

DATA SHEET



BC846; BC847; BC848 NPN general purpose transistors

Product specification
Supersedes data of 1999 Apr 23

2002 Feb 04

NPN general purpose transistors

BC846; BC847; BC848

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 65 V).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

NPN transistor in a SOT23 plastic package.
 PNP complements: BC856, BC857 and BC858.

MARKING

| TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|
| BC846 | 1D* |
| BC846A | 1A* |
| BC846B | 1B* |
| BC847 | 1H* |
| BC847A | 1E* |
| BC847B | 1F* |
| BC847C | 1G* |
| BC848B | 1K* |

Note

1. * = p: made in Hong Kong.
 * = t: made in Malaysia.

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | base |
| 2 | emitter |
| 3 | collector |

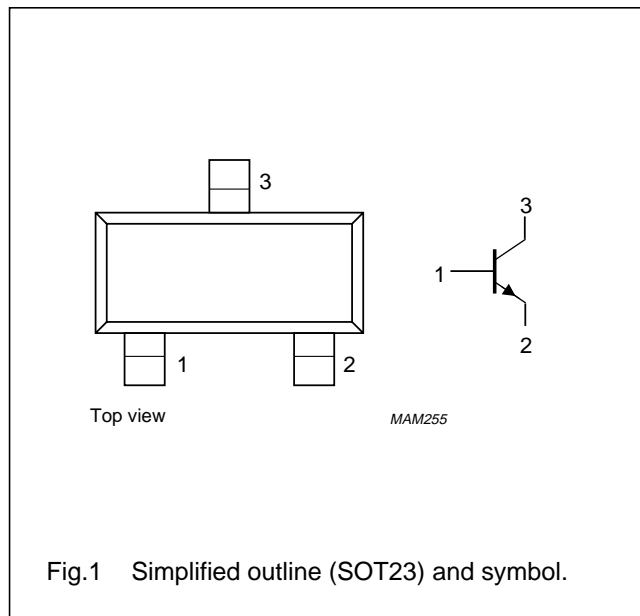


Fig.1 Simplified outline (SOT23) and symbol.

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LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|-------------------------------|----------------------------------|------|------|------|
| V _{CBO} | collector-base voltage | open emitter | | | |
| | BC846 | | – | 80 | V |
| | BC847 | | – | 50 | V |
| | BC848 | – | 30 | V | |
| V _{CEO} | collector-emitter voltage | open base | | | |
| | BC846 | | – | 65 | V |
| | BC847 | | – | 45 | V |
| | BC848 | – | 30 | V | |
| V _{EBO} | emitter-base voltage | open collector | | | |
| | BC846; BC847 | | – | 6 | V |
| | BC848 | – | 5 | V | |
| I _C | collector current (DC) | | – | 100 | mA |
| I _{CM} | peak collector current | | – | 200 | mA |
| I _{BM} | peak base current | | – | 200 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C; note 1 | – | 250 | mW |
| T _{stg} | storage temperature | | –65 | +150 | °C |
| T _j | junction temperature | | – | 150 | °C |
| T _{amb} | operating ambient temperature | | –65 | +150 | °C |

Note

1. Transistor mounted on an FR4 printed-circuit board, standard footprint.

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------------|---|---------------------|-------|------|
| R _{th j-a} | thermal resistance from junction to ambient | in free air; note 1 | 500 | K/W |

