

ZXTN25020DFL

20V, SOT23, NPN low power transistor

Summary

$BV_{CEX} > 100V$

$BV_{CEO} > 20V$

$BV_{ECO} > 5V$

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

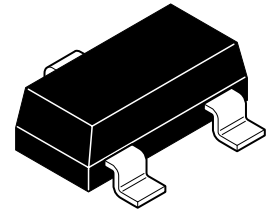
$I_{CM} = 8A$

$V_{CE(sat)} < 70mV @ 1A$

$R_{CE(sat)} = 55m\Omega$

$P_D = 350mW$

Complementary part number ZXTP25020DFL



Description

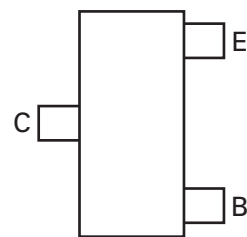
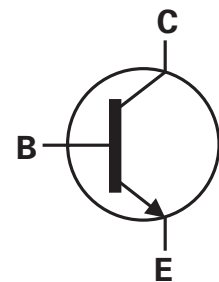
Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

Features

- High peak current
- Low saturation voltage
- 100V forward blocking voltage

Applications

- MOSFET and IGBT gate driving
- DC-DC conversion
- LED driving
- Interface between low voltage IC's and loads



Pinout - top view

Ordering information

| Device | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------------|--------------------|-----------------|-------------------|
| ZXTN25020DFLTA | 7 | 8 | 3,000 |

Device marking

1A1

ZXTN25020DFL

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|--|----------------|------------|-------|
| Collector-base voltage | V_{CBO} | 100 | V |
| Collector-emitter voltage (forward blocking) | V_{CEX} | 100 | V |
| Collector-emitter voltage | V_{CEO} | 20 | V |
| Emitter-collector voltage (reverse blocking) | V_{ECO} | 5 | V |
| Emitter-base voltage | V_{EBO} | 7 | V |
| Continuous collector current ^(a) | I_C | 2 | A |
| Base current | I_B | 500 | mA |
| Peak pulse current | I_{CM} | 8 | A |
| Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$ | P_D | 350 | mW |
| Linear derating factor | | 2.8 | mW/°C |
| Operating and storage temperature range | T_j, T_{stg} | -55 to 150 | °C |

