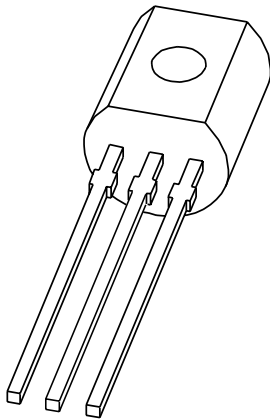


# DATA SHEET



## **JC546; JC548** NPN general purpose transistors

Product specification  
Supersedes data of 1999 Apr 27

2004 Dec 08

# NPN general purpose transistors

# JC546; JC548

### FEATURES

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

### APPLICATIONS

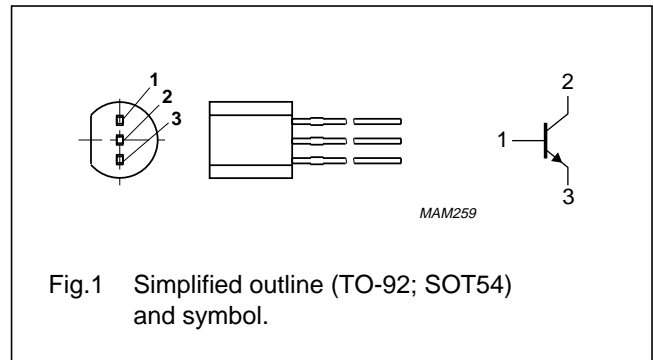
- General purpose switching and amplification, e.g. driver and output stages of audio amplifiers.

### DESCRIPTION

NPN transistor in a TO-92; SOT54 plastic package. PNP complements: JC556 and JC558.

### PINNING

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



### ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |   |         |
|-------------|---------|---|---------|
|             | NAME    | DESCRIPTION   | VERSION |
| JC546B      | SC-43A  | plastic single-ended leaded (through hole) package; 3 leads | SOT54   |
| JC548B      |         |   |         |

## NPN general purpose transistors

## JC546; JC548

**LIMITING VALUES**

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

| SYMBOL           | PARAMETER                 | CONDITIONS               | MIN. | MAX. | UNIT |
|------------------|---------------------------|--------------------------|------|------|------|
| V <sub>CBO</sub> | collector-base voltage    | open emitter             | –    | 80   | V    |
|                  | JC546B                    |                          |      | 30   | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open-base                | –    | 65   | V    |
|                  | JC548B                    |                          |      | 30   | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector           | –    | 6    | V    |
|                  | JC548B                    |                          |      | 5    | V    |
| I <sub>C</sub>   | collector current (DC)    |                          | –    | 100  | mA   |
| I <sub>CM</sub>  | peak collector current    |                          | –    | 200  | mA   |
| I <sub>BM</sub>  | peak base current         |                          | –    | 200  | mA   |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C | –    | 500  | mW   |
| T <sub>stg</sub> | storage temperature       |                          | –65  | +150 | °C   |
| T <sub>j</sub>   | junction temperature      |                          | –    | 150  | °C   |
| T <sub>amb</sub> | ambient temperature       |                          | –65  | +150 | °C   |

**THERMAL CHARACTERISTICS**

| SYMBOL               | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|----------------------|---|------------|-------|------|
| R <sub>th(j-a)</sub> | thermal resistance from junction to ambient | note 1     | 250   | K/W  |

