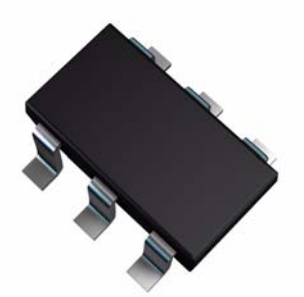
ZXTC2063E6
40V, SOT23-6, complementary medium power transistors

Summary



BV_{CEO} > 40 (-40)V

BV_{ECO} > 6 (-3)V

$I_{C(cont)}$ = 3.5 (-3)A

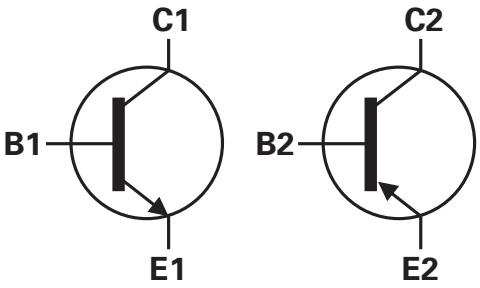
$V_{CE(sat)}$ < 60 (-90)mV @ 1A

$R_{CE(sat)}$ = 38 (58)mΩ

P_D = 1.1W

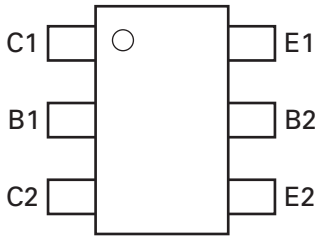
Description

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



Top view

Applications

- MOSFET and IGBT gate driving
- Motor drive

Ordering information

Device	reel size (inches)	Tape width (mm)	Quantity per reel
ZXTC2063E6TA	7	8	3000

Device marking

2063

Absolute maximum and thermal ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	130(-45)	V
Collector-emitter voltage	V_{CEO}	40(-40)	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	6(-3)	V
Emitter-base voltage	V_{EBO}	7(-7)	V
Continuous collector current[c][f]	I_C	3.5(-3)	A
Peak pulse current	I_{CM}	9(-9)	A
Base current	I_B	1(-1)	A
Power dissipation @ T_{amb} = 25°C[a][f]		0.7	W
Linear derating factor	P_D	5.6	mW/°C
Power dissipation @ T_{amb} = 25°C[b][f]		0.9	W
Linear derating factor	P_D	7.2	mW/°C
Power dissipation @ T_{amb} = 25°C[b][g]		1.1	W
Linear derating factor	P_D	8.8	mW/°C
Power dissipation @ T_{amb} = 25°C[c][f]		1.1	W
Linear derating factor	P_D	8.8	mW/°C
Power dissipation @ T_{amb} = 25°C[d][f]		1.7	W
Linear derating factor	P_D	13.6	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C
Thermal resistance junction to ambient[a][f]	$R_{\Theta JC}$	179	°C/W
Thermal resistance junction to ambient[b][f]	$R_{\Theta JA}$	139	°C/W
Thermal resistance junction to ambient[b][g]	$R_{\Theta JC}$	113	°C/W
Thermal resistance junction to ambient[c][f]	$R_{\Theta JC}$	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.

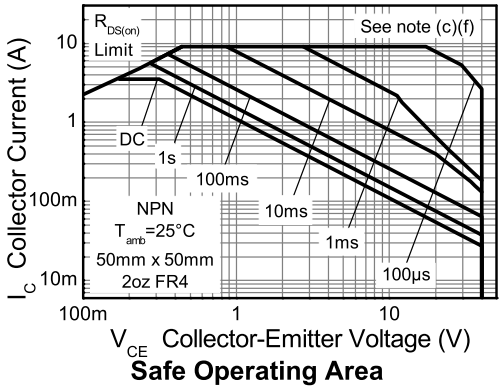
(d) As above measured at t<5 seconds.

