

ZXTN2007G

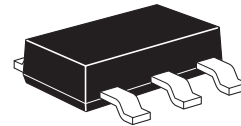
30V NPN MEDIUM POWER LOW SATURATION TRANSISTOR IN SOT223

SUMMARY

$BV_{CEO} = 30V$; $R_{SAT} = 28m\Omega$; $I_C = 7A$

DESCRIPTION

Packaged in the SOT223 outline this new low saturation 30V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



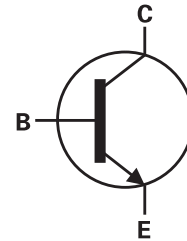
SOT223

FEATURES

- Extremely low equivalent on-resistance; $R_{SAT} = 28m\Omega$ at 6.5A
- 7 amps continuous current
- Up to 20 amps peak current
- Very low saturation voltages
- Excellent h_{FE} characteristics up to 20 amps

APPLICATIONS

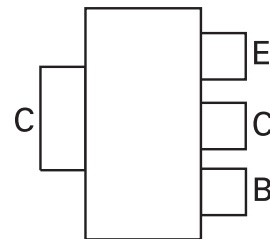
- DC - DC converters
- MOSFET gate drivers
- Charging circuits
- Power switches
- Motor control



ORDERING INFORMATION

| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|-------------|-----------|---------------|-------------------|
| ZXTN2007GTA | 7" | 12mm embossed | 1,000 units |
| ZXTN2007GTC | 13" | | 4,000 units |

PINOUT



TOP VIEW

DEVICE MARKING

ZXTN
2007

ZXTN2007G

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|----------------|-------------|----------------------|
| Collector-base voltage | BV_{CBO} | 80 | V |
| Collector-emitter voltage | BV_{CEO} | 30 | V |
| Emitter-base voltage | BV_{EBO} | 7 | V |
| Continuous collector current ^(a) | I_C | 7 | A |
| Peak pulse current | I_{CM} | 20 | A |
| Power dissipation at $T_A = 25^\circ\text{C}$ ^(a) | P_D | 3.0 | W |
| Linear derating factor | | 24 | mW/ $^\circ\text{C}$ |
| Power dissipation at $T_A = 25^\circ\text{C}$ ^(b) | P_D | 1.6 | W |
| Linear derating factor | | 12.8 | mW/ $^\circ\text{C}$ |
| Operating and storage temperature range | T_j, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

