

ZXTP03200BG

200V PNP Low $V_{CE(sat)}$ transistor in SOT223

Summary

$BV_{CEO} > -200V$

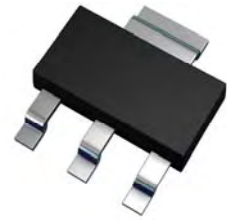
$BV_{ECO} > -2V$

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

$V_{CE(sat)} < -160mV @ -1A$

$R_{CE(sat)} = 135m\Omega$

$P_D = 3W$

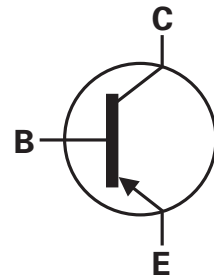


Description

Packaged in the SOT223 outline this new 5th generation low saturation 200V 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
- Up to 5 Amps peak current
- Very low saturation voltage
- Enhanced switching performance

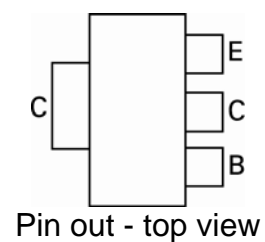


Applications

- DC-DC conversion

Ordering Information

| Device | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---------------|--------------------|-----------------|-------------------|
| ZXTP03200BGTA | 7 | 12 | 1000 |



Device Marking

ZXTP03200BG

Absolute Maximum Ratings

| Parameter | Symbol | Limit | Unit |
|--|----------------|--------------|------------|
| Collector-Base Voltage | V_{CBO} | -220 | V |
| Collector-Emitter Voltage | V_{CEO} | -200 | V |
| Emitter-Base Voltage | V_{EBO} | -7 | V |
| Continuous Collector Current ^(a) | I_C | -2 | A |
| Base Current | I_B | -1 | A |
| Peak Pulse Current | I_{CM} | -5 | A |
| Power Dissipation at $T_A=25^\circ\text{C}$ ^(a) Linear Derating Factor | P_D | 1.25 10 | W mW/°C |
| Power Dissipation at $T_A=25^\circ\text{C}$ ^(b) Linear Derating Factor | P_D | 1.65 13.2 | W mW/°C |
| Power Dissipation at $T_A=25^\circ\text{C}$ ^(c) Linear Derating Factor | P_D | 3 24 | W mW/°C |
| Power Dissipation at $T_A=25^\circ\text{C}$ ^(d) Linear Derating Factor | P_D | 5.8 46.5 | W mW/°C |
| Power Dissipation at $T_C=25^\circ\text{C}$ ^(e) Linear Derating Factor | P_D | 11.9 95.2 | W mW/°C |
| Operating and Storage Temperature Range | T_j, T_{stg} | -55 to 150 | °C |

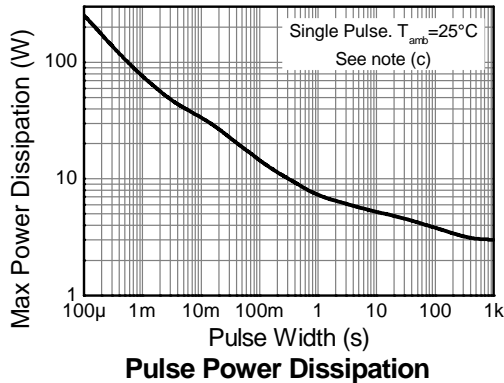
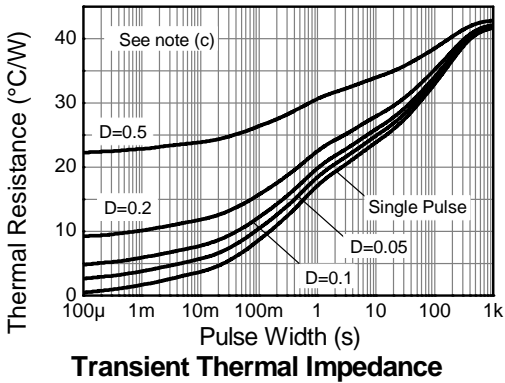
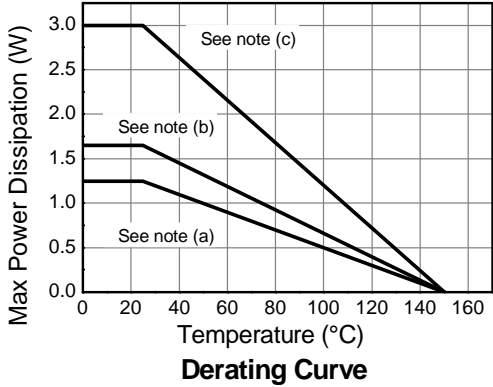
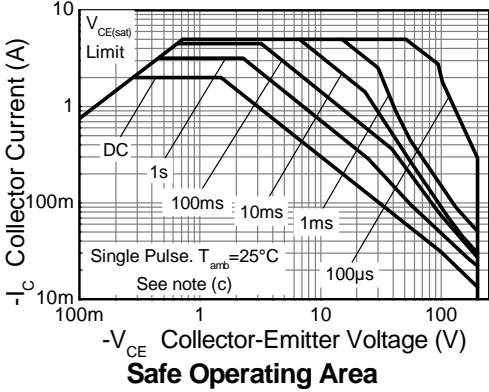
Thermal Resistance

