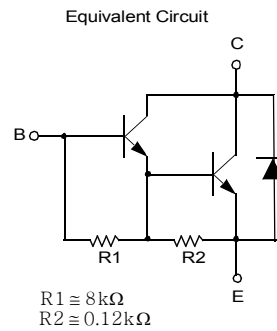
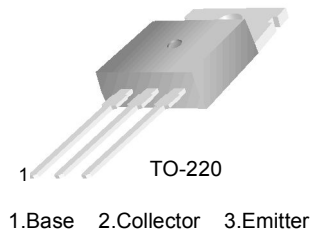


TIP120/TIP121/TIP122

NPN Epitaxial Darlington Transistor

- Medium Power Linear Switching Applications
- Complementary to TIP125/126/127



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

Symbol	Parameter	Ratings	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	$^\circ\text{C}$

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

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

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

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

Typical characteristics

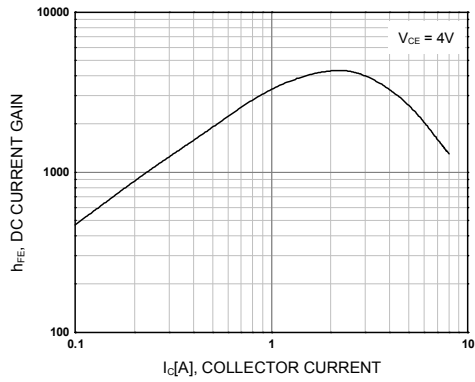


Figure 1. DC current Gain

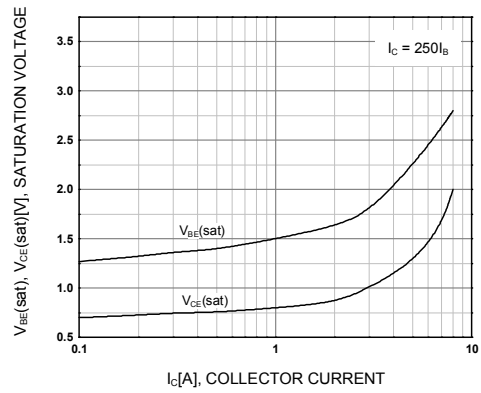


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

