

# ZXTP25100CZ

## 100V PNP medium power transistor in SOT89

### Summary

$BV_{CEO} > -100V$

$BV_{ECO} > -7V$

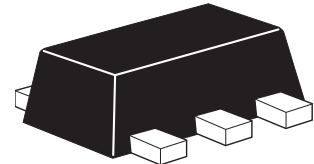
$I_{C(cont)} = 1A$

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

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

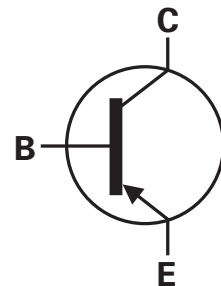
$P_D = 2.4W$

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

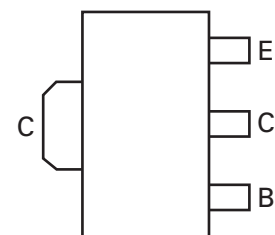
- High power dissipation SOT89 package
- High peak current
- Low saturation voltage
- 7V reverse blocking

### 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

# ZXTP25100CZ

## 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 <sup>(c)</sup>	$I_C$	-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 <sup>(a)</sup>	$R_{\theta JA}$	117	°C/W
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	68	°C/W
Junction to ambient <sup>(c)</sup>	$R_{\theta JA}$	51	°C/W
Junction to ambient <sup>(d)</sup>	$R_{\theta JA}$	28	°C/W
Junction to case <sup>(e)</sup>	$R_{\theta JC}$	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.

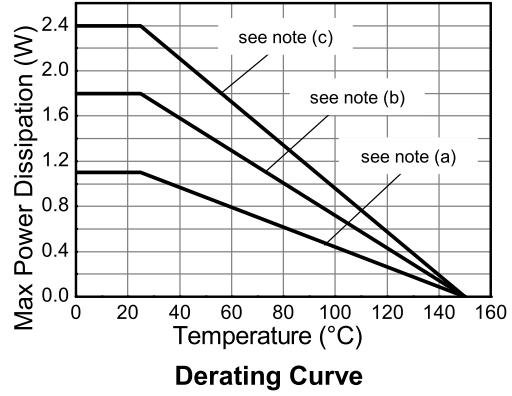
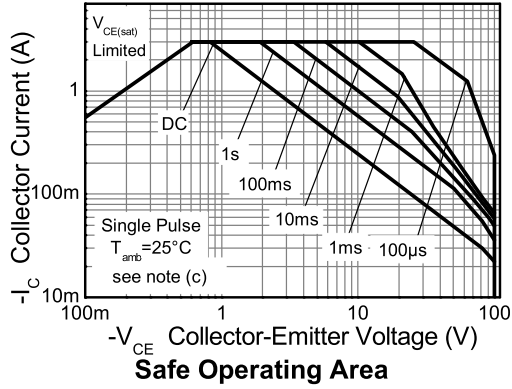
(c) Mounted on 50mm x 50mm x 0.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

