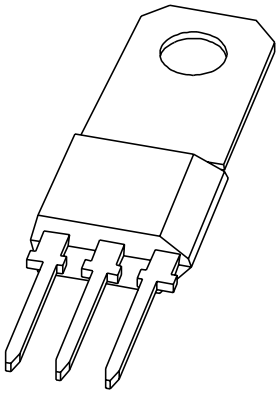
# DATA SHEET



# BF819
## NPN high-voltage transistor

Product specification
Supersedes data of 1997 Jun 20
File under Discrete Semiconductors, SC04

1997 Sep 03

Philips
Semiconductors

PHILIPS

# NPN high-voltage transistor BF819

## FEATURES

- Low current (max. 100 mA)
- High voltage (max. 250 V).

## APPLICATIONS

- Driver for a line output transistor in colour television receivers.

## DESCRIPTION

NPN high-voltage transistor in a TO-202; SOT128B plastic package.

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | emitter |
| 2 | collector, connected to mounting base |
| 3 | base |

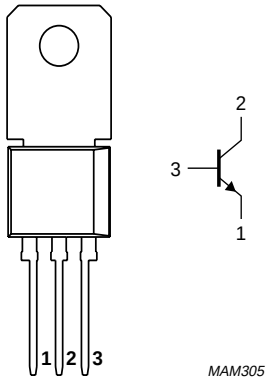



Fig.1 Simplified outline (TO-202; SOT128B) and symbol.

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{CBO}$ | collector-base voltage | open emitter | – | 300 | V |
| $V_{CEO}$ | collector-emitter voltage | open base | – | 250 | V |
| $I_{CM}$ | peak collector current | | – | 300 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 75$ °C | – | 6 | W |
| $h_{FE}$ | DC current gain | $I_C$ = 20 mA, $V_{CE}$ = 10 V | 45 | – | |
| $C_{re}$ | feedback capacitance | $I_C = i_c = 0$; $V_{CB}$ = 30 V; f = 1 MHz | – | 3.5 | pF |
| $f_T$ | transition frequency | $I_C$ = 15 mA; $V_{CE}$ = 10 V; f = 100 MHz | 90 | – | MHz |

## 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 | – | 300 | V |
| $V_{CEO}$ | collector-emitter voltage | open base | – | 250 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | – | 5 | V |
| $I_C$ | collector current (DC) | | – | 100 | mA |
| $I_{CM}$ | peak collector current | | – | 300 | mA |
| $I_{BM}$ | peak base current | | – | 100 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 75$ °C | – | 1.2 | W |
| | | $T_{mb} \leq 75$ °C | – | 6 | W |
| $T_{stg}$ | storage temperature | | –65 | +150 | °C |
| $T_j$ | junction temperature | | – | 150 | °C |
| $T_{amb}$ | operating ambient temperature | | –65 | +150 | °C |

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient | in free air | 62.5 | K/W |
| $R_{th\ j\text{-}mb}$ | thermal resistance from junction to mounting base | | 12.5 | K/W |

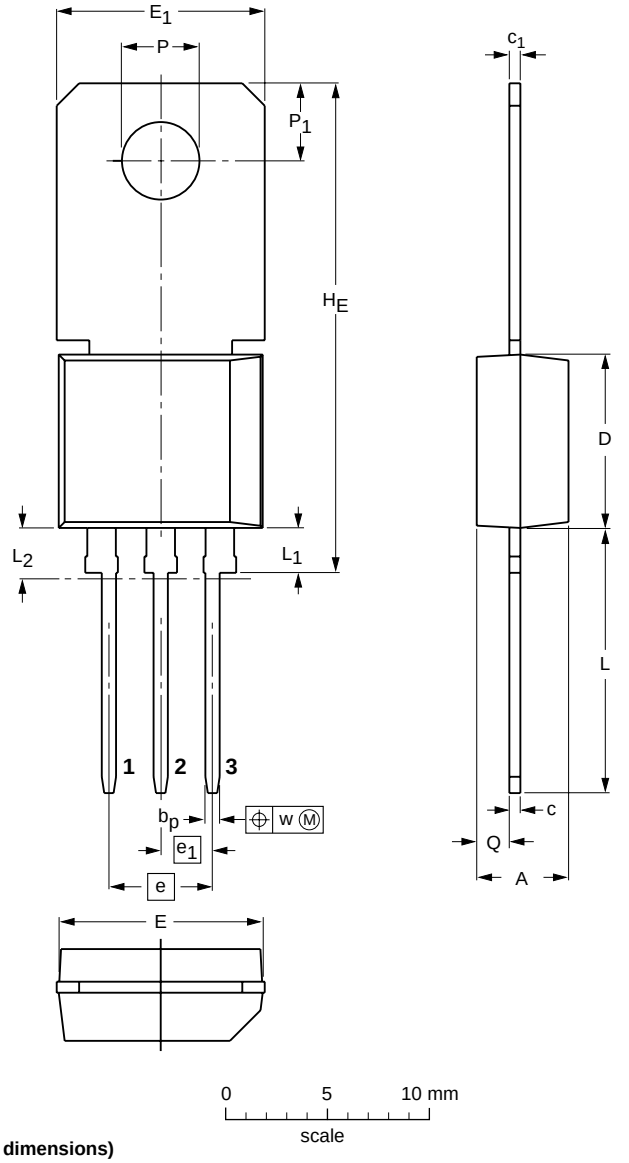
## CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| $I_{CBO}$ | collector cut-off current | $I_E = 0$; $V_{CB} = 250$ V | – | 50 | nA |
| | | $I_E = 0$; $V_{CB} = 250$ V; $T_j = 150$ °C | – | 5 | µA |
| $I_{EBO}$ | emitter cut-off current | $I_C = 0$; $V_{EB} = 5$ V | – | 100 | nA |
| $h_{FE}$ | DC current gain | $I_C = 20$ mA; $V_{CE} = 10$ V | 45 | – | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 200$ mA; $I_B = 20$ mA | – | 11 | V |
| $C_c$ | collector capacitance | $I_E = i_e = 0$; $V_{CB} = 30$ V; f = 1 MHz | – | 4.5 | pF |
| $C_{re}$ | feedback capacitance | $I_C = i_c = 0$; $V_{CB} = 30$ V; f = 1 MHz | – | 3.5 | pF |
| $f_T$ | transition frequency | $I_C = 15$ mA; $V_{CE} = 10$ V; f = 100 MHz | 90 | – | MHz |

## PACKAGE OUTLINE

**Plastic single-ended leaded (through hole) package; with cooling fin, mountable to heatsink, 1 mounting hole; 3 leads (in-line)** **SOT128B**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $b_p$ | c | $c_1$ | D | E | $E_1$ | e | $e_1$ | $H_E$ | L | $L_1$ | $L_2^{(1)}$ max | P | $P_1$ | Q | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 4.6<br>4.4 | 0.8<br>0.6 | 0.65<br>0.5 | 0.56<br>0.46 | 8.6<br>8.4 | 10.1<br>9.9 | 10.4<br>10.0 | 5.08 | 2.54 | 24.2<br>23.8 | 13.3<br>12.2 | 2.4<br>2.0 | 2.5 | 3.8<br>3.6 | 3.9<br>3.7 | 1.7<br>1.5 | 0.25 |

**Note**

1. Plastic flash allowed within this zone

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT128B | | TO-202 | | | | 97-02-28 |

## 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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**NOTES**

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