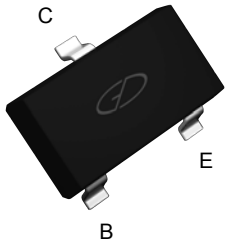
GOOD-ARK
SEMICONDUCTOR

# BC846x Series
# NPN Small Signal Transistor

## Features

- Ideally Suited for Automatic Insertion
- RoHS Compliant




**Package: SOT-23**

## Applications

- For Switching and RF Amplifier Applications

## Absolute Maximum Ratings ($T_A$ = 25 °C unless otherwise noted)

| Parameter | Symbol | Rating | UNIT |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 80 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 65 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 6.0 | V |
| Peak Collector Current | $I_{cm}$ | 300 | mA |
| Collector Current-Continuous | $I_C$ | 100 | mA |
| Collector Power Dissipation | $P_C$ | 350 | mW |
| Operating Temperature | $T_J$ | -55 to +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics ($T_A$ = 25 °C unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$=30V $I_E$=0 | | | 0.015 | uA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=5.0V $I_C$=2.0mA | 110 | | 450 | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)1}$ | $I_C$=10mA $I_B$=0.5mA | | 0.09 | 0.25 | V |
| | $V_{CE(sat)2}$ | $I_C$=100mA $I_B$=5.0mA | | 0.2 | 0.6 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)1}$ | $I_C$=10mA $I_B$=0.5mA | | 0.7 | | V |
| | $V_{BE(sat)2}$ | $I_C$=100mA $I_B$=5.0mA | | 0.9 | | V |
| Base-Emitter Voltage | $V_{BE(1)}$ | $V_{CE}$=5.0V $I_C$=2.0mA | 0.58 | | 0.7 | V |
| | $V_{BE(2)}$ | $V_{CE}$=5.0V $I_C$=10mA | | | 0.75 | V |
| Transition Frequency | $f_T$ | $V_{CE}$=5.0V $I_E$=10mA f=100MHz | | 300 | | MHz |
| Collector Output Capacitance | $C_{ob}$ | $V_{CB}$=10V $I_E$=0 f=1.0MHz | | 2.5 | 4.5 | pF |
| Noise Figure | NF | $V_{CE}$=6.0V $I_C$=0.1mA<br>$R_g$=10KΩ f=1.0KHz | | 1.0 | 10 | dB |

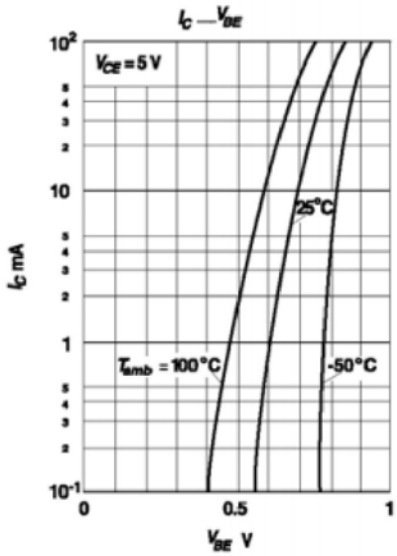
## Thermal Characteristics

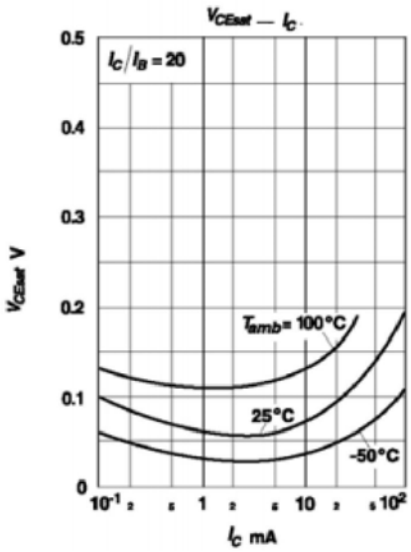
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance from Junction to Ambient | $R_{THJA}$ | 410 | °C/W |

