

# ZX5T851A

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

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### 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

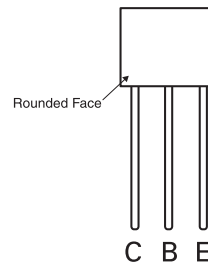
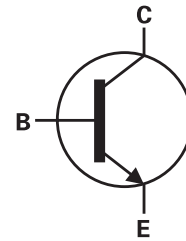
DEVICE	QUANTITY
ZX5T851ASTOA	2000 units / reel
ZX5T851ASTZ	2000 units / carton

### DEVICE MARKING

- X5T851



E-LINE



PINOUT

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## 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 <sup>(a)</sup>	$I_C$	4.5	A
Peak pulse current	$I_{CM}$	15	A
Practical power dissipation <sup>(a)</sup>	$P_D$	1.0	W
Linear derating factor		8	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}$ <sup>(b)</sup>	$P_D$	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 <sup>(a)</sup>	$R_{\theta JA}$	125	°C/W
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	175	°C/W

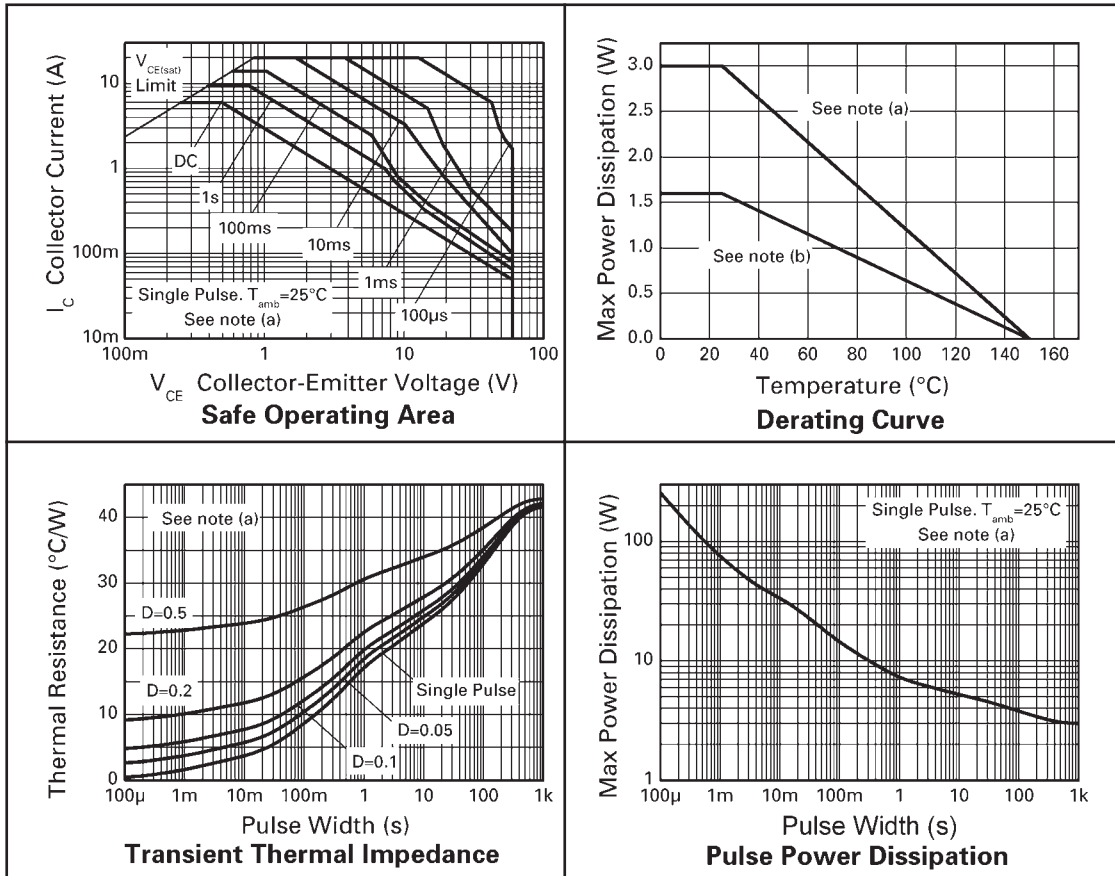
### NOTES

(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.

