

Features

- $BV_{CEO} > -60V$
- $I_C = -5A$ High Continuous Collector Current
- $I_{CM} = -15A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)} < -140mV @ -1A$
- $R_{CE(SAT)} = 55m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified up to $-10A$ for a High Gain Hold-Up
- Complementary NPN Type: FZT851
- **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)**

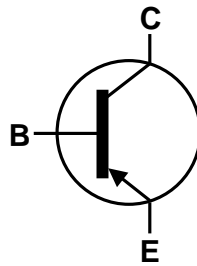
Mechanical Data

- 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)

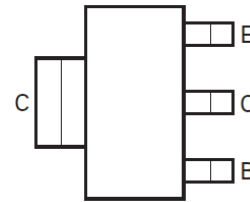


SOT223

Top View



Device Symbol



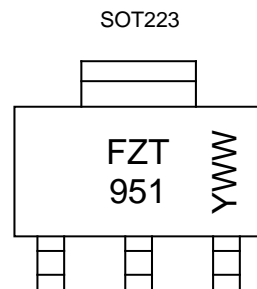
Top View
Pin-Out

Ordering Information (Notes 4 & 5)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|-----------|------------|---------|--------------------|-----------------|-------------------|
| FZT951TA | AEC-Q101 | FZT951 | 7 | 12 | 1000 |
| FZT951TC | AEC-Q101 | FZT951 | 13 | 12 | 4000 |
| FZT951QTA | Automotive | FZT951 | 7 | 12 | 1000 |
| FZT951QTC | Automotive | FZT951 | 13 | 12 | 4000 |

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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. Refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



FZT 951 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 8 = 2018)
 WW or $\bar{W}W$ = Week Code (01–53)

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | -100 | V |
| Collector-Emitter Voltage | V_{CEO} | -60 | V |
| Emitter-Base Voltage | V_{EBO} | -7 | V |
| Continuous Collector Current | I_C | -5 | A |
| Peak Pulse Current | I_{CM} | -15 | A |

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

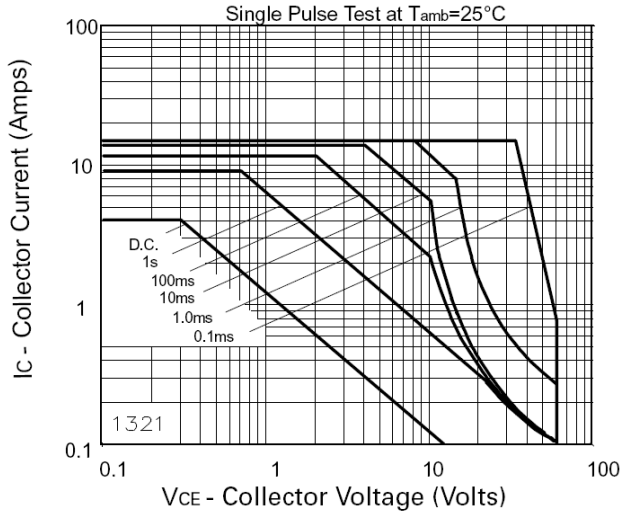
| Characteristic | Symbol | Value | Unit |
|---|--------------------------|-------------|----------------------|
| Power Dissipation | P_D | 3.0 | W |
| | | 24 | |
| Linear Derating Factor | | 1.6 | mW/ $^\circ\text{C}$ |
| | | 12.8 | |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ (Note 6) | 42 | $^\circ\text{C/W}$ |
| | $R_{\theta JA}$ (Note 7) | 78 | |
| Thermal Resistance Junction to Lead | $R_{\theta JL}$ (Note 8) | 8.8 | |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

ESD Ratings (Note 9)

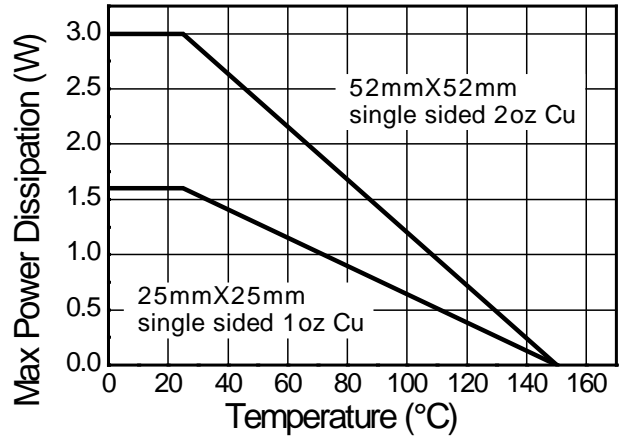
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge—Human Body Model | ESD HBM | 8000 | V | 3B |
| Electrostatic Discharge—Machine Model | ESD MM | 400 | V | C |

- 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.

