

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 ^[1] | 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

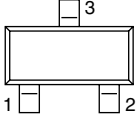
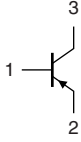
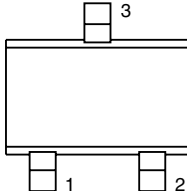
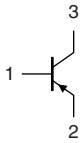
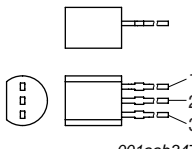
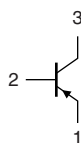
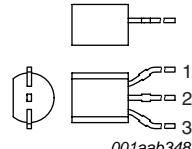
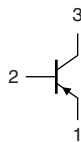
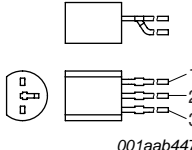
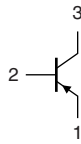
Table 2. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------|-------------------------------|---|-----|-----|------|------|
| V_{CEO} | collector-emitter voltage | open base; $I_C = 10 \text{ mA}$ | - | - | -45 | V |
| I_C | collector current (DC) | | - | - | -500 | mA |
| I_{CM} | peak collector current | | - | - | -1 | A |
| h_{FE} | DC current gain | $I_C = -100 \text{ mA}$; ^[1] $V_{CE} = -1 \text{ V}$ | | | | |
| | 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 |
|----------------------|-------------|--|--|
| SOT23 | | | |
| 1 | base |  |  sym013 |
| 2 | emitter | | |
| 3 | collector | | |
| SOT323 | | | |
| 1 | base |  |  sym013 |
| 2 | emitter | | |
| 3 | collector | | |
| SOT54 | | | |
| 1 | emitter |  |  006aaa149 |
| 2 | base | | |
| 3 | collector | | |
| SOT54A | | | |
| 1 | emitter |  |  006aaa149 |
| 2 | base | | |
| 3 | collector | | |
| SOT54 variant | | | |
| 1 | emitter |  |  006aaa149 |
| 2 | base | | |
| 3 | collector | | |

3. Ordering information

Table 4. Ordering information

| Type number ^[1] | Package | | Version |
|----------------------------|---------|---|---------|
| | Name | Description | |
| BC807 | - | plastic surface mounted package; 3 leads | SOT23 |
| BC807W | SC-70 | plastic surface mounted package; 3 leads | SOT323 |
| BC327 ^[2] | 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 ^[1] |
|-------------|-----------------------------|
| 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; $I_C = 10 \text{ mA}$ | - | -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 | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [1][2] | - | 250 | mW |
| | BC807W | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [1][2] | - | 200 | mW |
| | BC327 | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [1][2] | - | 625 | mW |
| T_{stg} | storage temperature | | -65 | +150 | $^\circ\text{C}$ | |
| T_j | junction temperature | | - | 150 | $^\circ\text{C}$ | |
| T_{amb} | ambient temperature | | -65 | +150 | $^\circ\text{C}$ | |

[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 | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [1][2] | - | - | 500 | K/W |
| | BC807W | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [1][2] | - | - | 625 | K/W |
| | BC327 | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [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

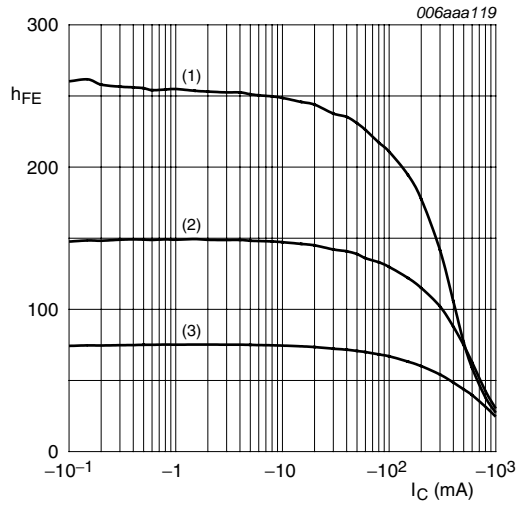
Table 8. Characteristics

$T_{amb} = 25\text{ °C}$ 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 | μA |
| 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 |

