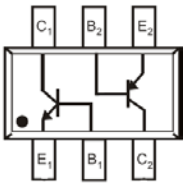
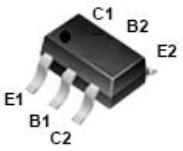
# BC847PN

**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-363**

## Mechanical Data

- Case: SOT-363
- Molding compound: 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 | $P_D$ | 200 | mW |
| Thermal Resistance (Junction-to-Ambient) | $R_{\theta JA}$ | 625 | °C/W |
| Operating Junction Temperature | $T_J$ | -55 ~ +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

# BC847PN

**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 (@ $T_A$ = 25℃ unless otherwise specified)

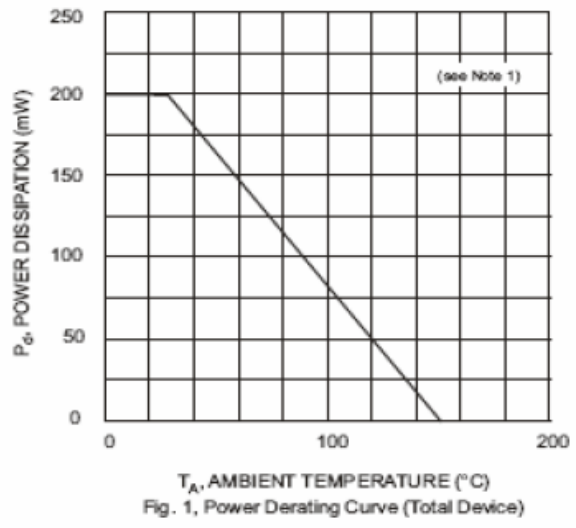


Fig. 1, Power Derating Curve (Total Device)

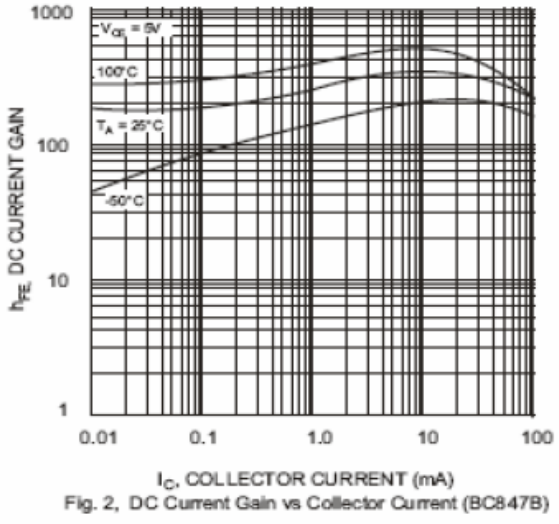


Fig. 2, DC Current Gain vs Collector Current (BC847B)

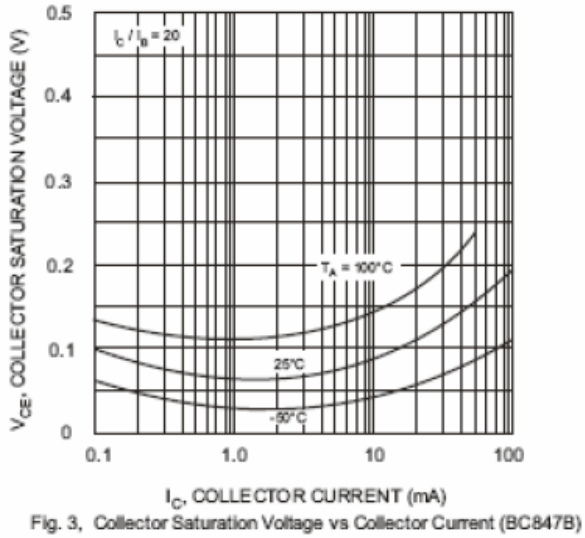


Fig. 3, Collector Saturation Voltage vs Collector Current (BC847B)

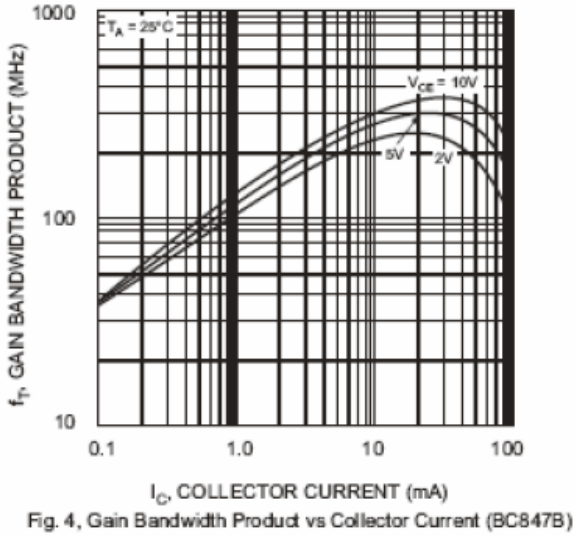


Fig. 4, Gain Bandwidth Product vs Collector Current (BC847B)

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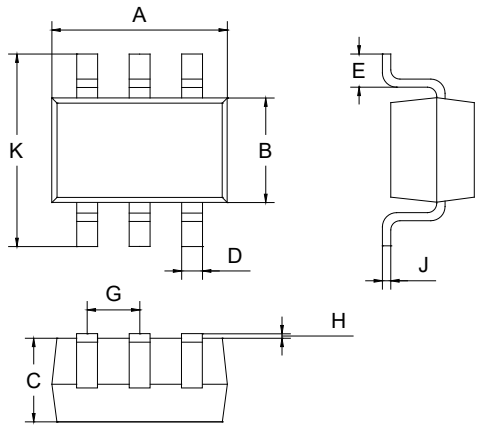
**Dual Bipolar Transistor(NPN+PNP)**

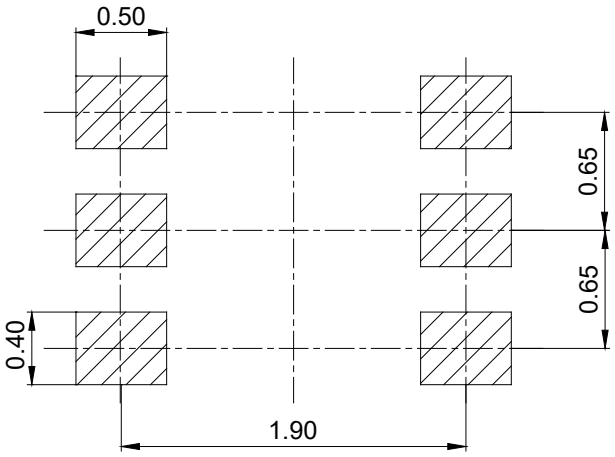
## Package Outline Dimensions (Unit: mm)




| SOT-363 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 2.00 | 2.20 |
| B | 1.15 | 1.35 |
| C | 0.85 | 1.05 |
| D | 0.15 | 0.35 |
| E | 0.25 | 0.40 |
| G | 0.60 | 0.70 |
| H | 0.02 | 0.10 |
| J | 0.05 | 0.15 |
| K | 2.20 | 2.40 |

## Package Outline Dimensions (Unit: mm)

### SOT-363




## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| BC847PN | SOT-363 | 3000pcs / Tape & Reel | 7P |