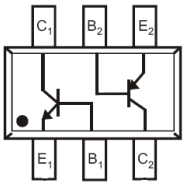
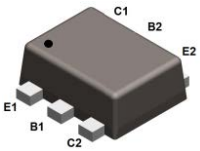
# BC846BPNV

## 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 | $V_{CBO}$ | 80 | -80 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 65 | -65 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 6 | -6 | V |
| Collector Current (Continuous) | $I_C$ | 100 | -100 | mA |
| Collector Current (Pulse) | $I_{CM}$ | 200 | -200 | mA |
| Base Current (Pulse) | $I_{BM}$ | 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 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

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

# BC846BPNV

**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 | 80 | - | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = 10mA, $I_B$ = 0 | 65 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = 10μA, $I_C$ = 0 | 6 | - | - | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$ = 50V, $I_E$ = 0 | - | - | 15 | nA |
| Emitter Cut-off Current | $I_{EBO}$ | $V_{EB}$ = 6V, $I_C$ = 0 | - | - | 100 | nA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = 5V, $I_C$ = 2mA | 200 | - | 450 | - |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = 10mA, $I_B$ = 0.5mA | - | - | 0.10 | V |
| | | $I_C$ = 100mA, $I_B$ = 5mA | - | - | 0.30 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 10mA, $I_B$ = 0.5mA | - | - | 0.85 | V |
| | | $I_C$ = 100mA, $I_B$ = 5mA | - | 1 | - | V |
| Base-Emitter Voltage | $V_{BE(ON)}$ | $V_{CE}$ = 5V, $I_C$= 2mA | 0.58 | - | 0.70 | V |
| | | $V_{CE}$ = 5V, $I_C$= 10mA | - | - | 0.77 | 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 | - | 1.9 | - | pF |

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

| Parameter | Symbol | Test Condition | | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ = -10μA, $I_E$ = 0 | -80 | - | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = -10mA, $I_B$ = 0 | -65 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = -10μA, $I_C$ = 0 | -6 | - | - | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$ = -50V, $I_E$ = 0 | - | - | -15 | nA |
| Emitter Cut-off Current | $I_{EBO}$ | $V_{EB}$ = -6V, $I_C$ = 0 | - | - | -100 | nA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = -5V, $I_C$ = -2mA | 200 | - | 450 | - |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = -10mA, $I_B$ = -0.5mA | - | - | -0.10 | V |
| | | $I_C$ = -100mA, $I_B$ = -5mA | - | - | -0.30 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = -10mA, $I_B$ = -0.5mA | - | - | -0.85 | V |
| | | $I_C$ = -100mA, $I_B$ = -5mA | - | -0.9 | - | V |
| Base-Emitter Voltage | $V_{BE(ON)}$ | $V_{CE}$ = -5V, $I_C$= -2mA | -0.6 | - | -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 | - | 2.3 | - | pF |

