

Features

- $BV_{CEO} > -45V$
- $I_C = -100mA$ high Collector Current
- $P_D = 435mW$ Power Dissipation
- 0.48mm² package footprint, 16 times smaller than SOT23
- 0.4mm height package minimizing off-board profile
- Complementary NPN Type BC847BFA
- **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

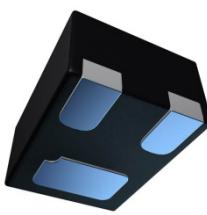
Mechanical Data

- Case: X2-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 **④**
- Weight: 0.0008 grams (approximate)

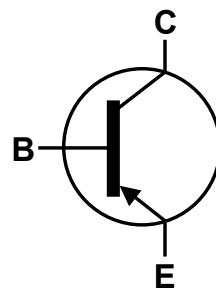
X2-DFN0806-3



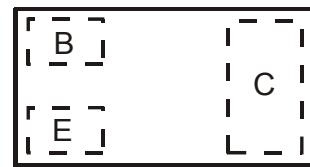
Top View



Bottom View



Device Symbol

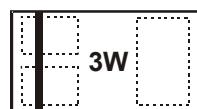

Top View
Device Schematic

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BC857BFA-7B	3W	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



3W = Product Type Marking Code

Top View
Bar Denotes Base
and Emitter Side

Absolute 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}	-6.0	V
Continuous Collector Current	I_C	-100	mA
Peak Pulse Collector Current	I_{CM}	-200	mA

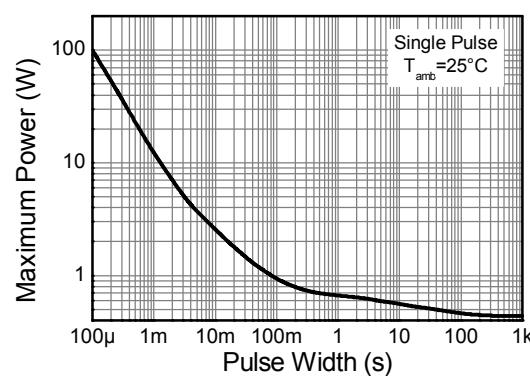
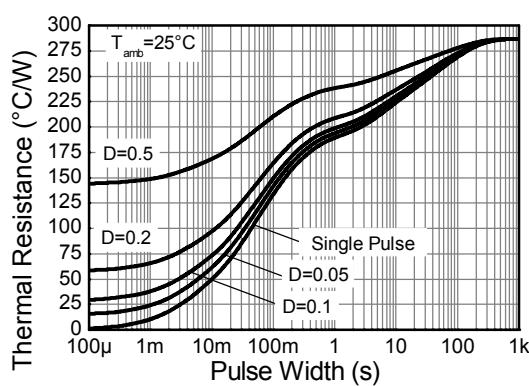
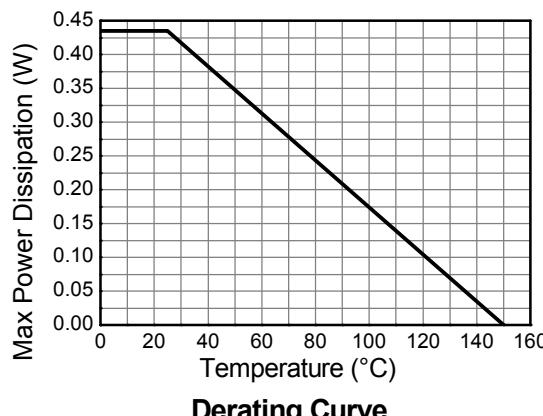
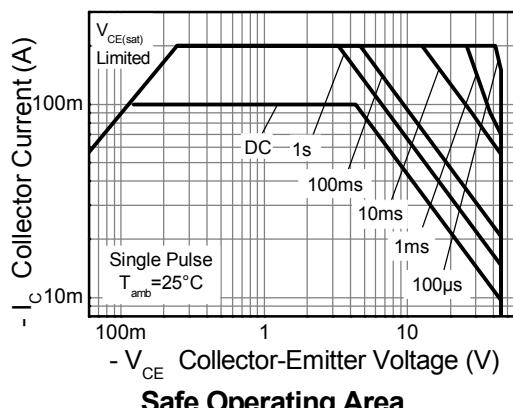
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	435	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	287	°C/W
Thermal Resistance, Junction to Lead (Note 6)	$R_{\theta JL}$	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:
- 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.
 - Thermal resistance from junction to solder-point (on the exposed collector pad).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information


