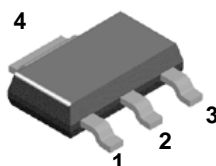


# BSP51

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

Symbol	Parameter	Value	Units
$V_{CES}$	Collector-Emitter Voltage	80	V
$V_{CBO}$	Collector-Base Voltage	90	V
$V_{EBO}$	Emitter-Base Voltage	5.0	V
$I_C$	Collector Current (Continuous)	500	mA
$T_J, T_{STG}$	Junction Temperature, Storage Temperature	-55 ~ +150	$^\circ\text{C}$

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

#### NOTES:

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

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

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

$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \mu\text{A}, I_E = 0$	90		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu\text{A}, I_C = 0$	5.0		V
$I_{CES}$	Collector Cutoff Current	$V_{CE} = 80 \text{ V}, I_{BE} = 0$		10	$\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 4.0 \text{ V}, I_C = 0$		10	$\mu\text{A}$

#### On Characteristics

$h_{FE}$	DC Current Gain	$I_C = 150 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 500 \text{ mA}, V_{CE} = 10 \text{ V}$	1000 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

\* Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$

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

Symbol	Characteristic	Max	Units
$P_D$	Total Device Dissipation	1000	mW
	Derate above $25^{\circ}\dots$	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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