

ZTX853

NPN SILICON PLANAR MEDIUM POWER HIGH CURRENT TRANSISTOR

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ISSUE 3 - NOVEMBER 1995

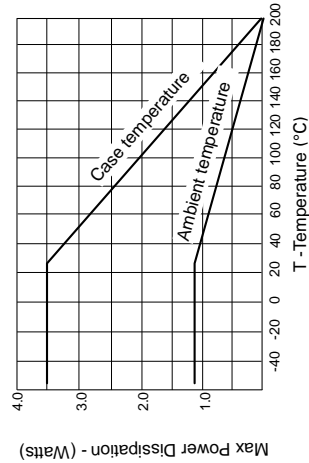
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Base-Emitter Turn-On Voltage	V _{BE(on)}		830	950	V	I _C =4A, V _{CE} =2V*
Static Forward Current Transfer Ratio	h _{FE}	100	200	300		I _C =10mA, V _{CE} =2V
		100	200			I _C =2A, V _{CE} =2V*
		50	100			I _C =4A, V _{CE} =2V*
		20	30			I _C =10A, V _{CE} =2V*
Transition Frequency	f _T		130		MHz	I _C =100mA, V _{CE} =10V, f=50MHz
Output Capacitance	C _{obo}		35		pF	V _{CE} =10V, f=1MHz
Switching Times	t _{on} t _{off}		50		ns	I _C =1A, I _B =100mA, V _{CE} =10V
			1650		ns	I _{B2} =100mA, V _{CE} =10V

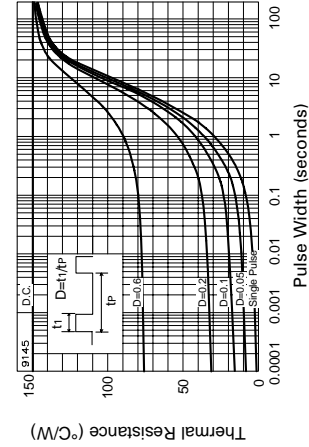
*Measured under pulsed conditions. Pulse width=300µs. Duty cycle ≤2%

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



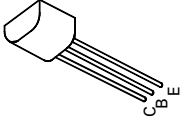
Derating curve



Maximum transient thermal impedance

FEATURES

- * 100 Volt V_{CEO}
- * 4 Amps continuous current
- * Up to 10 Amps peak current
- * Very low saturation voltage
- * P_{tot}=1.2 Watts



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V _{CBO}	200	V
Collector-Emitter Voltage	V _{CEO}	100	V
Emitter-Base Voltage	V _{EBO}	6	V
Peak Pulse Current	I _{CM}	10	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 ;Tstg	-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}	200	300		V	I _C =100µA
Collector-Emitter Breakdown Voltage	V _{(BR)CER}	200	300		V	I _C =1µA, R _B ≤ 1KΩ
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	100	120		V	I _C =10mA*
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6	8		V	I _E =100µA
Collector Cut-Off Current	I _{CBO}			50 1	nA µA	V _{CE} =150V V _{CE} =150V, T _{amb} =100°C
Collector Cut-Off Current	I _{CER} R ≤ 1KΩ			50 1	nA µA	V _{CE} =150V V _{CE} =150V, T _{amb} =100°C
Emitter Cut-Off Current	I _{EBO}			10	nA	V _{EB} =6V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	14	50		mV	I _C =0.1A, I _B =5mA
		100	150		mV	I _C =2A, I _B =100mA
		160	200		mV	I _C =4A, I _B =400mA*
Base-Emitter Saturation Voltage	V _{BE(sat)}		960	1100	mV	I _C =4A, I _B =400mA*

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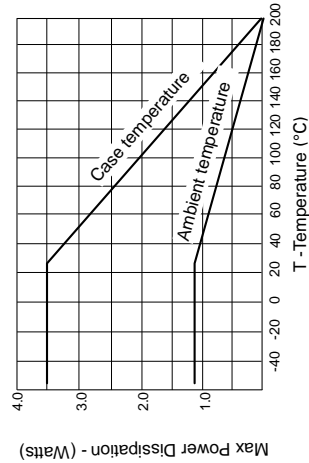
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		830	950	V	$I_C=4A, V_{CE}=2V^*$
Static Forward Current Transfer Ratio	h_{FE}	100	200	300		$I_C=10mA, V_{CE}=2V$
		100	200			$I_C=2A, V_{CE}=2V^*$
		50	100			$I_C=4A, V_{CE}=2V^*$
		20	30			$I_C=10A, V_{CE}=2V^*$
Transition Frequency	f_T		130		MHz	$I_C=100mA, V_{CE}=10V, f=50MHz$
Output Capacitance	C_{obo}		35		pF	$V_{CE}=10V, f=1MHz$
Switching Times	t_{on} t_{off}		50		ns	$I_C=1A, I_B=100mA, V_{CE}=10V$
			1650		ns	$I_{B2}=100mA, V_{CE}=10V$