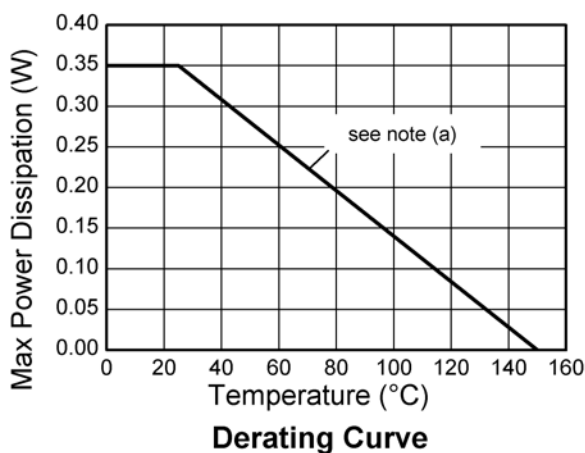
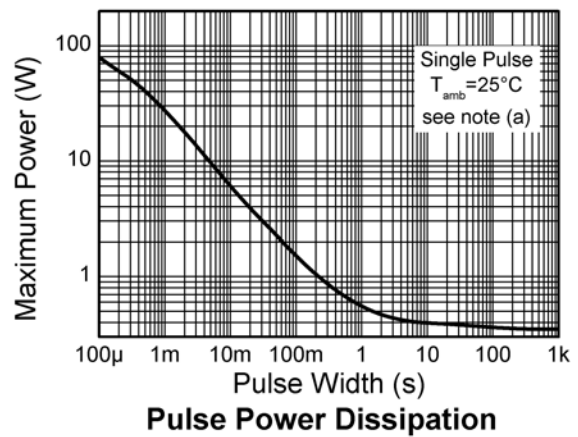
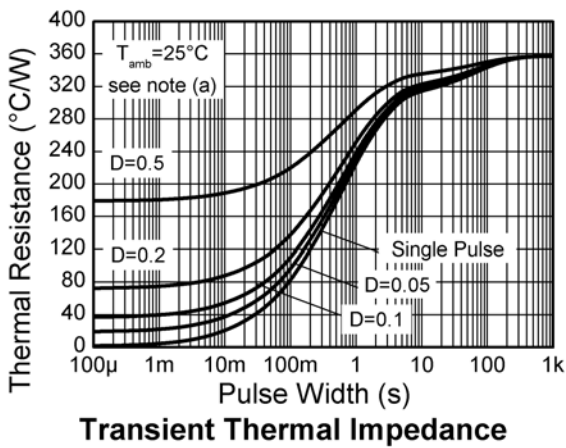
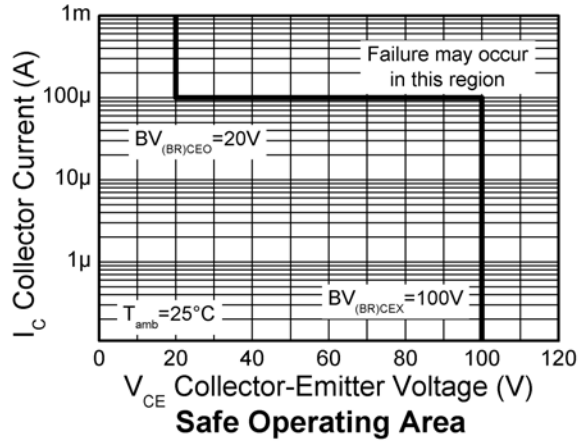
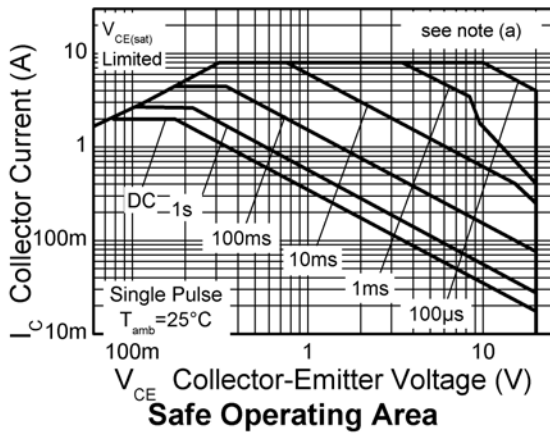
Thermal resistance

| Parameter | Symbol | Limit | Unit |
|------------------------------------|-----------------|-------|------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 357 | °C/W |

NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

Characteristics



ZXTN25020DFL

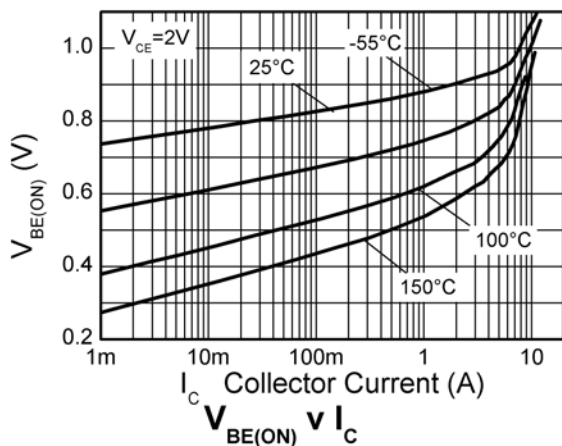
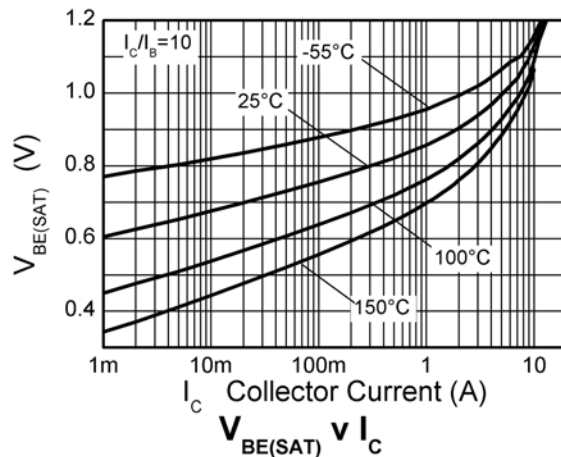
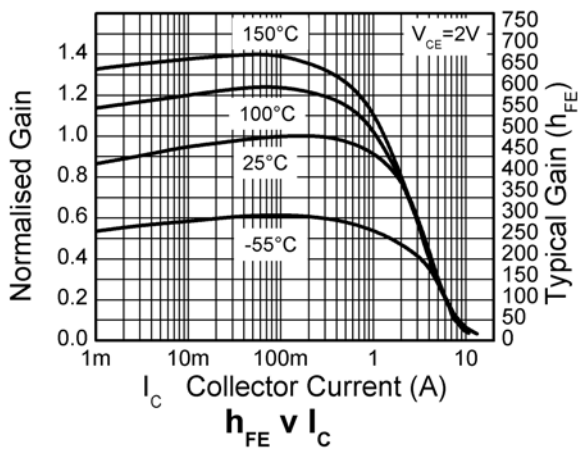
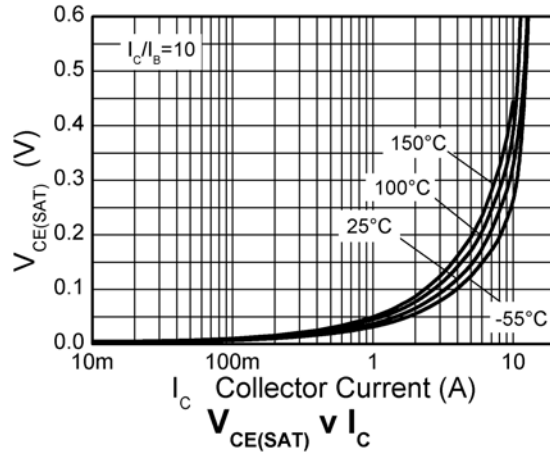
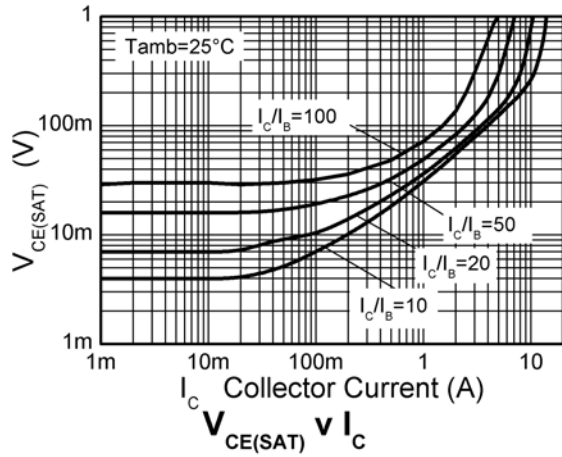
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--|---------------|------|------|----------|---------------------|--|
| Collector-base breakdown voltage | BV_{CBO} | 100 | 125 | | V | $I_C = 100\mu\text{A}$ |
| Collector-emitter breakdown voltage (forward blocking) | BV_{CEX} | 100 | 120 | | V | $I_C = 100\text{A}$; $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$ |
| Collector-emitter breakdown voltage (base open) | BV_{CEO} | 20 | 35 | | V | $I_C = 10\text{mA}^{(*)}$ |
| Emitter-collector breakdown voltage (reverse blocking) | BV_{ECX} | 6 | 8 | | 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 | 6 | | V | $I_E = 100\mu\text{A}$, |
| Emitter-base breakdown voltage | BV_{EBO} | 7 | 8.3 | | V | $I_E = 100\mu\text{A}$ |
| Collector cut-off current | I_{CBO} | | <1 | 50 20 | nA μA | $V_{CB} = 80\text{V}$ $V_{CB} = 80\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Collector-emitter cut-off current | I_{CEX} | | - | 100 | nA | $V_{CE} = 80\text{V}$; $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$ |
| Emitter cut-off current | I_{EBO} | | <1 | 50 | nA | $V_{EB} = 5.6\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(SAT)}$ | | 60 | 70 | mV | $I_C = 1\text{A}$, $I_B = 100\text{mA}^{(*)}$ |
| | | | 85 | 100 | mV | $I_C = 1\text{A}$, $I_B = 20\text{mA}^{(*)}$ |
| | | | 140 | 160 | mV | $I_C = 2\text{A}$, $I_B = 40\text{mA}^{(*)}$ |
| | | | 180 | 225 | mV | $I_C = 2\text{A}$, $I_B = 20\text{mA}^{(*)}$ |
| | | | 245 | 270 | mV | $I_C = 4.5\text{A}$, $I_B = 450\text{mA}^{(*)}$ |
| Base-emitter saturation voltage | $V_{BE(SAT)}$ | | 895 | 1000 | mV | $I_C = 2\text{A}$, $I_B = 40\text{mA}^{(*)}$ |
| Base-emitter turn-on voltage | $V_{BE(ON)}$ | | 825 | 900 | mV | $I_C = 2\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| Static forward current transfer ratio | h_{FE} | 300 | 450 | 900 | | $I_C = 10\text{mA}$, $V_{CE} = 2\text{V}^{(*)}$ |
| | | 220 | 350 | | | $I_C = 2\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| | | 80 | 120 | | | $I_C = 4.5\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| Transition frequency | f_T | | 215 | | MHz | $I_C = 50\text{mA}$, $V_{CE} = 10\text{V}$ $f = 100\text{MHz}$ |
| Output capacitance | C_{OBO} | | 16.5 | 25 | pF | $V_{CB} = 10\text{V}$, $f = 1\text{MHz}^{(*)}$ |
| Delay time | $t_{(d)}$ | | 67.7 | | ns | $V_{CC} = 10\text{V}$. $I_C = 1\text{A}$, $I_{B1} = I_{B2} = 10\text{mA}$. |
| Rise time | $t_{(r)}$ | | 72.2 | | ns | |
| Storage time | $t_{(s)}$ | | 361 | | ns | |
| Fall time | $t_{(f)}$ | | 63.9 | | ns | |

