ZX5T851A

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

SUMMARY

BV_{CEO} = 60V : R_{SAT} = 34mΩ; I_C = 4.5A

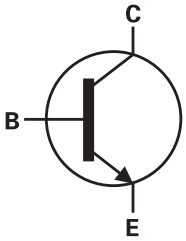
E-LINE

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

- Extemely low equivalent on-resistance; **R_{SAT} = 34mΩ at 5A**
- 4.5 amps continuous current
- Up to 15 amps peak current
- Very low saturation voltages

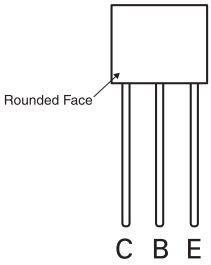


APPLICATIONS

- 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



PINOUT

DEVICE MARKING

- X5T851

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)] Linear derating factor	P_D	1.0 8	W mW/°C
Power dissipation at T_A =25°C [(b)] Linear derating factor	P_D	0.71 5.7	W mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

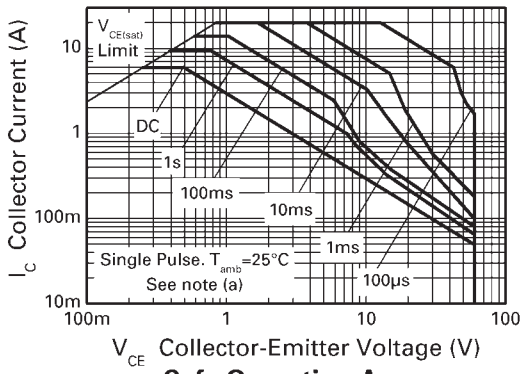
PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient [(a)]	$R_{\Theta JA}$	125	°C/W
Junction to ambient [(b)]	$R_{\Theta JA}$	175	°C/W

NOTES

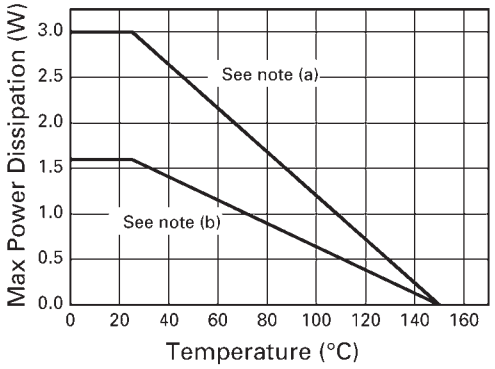
(a) For a device through hole mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions. Collector lead length to solder point 4mm.

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

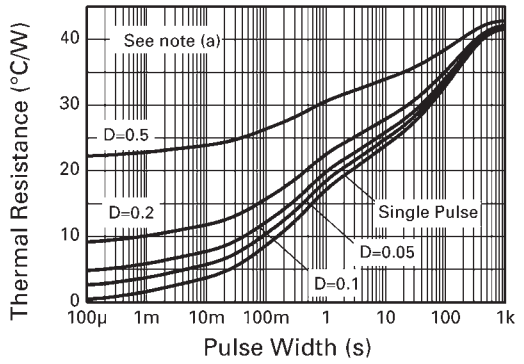
CHARACTERISTICS



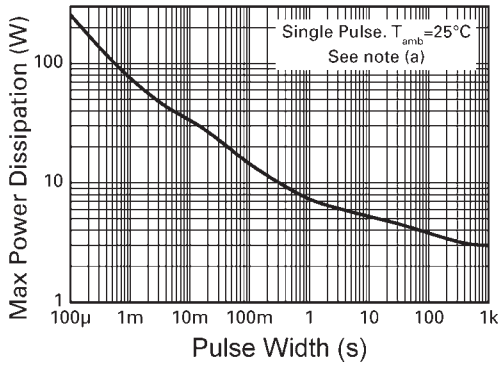
Safe Operating Area



Derating Curve



Transient Thermal Impedance



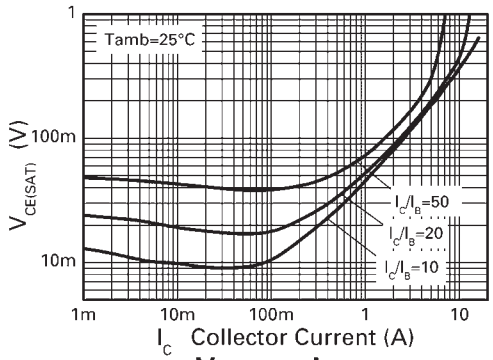
Pulse Power Dissipation

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated)

