

ZX5T851A

60V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN E-LINE

SUMMARY

$BV_{CEO} = 60V$; $R_{SAT} = 34m\Omega$; $I_C = 4.5A$

DESCRIPTION

Packaged in the E-line outline this new 5th generation low saturation 60V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.

FEATURES

- Extremely low equivalent on-resistance; $R_{SAT} = 34m\Omega$ at 5A
- 4.5 amps continuous current
- Up to 15 amps peak current
- Very low saturation voltages

APPLICATIONS

- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC modules
- Backlight inverters

ORDERING INFORMATION

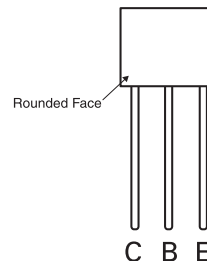
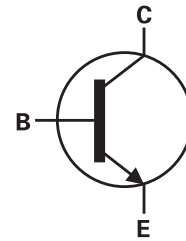
DEVICE	QUANTITY
ZX5T851ASTOA	2000 units / reel
ZX5T851ASTZ	2000 units / carton

DEVICE MARKING

- X5T851



E-LINE



PINOUT

ZX5T851A

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-base voltage	BV_{CBO}	150	V
Collector-emitter voltage	BV_{CEO}	60	V
Emitter-base voltage	BV_{EBO}	7	V
Continuous collector current ^(a)	I_C	4.5	A
Peak pulse current	I_{CM}	15	A
Practical power dissipation ^(a)	P_D	1.0	W
Linear derating factor		8	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}$ ^(b)	P_D	0.71	W
Linear derating factor		5.7	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	125	°C/W
Junction to ambient ^(b)	$R_{\theta JA}$	175	°C/W

