

Features

- $BV_{CEO} > 60V$
- $I_C = 6A$ High Continuous Collector Current
- $I_{CM} = 20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)} < 100mV @ 1A$
- $R_{CE(SAT)} = 44m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified Up to 10A for a High Gain Hold Up
- Complementary PNP Type: FZT951
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

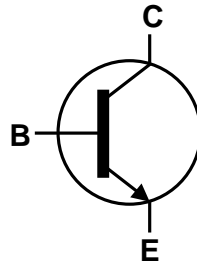
Mechanical Data

- 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 (e3)
- Weight: 0.112 grams (Approximate)

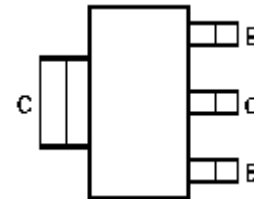
SOT223



Top View



Device Symbol


 Top View
Pin-Out

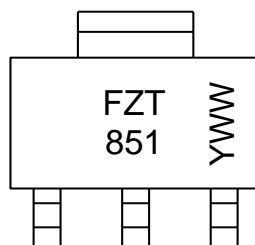
Ordering Information (Notes 4 & 5)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|-----------|------------|---------|--------------------|-----------------|-------------------|
| FZT851TA | AEC-Q101 | FZT851 | 7 | 12 | 1,000 |
| FZT851QTA | Automotive | FZT851 | 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT223



FZT 851 = 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 _{CBO} | 150 | V |
| Collector-Emitter Voltage | V _{CEO} | 60 | V |
| Emitter-Base Voltage | V _{EBO} | 7 | V |
| Continuous Collector Current | I _C | 6 | A |
| Peak Pulse Current | I _{CM} | 20 | A |

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

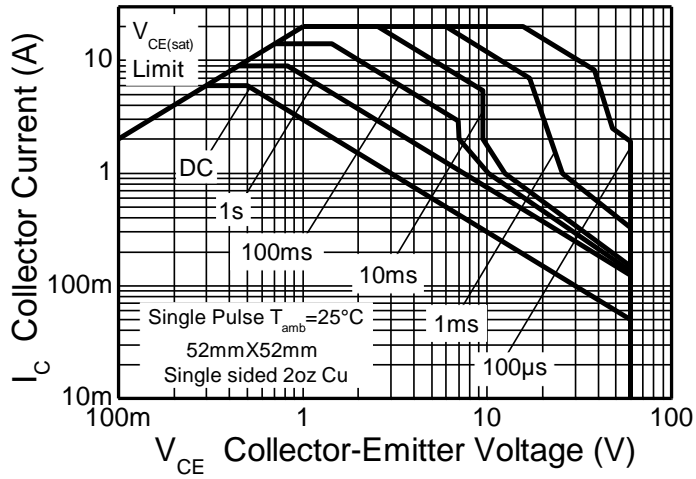
| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|-------|
| Power Dissipation | P _D | 3.0 | W |
| | | 24 | |
| Linear Derating Factor | | 1.6 | mW/°C |
| | | 12.8 | |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 42 | °C/W |
| | R _{θJA} | 78 | |
| Thermal Resistance Junction to Lead | R _{θJL} | 8.8 | |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 9)

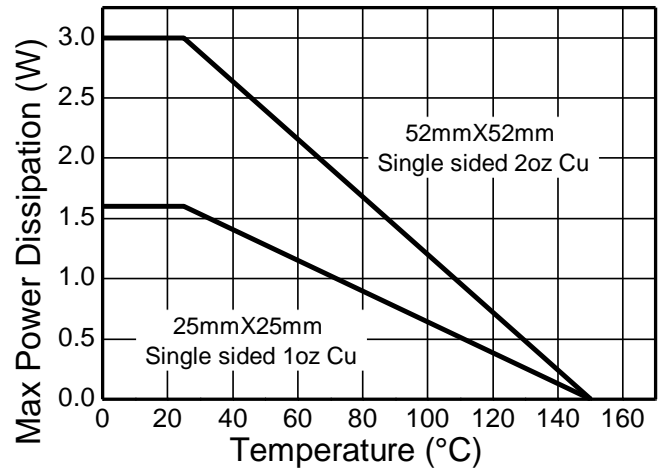
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 8,000 | V | 3B |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

