

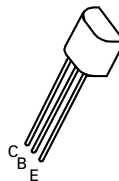
# PNP SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ISSUE 1 - January 1997

## ZTX1149A

### FEATURES

- \*  $V_{CE0} = -25V$
- \* 3 Amp Continuous Current
- \* 10 Amp Pulse Current
- \* Low Saturation Voltage
- \* High Gain



E-Line  
TO92 Compatible

### ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                  | SYMBOL         | ZTX1149A    | UNIT        |
|--|----------------|-------------|-------------|
| Collector-Base Voltage                     | $V_{CBO}$      | -30         | V           |
| Collector-Emitter Voltage                  | $V_{CEO}$      | -25         | V           |
| Emitter-Base Voltage                       | $V_{EBO}$      | -5          | V           |
| Peak Pulse Current                         | $I_{CM}$       | -10         | A           |
| Continuous Collector Current               | $I_C$          | -3          | 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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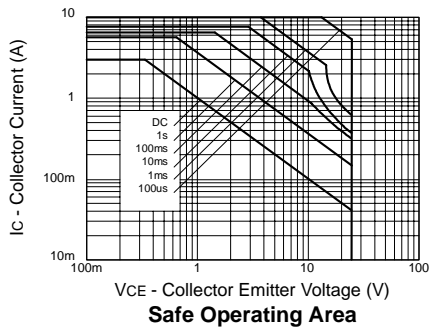
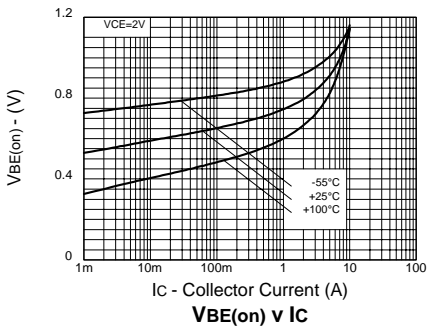
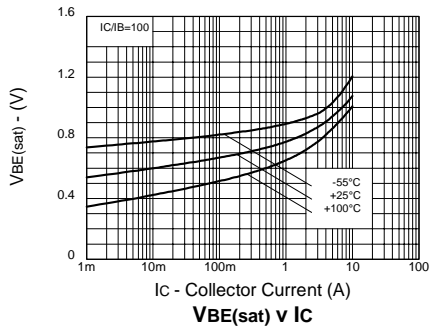
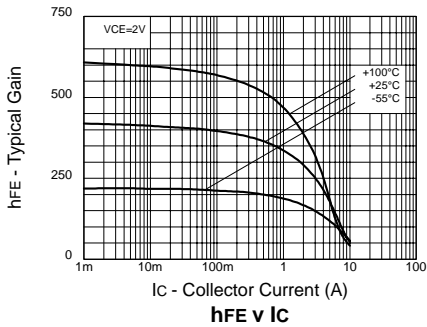
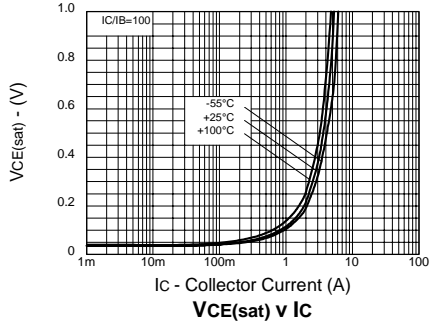
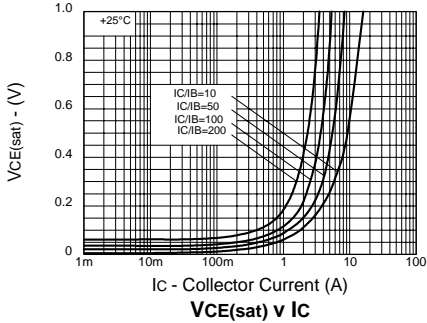
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| PARAMETER                             | SYMBOL        |                          |                                     |                                     | UNIT                       | CONDITIONS.  |
|---------------------------------------|---------------|--------------------------|-------------------------------------|-------------------------------------|----------------------------|--|
|                                       |               | MIN.                     | TYP.                                | MAX.                                |                            |  |
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | -30                      | -70                                 |                                     | V                          | $I_C = -100\mu\text{A}$  |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CES}$ | -25                      | -60                                 |                                     | V                          | $I_C = -100\mu\text{A}$  |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$ | -25                      | -60                                 |                                     | V                          | $I_C = -10\text{mA}^*$   |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEV}$ | -25                      | -60                                 |                                     | 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                         | $V_{CB} = -24\text{V}$   |
| 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                         | $V_{CE} = -20\text{V}$   |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |                          | -45<br>-100<br>-140<br>-170<br>-200 | -80<br>-170<br>-240<br>-260<br>-300 | mV<br>mV<br>mV<br>mV<br>mV | $I_C = -0.1\text{A}, I_B = -1.0\text{mA}^*$<br>$I_C = -0.5\text{A}, I_B = -3\text{mA}^*$<br>$I_C = -1\text{A}, I_B = -7\text{mA}^*$<br>$I_C = -2\text{A}, I_B = -30\text{mA}^*$<br>$I_C = -3\text{A}, I_B = -70\text{mA}^*$        |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$ |                          | -870                                | -1000                               | mV                         | $I_C = -3\text{A}, I_B = -70\text{mA}^*$   |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$  |                          | -800                                | -900                                | mV                         | $I_C = -3\text{A}, V_{CE} = -2\text{V}^*$  |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 270<br>250<br>195<br>115 | 450<br>400<br>320<br>190<br>50      | 800                                 |                            | $I_C = -10\text{mA}, V_{CE} = -2\text{V}^*$<br>$I_C = -0.5\text{A}, V_{CE} = -2\text{V}^*$<br>$I_C = -2\text{A}, V_{CE} = -2\text{V}^*$<br>$I_C = -5\text{A}, V_{CE} = -2\text{V}^*$<br>$I_C = -10\text{A}, V_{CE} = -2\text{V}^*$ |
| Transition Frequency                  | $f_T$         |                          | 135                                 |                                     | MHz                        | $I_C = -50\text{mA}, V_{CE} = -10\text{V}$<br>$f = 50\text{MHz}$   |
| Output Capacitance                    | $C_{cb}$      |                          | 50                                  |                                     | pF                         | $V_{CB} = -10\text{V}, f = 1\text{MHz}$  |
| Switching Times                       | $t_{on}$      |                          | 150                                 |                                     | ns                         | $I_C = -4\text{A}, I_B = -40\text{mA}, V_{CC} = -10\text{V}$   |
|                                       | $t_{off}$     |                          | 270                                 |                                     | ns                         | $I_C = -4\text{A}, I_B = \pm 40\text{mA}, V_{CC} = -10\text{V}$  |

