

ZXTC2062E6

20V, SOT23-6, complementary medium power transistors

Summary

$BV_{CEO} > 20$ (-20)V

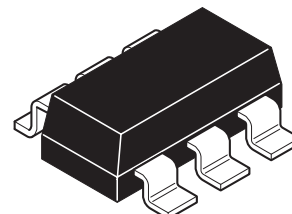
$BV_{ECO} > 5$ (-4)V

$I_{C(cont)} = 4$ (-3.5)A

$V_{CE(sat)} < 50$ (-65)mV @ 1A

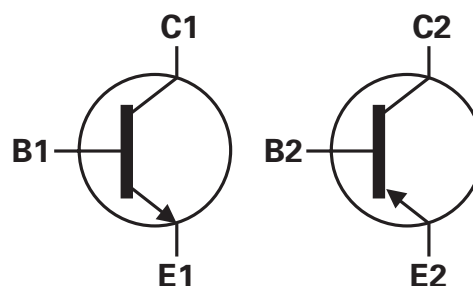
$R_{CE(sat)} = 35$ (54)m Ω

$P_D = 1.1$ W



Description

Advanced process capability has been used to achieve this high performance device. Combining NPN and PNP transistors in the SOT23-6 package provides a compact solution for the intended applications



Features

- NPN-PNP combination
- Very low saturation voltage
- High gain
- SOT23-6 package

Applications

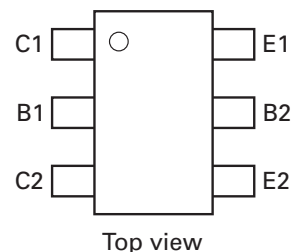
- MOSFET and IGBT gate driving
- Motor drive

Ordering information

DEVICE	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTC2062E6TA	7	8	3000

Device marking

2062



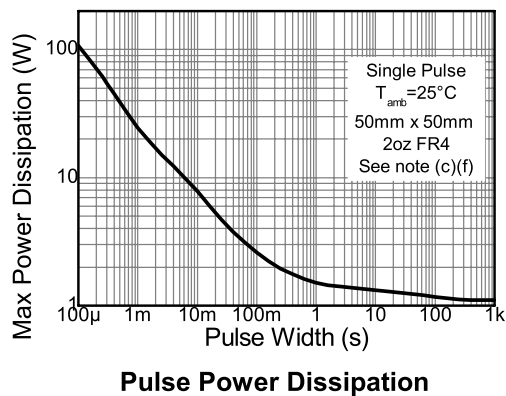
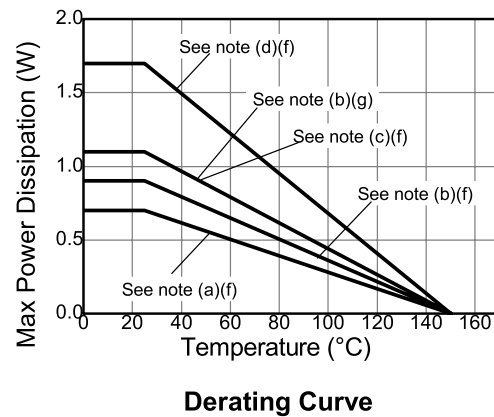
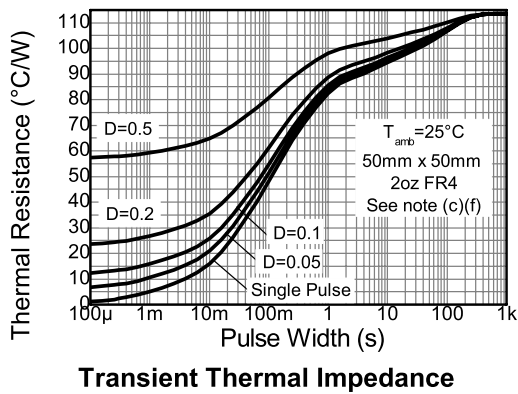
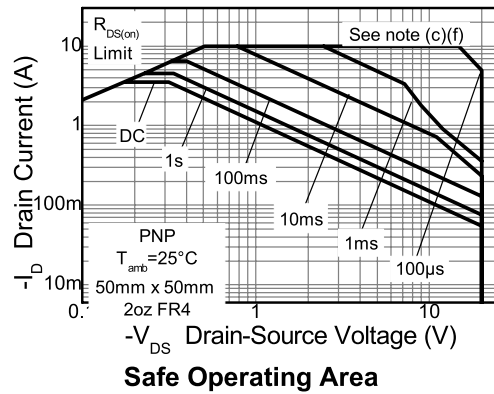
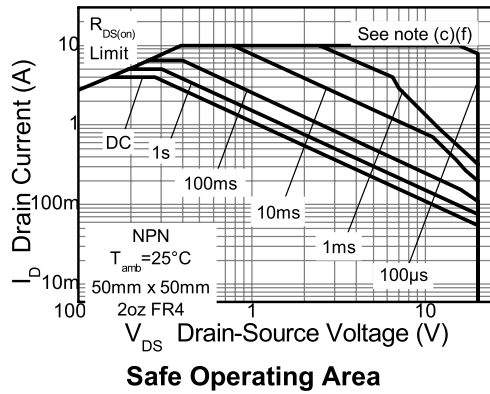
Absolute maximum and thermal ratings