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## CHARACTERISTICS



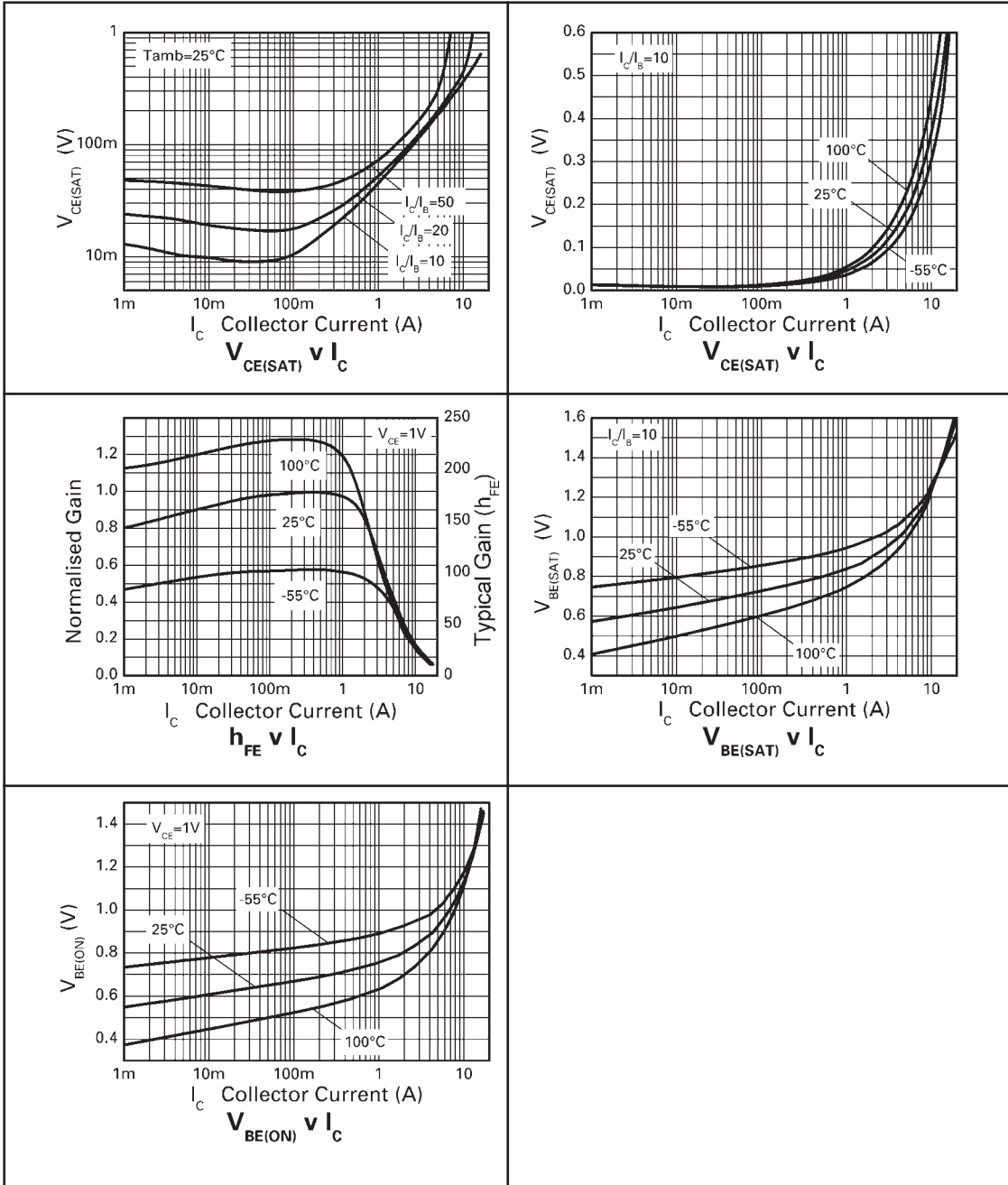
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## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

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 $\mu\text{A}$	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector cut-off current	$I_{CER}$ $R \leq 1\text{k}\Omega$			20 0.5	nA $\mu\text{A}$	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
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	$I_C = 1\text{A}$ , $V_{CC} = 10\text{V}$ , $I_{B1} = I_{B2} = 100\text{mA}$

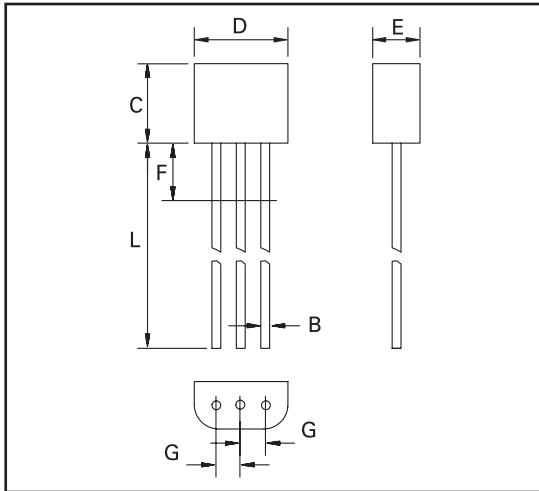
\* Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

TYPICAL CHARACTERISTICS



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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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