
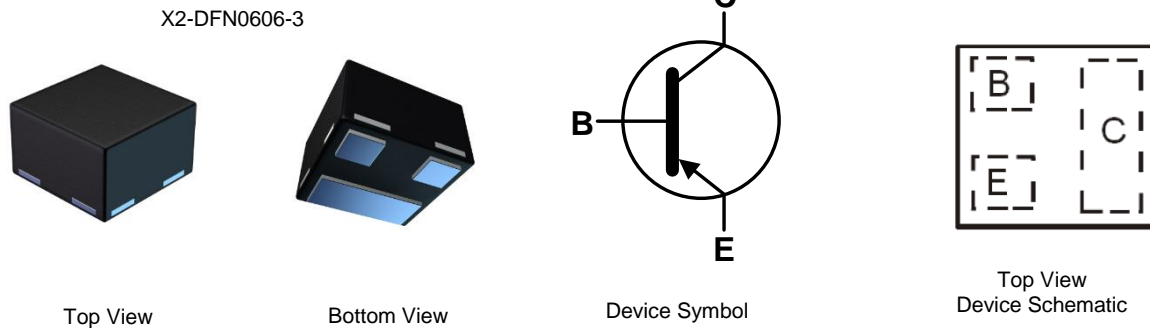


**Features**

- $BV_{CEO} > -45V$
- $I_C = -100mA$  High Collector Current
- $P_D = 925mW$  Power Dissipation
- $0.36mm^2$  Package Footprint, 40% Smaller than DFN1006
- 0.4mm Height Package Minimizing Off-Board Profile
- Complementary NPN Type BC847BFZ
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

**Mechanical Data**

- Case: X2-DFN0606-3
- 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)

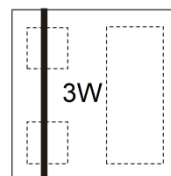


**Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BC857BFZ-7B	3W	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/products/packages.html>.

**Marking Information**



3W = Product Type Marking Code

Top View  
Bar Denotes Base and Emitter Side

**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>	-6.0	V
Continuous 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.)

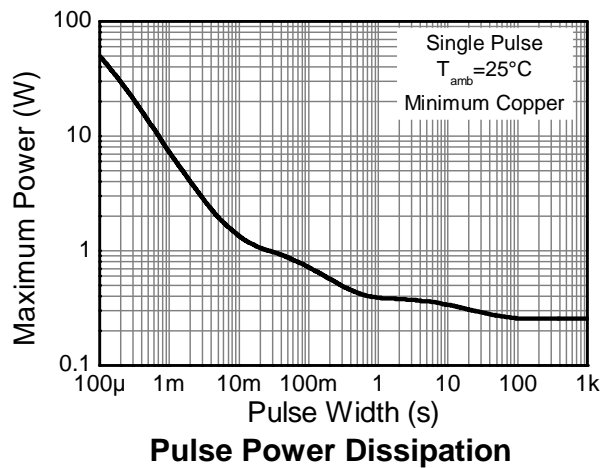
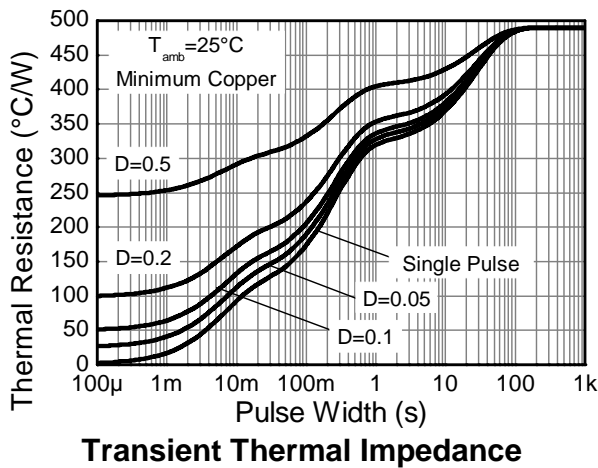
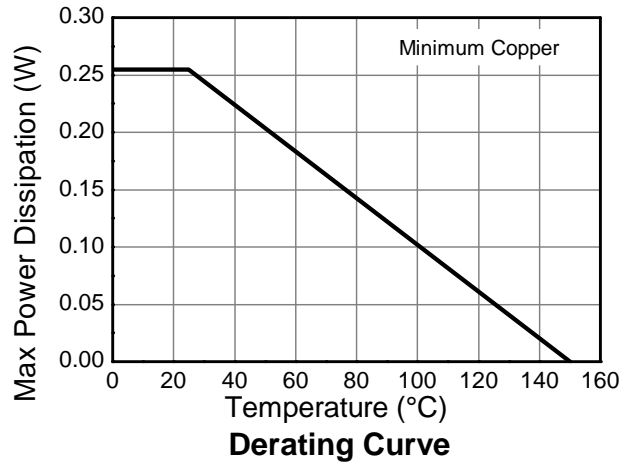
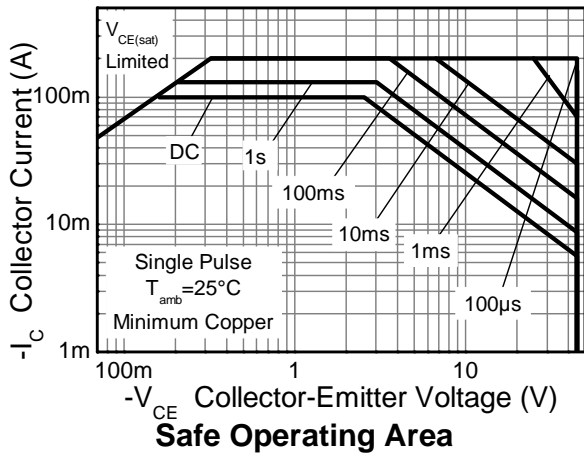
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	270
		(Note 6)	925
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 5)	465
		(Note 6)	135
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	135	°C/W
Operating and Storage and Temperature Range	T <sub>J</sub> , 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

