

ZXTP23140BFH

140V SOT23 PNP medium power transistor

Summary

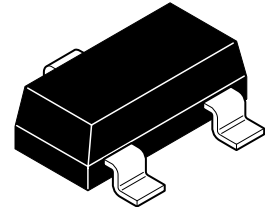
$V_{(BR)CEX} > -160V, V_{(BR)CEO} > -140V$

$I_{C(CONT)} = -2.5A$

$R_{CE(sat)} = 76m\Omega$ typical

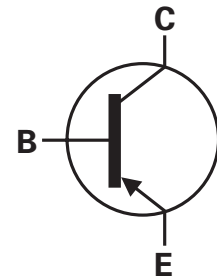
$V_{CE(sat)} < -95mV @ -1A$

$P_D = 1.25W$



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.

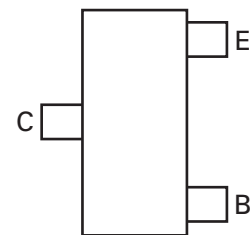


Features

- Higher power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 160V forward blocking voltage

Applications

- DC - DC converters
- Motor drive
- High side switches



Pinout - top view

Ordering information

| Device | Reel size (inches) | Tape width | Quantity per reel |
|----------------|--------------------|------------|-------------------|
| ZXTP23140BFHTA | 7 | 8mm | 3,000 |

Device marking

955

ZXTP23140BFH

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|--|---------------|--------------|------------|
| Collector-base voltage | V_{CBO} | -160 | V |
| Collector-emitter voltage | $V_{(BR)CEX}$ | -160 | V |
| Collector-emitter voltage | V_{CEO} | -140 | V |
| Emitter-base voltage | V_{EBO} | -7.0 | V |
| Peak pulse current | I_{CM} | -5 | A |
| Continuous collector current ^(b) | I_C | -2.5 | A |
| Base current | I_B | -1 | A |
| Power dissipation @ $T_A=25^\circ\text{C}$ ^(a) Linear derating factor ^(a) | P_D | 0.73 5.84 | W mW/°C |
| Power dissipation @ $T_A=25^\circ\text{C}$ ^(b) linear derating factor ^(b) | P_D | 1.05 8.4 | W mW/°C |
| Power dissipation @ $T_A=25^\circ\text{C}$ ^(c) linear derating factor ^(c) | P_D | 1.25 9.6 | W mW/°C |
| Power dissipation @ $T_A=25^\circ\text{C}$ ^(d) linear derating factor ^(d) | P_D | 1.81 14.5 | W mW/°C |
| Operating and storage temperature | $T_j:T_{stg}$ | -55 to +150 | °C |

