

# BC857AT, BT, CT

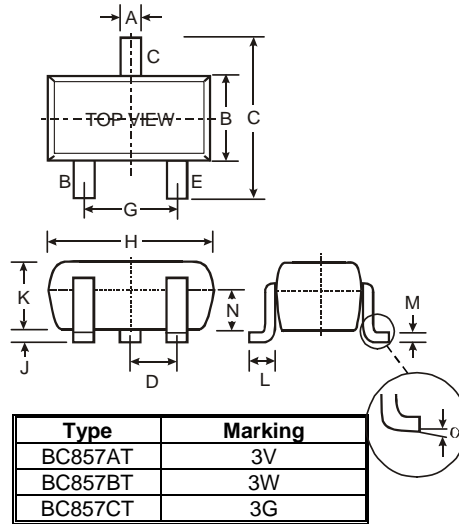
## PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

### Features

- Epitaxial Die Construction
- Complementary NPN Types Available (BC847AT,BT,CT)
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **"Green" Device (Note 4 and 5)**

### Mechanical Data

- Case: SOT-523
- 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 Code: See Table Below & Diagram on Page 2
- Ordering & Date Code Information: See Page 2
- Weight: 0.002 grams (approximate)



SOT-523			
Dim	Min	Max	Typ
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
α	0°	8°	—
All Dimensions in mm			

### Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-45	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	V
Collector Current	I <sub>C</sub>	-100	mA
Power Dissipation (Note 1)	P <sub>d</sub>	150	mW
Thermal Resistance, Junction to Ambient (Note 1)	R <sub>θJA</sub>	833	°C/W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C

### Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 3)	V <sub>(BR)CBO</sub>	-50	—	—	V	I <sub>C</sub> = 10μA, I <sub>B</sub> = 0
Collector-Emitter Breakdown Voltage (Note 3)	V <sub>(BR)CEO</sub>	-45	—	—	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage (Note 3)	V <sub>(BR)EBO</sub>	-5	—	—	V	I <sub>E</sub> = 1μA, I <sub>C</sub> = 0
DC Current Gain (Note 3) Current Gain A	h <sub>FE</sub>	125	—	250	—	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA
B		220	290	475		
C		420	520	800		
Collector-Emitter Saturation Voltage (Note 3)	V <sub>CE(SAT)</sub>	—	—	-300 -650	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA
Base-Emitter Saturation Voltage (Note 3)	V <sub>BE(SAT)</sub>	—	-700 -900	—	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA
Base-Emitter Voltage (Note 3)	V <sub>BE(ON)</sub>	-600 —	—	-750 -820	mV	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA
Collector-Cutoff Current (Note 3)	I <sub>CBO</sub>	—	—	-15 -4.0	NA μA	V <sub>CB</sub> = -30V V <sub>CB</sub> = -30V, T <sub>A</sub> = 150°C
Gain Bandwidth Product	f <sub>T</sub>	100	—	—	MHz	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA, f = 100MHz
Output Capacitance	C <sub>OB</sub>	—	—	4.5	pF	V <sub>CB</sub> = -10V, f = 1.0MHz
Noise Figure	NF	—	—	10	dB	I <sub>C</sub> = -0.2mA, V <sub>CE</sub> = -5.0Vdc, R <sub>S</sub> = 2.0KΩ, f = 1.0KHz, BW = 200Hz

- 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. Short duration pulse test used to minimize self-heating effect.
  4. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  5. 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.

