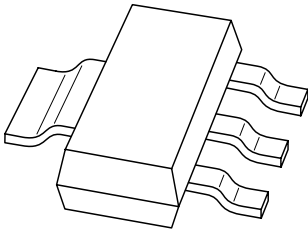


DATA SHEET



PZT4401 NPN switching transistor

Product data sheet

1999 May 10

NPN switching transistor

PZT4401

FEATURES

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

APPLICATIONS

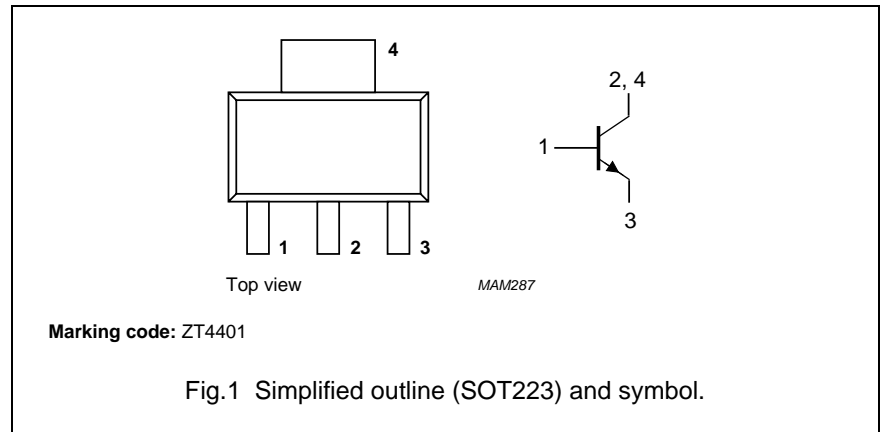
- Switching and linear amplification in industrial and consumer applications.

DESCRIPTION

NPN switching transistor in a SOT223 plastic package. PNP complement: PZT4403.

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 | – | 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 | – | 1150 | mW |
| 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*”.

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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

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|--------------------------------------|---|-----------------------|--------------------|----------|
| I_{CBO} | collector cut-off current | $I_E = 0; V_{CB} = 60\text{ V}$ | – | 50 | nA |
| I_{EBO} | emitter cut-off current | $I_C = 0; V_{EB} = 6\text{ V}$ | – | 50 | nA |
| h_{FE} | DC current gain | $V_{CE} = 1\text{ V}$; see Fig.2 $I_C = 0.1\text{ mA}$ $I_C = 1\text{ mA}$ $I_C = 10\text{ mA}$ $I_C = 150\text{ mA}$; note 1 | 20 40 80 100 | – – – 300 | |
| | | $V_{CE} = 2\text{ V}; I_C = 500\text{ mA}$; note 1 | 40 | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 150\text{ mA}; I_B = 15\text{ mA}$; note 1 $I_C = 500\text{ mA}; I_B = 50\text{ mA}$; note 1 | – – | 400 750 | mV mV |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 150\text{ mA}; I_B = 15\text{ mA}$; note 1 $I_C = 500\text{ mA}; I_B = 50\text{ mA}$; note 1 | – – | 950 1200 | mV mV |
| C_c | collector capacitance | $I_E = i_e = 0; V_{CB} = 5\text{ V}; f = 1\text{ MHz}$ | – | 8 | pF |
| C_e | emitter capacitance | $I_C = i_c = 0; V_{EB} = 500\text{ mV}; f = 1\text{ MHz}$ | – | 30 | pF |
| f_T | transition frequency | $I_C = 20\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$ | 250 | – | MHz |