**Note**

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

## NPN general purpose transistors

## JC546; JC548

**CHARACTERISTICS**

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

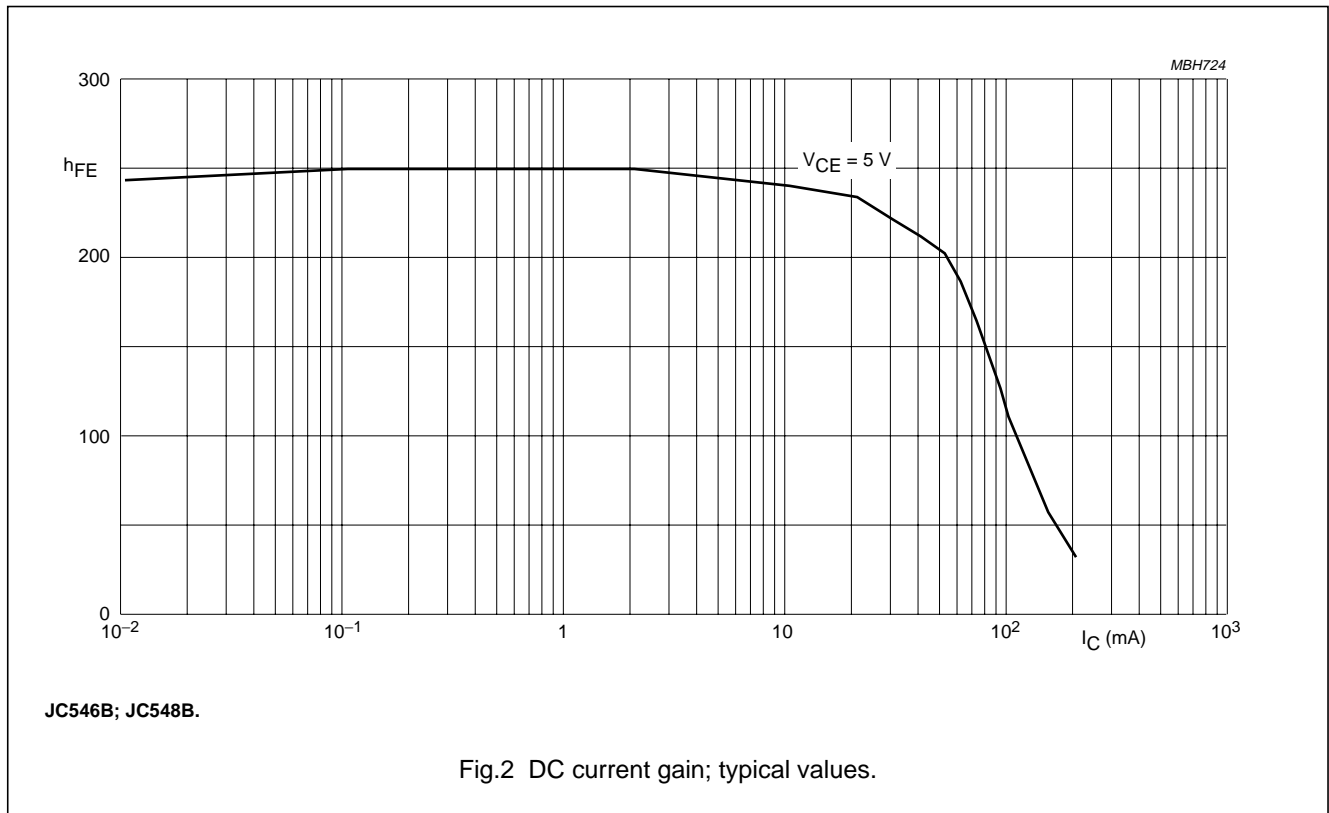
| SYMBOL      | PARAMETER                            | CONDITIONS  | MIN. | TYP. | MAX. | UNIT          |
|-------------|--------------------------------------|---|------|------|------|---------------|
| $I_{CBO}$   | collector-base cut-off current       | $V_{CB} = 30\text{ V}; I_E = 0\text{ A}$  | –    | –    | 15   | nA            |
|             |                                      | $V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ °C}$   | –    | –    | 5    | $\mu\text{A}$ |
| $I_{EBO}$   | emitter-base cut-off current         | $V_{EB} = 5\text{ V}; I_C = 0\text{ A}$   | –    | –    | 100  | nA            |
| $h_{FE}$    | DC current gain<br>JC546B; JC548B    | $V_{CE} = 5\text{ V};$ see Fig.2  |      |      |      |               |
|             |                                      | $I_C = 10\text{ }\mu\text{A}$   | –    | 150  | –    |               |
|             |                                      | $I_C = 2\text{ mA}$   | 200  | 290  | 450  |               |
| $V_{CEsat}$ | 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                 | $V_{CE} = 5\text{ V}; I_C = 2\text{ mA};$ note 2  | 580  | 660  | 700  | mV            |
|             |                                      | $V_{CE} = 5\text{ V}; I_C = 10\text{ mA};$ note 2   | –    | –    | 770  | mV            |
| $C_c$       | collector capacitance                | $V_{CB} = 10\text{ V}; I_E = I_e = 0\text{ A}; f = 1\text{ MHz}$  | –    | 2.5  | –    | pF            |
| $C_e$       | emitter capacitance                  | $V_{EB} = 0.5\text{ V}; I_C = I_c = 0\text{ A}; f = 1\text{ MHz}$   | –    | 11.5 | –    | pF            |
| $f_T$       | transition frequency                 | $V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}$   | 100  | –    | –    | MHz           |
| F           | noise figure                         | $V_{CE} = 5\text{ V}; I_C = 200\text{ }\mu\text{A}; R_S = 2\text{ k}\Omega;$<br>$f = 1\text{ kHz}; B = 200\text{ Hz}$ | –    | 2    | 10   | 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.