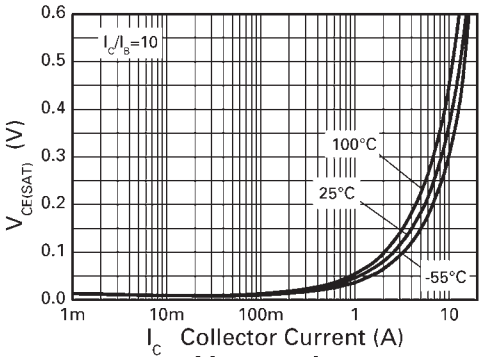
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	150	190		V	I_C=100μA
Collector-emitter breakdown voltage	BV_{CER}	150	190		V	I_C=1μA, RB≤1kΩ
Collector-emitter breakdown voltage	BV_{CEO}	60	80		V	I_C=10mA*
Emitter-base breakdown voltage	BV_{EBO}	7	8.1		V	I_E=100μA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

* Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.

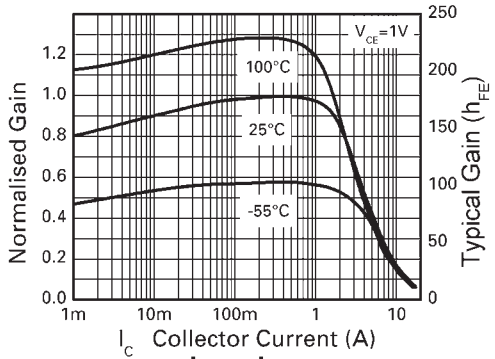
TYPICAL CHARACTERISTICS



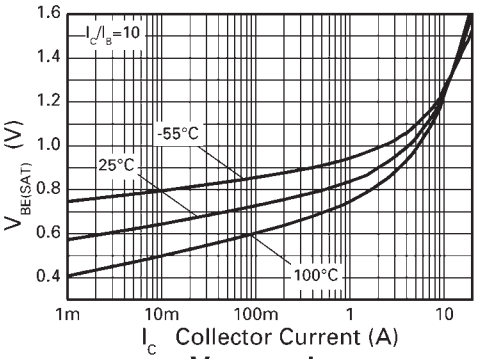
$V_{CE(SAT)}$ v I_C



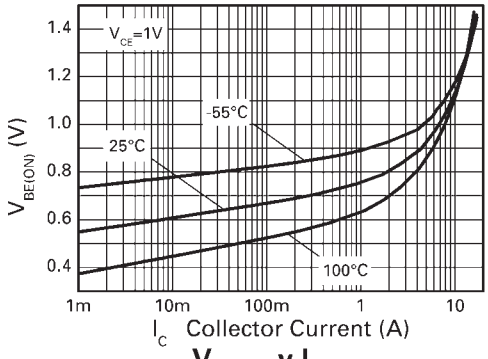
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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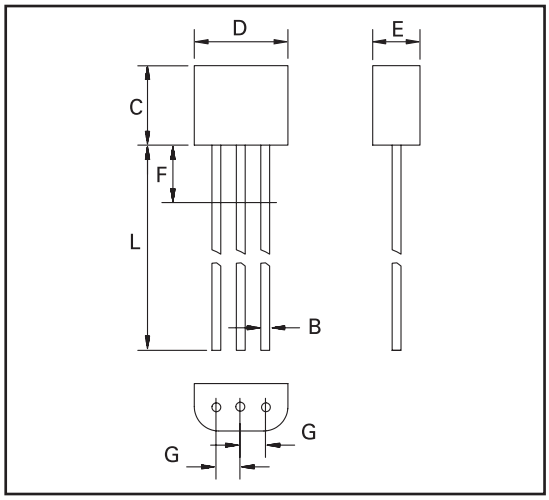
PACKAGE OUTLINE



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

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ZETEX SEMICONDUCTORS

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