

# ZXTN25100BFH

## 100V, SOT23, medium power transistor

### Summary

$BV_{CEX} > 170V$

$BV_{CEO} > 100V$

$BV_{ECO} > 6V$

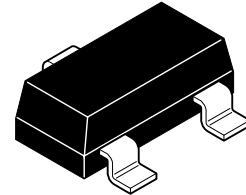
$I_{C(cont)} = 3A$

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

$R_{CE(sat)} = 67m\Omega$

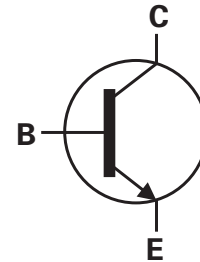
$P_D = 1.25W$

Complementary part number **ZXTP25100BFH**



### Description

Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium.

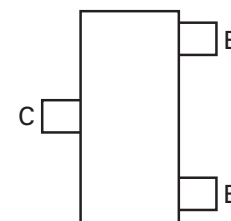


### Features

- High power dissipation SOT23 package
- Low saturation voltage
- 170V forward blocking voltage

### Applications

- Lamp relay and solenoid drivers
- General switching in automotive and industrial applications
- Motor drive and control



Pinout - top view

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25100BFHTA	7	8	3,000

### Device marking

021

# ZXTN25100BFH

## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	$V_{CBO}$	170	V
Collector-emitter voltage (forward blocking)	$V_{CEX}$	170	V
Collector-emitter voltage	$V_{CEO}$	100	V
Emitter-collector voltage (reverse blocking)	$V_{ECO}$	6	V
Emitter-base voltage	$V_{EBO}$	7	V
Continuous collector current <sup>(b)</sup>	$I_C$	3	A
Peak pulse current	$I_{CM}$	9	A
Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$	$P_D$	0.73	W
Linear derating factor		5.84	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$	$P_D$	1.05	W
Linear derating factor		8.4	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(c)}$	$P_D$	1.25	W
Linear derating factor		9.6	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$	$P_D$	1.81	W
Linear derating factor		14.5	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>	$R_{\theta JA}$	171	°C/W
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	119	°C/W
Junction to ambient <sup>(c)</sup>	$R_{\theta JA}$	100	°C/W
Junction to ambient <sup>(d)</sup>	$R_{\theta JA}$	69	°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.

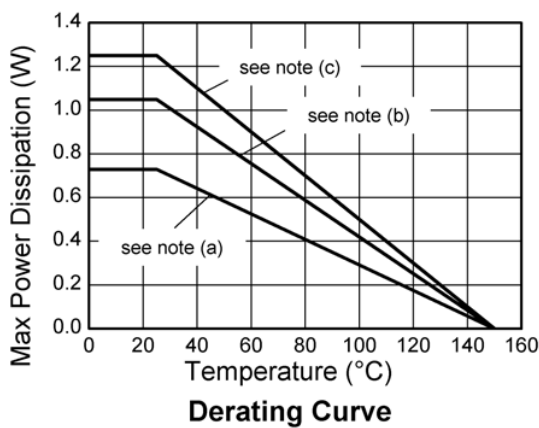
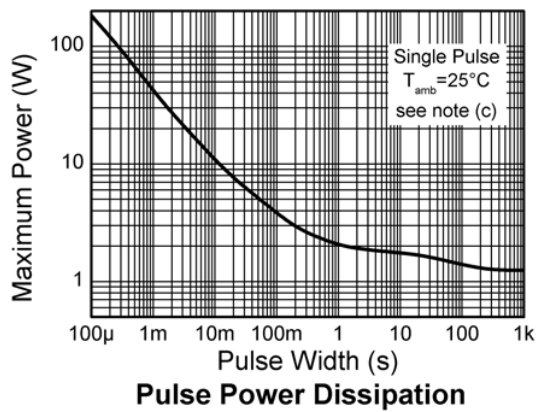
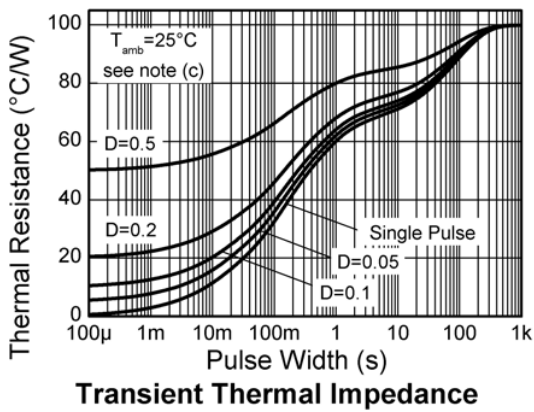
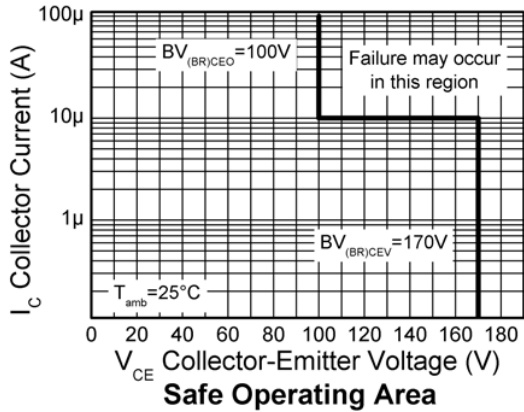
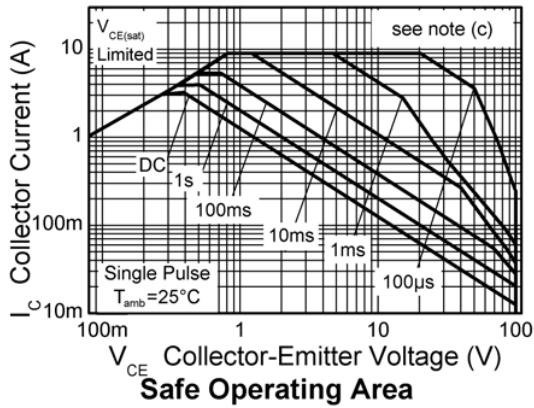
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(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.