PARAMETER	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	100(-25)	V
Collector-emitter voltage	V_{CEO}	(-)20	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	5(-4)	V
Emitter-base voltage	V_{EBO}	(-)7	V
Continuous collector current ^{(c)(f)}	I_C	4(-3.5)	A
Peak pulse current	I_{CM}	(-)10	A
Base current	I_B	(-)1	A
Power dissipation at $T_A = 25^{\circ}\text{C}^{(a)(f)}$ Linear derating factor	P_D	0.7 5.6	W mW/ $^{\circ}\text{C}$
Power dissipation at $T_A = 25^{\circ}\text{C}^{(b)(f)}$ Linear derating factor	P_D	0.9 7.2	W mW/ $^{\circ}\text{C}$
Power dissipation at $T_A = 25^{\circ}\text{C}^{(b)(g)}$ Linear derating factor	P_D	1.1 8.8	W mW/ $^{\circ}\text{C}$
Power dissipation at $T_A = 25^{\circ}\text{C}^{(c)(f)}$ Linear derating factor	P_D	1.1 8.8	W mW/ $^{\circ}\text{C}$
Power dissipation at $T_A = 25^{\circ}\text{C}^{(d)(f)}$ Linear derating factor	P_D	1.7 13.6	W mW/ $^{\circ}\text{C}$
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	$^{\circ}\text{C}$
Thermal resistance junction to ambient ^{(a)(f)}	$R_{\theta JA}$	179	$^{\circ}\text{C/W}$
Thermal resistance junction to ambient ^{(b)(f)}	$R_{\theta JA}$	139	$^{\circ}\text{C/W}$
Thermal resistance junction to ambient ^{(b)(g)}	$R_{\theta JA}$	113	$^{\circ}\text{C/W}$
Thermal resistance junction to ambient ^{(c)(f)}	$R_{\theta JA}$	113	$^{\circ}\text{C/W}$
Thermal resistance junction to ambient ^{(d)(f)}	$R_{\theta JA}$	73	$^{\circ}\text{C/W}$

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) 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.
- (c) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
- (d) As above measured at $t < 5$ seconds.
- (e) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
- (f) For device with one active die, both collectors attached to a common sink.
- (g) For device with two active dice running at equal power, split sink 50% to each collector.

Thermal characteristics



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ELECTRICAL CHARACTERISTICS (at Tamb = 25°C unless otherwise stated).

