

DATA SHEET



BC635; BC637; BC639 NPN medium power transistors

Product specification
Supersedes data of 1997 Mar 12

1999 Apr 23

NPN medium power transistors

BC635; BC637; BC639

FEATURES

- High current (max. 1 A)
- Low voltage (max. 80 V).

APPLICATIONS

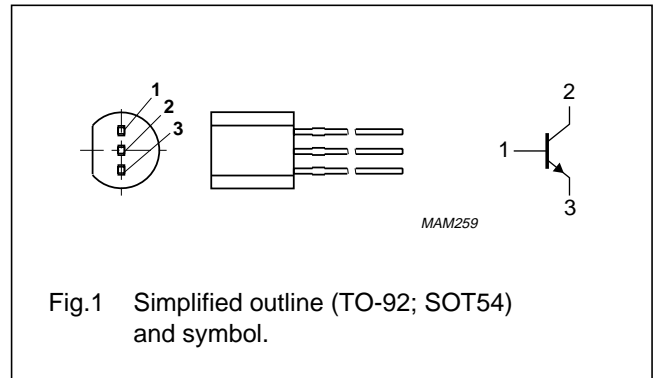
- Driver stages of audio/video amplifiers.

DESCRIPTION

NPN transistor in a TO-92; SOT54 plastic package.
 PNP complements: BC636, BC638 and BC640.

PINNING

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



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|-------------------------------|-----------------------------|------|------|------|
| V_{CBO} | collector-base voltage | open emitter | | | |
| | BC635 | | – | 45 | V |
| | BC637 | | – | 60 | V |
| | BC639 | | – | 100 | V |
| V_{CEO} | collector-emitter voltage | open base | | | |
| | BC635 | | – | 45 | V |
| | BC637 | | – | 60 | V |
| | BC639 | | – | 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 | | – | 200 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | – | 0.83 | W |
| T_{stg} | storage temperature | | –65 | +150 | °C |
| T_j | junction temperature | | – | 150 | °C |
| T_{amb} | operating ambient temperature | | –65 | +150 | °C |

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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1 | 150 | K/W |

Note

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

CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---------------------------|---|---|-----------|------------|---------------|
| I_{CBO} | collector cut-off current | $I_E = 0; V_{CB} = 30\text{ V}$ | – | 100 | nA |
| | | $I_E = 0; V_{CB} = 30\text{ V}; T_j = 150\text{ °C}$ | – | 10 | μA |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = 5\text{ V}$ | – | 100 | nA |
| h_{FE} | DC current gain | $V_{CE} = 2\text{ V}$; see Fig.2 $I_C = 5\text{ mA}$ | 40 | – | |
| | | $I_C = 150\text{ mA}$ $I_C = 500\text{ mA}$ | 63 25 | 250 – | |
| | DC current gain BC639-10 BC635-16; BC637-16; BC639-16 | $I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$; see Fig.2 | 63 100 | 160 250 | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 500\text{ mA}; I_B = 50\text{ mA}$ | – | 500 | mV |
| V_{BE} | base-emitter voltage | $I_C = 500\text{ mA}; V_{CE} = 2\text{ V}$ | – | 1 | V |
| f_T | transition frequency | $I_C = 50\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$ | 100 | – | 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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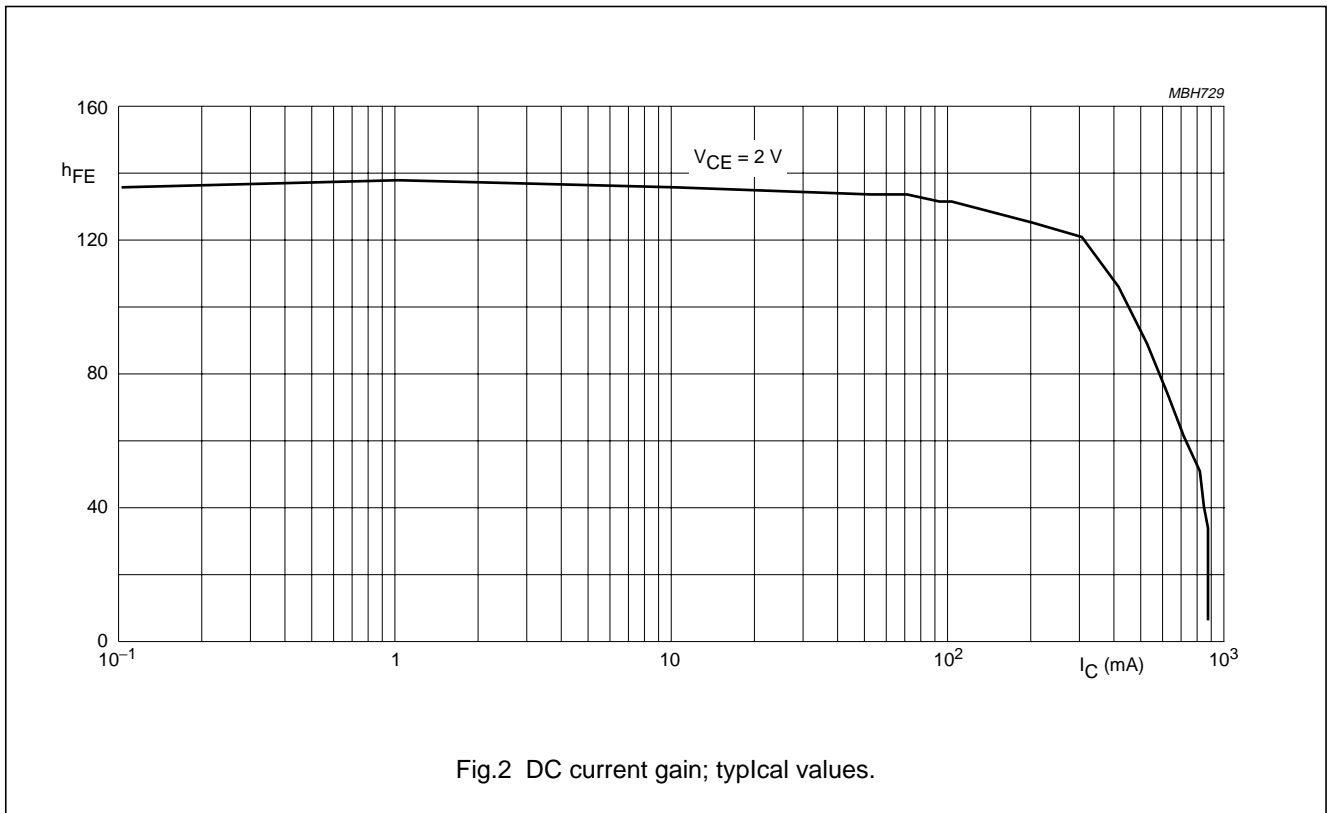


