



ZTX690B

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C)

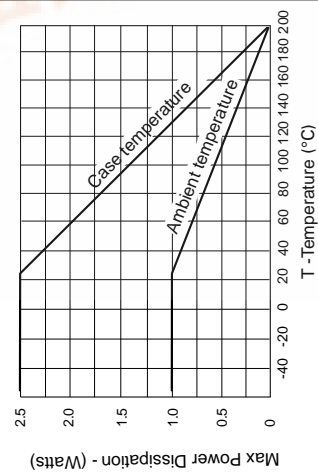
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Transition Frequency	f _T	150			MHz	I _C =50mA, V _{CE} =5V f=50MHz
Input Capacitance	C _{ibo}		200		pF	V _{EB} =0.5V, f=1MHz
Output Capacitance	C _{obo}		16		pF	V _{CB} =10V, f=1MHz
Switching Times	t _{on} t _{off}		33 1300		ns	I _C =500mA, I _B =50mA I _{B2} =50mA, V _{CC} =10V

Measured under pulsed conditions. Pulse width=300us. Duty cycle ≤2%

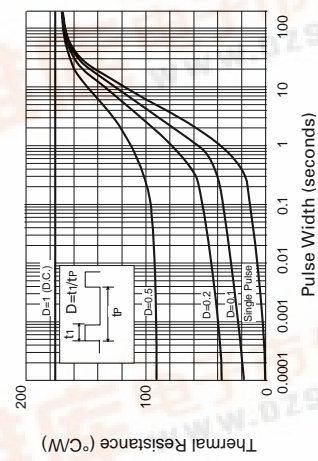
HERMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient ₁	R _{th(j-amb)1}	175	°CW
Junction to Ambient ₂	R _{th(j-amb)2}	116	°CW
Junction to Case	R _{th(j-case)}	70	°CW

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



Derating curve



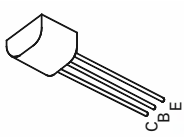
Maximum transient thermal impedance

NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ISSUE 1 - MAY 94

FEATURES

- * 45 Volt V_{CEO}
 - * Gain of 400 at I_C=1 Amp
 - * Very low saturation voltage
- APPLICATIONS
- * Darlington replacement
 - * Siren Drivers
 - * Battery powered circuits
 - * Motor drivers



E-Line
TO92 Compatible

ZTX690B

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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°C derate above 25°C	P _{tot}	1 5.7	W mW/°C
Operating and Storage Temperature Range	T _J ; T _{stg}	-55 to +200	°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°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	V _{(BR)CBO}	45			V	I _C =100μA
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	45			V	I _C =10mA*
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	5			V	I _E =100μA
Collector Cut-Off Current	I _{CBO}			0.1	μA	V _{CB} =35V
Emitter Cut-Off Current	I _{EBO}			0.1	μA	V _{EB} =4V
Collector-Emitter Saturation Voltage	V _{CE(sat)}			0.1 0.5	V	I _C =0.1A, I _B =0.5mA* I _C =1A, I _B =5mA*
Base-Emitter Saturation Voltage	V _{BE(sat)}			0.9	V	I _C =1A, I _B =10mA*
Base-Emitter Turn-On Voltage	V _{BE(on)}			0.9	V	I _C =1A, V _{CE} =2V*
Static Forward Current Transfer Ratio	h _{FE}	500 400 150				I _C =100mA, V _{CE} =2V* I _C =1A, V _{CE} =2V* I _C =2A, V _{CE} =2V*

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Output Capacitance	C_{obo}		16		pF	$V_{CB}=10\text{V}$, $f=1\text{MHz}$
Switching Times	t_{on} t_{off}		33 1300		ns	$I_C=500\text{mA}$, $I_B=50\text{mA}$ $I_B=50\text{mA}$, $V_{CC}=10\text{V}$

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

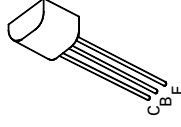
THERMAL CHARACTERISTICS

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

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

FEATURES

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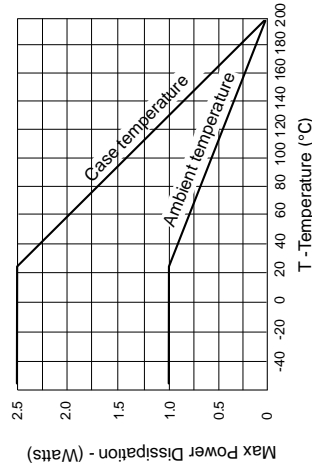
ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
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Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +200	$^{\circ}\text{C}$

