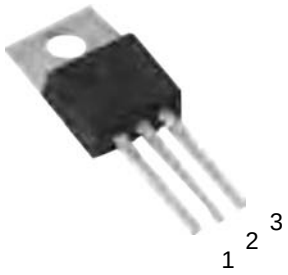
# TIP120-TIP127

TO-220 Darlington Transistor

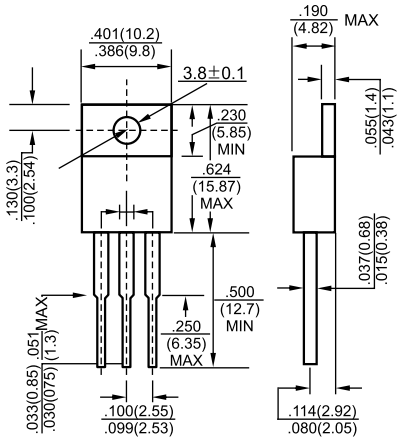



1.BASE

2.COLLECTOR

3.EMITTER

**TO-220**




**Dimensions in inches and (millimeters)**

## Features

- ✧ **TIP120,121,122** Darlington TRANSISTOR (NPN)
- ✧ **TIP125,126,127** Darlington TRANSISTOR (PNP)
- ✧ Medium Power Complementary silicon transistors

### MAXIMUM RATINGS ($T_A$=25℃ unless otherwise noted)

| Symbol | Parameter | TIP120<br>TIP125 | TIP121<br>TIP126 | TIP122<br>TIP127 | Units |
|---|---|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 60 | 80 | 100 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 60 | 80 | 100 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 5 | | | V |
| $I_C$ | Collector Current -Continuous | 5 | | | A |
| $P_C$ | Collector Power Dissipation | 2 | | | W |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 62.5 | | | ℃/W |
| $R_{\theta Jc}$ | Thermal Resistance Junction to Case | 1.92 | | | ℃/W |
| $T_J$ | Junction Temperature | 150 | | | ℃ |
| $T_{stg}$ | Storage Temperature | -55to+150 | | | ℃ |

### ELECTRICAL CHARACTERISTICS (Tamb=25℃ unless otherwise specified)

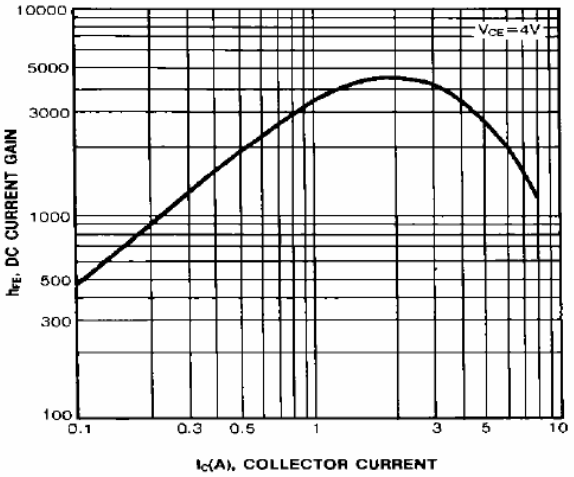
| Parameter | | Symbol | Test conditions | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|
| **Collector-base breakdown voltage** | **TIP120,TIP125**<br>**TIP121,TIP126**<br>**TIP122,TIP127** | $V(BR)_{CBO}$ | $I_C$= 1mA,$I_E$=0 | 60<br>80<br>100 | | V |
| **Collector-emitter breakdown voltage** | **TIP120,TIP125**<br>**TIP121,TIP126**<br>**TIP122,TIP127** | $V_{CEO}(SUS)$ | $I_C$= 30mA,$I_B$=0 | 60<br>80<br>100 | | V |
| **Collector cut-off current** | **TIP120,TIP125**<br>**TIP121,TIP126**<br>**TIP122,TIP127** | $I_{CBO}$ | $V_{CB}$= 60 V, $I_E$=0<br>$V_{CB}$= 80 V, $I_E$=0<br>$V_{CB}$= 100V, $I_E$=0 | | 0.2 | mA |
| **Collector cut-off current** | **TIP120,TIP125**<br>**TIP121,TIP126**<br>**TIP122,TIP127** | $I_{CEO}$ | $V_{CE}$=30 V, $I_B$=0<br>$V_{CE}$=40 V, $I_B$=0<br>$V_{CE}$=50 V, $I_B$=0 | | 0.5 | mA |
| **Emitter cut-off current** | | $I_{EBO}$ | $V_{EB}$=5 V, $I_C$=0 | | 2 | mA |
| **DC current gain** | | $h_{FE(1)}$ | $V_{CE}$= 3V, $I_C$=0.5A | 1000 | | |
| | | $h_{FE(2)}$ | $V_{CE}$= 3V, $I_C$=3 A | 1000 | | |
| **Collector-emitter saturation voltage** | | $V_{CE}$(sat) | $I_C$=3A,$I_B$=12mA<br>$I_C$=5 A,$I_B$=20mA | | 2<br>4 | V |
| **Base-emitter voltage** | | $V_{BE}$ | $V_{CE}$=3V, $I_C$=3 A | | 2.5 | V |
| **Output Capacitance** | **TIP125,TIP126,TIP127**<br>**TIP120,TIP121,TIP122** | Cob | $V_{CB}$=10V, $I_E$=0,f=0.1MHz | | 300<br>200 | pF |