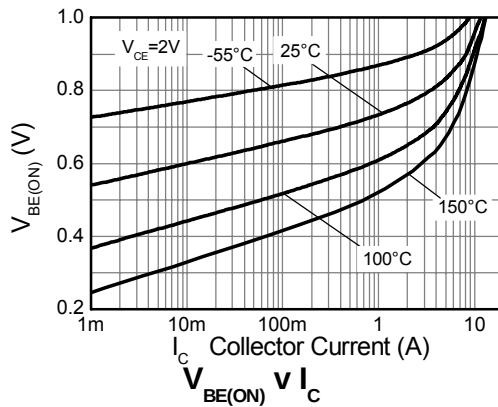
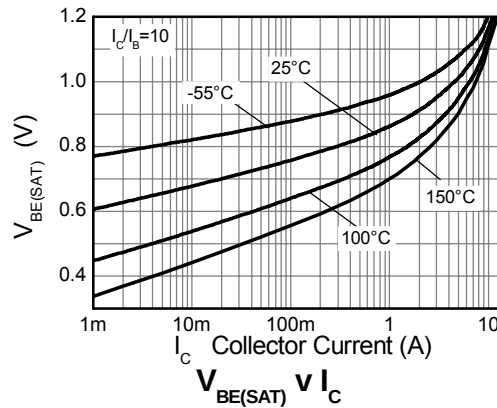
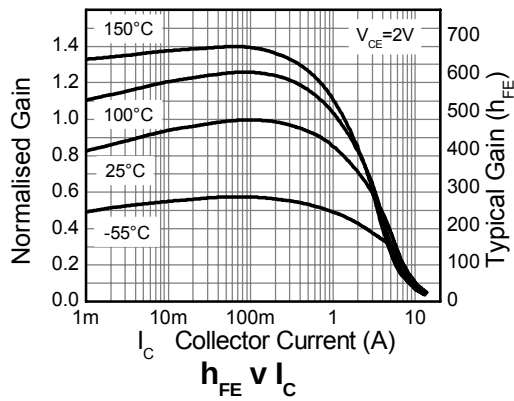
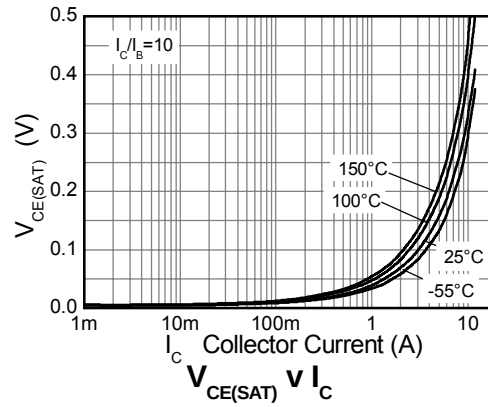
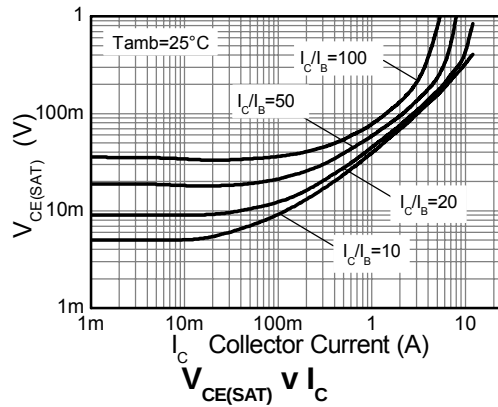
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
		100(-25)	140(-55)		V	$I_C = (-)100\mu A$
Collector-emitter breakdown voltage (base open)	BV_{CEO}	(-)20	35(-45)		V	$I_C = (-)10mA^{(*)}$
Emitter-base breakdown voltage	BV_{EBO}	(-)7	(-)8.3		V	$I_E = (-)100 A$
Emitter-collector breakdown voltage (base open)	BV_{ECO}	5(-4)	6(-8.5)		V	$I_E = (-)100 A$
Collector-base cut-off current	I_{CBO}		<1	(-)50 (-)0.5	nA A	$V_{CB} = 100(-25)V$ $V_{CB} = 100(-25)V, T_{amb} = 100^\circ C$
Emitter-base cut-off current	I_{EBO}		<1	(-)50	nA	$V_{EB} = (-)5.6V$
Collector-emitter saturation voltage	$V_{CE(sat)}$		40(-55)	50(-65)	mV	$I_C = (-)1A, I_B = (-)100mA^{(*)}$
			60(-100)	75(-135)	mV	$I_C = (-)1A, I_B = (-)20mA^{(*)}$
			95(-185)	115(-280)	mV	$I_C = (-)2A, I_B = (-)40mA^{(*)}$
			(-190)	(-250)	mV	$(I_C = -3.5A, I_B = -175mA)^{(*)}$
			140	190	mV	$I_C = 4A, I_B = 200mA^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		(-925)	(-1000)	mV	$(I_C = -3.5A, I_B = -175mA)^{(*)}$
			940	1050	mV	$I_C = 4A, I_B = 200mA^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		(-835)	(-900)	mV	$(I_C = -3.5A, V_{CE} = -2V)^{(*)}$
			810	900	mV	$I_C = 4A, V_{CE} = 2V^{(*)}$
Static forward current transfer ratio	h_{FE}	300(300)	450(450)	900(900)		$I_C = (-)10mA, V_{CE} = (-)2V^{(*)}$
		280(170)	420(300)			$I_C = (-)1A, V_{CE} = (-)2V^{(*)}$
		(65)	(100)			$(I_C = -3.5A, V_{CE} = -2V)^{(*)}$
		140	210			$I_C = 4A, V_{CE} = 2V^{(*)}$
			(15)			$(I_C = -10A, V_{CE} = -2V)^{(*)}$
Transition frequency	f_T		215 (290)		MHz	$I_C = (-)50mA, V_{CE} = (-)10V$ $f = 100MHz$
Output capacitance	C_{OBO}		17(21)	25(30)	pF	$V_{CB} = (-)10V, f = 1MHz^{(*)}$
Delay time	t_d		68(56)		ns	$V_{CC} = (-)10V, I_C = (-)1A,$ $I_{B1} = -I_{B2} = (-)10mA.$
Rise time	t_r		72(68)		ns	
Storage time	t_s		361(158)		ns	
Fall time	t_f		64(59)		ns	

