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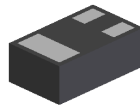
## Features

- $BV_{CE0} > -45V$
- $I_C = -100mA$  High Collector Current
- $P_D = 1000mW$  Power Dissipation
- $0.60mm^2$  Package Footprint, 13 times Smaller than SOT23
- 0.4mm Height Package Minimizing Off-Board Profile
- Complementary NPN Type BC847BLP4
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

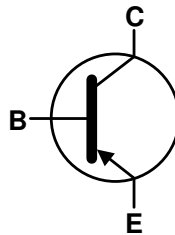
## Mechanical Data

- Case: X2-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. Solderable per MIL-STD-202, Method 208 <sup>(e4)</sup>
- Weight: 0.0008 grams (Approximate)

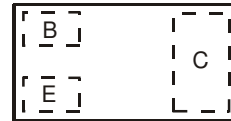
X2-DFN1006-3



Bottom View



Device Symbol



Top View  
Device Schematic

## Ordering Information (Note 4)

| Product      | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|--------------|---------|--------------------|-----------------|-------------------|
| BC857BLP4-7  | F2      | 7                  | 8               | 3,000             |
| BC857BLP4-7B | F2      | 7                  | 8               | 10,000            |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information

|                            |   |   |
|----------------------------|---|---|
| <p><b>BC857BLP4-7</b></p>  | <p>Top View<br/>Dot Denotes Collector Side</p>        | <p>From date code 1527 (YYWW),<br/>this changes to:</p> <p>Top View<br/>Bar Denotes Base and Emitter Side</p> |
| <p><b>BC857BLP4-7B</b></p> | <p>Top View<br/>Bar Denotes Base and Emitter Side</p> | <p>F2 = Product Type Marking Code</p>   |

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic               | Symbol           | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage       | V <sub>CBO</sub> | -50   | V    |
| Collector-Emitter Voltage    | V <sub>CEO</sub> | -45   | V    |
| Emitter-Base Voltage         | V <sub>EBO</sub> | -5.0  | V    |
| Collector Current            | I <sub>C</sub>   | -100  | mA   |
| Peak Pulse Collector Current | I <sub>CM</sub>  | -200  | mA   |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                              | Symbol                            | Value            | Unit |
|---|-----------------------------------|------------------|------|
| Power Dissipation                           | P <sub>D</sub>                    | (Note 5)<br>400  | mW   |
|   |                                   | (Note 6)<br>1000 |      |
| Thermal Resistance, Junction to Ambient     | R <sub>θJA</sub>                  | (Note 5)<br>310  | °C/W |
|   |                                   | (Note 6)<br>120  |      |
| Thermal Resistance, Junction to Lead        | R <sub>θJL</sub>                  | 120              | °C/W |
| Operating and Storage and Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150      | °C   |

**ESD Ratings** (Note 8)

| Characteristic                             | Symbol  | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V    | 3A          |
| Electrostatic Discharge - Machine Model    | ESD MM  | 200   | V    | B           |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                | Symbol               | Min  | Typ  | Max  | Unit     | Test Condition  |
|---|----------------------|------|------|------|----------|---|
| Collector-Base Breakdown Voltage              | BV <sub>CBO</sub>    | -50  | —    | —    | V        | I <sub>C</sub> = 10μA, I <sub>B</sub> = 0   |
| Collector-Emitter Breakdown Voltage (Note 9)  | BV <sub>CEO</sub>    | -45  | —    | —    | V        | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0   |
| Emitter-Base Breakdown Voltage                | BV <sub>EBO</sub>    | -5   | —    | —    | V        | I <sub>E</sub> = 1μA, I <sub>C</sub> = 0  |
| DC Current Gain                               | h <sub>FE</sub>      | 220  | 300  | 475  | —        | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA  |
| Collector-Emitter Saturation Voltage (Note 9) | V <sub>CE(SAT)</sub> | —    | -90  | -300 | mV       | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA<br>I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA |
|   |                      | —    | -250 | -650 |          |   |
| Base-Emitter Saturation Voltage (Note 9)      | V <sub>BE(SAT)</sub> | —    | -700 | —    | mV       | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA<br>I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA |
|   |                      | —    | -850 | —    |          |   |
| Base-Emitter Voltage (Note 9)                 | V <sub>BE(ON)</sub>  | -600 | -670 | -750 | mV       | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA<br>V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA |
|   |                      | —    | -710 | -820 |          |   |
| Collector-Cutoff Current                      | I <sub>CBO</sub>     | —    | —    | -15  | nA<br>μA | V <sub>CB</sub> = -30V<br>V <sub>CB</sub> = -30V, T <sub>A</sub> = +150°C                           |
|   |                      | —    | —    | -4.0 |          |   |
| Gain Bandwidth Product                        | f <sub>T</sub>       | 100  | —    | —    | MHz      | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA,<br>f = 100MHz                                      |
| Collector-Base Capacitance                    | C <sub>CBO</sub>     | —    | 3.0  | —    | pF       | V <sub>CB</sub> = -10V, f = 1.0MHz  |

- Notes:
- For the device mounted on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady state condition. The entire exposed collector pad is attached to the heatsink.
  - Same as Note 5, except the exposed collector pad is mounted on 25mm x 25mm 2oz copper.
  - Thermal resistance from junction to solder-point (on the exposed collector pad).
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.
  - Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.



