

## Important notice

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Should be replaced with:

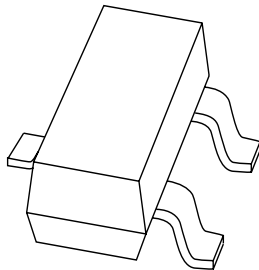
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If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via [salesaddresses@nexperia.com](mailto:salesaddresses@nexperia.com)). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

# DATA SHEET



**BFS20**

**NPN medium frequency transistor**

Product data sheet  
Supersedes data of 2004 Jan 5

2004 Feb 05

# NPN medium frequency transistor

# BFS20

### FEATURES

- $I_{C(max)} = 25 \text{ mA}$
- $V_{CEO(max)} = 20 \text{ V}$
- Very low feedback capacitance (typ. 350 fF).

### APPLICATIONS

- IF and VHF thick and thin-film circuit applications.

### DESCRIPTION

NPN medium frequency transistor in a SOT23 plastic package.

### MARKING

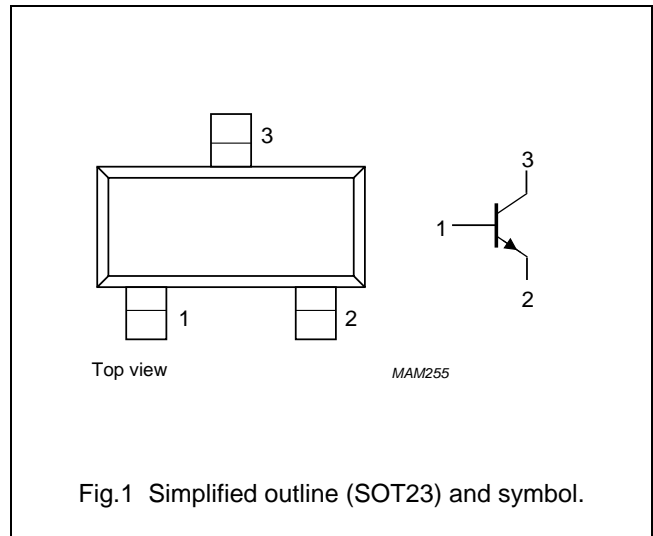
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BFS20       | G1*                         |

### Note

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

### PINNING

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



### ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |  |         |
|-------------|---------|--|---------|
|             | NAME    | DESCRIPTION                              | VERSION |
| BFS20       | -       | plastic surface mounted package; 3 leads | SOT23   |

### 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                                      | -    | 30   | V                |
| $V_{CEO}$ | collector-emitter voltage     | open base   | -    | 20   | V                |
| $V_{EBO}$ | emitter-base voltage          | open collector                                    | -    | 4    | V                |
| $I_C$     | collector current (DC)        |   | -    | 25   | mA               |
| $I_{CM}$  | peak collector current        |   | -    | 25   | mA               |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ ; note 1 | -    | 250  | mW               |
| $T_{stg}$ | storage temperature           |   | -65  | +150 | $^\circ\text{C}$ |
| $T_j$     | junction temperature          |   | -    | 150  | $^\circ\text{C}$ |
| $T_{amb}$ | operating ambient temperature |   | -65  | +150 | $^\circ\text{C}$ |

### Note

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

## NPN medium frequency transistor

BFS20

## 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. | TYP. | MAX. | UNIT          |
|-----------|--------------------------------|---|------|------|------|---------------|
| $I_{CB0}$ | collector-base cut-off current | $I_E = 0; V_{CB} = 20\text{ V}$                               | –    | –    | 100  | nA            |
|           |                                | $I_E = 0; V_{CB} = 20\text{ V}; T_j = 100\text{ °C}$          | –    | –    | 10   | $\mu\text{A}$ |
| $I_{EBO}$ | emitter-base cut-off current   | $I_C = 0; V_{EB} = 4\text{ V}$                                | –    | –    | 100  | nA            |
| $h_{FE}$  | DC current gain                | $I_C = 7\text{ mA}; V_{CE} = 10\text{ V}$                     | 40   | 85   | –    |               |
| $V_{BE}$  | base-emitter voltage           | $I_C = 7\text{ mA}; V_{CE} = 10\text{ V}$                     | –    | 740  | 900  | mV            |
| $C_c$     | collector capacitance          | $I_E = I_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$       | –    | 1    | –    | pF            |
| $C_{re}$  | feedback capacitance           | $I_C = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$             | –    | 350  | –    | fF            |
| $f_T$     | transition frequency           | $I_C = 5\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$ | 275  | 450  | –    | MHz           |

NPN medium frequency transistor

BFS20

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



NPN medium frequency transistor

BFS20

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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2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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# ***NXP Semiconductors***

## **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

## **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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