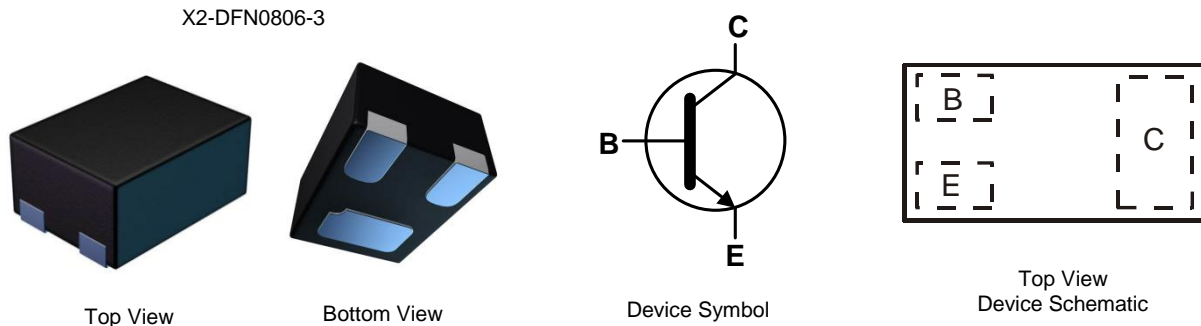


Features

- $V_{CE0} > 45V$
- $I_C = 100mA$ High Collector Current
- $P_D = 435mW$ Power Dissipation
- $0.48mm^2$ Package Footprint, 16 times smaller than SOT23
- 0.4mm Height Package Minimizing Off-Board Profile
- Complementary PNP Type BC857BFA
- **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**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([BC847BFAQ](#))**

Mechanical Data

- Case: X2-DFN0806-3
- 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
- Weight: 0.0008 grams (Approximate)

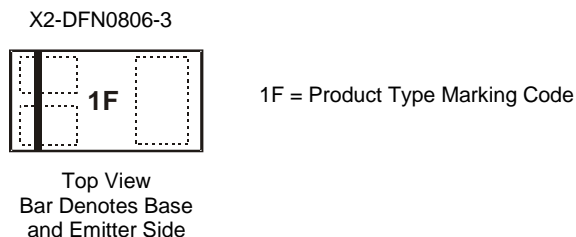


Ordering Information (Note 4)

| Product | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|------------|---------|--------------------|-----------------|-------------------|
| BC847BFA-7B | AEC-Q101 | 1F | 7 | 8mm | 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 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/products/packages.html>.

Marking Information



Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CB0} | 50 | V |
| Collector-Emitter Voltage | V _{CEO} | 45 | V |
| Emitter-Base Voltage | V _{EBO} | 6.0 | V |
| Continuous Collector Current | I _C | 100 | mA |
| Peak Pulse Collector Current | I _{CM} | 200 | mA |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

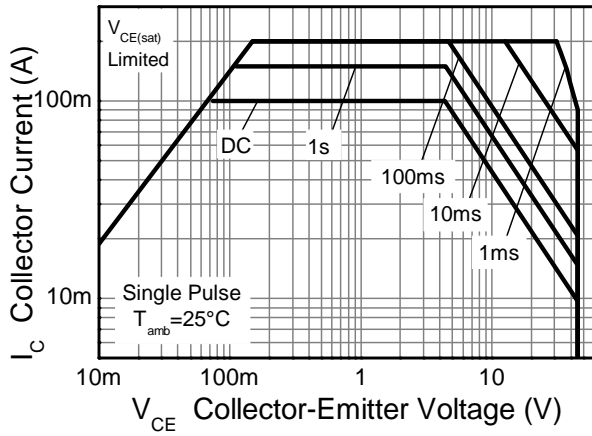
| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 435 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 287 | °C/W |
| Thermal Resistance, Junction to Lead (Note 6) | R _{θJL} | 150 | °C/W |
| Operating and Storage and Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 7)

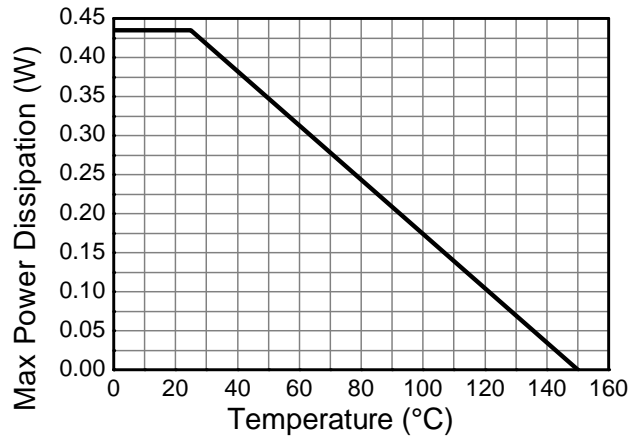
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 200 | V | B |