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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-100	—	V	$I_C = -50\mu\text{A}, I_B = 0$
Collector-Emitter Breakdown Voltage	BV_{CES}	-50	-90	—	—	$I_C = -50\mu\text{A}, I_B = 0$
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-45	-65	—	V	$I_C = -1\text{mA}, I_B = 0$
Collector-Base Breakdown Voltage	BV_{EBO}	-6.0	-8.5	—	V	$I_E = -50\mu\text{A}, I_C = 0$
Collector-Base Cutoff Current	I_{CBO}	—	—	-15	nA	$V_{\text{CB}} = -40\text{V}$
Collector-Emitter Cutoff Current	I_{CES}	—	—	-15	nA	$V_{\text{CE}} = -40\text{V}$
ON CHARACTERISTICS (Note 8)						
DC Current Gain	h_{FE}	100 200	340 330	— 470	—	$I_C = -10\mu\text{A}, V_{\text{CE}} = -5.0\text{V}$ $I_C = -2.0\text{mA}, V_{\text{CE}} = -5.0\text{V}$
Collector-Emitter Saturation Voltage	$V_{\text{CE}(\text{sat})}$	—	-70 -300	-175 -500	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$
Base-Emitter Saturation Voltage	$V_{\text{BE}(\text{sat})}$	—	-760 -885	-1000 -1100	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$
Base-Emitter Voltage	$V_{\text{BE}(\text{on})}$	-600 —	-670 -715	-780 -850	mV	$I_C = -2.0\text{mA}, V_{\text{CE}} = -5\text{V}$ $I_C = -10\text{mA}, V_{\text{CE}} = -5\text{V}$
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	2.0	—	pF	$V_{\text{CB}} = -10.0\text{V}, f = 1.0\text{MHz}, I_E = 0$
Current Gain-Bandwidth Product	f_T	100	340	—	MHz	$V_{\text{CE}} = -5\text{V}, I_C = -10\text{mA},$ $f = 100\text{MHz}$

Note: 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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