# ZXTN25100BFH

## Characteristics



# ZXTN25100BFH

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

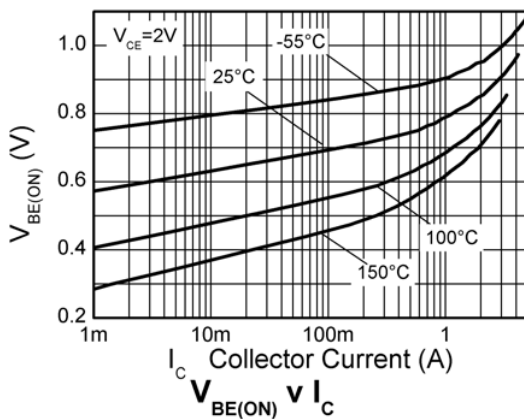
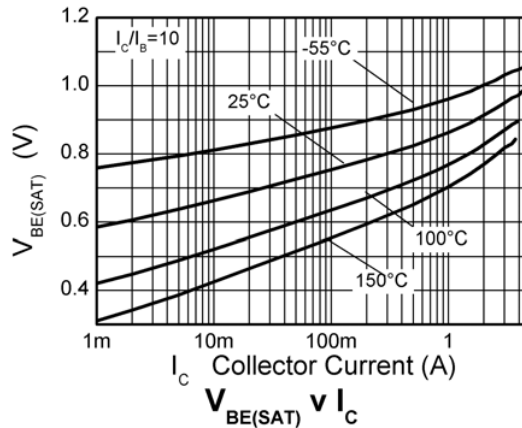
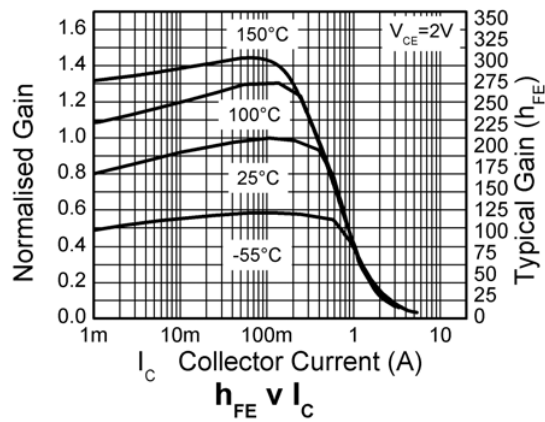
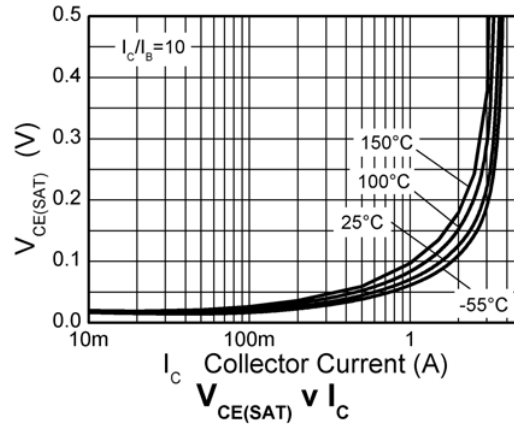
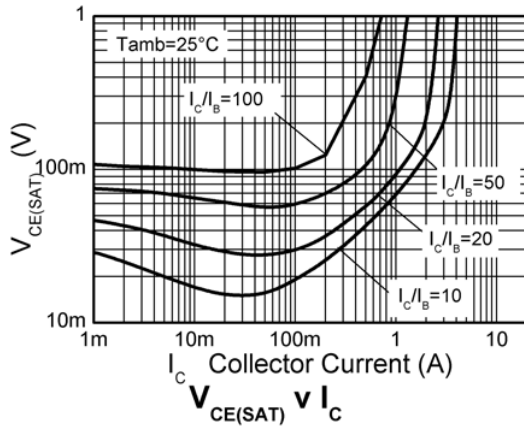
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	170	220		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage (forward blocking)	$BV_{CEX}$	170	210			$I_C = 100\mu\text{A}$ , $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-emitter breakdown voltage (base open)	$BV_{CEO}$	100	120		V	$I_C = 10\text{mA}^{(*)}$
Emitter-collector breakdown voltage (reverse blocking)	$BV_{ECX}$	6	7		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	8.4		V	$I_E = 100\mu\text{A}$ ,
Emitter-base breakdown voltage	$BV_{EBO}$	7	8		V	$I_E = 100\mu\text{A}$
Collector cut-off current	$I_{CBO}$		<1	50 20	nA $\mu\text{A}$	$V_{CB} = 136\text{V}$ $V_{CB} = 136\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector emitter cut-off current	$I_{CEX}$		-	100	nA	$V_{CE} = 136\text{V}$ ; $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter cut-off current	$I_{EBO}$		<1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		40 100 70 200	55 135 80 250	mV mV mV mV	$I_C = 0.5\text{A}$ , $I_B = 50\text{mA}^{(*)}$ $I_C = 0.5\text{A}$ , $I_B = 10\text{mA}^{(*)}$ $I_C = 1\text{A}$ , $I_B = 100\text{mA}^{(*)}$ $I_C = 3\text{A}$ , $I_B = 300\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		940	1050	mV	$I_C = 3\text{A}$ , $I_B = 300\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		890	1000	mV	$I_C = 3\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$
Static forward current transfer ratio	$h_{FE}$	100 50	200 85 20	300		$I_C = 10\text{mA}$ , $V_{CE} = 2\text{V}^{(*)}$ $I_C = 1\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$ $I_C = 3\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$
Transition frequency	$f_T$		160		MHz	$I_C = 100\text{mA}$ , $V_{CE} = 5\text{V}$ $f = 100\text{MHz}$
Output capacitance	$C_{OBO}$		9.4	20	pF	$V_{CB} = 10\text{V}$ , $f = 1\text{MHz}^{(*)}$
Delay time	$t_{(d)}$		16		ns	$V_{CC} = 10\text{V}$ . $I_C = 500\text{mA}$ ,
Rise time	$t_{(r)}$		55		ns	$I_{B1} = I_{B2} = 50\text{mA}$ .
Storage time	$t_{(s)}$		677		ns	
Fall time	$t_{(f)}$		95		ns	