| Parameter | Symbol | Value | Unit |
|------------------------------------|-----------------|-------|------|
| Junction to Ambient ^(a) | $R_{\theta JA}$ | 100 | °C/W |
| Junction to Ambient ^(b) | $R_{\theta JA}$ | 76 | °C/W |
| Junction to Ambient ^(c) | $R_{\theta JA}$ | 41.6 | °C/W |
| Junction to Ambient ^(d) | $R_{\theta JA}$ | 21.5 | °C/W |
| Junction to Lead ^(e) | $R_{\theta JL}$ | 10.5 | °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 high coverage of single sided 1oz copper, in still air conditions.
- (c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
- (d) As (c) above measured at $t < 5$ seconds.
- (e) Junction to Lead from Collector Tab. Typical

Thermal Characteristics



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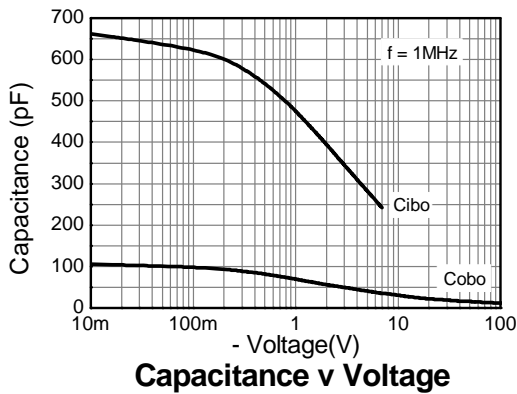
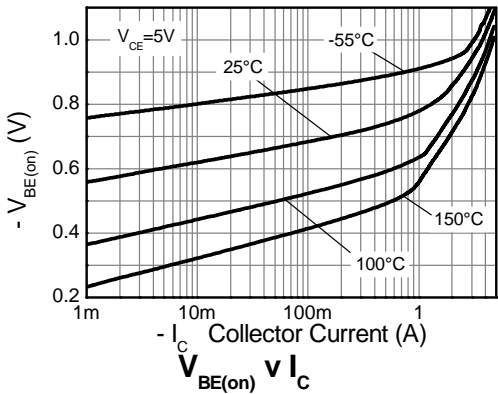
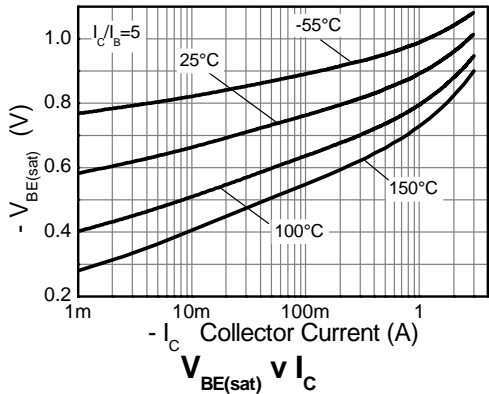
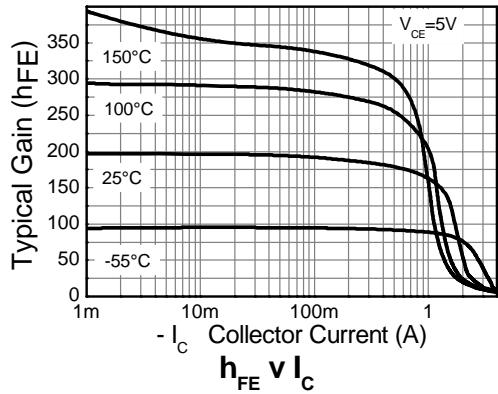
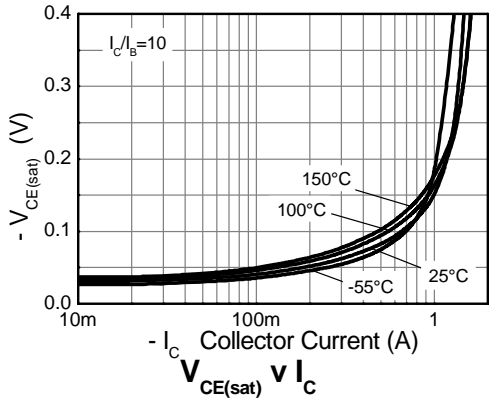
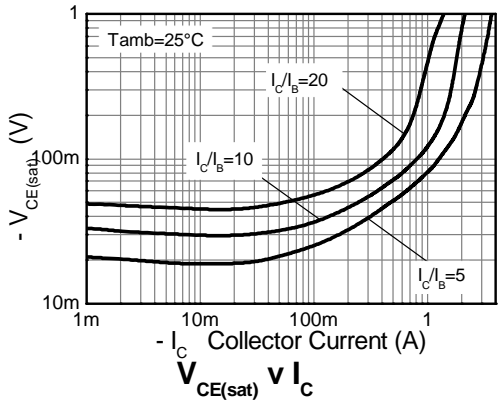
Electrical Characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---------------------------------------|---------------|------------------|-----------------------------|-----------------------------|----------------------|--|
| Collector-Base Breakdown Voltage | BV_{CBO} | -220 | -245 | | V | $I_C = -100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | BV_{CER} | -220 | -245 | | V | $I_C = -1\mu\text{A}$, $R_{BE} \leq 1\text{k}\Omega$ |
| Collector-Emitter Breakdown voltage | BV_{CEO} | -200 | -225 | | V | $I_C = -10\text{mA}$ (*) |
