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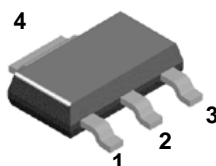
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BSP51

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 * $T_a = 25^\circ\text{C}$ 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	μA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 4.0 \text{ V}, I_C = 0$		10	μA

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	$^{\circ}\text{C/W}$

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

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