NOTES:

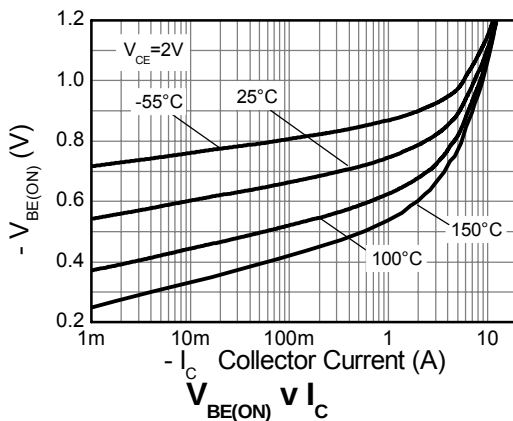
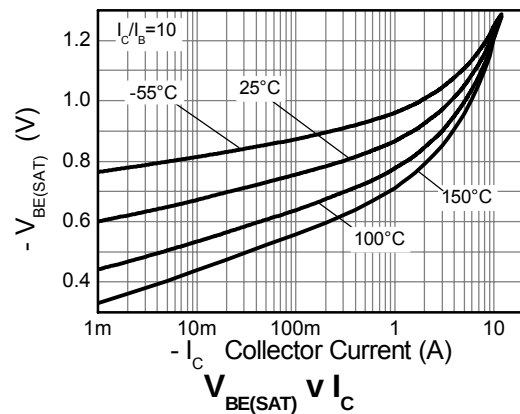
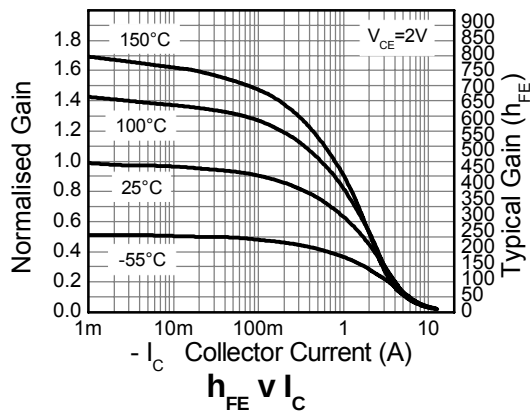
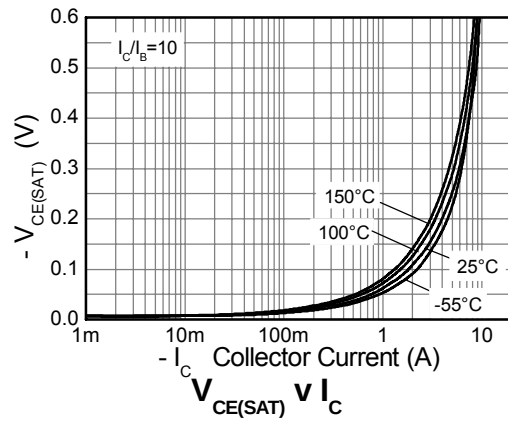
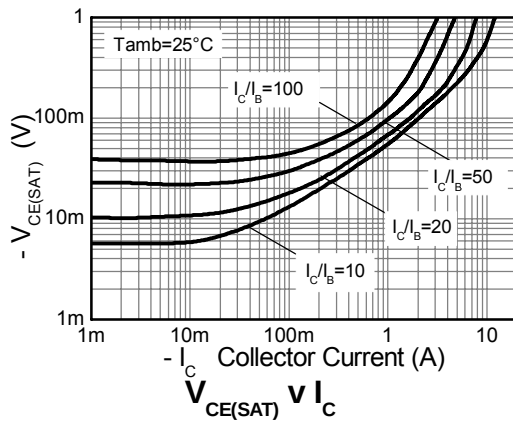
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

