

# ZX5T953Z

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## 100V PNP LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

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### SUMMARY

$BV_{CEO} = -100V$  ;  $R_{SAT} = 57m\Omega$ ;  $I_C = -3.5A$

### DESCRIPTION

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



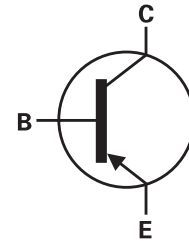
SOT89

### FEATURES

- 3.5 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)



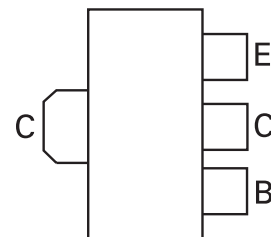
### ORDERING INFORMATION

| DEVICE     | REEL SIZE | TAPE WIDTH    | QUANTITY PER REEL |
|------------|-----------|---------------|-------------------|
| ZX5T953ZTA | 7"        | 12mm embossed | 1000 units        |

### DEVICE MARKING

- 953

### PINOUT



VIEW

# ZX5T953Z

## ABSOLUTE MAXIMUM RATINGS

| PARAMETER  | SYMBOL         | LIMIT      | UNIT  |
|--|----------------|------------|-------|
| Collector-base voltage                                     | $BV_{CBO}$     | -140       | V     |
| Collector-emitter voltage                                  | $BV_{CEO}$     | -100       | V     |
| Emitter-base voltage                                       | $BV_{EBO}$     | -7         | V     |
| Continuous collector current <sup>(a)</sup>                | $I_C$          | -3.5       | A     |
| Peak pulse current   | $I_{CM}$       | -10        | A     |
| Power dissipation at $T_A=25^\circ\text{C}$ <sup>(a)</sup> | $P_D$          | 1.5        | W     |
| Linear derating factor                                     |                | 12         | mW/°C |
| Power dissipation at $T_A=25^\circ\text{C}$ <sup>(b)</sup> | $P_D$          | 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 <sup>(a)</sup> | $R_{\theta JA}$ | 83    | °C/W |
| Junction to ambient <sup>(b)</sup> | $R_{\theta JA}$ | 60    | °C/W |

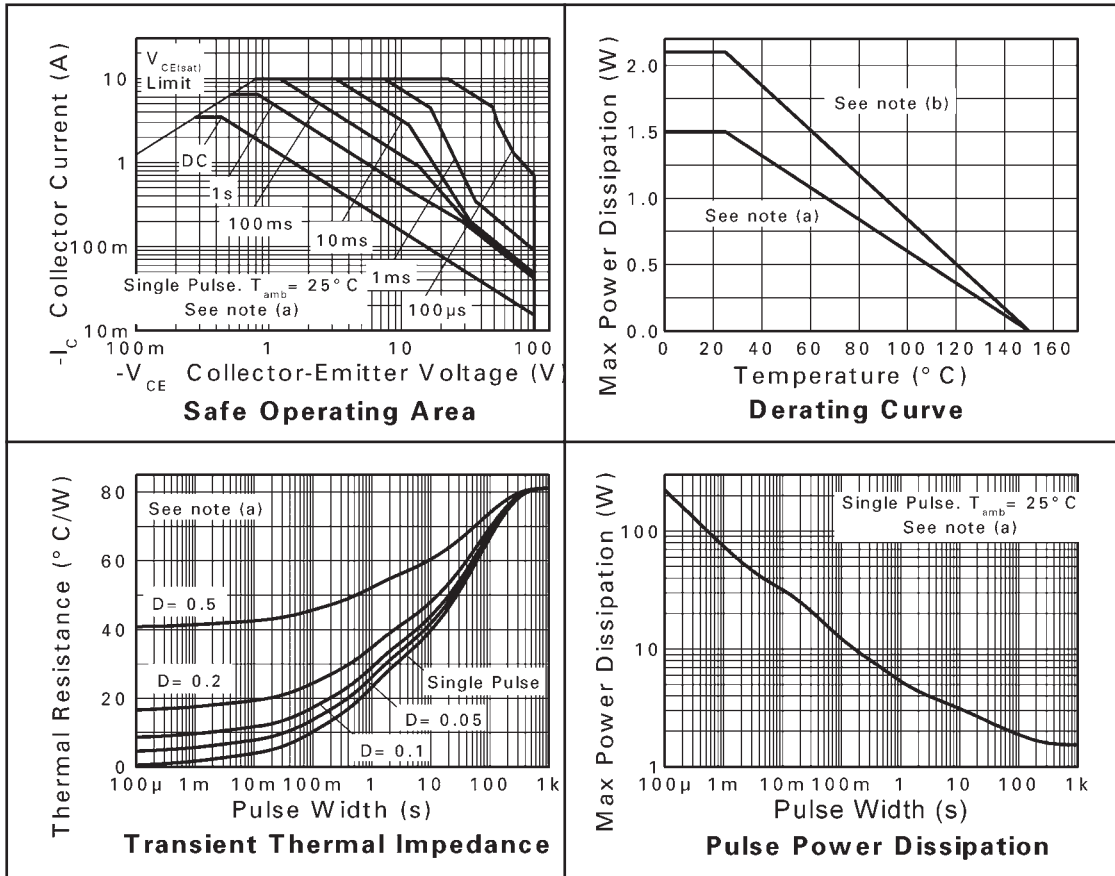
### NOTES:

