

# ZXTP19100CFF

## 100V, SOT23F, PNP medium power transistor

### Summary

$BV_{CEO} > -100V$

$BV_{ECO} > -7V$

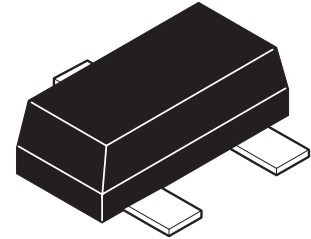
$I_{C(cont)} = -2A$

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

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

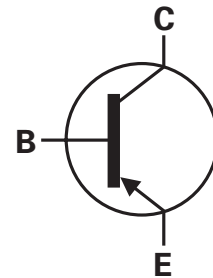
$P_D = 1.5W$

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.

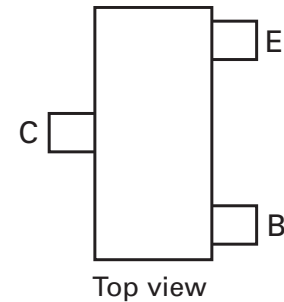


### Features

- 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 <sup>(c)</sup>	$I_C$	-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

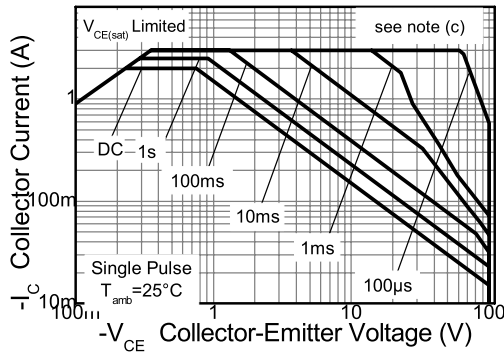
Parameter	Symbol	Value	Unit
Junction to Ambient <sup>(a)</sup>	$R_{\theta JA}$	149.3	°C/W
Junction to Ambient <sup>(b)</sup>	$R_{\theta JA}$	93.4	°C/W
Junction to Ambient <sup>(c)</sup>	$R_{\theta JA}$	83.3	°C/W
Junction to Ambient <sup>(d)</sup>	$R_{\theta JA}$	60	°C/W
Junction to Case <sup>(e)</sup>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

### NOTES:

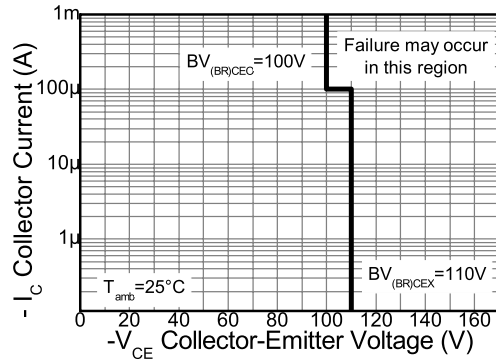
- (a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- (b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.
- (c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB 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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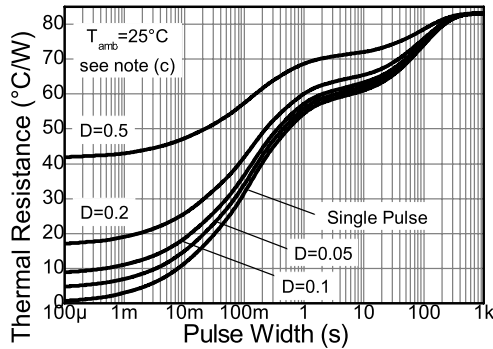
## Thermal characteristics



