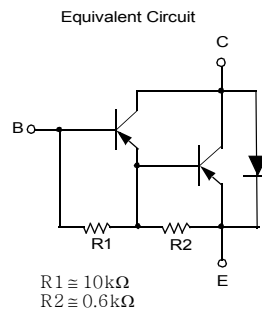
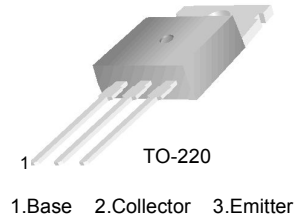


## TIP105/TIP106/TIP107 PNP Epitaxial Silicon Darlington Transistor

- Monolithic Construction With Built In Base-Emitter Shunt Resistors
- High DC Current Gain :  $h_{FE}=1000$  @  $V_{CE}=-4V$ ,  $I_C=-3A$  (Min.)
- Collector-Emitter Sustaining Voltage
- Low Collector-Emitter Saturation Voltage
- Industrial Use
- Complementary to TIP100/101/102



### Absolute Maximum Ratings\* $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter  | Ratings    | Units            |
|-----------|--|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                           | : TIP105   | - 60             |
|           |  | : TIP106   | - 80             |
|           |  | : TIP107   | - 100            |
| $V_{CEO}$ | Collector-Emitter Voltage                        | : TIP105   | - 60             |
|           |  | : TIP106   | - 80             |
|           |  | : TIP107   | - 100            |
| $V_{EBO}$ | Emitter-Base Voltage                             | - 5        | V                |
| $I_C$     | Collector Current (DC)                           | - 8        | A                |
| $I_{CP}$  | Collector Current (Pulse)                        | - 15       | A                |
| $I_B$     | Base Current (DC)                                | - 1        | A                |
| $P_C$     | Collector Dissipation ( $T_a=25^\circ\text{C}$ ) | 2          | W                |
|           | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 80         | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 65 ~ 150 | $^\circ\text{C}$ |

\* 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   |
|----------------|--|--|--------------------|------|-------------------|---|
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage<br>: TIP105<br>: TIP106<br>: TIP107 | $I_C = -30\text{mA}, I_B = 0$  | -60<br>-80<br>-100 |      |                   | V<br>V<br>V                                     |
| $I_{CEO}$      | Collector Cut-off Current<br>: TIP105<br>: TIP106<br>: TIP107            | $V_{CE} = -30\text{V}, I_B = 0$<br>$V_{CE} = -40\text{V}, I_B = 0$<br>$V_{CE} = -50\text{V}, I_B = 0$  |                    |      | -50<br>-50<br>-50 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{CBO}$      | Collector Cut-off Current<br>: TIP105<br>: TIP106<br>: TIP107            | $V_{CB} = -60\text{V}, I_E = 0$<br>$V_{CB} = -80\text{V}, I_E = 0$<br>$V_{CB} = -100\text{V}, I_E = 0$ |                    |      | -50<br>-50<br>-50 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current  | $V_{BE} = -5\text{V}, I_C = 0$   |                    |      | -2                | mA  |
| $h_{FE}$       | DC Current Gain  | $V_{CE} = -4\text{V}, I_C = -3\text{A}$<br>$V_{CE} = -4\text{V}, I_C = -8\text{A}$                     | 1000<br>200        |      | 20000             |   |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage                                     | $I_C = -3\text{A}, I_B = -6\text{mA}$<br>$I_C = -8\text{A}, I_B = -80\text{mA}$                        |                    |      | -2<br>-2.5        | V<br>V  |
| $V_{BE(on)}$   | Base-Emitter On Voltage  | $V_{CE} = -4\text{V}, I_C = -8\text{A}$  |                    |      | -2.8              | V   |
| $C_{ob}$       | Output Capacitance   | $V_{CB} = -10\text{V}, I_E = 0, f = 0.1\text{MHz}$   |                    |      | 300               | pF  |

\* Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 2\%$

## Typical Characteristics

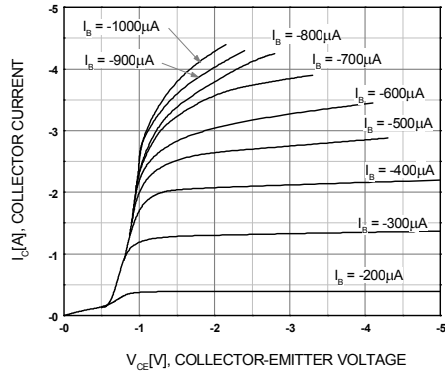


Figure 1. Static Characteristic

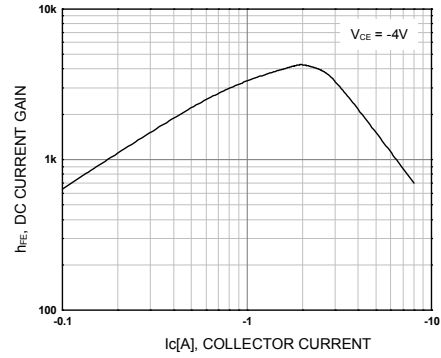


Figure 2. DC current Gain

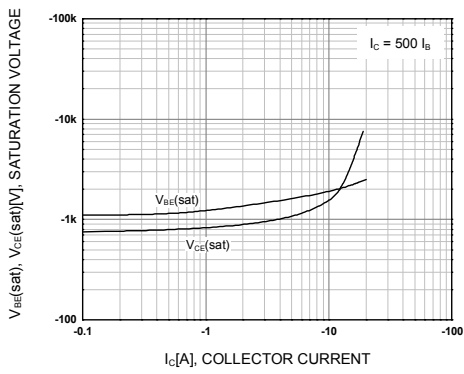


Figure 3. Collector-Emitter Saturation Voltage Base-Emitter Saturation Voltage

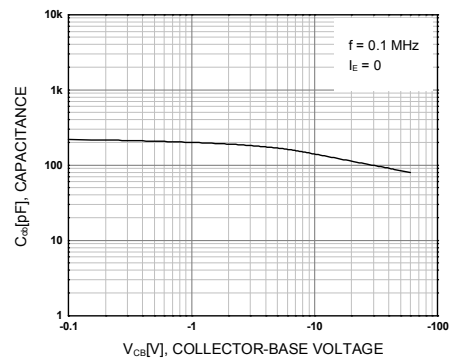


Figure 4. Collector Output Capacitance

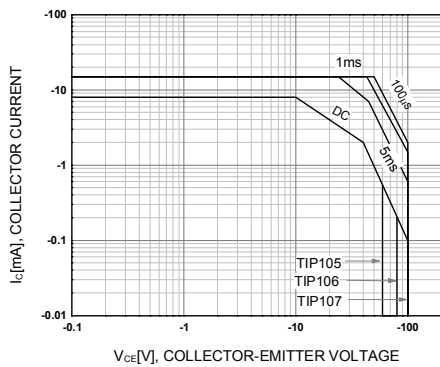


Figure 5. Safe Operating Area

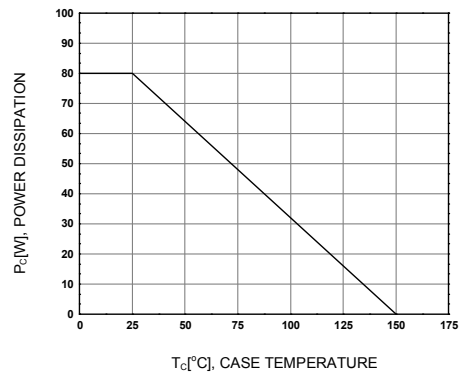
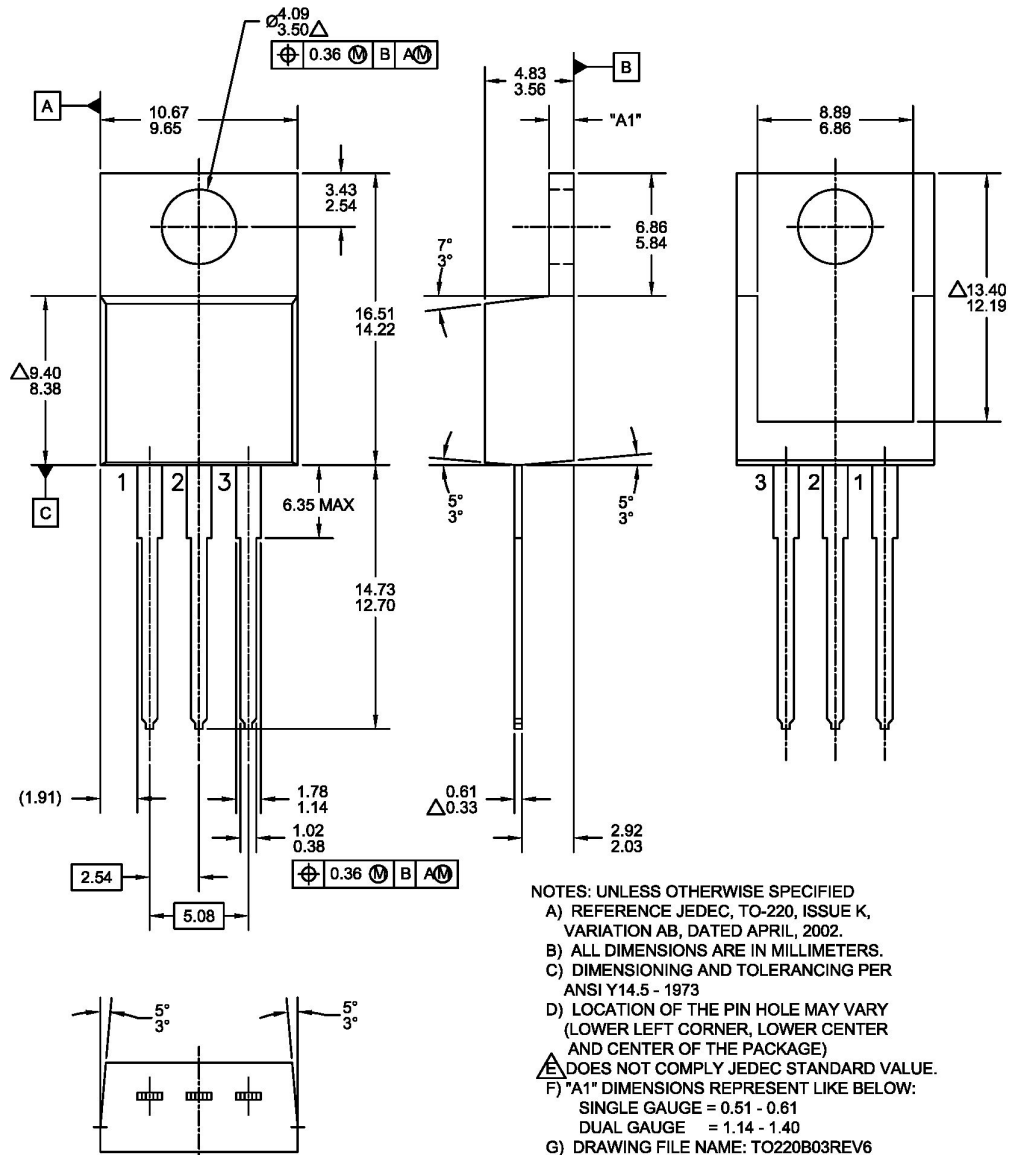


Figure 6. Power Derating

# Mechanical Dimensions

## TO220



- NOTES: UNLESS OTHERWISE SPECIFIED
- REFERENCE JEDEC, TO-220, ISSUE K, VARIATION AB, DATED APRIL, 2002.
  - ALL DIMENSIONS ARE IN MILLIMETERS.
  - DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973
  - LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
  - DOES NOT COMPLY JEDEC STANDARD VALUE.
  - "A1" DIMENSIONS REPRESENT LIKE BELOW:  
SINGLE GAUGE = 0.51 - 0.61  
DUAL GAUGE = 1.14 - 1.40
  - DRAWING FILE NAME: TO220B03REV6

TIP105/TIP106/TIP107 — PNP Epitaxial Silicon Darlington Transistor



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| CROSSVOLT™               | i-Lo™   | PowerTrench®               | <b>power</b><br>the franchise |
| CTL™                     | IntelliMAX™   | Programmable Active Droop™ | TinyBoost™                    |
| Current Transfer Logic™  | ISOPLANAR™  | QFET®                      | TinyBuck™                     |
| EcoSPARK®                | MegaBuck™   | QS™                        | TinyLogic®                    |
| <b>F</b> ®               | MICROCOUPLER™   | QT Optoelectronics™        | TINYOPTO™                     |
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| Fairchild Semiconductor® | MicroPak™   | RapidConfigure™            | TinyPWM™                      |
| FACT Quiet Series™       | MillerDrive™  | SMART START™               | TinyWire™                     |
| FACT®                    | Motion-SPM™   | SPM®                       | µSerDes™                      |
| FAST®                    | OPTOLOGIC®  | STEALTH™                   | UHC®                          |
| FastvCore™               | OPTOPLANAR®   | SuperFET™                  | UniFET™                       |
| FPS™                     |  ® | SuperSOT™-3                | VCX™                          |
| FRFET®                   | PDP-SPM™  | SuperSOT™-6                |                               |
| Global Power ResourceSM  | Power220®   |                            |                               |

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