(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



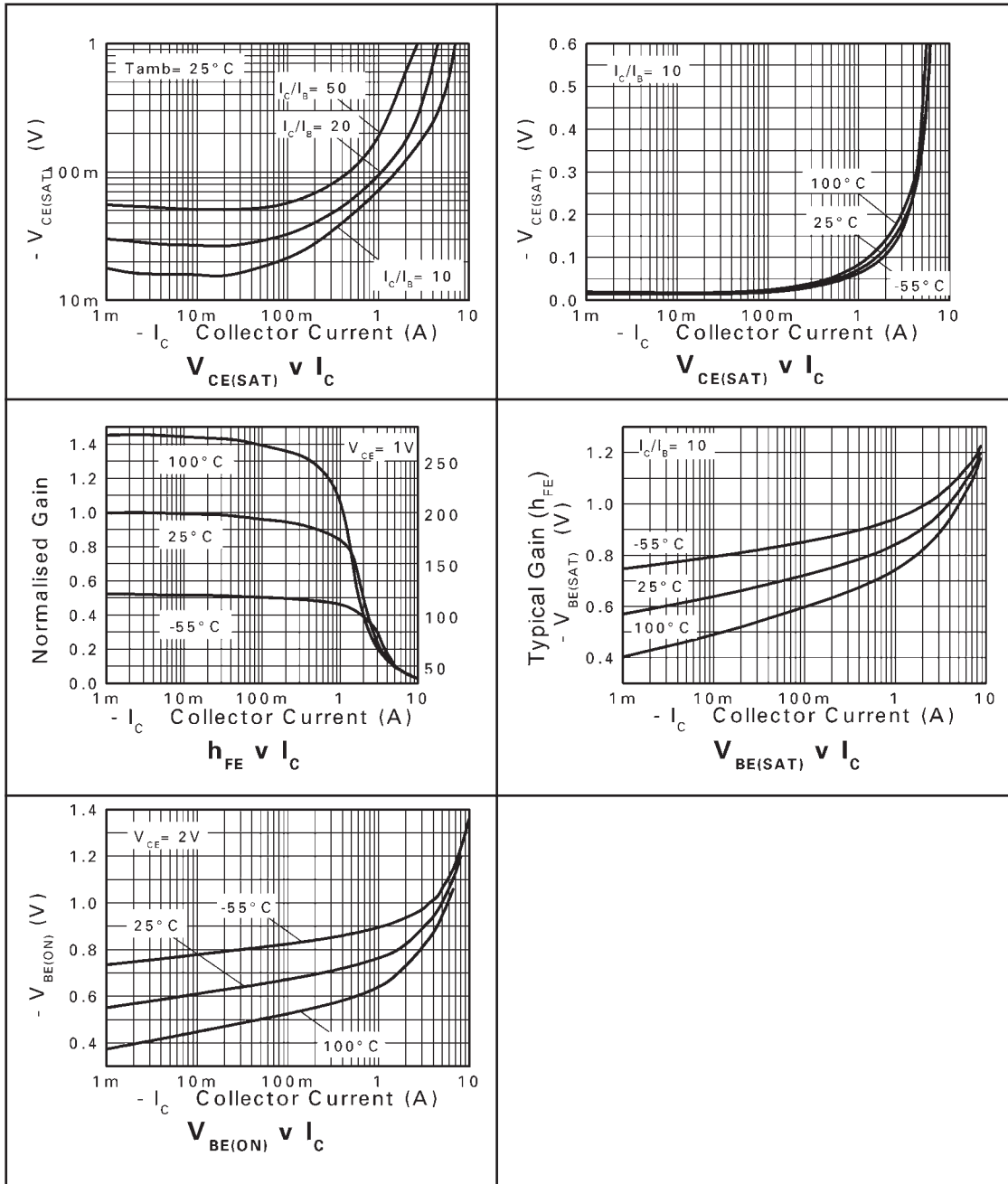
# ZX5T953Z

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

| PARAMETER                             | SYMBOL                                | MIN.                   | TYP.                        | MAX.                       | UNIT                 | CONDITIONS  |
|---------------------------------------|---------------------------------------|------------------------|-----------------------------|----------------------------|----------------------|---|
| Collector-base breakdown voltage      | $BV_{CBO}$                            | -140                   | -160                        |                            | V                    | $I_C = -100\mu\text{A}$   |
| Collector-emitter breakdown voltage   | $BV_{CER}$                            | -140                   | -160                        |                            | 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             | $I_{CBO}$                             |                        | <1                          | -20<br>-0.5                | nA<br>$\mu\text{A}$  | $V_{CB} = -100\text{V}$<br>$V_{CB} = -100\text{V}$ , $T_{amb}=100^{\circ}\text{C}$  |
| Collector cut-off current             | $I_{CER}$<br>$R \leq 1\text{k}\Omega$ |                        | <1                          | -20<br>-0.5                | nA<br>$\mu\text{A}$  | $V_{CB} = -100\text{V}$<br>$V_{CB} = -100\text{V}$ , $T_{amb}=100^{\circ}\text{C}$  |
| Emitter cut-off current               | $I_{EBO}$                             |                        | <1                          | -10                        | nA                   | $V_{EB} = -6\text{V}$   |
| Collector-emitter saturation voltage  | $V_{CE(SAT)}$                         |                        | -20<br>-65<br>-110<br>-230  | -30<br>-85<br>-135<br>-300 | mV<br>mV<br>mV<br>mV | $I_C = -0.1\text{A}$ , $I_B = -10\text{mA}^*$<br>$I_C = -1\text{A}$ , $I_B = -100\text{mA}^*$<br>$I_C = -2\text{A}$ , $I_B = -200\text{mA}^*$<br>$I_C = -4\text{A}$ , $I_B = -400\text{mA}^*$   |
