

FCX705

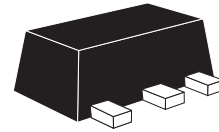
120V PNP SILICON HIGH VOLTAGE DARLINGTON TRANSISTOR

SUMMARY

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

DESCRIPTION

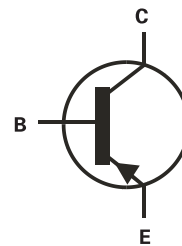
This new PNP Darlington transistor provides users with very efficient performance combining low $V_{CE(sat)}$ and very high H_{FE} to give extremely low on state losses at 120V operation. This makes it deal for use in a variety of efficient driving functions including motors, lamps relays and solenoids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

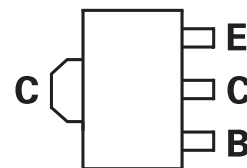
- Various driving functions
 - Lamps
 - Motors
 - Relays and solenoids
- High output current switches

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

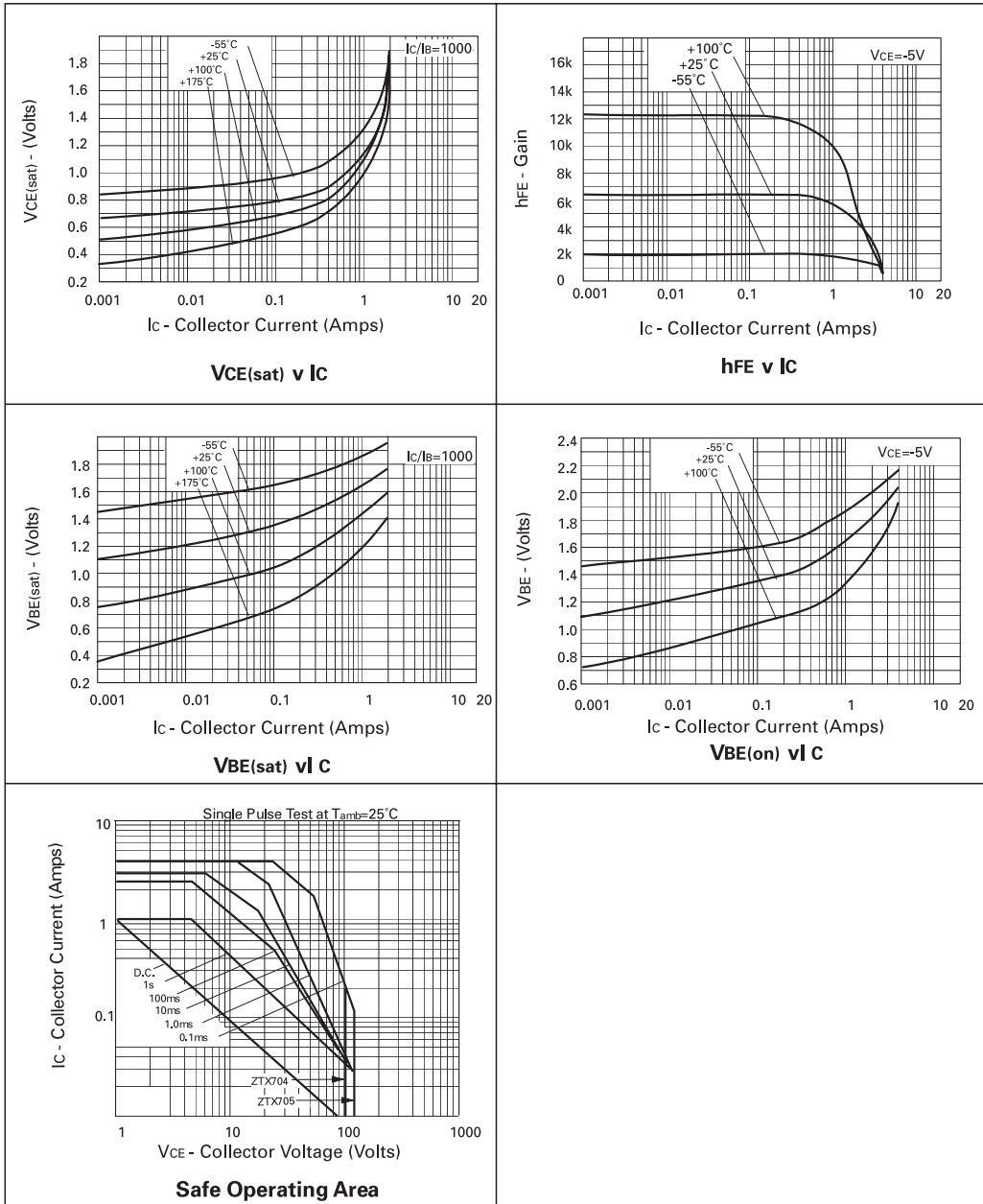
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| 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 μA | $V_{CB} = -10\text{V}$ $V_{CB} = -120\text{V}$ $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter Cut-Off Current | I_{EBO} | | | -0.1 | μA | $V_{EB} = -8\text{V}$ |
| Collector Emitter Cut-Off Current | I_{CES} | | | -10 | μA | $V_{CES} = -120\text{V}$ |
| 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 | | μs | $I_C = -500\text{mA}, V_{CE} = -10\text{V}$ $I_{B1} = I_{B2} = -0.5\text{mA}$ |
| Turn-Off Time | $t_{(off)}$ | | 0.8 | | μs | $I_C = -500\text{mA}, V_{CE} = -10\text{V}$ $I_{B1} = I_{B2} = -0.5\text{mA}$ |

