

## NPN medium power transistors

## BC635; BC637; BC639

## FEATURES

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

## APPLICATIONS

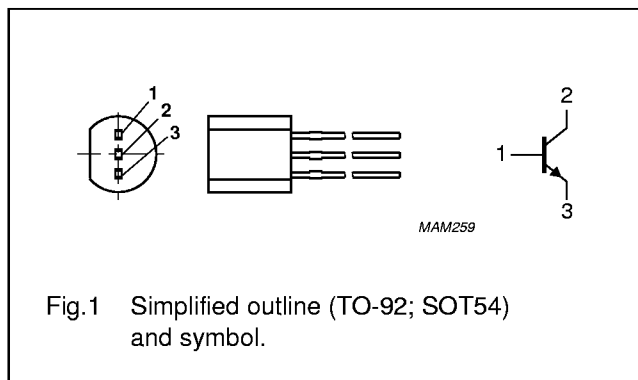
- Driver stages of audio/video amplifiers.

## 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       | $T_{amb} \leq 25\text{ }^{\circ}\text{C}$ | —    | 0.83 | W                  |
| $T_{stg}$ | storage temperature           |                                           | −65  | +150 | $^{\circ}\text{C}$ |
| $T_j$     | junction temperature          |                                           | —    | 150  | $^{\circ}\text{C}$ |
| $T_{amb}$ | operating ambient temperature |                                           | −65  | +150 | $^{\circ}\text{C}$ |

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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   | $\mu\text{A}$ |
| $I_{EBO}$                 | 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   | –    |               |
|                           |                                                             | $I_C = 150\text{ mA}$                                         | 63   | 250  |               |
|                           |                                                             | $I_C = 500\text{ mA}$                                         | 25   | –    |               |
|                           | DC current gain<br>BC639-10<br>BC635-16; BC637-16; BC639-16 | $I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$ ; see Fig.2        | 63   | 160  |               |
|                           |                                                             |                                                               | 100  | 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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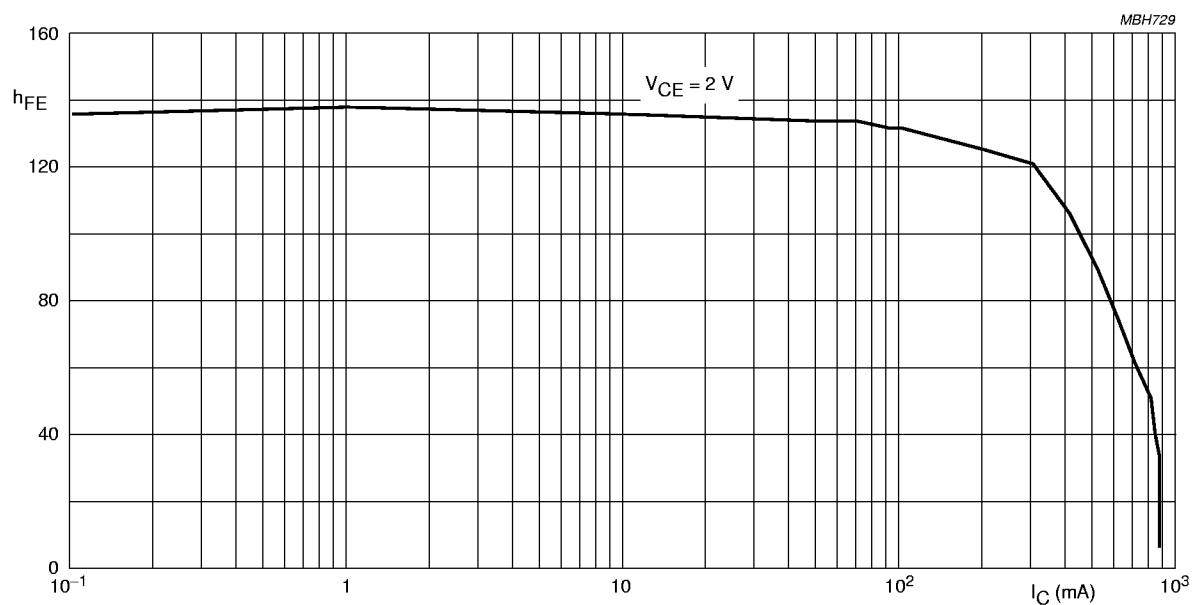


Fig.2 DC current gain; typical values.

