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November 2014

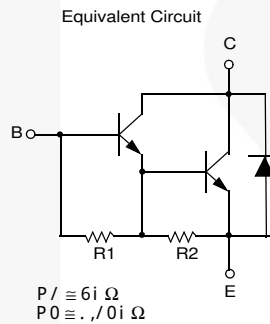
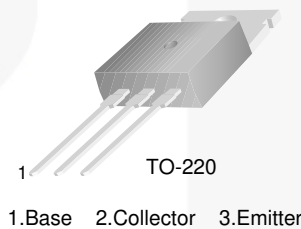
TIP142T — NPN Epitaxial Silicon Darlington Transistor

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		μs
t_R	Rise Time			0.55		μs
t_{STG}	Storage Time			2.50		μs
t_F	Fall Time			2.50		μs

Typical Performance Characteristics

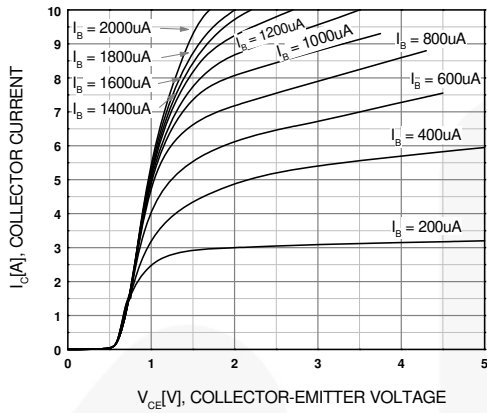


Figure 1. Static Characteristic

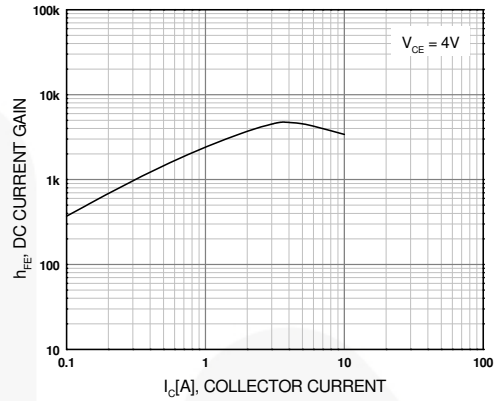


Figure 2. DC Current Gain

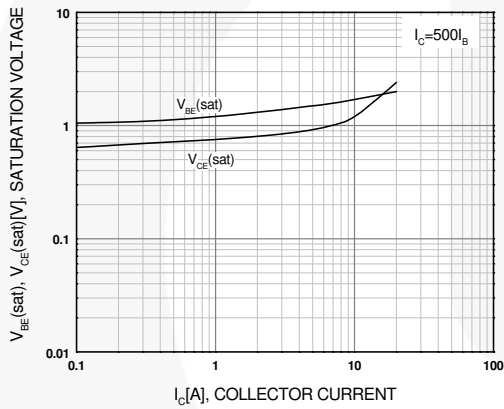


Figure 3. Collector-Emitter Saturation Voltage and Base-Emitter Saturation Voltage

