

100V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

Features

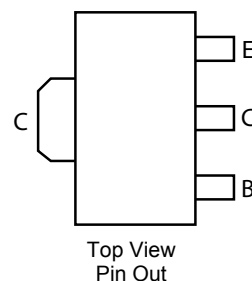
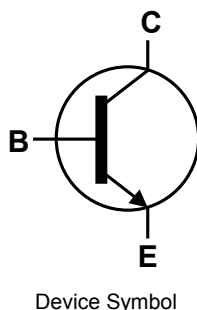
- $BV_{CE0} > 100V$
- $I_C = 4.5A$ high Continuous Current
- $I_{CM} = 10A$ Peak Pulse Current
- $R_{CE(sat)} = 31m\Omega$ for a low equivalent On-Resistance
- Low saturation voltage $V_{CE(sat)} < 60mV @ I_C = 1A$
- h_{FE} specified up to 10A for high current gain hold up
- **Lead-Free Finish; RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.05 grams (Approximate)

Applications

- Motor driving
- Line switching
- High side switches
- Subscriber line interface cards (SLIC)

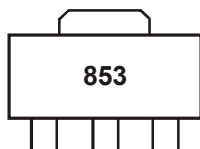


Ordering Information (Note 4)

| Product | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|---------|--------------------|-----------------|-------------------|
| ZXTN2011ZTA | 853 | 7 | 12 | 1,000 |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 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. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



853 = Product Type Marking Code

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

| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CB0} | 200 | V |
| Collector-Emitter Voltage | V _{CEO} | 100 | V |
| Emitter-Base Voltage | V _{EBO} | 7 | V |
| Continuous Collector Current | I _C | 4.5 | A |
| Peak Pulse Current | I _{CM} | 10 | A |

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

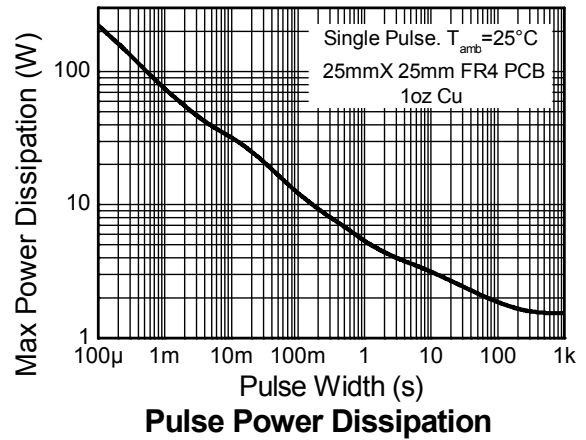
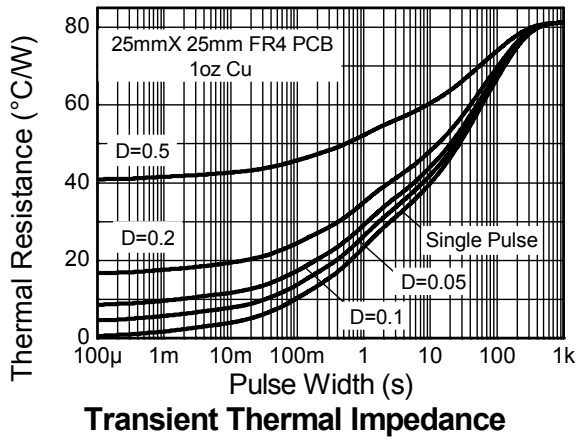
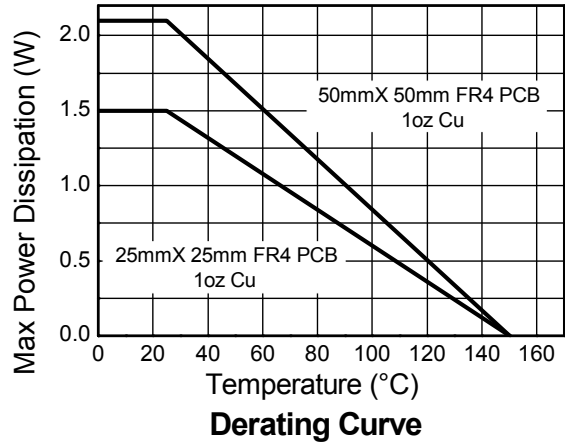
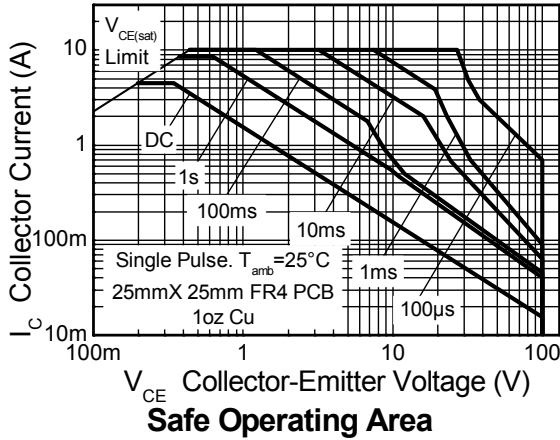
| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|-------|
| Power Dissipation (Note 5) | P _D | 1.5 | W |
| Linear derating factor | | 12 | mW/°C |
| Power Dissipation (Note 6) | P _D | 2.1 | W |
| Linear derating factor | | 16.8 | mW/°C |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 83 | °C/W |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 60 | °C/W |
| Thermal Resistance, Junction to Ambient (Note 7) | R _{θJL} | 3.23 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 8)