| Emitter-Base Breakdown Voltage | BV_{EBO} | -7 | -8.4 | | V | $I_E = -100\mu\text{A}$ |
| Collector-Base Cut-off Current | I_{CBO} | | <1 | -50 -0.5 | nA μA | $V_{CB} = -200\text{V}$ $V_{CB} = -200\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter Cut-off Current | I_{EBO} | | <1 | -10 | nA | $V_{EB} = -6\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | -37 -130 -135 -180 | -50 -155 -160 -275 | mV mV mV mV | $I_C = -0.1\text{A}$, $I_B = -10\text{mA}$ (*) $I_C = -0.5\text{A}$, $I_B = -25\text{mA}$ (*) $I_C = -1\text{A}$, $I_B = -100\text{mA}$ (*) $I_C = -2\text{A}$, $I_B = -400\text{mA}$ (*) |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | -955 | -1100 | mV | $I_C = -2\text{A}$, $I_B = -400\text{mA}$ (*) |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | -860 | -1000 | mV | $I_C = -2\text{A}$, $V_{CE} = -5\text{V}$ (*) |
| Static Forward Current Transfer Ratio | h_{FE} | 100 100 20 | 195 170 50 5 | 300 | | $I_C = -10\text{mA}$, $V_{CE} = -5\text{V}$ (*) $I_C = -1\text{A}$, $V_{CE} = -5\text{V}$ (*) $I_C = -2\text{A}$, $V_{CE} = -5\text{V}$ (*) $I_C = -5\text{A}$, $V_{CE} = -5\text{V}$ (*) |
| Transition Frequency | f_T | | 105 | | MHz | $I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$ |
| Output Capacitance | C_{obo} | | 31 | | pF | $V_{CB} = -10\text{V}$, $f = 1\text{MHz}$ (*) |
| Delay Time | t_d | | 21 | | ns | $I_C = -1\text{A}$, $V_{CC} = -50\text{V}$, $I_{B1} = -I_{B2} = -100\text{mA}$ |
| Rise Time | t_r | | 18 | | ns | |
| Storage Time | t_s | | 680 | | ns | |
| Fall Time | t_f | | 75 | | ns | |