- 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. Same as Note 5, except the exposed collector pad is mounted on 25mm x 25mm 2oz copper.
  7. Thermal resistance from junction to solder-point (on the exposed collector pad).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**



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

Characteristic	Symbol	Min	Typical	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-50	-100	—	V	I <sub>C</sub> = -50μA, I <sub>B</sub> = 0
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	-50	-90	—	V	I <sub>C</sub> = -50μA, I <sub>B</sub> = 0
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-45	-65	—	V	I <sub>C</sub> = -1mA, I <sub>B</sub> = 0
Collector-Base Breakdown Voltage	BV <sub>EBO</sub>	-6.0	-8.5	—	V	I <sub>E</sub> = -50μA, I <sub>C</sub> = 0
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	-15	nA	V <sub>CB</sub> = -40V
Collector-Emitter Cutoff Current	I <sub>CES</sub>	—	—	-15	nA	V <sub>CE</sub> = -40V
<b>ON CHARACTERISTICS (Note 9)</b>						
DC Current Gain	h <sub>FE</sub>	— 200	340 330	— 470	—	I <sub>C</sub> = -10μA, V <sub>CE</sub> = -5.0V I <sub>C</sub> = -2.0mA, V <sub>CE</sub> = -5.0V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	-70 -300	-175 -500	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	—	-760 -885	-1,000 -1,100	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA
Base-Emitter Voltage	V <sub>BE(on)</sub>	-600 —	-670 -715	-780 -850	mV	I <sub>C</sub> = -2.0mA, V <sub>CE</sub> = -5V I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Output Capacitance	C <sub>obo</sub>	—	2.0	—	pF	V <sub>CB</sub> = -10.0V, f = 1.0MHz, I <sub>E</sub> = 0
Current Gain-Bandwidth Product	f <sub>T</sub>	100	270	—	MHz	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA, f = 100MHz

