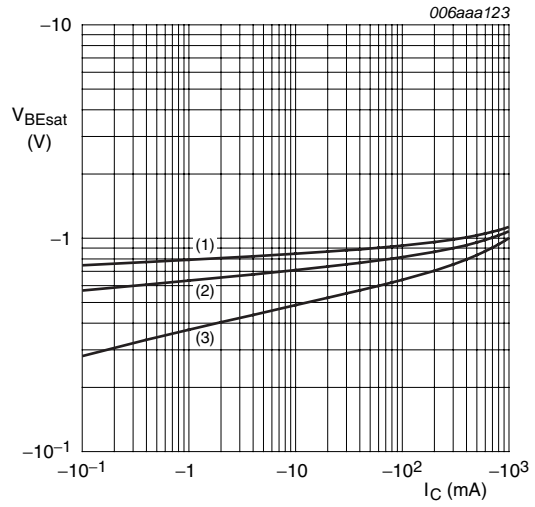
- $V_{CE} = -1\text{ V}$
- (1)  $T_{amb} = 150\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = -55\text{ °C}$

**Fig 3. Selection -40: DC current gain as a function of collector current; typical values**



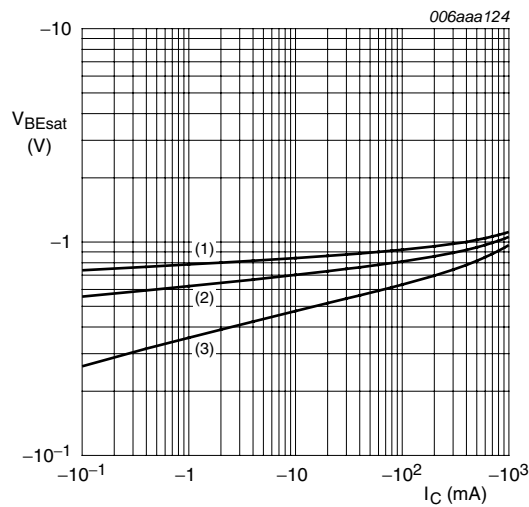
- $I_C/I_B = 10$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

**Fig 4. Selection -16: Base-emitter saturation voltage as a function of collector current; typical values**



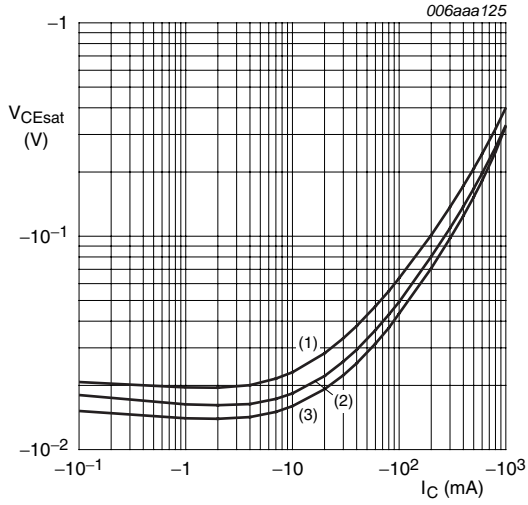
- $I_C/I_B = 10$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

**Fig 5. Selection -25: Base-emitter saturation voltage as a function of collector current; typical values**



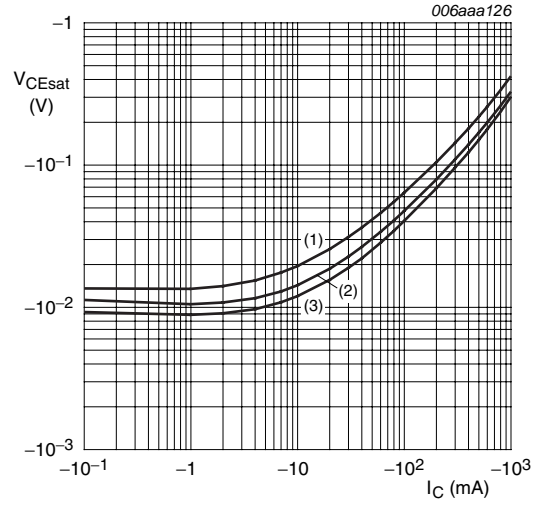
- $I_C/I_B = 10$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

