

## TO-18 Plastic-Encapsulate Transistors

### BD234/236/238 TRANSISTOR (PNP)

#### FEATURES

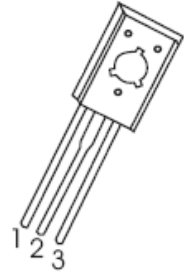
- Power Dissipation

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

| Symbol    | Parameter                       | Value   | Unit             |
|-----------|---------------------------------|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage BD234    | -45     | V                |
|           | BD236                           | -60     |                  |
|           | BD238                           | -100    |                  |
| $V_{CEO}$ | Collector-Emitter Voltage BD234 | -45     | V                |
|           | BD236                           | -60     |                  |
|           | BD238                           | -80     |                  |
| $V_{EBO}$ | Emitter-Base Voltage BD234      | -5      | V                |
|           | BD236                           | -5      |                  |
|           | BD238                           | -5      |                  |
| $I_C$     | Collector Current –Continuous   | -2      | A                |
| $P_C$     | Collector Power Dissipation     | 1.25    | W                |
| $T_J$     | Junction Temperature            | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature             | -55-150 | $^\circ\text{C}$ |

#### TO-18

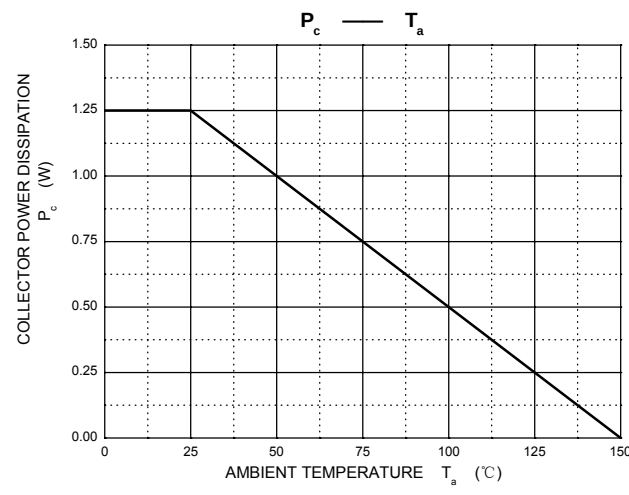
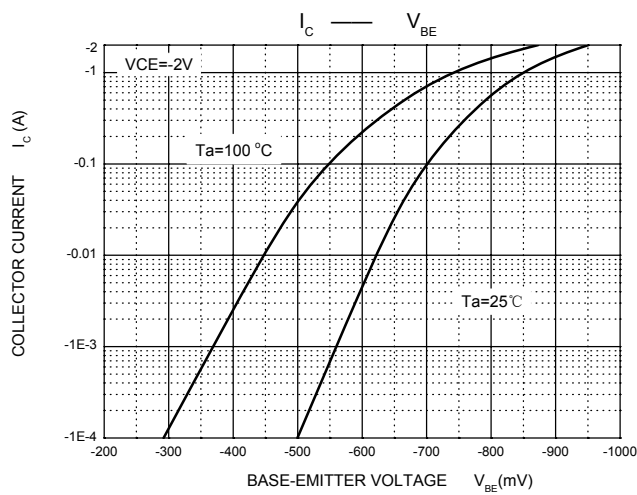
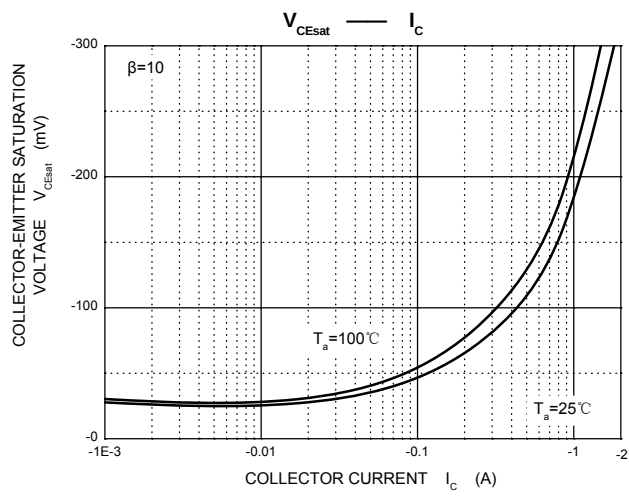
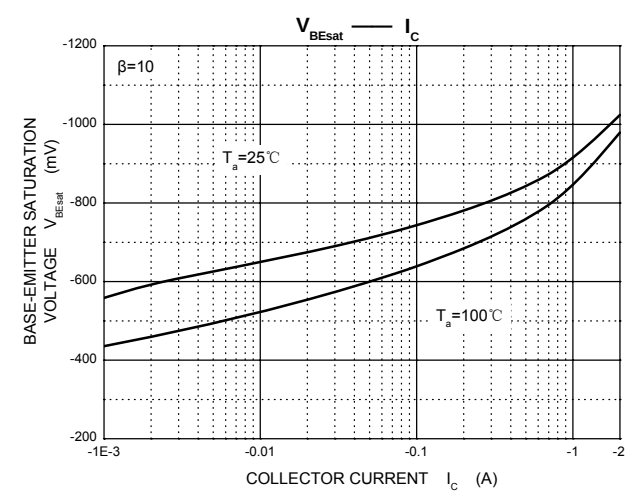
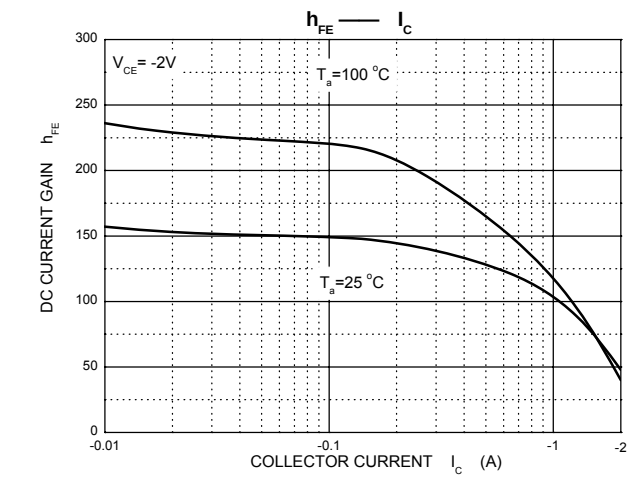
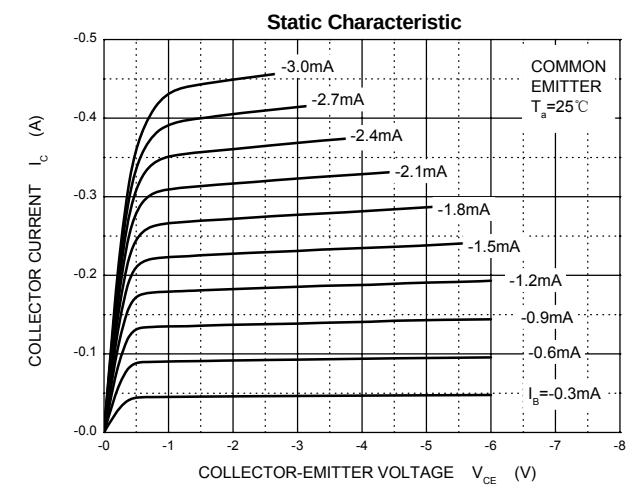
1. EMITTER
2. COLLECTOR
3. BASE