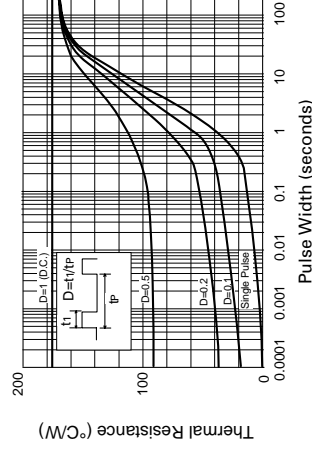
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PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45			V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	45			V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}			0.1	μA	$V_{CB}=35\text{V}$
Emitter Cut-Off Current	I_{EBO}			0.1	μA	$V_{EB}=4\text{V}$
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				$I_C=100\text{mA}$, $V_{CE}=2\text{V}^*$ $I_C=1\text{A}$, $V_{CE}=2\text{V}^*$ $I_C=2\text{A}$, $V_{CE}=2\text{V}^*$



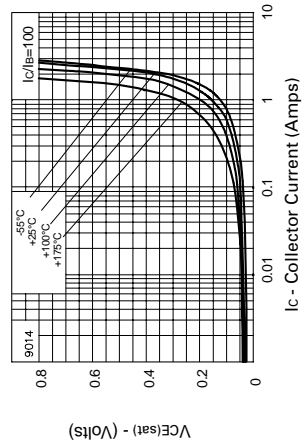
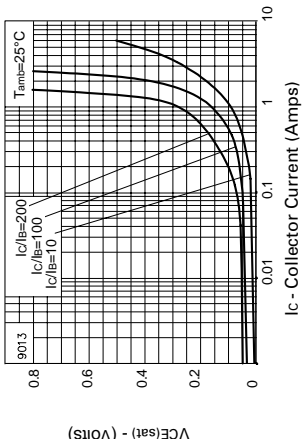
Derating curve



Maximum transient thermal impedance

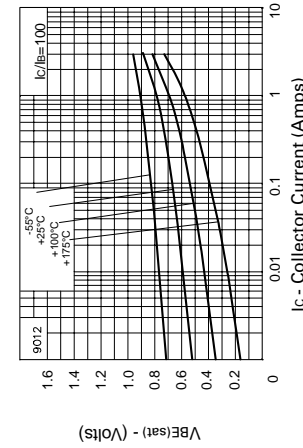
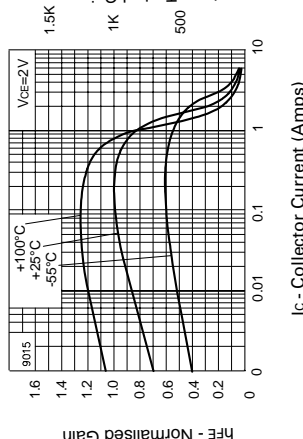
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TYPICAL CHARACTERISTICS



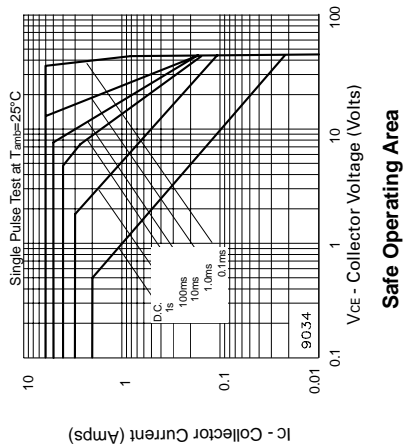
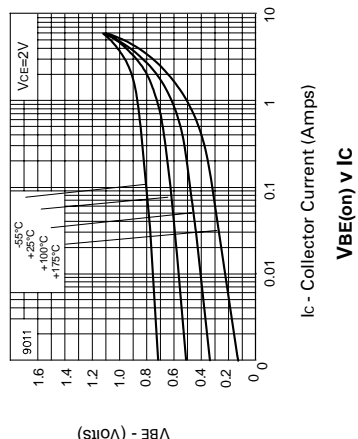
VCE(sat) v IC

VCE(sat) v IC



hFE v IC

VBE(sat) v IC



VBE(on) v IC

Safe Operating Area