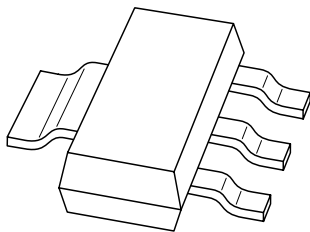


DATA SHEET



BSP60; BSP61; BSP62 PNP Darlington transistors

Product specification
Supersedes data of 1999 Apr 29

2001 May 31

PNP Darlington transistors

BSP60; BSP61; BSP62

FEATURES

- High current (max. 0.5 A)
- Low voltage (max. 80 V)
- Integrated diode and resistor.

APPLICATIONS

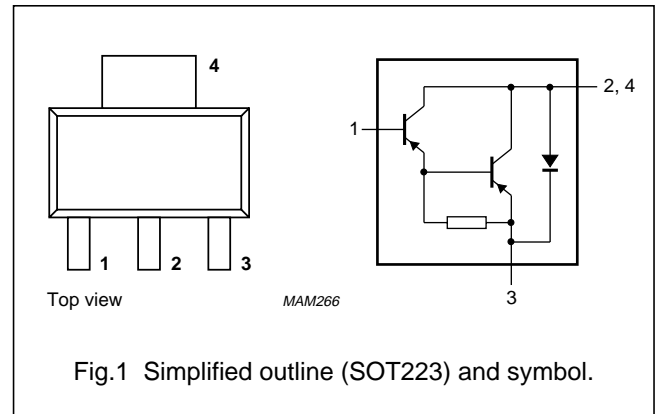
- Industrial switching applications such as:
 - Print hammer
 - Solenoid
 - Relay and lamp drivers.

DESCRIPTION

PNP Darlington transistor in a SOT223 plastic package.
 NPN complements: BSP50, BSP51 and BSP52.

PINNING

| PIN | DESCRIPTION |
|------|-------------|
| 1 | base |
| 2, 4 | collector |
| 3 | emitter |



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|-------------------------------|----------------------------------|------|------|------|
| V _{CB0} | collector-base voltage | open emitter | | | |
| | BSP60 | | – | –60 | V |
| | BSP61 | | – | –80 | V |
| V _{CES} | collector-emitter voltage | V _{BE} = 0 | | | |
| | BSP60 | | – | –45 | V |
| | BSP61 | | – | –60 | 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) | | – | –100 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C; note 1 | – | 1.25 | W |
| T _{stg} | storage temperature | | –65 | +150 | °C |
| T _j | junction temperature | | – | 150 | °C |
| T _{amb} | operating ambient temperature | | –65 | +150 | °C |

Note

1. Device mounted on a printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm².
 For other mounting conditions, see "Thermal considerations for the SOT223 in the General Part of associated Handbook".

PNP Darlington transistors

BSP60; BSP61; BSP62

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|--|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1 | 98 | K/W |
| $R_{th\ j-s}$ | thermal resistance from junction to solder point | | 17 | K/W |

Note

1. Device mounted on a printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm². For other mounting conditions, see "Thermal considerations for the SOT223 in the General Part of associated Handbook".