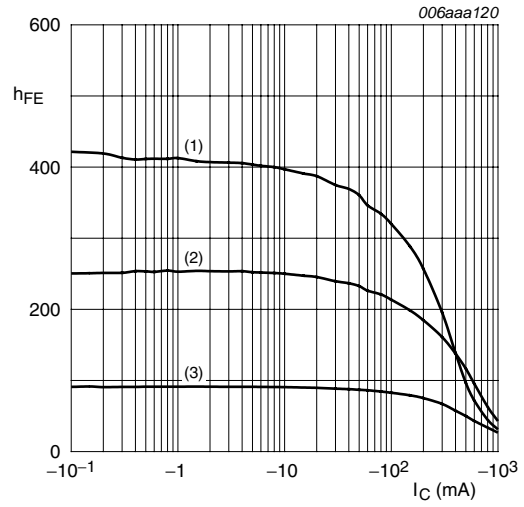
[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$.

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



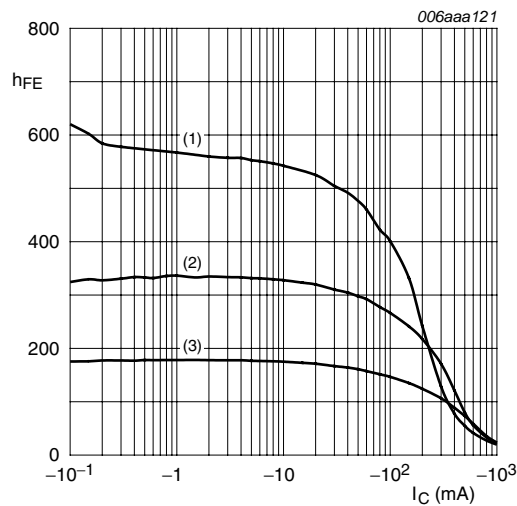
- $V_{CE} = -1\text{ V}$
- (1) $T_{amb} = 150\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = -55\text{ °C}$

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



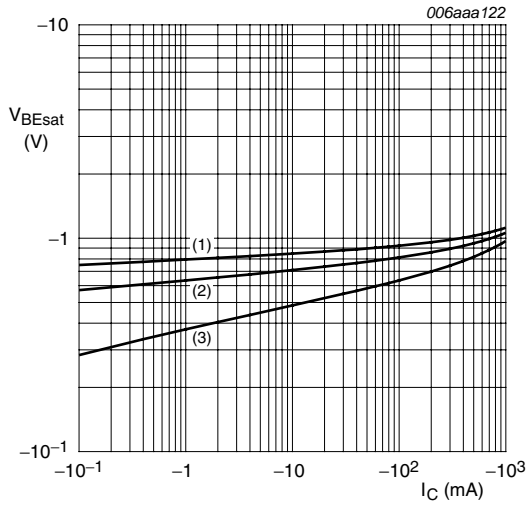
- $V_{CE} = -1\text{ V}$
- (1) $T_{amb} = 150\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = -55\text{ °C}$

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



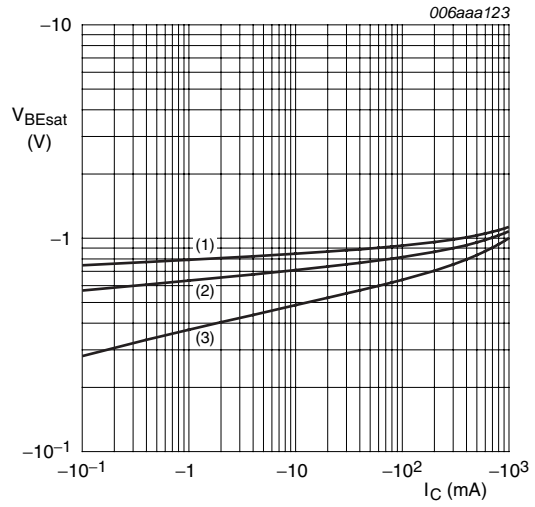
- $V_{CE} = -1\text{ V}$
- (1) $T_{amb} = 150\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = -55\text{ °C}$

