

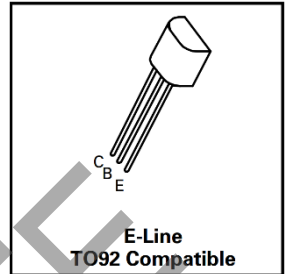
# PNP SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

## ZTX1147A

### ISSUE 2

#### FEATURES

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



#### 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 | $^{\circ}C$ |

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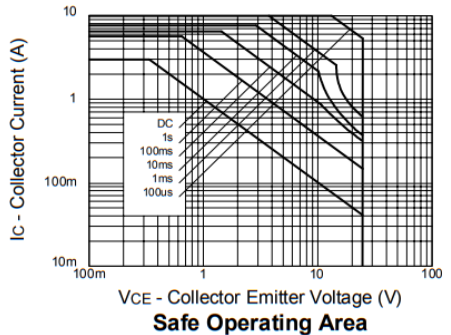
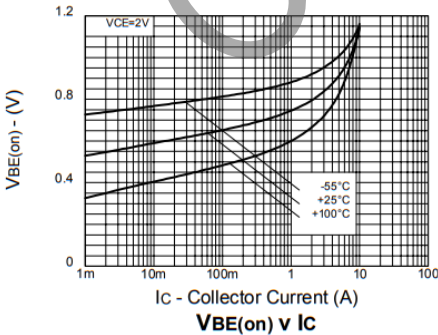
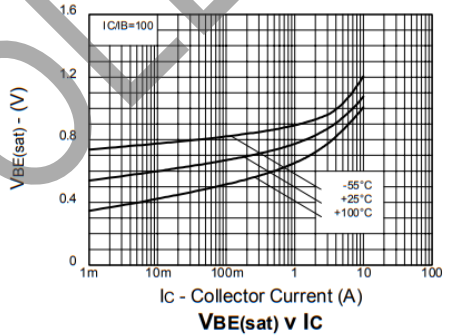
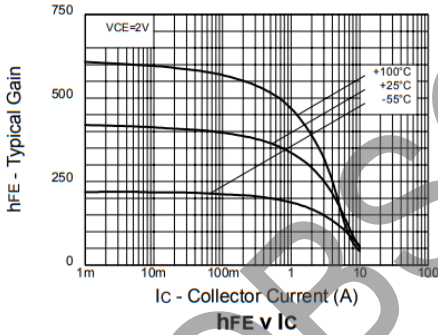
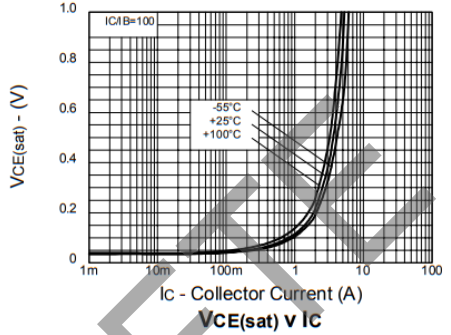
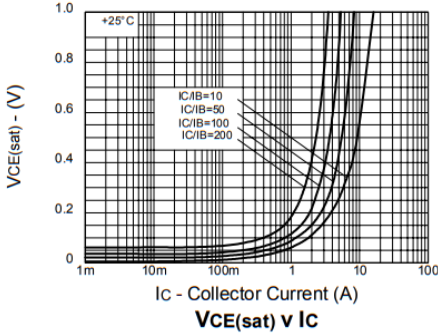
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| 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  | -50   | mV   | $I_C = 0.1\text{A}, I_B = -1\text{mA}^*$                         |
|                                       |               |       | -70  | -110  | mV   | $I_C = 0.5\text{A}, I_B = -2.5\text{mA}^*$                       |
|                                       |               |       | -90  | -130  | mV   | $I_C = 1\text{A}, I_B = -6\text{mA}^*$                           |
|                                       |               |       | -115 | -170  | mV   | $I_C = 2\text{A}, I_B = -20\text{mA}^*$                          |
|                                       |               |       | -175 | -235  | mV   | $I_C = 4\text{A}, I_B = -70\text{mA}^*$                          |
| 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   | 450  |       |  | $I_C = -10\text{mA}, V_{CE} = -2\text{V}^*$                      |
|                                       |               | 250   | 400  | 850   |  | $I_C = -0.5\text{A}, V_{CE} = -2\text{V}^*$                      |
|                                       |               | 200   | 340  |       |  | $I_C = -2.0\text{A}, V_{CE} = -2\text{V}^*$                      |
|                                       |               | 170   | 270  |       |  | $I_C = -4.0\text{A}, V_{CE} = -2\text{V}^*$                      |
|                                       |               | 90    | 150  |       |  | $I_C = -10\text{A}, V_{CE} = -2\text{V}^*$                       |
|                                       |               | 50    |      |       | $I_C = -20\text{A}, V_{CE} = -2\text{V}^*$ |  |
| Transition Frequency                  | $f_T$         |       | 115  |       | MHz  | $I_C = -50\text{mA}, V_{CE} = -10\text{V}$<br>$f = 50\text{MHz}$ |
| 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  $\leq 2\%$

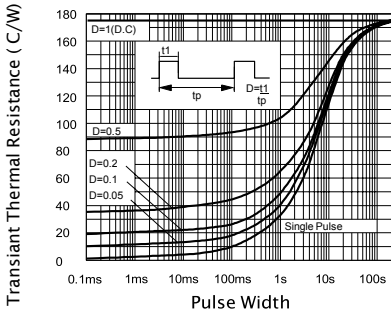
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TYPICAL CHARACTERISTICS

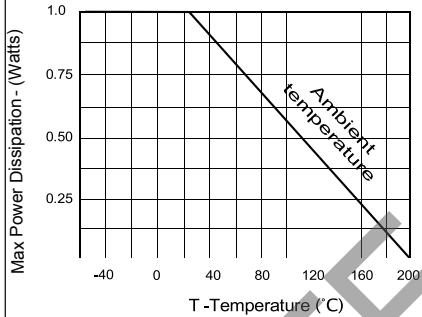


OBSOLETE - PART DISCONTINUED

# 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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