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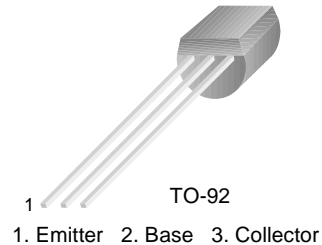
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# PN5134

## NPN General Purpose Amplifier

- This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300mA.



## Absolute Maximum Ratings\* $T_A=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CEO}$	Collector-Emitter Voltage	10	V
$V_{CBO}$	Collector-Base Voltage	20	V
$V_{EBO}$	Emitter-Base Voltage	3.5	V
$I_C$	Collector Current - Continuous	500	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	- 55 ~ 150	$^\circ\text{C}$

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

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage *	$I_C = 10\text{mA}, I_B = 0$	10		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\mu\text{A}, I_E = 0$	20		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\mu\text{A}, I_C = 0$	3.5		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = 10\mu\text{A}$	20		V
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = 15\text{V}, I_E = 0, T_A = 65^\circ\text{C}$		10	$\mu\text{A}$
$I_{CES}$	Collector Cutoff Current	$V_{CB} = 15\text{V}, I_C = 0$		0.4	$\mu\text{A}$
<b>On Characteristics</b>					
$h_{FE}$	DC Current Gain	$V_{CE} = 1.0\text{V}, I_C = 10\text{mA}$ $V_{CE} = 0.4\text{V}, I_C = 30\text{mA}$	20 15	150	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$ $I_C = 10\text{mA}, I_B = 3.3\text{mA}$		0.25 0.20	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{mA}, I_B = 1.0\text{mA}$ $I_C = 10\text{mA}, I_B = 3.3\text{mA}$	0.70 0.72	0.9 1.1	V
<b>Small Signal Characteristics</b>					
$C_{ob}$	Output Capacitance	$V_{CB} = 5.0\text{V}, f = 1.0\text{MHz}$		4.0	pF
$h_{fe}$	Small Signal Current Gain	$I_C = 10\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$	2.5		
<b>Switching Characteristics</b>					
$t_s$	Storage Time	$I_C = I_{B1} = I_{B2} = 15\text{mA}$		18	ns
$t_{on}$	Turn-on Time	$V_{CC} = 3.0\text{V}, I_C = 10\text{mA}$ $I_{B1} = 3.3\text{mA}$		18	ns
$t_d$	Delay Time			14	ns
$t_r$	Rise Time			12	ns
$t_{off}$	Turn-off Time	$V_{CC} = 3.0\text{V}, I_C = 10\text{mA}$ $I_{B1} = I_{B2} = 3.3\text{mA}$		18	ns
$t_s$	Storage Time			13	ns
$t_f$	Fall Time			13	ns

\* Pulse Test: Pulse Width  $\leq 300\text{ms}$ , Duty Cycle  $\leq 2.0\%$

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

Symbol	Parameter	Max.	Units
$P_D$	Total Device Dissipation	625	mW
	Derate above $25^\circ\text{C}$	5.0	$\text{mW}/^\circ\text{C}$
$R_{\theta\text{JC}}$	Thermal Resistance, Junction to Case	83.3	$^\circ\text{C}/\text{W}$
$R_{\theta\text{JA}}$	Thermal Resistance, Junction to Ambient	200	$^\circ\text{C}/\text{W}$

# Package Dimensions

## TO-92



Dimensions in Millimeters

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