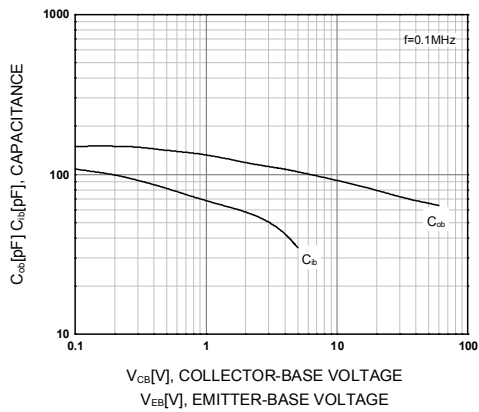


Figure 3. Output and Input Capacitance
vs. Reverse Voltage

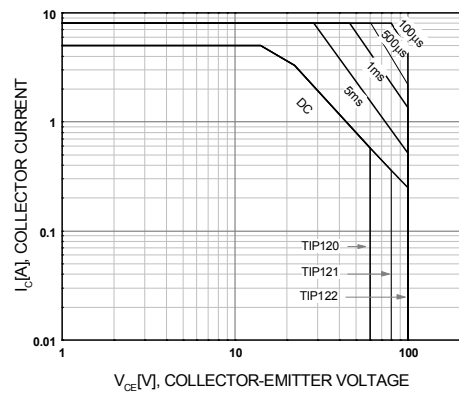


Figure 4. Safe Operating Area

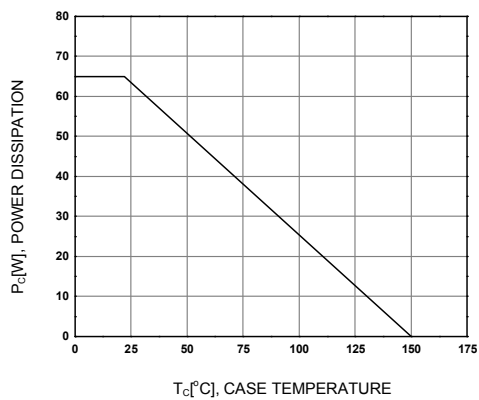
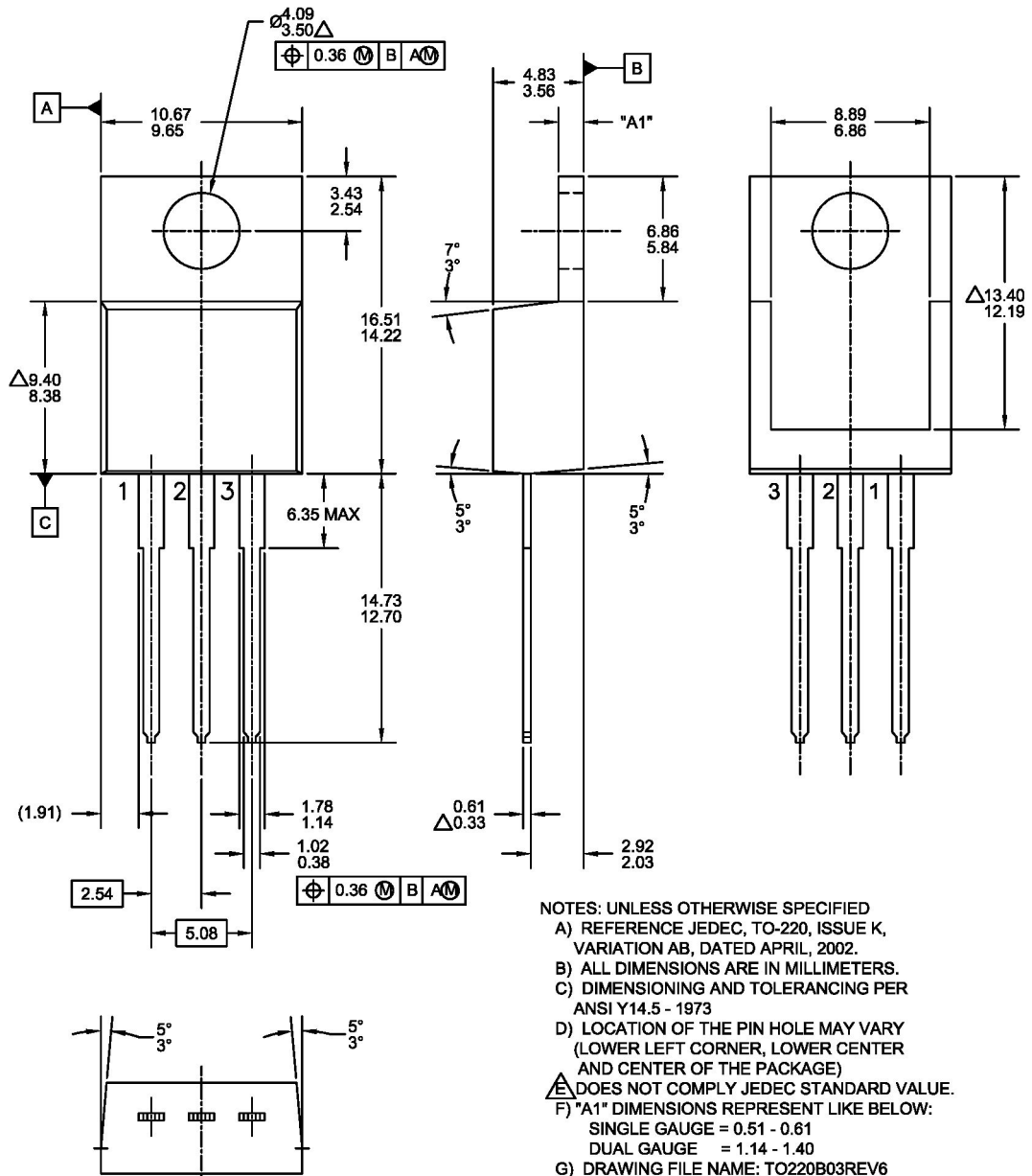


Figure 5. Power Derating

Mechanical Dimensions

TO220




- NOTES: UNLESS OTHERWISE SPECIFIED
 A) REFERENCE JEDEC, TO-220, ISSUE K, VARIATION AB, DATED APRIL, 2002.
 B) ALL DIMENSIONS ARE IN MILLIMETERS.
 C) DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973
 D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
 E) DOES NOT COMPLY JEDEC STANDARD VALUE.
 F) "A1" DIMENSIONS REPRESENT LIKE BELOW:
 SINGLE GAUGE = 0.51 - 0.61
 DUAL GAUGE = 1.14 - 1.40
 G) DRAWING FILE NAME: TO220B03REV6



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