

ZXTP19100CFF

100V, SOT23F, PNP medium power transistor

Summary

$BV_{CEO} > -100V$

$BV_{ECO} > -7V$

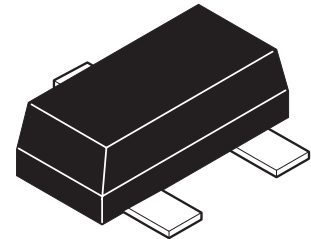
$I_{C(cont)} = -2A$

$V_{CE(sat)} < 120mV @ 1A$

$R_{CE(sat)} = 95m\Omega$

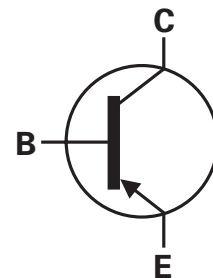
$P_D = 1.5W$

Complementary part number: ZXTN19100CFF



Description

Packaged in the SOT23 outline this new low saturation 100V PNP transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.

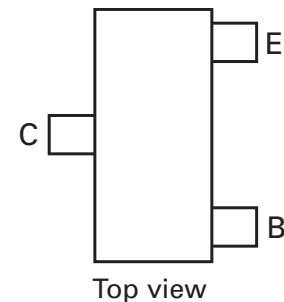


Features

- 2 amps continuous current
- Very low saturation voltages

Applications

- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC-DC modules
- Backlight inverters
- Power switches
- MOSFET gate drivers



Ordering information

| DEVICE | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------------|--------------------|-----------------|-------------------|
| ZXTP19100CFFTA | 7 | 8 | 3000 |

Device marking

1E1

ZXTP19100CFF

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|---|----------------|------------|------------|
| Collector-base voltage | V_{CBO} | -110 | V |
| Collector-emitter voltage (forward blocking) | V_{CEX} | -110 | V |
| Collector-emitter voltage | V_{CEO} | -100 | V |
| Emitter-collector voltage (reverse blocking) | V_{ECO} | -7 | V |
| Emitter-base voltage | V_{EBO} | -7 | V |
| Continuous collector current ^(c) | I_C | -2 | A |
| Peak pulse current | I_{CM} | -3 | A |
| Base current | I_B | -1 | A |
| Power dissipation at $T_A = 25^\circ\text{C}^{(a)}$ Linear derating factor | P_D | 0.84 | W mW/°C |
| Power dissipation at $T_A = 25^\circ\text{C}^{(b)}$ Linear derating factor | P_D | 1.34 | W mW/°C |
| Power dissipation at $T_A = 25^\circ\text{C}^{(c)}$ Linear derating factor | P_D | 1.5 | W mW/°C |
| Power dissipation at $T_A = 25^\circ\text{C}^{(d)}$ Linear derating factor | P_D | 2 | W mW/°C |
| Operating and storage temperature range | T_j, T_{stg} | -55 to 150 | °C |

Thermal resistance

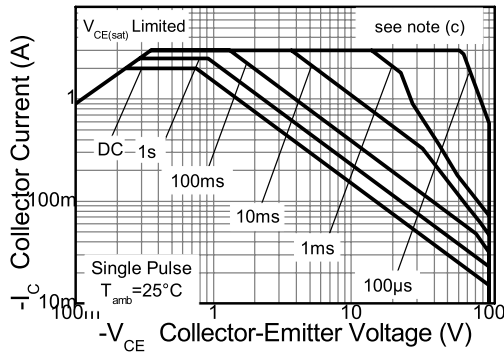
| Parameter | Symbol | Value | Unit |
|------------------------------------|-----------------|-------|------|
| Junction to Ambient ^(a) | $R_{\theta JA}$ | 149.3 | °C/W |
| Junction to Ambient ^(b) | $R_{\theta JA}$ | 93.4 | °C/W |
| Junction to Ambient ^(c) | $R_{\theta JA}$ | 83.3 | °C/W |
| Junction to Ambient ^(d) | $R_{\theta JA}$ | 60 | °C/W |
| Junction to Case ^(e) | $R_{\theta JC}$ | 38 | °C/W |

NOTES:

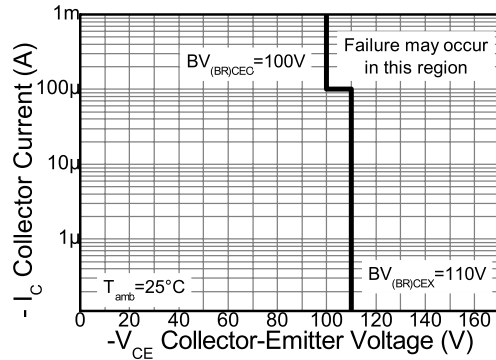
- (a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- (b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.
- (c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.
- (d) As (c) above measured at $t < 5\text{secs}$
- (e) Junction to Case from Collector Tab.

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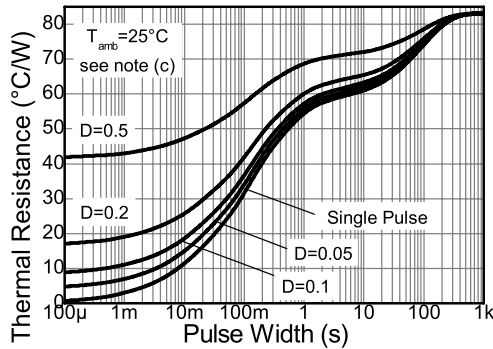
Thermal characteristics



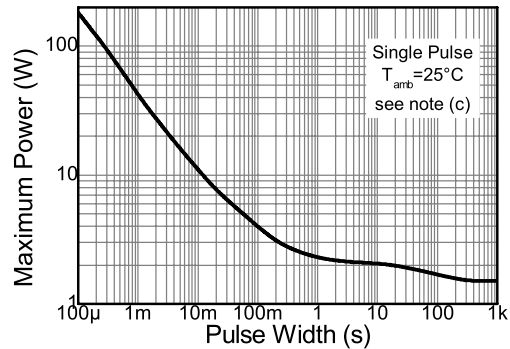
Safe Operating Area



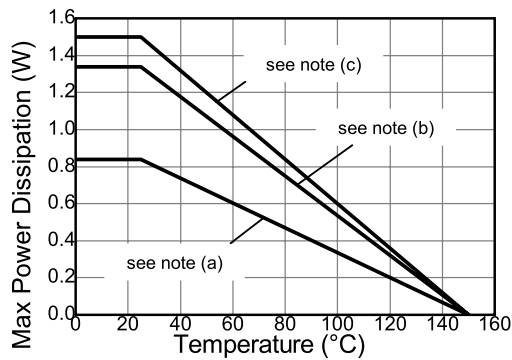
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

