


BSR43

80V NPN MEDIUM POWER TRANSISTOR IN SOT89

Features

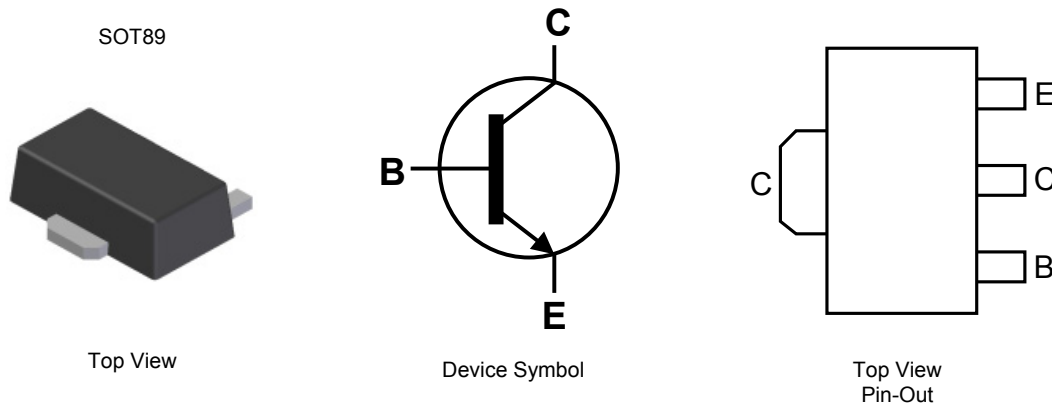
- $BV_{CE0} > 80V$
- $I_C = -1A$ High Continuous Current
- Low saturation voltage $V_{CE(sat)} < 250mV @ 150mA$
- Complementary type BSR33
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish, Solderable per MIL-STD-202,
Method 208 
- Weight: 0.052 grams (Approximate)

Application

- Load management functions
- Solenoid, relay and actuator drivers
- DC – DC modules

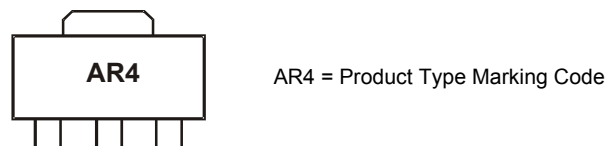


Ordering Information (Notes 4 & 5)

| Product | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------|------------|---------|--------------------|-----------------|-------------------|
| BSR43TA | AEC-Q101 | AR4 | 7 | 12 | 1,000 |
| BSR43QTA | Automotive | AR4 | 7 | 12 | 1,000 |

- 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 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. Automotive products are AEC-Q10x qualified and are PPAP capable. Automotive, AEC-Q10x and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

Marking Information



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

| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CBO} | 90 | V |
| Collector-Emitter Voltage | V _{CEO} | 80 | V |
| Emitter-Base Voltage | V _{EBO} | 5 | V |
| Continuous Collector Current | I _C | 1 | A |
| Peak Pulse Current | I _{CM} | 2 | A |
| Peak Base Current | I _{BM} | 200 | mA |

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

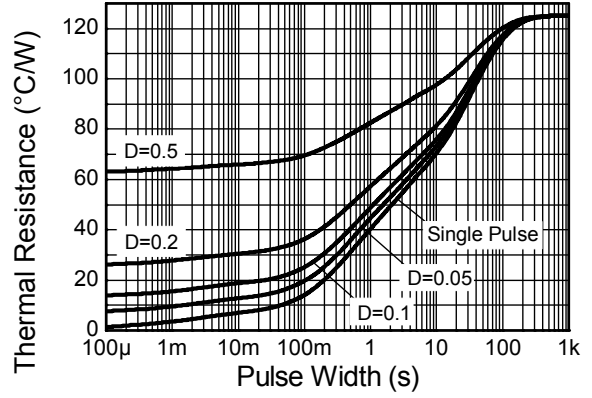
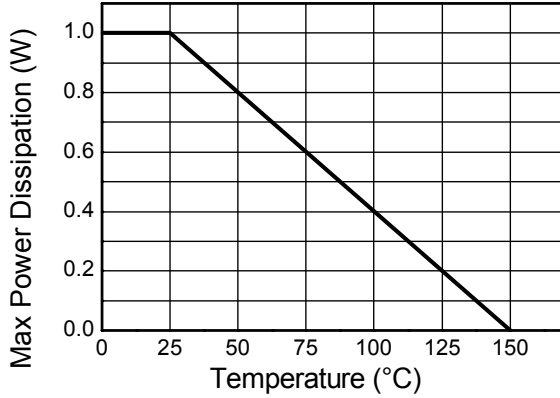
| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation | P _D | (Note 6) | 1 |
| | | (Note 7) | 1.5 |
| | | (Note 8) | 2.1 |
| Thermal Resistance, Junction to Ambient Air | R _{θJA} | (Note 6) | 125 |
| | | (Note 7) | 83 |
| | | (Note 8) | 60 |
| Thermal Resistance, Junction to Lead | R _{θJL} | 13 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

