

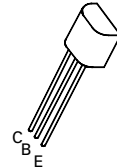
# PNP SILICON PLANAR MEDIUM POWER TRANSISTOR

ISSUE 1 – APRIL 94

## ZTX749

### FEATURES

- \* 25 Volt  $V_{CE0}$
- \* 2 Amp continuous current
- \* Low saturation voltage



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

### ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                                                | SYMBOL         | VALUE       | UNIT       |
|--------------------------------------------------------------------------|----------------|-------------|------------|
| Collector-Base Voltage                                                   | $V_{CBO}$      | -35         | V          |
| Collector-Emitter Voltage                                                | $V_{CEO}$      | -25         | V          |
| Emitter-Base Voltage                                                     | $V_{EBO}$      | -5          | V          |
| Peak Pulse Current                                                       | $I_{CM}$       | -6          | A          |
| Continuous Collector Current                                             | $I_C$          | -2          | A          |
| Power Dissipation at $T_{amb}=25^{\circ}C$<br>derate above $25^{\circ}C$ | $P_{tot}$      | 1<br>5.7    | W<br>mW/°C |
| Operating and Storage Temperature Range                                  | $T_j; T_{stg}$ | -55 to +200 | °C         |

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

| PARAMETER                             | SYMBOL        | MIN.                  | TYP.                    | MAX.         | UNIT    | CONDITIONS.                                                                                                                |
|---------------------------------------|---------------|-----------------------|-------------------------|--------------|---------|----------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | -35                   |                         |              | V       | $I_C = -100\mu A, I_E = 0$                                                                                                 |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$ | -25                   |                         |              | V       | $I_C = -10mA, I_B = 0^*$                                                                                                   |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$ | -5                    |                         |              | V       | $I_E = -100\mu A, I_C = 0$                                                                                                 |
| Collector Cut-Off Current             | $I_{CBO}$     |                       |                         | -0.1<br>-10  | $\mu A$ | $V_{CB} = -30V$<br>$V_{CB} = -30V, T_{amb} = 100^{\circ}C$                                                                 |
| Emitter Cut-Off Current               | $I_{EBO}$     |                       |                         | -0.1         | $\mu A$ | $V_{EB} = -4V, I_E = 0$                                                                                                    |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |                       | -0.12<br>-0.23          | -0.3<br>-0.5 | V       | $I_C = 1A, I_B = -100mA^*$<br>$I_C = 2A, I_B = -200mA^*$                                                                   |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$ |                       | -0.9                    | -1.25        | V       | $I_C = 1A, I_B = -100mA^*$                                                                                                 |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$  |                       | -0.8                    | -1           | V       | $I_C = 1A, V_{CE} = -2V^*$                                                                                                 |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 70<br>100<br>75<br>15 | 200<br>200<br>150<br>50 | 300          |         | $I_C = -50mA, V_{CE} = -2V^*$<br>$I_C = -1A, V_{CE} = -2V^*$<br>$I_C = -2A, V_{CE} = -2V^*$<br>$I_C = -6A, V_{CE} = -2V^*$ |

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

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

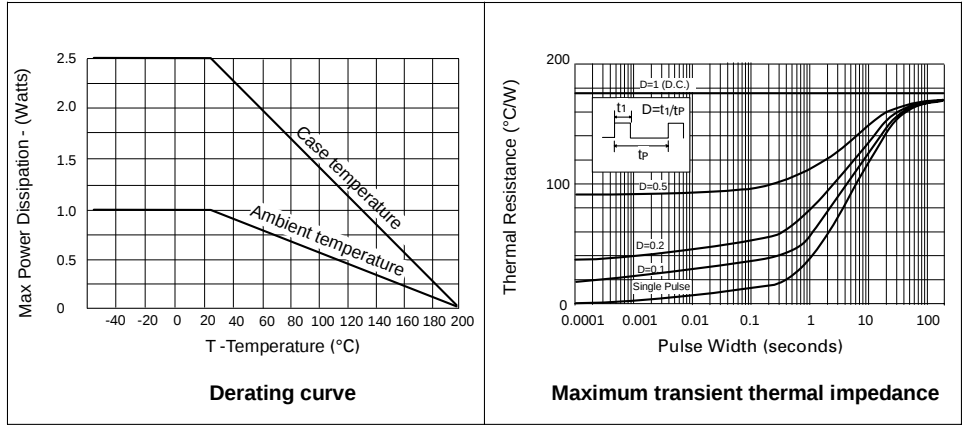
| PARAMETER            | SYMBOL    | MIN. | TYP. | MAX. | UNIT | CONDITIONS.                                                                           |
|----------------------|-----------|------|------|------|------|---------------------------------------------------------------------------------------|
| Transition Frequency | $f_T$     | 100  | 160  |      | MHz  | $I_C = -100\text{mA}$ ,<br>$V_{CE} = -5\text{V}$ $f = 100\text{MHz}$                  |
| Output Capacitance   | $C_{obo}$ |      | 55   | 100  | pF   | $V_{CB} = -10\text{V}$ $f = 1\text{MHz}$                                              |
| Switching Times      | $t_{on}$  |      | 40   |      | ns   | $I_C = -500\text{mA}$ ,<br>$V_{CC} = -10\text{V}$<br>$I_{B1} = I_{B2} = -50\text{mA}$ |
|                      | $t_{off}$ |      | 450  |      | ns   |                                                                                       |

