

ZXTN2018F

60V, SOT23, NPN medium power transistor

Summary

$V_{(BR)CEV} > 140V$, $V_{(BR)CEO} > 60V$

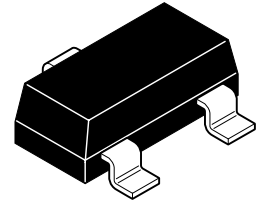
$I_{C(cont)} = 5A$

$R_{CE(sat)} = 25\ m\Omega$ typical

$V_{CE(sat)} < 45\ mV$ @ 1A

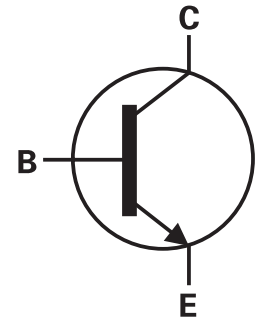
$P_D = 1.2W$

Complementary part number : ZXTP2027F



Description

Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium.

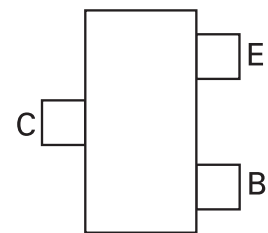


Features

- Higher power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 140V forward blocking voltage

Applications

- MOSFET and IGBT gate driving
- Motor drive
- Relay, lamp and solenoid drive



Pinout - top view

Ordering information

| Device | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|--------------------|-----------------|-------------------|
| ZXTN2018FTA | 7 | 8 | 3,000 |

Device marking

851

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|--|---------------|-------------|-----------------|
| Collector-base voltage | V_{CBO} | 140 | V |
| Collector-emitter voltage | $V_{(BR)CEV}$ | 140 | V |
| Collector-emitter voltage | V_{CEO} | 60 | V |
| Emitter-base voltage | V_{EBO} | 7 | V |
| Peak pulse current | I_{CM} | 12 | A |
| Continuous collector current ^(a) | I_C | 5 | A |
| Base current | I_B | 1 | A |
| Power dissipation @ $T_A=25^{\circ}C$ ^(a) | P_D | 1.0 | W |
| Linear derating factor | | 8.0 | mW/ $^{\circ}C$ |
| Power dissipation @ $T_A=25^{\circ}C$ ^(b) | P_D | 1.2 | W |
| Linear derating factor | | 9.6 | mW/ $^{\circ}C$ |
| Power dissipation @ $T_A=25^{\circ}C$ ^(c) | P_D | 1.56 | W |
| Linear derating factor | | 12.5 | mW/ $^{\circ}C$ |
| Operating and storage temperature | $T_j:T_{stg}$ | -55 to +150 | $^{\circ}C$ |