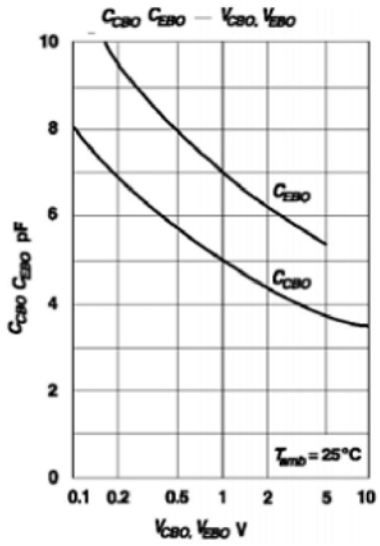
## hFE Classifications and Markings

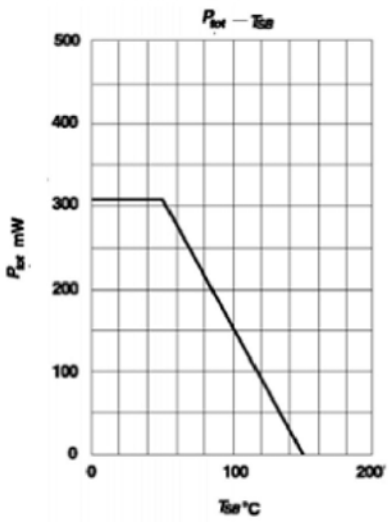
| $h_{FE}$ Classification | BC846A | BC846B |
|---|---|---|
| $h_{FE}$ Range | 110 - 220 | 200 - 450 |
| Marking | H1A | H1B |

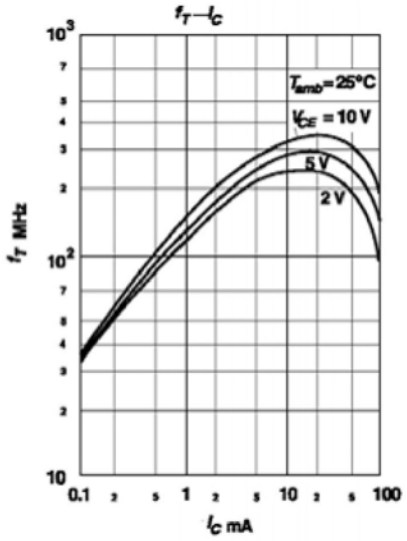
## Ratings and Characteristic Curves

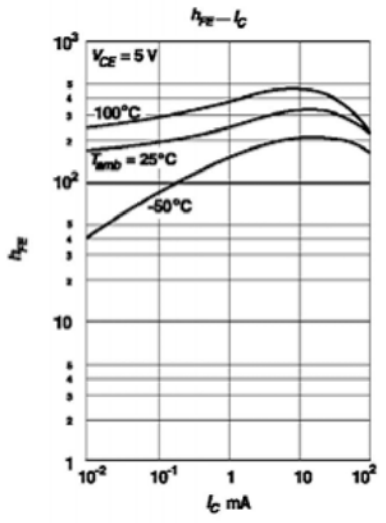


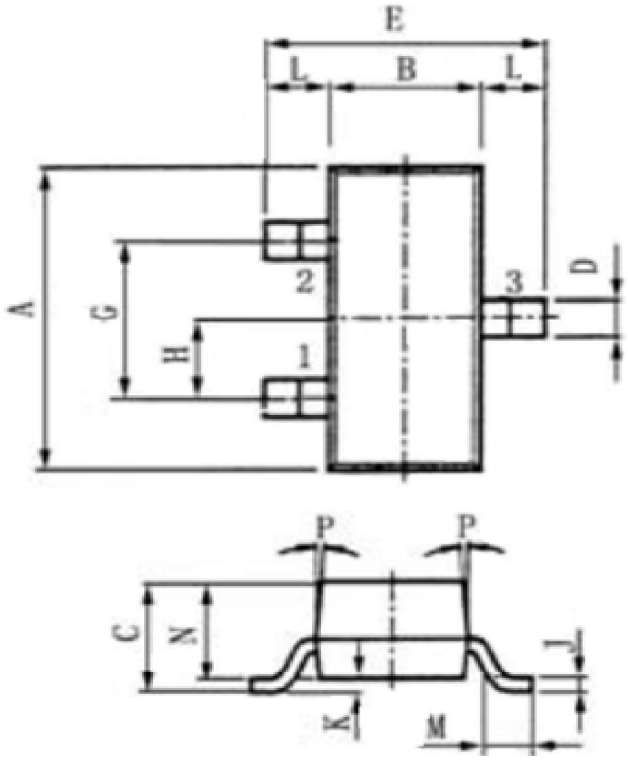



## Package Outline Dimensions

(SOT-23 in millimeters)




| | |
|---|---|
| A | 2.9±0.2 |
| B | 1.30+0.20/-0.15 |
| C | 1.30MAX |
| D | 0.40+0.15/-0.05 |
| E | 2.40+0.30/-0.20 |
| G | 1.9±0.2 |
| H | 0.95±0.1 |
| J | 0.10+0.10/-0.05 |
| K | 0.00-0.10 |
| L | 0.55±0.1 |
| M | 0.2MIN |
| N | 1.00+0.20/-0.10 |
| P | 7" |