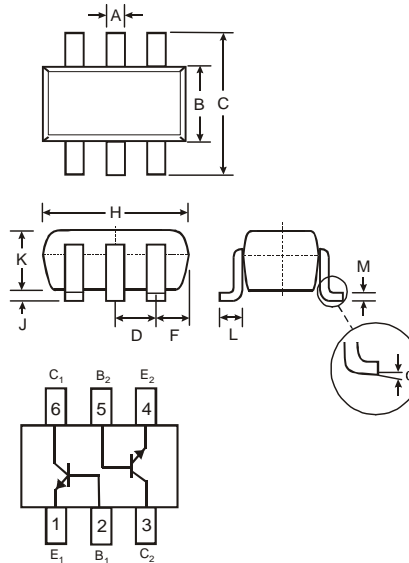


**Features**

- Ideally Suited for Automatic Insertion
- For Switching and AF Amplifier Applications
- Complementary PNP Type Available (BC856AS)
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 4 and 5)**

**Mechanical Data**

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.006 grams (approximate)



| SOT-363              |              |      |
|----------------------|--------------|------|
| Dim                  | Min          | Max  |
| A                    | 0.10         | 0.30 |
| B                    | 1.15         | 1.35 |
| C                    | 2.00         | 2.20 |
| D                    | 0.65 Nominal |      |
| F                    | 0.30         | 0.40 |
| H                    | 1.80         | 2.20 |
| J                    | —            | 0.10 |
| K                    | 0.90         | 1.00 |
| L                    | 0.25         | 0.40 |
| M                    | 0.10         | 0.25 |
| $\alpha$             | 0°           | 8°   |
| All Dimensions in mm |              |      |

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

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Base Voltage                           | V <sub>CB0</sub>                  | 80          | V    |
| Collector-Emitter Voltage                        | V <sub>CEO</sub>                  | 65          | V    |
| Emitter-Base Voltage                             | V <sub>EBO</sub>                  | 6.0         | V    |
| Collector Current                                | I <sub>C</sub>                    | 100         | mA   |
| Peak Collector Current                           | I <sub>CM</sub>                   | 200         | mA   |
| Peak Emitter Current                             | I <sub>EM</sub>                   | 200         | mA   |
| Power Dissipation (Note 2)                       | P <sub>d</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient (Note 2) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>stg</sub> | -65 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 3)     | V <sub>(BR)CBO</sub>                                     | 80          | —           | —               | V              | I <sub>C</sub> = 10μA, I <sub>B</sub> = 0   |
| Collector-Emitter Breakdown Voltage (Note 3)  | V <sub>(BR)CEO</sub>                                     | 65          | —           | —               | V              | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0   |
| Emitter-Base Breakdown Voltage (Note 3)       | V <sub>(BR)EBO</sub>                                     | 6           | —           | —               | V              | I <sub>E</sub> = 1μA, I <sub>C</sub> = 0  |
| DC Current Gain (Note 3)                      | h <sub>FE</sub>  | 110         | —           | 220             | —              | V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 2.0mA  |
| Collector-Emitter Saturation Voltage (Note 3) | V <sub>CE(SAT)</sub>                                     | —           | 90<br>200   | 250<br>600      | 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 3)      | 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 3)                 | V <sub>BE(ON)</sub>                                      | 580<br>—    | 660<br>—    | 700<br>770      | 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-Cutoff Current (Note 3)             | I <sub>CES</sub><br>I <sub>CB0</sub><br>I <sub>CBO</sub> | —<br>—<br>— | —<br>—<br>— | 15<br>15<br>5.0 | nA<br>nA<br>μA | V <sub>CE</sub> = 80V<br>V <sub>CB</sub> = 40V<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,<br>f = 100MHz                                    |
| Collector-Base Capacitance                    | C <sub>CB</sub>  | —           | 2.0         | —               | pF             | V <sub>CB</sub> = 10V, f = 1.0MHz   |

- Notes:
1. No purposefully added lead.
  2. Device mounted on FR-4 PCB, pad layout as shown on page 3 or on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  3. Short duration pulse test used to minimize self-heating effect.
  4. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  5. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