ESD Ratings (Note 9)

| 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 |

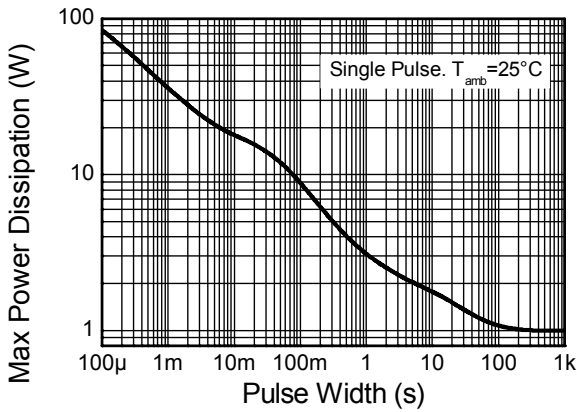
- Notes:
6. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 7. Same as note (5), except the device is mounted on 25mm x 25mm 1oz copper.
 8. Same as note (5), except the device is mounted on 50mm x 50mm 1oz copper.
 9. Thermal resistance from junction to solder-point (on the exposed collector pad).
 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

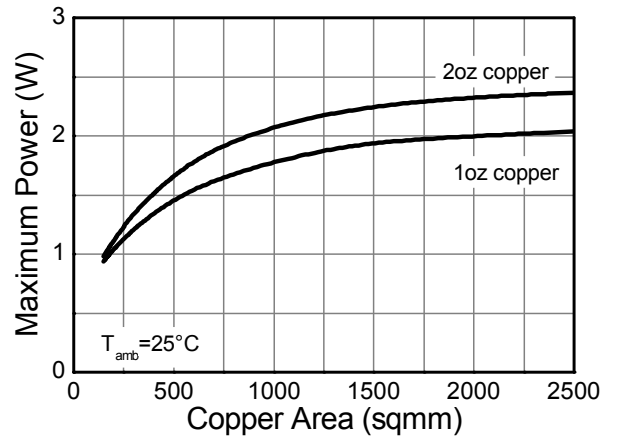
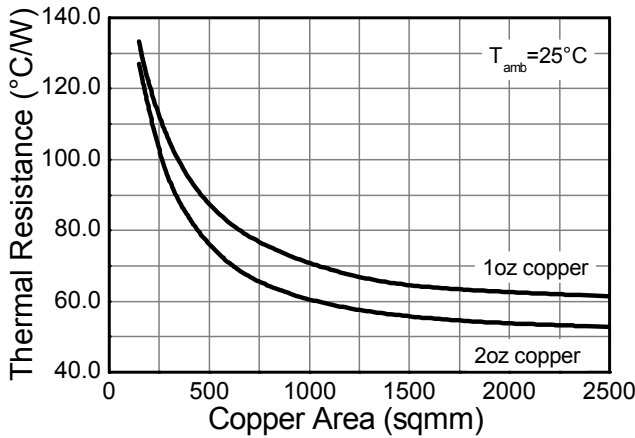


