

Features

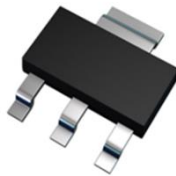
- $BV_{CEO} > -100V$
- $I_C = -5A$ High Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -115mV @ -1A$
- $R_{CE(sat)} = 75m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified up to $-10A$ for a High Gain Hold-up
- Complementary NPN Type: FZT853
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The FZT953Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

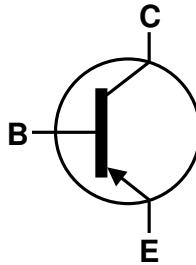
Mechanical Data

- Package: SOT223
- Package 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)

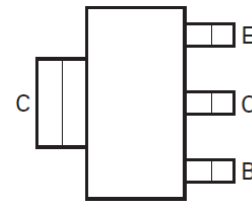
SOT223 (Type DN)



Top View



Device Symbol



Top View
Pin-Out

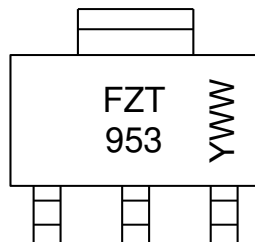
Ordering Information (Note 4)

| Part Number | Compliance | Package | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|-------------|------------|------------------|---------|--------------------|-----------------|---------|---------|
| | | | | | | Qty. | Carrier |
| FZT953QTA | Automotive | SOT223 (Type DN) | FZT953 | 7 | 12 | 1,000 | Reel |

- 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

SOT223 (Type DN)



FZT953 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 2 = 2022)
 WW or $\bar{W}W$ = Week Code (01 to 53)

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

| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CB0} | -140 | V |
| Collector-Emitter Voltage | V _{CEO} | -100 | V |
| Emitter-Base Voltage | V _{EBO} | -7 | V |
| Continuous Collector Current | I _C | -5 | A |
| Peak Pulse Current | I _{CM} | -10 | A |

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

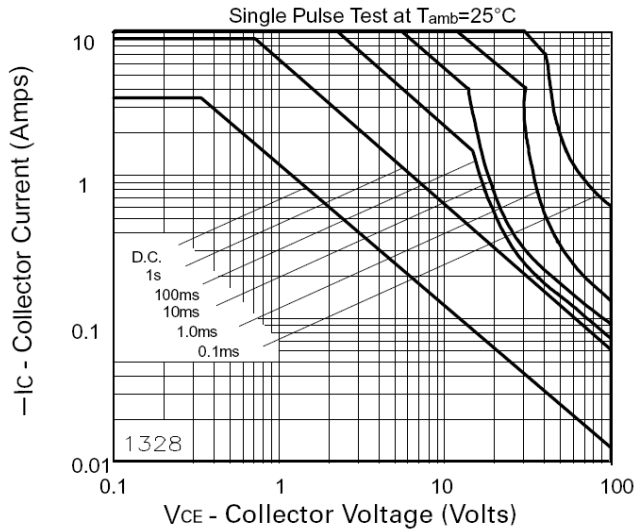
| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|-------|
| Power Dissipation | P _D | 3.0 | W |
| | | 24 | |
| Linear Derating Factor | | 1.6 | mW/°C |
| | | 12.8 | |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 42 | °C/W |
| | R _{θJA} | 78 | |
| Thermal Resistance, Junction to Lead | R _{θJL} | 8.84 | |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 8)

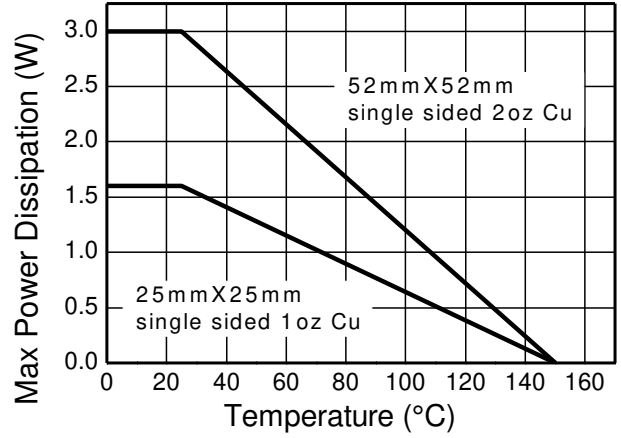
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

