

NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ZTX1051A

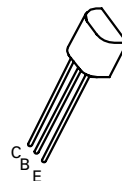
ISSUE 3 – FEBRUARY 95

FEATURES

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

APPLICATIONS

- * Emergency Lighting
- * Low Noise Audio



E-Line
TO92 Compatible

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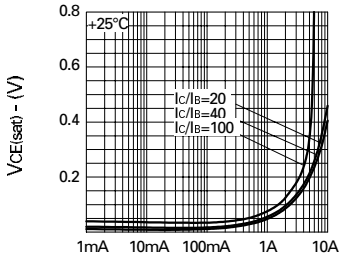
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

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	$I_C=4\text{A}, I_B=\pm 40\text{mA}, V_{CC}=10\text{V}$

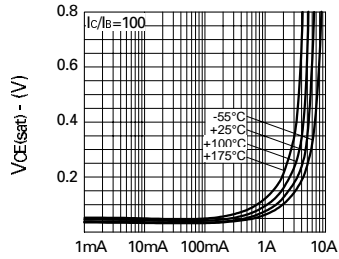
*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

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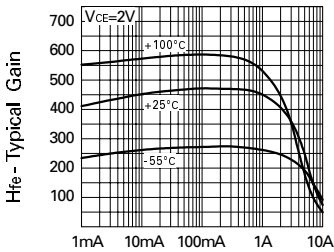
TYPICAL CHARACTERISTICS



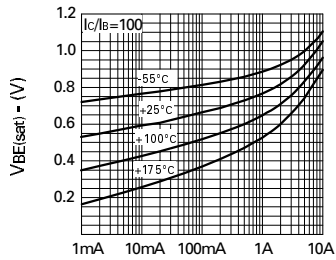
$V_{CE(sat)}$ v I_C



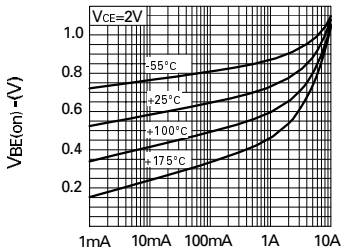
$V_{CE(sat)}$ v I_C



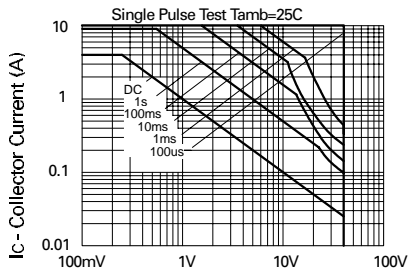
h_{FE} v I_C



$V_{BE(sat)}$ v I_C

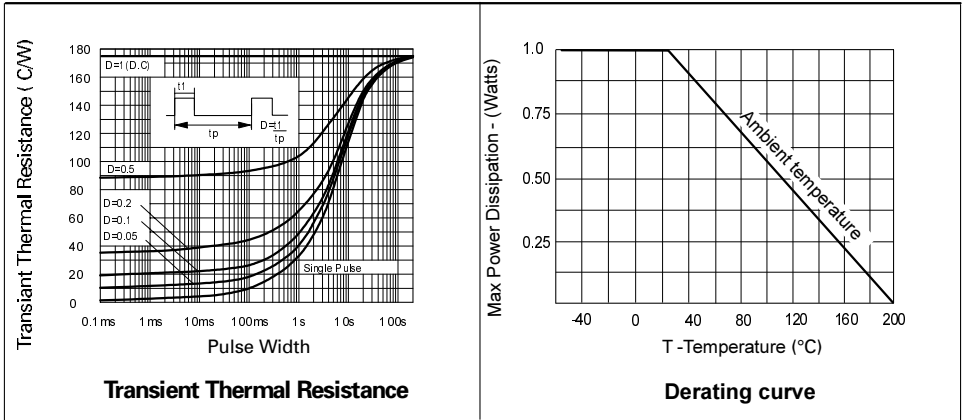


$V_{BE(on)}$ v I_C



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
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+ ISE=0.6E-13 NE=1.25 NR=1.0 BR=150 IKR=3 VAR=15
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```
+ ISC=1.0E-10 NC=1.7 RB=0.1 RE=0.023 RC=0.010
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+ CJC=90.36E-12 CJE=547.5E-12 MJC=0.385 MJE=0.357
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+ VJC=0.5 VJE=0.741 TF=600E-12 TR=8E-9
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