

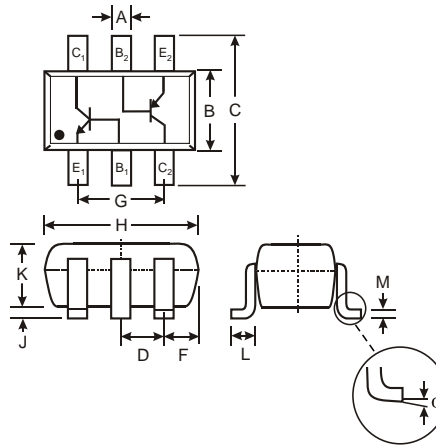
COMPLEMENTARY PAIR SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Die Construction
- Two Internally Isolated NPN/PNP Transistors in one package
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking (See Page 3): K7P
- Ordering Information: See Page 2
- Weight: 0.006 grams (approximate)



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J		0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
	8°	
All Dimensions in mm		

Maximum Ratings @ T_A = 25°C unless otherwise specified **NPN BC847B Section**

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
Collector Current	I _C	100	mA
Peak Collector Current	I _{CM}	200	mA
Peak Emitter Current	I _{EM}	200	mA

Maximum Ratings @ T_A = 25°C unless otherwise specified **PNP BC857B Section**

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
Peak Collector Current	I _{CM}	-200	mA
Peak Emitter Current	I _{EM}	-200	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 1) @ T _A = 25°C Total Device	P _d	200	mW
Thermal Resistance, Junction to Ambient (Note 1) @ T _A = 25°C	R _{JA}	625	°C/W
Operating and Storage Temperature Range	T _j , T _{STG}	-65 to +150	°C

- Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 2. No purposefully added lead.

Electrical Characteristics @ T_A = 25°C unless otherwise specified **NPN BC847B Section**

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 3)	V _{(BR)CBO}	50	—	—	V	I _C = 10μA, I _B = 0
Collector-Emitter Breakdown Voltage (Note 3)	V _{(BR)CEO}	45	—	—	V	I _C = 10mA, I _B = 0
Emitter-Base Breakdown Voltage (Note 3)	V _{(BR)EBO}	6	—	—	V	I _E = 1μA, I _C = 0
DC Current Gain (Note 3)	h _{FE}	200	290	450	—	V _{CE} = 5.0V, I _C = 2.0mA
Collector-Emitter Saturation Voltage (Note 3)	V _{CE(SAT)}	—	90 200	250 600	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA
Base-Emitter Saturation Voltage (Note 3)	V _{BE(SAT)}	—	700 900	—	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA
Base-Emitter Voltage (Note 3)	V _{BE(ON)}	580 —	660 —	700 720	mV	V _{CE} = 5.0V, I _C = 2.0mA V _{CE} = 5.0V, I _C = 10mA
Collector-Cutoff Current (Note 3)	I _{CBO} I _{CBO}	— —	— —	15 5.0	nA μA	V _{CB} = 30V V _{CB} = 30V, T _A = 150°C
Gain Bandwidth Product	f _T	100	300	—	MHz	V _{CE} = 5.0V, I _C = 10mA, f = 100MHz
Collector-Base Capacitance	C _{CBO}	—	3.5	6.0	pF	V _{CB} = 10V, f = 1.0MHz
Noise Figure	NF	—	2.0	10	dB	V _{CE} = 5V, I _C = 200μA, R _G = 2.0kΩ, f = 1.0kHz, f = 200Hz

Electrical Characteristics @ T_A = 25°C unless otherwise specified **PNP BC857B Section**

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 3)	V _{(BR)CBO}	-50	—	—	V	I _C = 10μA, I _B = 0
Collector-Emitter Breakdown Voltage (Note 3)	V _{(BR)CEO}	-45	—	—	V	I _C = 10mA, I _B = 0
Emitter-Base Breakdown Voltage (Note 3)	V _{(BR)EBO}	-5	—	—	V	I _E = 1μA, I _C = 0
DC Current Gain (Note 3)	h _{FE}	220	290	475	—	V _{CE} = 5.0V, I _C = 2.0mA
Collector-Emitter Saturation Voltage (Note 3)	V _{CE(SAT)}	—	-75 -250	-300 -650	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA
Base-Emitter Saturation Voltage (Note 3)	V _{BE(SAT)}	—	-700 -850	— -950	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA
Base-Emitter Voltage (Note 3)	V _{BE(ON)}	-600 —	-650 —	-750 -820	mV	V _{CE} = 5.0V, I _C = 2.0mA V _{CE} = 5.0V, I _C = 10mA
Collector-Cutoff Current (Note 3)	I _{CBO} I _{CBO}	— —	— —	-15 -4.0	nA μA	V _{CB} = 30V V _{CB} = 30V, T _A = 150°C
Gain Bandwidth Product	f _T	100	200	—	MHz	V _{CE} = 5.0V, I _C = 10mA, f = 100MHz
Collector-Base Capacitance	C _{CBO}	—	3	4.5	pF	V _{CB} = 10V, f = 1.0MHz
Noise Figure	NF	—	—	10	dB	V _{CE} = 5V, I _C = 200μA, R _G = 2.0kΩ, f = 1.0kHz, f = 200Hz

