

**NPN SILICON PLANAR MEDIUM POWER  
HIGH GAIN TRANSISTOR**

**ZTX1049A**

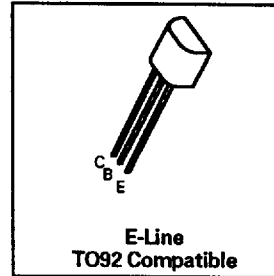
ISSUE 1 – JUNE 1995

**FEATURES**

- \*  $V_{CEV} = 80V$
- \* Very low saturation voltages
- \* High Gain
- \* 20 Amps pulse current

**APPLICATIONS**

- \* LCD Backlight converters
- \* Emergency lighting
- \* DC-DC converters



**ABSOLUTE MAXIMUM RATINGS.**

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	25	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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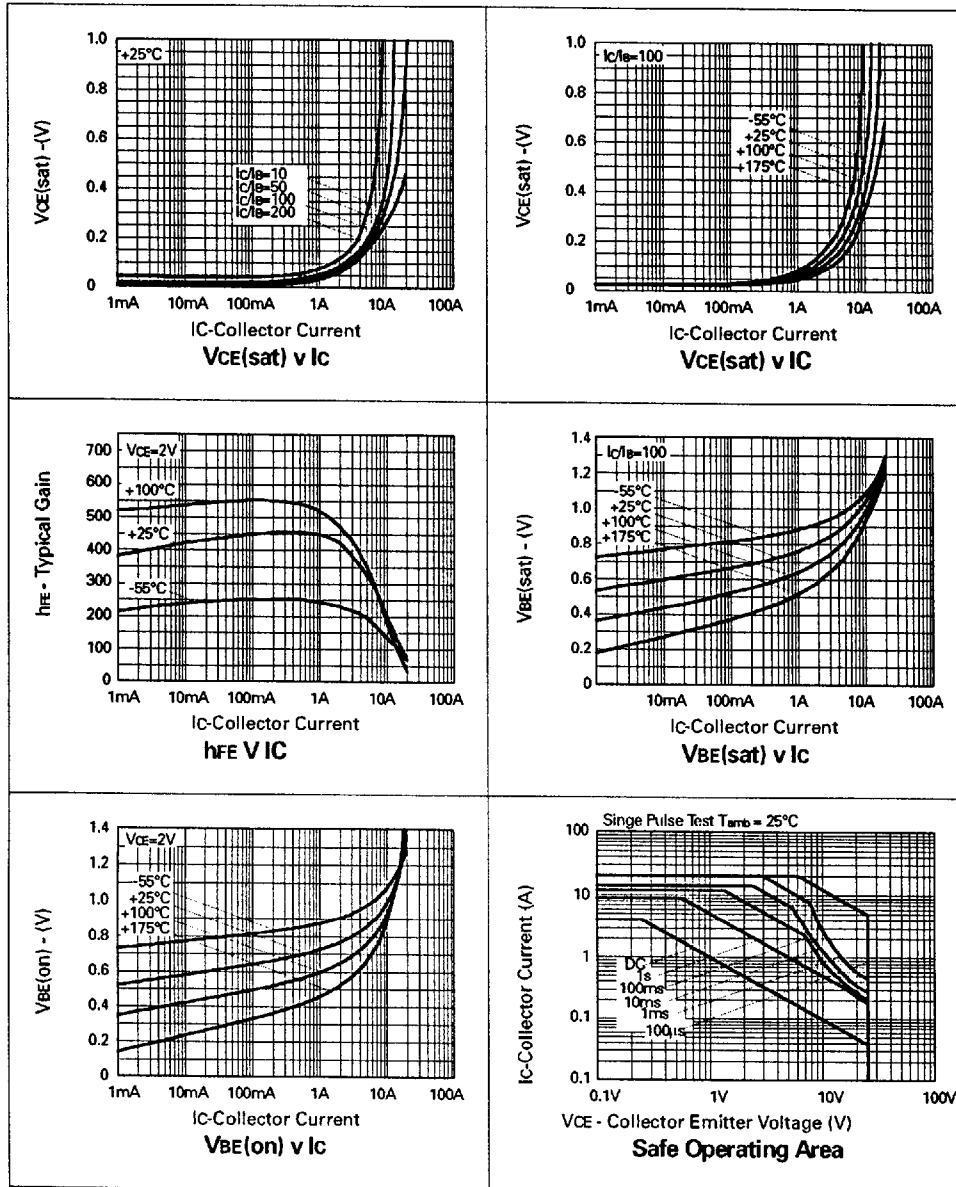
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80	120		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CES}$	80	120		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	25	35		V	$I_C=10\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{CEV}$	80	120		V	$I_C=100\mu\text{A}, V_{EB}=1\text{V}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.75		V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$		0.3	10	nA	$V_{CB}=50\text{V}$
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	$V_{CES}=50\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		30 60 125 155	45 80 180 220	mV	$I_C=0.5\text{A}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=2\text{A}, I_B=10\text{mA}^*$ $I_C=4\text{A}, I_B=50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		890	950	mV	$I_C=4\text{A}, I_B=50\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(ton)}$		820	900	mV	$I_C=4\text{A}, V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	250 300 300 200 35	430 450 450 350 70	1200		$I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=0.5\text{A}, V_{CE}=2\text{V}^*$ $I_C=1\text{A}, V_{CE}=2\text{V}^*$ $I_C=4\text{A}, V_{CE}=2\text{V}^*$ $I_C=20\text{A}, V_{CE}=2\text{V}^*$
Transition Frequency	$f_T$		180		MHz	$I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=50\text{MHz}$
Output Capacitance	$C_{obo}$		45	60	pF	$V_{CB}=10\text{V}, f=1\text{MHz}$
Turn - On Time	$t_{on}$		125		ns	$I_C=4\text{A}, I_B=40\text{mA}, V_{CC}=10\text{V}$
Turn - Off Time	$t_{off}$		380		ns	$I_C=4\text{A}, I_B=\pm 40\text{mA}, V_{CC}=10\text{V}$

