

ZXTP2006E6

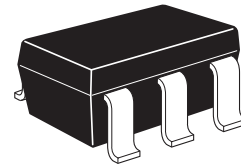
20V PNP LOW SAT MEDIUM POWER TRANSISTOR IN SOT23-6

SUMMARY

$BV_{CEO} = -20V$; $R_{SAT} = 31m\Omega$; $I_C = -3.5A$

DESCRIPTION

Packaged in the SOT23-6 outline this new low saturation 20V PNP transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



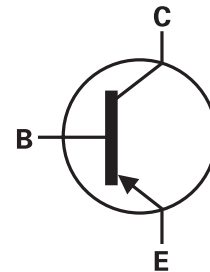
SOT23-6

FEATURES

- 3.5 Amps continuous current
- Extremely low saturation voltage (-70mV max @ 1A/100mA)
- Up to 10 Amps peak current
- Very low saturation voltages

APPLICATIONS

- DC - DC converters
- Battery charging
- Power switches
- Motor control
- Power management functions



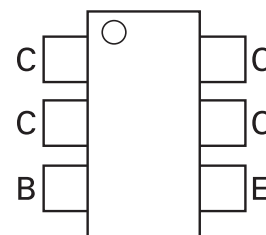
ORDERING INFORMATION

| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|--------------|-----------|--------------|-------------------|
| ZXTP2006E6TA | 7" | 8mm embossed | 3,000 |
| ZXTP2006E6TC | 13" | 8mm embossed | 10,000 |

DEVICE MARKING

52

PINOUT



TOP VIEW

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ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|------------|-------|----------------------|
| Collector-base voltage | BV_{CBO} | -25 | V |
| Collector-emitter voltage | BV_{CEO} | -20 | V |
| Emitter-base voltage | BV_{EBO} | -7.5 | V |
| Continuous collector current | I_C | -3.5 | A |
| Peak pulse current | I_{CM} | -10 | A |
| Power dissipation at $T_A = 25^\circ\text{C}$ ^(a) | P_D | 1.1 | W |
| Linear derating factor | | 8.8 | mW/ $^\circ\text{C}$ |
| Power dissipation at $T_A = 25^\circ\text{C}$ ^(b) | P_D | 1.7 | W |
| Linear derating factor | | 13.6 | mW/ $^\circ\text{C}$ |

THERMAL RESISTANCE

| PARAMETER | SYMBOL | VALUE | UNIT |
|------------------------------------|-----------------|-------|---------------------------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 113 | $^\circ\text{C}/\text{W}$ |
| Junction to ambient ^(b) | $R_{\theta JC}$ | 73 | $^\circ\text{C}/\text{W}$ |