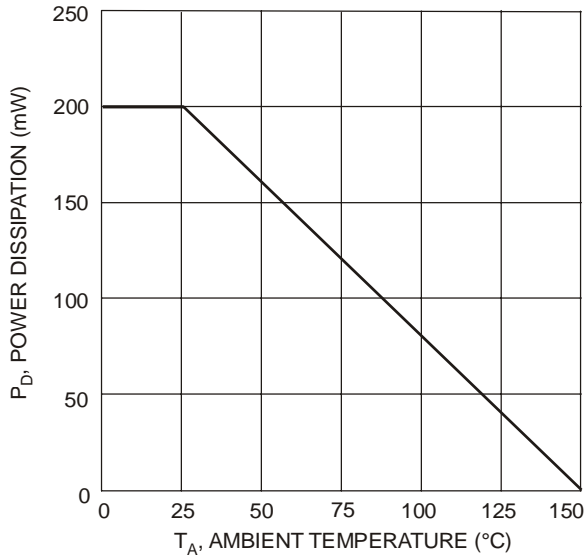


Fig. 1 Power Derating Curve (Note 2)

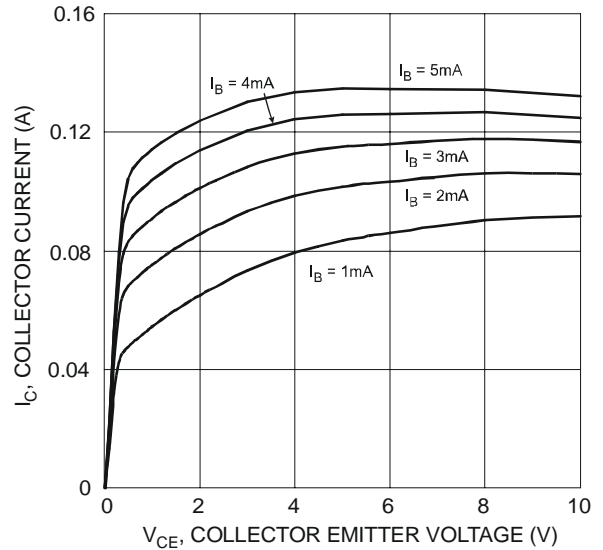


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

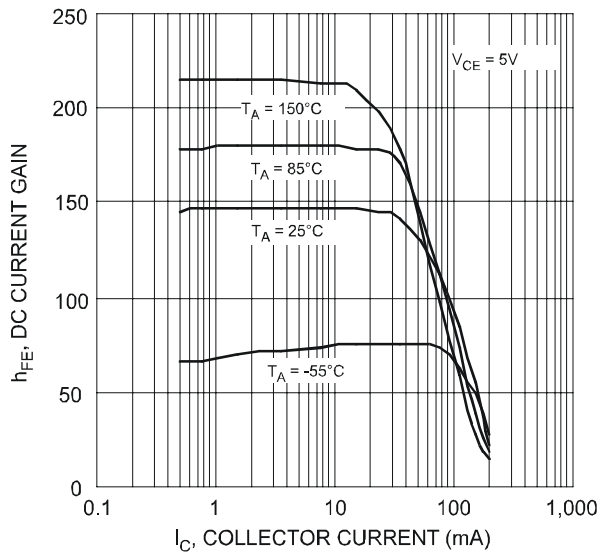


Fig. 3 Typical DC Current Gain vs. Collector Current

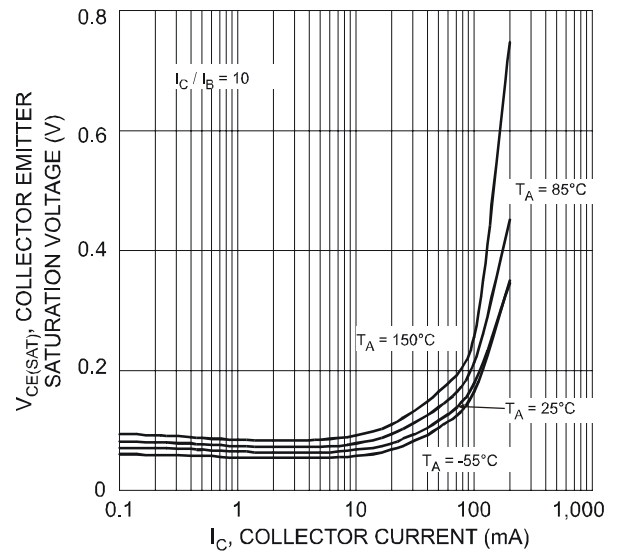


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

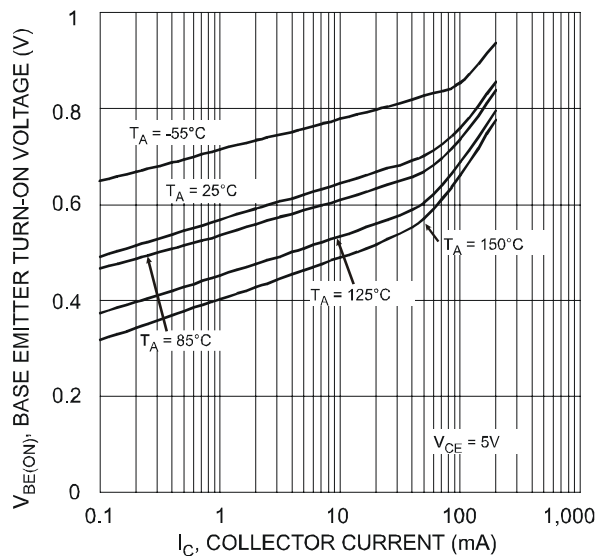


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

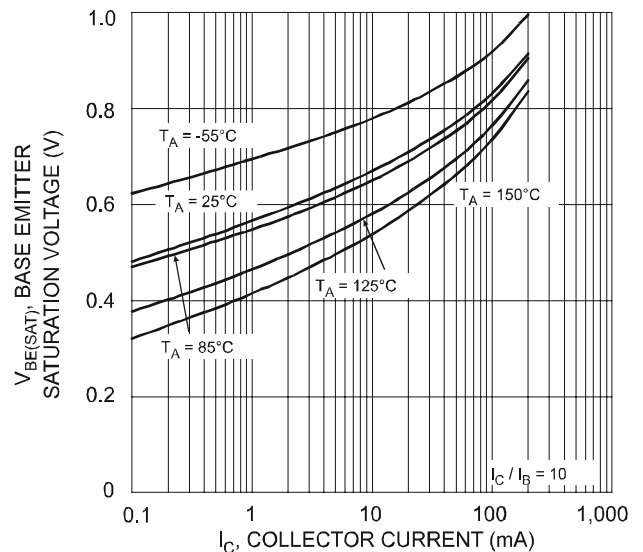


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

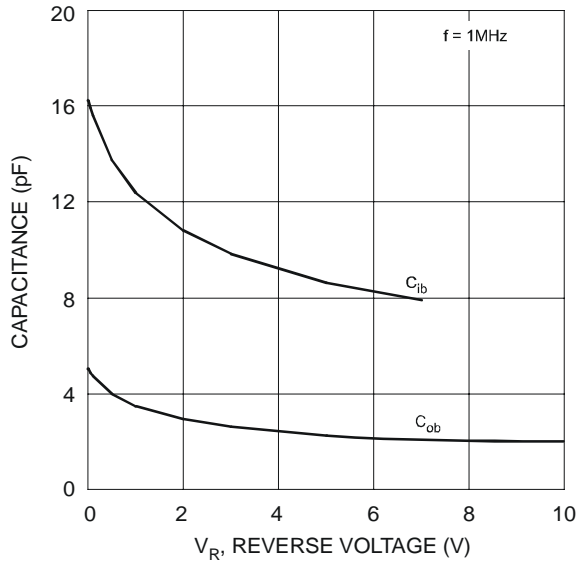


Fig. 7 Typical Capacitance Characteristics

