

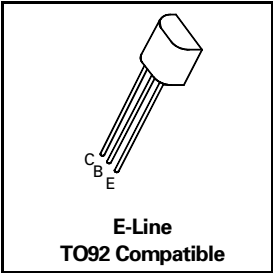
# NPN SILICON PLANAR MEDIUM POWER TRANSISTOR

**ZTX449**

ISSUE 2 – MARCH 1994

## FEATURES

- \* 30 Volt  $V_{CEO}$
- \* 1 Amp continuous current
- \*  $P_{tot}$  = 1 Watt



## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                         | SYMBOL         | VALUE       | UNIT             |
|---------------------------------------------------|----------------|-------------|------------------|
| Collector-Base Voltage                            | $V_{CBO}$      | 50          | V                |
| Collector-Emitter Voltage                         | $V_{CEO}$      | 30          | V                |
| Emitter-Base Voltage                              | $V_{EBO}$      | 5           | V                |
| Peak Pulse Current                                | $I_{CM}$       | 2           | A                |
| Continuous Collector Current                      | $I_C$          | 1           | A                |
| Power Dissipation at $T_{amb} = 25^\circ\text{C}$ | $P_{tot}$      | 1           | W                |
| Operating and Storage Temperature Range           | $T_j, T_{stg}$ | -55 to +200 | $^\circ\text{C}$ |

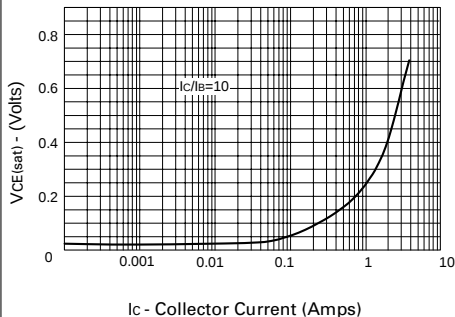
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ unless otherwise stated).

| PARAMETER                             | SYMBOL        | MIN.                  | TYP. | MAX.      | UNIT                           | CONDITIONS.                                                                                                                                                                   |
|---------------------------------------|---------------|-----------------------|------|-----------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | 50                    |      |           | V                              | $I_C = 100\mu\text{A}, I_E = 0$                                                                                                                                               |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$ | 30                    |      |           | V                              | $I_C = 10\text{mA}, I_B = 0$                                                                                                                                                  |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$ | 5                     |      |           | V                              | $I_E = 100\mu\text{A}, I_C = 0$                                                                                                                                               |
| Collector Cut-Off Current             | $I_{CBO}$     |                       |      | 0.1<br>10 | $\mu\text{A}$<br>$\mu\text{A}$ | $V_{CB} = 40\text{V}$<br>$V_{CB} = 40\text{V}, T_{amb} = 100^\circ\text{C}$                                                                                                   |
| Emitter Cut-Off Current               | $I_{EBO}$     |                       |      | 0.1       | $\mu\text{A}$                  | $V_{EB} = 4\text{V}, I_C = 0$                                                                                                                                                 |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |                       |      | 0.5<br>1  | V<br>V                         | $I_C = 1\text{A}, I_B = 100\text{mA}^*$<br>$I_C = 2\text{A}, I_B = 200\text{mA}^*$                                                                                            |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$ |                       |      | 1.25      | V                              | $I_C = 1\text{A}, I_B = 100\text{mA}^*$                                                                                                                                       |
| Base-Emitter Turn-on Voltage          | $V_{BE(on)}$  |                       |      | 1         | V                              | $I_C = 1\text{A}, V_{CE} = 2\text{V}^*$                                                                                                                                       |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 70<br>100<br>80<br>40 |      | 300       |                                | $I_C = 50\text{mA}, V_{CE} = 2\text{V}^*$<br>$I_C = 500\text{mA}, V_{CE} = 2\text{V}^*$<br>$I_C = 1\text{A}, V_{CE} = 2\text{V}^*$<br>$I_C = 2\text{A}, V_{CE} = 2\text{V}^*$ |
| Transition Frequency                  | $f_T$         | 150                   |      |           | MHz                            | $I_C = 50\text{mA}, V_{CE} = 10\text{V}$<br>$f = 100\text{MHz}$                                                                                                               |
| Output Capacitance                    | $C_{obo}$     |                       |      | 15        | pF                             | $V_{CB} = 10\text{V}, f = 1\text{MHz}$                                                                                                                                        |

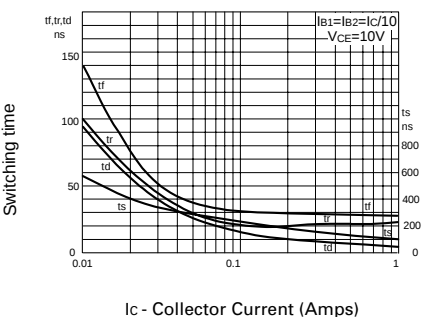
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

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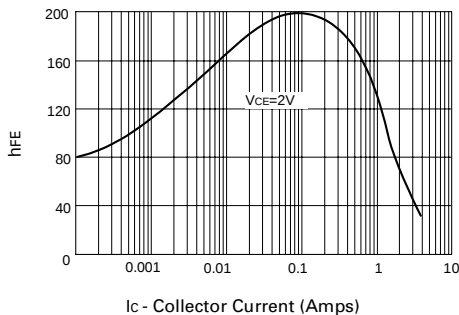
## TYPICAL CHARACTERISTICS



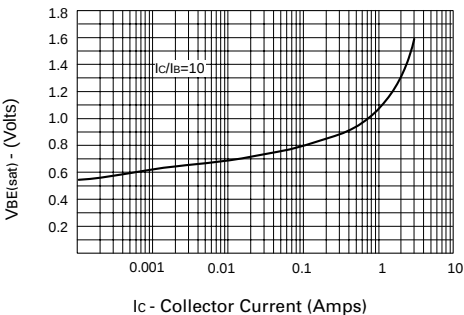
**$V_{CE(sat)}$  v  $I_C$**



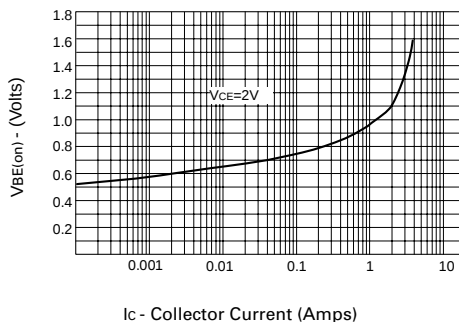
**Switching Speeds**



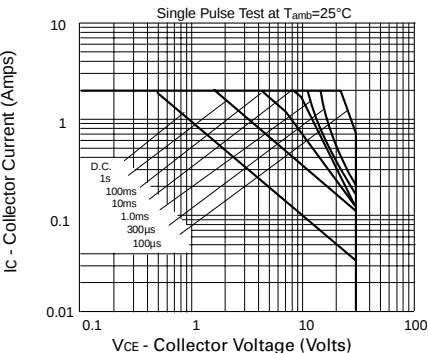
**$h_{FE}$  v  $I_C$**



**$V_{BE(sat)}$  v  $I_C$**



**$V_{BE(on)}$  v  $I_C$**



**Safe Operating Area**