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Should be replaced with:

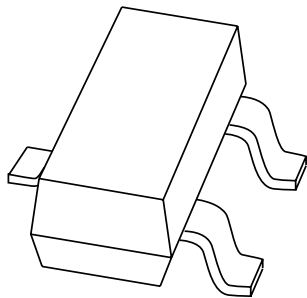
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If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via **[salesaddresses@nexperia.com](mailto:salesaddresses@nexperia.com)**). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

# DATA SHEET



## **BCW71; BCW72** NPN general purpose transistors

Product data sheet  
Supersedes data of 1997 Mar 06

1999 Apr 19

## NPN general purpose transistors

## BCW71; BCW72

## FEATURES

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

## APPLICATIONS

- General purpose switching and amplification.

## DESCRIPTION

NPN transistor in a SOT23 plastic package.  
PNP complements: BCW69 and BCW70.

## MARKING

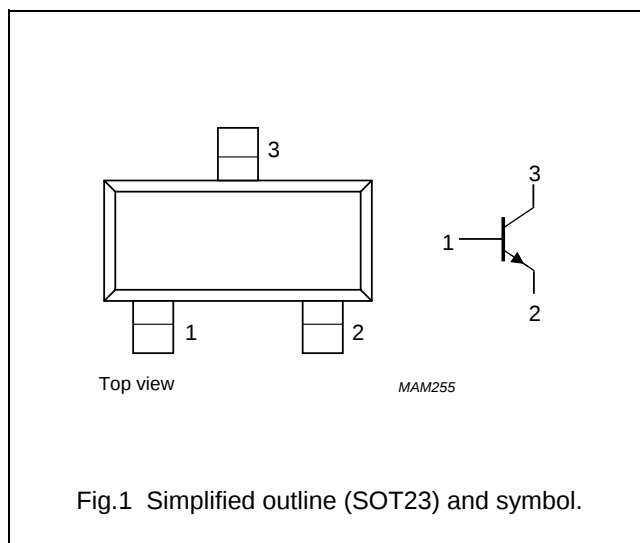
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BCW71       | K1*                         |
| BCW72       | K2*                         |

## Note

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

## PINNING

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



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL    | PARAMETER                     | CONDITIONS                      | MIN. | MAX. | UNIT |
|-----------|-------------------------------|---------------------------------|------|------|------|
| $V_{CBO}$ | collector-base voltage        | open emitter                    | –    | 50   | V    |
| $V_{CEO}$ | collector-emitter voltage     | open base; $I_C = 2 \text{ mA}$ | –    | 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       | $T_{amb} \leq 25 \text{ °C}$    | –    | 250  | mW   |
| $T_{stg}$ | storage temperature           |                                 | –65  | +150 | °C   |
| $T_j$     | junction temperature          |                                 | –    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature |                                 | –65  | +150 | °C   |

## NPN general purpose transistors

## BCW71; BCW72

## 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            |
|             |                                      | $I_E = 0; V_{CB} = 20\text{ V}; T_j = 100\text{ °C}$                                                             | –          | –    | 10   | $\mu\text{A}$ |
| $I_{EBO}$   | emitter cut-off current              | $I_C = 0; V_{EB} = 5\text{ V}$                                                                                   | –          | –    | 100  | $\mu\text{A}$ |
| $h_{FE}$    | DC current gain                      | $I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$                                                               | –          | 90   | –    |               |
|             | BCW71                                |                                                                                                                  |            | 150  | –    |               |
|             | DC current gain                      | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$                                                                         | 110<br>200 | –    | 220  |               |
|             | BCW71<br>BCW72                       |                                                                                                                  |            | –    | 450  |               |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$                                                                        | –          | 120  | 250  | mV            |
|             |                                      | $I_C = 50\text{ mA}; I_B = 2.5\text{ mA}$                                                                        | –          | 210  | –    | mV            |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$                                                                        | –          | 750  | –    | mV            |
|             |                                      | $I_C = 50\text{ mA}; I_B = 2.5\text{ mA}$                                                                        | –          | 850  | –    | mV            |
| $V_{BE}$    | base-emitter voltage                 | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$                                                                         | 550        | –    | 700  | mV            |
| $C_c$       | collector capacitance                | $I_E = I_B = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$                                                          | –          | 2.5  | –    | pF            |
| $f_T$       | transition frequency                 | $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$                                                    | 100        | –    | –    | MHz           |
| F           | noise figure                         | $I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; R_S = 2\text{ k}\Omega; f = 1\text{ kHz}; B = 200\text{ Hz}$ | –          | –    | 10   | dB            |

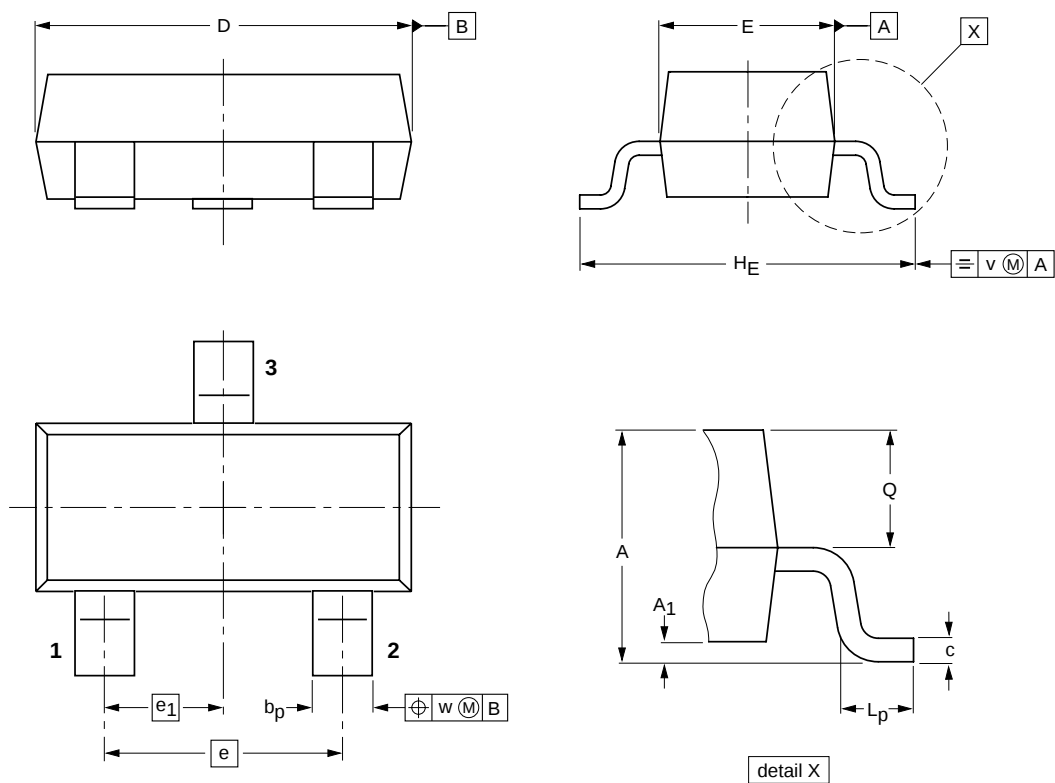
NPN general purpose transistors

BCW71; BCW72

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    | EIAJ |  |                                                                                       |                                 |
| SOT23              |            | TO-236AB |      |  |  | <del>97-02-28</del><br>99-09-13 |

## NPN general purpose transistors

## BCW71; BCW72

## 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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# ***NXP Semiconductors***

## **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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