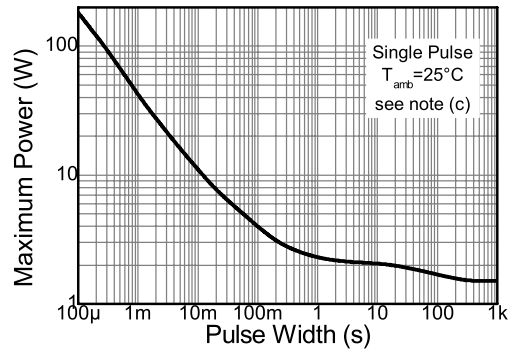
Safe Operating Area



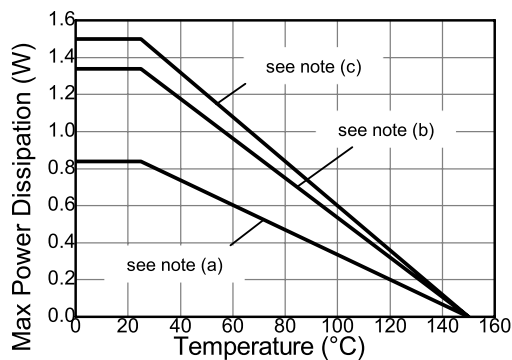
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

# ZXTP19100CFF

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

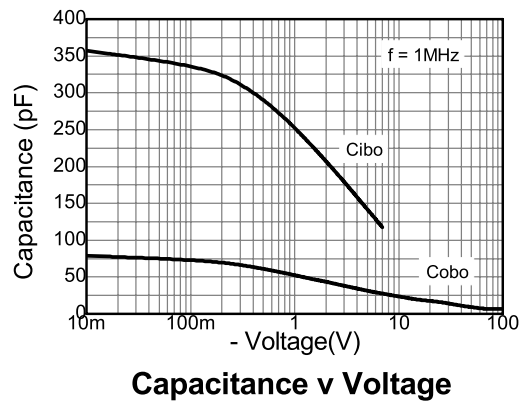
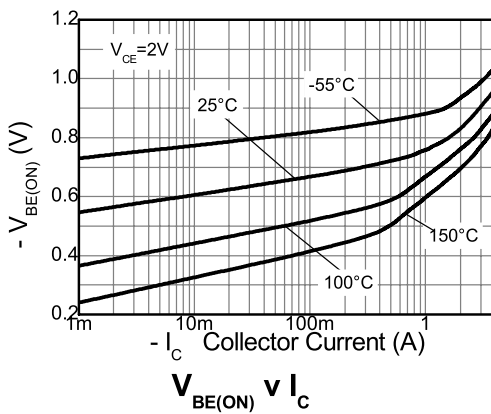
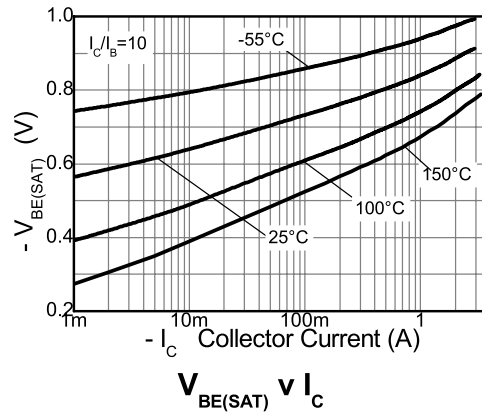
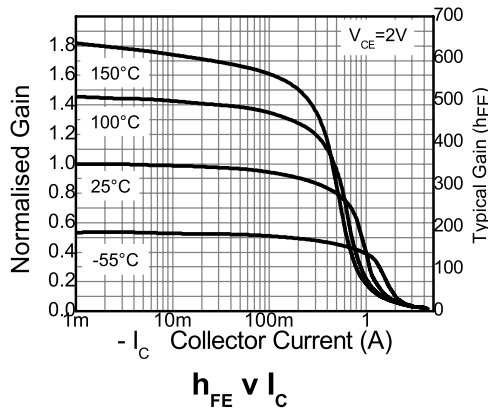
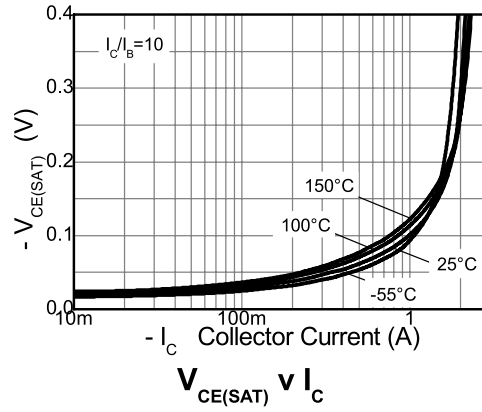
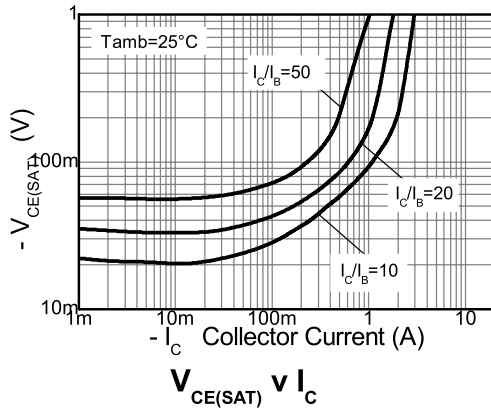
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base Breakdown Voltage	$BV_{CBO}$	-110	-135		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Base open)	$BV_{CEX}$	-110	-135		V	$I_C = -100\mu\text{A}$ , $R_{BC} < 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Collector-Emitter 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 $\mu\text{A}$	$V_{CB} = -110\text{V}$ $V_{CB} = -110\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
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  $\leq 2\%$ .

