

**Features**

- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

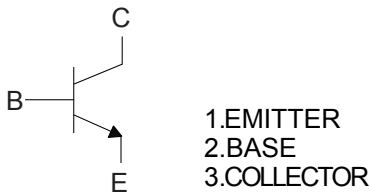
**Maximum Ratings @ 25°C Unless Otherwise Specified**

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 200°C/W Junction to Ambient

| Parameter                    | Symbol    | Rating | Unit |
|------------------------------|-----------|--------|------|
| Collector-Base Voltage       | $V_{CBO}$ | 180    | V    |
| Collector-Emitter Voltage    | $V_{CEO}$ | 160    | V    |
| Emitter-Base Voltage         | $V_{EBO}$ | 6      | V    |
| Continuous Collector Current | $I_C$     | 600    | mA   |
| Power Dissipation            | $P_D$     | 625    | mW   |

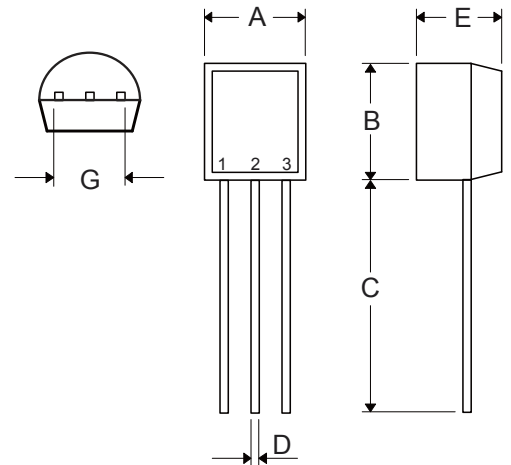
**Marking:**Type Number

**Internal Structure**



# NPN General Purpose Amplifier Transistor

TO-92



| DIM | DIMENSIONS |       |       |       | NOTE          |
|-----|------------|-------|-------|-------|---------------|
|     | INCHES     |       | MM    |       |               |
|     | MIN        | MAX   | MIN   | MAX   |               |
| A   | 0.169      | 0.185 | 4.30  | 4.70  |               |
| B   | 0.169      | 0.185 | 4.30  | 4.70  |               |
| C   | 0.500      | ----- | 12.70 | ----- |               |
| D   | 0.015      | 0.022 | 0.38  | 0.55  |               |
| E   | 0.130      | 0.146 | 3.30  | 3.70  |               |
| G   | 0.095      | 0.105 | 2.42  | 2.67  | Straight Lead |
|     | 0.173      | 0.220 | 4.40  | 5.60  | Bent          |

**Electrical Characteristics @  $T_A=25^\circ\text{C}$  Unless Otherwise Specified**

| Parameter                            | Symbol        | Min | Typ | Max  | Units         | Conditions   |
|--------------------------------------|---------------|-----|-----|------|---------------|--|
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | 180 |     |      | V             | $I_C=100\mu\text{A}, I_E=0$                        |
| Collector-Emitter Breakdown Voltage* | $V_{(BR)CEO}$ | 160 |     |      | V             | $I_C=1\text{mA}, I_B=0$                            |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | 6   |     |      | V             | $I_E=10\mu\text{A}, I_C=0$                         |
| Collector Cut-off Current            | $I_{CBO}$     |     |     | 0.05 | $\mu\text{A}$ | $V_{CB}=35\text{V}, I_E=0$                         |
|                                      |               |     |     | 50   | $\mu\text{A}$ | $V_{CB}=120\text{V}, I_E=0, T_A=100^\circ\text{C}$ |
| Emitter Cut-off Current              | $I_{EBO}$     |     |     | 0.05 | $\mu\text{A}$ | $V_{EB}=5\text{V}, I_C=0$                          |
| DC Current Gain*                     | $h_{FE(1)}$   | 80  |     |      |               | $V_{CE}=5\text{V}, I_C=1\text{mA}$                 |
|                                      | $h_{FE(2)}$   | 80  |     | 300  |               | $V_{CE}=5\text{V}, I_C=10\text{mA}$                |
|                                      | $h_{FE(3)}$   | 30  |     |      |               | $V_{CE}=5\text{V}, I_C=50\text{mA}$                |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ |     |     | 0.5  | V             | $I_C=50\text{mA}, I_B=5\text{mA}$                  |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ |     |     | 1    | V             | $I_C=50\text{mA}, I_B=5\text{mA}$                  |
| Transition Frequency                 | $f_T$         | 100 |     | 300  | MHz           | $V_{CE}=10\text{V}, I_C=10\text{mA}$               |
| Collector Output Capacitance         | $C_{ob}$      |     |     | 6    | pF            | $V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$          |
| Input Capacitance                    | $C_{ibo}$     |     |     | 20   | pF            | $V_{CE}=10\text{V}, I_C=0, f=1\text{MHz}$          |

\*.Pulse test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 2.0\%$ .