**Fig 6. Selection -40: Base-emitter saturation voltage as a function of collector current; typical values**



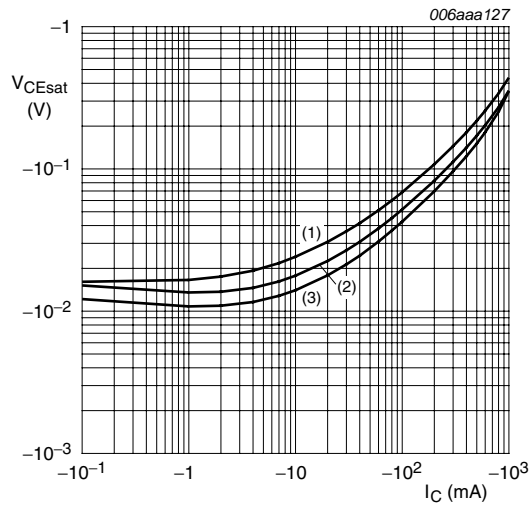
- $I_C/I_B = 10$
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
  - (2)  $T_{amb} = 25\text{ }^\circ\text{C}$
  - (3)  $T_{amb} = -55\text{ }^\circ\text{C}$

**Fig 7. Selection -16: Collector-emitter saturation voltage as a function of collector current; typical values**



- $I_C/I_B = 10$
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
  - (2)  $T_{amb} = 25\text{ }^\circ\text{C}$
  - (3)  $T_{amb} = -55\text{ }^\circ\text{C}$

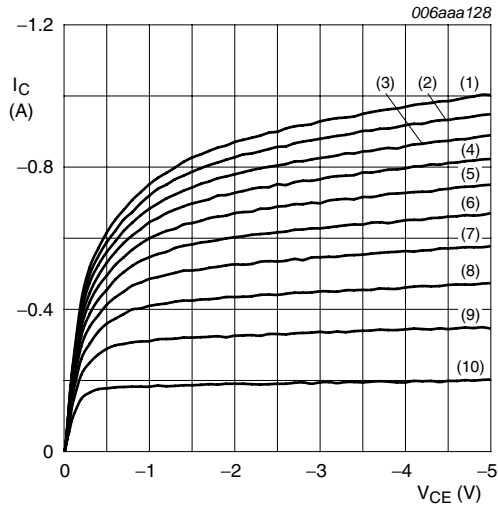
**Fig 8. Selection -25: Collector-emitter saturation voltage as a function of collector current; typical values**



- $I_C/I_B = 10$
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
  - (2)  $T_{amb} = 25\text{ }^\circ\text{C}$
  - (3)  $T_{amb} = -55\text{ }^\circ\text{C}$

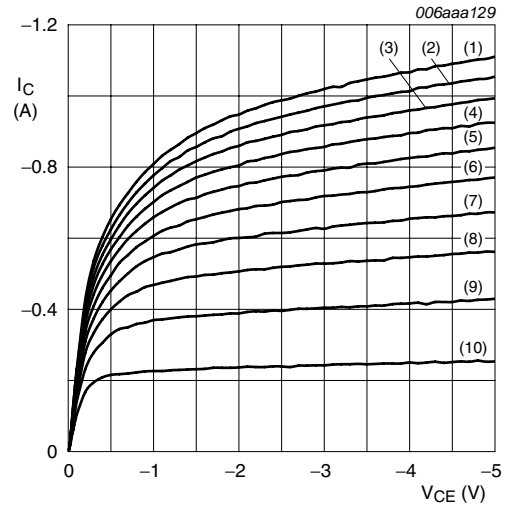
**Fig 9. Selection -40: Collector-emitter saturation voltage as a function of collector current; typical values**





