

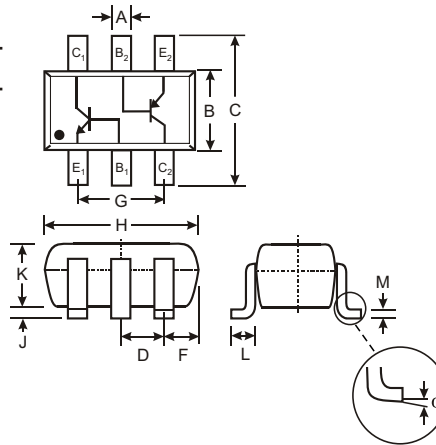
COMPLEMENTARY PAIR SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Die Construction
- Two internal isolated NPN/PNP Transistors in one package
- Ultra-Small Surface Mount Package

Mechanical Data

- Case: SOT-363, Molded Plastic
- Case material - UL Flammability Rating Classification 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 4, on Page 3
- Terminal Connections: See Diagram
- Marking (See Page 3): K7P
- Ordering & Date Code Information: See Page 3
- Weight: 0.006 grams (approx.)



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
α	8°	
All Dimensions in mm		

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified **Total Device**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 1)	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

Maximum Ratings @ $T_A = 25^\circ\text{C}$ 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 @ $T_A = 25^\circ\text{C}$ 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

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>.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

NPN BC847B Section

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 2)	$V_{(BR)CBO}$	50	—	—	V	$I_C = 10\mu\text{A}$, $I_B = 0$
Collector-Emitter Breakdown Voltage (Note 2)	$V_{(BR)CEO}$	45	—	—	V	$I_C = 10\text{mA}$, $I_B = 0$
Emitter-Base Breakdown Voltage (Note 2)	$V_{(BR)EBO}$	6	—	—	V	$I_E = 1\mu\text{A}$, $I_C = 0$
DC Current Gain (Note 2)	h_{FE}	200	290	450	—	$V_{CE} = 5.0\text{V}$, $I_C = 2.0\text{mA}$
Collector-Emitter Saturation Voltage (Note 2)	$V_{CE(SAT)}$	—	90 200	250 600	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 (Note 2)	$V_{BE(SAT)}$	—	700 900	—	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 (Note 2)	$V_{BE(ON)}$	580 —	660 —	700 720	mV	$V_{CE} = 5.0\text{V}$, $I_C = 2.0\text{mA}$ $V_{CE} = 5.0\text{V}$, $I_C = 10\text{mA}$
Collector-Cutoff Current (Note 2)	I_{CBO} I_{CBO}	— —	— —	15 5.0	nA μA	$V_{CB} = 30\text{V}$ $V_{CB} = 30\text{V}$, $T_A = 150^\circ\text{C}$
Gain Bandwidth Product	f_T	100	300	—	MHz	$V_{CE} = 5.0\text{V}$, $I_C = 10\text{mA}$, $f = 100\text{MHz}$
Collector-Base Capacitance	C_{CBO}	—	3.5	6.0	pF	$V_{CB} = 10\text{V}$, $f = 1.0\text{MHz}$
Noise Figure	NF	—	2.0	10	dB	$V_{CE} = 5\text{V}$, $I_C = 200\mu\text{A}$, $R_G = 2.0\text{k}\Omega$, $f = 1.0\text{kHz}$, $\Delta f = 200\text{Hz}$

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

PNP BC857B Section

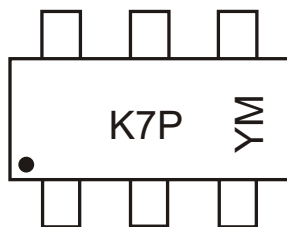
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 2)	$V_{(BR)CBO}$	-50	—	—	V	$I_C = 10\mu\text{A}$, $I_B = 0$
Collector-Emitter Breakdown Voltage (Note 2)	$V_{(BR)CEO}$	-45	—	—	V	$I_C = 10\text{mA}$, $I_B = 0$
Emitter-Base Breakdown Voltage (Note 2)	$V_{(BR)EBO}$	-5	—	—	V	$I_E = 1\mu\text{A}$, $I_C = 0$
DC Current Gain (Note 2)	h_{FE}	220	290	475	—	$V_{CE} = 5.0\text{V}$, $I_C = 2.0\text{mA}$
Collector-Emitter Saturation Voltage (Note 2)	$V_{CE(SAT)}$	—	-75 -250	-300 -650	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 (Note 2)	$V_{BE(SAT)}$	—	-700 -850	— -950	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 (Note 2)	$V_{BE(ON)}$	-600 —	-650 —	-750 -820	mV	$V_{CE} = 5.0\text{V}$, $I_C = 2.0\text{mA}$ $V_{CE} = 5.0\text{V}$, $I_C = 10\text{mA}$
Collector-Cutoff Current (Note 2)	I_{CBO} I_{CBO}	— —	— —	-15 -4.0	nA μA	$V_{CB} = 30\text{V}$ $V_{CB} = 30\text{V}$, $T_A = 150^\circ\text{C}$
Gain Bandwidth Product	f_T	100	200	—	MHz	$V_{CE} = 5.0\text{V}$, $I_C = 10\text{mA}$, $f = 100\text{MHz}$
Collector-Base Capacitance	C_{CBO}	—	3	4.5	pF	$V_{CB} = 10\text{V}$, $f = 1.0\text{MHz}$
Noise Figure	NF	—	—	10	dB	$V_{CE} = 5\text{V}$, $I_C = 200\mu\text{A}$, $R_G = 2.0\text{k}\Omega$, $f = 1.0\text{kHz}$, $\Delta f = 200\text{Hz}$

Ordering Information (Note 3)

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

- Notes:
- Short duration pulse test used to minimize self-heating effect.
 - For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
 - For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above.
Example: BC847PN-7-F.

Marking Information



K7P = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: N = 2002
 M = Month ex: 9 = September

Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004
Code	J	K	L	M	N	P	R

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

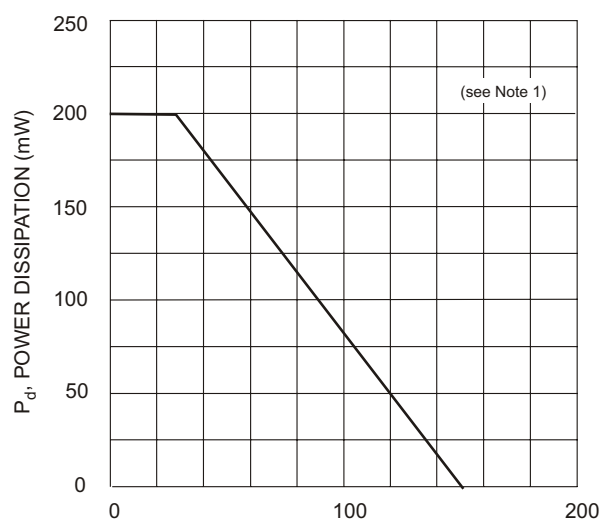


Fig. 1, Power Derating Curve (Total Device)

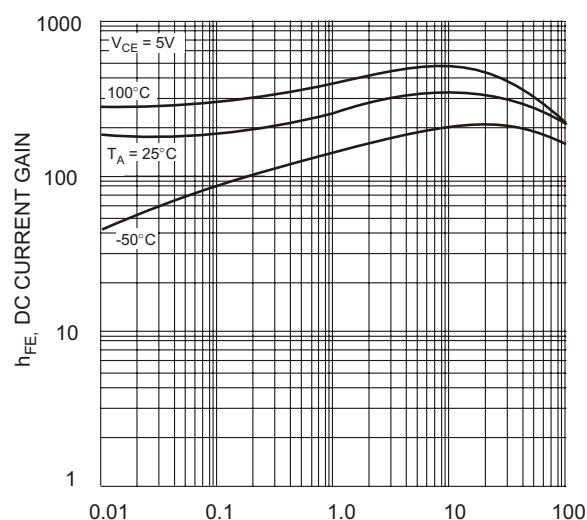


Fig. 2, DC Current Gain vs Collector Current (BC847B)

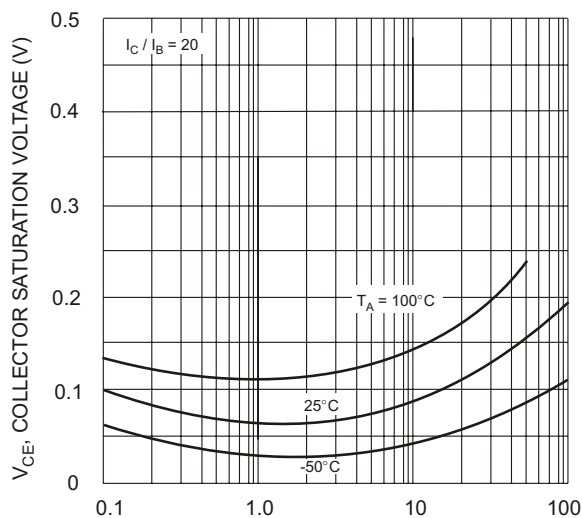


Fig. 3, Collector Saturation Voltage vs Collector Current (BC847B)