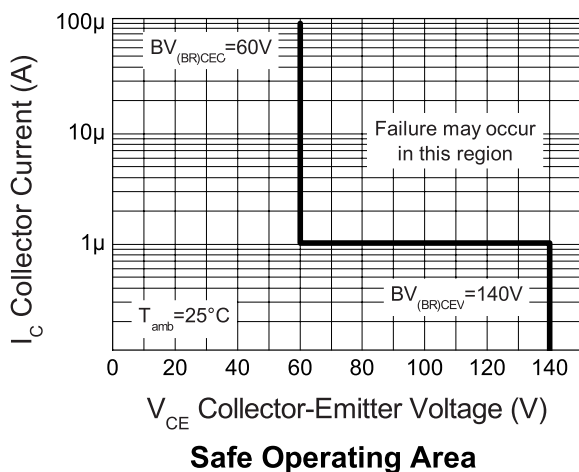
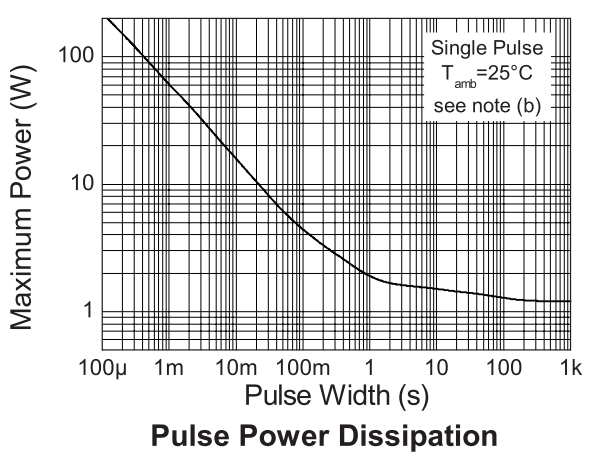
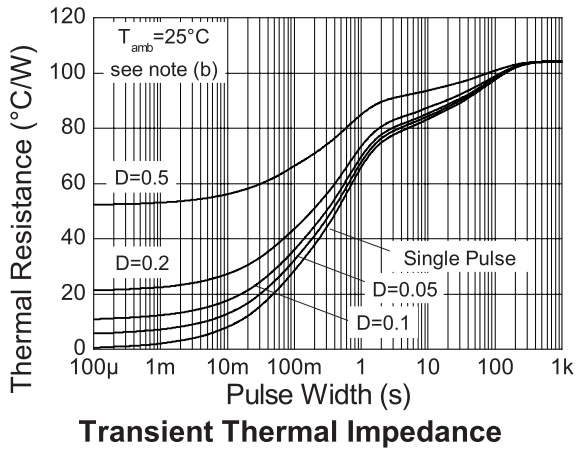
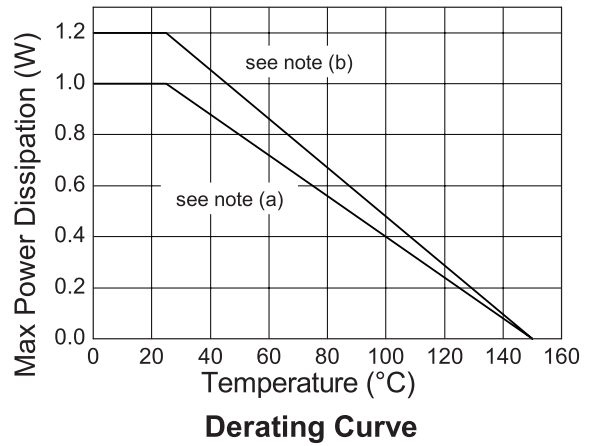
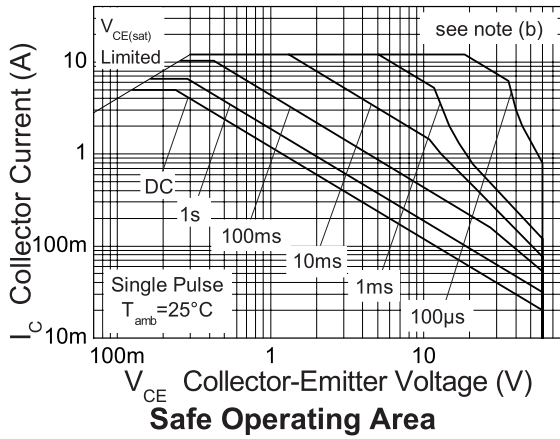
Thermal resistance

| Parameter | Symbol | Value | Unit |
|------------------------------------|-----------------|-------|---------------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 125 | $^{\circ}C/W$ |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 104 | $^{\circ}C/W$ |
| Junction to ambient ^(c) | $R_{\theta JA}$ | 80 | $^{\circ}C/W$ |

NOTES:

- (a) Mounted on 18mm x 18mm X 1.6mm FR4 PCB with a very high coverage of 2 oz weight copper in still air conditions.
 (b) Mounted on 30mm x 30mm X 1.6mm FR4 PCB with a very high coverage of 2 oz weight copper in still air conditions.
 (c) as (b) above measured at $t < 5$ secs.

