

# ZXTP19060CFF

## 60V, SOT23F, PNP medium power transistor

### Summary

$BV_{CEO} > -60V$

$BV_{ECO} > -7V$

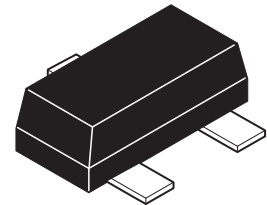
$I_{C(cont)} = -4A$

$V_{CE(sat)} < 75mV @ 100mA$

$R_{CE(sat)} = 45m\Omega$

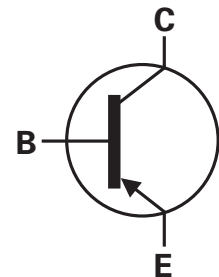
$P_D = 1.5 W$

Complementary part number ZXTN19060CFF



### Description

This medium voltage PNP transistor has been designed for applications requiring high gain and low saturation voltage. The SOT23F package is PIN compatible with the industry standard SOT23 footprint whilst offering a lower profile and higher power dissipation for applications where power density is of utmost importance.

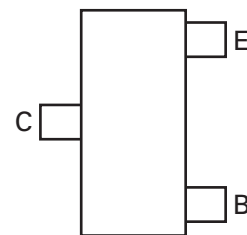


### Features

- High gain
- Low saturation voltage
- Low profile small outline package

### Applications

- High-side driver
- Motor drive
- Load disconnect switch



Pinout - top view

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP19060CFFTA	7	8	3000

### Device marking

1D9

# ZXTP19060CFF

## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	$V_{CBO}$	-60	V
Collector-emitter voltage	$V_{CEO}$	-60	V
Emitter-collector voltage (reverse blocking)	$V_{ECO}$	-7	V
Emitter-base voltage	$V_{EBO}$	-7	V
Continuous collector current <sup>(c)</sup>	$I_C$	-4	A
Peak pulse current	$I_{CM}$	-7	A
Base current	$I_B$	-1	A
Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$	$P_D$	0.84	W
Linear derating factor		6.72	mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$	$P_D$	1.34	W
Linear derating factor		10.72	mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(c)}$	$P_D$	1.5	W
Linear derating factor		12	mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$	$P_D$	2	W
Linear derating factor		16	mW/ $^{\circ}C$
Operating and storage temperature range	$T_j, T_{stg}$	-55 to 150	$^{\circ}C$

## Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	149.3	$^{\circ}C/W$
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	93.4	$^{\circ}C/W$
Junction to ambient <sup>(c)</sup>	$R_{\theta JA}$	83.3	$^{\circ}C/W$
Junction to ambient <sup>(d)</sup>	$R_{\theta JA}$	60	$^{\circ}C/W$

### 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.

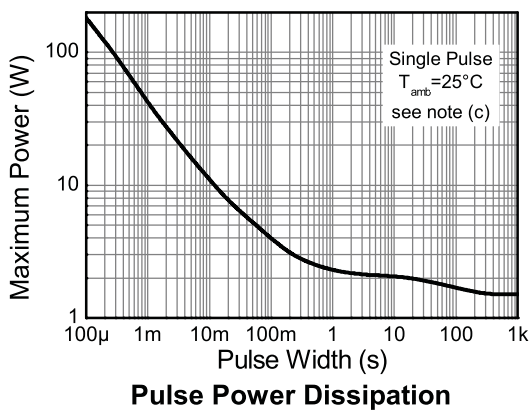
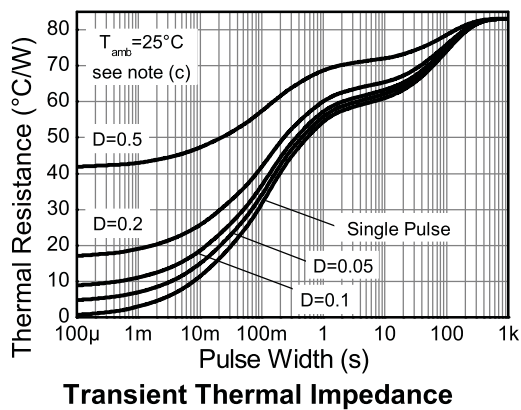
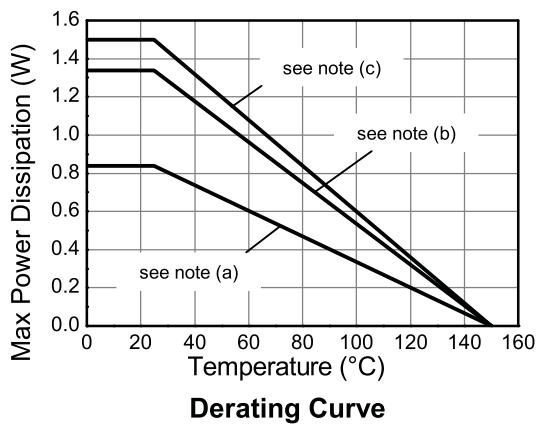
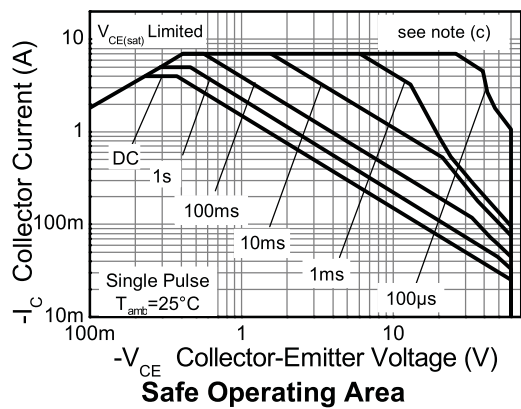
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(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  $t < 5$ secs.

