

**50V PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR**

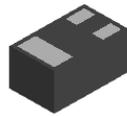
**Features**

- Epitaxial Die Construction
- Complementary NPN Type Available (BC847BLP)
- Ultra-Small Leadless Surface Mount Package
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

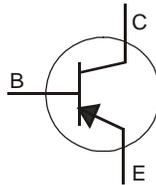
**Mechanical Data**

- Case: DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0009 grams

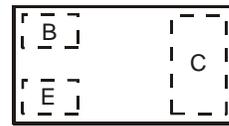
DFN1006-3



Bottom View



Device Symbol



Top View  
Pin-Out

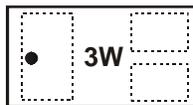
**Ordering Information** (Note 3)

| Product     | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|---------|--------------------|-----------------|-------------------|
| BC857BLP-7  | 3W      | 7                  | 8mm             | 3,000             |
| BC857BLP-7B | 3W      | 7                  | 8mm             | 10,000            |

- Notes:
1. No purposefully added lead.
  2. Halogen and Antimony Free. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**

BC857BLP-7



Top View  
Dot Denotes  
Collector Side

BC857BLP-7B



Top View  
Bar Denotes Base  
and Emitter Side

3W = Product Type Marking Code

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic            | Symbol    | Value | Unit |
|---------------------------|-----------|-------|------|
| Collector-Base Voltage    | $V_{CBO}$ | -50   | V    |
| Collector-Emitter Voltage | $V_{CEO}$ | -45   | V    |
| Emitter-Base Voltage      | $V_{EBO}$ | -5.0  | V    |
| Collector Current         | $I_C$     | -100  | mA   |

**Thermal Characteristics**

| Characteristic  | Symbol          | Value       | Unit                      |
|---|-----------------|-------------|---------------------------|
| Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$                           | $P_D$           | 250         | mW                        |
| Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 500         | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range   | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$          |

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic (Note 5)              | Symbol        | Min       | Typ          | Max          | Unit                | Test Condition  |
|--------------------------------------|---------------|-----------|--------------|--------------|---------------------|---|
| Collector-Base Breakdown Voltage     | $BV_{CBO}$    | -50       | —            | —            | V                   | $I_C = 10\mu\text{A}, I_B = 0$  |
| Collector-Emitter Breakdown Voltage  | $BV_{CEO}$    | -45       | —            | —            | V                   | $I_C = 10\text{mA}, I_B = 0$  |
| Emitter-Base Breakdown Voltage       | $BV_{EBO}$    | -5        | —            | —            | V                   | $I_E = 1\mu\text{A}, I_C = 0$   |
| DC Current Gain                      | $h_{FE}$      | 220       | 260          | 475          | —                   | $V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$  |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | —         | -90<br>-250  | -300<br>-650 | mV                  | $I_C = -10\text{mA}, I_B = -0.5\text{mA}$<br>$I_C = -100\text{mA}, I_B = -5.0\text{mA}$     |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | —         | -700<br>-850 | —            | mV                  | $I_C = -10\text{mA}, I_B = -0.5\text{mA}$<br>$I_C = -100\text{mA}, I_B = -5.0\text{mA}$     |
| Base-Emitter Voltage                 | $V_{BE(on)}$  | -600<br>— | -670<br>-710 | -750<br>-820 | mV                  | $V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$<br>$V_{CE} = -5.0\text{V}, I_C = -10\text{mA}$ |
| Collector-Cutoff Current             | $I_{CBO}$     | —         | —            | -15<br>-4.0  | nA<br>$\mu\text{A}$ | $V_{CB} = -30\text{V}$<br>$V_{CB} = -30\text{V}, T_A = 150^\circ\text{C}$                   |
| Gain Bandwidth Product               | $f_T$         | 100       | —            | —            | MHz                 | $V_{CE} = -5.0\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$                              |
| Collector-Base Capacitance           | $C_{CBO}$     | —         | 3.0          | —            | pF                  | $V_{CB} = -10\text{V}, f = 1.0\text{MHz}$   |

Notes: 4. Device mounted on FR-4 PCB, Diodes Inc. suggested pad layout document can be found on our website at <http://www.diodes.com>.  
5. Short duration pulse test used to minimize self-heating effect.

