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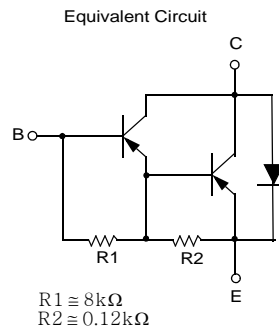
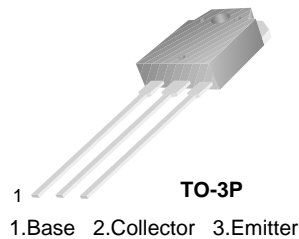
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# TIP145 / TIP146 / TIP147

## PNP Epitaxial Silicon Darlington Transistor

### Features

- Monolithic Construction With Built In Base-Emitter Shunt Resistors
- High DC Current Gain :  $h_{FE} = 1000$  @  $V_{CE} = -4V$ ,  $I_C = -5A$  (Min.)
- Industrial Use
- Complement to TIP140/141/142



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

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage : TIP145	- 60	V
	: TIP146	- 80	V
	: TIP147	- 100	V
$V_{CEO}$	Collector-Emitter Voltage : TIP145	- 60	V
	: TIP146	- 80	V
	: TIP147	- 100	V
$V_{EBO}$	Emitter-Base Voltage	- 5	V
$I_C$	Collector Current (DC)	- 10	A
$I_{CP}$	Collector Current (Pulse)	- 15	A
$I_B$	Base Current (DC)	- 0.5	A
$P_C$	Collector Dissipation ( $T_C=25^\circ C$ )	125	W
$T_J$	Junction Temperature	150	$^\circ C$
$T_{STG}$	Storage Temperature	- 65 to +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
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage : TIP145 : TIP146 : TIP147	$I_C = -30\text{mA}, I_B = 0$	-60 -80 -100			V V V
$I_{CEO}$	Collector Cut-off Current : TIP145 : TIP146 : TIP147	$V_{CE} = -30\text{V}, I_B = 0$ $V_{CE} = -40\text{V}, I_B = 0$ $V_{CE} = -50\text{V}, I_B = 0$			-2 -2 -2	mA mA mA
$I_{CBO}$	Collector Cut-off Current : TIP145 : TIP146 : TIP147	$V_{CB} = -60\text{V}, I_E = 0$ $V_{CB} = -80\text{V}, I_E = 0$ $V_{CB} = -100\text{V}, I_E = 0$			-1 -1 -1	mA mA mA
$I_{EBO}$	Emitter Cut-off Current	$V_{BE} = -5\text{V}, I_C = 0$			-2	mA
$h_{FE}$	DC Current Gain	$V_{CE} = -4\text{V}, I_C = -5\text{A}$ $V_{CE} = -4\text{V}, I_C = -10\text{A}$	1000 500			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -5\text{A}, I_B = -10\text{mA}$ $I_C = -10\text{A}, I_B = -40\text{mA}$			-2 -3	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = -10\text{A}, I_B = -40\text{mA}$			-3.5	V
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = -4\text{V}, I_C = -10\text{A}$			-3	V
$t_D$	Delay Time	$V_{CC} = -30\text{V}, I_C = -5\text{A}$ $I_{B1} = -20\text{mA}, I_{B2} = 20\text{mA}$ $R_L = 6\Omega$		0.15		$\mu\text{s}$
$t_R$	Rise Time			0.55		$\mu\text{s}$
$t_{STG}$	Storage Time			2.5		$\mu\text{s}$
$t_F$	Fall Time			2.5		$\mu\text{s}$

