

## ZXTP19060CZ 60V PNP medium transistor in SOT89

### Summary

$BV_{CEO} > -60V$

$BV_{ECO} > -7V$

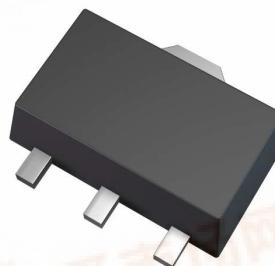
$I_C(\text{cont}) = 4.5A$

$V_{CE(\text{sat})} < -80mV @ -1A$

$R_{CE(\text{sat})} = 50m\Omega$

$P_D = 2.4W$

Complementary part number ZXTN19060CZ



### Description

Packaged in the SOT89 outline this new low saturation 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

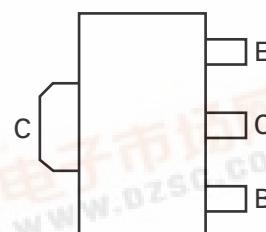
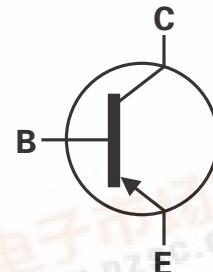
- High gain
- Low saturation voltage
- High peak current
- 7V reverse blocking voltage

### Applications

- High side driver
- Motor drive
- Load disconnect switch

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP19060CZTA	7	12	1000



Pinout - top view

### Device marking

1M2

# ZXTP19060CZ

## 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)	$V_{ECX}$	-7	V
Emitter-Base voltage	$V_{EBO}$	-7	V
Continuous Collector current <sup>(c)</sup>	$I_C$	-4.5	A
Base current	$I_B$	-1	A
Peak pulse current	$I_{CM}$	-7	A
Power dissipation at $T_A = 25^\circ\text{C}$ <sup>(a)</sup>	$P_D$	1.1	W
Linear derating factor		8.8	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ <sup>(b)</sup>	$P_D$	1.8	W
Linear derating factor		14.4	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ <sup>(c)</sup>	$P_D$	2.4	W
Linear derating factor		19.2	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ <sup>(d)</sup>	$P_D$	4.46	W
Linear derating factor		35.7	$\text{mW}/^\circ\text{C}$
Power dissipation at $T_C = 25^\circ\text{C}$ <sup>(e)</sup>	$P_D$	26.7	W
Linear derating factor		213	$\text{mW}/^\circ\text{C}$
Operating and storage temperature range	$T_j, T_{stg}$	-55 to 150	$^\circ\text{C}$

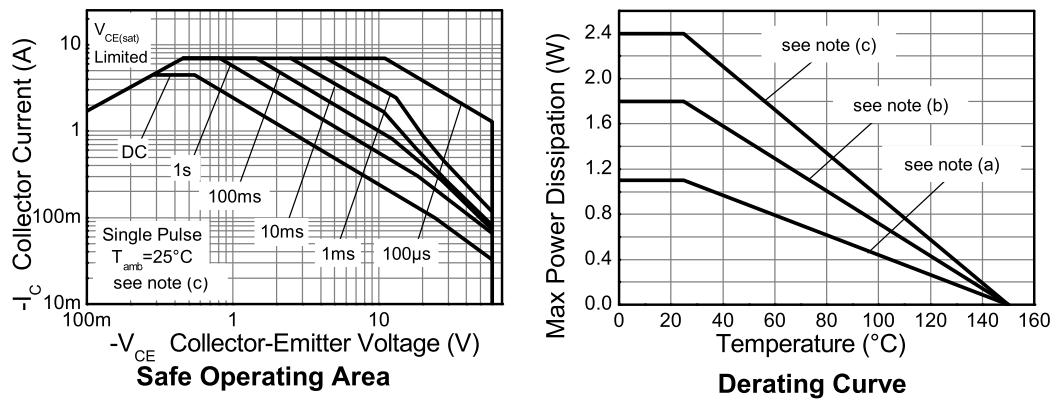
## Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient <sup>(a)</sup>	$R_{\Theta JA}$	117	$^\circ\text{C}/\text{W}$
Junction to ambient <sup>(b)</sup>	$R_{\Theta JA}$	68	$^\circ\text{C}/\text{W}$
Junction to ambient <sup>(c)</sup>	$R_{\Theta JA}$	51	$^\circ\text{C}/\text{W}$
Junction to ambient <sup>(d)</sup>	$R_{\Theta JA}$	28	$^\circ\text{C}/\text{W}$
Junction to case <sup>(e)</sup>	$R_{\Theta JC}$	4.69	$^\circ\text{C}/\text{W}$