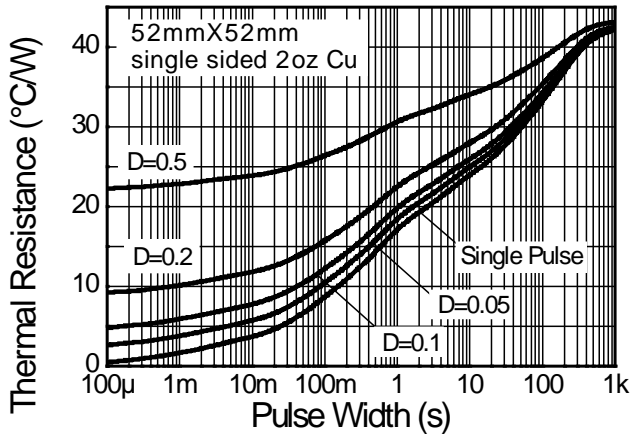
Thermal Characteristics and Derating Information



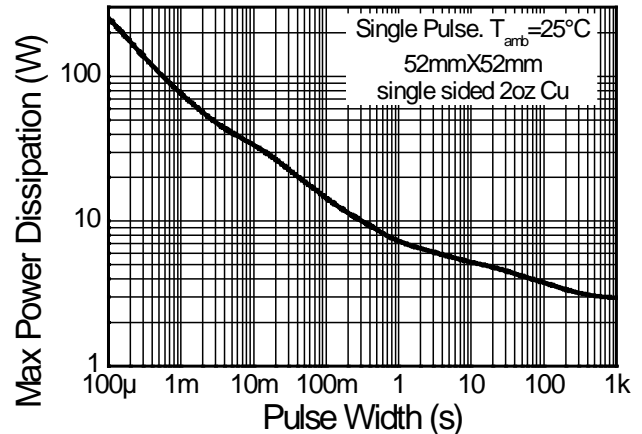
Safe Operating Area



Derating Curve



Transient Thermal Impedance



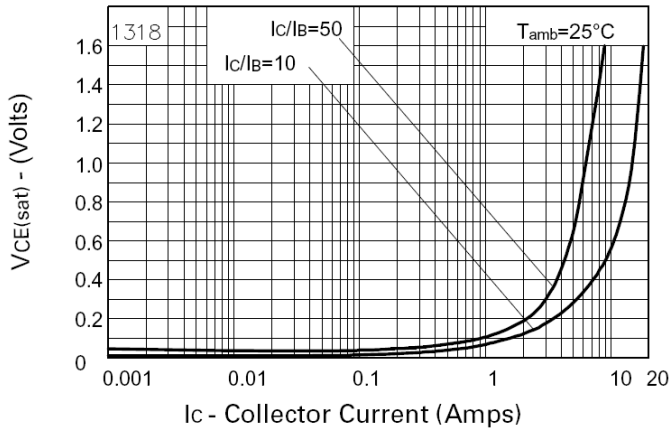
Pulse Power Dissipation

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

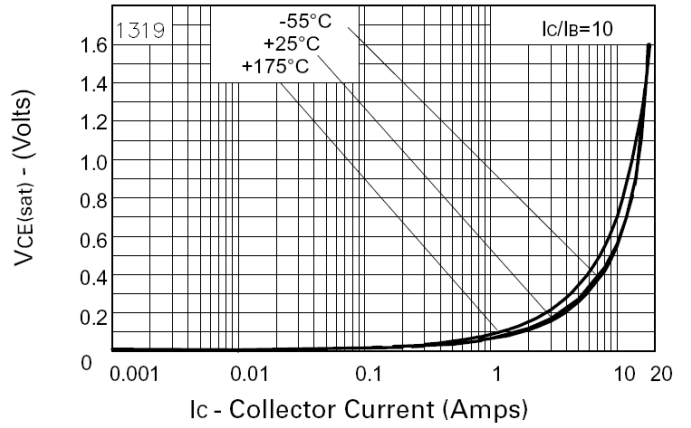
| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|--|----------------------|------|-------|-------|------|---|
| Collector-Base Breakdown Voltage | BV _{CBO} | -100 | -140 | — | V | I _C = -100μA |
| Collector-Emitter Breakdown Voltage (Note 10) | BV _{CER} | -100 | -140 | — | V | I _C = -1μA, R _B ≤ 1kΩ |
| Collector-Emitter Breakdown Voltage (Note 10) | BV _{CEO} | -60 | -90 | — | V | I _C = -10mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | -7 | -8 | — | V | I _E = -100μA |
| Collector Cut-Off Current | I _{CBO} | — | <-1 | -50 | nA | V _{CB} = -80V |
| Collector Cut-Off Current | I _{CER} | — | <-1 | -50 | μA | V _{CE} = -80V, R ≤ 1kΩ |
| Emitter Cut-Off Current | I _{EBO} | — | <-1 | -10 | nA | V _{EB} = -6V |
| DC Current Transfer Static Ratio (Note 10) | h _{FE} | 100 | 200 | — | — | I _C = -10mA, V _{CE} = -1V |