| 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:
- For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
 - Same as note (5), except the device is mounted on 50mm X 50mm single sided 1oz weight copper.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

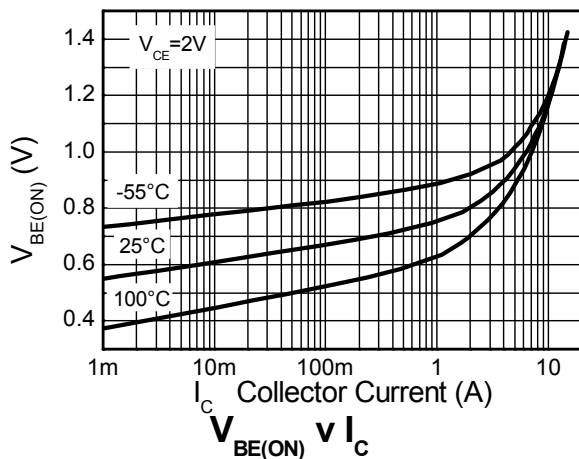
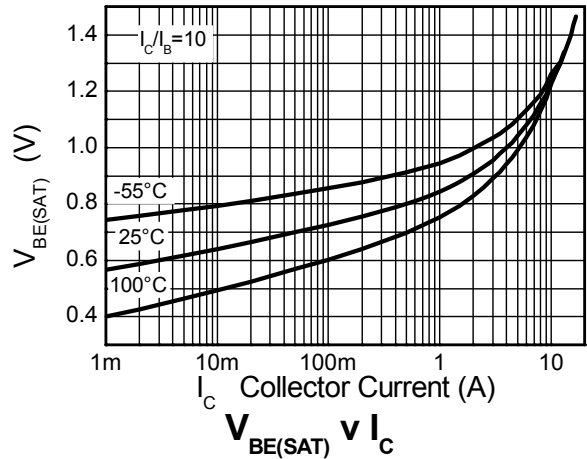
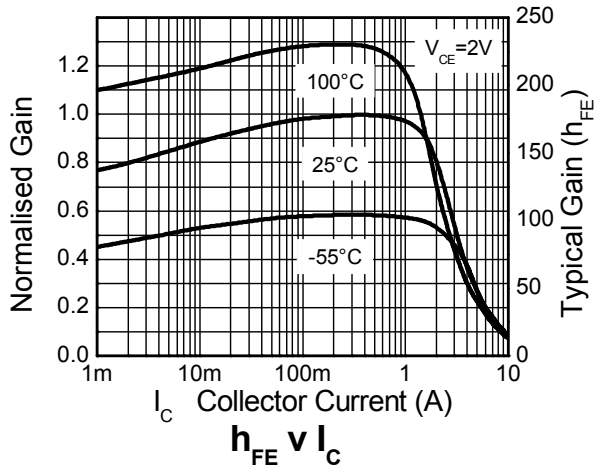
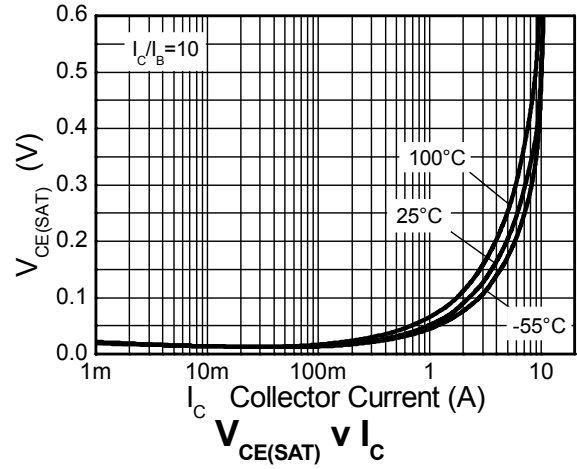
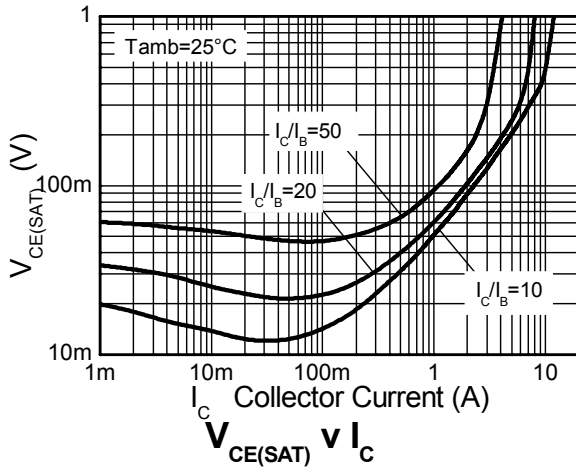


