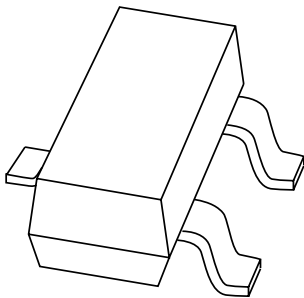


# DATA SHEET



## **PMBT5401** PNP high-voltage transistor

Product data sheet  
Supersedes data of 1999 Apr 15

2004 Jan 21

## PNP high-voltage transistor

## PMBT5401

## FEATURES

- Low current (max. 300 mA)
- High voltage (max. 150 V).

## APPLICATIONS

- Switching and amplification in high voltage applications such as telephony.

## DESCRIPTION

PNP high-voltage transistor in a SOT23 plastic package.  
NPN complement: PMBT5550.

## MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PMBT5401	*2L

## Note

- \* = p : Made in Hong Kong.  
\* = t : Made in Malaysia.  
\* = W : Made in China.

## PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

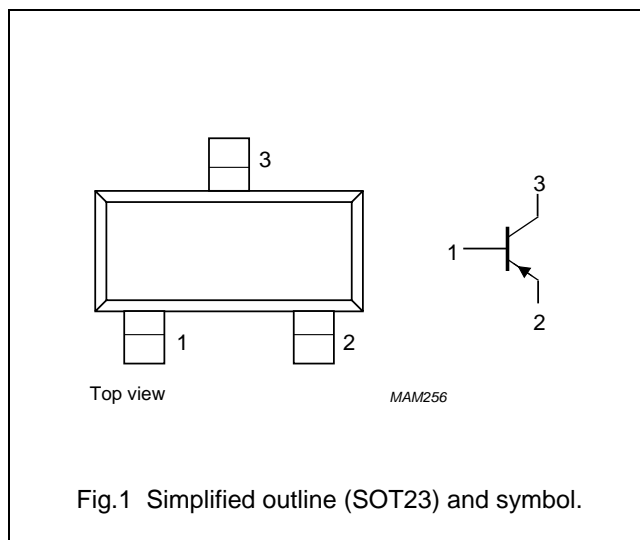


Fig.1 Simplified outline (SOT23) and symbol.

## ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PMBT5401	—	plastic surface mounted package; 3 leads	SOT23

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	—	–160	V
$V_{CEO}$	collector-emitter voltage	open base	—	–150	V
$V_{EBO}$	emitter-base voltage	open collector	—	–5	V
$I_C$	collector current (DC)		—	–300	mA
$I_{CM}$	peak collector current		—	–600	mA
$I_{BM}$	peak base current		—	–100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 1	—	250	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		—	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

## Note

1. Transistor mounted on an FR4 printed-circuit board.

## PNP high-voltage transistor

## PMBT5401

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	500	K/W

## Note

1. Transistor mounted on an FR4 printed-circuit board.

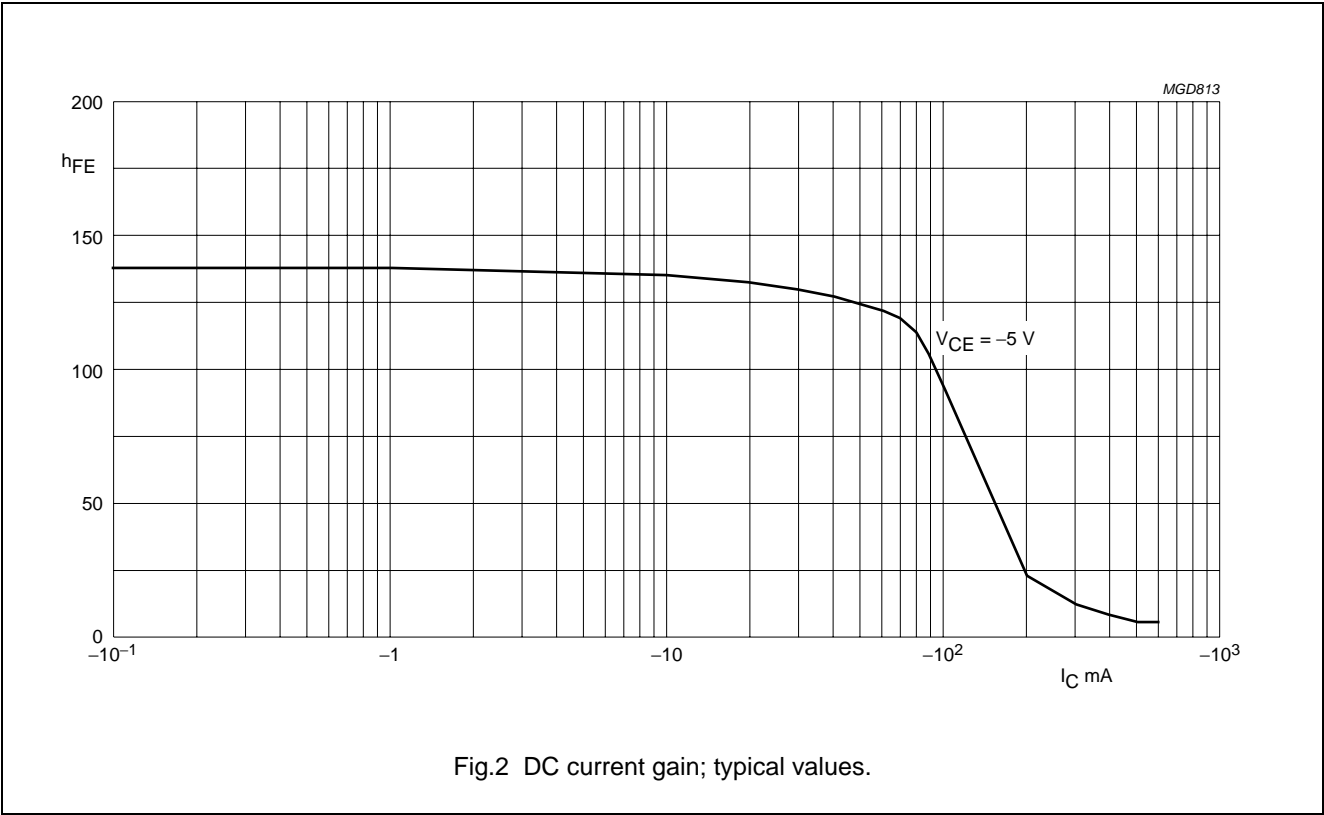
## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$I_E = 0; V_{CB} = -120\text{ V}$	–	–50	nA
		$I_E = 0; V_{CB} = -120\text{ V}; T_{amb} = 150\text{ °C}$	–	–50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$I_C = 0; V_{EB} = -4\text{ V}$	–	–50	nA
$h_{FE}$	DC current gain	$V_{CE} = -5\text{ V};$ (see Fig.2)			
		$I_C = -1\text{ mA}$	50	–	
		$I_C = -10\text{ mA}$	60	240	
		$I_C = -50\text{ mA}$	50	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	–	–200	mV
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	–	–500	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	–	–1	V
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	–	–1	V
$C_c$	collector capacitance	$I_E = I_e = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	–	6	pF
$f_T$	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -10\text{ V};$ $f = 100\text{ MHz}; T_{amb} = 25\text{ °C}$	100	300	MHz
F	noise figure	$I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 10\text{ Hz to }15.7\text{ kHz}; T_{amb} = 25\text{ °C}$	–	8	dB