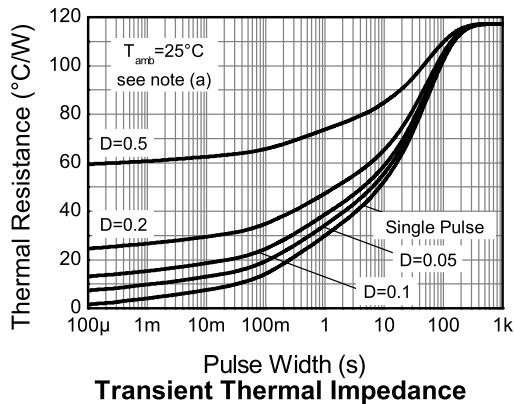
### NOTES:

- (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  $t < 10$  seconds.
- (e) Junction to case (collector tab). Typical

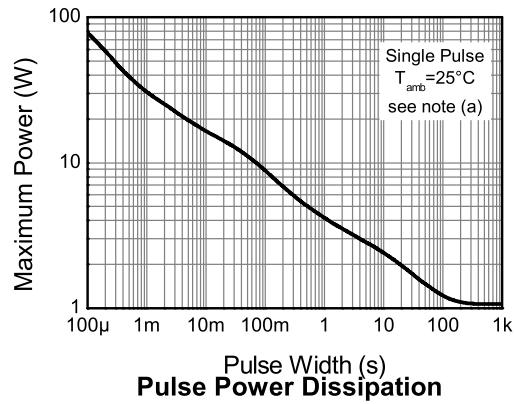
## Thermal characteristics



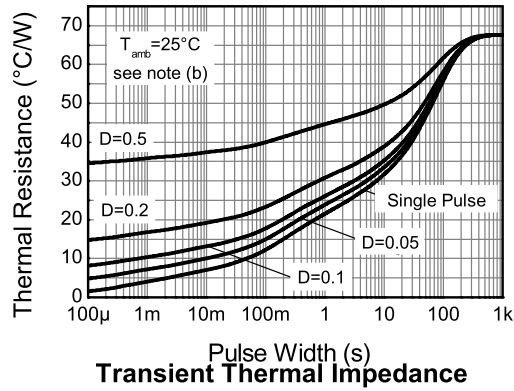
## Thermal characteristics



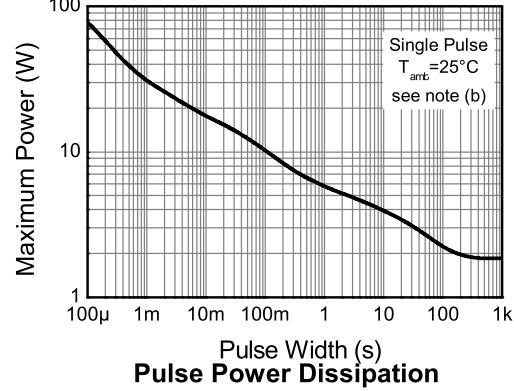
Transient Thermal Impedance



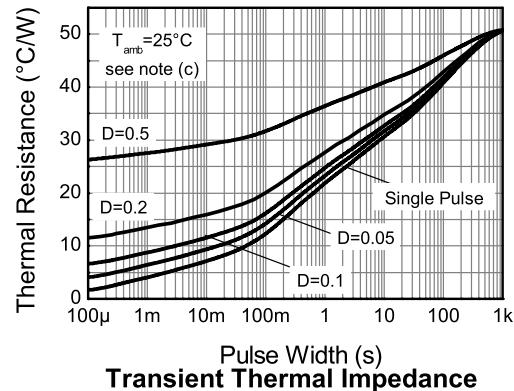
Pulse Power Dissipation



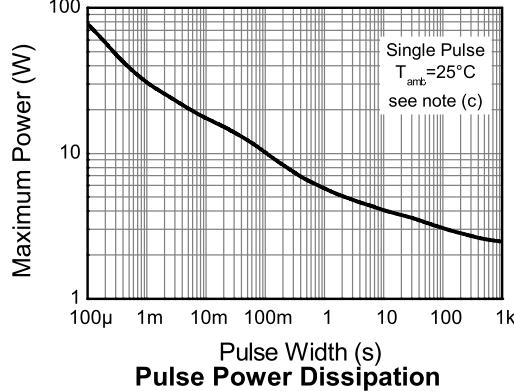
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