- Notes:
6. For a device mounted with the collector lead on 52mm x 52mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.
 7. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
 8. Thermal resistance from junction to solder-point (at the end of the collector lead).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

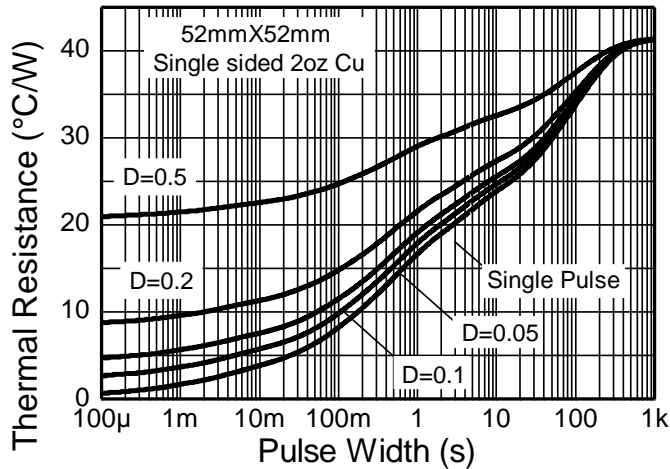
Thermal Characteristics and Derating Information



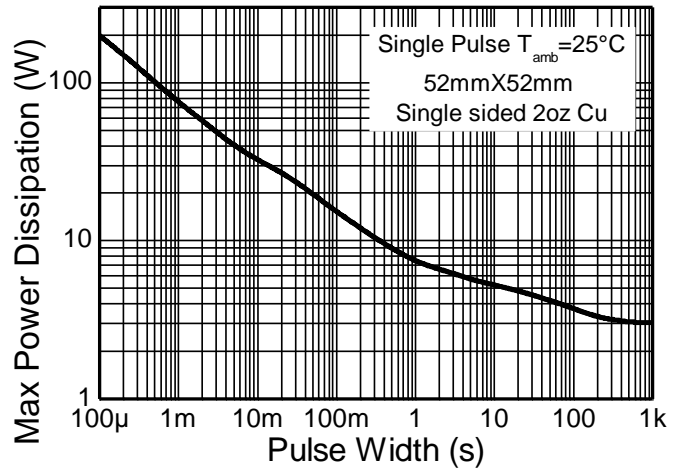
Safe Operating Area



Derating Curve



Transient Thermal Impedance



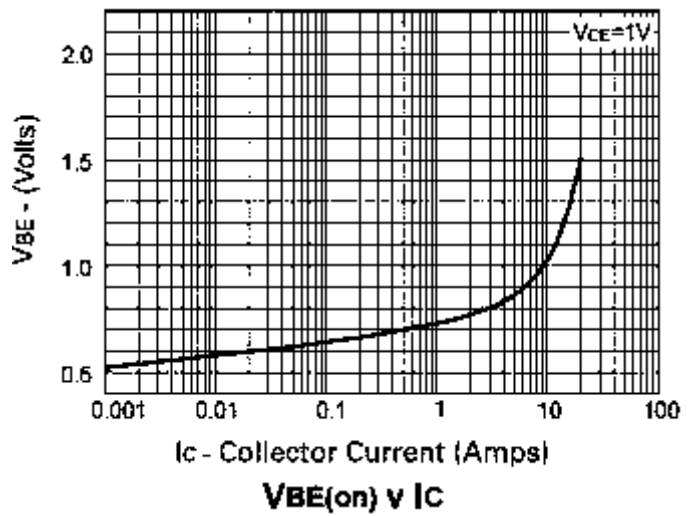
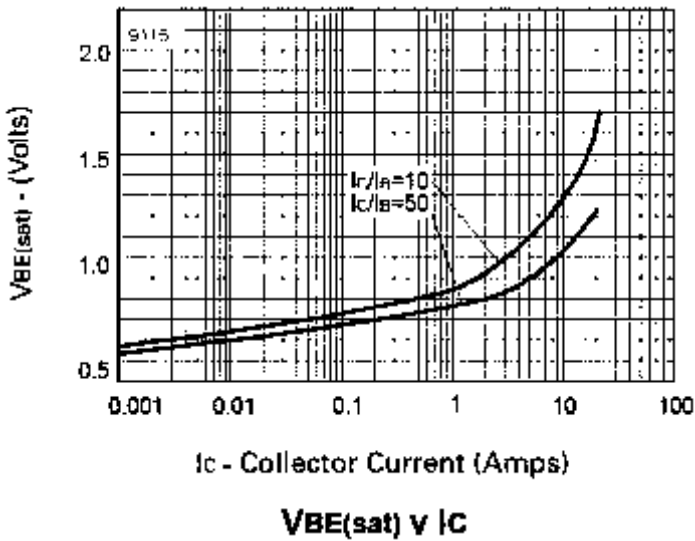
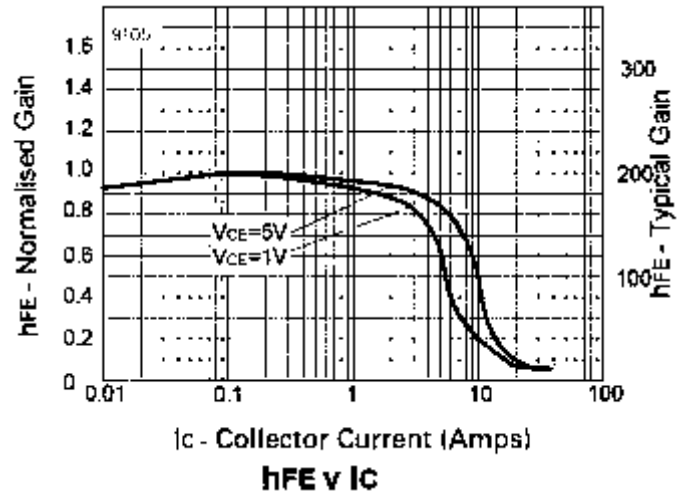
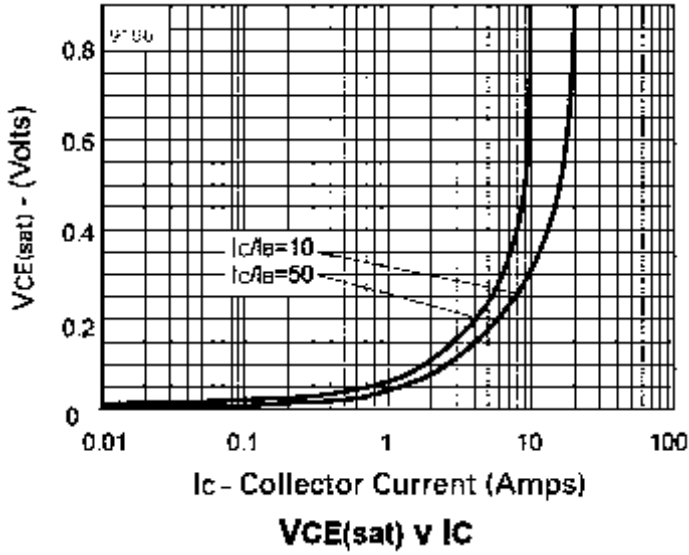
Pulse Power Dissipation

