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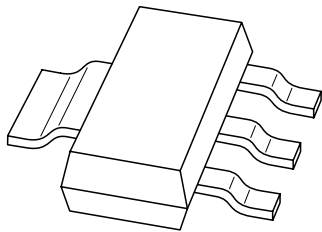
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Kind regards,

Team Nexperia

# DATA SHEET



## **PZT2222A** NPN switching transistor

Product data sheet  
Supersedes data of 1997 Jun 02

1999 Apr 14

## NPN switching transistor

## PZT2222A

## FEATURES

- High current (max. 600 mA)
- Low voltage (max. 40 V).

## APPLICATIONS

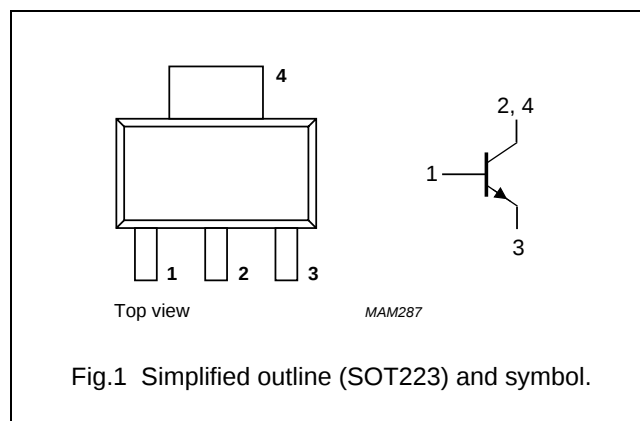
- Switching and linear amplification.

## DESCRIPTION

NPN switching transistor in a SOT223 plastic package.  
PNP complement: PZT2907A.

## 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                         | —    | 75   | V    |
| $V_{CEO}$ | collector-emitter voltage     | open base                            | —    | 40   | V    |
| $V_{EBO}$ | emitter-base voltage          | open collector                       | —    | 6    | 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       | $T_{amb} \leq 25\text{ °C}$ ; note 1 | —    | 1.15 | W    |
| $T_{stg}$ | storage temperature           |                                      | −65  | +150 | °C   |
| $T_j$     | junction temperature          |                                      | —    | 150  | °C   |
| $T_{amb}$ | operating ambient temperature |                                      | −65  | +150 | °C   |

## Note

1. 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*”.

## NPN switching transistor

PZT2222A

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                           | CONDITIONS | VALUE | UNIT |
|---------------|-----------------------------------------------------|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient         | note 1     | 109   | K/W  |
| $R_{th\ j-s}$ | thermal resistance from junction to soldering point |            | 28    | K/W  |

## Note

1. 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

$T_j = 25\ ^\circ\text{C}$  unless otherwise specified.