- Notes:
5. 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.
 6. Thermal resistance from junction to solder-point (on the exposed collector pad).
 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

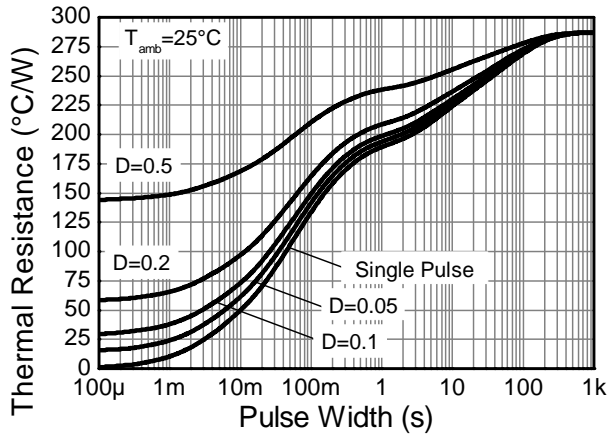
Thermal Characteristics and Derating Information



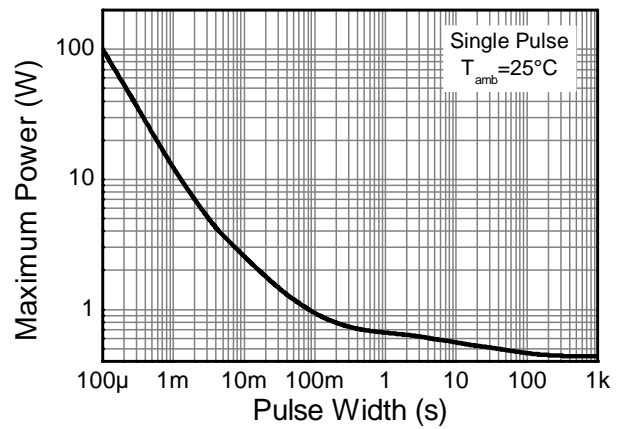
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typical | Max | Unit | Test Condition |
|--|----------------------|----------|------------|----------------|------|---|
| OFF CHARACTERISTICS | | | | | | |
| Collector-Base Breakdown Voltage | BV _{CBO} | 50 | 150 | — | V | I _C = 50μA, I _B = 0 |
| Collector-Emitter Breakdown Voltage | BV _{CES} | 50 | 150 | — | — | I _C = 50μA, I _B = 0 |
| Collector-Emitter Breakdown Voltage (Note 8) | BV _{CEO} | 45 | 65 | — | V | I _C = 1mA, I _B = 0 |
| Collector-Base Breakdown Voltage | BV _{EBO} | 6.0 | 8.35 | — | V | I _E = 50μA, I _C = 0 |
| Collector-Base Cut-Off Current | I _{CBO} | — | — | 15 | nA | V _{CB} = 40V |
| Collector-Emitter Cut-Off Current | I _{CES} | — | — | 15 | nA | V _{CE} = 40V |
| ON CHARACTERISTICS (Note 8) | | | | | | |
| DC Current Gain | h _{FE} | — 200 | 220 260 | — 470 | — | I _C = 10μA, V _{CE} = 5.0V I _C = 2.0mA, V _{CE} = 5.0V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | 50 122 | 125 300 | mV | I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA |
| Base-Emitter Saturation Voltage | V _{BE(sat)} | — | 760 880 | 1,000 1,100 | mV | I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA |
| Base-Emitter Voltage | V _{BE(on)} | 580 — | 650 725 | 750 800 | mV | I _C = 2.0mA, V _{CE} = 5V I _C = 10mA, V _{CE} = 5V |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Output Capacitance | C _{obo} | — | 1.5 | — | pF | V _{CB} = 10.0V, f = 1.0MHz, I _E = 0 |
| Current Gain-Bandwidth Product | f _T | 100 | 170 | — | MHz | V _{CE} = 5V, I _C = 10mA, f = 100MHz |

