

ZXTN08400BFF

400V, SOT23F, NPN medium power high voltage transistor

Summary

$BV_{CEX} > 450V$

$BV_{CEO} > 400V$

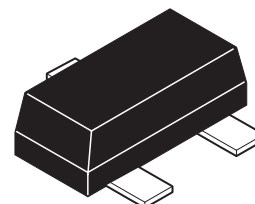
$BV_{ECO} > 6V$

$I_{C(cont)} = 0.5A$

$V_{CE(sat)} < 175mV @ 500mA$

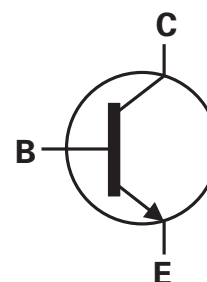
$P_D = 1.5W$

Complementary part number ZXTP08400BFF



Description

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

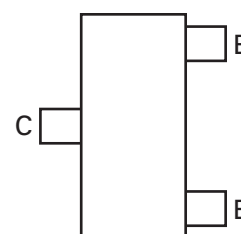


Features

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

Applications

- Modems
- Telecoms line switching



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN08400BFFTA	7	8	3000

Device marking

1D5

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	450	V
Collector-emitter voltage (forward blocking)	V_{CEX}	450	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 ^(c)	I_C	0.5	A
Peak pulse current	I_{CM}	1	A
Base current	I_B	0.2	A
Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$	P_D	0.84	W
Linear derating factor		6.72	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$	P_D	1.34	W
Linear derating factor		10.72	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(c)}$	P_D	1.5	W
Linear derating factor		12.0	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$	P_D	2.0	W
Linear derating factor		16.0	mW/°C
Operating and storage temperature range	T_j, T_{stg}	- 55 to 150	°C

Thermal resistance

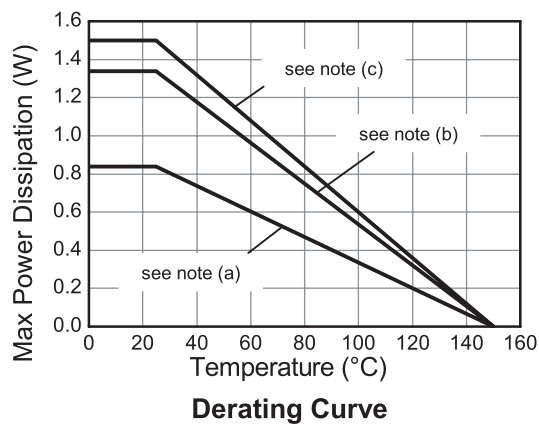
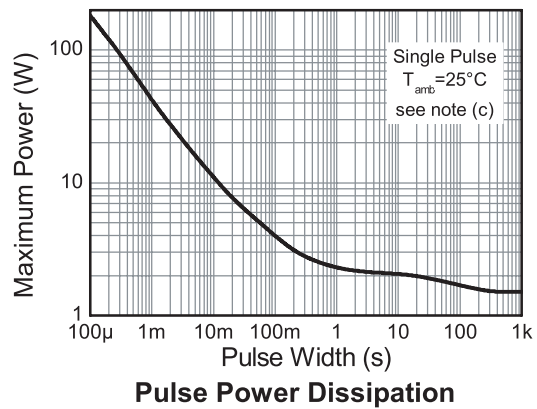
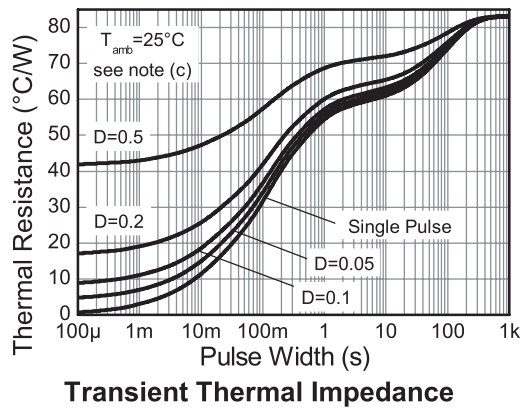
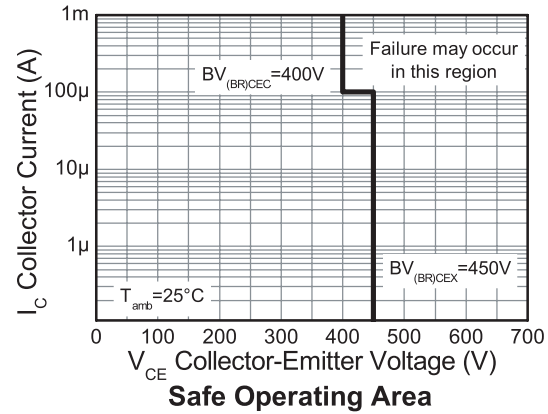
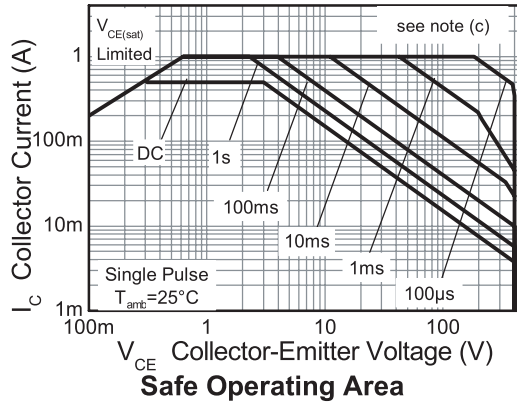
Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	149	°C/W
Junction to ambient ^(b)	$R_{\theta JA}$	93	°C/W
Junction to ambient ^(c)	$R_{\theta JA}$	83	°C/W
Junction to ambient ^(d)	$R_{\theta JA}$	60	°C/W

