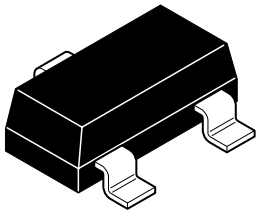
ZXTN25012EFL
12V, SOT23, NPN low power transistor

Summary



BV_{CEO} > 12V

BV_{ECO} > 4.5V

h_{FE} > 500

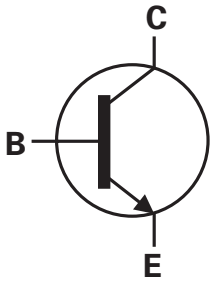
$I_{C(cont)}$ = 2A

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

$R_{CE(sat)}$ = 46 mΩ

P_D = 350mW

Description



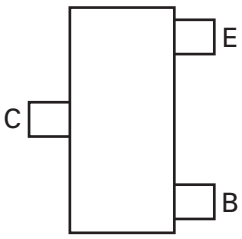
Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

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[a]	I_C	2	A
Base current	I_B	500	mA
Peak pulse current	I_{CM}	15	A
Power dissipation @ T_{amb} =25°C[a]	P_D	350	mW
Linear derating factor		2.8	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]	$R_{\Theta JA}$	357	°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.

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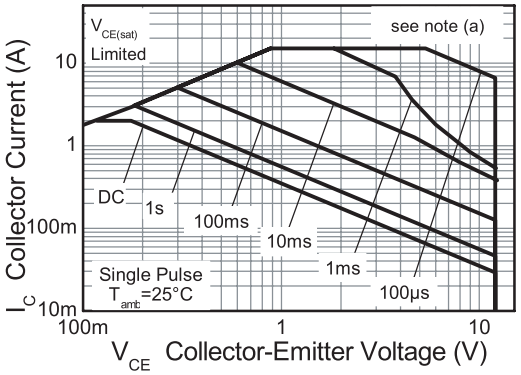
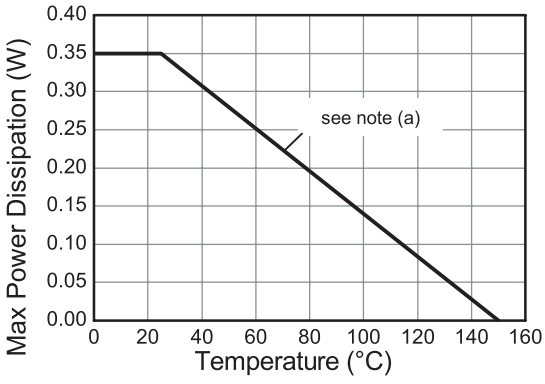
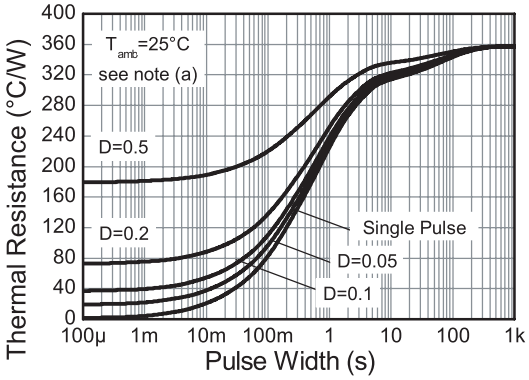
Characteristics



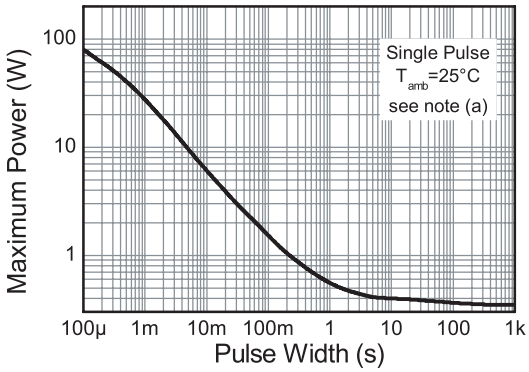
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	20	40		V	I_C = 100μA
Collector-emitter breakdown voltage	BV_{CEO}	12	17		V	I_C = 10mA (*)
Emitter-base breakdown voltage	BV_{EBO}	7	8.3		V	I_E = 100μA
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8		V	I_E = 100μA, $R_{BC} \leq 1k\Omega$ or 0.25v > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	4.5	5.5		V	I_E = 100μA,
Collector cut-off current	I_{CBO}		<1	50	nA	V_{CB} = 16V
				20	μA	V_{CB} = 16V, T_{amb}= 100°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 ≤300μs; duty cycle ≤2%.

