

ZXTP25100CZ

100V PNP medium power transistor in SOT89

Summary

$BV_{CEO} > -100V$

$BV_{ECO} > -7V$

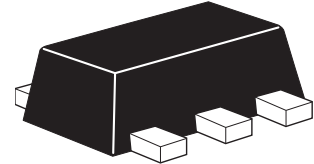
$I_{C(cont)} = 1A$

$V_{CE(sat)} < -225mV @ 1A$

$R_{CE(sat)} = 155m\Omega$

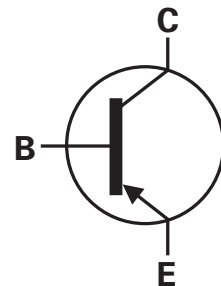
$P_D = 2.4W$

Complementary part number ZXTN25100DZ



Description

Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium.



Features

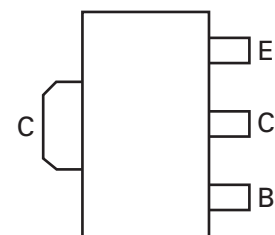
- High power dissipation SOT89 package
- High peak current
- Low saturation voltage
- 7V reverse blocking

Applications

- Motor drive
- High side driver
- Load disconnect switch

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25100CZTA	7	12	1000



Pinout - top view

Device marking

- IL7

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-Base voltage	V_{CBO}	-115	V
Collector-Emitter voltage	V_{CEO}	-100	V
Emitter-Collector voltage (reverse blocking)	V_{ECO}	-7	V
Emitter-Base voltage	V_{EBO}	-7	V
Continuous Collector current ^(c)	I_C	-1	A
Base current	I_B	-500	mA
Peak pulse current	I_{CM}	-3	A
Power dissipation at $T_A = 25^\circ\text{C}^{(a)}$	P_D	1.1	W
Linear derating factor		8.8	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(b)}$	P_D	1.8	W
Linear derating factor		14.4	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(c)}$	P_D	2.4	W
Linear derating factor		19.2	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(d)}$	P_D	4.46	W
Linear derating factor		35.7	mW/°C
Power dissipation at $T_C = 25^\circ\text{C}^{(e)}$	P_D	15.7	W
Linear derating factor		126	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)	$R_{\theta JA}$	117	°C/W
Junction to ambient ^(b)	$R_{\theta JA}$	68	°C/W
Junction to ambient ^(c)	$R_{\theta JA}$	51	°C/W
Junction to ambient ^(d)	$R_{\theta JA}$	28	°C/W
Junction to case ^(e)	$R_{\theta JC}$	7.95	°C/W

NOTES:

(a) For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) Mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

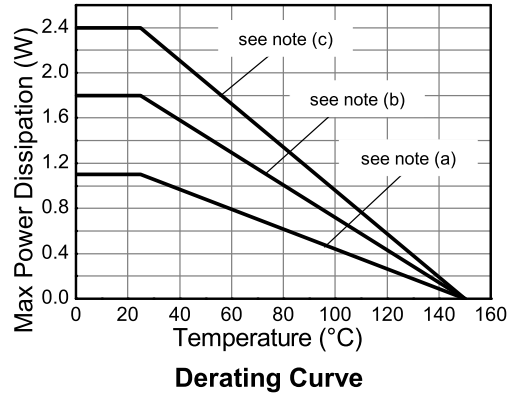
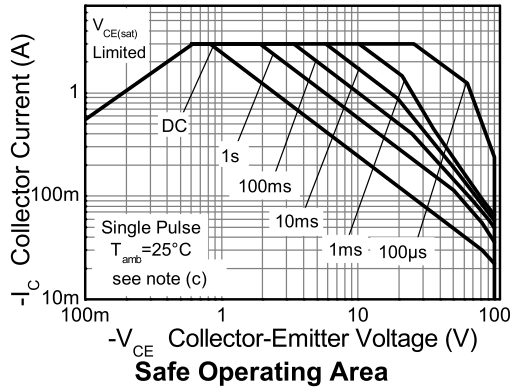
(c) Mounted on 50mm x 50mm x 0.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

(d) As (c) above measured at $t < 5$ seconds.

