

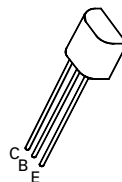
# NPN SILICON PLANAR MEDIUM POWER TRANSISTOR

## ZTX449

ISSUE 2 – MARCH 1994

### FEATURES

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



**E-Line**  
**TO92 Compatible**

### 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	$^\circ\text{C}$

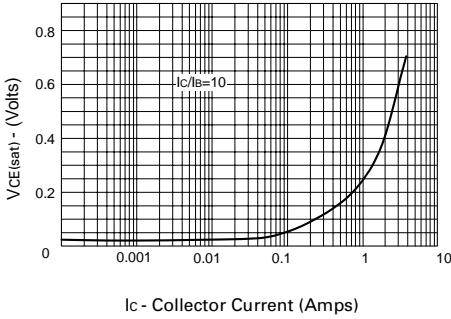
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ unless otherwise stated).

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 10	$\mu\text{A}$	$V_{CB} = 40\text{V}$ $V_{CB} = 40\text{V}$ , $T_{amb} = 100^\circ\text{C}$
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 1	V	$I_C = 1\text{A}$ , $I_B = 100\text{mA}^*$ $I_C = 2\text{A}$ , $I_B = 200\text{mA}^*$
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	$h_{FE}$	70 100 80 40		300		$I_C = 50\text{mA}$ , $V_{CE} = 2\text{V}^*$ $I_C = 500\text{mA}$ , $V_{CE} = 2\text{V}^*$ $I_C = 1\text{A}$ , $V_{CE} = 2\text{V}^*$ $I_C = 2\text{A}$ , $V_{CE} = 2\text{V}^*$
Transition Frequency	$f_T$	150			MHz	$I_C = 50\text{mA}$ , $V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	$C_{obo}$			15	pF	$V_{CB} = 10\text{V}$ , $f = 1\text{MHz}$

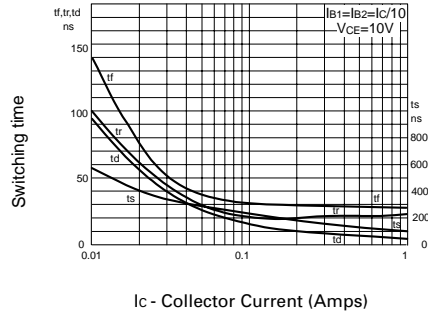
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

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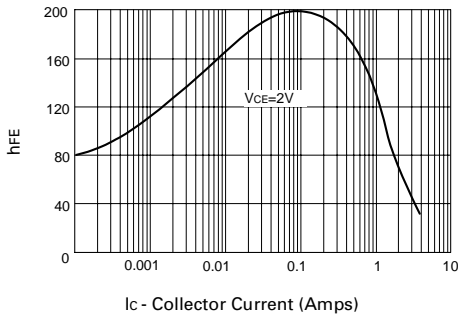
## TYPICAL CHARACTERISTICS



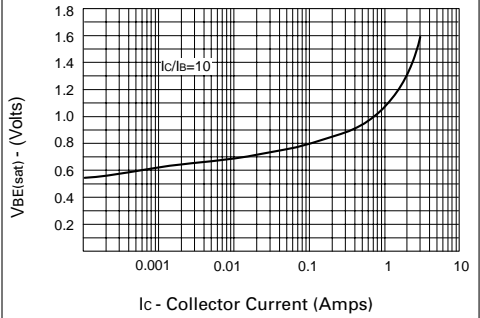
**$V_{CE(sat)}$  v  $I_C$**



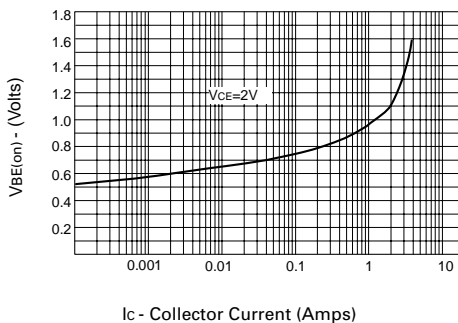
**Switching Speeds**



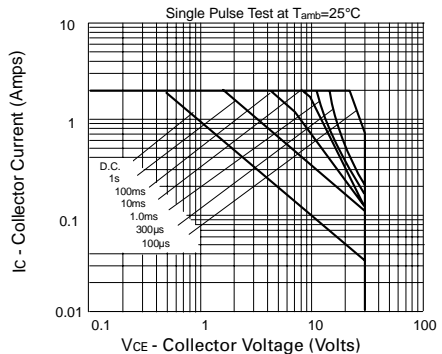
**$h_{FE}$  v  $I_C$**



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



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



**Safe Operating Area**