Description

The 2SC2837 is an NPN transistor of 150 V, 10 A. The product has constant $h_{FE}$ characteristics in a wide current range, providing high-quality audio sounds.

Features

- Complementary to 2SA1186
- LAPT (Linear Amplifier Power Transistor)
- High Transition Frequency
- Bare Lead Frame: Pb-free (RoHS Compliant)

- $V_{CEO} = 150\, \text{V}$
- $I_C = 10\, \text{A}$
- $f_T = 70\, \text{MHz}$
- $P_C = 100\, \text{W}$

Application

- Audio Power Amplifier

Package

TO3P-3L
## Absolute Maximum Ratings

Unless otherwise specified, $T_A = 25 \, ^\circ\text{C}$.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector to Base Voltage</td>
<td>$V_{CBO}$</td>
<td>$V_{CB} = 150 , \text{V}, I_E = 0 , \text{A}$</td>
<td>150</td>
<td>V</td>
</tr>
<tr>
<td>Collector to Emitter Voltage</td>
<td>$V_{CEO}$</td>
<td>$V_{CE} = 150 , \text{V}$</td>
<td>150</td>
<td>V</td>
</tr>
<tr>
<td>Emitter to Base Voltage</td>
<td>$V_{EBO}$</td>
<td>5</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Collector Current</td>
<td>$I_C$</td>
<td>10</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>Base Current</td>
<td>$I_B$</td>
<td>2</td>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>Collector Power Dissipation</td>
<td>$P_C$</td>
<td>$T_C = 25 , ^\circ\text{C}$</td>
<td>100</td>
<td>W</td>
</tr>
<tr>
<td>Operating Junction Temperature</td>
<td>$T_J$</td>
<td>150</td>
<td>150</td>
<td>^\circ\text{C}</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{STG}$</td>
<td>$-55$ to $150$</td>
<td>$-55$ to $150$</td>
<td>^\circ\text{C}</td>
</tr>
</tbody>
</table>

## Thermal Characteristics

Unless otherwise specified, $T_A = 25 \, ^\circ\text{C}$.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Resistance (Junction to Case)</td>
<td>$R_{OJC}$</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.25</td>
<td>^\circ\text{C}/W</td>
</tr>
<tr>
<td>Thermal Resistance (Junction to Ambient)</td>
<td>$R_{OJA}$</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>35.7</td>
<td>^\circ\text{C}/W</td>
</tr>
</tbody>
</table>

## Electrical Characteristics

Unless otherwise specified, $T_A = 25 \, ^\circ\text{C}$.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector Cut-off Current</td>
<td>$I_{CEO}$</td>
<td>$V_{CB} = 150 , \text{V}, I_E = 0 , \text{A}$</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>µA</td>
</tr>
<tr>
<td>Emitter Cut-off Current</td>
<td>$I_{EBO}$</td>
<td>$V_{EB} = 5 , \text{V}, I_C = 0 , \text{A}$</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>µA</td>
</tr>
<tr>
<td>Collector to Emitter Breakdown Voltage</td>
<td>$V_{BRCEO}$</td>
<td>$I_C = 25 , \text{mA}$</td>
<td>150</td>
<td>—</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>DC Current Gain</td>
<td>$h_{FE}$</td>
<td>$V_{CB} = 4 , \text{V}, I_C = 3 , \text{A}$</td>
<td>90</td>
<td>—</td>
<td>180</td>
<td>—</td>
</tr>
<tr>
<td>Collector to Emitter Saturation Voltage</td>
<td>$V_{CE(sat)}$</td>
<td>$I_C = 5 , \text{A}, I_B = 0.5 , \text{A}$</td>
<td>—</td>
<td>—</td>
<td>2.0</td>
<td>V</td>
</tr>
<tr>
<td>Transition Frequency</td>
<td>$f_T$</td>
<td>$V_{CE} = 12 , \text{V}, I_E = -1 , \text{A}$</td>
<td>—</td>
<td>70</td>
<td>—</td>
<td>MHz</td>
</tr>
<tr>
<td>Collector Output Capacitance</td>
<td>$C_{DB}$</td>
<td>$V_{CB} = 80 , \text{V}, I_E = 0 , \text{A}, f = 1\text{MHz}$</td>
<td>—</td>
<td>60</td>
<td>—</td>
<td>pF</td>
</tr>
</tbody>
</table>

### $h_{FE}$ Rank

For the marking area of the rank, see the Marking Diagram.

<table>
<thead>
<tr>
<th>Rank</th>
<th>O</th>
<th>P</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>$h_{FE}$</td>
<td>50 to 100</td>
<td>70 to 140</td>
<td>90 to 180</td>
</tr>
</tbody>
</table>
Rating and Characteristic Curves

![Graphs showing rating and characteristic curves for 2SC2837.]

**Figure 1.** Safe Operating Area

**Figure 2.** Power Dissipation vs. Ambient Temperature

**Figure 3.** Collector Current vs. Collector-Emitter Voltage

**Figure 4.** Collector-Emitter Saturation Voltage vs. Base Current
Figure 5. Collector Current vs. Base-Emitter Voltage

Figure 6. DC Current Gain Variation vs. Collector Current

Figure 7. DC Current Gain vs. Collector Current

Figure 8. Transition Frequency vs. Emitter Current
Figure 9. Transient Thermal Resistance
Physical Dimensions

- **TO3P-3L**

### Notes:
- Gate burr: 0.3 mm (max.)
- All dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the product, be sure to minimize the working time within the following limits:
  - 260 ± 5 °C 10 ± 1 s, 2 times (flow)
  - 380 ± 10 °C 3.5 ± 0.5 s, 1 time (soldering iron)
- Soldering should be at a distance of at least 1.5 mm from the body of the product.
- The recommended screw torque for TO3P: 0.686 N·m to 0.882 N·m (7 kgf·cm to 9 kgf·cm)
Marking Diagram

Specific Device Code (See Table 1)
Lot Number
- Y is the last digit of the year of manufacture (0 to 9)
- M is the month of the year (1 to 9, 0, N, or D)
- X is the hFE rank

Table 1. Specific Device Code

<table>
<thead>
<tr>
<th>Specific Device Code</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2837</td>
<td>2SC2837</td>
</tr>
</tbody>
</table>
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