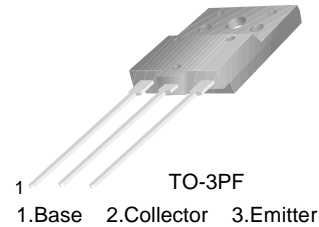


## TIP140F/141F/142F

### Monolithic Construction With Built In Base-Emitter Shunt Resistors

- Complement to TIP145F/146F/147F
- High DC Current Gain :  $h_{FE} = 1000$  @  $V_{CE} = 4V$ ,  $I_C = 5A$  (Min.)
- Industrial Use

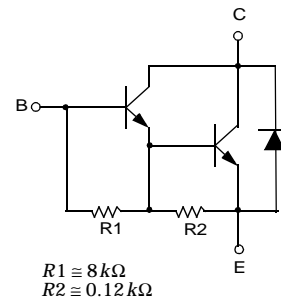


### NPN Epitaxial Darlington Transistor

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

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage : TIP140F	60	V
	: TIP141F	80	V
	: TIP142F	100	V
$V_{CEO}$	Collector-Emitter Voltage : TIP140F	60	V
	: TIP141F	80	V
	: TIP142F	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 : TIP140F : TIP141F : TIP142F	$I_C = 30\text{mA}$ , $I_B = 0$	60			V
			80			V
			100			V
$I_{CEO}$	Collector Cut-off Current : TIP140F : TIP141F : TIP142F	$V_{CE} = 30V$ , $I_B = 0$			2	mA
		$V_{CE} = 40V$ , $I_B = 0$			2	mA
		$V_{CE} = 50V$ , $I_B = 0$			2	mA
$I_{CBO}$	Collector Cut-off Current : TIP140F : TIP141F : TIP142F	$V_{CB} = 60V$ , $I_E = 0$			1	mA
		$V_{CB} = 80V$ , $I_E = 0$			1	mA
		$V_{CB} = 100V$ , $I_E = 0$			1	mA
$I_{EBO}$	Emitter Cut-off Current	$V_{BE} = 5V$ , $I_C = 0$			2	mA
$h_{FE}$	DC Current Gain	$V_{CE} = 4V$ , $I_C = 5A$ $V_{CE} = 4V$ , $I_C = 10A$	1000 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	$V_{CC} = 30V$ , $I_C = 5A$		0.15		$\mu\text{s}$
$t_R$	Rise Time	$I_B 1 = 20\text{mA}$ , $I_B 2 = -20\text{mA}$ $R_L = 6\Omega$		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

