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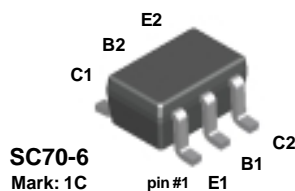
[BC847S](#)

For any questions, you can email us directly:

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## BC847S



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.

### NPN Multi-Chip General Purpose Amplifier

This device is designed for general purpose amplifier applications at collector currents to 200 mA. Sourced from Process 07.

#### Absolute Maximum Ratings\* T<sub>A</sub> = 25°C unless otherwise noted

| Symbol                            | Parameter  | Value       | Units |
|-----------------------------------|--|-------------|-------|
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 45          | V     |
| V <sub>CES</sub>                  | Collector-Base Voltage                           | 50          | V     |
| V <sub>CB0</sub>                  | Collector-Base Voltage                           | 50          | V     |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | 6.0         | V     |
| I <sub>C</sub>                    | Collector Current - Continuous                   | 200         | mA    |
| T <sub>J</sub> , T <sub>stg</sub> | Operating and Storage Junction Temperature Range | -55 to +150 | °C    |

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**NOTES:**

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

#### Thermal Characteristics T<sub>A</sub> = 25°C unless otherwise noted

| Symbol           | Characteristic                                | Max    | Units |
|------------------|---|--------|-------|
|                  |   | BC847S |       |
| P <sub>D</sub>   | Total Device Dissipation<br>Derate above 25°C | 300    | mW    |
|                  |   | 2.4    | mW/°C |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient       | 415    | °C/W  |

## NPN Multi-Chip General Purpose Amplifier

(continued)

### Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|--------|-----------|-----------------|-----|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-----|-------|

#### OFF CHARACTERISTICS

|               |                                     |   |     |  |           |                     |
|---------------|-------------------------------------|---|-----|--|-----------|---------------------|
| $V_{(BR)CEO}$ | 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      | $I_E = 10\text{ }\mu\text{A}, I_C = 0$  | 6.0 |  |           | V                   |
| $I_{CBO}$     | Collector-Cutoff Current            | $V_{CB} = 30\text{ V}, I_E = 0$<br>$V_{CB} = 30\text{ V}, I_E = 0, T_A = 150^\circ\text{C}$ |     |  | 15<br>5.0 | nA<br>$\mu\text{A}$ |

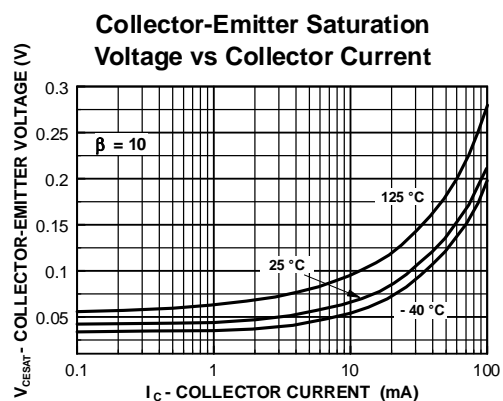
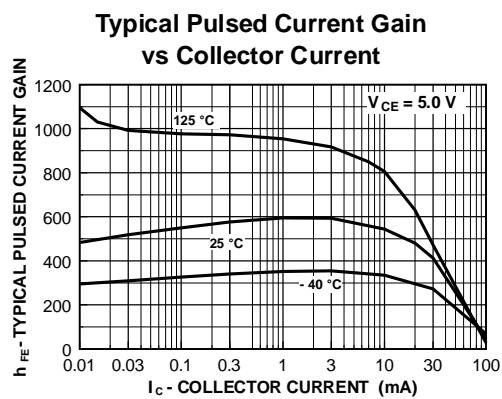
#### ON CHARACTERISTICS

|               |                                      |   |      |  |              |   |
|---------------|--------------------------------------|---|------|--|--------------|---|
| $h_{FE}$      | DC Current Gain                      | $I_C = 2.0\text{ mA}, V_{CE} = 5.0\text{ V}$  | 110  |  | 630          |   |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$<br>$I_C = 100\text{ mA}, I_B = 5.0\text{ mA}$     |      |  | 0.25<br>0.65 | V |
| $V_{BE(on)}$  | Base-Emitter ON Voltage              | $I_C = 2.0\text{ mA}, V_{CE} = 5.0\text{ V}$<br>$I_C = 10\text{ mA}, V_{CE} = 5.0\text{ V}$ | 0.58 |  | 0.7<br>0.77  | V |

#### SMALL SIGNAL CHARACTERISTICS

|           |                                  |   |  |     |  |     |
|-----------|----------------------------------|---|--|-----|--|-----|
| $f_T$     | Current Gain - Bandwidth Product | $I_C = 20\text{ mA}, V_{CE} = 5.0,$<br>$f = 100\text{ MHz}$ |  | 200 |  | MHz |
| $C_{obo}$ | Output Capacitance               | $V_{CB} = 10\text{ V}, f = 1.0\text{ MHz}$                  |  | 2.0 |  | pF  |