Note

1. Transistor mounted on an FR4 printed-circuit board, standard footprint.

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CHARACTERISTICS

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

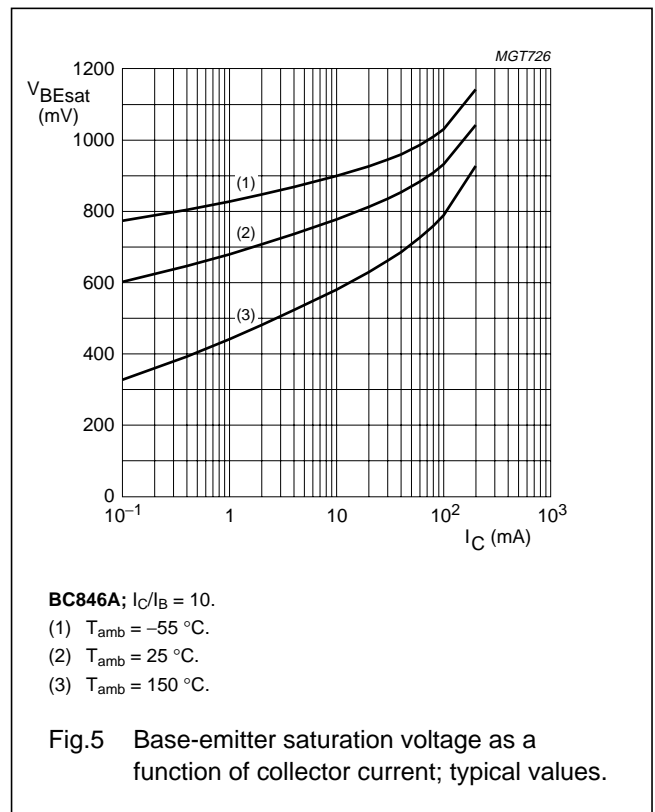
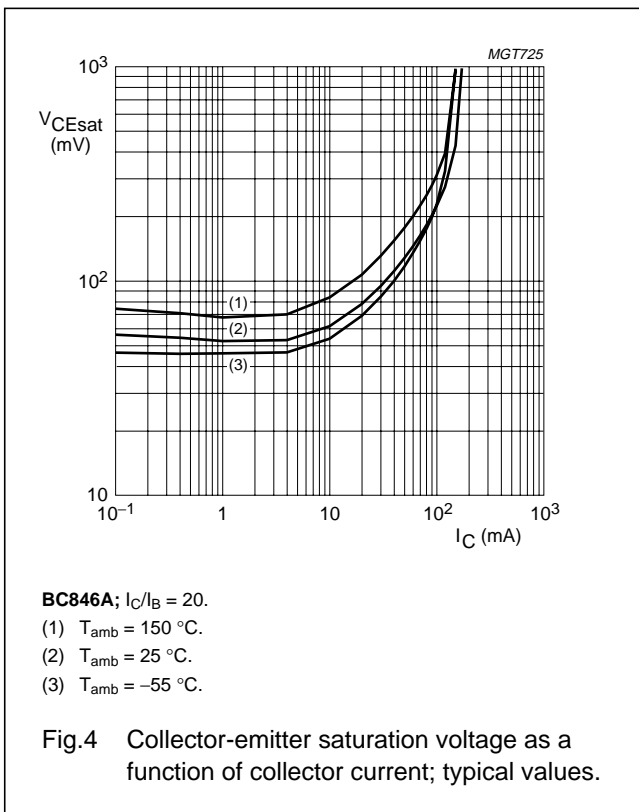
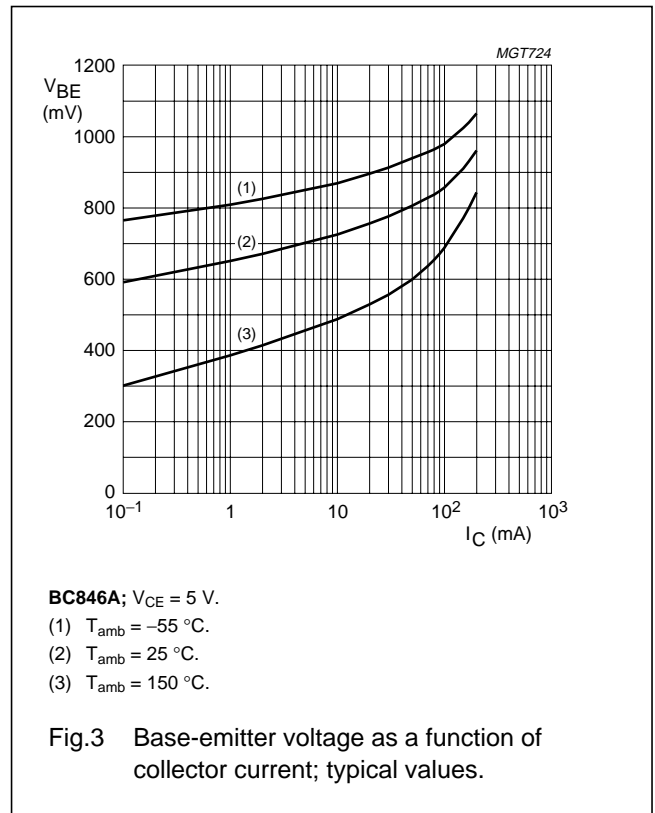
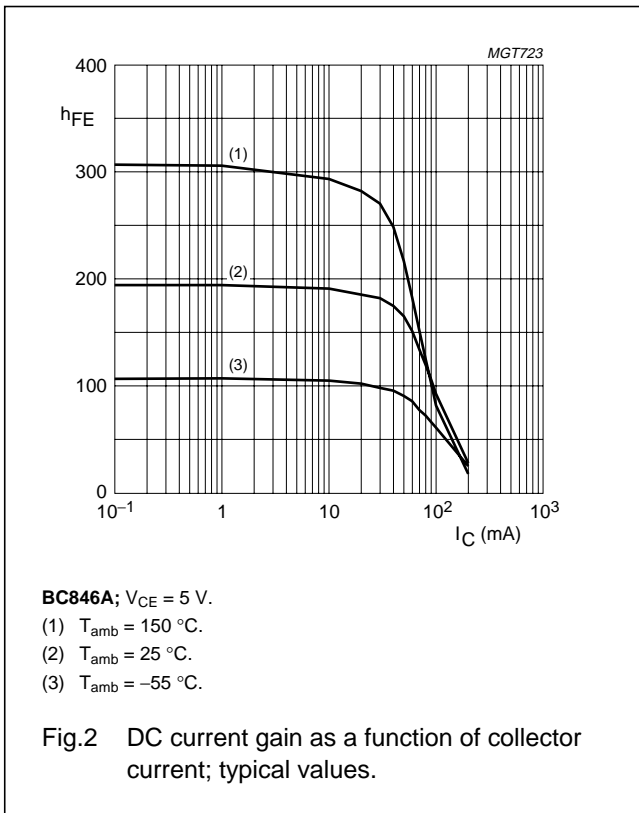
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------|--------------------------------------|--|------|------|------|---------------|
| I_{CBO} | collector-base cut-off current | $V_{CB} = 30\text{ V}; I_E = 0$ | – | – | 15 | nA |
| | | $V_{CB} = 30\text{ V}; I_E = 0;$ $T_J = 150\text{ °C}$ | – | – | 5 | μA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = 5\text{ V}; I_C = 0$ | – | – | 100 | nA |
| h_{FE} | DC current gain | $I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$ | – | 90 | – | – |
| | BC846A; BC847A | | | | | |
| | BC846B; BC847B; BC848B | | – | 150 | – | – |
| | BC847C | | | | | |
| | DC current gain | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$ | 110 | – | 450 | – |
| | BC846 | | | | | |
| | BC847 | | | | | |
| | BC846A; BC847A | | | | | |
| | BC846B; BC847B; BC848B | | | | | |
| | BC847C | | | | | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$ | – | 90 | 250 | mV |
| | | $I_C = 100\text{ mA}; I_B = 5\text{ mA};$ note 1 | – | 200 | 600 | mV |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$ | – | 700 | – | mV |
| | | $I_C = 100\text{ mA}; I_B = 5\text{ mA};$ note 1 | – | 900 | – | mV |
| V_{BE} | base-emitter voltage | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$ | 580 | 660 | 700 | mV |
| | | $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$ | – | – | 770 | mV |
| C_c | collector capacitance | $V_{CB} = 10\text{ V}; I_E = I_e = 0;$ $f = 1\text{ MHz}$ | – | 2.5 | – | pF |
| f_T | transition frequency | $V_{CE} = 5\text{ V}; I_C = 10\text{ mA};$ $f = 100\text{ MHz}$ | 100 | – | – | MHz |
| F | noise figure | $I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V};$ $R_S = 2\text{ k}\Omega; f = 1\text{ kHz};$ $B = 200\text{ Hz}$ | – | 2 | 10 | dB |