NOTES:

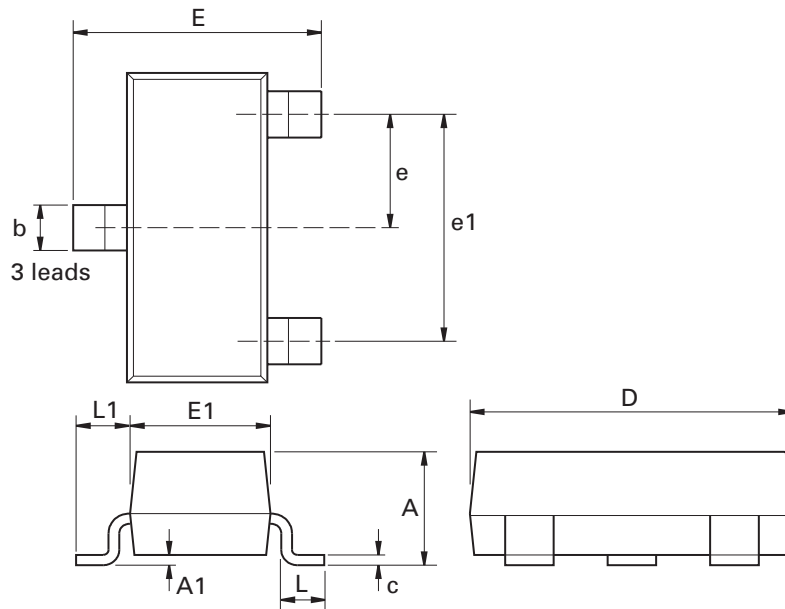
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics



ZXTN25020DFL

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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ESD (Electrostatic discharge)

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Product status key:

| | |
|-----------------------------------|--|
| "Preview" | Future device intended for production at some point. Samples may be available |
| "Active" | Product status recommended for new designs |
| "Last time buy (LTB)" | Device will be discontinued and last time buy period and delivery is in effect |
| "Not recommended for new designs" | Device is still in production to support existing designs and production |
| "Obsolete" | Production has been discontinued |

Datasheet status key:

| | |
|-----------------------|---|
| "Draft version" | This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice. |
| "Provisional version" | This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance. However, changes to the test conditions and specifications may occur, at any time and without notice. |
| "Issue" | This term denotes an issued datasheet containing finalized specifications. However, changes to specifications may occur, at any time and without notice. |

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Электрон
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