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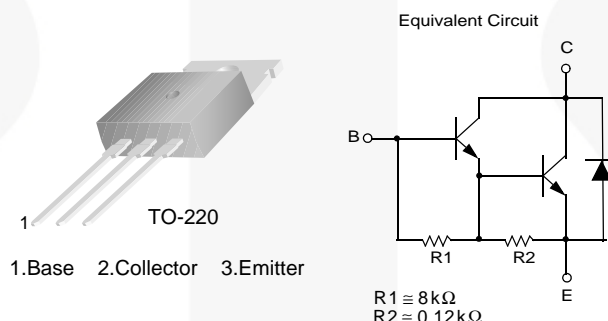
November 2014

# TIP142T

## NPN Epitaxial Silicon Darlington Transistor

### Features

- Monolithic Construction with Built-in Base-Emitter Shunt Resistors
- High DC Current Gain:  $h_{FE} = 1000$  at  $V_{CE} = 4$  V,  $I_C = 5$  A (Minimum)
- Industrial Use
- Complement to TIP147T



### Ordering Information

Part Number	Top Mark	Package	Packing Method
TIP142T	TIP142T	TO-220 3L (Single Gauge)	Bulk
TIP142TTU	TIP142T	TO-220 3L (Single Gauge)	Rail

### Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	100	V
$V_{CEO}$	Collector-Emitter Voltage	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 ( $T_C = 25^\circ\text{C}$ )	80	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-65 to 150	$^\circ\text{C}$

## Electrical Characteristics

Values are at  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 30\text{ mA}, I_B = 0$	100			V
$I_{CEO}$	Collector Cut-Off Current	$V_{CE} = 50\text{ V}, I_B = 0$			2	mA
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 100\text{ V}, I_E = 0$			1	mA
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 5\text{ V}, I_C = 0$			2	mA
$h_{FE}$	DC Current Gain	$V_{CE} = 4\text{ V}, I_C = 5\text{ A}$	1000			
		$V_{CE} = 4\text{ V}, I_C = 10\text{ A}$	500			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 5\text{ A}, I_B = 10\text{ mA}$			2	V
		$I_C = 10\text{ A}, I_B = 40\text{ mA}$			3	
$V_{BE(sat)}$	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			2.50		$\mu\text{s}$
$t_F$	Fall Time			2.50		$\mu\text{s}$

## Typical Performance Characteristics

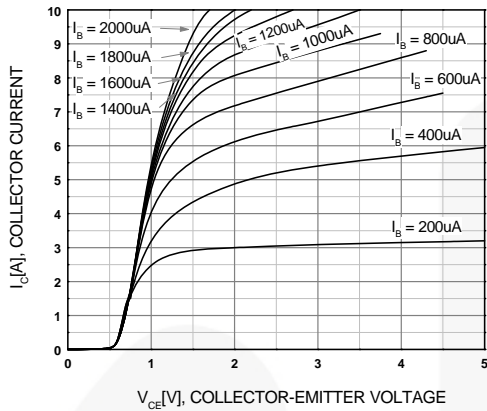


Figure 1. Static Characteristic

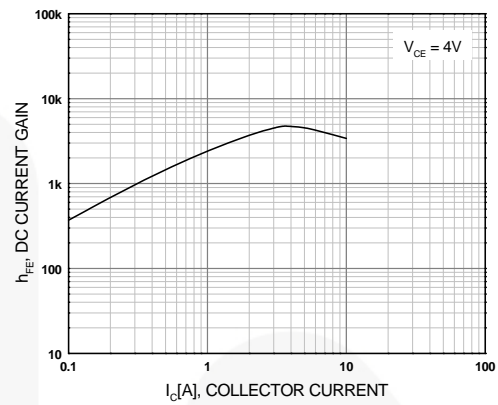


Figure 2. DC Current Gain

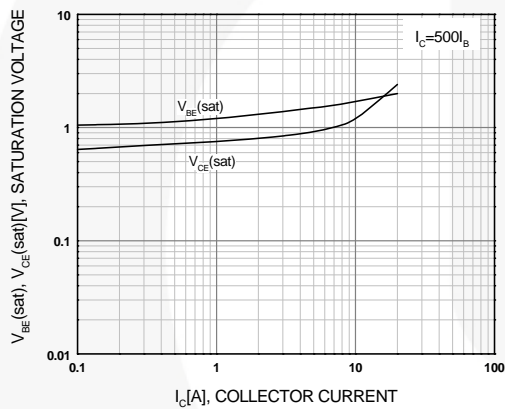


Figure 3. Collector-Emitter Saturation Voltage and Base-Emitter Saturation Voltage

