

# ZXTN25100BFH

## 100V, SOT23, medium power transistor

### Summary

$BV_{CEX} > 170V$

$BV_{CEO} > 100V$

$BV_{ECO} > 6V$

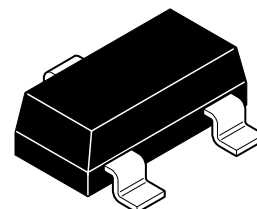
$I_{C(cont)} = 3A$

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

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

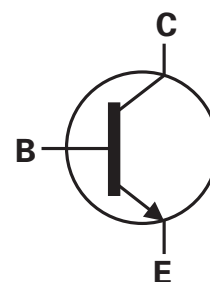
$P_D = 1.25W$

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.

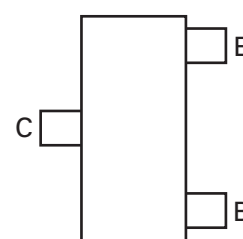


### Features

- 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 $T_{amb} = 25^{\circ}\text{C}^{(a)}$	$P_D$	0.73	W
Linear derating factor		5.84	mW/ $^{\circ}\text{C}$
Power dissipation at $T_{amb} = 25^{\circ}\text{C}^{(b)}$	$P_D$	1.05	W
Linear derating factor		8.4	mW/ $^{\circ}\text{C}$
Power dissipation at $T_{amb} = 25^{\circ}\text{C}^{(c)}$	$P_D$	1.25	W
Linear derating factor		9.6	mW/ $^{\circ}\text{C}$
Power dissipation at $T_{amb} = 25^{\circ}\text{C}^{(d)}$	$P_D$	1.81	W
Linear derating factor		14.5	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>	$R_{\theta JA}$	171	$^{\circ}\text{C}/\text{W}$
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	119	$^{\circ}\text{C}/\text{W}$
Junction to ambient <sup>(c)</sup>	$R_{\theta JA}$	100	$^{\circ}\text{C}/\text{W}$
Junction to ambient <sup>(d)</sup>	$R_{\theta JA}$	69	$^{\circ}\text{C}/\text{W}$

