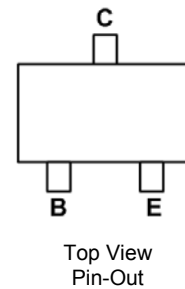
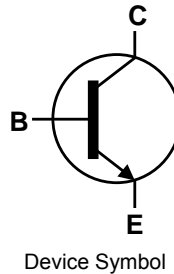


## Features

- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- Complementary PNP Types: BC807-xxW
- For switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOT23
- Case Material: molded plastic, "Green" molding compound  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight 0.006 grams (approximate)

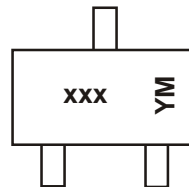


## Ordering Information (Note 4)

| Product     | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|---------|--------------------|-----------------|-------------------|
| BC817-16W-7 | K6A     | 7                  | 8               | 3,000             |
| BC817-25W-7 | K6B     | 7                  | 8               | 3,000             |
| BC817-40W-7 | K6C     | 7                  | 8               | 3,000             |

- 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>.

## Marking Information



xxx = Product Type Marking Code  
(Please see Ordering Information)  
YM = Date Code Marking  
Y or  $\bar{Y}$  = Year (ex: A = 2013)  
M or  $\bar{M}$  = Month (ex: 9 = September)

### Date Code Key

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|
| Code | X    | Y    | Z    | A    | B    | C    | D    | E    |

| 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   |

**Absolute 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     | V    |
| Continuous Collector Current | I <sub>C</sub>   | 500   | mA   |
| Peak Collector Current       | I <sub>CM</sub>  | 1.0   | A    |
| Peak Base Current            | I <sub>BM</sub>  | 200   | mA   |

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

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                       | P <sub>D</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**ESD Ratings** (Note 6)

| Characteristic                             | Symbol  | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V    | 3A          |
| Electrostatic Discharge - Machine Model    | ESD MM  | 400   | V    | C           |

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

| Characteristic                                | Symbol               | Min       | Typ | Max        | Unit     | Test Condition  |  |
|---|----------------------|-----------|-----|------------|----------|---|--|
| Collector-Emitter Breakdown Voltage (Note 7)  | V <sub>CEO</sub>     | 45        | —   | —          | V        | I <sub>C</sub> = 10mA   |  |
| Emitter-Base Breakdown Voltage                | V <sub>EBO</sub>     | 5         | —   | —          | V        | I <sub>C</sub> = 100μA  |  |
| Collector-Emitter Cutoff Current              | I <sub>CES</sub>     | —         | —   | 100<br>5.0 | nA<br>μA | V <sub>CE</sub> = 45V<br>V <sub>CE</sub> = 25V, T <sub>J</sub> = +150°C |  |
| Collector-Base Cutoff Current                 | I <sub>CB0</sub>     | —         | —   | 100<br>5.0 | nA<br>μA | V <sub>CE</sub> = 20V<br>V <sub>CE</sub> = 20V, T <sub>J</sub> = +150°C |  |
| Emitter-Base Cutoff Current                   | I <sub>EBO</sub>     | —         | —   | 100        | nA       | V <sub>EB</sub> = 5V  |  |
| DC Current Gain (Note 7)                      | h <sub>FE</sub>      | BC817-16W | 100 | —          | 250      | —   | I <sub>C</sub> = 100mA, V <sub>CE</sub> = 1.0V |
|   |                      | BC817-25W | 160 | —          | 400      |   |  |
|   |                      | BC817-40W | 250 | —          | 600      |   |  |
|   |                      | BC817-16W | 60  | —          | —        |   | I <sub>C</sub> = 300mA, V <sub>CE</sub> = 1.0V |
|   |                      | BC817-25W | 100 | —          | —        |   |  |
|   |                      | BC817-40W | 170 | —          | —        |   |  |
| Collector-Emitter Saturation Voltage (Note 7) | V <sub>CE(SAT)</sub> | —         | —   | 700        | mV       | I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA                           |  |
| Base-Emitter Voltage (Note 7)                 | V <sub>BE</sub>      | —         | —   | 1200       | mV       | I <sub>C</sub> = 300mA, V <sub>CE</sub> = 1.0V                          |  |
| Gain Bandwidth Product                        | f <sub>T</sub>       | 100       | —   | —          | MHz      | V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 10mA,<br>f = 50MHz             |  |
| Collector-Base Capacitance                    | C <sub>CB0</sub>     | —         | —   | 12         | pF       | V <sub>CB</sub> = 10V, f = 1.0MHz                                       |  |