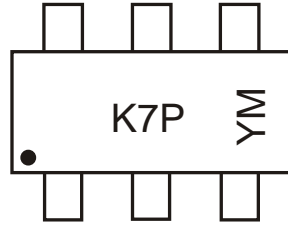
Ordering Information (Note 4)

Device	Packaging	Shipping
BC847PN-7-F	SOT-363	3000/Tape & Reel

Notes: 3. Short duration pulse test used to minimize self-heating effect.

4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



K7P = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: T = 2006
 M = Month ex: 9 = September

Date Code Key

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	M	N	P	R	S	T	U	V	W	X	Y	Z

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

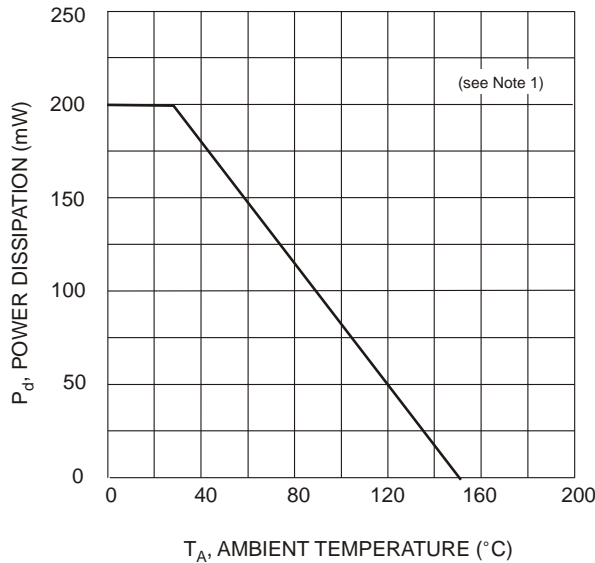


Fig. 1, Power Derating Curve (Total Device)

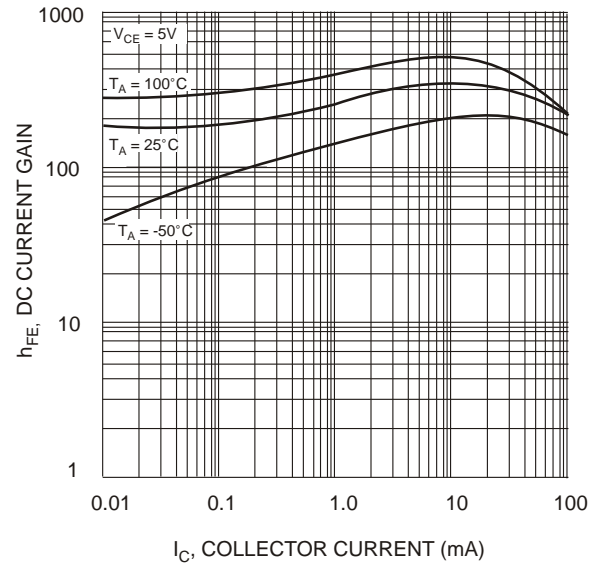


Fig. 2, DC Current Gain vs Collector Current (BC847B)

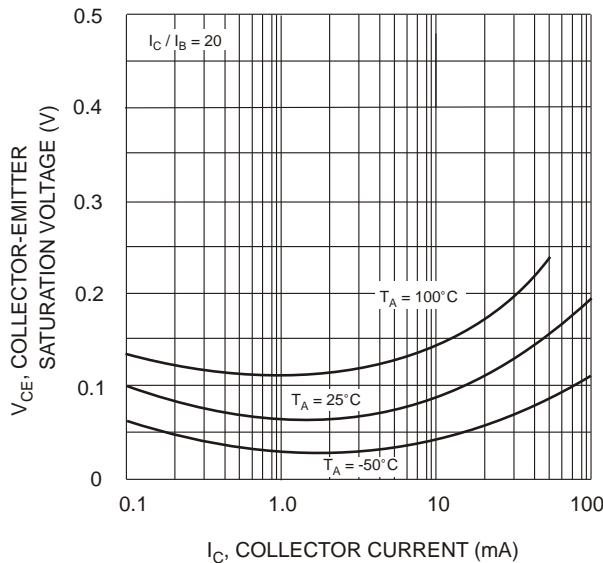


Fig. 3, Collector Saturation Voltage vs Collector Current (BC847B)

