

# FCX705

---

## 120V PNP SILICON HIGH VOLTAGE DARLINGTON TRANSISTOR

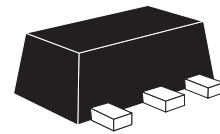
---

### SUMMARY

$V_{CEO}=120V$ ;  $V_{CE(sat)}= 1.3V$ ;  $I_C= -1A$

### DESCRIPTION

This new PNP Darlington transistor provides users with very efficient performance combining low  $V_{CE(sat)}$  and very high  $H_{FE}$  to give extremely low on state losses at 120V operation. This makes it deal for use in a variety of efficient driving functions including motors, lamps relays and solenoids and will also benefit circuits requiring high output current switching.



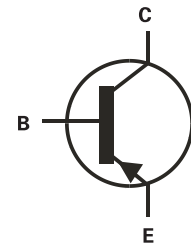
SOT89

### FEATURES

- Low Saturation Voltage
- $H_{FE}$  min 3K @ -1A
- $I_C= -2A$  Continuous
- SOT89 package with  $P_{tot} - 1W$
- Specification is also available in Eline and SOT223 package outlines

### APPLICATIONS

- Various driving functions
  - Lamps
  - Motors
  - Relays and solenoids
- High output current switches

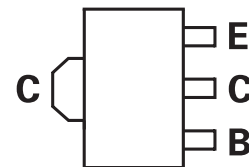


### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
FCX705TA	7"	12mm	1000 units

### DEVICE MARKING

705



Top View

# FCX705

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT PNP	UNIT
Collector-Base Voltage	$V_{CBO}$	-140	V
Collector-Emitter Voltage	$V_{CEO}$	-120	V
Emitter-Base Voltage	$V_{EBO}$	-10	V
Peak Pulse Current	$I_{CM}$	-4	A
Continuous Collector Current	$I_C$	-1	A
Power Dissipation at $T_A=25^\circ\text{C}$ (a) Linear Derating Factor	$P_D$	1 8	W mW/ $^\circ\text{C}$
Power Dissipation at $T_A=25^\circ\text{C}$ (b) Linear Derating Factor	$P_D$	2.8 22	W mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +150	$^\circ\text{C}$

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Junction to Ambient (b)	$R_{\theta JA}$	45	$^\circ\text{C}/\text{W}$

### NOTES

- (a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions  
(b) For a device surface mounted on FR4 PCB measured at  $t \leq 5$  secs.

