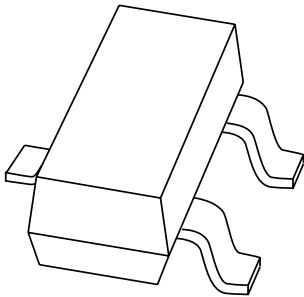


# DATA SHEET



## **BCV27; BCV47** NPN Darlington transistors

Product specification  
Supersedes data of 1997 Sep 04

1999 Apr 08

# NPN Darlington transistors

# BCV27; BCV47

### FEATURES

- Medium current (max. 500 mA)
- Low voltage (max. 60 V)
- High DC current gain (min. 20000).

### APPLICATIONS

- Pre-amplifier input applications.

### DESCRIPTION

NPN Darlington transistor in a SOT23 plastic package.  
PNP complements: BCV26 and BCV46.

### MARKING

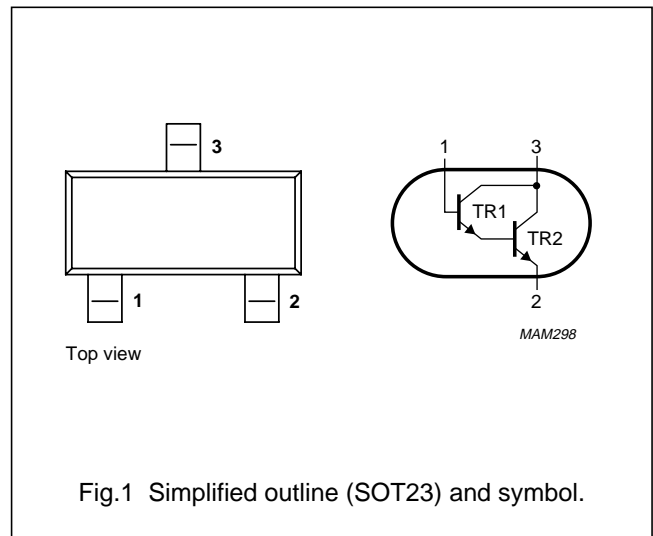
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BCV27       | FF*                         |
| BCV47       | FG*                         |

### 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 <sub>CBO</sub> | collector-base voltage        | open emitter                     |      |      |      |
|                  | BCV27                         |                                  | –    | 40   | V    |
|                  | BCV47                         |                                  | –    | 80   | V    |
| V <sub>CES</sub> | collector-emitter voltage     | open base                        |      |      |      |
|                  | BCV27                         |                                  | –    | 30   | V    |
|                  | BCV47                         |                                  | –    | 60   | V    |
| V <sub>EBO</sub> | emitter-base voltage          | open collector                   | –    | 10   | V    |
| I <sub>C</sub>   | collector current (DC)        |                                  | –    | 500  | mA   |
| I <sub>CM</sub>  | peak collector current        |                                  | –    | 800  | mA   |
| I <sub>B</sub>   | base current                  |                                  | –    | 100  | mA   |
| P <sub>tot</sub> | total power dissipation       | T <sub>amb</sub> ≤ 25 °C; note 1 | –    | 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   |

