

# ZXTC2062E6

## 20V, SOT23-6, complementary medium power transistors

### Summary

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

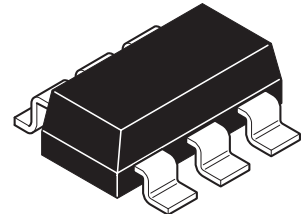
$BV_{ECO} > 5$  (-4)V

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

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

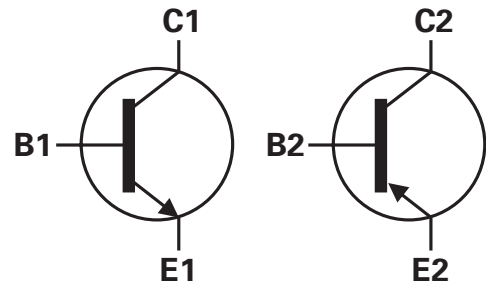
$R_{CE(sat)} = 35$  (54)m $\Omega$

$P_D = 1.1$ 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

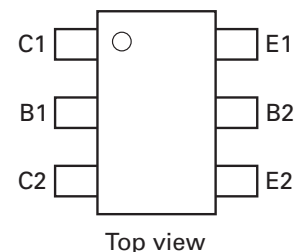
- MOSFET and IGBT gate driving
- Motor drive

### Ordering information

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

### Device marking

2062



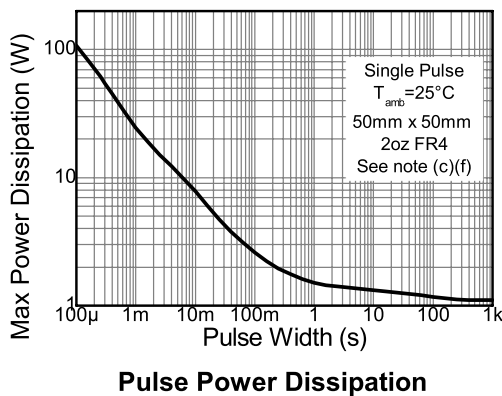
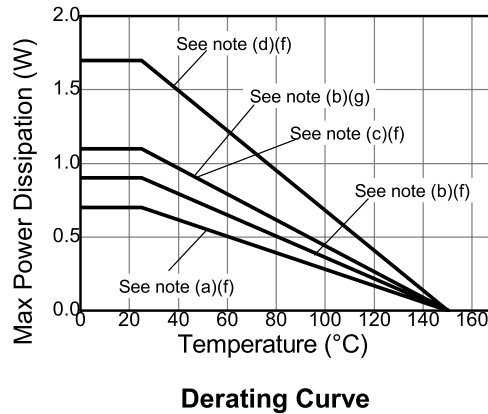
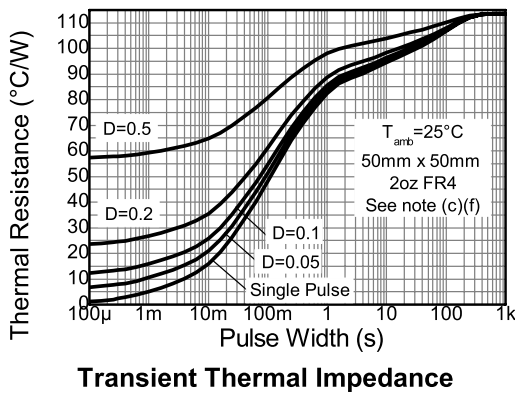
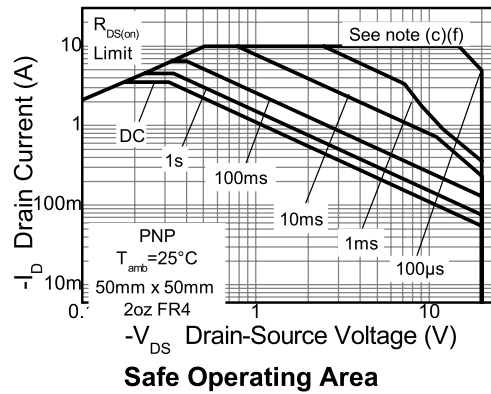
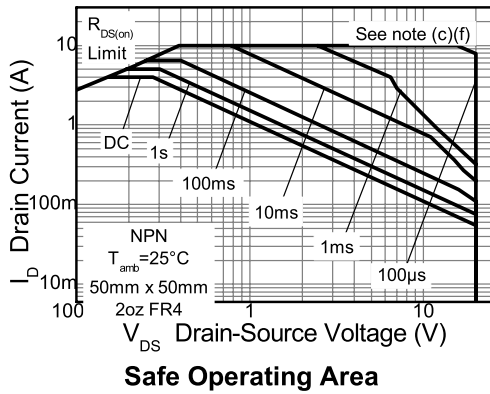
## Absolute maximum and thermal ratings

