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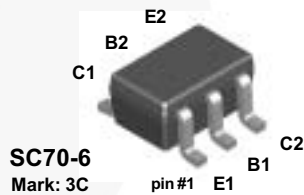
August 2015

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.



SC70-6
Mark: 3C

NOTE: The pinouts are symmetrical; pin 1 and pin 4 are interchangeable. Units inside the carrier can be of either orientation and will not affect the functionality of the device.

Figure 1. Device Package

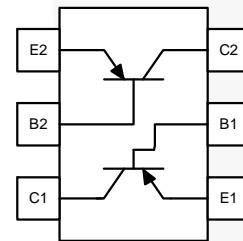


Figure 2. Internal Connections

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 | $I_C = -10\ \mu\text{A}$, $I_E = 0$ | -50 | | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C = -10\ \mu\text{A}$, $I_E = 0$ | -50 | | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E = -10\ \mu\text{A}$, $I_C = 0$ | -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

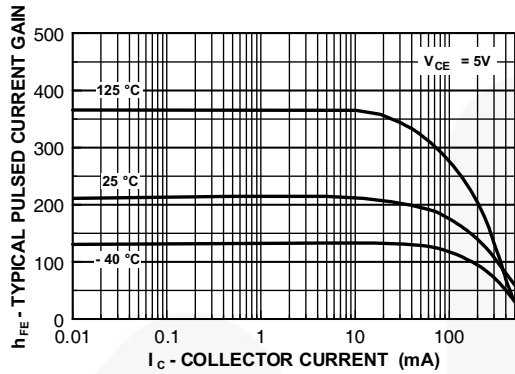


Figure 3. Typical Pulsed Current Gain vs. Collector Current

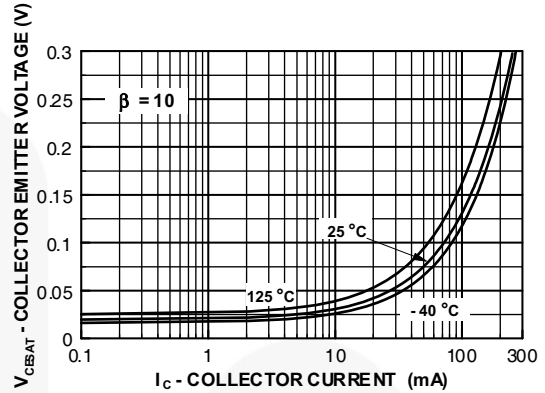


Figure 4. Collector-Emitter Saturation Voltage vs. Collector Current

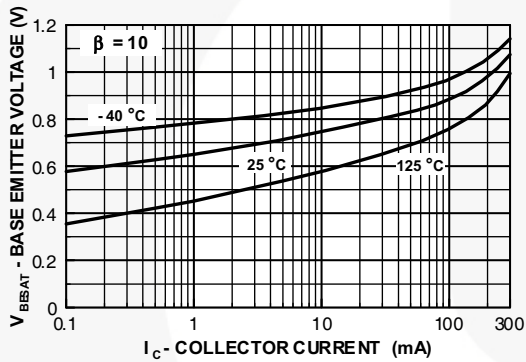


Figure 5. Base-Emitter Saturation Voltage vs. Collector Current

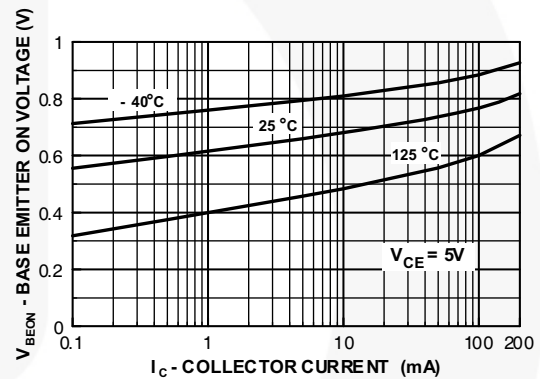


Figure 6. Base-Emitter On Voltage vs. Collector Current

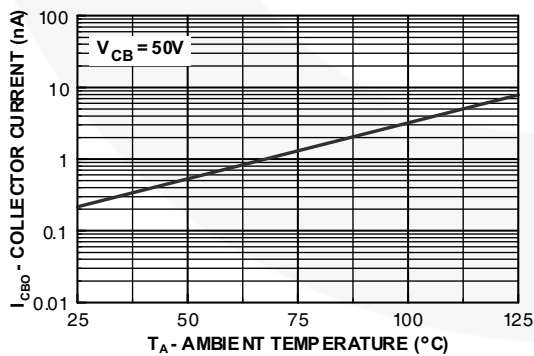


Figure 7. Collector Cut-Off Current vs. Ambient Temperature

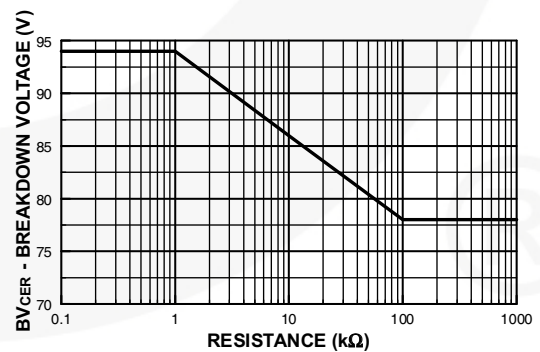


Figure 8. Collector-Emitter Breakdown Voltage with Resistance between Emitter-Base

Typical Performance Characteristics (Continued)

