

# NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

## ZTX1055A

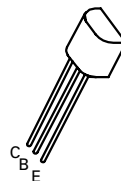
ISSUE 3 – JANUARY 1995

### FEATURES

- \*  $V_{CE0}=120V$
- \* 3 Amp continuous Current
- \* 6 Amp pulse Current
- \* Very Low Saturation Voltage

### APPLICATIONS

- \* Automotive Switching Circuit
- \* Audio Driver Stages



E-Line  
TO92 Compatible

### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	175	V
Collector-Emitter Voltage	$V_{CEO}$	120	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current	$I_{CM}$	6	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	$^{\circ}C$

The ZETEX logo consists of a stylized 'Z' symbol to the left of the word 'ZETEX' in a bold, sans-serif font.

# ZTX1055A

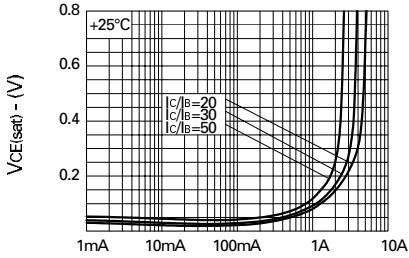
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	175	280		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CES}$	175	280		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	120	150		V	$I_C=10\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{CEV}$	175	280		V	$I_C=100\mu\text{A}, V_{EB}=1\text{V}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.8		V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$		0.3	10	nA	$V_{CB}=130\text{V}$
Emitter Cut-Off Current	$I_{EBO}$		0.3	10	nA	$V_{EB}=4\text{V}$
Collector Emitter Cut-Off Current	$I_{CES}$		0.3	10	nA	$V_{CES}=130\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		22 120 220	50 160 310	mV mV mV	$I_C=0.1\text{A}, I_B=5\text{mA}^*$ $I_C=1\text{A}, I_B=20\text{mA}^*$ $I_C=3\text{A}, I_B=150\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		950	1000	mV	$I_C=3\text{A}, I_B=150\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		810	900	mV	$I_C=3\text{A}, V_{CE}=10\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	275 300 50	400 450 110 15	1200		$I_C=10\text{mA}, V_{CE}=10\text{V}^*$ $I_C=1\text{A}, V_{CE}=10\text{V}^*$ $I_C=3\text{A}, V_{CE}=10\text{V}^*$ $I_C=6\text{A}, V_{CE}=10\text{V}^*$
Transition Frequency	$f_T$		130		MHz	$I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=100\text{MHz}$
Output Capacitance	$C_{obo}$		17	30	pF	$V_{CB}=10\text{V}, f=1\text{MHz}$
Switching Times	$t_{on}$		90		ns	$I_C=1\text{A}, I_B=10\text{mA}, V_{CC}=50\text{V}$
	$t_{off}$		2400		ns	$I_C=1\text{A}, I_B=\pm 10\text{mA}, V_{CC}=50\text{V}$

