



# BC857AT, BT, CT

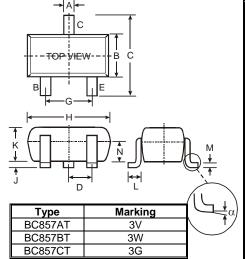
## PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

#### **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	Тур								
Α	0.15	0.30	0.22								
В	0.75	0.85	0.80								
С	1.45	1.75	1.60								
D	_		0.50								
G	0.90	1.10	1.00								
Н	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 D	All Dimensions in mm										

## **Maximum Ratings** @TA = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit		
Collector-Base Voltage		$V_{CBO}$	-50	V		
Collector-Emitter Voltage		V <sub>CEO</sub>	-45	V		
Emitter-Base Voltage		V <sub>EBO</sub>	-5.0	V		
Collector Current		Ic	-100	mA		
Power Dissipation	(Note 1)	P <sub>d</sub>	150	mW		
Thermal Resistance, Junction to Ambient	(Note 1)	$R_{ hetaJA}$	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	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	(Note 3)	V <sub>(BR)CBO</sub>	-50	_	_	V	$I_C = 10\mu A, I_B = 0$
Collector-Emitter Breakdown Voltage	(Note 3)	V <sub>(BR)CEO</sub>	-45	_	_	V	$I_C = 10 \text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	(Note 3)	V <sub>(BR)EBO</sub>	-5	_	_	V	$I_E = 1\mu A, I_C = 0$
DC Current Gain (Note 3)	Current Gain A		125	_	250		
	В	h <sub>FE</sub>	220	290	475	_	$V_{CE} = -5.0V, I_{C} = -2.0mA$
	C		420	520	800		
Collector-Emitter Saturation Voltage	(Note 3)	V	_	_	-300	mV	$I_C = -10 \text{mA}, I_B = -0.5 \text{mA}$
Collector-Emitter Saturation voltage	(Note 3)	V <sub>CE(SAT)</sub>			-650	IIIV	$I_C = -100 \text{mA}, I_B = -5.0 \text{mA}$
Base-Emitter Saturation Voltage	(Note 3)	V <sub>BE(SAT)</sub>	_	-700 -900	_	mV	$I_C = -10 \text{mA}, I_B = -0.5 \text{mA}$
Base-Emitter Saturation voltage	(Note 3)				_	IIIV	$I_C = -100 \text{mA}, I_B = -5.0 \text{mA}$
Page Emitter Voltage	(Note 3)	V <sub>BE(ON)</sub>	-600		-750	mV	$V_{CE} = -5.0V, I_{C} = -2.0mA$
Base-Emitter Voltage	(Note 3)		_		-820	IIIV	$V_{CE} = -5.0V, I_{C} = -10mA$
Collector-Cutoff Current	(Note 3)		_	_	-15	NA	V <sub>CB</sub> = -30V
Collector-Cutoff Current	(Note 3)	I <sub>CBO</sub>	_	_	-4.0	μΑ	$V_{CB} = -30V, T_A = 150^{\circ}C$
Gain Bandwidth Product		f <sub>T</sub>	100	_	_	MHz	$V_{CE} = -5.0V$ , $I_{C} = -10mA$ , $f = 100MHz$
Output Capacitance		СОВ	_	_	4.5	pF	V <sub>CB</sub> = -10V, f = 1.0MHz
		NF	_		10	dB	$I_C = -0.2 \text{mA}, V_{CE} = -5.0 \text{Vdc},$
Noise Figure							$R_S = 2.0K\Omega$ , $f = 1.0KHz$ ,
							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.
- 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.



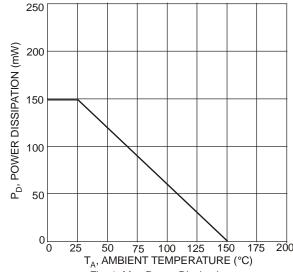


Fig. 1, Max Power Dissipation vs.
Ambient Temperature

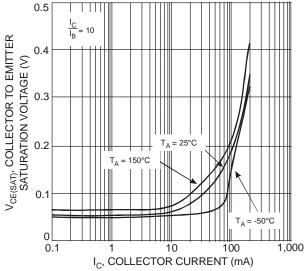
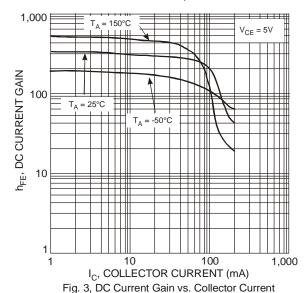
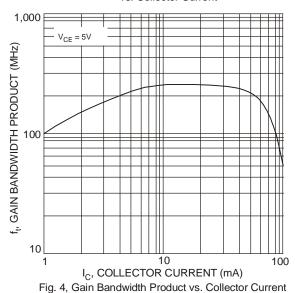


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current



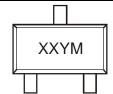


Ordering Information (Note 6)

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

Date Code Key															
Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	L	М	N	Р	R	S	Т	U	V	W	Χ	Υ	Z
Month	Jan	Fe	b	Mar	Apr	May	Ju	n	Jul	Aug	Sep	Oct	N	lov	Dec
Code	1	2		3	4	5	6	;	7	8	9	0		N	D



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