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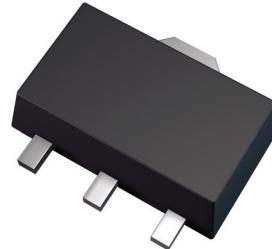
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ZXTN19100CZ

100V NPN medium power transistor in SOT89

Summary

$BV_{CEX} > 200V$
 $BV_{CEO} > 100V$
 $BV_{ECO} > 5V$
 $I_C(\text{cont}) = 5.25A$
 $V_{CE(\text{sat})} < 65mV @ 1A$
 $R_{CE(\text{sat})} = 44m\Omega$
 $P_D = 2.4W$



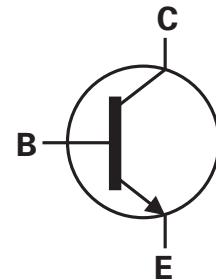
Complementary part number ZXTP19100CZ

Description

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

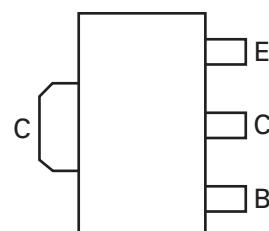
Features

- Higher power dissipation SOT89 package
- High peak current
- Low saturation voltage
- High forward blocking voltage



Applications

- PSU start up switch
- Motor drive
- Lamp, relay and solenoid switches



Pinout - top view

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN19100CZTA	7	12	1000

Device marking

1L9

ZXTN19100CZ

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-Base voltage	V_{CBO}	200	V
Collector-Emitter voltage (forward blocking)	V_{CEX}	200	V
Collector-Emitter voltage	V_{CEO}	100	V
Emitter-Collector voltage (reverse blocking)	V_{ECX}	6	V
Emitter-Base voltage	V_{EBO}	7	V
Continuous Collector current ^(c)	I_C	5.25	A
Base current	I_B	1	A
Peak pulse current	I_{CM}	10	A
Power dissipation at $T_A = 25^\circ\text{C}$ ^(a)	P_D	1.1	W
Linear derating factor		8.8	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(b)	P_D	1.8	W
Linear derating factor		14.4	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(c)	P_D	2.4	W
Linear derating factor		19.2	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(d)	P_D	4.46	W
Linear derating factor		35.7	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_C = 25^\circ\text{C}$ ^(e)	P_D	26.6	W
Linear derating factor		213	$\text{mW}/^\circ\text{C}$
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	$^\circ\text{C}$

Thermal resistance

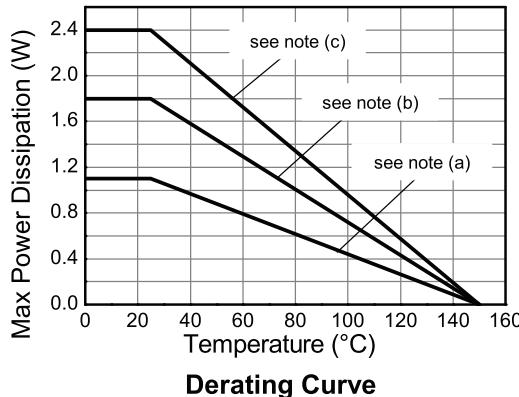
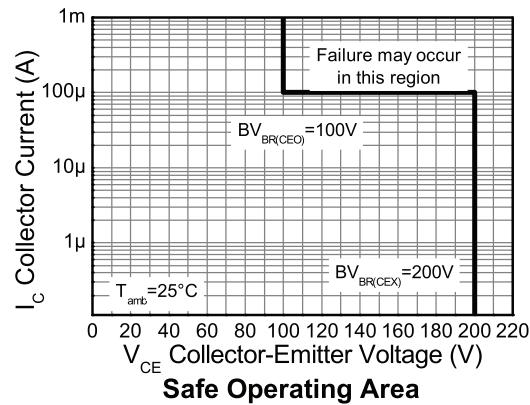
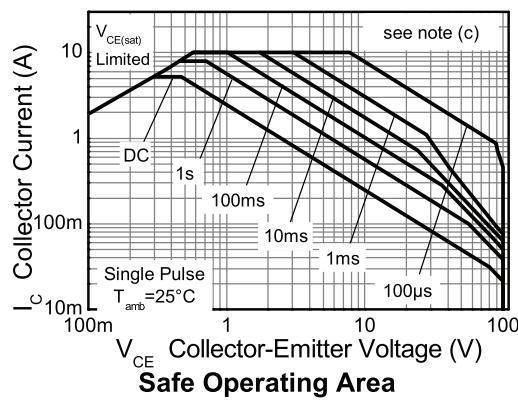
Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\Theta JA}$	117	$^\circ\text{C}/\text{W}$
Junction to ambient ^(b)	$R_{\Theta JA}$	68	$^\circ\text{C}/\text{W}$
Junction to ambient ^(c)	$R_{\Theta JA}$	51	$^\circ\text{C}/\text{W}$
Junction to ambient ^(d)	$R_{\Theta JA}$	28	$^\circ\text{C}/\text{W}$
Junction to case ^(e)	$R_{\Theta JC}$	4.69	$^\circ\text{C}/\text{W}$

