

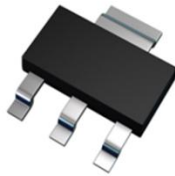
30V NPN MEDIUM POWER HIGH CURRENT TRANSISTOR IN SOT223
Features

- $BV_{CEO} > 30V$
- $I_C = 7A$ High Continuous Collector Current
- $I_{CM} = 20A$ Peak Pulse Current
- $P_D = 3W$ Power Dissipation
- Extremely Low Equivalent On-Resistance; $R_{CE(SAT)} = 36\Omega$ at 5A
- Very Low Saturation Voltages
- Complimentary PNP Type FZT949
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

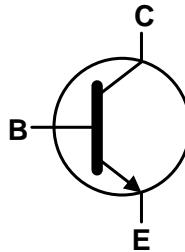
Mechanical Data

- 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
- Weight: 0.112 grams (Approximate)

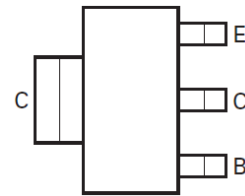
SOT223



Top View



Equivalent Circuit


 Top View
Pin-Out

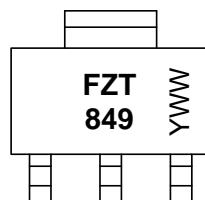
Ordering Information (Note 4)

| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity Per Reel |
|-------------|------------|---------|--------------------|-----------------|-------------------|
| FZT849TA | AEC-Q101 | FZT849 | 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

SOT223



FZT 849 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 6 = 2016)
 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 _{CBO} | 80 | V |
| Collector-Emitter Voltage | V _{CEO} | 30 | V |
| Emitter-Base Voltage | V _{EBO} | 7 | V |
| Continuous Collector Current | I _C | 7 | A |
| Peak Pulse Current | I _{CM} | 20 | A |

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

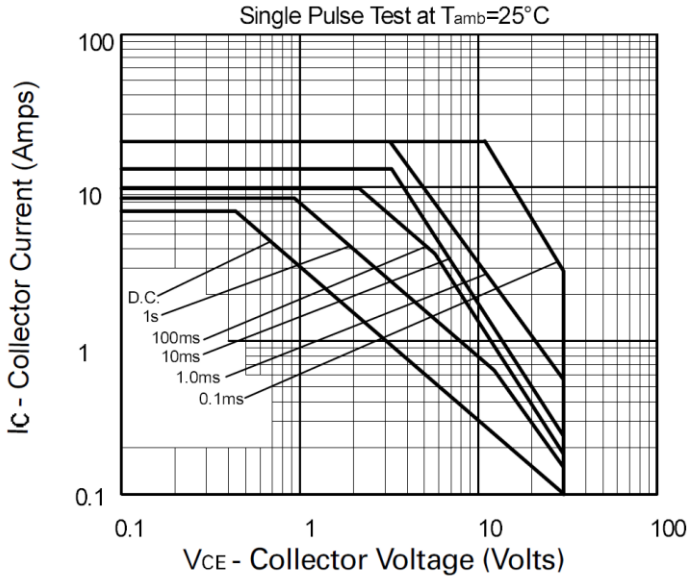
| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|-------|
| Power Dissipation | P _D | 3 | W |
| | | 24 | |
| Linear Derating Factor | | 1.6 | mW/°C |
| | | 12.8 | |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 42 | °C/W |
| | R _{θJA} | 78 | |
| 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 8)

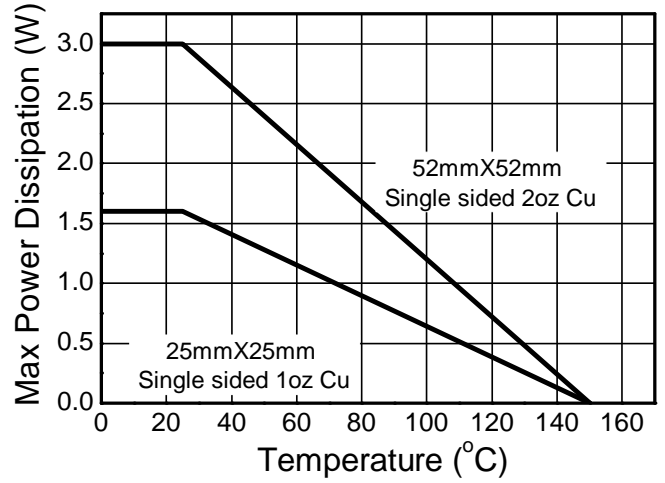
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

