

DATA SHEET



BCW60 series NPN general purpose transistors

Product specification
Supersedes data of 1997 Mar 10

1999 Apr 22

NPN general purpose transistors

BCW60 series

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 32 V).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

NPN transistor in a SOT23 plastic package.
PNP complements: BCW61 series.

MARKING

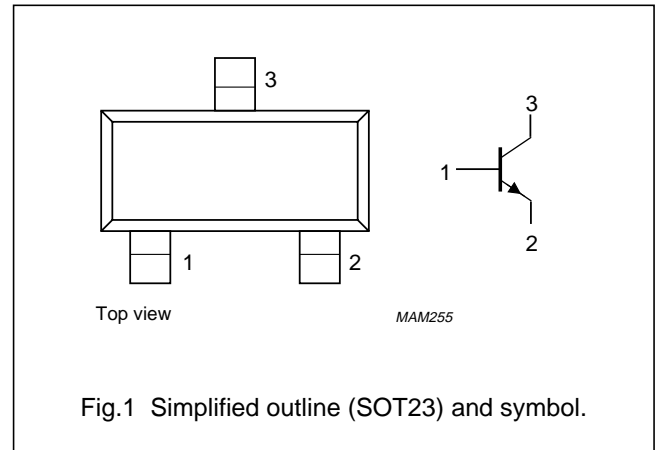
| TYPE NUMBER | MARKING CODE ⁽¹⁾ |
|-------------|-----------------------------|
| BCW60B | AB* |
| BCW60C | AC* |
| BCW60D | AD* |

Note

- * = 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 | – | 32 | V |
| V_{CEO} | collector-emitter voltage | open base | – | 32 | 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 | $T_{amb} \leq 25\text{ }^\circ\text{C}$ | – | 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 | $^\circ\text{C}$ |

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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

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT | |
|-------------|--------------------------------------|--|--------|------|------|---------------|--|
| I_{CBO} | collector cut-off current | $I_E = 0; V_{CB} = 32\text{ V}$ | – | – | 20 | nA | |
| | | $I_E = 0; V_{CB} = 32\text{ V}; T_{amb} = 150\text{ °C}$ | – | – | 20 | μA | |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = 4\text{ V}$ | – | – | 20 | nA | |
| h_{FE} | DC current gain | $I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$ | BCW60B | 20 | – | – | |
| | | | BCW60C | 40 | – | – | |
| | | | BCW60D | 100 | – | – | |
| | DC current gain | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$ | BCW60B | 180 | – | 310 | |
| | | | BCW60C | 250 | – | 460 | |
| | | | BCW60D | 380 | – | 630 | |
| | DC current gain | $I_C = 50\text{ mA}; V_{CE} = 1\text{ V}$ | BCW60B | 70 | – | – | |
| | | | BCW60C | 90 | – | – | |
| | | | BCW60D | 100 | – | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 0.25\text{ mA}$ | 50 | – | 350 | mV | |
| | | $I_C = 50\text{ mA}; I_B = 1.25\text{ mA}$ | 100 | – | 550 | mV | |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 10\text{ mA}; I_B = 0.25\text{ mA}$ | 600 | – | 850 | mV | |
| | | $I_C = 50\text{ mA}; I_B = 1.25\text{ mA}$ | 0.7 | – | 1.05 | V | |
| V_{BE} | base-emitter voltage | $I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$ | – | 520 | – | mV | |
| | | $I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$ | 550 | 650 | 750 | mV | |
| | | $I_C = 50\text{ mA}; V_{CE} = 1\text{ V}$ | – | 780 | – | mV | |
| C_c | collector capacitance | $I_E = I_E = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$ | – | 1.7 | – | pF | |
| C_e | emitter capacitance | $I_C = I_C = 0; V_{EB} = 0.5\text{ V}; f = 1\text{ MHz}$ | – | 11 | – | pF | |
| f_T | transition frequency | $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}; \text{note 1}$ | 100 | 250 | – | MHz | |
| F | noise figure | $I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; R_S = 2\text{ k}\Omega; f = 1\text{ kHz}; B = 200\text{ Hz}$ | – | 2 | 6 | dB | |

Note

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

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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DEFINITIONS

| Data Sheet Status | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

LIFE SUPPORT APPLICATIONS

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NOTES

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