DIODES INCORPORATED

BC847PN

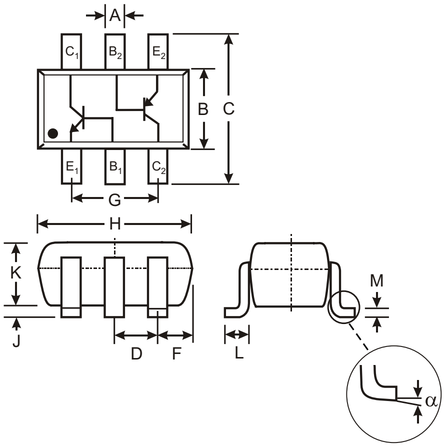
COMPLEMENTARY PAIR SMALL SIGNAL SURFACE MOUNT TRANSISTOR

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
- 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°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	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-65 to +150	°C

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

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 @ $T_A = 25°C$ 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	$I_C = 10\mu A$, $I_B = 0$
Collector-Emitter Breakdown Voltage (Note 2)	$V_{(BR)CEO}$	45	—	—	V	$I_C = 10mA$, $I_B = 0$
Emitter-Base Breakdown Voltage (Note 2)	$V_{(BR)EBO}$	6	—	—	V	$I_E = 1\mu A$, $I_C = 0$
DC Current Gain (Note 2)	h_{FE}	200	290	450	—	$V_{CE} = 5.0V$, $I_C = 2.0mA$
Collector-Emitter Saturation Voltage (Note 2)	$V_{CE(SAT)}$	—	90 200	250 600	mV	$I_C = 10mA$, $I_B = 0.5mA$ $I_C = 100mA$, $I_B = 5.0mA$
Base-Emitter Saturation Voltage (Note 2)	$V_{BE(SAT)}$	—	700 900	—	mV	$I_C = 10mA$, $I_B = 0.5mA$ $I_C = 100mA$, $I_B = 5.0mA$
Base-Emitter Voltage (Note 2)	$V_{BE(ON)}$	580 —	660 —	700 720	mV	$V_{CE} = 5.0V$, $I_C = 2.0mA$ $V_{CE} =5.0V$, $I_C = 10mA$
Collector-Cutoff Current (Note 2)	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	$V_{CE} = 5V$, $I_C = 200\mu A$, $R_G = 2.0k\Omega$, $f = 1.0kHz$, $\Delta f = 200Hz$

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 2)	$V_{(BR)CBO}$	-50	—	—	V	$I_C = 10\mu A$, $I_B = 0$
Collector-Emitter Breakdown Voltage (Note 2)	$V_{(BR)CEO}$	-45	—	—	V	$I_C = 10mA$, $I_B = 0$
Emitter-Base Breakdown Voltage (Note 2)	$V_{(BR)EBO}$	-5	—	—	V	$I_E = 1\mu A$, $I_C = 0$
DC Current Gain (Note 2)	h_{FE}	220	290	475	—	$V_{CE} = 5.0V$, $I_C = 2.0mA$
Collector-Emitter Saturation Voltage (Note 2)	$V_{CE(SAT)}$	—	-75 -250	-300 -650	mV	$I_C = 10mA$, $I_B = 0.5mA$ $I_C = 100mA$, $I_B = 5.0mA$
Base-Emitter Saturation Voltage (Note 2)	$V_{BE(SAT)}$	—	-700 -850	— -950	mV	$I_C = 10mA$, $I_B = 0.5mA$ $I_C = 100mA$, $I_B = 5.0mA$
Base-Emitter Voltage (Note 2)	$V_{BE(ON)}$	-600 —	-650 —	-750 -820	mV	$V_{CE} = 5.0V$, $I_C = 2.0mA$ $V_{CE} =5.0V$, $I_C = 10mA$
Collector-Cutoff Current (Note 2)	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	$V_{CE} = 5V$, $I_C = 200\mu A$, $R_G = 2.0k\Omega$, $f = 1.0kHz$, $\Delta f = 200Hz$

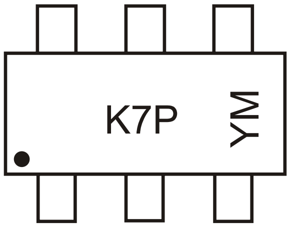
Notes: 2. Short duration pulse test used to minimize self-heating effect.

Ordering Information (Note 3)

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

Notes: 3. 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: 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