

# NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

## ZTX1051A

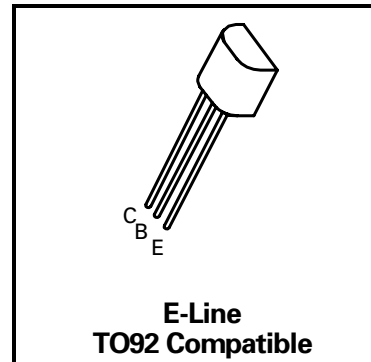
ISSUE 3 – FEBRUARY 95

### FEATURES

- \*  $B_{CEV}=150V$
- \* Very Low Saturation Voltage
- \* High Gain
- \* Inherently Low Noise

### APPLICATIONS

- \* Emergency Lighting
- \* Low Noise Audio



### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	150	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current	$I_{CM}$	10	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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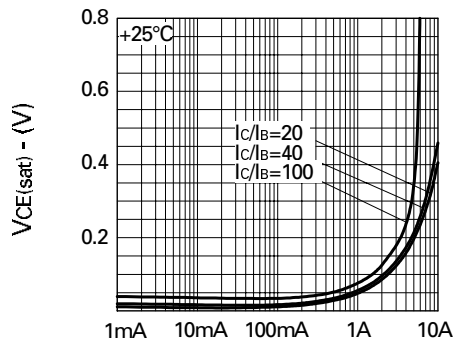
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	150	190		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CES}$	150	190		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	40	60		V	$I_C=10\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{CEV}$	150	190		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 75 165	25 110 210	mV mV mV	$I_C=0.2\text{A}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=4\text{A}, I_B=100\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		920	1000	mV	$I_C=4\text{A}, I_B=100\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		825	950	mV	$I_C=4\text{A}, V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	290 300 190 45	440 450 310 70	1200		$I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=1\text{A}, V_{CE}=2\text{V}^*$ $I_C=4\text{A}, V_{CE}=2\text{V}^*$ $I_C=10\text{A}, V_{CE}=2\text{V}^*$
Transition Frequency	$f_T$		155		MHz	$I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=100\text{MHz}$
Output Capacitance	$C_{obo}$		27	40	pF	$V_{CB}=10\text{V}, f=1\text{MHz}$
Switching Times	$t_{on}$		100		ns	$I_C=4\text{A}, I_B=40\text{mA}, V_{CC}=10\text{V}$
	$t_{off}$		300		ns	$I_C=4\text{A}, I_B=\pm 40\text{mA}, V_{CC}=10\text{V}$

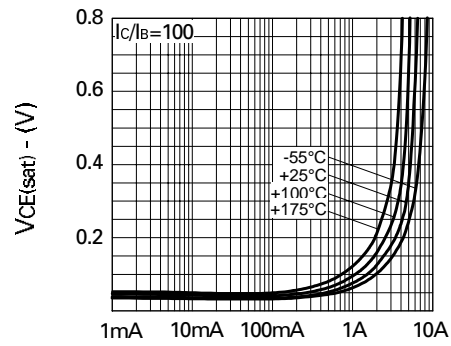
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

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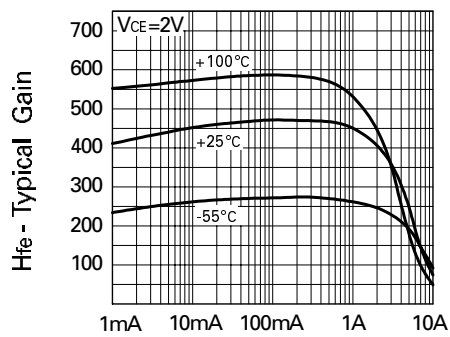
## TYPICAL CHARACTERISTICS



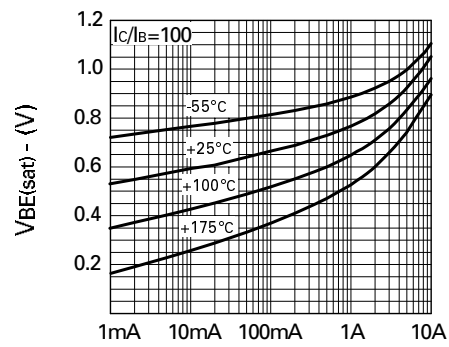
IC-Collector Current  
 **$V_{CE(sat)}$  v  $I_C$**



