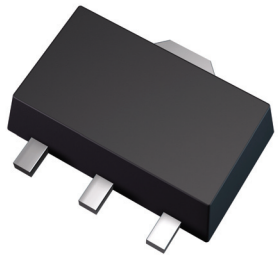
ZXTN19100CZ
100V NPN medium power transistor in SOT89

Summary

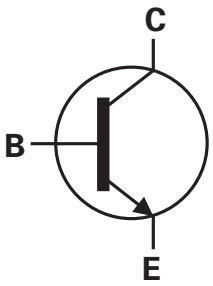


BV_{CEX} > 200V
BV_{CEO} > 100V
BV_{ECO} > 5V
$I_{C(cont)}$ = 5.25A
$V_{CE(sat)}$ < 65mV @ 1A
$R_{CE(sat)}$ = 44mΩ
P_D = 2.4W

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.

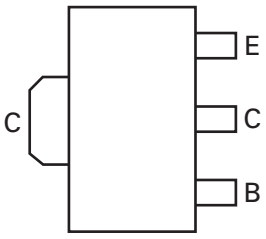


Features

- 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

Ordering information

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

Device marking

1L9

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°C[a] Linear derating factor	P_D	1.1 8.8	W mW/°C
Power dissipation at T_A =25°C[b] Linear derating factor	P_D	1.8 14.4	W mW/°C
Power dissipation at T_A =25°C[c] Linear derating factor	P_D	2.4 19.2	W mW/°C
Power dissipation at T_A =25°C[d] Linear derating factor	P_D	4.46 35.7	W mW/°C
Power dissipation at T_C =25°C[e] Linear derating factor	P_D	26.6 213	W 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]	$R_{\Theta JC}$	4.69	°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.

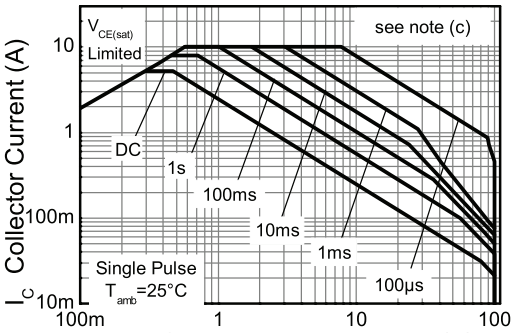
(b) Mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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

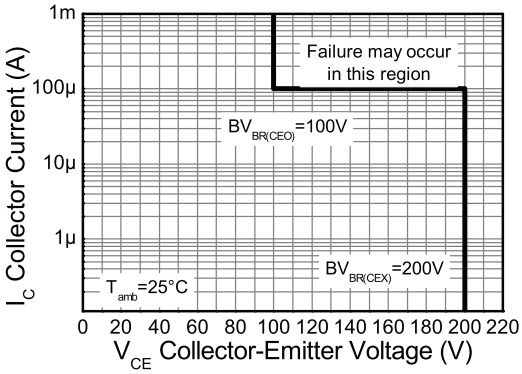
(d) As (c) above measured at t<5 seconds.