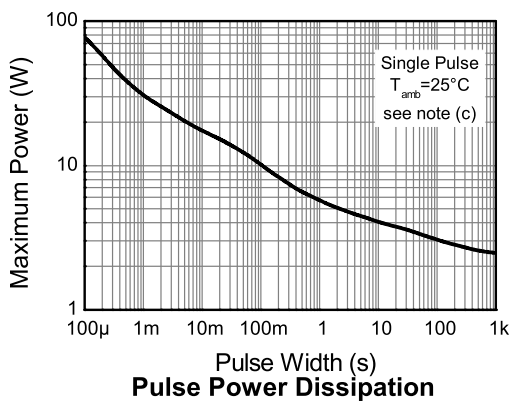
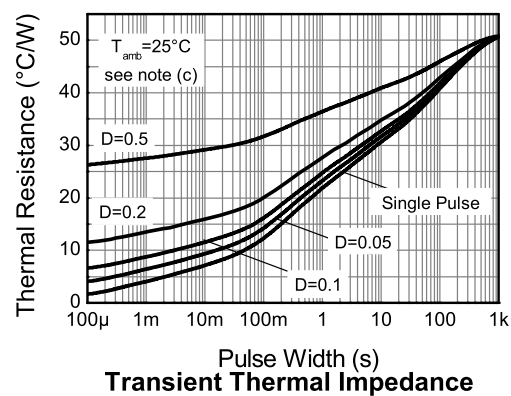
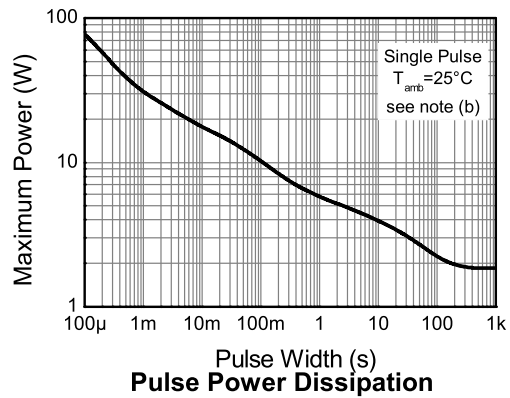
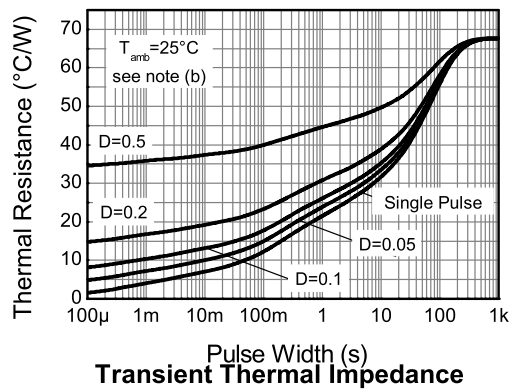
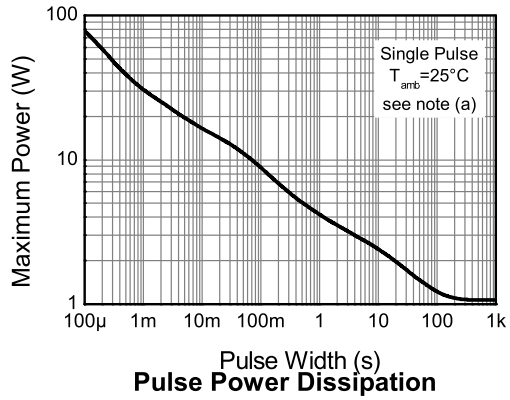
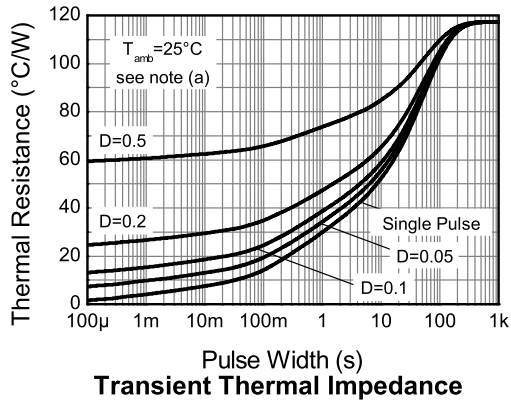
(e) Junction to case (collector tab). Typical

