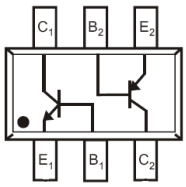
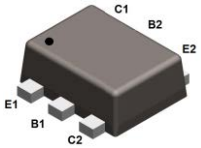
# BC847BVPN

## Dual Bipolar Transistor(NPN+PNP)

### Features

- Epitaxial planar die construction
- Two internal isolated NPN/PNP transistors in one package
- Ultra-small surface mount package




SOT-563

### Mechanical Data

- Case: SOT-563
- Molding compo und: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208

### Maximum Ratings (@ $T_A$ = 25℃ unless otherwise specified)

| Parameter | Symbol | NPN | PNP | Unit |
|---|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 50 | -50 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 45 | -45 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 6 | -5 | V |
| Collector Current (Continuous) | $I_C$ | 100 | -100 | mA |
| Collector Current (Pulse) | $I_{CM}$ | 200 | -200 | mA |

### Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation *1 | $P_D$ | 357 | mW |
| Thermal Resistance (Junction-to-Ambient) *1 | $R_{\theta JA}$ | 350 | °C/W |
| Operating Junction Temperature | $T_J$ | -55 ~ +150 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | ℃ |

Note 1: The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper

# BC847BVPN

## Dual Bipolar Transistor(NPN+PNP)

### Electrical Characteristics of NPN Transistor (@ $T_A$ = 25℃ unless otherwise specified)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ = 10μA, $I_E$ = 0 | 50 | - | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = 10mA, $I_B$ = 0 | 45 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = 1μA, $I_C$ = 0 | 6 | - | - | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$ = 30V, $I_E$ = 0 | - | - | 15 | nA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = 5V, $I_C$ = 2mA | 200 | 290 | 450 | - |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = 10mA, $I_B$ = 0.5mA | - | 0.09 | 0.25 | V |
| | | $I_C$ = 100mA, $I_B$ = 5mA | - | 0.20 | 0.60 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 10mA, $I_B$ = 0.5mA | - | 0.70 | - | V |
| | | $I_C$ = 100mA, $I_B$ = 5mA | - | 0.90 | - | V |
| Base-Emitter Voltage | $V_{BE(ON)}$ | $V_{CE}$ = 5V, $I_C$= 2mA | 0.58 | 0.66 | 0.70 | V |
| | | $V_{CE}$ = 5V, $I_C$= 10mA | - | - | 0.72 | V |
| Transition Frequency | $f_T$ | $V_{CE}$ = 5V, $I_C$= 10mA<br>f = 100MHz | 100 | - | - | MHz |
| Output Capacitance | $C_{OBO}$ | $V_{CB}$ = 10V, f = 1.0MHz | - | 3.5 | 6.0 | pF |
| Noise Figure | $N_F$ | $V_{CE}$ = 5V, f = 1.0MHz<br>$I_C$ = 200mA, $R_G$ = 2kΩ | - | 2.0 | 10 | dB |

### Electrical Characteristics of PNP Transistor (@ $T_A$ = 25℃ unless otherwise specified)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ = -10μA, $I_E$ = 0 | -50 | - | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = -10mA, $I_B$ = 0 | -45 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = -1μA, $I_C$ = 0 | -6 | - | - | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$ = -30V, $I_E$ = 0 | - | - | -15 | nA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = -5V, $I_C$ = -2mA | 200 | 290 | 450 | - |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = -10mA, $I_B$ = -0.5mA | - | -0.075 | -0.3 | V |
| | | $I_C$ = -100mA, $I_B$ = -5mA | - | -0.25 | -0.65 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = -10mA, $I_B$ = -0.5mA | - | -0.70 | - | V |
| | | $I_C$ = -100mA, $I_B$ = -5mA | - | -0.85 | -0.95 | V |
| Base-Emitter Voltage | $V_{BE(ON)}$ | $V_{CE}$ = -5V, $I_C$= -2mA | -0.6 | -0.65 | -0.75 | V |
| | | $V_{CE}$ = -5V, $I_C$= -10mA | - | - | -0.82 | V |
| Transition Frequency | $f_T$ | $V_{CE}$ = -5V, $I_C$= -10mA<br>f = 100MHz | 100 | - | - | MHz |
| Output Capacitance | $C_{OBO}$ | $V_{CB}$ = -10V, f = 1.0MHz | - | 3 | 4.5 | pF |
| Noise Figure | $N_F$ | $V_{CE}$ = -5V, f = 1.0MHz<br>$I_C$ = -200mA, $R_G$ = -2kΩ | - | - | 10 | dB |