### 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.

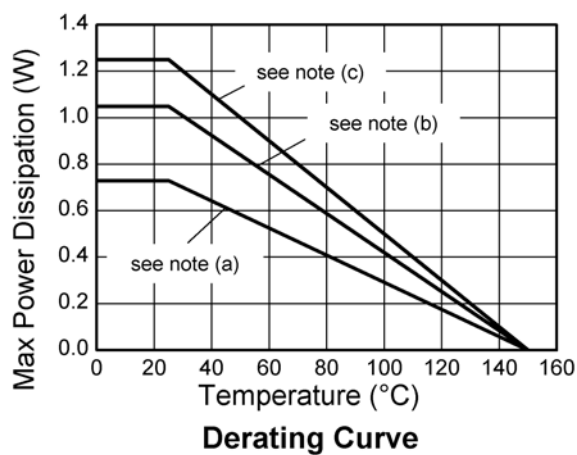
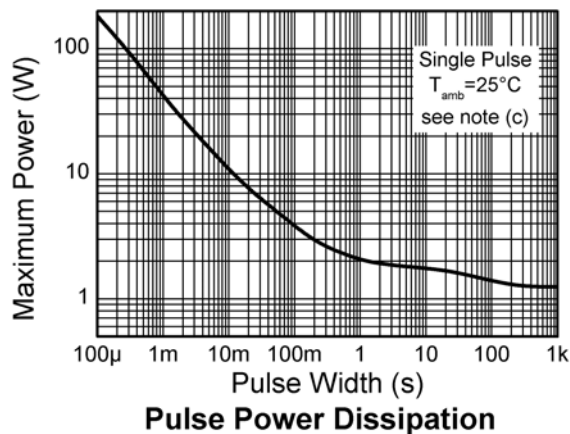
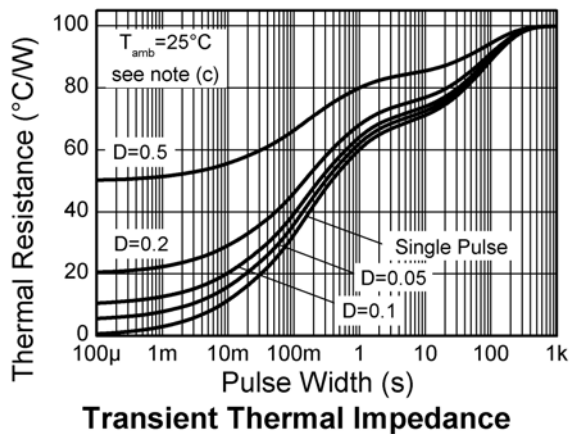
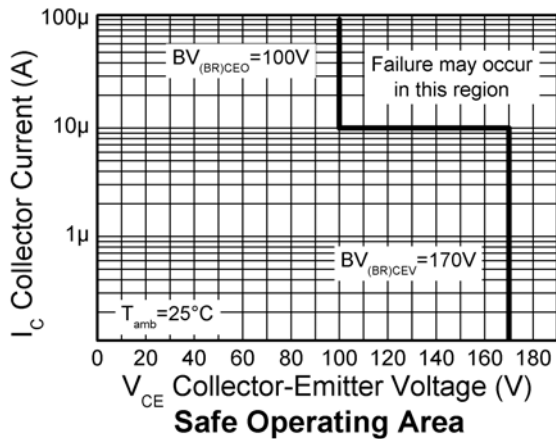
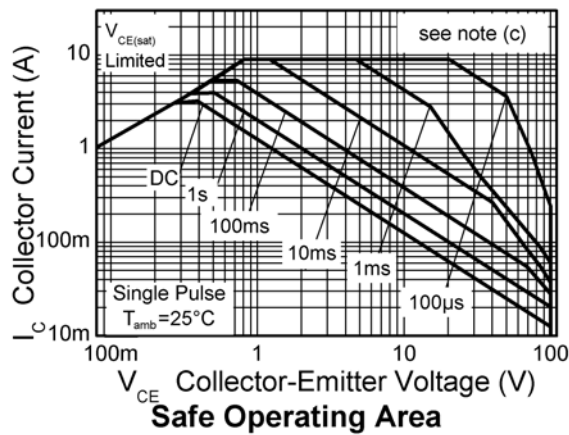
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(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  $t < 5\text{secs}$ .