- Notes:
5. For a device mounted with the collector lead on 52mm x 52mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
 6. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of the collector lead).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

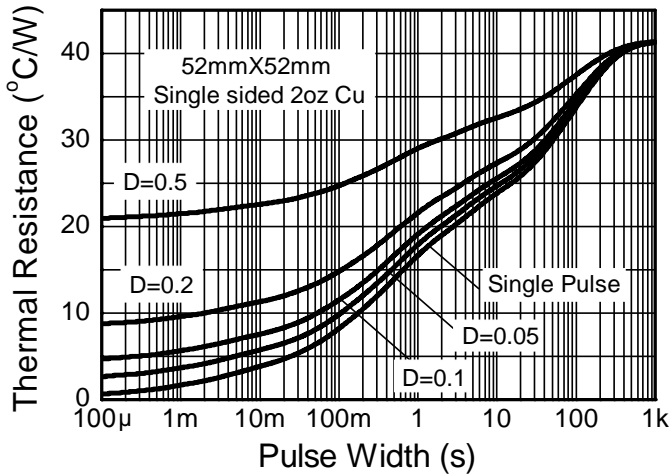
Thermal Characteristics and Derating Information



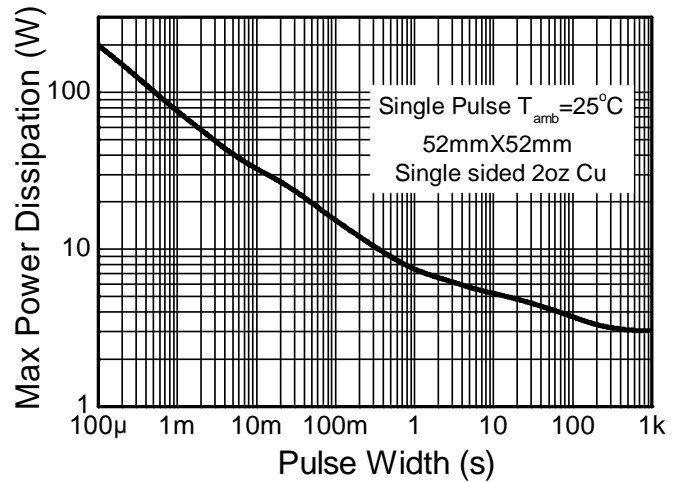
Safe Operating Area



Derating Curve



Transient Thermal Impedance



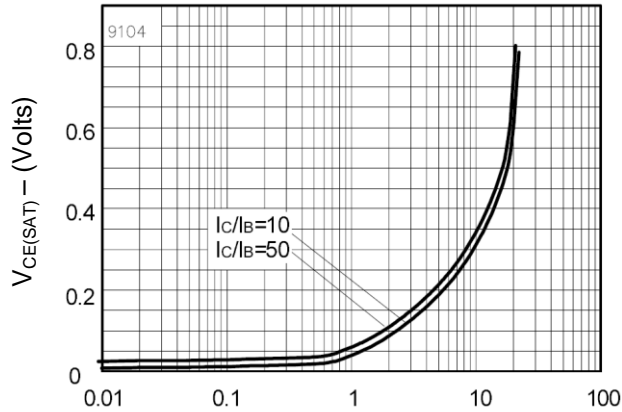
Pulse Power Dissipation

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---------------|-----|----------------------|-------------------------|---------------------|---|
| Collector-Base Breakdown Voltage | BV_{CBO} | 80 | 120 | — | V | $I_C = 100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | BV_{CER} | 80 | 120 | — | V | $I_C = 1\mu\text{A}$, $R \leq 1\text{k}\Omega$ |
| Collector-Emitter Breakdown Voltage (Note 9) | BV_{CEO} | 30 | 40 | — | V | $I_C = 10\text{mA}$ |
| Emitter-Base Breakdown Voltage | BV_{EBO} | 6 | 8 | — | V | $I_E = 100\mu\text{A}$ |
| Collector-Base Cut-Off Current | I_{CBO} | — | — | 50 1 | nA μA | $V_{CB} = 70\text{V}$ $V_{CB} = 70\text{V}$, $T_A = +100^\circ\text{C}$ |
| Collector Cut-Off Current | I_{CER} | — | — | 50 | nA | $V_{CE} = 70\text{V}$, $R \leq 1\text{k}\Omega$ |
| | | — | — | 1 | μA | $V_{CE} = 70\text{V}$, $R \leq 1\text{k}\Omega$, $T_A = +100^\circ\text{C}$ |
