

ZXTN2005Z

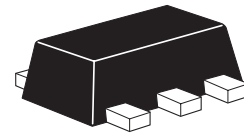
25V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

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.



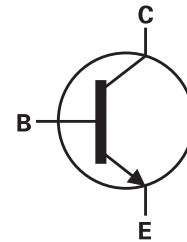
SOT89

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



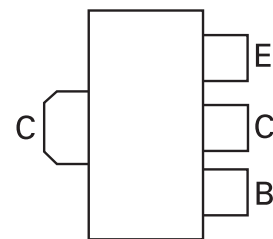
ORDERING INFORMATION

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

DEVICE MARKING

869

PINOUT



TOP VIEW

ZXTN2005Z

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

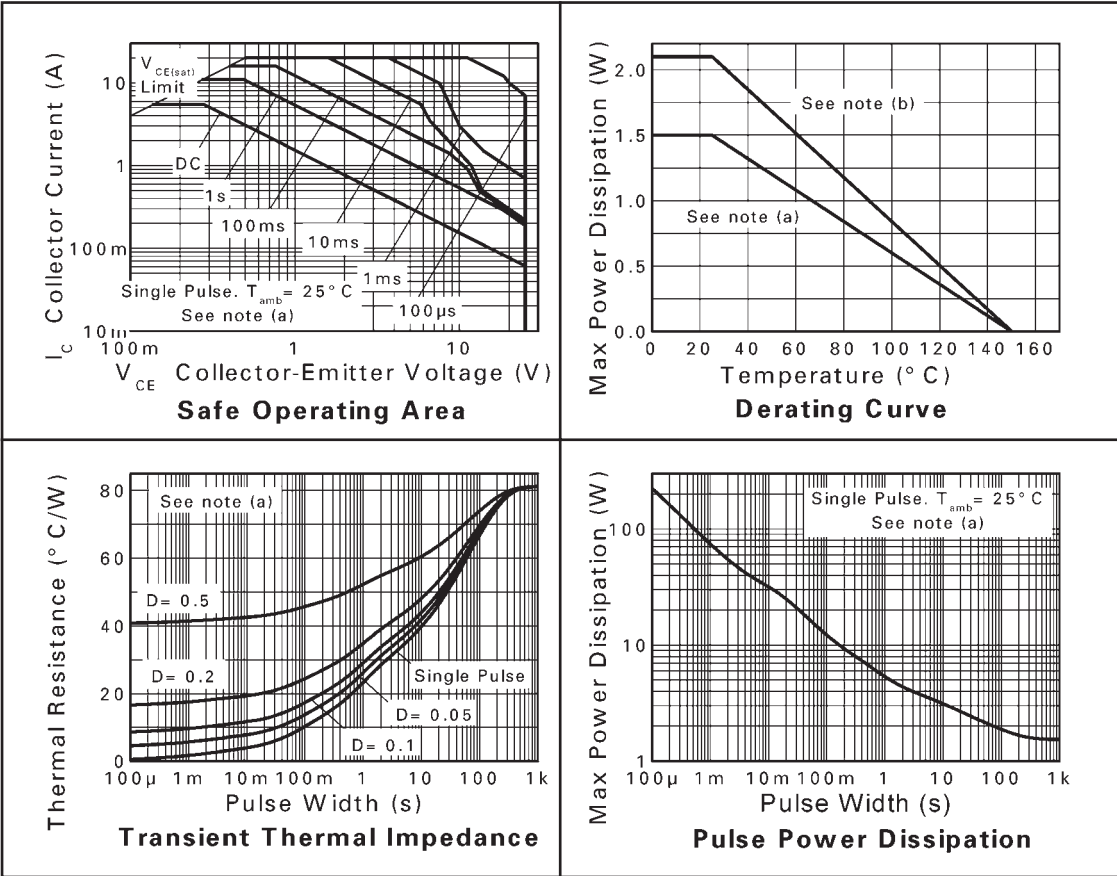
NOTES:

(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



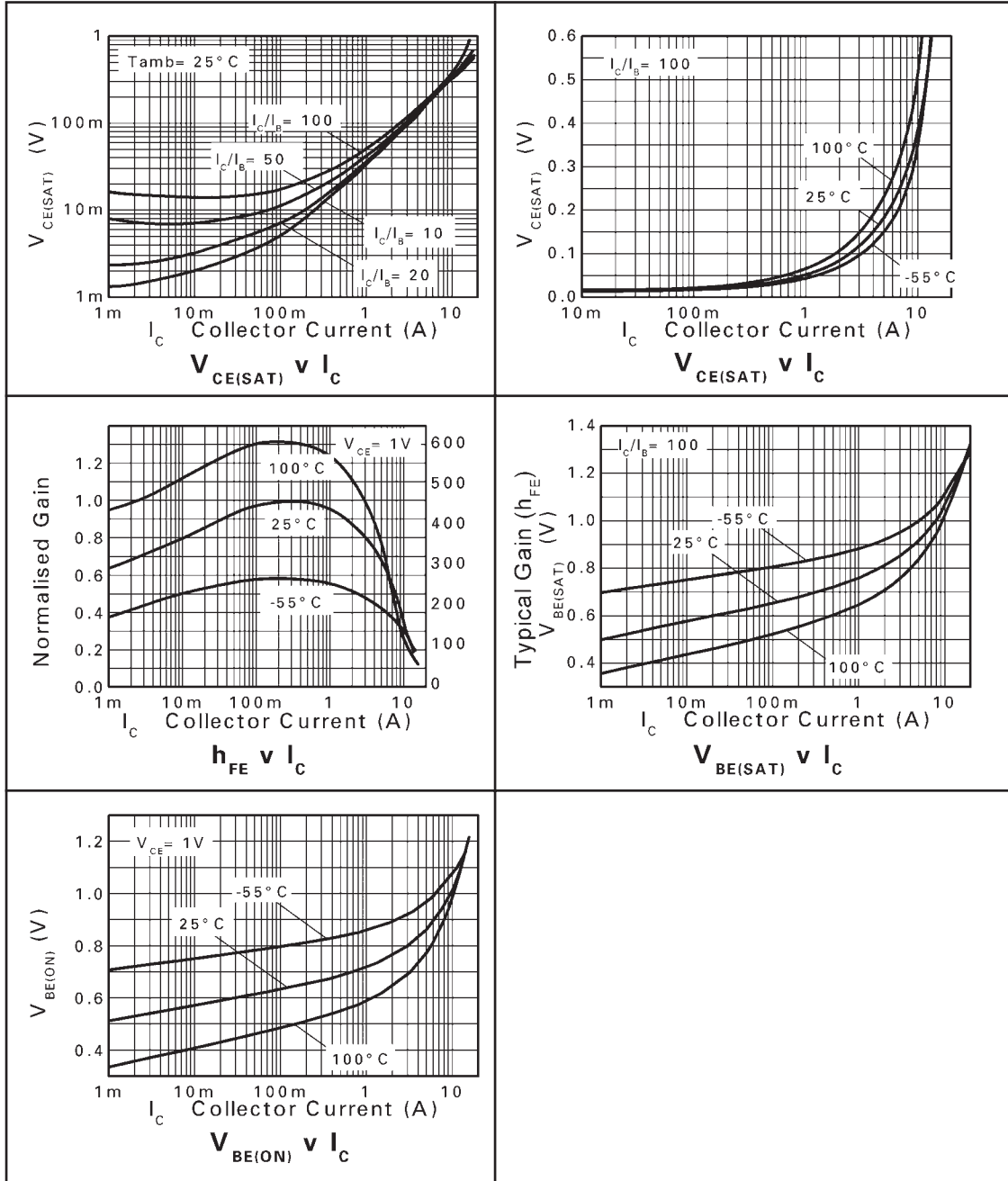
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ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

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	$I_C = 1\text{A}, V_{CC} = 10\text{V},$ $I_{B1} = -I_{B2} = 100\text{mA}$

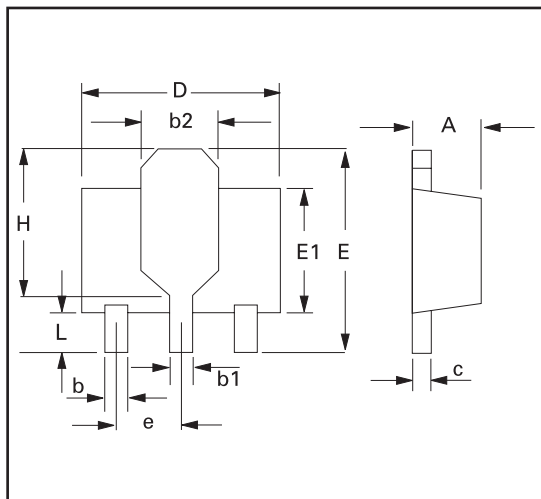
* Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

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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