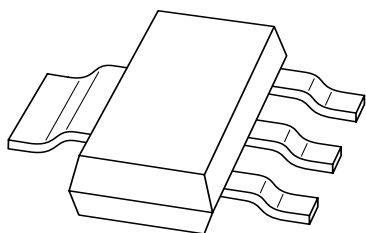


DATA SHEET



BCP54; BCP55; BCP56 NPN medium power transistors

Product specification
Supersedes data of 2001 Oct 10

2003 Feb 06

NPN medium power transistors

BCP54; BCP55; BCP56

FEATURES

- High collector current
- 1.3 W power dissipation.

APPLICATIONS

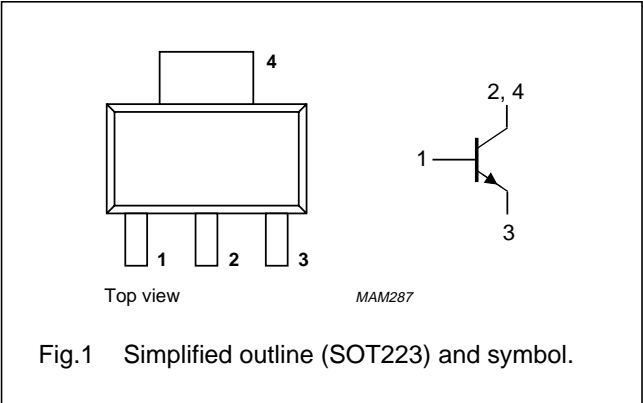
- General purpose medium power DC applications
- Low and medium frequency AC applications
- Peripheral drivers
- Linear voltage regulators and battery chargers.

DESCRIPTION

NPN medium power transistor in a SOT223 plastic package. PNP complements: BCP51, BCP52 and BCP53.

PINNING

| PIN | DESCRIPTION |
|------|-------------|
| 1 | base |
| 2, 4 | collector |
| 3 | emitter |



QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|-----------|---------------------------|------|------|
| V_{CEO} | collector-emitter voltage | 80 | V |
| I_C | collector current (DC) | 1 | A |
| I_{CM} | peak collector current | 1.5 | A |

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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 | | | |
| | BCP54 | | – | 45 | V |
| | BCP55 | | – | 60 | V |
| | BCP56 | | – | 100 | V |
| V _{CEO} | collector-emitter voltage | open base | | | |
| | BCP54 | | – | 45 | V |
| | BCP55 | | – | 60 | V |
| | BCP56 | | – | 80 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 5 | V |
| I _C | collector current (DC) | | – | 1 | A |
| I _{CM} | peak collector current | | – | 1.5 | A |
| I _{BM} | peak base current | | – | 0.2 | A |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C; note 1 | – | 1.33 | W |
| T _{stg} | storage temperature | | –65 | +150 | °C |
| T _j | junction temperature | | – | 150 | °C |
| T _{amb} | operating ambient temperature | | –65 | +150 | °C |

Note

1. Device mounted on printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm².
For other mounting conditions, see “*Thermal considerations for SOT223 in the General Part of associated Handbook*”.

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------------|---|------------|-------|------|
| R _{th j-a} | thermal resistance from junction to ambient | note 1 | 94 | K/W |
| R _{th j-s} | thermal resistance from junction to soldering point | | 13 | K/W |

Note

1. Device mounted on printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm².
For other mounting conditions, see “*Thermal considerations for SOT223 in the General Part of associated Handbook*”.

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CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---------------------------|--|--|------|------|------|---------------|
| I_{CBO} | collector cut-off current | $I_E = 0; V_{CB} = 30\text{ V}$ | – | – | 100 | nA |
| | | $I_E = 0; V_{CB} = 30\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ | – | – | 10 | μA |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = 5\text{ V}$ | – | – | 100 | nA |
| h_{FE} | DC current gain | $I_C = 5\text{ mA}; V_{CE} = 2\text{ V}$ | 63 | – | – | |
| | | $I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$ | 63 | – | 250 | |
| | | $I_C = 500\text{ mA}; V_{CE} = 2\text{ V}$ | 40 | – | – | |
| h_{FE} | DC current gain | $I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$ | | – | | |
| | BCP54-10; BCP55-10; BCP56-10 | | 63 | – | 160 | |
| | BCP54-16; BCP55-16; BCP56-16 | | 100 | – | 250 | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 0.5\text{ A}; I_B = 50\text{ mA}$ | – | – | 500 | mV |
| V_{BE} | base-emitter voltage | $I_C = 0.5\text{ A}; V_{CE} = 2\text{ V}$ | – | – | 1 | V |
| f_T | transition frequency | $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$ | – | 130 | – | MHz |
| $\frac{h_{FE1}}{h_{FE2}}$ | DC current gain ratio of the complementary pairs | $ I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$ | – | – | 1.6 | |

