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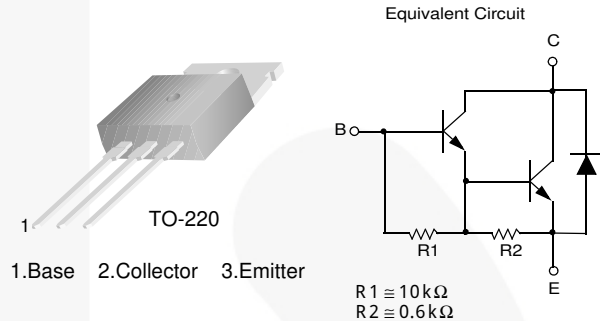


November 2014

TIP110 / TIP111 / TIP112 NPN Epitaxial Silicon Darlington Transistor

Features

- Monolithic Construction with Built-in Base-Emitter Shunt Resistors
- Complementary to TIP115 / TIP116 / TIP117
- High DC Current Gain:
 $h_{FE} = 1000 @ V_{CE} = 4 \text{ V}, I_C = 1 \text{ A}$ (Minimum)
- Low Collector-Emitter Saturation Voltage
- Industrial Use



Ordering Information

Part Number	Top Mark	Package	Packing Method
TIP110	TIP110	TO-220 3L (Single Gauge)	Bulk
TIP110TU	TIP110	TO-220 3L (Single Gauge)	Rail
TIP111TU	TIP111	TO-220 3L (Single Gauge)	Rail
TIP112	TIP112	TO-220 3L (Single Gauge)	Bulk
TIP112TU	TIP112	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	TIP110	60
		TIP111	80
		TIP112	100
V_{CEO}	Collector-Emitter Voltage	TIP110	60
		TIP111	80
		TIP112	100
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current (DC)	2	A
I_{CP}	Collector Current (Pulse)	4	A
I_B	Base Current (DC)	50	mA
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-65 to 150	$^\circ\text{C}$

TIP110 / TIP111 / TIP112 — NPN Epitaxial Silicon Darlington Transistor

Thermal Characteristics

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

Symbol	Parameter	Value	Unit
P_C	Collector Dissipation ($T_A = 25^\circ\text{C}$)	2	W
	Collector Dissipation ($T_C = 25^\circ\text{C}$)	50	

Electrical Characteristics⁽¹⁾

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

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	TIP110	$I_C = 30\text{ mA}, I_B = 0$	60	V
		TIP111		80	
		TIP112		100	
I_{CEO}	Collector Cut-Off Current	TIP110	$V_{CE} = 30\text{ V}, I_B = 0$	2	mA
		TIP111	$V_{CE} = 40\text{ V}, I_B = 0$	2	
		TIP112	$V_{CE} = 50\text{ V}, I_B = 0$	2	
I_{CBO}	Collector Cut-Off Current	TIP110	$V_{CB} = 60\text{ V}, I_E = 0$	1	mA
		TIP111	$V_{CB} = 80\text{ V}, I_E = 0$	1	
		TIP112	$V_{CB} = 100\text{ V}, I_E = 0$	1	
I_{EBO}	Emitter Cut-Off Current	$V_{EB} = 5\text{ V}, I_C = 0$		2	mA
h_{FE}	DC Current Gain	$V_{CE} = 4\text{ V}, I_C = 1\text{ A}$	1000		
		$V_{CE} = 4\text{ V}, I_C = 2\text{ A}$	500		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 2\text{ A}, I_B = 8\text{ mA}$		2.5	V
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = 4\text{ V}, I_C = 2\text{ A}$		2.8	V
C_{ob}	Output Capacitance	$V_{CB} = 10\text{ V}, I_E = 0,$ $f = 0.1\text{ MHz}$		100	pF

Note:

