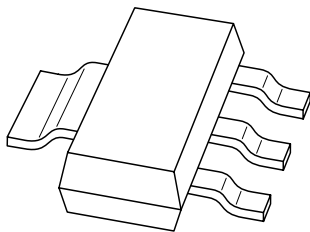


# DATA SHEET



## **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

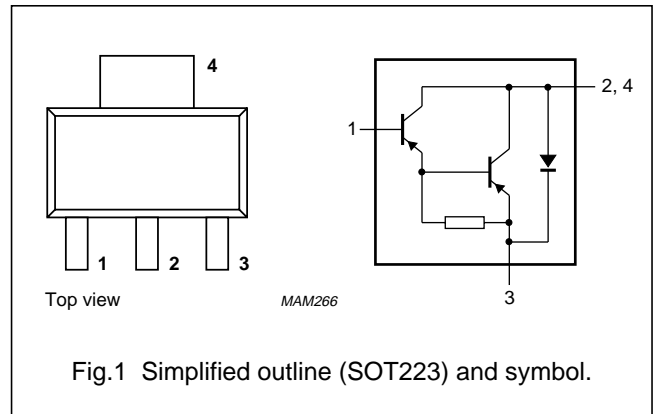
- Industrial switching applications such as:
  - Print hammer
  - Solenoid
  - Relay and lamp drivers.

### 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 <sub>CB0</sub>	collector-base voltage	open emitter			
	BSP60		–	–60	V
	BSP61		–	–80	V
V <sub>CES</sub>	collector-emitter voltage	V <sub>BE</sub> = 0			
	BSP60		–	–45	V
	BSP61		–	–60	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	–5	V
	BSP62		–	–90	V
	BSP62		–	–80	V
I <sub>C</sub>	collector current (DC)		–	–1	A
I <sub>CM</sub>	peak collector current		–	–2	A
I <sub>B</sub>	base current (DC)		–	–100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	–	1.25	W
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. Device mounted on a printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>. 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

- Device mounted on a printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.  
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.