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

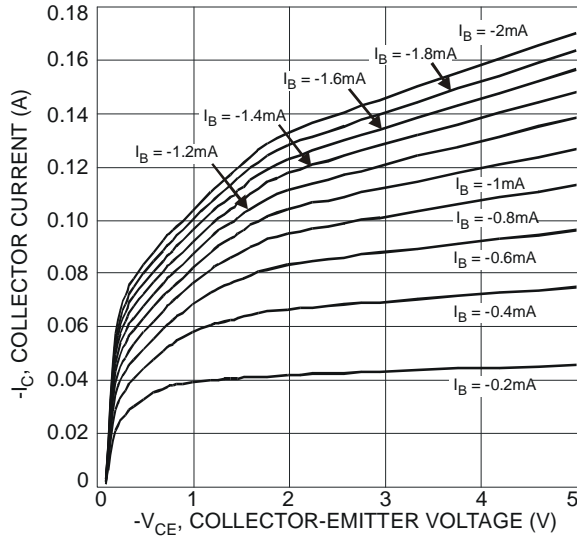


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

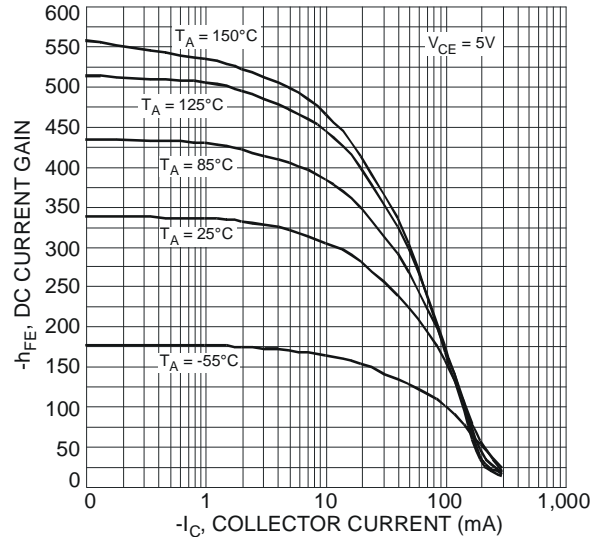


Fig. 5 Typical DC Current Gain vs. Collector Current

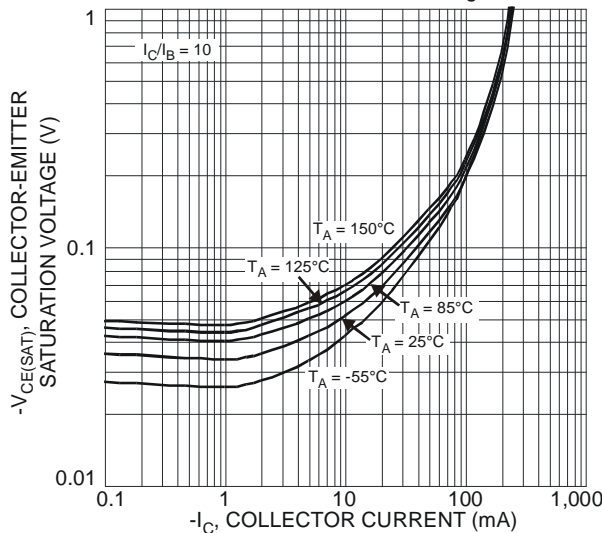


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

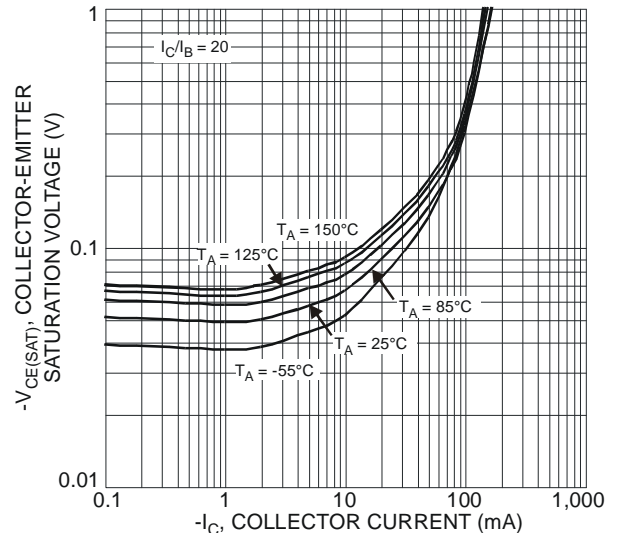


Fig. 7 Typical Collector-Emitter Saturation Voltage vs. Collector Current

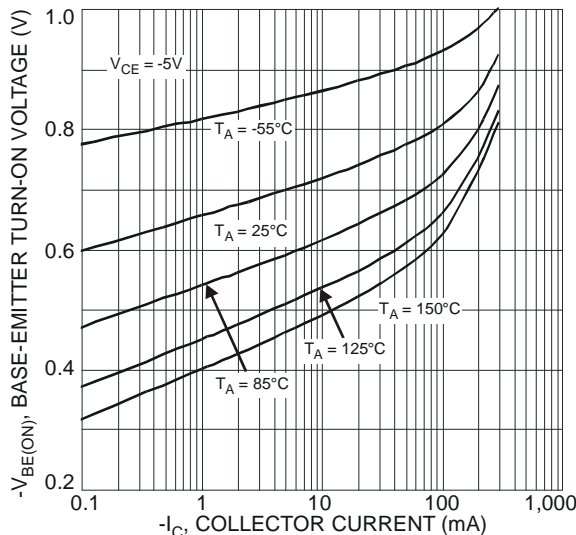


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

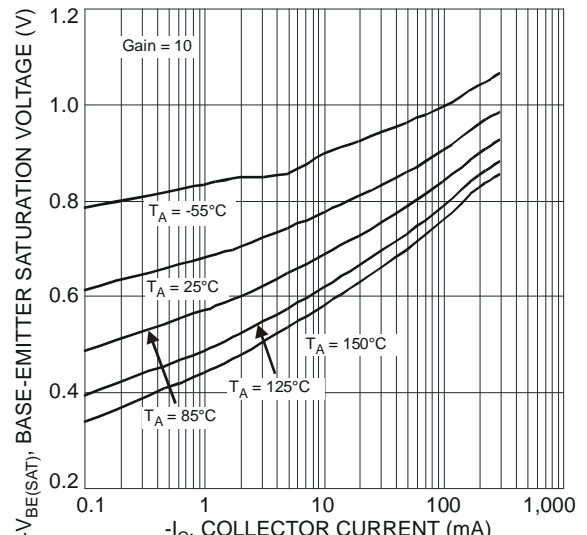