Characteristics



ZXTN2018F

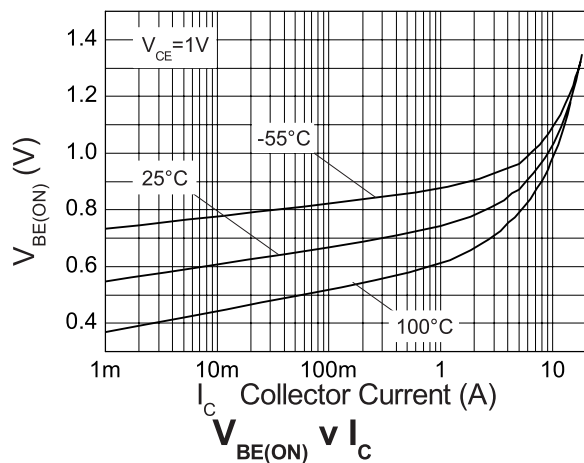
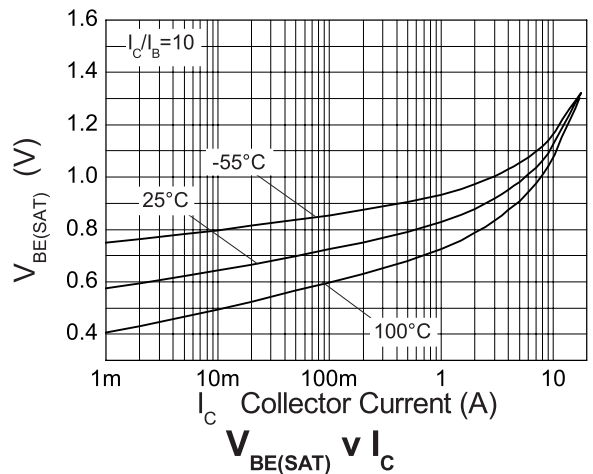
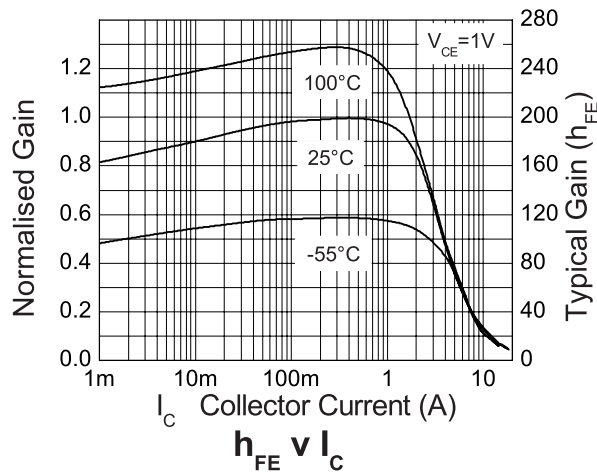
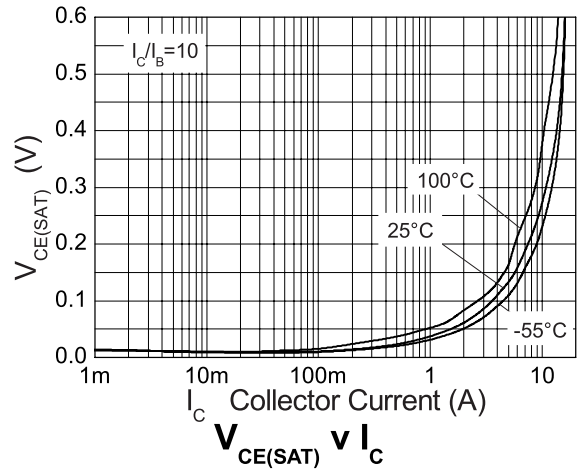
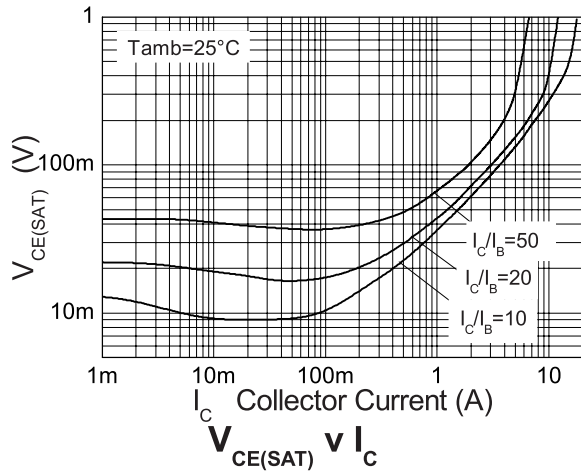
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---------------------------------------|---------------|------------------------|------------------------------------|-------------------------------------|----------------------------------|--|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | 140 | 180 | | V | $I_C=100\mu\text{A}$ |
| Collector-emitter breakdown voltage | $V_{(BR)CEV}$ | 140 | 180 | | V | $I_C=1\mu\text{A}$, $-1\text{V} < V_{BE} < +0.3\text{V}$ |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | 60 | 80 | | V | $I_C=10\text{mA}$ ^(a) |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | 7 | 8 | | V | $I_E=100\mu\text{A}$ |
| Collector-emitter cut-off current | I_{CEV} | | <1 | 20 | nA | $V_{CE}=110\text{V}$, $V_{BE} = -1\text{V}$ |
| Collector-base cut-off current | I_{CBO} | | <1 | 20 | nA | $V_{CB}=110\text{V}$ |
| Emitter-base cut-off current | I_{EBO} | | <1 | 10 | nA | $V_{EB}=6\text{V}$ |
| Static forward current transfer ratio | H_{FE} | 100 100 40 15 | 220 200 65 25 | 300 | | $I_C=10\text{mA}$, $V_{CE}=1\text{V}^{(a)}$ $I_C=2\text{A}$, $V_{CE}=1\text{V}^{(a)}$ $I_C=5\text{A}$, $V_{CE}=1\text{V}^{(a)}$ $I_C=10\text{A}$, $V_{CE}=1\text{V}^{(a)}$ |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | | 15 35 40 85 145 170 | 30 45 55 110 170 210 | mV mV mV mV mV mV | $I_C=0.1\text{A}$, $I_B=5\text{mA}^{(a)}$ $I_C=1\text{A}$, $I_B=100\text{mA}^{(a)}$ $I_C=1\text{A}$, $I_B=50\text{mA}^{(a)}$ $I_C=2\text{A}$, $I_B=50\text{mA}^{(a)}$ $I_C=5\text{A}$, $I_B=250\text{mA}^{(a)}$ $I_C=6\text{A}$, $I_B=300\text{mA}^{(a)}$ |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | | 0.92 | 1.00 | V | $I_C=5\text{A}$, $I_B=250\text{mA}^{(a)}$ |
| Base-emitter turn-on voltage | $V_{BE(on)}$ | | 0.85 | 0.95 | V | $I_C=5\text{A}$, $V_{CE}=1\text{V}^{(a)}$ |
| Transition frequency | f_T | | 130 | | MHz | $I_C=100\text{mA}$, $V_{CE}=10\text{V}$, $f=50\text{MHz}$ |
| Output capacitance | C_{obo} | | 28 | | pF | $V_{CB}=10\text{V}$, $f=1\text{MHz}$ |
| Turn-on time | $t_{(on)}$ | | 33 | | ns | $V_{CC}=10\text{V}$, $I_C=1\text{A}$, |
| Turn-off time | $t_{(off)}$ | | 668 | | ns | $I_{B1}=I_{B2}=100\text{mA}$ |