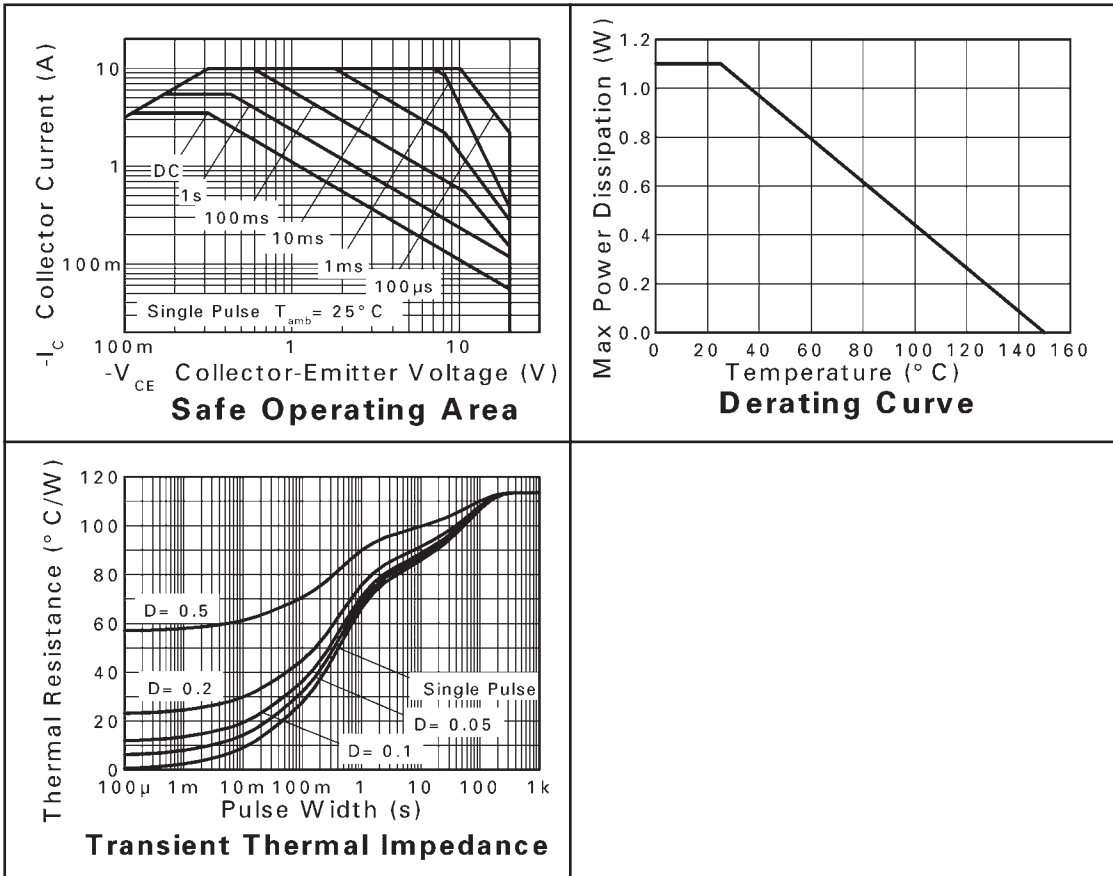
NOTES

(a) For a device surface mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) As above measured at $t < 5$ seconds.

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CHARACTERISTICS



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

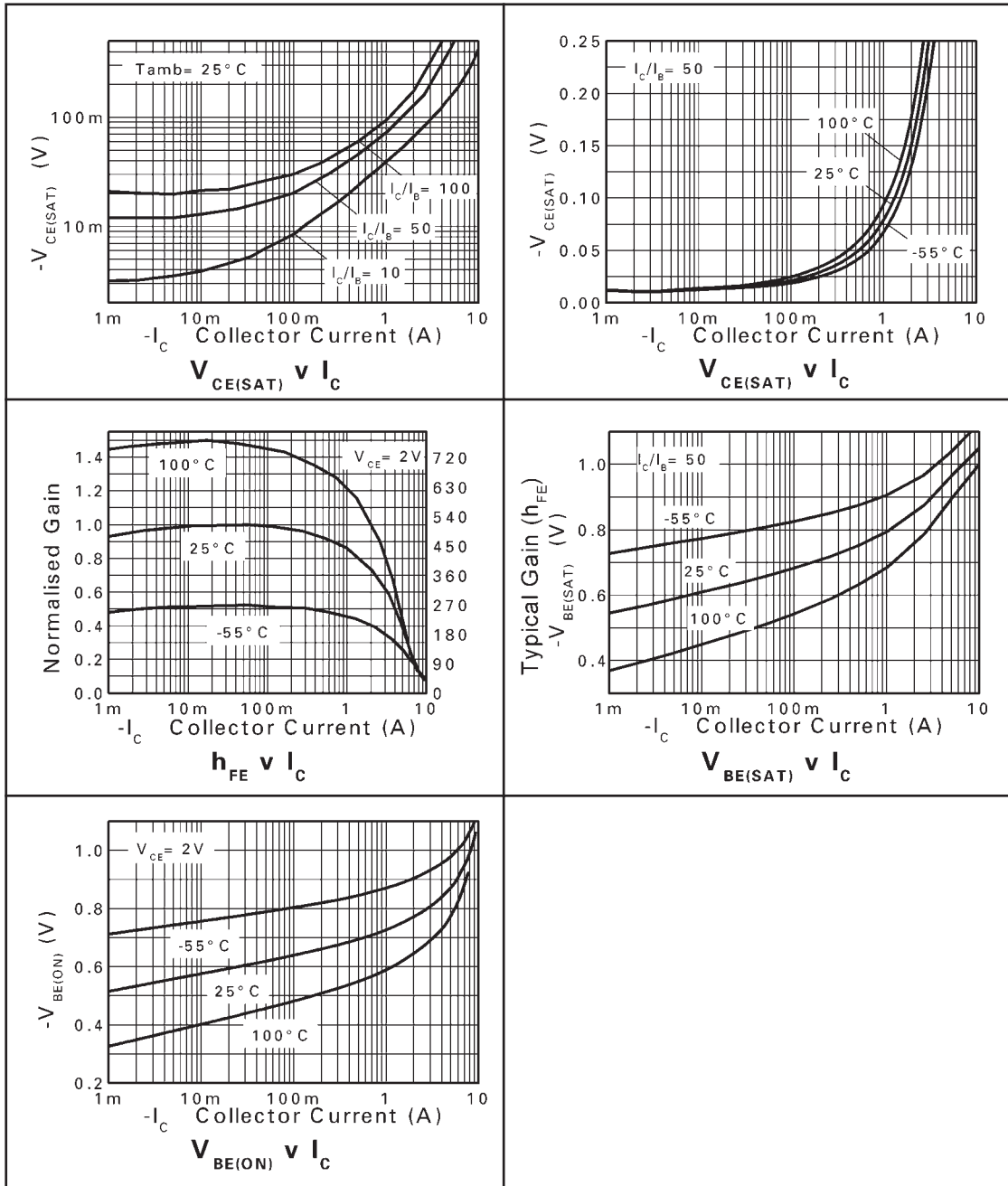
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|---------------------------------------|---------------|------|-------|------|------|--|
| Collector-base breakdown voltage | BV_{CBO} | -25 | -49 | | V | $I_C = -100\mu\text{A}$ |
| Collector-emitter breakdown voltage | BV_{CEO} | -20 | -43 | | V | $I_C = -10\text{mA}^*$ |
| Emitter-base breakdown voltage | BV_{EBO} | -7.5 | -8.4 | | V | $I_E = -100\mu\text{A}$ |
| Collector cut-off current | I_{CBO} | | | -100 | nA | $V_{CB} = -20\text{V}$ |
| Collector cut-off current | I_{CES} | | | -100 | nA | $V_{CB} = -20\text{V}$ |
| Emitter cut-off current | I_{EBO} | | | -100 | nA | $V_{EB} = -6\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(SAT)}$ | | -10 | -15 | mV | $I_C = -0.1\text{A}, I_B = -10\text{mA}^*$ |
| | | | -100 | -140 | mV | $I_C = -1\text{A}, I_B = -10\text{mA}^*$ |
| | | | -110 | -130 | mV | $I_C = -3.5\text{A}, I_B = -350\text{mA}^*$ |
| Base-emitter saturation voltage | $V_{BE(SAT)}$ | | -0.96 | -1.1 | V | $I_C = -3.5\text{A}, I_B = -350\text{mA}^*$ |
| Base-emitter turn-on voltage | $V_{BE(ON)}$ | | -0.8 | -0.9 | V | $I_C = -3.5\text{A}, V_{CE} = -2\text{V}^*$ |
| Static forward current transfer ratio | h_{FE} | 300 | 575 | | | $I_C = -10\text{mA}, V_{CE} = -2\text{V}^*$ |
| | | 300 | 450 | 900 | | $I_C = -1\text{A}, V_{CE} = -2\text{V}^*$ |
| | | 150 | 285 | | | $I_C = -3.5\text{A}, V_{CE} = -2\text{V}^*$ |
| | | 10 | 40 | | | $I_C = -10\text{A}, V_{CE} = -2\text{V}^*$ |
| Transition frequency | f_T | | 110 | | | $I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $f = 50\text{MHz}$ |
| Output capacitance | C_{OBO} | | 45 | | pF | $V_{CB} = -10\text{V}, f = 1\text{MHz}^*$ |

