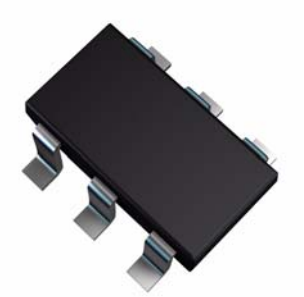
A Product Line of
Diodes Incorporated

ZXTC2061E6
12V, SOT23-6, complementary medium power transistors

Summary



BV_{CEO} > 12 (-12)V

h_{FE} > 500

$I_{C(cont)}$ = 5 (-3.5)A

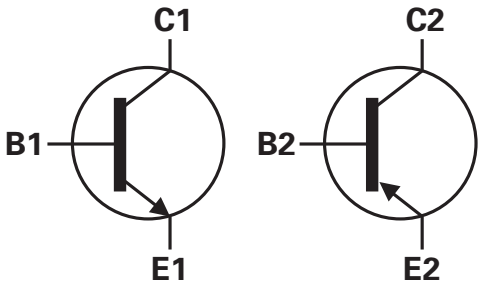
$V_{CE(sat)}$ < 40 (-70)mV @ 1A

$R_{CE(sat)}$ = 25 (45)mΩ

P_D = 1.1W

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

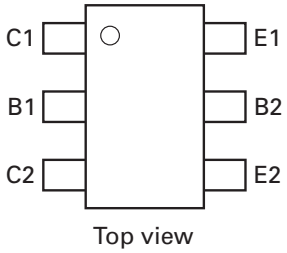
- NPN-PNP combination
- Very low saturation voltage
- High gain
- SOT23-6 package

Applications

- MOSFET and IGBT gate driving
- Motor drive

Ordering information

DEVICE	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTC2061E6TA	7	8	3000



Top view

Device marking

2061

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Absolute maximum and thermal ratings

PARAMETER	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	20(-12)	V
Collector-emitter voltage	V_{CEO}	12(-12)	V
Emitter-base voltage	V_{EBO}	7(-7)	V
Continuous collector current(c)(f)	I_C	5(-3.5)	A
Peak pulse current	I_{CM}	12(-10)	A
Base current	I_B	1(-1)	A
Power dissipation at T_A =25°C(a)(f) Linear derating factor	P_D	0.7 5.6	W mW/°C
Power dissipation at T_A =25°C(b)(f) Linear derating factor	P_D	0.9 7.2	W mW/°C
Power dissipation at T_A =25°C(b)(g) Linear derating factor	P_D	1.1 8.8	W mW/°C
Power dissipation at T_A =25°C(c)(f) Linear derating factor	P_D	1.1 8.8	W mW/°C
Power dissipation at T_A =25°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(a)(f)	$R_{\theta JA}$	179	°C/W
Thermal resistance junction to ambient(b)(f)	$R_{\theta JA}$	139	°C/W
Thermal resistance junction to ambient(b)(g)	$R_{\theta JA}$	113	°C/W
Thermal resistance junction to ambient(c)(f)	$R_{\theta JA}$	113	°C/W
Thermal resistance junction to ambient(d)(f)	$R_{\theta JA}$	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.

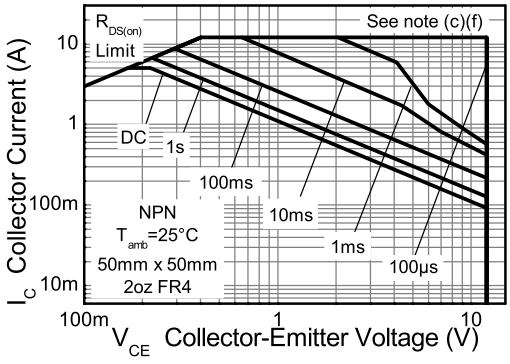
(e) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

(f) For device with one active die, both collectors attached to a common sink.

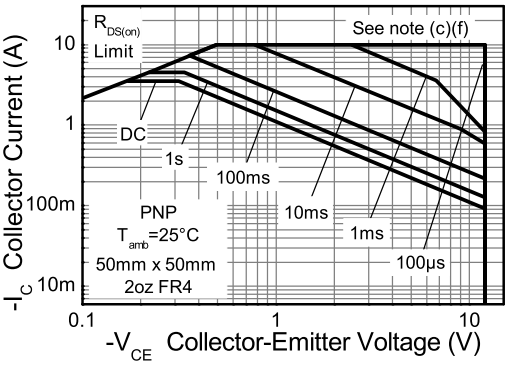
(g) For device with two active dice running at equal power, split sink 50% to each collector.

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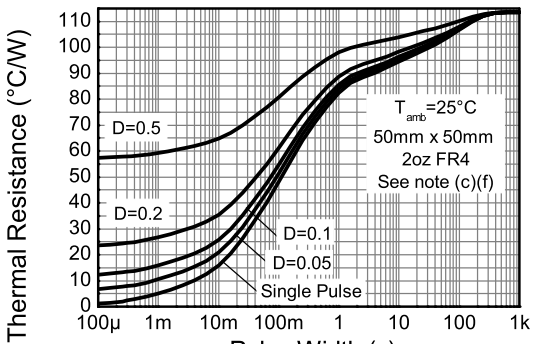
Thermal characteristics



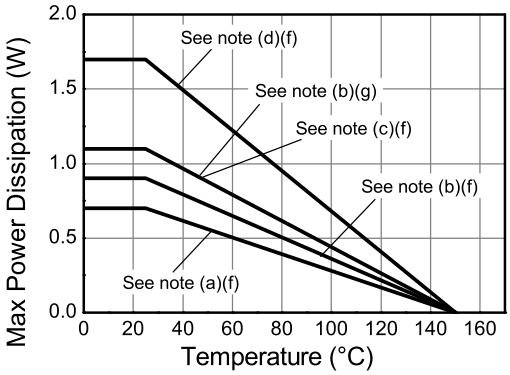
Safe Operating Area



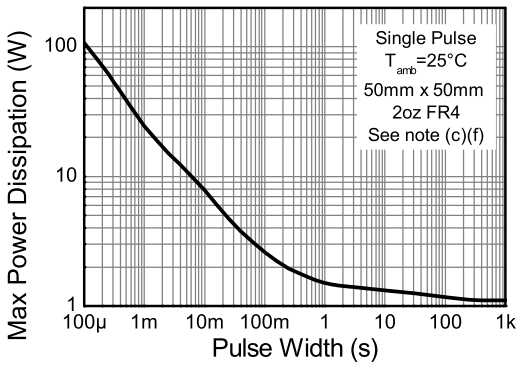
Safe Operating Area



Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation

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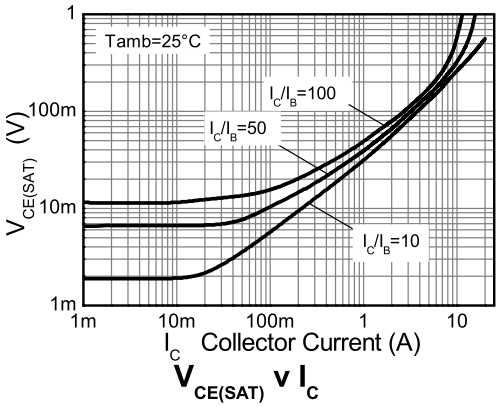
ELECTRICAL CHARACTERISTICS (at Tamb = 25°C unless otherwise stated).

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	20(-12)	40(-35)		V	I_C = (-)10μA
Collector-emitter breakdown voltage (base open)	BV_{CEO}	(-)12	17(-25)		V	I_C = (-)10mA (*)
Emitter-base breakdown voltage	BV_{EBO}	(-)7	(-)8.4		V	I_E = (-)100μA
Collector-base cut-off current	I_{CBO}		<1	(-)50 (-)0.5	nA μA	V_{CB} =20(-12)V V_{CB} =20(-12)V, T_{amb}= 100°C
Emitter-base cut-off current	I_{EBO}		<1	(-)50	nA	V_{EB} = (-)5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		32(-55) 50(-170) 65(-220) (-150) 145	40(-70) 60(-265) 80(-360) (-200) 180	mV mV mV mV mV	I_C = (-)1A, I_B = (-)100mA(*) I_C = (-)1A, I_B = (-)10mA(*) I_C = (-)2A, I_B = (-)40mA(*) (I_C = -3.5A, I_B = -350mA)(*) I_C = 5A, I_B = 100mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		(-955) 920	(-1050) 1000	mV mV	(I_C = -3.5A, I_B = -350mA(*)) I_C = 5A, I_B = 100mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		(-830) 810	(-900) 900	mV mV	(I_C = -3.5A, V_{CE} = -2V(*)) I_C = 5A, V_{CE} = 2V(*)
Static forward current transfer ratio	h_{FE}	500(500) 480(290) (75) 260	800(800) 750(450) (100) 390	1500(1500)		I_C = (-)10mA, V_{CE} = (-)2V(*) I_C = (-)1A, V_{CE} = (-)2V(*) (I_C = -3.5A, V_{CE} = -2V(*)) I_C = 5A, V_{CE} = 2V(*)
Transition frequency	f_T		260 (310)		MHz	I_C = (-)50mA, V_{CE} = (-)10V f = 100MHz
Output capacitance	C_{OBO}		26(17)	35(25)	pF	V_{CB} = (-)10V, f = 1MHz(*)
Delay time	t_d		71(41)		ns	V_{CC} = (-)10V. I_C = (-)1A, I_{B1} = -I_{B2}= (-)10mA.
Rise time	t_r		70(62)		ns	
Storage time	t_s		233(179)		ns	
Fall time	t_f		72(65)		ns	

