

ZXTP23015CFH

15V, SOT23, PNP medium power transistor

Summary

$V_{(BR)CES} > -15V$, $V_{(BR)CEO} > -15V$

$V_{(BR)ECO} > -6V$

$I_{C(CONT)} = -6A$

$R_{CE(SAT)} = 20m\Omega$ typical

$V_{CE(SAT)} < -36mV$ @ -1A

$P_D = 1.25W$

Complementary part number ZXTN23015CFH

Description

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

Feature

- Higher power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 15V forward blocking voltage
- 6V reverse blocking voltage

Applications

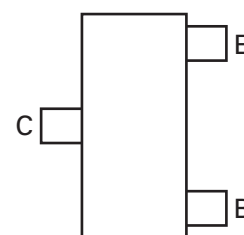
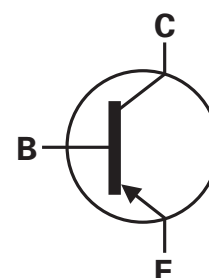
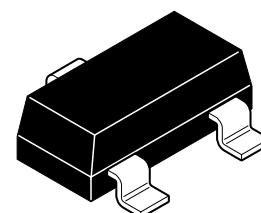
- High side disconnect switches
- DC - DC converters
- MOSFET and IGBT gate driving
- Motor drive
- Relay, lamp, and solenoid drive

Ordering information

Device	Reel size (inches)	Tape width	Quantity per reel
ZXTP23015CFHTA	7	8mm	3000

Device marking

317



Pinout - top view

ZXTP23015CFH

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-15	V
Collector-emitter voltage	$V_{(BR)CES}$	-15	V
Collector-emitter voltage	V_{CEO}	-15	V
Emitter-base voltage	V_{EBO}	-7.0	V
Emitter-collector voltage	V_{ECO}	-6.0	V
Peak pulse current	I_{CM}	-10	A
Continuous collector current ^(c)	I_C	-5	A
Continuous collector current ^(d)	I_C	-6	A
Base current	I_B	-1.2	A
Power dissipation @ $T_A=25^{\circ}C$ ^(a) Linear derating factor ^(a)	P_D	0.73 5.84	W mW/ $^{\circ}C$
Power dissipation @ $T_A=25^{\circ}C$ ^(b) Linear derating factor ^(b)	P_D	1.05 8.4	W mW/ $^{\circ}C$
Power dissipation @ $T_A=25^{\circ}C$ ^(c) Linear derating factor ^(c)	P_D	1.25 9.6	W mW/ $^{\circ}C$
Power dissipation @ $T_A=25^{\circ}C$ ^(d) Linear derating factor ^(d)	P_D	1.81 14.5	W mW/ $^{\circ}C$
Operating and storage temperature	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

Thermal resistance

Parameter	Symbol	Value	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.

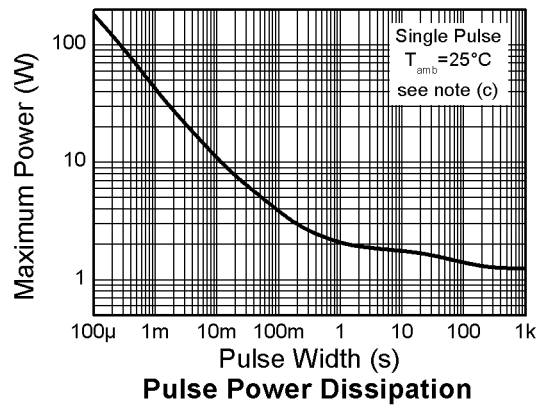
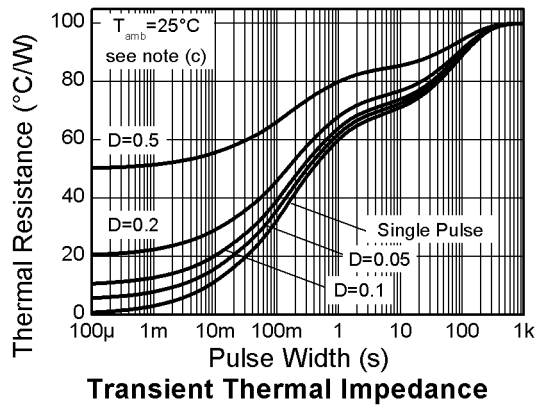
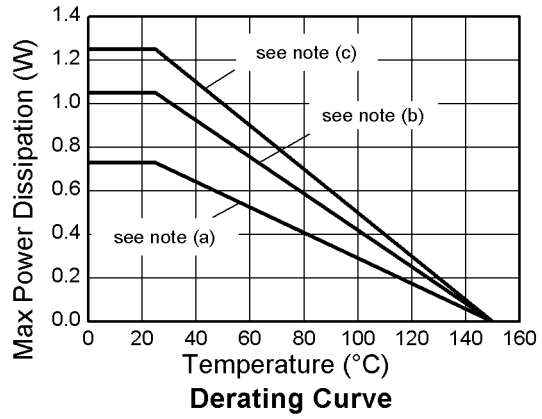
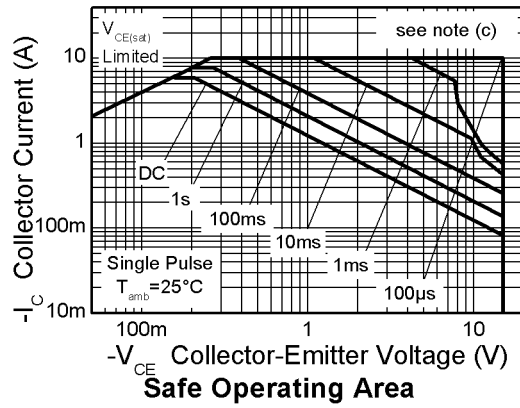
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