NOTES

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

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TYPICAL CHARACTERISTICS



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NOTES:

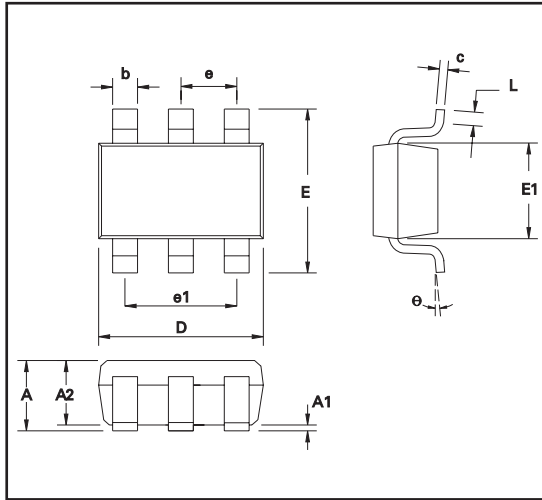
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NOTES:

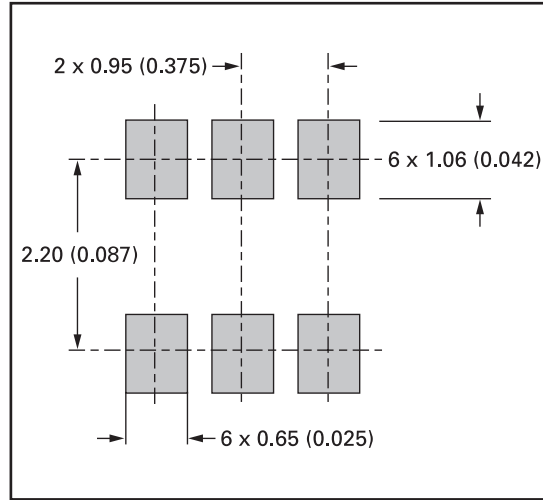
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PACKAGE OUTLINE



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 | 0.90 | 1.45 | 0.035 | 0.057 | E | 2.20 | 3.20 | 0.0866 | 0.118 |
| A1 | 0.00 | 0.15 | 0.00 | 0.006 | E1 | 1.30 | 1.80 | 0.0511 | 0.071 |
| A2 | 0.90 | 1.30 | 0.035 | 0.051 | L | 0.10 | 0.60 | 0.004 | 0.024 |
| b | 0.20 | 0.50 | 0.008 | 0.020 | e | 0.95 REF | | 0.037 REF | |
| C | 0.09 | 0.26 | 0.003 | 0.010 | e1 | 1.90 REF | | 0.075 REF | |
| D | 2.70 | 3.10 | 0.106 | 0.122 | theta | 0° | 30° | 0° | 30° |

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