

BST52

**80V NPN SILICON PLANAR DARLINGTON TRANSISTOR
IN SOT89**

Features

- $BV_{CEO} > 80V$
- High current gain
- Max Continuous Current $I_C = 500mA$
- Fast switching
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free, "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

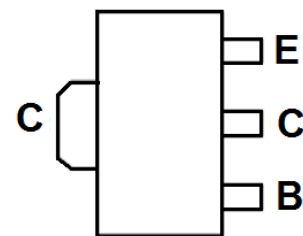
Mechanical Data

- Case: SOT89
- Moisture Sensitivity: Level 1 per J-STD-020
- UL Flammability Rating 94V-0
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (Approximate)

SOT89

Top View

Device symbol



Top View
Pin-out

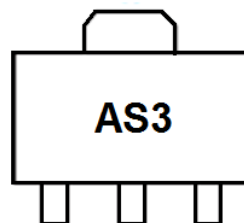
Ordering Information (Note 3)

| Product | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---------|---------|--------------------|-----------------|-------------------|
| BST52TA | AS3 | 7 | 12 | 1,000 |

Notes:

1. No purposefully added lead.
2. Halogen and Antimony Free. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>
3. For packaging details, go to our website at <http://www.diodes.com>

Marking Information



AS3 = Product Type Marking Code

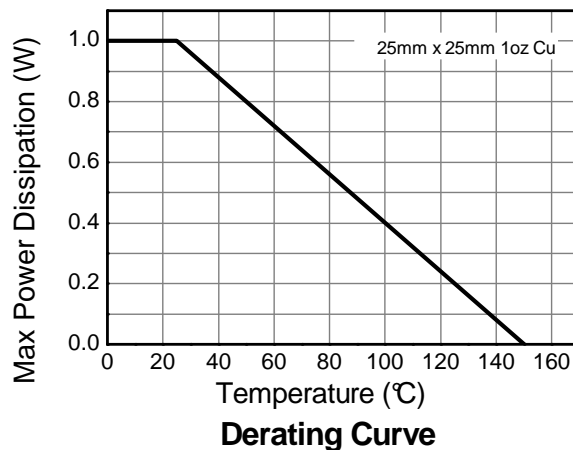
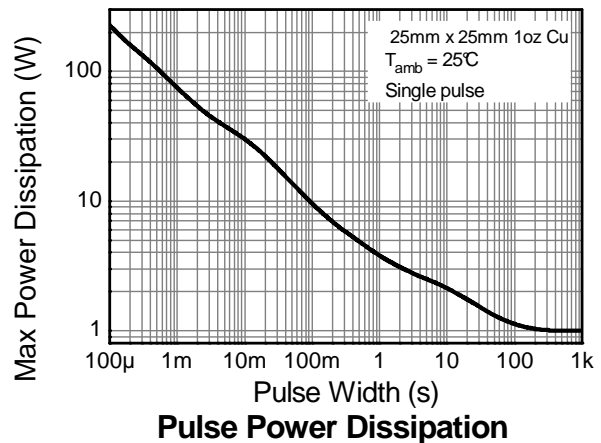
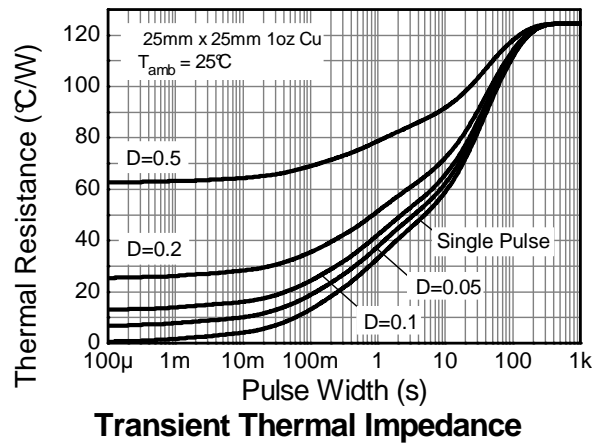
Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 90 | V |
| Collector-Emitter Voltage | V_{CEO} | 80 | V |
| Emitter-Base Voltage | V_{EBO} | 10 | V |
| Continuous Collector Current | I_C | 500 | mA |
| Peak Pulse Current | I_{CM} | 1.5 | A |
| Base Current | I_B | 100 | mA |

