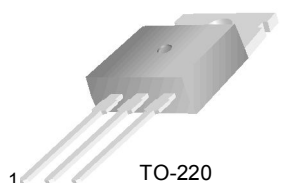


TIP47/TIP48/TIP49/TIP50 NPN Silicon Transistor

- High Voltage and Switching Applications
- High Sustaining Voltage : $V_{CEO(sus)} = 250 - 400V$
- 1A Rated Collector Current



TO-220
1.Base 2.Collector 3.Emitter

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

| Symbol | Parameter | Ratings | Units | |
|-----------|--|------------|------------|---|
| V_{CBO} | Collector-Base Voltage | : TIP47 | 350 | V |
| | | : TIP48 | 400 | V |
| | | : TIP49 | 450 | V |
| | | : TIP50 | 500 | V |
| V_{CEO} | Collector-Emitter Voltage | : TIP47 | 250 | V |
| | | : TIP48 | 300 | V |
| | | : TIP49 | 350 | V |
| | | : TIP50 | 400 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V | |
| I_C | Collector Current (DC) | 1 | A | |
| I_{CP} | Collector Current (Pulse) | 2 | A | |
| I_B | Base Current | 0.6 | A | |
| P_C | Collector Dissipation ($T_C=25^\circ C$) | 40 | W | |
| | Collector Dissipation ($T_a=25^\circ C$) | 2 | 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 |
|-----------------------|--|--|------|------|------|-------|
| $V_{\text{CEX(sus)}}$ | Collector-Emitter Sustaining Voltage | $I_C = 30\text{mA}, I_B = 0$ | 250 | | | V |
| | : TIP47 | | | | | |
| | : TIP48 | | | | | |
| | : TIP49 | | | | | |
| : TIP50 | | | | | | |
| I_{CEO} | Collector Cut-off Current | $V_{\text{CE}} = 150\text{V}, I_B = 0$ | | | 1 | mA |
| | : TIP47 | $V_{\text{CE}} = 200\text{V}, I_B = 0$ | | | 1 | mA |
| | : TIP48 | $V_{\text{CE}} = 250\text{V}, I_B = 0$ | | | 1 | mA |
| | : TIP49 | $V_{\text{CE}} = 300\text{V}, I_B = 0$ | | | 1 | mA |
| I_{CEX} | Collector Cut-off Current | $V_{\text{CE}} = 350\text{V}, V_{\text{BE}} = 0$ | | | 1 | mA |
| | : TIP47 | $V_{\text{CE}} = 400\text{V}, V_{\text{BE}} = 0$ | | | 1 | mA |
| | : TIP48 | $V_{\text{CE}} = 450\text{V}, V_{\text{BE}} = 0$ | | | 1 | mA |
| | : TIP49 | $V_{\text{CE}} = 500\text{V}, V_{\text{BE}} = 0$ | | | 1 | mA |
| I_{EBO} | Emitter Cut-off Current | $V_{\text{EB}} = 5\text{V}, I_C = 0$ | | | 1 | mA |
| h_{FE} | * DC Current Gain | $V_{\text{CE}} = 10\text{V}, I_C = 0.3\text{A}$ | 30 | | 150 | |
| | | $V_{\text{CE}} = 10\text{V}, I_C = 1\text{A}$ | 10 | | | |
| $V_{\text{CE(sat)}}$ | * Collector-Emitter Saturation Voltage | $I_C = 1\text{A}, I_B = 0.2\text{A}$ | | | 1 | V |
| $V_{\text{BE(sat)}}$ | * Base-Emitter Saturation Voltage | $V_{\text{CE}} = 10\text{V}, I_C = 1\text{A}$ | | | 1.5 | V |
| f_T | Current Gain Bandwidth Product | $V_{\text{CE}} = 10\text{V}, I_C = 0.2\text{A}, f = 1\text{MHz}$ | 10 | | | MHz |