1. Pulse test: $p_w \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

Typical Performance Characteristics

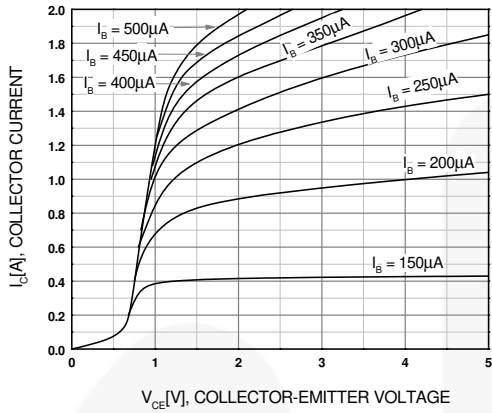


Figure 1. Static Characteristic

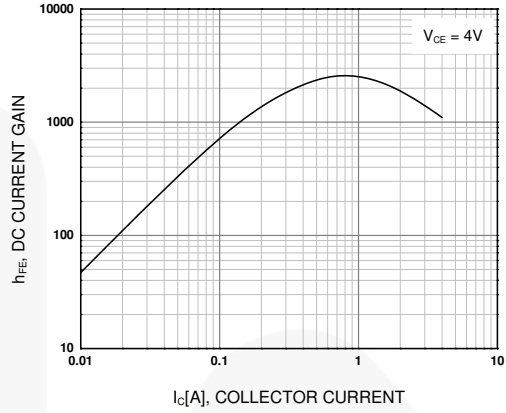


Figure 2. DC Current Gain

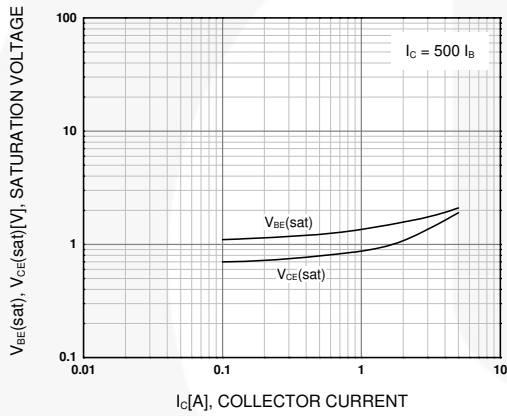


Figure 3. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

