



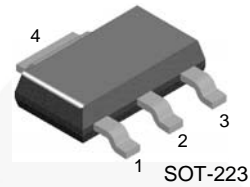
November 2014

# BSP52

## NPN Darlington Transistor

### Description

This device is designed for applications requiring extremely high-current gain at collector currents to 500 mA. Sourced from process 03.



1. Base 2,4. Collector 3. Emitter

### Ordering Information

Part Number	Marking	Package	Packing Method
BSP52	BSP52	SOT-223 4L	Tape and Reel

### Absolute Maximum Ratings<sup>(1),(2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage	80	V
$V_{CBO}$	Collector-Base Voltage	90	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current - Continuous	800	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

#### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

**Thermal Characteristics<sup>(3)</sup>**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Max.	Unit
$P_D$	Total Device Dissipation	1000	mW
	Derate Above $25^\circ\text{C}$	8.0	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	125	$^\circ\text{C}/\text{W}$

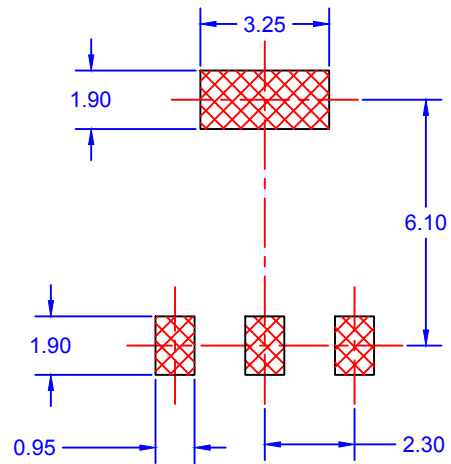
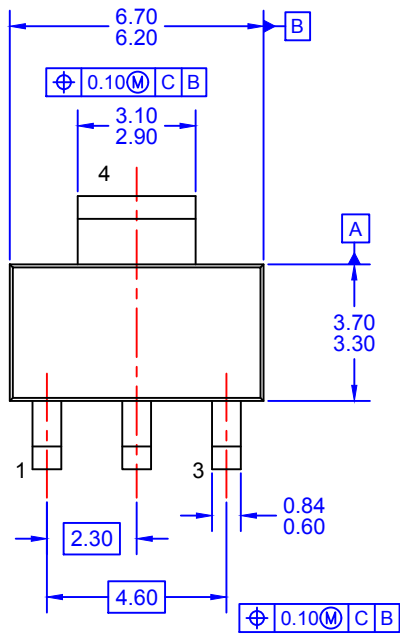
**Note:**

3. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

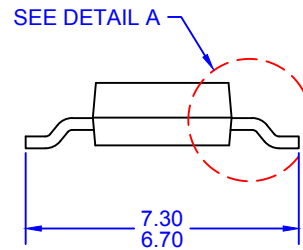
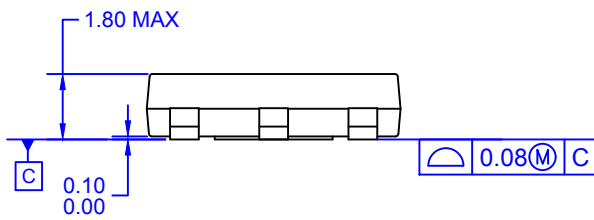
**Electrical Characteristics**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

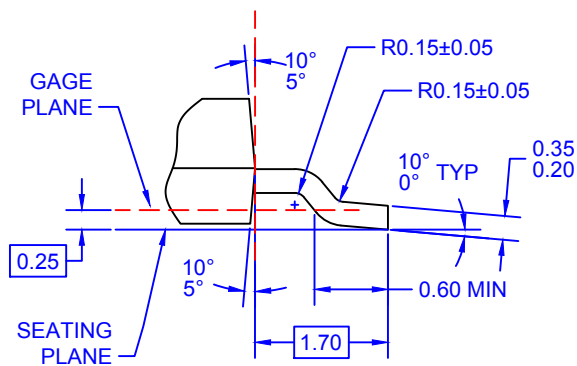
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \mu\text{A}$ , $I_E = 0$	90			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu\text{A}$ , $I_C = 0$	5			V
$I_{CES}$	Collector Cut-Off Current	$V_{CE} = 80 \text{ V}$ , $V_{BE} = 0$			10	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 4.0 \text{ V}$ , $I_C = 0$			10	$\mu\text{A}$
$h_{FE}$	DC Current Gain	$I_C = 150 \text{ mA}$ , $V_{CE} = 10 \text{ V}$	1000			
		$I_C = 500 \text{ mA}$ , $V_{CE} = 10 \text{ V}$	2000			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 500 \text{ mA}$ , $I_B = 0.5 \text{ mA}$			1.3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 500 \text{ mA}$ , $I_B = 0.5 \text{ mA}$			1.9	V



LAND PATTERN RECOMMENDATION



- NOTES: UNLESS OTHERWISE SPECIFIED  
 A) DRAWING BASED ON JEDEC REGISTRATION TO-261C, VARIATION AA.  
 B) ALL DIMENSIONS ARE IN MILLIMETERS.  
 C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.  
 D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.  
 E) LANDPATTERN NAME: SOT230P700X180-4BN  
 F) DRAWING FILENAME: MKT-MA04AREV3



DETAIL A  
 SCALE: 2:1





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