() = PNP

NPN electrical characteristics



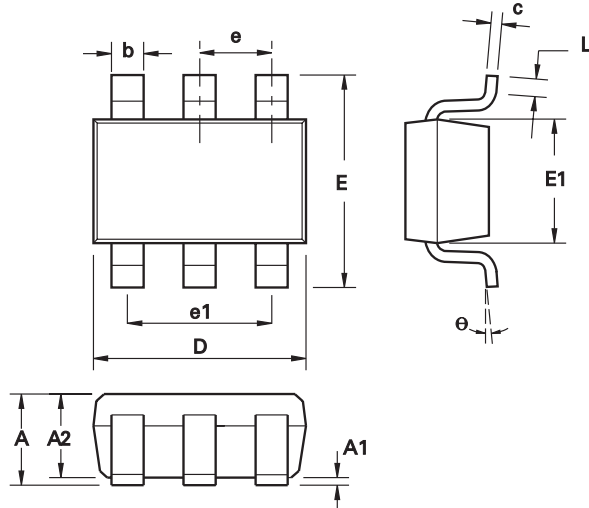
PNP electrical characteristics



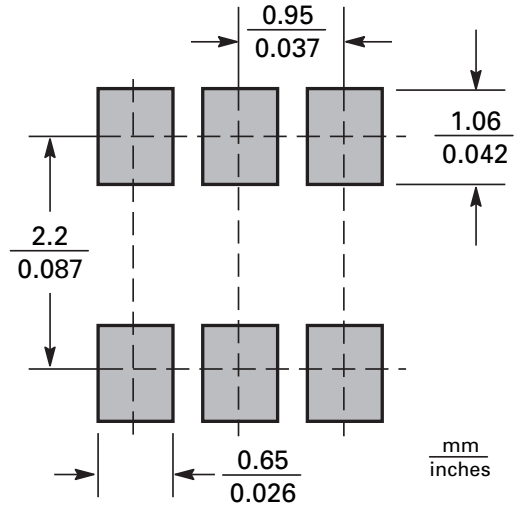
ZXTC2062E6

Package outline SOT23-6

Package outline



Pad layout details



DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.45	0.354	0.0570
A1	0.00	0.15	0.00	0.0059
A2	0.90	1.30	0.0354	0.0511
b	0.35	0.50	0.0078	0.0196
C	0.09	0.26	0.0035	0.0102
D	2.70	3.10	0.1062	0.1220
E	2.20	3.20	0.0866	0.1181
E1	1.30	1.80	0.0511	0.0708
L	0.10	0.60	0.0039	0.0236
e	0.95 REF		0.0374 REF	
e1	1.90 REF		0.0748 REF	
L	0°	30°	0°	30°

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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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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