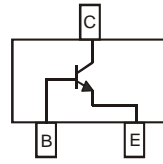


## Features

- Ideally Suited for Automated Insertion
- Epitaxial Planar Die Construction
- For Switching, AF Driver and Amplifier Applications
- Complementary PNP Types Available (BC807)
- **Lead, Halogen and Antimony Free, RoHS Compliant**
- **"Green" Device (Notes 3 and 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**



Top View



Device Schematic

## Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Pin Connections: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic            | Symbol    | Value | Unit |
|---------------------------|-----------|-------|------|
| Collector-Emitter Voltage | $V_{CEO}$ | 45    | V    |
| Emitter-Base Voltage      | $V_{EBO}$ | 5.0   | V    |
| Collector Current         | $I_C$     | 800   | mA   |
| Peak Collector Current    | $I_{CM}$  | 1000  | mA   |
| Peak Emitter Current      | $I_{EM}$  | 1000  | mA   |

## Thermal Characteristics

| Characteristic  | Symbol          | Value       | Unit                      |
|---|-----------------|-------------|---------------------------|
| Power Dissipation at $T_{SB} = 50^\circ\text{C}$ (Note 1)   | $P_D$           | 310         | mW                        |
| Thermal Resistance, Junction to Substrate Backside (Note 1) | $R_{\theta SB}$ | 320         | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Ambient Air (Note 1)        | $R_{\theta JA}$ | 403         | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range                     | $T_J, T_{STG}$  | -65 to +150 | $^\circ\text{C}$          |

## Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic (Note 2)              | Symbol        | Min | Max        | Unit                | Test Condition  |
|--------------------------------------|---------------|-----|------------|---------------------|---|
| DC Current Gain                      | $h_{FE}$      | 100 | 250        | —                   | $V_{CE} = 1.0\text{V}, I_C = 100\text{mA}$                              |
|                                      |               | 160 | 400        |                     |   |
|                                      |               | 250 | 600        |                     |   |
| Current Gain Group -16<br>-25<br>-40 | $h_{FE}$      | 60  | —          | —                   | $V_{CE} = 1.0\text{V}, I_C = 300\text{mA}$                              |
|                                      |               | 100 | —          |                     |   |
|                                      |               | 170 | —          |                     |   |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | —   | 0.7        | V                   | $I_C = 500\text{mA}, I_B = 50\text{mA}$                                 |
| Base-Emitter Voltage                 | $V_{BE}$      | —   | 1.2        | V                   | $V_{CE} = 1.0\text{V}, I_C = 300\text{mA}$                              |
| Collector-Emitter Cutoff Current     | $I_{CES}$     | —   | 100<br>5.0 | nA<br>$\mu\text{A}$ | $V_{CE} = 45\text{V}$<br>$V_{CE} = 25\text{V}, T_j = 150^\circ\text{C}$ |
| Emitter-Base Cutoff Current          | $I_{EBO}$     | —   | 100        | nA                  | $V_{EB} = 4.0\text{V}$  |
| Gain Bandwidth Product               | $f_T$         | 100 | —          | MHz                 | $V_{CE} = 5.0\text{V}, I_C = 10\text{mA},$<br>$f = 50\text{MHz}$        |
| Collector-Base Capacitance           | $C_{CB0}$     | —   | 12         | pF                  | $V_{CB} = 10\text{V}, f = 1.0\text{MHz}$                                |

- Notes:
1. Device mounted on Ceramic Substrate 0.7mm; 2.5cm<sup>2</sup> area.
  2. Short duration pulse test used to minimize self-heating effect.
  3. No purposefully added lead. Halogen and Antimony Free.
  4. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.

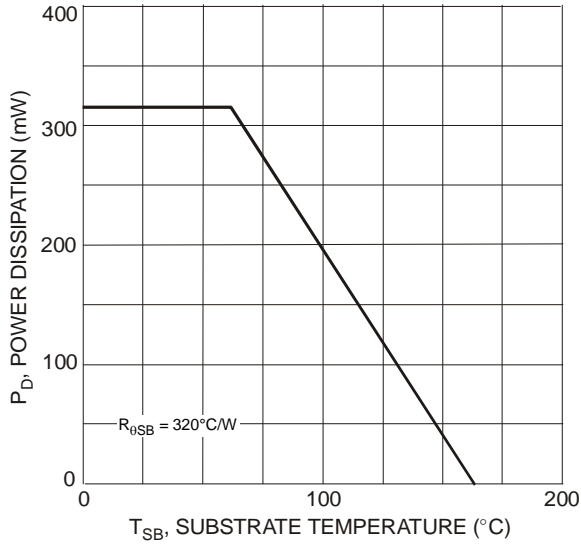


Fig. 1 Power Dissipation vs. Substrate Temperature (Note 1)

