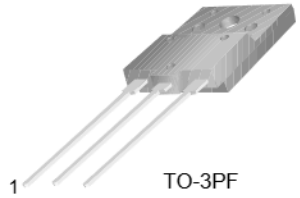
FAIRCHILD
SEMICONDUCTOR®

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



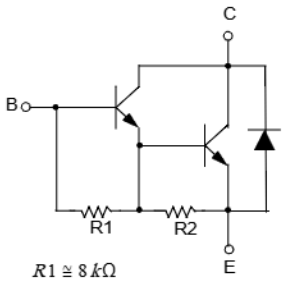
TO-3PF
1.Base 2.Collector 3.Emitter

NPN Epitaxial Darlington Transistor

Absolute Maximum Ratings T_C=25°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°C)		60	W
T_J	Junction Temperature		150	°C
T_{STG}	Storage Temperature		- 65 ~ 150	°C

Equivalent Circuit



$R1 \cong 8\,k\Omega$
$R2 \cong 0.12\,k\Omega$

Electrical Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V_{CEO}(sus)	Collector-Emitter Sustaining Voltage					
	: TIP140F	I_C = 30mA, I_B = 0	60			V
	: TIP141F		80			V
	: TIP142F		100			V
I_{CEO}	Collector Cut-off Current					
	: TIP140F	V_{CE} = 30V, I_B = 0			2	mA
	: TIP141F	V_{CE} = 40V, I_B = 0			2	mA
	: TIP142F	V_{CE} = 50V, I_B = 0			2	mA
I_{CBO}	Collector Cut-off Current					
	: TIP140F	V_{CB} = 60V, I_E = 0			1	mA
	: TIP141F	V_{CB} = 80V, I_E = 0			1	mA
	: TIP142F	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	1000			
		V_{CE} = 4V, I_C = 10A	500			
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C = 5A, I_B = 10mA			2	V
		I_C = 10A, I_B = 40mA			3	V
V_{BE}(sat)	Base-Emitter Saturation Voltage	I_C = 10A, I_B = 40mA			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		∝s
t_R	Rise Time	$I_{B\,1}$= 20mA, I_{B2} = -20mA		0.55		∝s
t_{STG}	Storage Time	R_L = 6Ω		2.5		∝s
t_F	Fall Time			2.5		∝s

