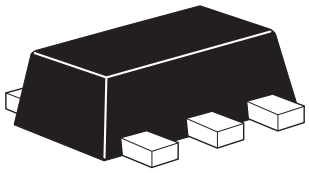
ZXTP25012EZ
20V PNP high gain transistor in SOT89



Summary

BV_{CEO} > -12V

h_{FE} > 500

$I_{C(cont)}$ = 4.5A

$V_{CE(sat)}$ < -70mV @ 1A

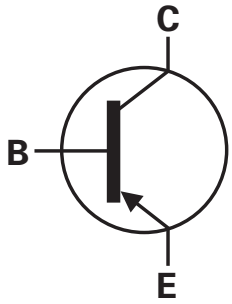
$R_{CE(sat)}$ = 45mΩ

P_D = 2.4W

Complementary part number ZXTN25012EZ

Description

Packaged in the SOT89 outline this new low saturation 12V PNP transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.

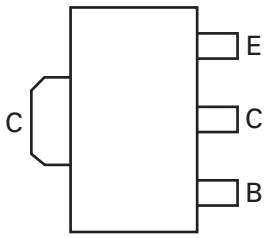


Features

- 4.5A continuous current
- Up to 10A peak current
- Very low saturation voltages
- High gain

Applications

- High side switch
- Battery charging
- Regulator circuits
- Buck converters
- MOSFET gate drivers



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25012EZTA	7	12	1000

Device marking

- 1L4

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-Base voltage	V_{CBO}	-20	V
Collector-Emitter voltage	V_{CEO}	-12	V
Emitter-Base voltage	V_{EBO}	-7	V
Continuous Collector current[c]	I_C	-4.5	A
Base current	I_B	-1	A
Peak pulse current	I_{CM}	-10	A
Power dissipation at T_A =25°C[a] Linear derating factor	P_D	1.1 8.8	W mW/°C
Power dissipation at T_A =25°C[b] Linear derating factor	P_D	1.8 14.4	W mW/°C
Power dissipation at T_A =25°C[c] Linear derating factor	P_D	2.4 19.2	W mW/°C
Power dissipation at T_A =25°C[d] Linear derating factor	P_D	4.46 35.7	W mW/°C
Power dissipation at T_A =25°C[d] Linear derating factor	P_D	19.2 153	W 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]	$R_{\Theta JA}$	117	°C/W
Junction to ambient[b]	$R_{\Theta JA}$	68	°C/W
Junction to ambient[c]	$R_{\Theta JA}$	51	°C/W
Junction to ambient[d]	$R_{\Theta JA}$	28	°C/W
Junction to case[e]	$R_{\Theta JC}$	7.95	°C/W

NOTES:

(a) For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

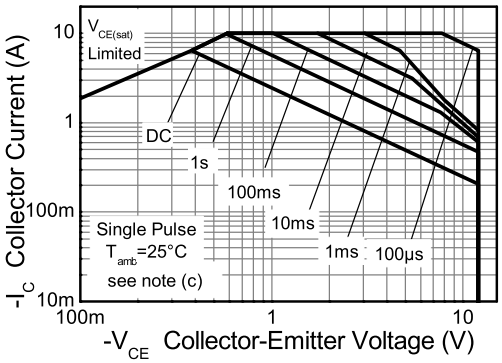
(b) Mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(c) Mounted on 50mm x 50mm x 0.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

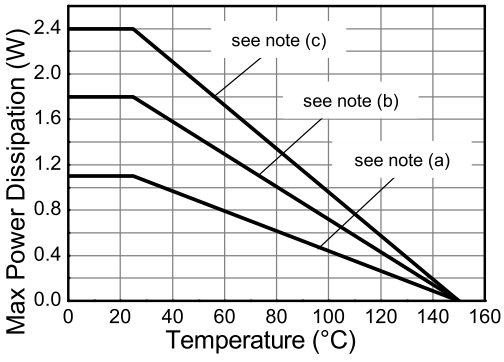
(d) As (c) above measured at t<5 seconds.