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

| Characteristic | Symbol | Value | Unit |
|--------------------------------------------------|-----------------|-------------|--------------------|
| Power Dissipation (Note 4) | P_D | 1 | W |
| Thermal Resistance, Junction to Ambient (Note 4) | $R_{\theta JA}$ | 125 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Leads (Note 5) | $R_{\theta JL}$ | 8.66 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Notes: 4. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 5. Thermal resistance from junction to solder-point (on the exposed collector pad).

Thermal Characteristics


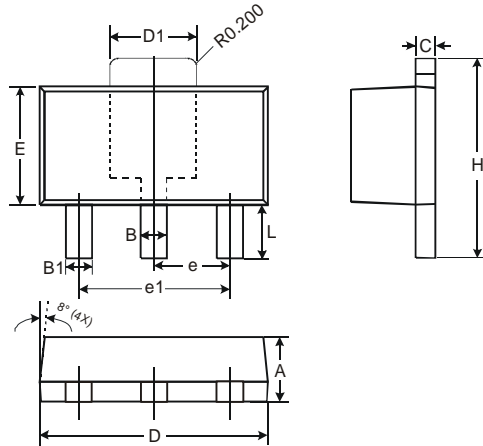
Electrical Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|------------------------------------------------|----------------------|--------------|------|------------|------|--------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage | BV _{CBO} | 90 | - | - | V | I _C = 10μA |
| Collector-Emitter Breakdown Voltage (Notes 6) | BV _{CEO} | 80 | - | - | V | I _C = 10mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 10 | - | - | V | I _E = 10μA |
| Collector Cutoff Current | I _{CES} | - | - | 10 | μA | V _{CE} = 80V |
| Emitter Cutoff Current | I _{EBO} | - | - | 10 | μA | V _{EB} = 8V |
| DC current transfer Static ratio (Notes 6) | h _{FE} | 1000 2000 | - | - | | I _C = 150mA, V _{CE} = 10V I _C = 500mA, V _{CE} = 10V |
| Collector-Emitter Saturation Voltage (Notes 6) | V _{CE(sat)} | - | - | 1.3 1.3 | V | I _C = 500mA, I _B = 0.5mA I _C = 500mA, I _B = 0.5mA, T _J = 150°C |
| Base-Emitter Saturation Voltage (Notes 6) | V _{BE(sat)} | - | - | 1.9 | V | I _C = 500mA, I _B = 0.5mA |
| Turn On Time | t _{ON} | - | 0.4 | - | μs | I _C = 500mA, I _{Bon} = I _{Boff} = 0.5mA |
| Turn Off Time | t _{OFF} | | 1.5 | | | |

Notes: 6. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

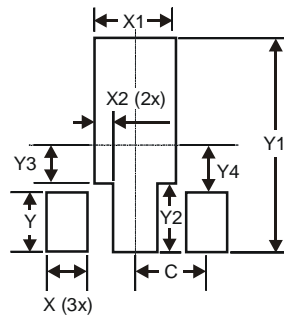
Typical Electrical Characteristics

Package Outline Dimensions



| SOT89 | | |
|----------------------|----------|------|
| Dim | Min | Max |
| A | 1.40 | 1.60 |
| B | 0.44 | 0.62 |
| B1 | 0.35 | 0.54 |
| C | 0.35 | 0.43 |
| D | 4.40 | 4.60 |
| D1 | 1.52 | 1.83 |
| E | 2.29 | 2.60 |
| e | 1.50 Typ | |
| e1 | 3.00 Typ | |
| H | 3.94 | 4.25 |
| L | 0.89 | 1.20 |
| All Dimensions in mm | | |

Suggested Pad Layout



| 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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