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



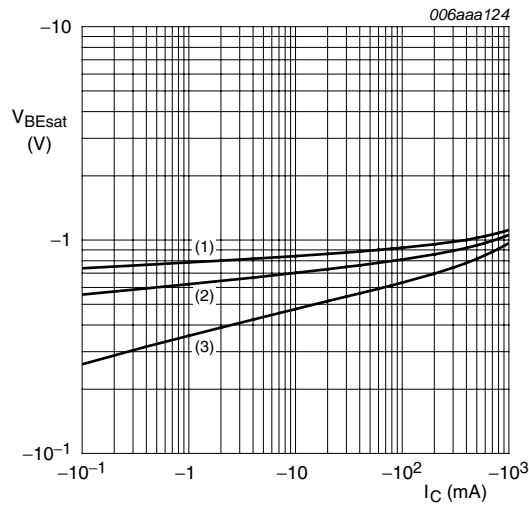
- $I_C/I_B = 10$
- (1) $T_{amb} = -55\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = 150\text{ °C}$

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



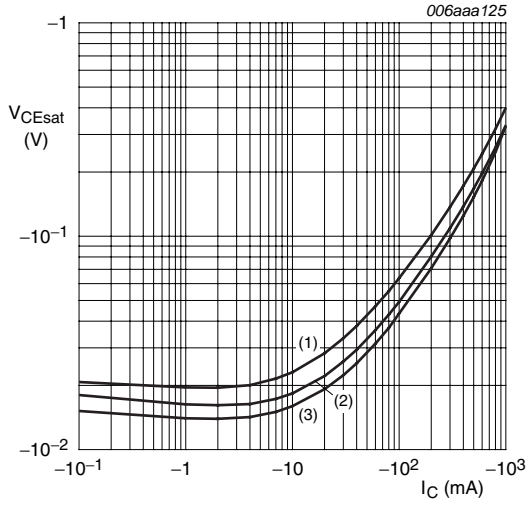
- $I_C/I_B = 10$
- (1) $T_{amb} = -55\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = 150\text{ °C}$

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



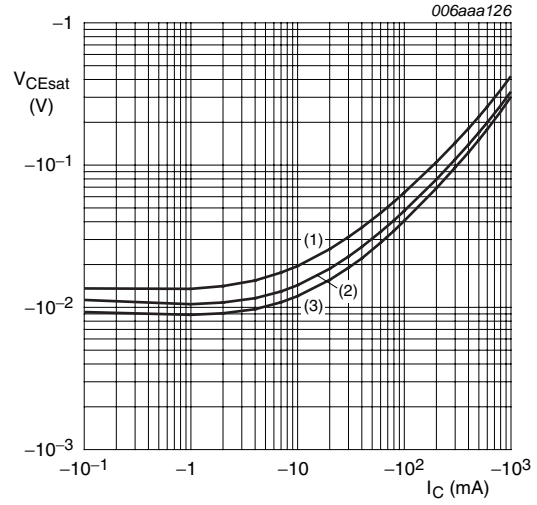
- $I_C/I_B = 10$
- (1) $T_{amb} = -55\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = 150\text{ °C}$

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



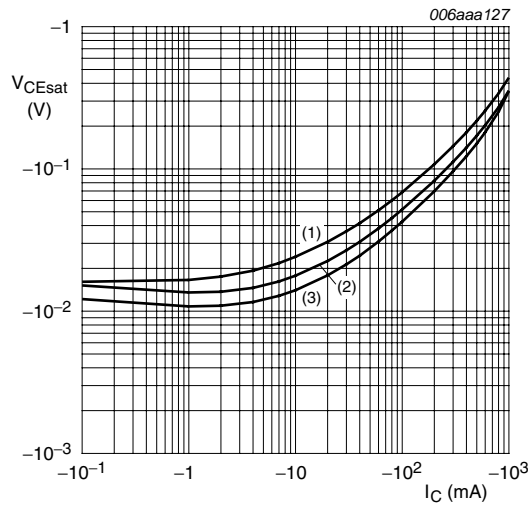
- $I_C/I_B = 10$
- (1) $T_{amb} = 150\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = -55\text{ °C}$

