

# SOT223 NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

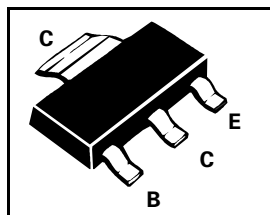
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## FEATURES

- \* Guaranteed  $h_{FE}$  Specified up to 2A
- \* Fast Switching

PARTMARKING DETAIL - FZT605

COMPLEMENTARY TYPES - FZT705



## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                               | SYMBOL         | VALUE       | UNIT |
|-----------------------------------------|----------------|-------------|------|
| Collector-Base Voltage                  | $V_{CBO}$      | 140         | V    |
| Collector-Emitter Voltage               | $V_{CEO}$      | 120         | V    |
| Emitter-Base Voltage                    | $V_{EBO}$      | 10          | V    |
| Peak Pulse Current                      | $I_{CM}$       | 4           | A    |
| Continuous Collector Current            | $I_C$          | 1.5         | 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.                       | MAX.        | UNIT          | CONDITIONS.                                                                                                                                                                 |
|---------------------------------------|-----------------------|----------------------------|-------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$         | 140                        |             | V             | $I_C = 100\mu\text{A}$                                                                                                                                                      |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$         | 120                        |             | V             | $I_C = 10\text{mA}^*$                                                                                                                                                       |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$         | 10                         |             | V             | $I_E = 100\mu\text{A}$                                                                                                                                                      |
| Collector Cut-Off Current             | $I_{CBO}$             |                            | 0.01<br>10  | $\mu\text{A}$ | $V_{CB} = 120\text{V}$<br>$V_{CB} = 120\text{V}, T_{amb} = 100^\circ\text{C}$                                                                                               |
| Emitter Cut-Off Current               | $I_{EBO}$             |                            | 0.1         | $\mu\text{A}$ | $V_{EB} = 8\text{V}$                                                                                                                                                        |
| Collector-Emitter Cut-Off Current     | $I_{CES}$             |                            | 10          | $\mu\text{A}$ | $V_{CES} = 120\text{V}$                                                                                                                                                     |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$         |                            | 1.0,<br>1.5 | V             | $I_C = 250\text{mA}, I_B = 0.25\text{mA}^*$<br>$I_C = 1\text{A}, I_B = 1\text{mA}^*$                                                                                        |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$         |                            | 1.8         | V             | $I_C = 1\text{A}, I_B = 1\text{mA}^*$                                                                                                                                       |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$          |                            | 1.7         | V             | $I_C = 1\text{A}, V_{CE} = 5\text{V}^*$                                                                                                                                     |
| Static Forward Current Transfer Ratio | $h_{FE}$              | 2K<br>5K<br>2K<br>0.5K     | 100K        |               | $I_C = 50\text{mA}, V_{CE} = 5\text{V}$<br>$I_C = 500\text{mA}, V_{CE} = 5\text{V}^*$<br>$I_C = 1\text{A}, V_{CE} = 5\text{V}^*$<br>$I_C = 2\text{A}, V_{CE} = 5\text{V}^*$ |
| Transition Frequency                  | $f_t$                 | 150                        |             | MHz           | $I_C = 100\text{mA}, V_{CE} = 10\text{V}$<br>$f = 20\text{MHz}$                                                                                                             |
| Input Capacitance                     | $C_{ibo}$             | 90 Typical                 |             | pF            | $V_{EB} = 500\text{mV}, f = 1\text{MHz}$                                                                                                                                    |
| Output Capacitance                    | $C_{obo}$             | 15 Typical                 |             | pF            | $V_{CB} = 10\text{V}, f = 1\text{MHz}$                                                                                                                                      |
| Switching Times                       | $t_{on}$<br>$t_{off}$ | 0.5 Typical<br>1.6 Typical |             | nsec<br>nsec  | $I_C = 500\text{mA}, V_{CE} = 10\text{V}$<br>$I_{B1} = I_{B2} = 0.5\text{mA}$                                                                                               |

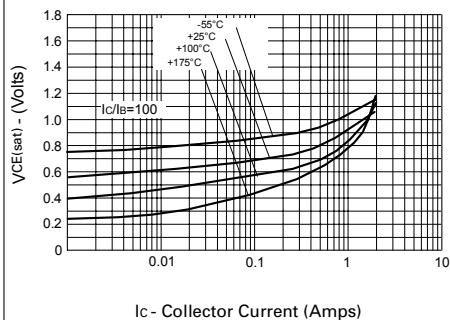
\* Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle 2%

Spice parameter data is available upon request for these devices.

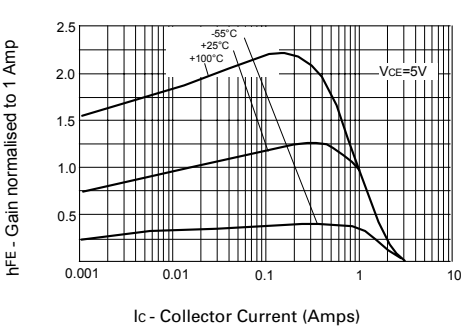


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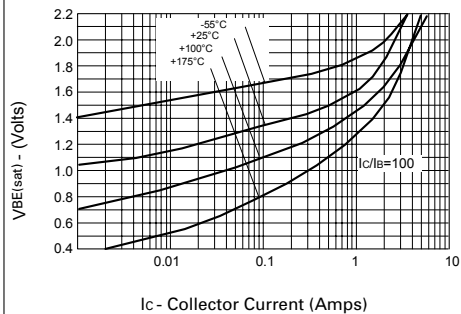
TYPICAL CHARACTERISTICS



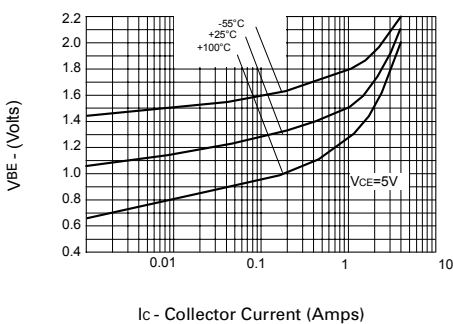
VCE(sat) v IC



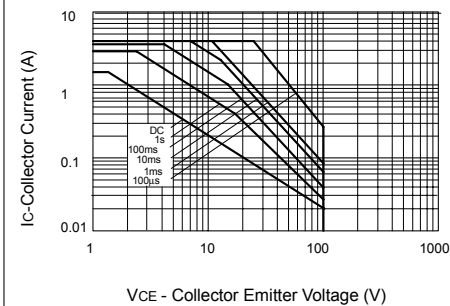
hFE v IC



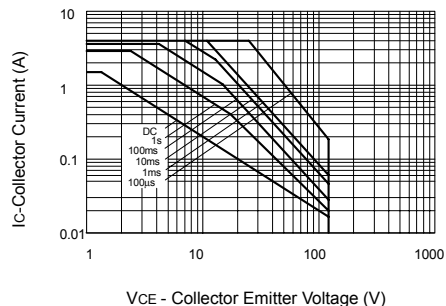
VBE(sat) v IC



VBE(on) v IC



FZT604 Safe Operating Area



FZT605 Safe Operating Area