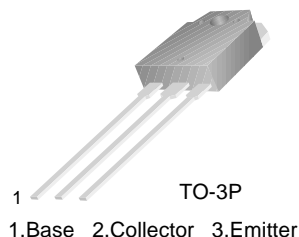


TIP145/146/147

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 TIP140/141/142

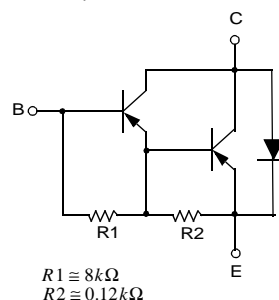


PNP Epitaxial Silicon Darlington Transistor

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

| Symbol | Parameter | Value | Units |
|-----------|--|------------|------------|
| V_{CBO} | Collector-Base Voltage : TIP145 | - 60 | V |
| | : TIP146 | - 80 | V |
| | : TIP147 | - 100 | V |
| V_{CEO} | Collector-Emitter Voltage : TIP145 | - 60 | V |
| | : TIP146 | - 80 | V |
| | : TIP147 | - 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 | $^\circ C$ |

Equivalent Circuit



Electrical Characteristics $T_C=25^\circ C$ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|----------------|--------------------------------------|--|-----------------------|------|-------------------|----------------|
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage | $I_C = -30mA$, $I_B = 0$ | - 60 - 80 - 100 | | | V V V |
| | : TIP145 | | | | | |
| | : TIP146 | | | | | |
| | : TIP147 | | | | | |
| I_{CEO} | Collector Cut-off Current | $V_{CE} = -30V$, $I_B = 0$ $V_{CE} = -40V$, $I_B = 0$ $V_{CE} = -50V$, $I_B = 0$ | | | - 2 - 2 - 2 | mA mA mA |
| | : TIP145 | | | | | |
| | : TIP146 | | | | | |
| | : TIP147 | | | | | |
| I_{CBO} | Collector Cut-off Current | $V_{CB} = -60V$, $I_E = 0$ $V_{CB} = -80V$, $I_E = 0$ $V_{CB} = -100V$, $I_E = 0$ | | | - 1 - 1 - 1 | mA mA mA |
| | : TIP145 | | | | | |
| | : TIP146 | | | | | |
| | : TIP147 | | | | | |
| I_{EBO} | Emitter Cut-off Current | $V_{BE} = -5V$, $I_C = 0$ | | | - 2 | mA |
| h_{FE} | DC Current Gain | $V_{CE} = -4V$, $I_C = -5A$ $V_{CE} = -4V$, $I_C = -10A$ | 1000 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 | $V_{CC} = -30V$, $I_C = -5A$ $I_{B1} = -20mA$, $I_{B2} = 20mA$ $R_L = 6\Omega$ | | 0.15 | | μs |
| t_R | Rise Time | | | 0.55 | | μs |
| t_{STG} | Storage Time | | | 2.5 | | μs |
| t_F | Fall Time | | | 2.5 | | μs |

