# NPN Silicon Epitaxial Planar Transistor

# FZT651

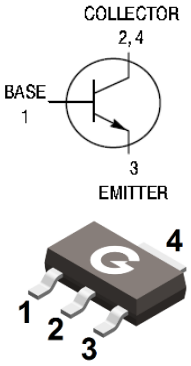
## Features

- Epitaxial planar die construction
- Low saturation voltage

HF

## Mechanic al Data

- Case: SOT-223
- Molding compound: UL flammability classification rating 94V-0
- Terminal s: Tin-plated; solderability per MIL-STD-202, Method 208




SOT-223

## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| FZT651 | SOT-223 | 4000 pcs / Tape & Reel | FZT651 |

## Maximum Ratings (@ $T_A$ = 25°C unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{CBO}$ | 80 | V |
| Collector-Emitter Breakdown Voltage | $V_{CEO}$ | 60 | V |
| Emitter-Base Breakdown Voltage | $V_{EBO}$ | 5 | V |
| Collector Current (Continuous) | $I_C$ | 3 | A |
| Collector Current (Pulse) | $I_{CM}$ | 6 | A |

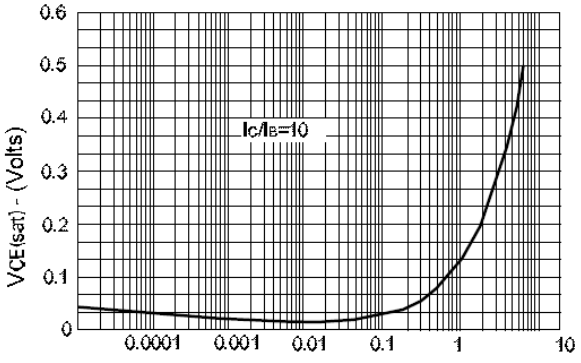
## Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation( $T_A$ = 25°C) | $P_D$ | 2 | W |
| Thermal Resistance (Junction-to-Ambient) | $R_{\theta JA}$ | 62.5 | °C/W |
| Junction Temperature | $T_J$ | -55 ~ +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

## Electrical Characteristics (@ $T_A$ = 25°C unless otherwise specified)

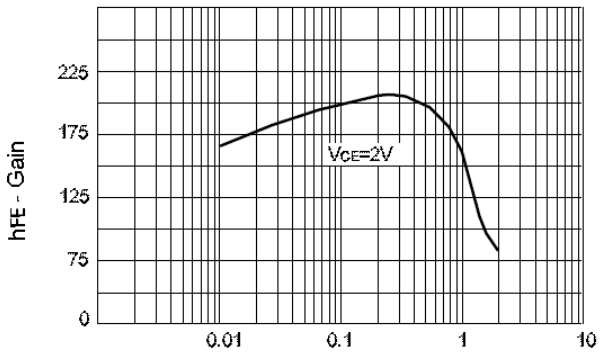
| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ = 100μA, $I_E$ = 0 | 80 | - | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = 10mA, $I_B$ = 0 | 60 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = 100μA, $I_C$ = 0 | 5 | - | - | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$ = 80V, $I_E$ = 0 | - | - | 0.1 | μA |
| Emitter Cut-off Current | $I_{EBO}$ | $V_{EB}$ = 4V, $I_C$ = 0 | - | - | 0.1 | μA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = 2V, $I_C$ = 50mA | 75 | - | - | - |
| | | $V_{CE}$ = 2V, $I_C$ = 500mA | 75 | - | - | - |
| | | $V_{CE}$ = 2V, $I_C$ = 1A | 75 | - | - | - |
| | | $V_{CE}$ = 2V, $I_C$ = 2A | 40 | - | - | - |
| Collector-emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = 1A, $I_B$ = 0.1A | - | - | 0.3 | V |
| | | $I_C$ = 3A, $I_B$ = 0.3A | - | - | 0.6 | V |
| Base-emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 1A, $I_B$ = 0.1A | - | - | 1.25 | V |
| Base-emitter Turn-on Voltage | $V_{BE(ON)}$ | $I_C$ = 1A, $V_{CE}$ = 2V | - | - | 1 | V |
| Output Capacitance | $C_{OBO}$ | $V_{CB}$ = 10V, f = 1MHz | - | - | 30 | pF |
| Transition Frequency | $f_T$ | $I_C$ = 100mA, $V_{CE}$ = 5V<br>f = 100MHz | 140 | - | - | MHZ |
| Turn-on Time | $t_{on}$ | $V_{CC}$ = 10V, $I_C$ = 500mA,<br>$I_{B1}$ = $I_{B2}$ = 50mA | - | 45 | - | ns |
| Turn-off Time | $t_{off}$ | | - | 800 | - | ns |

## Ratings and Characteristics Curves (@ $T_A$ = 25°C unless otherwise specified)



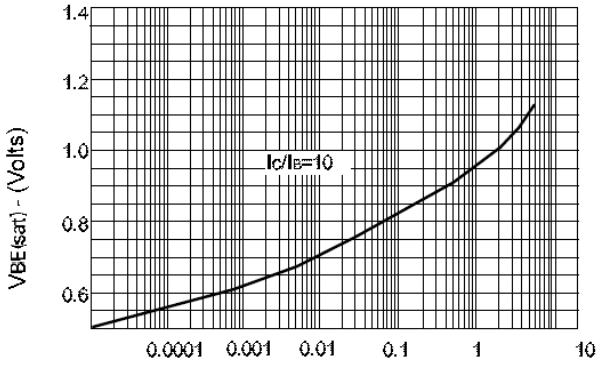

IC - Collector Current (Amps)

