

# ZXTN25012EFL

## 12V, SOT23, NPN low power transistor

### Summary

$BV_{CEO} > 12V$

$BV_{ECO} > 4.5V$

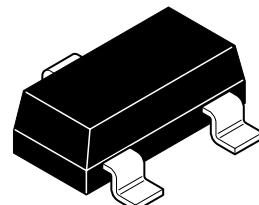
$h_{FE} > 500$

$I_{C(\text{cont})} = 2A$

$V_{CE(\text{sat})} < 65 \text{ mV} @ 1A$

$R_{CE(\text{sat})} = 46 \text{ m}\Omega$

$P_D = 350 \text{ mW}$

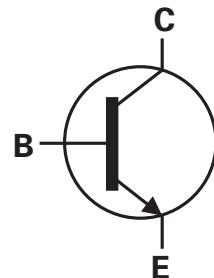


### Description

Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

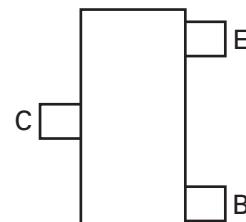
### Features

- High peak current
- Low saturation voltage
- 6V reverse blocking voltage



### Applications

- MOSFET and IGBT gate driving
- DC-DC conversion
- LED driving
- Interface between low voltage IC's and load



Pinout - top view

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25012EFLTA	7	8	3000

### Device marking

1B6

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## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	$V_{CBO}$	20	V
Collector-emitter voltage	$V_{CEO}$	12	V
Emitter-collector voltage	$V_{ECO}$	4.5	V
Emitter-base voltage	$V_{EBO}$	7	V
Continuous collector current <sup>(a)</sup>	$I_C$	2	A
Base current	$I_B$	500	mA
Peak pulse current	$I_{CM}$	15	A
Power dissipation @ $T_{amb} = 25^\circ\text{C}$ <sup>(a)</sup>	$P_D$	350	mW
Linear derating factor		2.8	mW/ $^\circ\text{C}$
Operating and storage temperature range	$T_j, T_{stg}$	- 55 to 150	$^\circ\text{C}$

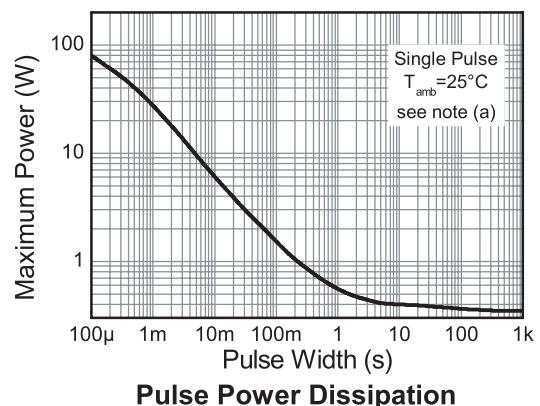
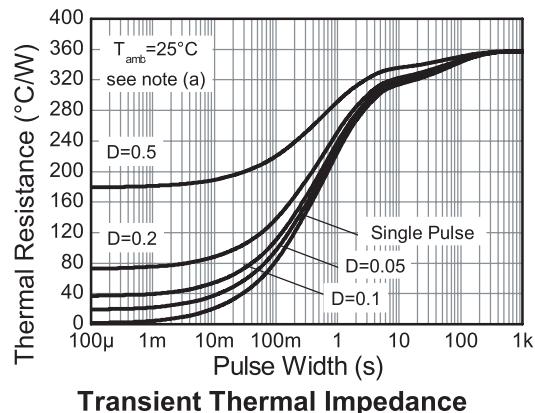
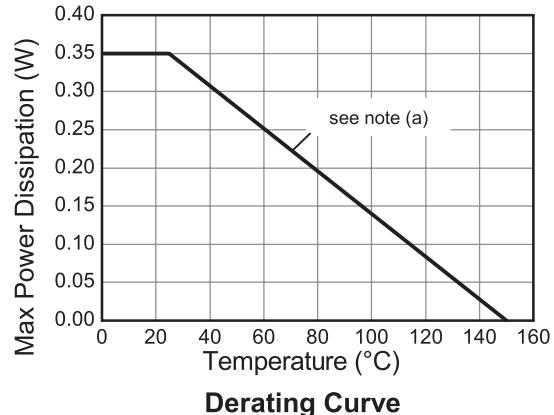
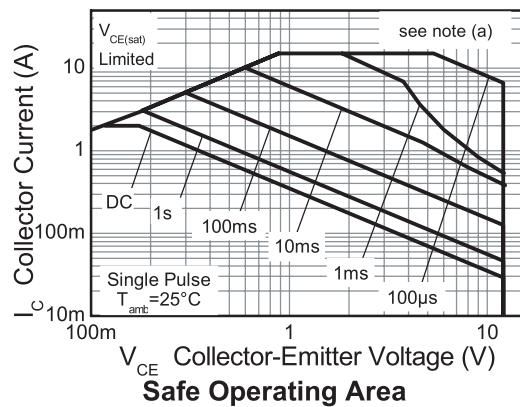
## Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient <sup>(a)</sup>	$R_{\Theta JA}$	357	$^\circ\text{C/W}$

### NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

## Characteristics



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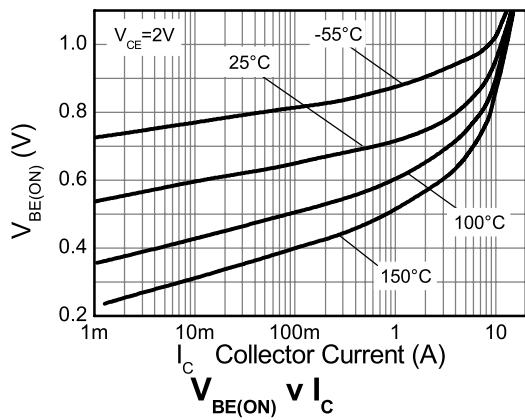
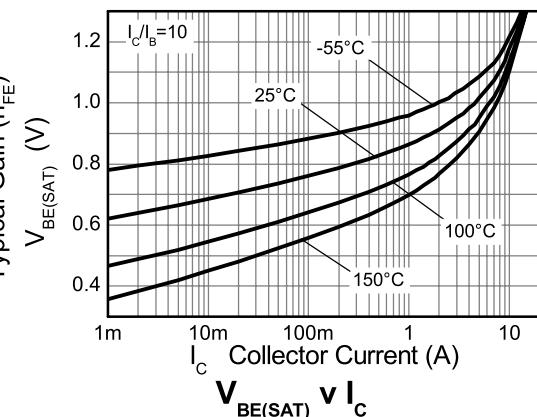
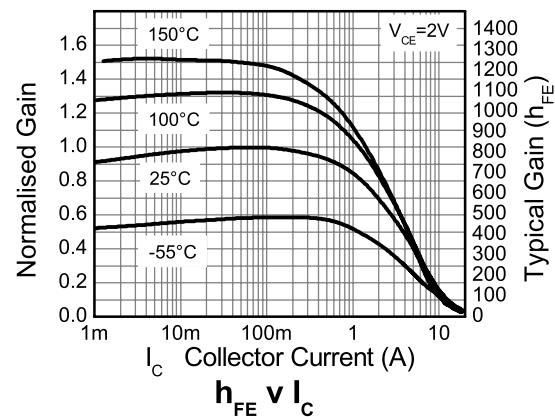
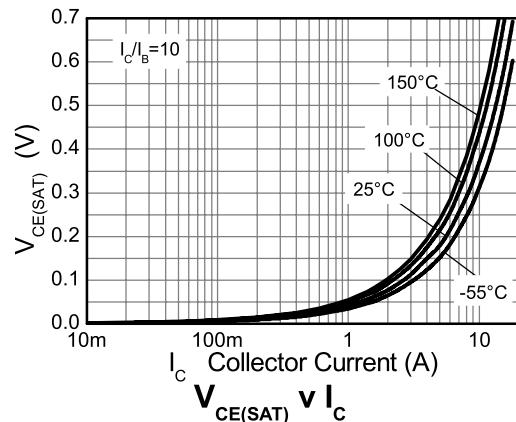
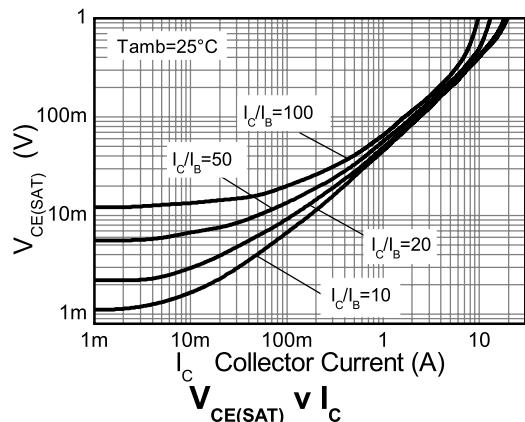
## Electrical characteristics (at $T_{amb} = 25^\circ C$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	20	40		V	$I_C = 100\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	12	17		V	$I_C = 10mA$ (*)
Emitter-base breakdown voltage	$BV_{EBO}$	7	8.3		V	$I_E = 100\mu A$
Emitter-collector breakdown voltage (reverse blocking)	$BV_{ECX}$	6	8		V	$I_E = 100\mu A, R_{BC} \leq 1k\Omega$ or $0.25V > V_{BC} > -0.25V$
Emitter-collector breakdown voltage (base open)	$BV_{ECO}$	4.5	5.5		V	$I_E = 100\mu A,$
Collector cut-off current	$I_{CBO}$		<1	50	nA	$V_{CB} = 16V$
				20	$\mu A$	$V_{CB} = 16V, T_{amb} = 100^\circ C$
Emitter-base cut-off current	$I_{EBO}$		<1	50	nA	$V_{EB} = 5.6V$
Collector-emitter saturation voltage	$V_{CE(sat)}$		50	65	mV	$I_C = 1A, I_B = 100mA$ (*)
			70	85	mV	$I_C = 1A, I_B = 10mA$ (*)
			105	130	mV	$I_C = 2A, I_B = 40mA$ (*)
			235	300	mV	$I_C = 5A, I_B = 100mA$ (*)
Base-emitter saturation voltage	$V_{BE(sat)}$		830	950	mV	$I_C = 2A, I_B = 40mA$ (*)
Base-emitter turn-on voltage	$V_{BE(on)}$		745	850	mV	$I_C = 2A, V_{CE} = 2V$ (*)
Static forward current transfer ratio	$h_{FE}$	500	800	1500		$I_C = 10mA, V_{CE} = 2V$ (*)
		500	700			$I_C = 1A, V_{CE} = 2V$ (*)
		370	575			$I_C = 2A, V_{CE} = 2V$ (*)
		210	335			$I_C = 5A, V_{CE} = 2V$ (*)
		30	55			$I_C = 15A, V_{CE} = 2V$ (*)
Transition frequency	$f_T$		260		MHz	$I_C = 50mA, V_{CE} = 10V$ $f = 100MHz$
Output capacitance	$C_{obo}$		25	35	pF	$V_{CB} = 10V, f = 1MHz$ (*)
Delay time	$t_{(d)}$		71		ns	$V_{CC} = 10V$ $I_C = 1A,$ $I_{B1} = I_{B2} = 10mA$
Rise time	$t_{(r)}$		70		ns	
Storage time	$t_{(s)}$		233		ns	
Fall time	$t_{(f)}$		72		ns	

