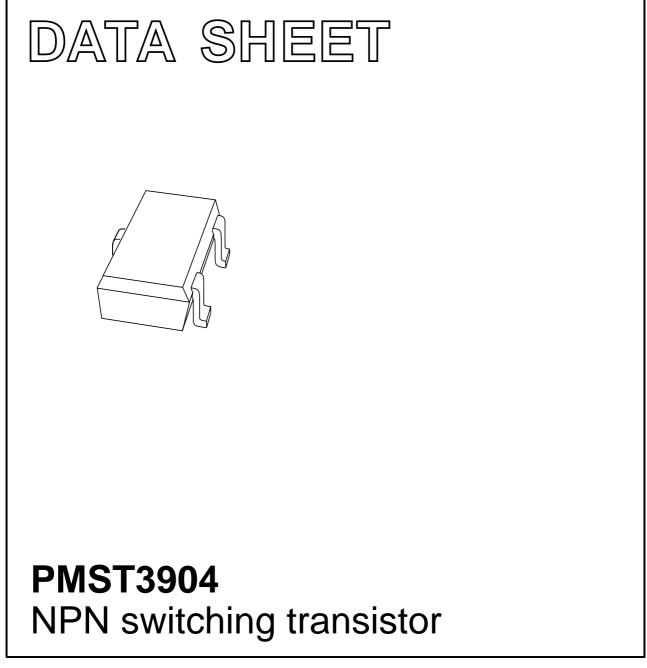
# DISCRETE SEMICONDUCTORS



Product data sheet Supersedes data of 1999 Apr 22 2004 Jan 21



## **PMST3904**

### FEATURES

- Collector current capability I<sub>C</sub> = 200 mA
- Collector-emitter voltage V<sub>CEO</sub> = 40 V.

## APPLICATIONS

• General amplification and switching.

### DESCRIPTION

NPN switching transistor in a SOT323 plastic package. PNP complement: PMST3906.

#### MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PMST3904	*1A

#### Note

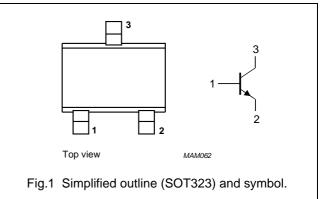
- 1. \* = p: Made in Hong Kong.
  - \* = t: Made in Malaysia.
  - \* = W: Made in China.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V <sub>CEO</sub>	collector-emitter voltage	40	V
I <sub>C</sub>	collector current (DC)	200	mA

#### PINNING

PIN	DESCRIPTION	
1	base	
2	emitter	
3	collector	



#### **ORDERING INFORMATION**

TYPE	PACKAGE				
NUMBER	NAME	DESCRIPTION VERSION			
PMST3904	_	<ul> <li>plastic surface mounted package; 3 leads</li> </ul>			

# PMST3904

### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter	-	60	V
V <sub>CEO</sub>	collector-emitter voltage	open base	-	40	V
V <sub>EBO</sub>	emitter-base voltage	open collector	-	6	V
I <sub>C</sub>	collector current (DC)		-	200	mA
I <sub>CM</sub>	peak collector current		-	200	mA
I <sub>BM</sub>	peak base current		-	100	mA
P <sub>tot</sub>	total power dissipation	$T_{amb} \le 25 \text{ °C}; \text{ note } 1$	-	200	mW
T <sub>stg</sub>	storage temperature		-65	+150	°C
Tj	junction temperature		-	150	°C
T <sub>amb</sub>	operating ambient temperature		-65	+150	°C

