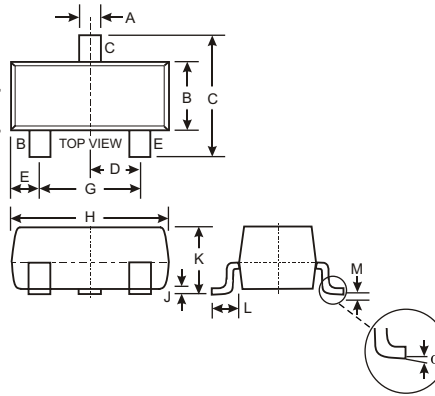


Features

- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC846-BC848)
- For Switching and AF Amplifier Applications

Mechanical Data

- Case: SOT-23, Molded Plastic
- Case material - UL Flammability Rating Classification 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Pin Connections: See Diagram
- Marking Codes (See Table Below & Diagram on Page 3)
- Ordering & Date Code Information: See Page 3
- Approx. Weight: 0.008 grams



| SOT-23 | | |
|----------------------|-------|------|
| Dim | Min | Max |
| A | 0.37 | 0.51 |
| B | 1.20 | 1.40 |
| C | 2.30 | 2.50 |
| D | 0.89 | 1.03 |
| E | 0.45 | 0.60 |
| G | 1.78 | 2.05 |
| H | 2.80 | 3.00 |
| J | 0.013 | 0.10 |
| K | 0.903 | 1.10 |
| L | 0.45 | 0.61 |
| M | 0.85 | 0.80 |
| α | 0° | 8° |
| All Dimensions in mm | | |

| Marking Code (Note 2) | | | |
|-----------------------|--------------|--------|-------------------|
| Type | Marking | Type | Marking |
| BC856A | 3A, K3A | BC857C | 3G, K3G |
| BC856B | 3B, K3B | BC858A | 3J, K3J, K3A, K3V |
| BC857A | 3E, K3V, K3A | BC858B | 3K, K3K, K3B, K3W |
| BC857B | 3F, K3W, K3B | BC858C | 3L, K3L, K3G |

Maximum Ratings @ T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------------|------|
| Collector-Base Voltage | V _{CBO} | -80 -50 -30 | V |
| Collector-Emitter Voltage | V _{CEO} | -65 -45 -30 | V |
| Emitter-Base Voltage | V _{EBO} | -5.0 | V |
| Collector Current | I _C | -100 | mA |
| Peak Collector Current | I _{CM} | -200 | mA |
| Peak Emitter Current | I _{EM} | -200 | mA |
| Power Dissipation (Note 1) | P _d | 300 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | R _{θJA} | 417 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

- Notes:
1. 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>.
 2. Current gain subgroup "C" is not available for BC856.

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

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition | |
|---|--------------------------------|---|-----------------------|--|----------------------------------|---|---|---|
| Collector-Base Breakdown Voltage (Note 3) | BC856 BC857 BC858 | $V_{(BR)CBO}$ | -80 -50 -30 | — — — | — — — | V | $I_C = 10\mu\text{A}, I_B = 0$ | |
| Collector-Emitter Breakdown Voltage (Note 3) | BC856 BC857 BC858 | $V_{(BR)CEO}$ | -65 -45 -30 | — — — | — — — | V | $I_C = 10\text{mA}, I_B = 0$ | |
| Emitter-Base Breakdown Voltage (Note 3) | | $V_{(BR)EBO}$ | -5 | — | — | V | $I_E = 1\mu\text{A}, I_C = 0$ | |
| H-Parameters | | | | | | | | |
| Small Signal Current Gain | Current Gain Group A B C | h_{fe} | — — — | 200 330 600 | — — — | — — — | $V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA},$ $f = 1.0\text{kHz}$ | |
| Input Impedance | Current Gain Group A B C | h_{ie} | — — — | 2.7 4.5 8.7 | — — — | $k\Omega$ $k\Omega$ $k\Omega$ | | |
| Output Admittance | Current Gain Group A B C | h_{oe} | — — — | 18 30 60 | — — — | μS μS μS | | |
| Reverse Voltage Transfer Ratio | Current Gain Group A B C | h_{re} | — — — | 1.5×10^{-4} 2×10^{-4} 3×10^{-4} | — — — | — — — | | |
| DC Current Gain (Note 3) | Current Gain Group A B C | h_{FE} | 125 220 420 | 180 290 520 | 250 475 800 | — | | $V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$ |
| Collector-Emitter Saturation Voltage (Note 3) | | $V_{CE(SAT)}$ | — | -75 -250 | -300 -650 | mV | | $I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$ |
| Base-Emitter Saturation Voltage (Note 3) | | $V_{BE(SAT)}$ | — | -700 -850 | — | mV | | $I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$ |
| Base-Emitter Voltage (Note 3) | | $V_{BE(ON)}$ | -600 — | -650 — | -750 -820 | mV | | $V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$ $V_{CE} = -5.0\text{V}, I_C = -10\text{mA}$ |
| Collector-Cutoff Current (Note 3) | BC856 BC857 BC858 | I_{CES} I_{CES} I_{CES} I_{CBO} I_{CBO} | — — — — — | — — — — — | -15 -15 -15 -15 -4.0 | nA nA nA nA μA | | $V_{CE} = -80\text{V}$ $V_{CE} = -50\text{V}$ $V_{CE} = -30\text{V}$ $V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}, T_A = 150^\circ\text{C}$ |
| Gain Bandwidth Product | | f_T | 100 | 200 | — | MHz | | $V_{CE} = -5.0\text{V}, I_C = -10\text{mA},$ $f = 100\text{MHz}$ |
| Collector-Base Capacitance | | C_{CBO} | — | 3 | — | pF | $V_{CB} = -10\text{V}, f = 1.0\text{MHz}$ | |
| Noise Figure | | NF | — | 2 | 10 | dB | $V_{CE} = -5.0\text{V}, I_C = 200\mu\text{A},$ $R_S = 2k\Omega, f = 1\text{kHz},$ $\Delta f = 200\text{Hz}$ | |

Notes: 3. Short duration pulse test used to minimize self-heating effect.

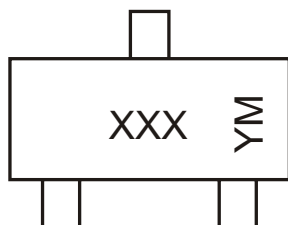
Ordering Information (Note 4)

| Device | Packaging | Shipping |
|-----------|-----------|------------------|
| BC85xx-7* | SOT-23 | 3000/Tape & Reel |

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

*xx = device type, e.g. BC856A-7.

Marking Information



XXX = Product Type Marking Code (See Page 1), e.g. K3A = BC856A

YM = Date Code Marking

Y = Year ex: N = 2002

M = Month ex: 9 = September

Date Code Key

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|------|------|------|------|------|------|------|------|
| Code | J | K | L | M | N | P | R |

| Month | Jan | Feb | March | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |