

BC846AW - BC848CW

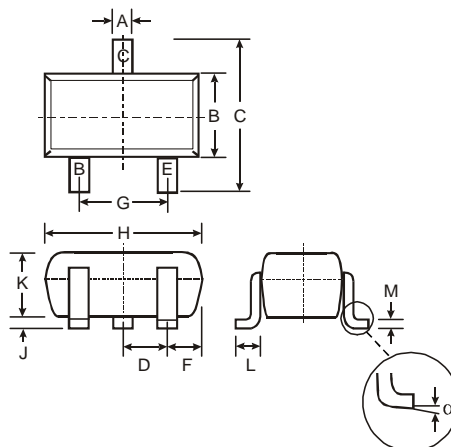
NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Ideally Suited for Automatic Insertion
- Complementary PNP Types Available (BC856W-BC858W)
- For Switching and AF Amplifier Applications
- **Lead Free/RoHS Compliant (Note 3)**
- "Green" Device (Note 4 and 5)

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 5. 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).
- Pin Connections: See Diagram
- Marking Codes (See Table Below & Diagram on Page 3)
- Ordering & Date Code Information: See Page 3
- Weight: 0.006 grams (approximate)



| SOT-323 | | |
|----------------------|--------------|------|
| Dim | Min | Max |
| A | 0.25 | 0.40 |
| B | 1.15 | 1.35 |
| C | 2.00 | 2.20 |
| D | 0.65 Nominal | |
| F | 0.30 | 0.40 |
| G | 1.20 | 1.40 |
| H | 1.80 | 2.20 |
| J | 0.0 | 0.10 |
| K | 0.90 | 1.00 |
| L | 0.25 | 0.40 |
| M | 0.10 | 0.18 |
| α | 0° | 8° |
| All Dimensions in mm | | |

| Marking Code (Note 2) | | | |
|-----------------------|----------|---------|---------------|
| Type | Marking | Type | Marking |
| BC846AW | K1Q | BC847CW | K1M |
| BC846BW | K1R | BC848AW | K1J, K1E, K1Q |
| BC847AW | K1E, K1Q | BC848BW | K1K, K1F, K1R |
| BC847BW | K1F, K1R | BC848CW | K1L, K1M |

Maximum Ratings @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Base Voltage | V _{CBO} | 80 | V |
| BC846 | | 50 | |
| BC847 | | 30 | |
| Collector-Emitter Voltage | V _{CEO} | 65 | V |
| BC846 | | 45 | |
| BC847 | | 30 | |
| Emitter-Base Voltage | V _{EBO} | 6.0 | V |
| BC846, BC847 | | 5.0 | |
| 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 | 200 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | R _{θJA} | 625 | °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 BC846W.
 3. No purposefully added lead.
 4. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 5. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

Electrical Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|-------------------|-------------------|-------------------|----------|--|
| Collector-Base Breakdown Voltage (Note 6) | BC846 BC847 BC848 | 80 50 30 | — — — | — — — | V | I _C = 10μA, I _B = 0 |
| Collector-Emitter Breakdown Voltage (Note 6) | BC846 BC847 BC848 | 65 45 30 | — — — | — — — | V | I _C = 10mA, I _B = 0 |
| Emitter-Base Breakdown Voltage (Note 6) | BC846, BC847 BC848 | 6 5 | — | — | V | I _E = 1μA, I _C = 0 |
| DC Current Gain | Current Gain Group A B (Note 6) C | 110 200 420 | 180 290 520 | 220 450 800 | — | V _{CE} = 5.0V, I _C = 2.0mA |
| Collector-Emitter Saturation Voltage (Note 6) | V _{CE(SAT)} | — | 90 200 | 250 600 | mV | I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA |
| Base-Emitter Saturation Voltage (Note 6) | V _{BE(SAT)} | — | 700 900 | — | mV | I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA |
| Base-Emitter Voltage (Note 6) | V _{BE(ON)} | 580 — | 660 — | 700 770 | mV | V _{CE} = 5.0V, I _C = 2.0mA V _{CE} = 5.0V, I _C = 10mA |
| Collector-Cutoff Current (Note 6) | I _{CBO} I _{CBO} | — — | — — | 15 5.0 | nA μA | V _{CB} = 30V V _{CB} = 30V, T _A = 150°C |
| Gain Bandwidth Product | f _T | 100 | 300 | — | MHz | V _{CE} = 5.0V, I _C = 10mA, f = 100MHz |
| Collector-Base Capacitance | C _{CBO} | — | 3.0 | 4.5 | pF | V _{CB} = 10V, f = 1.0MHz |
| Noise Figure | NF | — | — | 10 | dB | V _{CE} = 5V, I _C = 200μA, R _S = 2.0kΩ, f = 1.0kHz, Δf = 200Hz |

Notes: 6. Short duration pulse test used to minimize self-heating effect.