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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Typical characteristics



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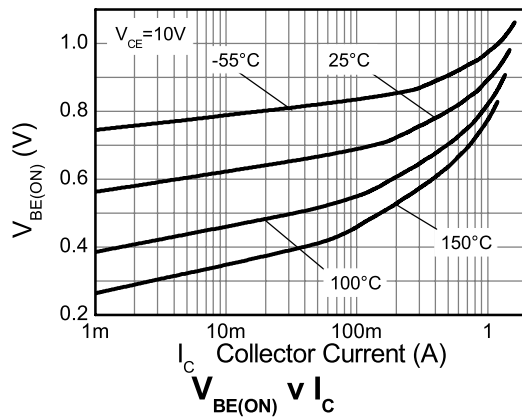
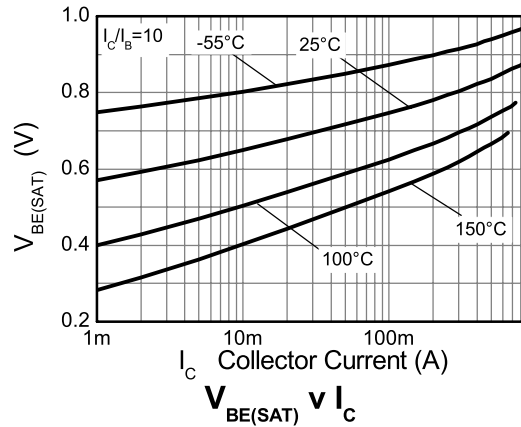
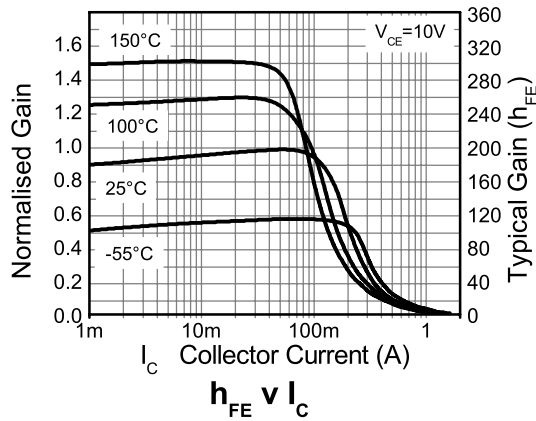
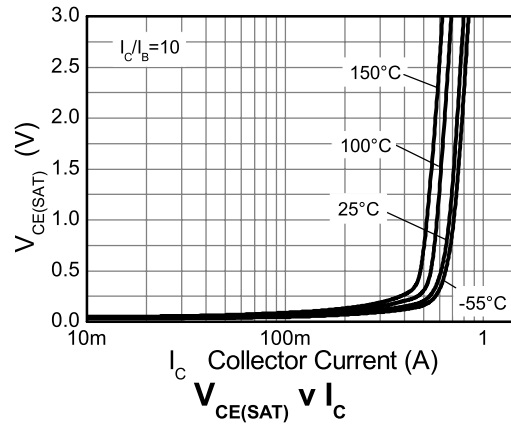
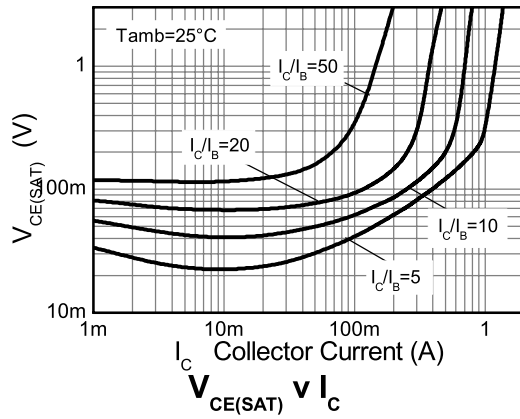
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	450	550		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	450	550		V	$I_C = 100\mu\text{A}$, $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-emitter breakdown voltage (base open)	BV_{CEO}	400	500		V	$I_C = 10\text{mA}^{(*)}$
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8.0		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	8.5		V	$I_E = 100\mu\text{A}$,
Emitter-base breakdown voltage	BV_{EBO}	7	8.1		V	$I_E = 100\mu\text{A}$
Collector-base cut-off current	I_{CBO}		<1	50 20	nA μA	$V_{CB} = 360\text{V}$ $V_{CB} = 360\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector-emitter cut-off current	I_{CEX}		<1	100	nA	$V_{CE} = 360\text{V}$, $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter-base cut-off current	I_{EBO}		<1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		70	85	mV	$I_C = 20\text{mA}$, $I_B = 1\text{mA}^{(*)}$
			50	70	mV	$I_C = 50\text{mA}$, $I_B = 5\text{mA}^{(*)}$
			120	170	mV	$I_C = 300\text{mA}$, $I_B = 30\text{mA}^{(*)}$
			125	175	mV	$I_C = 500\text{mA}$, $I_B = 100\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		865	950	mV	$I_C = 500\text{mA}$, $I_B = 100\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		800	900	mV	$I_C = 500\text{mA}$, $V_{CE} = 10\text{V}^{(*)}$
Static forward current transfer ratio	h_{FE}	90	165			$I_C = 1\text{mA}$, $V_{CE} = 5\text{V}^{(*)}$
		100	180	300		$I_C = 50\text{mA}$, $V_{CE} = 5\text{V}^{(*)}$
		10	20			$I_C = 500\text{mA}$, $V_{CE} = 10\text{V}^{(*)}$
Transition frequency	f_T		40		MHz	$I_C = 10\text{mA}$, $V_{CE} = 20\text{V}$ $f = 20\text{MHz}$
Output capacitance	C_{OBO}		8	10	pF	$V_{CB} = 20\text{V}$, $f = 1\text{MHz}^{(*)}$
Delay time	t_d		100		ns	$V_{CC} = 100\text{V}$. $I_C = 100\text{mA}$, $I_{B1} = 10\text{mA}$, $I_{B2} = 20\text{mA}$.
Rise time	t_r		52		ns	
Storage time	t_s		3122		ns	
Fall time	t_f		240		ns	