- Notes:
- For a device surface mounted on 52mm x 52mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as Note 5, except the device is surface mounted on 25mm x 25mm with 1oz copper.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

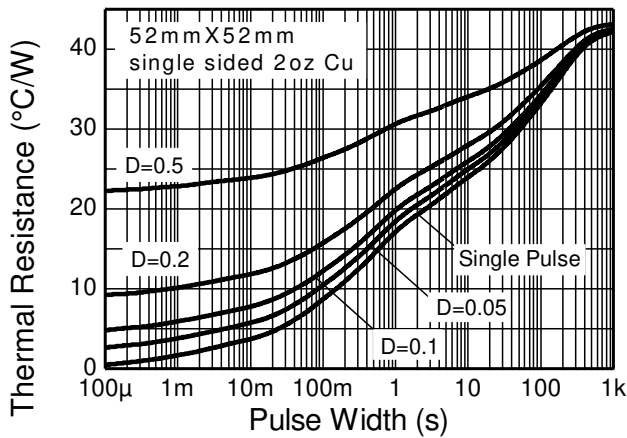
Thermal Characteristics and Derating Information



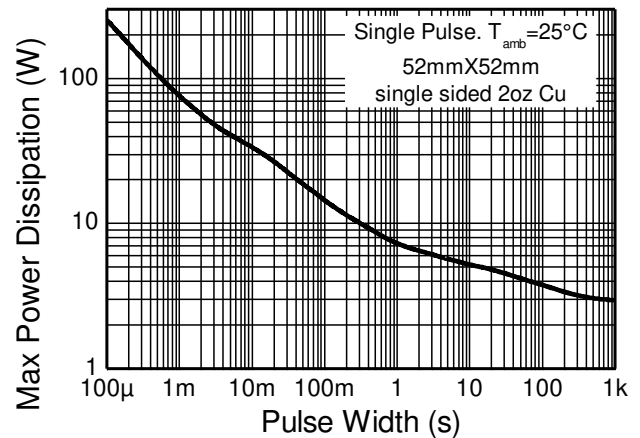
Safe Operating Area



Derating Curve



Transient Thermal Impedance



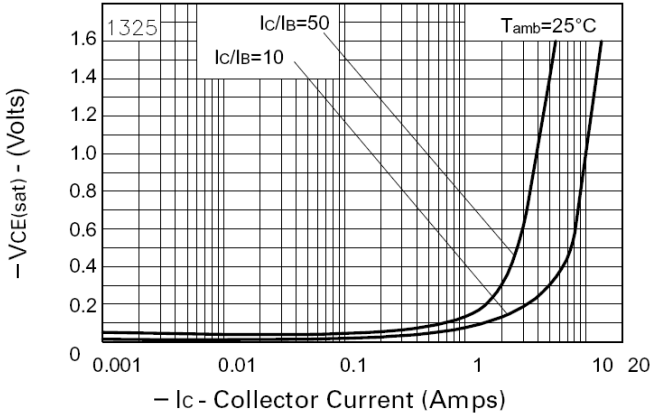
Pulse Power Dissipation

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

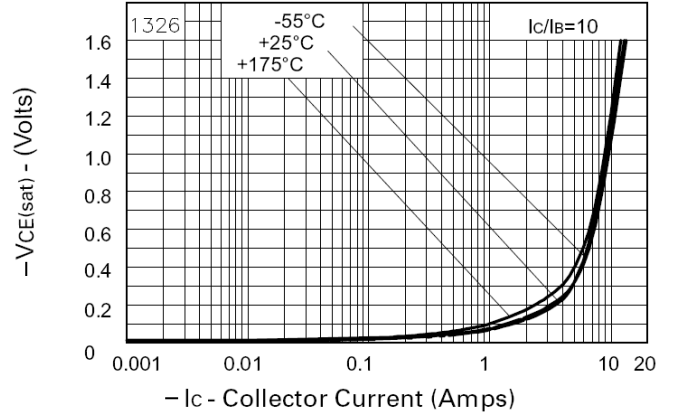
| Characteristic | Symbol | Min | Typ. | Max | Unit | Test Condition |
|---|----------------------|------|--------|-----------|----------|--|
| Collector-Base Breakdown Voltage | BV _{CBO} | -140 | -170 | — | V | I _C = -100μA |
| Collector-Emitter Breakdown Voltage (Note 9) | BV _{CER} | -140 | -170 | — | V | I _C = -1μA, R _B ≤ 1kΩ |
| Collector-Emitter Breakdown Voltage (Note 9) | BV _{CEO} | -100 | -120 | — | V | I _C = -1mA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | -7 | -8 | — | V | I _E = -100μA |
| Collector Cutoff Current | I _{CBO} | — | — | -50 -1 | nA μA | V _{CB} = -100V V _{CB} = -100V, T _A = +100°C |
| Collector Cutoff Current | I _{CER} | — | — | -50 -1 | nA μA | V _{CE} = -100V, R ≤ 1kΩ V _{CE} = -100V, T _A = +100°C |