Pulse Power Dissipation

# ZXTP19060CZ

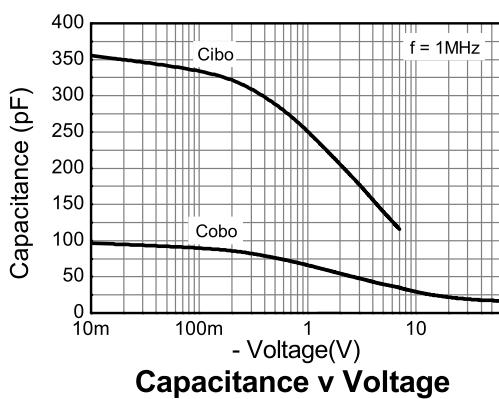
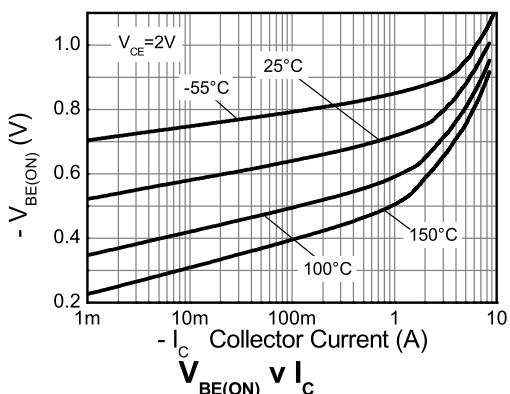
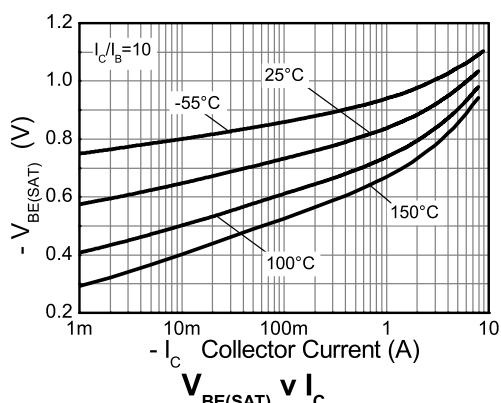
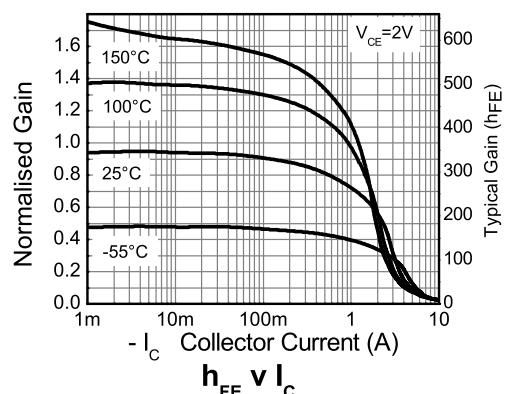
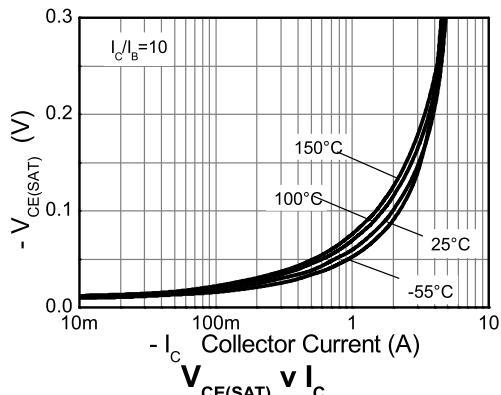
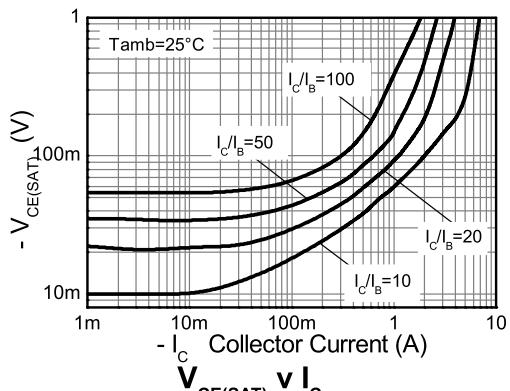
## Electrical characteristics (at $T_{amb} = 25^\circ C$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	$BV_{CBO}$	-60	-110		V	$I_C = -100\mu A$
Collector-Emitter breakdown voltage	$BV_{CEO}$	-60	-90		V	$I_C = -10mA$ (*)
Emitter-Collector breakdown voltage (reverse blocking)	$BV_{ECX}$	-7	-8.4		V	$I_E = -100\mu A, R_{BC} < 1k\Omega$ or $0.25V > V_{BC} > -0.25V$
Emitter-Collector breakdown voltage (reverse blocking)	$BV_{ECO}$	-7	-8.8		V	$I_E = -100\mu A$
Emitter-Base breakdown voltage	$BV_{EBO}$	-7	-8.4		V	$I_E = -100\mu A$
Collector-Base cut-off current	$I_{CBO}$		<1	-50 -0.5	nA $\mu A$	$V_{CB} = -60V$ $V_{CB} = -60V, T_{amb} = 100^\circ C$
Emitter cut-off current	$I_{EBO}$		<1	-50	nA	$V_{EB} = -5.6V$
Collector-Emitter saturation voltage	$V_{CE(sat)}$		-62 -150 -500 -105 -145 -240	-80 -205 -750 -165 -200 -410	mV mV mV mV mV mV	$I_C = -1A, I_B = -100mA$ (*) $I_C = -1A, I_B = -20mA$ (*) $I_C = -2A, I_B = -40mA$ (*) $I_C = -2A, I_B = -200mA$ (*) $I_C = -3A, I_B = -300mA$ (*) $I_C = -4.5A, I_B = -450mA$ (*)
Base-Emitter saturation voltage	$V_{BE(sat)}$		-965	-1050	mV	$I_C = -4.5A, I_B = -450mA$ (*)
Base-Emitter turn-on voltage	$V_{BE(on)}$		-875	-1000	mV	$I_C = -4.5A, V_{CE} = -2V$ (*)
Static forward current transfer ratio	$h_{FE}$	200 160 25	330 260 45	500		$I_C = -100mA, V_{CE} = -2V$ (*) $I_C = -1A, V_{CE} = -2V$ (*) $I_C = -4.5A, V_{CE} = -2V$ (*)
Transition frequency	$f_T$		180		MHz	$I_C = -50mA, V_{CE} = -10V$ $f = 50MHz$
Input capacitance	$C_{ibo}$		280	400	pF	$V_{EB} = -0.5V, f = 1MHz$ (*)
Output capacitance	$C_{obo}$		29.5	40	pF	$V_{CB} = -10V, f = 1MHz$ (*)
Delay time	$t_d$		24.3		ns	$I_C = -500mA, V_{CC} = -10V$ , $I_{B1} = -I_{B2} = -50mA$
Rise time	$t_r$		13.2		ns	
Storage time	$t_s$		456		ns	
Fall time	$t_f$		68.2		ns	