| Emitter Cut-Off Current | I_{EBO} | — | — | 10 | nA | $V_{EB} = 6\text{V}$ |
| Collector-Emitter Saturation Voltage (Note 9) | $V_{CE(SAT)}$ | — | 35 67 188 — | 50 110 215 350 | mV | $I_C = 500\text{mA}$, $I_B = 20\text{mA}$ $I_C = 1\text{A}$, $I_B = 20\text{mA}$ $I_C = 2\text{A}$, $I_B = 20\text{mA}$ $I_C = 6.5\text{A}$, $I_B = 300\text{mA}$ |
| Base-Emitter Saturation Voltage (Note 9) | $V_{BE(SAT)}$ | — | — | 1.2 | V | $I_C = 6.5\text{A}$, $I_B = 300\text{mA}$ |
| Base-Emitter Turn-On Voltage (Note 9) | $V_{BE(ON)}$ | — | — | 1.13 | V | $I_C = 6.5\text{A}$, $V_{CE} = 1\text{V}$ |
| DC Current Gain (Note 9) | h_{FE} | 100 | 200 | — | — | $I_C = 10\text{mA}$, $V_{CE} = 1\text{V}$ $I_C = 1\text{A}$, $V_{CE} = 1\text{V}$ $I_C = 7\text{A}$, $V_{CE} = 1\text{V}$ $I_C = 20\text{A}$, $V_{CE} = 2\text{V}$ |
| | | 100 | 200 | 300 | | |
| | | 100 | 150 | — | | |
| | | 30 | 65 | — | | |
| Transitional Frequency | f_T | 100 | — | — | MHz | $I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$ |
| Output Capacitance | C_{OBO} | — | 75 | — | pF | $V_{CB} = 10\text{V}$, $f = 1\text{MHz}$ |
| Switching Time | t_{ON} | — | 45 | — | ns | $I_C = 1\text{A}$, $I_{B1} = 100\text{mA}$ $I_{B2} = -100\text{mA}$, $V_{CC} = 10\text{V}$ |
| | t_{OFF} | — | 630 | — | ns | |

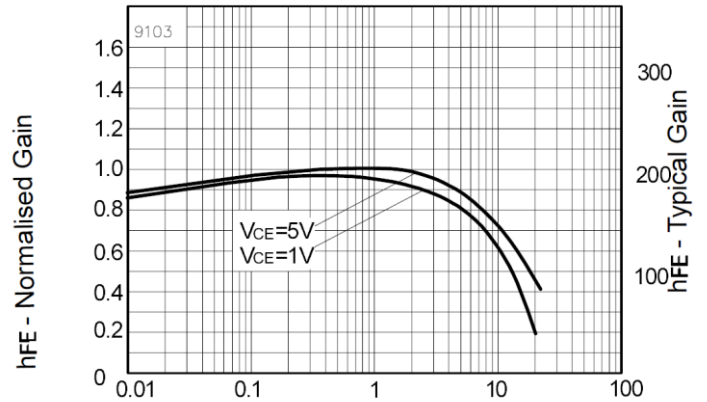
Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