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

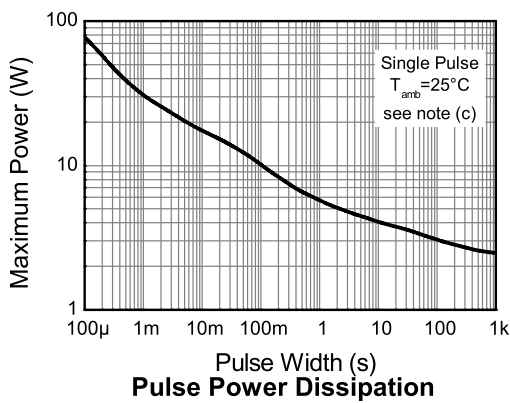
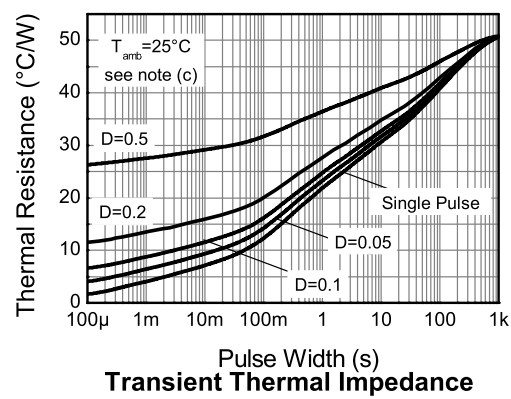
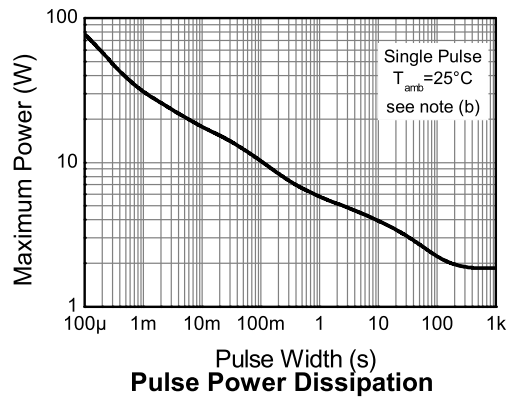
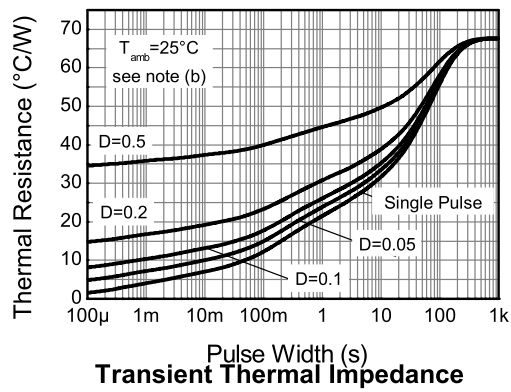
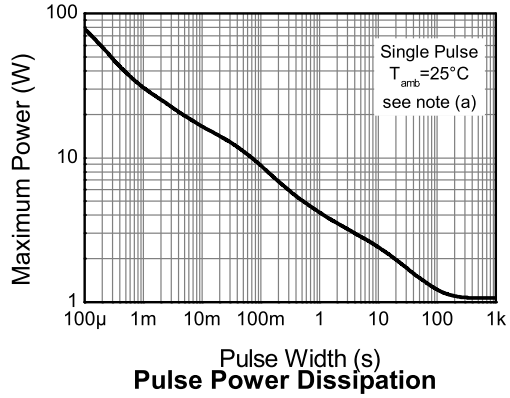
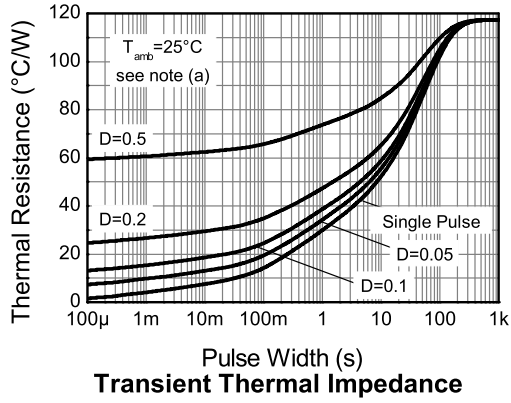
(e) Junction to case (collector tab). Typical

