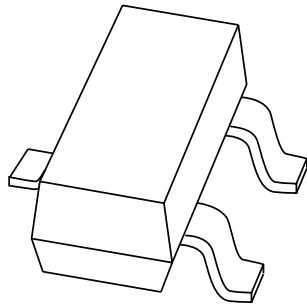


# DATA SHEET



## **BSR18A** PNP switching transistor

Product specification  
Supersedes data of 1997 May 28

2004 Mar 24

# PNP switching transistor

# BSR18A

### FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 40 V).

### APPLICATIONS

- High-speed saturated switching.

### DESCRIPTION

PNP switching transistor in a SOT23 plastic package.  
NPN complement: BSR17A.

### MARKING

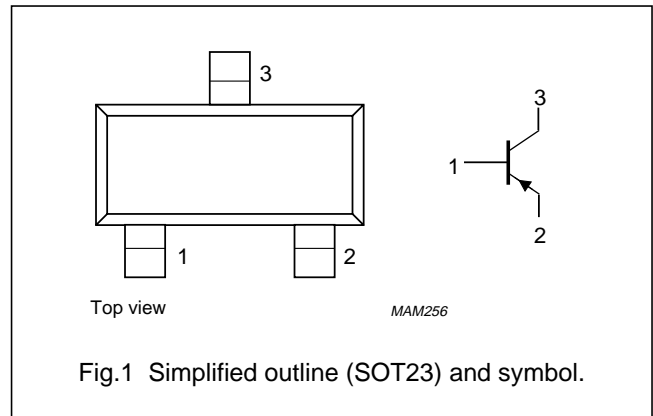
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BSR18A      | 55* or T92                  |

### 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 |
| BSR18A      | –       | plastic surface mounted package; 3 leads | SOT23   |

### QUICK REFERENCE DATA

| SYMBOL    | PARAMETER                 | CONDITIONS  | MIN. | MAX. | UNIT |
|-----------|---------------------------|---|------|------|------|
| $V_{CBO}$ | collector-base voltage    | open emitter  | –    | –40  | V    |
| $V_{CEO}$ | collector-emitter voltage | open base   | –    | –40  | V    |
| $I_C$     | collector current (DC)    |   | –    | –100 | mA   |
| $P_{tot}$ | total power dissipation   | $T_{amb} \leq 25\text{ }^\circ\text{C}$                                   | –    | 250  | mW   |
| $h_{FE}$  | DC current gain           | $I_C = -10\text{ mA}; V_{CE} = -1\text{ V}$                               | 100  | 300  |      |
| $f_T$     | transition frequency      | $I_C = -10\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}$          | 250  | –    | MHz  |
| $t_{off}$ | turn-off time             | $I_{Con} = -10\text{ mA}; I_{Bon} = -1\text{ mA}; I_{Boff} = 1\text{ mA}$ | –    | 300  | ns   |

## PNP switching transistor

## BSR18A

**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             | –    | –40  | V    |
| V <sub>CEO</sub> | collector-emitter voltage     | open base                | –    | –40  | V    |
| V <sub>EBO</sub> | emitter-base voltage          | open collector           | –    | –6   | V    |
| I <sub>C</sub>   | collector current (DC)        |                          | –    | –100 | mA   |
| I <sub>CM</sub>  | peak collector current        |                          | –    | –200 | mA   |
| I <sub>BM</sub>  | peak base current             |                          | –    | –100 | mA   |
| P <sub>tot</sub> | total power dissipation       | T <sub>amb</sub> ≤ 25 °C | –    | 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   |