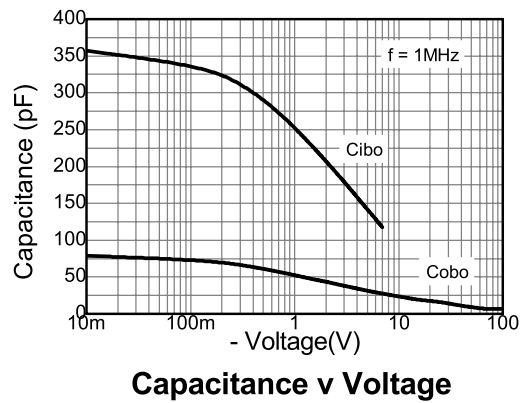
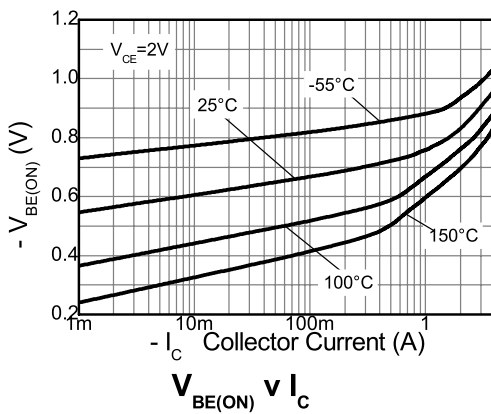
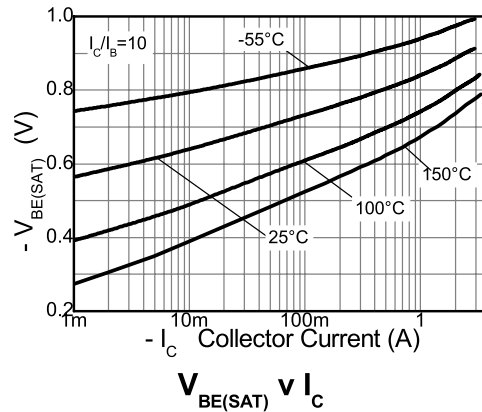
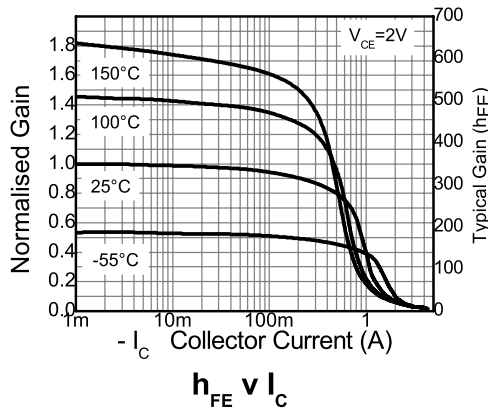
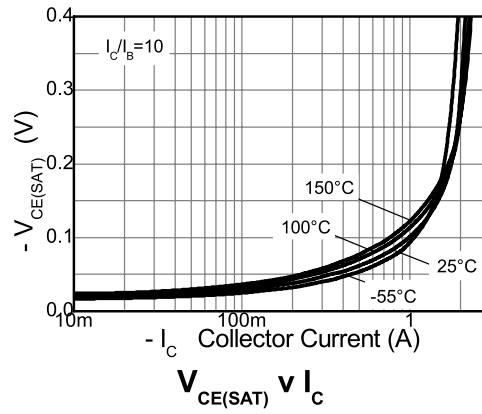
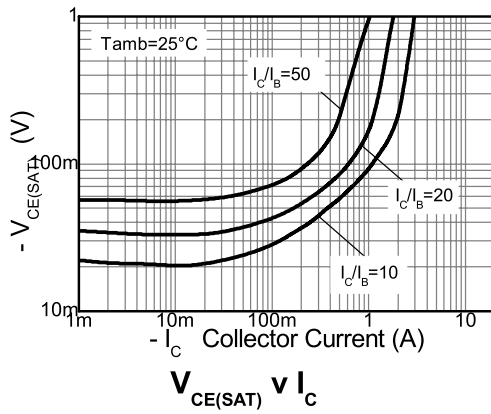
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--|---------------|-----------------|-----------------------------|------------------------------|----------------------|--|
| Collector-Base Breakdown Voltage | BV_{CBO} | -110 | -135 | | V | $I_C = -100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage (Base open) | BV_{CEX} | -110 | -135 | | V | $I_C = -100\mu\text{A}$, $R_{BC} < 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$ |
| Collector-Emitter Breakdown Voltage (Base open) | BV_{CEO} | -100 | -135 | | 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} | -7 | -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} | -7 | -8.7 | | V | $I_E = -100\mu\text{A}$ |
| Collector-Base Cut-Off Current | I_{CBO} | | <-1 | -50 -0.5 | nA μA | $V_{CB} = -110\text{V}$ $V_{CB} = -110\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter-Base Cut-Off Current | I_{EBO} | | <-1 | -50 | nA | $V_{EB} = -5.6\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | -100 -95 -175 -215 | -130 -120 -225 -275 | mV mV mV mV | $I_C = -0.5\text{A}$, $I_B = -20\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -50\text{mA}^{(*)}$ $I_C = -2\text{A}$, $I_B = -200\text{mA}^{(*)}$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | -870 | -950 | mV | $I_C = -2\text{A}$, $I_B = -200\text{mA}^{(*)}$ |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | -810 | -900 | mV | $I_C = -2\text{A}$, $V_{CE} = -2\text{V}^{(*)}$ |
| Static Forward Current Transfer Ratio | h_{FE} | 200 70 20 | 330 135 30 | 500 | | $I_C = -100\text{mA}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -1\text{A}$, $V_{CE} = -2\text{V}^{(*)}$ $I_C = -2\text{A}$, $V_{CE} = -2\text{V}^{(*)}$ |
| Transition Frequency | f_T | | 142 | | MHz | $I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$ |
| Input Capacitance | C_{ibo} | | 291 | 400 | pF | $V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}^{(*)}$ |
| Output Capacitance | C_{obo} | | 23.5 | | pF | $V_{CB} = -10\text{V}$, $f = 1\text{MHz}^{(*)}$ |
| Delay Time | t_d | | 24.7 | | ns | $I_C = -500\text{mA}$, $V_{CC} = -10\text{V}$ $I_{B1} = -I_{B2} = -50\text{mA}$ |
| Rise Time | t_r | | 22.4 | | ns | |
| Storage Time | t_s | | 660 | | ns | |
| Fall Time | t_f | | 107 | | ns | |

