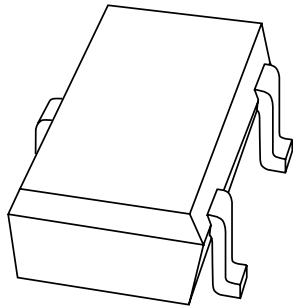


# DATA SHEET



## **PMSS3906** PNP switching transistor

Product data sheet  
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.

### 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	

### 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

## PNP switching transistor

PMSS3906

## 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.

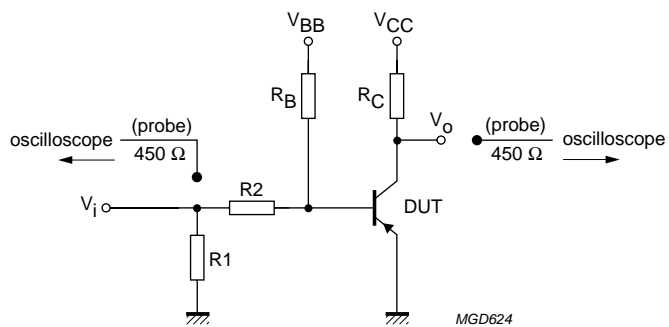
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$I_E = 0; V_{CB} = -30\text{ V}$	–	–50	nA
		$I_E = 0; V_{CB} = -30\text{ V}; T_j = 150\text{ °C}$	–	–10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	–	–50	nA
$h_{FE}$	DC current 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.

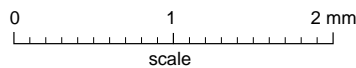
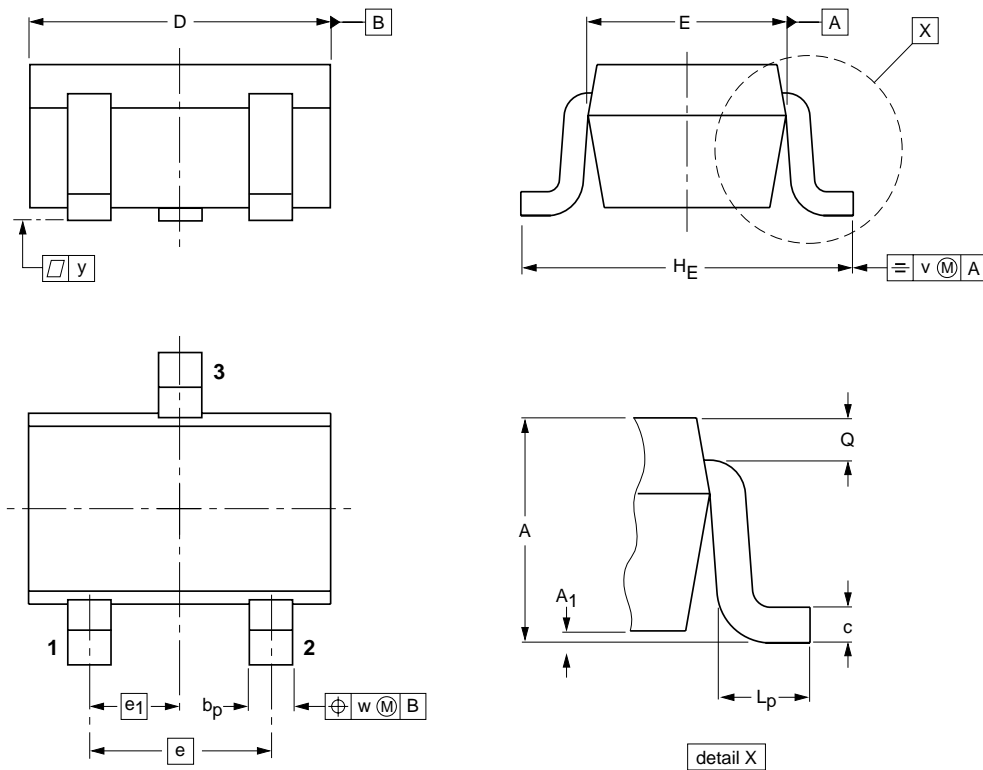
PNP switching transistor

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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	JEITA			
SOT323			SC-70			<del>04-11-04</del> 06-03-16

PNP switching transistor

PMSS3906

**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.

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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**

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