

ZXTN19100CFF

100V, SOT23F, NPN high gain power transistor

Summary

$BV_{CEX} > 200V$

$BV_{CEO} > 100V$

$BV_{ECO} > 5V$

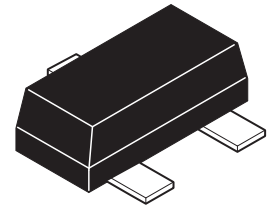
$I_{C(cont)} = 4.5A$

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

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

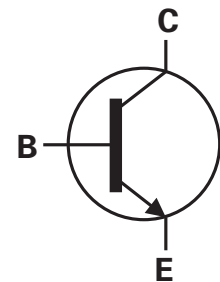
$P_D = 1.5W$

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

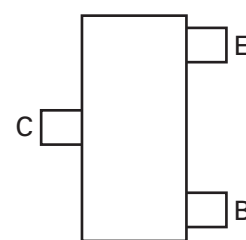


Features

- 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

ZXTN19100CFF

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

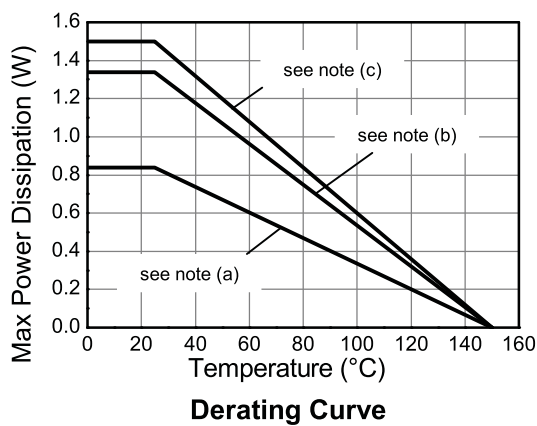
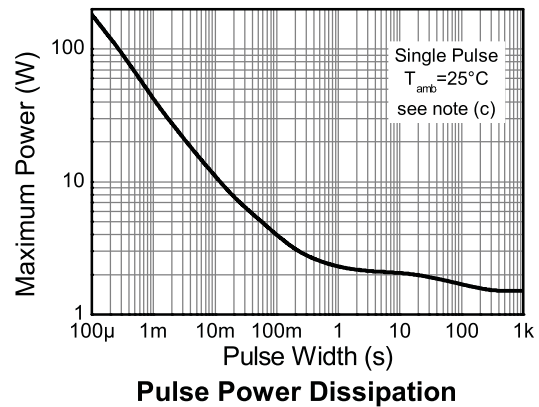
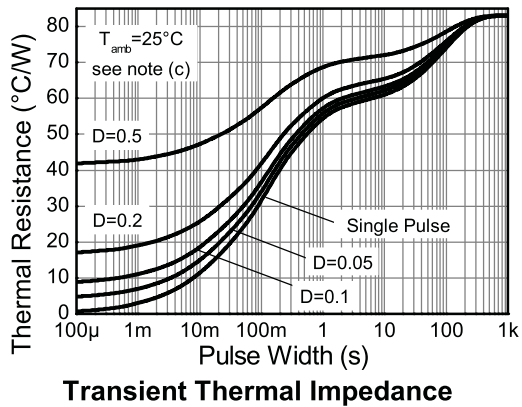
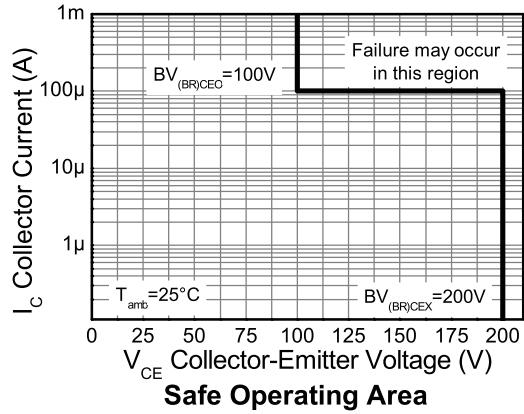
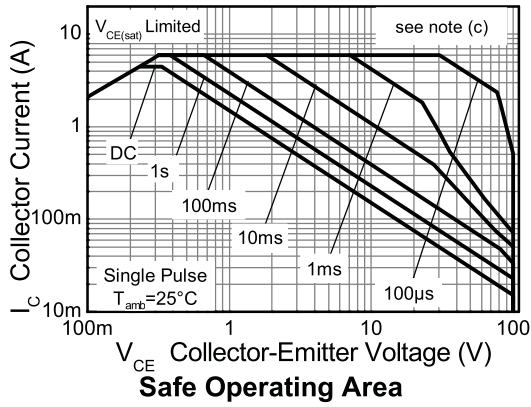
| Parameter | Symbol | Limit | Unit |
|------------------------------------|-----------------|-------|------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 149.3 | °C/W |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 93.4 | °C/W |
| Junction to ambient ^(c) | $R_{\theta JA}$ | 83.3 | °C/W |
| Junction 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.

