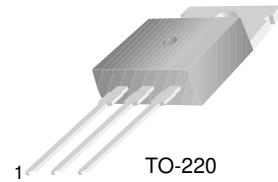


## TIP110/111/112

### 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

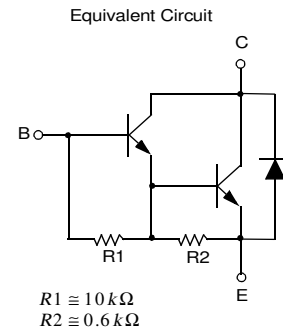


1.Base 2.Collector 3.Emitter

### NPN Epitaxial Silicon Darlington Transistor

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

Symbol	Parameter	Value	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 ( $T_a=25^\circ\text{C}$ )	2	W
	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	50	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$



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

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

# Typical Characteristics

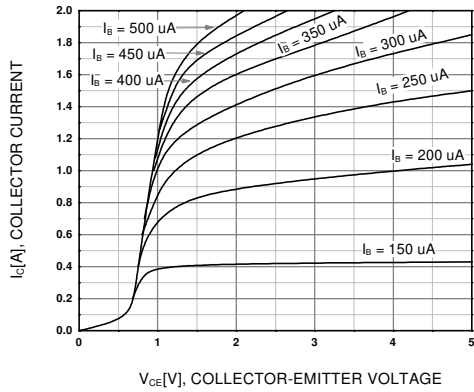


Figure 1. Static Characteristic

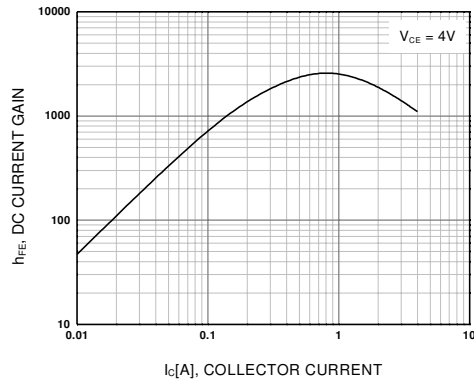


Figure 2. DC current Gain

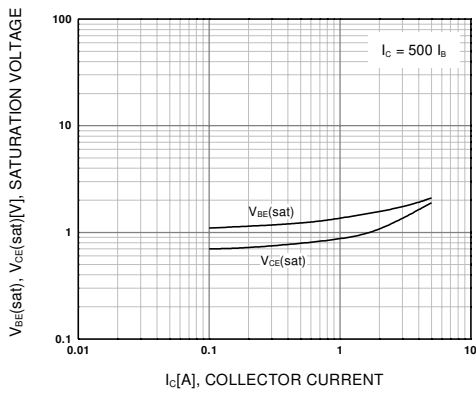


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emmitter Saturation Voltage

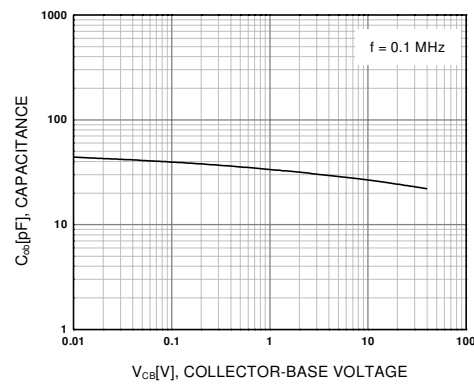


Figure 4. Collector Output Capacitance

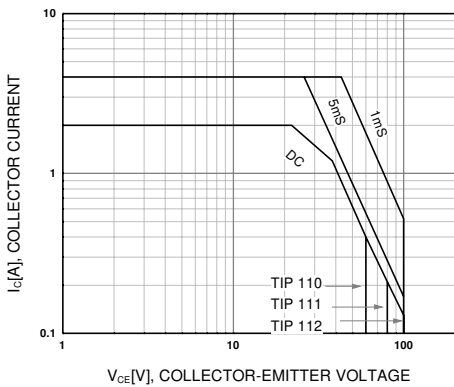


Figure 5. Safe Operating Area

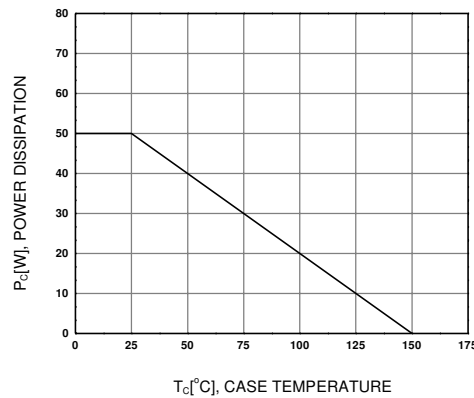
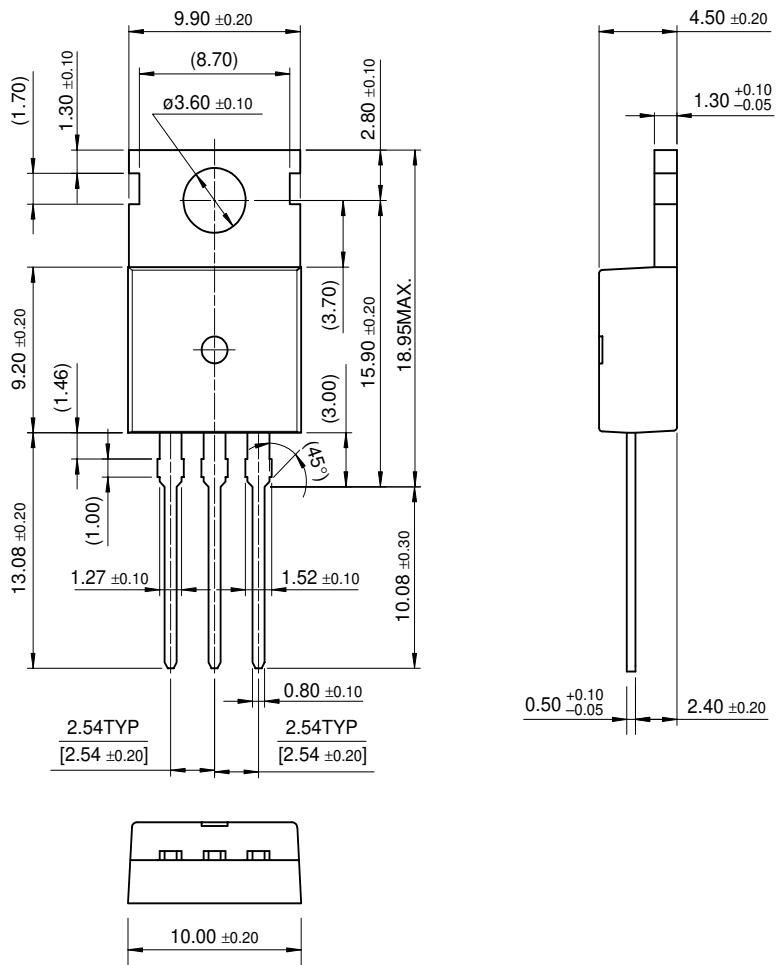


Figure 6. Power Derating

# Package Dimensions

TIP110/111/112

## TO-220



Dimensions in Millimeters

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