

# ZTX690B

# NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Transition Frequency	$f_T$	150			MHz	$I_C=50\text{mA}$ , $V_{CE}=5\text{V}$ $f=50\text{MHz}$
Input Capacitance	$C_{ibo}$		200		pF	$V_{EB}=0.5\text{V}$ , $f=1\text{MHz}$
Output Capacitance	$C_{obo}$		16		pF	$V_{CB}=10\text{V}$ , $f=1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		33 1300		ns ns	$I_C=500\text{mA}$ , $I_B=50\text{mA}$ $I_{B2}=50\text{mA}$ , $V_{CC}=10\text{V}$

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

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

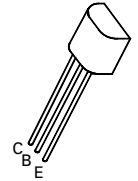
## ISSUE 1 – MAY 94

### FEATURES

- \* 45 Volt  $V_{CEO}$
- \* Gain of 400 at  $I_C=1\text{Amp}$
- \* Very low saturation voltage

### APPLICATIONS

- \* Darlington replacement
- \* Siren Drivers
- \* Battery powered circuits
- \* Motor drivers



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

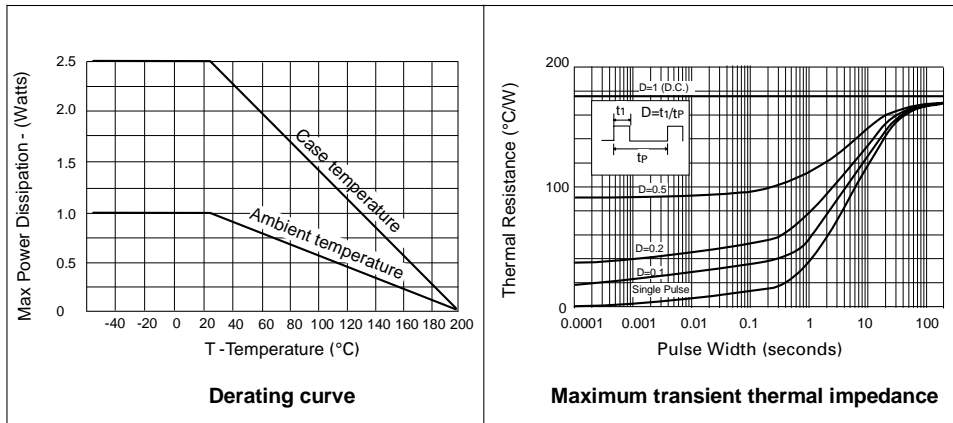
## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	45	V
Collector-Emitter Voltage	$V_{CEO}$	45	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current	$I_{CM}$	6	A
Continuous Collector Current	$I_C$	2	A
Practical Power Dissipation*	$P_{totp}$	1.5	W
Power Dissipation at $T_{amb}=25^{\circ}\text{C}$ derate above $25^{\circ}\text{C}$	$P_{tot}$	1 5.7	W mW/ $^{\circ}\text{C}$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +200	$^{\circ}\text{C}$

\*The power which can be dissipated assuming the device is mounted in a typical manner on a P.C.B. with copper equal to 1 inch square minimum

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
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Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	45			V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$			0.1	$\mu\text{A}$	$V_{CB}=35\text{V}$
Emitter Cut-Off Current	$I_{EBO}$			0.1	$\mu\text{A}$	$V_{EB}=4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.1 0.5	V	$I_C=0.1\text{A}$ , $I_B=0.5\text{mA}^*$ $I_C=1\text{A}$ , $I_B=5\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			0.9	V	$I_C=1\text{A}$ , $I_B=10\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			0.9	V	$I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	500 400 150				$I_C=100\text{mA}$ , $V_{CE}=2\text{V}^*$ $I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$ $I_C=2\text{A}$ , $V_{CE}=2\text{V}^*$



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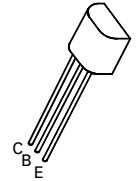
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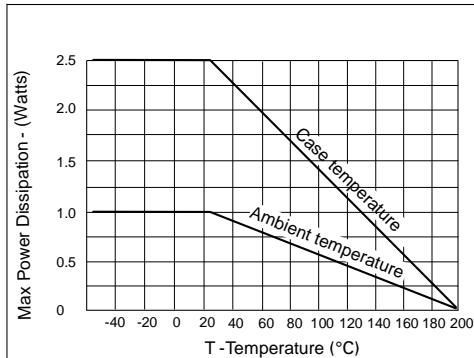
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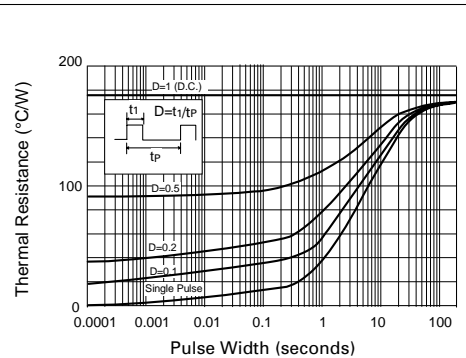
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Base-Emitter Turn-On Voltage	$V_{BE(on)}$			0.9	V	$I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	500 400 150				$I_C=100\text{mA}$ , $V_{CE}=2\text{V}^*$ $I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$ $I_C=2\text{A}$ , $V_{CE}=2\text{V}^*$



