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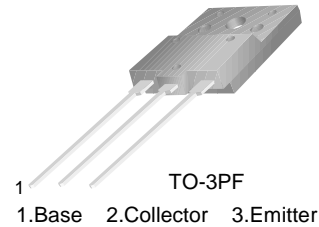
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## TIP145F/146F/147F

### 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 TIP140F/141F/142F

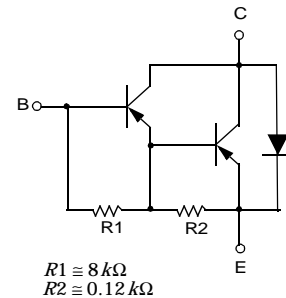


### PNP Epitaxial Darlington Transistor

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

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Emitter Voltage : TIP145F	- 60	V
	: TIP146F	- 80	V
	: TIP147F	- 100	V
$V_{CEO}$	Collector-Emitter Voltage : TIP145F	- 60	V
	: TIP146F	- 80	V
	: TIP147F	- 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 ( $T_C=25^\circ\text{C}$ )	60	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$

Equivalent Circuit



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = -30\text{mA}$ , $I_B = 0$	- 60 - 80 - 100			V
	: TIP145F					V
	: TIP146F					V
$I_{CEO}$	Collector Cut-off Current	$V_{CE} = -30V$ , $I_B = 0$ $V_{CE} = -40V$ , $I_B = 0$ $V_{CE} = -50V$ , $I_B = 0$			- 2 - 2 - 2	mA
	: TIP145F					mA
	: TIP146F					mA
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = -60V$ , $I_E = 0$ $V_{CB} = -80V$ , $I_E = 0$ $V_{CB} = -100V$ , $I_E = 0$			- 1 - 1 - 1	mA
	: TIP145F					mA
	: TIP146F					mA
$I_{EBO}$	Emitter Cut-off Current	$V_{BE} = -5V$ , $I_C = 0$			- 2	mA
$h_{FE}$	DC Current Gain	$V_{CE} = -4V$ , $I_C = -5A$	1000			
		$V_{CE} = -4V$ , $I_C = -10A$	500			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -5A$ , $I_B = -10\text{mA}$			- 2	V
		$I_C = -10A$ , $I_B = -40\text{mA}$			- 3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = -10A$ , $I_B = -40\text{mA}$			- 3.5	V
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = -4V$ , $I_C = -10A$			- 3	V
$t_D$	Delay Time	$V_{CC} = -30V$ , $I_C = -5A$ $I_{B1} = -20\text{mA}$ , $I_{B2} = 20\text{mA}$ $R_L = 6\Omega$		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		$\mu\text{s}$