| Emitter Cutoff Current | I _{EBO} | — | — | -10 | nA | V _{EB} = -6V |
| DC Current Transfer Static Ratio (Note 9) | h _{FE} | 100 | 200 | — | — | I _C = -10mA, V _{CE} = -1V |
| | | 100 | 200 | 300 | | I _C = -1A, V _{CE} = -1V |
| | | 50 | 90 | — | | I _C = -3A, V _{CE} = -1V |
| | | 30 | 50 | — | | I _C = -4A, V _{CE} = -1V |
| | | — | 15 | — | | I _C = -10A, V _{CE} = -1V |
| Collector-Emitter Saturation Voltage (Note 9) | V _{CE(sat)} | — | -20 | -50 | mV | I _C = -100mA, I _B = -10mA |
| | | — | -90 | -115 | | I _C = -1A, I _B = -100mA |
| | | — | -160 | -220 | | I _C = -2A, I _B = -200mA |
| | | — | -300 | -420 | | I _C = -4A, I _B = -400mA |
| Base-Emitter Saturation Voltage (Note 9) | V _{BE(sat)} | — | -1,010 | -1,170 | mV | I _C = -4A, I _B = -400mA |
| Base-Emitter Turn-On Voltage (Note 9) | V _{BE(on)} | — | -925 | -1,160 | mV | I _C = -4A, V _{CE} = -1V |
| Transitional Frequency | f _T | — | 125 | — | MHz | I _C = -100mA, V _{CE} = -10V f = 50MHz |
| Output Capacitance | C _{obo} | — | 65 | — | pF | V _{CB} = -10V, f = 1MHz |
| Switching Time | t _{on} | — | 110 | — | ns | V _{CC} = -10V, I _C = -2A I _{B1} = - I _{B2} = -200mA |
| | t _{off} | — | 460 | — | | |

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

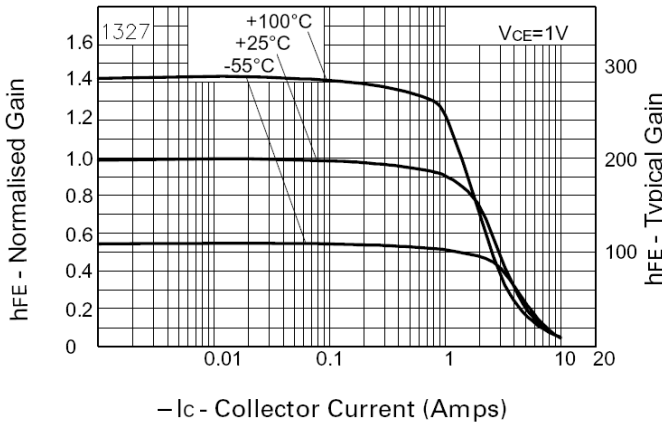
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



