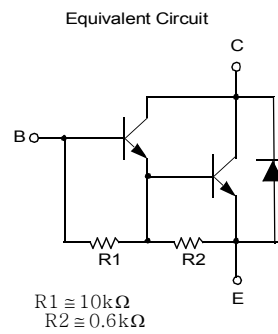
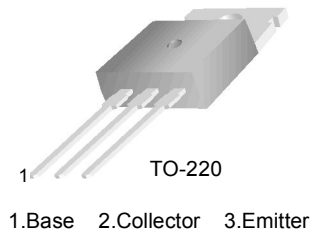


# TIP110/TIP111/TIP112

## 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					
$I_{\text{CEO}}$	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					
$I_{\text{CBO}}$	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					
$I_{\text{EBO}}$	Emitter Cut-off Current	$V_{\text{BE}} = 5\text{V}, I_C = 0$			2	mA
$h_{\text{FE}}$	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
$C_{\text{ob}}$	Output Capacitance	$V_{\text{CB}} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$			100	pF

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

# Typical Characteristics

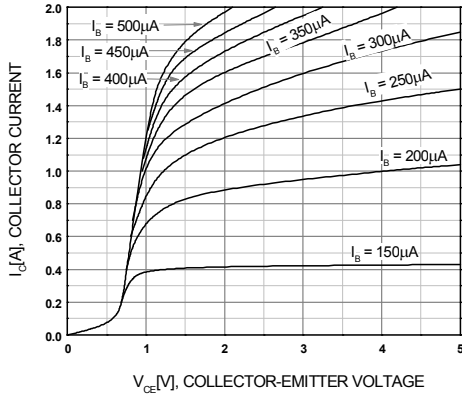


Figure 1. Static Characteristic

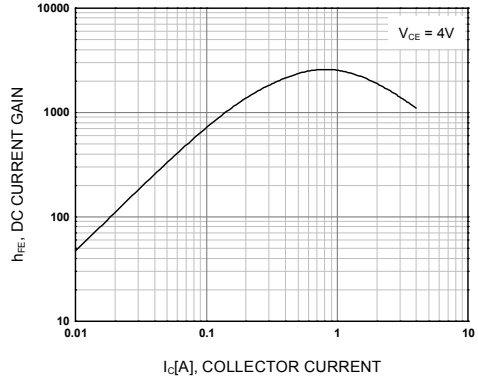


Figure 2. DC current Gain

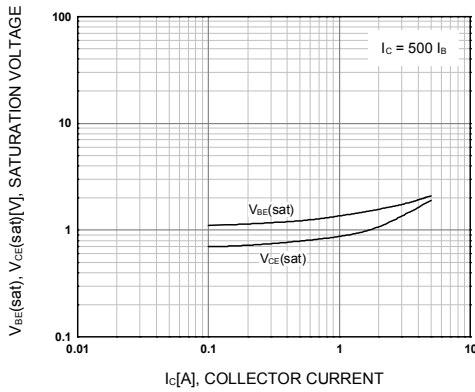


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

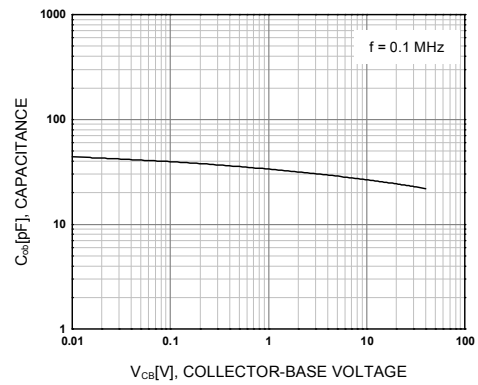


Figure 4. Collector Output Capacitance

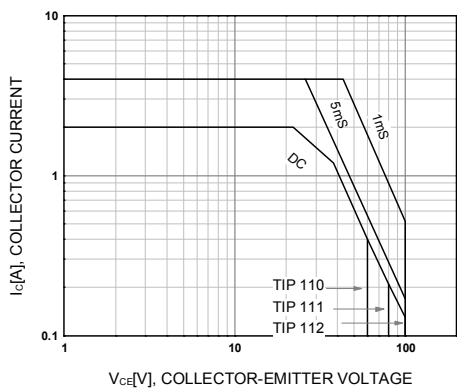


Figure 5. Safe Operating Area

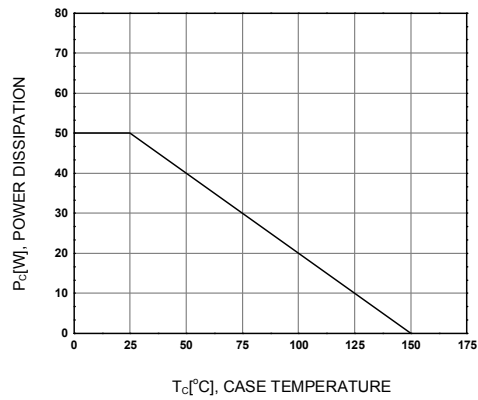
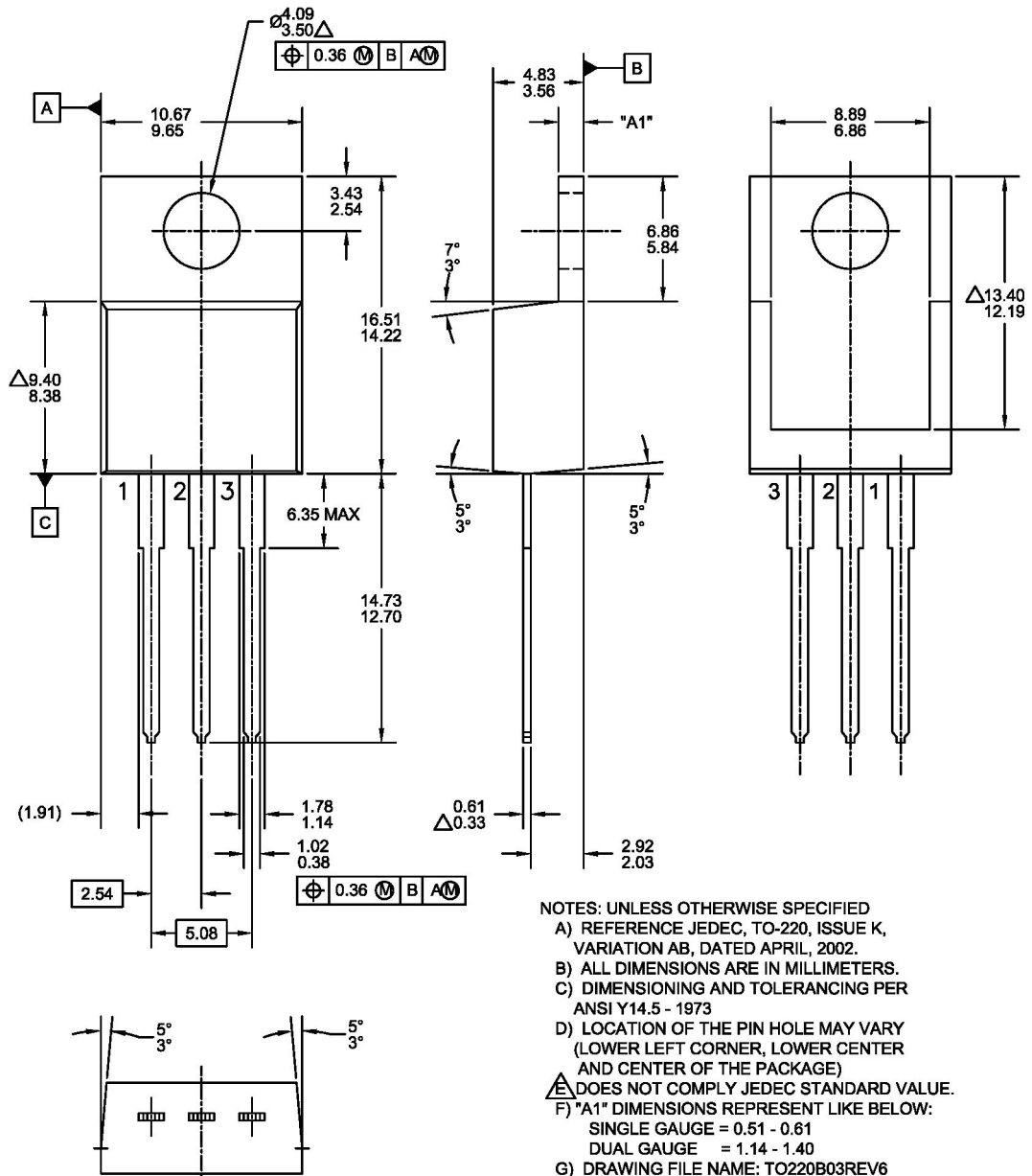


Figure 6. Power Derating

Mechanical Dimensions


TO220





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