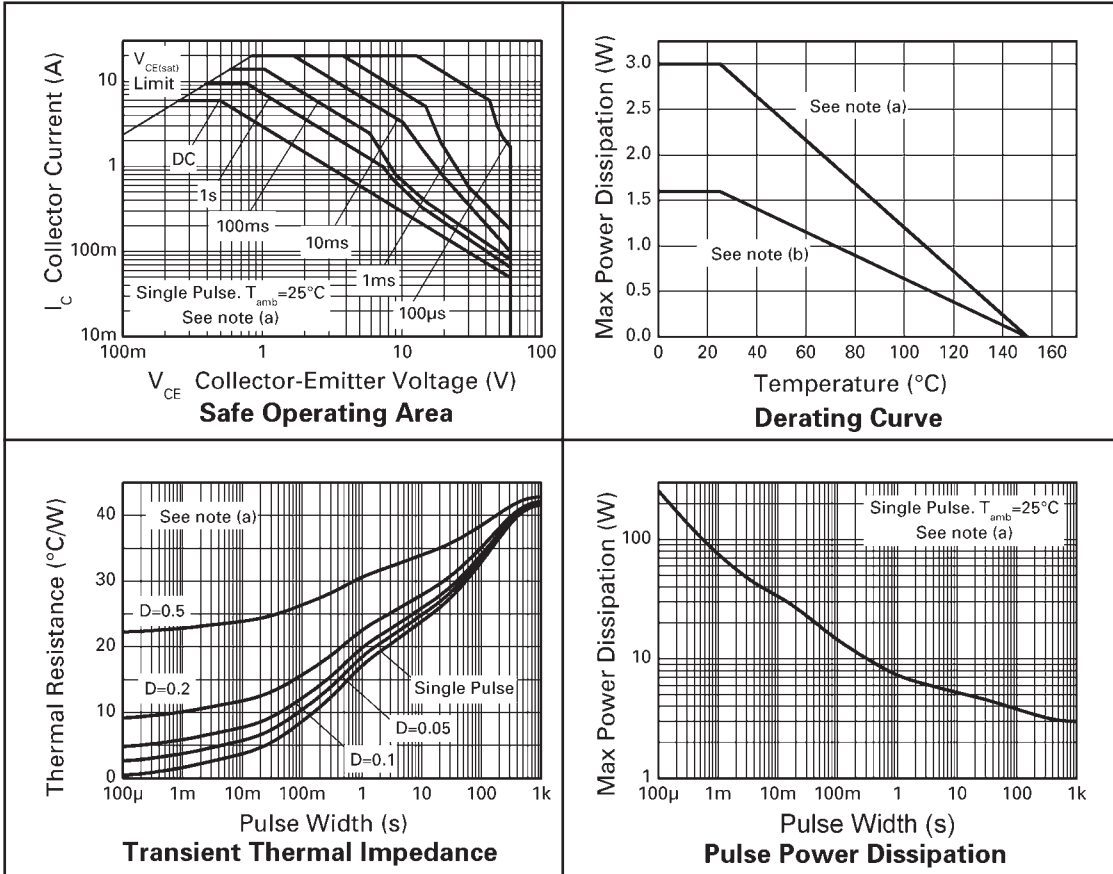
NOTES

(a) For a device through hole mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions. Collector lead length to solder point 4mm.

(b) For a device mounted in a socket in still air conditions. Collector lead length 10mm.

