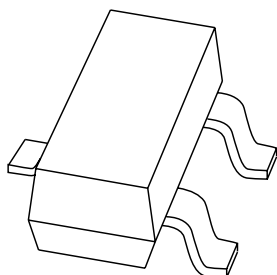


DATA SHEET



PMBS3906

PNP general purpose transistor

Product specification
Supersedes data of 1999 Apr 22

2004 Feb 02

PNP general purpose transistor

PMBS3906

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 40 V).

APPLICATIONS

- General purpose switching and amplification, e.g. telephony and professional communication equipment.

DESCRIPTION

PNP transistor in a SOT23 plastic package.
NPN complement: PMBS3904.

MARKING

TYPE NUMBER	MARKING CODE ⁽¹⁾
PMBS3906	*O6

Note

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

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

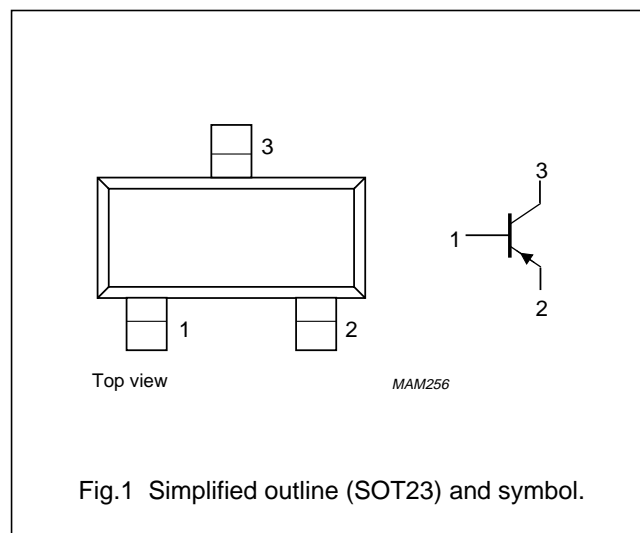


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PMBS3906	—	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	—	–40	V
V_{CEO}	collector-emitter voltage	open base	—	–40	V
V_{EBO}	emitter-base voltage	open collector	—	–5	V
I_C	collector current capability		—	–100	mA
I_{CM}	peak collector current		—	–200	mA
I_{BM}	peak base current		—	–200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	—	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		—	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

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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

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = -30\text{ V}$	—	—50	nA
I_{EBO}	emitter cut-off current	$I_C = 0$; $V_{EB} = -5\text{ V}$	—	—50	nA
h_{FE}	DC current gain	$V_{CE} = -1\text{ V}$; (see Fig.2) $I_C = -0.1\text{ mA}$ $I_C = -1\text{ mA}$ $I_C = -10\text{ mA}$ $I_C = -50\text{ mA}$; note 1 $I_C = -100\text{ mA}$; note 1	60 80 100 60 30	— — 300 — —	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$ $I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$; note 1	— —	—250 —400	mV mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$ $I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$; note 1	— —	—850 —950	mV mV
C_c	collector capacitance	$I_E = i_e = 0$; $V_{CB} = -5\text{ V}$; $f = 100\text{ MHz}$	—	4.5	pF
C_e	emitter capacitance	$I_C = i_c = 0$; $V_{EB} = -0.5\text{ V}$; $f = 100\text{ MHz}$	—	12	pF
f_T	transition frequency	$I_C = -10\text{ mA}$; $V_{CE} = -20\text{ V}$; $f = 100\text{ MHz}$	150	—	MHz
F	noise figure	$I_C = -100\text{ }\mu\text{A}$; $V_{CE} = -5\text{ V}$; $R_S = 1\text{ k}\Omega$; $f = 10\text{ Hz}$ to 15.7 kHz	—	4	dB

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

t_{on}	turn-on time	$I_{Con} = -10\text{ mA}$; $I_{Bon} = -1\text{ mA}$; $I_{Boff} = 1\text{ mA}$	—	100	ns
t_d	delay time		—	50	ns
t_r	rise time		—	50	ns
t_{off}	turn-off time		—	700	ns
t_s	storage time		—	600	ns
t_f	fall time		—	100	ns