Typical Characteristics

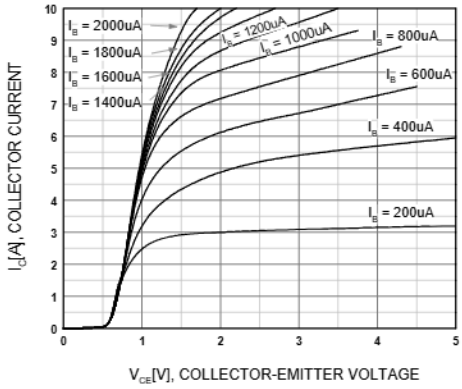


Figure 1. Static Characteristics

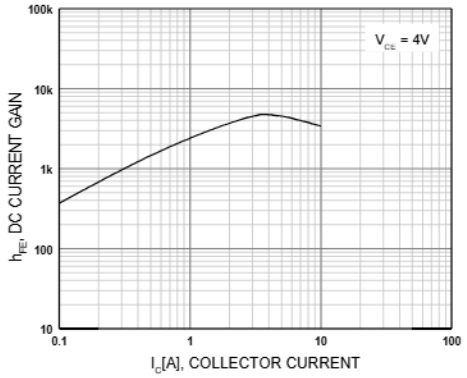


Figure 2. DC current Gain

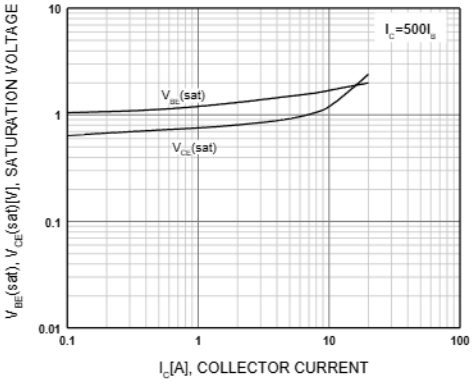


Figure 3. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

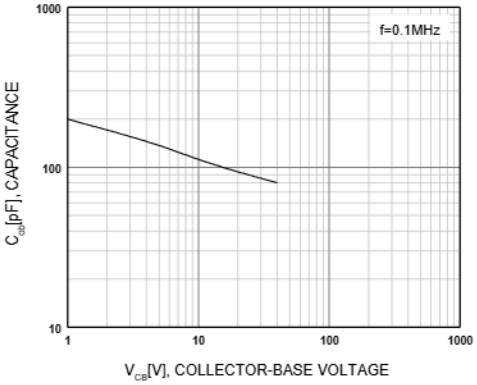


Figure 4. Collector Output Capacitance

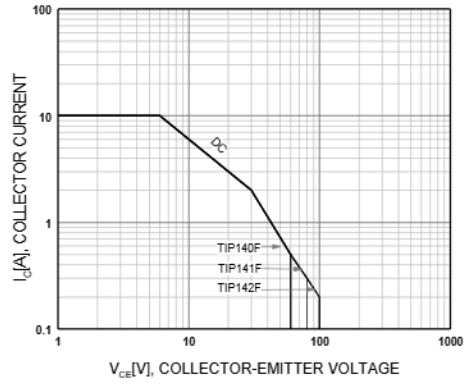


Figure 5. Safe Operating Area

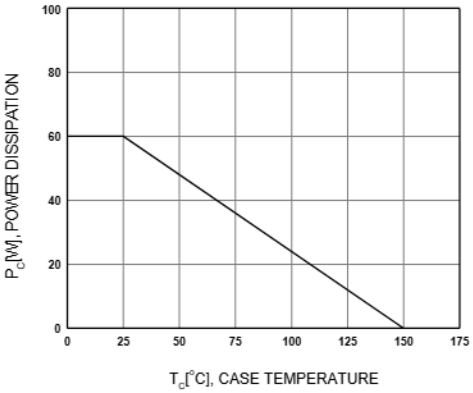
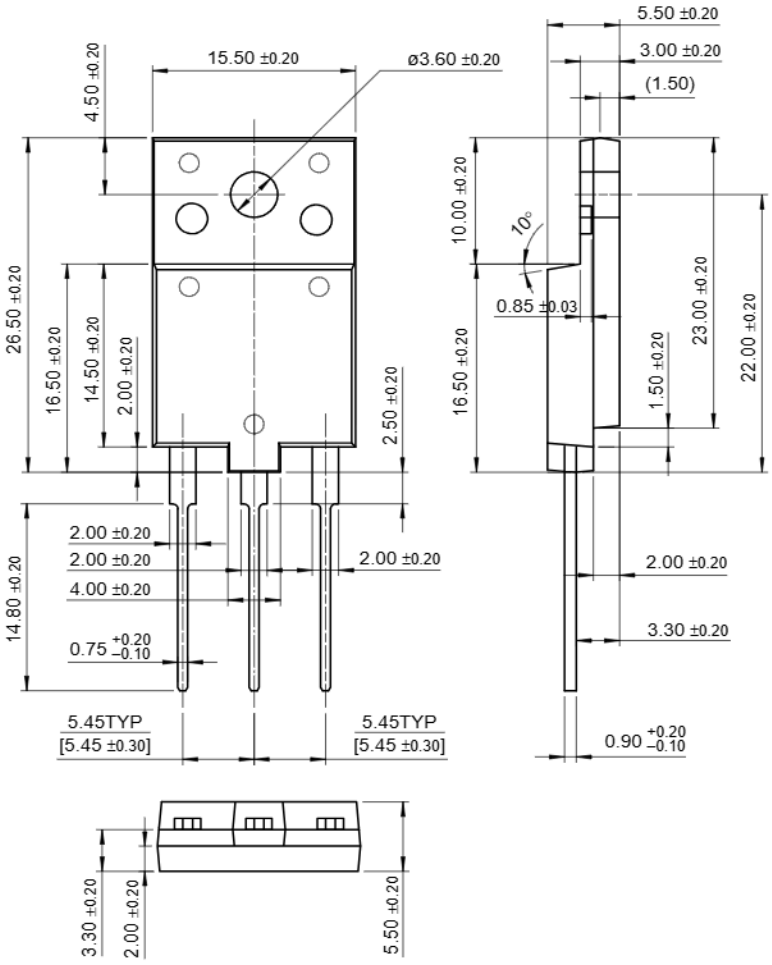


Figure 6. Power Derating

Package Dimensions

TO-3PF



Dimensions in Millimeters

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CROSSVOLT™	FRFET™	MicroPak™	QFET™	SuperSOT™-8
DOME™	GlobalOptoisolator™	MICROWIRE™	QS™	SyncFET™
EcoSPARK™	GTO™	MSX™	QT Optoelectronics™	TinyLogic™
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Programmable Active Droop™		OPTOPLANAR™	SMART START™	

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