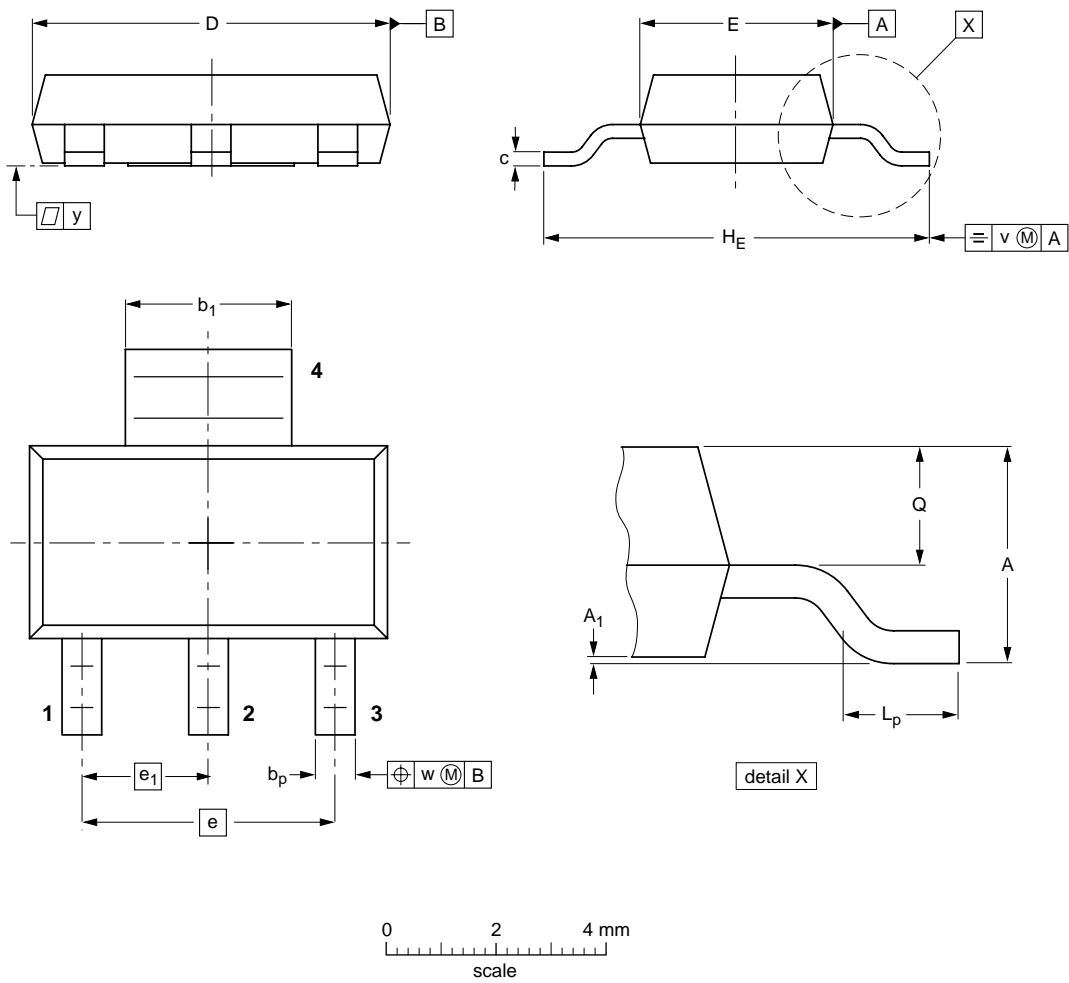
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ | b _p | b ₁ | c | D | E | e | e ₁ | H _E | L _p | Q | v | w | y |
|------|------------|----------------|----------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|--------------|-----|-----|-----|
| mm | 1.8 1.5 | 0.10 0.01 | 0.80 0.60 | 3.1 2.9 | 0.32 0.22 | 6.7 6.3 | 3.7 3.3 | 4.6 | 2.3 | 7.3 6.7 | 1.1 0.7 | 0.95 0.85 | 0.2 | 0.1 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|------------------------|----------------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT223 | | | SC-73 | | | 97-02-28 99-09-13 |

NPN medium power transistors

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DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾⁽³⁾ | DEFINITION |
|-------|----------------------------------|----------------------------------|--|
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