### Note

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

## NPN Darlington transistors

## BCV27; BCV47

## 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.

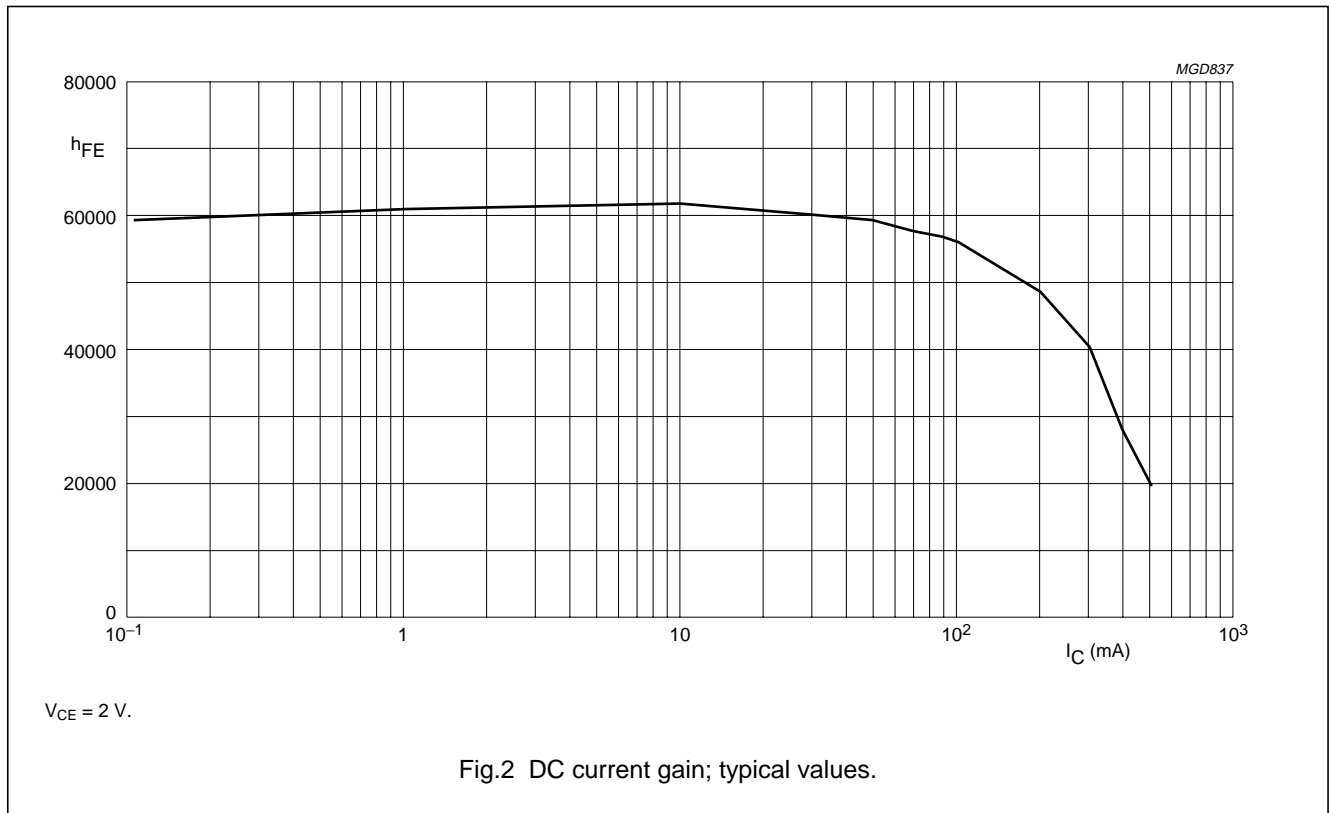
## CHARACTERISTICS

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

| SYMBOL      | PARAMETER                            | CONDITIONS  | MIN.                 | TYP.  | MAX. | UNIT |  |
|-------------|--------------------------------------|---|----------------------|-------|------|------|--|
| $I_{CBO}$   | collector cut-off current            |   |                      |       |      |      |  |
|             | BCV27                                | $I_E = 0; V_{CBO} = 30\text{ V}$                              | –                    | –     | 100  | nA   |  |
|             | BCV47                                | $I_E = 0; V_{CBO} = 60\text{ V}$                              | –                    | –     | 100  | nA   |  |
| $I_{EBO}$   | emitter cut-off current              | $I_E = 0; V_{EB} = 10\text{ V}$                               | –                    | –     | 100  | nA   |  |
| $h_{FE}$    | DC current gain                      | $V_{CE} = 5\text{ V};$ (see Fig.2)                            |                      |       |      |      |  |
|             |                                      | BCV27   | $I_C = 1\text{ mA}$  | 4000  | –    | –    |  |
|             |                                      |   | $I_C = 10\text{ mA}$ | 10000 | –    | –    |  |
|             |                                      | $I_C = 100\text{ mA}$   | 20000                | –     | –    |      |  |
|             | DC current gain                      | $V_{CE} = 5\text{ V};$ (see Fig.2)                            |                      |       |      |      |  |
|             |                                      | BCV47   | $I_C = 1\text{ mA}$  | 2000  | –    | –    |  |
|             |                                      | $I_C = 10\text{ mA}$  | 4000                 | –     | –    |      |  |
|             | $I_C = 100\text{ mA}$                | 10000   | –                    | –     |      |      |  |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 100\text{ mA}; I_B = 0.1\text{ mA}$                    | –                    | –     | 1    | V    |  |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = 100\text{ mA}; I_B = 0.1\text{ mA}$                    | –                    | –     | 1.5  | V    |  |
| $V_{BEon}$  | base-emitter on-state voltage        | $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$                     | –                    | –     | 1.4  | V    |  |
| $f_T$       | transition frequency                 | $I_C = 30\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$ | –                    | 220   | –    | MHz  |  |

NPN Darlington transistors

BCV27; BCV47



NPN Darlington transistors

BCV27; BCV47

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 VERSION | REFERENCES |       |      |  | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|------|--|---------------------|------------|
|                 | IEC        | JEDEC | EIAJ |  |                     |            |
| SOT23           |            |       |      |  |                     | 97-02-28   |

## NPN Darlington transistors

BCV27; BCV47

**DEFINITIONS**

| <b>Data Sheet Status</b>  |   |
|---|---|
| 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.                                |
| <b>Limiting values</b>  |   |
| 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. |   |
| <b>Application information</b>  |   |
| Where application information is given, it is advisory and does not form part of the specification.   |   |

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NPN Darlington transistors

BCV27; BCV47

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