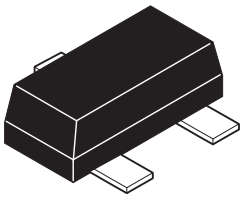
ZXTN19100CFF
100V, SOT23F, NPN high gain power transistor

Summary



BV_{CEX} > 200V

BV_{CEO} > 100V

BV_{ECO} > 5V

$I_{C(cont)}$ = 4.5A

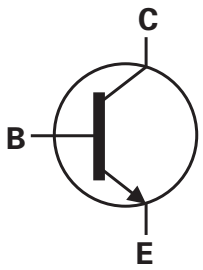
$V_{CE(sat)}$ < 60mV @ 1A

$R_{CE(sat)}$ = 38mΩ

P_D = 1.5W

Complementary part number ZXTP19100CFF

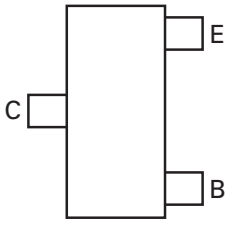
Description



Advanced process capability has been used to maximise the performance of this transistor. The SOT23F package is compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of utmost importance

Features

- High forward blocking voltage
- Low saturation voltage
- High gain
- Low profile high dissipation package



Pinout - top view

Applications

- Relay and solenoid driving
- DC fans
- Industrial and automotive switching

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN19100CFFTA	7	8	3000

Device marking

1E5

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	200	V
Collector-emitter voltage (forward blocking)	V_{CEX}	200	V
Collector-emitter voltage	V_{CEO}	100	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	5	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current(c)	I_C	4.5	A
Base current	I_B	1	A
Peak pulse current	I_{CM}	6	A
Power dissipation at T_{amb} = 25°C(a)		0.84	
Linear derating factor	P_D	6.72	W
Power dissipation at T_{amb} = 25°C(b)		1.34	mW/°C
Linear derating factor	P_D	10.72	W
Power dissipation at T_{amb} = 25°C(c)		1.5	mW/°C
Linear derating factor	P_D	12.0	W
Power dissipation at T_{amb} = 25°C(d)		2	mW/°C
Linear derating factor	P_D	16.0	W
Operating and storage temperature range	T_j, T_{stg}	- 55 to 150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient(a)	$R_{\Theta JA}$	149.3	°C/W
Junction to ambient(b)	$R_{\Theta JA}$	93.4	°C/W
Junction to ambient(c)	$R_{\Theta JA}$	83.3	°C/W
Junction to ambient(d)	$R_{\Theta JA}$	60	°C/W

NOTES:

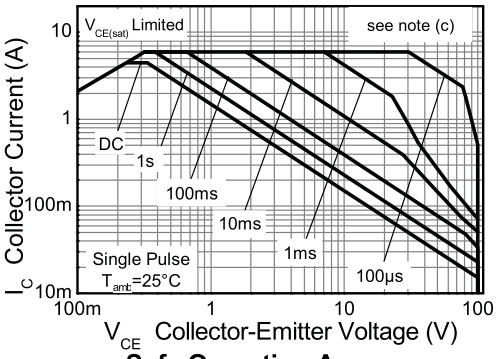
(a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(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.

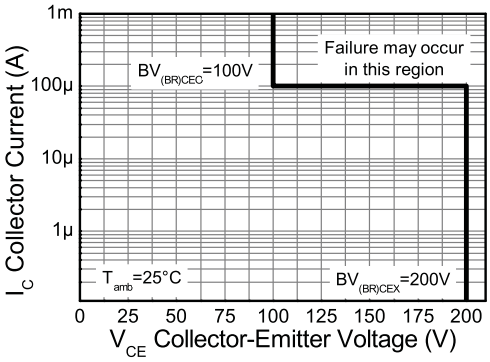
(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(d) As (c) above measured at t<5secs.

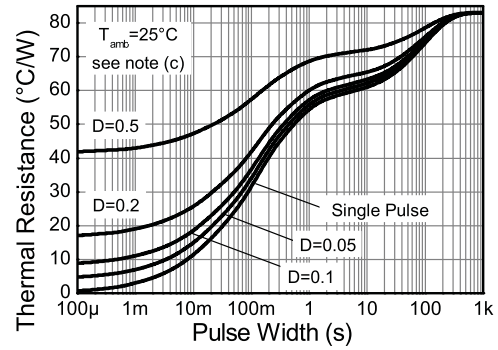
Characteristics



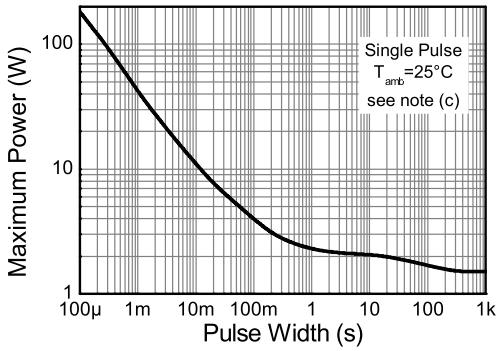
Safe Operating Area



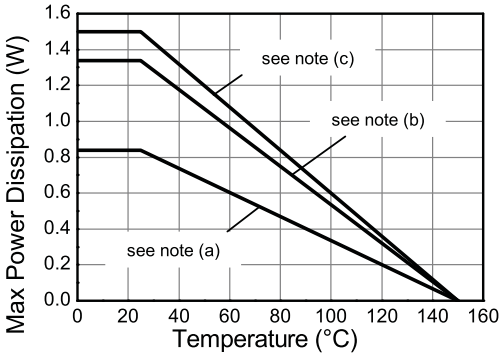
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



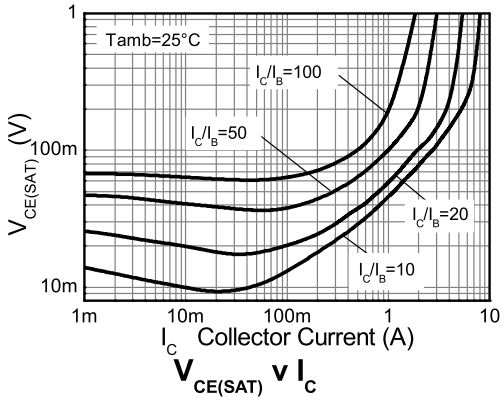
Derating Curve

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

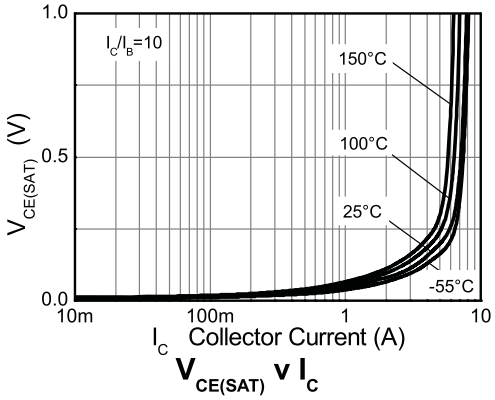
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	200	240		V	I_C = 100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	200	240		V	I_C = 100μA, R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	100	120		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	8.3		V	I_E = 100μA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	5	8		V	I_E = 100μA,
Collector-base cut-off current	I_{CBO}		<1	50	nA	V_{CB} = 160V
				20	μA	V_{CB} = 160V, T_{amb}= 100°C
Collector-emitter cut-off current	I_{CEX}		<1	100	nA	V_{CE} = 160V, R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Emitter-base cut-off current	I_{EBO}		<1	50	nA	V_{EB} = 5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		45	60	mV	I_C = 1A, I_B = 100mA(*)
			105	135	mV	I_C = 1A, I_B = 20mA(*)
			170	235	mV	I_C = 4.5A, I_B = 450mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		950	1050	mV	I_C = 4.5A, I_B = 450mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		880	1000	mV	I_C = 4.5A, V_{CE} = 2V (*)
Static forward current transfer ratio	h_{FE}	200	350	500		I_C = 0.1A, V_{CE} = 2V (*)
		130	250			I_C = 1A, V_{CE} = 2V (*)
			25			I_C = 5A, V_{CE} = 2V (*)
Transition frequency	f_T		150		MHz	I_C = 100mA, V_{CE} = 10V f =50MHz
Input capacitance	C_{ibo}		305		pF	V_{EB} = 0.5V, f = 1MHz (*)
Output capacitance	C_{obo}		15.7	25	pF	V_{CB} = 10V, f = 1MHz (*)
Delay time	t_d		28.3		ns	V_{CC} = 10V. I_C = 500mA, I_{B1} = I_{B2}= 50mA.
Rise time	t_r		23.6		ns	
Storage time	t_s		962		ns	
Fall time	t_f		133		ns	