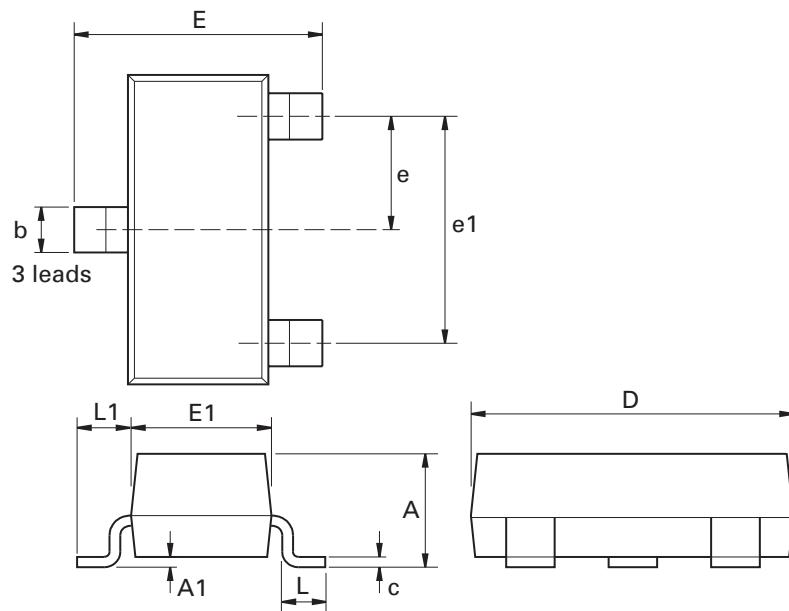
### NOTES:

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

## Typical characteristics



## Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
C	0.085	0.120	0.003	0.008	L	0.25	0.62	0.018	0.024
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.0375 NOM		-	-	-	-	-

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

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