### Typical Characteristics

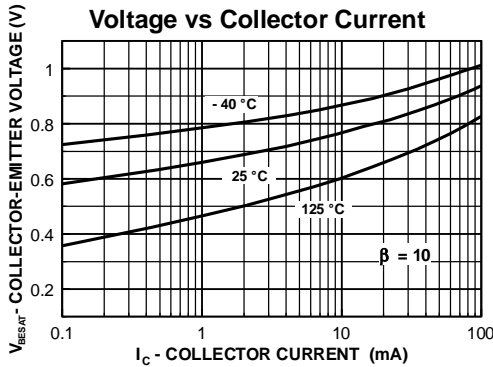


**NPN Multi-Chip General Purpose Amplifier**

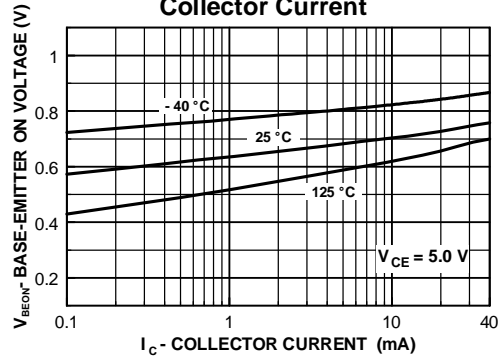
(continued)

**Typical Characteristics**

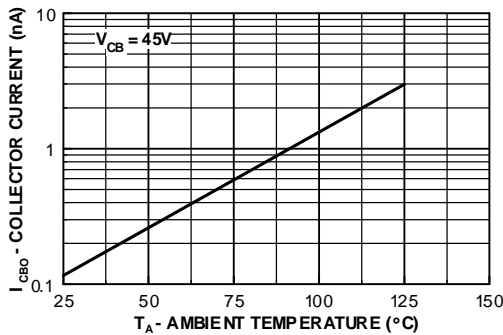
**Base-Emitter Saturation Voltage vs Collector Current**



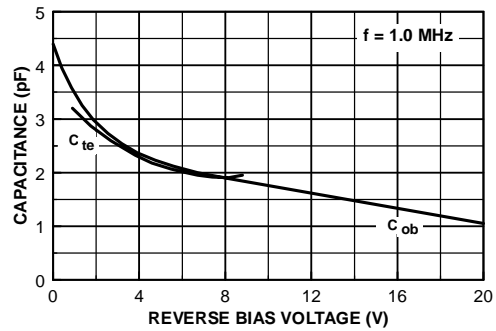
**Base-Emitter ON Voltage vs Collector Current**



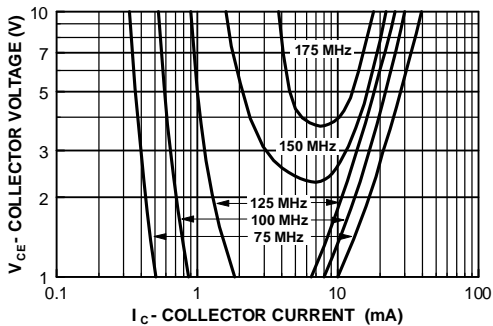
**Collector-Cutoff Current vs Ambient Temperature**



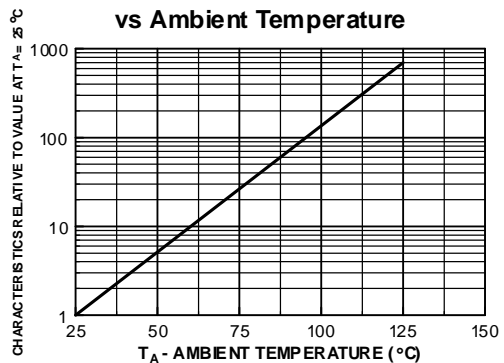
**Input and Output Capacitance vs Reverse Bias Voltage**



**Contours of Constant Gain Bandwidth Product ( $f_T$ )**



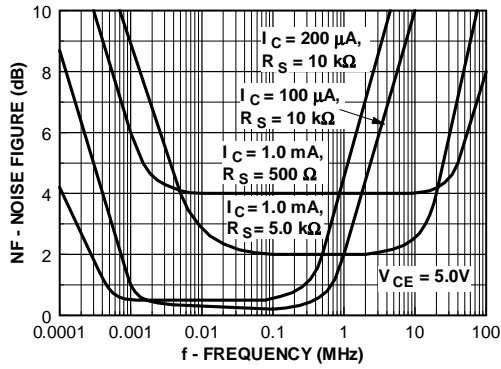
**Normalized Collector-Cutoff Current vs Ambient Temperature**



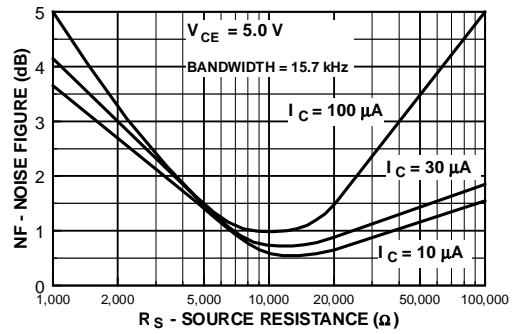
**NPN Multi-Chip General Purpose Amplifier**  
(continued)

**Typical Characteristics** (continued)

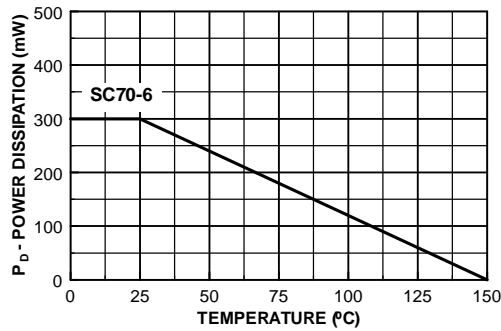
**Noise Figure vs Frequency**



**Wideband Noise Frequency vs Source Resistance**



**Power Dissipation vs Ambient Temperature**



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