NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ZTX1053A

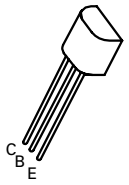
ISSUE 3– JANUARY 1995

FEATURES

* V_{CEO}=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°C	P_{tot}	1	W
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +200	°C

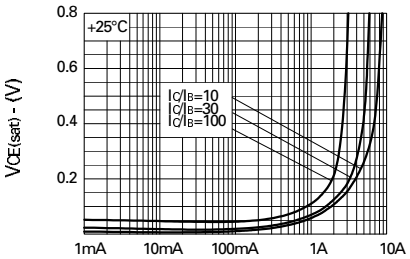
ZTX1053A

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	150	245		V	I_C=100μA
Collector-Emitter Breakdown Voltage	V_{CES}	150	245		V	IC=100μA
Collector-Emitter Breakdown Voltage	V_{CEO}	75	100		V	IC=10mA
Collector-Emitter Breakdown Voltage	V_{CEV}	150	245		V	IC=100μA, V_{EB}=1V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.8		V	I_E=100μA
Collector Cut-Off Current	I_{CBO}		0.3	10	nA	V_{CB}=120V
Emitter Cut-Off Current	I_{EBO}		0.3	10	nA	V_{EB}=4V
Collector Emitter Cut-Off Current	I_{CES}		0.3	10	nA	VCES=120V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		17 120 180	25 150 250	mV mV mV	I_C=0.2A, I_B=20mA* I_C=1A, I_B=10mA* I_C=3A, I_B=100mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		900	1000	mV	I_C=3A, I_B=100mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		825	950	mV	IC=3A, V_{CE}=2V*
Static Forward Current Transfer Ratio	h_{FE}	260 300 100	420 450 150 15	1200		I_C=10mA, V_{CE}=2V* I_C=1A, V_{CE}=2V* I_C=3A, V_{CE}=2V* I_C=10A, V_{CE}=2V*
Transition Frequency	f_T		140		MHz	I_C=50mA, V_{CE}=10V f=100MHz
Output Capacitance	C_{obo}		21	30	pF	V_{CB}=10V, f=1MHz
Switching Times	t_{on}		90		ns	I_C=2A, I_B=20mA, V_{CC}=50V
	t_{off}		750		ns	I_C=2A, I_B=±20mA, V_{CC}=50V

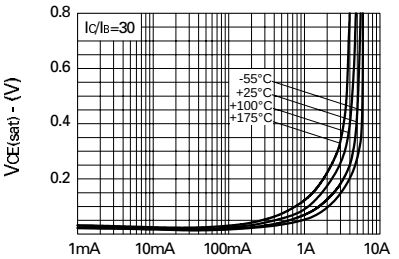
*Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤ 2%

TYPICAL CHARACTERISTICS



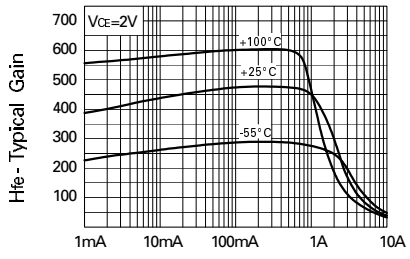
IC-Collector Current

$V_{CE(sat)}$ v I_C



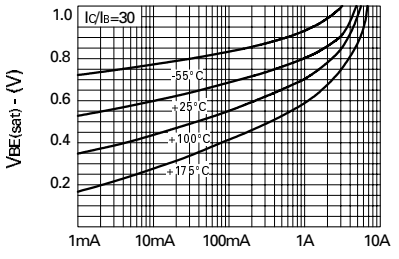
IC-Collector Current

$V_{CE(sat)}$ v I_C



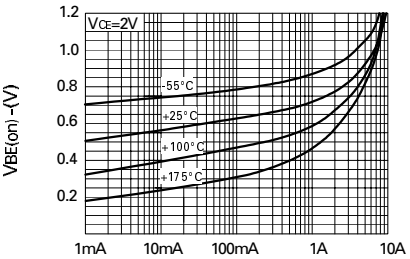
IC-Collector Current

h_{FE} v I_C



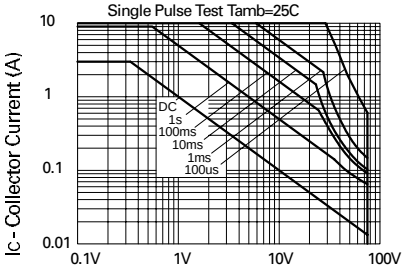
IC-Collector Current

$V_{BE(sat)}$ v I_C



IC-Collector Current

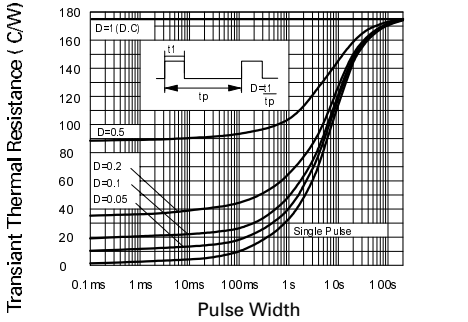
$V_{BE(on)}$ v I_C



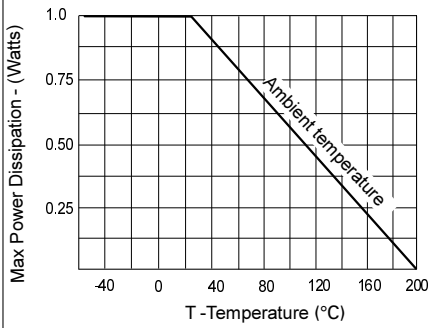
VCE - Collector Voltage

Safe Operating Area

ZTX1053A



Transient Thermal Resistance



Derating curve

SPICE PARAMETERS

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*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
*
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