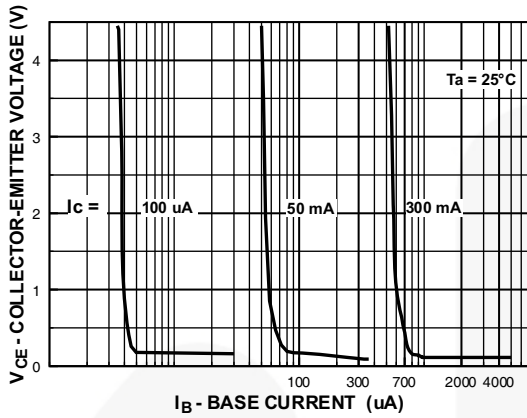


Figure 9. Collector Saturation Region

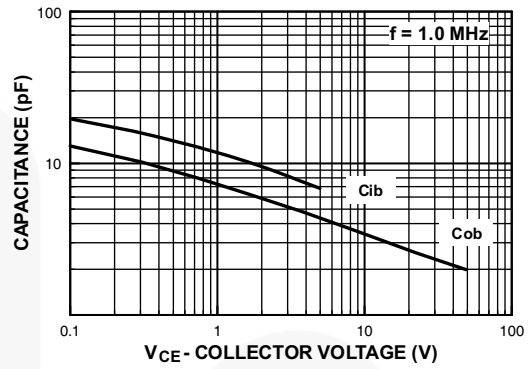


Figure 10. Input and Output Capacitance vs. Reverse Voltage

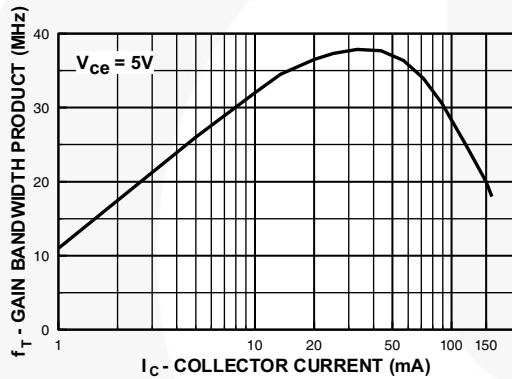


Figure 11. Gain Bandwidth Product vs. Collector Current

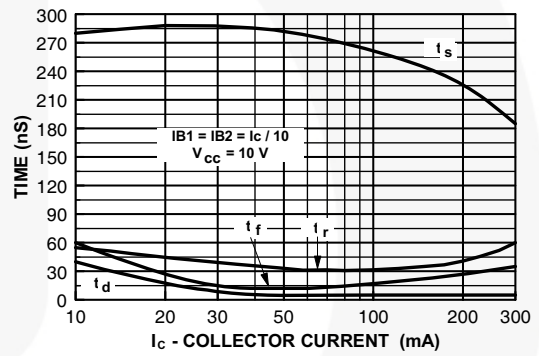