(e) Junction to case (collector tab). Typical

Thermal characteristics

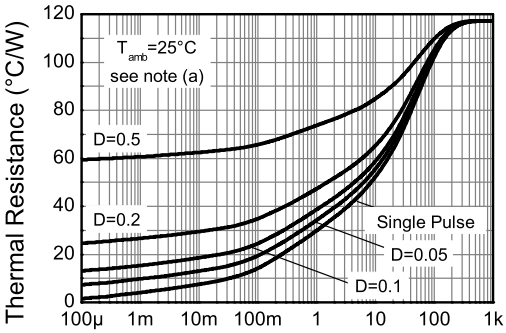


Safe Operating Area

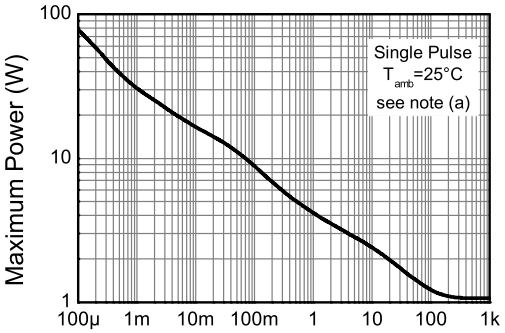


Derating Curve

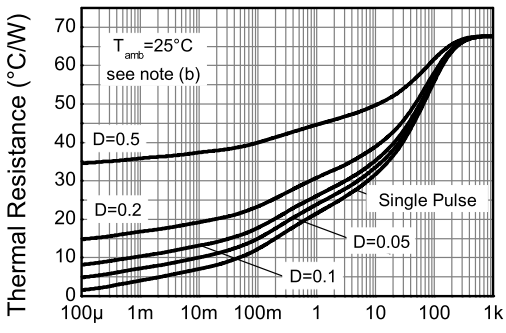
Thermal characteristics



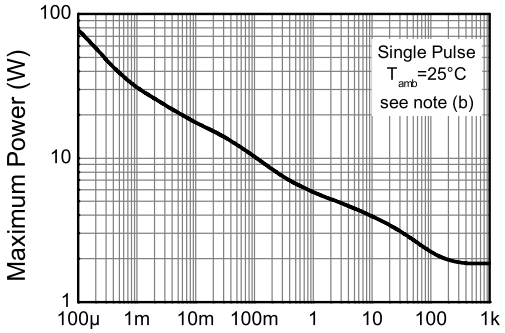
Transient Thermal Impedance



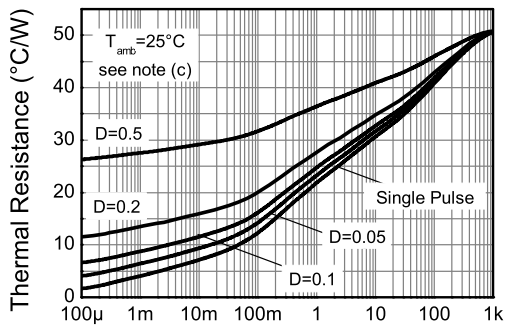
Pulse Power Dissipation



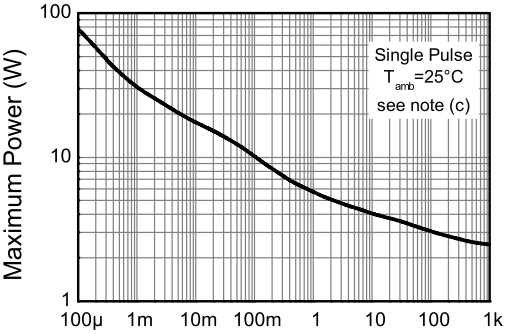
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



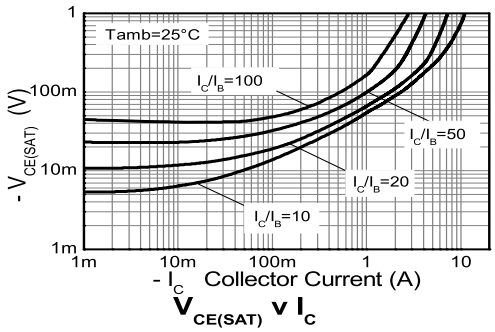
Pulse Power Dissipation

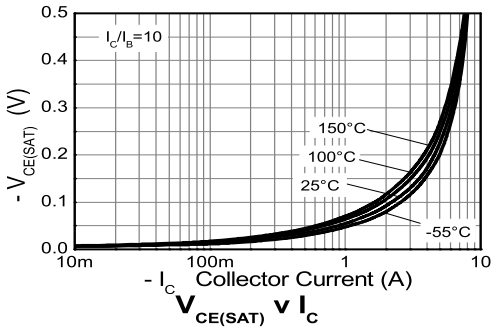
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

