

## Features

- For Switching and AF Amplifier Applications
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 320°C/W Junction to Solder-point (Note2)
- Thermal Resistance: 403°C/W Junction to Ambient (Note2)

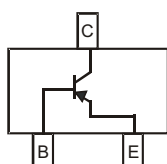
Parameter	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-45	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-100	mA
Peak Collector Current	$I_{CM}$	-200	mA
Peak Emitter Current	$I_{EM}$	-200	mA
Power Dissipation $T_S=50^\circ\text{C}$ (Note2)	$P_D$	310	mW

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

2. Package Mounted 1.0\*1.0mm Pad Layout 1oz Copper That is On a Single-sided FR4 PCB.

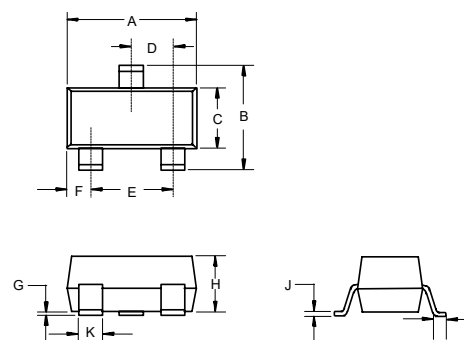
Part Number	BC857A	BC857B	BC857C
Marking	3E	3F	3G

## Internal Structure



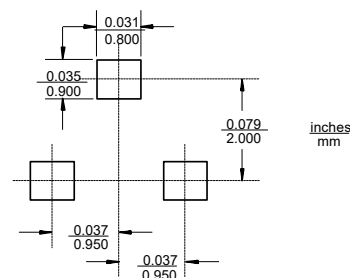
# PNP Small Signal Transistor

## SOT-23



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.014	0.020	0.35	0.51	
L	0.007	0.020	0.20	0.50	

## Suggested Solder Pad Layout



Electrical Characteristics @ 25°C Unless Otherwise Specified

Parameter		Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage <sup>(Note3)</sup>		V <sub>(BR)CBO</sub>	-50			V	I <sub>C</sub> =-10μA, I <sub>E</sub> =0
Collector-Emitter Breakdown Voltage <sup>(Note3)</sup>		V <sub>(BR)CEO</sub>	-45			V	I <sub>C</sub> =-10mA, I <sub>B</sub> =0
Emitter-Base Breakdown Voltage <sup>(Note3)</sup>		V <sub>(BR)EBO</sub>	-5			V	I <sub>E</sub> =-1μA, I <sub>C</sub> =0
Collector-Cutoff Current <sup>(Note3)</sup>		I <sub>CES</sub>			-15	nA	V <sub>CE</sub> =-50V
		I <sub>CBO</sub>			-15	nA	V <sub>CB</sub> =-30V
					-4	μA	V <sub>CB</sub> =-30V, T <sub>A</sub> =150°C
DC Current Gain <sup>(Note3)</sup>	BC857 A	h <sub>FE</sub>	125	180	250		V <sub>CE</sub> =-5Vdc, I <sub>C</sub> =-2mA
	BC857 B		220	290	475		
	BC857 C		420	520	800		
Small Signal Current Gain	BC857 A	h <sub>fe</sub>		200			V <sub>CE</sub> =-5V I <sub>C</sub> =-2mA f=1KHz
	BC857 B			330			
	BC857 C			600			
Input Impedance	BC857 A	h <sub>ie</sub>		2.7		KΩ	
	BC857 B			4.5			
	BC857 C			8.7			
Output Admittance	BC857 A	h <sub>oe</sub>		18		μS	
	BC857 B			30			
	BC857 C			60			
Reverse Voltage Transfer Ratio	BC857 A	h <sub>re</sub>		1.5x10 <sup>-4</sup>			
	BC857 B			2x10 <sup>-4</sup>			
	BC857 C			3x10 <sup>-4</sup>			
Collector-Emitter Saturation Voltage <sup>(Note3)</sup>		V <sub>CE(sat)</sub>		-75	-300	mV	I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA
				-250	-650	mV	I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA
Base-Emitter Saturation Voltage <sup>(Note3)</sup>		V <sub>BE(sat)</sub>		-700		mV	I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA
				-850		mV	I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA
Base-Emitter Voltage <sup>(Note3)</sup>		V <sub>BE</sub>	-600	-650	-750	mV	V <sub>CE</sub> =-5V, I <sub>C</sub> =-2mA
					-820	mV	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA
Current Gain-Bandwidth Product		f <sub>T</sub>	100	200		MHz	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA, f=100MHz
Collector-Base Capacitance		C <sub>CBO</sub>		3		pF	V <sub>CB</sub> =-10V, f=1MHz
Noise Figure		NF		2	10	dB	V <sub>CE</sub> =-5V, I <sub>C</sub> =-200μA R <sub>S</sub> =2KΩ, f=1KHz, Δf=200Hz