Derating Curve

Transient Thermal Impedance



Pulse Power Dissipation

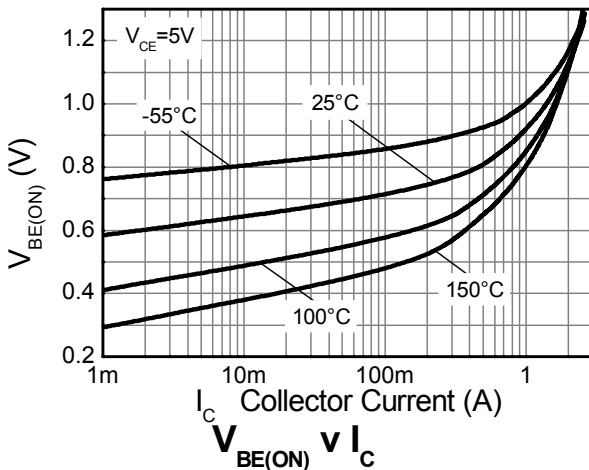
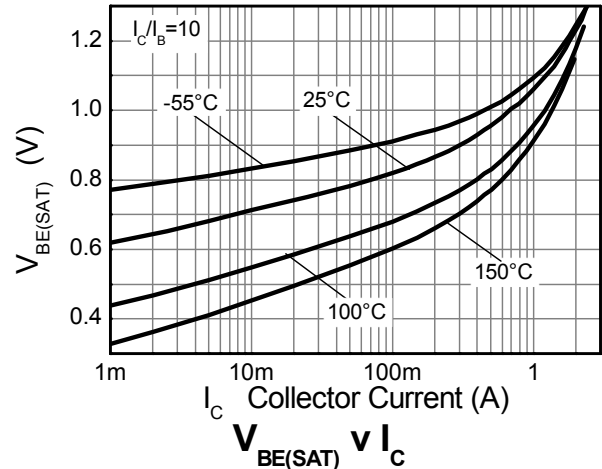
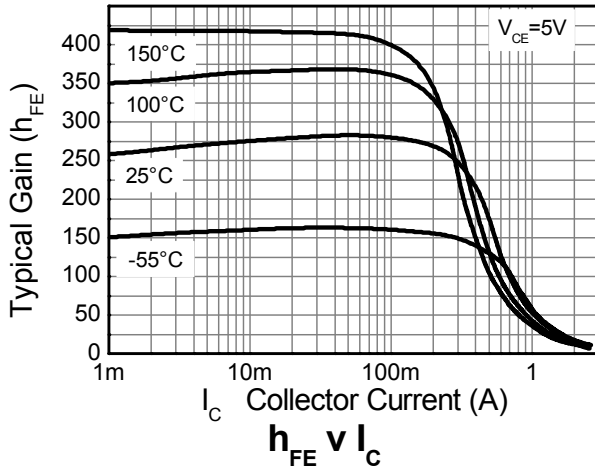
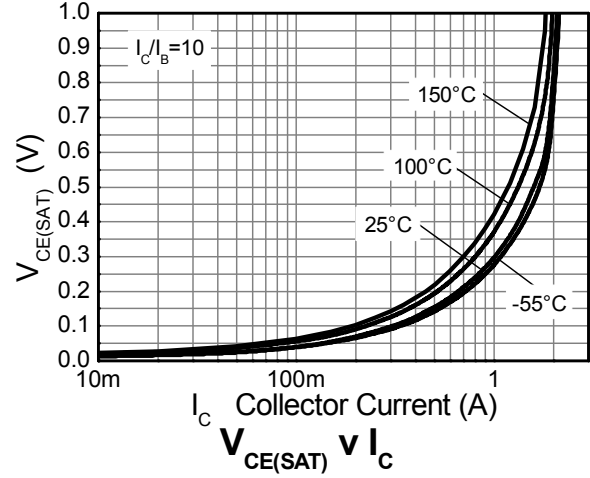
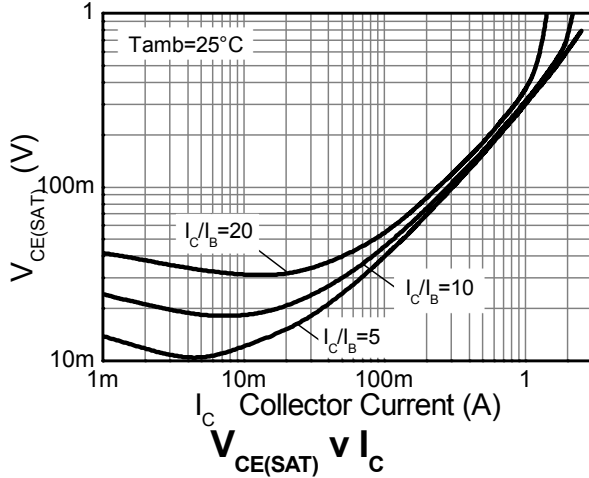