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Characteristics



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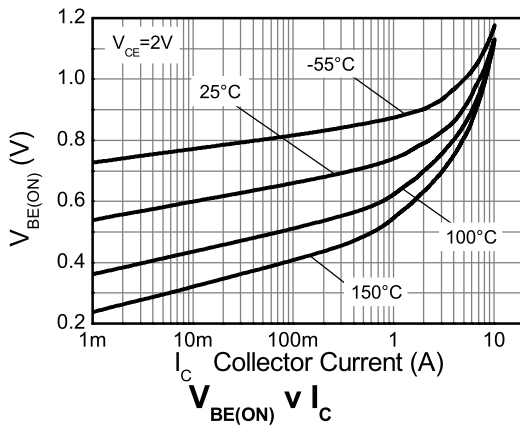
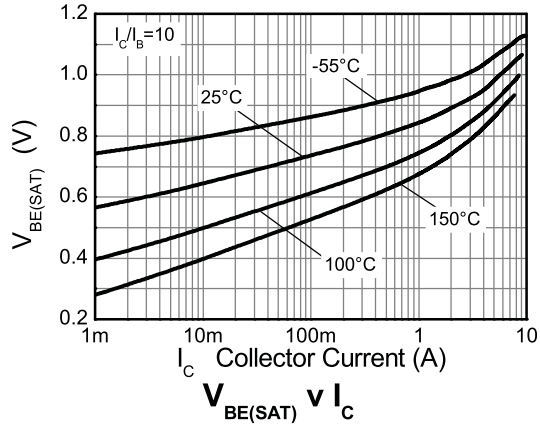
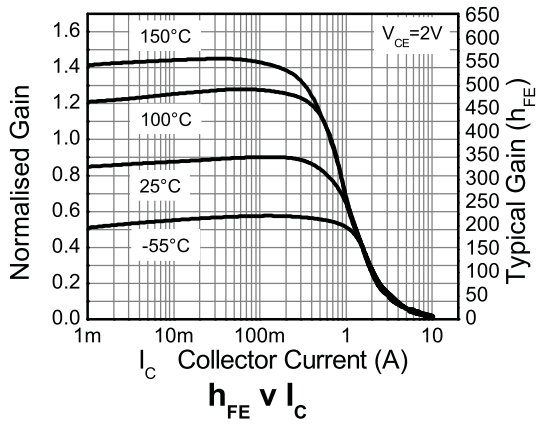
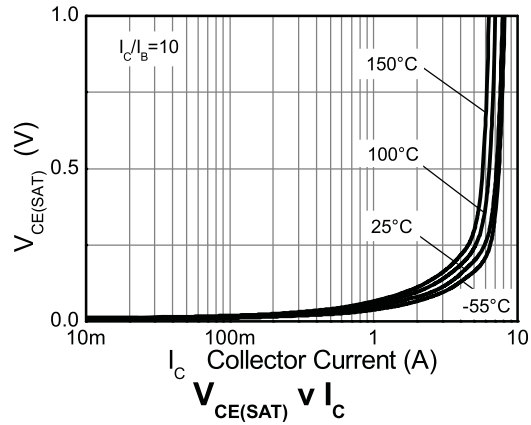
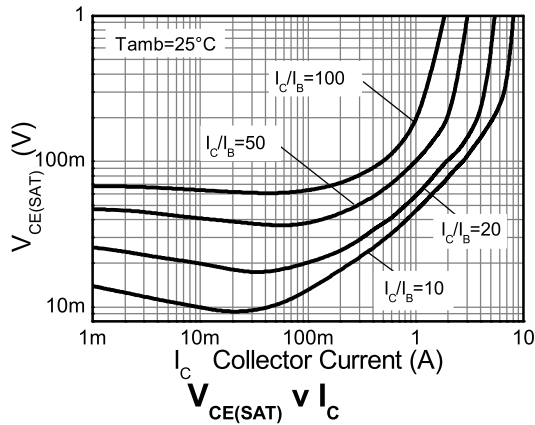
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

