

**SOT89 NPN SILICON PLANAR
MEDIUM POWER HIGH VOLTAGE TRANSISTOR**

FCX658A

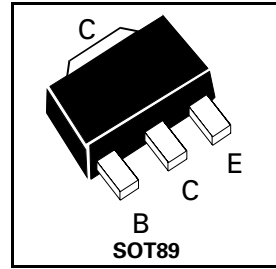
ISSUE 1 – NOVEMBER 2000

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_{CB0}	400	V
Collector-Emitter Voltage	V_{CE0}	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	$I_C = 100\text{mA}, V_{CE} = 100\text{V}$ $I_{B1} = 10\text{mA}, I_{B2} = -20\text{mA}$

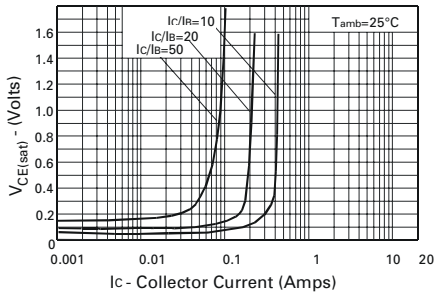
* Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

NB

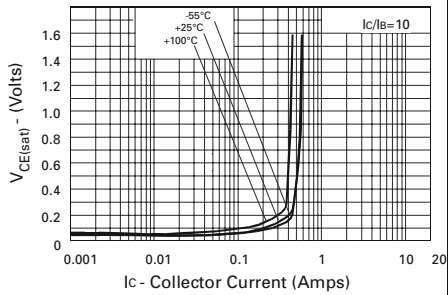
For high voltage applications the appropriate industry sector PCB guidelines should be considered with regard to voltage spacing between conductors.

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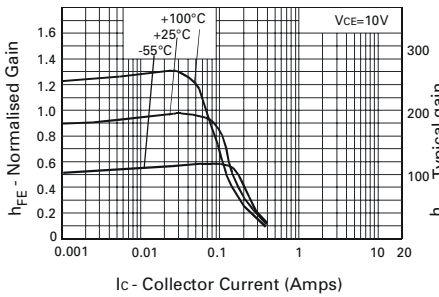
TYPICAL CHARACTERISTICS



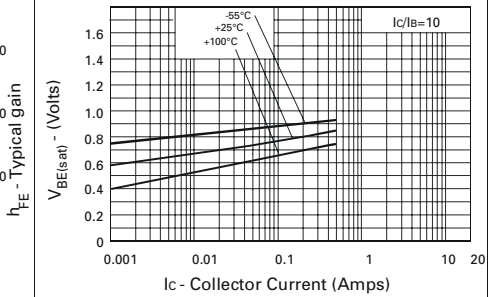
$V_{CE(sat)}$ v I_C



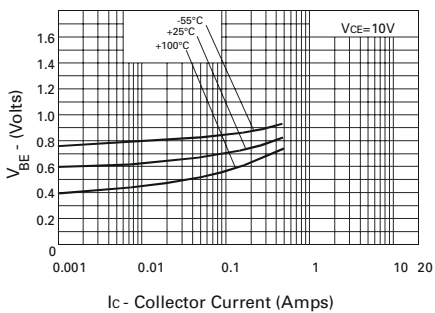
$V_{CE(sat)}$ v I_C



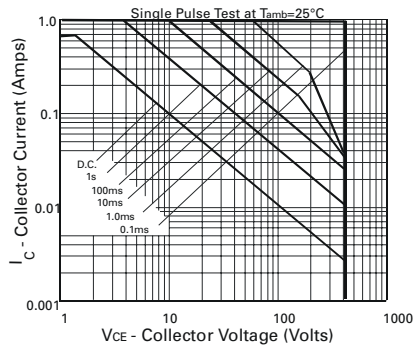
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

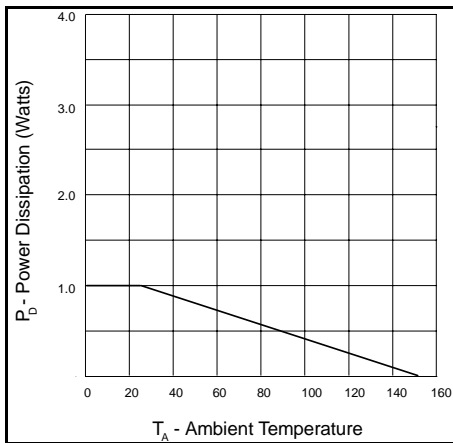


Safe Operating Area

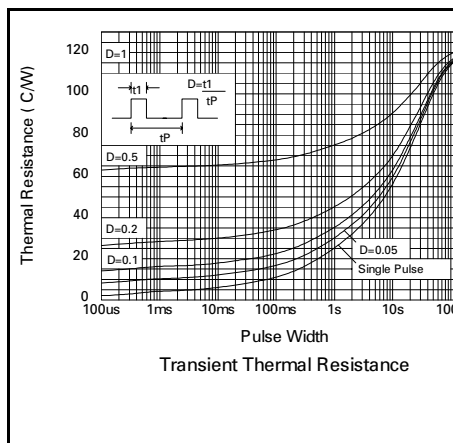
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THERMAL CHARACTERISTICS

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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