CHARACTERISTICS

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

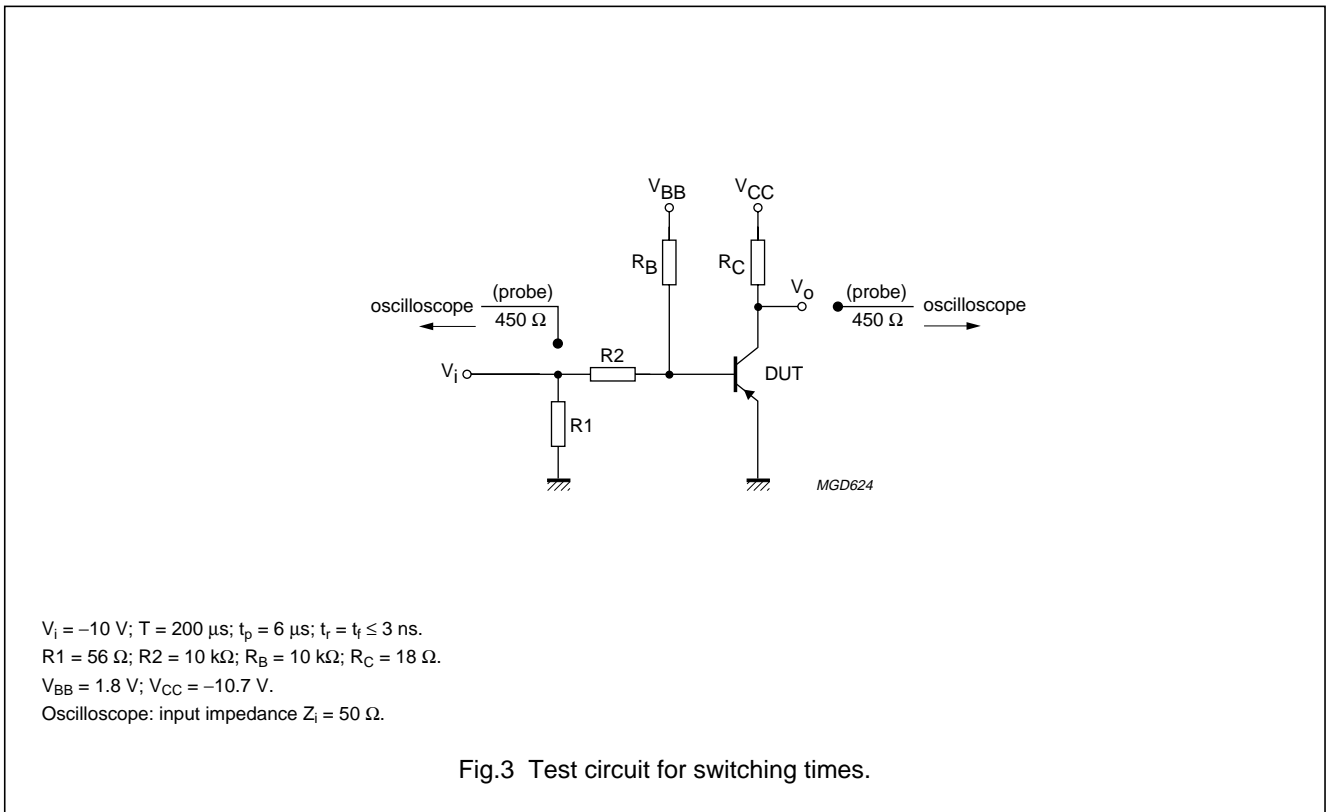
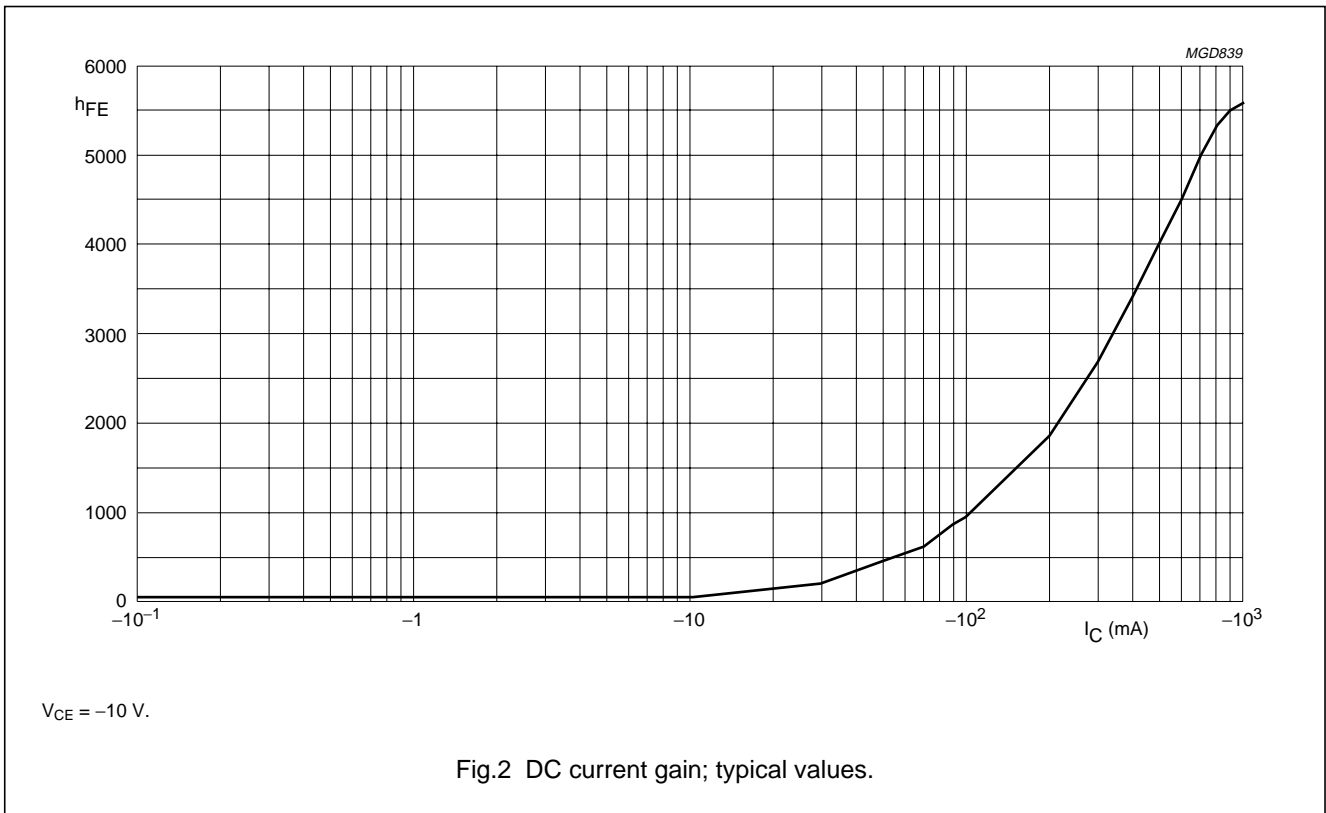
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--|--------------------------------------|--|------|------|------|------|
| I_{CES} | collector cut-off current | | | | | |
| | BSP60 | $V_{BE} = 0; V_{CE} = -45\text{ V}$ | – | – | –50 | nA |
| | BSP61 | $V_{BE} = 0; V_{CE} = -60\text{ V}$ | – | – | –50 | nA |
| | BSP62 | $V_{BE} = 0; V_{CE} = -80\text{ V}$ | – | – | –50 | nA |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = -4\text{ V}$ | – | – | –50 | nA |
| h_{FE} | DC current gain | $V_{CE} = -10\text{ V}$; note 1; see Fig.2 | | | | |
| | | $I_C = -150\text{ mA}$ | 1000 | – | – | |
| | | $I_C = -500\text{ mA}$ | 2000 | – | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = -500\text{ mA}; I_B = -0.5\text{ mA}$ | – | – | –1.3 | V |
| | | $I_C = -500\text{ mA}; I_B = -0.5\text{ mA}; T_j = 150\text{ °C}$ | – | – | –1.3 | V |
| V_{BEsat} | base-emitter saturation voltage | $I_C = -500\text{ mA}; I_B = -0.5\text{ mA}$ | – | – | –1.9 | V |
| f_T | transition frequency | $I_C = -500\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$ | – | 200 | – | MHz |
| Switching times (between 10% and 90% levels); see Fig.3 | | | | | | |
| t_{on} | turn-on time | $I_{Con} = -500\text{ mA}; I_{Bon} = -0.5\text{ mA}; I_{Boff} = 0.5\text{ mA}$ | – | 400 | – | ns |
| t_{off} | turn-off time | | – | 1500 | – | ns |

