

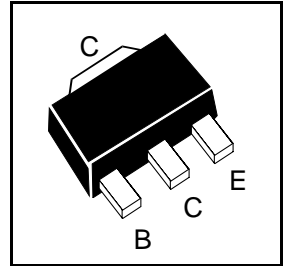
# SOT89 NPN SILICON POWER (SWITCHING) TRANSISTOR

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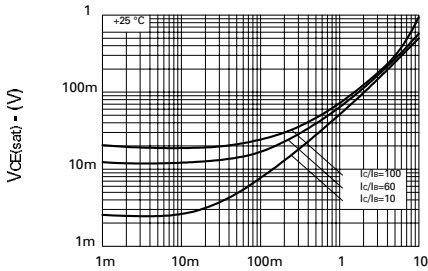
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	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	$V_{CC}=10\text{V}, I_C=3\text{A}$
Turn-Off Time	$t_{(off)}$		160		ns	$I_{B1}=I_{B2}=50\text{mA}$

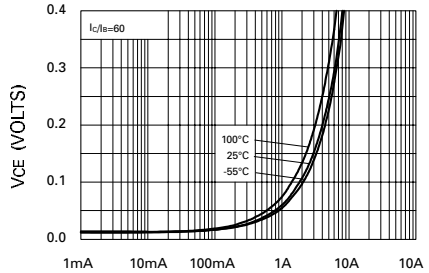
\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

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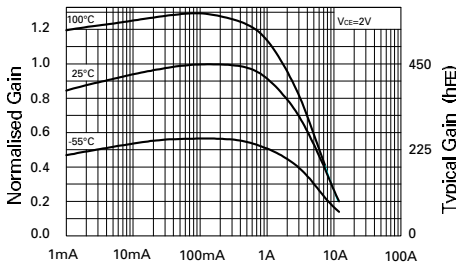
## TYPICAL CHARACTERISTICS



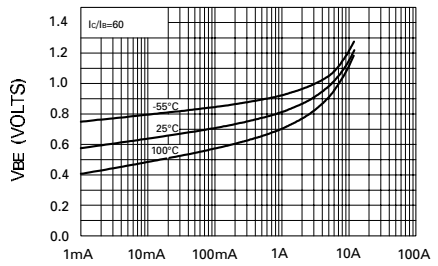
$I_C$  - Collector Current (A)  
 **$V_{CE(SAT)}$  v  $I_C$**



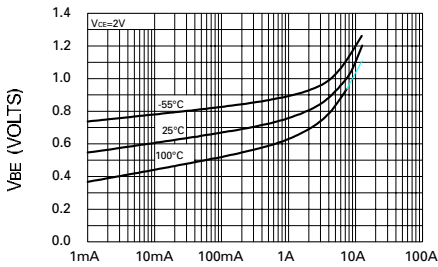
Collector Current  
 **$V_{CE(SAT)}$  vs  $I_C$**



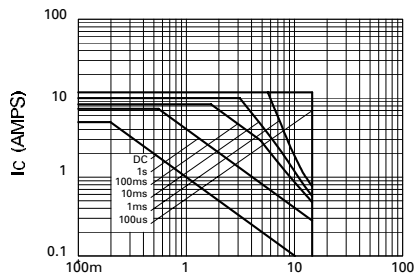
**hFE vs  $I_C$**



Collector Current  
 **$V_{BE(SAT)}$  vs  $I_C$**



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



**Safe Operating Area**