

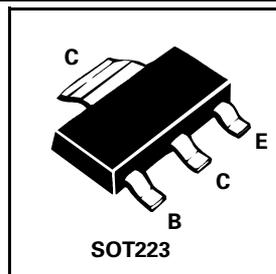
# SOT223 NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

## FZT1053A

ISSUE 2 - MARCH 2001

### 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	$I_C$	4.5	A
Base Current	$I_B$	500	mA
Power Dissipation at $T_{amb}=25^{\circ}C$ †	$P_{tot}$	2.5	W
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

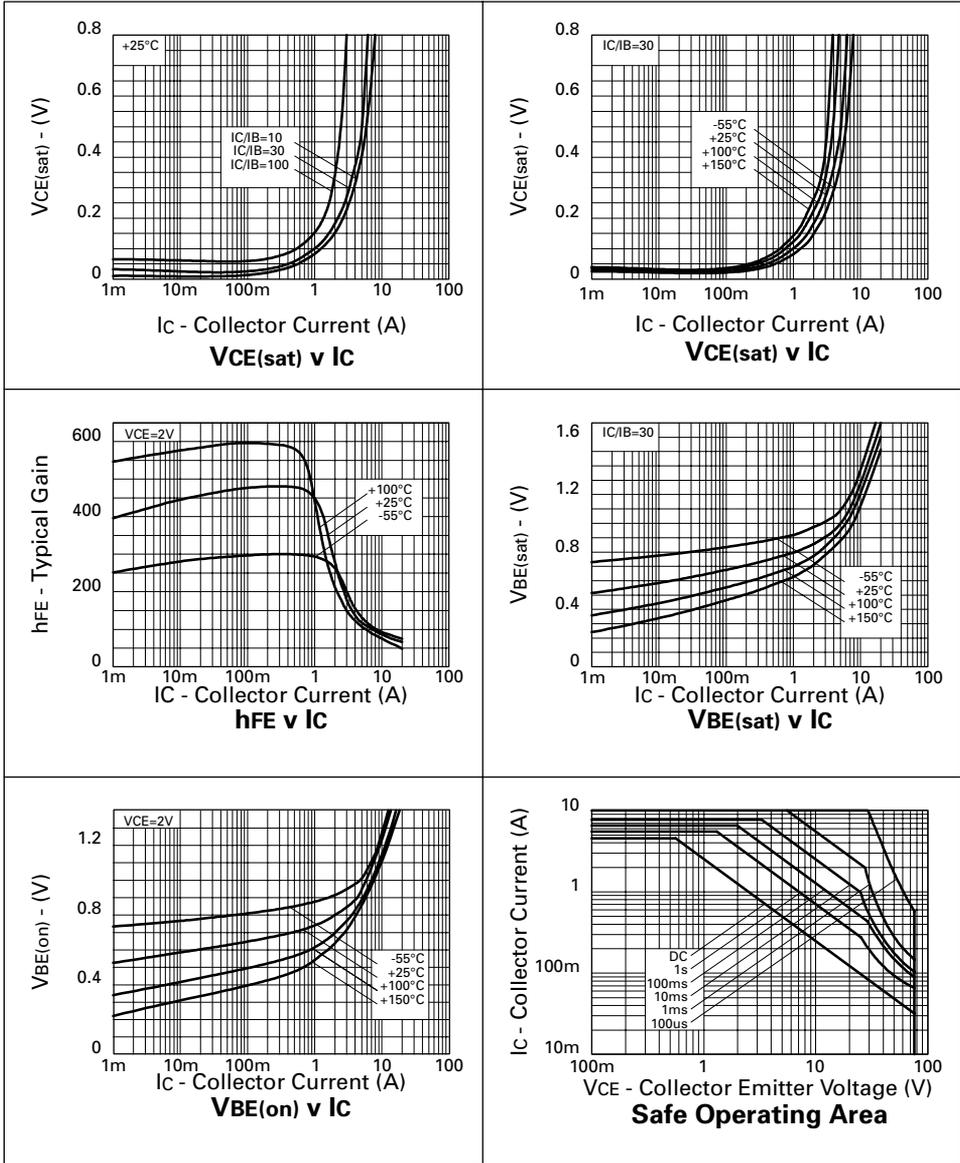
† The power which can be dissipated assuming the device is mounted in typical manner on a PCB with copper equal to 2 inches x 2 inches.

# 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	$I_C = 0.2\text{A}, I_B = 20\text{mA}^*$ $I_C = 0.5\text{A}, I_B = 20\text{mA}^*$ $I_C = 1\text{A}, I_B = 10\text{mA}^*$ $I_C = 2\text{A}, I_B = 100\text{mA}^*$ $I_C = 4.5\text{A}, I_B = 200\text{mA}^*$
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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