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

Typical Performance Characteristics

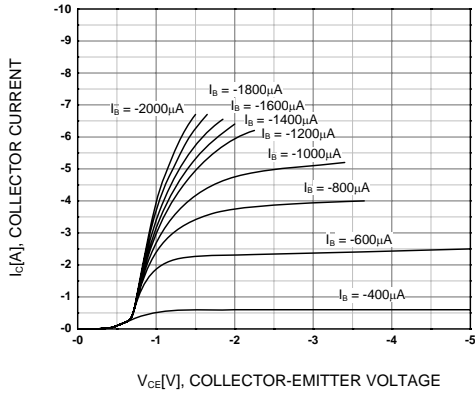


Figure 1. Static Characteristic

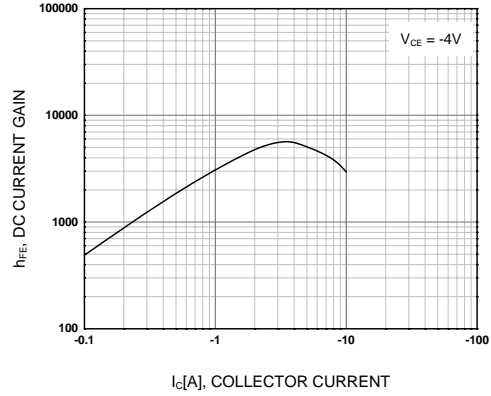


Figure 2. DC current Gain

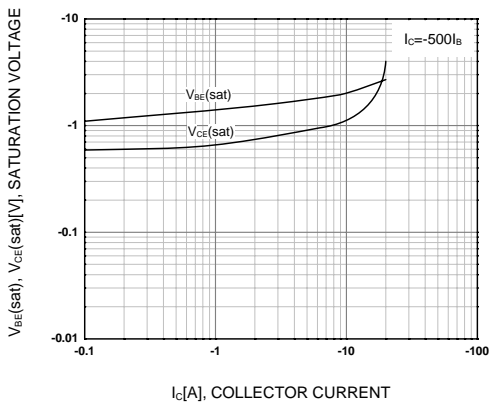


Figure 3. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