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Thermal characteristics



Thermal characteristics



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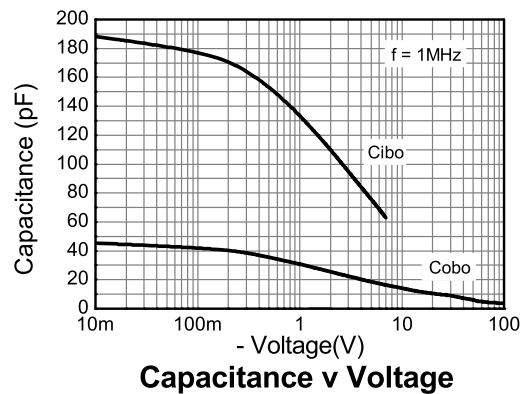
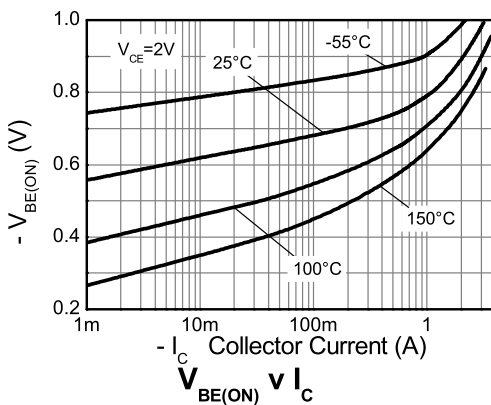
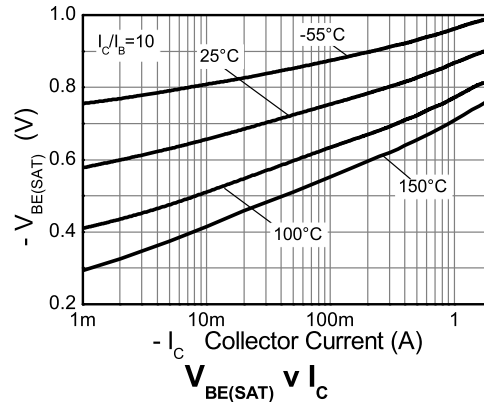
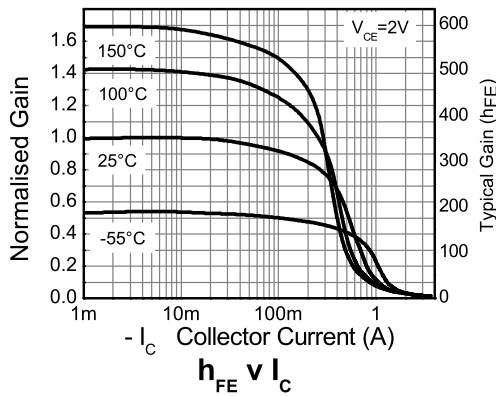
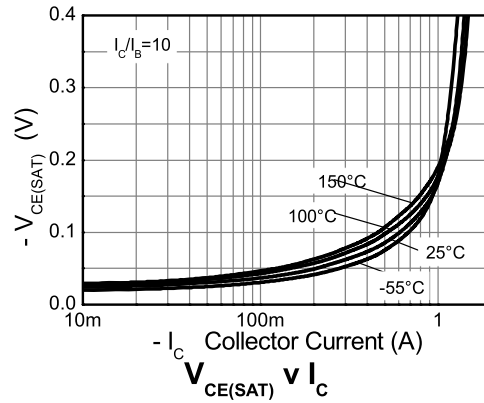
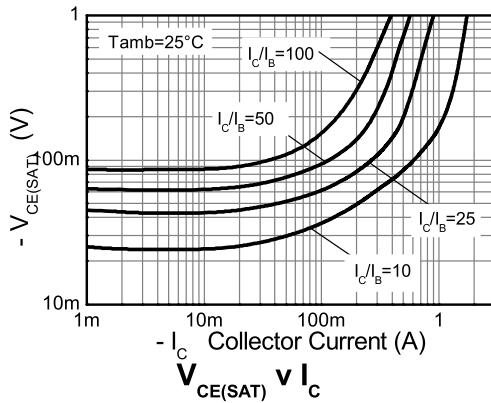
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV_{CBO}	-115	-180		V	$I_C = -100\mu\text{A}$
Collector-Emitter breakdown voltage (base open)	BV_{CEO}	-100	-140		V	$I_C = -10\text{mA}^{(*)}$
Emitter-Base breakdown voltage	BV_{EBO}	-7	-8.4		V	$I_E = -100\mu\text{A}$
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECX}	-7	-8.3		V	$I_E = -100\mu\text{A}$, $R_{BC} < 1\text{k}\Omega$ or $-0.25\text{V} > V_{BC} > 0.25\text{V}$
Emitter-Collector breakdown voltage (base open)	BV_{ECO}	-7	-8.8		V	$I_E = -100\mu\text{A}$
Collector-Base cut-off current	I_{CBO}		<-1	-50 -0.5	nA μA	$V_{CB} = -115\text{V}$ $V_{CB} = -115\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector-Emitter cut-off current	I_{CEX}			-100	nA	$V_{CE} = -90\text{V}$, $R_{BE} < 1\text{k}\Omega$ or $0.25\text{V} < V_{BE} < 1\text{V}$
Emitter-Base cut-off current	I_{EBO}		<-1	-50	nA	$V_{EB} = -5.6\text{V}$
Collector-Emitter saturation voltage	$V_{CE(sat)}$		-140 -80 -180 -155	-210 -115 -315 -225	mV mV mV mV	$I_C = -100\text{mA}$, $I_B = -1\text{mA}^{(*)}$ $I_C = -500\text{mA}$, $I_B = -50\text{mA}^{(*)}$ $I_C = -500\text{mA}$, $I_B = -20\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^{(*)}$
Base-Emitter saturation voltage	$V_{BE(sat)}$		-860	-950	mV	$I_C = -1\text{A}$, $I_B = -100\text{mA}^{(*)}$
