

SOT89 NPN SILICON PLANAR MEDIUM POWER HIGH VOLTAGE TRANSISTOR

FCX658A

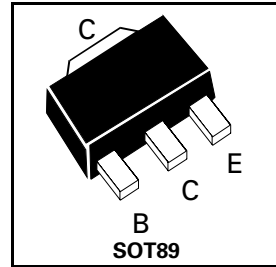
ISSUE 1 – NOVEMBER 2000

FEATURES

- * 400 Volt V_{CE0}
- * 0.5 Amp continuous current
- * $P_{tot}=1$ Watt
- * Optimised h_{fe} characterised upto 200mA

APPLICATIONS

- * Telephone dialler circuits
- * Hook switches for modems
- * Predrivers within HID lamp ballasts
- * (SLIC) Subscriber Line Interface Cards



Partmarking Detail - 65A

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|--|---------------|-------------|----------------------|
| Collector-Base Voltage | V_{CBO} | 400 | V |
| Collector-Emitter Voltage | V_{CEO} | 400 | V |
| Emitter-Base Voltage | V_{EBO} | 5 | V |
| Peak Pulse Current | I_{CM} | 1 | A |
| Continuous Collector Current | I_C | 500 | mA |
| Power Dissipation at $T_{amb}=25^{\circ}C$ derate above $25^{\circ}C$ | P_{tot} | 1 5.7 | W mW/ $^{\circ}C$ |
| Operating and Storage Temperature Range | $T_j:T_{stg}$ | -55 to +150 | $^{\circ}C$ |

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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 | $V_{(BR)CBO}$ | 400 | 480 | | V | $I_C = 100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 400 | 465 | | V | $I_C = 10\text{mA}^*$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 5 | 7.8 | | V | $I_E = 100\mu\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | | | 100 | nA | $V_{CB} = 320\text{V}$ |
| Collector Cut-Off Current | I_{CES} | | | 100 | nA | $V_{CE} = 320\text{V}$ |
| Emitter Cut-Off Current | I_{EBO} | | | 100 | nA | $V_{EB} = 4\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | 0.165 0.125 0.2 | V V V | $I_C = 20\text{mA}, I_B = 1\text{mA}$ $I_C = 50\text{mA}, I_B = 5\text{mA}^*$ $I_C = 100\text{mA}, I_B = 10\text{mA}^*$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | 0.75 | 0.85 | V | $I_C = 100\text{mA}, I_B = 10\text{mA}^*$ |
| Base-Emitter Turn On Voltage | $V_{BE(on)}$ | | 0.70 | 0.85 | V | $I_C = 100\text{mA}, V_{CE} = 5\text{V}^*$ |
| Static Forward Current Transfer Ratio | h_{FE} | 85 100 55 35 | 150 170 130 90 | | | $I_C = 1\text{mA}, V_{CE} = 5\text{V}^*$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}^*$ $I_C = 100\text{mA}, V_{CE} = 5\text{V}^*$ $I_C = 200\text{mA}, V_{CE} = 10\text{V}^*$ |
| Transition Frequency | f_T | 50 | | | MHz | $I_C = 20\text{mA}, V_{CE} = 20\text{V}$ $f = 20\text{MHz}$ |
| Output Capacitance | C_{obo} | | | 10 | pF | $V_{CB} = 20\text{V}, f = 1\text{MHz}$ |
| Switching times | t_{on} t_{off} | | 130 3300 | | ns ns | $I_C = 100\text{mA}, V_{CE} = 100\text{V}$ $I_{B1} = 10\text{mA}, I_{B2} = -20\text{mA}$ |

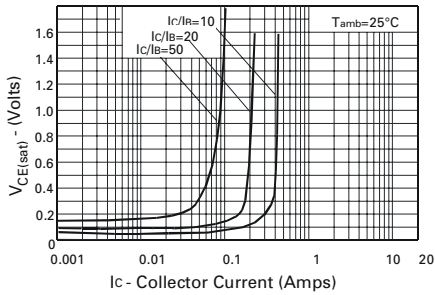
* Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

NB

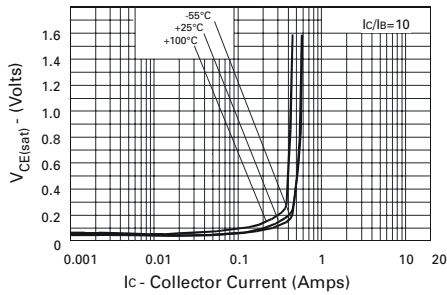
For high voltage applications the appropriate industry sector PCB guidelines should be considered with regard to voltage spacing between conductors.

