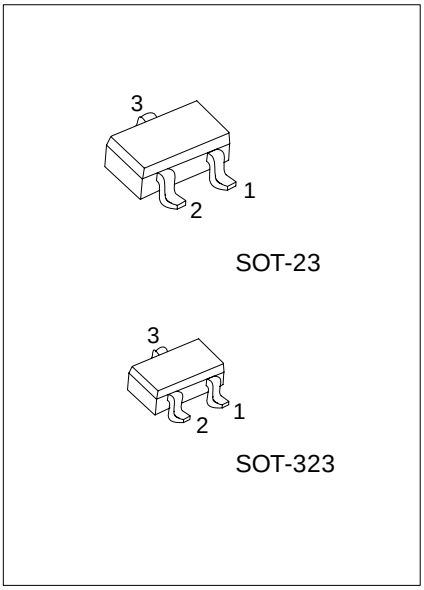
# BC846-BC850

**NPN SILICON TRANSISTOR**

## SWITCHING AND AMPLIFIER APPLICATION




*Pb-free plating product number:
BC846L/BC847L/BC848L/BC849L/BC850L

### ■ FEATURES

* Suitable for automatic insertion in thick and thin-film circuits.
* Complement to BC856 … BC860

### ■ ORDERING INFORMATION

| Order Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Normal | Lead Free Plating | | 1 | 2 | 3 | |
| BC846-x-AE3-R | BC846L-x-AE3-R | SOT-23 | E | B | C | Tape Reel |
| BC847-x-AE3-R | BC847L-x-AE3-R | SOT-23 | E | B | C | Tape Reel |
| BC848-x-AE3-R | BC848L-x-AE3-R | SOT-23 | E | B | C | Tape Reel |
| BC849-x-AE3-R | BC849L-x-AE3-R | SOT-23 | E | B | C | Tape Reel |
| BC850-x-AE3-R | BC850L-x-AE3-R | SOT-23 | E | B | C | Tape Reel |
| BC846-x-AL3-R | BC846L-x-AL3-R | SOT-323 | E | B | C | Tape Reel |
| BC847-x-AL3-R | BC847L-x-AL3-R | SOT-323 | E | B | C | Tape Reel |
| BC848-x-AL3-R | BC848L-x-AL3-R | SOT-323 | E | B | C | Tape Reel |
| BC849-x-AL3-R | BC849L-x-AL3-R | SOT-323 | E | B | C | Tape Reel |
| BC850-x-AL3-R | BC850L-x-AL3-R | SOT-323 | E | B | C | Tape Reel |

BC846L-x-AE3-R

(1)Packing Type
(2)Package Type
(3)Rank
(4)Lead Plating

(1) R: Tape Reel
(2) AE3: SOT-23, AL3: SOT-323
(3) x: refer to Classification of $h_{FE}$
(4) L: Lead Free Plating, Blank: Pb/Sn

### ■ MARKING

| BC846 | BC847 | BC848 | BC849 | BC850 |
|---|---|---|---|---|
| 8A□ | 8B□ | 8C□ | 8D□ | 8E□ |

□: Rank Code,refer to Classification of $h_{FE}$

## ■ ABSOLUTE MAXIMUM RATING (Ta=25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Collector-Base Voltage | BC846 | $V_{CBO}$ | 80 | V |
| | BC847 / BC850 | | 50 | V |
| | BC848 / BC849 | | 30 | V |
| Collector-Emitter Voltage | BC846 | $V_{CEO}$ | 65 | V |
| | BC847 / BC850 | | 45 | V |
| | BC848 / BC849 | | 30 | V |
| Emitter-Base Voltage | BC846 / BC847 | $V_{EBO}$ | 6 | V |
| | BC848 / BC849 / BC850 | | 5 | V |
| Collector Current (DC) | | Ic | 100 | mA |
| Collector Dissipation | SOT-23 | $P_D$ | 310 | mW |
| | SOT-323 | | 200 | mW |
| Junction Temperature | | $T_J$ | +150 | °C |
| Storage Temperature | | $T_{STG}$ | -40 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

