

# ZXTP19100CFF

## 100V, SOT23F, PNP medium power transistor

### Summary

$BV_{CEO} > -100V$

$BV_{ECO} > -7V$

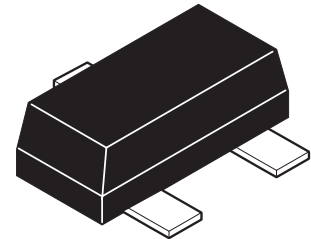
$I_{C(cont)} = -2A$

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

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

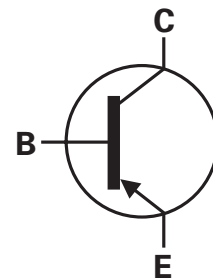
$P_D = 1.5W$

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.

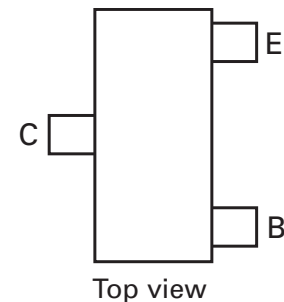


### Features

- 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

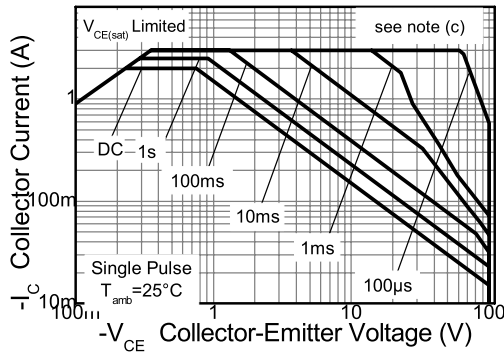
Parameter	Symbol	Value	Unit
Junction to Ambient <sup>(a)</sup>	$R_{\theta JA}$	149.3	°C/W
Junction to Ambient <sup>(b)</sup>	$R_{\theta JA}$	93.4	°C/W
Junction to Ambient <sup>(c)</sup>	$R_{\theta JA}$	83.3	°C/W
Junction to Ambient <sup>(d)</sup>	$R_{\theta JA}$	60	°C/W
Junction to Case <sup>(e)</sup>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

### NOTES:

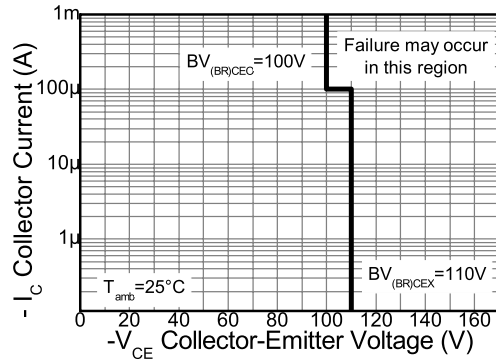
- (a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- (b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.
- (c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB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

