

ZTX788B

**PNP SILICON PLANAR MEDIUM POWER
HIGH GAIN TRANSISTOR**

ZTX788B

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Transition Frequency	f _T	100			MHz	I _C =50mA, V _{CE} =5V f=50MHz
Input Capacitance	C _{ibo}		225		pF	V _{EB} =0.5V, f=1MHz
Output Capacitance	C _{obo}		25		pF	V _{CB} =-10V, f=1MHz
Switching Times	t _{on}		35		ns	I _C =500mA, I _B I _E =50mA I _B I _E =50mA, V _{CE} =-10V
	t _{off}		400		ns	

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

THERMAL CHARACTERISTICS

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

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

FEATURES

- * 15 Volt V_{CEO}
 - * Gain of 300 at I_C=2 Amps
 - * Very low saturation voltage
- APPLICATIONS**
- * Darlington replacement
 - * Flash gun converters
 - * Battery powered circuits
 - * Motor drivers

ABSOLUTE MAXIMUM RATINGS.

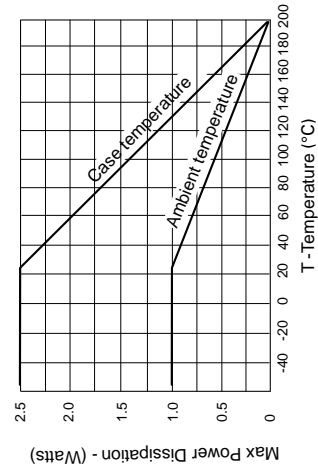
PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V _{CB0}	-15	V
Collector-Emitter Voltage	V _{CEO}	-15	V
Emitter-Base Voltage	V _{EBO}	-5	V
Peak Pulse Current	I _{CM}	-8	A
Continuous Collector Current	I _C	-3	A
Practical Power Dissipation*	P _{totp}	1.5	W
Power Dissipation at T _{amb} =25°C derate above 25°C	P _{tot}	1 5.7	W mW/°C
Operating and Storage Temperature Range	tj: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

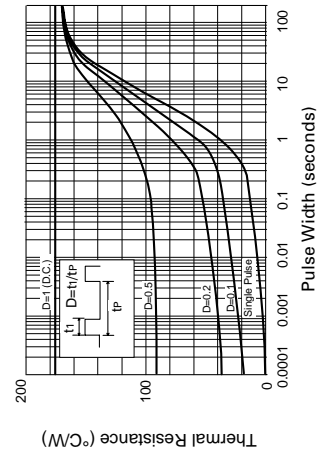
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	V _{(BR)CBO}	-15			V	I _C =-100µA
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	-15			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} =-10V
Emitter Cut-Off Current	I _{EBO}		-0.1		µA	V _{EB} =-4V
Collector-Emitter Saturation Voltage	V _{CE(sat)}		-0.15		V	I _C =-0.5A, I _B =-2.5mA*
			-0.25		V	I _C =-1A, I _B =-5mA*
			-0.45		V	I _C =-2A, I _B =-10mA*
Base-Emitter Saturation Voltage	V _{BE(sat)}		-0.9		V	I _C =-1A, I _B =-5mA*
Base-Emitter Turn-On Voltage	V _{BE(on)}		-0.75		V	I _C =-1A, V _{CE} =-2V*
Static Forward Current Transfer Ratio	h _{FE}	500		1500		I _C =-10mA, V _{CE} =-2V*
		400				I _C =-1A, V _{CE} =-2V*
		300				I _C =-2A, V _{CE} =-2V*
		150				I _C =-6A, V _{CE} =-2V*

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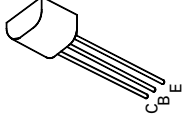


Derating curve



Maximum transient thermal impedance

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E-Line
TO92 Compatible

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ISSUE 2 – APRIL 94

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Transition Frequency	f_T	100			MHz	$I_C = 50\text{mA}$, $V_{CE} = 5\text{V}$, $f = 50\text{MHz}$
Input Capacitance	C_{ibo}		225		pF	$V_{EB} = 0.5\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{obo}		25		pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$
Switching Times	t_{on}		35		ns	$I_C = 500\text{mA}$, $I_B = 50\text{mA}$
	t_{off}		400		ns	