Note: 3. Short Duration Pulse Test to Minimize Self-heating Effect.

## Curve Characteristics

Fig. 1 - Static Characteristics

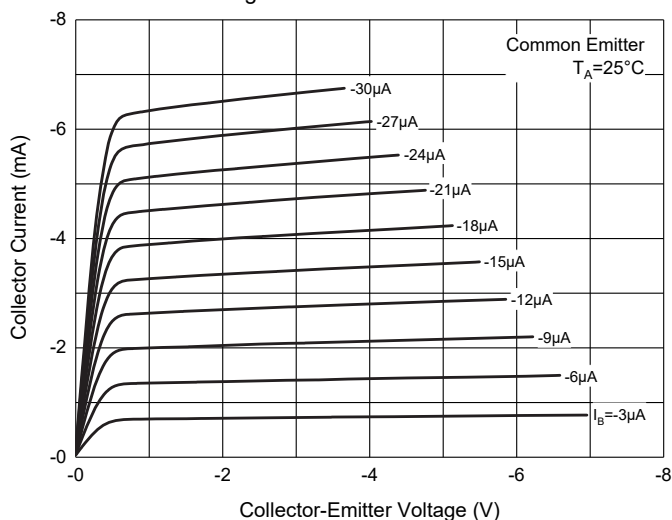


Fig. 2 - DC Current Gain Characteristics

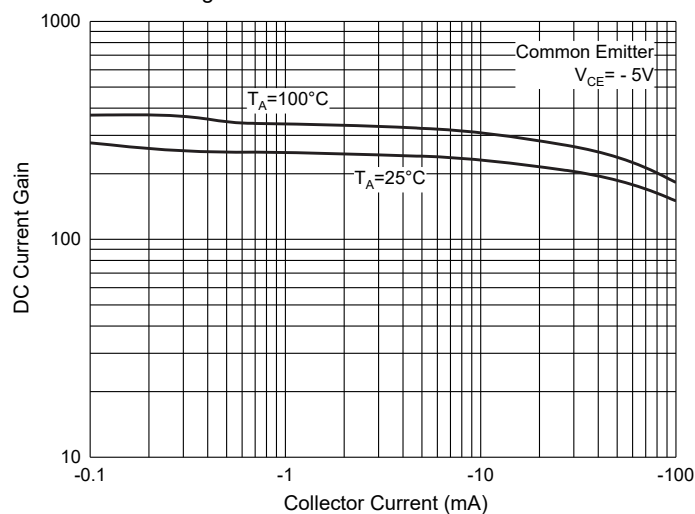


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

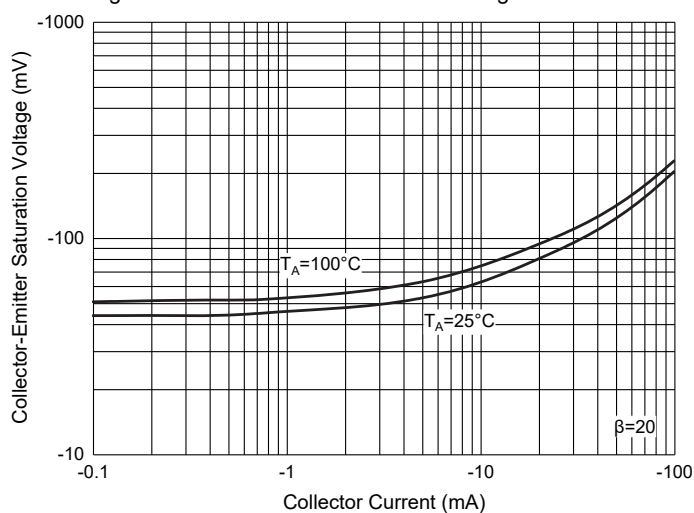


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

