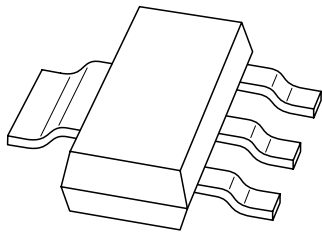


DATA SHEET



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

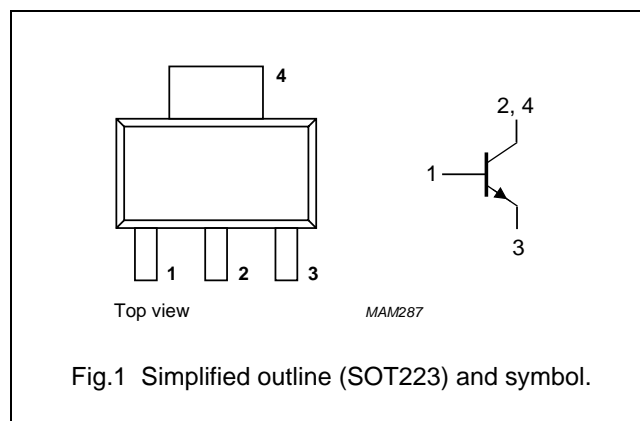
- Switching and linear amplification.

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 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

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".

CHARACTERISTICS

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

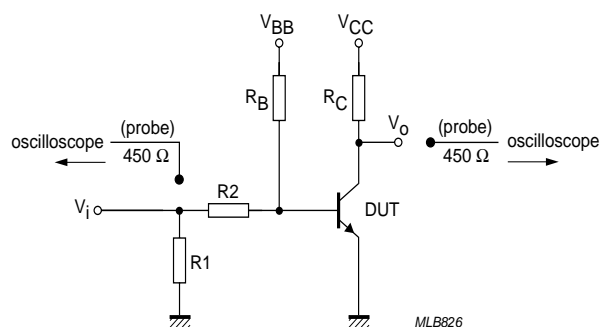
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = 60\text{ V}$	–	10	nA
		$I_E = 0$; $V_{CB} = 60\text{ V}$; $T_{amb} = 125\text{ °C}$	–	10	μA
I_{EBO}	emitter cut-off current	$I_C = 0$; $V_{EB} = 5\text{ V}$	–	10	nA
h_{FE}	DC current gain	$I_C = 0.1\text{ mA}$; $V_{CE} = 10\text{ V}$	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	–	
		$I_C = 150\text{ mA}$; $V_{CE} = 1\text{ V}$; note 1	50	–	
		$I_C = 150\text{ mA}$; $V_{CE} = 10\text{ V}$; note 1	100	300	
		$I_C = 500\text{ mA}$; $V_{CE} = 10\text{ V}$; 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

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

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

Fig.2 Test circuit for switching times.

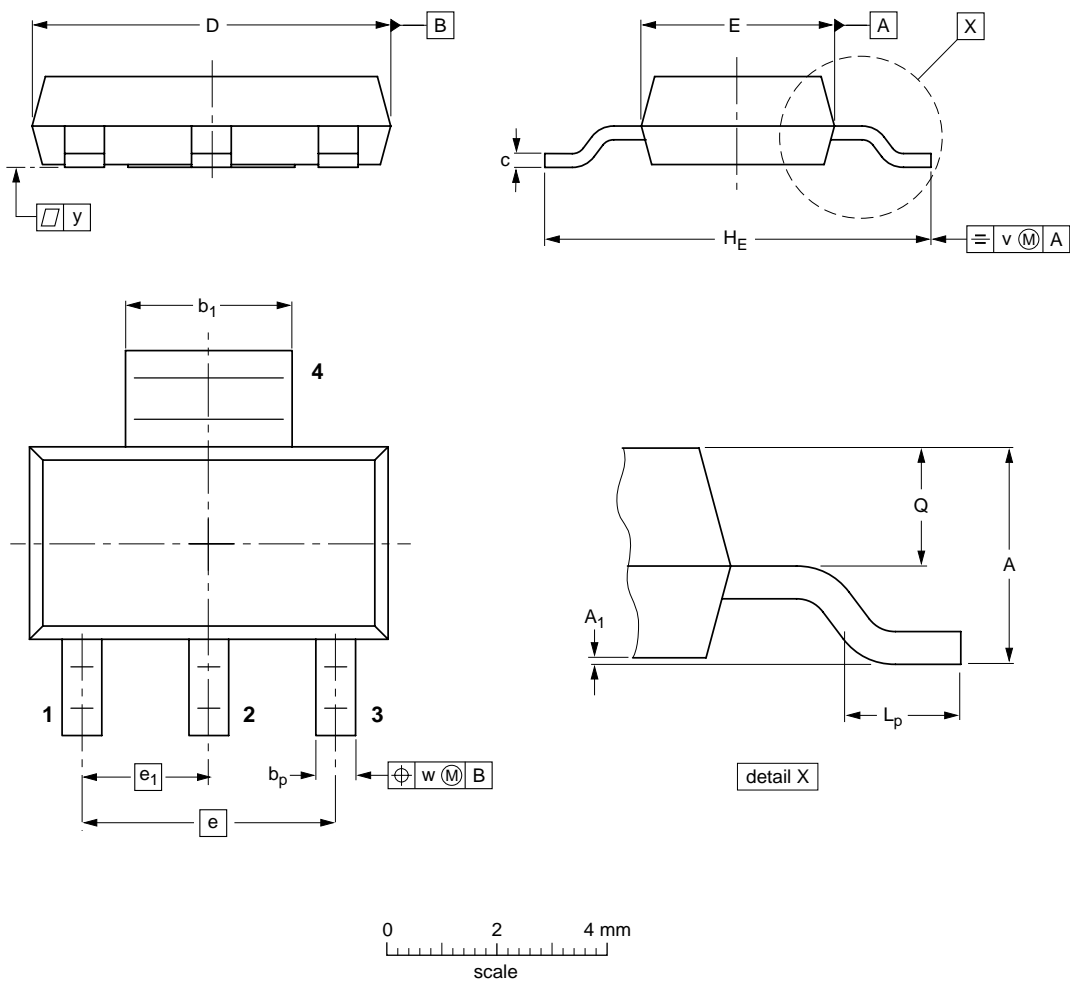
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PACKAGE OUTLINE


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

SOT223



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b _p	b ₁	c	D	E	e	e ₁	H _E	L _p	Q	v	w	y
mm	1.8 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT223			SC-73			97-02-28 99-09-13

NPN switching transistor

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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

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.

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