

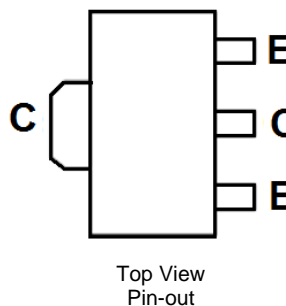
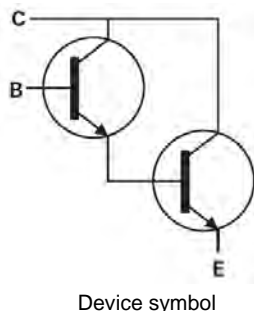
**80V NPN SILICON PLANAR DARLINGTON TRANSISTOR
IN SOT89**

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)

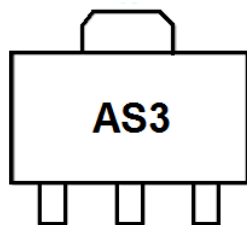


Ordering Information (Note 3)

| 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°C unless otherwise specified

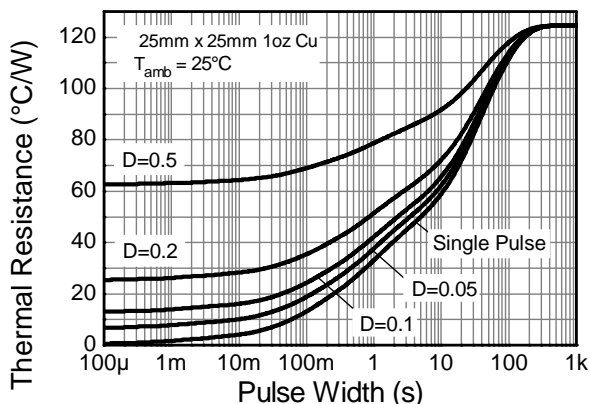
| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CBO} | 90 | V |
| Collector-Emitter Voltage | V _{CEO} | 80 | V |
| Emitter-Base Voltage | V _{EBO} | 10 | V |
| Continuous Collector Current | I _C | 500 | mA |
| Peak Pulse Current | I _{CM} | 1.5 | A |
| Base Current | I _B | 100 | mA |

Thermal Characteristics @T_A = 25°C unless otherwise specified

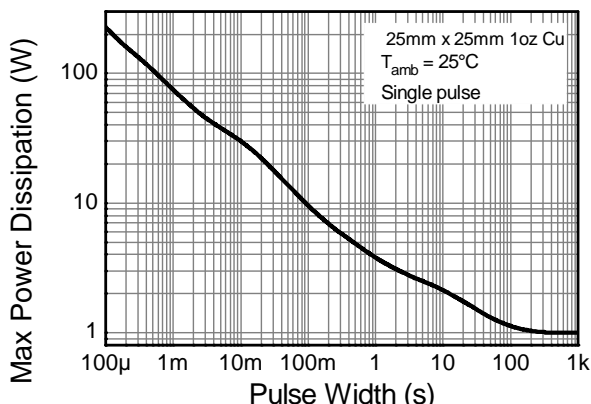
| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 4) | P _D | 1 | W |
| Thermal Resistance, Junction to Ambient (Note 4) | R _{θJA} | 125 | °C/W |
| Thermal Resistance, Junction to Leads (Note 5) | R _{θJL} | 8.66 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °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).