NOTES:

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

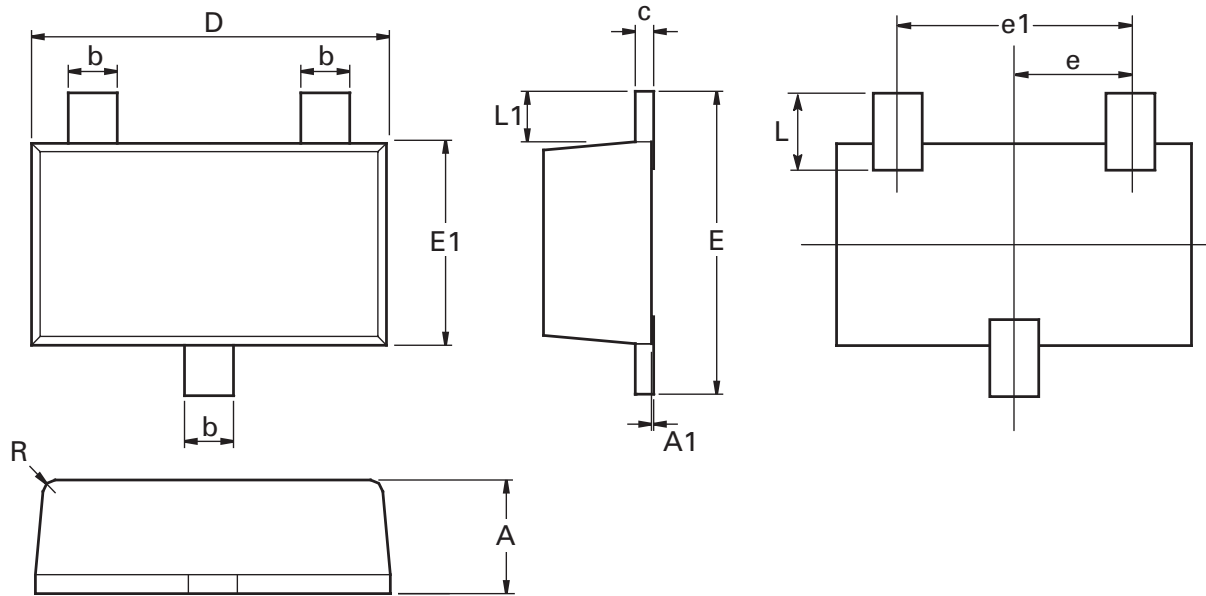
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Typical characteristics



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Package outline - SOT23F



| Dim. | Millimeters | | Inches | | Dim. | Millimeters | | Inches | |
|------|-------------|------|------------|--------|------|-------------|------|--------|--------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | 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 | L | 0.48 | 0.68 | 0.0189 | 0.0268 |
| c | 0.10 | 0.20 | 0.0043 | 0.0079 | L1 | 0.30 | 0.50 | 0.0153 | 0.0161 |
| D | 2.80 | 3.00 | 0.1102 | 0.1181 | R | 0.05 | 0.15 | 0.0019 | 0.0059 |
| e | 0.95 ref | | 0.0374 ref | | O | 0° | 12° | 0° | 12° |
| e1 | 1.80 | 2.00 | 0.0709 | 0.0787 | - | - | - | - | - |

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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| | |
|-----------------------------------|--|
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| | |
|-----------------------|---|
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