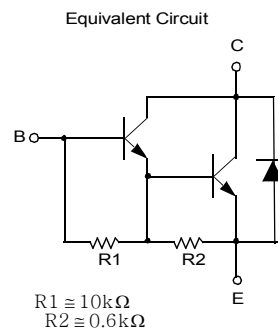
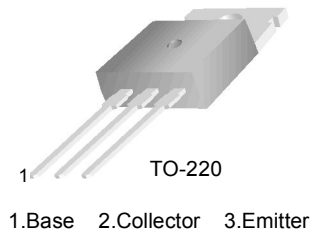


TIP110/TIP111/TIP112

NPN Epitaxial Silicon Darlington Transistor

- Monolithic Construction With Built In Base-Emitter Shunt Resistors
- Complementary to TIP115/116/117
- High DC Current Gain : $h_{FE}=1000$ @ $V_{CE}=4V$, $I_C=1A$ (Min.)
- Low Collector-Emitter Saturation Voltage
- Industrial Use



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

Symbol	Parameter	Ratings	Units
V_{CBO}	Collector-Base Voltage : TIP110	60	V
	: TIP111	80	V
	: TIP112	100	V
V_{CEO}	Collector-Emitter Voltage : TIP110	60	V
	: TIP111	80	V
	: TIP112	100	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current (DC)	2	A
I_{CP}	Collector Current (Pulse)	4	A
I_B	Base Current (DC)	50	mA
P_C	Collector Dissipation ($T_a=25^\circ C$)	2	W
	Collector Dissipation ($T_C=25^\circ C$)	50	W
T_J	Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature	- 65 ~ 150	$^\circ C$

* 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	$I_C = 30\text{mA}, I_B = 0$	60 80 100			V V V
	: TIP110					
	: TIP111 : TIP112					
I_{CEO}	Collector Cut-off Current	$V_{\text{CE}} = 30\text{V}, I_B = 0$ $V_{\text{CE}} = 40\text{V}, I_B = 0$ $V_{\text{CE}} = 50\text{V}, I_B = 0$			2 2 2	mA mA mA
	: TIP110					
	: TIP111 : TIP112					
I_{CBO}	Collector Cut-off Current	$V_{\text{CB}} = 60\text{V}, I_E = 0$ $V_{\text{CB}} = 80\text{V}, I_E = 0$ $V_{\text{CB}} = 100\text{V}, I_E = 0$			1 1 1	mA mA mA
	: TIP110					
	: TIP111 : TIP112					
I_{EBO}	Emitter Cut-off Current	$V_{\text{BE}} = 5\text{V}, I_C = 0$			2	mA
h_{FE}	DC Current Gain	$V_{\text{CE}} = 4\text{V}, I_C = 1\text{A}$	1000 500			
		$V_{\text{CE}} = 4\text{V}, I_C = 2\text{A}$				
$V_{\text{CE(sat)}}$	Collector-Emitter Saturation Voltage	$I_C = 2\text{A}, I_B = 8\text{mA}$			2.5	V
$V_{\text{BE(on)}}$	Base-Emitter On Voltage	$V_{\text{CE}} = 4\text{V}, I_C = 2\text{A}$			2.8	V
C_{ob}	Output Capacitance	$V_{\text{CB}} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$			100	pF