NOTES:

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

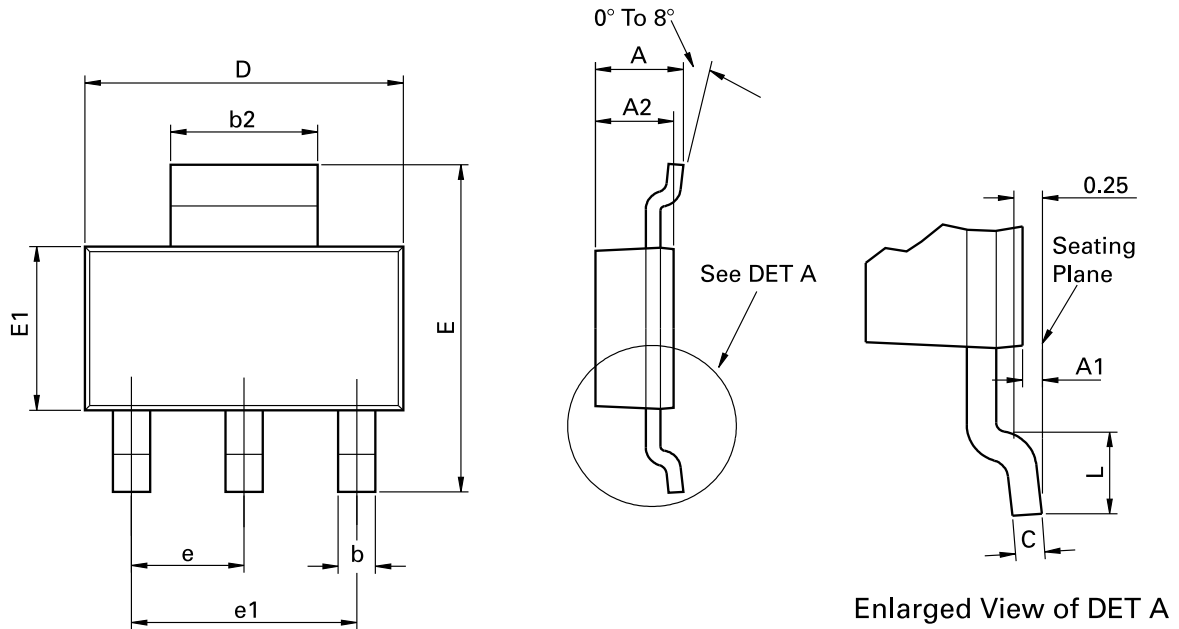
Typical Characteristics



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ZXTP03200BG

Package Information – SOT223



Conforms to JEDEC TO-261 AA Issue B

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|------|--------|-------|-----|-------------|------|------------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | - | 1.80 | - | 0.071 | e | 2.30 BSC | | 0.0905 BSC | |
| A1 | 0.02 | 0.10 | 0.0008 | 0.004 | e1 | 4.60 BSC | | 0.181 BSC | |
| b | 0.66 | 0.84 | 0.026 | 0.033 | E | 6.70 | 7.30 | 0.264 | 0.287 |
| b2 | 2.90 | 3.10 | 0.114 | 0.122 | E1 | 3.30 | 3.70 | 0.130 | 0.146 |
| C | 0.23 | 0.33 | 0.009 | 0.013 | L | 0.90 | - | 0.355 | - |
| D | 6.30 | 6.70 | 0.248 | 0.264 | - | - | - | - | - |

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