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

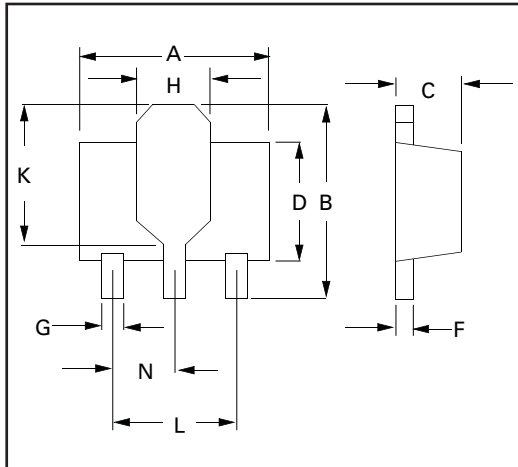
FCX705

PNP CHARACTERISTICS



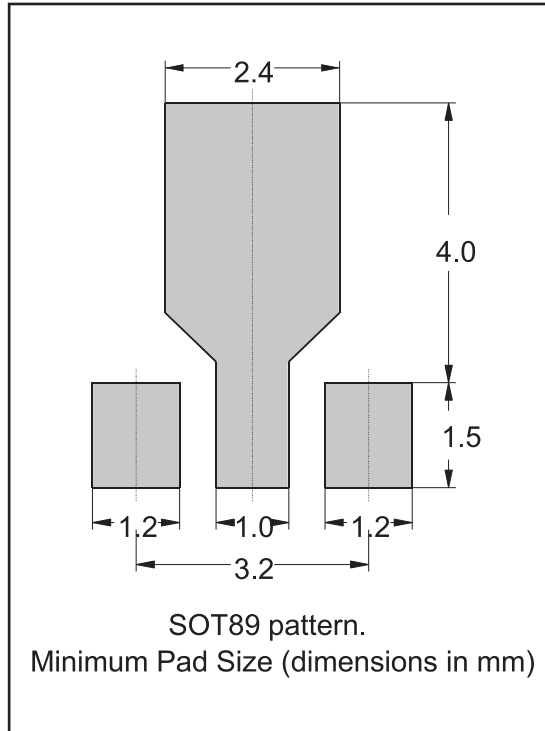
FCX705

PACKAGE DIMENSIONS



| 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 |

PAD LAYOUT DETAILS



© 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

ISSUE 4 - DECEMBER 2002