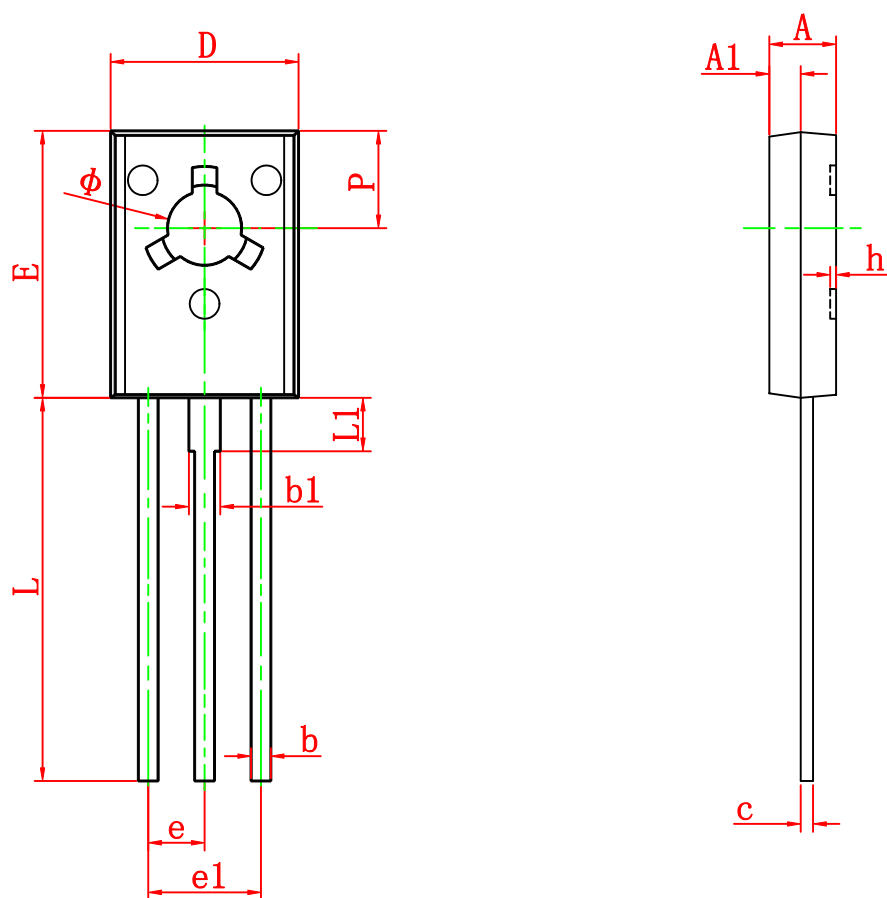
#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ unless otherwise specified)