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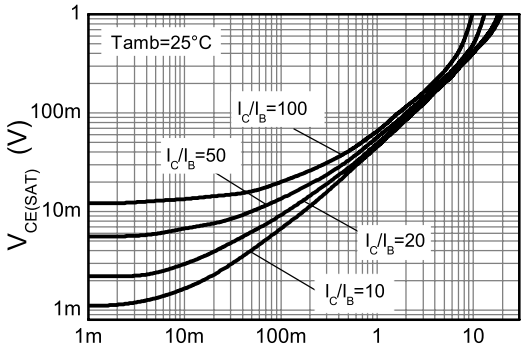
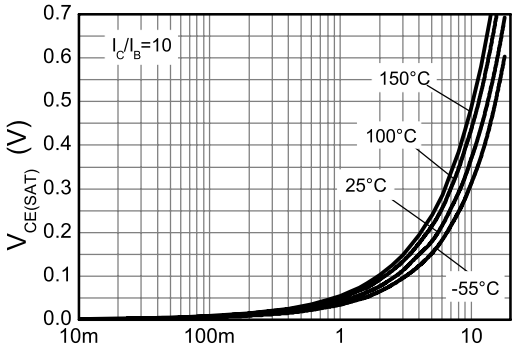
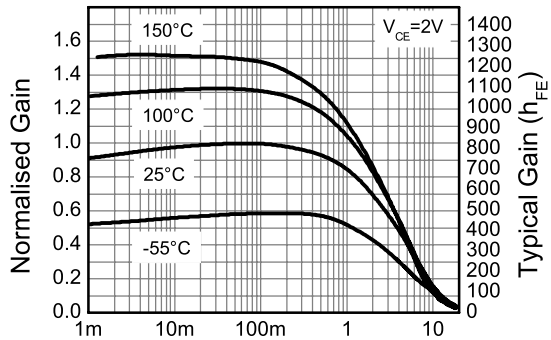
Typical characteristics



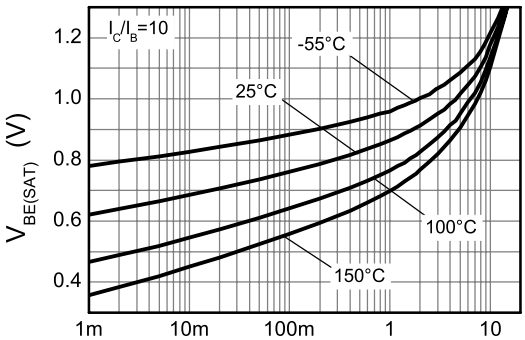
$V_{CE(SAT)}$ v I_C



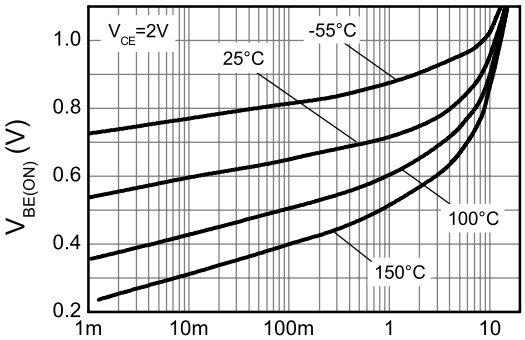
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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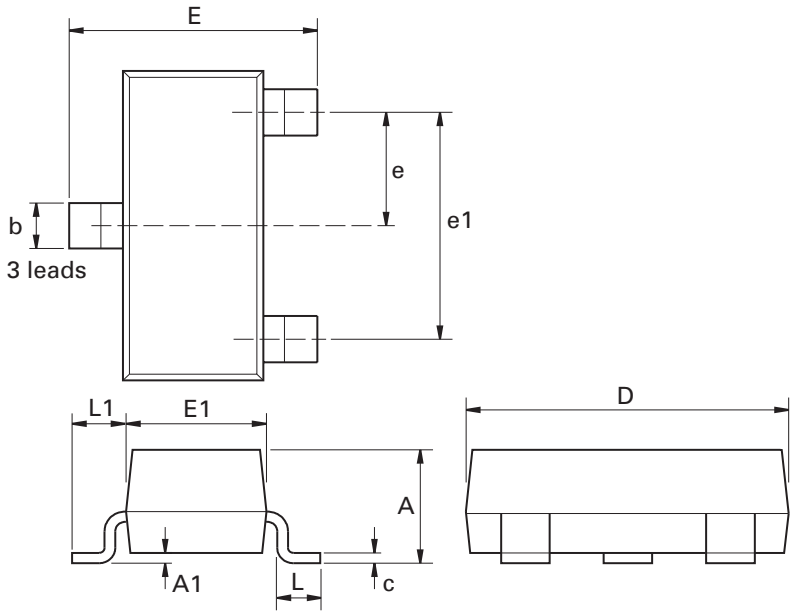
Package outline - SOT23



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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Zetex sales offices

Europe	**Americas**	**Asia Pacific**	**Corporate Headquarters**
Zetex GmbH Kustermann-park Balanstraße 59 D-81541 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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