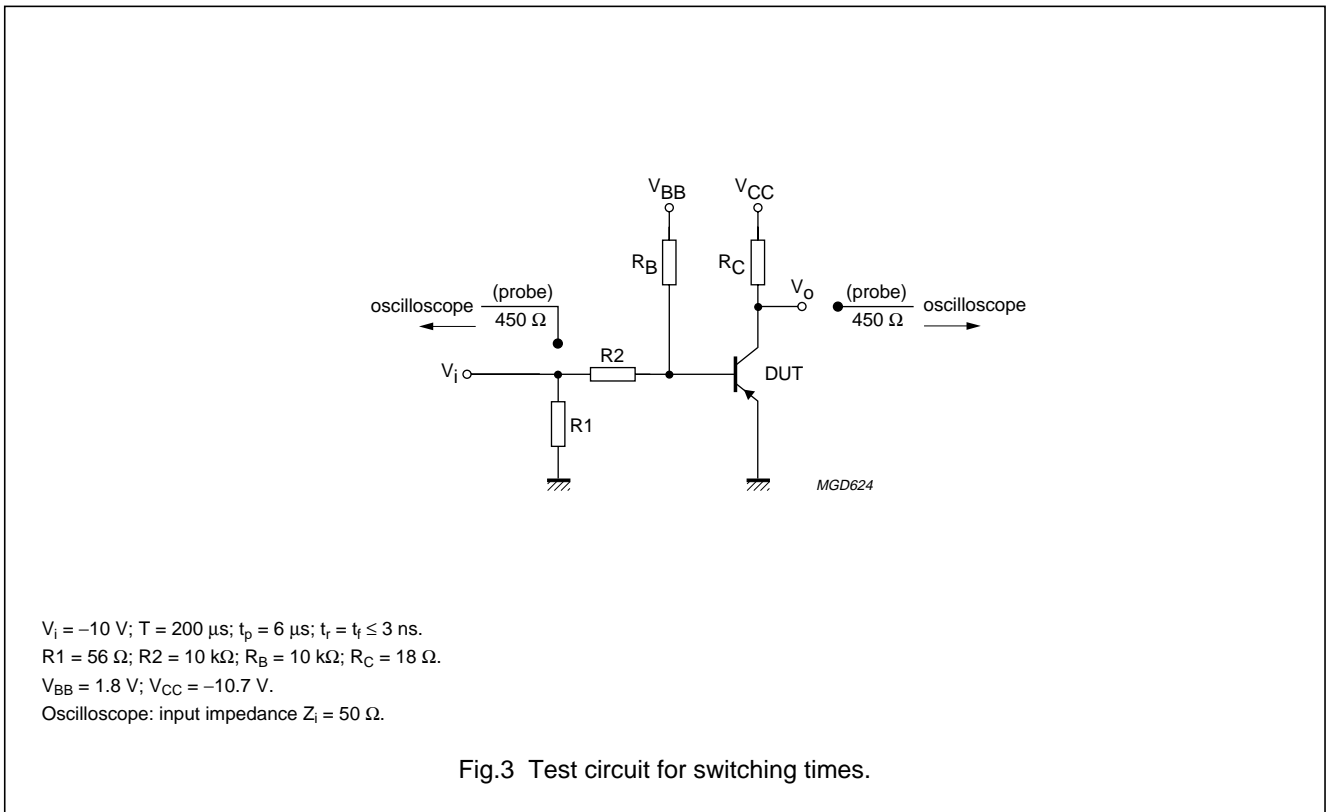
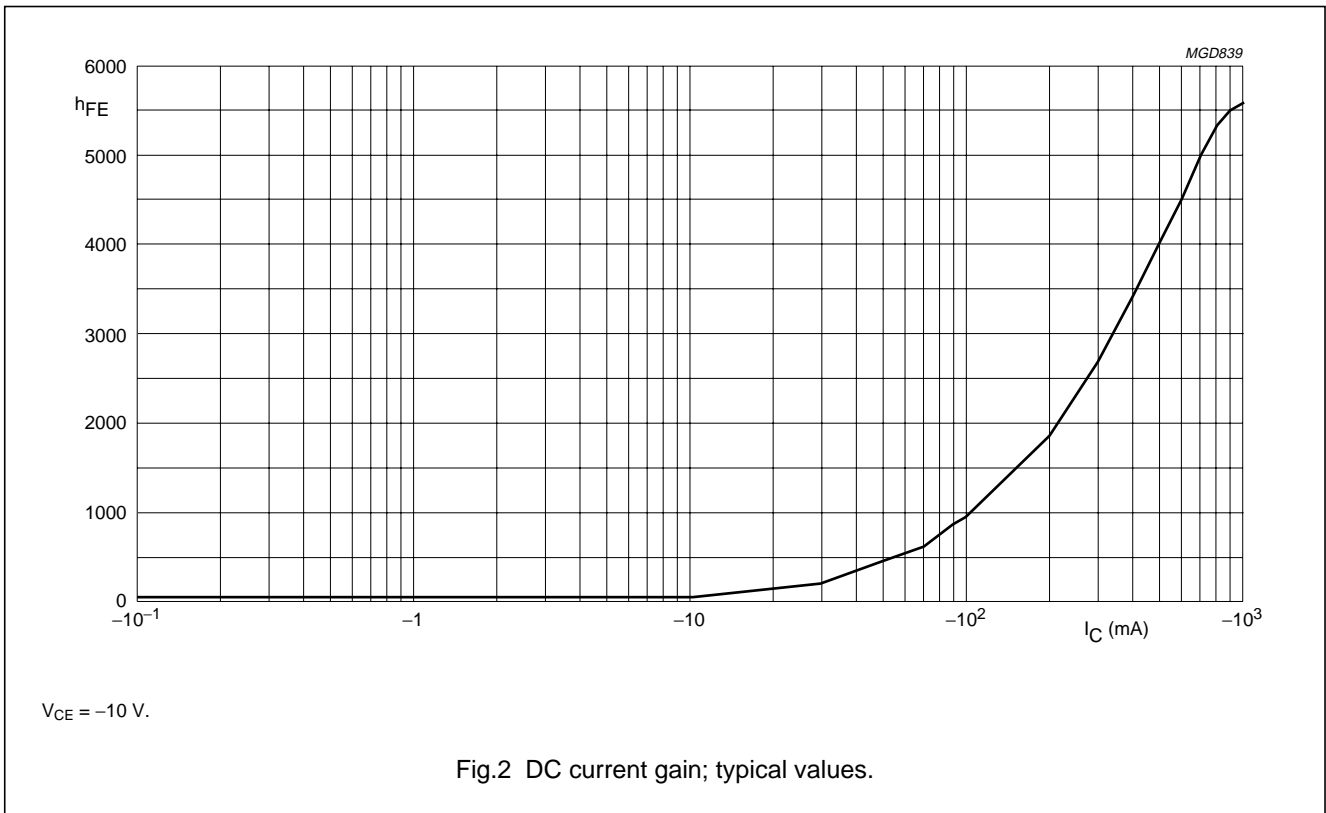
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CES}$	collector cut-off current					
	BSP60	$V_{BE} = 0; V_{CE} = -45\text{ V}$	–	–	–50	nA
	BSP61	$V_{BE} = 0; V_{CE} = -60\text{ V}$	–	–	–50	nA
	BSP62	$V_{BE} = 0; V_{CE} = -80\text{ V}$	–	–	–50	nA
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = -4\text{ V}$	–	–	–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
<b>Switching times (between 10% and 90% levels); see Fig.3</b>						
$t_{on}$	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