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



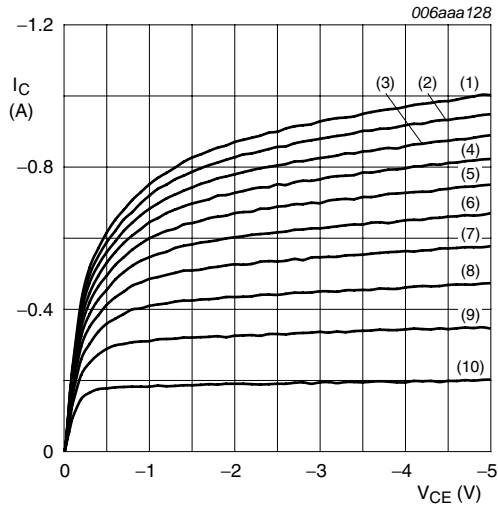
- $I_C/I_B = 10$
- (1) $T_{amb} = 150\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = -55\text{ °C}$

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



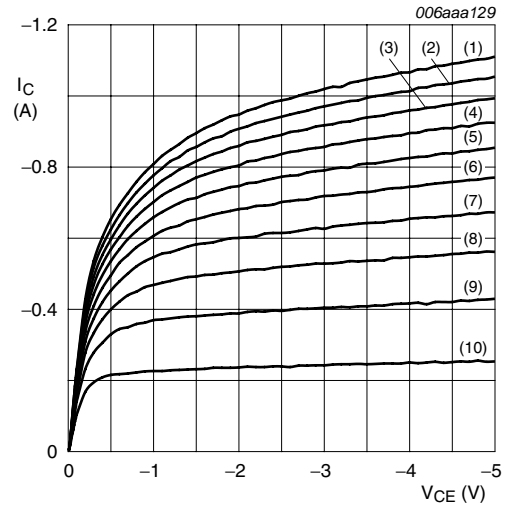
- $I_C/I_B = 10$
- (1) $T_{amb} = 150\text{ °C}$
 - (2) $T_{amb} = 25\text{ °C}$
 - (3) $T_{amb} = -55\text{ °C}$

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



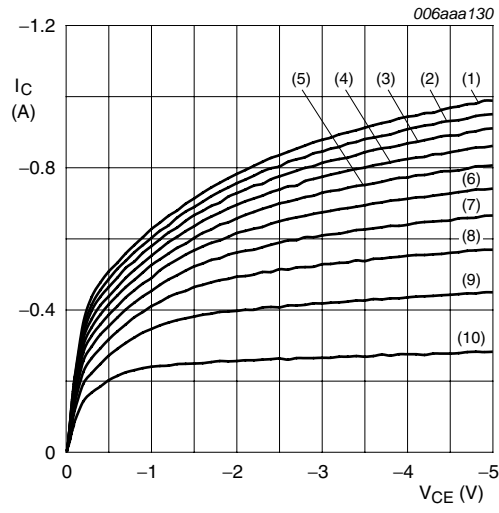
- $T_{amb} = 25\text{ }^\circ\text{C}$
- (1) $I_B = -16.0\text{ mA}$
 - (2) $I_B = -14.4\text{ mA}$
 - (3) $I_B = -12.8\text{ mA}$
 - (4) $I_B = -11.2\text{ mA}$
 - (5) $I_B = -9.6\text{ mA}$
 - (6) $I_B = -8.0\text{ mA}$
 - (7) $I_B = -6.4\text{ mA}$
 - (8) $I_B = -4.8\text{ mA}$
 - (9) $I_B = -3.2\text{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

