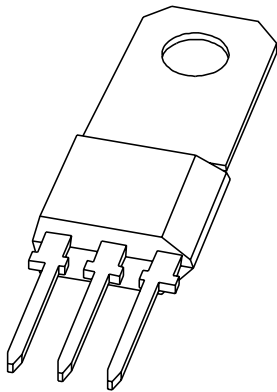


DATA SHEET



BF591; BF593 NPN high-voltage transistors

Product specification
Supersedes data of September 1994
File under Discrete Semiconductors, SC04

1997 Jul 02

NPN high-voltage transistors

BF591; BF593

FEATURES

- Low current (max. 150 mA)
- High voltage (max. 210 V).

APPLICATIONS

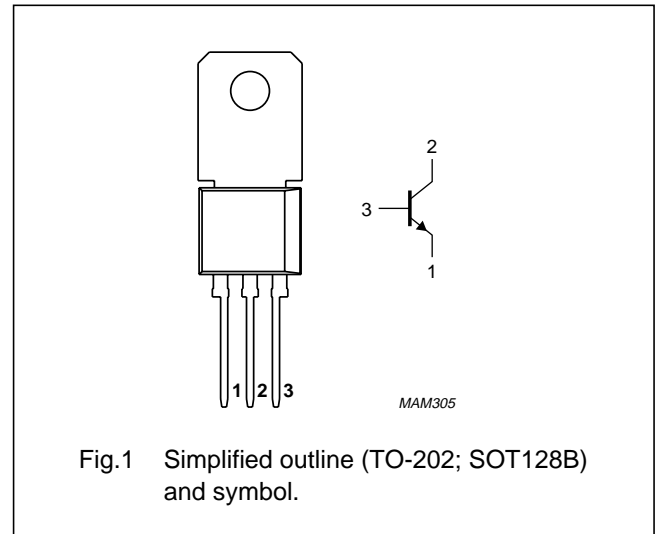
- Telephone systems.

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 |



QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|---------------------------|--|------|------|------|
| V _{CBO} | collector-base voltage | open emitter | | | |
| | BF591 | | – | 210 | V |
| | BF593 | | – | 250 | V |
| V _{CEO} | collector-emitter voltage | open base | | | |
| | BF591 | | – | 170 | V |
| | BF593 | | – | 210 | V |
| I _{CM} | peak collector current | | – | 300 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 55 °C | – | 1.3 | W |
| h _{FE} | DC current gain | I _C = 20 mA; V _{CE} = 5 V | 30 | – | |
| | | I _C = 100 mA; V _{CE} = 6 V | 30 | – | |

NPN high-voltage transistors

BF591; BF593

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 | | | |
| | BF591 | | – | 210 | V |
| | BF593 | | – | 250 | V |
| V _{CEO} | collector-emitter voltage | open base | | | |
| | BF591 | | – | 170 | V |
| | BF593 | | – | 210 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 5 | V |
| I _C | collector current (DC) | | – | 150 | mA |
| I _{CM} | peak collector current | | – | 300 | mA |
| I _{BM} | peak base current | | – | 100 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 55 °C | – | 1.3 | 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-a} | thermal resistance from junction to ambient | in free air | 73 | K/W |

CHARACTERISTICST_j = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|---------------------------|---|------|------|------|
| I _{CBO} | collector cut-off current | I _E = 0; V _{CB} = 60 V | – | 50 | nA |
| | | I _E = 0; V _{CB} = 60 V; T _j = 140 °C | – | 1 | μA |
| I _{EBO} | emitter cut-off current | I _C = 0; V _{EB} = 5 V | – | 100 | nA |
| h _{FE} | DC current gain | note 1 | | | |
| | | I _C = 20 mA; V _{CE} = 5 V | 30 | – | |
| | | I _C = 100 mA; V _{CE} = 6 V | 30 | – | |
| | | I _C = 150 mA; V _{CE} = 7 V | 20 | – | |

