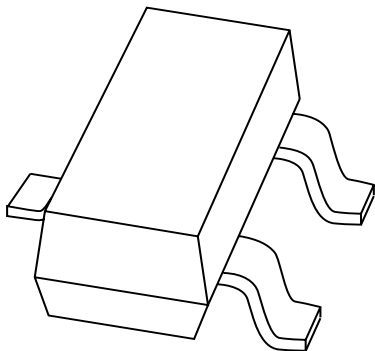


# DATA SHEET



## **BF820; BF822** NPN high-voltage transistors

Product data sheet  
Supersedes data of 1999 Apr 15

2004 Jan 16

## NPN high-voltage transistors

## BF820; BF822

## FEATURES

- Low current (max. 50 mA)
- High voltage (max. 300 V).

## APPLICATIONS

- Telephony and professional communication equipment.

## DESCRIPTION

NPN high-voltage transistor in a SOT23 plastic package.  
PNP complements: BF821; BF823.

## MARKING

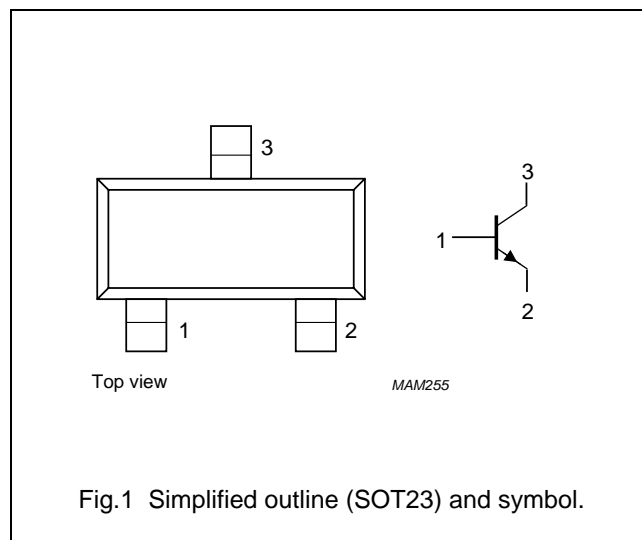
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BF820       | 1V*                         |
| BF822       | 1X*                         |

## Note

1. \* = p : Made in Hong Kong.  
 \* = t : Made in Malaysia.  
 \* = W : Made in China.

## PINNING

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



## ORDERING INFORMATION

| TYPENUMBER | PACKAGE |  |         |
|------------|---------|--|---------|
|            | NAME    | DESCRIPTION                              | VERSION |
| BF820      | —       | plastic surface mounted package; 3 leads | SOT23   |
| BF822      | —       | plastic surface mounted package; 3 leads | SOT23   |

## NPN high-voltage transistors

## BF820; BF822

## 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                         |      |      |      |
|           | BF820                         |                                      | –    | 300  | V    |
|           | BF822                         |                                      | –    | 250  | V    |
| $V_{CEO}$ | collector-emitter voltage     | open base                            |      |      |      |
|           | BF820                         |                                      | –    | 300  | V    |
|           | BF822                         |                                      | –    | 250  | V    |
| $V_{EBO}$ | emitter-base voltage          | open collector                       | –    | 5    | V    |
| $I_C$     | collector current (DC)        |                                      | –    | 50   | mA   |
| $I_{CM}$  | peak collector current        |                                      | –    | 100  | mA   |
| $I_{BM}$  | peak base current             |                                      | –    | 50   | mA   |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25\text{ °C}$ ; note 1 | –    | 250  | mW   |
| $T_{stg}$ | storage temperature           |                                      | –65  | +150 | °C   |
| $T_j$     | junction temperature          |                                      | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature |                                      | –65  | +150 | °C   |

## Note

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

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | note 1     | 500   | 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-base cut-off current       | $I_E = 0$ ; $V_{CB} = 200\text{ V}$                                  | –    | 10   | nA   |
|             |                                      | $I_E = 0$ ; $V_{CB} = 200\text{ V}$ ; $T_j = 150\text{ °C}$          | –    | 10   | μA   |
| $I_{EBO}$   | emitter-base cut-off current         | $I_C = 0$ ; $V_{EB} = 5\text{ V}$                                    | –    | 50   | nA   |
| $h_{FE}$    | DC current gain                      | $I_C = 25\text{ mA}$ ; $V_{CE} = 20\text{ V}$                        | 50   | –    |      |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 30\text{ mA}$ ; $I_B = 5\text{ mA}$                           | –    | 600  | mV   |
| $C_{re}$    | feedback capacitance                 | $I_C = I_c = 0$ ; $V_{CB} = 30\text{ V}$ ; $f = 1\text{ MHz}$        | –    | 1.6  | pF   |
| $f_T$       | transition frequency                 | $I_C = 10\text{ mA}$ ; $V_{CE} = 10\text{ V}$ ; $f = 100\text{ MHz}$ | 60   | –    | MHz  |