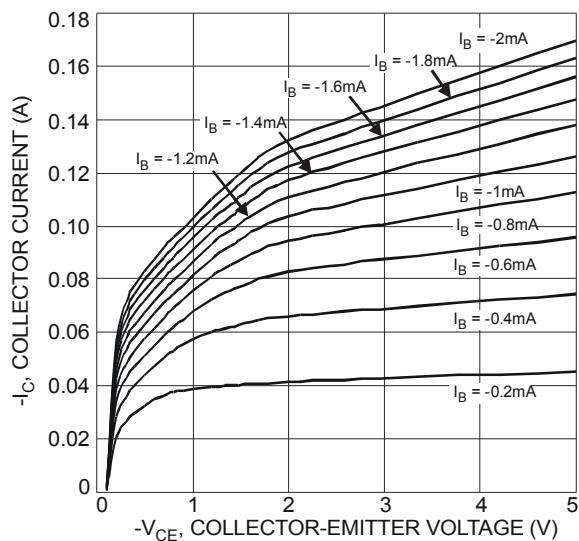


Fig. 4 Typical Collector Current
vs. Collector-Emitter Voltage

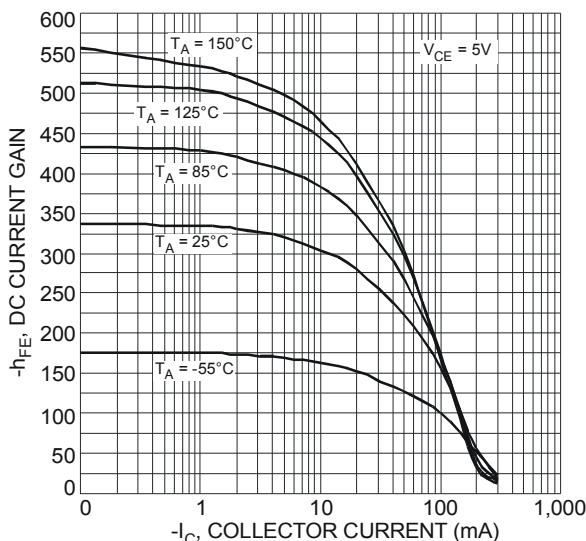


Fig. 5 Typical DC Current Gain vs. Collector Current

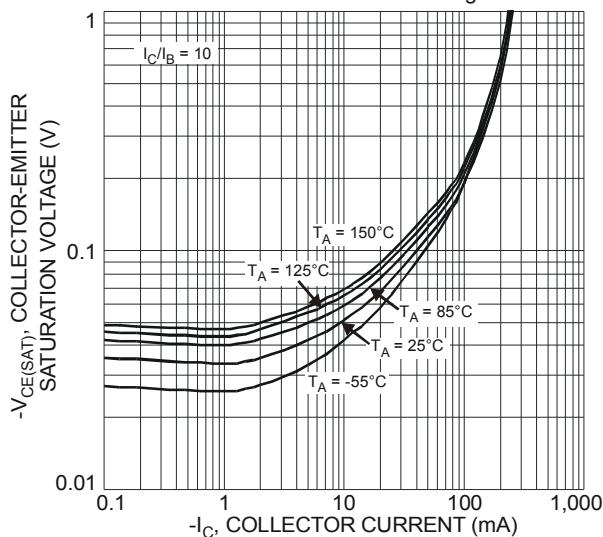


Fig. 6 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

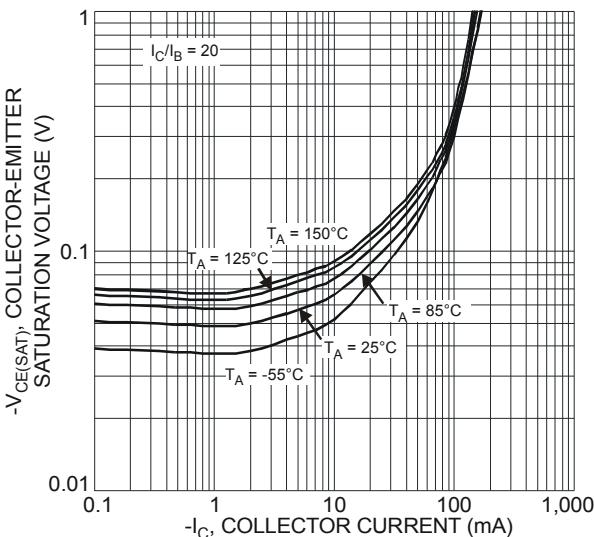


Fig. 7 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

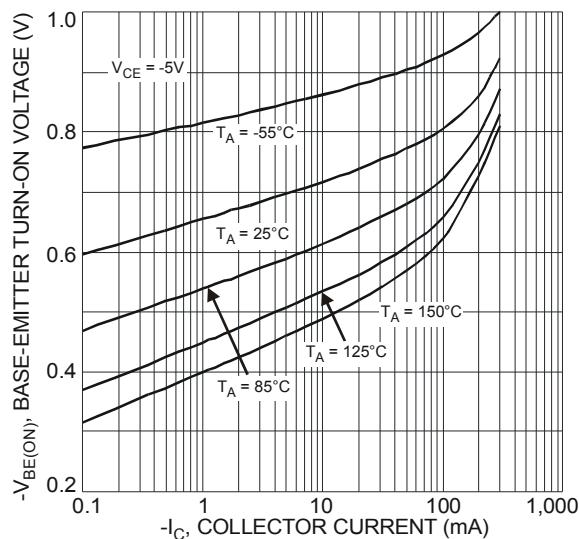


Fig. 8 Typical Base-Emitter Turn-On Voltage
vs. Collector Current

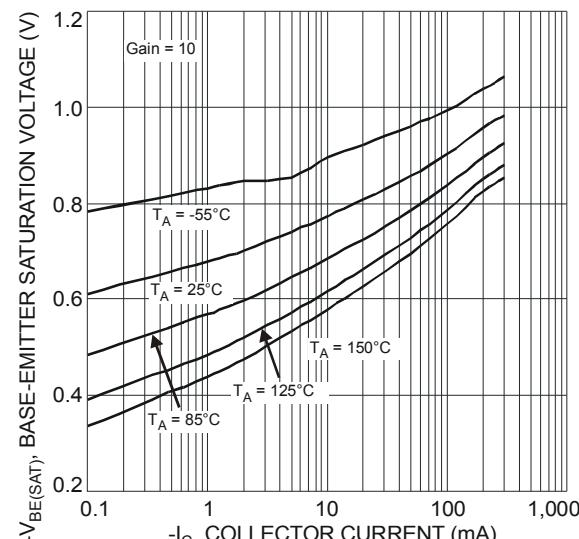
