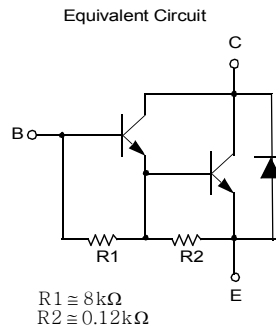
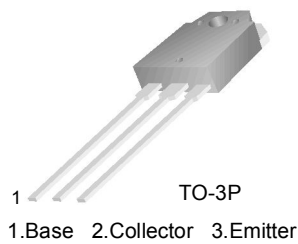


TIP140/TIP141/TIP142

NPN Epitaxial Silicon Darlington Transistor

- Monolithic Construction With Built In Base-Emitter Shunt Resistors
- High DC Current Gain : $h_{FE} = 1000$ @ $V_{CE} = 4V$, $I_C = 5A$ (Min.)
- Industrial Use
- Complement to TIP145/146/147



Absolute Maximum Ratings* $T_a = 25^\circ C$ unless otherwise noted

| Symbol | Parameter | Ratings | Units |
|-----------|--|------------|------------|
| V_{CBO} | Collector-Base Voltage : TIP140 | 60 | V |
| | : TIP141 | 80 | V |
| | : TIP142 | 100 | V |
| V_{CEO} | Collector-Emitter Voltage : TIP140 | 60 | V |
| | : TIP141 | 80 | V |
| | : TIP142 | 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 ($T_C=25^\circ C$) | 125 | W |
| T_J | Junction Temperature | 150 | $^\circ C$ |
| T_{STG} | Storage Temperature | - 65 ~ 150 | $^\circ C$ |

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Electrical Characteristics* $T_a=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|-----------------------|--|---|-----------------|------|-------------|----------------|
| $V_{\text{CEO(sus)}}$ | Collector-Emitter Sustaining Voltage : TIP140 : TIP141 : TIP142 | $I_C = 30\text{mA}, I_B = 0$ | 60 80 100 | | | V V V |
| I_{CEO} | Collector Cut-off Current : TIP140 : TIP141 : TIP142 | $V_{\text{CE}} = 30\text{V}, I_B = 0$ $V_{\text{CE}} = 40\text{V}, I_B = 0$ $V_{\text{CE}} = 50\text{V}, I_B = 0$ | | | 2 2 2 | mA mA mA |
| I_{CBO} | Collector Cut-off Current : TIP140 : TIP141 : TIP142 | $V_{\text{CB}} = 60\text{V}, I_E = 0$ $V_{\text{CB}} = 80\text{V}, I_E = 0$ $V_{\text{CB}} = 100\text{V}, I_E = 0$ | | | 1 1 1 | mA mA mA |
| I_{EBO} | Emitter Cut-off Current | $V_{\text{BE}} = 5\text{V}, I_C = 0$ | | | 2 | mA |
| h_{FE} | DC Current Gain | $V_{\text{CE}} = 4\text{V}, I_C = 5\text{A}$ $V_{\text{CE}} = 4\text{V}, I_C = 10\text{A}$ | 1000 500 | | | |
| $V_{\text{CE(sat)}}$ | Collector-Emitter Saturation Voltage | $I_C = 5\text{A}, I_B = 10\text{mA}$ $I_C = 10\text{A}, I_B = 40\text{mA}$ | | | 2 3 | V V |
| $V_{\text{BE(sat)}}$ | Base-Emitter Saturation Voltage | $I_C = 10\text{A}, I_B = 40\text{mA}$ | | | 3.5 | V |
| $V_{\text{BE(on)}}$ | Base-Emitter On Voltage | $V_{\text{CE}} = 4\text{V}, I_C = 10\text{A}$ | | | 3 | V |
| t_{D} | Delay Time | $V_{\text{CC}} = 30\text{V}, I_C = 5\text{A}$ $I_{\text{B1}} = 20\text{mA}, I_{\text{B2}} = -20\text{mA}$ $R_L = 6\Omega$ | | 0.15 | | μs |
| t_{R} | Rise Time | | | 0.55 | | μs |
| t_{STG} | Storage Time | | | 2.5 | | μs |
| t_{F} | Fall Time | | | 2.5 | | μs |

