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Kind regards,

Team Nexperia

DATA SHEET



BC849; BC850 NPN general purpose transistors

Product data sheet
Supersedes data of 1999 Apr 08

2004 Jan 16



NPN general purpose transistors

BC849; BC850

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 45 V).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

NPN transistor in a SOT23 plastic package.
 PNP complements: BC859 and BC860.

MARKING

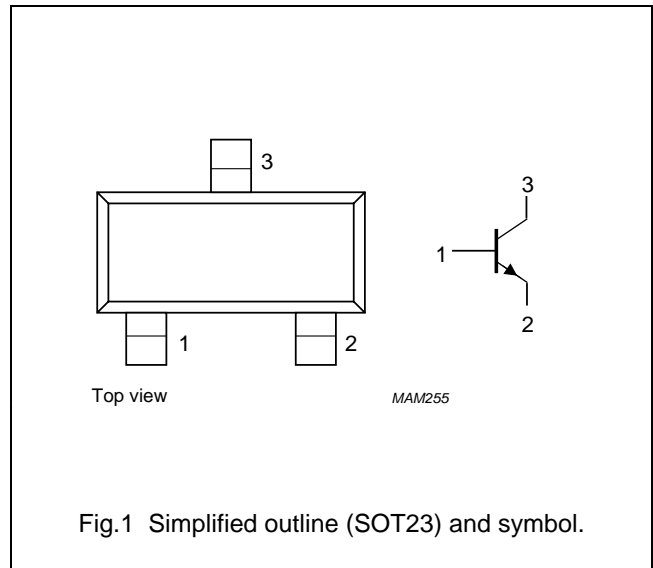
| TYPE NUMBER | MARKING CODE ⁽¹⁾ | TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|-------------|-----------------------------|
| BC849B | 2B* | BC850B | 2F* |
| BC849C | 2C* | BC850C | 2G* |

Note

- * = p : Made in Hong Kong.
 * = t : Made in Malaysia.
 * = W : Made in China.

PINNING

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



ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| BC849B | - | plastic surface mounted package; 3 leads | SOT23 |
| BC849C | | | |
| BC850B | | | |
| BC850C | | | |

NPN general purpose transistors

BC849; BC850

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 | | | |
| | BC849 | | – | 30 | V |
| | BC850 | | – | 50 | V |
| V _{CEO} | collector-emitter voltage | open base | | | |
| | BC849 | | – | 30 | V |
| | BC850 | | – | 45 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 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.