**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.

## PNP switching transistor

## BSR18A

## CHARACTERISTICS

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

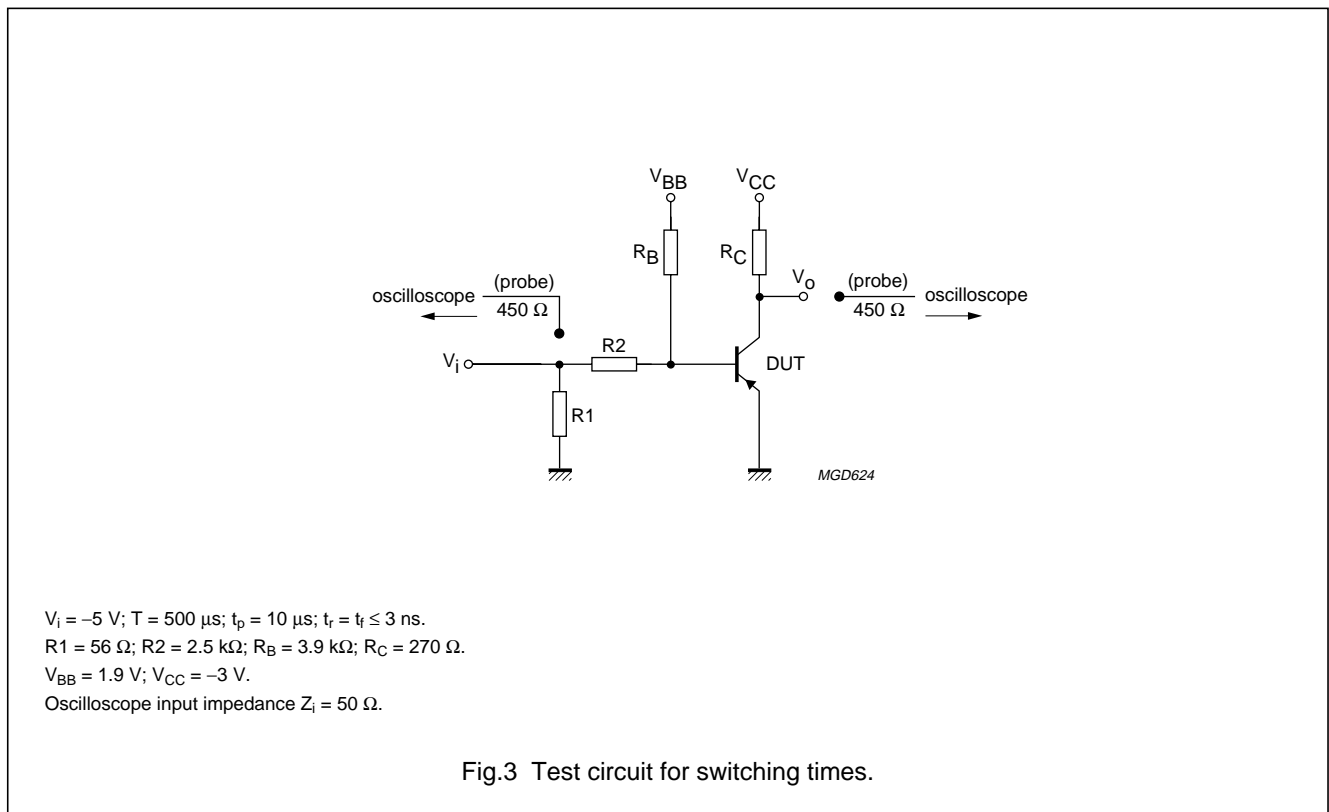
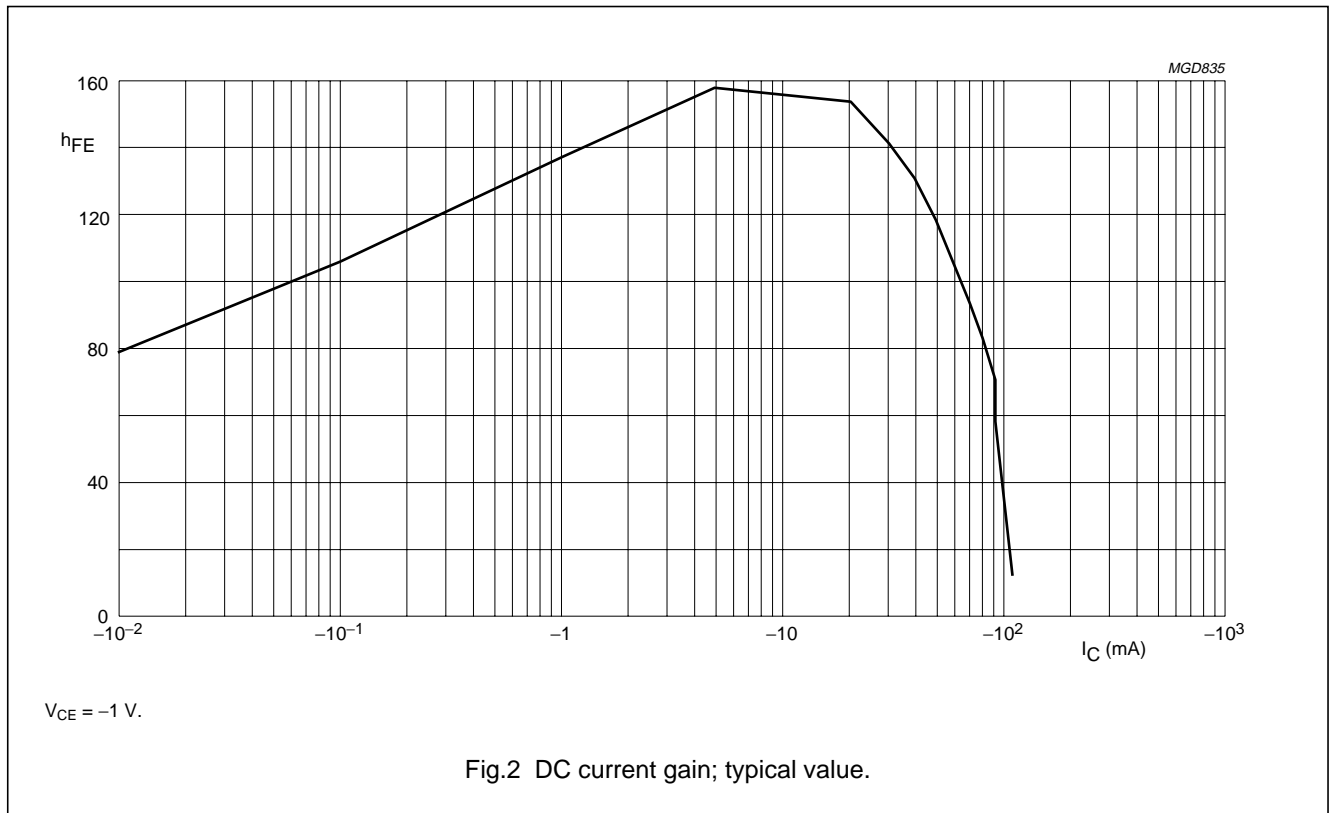
| SYMBOL   | PARAMETER                            | CONDITIONS   | MIN.                        | MAX.                    | UNIT |
|--|--------------------------------------|--|-----------------------------|-------------------------|------|
| $I_{CBO}$  | collector cut-off current            | $I_E = 0\text{ A}; V_{CB} = -30\text{ V}$  | –                           | –50                     | nA   |
| $I_{EBO}$  | emitter cut-off current              | $I_C = 0\text{ A}; V_{EB} = -6\text{ V}$   | –                           | –50                     | nA   |
| $h_{FE}$   | DC current gain                      | $V_{CE} = -1\text{ V}$ ; note 1; see Fig.2<br>$I_C = -0.1\text{ mA}$<br>$I_C = -1\text{ mA}$<br>$I_C = -10\text{ mA}$<br>$I_C = -50\text{ mA}$<br>$I_C = -100\text{ mA}$ | 60<br>80<br>100<br>60<br>30 | –<br>–<br>300<br>–<br>– |      |
| $V_{CEsat}$  | collector-emitter saturation voltage | $I_C = -10\text{ mA}; I_B = -1\text{ mA}$ ; note 1   | –                           | –200                    | mV   |
|  |                                      | $I_C = -50\text{ mA}; I_B = -5\text{ mA}$ ; note 1   | –                           | –200                    | mV   |
| $V_{BEsat}$  | base-emitter saturation voltage      | $I_C = -10\text{ mA}; I_B = -1\text{ mA}$ ; note 1   | –650                        | –850                    | mV   |
|  |                                      | $I_C = -50\text{ mA}; I_B = -5\text{ mA}$ ; note 1   | –                           | –950                    | mV   |
