

ZX5T853Z

100V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

SUMMARY

$BV_{CEO} = 100V$; $R_{SAT} = 31m\Omega$; $I_C = 4.5A$

DESCRIPTION

Packaged in the SOT89 outline this new 5th generation low saturation 100V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



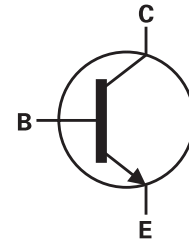
SOT89

FEATURES

- 4.5 amps continuous current
- Up to 10 amps peak current
- Very low saturation voltages

APPLICATIONS

- Motor driving
- Line switching
- High side switches
- Subscriber line interface cards (SLIC)



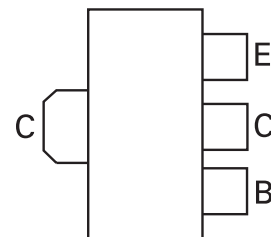
ORDERING INFORMATION

| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|------------|-----------|---------------|-------------------|
| ZX5T853ZTA | 7" | 12mm embossed | 1000 units |

DEVICE MARKING

- 853

PINOUT



VIEW

ZX5T853Z

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|----------------|-------------|-------|
| Collector base voltage | BV_{CBO} | 200 | V |
| Collector emitter voltage | BV_{CEO} | 100 | V |
| Emitter base voltage | BV_{EBO} | 7 | V |
| Continuous collector current ^(a) | I_C | 4.5 | A |
| Peak pulse current | I_{CM} | 10 | A |
| Power dissipation at $T_A=25^\circ\text{C}$ ^(a) | P_D | 1.5 | W |
| Linear derating factor | | 12 | mW/°C |
| Power dissipation at $T_A=25^\circ\text{C}$ ^(b) | P_D | 2.1 | W |
| Linear derating factor | | 16.8 | 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) | $R_{\theta JA}$ | 83 | °C/W |
| Junction to ambient ^(b) | $R_{\theta JA}$ | 60 | °C/W |

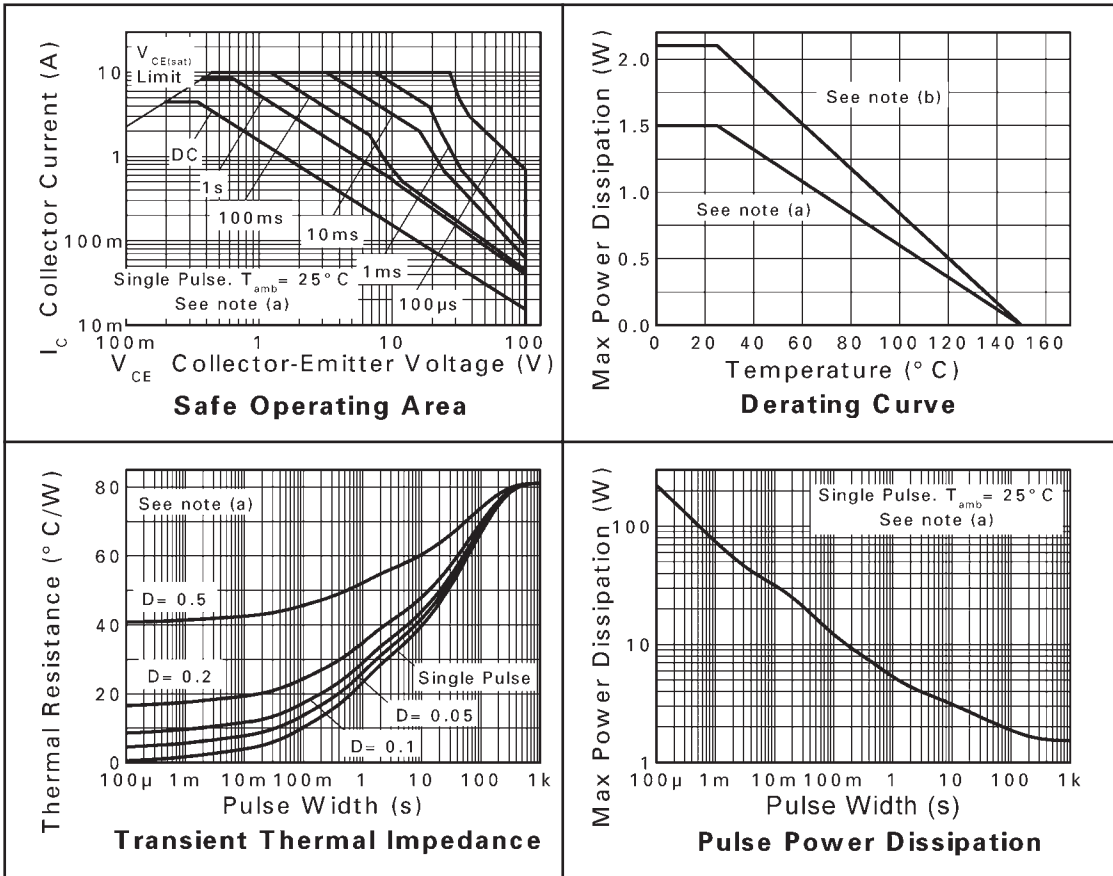
NOTES:

(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.

(b) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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CHARACTERISTICS



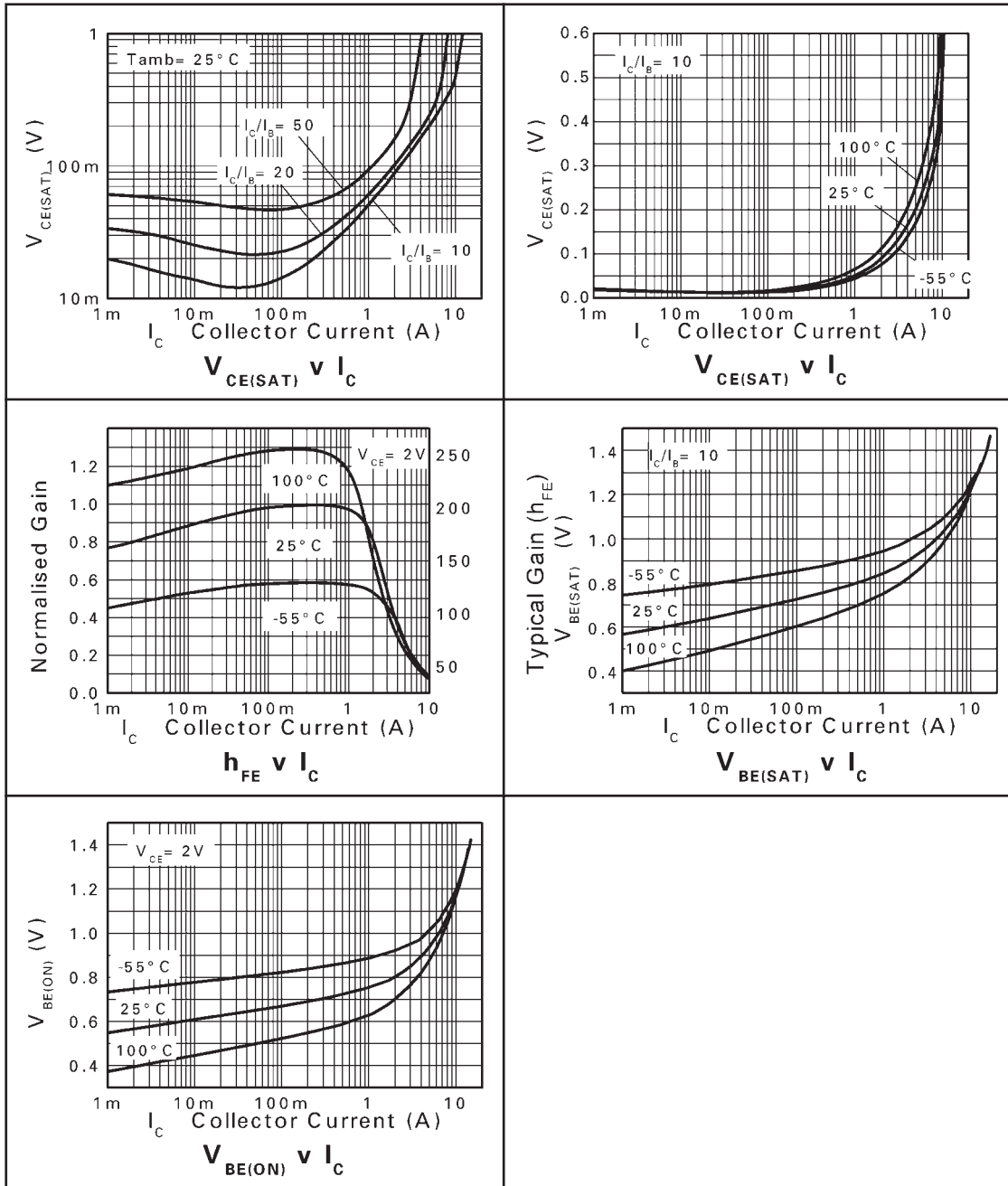
ZX5T853Z

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} | 200 | 235 | | V | $I_C = 100\mu\text{A}$ |
| Collector emitter breakdown voltage | BV_{CER} | 200 | 235 | | V | $I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$ |
| Collector emitter breakdown voltage | BV_{CEO} | 100 | 115 | | 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 | $V_{CB} = 150\text{V}$ $V_{CB} = 150\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Collector cut-off current | I_{CER} $R \leq 1\text{k}\Omega$ | | | 20 0.5 | nA μA | $V_{CB} = 150\text{V}$ $V_{CB} = 150\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter cut-off current | I_{EBO} | | | 10 | nA | $V_{EB} = 6\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(SAT)}$ | | 20 45 85 155 | 30 60 115 195 | mV mV mV mV | $I_C = 0.1\text{A}$, $I_B = 5\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 2\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 5\text{A}$, $I_B = 500\text{mA}^*$ |
| Base emitter saturation voltage | $V_{BE(SAT)}$ | | 1000 | 1100 | mV | $I_C = 5\text{A}$, $I_B = 500\text{mA}^*$ |
| Base emitter turn on voltage | $V_{BE(ON)}$ | | 900 | 1000 | mV | $I_C = 5\text{A}$, $V_{CE} = 2\text{V}^*$ |
| Static forward current transfer ratio | h_{FE} | 100 100 30 10 | 230 200 60 20 | 300 | | $I_C = 10\text{mA}$, $V_{CE} = 2\text{V}^*$ $I_C = 2\text{A}$, $V_{CE} = 2\text{V}^*$ $I_C = 5\text{A}$, $V_{CE} = 2\text{V}^*$ $I_C = 10\text{A}$, $V_{CE} = 2\text{V}^*$ |