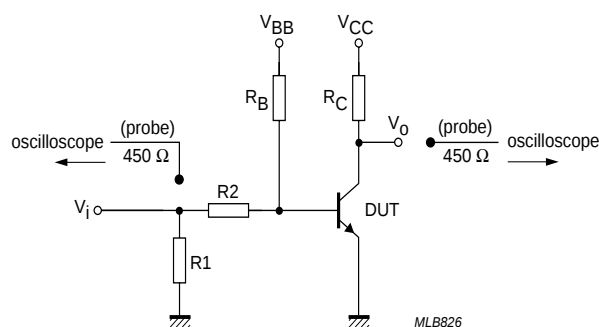
| SYMBOL                                                           | PARAMETER                            | CONDITIONS                                                                                                | MIN. | MAX. | UNIT          |
|------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------|------|------|---------------|
| $I_{CBO}$                                                        | collector cut-off current            | $I_E = 0; V_{CB} = 60\text{ V}$                                                                           | –    | 10   | nA            |
|                                                                  |                                      | $I_E = 0; V_{CB} = 60\text{ V}; T_{amb} = 125\ ^\circ\text{C}$                                            | –    | 10   | $\mu\text{A}$ |
| $I_{EBO}$                                                        | emitter cut-off current              | $I_C = 0; V_{EB} = 5\text{ V}$                                                                            | –    | 10   | nA            |
| $h_{FE}$                                                         | DC current gain                      | $I_C = 0.1\text{ mA}; V_{CE} = 10\text{ V}$                                                               | 35   | –    |               |
|                                                                  |                                      | $I_C = 1\text{ mA}; V_{CE} = 10\text{ V}$                                                                 | 50   | –    |               |
|                                                                  |                                      | $I_C = 10\text{ mA}; V_{CE} = 10\text{ V}$                                                                | 75   | –    |               |
|                                                                  |                                      | $I_C = 10\text{ mA}; V_{CE} = 10\text{ V}; T_{amb} = -55\ ^\circ\text{C}$                                 | 35   | –    |               |
|                                                                  |                                      | $I_C = 150\text{ mA}; V_{CE} = 1\text{ V}; \text{note 1}$                                                 | 50   | –    |               |
|                                                                  |                                      | $I_C = 150\text{ mA}; V_{CE} = 10\text{ V}; \text{note 1}$                                                | 100  | 300  |               |
|                                                                  |                                      | $I_C = 500\text{ mA}; V_{CE} = 10\text{ V}; \text{note 1}$                                                | 40   | –    |               |
| $V_{CEsat}$                                                      | collector-emitter saturation voltage | $I_C = 150\text{ mA}; I_B = 15\text{ mA}$                                                                 | –    | 300  | mV            |
|                                                                  |                                      | $I_C = 500\text{ mA}; I_B = 50\text{ mA}$                                                                 | –    | 1    | V             |
| $V_{BEsat}$                                                      | base-emitter saturation voltage      | $I_C = 150\text{ mA}; I_B = 15\text{ mA}$                                                                 | 0.6  | 1.2  | V             |
|                                                                  |                                      | $I_C = 500\text{ mA}; I_B = 50\text{ mA}$                                                                 | –    | 2    | V             |
| $C_c$                                                            | collector capacitance                | $I_E = i_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$                                                   | –    | 8    | pF            |
| $C_e$                                                            | emitter capacitance                  | $I_C = i_c = 0; V_{EB} = 500\text{ mV}; f = 1\text{ MHz}$                                                 | –    | 25   | pF            |
| $f_T$                                                            | transition frequency                 | $I_C = 20\text{ mA}; V_{CE} = 20\text{ V}; f = 100\text{ MHz}$                                            | 300  | –    | MHz           |
| <b>Switching times (between 10% and 90% levels); (see Fig.2)</b> |                                      |                                                                                                           |      |      |               |
| $t_{on}$                                                         | turn-on time                         | $I_{Con} = 150\text{ mA}; I_{Bon} = 15\text{ mA}; I_{Boff} = -15\text{ mA}; T_{amb} = 25\ ^\circ\text{C}$ | –    | 35   | ns            |
| $t_d$                                                            | delay time                           |                                                                                                           | –    | 10   | ns            |
| $t_r$                                                            | rise time                            |                                                                                                           | –    | 25   | ns            |
| $t_{off}$                                                        | turn-off time                        |                                                                                                           | –    | 250  | ns            |
| $t_s$                                                            | storage time                         |                                                                                                           | –    | 200  | ns            |
| $t_f$                                                            | fall time                            |                                                                                                           | –    | 60   | ns            |

## Note

1. Pulse test:  $t_p \leq 300\ \mu\text{s}; \delta \leq 0.02$ .

## NPN switching transistor

PZT2222A



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

Fig.2 Test circuit for switching times.

