

ZXTP19100CFF

100V, SOT23F, PNP medium power transistor

Summary

$BV_{CEO} > -100V$

$BV_{ECO} > -7V$

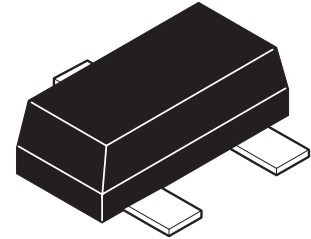
$I_{C(cont)} = -2A$

$V_{CE(sat)} < 120mV @ 1A$

$R_{CE(sat)} = 95m\Omega$

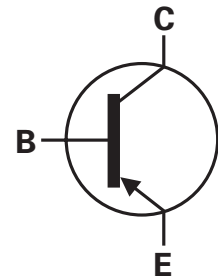
$P_D = 1.5W$

Complementary part number: ZXTN19100CFF



Description

Packaged in the SOT23 outline this new low saturation 100V PNP transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.

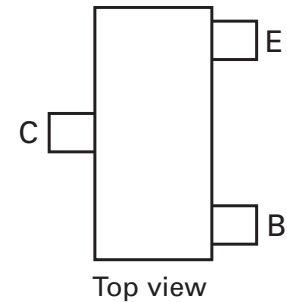


Features

- 2 amps continuous current
- Very low saturation voltages

Applications

- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC-DC modules
- Backlight inverters
- Power switches
- MOSFET gate drivers



Ordering information

DEVICE	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP19100CFFTA	7	8	3000

Device marking

1E1

ZXTP19100CFF

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-110	V
Collector-emitter voltage (forward blocking)	V_{CEX}	-110	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	-2	A
Peak pulse current	I_{CM}	-3	A
Base current	I_B	-1	A
Power dissipation at $T_A = 25^\circ\text{C}^{(a)}$ Linear derating factor	P_D	0.84	W mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(b)}$ Linear derating factor	P_D	1.34	W mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(c)}$ Linear derating factor	P_D	1.5	W mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(d)}$ Linear derating factor	P_D	2	W mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

Thermal resistance

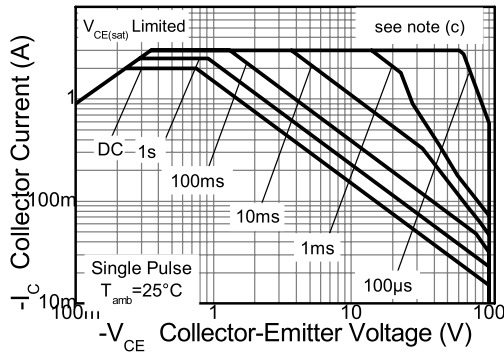
Parameter	Symbol	Value	Unit
Junction to Ambient ^(a)	$R_{\theta JA}$	149.3	°C/W
Junction to Ambient ^(b)	$R_{\theta JA}$	93.4	°C/W
Junction to Ambient ^(c)	$R_{\theta JA}$	83.3	°C/W
Junction to Ambient ^(d)	$R_{\theta JA}$	60	°C/W
Junction to Case ^(e)	$R_{\theta JC}$	38	°C/W

NOTES:

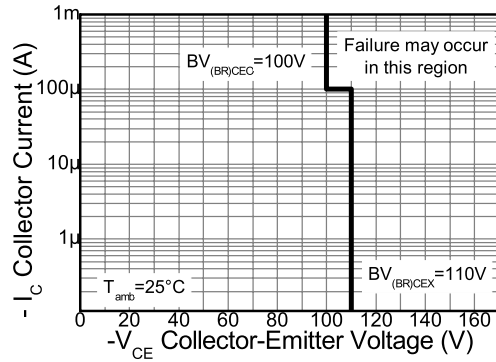
- (a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- (b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.
- (c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.
- (d) As (c) above measured at $t < 5\text{secs}$
- (e) Junction to Case from Collector Tab.

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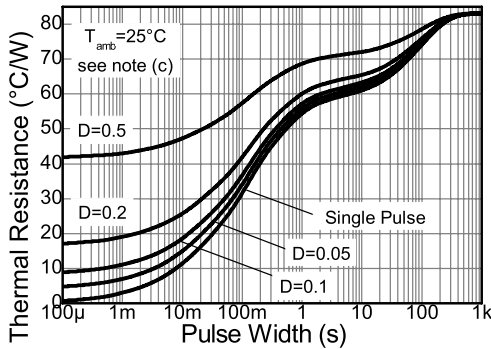
Thermal characteristics