**VCE(sat) v IC**



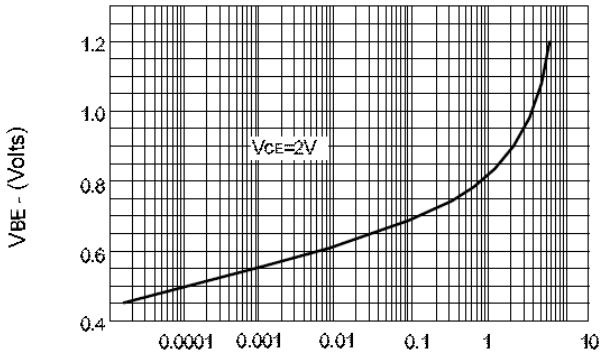

IC - Collector Current (Amps)

**hFE v IC**



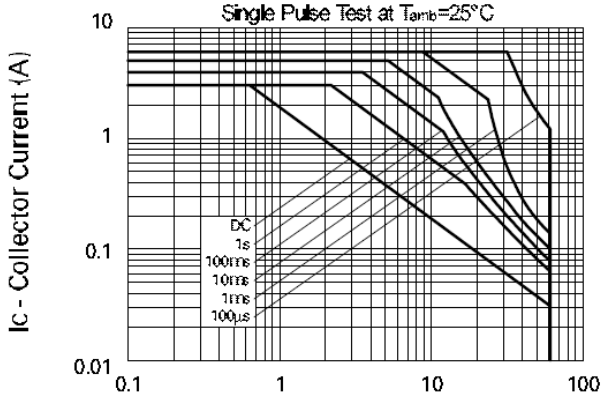

IC - Collector Current (Amps)

**VBE(sat) v IC**



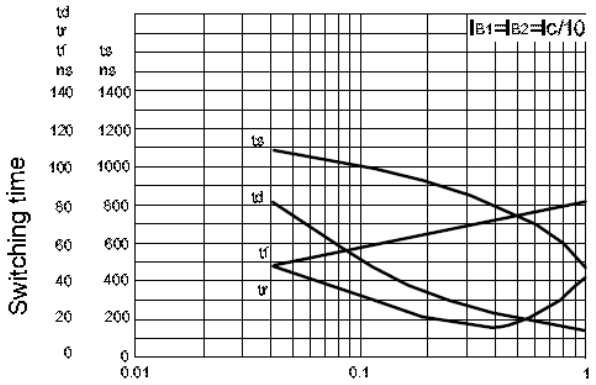

IC - Collector Current (Amps)

**VBE(on) v IC**




VCE - Collector Emitter Voltage (V)

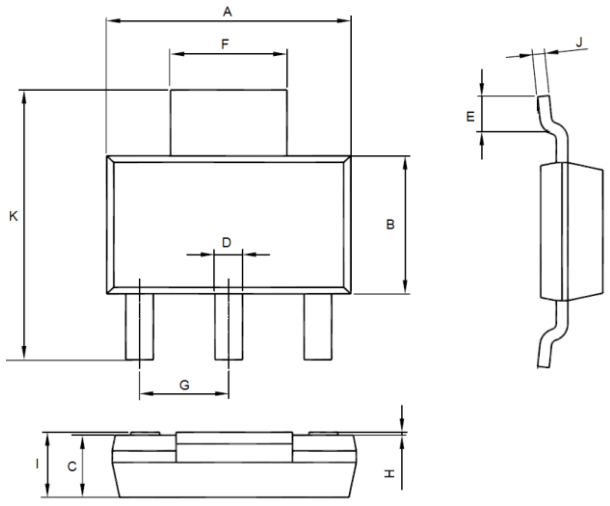
**Safe Operating Area**




IC - Collector Current (Amps)

**Switching Speeds**

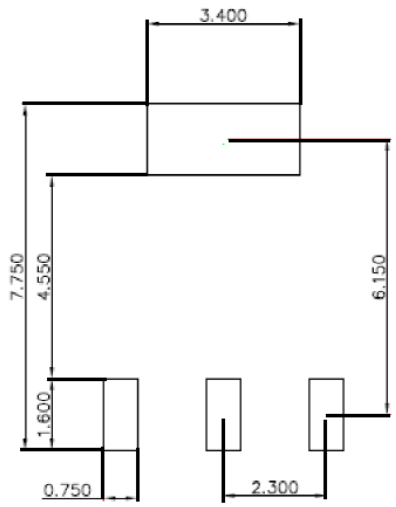
## Package Outline Dimensions (Unit: mm)




| SOT-223 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 6.10 | 6.50 |
| B | 3.30 | 3.70 |
| C | 1.50 | 1.70 |
| D | 0.66 | 0.82 |
| E | 0.90 | 1.15 |
| F | 2.90 | 3.10 |
| G | 2.20 | 2.40 |
| H | 0.02 | 0.10 |
| I | 1.52 | 1.80 |
| J | 0.20 | 0.40 |
| K | 6.70 | 7.30 |

## Mounting Pad Layout (Unit: mm)

### SOT-223

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