**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

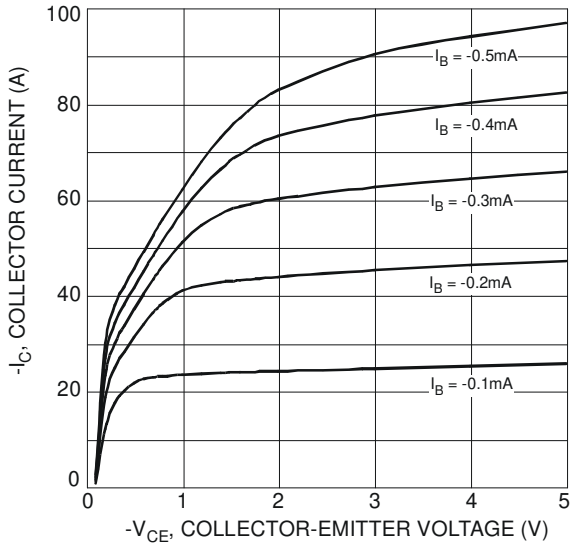


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

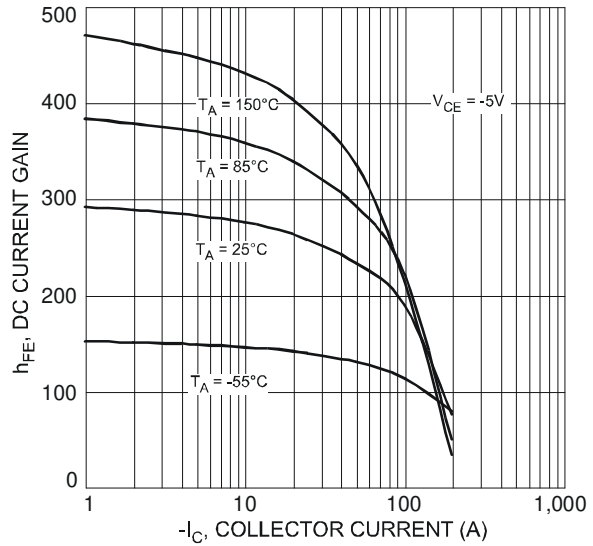


Fig. 3 Typical DC Current Gain vs. Collector Current

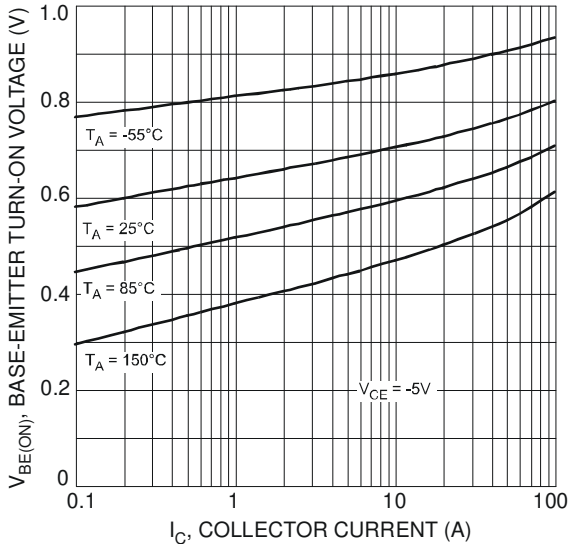


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

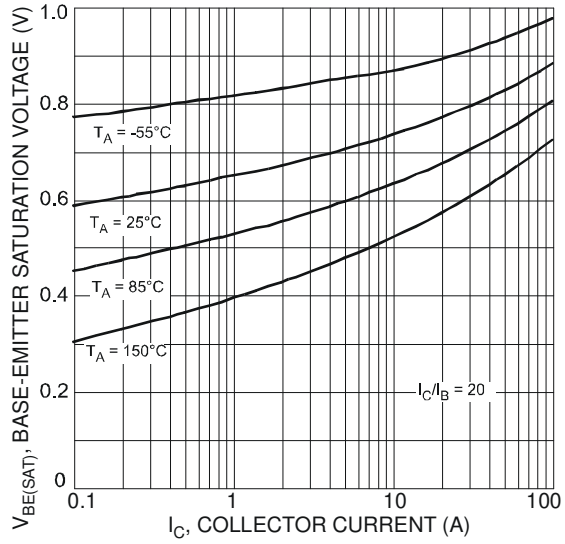
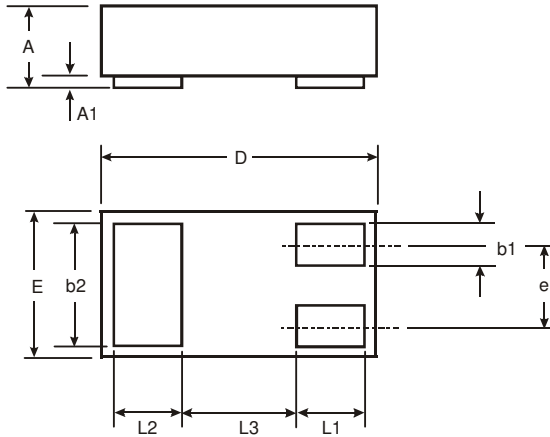


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

### Package Outline Dimensions

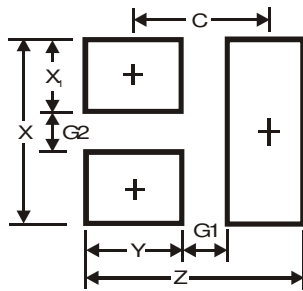
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| X2-DFN1006-3         |      |       |      |
|----------------------|------|-------|------|
| Dim                  | Min  | Max   | Typ  |
| A                    | —    | 0.40  | —    |
| A1                   | 0    | 0.05  | 0.02 |
| 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

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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

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