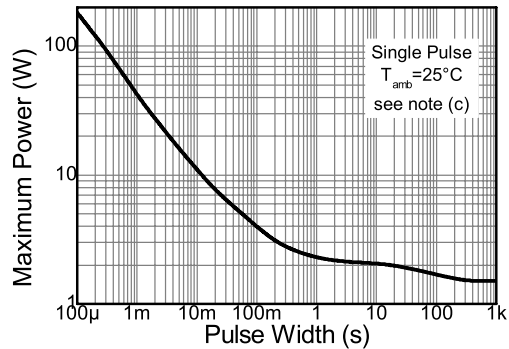
Safe Operating Area



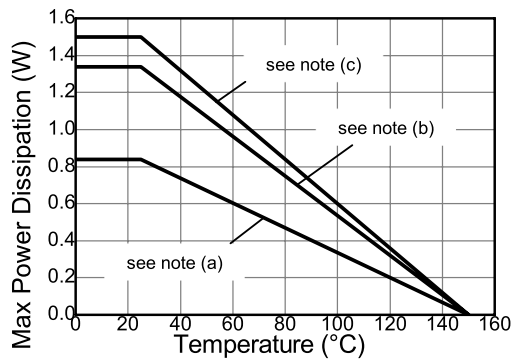
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

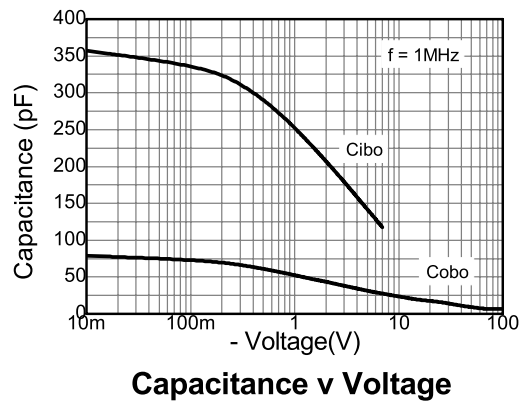
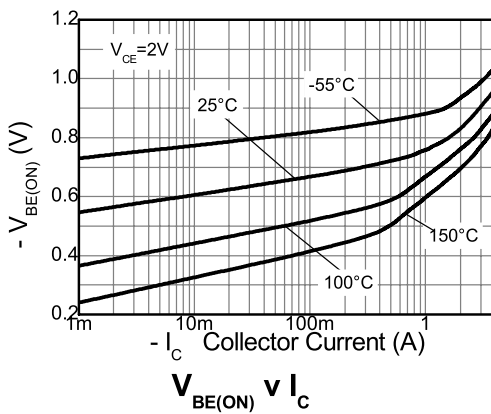
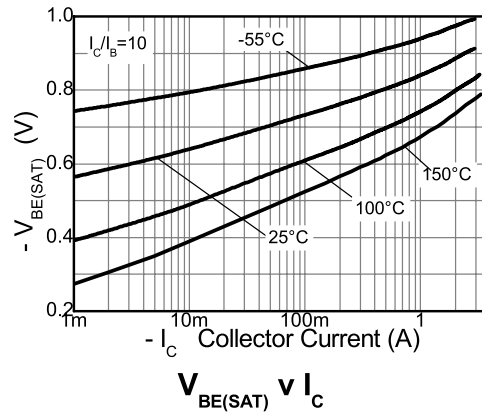
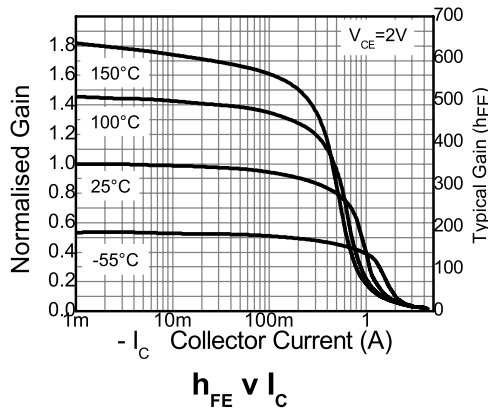
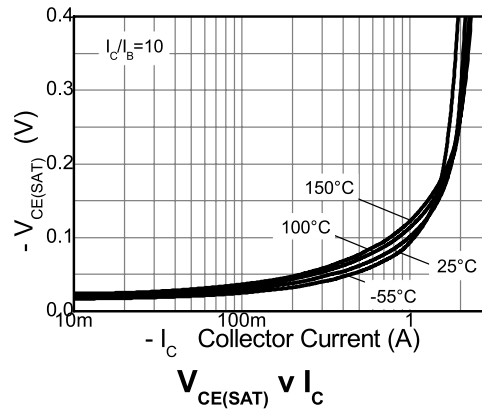
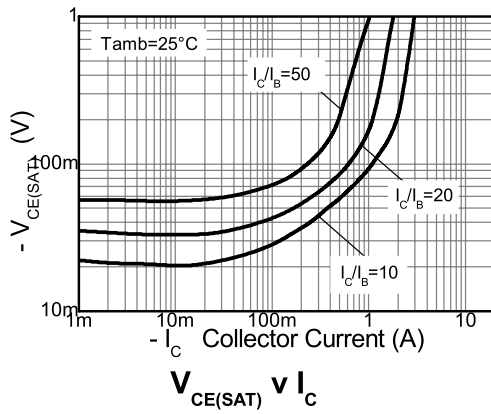
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base Breakdown Voltage	BV_{CBO}	-110	-135		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Base open)	BV_{CEX}	-110	-135		V	$I_C = -100\mu\text{A}$, $R_{BC} < 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Collector-Emitter Breakdown Voltage (Base open)	BV_{CEO}	-100	-135		V	$I_C = -10\text{mA}^{(*)}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.3		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	-8.7		V	$I_E = -100\mu\text{A}$
Collector-Base Cut-Off Current	I_{CBO}		<-1	-50 -0.5	nA μA	$V_{CB} = -110\text{V}$ $V_{CB} = -110\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Emitter-Base Cut-Off Current	I_{EBO}		<-1	-50	nA	$V_{EB} = -5.6\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-100 -95 -175 -215	-130 -120 -225 -275	mV mV mV mV	$I_C = -0.5\text{A}$, $I_B = -20\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -50\text{mA}^{(*)}$ $I_C = -2\text{A}$, $I_B = -200\text{mA}^{(*)}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-870	-950	mV	$I_C = -2\text{A}$, $I_B = -200\text{mA}^{(*)}$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-810	-900	mV	$I_C = -2\text{A}$, $V_{CE} = -2\text{V}^{(*)}$
Static Forward Current Transfer Ratio	h_{FE}	200 70 20	330 135 30	500		$I_C = -100\text{mA}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -1\text{A}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -2\text{A}$, $V_{CE} = -2\text{V}^{(*)}$
Transition Frequency	f_T		142		MHz	$I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Input Capacitance	C_{ibo}		291	400	pF	$V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}^{(*)}$
Output Capacitance	C_{obo}		23.5		pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}^{(*)}$
Delay Time	t_d		24.7		ns	$I_C = -500\text{mA}$, $V_{CC} = -10\text{V}$ $I_{B1} = -I_{B2} = -50\text{mA}$
Rise Time	t_r		22.4		ns	
Storage Time	t_s		660		ns	
Fall Time	t_f		107		ns	