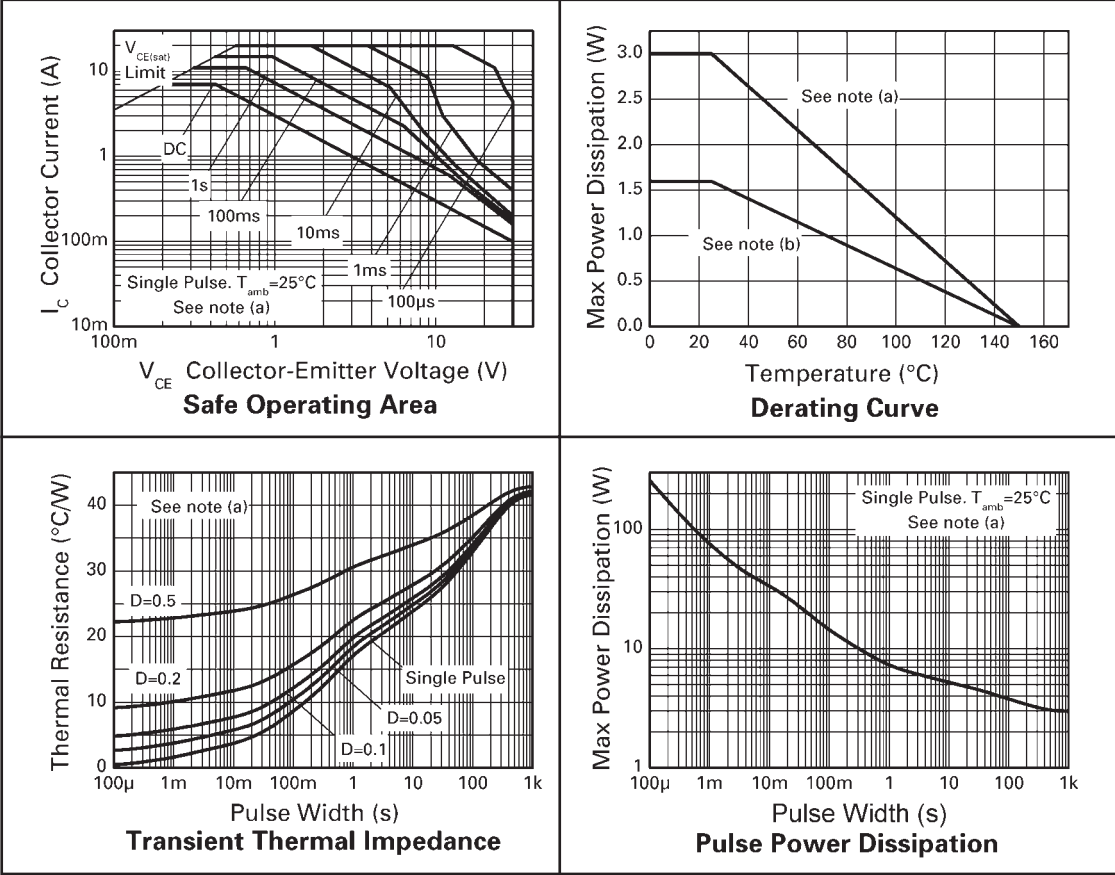
THERMAL RESISTANCE

| PARAMETER | SYMBOL | VALUE | UNIT |
|------------------------------------|-----------------|-------|---------------------------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 42 | $^\circ\text{C}/\text{W}$ |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 78 | $^\circ\text{C}/\text{W}$ |

NOTES

- (a) For a device surface mounted on 52mm x 52mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
(b) 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