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

Typical Characteristics

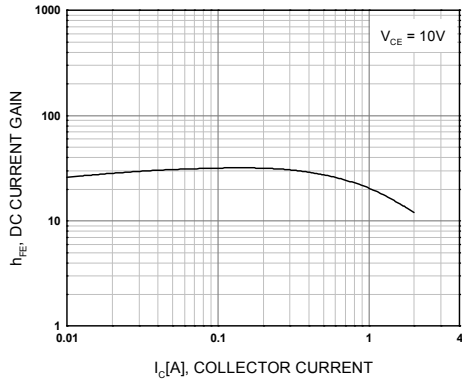


Figure 1. DC current Gain

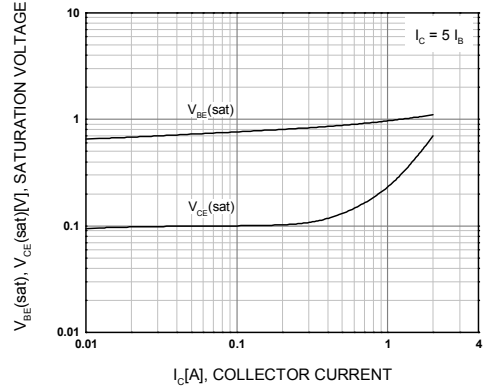


Figure 2. Collector-Emitter Saturation Voltage
Base-Emitter Saturation Voltage

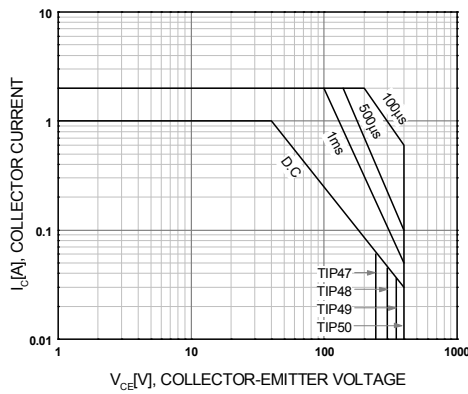


Figure 3. Safe Operating Area

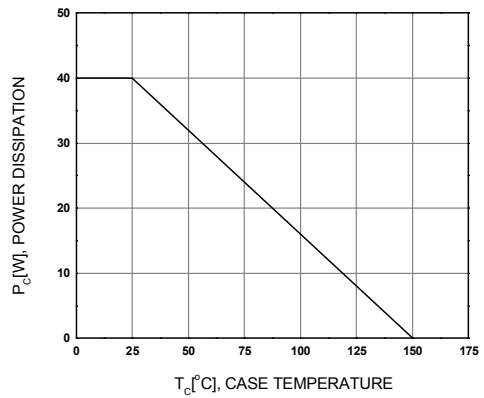
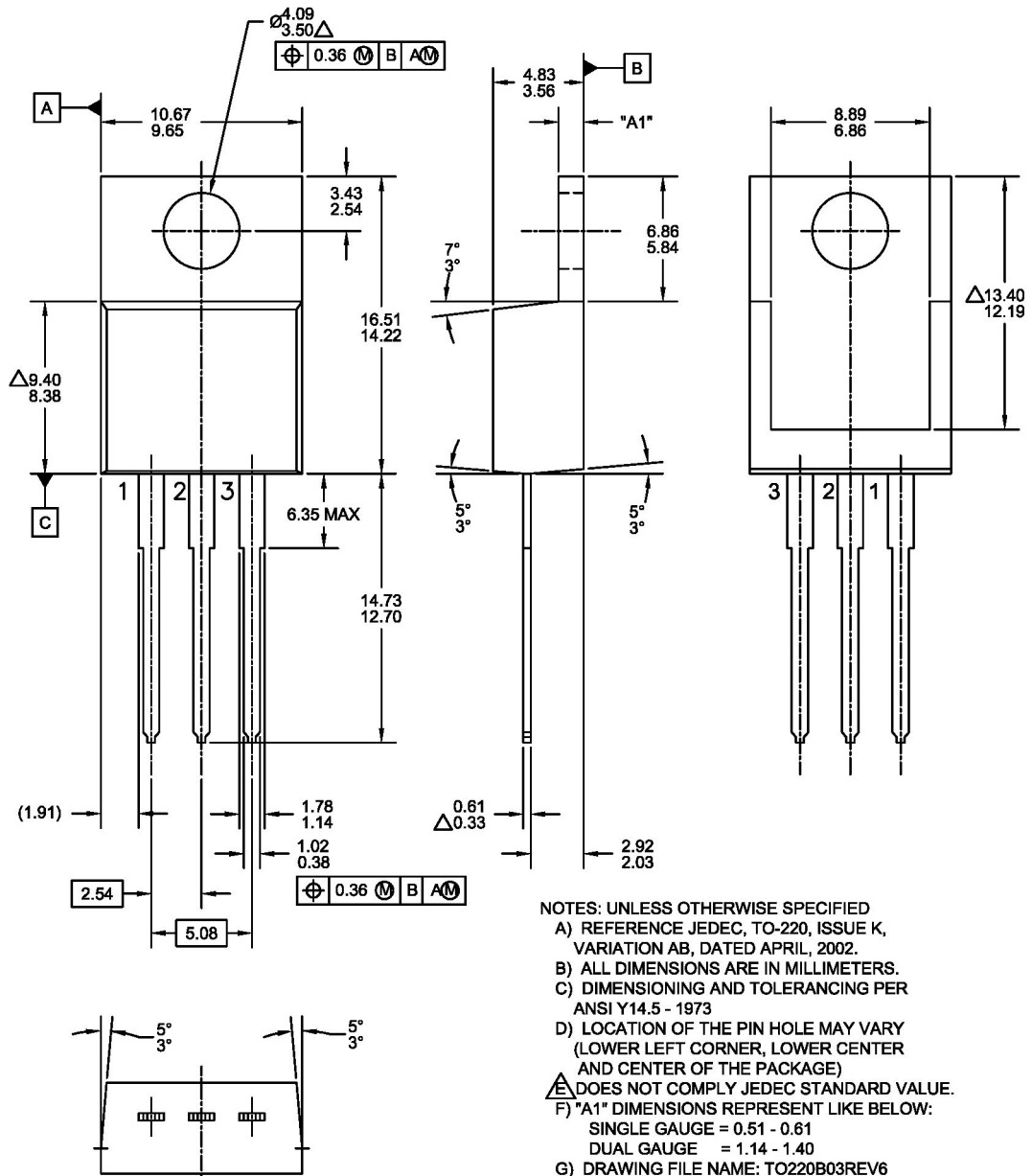


Figure 4. Power Derating

Mechanical Dimensions


TO220





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