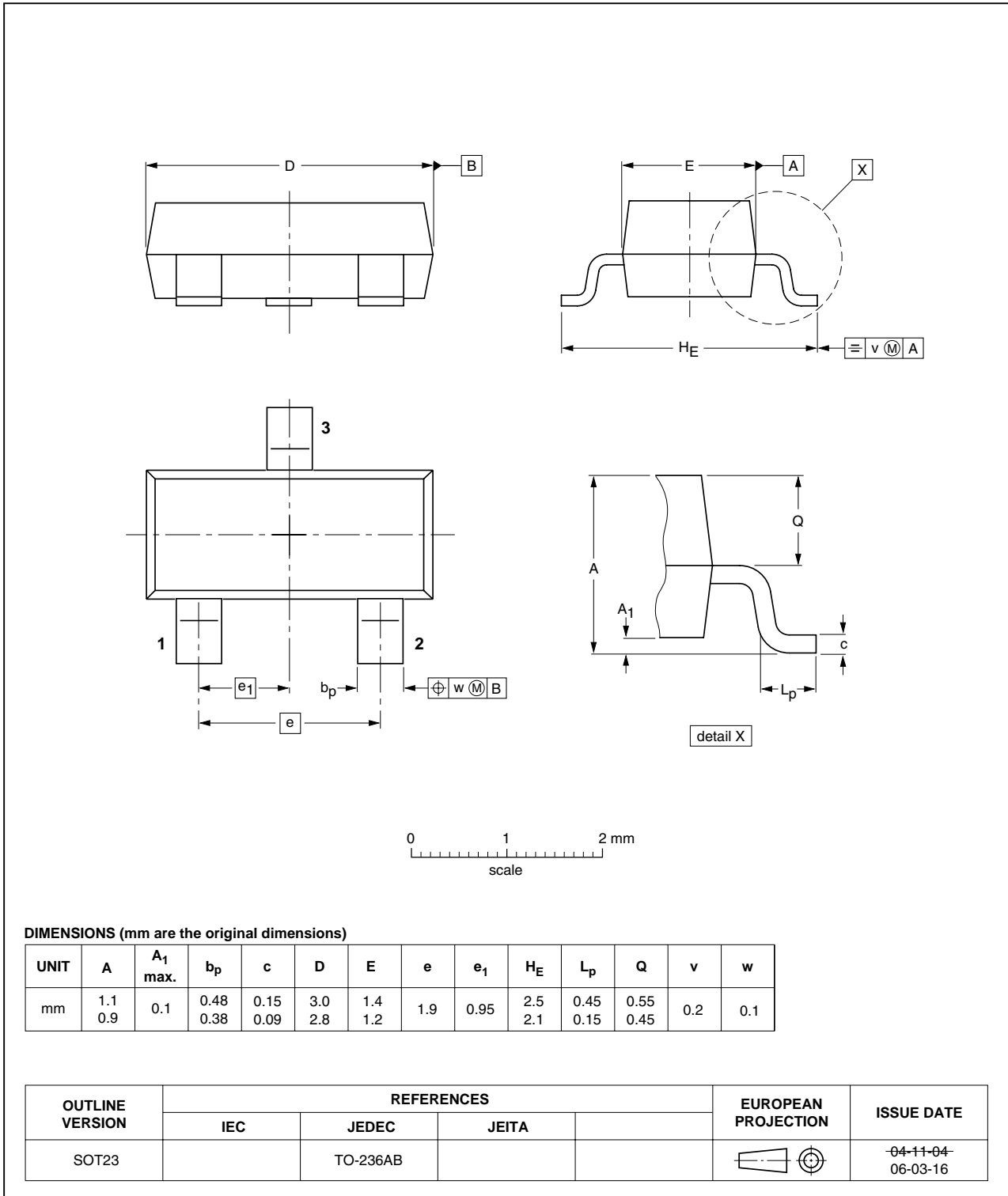


Fig 13. Package outline SOT23 (TO-236AB)