Thermal resistance

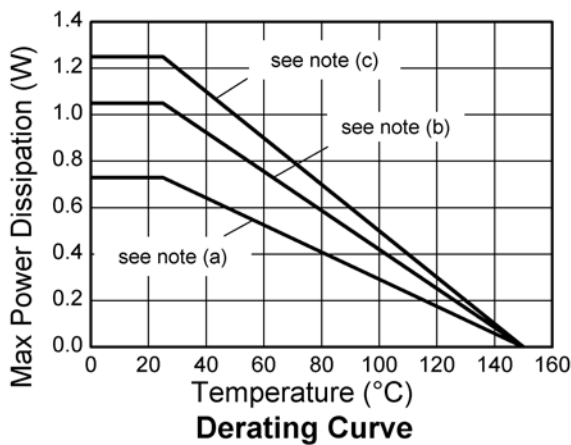
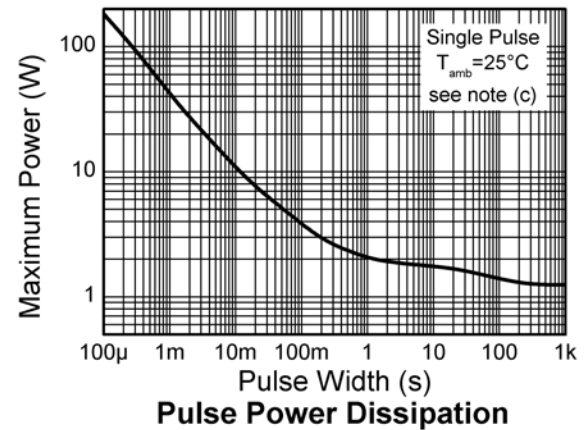
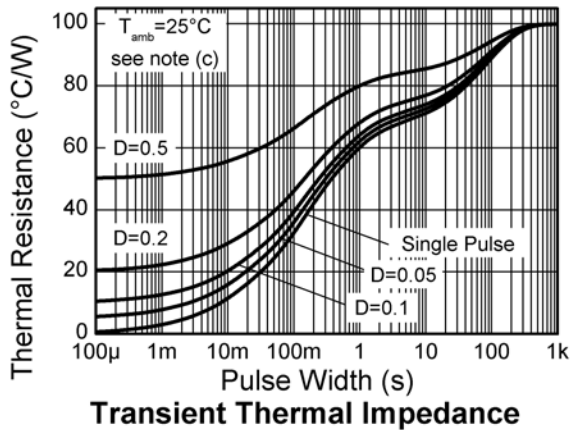
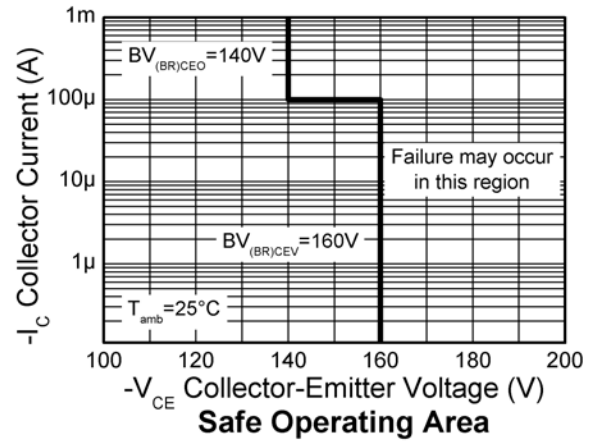
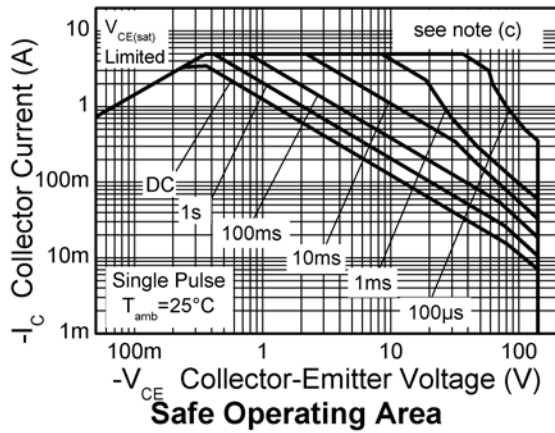
| Parameter | Symbol | Limit | Unit |
|------------------------------------|-----------------|-------|------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 171 | °C/W |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 119 | °C/W |
| Junction to ambient ^(c) | $R_{\theta JA}$ | 100 | °C/W |
| Junction to ambient ^(d) | $R_{\theta JA}$ | 69 | °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 $t < 5\text{sec}$.