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

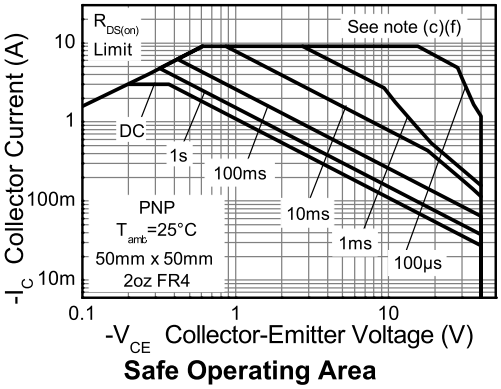
(f) For device with one active die, both collectors attached to a common sink.

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

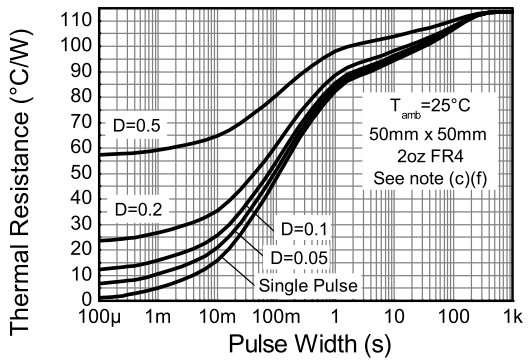
Thermal characteristics



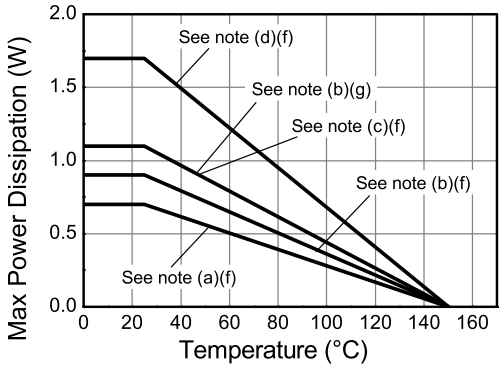
Safe Operating Area



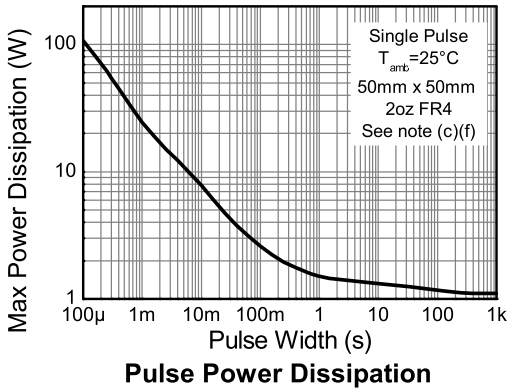
Safe Operating Area



Transient Thermal Impedance



Derating Curve



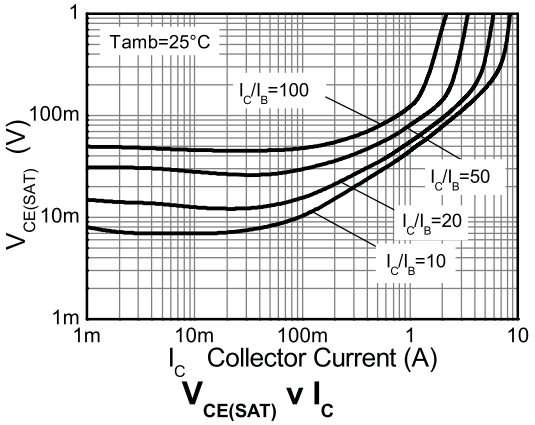
Pulse Power Dissipation

Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

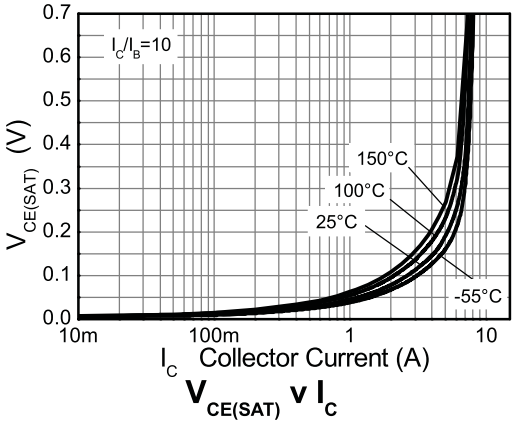
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	130(-45)	170(-80)		V	I_C = (-)100μA
Collector-emitter breakdown voltage (base open)	BV_{CEO}	(-)40	63(-65)		V	I_C = (-)10mA (*) *
Emitter-base breakdown voltage	BV_{EBO}	(-)7	(-)8.3		V	I_E = (-)100μA
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	(-)6	(-)7.4		V	I_E = (-)100μA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V ($0.25V < V_{BC} < -0.25V$)
Emitter-collector breakdown voltage (base open)	BV_{ECO}	6(-3)	7.4(-8.7)		V	I_E = (-)100μA
Collector-base cut-off current	I_{CBO}		<1	(-)50	nA	V_{CB} =100(-36)V
