

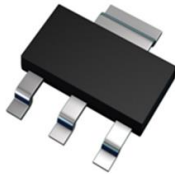
## Features

- $BV_{CEO} > 30V$
- $I_C = 1A$  High Continuous Current
- $I_{CM} = 4A$  Peak Pulse Current
- Low Saturation Voltage
- Complementary PNP Type: [FZT589](#)
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under a separate datasheet ([FZT489Q](#))**

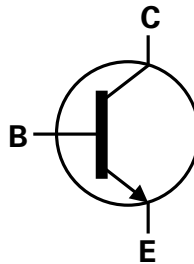
## Mechanical Data

- 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 
- Weight: 0.112 grams (Approximate)

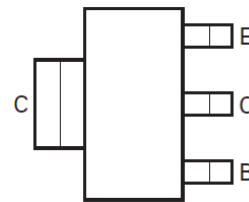
SOT223 (Type DN)



Top View



Device Symbol



Top View  
Pin-Out

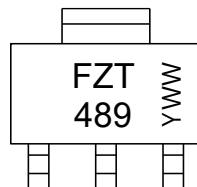
## Ordering Information (Note 4)

| Orderable Part Number | Package          | Marking | Reel Size (inches) | Tape Width (mm) | Packing |         |
|-----------------------|------------------|---------|--------------------|-----------------|---------|---------|
|                       |                  |         |                    |                 | Qty.    | Carrier |
| FZT489TA              | SOT223 (Type DN) | FZT489  | 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)



FZT489 = Product Type Marking Code  
 YYWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 6 = 2026)  
 WW or  $\bar{W}W$  = Week Code (01 to 53)

## Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic               | Symbol           | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage       | V <sub>CB0</sub> | 50    | V    |
| Collector-Emitter Voltage    | V <sub>CEO</sub> | 30    | V    |
| Emitter-Base Voltage         | V <sub>EB0</sub> | 7     | V    |
| Continuous Collector Current | I <sub>C</sub>   | 1     | A    |
| Base Current                 | I <sub>B</sub>   | 200   | mA   |
| Peak Pulse Current           | I <sub>CM</sub>  | 4     | A    |

## Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

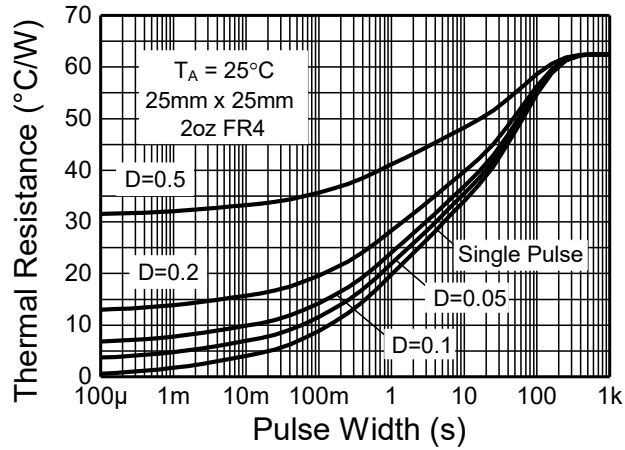
| Characteristic                          | Symbol                            | Value       | Unit |
|-----------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation                       | P <sub>D</sub>                    | 3.0         | W    |
|                                         |                                   | 2.0         |      |
|                                         |                                   | 1.6         |      |
|                                         |                                   | 1.2         |      |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 41.7        | °C/W |
|                                         |                                   | 62.5        |      |
|                                         |                                   | 78.1        |      |
|                                         |                                   | 104         |      |
| Thermal Resistance Junction to Lead     | R <sub>θJL</sub>                  | 19.4        |      |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

## ESD Ratings (Note 10)

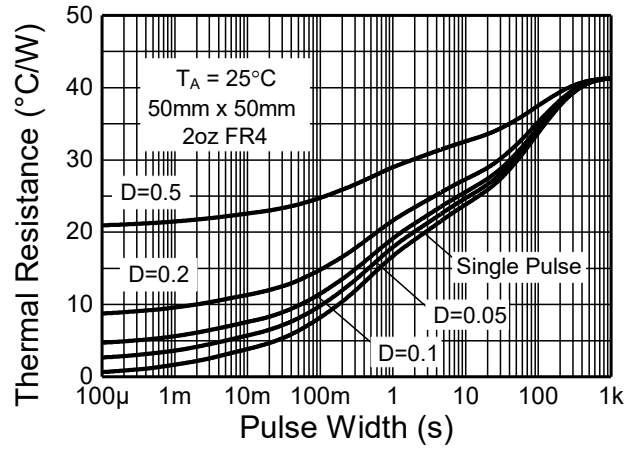
| Characteristic                             | Symbol  | Value | Unit | JEDEC Class |
|--------------------------------------------|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V    | 3A          |
| Electrostatic Discharge - Machine Model 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

- Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady state.
  6. Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
  7. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
  8. Same as Note 5, except the device is mounted on minimum recommended pad layout.
  9. Thermal resistance from junction to solder-point (at the end of the collector lead).
  10. Refer to JEDEC specifications JESD22-A114 and JESD22-A115.

