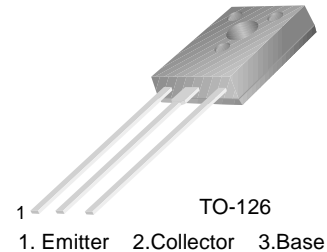


## BD434/436/438

### 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   | $I_C = -100\text{mA}, I_B = 0$             | -22<br>-32<br>-45          |                   |                      | V<br>V<br>V                                     |                        |  |
|                | : BD434                                |  |                            |                   |                      |   |                        |  |
|                | : BD436<br>: BD438                     |  |                            |                   |                      |   |                        |  |
| $I_{CBO}$      | Collector Cut-off Current              | $V_{CB} = -22\text{V}, I_E = 0$            |                            |                   | -100<br>-100<br>-100 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |                        |  |
|                | : BD434                                | $V_{CB} = -32\text{V}, I_E = 0$            |                            |                   |                      |   |                        |  |
|                | : BD436<br>: BD438                     | $V_{CB} = -45\text{V}, I_E = 0$            |                            |                   |                      |   |                        |  |
| $I_{CEO}$      | Collector Cut-off Current              | $V_{CE} = -22\text{V}, V_{BE} = 0$         |                            |                   | -100<br>-100<br>-100 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |                        |  |
|                | : BD434                                | $V_{CE} = -32\text{V}, V_{BE} = 0$         |                            |                   |                      |   |                        |  |
|                | : BD436<br>: BD438                     | $V_{CE} = -45\text{V}, V_{BE} = 0$         |                            |                   |                      |   |                        |  |
| $I_{EBO}$      | Emitter Cut-off Current                | $V_{EB} = -5\text{V}, I_C = 0$             |                            |                   | -1                   | mA  |                        |  |
| $h_{FE}$       | * DC Current Gain                      | $V_{CE} = -5\text{V}, I_C = -10\text{mA}$  | 40<br>30<br>85<br>50<br>40 | 140<br>140<br>140 |                      |   |                        |  |
|                |  |  |                            |                   |                      |   | : BD434/436            |  |
|                |  |  |                            |                   |                      |   | : BD438                |  |
|                |  |  |                            |                   |                      |   | : ALL DEVICE           | $V_{CE} = -1\text{V}, I_C = -500\text{mA}$ |
|                |  |  |                            |                   |                      |   | : BD434/436<br>: BD438 | $V_{CE} = -1\text{V}, I_C = -2\text{A}$    |
| $V_{CE(sat)}$  | * Collector-Emitter Saturation Voltage | $I_C = -2\text{A}, I_B = -0.2\text{A}$     |                            |                   | -0.2<br>-0.2<br>-0.2 | -0.5<br>-0.5<br>-0.6                            |                        |  |
|                |  |  |                            |                   |                      |   | : BD434                |  |
|                |  |  |                            |                   |                      |   | : BD436<br>: BD438     |  |
| $V_{BE(on)}$   | * Base-Emitter ON Voltage              | $V_{CE} = -1\text{V}, I_C = -2\text{A}$    |                            |                   | -1.1<br>-1.1<br>-1.2 | V<br>V<br>V                                     |                        |  |
|                |  |  |                            |                   |                      |   | : BD434                |  |
|                |  |  |                            |                   |                      |   | : BD436<br>: BD438     |  |
| $f_T$          | 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