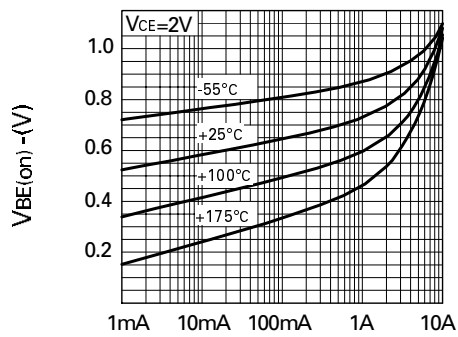
IC-Collector Current  
 **$V_{CE(sat)}$  v  $I_C$**



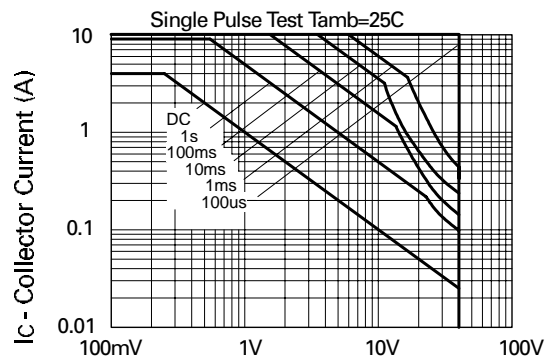
IC-Collector Current  
 **$h_{FE}$  v  $I_C$**



IC-Collector Current  
 **$V_{BE(sat)}$  v  $I_C$**

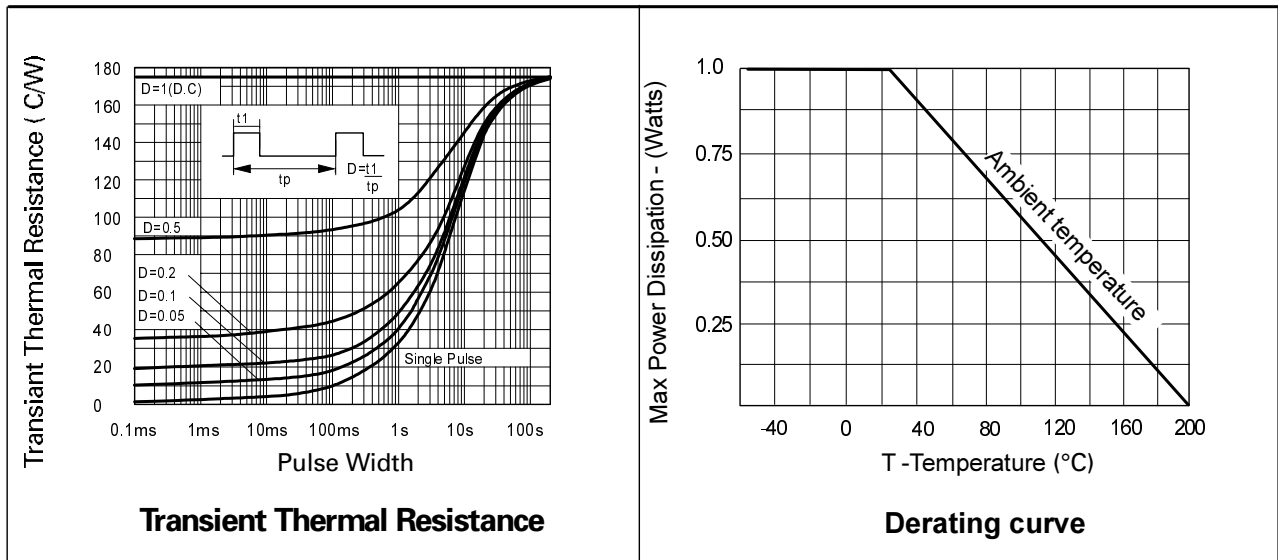


IC-Collector Current  
 **$V_{BE(on)}$  v  $I_C$**



VCE - Collector Voltage  
**Safe Operating Area**

# ZTX1051A



## SPICE PARAMETERS

\*ZETEX ZTX1051A Spice model Last revision 16/12/94

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.MODEL ZTX1051A NPN IS=1.35E-12 NF=1.0 BF=600 IKF=5.0 VAF=120
+ ISE=0.6E-13 NE=1.25 NR=1.0 BR=150 IKR=3 VAR=15
+ ISC=1.0E-10 NC=1.7 RB=0.1 RE=0.023 RC=0.010
+ CJC=90.36E-12 CJE=547.5E-12 MJC=0.385 MJE=0.357
+ VJC=0.5 VJE=0.741 TF=600E-12 TR=8E-9
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\*

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