

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

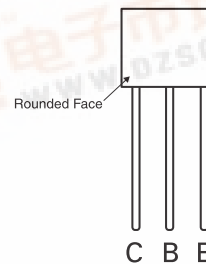
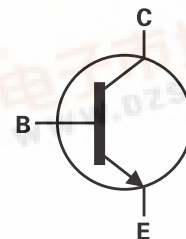
DEVICE	QUANTITY
ZX5T851ASTOA	2000 units / reel
ZX5T851ASTZ	2000 units / carton

DEVICE MARKING

- X5T851



E-LINE



PINOUT

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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 ^(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

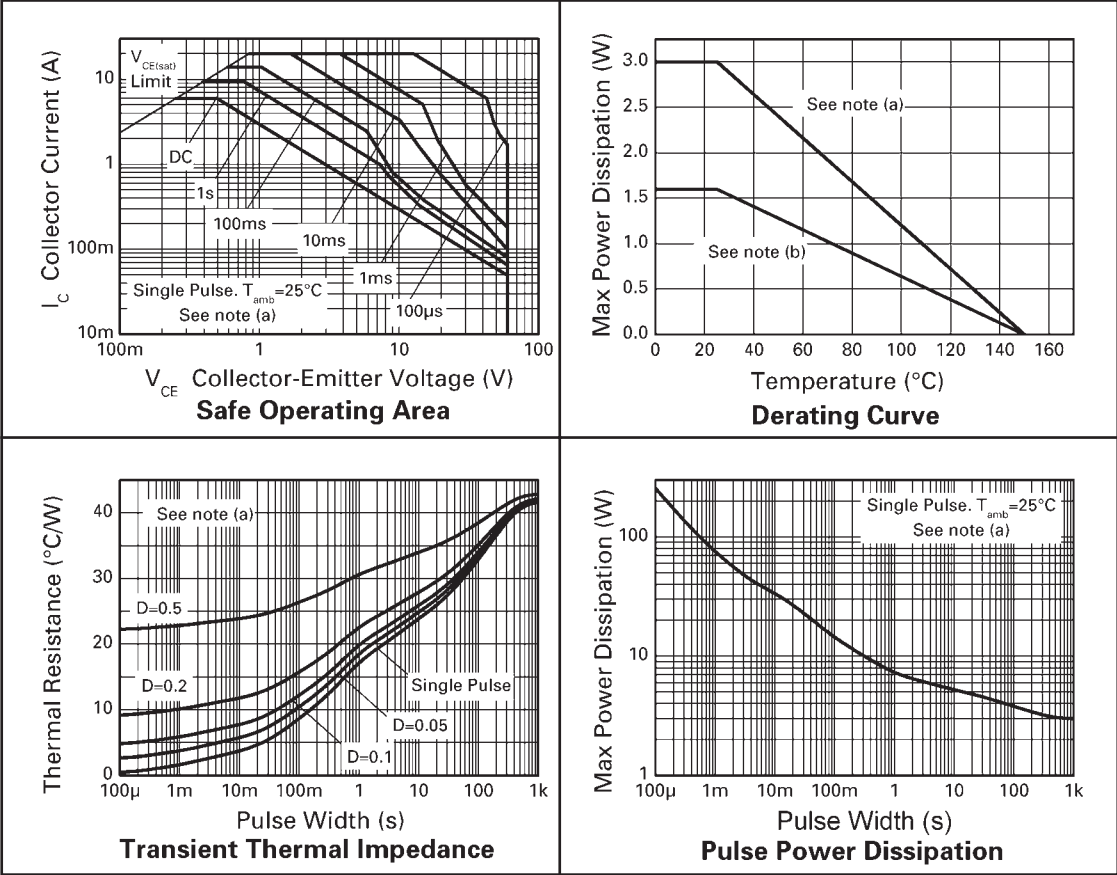
NOTES

(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.

