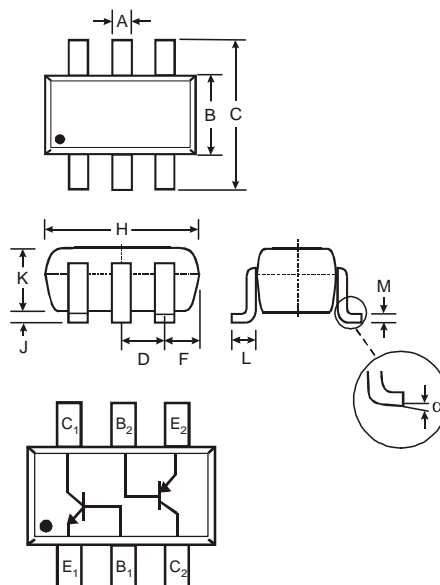


COMPLEMENTARY PAIR SMALL SIGNAL SURFACE MOUNT TRANSISTOR
Features

- 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**
- **"Green" Device (Note 3 and 4)**

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 Information: K7P, See Page 4
- Ordering Information: See Page 4
- 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
α	8°	
All Dimensions in mm		

Maximum Ratings, NPN Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	50	V
Collector-Emitter Voltage	V_{CE0}	45	V
Emitter-Base Voltage	V_{EB0}	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, PNP Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-50	V
Collector-Emitter Voltage	V_{CE0}	-45	V
Emitter-Base Voltage	V_{EB0}	-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) @ $T_A = 25^\circ\text{C}$ Total Device	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_j, T_{STG}	-65 to +150	$^\circ\text{C}$

- 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.
 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 5)	V _{(BR)CBO}	50	—	—	V	I _C = 10μA, I _B = 0
Collector-Emitter Breakdown Voltage (Note 5)	V _{(BR)CEO}	45	—	—	V	I _C = 10mA, I _B = 0
Emitter-Base Breakdown Voltage (Note 5)	V _{(BR)EBO}	6	—	—	V	I _E = 1μA, I _C = 0
DC Current Gain (Note 5)	h _{FE}	200	290	450	—	V _{CE} = 5.0V, I _C = 2.0mA
Collector-Emitter Saturation Voltage (Note 5)	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 5)	V _{BE(SAT)}	—	700 900	—	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA
Base-Emitter Voltage (Note 5)	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 5)	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, Δf = 200Hz

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 5)	V _{(BR)CBO}	-50	—	—	V	I _C = -10μA, I _B = 0
Collector-Emitter Breakdown Voltage (Note 5)	V _{(BR)CEO}	-45	—	—	V	I _C = -10mA, I _B = 0
Emitter-Base Breakdown Voltage (Note 5)	V _{(BR)EBO}	-5	—	—	V	I _E = -1μA, I _C = 0
DC Current Gain (Note 5)	h _{FE}	220	290	475	—	V _{CE} = -5.0V, I _C = -2.0mA
Collector-Emitter Saturation Voltage (Note 5)	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 5)	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 5)	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 5)	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, Δf = 200Hz

Notes: 5. Short duration pulse test used to minimize self-heating effect.

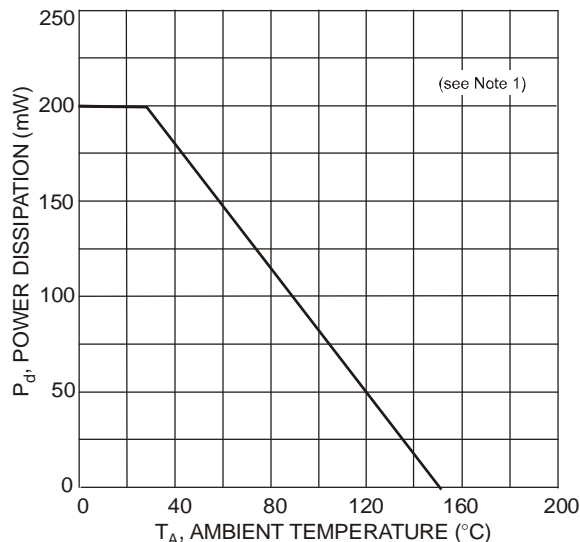


Fig. 1, Power Derating Curve (Total Device)

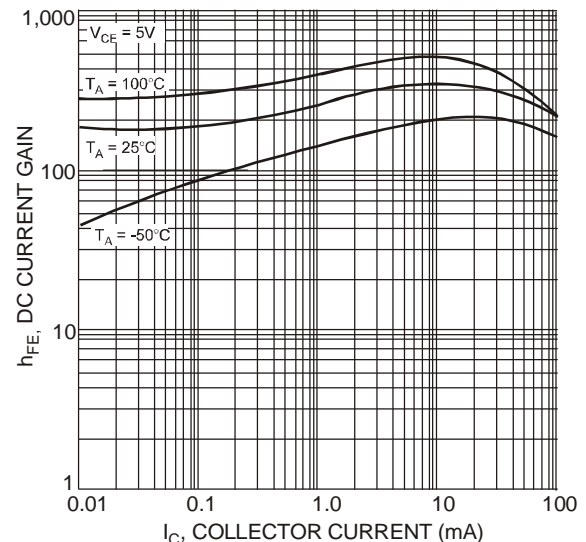


Fig. 2, DC Current Gain vs. Collector Current (NPN)

