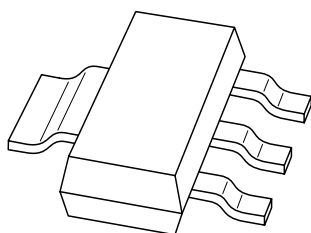


# DATA SHEET



## **PZT2907A** PNP switching transistor

Product specification  
Supersedes data of 1997 Jun 02

1999 Apr 14

## PNP switching transistor

## PZT2907A

## FEATURES

- High current (max. 600 mA)
- Low voltage (max. 60 V).

## APPLICATIONS

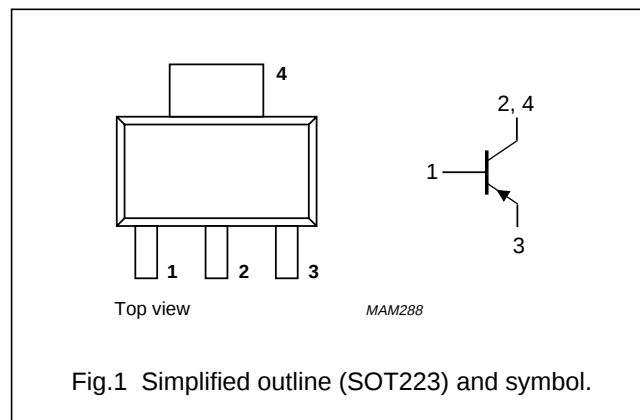
- Switching and linear amplification.

## DESCRIPTION

PNP switching transistor in a SOT223 plastic package.  
NPN complement: PZT2222A.

## PINNING

| PIN  | DESCRIPTION |
|------|-------------|
| 1    | base        |
| 2, 4 | collector   |
| 3    | emitter     |



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL    | PARAMETER                     | CONDITIONS                                | MIN. | MAX. | UNIT               |
|-----------|-------------------------------|-------------------------------------------|------|------|--------------------|
| $V_{CBO}$ | collector-base voltage        | open emitter                              | –    | –60  | V                  |
| $V_{CEO}$ | collector-emitter voltage     | open base                                 | –    | –60  | V                  |
| $V_{EBO}$ | emitter-base voltage          | open collector                            | –    | –5   | V                  |
| $I_C$     | collector current (DC)        |                                           | –    | –600 | mA                 |
| $I_{CM}$  | peak collector current        |                                           | –    | –800 | mA                 |
| $I_{BM}$  | peak base current             |                                           | –    | –200 | mA                 |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25\text{ }^{\circ}\text{C}$ | –    | 1.15 | W                  |
| $T_{stg}$ | storage temperature           |                                           | –65  | +150 | $^{\circ}\text{C}$ |
| $T_j$     | junction temperature          |                                           | –    | 150  | $^{\circ}\text{C}$ |
| $T_{amb}$ | operating ambient temperature |                                           | –65  | +150 | $^{\circ}\text{C}$ |

## PNP switching transistor

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## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                           | CONDITIONS | VALUE | UNIT |
|---------------|-----------------------------------------------------|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient         | note 1     | 106   | K/W  |
| $R_{th\ j-s}$ | thermal resistance from junction to soldering point |            | 25    | K/W  |

## Note

- Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.  
For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

## CHARACTERISTICS

$T_{amb} = 25\text{ °C}$  unless otherwise specified.