				(-)20	μA	V_{CB} =100(-36)V, T_{amb}= 100°C
Emitter-base cut-off current	I_{EBO}		<1	(-)50	nA	V_{EB} = (-)5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		50(-70)	60(-90)	mV	I_C = (-)1A, I_B = (-)100mA *
			85(-195)	110(-290)	mV	I_C = (-)1A, I_B = (-)20mA *
			150	220	mV	I_C = 2A, I_B = 40mA *
			(-175)	(-260)	mV	(I_C = -3A, I_B = -300mA *)
			135	195	mV	I_C = 3.5A, I_B = 350mA *
Base-emitter saturation voltage	$V_{BE(sat)}$		(-935)	(-1000)	mV	(I_C = -3A, I_B = -300mA *)
			960	1050	mV	I_C = 3.5A, I_B = 350mA *
Base-emitter turn-on voltage	$V_{BE(on)}$		(-855)	(-950)	mV	(I_C = -3A, V_{CE} = -2V *)
			860	950	mV	I_C = 3.5A, V_{CE} = 2V *
Static forward current transfer ratio	h_{FE}	( )300	( )450	( )900		I_C = (-)10mA, V_{CE} = (-)2V *
		280(200)	400(280)			I_C = (-)1A, V_{CE} = (-)2V *
		(20)	(50)			(I_C = -3A, V_{CE} = -2V *)
		40	60			I_C = 3.5A, V_{CE} = 2V *
Transition frequency	f_T		190 (270)		MHz	I_C = (-)50mA, V_{CE} = (-)10V f = 100MHz
Output capacitance	C_{OBO}		12(17)	20(25)	pF	V_{CB} = (-)10V, f = 1MHz *
Delay time	t_d		64(57)		ns	V_{CC} = (-)10V. I_C = (-)1A, I_{B1} = I_{B2}= (-)10mA.
Rise time	t_r		108(69)		ns	
Storage time	t_s		428(154)		ns	
Fall time	t_f		130(60)		ns	