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.

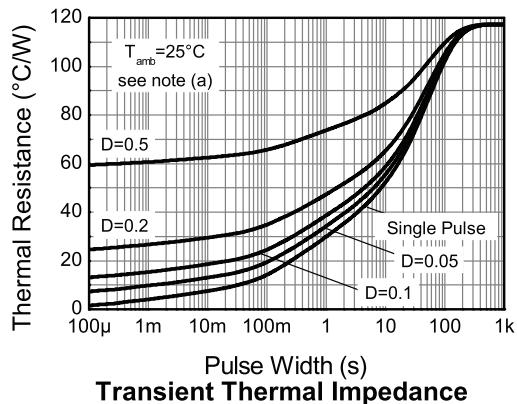
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Thermal characteristics

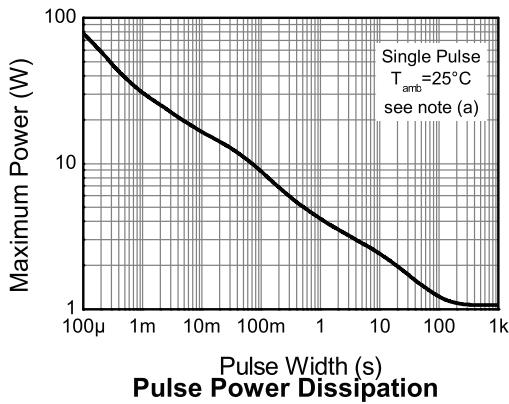


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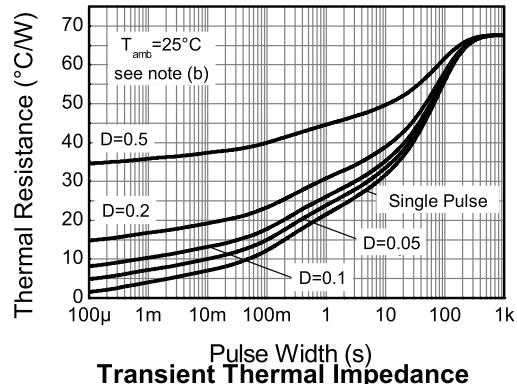
Thermal characteristics



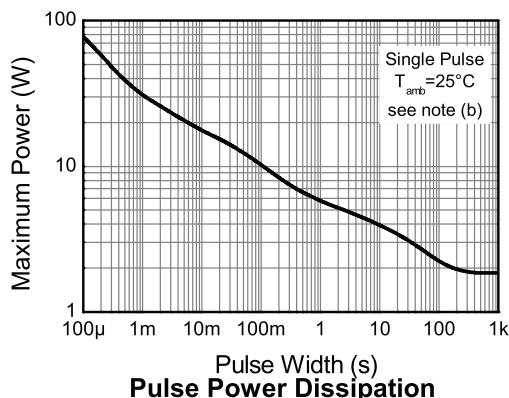
Transient Thermal Impedance



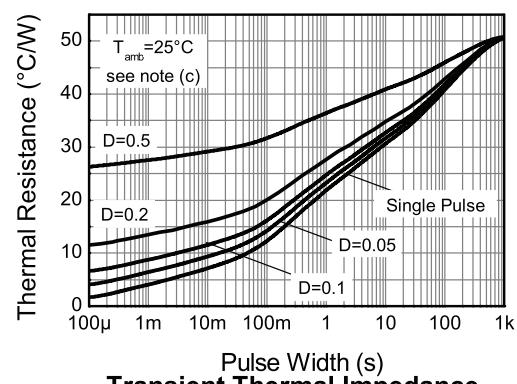
Pulse Power Dissipation



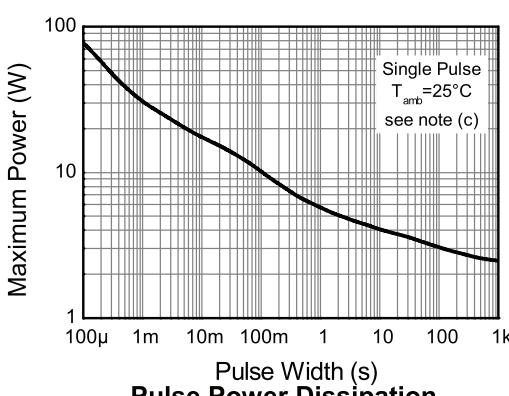
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



