

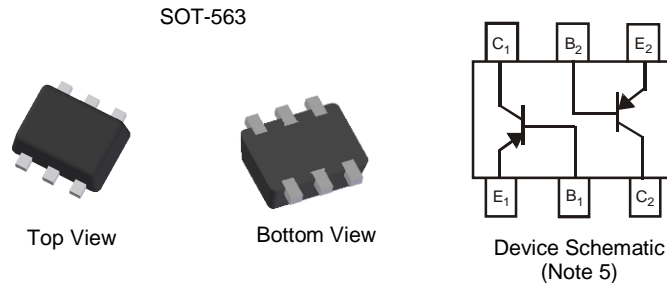
## PNP DUAL SMALL SIGNAL SURFACE MOUNT TRANSISTOR

### Features

- Epitaxial Die Construction
- Complementary PNP Type Available (BC847BV)
- Ultra-Small Surface Mount Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

### Mechanical Data

- Case: SOT-563
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208
- Weight: 0.003 grams (Approximate)

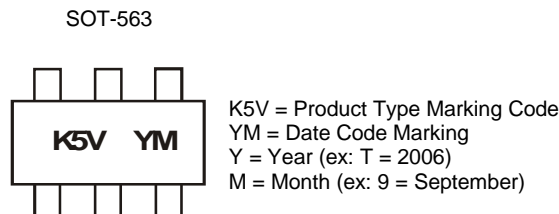


### Ordering Information (Note 4)

| Part Number | Case    | Packaging         |
|-------------|---------|-------------------|
| BC857BV-7   | SOT-563 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.
  5. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).

### Marking Information



#### Date Code Key

| Year  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | P    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    | A    | B    | C    |
| Month | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |      |
| Code  | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | O    | N    | D    |      |

**Maximum Ratings** (@T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic            | Symbol           | Value | Unit |
|---------------------------|------------------|-------|------|
| Collector-Base Voltage    | V <sub>CB0</sub> | -50   | V    |
| Collector-Emitter Voltage | V <sub>CEO</sub> | -45   | V    |
| Emitter-Base Voltage      | V <sub>EBO</sub> | -5.0  | V    |
| Collector Current         | I <sub>C</sub>   | -100  | mA   |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 6)                       | P <sub>D</sub>                    | 150         | mW   |
| Thermal Resistance, Junction to Ambient (Note 6) | R <sub>θJA</sub>                  | 833         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic                                | Symbol               | Min       | Typ          | Max          | Unit     | Test Condition  |
|---|----------------------|-----------|--------------|--------------|----------|---|
| Collector-Base Breakdown Voltage (Note 7)     | V <sub>(BR)CBO</sub> | -50       | —            | —            | V        | I <sub>C</sub> = 10μA, I <sub>B</sub> = 0   |
| Collector-Emitter Breakdown Voltage (Note 7)  | V <sub>(BR)CEO</sub> | -45       | —            | —            | V        | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0   |
| Emitter-Base Breakdown Voltage (Note 7)       | V <sub>(BR)EBO</sub> | -5        | —            | —            | V        | I <sub>E</sub> = 1μA, I <sub>C</sub> = 0  |
| DC Current Gain (Note 7)                      | h <sub>FE</sub>      | 220       | 290          | 475          | —        | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA  |
| Collector-Emitter Saturation Voltage (Note 7) | V <sub>CE(SAT)</sub> | —         | —            | -100<br>-400 | mV       | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA<br>I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA   |
| Base-Emitter Saturation Voltage (Note 7)      | V <sub>BE(SAT)</sub> | —         | -700<br>-900 | —            | mV       | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA<br>I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA   |
| Base-Emitter Voltage (Note 7)                 | V <sub>BE(ON)</sub>  | -600<br>— | —            | -750<br>-820 | mV       | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA<br>V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA   |
| Collector Cut-Off Current (Note 7)            | I <sub>CBO</sub>     | —         | —            | -15<br>-4.0  | nA<br>μA | V <sub>CB</sub> = -30V<br>V <sub>CB</sub> = -30V, T <sub>A</sub> = +150°C                             |
| Gain Bandwidth Product                        | f <sub>T</sub>       | 100       | —            | —            | MHz      | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA, f = 100MHz   |
| Output Capacitance                            | C <sub>OB</sub>      | —         | —            | 4.5          | pF       | V <sub>CB</sub> = -10V, f = 1.0MHz  |
| Noise Figure                                  | NF                   | —         | —            | 10           | dB       | I <sub>C</sub> = -0.2mA, V <sub>CE</sub> = -5.0Vdc,<br>R <sub>S</sub> = 2.0KΩ, f = 1.0KHz, BW = 200Hz |

- Notes: 6. Device mounted on FR-4 PCB, 1-inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.  
7. Short duration pulse test used to minimize self-heating effect.