| Transition frequency | f_T | | 130 | | MHz | $I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$ |
| Output capacitance | C_{OBO} | | 26 | | pF | $V_{CB} = 10\text{V}$, $f = 1\text{MHz}^*$ |
| Switching times | t_{ON} t_{OFF} | | 41 1010 | | ns | $I_C = 1\text{A}$, $V_{CC} = 10\text{V}$, $I_{B1} = I_{B2} = 100\text{mA}$ |

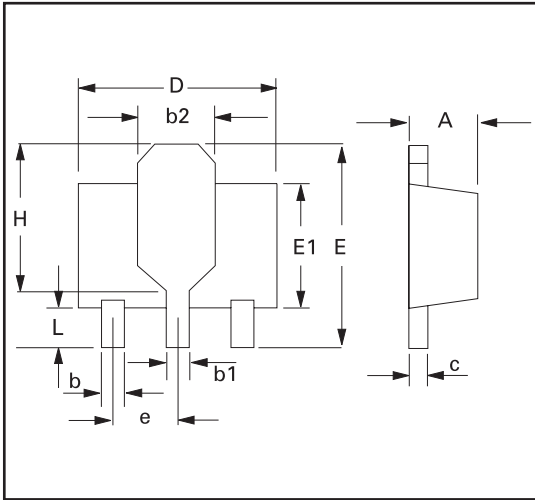
* Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS



ZX5T853Z

PACKAGE OUTLINE



PACKAGE DIMENSIONS

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|------|--------|-------|-----|-------------|------|--------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | 1.40 | 1.60 | 0.550 | 0.630 | e | 1.40 | 1.50 | 0.055 | 0.059 |
| b | 0.38 | 0.48 | 0.015 | 0.019 | E | 3.75 | 4.25 | 0.150 | 0.167 |
| b1 | - | 0.53 | - | 0.021 | E1 | - | 2.60 | - | 0.102 |
| b2 | 1.50 | 1.80 | 0.060 | 0.071 | G | 2.90 | 3.00 | 0.114 | 0.118 |
| c | 0.28 | 0.44 | 0.011 | 0.017 | H | 2.60 | 2.85 | 0.102 | 0.112 |
| D | 4.40 | 4.60 | 0.173 | 0.181 | - | - | - | - | - |

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| Europe | Americas | Asia Pacific | Corporate Headquarters |
|---|--|--|---|
| Zetex GmbH Streitfeldstraße 19 D-81673 München Germany | Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA | Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong | Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom |
| Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.sales@zetex.com | Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com | Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com | Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com |

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