Note

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

PNP general purpose transistor

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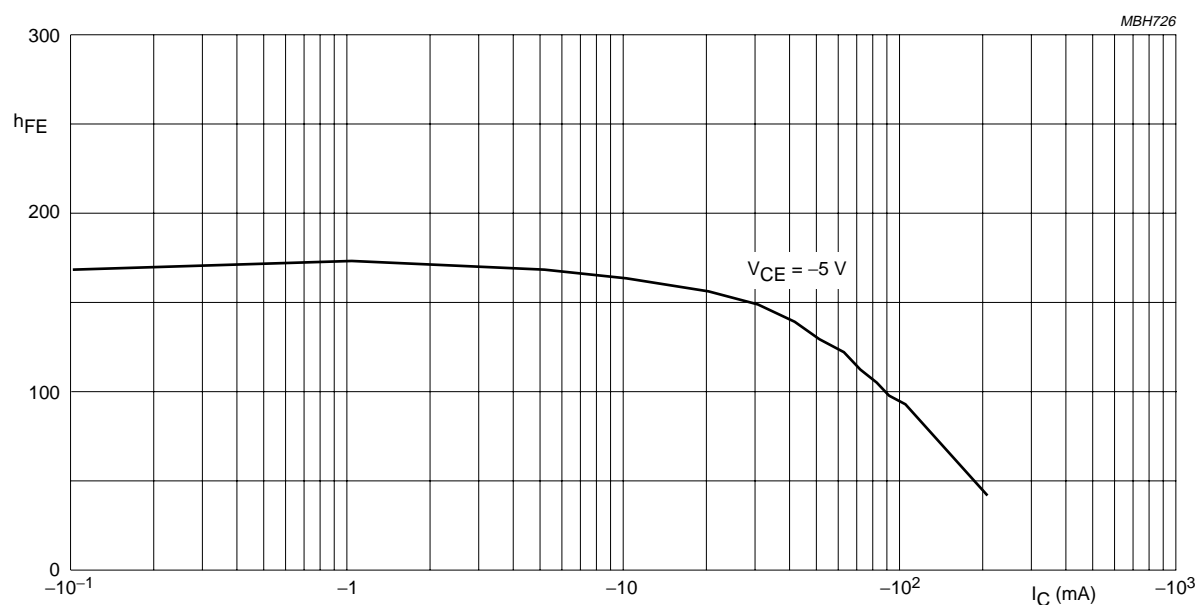
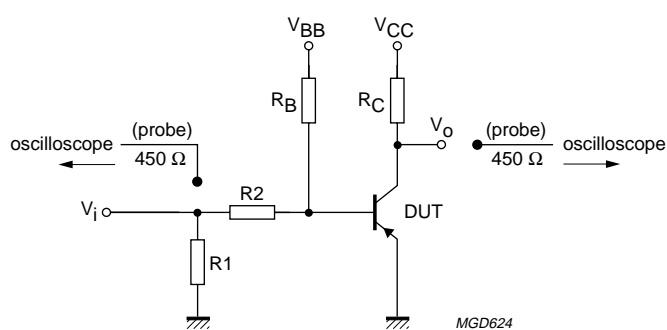


Fig.2 DC current gain; typical values.



$V_i = -5\text{ V}$; $T = 500\text{ }\mu\text{s}$; $t_p = 10\text{ }\mu\text{s}$; $t_r = t_f \leq 3\text{ ns}$.
 $R_1 = 56\text{ }\Omega$; $R_2 = 2.5\text{ k}\Omega$; $R_B = 3.9\text{ k}\Omega$; $R_C = 270\text{ }\Omega$.
 $V_{BB} = 1.9\text{ V}$; $V_{CC} = 3\text{ V}$.
 Oscilloscope input impedance $Z_i = 50\text{ }\Omega$.

Fig.3 Test circuit for switching times.

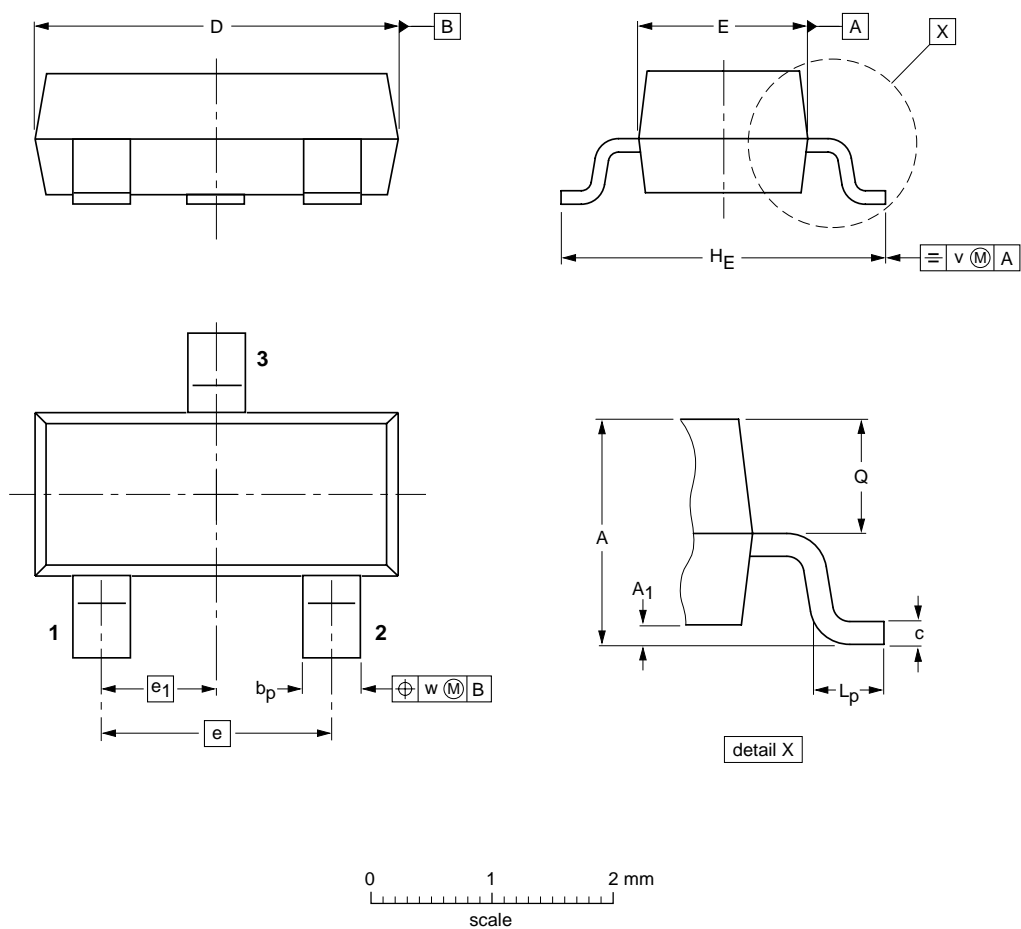
PNP general purpose transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max.	b _p	c	D	E	e	e ₁	H _E	L _p	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	EIAJ			
SOT23		TO-236AB				97-02-28 99-09-13

PNP general purpose transistor

PMBS3906

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
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Notes

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DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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