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CHARACTERISTICS



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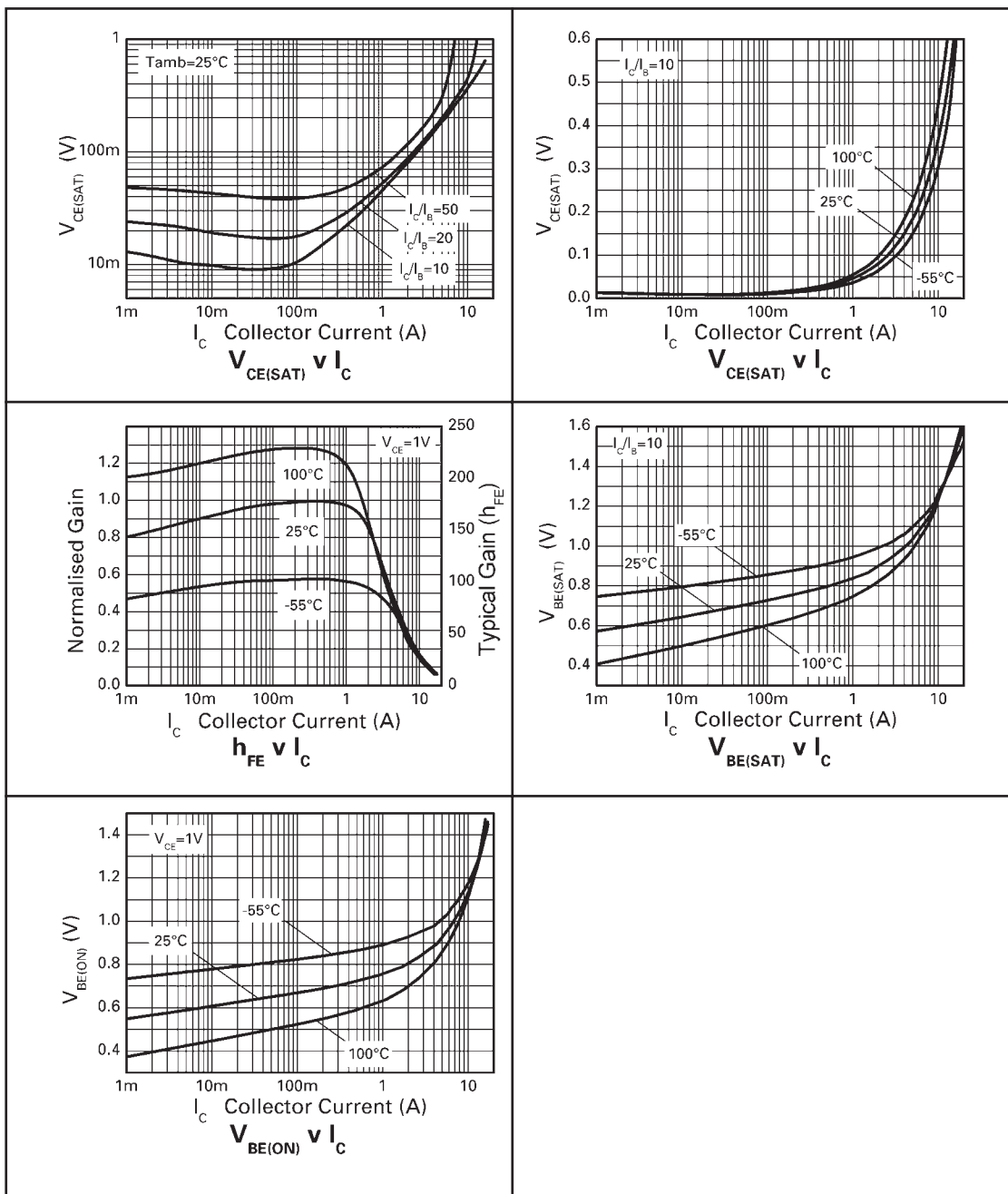
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

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 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 mV mV mV 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 $\leq 2\%$.

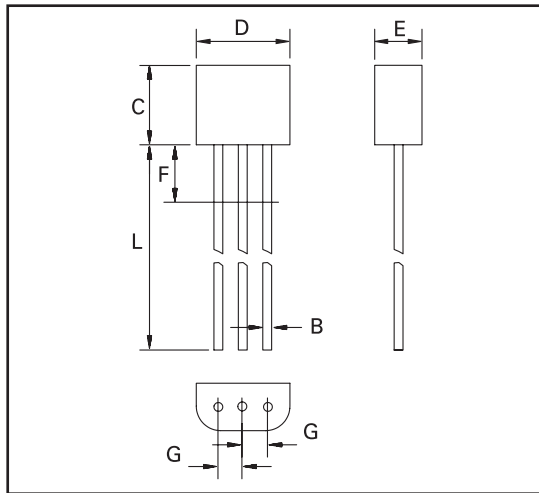
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TYPICAL CHARACTERISTICS



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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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