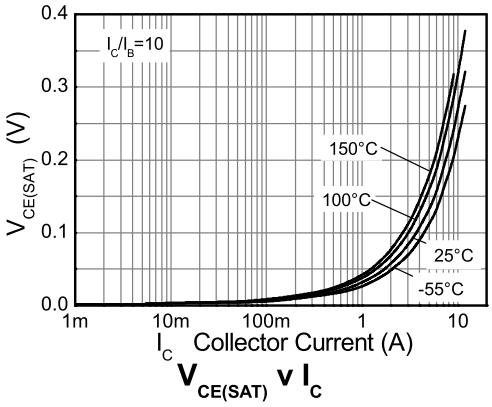
NOTES:
(*) Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
( ) = PNP

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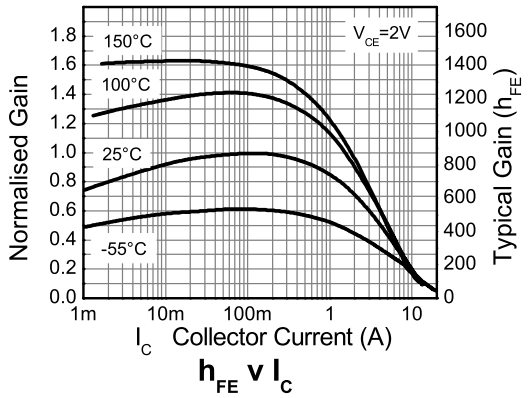
NPN electrical characteristics



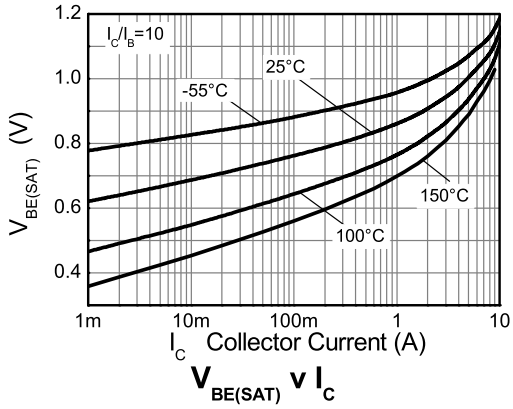
$V_{CE(SAT)}$ v I_C



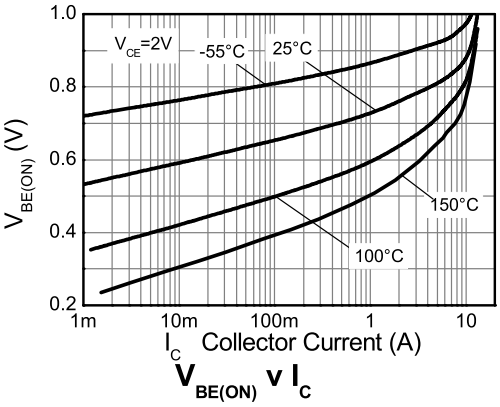
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