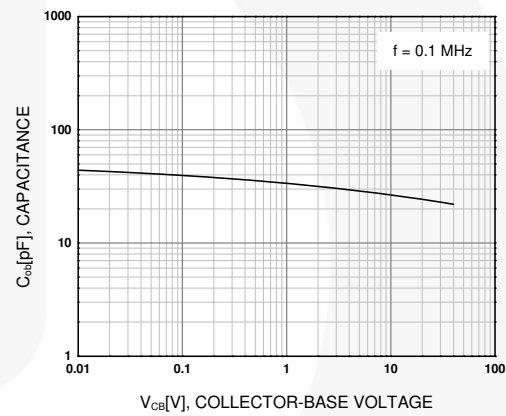


Figure 4. Collector Output Capacitance

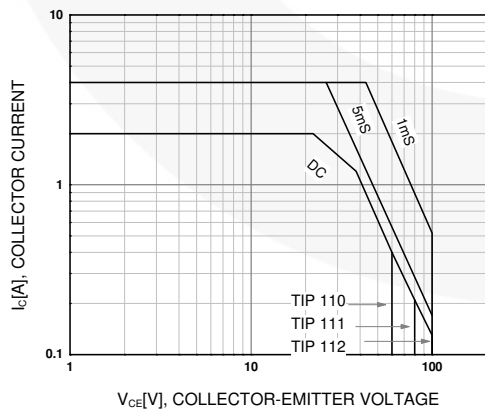


Figure 5. Safe Operating Area

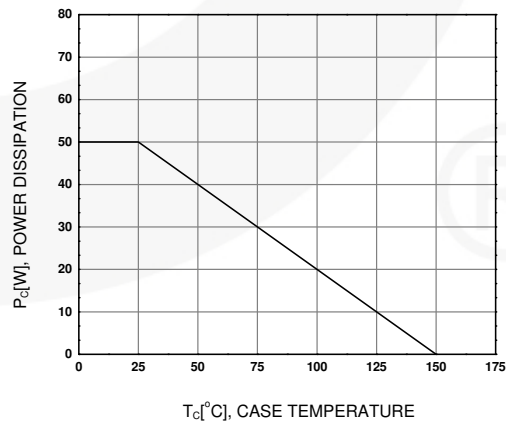


Figure 6. Power Derating

Physical Dimensions

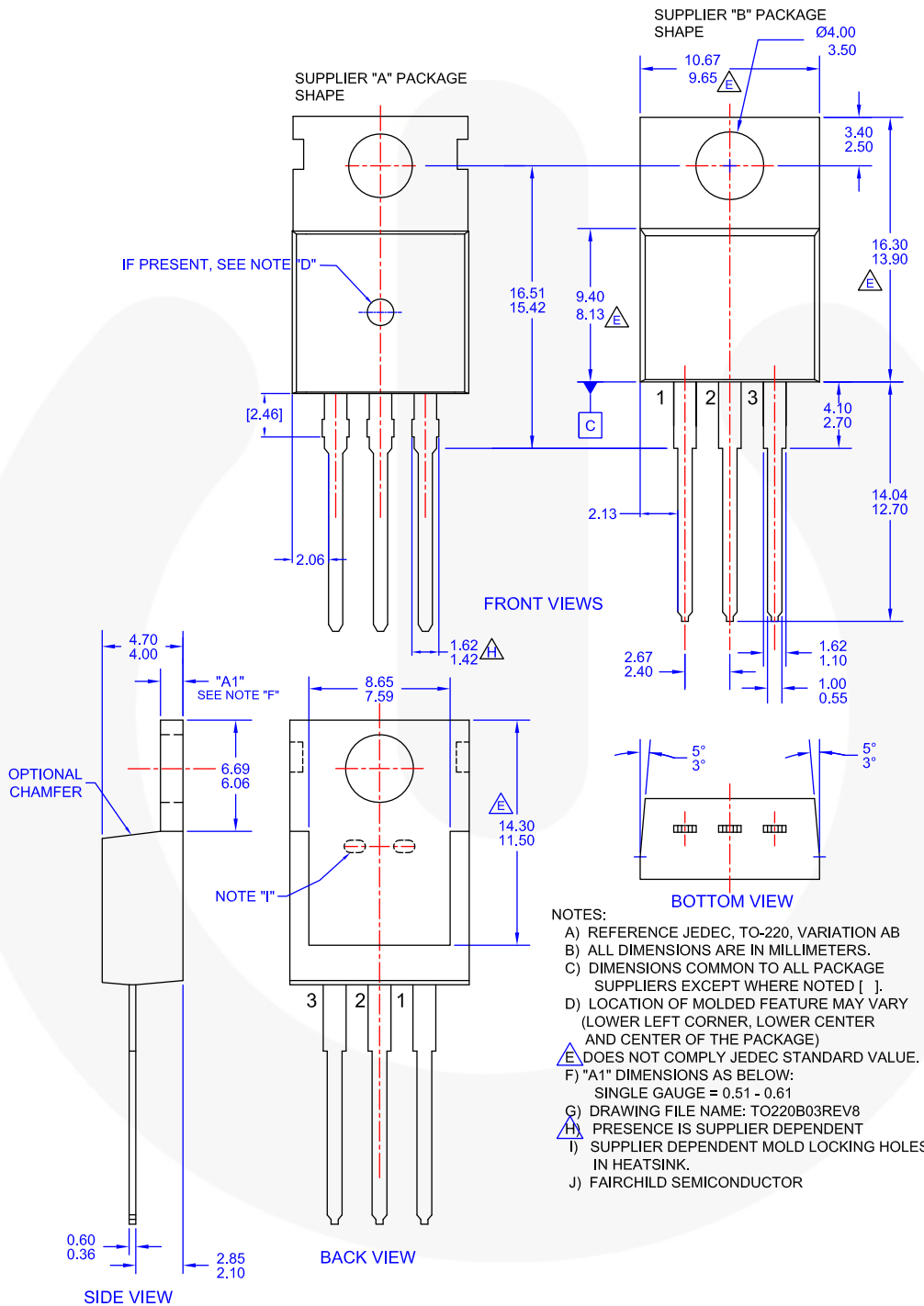







Figure 7. TO-220, MOLDED, 3LEAD, JEDEC VARIATION AB



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