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 <sup>(c)(f)</sup>	$I_C$	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/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(b)(f)}$ Linear derating factor	$P_D$	0.9 7.2	W mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(b)(g)}$ Linear derating factor	$P_D$	1.1 8.8	W mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(c)(f)}$ Linear derating factor	$P_D$	1.1 8.8	W mW/°C
Power dissipation at $T_A = 25^\circ\text{C}^{(d)(f)}$ Linear derating factor	$P_D$	1.7 13.6	W mW/°C
Operating and storage temperature range	$T_j, T_{stg}$	-55 to +150	°C
Thermal resistance junction to ambient <sup>(a)(f)</sup>	$R_{\theta JA}$	179	°C/W
Thermal resistance junction to ambient <sup>(b)(f)</sup>	$R_{\theta JA}$	139	°C/W
Thermal resistance junction to ambient <sup>(b)(g)</sup>	$R_{\theta JA}$	113	°C/W
Thermal resistance junction to ambient <sup>(c)(f)</sup>	$R_{\theta JA}$	113	°C/W
Thermal resistance junction to ambient <sup>(d)(f)</sup>	$R_{\theta JA}$	73	°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



# ZXTC2062E6

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

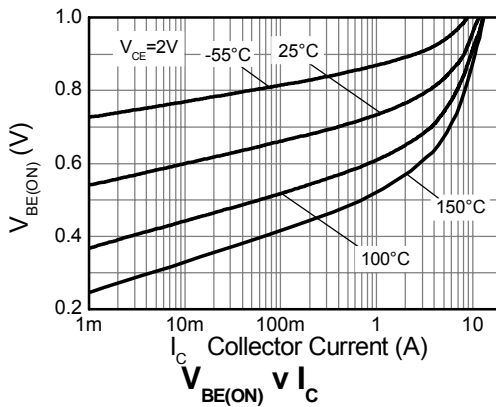
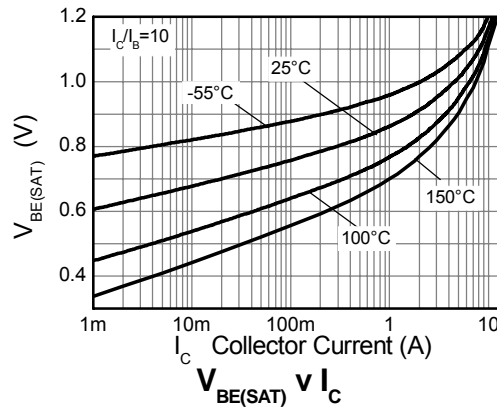
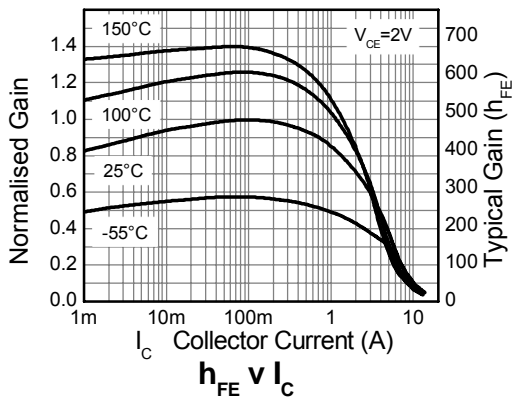
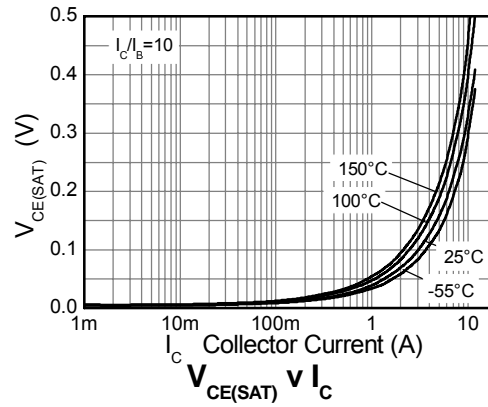