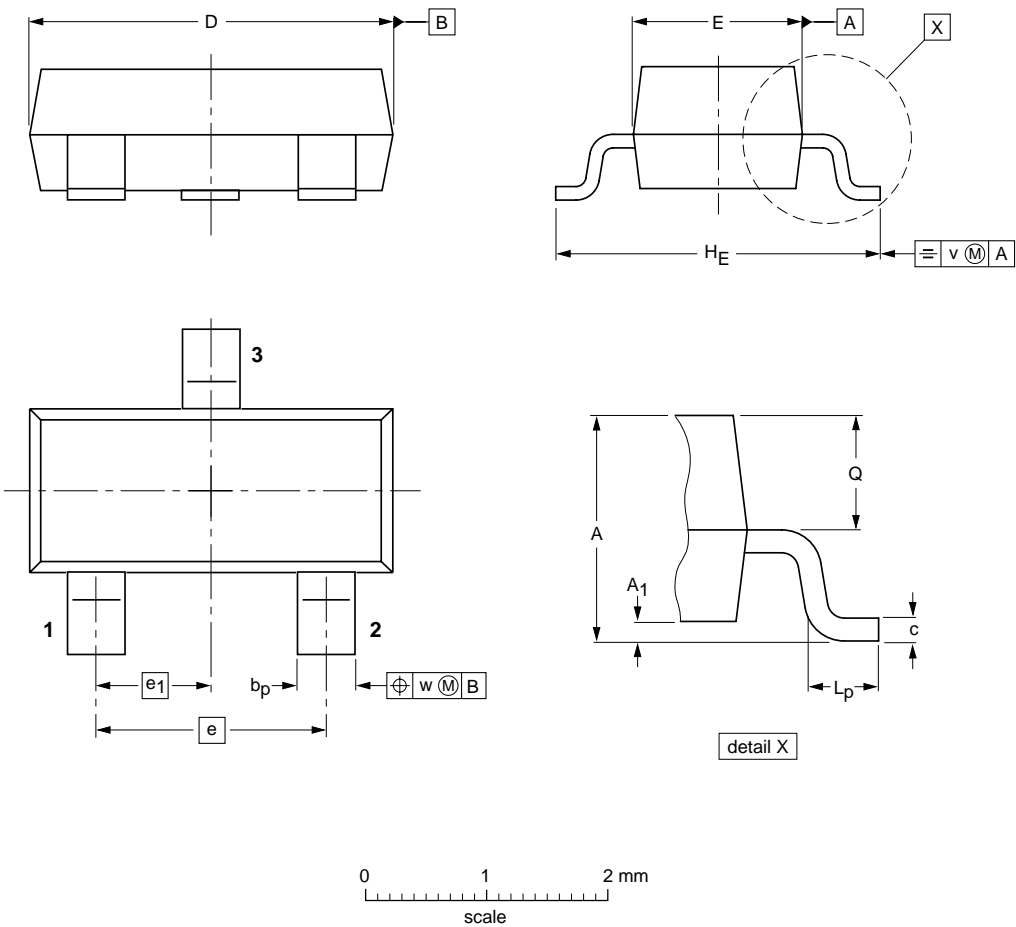
NPN high-voltage transistors

BF820; BF822

PACKAGE OUTLINE


Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub><br>max. | b <sub>p</sub> | c            | D          | E          | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | Q            | v   | w   |
|------|------------|------------------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm   | 1.1<br>0.9 | 0.1                    | 0.48<br>0.38   | 0.15<br>0.09 | 3.0<br>2.8 | 1.4<br>1.2 | 1.9 | 0.95           | 2.5<br>2.1     | 0.45<br>0.15   | 0.55<br>0.45 | 0.2 | 0.1 |

| OUTLINE<br>VERSION | REFERENCES |          |       |  | EUROPEAN<br>PROJECTION  | ISSUE DATE           |
|--------------------|------------|----------|-------|--|---|----------------------|
|                    | IEC        | JEDEC    | JEITA |  |   |                      |
| SOT23              |            | TO-236AB |       |  |  | 04-11-04<br>06-03-16 |

## NPN high-voltage transistors

BF820; BF822

## DATA SHEET STATUS

| DOCUMENT STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITION  |
|--------------------------------|-------------------------------|---|
| Objective data sheet           | Development                   | This document contains data from the objective specification for product development. |
| Preliminary data sheet         | Qualification                 | This document contains data from the preliminary specification.                       |
| Product data sheet             | Production                    | This document contains the product specification.                                     |

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## **Contact information**

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