Note

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

PNP Darlington transistors

BSP60; BSP61; BSP62



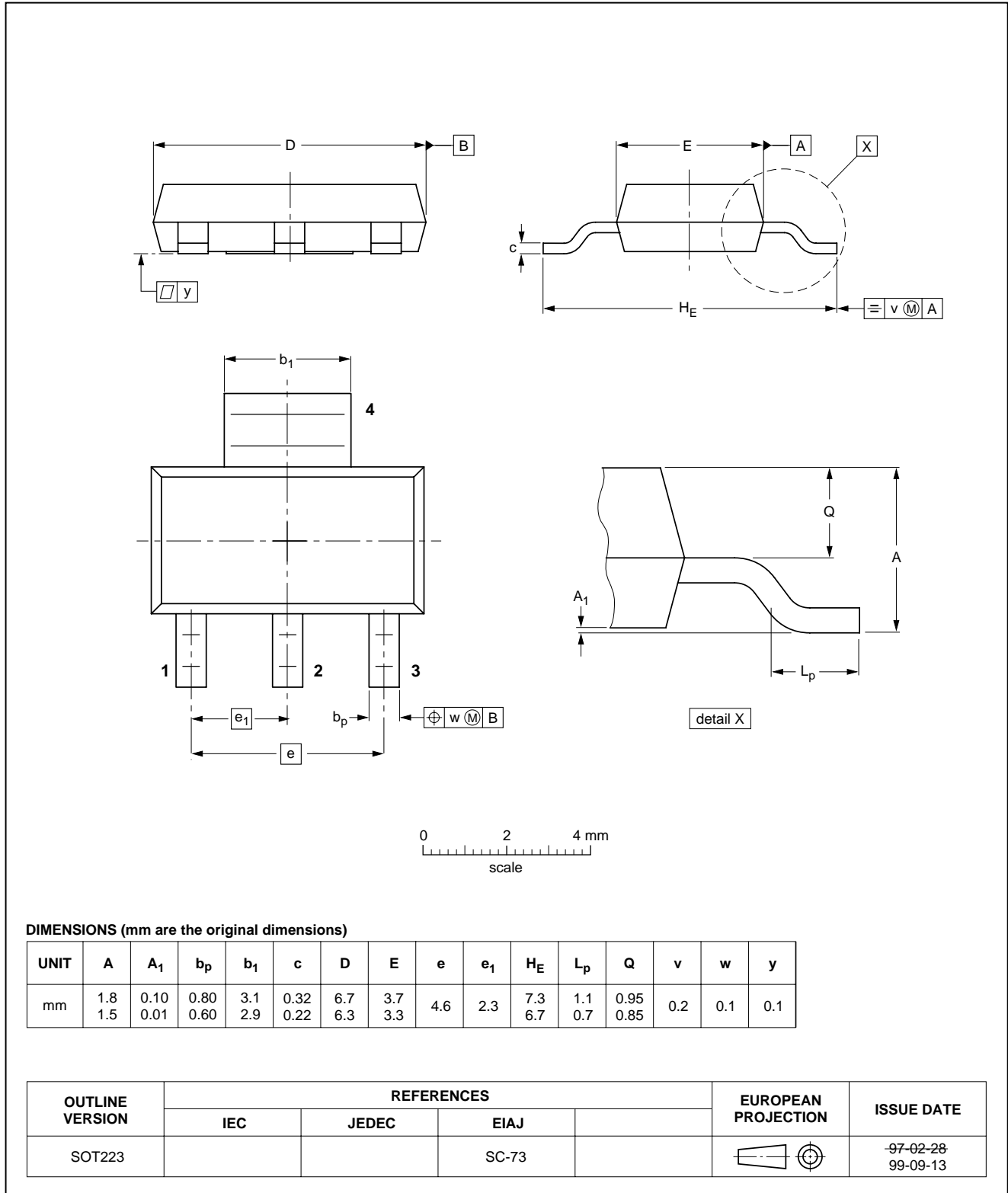
PNP Darlington transistors

BSP60; BSP61; BSP62

PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



PNP Darlington transistors

BSP60; BSP61; BSP62

DATA SHEET STATUS

| DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITIONS |
|----------------------------------|-------------------------------|--|
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PNP Darlington transistors

BSP60; BSP61; BSP62

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