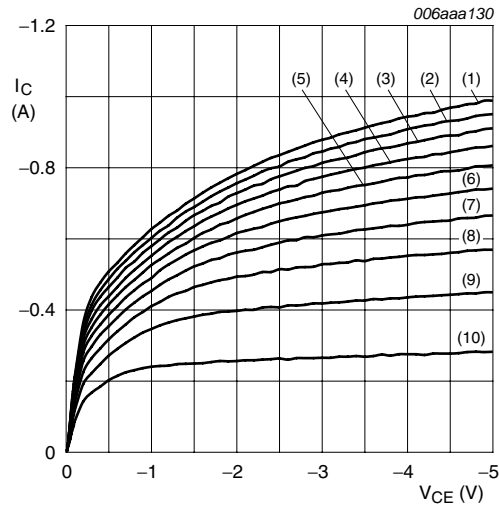
- $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (1)  $I_B = -16.0\text{ mA}$
  - (2)  $I_B = -14.4\text{ mA}$
  - (3)  $I_B = -12.8\text{ mA}$
  - (4)  $I_B = -11.2\text{ mA}$
  - (5)  $I_B = -9.6\text{ mA}$
  - (6)  $I_B = -8.0\text{ mA}$
  - (7)  $I_B = -6.4\text{ mA}$
  - (8)  $I_B = -4.8\text{ mA}$
  - (9)  $I_B = -3.2\text{ mA}$
  - (10)  $I_B = -1.6\text{ mA}$

**Fig 10. Selection -16: Collector current as a function of collector-emitter voltage; typical values**



- $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (1)  $I_B = -13.0\text{ mA}$
  - (2)  $I_B = -11.7\text{ mA}$
  - (3)  $I_B = -10.4\text{ mA}$
  - (4)  $I_B = -9.1\text{ mA}$
  - (5)  $I_B = -7.8\text{ mA}$
  - (6)  $I_B = -6.5\text{ mA}$
  - (7)  $I_B = -5.2\text{ mA}$
  - (8)  $I_B = -3.9\text{ mA}$
  - (9)  $I_B = -2.6\text{ mA}$
  - (10)  $I_B = -1.3\text{ mA}$