#### Note

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

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	note 1	625	K/W

#### Note

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

# PMST3904

### CHARACTERISTICS

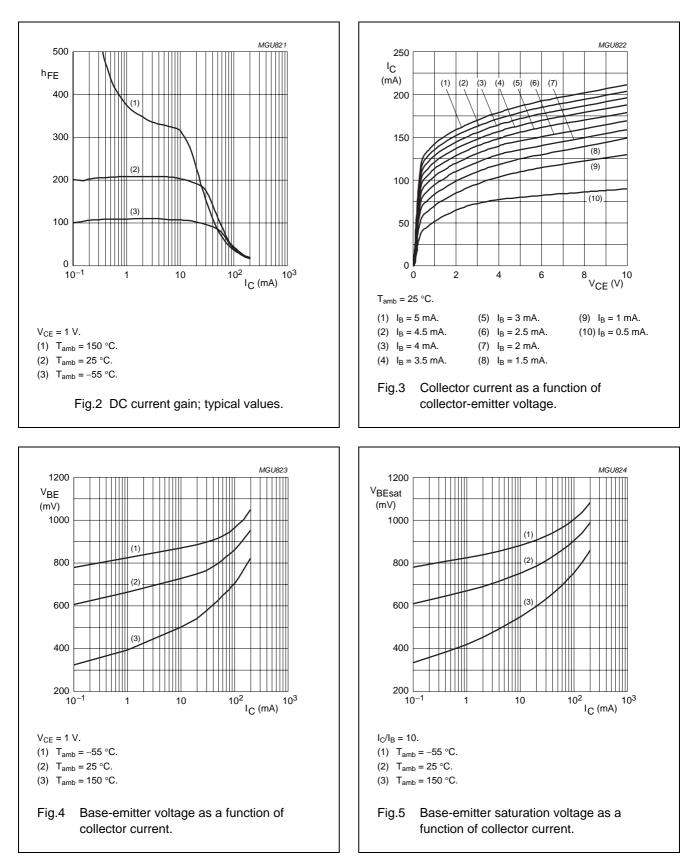
 $T_{amb}$  = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I <sub>CBO</sub>	collector cut-off current	I <sub>E</sub> = 0; V <sub>CB</sub> = 30 V	_	50	nA
I <sub>EBO</sub>	emitter cut-off current	$I_{\rm C} = 0; V_{\rm EB} = 6 \text{ V}$	-	50	nA
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = 1 V; see Fig.2; note 1			
		I <sub>C</sub> = 0.1 mA	60	-	
		$I_{C} = 1 \text{ mA}$	80	-	
		I <sub>C</sub> = 10 mA	100	300	
		I <sub>C</sub> = 50 mA	60	-	
		I <sub>C</sub> = 100 mA	30	-	
V <sub>CEsat</sub>	collector-emitter saturation	I <sub>C</sub> = 10 mA; I <sub>B</sub> = 1 mA	-	200	mV
	voltage	I <sub>C</sub> = 50 mA; I <sub>B</sub> = 5 mA	-	300	mV
V <sub>BEsat</sub>	base-emitter saturation voltage	I <sub>C</sub> = 10 mA; I <sub>B</sub> = 1 mA	650	850	mV
		I <sub>C</sub> = 50 mA; I <sub>B</sub> = 5 mA	-	950	mV
C <sub>c</sub>	collector capacitance	$I_{E} = I_{e} = 0; V_{CB} = 5 V; f = 1 MHz$	-	4	pF
C <sub>e</sub>	emitter capacitance	$I_{C} = I_{c} = 0$ ; $V_{BE} = 500 \text{ mV}$ ; f = 1 MHz	-	8	pF
f <sub>T</sub>	transition frequency	$I_{C} = 10 \text{ mA}; V_{CE} = 20 \text{ V};$ f = 100 MHz	300	-	MHz
F	noise figure	$I_C$ = 100 μA; $V_{CE}$ = 5 V; $R_S$ = 1 kΩ; f = 10 Hz to 15.7 kHz	_	5	dB
Switching t	imes (between 10% and 90% lev	<b>els);</b> see Fig.7			
t <sub>d</sub>	delay time	I <sub>Con</sub> = 10 mA; I <sub>Bon</sub> = 1 mA;	_	35	ns
t <sub>r</sub>	rise time	I <sub>Boff</sub> = –1 mA	_	35	ns
ts	storage time	]	_	200	ns
t <sub>f</sub>	fall time		_	50	ns