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Characteristics



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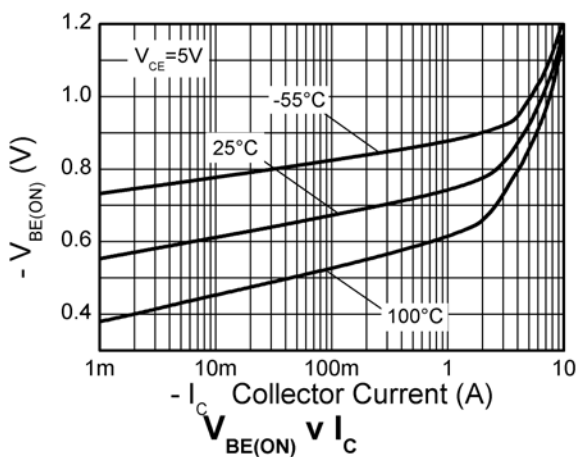
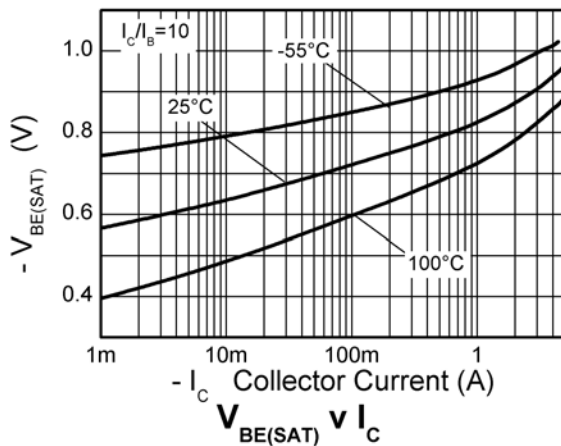
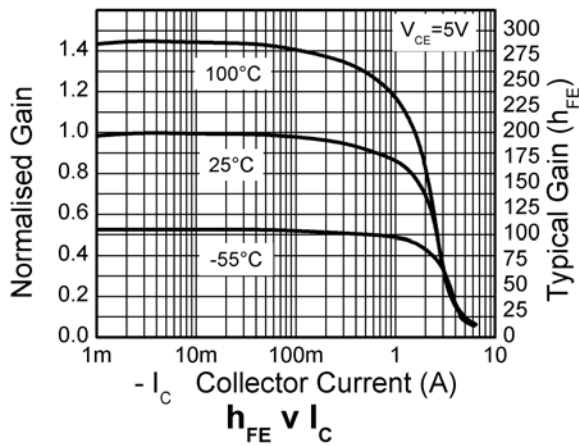
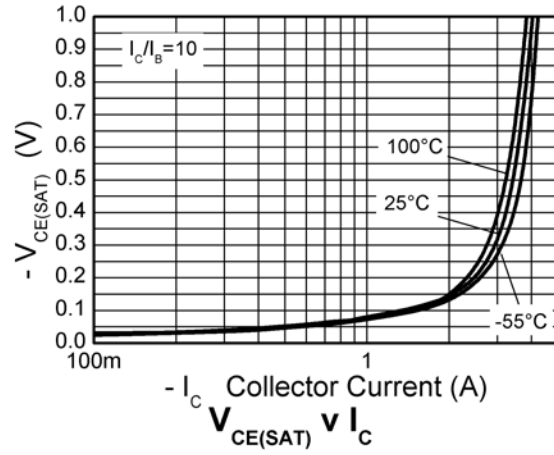
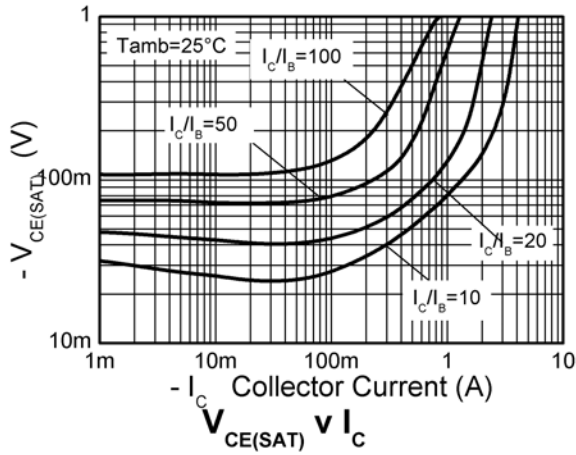
ELECTRICAL CHARACTERISTICS (at $T_{AMB} = 25^{\circ}\text{C}$ unless otherwise stated)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---------------------------------------|---------------|------------------|--------------------|--------------------|----------------|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | -160 | -180 | | V | $I_C = -100\mu\text{A}$ |
| Collector-emitter breakdown voltage | $V_{(BR)CEX}$ | -160 | -180 | | V | $I_C = -100\mu\text{A}$, $R_{BE} \leq 1\text{k}\Omega$ OR $-0.25\text{V} < V_{BE} < 1\text{V}$ |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | -140 | -160 | | V | $I_C = -10\text{mA}^{(*)}$ |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | -7.0 | -8.2 | | V | $I_E = -100\mu\text{A}$ |
| Collector-emitter cut-off current | I_{CEX} | | - | -100 | nA | $V_{CE} = -130\text{V}$; $R_{BE} \leq 1\text{k}\Omega$ OR $-0.25\text{V} < V_{BE} < 1\text{V}$ |
| Collector-base cut-off current | I_{CBO} | | <1 | -20 | nA | $V_{CB} = -130\text{V}$ |
| 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 | 200 180 100 | 300 | | $I_C = -10\text{mA}$, $V_{CE} = -5\text{V}^{(*)}$ $I_C = -1\text{A}$, $V_{CE} = -5\text{V}^{(*)}$ $I_C = -2.5\text{A}$, $V_{CE} = -5\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | | -45 -80 -190 | -55 -95 -280 | mV mV mV | $I_C = -100\text{mA}$, $I_B = -5\text{mA}^{(*)}$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^{(*)}$ $I_C = -2.5\text{A}$, $I_B = -250\text{mA}^{(*)}$ |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | | -0.89 | -1.00 | V | $I_C = -2.5\text{A}$, $I_B = -250\text{mA}^{(*)}$ |
| Base-emitter turn-on voltage | $V_{BE(on)}$ | | -0.78 | -0.90 | V | $I_C = -2.5\text{A}$, $V_{CE} = -5\text{V}^{(*)}$ |
| Transition frequency | f_T | | 130 | | MHz | $I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$, $f = 50\text{MHz}$ |
| Output capacitance | C_{obo} | | 30.9 | | pF | $V_{CB} = -10\text{V}$, $f = 1\text{MHz}$ |
| Turn-on time | $t_{(on)}$ | | 132.4 | | ns | $V_{CC} = -10\text{V}$, $I_C = -2\text{A}$, $I_{B1} = I_{B2} = -200\text{mA}$ |
| Turn-off time | $t_{(off)}$ | | 345.5 | | ns | |

NOTES:

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

Typical characteristics



ZXTP23140BFH

Package outline - 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

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