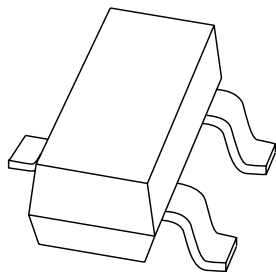


# DATA SHEET



## **BCW69; BCW70** PNP general purpose transistors

Product data sheet  
Supersedes data of 1999 Apr 19

2004 Feb 06

# PNP general purpose transistors

# BCW69; BCW70

### FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 45 V).

### APPLICATIONS

- General purpose switching and amplification.

### DESCRIPTION

PNP transistor in a SOT23 plastic package.  
NPN complements: BCW71 and BCW72.

### MARKING

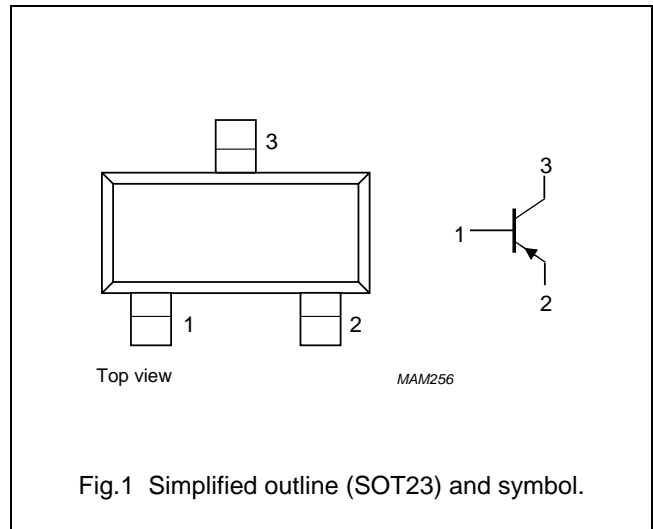
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BCW69       | H1*                         |
| BCW70       | H2*                         |

### 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 |
| BCW69       | –       | plastic surface mounted package; 3 leads | SOT23   |
| BCW70       |         |                                          |         |

### 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             | –    | –50  | V    |
| $V_{CEO}$ | collector-emitter voltage     | open base; $I_C = -2$ mA | –    | –45  | V    |
| $V_{EBO}$ | emitter-base voltage          | open collector           | –    | –5   | V    |
| $I_C$     | collector current (DC)        |                          | –    | –100 | mA   |
| $I_{CM}$  | peak collector current        |                          | –    | –200 | mA   |
| $I_{BM}$  | peak base current             |                          | –    | –200 | mA   |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25$ °C     | –    | 250  | mW   |
| $T_{stg}$ | storage temperature           |                          | –65  | +150 | °C   |
| $T_j$     | junction temperature          |                          | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature |                          | –65  | +150 | °C   |

## PNP general purpose transistors

## BCW69; BCW70

## 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          |
|-------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------|------|------|---------------|
| $I_{CBO}$   | collector cut-off current            | $I_E = 0; V_{CB} = -20\text{ V}$                                                                                        | –    | –    | –100 | nA            |
|             |                                      | $I_C = 0; V_{CB} = -20\text{ V}; T_j = 100\text{ °C}$                                                                   | –    | –    | –10  | $\mu\text{A}$ |
| $I_{EBO}$   | emitter cut-off current              | $I_C = 0; V_{EB} = -5\text{ V}$                                                                                         | –    | –    | –100 | nA            |
| $h_{FE}$    | DC current gain<br>BCW69<br>BCW70    | $I_C = -10\text{ }\mu\text{A}; V_{CE} = -5\text{ V}$                                                                    | –    | 90   | –    |               |
|             |                                      |                                                                                                                         | –    | 150  | –    |               |
|             | DC current gain<br>BCW69<br>BCW70    | $I_C = -2\text{ mA}; V_{CE} = -5\text{ V}$                                                                              | 120  | –    | 260  |               |
|             |                                      |                                                                                                                         | 215  | –    | 500  |               |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$                                                                             | –    | –80  | –300 | mV            |
|             |                                      | $I_C = -50\text{ mA}; I_B = -2.5\text{ mA}; \text{note 1}$                                                              | –    | –150 | –    | mV            |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$                                                                             | –    | –720 | –    | mV            |
|             |                                      | $I_C = -50\text{ mA}; I_B = -2.5\text{ mA}; \text{note 1}$                                                              | –    | –810 | –    | mV            |
| $V_{BE}$    | base-emitter voltage                 | $I_C = -2\text{ mA}; V_{CE} = -5\text{ V}$                                                                              | –600 | –    | –750 | mV            |
| $C_c$       | collector capacitance                | $I_E = I_e = 0; V_{CB} = -10\text{ V};$<br>$f = 1\text{ MHz}$                                                           | –    | 4.5  | –    | pF            |
| $f_T$       | transition frequency                 | $I_C = -10\text{ mA}; V_{CE} = -5\text{ V};$<br>$f = 100\text{ MHz}$                                                    | 100  | –    | –    | MHz           |
| F           | noise figure                         | $I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V};$<br>$R_S = 2\text{ k}\Omega; f = 1\text{ kHz}; B = 200\text{ Hz}$ | –    | –    | 10   | dB            |