* Pulse Test: Pulse Width \leq 300 μs , Duty Cycle \leq 2%

Typical Characteristics

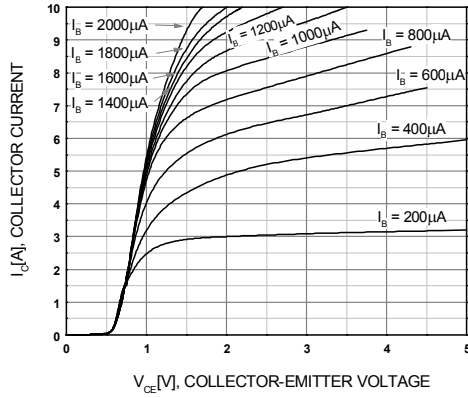


Figure 1. Static Characteristic

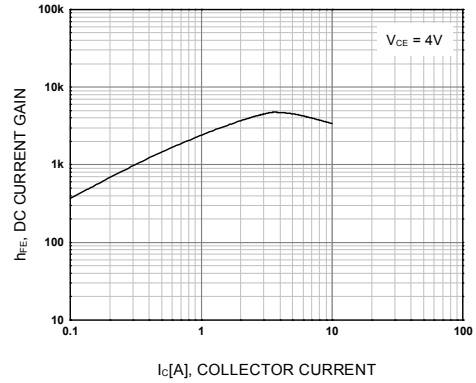


Figure 2. DC current Gain

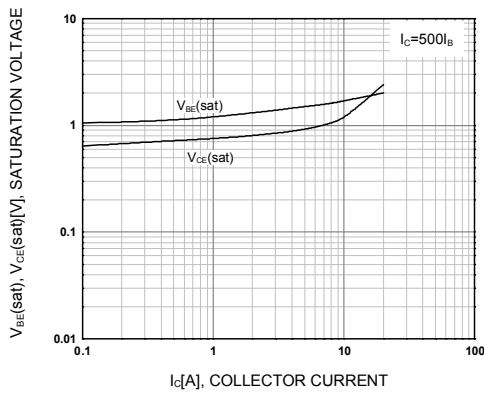


Figure 3. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

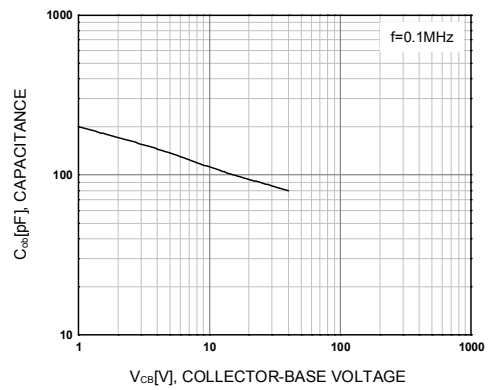


Figure 4. Collector Output Capacitance

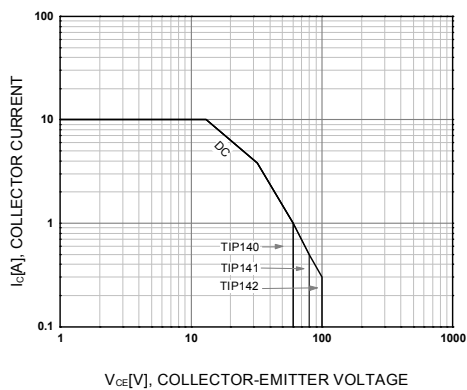


Figure 5. Safe Operating Area

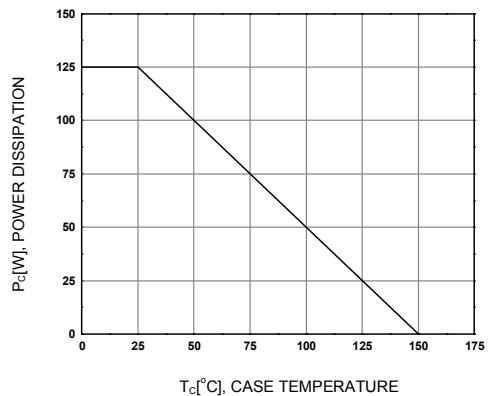
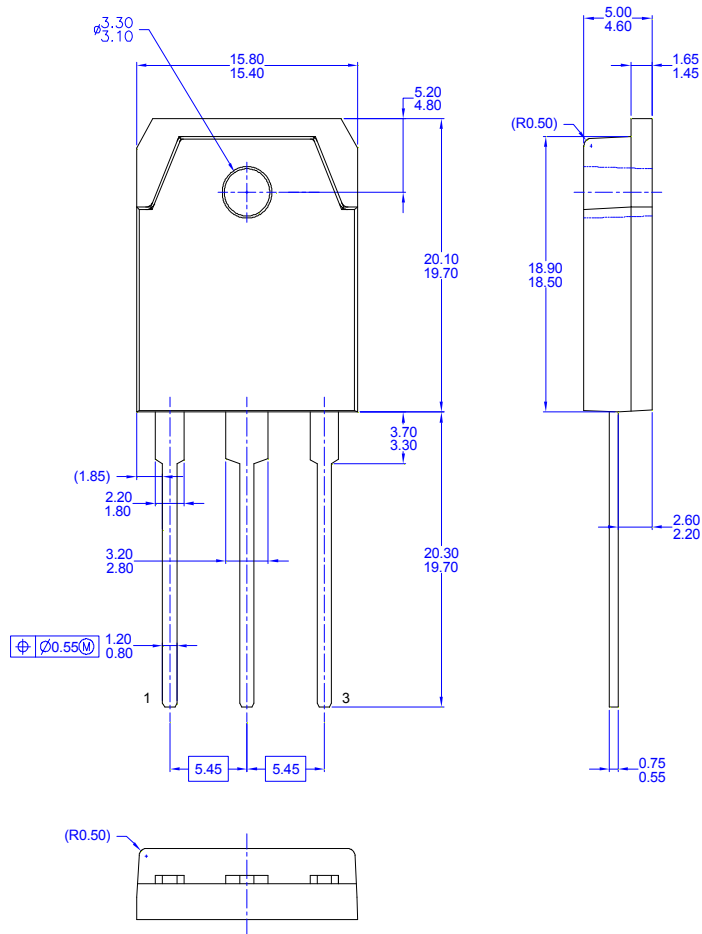


Figure 6. Power Derating

Package Dimension (TO-3P)



- NOTES:
- A) THIS PACKAGE CONFORMS TO EIAJ SC-65 PACKAGING STANDARD.
 - B) ALL DIMENSIONS ARE IN MILLIMETERS.
 - C) DIMENSIONING AND TOLERANCING PER ASME14.5 1973.
 - D) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
 - E) DRAWING FILE NAME: T03P03AREV2.



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