Plastic surface-mounted package; 3 leads

SOT323

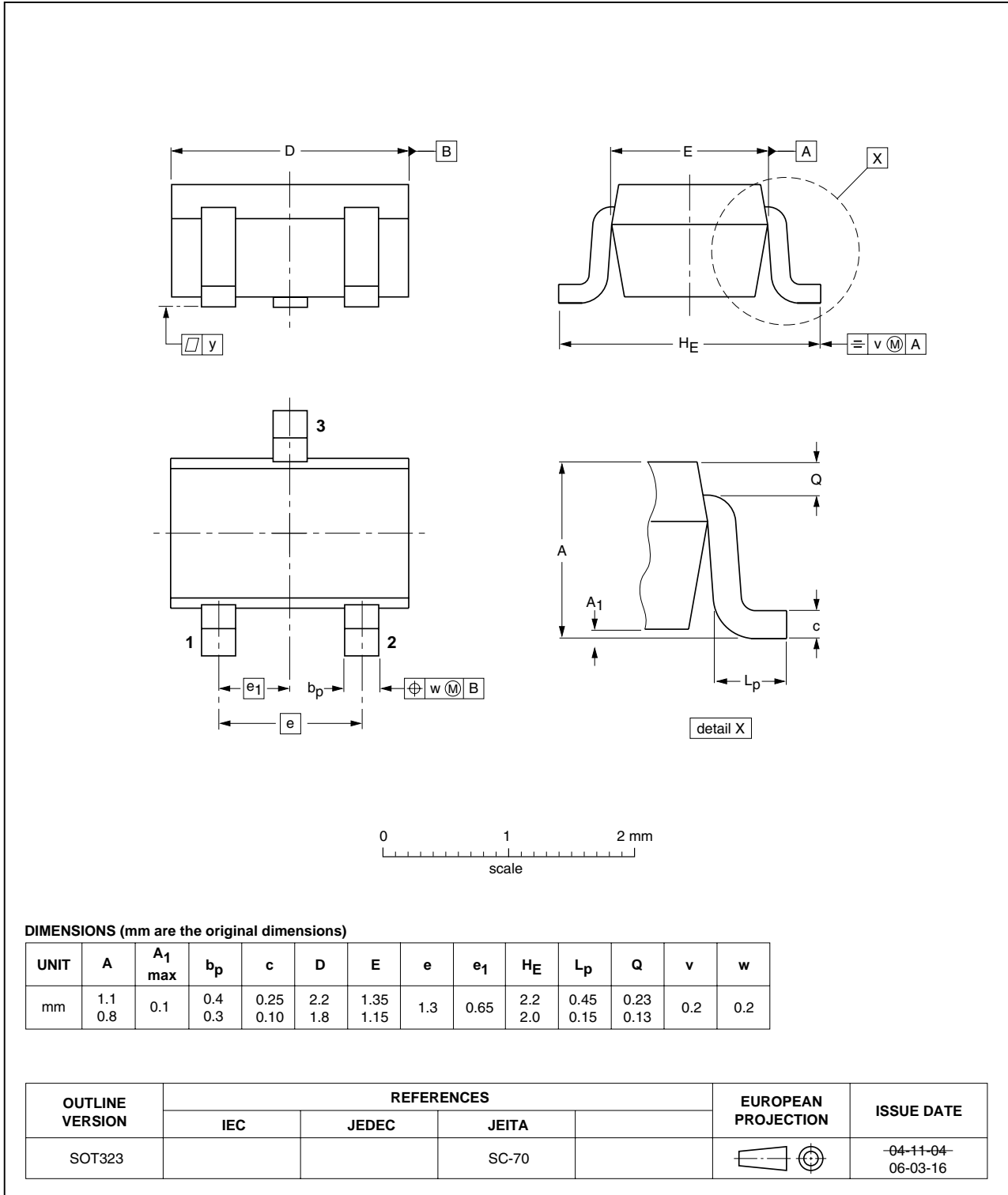


Fig 14. Package outline SOT323 (SC-70)