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

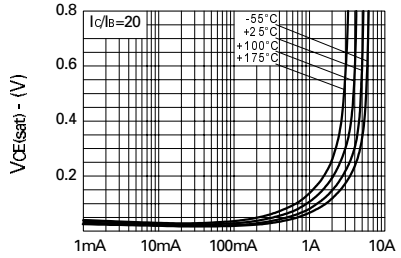
# ZTX1055A

## TYPICAL CHARACTERISTICS



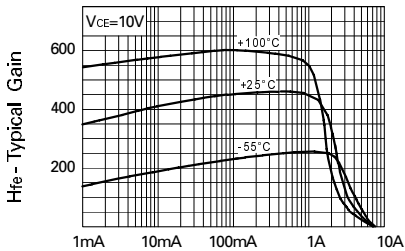
$I_C$ -Collector Current

**$V_{CE(sat)}$  v  $I_C$**



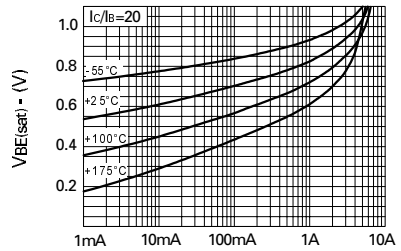
$I_C$ -Collector Current

**$V_{CE(sat)}$  v  $I_C$**



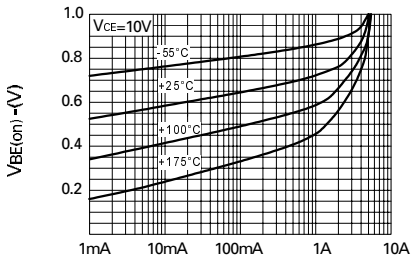
$I_C$ -Collector Current

**$h_{FE}$  v  $I_C$**



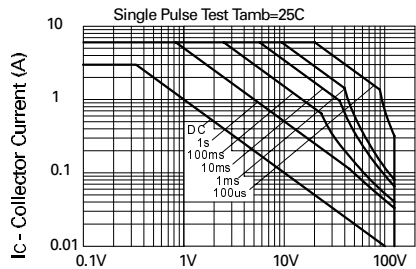
$I_C$ -Collector Current

**$V_{BE(sat)}$  v  $I_C$**



$I_C$ -Collector Current

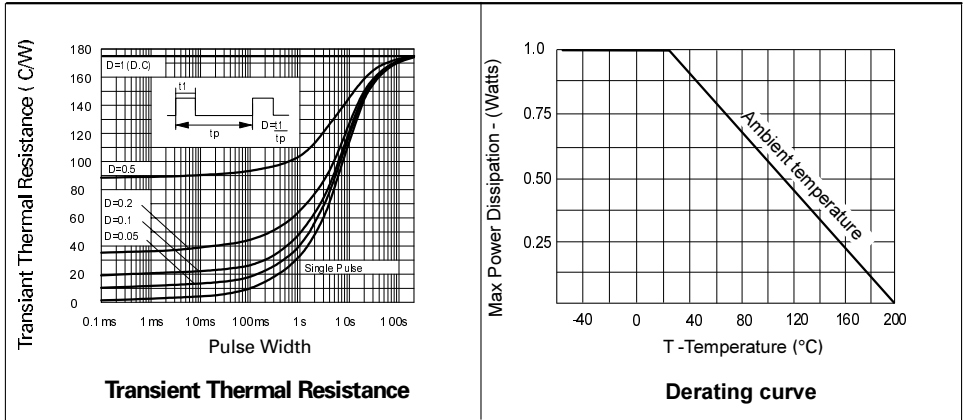
**$V_{BE(on)}$  v  $I_C$**



$V_{CE}$  - Collector Voltage

**Safe Operating Area**

# ZTX1055A



## SPICE PARAMETERS

\*ZETEX ZTX1055A Spice model Last revision 25/1/95

\*

```
.MODEL ZTX1055A NPN IS=1.60E-12 NF=1.0 BF=500 IKF=4.0 VAF=120
```

```
+ ISE=4.0E-13 NE=1.4 NR=1.0 BR=80 IKR=2.5 VAR=15
```

```
+ ISC=5.0E-10 NC=1.7 RB=0.1 RE=0.040 RC=0.030
```

```
+ CJC=63.3E-12 CJE=512.6E-12 MJC=0.439 MJE=0.373
```

```
+ VJC=0.511 VJE=0.800 TF=700E-12 TR=110E-9
```

\*

© 1995 ZETEX PLC

The copyright in this model and the design embodied belong to Zetex PLC ("Zetex"). It is supplied free of charge by Zetex for the purpose of research and design and may be used or copied intact (including this notice) for that purpose only. All other rights are reserved. The model is believed accurate but no condition or warranty as to its merchantability or fitness for purpose is given and no liability in respect of any use is accepted by Zetex PLC, its distributors or agents.



Zetex plc.

Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.

Telephone: (44)161-627 5105 (Sales), (44)161-627 4963 (General Enquiries)

Facsimile: (44)161-627 5467

Zetex GmbH  
Streitfeldstraße 19  
D-81673 München  
Telefon: (49) 89 45 49 49 0  
Fax: (49) 89 45 49 49 49

Zetex Inc.  
87 Modular Avenue  
Commack NY11725  
Telephone: (516) 543-7100  
Fax: (516) 864-7630

Zetex (Asia) Ltd.  
3510 Metroplaza, Tower 2  
Hing Fong Road, Kwai Fong  
Telephone: (852) 26100 611  
Fax: (852) 24250 494

These are supported by  
agents and distributors in  
major countries world-wide  
© Zetex plc 1995

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.