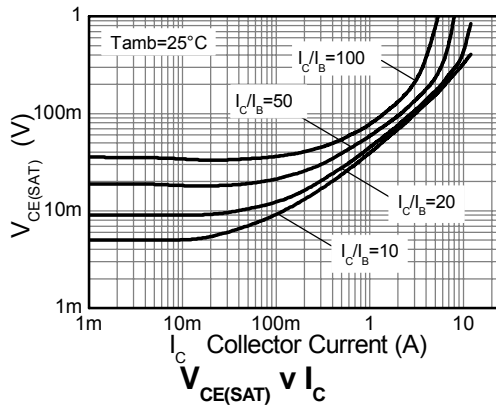
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
		100(-25)	140(-55)		V	$I_C = (-)100\mu A$
Collector-emitter breakdown voltage (base open)	$BV_{CEO}$	(-)20	35(-45)		V	$I_C = (-)10mA^{(*)}$
Emitter-base breakdown voltage	$BV_{EBO}$	(-)7	(-)8.3		V	$I_E = (-)100 A$
Emitter-collector breakdown voltage (base 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) 60(-100) 95(-185) (-190) 140	50(-65) 75(-135) 115(-280) (-250) 190	mV mV mV mV mV	$I_C = (-)1A, I_B = (-)100mA^{(*)}$ $I_C = (-)1A, I_B = (-)20mA^{(*)}$ $I_C = (-)2A, I_B = (-)40mA^{(*)}$ $(I_C = -3.5A, I_B = -175mA)^{(*)}$ $I_C = 4A, I_B = 200mA^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		(-925) 940	(-1000) 1050	mV mV	$(I_C = -3.5A, I_B = -175mA)^{(*)}$ $I_C = 4A, I_B = 200mA^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		(-835) 810	(-900) 900	mV mV	$(I_C = -3.5A, V_{CE} = -2V)^{(*)}$ $I_C = 4A, V_{CE} = 2V^{(*)}$
Static forward current transfer ratio	$h_{FE}$	300(300) 280(170) (65) 140	450(450) 420(300) (100) 210 (15) 15	900(900)		$I_C = (-)10mA, V_{CE} = (-)2V^{(*)}$ $I_C = (-)1A, V_{CE} = (-)2V^{(*)}$ $(I_C = -3.5A, V_{CE} = -2V)^{(*)}$ $I_C = 4A, V_{CE} = 2V^{(*)}$ $(I_C = -10A, V_{CE} = -2V)^{(*)}$ $I_C = 15A, V_{CE} = 2V^{(*)}$
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:

