

## 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

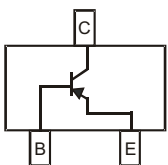
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 320°C/W Junction to Solder-point (Note2)
- Thermal Resistance: 403°C/W Junction to Ambient (Note2)

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.

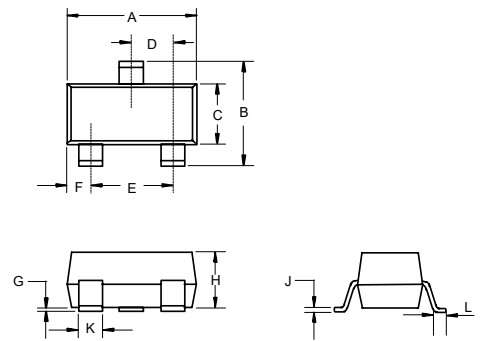
Part Number	BC857A	BC857B	BC857C
Marking	3E	3F	3G

## Internal Structure



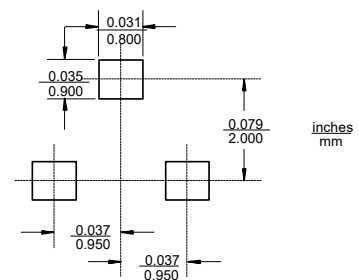
# PNP Small Signal Transistor

## SOT-23



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>		$V_{(BR)CBO}$	-50			V	$I_C=-10\mu A, I_E=0$
Collector-Emitter Breakdown Voltage <sup>(Note3)</sup>		$V_{(BR)CEO}$	-45			V	$I_C=-10mA, I_B=0$
Emitter-Base Breakdown Voltage <sup>(Note3)</sup>		$V_{(BR)EBO}$	-5			V	$I_E=-1\mu A, I_C=0$
Collector-Cutoff Current <sup>(Note3)</sup>		$I_{CES}$			-15	nA	$V_{CE}=-50V$
		$I_{CBO}$			-15	nA	$V_{CB}=-30V$
					-4	$\mu A$	$V_{CB}=-30V, T_A=150^\circ C$
DC Current Gain <sup>(Note3)</sup>	BC857 A	$h_{FE}$	125	180	250		$V_{CE}=-5Vdc, I_C=-2mA$
	BC857 B		220	290	475		
	BC857 C		420	520	800		
Small Signal Current Gain	BC857 A	$h_{fe}$		200			$V_{CE}=-5V$ $I_C=-2mA$ $f=1KHz$
	BC857 B			330			
	BC857 C			600			
Input Impedance	BC857 A	$h_{ie}$		2.7		K $\Omega$	
	BC857 B			4.5			
	BC857 C			8.7			
Output Admittance	BC857 A	$h_{oe}$		18		$\mu S$	
	BC857 B			30			
	BC857 C			60			
Reverse Voltage Transfer Ratio	BC857 A	$h_{re}$		$1.5 \times 10^{-4}$			
	BC857 B			$2 \times 10^{-4}$			
	BC857 C			$3 \times 10^{-4}$			
Collector-Emitter Saturation Voltage <sup>(Note3)</sup>		$V_{CE(sat)}$		-75	-300	mV	$I_C=-10mA, I_B=-0.5mA$
				-250	-650	mV	$I_C=-100mA, I_B=-5mA$
Base-Emitter Saturation Voltage <sup>(Note3)</sup>		$V_{BE(sat)}$		-700		mV	$I_C=-10mA, I_B=-0.5mA$
				-850		mV	$I_C=-100mA, I_B=-5mA$
Base-Emitter Voltage <sup>(Note3)</sup>		$V_{BE}$	-600	-650	-750	mV	$V_{CE}=-5V, I_C=-2mA$
					-820	mV	$V_{CE}=-5V, I_C=-10mA$
Current Gain-Bandwidth Product		$f_T$	100	200		MHz	$V_{CE}=-5V, I_C=-10mA, f=100MHz$
Collector-Base Capacitance		$C_{CBO}$		3		pF	$V_{CB}=-10V, f=1MHz$
Noise Figure		NF		2	10	dB	$V_{CE}=-5V, I_C=-200\mu A$ $R_S=2K\Omega, f=1KHz, \Delta f=200Hz$