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

## THERMAL CHARACTERISTICS

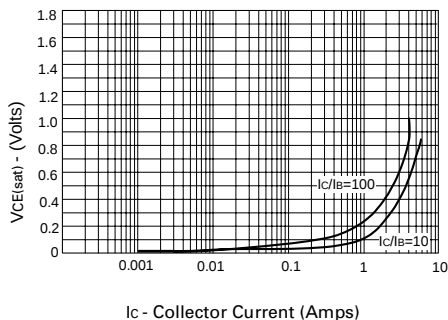
| PARAMETER                                            | SYMBOL                    | MAX. | UNIT                 |
|------------------------------------------------------|---------------------------|------|----------------------|
| Thermal Resistance: Junction to Ambient <sub>1</sub> | $R_{th(j-amb)1}$          | 175  | $^{\circ}\text{C/W}$ |
| Junction to Ambient <sub>2</sub>                     | $R_{th(j-amb)2} \uparrow$ | 116  | $^{\circ}\text{C/W}$ |
| Junction to Case                                     | $R_{th(j-case)}$          | 70   | $^{\circ}\text{C/W}$ |

$\uparrow$  Device mounted on P.C.B. with copper equal to 1 sq. Inch minimum.

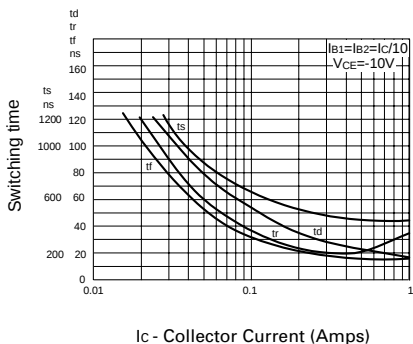


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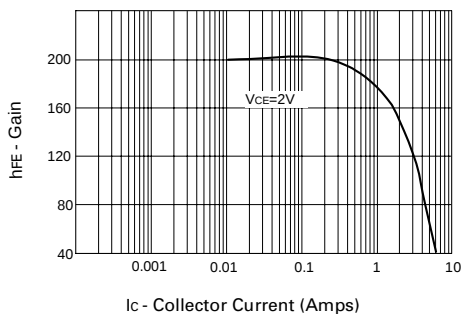
## TYPICAL CHARACTERISTICS



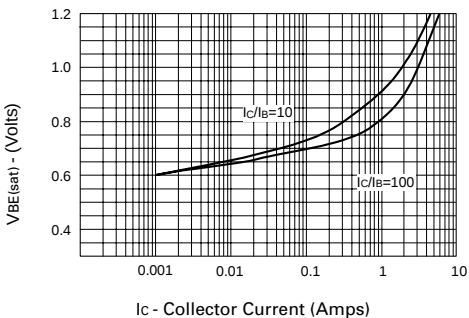
**$V_{CE(sat)}$  v  $I_C$**



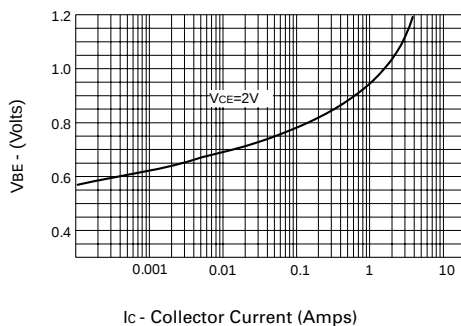
**Switching Speeds**



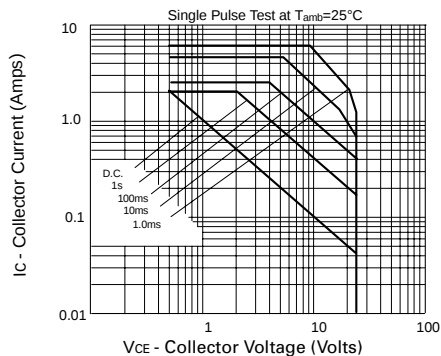
**$hFE$  v  $I_C$**



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



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



**Safe Operating Area**