# ZXTP19100CFF

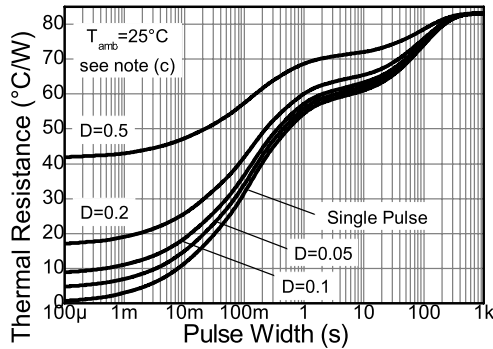
## Thermal characteristics



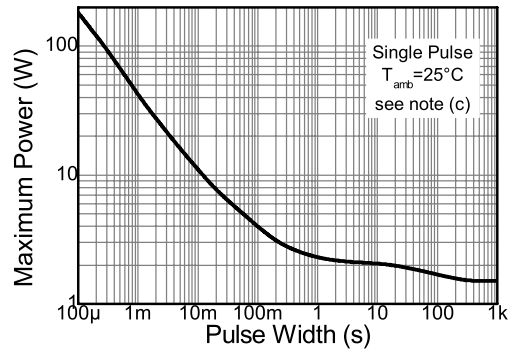
**Safe Operating Area**



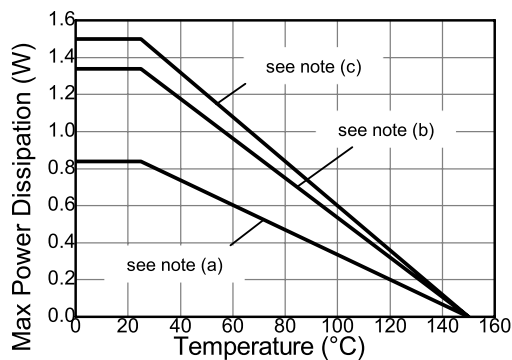
**Safe Operating Area**



**Transient Thermal Impedance**



**Pulse Power Dissipation**



**Derating Curve**

# ZXTP19100CFF

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

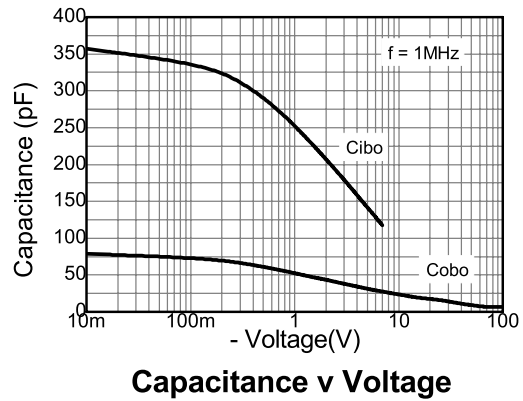
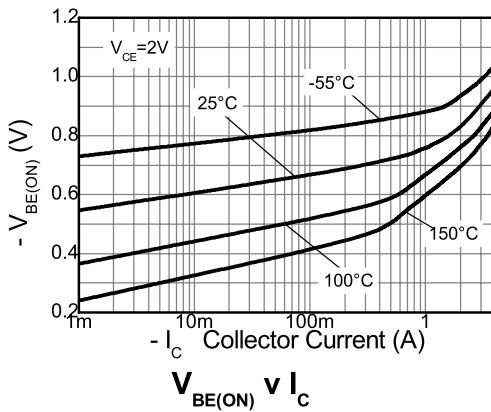
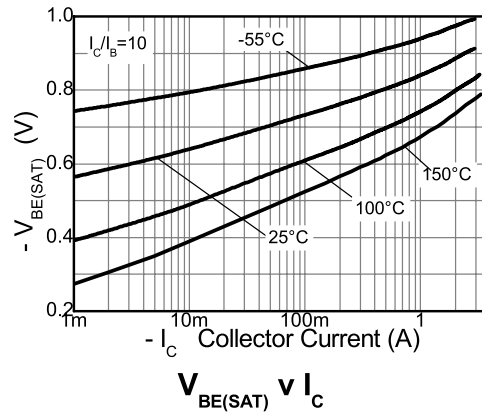
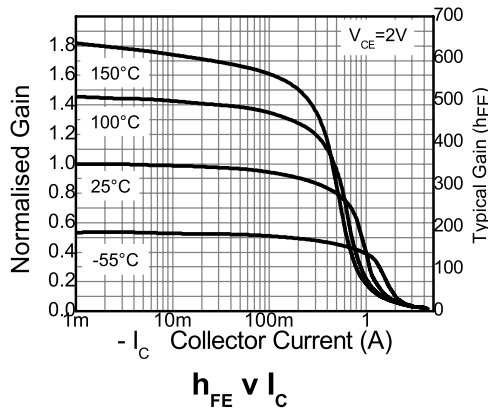
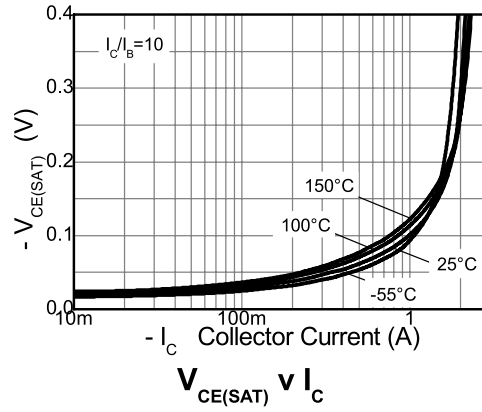
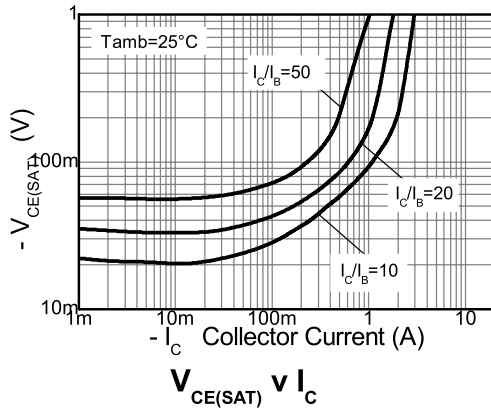
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base Breakdown Voltage	$BV_{CBO}$	-110	-135		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Base open)	$BV_{CEX}$	-110	-135		V	$I_C = -100\mu\text{A}$ , $R_{BC} < 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Collector-Emitter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

