

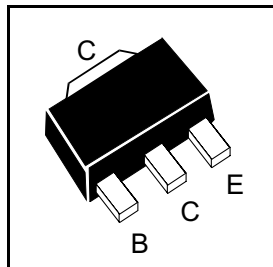
# SOT89 NPN SILICON POWER (SWITCHING) TRANSISTOR

ISSUE 2 - DECEMBER 1998

**FCX1047A**

## FEATURES

- \* **2W POWER DISSIPATION**
- \* 20A Peak Pulse Current
- \* Excellent  $H_{FE}$  Characteristics up to 20 Amps
- \* Extremely Low Saturation Voltage E.g. 25mv Typ.
- \* Extremely Low Equivalent On-resistance;
- \*  **$R_{CE(sat)}$  40m $\Omega$  at 4A**



Complimentary Type - FCX1147A  
Partmarking Detail - 047

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	35	V
Collector-Emitter Voltage	$V_{CEO}$	10	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current **	$I_{CM}$	20	A
Continuous Collector Current	$I_C$	4	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.

# FCX1047A

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

PARAMETER	SYMBOL	Min	Typ	Max	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	35			V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CES}$	35			V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	10			V	$I_C=10\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{CEV}$	35			V	$I_C=100\mu\text{A}, V_{EB}=1\text{V}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$		0.3	10	nA	$V_{CB}=20\text{V}$
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	$V_{CES}=20\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		25 50 140 160 220	40 70 200 240 350	mV mV mV mV mV	$I_C=0.5\text{A}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=3\text{A}, I_B=15\text{mA}^*$ $I_C=4\text{A}, I_B=50\text{mA}^*$ $I_C=5\text{A}, I_B=25\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		920	1000	mV	$I_C=4\text{A}, I_B=50\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		860	950	mV	$I_C=4\text{A}, V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	280 290 300 200 200 60	430 440 450 350 330 110	1200		$I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=0.5\text{A}, V_{CE}=2\text{V}^*$ $I_C=1\text{A}, V_{CE}=2\text{V}^*$ $I_C=4\text{A}, V_{CE}=2\text{V}^*$ $I_C=5\text{A}, V_{CE}=2\text{V}^*$ $I_C=20\text{A}, V_{CE}=2\text{V}^*$
Transition Frequency	$f_T$		150		MHz	$I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=50\text{MHz}$
Output Capacitance	$C_{obo}$		85		pF	$V_{CB}=10\text{V}, f=1\text{MHz}$
Switching Times	$t_{on}$		130		ns	$I_C=4\text{A}, I_B=40\text{mA}, V_{CC}=10\text{V}$
	$t_{off}$		230		ns	$I_C=4\text{A}, I_B=\pm 40\text{mA}, V_{CC}=10\text{V}$

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

## TYPICAL CHARACTERISTICS