# ZXTP19060CFF

## Characteristics



# ZXTP19060CFF

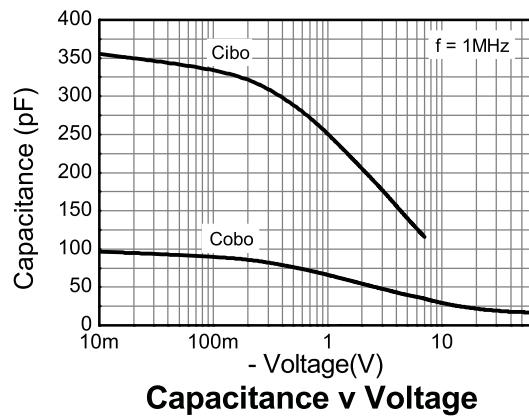
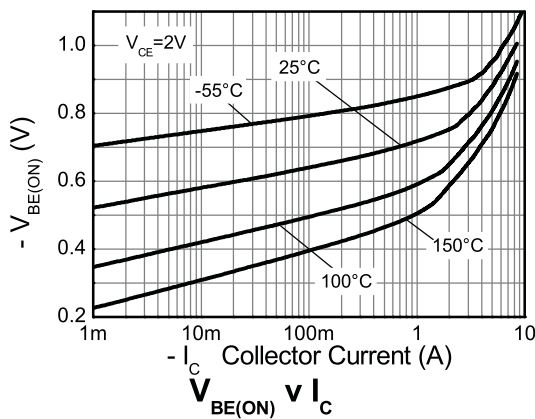
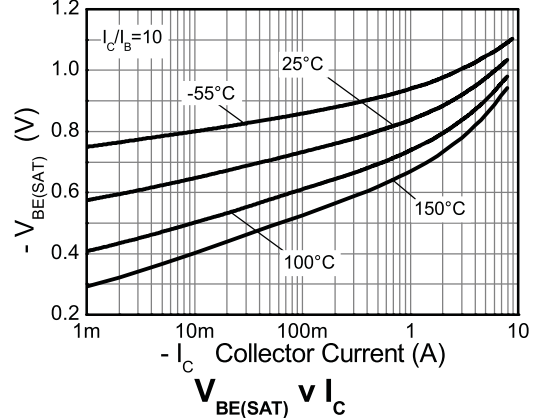
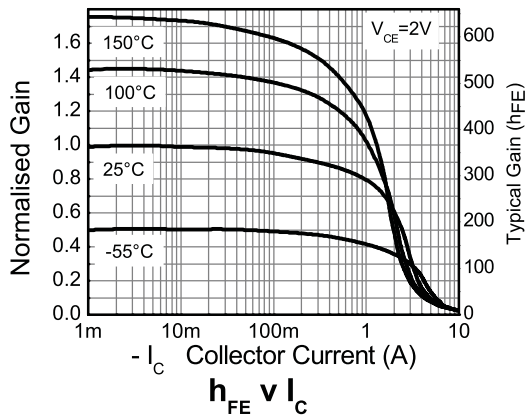
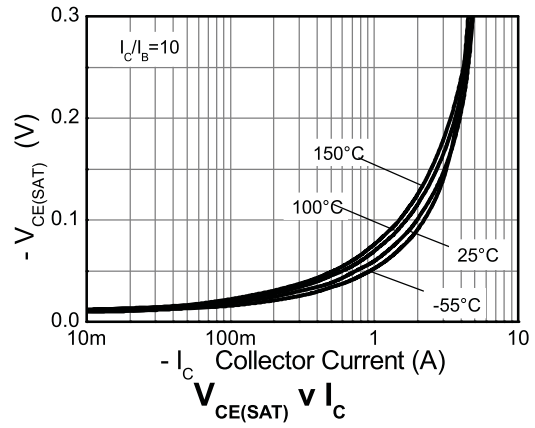
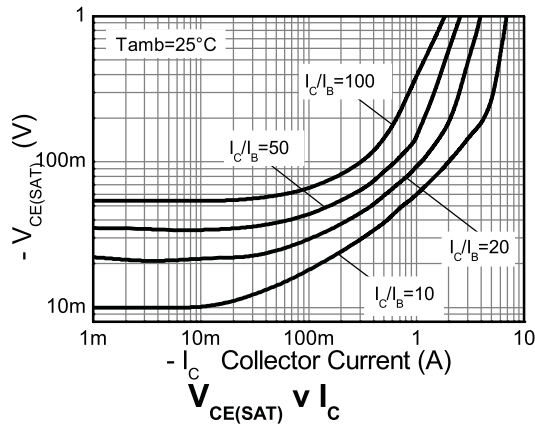
## Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	-60	-110		V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage (base open)	$BV_{CEO}$	-60	-90		V	$I_C = -10\text{mA}^{(*)}$
Emitter-base breakdown voltage	$BV_{EBO}$	-7	-8.4		V	$I_E = -100\mu\text{A}$
Emitter-collector breakdown voltage (reverse blocking)	$BV_{ECX}$	-7	-8.4		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	-8.8		V	$I_E = -100\mu\text{A}$ ,
Collector-base cut-off current	$I_{CBO}$		<-1	-50 -50	nA $\mu\text{A}$	$V_{CB} = -48\text{V}$ $V_{CB} = -48\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter-base cut-off current	$I_{EBO}$		<-1	-50	nA	$V_{EB} = -5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		-60 -140 -180	-75 -200 -270	mV mV mV	$I_C = -1\text{A}$ , $I_B = -100\text{mA}^{(*)}$ $I_C = -1\text{A}$ , $I_B = -20\text{mA}^{(*)}$ $I_C = -4\text{A}$ , $I_B = -400\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		-935	-1050	mV	$I_C = -4\text{A}$ , $I_B = -400\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		-835	-950	mV	$I_C = -4\text{A}$ , $V_{CE} = -2\text{V}^{(*)}$
Static forward current transfer ratio	$h_{FE}$	200 160 30	350 280 50	500		$I_C = -100\text{mA}$ , $V_{CE} = -2\text{V}^{(*)}$ $I_C = -1\text{A}$ , $V_{CE} = -2\text{V}^{(*)}$ $I_C = -4\text{A}$ , $V_{CE} = -2\text{V}^{(*)}$
Transition frequency	$f_T$		180		MHz	$I_C = -50\text{mA}$ , $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Output capacitance	$C_{obo}$		29.5	40	pF	$V_{CB} = -10\text{V}$ , $f = 1\text{MHz}^{(*)}$
Delay time	$t_d$		24.3		ns	$V_{CC} = -10\text{V}$ . $I_C = -500\text{mA}$ , $I_{B1} = -50\text{mA}$ , $I_{B2} = -50\text{mA}$ .
Rise time	$t_r$		13.2		ns	
Storage time	$t_s$		456		ns	
Fall time	$t_f$		68.2		ns	