## Curve Characteristics

Fig. 1 - Static Characteristics

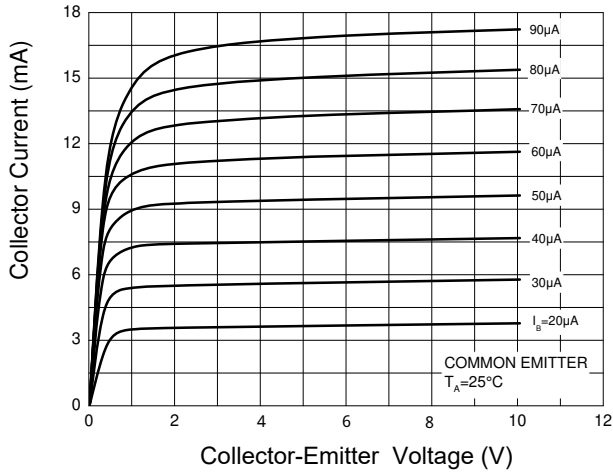


Fig. 2 - DC Current Gain Characteristics

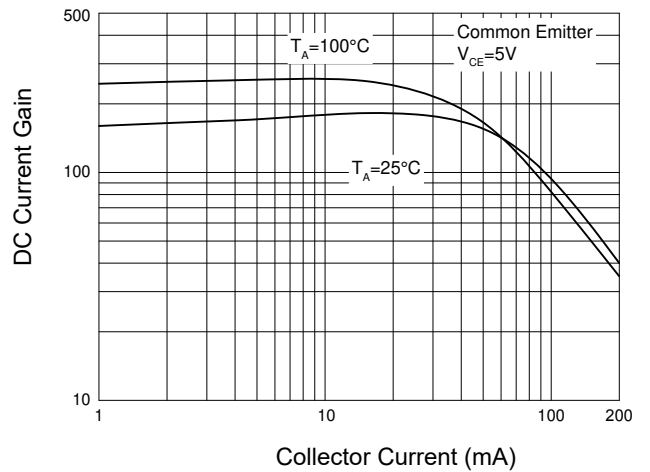


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

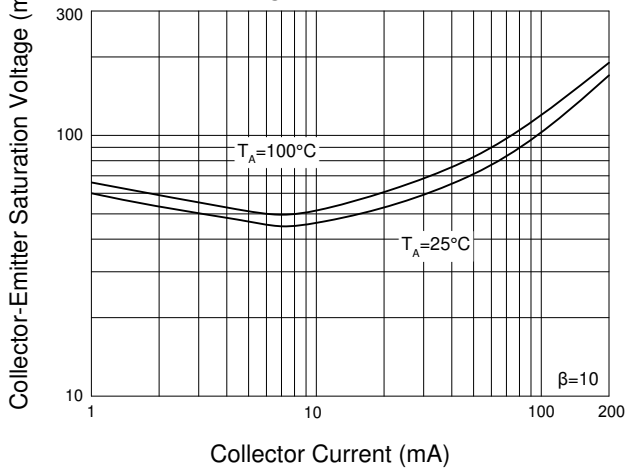


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

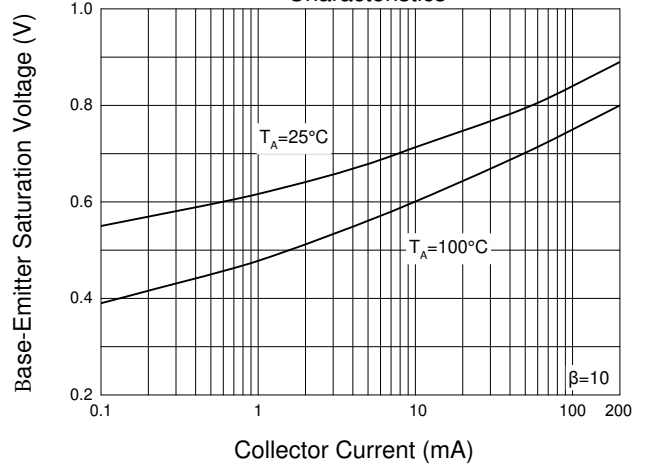


Fig. 5 - Base-Emitter Voltage Characteristics

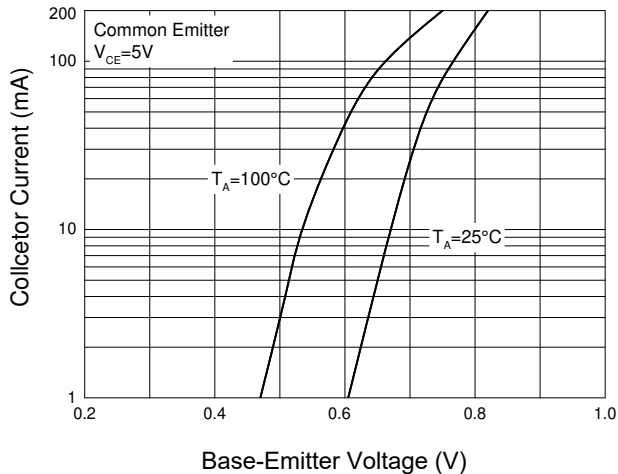
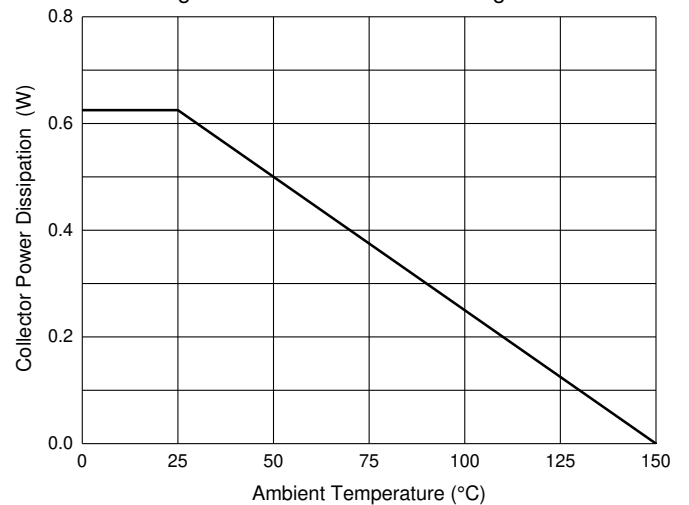


Fig. 6 - Collector Power Derating Curve



## Ordering Information

| Device         | Packing                     |
|----------------|-----------------------------|
| Part Number-AP | Ammo Packing: 20Kpcs/Carton |
| Part Number-BP | Bulk: 100Kpcs/Carton        |

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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