

NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ISSUE 3- JANUARY 1995

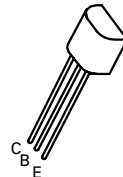
ZTX1053A

FEATURES

- * $V_{CE0}=75V$
- * 3 Amp Continuous Current
- * 10 Amp Pulse Current
- * Very Low Saturation Voltage

APPLICATIONS

- * Automotive Switching Circuits
- * DC-DC Convertors



**E-Line
TO92 Compatible**

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	ZTX1053A	UNIT
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	75	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	$^{\circ}C$

ZTX1053A

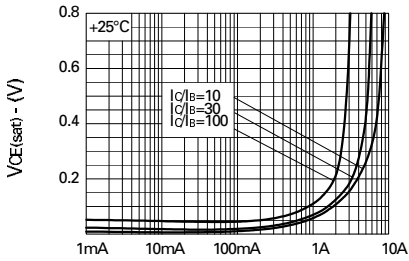
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	150	245		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	V_{CES}	150	245		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	V_{CEO}	75	100		V	$I_C=10\text{mA}$
Collector-Emitter Breakdown Voltage	V_{CEV}	150	245		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	$V_{CB}=120\text{V}$
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	$V_{CES}=120\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		17 120 180	25 150 250	mV mV mV	$I_C=0.2\text{A}$, $I_B=20\text{mA}^*$ $I_C=1\text{A}$, $I_B=10\text{mA}^*$ $I_C=3\text{A}$, $I_B=100\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		900	1000	mV	$I_C=3\text{A}$, $I_B=100\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		825	950	mV	$I_C=3\text{A}$, $V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	260 300 100	420 450 150 15	1200		$I_C=10\text{mA}$, $V_{CE}=2\text{V}^*$ $I_C=1\text{A}$, $V_{CE}=2\text{V}^*$ $I_C=3\text{A}$, $V_{CE}=2\text{V}^*$ $I_C=10\text{A}$, $V_{CE}=2\text{V}^*$
Transition Frequency	f_T		140		MHz	$I_C=50\text{mA}$, $V_{CE}=10\text{V}$ $f=100\text{MHz}$
Output Capacitance	C_{obo}		21	30	pF	$V_{CB}=10\text{V}$, $f=1\text{MHz}$
Switching Times	t_{on}		90		ns	$I_C=2\text{A}$, $I_B=20\text{mA}$, $V_{CC}=50\text{V}$
	t_{off}		750		ns	$I_C=2\text{A}$, $I_B=\pm 20\text{mA}$, $V_{CC}=50\text{V}$

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

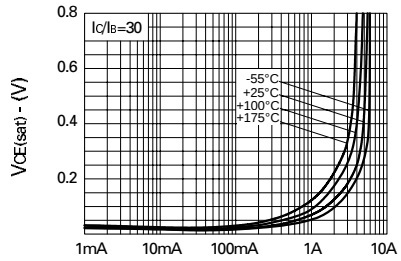
ZTX1053A

TYPICAL CHARACTERISTICS



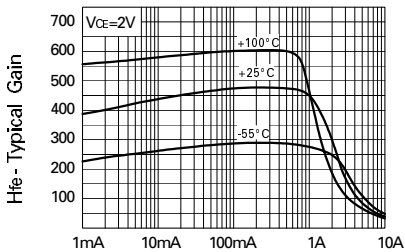
I_C -Collector Current

$V_{CE(sat)}$ v I_C



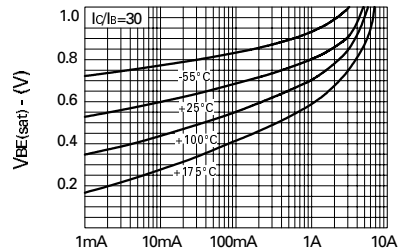
I_C -Collector Current

$V_{CE(sat)}$ v I_C



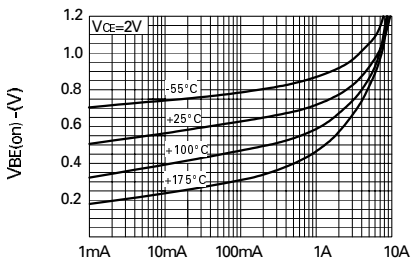
I_C -Collector Current

h_{fe} v I_C



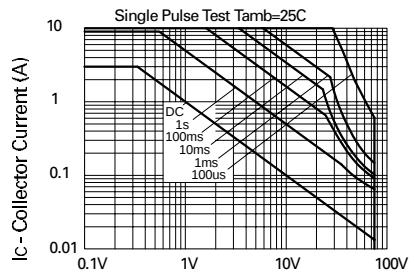
I_C -Collector Current

$V_{BE(sat)}$ v I_C



I_C -Collector Current

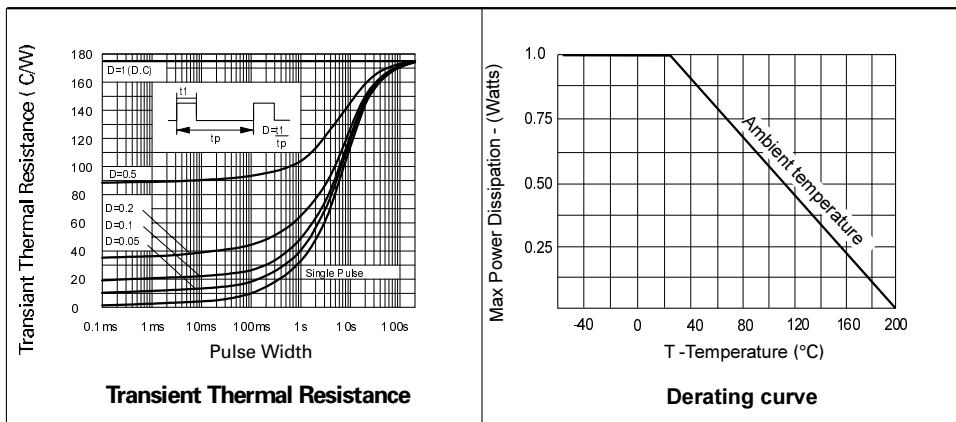
$V_{BE(on)}$ v I_C



V_{CE} - Collector Voltage

Safe Operating Area

ZTX1053A



SPICE PARAMETERS

*ZETEX ZTX1053A Spice model Last revision 19/01/95

*

.MODEL ZTX1053A NPN IS=2.1E-12 NF=1.0 BF=600 IKF=2.2 VAF=100

+ ISE=0.9E-13 NE=1.25 NR=0.99 BR=150 IKR=2.5 VAR=15

+ ISC=5.0E-10 NC=1.76 RB=0.1 RE=0.028 RC=0.016

+ CJC=75.1E-12 CJE=520E-12 MJC=0.415 MJE=0.367

+ VJC=0.512 VJE=0.766 TF=550E-12 TR=22E-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.