**Fig 11. Selection -25: Collector current as a function of collector-emitter voltage; typical values**



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

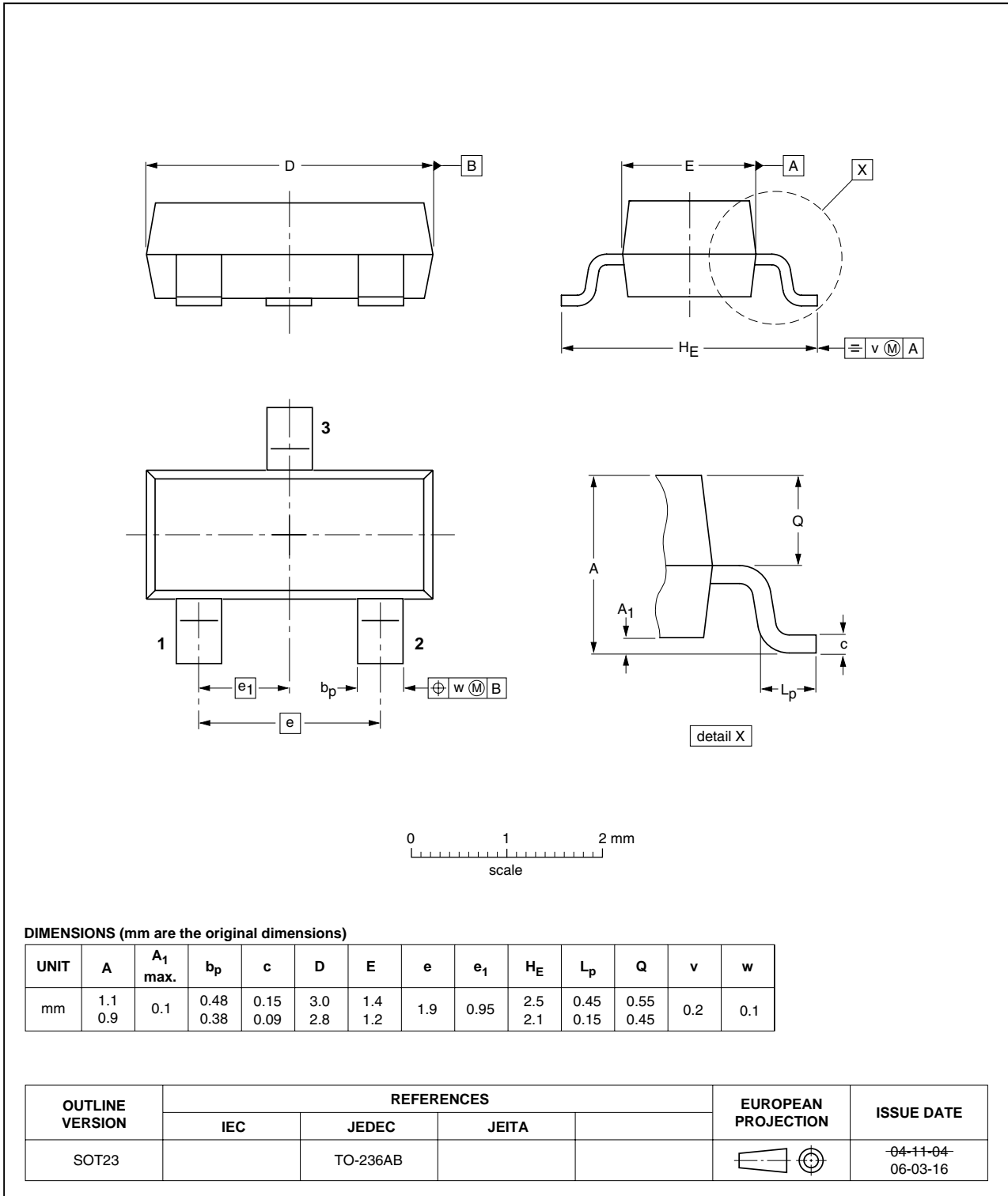
- (1)  $I_B = -12.0\text{ mA}$
- (2)  $I_B = -10.8\text{ mA}$
- (3)  $I_B = -9.6\text{ mA}$
- (4)  $I_B = -8.4\text{ mA}$
- (5)  $I_B = -7.2\text{ mA}$
- (6)  $I_B = -6.0\text{ mA}$
- (7)  $I_B = -4.8\text{ mA}$
- (8)  $I_B = -3.6\text{ mA}$
- (9)  $I_B = -2.4\text{ mA}$
- (10)  $I_B = -1.2\text{ mA}$

