BD136 / BD138 / BD140
PNP Epitaxial Silicon Transistor

Features
• Complement to BD135, BD137 and BD139 respectively

Applications
• Medium Power Linear and Switching

Ordering Information

<table>
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<tr>
<th>Part Number</th>
<th>Marking</th>
<th>Package</th>
<th>Packing Method</th>
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<td>BD136-10</td>
<td>TO-126 3L</td>
<td>Bulk</td>
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<tr>
<td>BD13610STU</td>
<td>BD136-10</td>
<td>TO-126 3L</td>
<td>Rail</td>
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<td>BD13616S</td>
<td>BD136-16</td>
<td>TO-126 3L</td>
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<td>BD140-16</td>
<td>TO-126 3L</td>
<td>Rail</td>
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Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
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<tbody>
<tr>
<td>$V_{CBO}$</td>
<td>Collector-Base Voltage</td>
<td>BD136</td>
<td>-45</td>
</tr>
<tr>
<td>BD138</td>
<td>-60</td>
<td></td>
<td></td>
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<tr>
<td>BD140</td>
<td>-80</td>
<td></td>
<td></td>
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<tr>
<td>$V_{CEO}$</td>
<td>Collector-Emitter Voltage</td>
<td>BD136</td>
<td>-45</td>
</tr>
<tr>
<td>BD138</td>
<td>-60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BD140</td>
<td>-80</td>
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<tr>
<td>$V_{EBO}$</td>
<td>Emitter-Base Voltage</td>
<td>-5</td>
<td>V</td>
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<tr>
<td>$I_C$</td>
<td>Collector Current (DC)</td>
<td>-1.5</td>
<td>A</td>
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<tr>
<td>$I_C$</td>
<td>Collector Current (Pulse)</td>
<td>-3.0</td>
<td>A</td>
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<tr>
<td>$I_B$</td>
<td>Base Current</td>
<td>-0.5</td>
<td>A</td>
</tr>
<tr>
<td>$P_C$</td>
<td>Collector Dissipation</td>
<td>$T_C = 25^\circ C$</td>
<td>12.5</td>
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<tr>
<td>$T_J$</td>
<td>Junction Temperature</td>
<td>150</td>
<td>$^\circ C$</td>
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<tr>
<td>$T_{STG}$</td>
<td>Storage Temperature</td>
<td>-55 to +150</td>
<td>$^\circ C$</td>
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Electrical Characteristics

Values are at $T_A = 25^\circ C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
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<tr>
<td>$V_{CEO(sus)}$</td>
<td>Collector-Emitter Sustaining Voltage$^{(1)}$</td>
<td>$I_C = -30$ mA, $I_B = 0$</td>
<td>BD136</td>
<td>-45</td>
<td>V</td>
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<tr>
<td>BD138</td>
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</tr>
<tr>
<td>BD140</td>
<td>-80</td>
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<tr>
<td>$I_{CBO}$</td>
<td>Collector Cut-Off Current</td>
<td>$V_{CB} = -30$ V, $I_E = 0$</td>
<td>-0.1</td>
<td>$\mu$A</td>
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<tr>
<td>$I_{EBO}$</td>
<td>Emitter Cut-Off Current</td>
<td>$V_{EB} = -5$ V, $I_C = 0$</td>
<td>-10</td>
<td>$\mu$A</td>
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<tr>
<td>$h_{FE1}$</td>
<td>DC Current Gain$^{(1)}$</td>
<td>$V_{CE} = -2$ V, $I_C = -5$ mA</td>
<td>25</td>
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<tr>
<td>$h_{FE2}$</td>
<td>DC Current Gain$^{(1)}$</td>
<td>$V_{CE} = -2$ V, $I_C = -0.5$ A</td>
<td>25</td>
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<tr>
<td>$h_{FE3}$</td>
<td>DC Current Gain$^{(1)}$</td>
<td>$V_{CE} = -2$ V, $I_C = -150$ mA</td>
<td>40</td>
<td>250</td>
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<tr>
<td>$V_{CE(sat)}$</td>
<td>Collector-Emitter Saturation Voltage$^{(1)}$</td>
<td>$I_C = -500$ mA, $I_B = -50$ mA</td>
<td>0.5</td>
<td>V</td>
<td></td>
<td></td>
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<tr>
<td>$V_{BE(on)}$</td>
<td>Base-Emitter On Voltage$^{(1)}$</td>
<td>$V_{CE} = -2$ V, $I_C = -0.5$ A</td>
<td>-1</td>
<td>V</td>
<td></td>
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Note:
1. Pulse test: pulse width = 350 $\mu$s, duty cycle = 2.0% pulsed.

$\textbf{h}_{\text{FE}}$ Classification

<table>
<thead>
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<td>$h_{FE3}$</td>
<td>63 ~ 160</td>
<td>100 ~ 250</td>
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</table>
Typical Performance 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

Physical Dimensions

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C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
D) FOR TERMINAL LENGTH SEE TABLE
E) DRAWING FILE NAME AND REVISION: MKT-TO126Arev1

Figure 6. TO-126 (SOT-32) UNIFIED DRAWING (TSTU, TSSTU, STANDARD)
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SuperSOT-6™
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<th>Datasheet Identification</th>
<th>Product Status</th>
<th>Definition</th>
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<td>Advance Information</td>
<td>Formative / In Design</td>
<td>Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.</td>
</tr>
<tr>
<td>Preliminary</td>
<td>First Production</td>
<td>Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.</td>
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<td>Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.</td>
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