

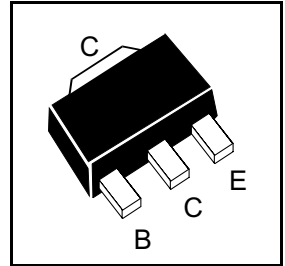
SOT89 NPN SILICON POWER (SWITCHING) TRANSISTOR

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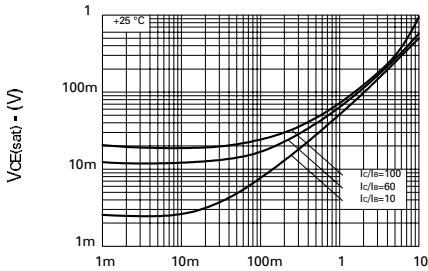
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|---------------|--------------------------|--------------------------------|--------------------------------|----------------------------|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 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 70 150 | 14 100 230 300 400 | mV mV mV mV mV | $I_C=0.1\text{A}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=3\text{A}, I_B=50\text{mA}^*$ $I_C=4\text{A}, I_B=50\text{mA}^*$ $I_C=5\text{A}, I_B=50\text{mA}^*$ |
| 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} | 200 300 200 150 | 415 450 320 240 80 | | | $I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=200\text{mA}, V_{CE}=2\text{V}^*$ $I_C=3\text{A}, V_{CE}=2\text{V}^*$ $I_C=5\text{A}, V_{CE}=2\text{V}^*$ $I_C=12\text{A}, V_{CE}=2\text{V}^*$ |
| Transition Frequency | f_T | 80 | 120 | | MHz | $I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=50\text{MHz}$ |
| Output Capacitance | C_{obo} | | 30 | 40 | pF | $V_{CB}=10\text{V}, f=1\text{MHz}$ |
| Turn-On Time | $t_{(on)}$ | | 120 | | ns | $V_{CC}=10\text{V}, I_C=3\text{A}$ $I_{B1}=I_{B2}=50\text{mA}$ |
| Turn-Off Time | $t_{(off)}$ | | 160 | | ns | |

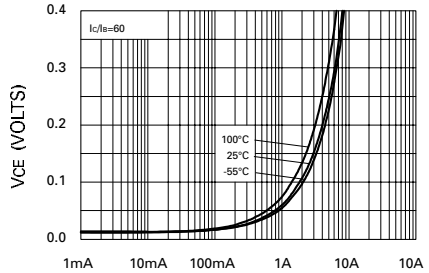
*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

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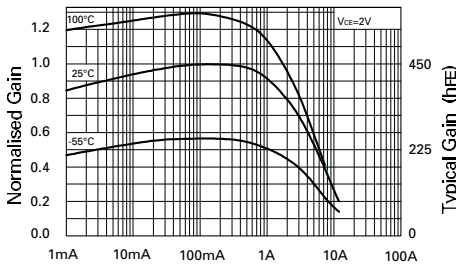
TYPICAL CHARACTERISTICS



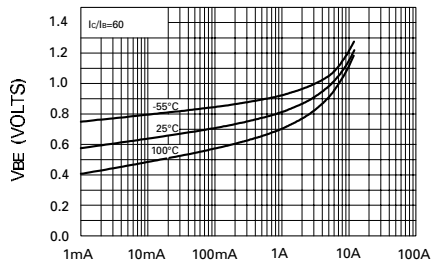
I_C - Collector Current (A)
 $V_{CE(SAT)}$ v I_C



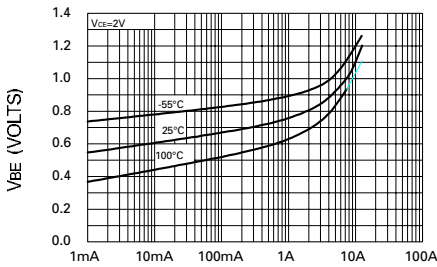
Collector Current
 $V_{CE(SAT)}$ vs I_C



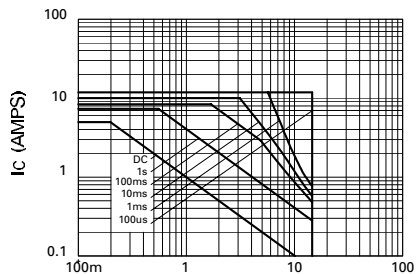
h_{FE} vs I_C



$V_{BE(SAT)}$ vs I_C



Collector Current
 $V_{BE(ON)}$ vs I_C



Safe Operating Area