Typical Characteristics

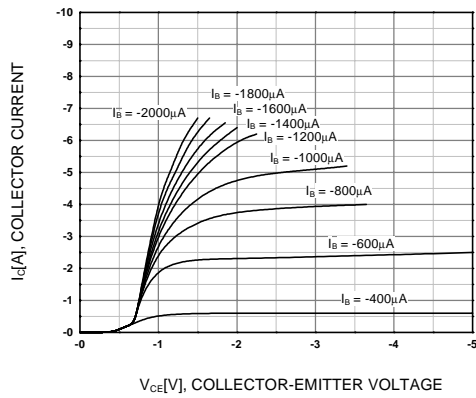


Figure 1. Static Characteristic

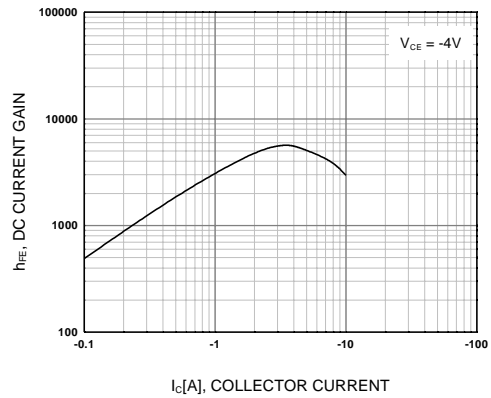


Figure 2. DC current Gain

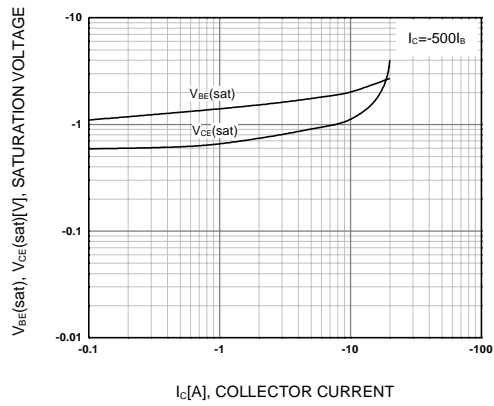


Figure 3. Collector-Emitter Saturation Voltage
Base-Emitter Saturation Voltage

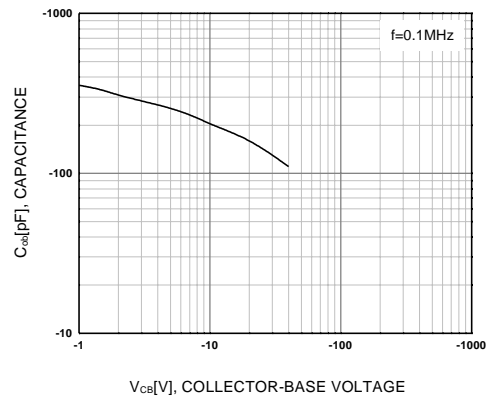


Figure 4. Collector Output Capacitance

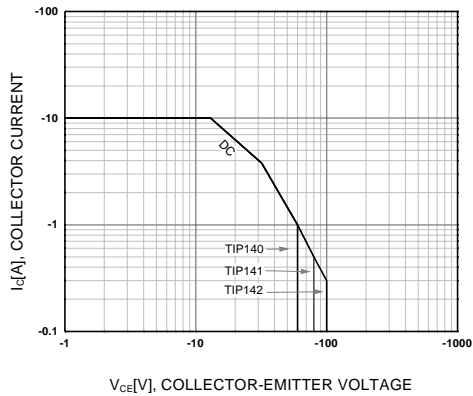


Figure 5. Safe Operating Area

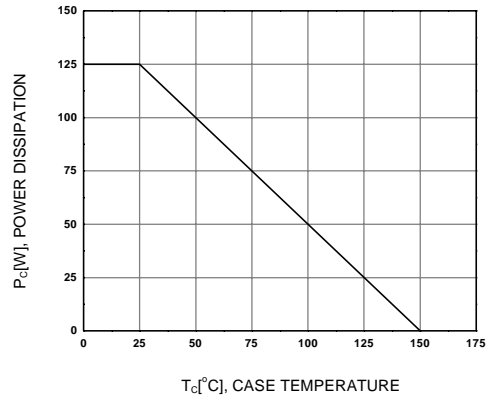
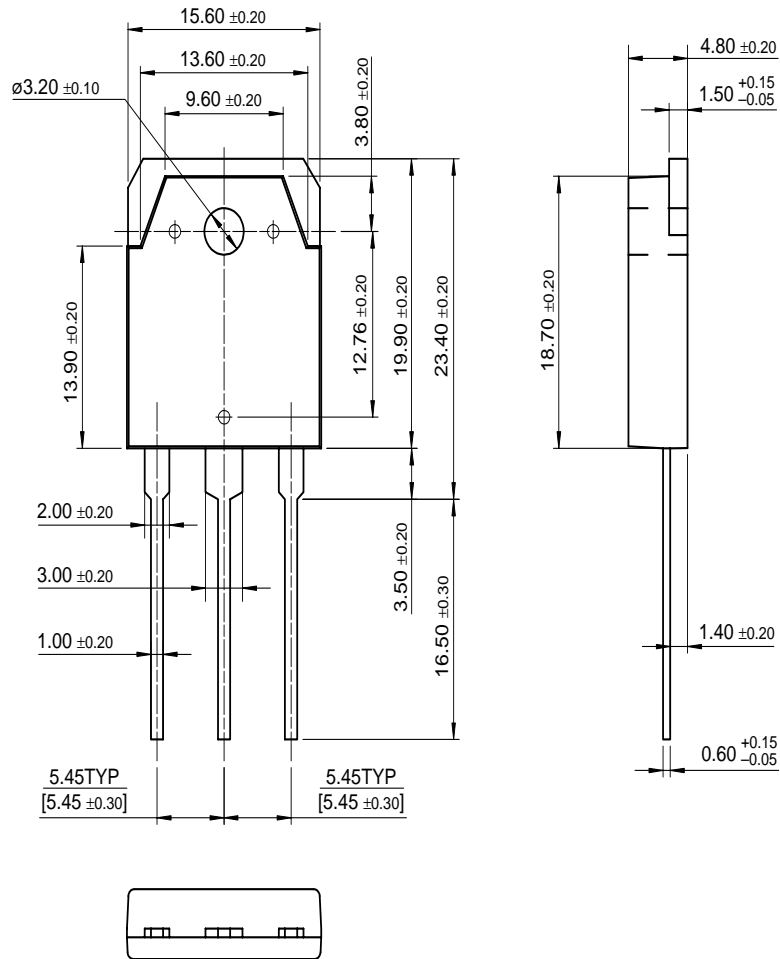


Figure 6. Power Derating

Package Dimensions

TO-3P



Dimensions in Millimeters

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