

NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ZTX1055A

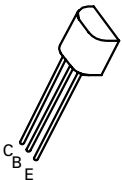
ISSUE 3 – JANUARY 1995

FEATURES

- * $V_{CEO}=120V$
- * 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	$^{\circ}C$

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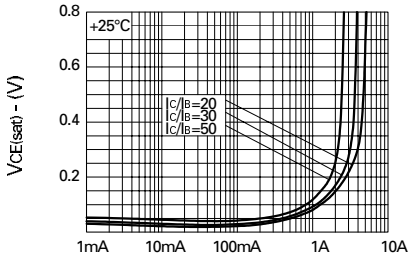
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	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 μs . Duty cycle $\leq 2\%$

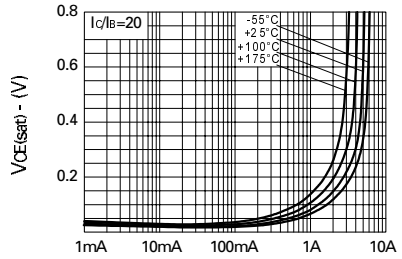
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TYPICAL CHARACTERISTICS



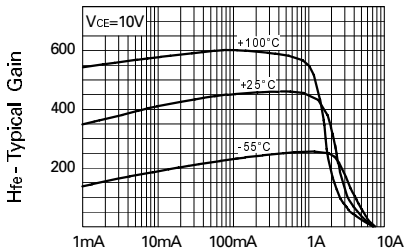
I_C -Collector Current

$V_{CE(sat)}$ v I_C



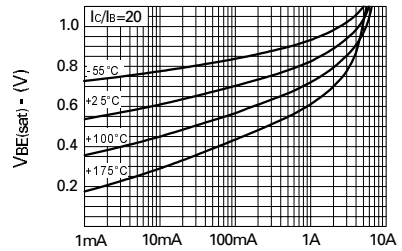
I_C -Collector Current

$V_{CE(sat)}$ v I_C



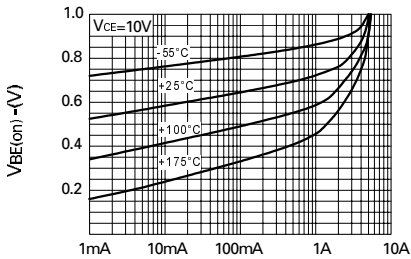
I_C -Collector Current

h_{FE} v I_C



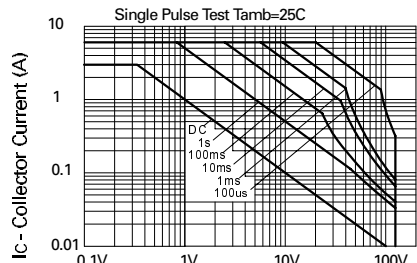
I_C -Collector Current

$V_{BE(sat)}$ v I_C



I_C -Collector Current

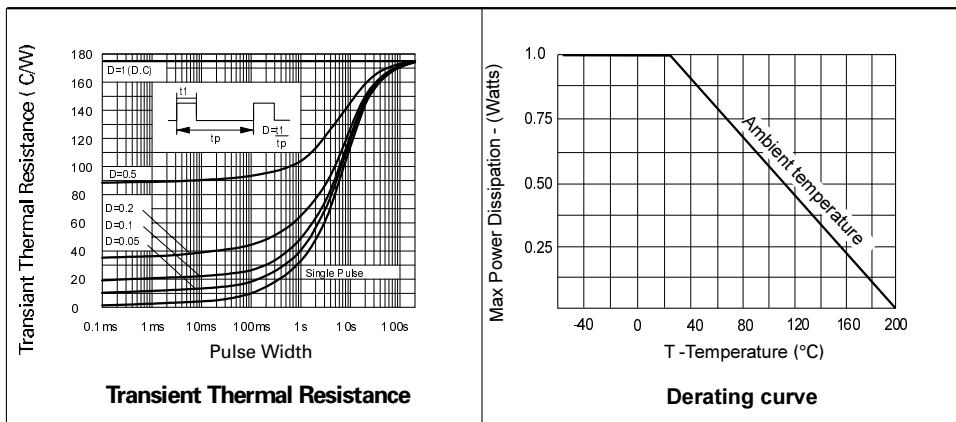
$V_{BE(on)}$ v I_C



V_{CE} - Collector Voltage

Safe Operating Area

ZTX1055A



SPICE PARAMETERS

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

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.MODEL ZTX1055A NPN IS=1.60E-12 NF=1.0 BF=500 IKF=4.0 VAF=120
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+ ISE=4.0E-13 NE=1.4 NR=1.0 BR=80 IKR=2.5 VAR=15
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```
+ ISC=5.0E-10 NC=1.7 RB=0.1 RE=0.040 RC=0.030
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+ CJC=63.3E-12 CJE=512.6E-12 MJC=0.439 MJE=0.373
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+ VJC=0.511 VJE=0.800 TF=700E-12 TR=110E-9
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