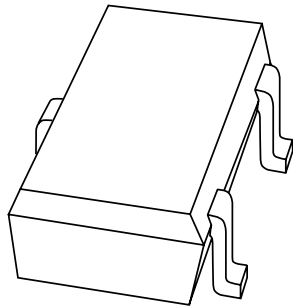


# DATA SHEET



## **PMSS3906** PNP switching transistor

Product specification  
Supersedes data of 1999 Apr 22

2004 Jan 09

## PNP switching transistor

## PMSS3906

## FEATURES

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

## APPLICATIONS

- Switching, e.g. telephony and professional communication equipment.

## DESCRIPTION

PNP switching transistor in an SOT323 (SC-70) plastic package. NPN complement: PMSS3904.

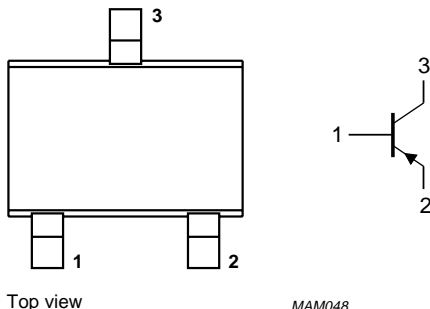
## PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE <sup>(1)</sup>	NPN COMPLEMENT
	PHILIPS	EIAJ		
PMSS3906	SOT323	SC-70	06*	PMSS3904

## Note

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

## SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
PMSS3906	 <p>Top view</p> <p>MAM048</p>	1 2 3	base emitter collector

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	TYP.	MAX.	UNIT
$V_{CE0}$	collector-emitter voltage	–	–40	V
$I_C$	collector current	–	–100	mA
$h_{FE}$	DC current gain	100	300	

## PNP switching transistor

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## ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PMSS3906	–	plastic surface mounted package; 3 leads	SOT323

## 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 (DC)		–	–100	mA
$I_{CM}$	peak collector current		–	–200	mA
$I_{BM}$	peak base current		–	–100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; notes 1 and 2	–	200	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

## Notes

1. Refer to standard mounting conditions.
2. Transistor mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint.

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	notes 1 and 2	625	K/W

## Notes

1. Refer to standard mounting conditions.
2. Transistor mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint.

## PNP switching transistor

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## CHARACTERISTICS

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

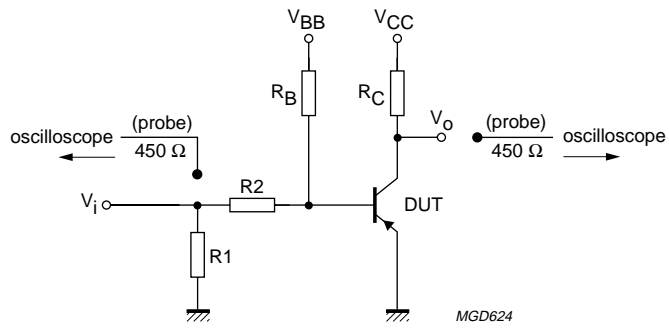
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$I_E = 0; V_{CB} = -30\text{ V}$	–	–50	nA
		$I_E = 0; V_{CB} = -30\text{ V}; T_j = 150\text{ °C}$	–	–10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	–	–50	nA
$h_{FE}$	DC current gain	$V_{CE} = -1\text{ V}$			
		$I_C = -0.1\text{ mA}$	60	–	
		$I_C = -1\text{ mA}$	80	–	
		$I_C = -10\text{ mA}$	100	300	
		$I_C = -50\text{ mA}; \text{note 1}$	60	–	
		$I_C = -100\text{ mA}; \text{note 1}$	30	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	–	–250	mV
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	–	–400	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	–	–850	mV
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	–	–950	mV
$C_C$	collector capacitance	$I_E = i_e = 0; V_{CB} = -5\text{ V}; f = 1\text{ MHz}$	–	4.5	pF
$C_e$	emitter capacitance	$I_C = i_c = 0; V_{EB} = -0.5\text{ V}; f = 1\text{ MHz}$	–	14	pF
$f_T$	transition frequency	$I_E = -10\text{ mA}; V_{CB} = -20\text{ V}; f = 100\text{ MHz}$	150	–	MHz
F	noise figure	$I_C = -100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 1\text{ k}\Omega;$ $f = 10\text{ Hz to }15.7\text{ kHz}$	–	4	dB
<b>Switching times (between 10% and 90% levels); see Fig.1</b>					
$t_{on}$	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:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

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

Fig.1 Test circuit for switching times.

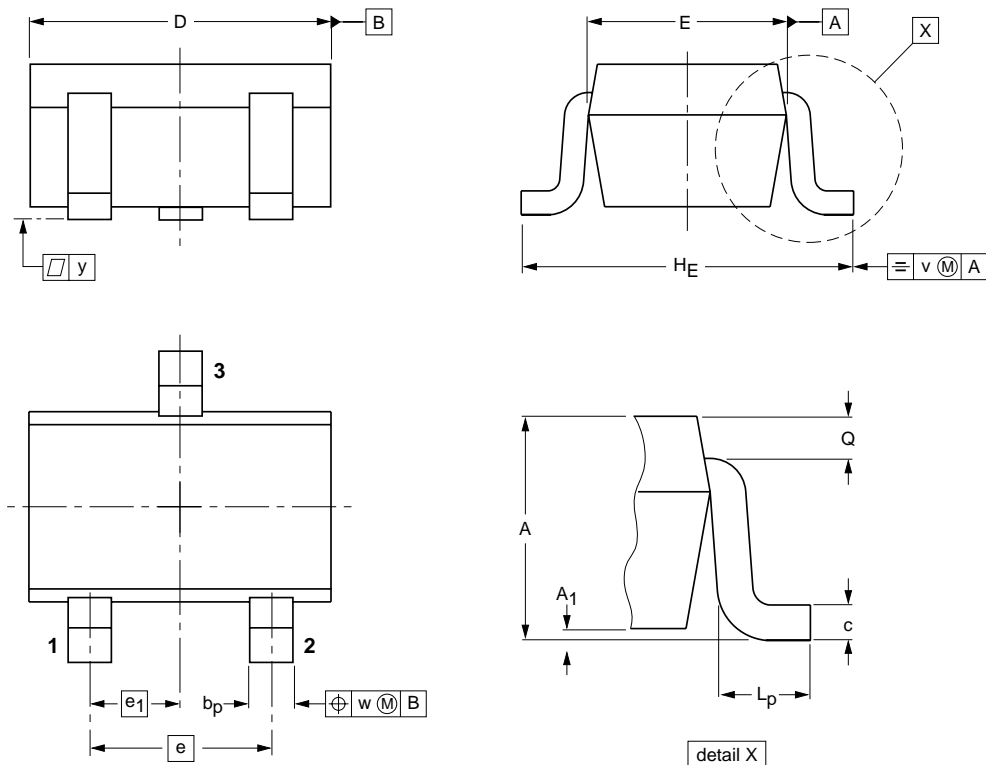
PNP switching transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT323



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 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

## PNP switching transistor

## PMSS3906

## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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.
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