*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 Junction to Ambient ₂ Junction to Case	$R_{th(j-amb)1}$	175	$^{\circ}\text{C/W}$
	$R_{th(j-amb)2}$	116	$^{\circ}\text{C/W}$
	$R_{th(j-case)}$	70	$^{\circ}\text{C/W}$

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

FEATURES

- * 15 Volt V_{CEO}
 - * Gain of 300 at $I_C = 2$ Amps
 - * Very low saturation voltage
- ### APPLICATIONS
- * Darlington replacement
 - * Flash gun converters
 - * Battery powered circuits
 - * Motor drivers

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	-15	V
Collector-Emitter Voltage	V_{CEO}	-15	V
Emitter-Base Voltage	V_{EBO}	-5	V
Peak Pulse Current	I_{CM}	-8	A
Continuous Collector Current	I_C	-3	A
Practical Power Dissipation*	P_{totp}	1.5	W
Power Dissipation at $T_{amb} = 25^{\circ}\text{C}$ derate above 25°C	P_{tot}	1 5.7	W mW/ $^{\circ}\text{C}$
Operating and Storage Temperature Range	tj: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.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-15			V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-15			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	$V_{CB} = 10\text{V}$
Emitter Cut-Off Current	I_{EBO}		-0.1		μA	$V_{EB} = 4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-0.15		V	$I_C = 0.5\text{A}$, $I_B = 2.5\text{mA}^*$
			-0.25		V	$I_C = 1\text{A}$, $I_B = 5\text{mA}^*$
			-0.45		V	$I_C = 2\text{A}$, $I_B = 10\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-0.9		V	$I_C = 1\text{A}$, $I_B = 5\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-0.75		V	$I_C = 1\text{A}$, $V_{CE} = 2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	500		1500		$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}^*$
		400				$I_C = 1\text{A}$, $V_{CE} = 2\text{V}^*$
		300				$I_C = 2\text{A}$, $V_{CE} = 2\text{V}^*$
		150				$I_C = 6\text{A}$, $V_{CE} = 2\text{V}^*$

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Output Capacitance	C_{obo}		25		pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$
Switching Times	t_{on}		35		ns	$I_C = 500\text{mA}$, $I_B = 50\text{mA}$
	t_{off}		400		ns	