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

**Curve Characteristics**

Fig. 1 - Static Characteristics

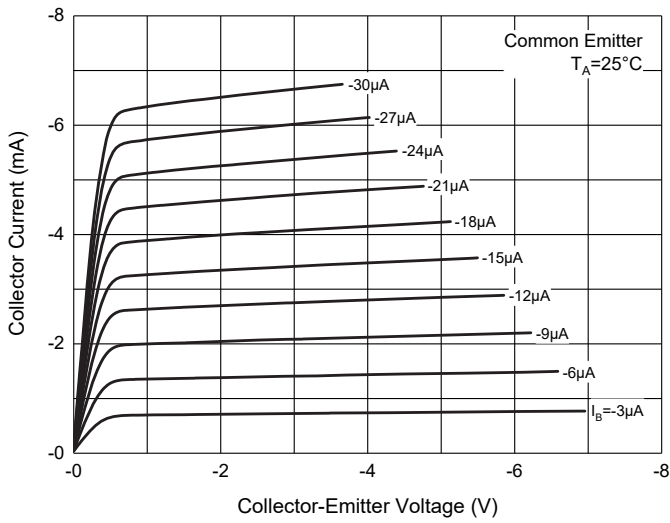


Fig. 2 - DC Current Gain Characteristics

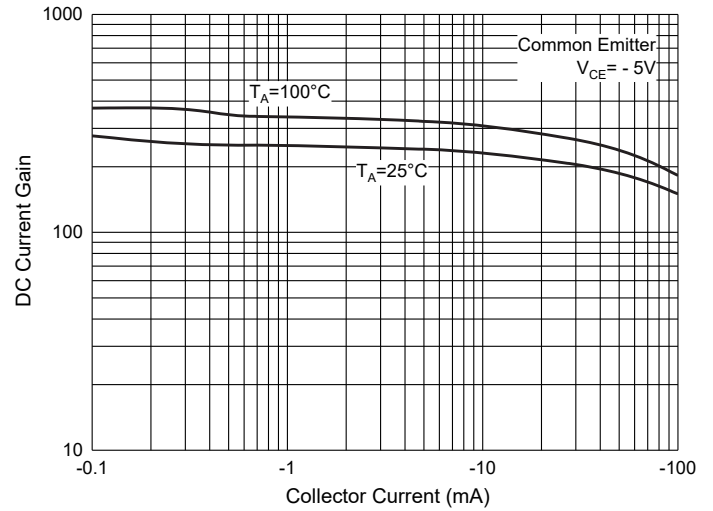


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

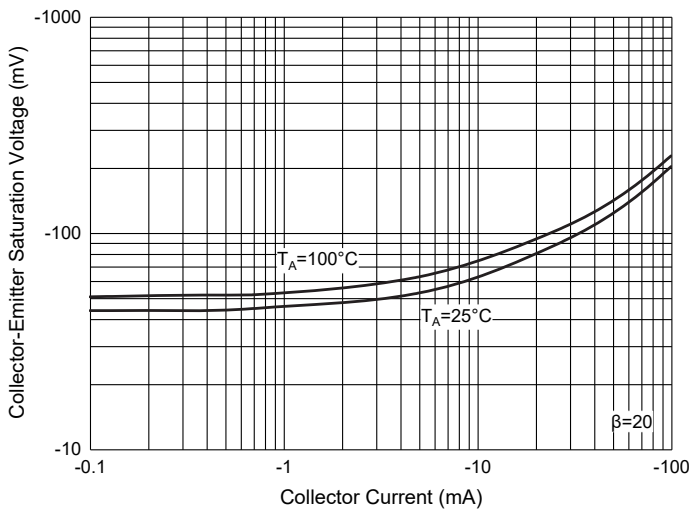


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

