

ZTX951

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PNP SILICON PLANAR MEDIUM POWER HIGH CURRENT TRANSISTOR

ISSUE 4 – JUNE 94

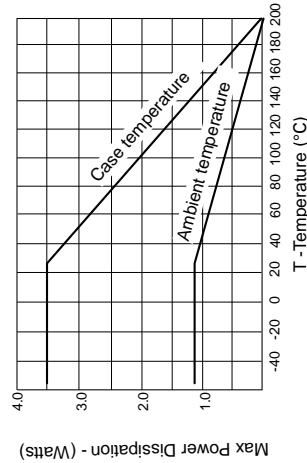
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Base-Emitter Turn-On Voltage	V _{BE(on)}		-850	-1000	mV	I _C =-4A, V _{CE} =-1V*
Static Forward Current Transfer Ratio	h _{FE}	100	200	300		I _C =-10mA, V _{CE} =-1V*
		100	200			I _C =-1A, V _{CE} =-1V*
		75	120			I _C =-4A, V _{CE} =-1V*
		10	25			I _C =-10A, V _{CE} =-1V*
Transition Frequency	f _T		120		MHz	I _C =-100mA, V _{CE} =-10V, f=50MHz
Output Capacitance	C _{obo}		74		pF	V _{CE} =-10V, f=1MHz
Switching Times	t _{on}		82		ns	I _C =-2A, I _B F=200mA, V _{CE} =-10V
	t _{off}		350		ns	I _B F=200mA, V _{CE} =-10V

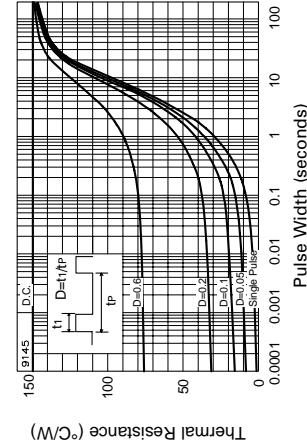
*Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤2%

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient Junction to Case	R _{th(j-amb)}	150	°C/W
	R _{th(j-case)}	50	°C/W



Derating curve



Maximum transient thermal impedance

- * 4 Amps continuous current
- * Up to 15 Amps peak current
- * Very low saturation voltage
- * Excellent gain up to 10 Amps
- * Spice model available

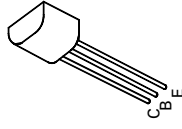
ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V _{CB0}	-100	V
Collector-Emitter Voltage	V _{CE0}	-60	V
Emitter-Base Voltage	V _{EBO}	-6	V
Peak Pulse Current	I _{CM}	-15	A
Continuous Collector Current	I _C	-4	A
Practical Power Dissipation*	P _{totp}	1.58	W
Power Dissipation at T _{amb} =25°C	P _{tot}	1.2	W
Operating and Storage Temperature Range	T _J ; T _{sg}	-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 unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	V _{(BR)CBO}	-100	-140		V	I _C =-100μA
Collector-Emitter Breakdown Voltage	V _{(BR)CEr}	-100	-140		V	I _C =-1μA, R _B ≤ 1KΩ
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	-60	-90		V	I _C =-10mA*
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	-6	-8		V	I _E =-100μA
Collector Cut-Off Current	I _{CBO}			-50	nA	V _{CB} =-80V, T _{amb} =100°C
				-1	μA	V _{CB} =-80V, T _{amb} =100°C
Collector Cut-Off Current	I _{GER}			-50	nA	V _{CB} =-80V
	R ≤ 1KΩ			-1	μA	V _{CB} =-80V, T _{amb} =100°C
Emitter Cut-Off Current	I _{EBO}			-10	nA	V _{EB} =-6V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	-15			mV	I _C =-100mA, I _B =-10mA*
		-60			mV	I _C =-1A, I _B =-100mA*
		-120			mV	I _C =-2A, I _B =-200mA*
		-220			mV	I _C =-4A, I _B =-400mA*
Base-Emitter Saturation Voltage	V _{BE(sat)}		-960		mV	I _C =-4A, I _B =-400mA*



E-Line
TO92 Compatible

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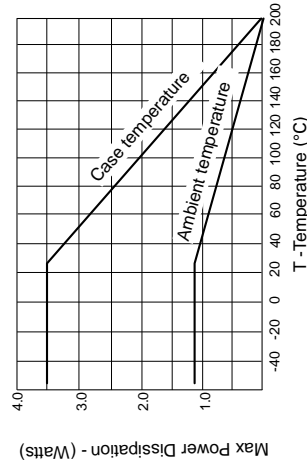
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
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Static Forward Current Transfer Ratio	h_{FE}	100	200	300		$I_C = -10mA, V_{CE} = -1V^*$
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Transition Frequency	f_T		120		MHz	$I_C = -100mA, V_{CE} = -10V, f = 50MHz$
Output Capacitance	C_{obo}		74		pF	$V_{CE} = -10V, f = 1MHz$
Switching Times	t_{on}		82		ns	$I_C = -2A, I_B = -200mA, V_{CE} = -10V$
	t_{off}		350		ns	$I_B = -200mA, V_{CE} = -10V$