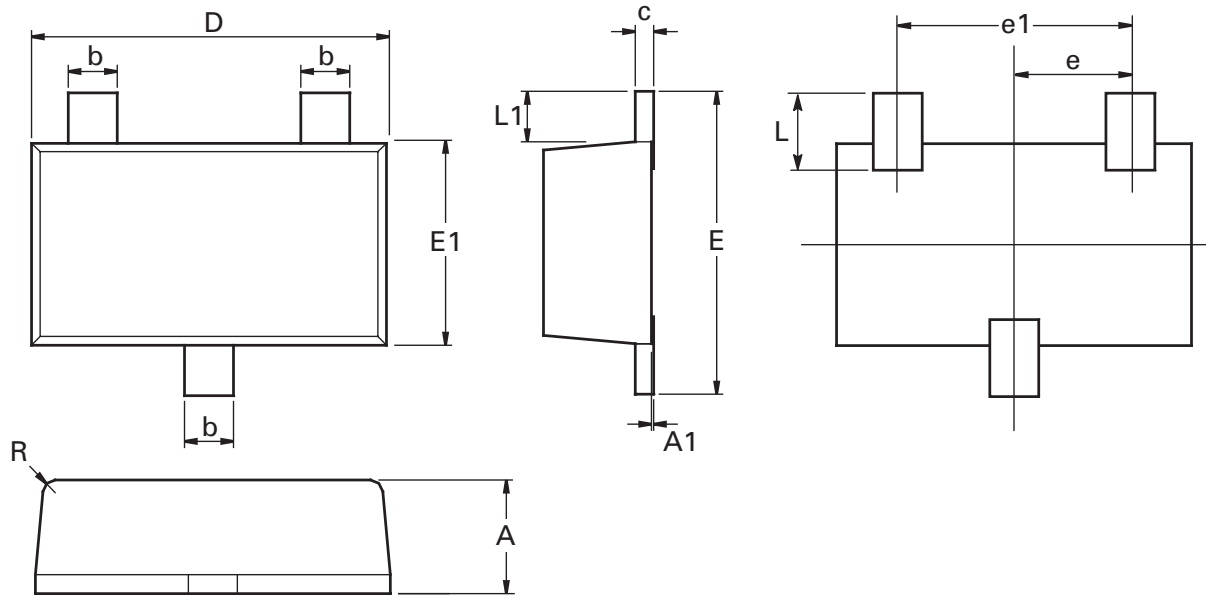
# ZXTP19100CFF

## 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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