**Fig 12. Selection -40: Collector current as a function of collector-emitter voltage; typical values**

**8. Package outline**

Plastic surface-mounted package; 3 leads

SOT23



**Fig 13. Package outline SOT23 (TO-236AB)**

Plastic surface-mounted package; 3 leads

SOT323

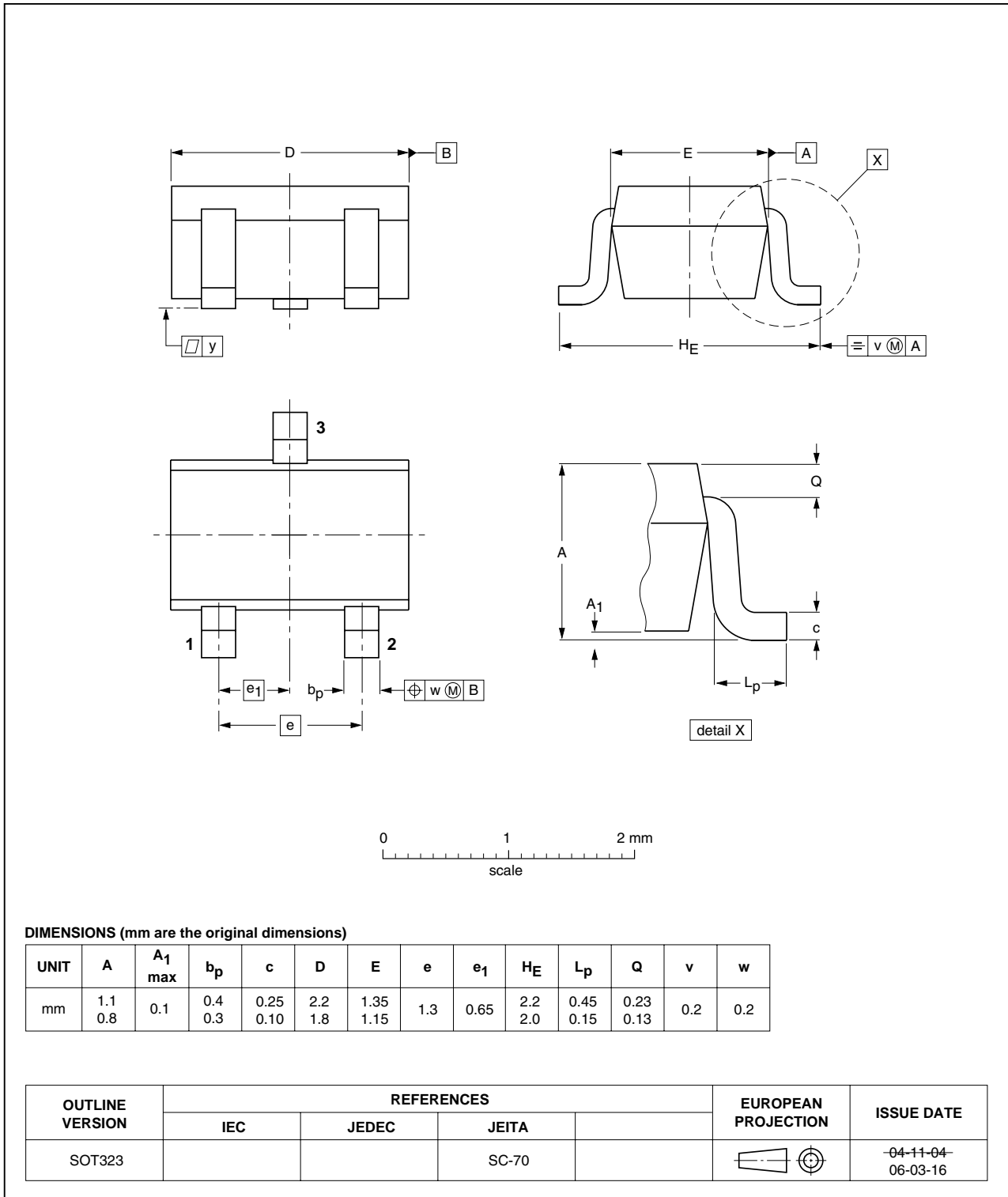


Fig 14. Package outline SOT323 (SC-70)