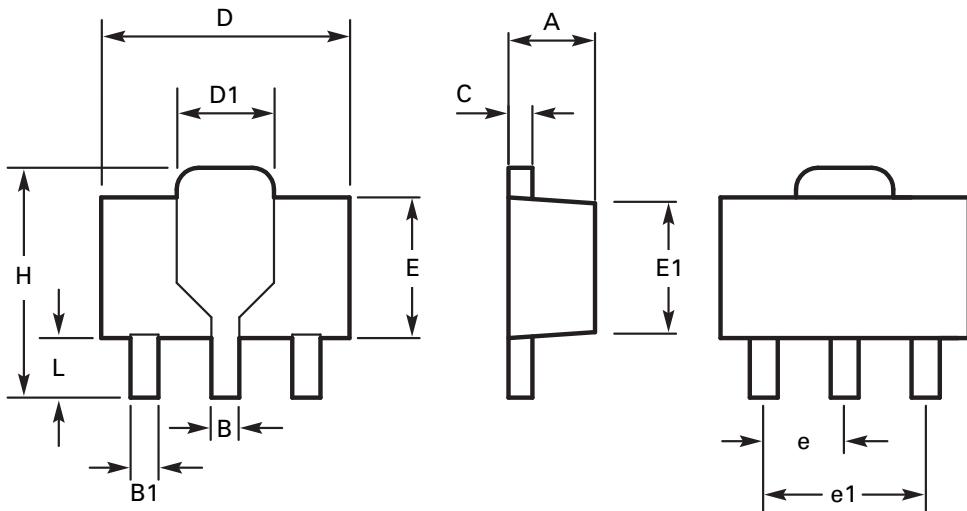
### NOTES:

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

## Typical characteristics



## 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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