

# ZXTP2012A

## 60V PNP LOW SATURATION MEDIUM POWER TRANSISTOR IN E-LINE

### SUMMARY

$BV_{CEO} = -60V$  ;  $R_{SAT} = 38m\Omega$ ;  $I_C = -3.5A$

### DESCRIPTION

Packaged in the E-line outline this new low saturation 60V 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

- 3.5 amps continuous current
- Up to 15 amps peak current
- Very low saturation voltages
- Excellent gain up to 10 amps

### APPLICATIONS

- DC - DC converters
- MOSFET gate drivers
- Power switches
- Motor control

### ORDERING INFORMATION

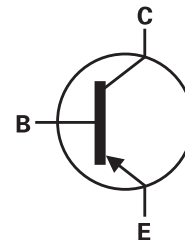
DEVICE	QUANTITY PER REEL
ZXTP2012ASTOA	2,000 units / reel
ZXTP2012ASTZ	2,000 units / carton

### DEVICE MARKING

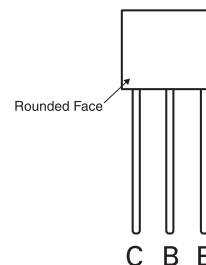
ZXT  
P20  
12



E-line



### PINOUT



TOP VIEW

# ZXTP2012A

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-base voltage	$BV_{CBO}$	-100	V
Collector-emitter voltage	$BV_{CEO}$	-60	V
Emitter-base voltage	$BV_{EBO}$	-7	V
Continuous collector current <sup>(a)</sup>	$I_C$	-3.5	A
Peak pulse current	$I_{CM}$	-15	A
Practical power dissipation at $T_A = 25^\circ\text{C}$ <sup>(a)</sup>	$P_D$	1.0	W
Linear derating factor		8	mW/ $^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ <sup>(b)</sup>	$P_D$	0.71	W
Linear derating factor		5.7	mW/ $^\circ\text{C}$
Operating and storage temperature range	$T_j, T_{stg}$	-55 to 150	$^\circ\text{C}$

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	175	$^\circ\text{C}/\text{W}$

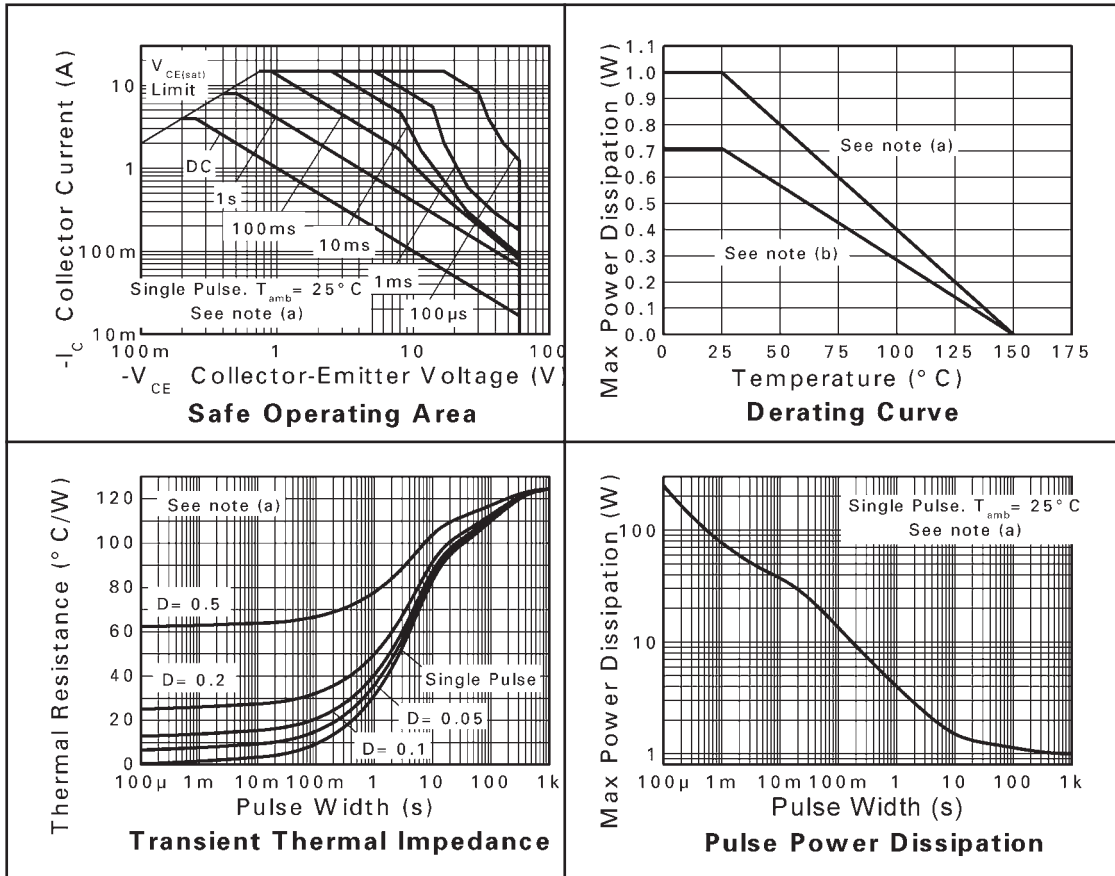
### NOTES

(a) For a device through hole mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions. Collector lead length to solder point 4mm.

