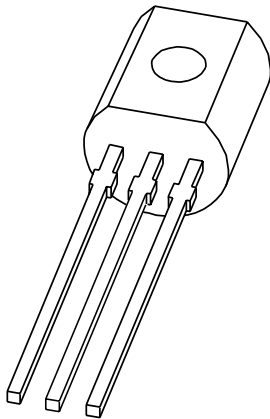


# DATA SHEET



**2PC1815**

**NPN general purpose transistor**

Product specification  
Supersedes data of 1999 May 28

2004 Nov 05

NPN general purpose transistor

2PC1815

FEATURES

- Low current (max. 150 mA)
- Low voltage (max. 50 V).

APPLICATIONS

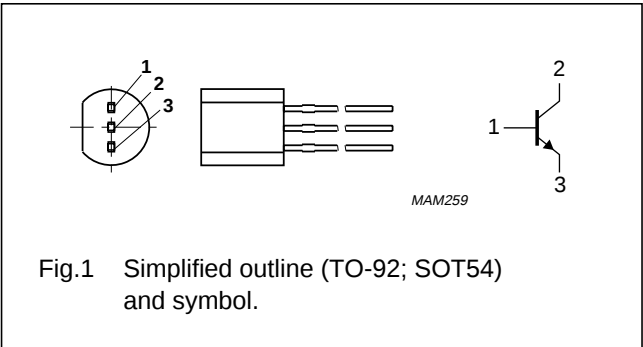
- General purpose switching and amplification, e.g. audio amplifier driver stages.

DESCRIPTION

NPN transistor in a TO-92 (SOT54) plastic package.  
PNP complement: 2PA1015.

PINNING

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



ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |                                                             |         |
|-------------|---------|-------------------------------------------------------------|---------|
|             | NAME    | DESCRIPTION                                                 | VERSION |
| 2PC1815     | SC-43A  | plastic single-ended leaded (through hole) package; 3 leads | SOT54   |

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                         | –    | 60   | V    |
| $V_{CEO}$ | collector-emitter voltage | open base                            | –    | 50   | V    |
| $V_{EBO}$ | emitter-base voltage      | open collector                       | –    | 5    | V    |
| $I_C$     | collector current (DC)    |                                      | –    | 150  | mA   |
| $I_{CM}$  | peak collector current    |                                      | –    | 200  | mA   |
| $I_{BM}$  | peak base current         |                                      | –    | 200  | mA   |
| $P_{tot}$ | total power dissipation   | $T_{amb} \leq 25\text{ °C}$ ; note 1 | –    | 500  | mW   |
| $T_{stg}$ | storage temperature       |                                      | –65  | +150 | °C   |
| $T_j$     | junction temperature      |                                      | –    | 150  | °C   |
| $T_{amb}$ | ambient temperature       |                                      | –65  | +150 | °C   |

Note

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

## NPN general purpose transistor

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## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|---------------|---------------------------------------------|------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | note 1     | 250   | K/W  |

## Note

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

## CHARACTERISTICS

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

| SYMBOL      | PARAMETER                            | CONDITIONS                                                                                         | MIN. | TYP. | MAX. | UNIT |
|-------------|--------------------------------------|----------------------------------------------------------------------------------------------------|------|------|------|------|
| $I_{CBO}$   | collector-base cut-off current       | $V_{CB} = 60\text{ V}; I_E = 0\text{ A}$                                                           | –    | –    | 100  | nA   |
| $I_{EBO}$   | emitter-base cut-off current         | $V_{EB} = 5\text{ V}; I_C = 0\text{ A}$                                                            | –    | –    | 100  | nA   |
| $h_{FE}$    | DC current gain                      | $V_{CE} = 6\text{ V}; I_C = 150\text{ mA}$                                                         | 25   | –    | –    |      |
| $h_{FE}$    | DC current gain                      | $V_{CE} = 6\text{ V}; I_C = 2\text{ mA}$                                                           |      |      |      |      |
|             | 2PC1815                              |                                                                                                    | 120  | –    | 700  |      |
|             | 2PC1815Y                             |                                                                                                    | 120  | –    | 240  |      |
|             | 2PC1815GR                            |                                                                                                    | 200  | –    | 400  |      |
|             | 2PC1815BL                            |                                                                                                    | 350  | –    | 700  |      |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 100\text{ mA}; I_B = 10\text{ mA}$                                                          | –    | –    | 300  | mV   |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = 100\text{ mA}; I_B = 10\text{ mA}$                                                          | –    | –    | 1.1  | V    |
| $C_c$       | collector capacitance                | $V_{CB} = 10\text{ V}; I_E = I_C = 0\text{ A};$<br>$f = 1\text{ MHz}$                              | –    | 2.5  | 3.5  | pF   |
| $f_T$       | transition frequency                 | $V_{CE} = 6\text{ V}; I_C = 1\text{ mA}; f = 100\text{ MHz}$                                       | 80   | –    | –    | MHz  |
| F           | noise figure                         | $V_{CE} = 5\text{ V}; I_C = 200\text{ }\mu\text{A};$<br>$R_S = 2\text{ k}\Omega; f = 1\text{ kHz}$ | –    | –    | 10   | dB   |

