

## TO-220 Plastic-Encapsulate Transistors

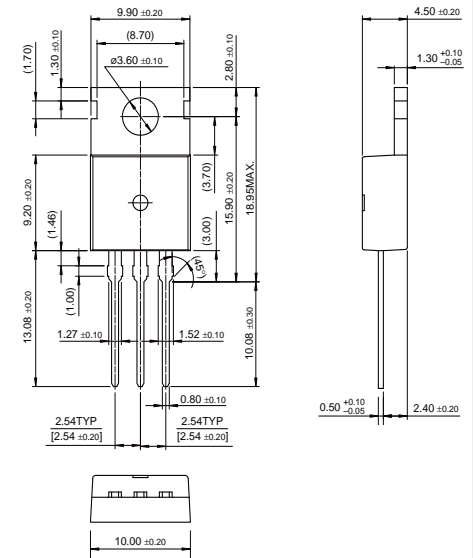
### FEATURES

- NPN Silicon Transistor
- High speed Switching
- Suitable for Switching Regulator and Motor Control
- High Voltage Mode Application

### MECHANICAL DATA

- Case style:TO-220 molded plastic
- Mounting position:any

### TO-220



Unit: inch (mm)

### MAXIMUM RATINGS

( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

| Parameter                   | Symbol     | Value   | Unit               |
|-----------------------------|------------|---------|--------------------|
| Collector-Base Voltage      | $BV_{CBO}$ | 700     | V                  |
| Collector-Emitter Voltage   | $BV_{CEO}$ | 400     | V                  |
| Emitter-Base Voltage        | $BV_{EBO}$ | 9       | V                  |
| Collector Current           | $I_C$      | 12      | A                  |
| Collector Power Dissipation | $P_C$      | 100     | W                  |
| Junction Temperature        | $T_j$      | 150     | $^{\circ}\text{C}$ |
| Storage Temperature         | $T_{stg}$  | -55~150 | $^{\circ}\text{C}$ |

### Electrical Characteristics ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                             | Symbol        | Conditions   | Value  |     |               | Unit          |
|---------------------------------------|---------------|--|--------|-----|---------------|---------------|
|                                       |               |  | Min    | Typ | Max           |               |
| Collector-base breakdown voltage      | $BV_{CBO}$    | $I_C = 100\mu\text{A}$ , $I_E = 0$   | 700    |     |               | V             |
| Collector-emitter breakdown voltage   | $BV_{CEO}$    | $I_C = 10\text{mA}$ , $I_B = 0$  | 400    |     |               | V             |
| Emitter-base breakdown voltage        | $BV_{EBO}$    | $I_E = 100\mu\text{A}$ , $I_C = 0$   | 9      |     |               | V             |
| Collector cut-off current             | $I_{CBO}$     | $V_{CB} = 700\text{V}$ , $I_E = 0$   |        |     | 0.1           | mA            |
| Collector cut-off current             | $I_{CEO}$     | $V_{CE} = 400\text{V}$ , $I_B = 0$   |        |     | 1             | mA            |
| Emitter cut-off current               | $I_{EBO}$     | $V_{EB} = 9\text{V}$ , $I_C = 0$   |        |     | 0.1           | mA            |
| *DC current gain                      | $h_{FE}$      | $V_{CE} = 5\text{V}$ , $I_C = 5\text{A}$<br>$V_{CE} = 5\text{V}$ , $I_C = 8\text{A}$                                       | 8<br>6 |     | 40<br>30      |               |
| *Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 5\text{A}$ , $I_B = 1\text{A}$<br>$I_C = 8\text{A}$ , $I_B = 1.6\text{A}$<br>$I_C = 12\text{A}$ , $I_B = 3\text{A}$ |        |     | 1<br>1.5<br>3 | V             |
| *Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = 5\text{A}$ , $I_B = 1\text{A}$<br>$I_C = 8\text{A}$ , $I_B = 1.6\text{A}$   |        |     | 1.2<br>1.6    | V             |
| Transition frequency                  | $f_T$         | $V_{CE} = 10\text{V}$ , $I_B = 0.5\text{A}$  | 4      |     |               | MHz           |
| Turn On Time                          | $t_{ON}$      | $V_{CC} = 125\text{V}$ , $I_C = 8\text{A}$   |        |     | 1.1           | $\mu\text{s}$ |
| Storage Time                          | $t_{STG}$     | $I_{B1} = 1.6\text{A}$ , $I_{B2} = -1.6\text{A}$   |        |     | 3.0           | $\mu\text{s}$ |
| Fall Time                             | $t_F$         | $R_L = 15.6\Omega$   |        |     | 0.7           | $\mu\text{s}$ |

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