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

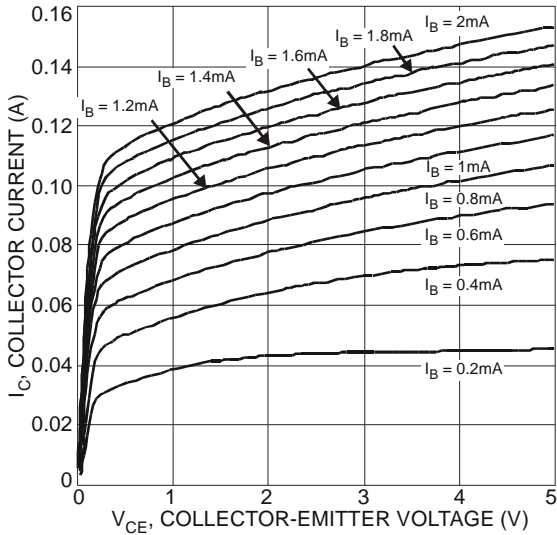


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

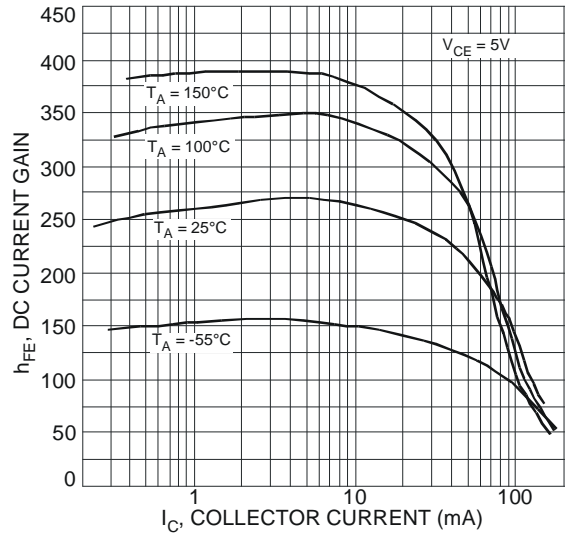


Fig. 5 Typical DC Current Gain vs. Collector Current

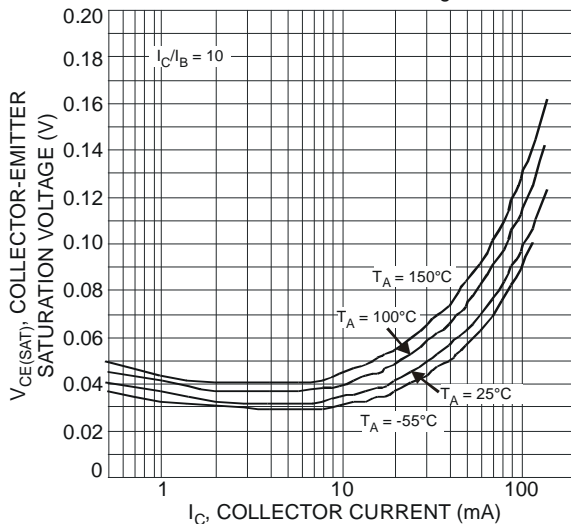


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

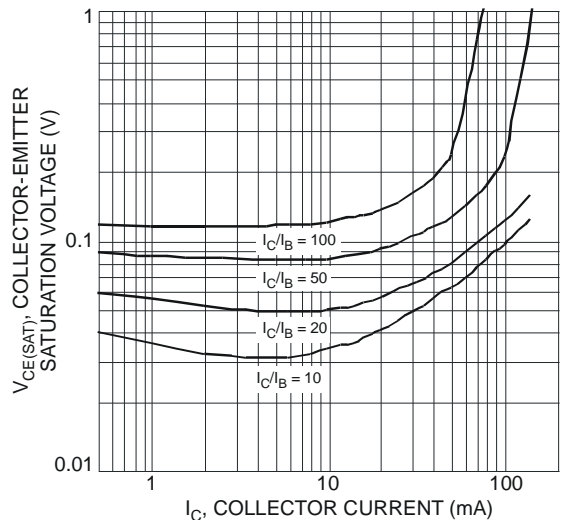


Fig. 7 Typical Collector-Emitter Saturation Voltage vs. Collector Current

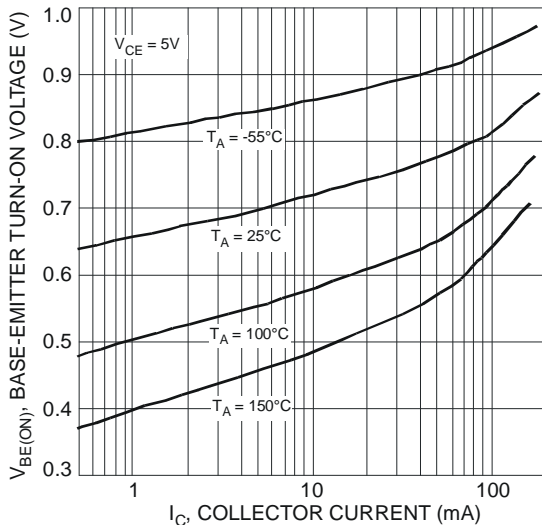


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

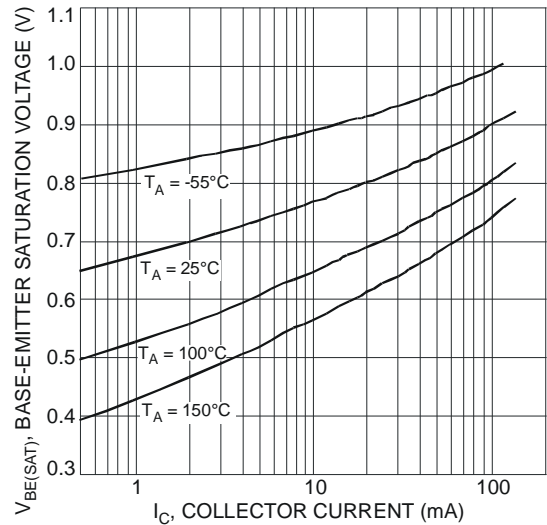
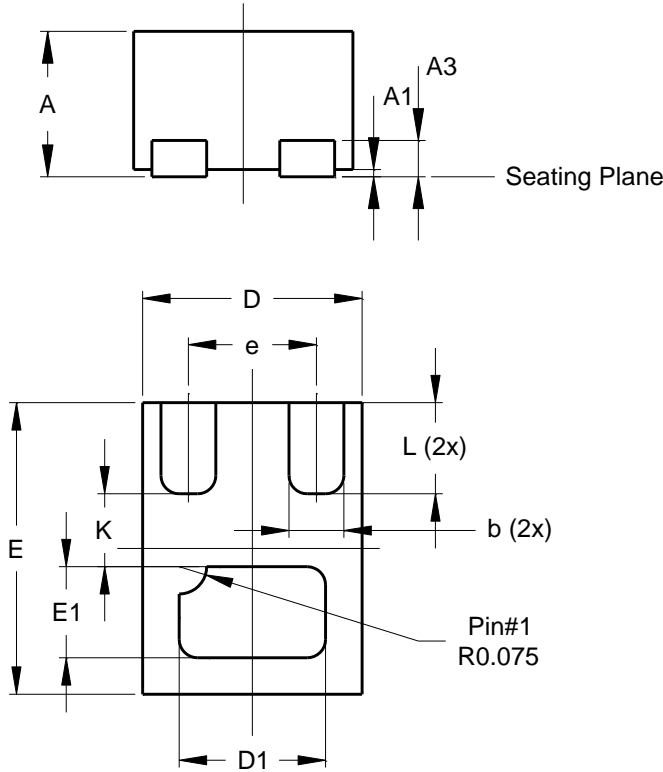


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

