

BC857S

PNP, Multi-Chip, General-Purpose Amplifier

Description

This device is designed for general-purpose amplifier applications at collector currents to 200 mA. Sourced from Process 68.

Block Diagram

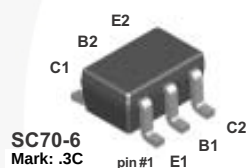


Figure 1. Device Package

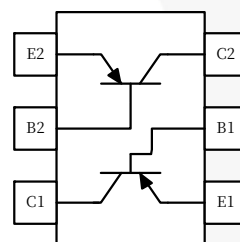


Figure 2. Internal Connections

Ordering Information

Part Number	Top Mark	Package	Packing Method
BC857S	.3C	SC70 6L	Tape and Reel

Absolute Maximum Ratings^{(1),(2)}

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	-45	V
V_{CES}	Collector-Base Voltage	-50	V
V_{CBO}	Collector-Base Voltage	-50	V
V_{EBO}	Emitter-Base Voltage	-5.0	V
I_C	Collector Current - Continuous	-200	mA
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Notes:

1. These ratings are based on a maximum junction temperature of 150°C .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty cycle operations.

Thermal Characteristics⁽³⁾

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Max.	Unit
P_D	Total Device Dissipation	300	mW
	Derate Above 25°C	2.4	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	415	$^\circ\text{C/W}$

Note:

3. PCB size: FR-4 76 x 114 x 1.57 mm³ (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = -10\text{ mA}, I_B = 0$	-45			V
$V_{(BR)CES}$	Collector-Base Breakdown Voltage	$I_C = -10\text{ }\mu\text{A}, I_E = 0$	-50			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\text{ }\mu\text{A}, I_E = 0$	-50			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\text{ }\mu\text{A}, I_C = 0$	-5			V
I_{CBO}	Collector Cut-Off Current	$V_{CB} = -30\text{ V}$			-15	nA
		$V_{CB} = -30\text{ V}, T_A = 150^\circ\text{C}$			-4	μA
h_{FE}	DC Current Gain	$I_C = -2.0\text{ mA}, V_{CE} = -5.0\text{ V}$	125		630	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -10\text{ mA}, I_B = -0.5\text{ mA}$			-0.30	V
		$I_C = -100\text{ mA}, I_B = -5.0\text{ mA}$			-0.65	
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = -2.0\text{ mA}, V_{CE} = -5.0\text{ V}$	-0.60		-0.75	V
		$I_C = -10\text{ mA}, V_{CE} = -5.0\text{ V}$			-0.82	
f_T	Current Gain-Bandwidth Product	$I_C = -10\text{ mA}, V_{CE} = -5.0\text{ V}, f = 100\text{ MHz}$		200		MHz
C_{ob}	Output Capacitance	$V_{CB} = -10\text{ V}, f = 1.0\text{ MHz}$		3.5		pF
NF	Noise Figure	$I_C = -0.2\text{ mA}, V_{CE} = -5.0\text{ V}, R_S = 2.0\text{ k}\Omega, f = 1.0\text{ kHz}, BW = 200\text{ Hz}$		2.5		dB