Note

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

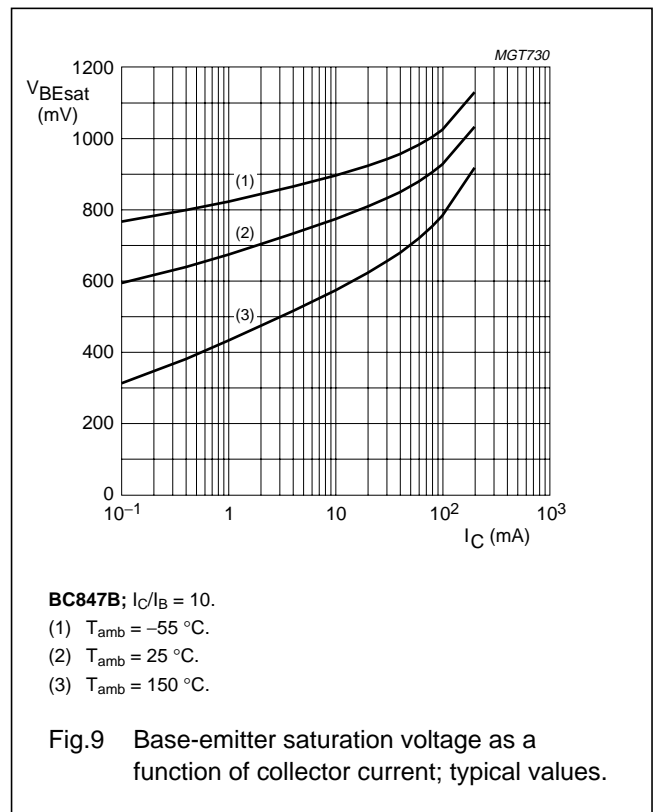
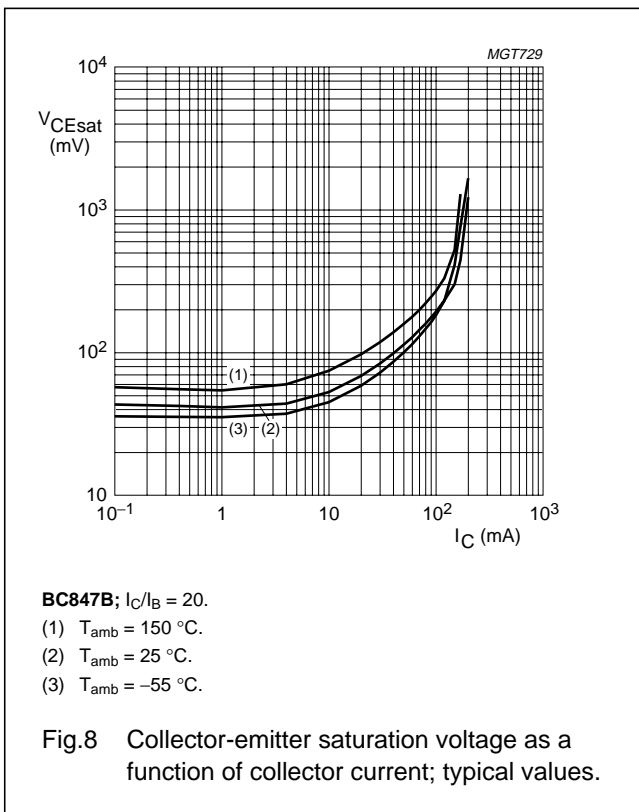
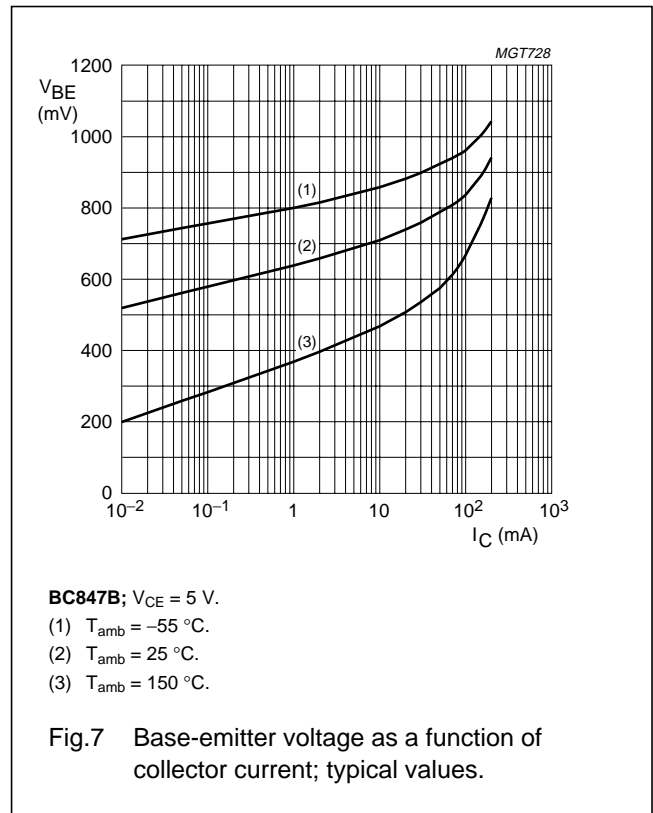
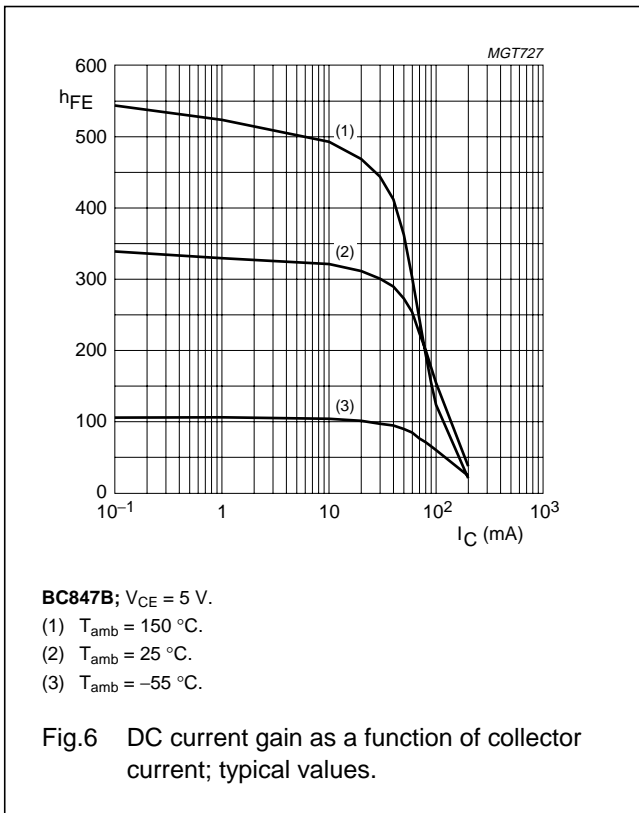