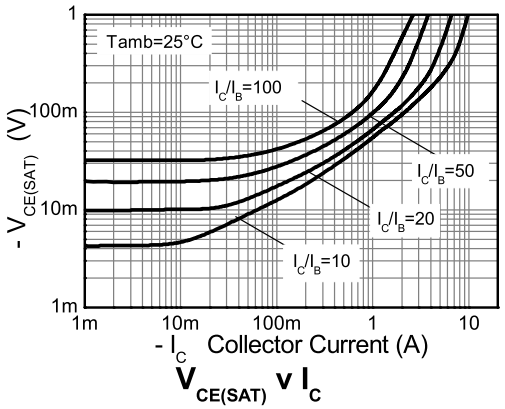
$V_{BE(SAT)}$ v I_C



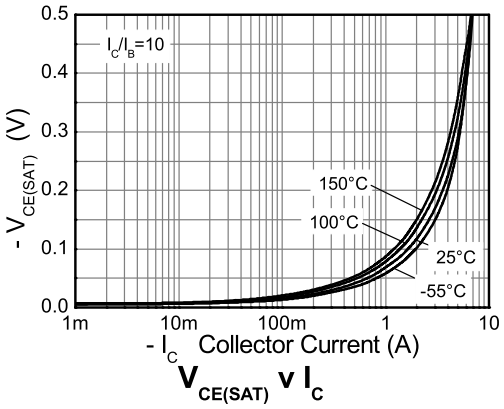
$V_{BE(ON)}$ v I_C

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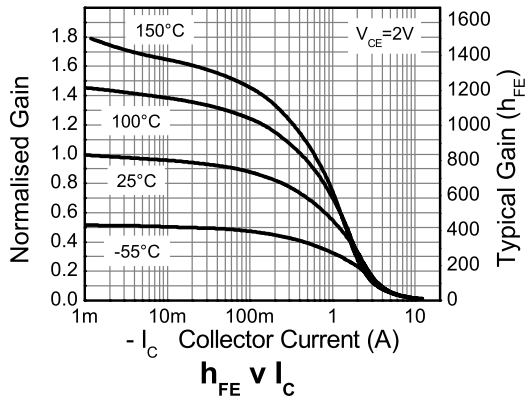
PNP electrical characteristics



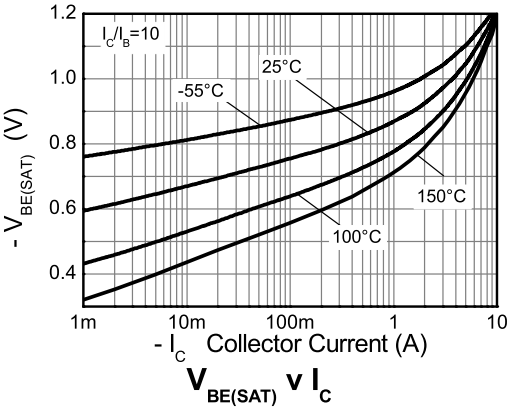
$V_{CE(SAT)}$ v I_C



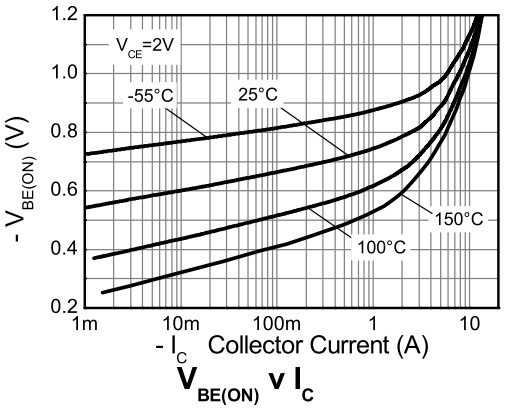
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

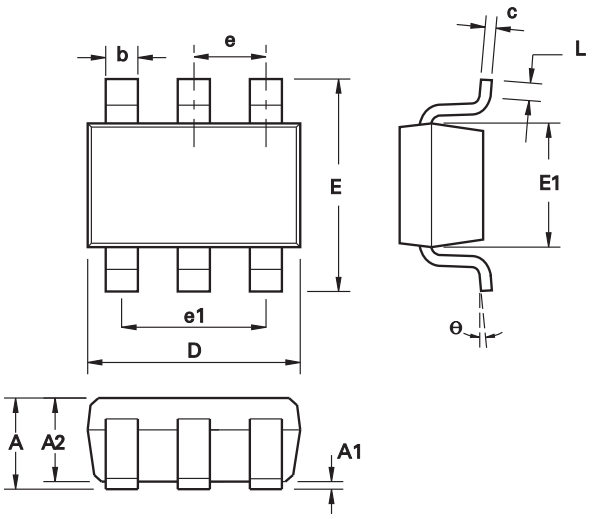


$V_{BE(ON)}$ v I_C

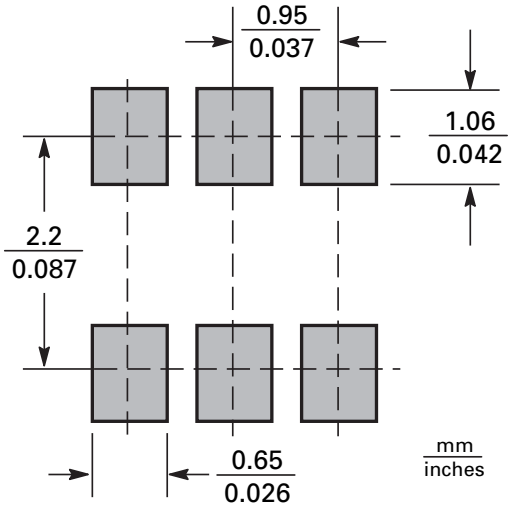
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Package outline SOT23-6

Package outline



Pad latout 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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"Obsolete"	Production has been discontinued

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