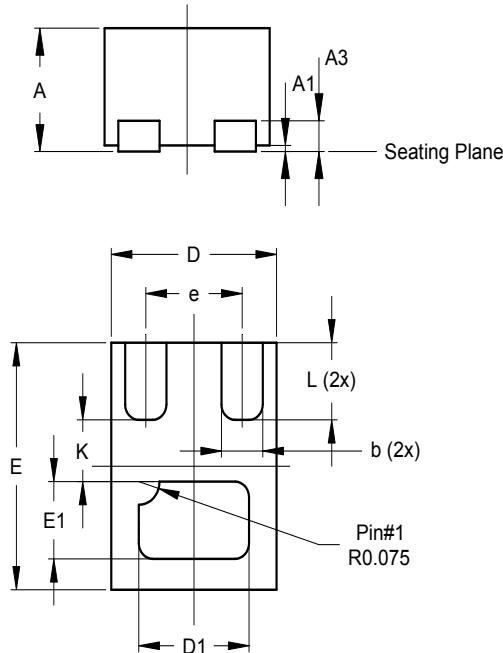


Fig. 9 Typical Base-Emitter Saturation Voltage
vs. Collector Current

Package Outline Dimensions

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

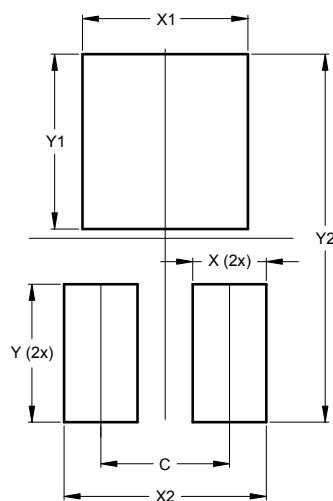


X2-DFN0806-3			
Dim	Min	Max	Typ
A	0.375	0.40	0.39
A1	0	0.05	0.02
A3	-	-	0.10
b	0.10	0.20	0.15
D	0.55	0.65	0.60
D1	0.35	0.45	0.40
E	0.75	0.85	0.80
E1	0.20	0.30	0.25
e	-	-	0.35
K	-	-	0.20
L	0.20	0.30	0.25

All Dimensions in mm

Suggested Pad Layout

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