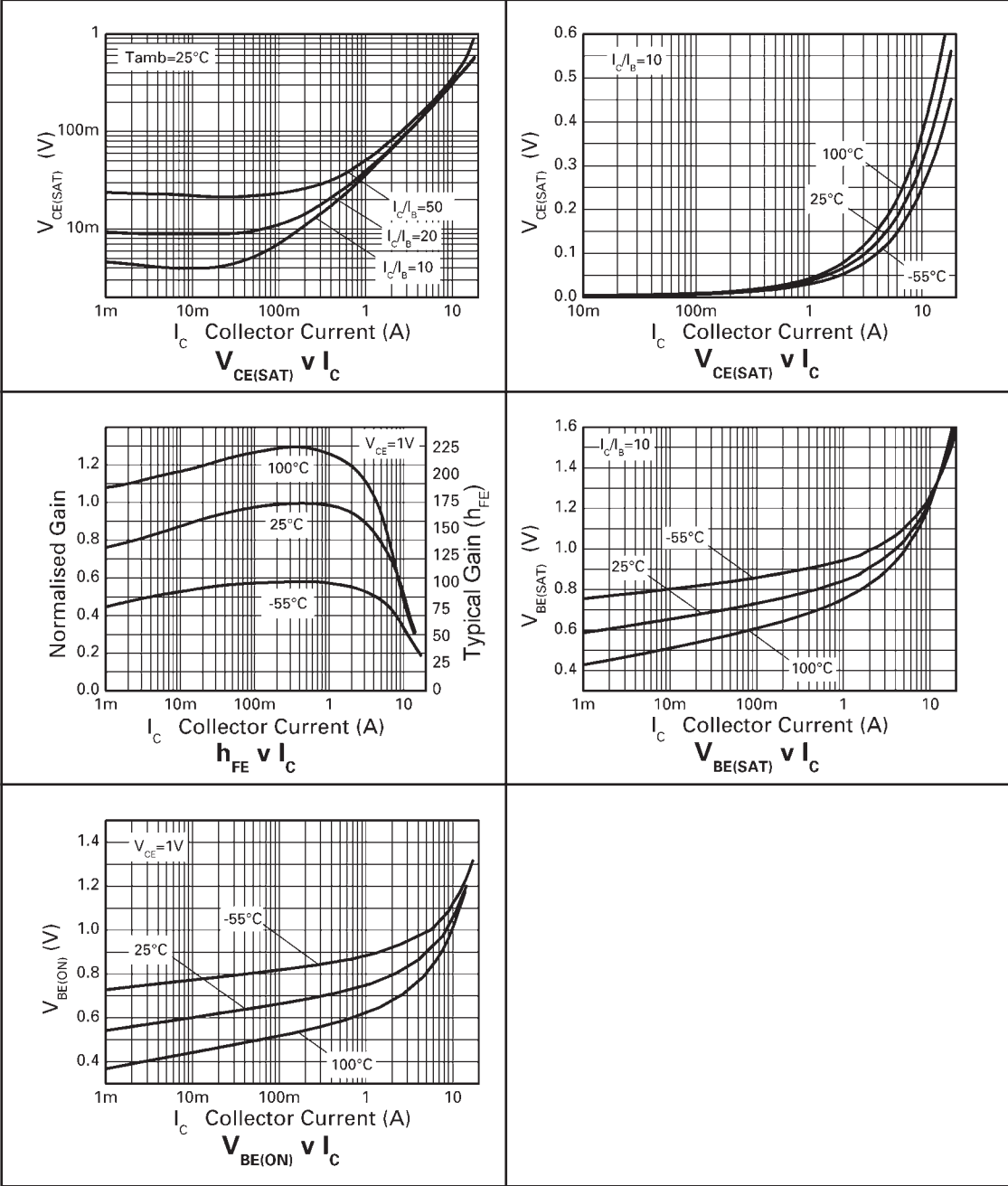
ZXTN2007G

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} | 80 | 125 | | V | $I_C = 100\mu\text{A}$ |
| Collector-emitter breakdown voltage | BV_{CER} | 80 | 125 | | V | $I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$ |
| Collector-emitter breakdown voltage | BV_{CEO} | 30 | 40 | | V | $I_C = 10\text{mA}^*$ |
| Emitter-base breakdown voltage | BV_{EBO} | 7 | 8.1 | | V | $I_E = 100\mu\text{A}$ |
| Collector cut-off current | I_{CBO} | | | 20 0.5 | nA μA | $V_{CB} = 70\text{V}$ $V_{CB} = 70\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Collector cut-off current | I_{CER} $R \leq 1\text{k}\Omega$ | | | 20 0.5 | nA μA | $V_{CB} = 70\text{V}$ $V_{CB} = 70\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter cut-off current | I_{EBO} | | | 10 | nA | $V_{EB} = 6\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(SAT)}$ | | 25 35 50 100 185 | 35 50 65 125 220 | mV | $I_C = 0.5\text{A}$, $I_B = 20\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 20\text{mA}^*$ $I_C = 2\text{A}$, $I_B = 20\text{mA}^*$ $I_C = 6.5\text{A}$, $I_B = 300\text{mA}^*$ |
| Base-emitter saturation voltage | $V_{BE(SAT)}$ | | 1025 | 1130 | mV | $I_C = 6.5\text{A}$, $I_B = 300\text{mA}^*$ |
| Base-emitter turn-on voltage | $V_{BE(ON)}$ | | 920 | 1000 | mV | $I_C = 6.5\text{A}$, $V_{CE} = 1\text{V}^*$ |
| Static forward current transfer ratio | h_{FE} | 100 100 100 20 | 175 200 150 30 | 300 | | $I_C = 10\text{mA}$, $V_{CE} = 1\text{V}^*$ $I_C = 1\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 7\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 20\text{A}$, $V_{CE} = 1\text{V}^*$ |
| Transition frequency | f_T | | 140 | | MHz | $I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$ |
| Output capacitance | C_{OBO} | | 48 | | pF | $V_{CB} = 10\text{V}$, $f = 1\text{MHz}^*$ |
| Switching times | t_{ON} t_{OFF} | | 37 425 | | ns | $I_C = 1\text{A}$, $V_{CC} = 10\text{V}$, $I_{B1} = -I_{B2} = 100\text{mA}$ |

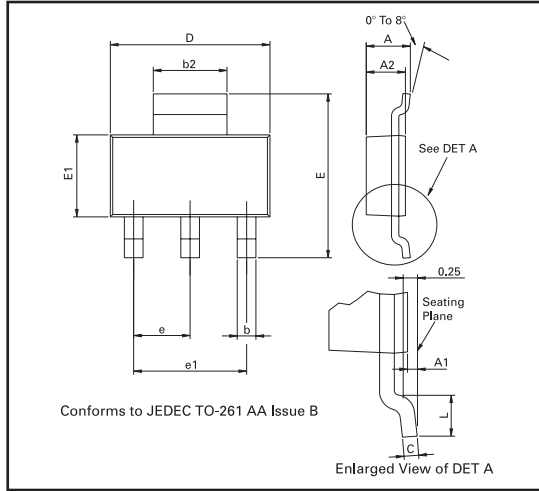
* Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS

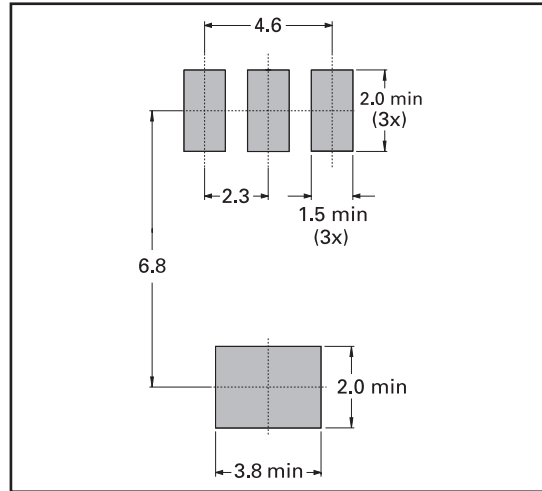


ZXTN2007G

PACKAGE OUTLINE



PAD LAYOUT DETAILS



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

| 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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