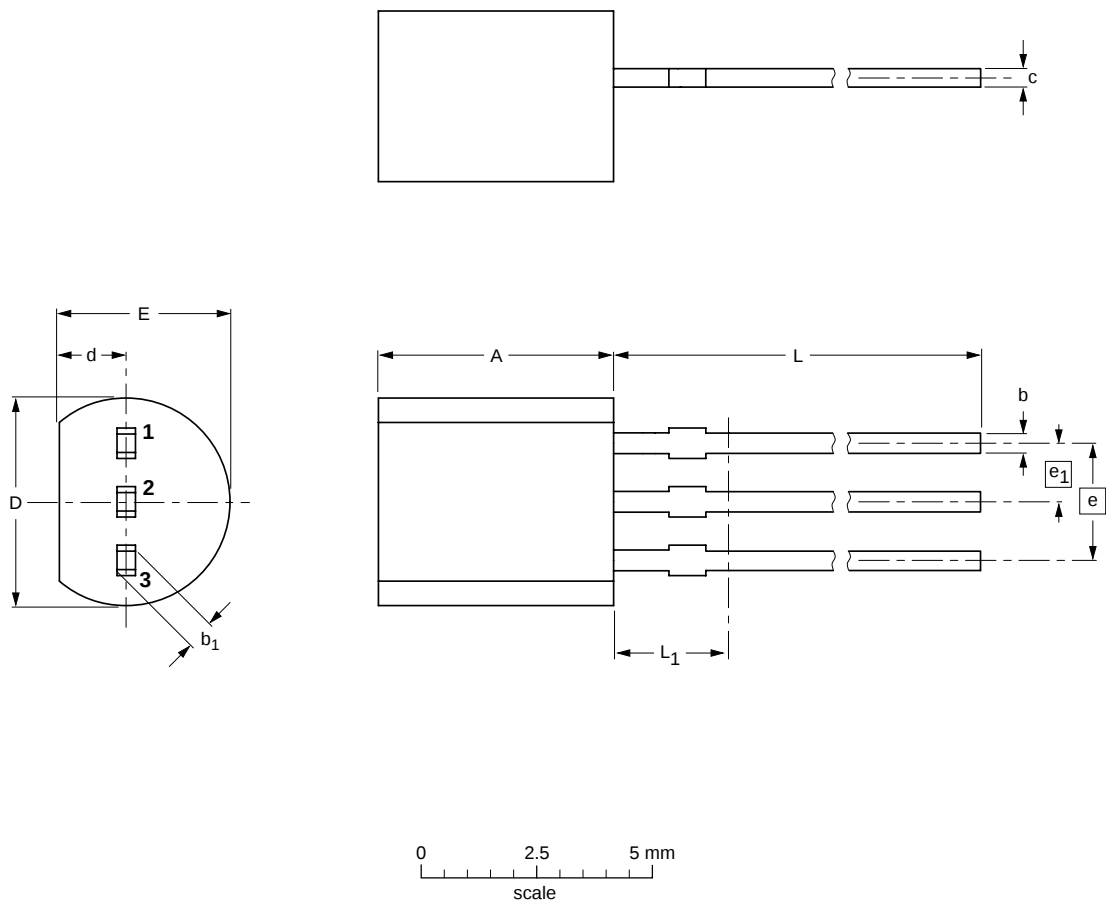
NPN general purpose transistor

2PC1815

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<br>VERSION | REFERENCES |       |        |  | EUROPEAN<br>PROJECTION | ISSUE DATE            |
|--------------------|------------|-------|--------|--|------------------------|-----------------------|
|                    | IEC        | JEDEC | JEITA  |  |                        |                       |
| SOT54              |            | TO-92 | SC-43A |  |                        | -97-02-28<br>04-06-28 |

## NPN general purpose transistor

2PC1815

## DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)(3)</sup> | DEFINITION                                                                                                                                                                                                                                                                                     |
|-------|----------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I     | Objective data                   | Development                      | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.                                                                                                    |
| II    | Preliminary data                 | Qualification                    | This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.             |
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