| $C_c$  | collector capacitance                | $I_E = i_e = 0\text{ A}; V_{CB} = -5\text{ V}; f = 1\text{ MHz}$   | –                           | 4.5                     | pF   |
| $C_e$  | emitter capacitance                  | $I_C = i_c = 0\text{ A}; V_{EB} = -500\text{ mV}; f = 1\text{ MHz}$  | –                           | 10                      | pF   |
| $f_T$  | transition frequency                 | $I_C = -10\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}$   | 250                         | –                       | MHz  |
| F  | noise figure                         | $I_C = -100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 1\text{ k}\Omega$ ;<br>$f = 10\text{ Hz to }15.7\text{ kHz}$   | –                           | 4                       | dB   |
| <b>Switching times (between 10% and 90% levels); see Fig.3</b> |                                      |  |                             |                         |      |
| $t_{on}$   | turn-on time                         | $I_{Con} = -10\text{ mA}; I_{Bon} = -1\text{ mA}; I_{Boff} = 1\text{ mA}$  | –                           | 65                      | ns   |
| $t_d$  | delay time                           |  | –                           | 35                      | ns   |
| $t_r$  | rise time                            |  | –                           | 35                      | ns   |
| $t_{off}$  | turn-off time                        |  | –                           | 300                     | ns   |
| $t_s$  | storage time                         |  | –                           | 225                     | ns   |
| $t_f$  | fall time                            |  | –                           | 75                      | ns   |

