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ZXTN2005Z

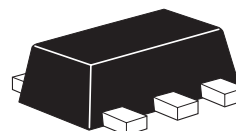
25V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

SUMMARY

$BV_{CEO} = 25V$; $R_{SAT} = 25m\Omega$; $I_C = 5.5A$

DESCRIPTION

Packaged in the SOT89 outline this new low saturation 25V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



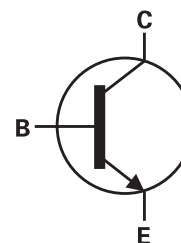
SOT89

FEATURES

- Extremely low equivalent on-resistance; $R_{SAT} = 25m\Omega$ at 6.5A
- 5.5 amps continuous current
- Up to 20 amps peak current
- Very low saturation voltages
- Excellent h_{FE} characteristics up to 20 amps

APPLICATIONS

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



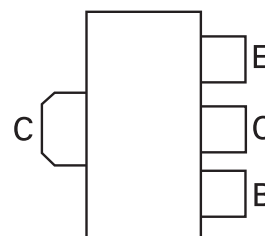
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXTN2005ZTA	7"	12mm embossed	1,000 units

DEVICE MARKING

869

PINOUT



TOP VIEW

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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-base voltage	BV_{CBO}	60	V
Collector-emitter voltage	BV_{CEO}	25	V
Emitter-base voltage	BV_{EBO}	7	V
Continuous collector current ^(a)	I_C	5.5	A
Peak pulse current	I_{CM}	20	A
Power dissipation at $T_A=25^\circ\text{C}$ ^(a)	P_D	1.5	W
Linear derating factor		12	mW/°C
Power dissipation at $T_A=25^\circ\text{C}$ ^(b)	P_D	2.1	W
Linear derating factor		16.8	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	83	°C/W
Junction to ambient ^(b)	$R_{\theta JA}$	60	°C/W

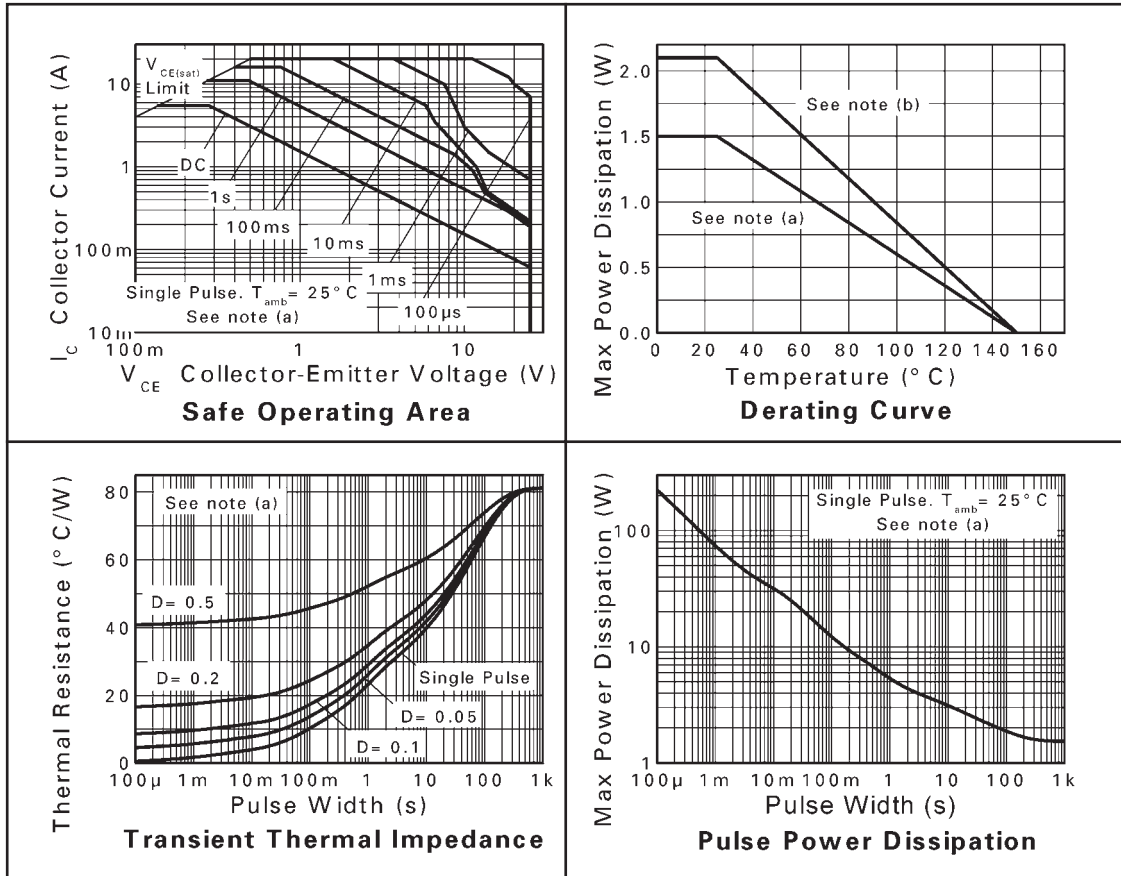
NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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CHARACTERISTICS



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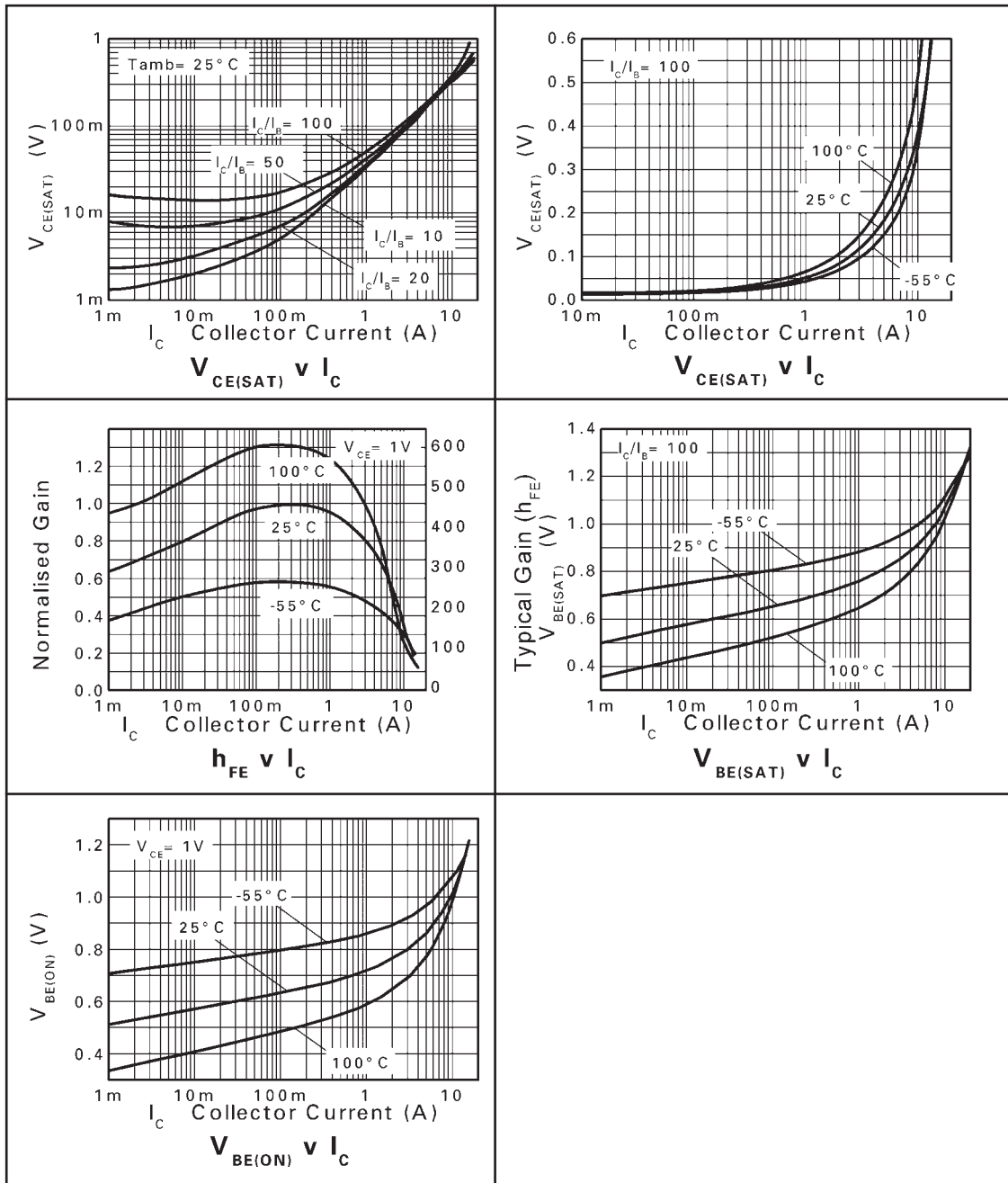
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	60	120		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CER}	60	120		V	$I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-emitter breakdown voltage	BV_{CEO}	25	35		V	$I_C = 10\text{mA}^*$
Emitter base breakdown voltage	BV_{EBO}	7.0	8.1		V	$I_E = 100\mu\text{A}$
Collector cut-off current	I_{CBO}			20 0.5	nA μA	$V_{CB} = 50\text{V}$ $V_{CB} = 50\text{V}$, $T_{amb}=100^{\circ}\text{C}$
Collector cut-off current	I_{CER} $R \leq 1\text{k}\Omega$			20 0.5	nA μA	$V_{CB} = 50\text{V}$ $V_{CB} = 50\text{V}$, $T_{amb}=100^{\circ}\text{C}$
Emitter cut-off current	I_{EBO}			10	nA	$V_{EB} = 6\text{V}$
Collector-emitter saturation voltage	$V_{CE(SAT)}$		25 30 45 105 160	35 45 70 130 200	mV mV mV mV mV	$I_C = 500\text{mA}$, $I_B = 10\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 10\text{mA}^*$ $I_C = 2\text{A}$, $I_B = 10\text{mA}^*$ $I_C = 6.5\text{A}$, $I_B = 150\text{mA}^*$
Base-emitter saturation voltage	$V_{BE(SAT)}$		950	1050	mV	$I_C = 6.5\text{A}$, $I_B = 150\text{mA}^*$
Base-emitter turn on voltage	$V_{BE(ON)}$		860	960	mV	$I_C = 6.5\text{A}$, $V_{CE} = 1\text{V}^*$
Static forward current transfer ratio	h_{FE}	300 300 200 40	400 450 275 55			$I_C = 10\text{mA}$, $V_{CE} = 1\text{V}^*$ $I_C = 1\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 7\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 20\text{A}$, $V_{CE} = 1\text{V}^*$
Transition frequency	f_T		150			$I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f=50\text{MHz}$
Output capacitance	C_{OBO}		48		pF	$V_{CB} = 10\text{V}$, $f= 1\text{MHz}^*$
Switching times	t_{ON} t_{OFF}		33 464		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 $\leq 2\%$.

