

ZXTP25012EFH

12V, SOT23, PNP medium power transistor

Summary

$BV_{CEO} > -12V$

$h_{FE} > 500$

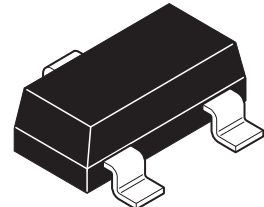
$I_{C(cont)} = 4A$

$R_{CE(sat)} = 40m\Omega$

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

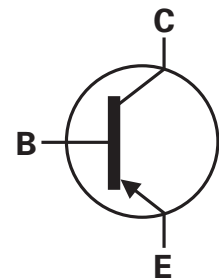
$P_D = 1.25W$

Complementary part number ZXTN25012EFH



Description

Advanced process capability and package design have been used to maximise 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.

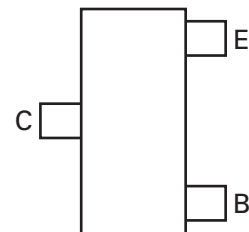


Features

- High power dissipation SOT23 package
- High peak current
- Very high gain, 500 minimum
- Low saturation voltage

Applications

- MOSFET and IGBT gate driving
- DC - DC converters
- Motor drive
- High side driver
- Line disconnect switch



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25012EFHTA	7	8	3000

Device marking

1E8

ZXTP25012EFH

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-12	V
Collector-emitter voltage	V_{CEO}	-12	V
Emitter-base voltage	V_{EBO}	-7	V
Continuous collector current ^(b)	I_C	-4	A
Base current	I_B	-1	A
Peak pulse current	I_{CM}	-10	A
Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$	P_D	0.73	W
Linear derating factor		5.84	mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$	P_D	1.05	W
Linear derating factor		8.4	mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(c)}$	P_D	1.25	W
Linear derating factor		9.6	mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$	P_D	1.81	W
Linear derating factor		14.5	mW/ $^{\circ}C$
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	$^{\circ}C$

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	171	$^{\circ}C/W$
Junction to ambient ^(b)	$R_{\theta JA}$	119	$^{\circ}C/W$
Junction to ambient ^(c)	$R_{\theta JA}$	100	$^{\circ}C/W$
Junction to ambient ^(d)	$R_{\theta JA}$	69	$^{\circ}C/W$

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.

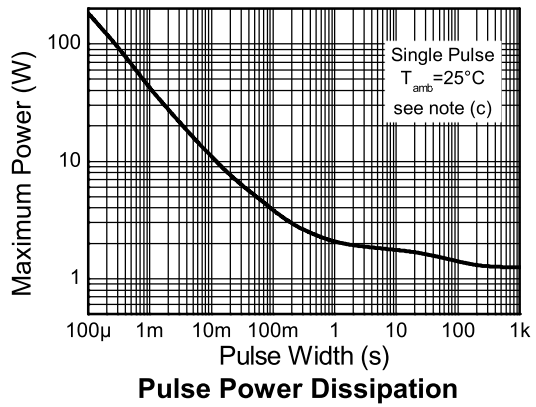
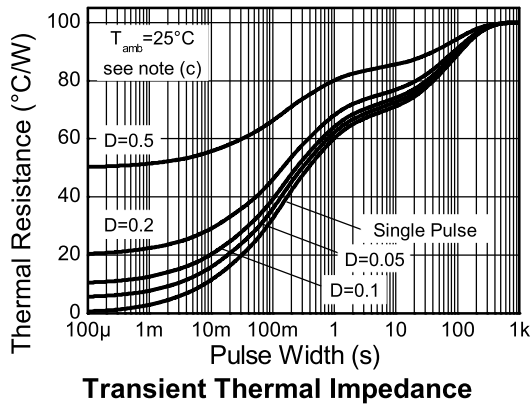
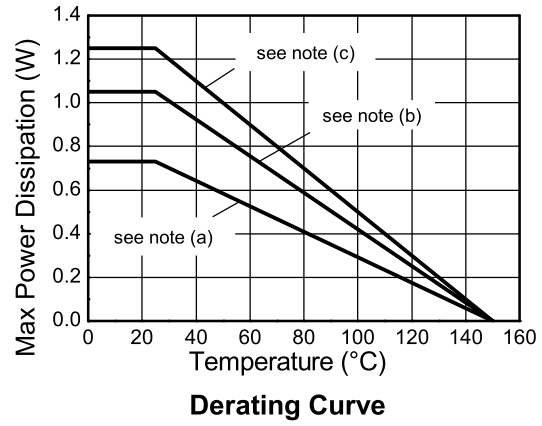
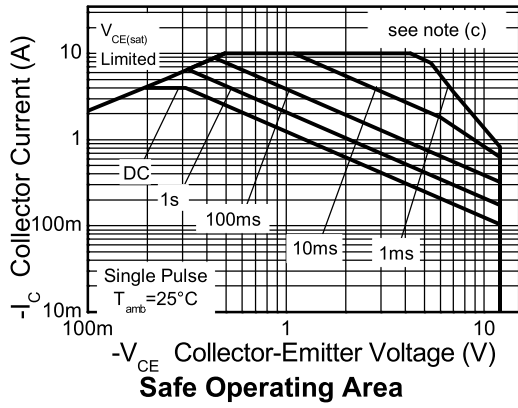
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(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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Characteristics