NOTES:

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

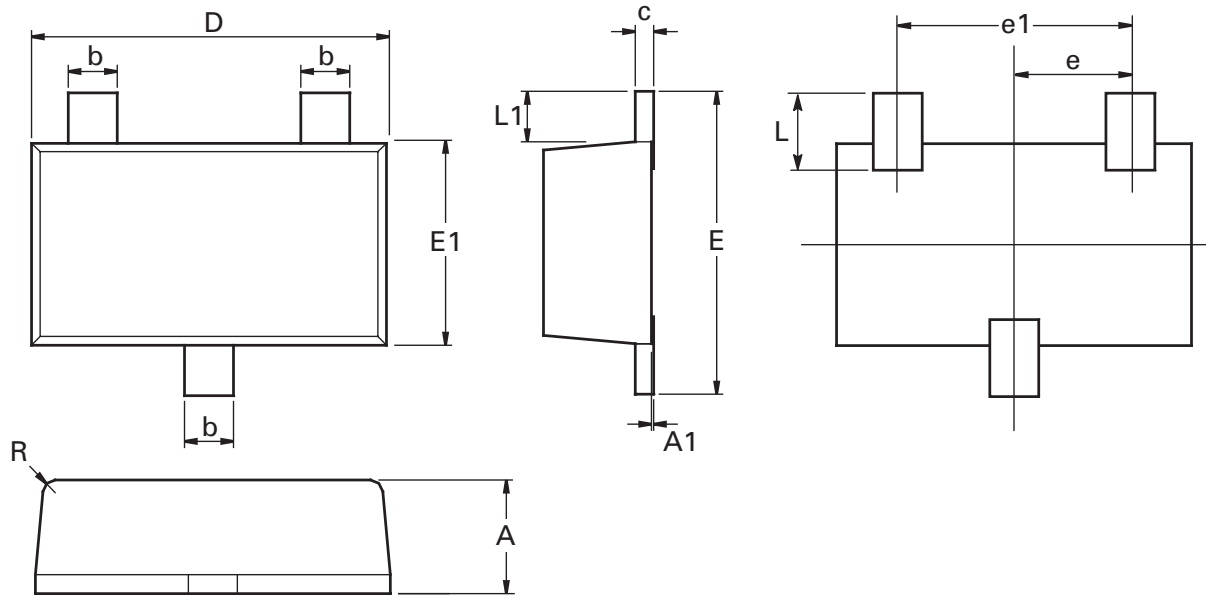
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Typical characteristics



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Package outline - SOT23F



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.80	1.00	0.0315	0.0394	E	2.30	2.50	0.0906	0.0984
A1	0.00	0.10	0.00	0.0043	E1	1.50	1.70	0.0590	0.0669
b	0.35	0.45	0.0153	0.0161	L	0.48	0.68	0.0189	0.0268
c	0.10	0.20	0.0043	0.0079	L1	0.30	0.50	0.0153	0.0161
D	2.80	3.00	0.1102	0.1181	R	0.05	0.15	0.0019	0.0059
e	0.95 ref		0.0374 ref		O	0°	12°	0°	12°
e1	1.80	2.00	0.0709	0.0787	-	-	-	-	-

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

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"Issue"	This term denotes an issued datasheet containing finalized specifications. However, changes to specifications may occur, at any time and without notice.

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