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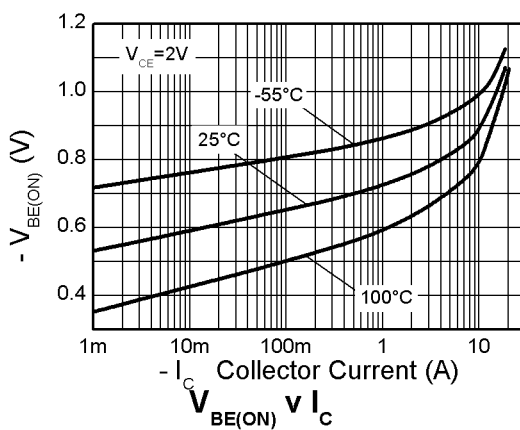
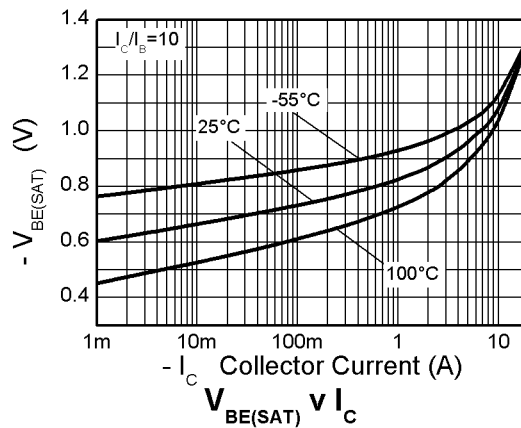
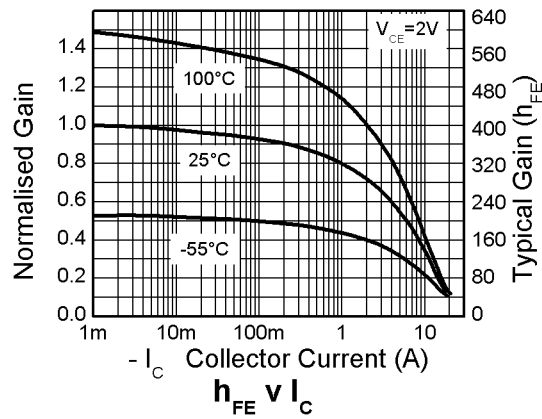
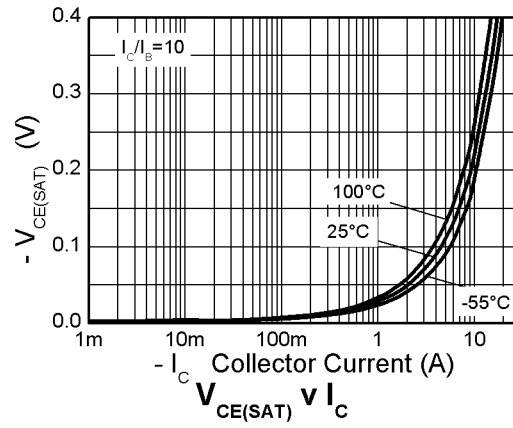
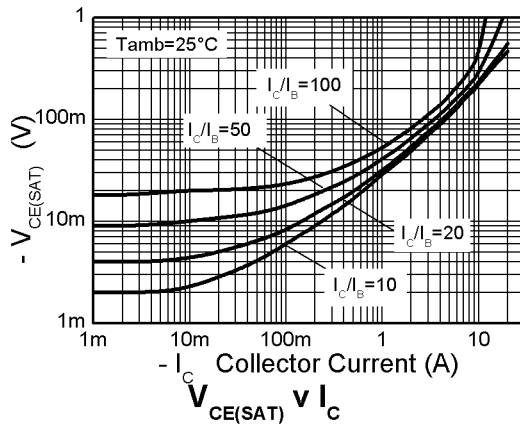
ELECTRICAL CHARACTERISTICS (at $T_{AMB} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	-15	-40		V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CES}$	-15	-40		V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	-15	-25		V	$I_C = -10\text{mA}^{(*)}$
Emitter-base breakdown voltage	$V_{(BR)EBO}$	-7.0	-8.2		V	$I_E = -100\mu\text{A}$
Emitter-collector breakdown voltage	$V_{(BR)ECO}$	-6.0	-8.5		V	$I_E = -100\mu\text{A}$
Collector-emitter cut-off current	I_{CES}			-20	nA	$V_{CE} = -12\text{V}$
Collector-base cut-off current	I_{CBO}			-20	nA	$V_{CB} = -12\text{V}$
Emitter-base cut-off current	I_{EBO}			-10	nA	$V_{EB} = -6\text{V}$
Static forward current transfer ratio	H_{FE}	200 200 140	380 350 220	560		$I_C = -10\text{mA}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -500\text{mA}$, $V_{CE} = -2\text{V}$ $I_C = -6\text{A}$, $V_{CE} = -2\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		-6 -27 -90 -140	-10 -36 -120 -190	mV mV mV mV	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^{(*)}$ $I_C = -3\text{A}$, $I_B = -60\text{mA}^{(*)}$ $I_C = -6\text{A}$, $I_B = -240\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		-0.83 -0.93	-0.93 -1.03	V V	$I_C = -3\text{A}$, $I_B = -60\text{mA}^{(*)}$ $I_C = -6\text{A}$, $I_B = -240\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		-0.83	-0.93	V	$I_C = -6\text{A}$, $V_{CE} = -2\text{V}^{(*)}$
Transition frequency	f_T		270		MHz	$I_C = -500\text{mA}$, $V_{CE} = -2\text{V}$, $f = 50\text{MHz}$
Output capacitance	C_{obo}		78.4		pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Delay time	$t_{(d)}$		16		ns	$V_{CC} = -5\text{V}$, $I_C = -3\text{A}$, $I_{B1} = I_{B2} = -150\text{mA}$
Rise time	$t_{(r)}$		13		ns	
Storage time	$t_{(stg)}$		123		ns	
Fall time	$t_{(f)}$		9		ns	