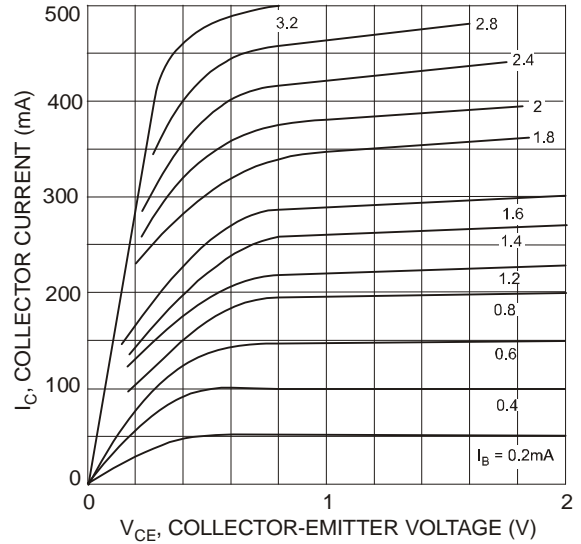


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

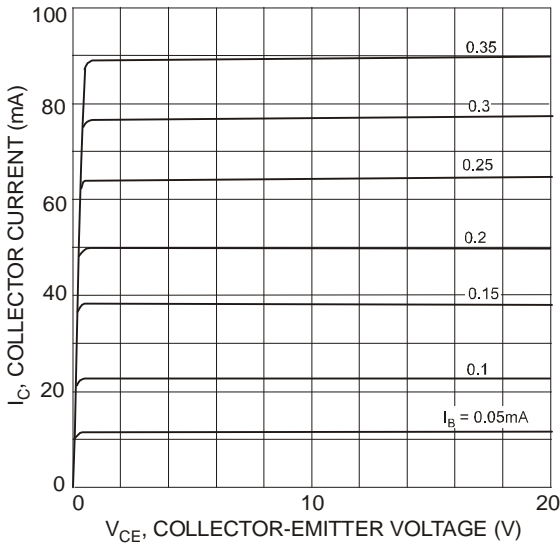


Fig. 3 Typical Collector Current vs. Collector-Emitter Voltage

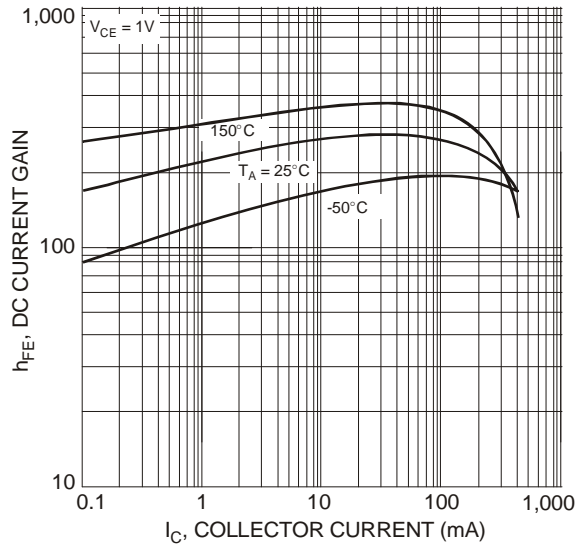


Fig. 4 Typical DC Current Gain vs. Collector Current

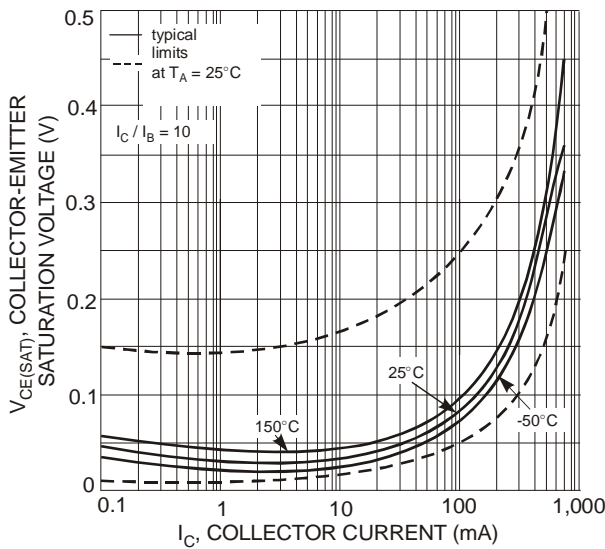


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

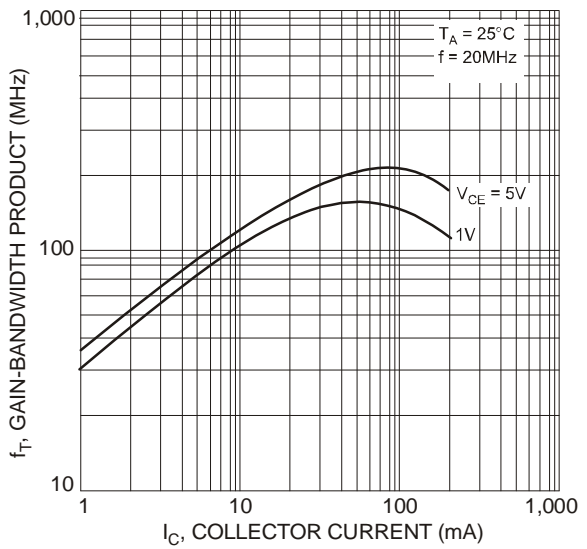


Fig. 6 Gain-Bandwidth Product vs. Collector Current

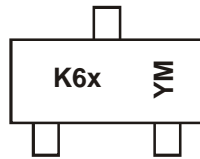
### Ordering Information (Note 5)

| Part Number  | Case   | Packaging        |
|--------------|--------|------------------|
| BC817-xx-7-F | SOT-23 | 3000/Tape & Reel |

\*xx = gain group, e.g. BC817-16-7-F.

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information



K6x = Product Type Marking Code:

K6A = BC817-16

K6B = BC817-25

K6C = BC817-40

YM = Date Code Marking

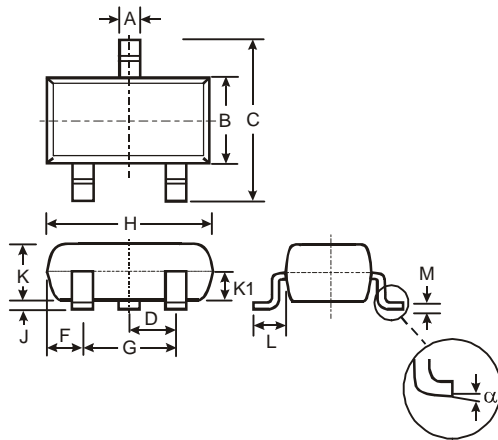
Y = Year (ex: T = 2006)

M = Month (ex: 9 = September)

Date Code Key

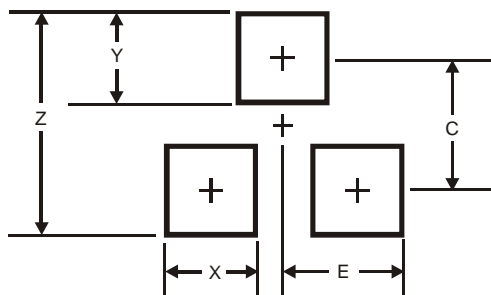
| Year  | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | J    | K    | L    | M    | N    | 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    |      |      |      |      |      |      |

### Package Outline Dimensions



| SOT-23                      |       |      |       |
|-----------------------------|-------|------|-------|
| Dim                         | Min   | Max  | Typ   |
| A                           | 0.37  | 0.51 | 0.40  |
| B                           | 1.20  | 1.40 | 1.30  |
| C                           | 2.30  | 2.50 | 2.40  |
| D                           | 0.89  | 1.03 | 0.915 |
| F                           | 0.45  | 0.60 | 0.535 |
| G                           | 1.78  | 2.05 | 1.83  |
| H                           | 2.80  | 3.00 | 2.90  |
| J                           | 0.013 | 0.10 | 0.05  |
| K                           | 0.903 | 1.10 | 1.00  |
| K1                          | -     | -    | 0.400 |
| L                           | 0.45  | 0.61 | 0.55  |
| M                           | 0.085 | 0.18 | 0.11  |
| α                           | 0°    | 8°   | -     |
| <b>All Dimensions in mm</b> |       |      |       |

### Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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