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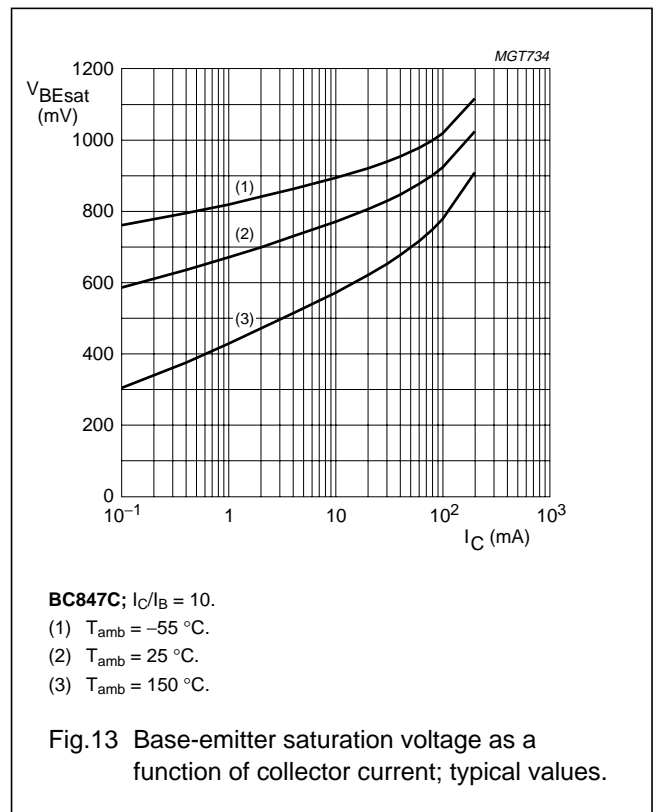
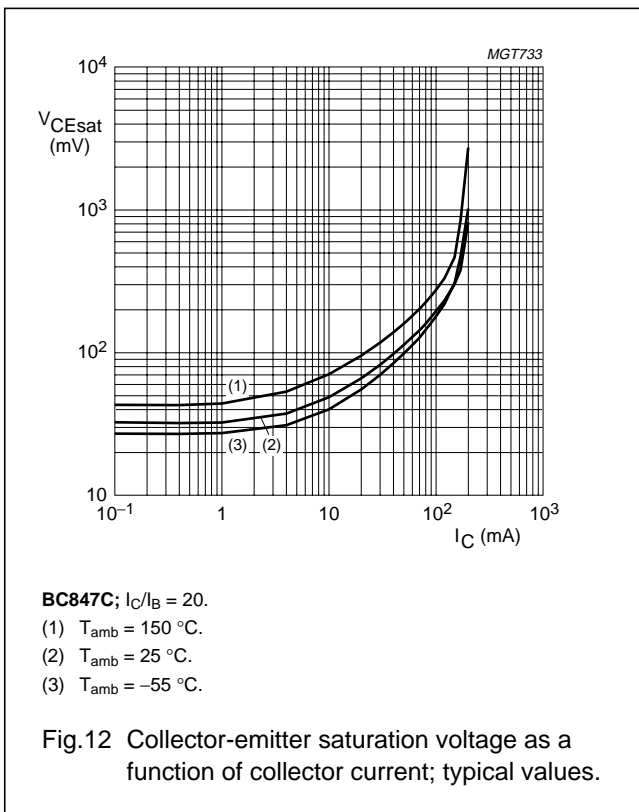
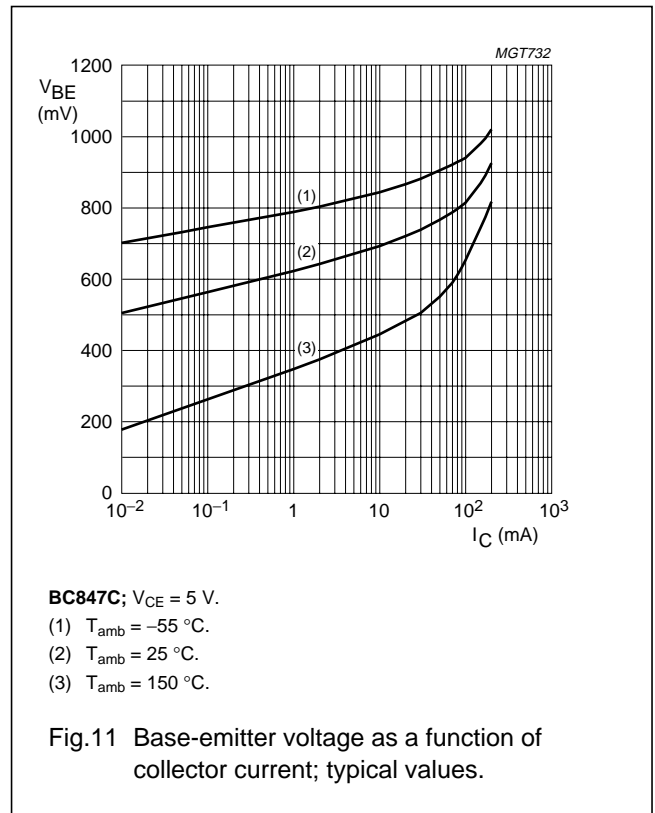
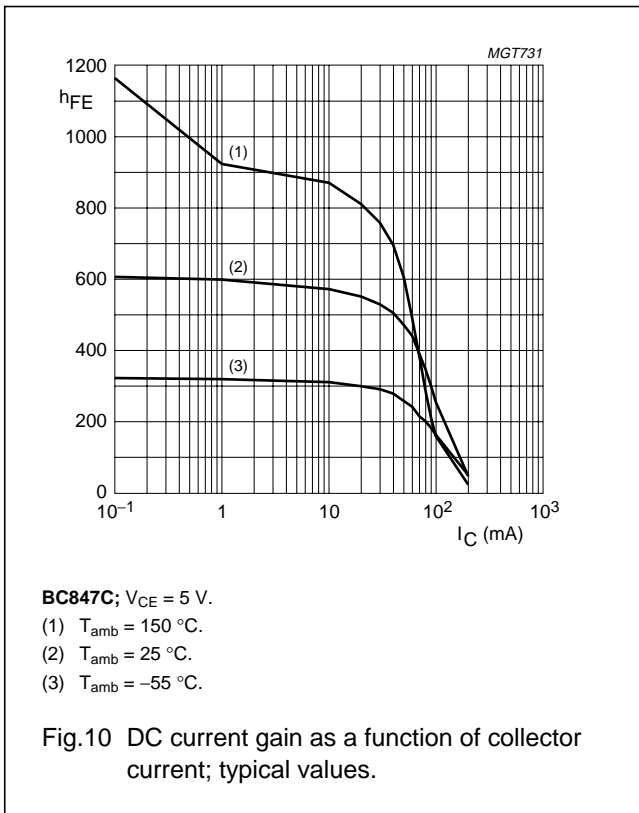
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