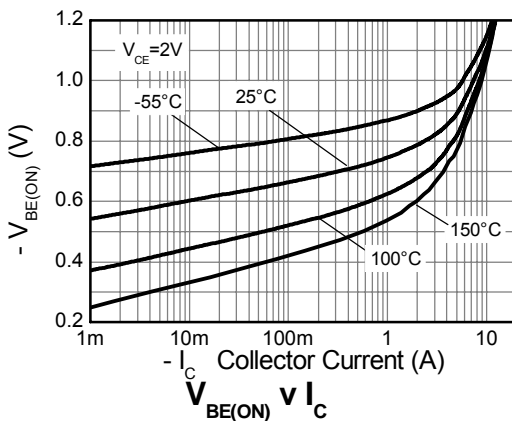
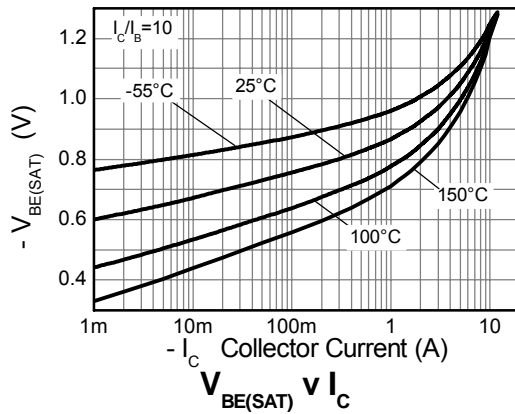
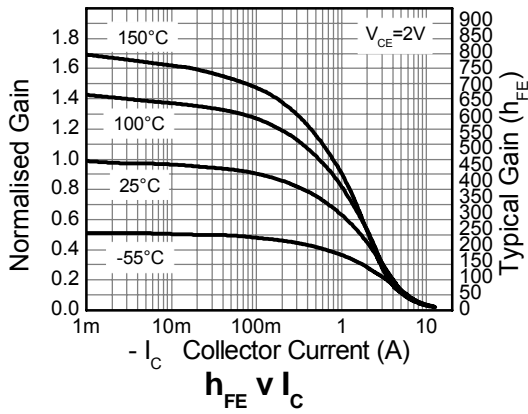
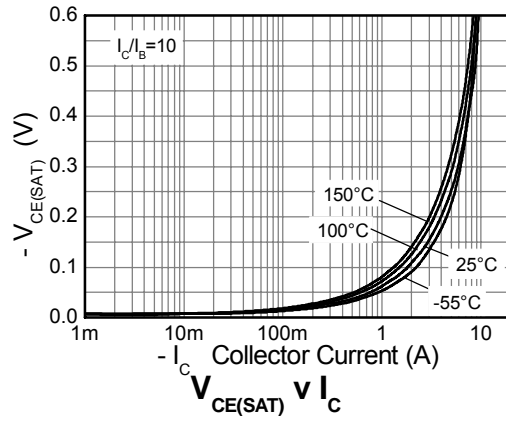
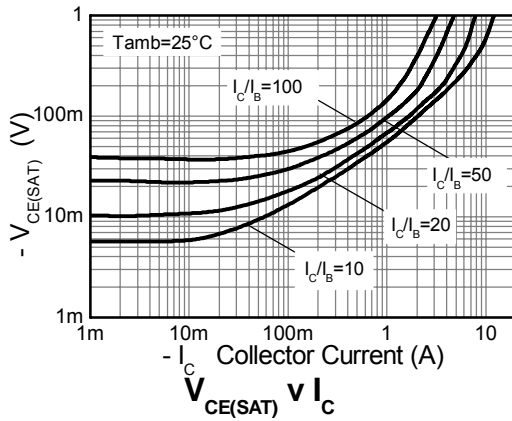
(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .

( ) = PNP

## NPN electrical characteristics



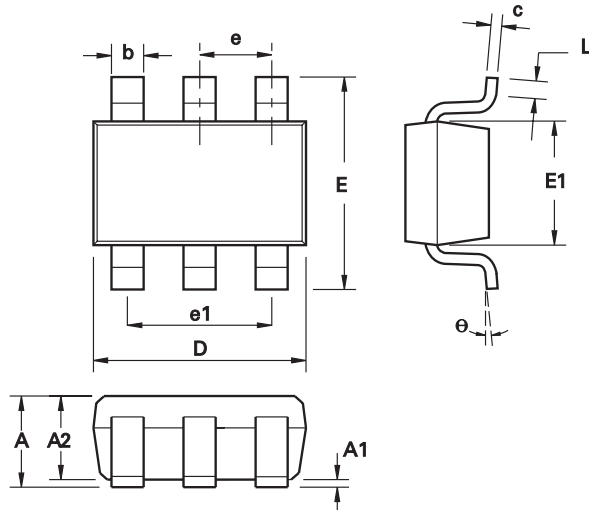
## PNP electrical characteristics



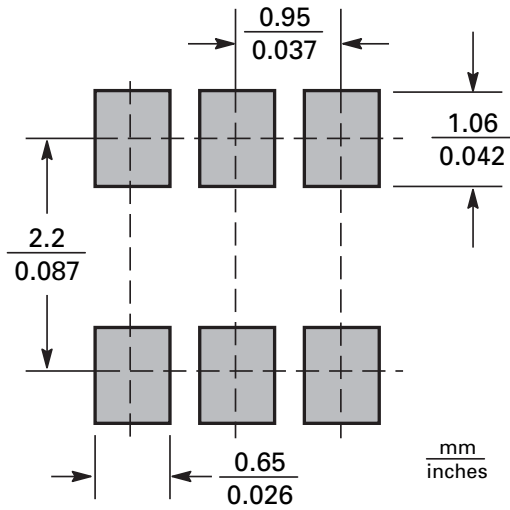
# ZXTC2062E6

## 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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