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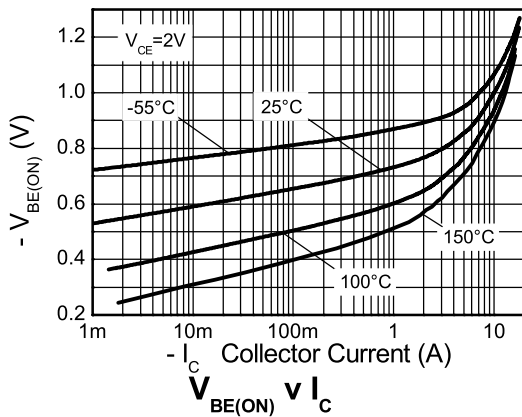
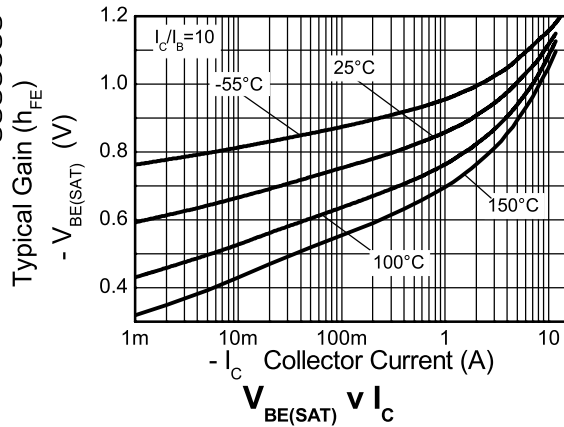
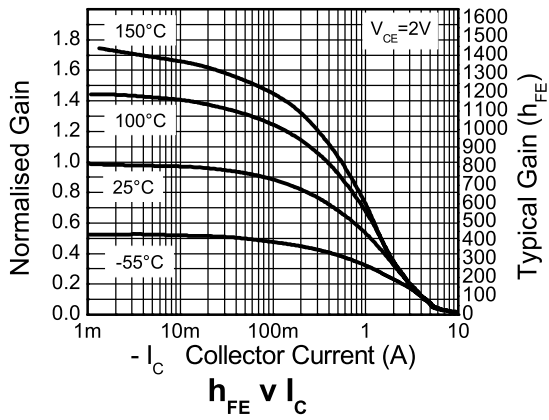
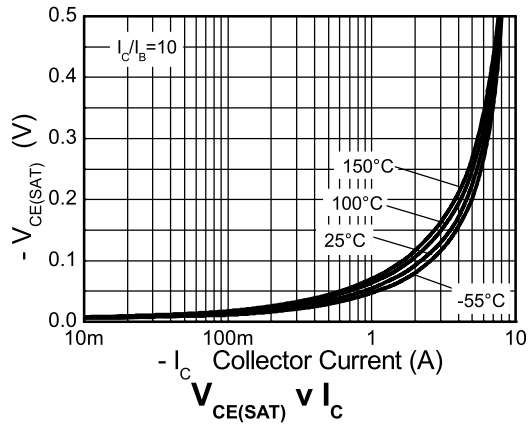
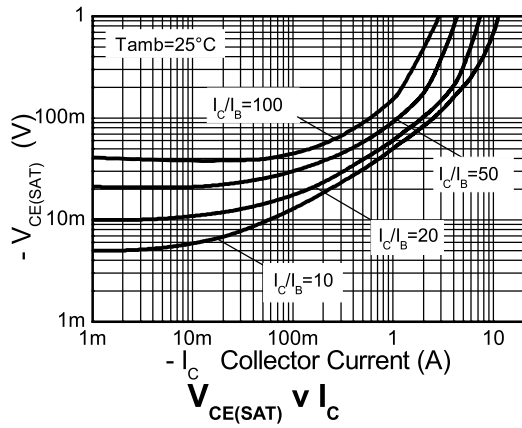
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	-12	-35		V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage (base open)	BV_{CEO}	-12	-25		V	$I_C = -10\text{mA}^{(*)}$
Emitter-base breakdown voltage	BV_{EBO}	-7	-8.5		V	$I_E = -100\mu\text{A}$
Collector-base cut-off current	I_{CBO}		<-1	-50 -0.5	nA μA	$V_{CB} = -12\text{V}$ $V_{CB} = -12\text{V}, T_{amb} = 100^{\circ}\text{C}$
Emitter-base cut-off current	I_{EBO}		<-1	-50	nA	$V_{EB} = -5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		-50 -150 -175 -160	-65 -260 -350 -210	mV mV mV mV	$I_C = -1\text{A}, I_B = -100\text{mA}^{(*)}$ $I_C = -1\text{A}, I_B = -10\text{mA}^{(*)}$ $I_C = -2\text{A}, I_B = -40\text{mA}^{(*)}$ $I_C = -4\text{A}, I_B = -400\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		-970	-1050	mV	$I_C = -4\text{A}, I_B = -400\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		-825	-950	mV	$I_C = -4\text{A}, V_{CE} = -2\text{V}^{(*)}$
Static forward current transfer ratio	h_{FE}	500 300 50	800 450 100	1500		$I_C = -10\text{mA}, V_{CE} = -2\text{V}^{(*)}$ $I_C = -1\text{A}, V_{CE} = -2\text{V}^{(*)}$ $I_C = -4\text{A}, V_{CE} = -2\text{V}^{(*)}$
Transition frequency	f_T		310		MHz	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Output capacitance	C_{obo}		16.9		pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}^{(*)}$
Delay time	t_d		41		ns	$V_{CC} = -10\text{V}$ $I_C = -1\text{A},$ $I_{B1} = I_{B2} = -10\text{mA}$
Rise time	t_r		62		ns	
Storage time	t_s		179		ns	
Fall time	t_f		65		ns	