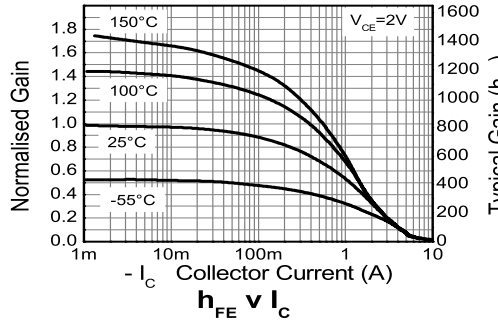
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV_{CBO}	-12	-35		V	I_C = -100μA
Collector-Emitter breakdown voltage	BV_{CEO}	-12	-25		V	I_C= -10mA (*)
Emitter-Base breakdown voltage	BV_{EBO}	-7	-8.5		V	I_E = -100μA
Collector-Base cut-off current	I_{CBO}		<-1	-50 -0.5	nA μA	V_{CB} = -12V V_{CB} = -12V, T_{amb}=100°C
Emitter Base cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-Emitter saturation voltage	$V_{CE(sat)}$		-55 -155 -185 -200	-70 -265 -355 -285	mV mV mV mV	I_C = -1A, I_B = -100mA(*) I_C = -1A, I_B = -10mA(*) I_C = -2A, I_B = -40mA(*) I_C = -4.5A, I_B = -450mA(*)
Base-Emitter saturation voltage	$V_{BE(sat)}$		-990	-1100	mV	I_C = -4.5A, I_B = -450mA(*)
Base-Emitter turn-on voltage	$V_{BE(on)}$		-865	-975	mV	I_C = -4.5A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	500 300 40	800 450 85 15	1500		I_C = -10mA, V_{CE} = -2V(*) I_C = -1A, V_{CE} = -2V(*) I_C = -4.5A, V_{CE} = -2V(*) I_C = -10A, V_{CE} = -2V(*)
Transition frequency	f_T		310		MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Input capacitance	C_{ibo}		127	250	pF	V_{EB} = -0.5V, f = 1MHz(*)
Output capacitance	C_{obo}		16.9	30	pF	V_{CB} = -10V, f = 1MHz(*)
Delay time	t_d		41		ns	V_{CC} = -10V, I_C = -1A, I_{B1} = -I_{B2} = -10mA
Rise time	t_r		62		ns	
Storage time	t_s		179		ns	
Fall time	t_f		65		ns	

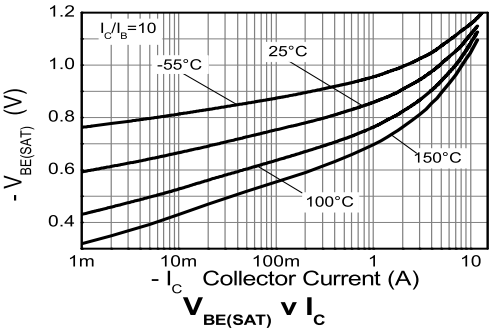
NOTES:
(*) Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.

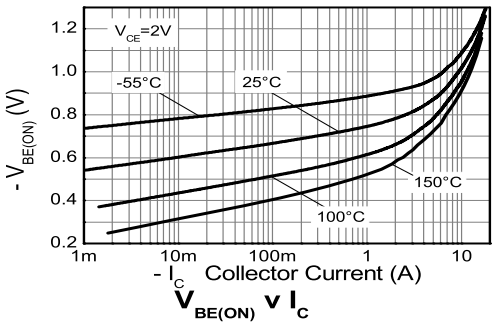
Typical characteristics



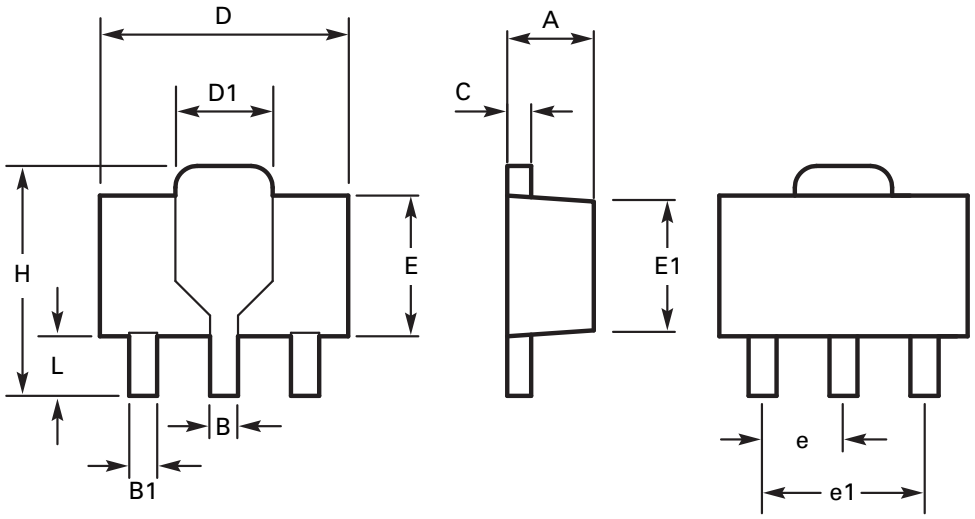








Package outline



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	E	2.29	2.60	0.090	0.102
B	0.44	0.56	0.017	0.022	E1	2.13	2.29	0.084	0.090
B1	0.36	0.48	0.014	0.019	e	1.50 BSC		0.059 BSC	
C	0.35	0.44	0.014	0.017	e1	3.00 BSC		0.118 BSC	
D	4.40	4.60	0.173	0.181	H	3.94	4.25	0.155	0.167
D1	1.52	1.83	0.064	0.072	L	0.89	1.20	0.035	0.047

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