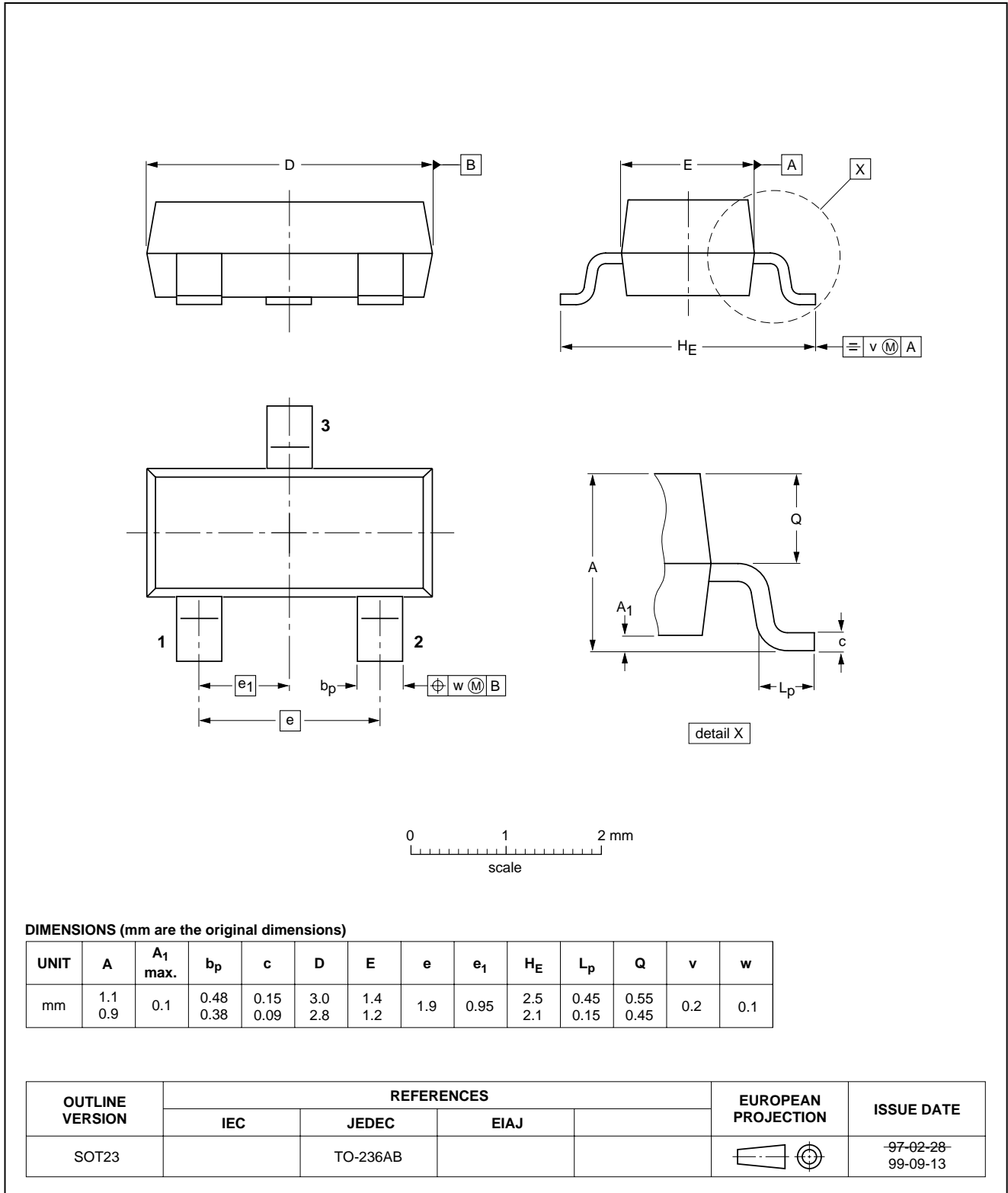
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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DATA SHEET STATUS

| DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITIONS |
|----------------------------------|-------------------------------|--|
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NOTES

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NOTES

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