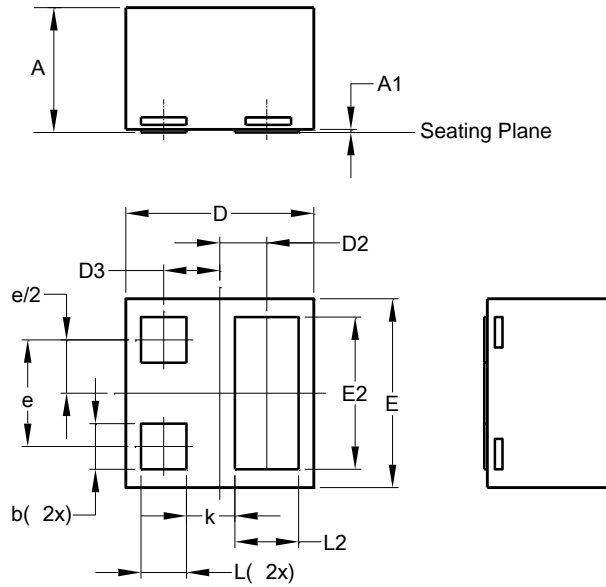


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

## Package Outline Dimensions

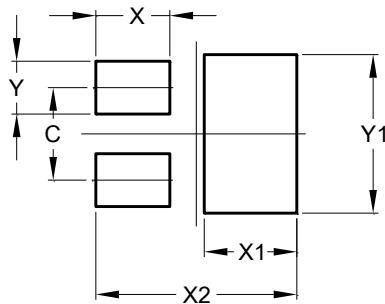
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



X2-DFN0606-3			
Dim	Min	Max	Typ
A	0.36	0.42	0.39
A1	0	0.05	0.02
b	0.10	0.20	0.15
D	0.57	0.67	0.62
D2	0.155 BSC		
D3	0.185 BSC		
E	0.57	0.67	0.62
E2	0.40	0.60	0.50
e	0.35 BSC		
k	0.16 REF		
L	0.09	0.21	0.15
L2	0.11	0.31	0.21
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)
C	0.350
X	0.280
X1	0.350
X2	0.760
Y	0.200
Y1	0.600

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