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

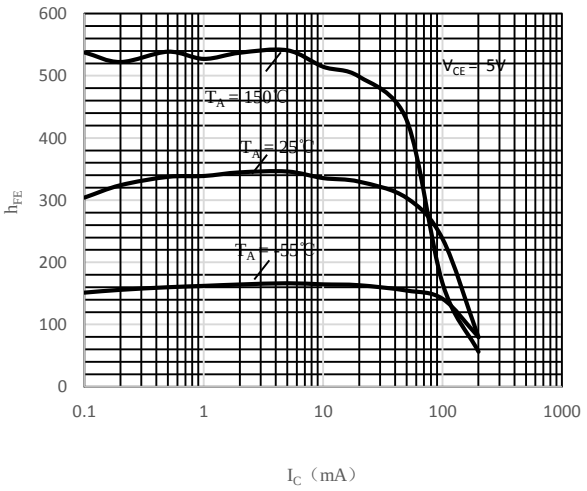



Fig 1 $h_{FE}$ vs. $I_C$

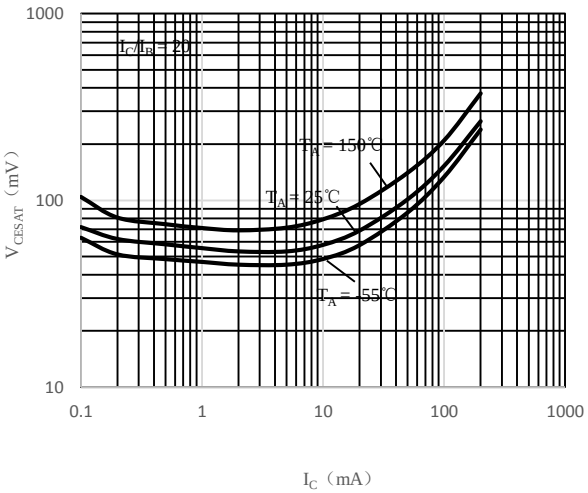



Fig 2 $V_{CE(sat)}$ vs. $I_C$

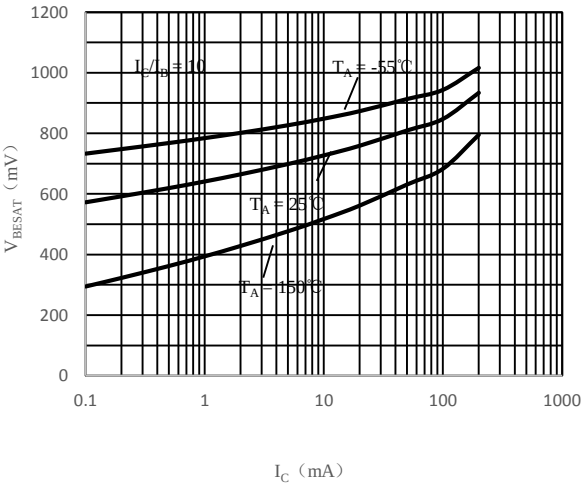



Fig 3 $V_{BE(sat)}$ vs. $I_C$

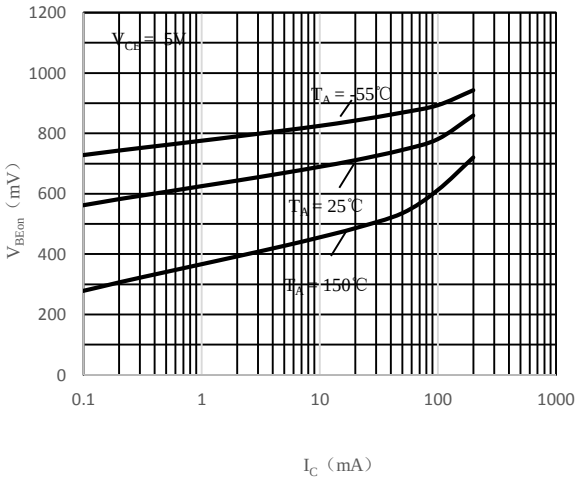



Fig 4 $V_{BE(ON)}$ vs. $I_C$

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

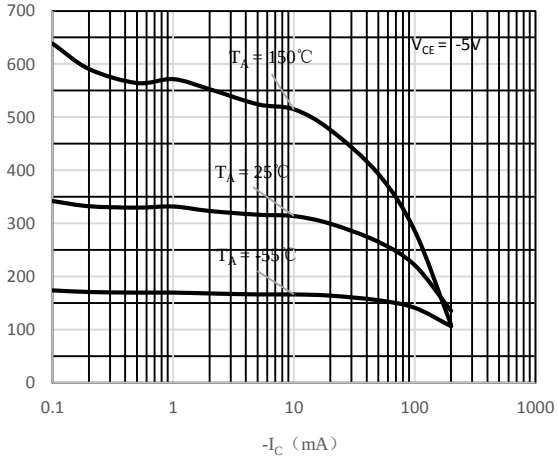



**Fig 1 $h_{FE}$ vs. $I_C$**

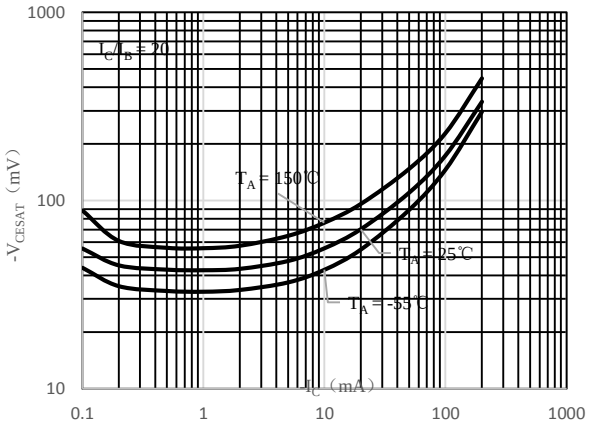



**Fig 2 $V_{CE(sat)}$ vs. $I_C$**

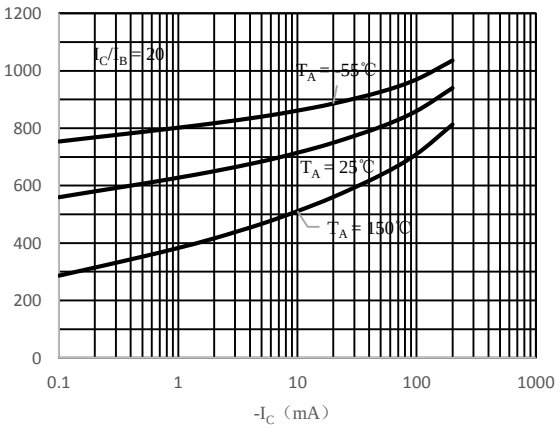



