



# THE DATASHEET OF FCX658ATA



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

**FCX658A**

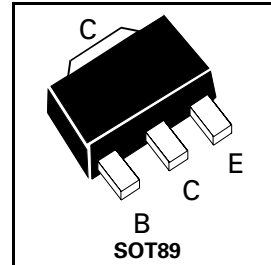
**ISSUE 1 – NOVEMBER 2000**

**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	$^{\circ}C$

 **ZETEX**

# FCX658A

## 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	$I_C=20\text{mA}, I_B=1\text{mA}$ $I_C=50\text{mA}, I_B=5\text{mA}^*$ $I_C=100\text{mA}, I_B=10\text{mA}^*$
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	$I_C=100\text{mA}, V_C=100\text{V}$ $I_{B1}=10\text{mA}, I_{B2}=-20\text{mA}$

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

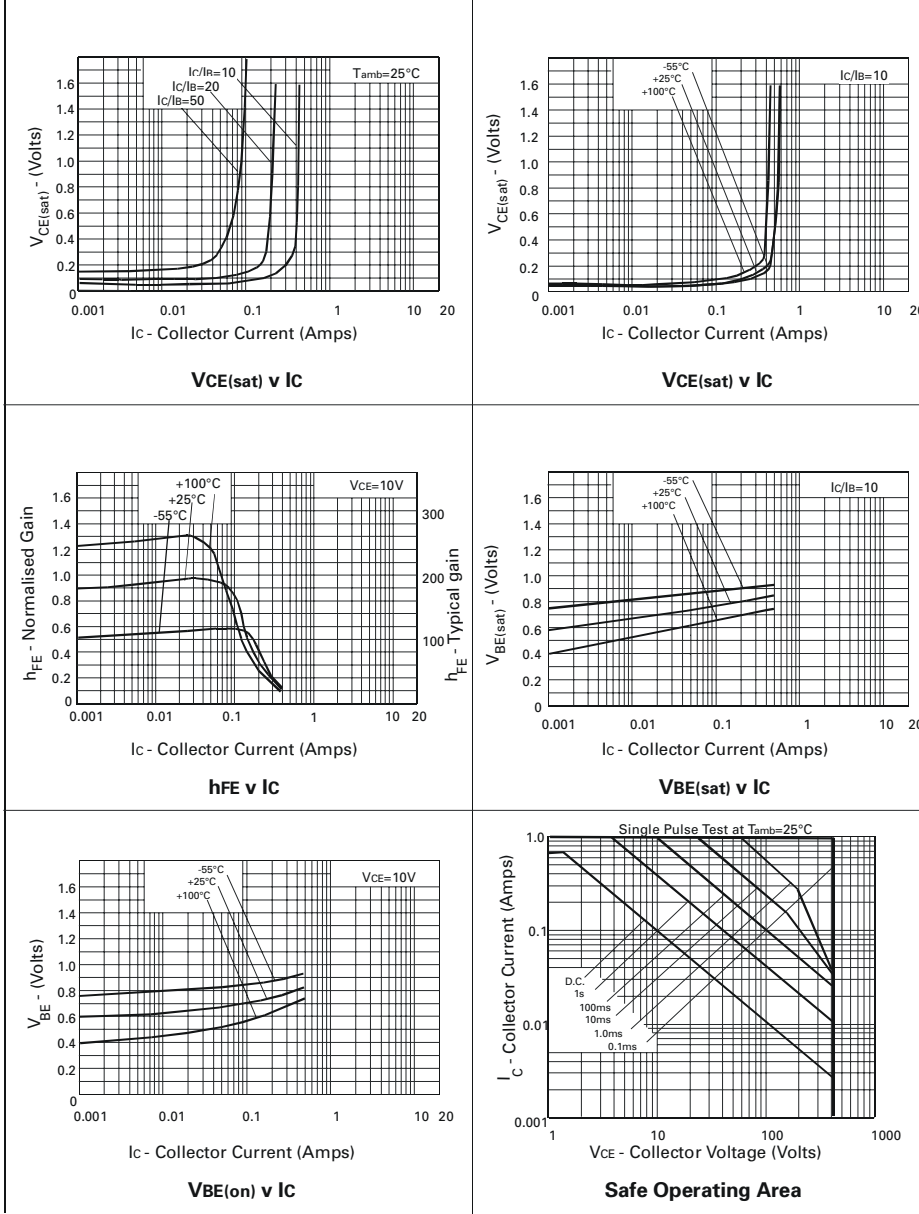
### NB

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



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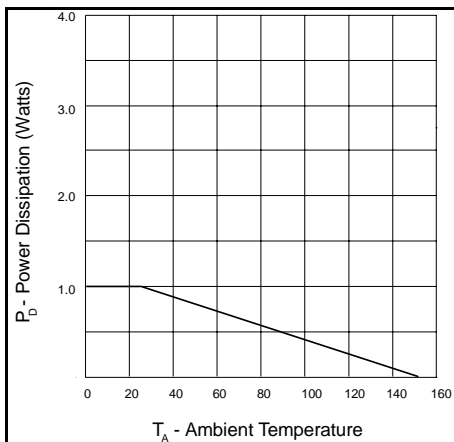
## TYPICAL CHARACTERISTICS



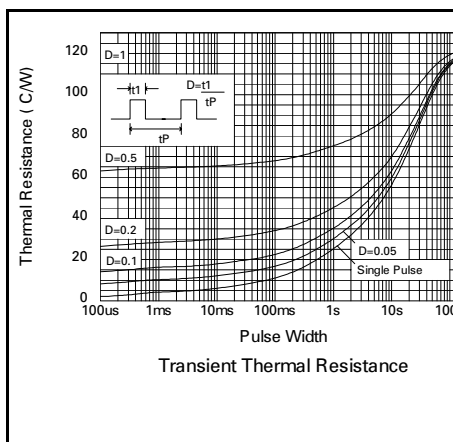
# FCX658

## THERMAL CHARACTERISTICS

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



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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