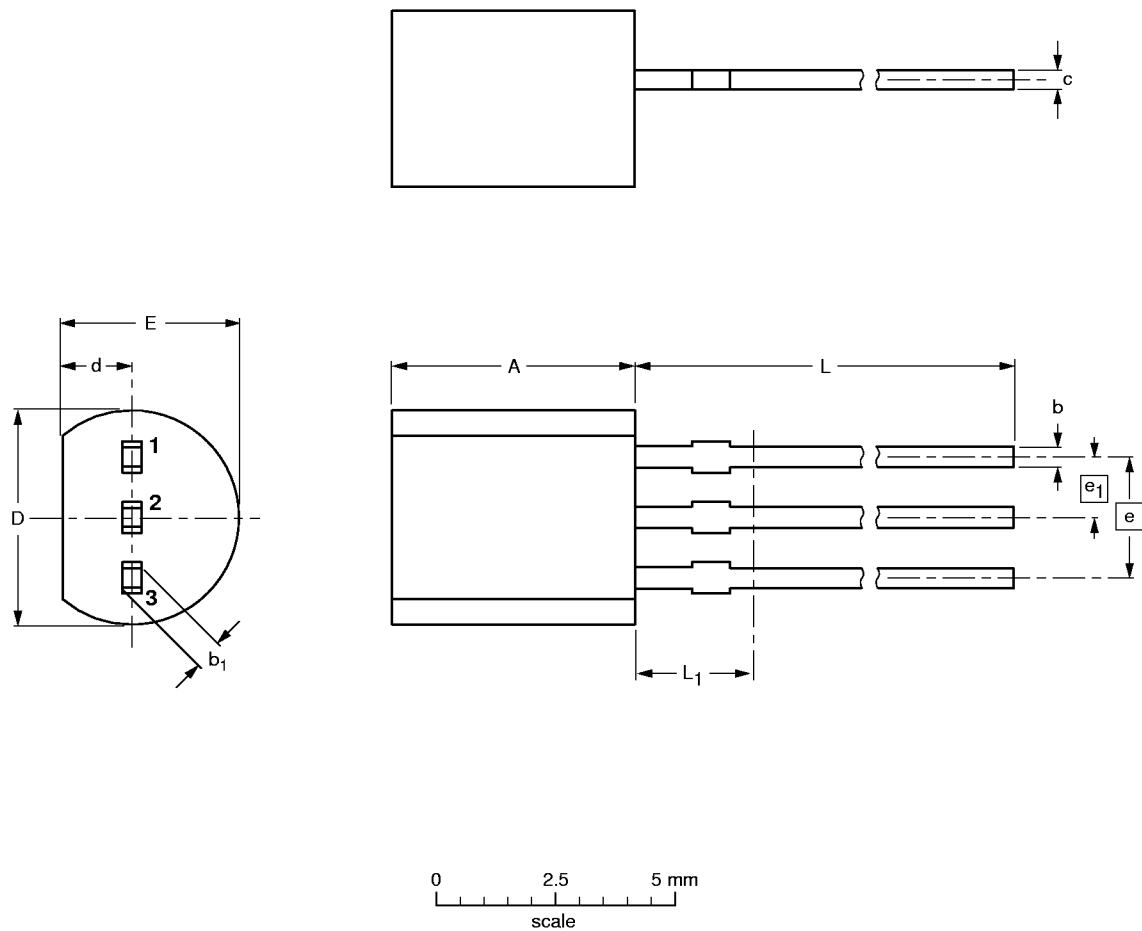
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PACKAGE OUTLINE

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

SOT54



DIMENSIONS (mm are the original dimensions)

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

Note

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

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