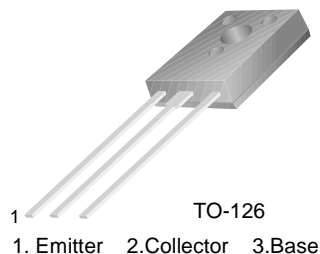


# BD135/137/139

## Medium Power Linear and Switching Applications

- Complement to BD136, BD138 and BD140 respectively



## NPN Epitaxial Silicon Transistor

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

| Symbol    | Parameter  | Value      | Units            |
|-----------|--|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage : BD135                   | 45         | V                |
|           | : BD137  | 60         | V                |
|           | : BD139  | 80         | V                |
| $V_{CEO}$ | Collector-Emitter Voltage : BD135                | 45         | V                |
|           | : BD137  | 60         | V                |
|           | : BD139  | 80         | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | 5          | V                |
| $I_C$     | Collector Current (DC)                           | 1.5        | A                |
| $I_{CP}$  | Collector Current (Pulse)                        | 3.0        | A                |
| $I_B$     | Base Current                                     | 0.5        | A                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 12.5       | W                |
| $P_C$     | Collector Dissipation ( $T_a=25^\circ\text{C}$ ) | 1.25       | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 55 ~ 150 | $^\circ\text{C}$ |

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol         | Parameter                                    | Test Condition                           | Min. | Typ. | Max. | Units         |
|----------------|--|--|------|------|------|---------------|
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage : BD135 | $I_C = 30\text{mA}, I_B = 0$             | 45   |      |      | V             |
|                | : BD137                                      |  | 60   |      |      | V             |
|                | : BD139                                      |  | 80   |      |      | V             |
|                |  |  |      |      |      |               |
| $I_{CBO}$      | Collector Cut-off Current                    | $V_{CB} = 30\text{V}, I_E = 0$           |      |      | 0.1  | $\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current                      | $V_{EB} = 5\text{V}, I_C = 0$            |      |      | 10   | $\mu\text{A}$ |
| $h_{FE1}$      | DC Current Gain : ALL DEVICE                 | $V_{CE} = 2\text{V}, I_C = 5\text{mA}$   | 25   |      |      |               |
| $h_{FE2}$      | : ALL DEVICE                                 | $V_{CE} = 2\text{V}, I_C = 0.5\text{A}$  | 25   |      |      |               |
| $h_{FE3}$      | : BD135                                      | $V_{CE} = 2\text{V}, I_C = 150\text{mA}$ | 40   |      | 250  |               |
|                | : BD137, BD139                               |  | 40   |      | 160  |               |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage         | $I_C = 500\text{mA}, I_B = 50\text{mA}$  |      |      | 0.5  | V             |
| $V_{BE(on)}$   | Base-Emitter ON Voltage                      | $V_{CE} = 2\text{V}, I_C = 0.5\text{A}$  |      |      | 1    | V             |

### $h_{FE}$ Classification

| Classification | 6        | 10       | 16        |
|----------------|----------|----------|-----------|
| $h_{FE3}$      | 40 ~ 100 | 63 ~ 160 | 100 ~ 250 |