| Parameter                                                   | Symbol        | Test conditions                                                                            | Min                | Max  | Unit          |
|-------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------|--------------------|------|---------------|
| Collector-base breakdown voltage BD234<br>BD236<br>BD238    | $V_{(BR)CBO}$ | $I_C=-1\text{mA}, I_E=0$                                                                   | -45<br>-60<br>-100 |      | V             |
| Collector-emitter breakdown voltage BD234<br>BD236<br>BD238 | $V_{(BR)CEO}$ | $I_C=-100\text{mA}, I_B=0$                                                                 | -45<br>-60<br>-80  |      | V             |
| Emitter-base breakdown voltage                              | $V_{(BR)EBO}$ | $I_E=-1\text{mA}, I_C=0$                                                                   | -5                 |      | V             |
| Collector cut-off current BD234<br>BD236<br>BD238           | $I_{CBO}$     | $V_{CB}=-45\text{V}, I_E=0$<br>$V_{CB}=-60\text{V}, I_E=0$<br>$V_{CB}=-100\text{V}, I_E=0$ |                    | -100 | $\mu\text{A}$ |
| Emitter cut-off current                                     | $I_{EBO}$     | $V_{EB}=-5\text{V}, I_C=0$                                                                 |                    | -1   | mA            |
| DC current gain                                             | $h_{FE(1)}$   | $V_{CE}=-2\text{V}, I_C=-150\text{mA}$                                                     | 40                 |      |               |
|                                                             | $h_{FE(2)}$   | $V_{CE}=-2\text{V}, I_C=-1\text{A}$                                                        | 25                 |      |               |
| Collector-emitter saturation voltage                        | $V_{CE(sat)}$ | $I_C=-1\text{A}, I_B=-100\text{mA}$                                                        |                    | -0.6 | V             |
| Transition frequency                                        | $f_T$         | $V_{CE}=-10\text{V}, I_C=-250\text{mA}, f=10\text{MHz}$                                    | 3                  |      | MHz           |

# Typical Characteristics



## TO-126 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 2.500                     | 2.900  | 0.098                | 0.114 |
| A1     | 1.100                     | 1.500  | 0.043                | 0.059 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| b1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| c      | 0.450                     | 0.600  | 0.018                | 0.024 |
| D      | 7.400                     | 7.800  | 0.291                | 0.307 |
| E      | 10.600                    | 11.000 | 0.417                | 0.433 |
| e      | 2.290 TYP                 |        | 0.090 TYP            |       |
| e1     | 4.480                     | 4.680  | 0.176                | 0.184 |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| L      | 15.300                    | 15.700 | 0.602                | 0.618 |
| L1     | 2.100                     | 2.300  | 0.083                | 0.091 |
| P      | 3.900                     | 4.100  | 0.154                | 0.161 |
| Φ      | 3.000                     | 3.200  | 0.118                | 0.126 |