



ZTX788B

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

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**ELECTRICAL CHARACTERISTICS (at T<sub>amb</sub> = 25°C)**

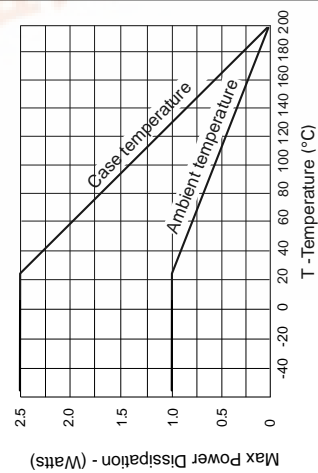
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Transition Frequency	f <sub>T</sub>	100			MHz	I <sub>C</sub> =50mA, V <sub>CE</sub> =5V, f=50MHz
Input Capacitance	C <sub>ibo</sub>		225		pF	V <sub>EB</sub> =-0.5V, f=1MHz
Output Capacitance	C <sub>obo</sub>		25		pF	V <sub>CB</sub> =-10V, f=1MHz
Switching Times	t <sub>on</sub>		35		ns	I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA
	t <sub>off</sub>		400		ns	I <sub>BZ</sub> =-50mA, V <sub>CC</sub> =-10V

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

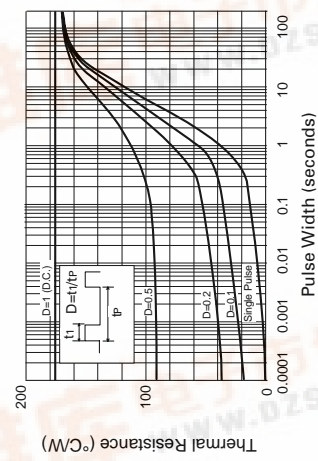
**HERMAL CHARACTERISTICS**

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

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



Derating curve



Maximum transient thermal impedance

**FEATURES**

- \* 15 Volt V<sub>CEO</sub>
  - \* Gain of 300 at I<sub>C</sub>=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 <sub>CB0</sub>	-15	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-15	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Peak Pulse Current	I <sub>CM</sub>	-8	A
Continuous Collector Current	I <sub>C</sub>	-3	A
Practical Power Dissipation*	P <sub>totp</sub>	1.5	W
Power Dissipation at T <sub>amb</sub> =25°C derate above 25°C	P <sub>tot</sub>	1	W
		5.7	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<sub>amb</sub> = 25°C)**

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

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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	$I_B=50\text{mA}$ , $V_{CC}=-10\text{V}$

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

## HEMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient <sub>1</sub> Junction to Ambient <sub>2</sub> 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

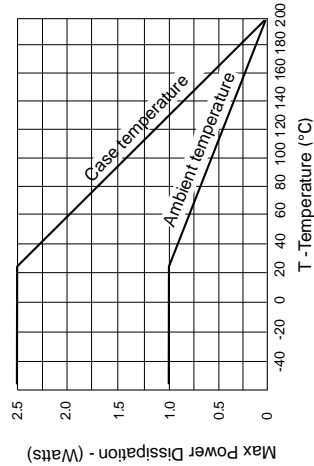
## ABSOLUTE MAXIMUM RATINGS.

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 $25^{\circ}\text{C}$	$P_{tot}$	1	W
	$t_j:tstg$	5.7	$\text{mW}/^{\circ}\text{C}$
Operating and Storage Temperature Range	$t_j:tstg$	-55 to +200	$^{\circ}\text{C}$

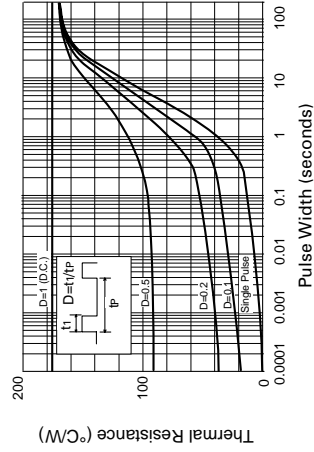
\*The power which can be dissipated assuming the device is mounted in a typical manner on a P.C.B. with copper equal to 1 inch square minimum

## 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	$\mu\text{A}$	$V_{CB}=-10\text{V}$
Emitter Cut-Off Current	$I_{EBO}$			-0.1	$\mu\text{A}$	$V_{EB}=-4\text{V}$
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				$I_C=6\text{A}$ , $V_{CE}=2\text{V}^*$



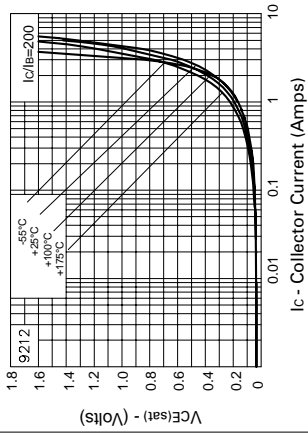
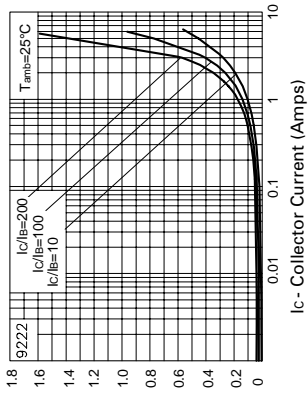
Derating curve



Maximum transient thermal impedance

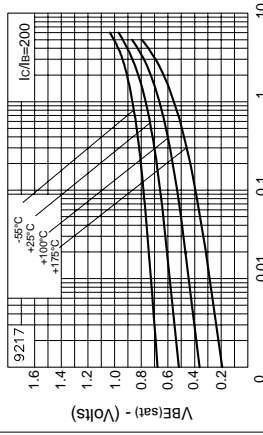
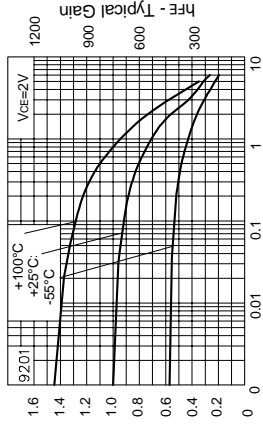
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## TYPICAL CHARACTERISTICS



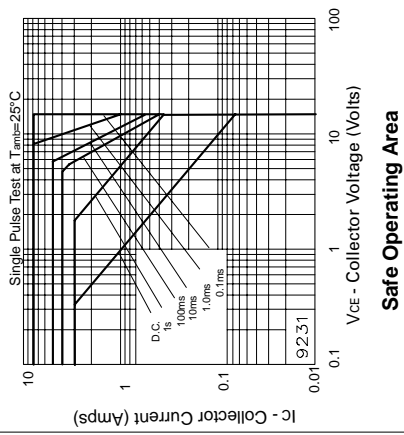
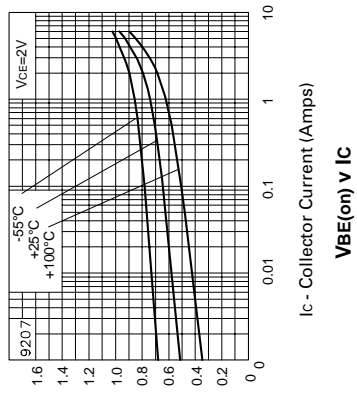
VCE(sat) v IC

VCE(sat) v IC



hFE v IC

VBE(sat) v IC



VBE(on) v IC

VCE - Collector Voltage (Volts)

Safe Operating Area