## Typical Characteristics

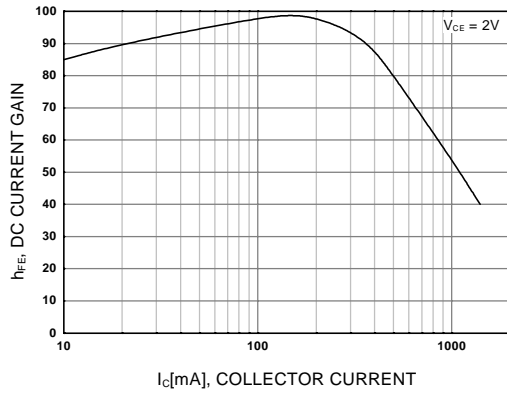


Figure 1. DC current Gain

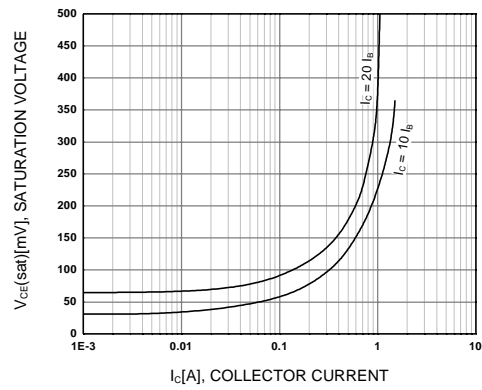


Figure 2. Collector-Emitter Saturation Voltage

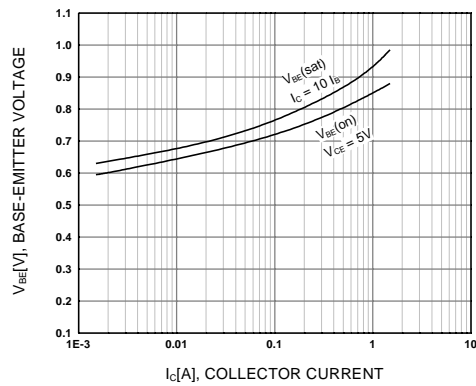


Figure 3. Base-Emitter Voltage

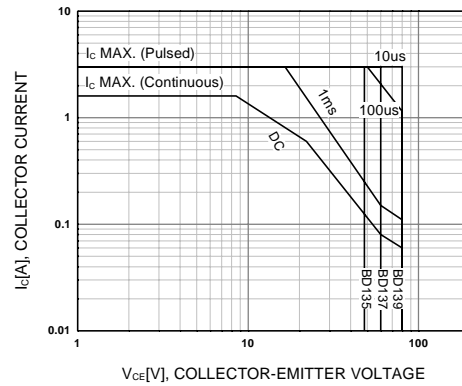


Figure 4. Safe Operating Area

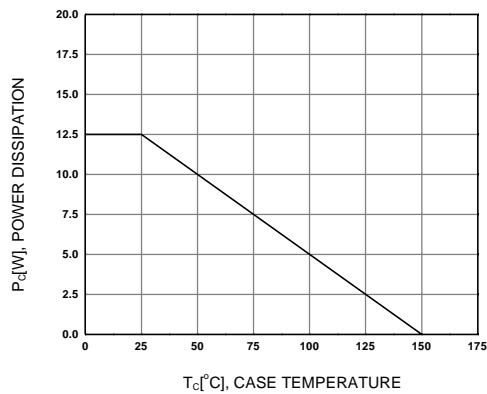
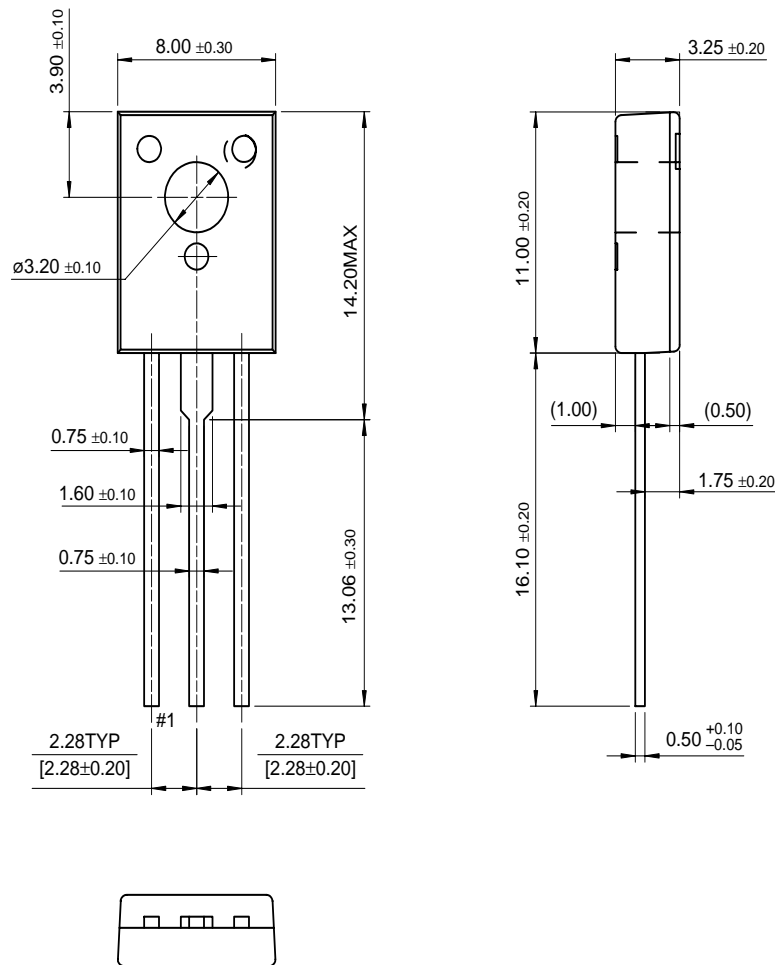


Figure 5. Power Derating

# Package Dimensions

BD135/137/139

## TO-126



Dimensions in Millimeters

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