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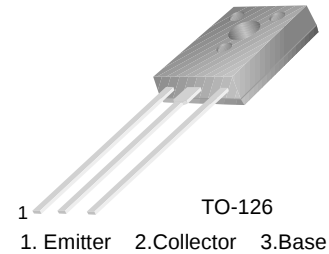
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## BD434/436/438

### Medium Power Linear and Switching Applications

- Complement to BD433, BD435 and BD437 respectively



### PNP Epitaxial Silicon Transistor

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

| Symbol    | Parameter                                        | Value      | Units            |
|-----------|--------------------------------------------------|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                           |            |                  |
|           | : BD434                                          | - 22       | V                |
|           | : BD436                                          | - 32       | V                |
|           | : BD438                                          | - 45       | V                |
| $V_{CES}$ | Collector-Emitter Voltage                        |            |                  |
|           | : BD434                                          | - 22       | V                |
|           | : BD436                                          | - 32       | V                |
|           | : BD438                                          | - 45       | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                        |            |                  |
|           | : BD434                                          | - 22       | V                |
|           | : BD436                                          | - 32       | V                |
|           | : BD438                                          | - 45       | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | - 5        | V                |
| $I_C$     | Collector Current (DC)                           | - 4        | A                |
| $I_{CP}$  | *Collector Current (Pulse)                       | - 7        | A                |
| $I_B$     | Base Current                                     | - 1        | A                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 36         | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 65 ~ 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<br>: BD434<br>: BD436<br>: BD438                 | $I_C = -100\text{mA}, I_B = 0$                                                                                                     | - 22<br>- 32<br>- 45       |                         |                         | V<br>V<br>V                                     |
| $I_{CBO}$      | Collector Cut-off Current<br>: BD434<br>: BD436<br>: BD438                            | $V_{CB} = -22\text{V}, I_E = 0$<br>$V_{CB} = -32\text{V}, I_E = 0$<br>$V_{CB} = -45\text{V}, I_E = 0$                              |                            |                         | - 100<br>- 100<br>- 100 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{CEO}$      | Collector Cut-off Current<br>: BD434<br>: BD436<br>: BD438                            | $V_{CE} = -22\text{V}, V_{BE} = 0$<br>$V_{CE} = -32\text{V}, V_{BE} = 0$<br>$V_{CE} = -45\text{V}, V_{BE} = 0$                     |                            |                         | - 100<br>- 100<br>- 100 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current                                                               | $V_{EB} = -5\text{V}, I_C = 0$                                                                                                     |                            |                         | - 1                     | mA                                              |
| $h_{FE}$       | * DC Current Gain<br>: BD434/436<br>: BD438<br>: ALL DEVICE<br>: BD434/436<br>: BD438 | $V_{CE} = -5\text{V}, I_C = -10\text{mA}$<br>$V_{CE} = -1\text{V}, I_C = -500\text{mA}$<br>$V_{CE} = -1\text{V}, I_C = -2\text{A}$ | 40<br>30<br>85<br>50<br>40 | 140<br>140<br>140       |                         |                                                 |
| $V_{CE(sat)}$  | * Collector-Emitter Saturation Voltage<br>: BD434<br>: BD436<br>: BD438               | $I_C = -2\text{A}, I_B = -0.2\text{A}$                                                                                             |                            | - 0.2<br>- 0.2<br>- 0.2 | - 0.5<br>- 0.5<br>- 0.6 | V<br>V<br>V                                     |
| $V_{BE(on)}$   | * Base-Emitter ON Voltage<br>: BD434<br>: BD436<br>: BD438                            | $V_{CE} = -1\text{V}, I_C = -2\text{A}$                                                                                            |                            |                         | - 1.1<br>- 1.1<br>- 1.2 | V<br>V<br>V                                     |
| $f_T$          | Current Gain Bandwidth Product                                                        | $V_{CE} = -1\text{V}, I_C = -250\text{mA}$                                                                                         | 3                          |                         |                         | MHz                                             |

