



**THE DATASHEET OF
ZTX1051ASTZ**



ZTX1051A

NPN SILICON PLANAR MEDIUM GAIN TRANSISTOR

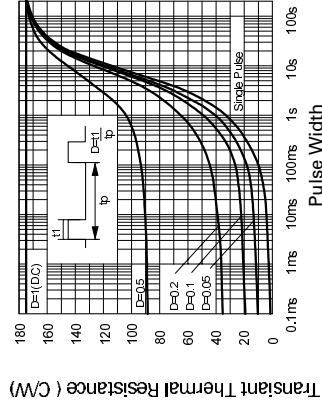
ISSUE 3 – FEBRUARY 95

FEATURES

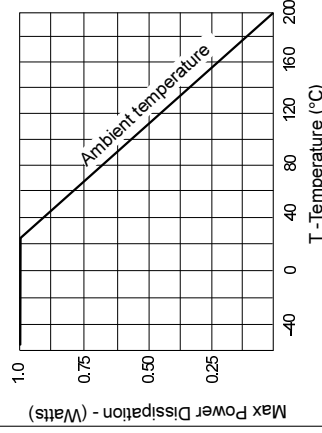
- * $B_{CEV}=150V$
- * Very Low Saturation Voltage
- * High Gain
- * Inherently Low Noise

APPLICATIONS

- * Emergency Lighting
- * Low Noise Audio



Transient Thermal Resistance



Derating curve

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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ABSOLUTE MAXIMUM RATINGS

PARAMETER
Collector-Base Voltage
Collector-Emitter Voltage
Emitter-Base Voltage
Peak Pulse Current
Continuous Collector Current
Base Current
Power Dissipation at $T_{amb}=25^{\circ}C$
Operating and Storage Temperature Range

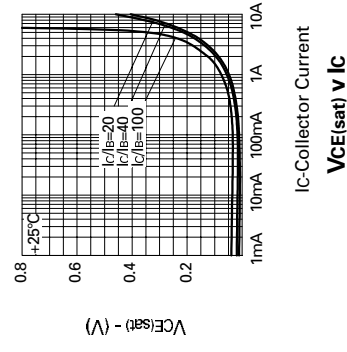
ZTX1051A

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

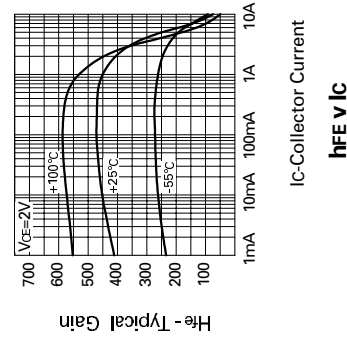
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	150	190		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	V_{CES}	150	190		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	V_{CEO}	40	60		V	$I_C = 10\text{mA}$
Collector-Emitter Breakdown 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	$I_C = 0.2\text{A}$, $I_B = 10\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 10\text{mA}^*$ $I_C = 4\text{A}$, $I_B = 100\text{mA}^*$
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 $\leq 2\%$

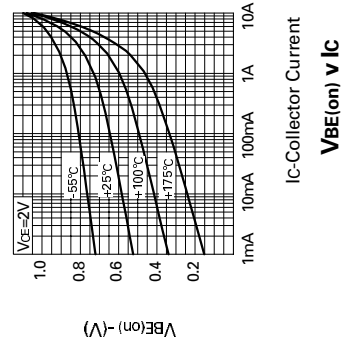
TYPICAL



$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(on)}$ v I_C

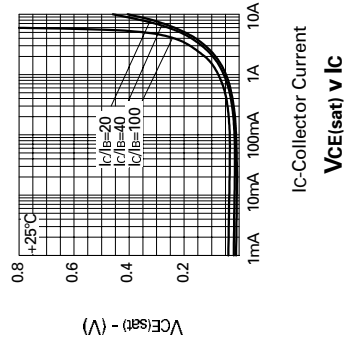
ZTX1051A

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

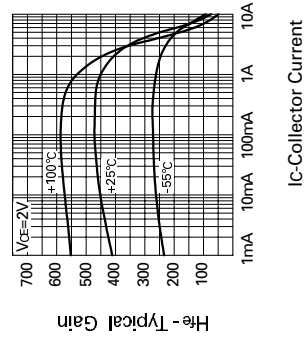
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Collector Emitter Cut-Off Current	I_{CES}		0.3	10	nA	$V_{CES} = 120\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		17	25	mV	$I_C = 0.2\text{A}$, $I_B = 10\text{mA}^*$
			75	110	mV	$I_C = 1\text{A}$, $I_B = 10\text{mA}^*$
			165	210	mV	$I_C = 4\text{A}$, $I_B = 100\text{mA}^*$
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	440			$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}^*$
		300	450	1200		$I_C = 1\text{A}$, $V_{CE} = 2\text{V}^*$
		190	310			$I_C = 4\text{A}$, $V_{CE} = 2\text{V}^*$
		45	70			$I_C = 10\text{A}$, $V_{CE} = 2\text{V}^*$
Transition Frequency	f_T		155		MHz	$I_C = 50\text{mA}$, $V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
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	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 $\leq 2\%$

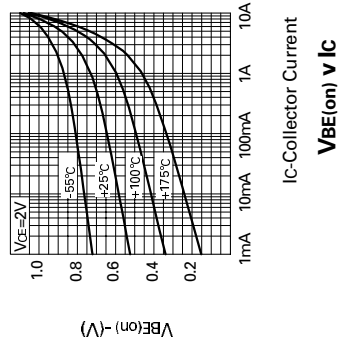
TYPICAL



$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(on)}$ v I_C

ZTX1051A

NPN SILICON PLANAR ME HIGH GAIN TRANSISTOR

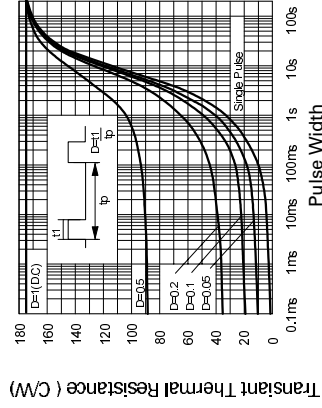
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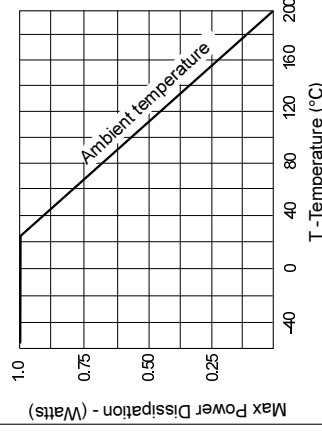
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*
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Continuous Collector Current
Base Current
Power Dissipation at $T_{amb}=25^{\circ}C$
Operating and Storage Temperature Range

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