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

Typical Characteristics

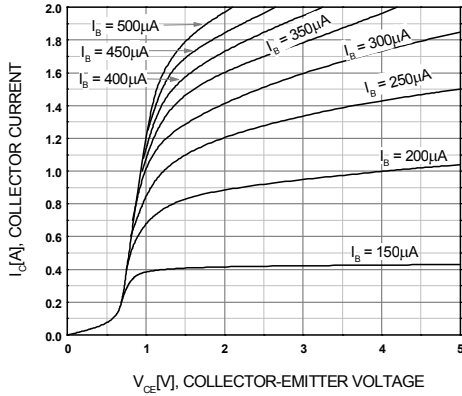


Figure 1. Static Characteristic

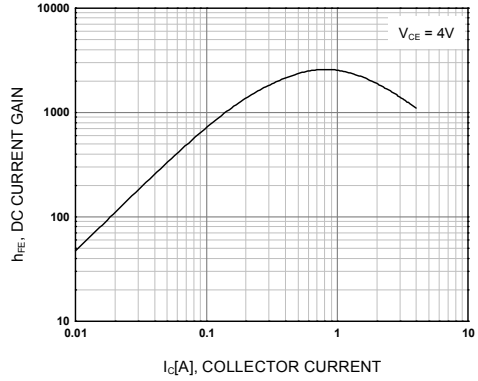


Figure 2. DC current Gain

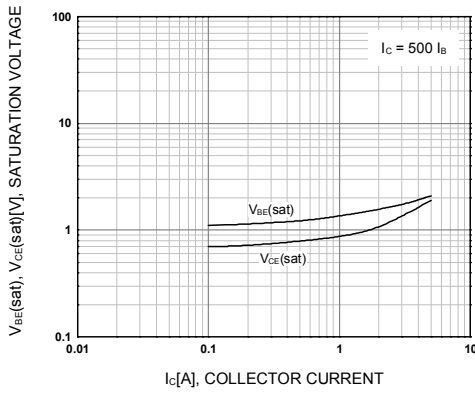


Figure 3. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

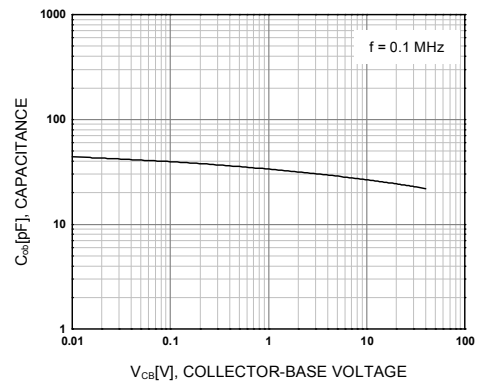


Figure 4. Collector Output Capacitance

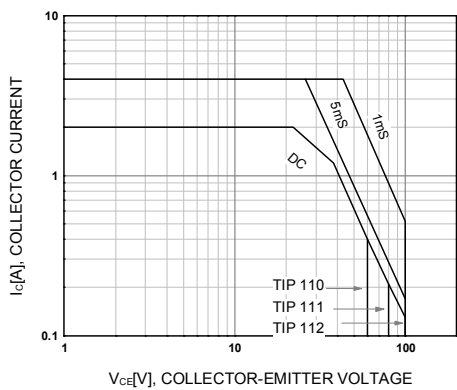


Figure 5. Safe Operating Area

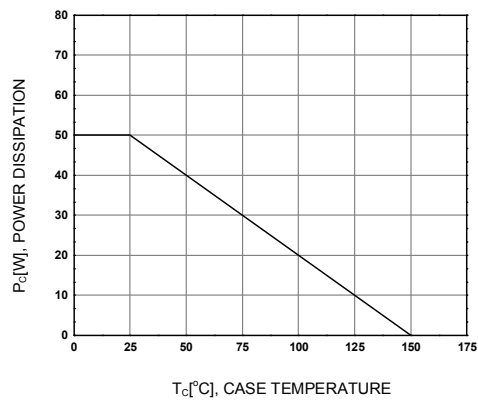
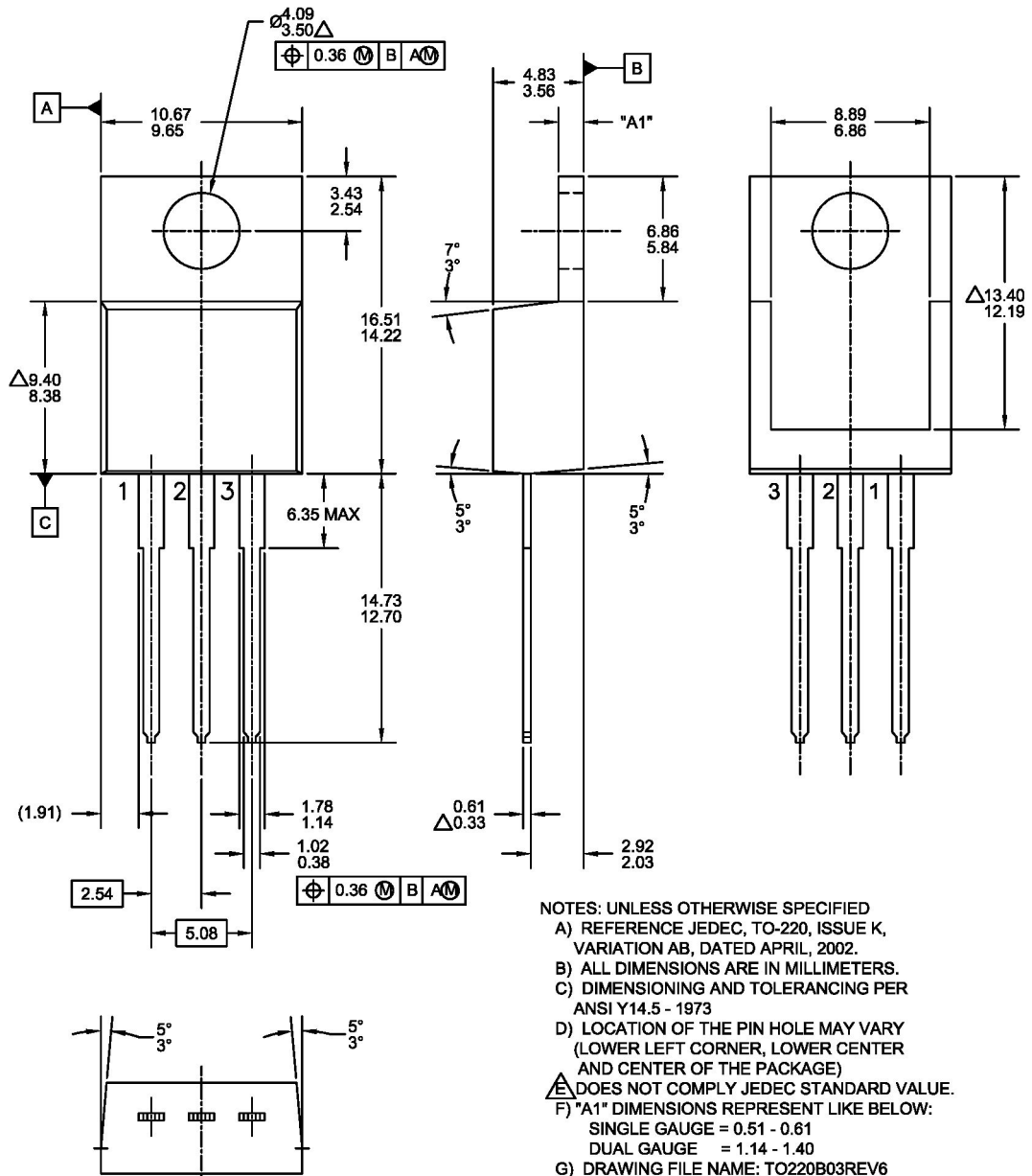


Figure 6. Power Derating

Mechanical Dimensions

TO220





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