NOTES:

(*) Measured under pulsed conditions. Pulse width = $300\mu\text{S}$. Duty cycle $\leq 2\%$.

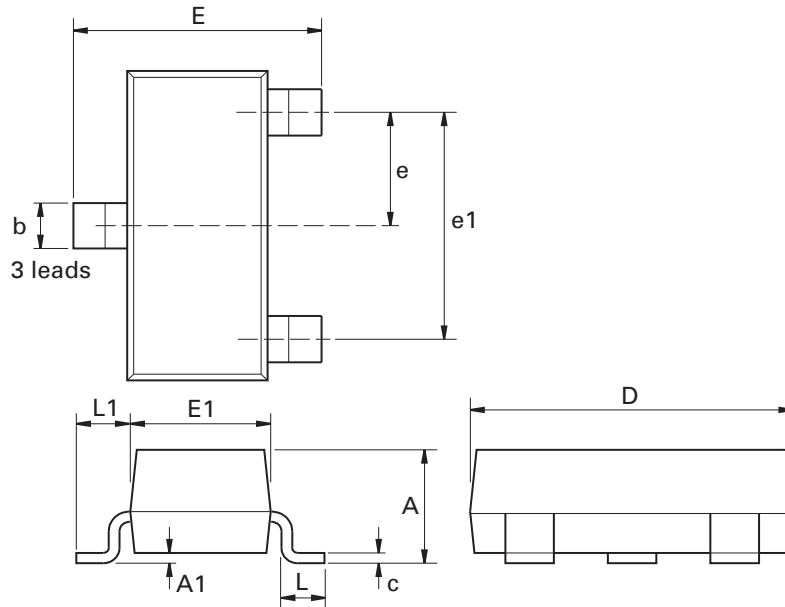
Typical characteristics



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Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	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	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 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 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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Website :

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Contact Us :

➤ Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
Minhang District, Shanghai , China

➤ Sales :

Direct +86 (21) 6401-6692

Email amall@ameya360.com

QQ 800077892

Skype ameyasales1 ameyasales2

➤ Customer Service :

Email service@ameya360.com

➤ Partnership :

Tel +86 (21) 64016692-8333

Email mkt@ameya360.com