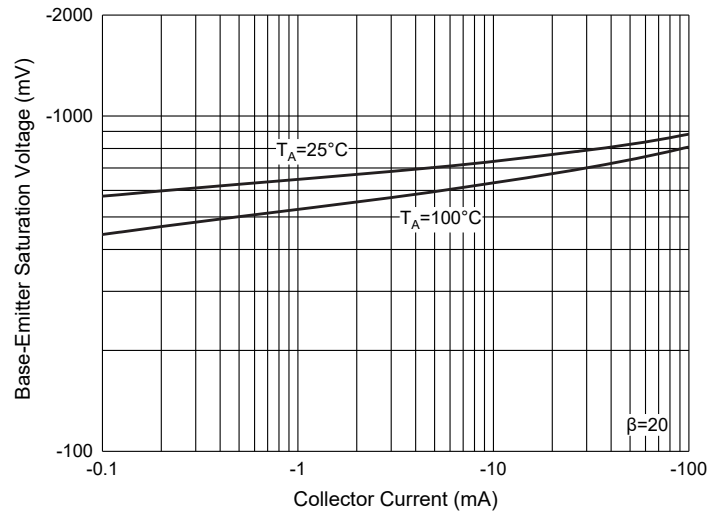


Fig. 5 - Base-Emitter Voltage Characteristics

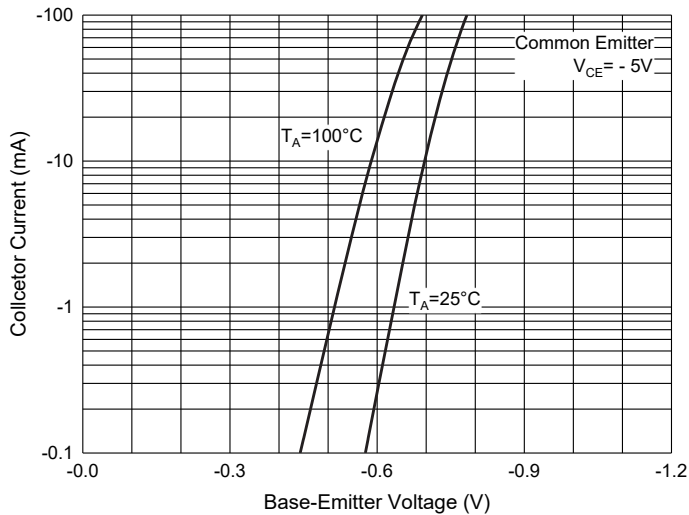
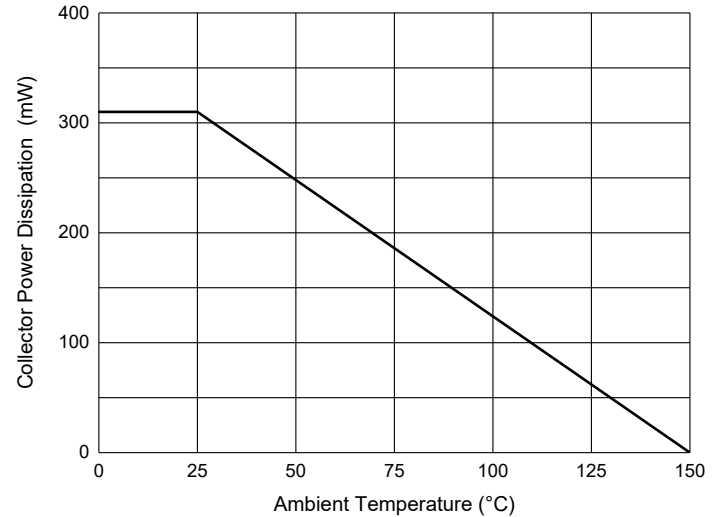


Fig. 6 - Collector Power Derating Curve



## Ordering Information

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

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