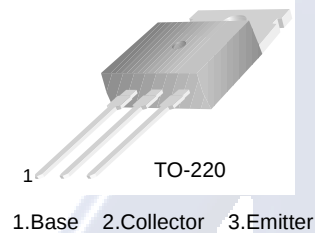




TIP120/121/122

Medium Power Linear Switching Applications

- Complementary to TIP125/126/127

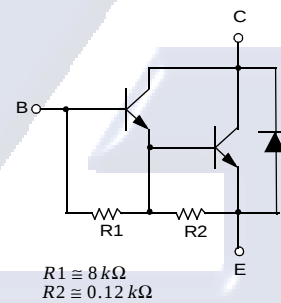


NPN Epitaxial Darlington Transistor

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

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage : TIP120	60	V
	: TIP121	80	V
	: TIP122	100	V
V_{CEO}	Collector-Emitter Voltage : TIP120	60	V
	: TIP121	80	V
	: TIP122	100	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current (DC)	5	A
I_{CP}	Collector Current (Pulse)	8	A
I_B	Base Current (DC)	120	mA
P_C	Collector Dissipation ($T_a=25^\circ\text{C}$)	2	W
	Collector Dissipation ($T_C=25^\circ\text{C}$)	65	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$

Equivalent Circuit



Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage : TIP120 : TIP121 : TIP122	$I_C = 100\text{mA}, I_B = 0$	60		V
			80		V
			100		V
					V
I_{CEO}	Collector Cut-off Current : TIP120 : TIP121 : TIP122	$V_{CE} = 30\text{V}, I_B = 0$ $V_{CE} = 40\text{V}, I_B = 0$ $V_{CE} = 50\text{V}, I_B = 0$		0.5	mA
				0.5	mA
				0.5	mA
					mA
I_{CBO}	Collector Cut-off Current : TIP120 : TIP121 : TIP122	$V_{CB} = 60\text{V}, I_E = 0$ $V_{CB} = 80\text{V}, I_E = 0$ $V_{CB} = 100\text{V}, I_E = 0$		0.2	mA
				0.2	mA
				0.2	mA
					mA
I_{EBO}	Emitter Cut-off Current	$V_{BE} = 5\text{V}, I_C = 0$		2	mA
h_{FE}	* DC Current Gain	$V_{CE} = 3\text{V}, I_C = 0.5\text{A}$ $V_{CE} = 3\text{V}, I_C = 3\text{A}$	1000 1000		
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = 3\text{A}, I_B = 12\text{mA}$ $I_C = 5\text{A}, I_B = 20\text{mA}$		2.0 4.0	V V
$V_{BE(on)}$	* Base-Emitter ON Voltage	$V_{CE} = 3\text{V}, I_C = 3\text{A}$		2.5	V
C_{ob}	Output Capacitance	$V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$		200	pF

* Pulse Test : $PW \leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

Typical characteristics

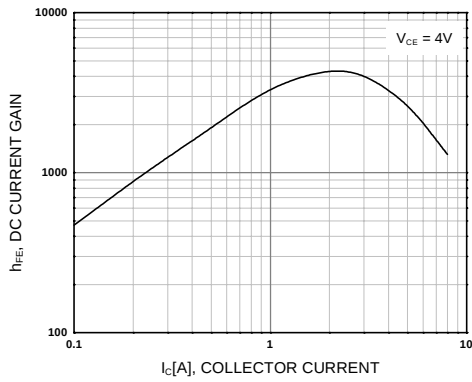


Figure 1. DC current Gain

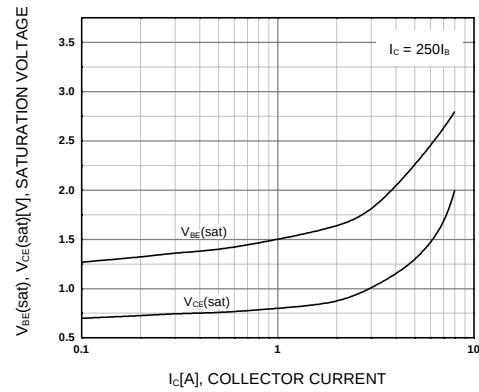


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

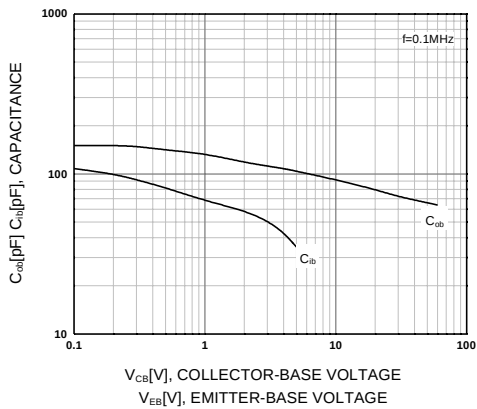


Figure 3. Output and Input Capacitance
vs. Reverse Voltage

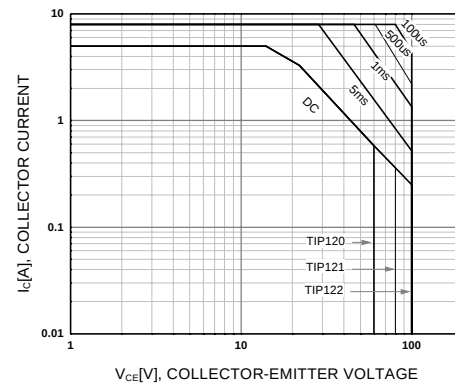


Figure 4. Safe Operating Area

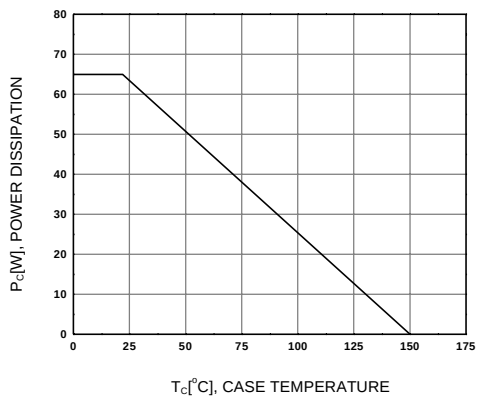
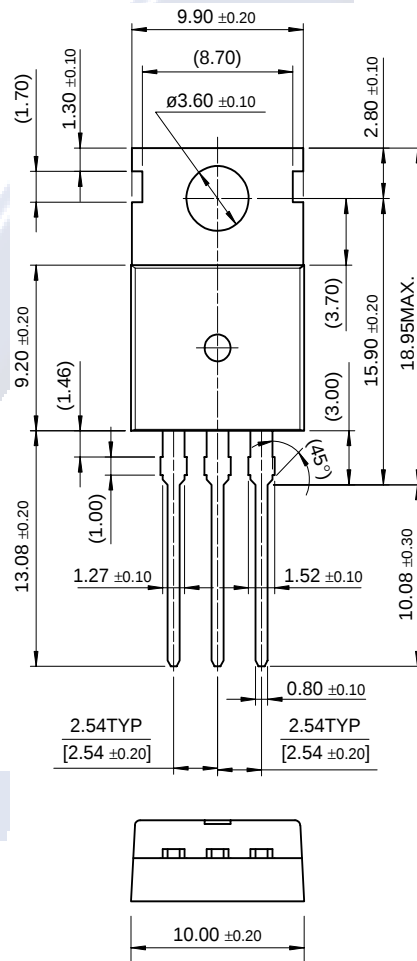


Figure 5. Power Derating

Package Dimensions

TO-220

TIP120/121/122



Dimensions in Millimeters

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