

ZXTN19100CFF

100V, SOT23F, NPN high gain power transistor

Summary

$BV_{CEX} > 200V$

$BV_{CEO} > 100V$

$BV_{ECO} > 5V$

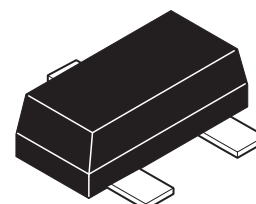
$I_{C(cont)} = 4.5A$

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

$R_{CE(sat)} = 38m\Omega$

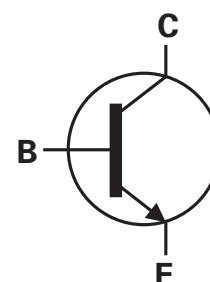
$P_D = 1.5W$

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

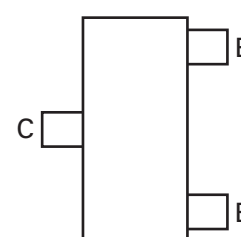


Features

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

Applications

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



Pinout - top view

Ordering information

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

Device marking

1E5

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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 $T_{amb} = 25^{\circ}C^{(a)}$	P_D	0.84	W
Linear derating factor		6.72	
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$	P_D	1.34	mW/°C
Linear derating factor		10.72	W
Power dissipation at $T_{amb} = 25^{\circ}C^{(c)}$	P_D	1.5	mW/°C
Linear derating factor		12.0	W
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$	P_D	2	mW/°C
Linear derating factor		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.

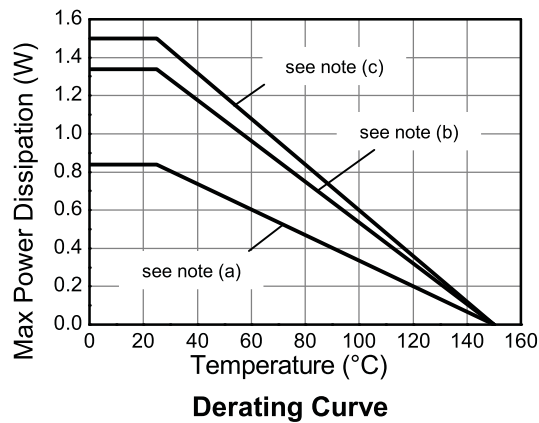
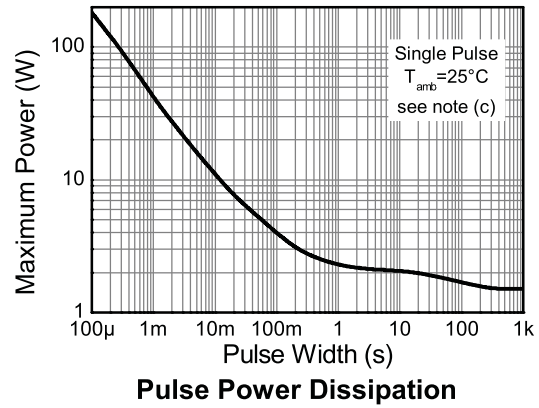
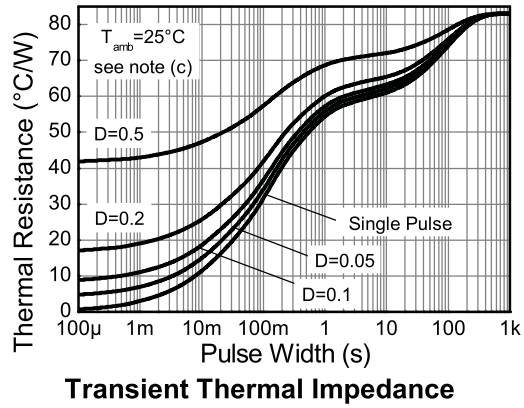
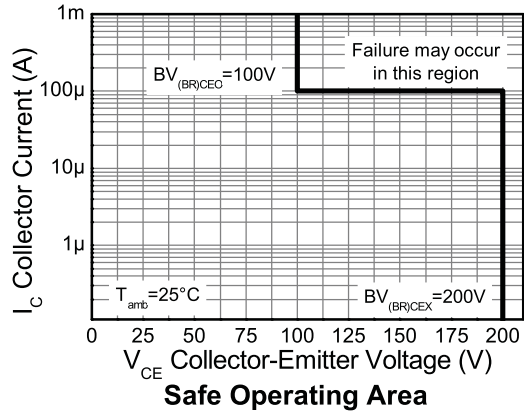
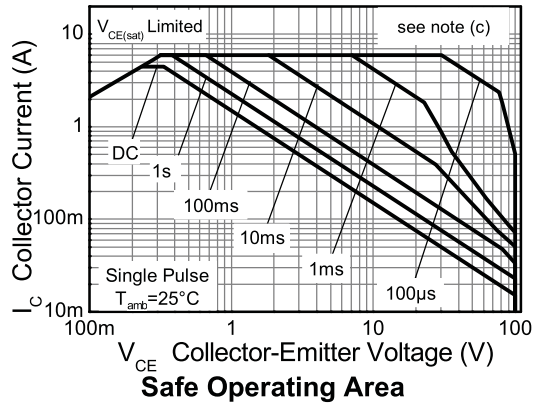
(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(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 $t < 5$ secs.