Figure 12. Switching Times vs. Collector Current

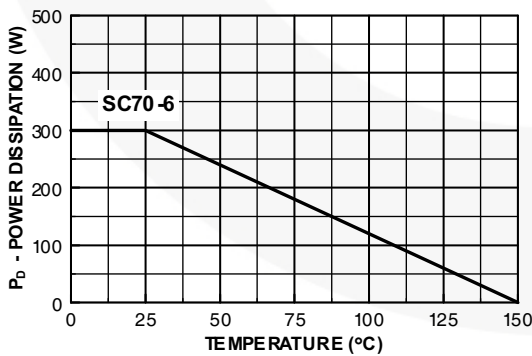


Figure 13. Power Dissipation vs. Ambient Temperature

Physical Dimensions

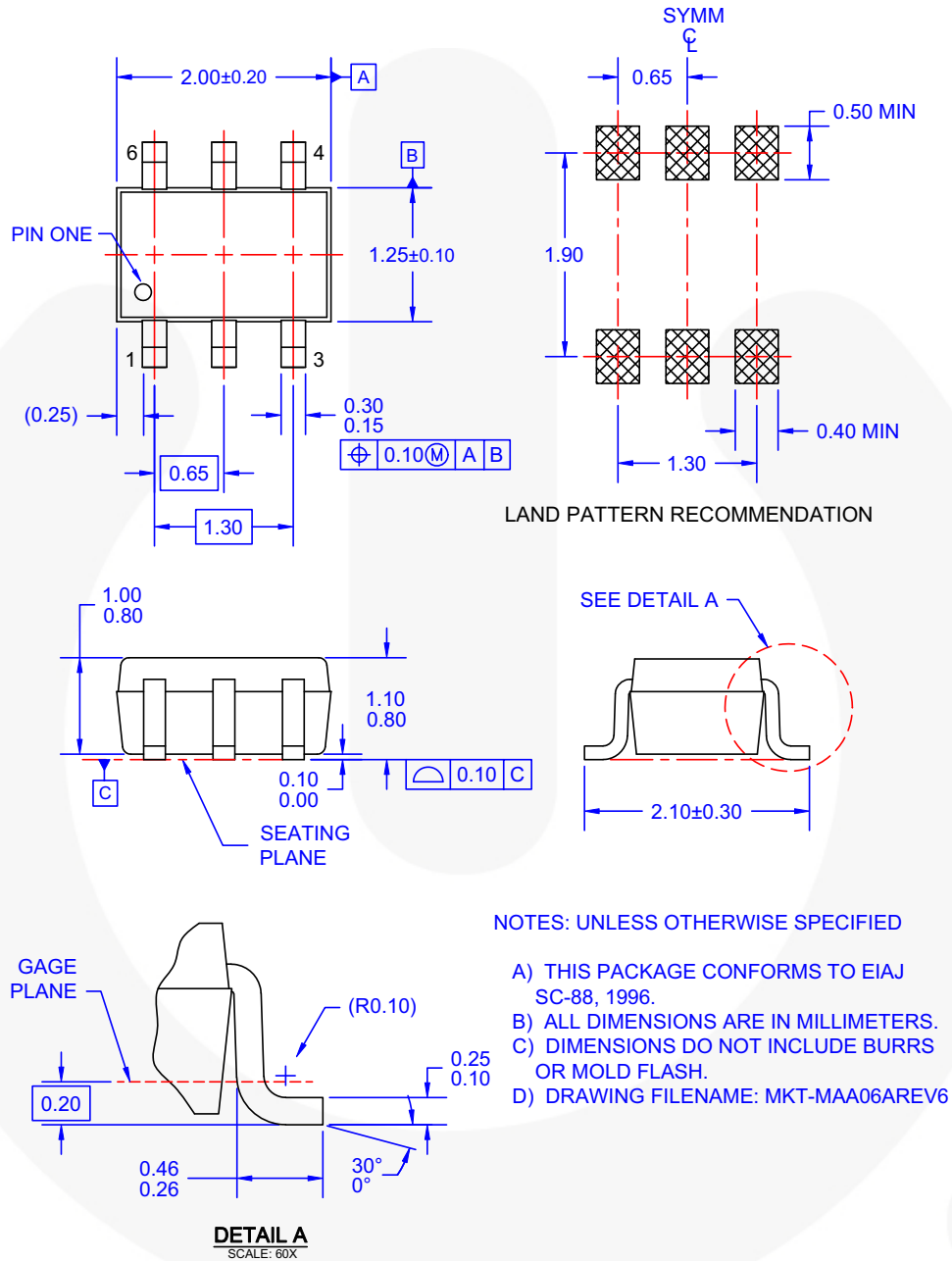


Figure 14. 6-LEAD, SC70, EIAJ SC-88, 1.25 MM WIDE



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