| | | 100 | 200 | 300 | | I _C = -2A, V _{CE} = -1V |
| | | 75 | 90 | — | | I _C = -5A, V _{CE} = -1V |
| | | 10 | 25 | — | | I _C = -10A, V _{CE} = -1V |
| Collector-Emitter Saturation Voltage (Note 10) | V _{CE(SAT)} | — | -20 | -50 | mV | I _C = -100mA, I _B = -10mA |
| | | — | -85 | -140 | | I _C = -1A, I _B = -100mA |
| | | — | -155 | -210 | | I _C = -2A, I _B = -200mA |
| | | — | -370 | -460 | | I _C = -5A, I _B = -500mA |
| Base-Emitter Saturation Voltage (Note 10) | V _{BE(SAT)} | — | -1080 | -1240 | mV | I _C = -5A, I _B = -500mA |
| Base-Emitter Turn-On Voltage (Note 10) | V _{BE(ON)} | — | -935 | -1070 | mV | I _C = -5A, V _{CE} = -1V |
| Transitional Frequency (Note 10) | f _T | — | 120 | — | MHz | I _C = -100mA, V _{CE} = -10V, f = 50MHz |
| Output Capacitance | C _{OBO} | — | 74 | — | pF | V _{CB} = -10V, f = 1MHz |
| Switching Time | t _{ON} | — | 82 | — | ns | V _{CC} = -10V, I _C = -2A, -I _{B1} = I _{B2} = -200mA |
| | t _{OFF} | — | 350 | — | | |

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

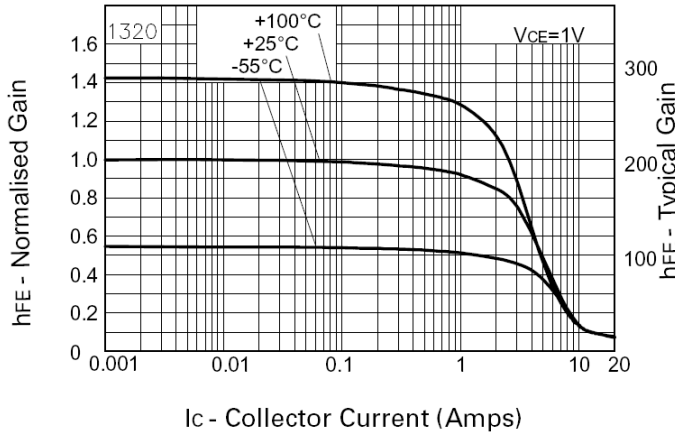
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



