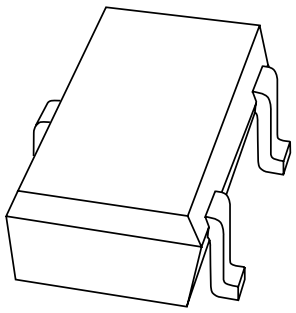
DATA SHEET



PMSS3906
PNP switching transistor

Product data sheet
Supersedes data of 1999 Apr 22

2004 Jan 09

NXP founded by Philips

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_{CEO}	collector-emitter voltage	–	–40	V
I_C	collector current	–	–100	mA
h_{FE}	DC current gain	100	300	

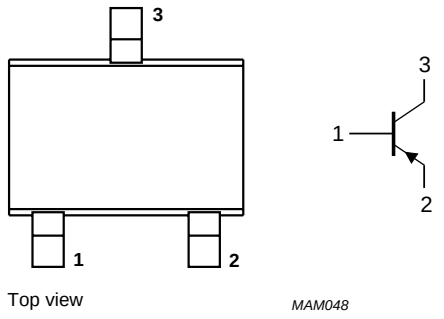
PRODUCT OVERVIEW

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

Note

1. * = 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		1	base
		2	emitter
		3	collector

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	$T_{amb} \leq 25$ °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.

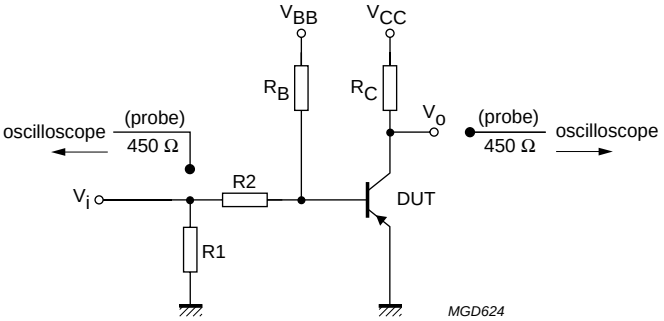
CHARACTERISTICS

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

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

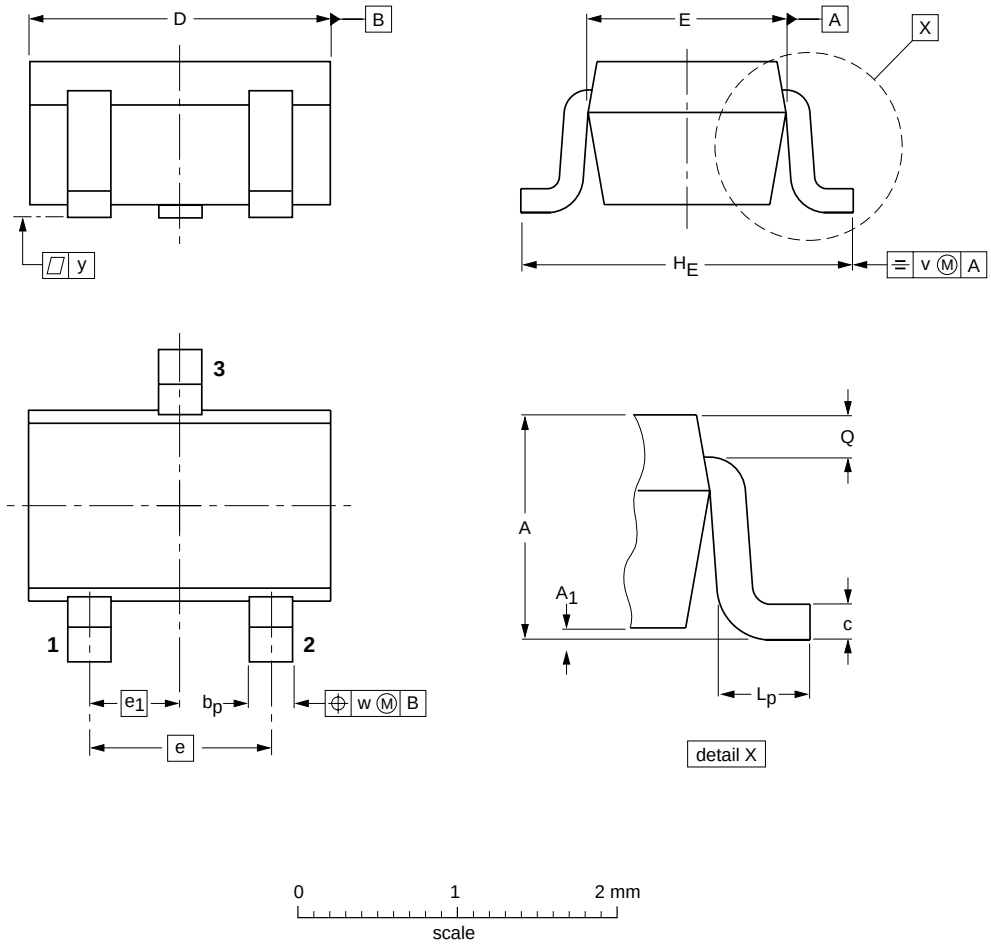


V_i = −5 V; T = 500 μs; t_p = 10 μs; $t_r = t_f \leq 3$ ns.
R1 = 56 Ω; R2 = 2.5 kΩ; R_B = 3.9 kΩ; R_C = 270 Ω.
V_{BB} = 1.9 V; V_{CC} = 3 V.
Oscilloscope input impedance Z_i = 50 Ω.

Fig.1 Test circuit for switching times.

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads **SOT323**



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 0.8	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			~~04-11-04~~ 06-03-16

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.

Notes

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2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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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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