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

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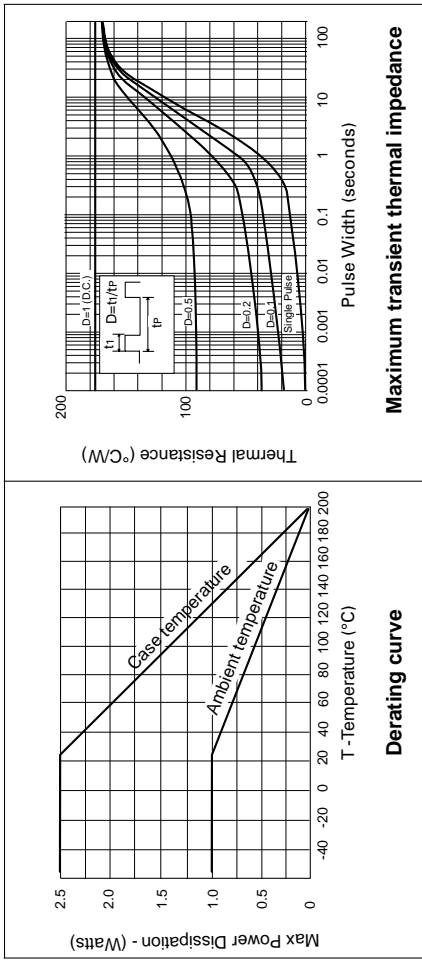
ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	-15	V
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Emitter-Base Voltage	V_{EBO}	-5	V
Peak Pulse Current	I_{CM}	-8	A
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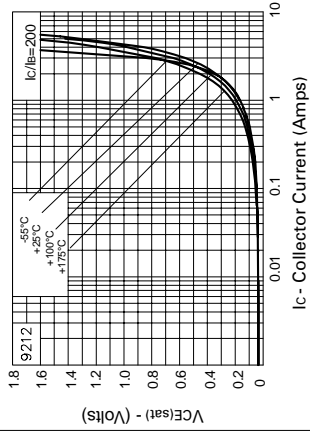
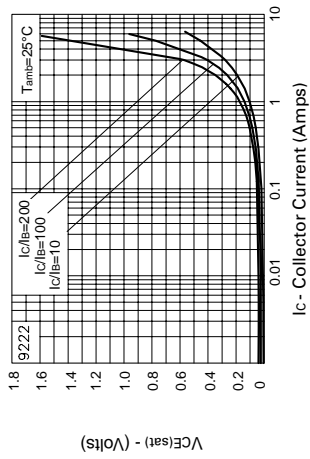
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PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
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Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-15			V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}		-0.1		μA	$V_{CB} = 10\text{V}$
Emitter Cut-Off Current	I_{EBO}		-0.1		μA	$V_{EB} = 4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-0.15		V	$I_C = 0.5\text{A}$, $I_B = 2.5\text{mA}^*$
			-0.25		V	$I_C = 1\text{A}$, $I_B = 5\text{mA}^*$
			-0.45		V	$I_C = 2\text{A}$, $I_B = 10\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-0.9		V	$I_C = 1\text{A}$, $I_B = 5\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-0.75		V	$I_C = 1\text{A}$, $V_{CE} = 2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	500		1500		$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}^*$
		400				$I_C = 1\text{A}$, $V_{CE} = 2\text{V}^*$
		300				$I_C = 2\text{A}$, $V_{CE} = 2\text{V}^*$
		150				$I_C = 6\text{A}$, $V_{CE} = 2\text{V}^*$



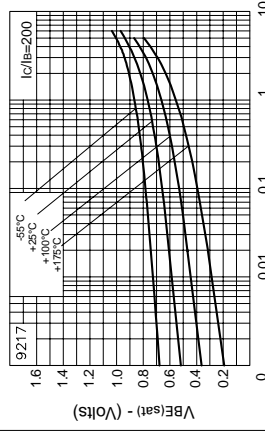
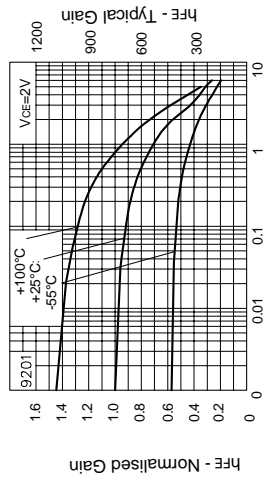
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TYPICAL CHARACTERISTICS



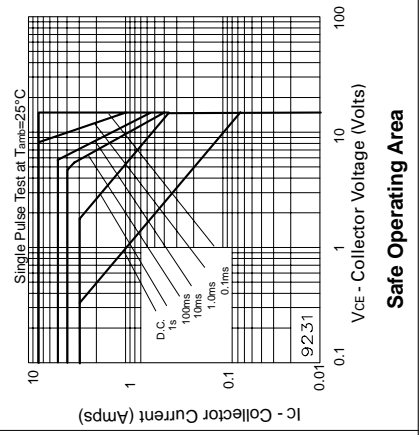
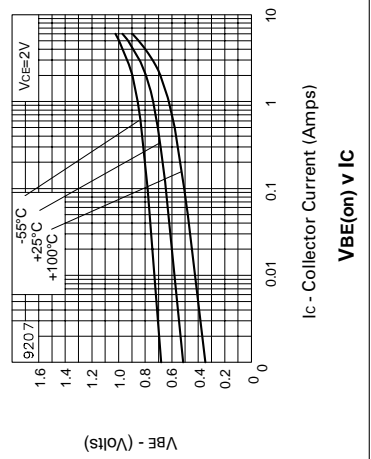
VCE(sat) v IC

VCE(sat) v IC



hFE v IC

VBE(sat) v IC



VBE(on) v IC

Safe Operating Area