**Fig 3 $V_{BE(sat)}$ vs. $I_C$**

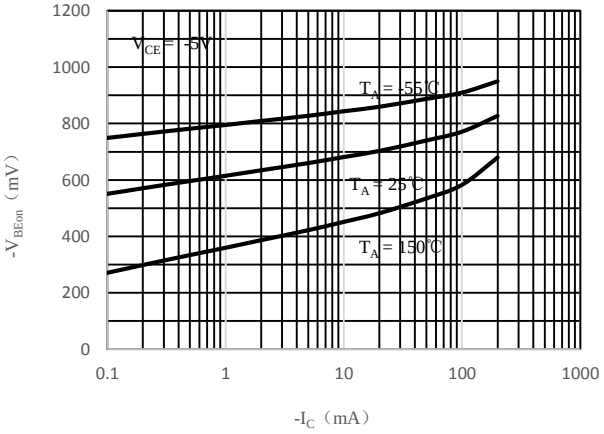



**Fig 4 $V_{BE(ON)}$ vs. $I_C$**

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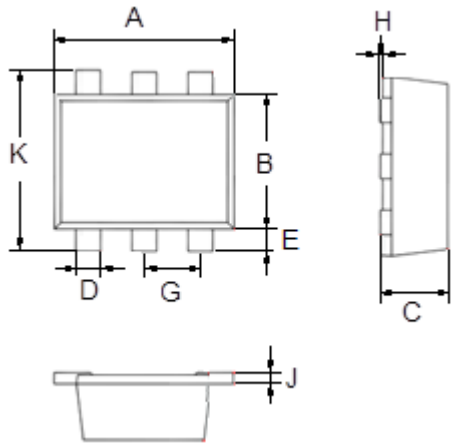
**Dual Bipolar Transistor(NPN+PNP)**

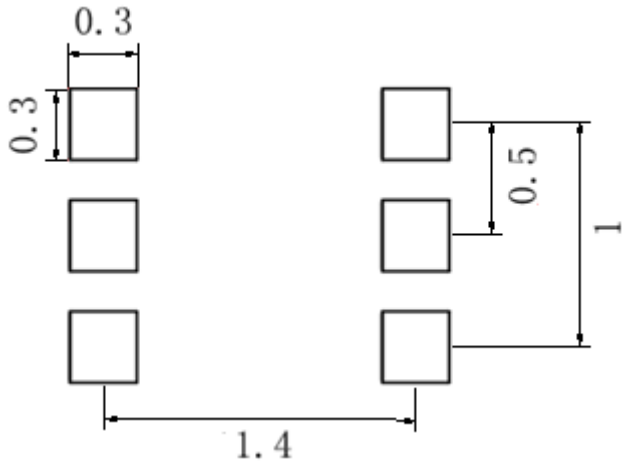
## Package Outline Dimensions (Unit: mm)




| SOT-563 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| 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 |
|---|---|---|---|
| BC846BPNV | SOT-563 | 3000 pcs / Tape & Reel | PJ |