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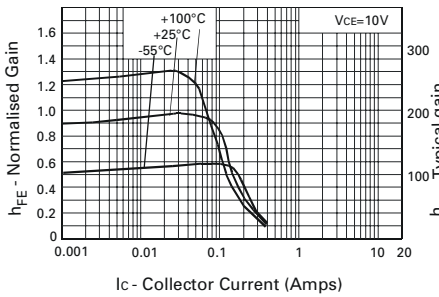
TYPICAL CHARACTERISTICS



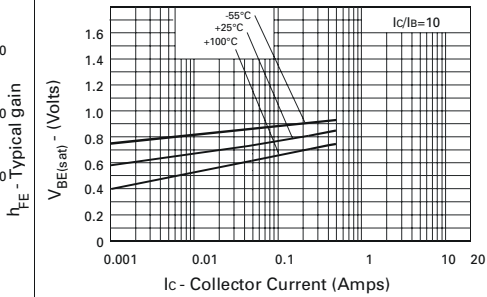
VCE(sat) v IC



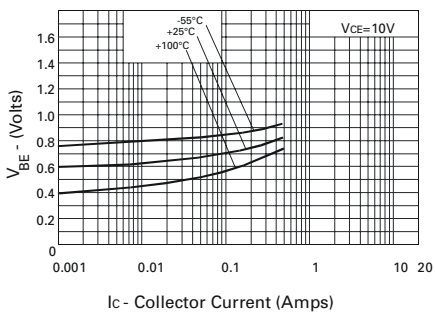
VCE(sat) v IC



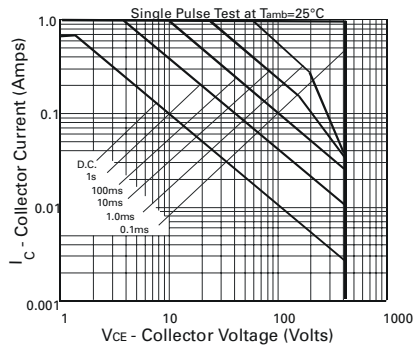
hFE v IC



VBE(sat) v IC



VBE(on) v IC

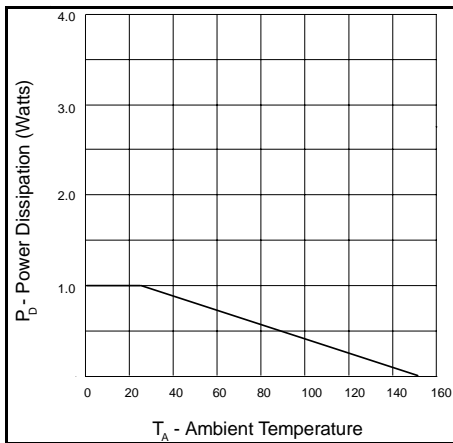


Safe Operating Area

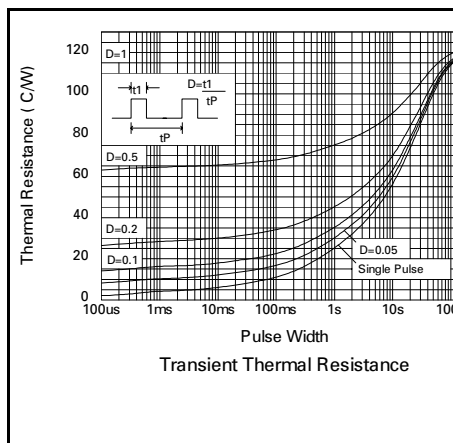
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THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | MAX. | UNIT |
|--|--------------------------------------|-----------|--------------|
| Thermal Resistance: Junction to Ambient ₁ Junction to Case | $R_{th(j-amb)1}$ $R_{th(j-case)}$ | 125 10 | °C/W °C/W |



SOT89 (1W) Derating



Transient thermal resistance for a Zetex 1W SOT89 device mounted on a 15 mm x 15 mm ceramic substrate



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