## Ratings and Characteristic Curves-NPN (@ $T_A$ = 25℃ unless otherwise specified)

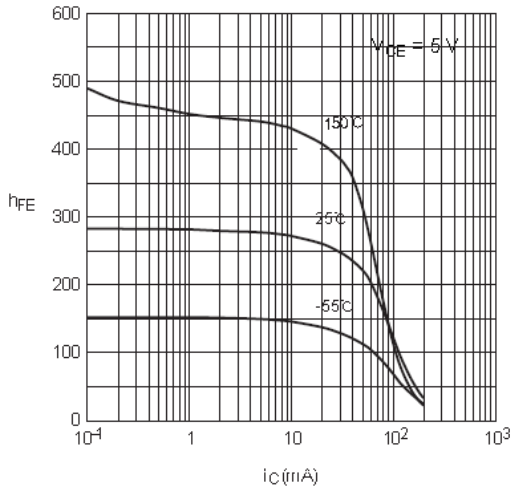



Fig 1 DC current gain as a function of collector current

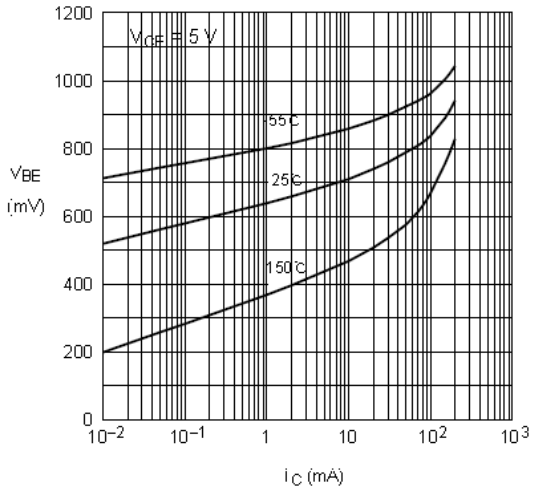



Fig 2 Base-emitter voltage as a function of collector current

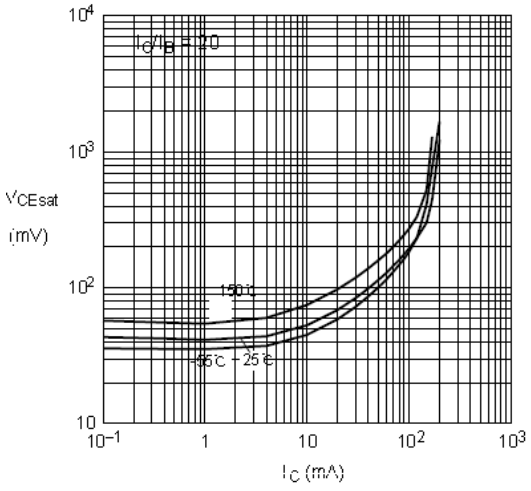



Fig 3 Collector-emitter saturation voltage as a function of collector current

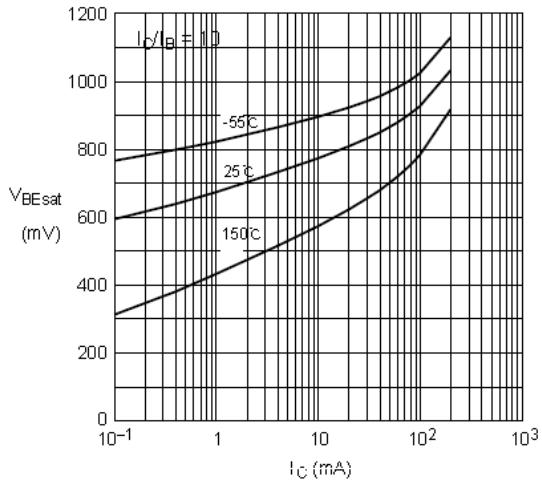



Fig 4 Base-emitter saturation voltage as a function of collector current

## Ratings and Characteristic Curves-PNP (@ $T_A$ = 25℃ unless otherwise specified)

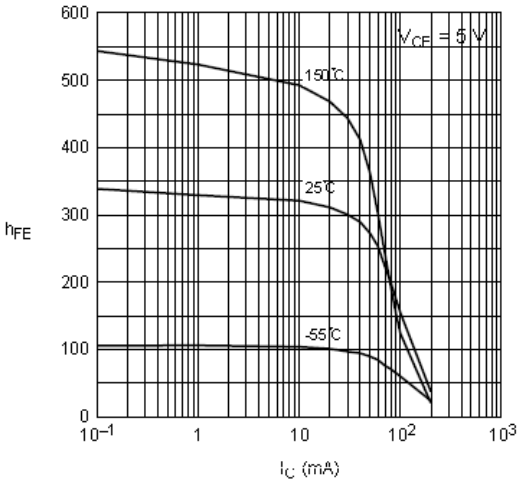



Fig 1 DC current gain as a function of collector current

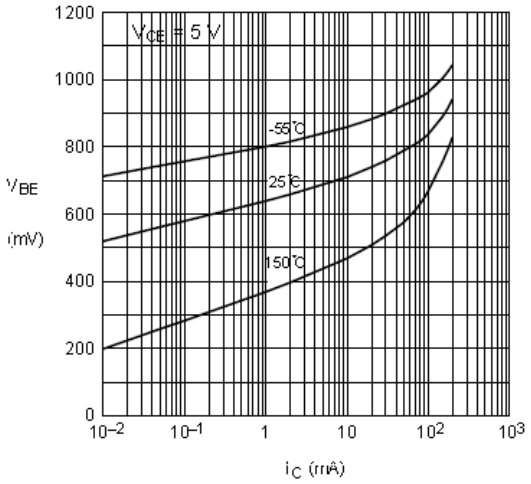



Fig 2 Base-emitter voltage as a function of collector current