\* Pulse Test: PW=300 $\mu\text{s}$ , duty Cycle=1.5% Pulsed

## Typical Characteristics

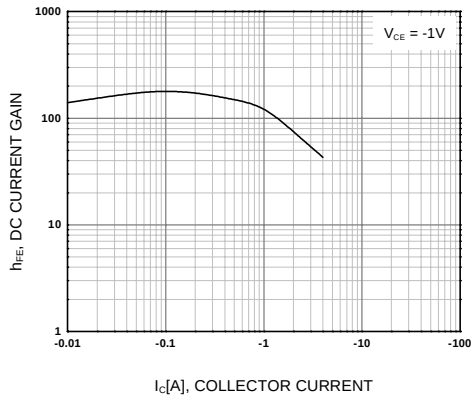


Figure 1. DC current Gain

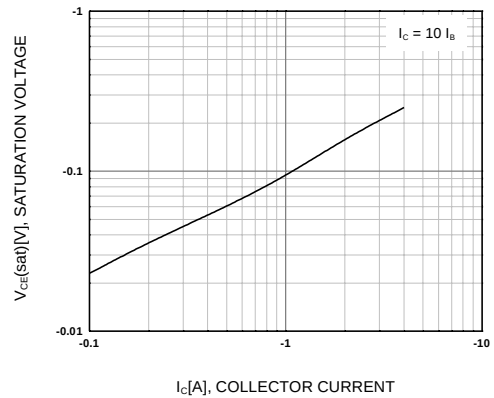


Figure 2. Collector-Emitter Saturation Voltage

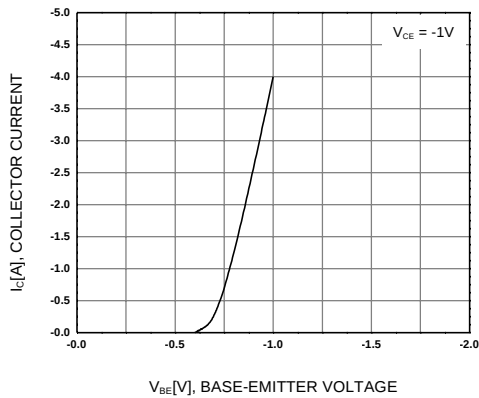


Figure 3. Base-Emitter On Voltage

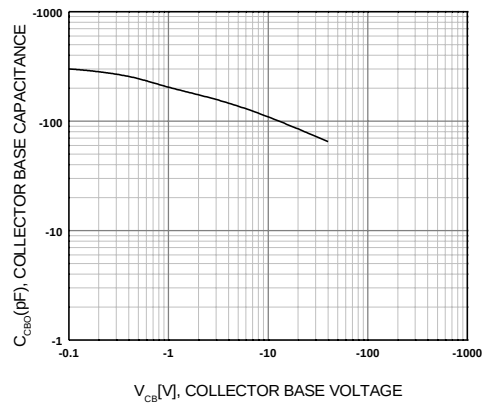


Figure 4. Collector-Base Capacitance

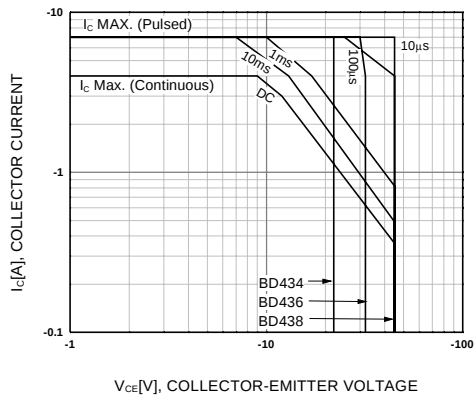


Figure 5. Safe Operating Area

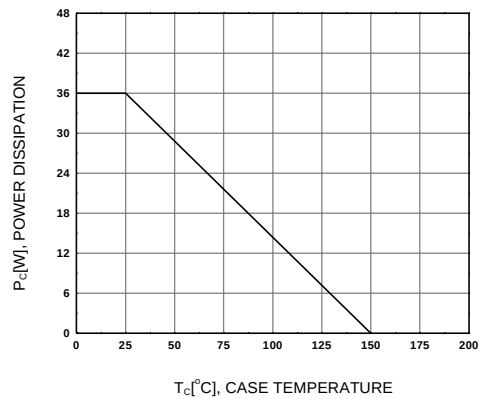
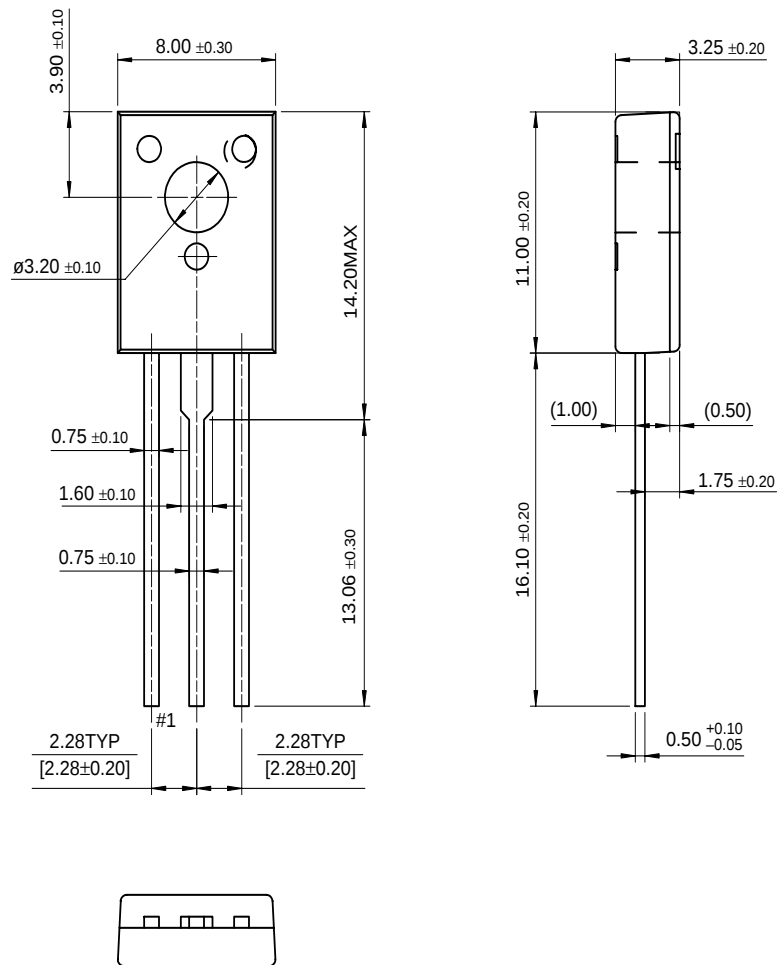


Figure 6. Power Derating

# Package Dimensions

## TO-126



Dimensions in Millimeters

BD434/436/438

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| DenseTrench™         | GTO™                | QFET™               | TinyLogic™  |
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