## Note

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.01$ .

PNP switching transistor

BSR18A



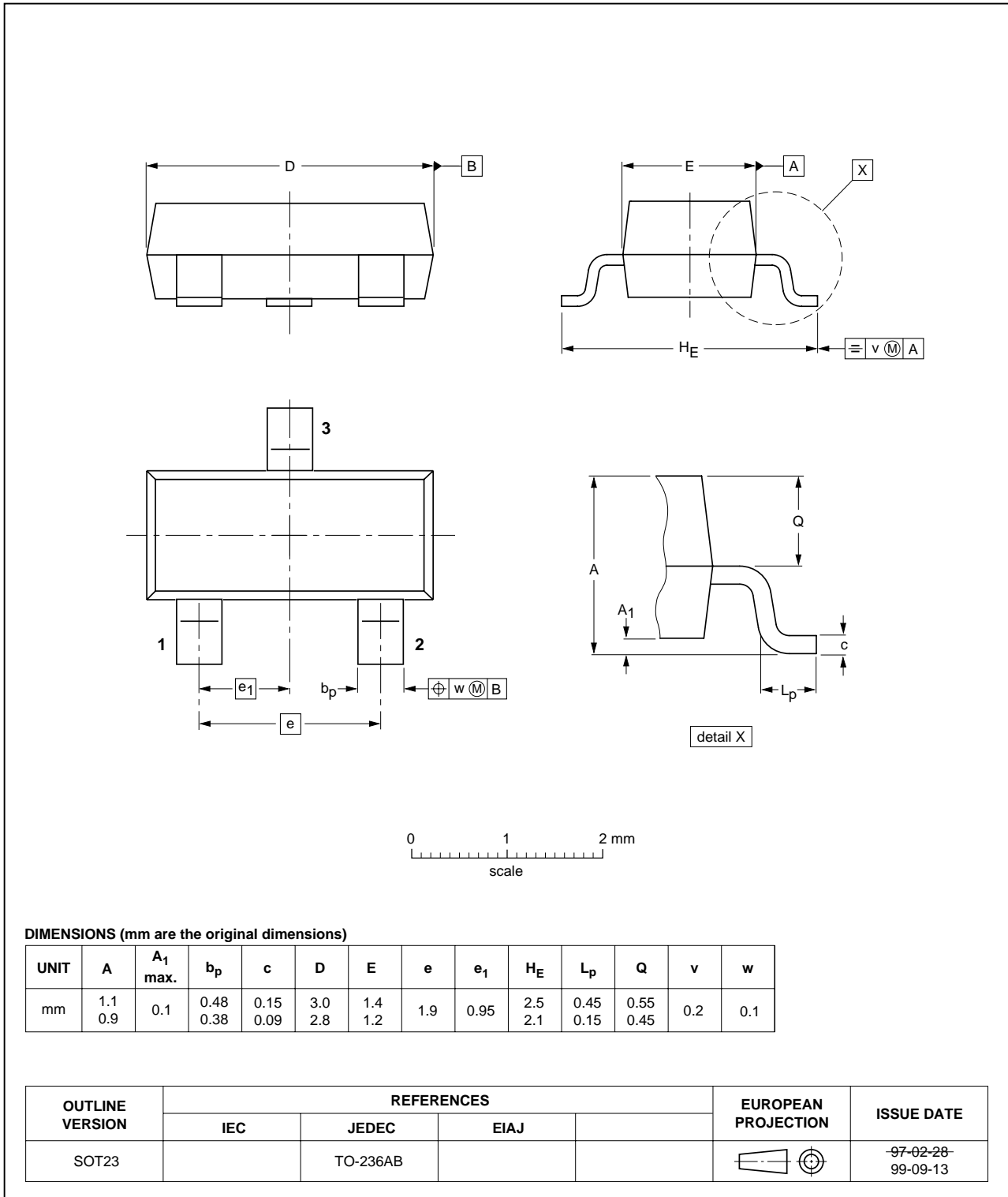
PNP switching transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



## PNP switching transistor

BSR18A

## DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)(3)</sup> | DEFINITION   |
|-------|----------------------------------|----------------------------------|--|
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Printed in The Netherlands

R75/03/pp8

Date of release: 2004 Mar 24

Document order number: 9397 750 12912

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