NOTES:

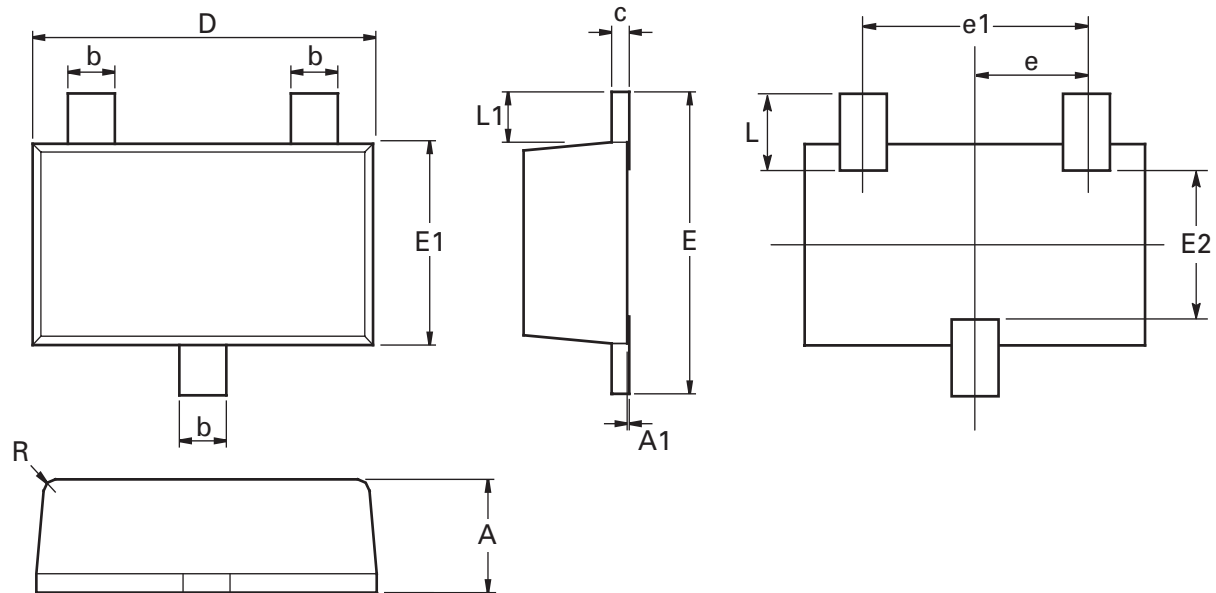
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics



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Package outline - SOT23F



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	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	E2	1.10	1.26	0.0433	0.0496
c	0.10	0.20	0.0043	0.0079	L	0.48	0.68	0.0189	0.0268
D	2.80	3.00	0.1102	0.1181	L1	0.30	0.50	0.0153	0.0161
e	0.95 ref		0.0374 ref		R	0.05	0.15	0.0019	0.0059
e1	1.80	2.00	0.0709	0.0787	O	0°	12°	0°	12°

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

Europe

Zetex GmbH
Kustermann-park
Balanstraße 59
D-81541 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49
europe.sales@zetex.com

Americas

Zetex Inc
700 Veterans Memorial Highway
Hauppauge, NY 11788
USA
Telephone: (1) 631 360 2222
Fax: (1) 631 360 8222
usa.sales@zetex.com

Asia Pacific

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

Corporate Headquarters

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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