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

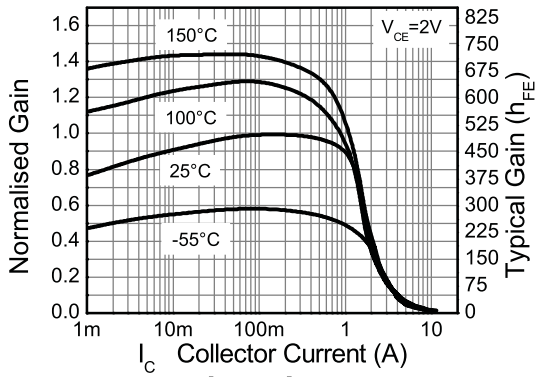
NPN Characteristics



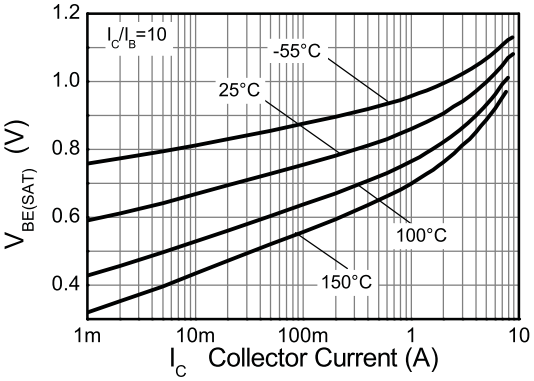
$V_{CE(SAT)}$ v I_C



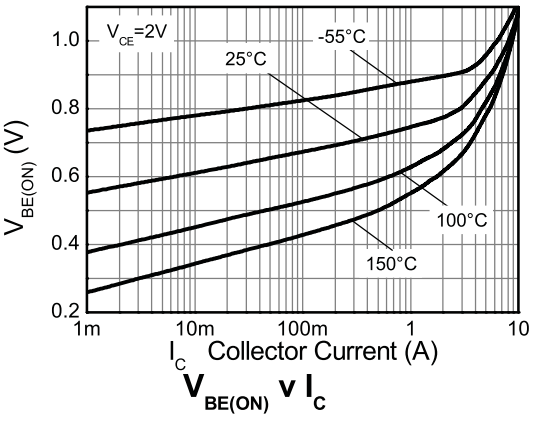
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