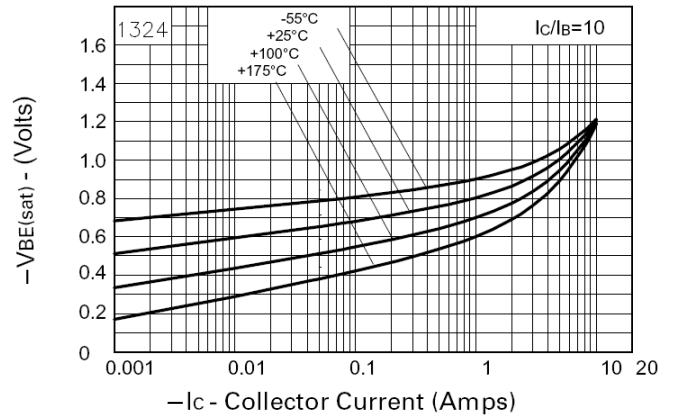
VCE(sat) v IC



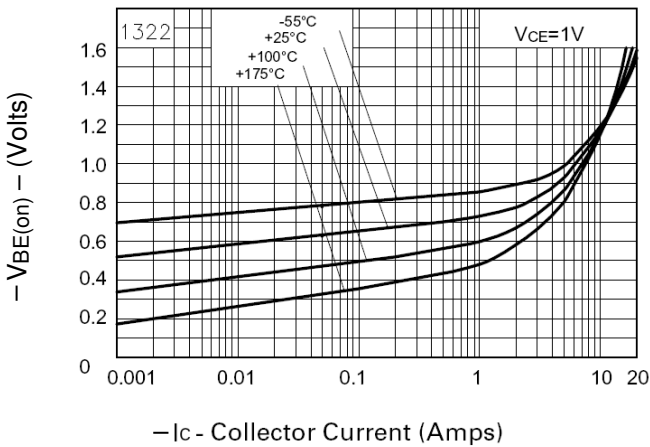
VCE(sat) v IC



hFE v IC



VBE(sat) v IC

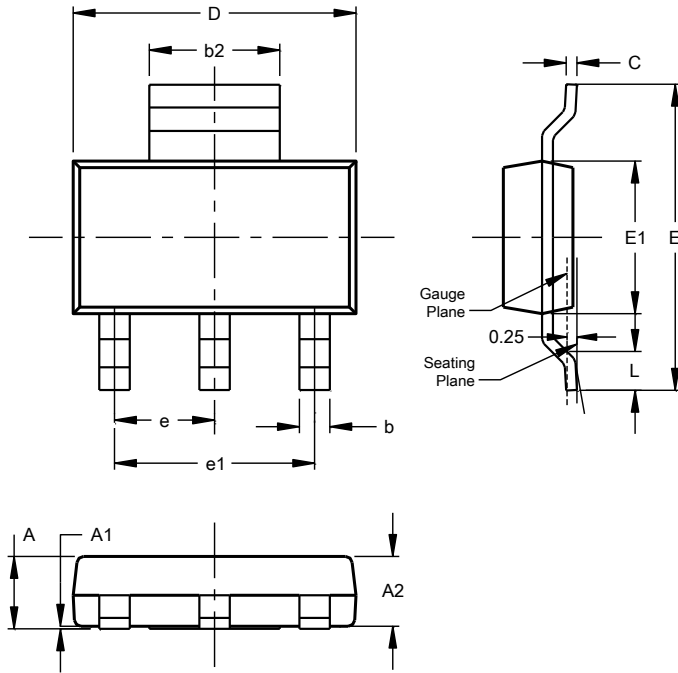


VBE(on) v IC

Package Outline Dimensions

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

SOT223 (Type DN)

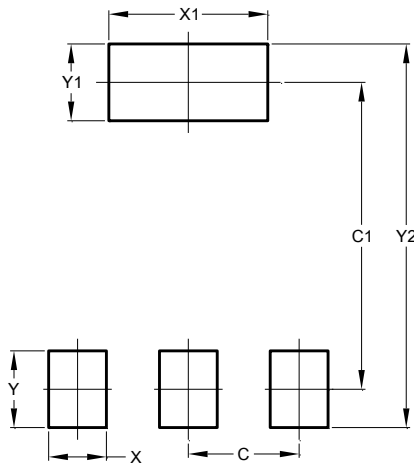


| SOT223 (Type DN) | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | -- | 1.70 | -- |
| A1 | 0.01 | 0.15 | -- |
| A2 | 1.50 | 1.68 | 1.60 |
| b | 0.60 | 0.80 | 0.70 |
| b2 | 2.90 | 3.10 | -- |
| c | 0.20 | 0.32 | -- |
| D | 6.30 | 6.70 | -- |
| E | 6.70 | 7.30 | -- |
| 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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