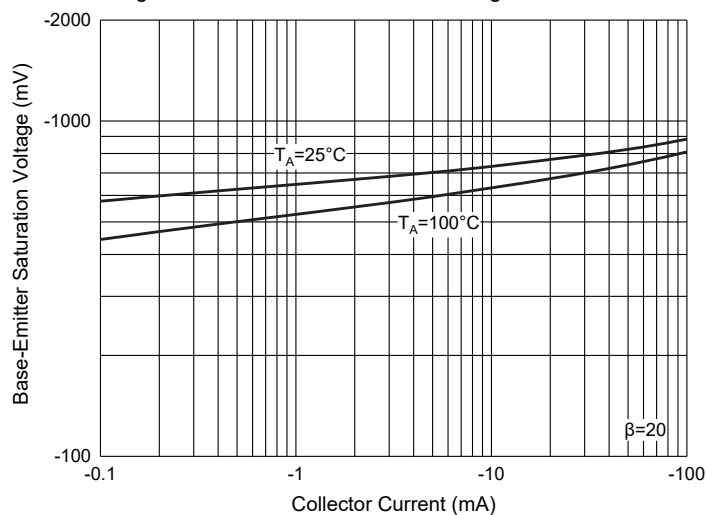


Fig. 5 - Base-Emitter Voltage Characteristics

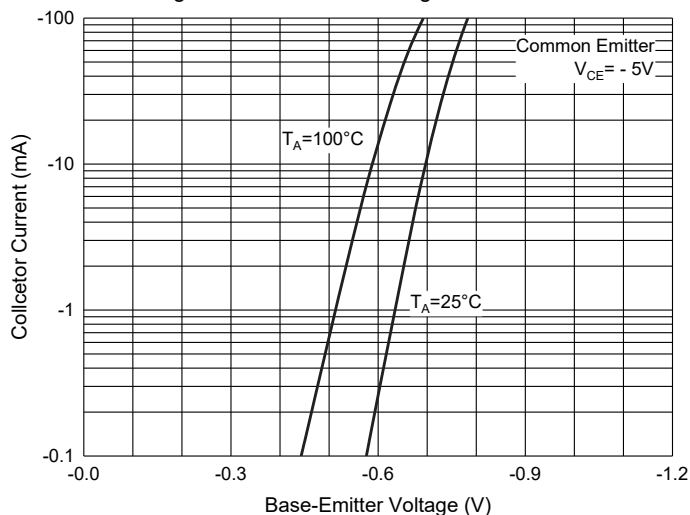
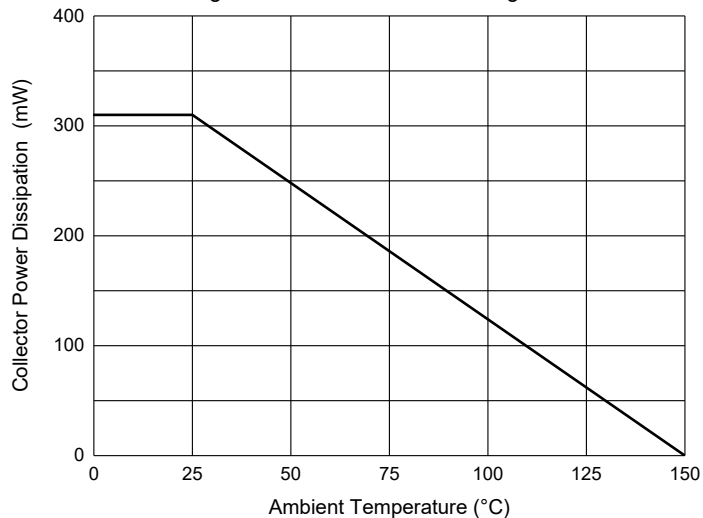


Fig. 6 - Collector Power Derating Curve



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel
Part Number-13P	Tape&Reel:10Kpcs/Reel

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