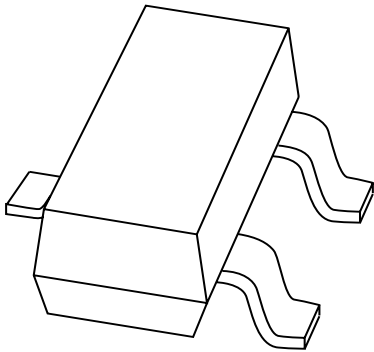


# DATA SHEET



## **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

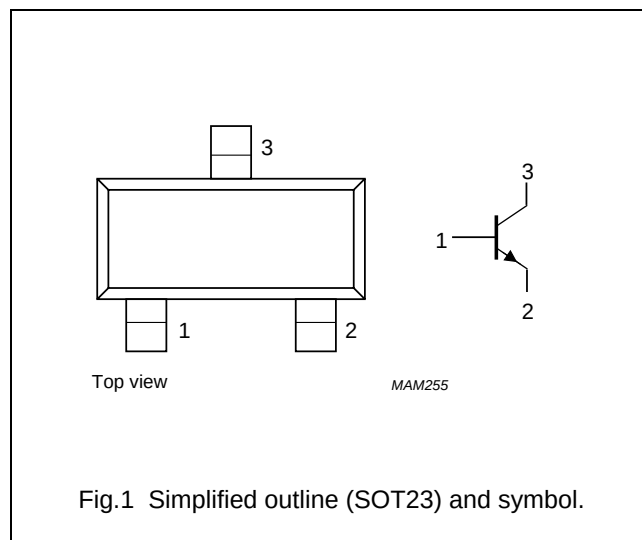
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BF820       | 1V*                         |
| BF822       | 1X*                         |

## 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 <sub>CBO</sub> | collector-base voltage        | open emitter                     |      |      |      |
|                  | BF820                         |                                  | –    | 300  | V    |
|                  | BF822                         |                                  | –    | 250  | V    |
| V <sub>CEO</sub> | collector-emitter voltage     | open base                        |      |      |      |
|                  | BF820                         |                                  | –    | 300  | V    |
|                  | BF822                         |                                  | –    | 250  | V    |
| V <sub>EBO</sub> | emitter-base voltage          | open collector                   | –    | 5    | V    |
| I <sub>C</sub>   | collector current (DC)        |                                  | –    | 50   | mA   |
| I <sub>CM</sub>  | peak collector current        |                                  | –    | 100  | mA   |
| I <sub>BM</sub>  | peak base current             |                                  | –    | 50   | mA   |
| P <sub>tot</sub> | total power dissipation       | T <sub>amb</sub> ≤ 25 °C; note 1 | –    | 250  | mW   |
| T <sub>stg</sub> | storage temperature           |                                  | –65  | +150 | °C   |
| T <sub>j</sub>   | junction temperature          |                                  | –    | 150  | °C   |
| T <sub>amb</sub> | operating ambient temperature |                                  | –65  | +150 | °C   |

## Note

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

## THERMAL CHARACTERISTICS

| SYMBOL               | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|----------------------|---------------------------------------------|------------|-------|------|
| R <sub>th(j-a)</sub> | thermal resistance from junction to ambient | note 1     | 500   | K/W  |

## Note

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

## CHARACTERISTICS

T<sub>j</sub> = 25 °C unless otherwise specified.

| SYMBOL             | PARAMETER                            | CONDITIONS                                                             | MIN. | MAX. | UNIT |
|--------------------|--------------------------------------|------------------------------------------------------------------------|------|------|------|
| I <sub>CBO</sub>   | collector-base cut-off current       | I <sub>E</sub> = 0; V <sub>CB</sub> = 200 V                            | –    | 10   | nA   |
|                    |                                      | I <sub>E</sub> = 0; V <sub>CB</sub> = 200 V; T <sub>j</sub> = 150 °C   | –    | 10   | μA   |
| I <sub>EBO</sub>   | emitter-base cut-off current         | I <sub>C</sub> = 0; V <sub>EB</sub> = 5 V                              | –    | 50   | nA   |
| h <sub>FE</sub>    | DC current gain                      | I <sub>C</sub> = 25 mA; V <sub>CE</sub> = 20 V                         | 50   | –    |      |
| V <sub>CEsat</sub> | collector-emitter saturation voltage | I <sub>C</sub> = 30 mA; I <sub>B</sub> = 5 mA                          | –    | 600  | mV   |
| C <sub>re</sub>    | feedback capacitance                 | I <sub>C</sub> = I <sub>c</sub> = 0; V <sub>CB</sub> = 30 V; f = 1 MHz | –    | 1.6  | pF   |
| f <sub>T</sub>     | transition frequency                 | I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 10 V; f = 100 MHz            | 60   | –    | MHz  |

NPN high-voltage transistors

BF820; BF822

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23

0 1 2 mm  
scale

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.                                     |

## Notes

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## **Customer notification**

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## **Contact information**

For additional information please visit: <http://www.nxp.com>

For sales offices addresses send e-mail to: [salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)

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