

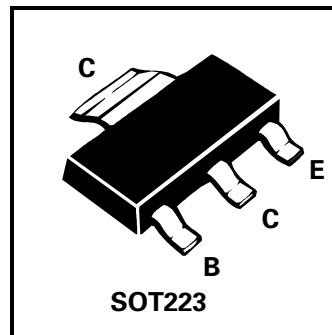
# SOT223 NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ISSUE 2 - MARCH 2001

**FZT1053A**

## FEATURES

- \*  $V_{CEO} = 75V$
- \* 4.5 Amp Continuous Current
- \* 10 Amp Pulse Current
- \* Low Saturation Voltage
- \* High Gain
- \* Extremely Low Equivalent On-resistance;  $R_{CE(sat)} = 78m\Omega$  at 4.5A



## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	150	V
Collector-Emitter Voltage	$V_{CEO}$	75	V
Emitter-Base Voltage	$V_{EBO}$	7.5	V
Peak Pulse Current	$I_{CM}$	10	A
Continuous Collector Current	$I_C$	<b>4.5</b>	A
Base Current	$I_B$	500	mA
Power Dissipation at $T_{amb}=25^{\circ}C$ †	$P_{tot}$	<b>2.5</b>	W
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

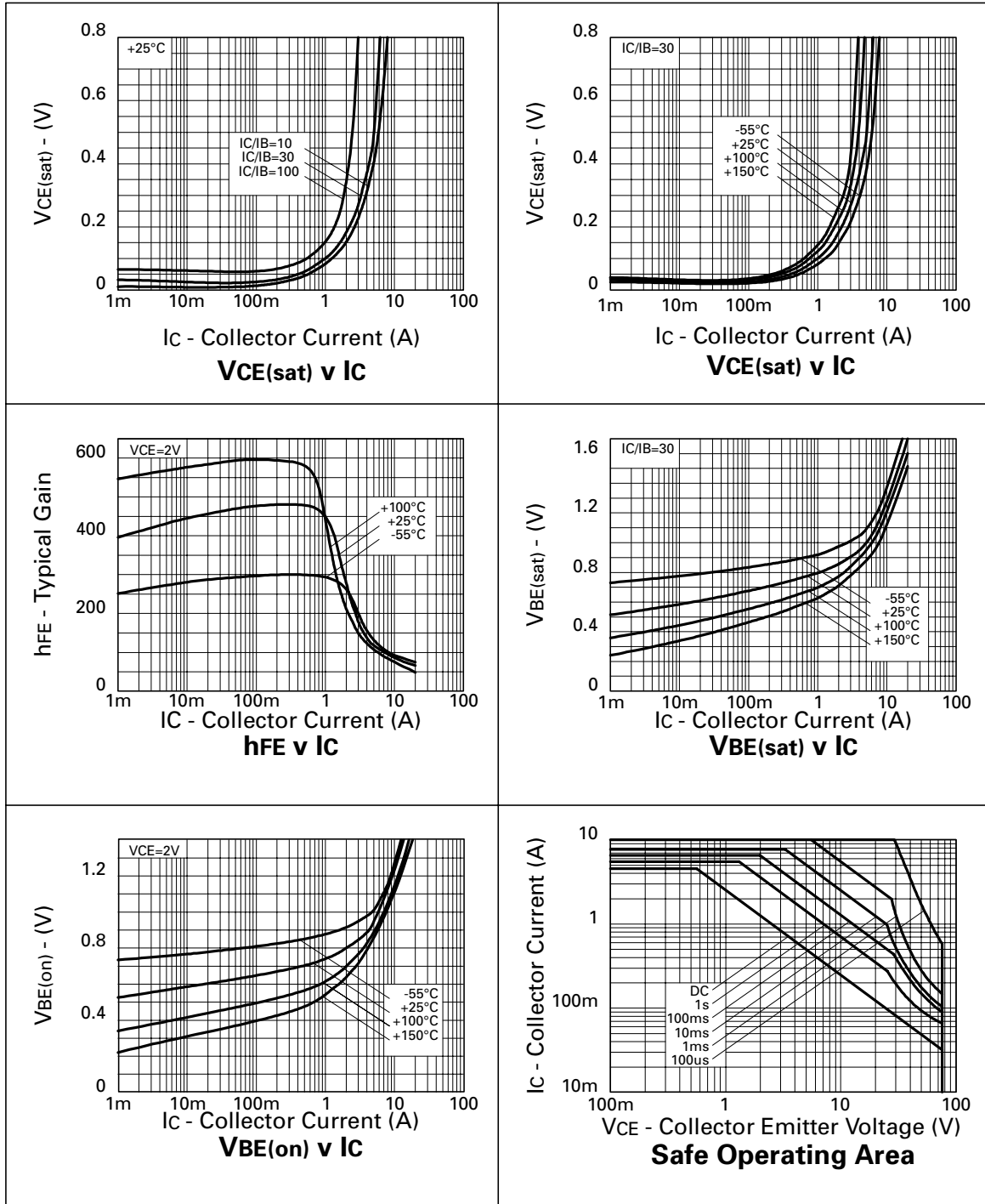
† The power which can be dissipated assuming the device is mounted in typical manner on a PCB with copper equal to 2 inches x 2 inches.

# FZT1053A

## 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	250		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CES}$	150	250		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	75	100		V	$I_C=10\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{CEV}$	150	250		V	$I_C=100\mu\text{A}, V_{EB}=1\text{V}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5	8.8		V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$		0.9	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	$I_{CES}$		1.5	10	nA	$V_{CES}=120\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		21 55 150 160 350	30 75 200 210 440	mV mV mV mV mV	$I_C=0.2\text{A}, I_B=20\text{mA}^*$ $I_C=0.5\text{A}, I_B=20\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=2\text{A}, I_B=100\text{mA}^*$ $I_C=4.5\text{A}, I_B=200\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		900	1000	mV	$I_C=3\text{A}, I_B=100\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		825	950	mV	$I_C=3\text{A}, V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	270 300 300 40	440 450 450 60 20	1200		$I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=0.5\text{A}, V_{CE}=2\text{V}^*$ $I_C=1\text{A}, V_{CE}=2\text{V}^*$ $I_C=4.5\text{A}, V_{CE}=2\text{V}^*$ $I_C=10\text{A}, V_{CE}=2\text{V}^*$
Switching Times	$t_{on}$		162		ns	$I_C=2\text{A}, I_{B1}=I_{B2}=\pm 20\text{mA}, V_{CC}=50\text{V}$
	$t_{off}$		900		ns	$I_C=2\text{A}, I_{B1}=I_{B2}=\pm 20\text{mA}, V_{CC}=50\text{V}$
Transition Frequency	$f_T$		140		MHz	$I_C=50\text{mA}, V_{CE}=10\text{V}, f=100\text{MHz}$
Output Capacitance	$C_{obo}$		21	30	pF	$V_{CB}=10\text{V}, f=1\text{MHz}$

## TYPICAL CHARACTERISTICS



**FZT1053A**

## SPICE PARAMETERS

**\*ZETEX FZT1053A Spice model Last revision 18/3/97**

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**.MODEL FZT1053A**

**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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