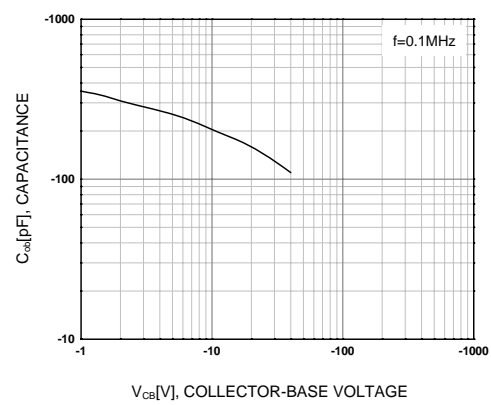


Figure 4. Collector Output Capacitance

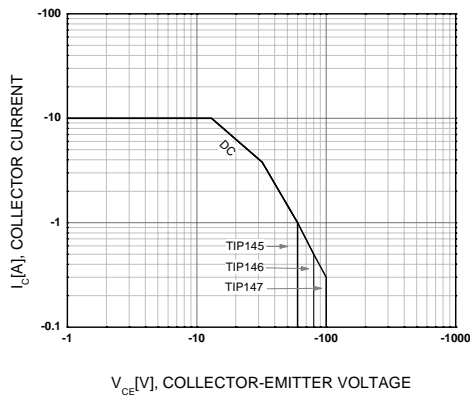


Figure 5. Safe Operating Area

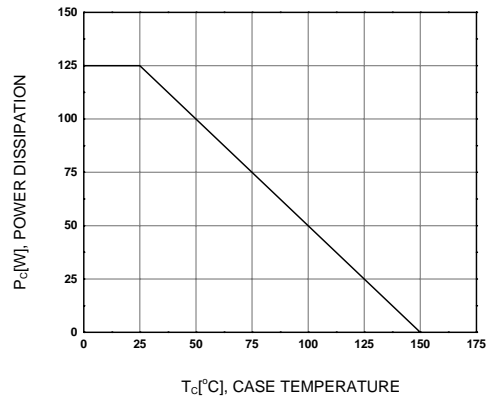
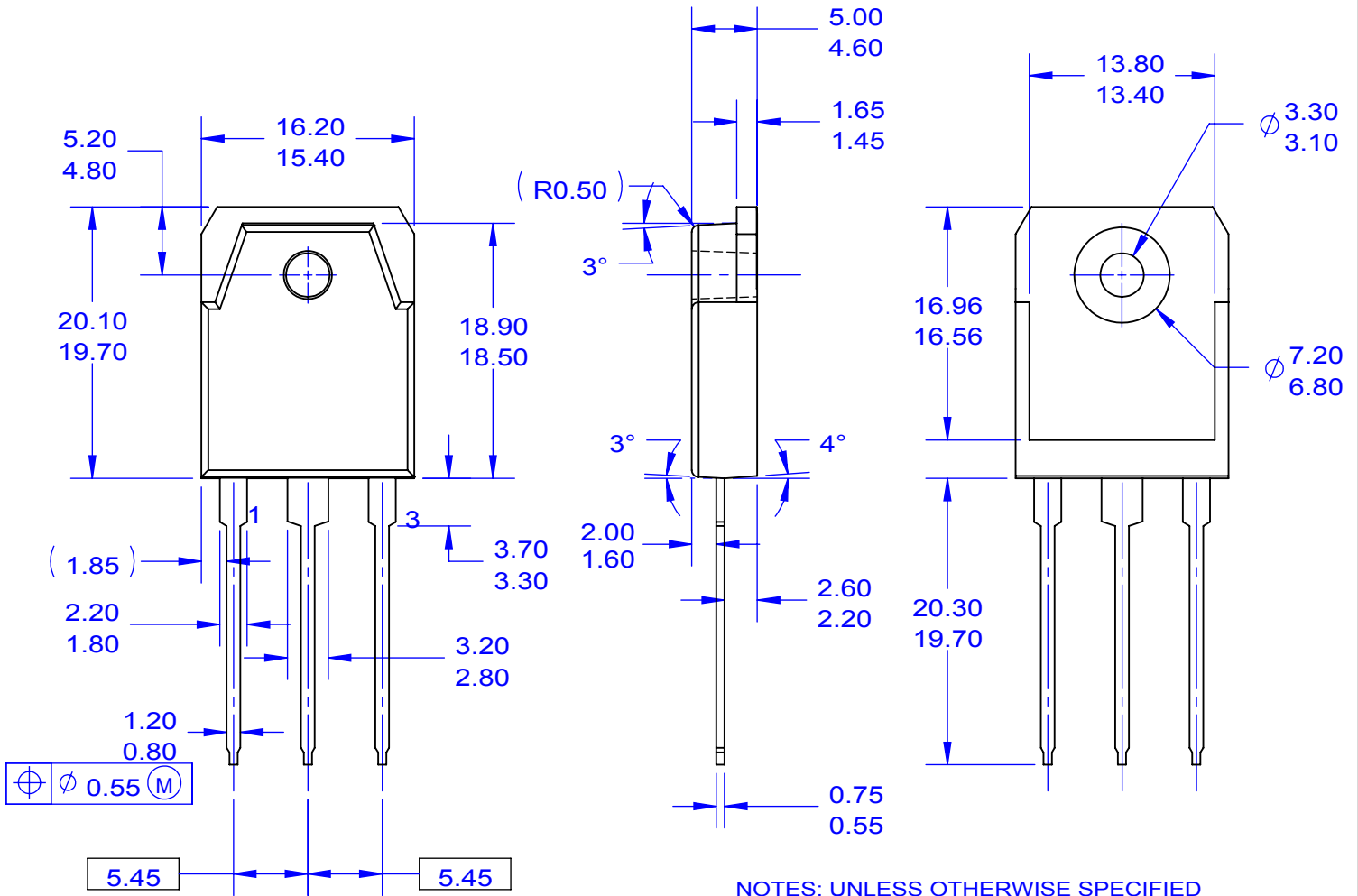


Figure 6. Power Derating



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