

100V NPN DARLINGTON TRANSISTOR IN SOT223

Features

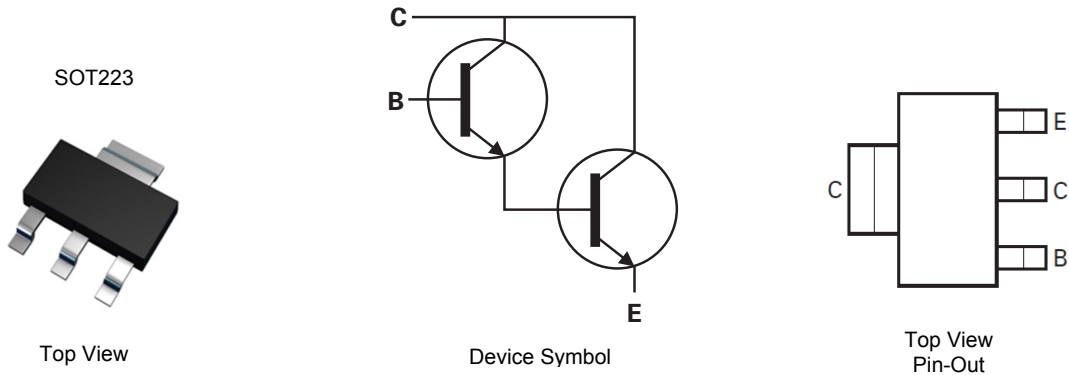
- $BV_{CEO} > 100V$
- $BV_{CBO} > 100V$
- $I_C = 1.5A$ high Continuous current
- $h_{FE} > 10k$ for very high gain @ 100mA
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT223
- 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: 0.112 grams (approximate)

Applications

- Lamp
- Relay
- Solenoid driving

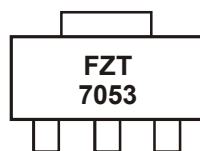


Ordering Information (Note 4)

| Product | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-----------|---------|--------------------|-----------------|-------------------|
| FZT7053TA | FZT7053 | 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



FZT7053 = Product Type Marking Code

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

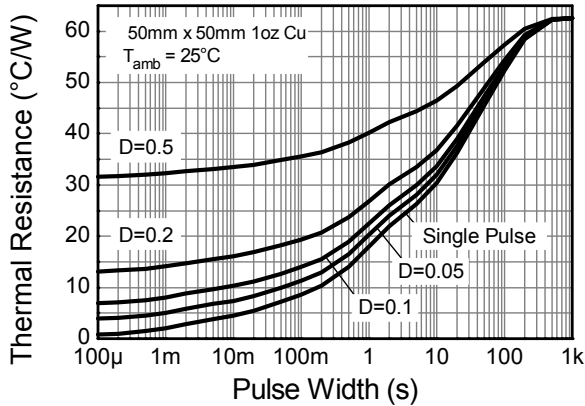
| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CB0} | 100 | V |
| Collector-Emitter Voltage | V _{CEO} | 100 | V |
| Emitter-Base Voltage | V _{EBO} | 12 | V |
| Continuous Collector Current | I _C | 1.5 | A |
| Peak Pulse Current | I _{CM} | 2 | A |

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

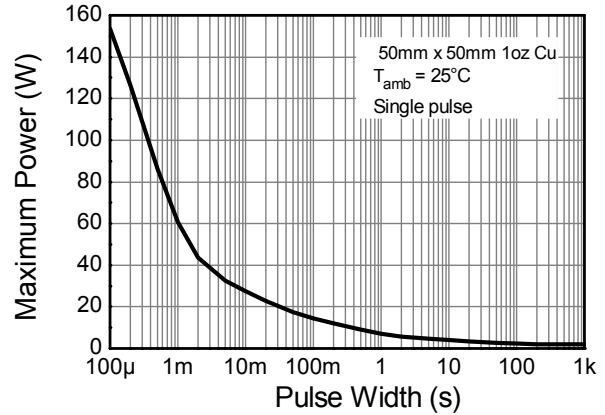
| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 1 | W |
| Power Dissipation (Note 6) | P _D | 1.25 | W |
| Power Dissipation (Note 7) | P _D | 2 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 125 | °C/W |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 100 | °C/W |
| Thermal Resistance, Junction to Ambient (Note 7) | R _{θJA} | 62 | °C/W |
| Thermal Resistance, Junction to Lead (Note 8) | R _{θJL} | 19.4 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

- Notes:
5. For a device surface mounted on 15mm x 14mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Same as note (5), except the device is surface mounted on 25mm x 25mm with 1oz copper.
 7. Same as note (5), except the device is surface mounted on 50mm x 50mm with 1oz copper.
 8. Thermal resistance from junction to solder-point (at the end of the collector lead).

