

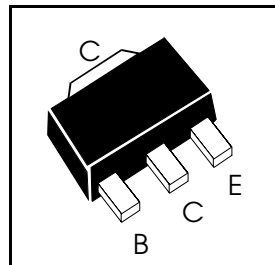
# SOT89 NPN SILICON POWER (SWITCHING) TRANSISTOR

ISSUE 1 - MARCH 1999

**FCX1053A**

## FEATURES

- \* **2W POWER DISSIPATION**
- \* 10A Peak Pulse Current
- \* Excellent HFE Characteristics up to 10 Amps
- \* Extremely Low Saturation Voltage E.g. 21mv Typ.
- \* Extremely Low Equivalent On-resistance;  
 $R_{CE(sat)} 78m\Omega$  at 4.5A



Partmarking Detail - 053

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	150	V
Collector-Emitter Voltage	$V_{CEO}$	75	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current **	$I_{CM}$	10	A
Continuous Collector Current	$I_C$	3	A
Power Dissipation at $T_{amb}=25^{\circ}C$	$P_{tot}$	1 † 2 ‡	W W
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

† recommended  $P_{tot}$  calculated using FR4 measuring 15x15x0.6mm

‡ Maximum power dissipation is calculated assuming that the device is mounted on FR4 substrate measuring 40x40x0.6mm and using comparable measurement methods adopted by other suppliers.

\*\*Measured under pulsed conditions. Pulse width=300 $\mu$ s. Duty cycle  $\leq$  2%

Spice parameter data is available upon request for these devices.

Refer to the handling instructions for soldering surface mount components.

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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	$V_{(BR)CBO}$	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	$V_{(BR)EBO}$	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	$V_{CB}=10\text{V}, f=1\text{MHz}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

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## TYPICAL CHARACTERISTICS

