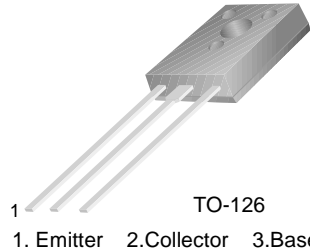


BD439/441

BD439/441

Medium Power Linear and Switching Applications

- Complement to BD440, BD442 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 | | |
| | : BD439 | 60 | V |
| | : BD441 | 80 | V |
| V_{CES} | Collector-Emitter Voltage | | |
| | : BD439 | 60 | V |
| | : BD441 | 80 | V |
| V_{CEO} | Collector-Emitter Voltage | | |
| | : BD439 | 60 | V |
| | : BD441 | 80 | 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 | | | | | |
| | : BD439 | $I_C = 100\text{mA}, I_B = 0$ | 60 | | | V |
| | : BD441 | | 80 | | | V |
| I_{CBO} | Collector Cut-off Current | | | | | |
| | : BD439 | $V_{CB} = 60\text{V}, I_E = 0$ | | | 100 | μA |
| | : BD441 | $V_{CB} = 80\text{V}, I_E = 0$ | | | 100 | μA |
| I_{CES} | Collector Cut-off Current | | | | | |
| | : BD439 | $V_{CE} = 60\text{V}, V_{BE} = 0$ | | | 100 | μA |
| | : BD441 | $V_{CE} = 80\text{V}, V_{BE} = 0$ | | | 100 | μA |
| I_{EBO} | Emitter Cut-off Current | $V_{EB} = 5\text{V}, I_C = 0$ | | | 1 | mA |
| h_{FE} | * DC Current Gain | | | | | |
| | : BD439 | $V_{CE} = 5\text{V}, I_C = 10\text{mA}$ | 20 | 130 | | |
| | : BD441 | | 15 | 130 | | |
| | : BD439 | $V_{CE} = 1\text{V}, I_C = 500\text{mA}$ | 40 | 140 | | |
| | : BD441 | | 40 | 140 | | |
| | : BD439 | $V_{CE} = 1\text{V}, I_C = 2\text{A}$ | 25 | | | |
| | : BD441 | | 15 | | | |
| $V_{CE(sat)}$ | * Collector-Emitter Saturation Voltage | $I_C = 2\text{A}, I_B = 0.2\text{A}$ | | | 0.8 | V |
| $V_{BE(on)}$ | * Base-Emitter ON Voltage | | | | | |
| | : BD439 | $V_{CE} = 5\text{V}, I_C = 10\text{mA}$ | | 0.58 | | V |
| | : BD441 | $V_{CE} = 1\text{V}, I_C = 2\text{A}$ | | | 1.5 | V |
| f_T | Current Gain Bandwidth Product | $V_{CE} = 1\text{V}, I_C = 250\text{mA}$ | 3 | | | MHz |

* Pulse Test: PW=300 μs , duty Cycle=1.5% Pulsed

Typical Characteristics

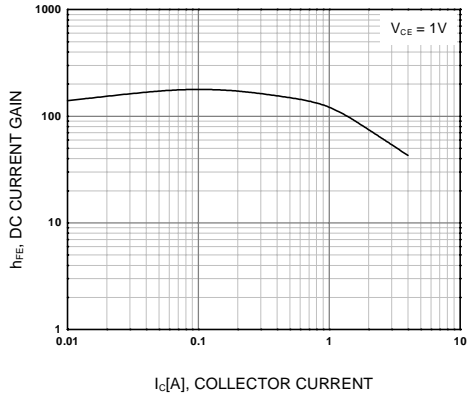


Figure 1. DC current Gain

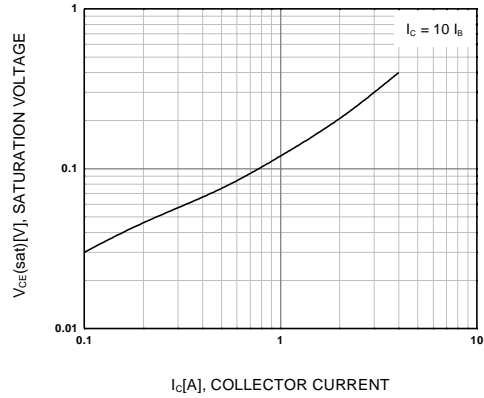


Figure 2. Collector-Emitter Saturation Voltage

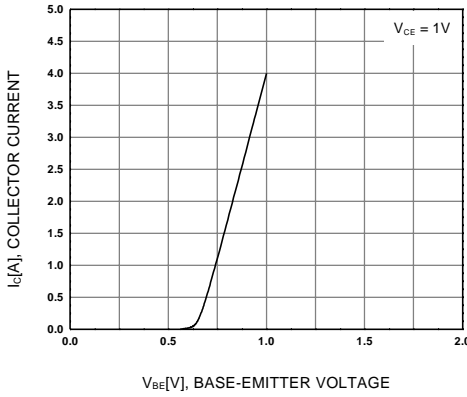


Figure 3. Base-Emitter On Voltage

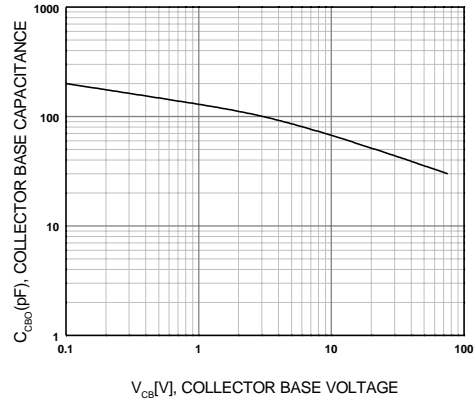


Figure 4. Collector-Base Capacitance

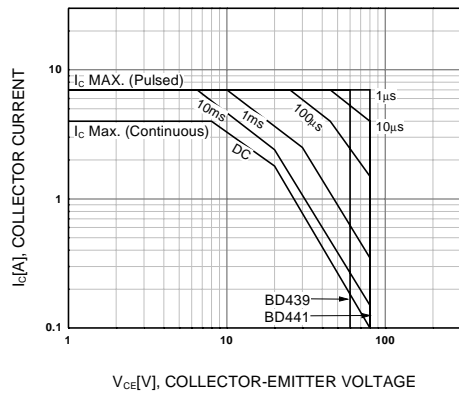


Figure 5. Safe Operating Area

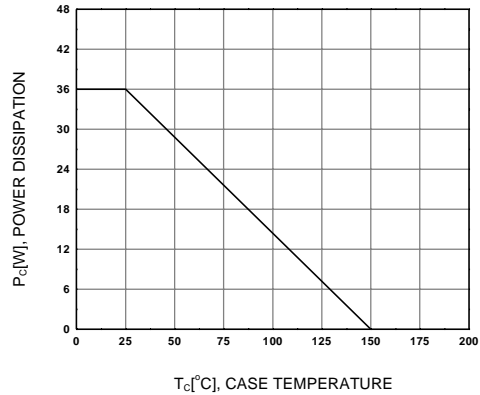


Figure 6. Power Derating

Package Dimensions

BD439/441

TO-126



Dimensions in Millimeters

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| CoolFET™ | FRFET™ | POP™ | SuperSOT™-8 |
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