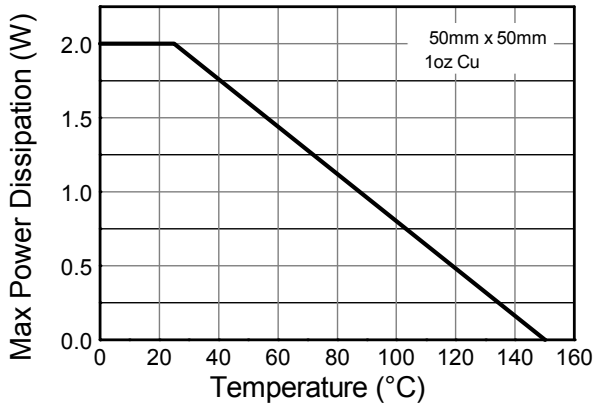
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Pulse Power Dissipation



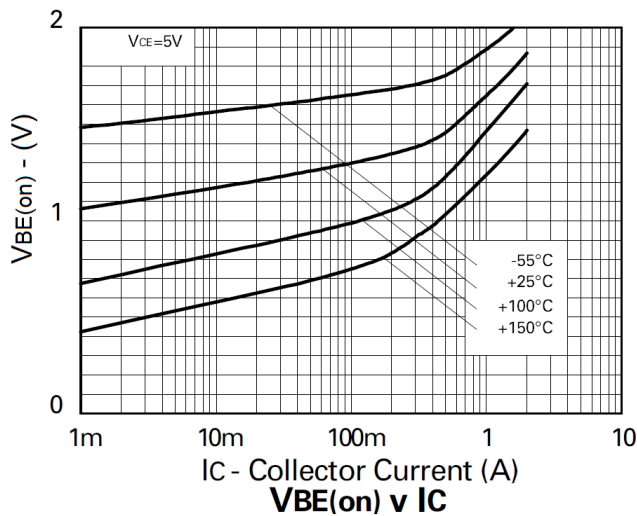
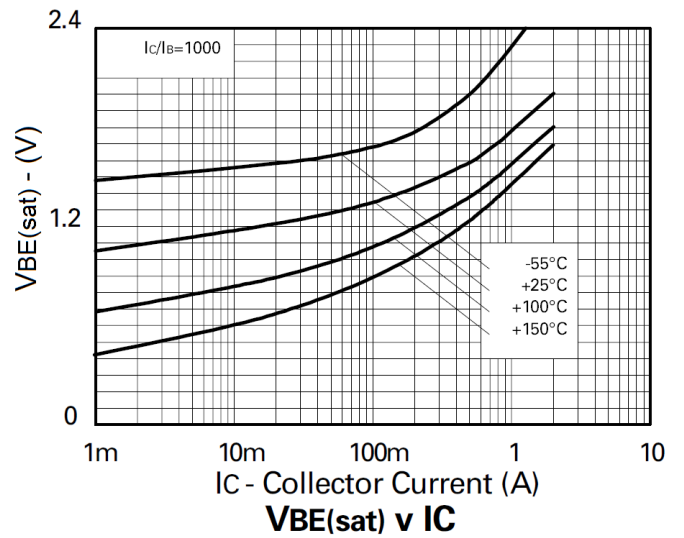
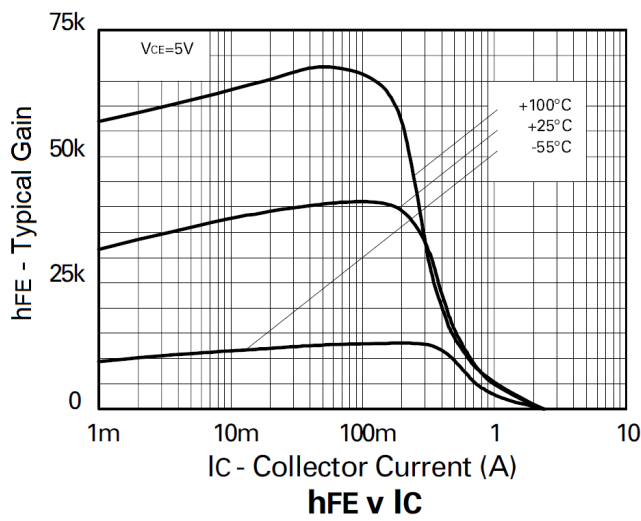
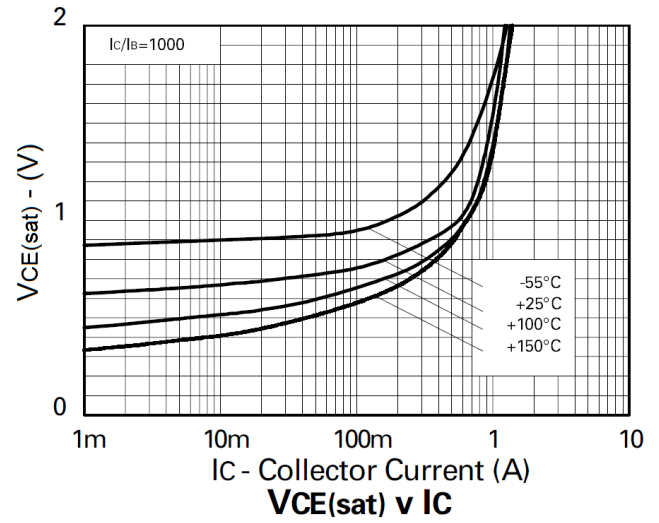
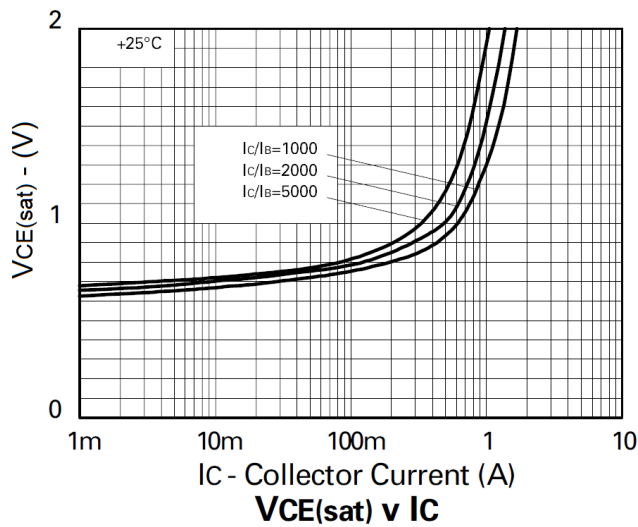
Derating Curve