| SYMBOL      | PARAMETER                            | CONDITIONS                                                                      | MIN. | MAX. | UNIT |
|-------------|--------------------------------------|---------------------------------------------------------------------------------|------|------|------|
| $I_{CBO}$   | collector cut-off current            | $I_E = 0; V_{CB} = -50\text{ V}$                                                | –    | –10  | nA   |
|             |                                      | $I_E = 0; V_{CB} = -50\text{ V}; T_{amb} = 150\text{ °C}$                       | –    | –10  | μA   |
| $I_{EBO}$   | emitter cut-off current              | $I_C = 0; V_{EB} = -5\text{ V}$                                                 | –    | –50  | nA   |
| $h_{FE}$    | DC current gain                      | $I_C = -0.1\text{ mA}; V_{CE} = -10\text{ V}$                                   | 75   | –    |      |
|             |                                      | $I_C = -1\text{ mA}; V_{CE} = -10\text{ V}$                                     | 100  | –    |      |
|             |                                      | $I_C = -10\text{ mA}; V_{CE} = -10\text{ V}$                                    | 100  | –    |      |
|             |                                      | $I_C = -150\text{ mA}; V_{CE} = -10\text{ V}; \text{note 1}$                    | 100  | 300  |      |
|             |                                      | $I_C = -500\text{ mA}; V_{CE} = -10\text{ V}; \text{note 1}$                    | 50   | –    |      |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = -150\text{ mA}; I_B = -15\text{ mA}; \text{note 1}$                      | –    | –400 | mV   |
|             |                                      | $I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$                      | –    | –1.6 | V    |
| $V_{BEsat}$ | base-emitter saturation voltage      | $I_C = -150\text{ mA}; I_B = -15\text{ mA}; \text{note 1}$                      | –    | –1.3 | V    |
|             |                                      | $I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$                      | –    | –2.6 | V    |
| $C_c$       | collector capacitance                | $I_E = I_B = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$                        | –    | 8    | pF   |
| $C_e$       | emitter capacitance                  | $I_C = I_E = 0; V_{EB} = -2\text{ V}; f = 1\text{ MHz}$                         | –    | 30   | pF   |
| $f_T$       | transition frequency                 | $I_C = -50\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}; \text{note 1}$ | 200  | –    | MHz  |

## Switching times (between 10% and 90% levels); (see Fig.2)

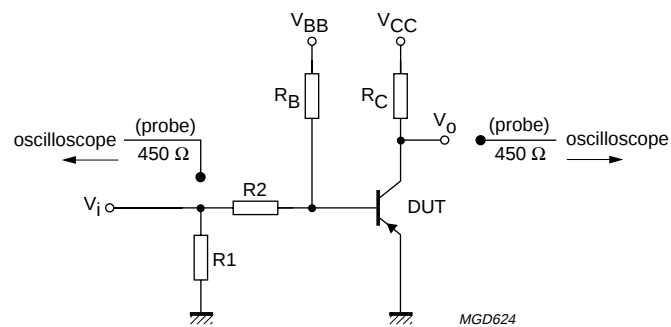
|           |               |                                                                              |   |     |    |
|-----------|---------------|------------------------------------------------------------------------------|---|-----|----|
| $t_{on}$  | turn-on time  | $I_{Con} = -150\text{ mA}; I_{Bon} = -15\text{ mA}; I_{Boff} = 15\text{ mA}$ | – | 40  | ns |
| $t_d$     | delay time    |                                                                              | – | 12  | ns |
| $t_r$     | rise time     |                                                                              | – | 30  | ns |
| $t_{off}$ | turn-off time |                                                                              | – | 365 | ns |
| $t_s$     | storage time  |                                                                              | – | 300 | ns |
| $t_f$     | fall time     |                                                                              | – | 65  | ns |

## Note

- Pulse test:  $t_p \leq 300\text{ μs}$ ;  $\delta \leq 0.02$ .

## PNP switching transistor

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$V_i = -9.5 \text{ V}$ ;  $T = 500 \mu\text{s}$ ;  $t_p = 10 \mu\text{s}$ ;  $t_r = t_f \leq 3 \text{ ns}$ .  
 $R_1 = 68 \Omega$ ;  $R_2 = 325 \Omega$ ;  $R_B = 325 \Omega$ ;  $R_C = 160 \Omega$ .  
 $V_{BB} = 3.5 \text{ V}$ ;  $V_{CC} = -29.5 \text{ V}$ .  
 Oscilloscope input impedance  $Z_i = 50 \Omega$ .

Fig.2 Test circuit for switching times.

