

100V NPN DARLINGTON TRANSISTOR IN SOT223

Features

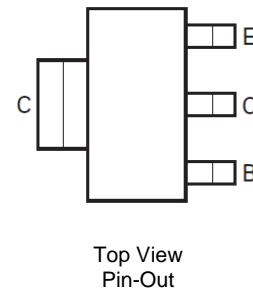
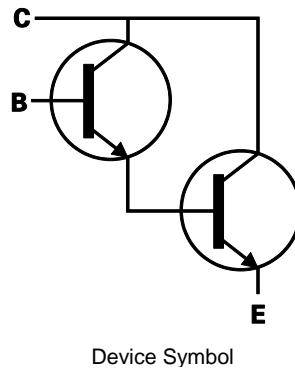
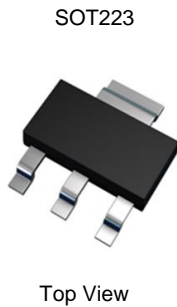
- $BV_{CEO} > 100V$
- $BV_{CBO} > 100V$
- $I_C = 1.5A$ High Continuous Current
- $hFE > 10k$ for very High Gain @100mA
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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

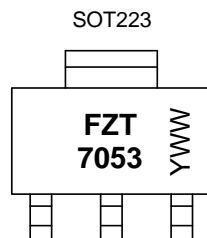


Ordering Information (Note 4)

| 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/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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



FZT 7053 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or $\bar{W}W$ = Week Code (01~53)

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

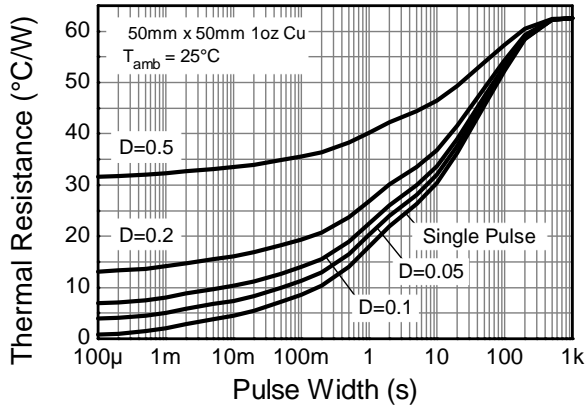
| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CB0} | 100 | V |
| Collector-Emitter Voltage | V _{CEO} | 100 | V |
| Emitter-Base Voltage | V _{EBO} | 12 | V |
| Continuous Collector Current | I _C | 1.5 | A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

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

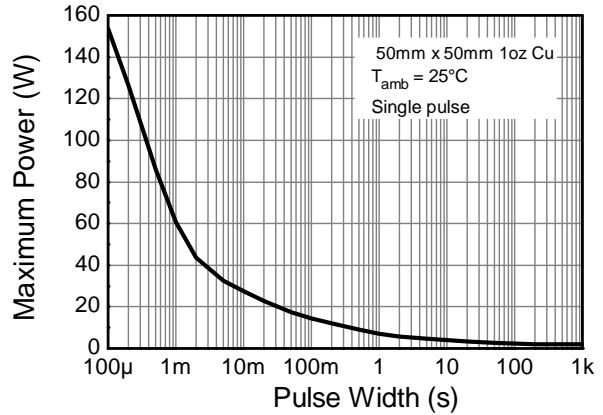
| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 1 | W |
| Power Dissipation (Note 6) | P _D | 1.25 | W |
| Power Dissipation (Note 7) | P _D | 2 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{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).

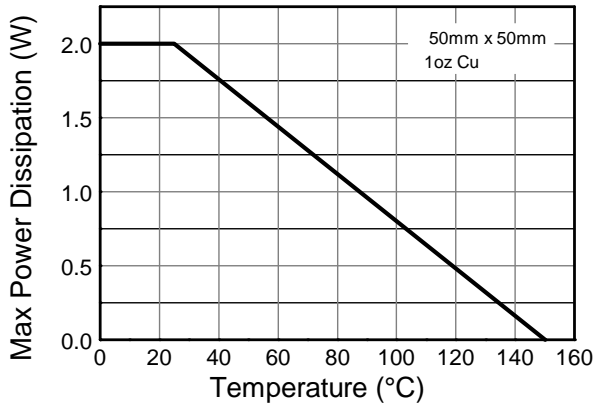
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Pulse Power Dissipation