Typical Performance Characteristics

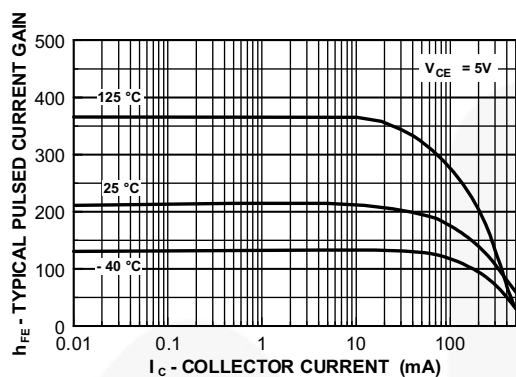


Figure 3. Typical Pulsed Current Gain vs. Collector Current

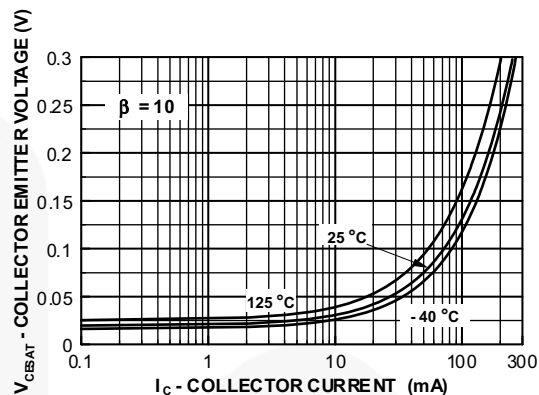


Figure 4. Collector-Emitter Saturation Voltage vs. Collector Current

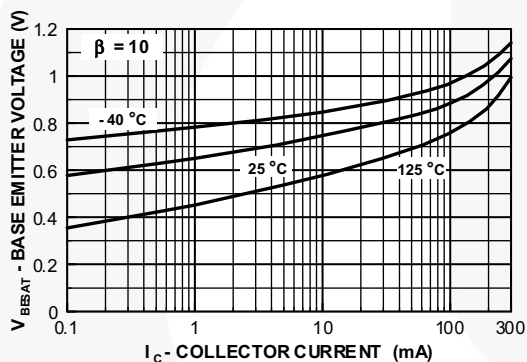


Figure 5. Base-Emitter Saturation Voltage vs. Collector Current

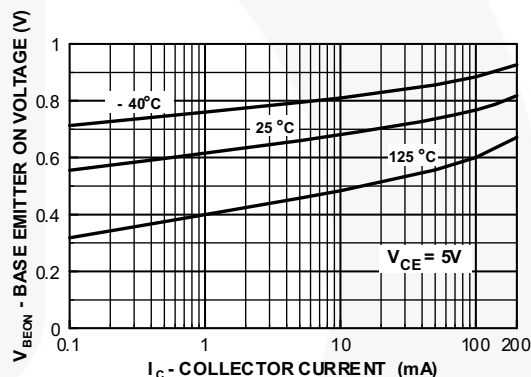


Figure 6. Base-Emitter On Voltage vs. Collector Current

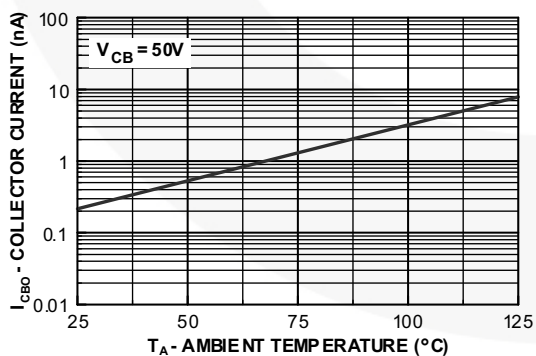


Figure 7. Collector Cut-Off Current vs. Ambient Temperature

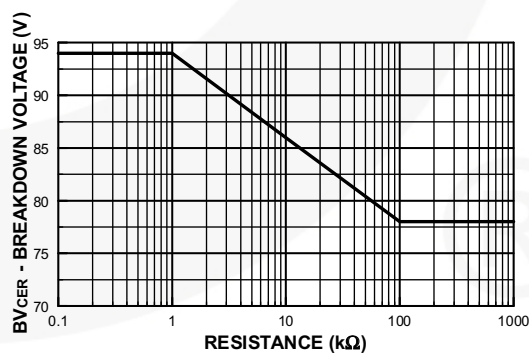


Figure 8. Collector-Emitter Breakdown Voltage with Resistance between Emitter-Base

Typical Performance Characteristics (Continued)