Switching times (between 10% and 90% levels); see Fig.3

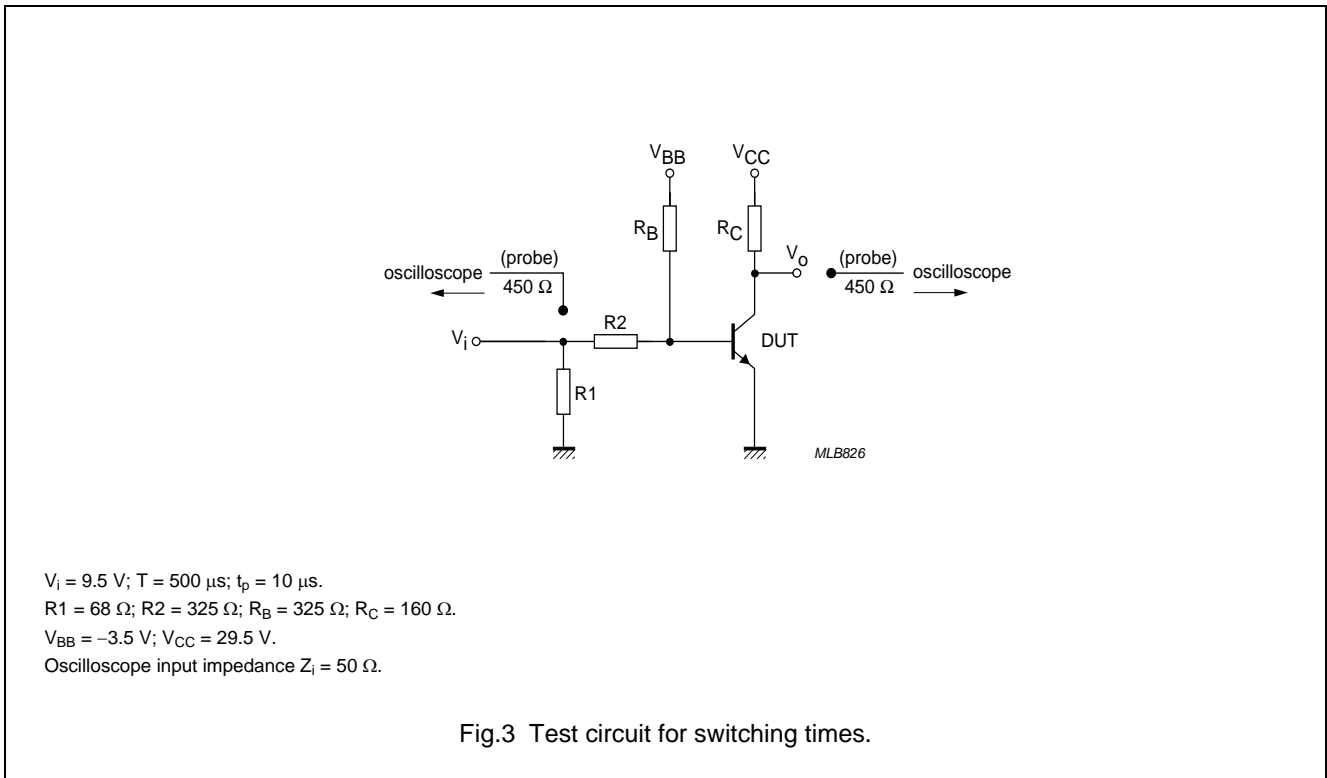
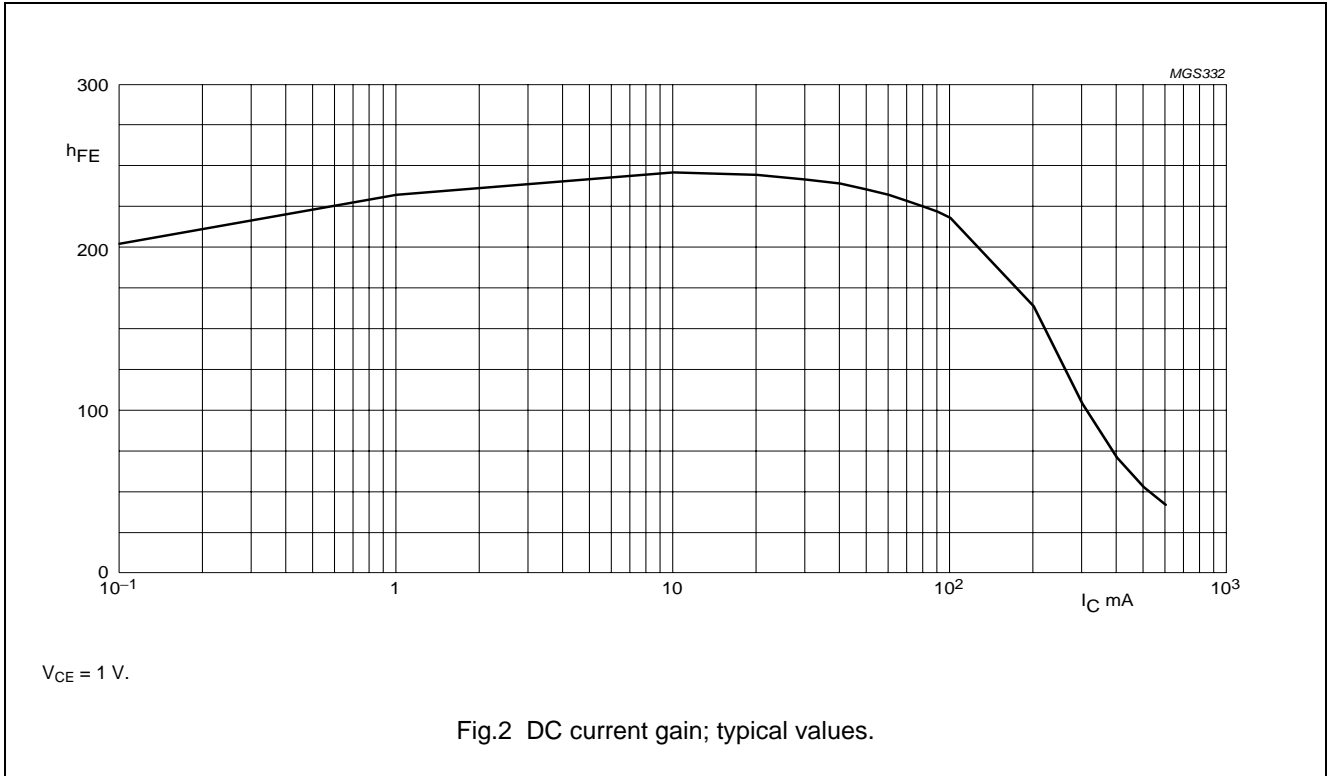
| | | | | | |
|-----------|---------------|---|---|-----|----|
| t_{on} | turn-on time | $I_{Con} = 150\text{ mA}; I_{Bon} = 15\text{ mA};$ $I_{Boff} = -15\text{ mA}; V_{BB} = -3.5\text{ V};$ $V_{CC} = 29.5\text{ V}$ | – | 35 | ns |
| t_d | delay time | | – | 15 | ns |
| t_r | rise time | | – | 20 | 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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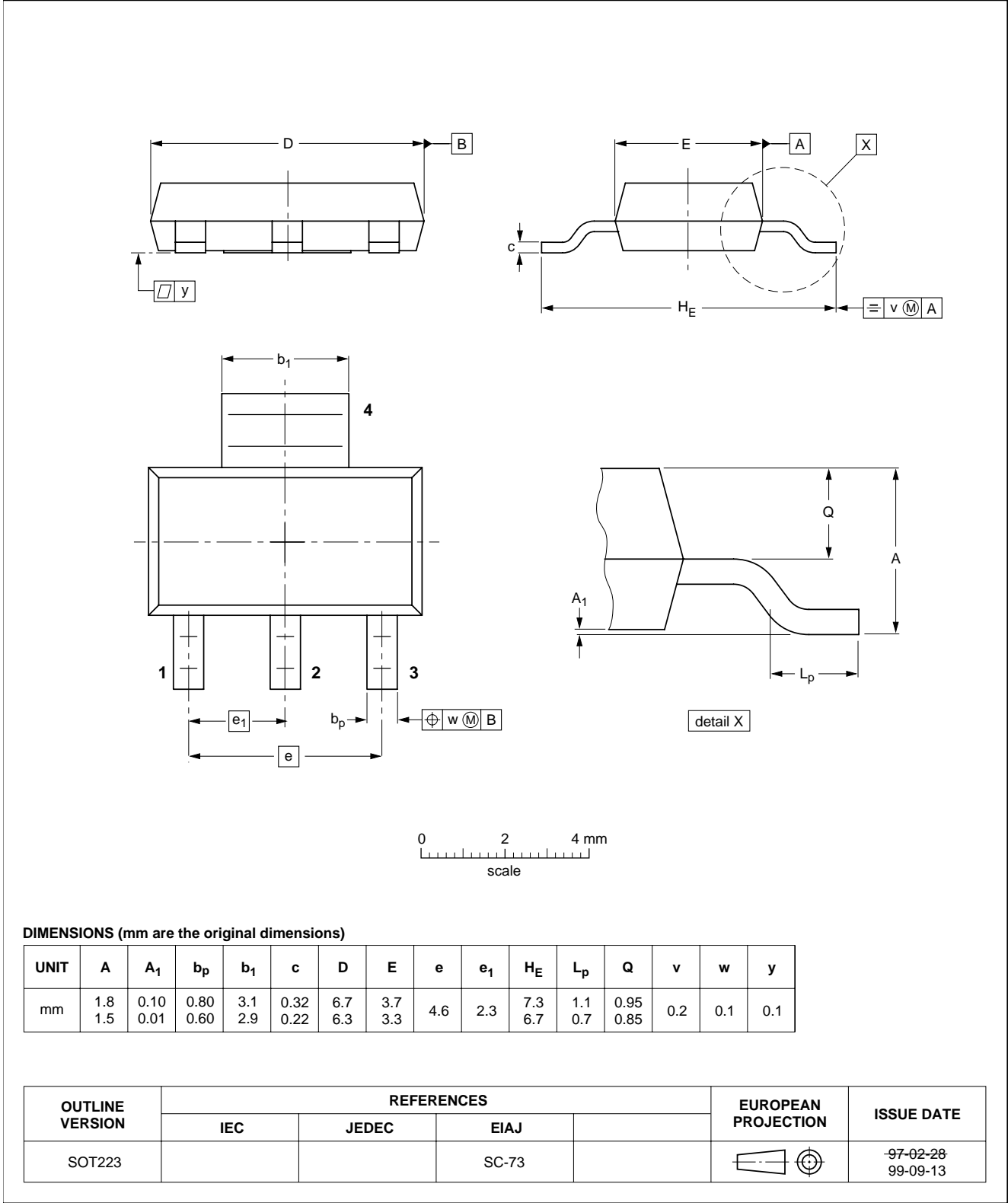
NPN switching transistor

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PACKAGE OUTLINE

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

SOT223



NPN switching transistor

PZT4401

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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Customer notification

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Contact information

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