| 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 | $V_{CE(sat)}$ | | 45 105 170 | 60 135 235 | mV mV mV | $I_C = 1\text{A}$, $I_B = 100\text{mA}^{(*)}$ $I_C = 1\text{A}$, $I_B = 20\text{mA}^{(*)}$ $I_C = 4.5\text{A}$, $I_B = 450\text{mA}^{(*)}$ |
| 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} | 200 130 | 350 250 25 | 500 | | $I_C = 0.1\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ $I_C = 1\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ $I_C = 5\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| 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 | $V_{CC} = 10\text{V}$. |
| Rise time | t_r | | 23.6 | | ns | $I_C = 500\text{mA}$, |
| Storage time | t_s | | 962 | | ns | $I_{B1} = I_{B2} = 50\text{mA}$. |
| Fall time | t_f | | 133 | | ns | |

NOTES:

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

Typical characteristics

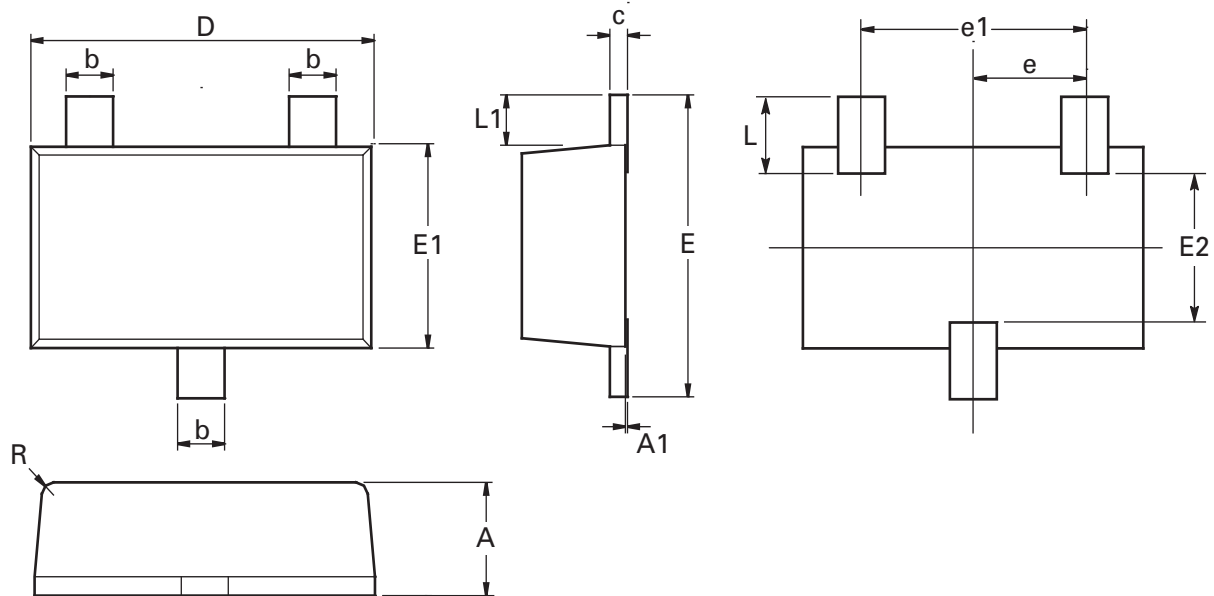


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Package outline - SOT23F



| 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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| | |
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| "Last time buy (LTB)" | Device will be discontinued and last time buy period and delivery is in effect |
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| | |
|-----------------------|---|
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| Zetex GmbH Kustermann-park Balanstraße 59 D-81541 München Germany Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com | Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com | Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com | Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com |

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А