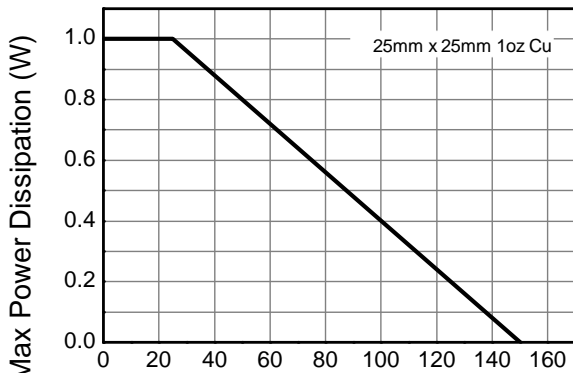
Thermal Characteristics



Transient Thermal Impedance



Pulse Power Dissipation



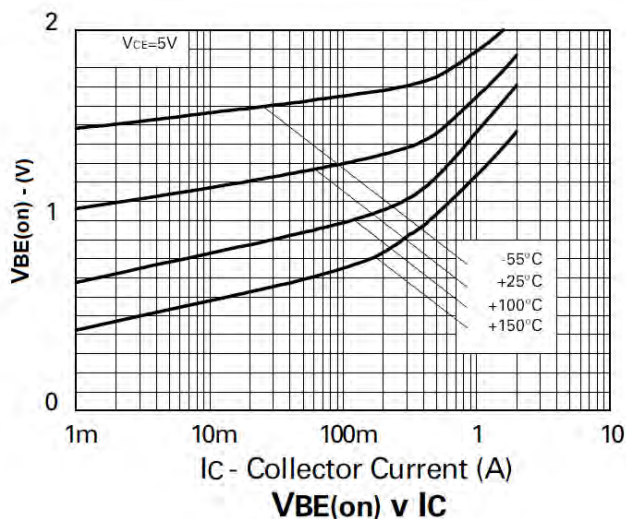
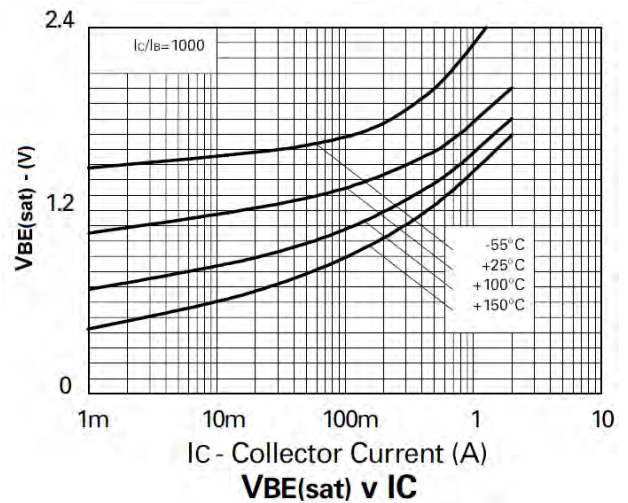
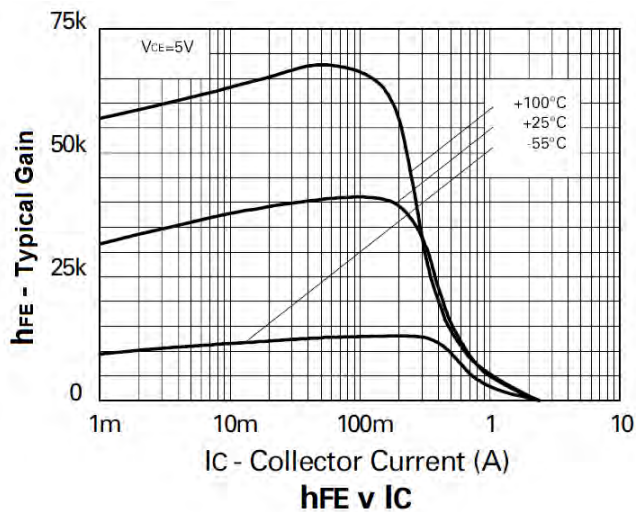
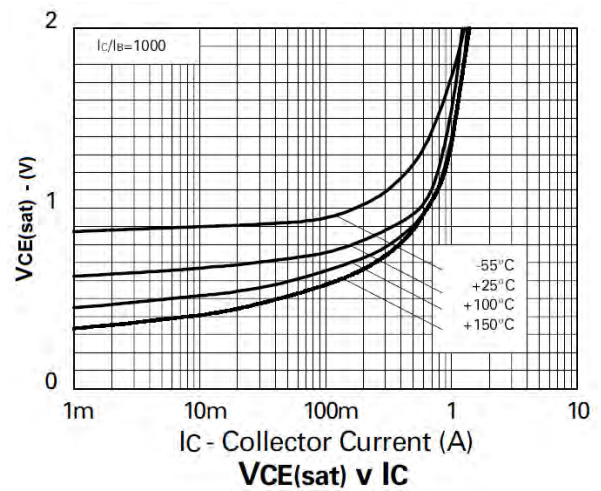
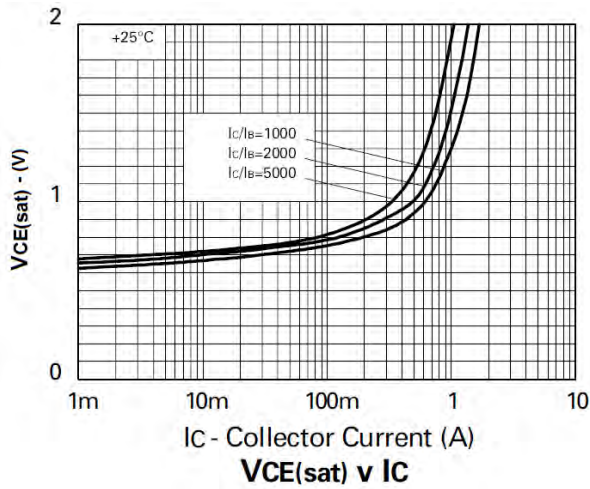
Derating Curve