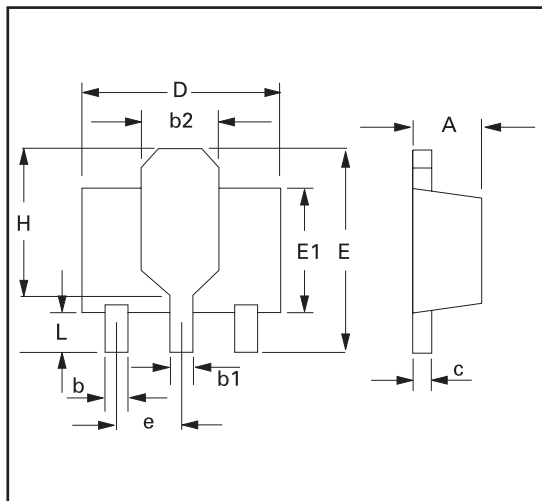
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TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE



PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	e	1.40	1.50	0.055	0.059
b	0.38	0.48	0.015	0.019	E	3.75	4.25	0.150	0.167
b1	-	0.53	-	0.021	E1	-	2.60	-	0.102
b2	1.50	1.80	0.060	0.071	G	2.90	3.00	0.114	0.118
c	0.28	0.44	0.011	0.017	H	2.60	2.85	0.102	0.112
D	4.40	4.60	0.173	0.181	-	-	-	-	-

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