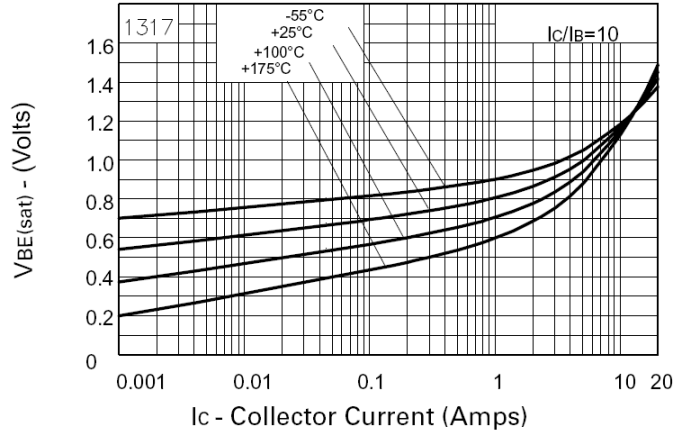
VCE(sat) v IC



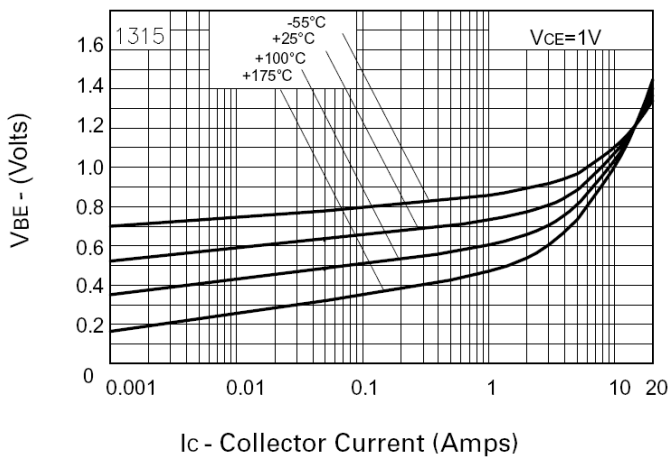
VCE(sat) v IC



hFE v IC



VBE(sat) v IC

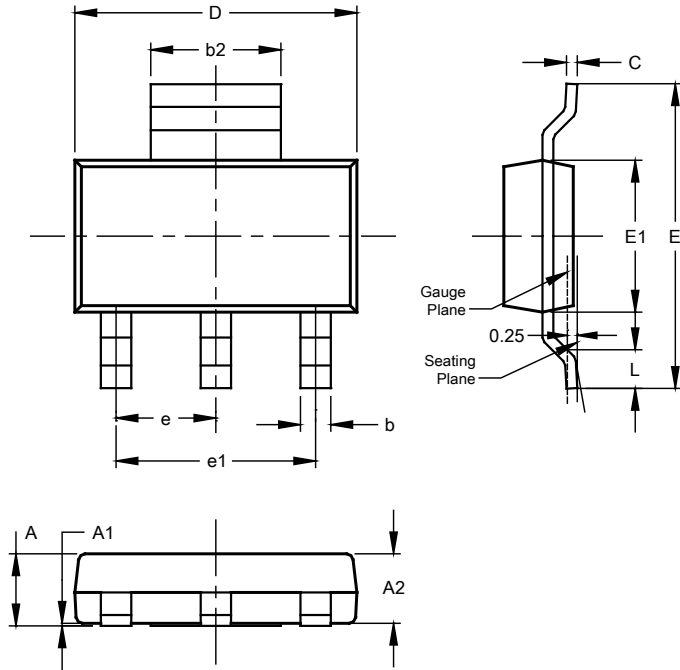


VBE(on) v IC

Package Outline Dimensions

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

SOT223 (Type DN)

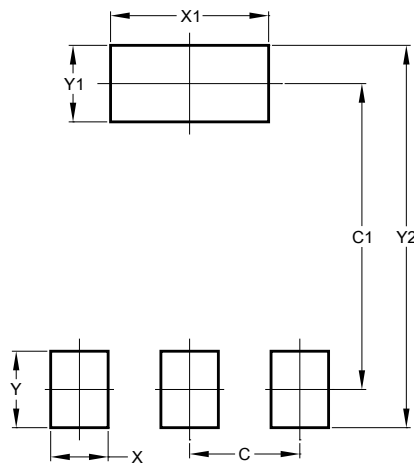


| SOT223 (Type DN) | | | |
|-----------------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | -- | 1.70 | -- |
| A1 | 0.01 | 0.15 | -- |
| A2 | 1.50 | 1.68 | 1.60 |
| b | 0.60 | 0.80 | 0.70 |
| b2 | 2.90 | 3.10 | -- |
| c | 0.20 | 0.32 | -- |
| D | 6.30 | 6.70 | -- |
| E | 6.70 | 7.30 | -- |
| E1 | 3.30 | 3.70 | -- |
| e | -- | -- | 2.30 |
| e1 | -- | -- | 4.60 |
| L | 0.85 | -- | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

SOT223 (Type DN)



| 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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