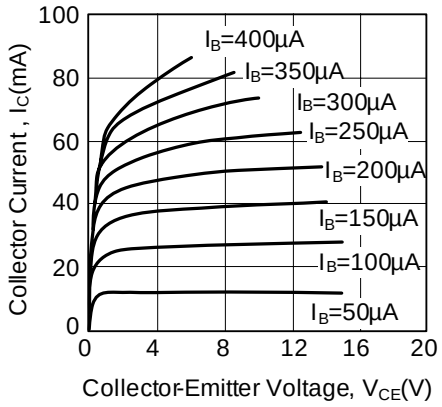
| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| Collector Cut-Off Current | | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | | | 15 | nA |
| DC Current Gain | | $h_{FE}$ | $V_{CE}$=5.0V, Ic=2.0mA | 110 | | 800 | |
| Collector-Emitter Saturation Voltage | | $V_{CE(SAT)}$ | Ic=10mA,$I_B$=0.5mA | | 90 | 250 | mV |
| | | | Ic=100mA,$I_B$=5.0mA | | 200 | 600 | mV |
| Collector-Base Saturation Voltage | | $V_{BE(SAT)}$ | Ic=10mA,$I_B$=0.5mA | | 700 | | mV |
| | | | Ic=100mA,$I_B$=5.0mA | | 900 | | mV |
| Base-Emitter On Voltage | | $V_{BE(ON)}$ | $V_{CE}$=5.0V,Ic=2.0mA | 580 | 660 | 700 | mV |
| | | | $V_{CE}$=5.0V,Ic=10mA | | | 720 | mV |
| Current Gain Bandwidth Product | | $f_T$ | $V_{CE}$=5.0V,Ic=10mA f=100MHz | | 300 | | MHz |
| Output Capacitance | | Cob | $V_{CB}$=10V, $I_E$=0, f=1.0MHz | | 3.5 | 6 | pF |
| Input Capacitance | | Cib | $V_{EB}$=0.5V, $I_C$=0, f=1.0MHz | | 9 | | pF |
| Noise Figure | BC846/BC847/BC848 | NF | $V_{CE}$=5V, Ic=200μA, f=1KHz, $R_G$=2KΩ | | 2 | 10 | dB |
| | BC849/BC850 | | | | 1.2 | 4 | dB |
| | BC849 | | $V_{CE}$=5V, $I_C$=200μA, $R_G$=2KΩ, f=30~15000Hz | | 1.4 | 4 | dB |
| | BC850 | | | | 1.4 | 3 | dB |

## ■ CLASSIFICATION OF $h_{FE}$

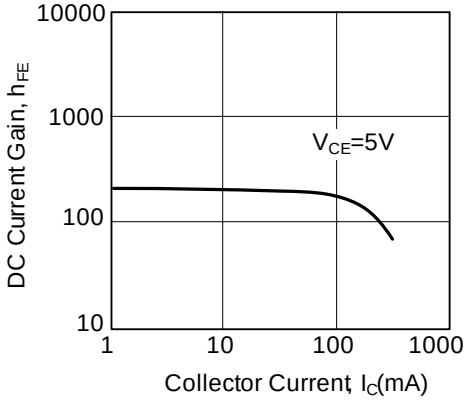
| RANK | A | B | C |
|---|---|---|---|
| RANGE | 110-220 | 200-450 | 420-800 |

## ■ TYPICAL CHARACTERISTICS

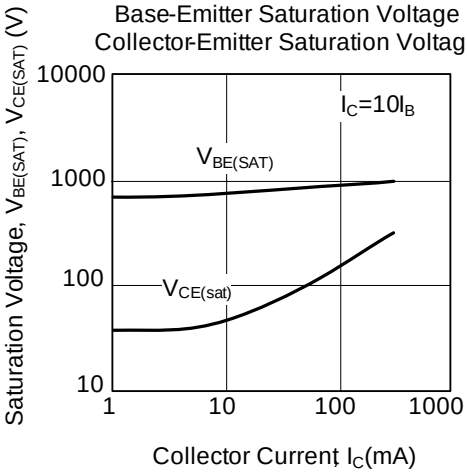
Static Characteristic



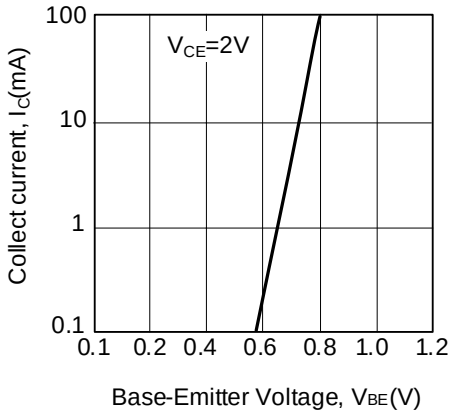

DC Current Gain



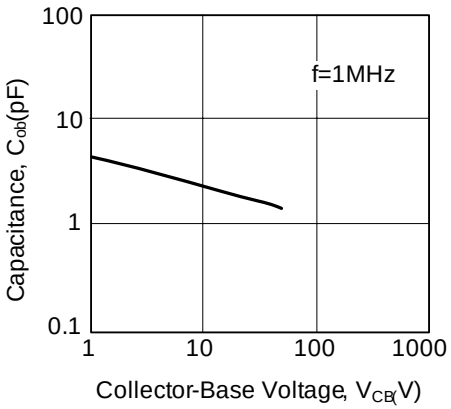

Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage




Base-Emitter on Voltage




Collector Output Capacitance




Current Gain Bandwidth Product