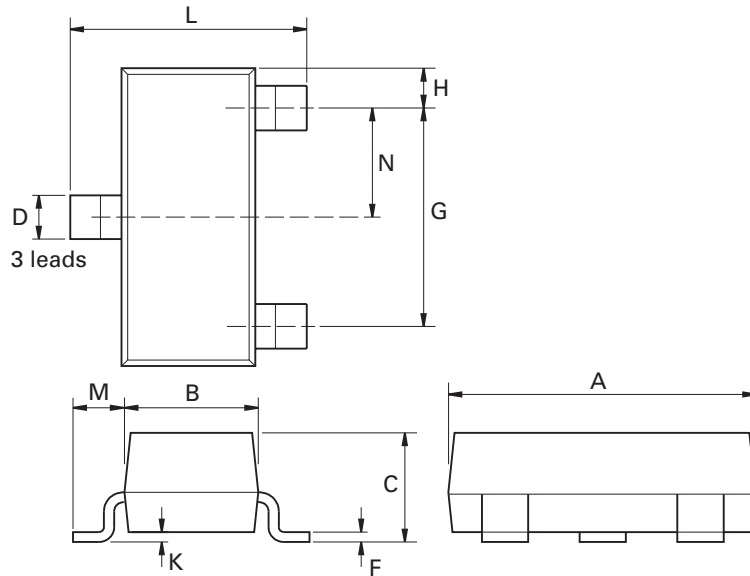
NOTES:

(a) Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$.

Typical characteristics



Packaging details - SOT23



| Dim. | Millimeters | | Inches | | Dim. | Millimeters | | Inches | |
|------|-------------|------|-----------|--------|------|-------------|------|------------|--------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Max. | Max. |
| A | 2.67 | 3.05 | 0.105 | 0.120 | H | 0.33 | 0.51 | 0.013 | 0.020 |
| B | 1.20 | 1.40 | 0.047 | 0.055 | K | 0.01 | 0.10 | 0.0004 | 0.004 |
| C | - | 1.10 | - | 0.043 | L | 2.10 | 2.50 | 0.083 | 0.0985 |
| D | 0.37 | 0.53 | 0.015 | 0.021 | M | 0.45 | 0.64 | 0.018 | 0.025 |
| F | 0.085 | 0.15 | 0.0034 | 0.0059 | N | 0.95 NOM | | 0.0375 NOM | |
| G | 1.90 NOM | | 0.075 NOM | | - | - | - | - | - |

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

Europe

Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany

Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49
europe.sales@zetex.com

Americas

Zetex Inc
700 Veterans Memorial Highway
Hauppauge, NY 11788
USA

Telephone: (1) 631 360 2222
Fax: (1) 631 360 8222
usa.sales@zetex.com

Asia Pacific

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

Corporate Headquarters

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

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contact or be regarded as a representation relating to the products or services concerned. The company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.