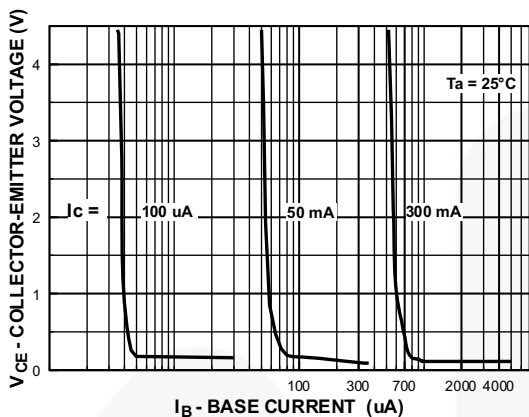


Figure 9. Collector Saturation Region

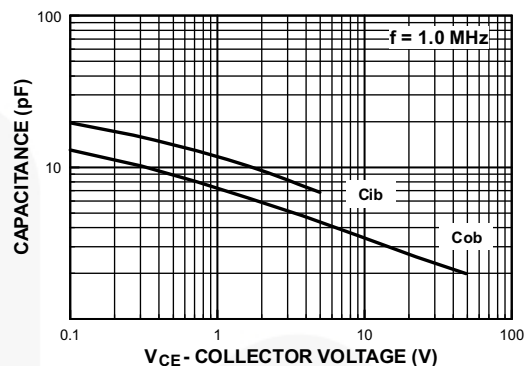


Figure 10. Input and Output Capacitance vs. Reverse Voltage

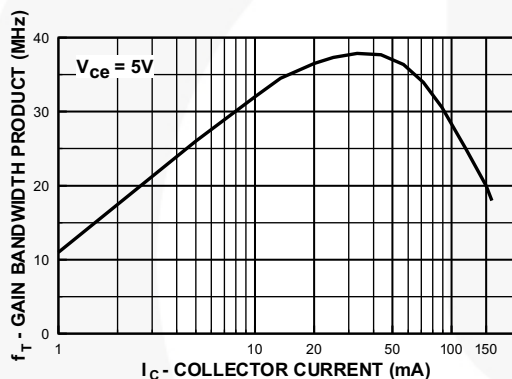


Figure 11. Gain Bandwidth Product vs. Collector Current

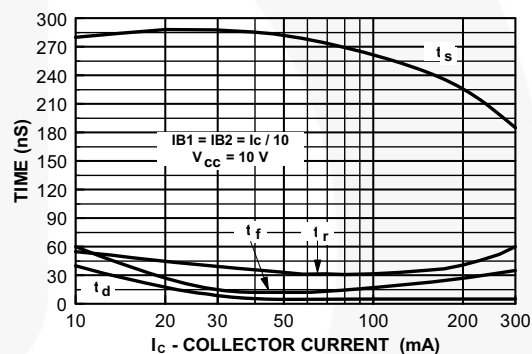


Figure 12. Switching Times vs. Collector Current

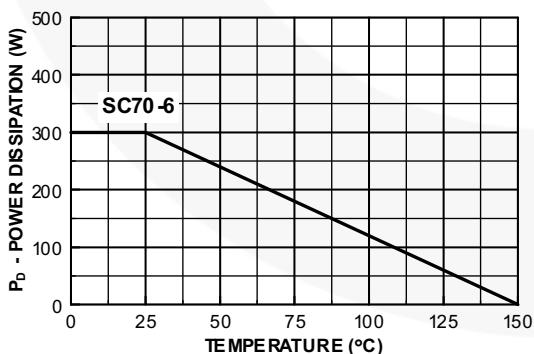


Figure 13. Power Dissipation vs. Ambient Temperature

Physical Dimensions

SC70 6L

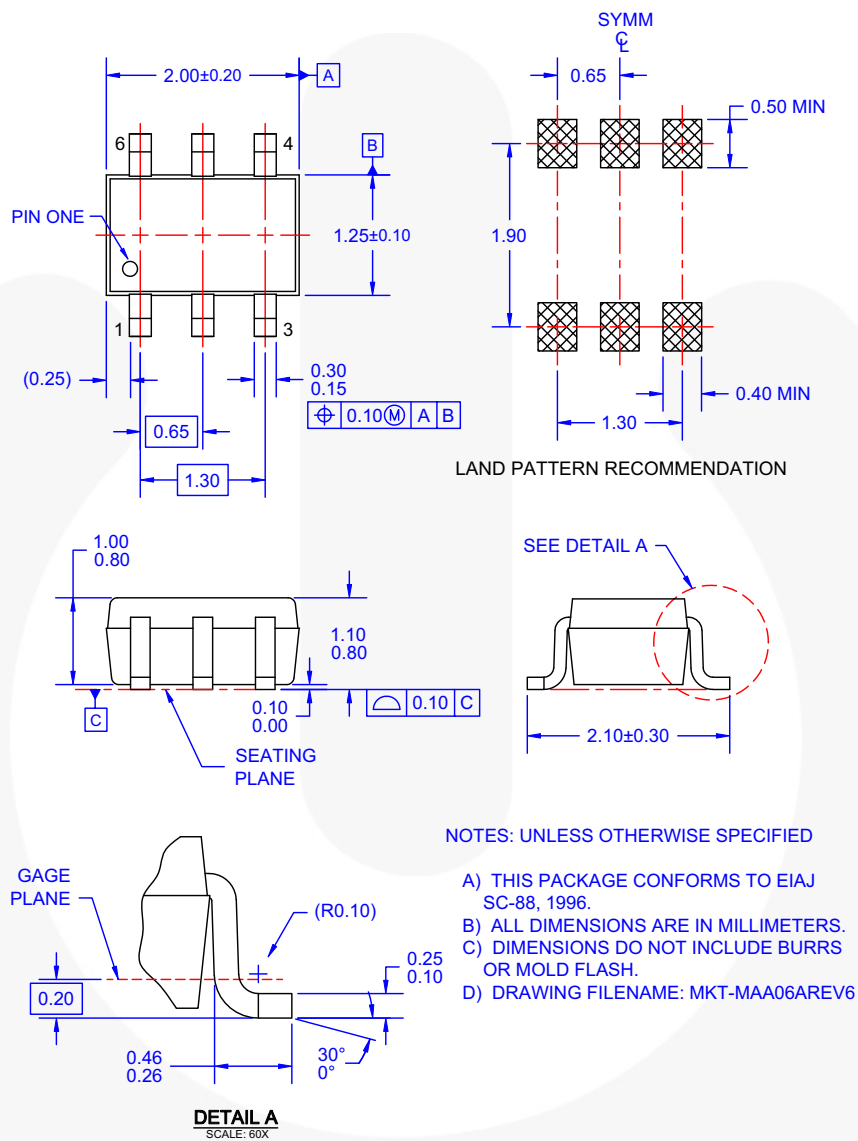


Figure 14. 6-LEAD, SC70, EIAJ SC-88, 1.25 MM WIDE (ACTIVE)

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