

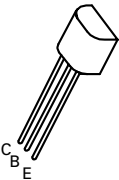
PNP SILICON PLANAR MEDIUM POWER  
HIGH GAIN TRANSISTOR

ISSUE 1 - January 1997

ZTX1149A

FEATURES

- \*  $V_{CEO} = -25V$
- \* 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 | $^{\circ}C$ |

# ZTX1149A

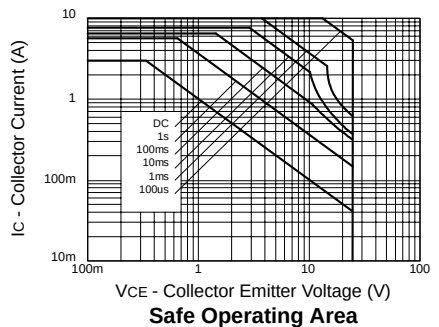
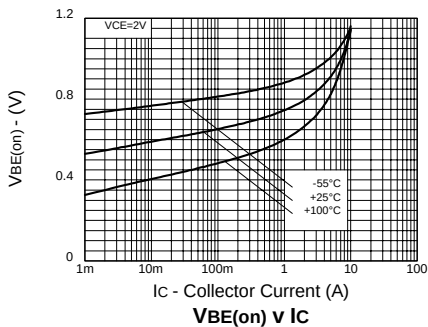
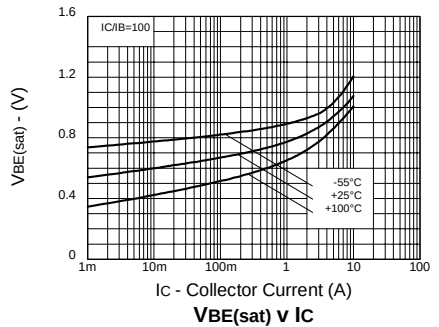
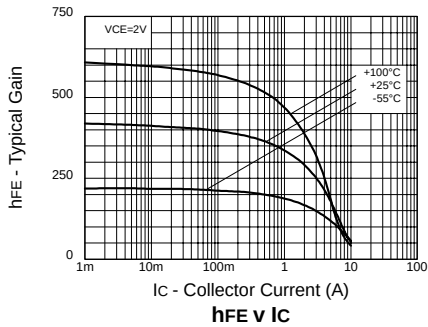
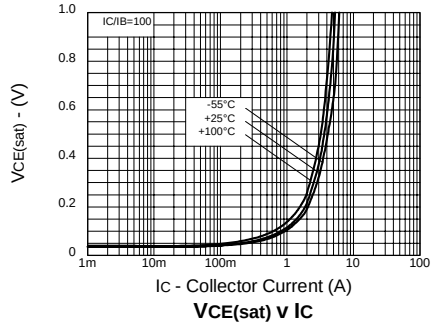
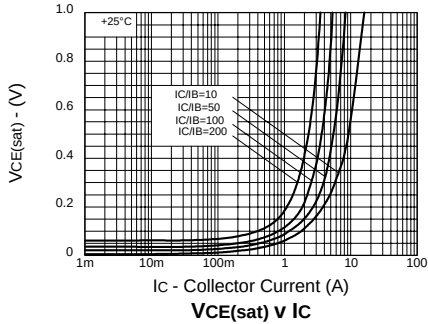
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| 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                            | -80   | mV   | $I_C = -0.1\text{A}$ , $I_B = -1.0\text{mA}^*$                                                                                                                                                                                                    |
|                                       |               |                          | -100                           | -170  | mV   | $I_C = -0.5\text{A}$ , $I_B = -3\text{mA}^*$                                                                                                                                                                                                      |
|                                       |               |                          | -140                           | -240  | mV   | $I_C = -1\text{A}$ , $I_B = -7\text{mA}^*$                                                                                                                                                                                                        |
|                                       |               |                          | -170                           | -260  | mV   | $I_C = -2\text{A}$ , $I_B = -30\text{mA}^*$                                                                                                                                                                                                       |
|                                       |               |                          | -200                           | -300  | mV   | $I_C = -3\text{A}$ , $I_B = -70\text{mA}^*$                                                                                                                                                                                                       |
| 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   | $I_C = -4\text{A}$ , $I_B = -40\text{mA}$ ,<br>$V_{CC} = -10\text{V}$                                                                                                                                                                             |
|                                       | $t_{off}$     |                          | 270                            |       | ns   | $I_C = -4\text{A}$ , $I_B = \pm 40\text{mA}$ ,<br>$V_{CC} = -10\text{V}$                                                                                                                                                                          |

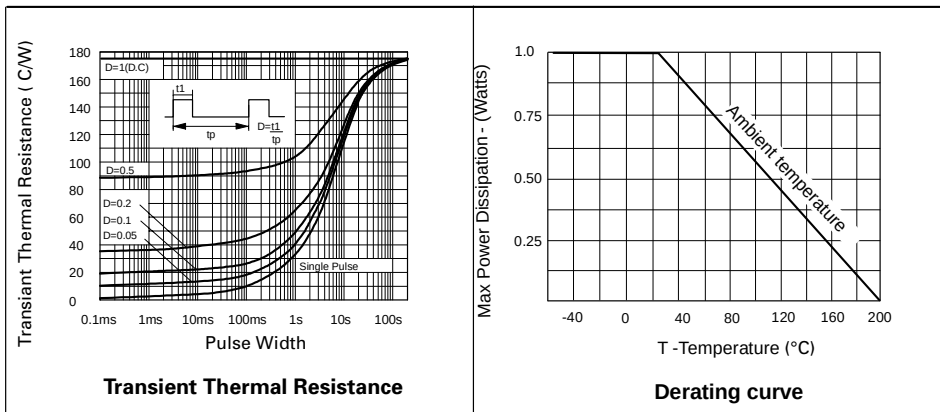
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

# 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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