

ZX5T851A

60V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN E-LINE

SUMMARY

$BV_{CEO} = 60V$; $R_{SAT} = 34m\Omega$; $I_C = 4.5A$

DESCRIPTION

Packaged in the E-line outline this new 5th generation low saturation 60V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.

FEATURES

- Extremely low equivalent on-resistance; $R_{SAT} = 34m\Omega$ at 5A
- 4.5 amps continuous current
- Up to 15 amps peak current
- Very low saturation voltages

APPLICATIONS

- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC modules
- Backlight inverters

ORDERING INFORMATION

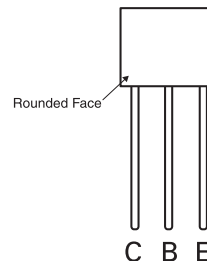
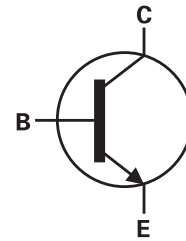
| DEVICE | QUANTITY |
|--------------|---------------------|
| ZX5T851ASTOA | 2000 units / reel |
| ZX5T851ASTZ | 2000 units / carton |

DEVICE MARKING

- X5T851



E-LINE



PINOUT

ZX5T851A

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|----------------|-------------|-------|
| Collector-base voltage | BV_{CBO} | 150 | V |
| Collector-emitter voltage | BV_{CEO} | 60 | V |
| Emitter-base voltage | BV_{EBO} | 7 | V |
| Continuous collector current ^(a) | I_C | 4.5 | A |
| Peak pulse current | I_{CM} | 15 | A |
| Practical power dissipation ^(a) | P_D | 1.0 | W |
| Linear derating factor | | 8 | mW/°C |
| Power dissipation at $T_A = 25^\circ\text{C}$ ^(b) | P_D | 0.71 | W |
| Linear derating factor | | 5.7 | 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) | $R_{\theta JA}$ | 125 | °C/W |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 175 | °C/W |

