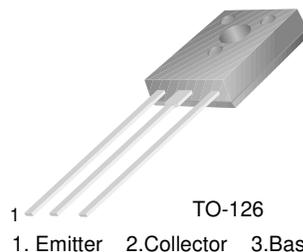


BD440/442

BD440/442

Medium Power Linear and Switching Applications

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

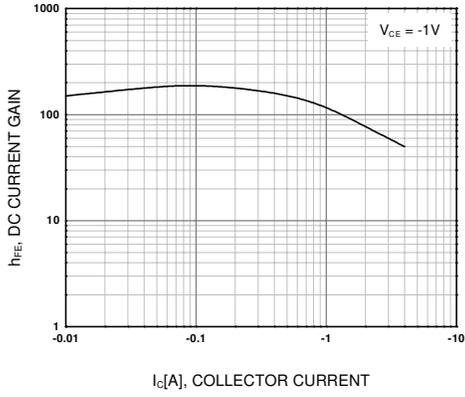


Figure 1. DC current Gain

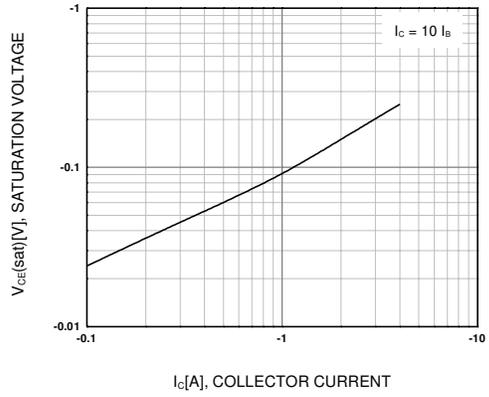


Figure 2. Collector-Emitter Saturation Voltage

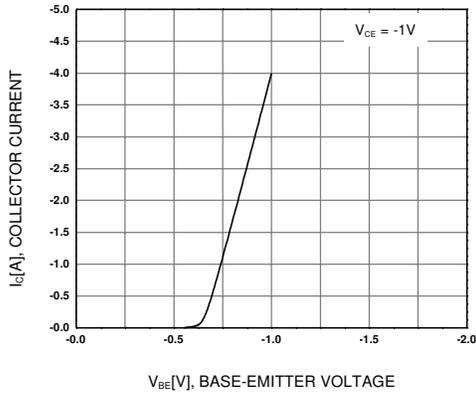


Figure 3. Base-Emitter On Voltage

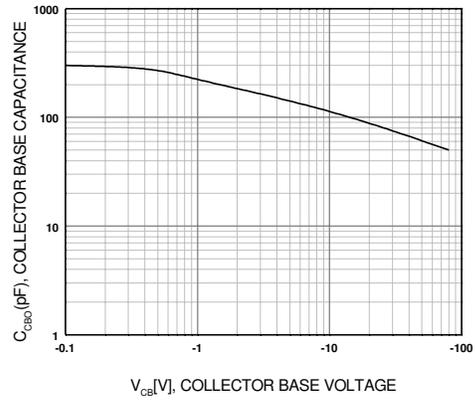


Figure 4. Collector-Base Capacitance

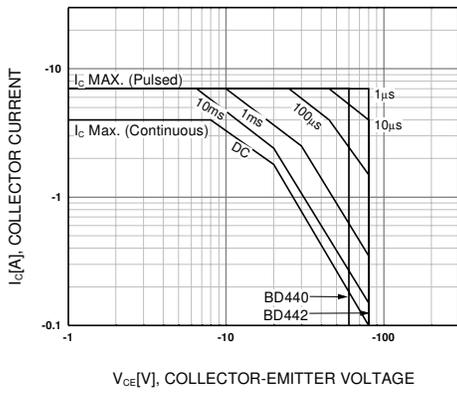


Figure 5. Safe Operating Area

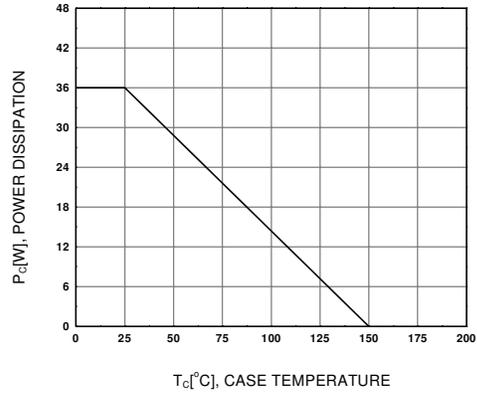
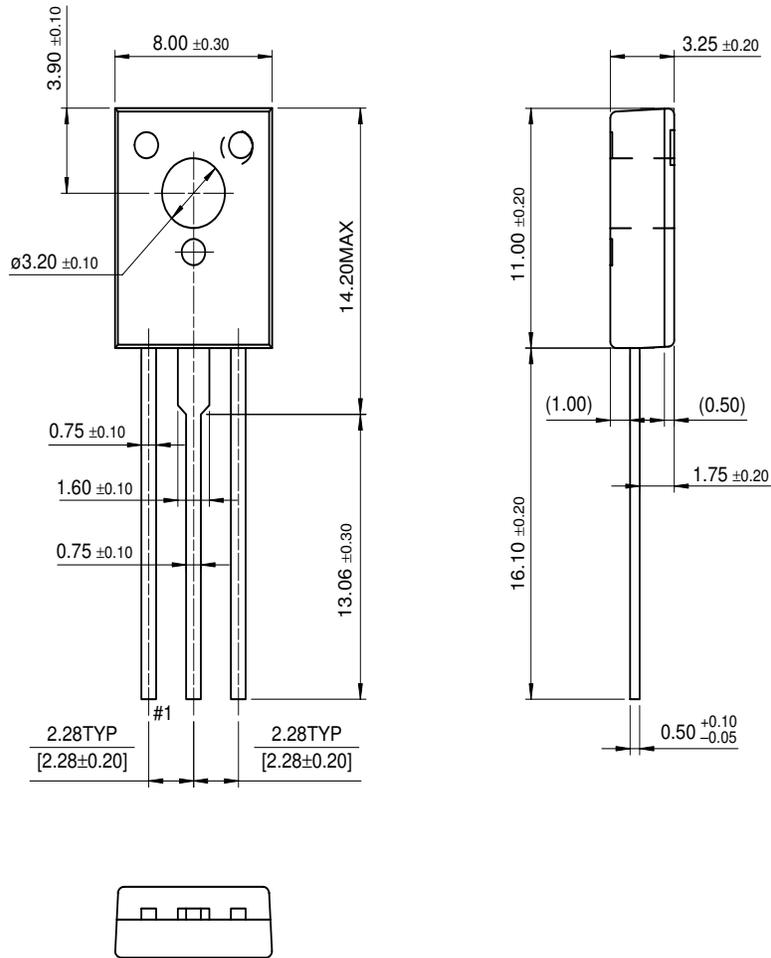


Figure 6. Power Derating

Package Dimensions

TO-126



Dimensions in Millimeters

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|----------------------|---------------------|------------------------------|-----------------------|
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| DenseTrench™ | GTO™ | QFET™ | TinyLogic™ |
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| EcoSPARK™ | ISOPLANAR™ | QT Optoelectronics™ | UltraFET [®] |
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