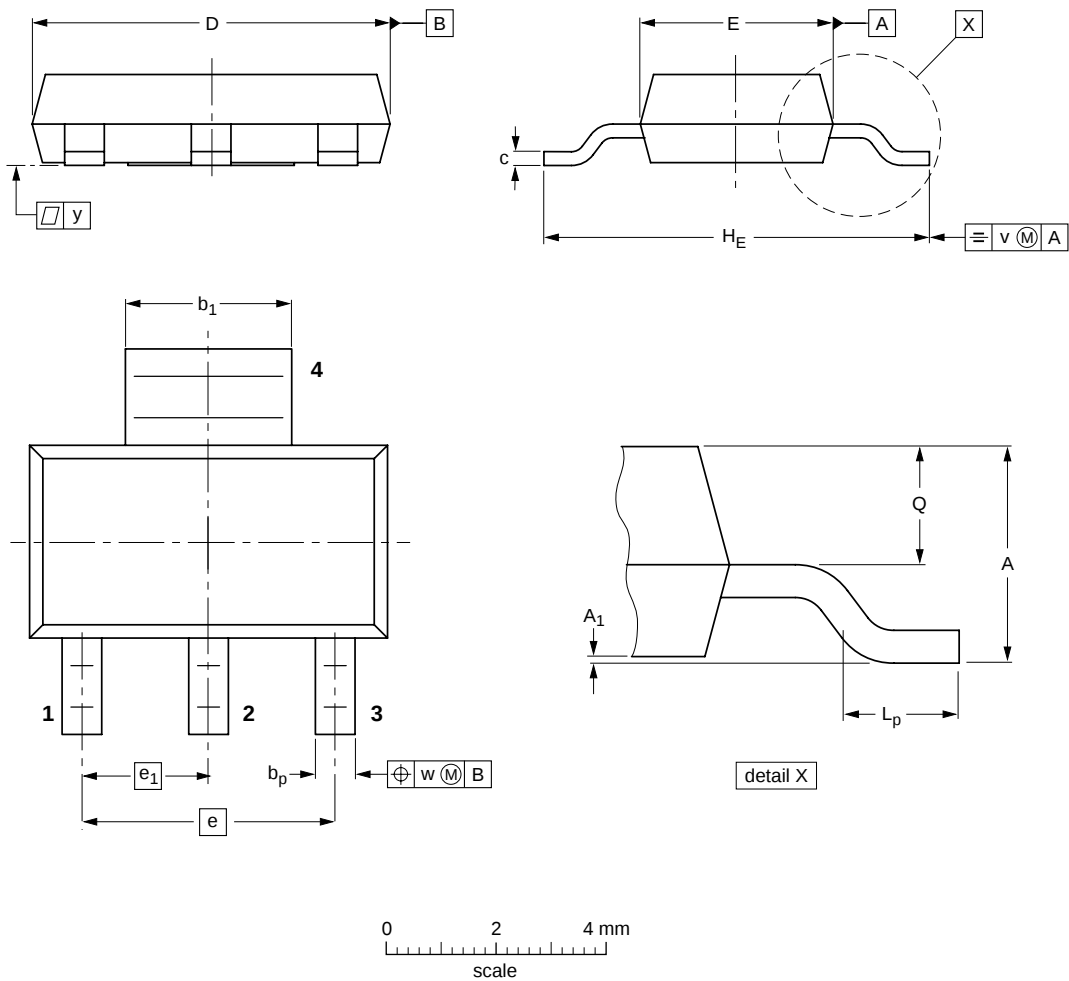
PNP switching transistor

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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub> | b <sub>p</sub> | b <sub>1</sub> | c            | D          | E          | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | Q            | v   | w   | y   |
|------|------------|----------------|----------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|--------------|-----|-----|-----|
| mm   | 1.8<br>1.5 | 0.10<br>0.01   | 0.80<br>0.60   | 3.1<br>2.9     | 0.32<br>0.22 | 6.7<br>6.3 | 3.7<br>3.3 | 4.6 | 2.3            | 7.3<br>6.7     | 1.1<br>0.7     | 0.95<br>0.85 | 0.2 | 0.1 | 0.1 |

| OUTLINE<br>VERSION | REFERENCES |       |      |  | EUROPEAN<br>PROJECTION | ISSUE DATE           |
|--------------------|------------|-------|------|--|------------------------|----------------------|
|                    | IEC        | JEDEC | EIAJ |  |                        |                      |
| SOT223             |            |       |      |  |                        | 96-11-11<br>97-02-28 |

## PNP switching transistor

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**DEFINITIONS**

| <b>Data sheet status</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Objective specification                                                                                                                                                                                                                                                                                                                                                                                                                                   | This data sheet contains target or goal specifications for product development.       |
| Preliminary specification                                                                                                                                                                                                                                                                                                                                                                                                                                 | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification                                                                                                                                                                                                                                                                                                                                                                                                                                     | This data sheet contains final product specifications.                                |
| <b>Limiting values</b>                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. |                                                                                       |
| <b>Application information</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                       |
| Where application information is given, it is advisory and does not form part of the specification.                                                                                                                                                                                                                                                                                                                                                       |                                                                                       |

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PNP switching transistor

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