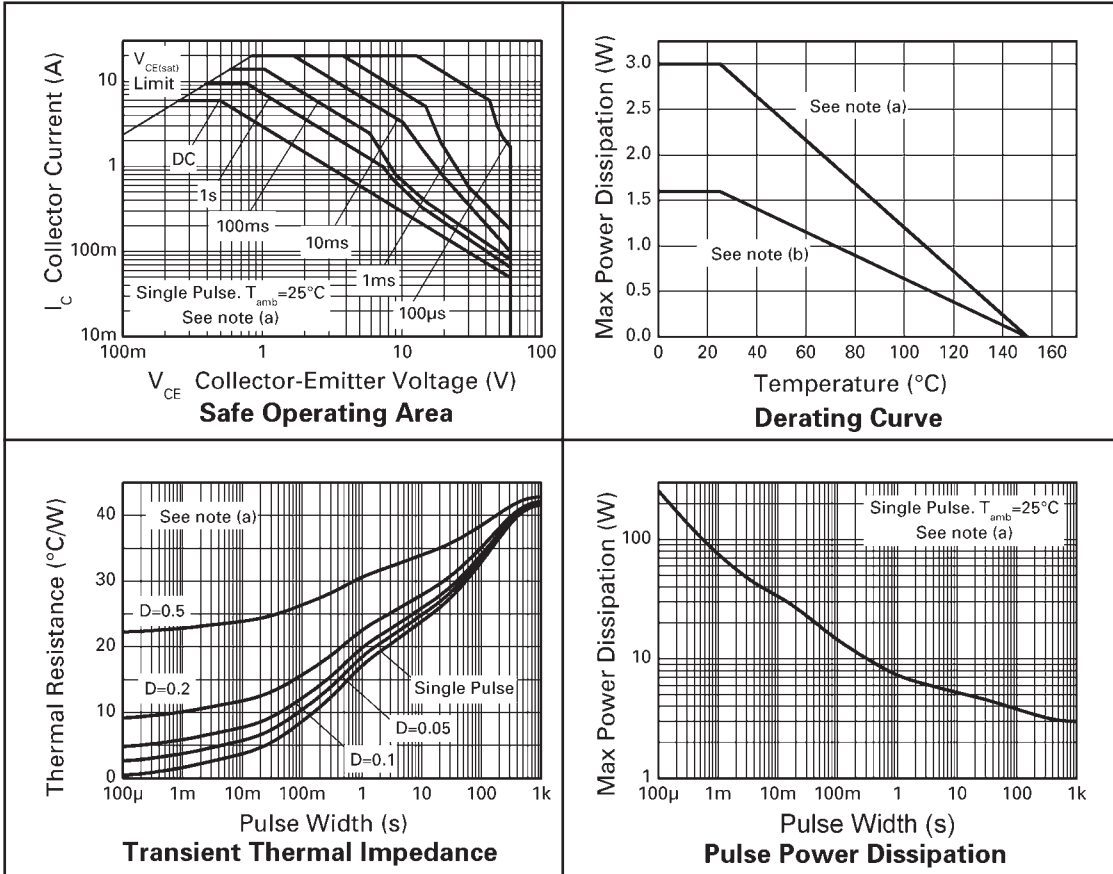
NOTES

(a) For a device through hole mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions. Collector lead length to solder point 4mm.

(b) For a device mounted in a socket in still air conditions. Collector lead length 10mm.

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CHARACTERISTICS



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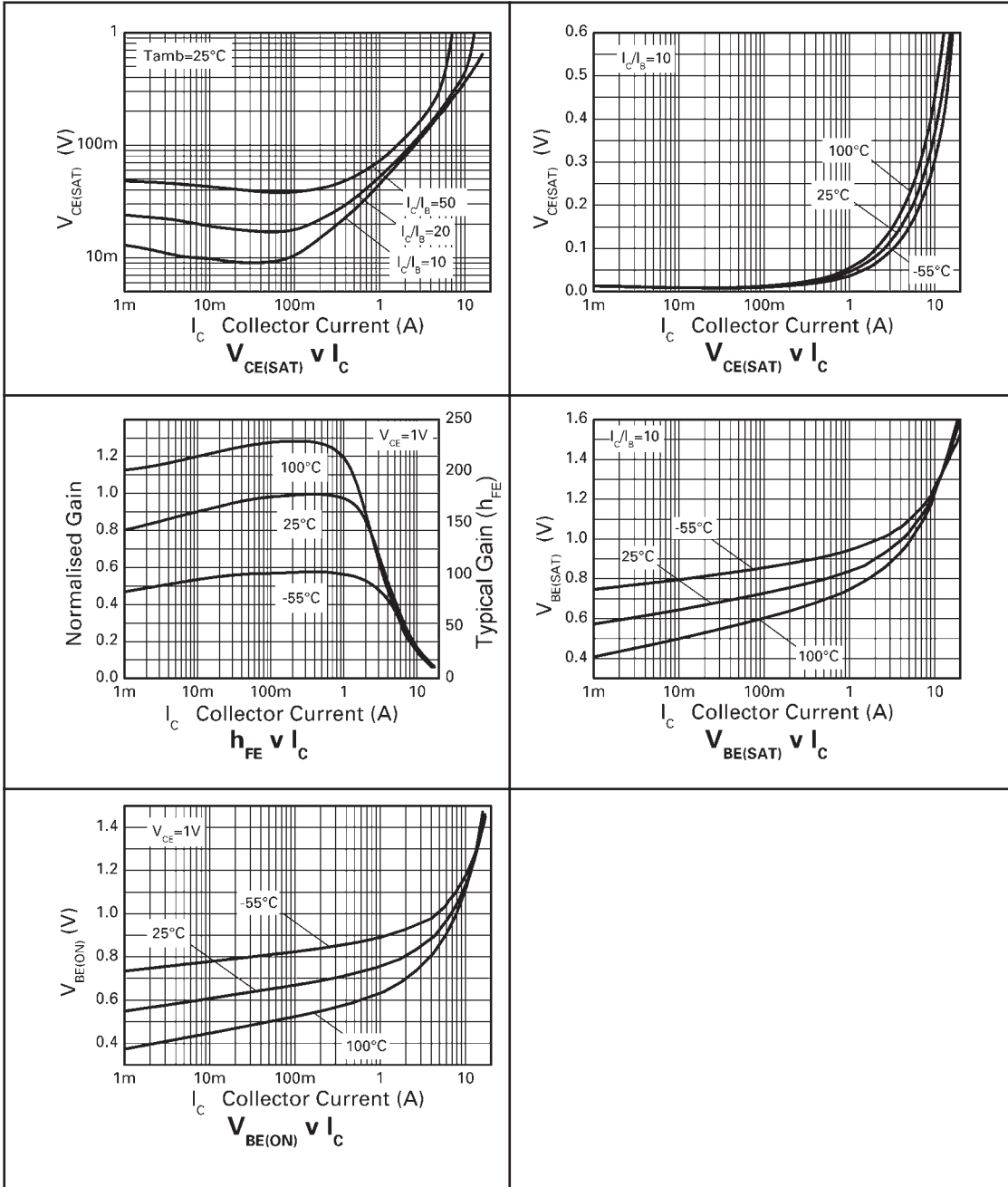
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|---------------------------------------|---------------------------------------|------------------------|-----------------------------|------------------------------|---------------------|---|
| Collector-base breakdown voltage | BV_{CBO} | 150 | 190 | | V | $I_C = 100\mu\text{A}$ |
| Collector-emitter breakdown voltage | BV_{CER} | 150 | 190 | | V | $I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$ |
| Collector-emitter breakdown voltage | BV_{CEO} | 60 | 80 | | 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 | $V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Collector cut-off current | I_{CER} $R \leq 1\text{k}\Omega$ | | | 20 0.5 | nA μA | $V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter cut-off current | I_{EBO} | | | 10 | nA | $V_{EB} = 6\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(SAT)}$ | | 18 40 45 95 170 | 30 55 65 130 210 | mV | $I_C = 100\text{mA}$, $I_B = 5\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 50\text{mA}^*$ $I_C = 2\text{A}$, $I_B = 50\text{mA}^*$ $I_C = 5\text{A}$, $I_B = 200\text{mA}^*$ |
| Base-emitter saturation voltage | $V_{BE(SAT)}$ | | 950 | 1050 | mV | $I_C = 4\text{A}$, $I_B = 200\text{mA}^*$ |
| Base-emitter turn-on voltage | $V_{BE(ON)}$ | | 840 | 950 | mV | $I_C = 4\text{A}$, $V_{CE} = 1\text{V}^*$ |
| Static forward current transfer ratio | h_{FE} | 100 100 55 20 | 200 200 105 40 | 300 | | $I_C = 10\text{mA}$, $V_{CE} = 1\text{V}^*$ $I_C = 2\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 5\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 10\text{A}$, $V_{CE} = 1\text{V}^*$ |
| Transition frequency | f_T | | 130 | | MHz | $I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$ |
| Output capacitance | C_{OBO} | | 31 | | pF | $V_{CB} = 10\text{V}$, $f = 1\text{MHz}^*$ |
| Switching times | t_{ON} t_{OFF} | | 42 760 | | ns 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 $\leq 2\%$.