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|----------------------|-----|-------|-------|----------|---|
| Collector-Base Breakdown Voltage | BV _{CBO} | 150 | 220 | — | V | I _C = 100μA |
| Collector-Emitter Breakdown Voltage | BV _{CER} | 150 | 220 | — | V | I _C = 1μA, R _B ≤ 1kΩ |
| Collector-Emitter Breakdown Voltage (Note 10) | BV _{CEO} | 60 | 85 | — | V | I _C = 10mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 7 | 8.1 | — | V | I _E = 100μA |
| Collector Cut-Off Current | I _{CBO} | — | <1 | 50 | nA μA | V _{CB} = 120V V _{CB} = 120V, T _A = +100°C |
| Collector Cut-Off Current | I _{CER} | — | <1 | 50 | nA μA | V _{CE} = 120V, R _B ≤ 1kΩ V _{CE} = 120V, T _A = +100°C |
| Emitter Cut-Off Current | I _{EBO} | — | <1 | 10 | nA | V _{EB} = 6V |
| DC Current Gain (Note 10) | h _{FE} | 100 | 200 | — | — | I _C = 10mA, V _{CE} = 1V |
| | | 100 | 200 | 300 | | I _C = 2A, V _{CE} = 1V |
| | | 75 | 120 | — | | I _C = 5A, V _{CE} = 1V |
| | | 25 | 50 | — | | I _C = 10A, V _{CE} = 1V |
| Collector-Emitter Saturation Voltage (Note 10) | V _{CE(SAT)} | — | — | 50 | mV | I _C = 100mA, I _B = 5mA |
| | | — | — | 100 | | I _C = 1A, I _B = 50mA |
| | | — | — | 170 | | I _C = 2A, I _B = 50mA |
| | | — | — | 375 | | I _C = 6A, I _B = 300mA |
| Base-Emitter Saturation Voltage (Note 10) | V _{BE(SAT)} | — | — | 1,200 | mV | I _C = 6A, I _B = 300mA |
| Base-Emitter Turn-On Voltage (Note 10) | V _{BE(ON)} | — | — | 1,150 | mV | I _C = 6A, V _{CE} = 1V |
| Current Gain-Bandwidth Product (Note 10) | f _T | — | 130 | — | MHz | I _C = 100mA, V _{CE} = 10V, f = 50MHz |
| Output Capacitance | C _{OBO} | — | 45 | — | pF | V _{CB} = 10V, f = 1MHz |
| Switching Times | t _{ON} | — | 45 | — | ns | I _C = 1A, V _{CC} = 10V, I _{B1} = -I _{B2} = 100mA |
| | t _{OFF} | — | 1,100 | — | | |

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

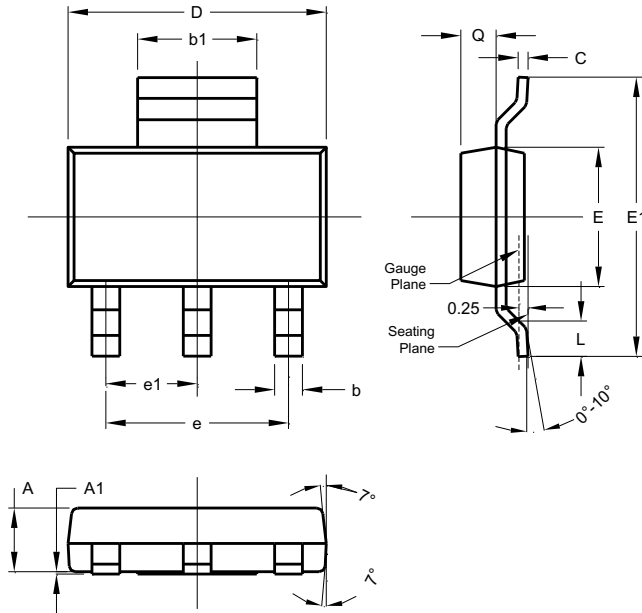
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT223



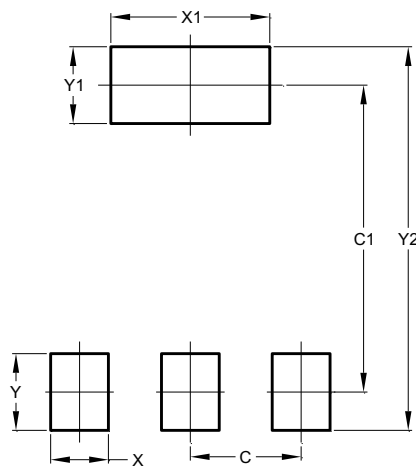
| SOT223 | | | |
|--------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b | 0.60 | 0.80 | 0.70 |
| b1 | 2.90 | 3.10 | 3.00 |
| C | 0.20 | 0.30 | 0.25 |
| D | 6.45 | 6.55 | 6.50 |
| E | 3.45 | 3.55 | 3.50 |
| E1 | 6.90 | 7.10 | 7.00 |
| e | - | - | 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 <http://www.diodes.com/package-outlines.html> for the latest version.

SOT223



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 2.30 |
| C1 | 6.40 |
| X | 1.20 |
| X1 | 3.30 |
| Y | 1.60 |
| Y1 | 1.60 |
| Y2 | 8.00 |

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