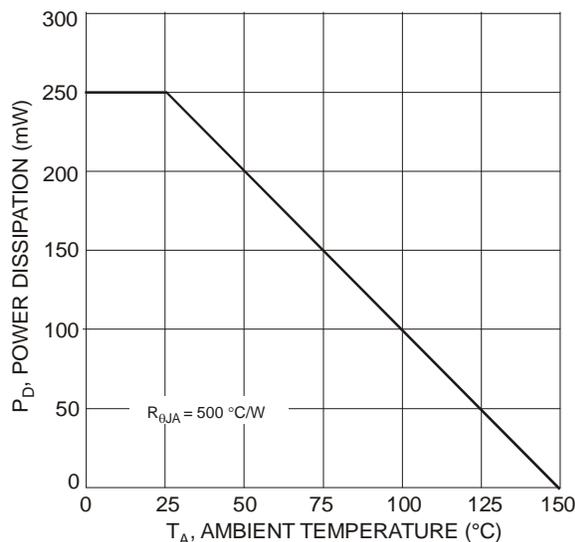


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 4)

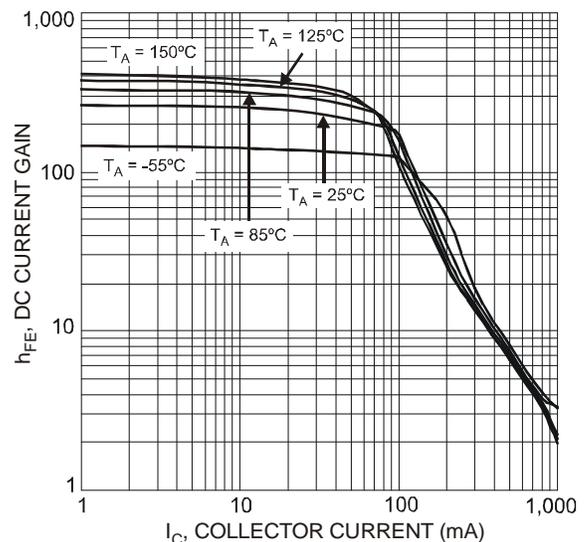


Fig. 2 Typical DC Current Gain vs. Collector Current

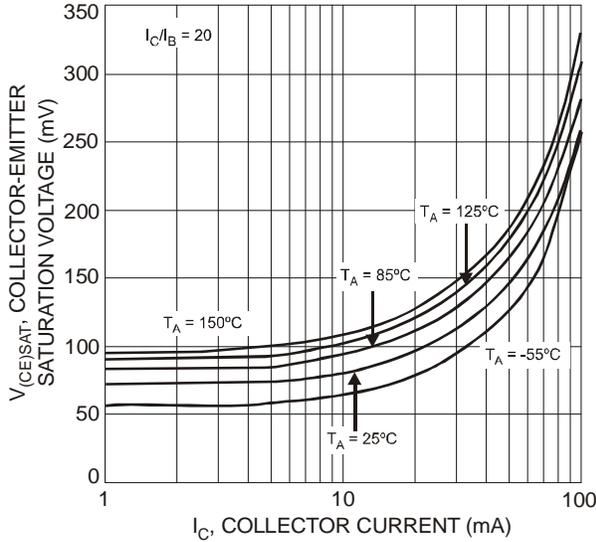


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

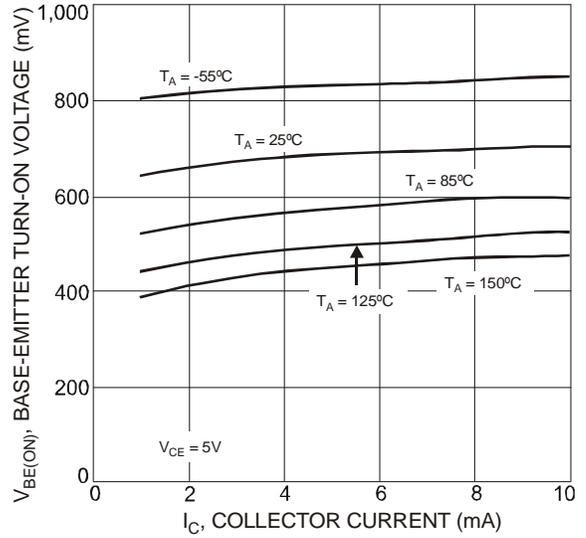


Fig. 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

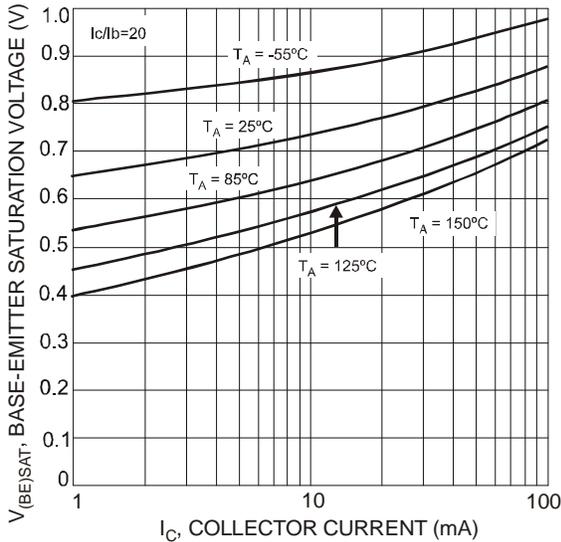
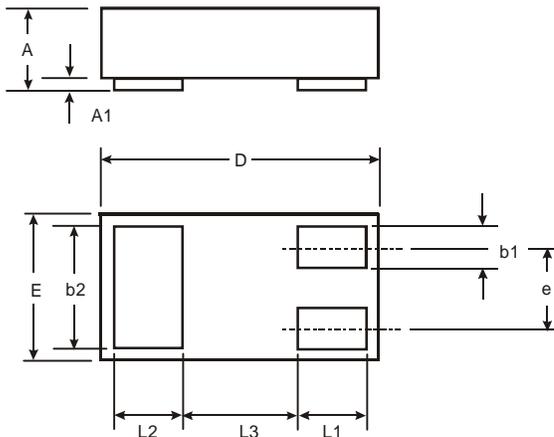


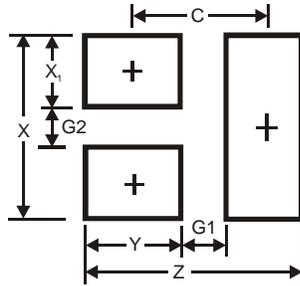
Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

**Package Outline Dimensions**



| DFN1006-3            |      |       |      |
|----------------------|------|-------|------|
| Dim                  | Min  | Max   | Typ  |
| A                    | 0.47 | 0.53  | 0.50 |
| A1                   | 0    | 0.05  | 0.03 |
| b1                   | 0.10 | 0.20  | 0.15 |
| b2                   | 0.45 | 0.55  | 0.50 |
| D                    | 0.95 | 1.075 | 1.00 |
| E                    | 0.55 | 0.675 | 0.60 |
| e                    | —    | —     | 0.35 |
| L1                   | 0.20 | 0.30  | 0.25 |
| L2                   | 0.20 | 0.30  | 0.25 |
| L3                   | —    | —     | 0.40 |
| All Dimensions in mm |      |       |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| <b>Z</b>   | 1.1           |
| <b>G1</b>  | 0.3           |
| <b>G2</b>  | 0.2           |
| <b>X</b>   | 0.7           |
| <b>X1</b>  | 0.25          |
| <b>Y</b>   | 0.4           |
| <b>C</b>   | 0.7           |

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