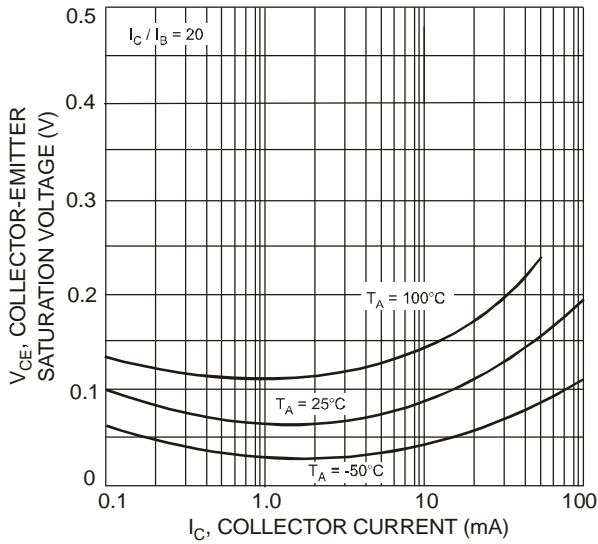


Fig. 3, Collector Saturation Voltage vs. Collector Current (NPN)

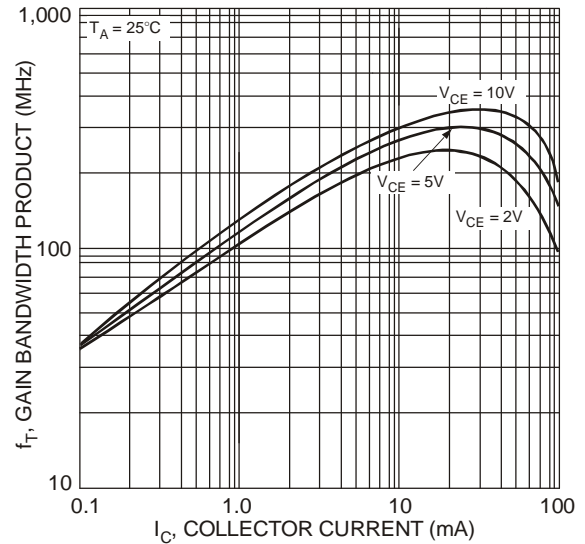


Fig. 4, Gain Bandwidth Product vs. Collector Current (NPN)

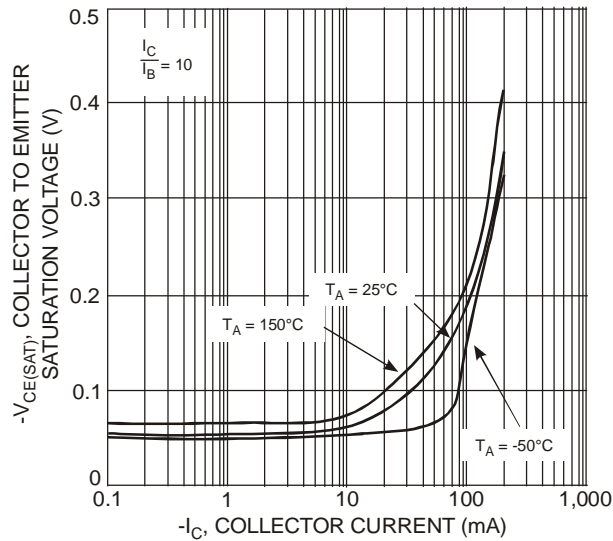


Fig. 5, Collector Emitter Saturation Voltage vs. Collector Current (PNP)

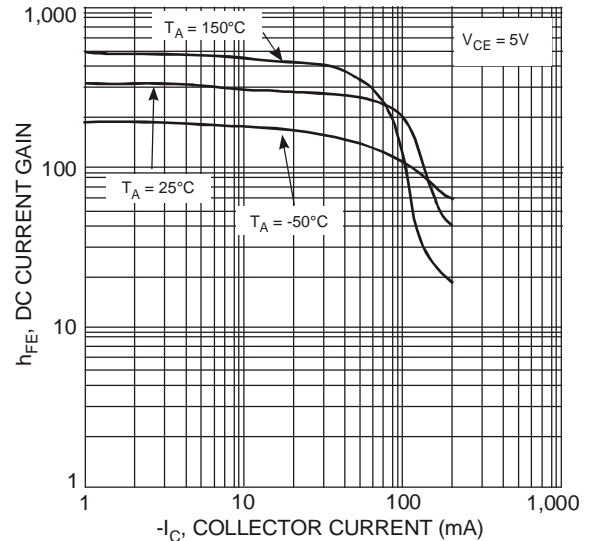


Fig. 6, DC Current Gain vs. Collector Current (PNP)

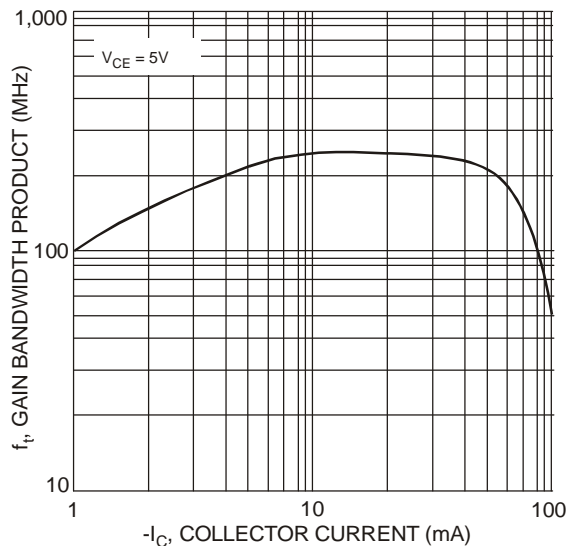


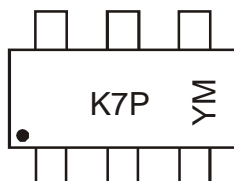
Fig. 7, Gain Bandwidth Product vs. Collector Current (PNP)

Ordering Information (Note 6)

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

Notes: 6. 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

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