# FCX705

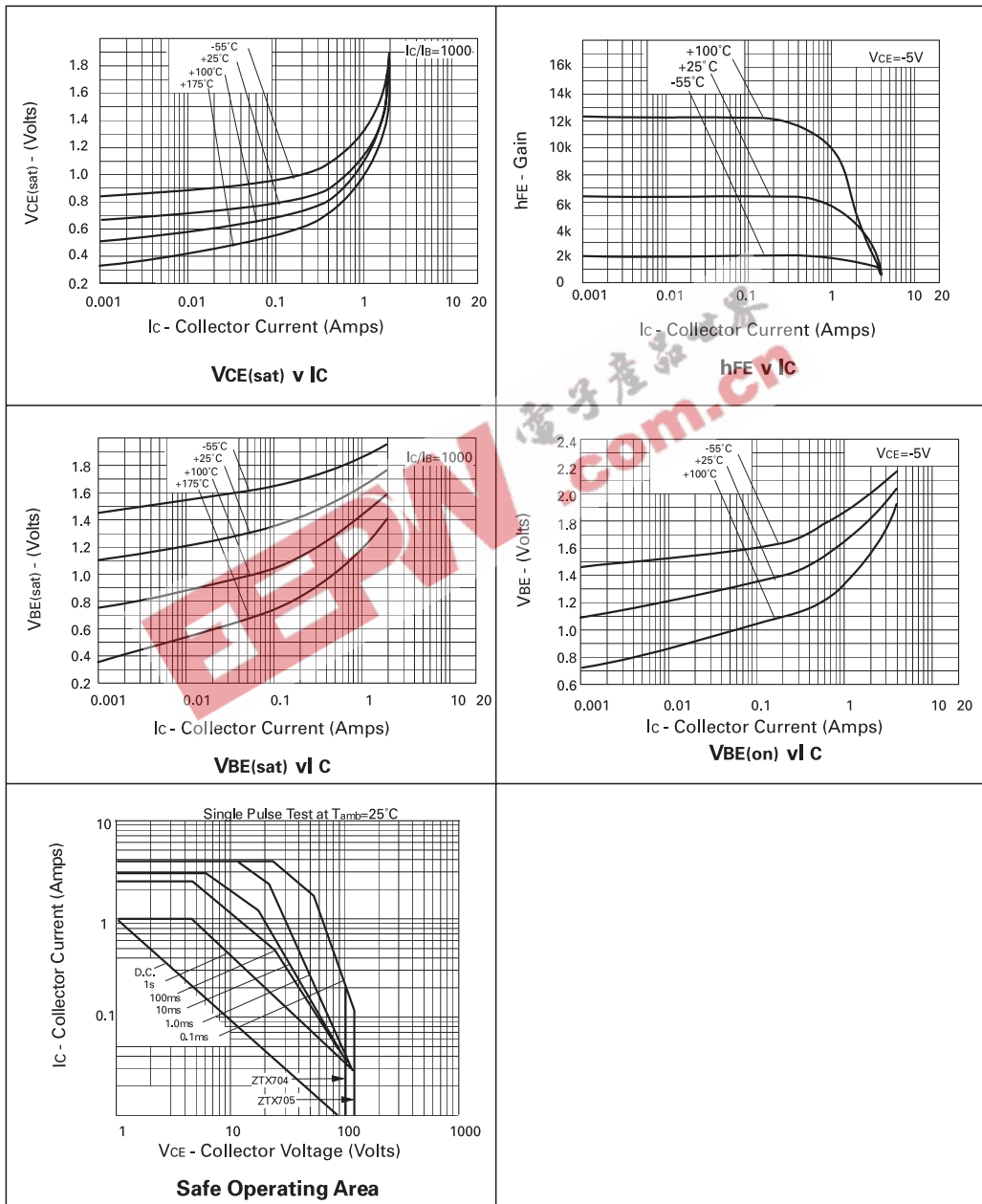
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-140			V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-120			V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-10			V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$			-100 -10	nA $\mu\text{A}$	$V_{CB} = -10\text{V}$ $V_{CB} = -120\text{V}$ $T_{amb} = 100^{\circ}\text{C}$
Emitter Cut-Off Current	$I_{EBO}$			-0.1	$\mu\text{A}$	$V_{EB} = -8\text{V}$
Collector Emitter Cut-Off Current	$I_{CES}$			-10	$\mu\text{A}$	$V_{CES} = -120\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-1.3 -2.5	V V	$I_C = -1\text{A}, I_B = -1\text{mA}^*$ $I_C = -2\text{A}, I_B = -2\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-1.8	V	$I_C = -1\text{A}, I_B = -1\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			-1.7	V	$I_C = -1\text{A}, V_{CE} = -5\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	3K 3K 3K 2K		30K		$I_C = -10\text{mA}, V_{CE} = -5\text{V}^*$ $I_C = -100\text{mA}, V_{CE} = -5\text{V}^*$ $I_C = -1\text{A}, V_{CE} = -5\text{V}^*$ $I_C = -2\text{A}, V_{CE} = -5\text{V}^*$
Transition Frequency	$f_T$		160		MHz	$I_C = -100\text{mA}, V_{CE} = -10\text{V}$ $f = 20\text{MHz}$
Input Capacitance	$C_{ibo}$		90		pF	$V_{CB} = -500\text{mV}, f = 1\text{MHz}$
Output Capacitance	$C_{obo}$		15		pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$		0.6		$\mu\text{s}$	$I_C = -500\text{mA}, V_{CE} = -10\text{V}$ $I_{B1} = I_{B2} = -0.5\text{mA}$
Turn-Off Time	$t_{(off)}$		0.8		$\mu\text{s}$	$I_C = -500\text{mA}, V_{CE} = -10\text{V}$ $I_{B1} = I_{B2} = -0.5\text{mA}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
Nb. Spice parameter data is available upon request for this device.