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## Thermal characteristics



## Thermal characteristics



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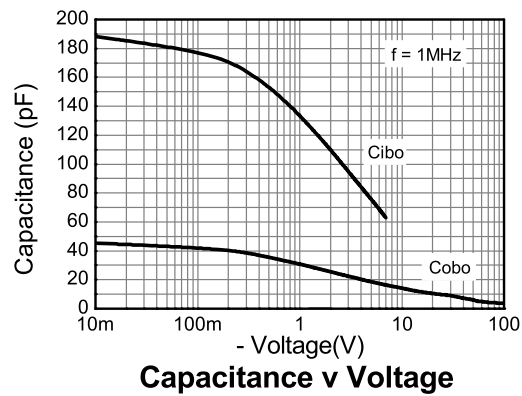
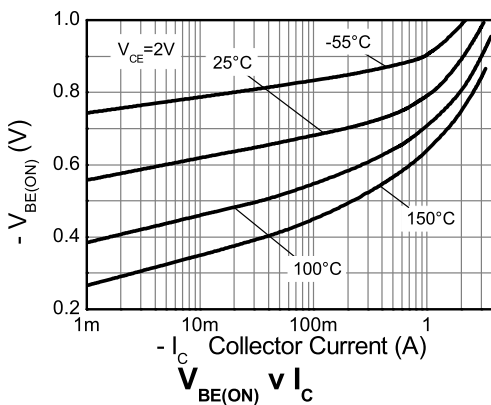
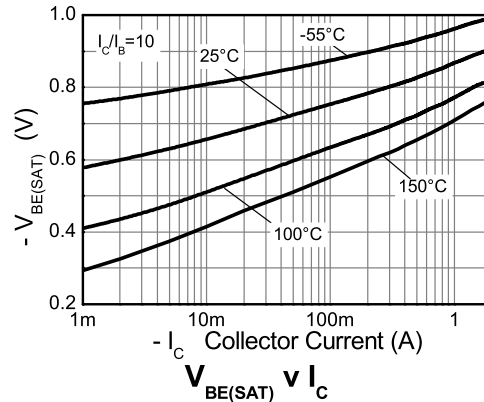
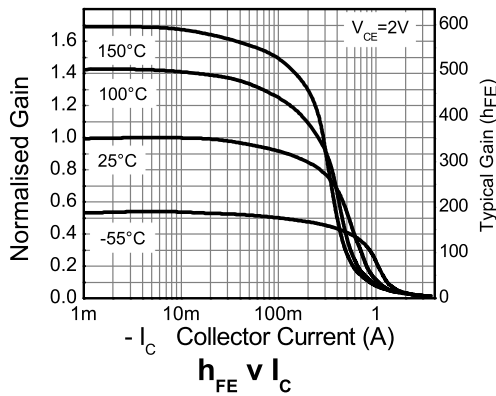
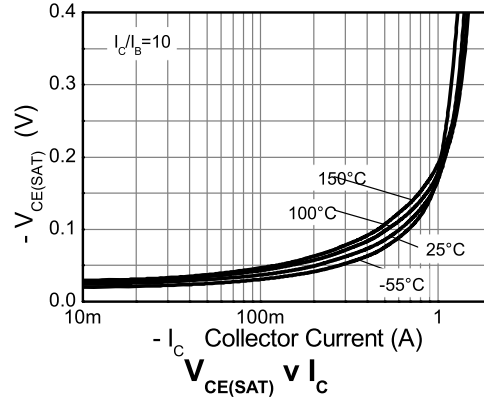
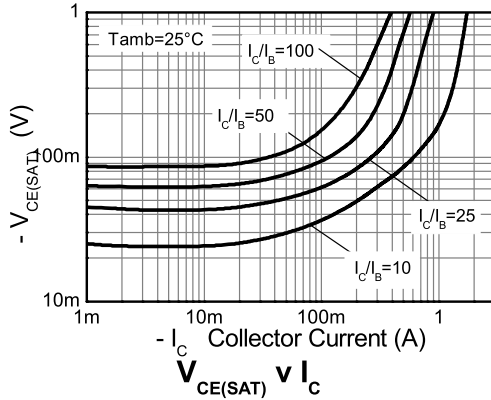
## Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

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 $\mu\text{A}$	$V_{CB} = -115\text{V}$ $V_{CB} = -115\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
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:

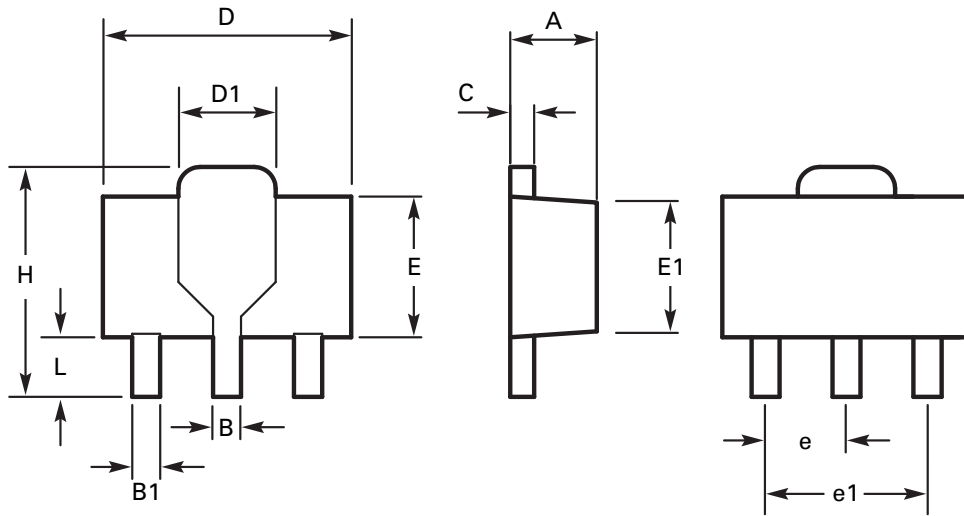
(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

## 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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