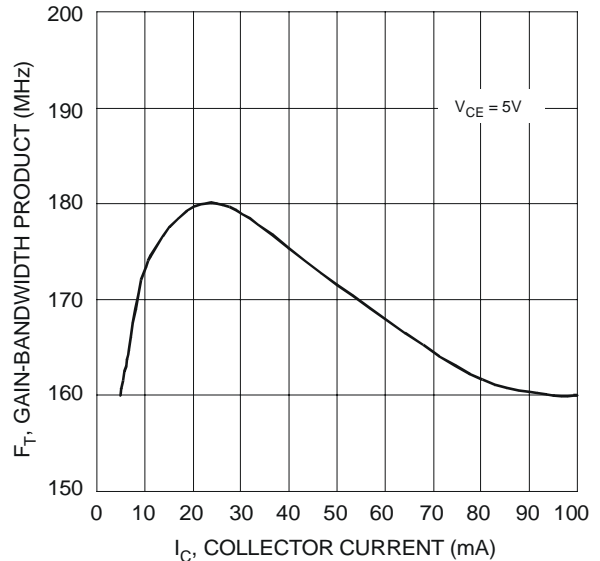


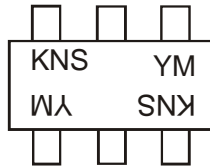
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 6)

| Device    | Packaging | Shipping         |
|-----------|-----------|------------------|
| BC846AS-7 | SOT-363   | 3000/Tape & Reel |

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



KNS = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: U = 2007  
 M = Month ex: 9 = September

### Data Code Key

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|
| Code | U    | V    | W    | X    | Y    | Z    |

| 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   |

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