


PNP SURFACE MOUNT SMALL SIGNAL TRANSISTOR IN SOT323

Features

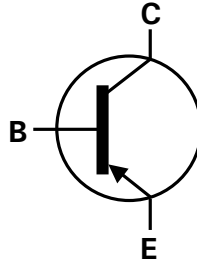
- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC846W – BC848W)
- For switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

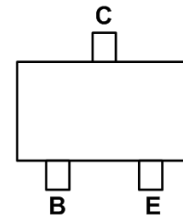
- Case: SOT323
- Case material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 
- Weight: 0.006 grams (Approximate)



Top View



Device Symbol



Top View
Pin-Out

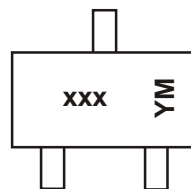
Ordering Information (Note 4)

| Product | Marking | Reel size (inches) | Quantity per reel |
|--------------|---------|--------------------|-------------------|
| BC856AW-7-F | K3A | 7 | 3,000 |
| BC856BW-7-F | K3B | 7 | 3,000 |
| BC856BW-13-F | K3B | 13 | 10,000 |
| BC857AW-7-F | K3A | 7 | 3,000 |
| BC857BW-7-F | K3B | 7 | 3,000 |

| Product | Marking | Reel size (inches) | Quantity per reel |
|-------------|---------|--------------------|-------------------|
| BC857CW-7-F | K3G | 7 | 3,000 |
| BC858AW-7-F | K3A | 7 | 3,000 |
| BC858BW-7-F | K3B | 7 | 3,000 |
| BC858CW-7-F | K3G | 7 | 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> 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. Tape width is 8mm. For more packaging details, go to our website at <http://www.diodes.com>.

Marking Information



xxx = Product Type Marking Code
(Please see Ordering Information)
YM = Date Code Marking
Y = Year (ex: X = 2010)
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 |

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | |
|------------------------------|------------------|-------|------|---|
| Collector-Base Voltage | V _{CBO} | BC856 | -80 | V |
| | | BC857 | -50 | |
| | | BC858 | -30 | |
| Collector-Emitter Voltage | V _{CEO} | BC856 | -65 | V |
| | | BC857 | -45 | |
| | | BC858 | -30 | |
| Emitter-Base Voltage | V _{EBO} | -5.0 | V | |
| Continuous Collector Current | I _C | -100 | mA | |
| Peak Collector Current | I _{CM} | -200 | mA | |
| Peak Emitter Current | I _{EM} | -200 | mA | |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation | P _D | 200 | mW |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 625 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition | |
|---|----------------------|-------|------|------|------|--|--|
| Collector-Base Breakdown Voltage | BV _{CBO} | BC856 | -80 | - | - | V | I _C = -100nA |
| | | BC857 | -50 | | | | |
| | | BC858 | -30 | | | | |
| Collector-Emitter Breakdown Voltage (Note 6) | BV _{CEO} | BC856 | -65 | - | - | V | I _C = -10mA |
| | | BC857 | -45 | | | | |
| | | BC858 | -30 | | | | |
| Emitter-Base Breakdown Voltage | BV _{EBO} | -5 | - | - | V | I _E = -100nA | |
| DC Current Gain (Note 6) | Current Gain Group | A | 125 | 180 | 250 | - | V _{CE} = -5.0V, I _C = -2.0mA |
| | | B | 220 | 290 | 475 | | |
| | | C | 420 | 520 | 800 | | |
| Collector Cutoff Current | I _{CBO} | - | - | -15 | nA | V _{CB} = -30V | |
| | | | | -4 | µA | V _{CB} = -30V, T _A = +150°C | |
| Collector-Emitter Saturation Voltage (Note 6) | V _{CE(sat)} | - | -75 | -300 | mV | I _C = -10mA, I _B = -0.5mA | |
| | | | -250 | -650 | | I _C = -100mA, I _B = -5.0mA | |
| Base-Emitter Turn-On Voltage (Note 6) | V _{BE(on)} | - | -600 | -650 | mV | I _C = -2mA, V _{CE} = -5V | |
| | | | - | - | | I _C = -10mA, V _{CE} = -5V | |
| Base-Emitter Saturation Voltage (Note 6) | V _{BE(sat)} | - | -700 | - | mV | I _C = -10mA, I _B = -0.5mA | |
| | | | -850 | -950 | | I _C = -100mA, I _B = -5mA | |
| Output Capacitance | C _{obo} | - | 3 | 4.5 | pF | V _{CB} = -10V, f = 1.0MHz | |
| Transition Frequency | f _T | 100 | 200 | - | MHz | V _{CE} = -5V, I _C = -10mA, f = 100MHz | |
| Noise Figure | NF | - | - | 10 | dB | V _{CE} = -5V, I _C = -200µA R _S = 2kΩ, f = 1kHz Δf = 200Hz | |

- Notes:
- For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition; the device is measured when operating in a steady-state condition.
 - Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