## Note

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

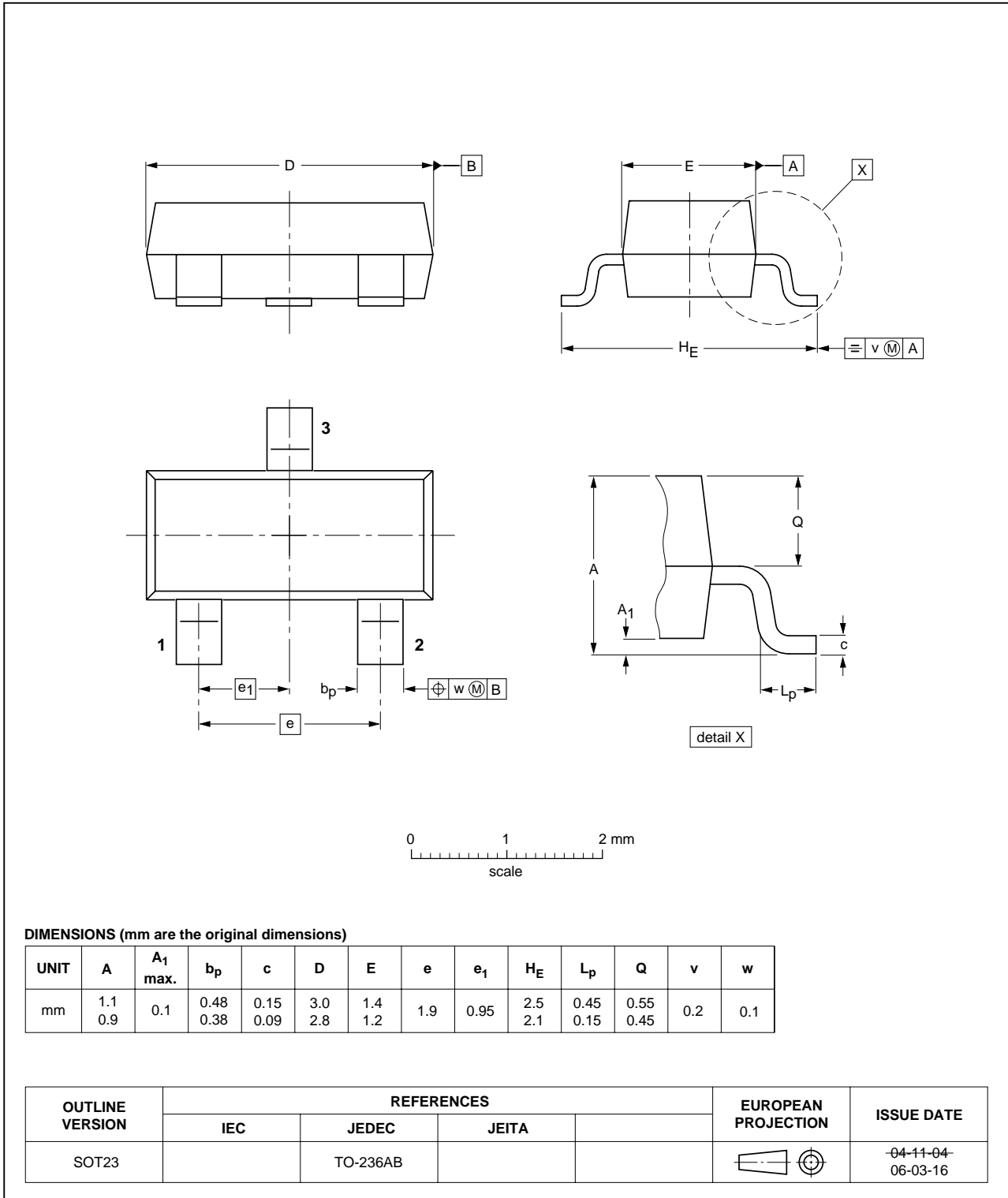
PNP general purpose transistors

BCW69; BCW70

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



## PNP general purpose transistors

## BCW69; BCW70

## 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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