

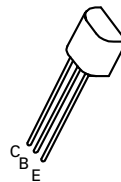
# PNP SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ISSUE 1 - JANUARY 1997

## ZTX1147A

### FEATURES

- \*  $V_{CE0} = -12V$
- \* 4 Amp Continuous Current
- \* 20 Amp pulse Current
- \* Low Saturation Voltage
- \* High Gain



E-Line  
T092 Compatible

### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	-15	V
Collector-Emitter Voltage	$V_{CEO}$	-12	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Peak Pulse Current	$I_{CM}$	-20	A
Continuous Collector Current	$I_C$	-4	A
Base Current	$I_B$	-500	mA
Power Dissipation at $T_{amb}=25^{\circ}C$	$P_{tot}$	1	W
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +200	$^{\circ}C$

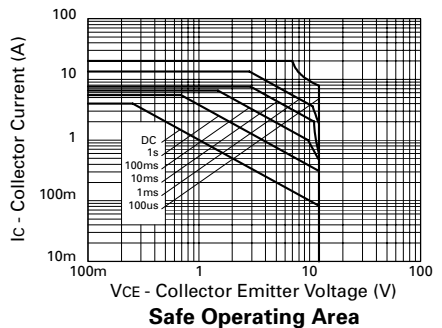
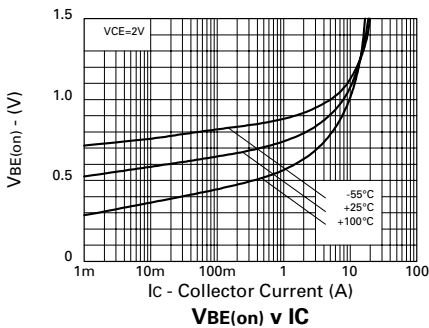
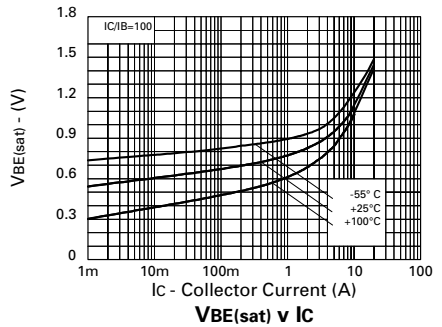
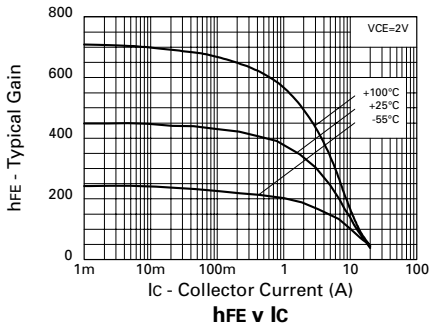
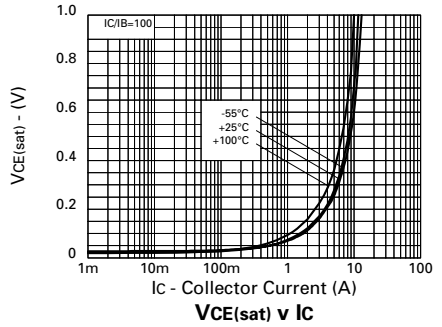
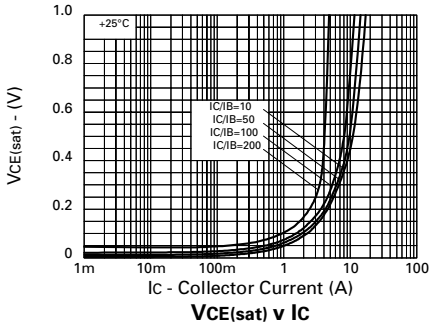
# ZTX1147A