(b) For a device mounted in a socket in still air conditions. Collector lead length 10mm.

# ZXTP2012A

## CHARACTERISTICS



# ZXTP2012A

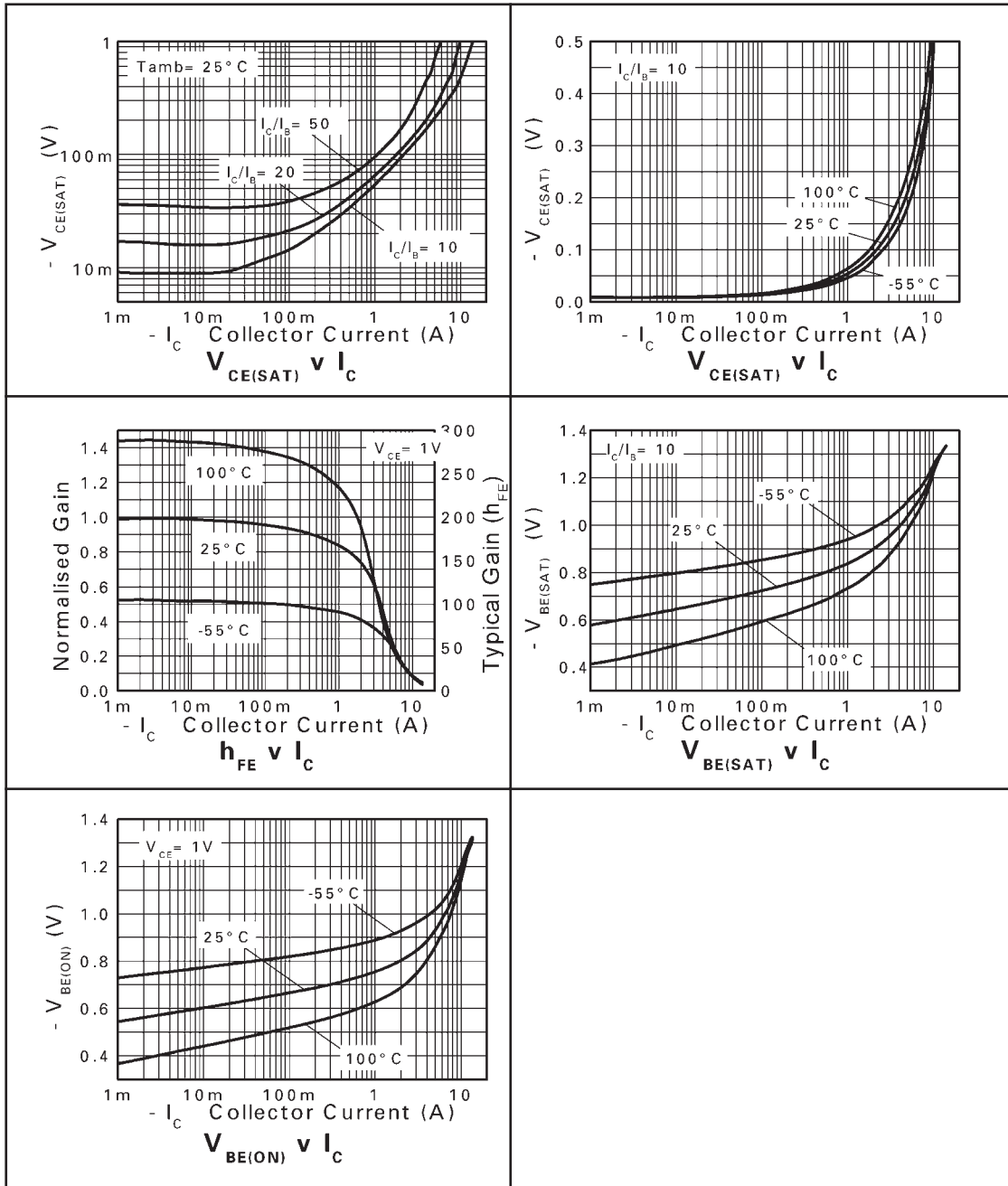
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	$BV_{CBO}$	-100	-120		V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CER}$	-100	-120		V	$I_C = -1\mu\text{A}$ , $R_B \leq 1\text{k}\Omega$
Collector-emitter breakdown voltage	$BV_{CEO}$	-60	-80		V	$I_C = -10\text{mA}^*$
Emitter-base breakdown voltage	$BV_{EBO}$	-7	-8.1		V	$I_E = -100\mu\text{A}$
Collector cut-off current	$I_{CBO}$		<1	-20 -0.5	nA $\mu\text{A}$	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector cut-off current	$I_{CER}$ $R \leq 1\text{k}\Omega$		<1	-20 -0.5	nA $\mu\text{A}$	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter cut-off current	$I_{EBO}$		<1	-10	nA	$V_{EB} = -6\text{V}$
Collector-emitter saturation voltage	$V_{CE(SAT)}$		-14 -50 -80 -145	-20 -65 -115 -210	mV mV mV mV	$I_C = -0.1\text{A}$ , $I_B = -10\text{mA}^*$ $I_C = -1\text{A}$ , $I_B = -100\text{mA}^*$ $I_C = -2\text{A}$ , $I_B = -200\text{mA}^*$ $I_C = -4\text{A}$ , $I_B = -400\text{mA}^*$
Base-emitter saturation voltage	$V_{BE(SAT)}$		-960	-1060	mV	$I_C = -4\text{A}$ , $I_B = -400\text{mA}^*$
Base-emitter turn-on voltage	$V_{BE(ON)}$		-850	-960	mV	$I_C = -4\text{A}$ , $V_{CE} = -1\text{V}^*$
Static forward current transfer ratio	$h_{FE}$	100 100 65 10	250 200 120 25	300		$I_C = -10\text{mA}$ , $V_{CE} = -1\text{V}^*$ $I_C = -1\text{A}$ , $V_{CE} = -1\text{V}^*$ $I_C = -4\text{A}$ , $V_{CE} = -1\text{V}^*$ $I_C = -10\text{A}$ , $V_{CE} = -1\text{V}^*$
Transition frequency	$f_T$		120		MHz	$I_C = -100\text{mA}$ , $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Output capacitance	$C_{OBO}$		48		pF	$V_{CB} = -10\text{V}$ , $f = 1\text{MHz}^*$
Switching times	$t_{ON}$ $t_{OFF}$		39 370		ns	$I_C = -1\text{A}$ , $V_{CC} = -10\text{V}$ , $I_{B1} = I_{B2} = -100\text{mA}$