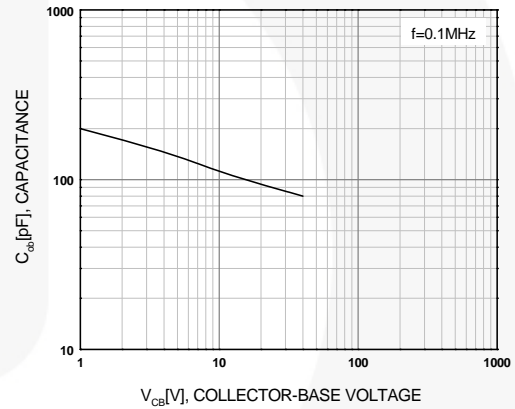


Figure 4. Collector Output Capacitance

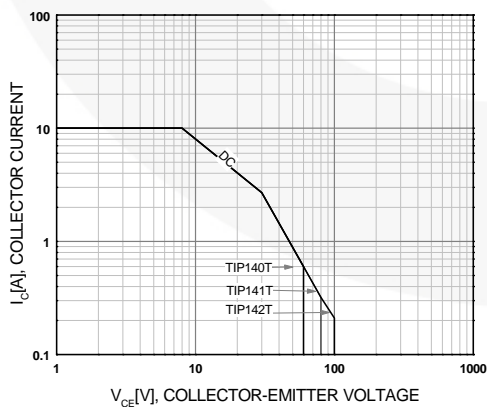


Figure 5. Safe Operating Area

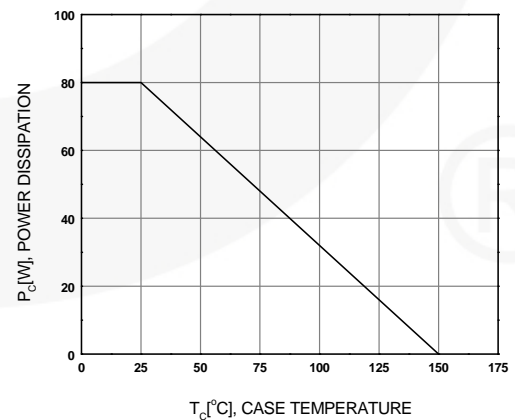


Figure 6. Power Derating

# Physical Dimensions

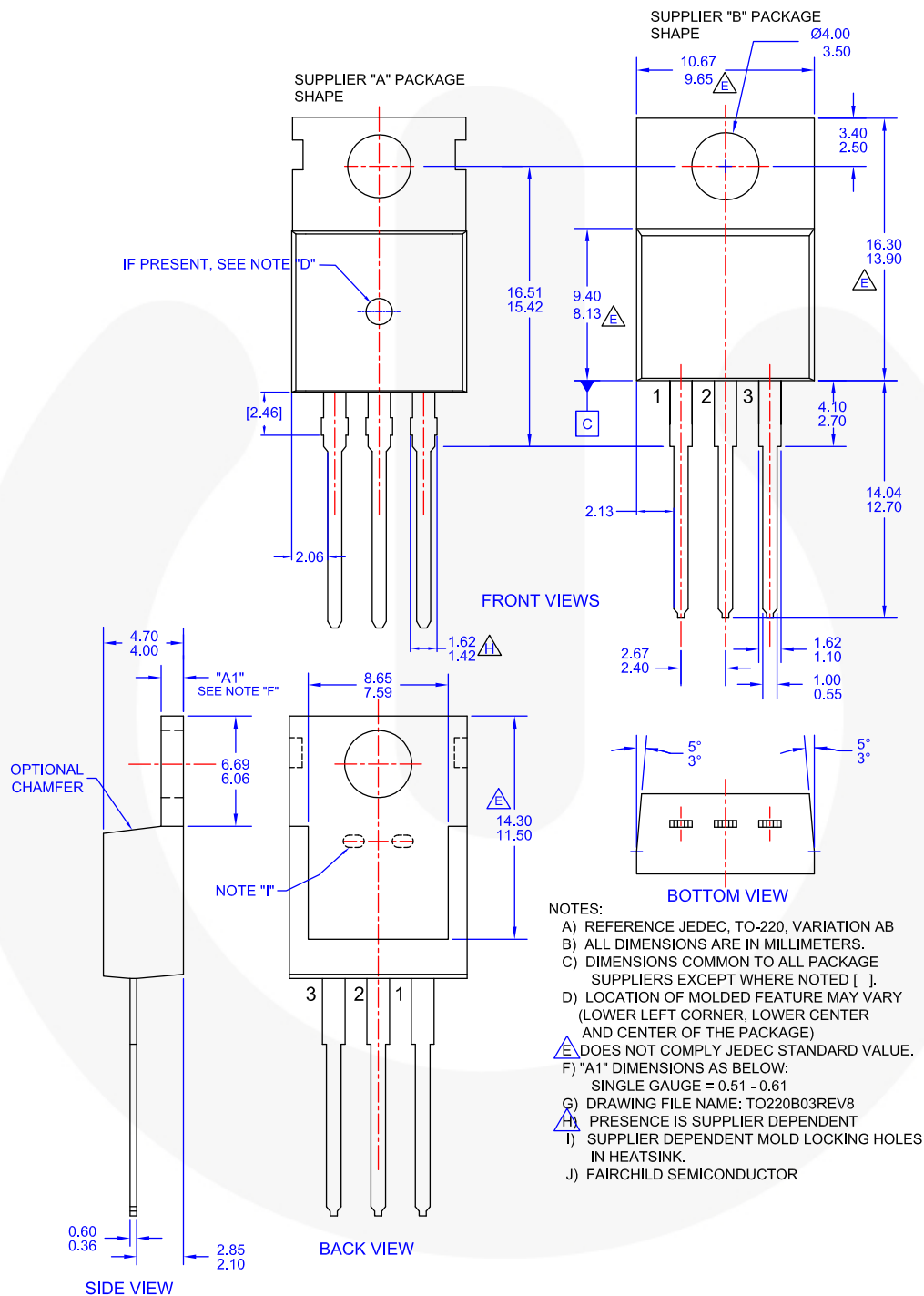


Figure 7. TO-220, MOLDED, 3LEAD, JEDEC VARIATION AB



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**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.