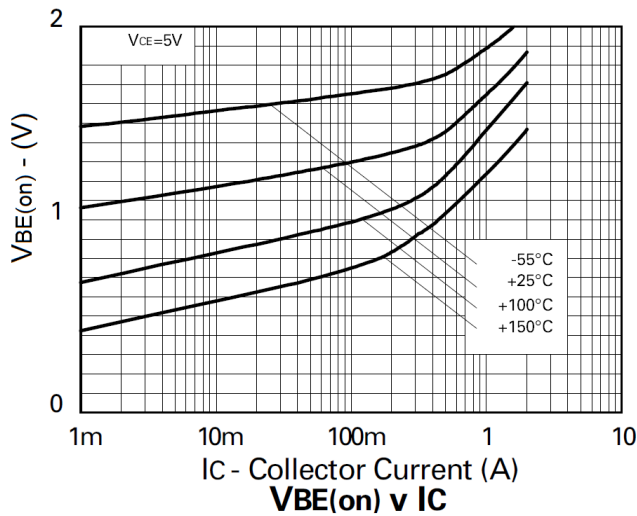
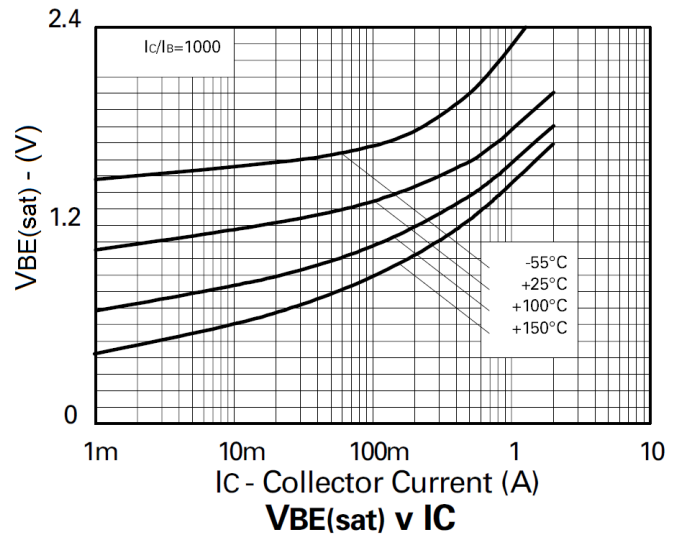
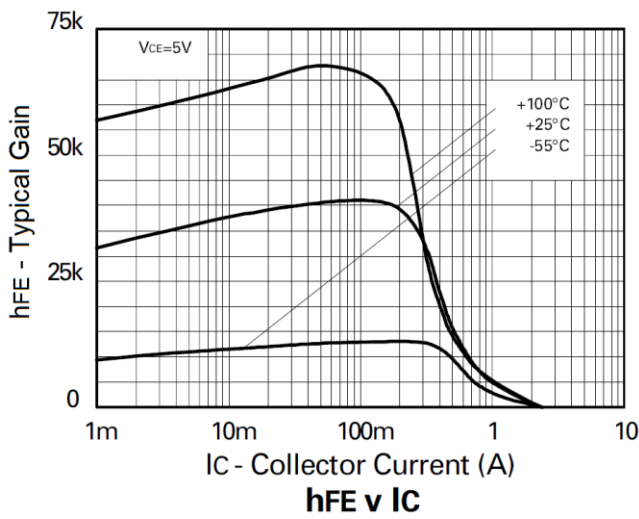
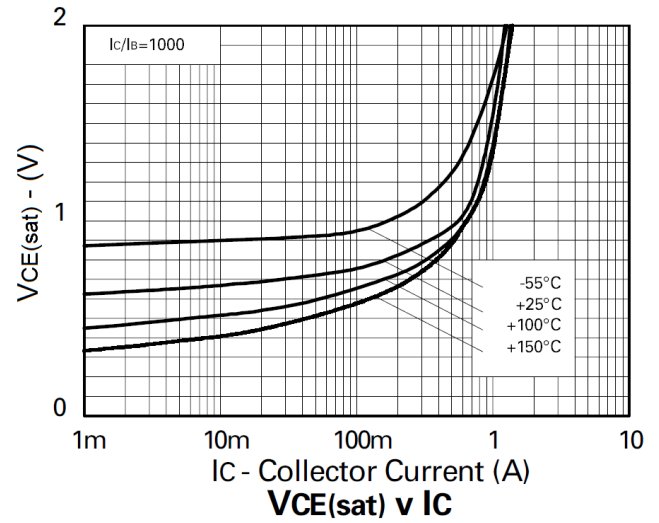
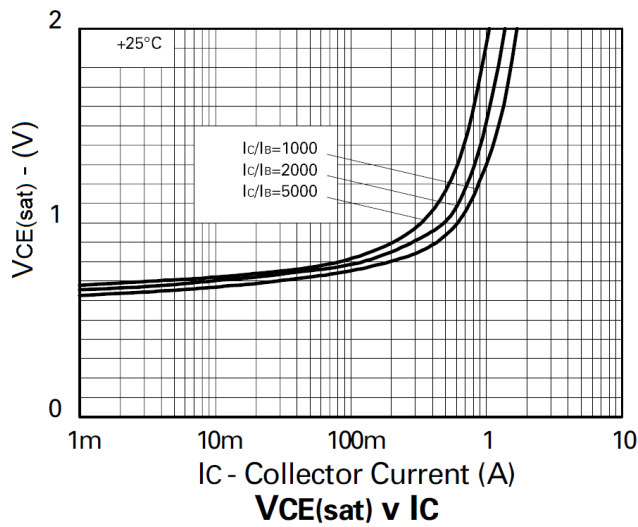
Derating Curve

