

DATA SHEET



BC875; BC879 NPN Darlington transistors

Product specification
Supersedes data of 1997 Apr 22

1999 May 28

NPN Darlington transistors

BC875; BC879

FEATURES

- High DC current gain (min. 1000)
- High current (max. 1 A)
- Low voltage (max. 80 V)
- Integrated diode and resistor.

APPLICATIONS

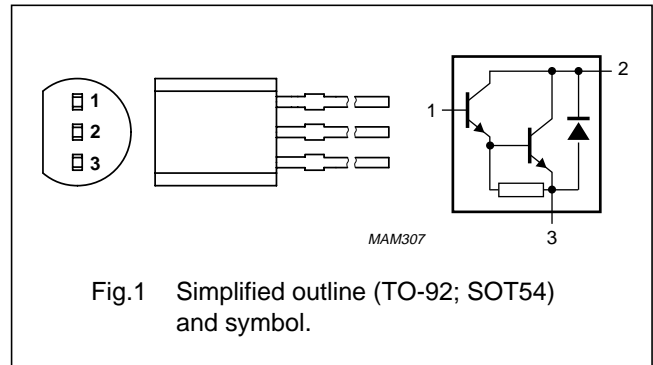
- Relay drivers.

DESCRIPTION

NPN Darlington transistor in a TO-92 (SOT54) plastic package. PNP complement: BC878.

PINNING

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



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 | | | |
| | BC875 | | – | 60 | V |
| | BC879 | | – | 100 | V |
| V _{CES} | collector-emitter voltage | V _{BE} = 0 | | | |
| | BC875 | | – | 45 | V |
| | BC879 | | – | 80 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 5 | V |
| I _C | collector current (DC) | | – | 1 | A |
| I _{CM} | peak collector current | | – | 2 | A |
| I _B | base current (DC) | | – | 0.2 | A |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C; note 1 | – | 0.83 | W |
| T _{stg} | storage temperature | | –65 | +150 | °C |
| T _j | junction temperature | | – | 150 | °C |
| T _{amb} | operating ambient temperature | | –65 | +150 | °C |

Note

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

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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1 | 150 | K/W |