Pulse Power Dissipation

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

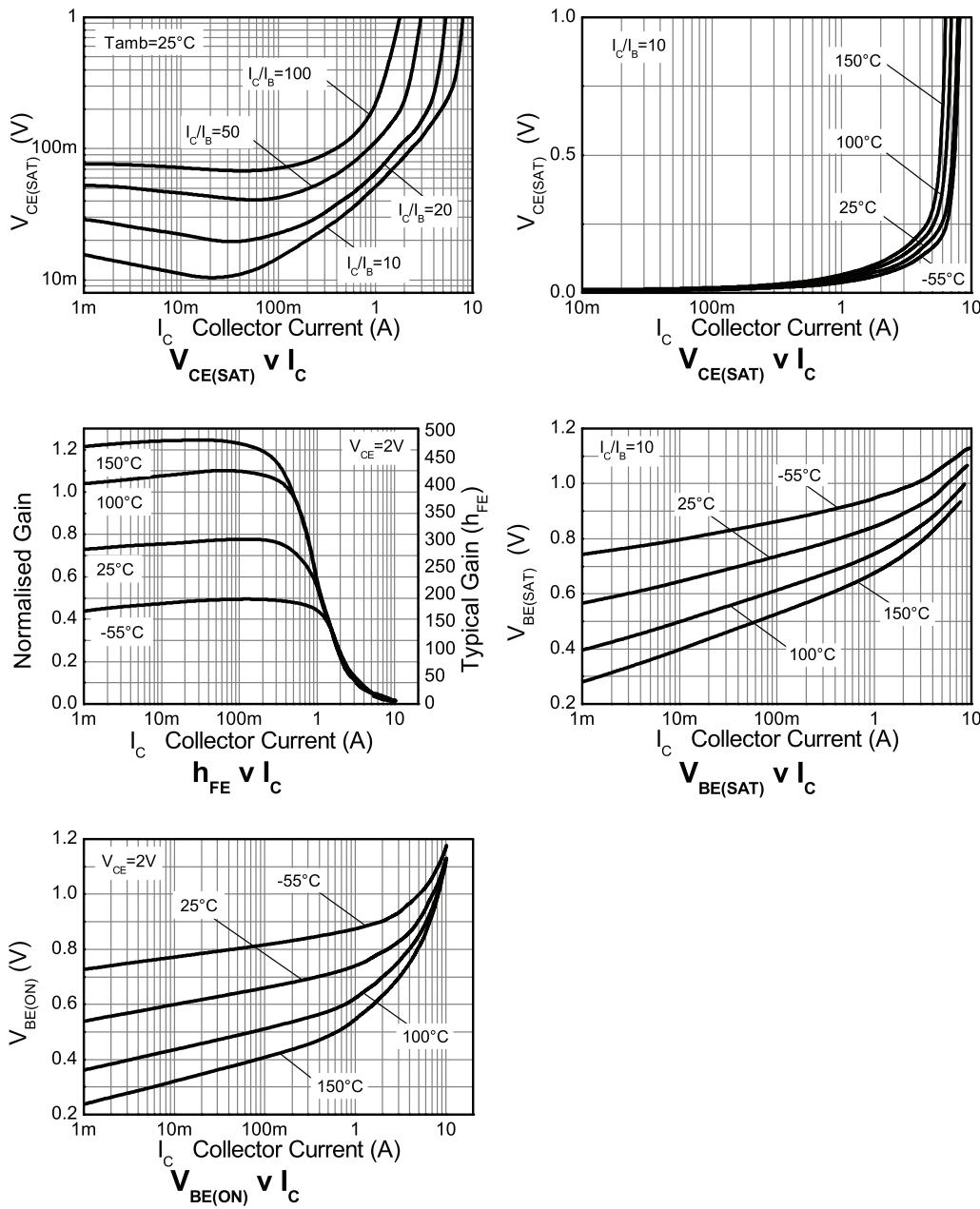
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV_{CBO}	200	240		V	$I_C = 100\mu\text{A}$
Collector-Emitter breakdown voltage (forward blocking)	BV_{CEX}	200	240		V	$I_C = 100\mu\text{A}, R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-Emitter breakdown voltage	BV_{CEO}	100	120		V	$I_C = 10\text{mA}$ (*)
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8.3		V	$I_E = 100\mu\text{A}, R_{BC} \leq 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECO}	5	8		V	$I_E = 100\mu\text{A}$
Emitter-Base breakdown voltage	BV_{EBO}	7	8.3		V	$I_E = 100\mu\text{A}$
Collector-Base cut-off current	I_{CBO}		<1	50 0.5	nA μA	$V_{CB} = 200\text{V}$ $V_{CB} = 200\text{V}, T_{amb}=100^\circ\text{C}$
Collector-Emitter cut-off current	I_{CEX}			100	nA	$V_{CE} = 200\text{V}, R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter cut-off current	I_{EBO}		<1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-Emitter saturation voltage	$V_{\text{CE}(\text{sat})}$		50 105 210	65 140 350	mV mV mV	$I_C = 1\text{A}, I_B = 100\text{mA}$ (*) $I_C = 1\text{A}, I_B = 20\text{mA}$ (*) $I_C = 5.25\text{A}, I_B = 525\text{mA}$ (*)
Base-Emitter saturation voltage	$V_{\text{BE}(\text{sat})}$		1000	1075	mV	$I_C = 5.25\text{A}, I_B = 525\text{mA}$ (*)
Base-Emitter turn-on voltage	$V_{\text{BE}(\text{on})}$		930	1025	mV	$I_C = 5.25\text{A}, V_{CE} = 2\text{V}$ (*)
Static forward current transfer ratio	h_{FE}	200 130	300 200 30	500		$I_C = 100\text{mA}, V_{CE} = 2\text{V}$ (*) $I_C = 1\text{A}, V_{CE} = 2\text{V}$ (*) $I_C = 5.25\text{A}, V_{CE} = 2\text{V}$ (*)
Transition frequency	f_T		150		MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Input capacitance	C_{ibo}		305	400	pF	$V_{EB} = 0.5\text{V}, f = 1\text{MHz}$ (*)
Output capacitance	C_{obo}		15.7	25	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$ (*)
Delay time	t_d		28.3		ns	$I_C = 500\text{mA}, V_{CC} = 10\text{V}$, $I_{B1} = -I_{B2} = 50\text{mA}$
Rise time	t_r		23.6		ns	
Storage time	t_s		962		ns	
Fall time	t_f		133		ns	

