

BD135/137/139

Medium Power Linear and Switching Applications

- Complement to BD136, BD138 and BD140 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 : BD135 | 45 | V |
| | : BD137 | 60 | V |
| | : BD139 | 80 | V |
| V_{CEO} | Collector-Emitter Voltage : BD135 | 45 | V |
| | : BD137 | 60 | V |
| | : BD139 | 80 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current (DC) | 1.5 | A |
| I_{CP} | Collector Current (Pulse) | 3.0 | A |
| I_B | Base Current | 0.5 | A |
| P_C | Collector Dissipation ($T_C=25^\circ\text{C}$) | 12.5 | W |
| P_C | Collector Dissipation ($T_a=25^\circ\text{C}$) | 1.25 | W |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature | - 55 ~ 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 : BD135 | $I_C = 30\text{mA}, I_B = 0$ | 45 | | | V | |
| | : BD137 | | 60 | | | V | |
| | : BD139 | | 80 | | | V | |
| I_{CBO} | Collector Cut-off Current | $V_{CB} = 30\text{V}, I_E = 0$ | | | 0.1 | μA | |
| I_{EBO} | Emitter Cut-off Current | $V_{EB} = 5\text{V}, I_C = 0$ | | | 10 | μA | |
| h_{FE1} | DC Current Gain : ALL DEVICE | $V_{CE} = 2\text{V}, I_C = 5\text{mA}$ | 25 | | | | |
| h_{FE2} | | $V_{CE} = 2\text{V}, I_C = 0.5\text{A}$ | 25 | | | | |
| h_{FE3} | | : BD135 | $V_{CE} = 2\text{V}, I_C = 150\text{mA}$ | 40 | | 250 | |
| | | : BD137, BD139 | | 40 | | 160 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 500\text{mA}, I_B = 50\text{mA}$ | | | 0.5 | V | |
| $V_{BE(on)}$ | Base-Emitter ON Voltage | $V_{CE} = 2\text{V}, I_C = 0.5\text{A}$ | | | 1 | V | |

h_{FE} Classification

| Classification | 6 | 10 | 16 |
|----------------|----------|----------|-----------|
| h_{FE3} | 40 ~ 100 | 63 ~ 160 | 100 ~ 250 |

Typical Characteristics



Figure 1. DC current Gain

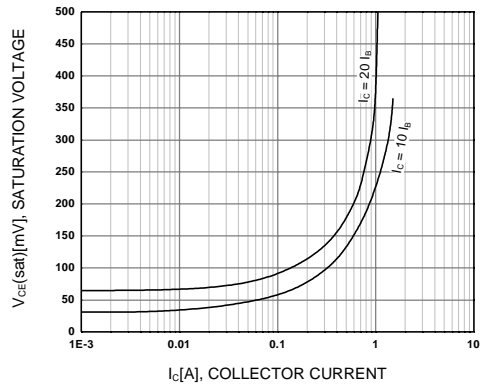


Figure 2. Collector-Emitter Saturation Voltage



Figure 3. Base-Emitter Voltage

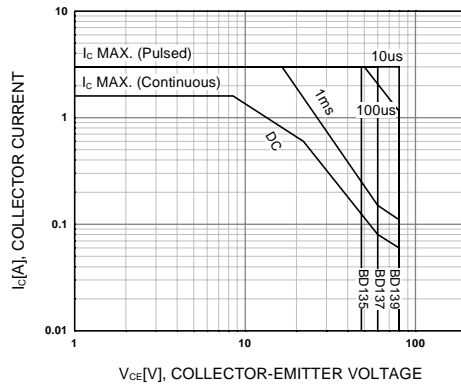


Figure 4. Safe Operating Area



Figure 5. Power Derating

Package Dimensions

TO-126

BD135/137/139



Dimensions in Millimeters

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| E ² CMOS™ | PowerTrench® | VCX™ |
| FACT™ | QFET™ | |
| FACT Quiet Series™ | QS™ | |
| FAST® | Quiet Series™ | |
| FASTr™ | SuperSOT™-3 | |
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