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

SOT54

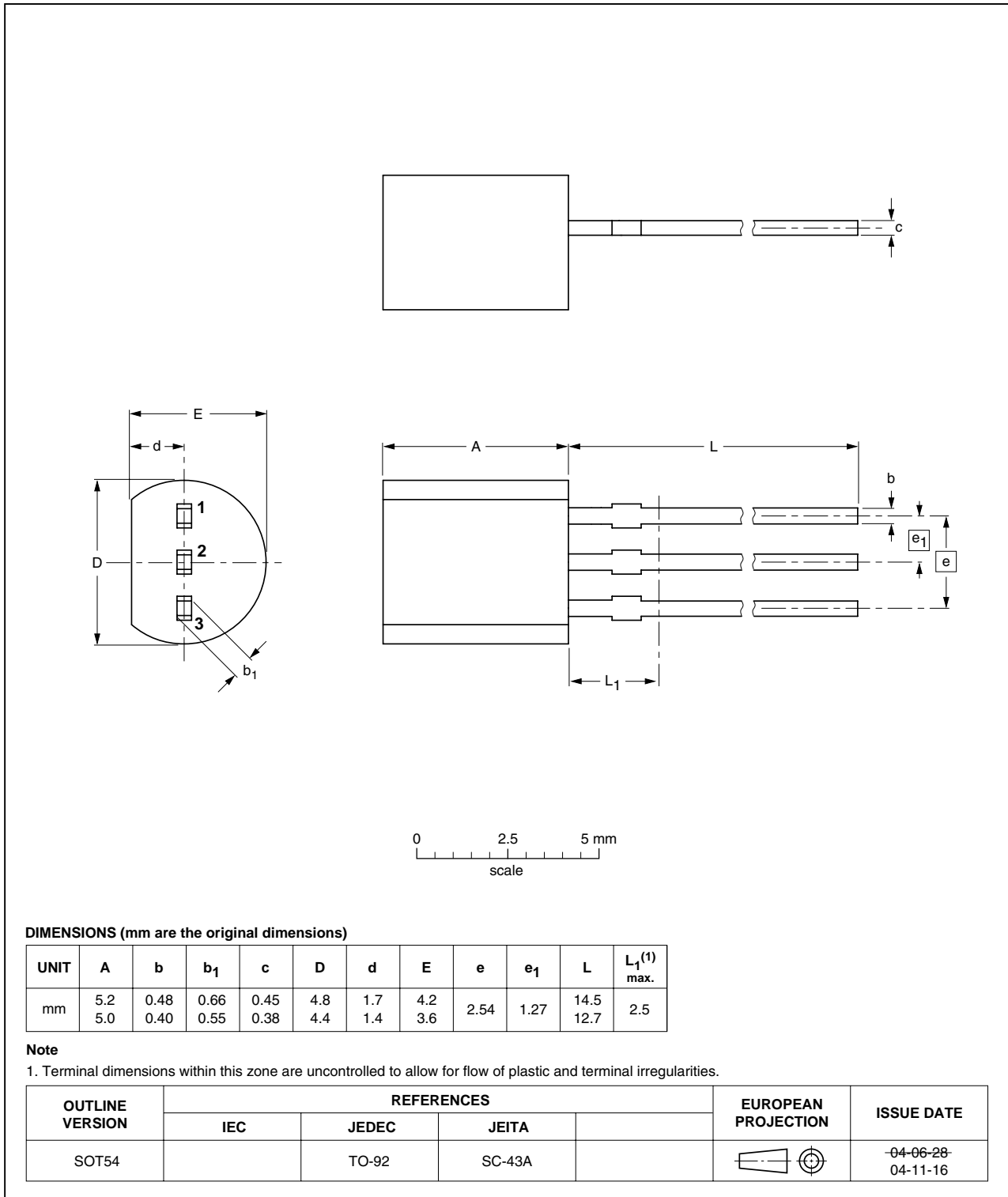


Fig 15. Package outline SOT54 (SC-43A/TO-92)