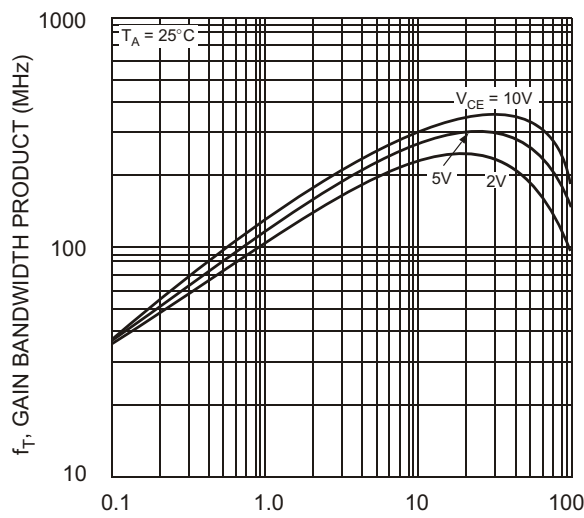


Fig. 4, Gain Bandwidth Product vs Collector Current (BC847B)

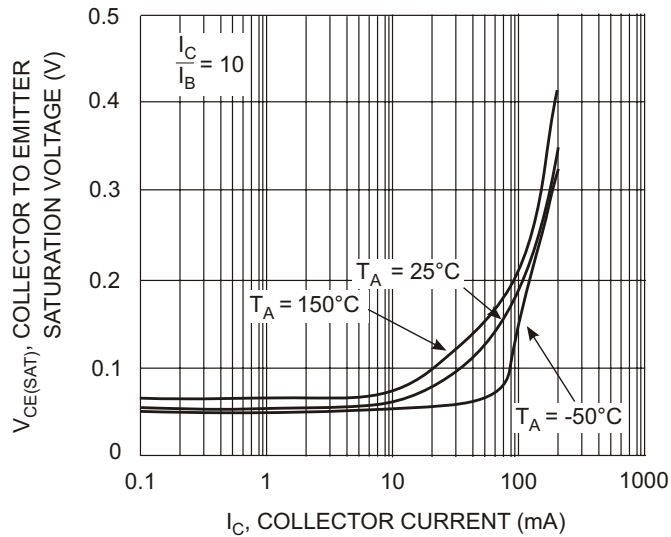


Fig. 5, Collector Emitter Saturation Voltage vs. Collector Current (BC857B)

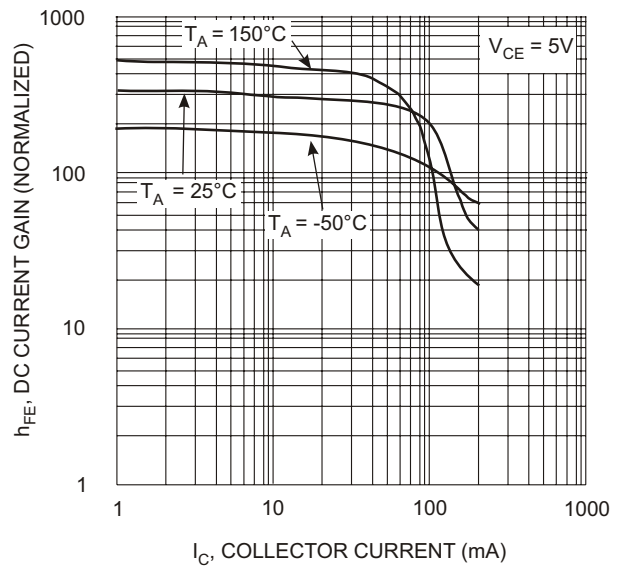


Fig. 6, DC Current Gain vs. Collector Current (BC857B)

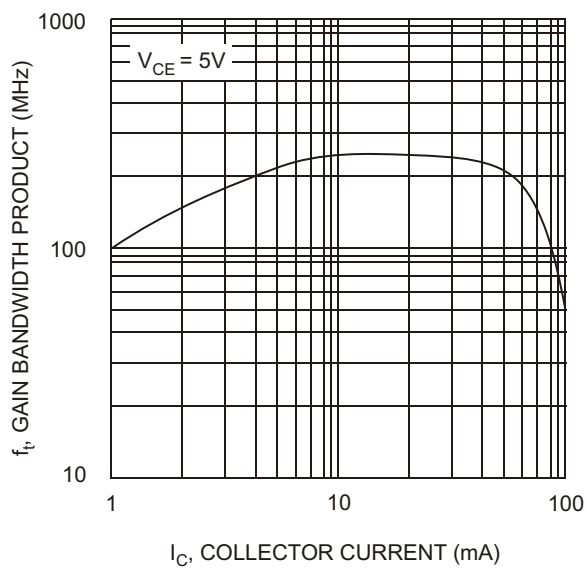


Fig. 7, Gain Bandwidth Product vs Collector Current (BC857B)