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

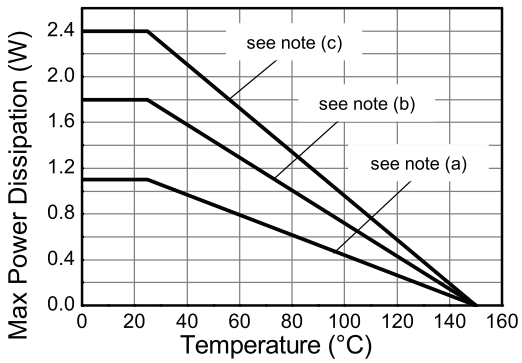
Thermal characteristics



Safe Operating Area

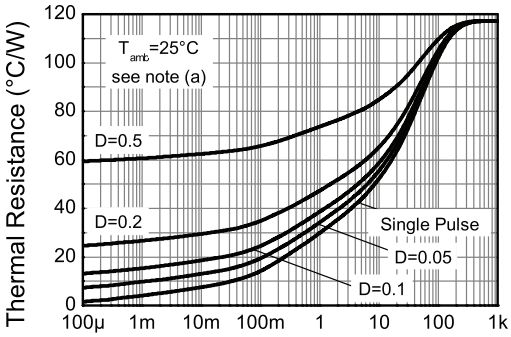


Safe Operating Area

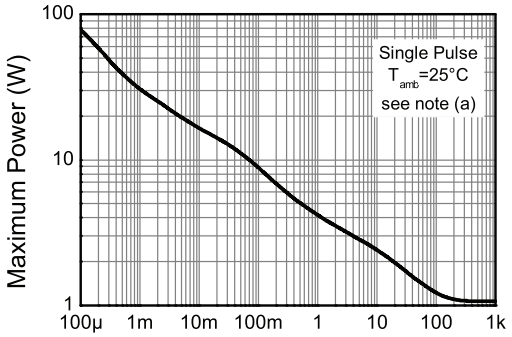


Derating Curve

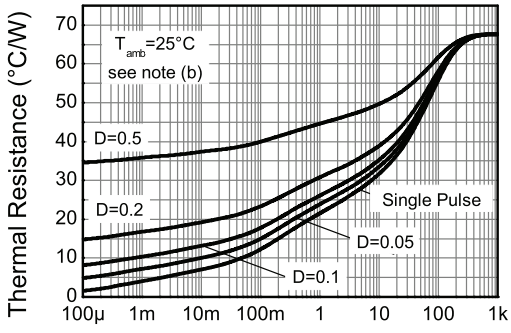
Thermal characteristics



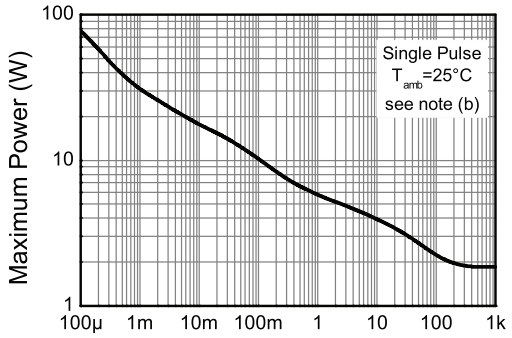
Transient Thermal Impedance



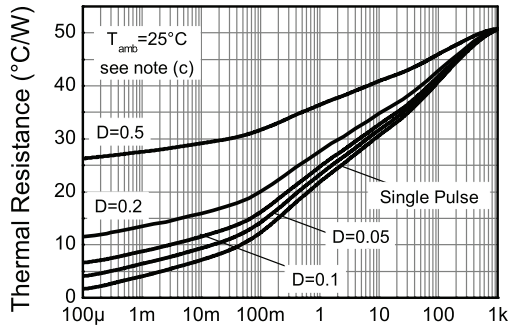
Pulse Power Dissipation



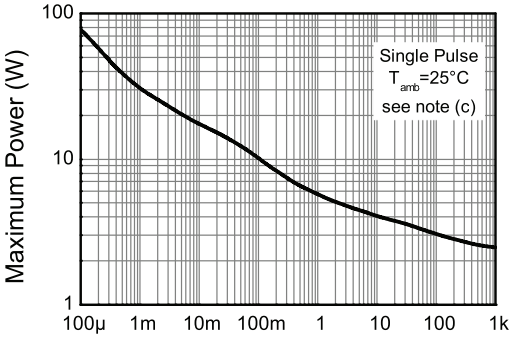
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



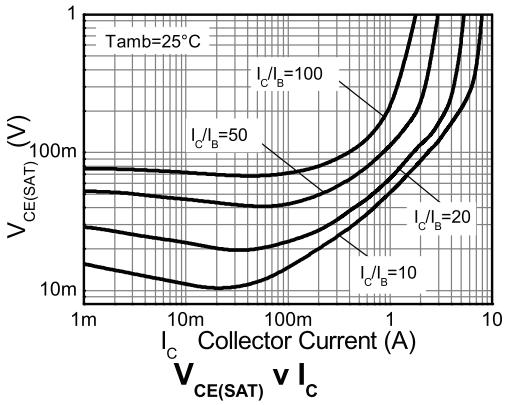
Pulse Power Dissipation

Electrical characteristics (at T_{amb} = 25°C unless otherwise stated).

