

# ZXTP08400BFF

## 400V, SOT23F, PNP medium power high voltage transistor

### Summary;

$BV_{CEO} > -400V$

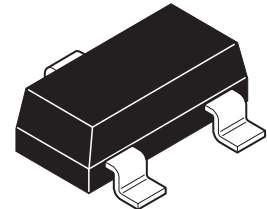
$BV_{ECO} > -6V$

$I_{C(cont)} = -0.2A$

$V_{CE(sat)} < 220mV @ 100mA$

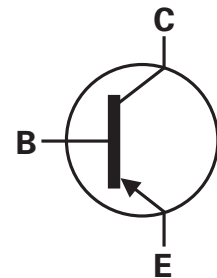
$P_D = 1.5W$

Complementary part number ZXTN08400BFF



### Description

This PNP transistor has been designed for applications requiring high blocking voltage. The SOT23F package is pin compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of utmost importance.

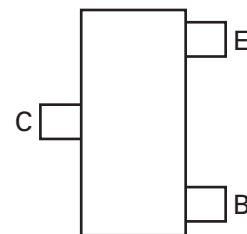


### Features

- High voltage
- Low saturation voltage

### Applications

- Telecoms switching



Pinout - top view

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP08400BFFTA	7	8	3000

### Device marking

1D6

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## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	$V_{CBO}$	-400	V
Collector-emitter voltage	$V_{CEO}$	-400	V
Emitter-collector voltage (reverse blocking)	$V_{ECO}$	-6	V
Emitter-base voltage	$V_{EBO}$	-7	V
Continuous collector current <sup>(c)</sup>	$I_C$	-0.2	A
Peak pulse current	$I_{CM}$	-1	A
Base current	$I_B$	-0.2	A
Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$		0.84	W
Linear derating factor	$P_D$	6.72	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$		1.34	W
Linear derating factor	$P_D$	10.72	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(c)}$		1.50	W
Linear derating factor	$P_D$	12.0	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$		2.0	W
Linear derating factor	$P_D$	16.0	mW/°C
Operating and storage temperature range	$T_j, T_{stg}$	-55 to 150	°C

## Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	149	°C/W
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	93	°C/W
Junction to ambient <sup>(c)</sup>	$R_{\theta JA}$	83	°C/W
Junction to ambient <sup>(d)</sup>	$R_{\theta JA}$	60	°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.

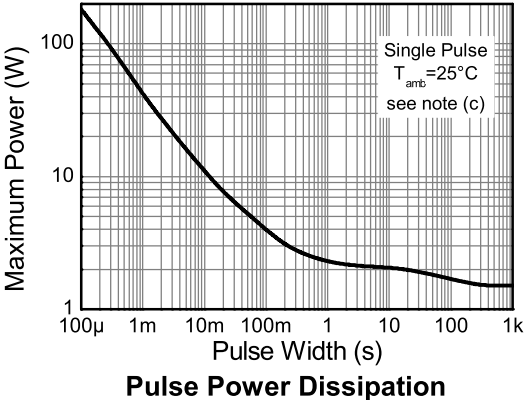
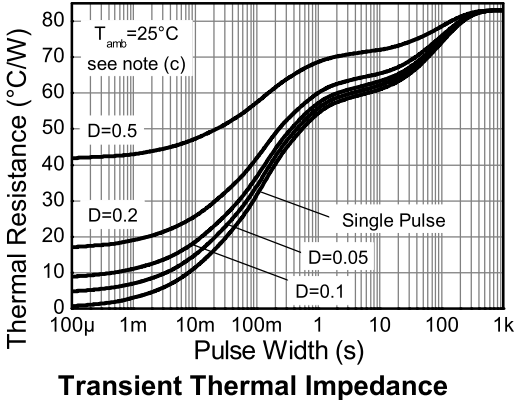
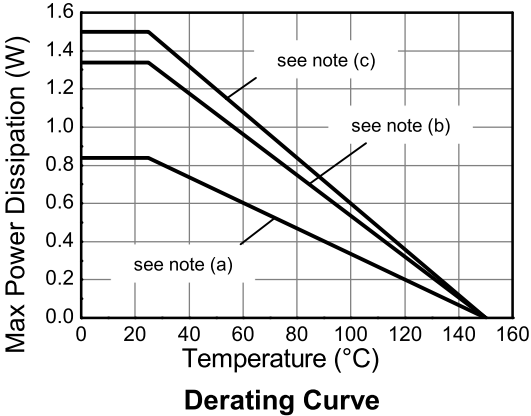
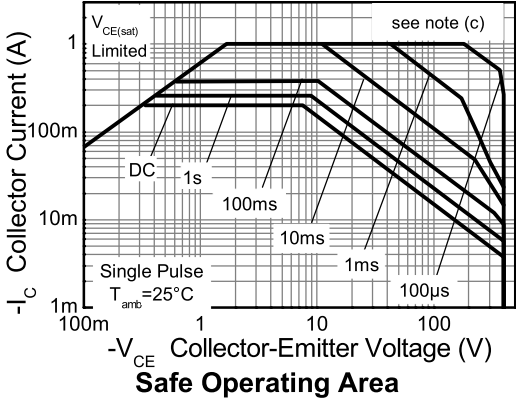
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(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.