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

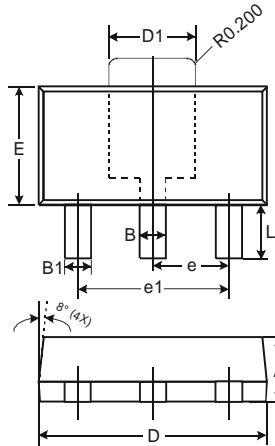
| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|--|---------------|--------------|------|------------|---------------|---|
| Collector-Base Breakdown Voltage | BV_{CBO} | 90 | - | - | V | $I_C = 10\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage (Notes 6) | BV_{CEO} | 80 | - | - | V | $I_C = 10\text{mA}$ |
| Emitter-Base Breakdown Voltage | BV_{EBO} | 10 | - | - | V | $I_E = 10\mu\text{A}$ |
| Collector Cutoff Current | I_{CES} | - | - | 10 | μA | $V_{CE} = 80\text{V}$ |
| Emitter Cutoff Current | I_{EBO} | - | - | 10 | μA | $V_{EB} = 8\text{V}$ |
| DC current transfer Static ratio (Notes 6) | h_{FE} | 1000 2000 | - | - | | $I_C = 150\text{mA}, V_{CE} = 10\text{V}$ $I_C = 500\text{mA}, V_{CE} = 10\text{V}$ |
| Collector-Emitter Saturation Voltage (Notes 6) | $V_{CE(sat)}$ | - | - | 1.3 1.3 | V | $I_C = 500\text{mA}, I_B = 0.5\text{mA}$ $I_C = 500\text{mA}, I_B = 0.5\text{mA}, T_J = 150^\circ\text{C}$ |
| Base-Emitter Saturation Voltage (Notes 6) | $V_{BE(sat)}$ | - | - | 1.9 | V | $I_C = 500\text{mA}, I_B = 0.5\text{mA}$ |
| Turn On Time | t_{ON} | - | 0.4 | - | μs | $I_C = 500\text{mA},$ $I_{Bon} = I_{Boff} = 0.5\text{mA}$ |
| Turn Off Time | t_{OFF} | | 1.5 | | | |

Notes: 6. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

Typical Electrical Characteristics

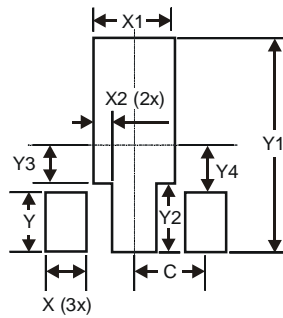


Package Outline Dimensions



| 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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