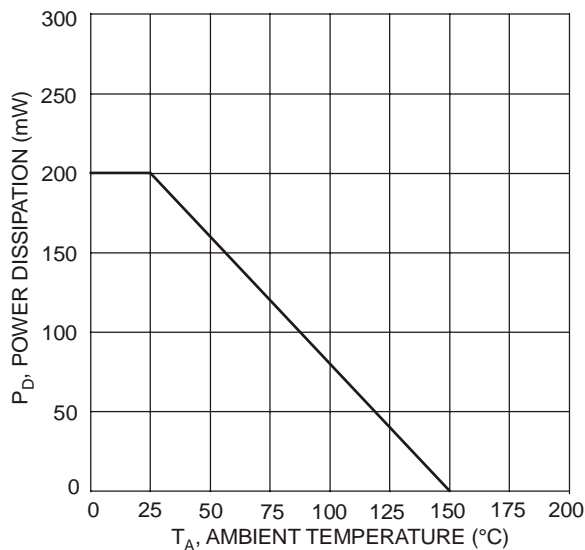


Fig. 1, Max Power Dissipation vs. Ambient Temperature

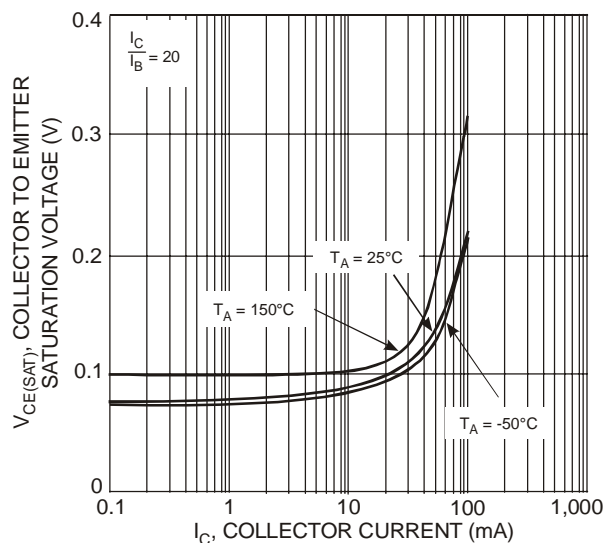


Fig. 2 Collector Emitter Saturation Voltage vs. Collector Current

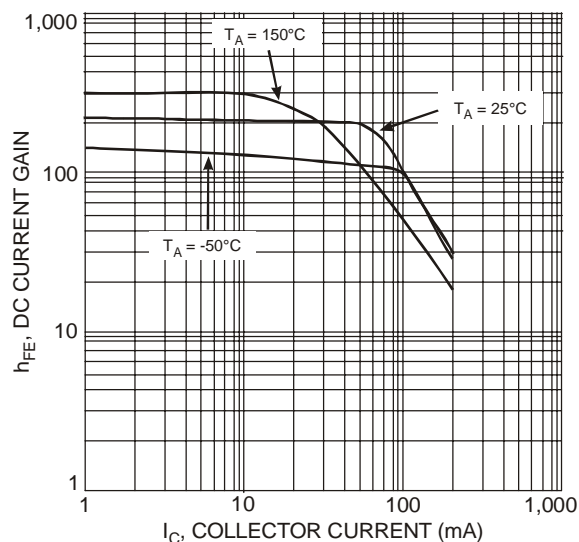


Fig. 3, DC Current Gain vs. Collector Current

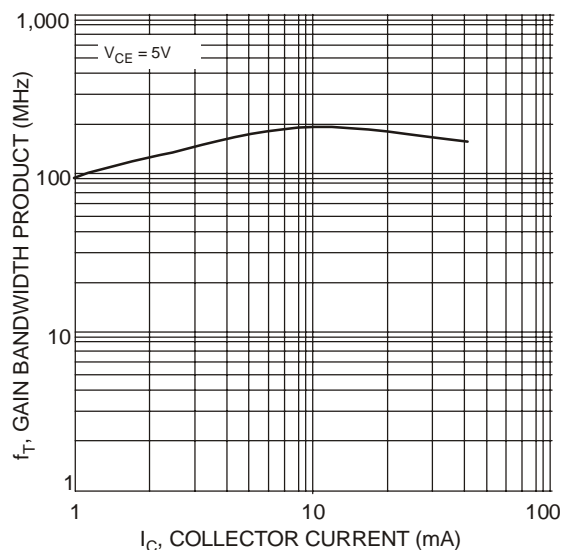


Fig. 4, Gain Bandwidth Product vs. Collector Current

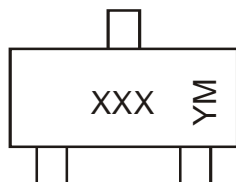
Ordering Information (Note 5 & 7)

| Device | Packaging | Shipping |
|--------------|-----------|------------------|
| BC84xxW-7-F* | SOT-323 | 3000/Tape & Reel |

*xx = device type, e.g. BC846AW-7.

Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



XXX = Product Type Marking Code (See Page 1), e.g. K1Q = BC846AW
 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 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | J | K | L | M | N | P | R | S | T | 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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