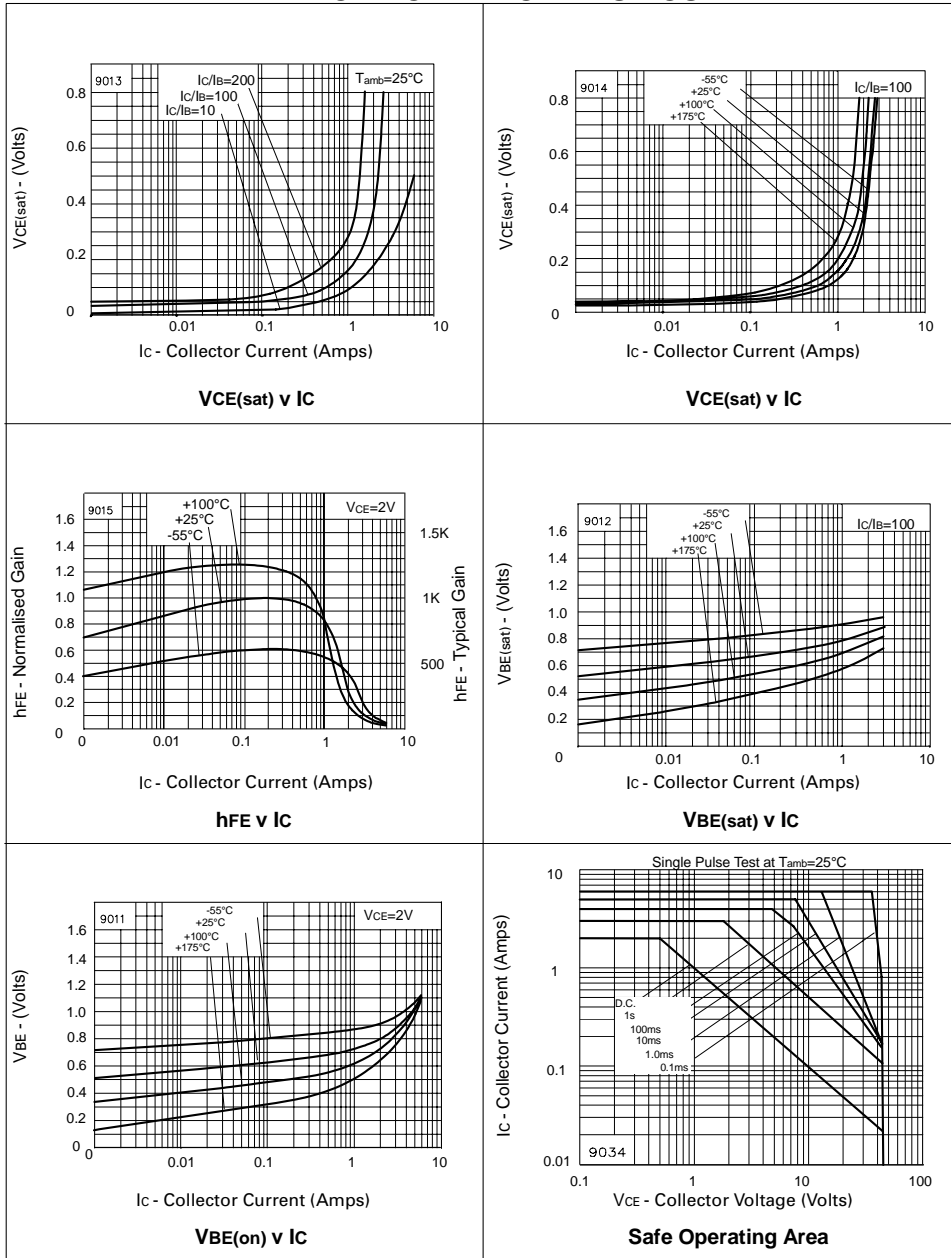
Derating curve



Maximum transient thermal impedance

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## TYPICAL CHARACTERISTICS



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