Base-Emitter turn-on voltage	$V_{BE(on)}$		-800	-900	mV	$I_C = -1\text{A}$, $V_{CE} = -2\text{V}^{(*)}$
Static forward current transfer ratio	h_{FE}	200 180 110 20	350 320 190 35	500		$I_C = -10\text{mA}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -100\text{mA}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -500\text{mA}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -1\text{A}$, $V_{CE} = -2\text{V}^{(*)}$
Transition frequency	f_T		180		MHz	$I_C = -20\text{mA}$, $V_{CE} = -15\text{V}$ $f = 100\text{MHz}$
Input capacitance	C_{ibo}		153		pF	$V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}^{(*)}$
Output capacitance	C_{obo}		14.1	20	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}^{(*)}$
Delay time	t_d		15.8		ns	$V_{CC} = -10\text{V}$, $I_C = -500\text{mA}$ $I_{B1} = -I_{B2} = -50\text{mA}$
Rise time	t_r		41		ns	
Storage time	t_s		411		ns	
Fall time	t_f		89		ns	

NOTES:

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

Typical characteristics



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Package outline - SOT89



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	E	2.29	2.60	0.090	0.102
B	0.44	0.56	0.017	0.022	E1	2.13	2.29	0.084	0.090
B1	0.36	0.48	0.014	0.019	e	1.50 BSC		0.059 BSC	
C	0.35	0.44	0.014	0.017	e1	3.00 BSC		0.118 BSC	
D	4.40	4.60	0.173	0.181	H	3.94	4.25	0.155	0.167
D1	1.52	1.83	0.064	0.072	L	0.89	1.20	0.035	0.047

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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Zetex sales offices

Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Kustermann-park Balanstraße 59 D-81541 München Germany Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.