PNP high-voltage transistor

PMBT5401



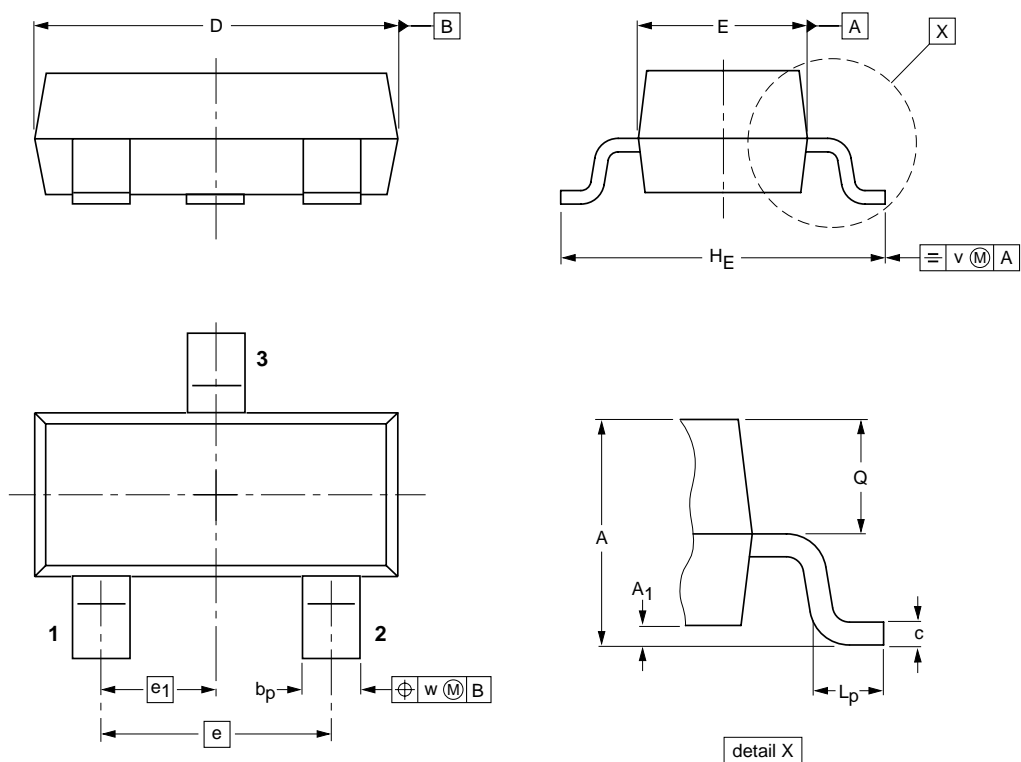
PNP high-voltage transistor

PMBT5401

PACKAGE OUTLINE


Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				04-11-04 06-03-16

## PNP high-voltage transistor

PMBT5401

## 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.

## Notes

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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.

## **Contact information**

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

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Printed in The Netherlands

R75/04/pp7

Date of release: 2004 Jan 21

Document order number: 9397 750 12502

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