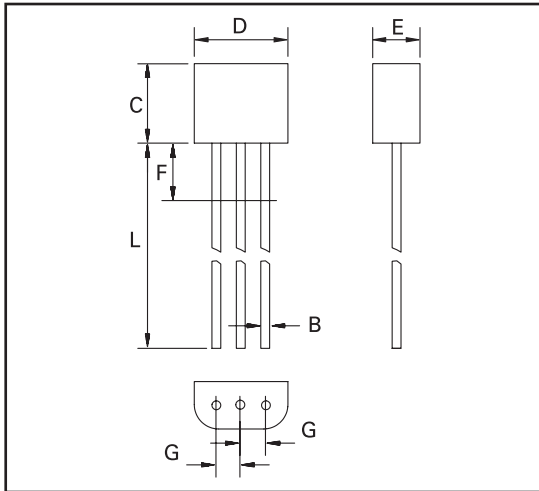
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TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE



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

PACKAGE DIMENSIONS

| DIM | Millimeters | | Inches | |
|-----|-------------|-------|-----------|--------|
| | Min | Max | Min | Max |
| A | 0.41 | 0.495 | 0.016 | 0.0195 |
| B | 0.41 | 0.495 | 0.016 | 0.0195 |
| C | 3.61 | 4.01 | 0.142 | 0.158 |
| D | 4.37 | 4.77 | 0.172 | 0.188 |
| E | 2.16 | 2.41 | 0.085 | 0.095 |
| F | — | 2.50 | — | 0.098 |
| G | 1.27 NOM | | 0.050 NOM | |
| L | 13.00 | 13.97 | 0.512 | 0.550 |

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