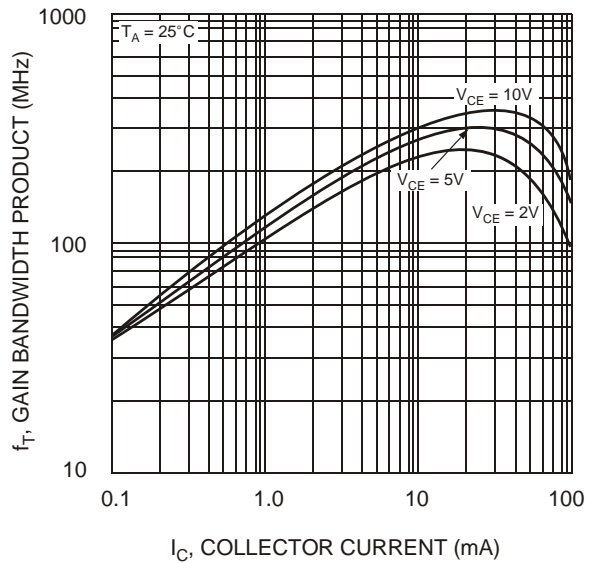


Fig. 4, Gain Bandwidth Product vs Collector Current (BC847B)

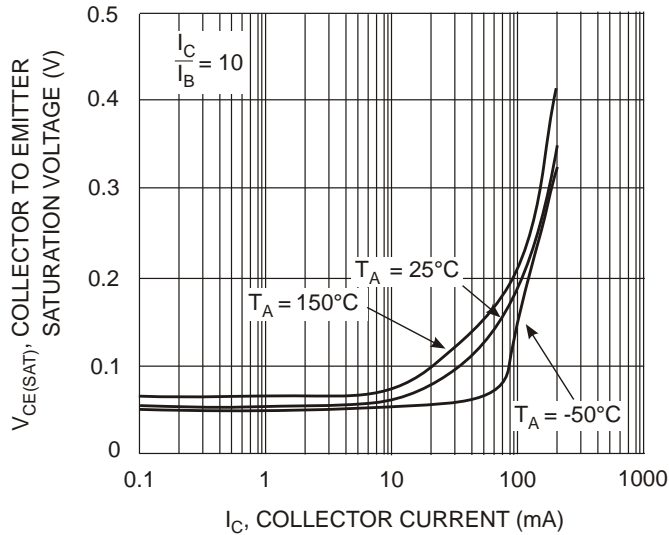


Fig. 5, Collector Emitter Saturation Voltage vs. Collector Current (BC857B)

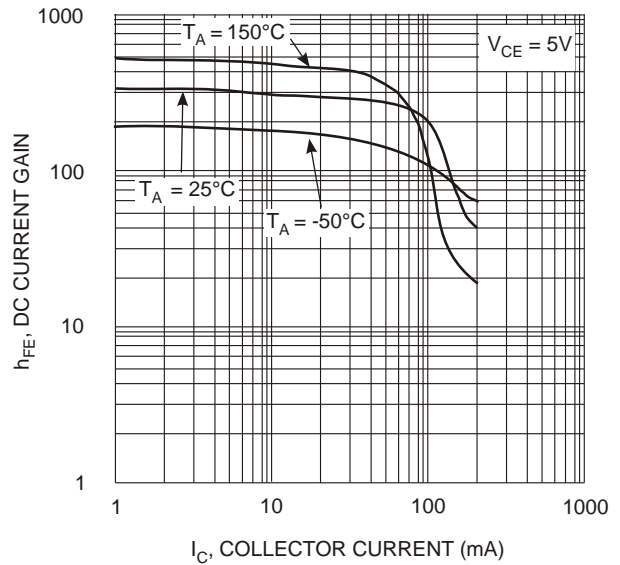


Fig. 6, DC Current Gain vs. Collector Current (BC857B)

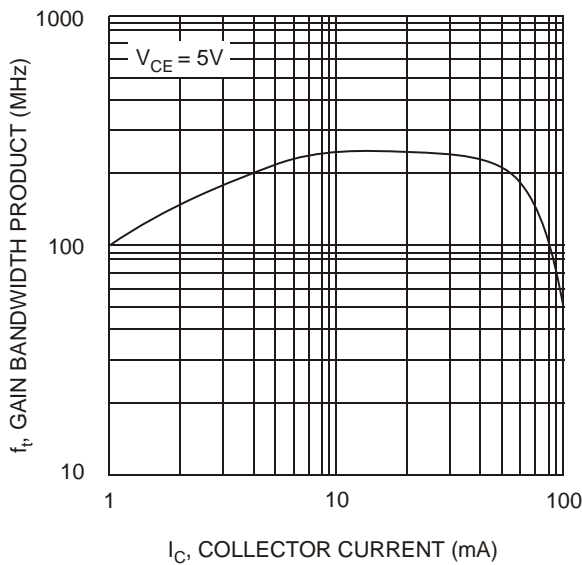


Fig. 7, Gain Bandwidth Product vs Collector Current (BC857B)

IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.