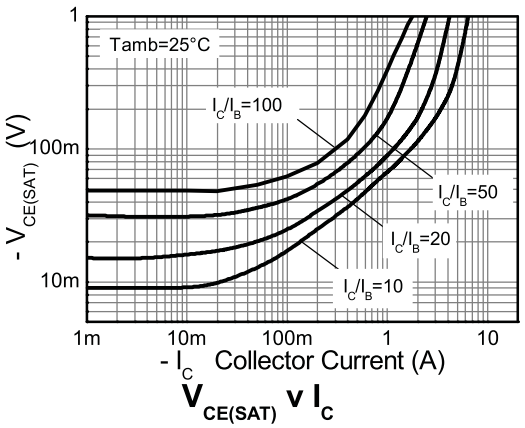


$V_{BE(SAT)}$ v I_C

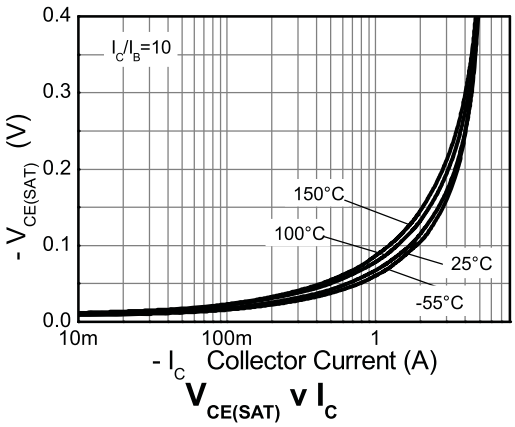


$V_{BE(ON)}$ v I_C

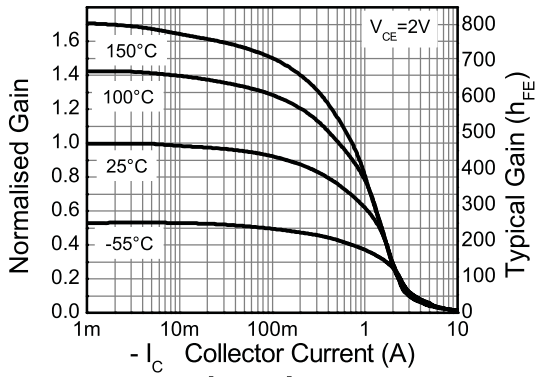
PNP Characteristics



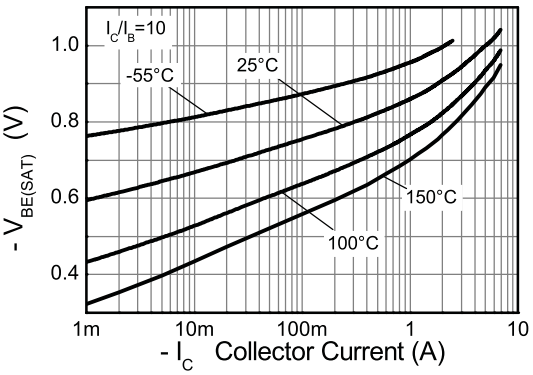
$V_{CE(SAT)}$ v I_C



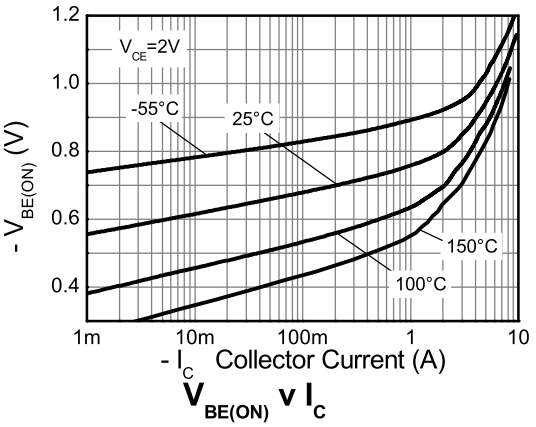
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

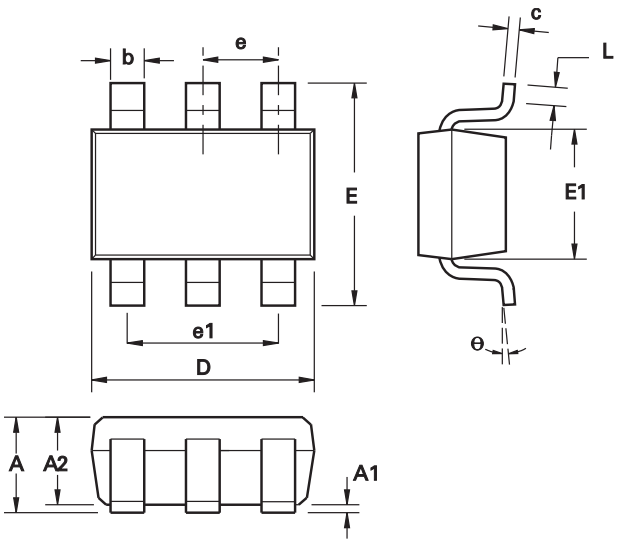


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT23-6



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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Sales offices

The Americas

3050 E. Hillcrest Drive
Westlake Village,
CA 91362-3154
Tel: (+1) 805 446 4800
Fax: (+1) 805 446 4850

Europe

Kustermann-Park
Balanstraße 59,
D-81541 München
Germany
Tel: (+49) 894 549 490
Fax: (+49) 894 549 4949

Taiwan

7F, No. 50,
Min Chuan Road
Hsin-Tien
Taipei, Taiwan
Tel: (+886) 289 146 000
Fax: (+886) 289 146 639

Shanghai

Rm. 606, No.1158
Changning Road
Shanghai, China
Tel: (+86) 215 241 4882
Fax (+86) 215 241 4891

Shenzhen

ANLIAN Plaza, #4018
Jintian Road
Futian CBD,
Shenzhen, China
Tel: (+86) 755 882 849 88
Fax: (+86) 755 882 849 99

Korea

6 Floor, Changhwa B/D,
1005-5 Yeongtong-dong,
Yeongtong-gu, Suwon-si,
Gyeonggi-do, Korea 443-813
Tel: (+82) 312 731 884
Fax: (+82) 312 731 885