

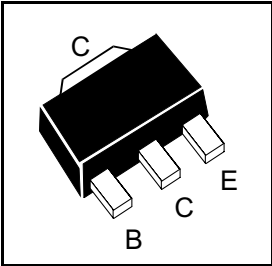
SOT89 NPN SILICON POWER  
(SWITCHING) TRANSISTOR

ISSUE 1 - NOVEMBER 1998

FCX617

FEATURES

- \* **2W POWER DISSIPATION**
- \* 12A Peak Pulse Current
- \* Excellent  $H_{FE}$  Characteristics up to 12 Amps
- \* Extremely Low Saturation Voltage E.g. 8mv Typ.
- \* Extremely Low Equivalent On-resistance;  
 **$R_{CE(sat)}$  50m $\Omega$  at 3A**



Partmarking Detail -

617

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                  | SYMBOL         | VALUE       | UNIT        |
|--------------------------------------------|----------------|-------------|-------------|
| Collector-Base Voltage                     | $V_{CBO}$      | 15          | V           |
| Collector-Emitter Voltage                  | $V_{CEO}$      | 15          | V           |
| Emitter-Base Voltage                       | $V_{EBO}$      | 5           | V           |
| Peak Pulse Current **                      | $I_{CM}$       | 12          | A           |
| Continuous Collector Current               | $I_C$          | 3           | A           |
| Base Current                               | $I_B$          | 500         | mA          |
| Power Dissipation at $T_{amb}=25^{\circ}C$ | $P_{tot}$      | 1 †<br>2 ‡  | W<br>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.

# FCX617

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

| PARAMETER                             | SYMBOL        | MIN.                     | TYP.                           | MAX.                           | UNIT                       | CONDITIONS.                                                                                                                                                                                           |
|---------------------------------------|---------------|--------------------------|--------------------------------|--------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | 15                       |                                |                                | V                          | $I_C=100\mu\text{A}$                                                                                                                                                                                  |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$ | 15                       |                                |                                | V                          | $I_C=10\text{mA}^*$                                                                                                                                                                                   |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$ | 5                        |                                |                                | V                          | $I_E=100\mu\text{A}$                                                                                                                                                                                  |
| Collector Cut-Off Current             | $I_{CBO}$     |                          | 0.3                            | 100                            | nA                         | $V_{CB}=10\text{V}$                                                                                                                                                                                   |
| Emitter Cut-Off Current               | $I_{EBO}$     |                          | 0.3                            | 100                            | nA                         | $V_{EB}=4\text{V}$                                                                                                                                                                                    |
| Collector Emitter Cut-Off Current     | $I_{CES}$     |                          | 0.3                            | 100                            | nA                         | $V_{CES}=10\text{V}$                                                                                                                                                                                  |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |                          | 8<br>70<br>150                 | 14<br>100<br>230<br>300<br>400 | mV<br>mV<br>mV<br>mV<br>mV | $I_C=0.1\text{A}, I_B=10\text{mA}^*$<br>$I_C=1\text{A}, I_B=10\text{mA}^*$<br>$I_C=3\text{A}, I_B=50\text{mA}^*$<br>$I_C=4\text{A}, I_B=50\text{mA}^*$<br>$I_C=5\text{A}, I_B=50\text{mA}^*$          |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$ |                          | 0.89                           | 1.0                            | V                          | $I_C=3\text{A}, I_B=50\text{mA}^*$                                                                                                                                                                    |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$  |                          | 0.82                           | 1.0                            | V                          | $I_C=3\text{A}, V_{CE}=2\text{V}^*$                                                                                                                                                                   |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 200<br>300<br>200<br>150 | 415<br>450<br>320<br>240<br>80 |                                |                            | $I_C=10\text{mA}, V_{CE}=2\text{V}^*$<br>$I_C=200\text{mA}, V_{CE}=2\text{V}^*$<br>$I_C=3\text{A}, V_{CE}=2\text{V}^*$<br>$I_C=5\text{A}, V_{CE}=2\text{V}^*$<br>$I_C=12\text{A}, V_{CE}=2\text{V}^*$ |
| Transition Frequency                  | $f_T$         | 80                       | 120                            |                                | MHz                        | $I_C=50\text{mA}, V_{CE}=10\text{V}$<br>$f=50\text{MHz}$                                                                                                                                              |
| Output Capacitance                    | $C_{obo}$     |                          | 30                             | 40                             | pF                         | $V_{CB}=10\text{V}, f=1\text{MHz}$                                                                                                                                                                    |
| Turn-On Time                          | $t_{(on)}$    |                          | 120                            |                                | ns                         | $V_{CC}=10\text{V}, I_C=3\text{A}$<br>$I_{B1}=I_{B2}=50\text{mA}$                                                                                                                                     |
| Turn-Off Time                         | $t_{(off)}$   |                          | 160                            |                                | ns                         |                                                                                                                                                                                                       |

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

TYPICAL CHARACTERISTICS