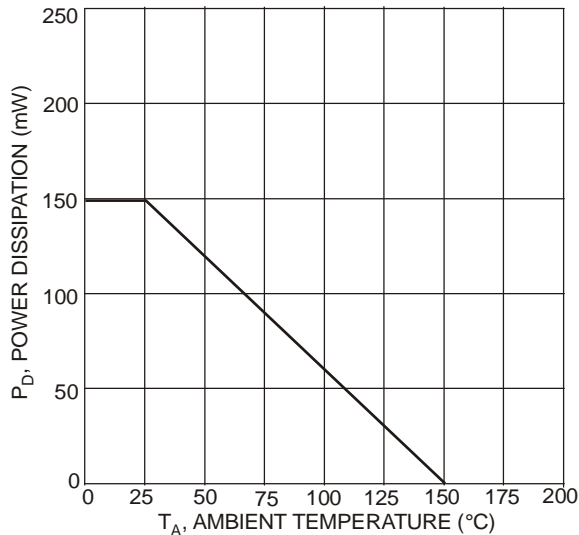


Fig. 1, Max Power Dissipation vs. Ambient Temperature

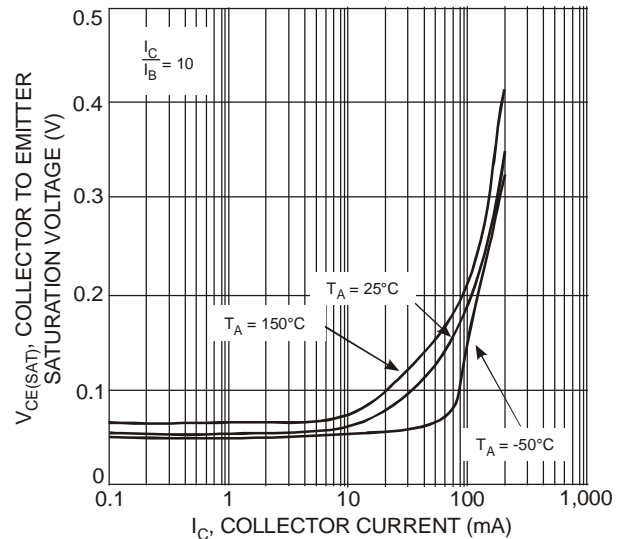


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

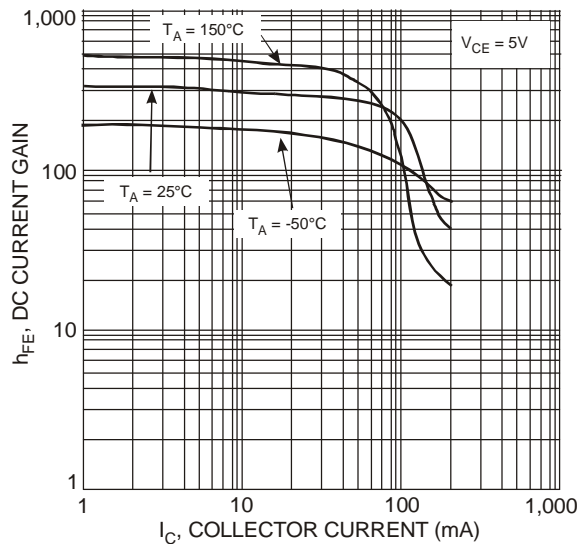


Fig. 3, DC Current Gain vs. Collector Current

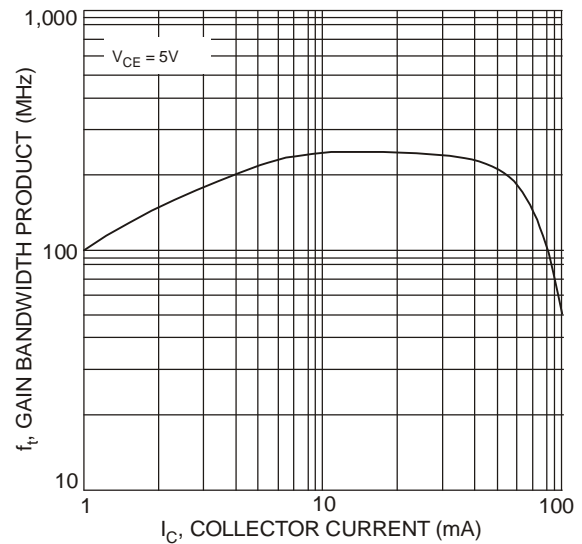


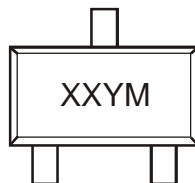
Fig. 4, Gain Bandwidth Product vs. Collector Current

## Ordering Information (Note 6)

Device	Packaging	Shipping
BC857AT-7-F	SOT-523	3000/Tape & Reel
BC857BT-7-F	SOT-523	3000/Tape & Reel
BC857CT-7-F	SOT-523	3000/Tape & Reel

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



XX = Product Type Marking Code (See Page 1), e.g. 3V = BC857AT  
 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	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	L	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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