- Notes:
- For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.
  - Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

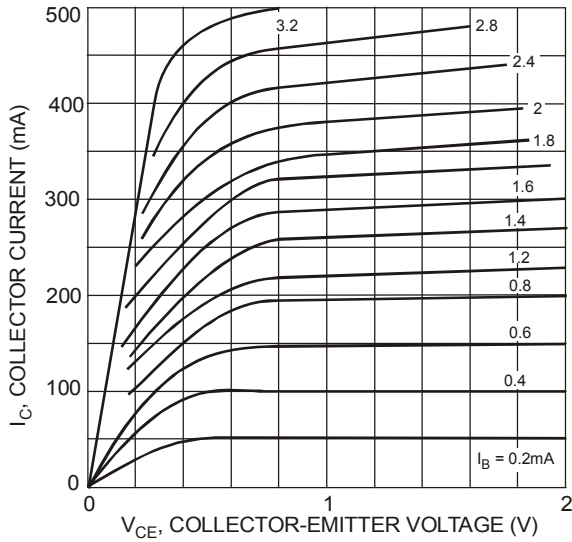


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

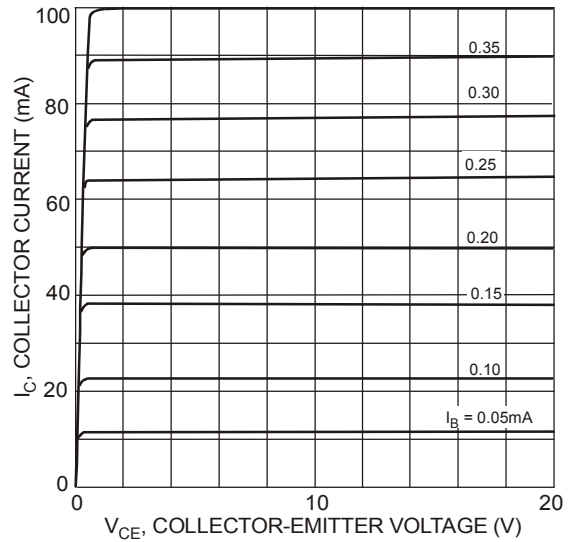


Figure 2 Typical Collector Current vs. Collector-Emitter Voltage

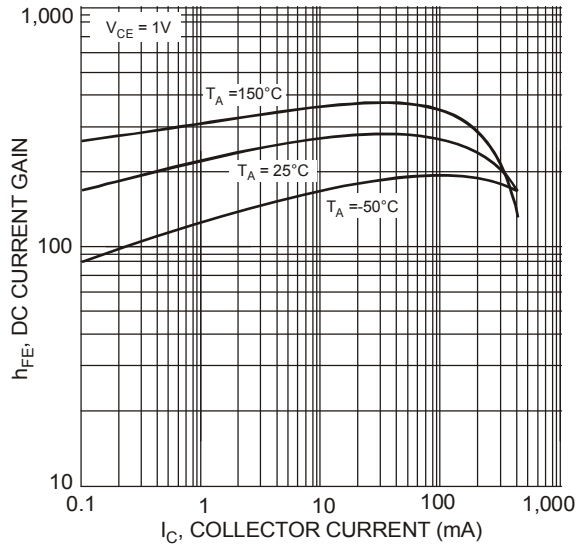


Figure 3 Typical DC Current Gain vs. Collector Current

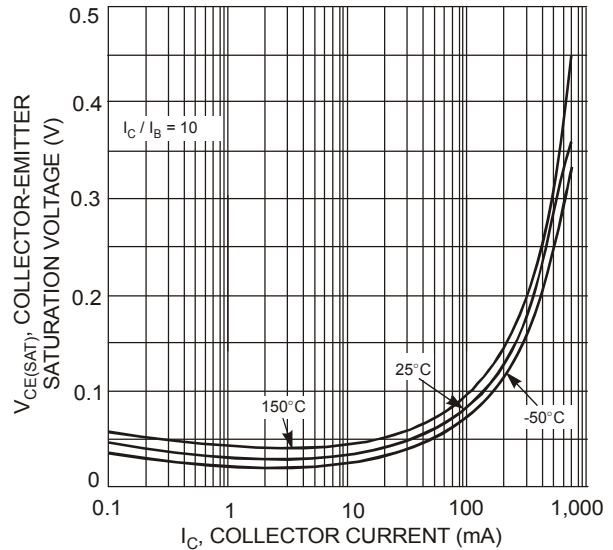


Figure 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

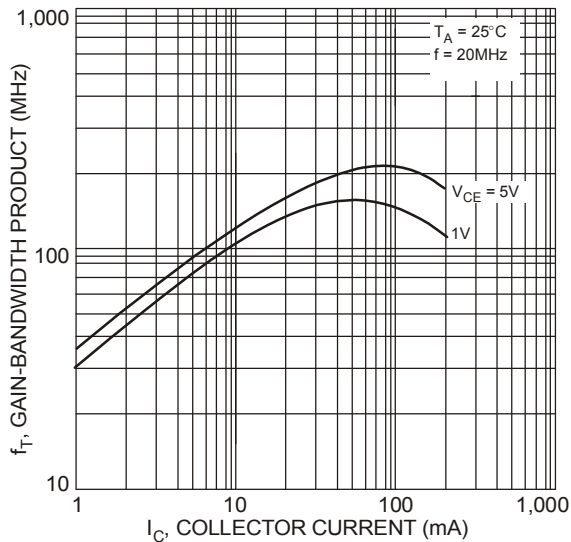
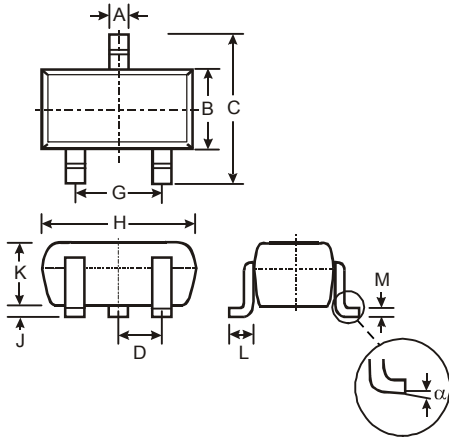


Figure 5 Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

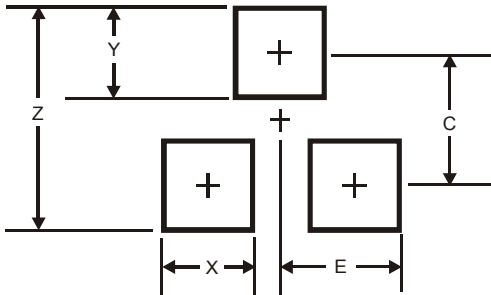
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT323               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.25 | 0.40 | 0.30 |
| B                    | 1.15 | 1.35 | 1.30 |
| C                    | 2.00 | 2.20 | 2.10 |
| D                    | -    | -    | 0.65 |
| G                    | 1.20 | 1.40 | 1.30 |
| H                    | 1.80 | 2.20 | 2.15 |
| J                    | 0.0  | 0.10 | 0.05 |
| K                    | 0.90 | 1.00 | 1.00 |
| L                    | 0.25 | 0.40 | 0.30 |
| M                    | 0.10 | 0.18 | 0.11 |
| α                    | 0°   | 8°   | -    |
| 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          | 2.8           |
| X          | 0.7           |
| Y          | 0.9           |
| C          | 1.9           |
| E          | 1.0           |

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