### NOTES:

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

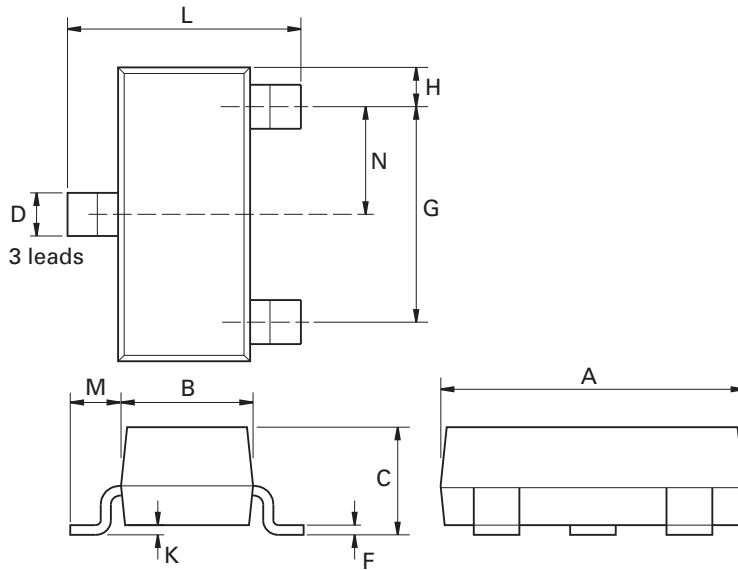
# ZXTN25100BFH

## Typical characteristics



# ZXTN25100BFH

## Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	-	1.10	-	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		-	-	-	-	-

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

### Europe

Zetex GmbH  
Streitfeldstraße 19  
D-81673 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

For international sales offices visit [www.zetex.com/offices](http://www.zetex.com/offices)

Zetex products are distributed worldwide. For details, see [www.zetex.com/salesnetwork](http://www.zetex.com/salesnetwork)

This publication is issued to provide outline information only which (unless agreed by the company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.