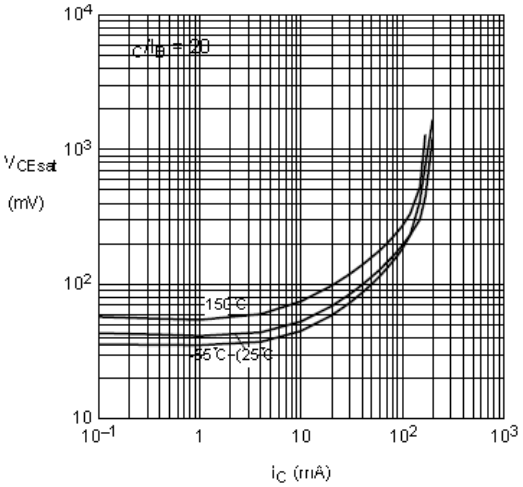



Fig 3 Collector-emitter saturation voltage as a function of collector current

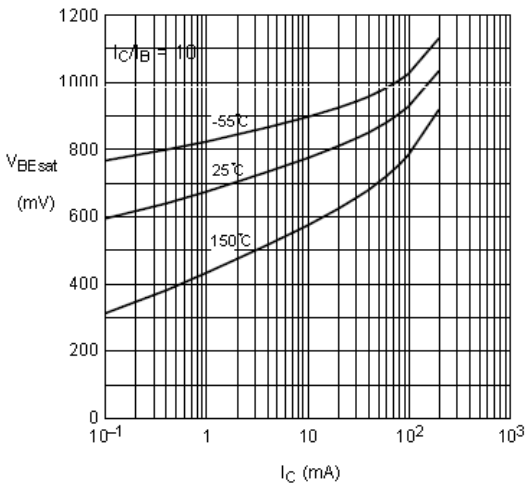
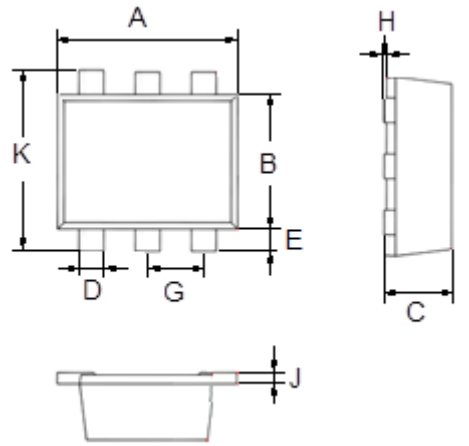



Fig 4 Base-emitter saturation voltage as a function of collector current

# BC847BVPN

**Dual Bipolar Transistor(NPN+PNP)**

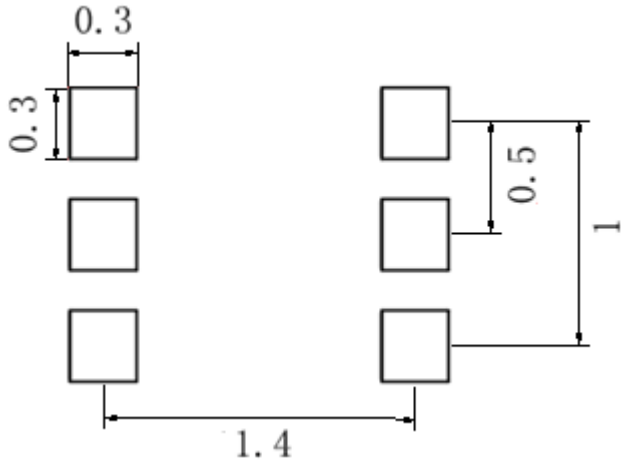
## Package Outline Dimensions (Unit: mm)




| SOT-563 | | |
|---|---|---|
| **Dimension** | **Min.** | |
| A | 1.500 | 1.700 |
| B | 1.100 | 1.300 |
| C | 0.525 | 0.600 |
| D | 0.170 | 0.270 |
| E | 0.100 | 0.300 |
| G | 0.450 | 0.550 |
| H | 0.000 | 0.050 |
| J | 0.090 | 0.160 |
| K | 1.500 | 1.700 |

## Package Outline Dimensions (Unit: mm)

### SOT-563




## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| BC847BVPN | SOT-563 | 3000 pcs / Tape & Reel | 7P |