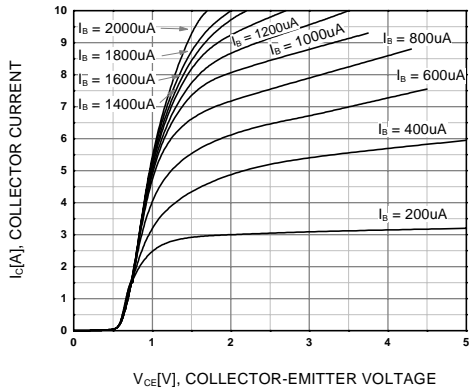


Figure 1. Static Characteristics

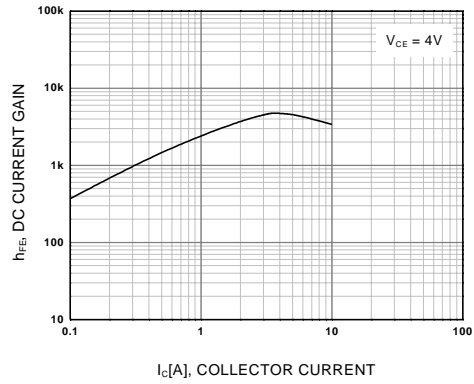


Figure 2. DC current Gain

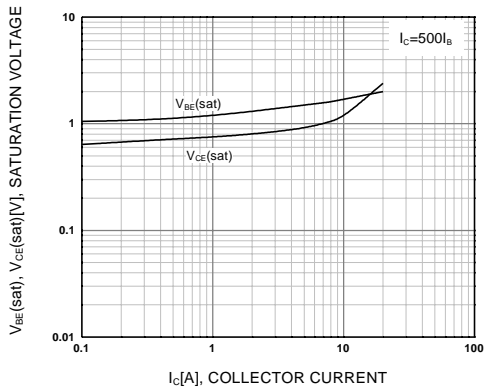


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

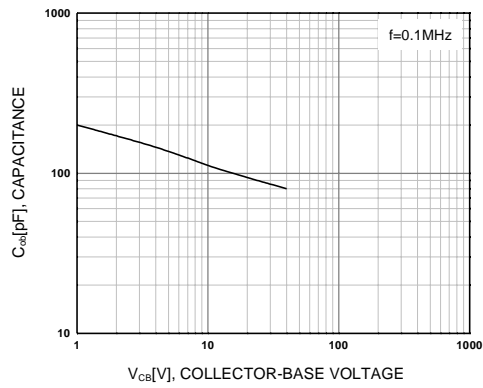


Figure 4. Collector Output Capacitance

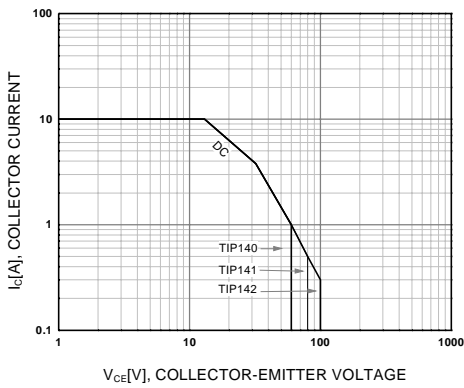


Figure 5. Safe Operating Area

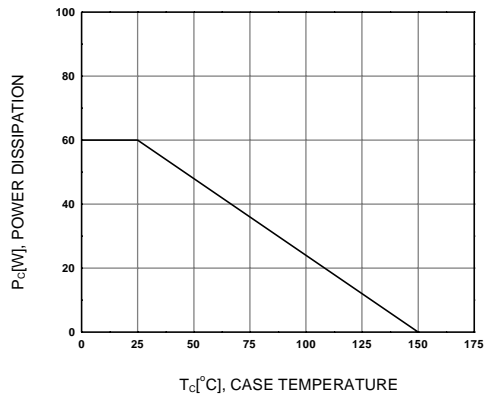
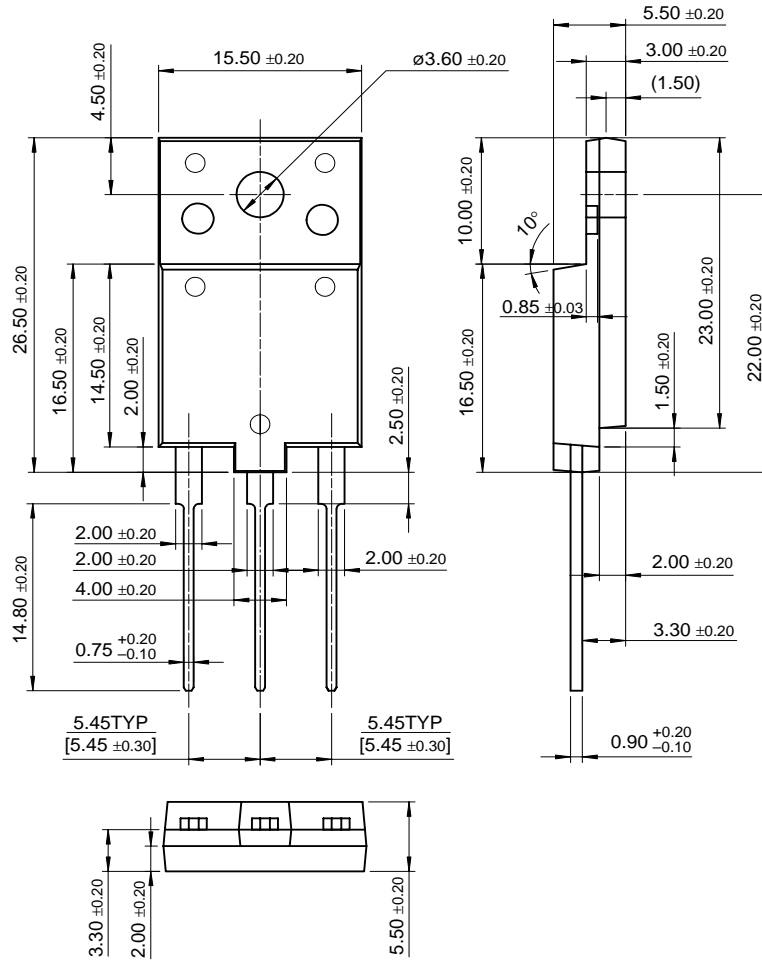


Figure 6. Power Derating

# Package Dimensions

## TO-3PF

TIP140F/141F/142F



Dimensions in Millimeters

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E <sup>2</sup> CMOS™	LittleFET™	QT Optoelectronics™	TinyLogic™
EnSigna™	MicroFET™	Quiet Series™	UHC™
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