# ZXTN25100BFH

## Characteristics



# ZXTN25100BFH

## ELECTRICAL CHARACTERISTICS (at Tamb = 25°C unless otherwise stated)

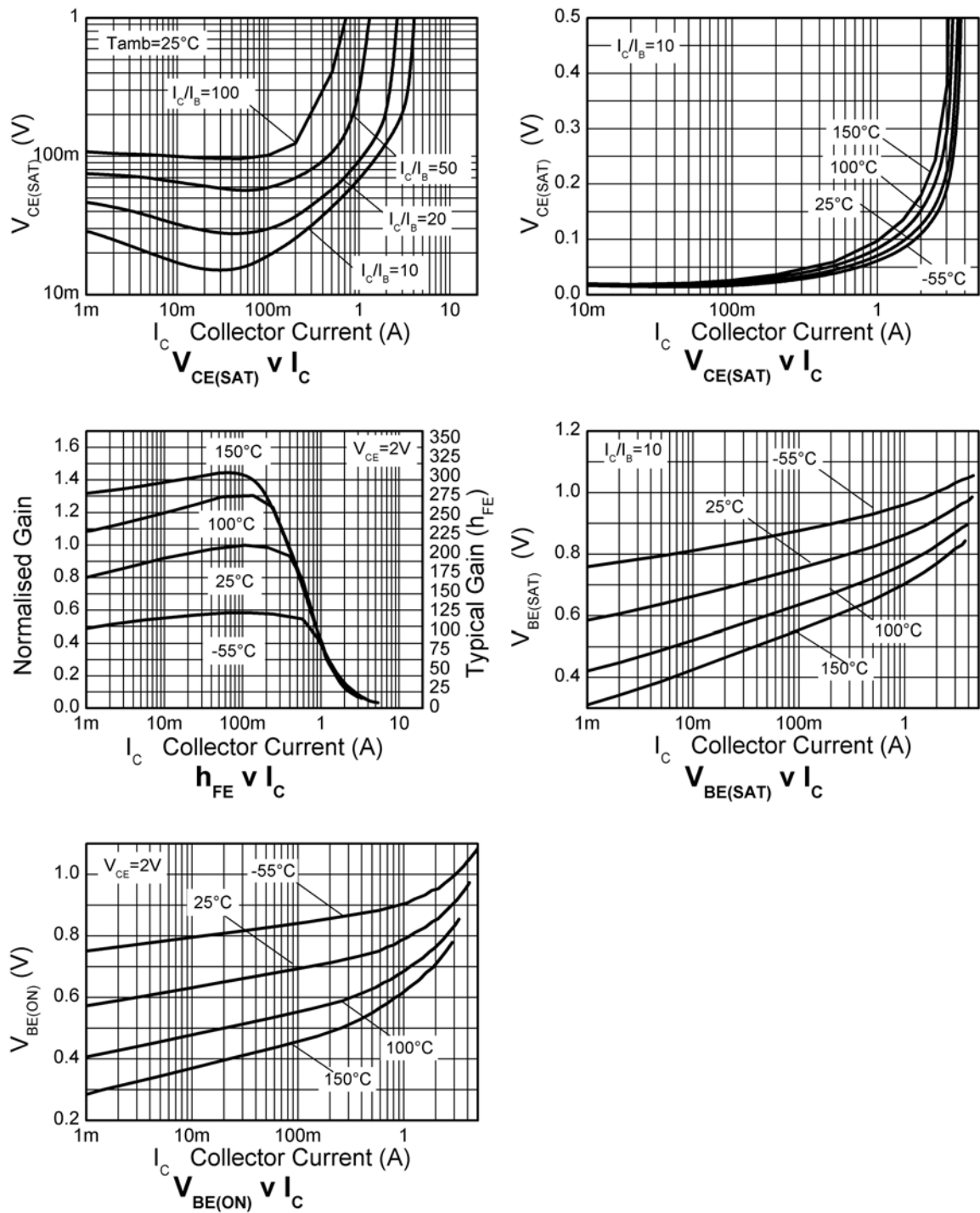
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	170	220		V	$I_C = 100\mu A$
Collector-emitter breakdown voltage (forward blocking)	$BV_{CEX}$	170	210			$I_C = 100\mu A$ , $R_{BE} < 1k\Omega$ or $-1V < V_{BE} < 0.25V$
Collector-emitter breakdown voltage (base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

### NOTES:

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

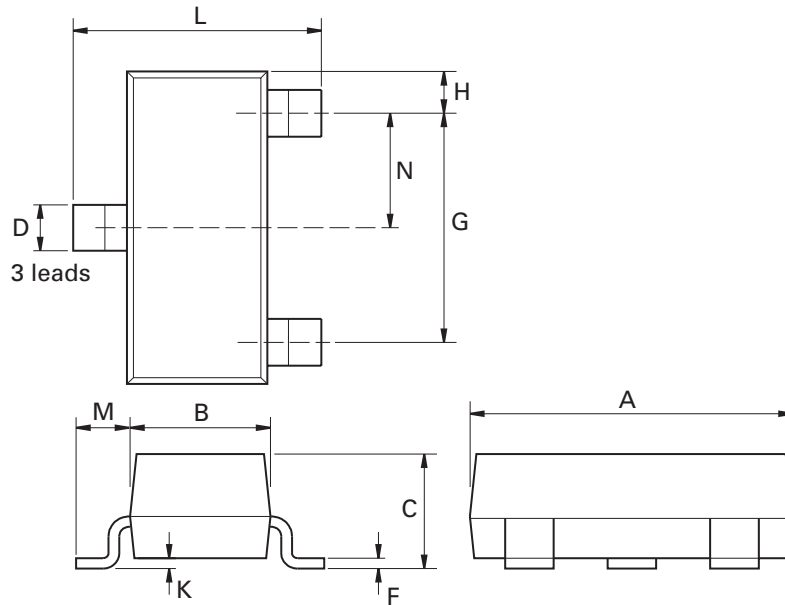
# ZXTN25100BFH

## 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	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA	Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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