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Characteristics



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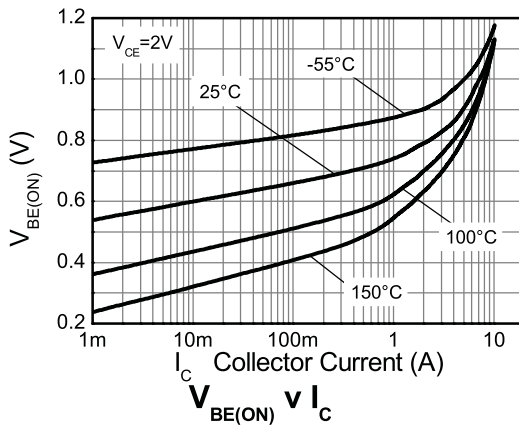
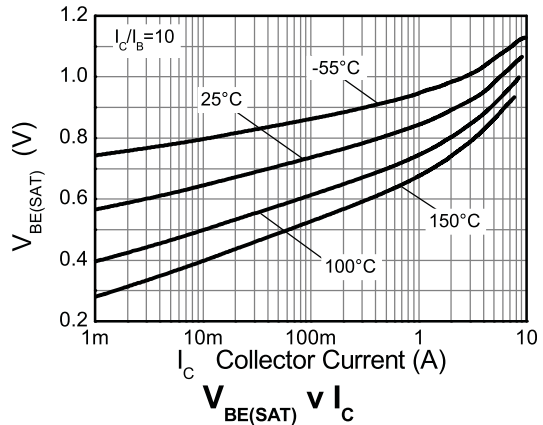
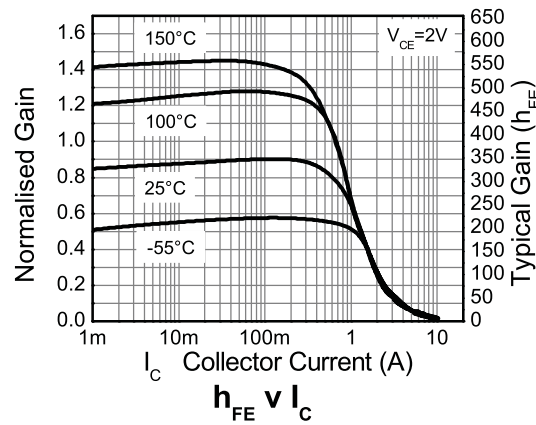
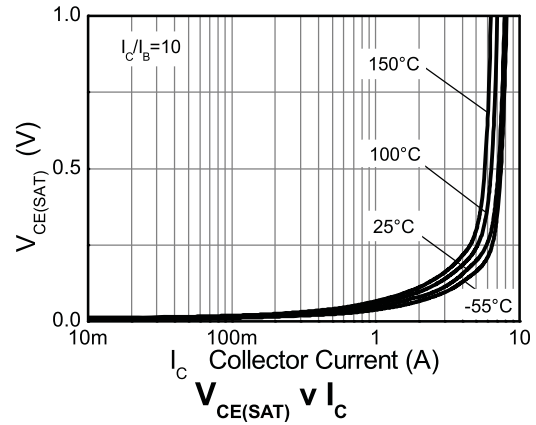
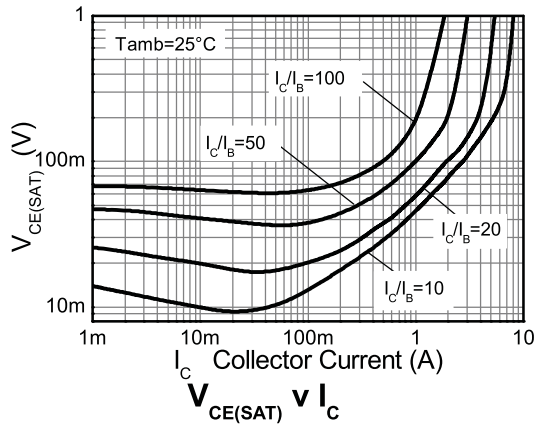
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	200	240		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	200	240		V	$I_C = 100\mu\text{A}$, $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-emitter breakdown voltage (base open)	BV_{CEO}	100	120		V	$I_C = 10\text{mA}^{(*)}$
Emitter-base breakdown voltage	BV_{EBO}	7	8.3		V	$I_E = 100\mu\text{A}$
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	8.3		V	$I_E = 100\mu\text{A}$, $R_{BC} < 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Emitter-collector breakdown voltage (base open)	BV_{ECO}	5	8		V	$I_E = 100\mu\text{A}$,
Collector-base cut-off current	I_{CBO}		<1	50 20	nA μA	$V_{CB} = 160\text{V}$ $V_{CB} = 160\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector-emitter cut-off current	I_{CEX}		<1	100	nA	$V_{CE} = 160\text{V}$, $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter-base cut-off current	I_{EBO}		<1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		45	60	mV	$I_C = 1\text{A}$, $I_B = 100\text{mA}^{(*)}$
			105	135	mV	$I_C = 1\text{A}$, $I_B = 20\text{mA}^{(*)}$
			170	235	mV	$I_C = 4.5\text{A}$, $I_B = 450\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		950	1050	mV	$I_C = 4.5\text{A}$, $I_B = 450\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		880	1000	mV	$I_C = 4.5\text{A}$, $V_{CE} = 2\text{V}^{(*)}$
Static forward current transfer ratio	h_{FE}	200	350	500		$I_C = 0.1\text{A}$, $V_{CE} = 2\text{V}^{(*)}$
		130	250			$I_C = 1\text{A}$, $V_{CE} = 2\text{V}^{(*)}$
			25			$I_C = 5\text{A}$, $V_{CE} = 2\text{V}^{(*)}$
Transition frequency	f_T		150		MHz	$I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Input capacitance	C_{ibo}		305		pF	$V_{EB} = 0.5\text{V}$, $f = 1\text{MHz}^{(*)}$
Output capacitance	C_{obo}		15.7	25	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}^{(*)}$
Delay time	t_d		28.3		ns	$V_{CC} = 10\text{V}$. $I_C = 500\text{mA}$, $I_{B1} = I_{B2} = 50\text{mA}$.
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 $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics

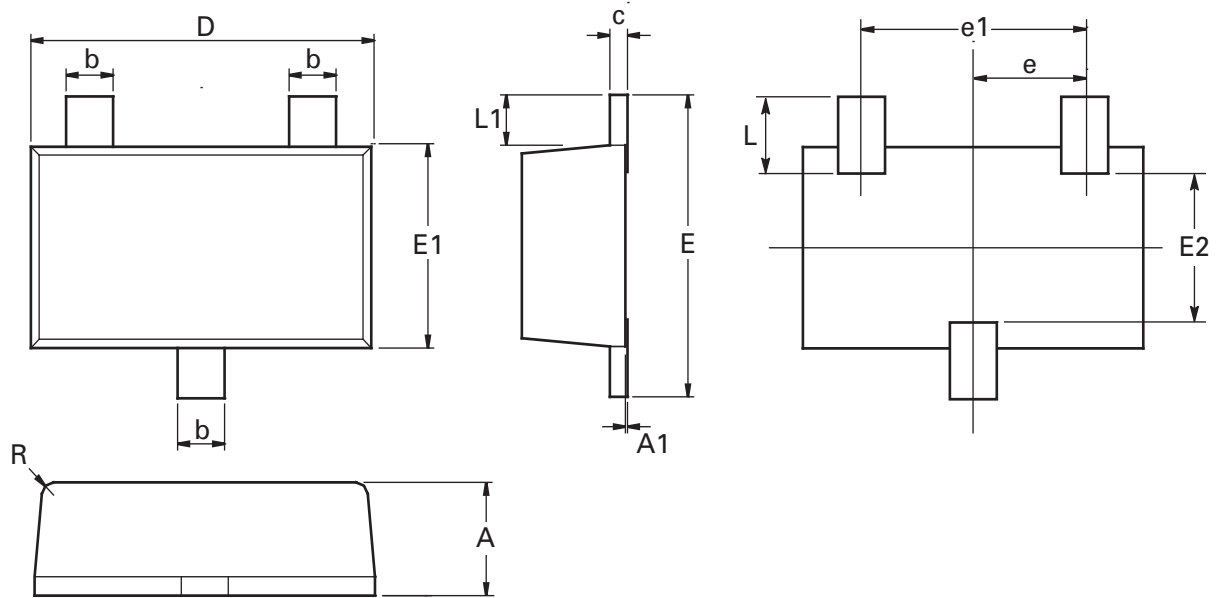


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Package outline - SOT23F



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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