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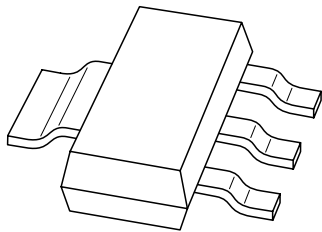
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Kind regards,

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

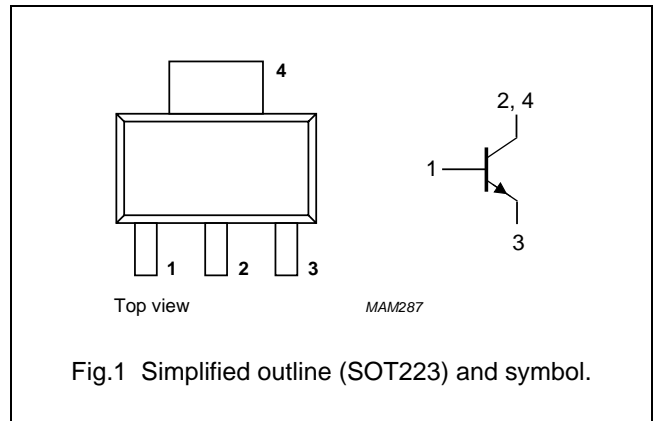
- Switching and linear amplification.

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 _{CB0} | 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} ≤ 25 °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 cm². For other mounting conditions, see “Thermal considerations for SOT223 in the General Part of associated Handbook”.

NPN 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 | 109 | K/W |
| $R_{th\ j-s}$ | thermal resistance from junction to soldering point | | 28 | K/W |

Note

- Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm². For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

CHARACTERISTICS

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

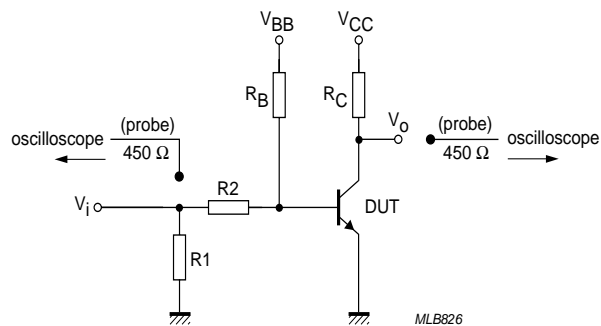
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|--|--------------------------------------|---|------|------|---------------|
| I_{CBO} | collector cut-off current | $I_E = 0; V_{CB} = 60\text{ V}$ | – | 10 | nA |
| | | $I_E = 0; V_{CB} = 60\text{ V}; T_{amb} = 125\text{ °C}$ | – | 10 | μA |
| 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 | – | |
| | | $I_C = 10\text{ mA}; V_{CE} = 10\text{ V}; T_{amb} = -55\text{ °C}$ | 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 |
| Switching times (between 10% and 90% levels); (see Fig.2) | | | | | |
| t_{on} | turn-on time | $I_{Con} = 150\text{ mA}; I_{Bon} = 15\text{ mA}; I_{Boff} = -15\text{ mA}; T_{amb} = 25\text{ °C}$ | – | 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

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

NPN 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.

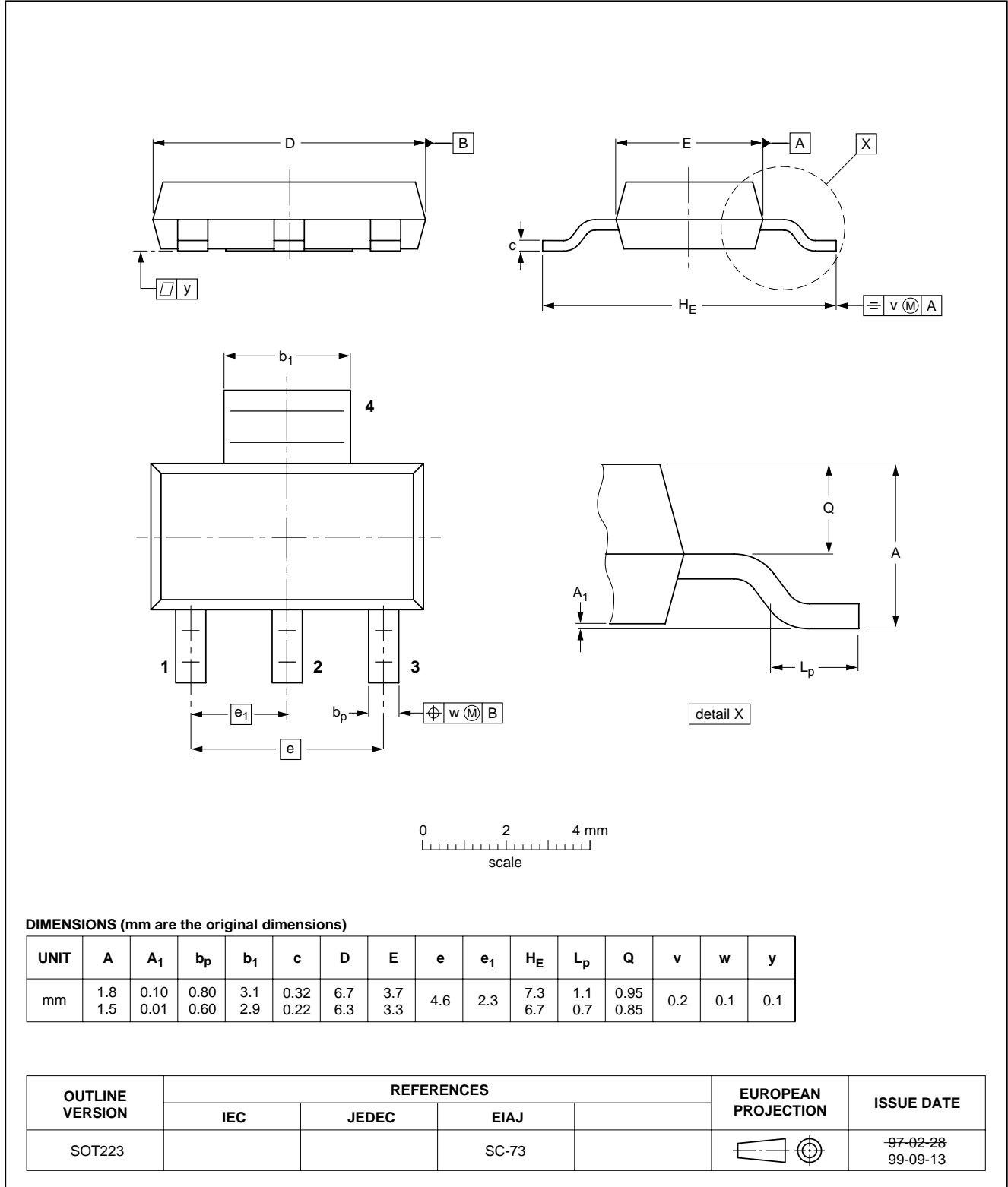
NPN switching transistor

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 ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | 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

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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

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