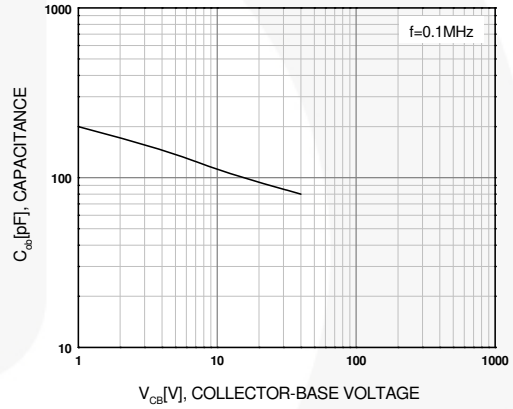


Figure 4. Collector Output Capacitance

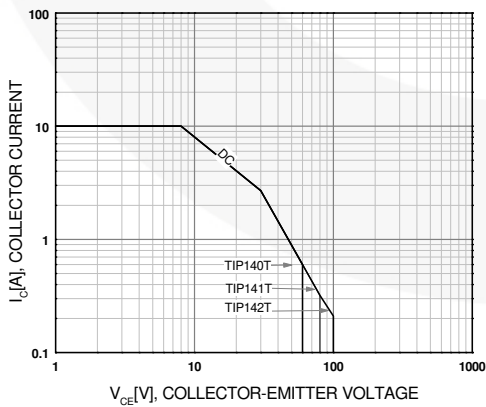


Figure 5. Safe Operating Area

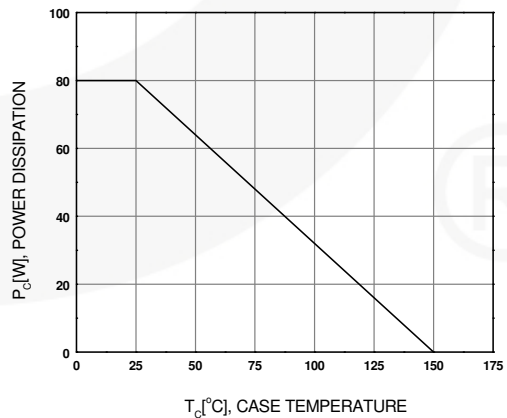


Figure 6. Power Derating

Physical Dimensions

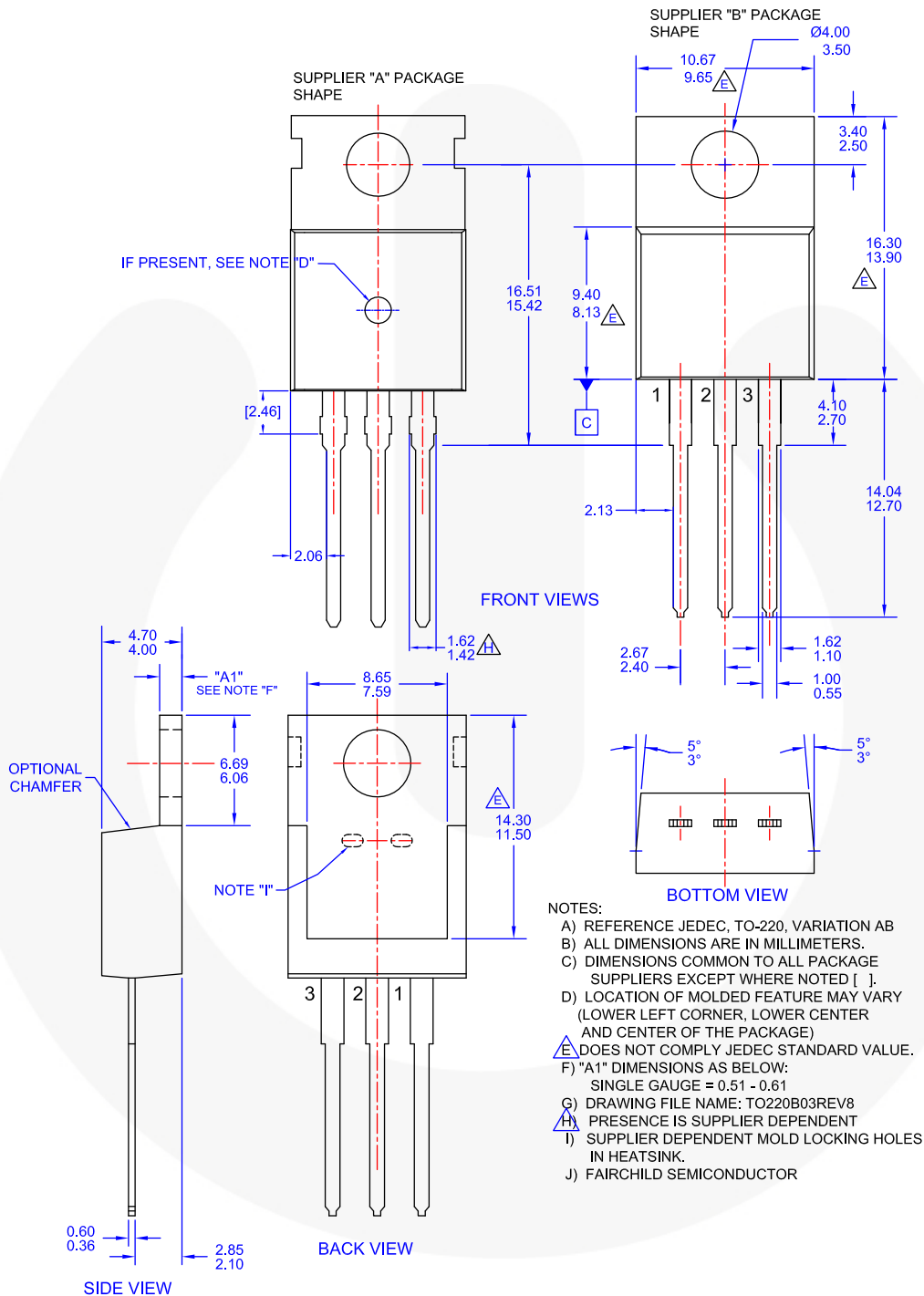







Figure 7. TO-220, MOLDED, 3LEAD, JEDEC VARIATION AB



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