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

SOT54A

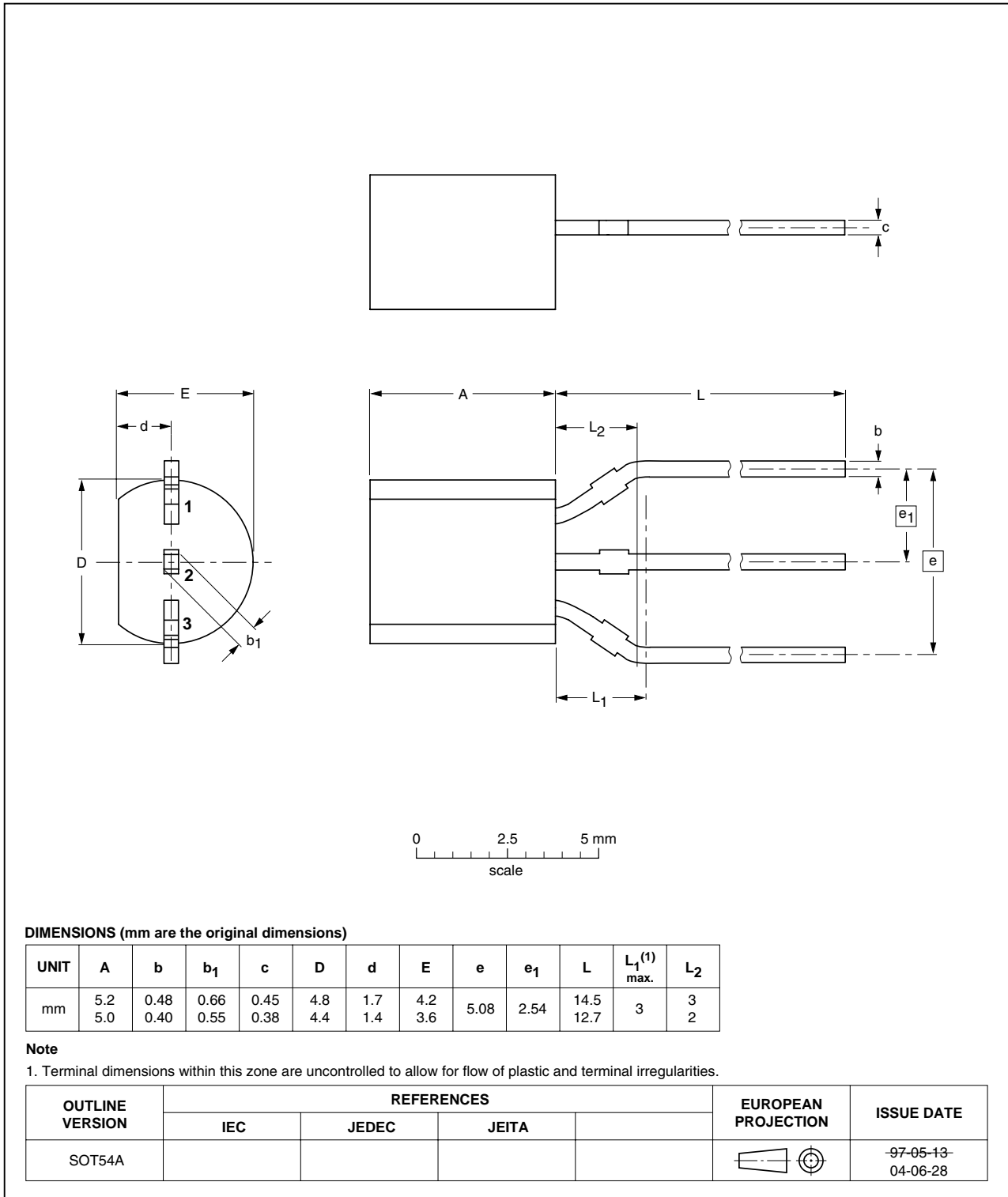


Fig 16. Package outline SOT54A

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

SOT54 variant

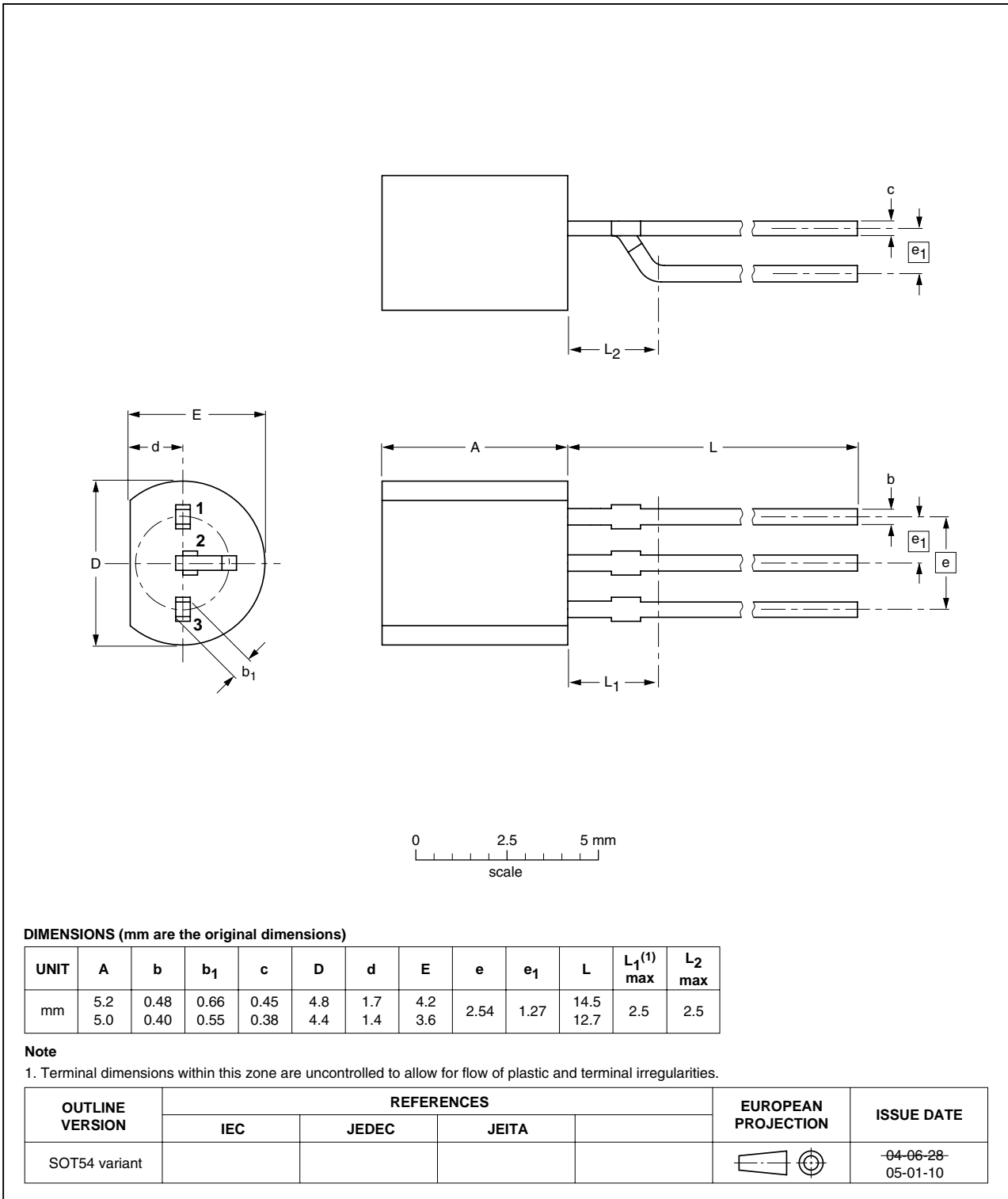


Fig 17. Package outline SOT54 variant

## 9. Packing information

**Table 9. Packing methods**

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

| Type number | Package        | Description                     | Packing quantity |      |       |
|-------------|----------------|---------------------------------|------------------|------|-------|
|             |                |                                 | 3000             | 5000 | 10000 |
| BC807       | SOT23          | 4 mm pitch, 8 mm tape and reel  | -215             | -    | -235  |
| BC807W      | SOT323         | 4 mm pitch, 8 mm tape and reel  | -115             | -    | -135  |
| BC327       | SOT54          | bulk, straight leads            | -                | -412 | -     |
| BC327       | SOT54A         | tape and reel, wide pitch       | -                | -    | -116  |
| BC327       | SOT54A         | tape ammopack, wide pitch       | -                | -    | -126  |
| BC327       | SOT 54 variant | bulk, delta pinning (on-circle) | -                | -112 | -     |

[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                    |
|--------------------------|--------------|---|----------------------------------|-------------------------------|
| BC807_BC807W_<br>BC327_6 | 20091117     | Product data sheet  | -                                | BC807_BC807W_<br>BC327_5      |
| 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="#">Table 3 "Pinning"</a>: updated</li> <li><a href="#">Figure 13 "Package outline SOT23 (TO-236AB)"</a>: updated</li> <li><a href="#">Figure 14 "Package outline SOT323 (SC-70)"</a>: updated</li> </ul> |                                  |                               |
| BC807_BC807W_<br>BC327_5 | 20050221     | Product data sheet  | CPCN200302007F<br>CPCN200405006F | BC807_4; BC807W_3;<br>BC327_3 |
| BC807_4                  | 20040116     | Product specification   | -                                | BC807_3                       |
| BC807W_3                 | 19990518     | Product specification   | -                                | BC807W_808W_CNV_2             |
| BC327_3                  | 19990415     | Product specification   | -                                | BC327_2                       |

## 11. Legal information

### 11.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition  |
|-----------------------------------|-------------------------------|---|
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| 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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[2] The term 'short data sheet' is explained in section "Definitions".

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