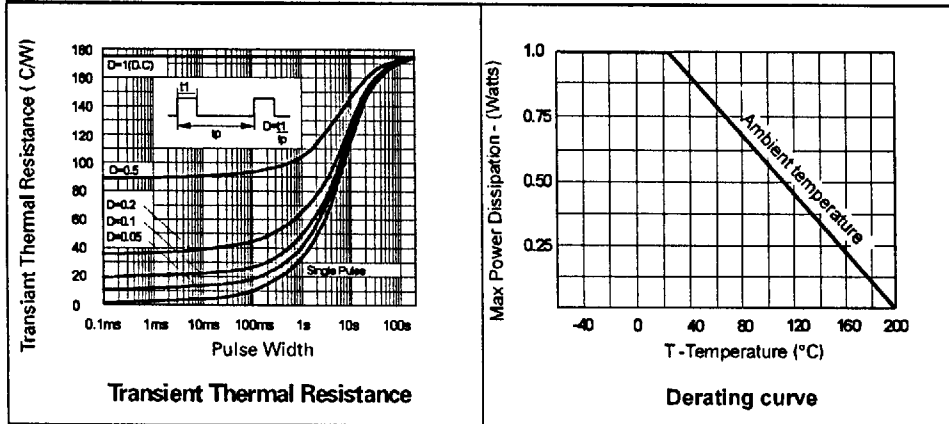
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq$  2%

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## TYPICAL CHARACTERISTICS



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## SPICE PARAMETERS

\*ZETEX ZTX1049A Spice model Last revision 15/6/95

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.MODEL ZTX1049A NPN IS=1.5E-12 NF=1.0 BF=600 IKF=7.5 VAF=100

+ ISE=0.9E-13 NE=1.25 NR=1.0 BR=150 IKR=3 VAR=15

+ ISC=5.0E-13 NC=1.76 RB=0.1 RE=0.018 RC=0.007

+ CJC=136E-12 CJE=550E-12 MJC=0.352 MJE=0.36

+ VJC=0.554 VJE=0.726 TF=400E-12 TR=6.9E-9

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**ZETEX**

Zetex plc.

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

Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)

Fax: (44)161 622 4420

Zetex GmbH

Streffeldstraße 19

D-81673 München

Germany

Telephone: (49) 89 45 49 49 0

Fax: (49) 89 45 49 49 49

Zetex Inc.

47 Mall Drive, Unit 4

Commack NY 11725

USA

Telephone: (516) 543-7100

Fax: (516) 864-7630

Zetex (Asia) Ltd.

3510 Metroplaza, Tower 2

Hing Fong Road,

Kwai Fong, Hong Kong

Telephone: (852) 26100 611

Fax: (852) 24250 494

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