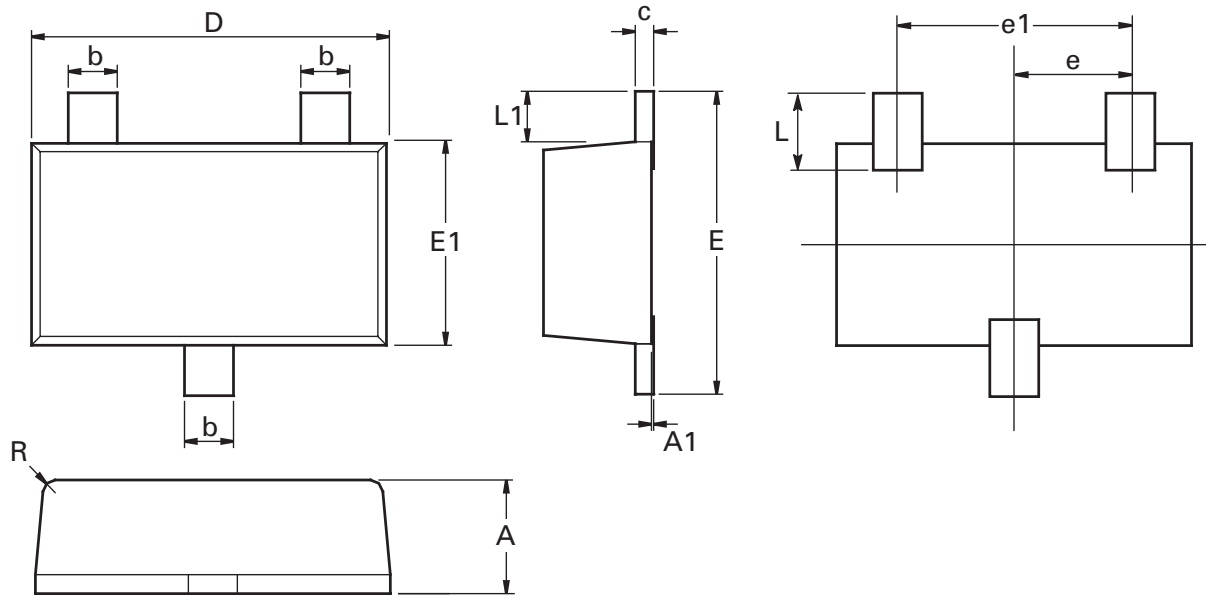
# ZXTP19100CFF

## Typical characteristics



# ZXTP19100CFF

## 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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"Active"	Product status recommended for new designs
"Last time buy (LTB)"	Device will be discontinued and last time buy period and delivery is in effect
"Not recommended for new designs"	Device is still in production to support existing designs and production
"Obsolete"	Production has been discontinued

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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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