NPN general purpose transistors

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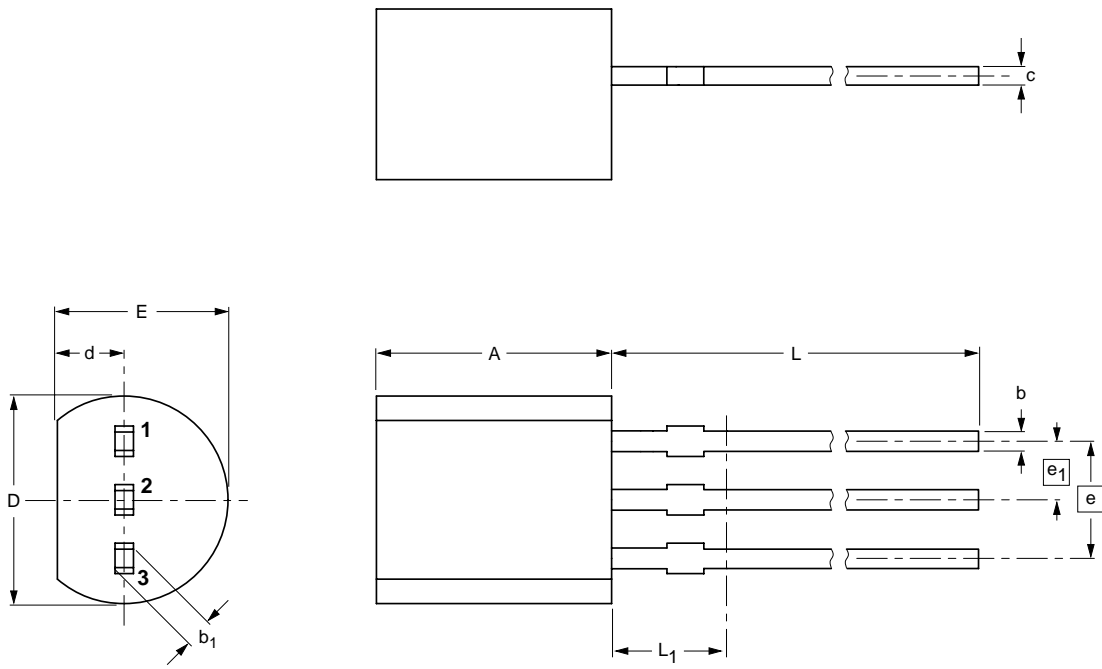
NPN general purpose transistors

JC546; JC548

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><br>max. |
|------|------------|--------------|----------------|--------------|------------|------------|------------|------|----------------|--------------|---------------------------------------|
| mm   | 5.2<br>5.0 | 0.48<br>0.40 | 0.66<br>0.55   | 0.45<br>0.38 | 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 VERSION | REFERENCES |       |        | EUROPEAN PROJECTION | ISSUE DATE                      |
|-----------------|------------|-------|--------|---------------------|---------------------------------|
|                 | IEC        | JEDEC | JEITA  |                     |                                 |
| SOT54           |            | TO-92 | SC-43A |                     | <del>04-06-28</del><br>04-11-16 |

## NPN general purpose transistors

JC546; JC548

## DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)(3)</sup> | DEFINITION   |
|-------|----------------------------------|----------------------------------|--|
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