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

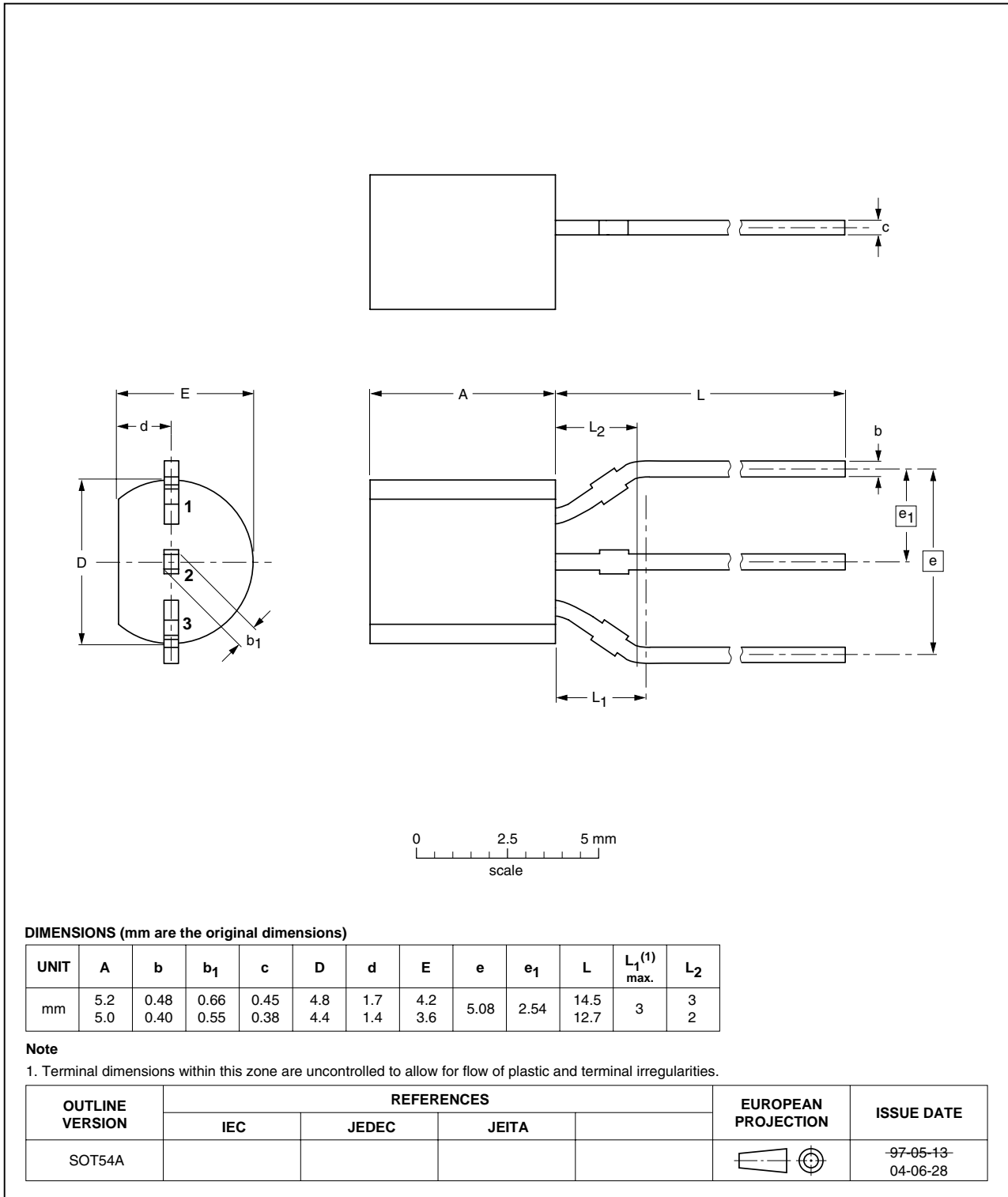


Fig 16. Package outline SOT54A

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.^[1]

| 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_ BC327_6 | 20091117 | Product data sheet | - | BC807_BC807W_ BC327_5 |
| 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. Table 3 "Pinning": updated Figure 13 "Package outline SOT23 (TO-236AB)": updated Figure 14 "Package outline SOT323 (SC-70)": updated | | |
| BC807_BC807W_ BC327_5 | 20050221 | Product data sheet | CPCN200302007F CPCN200405006F | BC807_4; BC807W_3; 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 ^{[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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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Date of release: 17 November 2009

Document identifier: BC807_BC807W_BC327_6

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