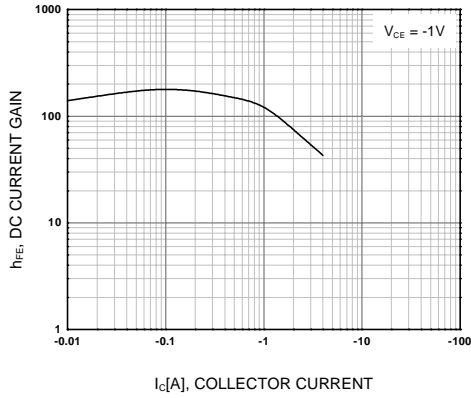


Figure 1. DC current Gain

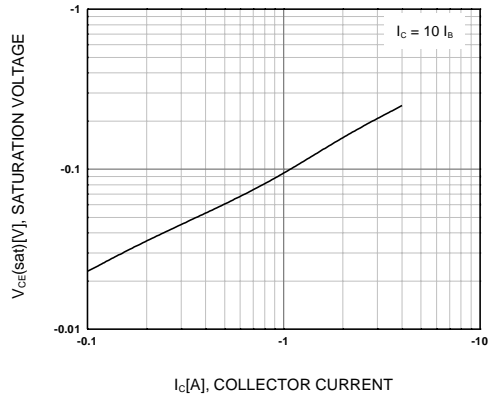


Figure 2. Collector-Emitter Saturation Voltage

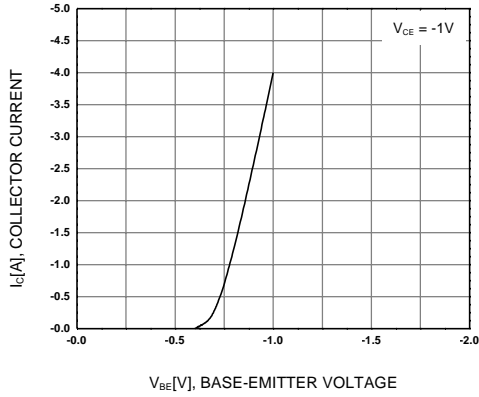


Figure 3. Base-Emitter On Voltage

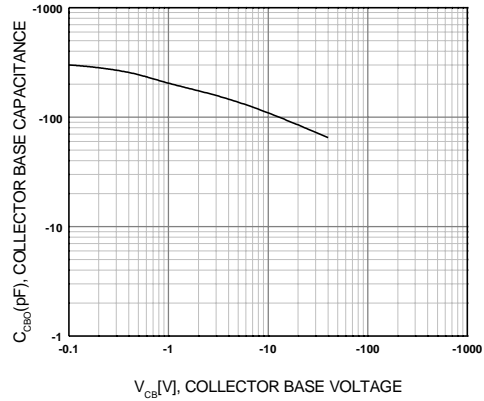


Figure 4. Collector-Base Capacitance

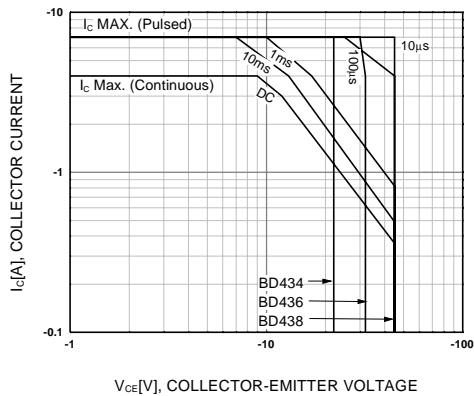


Figure 5. Safe Operating Area

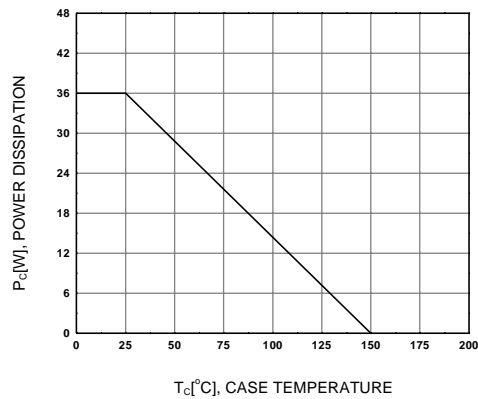
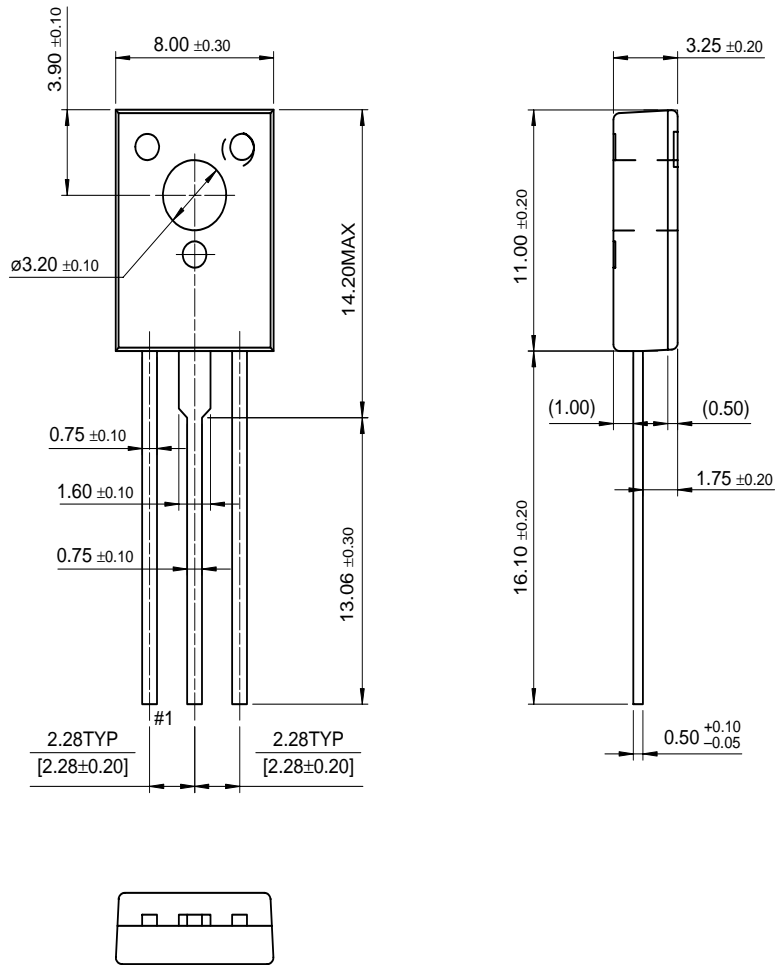


Figure 6. Power Derating

# Package Dimensions

## TO-126

BD434/436/438



Dimensions in Millimeters

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| CoolFET™             | FRFET™              | POP™                         | SuperSOT™-8           |
| CROSSVOLT™           | GlobalOptoisolator™ | PowerTrench <sup>®</sup>     | SyncFET™              |
| DenseTrench™         | GTO™                | QFET™                        | TinyLogic™            |
| DOME™                | HiSeC™              | QS™                          | UHC™                  |
| EcoSPARK™            | ISOPLANAR™          | QT Optoelectronics™          | UltraFET <sup>®</sup> |
| E <sup>2</sup> CMOS™ | LittleFET™          | Quiet Series™                | VCX™                  |
| EnSigna™             | MicroFET™           | SLIENT SWITCHER <sup>®</sup> |                       |
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