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

PNP Darlington transistors

BSP60; BSP61; BSP62



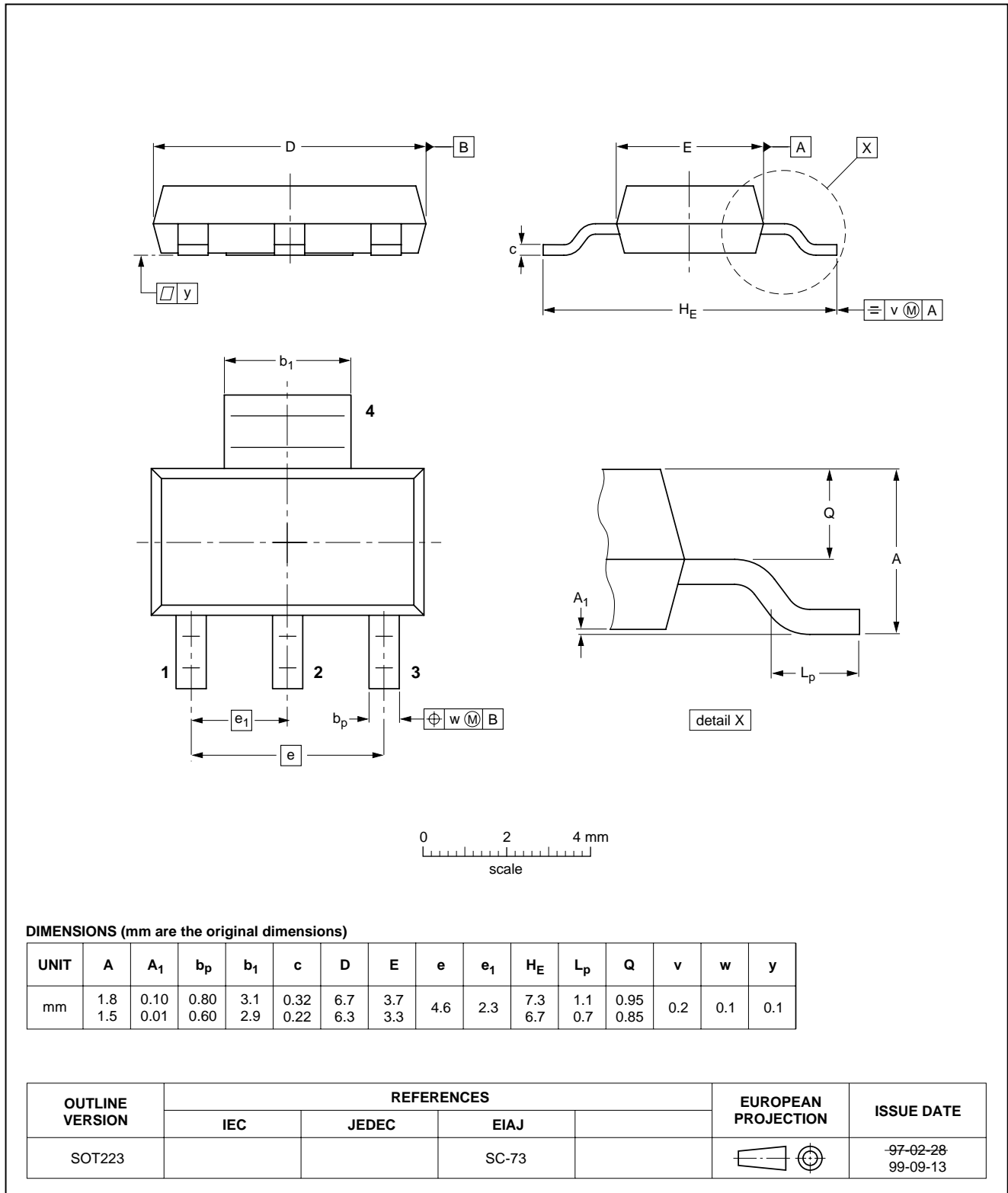
PNP Darlington transistors

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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 <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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PNP Darlington transistors

BSP60; BSP61; BSP62

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