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|----------------------|-----------------|-----|-----|------|---|
| Collector-Base Breakdown Voltage | BV _{CBO} | 100 | 300 | - | V | I _C = 100μA |
| Collector-Emitter Breakdown Voltage (Note 9) | BV _{CEO} | 100 | 130 | - | V | I _C = 1mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 12 | 14 | - | V | I _E = 100μA |
| Collector-Base Cut-Off Current | I _{CBO} | - | <10 | 100 | nA | V _{CB} = 80V |
| Collector-Emitter Cut-Off Current | I _{CES} | - | <10 | 200 | nA | V _{CE} = 80V |
| Emitter Cut-Off Current | I _{EBO} | - | <10 | 100 | nA | V _{EB} = 7V |
| DC Current Gain (Note 9) | h _{FE} | 10,000 1,000 | - | - | - | I _C = 100mA, V _{CE} = 5V I _C = 1A, V _{CE} = 5V |
| Collector-Emitter Saturation Voltage (Note 9) | V _{CE(sat)} | - | - | 1.5 | V | I _C = 100mA, I _B = 0.1mA |
| Base-Emitter Turn-On Voltage (Note 9) | V _{BE(on)} | - | - | 2.0 | V | I _C = 100mA, V _{CE} = 5V |
| Output Capacitance (Note 9) | C _{obo} | - | 6.0 | 8.0 | pF | V _{CB} = 10V, f = 1MHz |
| Current Gain-Bandwidth Product (Note 9) | f _T | 200 | - | - | MHz | V _{CE} = 5V, I _C = 100mA |
| Turn-On Time | t _{on} | - | 0.7 | - | μs | V _{CC} = 10V, I _C = 100μA |
| Turn-Off Time | t _{off} | - | 2.5 | - | μs | I _{B1} = -I _{B2} = 0.1mA |

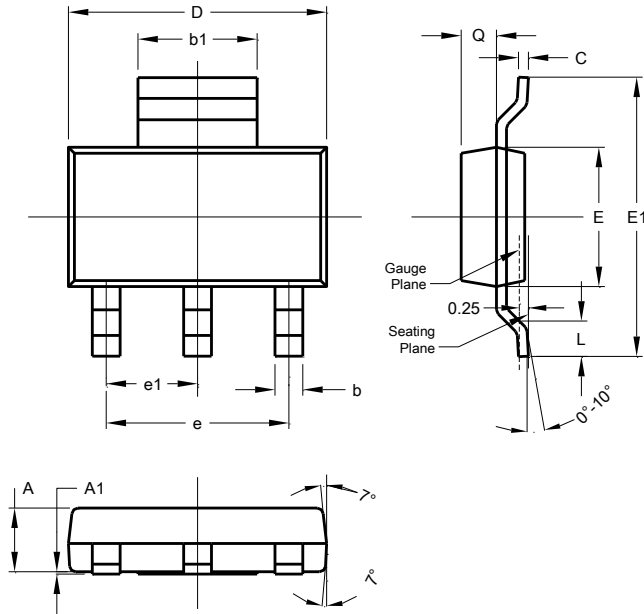
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

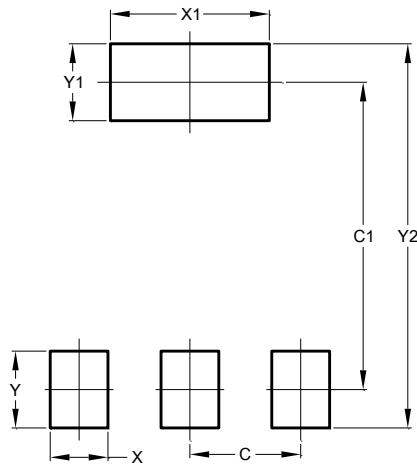
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT223 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b | 0.60 | 0.80 | 0.70 |
| b1 | 2.90 | 3.10 | 3.00 |
| 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) |
|------------|---------------|
| C | 2.30 |
| C1 | 6.40 |
| X | 1.20 |
| X1 | 3.30 |
| Y | 1.60 |
| Y1 | 1.60 |
| C2 | 8.00 |

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