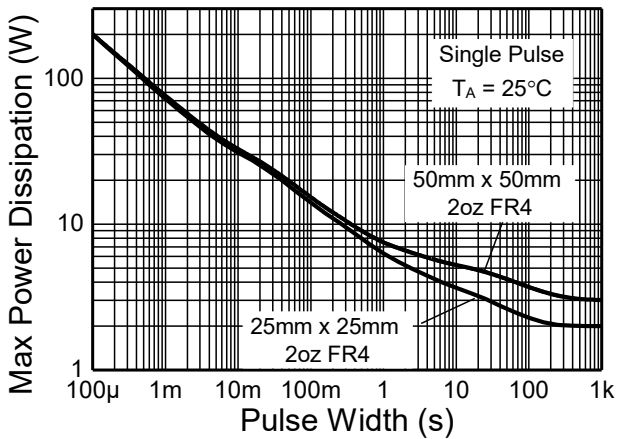
## Thermal Characteristics and Derating Characteristics



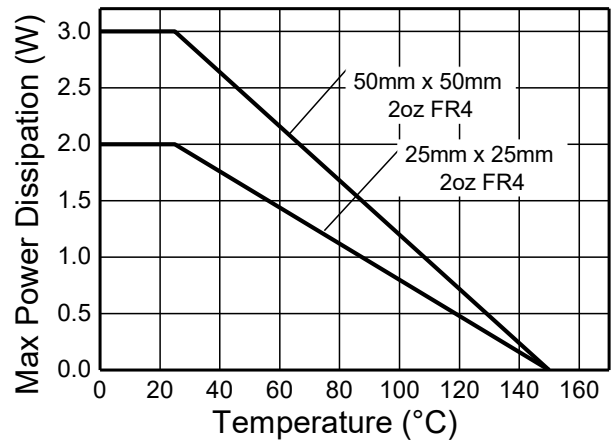
**Fig.1 Transient Thermal Impedance**



**Fig.2 Transient Thermal Impedance**



**Fig.3 Pulse Power Dissipation**



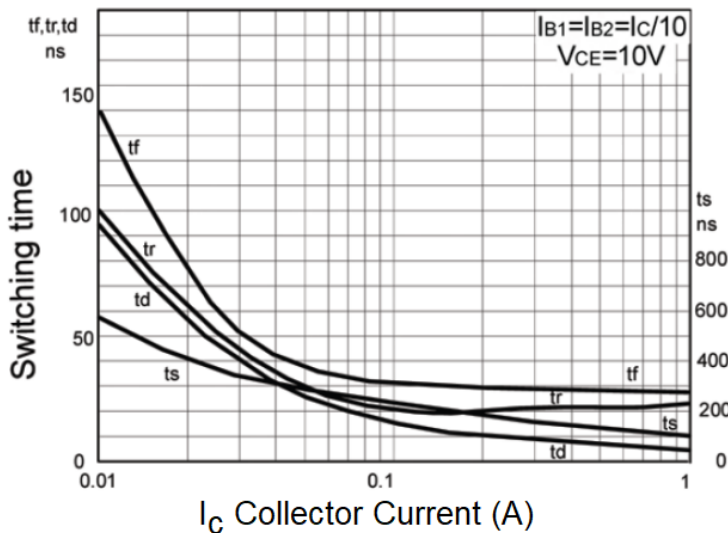
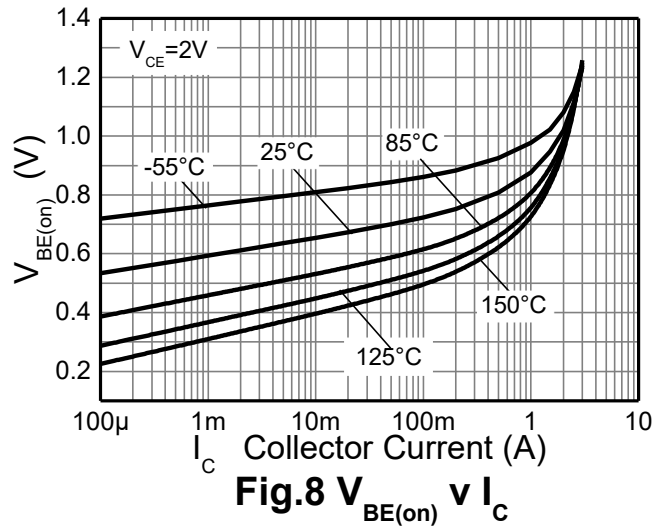
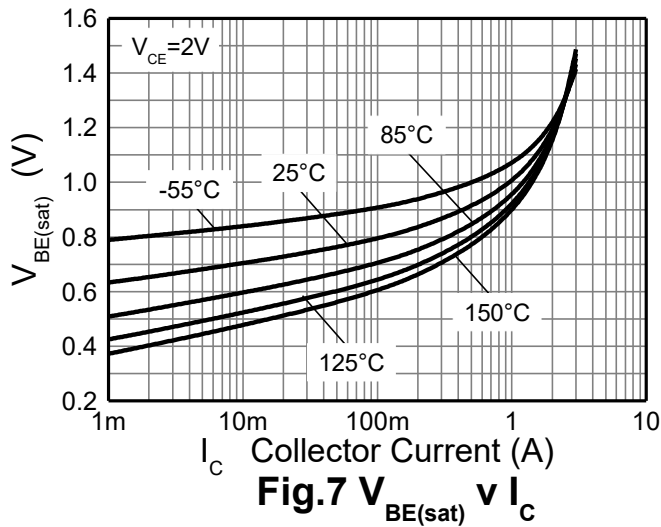
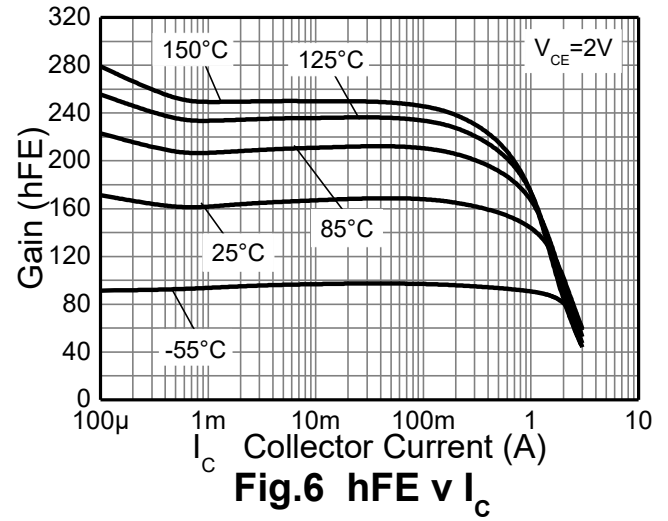
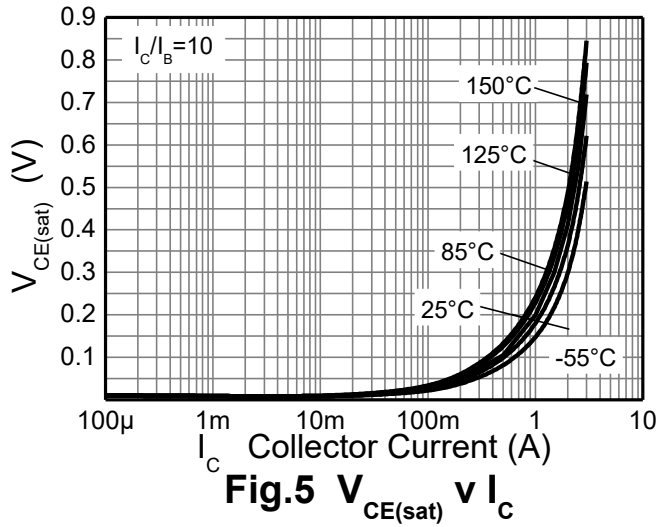
**Fig.4 Derating Curve**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                 | Symbol               | Min                    | Typ              | Max                | Unit | Test Condition                                                                                                                                                                    |
|------------------------------------------------|----------------------|------------------------|------------------|--------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage               | BV <sub>CBO</sub>    | 50                     | —                | —                  | V    | I <sub>C</sub> = 100μA                                                                                                                                                            |
| Collector-Emitter Breakdown Voltage (Note 11)  | BV <sub>CEO</sub>    | 30                     | —                | —                  | V    | I <sub>C</sub> = 10mA                                                                                                                                                             |
| Emitter-Base Breakdown Voltage                 | BV <sub>EBO</sub>    | 7                      | —                | —                  | V    | I <sub>E</sub> = 100μA                                                                                                                                                            |
| Collector Cutoff Current                       | I <sub>CBO</sub>     | —                      | —                | 100                | nA   | V <sub>CB</sub> = 30V                                                                                                                                                             |
| Collector Cutoff Current                       | I <sub>CES</sub>     | —                      | —                | 100                | nA   | V <sub>CE</sub> = 30V                                                                                                                                                             |