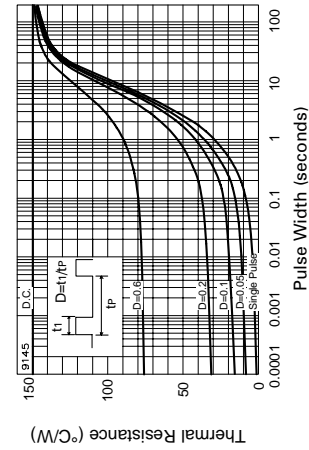
*Measured under pulsed conditions. Pulse width=300 μ s. Duty cycle \leq 2%

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	$^{\circ}\text{C/W}$



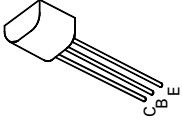
Derating curve



Maximum transient thermal impedance

FEATURES

- * 100 Volt V_{CE0}
- * 4 Amps continuous current
- * Up to 10 Amps peak current
- * Very low saturation voltage
- * $P_{tot}=1.2$ Watts



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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	6	V
Peak Pulse Current	I_{CM}	10	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	$T_j; T_{stg}$	-55 to +200	$^{\circ}\text{C}$

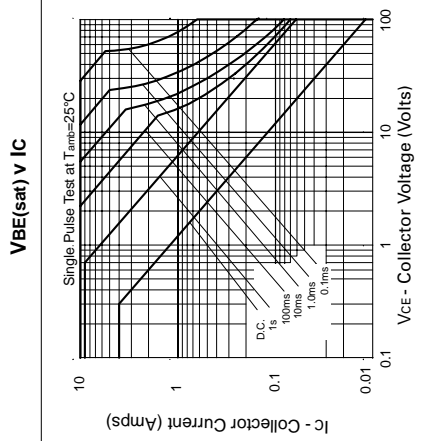
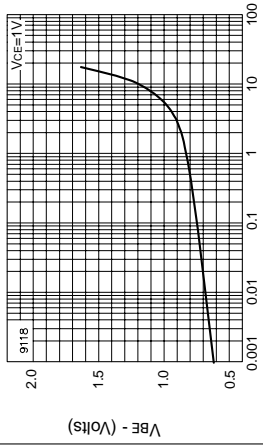
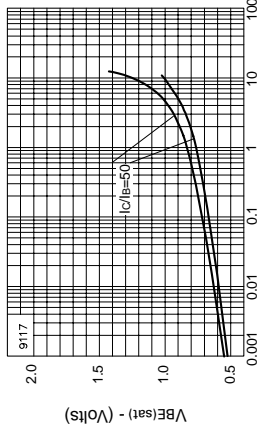
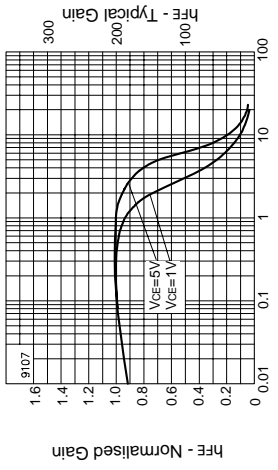
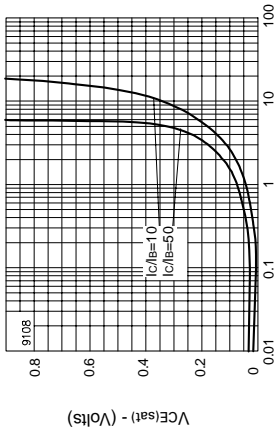
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ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	200	300		V	$I_C=100\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	200	300		V	$I_C=1\mu A, R_B \leq 1K\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	100	120		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	$V_{CE}=150V, V_{CB}=150V, T_{amb}=100^{\circ}\text{C}$
Collector Cut-Off Current	I_{CER} $R \leq 1K\Omega$			50 1	nA μA	$V_{CE}=150V, V_{CB}=150V, T_{amb}=100^{\circ}\text{C}$
Emitter Cut-Off Current	I_{EBO}			10	nA	$V_{EB}=6V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	14	50		mV	$I_C=0.1A, I_B=5mA$
		100	150		mV	$I_C=2A, I_B=100mA$
		160	200		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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TYPICAL CHARACTERISTICS



IC - Collector Current (Amps)

VBE(on) v IC

VBE(sat) v IC