Fig.2 DC current gain; typical values.

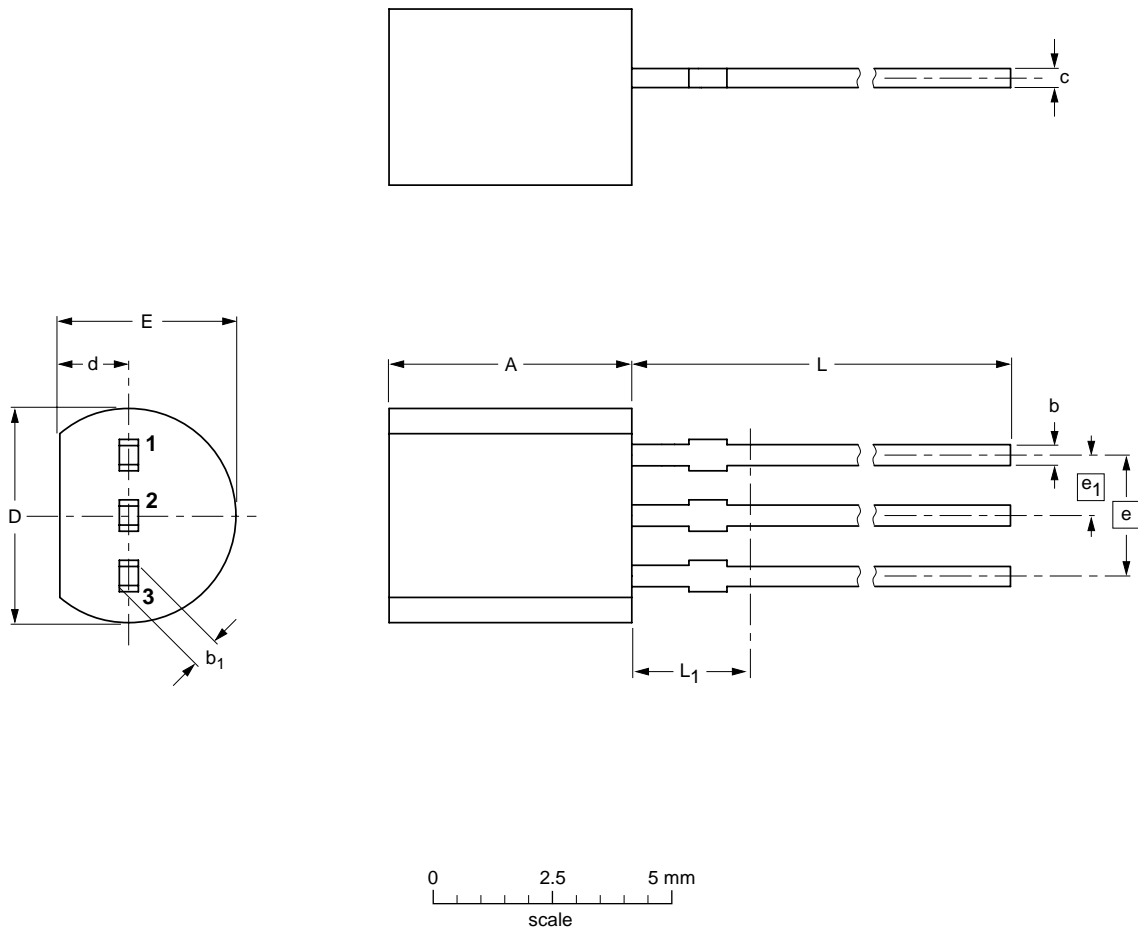
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PACKAGE OUTLINE

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

SOT54



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b | b ₁ | c | D | d | E | e | e ₁ | L | L ₁ ⁽¹⁾ |
|------|------------|--------------|----------------|--------------|------------|------------|------------|------|----------------|--------------|-------------------------------|
| mm | 5.2 5.0 | 0.48 0.40 | 0.66 0.56 | 0.45 0.40 | 4.8 4.4 | 1.7 1.4 | 4.2 3.6 | 2.54 | 1.27 | 14.5 12.7 | 2.5 |

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|-------|---------------------|------------|
| | IEC | JEDEC | EIAJ | | |
| SOT54 | | TO-92 | SC-43 | | 97-02-28 |

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DEFINITIONS

| Data Sheet Status | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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