# Typical Characteristics

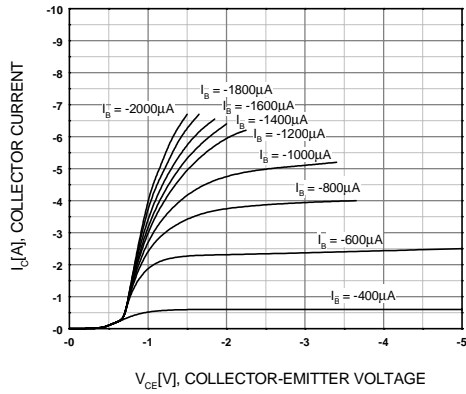


Figure 1. Static Characteristic

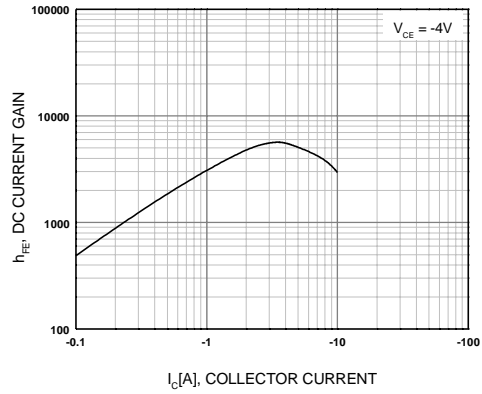


Figure 2. DC current Gain

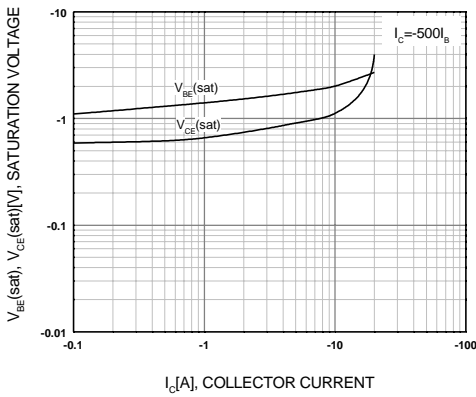


Figure 3. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

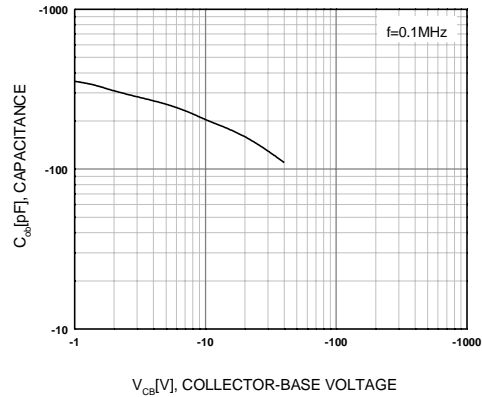


Figure 4. Collector Output Capacitance

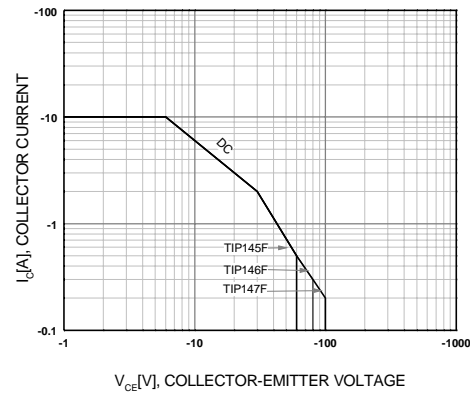


Figure 5. Safe Operating Area

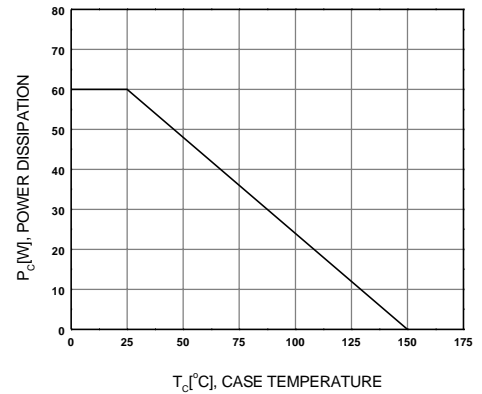
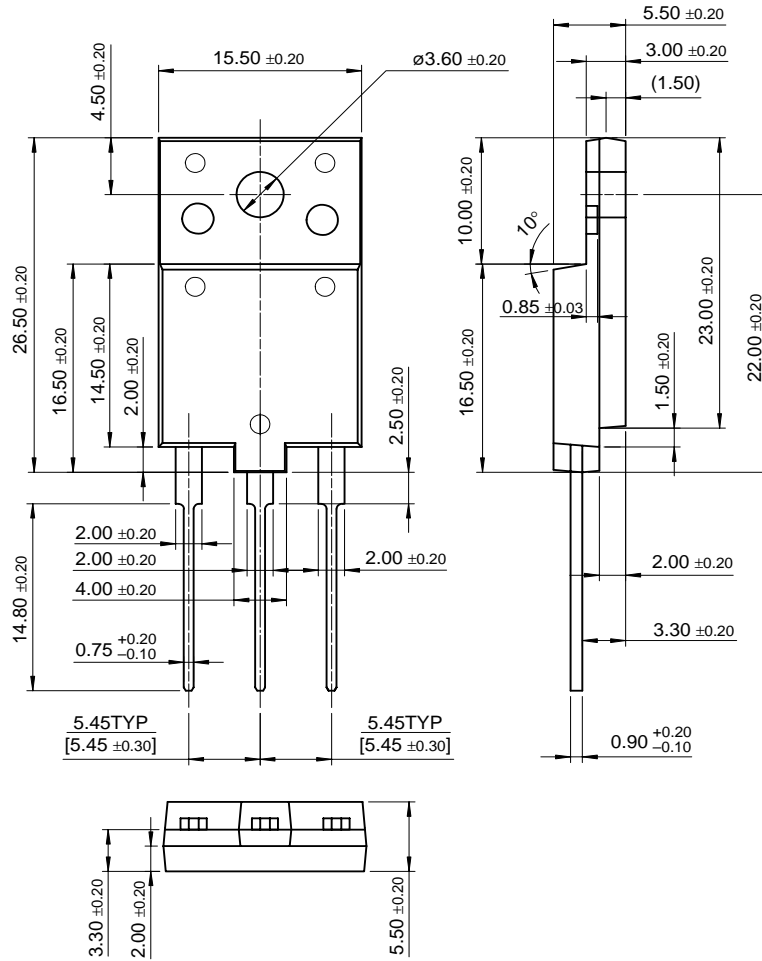


Figure 6. Power Derating

# Package Dimensions

## TO-3PF

TIP145F/146F/147F



Dimensions in Millimeters

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