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|--|----------------------|-----------------|-------------|---------------|----------|--|
| Collector-Base Breakdown Voltage | BV _{CBO} | 90 | – | – | V | I _C = 100μA |
| Collector-Emitter Breakdown Voltage (Note 11) | BV _{CEO} | 80 | – | – | V | I _C = 10mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 5 | – | – | V | I _E = 100μA |
| Collector Cutoff Current | I _{CBO} | – | – | 100 50 | nA μA | V _{CB} = 60V V _{CB} = 60V, T _J = +150°C |
| DC current transfer Static ratio (Note 11) | h _{FE} | 30 100 50 | – – – | – 300 – | – | I _C = 100μA, V _{CE} = 5V I _C = 100mA, V _{CE} = 5V I _C = 500mA, V _{CE} = 5V |
| Collector-Emitter Saturation Voltage (Note 11) | V _{CE(sat)} | – – | – – | 0.25 0.5 | V | I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA |
| Base-Emitter Saturation Voltage (Note 11) | V _{BE(sat)} | – | – | 1.0 1.2 | V | I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA |
| Transitional Frequency | f _T | 100 | – | – | MHz | I _C = 50mA, V _{CE} = 10V f = 35MHz |
| Output capacitance | C _{obo} | – | – | 12 | pF | V _{CB} = 10V, f = 1MHz |
| Input Capacitance | C _{ibo} | – | – | 90 | pF | V _{CB} = 0.5V, f = 1MHz |
| Turn-On Time | T _{on} | – | – | 250 | ns | V _{CC} = 20V, I _C = 100mA |
| Turn-Off Time | T _{off} | – | – | 1000 | ns | I _{B1} = I _{B2} = 5mA |

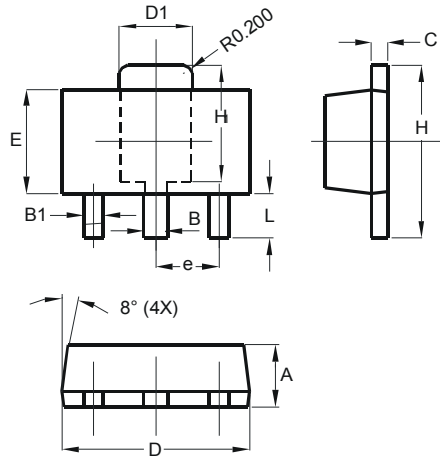
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

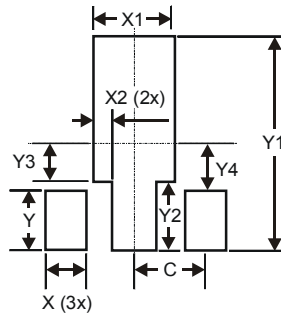
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT89 | | |
|-----------------------------|----------|------|
| Dim | Min | Max |
| A | 1.40 | 1.60 |
| B | 0.44 | 0.62 |
| B1 | 0.35 | 0.54 |
| C | 0.35 | 0.44 |
| D | 4.40 | 4.60 |
| D1 | 1.62 | 1.83 |
| E | 2.29 | 2.60 |
| e | 1.50 Typ | |
| H | 3.94 | 4.25 |
| H1 | 2.63 | 2.93 |
| L | 0.89 | 1.20 |
| 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) |
|------------|---------------|
| X | 0.900 |
| X1 | 1.733 |
| X2 | 0.416 |
| Y | 1.300 |
| Y1 | 4.600 |
| Y2 | 1.475 |
| Y3 | 0.950 |
| Y4 | 1.125 |
| C | 1.500 |

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