| Emitter Cutoff Current                         | I <sub>EBO</sub>     | —                      | —                | 100                | nA   | V <sub>EB</sub> = 4V                                                                                                                                                              |
| Collector-Emitter Saturation Voltage (Note 11) | V <sub>CE(sat)</sub> | —                      | —                | 0.3<br>0.6         | V    | I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA<br>I <sub>C</sub> = 2A, I <sub>B</sub> = 200mA                                                                                        |
| Base-Emitter Saturation Voltage (Note 11)      | V <sub>BE(sat)</sub> | —                      | —                | 1.1                | V    | I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA                                                                                                                                       |
| Base-Emitter Turn-On Voltage (Note 11)         | V <sub>BE(on)</sub>  | —                      | —                | 1.0                | V    | I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V                                                                                                                                         |
| DC Current Gain (Note 11)                      | h <sub>FE</sub>      | 100<br>100<br>60<br>20 | —<br>—<br>—<br>— | —<br>300<br>—<br>— | —    | I <sub>C</sub> = 1mA, V <sub>CE</sub> = 2V<br>I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V<br>I <sub>C</sub> = 2A, V <sub>CE</sub> = 2V<br>I <sub>C</sub> = 4A, V <sub>CE</sub> = 2V |
| Current Gain-Bandwidth Product                 | f <sub>T</sub>       | 150                    | —                | —                  | MHz  | V <sub>CE</sub> = 10V, I <sub>C</sub> = 50mA,<br>f = 100MHz                                                                                                                       |
| Output Capacitance                             | C <sub>obo</sub>     | —                      | —                | 10                 | pF   | V <sub>CB</sub> = 10V, f = 1MHz                                                                                                                                                   |

