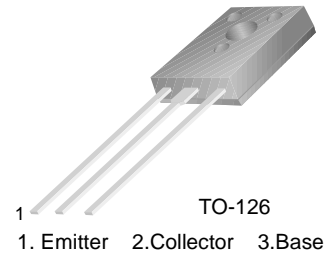


## BD135/137/139

### 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 | $I_C = 30\text{mA}, I_B = 0$            | 45   |      |      | V             |
|                                     | : BD135                              |   | 60   |      |      | V             |
|                                     | : BD137                              |   | 80   |      |      | V             |
|                                     | : BD139                              |   |      |      |      |               |
| $I_{CBO}$                           | 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   | $\mu\text{A}$ |
| $h_{FE1}$<br>$h_{FE2}$<br>$h_{FE3}$ | DC Current Gain : ALL DEVICE         | $V_{CE} = 2\text{V}, I_C = 5\text{mA}$  | 25   |      |      |               |
|                                     |                                      |   | 25   |      |      |               |
|                                     |                                      |   | 40   |      | 250  |               |
|                                     |                                      |   | 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

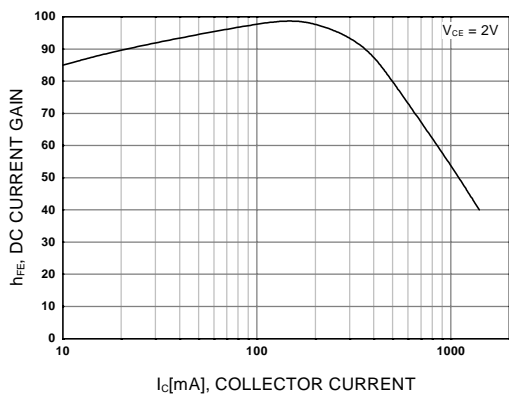


Figure 1. DC current Gain

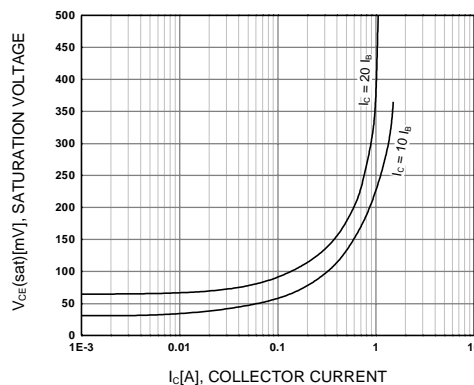


Figure 2. Collector-Emitter Saturation Voltage

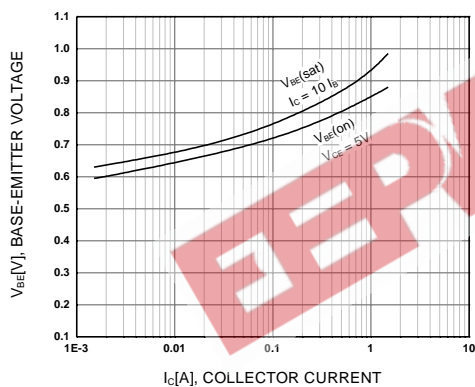


Figure 3. Base-Emitter Voltage

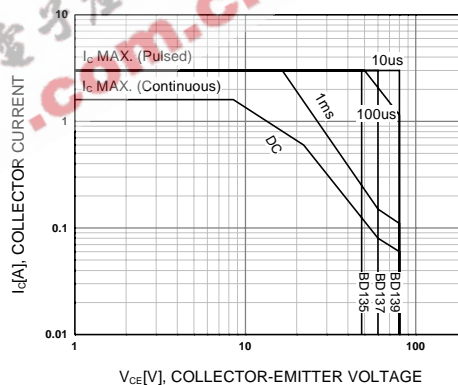


Figure 4. Safe Operating Area

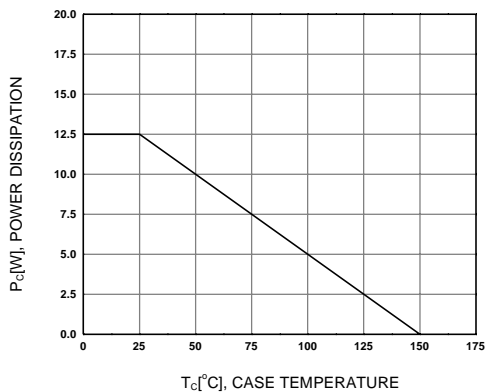
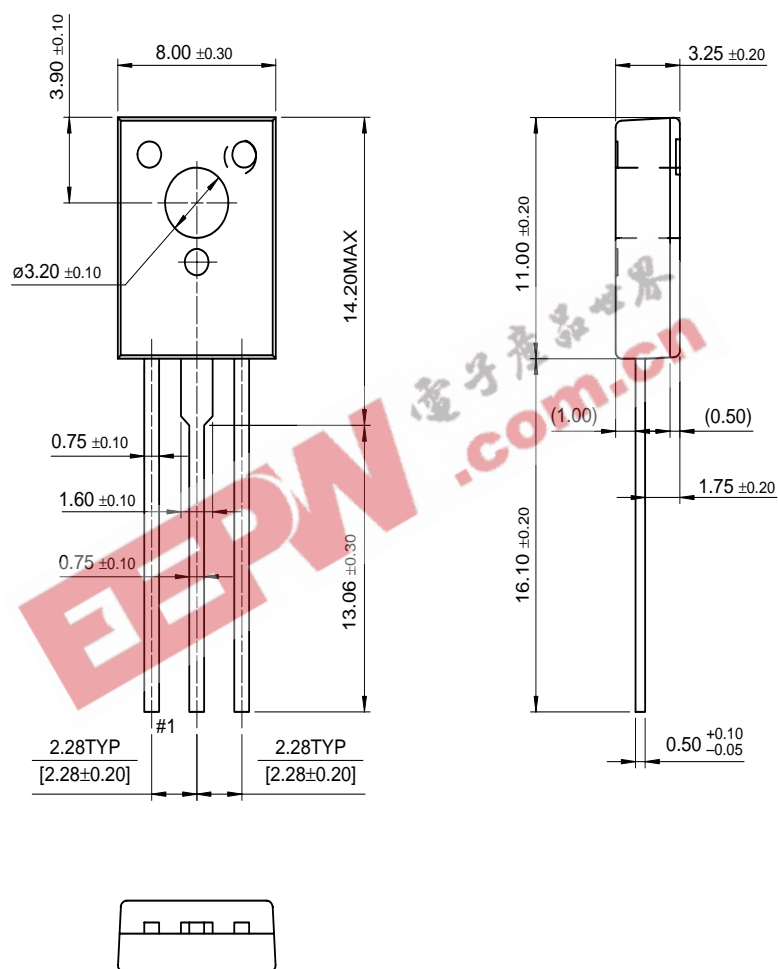


Figure 5. Power Derating

# Package Dimensions

## TO-126



Dimensions in Millimeters

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|----------------------|---------------|-------------|
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| Bottomless™          | ISOPLANAR™    | SyncFET™    |
| CoolFET™             | MICROWIRE™    | TinyLogic™  |
| CROSSVOLT™           | POP™          | UHC™        |
| E <sup>2</sup> CMOS™ | PowerTrench®  | VCX™        |
| FACT™                | QFET™         |             |
| FACT Quiet Series™   | QS™           |             |
| FAST®                | Quiet Series™ |             |
| FASTr™               | SuperSOT™-3   |             |
| GTO™                 | SuperSOT™-6   |             |

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