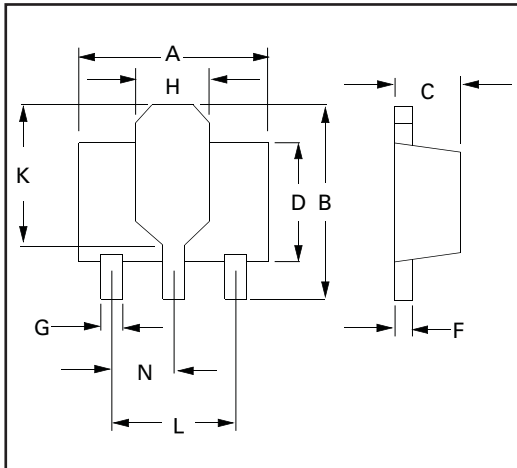
# FCX705

## PNP CHARACTERISTICS

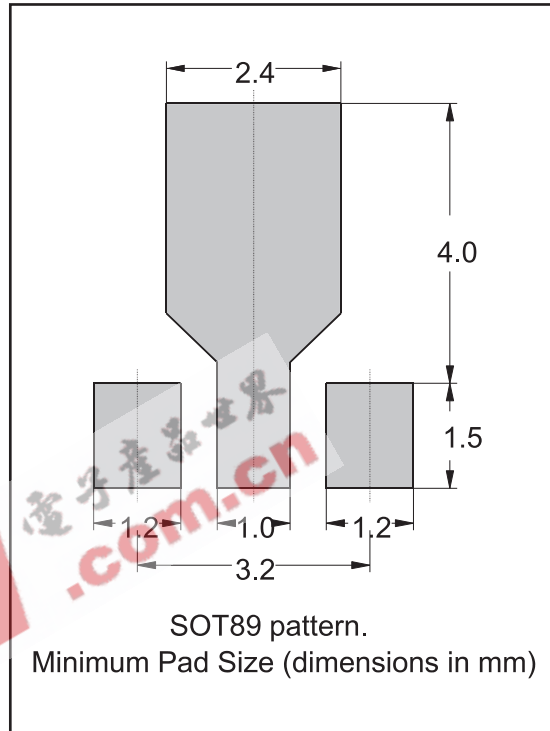


# FCX705

## PACKAGE DIMENSIONS



## PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
B	3.75	4.25	.150	0.167
C	1.40	1.60	0.550	0.630
D	-	2.60	-	0.102
F	0.28	0.45	0.011	0.018
G	0.38	0.55	0.015	0.022
H	1.50	1.80	0.060	0.072
K	2.60	2.85	0.102	0.112
L	2.90	3.10	0.114	0.112
N	1.4	1.60	0.055	0.063

© Zetex plc 2003

### Europe

Zetex plc  
Fields New Road  
Chadderton  
Oldham, OL9 8NP  
United Kingdom  
Telephone (44) 161 622 4444  
Fax: (44) 161 622 4446  
hq@zetex.com

Zetex GmbH  
Streitfeldstraße 19  
D-81673 München

Germany  
Telefon: (49) 89 45 49 49 0  
Fax: (49) 89 45 49 49 49  
europe.sales@zetex.com

### Americas

Zetex Inc  
700 Veterans Memorial Hwy  
Hauppauge, NY 11788

USA  
Telephone: (1) 631 360 2222  
Fax: (1) 631 360 8222  
usa.sales@zetex.com

### Asia Pacific

Zetex (Asia) Ltd  
3701-04 Metroplaza Tower 1  
Hing Fong Road  
Kwai Fong  
Hong Kong  
Telephone: (852) 26100 611  
Fax: (852) 24250 494  
asia.sales@zetex.com

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to [www.zetex.com](http://www.zetex.com)

ISSUE 4 - DECEMBER 2002

 **ZETEX**  
SEMICONDUCTORS