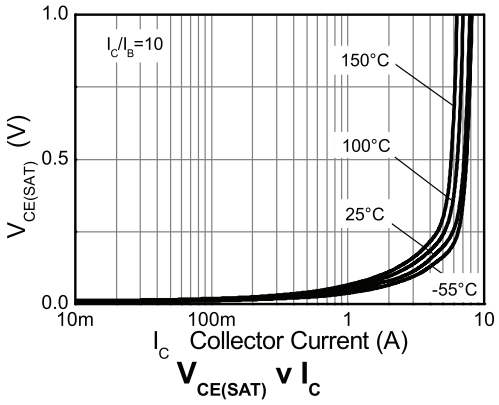
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV_{CBO}	200	240		V	I_C = 100μA
Collector-Emitter breakdown voltage (forward blocking)	BV_{CEX}	200	240		V	I_C = 100μA, $R_{BE} \leq 1k\Omega$ or $-1V < V_{BE} < 0.25V$
Collector-Emitter breakdown voltage	BV_{CEO}	100	120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

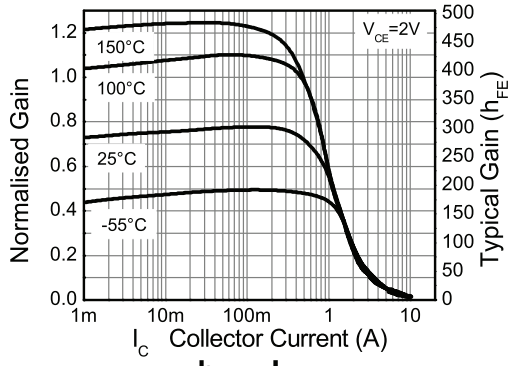
Typical characteristics



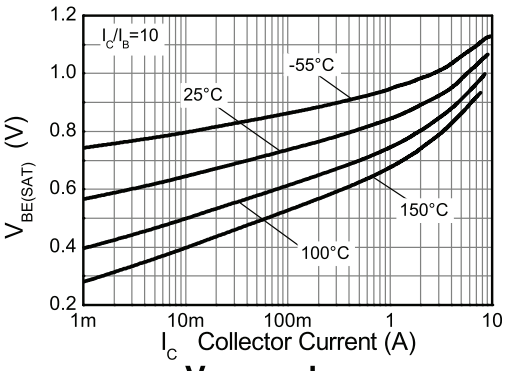
$V_{CE(SAT)}$ v I_C



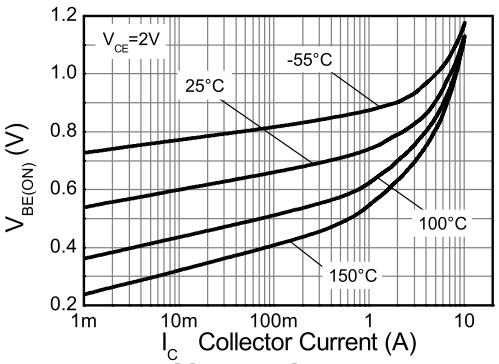
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

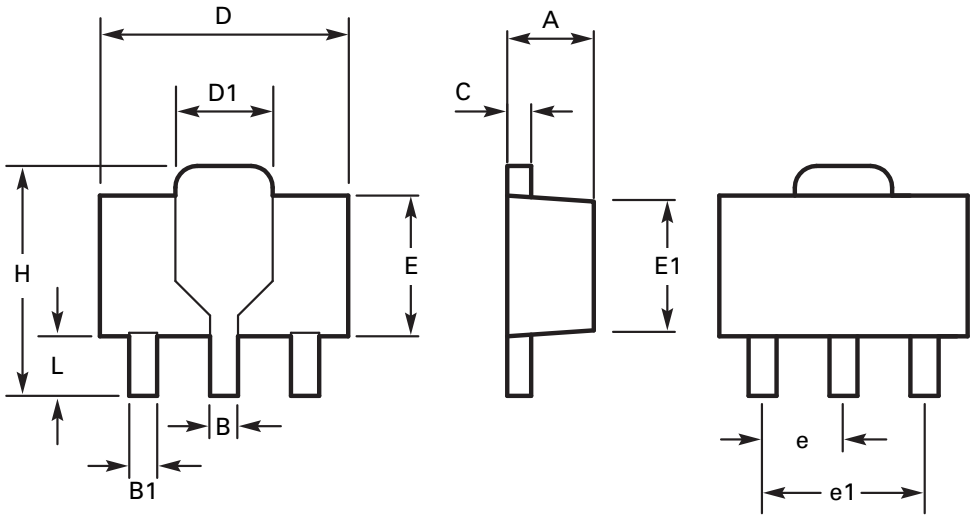


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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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