ZX5T851A

CHARACTERISTICS



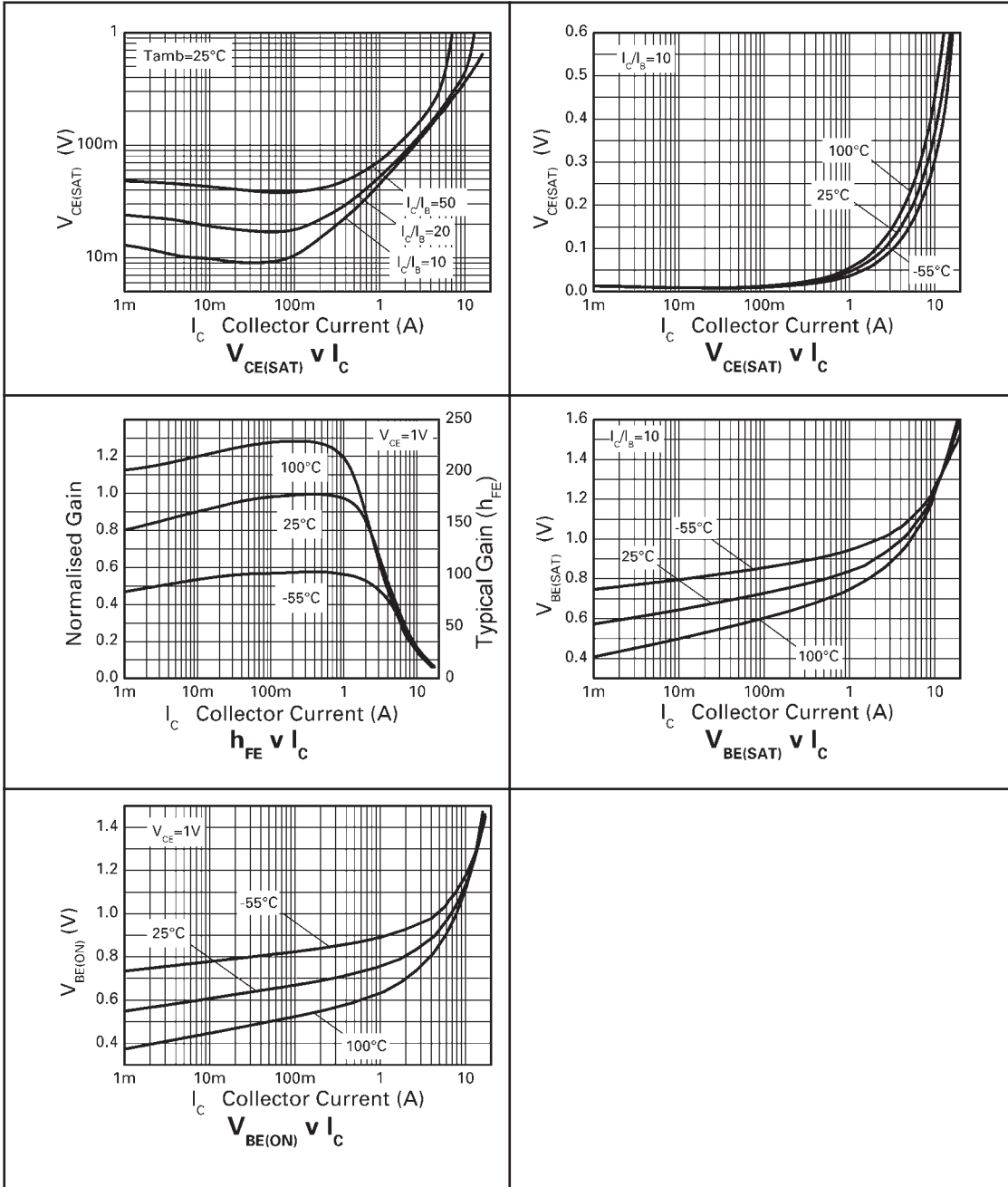
ZX5T851A

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	150	190		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CER}	150	190		V	$I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-emitter breakdown voltage	BV_{CEO}	60	80		V	$I_C = 10\text{mA}^*$
Emitter-base breakdown voltage	BV_{EBO}	7	8.1		V	$I_E = 100\mu\text{A}$
Collector cut-off current	I_{CBO}			20 0.5	nA μA	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector cut-off current	I_{CER} $R \leq 1\text{k}\Omega$			20 0.5	nA μA	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Emitter cut-off current	I_{EBO}			10	nA	$V_{EB} = 6\text{V}$
Collector-emitter saturation voltage	$V_{CE(SAT)}$		18 40 45 95 170	30 55 65 130 210	mV	$I_C = 100\text{mA}$, $I_B = 5\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 50\text{mA}^*$ $I_C = 2\text{A}$, $I_B = 50\text{mA}^*$ $I_C = 5\text{A}$, $I_B = 200\text{mA}^*$
Base-emitter saturation voltage	$V_{BE(SAT)}$		950	1050	mV	$I_C = 4\text{A}$, $I_B = 200\text{mA}^*$
Base-emitter turn-on voltage	$V_{BE(ON)}$		840	950	mV	$I_C = 4\text{A}$, $V_{CE} = 1\text{V}^*$
Static forward current transfer ratio	h_{FE}	100 100 55 20	200 200 105 40	300		$I_C = 10\text{mA}$, $V_{CE} = 1\text{V}^*$ $I_C = 2\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 5\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 10\text{A}$, $V_{CE} = 1\text{V}^*$
Transition frequency	f_T		130		MHz	$I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output capacitance	C_{OBO}		31		pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}^*$
Switching times	t_{ON} t_{OFF}		42 760		ns ns	$I_C = 1\text{A}$, $V_{CC} = 10\text{V}$, $I_{B1} = I_{B2} = 100\text{mA}$

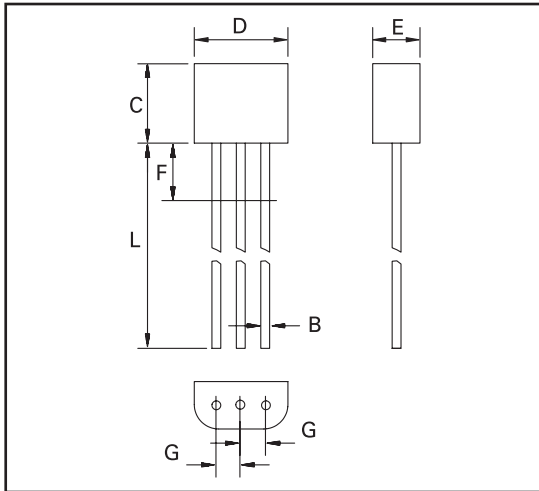
* Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS



ZX5T851A

PACKAGE OUTLINE



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.41	0.495	0.016	0.0195
B	0.41	0.495	0.016	0.0195
C	3.61	4.01	0.142	0.158
D	4.37	4.77	0.172	0.188
E	2.16	2.41	0.085	0.095
F	—	2.50	—	0.098
G	1.27 NOM		0.050 NOM	
L	13.00	13.97	0.512	0.550

© 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 1 - NOVEMBER 2003