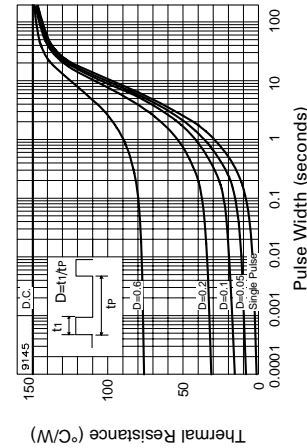
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THERMAL CHARACTERISTICS

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



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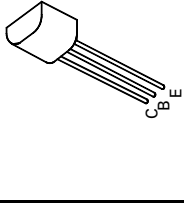
ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CB0}	-100	V
Collector-Emitter Voltage	V_{CE0}	-60	V
Emitter-Base Voltage	V_{EB0}	-6	V
Peak Pulse Current	I_{CM}	-15	A
Continuous Collector Current	I_C	-4	A
Practical Power Dissipation*	P_{totp}	1.58	W
Power Dissipation at $T_{amb} = 25^{\circ}\text{C}$	P_{tot}	1.2	W
Operating and Storage Temperature Range	T_j, T_{sg}	-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 $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

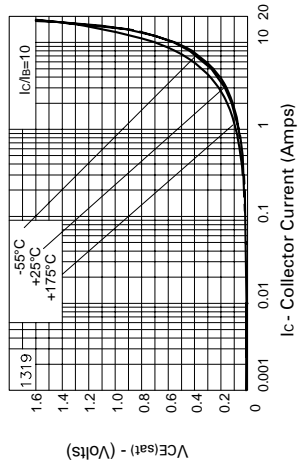
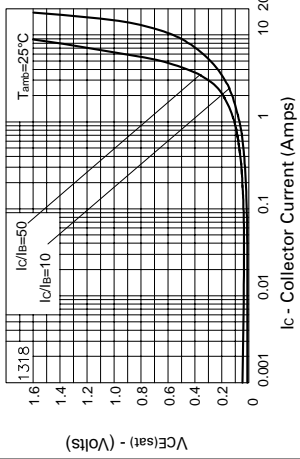
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-100	-140		V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEr}$	-100	-140		V	$I_C = -1\mu A, R_B \leq 1K\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-60	-90		V	$I_C = -10mA^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-6	-8		V	$I_E = -100\mu A$
Collector Cut-Off Current	I_{CBO}			-50 -1	nA μA	$V_{CB} = -80V, V_{CE} = -80V, T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	I_{CER} $R \leq 1K\Omega$			-50 -1	nA μA	$V_{CB} = -80V, T_{amb} = 100^{\circ}\text{C}$
Emitter Cut-Off Current	I_{EBO}			-10	nA	$V_{EB} = -6V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-15			mV	$I_C = -100mA, I_B = -10mA^*$
		-60			mV	$I_C = -1A, I_B = -100mA^*$
		-120			mV	$I_C = -2A, I_B = -200mA^*$
		-220			mV	$I_C = -4A, I_B = -400mA^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-960		mV	$I_C = -4A, I_B = -400mA^*$



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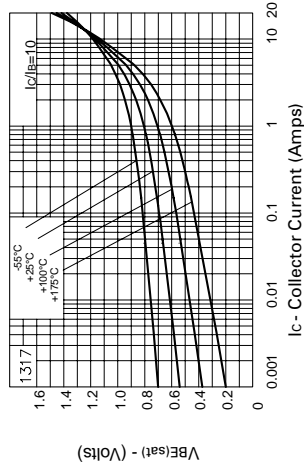
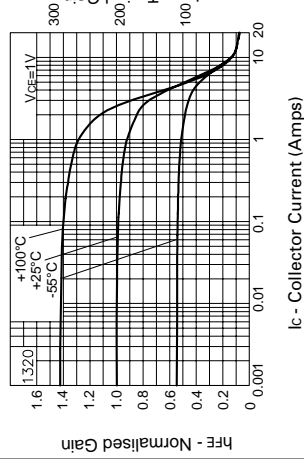
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TYPICAL CHARACTERISTICS



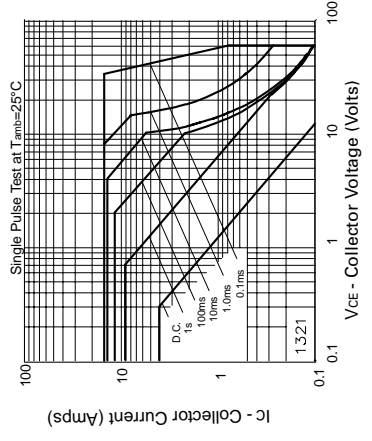
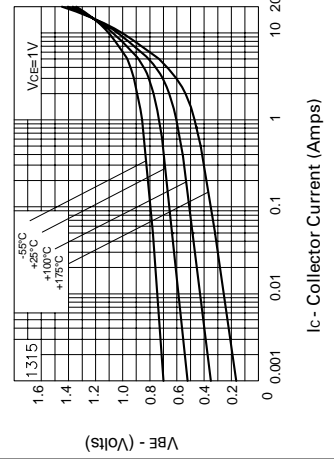
VCE(sat) v IC

VCE(sat) v IC



hFE v IC

VBE(sat) v IC



VBE(on) v IC

Safe Operating Area