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} | 100 | 300 | - | V | $I_C = 100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage (Note 9) | BV_{CEO} | 100 | 130 | - | V | $I_C = 1\text{mA}$ |
| Emitter-Base Breakdown Voltage | BV_{EBO} | 12 | 14 | - | V | $I_E = 100\mu\text{A}$ |
| Collector-Base Cutoff Current | I_{CBO} | - | <10 | 100 | nA | $V_{CB} = 80\text{V}$ |
| Collector-Emitter Cutoff Current | I_{CES} | - | <10 | 200 | nA | $V_{CE} = 80\text{V}$ |
| Emitter Cutoff Current | I_{EBO} | - | <10 | 100 | nA | $V_{EB} = 7\text{V}$ |
| DC Current Gain (Note 9) | h_{FE} | 10,000 1,000 | - | - | - | $I_C = 100\text{mA}$, $V_{CE} = 5\text{V}$ $I_C = 1\text{A}$, $V_{CE} = 5\text{V}$ |
| Collector-Emitter Saturation Voltage (Note 9) | $V_{CE(sat)}$ | - | - | 1.5 | V | $I_C = 100\text{mA}$, $I_B = 0.1\text{mA}$ |
| Base-Emitter Turn-On Voltage (Note 9) | $V_{BE(on)}$ | - | - | 2.0 | V | $I_C = 100\text{mA}$, $V_{CE} = 5\text{V}$ |
| Output Capacitance (Note 9) | C_{obo} | - | 6.0 | 8.0 | pF | $V_{CB} = 10\text{V}$, $f = 1\text{MHz}$ |
| Current Gain-Bandwidth Product (Note 9) | f_T | 200 | - | - | MHz | $V_{CE} = 5\text{V}$, $I_C = 100\text{mA}$ |
| Turn-On Time | t_{on} | - | 0.7 | - | μs | $V_{CC} = 10\text{V}$, $I_C = 100\mu\text{A}$ |
| Turn-Off Time | t_{off} | - | 2.5 | - | μs | $I_{B1} = -I_{B2} = 0.1\text{mA}$ |

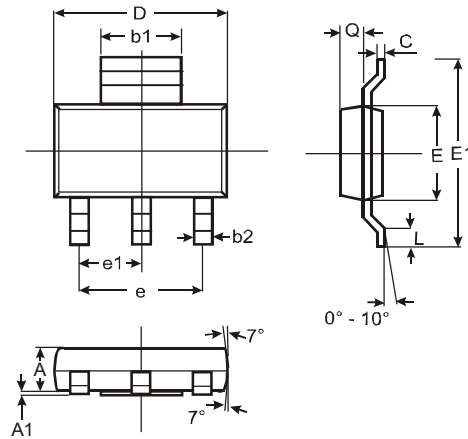
Notes: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



Package Outline Dimensions

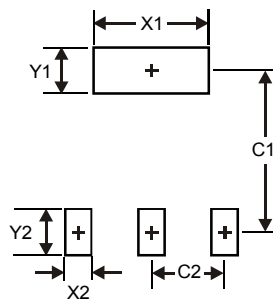
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT223 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b1 | 2.90 | 3.10 | 3.00 |
| b2 | 0.60 | 0.80 | 0.70 |
| C | 0.20 | 0.30 | 0.25 |
| D | 6.45 | 6.55 | 6.50 |
| E | 3.45 | 3.55 | 3.50 |
| E1 | 6.90 | 7.10 | 7.00 |
| e | — | — | 4.60 |
| e1 | — | — | 2.30 |
| L | 0.85 | 1.05 | 0.95 |
| Q | 0.84 | 0.94 | 0.89 |
| 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) |
|------------|---------------|
| X1 | 3.3 |
| X2 | 1.2 |
| Y1 | 1.6 |
| Y2 | 1.6 |
| C1 | 6.4 |
| C2 | 2.3 |

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