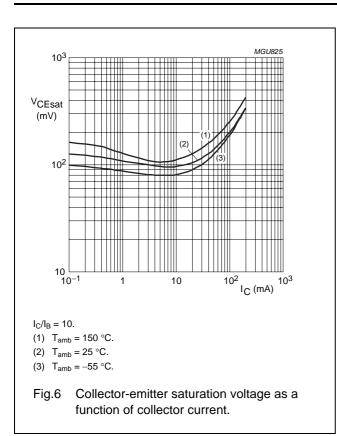
## Note

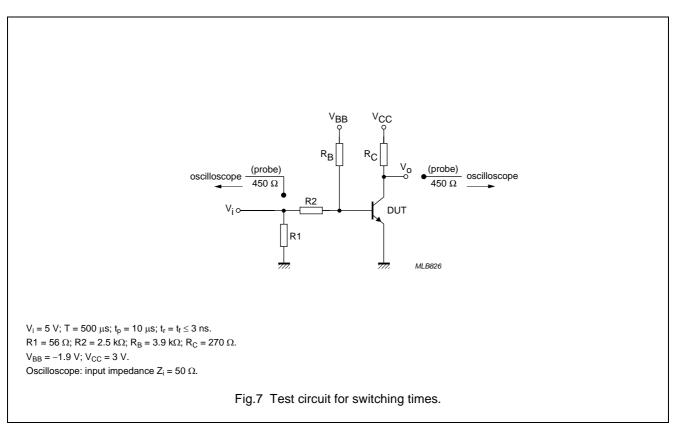
1. Pulse test:  $t_p \leq 300~\mu s;~\delta \leq 0.02.$ 

## PMST3904

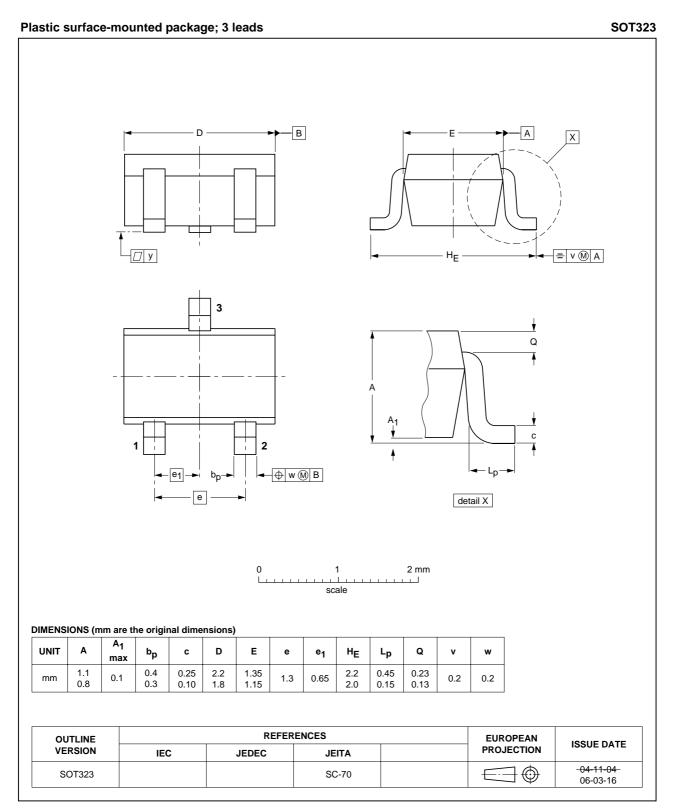


# PMST3904





### PACKAGE OUTLINE



## PMST3904

PMST3904

### 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

- 1. Please consult the most recently issued document before initiating or completing a design.
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# **NXP Semiconductors**

#### **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 For sales offices addresses send e-mail to: salesaddresses@nxp.com

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