NOTES:

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

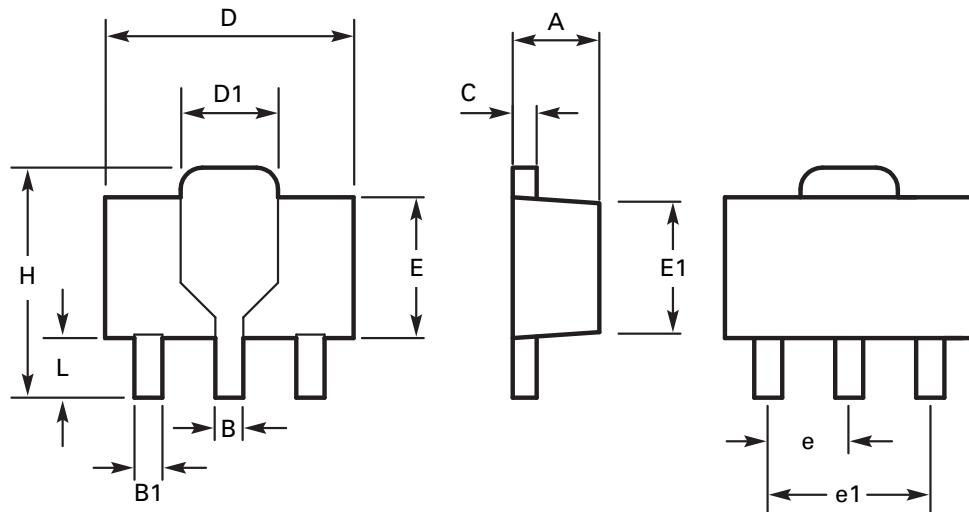
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Typical characteristics



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Package outline - 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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