# TIP120-TIP127

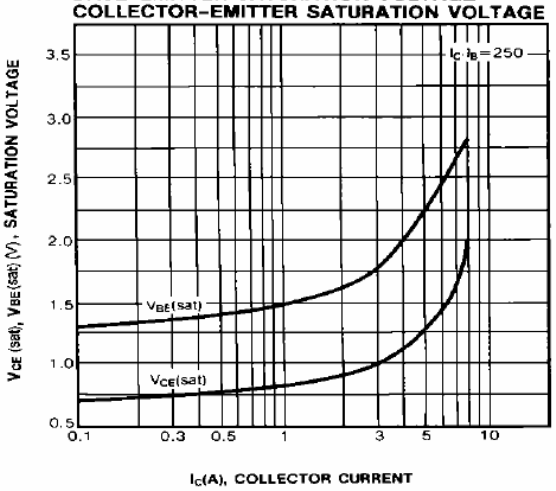
TO-220 Darlington Transistor

## Typical Characteristics

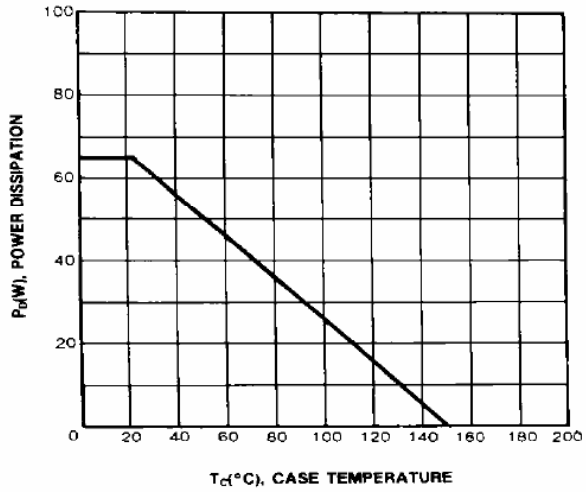
DC CURRENT GAIN



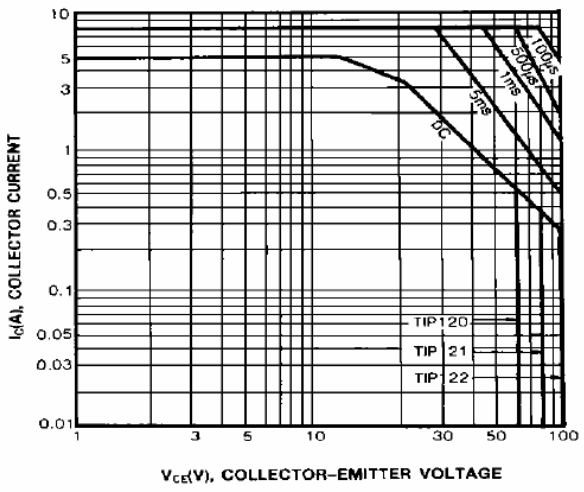

BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE




POWER DERATING




SAFE OPERATING AREA




OUTPUT AND INPUT CAPACITANCE
vs. REVERSE VOLTAGE