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

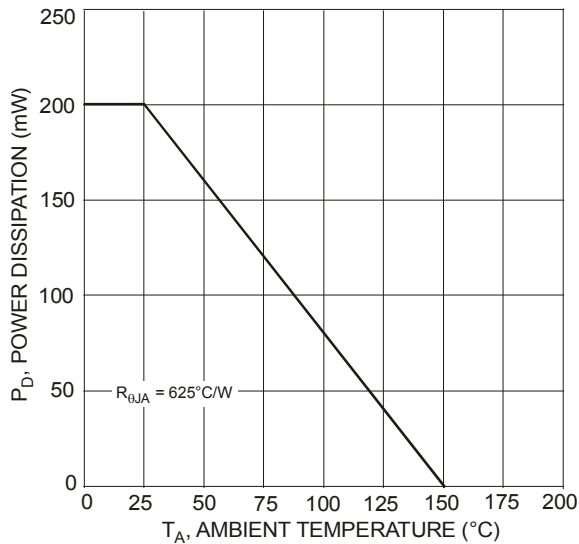


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 5)

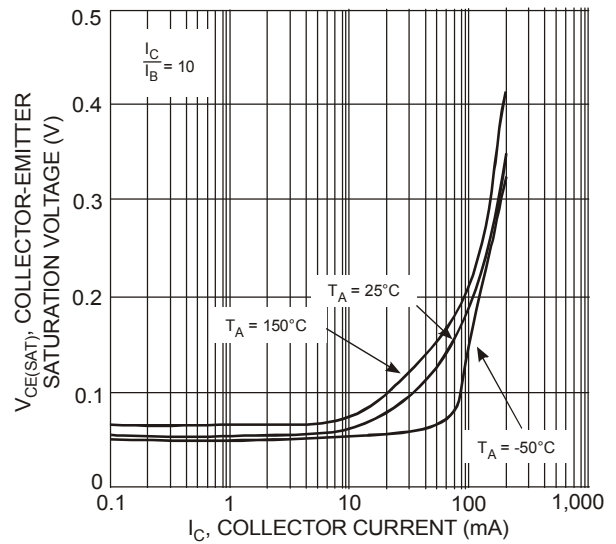


Fig. 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

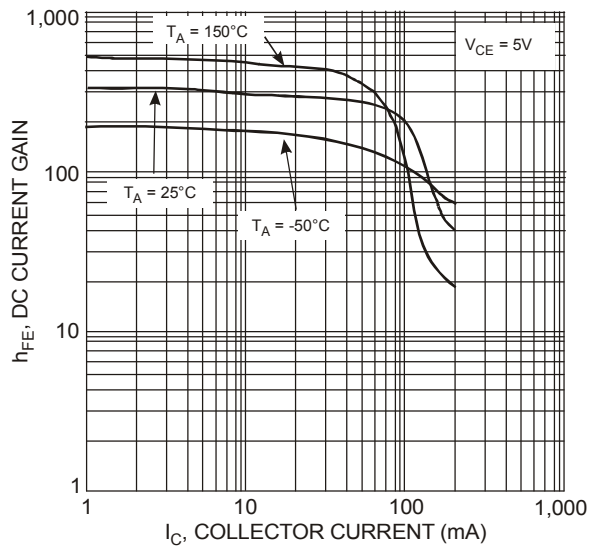


Fig. 3 Typical DC Current Gain (Group B) vs. Collector Current

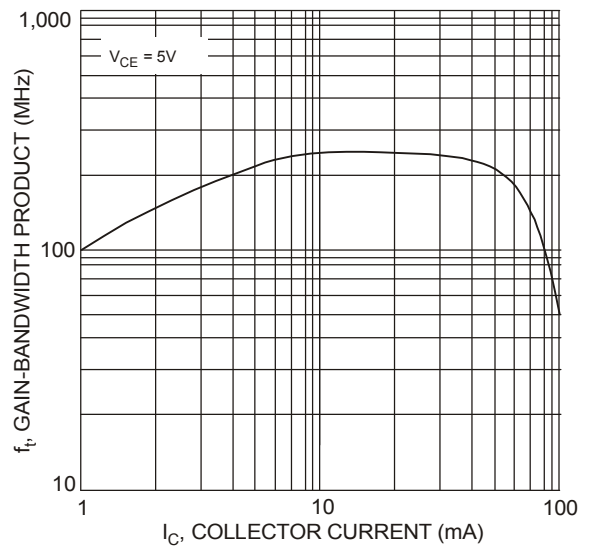
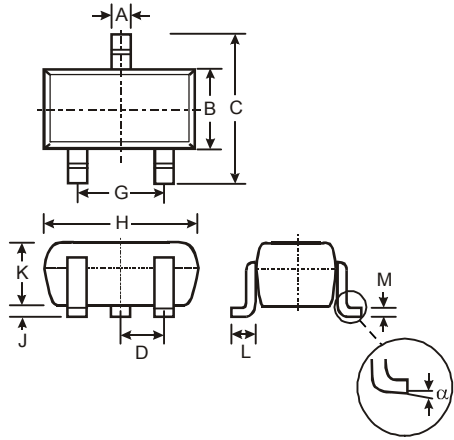


Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

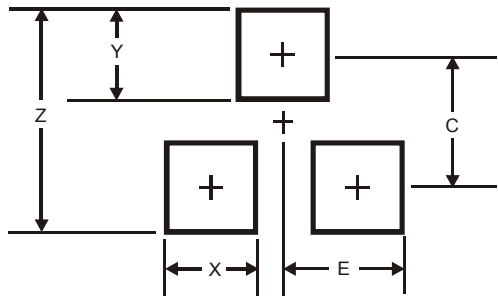
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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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