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

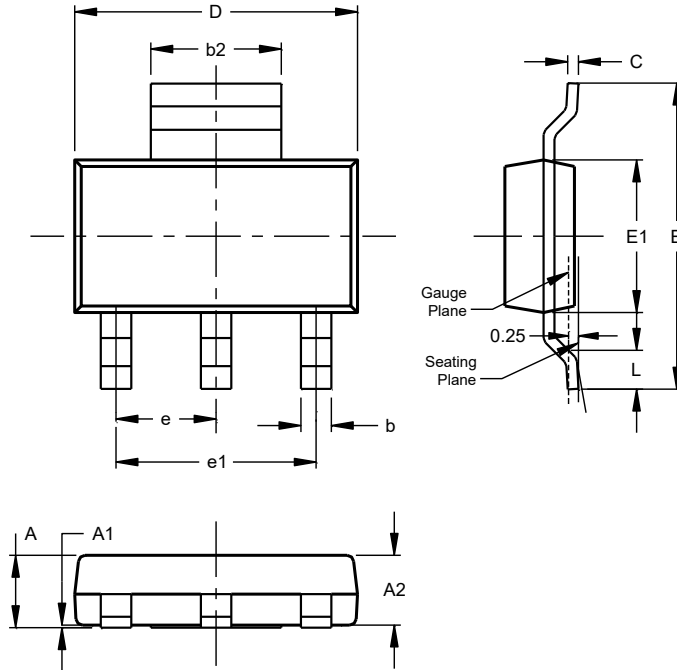
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

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

SOT223 (Type DN)

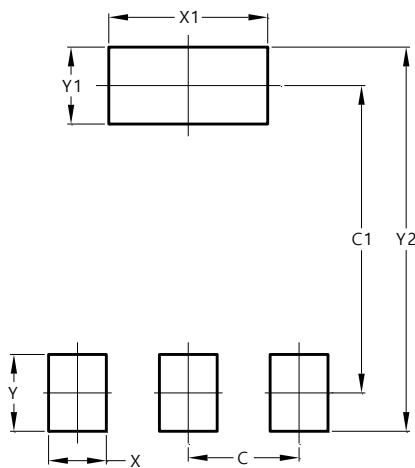


| SOT223 (Type DN)     |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | --   | 1.70 | --   |
| A1                   | 0.01 | 0.15 | --   |
| A2                   | 1.50 | 1.68 | 1.60 |
| b                    | 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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