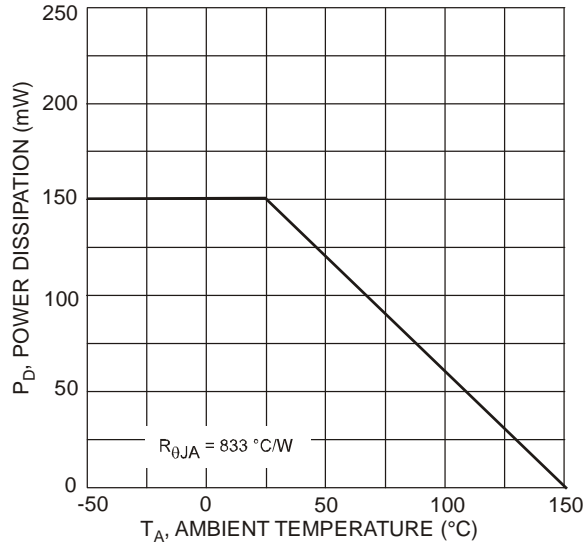


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 2)

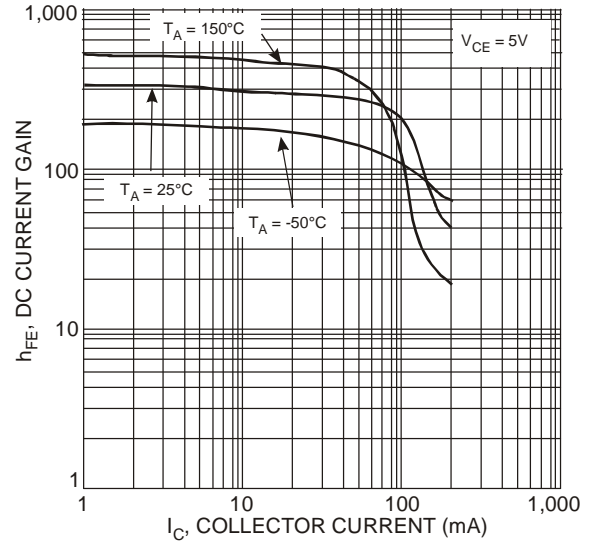


Fig. 2 Typical DC Current Gain vs. Collector Current

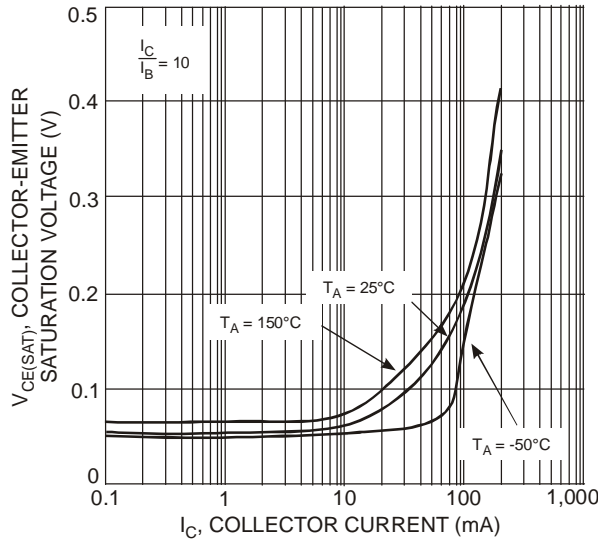


Fig. 3 Collector-Emitter Saturation Voltage vs. Collector Current

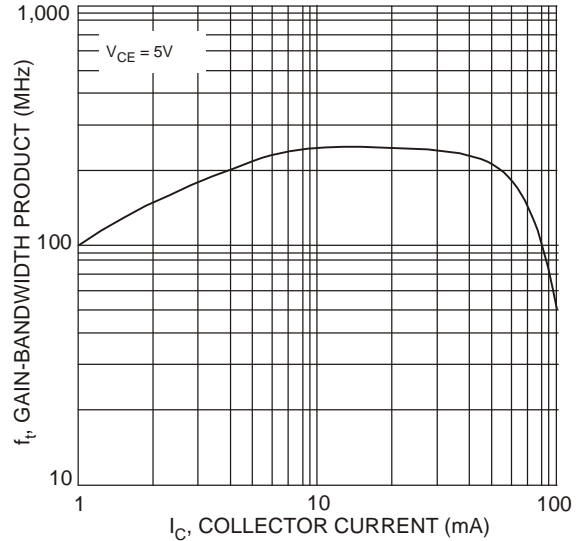
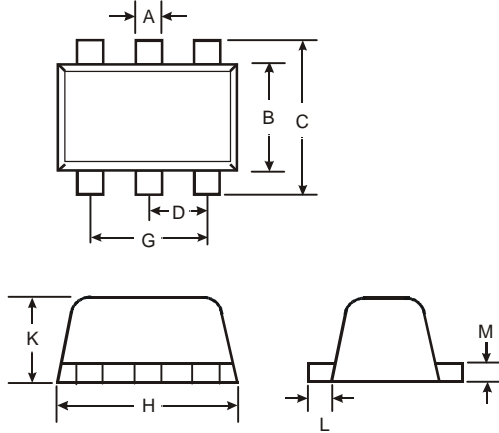


Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

### Package Outline Dimensions

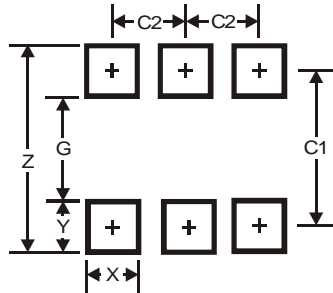
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT-563              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.20 |
| B                    | 1.10 | 1.25 | 1.20 |
| C                    | 1.55 | 1.70 | 1.60 |
| D                    | -    | -    | 0.50 |
| G                    | 0.90 | 1.10 | 1.00 |
| H                    | 1.50 | 1.70 | 1.60 |
| K                    | 0.55 | 0.60 | 0.60 |
| L                    | 0.10 | 0.30 | 0.20 |
| M                    | 0.10 | 0.18 | 0.11 |
| All Dimensions in mm |      |      |      |

### Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.2           |
| G          | 1.2           |
| X          | 0.375         |
| Y          | 0.5           |
| C1         | 1.7           |
| C2         | 0.5           |

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