Note

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

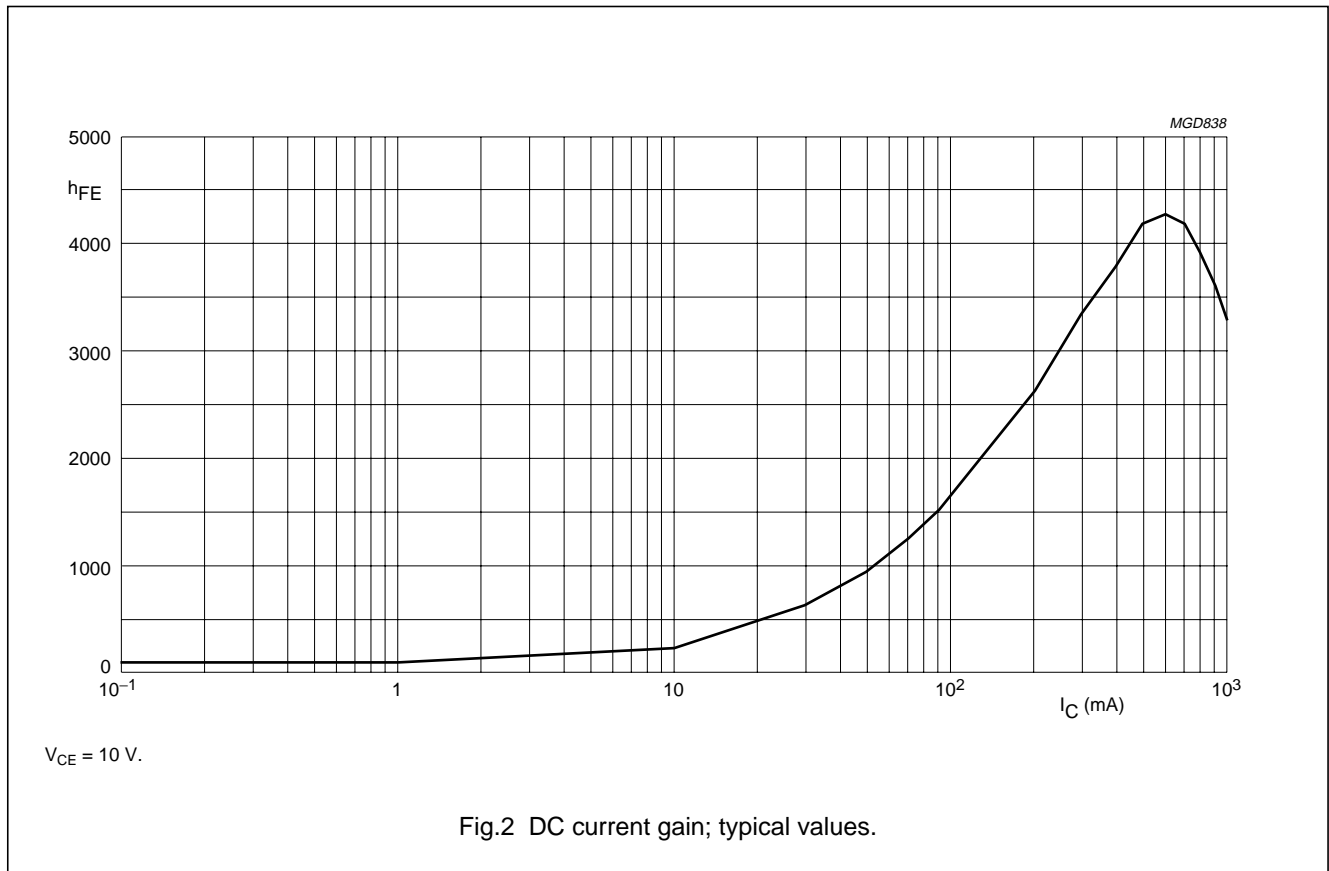
CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|--------------------------------------|--|------|------|------|------|
| I_{CES} | collector cut-off current | | | | | |
| | BC875 | $V_{BE} = 0; V_{CE} = 45\text{ V}$ | – | – | 50 | nA |
| | BC879 | $V_{BE} = 0; V_{CE} = 80\text{ V}$ | – | – | 50 | nA |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = 4\text{ V}$ | – | – | 50 | nA |
| h_{FE} | DC current gain | $I_C = 150\text{ mA}; V_{CE} = 10\text{ V};$ see Fig.2 | 1000 | – | – | |
| | | $I_C = 0.5\text{ A}; V_{CE} = 10\text{ V};$ see Fig.2 | 2000 | – | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 0.5\text{ A}; I_B = 0.5\text{ mA}$ | – | – | 1.3 | V |
| | | $I_C = 1\text{ A}; I_B = 1\text{ mA}$ | – | – | 1.8 | V |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 1\text{ A}; I_B = 1\text{ mA}$ | – | – | 2.2 | V |
| f_T | transition frequency | $I_C = 0.5\text{ A}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$ | – | 200 | – | MHz |
| Switching times (between 10% and 90% levels) | | | | | | |
| t_{on} | turn-on time | $I_{Con} = 500\text{ mA}; I_{Bon} = 0.5\text{ mA};$ $I_{Boff} = -0.5\text{ mA}$ | – | 500 | – | ns |
| t_{off} | turn-off time | | – | 1300 | – | ns |

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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b | b ₁ | c | D | d | E | e | e ₁ | L | L ₁ ⁽¹⁾ |
|------|------------|--------------|----------------|--------------|------------|------------|------------|------|----------------|--------------|-------------------------------|
| mm | 5.2 5.0 | 0.48 0.40 | 0.66 0.56 | 0.45 0.40 | 4.8 4.4 | 1.7 1.4 | 4.2 3.6 | 2.54 | 1.27 | 14.5 12.7 | 2.5 |

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|-------|---------------------|------------|
| | IEC | JEDEC | EIAJ | | |
| SOT54 | | TO-92 | SC-43 | | 97-02-28 |

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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. | |

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