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|--|----------------------|-----|------|------|------|--|
| Collector-Base Breakdown Voltage | BV _{CBO} | 200 | 235 | - | V | I _C = 100μA |
| Collector-Emitter Breakdown Voltage (Notes 9) | BV _{CER} | 200 | 235 | - | V | I _C = 1μA, R _B ≤ 1kΩ |
| Collector-Emitter Breakdown Voltage (Notes 9) | BV _{CEO} | 100 | 115 | - | V | I _C = 1mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 7 | 8.1 | - | V | I _E = 100μA |
| Collector Cutoff Current | I _{CBO} | - | <1 | 50 | nA | V _{CB} = 150V |
| | | - | - | 500 | nA | V _{CB} = 150V, T _A = +100°C |
| Collector Cutoff Current | I _{CER} | - | <1 | 100 | nA | V _{CB} = 150V |
| | R ≤ 1kΩ | - | - | 500 | nA | V _{CB} = 150V, T _A = +100°C |
| Emitter Cutoff Current | I _{EBO} | - | <1 | 10 | nA | V _{EB} = 6V |
| DC Current Transfer Static Ratio (Notes 9) | h _{FE} | 100 | 230 | - | - | I _C = 10mA, V _{CE} = 2V |
| | | 100 | 200 | 300 | | I _C = 2A, V _{CE} = 2V |
| | | 30 | 60 | - | | I _C = 5A, V _{CE} = 2V |
| | | 10 | 20 | - | | I _C = 10A, V _{CE} = 2V |
| Collector-Emitter Saturation Voltage (Notes 9) | V _{CE(sat)} | - | 20 | 30 | mV | I _C = 100mA, I _B = 5mA |
| | | - | 45 | 60 | | I _C = 1A, I _B = 100mA |
| | | - | 85 | 115 | | I _C = 2A, I _B = 100mA |
| | | - | 155 | 195 | | I _C = 5A, I _B = 500mA |
| Base-Emitter Saturation Voltage (Notes 9) | V _{BE(sat)} | - | 1000 | 1100 | mV | I _C = 5A, I _B = 500mA |
| Base-Emitter Turn-on Voltage (Notes 9) | V _{BE(on)} | - | 900 | 1000 | mV | I _C = 5A, V _{CE} = 2V |
| Transitional Frequency | f _T | - | 130 | - | MHz | I _C = 100mA, V _{CE} = 10V, f = 50MHz |
| Output Capacitance | C _{obo} | - | 26 | - | pF | V _{CB} = 10V, f = 1MHz, |
| Switching Time | t _{on} | - | 41 | - | ns | V _{CC} = 10V, I _C = 1A, I _{B1} = I _{B2} = 100mA |
| | t _{off} | - | 1010 | - | | |

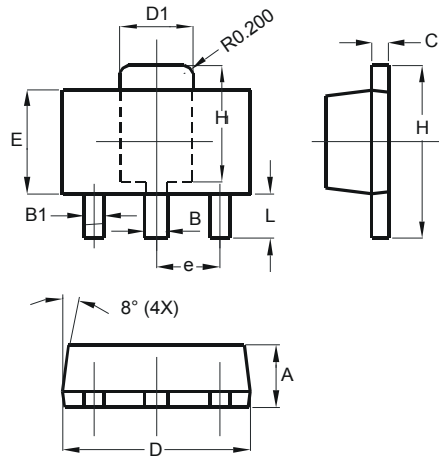
Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

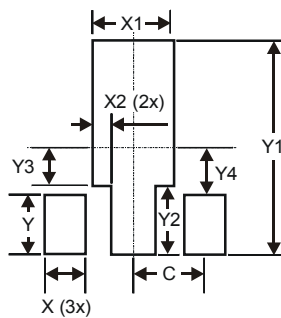
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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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