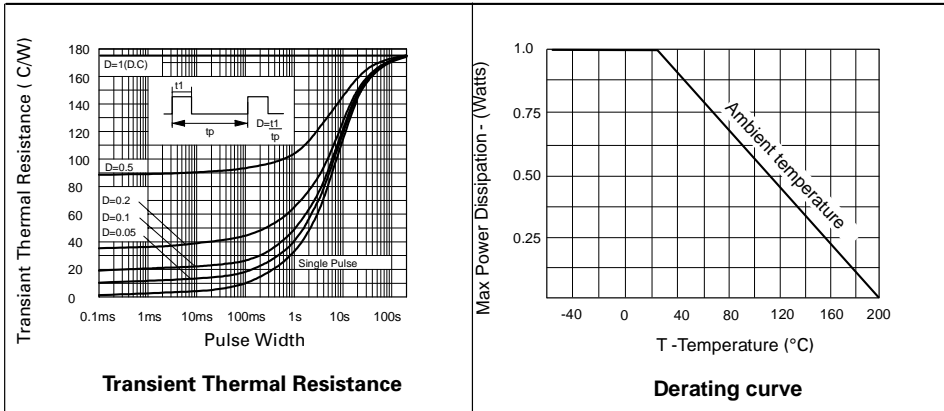
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

# ZTX1149A

## TYPICAL CHARACTERISTICS



# ZTX1149A



\*ZETEX ZTX1149 Spice model Last revision 10/1/97

\*

.MODEL ZTX1149 PNP IS =9.5e-13 NF=1.002 ISE=1.2e-13 NE =1.4 BF =520

+ VAF=24.97 IKF=5 NR =0.997 ISC=4.5E-13 NC =1.25

+ BR = 40 VAR=2.51 IKR=0.7 RE =20e-3 RB =150e-3

+ RC =10e-3 CJE=490e-12 CJC=150e-12 VJC=1.094

+ MJC= 0.4739 TF =1e-9 TR = 3.5e-9

\*

\*

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