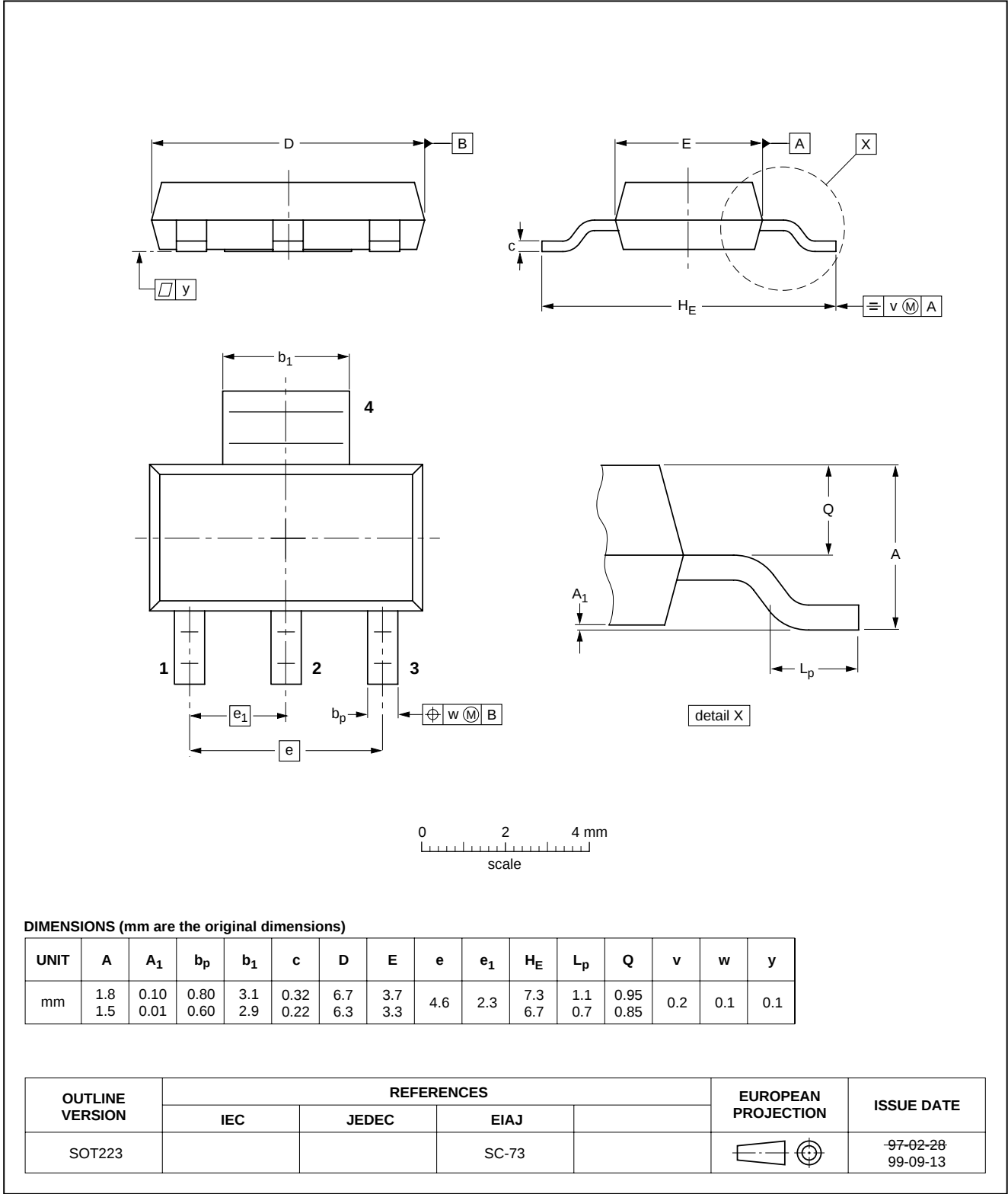
NPN switching transistor

PZT2222A

PACKAGE OUTLINE

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

SOT223



## NPN switching transistor

PZT2222A

## DATA SHEET STATUS

| DOCUMENT STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITION                                                                            |
|--------------------------------|-------------------------------|---------------------------------------------------------------------------------------|
| Objective data sheet           | Development                   | This document contains data from the objective specification for product development. |
| Preliminary data sheet         | Qualification                 | This document contains data from the preliminary specification.                       |
| Product data sheet             | Production                    | This document contains the product specification.                                     |

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# ***NXP Semiconductors***

## **Customer notification**

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## **Contact information**

For additional information please visit: <http://www.nxp.com>

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