Package Outline Dimensions

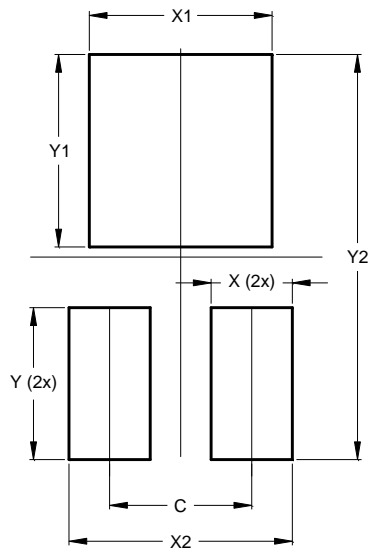
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



| X2-DFN0806-3 | | | |
|-----------------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 0.375 | 0.40 | 0.39 |
| A1 | 0 | 0.05 | 0.02 |
| A3 | - | - | 0.10 |
| b | 0.10 | 0.20 | 0.15 |
| D | 0.55 | 0.65 | 0.60 |
| D1 | 0.35 | 0.45 | 0.40 |
| E | 0.75 | 0.85 | 0.80 |
| E1 | 0.20 | 0.30 | 0.25 |
| e | - | - | 0.35 |
| K | - | - | 0.20 |
| L | 0.20 | 0.30 | 0.25 |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.350 |
| X | 0.200 |
| X1 | 0.450 |
| X2 | 0.550 |
| Y | 0.375 |
| Y1 | 0.475 |
| Y2 | 1.000 |

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