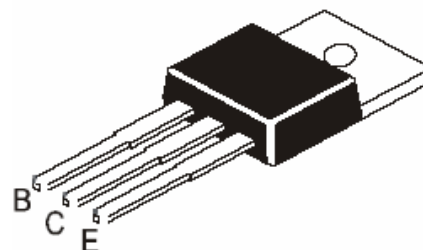


## Darlington Power Transistors (NPN)

### Features

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



TO-220



### Mechanical Data

<b>Case:</b>	TO-220, Plastic Package
<b>Terminals:</b>	Solderable per MIL-STD-202, Method 208
<b>Weight:</b>	0.08 ounces, 2.24 grams

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

Symbol	Description	TIP120	TIP121	TIP122	Unit
<b>V<sub>CBO</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>EBO</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

# Darlington Power Transistors (NPN)

## TIP120/121/122

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

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

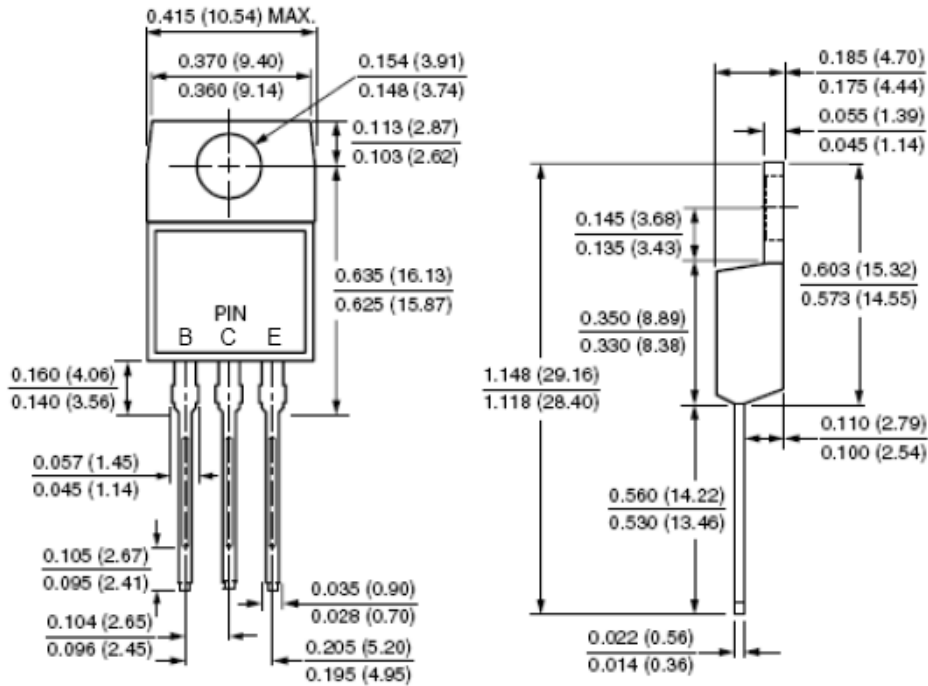
\*Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$

# Darlington Power Transistors (NPN)

## TIP120/121/122

Dimensions in inch (mm)

### TO-220



### Pin Configuration

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

# Darlington Power Transistors (NPN)

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TIP120/121/122

## How to contact us:

### US HEADQUARTERS

28040 WEST HARRISON PARKWAY, VALENCIA, CA 91355-4162

Tel: (800) TAITRON (800) 824-8766 (661) 257-6060

Fax: (800) TAITFAX (800) 824-8329 (661) 257-6415

Email: [taitron@taitroncomponents.com](mailto:taitron@taitroncomponents.com)

Http://[www.taitroncomponents.com](http://www.taitroncomponents.com)

### TAITRON COMPONENTS MEXICO, S.A .DE C.V.

BOULEVARD CENTRAL 5000 INTERIOR 5 PARQUE INDUSTRIAL ATITALAQUIA, HIDALGO C.P.  
42970 MEXICO

Tel: +52-55-5560-1519

Fax: +52-55-5560-2190

### TAITRON COMPONENTS INCORPORATED REPRESENTAÇÕES DO BRASIL LTDA

RUA DOMINGOS DE MORAIS, 2777, 2.ANDAR, SALA 24 SAÚDE - SÃO PAULO-SP 04035-001 BRAZIL

Tel: +55-11-5574-7949

Fax: +55-11-5572-0052

### TAITRON COMPONENTS INCORPORATED, SHANGHAI REPRESENTATIVE OFFICE

METROBANK PLAZA, 1160 WEST YAN' AN ROAD, SUITE 1503, SHANGHAI, 200052, CHINA

Tel: +86-21-5424-9942

Fax: +86-21-5424-9931