| Base-emitter saturation voltage       | $V_{BE(SAT)}$                         |                        | -970                        | -1060                      | mV                   | $I_C = -4\text{A}$ , $I_B = -400\text{mA}^*$  |
| Base-emitter turn on voltage          | $V_{BE(ON)}$                          |                        | -910                        | -1030                      | mV                   | $I_C = -4\text{A}$ , $V_{CE} = -1\text{V}^*$  |
| Static forward current transfer ratio | $h_{FE}$                              | 100<br>100<br>25<br>15 | 250<br>200<br>50<br>30<br>5 | 300                        |                      | $I_C = -10\text{mA}$ , $V_{CE} = -1\text{V}^*$<br>$I_C = -1\text{A}$ , $V_{CE} = -1\text{V}^*$<br>$I_C = -3\text{A}$ , $V_{CE} = -1\text{V}^*$<br>$I_C = -4\text{A}$ , $V_{CE} = -1\text{V}^*$<br>$I_C = -10\text{A}$ , $V_{CE} = -1\text{V}^*$ |
| Transition frequency                  | $f_T$                                 |                        | 125                         |                            | MHz                  | $I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$<br>$f=50\text{MHz}$  |
| Output capacitance                    | $C_{OBO}$                             |                        | 42                          |                            | pF                   | $V_{CB} = -10\text{V}$ , $f=1\text{MHz}^*$  |
| Switching times                       | $t_{ON}$<br>$t_{OFF}$                 |                        | 42<br>540                   |                            | ns                   | $I_C = 1\text{A}$ , $V_{CC} = 10\text{V}$ ,<br>$I_{B1} = I_{B2} = 100\text{mA}$   |

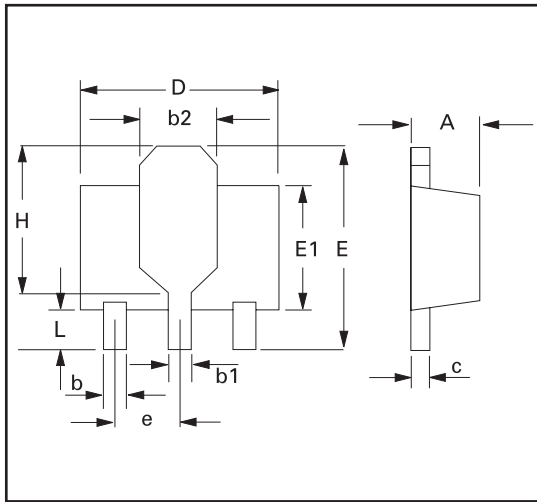
\* Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

TYPICAL CHARACTERISTICS



# ZX5T953Z

## 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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