NOTES:

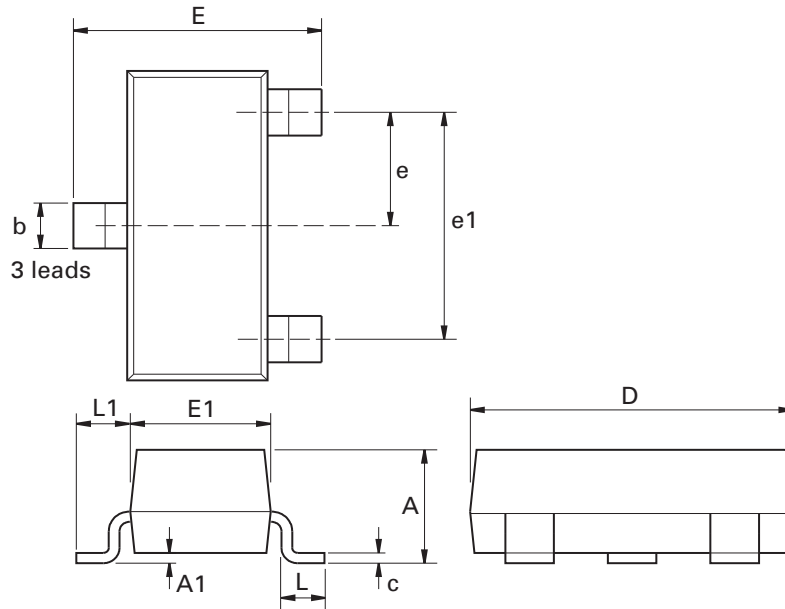
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics



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Package outline - 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 Telephone: (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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