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

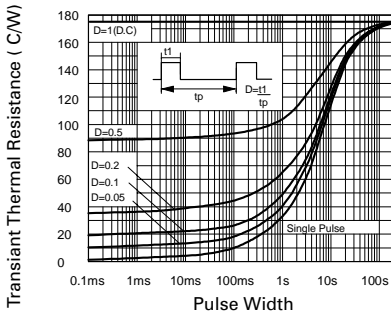
PARAMETER	SYMBOL	VALUE			UNIT	CONDITIONS.
		MIN.	TYP.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-15	-35		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	-12	-25		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-12	-25		V	$I_C = -10\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEV}$	-12	-25		V	$I_C = -100\mu\text{A}$ , $V_{EB} = +1\text{V}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5	-8.5		V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$		-0.3	-100	nA	$V_{CB} = -12\text{V}$
Emitter Cut-Off Current	$I_{EBO}$		-0.3	-100	nA	$V_{EB} = -4\text{V}$
Collector Emitter Cut-Off Current	$I_{CES}$		-0.3	-100	nA	$V_{CE} = -10\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-25 -70 -90 -115 -175	-50 -110 -130 -170 -235	mV mV mV mV mV	$I_C = -0.1\text{A}$ , $I_B = -1\text{mA}^*$ $I_C = -0.5\text{A}$ , $I_B = -2.5\text{mA}^*$ $I_C = -1\text{A}$ , $I_B = -6\text{mA}^*$ $I_C = -2\text{A}$ , $I_B = -20\text{mA}^*$ $I_C = -4\text{A}$ , $I_B = -70\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-890	-1000	mV	$I_C = -4\text{A}$ , $I_B = -70\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-830	-950	mV	$I_C = -4\text{A}$ , $V_{CE} = -2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	270 250 200 170 90	450 400 340 270 150 50	850		$I_C = -10\text{mA}$ , $V_{CE} = -2\text{V}^*$ $I_C = -0.5\text{A}$ , $V_{CE} = -2\text{V}^*$ $I_C = -2.0\text{A}$ , $V_{CE} = -2\text{V}^*$ $I_C = -4.0\text{A}$ , $V_{CE} = -2\text{V}^*$ $I_C = -10\text{A}$ , $V_{CE} = -2\text{V}^*$ $I_C = -20\text{A}$ , $V_{CE} = -2\text{V}^*$
Transition Frequency	$f_T$		115		MHz	$I_C = -50\text{mA}$ , $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Out Capacitance	$C_{cb}$		80		pF	$V_{CB} = -10\text{V}$ , $f = 1\text{MHz}$
Switching Times	$t_{on}$		150		ns	$I_C = -4\text{A}$ , $I_B = -40\text{mA}$ , $V_{CC} = -10\text{V}$
	$t_{off}$		220		ns	$I_C = -4\text{A}$ , $I_B = \pm 40\text{mA}$ , $V_{CC} = -10\text{V}$

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

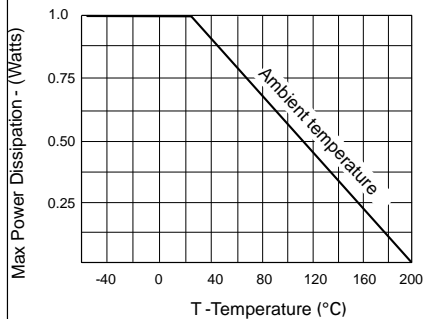
## TYPICAL CHARACTERISTICS



# ZTX1147A



Transient Thermal Resistance



Derating curve

## SPICE PARAMETERS

\* ZETEX ZTX1147 Spice model Last revision 10/12/96

\*

.MODEL ZTX1147 PNP IS=1.272e-12 NF=0.989 ISE=2.5e-13 NE=1.65

+ BF=500 VAF=14.59 IKF=8 NR=1 ISC=8e-14 NC= 1.6

+ BR=90 VAR=3.1 IKR=1.2 RE=15e-3 RB=145e-3

+ RC=13e-3 CJE=560e-12

+ CJC=255e-12 VJC=0.6288

+ MJC=0.4048 TF=1.2e-9 TR=13e-9

\*

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