Note

1. Pulse test: t_p ≤ 300 μs; δ ≤ 0.01.

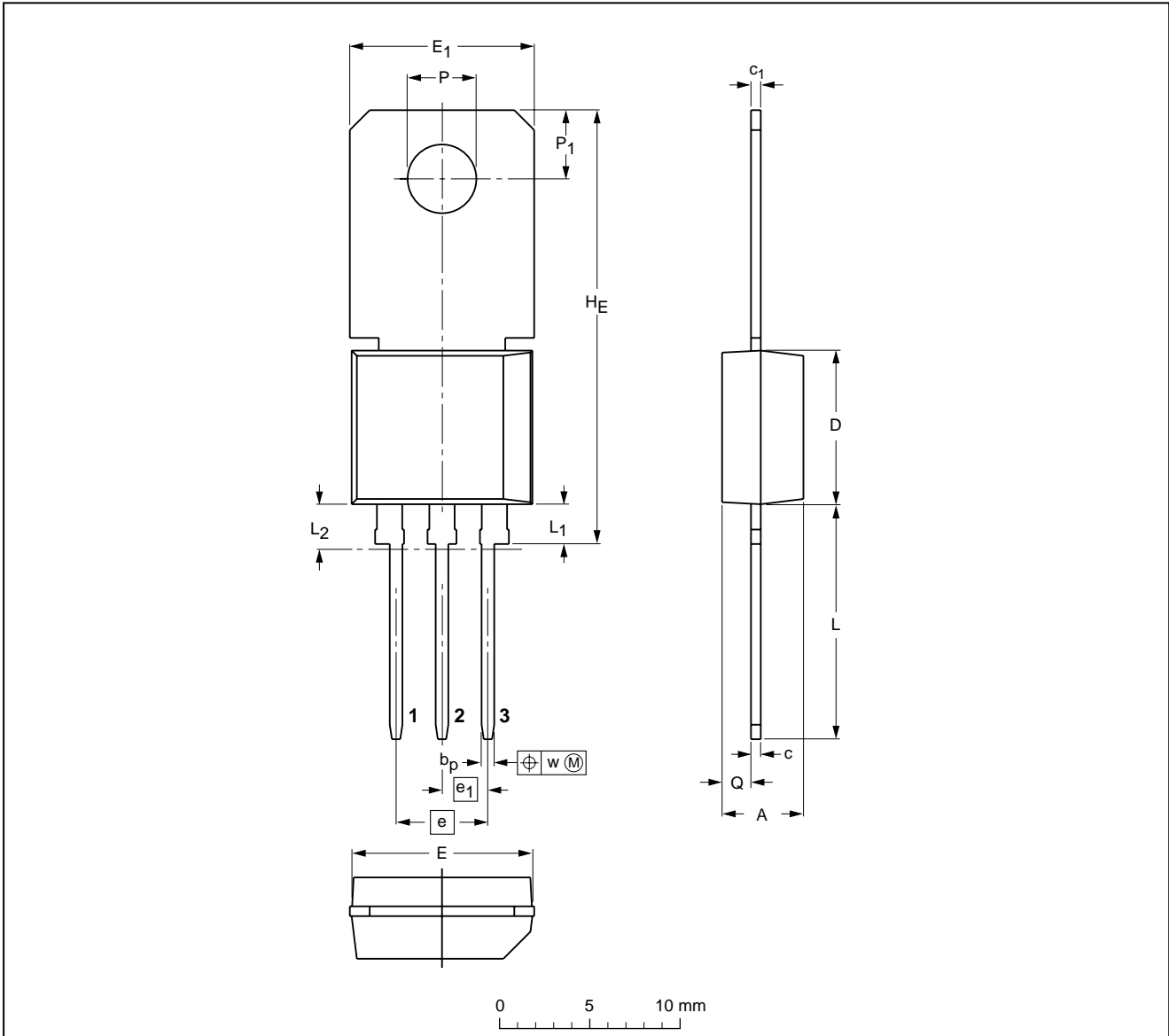
NPN high-voltage transistors

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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 4.4 | 0.8 0.6 | 0.65 0.5 | 0.56 0.46 | 8.6 8.4 | 10.1 9.9 | 10.4 10.0 | 5.08 | 2.54 | 24.2 23.8 | 13.3 12.2 | 2.4 2.0 | 2.5 | 3.8 3.6 | 3.9 3.7 | 1.7 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 |

NPN high-voltage transistors

BF591; BF593

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. | |

LIFE SUPPORT APPLICATIONS

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NPN high-voltage transistors

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NOTES

NPN high-voltage transistors

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NOTES

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