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## Characteristics



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

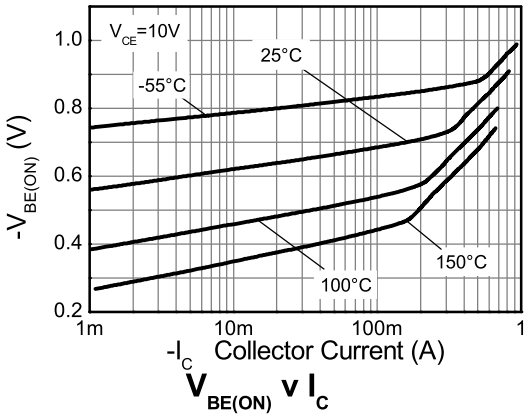
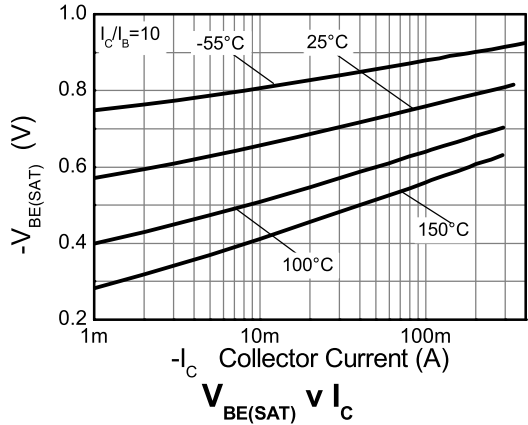
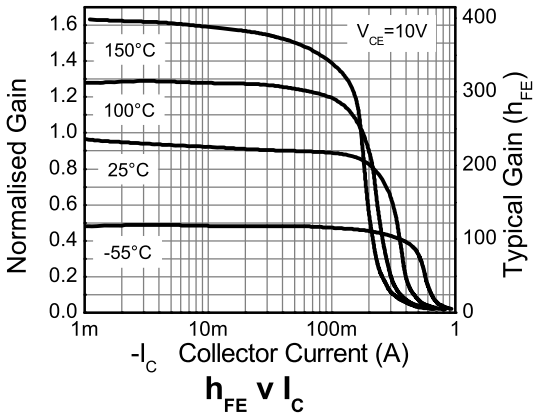
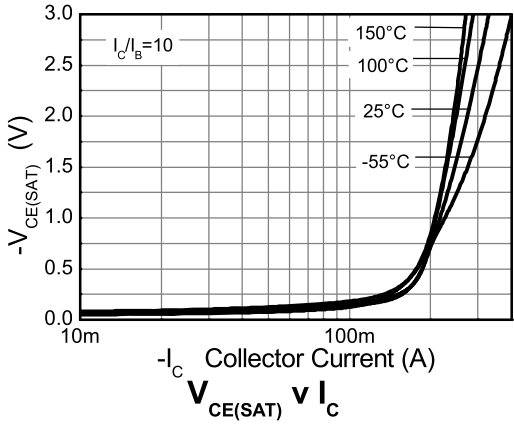
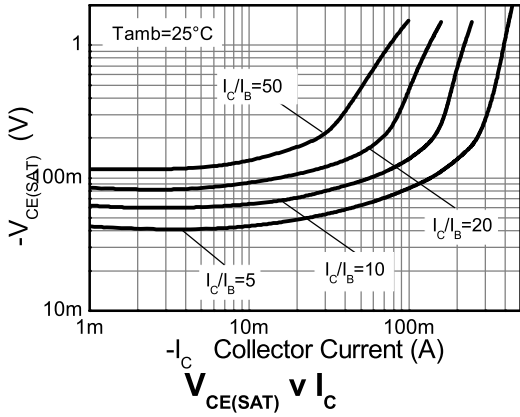
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	-400	-500		V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage (base open)	$BV_{CEO}$	-400	-480		V	$I_C = -10\text{mA}^{(*)}$
Emitter-base breakdown voltage	$BV_{EBO}$	-7	-8.1		V	$I_E = -100\mu\text{A}$
Emitter-collector breakdown voltage (reverse blocking)	$BV_{ECX}$	-6	-8.2		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)	$BV_{ECO}$	-6	-8.6		V	$I_E = -100\mu\text{A}$ ,
Collector-base cut-off current	$I_{CBO}$		<-1	-50 -20	nA $\mu\text{A}$	$V_{CB} = -320\text{V}$ $V_{CB} = -320\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter-base cut-off current	$I_{EBO}$		<-1	-50	nA	$V_{EB} = -5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		-10	-145	mV	$I_C = -20\text{mA}$ , $I_B = -1\text{mA}^{(*)}$
			-95	-125	mV	$I_C = -50\text{mA}$ , $I_B = -5\text{mA}^{(*)}$
			-140	-220	mV	$I_C = -100\text{mA}$ , $I_B = -10\text{mA}^{(*)}$
			-140	-190	mV	$I_C = -200\text{mA}$ , $I_B = -40\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		-810	-900	mV	$I_C = -200\text{mA}$ , $I_B = -40\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		-705	-800	mV	$I_C = -200\text{mA}$ , $V_{CE} = -10\text{V}^{(*)}$
Static forward current transfer ratio	$h_{FE}$	100	220			$I_C = -1\text{mA}$ , $V_{CE} = -5\text{V}^{(*)}$
		100	200	300		$I_C = -50\text{mA}$ , $V_{CE} = -5\text{V}^{(*)}$
		100	200			$I_C = -200\text{mA}$ , $V_{CE} = -10\text{V}^{(*)}$
Transition frequency	$f_T$	50	70		MHz	$I_C = -20\text{mA}$ , $V_{CE} = -20\text{V}$ $f = 20\text{MHz}$
Output capacitance	$C_{obo}$		12.9	20	pF	$V_{CB} = -20\text{V}$ , $f = 1\text{MHz}^{(*)}$
Delay time	$t_d$		95		ns	$V_{CC} = -100\text{V}$ .
Rise time	$t_r$		73.8		ns	$I_C = -100\text{mA}$ , $I_{B1} = 10\text{mA}$ , $I_{B2} = -20\text{mA}$ .
Storage time	$t_s$		1790		ns	
Fall time	$t_f$		153.8		ns	