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

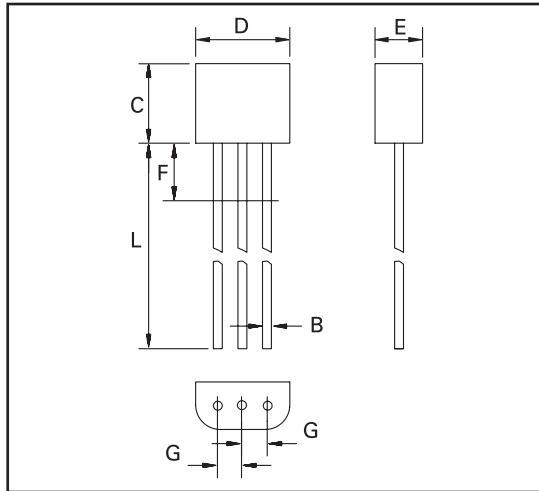
# ZXTP2012A

## TYPICAL CHARACTERISTICS



# ZXTP2012A

## PACKAGE OUTLINE



Controlling dimensions are in millimeters. Approximate conversions are given in inches

## PACKAGE DIMENSIONS

DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.41	0.495	0.016	0.0195
B	0.41	0.495	0.016	0.0195
C	3.61	4.01	0.142	0.158
D	4.37	4.77	0.172	0.188
E	2.16	2.41	0.085	0.095
F	—	2.50	—	0.098
G	1.27 NOM		0.050 NOM	
L	13.00	13.97	0.512	0.550

© Zetex Semiconductors plc 2005

Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Hwy 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 <a href="mailto:europa.sales@zetex.com">europa.sales@zetex.com</a>	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 <a href="mailto:usa.sales@zetex.com">usa.sales@zetex.com</a>	Telephone: (852) 26100 611 Fax: (852) 24250 494 <a href="mailto:asia.sales@zetex.com">asia.sales@zetex.com</a>	Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 <a href="mailto:hq@zetex.com">hq@zetex.com</a>

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to [www.zetex.com](http://www.zetex.com)



ISSUE 2 - NOVEMBER 2005