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

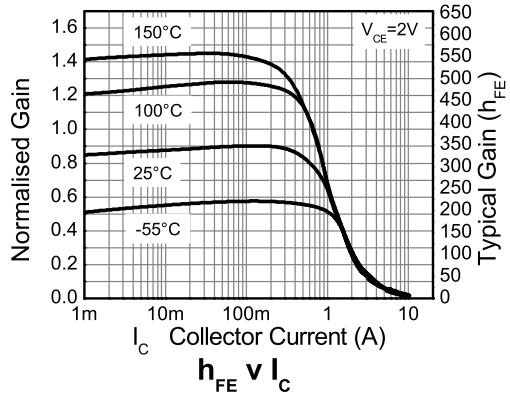
Typical characteristics



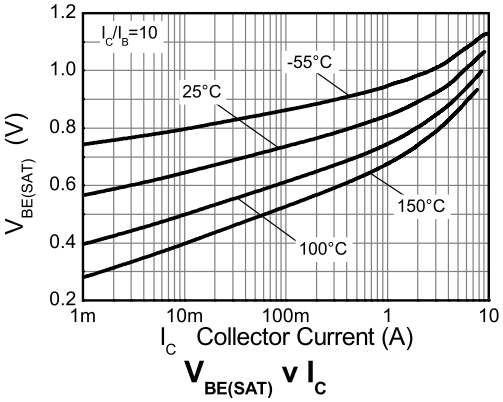
$V_{CE(SAT)}$ v I_C



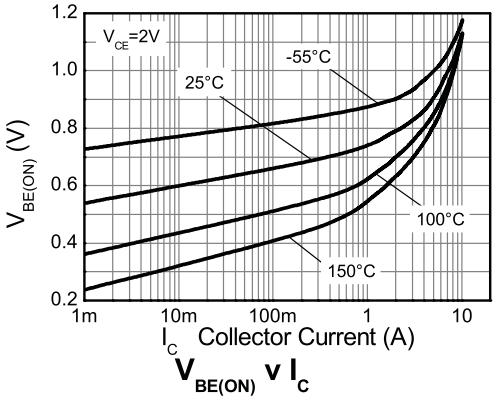
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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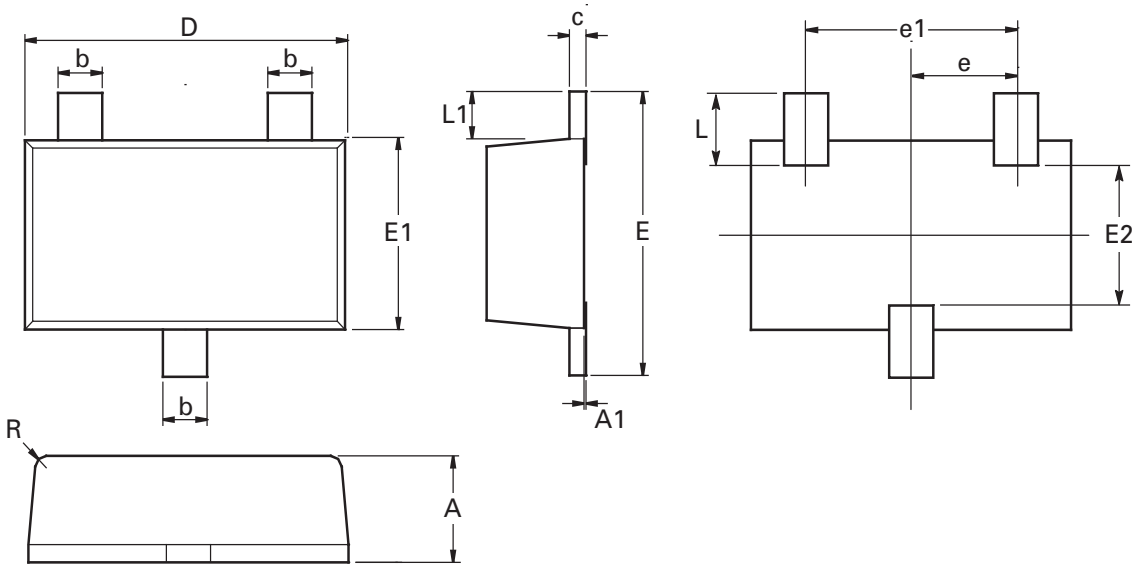
Package outline - SOT23F



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	0.80	1.00	0.0315	0.0394	E	2.30	2.50	0.0906	0.0984
A1	0.00	0.10	0.00	0.0043	E1	1.50	1.70	0.0590	0.0669
b	0.35	0.45	0.0153	0.0161	E2	1.10	1.26	0.0433	0.0496
c	0.10	0.20	0.0043	0.0079	L	0.48	0.68	0.0189	0.0268
D	2.80	3.00	0.1102	0.1181	L1	0.30	0.50	0.0153	0.0161
e	0.95 ref		0.0374 ref		R	0.05	0.15	0.0019	0.0059
e1	1.80	2.00	0.0709	0.0787	O	0°	12°	0°	12°

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	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA	Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com