THERMAL CHARACTERISTICS

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

Note

1. Transistor mounted on an FR4 printed-circuit board.

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CHARACTERISTICS

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

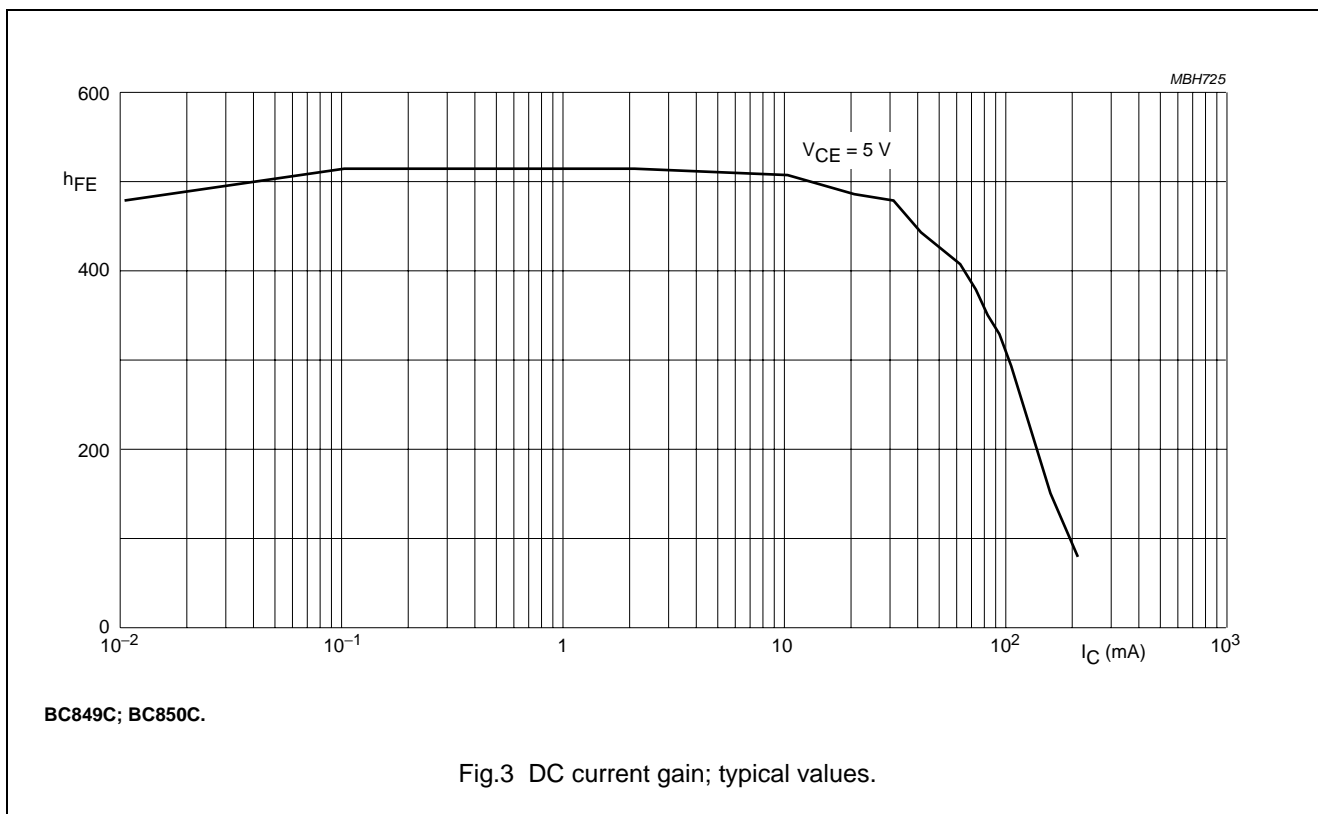
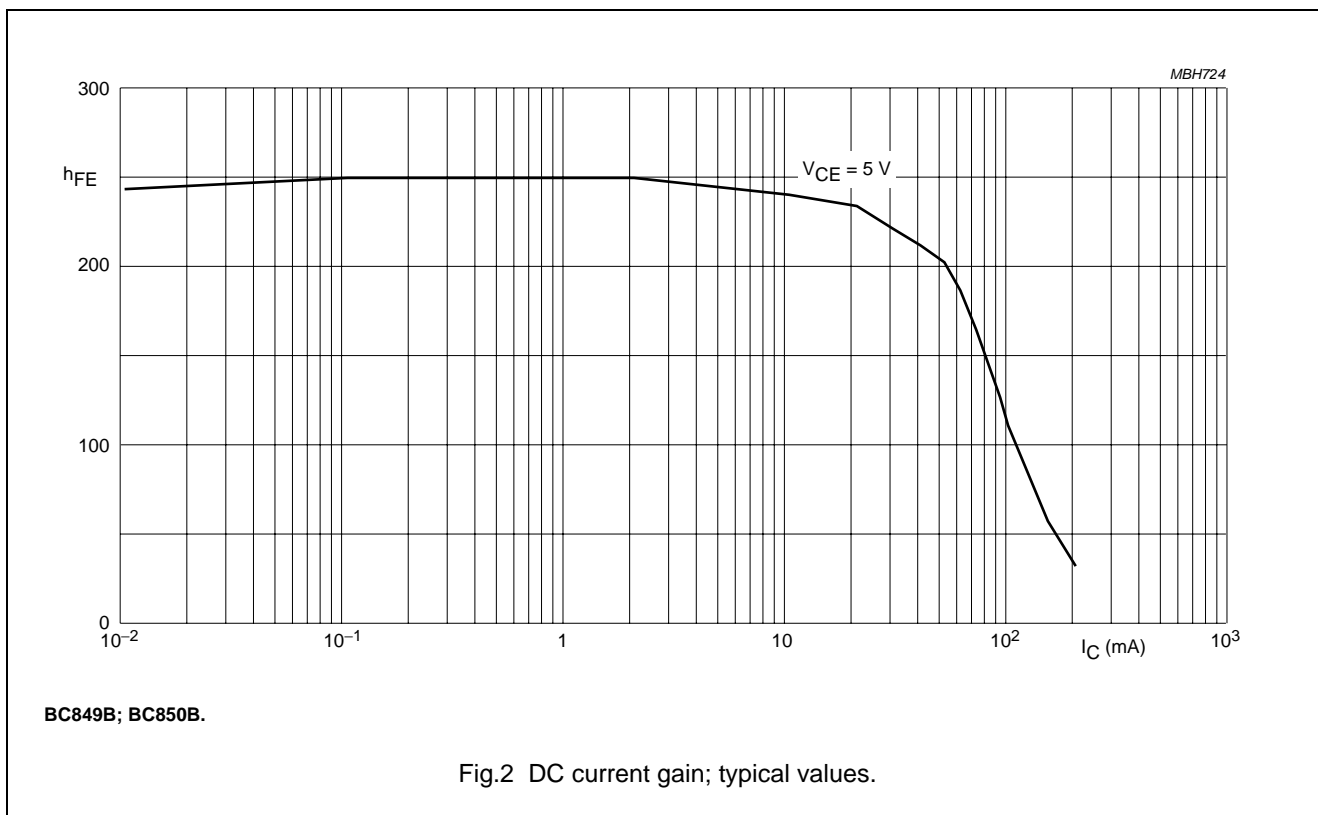
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------|--------------------------------------|---|------|------|------|---------------|
| I_{CBO} | collector cut-off current | $I_E = 0; V_{CB} = 30\text{ V}$ | – | – | 15 | nA |
| | | $I_E = 0; V_{CB} = 30\text{ V}; T_j = 150\text{ °C}$ | – | – | 5 | μA |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = 5\text{ V}$ | – | – | 100 | nA |
| h_{FE} | DC current gain BC849B; BC850B | $I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V};$ see Figs 2 and 3 | – | 240 | – | |
| | BC849C; BC850C | | – | 450 | – | |
| h_{FE} | DC current gain BC849B; BC850B | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V};$ see Figs 2 and 3 | 200 | 290 | 450 | |
| | BC849C; BC850C | | 420 | 520 | 800 | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$ | – | 90 | 250 | mV |
| | | $I_C = 100\text{ mA}; I_B = 5\text{ mA}$ | – | 200 | 600 | mV |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 0.5\text{ mA};$ note 1 | – | 700 | – | mV |
| | | $I_C = 100\text{ mA}; I_B = 5\text{ mA};$ note 1 | – | 900 | – | mV |
| V_{BE} | base-emitter voltage | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V};$ note 2 | 580 | 660 | 700 | mV |
| | | $I_C = 10\text{ mA}; V_{CE} = 5\text{ V};$ note 2 | – | – | 770 | mV |
| C_c | collector capacitance | $I_E = I_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$ | – | 2.5 | – | pF |
| C_e | emitter capacitance | $I_C = I_c = 0; V_{EB} = 500\text{ mV}; f = 1\text{ MHz}$ | – | 11 | – | pF |
| f_T | transition frequency | $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$ | 100 | – | – | MHz |
| F | noise figure | $I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 10\text{ Hz to }15.7\text{ kHz}$ | – | – | 4 | dB |
| | | $I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 1\text{ kHz}; B = 200\text{ Hz}$ | – | – | 4 | dB |

Notes

- V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.
- V_{BE} decreases by about 2 mV/K with increasing temperature.

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PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



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BC849; BC850

DATA SHEET STATUS

| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITION |
|--------------------------------|-------------------------------|---|
| Objective data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary data sheet | Qualification | This document contains data from the preliminary specification. |
| Product data sheet | Production | This document contains the product specification. |

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NXP Semiconductors

Customer notification

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, except for package outline drawings which were updated to the latest version.

Contact information

For additional information please visit: <http://www.nxp.com>

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