



# THE DATASHEET OF ZTX649STZ



# ZTX649

## NPN SILICON PLANAR MEDIUM POWER TRANSISTOR

ISSUE 2 – APRIL 94

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Output Capacitance	$C_{obo}$		25	50	pF	$V_{CE}=10\text{V}$ $f=1\text{MHz}$
Switching Times	$t_{on}$		55		ns	$I_C=500\text{mA}$ , $V_{CC}=10\text{V}$ $I_{B1}=I_{B2}=50\text{mA}$
	$t_{off}$		300		ns	

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

### FEATURES

- \* 25 Volt  $V_{CE0}$
- \* 2 Amp continuous current
- \* Low saturation voltage
- \*  $P_{tot}=1$  Watt

### APPLICATIONS

- \* Motor driver
- \* DC-DC converters

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	UNIT
Collector-Base Voltage	
Collector-Emitter Voltage	
Emitter-Base Voltage	
Peak Pulse Current	
Continuous Collector Current	
Power Dissipation at $T_{amb}=25^{\circ}\text{C}$ derate above $25^{\circ}\text{C}$	
Operating and Storage Temperature	$^{\circ}\text{C}$

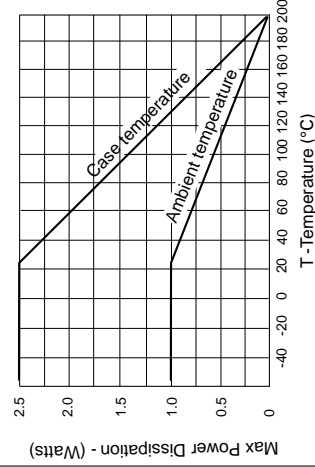
### THERMAL CHARACTERISTICS

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>	$R_{th(j-amb)2}$	116	$^{\circ}\text{C/W}$
Junction to Case	$R_{th(j-case)}$	70	$^{\circ}\text{C/W}$

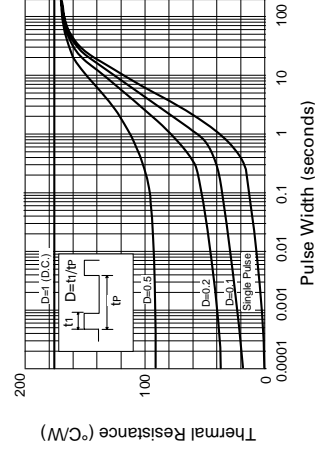
† Device mounted on P.C.B. with copper equal to 1 sq. Inch minimum.

### ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	UNIT
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	35
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	25
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5
Collector Cut-Off Current	$I_{CBO}$	
Emitter Cut-Off Current	$I_{EBO}$	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	
Static Forward Current Transfer Ratio	$h_{FE}$	70 100 75 15
Transition Frequency	$f_T$	15



Derating curve



Maximum transient thermal impedance

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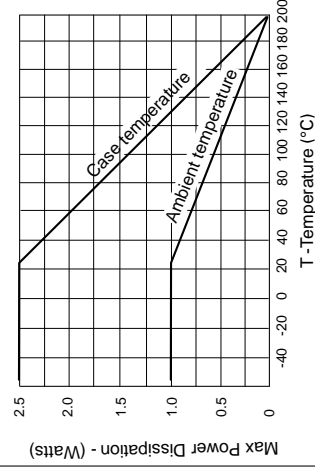
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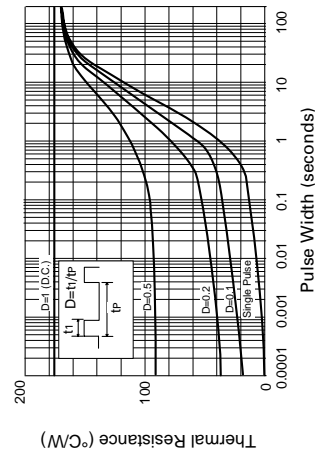
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Base-Emitter Turn-On Voltage	$V_{BE(on)}$	
Static Forward Current Transfer Ratio	$h_{FE}$	70 100 75 15
Transition Frequency	$f_T$	15



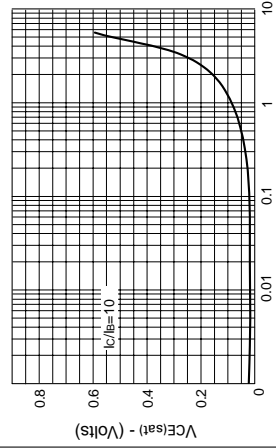
Derating curve



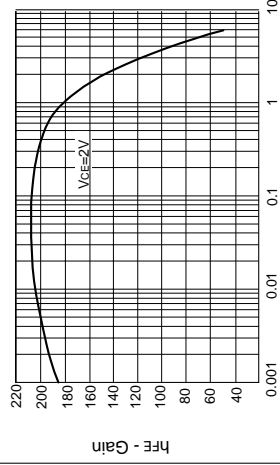
Maximum transient thermal impedance

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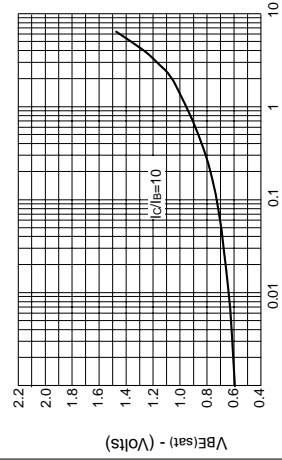
## TYPICAL CHARACTERISTICS



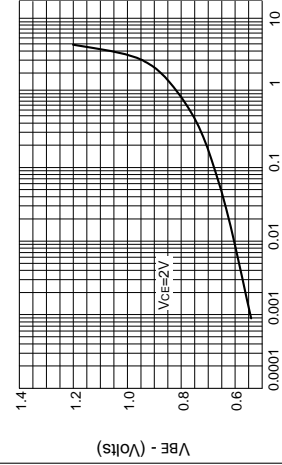
$I_C$  - Collector Current (Amps)  
 $V_{CE(sat)}$  v  $I_C$



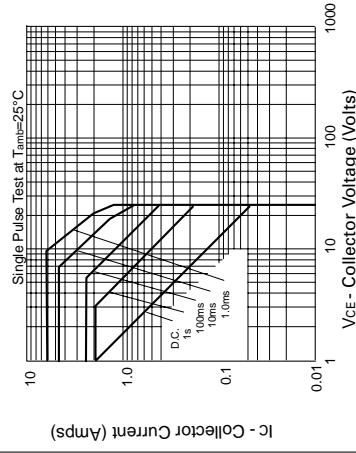
$I_C$  - Collector Current (Amps)  
 $h_{FE}$  v  $I_C$



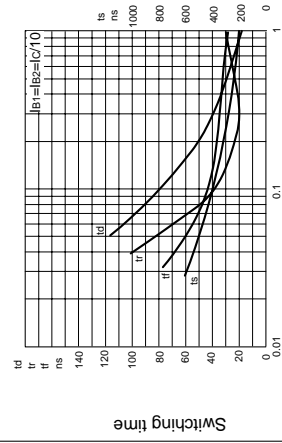
$I_C$  - Collector Current (Amps)  
 $V_{BE(sat)}$  v  $I_C$



$I_C$  - Collector Current (Amps)  
 $V_{BE(on)}$  v  $I_C$





Safe Operating Area



$I_C$  - Collector Current (Amps)  
Switching Speeds

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-  [Diodes Incorporated Information](#)

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