



# THE DATASHEET OF ZTX953



# ZTX953

## PNP SILICON PLANAR ME HIGH CURRENT TRANSIS ISSUE 4 – JUNE 94

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-880	-1100	mV	$I_C = -4A, V_{CE} = -1V^*$
Static Forward Current Transfer	$h_{FE}$	100	200	300		$I_C = -10mA, V_{CE} = -1V^*$
		100	200			$I_C = -1A, V_{CE} = -1V^*$
		50	90			$I_C = -3A, V_{CE} = -1V^*$
		30	50			$I_C = -4A, V_{CE} = -1V^*$
Transition Frequency	$f_T$		125		MHz	$I_C = -100mA, V_{CE} = -10V, f = 50MHz$
Output Capacitance	$C_{ob0}$		65		pF	$V_{CE} = -10V, f = 1MHz$
Switching Times	$t_{on}$		110		ns	$I_C = -2A, I_B = -200mA$
	$t_{off}$		460		ns	$I_B = -200mA, V_{CE} = -10V$

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

### FEATURES

- \* 3.5 Amps continuous current
- \* Up to 10 Amps peak current
- \* Very low saturation voltage
- \* Excellent gain up to 10 Amps
- \* Spice model available

### ABSOLUTE MAXIMUM RATINGS

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

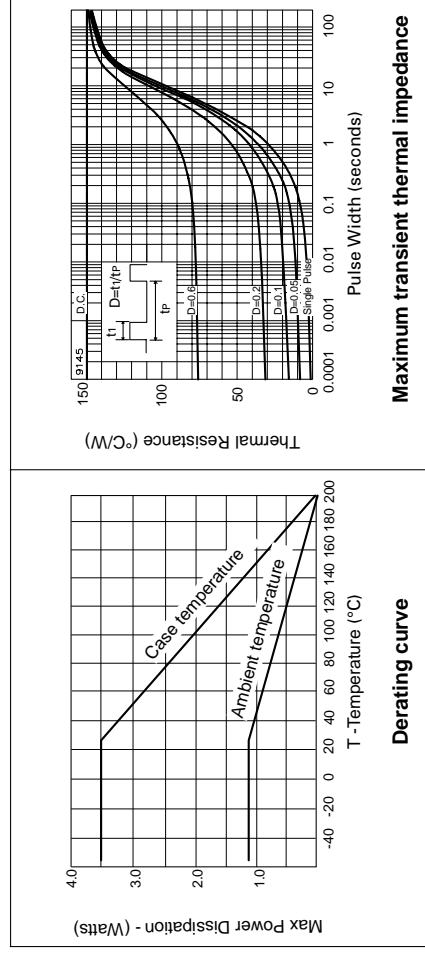
\*The power which can be dissipated as a function of ambient temperature. P.C.B. with copper equal to 1 inch square.

### ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	UNIT
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	
Collector Cut-Off Current	$I_{CBO}$	
Collector Cut-Off Current	$I_{CER}$ $R \leq 1K\Omega$	
Emitter Cut-Off Current	$I_{EBO}$	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	

### THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient	$R_{th(j-amb)}$	150	$^{\circ}\text{C/W}$
Junction to Case	$R_{th(j-case)}$	50	$^{\circ}\text{C/W}$



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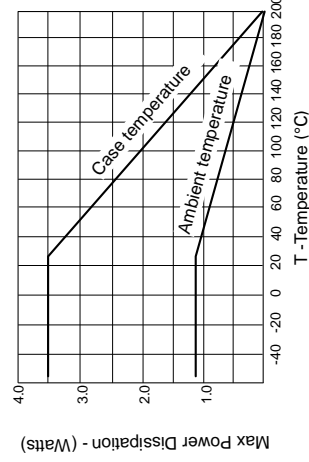
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ )

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
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Transition Frequency	$f_T$		125		MHz	$I_C = -100mA, V_{CE} = -10V, f = 50MHz$
			65		pF	$V_{CE} = -10V, f = 1MHz$
Output Capacitance	$C_{ob0}$				ns	$I_C = -2A, I_B = -200mA$
Switching Times	$t_{on}$		110		ns	$I_B = -200mA, V_{CE} = -10V$
	$t_{off}$		460		ns	

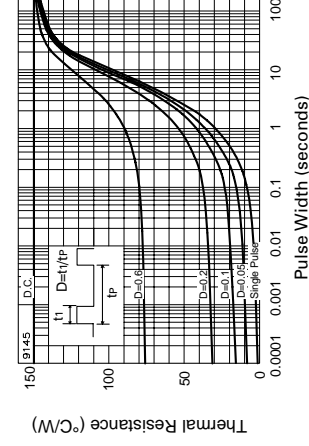
\*Measured under pulsed conditions. Pulse width=300 $\mu$ s. Duty cycle  $\leq 2\%$

### THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient	$R_{th(j-amb)}$	150	$^{\circ}\text{C/W}$
Junction to Case	$R_{th(j-case)}$	50	$^{\circ}\text{C/W}$



Derating curve



Maximum transient thermal impedance

### FEATURES

- \* 3.5 Amps continuous current
- \* Up to 10 Amps peak current
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### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	UNIT
Collector-Base Voltage	$V_{(BR)CBO}$	V
Collector-Emitter Voltage	$V_{(BR)CER}$	V
Emitter-Base Voltage	$V_{(BR)EBO}$	V
Peak Pulse Current	$I_{CBO}$	A
Continuous Collector Current	$I_{CER}$	A
Practical Power Dissipation*	$R \leq 1K\Omega$	$^{\circ}\text{C/W}$
Power Dissipation at $T_{amb} = 25^{\circ}\text{C}$		

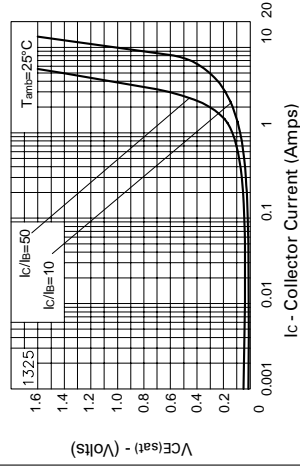
Operating and Storage Temperature Range  
\*The power which can be dissipated as a function of ambient temperature. P.C.B. with copper equal to 1 inch square.

### ELECTRICAL CHARACTERISTICS

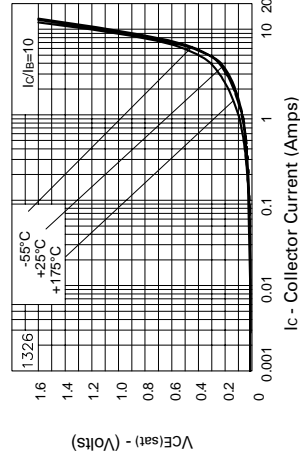
PARAMETER	SYMBOL	UNIT
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	V
Collector-Emitter Breakdown Voltage	$V_{(BR)EBO}$	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	V
Collector Cut-Off Current	$I_{CBO}$	A
Collector Cut-Off Current	$I_{CER}$	A
Emitter Cut-Off Current	$I_{EBO}$	A
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	V

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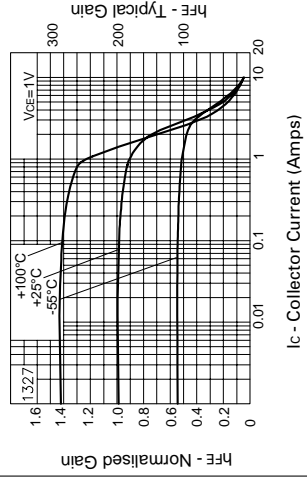
## TYPICAL CHARACTERISTICS



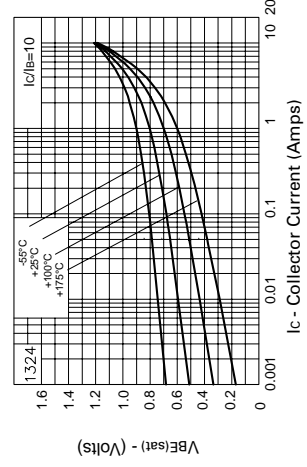
VCE(sat) v IC



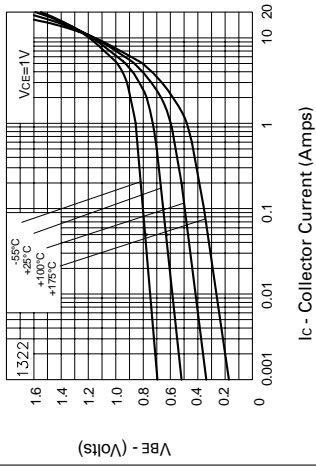
VCE(sat) v IC



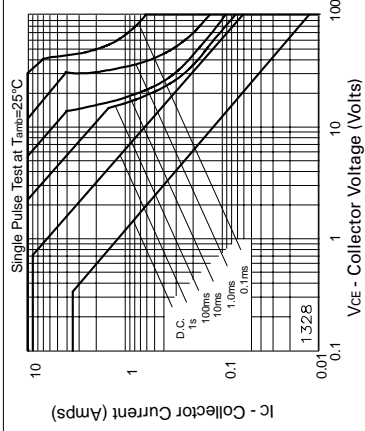
hFE v IC



VBE(sat) v IC





VBE(on) v IC



Safe Operating Area

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