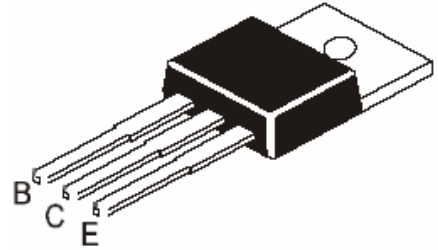


## Darlington Power Transistors (NPN)

### Features

- Designed for general-purpose amplifier and low speed switching applications
- RoHS Compliant



TO-220

### Maximum Ratings *(T<sub>Ambient</sub>=25°C unless noted otherwise)*

Symbol	Description	TIP120	TIP121	TIP122	Unit
<b>V<sub>CB0</sub></b>	Collector-Base Voltage	60	80	100	V
<b>V<sub>CEO</sub></b>	Collector-Emitter Voltage	60	80	100	V
<b>V<sub>EB0</sub></b>	Emitter-Base Voltage	5.0			V
<b>I<sub>C</sub></b>	Collector Current Continuous	5.0			A
<b>I<sub>CM</sub></b>	Collector Current Peak	8.0			A
<b>I<sub>B</sub></b>	Base Current	120			mA
<b>P<sub>D</sub></b>	Power Dissipation upto T <sub>C</sub> =25°C	65			W
	Power Dissipation Derate above T <sub>C</sub> =25°C	0.52			W/° C
	Power Dissipation upto T <sub>A</sub> =25°C	2.0			W
	Power Dissipation Derate above T <sub>A</sub> =25°C	16			mW/° C
<b>R<sub>θJA</sub></b>	Thermal Resistance from Junction to Ambient in Free Air	62.5			° C /W
<b>R<sub>θJC</sub></b>	Thermal Resistance from Junction to Case	1.92			° C /W
<b>T<sub>J</sub>, T<sub>STG</sub></b>	Operating Junction and Storage Temperature Range	-65 to +150			° C

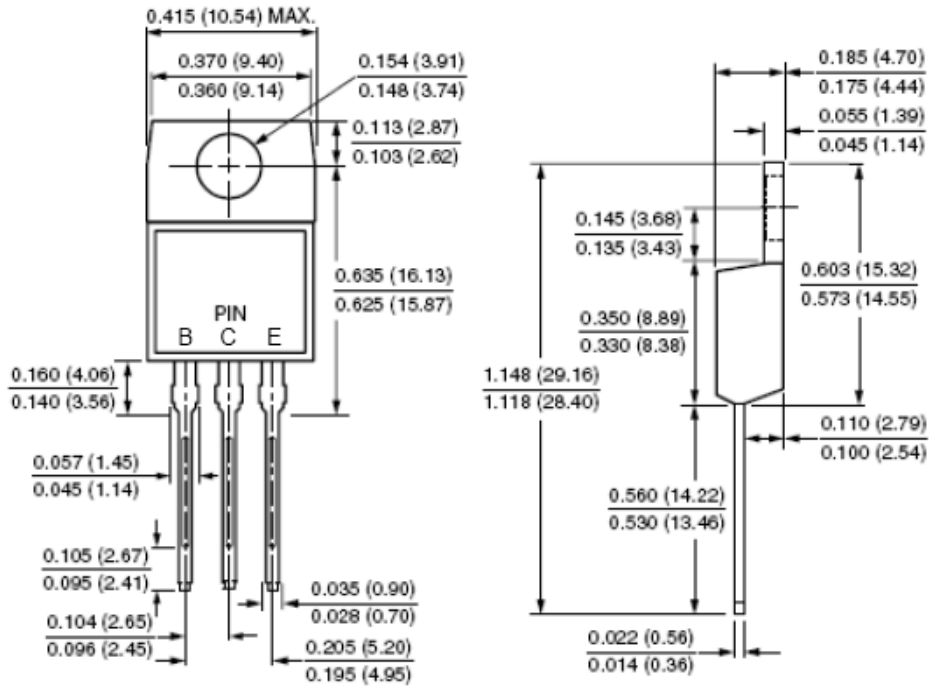
## Electrical Characteristics ( $T_{Ambient}=25^{\circ}C$ unless noted otherwise)

Symbol	Description	Min.	Max.	Unit	Conditions	
<b>*h<sub>FE</sub></b>	D.C. Current Gain	1000	-		V <sub>CE</sub> =3V, I <sub>C</sub> =0.5A	
		1000	-		V <sub>CE</sub> =3V, I <sub>C</sub> =3A	
<b>*V<sub>CEO(sus)</sub></b>	Collector-Emitter Sustaining Voltage	<b>TIP120</b>	60	-	V	I <sub>C</sub> =100mA, I <sub>B</sub> =0
		<b>TIP121</b>	80	-	V	
		<b>TIP122</b>	100	-	V	
<b>*V<sub>CE(sat)</sub></b>	Collector-Emitter Saturation Voltage	-	2.0	V	I <sub>C</sub> =3A, I <sub>B</sub> =12mA	
		-	4.0	V	I <sub>C</sub> =5A, I <sub>B</sub> =20mA	
<b>*V<sub>BE(on)</sub></b>	Base-Emitter On Voltage	-	2.5	V	I <sub>C</sub> =3A, V <sub>CE</sub> =3V	
<b>I<sub>CEO</sub></b>	Collector-Emitter Cut-off Current	<b>TIP120</b>	-	0.5	mA	V <sub>CE</sub> =30V, I <sub>B</sub> =0
		<b>TIP121</b>	-	0.5		V <sub>CE</sub> =40V, I <sub>B</sub> =0
		<b>TIP122</b>	-	0.5		V <sub>CE</sub> =50V, I <sub>B</sub> =0
<b>I<sub>CBO</sub></b>	Collector-Base Cut-off Current	<b>TIP120</b>	-	0.2	mA	V <sub>CB</sub> =60V, I <sub>E</sub> =0
		<b>TIP121</b>	-	0.2		V <sub>CB</sub> =80V, I <sub>E</sub> =0
		<b>TIP122</b>	-	0.2		V <sub>CB</sub> =100V, I <sub>E</sub> =0
<b>I<sub>EBO</sub></b>	Emitter-Base Cut-off Current	-	2	mA	V <sub>EB</sub> =5V, I <sub>C</sub> =0	
<b>h<sub>fe</sub></b>	Small Signal Current Gain	4.0	-		I <sub>C</sub> =3A, V <sub>CE</sub> =4V, f=1.0MHz,	
<b>C<sub>ob</sub></b>	Output Capacitance	-	200	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=0.1MHz,	
<b>t<sub>on</sub></b>	Turn on time	<b>Typ. 0.4</b>		μS	I <sub>C</sub> =3A, R <sub>L</sub> =10Ω, I <sub>B1</sub> =I <sub>B2</sub> =12mA, V <sub>EB(off)</sub> =5V	
<b>t<sub>off</sub></b>	Turn off time	<b>Typ. 1.2</b>				

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

## Dimensions in inch (mm)

### TO-220



### Pin Configuration

- B. Base
- C. Collector
- E. Emitter

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