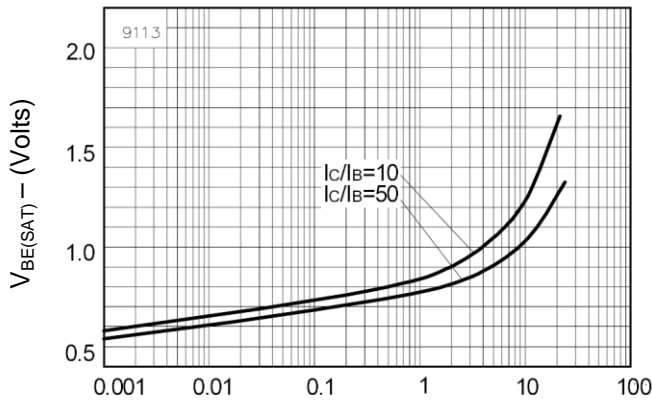
I_C - Collector Current (Amps)

$V_{CE(SAT)}$ v I_C



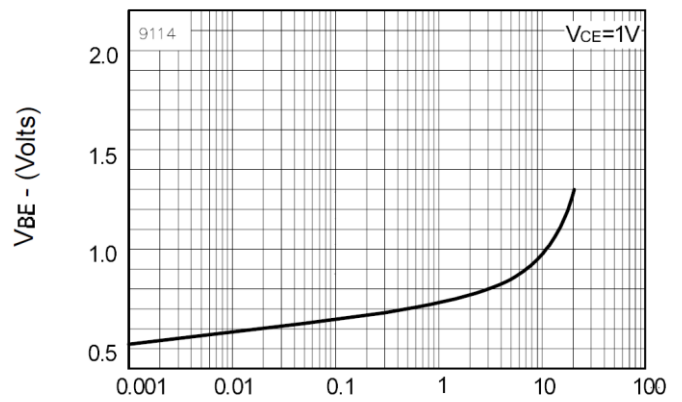
I_C - Collector Current (Amps)

hFE v I_C



I_C - Collector Current (Amps)

$V_{BE(SAT)}$ v I_C



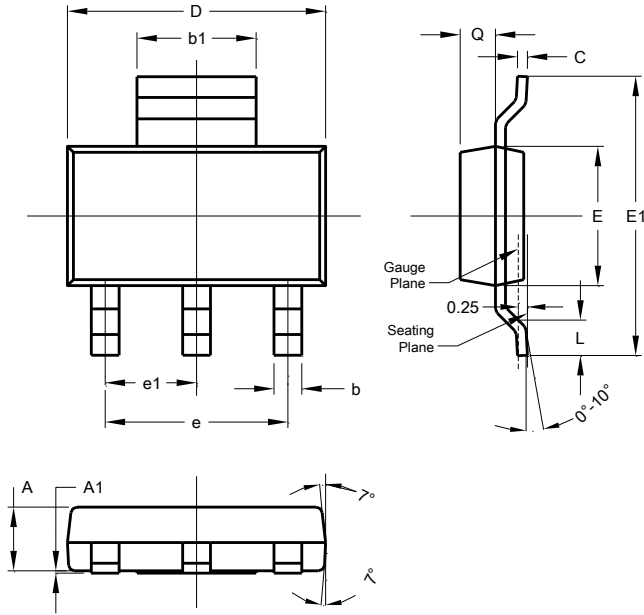
I_C - Collector Current (Amps)

$V_{BE(ON)}$ v I_C

Package Outline Dimensions

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

SOT223

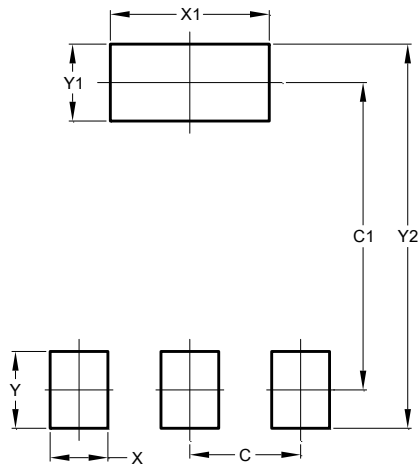


| SOT223 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b | 0.60 | 0.80 | 0.70 |
| b1 | 2.90 | 3.10 | 3.00 |
| C | 0.20 | 0.30 | 0.25 |
| D | 6.45 | 6.55 | 6.50 |
| E | 3.45 | 3.55 | 3.50 |
| E1 | 6.90 | 7.10 | 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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