### NOTES:

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

## Typical characteristics

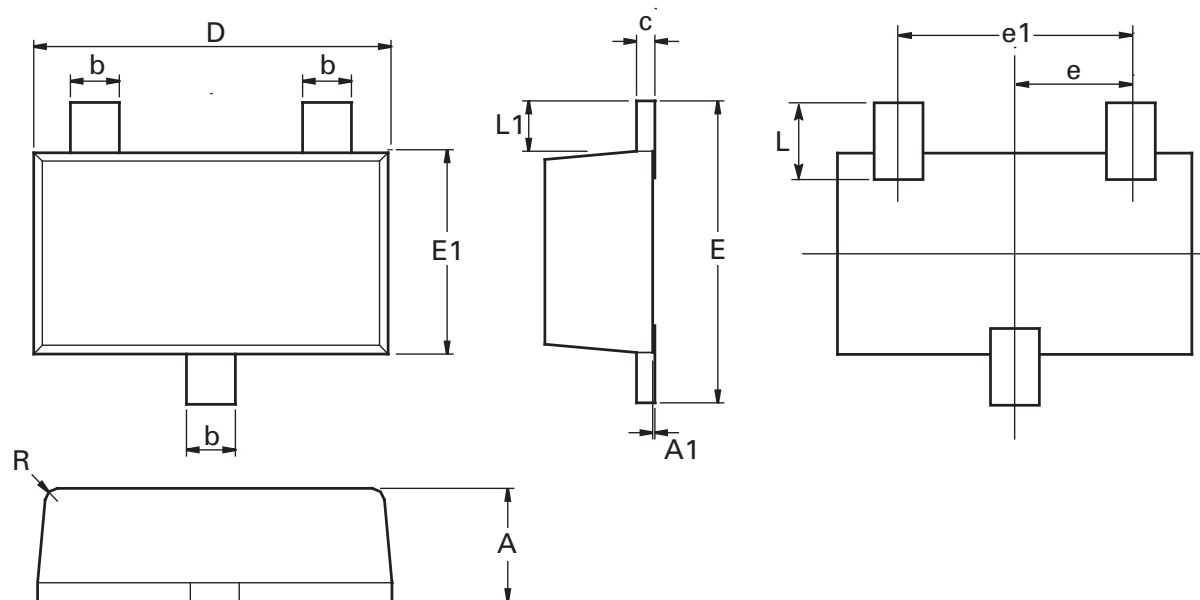


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# ZXTP19060CFF

## 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

# ZXTP19060CFF

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Issue 1 - May 2007

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