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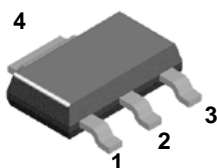
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# BSP51

## NPN Darlington Transistor

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



**SOT-223**

1. Base 2. Collector 3. Emitter

### Absolute Maximum Ratings \* T<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CES</sub>	Collector-Emitter Voltage	80	V
V <sub>CBO</sub>	Collector-Base Voltage	90	V
V <sub>EBO</sub>	Emitter-Base Voltage	5.0	V
I <sub>C</sub>	Collector Current (Continuous)	500	mA
T <sub>J</sub> , T <sub>STG</sub>	Junction Temperature, Storage Temperature	-55 ~ +150	°C

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES:

- These ratings are based on a maximum junction temperature of 150 degrees C.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Electrical Characteristics \* T<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Test Condition	MIN	MAX	Units
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#### Off Characteristics

V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0	90		V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0	5.0		V
I <sub>CES</sub>	Collector Cutoff Current	V <sub>CE</sub> = 80 V, I <sub>BE</sub> = 0		10	μA
I <sub>EBO</sub>	Emitter Cutoff Current	V <sub>EB</sub> = 4.0 V, I <sub>C</sub> = 0		10	μA

#### On Characteristics

h <sub>FE</sub>	DC Current Gain	I <sub>C</sub> = 150 mA, V <sub>CE</sub> = 10 V I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 10 V	1000 2000		
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage *	I <sub>C</sub> = 500 mA, I <sub>B</sub> = 0.5 mA		1.3	V
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage *	I <sub>C</sub> = 500 mA, I <sub>B</sub> = 0.5 mA		1.9	V

\* Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%

**Thermal Characteristics** \*  $T_a = 25^\circ\text{C}$  unless otherwise noted

Symbol	Characteristic	Max	Units
$P_D$	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	$^\circ\text{C}/\text{W}$

\*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06".



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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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