

SOT223 NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTOR

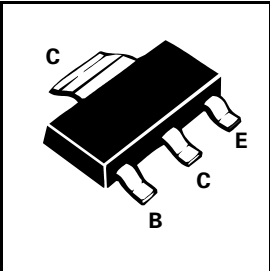
FZT603

ISSUE 3 – NOVEMBER 1995

FEATURES

- * 2A continuous current
- * Useful h_{FE} up to 6A
- * Fast Switching

PARTMARKING DETAIL – DEVICE TYPE IN FULL



ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|----------------|-------------|------|
| Collector-Base Voltage | V_{CBO} | 100 | V |
| Collector-Emitter Voltage | V_{CEO} | 80 | V |
| Emitter-Base Voltage | V_{EBO} | 10 | V |
| Peak Pulse Current | I_{CM} | 6 | A |
| Continuous Collector Current | I_C | 2 | A |
| Power Dissipation | P_{tot} | 2 | W |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +150 | °C |

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ unless otherwise stated).

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|--------------------------------------|---------------|------|--------------------------------------|------------------------------|--------------------------------|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 100 | 240 | | V | $I_C=100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 80 | 110 | | V | $I_C=10\text{mA}^*$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 10 | 16 | | V | $I_E=100\mu\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | | | 0.01 10 | μA μA | $V_{CB}=80\text{V}$ $V_{CB}=80\text{V}, T_{amb}=100^\circ\text{C}$ |
| Emitter Cut-Off Current | I_{EBO} | | | 0.1 | μA | $V_{EB}=8\text{V}$ |
| Collector Cut-Off Current | I_{CES} | | | 10 | μA | $V_{CES}=80\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | 0.79 0.80 0.88 0.99 0.86 | 0.88 0.90 1.00 1.13 | V V V V V | $I_C=0.25\text{A}, I_B=0.25\text{mA}^*$ $I_C=0.4\text{A}, I_B=0.4\text{mA}^*$ $I_C=1\text{A}, I_B=1\text{mA}^*$ $I_C=2\text{A}, I_B=20\text{mA}^*$ $I_C=2\text{A}, I_B=20\text{mA} \quad \dagger$ |

† $T_j=150^\circ\text{C}$



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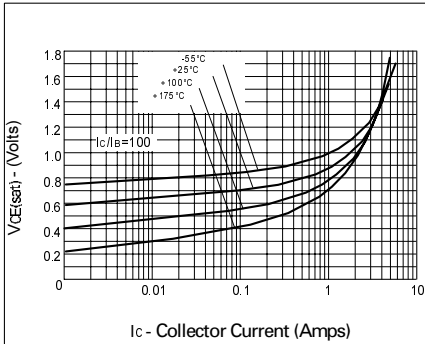
ELECTRICAL CHARACTERISTICS (Continued)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|---------------|----------------------|---------------------------------------|------|---------|---|
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | 1.7 | 1.95 | V | $I_C=2A, I_B=20mA^*$ |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | 1.5 | 1.75 | V | $I_C=2A, V_{CE}=5V^*$ |
| Static Forward Current Transfer Ratio | h_{FE} | 3k 5k 3k 2k | 14k 15k 14k 10k 2k 750 | 100k | | $I_C=50mA, V_{CE}=5V^*$ $I_C=500mA, V_{CE}=5V^*$ $I_C=1A, V_{CE}=5V^*$ $I_C=2A, V_{CE}=5V^*$ $I_C=5A, V_{CE}=5V^*$ $I_C=6A, V_{CE}=5V^*$ |
| Transition Frequency | f_T | 150 | | | MHz | $I_C=100mA, V_{CE}=10V$ $f=20MHz$ |
| Output Capacitance | C_{ibo} | | 90 | | pF | $V_{EB}=500mV, f=1MHz$ |
| Output Capacitance | C_{obo} | | 15 | | pF | $V_{CB}=10V, f=1MHz$ |
| Switching Times | t_{on} | | 0.5 | | μs | $I_C=0.5A, V_{CE}=10V$ $I_{B1}=I_{B2}=0.5mA$ |
| | t_{off} | | 1.6 | | μs | |

*Measured under pulsed conditions. Pulse width=300ms. Duty cycle $\leq 2\%$
 Spice parameter data is available upon request for this device

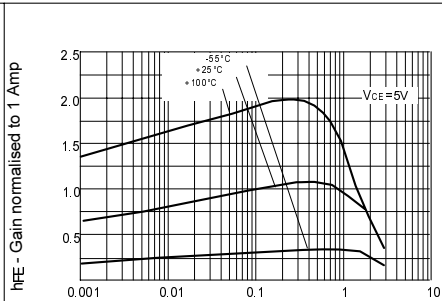
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TYPICAL CHARACTERISTICS



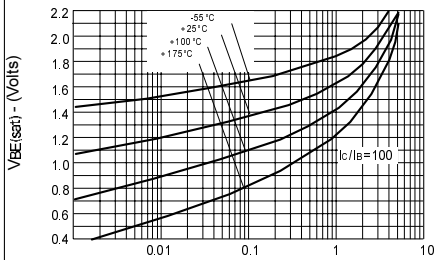
I_C - Collector Current (Amps)

$V_{CE(sat)}$ v I_C



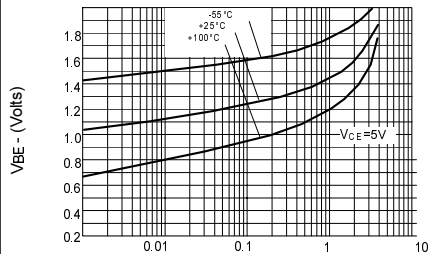
I_C - Collector Current (Amps)

h_{FE} v I_C



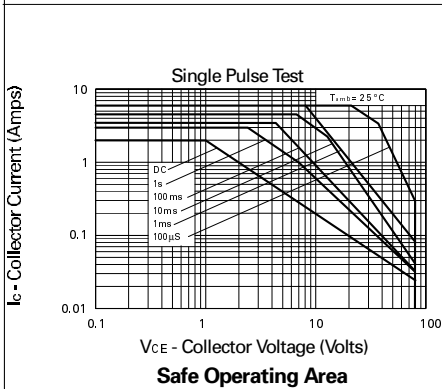
I_C - Collector Current (Amps)

$V_{BE(sat)}$ v I_C



I_C - Collector Current (Amps)

$V_{BE(on)}$ v I_C



V_{CE} - Collector Voltage (Volts)

Safe Operating Area