### NOTES:

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

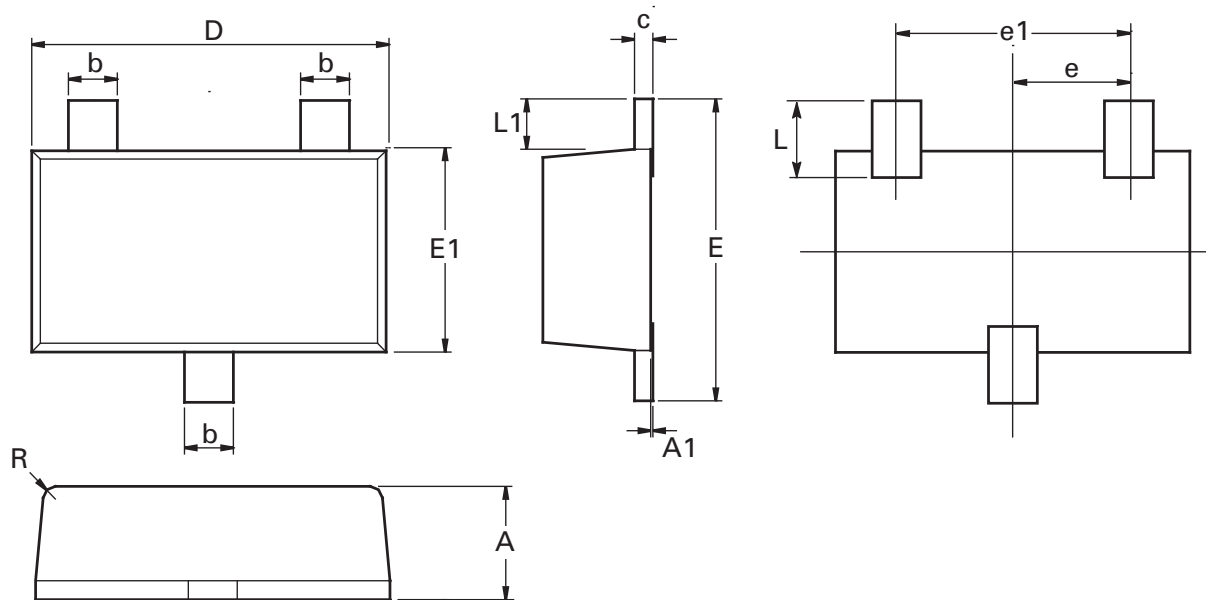
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## Typical characteristics



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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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