

## BD175/177/179

### Medium Power Linear and Switching Applications

- Complement to BD 176/178/180 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 : BD175                  | 45         | V                |
|           | : BD177  | 60         | V                |
|           | : BD179  | 80         | V                |
| $V_{CEO}$ | Collector-Emitter Voltage : BD175                | 45         | V                |
|           | : BD177  | 60         | V                |
|           | : BD179  | 80         | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | 5          | V                |
| $I_C$     | Collector Current (DC)                           | 3          | A                |
| $I_{CP}$  | *Collector Current (Pulse)                       | 7          | A                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 30         | 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 : BD175 | $I_C = 100\text{mA}, I_B = 0$   | 45       |      |      | V             |
|                        | : BD177  |   | 60       |      |      | V             |
|                        | : BD179  |   | 80       |      |      | V             |
| $I_{CBO}$              | Collector Cut-off Current : BD175              | $V_{CB} = 45\text{V}, I_E = 0$  |          |      | 100  | $\mu\text{A}$ |
|                        | : BD177  | $V_{CB} = 60\text{V}, I_E = 0$  |          |      | 100  | $\mu\text{A}$ |
|                        | : BD179  | $V_{CB} = 80\text{V}, I_E = 0$  |          |      | 100  | $\mu\text{A}$ |
| $I_{EBO}$              | Emitter Cut-off Current                        | $V_{EB} = 5\text{V}, I_C = 0$   |          |      | 1    | mA            |
| $h_{FE1}$<br>$h_{FE2}$ | * DC Current Gain                              | $V_{CE} = 2\text{V}, I_C = 150\text{mA}$<br>$V_{CE} = 2\text{V}, I_C = 1\text{A}$ | 40<br>15 |      | 250  |               |
| $V_{CE(sat)}$          | * Collector-Emitter Saturation Voltage         | $I_C = 1\text{A}, I_B = 0.1\text{A}$  |          |      | 0.8  | V             |
| $V_{BE(on)}$           | * Base-Emitter On Voltage                      | $V_{CE} = 2\text{V}, I_C = 1\text{A}$   |          |      | 1.3  | V             |
| $f_T$                  | Current Gain Bandwidth Product                 | $V_{CE} = 10\text{V}, I_C = 250\text{mA}$   | 3        |      |      | MHz           |

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

#### $h_{FE}$ Classification

| Classification | 6        | 10       | 16        |
|----------------|----------|----------|-----------|
| $h_{FE1}$      | 40 ~ 100 | 63 ~ 160 | 100 ~ 250 |

\* Classification 16: Only BD175

# Typical Characteristics

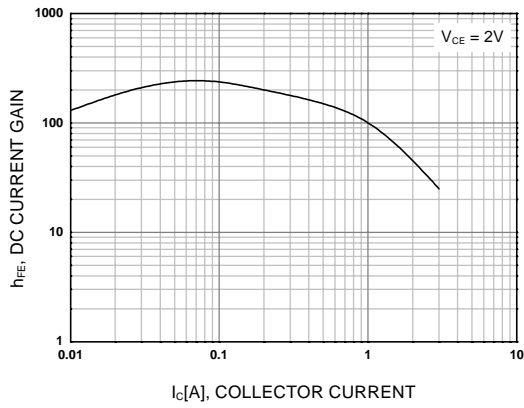


Figure 1. DC current Gain

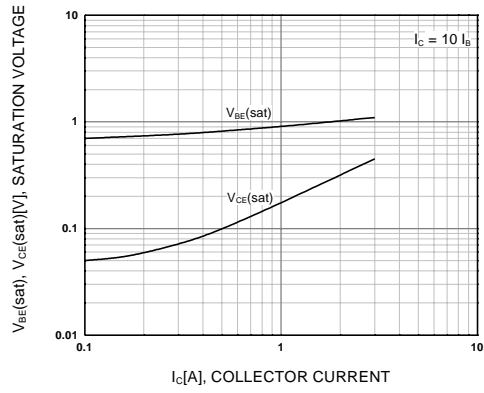


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

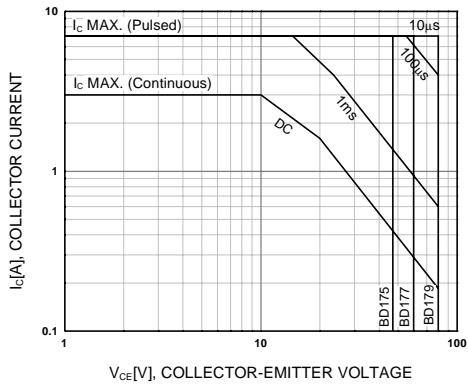


Figure 3. Safe Operating Area

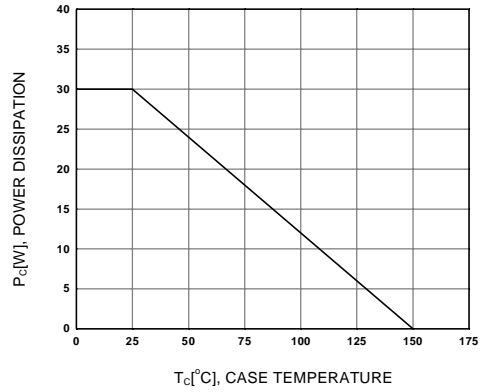


Figure 4. Power Derating

# Package Dimensions

## TO-126

BD175/177/179



Dimensions in Millimeters

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| E <sup>2</sup> CMOS™ | PowerTrench®  | VCX™        |
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| FACT Quiet Series™   | QS™           |             |
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